Computer algebra independent integration tests

`1_Algebraic_functions/1.1_Binomial_products/1.1.3General/1.1.3.2(cx)^m(a+bx^n)^p`

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Contents

1 Introduction

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

1.1 Listing of CAS systems tested

The following systems were tested at this time.

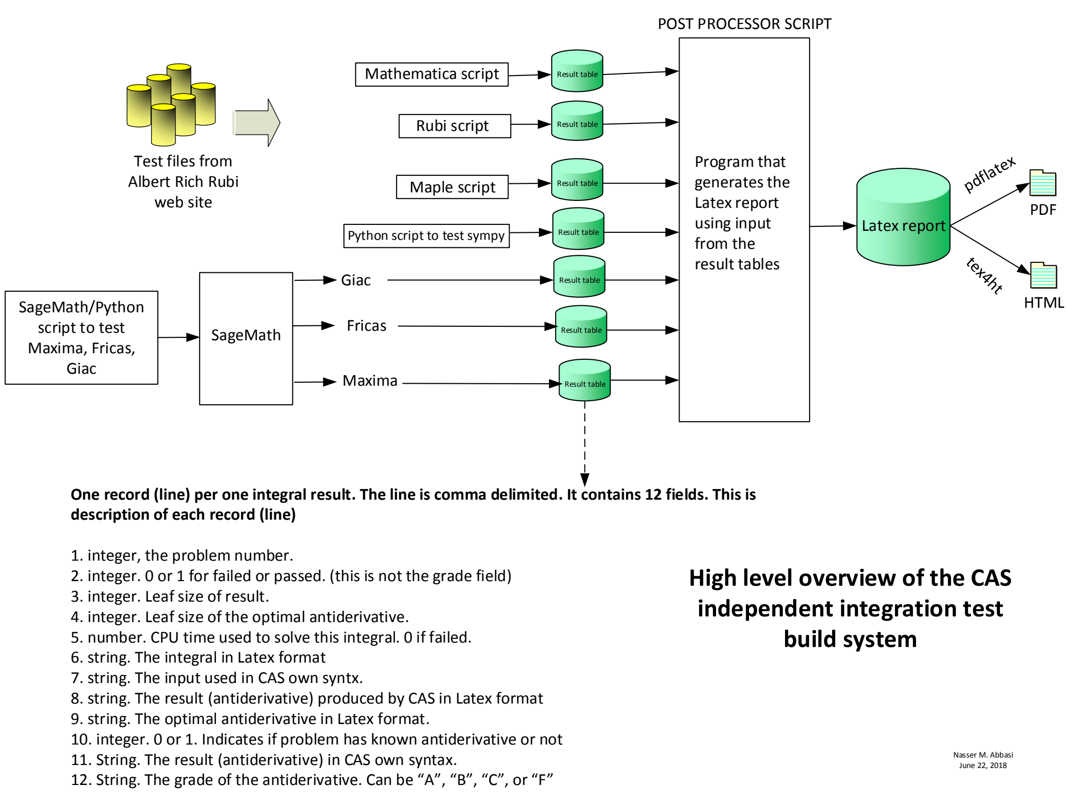
1. Mathematica 11.3 (64 bit).
2. Rubi 4.15.2 in Mathematica 11.3.
3. Rubi in Sympy (Version 1.3) under Python 3.7.0 using Anaconda distribution.
4. Maple 2018.1 (64 bit).
5. Maxima 5.41 Using Lisp ECL 16.1.2.
6. Fricas 1.3.4.
7. Sympy 1.3 under Python 3.7.0 using Anaconda distribution.
8. Giac/Xcas 1.4.9.

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

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

1.2 Design of the test system

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



1.3 Timing

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

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

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

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

1.4 Verification

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

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

1.5 Important notes about some of the results

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

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

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

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

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

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

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

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

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

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

These will fail With error `Exception raised: NotImplementedError`

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

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

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

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

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

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

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

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

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

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

  except Exception as ee:
         leafCount =1
```

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

1.6 Grading of results

The table below summarizes the grading of each CAS system.

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

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

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

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

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

System	solved	Failed
Rubi	% 100. (3071)	% 0. (0)
Rubi in Sympy	% 86.49 (2656)	% 13.51 (415)
Mathematica	% 97.2 (2985)	% 2.8 (86)
Maple	% 84.14 (2584)	% 15.86 (487)
Maxima	% 54.38 (1670)	% 45.62 (1401)
Fricas	% 76.59 (2352)	% 23.41 (719)
Sympy	% 78.25 (2403)	% 21.75 (668)
Giac	% 63.76 (1958)	% 36.24 (1113)

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

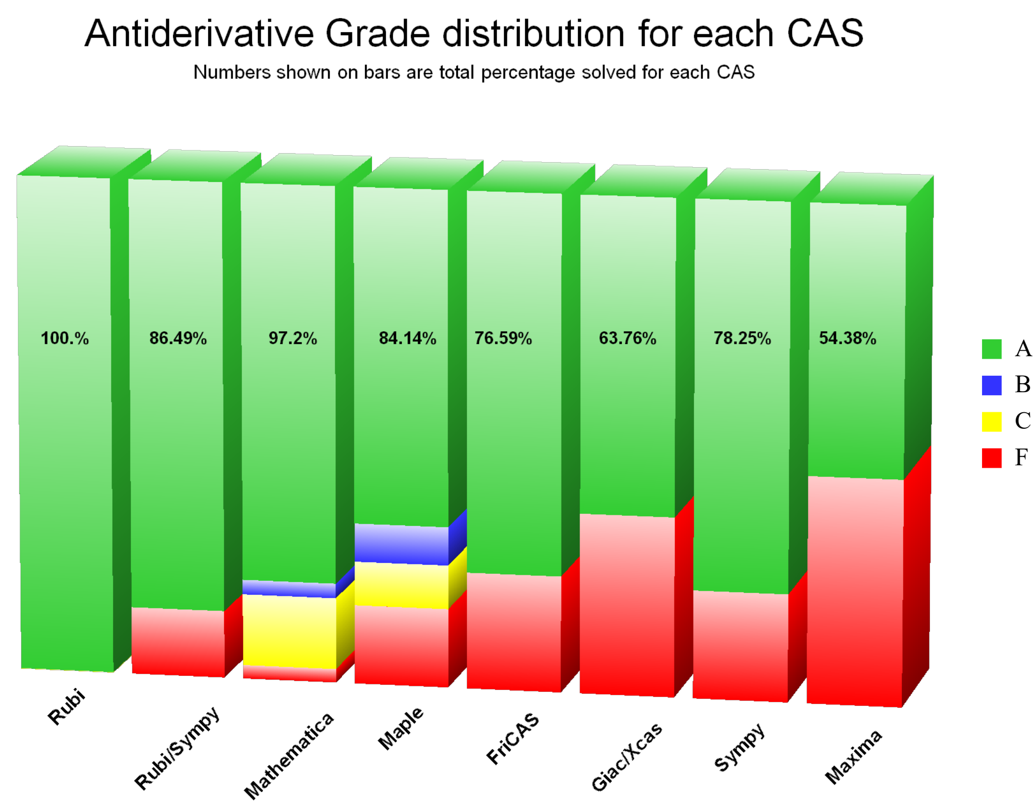
grade	description
A	Integral was solved and antiderivative is optimal in quality and leaf size.
B	Integral was solved and antiderivative is optimal in quality but leaf size is larger than twice the optimal antiderivatives leaf size.
C	Integral was solved and antiderivative is non-optimal in quality.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

Grading is currently implemented only for for Mathematica, Rubi and Maple results. For all other CAS systems (Maxima, Fricas, Sympy, Giac, Rubi in sympy), the grading function is not yet implemented. For these systems, a grade of A is assigned if the integrate command completes successfully and a grade of F otherwise.

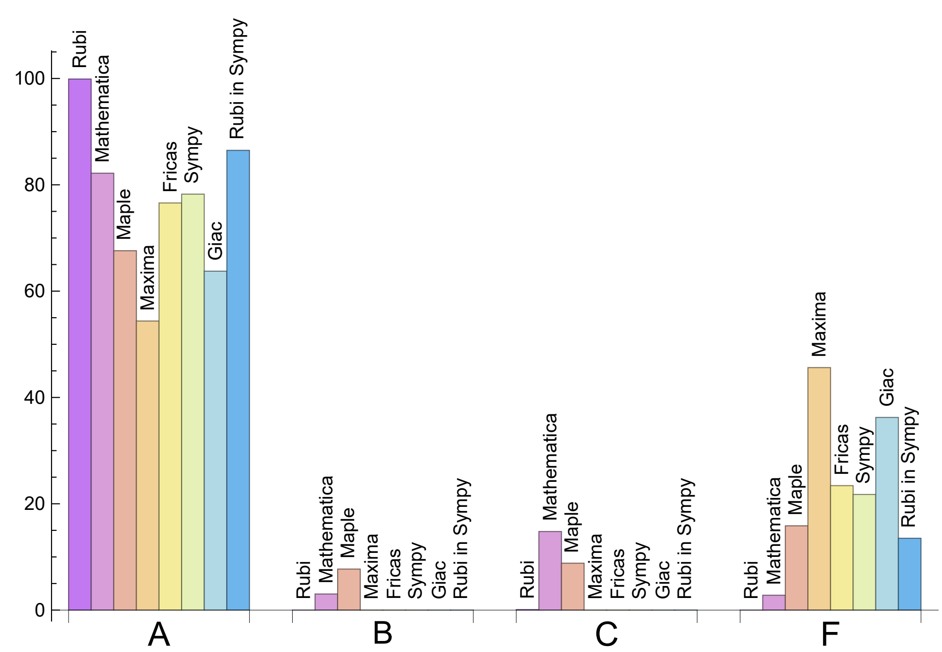
Based on the above, the following table summarizes the grading for this test suite.

System	% A grade	% B grade	% C grade	% F grade
Rubi	99.9	0.	0.1	0.
Rubi in Sympy	86.49	0.	0.	13.51
Mathematica	82.19	3.03	14.78	2.8
Maple	67.6	7.72	8.82	15.86
Maxima	54.38	0.	0.	45.62
Fricas	76.59	0.	0.	23.41
Sympy	78.25	0.	0.	21.75
Giac	63.76	0.	0.	36.24

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



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



1.7 Performance

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

System	Mean time (sec)	Mean size	Normalized mean	Median size	Normalized median
Rubi	0.12	87.29	1.01	58.	1.
Rubi in Sympy	14.02	76.47	0.88	49.	0.87
Mathematica	0.11	73.84	1.01	54.	0.94
Maple	0.11	133.34	1.54	47.	0.87
Maxima	1.67	72.45	1.43	47.	1.16
Fricas	0.24	103.85	1.38	47.	1.18
Sympy	9.6	135.53	1.96	39.	0.93
Giac	0.29	100.66	1.53	59.	1.19

1.8 list of integrals that has no closed form antiderivative

{}

1.9 list of integrals not solved by each system

Not solved by Rubi {}

Not solved by Rubi in Sympy {5, 16, 28, 39, 48, 57, 78, 93, 102, 123, 182, 191, 196, 202, 207, 208, 209, 211, 212, 221, 222, 223, 224, 226, 227, 228, 241, 242, 243, 251, 252, 253, 255, 257, 264, 265, 266, 267, 268, 277, 278, 279, 281, 283, 292, 293, 294, 295, 296, 297, 298, 299, 310, 311, 312, 314, 316, 318, 319, 329, 340, 352, 353, 604, 606, 607, 610, 611, 623, 624, 625, 627, 629, 635, 636, 637, 639, 641, 642, 643, 656, 685, 686, 1023, 1024, 1025, 1026, 1027, 1028, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1145, 1146, 1147, 1148, 1149, 1150, 1151, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1265, 1266, 1267, 1268, 1274, 1275, 1276, 1277, 1283, 1284, 1288, 1289, 1293, 1298, 1299, 1300, 1301, 1302, 1303, 1304, 1305, 1318, 1320, 1324, 1326, 1331, 1333, 1337, 1339, 1400, 1401, 1402, 1426, 1427, 1428, 1429, 1438, 1441, 1445, 1548, 1549, 1550, 1559, 1561, 1562, 1572, 1573, 1574, 1589, 1590, 1591, 1592, 1593, 1594, 1595, 1596, 1605, 1606, 1607, 1608, 1609, 1617, 1618, 1619, 1620, 1621, 1622, 1631, 1632, 1633, 1634, 1635, 1805, 1806, 1807, 1808, 1817, 1818, 1820, 1821, 1828, 1829, 1831, 1833, 1834, 1841, 1842, 1843, 1844, 1845, 1846, 1856, 1857, 1858, 1859, 1860, 1861, 1872, 1873, 1874, 1875, 1876, 1963, 1964, 1965, 1966, 1976, 1977, 1978, 1979, 2104, 2107, 2112, 2113, 2122, 2123, 2133, 2134, 2144, 2145, 2146, 2156, 2157, 2158, 2159, 2160, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2189, 2190, 2191, 2192, 2197, 2198, 2199, 2205, 2206, 2207, 2213, 2214, 2215, 2221, 2222, 2228, 2229, 2248, 2281, 2282, 2291, 2292, 2301, 2310, 2311, 2322, 2323, 2324, 2325, 2338, 2339, 2340, 2341, 2349, 2350, 2351, 2352, 2358, 2359, 2360, 2361, 2366, 2367, 2368, 2373, 2376, 2383, 2390, 2391, 2409, 2414, 2415, 2416, 2422, 2423, 2424, 2430, 2431, 2432, 2437, 2438, 2441, 2446, 2447, 2453, 2454, 2455, 2460, 2461, 2462, 2523, 2525, 2526, 2536, 2537, 2538, 2548, 2549, 2550, 2551, 2552, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2590, 2591, 2592, 2593, 2599, 2600, 2601, 2602, 2608, 2609, 2610, 2611, 2617, 2618, 2625, 2821, 2830, 2831, 2832, 2833, 2835, 2904, 2948, 2949, 2950, 2951, 2953, 2955, 2956, 2957, 2958, 2959, 2960, 2961, 2962, 2963, 2964, 2965, 2966, 2968, 2969, 2970, 2971, 2972, 2973, 2974, 2996, 2999, 3000, 3001, 3006, 3007, 3021, 3022, 3023, 3033, 3034, 3035, 3039, 3040, 3041, 3042, 3043, 3044, 3054, 3065, 3066, 3067}

Not solved by Mathematica {2105, 2106, 2922, 2926, 2927, 2928, 2929, 2930, 2932, 2933, 2934, 2935, 2936, 2938, 2939, 2941, 2942, 2943, 2944, 2946, 2947, 2948, 2951, 2952, 2955, 2956, 2957, 2958, 2959, 2960, 2961, 2962, 2963, 2964, 2965, 2966, 2968, 2969, 2970, 2971, 2974, 2988, 2991, 2992, 2995, 2999, 3000, 3001, 3004, 3005, 3006, 3007, 3008, 3011, 3012, 3014, 3024, 3025, 3026, 3027, 3028, 3031, 3032, 3036, 3037, 3038, 3045, 3046, 3047, 3048, 3049, 3050, 3051, 3052, 3053, 3054, 3055, 3056, 3057, 3058, 3059, 3060, 3061, 3062, 3067, 3068}

Not solved by Maple {183, 187, 188, 197, 198, 203, 204, 514, 515, 516, 517, 518, 522, 523, 524, 525, 530, 531, 532, 533, 534, 535, 536, 537, 538, 547, 548, 549, 550, 551, 552, 553, 554, 555, 564, 565, 566, 567, 572, 573, 574, 575, 576, 577, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000, 1001, 1002, 1007, 1008, 1009, 1010, 1011, 1012, 1013, 1014, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1029, 1030, 1031, 1032, 1033, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1060, 1061, 1062, 1063, 1064, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1150, 1151, 1152, 1153, 1154, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1170, 1178, 1179, 1180, 1181, 1182, 1183, 1184, 1185, 1186, 1187, 1188, 1189, 1194, 1195, 1196, 1197, 1198, 1199, 1200, 1201, 1207, 1208, 1209, 1210, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1219, 1225, 1226, 1227, 1228, 1229, 1230, 1231, 1237, 1238, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1248, 1249, 1254, 1255, 1256, 1257, 1258, 1259, 1260, 1261, 1264, 1306, 1307, 1308, 1439, 1443, 1957, 1958, 1959, 1960, 1961, 1962, 2105, 2106, 2243, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2271, 2272, 2274, 2275, 2276, 2386, 2443, 2465, 2466, 2468, 2469, 2470, 2471, 2473, 2474, 2475, 2476, 2478, 2479, 2480, 2481, 2483, 2484, 2485, 2486, 2488, 2489, 2490, 2491, 2493, 2494, 2495, 2496, 2498, 2499, 2500, 2501, 2503, 2504, 2505, 2506, 2508, 2509, 2647, 2648, 2649, 2650, 2656, 2657, 2658, 2659, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2683, 2684, 2685, 2686, 2687, 2688, 2689, 2691, 2692, 2693, 2694, 2695, 2696, 2697, 2698, 2699, 2700, 2702, 2703, 2704, 2717, 2723, 2724, 2725, 2727, 2728, 2729, 2739, 2740, 2741, 2742, 2743, 2744, 2745, 2755, 2756, 2757, 2758, 2759, 2760, 2761, 2762, 2763, 2764, 2765, 2766, 2767, 2768, 2769, 2770, 2771, 2772, 2774, 2775, 2776, 2777, 2778, 2779, 2780, 2781, 2782, 2783, 2784, 2785, 2786, 2787, 2788, 2789, 2790, 2791, 2792, 2793, 2794, 2841, 2843, 2845, 2912, 2913, 2914, 2915, 2916, 2917, 2918, 2919, 2920, 2921, 2935, 2936, 2938, 2939, 2940, 2941, 2942, 2943, 2944, 2946, 2947, 2948, 2949, 2950, 2951, 2963, 2964, 2965, 2966, 2968, 2969, 2970, 2971, 2972, 2973, 2974, 2988, 2989, 2990, 2991, 2992, 2993, 2994, 2995, 2997, 2998, 3019, 3020, 3021, 3022, 3024, 3025, 3026, 3033, 3034, 3036, 3037, 3038, 3039, 3040, 3041, 3042, 3043, 3044, 3045, 3053, 3064, 3065, 3066}

Not solved by Maxima {2, 3, 5, 6, 7, 8, 9, 10, 12, 14, 15, 16, 17, 18, 19, 20, 21, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 71, 78, 84, 101, 109, 116, 124, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 323, 324, 325, 326, 327, 328, 334, 335, 336, 337, 338, 339, 346, 347, 348, 349, 350, 351, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 514, 515, 516, 517, 518, 522, 523, 524, 525, 530, 531, 532, 533, 534, 535, 536, 537, 538, 547, 548, 549, 550, 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1096, 1097, 1098, 1099, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1116, 1117, 1118, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1145, 1146, 1147, 1148, 1149, 1150, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170, 1171, 1172, 1181, 1182, 1183, 1184, 1185, 1186, 1194, 1195, 1196, 1197, 1198, 1199, 1200, 1201, 1210, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1220, 1221, 1222, 1223, 1224, 1225, 1226, 1227, 1228, 1229, 1230, 1231, 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1248, 1249, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1259, 1260, 1261, 1264, 1320, 1326, 1333, 1339, 1361, 1369, 1373, 1375, 1376, 1378, 1388, 1389, 1394, 1395, 1396, 1397, 1398, 1399, 1400, 1401, 1402, 1403, 1404, 1405, 1413, 1414, 1416, 1417, 1418, 1419, 1420, 1421, 1422, 1423, 1424, 1425, 1426, 1427, 1428, 1429, 1430, 1431, 1432, 1439, 1443, 1508, 1510, 1522, 1523, 1524, 1525, 1526, 1527, 1528, 1529, 1530, 1531, 1532, 1533, 1534, 1535, 1536, 1537, 1693, 1702, 1703, 1712, 1713, 1714, 1915, 1917, 1918, 1919, 1920, 1921, 1923, 1924, 1925, 1926, 1927, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2017, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2060, 2061, 2062, 2063, 2068, 2069, 2070, 2071, 2076, 2077, 2078, 2079, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2105, 2106, 2259, 2260, 2261, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2384, 2385, 2386, 2439, 2440, 2443, 2448, 2449, 2450, 2455, 2456, 2457, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2515, 2521, 2522, 2523, 2525, 2532, 2533, 2534, 2536, 2544, 2545, 2546, 2548, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2568, 2590, 2591, 2592, 2593, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2655, 2656, 2657, 2658, 2659, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 2681, 2682, 2683, 2684, 2685, 2686, 2687, 2688, 2689, 2690, 2691, 2692, 2693, 2694, 2695, 2696, 2697, 2698, 2699, 2700, 2701, 2702, 2703, 2704, 2709, 2710, 2711, 2712, 2714, 2715, 2716, 2717, 2719, 2721, 2723, 2724, 2725, 2726, 2727, 2728, 2729, 2730, 2736, 2737, 2738, 2739, 2740, 2741, 2742, 2743, 2744, 2745, 2752, 2753, 2754, 2755, 2756, 2757, 2758, 2759, 2760, 2761, 2762, 2763, 2764, 2765, 2766, 2767, 2768, 2769, 2770, 2771, 2772, 2773, 2774, 2775, 2776, 2777, 2778, 2779, 2780, 2781, 2782, 2783, 2784, 2785, 2786, 2787, 2788, 2789, 2790, 2791, 2792, 2793, 2794, 2822, 2823, 2828, 2829, 2832, 2841, 2843, 2845, 2852, 2853, 2855, 2856, 2859, 2861, 2862, 2864, 2865, 2868, 2870, 2871, 2873, 2874, 2877, 2879, 2880, 2882, 2885, 2887, 2888, 2890, 2893, 2895, 2896, 2898, 2901, 2910, 2911, 2912, 2913, 2914, 2915, 2916, 2917, 2918, 2919, 2920, 2921, 2940, 2941, 2942, 2943, 2944, 2945, 2946, 2947, 2948, 2949, 2950, 2951, 2957, 2958, 2959, 2960, 2961, 2962, 2967, 2968, 2969, 2970, 2971, 2972, 2973, 2974, 2975, 2976, 2977, 2978, 2979, 2980, 2981, 2982, 2983, 2985, 2986, 2987, 2988, 2989, 2990, 2991, 2992, 2993, 2994, 2995, 2999, 3000, 3001, 3002, 3003, 3004, 3005, 3006, 3007, 3008, 3009, 3010, 3011, 3012, 3013, 3019, 3020, 3024, 3025, 3026, 3036, 3037, 3038, 3039, 3040, 3041, 3042, 3043, 3044, 3045, 3049, 3050, 3051, 3052, 3053, 3054, 3055, 3057, 3059, 3060, 3067, 3068, 3069, 3070, 3071}

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

Rubi {}

Rubi in Sympy {}

Mathematica {}

Maple {}

Maxima {}

Fricas {}

Sympy {}

Giac {}

1.11 list of integrals solved by CAS but failed verification

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

Rubi {1274, 1302, 1441, 1445, 2960}

Mathematica {376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 523, 537, 574, 706, 1300, 1301, 1304, 1305, 1377, 1394, 1395, 1396, 1400, 1401, 1402, 1418, 1419, 1420, 1421, 1426, 1427, 1428, 1429, 1441, 1445, 1528, 1529, 1532, 1533, 1536, 1537, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 3029}

Maple Verification phase not implemented yet.

Maxima Verification phase not implemented yet.

Fricas Verification phase not implemented yet.

Sympy Verification phase not implemented yet.

Giac Verification phase not implemented yet.

Rubi in Sympy Verification phase not implemented yet.

2 detailed summary tables of results

2.1 Detailed conclusion table per each integral for all CAS systems

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

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

Problem 1	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	18	19	32	39	0	35	24
normalized size	1	1.	0.82	0.86	1.45	1.77	0.	1.59	1.09
time (sec)	N/A	0.023	0.007	0.002	1.44	0.268	0.	0.21	3.436

Problem 2	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	13	0	16	15	14	12
normalized size	1	1.	1.	0.81	0.	1.	0.94	0.88	0.75
time (sec)	N/A	0.006	0.003	0.004	0.	0.23	0.918	0.217	2.57

Problem 3	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	13	0	16	15	14	12
normalized size	1	1.	1.	0.81	0.	1.	0.94	0.88	0.75
time (sec)	N/A	0.007	0.002	0.004	0.	0.233	0.67	0.213	1.935

Problem 4	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	13	16	16	15	14	10
normalized size	1	1.	1.	0.81	1.	1.	0.94	0.88	0.62
time (sec)	N/A	0.007	0.002	0.003	1.445	0.224	0.508	0.219	2.118

Problem 5	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	11	0	14	14	14	0
normalized size	1	1.	1.	0.79	0.	1.	1.	1.	0.
time (sec)	N/A	0.007	0.001	0.002	0.	0.238	0.411	0.217	0.

Problem 6	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	9	9	14	8	0	9	10	9	7
normalized size	1	1.	1.56	0.89	0.	1.	1.11	1.	0.78
time (sec)	N/A	0.005	0.003	0.002	0.	0.234	0.39	0.207	2.272

Problem 7	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	14	14	0	18	0	12	12
normalized size	1	1.	0.93	0.93	0.	1.2	0.	0.8	0.8
time (sec)	N/A	0.007	0.003	0.005	0.	0.226	0.	0.212	1.913

Problem 8	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	13	0	16	15	14	10
normalized size	1	1.	1.	0.93	0.	1.14	1.07	1.	0.71
time (sec)	N/A	0.007	0.003	0.003	0.	0.248	1.609	0.213	2.433

Problem 9	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	13	0	16	17	14	14
normalized size	1	1.	1.	0.81	0.	1.	1.06	0.88	0.88
time (sec)	N/A	0.007	0.002	0.003	0.	0.254	1.909	0.215	1.93

Problem 10	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	13	0	16	17	14	14
normalized size	1	1.	1.	0.81	0.	1.	1.06	0.88	0.88
time (sec)	N/A	0.007	0.002	0.003	0.	0.254	2.113	0.221	2.497

Problem 11	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	12	11	11	7	3	9	10
normalized size	1	1.	0.86	0.79	0.79	0.5	0.21	0.64	0.71
time (sec)	N/A	0.005	0.006	0.003	1.433	0.247	0.092	0.209	1.808

Problem 12	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	16	13	0	18	15	14	14
normalized size	1	1.	0.94	0.76	0.	1.06	0.88	0.82	0.82
time (sec)	N/A	0.008	0.003	0.003	0.	0.289	1.969	0.214	2.285

Problem 13	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	16	13	16	18	15	14	10
normalized size	1	1.	0.94	0.76	0.94	1.06	0.88	0.82	0.59
time (sec)	N/A	0.008	0.003	0.003	1.455	0.266	1.56	0.213	2.143

Problem 14	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	14	11	0	18	14	14	14
normalized size	1	1.	0.82	0.65	0.	1.06	0.82	0.82	0.82
time (sec)	N/A	0.007	0.001	0.002	0.	0.241	1.162	0.21	1.217

Problem 15	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	10	0	18	12	14	8
normalized size	1	1.	1.	0.59	0.	1.06	0.71	0.82	0.47
time (sec)	N/A	0.008	0.001	0.003	0.	0.247	1.158	0.211	2.293

Problem 16	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	13	0	15	14	14	0
normalized size	1	1.	1.	0.87	0.	1.	0.93	0.93	0.
time (sec)	N/A	0.008	0.002	0.002	0.	0.245	1.173	0.213	0.

Problem 17	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	11	11	13	12	0	12	14	9	8
normalized size	1	1.	1.18	1.09	0.	1.09	1.27	0.82	0.73
time (sec)	N/A	0.006	0.002	0.002	0.	0.243	2.079	0.213	2.423

Problem 18	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	15	14	0	19	0	12	14
normalized size	1	1.	0.94	0.88	0.	1.19	0.	0.75	0.88
time (sec)	N/A	0.007	0.003	0.004	0.	0.236	0.	0.215	2.067

Problem 19	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	14	13	0	18	15	14	12
normalized size	1	1.	0.93	0.87	0.	1.2	1.	0.93	0.8
time (sec)	N/A	0.008	0.003	0.003	0.	0.225	2.951	0.215	2.54

Problem 20	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	16	13	0	18	17	14	15
normalized size	1	1.	0.94	0.76	0.	1.06	1.	0.82	0.88
time (sec)	N/A	0.007	0.003	0.003	0.	0.234	3.883	0.218	2.049

Problem 21	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	16	13	0	18	17	14	14
normalized size	1	1.	0.94	0.76	0.	1.06	1.	0.82	0.82
time (sec)	N/A	0.008	0.002	0.003	0.	0.233	4.843	0.232	2.55

Problem 22	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	12	9	11	7	3	9	10
normalized size	1	1.	0.86	0.64	0.79	0.5	0.21	0.64	0.71
time (sec)	N/A	0.005	0.006	0.003	1.442	0.227	0.089	0.221	1.099

Problem 23	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	16	13	16	20	15	14	10
normalized size	1	1.	0.84	0.68	0.84	1.05	0.79	0.74	0.53
time (sec)	N/A	0.008	0.003	0.005	1.433	0.22	4.935	0.228	2.148

Problem 24	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	14	11	0	20	14	14	15
normalized size	1	1.	0.74	0.58	0.	1.05	0.74	0.74	0.79
time (sec)	N/A	0.008	0.002	0.002	0.	0.217	3.701	0.218	1.485

Problem 25	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	17	10	0	20	12	14	8
normalized size	1	1.	0.89	0.53	0.	1.05	0.63	0.74	0.42
time (sec)	N/A	0.008	0.003	0.003	0.	0.22	3.492	0.215	2.345

Problem 26	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	15	13	0	20	14	14	15
normalized size	1	1.	0.79	0.68	0.	1.05	0.74	0.74	0.79
time (sec)	N/A	0.008	0.002	0.003	0.	0.253	3.661	0.212	2.295

Problem 27	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	16	13	0	20	15	14	10
normalized size	1	1.	0.84	0.68	0.	1.05	0.79	0.74	0.53
time (sec)	N/A	0.008	0.003	0.003	0.	0.249	4.624	0.226	2.433

Problem 28	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	13	0	18	15	14	0
normalized size	1	1.	1.	0.76	0.	1.06	0.88	0.82	0.
time (sec)	N/A	0.008	0.002	0.001	0.	0.247	4.669	0.212	0.

Problem 29	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	12	0	15	14	9	10
normalized size	1	1.	1.	0.92	0.	1.15	1.08	0.69	0.77
time (sec)	N/A	0.007	0.003	0.003	0.	0.217	4.729	0.219	2.624

Problem 30	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	15	14	0	22	0	12	15
normalized size	1	1.	0.83	0.78	0.	1.22	0.	0.67	0.83
time (sec)	N/A	0.007	0.004	0.004	0.	0.273	0.	0.212	2.314

Problem 31	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	14	13	0	20	15	14	12
normalized size	1	1.	0.82	0.76	0.	1.18	0.88	0.82	0.71
time (sec)	N/A	0.008	0.004	0.003	0.	0.24	7.028	0.215	2.516

Problem 32	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	16	13	0	20	17	14	17
normalized size	1	1.	0.84	0.68	0.	1.05	0.89	0.74	0.89
time (sec)	N/A	0.008	0.003	0.003	0.	0.263	8.659	0.233	2.286

Problem 33	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	16	13	0	20	17	14	14
normalized size	1	1.	0.84	0.68	0.	1.05	0.89	0.74	0.74
time (sec)	N/A	0.008	0.003	0.003	0.	0.222	10.866	0.211	2.505

Problem 34	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	12	9	11	7	3	9	10
normalized size	1	1.	0.86	0.64	0.79	0.5	0.21	0.64	0.71
time (sec)	N/A	0.005	0.006	0.003	1.439	0.217	0.105	0.221	1.086

Problem 35	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	13	20	20	15	20	12
normalized size	1	1.	1.	0.81	1.25	1.25	0.94	1.25	0.75
time (sec)	N/A	0.007	0.003	0.002	1.436	0.235	1.91	0.212	2.555

Problem 36	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	12	15	15	14	15	8
normalized size	1	1.	1.	0.92	1.15	1.15	1.08	1.15	0.62
time (sec)	N/A	0.006	0.002	0.003	1.433	0.22	1.637	0.213	2.218

Problem 37	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	11	11	15	10	11	20	14	12	10
normalized size	1	1.	1.36	0.91	1.	1.82	1.27	1.09	0.91
time (sec)	N/A	0.006	0.004	0.003	1.445	0.233	1.751	0.219	2.331

Problem 38	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	13	11	20	19	16	12
normalized size	1	1.	1.	0.81	0.69	1.25	1.19	1.	0.75
time (sec)	N/A	0.006	0.004	0.002	1.431	0.241	2.314	0.21	2.489

Problem 39	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	13	11	18	15	18	0
normalized size	1	1.	1.	0.81	0.69	1.12	0.94	1.12	0.
time (sec)	N/A	0.007	0.003	0.002	1.434	0.215	1.668	0.22	0.

Problem 40	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	12	8	22	0	24	14
normalized size	1	1.	1.	0.92	0.62	1.69	0.	1.85	1.08
time (sec)	N/A	0.006	0.	0.004	1.429	0.216	0.	0.224	1.513

Problem 41	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	15	13	11	20	17	4	15
normalized size	1	1.	0.94	0.81	0.69	1.25	1.06	0.25	0.94
time (sec)	N/A	0.007	0.004	0.002	1.413	0.213	1.914	0.573	2.492

Problem 42	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	16	13	20	20	15	20	12
normalized size	1	1.	0.84	0.68	1.05	1.05	0.79	1.05	0.63
time (sec)	N/A	0.008	0.002	0.003	1.414	0.262	2.528	0.219	2.773

Problem 43	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	13	12	19	15	14	15	10
normalized size	1	1.	0.81	0.75	1.19	0.94	0.88	0.94	0.62
time (sec)	N/A	0.007	0.002	0.002	1.44	0.232	1.974	0.213	2.586

Problem 44	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	13	16	20	15	16	12
normalized size	1	1.	1.	0.93	1.14	1.43	1.07	1.14	0.86
time (sec)	N/A	0.007	0.002	0.004	1.43	0.217	1.962	0.209	2.128

Problem 45	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	17	10	11	20	15	20	12
normalized size	1	1.	0.89	0.53	0.58	1.05	0.79	1.05	0.63
time (sec)	N/A	0.008	0.005	0.004	1.414	0.217	2.266	0.221	2.287

Problem 46	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	16	13	11	20	19	20	12
normalized size	1	1.	0.84	0.68	0.58	1.05	1.	1.05	0.63
time (sec)	N/A	0.009	0.005	0.003	1.419	0.216	3.005	0.212	2.501

Problem 47	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	16	13	20	20	15	20	15
normalized size	1	1.	0.84	0.68	1.05	1.05	0.79	1.05	0.79
time (sec)	N/A	0.009	0.003	0.004	1.425	0.211	3.111	0.22	2.435

Problem 48	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	16	13	20	18	15	18	0
normalized size	1	1.	0.84	0.68	1.05	0.95	0.79	0.95	0.
time (sec)	N/A	0.009	0.002	0.001	1.422	0.261	2.349	0.218	0.

Problem 49	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	15	14	8	22	0	28	15
normalized size	1	1.	0.94	0.88	0.5	1.38	0.	1.75	0.94
time (sec)	N/A	0.007	0.003	0.004	1.44	0.241	0.	0.217	2.318

Problem 50	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	14	11	11	20	15	4	17
normalized size	1	1.	0.74	0.58	0.58	1.05	0.79	0.21	0.89
time (sec)	N/A	0.009	0.	0.003	1.422	0.217	1.958	0.539	1.482

Problem 51	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	15	13	11	20	17	4	17
normalized size	1	1.	0.79	0.68	0.58	1.05	0.89	0.21	0.89
time (sec)	N/A	0.009	0.003	0.003	1.412	0.219	2.562	0.563	2.376

Problem 52	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	16	13	20	20	15	20	12
normalized size	1	1.	0.84	0.68	1.05	1.05	0.79	1.05	0.63
time (sec)	N/A	0.009	0.002	0.003	1.415	0.22	4.651	0.214	2.637

Problem 53	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	13	12	19	15	14	15	10
normalized size	1	1.	0.81	0.75	1.19	0.94	0.88	0.94	0.62
time (sec)	N/A	0.008	0.002	0.003	1.443	0.213	3.086	0.211	2.692

Problem 54	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	13	20	20	15	16	14
normalized size	1	1.	1.	0.93	1.43	1.43	1.07	1.14	1.
time (sec)	N/A	0.008	0.002	0.004	1.436	0.244	3.11	0.225	2.701

Problem 55	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	16	13	16	20	17	20	14
normalized size	1	1.	0.84	0.68	0.84	1.05	0.89	1.05	0.74
time (sec)	N/A	0.009	0.001	0.004	1.41	0.239	3.093	0.221	2.173

Problem 56	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	17	10	11	20	15	20	12
normalized size	1	1.	0.89	0.53	0.58	1.05	0.79	1.05	0.63
time (sec)	N/A	0.009	0.005	0.005	1.43	0.227	3.522	0.215	2.307

Problem 57	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	16	13	20	18	15	18	0
normalized size	1	1.	0.84	0.68	1.05	0.95	0.79	0.95	0.
time (sec)	N/A	0.008	0.003	0.004	1.448	0.252	3.72	0.22	0.

Problem 58	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	15	14	8	22	0	28	15
normalized size	1	1.	0.94	0.88	0.5	1.38	0.	1.75	0.94
time (sec)	N/A	0.008	0.002	0.006	1.44	0.242	0.	0.235	2.355

Problem 59	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	16	13	11	20	17	4	17
normalized size	1	1.	0.84	0.68	0.58	1.05	0.89	0.21	0.89
time (sec)	N/A	0.009	0.003	0.004	1.433	0.216	3.045	0.527	2.375

Problem 60	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	14	11	11	20	15	4	17
normalized size	1	1.	0.74	0.58	0.58	1.05	0.79	0.21	0.89
time (sec)	N/A	0.008	0.	0.004	1.438	0.225	3.068	0.545	1.472

Problem 61	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	15	13	11	20	17	4	17
normalized size	1	1.	0.79	0.68	0.58	1.05	0.89	0.21	0.89
time (sec)	N/A	0.008	0.004	0.003	1.443	0.216	4.635	0.535	2.298

Problem 62	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	21	20	24	30	0	0	27
normalized size	1	1.	0.72	0.69	0.83	1.03	0.	0.	0.93
time (sec)	N/A	0.028	0.009	0.003	1.46	0.27	0.	0.	4.053

Problem 63	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	21	20	24	26	0	0	26
normalized size	1	1.	0.75	0.71	0.86	0.93	0.	0.	0.93
time (sec)	N/A	0.026	0.006	0.003	1.457	0.276	0.	0.	3.924

Problem 64	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	18	18	30	0	0	17
normalized size	1	1.	1.	0.95	0.95	1.58	0.	0.	0.89
time (sec)	N/A	0.015	0.005	0.004	1.463	0.24	0.	0.	4.258

Problem 65	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	21	20	24	39	0	0	31
normalized size	1	1.	0.66	0.62	0.75	1.22	0.	0.	0.97
time (sec)	N/A	0.032	0.007	0.003	1.46	0.232	0.	0.	4.875

Problem 66	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	22	32	32	0	34	26
normalized size	1	1.	1.	1.05	1.52	1.52	0.	1.62	1.24
time (sec)	N/A	0.015	0.007	0.004	1.448	0.234	0.	0.214	3.11

Problem 67	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	23	36	43	0	39	34
normalized size	1	1.	1.	1.05	1.64	1.95	0.	1.77	1.55
time (sec)	N/A	0.016	0.006	0.001	1.457	0.238	0.	0.219	4.523

Problem 68	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	21	3	3	0	0	12
normalized size	1	1.	1.	1.62	0.23	0.23	0.	0.	0.92
time (sec)	N/A	0.008	0.01	0.035	1.442	0.26	0.	0.	1.939

Problem 69	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	18	18	24	23	24	26	15
normalized size	1	1.	0.95	0.95	1.26	1.21	1.26	1.37	0.79
time (sec)	N/A	0.014	0.004	0.001	1.441	0.249	1.194	0.231	3.564

Problem 70	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	19	26	24	0	27	22
normalized size	1	1.	1.	1.06	1.44	1.33	0.	1.5	1.22
time (sec)	N/A	0.013	0.004	0.002	1.445	0.232	0.	0.218	3.189

Problem 71	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	18	18	0	23	22	26	14
normalized size	1	1.	0.95	0.95	0.	1.21	1.16	1.37	0.74
time (sec)	N/A	0.014	0.004	0.002	0.	0.235	0.583	0.223	2.984

Problem 72	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	17	23	22	0	24	22
normalized size	1	1.	1.	1.06	1.44	1.38	0.	1.5	1.38
time (sec)	N/A	0.013	0.003	0.003	1.446	0.254	0.	0.223	2.011

Problem 73	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	13	18	16	14	0	8
normalized size	1	1.	1.	0.93	1.29	1.14	1.	0.	0.57
time (sec)	N/A	0.01	0.002	0.002	1.439	0.269	0.464	0.	2.736

Problem 74	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	18	19	26	24	0	0	24
normalized size	1	1.	0.95	1.	1.37	1.26	0.	0.	1.26
time (sec)	N/A	0.016	0.006	0.002	1.445	0.244	0.	0.	2.909

Problem 75	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	18	18	24	23	24	0	15
normalized size	1	1.	0.86	0.86	1.14	1.1	1.14	0.	0.71
time (sec)	N/A	0.015	0.005	0.003	1.452	0.232	1.849	0.	3.271

Problem 76	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	18	19	26	24	0	0	24
normalized size	1	1.	0.95	1.	1.37	1.26	0.	0.	1.26
time (sec)	N/A	0.016	0.004	0.002	1.452	0.236	0.	0.	3.032

Problem 77	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	11	14	14	15	16	12
normalized size	1	1.	1.	0.79	1.	1.	1.07	1.14	0.86
time (sec)	N/A	0.007	0.002	0.003	1.436	0.256	0.379	0.227	1.169

Problem 78	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	11	0	14	14	14	0
normalized size	1	1.	1.	0.79	0.	1.	1.	1.	0.
time (sec)	N/A	0.007	0.002	0.	0.	0.234	0.367	0.226	0.

Problem 79	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	12	9	14	11	10	11	10
normalized size	1	1.	0.86	0.64	1.	0.79	0.71	0.79	0.71
time (sec)	N/A	0.007	0.002	0.003	1.442	0.222	0.061	0.228	1.242

Problem 80	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	11	14	14	14	12	8
normalized size	1	1.	1.	0.92	1.17	1.17	1.17	1.	0.67
time (sec)	N/A	0.007	0.002	0.003	1.436	0.226	0.377	0.224	1.15

Problem 81	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	12	15	15	0	12	12
normalized size	1	1.	1.	0.92	1.15	1.15	0.	0.92	0.92
time (sec)	N/A	0.008	0.002	0.007	1.436	0.225	0.	0.24	1.154

Problem 82	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	11	14	14	17	11	12
normalized size	1	1.	1.	0.92	1.17	1.17	1.42	0.92	1.
time (sec)	N/A	0.007	0.003	0.003	1.476	0.219	1.24	0.228	1.22

Problem 83	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	14	11	14	18	15	18	15
normalized size	1	1.	0.82	0.65	0.82	1.06	0.88	1.06	0.88
time (sec)	N/A	0.008	0.003	0.003	1.425	0.226	1.128	0.216	1.309

Problem 84	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	14	11	0	18	14	14	14
normalized size	1	1.	0.82	0.65	0.	1.06	0.82	0.82	0.82
time (sec)	N/A	0.008	0.001	0.	0.	0.246	1.093	0.226	1.299

Problem 85	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	12	9	14	15	10	15	10
normalized size	1	1.	0.86	0.64	1.	1.07	0.71	1.07	0.71
time (sec)	N/A	0.007	0.002	0.003	1.434	0.249	0.061	0.227	1.342

Problem 86	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	11	14	14	15	16	10
normalized size	1	1.	1.	0.92	1.17	1.17	1.25	1.33	0.83
time (sec)	N/A	0.007	0.002	0.003	1.44	0.245	1.086	0.227	1.275

Problem 87	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	14	11	14	18	17	14	14
normalized size	1	1.	0.82	0.65	0.82	1.06	1.	0.82	0.82
time (sec)	N/A	0.008	0.002	0.003	1.452	0.242	1.946	0.23	1.323

Problem 88	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	14	11	14	18	19	18	17
normalized size	1	1.	0.82	0.65	0.82	1.06	1.12	1.06	1.
time (sec)	N/A	0.008	0.002	0.003	1.434	0.251	1.931	0.226	1.333

Problem 89	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	11	14	20	15	15	15
normalized size	1	1.	1.	0.92	1.17	1.67	1.25	1.25	1.25
time (sec)	N/A	0.007	0.003	0.003	1.426	0.237	1.483	0.227	1.58

Problem 90	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	12	8	22	0	24	14
normalized size	1	1.	1.	0.92	0.62	1.69	0.	1.85	1.08
time (sec)	N/A	0.007	0.003	0.	1.434	0.244	0.	0.247	1.49

Problem 91	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	10	9	14	14	8	14	8
normalized size	1	1.	0.83	0.75	1.17	1.17	0.67	1.17	0.67
time (sec)	N/A	0.007	0.003	0.003	1.456	0.252	0.064	0.216	1.371

Problem 92	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	11	14	14	15	20	14
normalized size	1	1.	1.	0.79	1.	1.	1.07	1.43	1.
time (sec)	N/A	0.006	0.003	0.003	1.418	0.268	1.534	0.22	1.576

Problem 93	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	11	14	20	15	16	0
normalized size	1	1.	1.	0.79	1.	1.43	1.07	1.14	0.
time (sec)	N/A	0.007	0.004	0.003	1.462	0.251	1.574	0.222	0.

Problem 94	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	11	14	20	17	18	15
normalized size	1	1.	1.	0.79	1.	1.43	1.21	1.29	1.07
time (sec)	N/A	0.007	0.003	0.003	1.434	0.257	1.6	0.23	1.587

Problem 95	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	14	11	14	20	17	4	19
normalized size	1	1.	0.74	0.58	0.74	1.05	0.89	0.21	1.
time (sec)	N/A	0.008	0.003	0.002	1.418	0.306	1.871	0.59	1.581

Problem 96	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	14	11	11	20	15	4	17
normalized size	1	1.	0.74	0.58	0.58	1.05	0.79	0.21	0.89
time (sec)	N/A	0.008	0.002	0.	1.443	0.23	2.019	0.558	1.566

Problem 97	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	10	9	14	14	10	14	10
normalized size	1	1.	0.83	0.75	1.17	1.17	0.83	1.17	0.83
time (sec)	N/A	0.007	0.002	0.003	1.422	0.217	0.07	0.227	1.333

Problem 98	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	14	11	14	20	15	20	15
normalized size	1	1.	0.74	0.58	0.74	1.05	0.79	1.05	0.79
time (sec)	N/A	0.009	0.004	0.003	1.451	0.228	1.851	0.235	1.618

Problem 99	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	14	11	14	20	15	11	15
normalized size	1	1.	0.74	0.58	0.74	1.05	0.79	0.58	0.79
time (sec)	N/A	0.009	0.004	0.003	1.521	0.222	1.883	0.222	1.556

Problem 100	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	14	11	14	20	17	0	17
normalized size	1	1.	0.74	0.58	0.74	1.05	0.89	0.	0.89
time (sec)	N/A	0.009	0.004	0.003	1.441	0.221	1.884	0.	1.59

Problem 101	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	F(-2)	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	16	0	0	0	23	24
normalized size	1	1.	1.	0.94	0.	0.	0.	1.35	1.41
time (sec)	N/A	0.014	0.005	0.002	0.	0.	0.	0.227	2.072

Problem 102	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	11	14	14	14	11	0
normalized size	1	1.	1.	0.79	1.	1.	1.	0.79	0.
time (sec)	N/A	0.007	0.002	0.002	1.44	0.212	0.492	0.232	0.

Problem 103	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	11	14	18	15	0	12
normalized size	1	1.	1.	0.79	1.	1.29	1.07	0.	0.86
time (sec)	N/A	0.007	0.002	0.002	1.441	0.223	0.494	0.	1.229

Problem 104	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	12	9	14	11	10	11	10
normalized size	1	1.	0.86	0.64	1.	0.79	0.71	0.79	0.71
time (sec)	N/A	0.007	0.002	0.003	1.434	0.216	0.064	0.249	1.337

Problem 105	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	11	14	14	15	14	10
normalized size	1	1.	1.	0.79	1.	1.	1.07	1.	0.71
time (sec)	N/A	0.007	0.002	0.003	1.441	0.219	0.475	0.234	1.206

Problem 106	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	11	14	14	15	0	10
normalized size	1	1.	1.	0.92	1.17	1.17	1.25	0.	0.83
time (sec)	N/A	0.007	0.002	0.003	1.435	0.245	1.317	0.	1.202

Problem 107	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	12	15	15	0	0	12
normalized size	1	1.	1.	0.92	1.15	1.15	0.	0.	0.92
time (sec)	N/A	0.009	0.002	0.017	1.434	0.228	0.	0.	1.179

Problem 108	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	11	14	14	17	0	12
normalized size	1	1.	1.	0.92	1.17	1.17	1.42	0.	1.
time (sec)	N/A	0.007	0.002	0.003	1.434	0.224	1.406	0.	1.227

Problem 109	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	F(-2)	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	20	18	0	0	0	26	29
normalized size	1	1.	1.05	0.95	0.	0.	0.	1.37	1.53
time (sec)	N/A	0.015	0.005	0.002	0.	0.	0.	0.248	2.25

Problem 110	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	11	14	18	15	0	12
normalized size	1	1.	1.	0.79	1.	1.29	1.07	0.	0.86
time (sec)	N/A	0.007	0.002	0.002	1.433	0.218	0.854	0.	1.267

Problem 111	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	12	9	14	11	10	11	10
normalized size	1	1.	0.86	0.64	1.	0.79	0.71	0.79	0.71
time (sec)	N/A	0.007	0.002	0.004	1.443	0.217	0.071	0.234	1.393

Problem 112	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	11	14	14	14	14	8
normalized size	1	1.	1.	0.92	1.17	1.17	1.17	1.17	0.67
time (sec)	N/A	0.007	0.002	0.003	1.444	0.216	0.936	0.248	1.248

Problem 113	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	11	14	18	17	0	12
normalized size	1	1.	1.	0.92	1.17	1.5	1.42	0.	1.
time (sec)	N/A	0.007	0.003	0.003	1.436	0.248	1.696	0.	1.272

Problem 114	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	11	14	14	15	0	10
normalized size	1	1.	1.	0.92	1.17	1.17	1.25	0.	0.83
time (sec)	N/A	0.007	0.002	0.003	1.44	0.213	1.697	0.	1.211

Problem 115	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	11	14	14	19	0	14
normalized size	1	1.	1.	0.79	1.	1.	1.36	0.	1.
time (sec)	N/A	0.007	0.002	0.003	1.438	0.221	1.692	0.	1.256

Problem 116	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	17	16	0	0	0	0	27
normalized size	1	1.	0.89	0.84	0.	0.	0.	0.	1.42
time (sec)	N/A	0.014	0.008	0.002	0.	0.	0.	0.	2.833

Problem 117	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	11	14	20	15	0	15
normalized size	1	1.	1.	0.92	1.17	1.67	1.25	0.	1.25
time (sec)	N/A	0.007	0.004	0.001	1.44	0.217	1.529	0.	1.581

Problem 118	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	12	15	22	0	0	15
normalized size	1	1.	1.	0.92	1.15	1.69	0.	0.	1.15
time (sec)	N/A	0.006	0.003	0.013	1.431	0.226	0.	0.	1.554

Problem 119	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	11	14	14	14	0	12
normalized size	1	1.	1.	0.92	1.17	1.17	1.17	0.	1.
time (sec)	N/A	0.007	0.002	0.003	1.44	0.214	1.465	0.	1.574

Problem 120	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	12	9	14	14	10	14	10
normalized size	1	1.	0.86	0.64	1.	1.	0.71	1.	0.71
time (sec)	N/A	0.006	0.002	0.003	1.436	0.228	0.064	0.225	1.316

Problem 121	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	11	14	14	15	14	14
normalized size	1	1.	1.	0.79	1.	1.	1.07	1.	1.
time (sec)	N/A	0.007	0.003	0.003	1.44	0.217	1.569	0.229	1.551

Problem 122	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	11	14	20	17	0	15
normalized size	1	1.	1.	0.79	1.	1.43	1.21	0.	1.07
time (sec)	N/A	0.007	0.003	0.003	1.439	0.216	1.545	0.	1.53

Problem 123	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	11	14	20	15	0	0
normalized size	1	1.	1.	0.79	1.	1.43	1.07	0.	0.
time (sec)	N/A	0.006	0.003	0.001	1.438	0.215	1.55	0.	0.

Problem 124	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	F(-2)	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	20	18	0	0	0	0	29
normalized size	1	1.	1.05	0.95	0.	0.	0.	0.	1.53
time (sec)	N/A	0.016	0.01	0.002	0.	0.	0.	0.	2.761

Problem 125	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	11	14	20	14	0	14
normalized size	1	1.	1.	0.92	1.17	1.67	1.17	0.	1.17
time (sec)	N/A	0.007	0.003	0.002	1.445	0.235	1.697	0.	1.53

Problem 126	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	11	14	20	15	0	14
normalized size	1	1.	1.	0.92	1.17	1.67	1.25	0.	1.17
time (sec)	N/A	0.007	0.003	0.001	1.429	0.251	1.611	0.	1.544

Problem 127	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	10	9	14	14	8	14	8
normalized size	1	1.	0.83	0.75	1.17	1.17	0.67	1.17	0.67
time (sec)	N/A	0.006	0.002	0.003	1.435	0.214	0.064	0.221	1.339

Problem 128	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	11	14	14	15	14	14
normalized size	1	1.	1.	0.79	1.	1.	1.07	1.	1.
time (sec)	N/A	0.006	0.003	0.003	1.423	0.221	1.572	0.229	1.648

Problem 129	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	11	14	20	17	0	15
normalized size	1	1.	1.	0.79	1.	1.43	1.21	0.	1.07
time (sec)	N/A	0.007	0.004	0.003	1.437	0.219	1.657	0.	1.56

Problem 130	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	11	14	20	15	0	14
normalized size	1	1.	1.	0.79	1.	1.43	1.07	0.	1.
time (sec)	N/A	0.007	0.003	0.003	1.447	0.217	1.665	0.	1.545

Problem 131	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	F(-2)	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	18	0	0	0	26	24
normalized size	1	1.	1.	0.95	0.	0.	0.	1.37	1.26
time (sec)	N/A	0.015	0.006	0.003	0.	0.	0.	0.226	3.016

Problem 132	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	F(-2)	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	18	0	0	0	26	24
normalized size	1	1.	1.	0.95	0.	0.	0.	1.37	1.26
time (sec)	N/A	0.014	0.005	0.001	0.	0.	0.	0.225	2.791

Problem 133	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	F(-2)	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	16	0	0	0	23	24
normalized size	1	1.	1.	0.94	0.	0.	0.	1.35	1.41
time (sec)	N/A	0.014	0.003	0.002	0.	0.	0.	0.228	1.987

Problem 134	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	13	0	16	22	0	10
normalized size	1	1.	1.	0.93	0.	1.14	1.57	0.	0.71
time (sec)	N/A	0.01	0.003	0.003	0.	0.227	0.753	0.	2.727

Problem 135	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	19	18	0	0	0	0	26
normalized size	1	1.	0.9	0.86	0.	0.	0.	0.	1.24
time (sec)	N/A	0.015	0.004	0.002	0.	0.	0.	0.	2.905

Problem 136	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	19	18	0	0	0	0	26
normalized size	1	1.	0.9	0.86	0.	0.	0.	0.	1.24
time (sec)	N/A	0.015	0.004	0.003	0.	0.	0.	0.	3.079

Problem 137	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	F(-2)	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	22	20	0	0	0	28	29
normalized size	1	1.	0.92	0.83	0.	0.	0.	1.17	1.21
time (sec)	N/A	0.017	0.01	0.004	0.	0.	0.	0.229	2.954

Problem 138	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	F(-2)	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	20	18	0	0	0	26	29
normalized size	1	1.	0.83	0.75	0.	0.	0.	1.08	1.21
time (sec)	N/A	0.017	0.006	0.001	0.	0.	0.	0.227	2.282

Problem 139	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	16	13	0	22	24	0	12
normalized size	1	1.	0.8	0.65	0.	1.1	1.2	0.	0.6
time (sec)	N/A	0.011	0.004	0.002	0.	0.229	12.463	0.	2.802

Problem 140	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	22	20	0	0	0	0	31
normalized size	1	1.	0.92	0.83	0.	0.	0.	0.	1.29
time (sec)	N/A	0.019	0.012	0.002	0.	0.	0.	0.	3.254

Problem 141	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	F(-2)	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	22	20	0	0	0	0	31
normalized size	1	1.	0.92	0.83	0.	0.	0.	0.	1.29
time (sec)	N/A	0.019	0.011	0.001	0.	0.	0.	0.	3.286

Problem 142	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	26	26	22	18	0	0	0	0	31
normalized size	1	1.	0.85	0.69	0.	0.	0.	0.	1.19
time (sec)	N/A	0.017	0.01	0.002	0.	0.	0.	0.	3.227

Problem 143	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	19	18	0	0	0	0	26
normalized size	1	1.	0.9	0.86	0.	0.	0.	0.	1.24
time (sec)	N/A	0.015	0.009	0.002	0.	0.	0.	0.	3.63

Problem 144	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	19	18	0	0	0	0	26
normalized size	1	1.	0.9	0.86	0.	0.	0.	0.	1.24
time (sec)	N/A	0.013	0.007	0.002	0.	0.	0.	0.	3.417

Problem 145	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	17	16	0	0	0	0	26
normalized size	1	1.	0.89	0.84	0.	0.	0.	0.	1.37
time (sec)	N/A	0.013	0.005	0.001	0.	0.	0.	0.	2.624

Problem 146	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	13	0	16	24	0	12
normalized size	1	1.	1.	0.93	0.	1.14	1.71	0.	0.86
time (sec)	N/A	0.009	0.005	0.002	0.	0.228	3.726	0.	2.79

Problem 147	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	18	0	0	0	0	29
normalized size	1	1.	1.	0.95	0.	0.	0.	0.	1.53
time (sec)	N/A	0.014	0.007	0.002	0.	0.	0.	0.	3.597

Problem 148	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	18	0	0	0	0	29
normalized size	1	1.	1.	0.95	0.	0.	0.	0.	1.53
time (sec)	N/A	0.013	0.008	0.002	0.	0.	0.	0.	3.738

Problem 149	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	22	18	0	0	0	0	31
normalized size	1	1.	0.73	0.6	0.	0.	0.	0.	1.03
time (sec)	N/A	0.024	0.014	0.003	0.	0.	0.	0.	3.774

Problem 150	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	22	20	0	0	0	0	31
normalized size	1	1.	0.79	0.71	0.	0.	0.	0.	1.11
time (sec)	N/A	0.021	0.012	0.003	0.	0.	0.	0.	3.626

Problem 151	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	20	18	0	0	0	0	31
normalized size	1	1.	0.71	0.64	0.	0.	0.	0.	1.11
time (sec)	N/A	0.02	0.012	0.001	0.	0.	0.	0.	2.882

Problem 152	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	16	13	0	27	26	0	14
normalized size	1	1.	0.67	0.54	0.	1.12	1.08	0.	0.58
time (sec)	N/A	0.013	0.006	0.003	0.	0.279	9.452	0.	2.811

Problem 153	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	F(-2)	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	22	20	0	0	0	0	34
normalized size	1	1.	0.79	0.71	0.	0.	0.	0.	1.21
time (sec)	N/A	0.02	0.02	0.003	0.	0.	0.	0.	3.69

Problem 154	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	F(-2)	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	22	20	0	0	0	0	34
normalized size	1	1.	0.79	0.71	0.	0.	0.	0.	1.21
time (sec)	N/A	0.019	0.018	0.003	0.	0.	0.	0.	3.762

Problem 155	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	22	18	0	0	0	0	34
normalized size	1	1.	0.79	0.64	0.	0.	0.	0.	1.21
time (sec)	N/A	0.02	0.014	0.002	0.	0.	0.	0.	3.617

Problem 156	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	F(-2)	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	25	25	32	0	0	0	36
normalized size	1	1.	0.78	0.78	1.	0.	0.	0.	1.12
time (sec)	N/A	0.024	0.018	0.003	1.46	0.	0.	0.	4.085

Problem 157	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	F(-2)	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	26	26	36	0	0	0	44
normalized size	1	1.	0.72	0.72	1.	0.	0.	0.	1.22
time (sec)	N/A	0.02	0.011	0.003	1.473	0.	0.	0.	6.201

Problem 158	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	F(-2)	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	25	25	32	0	0	36	34
normalized size	1	1.	0.89	0.89	1.14	0.	0.	1.29	1.21
time (sec)	N/A	0.02	0.012	0.001	1.453	0.	0.	0.227	3.548

Problem 159	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	F(-2)	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	25	23	30	0	0	34	29
normalized size	1	1.	1.04	0.96	1.25	0.	0.	1.42	1.21
time (sec)	N/A	0.017	0.008	0.003	1.455	0.	0.	0.227	3.381

Problem 160	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	26	26	25	25	32	0	0	0	31
normalized size	1	1.	0.96	0.96	1.23	0.	0.	0.	1.19
time (sec)	N/A	0.019	0.012	0.003	1.462	0.	0.	0.	3.929

Problem 161	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	F(-2)	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	25	25	32	0	0	0	36
normalized size	1	1.	0.78	0.78	1.	0.	0.	0.	1.12
time (sec)	N/A	0.019	0.014	0.002	1.461	0.	0.	0.	4.053

Problem 162	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	F(-2)	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	36	26	26	36	0	0	42	44
normalized size	1	1.16	0.84	0.84	1.16	0.	0.	1.35	1.42
time (sec)	N/A	0.03	0.019	0.003	1.464	0.	0.	0.238	5.968

Problem 163	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	F(-2)	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	26	26	36	0	0	42	42
normalized size	1	1.	0.81	0.81	1.12	0.	0.	1.31	1.31
time (sec)	N/A	0.021	0.011	0.002	1.459	0.	0.	0.233	5.277

Problem 164	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	F(-2)	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	25	26	24	34	0	0	39	37
normalized size	1	0.86	0.9	0.83	1.17	0.	0.	1.34	1.28
time (sec)	N/A	0.017	0.009	0.002	1.46	0.	0.	0.223	4.944

Problem 165	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	26	26	36	0	0	0	39
normalized size	1	1.	0.96	0.96	1.33	0.	0.	0.	1.44
time (sec)	N/A	0.018	0.01	0.002	1.466	0.	0.	0.	6.051

Problem 166	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	F(-2)	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	26	26	36	0	0	0	44
normalized size	1	1.	0.72	0.72	1.	0.	0.	0.	1.22
time (sec)	N/A	0.021	0.012	0.001	1.46	0.	0.	0.	6.052

Problem 167	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	F(-2)	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	26	26	36	0	0	0	44
normalized size	1	1.	0.72	0.72	1.	0.	0.	0.	1.22
time (sec)	N/A	0.031	0.018	0.003	1.467	0.	0.	0.	6.176

Problem 168	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	19	23	8	8	0	8	17
normalized size	1	1.	0.95	1.15	0.4	0.4	0.	0.4	0.85
time (sec)	N/A	0.009	0.008	0.054	1.495	0.239	0.	0.248	2.414

Problem 169	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	22	8	36	0	8	15
normalized size	1	1.	1.	1.16	0.42	1.89	0.	0.42	0.79
time (sec)	N/A	0.009	0.007	0.044	1.51	0.227	0.	0.234	2.321

Problem 170	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	20	8	41	0	0	17
normalized size	1	1.	1.	1.05	0.42	2.16	0.	0.	0.89
time (sec)	N/A	0.01	0.006	0.044	1.513	0.23	0.	0.	2.65

Problem 171	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	19	23	8	27	0	0	19
normalized size	1	1.	0.86	1.05	0.36	1.23	0.	0.	0.86
time (sec)	N/A	0.009	0.007	0.045	1.53	0.238	0.	0.	2.651

Problem 172	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	22	34	32	0	34	26
normalized size	1	1.	1.	1.05	1.62	1.52	0.	1.62	1.24
time (sec)	N/A	0.016	0.008	0.003	1.454	0.235	0.	0.23	3.387

Problem 173	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	26	22	22	23	38	39	0	39	34
normalized size	1	0.85	0.85	0.88	1.46	1.5	0.	1.5	1.31
time (sec)	N/A	0.016	0.007	0.001	1.447	0.253	0.	0.231	4.977

Problem 174	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	19	26	30	0	30	22
normalized size	1	1.	1.	1.06	1.44	1.67	0.	1.67	1.22
time (sec)	N/A	0.014	0.005	0.001	1.451	0.23	0.	0.23	3.177

Problem 175	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	19	26	30	0	30	22
normalized size	1	1.	1.	1.06	1.44	1.67	0.	1.67	1.22
time (sec)	N/A	0.014	0.005	0.002	1.452	0.229	0.	0.239	3.023

Problem 176	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	17	23	27	0	27	22
normalized size	1	1.	1.	1.06	1.44	1.69	0.	1.69	1.38
time (sec)	N/A	0.014	0.003	0.002	1.485	0.23	0.	0.229	2.302

Problem 177	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	15	20	24	22	0	8
normalized size	1	1.	1.	1.07	1.43	1.71	1.57	0.	0.57
time (sec)	N/A	0.012	0.003	0.002	1.462	0.232	0.794	0.	3.388

Problem 178	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	18	19	26	30	0	0	24
normalized size	1	1.	0.9	0.95	1.3	1.5	0.	0.	1.2
time (sec)	N/A	0.018	0.006	0.002	1.474	0.242	0.	0.	3.275

Problem 179	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	18	19	26	30	0	0	24
normalized size	1	1.	0.9	0.95	1.3	1.5	0.	0.	1.2
time (sec)	N/A	0.018	0.005	0.002	1.464	0.23	0.	0.	3.311

Problem 180	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	20	21	36	19	0	23	14
normalized size	1	1.	1.	1.05	1.8	0.95	0.	1.15	0.7
time (sec)	N/A	0.011	0.008	0.002	1.463	0.232	0.	0.224	2.741

Problem 181	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	22	41	28	0	28	15
normalized size	1	1.	1.	1.05	1.95	1.33	0.	1.33	0.71
time (sec)	N/A	0.015	0.005	0.002	1.497	0.236	0.	0.232	4.081

Problem 182	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	17	28	16	0	18	0
normalized size	1	1.	1.	0.94	1.56	0.89	0.	1.	0.
time (sec)	N/A	0.008	0.004	0.002	1.451	0.226	0.	0.223	0.

Problem 183	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	A	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	0	27	12	0	14	10
normalized size	1	1.	1.	0.	1.8	0.8	0.	0.93	0.67
time (sec)	N/A	0.007	0.002	0.029	1.464	0.225	0.	0.238	2.123

Problem 184	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	29	14	14	0	15	12
normalized size	1	1.	1.	1.93	0.93	0.93	0.	1.	0.8
time (sec)	N/A	0.007	0.002	0.029	1.571	0.231	0.	0.233	1.359

Problem 185	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	14	24	16	0	0	10
normalized size	1	1.	1.	1.08	1.85	1.23	0.	0.	0.77
time (sec)	N/A	0.007	0.002	0.003	1.46	0.226	0.	0.	3.004

Problem 186	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	17	16	16	0	0	14
normalized size	1	1.	1.	0.94	0.89	0.89	0.	0.	0.78
time (sec)	N/A	0.008	0.003	0.002	1.485	0.222	0.	0.	2.414

Problem 187	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	A	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	0	23	19	0	0	17
normalized size	1	1.	1.	0.	1.05	0.86	0.	0.	0.77
time (sec)	N/A	0.012	0.015	0.069	1.514	0.239	0.	0.	2.813

Problem 188	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	A	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	0	8	8	0	0	14
normalized size	1	1.	1.	0.	0.5	0.5	0.	0.	0.88
time (sec)	N/A	0.01	0.008	0.061	1.505	0.227	0.	0.	2.368

Problem 189	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	26	26	26	27	45	42	0	43	34
normalized size	1	1.	1.	1.04	1.73	1.62	0.	1.65	1.31
time (sec)	N/A	0.081	0.017	0.003	1.649	0.236	0.	0.225	7.057

Problem 190	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	23	24	36	39	0	39	31
normalized size	1	1.	1.	1.04	1.57	1.7	0.	1.7	1.35
time (sec)	N/A	0.083	0.009	0.002	1.652	0.243	0.	0.227	7.219

Problem 191	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	23	24	36	39	0	39	0
normalized size	1	1.	1.	1.04	1.57	1.7	0.	1.7	0.
time (sec)	N/A	0.054	0.009	0.003	1.658	0.248	0.	0.247	0.

Problem 192	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	22	34	36	0	36	31
normalized size	1	1.	1.	1.05	1.62	1.71	0.	1.71	1.48
time (sec)	N/A	0.03	0.005	0.002	1.652	0.237	0.	0.238	2.517

Problem 193	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	22	34	36	42	0	14
normalized size	1	1.	1.	1.05	1.62	1.71	2.	0.	0.67
time (sec)	N/A	0.08	0.005	0.002	1.653	0.241	1.612	0.	7.268

Problem 194	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	23	24	36	39	0	0	32
normalized size	1	1.	0.92	0.96	1.44	1.56	0.	0.	1.28
time (sec)	N/A	0.083	0.01	0.003	1.64	0.275	0.	0.	6.62

Problem 195	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	23	24	36	39	0	0	32
normalized size	1	1.	0.92	0.96	1.44	1.56	0.	0.	1.28
time (sec)	N/A	0.083	0.007	0.003	1.644	0.24	0.	0.	6.779

Problem 196	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	25	25	55	28	0	28	0
normalized size	1	1.	1.	1.	2.2	1.12	0.	1.12	0.
time (sec)	N/A	0.086	0.018	0.003	1.713	0.236	0.	0.277	0.

Problem 197	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	A	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	0	54	24	0	24	15
normalized size	1	1.	1.	0.	2.45	1.09	0.	1.09	0.68
time (sec)	N/A	0.053	0.005	0.156	1.705	0.232	0.	0.266	4.88

Problem 198	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	0	34	26	0	26	17
normalized size	1	1.	1.	0.	1.55	1.18	0.	1.18	0.77
time (sec)	N/A	0.025	0.003	0.069	1.811	0.233	0.	0.253	2.154

Problem 199	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	20	22	51	28	0	0	15
normalized size	1	1.	1.	1.1	2.55	1.4	0.	0.	0.75
time (sec)	N/A	0.077	0.004	0.003	1.71	0.232	0.	0.	6.502

Problem 200	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	25	25	36	28	0	0	19
normalized size	1	1.	1.	1.	1.44	1.12	0.	0.	0.76
time (sec)	N/A	0.076	0.007	0.003	1.902	0.235	0.	0.	6.566

Problem 201	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	24	23	18	22	0	24	20
normalized size	1	1.	1.	0.96	0.75	0.92	0.	1.	0.83
time (sec)	N/A	0.073	0.01	0.003	1.84	0.23	0.	0.255	8.85

Problem 202	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	24	23	18	22	0	22	0
normalized size	1	1.	1.	0.96	0.75	0.92	0.	0.92	0.
time (sec)	N/A	0.075	0.008	0.002	1.772	0.229	0.	0.28	0.

Problem 203	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	0	14	18	22	18	17
normalized size	1	1.	1.	0.	0.67	0.86	1.05	0.86	0.81
time (sec)	N/A	0.075	0.006	0.29	1.749	0.228	10.041	0.306	8.177

Problem 204	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	0	15	19	0	0	19
normalized size	1	1.	1.	0.	0.71	0.9	0.	0.	0.9
time (sec)	N/A	0.076	0.011	0.252	1.833	0.234	0.	0.	8.693

Problem 205	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	23	18	22	0	24	19
normalized size	1	1.	1.	1.05	0.82	1.	0.	1.09	0.86
time (sec)	N/A	0.074	0.011	0.003	1.829	0.23	0.	0.333	8.781

Problem 206	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	18	1	12	18	12
normalized size	1	1.	1.	0.82	1.06	0.06	0.71	1.06	0.71
time (sec)	N/A	0.013	0.002	0.001	1.486	0.191	0.064	0.258	3.166

Problem 207	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	19	1	12	18	0
normalized size	1	1.	1.	0.82	1.12	0.06	0.71	1.06	0.
time (sec)	N/A	0.013	0.002	0.001	1.425	0.188	0.066	0.273	0.

Problem 208	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	18	1	12	18	0
normalized size	1	1.	1.	0.82	1.06	0.06	0.71	1.06	0.
time (sec)	N/A	0.012	0.002	0.	1.44	0.19	0.062	0.249	0.

Problem 209	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	11	14	1	8	14	0
normalized size	1	1.	1.	0.92	1.17	0.08	0.67	1.17	0.
time (sec)	N/A	0.008	0.	0.001	1.424	0.193	0.055	0.265	0.

Problem 210	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	12	19	15	10	16	10
normalized size	1	1.	1.	0.92	1.46	1.15	0.77	1.23	0.77
time (sec)	N/A	0.011	0.003	0.003	1.423	0.212	0.155	0.266	2.756

Problem 211	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	14	18	19	8	18	0
normalized size	1	1.	1.	0.93	1.2	1.27	0.53	1.2	0.
time (sec)	N/A	0.013	0.002	0.005	1.442	0.211	1.025	0.233	0.

Problem 212	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	11	14	20	8	14	0
normalized size	1	1.	1.	0.92	1.17	1.67	0.67	1.17	0.
time (sec)	N/A	0.012	0.002	0.003	1.447	0.208	1.003	0.218	0.

Problem 213	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	12	19	23	10	24	10
normalized size	1	1.	1.	0.92	1.46	1.77	0.77	1.85	0.77
time (sec)	N/A	0.012	0.005	0.007	1.479	0.218	1.085	0.22	2.801

Problem 214	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	14	18	18	14	18	10
normalized size	1	1.	1.	0.93	1.2	1.2	0.93	1.2	0.67
time (sec)	N/A	0.013	0.003	0.006	1.438	0.21	1.147	0.214	2.93

Problem 215	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	20	20	15	20	14
normalized size	1	1.	1.	0.82	1.18	1.18	0.88	1.18	0.82
time (sec)	N/A	0.013	0.003	0.008	1.42	0.214	1.192	0.218	2.977

Problem 216	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	18	18	14	18	14
normalized size	1	1.	1.	0.82	1.06	1.06	0.82	1.06	0.82
time (sec)	N/A	0.013	0.004	0.006	1.436	0.208	1.199	0.215	2.972

Problem 217	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	20	20	15	20	14
normalized size	1	1.	1.	0.82	1.18	1.18	0.88	1.18	0.82
time (sec)	N/A	0.013	0.004	0.006	1.421	0.211	1.213	0.216	3.039

Problem 218	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	25	32	1	24	32	24
normalized size	1	1.	1.	0.83	1.07	0.03	0.8	1.07	0.8
time (sec)	N/A	0.034	0.002	0.001	1.451	0.189	0.087	0.213	5.365

Problem 219	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	25	32	1	26	32	26
normalized size	1	1.	1.	0.83	1.07	0.03	0.87	1.07	0.87
time (sec)	N/A	0.031	0.001	0.001	1.436	0.192	0.088	0.218	5.417

Problem 220	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	30	25	19	1	24	19	10
normalized size	1	1.	1.88	1.56	1.19	0.06	1.5	1.19	0.62
time (sec)	N/A	0.011	0.001	0.001	1.426	0.201	0.09	0.213	2.153

Problem 221	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	25	32	1	26	32	0
normalized size	1	1.	1.	0.83	1.07	0.03	0.87	1.07	0.
time (sec)	N/A	0.03	0.002	0.	1.448	0.214	0.084	0.218	0.

Problem 222	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	25	22	28	1	20	28	0
normalized size	1	1.	1.	0.88	1.12	0.04	0.8	1.12	0.
time (sec)	N/A	0.019	0.001	0.002	1.434	0.231	0.082	0.221	0.

Problem 223	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	26	26	26	23	34	30	24	31	0
normalized size	1	1.	1.	0.88	1.31	1.15	0.92	1.19	0.
time (sec)	N/A	0.034	0.001	0.002	1.423	0.243	1.053	0.224	0.

Problem 224	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	25	24	31	34	19	31	0
normalized size	1	1.	1.	0.96	1.24	1.36	0.76	1.24	0.
time (sec)	N/A	0.028	0.002	0.006	1.427	0.238	1.077	0.217	0.

Problem 225	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	26	26	26	23	30	34	22	30	22
normalized size	1	1.	1.	0.88	1.15	1.31	0.85	1.15	0.85
time (sec)	N/A	0.028	0.001	0.004	1.436	0.242	1.118	0.216	5.126

Problem 226	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	27	24	34	36	24	43	0
normalized size	1	1.	1.	0.89	1.26	1.33	0.89	1.59	0.
time (sec)	N/A	0.04	0.001	0.007	1.433	0.255	1.211	0.219	0.

Problem 227	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	28	25	34	35	24	34	0
normalized size	1	1.	1.	0.89	1.21	1.25	0.86	1.21	0.
time (sec)	N/A	0.029	0.002	0.009	1.43	0.268	1.241	0.229	0.

Problem 228	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	23	22	30	35	20	30	0
normalized size	1	1.	1.	0.96	1.3	1.52	0.87	1.3	0.
time (sec)	N/A	0.028	0.001	0.007	1.44	0.256	1.31	0.244	0.

Problem 229	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	26	26	26	23	35	38	22	43	27
normalized size	1	1.	1.	0.88	1.35	1.46	0.85	1.65	1.04
time (sec)	N/A	0.038	0.001	0.008	1.441	0.283	1.374	0.258	6.448

Problem 230	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	28	25	35	35	27	35	22
normalized size	1	1.	1.	0.89	1.25	1.25	0.96	1.25	0.79
time (sec)	N/A	0.029	0.001	0.008	1.468	0.259	1.362	0.216	5.248

Problem 231	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	25	35	35	27	35	27
normalized size	1	1.	1.	0.83	1.17	1.17	0.9	1.17	0.9
time (sec)	N/A	0.029	0.001	0.007	1.442	0.262	1.396	0.225	5.281

Problem 232	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	30	25	32	32	26	32	15
normalized size	1	1.	1.58	1.32	1.68	1.68	1.37	1.68	0.79
time (sec)	N/A	0.015	0.002	0.008	1.439	0.224	1.47	0.224	2.798

Problem 233	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	25	35	35	27	35	27
normalized size	1	1.	1.	0.83	1.17	1.17	0.9	1.17	0.9
time (sec)	N/A	0.029	0.002	0.007	1.436	0.233	1.519	0.218	5.308

Problem 234	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	25	35	35	27	35	26
normalized size	1	1.	1.	0.83	1.17	1.17	0.9	1.17	0.87
time (sec)	N/A	0.029	0.002	0.007	1.442	0.225	1.521	0.219	5.384

Problem 235	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	25	35	35	27	35	27
normalized size	1	1.	1.	0.83	1.17	1.17	0.9	1.17	0.9
time (sec)	N/A	0.039	0.001	0.008	1.441	0.207	1.577	0.224	6.684

Problem 236	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	43	36	47	1	36	47	36
normalized size	1	1.	1.	0.84	1.09	0.02	0.84	1.09	0.84
time (sec)	N/A	0.078	0.003	0.002	1.439	0.196	0.102	0.216	10.126

Problem 237	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	43	36	47	1	36	47	36
normalized size	1	1.	1.	0.84	1.09	0.02	0.84	1.09	0.84
time (sec)	N/A	0.072	0.003	0.	1.439	0.191	0.098	0.22	9.848

Problem 238	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	43	36	47	1	36	47	36
normalized size	1	1.	1.	0.84	1.09	0.02	0.84	1.09	0.84
time (sec)	N/A	0.072	0.003	0.001	1.438	0.194	0.099	0.214	9.6

Problem 239	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	43	36	47	1	36	47	27
normalized size	1	1.	1.26	1.06	1.38	0.03	1.06	1.38	0.79
time (sec)	N/A	0.081	0.003	0.001	1.444	0.192	0.096	0.225	8.361

Problem 240	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	43	36	19	1	36	19	10
normalized size	1	1.	2.69	2.25	1.19	0.06	2.25	1.19	0.62
time (sec)	N/A	0.012	0.003	0.001	1.437	0.19	0.099	0.219	2.14

Problem 241	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	36	33	47	43	32	45	0
normalized size	1	1.	1.	0.92	1.31	1.19	0.89	1.25	0.
time (sec)	N/A	0.048	0.007	0.003	1.439	0.217	1.078	0.217	0.

Problem 242	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	37	37	37	34	46	51	34	59	0
normalized size	1	1.	1.	0.92	1.24	1.38	0.92	1.59	0.
time (sec)	N/A	0.056	0.007	0.01	1.444	0.218	1.208	0.218	0.

Problem 243	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	38	35	49	53	36	61	0
normalized size	1	1.	1.	0.92	1.29	1.39	0.95	1.61	0.
time (sec)	N/A	0.052	0.007	0.008	1.437	0.221	1.425	0.22	0.

Problem 244	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	37	37	37	34	53	53	36	61	36
normalized size	1	1.	1.	0.92	1.43	1.43	0.97	1.65	0.97
time (sec)	N/A	0.049	0.007	0.008	1.442	0.23	1.711	0.22	8.556

Problem 245	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	43	36	47	47	37	47	15
normalized size	1	1.	2.26	1.89	2.47	2.47	1.95	2.47	0.79
time (sec)	N/A	0.016	0.006	0.008	1.442	0.222	1.829	0.216	2.751

Problem 246	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	43	36	50	50	39	50	37
normalized size	1	1.	1.08	0.9	1.25	1.25	0.98	1.25	0.92
time (sec)	N/A	0.052	0.007	0.008	1.437	0.206	1.97	0.214	8.759

Problem 247	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	43	36	50	50	39	50	37
normalized size	1	1.	1.	0.84	1.16	1.16	0.91	1.16	0.86
time (sec)	N/A	0.053	0.007	0.009	1.441	0.205	2.118	0.222	8.882

Problem 248	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	43	36	50	50	39	50	37
normalized size	1	1.	1.	0.84	1.16	1.16	0.91	1.16	0.86
time (sec)	N/A	0.05	0.007	0.009	1.466	0.203	2.309	0.215	8.779

Problem 249	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	43	36	47	1	39	47	39
normalized size	1	1.	1.	0.84	1.09	0.02	0.91	1.09	0.91
time (sec)	N/A	0.044	0.003	0.	1.423	0.189	0.099	0.224	7.016

Problem 250	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	43	36	47	1	39	47	39
normalized size	1	1.	1.	0.84	1.09	0.02	0.91	1.09	0.91
time (sec)	N/A	0.041	0.003	0.	1.414	0.191	0.098	0.214	7.195

Problem 251	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	43	36	47	1	39	47	0
normalized size	1	1.	1.	0.84	1.09	0.02	0.91	1.09	0.
time (sec)	N/A	0.039	0.003	0.001	1.414	0.188	0.096	0.214	0.

Problem 252	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	38	33	43	1	36	43	0
normalized size	1	1.	1.	0.87	1.13	0.03	0.95	1.13	0.
time (sec)	N/A	0.028	0.002	0.001	1.43	0.189	0.091	0.216	0.

Problem 253	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	41	41	41	36	47	50	36	47	0
normalized size	1	1.	1.	0.88	1.15	1.22	0.88	1.15	0.
time (sec)	N/A	0.038	0.006	0.005	1.416	0.203	1.051	0.217	0.

Problem 254	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	39	34	45	50	36	45	36
normalized size	1	1.	1.	0.87	1.15	1.28	0.92	1.15	0.92
time (sec)	N/A	0.038	0.012	0.005	1.422	0.224	1.086	0.213	6.634

Problem 255	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	41	41	41	36	49	50	37	49	0
normalized size	1	1.	1.	0.88	1.2	1.22	0.9	1.2	0.
time (sec)	N/A	0.038	0.007	0.006	1.418	0.207	1.262	0.216	0.

Problem 256	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	39	34	49	50	36	49	36
normalized size	1	1.	1.	0.87	1.26	1.28	0.92	1.26	0.92
time (sec)	N/A	0.038	0.011	0.009	1.427	0.202	1.273	0.229	6.716

Problem 257	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	41	41	41	36	51	50	37	51	0
normalized size	1	1.	1.	0.88	1.24	1.22	0.9	1.24	0.
time (sec)	N/A	0.037	0.007	0.008	1.418	0.203	1.461	0.222	0.

Problem 258	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	69	58	77	1	65	77	65
normalized size	1	1.	1.	0.84	1.12	0.01	0.94	1.12	0.94
time (sec)	N/A	0.111	0.005	0.002	1.428	0.188	0.131	0.229	15.81

Problem 259	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	69	58	77	1	66	77	66
normalized size	1	1.	1.	0.84	1.12	0.01	0.96	1.12	0.96
time (sec)	N/A	0.106	0.004	0.003	1.422	0.188	0.126	0.214	15.516

Problem 260	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	72	72	69	58	77	1	65	77	65
normalized size	1	1.	0.96	0.81	1.07	0.01	0.9	1.07	0.9
time (sec)	N/A	0.189	0.004	0.001	1.434	0.193	0.122	0.216	15.027

Problem 261	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	69	58	77	1	66	77	46
normalized size	1	1.	1.3	1.09	1.45	0.02	1.25	1.45	0.87
time (sec)	N/A	0.144	0.004	0.002	1.421	0.189	0.124	0.216	13.598

Problem 262	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	69	58	77	1	66	77	27
normalized size	1	1.	2.03	1.71	2.26	0.03	1.94	2.26	0.79
time (sec)	N/A	0.087	0.004	0.002	1.455	0.191	0.12	0.22	9.692

Problem 263	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	69	58	19	1	65	19	10
normalized size	1	1.	4.31	3.62	1.19	0.06	4.06	1.19	0.62
time (sec)	N/A	0.012	0.004	0.002	1.455	0.189	0.119	0.212	2.147

Problem 264	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	65	65	56	78	74	65	76	0
normalized size	1	1.	1.	0.86	1.2	1.14	1.	1.17	0.
time (sec)	N/A	0.075	0.007	0.003	1.427	0.217	1.152	0.224	0.

Problem 265	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	66	57	78	82	65	90	0
normalized size	1	1.	1.	0.86	1.18	1.24	0.98	1.36	0.
time (sec)	N/A	0.085	0.008	0.009	1.439	0.211	1.31	0.224	0.

Problem 266	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	66	57	80	82	63	93	0
normalized size	1	1.	1.	0.86	1.21	1.24	0.95	1.41	0.
time (sec)	N/A	0.086	0.008	0.009	1.44	0.213	1.566	0.226	0.

Problem 267	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	66	57	82	82	63	96	0
normalized size	1	1.	1.	0.86	1.24	1.24	0.95	1.45	0.
time (sec)	N/A	0.082	0.012	0.009	1.441	0.213	1.889	0.226	0.

Problem 268	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	66	57	82	82	61	93	0
normalized size	1	1.	1.	0.86	1.24	1.24	0.92	1.41	0.
time (sec)	N/A	0.086	0.009	0.01	1.432	0.215	2.189	0.222	0.

Problem 269	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	65	65	56	82	82	60	90	68
normalized size	1	1.	1.	0.86	1.26	1.26	0.92	1.38	1.05
time (sec)	N/A	0.074	0.008	0.01	1.438	0.211	2.563	0.22	13.568

Problem 270	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	69	58	77	77	61	77	15
normalized size	1	1.	3.63	3.05	4.05	4.05	3.21	4.05	0.79
time (sec)	N/A	0.016	0.008	0.009	1.429	0.204	2.862	0.221	2.732

Problem 271	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	69	58	80	80	63	80	32
normalized size	1	1.	1.72	1.45	2.	2.	1.58	2.	0.8
time (sec)	N/A	0.052	0.007	0.008	1.449	0.209	3.073	0.226	5.792

Problem 272	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	69	58	80	80	63	80	68
normalized size	1	1.	1.11	0.94	1.29	1.29	1.02	1.29	1.1
time (sec)	N/A	0.077	0.013	0.009	1.449	0.207	3.238	0.222	14.03

Problem 273	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	69	58	80	80	63	80	66
normalized size	1	1.	1.	0.84	1.16	1.16	0.91	1.16	0.96
time (sec)	N/A	0.08	0.008	0.008	1.457	0.203	3.461	0.218	13.934

Problem 274	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	69	58	80	80	63	80	68
normalized size	1	1.	1.	0.84	1.16	1.16	0.91	1.16	0.99
time (sec)	N/A	0.086	0.008	0.01	1.438	0.205	3.725	0.219	14.015

Problem 275	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	69	58	77	1	66	77	66
normalized size	1	1.	1.	0.84	1.12	0.01	0.96	1.12	0.96
time (sec)	N/A	0.075	0.004	0.002	1.454	0.189	0.13	0.219	11.236

Problem 276	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	66	57	76	1	63	76	63
normalized size	1	1.	1.	0.86	1.15	0.02	0.95	1.15	0.95
time (sec)	N/A	0.071	0.004	0.002	1.442	0.188	0.121	0.222	11.405

Problem 277	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	66	57	76	1	63	76	0
normalized size	1	1.	1.	0.86	1.15	0.02	0.95	1.15	0.
time (sec)	N/A	0.065	0.004	0.001	1.432	0.187	0.123	0.221	0.

Problem 278	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	61	54	72	1	60	72	0
normalized size	1	1.	1.	0.89	1.18	0.02	0.98	1.18	0.
time (sec)	N/A	0.047	0.002	0.002	1.444	0.188	0.117	0.222	0.

Problem 279	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	65	65	58	77	80	61	77	0
normalized size	1	1.	1.	0.89	1.18	1.23	0.94	1.18	0.
time (sec)	N/A	0.059	0.007	0.005	1.435	0.205	1.172	0.226	0.

Problem 280	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	65	65	56	74	80	61	74	61
normalized size	1	1.	1.	0.86	1.14	1.23	0.94	1.14	0.94
time (sec)	N/A	0.056	0.008	0.005	1.443	0.203	1.209	0.224	10.864

Problem 281	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	63	58	78	80	61	78	0
normalized size	1	1.	1.	0.92	1.24	1.27	0.97	1.24	0.
time (sec)	N/A	0.058	0.011	0.008	1.424	0.205	1.392	0.219	0.

Problem 282	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	65	65	56	78	80	63	78	63
normalized size	1	1.	1.	0.86	1.2	1.23	0.97	1.2	0.97
time (sec)	N/A	0.057	0.007	0.008	1.433	0.203	1.367	0.221	10.951

Problem 283	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	62	57	80	80	60	80	0
normalized size	1	1.	1.	0.92	1.29	1.29	0.97	1.29	0.
time (sec)	N/A	0.067	0.007	0.008	1.429	0.207	1.611	0.218	0.

Problem 284	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	61	56	76	80	60	76	58
normalized size	1	1.	1.	0.92	1.25	1.31	0.98	1.25	0.95
time (sec)	N/A	0.06	0.007	0.008	1.44	0.205	1.62	0.219	11.078

Problem 285	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	129	129	108	91	122	1	105	122	105
normalized size	1	1.	0.84	0.71	0.95	0.01	0.81	0.95	0.81
time (sec)	N/A	0.439	0.005	0.003	1.429	0.191	0.179	0.217	25.296

Problem 286	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	110	110	108	91	122	1	107	122	100
normalized size	1	1.	0.98	0.83	1.11	0.01	0.97	1.11	0.91
time (sec)	N/A	0.347	0.005	0.003	1.434	0.193	0.163	0.215	27.734

Problem 287	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	91	91	108	91	122	1	107	122	82
normalized size	1	1.	1.19	1.	1.34	0.01	1.18	1.34	0.9
time (sec)	N/A	0.29	0.005	0.001	1.443	0.191	0.159	0.214	23.79

Problem 288	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	72	72	108	91	122	1	107	122	61
normalized size	1	1.	1.5	1.26	1.69	0.01	1.49	1.69	0.85
time (sec)	N/A	0.236	0.005	0.001	1.451	0.191	0.173	0.217	20.297

Problem 289	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	108	91	122	1	107	122	44
normalized size	1	1.	2.04	1.72	2.3	0.02	2.02	2.3	0.83
time (sec)	N/A	0.183	0.005	0.003	1.435	0.191	0.164	0.211	16.538

Problem 290	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	108	91	122	1	107	122	27
normalized size	1	1.	3.18	2.68	3.59	0.03	3.15	3.59	0.79
time (sec)	N/A	0.122	0.005	0.003	1.45	0.193	0.159	0.217	12.628

Problem 291	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	108	91	19	1	105	19	10
normalized size	1	1.	6.75	5.69	1.19	0.06	6.56	1.19	0.62
time (sec)	N/A	0.013	0.005	0.003	1.465	0.192	0.157	0.217	2.168

Problem 292	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	104	104	104	89	123	119	105	120	0
normalized size	1	1.	1.	0.86	1.18	1.14	1.01	1.15	0.
time (sec)	N/A	0.12	0.008	0.005	1.448	0.214	1.321	0.216	0.

Problem 293	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	105	90	123	127	105	135	0
normalized size	1	1.	1.	0.86	1.17	1.21	1.	1.29	0.
time (sec)	N/A	0.156	0.017	0.009	1.426	0.21	1.521	0.225	0.

Problem 294	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	105	90	124	127	104	138	0
normalized size	1	1.	1.	0.86	1.18	1.21	0.99	1.31	0.
time (sec)	N/A	0.134	0.009	0.009	1.432	0.215	1.759	0.216	0.

Problem 295	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	105	90	124	127	102	138	0
normalized size	1	1.	1.	0.86	1.18	1.21	0.97	1.31	0.
time (sec)	N/A	0.13	0.018	0.01	1.426	0.215	2.048	0.224	0.

Problem 296	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	105	90	127	127	102	140	0
normalized size	1	1.	1.	0.86	1.21	1.21	0.97	1.33	0.
time (sec)	N/A	0.127	0.009	0.01	1.451	0.213	2.501	0.22	0.

Problem 297	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	105	90	127	127	100	140	0
normalized size	1	1.	1.	0.86	1.21	1.21	0.95	1.33	0.
time (sec)	N/A	0.127	0.012	0.012	1.425	0.214	2.866	0.223	0.

Problem 298	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	105	90	127	127	99	140	0
normalized size	1	1.	1.	0.86	1.21	1.21	0.94	1.33	0.
time (sec)	N/A	0.125	0.009	0.013	1.453	0.213	3.411	0.219	0.

Problem 299	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	105	90	127	127	97	138	0
normalized size	1	1.	1.	0.86	1.21	1.21	0.92	1.31	0.
time (sec)	N/A	0.121	0.018	0.013	1.424	0.21	3.958	0.216	0.

Problem 300	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	104	104	104	89	127	127	95	135	109
normalized size	1	1.	1.	0.86	1.22	1.22	0.91	1.3	1.05
time (sec)	N/A	0.116	0.009	0.011	1.442	0.211	4.642	0.219	23.077

Problem 301	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	108	91	122	122	97	122	15
normalized size	1	1.	5.68	4.79	6.42	6.42	5.11	6.42	0.79
time (sec)	N/A	0.018	0.016	0.01	1.474	0.204	5.123	0.22	2.828

Problem 302	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	108	91	124	124	99	124	32
normalized size	1	1.	2.7	2.28	3.1	3.1	2.48	3.1	0.8
time (sec)	N/A	0.054	0.009	0.01	1.426	0.204	5.53	0.228	5.965

Problem 303	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	108	91	124	124	99	124	53
normalized size	1	1.	1.74	1.47	2.	2.	1.6	2.	0.85
time (sec)	N/A	0.078	0.018	0.01	1.434	0.202	5.722	0.219	8.765

Problem 304	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	108	91	124	124	99	124	73
normalized size	1	1.	1.29	1.08	1.48	1.48	1.18	1.48	0.87
time (sec)	N/A	0.106	0.008	0.01	1.422	0.203	6.096	0.222	12.637

Problem 305	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	106	106	108	91	124	124	99	124	109
normalized size	1	1.	1.02	0.86	1.17	1.17	0.93	1.17	1.03
time (sec)	N/A	0.137	0.012	0.01	1.458	0.205	6.496	0.218	23.769

Problem 306	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	108	108	108	91	124	124	99	124	109
normalized size	1	1.	1.	0.84	1.15	1.15	0.92	1.15	1.01
time (sec)	N/A	0.127	0.008	0.009	1.42	0.204	7.048	0.219	23.589

Problem 307	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	108	108	108	91	124	124	99	124	107
normalized size	1	1.	1.	0.84	1.15	1.15	0.92	1.15	0.99
time (sec)	N/A	0.127	0.017	0.01	1.439	0.206	7.419	0.218	24.167

Problem 308	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	103	103	103	90	120	1	102	120	102
normalized size	1	1.	1.	0.87	1.17	0.01	0.99	1.17	0.99
time (sec)	N/A	0.113	0.005	0.002	1.553	0.19	0.16	0.218	18.762

Problem 309	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	108	108	108	91	122	1	107	122	107
normalized size	1	1.	1.	0.84	1.13	0.01	0.99	1.13	0.99
time (sec)	N/A	0.104	0.005	0.002	1.435	0.19	0.159	0.214	18.881

Problem 310	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	106	106	106	91	122	1	105	122	0
normalized size	1	1.	1.	0.86	1.15	0.01	0.99	1.15	0.
time (sec)	N/A	0.102	0.004	0.002	1.438	0.19	0.173	0.223	0.

Problem 311	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	99	99	99	88	117	1	100	117	0
normalized size	1	1.	1.	0.89	1.18	0.01	1.01	1.18	0.
time (sec)	N/A	0.085	0.002	0.002	1.441	0.205	0.159	0.212	0.

Problem 312	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	100	91	122	124	99	122	0
normalized size	1	1.	1.	0.91	1.22	1.24	0.99	1.22	0.
time (sec)	N/A	0.097	0.017	0.004	1.445	0.204	1.313	0.213	0.

Problem 313	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	98	89	119	124	99	119	99
normalized size	1	1.	1.	0.91	1.21	1.27	1.01	1.21	1.01
time (sec)	N/A	0.095	0.008	0.006	1.437	0.208	1.36	0.216	19.426

Problem 314	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	102	102	102	91	123	124	102	123	0
normalized size	1	1.	1.	0.89	1.21	1.22	1.	1.21	0.
time (sec)	N/A	0.097	0.008	0.008	1.433	0.207	1.591	0.22	0.

Problem 315	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	98	89	120	124	97	120	97
normalized size	1	1.	1.	0.91	1.22	1.27	0.99	1.22	0.99
time (sec)	N/A	0.094	0.017	0.009	1.438	0.207	1.54	0.218	19.584

Problem 316	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	98	91	123	124	99	123	0
normalized size	1	1.	1.	0.93	1.26	1.27	1.01	1.26	0.
time (sec)	N/A	0.097	0.012	0.009	1.439	0.208	1.818	0.213	0.

Problem 317	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	100	89	123	124	100	123	100
normalized size	1	1.	1.	0.89	1.23	1.24	1.	1.23	1.
time (sec)	N/A	0.091	0.008	0.009	1.438	0.206	1.799	0.215	19.388

Problem 318	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	40	35	46	45	32	47	0
normalized size	1	1.	1.	0.88	1.15	1.12	0.8	1.18	0.
time (sec)	N/A	0.064	0.01	0.004	1.442	0.21	1.296	0.225	0.

Problem 319	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	27	24	31	30	20	32	0
normalized size	1	1.	1.	0.89	1.15	1.11	0.74	1.19	0.
time (sec)	N/A	0.044	0.007	0.003	1.445	0.224	1.256	0.22	0.

Problem 320	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	14	18	18	10	19	10
normalized size	1	1.	1.	0.93	1.2	1.2	0.67	1.27	0.67
time (sec)	N/A	0.009	0.004	0.001	1.432	0.216	0.296	0.215	2.212

Problem 321	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	21	31	24	15	30	19
normalized size	1	1.	1.	0.95	1.41	1.09	0.68	1.36	0.86
time (sec)	N/A	0.032	0.008	0.007	1.433	0.215	0.578	0.222	5.852

Problem 322	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	35	32	45	45	31	57	34
normalized size	1	1.	1.	0.91	1.29	1.29	0.89	1.63	0.97
time (sec)	N/A	0.054	0.012	0.009	1.431	0.218	1.79	0.22	8.329

Problem 323	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	111	102	0	190	32	154	116
normalized size	1	1.	0.9	0.82	0.	1.53	0.26	1.24	0.94
time (sec)	N/A	0.175	0.061	0.009	0.	0.221	1.256	0.222	30.027

Problem 324	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	119	119	108	99	0	157	22	150	112
normalized size	1	1.	0.91	0.83	0.	1.32	0.18	1.26	0.94
time (sec)	N/A	0.146	0.029	0.003	0.	0.223	1.201	0.217	31.198

Problem 325	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	115	115	89	91	0	134	24	151	109
normalized size	1	1.	0.77	0.79	0.	1.17	0.21	1.31	0.95
time (sec)	N/A	0.11	0.024	0.003	0.	0.22	0.303	0.222	24.446

Problem 326	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	115	115	89	91	0	120	20	151	109
normalized size	1	1.	0.77	0.79	0.	1.04	0.17	1.31	0.95
time (sec)	N/A	0.106	0.022	0.002	0.	0.246	0.347	0.22	24.922

Problem 327	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	114	99	0	171	29	163	114
normalized size	1	1.	0.93	0.81	0.	1.4	0.24	1.34	0.93
time (sec)	N/A	0.139	0.036	0.007	0.	0.236	1.327	0.224	30.497

Problem 328	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	119	99	0	217	32	155	117
normalized size	1	1.	0.96	0.8	0.	1.75	0.26	1.25	0.94
time (sec)	N/A	0.139	0.037	0.007	0.	0.225	1.491	0.222	33.015

Problem 329	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	38	41	58	76	42	66	0
normalized size	1	1.	0.83	0.89	1.26	1.65	0.91	1.43	0.
time (sec)	N/A	0.074	0.032	0.007	1.436	0.211	1.764	0.222	0.

Problem 330	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	27	30	43	47	29	65	26
normalized size	1	1.	0.82	0.91	1.3	1.42	0.88	1.97	0.79
time (sec)	N/A	0.057	0.016	0.007	1.44	0.211	1.598	0.215	8.297

Problem 331	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	15	19	20	15	19	12
normalized size	1	1.	1.	0.94	1.19	1.25	0.94	1.19	0.75
time (sec)	N/A	0.01	0.009	0.001	1.438	0.206	1.374	0.219	2.348

Problem 332	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	33	35	50	63	34	61	34
normalized size	1	1.	0.87	0.92	1.32	1.66	0.89	1.61	0.89
time (sec)	N/A	0.061	0.023	0.011	1.441	0.228	1.907	0.224	9.234

Problem 333	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	41	47	72	99	53	69	53
normalized size	1	1.	0.79	0.9	1.38	1.9	1.02	1.33	1.02
time (sec)	N/A	0.079	0.085	0.013	1.458	0.239	3.132	0.22	11.576

Problem 334	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	136	136	119	108	0	201	44	178	126
normalized size	1	1.	0.88	0.79	0.	1.48	0.32	1.31	0.93
time (sec)	N/A	0.15	0.163	0.01	0.	0.226	1.607	0.226	29.693

Problem 335	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	134	134	118	106	0	184	39	176	121
normalized size	1	1.	0.88	0.79	0.	1.37	0.29	1.31	0.9
time (sec)	N/A	0.142	0.13	0.01	0.	0.233	1.583	0.223	30.444

Problem 336	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	136	136	119	117	0	201	44	174	122
normalized size	1	1.	0.88	0.86	0.	1.48	0.32	1.28	0.9
time (sec)	N/A	0.138	0.127	0.006	0.	0.236	1.556	0.219	29.914

Problem 337	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	134	134	118	115	0	182	39	171	124
normalized size	1	1.	0.88	0.86	0.	1.36	0.29	1.28	0.93
time (sec)	N/A	0.132	0.129	0.007	0.	0.238	1.63	0.217	29.942

Problem 338	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	146	146	131	117	0	232	54	188	136
normalized size	1	1.	0.9	0.8	0.	1.59	0.37	1.29	0.93
time (sec)	N/A	0.172	0.215	0.015	0.	0.242	2.04	0.225	34.999

Problem 339	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	146	146	129	115	0	281	56	177	139
normalized size	1	1.	0.88	0.79	0.	1.92	0.38	1.21	0.95
time (sec)	N/A	0.171	0.175	0.014	0.	0.239	2.382	0.221	38.741

Problem 340	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	48	58	89	123	63	84	0
normalized size	1	1.	0.79	0.95	1.46	2.02	1.03	1.38	0.
time (sec)	N/A	0.104	0.107	0.008	1.445	0.227	2.75	0.231	0.

Problem 341	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	39	47	74	93	53	57	44
normalized size	1	1.	0.75	0.9	1.42	1.79	1.02	1.1	0.85
time (sec)	N/A	0.084	0.029	0.007	1.441	0.225	2.518	0.218	12.743

Problem 342	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	24	31	49	49	36	30	14
normalized size	1	1.	1.26	1.63	2.58	2.58	1.89	1.58	0.74
time (sec)	N/A	0.017	0.013	0.006	1.434	0.246	2.253	0.219	2.956

Problem 343	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	15	19	35	27	19	14
normalized size	1	1.	1.	0.94	1.19	2.19	1.69	1.19	0.88
time (sec)	N/A	0.009	0.009	0.002	1.428	0.242	2.115	0.219	2.191

Problem 344	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	43	49	81	122	56	77	49
normalized size	1	1.	0.8	0.91	1.5	2.26	1.04	1.43	0.91
time (sec)	N/A	0.081	0.056	0.011	1.427	0.22	3.471	0.228	11.345

Problem 345	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	59	61	103	161	75	108	63
normalized size	1	1.	0.89	0.92	1.56	2.44	1.14	1.64	0.95
time (sec)	N/A	0.103	0.099	0.014	1.451	0.221	10.701	0.218	15.545

Problem 346	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	155	155	140	119	0	278	68	192	146
normalized size	1	1.	0.9	0.77	0.	1.79	0.44	1.24	0.94
time (sec)	N/A	0.192	0.16	0.013	0.	0.223	2.545	0.237	35.882

Problem 347	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	153	153	136	117	0	261	66	189	143
normalized size	1	1.	0.89	0.76	0.	1.71	0.43	1.24	0.93
time (sec)	N/A	0.182	0.138	0.013	0.	0.245	2.522	0.225	38.213

Problem 348	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	158	158	141	127	0	278	70	196	139
normalized size	1	1.	0.89	0.8	0.	1.76	0.44	1.24	0.88
time (sec)	N/A	0.172	0.206	0.013	0.	0.241	2.488	0.225	38.075

Problem 349	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	154	154	138	125	0	259	65	192	136
normalized size	1	1.	0.9	0.81	0.	1.68	0.42	1.25	0.88
time (sec)	N/A	0.164	0.165	0.014	0.	0.233	2.392	0.251	39.127

Problem 350	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	155	155	139	134	0	277	70	188	144
normalized size	1	1.	0.9	0.86	0.	1.79	0.45	1.21	0.93
time (sec)	N/A	0.168	0.126	0.006	0.	0.226	2.388	0.253	36.445

Problem 351	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	151	151	135	130	0	259	63	185	143
normalized size	1	1.	0.89	0.86	0.	1.72	0.42	1.23	0.95
time (sec)	N/A	0.158	0.121	0.006	0.	0.24	2.449	0.249	34.137

Problem 352	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	41	41	41	37	49	47	34	50	0
normalized size	1	1.	1.	0.9	1.2	1.15	0.83	1.22	0.
time (sec)	N/A	0.072	0.013	0.004	1.439	0.278	1.34	0.246	0.

Problem 353	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	28	26	34	31	22	35	0
normalized size	1	1.	1.	0.93	1.21	1.11	0.79	1.25	0.
time (sec)	N/A	0.049	0.008	0.003	1.433	0.242	1.27	0.242	0.

Problem 354	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	16	20	20	12	22	12
normalized size	1	1.	1.	1.	1.25	1.25	0.75	1.38	0.75
time (sec)	N/A	0.009	0.005	0.002	1.439	0.222	0.327	0.241	2.44

Problem 355	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	23	23	34	27	15	32	19
normalized size	1	1.	1.	1.	1.48	1.17	0.65	1.39	0.83
time (sec)	N/A	0.034	0.011	0.005	1.434	0.242	0.668	0.243	6.213

Problem 356	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	35	33	47	45	31	55	34
normalized size	1	1.	1.	0.94	1.34	1.29	0.89	1.57	0.97
time (sec)	N/A	0.055	0.015	0.009	1.451	0.257	1.84	0.251	8.914

Problem 357	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	125	125	111	103	0	200	34	143	116
normalized size	1	1.	0.89	0.82	0.	1.6	0.27	1.14	0.93
time (sec)	N/A	0.154	0.07	0.007	0.	0.234	1.259	0.236	30.401

Problem 358	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	120	120	108	101	0	157	24	140	112
normalized size	1	1.	0.9	0.84	0.	1.31	0.2	1.17	0.93
time (sec)	N/A	0.138	0.029	0.004	0.	0.244	1.25	0.231	28.114

Problem 359	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	115	115	89	92	0	136	26	140	109
normalized size	1	1.	0.77	0.8	0.	1.18	0.23	1.22	0.95
time (sec)	N/A	0.11	0.026	0.003	0.	0.222	0.337	0.252	24.716

Problem 360	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	114	114	89	92	0	127	22	140	109
normalized size	1	1.	0.78	0.81	0.	1.11	0.19	1.23	0.96
time (sec)	N/A	0.102	0.019	0.002	0.	0.221	0.369	0.221	22.058

Problem 361	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	123	123	114	100	0	182	31	153	114
normalized size	1	1.	0.93	0.81	0.	1.48	0.25	1.24	0.93
time (sec)	N/A	0.137	0.056	0.007	0.	0.216	1.363	0.256	30.801

Problem 362	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	119	100	0	219	34	144	117
normalized size	1	1.	0.96	0.81	0.	1.77	0.27	1.16	0.94
time (sec)	N/A	0.128	0.038	0.006	0.	0.22	1.459	0.238	27.865

Problem 363	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	125	125	101	105	0	169	32	193	117
normalized size	1	1.	0.81	0.84	0.	1.35	0.26	1.54	0.94
time (sec)	N/A	0.178	0.06	0.009	0.	0.217	0.62	0.249	28.794

Problem 364	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	124	106	0	176	34	177	117
normalized size	1	1.	1.	0.85	0.	1.42	0.27	1.43	0.94
time (sec)	N/A	0.138	0.114	0.007	0.	0.219	0.652	0.241	25.193

Problem 365	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	139	139	101	105	0	169	32	192	117
normalized size	1	1.	0.73	0.76	0.	1.22	0.23	1.38	0.84
time (sec)	N/A	0.202	0.061	0.006	0.	0.216	0.69	0.255	27.295

Problem 366	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	138	138	124	106	0	176	34	186	117
normalized size	1	1.	0.9	0.77	0.	1.28	0.25	1.35	0.85
time (sec)	N/A	0.154	0.103	0.006	0.	0.218	0.736	0.253	28.645

Problem 367	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	10	10	10	7	8	8	42	8	8
normalized size	1	1.	1.	0.7	0.8	0.8	4.2	0.8	0.8
time (sec)	N/A	0.02	0.008	0.008	1.578	0.222	5.247	0.218	4.169

Problem 368	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	61	47	86	77	114	77	75
normalized size	1	1.	0.76	0.59	1.08	0.96	1.42	0.96	0.94
time (sec)	N/A	0.109	0.03	0.01	1.439	0.214	10.54	0.229	14.766

Problem 369	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	50	36	63	62	90	58	54
normalized size	1	1.	0.85	0.61	1.07	1.05	1.53	0.98	0.92
time (sec)	N/A	0.084	0.024	0.009	1.441	0.212	4.438	0.261	11.025

Problem 370	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	38	25	41	46	66	39	34
normalized size	1	1.	1.	0.66	1.08	1.21	1.74	1.03	0.89
time (sec)	N/A	0.059	0.019	0.008	1.442	0.218	1.622	0.264	7.351

Problem 371	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	15	19	19	42	19	14
normalized size	1	1.	1.	0.83	1.06	1.06	2.33	1.06	0.78
time (sec)	N/A	0.011	0.012	0.005	1.445	0.212	0.514	0.26	2.235

Problem 372	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	48	32	0	1	76	49	37
normalized size	1	1.	1.12	0.74	0.	0.02	1.77	1.14	0.86
time (sec)	N/A	0.07	0.101	0.158	0.	0.23	5.016	0.27	6.956

Problem 373	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	59	36	0	1	49	58	41
normalized size	1	1.	1.26	0.77	0.	0.02	1.04	1.23	0.87
time (sec)	N/A	0.072	0.106	0.026	0.	0.225	6.703	0.261	7.283

Problem 374	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	67	56	0	1	100	84	60
normalized size	1	1.	0.94	0.79	0.	0.01	1.41	1.18	0.85
time (sec)	N/A	0.105	0.195	0.03	0.	0.224	12.786	0.247	9.89

Problem 375	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	79	76	0	1	129	108	82
normalized size	1	1.	0.83	0.8	0.	0.01	1.36	1.14	0.86
time (sec)	N/A	0.138	0.276	0.031	0.	0.228	21.417	0.233	13.574

Problem 376	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	275	275	184	337	0	0	39	0	246
normalized size	1	1.	0.67	1.23	0.	0.	0.14	0.	0.89
time (sec)	N/A	0.298	0.508	0.024	0.	0.	2.869	0.	23.093

Problem 377	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	251	251	168	317	0	0	39	0	223
normalized size	1	1.	0.67	1.26	0.	0.	0.16	0.	0.89
time (sec)	N/A	0.191	0.838	0.023	0.	0.	2.332	0.	16.617

Problem 378	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	227	227	155	297	0	0	37	0	201
normalized size	1	1.	0.68	1.31	0.	0.	0.16	0.	0.89
time (sec)	N/A	0.114	0.56	0.018	0.	0.	2.17	0.	8.324

Problem 379	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	228	228	158	295	0	0	42	0	197
normalized size	1	1.	0.69	1.29	0.	0.	0.18	0.	0.86
time (sec)	N/A	0.125	0.762	0.026	0.	0.	2.46	0.	9.897

Problem 380	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	253	253	173	317	0	0	46	0	221
normalized size	1	1.	0.68	1.25	0.	0.	0.18	0.	0.87
time (sec)	N/A	0.189	0.91	0.037	0.	0.	3.081	0.	16.121

Problem 381	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	277	277	181	339	0	0	46	0	246
normalized size	1	1.	0.65	1.22	0.	0.	0.17	0.	0.89
time (sec)	N/A	0.25	0.83	0.031	0.	0.	4.557	0.	22.279

Problem 382	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	535	535	238	491	0	0	39	0	476
normalized size	1	1.	0.44	0.92	0.	0.	0.07	0.	0.89
time (sec)	N/A	0.653	1.381	0.025	0.	0.	3.169	0.	55.73

Problem 383	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	511	511	231	471	0	0	39	0	452
normalized size	1	1.	0.45	0.92	0.	0.	0.08	0.	0.88
time (sec)	N/A	0.533	1.635	0.023	0.	0.	2.518	0.	46.658

Problem 384	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	487	487	218	451	0	0	39	0	430
normalized size	1	1.	0.45	0.93	0.	0.	0.08	0.	0.88
time (sec)	N/A	0.374	1.314	0.02	0.	0.	2.166	0.	36.283

Problem 385	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	479	479	214	447	0	0	41	0	418
normalized size	1	1.	0.45	0.93	0.	0.	0.09	0.	0.87
time (sec)	N/A	0.374	1.213	0.025	0.	0.	2.295	0.	34.958

Problem 386	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	511	511	231	469	0	0	46	0	445
normalized size	1	1.	0.45	0.92	0.	0.	0.09	0.	0.87
time (sec)	N/A	0.482	1.879	0.027	0.	0.	2.772	0.	46.281

Problem 387	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	50	47	86	92	136	181	75
normalized size	1	1.	0.62	0.59	1.08	1.15	1.7	2.26	0.94
time (sec)	N/A	0.111	0.05	0.009	1.457	0.243	24.805	0.245	14.868

Problem 388	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	39	36	63	77	112	143	54
normalized size	1	1.	0.66	0.61	1.07	1.31	1.9	2.42	0.92
time (sec)	N/A	0.087	0.038	0.007	1.436	0.211	12.732	0.224	10.993

Problem 389	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	28	25	41	61	88	105	34
normalized size	1	1.	0.74	0.66	1.08	1.61	2.32	2.76	0.89
time (sec)	N/A	0.06	0.033	0.008	1.428	0.212	5.662	0.232	7.381

Problem 390	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	15	19	43	65	19	14
normalized size	1	1.	1.	0.83	1.06	2.39	3.61	1.06	0.78
time (sec)	N/A	0.011	0.014	0.006	1.428	0.217	2.026	0.239	2.263

Problem 391	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	61	48	0	1	83	68	53
normalized size	1	1.	1.03	0.81	0.	0.02	1.41	1.15	0.9
time (sec)	N/A	0.093	0.177	0.023	0.	0.231	7.	0.261	8.95

Problem 392	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	58	49	0	1	100	77	49
normalized size	1	1.	1.	0.84	0.	0.02	1.72	1.33	0.84
time (sec)	N/A	0.092	0.182	0.027	0.	0.222	8.825	0.252	9.438

Problem 393	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	70	54	0	1	78	82	60
normalized size	1	1.	1.03	0.79	0.	0.01	1.15	1.21	0.88
time (sec)	N/A	0.096	0.197	0.03	0.	0.235	12.039	0.219	10.039

Problem 394	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	296	296	195	355	0	0	39	0	267
normalized size	1	1.	0.66	1.2	0.	0.	0.13	0.	0.9
time (sec)	N/A	0.323	0.423	0.024	0.	0.	5.352	0.	29.4

Problem 395	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	272	272	178	335	0	0	39	0	243
normalized size	1	1.	0.65	1.23	0.	0.	0.14	0.	0.89
time (sec)	N/A	0.241	0.706	0.023	0.	0.	3.542	0.	22.623

Problem 396	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	246	246	166	315	0	0	37	0	219
normalized size	1	1.	0.67	1.28	0.	0.	0.15	0.	0.89
time (sec)	N/A	0.157	0.938	0.019	0.	0.	2.875	0.	12.492

Problem 397	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	246	246	167	310	0	0	42	0	218
normalized size	1	1.	0.68	1.26	0.	0.	0.17	0.	0.89
time (sec)	N/A	0.166	0.811	0.026	0.	0.	3.108	0.	13.805

Problem 398	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	247	247	167	312	0	0	46	0	218
normalized size	1	1.	0.68	1.26	0.	0.	0.19	0.	0.88
time (sec)	N/A	0.172	1.028	0.029	0.	0.	4.115	0.	15.064

Problem 399	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	556	556	253	509	0	0	39	0	496
normalized size	1	1.	0.46	0.92	0.	0.	0.07	0.	0.89
time (sec)	N/A	0.705	1.653	0.026	0.	0.	6.114	0.	67.189

Problem 400	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	532	532	238	489	0	0	39	0	473
normalized size	1	1.	0.45	0.92	0.	0.	0.07	0.	0.89
time (sec)	N/A	0.591	1.722	0.023	0.	0.	3.998	0.	55.428

Problem 401	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	508	508	229	469	0	0	39	0	450
normalized size	1	1.	0.45	0.92	0.	0.	0.08	0.	0.89
time (sec)	N/A	0.473	1.354	0.02	0.	0.	2.909	0.	43.688

Problem 402	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	504	504	228	464	0	0	41	0	445
normalized size	1	1.	0.45	0.92	0.	0.	0.08	0.	0.88
time (sec)	N/A	0.469	1.585	0.024	0.	0.	3.142	0.	43.393

Problem 403	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	505	505	228	464	0	0	46	0	445
normalized size	1	1.	0.45	0.92	0.	0.	0.09	0.	0.88
time (sec)	N/A	0.465	1.876	0.027	0.	0.	3.733	0.	43.724

Problem 404	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	50	47	86	62	94	77	75
normalized size	1	1.	0.62	0.59	1.08	0.78	1.18	0.96	0.94
time (sec)	N/A	0.115	0.03	0.008	1.444	0.226	10.079	0.211	14.494

Problem 405	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	39	36	63	47	70	58	54
normalized size	1	1.	0.66	0.61	1.07	0.8	1.19	0.98	0.92
time (sec)	N/A	0.088	0.026	0.008	1.436	0.224	4.846	0.225	10.828

Problem 406	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	27	25	41	31	46	36	34
normalized size	1	1.	0.71	0.66	1.08	0.82	1.21	0.95	0.89
time (sec)	N/A	0.063	0.02	0.007	1.439	0.231	2.552	0.213	7.304

Problem 407	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	15	19	19	24	19	14
normalized size	1	1.	1.	0.83	1.06	1.06	1.33	1.06	0.78
time (sec)	N/A	0.011	0.009	0.007	1.434	0.222	1.594	0.219	2.172

Problem 408	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	44	20	0	1	26	31	26
normalized size	1	1.	1.63	0.74	0.	0.04	0.96	1.15	0.96
time (sec)	N/A	0.05	0.047	0.022	0.	0.235	3.724	0.258	5.236

Problem 409	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	56	39	0	1	49	65	41
normalized size	1	1.	1.12	0.78	0.	0.02	0.98	1.3	0.82
time (sec)	N/A	0.075	0.161	0.028	0.	0.245	8.071	0.229	7.12

Problem 410	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	68	59	0	1	104	89	63
normalized size	1	1.	0.92	0.8	0.	0.01	1.41	1.2	0.85
time (sec)	N/A	0.105	0.202	0.028	0.	0.247	14.532	0.219	10.141

Problem 411	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	254	254	174	320	0	0	37	0	226
normalized size	1	1.	0.69	1.26	0.	0.	0.15	0.	0.89
time (sec)	N/A	0.197	0.496	0.025	0.	0.	2.7	0.	16.547

Problem 412	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	230	230	158	300	0	0	37	0	202
normalized size	1	1.	0.69	1.3	0.	0.	0.16	0.	0.88
time (sec)	N/A	0.133	0.671	0.023	0.	0.	2.295	0.	10.614

Problem 413	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	207	207	136	283	0	0	36	0	184
normalized size	1	1.	0.66	1.37	0.	0.	0.17	0.	0.89
time (sec)	N/A	0.068	0.131	0.019	0.	0.	2.107	0.	4.986

Problem 414	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	234	234	161	301	0	0	41	0	202
normalized size	1	1.	0.69	1.29	0.	0.	0.18	0.	0.86
time (sec)	N/A	0.142	0.701	0.025	0.	0.	2.606	0.	10.73

Problem 415	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	256	256	170	320	0	0	44	0	226
normalized size	1	1.	0.66	1.25	0.	0.	0.17	0.	0.88
time (sec)	N/A	0.187	0.796	0.028	0.	0.	3.424	0.	16.253

Problem 416	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	514	514	228	474	0	0	37	0	456
normalized size	1	1.	0.44	0.92	0.	0.	0.07	0.	0.89
time (sec)	N/A	0.496	1.445	0.024	0.	0.	3.023	0.	45.583

Problem 417	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	490	490	221	454	0	0	37	0	432
normalized size	1	1.	0.45	0.93	0.	0.	0.08	0.	0.88
time (sec)	N/A	0.39	1.914	0.022	0.	0.	2.369	0.	34.841

Problem 418	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	462	462	197	435	0	0	37	0	406
normalized size	1	1.	0.43	0.94	0.	0.	0.08	0.	0.88
time (sec)	N/A	0.283	0.229	0.021	0.	0.	2.187	0.	25.514

Problem 419	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	484	484	217	453	0	0	39	0	420
normalized size	1	1.	0.45	0.94	0.	0.	0.08	0.	0.87
time (sec)	N/A	0.38	1.226	0.023	0.	0.	2.428	0.	35.68

Problem 420	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	514	514	231	472	0	0	44	0	452
normalized size	1	1.	0.45	0.92	0.	0.	0.09	0.	0.88
time (sec)	N/A	0.498	2.085	0.026	0.	0.	3.049	0.	45.939

Problem 421	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	78	78	49	46	86	61	94	74	73
normalized size	1	1.	0.63	0.59	1.1	0.78	1.21	0.95	0.94
time (sec)	N/A	0.111	0.037	0.01	1.419	0.229	11.272	0.214	14.963

Problem 422	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	38	36	63	46	70	55	54
normalized size	1	1.	0.64	0.61	1.07	0.78	1.19	0.93	0.92
time (sec)	N/A	0.089	0.03	0.007	1.439	0.227	5.485	0.235	10.828

Problem 423	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	27	24	41	31	46	35	34
normalized size	1	1.	0.71	0.63	1.08	0.82	1.21	0.92	0.89
time (sec)	N/A	0.061	0.021	0.008	1.422	0.228	3.	0.245	7.316

Problem 424	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	15	19	19	26	19	15
normalized size	1	1.	1.	0.83	1.06	1.06	1.44	1.06	0.83
time (sec)	N/A	0.011	0.01	0.005	1.449	0.223	2.048	0.21	2.2

Problem 425	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	51	39	0	1	184	55	39
normalized size	1	1.	1.11	0.85	0.	0.02	4.	1.2	0.85
time (sec)	N/A	0.075	0.135	0.035	0.	0.238	6.03	0.213	7.526

Problem 426	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	64	57	0	1	75	89	58
normalized size	1	1.	0.97	0.86	0.	0.02	1.14	1.35	0.88
time (sec)	N/A	0.103	0.338	0.033	0.	0.244	11.964	0.213	10.166

Problem 427	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	73	80	0	1	112	108	88
normalized size	1	1.	0.77	0.84	0.	0.01	1.18	1.14	0.93
time (sec)	N/A	0.138	0.332	0.038	0.	0.242	21.49	0.213	14.051

Problem 428	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	251	251	161	320	0	0	37	0	223
normalized size	1	1.	0.64	1.27	0.	0.	0.15	0.	0.89
time (sec)	N/A	0.195	0.385	0.027	0.	0.	3.017	0.	16.83

Problem 429	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	229	229	151	303	0	0	37	0	201
normalized size	1	1.	0.66	1.32	0.	0.	0.16	0.	0.88
time (sec)	N/A	0.133	0.554	0.026	0.	0.	2.451	0.	10.957

Problem 430	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	232	232	154	306	0	0	36	0	202
normalized size	1	1.	0.66	1.32	0.	0.	0.16	0.	0.87
time (sec)	N/A	0.119	0.417	0.023	0.	0.	2.351	0.	9.122

Problem 431	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	255	255	170	321	0	0	41	0	226
normalized size	1	1.	0.67	1.26	0.	0.	0.16	0.	0.89
time (sec)	N/A	0.186	0.512	0.03	0.	0.	3.121	0.	17.12

Problem 432	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	277	277	183	342	0	0	44	0	248
normalized size	1	1.	0.66	1.23	0.	0.	0.16	0.	0.9
time (sec)	N/A	0.245	0.524	0.035	0.	0.	5.029	0.	22.749

Problem 433	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	511	511	221	476	0	0	37	0	452
normalized size	1	1.	0.43	0.93	0.	0.	0.07	0.	0.88
time (sec)	N/A	0.482	1.839	0.027	0.	0.	3.259	0.	46.78

Problem 434	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	487	487	216	457	0	0	37	0	430
normalized size	1	1.	0.44	0.94	0.	0.	0.08	0.	0.88
time (sec)	N/A	0.386	1.74	0.028	0.	0.	2.52	0.	36.054

Problem 435	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	489	489	212	460	0	0	37	0	430
normalized size	1	1.	0.43	0.94	0.	0.	0.08	0.	0.88
time (sec)	N/A	0.374	2.51	0.023	0.	0.	2.363	0.	35.334

Problem 436	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	513	513	226	475	0	0	39	0	450
normalized size	1	1.	0.44	0.93	0.	0.	0.08	0.	0.88
time (sec)	N/A	0.479	0.966	0.03	0.	0.	3.001	0.	46.502

Problem 437	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	535	535	241	496	0	0	44	0	474
normalized size	1	1.	0.45	0.93	0.	0.	0.08	0.	0.89
time (sec)	N/A	0.592	1.66	0.035	0.	0.	4.119	0.	57.683

Problem 438	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	30	38	50	35	56	50	46
normalized size	1	1.	0.57	0.72	0.94	0.66	1.06	0.94	0.87
time (sec)	N/A	0.048	0.015	0.008	1.423	0.231	4.493	0.242	5.045

Problem 439	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	25	33	38	28	41	38	34
normalized size	1	1.	0.62	0.82	0.95	0.7	1.02	0.95	0.85
time (sec)	N/A	0.042	0.013	0.006	1.432	0.221	1.919	0.223	4.176

Problem 440	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	18	26	26	19	26	26	22
normalized size	1	1.	0.67	0.96	0.96	0.7	0.96	0.96	0.81
time (sec)	N/A	0.032	0.007	0.006	1.444	0.22	0.769	0.215	3.507

Problem 441	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	21	12	12	10	12	10
normalized size	1	1.	1.	1.62	0.92	0.92	0.77	0.92	0.77
time (sec)	N/A	0.007	0.005	0.005	1.434	0.226	0.324	0.212	1.706

Problem 442	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	11	34	34	12	35	14
normalized size	1	1.	1.	0.79	2.43	2.43	0.86	2.5	1.
time (sec)	N/A	0.024	0.017	0.17	1.437	0.228	3.364	0.215	3.278

Problem 443	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	31	24	50	59	26	51	24
normalized size	1	1.	1.	0.77	1.61	1.9	0.84	1.65	0.77
time (sec)	N/A	0.038	0.028	0.029	1.446	0.229	6.323	0.217	4.134

Problem 444	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	37	36	86	70	65	68	37
normalized size	1	1.	0.79	0.77	1.83	1.49	1.38	1.45	0.79
time (sec)	N/A	0.05	0.042	0.03	1.435	0.229	10.529	0.246	4.852

Problem 445	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	42	48	108	77	85	80	56
normalized size	1	1.	0.67	0.76	1.71	1.22	1.35	1.27	0.89
time (sec)	N/A	0.062	0.046	0.033	1.44	0.228	17.492	0.245	5.724

Problem 446	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	136	136	108	139	0	0	29	0	124
normalized size	1	1.	0.79	1.02	0.	0.	0.21	0.	0.91
time (sec)	N/A	0.097	0.236	0.025	0.	0.	2.216	0.	5.71

Problem 447	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	120	120	100	127	0	0	29	0	109
normalized size	1	1.	0.83	1.06	0.	0.	0.24	0.	0.91
time (sec)	N/A	0.057	0.209	0.025	0.	0.	1.893	0.	4.18

Problem 448	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	103	103	88	116	0	0	27	0	95
normalized size	1	1.	0.85	1.13	0.	0.	0.26	0.	0.92
time (sec)	N/A	0.028	0.072	0.02	0.	0.	1.676	0.	1.949

Problem 449	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	104	129	0	0	32	0	109
normalized size	1	1.	0.85	1.06	0.	0.	0.26	0.	0.89
time (sec)	N/A	0.056	0.183	0.028	0.	0.	2.184	0.	4.084

Problem 450	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	138	138	110	141	0	0	36	0	124
normalized size	1	1.	0.8	1.02	0.	0.	0.26	0.	0.9
time (sec)	N/A	0.081	0.136	0.029	0.	0.	2.852	0.	5.684

Problem 451	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	262	262	145	198	0	0	29	0	240
normalized size	1	1.	0.55	0.76	0.	0.	0.11	0.	0.92
time (sec)	N/A	0.18	0.458	0.026	0.	0.	2.433	0.	13.672

Problem 452	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	246	246	138	186	0	0	29	0	224
normalized size	1	1.	0.56	0.76	0.	0.	0.12	0.	0.91
time (sec)	N/A	0.142	0.584	0.024	0.	0.	1.955	0.	11.236

Problem 453	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	224	224	123	173	0	0	29	0	202
normalized size	1	1.	0.55	0.77	0.	0.	0.13	0.	0.9
time (sec)	N/A	0.106	0.099	0.023	0.	0.	1.727	0.	9.077

Problem 454	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	238	238	138	185	0	0	31	0	211
normalized size	1	1.	0.58	0.78	0.	0.	0.13	0.	0.89
time (sec)	N/A	0.149	0.427	0.026	0.	0.	2.004	0.	11.383

Problem 455	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	262	262	145	198	0	0	36	0	236
normalized size	1	1.	0.55	0.76	0.	0.	0.14	0.	0.9
time (sec)	N/A	0.181	0.367	0.029	0.	0.	2.505	0.	14.37

Problem 456	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	32	38	61	38	58	80	46
normalized size	1	1.	0.52	0.62	1.	0.62	0.95	1.31	0.75
time (sec)	N/A	0.066	0.017	0.007	1.505	0.231	4.528	0.229	7.034

Problem 457	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	27	33	46	31	42	55	34
normalized size	1	1.	0.59	0.72	1.	0.67	0.91	1.2	0.74
time (sec)	N/A	0.055	0.014	0.007	1.423	0.227	1.847	0.218	5.355

Problem 458	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	20	26	31	22	27	31	22
normalized size	1	1.	0.65	0.84	1.	0.71	0.87	1.	0.71
time (sec)	N/A	0.041	0.008	0.006	1.423	0.228	0.78	0.219	4.684

Problem 459	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	21	15	15	12	15	12
normalized size	1	1.	1.	1.4	1.	1.	0.8	1.	0.8
time (sec)	N/A	0.009	0.006	0.006	1.424	0.223	0.343	0.218	1.996

Problem 460	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	13	39	39	31	41	14
normalized size	1	1.	1.	0.81	2.44	2.44	1.94	2.56	0.88
time (sec)	N/A	0.03	0.02	0.118	1.431	0.235	3.451	0.218	3.893

Problem 461	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	35	28	58	68	82	59	26
normalized size	1	1.	1.	0.8	1.66	1.94	2.34	1.69	0.74
time (sec)	N/A	0.046	0.029	0.034	1.436	0.234	6.462	0.222	4.806

Problem 462	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	44	42	95	78	138	78	39
normalized size	1	1.	0.83	0.79	1.79	1.47	2.6	1.47	0.74
time (sec)	N/A	0.062	0.046	0.036	1.505	0.235	10.667	0.218	5.916

Problem 463	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	47	56	122	85	182	103	58
normalized size	1	1.	0.66	0.79	1.72	1.2	2.56	1.45	0.82
time (sec)	N/A	0.082	0.047	0.037	1.445	0.228	17.655	0.216	6.818

Problem 464	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	152	152	93	134	0	0	31	0	126
normalized size	1	1.	0.61	0.88	0.	0.	0.2	0.	0.83
time (sec)	N/A	0.11	0.124	0.031	0.	0.	2.288	0.	6.653

Problem 465	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	134	134	86	120	0	0	31	0	110
normalized size	1	1.	0.64	0.9	0.	0.	0.23	0.	0.82
time (sec)	N/A	0.069	0.109	0.031	0.	0.	1.929	0.	4.787

Problem 466	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	115	115	73	107	0	0	29	0	97
normalized size	1	1.	0.63	0.93	0.	0.	0.25	0.	0.84
time (sec)	N/A	0.035	0.04	0.028	0.	0.	1.8	0.	1.924

Problem 467	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	136	136	90	122	0	0	34	0	109
normalized size	1	1.	0.66	0.9	0.	0.	0.25	0.	0.8
time (sec)	N/A	0.068	0.073	0.033	0.	0.	2.208	0.	4.58

Problem 468	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	154	154	95	136	0	0	37	0	126
normalized size	1	1.	0.62	0.88	0.	0.	0.24	0.	0.82
time (sec)	N/A	0.096	0.073	0.035	0.	0.	2.894	0.	6.531

Problem 469	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	294	294	144	187	0	0	31	0	240
normalized size	1	1.	0.49	0.64	0.	0.	0.11	0.	0.82
time (sec)	N/A	0.215	0.267	0.031	0.	0.	2.535	0.	17.049

Problem 470	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	276	276	137	173	0	0	31	0	224
normalized size	1	1.	0.5	0.63	0.	0.	0.11	0.	0.81
time (sec)	N/A	0.175	0.297	0.031	0.	0.	2.052	0.	14.051

Problem 471	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	252	252	122	158	0	0	31	0	202
normalized size	1	1.	0.48	0.63	0.	0.	0.12	0.	0.8
time (sec)	N/A	0.128	0.068	0.029	0.	0.	1.87	0.	11.323

Problem 472	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	270	270	133	173	0	0	32	0	211
normalized size	1	1.	0.49	0.64	0.	0.	0.12	0.	0.78
time (sec)	N/A	0.178	0.245	0.033	0.	0.	2.149	0.	13.849

Problem 473	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	294	294	145	187	0	0	37	0	236
normalized size	1	1.	0.49	0.64	0.	0.	0.13	0.	0.8
time (sec)	N/A	0.217	0.257	0.035	0.	0.	2.633	0.	16.42

Problem 474	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	30	36	50	35	56	50	46
normalized size	1	1.	0.57	0.68	0.94	0.66	1.06	0.94	0.87
time (sec)	N/A	0.049	0.015	0.007	1.441	0.231	4.541	0.221	4.775

Problem 475	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	25	31	38	28	41	38	34
normalized size	1	1.	0.62	0.78	0.95	0.7	1.02	0.95	0.85
time (sec)	N/A	0.041	0.013	0.006	1.439	0.228	1.889	0.213	4.197

Problem 476	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	18	24	26	19	26	26	22
normalized size	1	1.	0.67	0.89	0.96	0.7	0.96	0.96	0.81
time (sec)	N/A	0.031	0.007	0.007	1.435	0.229	0.779	0.217	3.307

Problem 477	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	19	12	12	10	12	10
normalized size	1	1.	1.	1.46	0.92	0.92	0.77	0.92	0.77
time (sec)	N/A	0.007	0.005	0.006	1.426	0.225	0.344	0.219	1.655

Problem 478	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	36	11	14	14	31	14	12
normalized size	1	1.	2.57	0.79	1.	1.	2.21	1.	0.86
time (sec)	N/A	0.024	0.023	0.029	1.59	0.231	3.455	0.215	3.262

Problem 479	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	41	24	31	34	82	31	24
normalized size	1	1.	1.32	0.77	1.	1.1	2.65	1.	0.77
time (sec)	N/A	0.037	0.037	0.033	1.599	0.235	6.355	0.211	4.087

Problem 480	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	48	36	65	46	138	47	37
normalized size	1	1.	1.02	0.77	1.38	0.98	2.94	1.	0.79
time (sec)	N/A	0.05	0.06	0.03	1.586	0.239	10.604	0.222	4.844

Problem 481	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	55	48	89	53	182	59	56
normalized size	1	1.	0.87	0.76	1.41	0.84	2.89	0.94	0.89
time (sec)	N/A	0.062	0.065	0.034	1.591	0.233	16.869	0.215	5.625

Problem 482	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	153	153	91	139	0	0	27	0	122
normalized size	1	1.	0.59	0.91	0.	0.	0.18	0.	0.8
time (sec)	N/A	0.112	0.128	0.025	0.	0.	2.248	0.	5.907

Problem 483	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	137	137	84	127	0	0	27	0	107
normalized size	1	1.	0.61	0.93	0.	0.	0.2	0.	0.78
time (sec)	N/A	0.072	0.103	0.024	0.	0.	1.919	0.	4.217

Problem 484	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	120	120	71	116	0	0	26	0	95
normalized size	1	1.	0.59	0.97	0.	0.	0.22	0.	0.79
time (sec)	N/A	0.035	0.042	0.022	0.	0.	1.761	0.	1.896

Problem 485	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	139	139	90	129	0	0	31	0	105
normalized size	1	1.	0.65	0.93	0.	0.	0.22	0.	0.76
time (sec)	N/A	0.067	0.058	0.027	0.	0.	2.189	0.	4.08

Problem 486	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	155	155	93	141	0	0	34	0	122
normalized size	1	1.	0.6	0.91	0.	0.	0.22	0.	0.79
time (sec)	N/A	0.093	0.074	0.028	0.	0.	2.883	0.	5.868

Problem 487	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	294	294	142	198	0	0	27	0	236
normalized size	1	1.	0.48	0.67	0.	0.	0.09	0.	0.8
time (sec)	N/A	0.205	0.223	0.026	0.	0.	2.568	0.	14.313

Problem 488	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	278	278	135	186	0	0	27	0	221
normalized size	1	1.	0.49	0.67	0.	0.	0.1	0.	0.79
time (sec)	N/A	0.165	0.288	0.024	0.	0.	2.098	0.	11.867

Problem 489	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	255	255	120	173	0	0	27	0	199
normalized size	1	1.	0.47	0.68	0.	0.	0.11	0.	0.78
time (sec)	N/A	0.12	0.063	0.022	0.	0.	1.89	0.	9.295

Problem 490	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	269	269	130	185	0	0	29	0	207
normalized size	1	1.	0.48	0.69	0.	0.	0.11	0.	0.77
time (sec)	N/A	0.161	0.243	0.028	0.	0.	2.184	0.	11.917

Problem 491	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	294	294	140	198	0	0	34	0	233
normalized size	1	1.	0.48	0.67	0.	0.	0.12	0.	0.79
time (sec)	N/A	0.203	0.262	0.027	0.	0.	2.615	0.	14.636

Problem 492	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	32	40	61	38	63	80	53
normalized size	1	1.	0.52	0.66	1.	0.62	1.03	1.31	0.87
time (sec)	N/A	0.066	0.017	0.007	1.44	0.226	4.509	0.213	7.327

Problem 493	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	27	35	46	31	46	55	41
normalized size	1	1.	0.59	0.76	1.	0.67	1.	1.2	0.89
time (sec)	N/A	0.053	0.014	0.007	1.438	0.225	1.891	0.217	5.446

Problem 494	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	20	28	31	22	29	31	26
normalized size	1	1.	0.65	0.9	1.	0.71	0.94	1.	0.84
time (sec)	N/A	0.04	0.008	0.006	1.463	0.227	0.765	0.211	5.105

Problem 495	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	23	15	15	14	15	14
normalized size	1	1.	1.	1.53	1.	1.	0.93	1.	0.93
time (sec)	N/A	0.008	0.005	0.006	1.444	0.228	0.34	0.211	2.057

Problem 496	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	34	13	16	16	12	16	14
normalized size	1	1.	2.12	0.81	1.	1.	0.75	1.	0.88
time (sec)	N/A	0.028	0.025	0.036	1.571	0.234	3.468	0.229	4.063

Problem 497	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	53	28	36	42	29	36	27
normalized size	1	1.	1.51	0.8	1.03	1.2	0.83	1.03	0.77
time (sec)	N/A	0.046	0.036	0.034	1.637	0.234	6.327	0.219	4.953

Problem 498	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	62	42	76	53	66	55	42
normalized size	1	1.	1.17	0.79	1.43	1.	1.25	1.04	0.79
time (sec)	N/A	0.061	0.044	0.035	1.574	0.227	10.78	0.214	6.073

Problem 499	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	65	56	100	59	90	80	63
normalized size	1	1.	0.92	0.79	1.41	0.83	1.27	1.13	0.89
time (sec)	N/A	0.081	0.051	0.037	1.592	0.23	17.82	0.218	7.175

Problem 500	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	149	149	115	134	0	0	32	0	129
normalized size	1	1.	0.77	0.9	0.	0.	0.21	0.	0.87
time (sec)	N/A	0.111	0.216	0.033	0.	0.	2.272	0.	6.652

Problem 501	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	131	131	107	120	0	0	32	0	114
normalized size	1	1.	0.82	0.92	0.	0.	0.24	0.	0.87
time (sec)	N/A	0.064	0.166	0.031	0.	0.	1.877	0.	4.68

Problem 502	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	112	112	95	107	0	0	31	0	97
normalized size	1	1.	0.85	0.96	0.	0.	0.28	0.	0.87
time (sec)	N/A	0.031	0.078	0.027	0.	0.	1.743	0.	1.899

Problem 503	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	133	133	111	122	0	0	36	0	110
normalized size	1	1.	0.83	0.92	0.	0.	0.27	0.	0.83
time (sec)	N/A	0.067	0.163	0.032	0.	0.	2.196	0.	4.45

Problem 504	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	151	151	117	136	0	0	39	0	129
normalized size	1	1.	0.77	0.9	0.	0.	0.26	0.	0.85
time (sec)	N/A	0.085	0.132	0.034	0.	0.	2.78	0.	6.473

Problem 505	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	282	282	164	189	0	0	32	0	248
normalized size	1	1.	0.58	0.67	0.	0.	0.11	0.	0.88
time (sec)	N/A	0.195	0.508	0.032	0.	0.	2.404	0.	14.512

Problem 506	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	264	264	157	175	0	0	32	0	231
normalized size	1	1.	0.59	0.66	0.	0.	0.12	0.	0.88
time (sec)	N/A	0.156	0.437	0.031	0.	0.	1.943	0.	11.709

Problem 507	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	239	239	142	160	0	0	32	0	207
normalized size	1	1.	0.59	0.67	0.	0.	0.13	0.	0.87
time (sec)	N/A	0.116	0.101	0.03	0.	0.	1.73	0.	9.078

Problem 508	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	257	257	156	174	0	0	34	0	218
normalized size	1	1.	0.61	0.68	0.	0.	0.13	0.	0.85
time (sec)	N/A	0.162	0.382	0.033	0.	0.	1.991	0.	11.869

Problem 509	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	282	282	164	189	0	0	39	0	245
normalized size	1	1.	0.58	0.67	0.	0.	0.14	0.	0.87
time (sec)	N/A	0.195	0.402	0.036	0.	0.	2.518	0.	14.555

Problem 510	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	61	47	86	77	110	77	71
normalized size	1	1.	0.76	0.59	1.08	0.96	1.38	0.96	0.89
time (sec)	N/A	0.108	0.031	0.009	1.439	0.22	13.304	0.219	14.644

Problem 511	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	50	36	63	62	87	58	51
normalized size	1	1.	0.85	0.61	1.07	1.05	1.47	0.98	0.86
time (sec)	N/A	0.085	0.025	0.009	1.444	0.223	5.817	0.225	10.9

Problem 512	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	38	25	41	46	63	39	31
normalized size	1	1.	1.	0.66	1.08	1.21	1.66	1.03	0.82
time (sec)	N/A	0.06	0.019	0.007	1.442	0.228	2.116	0.264	7.185

Problem 513	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	15	19	19	39	19	12
normalized size	1	1.	1.	0.83	1.06	1.06	2.17	1.06	0.67
time (sec)	N/A	0.011	0.011	0.006	1.43	0.231	0.658	0.211	2.146

Problem 514	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	61	0	0	150	42	0	88
normalized size	1	1.	0.64	0.	0.	1.58	0.44	0.	0.93
time (sec)	N/A	0.166	0.046	0.044	0.	0.239	3.821	0.	9.908

Problem 515	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	107	107	67	0	0	193	41	0	99
normalized size	1	1.	0.63	0.	0.	1.8	0.38	0.	0.93
time (sec)	N/A	0.153	0.043	0.047	0.	0.241	4.526	0.	10.399

Problem 516	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	173	173	78	0	0	232	39	0	158
normalized size	1	1.	0.45	0.	0.	1.34	0.23	0.	0.91
time (sec)	N/A	0.239	0.059	0.042	0.	0.242	5.098	0.	26.325

Problem 517	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	145	145	63	0	0	223	39	0	134
normalized size	1	1.	0.43	0.	0.	1.54	0.27	0.	0.92
time (sec)	N/A	0.16	0.045	0.033	0.	0.236	4.086	0.	21.256

Problem 518	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	F(-1)	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	138	138	66	0	0	0	41	0	126
normalized size	1	1.	0.48	0.	0.	0.	0.3	0.	0.91
time (sec)	N/A	0.152	0.038	0.039	0.	0.	3.94	0.	21.432

Problem 519	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	18	23	23	68	0	17
normalized size	1	1.	1.	0.86	1.1	1.1	3.24	0.	0.81
time (sec)	N/A	0.02	0.015	0.006	1.438	0.276	2.536	0.	2.783

Problem 520	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	41	28	47	51	109	0	37
normalized size	1	1.	0.93	0.64	1.07	1.16	2.48	0.	0.84
time (sec)	N/A	0.041	0.022	0.008	1.441	0.274	4.381	0.	4.336

Problem 521	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	53	39	70	66	520	0	61
normalized size	1	1.	0.78	0.57	1.03	0.97	7.65	0.	0.9
time (sec)	N/A	0.064	0.027	0.008	1.44	0.292	7.981	0.	6.764

Problem 522	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	51	76	0	0	0	39	0	42
normalized size	1	1.34	2.	0.	0.	0.	1.03	0.	1.11
time (sec)	N/A	0.056	0.054	0.04	0.	0.	2.524	0.	6.388

Problem 523	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	33	46	196	0	0	0	37	0	39
normalized size	1	1.39	5.94	0.	0.	0.	1.12	0.	1.18
time (sec)	N/A	0.025	0.4	0.045	0.	0.	2.239	0.	3.372

Problem 524	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	51	66	0	0	0	42	0	46
normalized size	1	1.34	1.74	0.	0.	0.	1.11	0.	1.21
time (sec)	N/A	0.052	0.049	0.039	0.	0.	2.55	0.	5.997

Problem 525	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	51	83	0	0	0	42	0	48
normalized size	1	1.34	2.18	0.	0.	0.	1.11	0.	1.26
time (sec)	N/A	0.052	0.046	0.045	0.	0.	3.47	0.	5.98

Problem 526	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	61	47	86	77	110	77	71
normalized size	1	1.	0.76	0.59	1.08	0.96	1.38	0.96	0.89
time (sec)	N/A	0.105	0.03	0.008	1.446	0.263	20.989	0.229	14.58

Problem 527	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	50	36	63	62	87	58	49
normalized size	1	1.	0.85	0.61	1.07	1.05	1.47	0.98	0.83
time (sec)	N/A	0.085	0.027	0.009	1.436	0.264	10.244	0.242	10.917

Problem 528	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	39	25	41	47	63	39	31
normalized size	1	1.	1.03	0.66	1.08	1.24	1.66	1.03	0.82
time (sec)	N/A	0.058	0.022	0.007	1.442	0.257	4.108	0.226	7.106

Problem 529	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	15	19	19	39	19	12
normalized size	1	1.	1.	0.83	1.06	1.06	2.17	1.06	0.67
time (sec)	N/A	0.011	0.011	0.006	1.436	0.385	1.434	0.254	2.133

Problem 530	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	58	0	0	181	44	0	90
normalized size	1	1.	0.59	0.	0.	1.85	0.45	0.	0.92
time (sec)	N/A	0.15	0.049	0.034	0.	0.276	3.959	0.	9.611

Problem 531	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	107	107	67	0	0	173	39	0	100
normalized size	1	1.	0.63	0.	0.	1.62	0.36	0.	0.93
time (sec)	N/A	0.148	0.042	0.047	0.	0.271	4.838	0.	9.972

Problem 532	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	51	78	0	0	0	39	0	42
normalized size	1	1.34	2.05	0.	0.	0.	1.03	0.	1.11
time (sec)	N/A	0.057	0.058	0.041	0.	0.	3.242	0.	6.029

Problem 533	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	51	60	0	0	0	39	0	42
normalized size	1	1.34	1.58	0.	0.	0.	1.03	0.	1.11
time (sec)	N/A	0.044	0.048	0.033	0.	0.	2.527	0.	5.388

Problem 534	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	49	63	0	0	0	41	0	42
normalized size	1	1.36	1.75	0.	0.	0.	1.14	0.	1.17
time (sec)	N/A	0.052	0.036	0.038	0.	0.	2.524	0.	5.864

Problem 535	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	51	82	0	0	0	46	0	48
normalized size	1	1.34	2.16	0.	0.	0.	1.21	0.	1.26
time (sec)	N/A	0.052	0.045	0.043	0.	0.	3.362	0.	5.876

Problem 536	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	117	117	143	0	0	207	39	0	156
normalized size	1	1.	1.22	0.	0.	1.77	0.33	0.	1.33
time (sec)	N/A	0.096	0.188	0.041	0.	0.26	5.222	0.	23.142

Problem 537	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	91	91	196	0	0	204	37	0	136
normalized size	1	1.	2.15	0.	0.	2.24	0.41	0.	1.49
time (sec)	N/A	0.049	0.359	0.045	0.	0.264	4.432	0.	16.203

Problem 538	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	F(-1)	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	129	0	0	0	42	0	129
normalized size	1	1.	1.47	0.	0.	0.	0.48	0.	1.47
time (sec)	N/A	0.056	0.178	0.038	0.	0.	4.267	0.	17.509

Problem 539	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	18	23	23	68	0	17
normalized size	1	1.	1.	0.86	1.1	1.1	3.24	0.	0.81
time (sec)	N/A	0.02	0.017	0.007	1.416	0.248	3.241	0.	2.73

Problem 540	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	44	28	47	51	110	0	37
normalized size	1	1.	1.	0.64	1.07	1.16	2.5	0.	0.84
time (sec)	N/A	0.042	0.025	0.007	1.449	0.254	6.094	0.	4.255

Problem 541	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	53	39	70	66	520	0	61
normalized size	1	1.	0.78	0.57	1.03	0.97	7.65	0.	0.9
time (sec)	N/A	0.065	0.028	0.008	1.439	0.25	11.246	0.	6.73

Problem 542	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	27	33	46	45	71	74	34
normalized size	1	1.	0.59	0.72	1.	0.98	1.54	1.61	0.74
time (sec)	N/A	0.052	0.024	0.006	1.436	0.24	34.024	0.323	5.071

Problem 543	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	50	47	86	62	92	77	71
normalized size	1	1.	0.62	0.59	1.08	0.78	1.15	0.96	0.89
time (sec)	N/A	0.107	0.032	0.009	1.441	0.244	10.06	0.332	14.276

Problem 544	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	39	36	63	47	68	58	51
normalized size	1	1.	0.66	0.61	1.07	0.8	1.15	0.98	0.86
time (sec)	N/A	0.085	0.028	0.007	1.429	0.25	4.752	0.308	10.648

Problem 545	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	28	25	41	32	44	39	31
normalized size	1	1.	0.74	0.66	1.08	0.84	1.16	1.03	0.82
time (sec)	N/A	0.06	0.022	0.006	1.435	0.269	2.394	0.326	7.087

Problem 546	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	15	19	19	22	19	12
normalized size	1	1.	1.	0.83	1.06	1.06	1.22	1.06	0.67
time (sec)	N/A	0.011	0.009	0.006	1.431	0.233	1.568	0.255	2.137

Problem 547	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	83	46	0	0	130	37	0	78
normalized size	1	1.	0.55	0.	0.	1.57	0.45	0.	0.94
time (sec)	N/A	0.119	0.034	0.045	0.	0.252	3.708	0.	7.28

Problem 548	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	110	110	69	0	0	197	39	0	100
normalized size	1	1.	0.63	0.	0.	1.79	0.35	0.	0.91
time (sec)	N/A	0.148	0.052	0.046	0.	0.257	4.678	0.	10.441

Problem 549	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	51	80	0	0	0	37	0	42
normalized size	1	1.34	2.11	0.	0.	0.	0.97	0.	1.11
time (sec)	N/A	0.056	0.067	0.038	0.	0.	2.95	0.	6.378

Problem 550	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	51	64	0	0	0	37	0	42
normalized size	1	1.34	1.68	0.	0.	0.	0.97	0.	1.11
time (sec)	N/A	0.056	0.048	0.053	0.	0.	2.406	0.	6.409

Problem 551	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	51	52	0	0	0	37	0	42
normalized size	1	1.34	1.37	0.	0.	0.	0.97	0.	1.11
time (sec)	N/A	0.043	0.028	0.026	0.	0.	2.212	0.	5.7

Problem 552	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	49	69	0	0	0	39	0	42
normalized size	1	1.36	1.92	0.	0.	0.	1.08	0.	1.17
time (sec)	N/A	0.052	0.046	0.037	0.	0.	2.455	0.	6.117

Problem 553	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	51	82	0	0	0	44	0	48
normalized size	1	1.34	2.16	0.	0.	0.	1.16	0.	1.26
time (sec)	N/A	0.051	0.055	0.043	0.	0.	3.076	0.	6.147

Problem 554	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	131	0	0	185	37	0	134
normalized size	1	1.	1.39	0.	0.	1.97	0.39	0.	1.43
time (sec)	N/A	0.06	0.123	0.035	0.	0.244	4.116	0.	18.493

Problem 555	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	110	0	0	173	36	0	114
normalized size	1	1.	1.57	0.	0.	2.47	0.51	0.	1.63
time (sec)	N/A	0.028	0.011	0.037	0.	0.238	3.581	0.	13.934

Problem 556	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	18	23	23	31	0	17
normalized size	1	1.	1.	0.86	1.1	1.1	1.48	0.	0.81
time (sec)	N/A	0.021	0.017	0.007	1.446	0.236	2.059	0.	2.695

Problem 557	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	31	28	47	36	70	0	37
normalized size	1	1.	0.7	0.64	1.07	0.82	1.59	0.	0.84
time (sec)	N/A	0.042	0.025	0.007	1.437	0.236	3.273	0.	4.241

Problem 558	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	42	39	70	51	406	0	61
normalized size	1	1.	0.62	0.57	1.03	0.75	5.97	0.	0.9
time (sec)	N/A	0.066	0.031	0.008	1.44	0.237	6.024	0.	6.713

Problem 559	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	53	50	93	66	692	0	85
normalized size	1	1.	0.58	0.54	1.01	0.72	7.52	0.	0.92
time (sec)	N/A	0.093	0.039	0.01	1.446	0.236	10.643	0.	9.747

Problem 560	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	78	78	50	47	86	62	92	77	70
normalized size	1	1.	0.64	0.6	1.1	0.79	1.18	0.99	0.9
time (sec)	N/A	0.104	0.029	0.009	1.443	0.231	10.981	0.559	14.171

Problem 561	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	39	36	62	47	68	58	48
normalized size	1	1.	0.7	0.64	1.11	0.84	1.21	1.04	0.86
time (sec)	N/A	0.084	0.027	0.006	1.439	0.226	5.059	0.296	10.546

Problem 562	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	27	25	41	31	44	36	29
normalized size	1	1.	0.75	0.69	1.14	0.86	1.22	1.	0.81
time (sec)	N/A	0.06	0.02	0.007	1.428	0.232	2.71	0.337	7.064

Problem 563	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	14	18	18	20	18	10
normalized size	1	1.	1.	0.93	1.2	1.2	1.33	1.2	0.67
time (sec)	N/A	0.01	0.008	0.005	1.433	0.228	1.608	0.358	2.159

Problem 564	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	48	0	0	147	39	0	78
normalized size	1	1.	0.57	0.	0.	1.75	0.46	0.	0.93
time (sec)	N/A	0.116	0.033	0.031	0.	0.252	3.865	0.	7.388

Problem 565	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	110	110	69	0	0	212	39	0	102
normalized size	1	1.	0.63	0.	0.	1.93	0.35	0.	0.93
time (sec)	N/A	0.153	0.049	0.044	0.	0.251	5.082	0.	10.472

Problem 566	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	148	148	64	0	0	212	37	0	139
normalized size	1	1.	0.43	0.	0.	1.43	0.25	0.	0.94
time (sec)	N/A	0.16	0.049	0.036	0.	0.26	4.335	0.	21.213

Problem 567	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	72	122	52	0	0	186	37	0	114
normalized size	1	1.69	0.72	0.	0.	2.58	0.51	0.	1.58
time (sec)	N/A	0.116	0.026	0.027	0.	0.243	3.654	0.	17.548

Problem 568	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	18	23	23	31	0	14
normalized size	1	1.	1.	0.95	1.21	1.21	1.63	0.	0.74
time (sec)	N/A	0.02	0.015	0.004	1.441	0.234	2.212	0.	2.68

Problem 569	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	29	26	47	36	68	0	36
normalized size	1	1.	0.66	0.59	1.07	0.82	1.55	0.	0.82
time (sec)	N/A	0.041	0.022	0.007	1.436	0.244	3.376	0.	4.234

Problem 570	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	42	39	70	51	406	0	60
normalized size	1	1.	0.62	0.57	1.03	0.75	5.97	0.	0.88
time (sec)	N/A	0.065	0.03	0.007	1.436	0.241	6.429	0.	6.636

Problem 571	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	53	50	93	66	692	0	83
normalized size	1	1.	0.58	0.54	1.01	0.72	7.52	0.	0.9
time (sec)	N/A	0.094	0.037	0.008	1.437	0.238	11.56	0.	9.749

Problem 572	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	51	78	0	0	0	37	0	42
normalized size	1	1.34	2.05	0.	0.	0.	0.97	0.	1.11
time (sec)	N/A	0.058	0.054	0.037	0.	0.	2.917	0.	6.292

Problem 573	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	51	62	0	0	0	37	0	42
normalized size	1	1.34	1.63	0.	0.	0.	0.97	0.	1.11
time (sec)	N/A	0.055	0.048	0.052	0.	0.	2.354	0.	6.536

Problem 574	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	33	46	177	0	0	0	36	0	39
normalized size	1	1.39	5.36	0.	0.	0.	1.09	0.	1.18
time (sec)	N/A	0.025	0.395	0.039	0.	0.	2.131	0.	3.657

Problem 575	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	51	70	0	0	0	41	0	46
normalized size	1	1.34	1.84	0.	0.	0.	1.08	0.	1.21
time (sec)	N/A	0.053	0.053	0.039	0.	0.	2.854	0.	6.089

Problem 576	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	51	82	0	0	0	44	0	48
normalized size	1	1.34	2.16	0.	0.	0.	1.16	0.	1.26
time (sec)	N/A	0.053	0.061	0.046	0.	0.	4.017	0.	6.121

Problem 577	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	72	72	116	0	0	161	37	0	114
normalized size	1	1.	1.61	0.	0.	2.24	0.51	0.	1.58
time (sec)	N/A	0.03	0.133	0.045	0.	0.243	3.66	0.	16.488

Problem 578	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	78	18	93	113	34	0	71
normalized size	1	1.	1.7	0.39	2.02	2.46	0.74	0.	1.54
time (sec)	N/A	0.017	0.06	0.041	1.587	0.245	3.226	0.	5.35

Problem 579	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	87	20	15	105	122	31	0	71
normalized size	1	1.78	0.41	0.31	2.14	2.49	0.63	0.	1.45
time (sec)	N/A	0.091	0.013	0.053	1.581	0.244	3.32	0.	8.296

Problem 580	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	10	12	12	10	12	10
normalized size	1	1.	1.	0.77	0.92	0.92	0.77	0.92	0.77
time (sec)	N/A	0.007	0.006	0.005	1.415	0.232	0.449	0.218	1.624

Problem 581	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	151	151	135	1023	0	1143	5902	1	138
normalized size	1	1.	0.89	6.77	0.	7.57	39.09	0.01	0.91
time (sec)	N/A	0.171	0.082	0.013	0.	0.253	158.549	0.256	25.476

Problem 582	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	97	97	87	432	0	495	2006	826	87
normalized size	1	1.	0.9	4.45	0.	5.1	20.68	8.52	0.9
time (sec)	N/A	0.096	0.055	0.01	0.	0.246	41.598	0.228	16.168

Problem 583	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	55	178	0	212	666	346	53
normalized size	1	1.	0.9	2.92	0.	3.48	10.92	5.67	0.87
time (sec)	N/A	0.059	0.042	0.007	0.	0.246	9.836	0.237	9.977

Problem 584	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	39	93	0	115	313	182	36
normalized size	1	1.	0.91	2.16	0.	2.67	7.28	4.23	0.84
time (sec)	N/A	0.041	0.03	0.008	0.	0.248	4.311	0.22	7.231

Problem 585	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	23	35	0	45	94	69	19
normalized size	1	1.	0.92	1.4	0.	1.8	3.76	2.76	0.76
time (sec)	N/A	0.02	0.025	0.003	0.	0.251	1.488	0.242	3.847

Problem 586	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	41	0	0	0	88	0	29
normalized size	1	1.	1.05	0.	0.	0.	2.26	0.	0.74
time (sec)	N/A	0.029	0.029	0.046	0.	0.	22.774	0.	4.28

Problem 587	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	41	0	0	0	0	0	31
normalized size	1	1.	1.05	0.	0.	0.	0.	0.	0.79
time (sec)	N/A	0.028	0.03	0.059	0.	0.	0.	0.	3.879

Problem 588	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	41	0	0	0	0	0	31
normalized size	1	1.	1.05	0.	0.	0.	0.	0.	0.79
time (sec)	N/A	0.028	0.032	0.047	0.	0.	0.	0.	3.893

Problem 589	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	64	64	109	0	0	0	54	0	54
normalized size	1	1.	1.7	0.	0.	0.	0.84	0.	0.84
time (sec)	N/A	0.059	0.123	0.038	0.	0.	21.288	0.	7.014

Problem 590	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	63	0	0	0	54	0	53
normalized size	1	1.	1.	0.	0.	0.	0.86	0.	0.84
time (sec)	N/A	0.056	0.03	0.029	0.	0.	3.702	0.	6.916

Problem 591	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	63	63	0	0	0	53	0	53
normalized size	1	1.21	1.21	0.	0.	0.	1.02	0.	1.02
time (sec)	N/A	0.057	0.052	0.031	0.	0.	3.014	0.	7.447

Problem 592	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	66	0	0	0	53	0	54
normalized size	1	1.	1.	0.	0.	0.	0.8	0.	0.82
time (sec)	N/A	0.06	0.055	0.03	0.	0.	5.549	0.	7.324

Problem 593	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	110	0	0	0	58	0	58
normalized size	1	1.	1.59	0.	0.	0.	0.84	0.	0.84
time (sec)	N/A	0.067	0.123	0.029	0.	0.	162.541	0.	7.795

Problem 594	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	68	64	0	0	0	58	0	56
normalized size	1	1.11	1.05	0.	0.	0.	0.95	0.	0.92
time (sec)	N/A	0.063	0.049	0.028	0.	0.	12.536	0.	7.702

Problem 595	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	68	64	0	0	0	58	0	56
normalized size	1	1.11	1.05	0.	0.	0.	0.95	0.	0.92
time (sec)	N/A	0.063	0.03	0.029	0.	0.	5.047	0.	7.665

Problem 596	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	64	0	0	0	0	0	51
normalized size	1	1.	0.97	0.	0.	0.	0.	0.	0.77
time (sec)	N/A	0.051	0.055	0.094	0.	0.	0.	0.	7.929

Problem 597	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	22	22	0	34	134	28	15
normalized size	1	1.	0.96	0.96	0.	1.48	5.83	1.22	0.65
time (sec)	N/A	0.018	0.018	0.006	0.	0.243	5.871	0.213	2.598

Problem 598	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	48	40	42	63	78	524	138	37
normalized size	1	1.	0.83	0.88	1.31	1.62	10.92	2.88	0.77
time (sec)	N/A	0.066	0.029	0.007	1.453	0.246	21.325	0.213	10.192

Problem 599	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	64	80	99	132	1368	336	61
normalized size	1	1.	0.86	1.08	1.34	1.78	18.49	4.54	0.82
time (sec)	N/A	0.097	0.046	0.008	1.45	0.244	90.771	0.22	16.566

Problem 600	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	93	132	143	200	0	597	78
normalized size	1	1.	0.98	1.39	1.51	2.11	0.	6.28	0.82
time (sec)	N/A	0.128	0.063	0.01	1.464	0.245	0.	0.218	22.821

Problem 601	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	23	35	0	45	94	69	19
normalized size	1	1.	0.92	1.4	0.	1.8	3.76	2.76	0.76
time (sec)	N/A	0.022	0.026	0.005	0.	0.249	1.981	0.215	3.831

Problem 602	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	18	1	12	18	12
normalized size	1	1.	1.	0.82	1.06	0.06	0.71	1.06	0.71
time (sec)	N/A	0.015	0.002	0.001	1.44	0.201	0.069	0.218	2.909

Problem 603	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	18	1	12	18	12
normalized size	1	1.	1.	0.82	1.06	0.06	0.71	1.06	0.71
time (sec)	N/A	0.014	0.002	0.	1.435	0.202	0.063	0.223	3.075

Problem 604	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	19	1	12	18	0
normalized size	1	1.	1.	0.82	1.12	0.06	0.71	1.06	0.
time (sec)	N/A	0.014	0.002	0.001	1.437	0.2	0.066	0.215	0.

Problem 605	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	18	1	12	18	12
normalized size	1	1.	1.	0.82	1.06	0.06	0.71	1.06	0.71
time (sec)	N/A	0.014	0.002	0.002	1.431	0.201	0.068	0.216	2.948

Problem 606	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	18	1	12	18	0
normalized size	1	1.	1.	0.82	1.06	0.06	0.71	1.06	0.
time (sec)	N/A	0.013	0.002	0.002	1.434	0.199	0.064	0.222	0.

Problem 607	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	11	14	1	8	14	0
normalized size	1	1.	1.	0.92	1.17	0.08	0.67	1.17	0.
time (sec)	N/A	0.009	0.	0.001	1.438	0.199	0.059	0.22	0.

Problem 608	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	12	19	15	10	19	10
normalized size	1	1.	1.	0.92	1.46	1.15	0.77	1.46	0.77
time (sec)	N/A	0.012	0.004	0.003	1.437	0.226	0.135	0.222	2.718

Problem 609	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	14	18	19	8	18	8
normalized size	1	1.	1.	0.93	1.2	1.27	0.53	1.2	0.53
time (sec)	N/A	0.013	0.004	0.004	1.432	0.216	0.963	0.218	2.823

Problem 610	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	18	19	12	18	0
normalized size	1	1.	1.	0.82	1.06	1.12	0.71	1.06	0.
time (sec)	N/A	0.014	0.002	0.005	1.433	0.224	0.978	0.218	0.

Problem 611	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	11	14	20	8	14	0
normalized size	1	1.	1.	0.92	1.17	1.67	0.67	1.17	0.
time (sec)	N/A	0.012	0.002	0.006	1.447	0.226	1.014	0.223	0.

Problem 612	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	12	19	23	10	27	10
normalized size	1	1.	1.	0.92	1.46	1.77	0.77	2.08	0.77
time (sec)	N/A	0.014	0.004	0.007	1.442	0.228	1.092	0.226	2.774

Problem 613	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	14	18	18	14	18	10
normalized size	1	1.	1.	0.93	1.2	1.2	0.93	1.2	0.67
time (sec)	N/A	0.014	0.004	0.008	1.439	0.219	1.123	0.218	2.906

Problem 614	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	18	18	14	18	14
normalized size	1	1.	1.	0.82	1.06	1.06	0.82	1.06	0.82
time (sec)	N/A	0.013	0.003	0.007	1.429	0.216	1.148	0.245	2.912

Problem 615	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	20	20	15	20	14
normalized size	1	1.	1.	0.82	1.18	1.18	0.88	1.18	0.82
time (sec)	N/A	0.014	0.004	0.007	1.441	0.217	1.167	0.234	2.949

Problem 616	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	18	18	14	18	14
normalized size	1	1.	1.	0.82	1.06	1.06	0.82	1.06	0.82
time (sec)	N/A	0.013	0.004	0.006	1.446	0.219	1.197	0.22	2.957

Problem 617	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	20	20	15	20	14
normalized size	1	1.	1.	0.82	1.18	1.18	0.88	1.18	0.82
time (sec)	N/A	0.014	0.004	0.008	1.441	0.219	1.256	0.236	2.98

Problem 618	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	39	93	0	115	309	182	36
normalized size	1	1.	0.91	2.16	0.	2.67	7.19	4.23	0.84
time (sec)	N/A	0.044	0.028	0.008	0.	0.246	7.125	0.228	7.248

Problem 619	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	25	32	1	24	32	24
normalized size	1	1.	1.	0.83	1.07	0.03	0.8	1.07	0.8
time (sec)	N/A	0.034	0.002	0.001	1.415	0.2	0.088	0.222	5.238

Problem 620	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	25	32	1	26	32	26
normalized size	1	1.	1.	0.83	1.07	0.03	0.87	1.07	0.87
time (sec)	N/A	0.032	0.001	0.002	1.438	0.199	0.082	0.22	5.327

Problem 621	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	30	25	19	1	24	19	10
normalized size	1	1.	1.88	1.56	1.19	0.06	1.5	1.19	0.62
time (sec)	N/A	0.011	0.001	0.001	1.428	0.202	0.091	0.221	2.178

Problem 622	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	25	32	1	26	32	26
normalized size	1	1.	1.	0.83	1.07	0.03	0.87	1.07	0.87
time (sec)	N/A	0.032	0.002	0.001	1.422	0.2	0.084	0.218	5.201

Problem 623	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	25	32	1	24	32	0
normalized size	1	1.	1.	0.83	1.07	0.03	0.8	1.07	0.
time (sec)	N/A	0.03	0.002	0.	1.425	0.204	0.085	0.22	0.

Problem 624	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	25	22	28	1	22	28	0
normalized size	1	1.	1.	0.88	1.12	0.04	0.88	1.12	0.
time (sec)	N/A	0.02	0.001	0.001	1.422	0.206	0.083	0.218	0.

Problem 625	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	26	26	26	23	34	30	22	34	0
normalized size	1	1.	1.	0.88	1.31	1.15	0.85	1.31	0.
time (sec)	N/A	0.034	0.001	0.003	1.414	0.224	1.015	0.221	0.

Problem 626	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	28	25	32	35	22	32	22
normalized size	1	1.	1.	0.89	1.14	1.25	0.79	1.14	0.79
time (sec)	N/A	0.029	0.002	0.004	1.439	0.212	1.004	0.234	5.018

Problem 627	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	27	24	31	34	22	31	0
normalized size	1	1.	1.	0.89	1.15	1.26	0.81	1.15	0.
time (sec)	N/A	0.029	0.002	0.004	1.419	0.219	1.029	0.226	0.

Problem 628	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	26	26	26	23	30	35	22	30	22
normalized size	1	1.	1.	0.88	1.15	1.35	0.85	1.15	0.85
time (sec)	N/A	0.028	0.001	0.005	1.491	0.217	1.043	0.223	5.011

Problem 629	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	27	24	34	36	24	45	0
normalized size	1	1.	1.	0.89	1.26	1.33	0.89	1.67	0.
time (sec)	N/A	0.038	0.001	0.008	1.417	0.224	1.178	0.232	0.

Problem 630	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	55	178	0	212	683	346	53
normalized size	1	1.	0.9	2.92	0.	3.48	11.2	5.67	0.87
time (sec)	N/A	0.057	0.042	0.008	0.	0.248	18.27	0.232	9.996

Problem 631	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	43	36	47	1	39	47	39
normalized size	1	1.	1.	0.84	1.09	0.02	0.91	1.09	0.91
time (sec)	N/A	0.044	0.004	0.001	1.425	0.2	0.098	0.219	6.895

Problem 632	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	43	36	47	1	37	47	37
normalized size	1	1.	1.	0.84	1.09	0.02	0.86	1.09	0.86
time (sec)	N/A	0.042	0.003	0.001	1.427	0.201	0.099	0.217	7.011

Problem 633	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	43	36	19	1	37	19	10
normalized size	1	1.	2.69	2.25	1.19	0.06	2.31	1.19	0.62
time (sec)	N/A	0.012	0.003	0.002	1.418	0.2	0.098	0.22	2.131

Problem 634	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	43	36	47	1	39	47	39
normalized size	1	1.	1.	0.84	1.09	0.02	0.91	1.09	0.91
time (sec)	N/A	0.042	0.003	0.001	1.44	0.202	0.104	0.223	6.863

Problem 635	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	43	36	47	1	37	47	0
normalized size	1	1.	1.	0.84	1.09	0.02	0.86	1.09	0.
time (sec)	N/A	0.04	0.003	0.002	1.436	0.201	0.095	0.217	0.

Problem 636	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	38	33	43	1	34	43	0
normalized size	1	1.	1.	0.87	1.13	0.03	0.89	1.13	0.
time (sec)	N/A	0.028	0.002	0.001	1.441	0.218	0.091	0.216	0.

Problem 637	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	39	34	49	45	37	49	0
normalized size	1	1.	1.	0.87	1.26	1.15	0.95	1.26	0.
time (sec)	N/A	0.047	0.007	0.003	1.435	0.227	1.072	0.229	0.

Problem 638	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	38	35	46	50	32	46	32
normalized size	1	1.	1.	0.92	1.21	1.32	0.84	1.21	0.84
time (sec)	N/A	0.036	0.007	0.005	1.438	0.22	1.037	0.234	6.724

Problem 639	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	43	36	47	49	37	47	0
normalized size	1	1.	1.	0.84	1.09	1.14	0.86	1.09	0.
time (sec)	N/A	0.037	0.011	0.004	1.441	0.216	1.073	0.215	0.

Problem 640	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	39	34	45	50	36	45	36
normalized size	1	1.	1.	0.87	1.15	1.28	0.92	1.15	0.92
time (sec)	N/A	0.036	0.007	0.006	1.44	0.216	1.085	0.216	6.517

Problem 641	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	40	35	49	51	37	62	0
normalized size	1	1.	1.	0.88	1.22	1.27	0.92	1.55	0.
time (sec)	N/A	0.053	0.008	0.007	1.43	0.224	1.253	0.219	0.

Problem 642	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	51	51	48	43	0	1	87	61	0
normalized size	1	1.	0.94	0.84	0.	0.02	1.71	1.2	0.
time (sec)	N/A	0.077	0.056	0.008	0.	0.237	1.39	0.224	0.

Problem 643	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	27	24	31	30	20	32	0
normalized size	1	1.	1.	0.89	1.15	1.11	0.74	1.19	0.
time (sec)	N/A	0.047	0.01	0.004	1.438	0.22	1.336	0.221	0.

Problem 644	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	40	32	0	1	63	42	32
normalized size	1	1.	1.	0.8	0.	0.02	1.58	1.05	0.8
time (sec)	N/A	0.055	0.022	0.004	0.	0.232	1.357	0.221	9.083

Problem 645	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	14	18	18	10	19	10
normalized size	1	1.	1.	0.93	1.2	1.2	0.67	1.27	0.67
time (sec)	N/A	0.009	0.006	0.002	1.445	0.22	0.363	0.222	2.168

Problem 646	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	29	19	0	1	56	24	26
normalized size	1	1.	1.	0.66	0.	0.03	1.93	0.83	0.9
time (sec)	N/A	0.031	0.009	0.002	0.	0.241	0.407	0.224	4.705

Problem 647	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	21	31	24	15	32	19
normalized size	1	1.	1.	0.95	1.41	1.09	0.68	1.45	0.86
time (sec)	N/A	0.033	0.011	0.007	1.432	0.227	0.665	0.223	5.45

Problem 648	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	79	32	0	1	71	42	36
normalized size	1	1.	1.98	0.8	0.	0.02	1.78	1.05	0.9
time (sec)	N/A	0.05	0.06	0.005	0.	0.233	1.517	0.225	8.766

Problem 649	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	35	32	45	45	31	58	34
normalized size	1	1.	1.	0.91	1.29	1.29	0.89	1.66	0.97
time (sec)	N/A	0.055	0.013	0.009	1.434	0.227	2.159	0.223	8.116

Problem 650	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	51	51	88	43	0	1	90	58	44
normalized size	1	1.	1.73	0.84	0.	0.02	1.76	1.14	0.86
time (sec)	N/A	0.068	0.077	0.008	0.	0.229	2.715	0.225	12.673

Problem 651	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	190	190	173	133	0	136	22	232	175
normalized size	1	1.	0.91	0.7	0.	0.72	0.12	1.22	0.92
time (sec)	N/A	0.279	0.062	0.013	0.	0.253	1.255	0.223	53.027

Problem 652	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	185	185	134	128	0	153	26	242	172
normalized size	1	1.	0.72	0.69	0.	0.83	0.14	1.31	0.93
time (sec)	N/A	0.21	0.051	0.004	0.	0.239	0.375	0.226	47.787

Problem 653	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	185	185	134	128	0	142	20	242	172
normalized size	1	1.	0.72	0.69	0.	0.77	0.11	1.31	0.93
time (sec)	N/A	0.197	0.033	0.004	0.	0.237	0.373	0.219	46.171

Problem 654	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	193	193	179	136	0	171	29	252	177
normalized size	1	1.	0.93	0.7	0.	0.89	0.15	1.31	0.92
time (sec)	N/A	0.244	0.058	0.006	0.	0.257	1.371	0.225	54.78

Problem 655	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	195	195	188	139	0	200	32	236	180
normalized size	1	1.	0.96	0.71	0.	1.03	0.16	1.21	0.92
time (sec)	N/A	0.24	0.066	0.006	0.	0.25	1.587	0.228	52.765

Problem 656	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	38	41	58	76	41	66	0
normalized size	1	1.	0.83	0.89	1.26	1.65	0.89	1.43	0.
time (sec)	N/A	0.076	0.034	0.019	1.437	0.225	2.047	0.22	0.

Problem 657	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	60	50	0	1	92	66	51
normalized size	1	1.	1.02	0.85	0.	0.02	1.56	1.12	0.86
time (sec)	N/A	0.078	0.082	0.014	0.	0.244	2.139	0.221	13.136

Problem 658	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	27	30	43	47	29	65	26
normalized size	1	1.	0.82	0.91	1.3	1.42	0.88	1.97	0.79
time (sec)	N/A	0.056	0.019	0.014	1.446	0.244	1.856	0.222	7.459

Problem 659	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	40	0	1	83	53	39
normalized size	1	1.	1.	0.82	0.	0.02	1.69	1.08	0.8
time (sec)	N/A	0.059	0.041	0.013	0.	0.228	1.887	0.223	8.749

Problem 660	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	15	19	20	15	19	12
normalized size	1	1.	1.	0.94	1.19	1.25	0.94	1.19	0.75
time (sec)	N/A	0.01	0.008	0.001	1.446	0.22	1.618	0.217	2.137

Problem 661	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	40	0	1	83	53	39
normalized size	1	1.	1.	0.82	0.	0.02	1.69	1.08	0.8
time (sec)	N/A	0.05	0.051	0.008	0.	0.248	1.851	0.218	6.214

Problem 662	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	33	35	50	63	34	63	34
normalized size	1	1.	0.87	0.92	1.32	1.66	0.89	1.66	0.89
time (sec)	N/A	0.059	0.024	0.02	1.425	0.234	2.354	0.224	8.299

Problem 663	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	94	50	0	1	95	69	53
normalized size	1	1.	1.59	0.85	0.	0.02	1.61	1.17	0.9
time (sec)	N/A	0.073	0.122	0.017	0.	0.24	3.723	0.218	12.376

Problem 664	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	204	204	185	145	0	228	44	265	192
normalized size	1	1.	0.91	0.71	0.	1.12	0.22	1.3	0.94
time (sec)	N/A	0.263	0.3	0.011	0.	0.247	1.888	0.226	53.822

Problem 665	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	202	202	182	152	0	217	39	262	184
normalized size	1	1.	0.9	0.75	0.	1.07	0.19	1.3	0.91
time (sec)	N/A	0.242	0.312	0.011	0.	0.249	1.797	0.224	52.867

Problem 666	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	204	204	184	154	0	230	46	265	185
normalized size	1	1.	0.9	0.75	0.	1.13	0.23	1.3	0.91
time (sec)	N/A	0.242	0.273	0.009	0.	0.246	1.847	0.224	53.375

Problem 667	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	202	202	183	143	0	213	39	262	190
normalized size	1	1.	0.91	0.71	0.	1.05	0.19	1.3	0.94
time (sec)	N/A	0.233	0.253	0.006	0.	0.241	1.868	0.219	51.025

Problem 668	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	214	214	196	154	0	250	54	277	201
normalized size	1	1.	0.92	0.72	0.	1.17	0.25	1.29	0.94
time (sec)	N/A	0.284	0.321	0.015	0.	0.261	2.739	0.24	59.835

Problem 669	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	214	214	194	155	0	279	56	258	204
normalized size	1	1.	0.91	0.72	0.	1.3	0.26	1.21	0.95
time (sec)	N/A	0.28	0.322	0.015	0.	0.251	5.223	0.235	58.766

Problem 670	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	39	47	74	93	53	57	42
normalized size	1	1.	0.75	0.9	1.42	1.79	1.02	1.1	0.81
time (sec)	N/A	0.083	0.032	0.016	1.456	0.219	5.038	0.226	11.62

Problem 671	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	58	52	0	1	114	66	60
normalized size	1	1.	0.85	0.76	0.	0.01	1.68	0.97	0.88
time (sec)	N/A	0.088	0.092	0.015	0.	0.233	5.103	0.222	12.87

Problem 672	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	24	31	49	49	36	30	14
normalized size	1	1.	1.26	1.63	2.58	2.58	1.89	1.58	0.74
time (sec)	N/A	0.016	0.016	0.013	1.439	0.217	4.813	0.22	2.844

Problem 673	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	62	54	0	1	116	73	56
normalized size	1	1.	0.87	0.76	0.	0.01	1.63	1.03	0.79
time (sec)	N/A	0.083	0.056	0.014	0.	0.234	4.983	0.226	11.369

Problem 674	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	15	19	35	27	19	14
normalized size	1	1.	1.	0.94	1.19	2.19	1.69	1.19	0.88
time (sec)	N/A	0.01	0.007	0.001	1.432	0.215	4.599	0.221	2.128

Problem 675	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	58	57	0	1	110	66	60
normalized size	1	1.	0.85	0.84	0.	0.01	1.62	0.97	0.88
time (sec)	N/A	0.071	0.079	0.009	0.	0.238	4.943	0.222	8.34

Problem 676	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	43	49	81	122	56	80	49
normalized size	1	1.	0.8	0.91	1.5	2.26	1.04	1.48	0.91
time (sec)	N/A	0.08	0.062	0.022	1.427	0.231	10.594	0.224	10.85

Problem 677	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	78	78	105	70	0	1	119	82	71
normalized size	1	1.	1.35	0.9	0.	0.01	1.53	1.05	0.91
time (sec)	N/A	0.102	0.178	0.02	0.	0.241	34.257	0.22	16.362

Problem 678	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	223	223	205	156	0	308	68	278	211
normalized size	1	1.	0.92	0.7	0.	1.38	0.3	1.25	0.95
time (sec)	N/A	0.303	0.202	0.017	0.	0.241	5.144	0.227	60.689

Problem 679	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	221	221	201	163	0	306	66	275	209
normalized size	1	1.	0.91	0.74	0.	1.38	0.3	1.24	0.95
time (sec)	N/A	0.288	0.183	0.015	0.	0.247	4.97	0.224	59.655

Problem 680	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	226	226	207	164	0	324	71	282	211
normalized size	1	1.	0.92	0.73	0.	1.43	0.31	1.25	0.93
time (sec)	N/A	0.289	0.201	0.015	0.	0.246	5.049	0.224	60.376

Problem 681	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	222	222	203	162	0	312	66	278	206
normalized size	1	1.	0.91	0.73	0.	1.41	0.3	1.25	0.93
time (sec)	N/A	0.277	0.188	0.017	0.	0.251	4.871	0.234	58.266

Problem 682	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	223	223	204	171	0	311	71	278	211
normalized size	1	1.	0.91	0.77	0.	1.39	0.32	1.25	0.95
time (sec)	N/A	0.286	0.184	0.007	0.	0.25	4.923	0.227	60.191

Problem 683	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	219	219	200	158	0	293	63	275	207
normalized size	1	1.	0.91	0.72	0.	1.34	0.29	1.26	0.95
time (sec)	N/A	0.269	0.191	0.007	0.	0.246	4.881	0.218	56.352

Problem 684	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	233	233	216	174	0	324	78	293	218
normalized size	1	1.	0.93	0.75	0.	1.39	0.33	1.26	0.94
time (sec)	N/A	0.328	0.195	0.02	0.	0.251	18.637	0.224	66.753

Problem 685	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	34	26	34	49	27	34	0
normalized size	1	1.	0.89	0.68	0.89	1.29	0.71	0.89	0.
time (sec)	N/A	0.051	0.029	0.005	1.587	0.223	0.203	0.219	0.

Problem 686	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	21	17	22	22	14	22	0
normalized size	1	1.	1.05	0.85	1.1	1.1	0.7	1.1	0.
time (sec)	N/A	0.033	0.009	0.004	1.441	0.224	0.154	0.22	0.

Problem 687	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	29	21	27	32	22	27	22
normalized size	1	1.	1.	0.72	0.93	1.1	0.76	0.93	0.76
time (sec)	N/A	0.038	0.019	0.003	1.586	0.227	0.2	0.22	5.475

Problem 688	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	11	14	14	8	14	8
normalized size	1	1.	1.	0.92	1.17	1.17	0.67	1.17	0.67
time (sec)	N/A	0.007	0.005	0.001	1.428	0.223	0.145	0.22	1.942

Problem 689	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	15	19	19	17	19	17
normalized size	1	1.	1.	0.71	0.9	0.9	0.81	0.9	0.81
time (sec)	N/A	0.02	0.013	0.002	1.592	0.223	0.19	0.225	2.621

Problem 690	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	16	23	20	14	23	15
normalized size	1	1.	1.	0.84	1.21	1.05	0.74	1.21	0.79
time (sec)	N/A	0.025	0.006	0.006	1.418	0.223	0.195	0.221	3.905

Problem 691	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	48	21	27	42	26	27	26
normalized size	1	1.	1.55	0.68	0.87	1.35	0.84	0.87	0.84
time (sec)	N/A	0.035	0.036	0.006	1.592	0.221	0.28	0.22	5.175

Problem 692	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	104	98	116	170	235	92	135	88
normalized size	1	0.85	0.8	0.95	1.39	1.93	0.75	1.11	0.72
time (sec)	N/A	0.196	0.053	0.008	1.604	0.24	1.516	0.226	20.201

Problem 693	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	120	102	96	114	167	227	90	132	87
normalized size	1	0.85	0.8	0.95	1.39	1.89	0.75	1.1	0.72
time (sec)	N/A	0.15	0.043	0.006	1.597	0.249	1.58	0.227	19.221

Problem 694	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	115	97	77	111	163	223	87	128	83
normalized size	1	0.84	0.67	0.97	1.42	1.94	0.76	1.11	0.72
time (sec)	N/A	0.134	0.031	0.004	1.6	0.239	1.548	0.229	18.426

Problem 695	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	115	97	77	111	163	219	87	128	83
normalized size	1	0.84	0.67	0.97	1.42	1.9	0.76	1.11	0.72
time (sec)	N/A	0.127	0.027	0.003	1.607	0.241	1.571	0.233	17.388

Problem 696	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	142	124	101	116	170	297	92	135	88
normalized size	1	0.87	0.71	0.82	1.2	2.09	0.65	0.95	0.62
time (sec)	N/A	0.153	0.042	0.007	1.598	0.245	1.606	0.236	20.154

Problem 697	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	12	15	15	8	15	8
normalized size	1	1.	1.	0.92	1.15	1.15	0.62	1.15	0.62
time (sec)	N/A	0.008	0.006	0.001	1.438	0.217	0.249	0.224	1.925

Problem 698	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	38	30	39	53	27	39	27
normalized size	1	1.	1.	0.79	1.03	1.39	0.71	1.03	0.71
time (sec)	N/A	0.035	0.03	0.01	1.579	0.23	0.324	0.224	2.866

Problem 699	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	32	27	38	54	22	47	24
normalized size	1	1.	1.	0.84	1.19	1.69	0.69	1.47	0.75
time (sec)	N/A	0.045	0.016	0.019	1.425	0.23	0.335	0.226	5.386

Problem 700	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	59	33	50	78	37	50	39
normalized size	1	1.	1.26	0.7	1.06	1.66	0.79	1.06	0.83
time (sec)	N/A	0.053	0.074	0.016	1.649	0.227	0.441	0.22	7.192

Problem 701	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	129	111	105	121	180	277	95	144	92
normalized size	1	0.86	0.81	0.94	1.4	2.15	0.74	1.12	0.71
time (sec)	N/A	0.146	0.167	0.011	1.583	0.241	1.706	0.229	19.694

Problem 702	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	131	113	107	125	182	284	97	147	94
normalized size	1	0.86	0.82	0.95	1.39	2.17	0.74	1.12	0.72
time (sec)	N/A	0.151	0.148	0.006	1.615	0.242	1.698	0.225	20.616

Problem 703	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	149	131	105	123	180	354	95	144	92
normalized size	1	0.88	0.7	0.83	1.21	2.38	0.64	0.97	0.62
time (sec)	N/A	0.141	0.138	0.007	1.593	0.245	1.723	0.227	18.035

Problem 704	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	158	140	113	128	190	362	109	155	107
normalized size	1	0.89	0.72	0.81	1.2	2.29	0.69	0.98	0.68
time (sec)	N/A	0.175	0.164	0.016	1.617	0.247	1.759	0.229	22.041

Problem 705	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	133	133	101	85	144	215	124	128	124
normalized size	1	1.	0.76	0.64	1.08	1.62	0.93	0.96	0.93
time (sec)	N/A	0.154	0.077	0.006	1.591	0.236	1.6	0.225	19.84

Problem 706	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	83	83	160	170	0	242	32	360	63
normalized size	1	1.	1.93	2.05	0.	2.92	0.39	4.34	0.76
time (sec)	N/A	0.141	0.118	0.014	0.	0.241	0.816	0.217	16.737

Problem 707	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	79	79	128	137	0	335	42	296	68
normalized size	1	1.	1.62	1.73	0.	4.24	0.53	3.75	0.86
time (sec)	N/A	0.116	0.12	0.01	0.	0.249	0.616	0.22	10.18

Problem 708	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	79	79	128	137	0	335	42	296	68
normalized size	1	1.	1.62	1.73	0.	4.24	0.53	3.75	0.86
time (sec)	N/A	0.073	0.021	0.001	0.	0.241	0.621	0.219	10.18

Problem 709	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	33	26	0	1	110	32	31
normalized size	1	1.	1.	0.79	0.	0.03	3.33	0.97	0.94
time (sec)	N/A	0.052	0.015	0.005	0.	0.228	0.592	0.218	4.725

Problem 710	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	33	26	0	1	110	32	31
normalized size	1	1.	1.	0.79	0.	0.03	3.33	0.97	0.94
time (sec)	N/A	0.034	0.009	0.	0.	0.233	0.599	0.216	4.705

Problem 711	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	79	79	128	137	0	171	29	296	66
normalized size	1	1.	1.62	1.73	0.	2.16	0.37	3.75	0.84
time (sec)	N/A	0.064	0.052	0.005	0.	0.242	0.506	0.224	11.037

Problem 712	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	79	79	128	137	0	171	29	296	66
normalized size	1	1.	1.62	1.73	0.	2.16	0.37	3.75	0.84
time (sec)	N/A	0.063	0.021	0.	0.	0.234	0.5	0.221	11.139

Problem 713	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	15	14	18	18	12	19	12
normalized size	1	1.	1.07	1.	1.29	1.29	0.86	1.36	0.86
time (sec)	N/A	0.007	0.006	0.002	1.444	0.22	0.356	0.223	2.511

Problem 714	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	15	14	18	18	12	19	12
normalized size	1	1.	1.07	1.	1.29	1.29	0.86	1.36	0.86
time (sec)	N/A	0.007	0.006	0.	1.473	0.22	0.35	0.225	2.523

Problem 715	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	16	18	24	19	18	19
normalized size	1	1.	1.	0.76	0.86	1.14	0.9	0.86	0.9
time (sec)	N/A	0.012	0.008	0.006	1.449	0.227	18.927	0.216	2.619

Problem 716	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	16	18	24	19	18	19
normalized size	1	1.	1.	0.76	0.86	1.14	0.9	0.86	0.9
time (sec)	N/A	0.016	0.007	0.004	1.455	0.225	7.821	0.211	2.608

Problem 717	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	16	18	22	19	18	19
normalized size	1	1.	1.	0.76	0.86	1.05	0.9	0.86	0.9
time (sec)	N/A	0.016	0.007	0.005	1.509	0.225	2.31	0.214	2.656

Problem 718	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	15	18	19	17	18	17
normalized size	1	1.	1.	0.79	0.95	1.	0.89	0.95	0.89
time (sec)	N/A	0.014	0.007	0.003	1.436	0.239	1.954	0.212	2.635

Problem 719	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	16	18	19	17	18	17
normalized size	1	1.	1.	0.84	0.95	1.	0.89	0.95	0.89
time (sec)	N/A	0.012	0.008	0.004	1.436	0.237	3.127	0.212	2.621

Problem 720	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	16	18	20	19	18	19
normalized size	1	1.	1.	0.76	0.86	0.95	0.9	0.86	0.9
time (sec)	N/A	0.012	0.009	0.005	1.438	0.224	4.014	0.216	2.622

Problem 721	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	16	18	20	19	18	19
normalized size	1	1.	1.	0.76	0.86	0.95	0.9	0.86	0.9
time (sec)	N/A	0.013	0.009	0.005	1.445	0.224	6.058	0.218	2.622

Problem 722	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	30	27	32	39	34	32	34
normalized size	1	1.	0.83	0.75	0.89	1.08	0.94	0.89	0.94
time (sec)	N/A	0.026	0.013	0.006	1.44	0.226	70.494	0.217	4.518

Problem 723	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	30	27	32	39	34	32	34
normalized size	1	1.	0.83	0.75	0.89	1.08	0.94	0.89	0.94
time (sec)	N/A	0.029	0.012	0.008	1.425	0.239	37.874	0.217	4.508

Problem 724	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	30	27	32	36	34	32	34
normalized size	1	1.	0.83	0.75	0.89	1.	0.94	0.89	0.94
time (sec)	N/A	0.028	0.011	0.008	1.44	0.229	9.642	0.215	4.487

Problem 725	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	30	27	32	35	32	32	32
normalized size	1	1.	0.88	0.79	0.94	1.03	0.94	0.94	0.94
time (sec)	N/A	0.026	0.012	0.006	1.436	0.223	15.439	0.211	4.572

Problem 726	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	30	27	32	35	32	32	32
normalized size	1	1.	0.88	0.79	0.94	1.03	0.94	0.94	0.94
time (sec)	N/A	0.03	0.013	0.008	1.437	0.227	18.705	0.215	4.499

Problem 727	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	30	27	32	35	34	32	34
normalized size	1	1.	0.83	0.75	0.89	0.97	0.94	0.89	0.94
time (sec)	N/A	0.026	0.014	0.009	1.439	0.228	22.551	0.213	4.531

Problem 728	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	30	27	32	35	34	32	34
normalized size	1	1.	0.83	0.75	0.89	0.97	0.94	0.89	0.94
time (sec)	N/A	0.026	0.014	0.007	1.441	0.233	31.733	0.216	4.509

Problem 729	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	51	51	51	38	47	54	0	47	49
normalized size	1	1.	1.	0.75	0.92	1.06	0.	0.92	0.96
time (sec)	N/A	0.037	0.017	0.009	1.415	0.224	0.	0.214	5.75

Problem 730	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	51	51	51	38	47	54	49	47	49
normalized size	1	1.	1.	0.75	0.92	1.06	0.96	0.92	0.96
time (sec)	N/A	0.036	0.016	0.009	1.438	0.224	122.576	0.214	5.807

Problem 731	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	51	51	41	38	47	51	49	47	49
normalized size	1	1.	0.8	0.75	0.92	1.	0.96	0.92	0.96
time (sec)	N/A	0.035	0.014	0.009	1.428	0.228	29.199	0.212	5.8

Problem 732	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	41	38	47	50	48	47	48
normalized size	1	1.	0.84	0.78	0.96	1.02	0.98	0.96	0.98
time (sec)	N/A	0.035	0.014	0.008	1.435	0.227	60.615	0.216	5.791

Problem 733	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	41	38	47	50	48	47	48
normalized size	1	1.	0.84	0.78	0.96	1.02	0.98	0.96	0.98
time (sec)	N/A	0.035	0.016	0.009	1.435	0.225	69.283	0.211	5.782

Problem 734	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	51	51	41	38	47	50	49	47	49
normalized size	1	1.	0.8	0.75	0.92	0.98	0.96	0.92	0.96
time (sec)	N/A	0.036	0.016	0.008	1.442	0.228	78.791	0.217	5.769

Problem 735	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	41	38	47	50	48	47	48
normalized size	1	1.	0.84	0.78	0.96	1.02	0.98	0.96	0.98
time (sec)	N/A	0.039	0.019	0.007	1.443	0.233	101.494	0.215	5.757

Problem 736	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	299	299	397	39	0	636	0	601	274
normalized size	1	1.	1.33	0.13	0.	2.13	0.	2.01	0.92
time (sec)	N/A	0.715	0.502	0.107	0.	0.259	0.	0.305	120.22

Problem 737	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	297	297	395	39	0	504	0	601	272
normalized size	1	1.	1.33	0.13	0.	1.7	0.	2.02	0.92
time (sec)	N/A	0.575	0.369	0.023	0.	0.263	0.	0.281	118.395

Problem 738	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	287	287	348	29	0	594	0	590	264
normalized size	1	1.	1.21	0.1	0.	2.07	0.	2.06	0.92
time (sec)	N/A	0.508	0.254	0.023	0.	0.253	0.	0.296	99.322

Problem 739	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	287	287	348	29	0	610	0	590	264
normalized size	1	1.	1.21	0.1	0.	2.13	0.	2.06	0.92
time (sec)	N/A	0.48	0.41	0.023	0.	0.265	0.	0.295	99.528

Problem 740	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	287	287	348	29	0	606	0	590	264
normalized size	1	1.	1.21	0.1	0.	2.11	0.	2.06	0.92
time (sec)	N/A	0.494	0.303	0.009	0.	0.259	0.	0.3	108.745

Problem 741	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	287	287	348	29	0	541	0	590	264
normalized size	1	1.	1.21	0.1	0.	1.89	0.	2.06	0.92
time (sec)	N/A	0.466	0.29	0.008	0.	0.259	0.	0.271	104.998

Problem 742	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	297	297	435	38	0	608	0	612	272
normalized size	1	1.	1.46	0.13	0.	2.05	0.	2.06	0.92
time (sec)	N/A	0.619	0.444	0.013	0.	0.26	0.	0.297	113.016

Problem 743	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	299	299	437	38	0	710	0	612	274
normalized size	1	1.	1.46	0.13	0.	2.37	0.	2.05	0.92
time (sec)	N/A	0.599	0.349	0.012	0.	0.261	0.	0.293	114.322

Problem 744	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	308	308	406	47	0	729	0	645	289
normalized size	1	1.	1.32	0.15	0.	2.37	0.	2.09	0.94
time (sec)	N/A	0.569	1.726	0.02	0.	0.264	0.	0.331	109.696

Problem 745	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	308	308	406	47	0	759	0	645	289
normalized size	1	1.	1.32	0.15	0.	2.46	0.	2.09	0.94
time (sec)	N/A	0.523	1.585	0.019	0.	0.261	0.	0.34	110.127

Problem 746	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	308	308	406	47	0	771	0	645	289
normalized size	1	1.	1.32	0.15	0.	2.5	0.	2.09	0.94
time (sec)	N/A	0.544	1.945	0.02	0.	0.278	0.	0.333	117.273

Problem 747	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	308	308	404	47	0	709	0	645	279
normalized size	1	1.	1.31	0.15	0.	2.3	0.	2.09	0.91
time (sec)	N/A	0.528	1.554	0.018	0.	0.262	0.	0.304	114.957

Problem 748	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	308	308	404	50	0	759	0	613	279
normalized size	1	1.	1.31	0.16	0.	2.46	0.	1.99	0.91
time (sec)	N/A	0.531	1.7	0.018	0.	0.268	0.	0.332	113.475

Problem 749	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	308	308	406	50	0	748	0	613	289
normalized size	1	1.	1.32	0.16	0.	2.43	0.	1.99	0.94
time (sec)	N/A	0.532	1.955	0.018	0.	0.271	0.	0.336	113.347

Problem 750	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	308	308	406	50	0	730	0	613	289
normalized size	1	1.	1.32	0.16	0.	2.37	0.	1.99	0.94
time (sec)	N/A	0.563	2.032	0.019	0.	0.262	0.	0.328	120.903

Problem 751	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	308	308	406	50	0	695	0	613	289
normalized size	1	1.	1.32	0.16	0.	2.26	0.	1.99	0.94
time (sec)	N/A	0.577	2.076	0.019	0.	0.267	0.	0.296	119.262

Problem 752	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	320	320	419	56	0	755	0	639	303
normalized size	1	1.	1.31	0.18	0.	2.36	0.	2.	0.95
time (sec)	N/A	0.615	1.321	0.023	0.	0.28	0.	0.323	127.681

Problem 753	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	329	329	428	59	0	895	0	659	309
normalized size	1	1.	1.3	0.18	0.	2.72	0.	2.	0.94
time (sec)	N/A	0.597	0.838	0.028	0.	0.267	0.	0.331	127.005

Problem 754	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	332	332	430	61	0	941	0	663	309
normalized size	1	1.	1.3	0.18	0.	2.83	0.	2.	0.93
time (sec)	N/A	0.61	0.979	0.029	0.	0.272	0.	0.353	124.404

Problem 755	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	332	332	430	61	0	941	0	663	309
normalized size	1	1.	1.3	0.18	0.	2.83	0.	2.	0.93
time (sec)	N/A	0.592	0.973	0.027	0.	0.269	0.	0.357	124.944

Problem 756	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	332	332	430	61	0	937	0	663	309
normalized size	1	1.	1.3	0.18	0.	2.82	0.	2.	0.93
time (sec)	N/A	0.612	1.121	0.028	0.	0.264	0.	0.355	132.536

Problem 757	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	332	332	430	61	0	905	0	662	308
normalized size	1	1.	1.3	0.18	0.	2.73	0.	1.99	0.93
time (sec)	N/A	0.613	0.916	0.03	0.	0.275	0.	0.336	130.399

Problem 758	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	329	329	427	62	0	919	0	626	309
normalized size	1	1.	1.3	0.19	0.	2.79	0.	1.9	0.94
time (sec)	N/A	0.625	0.985	0.026	0.	0.263	0.	0.356	128.337

Problem 759	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	329	329	427	62	0	906	0	626	309
normalized size	1	1.	1.3	0.19	0.	2.75	0.	1.9	0.94
time (sec)	N/A	0.626	1.026	0.027	0.	0.265	0.	0.355	127.908

Problem 760	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	329	329	427	62	0	886	0	626	309
normalized size	1	1.	1.3	0.19	0.	2.69	0.	1.9	0.94
time (sec)	N/A	0.651	1.084	0.027	0.	0.271	0.	0.351	135.674

Problem 761	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	329	329	427	62	0	849	0	626	309
normalized size	1	1.	1.3	0.19	0.	2.58	0.	1.9	0.94
time (sec)	N/A	0.626	0.875	0.026	0.	0.259	0.	0.336	133.098

Problem 762	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	50	36	63	62	87	58	49
normalized size	1	1.	0.85	0.61	1.07	1.05	1.47	0.98	0.83
time (sec)	N/A	0.082	0.028	0.008	1.43	0.226	9.761	0.219	10.589

Problem 763	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	38	25	41	46	61	39	31
normalized size	1	1.	1.	0.66	1.08	1.21	1.61	1.03	0.82
time (sec)	N/A	0.058	0.022	0.008	1.444	0.231	2.93	0.213	7.089

Problem 764	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	15	19	19	39	19	12
normalized size	1	1.	1.	0.83	1.06	1.06	2.17	1.06	0.67
time (sec)	N/A	0.01	0.009	0.007	1.437	0.245	0.66	0.214	2.128

Problem 765	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	43	41	0	1	66	49	34
normalized size	1	1.	1.	0.95	0.	0.02	1.53	1.14	0.79
time (sec)	N/A	0.067	0.07	0.017	0.	0.277	4.811	0.217	6.696

Problem 766	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	47	63	0	1	46	58	41
normalized size	1	1.	1.	1.34	0.	0.02	0.98	1.23	0.87
time (sec)	N/A	0.068	0.077	0.014	0.	0.266	6.79	0.217	6.94

Problem 767	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	62	85	0	1	95	84	60
normalized size	1	1.	0.87	1.2	0.	0.01	1.34	1.18	0.85
time (sec)	N/A	0.098	0.097	0.018	0.	0.274	13.727	0.22	9.702

Problem 768	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	67	63	0	1	95	73	63
normalized size	1	1.	0.91	0.85	0.	0.01	1.28	0.99	0.85
time (sec)	N/A	0.109	0.053	0.019	0.	0.254	11.936	0.231	11.553

Problem 769	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	53	40	0	1	44	55	42
normalized size	1	1.	1.06	0.8	0.	0.02	0.88	1.1	0.84
time (sec)	N/A	0.056	0.029	0.009	0.	0.295	6.241	0.217	5.118

Problem 770	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	60	0	1	66	49	41
normalized size	1	1.	1.	1.22	0.	0.02	1.35	1.	0.84
time (sec)	N/A	0.067	0.061	0.015	0.	0.268	4.945	0.219	7.075

Problem 771	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	18	23	23	42	19	17
normalized size	1	1.	1.	0.86	1.1	1.1	2.	0.9	0.81
time (sec)	N/A	0.019	0.017	0.006	1.442	0.245	2.837	0.215	2.721

Problem 772	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	41	28	47	51	66	39	36
normalized size	1	1.	0.93	0.64	1.07	1.16	1.5	0.89	0.82
time (sec)	N/A	0.04	0.024	0.007	1.44	0.279	6.083	0.217	4.285

Problem 773	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	53	39	70	66	359	58	61
normalized size	1	1.	0.78	0.57	1.03	0.97	5.28	0.85	0.9
time (sec)	N/A	0.061	0.03	0.009	1.455	0.297	13.414	0.218	6.742

Problem 774	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	127	127	106	108	0	0	39	0	112
normalized size	1	1.	0.83	0.85	0.	0.	0.31	0.	0.88
time (sec)	N/A	0.104	0.281	0.05	0.	0.	2.465	0.	11.111

Problem 775	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	89	85	0	0	37	0	92
normalized size	1	1.	0.85	0.81	0.	0.	0.35	0.	0.88
time (sec)	N/A	0.056	0.2	0.008	0.	0.	2.098	0.	5.396

Problem 776	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	107	107	92	87	0	0	42	0	94
normalized size	1	1.	0.86	0.81	0.	0.	0.39	0.	0.88
time (sec)	N/A	0.068	0.209	0.015	0.	0.	2.484	0.	7.023

Problem 777	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	129	129	106	110	0	0	46	0	116
normalized size	1	1.	0.82	0.85	0.	0.	0.36	0.	0.9
time (sec)	N/A	0.101	0.347	0.02	0.	0.	3.709	0.	10.83

Problem 778	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	234	234	121	112	0	0	39	0	211
normalized size	1	1.	0.52	0.48	0.	0.	0.17	0.	0.9
time (sec)	N/A	0.189	0.547	0.012	0.	0.	2.244	0.	22.388

Problem 779	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	224	224	119	112	0	0	41	0	201
normalized size	1	1.	0.53	0.5	0.	0.	0.18	0.	0.9
time (sec)	N/A	0.187	0.448	0.014	0.	0.	2.261	0.	22.537

Problem 780	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	258	258	133	130	0	0	46	0	230
normalized size	1	1.	0.52	0.5	0.	0.	0.18	0.	0.89
time (sec)	N/A	0.24	0.476	0.019	0.	0.	2.971	0.	28.8

Problem 781	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	39	36	63	77	109	143	49
normalized size	1	1.	0.66	0.61	1.07	1.31	1.85	2.42	0.83
time (sec)	N/A	0.085	0.041	0.008	1.447	0.233	23.836	0.219	10.693

Problem 782	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	28	25	41	61	83	105	31
normalized size	1	1.	0.74	0.66	1.08	1.61	2.18	2.76	0.82
time (sec)	N/A	0.06	0.034	0.007	1.425	0.255	9.491	0.214	7.159

Problem 783	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	15	19	43	60	19	12
normalized size	1	1.	1.	0.83	1.06	2.39	3.33	1.06	0.67
time (sec)	N/A	0.011	0.009	0.005	1.442	0.254	2.785	0.216	2.162

Problem 784	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	51	57	0	1	80	68	48
normalized size	1	1.	0.86	0.97	0.	0.02	1.36	1.15	0.81
time (sec)	N/A	0.091	0.096	0.023	0.	0.261	6.845	0.219	8.633

Problem 785	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	55	58	0	1	95	77	56
normalized size	1	1.	0.87	0.92	0.	0.02	1.51	1.22	0.89
time (sec)	N/A	0.094	0.082	0.021	0.	0.247	8.947	0.214	8.957

Problem 786	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	60	63	0	1	75	82	63
normalized size	1	1.	0.88	0.93	0.	0.01	1.1	1.21	0.93
time (sec)	N/A	0.097	0.105	0.023	0.	0.267	13.572	0.216	9.594

Problem 787	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	82	78	0	1	122	90	82
normalized size	1	1.	0.86	0.82	0.	0.01	1.28	0.95	0.86
time (sec)	N/A	0.148	0.067	0.025	0.	0.29	18.403	0.229	15.36

Problem 788	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	64	58	0	1	73	72	65
normalized size	1	1.	0.9	0.82	0.	0.01	1.03	1.01	0.92
time (sec)	N/A	0.079	0.066	0.014	0.	0.263	10.056	0.224	6.593

Problem 789	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	58	56	0	1	95	72	63
normalized size	1	1.	0.84	0.81	0.	0.01	1.38	1.04	0.91
time (sec)	N/A	0.093	0.092	0.023	0.	0.268	8.378	0.243	8.178

Problem 790	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	57	55	0	1	80	68	58
normalized size	1	1.	0.84	0.81	0.	0.01	1.18	1.	0.85
time (sec)	N/A	0.1	0.071	0.022	0.	0.276	8.765	0.219	9.87

Problem 791	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	18	23	47	66	19	17
normalized size	1	1.	1.	0.86	1.1	2.24	3.14	0.9	0.81
time (sec)	N/A	0.02	0.027	0.007	1.426	0.261	8.546	0.217	2.704

Problem 792	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	31	28	47	66	92	105	36
normalized size	1	1.	0.7	0.64	1.07	1.5	2.09	2.39	0.82
time (sec)	N/A	0.04	0.04	0.007	1.423	0.291	18.523	0.219	4.276

Problem 793	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	42	39	70	81	420	143	61
normalized size	1	1.	0.62	0.57	1.03	1.19	6.18	2.1	0.9
time (sec)	N/A	0.064	0.054	0.008	1.432	0.318	32.286	0.217	6.686

Problem 794	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	148	148	117	126	0	0	39	0	134
normalized size	1	1.	0.79	0.85	0.	0.	0.26	0.	0.91
time (sec)	N/A	0.136	0.333	0.012	0.	0.	3.988	0.	15.044

Problem 795	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	102	103	0	0	37	0	110
normalized size	1	1.	0.84	0.84	0.	0.	0.3	0.	0.9
time (sec)	N/A	0.078	0.247	0.008	0.	0.	2.776	0.	7.268

Problem 796	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	96	102	0	0	42	0	112
normalized size	1	1.	0.77	0.82	0.	0.	0.34	0.	0.9
time (sec)	N/A	0.085	0.211	0.017	0.	0.	3.16	0.	8.85

Problem 797	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	106	105	0	0	46	0	114
normalized size	1	1.	0.84	0.83	0.	0.	0.37	0.	0.9
time (sec)	N/A	0.097	0.246	0.02	0.	0.	5.502	0.	10.268

Problem 798	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	255	255	133	128	0	0	39	0	233
normalized size	1	1.	0.52	0.5	0.	0.	0.15	0.	0.91
time (sec)	N/A	0.236	0.539	0.013	0.	0.	3.174	0.	28.089

Problem 799	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	251	251	136	128	0	0	41	0	230
normalized size	1	1.	0.54	0.51	0.	0.	0.16	0.	0.92
time (sec)	N/A	0.238	0.398	0.016	0.	0.	3.101	0.	27.587

Problem 800	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	252	252	132	128	0	0	46	0	230
normalized size	1	1.	0.52	0.51	0.	0.	0.18	0.	0.91
time (sec)	N/A	0.231	0.48	0.019	0.	0.	4.026	0.	27.559

Problem 801	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	72	72	55	84	0	0	29	0	65
normalized size	1	1.	0.76	1.17	0.	0.	0.4	0.	0.9
time (sec)	N/A	0.033	0.04	0.128	0.	0.	2.298	0.	1.69

Problem 802	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	41	41	44	59	0	0	31	0	34
normalized size	1	1.	1.07	1.44	0.	0.	0.76	0.	0.83
time (sec)	N/A	0.018	0.036	0.009	0.	0.	2.378	0.	1.428

Problem 803	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	22	19	31	31	42	31	24
normalized size	1	1.	0.71	0.61	1.	1.	1.35	1.	0.77
time (sec)	N/A	0.039	0.013	0.006	1.437	0.231	1.662	0.216	4.844

Problem 804	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	10	12	12	24	12	8
normalized size	1	1.	1.	0.77	0.92	0.92	1.85	0.92	0.62
time (sec)	N/A	0.007	0.006	0.006	1.433	0.228	0.474	0.214	1.621

Problem 805	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	40	30	103	72	51	53	34
normalized size	1	1.	1.	0.75	2.58	1.8	1.27	1.32	0.85
time (sec)	N/A	0.04	0.023	0.011	1.59	0.251	4.959	0.215	2.875

Problem 806	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	35	28	78	109	90	39	27
normalized size	1	1.	1.	0.8	2.23	3.11	2.57	1.11	0.77
time (sec)	N/A	0.029	0.015	0.012	1.441	0.274	5.274	0.219	2.529

Problem 807	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	48	72	0	0	29	0	49
normalized size	1	1.	0.83	1.24	0.	0.	0.5	0.	0.84
time (sec)	N/A	0.022	0.033	0.006	0.	0.	1.695	0.	1.428

Problem 808	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	39	45	0	0	31	0	20
normalized size	1	1.	1.56	1.8	0.	0.	1.24	0.	0.8
time (sec)	N/A	0.011	0.031	0.008	0.	0.	1.761	0.	1.184

Problem 809	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	39	36	63	47	68	58	49
normalized size	1	1.	0.66	0.61	1.07	0.8	1.15	0.98	0.83
time (sec)	N/A	0.089	0.029	0.009	1.423	0.248	8.937	0.215	10.665

Problem 810	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	27	25	41	31	42	36	31
normalized size	1	1.	0.71	0.66	1.08	0.82	1.11	0.95	0.82
time (sec)	N/A	0.063	0.022	0.007	1.438	0.236	3.582	0.215	7.131

Problem 811	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	15	19	19	22	19	12
normalized size	1	1.	1.	0.83	1.06	1.06	1.22	1.06	0.67
time (sec)	N/A	0.011	0.006	0.008	1.434	0.266	1.668	0.213	2.123

Problem 812	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	27	29	0	1	22	31	24
normalized size	1	1.	1.	1.07	0.	0.04	0.81	1.15	0.89
time (sec)	N/A	0.048	0.064	0.03	0.	0.276	3.698	0.215	5.191

Problem 813	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	50	48	0	1	46	65	41
normalized size	1	1.	1.	0.96	0.	0.02	0.92	1.3	0.82
time (sec)	N/A	0.072	0.075	0.014	0.	0.252	8.102	0.216	7.036

Problem 814	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	56	43	0	1	46	59	44
normalized size	1	1.	1.06	0.81	0.	0.02	0.87	1.11	0.83
time (sec)	N/A	0.076	0.043	0.016	0.	0.262	7.681	0.232	8.045

Problem 815	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	24	0	1	20	34	26
normalized size	1	1.	1.	0.8	0.	0.03	0.67	1.13	0.87
time (sec)	N/A	0.038	0.015	0.008	0.	0.247	3.56	0.224	4.282

Problem 816	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	18	23	23	20	19	17
normalized size	1	1.	1.	0.86	1.1	1.1	0.95	0.9	0.81
time (sec)	N/A	0.02	0.015	0.006	1.437	0.232	2.039	0.223	2.787

Problem 817	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	29	26	47	36	44	36	36
normalized size	1	1.	0.66	0.59	1.07	0.82	1.	0.82	0.82
time (sec)	N/A	0.041	0.023	0.007	1.437	0.234	3.6	0.221	4.347

Problem 818	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	42	39	70	51	298	58	61
normalized size	1	1.	0.62	0.57	1.03	0.75	4.38	0.85	0.9
time (sec)	N/A	0.066	0.034	0.007	1.436	0.267	8.001	0.218	6.805

Problem 819	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	130	130	106	111	0	0	37	0	117
normalized size	1	1.	0.82	0.85	0.	0.	0.28	0.	0.9
time (sec)	N/A	0.11	0.281	0.051	0.	0.	3.186	0.	11.079

Problem 820	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	108	108	92	91	0	0	37	0	94
normalized size	1	1.	0.85	0.84	0.	0.	0.34	0.	0.87
time (sec)	N/A	0.068	0.217	0.012	0.	0.	2.268	0.	7.603

Problem 821	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	74	70	0	0	36	0	78
normalized size	1	1.	0.84	0.8	0.	0.	0.41	0.	0.89
time (sec)	N/A	0.036	0.053	0.005	0.	0.	1.99	0.	3.737

Problem 822	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	110	110	95	93	0	0	41	0	97
normalized size	1	1.	0.86	0.85	0.	0.	0.37	0.	0.88
time (sec)	N/A	0.069	0.203	0.017	0.	0.	2.7	0.	7.43

Problem 823	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	132	132	106	113	0	0	44	0	119
normalized size	1	1.	0.8	0.86	0.	0.	0.33	0.	0.9
time (sec)	N/A	0.106	0.245	0.021	0.	0.	4.445	0.	10.94

Problem 824	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	261	261	136	133	0	0	37	0	238
normalized size	1	1.	0.52	0.51	0.	0.	0.14	0.	0.91
time (sec)	N/A	0.251	0.759	0.012	0.	0.	4.425	0.	28.839

Problem 825	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	237	237	168	115	0	0	37	0	214
normalized size	1	1.	0.71	0.49	0.	0.	0.16	0.	0.9
time (sec)	N/A	0.192	0.226	0.011	0.	0.	2.644	0.	22.838

Problem 826	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	210	210	104	97	0	0	37	0	187
normalized size	1	1.	0.5	0.46	0.	0.	0.18	0.	0.89
time (sec)	N/A	0.141	0.085	0.009	0.	0.	2.122	0.	17.304

Problem 827	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	232	232	121	115	0	0	39	0	202
normalized size	1	1.	0.52	0.5	0.	0.	0.17	0.	0.87
time (sec)	N/A	0.194	0.47	0.014	0.	0.	2.388	0.	22.887

Problem 828	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	261	261	135	133	0	0	44	0	236
normalized size	1	1.	0.52	0.51	0.	0.	0.17	0.	0.9
time (sec)	N/A	0.243	0.494	0.02	0.	0.	3.336	0.	29.256

Problem 829	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	40	37	68	49	70	77	49
normalized size	1	1.	0.65	0.6	1.1	0.79	1.13	1.24	0.79
time (sec)	N/A	0.092	0.031	0.01	1.44	0.255	8.982	0.219	11.718

Problem 830	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	28	25	43	32	44	39	31
normalized size	1	1.	0.7	0.62	1.08	0.8	1.1	0.98	0.78
time (sec)	N/A	0.065	0.024	0.007	1.426	0.27	3.581	0.218	7.907

Problem 831	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	16	20	20	24	20	14
normalized size	1	1.	1.	0.84	1.05	1.05	1.26	1.05	0.74
time (sec)	N/A	0.011	0.008	0.005	1.439	0.226	1.686	0.215	2.383

Problem 832	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	28	30	0	1	53	32	24
normalized size	1	1.	1.	1.07	0.	0.04	1.89	1.14	0.86
time (sec)	N/A	0.051	0.076	0.016	0.	0.264	3.895	0.223	5.648

Problem 833	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	52	50	0	1	129	69	42
normalized size	1	1.	1.	0.96	0.	0.02	2.48	1.33	0.81
time (sec)	N/A	0.079	0.098	0.018	0.	0.287	8.478	0.214	7.78

Problem 834	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	55	44	0	1	128	72	44
normalized size	1	1.	1.	0.8	0.	0.02	2.33	1.31	0.8
time (sec)	N/A	0.081	0.056	0.019	0.	0.26	7.839	0.235	8.758

Problem 835	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	31	24	0	1	53	41	26
normalized size	1	1.	1.	0.77	0.	0.03	1.71	1.32	0.84
time (sec)	N/A	0.04	0.012	0.008	0.	0.247	3.758	0.223	4.476

Problem 836	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	19	24	24	51	22	17
normalized size	1	1.	1.	0.86	1.09	1.09	2.32	1.	0.77
time (sec)	N/A	0.021	0.017	0.006	1.437	0.273	2.219	0.222	3.041

Problem 837	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	30	27	49	35	189	42	37
normalized size	1	1.	0.65	0.59	1.07	0.76	4.11	0.91	0.8
time (sec)	N/A	0.044	0.027	0.007	1.414	0.251	3.819	0.216	4.897

Problem 838	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	43	40	74	53	609	80	63
normalized size	1	1.	0.61	0.56	1.04	0.75	8.58	1.13	0.89
time (sec)	N/A	0.07	0.033	0.008	1.526	0.273	8.242	0.22	7.636

Problem 839	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	122	107	0	0	39	0	88
normalized size	1	1.	1.22	1.07	0.	0.	0.39	0.	0.88
time (sec)	N/A	0.1	0.161	0.027	0.	0.	3.27	0.	12.865

Problem 840	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	108	86	0	0	39	0	65
normalized size	1	1.	1.4	1.12	0.	0.	0.51	0.	0.84
time (sec)	N/A	0.063	0.134	0.013	0.	0.	2.373	0.	9.273

Problem 841	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	72	64	0	0	37	0	48
normalized size	1	1.	1.36	1.21	0.	0.	0.7	0.	0.91
time (sec)	N/A	0.033	0.054	0.008	0.	0.	2.08	0.	5.371

Problem 842	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	79	79	90	88	0	0	42	0	66
normalized size	1	1.	1.14	1.11	0.	0.	0.53	0.	0.84
time (sec)	N/A	0.063	0.257	0.018	0.	0.	2.86	0.	9.086

Problem 843	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	102	102	104	109	0	0	46	0	90
normalized size	1	1.	1.02	1.07	0.	0.	0.45	0.	0.88
time (sec)	N/A	0.091	0.248	0.022	0.	0.	4.571	0.	12.536

Problem 844	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	158	158	134	126	0	0	39	0	143
normalized size	1	1.	0.85	0.8	0.	0.	0.25	0.	0.91
time (sec)	N/A	0.283	1.379	0.014	0.	0.	4.531	0.	45.334

Problem 845	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	135	135	120	107	0	0	39	0	121
normalized size	1	1.	0.89	0.79	0.	0.	0.29	0.	0.9
time (sec)	N/A	0.229	0.693	0.013	0.	0.	2.748	0.	40.3

Problem 846	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	108	108	100	88	0	0	39	0	97
normalized size	1	1.	0.93	0.81	0.	0.	0.36	0.	0.9
time (sec)	N/A	0.196	0.105	0.01	0.	0.	2.219	0.	36.291

Problem 847	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	128	128	115	106	0	0	41	0	110
normalized size	1	1.	0.9	0.83	0.	0.	0.32	0.	0.86
time (sec)	N/A	0.233	0.49	0.015	0.	0.	2.465	0.	39.979

Problem 848	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	158	158	131	126	0	0	46	0	141
normalized size	1	1.	0.83	0.8	0.	0.	0.29	0.	0.89
time (sec)	N/A	0.266	0.558	0.02	0.	0.	3.436	0.	44.818

Problem 849	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	57	38	36	63	46	68	55	48
normalized size	1	1.	0.67	0.63	1.11	0.81	1.19	0.96	0.84
time (sec)	N/A	0.085	0.034	0.008	1.431	0.266	10.198	0.223	10.549

Problem 850	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	27	24	41	31	41	35	31
normalized size	1	1.	0.71	0.63	1.08	0.82	1.08	0.92	0.82
time (sec)	N/A	0.058	0.025	0.007	1.443	0.254	4.01	0.217	7.102

Problem 851	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	15	19	19	26	19	15
normalized size	1	1.	1.	0.83	1.06	1.06	1.44	1.06	0.83
time (sec)	N/A	0.01	0.01	0.007	1.443	0.265	1.909	0.218	2.133

Problem 852	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	46	44	0	1	184	55	37
normalized size	1	1.	1.	0.96	0.	0.02	4.	1.2	0.8
time (sec)	N/A	0.072	0.102	0.019	0.	0.293	5.846	0.216	7.192

Problem 853	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	58	63	0	1	76	89	65
normalized size	1	1.	0.82	0.89	0.	0.01	1.07	1.25	0.92
time (sec)	N/A	0.099	0.131	0.018	0.	0.384	12.122	0.215	9.88

Problem 854	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	65	61	0	1	75	74	66
normalized size	1	1.	0.88	0.82	0.	0.01	1.01	1.	0.89
time (sec)	N/A	0.11	0.109	0.017	0.	0.327	12.393	0.234	11.772

Problem 855	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	55	42	0	1	44	58	42
normalized size	1	1.	1.06	0.81	0.	0.02	0.85	1.12	0.81
time (sec)	N/A	0.074	0.042	0.016	0.	0.327	5.976	0.239	7.899

Problem 856	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	18	23	35	20	23	15
normalized size	1	1.	1.	0.86	1.1	1.67	0.95	1.1	0.71
time (sec)	N/A	0.017	0.017	0.006	1.437	0.273	1.807	0.231	2.502

Problem 857	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	42	29	26	49	50	46	47	37
normalized size	1	1.	0.69	0.62	1.17	1.19	1.1	1.12	0.88
time (sec)	N/A	0.038	0.025	0.007	1.442	0.253	2.857	0.243	4.062

Problem 858	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	42	37	76	68	233	65	63
normalized size	1	1.	0.62	0.54	1.12	1.	3.43	0.96	0.93
time (sec)	N/A	0.061	0.038	0.007	1.44	0.281	6.359	0.239	6.489

Problem 859	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	151	151	106	133	0	0	37	0	138
normalized size	1	1.	0.7	0.88	0.	0.	0.25	0.	0.91
time (sec)	N/A	0.141	0.263	0.024	0.	0.	6.998	0.	15.8

Problem 860	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	129	129	93	111	0	0	37	0	116
normalized size	1	1.	0.72	0.86	0.	0.	0.29	0.	0.9
time (sec)	N/A	0.108	0.218	0.018	0.	0.	3.516	0.	11.68

Problem 861	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	108	108	102	94	0	0	37	0	94
normalized size	1	1.	0.94	0.87	0.	0.	0.34	0.	0.87
time (sec)	N/A	0.074	0.124	0.018	0.	0.	2.399	0.	7.602

Problem 862	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	108	108	102	94	0	0	36	0	94
normalized size	1	1.	0.94	0.87	0.	0.	0.33	0.	0.87
time (sec)	N/A	0.059	0.072	0.012	0.	0.	2.243	0.	5.641

Problem 863	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	131	131	93	113	0	0	41	0	119
normalized size	1	1.	0.71	0.86	0.	0.	0.31	0.	0.91
time (sec)	N/A	0.103	0.218	0.025	0.	0.	3.468	0.	11.112

Problem 864	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	153	153	106	135	0	0	44	0	141
normalized size	1	1.	0.69	0.88	0.	0.	0.29	0.	0.92
time (sec)	N/A	0.139	0.302	0.032	0.	0.	7.011	0.	15.084

Problem 865	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	282	282	183	157	0	0	37	0	258
normalized size	1	1.	0.65	0.56	0.	0.	0.13	0.	0.91
time (sec)	N/A	0.304	0.345	0.018	0.	0.	10.295	0.	35.924

Problem 866	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	258	258	172	137	0	0	37	0	235
normalized size	1	1.	0.67	0.53	0.	0.	0.14	0.	0.91
time (sec)	N/A	0.247	0.229	0.018	0.	0.	5.103	0.	29.257

Problem 867	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	236	236	163	119	0	0	37	0	212
normalized size	1	1.	0.69	0.5	0.	0.	0.16	0.	0.9
time (sec)	N/A	0.191	0.168	0.016	0.	0.	2.82	0.	23.444

Problem 868	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	239	239	163	119	0	0	37	0	209
normalized size	1	1.	0.68	0.5	0.	0.	0.15	0.	0.87
time (sec)	N/A	0.194	0.203	0.016	0.	0.	2.267	0.	23.342

Problem 869	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	260	260	178	137	0	0	39	0	235
normalized size	1	1.	0.68	0.53	0.	0.	0.15	0.	0.9
time (sec)	N/A	0.24	0.227	0.022	0.	0.	2.892	0.	29.382

Problem 870	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	282	282	192	157	0	0	44	0	258
normalized size	1	1.	0.68	0.56	0.	0.	0.16	0.	0.91
time (sec)	N/A	0.299	0.269	0.027	0.	0.	4.904	0.	35.655

Problem 871	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	127	127	99	123	0	0	36	0	114
normalized size	1	1.	0.78	0.97	0.	0.	0.28	0.	0.9
time (sec)	N/A	0.081	0.337	0.019	0.	0.	2.802	0.	8.11

Problem 872	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	27	35	46	31	41	55	29
normalized size	1	1.	0.59	0.76	1.	0.67	0.89	1.2	0.63
time (sec)	N/A	0.053	0.016	0.007	1.44	0.266	4.083	0.212	5.088

Problem 873	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	20	28	31	22	24	31	19
normalized size	1	1.	0.65	0.9	1.	0.71	0.77	1.	0.61
time (sec)	N/A	0.04	0.01	0.006	1.432	0.249	1.311	0.21	4.561

Problem 874	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	23	15	15	10	15	10
normalized size	1	1.	1.	1.53	1.	1.	0.67	1.	0.67
time (sec)	N/A	0.008	0.005	0.007	1.441	0.273	0.389	0.211	1.932

Problem 875	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	13	39	39	24	42	12
normalized size	1	1.	1.	0.81	2.44	2.44	1.5	2.62	0.75
time (sec)	N/A	0.028	0.036	0.014	1.434	0.288	3.367	0.216	3.804

Problem 876	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	35	28	58	68	73	61	26
normalized size	1	1.	1.	0.8	1.66	1.94	2.09	1.74	0.74
time (sec)	N/A	0.046	0.042	0.015	1.54	0.239	6.43	0.215	4.695

Problem 877	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	27	22	59	115	61	28	19
normalized size	1	1.	1.	0.81	2.19	4.26	2.26	1.04	0.7
time (sec)	N/A	0.038	0.016	0.015	1.59	0.247	5.918	0.218	5.171

Problem 878	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	8	8	8	7	22	24	19	8	5
normalized size	1	1.	1.	0.88	2.75	3.	2.38	1.	0.62
time (sec)	N/A	0.013	0.009	0.01	1.59	0.245	3.238	0.218	2.496

Problem 879	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	26	19	50	34	12	14
normalized size	1	1.	1.	1.44	1.06	2.78	1.89	0.67	0.78
time (sec)	N/A	0.015	0.01	0.007	1.426	0.238	1.87	0.214	2.53

Problem 880	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	37	37	27	33	39	100	63	26	27
normalized size	1	1.	0.73	0.89	1.05	2.7	1.7	0.7	0.73
time (sec)	N/A	0.03	0.014	0.007	1.431	0.246	3.049	0.211	3.538

Problem 881	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	30	38	58	140	104	38	44
normalized size	1	1.	0.55	0.69	1.05	2.55	1.89	0.69	0.8
time (sec)	N/A	0.046	0.015	0.007	1.435	0.252	6.44	0.215	4.686

Problem 882	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	46	59	0	0	31	0	36
normalized size	1	1.	1.07	1.37	0.	0.	0.72	0.	0.84
time (sec)	N/A	0.035	0.036	0.012	0.	0.	2.651	0.	4.191

Problem 883	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	38	45	0	0	31	0	19
normalized size	1	1.	1.52	1.8	0.	0.	1.24	0.	0.76
time (sec)	N/A	0.022	0.033	0.011	0.	0.	1.918	0.	2.974

Problem 884	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	4	4	4	31	0	0	29	0	5
normalized size	1	1.	1.	7.75	0.	0.	7.25	0.	1.25
time (sec)	N/A	0.005	0.017	0.007	0.	0.	1.717	0.	0.171

Problem 885	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	42	47	0	0	34	0	20
normalized size	1	1.	1.56	1.74	0.	0.	1.26	0.	0.74
time (sec)	N/A	0.021	0.032	0.015	0.	0.	2.279	0.	2.897

Problem 886	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	50	61	0	0	37	0	37
normalized size	1	1.	1.11	1.36	0.	0.	0.82	0.	0.82
time (sec)	N/A	0.036	0.036	0.018	0.	0.	3.722	0.	4.067

Problem 887	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	44	68	0	0	31	0	48
normalized size	1	1.	0.83	1.28	0.	0.	0.58	0.	0.91
time (sec)	N/A	0.078	0.081	0.012	0.	0.	3.63	0.	11.822

Problem 888	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	48	54	0	0	31	0	32
normalized size	1	1.	1.37	1.54	0.	0.	0.89	0.	0.91
time (sec)	N/A	0.063	0.069	0.013	0.	0.	2.231	0.	10.616

Problem 889	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	11	11	11	39	0	0	31	0	12
normalized size	1	1.	1.	3.55	0.	0.	2.82	0.	1.09
time (sec)	N/A	0.048	0.028	0.01	0.	0.	1.78	0.	9.356

Problem 890	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	42	53	0	0	32	0	22
normalized size	1	1.	1.56	1.96	0.	0.	1.19	0.	0.81
time (sec)	N/A	0.06	0.055	0.014	0.	0.	2.02	0.	10.453

Problem 891	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	70	68	0	0	37	0	46
normalized size	1	1.	1.32	1.28	0.	0.	0.7	0.	0.87
time (sec)	N/A	0.076	0.068	0.017	0.	0.	2.826	0.	11.689

Problem 892	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	42	27	33	43	28	39	43	29
normalized size	1	1.	0.64	0.79	1.02	0.67	0.93	1.02	0.69
time (sec)	N/A	0.053	0.017	0.008	1.436	0.283	5.642	0.213	4.999

Problem 893	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	22	28	31	22	22	31	20
normalized size	1	1.	0.71	0.9	1.	0.71	0.71	1.	0.65
time (sec)	N/A	0.039	0.011	0.006	1.44	0.285	2.345	0.211	4.542

Problem 894	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	23	15	15	10	15	10
normalized size	1	1.	1.	1.53	1.	1.	0.67	1.	0.67
time (sec)	N/A	0.008	0.005	0.006	1.434	0.279	1.369	0.213	1.923

Problem 895	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	30	68	54	78	228	57	22
normalized size	1	1.	0.94	2.12	1.69	2.44	7.12	1.78	0.69
time (sec)	N/A	0.042	0.051	0.024	1.41	0.306	4.884	0.213	4.793

Problem 896	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	41	82	82	99	95	85	42
normalized size	1	1.	0.77	1.55	1.55	1.87	1.79	1.6	0.79
time (sec)	N/A	0.061	0.091	0.024	1.439	0.283	8.957	0.216	5.872

Problem 897	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	32	76	81	158	82	45	36
normalized size	1	1.	0.71	1.69	1.8	3.51	1.82	1.	0.8
time (sec)	N/A	0.059	0.046	0.023	1.592	0.262	9.277	0.218	7.229

Problem 898	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	26	62	42	93	46	38	19
normalized size	1	1.	0.96	2.3	1.56	3.44	1.7	1.41	0.7
time (sec)	N/A	0.036	0.037	0.021	1.634	0.289	4.865	0.22	4.937

Problem 899	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	26	19	50	32	28	12
normalized size	1	1.	1.	1.44	1.06	2.78	1.78	1.56	0.67
time (sec)	N/A	0.013	0.011	0.005	1.43	0.268	1.668	0.219	2.267

Problem 900	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	25	33	39	88	90	42	26
normalized size	1	1.	0.74	0.97	1.15	2.59	2.65	1.24	0.76
time (sec)	N/A	0.028	0.017	0.007	1.433	0.297	2.44	0.223	3.24

Problem 901	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	30	38	58	128	151	54	44
normalized size	1	1.	0.55	0.69	1.05	2.33	2.75	0.98	0.8
time (sec)	N/A	0.042	0.022	0.007	1.443	0.289	5.193	0.226	4.297

Problem 902	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	46	71	0	0	31	0	51
normalized size	1	1.	0.75	1.16	0.	0.	0.51	0.	0.84
time (sec)	N/A	0.052	0.05	0.014	0.	0.	5.857	0.	5.976

Problem 903	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	41	57	0	0	31	0	36
normalized size	1	1.	0.95	1.33	0.	0.	0.72	0.	0.84
time (sec)	N/A	0.036	0.045	0.015	0.	0.	2.943	0.	4.639

Problem 904	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	24	45	0	0	31	0	19
normalized size	1	1.	0.96	1.8	0.	0.	1.24	0.	0.76
time (sec)	N/A	0.021	0.039	0.013	0.	0.	2.002	0.	2.868

Problem 905	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	22	45	0	0	29	0	19
normalized size	1	1.	0.88	1.8	0.	0.	1.16	0.	0.76
time (sec)	N/A	0.011	0.032	0.012	0.	0.	1.903	0.	1.177

Problem 906	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	33	59	0	0	34	0	39
normalized size	1	1.	0.73	1.31	0.	0.	0.76	0.	0.87
time (sec)	N/A	0.034	0.061	0.02	0.	0.	2.936	0.	4.416

Problem 907	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	50	73	0	0	37	0	54
normalized size	1	1.	0.79	1.16	0.	0.	0.59	0.	0.86
time (sec)	N/A	0.052	0.045	0.023	0.	0.	5.945	0.	5.656

Problem 908	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	44	82	0	0	31	0	63
normalized size	1	1.	0.62	1.15	0.	0.	0.44	0.	0.89
time (sec)	N/A	0.092	0.084	0.016	0.	0.	8.632	0.	13.483

Problem 909	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	49	68	0	0	31	0	48
normalized size	1	1.	0.92	1.28	0.	0.	0.58	0.	0.91
time (sec)	N/A	0.076	0.064	0.016	0.	0.	4.227	0.	12.316

Problem 910	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	32	54	0	0	31	0	32
normalized size	1	1.	0.91	1.54	0.	0.	0.89	0.	0.91
time (sec)	N/A	0.061	0.057	0.014	0.	0.	2.387	0.	11.015

Problem 911	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	30	54	0	0	31	0	29
normalized size	1	1.	0.86	1.54	0.	0.	0.89	0.	0.83
time (sec)	N/A	0.06	0.051	0.014	0.	0.	1.94	0.	10.978

Problem 912	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	49	68	0	0	32	0	46
normalized size	1	1.	0.92	1.28	0.	0.	0.6	0.	0.87
time (sec)	N/A	0.071	0.064	0.019	0.	0.	2.457	0.	12.113

Problem 913	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	70	82	0	0	37	0	63
normalized size	1	1.	0.99	1.15	0.	0.	0.52	0.	0.89
time (sec)	N/A	0.088	0.068	0.023	0.	0.	4.122	0.	13.349

Problem 914	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	41	41	41	64	0	0	29	0	34
normalized size	1	1.	1.	1.56	0.	0.	0.71	0.	0.83
time (sec)	N/A	0.019	0.067	0.013	0.	0.	2.38	0.	1.43

Problem 915	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	25	22	38	28	39	38	29
normalized size	1	1.	0.62	0.55	0.95	0.7	0.98	0.95	0.72
time (sec)	N/A	0.041	0.015	0.006	1.436	0.266	4.088	0.213	4.117

Problem 916	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	18	15	26	19	22	26	19
normalized size	1	1.	0.67	0.56	0.96	0.7	0.81	0.96	0.7
time (sec)	N/A	0.032	0.009	0.007	1.438	0.261	1.28	0.21	3.42

Problem 917	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	10	12	12	8	12	8
normalized size	1	1.	1.	0.77	0.92	0.92	0.62	0.92	0.62
time (sec)	N/A	0.007	0.005	0.006	1.435	0.262	0.378	0.211	1.628

Problem 918	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	11	34	34	8	34	12
normalized size	1	1.	1.	0.79	2.43	2.43	0.57	2.43	0.86
time (sec)	N/A	0.023	0.03	0.012	1.438	0.271	3.254	0.215	3.215

Problem 919	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	31	24	50	59	22	50	24
normalized size	1	1.	1.	0.77	1.61	1.9	0.71	1.61	0.77
time (sec)	N/A	0.036	0.038	0.013	1.438	0.261	6.3	0.227	3.955

Problem 920	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	25	20	78	117	19	39	19
normalized size	1	1.	1.	0.8	3.12	4.68	0.76	1.56	0.76
time (sec)	N/A	0.032	0.014	0.014	1.442	0.258	5.869	0.223	4.459

Problem 921	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	8	8	8	7	45	22	5	22	5
normalized size	1	1.	1.	0.88	5.62	2.75	0.62	2.75	0.62
time (sec)	N/A	0.011	0.007	0.008	1.443	0.262	3.127	0.226	2.18

Problem 922	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	13	16	27	12	12	14
normalized size	1	1.	1.	0.81	1.	1.69	0.75	0.75	0.88
time (sec)	N/A	0.014	0.008	0.004	1.439	0.253	1.751	0.234	2.217

Problem 923	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	25	20	34	70	26	26	26
normalized size	1	1.	0.76	0.61	1.03	2.12	0.79	0.79	0.79
time (sec)	N/A	0.026	0.012	0.005	1.442	0.251	2.929	0.221	3.137

Problem 924	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	28	25	50	101	44	38	42
normalized size	1	1.	0.57	0.51	1.02	2.06	0.9	0.78	0.86
time (sec)	N/A	0.039	0.015	0.006	1.436	0.256	6.355	0.231	4.167

Problem 925	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	57	84	0	0	29	0	66
normalized size	1	1.	0.77	1.14	0.	0.	0.39	0.	0.89
time (sec)	N/A	0.046	0.05	0.008	0.	0.	2.559	0.	4.088

Problem 926	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	47	72	0	0	29	0	49
normalized size	1	1.	0.81	1.24	0.	0.	0.5	0.	0.84
time (sec)	N/A	0.031	0.034	0.009	0.	0.	1.835	0.	2.918

Problem 927	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	21	60	0	0	27	0	37
normalized size	1	1.	0.49	1.4	0.	0.	0.63	0.	0.86
time (sec)	N/A	0.013	0.019	0.006	0.	0.	1.609	0.	1.155

Problem 928	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	60	60	55	74	0	0	32	0	53
normalized size	1	1.	0.92	1.23	0.	0.	0.53	0.	0.88
time (sec)	N/A	0.03	0.034	0.013	0.	0.	2.213	0.	2.765

Problem 929	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	76	76	61	86	0	0	36	0	68
normalized size	1	1.	0.8	1.13	0.	0.	0.47	0.	0.89
time (sec)	N/A	0.046	0.04	0.017	0.	0.	3.594	0.	4.

Problem 930	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	140	140	72	107	0	0	29	0	128
normalized size	1	1.	0.51	0.76	0.	0.	0.21	0.	0.91
time (sec)	N/A	0.091	0.092	0.01	0.	0.	3.522	0.	8.429

Problem 931	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	73	95	0	0	29	0	112
normalized size	1	1.	0.59	0.77	0.	0.	0.23	0.	0.9
time (sec)	N/A	0.069	0.087	0.01	0.	0.	2.136	0.	6.933

Problem 932	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	103	103	37	82	0	0	29	0	90
normalized size	1	1.	0.36	0.8	0.	0.	0.28	0.	0.87
time (sec)	N/A	0.049	0.031	0.008	0.	0.	1.706	0.	5.588

Problem 933	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	117	117	70	95	0	0	31	0	100
normalized size	1	1.	0.6	0.81	0.	0.	0.26	0.	0.85
time (sec)	N/A	0.06	0.065	0.012	0.	0.	1.944	0.	6.716

Problem 934	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	140	140	94	107	0	0	36	0	126
normalized size	1	1.	0.67	0.76	0.	0.	0.26	0.	0.9
time (sec)	N/A	0.081	0.053	0.015	0.	0.	2.711	0.	8.14

Problem 935	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	23	20	38	26	39	38	29
normalized size	1	1.	0.61	0.53	1.	0.68	1.03	1.	0.76
time (sec)	N/A	0.041	0.016	0.006	1.432	0.263	5.664	0.228	4.046

Problem 936	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	18	15	26	19	22	26	20
normalized size	1	1.	0.67	0.56	0.96	0.7	0.81	0.96	0.74
time (sec)	N/A	0.032	0.01	0.006	1.444	0.248	2.331	0.221	3.328

Problem 937	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	10	12	12	12	12	12
normalized size	1	1.	1.	0.77	0.92	0.92	0.92	0.92	0.92
time (sec)	N/A	0.007	0.004	0.007	1.454	0.258	1.346	0.228	1.619

Problem 938	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	28	21	46	65	87	46	22
normalized size	1	1.	1.	0.75	1.64	2.32	3.11	1.64	0.79
time (sec)	N/A	0.033	0.036	0.016	1.416	0.267	4.709	0.222	3.95

Problem 939	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	38	33	72	85	42	72	42
normalized size	1	1.	0.81	0.7	1.53	1.81	0.89	1.53	0.89
time (sec)	N/A	0.047	0.062	0.016	1.441	0.261	8.98	0.233	4.872

Problem 940	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	41	41	37	32	99	170	36	46	36
normalized size	1	1.	0.9	0.78	2.41	4.15	0.88	1.12	0.88
time (sec)	N/A	0.048	0.031	0.015	1.423	0.253	9.204	0.227	6.233

Problem 941	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	25	20	61	74	19	39	19
normalized size	1	1.	1.	0.8	2.44	2.96	0.76	1.56	0.76
time (sec)	N/A	0.03	0.022	0.013	1.447	0.264	4.812	0.229	4.268

Problem 942	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	13	16	28	12	16	12
normalized size	1	1.	1.	0.81	1.	1.75	0.75	1.	0.75
time (sec)	N/A	0.011	0.009	0.003	1.418	0.262	1.576	0.229	1.973

Problem 943	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	23	20	34	45	42	30	27
normalized size	1	1.	0.74	0.65	1.1	1.45	1.35	0.97	0.87
time (sec)	N/A	0.022	0.013	0.005	1.462	0.265	2.353	0.234	2.857

Problem 944	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	28	25	49	84	70	39	44
normalized size	1	1.	0.57	0.51	1.	1.71	1.43	0.8	0.9
time (sec)	N/A	0.035	0.016	0.006	1.489	0.264	5.066	0.233	3.79

Problem 945	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	90	90	57	94	0	0	29	0	82
normalized size	1	1.	0.63	1.04	0.	0.	0.32	0.	0.91
time (sec)	N/A	0.062	0.051	0.013	0.	0.	5.745	0.	5.683

Problem 946	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	52	82	0	0	29	0	66
normalized size	1	1.	0.7	1.11	0.	0.	0.39	0.	0.89
time (sec)	N/A	0.047	0.04	0.012	0.	0.	2.843	0.	4.442

Problem 947	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	38	72	0	0	29	0	49
normalized size	1	1.	0.66	1.24	0.	0.	0.5	0.	0.84
time (sec)	N/A	0.03	0.038	0.011	0.	0.	1.924	0.	2.821

Problem 948	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	37	72	0	0	27	0	49
normalized size	1	1.	0.64	1.24	0.	0.	0.47	0.	0.84
time (sec)	N/A	0.022	0.032	0.008	0.	0.	1.806	0.	1.376

Problem 949	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	76	76	46	84	0	0	32	0	70
normalized size	1	1.	0.61	1.11	0.	0.	0.42	0.	0.92
time (sec)	N/A	0.045	0.066	0.017	0.	0.	2.838	0.	4.185

Problem 950	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	61	96	0	0	36	0	85
normalized size	1	1.	0.66	1.04	0.	0.	0.39	0.	0.92
time (sec)	N/A	0.061	0.042	0.02	0.	0.	5.824	0.	5.498

Problem 951	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	156	156	72	119	0	0	29	0	143
normalized size	1	1.	0.46	0.76	0.	0.	0.19	0.	0.92
time (sec)	N/A	0.113	0.096	0.012	0.	0.	8.62	0.	10.237

Problem 952	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	140	140	75	107	0	0	29	0	128
normalized size	1	1.	0.54	0.76	0.	0.	0.21	0.	0.91
time (sec)	N/A	0.09	0.072	0.012	0.	0.	4.104	0.	8.763

Problem 953	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	61	95	0	0	29	0	112
normalized size	1	1.	0.49	0.77	0.	0.	0.23	0.	0.9
time (sec)	N/A	0.069	0.067	0.012	0.	0.	2.298	0.	7.369

Problem 954	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	59	95	0	0	29	0	107
normalized size	1	1.	0.48	0.77	0.	0.	0.23	0.	0.86
time (sec)	N/A	0.073	0.063	0.01	0.	0.	1.876	0.	7.196

Problem 955	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	140	140	75	107	0	0	31	0	126
normalized size	1	1.	0.54	0.76	0.	0.	0.22	0.	0.9
time (sec)	N/A	0.081	0.074	0.016	0.	0.	2.386	0.	8.411

Problem 956	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	156	156	94	119	0	0	36	0	143
normalized size	1	1.	0.6	0.76	0.	0.	0.23	0.	0.92
time (sec)	N/A	0.105	0.059	0.02	0.	0.	4.034	0.	9.799

Problem 957	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	72	72	52	82	0	0	27	0	65
normalized size	1	1.	0.72	1.14	0.	0.	0.38	0.	0.9
time (sec)	N/A	0.031	0.061	0.013	0.	0.	2.257	0.	1.694

Problem 958	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	20	28	31	22	26	31	19
normalized size	1	1.	0.69	0.97	1.07	0.76	0.9	1.07	0.66
time (sec)	N/A	0.04	0.013	0.007	1.432	0.262	1.286	0.214	4.799

Problem 959	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	29	24	59	115	80	31	20
normalized size	1	1.	1.	0.83	2.03	3.97	2.76	1.07	0.69
time (sec)	N/A	0.042	0.016	0.018	1.589	0.268	6.106	0.221	5.268

Problem 960	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	23	15	15	10	15	10
normalized size	1	1.	1.	1.53	1.	1.	0.67	1.	0.67
time (sec)	N/A	0.008	0.005	0.007	1.438	0.246	0.391	0.214	1.912

Problem 961	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	9	22	24	24	11	7
normalized size	1	1.	1.	0.75	1.83	2.	2.	0.92	0.58
time (sec)	N/A	0.015	0.009	0.01	1.602	0.255	3.318	0.221	2.546

Problem 962	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	20	15	39	39	26	42	14
normalized size	1	1.	1.	0.75	1.95	1.95	1.3	2.1	0.7
time (sec)	N/A	0.031	0.037	0.013	1.42	0.281	3.414	0.214	3.928

Problem 963	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	26	19	53	34	15	14
normalized size	1	1.	1.	1.44	1.06	2.94	1.89	0.83	0.78
time (sec)	N/A	0.016	0.01	0.006	1.439	0.273	1.894	0.214	2.54

Problem 964	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	39	30	58	68	75	61	27
normalized size	1	1.	1.	0.77	1.49	1.74	1.92	1.56	0.69
time (sec)	N/A	0.054	0.045	0.016	1.435	0.28	6.69	0.215	4.77

Problem 965	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	37	37	23	31	39	99	66	31	27
normalized size	1	1.	0.62	0.84	1.05	2.68	1.78	0.84	0.73
time (sec)	N/A	0.029	0.013	0.007	1.439	0.262	3.103	0.215	3.546

Problem 966	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	56	58	0	0	32	0	36
normalized size	1	1.	1.3	1.35	0.	0.	0.74	0.	0.84
time (sec)	N/A	0.067	0.071	0.012	0.	0.	2.301	0.	11.504

Problem 967	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	43	47	0	0	32	0	22
normalized size	1	1.	1.48	1.62	0.	0.	1.1	0.	0.76
time (sec)	N/A	0.022	0.034	0.01	0.	0.	1.992	0.	3.073

Problem 968	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	43	0	0	32	0	19
normalized size	1	1.	1.	2.05	0.	0.	1.52	0.	0.9
time (sec)	N/A	0.052	0.03	0.01	0.	0.	1.847	0.	10.265

Problem 969	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	34	0	0	31	0	8
normalized size	1	1.	1.	2.83	0.	0.	2.58	0.	0.67
time (sec)	N/A	0.006	0.021	0.007	0.	0.	1.73	0.	1.04

Problem 970	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	57	58	0	0	34	0	31
normalized size	1	1.	1.33	1.35	0.	0.	0.79	0.	0.72
time (sec)	N/A	0.066	0.075	0.014	0.	0.	2.065	0.	11.458

Problem 971	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	48	49	0	0	36	0	22
normalized size	1	1.	1.55	1.58	0.	0.	1.16	0.	0.71
time (sec)	N/A	0.022	0.036	0.016	0.	0.	2.36	0.	2.944

Problem 972	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	42	15	45	22	24	22	14
normalized size	1	1.	2.33	0.83	2.5	1.22	1.33	1.22	0.78
time (sec)	N/A	0.02	0.008	0.011	1.429	0.263	3.331	0.22	2.356

Problem 973	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	9	45	22	7	22	7
normalized size	1	1.	1.	0.75	3.75	1.83	0.58	1.83	0.58
time (sec)	N/A	0.014	0.009	0.011	1.44	0.261	3.161	0.22	2.208

Problem 974	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	11	14	14	24	14	10
normalized size	1	1.	1.	0.79	1.	1.	1.71	1.	0.71
time (sec)	N/A	0.024	0.032	0.016	1.62	0.275	3.333	0.213	3.206

Problem 975	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	72	72	36	45	0	0	27	0	36
normalized size	1	1.	0.5	0.62	0.	0.	0.38	0.	0.5
time (sec)	N/A	0.033	0.034	0.012	0.	0.	1.917	0.	2.948

Problem 976	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	25	34	0	0	26	0	22
normalized size	1	1.	0.46	0.63	0.	0.	0.48	0.	0.41
time (sec)	N/A	0.015	0.018	0.007	0.	0.	1.669	0.	1.274

Problem 977	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	40	47	0	0	31	0	37
normalized size	1	1.	0.54	0.64	0.	0.	0.42	0.	0.5
time (sec)	N/A	0.033	0.031	0.014	0.	0.	2.285	0.	2.844

Problem 978	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	150	150	56	57	0	0	27	0	112
normalized size	1	1.	0.37	0.38	0.	0.	0.18	0.	0.75
time (sec)	N/A	0.074	0.046	0.011	0.	0.	2.222	0.	7.127

Problem 979	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	32	44	0	0	27	0	88
normalized size	1	1.	0.25	0.35	0.	0.	0.21	0.	0.7
time (sec)	N/A	0.05	0.031	0.009	0.	0.	1.808	0.	5.771

Problem 980	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	140	140	55	56	0	0	29	0	99
normalized size	1	1.	0.39	0.4	0.	0.	0.21	0.	0.71
time (sec)	N/A	0.061	0.046	0.013	0.	0.	2.009	0.	6.847

Problem 981	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	48	38	69	0	0	39	0	49
normalized size	1	1.	0.79	1.44	0.	0.	0.81	0.	1.02
time (sec)	N/A	0.124	0.052	0.082	0.	0.	1.922	0.	13.757

Problem 982	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	76	94	0	0	39	0	56
normalized size	1	1.	1.41	1.74	0.	0.	0.72	0.	1.04
time (sec)	N/A	0.145	0.071	0.02	0.	0.	2.112	0.	23.808

Problem 983	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	20	17	26	26	41	26	22
normalized size	1	1.	0.74	0.63	0.96	0.96	1.52	0.96	0.81
time (sec)	N/A	0.031	0.012	0.006	1.438	0.251	2.189	0.213	3.31

Problem 984	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	10	12	12	12	12	12
normalized size	1	1.	1.	0.77	0.92	0.92	0.92	0.92	0.92
time (sec)	N/A	0.007	0.006	0.005	1.42	0.251	1.544	0.214	1.638

Problem 985	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	10	12	12	10	12	10
normalized size	1	1.	1.	0.77	0.92	0.92	0.77	0.92	0.77
time (sec)	N/A	0.007	0.005	0.006	1.442	0.269	0.404	0.213	1.644

Problem 986	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	101	101	72	58	109	92	134	96	92
normalized size	1	1.	0.71	0.57	1.08	0.91	1.33	0.95	0.91
time (sec)	N/A	0.134	0.034	0.01	1.428	0.243	67.054	0.216	17.497

Problem 987	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	61	47	86	77	110	77	70
normalized size	1	1.	0.76	0.59	1.08	0.96	1.38	0.96	0.88
time (sec)	N/A	0.107	0.03	0.009	1.44	0.266	34.803	0.216	14.24

Problem 988	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	50	36	63	62	87	58	51
normalized size	1	1.	0.85	0.61	1.07	1.05	1.47	0.98	0.86
time (sec)	N/A	0.083	0.025	0.008	1.45	0.266	14.904	0.216	10.563

Problem 989	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	38	25	41	46	63	39	31
normalized size	1	1.	1.	0.66	1.08	1.21	1.66	1.03	0.82
time (sec)	N/A	0.059	0.021	0.008	1.588	0.255	5.225	0.215	7.054

Problem 990	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	15	19	19	39	19	12
normalized size	1	1.	1.	0.83	1.06	1.06	2.17	1.06	0.67
time (sec)	N/A	0.01	0.009	0.007	1.434	0.27	1.342	0.212	2.119

Problem 991	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	61	0	0	116	42	247	56
normalized size	1	1.	0.92	0.	0.	1.76	0.64	3.74	0.85
time (sec)	N/A	0.101	0.043	0.045	0.	0.295	3.767	0.229	10.501

Problem 992	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	67	0	0	219	41	277	66
normalized size	1	1.	0.89	0.	0.	2.92	0.55	3.69	0.88
time (sec)	N/A	0.103	0.042	0.05	0.	0.275	5.043	0.231	10.868

Problem 993	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	101	101	82	0	0	261	41	302	90
normalized size	1	1.	0.81	0.	0.	2.58	0.41	2.99	0.89
time (sec)	N/A	0.138	0.052	0.052	0.	0.29	8.383	0.232	14.68

Problem 994	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	125	125	91	0	0	0	29	0	110
normalized size	1	1.	0.73	0.	0.	0.	0.23	0.	0.88
time (sec)	N/A	0.2	0.068	0.043	0.	0.	5.828	0.	19.345

Problem 995	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	101	101	78	0	0	0	29	0	87
normalized size	1	1.	0.77	0.	0.	0.	0.29	0.	0.86
time (sec)	N/A	0.148	0.058	0.038	0.	0.	3.186	0.	14.781

Problem 996	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	79	79	63	0	0	0	29	0	66
normalized size	1	1.	0.8	0.	0.	0.	0.37	0.	0.84
time (sec)	N/A	0.091	0.038	0.034	0.	0.	2.332	0.	8.277

Problem 997	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	79	79	66	0	0	0	32	0	66
normalized size	1	1.	0.84	0.	0.	0.	0.41	0.	0.84
time (sec)	N/A	0.101	0.042	0.041	0.	0.	2.668	0.	10.291

Problem 998	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	101	101	85	0	0	0	34	0	87
normalized size	1	1.	0.84	0.	0.	0.	0.34	0.	0.86
time (sec)	N/A	0.141	0.056	0.046	0.	0.	4.424	0.	14.368

Problem 999	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	125	125	94	0	0	0	34	0	107
normalized size	1	1.	0.75	0.	0.	0.	0.27	0.	0.86
time (sec)	N/A	0.184	0.054	0.051	0.	0.	8.725	0.	18.991

Problem 1000	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	103	103	78	0	0	274	39	348	94
normalized size	1	1.	0.76	0.	0.	2.66	0.38	3.38	0.91
time (sec)	N/A	0.112	0.053	0.046	0.	0.286	5.889	0.238	13.911

Problem 1001	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	63	0	0	234	39	304	68
normalized size	1	1.	0.82	0.	0.	3.04	0.51	3.95	0.88
time (sec)	N/A	0.076	0.043	0.039	0.	0.283	4.183	0.235	10.541

Problem 1002	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	F(-1)	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	73	73	66	0	0	0	41	281	61
normalized size	1	1.	0.9	0.	0.	0.	0.56	3.85	0.84
time (sec)	N/A	0.073	0.04	0.042	0.	0.	3.843	0.232	10.47

Problem 1003	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	18	23	23	68	32	17
normalized size	1	1.	1.	0.86	1.1	1.1	3.24	1.52	0.81
time (sec)	N/A	0.019	0.016	0.006	1.439	0.321	3.201	0.224	2.774

Problem 1004	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	41	28	47	51	109	81	37
normalized size	1	1.	0.93	0.64	1.07	1.16	2.48	1.84	0.84
time (sec)	N/A	0.04	0.023	0.008	1.445	0.397	7.104	0.222	4.279

Problem 1005	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	53	39	70	66	520	143	61
normalized size	1	1.	0.78	0.57	1.03	0.97	7.65	2.1	0.9
time (sec)	N/A	0.063	0.03	0.009	1.439	0.324	15.79	0.223	6.666

Problem 1006	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	64	50	93	81	847	220	85
normalized size	1	1.	0.7	0.54	1.01	0.88	9.21	2.39	0.92
time (sec)	N/A	0.089	0.041	0.01	1.438	0.343	31.623	0.223	9.772

Problem 1007	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	150	150	101	0	0	0	39	0	136
normalized size	1	1.	0.67	0.	0.	0.	0.26	0.	0.91
time (sec)	N/A	0.214	0.059	0.043	0.	0.	9.954	0.	23.338

Problem 1008	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	90	0	0	0	39	0	109
normalized size	1	1.	0.71	0.	0.	0.	0.31	0.	0.87
time (sec)	N/A	0.158	0.047	0.037	0.	0.	5.04	0.	18.751

Problem 1009	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	102	102	76	0	0	0	39	0	87
normalized size	1	1.	0.75	0.	0.	0.	0.38	0.	0.85
time (sec)	N/A	0.127	0.05	0.036	0.	0.	2.913	0.	15.115

Problem 1010	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	58	0	0	0	37	0	68
normalized size	1	1.	0.72	0.	0.	0.	0.46	0.	0.85
time (sec)	N/A	0.089	0.038	0.045	0.	0.	2.294	0.	9.98

Problem 1011	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	66	0	0	0	31	0	71
normalized size	1	1.	0.8	0.	0.	0.	0.38	0.	0.87
time (sec)	N/A	0.099	0.04	0.041	0.	0.	3.013	0.	11.485

Problem 1012	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	104	104	83	0	0	0	31	0	90
normalized size	1	1.	0.8	0.	0.	0.	0.3	0.	0.87
time (sec)	N/A	0.129	0.045	0.046	0.	0.	5.306	0.	14.967

Problem 1013	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	128	128	93	0	0	0	46	0	114
normalized size	1	1.	0.73	0.	0.	0.	0.36	0.	0.89
time (sec)	N/A	0.159	0.054	0.052	0.	0.	10.573	0.	18.773

Problem 1014	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	152	152	105	0	0	0	46	0	138
normalized size	1	1.	0.69	0.	0.	0.	0.3	0.	0.91
time (sec)	N/A	0.201	0.062	0.058	0.	0.	21.716	0.	23.318

Problem 1015	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	101	101	72	58	109	92	136	96	92
normalized size	1	1.	0.71	0.57	1.08	0.91	1.35	0.95	0.91
time (sec)	N/A	0.125	0.036	0.01	1.433	0.362	122.811	0.218	17.545

Problem 1016	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	61	47	86	77	110	77	70
normalized size	1	1.	0.76	0.59	1.08	0.96	1.38	0.96	0.88
time (sec)	N/A	0.107	0.034	0.008	1.426	0.37	66.588	0.216	14.295

Problem 1017	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	50	36	63	62	87	58	51
normalized size	1	1.	0.85	0.61	1.07	1.05	1.47	0.98	0.86
time (sec)	N/A	0.082	0.027	0.008	1.424	0.317	34.187	0.218	10.601

Problem 1018	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	39	25	41	47	65	39	31
normalized size	1	1.	1.03	0.66	1.08	1.24	1.71	1.03	0.82
time (sec)	N/A	0.058	0.024	0.007	1.44	0.368	14.538	0.218	7.035

Problem 1019	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	15	19	19	39	19	12
normalized size	1	1.	1.	0.83	1.06	1.06	2.17	1.06	0.67
time (sec)	N/A	0.01	0.009	0.006	1.418	0.324	4.866	0.216	2.128

Problem 1020	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	58	0	0	166	44	250	58
normalized size	1	1.	0.83	0.	0.	2.37	0.63	3.57	0.83
time (sec)	N/A	0.106	0.046	0.034	0.	0.271	4.399	0.225	11.483

Problem 1021	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	67	0	0	234	39	278	68
normalized size	1	1.	0.89	0.	0.	3.12	0.52	3.71	0.91
time (sec)	N/A	0.108	0.049	0.047	0.	0.462	6.132	0.229	11.956

Problem 1022	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	101	101	83	0	0	266	41	304	92
normalized size	1	1.	0.82	0.	0.	2.63	0.41	3.01	0.91
time (sec)	N/A	0.148	0.056	0.052	0.	0.422	10.89	0.229	15.695

Problem 1023	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	149	149	91	0	0	0	29	0	0
normalized size	1	1.	0.61	0.	0.	0.	0.19	0.	0.
time (sec)	N/A	0.221	0.065	0.041	0.	0.	11.822	0.	0.

Problem 1024	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	125	125	80	0	0	0	29	0	0
normalized size	1	1.	0.64	0.	0.	0.	0.23	0.	0.
time (sec)	N/A	0.171	0.061	0.038	0.	0.	5.805	0.	0.

Problem 1025	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	64	0	0	0	29	0	0
normalized size	1	1.	0.65	0.	0.	0.	0.3	0.	0.
time (sec)	N/A	0.122	0.057	0.033	0.	0.	3.141	0.	0.

Problem 1026	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	67	0	0	0	32	0	0
normalized size	1	1.	0.68	0.	0.	0.	0.33	0.	0.
time (sec)	N/A	0.135	0.041	0.04	0.	0.	3.159	0.	0.

Problem 1027	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	125	125	86	0	0	0	34	0	0
normalized size	1	1.	0.69	0.	0.	0.	0.27	0.	0.
time (sec)	N/A	0.164	0.052	0.044	0.	0.	6.161	0.	0.

Problem 1028	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	149	149	94	0	0	0	34	0	0
normalized size	1	1.	0.63	0.	0.	0.	0.23	0.	0.
time (sec)	N/A	0.216	0.056	0.05	0.	0.	12.717	0.	0.

Problem 1029	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	149	149	135	0	0	315	39	0	139
normalized size	1	1.	0.91	0.	0.	2.11	0.26	0.	0.93
time (sec)	N/A	0.162	0.165	0.042	0.	0.298	23.474	0.	19.873

Problem 1030	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	125	125	122	0	0	300	39	0	116
normalized size	1	1.	0.98	0.	0.	2.4	0.31	0.	0.93
time (sec)	N/A	0.124	0.122	0.038	0.	0.272	12.638	0.	15.044

Problem 1031	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	101	101	109	0	0	277	39	0	94
normalized size	1	1.	1.08	0.	0.	2.74	0.39	0.	0.93
time (sec)	N/A	0.088	0.106	0.037	0.	0.28	7.181	0.	11.042

Problem 1032	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	94	0	0	242	37	302	70
normalized size	1	1.	1.25	0.	0.	3.23	0.49	4.03	0.93
time (sec)	N/A	0.046	0.061	0.044	0.	0.273	4.586	0.236	5.314

Problem 1033	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	F(-1)	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	95	0	0	0	42	0	65
normalized size	1	1.	1.27	0.	0.	0.	0.56	0.	0.87
time (sec)	N/A	0.057	0.086	0.037	0.	0.	5.038	0.	6.82

Problem 1034	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	18	23	23	68	0	17
normalized size	1	1.	1.	0.86	1.1	1.1	3.24	0.	0.81
time (sec)	N/A	0.02	0.018	0.006	1.442	0.342	6.715	0.	2.678

Problem 1035	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	44	28	47	51	110	0	37
normalized size	1	1.	1.	0.64	1.07	1.16	2.5	0.	0.84
time (sec)	N/A	0.042	0.026	0.007	1.439	0.285	14.897	0.	4.246

Problem 1036	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	53	39	70	66	520	0	61
normalized size	1	1.	0.78	0.57	1.03	0.97	7.65	0.	0.9
time (sec)	N/A	0.064	0.03	0.008	1.434	0.355	30.467	0.	6.69

Problem 1037	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	64	50	93	81	847	0	85
normalized size	1	1.	0.7	0.54	1.01	0.88	9.21	0.	0.92
time (sec)	N/A	0.09	0.04	0.01	1.436	0.32	65.737	0.	9.776

Problem 1038	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	150	150	91	0	0	0	39	0	0
normalized size	1	1.	0.61	0.	0.	0.	0.26	0.	0.
time (sec)	N/A	0.216	0.069	0.043	0.	0.	14.173	0.	0.

Problem 1039	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	78	0	0	0	39	0	0
normalized size	1	1.	0.62	0.	0.	0.	0.31	0.	0.
time (sec)	N/A	0.195	0.053	0.04	0.	0.	6.924	0.	0.

Problem 1040	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	99	99	60	0	0	0	39	0	0
normalized size	1	1.	0.61	0.	0.	0.	0.39	0.	0.
time (sec)	N/A	0.147	0.044	0.036	0.	0.	3.675	0.	0.

Problem 1041	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	97	97	63	0	0	0	41	0	0
normalized size	1	1.	0.65	0.	0.	0.	0.42	0.	0.
time (sec)	N/A	0.152	0.038	0.043	0.	0.	3.204	0.	0.

Problem 1042	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	99	99	83	0	0	0	31	0	0
normalized size	1	1.	0.84	0.	0.	0.	0.31	0.	0.
time (sec)	N/A	0.16	0.048	0.046	0.	0.	5.281	0.	0.

Problem 1043	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	94	0	0	0	31	0	0
normalized size	1	1.	0.75	0.	0.	0.	0.25	0.	0.
time (sec)	N/A	0.175	0.055	0.053	0.	0.	10.58	0.	0.

Problem 1044	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	150	150	104	0	0	0	46	0	0
normalized size	1	1.	0.69	0.	0.	0.	0.31	0.	0.
time (sec)	N/A	0.214	0.064	0.056	0.	0.	21.657	0.	0.

Problem 1045	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	101	101	61	58	109	107	0	219	92
normalized size	1	1.	0.6	0.57	1.08	1.06	0.	2.17	0.91
time (sec)	N/A	0.131	0.047	0.011	1.426	0.3	0.	0.221	17.647

Problem 1046	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	50	47	86	92	134	181	71
normalized size	1	1.	0.62	0.59	1.08	1.15	1.68	2.26	0.89
time (sec)	N/A	0.108	0.05	0.009	1.445	0.288	121.707	0.216	14.28

Problem 1047	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	39	36	63	77	110	144	51
normalized size	1	1.	0.66	0.61	1.07	1.31	1.86	2.44	0.86
time (sec)	N/A	0.086	0.038	0.008	1.436	0.249	65.802	0.22	10.718

Problem 1048	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	28	25	41	61	85	105	31
normalized size	1	1.	0.74	0.66	1.08	1.61	2.24	2.76	0.82
time (sec)	N/A	0.058	0.033	0.008	1.429	0.292	33.706	0.215	7.138

Problem 1049	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	15	19	43	61	19	12
normalized size	1	1.	1.	0.83	1.06	2.39	3.39	1.06	0.67
time (sec)	N/A	0.011	0.008	0.007	1.436	0.283	14.318	0.216	2.128

Problem 1050	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	83	76	0	0	163	48	270	70
normalized size	1	1.	0.92	0.	0.	1.96	0.58	3.25	0.84
time (sec)	N/A	0.135	0.055	0.035	0.	0.282	7.077	0.224	12.868

Problem 1051	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	91	91	73	0	0	209	42	278	83
normalized size	1	1.	0.8	0.	0.	2.3	0.46	3.05	0.91
time (sec)	N/A	0.138	0.098	0.053	0.	0.299	8.262	0.225	13.216

Problem 1052	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	85	0	0	246	41	301	92
normalized size	1	1.	0.87	0.	0.	2.51	0.42	3.07	0.94
time (sec)	N/A	0.138	0.062	0.05	0.	0.308	15.154	0.228	14.353

Problem 1053	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	146	146	102	0	0	0	29	0	129
normalized size	1	1.	0.7	0.	0.	0.	0.2	0.	0.88
time (sec)	N/A	0.236	0.076	0.039	0.	0.	23.519	0.	24.211

Problem 1054	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	91	0	0	0	29	0	109
normalized size	1	1.	0.75	0.	0.	0.	0.24	0.	0.89
time (sec)	N/A	0.186	0.072	0.039	0.	0.	12.239	0.	19.112

Problem 1055	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	77	0	0	0	29	0	87
normalized size	1	1.	0.79	0.	0.	0.	0.3	0.	0.89
time (sec)	N/A	0.117	0.058	0.035	0.	0.	6.163	0.	9.975

Problem 1056	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	79	0	0	0	32	0	87
normalized size	1	1.	0.81	0.	0.	0.	0.33	0.	0.89
time (sec)	N/A	0.131	0.049	0.042	0.	0.	6.301	0.	12.003

Problem 1057	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	85	0	0	0	34	0	87
normalized size	1	1.	0.87	0.	0.	0.	0.35	0.	0.89
time (sec)	N/A	0.141	0.057	0.045	0.	0.	8.951	0.	13.78

Problem 1058	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	97	0	0	0	34	0	105
normalized size	1	1.	0.8	0.	0.	0.	0.28	0.	0.86
time (sec)	N/A	0.182	0.062	0.052	0.	0.	18.76	0.	18.562

Problem 1059	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	146	146	105	0	0	0	34	0	129
normalized size	1	1.	0.72	0.	0.	0.	0.23	0.	0.88
time (sec)	N/A	0.229	0.066	0.06	0.	0.	31.512	0.	23.792

Problem 1060	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	148	148	102	0	0	313	39	459	139
normalized size	1	1.	0.69	0.	0.	2.11	0.26	3.1	0.94
time (sec)	N/A	0.18	0.071	0.042	0.	0.278	28.7	0.245	22.24

Problem 1061	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	91	0	0	290	39	397	116
normalized size	1	1.	0.73	0.	0.	2.34	0.31	3.2	0.94
time (sec)	N/A	0.138	0.062	0.04	0.	0.279	17.217	0.239	17.603

Problem 1062	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	77	0	0	257	39	346	94
normalized size	1	1.	0.77	0.	0.	2.57	0.39	3.46	0.94
time (sec)	N/A	0.104	0.053	0.039	0.	0.267	9.405	0.242	13.592

Problem 1063	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	F(-1)	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	79	0	0	0	41	309	87
normalized size	1	1.	0.84	0.	0.	0.	0.44	3.29	0.93
time (sec)	N/A	0.101	0.043	0.043	0.	0.	8.151	0.238	13.234

Problem 1064	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	F(-1)	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	81	0	0	0	46	316	78
normalized size	1	1.	0.88	0.	0.	0.	0.5	3.43	0.85
time (sec)	N/A	0.097	0.056	0.046	0.	0.	9.034	0.238	13.162

Problem 1065	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	18	23	47	105	47	17
normalized size	1	1.	1.	0.86	1.1	2.24	5.	2.24	0.81
time (sec)	N/A	0.019	0.031	0.007	1.426	0.291	14.885	0.227	2.689

Problem 1066	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	31	28	47	66	148	234	37
normalized size	1	1.	0.7	0.64	1.07	1.5	3.36	5.32	0.84
time (sec)	N/A	0.043	0.039	0.007	1.412	0.264	29.86	0.229	4.263

Problem 1067	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	42	39	70	81	609	373	61
normalized size	1	1.	0.62	0.57	1.03	1.19	8.96	5.49	0.9
time (sec)	N/A	0.065	0.051	0.008	1.427	0.255	65.	0.231	6.637

Problem 1068	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	53	50	93	96	954	541	85
normalized size	1	1.	0.58	0.54	1.01	1.04	10.37	5.88	0.92
time (sec)	N/A	0.092	0.057	0.007	1.414	0.247	115.477	0.231	9.809

Problem 1069	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	171	171	112	0	0	0	39	0	155
normalized size	1	1.	0.65	0.	0.	0.	0.23	0.	0.91
time (sec)	N/A	0.244	0.062	0.038	0.	0.	34.25	0.	27.946

Problem 1070	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	147	147	101	0	0	0	39	0	131
normalized size	1	1.	0.69	0.	0.	0.	0.27	0.	0.89
time (sec)	N/A	0.199	0.055	0.039	0.	0.	20.564	0.	22.777

Problem 1071	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	123	123	90	0	0	0	39	0	105
normalized size	1	1.	0.73	0.	0.	0.	0.32	0.	0.85
time (sec)	N/A	0.162	0.052	0.038	0.	0.	10.381	0.	18.56

Problem 1072	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	97	97	76	0	0	0	37	0	87
normalized size	1	1.	0.78	0.	0.	0.	0.38	0.	0.9
time (sec)	N/A	0.107	0.042	0.044	0.	0.	5.331	0.	11.457

Problem 1073	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	99	99	80	0	0	0	42	0	88
normalized size	1	1.	0.81	0.	0.	0.	0.42	0.	0.89
time (sec)	N/A	0.113	0.049	0.041	0.	0.	6.343	0.	13.041

Problem 1074	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	101	101	80	0	0	0	31	0	92
normalized size	1	1.	0.79	0.	0.	0.	0.31	0.	0.91
time (sec)	N/A	0.124	0.05	0.045	0.	0.	10.926	0.	14.443

Problem 1075	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	125	125	94	0	0	0	31	0	112
normalized size	1	1.	0.75	0.	0.	0.	0.25	0.	0.9
time (sec)	N/A	0.16	0.058	0.053	0.	0.	22.086	0.	18.471

Problem 1076	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	149	149	105	0	0	0	46	0	133
normalized size	1	1.	0.7	0.	0.	0.	0.31	0.	0.89
time (sec)	N/A	0.195	0.063	0.063	0.	0.	36.735	0.	22.877

Problem 1077	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	107	0	0	255	37	0	90
normalized size	1	1.	1.11	0.	0.	2.66	0.39	0.	0.94
time (sec)	N/A	0.066	0.174	0.046	0.	0.302	12.411	0.	7.164

Problem 1078	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	101	101	61	58	109	77	116	96	92
normalized size	1	1.	0.6	0.57	1.08	0.76	1.15	0.95	0.91
time (sec)	N/A	0.126	0.04	0.012	1.445	0.301	53.137	0.216	17.383

Problem 1079	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	50	47	86	62	92	77	71
normalized size	1	1.	0.62	0.59	1.08	0.78	1.15	0.96	0.89
time (sec)	N/A	0.108	0.036	0.009	1.444	0.272	25.23	0.217	14.198

Problem 1080	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	39	36	63	47	68	58	51
normalized size	1	1.	0.66	0.61	1.07	0.8	1.15	0.98	0.86
time (sec)	N/A	0.086	0.03	0.009	1.45	0.262	10.832	0.214	10.5

Problem 1081	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	28	25	41	32	44	39	31
normalized size	1	1.	0.74	0.66	1.08	0.84	1.16	1.03	0.82
time (sec)	N/A	0.059	0.024	0.007	1.45	0.27	4.239	0.215	7.04

Problem 1082	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	15	19	19	22	19	12
normalized size	1	1.	1.	0.83	1.06	1.06	1.22	1.06	0.67
time (sec)	N/A	0.011	0.007	0.005	1.446	0.301	1.869	0.215	2.119

Problem 1083	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	46	0	0	105	37	251	46
normalized size	1	1.	0.84	0.	0.	1.91	0.67	4.56	0.84
time (sec)	N/A	0.086	0.033	0.028	0.	0.282	3.623	0.231	9.377

Problem 1084	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	78	78	69	0	0	247	39	281	66
normalized size	1	1.	0.88	0.	0.	3.17	0.5	3.6	0.85
time (sec)	N/A	0.112	0.056	0.047	0.	0.331	5.112	0.227	12.12

Problem 1085	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	104	104	82	0	0	274	39	305	95
normalized size	1	1.	0.79	0.	0.	2.63	0.38	2.93	0.91
time (sec)	N/A	0.147	0.068	0.048	0.	0.281	8.587	0.233	16.04

Problem 1086	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	152	152	91	0	0	0	27	0	0
normalized size	1	1.	0.6	0.	0.	0.	0.18	0.	0.
time (sec)	N/A	0.223	0.076	0.039	0.	0.	8.57	0.	0.

Problem 1087	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	128	128	80	0	0	0	27	0	0
normalized size	1	1.	0.62	0.	0.	0.	0.21	0.	0.
time (sec)	N/A	0.178	0.059	0.037	0.	0.	4.417	0.	0.

Problem 1088	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	104	104	64	0	0	0	27	0	0
normalized size	1	1.	0.62	0.	0.	0.	0.26	0.	0.
time (sec)	N/A	0.13	0.053	0.037	0.	0.	2.676	0.	0.

Problem 1089	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	52	0	0	0	27	0	0
normalized size	1	1.	0.7	0.	0.	0.	0.36	0.	0.
time (sec)	N/A	0.085	0.03	0.027	0.	0.	2.21	0.	0.

Problem 1090	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	104	104	69	0	0	0	31	0	0
normalized size	1	1.	0.66	0.	0.	0.	0.3	0.	0.
time (sec)	N/A	0.129	0.049	0.039	0.	0.	2.69	0.	0.

Problem 1091	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	128	128	83	0	0	0	32	0	0
normalized size	1	1.	0.65	0.	0.	0.	0.25	0.	0.
time (sec)	N/A	0.172	0.059	0.043	0.	0.	4.494	0.	0.

Problem 1092	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	152	152	94	0	0	0	32	0	0
normalized size	1	1.	0.62	0.	0.	0.	0.21	0.	0.
time (sec)	N/A	0.215	0.066	0.048	0.	0.	8.88	0.	0.

Problem 1093	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	104	104	112	0	0	285	37	0	97
normalized size	1	1.	1.08	0.	0.	2.74	0.36	0.	0.93
time (sec)	N/A	0.093	0.143	0.037	0.	0.277	6.083	0.	11.271

Problem 1094	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	78	78	97	0	0	261	37	0	68
normalized size	1	1.	1.24	0.	0.	3.35	0.47	0.	0.87
time (sec)	N/A	0.06	0.062	0.036	0.	0.282	4.242	0.	7.663

Problem 1095	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	57	76	0	0	136	36	278	49
normalized size	1	1.	1.33	0.	0.	2.39	0.63	4.88	0.86
time (sec)	N/A	0.033	0.011	0.051	0.	0.289	3.534	0.234	4.043

Problem 1096	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	18	23	23	31	0	17
normalized size	1	1.	1.	0.86	1.1	1.1	1.48	0.	0.81
time (sec)	N/A	0.02	0.017	0.007	1.428	0.26	2.459	0.	2.691

Problem 1097	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	31	28	47	36	70	0	37
normalized size	1	1.	0.7	0.64	1.07	0.82	1.59	0.	0.84
time (sec)	N/A	0.041	0.027	0.007	1.422	0.237	5.086	0.	4.258

Problem 1098	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	42	39	70	51	406	0	61
normalized size	1	1.	0.62	0.57	1.03	0.75	5.97	0.	0.9
time (sec)	N/A	0.064	0.034	0.007	1.416	0.244	11.598	0.	6.691

Problem 1099	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	53	50	93	66	692	0	85
normalized size	1	1.	0.58	0.54	1.01	0.72	7.52	0.	0.92
time (sec)	N/A	0.092	0.042	0.01	1.444	0.236	23.73	0.	9.719

Problem 1100	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	64	61	116	81	1046	0	109
normalized size	1	1.	0.55	0.53	1.	0.7	9.02	0.	0.94
time (sec)	N/A	0.122	0.048	0.011	1.423	0.248	40.212	0.	13.524

Problem 1101	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	129	129	80	0	0	0	37	0	0
normalized size	1	1.	0.62	0.	0.	0.	0.29	0.	0.
time (sec)	N/A	0.178	0.07	0.04	0.	0.	5.169	0.	0.

Problem 1102	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	64	0	0	0	37	0	0
normalized size	1	1.	0.61	0.	0.	0.	0.35	0.	0.
time (sec)	N/A	0.143	0.047	0.039	0.	0.	2.891	0.	0.

Problem 1103	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	52	0	0	0	37	0	0
normalized size	1	1.	0.65	0.	0.	0.	0.46	0.	0.
time (sec)	N/A	0.113	0.028	0.027	0.	0.	2.208	0.	0.

Problem 1104	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	70	0	0	0	39	0	0
normalized size	1	1.	0.93	0.	0.	0.	0.52	0.	0.
time (sec)	N/A	0.113	0.047	0.041	0.	0.	2.521	0.	0.

Problem 1105	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	83	0	0	0	29	0	0
normalized size	1	1.	0.79	0.	0.	0.	0.28	0.	0.
time (sec)	N/A	0.143	0.057	0.046	0.	0.	3.854	0.	0.

Problem 1106	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	129	129	93	0	0	0	44	0	0
normalized size	1	1.	0.72	0.	0.	0.	0.34	0.	0.
time (sec)	N/A	0.177	0.069	0.049	0.	0.	7.354	0.	0.

Problem 1107	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	153	153	104	0	0	0	44	0	0
normalized size	1	1.	0.68	0.	0.	0.	0.29	0.	0.
time (sec)	N/A	0.207	0.07	0.053	0.	0.	15.364	0.	0.

Problem 1108	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	61	58	108	77	116	96	90
normalized size	1	1.	0.62	0.59	1.1	0.79	1.18	0.98	0.92
time (sec)	N/A	0.129	0.035	0.011	1.417	0.238	50.13	0.22	17.365

Problem 1109	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	78	78	50	47	86	62	92	77	68
normalized size	1	1.	0.64	0.6	1.1	0.79	1.18	0.99	0.87
time (sec)	N/A	0.107	0.031	0.009	1.437	0.232	23.627	0.216	14.117

Problem 1110	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	39	36	62	47	68	58	49
normalized size	1	1.	0.7	0.64	1.11	0.84	1.21	1.04	0.88
time (sec)	N/A	0.085	0.027	0.008	1.411	0.228	9.985	0.215	10.507

Problem 1111	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	27	25	41	31	44	36	29
normalized size	1	1.	0.75	0.69	1.14	0.86	1.22	1.	0.81
time (sec)	N/A	0.06	0.022	0.007	1.439	0.228	3.844	0.214	7.018

Problem 1112	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	14	18	18	20	18	10
normalized size	1	1.	1.	0.93	1.2	1.2	1.33	1.2	0.67
time (sec)	N/A	0.011	0.007	0.005	1.437	0.234	1.73	0.214	2.12

Problem 1113	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	48	0	0	134	39	251	48
normalized size	1	1.	0.87	0.	0.	2.44	0.71	4.56	0.87
time (sec)	N/A	0.078	0.035	0.031	0.	0.258	3.808	0.22	8.293

Problem 1114	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	78	78	69	0	0	240	39	282	70
normalized size	1	1.	0.88	0.	0.	3.08	0.5	3.62	0.9
time (sec)	N/A	0.107	0.052	0.045	0.	0.253	5.738	0.224	11.01

Problem 1115	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	104	104	83	0	0	270	39	305	95
normalized size	1	1.	0.8	0.	0.	2.6	0.38	2.93	0.91
time (sec)	N/A	0.145	0.058	0.05	0.	0.264	10.44	0.224	15.03

Problem 1116	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	128	128	91	0	0	0	27	0	116
normalized size	1	1.	0.71	0.	0.	0.	0.21	0.	0.91
time (sec)	N/A	0.198	0.073	0.038	0.	0.	8.401	0.	19.623

Problem 1117	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	104	104	79	0	0	0	27	0	92
normalized size	1	1.	0.76	0.	0.	0.	0.26	0.	0.88
time (sec)	N/A	0.151	0.059	0.037	0.	0.	4.276	0.	14.891

Problem 1118	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	64	0	0	0	27	0	70
normalized size	1	1.	0.78	0.	0.	0.	0.33	0.	0.85
time (sec)	N/A	0.113	0.046	0.036	0.	0.	2.679	0.	11.128

Problem 1119	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	57	52	0	0	0	27	0	49
normalized size	1	1.	0.91	0.	0.	0.	0.47	0.	0.86
time (sec)	N/A	0.068	0.029	0.028	0.	0.	2.251	0.	6.708

Problem 1120	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	70	0	0	0	31	0	70
normalized size	1	1.	0.85	0.	0.	0.	0.38	0.	0.85
time (sec)	N/A	0.108	0.045	0.04	0.	0.	3.061	0.	10.727

Problem 1121	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	104	104	83	0	0	0	32	0	92
normalized size	1	1.	0.8	0.	0.	0.	0.31	0.	0.88
time (sec)	N/A	0.146	0.056	0.046	0.	0.	5.778	0.	14.491

Problem 1122	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	128	128	94	0	0	0	32	0	116
normalized size	1	1.	0.73	0.	0.	0.	0.25	0.	0.91
time (sec)	N/A	0.188	0.062	0.048	0.	0.	12.198	0.	19.182

Problem 1123	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	106	106	80	0	0	284	37	0	99
normalized size	1	1.	0.75	0.	0.	2.68	0.35	0.	0.93
time (sec)	N/A	0.11	0.064	0.041	0.	0.253	7.298	0.	14.168

Problem 1124	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	64	0	0	254	37	0	73
normalized size	1	1.	0.8	0.	0.	3.18	0.46	0.	0.91
time (sec)	N/A	0.08	0.048	0.05	0.	0.267	4.618	0.	10.64

Problem 1125	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	57	52	0	0	165	37	0	49
normalized size	1	1.	0.91	0.	0.	2.89	0.65	0.	0.86
time (sec)	N/A	0.052	0.027	0.034	0.	0.267	3.647	0.	7.82

Problem 1126	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	18	23	23	31	0	14
normalized size	1	1.	1.	0.95	1.21	1.21	1.63	0.	0.74
time (sec)	N/A	0.02	0.016	0.006	1.437	0.239	2.41	0.	2.667

Problem 1127	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	29	26	47	36	68	0	36
normalized size	1	1.	0.66	0.59	1.07	0.82	1.55	0.	0.82
time (sec)	N/A	0.042	0.023	0.007	1.443	0.237	4.642	0.	4.247

Problem 1128	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	42	39	70	51	406	0	60
normalized size	1	1.	0.62	0.57	1.03	0.75	5.97	0.	0.88
time (sec)	N/A	0.065	0.033	0.009	1.439	0.234	10.5	0.	6.663

Problem 1129	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	53	50	93	66	692	0	83
normalized size	1	1.	0.58	0.54	1.01	0.72	7.52	0.	0.9
time (sec)	N/A	0.089	0.042	0.009	1.44	0.242	22.715	0.	9.716

Problem 1130	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	129	129	90	0	0	0	37	0	117
normalized size	1	1.	0.7	0.	0.	0.	0.29	0.	0.91
time (sec)	N/A	0.164	0.056	0.037	0.	0.	6.986	0.	19.054

Problem 1131	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	79	0	0	0	37	0	94
normalized size	1	1.	0.75	0.	0.	0.	0.35	0.	0.9
time (sec)	N/A	0.133	0.05	0.037	0.	0.	3.555	0.	15.15

Problem 1132	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	83	62	0	0	0	37	0	70
normalized size	1	1.	0.75	0.	0.	0.	0.45	0.	0.84
time (sec)	N/A	0.103	0.043	0.038	0.	0.	2.445	0.	11.885

Problem 1133	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	47	0	0	0	36	0	54
normalized size	1	1.	0.77	0.	0.	0.	0.59	0.	0.89
time (sec)	N/A	0.073	0.021	0.039	0.	0.	2.251	0.	8.592

Problem 1134	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	70	0	0	0	41	0	73
normalized size	1	1.	0.82	0.	0.	0.	0.48	0.	0.86
time (sec)	N/A	0.1	0.045	0.04	0.	0.	3.473	0.	11.703

Problem 1135	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	107	107	82	0	0	0	44	0	95
normalized size	1	1.	0.77	0.	0.	0.	0.41	0.	0.89
time (sec)	N/A	0.13	0.056	0.045	0.	0.	7.003	0.	15.105

Problem 1136	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	131	131	94	0	0	0	44	0	119
normalized size	1	1.	0.72	0.	0.	0.	0.34	0.	0.91
time (sec)	N/A	0.162	0.063	0.048	0.	0.	14.716	0.	18.847

Problem 1137	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	99	99	61	58	109	77	116	96	90
normalized size	1	1.	0.62	0.59	1.1	0.78	1.17	0.97	0.91
time (sec)	N/A	0.129	0.047	0.011	1.419	0.23	50.527	0.222	17.337

Problem 1138	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	50	47	84	62	92	77	66
normalized size	1	1.	0.68	0.64	1.14	0.84	1.24	1.04	0.89
time (sec)	N/A	0.106	0.036	0.008	1.413	0.224	23.813	0.218	14.325

Problem 1139	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	57	39	36	63	47	68	58	49
normalized size	1	1.	0.68	0.63	1.11	0.82	1.19	1.02	0.86
time (sec)	N/A	0.084	0.033	0.008	1.416	0.231	10.277	0.214	10.57

Problem 1140	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	27	24	39	31	44	36	29
normalized size	1	1.	0.77	0.69	1.11	0.89	1.26	1.03	0.83
time (sec)	N/A	0.059	0.025	0.007	1.442	0.233	4.057	0.215	7.069

Problem 1141	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	15	19	19	24	19	14
normalized size	1	1.	1.	0.94	1.19	1.19	1.5	1.19	0.88
time (sec)	N/A	0.01	0.008	0.007	1.432	0.229	2.611	0.212	2.134

Problem 1142	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	52	0	0	203	39	269	60
normalized size	1	1.	0.74	0.	0.	2.9	0.56	3.84	0.86
time (sec)	N/A	0.108	0.049	0.042	0.	0.26	4.341	0.225	12.193

Problem 1143	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	70	0	0	306	39	305	90
normalized size	1	1.	0.73	0.	0.	3.19	0.41	3.18	0.94
time (sec)	N/A	0.143	0.063	0.076	0.	0.263	7.259	0.229	15.558

Problem 1144	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	83	0	0	321	39	324	116
normalized size	1	1.	0.68	0.	0.	2.63	0.32	2.66	0.95
time (sec)	N/A	0.18	0.075	0.085	0.	0.263	14.695	0.233	20.317

Problem 1145	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	128	128	79	0	0	0	27	0	0
normalized size	1	1.	0.62	0.	0.	0.	0.21	0.	0.
time (sec)	N/A	0.203	0.074	0.081	0.	0.	8.515	0.	0.

Problem 1146	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	104	104	66	0	0	0	27	0	0
normalized size	1	1.	0.63	0.	0.	0.	0.26	0.	0.
time (sec)	N/A	0.153	0.058	0.067	0.	0.	4.304	0.	0.

Problem 1147	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	54	0	0	0	27	0	0
normalized size	1	1.	0.7	0.	0.	0.	0.35	0.	0.
time (sec)	N/A	0.111	0.051	0.036	0.	0.	2.636	0.	0.

Problem 1148	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	57	57	0	0	0	27	0	0
normalized size	1	1.	1.	0.	0.	0.	0.47	0.	0.
time (sec)	N/A	0.067	0.04	0.032	0.	0.	2.618	0.	0.

Problem 1149	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	71	0	0	0	31	0	0
normalized size	1	1.	0.87	0.	0.	0.	0.38	0.	0.
time (sec)	N/A	0.11	0.054	0.069	0.	0.	3.972	0.	0.

Problem 1150	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	104	104	83	0	0	0	32	0	0
normalized size	1	1.	0.8	0.	0.	0.	0.31	0.	0.
time (sec)	N/A	0.15	0.073	0.076	0.	0.	8.297	0.	0.

Problem 1151	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	128	128	94	0	0	0	32	0	0
normalized size	1	1.	0.73	0.	0.	0.	0.25	0.	0.
time (sec)	N/A	0.195	0.079	0.084	0.	0.	17.721	0.	0.

Problem 1152	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	123	123	120	0	0	356	37	0	116
normalized size	1	1.	0.98	0.	0.	2.89	0.3	0.	0.94
time (sec)	N/A	0.127	0.295	0.066	0.	0.271	9.449	0.	15.816

Problem 1153	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	97	97	106	0	0	340	37	0	90
normalized size	1	1.	1.09	0.	0.	3.51	0.38	0.	0.93
time (sec)	N/A	0.091	0.201	0.062	0.	0.265	5.419	0.	11.328

Problem 1154	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	94	0	0	252	37	0	63
normalized size	1	1.	1.27	0.	0.	3.41	0.5	0.	0.85
time (sec)	N/A	0.06	0.099	0.043	0.	0.26	4.017	0.	7.613

Problem 1155	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	15	19	31	29	0	12
normalized size	1	1.	1.	0.94	1.19	1.94	1.81	0.	0.75
time (sec)	N/A	0.009	0.012	0.005	1.435	0.233	2.129	0.	1.272

Problem 1156	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	42	29	26	46	50	68	0	39
normalized size	1	1.	0.69	0.62	1.1	1.19	1.62	0.	0.93
time (sec)	N/A	0.031	0.027	0.007	1.443	0.243	4.661	0.	3.52

Problem 1157	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	42	39	72	68	323	0	61
normalized size	1	1.	0.64	0.59	1.09	1.03	4.89	0.	0.92
time (sec)	N/A	0.055	0.038	0.007	1.425	0.24	10.631	0.	5.996

Problem 1158	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	90	90	53	50	96	82	592	0	85
normalized size	1	1.	0.59	0.56	1.07	0.91	6.58	0.	0.94
time (sec)	N/A	0.082	0.049	0.009	1.441	0.25	23.1	0.	8.991

Problem 1159	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	114	114	64	61	117	97	928	0	109
normalized size	1	1.	0.56	0.54	1.03	0.85	8.14	0.	0.96
time (sec)	N/A	0.111	0.059	0.009	1.439	0.244	51.586	0.	12.719

Problem 1160	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	129	129	80	0	0	0	37	0	0
normalized size	1	1.	0.62	0.	0.	0.	0.29	0.	0.
time (sec)	N/A	0.186	0.07	0.072	0.	0.	10.349	0.	0.

Problem 1161	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	66	0	0	0	37	0	0
normalized size	1	1.	0.63	0.	0.	0.	0.35	0.	0.
time (sec)	N/A	0.146	0.055	0.068	0.	0.	5.085	0.	0.

Problem 1162	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	83	54	0	0	0	37	0	0
normalized size	1	1.	0.65	0.	0.	0.	0.45	0.	0.
time (sec)	N/A	0.115	0.048	0.039	0.	0.	2.878	0.	0.

Problem 1163	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	58	0	0	0	37	0	0
normalized size	1	1.	0.98	0.	0.	0.	0.63	0.	0.
time (sec)	N/A	0.087	0.043	0.034	0.	0.	2.646	0.	0.

Problem 1164	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	79	79	71	0	0	0	39	0	0
normalized size	1	1.	0.9	0.	0.	0.	0.49	0.	0.
time (sec)	N/A	0.115	0.05	0.071	0.	0.	3.54	0.	0.

Problem 1165	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	83	0	0	0	44	0	0
normalized size	1	1.	0.79	0.	0.	0.	0.42	0.	0.
time (sec)	N/A	0.144	0.064	0.077	0.	0.	7.035	0.	0.

Problem 1166	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	129	129	94	0	0	0	44	0	0
normalized size	1	1.	0.73	0.	0.	0.	0.34	0.	0.
time (sec)	N/A	0.178	0.076	0.087	0.	0.	14.867	0.	0.

Problem 1167	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	153	153	105	0	0	0	44	0	0
normalized size	1	1.	0.69	0.	0.	0.	0.29	0.	0.
time (sec)	N/A	0.213	0.089	0.096	0.	0.	30.801	0.	0.

Problem 1168	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	83	56	0	0	0	36	0	71
normalized size	1	1.	0.67	0.	0.	0.	0.43	0.	0.86
time (sec)	N/A	0.089	0.041	0.049	0.	0.	3.563	0.	10.181

Problem 1169	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	29	26	42	63	126	0	32
normalized size	1	1.	0.74	0.67	1.08	1.62	3.23	0.	0.82
time (sec)	N/A	0.02	0.023	0.005	1.431	0.249	6.952	0.	2.003

Problem 1170	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	102	102	72	0	0	0	36	0	90
normalized size	1	1.	0.71	0.	0.	0.	0.35	0.	0.88
time (sec)	N/A	0.111	0.081	0.048	0.	0.	14.771	0.	12.381

Problem 1171	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	40	37	68	93	515	0	51
normalized size	1	1.	0.69	0.64	1.17	1.6	8.88	0.	0.88
time (sec)	N/A	0.031	0.03	0.005	1.444	0.238	30.227	0.	3.285

Problem 1172	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	51	48	90	123	1550	0	70
normalized size	1	1.	0.66	0.62	1.17	1.6	20.13	0.	0.91
time (sec)	N/A	0.045	0.035	0.008	1.439	0.244	114.815	0.	4.943

Problem 1173	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	106	106	73	59	116	93	134	162	92
normalized size	1	1.	0.69	0.56	1.09	0.88	1.26	1.53	0.87
time (sec)	N/A	0.135	0.037	0.012	1.445	0.24	66.88	0.249	19.082

Problem 1174	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	62	48	92	78	110	127	70
normalized size	1	1.	0.74	0.57	1.1	0.93	1.31	1.51	0.83
time (sec)	N/A	0.114	0.031	0.011	1.441	0.231	36.194	0.244	15.524

Problem 1175	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	51	37	68	63	87	92	51
normalized size	1	1.	0.82	0.6	1.1	1.02	1.4	1.48	0.82
time (sec)	N/A	0.087	0.029	0.008	1.438	0.248	15.202	0.252	11.682

Problem 1176	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	29	26	43	49	63	57	31
normalized size	1	1.	0.72	0.65	1.08	1.22	1.58	1.42	0.78
time (sec)	N/A	0.061	0.024	0.007	1.466	0.243	5.314	0.251	7.871

Problem 1177	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	16	20	32	39	20	14
normalized size	1	1.	1.	0.84	1.05	1.68	2.05	1.05	0.74
time (sec)	N/A	0.011	0.009	0.005	1.42	0.235	1.397	0.254	2.39

Problem 1178	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	63	0	0	123	44	257	56
normalized size	1	1.	0.91	0.	0.	1.78	0.64	3.72	0.81
time (sec)	N/A	0.103	0.044	0.051	0.	0.27	4.02	0.223	11.24

Problem 1179	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	78	78	67	0	0	225	42	286	65
normalized size	1	1.	0.86	0.	0.	2.88	0.54	3.67	0.83
time (sec)	N/A	0.107	0.041	0.04	0.	0.263	5.285	0.227	11.531

Problem 1180	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	83	0	0	267	44	313	90
normalized size	1	1.	0.79	0.	0.	2.54	0.42	2.98	0.86
time (sec)	N/A	0.146	0.049	0.041	0.	0.269	8.564	0.229	15.68

Problem 1181	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	130	130	91	0	0	0	31	0	110
normalized size	1	1.	0.7	0.	0.	0.	0.24	0.	0.85
time (sec)	N/A	0.208	0.071	0.035	0.	0.	6.021	0.	22.372

Problem 1182	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	80	0	0	0	31	0	87
normalized size	1	1.	0.76	0.	0.	0.	0.3	0.	0.83
time (sec)	N/A	0.157	0.074	0.027	0.	0.	3.305	0.	17.568

Problem 1183	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	64	0	0	0	31	0	66
normalized size	1	1.	0.78	0.	0.	0.	0.38	0.	0.8
time (sec)	N/A	0.101	0.053	0.025	0.	0.	2.409	0.	10.282

Problem 1184	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	68	0	0	0	34	0	68
normalized size	1	1.	0.83	0.	0.	0.	0.41	0.	0.83
time (sec)	N/A	0.112	0.042	0.032	0.	0.	2.769	0.	12.483

Problem 1185	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	84	0	0	0	36	0	85
normalized size	1	1.	0.8	0.	0.	0.	0.34	0.	0.81
time (sec)	N/A	0.153	0.049	0.037	0.	0.	4.637	0.	16.998

Problem 1186	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	130	130	95	0	0	0	36	0	107
normalized size	1	1.	0.73	0.	0.	0.	0.28	0.	0.82
time (sec)	N/A	0.199	0.06	0.043	0.	0.	8.885	0.	21.82

Problem 1187	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	263	263	80	0	0	292	41	312	240
normalized size	1	1.	0.3	0.	0.	1.11	0.16	1.19	0.91
time (sec)	N/A	0.365	0.075	0.036	0.	0.259	6.182	0.265	41.108

Problem 1188	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	232	232	64	0	0	250	41	265	207
normalized size	1	1.	0.28	0.	0.	1.08	0.18	1.14	0.89
time (sec)	N/A	0.259	0.046	0.029	0.	0.261	4.479	0.267	35.13

Problem 1189	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	F(-1)	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	226	226	68	0	0	0	42	258	197
normalized size	1	1.	0.3	0.	0.	0.	0.19	1.14	0.87
time (sec)	N/A	0.251	0.043	0.033	0.	0.	4.167	0.261	35.063

Problem 1190	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	19	24	36	162	35	17
normalized size	1	1.	1.	0.86	1.09	1.64	7.36	1.59	0.77
time (sec)	N/A	0.021	0.014	0.006	1.436	0.237	3.606	0.245	2.961

Problem 1191	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	42	29	50	51	413	85	39
normalized size	1	1.	0.91	0.63	1.09	1.11	8.98	1.85	0.85
time (sec)	N/A	0.043	0.026	0.007	1.433	0.25	7.64	0.247	4.72

Problem 1192	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	54	40	74	68	1100	151	63
normalized size	1	1.	0.76	0.56	1.04	0.96	15.49	2.13	0.89
time (sec)	N/A	0.067	0.035	0.008	1.414	0.237	16.576	0.258	7.344

Problem 1193	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	65	51	99	82	1770	230	87
normalized size	1	1.	0.68	0.53	1.03	0.85	18.44	2.4	0.91
time (sec)	N/A	0.094	0.042	0.01	1.441	0.237	32.854	0.264	10.701

Problem 1194	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	156	156	102	0	0	0	41	0	136
normalized size	1	1.	0.65	0.	0.	0.	0.26	0.	0.87
time (sec)	N/A	0.217	0.069	0.033	0.	0.	10.243	0.	27.199

Problem 1195	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	131	131	91	0	0	0	41	0	109
normalized size	1	1.	0.69	0.	0.	0.	0.31	0.	0.83
time (sec)	N/A	0.174	0.049	0.027	0.	0.	5.251	0.	22.307

Problem 1196	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	106	106	79	0	0	0	41	0	87
normalized size	1	1.	0.75	0.	0.	0.	0.39	0.	0.82
time (sec)	N/A	0.139	0.047	0.028	0.	0.	3.045	0.	18.468

Problem 1197	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	83	62	0	0	0	39	0	68
normalized size	1	1.	0.75	0.	0.	0.	0.47	0.	0.82
time (sec)	N/A	0.095	0.037	0.039	0.	0.	2.424	0.	12.549

Problem 1198	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	67	0	0	0	36	0	70
normalized size	1	1.	0.79	0.	0.	0.	0.42	0.	0.82
time (sec)	N/A	0.106	0.04	0.032	0.	0.	3.145	0.	14.238

Problem 1199	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	108	108	84	0	0	0	34	0	90
normalized size	1	1.	0.78	0.	0.	0.	0.31	0.	0.83
time (sec)	N/A	0.141	0.049	0.037	0.	0.	5.575	0.	18.193

Problem 1200	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	133	133	94	0	0	0	36	0	114
normalized size	1	1.	0.71	0.	0.	0.	0.27	0.	0.86
time (sec)	N/A	0.17	0.058	0.043	0.	0.	11.042	0.	22.193

Problem 1201	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	158	158	106	0	0	0	34	0	138
normalized size	1	1.	0.67	0.	0.	0.	0.22	0.	0.87
time (sec)	N/A	0.212	0.066	0.049	0.	0.	22.619	0.	27.017

Problem 1202	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	106	106	62	59	116	78	117	147	92
normalized size	1	1.	0.58	0.56	1.09	0.74	1.1	1.39	0.87
time (sec)	N/A	0.137	0.044	0.011	1.437	0.229	53.659	0.243	18.888

Problem 1203	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	51	48	92	63	94	112	71
normalized size	1	1.	0.61	0.57	1.1	0.75	1.12	1.33	0.85
time (sec)	N/A	0.115	0.035	0.01	1.445	0.23	25.809	0.244	15.397

Problem 1204	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	40	37	68	49	70	77	51
normalized size	1	1.	0.65	0.6	1.1	0.79	1.13	1.24	0.82
time (sec)	N/A	0.089	0.031	0.009	1.438	0.23	11.031	0.217	11.558

Problem 1205	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	29	26	43	34	46	42	31
normalized size	1	1.	0.72	0.65	1.08	0.85	1.15	1.05	0.78
time (sec)	N/A	0.063	0.021	0.006	1.45	0.231	4.355	0.213	7.816

Problem 1206	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	16	20	20	24	20	14
normalized size	1	1.	1.	0.84	1.05	1.05	1.26	1.05	0.74
time (sec)	N/A	0.011	0.008	0.006	1.438	0.229	1.933	0.217	2.378

Problem 1207	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	57	47	0	0	111	39	259	46
normalized size	1	1.	0.82	0.	0.	1.95	0.68	4.54	0.81
time (sec)	N/A	0.09	0.038	0.033	0.	0.249	3.811	0.227	9.918

Problem 1208	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	70	0	0	254	41	290	66
normalized size	1	1.	0.86	0.	0.	3.14	0.51	3.58	0.81
time (sec)	N/A	0.121	0.056	0.046	0.	0.252	5.258	0.23	12.922

Problem 1209	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	108	108	84	0	0	281	42	316	95
normalized size	1	1.	0.78	0.	0.	2.6	0.39	2.93	0.88
time (sec)	N/A	0.155	0.062	0.049	0.	0.255	8.961	0.236	18.329

Problem 1210	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	133	133	91	0	0	0	29	0	116
normalized size	1	1.	0.68	0.	0.	0.	0.22	0.	0.87
time (sec)	N/A	0.21	0.086	0.043	0.	0.	8.802	0.	24.028

Problem 1211	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	108	108	80	0	0	0	29	0	92
normalized size	1	1.	0.74	0.	0.	0.	0.27	0.	0.85
time (sec)	N/A	0.16	0.07	0.039	0.	0.	4.562	0.	18.624

Problem 1212	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	66	0	0	0	29	0	70
normalized size	1	1.	0.78	0.	0.	0.	0.34	0.	0.82
time (sec)	N/A	0.119	0.055	0.037	0.	0.	2.894	0.	14.326

Problem 1213	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	53	0	0	0	29	0	49
normalized size	1	1.	0.9	0.	0.	0.	0.49	0.	0.83
time (sec)	N/A	0.072	0.028	0.027	0.	0.	2.325	0.	8.991

Problem 1214	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	71	0	0	0	32	0	70
normalized size	1	1.	0.84	0.	0.	0.	0.38	0.	0.82
time (sec)	N/A	0.112	0.052	0.043	0.	0.	2.84	0.	13.402

Problem 1215	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	108	108	84	0	0	0	34	0	90
normalized size	1	1.	0.78	0.	0.	0.	0.31	0.	0.83
time (sec)	N/A	0.154	0.065	0.043	0.	0.	4.662	0.	17.442

Problem 1216	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	133	133	95	0	0	0	34	0	117
normalized size	1	1.	0.71	0.	0.	0.	0.26	0.	0.88
time (sec)	N/A	0.203	0.074	0.049	0.	0.	9.165	0.	23.317

Problem 1217	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	264	264	210	0	0	304	39	0	243
normalized size	1	1.	0.8	0.	0.	1.15	0.15	0.	0.92
time (sec)	N/A	0.32	0.325	0.042	0.	0.249	6.353	0.	41.072

Problem 1218	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	233	233	195	0	0	279	39	0	207
normalized size	1	1.	0.84	0.	0.	1.2	0.17	0.	0.89
time (sec)	N/A	0.241	0.125	0.037	0.	0.248	4.437	0.	34.955

Problem 1219	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	209	209	173	0	0	190	37	238	185
normalized size	1	1.	0.83	0.	0.	0.91	0.18	1.14	0.89
time (sec)	N/A	0.185	0.035	0.052	0.	0.239	3.708	0.232	28.799

Problem 1220	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	19	24	24	80	0	17
normalized size	1	1.	1.	0.86	1.09	1.09	3.64	0.	0.77
time (sec)	N/A	0.022	0.021	0.006	1.428	0.223	2.727	0.	3.144

Problem 1221	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	32	29	50	38	287	0	39
normalized size	1	1.	0.7	0.63	1.09	0.83	6.24	0.	0.85
time (sec)	N/A	0.044	0.028	0.006	1.423	0.226	5.54	0.	5.106

Problem 1222	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	43	40	74	53	864	0	63
normalized size	1	1.	0.61	0.56	1.04	0.75	12.17	0.	0.89
time (sec)	N/A	0.07	0.036	0.009	1.431	0.226	12.291	0.	7.96

Problem 1223	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	54	51	99	68	1452	0	87
normalized size	1	1.	0.56	0.53	1.03	0.71	15.12	0.	0.91
time (sec)	N/A	0.099	0.042	0.008	1.442	0.229	24.879	0.	11.186

Problem 1224	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	121	121	65	62	123	82	2176	0	110
normalized size	1	1.	0.54	0.51	1.02	0.68	17.98	0.	0.91
time (sec)	N/A	0.13	0.049	0.012	1.436	0.227	42.074	0.	15.243

Problem 1225	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	134	134	80	0	0	0	39	0	116
normalized size	1	1.	0.6	0.	0.	0.	0.29	0.	0.87
time (sec)	N/A	0.191	0.072	0.051	0.	0.	5.3	0.	23.87

Problem 1226	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	109	109	66	0	0	0	39	0	88
normalized size	1	1.	0.61	0.	0.	0.	0.36	0.	0.81
time (sec)	N/A	0.154	0.053	0.043	0.	0.	3.056	0.	19.682

Problem 1227	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	53	0	0	0	39	0	68
normalized size	1	1.	0.62	0.	0.	0.	0.45	0.	0.79
time (sec)	N/A	0.123	0.03	0.029	0.	0.	2.361	0.	16.132

Problem 1228	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	71	0	0	0	31	0	53
normalized size	1	1.	1.16	0.	0.	0.	0.51	0.	0.87
time (sec)	N/A	0.091	0.049	0.041	0.	0.	2.784	0.	13.131

Problem 1229	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	84	0	0	0	34	0	73
normalized size	1	1.	0.98	0.	0.	0.	0.4	0.	0.85
time (sec)	N/A	0.122	0.063	0.054	0.	0.	4.042	0.	16.143

Problem 1230	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	109	109	95	0	0	0	32	0	95
normalized size	1	1.	0.87	0.	0.	0.	0.29	0.	0.87
time (sec)	N/A	0.155	0.068	0.051	0.	0.	7.678	0.	19.957

Problem 1231	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	134	134	106	0	0	0	34	0	119
normalized size	1	1.	0.79	0.	0.	0.	0.25	0.	0.89
time (sec)	N/A	0.187	0.078	0.054	0.	0.	15.802	0.	24.016

Problem 1232	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	104	104	62	59	116	78	117	147	90
normalized size	1	1.	0.6	0.57	1.12	0.75	1.12	1.41	0.87
time (sec)	N/A	0.137	0.037	0.012	1.436	0.221	50.944	0.218	19.653

Problem 1233	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	51	48	92	63	94	112	68
normalized size	1	1.	0.62	0.59	1.12	0.77	1.15	1.37	0.83
time (sec)	N/A	0.113	0.034	0.009	1.567	0.221	24.016	0.215	16.072

Problem 1234	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	60	60	40	37	68	49	70	77	49
normalized size	1	1.	0.67	0.62	1.13	0.82	1.17	1.28	0.82
time (sec)	N/A	0.091	0.03	0.008	1.439	0.221	10.223	0.215	11.987

Problem 1235	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	28	25	43	32	46	39	29
normalized size	1	1.	0.74	0.66	1.13	0.84	1.21	1.03	0.76
time (sec)	N/A	0.064	0.023	0.008	1.445	0.22	3.89	0.216	8.168

Problem 1236	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	16	20	20	22	20	12
normalized size	1	1.	1.	0.94	1.18	1.18	1.29	1.18	0.71
time (sec)	N/A	0.011	0.008	0.005	1.44	0.219	1.782	0.216	2.464

Problem 1237	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	57	49	0	0	139	42	259	48
normalized size	1	1.	0.86	0.	0.	2.44	0.74	4.54	0.84
time (sec)	N/A	0.085	0.037	0.036	0.	0.242	4.108	0.221	9.304

Problem 1238	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	70	0	0	247	41	292	71
normalized size	1	1.	0.86	0.	0.	3.05	0.51	3.6	0.88
time (sec)	N/A	0.115	0.05	0.036	0.	0.244	5.968	0.222	12.316

Problem 1239	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	108	108	84	0	0	277	42	316	97
normalized size	1	1.	0.78	0.	0.	2.56	0.39	2.93	0.9
time (sec)	N/A	0.154	0.06	0.041	0.	0.245	10.768	0.222	16.919

Problem 1240	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	133	133	92	0	0	0	29	0	116
normalized size	1	1.	0.69	0.	0.	0.	0.22	0.	0.87
time (sec)	N/A	0.212	0.087	0.029	0.	0.	8.524	0.	23.762

Problem 1241	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	108	108	79	0	0	0	29	0	92
normalized size	1	1.	0.73	0.	0.	0.	0.27	0.	0.85
time (sec)	N/A	0.159	0.064	0.028	0.	0.	4.443	0.	18.339

Problem 1242	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	66	0	0	0	29	0	70
normalized size	1	1.	0.78	0.	0.	0.	0.34	0.	0.82
time (sec)	N/A	0.117	0.054	0.027	0.	0.	2.789	0.	14.045

Problem 1243	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	53	0	0	0	29	0	49
normalized size	1	1.	0.9	0.	0.	0.	0.49	0.	0.83
time (sec)	N/A	0.072	0.032	0.032	0.	0.	2.405	0.	9.106

Problem 1244	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	70	0	0	0	32	0	68
normalized size	1	1.	0.82	0.	0.	0.	0.38	0.	0.8
time (sec)	N/A	0.114	0.049	0.031	0.	0.	3.272	0.	13.59

Problem 1245	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	108	108	84	0	0	0	34	0	92
normalized size	1	1.	0.78	0.	0.	0.	0.31	0.	0.85
time (sec)	N/A	0.158	0.058	0.036	0.	0.	5.976	0.	17.816

Problem 1246	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	133	133	95	0	0	0	34	0	116
normalized size	1	1.	0.71	0.	0.	0.	0.26	0.	0.87
time (sec)	N/A	0.204	0.07	0.039	0.	0.	12.525	0.	23.055

Problem 1247	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	266	266	81	0	0	300	39	0	245
normalized size	1	1.	0.3	0.	0.	1.13	0.15	0.	0.92
time (sec)	N/A	0.349	0.062	0.042	0.	0.247	7.61	0.	43.687

Problem 1248	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	235	235	66	0	0	270	39	0	216
normalized size	1	1.	0.28	0.	0.	1.15	0.17	0.	0.92
time (sec)	N/A	0.263	0.052	0.031	0.	0.243	4.944	0.	37.092

Problem 1249	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	209	209	53	0	0	188	39	0	185
normalized size	1	1.	0.25	0.	0.	0.9	0.19	0.	0.89
time (sec)	N/A	0.2	0.031	0.035	0.	0.24	3.91	0.	32.255

Problem 1250	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	20	19	24	24	80	0	14
normalized size	1	1.	1.	0.95	1.2	1.2	4.	0.	0.7
time (sec)	N/A	0.021	0.018	0.007	1.437	0.224	2.678	0.	3.161

Problem 1251	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	30	27	49	35	286	0	37
normalized size	1	1.	0.65	0.59	1.07	0.76	6.22	0.	0.8
time (sec)	N/A	0.044	0.025	0.007	1.443	0.225	5.146	0.	4.943

Problem 1252	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	43	40	74	53	864	0	61
normalized size	1	1.	0.61	0.56	1.04	0.75	12.17	0.	0.86
time (sec)	N/A	0.07	0.033	0.006	1.44	0.227	11.217	0.	7.692

Problem 1253	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	54	51	99	68	1452	0	85
normalized size	1	1.	0.56	0.53	1.03	0.71	15.12	0.	0.89
time (sec)	N/A	0.098	0.041	0.009	1.444	0.229	23.767	0.	11.151

Problem 1254	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	134	134	91	0	0	0	39	0	119
normalized size	1	1.	0.68	0.	0.	0.	0.29	0.	0.89
time (sec)	N/A	0.173	0.063	0.028	0.	0.	7.229	0.	23.576

Problem 1255	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	109	109	80	0	0	0	39	0	95
normalized size	1	1.	0.73	0.	0.	0.	0.36	0.	0.87
time (sec)	N/A	0.139	0.056	0.028	0.	0.	3.7	0.	19.273

Problem 1256	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	64	0	0	0	39	0	71
normalized size	1	1.	0.74	0.	0.	0.	0.45	0.	0.83
time (sec)	N/A	0.109	0.051	0.028	0.	0.	2.653	0.	15.725

Problem 1257	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	48	0	0	0	37	0	54
normalized size	1	1.	0.76	0.	0.	0.	0.59	0.	0.86
time (sec)	N/A	0.077	0.022	0.043	0.	0.	2.375	0.	11.781

Problem 1258	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	70	0	0	0	34	0	75
normalized size	1	1.	0.8	0.	0.	0.	0.39	0.	0.85
time (sec)	N/A	0.108	0.047	0.033	0.	0.	3.735	0.	15.793

Problem 1259	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	111	111	84	0	0	0	32	0	97
normalized size	1	1.	0.76	0.	0.	0.	0.29	0.	0.87
time (sec)	N/A	0.14	0.06	0.036	0.	0.	7.427	0.	18.991

Problem 1260	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	136	136	95	0	0	0	34	0	121
normalized size	1	1.	0.7	0.	0.	0.	0.25	0.	0.89
time (sec)	N/A	0.175	0.067	0.039	0.	0.	15.135	0.	23.286

Problem 1261	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	59	0	0	0	39	0	66
normalized size	1	1.	0.73	0.	0.	0.	0.48	0.	0.81
time (sec)	N/A	0.125	0.054	0.039	0.	0.	2.788	0.	16.862

Problem 1262	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	48	40	42	63	78	495	138	37
normalized size	1	1.	0.83	0.88	1.31	1.62	10.31	2.88	0.77
time (sec)	N/A	0.066	0.035	0.008	1.45	0.235	28.769	0.221	10.462

Problem 1263	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	22	22	0	34	129	28	15
normalized size	1	1.	0.96	0.96	0.	1.48	5.61	1.22	0.65
time (sec)	N/A	0.016	0.011	0.005	0.	0.235	8.009	0.219	2.744

Problem 1264	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	41	41	51	0	0	0	39	0	31
normalized size	1	1.	1.24	0.	0.	0.	0.95	0.	0.76
time (sec)	N/A	0.051	0.027	0.037	0.	0.	48.437	0.	5.644

Problem 1265	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	66	57	77	76	56	78	0
normalized size	1	1.	1.	0.86	1.17	1.15	0.85	1.18	0.
time (sec)	N/A	0.1	0.013	0.005	1.446	0.214	1.618	0.228	0.

Problem 1266	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	53	46	62	61	44	63	0
normalized size	1	1.	1.	0.87	1.17	1.15	0.83	1.19	0.
time (sec)	N/A	0.077	0.01	0.004	1.428	0.216	1.513	0.228	0.

Problem 1267	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	40	35	46	45	32	47	0
normalized size	1	1.	1.	0.88	1.15	1.12	0.8	1.18	0.
time (sec)	N/A	0.06	0.01	0.003	1.443	0.212	1.519	0.223	0.

Problem 1268	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	27	24	31	30	20	32	0
normalized size	1	1.	1.	0.89	1.15	1.11	0.74	1.19	0.
time (sec)	N/A	0.044	0.007	0.003	1.466	0.217	1.427	0.223	0.

Problem 1269	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	14	18	18	10	19	10
normalized size	1	1.	1.	0.93	1.2	1.2	0.67	1.27	0.67
time (sec)	N/A	0.009	0.005	0.001	1.425	0.215	0.418	0.227	2.164

Problem 1270	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	21	31	24	15	30	19
normalized size	1	1.	1.	0.95	1.41	1.09	0.68	1.36	0.86
time (sec)	N/A	0.032	0.009	0.007	1.427	0.218	0.788	0.221	5.437

Problem 1271	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	35	32	45	45	31	57	34
normalized size	1	1.	1.	0.91	1.29	1.29	0.89	1.63	0.97
time (sec)	N/A	0.054	0.011	0.009	1.433	0.219	2.969	0.232	8.073

Problem 1272	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	44	63	61	42	74	48
normalized size	1	1.	1.	0.9	1.29	1.24	0.86	1.51	0.98
time (sec)	N/A	0.065	0.012	0.011	1.444	0.223	18.819	0.238	10.535

Problem 1273	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	63	56	78	78	56	93	60
normalized size	1	1.	1.	0.89	1.24	1.24	0.89	1.48	0.95
time (sec)	N/A	0.08	0.012	0.011	1.415	0.222	157.098	0.238	12.563

Problem 1274	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	F(-2)	A	A	F(-1)
verified	N/A	NO	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	301	305	311	895	429	0	20	371	0
normalized size	1	1.01	1.03	2.97	1.43	0.	0.07	1.23	0.
time (sec)	N/A	1.167	0.309	0.115	1.605	0.	0.408	0.239	0.

Problem 1275	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	72	72	60	63	88	109	68	108	0
normalized size	1	1.	0.83	0.88	1.22	1.51	0.94	1.5	0.
time (sec)	N/A	0.12	0.044	0.01	1.432	0.214	2.966	0.233	0.

Problem 1276	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	49	52	73	95	56	90	0
normalized size	1	1.	0.83	0.88	1.24	1.61	0.95	1.53	0.
time (sec)	N/A	0.103	0.028	0.008	1.42	0.215	2.9	0.233	0.

Problem 1277	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	38	41	58	76	42	66	0
normalized size	1	1.	0.83	0.89	1.26	1.65	0.91	1.43	0.
time (sec)	N/A	0.077	0.028	0.008	1.437	0.212	2.789	0.23	0.

Problem 1278	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	27	30	43	47	29	65	26
normalized size	1	1.	0.82	0.91	1.3	1.42	0.88	1.97	0.79
time (sec)	N/A	0.059	0.016	0.007	1.426	0.217	2.543	0.231	7.777

Problem 1279	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	15	19	20	15	19	12
normalized size	1	1.	1.	0.94	1.19	1.25	0.94	1.19	0.75
time (sec)	N/A	0.01	0.008	0.002	1.438	0.219	2.198	0.227	2.114

Problem 1280	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	33	35	50	63	34	61	34
normalized size	1	1.	0.87	0.92	1.32	1.66	0.89	1.61	0.89
time (sec)	N/A	0.061	0.023	0.011	1.439	0.219	3.514	0.231	8.35

Problem 1281	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	41	47	72	99	53	69	53
normalized size	1	1.	0.79	0.9	1.38	1.9	1.02	1.33	1.02
time (sec)	N/A	0.08	0.075	0.014	1.44	0.221	43.265	0.227	11.46

Problem 1282	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	57	62	95	122	0	115	70
normalized size	1	1.	0.83	0.9	1.38	1.77	0.	1.67	1.01
time (sec)	N/A	0.1	0.108	0.014	1.438	0.221	0.	0.228	15.673

Problem 1283	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	25	29	35	30	26	41	0
normalized size	1	1.	0.74	0.85	1.03	0.88	0.76	1.21	0.
time (sec)	N/A	0.05	0.012	0.004	1.444	0.216	0.501	0.233	0.

Problem 1284	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	24	21	27	23	17	28	0
normalized size	1	1.	1.	0.88	1.12	0.96	0.71	1.17	0.
time (sec)	N/A	0.037	0.006	0.002	1.431	0.215	0.482	0.232	0.

Problem 1285	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	17	12	20	15	8	22	8
normalized size	1	1.	1.31	0.92	1.54	1.15	0.62	1.69	0.62
time (sec)	N/A	0.007	0.005	0.	1.447	0.215	0.43	0.235	2.548

Problem 1286	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	23	20	28	22	15	28	17
normalized size	1	1.	1.	0.87	1.22	0.96	0.65	1.22	0.74
time (sec)	N/A	0.03	0.01	0.006	1.441	0.221	0.772	0.237	5.876

Problem 1287	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	33	28	39	36	24	46	26
normalized size	1	1.	1.	0.85	1.18	1.09	0.73	1.39	0.79
time (sec)	N/A	0.045	0.008	0.01	1.445	0.22	2.806	0.239	8.061

Problem 1288	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	36	31	41	39	31	42	0
normalized size	1	1.	1.	0.86	1.14	1.08	0.86	1.17	0.
time (sec)	N/A	0.056	0.01	0.005	1.435	0.214	1.343	0.289	0.

Problem 1289	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	26	26	26	23	30	28	20	31	0
normalized size	1	1.	1.	0.88	1.15	1.08	0.77	1.19	0.
time (sec)	N/A	0.042	0.007	0.003	1.438	0.213	1.304	0.287	0.

Problem 1290	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	14	18	18	10	19	10
normalized size	1	1.	1.	0.93	1.2	1.2	0.67	1.27	0.67
time (sec)	N/A	0.009	0.005	0.002	1.436	0.221	0.379	0.287	2.25

Problem 1291	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	16	23	20	14	23	15
normalized size	1	1.	1.	0.84	1.21	1.05	0.74	1.21	0.79
time (sec)	N/A	0.029	0.007	0.006	1.444	0.215	0.396	0.283	4.436

Problem 1292	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	28	23	32	38	24	42	26
normalized size	1	1.	1.	0.82	1.14	1.36	0.86	1.5	0.93
time (sec)	N/A	0.045	0.008	0.009	1.439	0.215	2.73	0.285	6.232

Problem 1293	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	22	20	26	26	17	27	0
normalized size	1	1.	0.88	0.8	1.04	1.04	0.68	1.08	0.
time (sec)	N/A	0.031	0.009	0.003	1.427	0.216	0.176	0.226	0.

Problem 1294	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	15	19	19	12	20	12
normalized size	1	1.	1.	0.83	1.06	1.06	0.67	1.11	0.67
time (sec)	N/A	0.023	0.004	0.003	1.433	0.219	0.17	0.227	3.614

Problem 1295	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	10	10	10	9	11	11	7	12	7
normalized size	1	1.	1.	0.9	1.1	1.1	0.7	1.2	0.7
time (sec)	N/A	0.006	0.004	0.001	1.444	0.215	0.16	0.229	1.674

Problem 1296	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	29	20	15	10	18	14
normalized size	1	1.	1.	2.23	1.54	1.15	0.77	1.38	1.08
time (sec)	N/A	0.017	0.005	0.01	1.444	0.216	0.219	0.228	3.229

Problem 1297	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	36	27	32	17	34	20
normalized size	1	1.	1.	1.64	1.23	1.45	0.77	1.55	0.91
time (sec)	N/A	0.027	0.006	0.011	1.45	0.211	0.32	0.227	3.855

Problem 1298	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	F(-2)	A	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	186	186	147	219	196	0	36	173	0
normalized size	1	1.	0.79	1.18	1.05	0.	0.19	0.93	0.
time (sec)	N/A	0.49	0.231	0.049	1.596	0.	2.768	0.229	0.

Problem 1299	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	F(-2)	A	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	185	185	144	216	194	0	36	151	0
normalized size	1	1.	0.78	1.17	1.05	0.	0.19	0.82	0.
time (sec)	N/A	0.619	0.139	0.023	1.584	0.	2.688	0.233	0.

Problem 1300	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	F(-2)	A	A	F(-1)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	185	185	144	156	166	0	36	151	0
normalized size	1	1.	0.78	0.84	0.9	0.	0.19	0.82	0.
time (sec)	N/A	0.612	0.162	0.02	1.609	0.	4.281	0.231	0.

Problem 1301	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	F(-2)	A	A	F(-1)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	185	185	144	156	167	0	36	151	0
normalized size	1	1.	0.78	0.84	0.9	0.	0.19	0.82	0.
time (sec)	N/A	0.54	0.257	0.02	1.588	0.	2.742	0.23	0.

Problem 1302	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	F(-2)	A	A	F(-1)
verified	N/A	NO	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	168	185	144	216	194	0	34	151	0
normalized size	1	1.1	0.86	1.29	1.15	0.	0.2	0.9	0.
time (sec)	N/A	0.472	0.256	0.02	1.587	0.	4.204	0.229	0.

Problem 1303	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	F(-2)	A	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	190	190	149	223	201	0	39	178	0
normalized size	1	1.	0.78	1.17	1.06	0.	0.21	0.94	0.
time (sec)	N/A	0.608	0.248	0.02	1.584	0.	4.495	0.235	0.

Problem 1304	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	F(-2)	A	A	F(-1)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	192	192	149	161	174	0	42	178	0
normalized size	1	1.	0.78	0.84	0.91	0.	0.22	0.93	0.
time (sec)	N/A	0.622	0.276	0.023	1.608	0.	2.82	0.235	0.

Problem 1305	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	F(-2)	A	A	F(-1)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	192	192	150	161	173	0	42	178	0
normalized size	1	1.	0.78	0.84	0.9	0.	0.22	0.93	0.
time (sec)	N/A	0.535	0.403	0.022	1.603	0.	4.618	0.237	0.

Problem 1306	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	83	70	0	0	1	0	78	75
normalized size	1	1.	0.84	0.	0.	0.01	0.	0.94	0.9
time (sec)	N/A	0.117	0.118	0.076	0.	0.734	0.	0.259	12.073

Problem 1307	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	57	57	0	0	1	0	59	48
normalized size	1	1.	1.	0.	0.	0.02	0.	1.04	0.84
time (sec)	N/A	0.089	0.101	0.053	0.	0.721	0.	0.25	8.758

Problem 1308	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	32	0	0	1	24	55	29
normalized size	1	1.	1.	0.	0.	0.03	0.75	1.72	0.91
time (sec)	N/A	0.065	0.06	0.036	0.	0.691	6.806	0.236	6.806

Problem 1309	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	23	18	23	23	22	31	20
normalized size	1	1.	1.	0.78	1.	1.	0.96	1.35	0.87
time (sec)	N/A	0.02	0.019	0.006	1.446	0.224	152.634	0.232	2.77

Problem 1310	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	48	31	26	47	36	0	49	42
normalized size	1	1.	0.65	0.54	0.98	0.75	0.	1.02	0.88
time (sec)	N/A	0.043	0.035	0.007	1.439	0.228	0.	0.232	4.531

Problem 1311	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	35	46	116	62	0	49	41
normalized size	1	1.	0.74	0.98	2.47	1.32	0.	1.04	0.87
time (sec)	N/A	0.047	0.073	0.073	1.43	0.269	0.	0.234	6.026

Problem 1312	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	29	39	78	47	0	39	22
normalized size	1	1.	1.	1.34	2.69	1.62	0.	1.34	0.76
time (sec)	N/A	0.035	0.053	0.049	1.5	0.266	0.	0.231	4.949

Problem 1313	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	10	10	10	7	45	30	8	34	8
normalized size	1	1.	1.	0.7	4.5	3.	0.8	3.4	0.8
time (sec)	N/A	0.023	0.044	0.043	1.438	0.265	5.56	0.229	3.911

Problem 1314	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	32	16	16	14	15	17
normalized size	1	1.	1.	1.78	0.89	0.89	0.78	0.83	0.94
time (sec)	N/A	0.013	0.011	0.006	1.438	0.228	133.216	0.225	2.22

Problem 1315	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	37	37	25	39	34	26	0	27	32
normalized size	1	1.	0.68	1.05	0.92	0.7	0.	0.73	0.86
time (sec)	N/A	0.025	0.015	0.007	1.574	0.227	0.	0.226	3.227

Problem 1316	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	40	32	0	1	63	42	32
normalized size	1	1.	1.	0.8	0.	0.02	1.58	1.05	0.8
time (sec)	N/A	0.054	0.027	0.004	0.	0.22	1.497	0.224	9.381

Problem 1317	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	133	133	186	108	0	169	27	162	121
normalized size	1	1.	1.4	0.81	0.	1.27	0.2	1.22	0.91
time (sec)	N/A	0.228	0.092	0.004	0.	0.223	1.498	0.227	34.42

Problem 1318	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	220	220	182	167	0	389	22	243	0
normalized size	1	1.	0.83	0.76	0.	1.77	0.1	1.1	0.
time (sec)	N/A	0.796	0.067	0.09	0.	0.236	1.385	0.23	0.

Problem 1319	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	14	18	18	10	19	10
normalized size	1	1.	1.	0.93	1.2	1.2	0.67	1.27	0.67
time (sec)	N/A	0.009	0.006	0.002	1.436	0.213	0.516	0.226	2.172

Problem 1320	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F(-2)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	215	215	154	162	0	477	26	0	0
normalized size	1	1.	0.72	0.75	0.	2.22	0.12	0.	0.
time (sec)	N/A	1.03	0.039	0.061	0.	0.235	0.442	0.	0.

Problem 1321	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	123	123	154	97	0	143	26	159	114
normalized size	1	1.	1.25	0.79	0.	1.16	0.21	1.29	0.93
time (sec)	N/A	0.201	0.044	0.003	0.	0.222	0.496	0.23	28.627

Problem 1322	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	29	19	0	1	56	24	26
normalized size	1	1.	1.	0.66	0.	0.03	1.93	0.83	0.9
time (sec)	N/A	0.037	0.011	0.002	0.	0.225	0.546	0.224	5.145

Problem 1323	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	123	123	154	97	0	128	22	159	114
normalized size	1	1.	1.25	0.79	0.	1.04	0.18	1.29	0.93
time (sec)	N/A	0.172	0.051	0.002	0.	0.225	0.497	0.229	28.441

Problem 1324	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	215	215	154	162	0	425	20	257	0
normalized size	1	1.	0.72	0.75	0.	1.98	0.09	1.2	0.
time (sec)	N/A	0.806	0.035	0.041	0.	0.233	0.43	0.222	0.

Problem 1325	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	21	31	24	15	32	19
normalized size	1	1.	1.	0.95	1.41	1.09	0.68	1.45	0.86
time (sec)	N/A	0.033	0.011	0.006	1.443	0.219	0.857	0.22	5.793

Problem 1326	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F(-2)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	223	223	189	172	0	463	29	0	0
normalized size	1	1.	0.85	0.77	0.	2.08	0.13	0.	0.
time (sec)	N/A	1.078	0.089	0.042	0.	0.239	1.526	0.	0.

Problem 1327	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	133	133	203	105	0	188	34	171	122
normalized size	1	1.	1.53	0.79	0.	1.41	0.26	1.29	0.92
time (sec)	N/A	0.223	0.064	0.007	0.	0.221	1.724	0.226	34.009

Problem 1328	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	101	32	0	1	71	42	36
normalized size	1	1.	2.52	0.8	0.	0.02	1.78	1.05	0.9
time (sec)	N/A	0.054	0.045	0.005	0.	0.226	2.019	0.22	8.873

Problem 1329	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	40	0	1	83	53	39
normalized size	1	1.	1.	0.82	0.	0.02	1.69	1.08	0.8
time (sec)	N/A	0.064	0.047	0.007	0.	0.223	4.25	0.227	8.933

Problem 1330	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	142	142	197	114	0	194	42	186	128
normalized size	1	1.	1.39	0.8	0.	1.37	0.3	1.31	0.9
time (sec)	N/A	0.222	0.384	0.005	0.	0.228	4.37	0.227	35.71

Problem 1331	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	232	232	191	192	0	567	39	277	0
normalized size	1	1.	0.82	0.83	0.	2.44	0.17	1.19	0.
time (sec)	N/A	0.777	0.29	0.053	0.	0.237	4.164	0.224	0.

Problem 1332	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	15	19	20	15	19	12
normalized size	1	1.	1.	0.94	1.19	1.25	0.94	1.19	0.75
time (sec)	N/A	0.01	0.007	0.001	1.436	0.205	3.873	0.222	2.176

Problem 1333	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	F(-2)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	234	234	193	349	0	620	46	0	0
normalized size	1	1.	0.82	1.49	0.	2.65	0.2	0.	0.
time (sec)	N/A	1.084	0.301	0.354	0.	0.245	4.138	0.	0.

Problem 1334	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	142	142	195	123	0	211	46	182	128
normalized size	1	1.	1.37	0.87	0.	1.49	0.32	1.28	0.9
time (sec)	N/A	0.231	0.267	0.006	0.	0.222	4.144	0.226	33.723

Problem 1335	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	40	0	1	83	53	39
normalized size	1	1.	1.	0.82	0.	0.02	1.69	1.08	0.8
time (sec)	N/A	0.055	0.054	0.006	0.	0.228	4.171	0.221	6.703

Problem 1336	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	142	142	197	123	0	194	41	182	128
normalized size	1	1.	1.39	0.87	0.	1.37	0.29	1.28	0.9
time (sec)	N/A	0.203	0.317	0.006	0.	0.227	4.169	0.226	32.662

Problem 1337	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	232	232	192	346	0	556	39	277	0
normalized size	1	1.	0.83	1.49	0.	2.4	0.17	1.19	0.
time (sec)	N/A	0.765	0.254	0.322	0.	0.242	4.286	0.222	0.

Problem 1338	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	33	35	50	63	34	63	34
normalized size	1	1.	0.87	0.92	1.32	1.66	0.89	1.66	0.89
time (sec)	N/A	0.061	0.024	0.017	1.445	0.223	6.994	0.223	8.778

Problem 1339	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F(-2)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	244	244	205	190	0	594	54	0	0
normalized size	1	1.	0.84	0.78	0.	2.43	0.22	0.	0.
time (sec)	N/A	1.165	0.361	0.017	0.	0.25	11.645	0.	0.

Problem 1340	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	152	152	208	123	0	251	58	198	143
normalized size	1	1.	1.37	0.81	0.	1.65	0.38	1.3	0.94
time (sec)	N/A	0.262	0.33	0.019	0.	0.233	21.589	0.228	38.565

Problem 1341	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	114	50	0	1	92	69	51
normalized size	1	1.	1.93	0.85	0.	0.02	1.56	1.17	0.86
time (sec)	N/A	0.078	0.157	0.017	0.	0.231	41.037	0.226	12.534

Problem 1342	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	30	23	30	30	20	32	10
normalized size	1	1.	1.88	1.44	1.88	1.88	1.25	2.	0.62
time (sec)	N/A	0.025	0.009	0.005	1.44	0.219	0.228	0.224	5.417

Problem 1343	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	78	71	58	73	51	59	48
normalized size	1	1.	1.39	1.27	1.04	1.3	0.91	1.05	0.86
time (sec)	N/A	0.084	0.034	0.017	1.592	0.226	0.427	0.227	9.387

Problem 1344	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	76	78	69	92	109	85	95	70
normalized size	1	1.52	1.56	1.38	1.84	2.18	1.7	1.9	1.4
time (sec)	N/A	0.207	0.02	0.013	1.584	0.227	0.736	0.227	36.415

Problem 1345	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	18	11	11	8	12	24
normalized size	1	1.	1.	1.5	0.92	0.92	0.67	1.	2.
time (sec)	N/A	0.007	0.005	0.004	1.416	0.219	0.187	0.228	2.19

Problem 1346	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	73	75	66	88	101	83	90	68
normalized size	1	1.55	1.6	1.4	1.87	2.15	1.77	1.91	1.45
time (sec)	N/A	0.28	0.019	0.013	1.58	0.231	0.769	0.224	44.548

Problem 1347	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	73	66	51	61	46	53	42
normalized size	1	1.	1.49	1.35	1.04	1.24	0.94	1.08	0.86
time (sec)	N/A	0.077	0.016	0.011	1.579	0.223	0.403	0.222	9.215

Problem 1348	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	8	8	23	18	23	23	15	26	5
normalized size	1	1.	2.88	2.25	2.88	2.88	1.88	3.25	0.62
time (sec)	N/A	0.013	0.006	0.003	1.435	0.225	0.219	0.231	2.847

Problem 1349	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	73	66	51	61	46	53	42
normalized size	1	1.	1.49	1.35	1.04	1.24	0.94	1.08	0.86
time (sec)	N/A	0.07	0.015	0.011	1.572	0.226	0.395	0.22	6.819

Problem 1350	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	73	75	66	88	101	83	90	68
normalized size	1	1.55	1.6	1.4	1.87	2.15	1.77	1.91	1.45
time (sec)	N/A	0.194	0.015	0.01	1.58	0.229	0.772	0.223	35.39

Problem 1351	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	36	20	15	10	22	14
normalized size	1	1.	1.	2.4	1.33	1.	0.67	1.47	0.93
time (sec)	N/A	0.022	0.006	0.013	1.417	0.219	0.244	0.236	3.79

Problem 1352	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	78	86	71	95	120	87	97	71
normalized size	1	1.5	1.65	1.37	1.83	2.31	1.67	1.87	1.37
time (sec)	N/A	0.297	0.041	0.013	1.581	0.228	0.826	0.225	49.879

Problem 1353	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	78	71	58	84	53	59	49
normalized size	1	1.	1.39	1.27	1.04	1.5	0.95	1.05	0.88
time (sec)	N/A	0.085	0.041	0.014	1.577	0.228	0.514	0.224	10.469

Problem 1354	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	30	39	30	38	22	32	12
normalized size	1	1.	1.88	2.44	1.88	2.38	1.38	2.	0.75
time (sec)	N/A	0.023	0.008	0.013	1.44	0.226	0.319	0.224	5.134

Problem 1355	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	78	71	58	84	53	59	49
normalized size	1	1.	1.39	1.27	1.04	1.5	0.95	1.05	0.88
time (sec)	N/A	0.08	0.044	0.015	1.641	0.228	0.543	0.227	9.158

Problem 1356	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	82	71	95	138	90	97	75
normalized size	1	1.	1.02	0.89	1.19	1.72	1.12	1.21	0.94
time (sec)	N/A	0.205	0.047	0.013	1.58	0.228	0.922	0.222	36.413

Problem 1357	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	41	27	32	17	35	20
normalized size	1	1.	1.	1.86	1.23	1.45	0.77	1.59	0.91
time (sec)	N/A	0.032	0.007	0.014	1.454	0.226	0.391	0.225	4.774

Problem 1358	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	87	76	104	147	95	107	78
normalized size	1	1.	1.02	0.89	1.22	1.73	1.12	1.26	0.92
time (sec)	N/A	0.296	0.055	0.015	1.599	0.227	0.988	0.223	46.976

Problem 1359	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	13	16	16	10	16	10
normalized size	1	1.	1.	0.81	1.	1.	0.62	1.	0.62
time (sec)	N/A	0.021	0.008	0.003	1.594	0.211	0.221	0.228	4.732

Problem 1360	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	79	46	61	74	51	61	48
normalized size	1	1.	1.41	0.82	1.09	1.32	0.91	1.09	0.86
time (sec)	N/A	0.085	0.03	0.01	1.587	0.219	0.419	0.222	10.35

Problem 1361	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	76	62	82	127	70	0	70
normalized size	1	1.	0.94	0.77	1.01	1.57	0.86	0.	0.86
time (sec)	N/A	0.334	0.023	0.032	1.592	0.237	0.653	0.	57.637

Problem 1362	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	10	10	10	9	11	11	7	11	7
normalized size	1	1.	1.	0.9	1.1	1.1	0.7	1.1	0.7
time (sec)	N/A	0.006	0.004	0.001	1.449	0.208	0.176	0.226	1.655

Problem 1363	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	73	61	81	126	68	81	68
normalized size	1	1.	0.91	0.76	1.01	1.58	0.85	1.01	0.85
time (sec)	N/A	0.683	0.02	0.002	1.596	0.237	0.69	0.226	90.36

Problem 1364	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	74	41	54	63	46	54	42
normalized size	1	1.	1.51	0.84	1.1	1.29	0.94	1.1	0.86
time (sec)	N/A	0.082	0.018	0.006	1.598	0.221	0.396	0.222	8.764

Problem 1365	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	8	8	8	7	8	8	5	8	5
normalized size	1	1.	1.	0.88	1.	1.	0.62	1.	0.62
time (sec)	N/A	0.012	0.006	0.002	1.574	0.212	0.2	0.223	2.557

Problem 1366	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	78	41	54	63	46	54	42
normalized size	1	1.	1.59	0.84	1.1	1.29	0.94	1.1	0.86
time (sec)	N/A	0.072	0.016	0.007	1.593	0.222	0.387	0.221	8.468

Problem 1367	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	73	61	81	126	68	81	68
normalized size	1	1.	0.91	0.76	1.01	1.58	0.85	1.01	0.85
time (sec)	N/A	0.322	0.019	0.017	1.587	0.233	0.666	0.227	58.486

Problem 1368	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	25	20	15	10	20	14
normalized size	1	1.	1.	1.92	1.54	1.15	0.77	1.54	1.08
time (sec)	N/A	0.018	0.006	0.01	1.437	0.212	0.226	0.227	3.333

Problem 1369	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	82	66	88	139	71	0	71
normalized size	1	1.	0.96	0.78	1.04	1.64	0.84	0.	0.84
time (sec)	N/A	0.508	0.042	0.02	1.594	0.234	0.733	0.	106.733

Problem 1370	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	83	46	61	86	53	61	49
normalized size	1	1.	1.48	0.82	1.09	1.54	0.95	1.09	0.88
time (sec)	N/A	0.088	0.039	0.013	1.609	0.219	0.479	0.227	9.685

Problem 1371	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	33	16	20	14	16	14
normalized size	1	1.	1.	2.06	1.	1.25	0.88	1.	0.88
time (sec)	N/A	0.021	0.008	0.02	1.583	0.211	0.315	0.222	4.498

Problem 1372	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	79	46	61	86	53	61	49
normalized size	1	1.	1.41	0.82	1.09	1.54	0.95	1.09	0.88
time (sec)	N/A	0.081	0.04	0.013	1.586	0.221	0.539	0.229	10.215

Problem 1373	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	87	87	79	66	88	154	75	0	75
normalized size	1	1.	0.91	0.76	1.01	1.77	0.86	0.	0.86
time (sec)	N/A	0.339	0.049	0.01	1.587	0.233	0.814	0.	58.286

Problem 1374	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	32	27	32	17	34	20
normalized size	1	1.	1.	1.45	1.23	1.45	0.77	1.55	0.91
time (sec)	N/A	0.028	0.006	0.012	1.432	0.212	0.39	0.229	3.909

Problem 1375	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	90	90	84	69	97	161	80	0	78
normalized size	1	1.	0.93	0.77	1.08	1.79	0.89	0.	0.87
time (sec)	N/A	0.511	0.051	0.025	1.588	0.235	0.879	0.	92.522

Problem 1376	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	180	167	162	228	302	215	15	0	192
normalized size	1	0.93	0.9	1.27	1.68	1.19	0.08	0.	1.07
time (sec)	N/A	0.644	0.126	0.523	1.606	0.229	2.237	0.	112.783

Problem 1377	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	F(-1)	A	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	244	244	448	162	0	671	0	293	298
normalized size	1	1.	1.84	0.66	0.	2.75	0.	1.2	1.22
time (sec)	N/A	0.551	0.674	0.046	0.	0.264	0.	1.106	113.974

Problem 1378	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	48	53	131	193	119	0	48
normalized size	1	1.	0.83	0.91	2.26	3.33	2.05	0.	0.83
time (sec)	N/A	0.073	0.032	0.074	1.44	0.228	10.082	0.	8.13

Problem 1379	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	43	18	18	29	18	12
normalized size	1	1.	1.	2.53	1.06	1.06	1.71	1.06	0.71
time (sec)	N/A	0.009	0.01	0.01	1.436	0.221	0.889	0.221	2.103

Problem 1380	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	35	47	78	109	90	41	27
normalized size	1	1.	1.	1.34	2.23	3.11	2.57	1.17	0.77
time (sec)	N/A	0.032	0.014	0.069	1.437	0.226	5.473	0.223	2.884

Problem 1381	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	30	27	50	35	54	50	44
normalized size	1	1.	0.57	0.51	0.94	0.66	1.02	0.94	0.83
time (sec)	N/A	0.046	0.016	0.01	1.498	0.221	40.445	0.218	5.135

Problem 1382	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	25	22	38	28	39	38	32
normalized size	1	1.	0.62	0.55	0.95	0.7	0.98	0.95	0.8
time (sec)	N/A	0.039	0.013	0.006	1.418	0.22	15.857	0.22	4.47

Problem 1383	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	18	15	26	19	24	26	20
normalized size	1	1.	0.67	0.56	0.96	0.7	0.89	0.96	0.74
time (sec)	N/A	0.03	0.009	0.007	1.452	0.22	4.004	0.219	3.634

Problem 1384	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	10	12	12	8	12	8
normalized size	1	1.	1.	0.77	0.92	0.92	0.62	0.92	0.62
time (sec)	N/A	0.007	0.004	0.005	1.417	0.224	0.694	0.22	1.687

Problem 1385	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	25	26	49	39	17	50	24
normalized size	1	1.	1.	1.04	1.96	1.56	0.68	2.	0.96
time (sec)	N/A	0.033	0.024	0.008	1.581	0.227	3.387	0.223	3.521

Problem 1386	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	42	42	39	66	66	31	63	36
normalized size	1	1.	1.	0.93	1.57	1.57	0.74	1.5	0.86
time (sec)	N/A	0.045	0.037	0.035	1.585	0.226	7.039	0.228	4.255

Problem 1387	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	51	51	103	77	66	80	49
normalized size	1	1.	0.88	0.88	1.78	1.33	1.14	1.38	0.84
time (sec)	N/A	0.059	0.05	0.034	1.59	0.226	16.786	0.226	5.212

Problem 1388	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	35	30	116	165	53	0	39
normalized size	1	1.	0.74	0.64	2.47	3.51	1.13	0.	0.83
time (sec)	N/A	0.055	0.032	0.045	1.433	0.226	14.861	0.	6.308

Problem 1389	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	31	25	78	107	39	0	26
normalized size	1	1.	1.	0.81	2.52	3.45	1.26	0.	0.84
time (sec)	N/A	0.036	0.017	0.034	1.438	0.223	6.707	0.	4.682

Problem 1390	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	12	45	22	12	22	12
normalized size	1	1.	1.	0.86	3.21	1.57	0.86	1.57	0.86
time (sec)	N/A	0.019	0.008	0.024	1.425	0.216	3.309	0.225	2.598

Problem 1391	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	13	16	27	12	27	14
normalized size	1	1.	1.	0.81	1.	1.69	0.75	1.69	0.88
time (sec)	N/A	0.013	0.009	0.006	1.422	0.216	2.023	0.225	2.32

Problem 1392	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	21	18	34	70	26	43	26
normalized size	1	1.	0.64	0.55	1.03	2.12	0.79	1.3	0.79
time (sec)	N/A	0.025	0.012	0.006	1.481	0.218	5.25	0.229	3.225

Problem 1393	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	28	25	50	101	41	61	39
normalized size	1	1.	0.57	0.51	1.02	2.06	0.84	1.24	0.8
time (sec)	N/A	0.038	0.015	0.006	1.434	0.219	16.571	0.226	4.312

Problem 1394	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	186	186	133	33	0	0	36	0	175
normalized size	1	1.	0.72	0.18	0.	0.	0.19	0.	0.94
time (sec)	N/A	0.264	0.372	0.046	0.	0.	2.541	0.	7.139

Problem 1395	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	166	166	116	20	0	0	36	0	160
normalized size	1	1.	0.7	0.12	0.	0.	0.22	0.	0.96
time (sec)	N/A	0.144	0.156	0.023	0.	0.	1.773	0.	4.37

Problem 1396	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	186	186	136	33	0	0	39	0	175
normalized size	1	1.	0.73	0.18	0.	0.	0.21	0.	0.94
time (sec)	N/A	0.19	0.43	0.039	0.	0.	2.585	0.	6.923

Problem 1397	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	179	179	173	29	0	0	36	0	153
normalized size	1	1.	0.97	0.16	0.	0.	0.2	0.	0.85
time (sec)	N/A	0.114	1.248	0.046	0.	0.	2.269	0.	4.326

Problem 1398	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	164	164	163	18	0	0	34	0	141
normalized size	1	1.	0.99	0.11	0.	0.	0.21	0.	0.86
time (sec)	N/A	0.051	0.288	0.013	0.	0.	1.739	0.	1.946

Problem 1399	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	181	181	178	31	0	0	39	0	156
normalized size	1	1.	0.98	0.17	0.	0.	0.22	0.	0.86
time (sec)	N/A	0.089	0.834	0.041	0.	0.	2.823	0.	4.157

Problem 1400	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	F(-2)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	378	378	189	33	0	0	36	0	0
normalized size	1	1.	0.5	0.09	0.	0.	0.1	0.	0.
time (sec)	N/A	0.438	0.612	0.047	0.	0.	3.252	0.	0.

Problem 1401	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	F(-2)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	354	354	170	20	0	0	36	0	0
normalized size	1	1.	0.48	0.06	0.	0.	0.1	0.	0.
time (sec)	N/A	0.391	0.22	0.022	0.	0.	1.913	0.	0.

Problem 1402	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	F(-2)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	378	378	189	33	0	0	39	0	0
normalized size	1	1.	0.5	0.09	0.	0.	0.1	0.	0.
time (sec)	N/A	0.433	0.791	0.039	0.	0.	2.172	0.	0.

Problem 1403	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	394	394	279	33	0	0	36	0	357
normalized size	1	1.	0.71	0.08	0.	0.	0.09	0.	0.91
time (sec)	N/A	0.289	0.839	0.049	0.	0.	3.766	0.	15.186

Problem 1404	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	376	376	276	20	0	0	36	0	338
normalized size	1	1.	0.73	0.05	0.	0.	0.1	0.	0.9
time (sec)	N/A	0.202	0.654	0.023	0.	0.	2.007	0.	12.524

Problem 1405	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	392	392	276	33	0	0	37	0	350
normalized size	1	1.	0.7	0.08	0.	0.	0.09	0.	0.89
time (sec)	N/A	0.209	0.712	0.021	0.	0.	2.025	0.	14.131

Problem 1406	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	51	51	28	25	50	32	54	50	42
normalized size	1	1.	0.55	0.49	0.98	0.63	1.06	0.98	0.82
time (sec)	N/A	0.046	0.018	0.006	1.445	0.217	47.14	0.22	5.152

Problem 1407	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	23	20	38	26	39	38	32
normalized size	1	1.	0.57	0.5	0.95	0.65	0.98	0.95	0.8
time (sec)	N/A	0.04	0.015	0.008	1.432	0.216	19.239	0.222	4.511

Problem 1408	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	18	15	26	19	24	26	20
normalized size	1	1.	0.67	0.56	0.96	0.7	0.89	0.96	0.74
time (sec)	N/A	0.03	0.011	0.006	1.442	0.219	5.649	0.221	3.675

Problem 1409	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	10	12	12	12	12	12
normalized size	1	1.	1.	0.77	0.92	0.92	0.92	0.92	0.92
time (sec)	N/A	0.007	0.005	0.005	1.441	0.217	1.757	0.218	1.673

Problem 1410	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	39	36	62	68	194	59	34
normalized size	1	1.	1.	0.92	1.59	1.74	4.97	1.51	0.87
time (sec)	N/A	0.045	0.045	0.027	1.598	0.221	4.975	0.221	4.363

Problem 1411	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	49	46	88	86	49	85	51
normalized size	1	1.	0.84	0.79	1.52	1.48	0.84	1.47	0.88
time (sec)	N/A	0.058	0.073	0.031	1.592	0.22	10.582	0.225	5.237

Problem 1412	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	54	51	112	93	68	92	70
normalized size	1	1.	0.73	0.69	1.51	1.26	0.92	1.24	0.95
time (sec)	N/A	0.074	0.081	0.037	1.59	0.223	25.56	0.223	6.113

Problem 1413	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	43	30	99	170	36	0	37
normalized size	1	1.	0.96	0.67	2.2	3.78	0.8	0.	0.82
time (sec)	N/A	0.055	0.039	0.034	1.436	0.22	14.939	0.	6.498

Problem 1414	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	31	25	61	74	26	0	26
normalized size	1	1.	1.	0.81	1.97	2.39	0.84	0.	0.84
time (sec)	N/A	0.035	0.024	0.019	1.44	0.22	5.635	0.	4.457

Problem 1415	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	13	16	28	12	16	12
normalized size	1	1.	1.	0.81	1.	1.75	0.75	1.	0.75
time (sec)	N/A	0.014	0.009	0.005	1.435	0.225	1.63	0.229	2.281

Problem 1416	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	21	18	34	39	31	0	29
normalized size	1	1.	0.64	0.55	1.03	1.18	0.94	0.	0.88
time (sec)	N/A	0.024	0.013	0.006	1.44	0.218	2.823	0.	3.201

Problem 1417	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	28	25	50	84	70	0	42
normalized size	1	1.	0.57	0.51	1.02	1.71	1.43	0.	0.86
time (sec)	N/A	0.037	0.017	0.007	1.439	0.225	8.895	0.	4.348

Problem 1418	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	202	202	144	40	0	0	36	0	190
normalized size	1	1.	0.71	0.2	0.	0.	0.18	0.	0.94
time (sec)	N/A	0.233	0.231	0.036	0.	0.	7.361	0.	9.49

Problem 1419	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	186	186	136	33	0	0	36	0	173
normalized size	1	1.	0.73	0.18	0.	0.	0.19	0.	0.93
time (sec)	N/A	0.194	0.238	0.034	0.	0.	2.76	0.	7.076

Problem 1420	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	186	186	136	33	0	0	36	0	173
normalized size	1	1.	0.73	0.18	0.	0.	0.19	0.	0.93
time (sec)	N/A	0.183	0.226	0.034	0.	0.	2.082	0.	5.49

Problem 1421	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	202	202	146	40	0	0	39	0	192
normalized size	1	1.	0.72	0.2	0.	0.	0.19	0.	0.95
time (sec)	N/A	0.229	0.294	0.039	0.	0.	3.423	0.	9.374

Problem 1422	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	195	195	183	36	0	0	36	0	170
normalized size	1	1.	0.94	0.18	0.	0.	0.18	0.	0.87
time (sec)	N/A	0.129	0.97	0.035	0.	0.	6.081	0.	6.474

Problem 1423	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	179	179	166	29	0	0	36	0	153
normalized size	1	1.	0.93	0.16	0.	0.	0.2	0.	0.85
time (sec)	N/A	0.091	1.027	0.033	0.	0.	2.43	0.	4.187

Problem 1424	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	179	179	166	18	0	0	34	0	153
normalized size	1	1.	0.93	0.1	0.	0.	0.19	0.	0.85
time (sec)	N/A	0.082	0.716	0.023	0.	0.	1.948	0.	2.699

Problem 1425	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	197	197	183	38	0	0	39	0	172
normalized size	1	1.	0.93	0.19	0.	0.	0.2	0.	0.87
time (sec)	N/A	0.123	1.262	0.039	0.	0.	4.163	0.	6.091

Problem 1426	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	F(-2)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	394	394	195	40	0	0	36	0	0
normalized size	1	1.	0.49	0.1	0.	0.	0.09	0.	0.
time (sec)	N/A	0.493	0.54	0.035	0.	0.	10.867	0.	0.

Problem 1427	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	F(-2)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	376	376	177	33	0	0	36	0	0
normalized size	1	1.	0.47	0.09	0.	0.	0.1	0.	0.
time (sec)	N/A	0.43	0.616	0.036	0.	0.	3.699	0.	0.

Problem 1428	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	F(-2)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	378	378	189	33	0	0	36	0	0
normalized size	1	1.	0.5	0.09	0.	0.	0.1	0.	0.
time (sec)	N/A	0.431	0.834	0.035	0.	0.	1.975	0.	0.

Problem 1429	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	F(-2)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	394	394	198	40	0	0	39	0	0
normalized size	1	1.	0.5	0.1	0.	0.	0.1	0.	0.
time (sec)	N/A	0.492	0.866	0.042	0.	0.	2.629	0.	0.

Problem 1430	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	392	392	274	33	0	0	36	0	357
normalized size	1	1.	0.7	0.08	0.	0.	0.09	0.	0.91
time (sec)	N/A	0.274	0.82	0.036	0.	0.	4.325	0.	15.659

Problem 1431	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	391	391	273	33	0	0	36	0	352
normalized size	1	1.	0.7	0.08	0.	0.	0.09	0.	0.9
time (sec)	N/A	0.257	0.734	0.035	0.	0.	2.06	0.	15.337

Problem 1432	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	408	408	281	40	0	0	37	0	364
normalized size	1	1.	0.69	0.1	0.	0.	0.09	0.	0.89
time (sec)	N/A	0.275	0.788	0.04	0.	0.	2.478	0.	17.001

Problem 1433	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	23	35	0	45	94	69	19
normalized size	1	1.	0.92	1.4	0.	1.8	3.76	2.76	0.76
time (sec)	N/A	0.021	0.027	0.004	0.	0.233	5.047	0.224	3.965

Problem 1434	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	18	1	12	18	12
normalized size	1	1.	1.	0.82	1.06	0.06	0.71	1.06	0.71
time (sec)	N/A	0.014	0.002	0.	1.439	0.19	0.067	0.219	2.998

Problem 1435	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	12	19	23	10	24	10
normalized size	1	1.	1.	0.92	1.46	1.77	0.77	1.85	0.77
time (sec)	N/A	0.013	0.004	0.008	1.439	0.212	1.203	0.221	2.858

Problem 1436	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	39	93	0	115	313	182	36
normalized size	1	1.	0.91	2.16	0.	2.67	7.28	4.23	0.84
time (sec)	N/A	0.044	0.031	0.009	0.	0.238	26.354	0.229	7.489

Problem 1437	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	25	32	1	24	32	24
normalized size	1	1.	1.	0.83	1.07	0.03	0.8	1.07	0.8
time (sec)	N/A	0.033	0.001	0.001	1.438	0.19	0.093	0.218	5.447

Problem 1438	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	27	24	34	36	24	43	0
normalized size	1	1.	1.	0.89	1.26	1.33	0.89	1.59	0.
time (sec)	N/A	0.039	0.001	0.009	1.438	0.215	1.295	0.224	0.

Problem 1439	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	41	0	0	0	0	0	29
normalized size	1	1.	1.05	0.	0.	0.	0.	0.	0.74
time (sec)	N/A	0.03	0.028	0.054	0.	0.	0.	0.	4.359

Problem 1440	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	14	18	18	10	19	10
normalized size	1	1.	1.	0.93	1.2	1.2	0.67	1.27	0.67
time (sec)	N/A	0.009	0.005	0.001	1.46	0.217	0.553	0.221	2.167

Problem 1441	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F(-2)	A	A	F(-1)
verified	N/A	NO	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	335	335	262	27	0	0	20	419	0
normalized size	1	1.	0.78	0.08	0.	0.	0.06	1.25	0.
time (sec)	N/A	0.903	0.529	0.648	0.	0.	0.449	0.229	0.

Problem 1442	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	21	31	24	15	30	19
normalized size	1	1.	1.	0.95	1.41	1.09	0.68	1.36	0.86
time (sec)	N/A	0.031	0.01	0.006	1.442	0.222	0.91	0.223	5.518

Problem 1443	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	40	0	0	0	0	0	27
normalized size	1	1.	1.05	0.	0.	0.	0.	0.	0.71
time (sec)	N/A	0.027	0.032	0.055	0.	0.	0.	0.	4.753

Problem 1444	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	16	20	20	12	22	12
normalized size	1	1.	1.	1.	1.25	1.25	0.75	1.38	0.75
time (sec)	N/A	0.009	0.005	0.	1.446	0.211	0.549	0.223	2.464

Problem 1445	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F(-2)	A	A	F(-1)
verified	N/A	NO	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	335	335	263	29	0	0	22	392	0
normalized size	1	1.	0.79	0.09	0.	0.	0.07	1.17	0.
time (sec)	N/A	0.808	0.549	0.156	0.	0.	0.477	0.228	0.

Problem 1446	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	23	23	34	27	15	32	19
normalized size	1	1.	1.	1.	1.48	1.17	0.65	1.39	0.83
time (sec)	N/A	0.04	0.012	0.005	1.447	0.224	0.949	0.22	5.979

Problem 1447	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F(-2)	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	166	166	166	89	0	0	46	171	211
normalized size	1	1.	1.	0.54	0.	0.	0.28	1.03	1.27
time (sec)	N/A	0.273	0.007	0.014	0.	0.	0.551	0.219	75.889

Problem 1448	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F(-2)	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	165	165	166	97	0	0	44	174	209
normalized size	1	1.	1.01	0.59	0.	0.	0.27	1.05	1.27
time (sec)	N/A	0.294	0.007	0.014	0.	0.	0.547	0.22	72.272

Problem 1449	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	203	203	361	144	0	147	27	247	185
normalized size	1	1.	1.78	0.71	0.	0.72	0.13	1.22	0.91
time (sec)	N/A	0.432	0.456	0.008	0.	0.233	1.505	0.231	60.812

Problem 1450	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	14	18	18	10	19	10
normalized size	1	1.	1.	0.93	1.2	1.2	0.67	1.27	0.67
time (sec)	N/A	0.011	0.007	0.002	1.43	0.213	0.61	0.229	2.183

Problem 1451	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	193	193	279	136	0	162	27	269	178
normalized size	1	1.	1.45	0.7	0.	0.84	0.14	1.39	0.92
time (sec)	N/A	0.348	0.421	0.003	0.	0.232	0.546	0.231	55.071

Problem 1452	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	29	19	0	1	56	24	26
normalized size	1	1.	1.	0.66	0.	0.03	1.93	0.83	0.9
time (sec)	N/A	0.039	0.012	0.003	0.	0.221	0.658	0.228	5.367

Problem 1453	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	193	193	279	136	0	150	22	252	178
normalized size	1	1.	1.45	0.7	0.	0.78	0.11	1.31	0.92
time (sec)	N/A	0.331	0.335	0.002	0.	0.23	0.531	0.236	53.677

Problem 1454	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	21	31	24	15	32	19
normalized size	1	1.	1.	0.95	1.41	1.09	0.68	1.45	0.86
time (sec)	N/A	0.037	0.011	0.005	1.431	0.223	1.021	0.228	5.654

Problem 1455	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	203	203	385	144	0	186	34	263	187
normalized size	1	1.	1.9	0.71	0.	0.92	0.17	1.3	0.92
time (sec)	N/A	0.384	0.257	0.007	0.	0.233	1.993	0.232	61.83

Problem 1456	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	164	32	0	1	71	42	36
normalized size	1	1.	4.1	0.8	0.	0.02	1.78	1.05	0.9
time (sec)	N/A	0.059	0.273	0.007	0.	0.223	3.574	0.231	9.397

Problem 1457	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	203	203	387	147	0	208	34	247	187
normalized size	1	1.	1.91	0.72	0.	1.02	0.17	1.22	0.92
time (sec)	N/A	0.384	0.398	0.007	0.	0.236	9.156	0.231	60.545

Problem 1458	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	35	32	45	45	31	58	34
normalized size	1	1.	1.	0.91	1.29	1.29	0.89	1.66	0.97
time (sec)	N/A	0.061	0.012	0.008	1.435	0.225	26.805	0.229	8.375

Problem 1459	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	272	272	367	34	0	478	22	586	250
normalized size	1	1.	1.35	0.12	0.	1.76	0.08	2.15	0.92
time (sec)	N/A	0.616	0.351	0.023	0.	0.243	1.411	0.238	111.698

Problem 1460	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	267	267	324	27	0	579	26	579	246
normalized size	1	1.	1.21	0.1	0.	2.17	0.1	2.17	0.92
time (sec)	N/A	0.467	0.302	0.016	0.	0.241	0.483	0.259	91.695

Problem 1461	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	267	267	324	27	0	595	29	579	246
normalized size	1	1.	1.21	0.1	0.	2.23	0.11	2.17	0.92
time (sec)	N/A	0.419	0.446	0.018	0.	0.241	0.499	0.256	93.929

Problem 1462	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	267	267	324	27	0	586	27	579	246
normalized size	1	1.	1.21	0.1	0.	2.19	0.1	2.17	0.92
time (sec)	N/A	0.452	0.208	0.018	0.	0.241	0.56	0.269	101.65

Problem 1463	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	267	267	324	27	0	518	20	579	246
normalized size	1	1.	1.21	0.1	0.	1.94	0.07	2.17	0.92
time (sec)	N/A	0.404	0.205	0.002	0.	0.235	0.465	0.232	99.913

Problem 1464	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	275	275	377	36	0	576	29	601	252
normalized size	1	1.	1.37	0.13	0.	2.09	0.11	2.19	0.92
time (sec)	N/A	0.503	0.453	0.008	0.	0.24	1.66	0.261	108.675

Problem 1465	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	277	277	395	36	0	698	36	601	255
normalized size	1	1.	1.43	0.13	0.	2.52	0.13	2.17	0.92
time (sec)	N/A	0.511	0.365	0.007	0.	0.242	2.504	0.258	109.79

Problem 1466	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	277	277	395	36	0	703	36	601	255
normalized size	1	1.	1.43	0.13	0.	2.54	0.13	2.17	0.92
time (sec)	N/A	0.542	0.344	0.008	0.	0.238	5.417	0.255	117.637

Problem 1467	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	277	277	395	36	0	671	32	601	255
normalized size	1	1.	1.43	0.13	0.	2.42	0.12	2.17	0.92
time (sec)	N/A	0.514	0.563	0.007	0.	0.243	15.228	0.236	115.804

Problem 1468	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	239	239	198	29	0	487	22	612	223
normalized size	1	1.	0.83	0.12	0.	2.04	0.09	2.56	0.93
time (sec)	N/A	0.378	0.101	0.019	0.	0.236	0.498	0.228	73.166

Problem 1469	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	38	33	38	38	27	39	17
normalized size	1	1.	1.58	1.38	1.58	1.58	1.12	1.62	0.71
time (sec)	N/A	0.034	0.011	0.009	1.59	0.229	0.412	0.222	5.436

Problem 1470	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	30	11	11	8	12	20
normalized size	1	1.	1.	2.5	0.92	0.92	0.67	1.	1.67
time (sec)	N/A	0.008	0.005	0.008	1.414	0.21	0.238	0.22	2.223

Problem 1471	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	31	28	31	31	22	74	12
normalized size	1	1.	1.82	1.65	1.82	1.82	1.29	4.35	0.71
time (sec)	N/A	0.03	0.009	0.008	1.584	0.22	0.438	0.22	5.126

Problem 1472	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	8	8	23	30	23	23	15	24	5
normalized size	1	1.	2.88	3.75	2.88	2.88	1.88	3.	0.62
time (sec)	N/A	0.015	0.006	0.005	1.417	0.216	0.279	0.217	2.951

Problem 1473	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	31	28	31	31	22	32	12
normalized size	1	1.	1.82	1.65	1.82	1.82	1.29	1.88	0.71
time (sec)	N/A	0.02	0.008	0.005	1.589	0.221	0.459	0.22	2.972

Problem 1474	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	32	20	15	10	22	14
normalized size	1	1.	1.	2.13	1.33	1.	0.67	1.47	0.93
time (sec)	N/A	0.025	0.006	0.015	1.415	0.214	0.276	0.222	3.94

Problem 1475	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	38	33	38	50	29	39	19
normalized size	1	1.	1.58	1.38	1.58	2.08	1.21	1.62	0.79
time (sec)	N/A	0.038	0.01	0.016	1.615	0.225	0.505	0.218	6.374

Problem 1476	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	30	35	30	38	22	31	12
normalized size	1	1.	1.88	2.19	1.88	2.38	1.38	1.94	0.75
time (sec)	N/A	0.025	0.007	0.016	1.44	0.214	0.397	0.219	5.373

Problem 1477	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	38	33	38	51	29	39	19
normalized size	1	1.	1.58	1.38	1.58	2.12	1.21	1.62	0.79
time (sec)	N/A	0.029	0.01	0.016	1.588	0.22	0.63	0.225	5.306

Problem 1478	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	37	27	32	17	35	20
normalized size	1	1.	1.	1.68	1.23	1.45	0.77	1.59	0.91
time (sec)	N/A	0.032	0.007	0.018	1.439	0.215	0.544	0.218	4.954

Problem 1479	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	101	77	123	159	0	126	85
normalized size	1	1.	1.01	0.77	1.23	1.59	0.	1.26	0.85
time (sec)	N/A	0.123	0.052	0.007	1.591	0.238	0.	0.22	17.704

Problem 1480	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	97	97	98	74	119	151	0	122	83
normalized size	1	1.	1.01	0.76	1.23	1.56	0.	1.26	0.86
time (sec)	N/A	0.133	0.034	0.007	1.59	0.24	0.	0.232	19.579

Problem 1481	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	97	97	98	74	119	151	0	122	83
normalized size	1	1.	1.01	0.76	1.23	1.56	0.	1.26	0.86
time (sec)	N/A	0.12	0.032	0.006	1.6	0.237	0.	0.232	16.849

Problem 1482	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	97	97	98	74	119	151	0	122	83
normalized size	1	1.	1.01	0.76	1.23	1.56	0.	1.26	0.86
time (sec)	N/A	0.133	0.029	0.003	1.603	0.238	0.	0.273	19.481

Problem 1483	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	97	97	98	66	119	151	0	122	83
normalized size	1	1.	1.01	0.68	1.23	1.56	0.	1.26	0.86
time (sec)	N/A	0.114	0.029	0.003	1.604	0.236	0.	0.233	14.799

Problem 1484	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	102	102	109	79	126	173	0	128	87
normalized size	1	1.	1.07	0.77	1.24	1.7	0.	1.25	0.85
time (sec)	N/A	0.133	0.059	0.016	1.594	0.236	0.	0.231	21.088

Problem 1485	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	104	104	104	79	126	194	0	128	90
normalized size	1	1.	1.	0.76	1.21	1.87	0.	1.23	0.87
time (sec)	N/A	0.128	0.076	0.016	1.594	0.238	0.	0.24	18.322

Problem 1486	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	104	104	104	79	126	194	0	128	90
normalized size	1	1.	1.	0.76	1.21	1.87	0.	1.23	0.87
time (sec)	N/A	0.14	0.078	0.016	1.593	0.235	0.	0.237	20.935

Problem 1487	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	104	104	104	79	126	194	0	128	90
normalized size	1	1.	1.	0.76	1.21	1.87	0.	1.23	0.87
time (sec)	N/A	0.12	0.075	0.015	1.596	0.236	0.	0.243	16.907

Problem 1488	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	191	71	115	154	85	115	85
normalized size	1	1.	1.91	0.71	1.15	1.54	0.85	1.15	0.85
time (sec)	N/A	0.148	0.15	0.004	1.593	0.228	0.47	0.229	17.123

Problem 1489	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	10	10	10	9	11	11	7	11	7
normalized size	1	1.	1.	0.9	1.1	1.1	0.7	1.1	0.7
time (sec)	N/A	0.007	0.004	0.001	1.443	0.208	0.214	0.238	1.703

Problem 1490	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	93	93	149	66	108	147	80	269	80
normalized size	1	1.	1.6	0.71	1.16	1.58	0.86	2.89	0.86
time (sec)	N/A	0.152	0.09	0.002	1.598	0.228	0.48	0.263	16.822

Problem 1491	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	8	8	8	7	8	8	5	8	5
normalized size	1	1.	1.	0.88	1.	1.	0.62	1.	0.62
time (sec)	N/A	0.014	0.006	0.001	1.585	0.214	0.238	0.242	2.562

Problem 1492	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	93	93	149	66	108	147	80	108	80
normalized size	1	1.	1.6	0.71	1.16	1.58	0.86	1.16	0.86
time (sec)	N/A	0.141	0.055	0.003	1.586	0.231	0.461	0.241	15.51

Problem 1493	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	12	20	15	10	20	14
normalized size	1	1.	1.	0.92	1.54	1.15	0.77	1.54	1.08
time (sec)	N/A	0.02	0.005	0.006	1.431	0.215	0.265	0.234	3.262

Problem 1494	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	208	71	115	170	87	131	87
normalized size	1	1.	2.08	0.71	1.15	1.7	0.87	1.31	0.87
time (sec)	N/A	0.153	0.088	0.006	1.584	0.231	0.561	0.234	18.057

Problem 1495	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	13	16	20	14	16	14
normalized size	1	1.	1.	0.81	1.	1.25	0.88	1.	0.88
time (sec)	N/A	0.024	0.008	0.008	1.567	0.215	0.37	0.233	4.722

Problem 1496	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	193	71	115	171	87	115	87
normalized size	1	1.	1.93	0.71	1.15	1.71	0.87	1.15	0.87
time (sec)	N/A	0.15	0.182	0.006	1.572	0.23	0.656	0.24	17.227

Problem 1497	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	19	27	32	17	34	20
normalized size	1	1.	1.	0.86	1.23	1.45	0.77	1.55	0.91
time (sec)	N/A	0.031	0.006	0.009	1.423	0.213	0.479	0.238	3.975

Problem 1498	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	340	340	210	24	0	1353	15	324	530
normalized size	1	1.	0.62	0.07	0.	3.98	0.04	0.95	1.56
time (sec)	N/A	0.848	0.01	0.006	0.	0.241	4.191	0.247	62.815

Problem 1499	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	339	339	209	22	0	3343	15	323	508
normalized size	1	1.	0.62	0.06	0.	9.86	0.04	0.95	1.5
time (sec)	N/A	0.623	0.01	0.006	0.	0.256	4.295	0.28	73.974

Problem 1500	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	347	347	209	22	0	1345	15	323	311
normalized size	1	1.	0.6	0.06	0.	3.88	0.04	0.93	0.9
time (sec)	N/A	0.549	0.01	0.006	0.	0.241	4.33	0.261	56.054

Problem 1501	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	339	339	209	22	0	3343	15	323	311
normalized size	1	1.	0.62	0.06	0.	9.86	0.04	0.95	0.92
time (sec)	N/A	0.556	0.01	0.004	0.	0.251	4.267	0.255	37.561

Problem 1502	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	339	339	209	22	0	1345	14	323	529
normalized size	1	1.	0.62	0.06	0.	3.97	0.04	0.95	1.56
time (sec)	N/A	0.718	0.009	0.005	0.	0.243	4.262	0.244	61.553

Problem 1503	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	344	344	214	28	0	3402	19	329	512
normalized size	1	1.	0.62	0.08	0.	9.89	0.06	0.96	1.49
time (sec)	N/A	0.607	0.011	0.01	0.	0.254	4.298	0.263	76.088

Problem 1504	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	354	354	216	28	0	1474	22	329	318
normalized size	1	1.	0.61	0.08	0.	4.16	0.06	0.93	0.9
time (sec)	N/A	0.54	0.011	0.01	0.	0.25	4.381	0.258	55.896

Problem 1505	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	346	346	216	28	0	3472	22	329	318
normalized size	1	1.	0.62	0.08	0.	10.03	0.06	0.95	0.92
time (sec)	N/A	0.523	0.012	0.008	0.	0.255	4.455	0.255	39.664

Problem 1506	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	346	346	216	28	0	1474	20	329	536
normalized size	1	1.	0.62	0.08	0.	4.26	0.06	0.95	1.55
time (sec)	N/A	0.737	0.011	0.005	0.	0.248	4.514	0.241	63.475

Problem 1507	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	22	20	78	116	19	39	19
normalized size	1	1.	0.88	0.8	3.12	4.64	0.76	1.56	0.76
time (sec)	N/A	0.026	0.013	0.044	1.429	0.222	5.137	0.229	2.729

Problem 1508	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	34	30	0	0	31	0	53
normalized size	1	1.	0.55	0.48	0.	0.	0.5	0.	0.85
time (sec)	N/A	0.058	0.025	0.041	0.	0.	1.742	0.	2.813

Problem 1509	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	28	56	46	46	39	46	20
normalized size	1	1.	1.	2.	1.64	1.64	1.39	1.64	0.71
time (sec)	N/A	0.037	0.021	0.055	1.458	0.226	4.088	0.226	4.104

Problem 1510	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	125	125	39	30	0	0	34	0	109
normalized size	1	1.	0.31	0.24	0.	0.	0.27	0.	0.87
time (sec)	N/A	0.135	0.029	0.047	0.	0.	1.986	0.	9.31

Problem 1511	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	35	47	78	109	90	39	27
normalized size	1	1.	1.	1.34	2.23	3.11	2.57	1.11	0.77
time (sec)	N/A	0.037	0.015	0.069	1.434	0.224	5.522	0.225	2.895

Problem 1512	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	41	41	31	27	116	170	49	59	36
normalized size	1	1.	0.76	0.66	2.83	4.15	1.2	1.44	0.88
time (sec)	N/A	0.056	0.029	0.036	1.44	0.223	25.972	0.24	6.297

Problem 1513	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	18	15	26	19	22	26	19
normalized size	1	1.	0.67	0.56	0.96	0.7	0.81	0.96	0.7
time (sec)	N/A	0.035	0.009	0.007	1.437	0.221	10.282	0.223	3.558

Problem 1514	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	25	20	78	117	19	50	19
normalized size	1	1.	1.	0.8	3.12	4.68	0.76	2.	0.76
time (sec)	N/A	0.036	0.013	0.035	1.443	0.222	8.39	0.243	4.666

Problem 1515	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	10	12	12	8	12	8
normalized size	1	1.	1.	0.77	0.92	0.92	0.62	0.92	0.62
time (sec)	N/A	0.008	0.005	0.005	1.413	0.219	1.21	0.228	1.669

Problem 1516	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	8	8	8	7	45	22	5	22	5
normalized size	1	1.	1.	0.88	5.62	2.75	0.62	2.75	0.62
time (sec)	N/A	0.016	0.008	0.023	1.441	0.222	3.325	0.234	2.561

Problem 1517	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	19	34	34	8	34	12
normalized size	1	1.	1.	1.36	2.43	2.43	0.57	2.43	0.86
time (sec)	N/A	0.026	0.016	0.009	1.437	0.241	3.345	0.229	3.318

Problem 1518	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	13	16	27	12	12	14
normalized size	1	1.	1.	0.81	1.	1.69	0.75	0.75	0.88
time (sec)	N/A	0.015	0.009	0.005	1.441	0.232	2.187	0.226	2.277

Problem 1519	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	31	32	50	59	22	50	24
normalized size	1	1.	1.	1.03	1.61	1.9	0.71	1.61	0.77
time (sec)	N/A	0.039	0.031	0.036	1.443	0.239	8.504	0.225	4.191

Problem 1520	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	25	20	34	70	26	26	26
normalized size	1	1.	0.76	0.61	1.03	2.12	0.79	0.79	0.79
time (sec)	N/A	0.027	0.013	0.005	1.428	0.228	9.411	0.234	3.265

Problem 1521	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	37	42	86	70	60	66	41
normalized size	1	1.	0.79	0.89	1.83	1.49	1.28	1.4	0.87
time (sec)	N/A	0.053	0.043	0.037	1.438	0.238	27.263	0.229	5.063

Problem 1522	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	130	130	34	30	0	0	29	0	117
normalized size	1	1.	0.26	0.23	0.	0.	0.22	0.	0.9
time (sec)	N/A	0.137	0.029	0.036	0.	0.	6.225	0.	9.351

Problem 1523	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	34	30	0	0	29	0	53
normalized size	1	1.	0.55	0.48	0.	0.	0.47	0.	0.85
time (sec)	N/A	0.069	0.028	0.033	0.	0.	3.173	0.	4.678

Problem 1524	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	114	114	22	17	0	0	29	0	99
normalized size	1	1.	0.19	0.15	0.	0.	0.25	0.	0.87
time (sec)	N/A	0.109	0.022	0.023	0.	0.	2.062	0.	7.634

Problem 1525	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	22	17	0	0	29	0	39
normalized size	1	1.	0.49	0.38	0.	0.	0.64	0.	0.87
time (sec)	N/A	0.043	0.019	0.02	0.	0.	1.643	0.	2.496

Problem 1526	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	130	130	39	30	0	0	32	0	112
normalized size	1	1.	0.3	0.23	0.	0.	0.25	0.	0.86
time (sec)	N/A	0.127	0.023	0.023	0.	0.	2.154	0.	9.198

Problem 1527	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	36	30	0	0	32	0	54
normalized size	1	1.	0.58	0.48	0.	0.	0.52	0.	0.87
time (sec)	N/A	0.069	0.026	0.027	0.	0.	3.146	0.	4.717

Problem 1528	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	239	239	215	30	0	0	29	0	206
normalized size	1	1.	0.9	0.13	0.	0.	0.12	0.	0.86
time (sec)	N/A	0.171	1.324	0.049	0.	0.	3.772	0.	14.939

Problem 1529	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	237	237	218	26	0	0	29	0	201
normalized size	1	1.	0.92	0.11	0.	0.	0.12	0.	0.85
time (sec)	N/A	0.155	1.944	0.046	0.	0.	2.739	0.	13.46

Problem 1530	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	17	0	0	29	0	15
normalized size	1	1.	1.	0.77	0.	0.	1.32	0.	0.68
time (sec)	N/A	0.018	0.023	0.036	0.	0.	2.246	0.	2.817

Problem 1531	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	17	0	0	29	0	15
normalized size	1	1.	1.	0.77	0.	0.	1.32	0.	0.68
time (sec)	N/A	0.019	0.022	0.036	0.	0.	1.923	0.	2.758

Problem 1532	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	223	223	166	17	0	0	29	0	190
normalized size	1	1.	0.74	0.08	0.	0.	0.13	0.	0.85
time (sec)	N/A	0.124	0.465	0.024	0.	0.	1.718	0.	12.334

Problem 1533	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	223	223	167	14	0	0	27	0	189
normalized size	1	1.	0.75	0.06	0.	0.	0.12	0.	0.85
time (sec)	N/A	0.125	0.434	0.013	0.	0.	1.674	0.	11.542

Problem 1534	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	37	37	37	30	0	0	31	0	27
normalized size	1	1.	1.	0.81	0.	0.	0.84	0.	0.73
time (sec)	N/A	0.035	0.032	0.038	0.	0.	2.029	0.	3.992

Problem 1535	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	39	30	0	0	32	0	29
normalized size	1	1.	1.	0.77	0.	0.	0.82	0.	0.74
time (sec)	N/A	0.037	0.032	0.039	0.	0.	2.282	0.	3.93

Problem 1536	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	239	239	221	30	0	0	32	0	202
normalized size	1	1.	0.92	0.13	0.	0.	0.13	0.	0.85
time (sec)	N/A	0.162	1.412	0.042	0.	0.	2.808	0.	13.941

Problem 1537	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	239	239	221	28	0	0	32	0	206
normalized size	1	1.	0.92	0.12	0.	0.	0.13	0.	0.86
time (sec)	N/A	0.152	1.374	0.038	0.	0.	3.716	0.	13.212

Problem 1538	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	F(-2)	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	163	325	289	426	0	0	70	301	291
normalized size	1	1.99	1.77	2.61	0.	0.	0.43	1.85	1.79
time (sec)	N/A	0.47	0.685	0.04	0.	0.	12.525	0.231	38.738

Problem 1539	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	8	8	8	7	22	24	19	8	5
normalized size	1	1.	1.	0.88	2.75	3.	2.38	1.	0.62
time (sec)	N/A	0.018	0.01	0.051	1.579	0.233	3.524	0.233	2.876

Problem 1540	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	C	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	42	34	45	22	34	23	14
normalized size	1	1.	2.33	1.89	2.5	1.22	1.89	1.28	0.78
time (sec)	N/A	0.026	0.008	0.059	1.434	0.234	3.681	0.247	2.737

Problem 1541	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	9	11	11	7	11	7
normalized size	1	1.	1.	0.75	0.92	0.92	0.58	0.92	0.58
time (sec)	N/A	0.017	0.007	0.004	1.588	0.223	0.32	0.234	2.707

Problem 1542	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	23	18	23	23	15	24	7
normalized size	1	1.	1.92	1.5	1.92	1.92	1.25	2.	0.58
time (sec)	N/A	0.019	0.006	0.009	1.418	0.224	0.332	0.228	3.027

Problem 1543	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	29	22	78	120	37	39	22
normalized size	1	1.	1.	0.76	2.69	4.14	1.28	1.34	0.76
time (sec)	N/A	0.029	0.013	0.046	1.436	0.237	5.554	0.227	2.793

Problem 1544	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	18	18	12	18	12
normalized size	1	1.	1.	0.82	1.06	1.06	0.71	1.06	0.71
time (sec)	N/A	0.028	0.002	0.001	1.426	0.212	0.063	0.225	2.887

Problem 1545	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	18	18	12	18	12
normalized size	1	1.	1.	0.82	1.06	1.06	0.71	1.06	0.71
time (sec)	N/A	0.025	0.002	0.001	1.448	0.215	0.059	0.224	2.891

Problem 1546	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	18	18	12	18	12
normalized size	1	1.	1.	0.82	1.06	1.06	0.71	1.06	0.71
time (sec)	N/A	0.023	0.002	0.001	1.427	0.213	0.064	0.224	2.894

Problem 1547	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	18	18	12	18	12
normalized size	1	1.	1.	0.82	1.06	1.06	0.71	1.06	0.71
time (sec)	N/A	0.021	0.002	0.002	1.425	0.214	0.066	0.223	2.886

Problem 1548	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	18	18	12	18	0
normalized size	1	1.	1.	0.82	1.06	1.06	0.71	1.06	0.
time (sec)	N/A	0.018	0.002	0.001	1.425	0.215	0.065	0.226	0.

Problem 1549	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	11	14	14	8	14	0
normalized size	1	1.	1.	0.92	1.17	1.17	0.67	1.17	0.
time (sec)	N/A	0.013	0.001	0.	1.433	0.213	0.063	0.225	0.

Problem 1550	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	8	8	8	9	11	11	7	12	0
normalized size	1	1.	1.	1.12	1.38	1.38	0.88	1.5	0.
time (sec)	N/A	0.009	0.001	0.002	1.415	0.223	0.146	0.226	0.

Problem 1551	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	11	11	11	12	15	18	7	16	7
normalized size	1	1.	1.	1.09	1.36	1.64	0.64	1.45	0.64
time (sec)	N/A	0.014	0.003	0.007	1.466	0.221	1.038	0.228	3.011

Problem 1552	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	14	19	15	12	18	10
normalized size	1	1.	1.	0.93	1.27	1.	0.8	1.2	0.67
time (sec)	N/A	0.014	0.003	0.005	1.419	0.212	1.025	0.23	2.949

Problem 1553	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	18	18	14	18	14
normalized size	1	1.	1.	0.82	1.06	1.06	0.82	1.06	0.82
time (sec)	N/A	0.016	0.003	0.006	1.456	0.219	1.068	0.23	2.951

Problem 1554	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	18	18	14	18	14
normalized size	1	1.	1.	0.82	1.06	1.06	0.82	1.06	0.82
time (sec)	N/A	0.015	0.003	0.007	1.417	0.218	1.113	0.224	2.942

Problem 1555	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	18	18	14	18	14
normalized size	1	1.	1.	0.82	1.06	1.06	0.82	1.06	0.82
time (sec)	N/A	0.016	0.004	0.006	1.511	0.215	1.125	0.225	2.973

Problem 1556	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	18	18	14	18	14
normalized size	1	1.	1.	0.82	1.06	1.06	0.82	1.06	0.82
time (sec)	N/A	0.015	0.003	0.007	1.44	0.217	1.177	0.224	3.053

Problem 1557	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	25	32	32	26	32	26
normalized size	1	1.	1.	0.83	1.07	1.07	0.87	1.07	0.87
time (sec)	N/A	0.048	0.003	0.001	1.441	0.217	0.092	0.222	7.018

Problem 1558	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	25	32	32	24	32	24
normalized size	1	1.	1.	0.83	1.07	1.07	0.8	1.07	0.8
time (sec)	N/A	0.042	0.003	0.001	1.44	0.22	0.086	0.226	6.698

Problem 1559	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	25	32	32	26	32	0
normalized size	1	1.	1.	0.83	1.07	1.07	0.87	1.07	0.
time (sec)	N/A	0.04	0.002	0.002	1.421	0.218	0.094	0.223	0.

Problem 1560	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	13	27	27	19	27	8
normalized size	1	1.	1.	0.93	1.93	1.93	1.36	1.93	0.57
time (sec)	N/A	0.016	0.003	0.001	1.446	0.217	0.085	0.222	2.964

Problem 1561	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	21	27	27	20	28	0
normalized size	1	1.	1.	0.95	1.23	1.23	0.91	1.27	0.
time (sec)	N/A	0.027	0.002	0.003	1.437	0.224	1.035	0.222	0.

Problem 1562	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	20	21	27	32	17	28	0
normalized size	1	1.	1.	1.05	1.35	1.6	0.85	1.4	0.
time (sec)	N/A	0.029	0.006	0.008	1.44	0.225	1.087	0.222	0.

Problem 1563	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	24	23	28	35	20	30	20
normalized size	1	1.	1.	0.96	1.17	1.46	0.83	1.25	0.83
time (sec)	N/A	0.035	0.006	0.008	1.437	0.228	1.197	0.225	6.382

Problem 1564	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	26	25	19	30	24	19	10
normalized size	1	1.	1.62	1.56	1.19	1.88	1.5	1.19	0.62
time (sec)	N/A	0.017	0.011	0.008	1.443	0.217	1.202	0.226	2.219

Problem 1565	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	25	32	32	26	32	27
normalized size	1	1.	1.	0.83	1.07	1.07	0.87	1.07	0.9
time (sec)	N/A	0.037	0.006	0.007	1.441	0.219	1.246	0.228	6.163

Problem 1566	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	25	32	32	26	32	26
normalized size	1	1.	1.	0.83	1.07	1.07	0.87	1.07	0.87
time (sec)	N/A	0.035	0.011	0.007	1.441	0.218	1.294	0.227	6.152

Problem 1567	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	25	32	32	26	32	27
normalized size	1	1.	1.	0.83	1.07	1.07	0.87	1.07	0.9
time (sec)	N/A	0.036	0.005	0.007	1.444	0.214	1.334	0.225	6.193

Problem 1568	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	43	36	47	47	37	47	37
normalized size	1	1.	1.	0.84	1.09	1.09	0.86	1.09	0.86
time (sec)	N/A	0.064	0.003	0.002	1.436	0.212	0.099	0.22	8.892

Problem 1569	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	43	36	47	47	39	47	39
normalized size	1	1.	1.	0.84	1.09	1.09	0.91	1.09	0.91
time (sec)	N/A	0.058	0.003	0.001	1.434	0.216	0.097	0.227	8.445

Problem 1570	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	40	35	46	46	36	46	24
normalized size	1	1.	1.33	1.17	1.53	1.53	1.2	1.53	0.8
time (sec)	N/A	0.039	0.003	0.001	1.444	0.21	0.092	0.224	7.651

Problem 1571	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	13	42	42	32	42	8
normalized size	1	1.	1.	0.93	3.	3.	2.29	3.	0.57
time (sec)	N/A	0.017	0.003	0.001	1.441	0.211	0.106	0.221	2.965

Problem 1572	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	35	32	42	42	34	43	0
normalized size	1	1.	1.	0.91	1.2	1.2	0.97	1.23	0.
time (sec)	N/A	0.05	0.005	0.003	1.444	0.221	1.071	0.226	0.

Problem 1573	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	33	43	49	31	45	0
normalized size	1	1.	1.	0.97	1.26	1.44	0.91	1.32	0.
time (sec)	N/A	0.046	0.007	0.007	1.44	0.219	1.139	0.222	0.

Problem 1574	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	33	32	42	50	31	42	0
normalized size	1	1.	1.	0.97	1.27	1.52	0.94	1.27	0.
time (sec)	N/A	0.037	0.006	0.009	1.437	0.218	1.294	0.22	0.

Problem 1575	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	37	37	37	34	46	50	34	47	34
normalized size	1	1.	1.	0.92	1.24	1.35	0.92	1.27	0.92
time (sec)	N/A	0.043	0.006	0.01	1.44	0.218	1.357	0.225	7.992

Problem 1576	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	39	36	19	45	36	19	10
normalized size	1	1.	2.44	2.25	1.19	2.81	2.25	1.19	0.62
time (sec)	N/A	0.016	0.006	0.007	1.44	0.209	1.417	0.229	2.194

Problem 1577	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	41	36	47	47	37	47	37
normalized size	1	1.	1.14	1.	1.31	1.31	1.03	1.31	1.03
time (sec)	N/A	0.037	0.01	0.007	1.444	0.211	1.466	0.223	7.835

Problem 1578	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	43	36	47	47	37	47	41
normalized size	1	1.	1.	0.84	1.09	1.09	0.86	1.09	0.95
time (sec)	N/A	0.045	0.006	0.006	1.434	0.216	1.535	0.219	7.952

Problem 1579	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	43	36	47	47	37	47	39
normalized size	1	1.	1.	0.84	1.09	1.09	0.86	1.09	0.91
time (sec)	N/A	0.046	0.006	0.009	1.437	0.214	1.652	0.218	8.076

Problem 1580	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	43	36	47	47	37	47	39
normalized size	1	1.	1.	0.84	1.09	1.09	0.86	1.09	0.91
time (sec)	N/A	0.047	0.01	0.007	1.457	0.21	1.627	0.218	8.246

Problem 1581	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	106	106	106	91	122	122	104	122	104
normalized size	1	1.	1.	0.86	1.15	1.15	0.98	1.15	0.98
time (sec)	N/A	0.134	0.006	0.004	1.427	0.211	0.158	0.219	23.775

Problem 1582	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	106	106	106	91	122	122	105	122	105
normalized size	1	1.	1.	0.86	1.15	1.15	0.99	1.15	0.99
time (sec)	N/A	0.129	0.005	0.002	1.438	0.212	0.169	0.219	23.078

Problem 1583	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	106	91	122	122	105	122	90
normalized size	1	1.	1.08	0.93	1.24	1.24	1.07	1.24	0.92
time (sec)	N/A	0.125	0.005	0.003	1.43	0.213	0.159	0.217	24.436

Problem 1584	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	104	91	122	122	104	122	73
normalized size	1	1.	1.28	1.12	1.51	1.51	1.28	1.51	0.9
time (sec)	N/A	0.11	0.006	0.003	1.444	0.213	0.154	0.225	21.072

Problem 1585	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	64	64	106	91	122	122	105	122	58
normalized size	1	1.	1.66	1.42	1.91	1.91	1.64	1.91	0.91
time (sec)	N/A	0.092	0.005	0.001	1.436	0.211	0.155	0.222	18.378

Problem 1586	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	102	91	122	122	102	122	39
normalized size	1	1.	2.17	1.94	2.6	2.6	2.17	2.6	0.83
time (sec)	N/A	0.078	0.005	0.002	1.426	0.211	0.149	0.228	15.093

Problem 1587	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	104	91	122	122	104	122	24
normalized size	1	1.	3.47	3.03	4.07	4.07	3.47	4.07	0.8
time (sec)	N/A	0.043	0.004	0.002	1.448	0.212	0.155	0.221	12.195

Problem 1588	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	13	116	116	94	116	8
normalized size	1	1.	1.	0.93	8.29	8.29	6.71	8.29	0.57
time (sec)	N/A	0.016	0.002	0.002	1.459	0.213	0.147	0.223	2.923

Problem 1589	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	98	87	116	116	100	117	0
normalized size	1	1.	1.	0.89	1.18	1.18	1.02	1.19	0.
time (sec)	N/A	0.093	0.006	0.004	1.428	0.219	1.363	0.228	0.

Problem 1590	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	95	88	117	124	95	119	0
normalized size	1	1.	1.	0.93	1.23	1.31	1.	1.25	0.
time (sec)	N/A	0.107	0.016	0.009	1.439	0.219	1.403	0.228	0.

Problem 1591	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	95	88	116	124	95	117	0
normalized size	1	1.	1.	0.93	1.22	1.31	1.	1.23	0.
time (sec)	N/A	0.109	0.008	0.009	1.434	0.22	1.532	0.224	0.

Problem 1592	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	93	93	93	88	116	124	94	117	0
normalized size	1	1.	1.	0.95	1.25	1.33	1.01	1.26	0.
time (sec)	N/A	0.111	0.015	0.01	1.446	0.22	1.722	0.224	0.

Problem 1593	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	95	88	119	124	95	120	0
normalized size	1	1.	1.	0.93	1.25	1.31	1.	1.26	0.
time (sec)	N/A	0.111	0.008	0.01	1.419	0.22	1.871	0.226	0.

Problem 1594	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	93	93	93	88	119	124	94	120	0
normalized size	1	1.	1.	0.95	1.28	1.33	1.01	1.29	0.
time (sec)	N/A	0.109	0.015	0.01	1.43	0.221	2.433	0.225	0.

Problem 1595	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	95	88	119	124	94	120	0
normalized size	1	1.	1.	0.93	1.25	1.31	0.99	1.26	0.
time (sec)	N/A	0.113	0.009	0.01	1.441	0.222	2.262	0.226	0.

Problem 1596	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	94	87	117	124	92	119	0
normalized size	1	1.	1.	0.93	1.24	1.32	0.98	1.27	0.
time (sec)	N/A	0.105	0.009	0.011	1.442	0.219	2.622	0.222	0.

Problem 1597	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	100	89	120	124	94	122	100
normalized size	1	1.	1.	0.89	1.2	1.24	0.94	1.22	1.
time (sec)	N/A	0.108	0.008	0.012	1.43	0.22	2.815	0.224	20.353

Problem 1598	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	96	91	19	119	95	19	10
normalized size	1	1.	6.	5.69	1.19	7.44	5.94	1.19	0.62
time (sec)	N/A	0.016	0.015	0.008	1.554	0.216	3.022	0.223	2.201

Problem 1599	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	104	91	122	122	97	122	29
normalized size	1	1.	2.89	2.53	3.39	3.39	2.69	3.39	0.81
time (sec)	N/A	0.039	0.007	0.009	1.445	0.216	3.147	0.228	5.432

Problem 1600	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	102	91	122	122	97	122	48
normalized size	1	1.	1.82	1.62	2.18	2.18	1.73	2.18	0.86
time (sec)	N/A	0.055	0.014	0.009	1.445	0.213	3.343	0.226	7.607

Problem 1601	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	76	76	106	91	122	122	97	122	66
normalized size	1	1.	1.39	1.2	1.61	1.61	1.28	1.61	0.87
time (sec)	N/A	0.076	0.007	0.01	1.44	0.217	3.444	0.221	11.114

Problem 1602	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	104	91	122	122	97	122	105
normalized size	1	1.	1.08	0.95	1.27	1.27	1.01	1.27	1.09
time (sec)	N/A	0.102	0.016	0.009	1.453	0.211	3.635	0.221	20.468

Problem 1603	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	106	106	106	91	122	122	97	122	107
normalized size	1	1.	1.	0.86	1.15	1.15	0.92	1.15	1.01
time (sec)	N/A	0.111	0.007	0.008	1.441	0.213	3.759	0.224	20.451

Problem 1604	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	106	106	106	91	122	122	97	122	105
normalized size	1	1.	1.	0.86	1.15	1.15	0.92	1.15	0.99
time (sec)	N/A	0.113	0.011	0.009	1.446	0.212	3.893	0.225	20.717

Problem 1605	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	70	63	86	85	61	88	0
normalized size	1	1.	1.	0.9	1.23	1.21	0.87	1.26	0.
time (sec)	N/A	0.1	0.007	0.006	1.444	0.221	1.168	0.229	0.

Problem 1606	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	57	57	52	70	70	49	72	0
normalized size	1	1.	1.	0.91	1.23	1.23	0.86	1.26	0.
time (sec)	N/A	0.077	0.007	0.004	1.438	0.219	1.151	0.228	0.

Problem 1607	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	44	41	57	55	37	58	0
normalized size	1	1.	1.	0.93	1.3	1.25	0.84	1.32	0.
time (sec)	N/A	0.062	0.006	0.004	1.439	0.22	1.12	0.224	0.

Problem 1608	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	31	30	39	39	26	41	0
normalized size	1	1.	1.	0.97	1.26	1.26	0.84	1.32	0.
time (sec)	N/A	0.048	0.006	0.003	1.438	0.218	1.097	0.224	0.

Problem 1609	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	19	24	23	14	26	0
normalized size	1	1.	1.	1.06	1.33	1.28	0.78	1.44	0.
time (sec)	N/A	0.031	0.004	0.003	1.441	0.219	1.046	0.226	0.

Problem 1610	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	10	10	10	11	14	14	7	15	7
normalized size	1	1.	1.	1.1	1.4	1.4	0.7	1.5	0.7
time (sec)	N/A	0.016	0.002	0.002	1.437	0.221	0.094	0.226	3.213

Problem 1611	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	18	19	18	22	10	19	8
normalized size	1	1.	1.38	1.46	1.38	1.69	0.77	1.46	0.62
time (sec)	N/A	0.016	0.006	0.007	1.441	0.227	0.326	0.223	2.226

Problem 1612	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	28	29	38	35	19	41	24
normalized size	1	1.	1.	1.04	1.36	1.25	0.68	1.46	0.86
time (sec)	N/A	0.047	0.007	0.012	1.436	0.228	1.288	0.223	7.225

Problem 1613	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	42	42	41	54	55	31	61	37
normalized size	1	1.	1.	0.98	1.29	1.31	0.74	1.45	0.88
time (sec)	N/A	0.055	0.008	0.013	1.438	0.227	1.399	0.223	9.397

Problem 1614	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	56	53	69	73	44	76	49
normalized size	1	1.	1.	0.95	1.23	1.3	0.79	1.36	0.88
time (sec)	N/A	0.071	0.01	0.011	1.42	0.227	1.547	0.231	11.086

Problem 1615	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	68	63	84	88	56	90	61
normalized size	1	1.	1.	0.93	1.24	1.29	0.82	1.32	0.9
time (sec)	N/A	0.085	0.008	0.012	1.436	0.224	1.676	0.223	12.977

Problem 1616	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	82	75	99	103	68	105	73
normalized size	1	1.	1.	0.91	1.21	1.26	0.83	1.28	0.89
time (sec)	N/A	0.102	0.009	0.013	1.448	0.226	1.791	0.223	14.773

Problem 1617	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	88	89	124	144	99	128	0
normalized size	1	1.	0.9	0.91	1.27	1.47	1.01	1.31	0.
time (sec)	N/A	0.158	0.041	0.012	1.441	0.219	1.561	0.226	0.

Problem 1618	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	77	78	111	130	78	115	0
normalized size	1	1.	0.95	0.96	1.37	1.6	0.96	1.42	0.
time (sec)	N/A	0.133	0.042	0.011	1.437	0.218	1.564	0.222	0.

Problem 1619	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	72	72	66	67	95	115	71	99	0
normalized size	1	1.	0.92	0.93	1.32	1.6	0.99	1.38	0.
time (sec)	N/A	0.113	0.033	0.01	1.437	0.234	1.449	0.233	0.

Problem 1620	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	54	57	80	99	54	84	0
normalized size	1	1.	0.93	0.98	1.38	1.71	0.93	1.45	0.
time (sec)	N/A	0.093	0.037	0.01	1.444	0.219	1.416	0.222	0.

Problem 1621	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	43	45	63	84	44	65	0
normalized size	1	1.	0.93	0.98	1.37	1.83	0.96	1.41	0.
time (sec)	N/A	0.074	0.026	0.01	1.439	0.22	1.359	0.226	0.

Problem 1622	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	29	34	49	63	31	46	0
normalized size	1	1.	0.85	1.	1.44	1.85	0.91	1.35	0.
time (sec)	N/A	0.042	0.021	0.009	1.442	0.22	1.279	0.233	0.

Problem 1623	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	20	24	35	38	20	32	19
normalized size	1	1.	0.87	1.04	1.52	1.65	0.87	1.39	0.83
time (sec)	N/A	0.043	0.013	0.007	1.457	0.22	1.163	0.224	7.564

Problem 1624	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	12	13	18	18	10	18	7
normalized size	1	1.	0.92	1.	1.38	1.38	0.77	1.38	0.54
time (sec)	N/A	0.017	0.005	0.001	1.421	0.211	1.117	0.222	2.256

Problem 1625	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	24	30	38	53	22	42	24
normalized size	1	1.	0.83	1.03	1.31	1.83	0.76	1.45	0.83
time (sec)	N/A	0.051	0.017	0.012	1.456	0.225	1.409	0.233	7.835

Problem 1626	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	42	35	43	61	85	36	61	39
normalized size	1	1.	0.83	1.02	1.45	2.02	0.86	1.45	0.93
time (sec)	N/A	0.068	0.071	0.015	1.457	0.221	1.594	0.229	9.742

Problem 1627	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	53	57	86	116	54	86	56
normalized size	1	1.	0.91	0.98	1.48	2.	0.93	1.48	0.97
time (sec)	N/A	0.086	0.096	0.016	1.451	0.221	1.753	0.224	13.041

Problem 1628	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	66	68	99	128	66	99	66
normalized size	1	1.	0.96	0.99	1.43	1.86	0.96	1.43	0.96
time (sec)	N/A	0.102	0.097	0.017	1.442	0.227	1.872	0.229	14.477

Problem 1629	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	79	79	116	146	80	116	83
normalized size	1	1.	0.94	0.94	1.38	1.74	0.95	1.38	0.99
time (sec)	N/A	0.118	0.082	0.017	1.426	0.233	2.026	0.225	17.482

Problem 1630	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	90	91	131	161	92	131	90
normalized size	1	1.	0.96	0.97	1.39	1.71	0.98	1.39	0.96
time (sec)	N/A	0.137	0.133	0.017	1.451	0.226	2.228	0.229	19.331

Problem 1631	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	99	99	85	94	139	174	107	128	0
normalized size	1	1.	0.86	0.95	1.4	1.76	1.08	1.29	0.
time (sec)	N/A	0.171	0.095	0.012	1.431	0.219	1.89	0.223	0.

Problem 1632	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	73	83	123	158	92	112	0
normalized size	1	1.	0.85	0.97	1.43	1.84	1.07	1.3	0.
time (sec)	N/A	0.145	0.09	0.012	1.467	0.217	1.821	0.224	0.

Problem 1633	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	63	72	109	144	83	99	0
normalized size	1	1.	0.82	0.94	1.42	1.87	1.08	1.29	0.
time (sec)	N/A	0.122	0.08	0.01	1.453	0.219	1.746	0.23	0.

Problem 1634	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	64	64	50	61	93	128	70	82	0
normalized size	1	1.	0.78	0.95	1.45	2.	1.09	1.28	0.
time (sec)	N/A	0.098	0.07	0.012	1.427	0.219	1.703	0.228	0.

Problem 1635	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	40	49	77	112	56	59	0
normalized size	1	1.	0.75	0.92	1.45	2.11	1.06	1.11	0.
time (sec)	N/A	0.056	0.073	0.01	1.426	0.218	1.607	0.224	0.

Problem 1636	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	41	41	33	40	65	82	46	50	36
normalized size	1	1.	0.8	0.98	1.59	2.	1.12	1.22	0.88
time (sec)	N/A	0.064	0.024	0.009	1.423	0.224	1.392	0.225	11.022

Problem 1637	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	20	27	19	43	32	19	10
normalized size	1	1.	1.25	1.69	1.19	2.69	2.	1.19	0.62
time (sec)	N/A	0.017	0.01	0.007	1.416	0.215	1.365	0.226	2.203

Problem 1638	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	13	32	32	26	16	12
normalized size	1	1.	1.	0.93	2.29	2.29	1.86	1.14	0.86
time (sec)	N/A	0.017	0.005	0.003	1.445	0.214	1.31	0.227	2.908

Problem 1639	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	37	42	69	108	46	58	37
normalized size	1	1.	0.86	0.98	1.6	2.51	1.07	1.35	0.86
time (sec)	N/A	0.065	0.052	0.011	1.433	0.233	1.705	0.236	10.438

Problem 1640	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	57	53	56	93	147	65	81	54
normalized size	1	1.	0.93	0.98	1.63	2.58	1.14	1.42	0.95
time (sec)	N/A	0.085	0.091	0.016	1.431	0.231	1.947	0.226	12.802

Problem 1641	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	76	76	68	73	116	176	78	99	73
normalized size	1	1.	0.89	0.96	1.53	2.32	1.03	1.3	0.96
time (sec)	N/A	0.11	0.105	0.016	1.444	0.23	2.062	0.223	16.426

Problem 1642	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	89	89	79	84	131	190	92	116	87
normalized size	1	1.	0.89	0.94	1.47	2.13	1.03	1.3	0.98
time (sec)	N/A	0.128	0.128	0.017	1.45	0.232	2.295	0.228	18.841

Problem 1643	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	97	97	90	94	146	205	102	131	95
normalized size	1	1.	0.93	0.97	1.51	2.11	1.05	1.35	0.98
time (sec)	N/A	0.149	0.104	0.018	1.441	0.23	2.443	0.229	22.186

Problem 1644	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	111	111	101	106	161	220	116	146	110
normalized size	1	1.	0.91	0.95	1.45	1.98	1.05	1.32	0.99
time (sec)	N/A	0.17	0.166	0.017	1.446	0.227	2.739	0.224	25.914

Problem 1645	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	17	14	20	24	19	18	19
normalized size	1	1.	0.81	0.67	0.95	1.14	0.9	0.86	0.9
time (sec)	N/A	0.015	0.007	0.005	1.445	0.227	5.921	0.223	2.838

Problem 1646	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	17	14	20	22	19	18	19
normalized size	1	1.	0.81	0.67	0.95	1.05	0.9	0.86	0.9
time (sec)	N/A	0.014	0.006	0.003	1.438	0.227	1.834	0.23	2.784

Problem 1647	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	16	13	18	16	17	18	17
normalized size	1	1.	0.84	0.68	0.95	0.84	0.89	0.95	0.89
time (sec)	N/A	0.014	0.005	0.005	1.437	0.225	0.546	0.223	2.855

Problem 1648	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	14	13	18	16	15	18	15
normalized size	1	1.	0.82	0.76	1.06	0.94	0.88	1.06	0.88
time (sec)	N/A	0.014	0.007	0.004	1.438	0.225	1.36	0.219	2.836

Problem 1649	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	15	12	18	15	19	15	19
normalized size	1	1.	0.79	0.63	0.95	0.79	1.	0.79	1.
time (sec)	N/A	0.014	0.007	0.003	1.435	0.224	1.816	0.231	2.822

Problem 1650	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	17	14	18	18	20	18	20
normalized size	1	1.	0.81	0.67	0.86	0.86	0.95	0.86	0.95
time (sec)	N/A	0.014	0.008	0.004	1.443	0.23	2.995	0.222	2.836

Problem 1651	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	28	25	35	36	34	32	34
normalized size	1	1.	0.78	0.69	0.97	1.	0.94	0.89	0.94
time (sec)	N/A	0.035	0.012	0.007	1.437	0.231	9.341	0.226	5.48

Problem 1652	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	28	25	35	32	32	32	32
normalized size	1	1.	0.82	0.74	1.03	0.94	0.94	0.94	0.94
time (sec)	N/A	0.034	0.01	0.006	1.45	0.227	3.29	0.228	5.458

Problem 1653	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	27	24	34	31	31	32	31
normalized size	1	1.	0.84	0.75	1.06	0.97	0.97	1.	0.97
time (sec)	N/A	0.035	0.013	0.007	1.441	0.226	1.896	0.225	5.583

Problem 1654	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	26	25	32	32	31	31	31
normalized size	1	1.	0.81	0.78	1.	1.	0.97	0.97	0.97
time (sec)	N/A	0.034	0.013	0.007	1.44	0.23	1.898	0.221	5.751

Problem 1655	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	28	25	32	32	34	32	34
normalized size	1	1.	0.82	0.74	0.94	0.94	1.	0.94	1.
time (sec)	N/A	0.035	0.012	0.006	1.44	0.228	2.596	0.216	5.625

Problem 1656	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	28	25	32	32	36	32	36
normalized size	1	1.	0.78	0.69	0.89	0.89	1.	0.89	1.
time (sec)	N/A	0.034	0.013	0.005	1.442	0.227	4.937	0.222	5.526

Problem 1657	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	39	36	50	47	46	47	46
normalized size	1	1.	0.83	0.77	1.06	1.	0.98	1.	0.98
time (sec)	N/A	0.045	0.013	0.007	1.445	0.228	14.801	0.223	6.848

Problem 1658	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	38	35	49	46	44	47	44
normalized size	1	1.	0.84	0.78	1.09	1.02	0.98	1.04	0.98
time (sec)	N/A	0.044	0.014	0.007	1.439	0.228	6.694	0.222	6.921

Problem 1659	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	38	35	49	46	46	46	46
normalized size	1	1.	0.81	0.74	1.04	0.98	0.98	0.98	0.98
time (sec)	N/A	0.044	0.014	0.007	1.441	0.227	2.705	0.23	6.785

Problem 1660	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	39	36	47	47	44	46	44
normalized size	1	1.	0.87	0.8	1.04	1.04	0.98	1.02	0.98
time (sec)	N/A	0.044	0.015	0.008	1.437	0.226	2.672	0.223	6.888

Problem 1661	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	39	36	47	47	48	47	48
normalized size	1	1.	0.83	0.77	1.	1.	1.02	1.	1.02
time (sec)	N/A	0.044	0.015	0.006	1.435	0.227	4.067	0.226	6.92

Problem 1662	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	51	51	39	36	47	47	51	47	51
normalized size	1	1.	0.76	0.71	0.92	0.92	1.	0.92	1.
time (sec)	N/A	0.045	0.016	0.006	1.439	0.225	7.519	0.23	6.827

Problem 1663	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	83	72	65	0	1	136	95	80
normalized size	1	1.	0.87	0.78	0.	0.01	1.64	1.14	0.96
time (sec)	N/A	0.114	0.057	0.012	0.	0.241	73.203	0.225	17.721

Problem 1664	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	61	54	0	1	121	80	65
normalized size	1	1.	0.9	0.79	0.	0.01	1.78	1.18	0.96
time (sec)	N/A	0.077	0.046	0.008	0.	0.24	23.197	0.218	13.863

Problem 1665	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	49	43	0	1	105	61	49
normalized size	1	1.	0.92	0.81	0.	0.02	1.98	1.15	0.92
time (sec)	N/A	0.06	0.037	0.007	0.	0.239	4.737	0.223	10.81

Problem 1666	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	40	32	0	1	92	42	36
normalized size	1	1.	1.	0.8	0.	0.02	2.3	1.05	0.9
time (sec)	N/A	0.045	0.021	0.008	0.	0.239	4.9	0.22	8.226

Problem 1667	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	29	19	0	1	94	24	27
normalized size	1	1.	1.	0.66	0.	0.03	3.24	0.83	0.93
time (sec)	N/A	0.036	0.009	0.007	0.	0.245	10.671	0.223	6.271

Problem 1668	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	40	32	0	1	102	42	37
normalized size	1	1.	1.	0.8	0.	0.02	2.55	1.05	0.92
time (sec)	N/A	0.049	0.023	0.01	0.	0.246	30.47	0.221	8.466

Problem 1669	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	50	43	0	1	121	55	49
normalized size	1	1.	0.94	0.81	0.	0.02	2.28	1.04	0.92
time (sec)	N/A	0.065	0.045	0.013	0.	0.245	116.555	0.219	10.732

Problem 1670	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	61	54	0	1	0	70	65
normalized size	1	1.	0.9	0.79	0.	0.01	0.	1.03	0.96
time (sec)	N/A	0.081	0.055	0.014	0.	0.243	0.	0.22	14.052

Problem 1671	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	90	83	0	1	0	119	92
normalized size	1	1.	0.92	0.85	0.	0.01	0.	1.21	0.94
time (sec)	N/A	0.121	0.099	0.015	0.	0.24	0.	0.219	22.227

Problem 1672	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	79	71	0	1	0	103	78
normalized size	1	1.	0.93	0.84	0.	0.01	0.	1.21	0.92
time (sec)	N/A	0.098	0.086	0.017	0.	0.24	0.	0.223	17.764

Problem 1673	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	68	61	0	1	479	88	63
normalized size	1	1.	0.97	0.87	0.	0.01	6.84	1.26	0.9
time (sec)	N/A	0.078	0.074	0.016	0.	0.243	32.028	0.228	13.946

Problem 1674	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	57	54	47	0	1	411	62	49
normalized size	1	1.	0.95	0.82	0.	0.02	7.21	1.09	0.86
time (sec)	N/A	0.064	0.061	0.016	0.	0.242	32.902	0.234	11.117

Problem 1675	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	46	37	0	1	337	49	37
normalized size	1	1.	1.	0.8	0.	0.02	7.33	1.07	0.8
time (sec)	N/A	0.051	0.036	0.015	0.	0.239	84.215	0.232	8.833

Problem 1676	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	45	36	0	1	0	47	37
normalized size	1	1.	1.	0.8	0.	0.02	0.	1.04	0.82
time (sec)	N/A	0.049	0.037	0.01	0.	0.236	0.	0.23	8.593

Problem 1677	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	54	48	0	1	0	66	51
normalized size	1	1.	0.96	0.86	0.	0.02	0.	1.18	0.91
time (sec)	N/A	0.065	0.062	0.018	0.	0.248	0.	0.223	11.088

Problem 1678	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	68	60	0	1	0	78	65
normalized size	1	1.	0.99	0.87	0.	0.01	0.	1.13	0.94
time (sec)	N/A	0.08	0.075	0.02	0.	0.24	0.	0.219	14.052

Problem 1679	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	79	72	0	1	0	95	80
normalized size	1	1.	0.94	0.86	0.	0.01	0.	1.13	0.95
time (sec)	N/A	0.101	0.103	0.022	0.	0.241	0.	0.221	17.712

Problem 1680	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	110	110	92	90	0	1	0	119	102
normalized size	1	1.	0.84	0.82	0.	0.01	0.	1.08	0.93
time (sec)	N/A	0.121	0.085	0.019	0.	0.24	0.	0.229	22.278

Problem 1681	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	81	79	0	1	906	104	87
normalized size	1	1.	0.85	0.83	0.	0.01	9.54	1.09	0.92
time (sec)	N/A	0.097	0.075	0.018	0.	0.245	144.891	0.223	17.711

Problem 1682	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	70	66	0	1	816	80	73
normalized size	1	1.	0.85	0.8	0.	0.01	9.95	0.98	0.89
time (sec)	N/A	0.08	0.067	0.019	0.	0.246	144.385	0.219	14.474

Problem 1683	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	59	50	0	1	0	63	61
normalized size	1	1.	0.84	0.71	0.	0.01	0.	0.9	0.87
time (sec)	N/A	0.068	0.063	0.016	0.	0.245	0.	0.221	11.857

Problem 1684	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	73	73	62	52	0	1	0	70	58
normalized size	1	1.	0.85	0.71	0.	0.01	0.	0.96	0.79
time (sec)	N/A	0.069	0.059	0.016	0.	0.244	0.	0.218	12.239

Problem 1685	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	59	53	0	1	0	63	61
normalized size	1	1.	0.84	0.76	0.	0.01	0.	0.9	0.87
time (sec)	N/A	0.068	0.051	0.01	0.	0.242	0.	0.223	11.565

Problem 1686	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	70	66	0	1	0	80	75
normalized size	1	1.	0.85	0.8	0.	0.01	0.	0.98	0.91
time (sec)	N/A	0.084	0.071	0.02	0.	0.246	0.	0.217	14.343

Problem 1687	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	81	79	0	1	0	96	88
normalized size	1	1.	0.85	0.83	0.	0.01	0.	1.01	0.93
time (sec)	N/A	0.1	0.08	0.023	0.	0.246	0.	0.222	17.584

Problem 1688	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	110	110	92	90	0	1	0	108	104
normalized size	1	1.	0.84	0.82	0.	0.01	0.	0.98	0.95
time (sec)	N/A	0.123	0.095	0.023	0.	0.242	0.	0.221	22.245

Problem 1689	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	117	117	90	135	0	1	153	146	99
normalized size	1	1.	0.77	1.15	0.	0.01	1.31	1.25	0.85
time (sec)	N/A	0.171	0.138	0.02	0.	0.246	29.526	0.241	16.068

Problem 1690	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	93	93	79	115	0	1	122	127	73
normalized size	1	1.	0.85	1.24	0.	0.01	1.31	1.37	0.78
time (sec)	N/A	0.129	0.095	0.012	0.	0.24	19.305	0.242	12.225

Problem 1691	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	64	96	0	1	97	105	53
normalized size	1	1.	0.93	1.39	0.	0.01	1.41	1.52	0.77
time (sec)	N/A	0.09	0.096	0.01	0.	0.242	12.133	0.245	8.853

Problem 1692	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	50	74	0	1	42	86	31
normalized size	1	1.	1.28	1.9	0.	0.03	1.08	2.21	0.79
time (sec)	N/A	0.059	0.038	0.008	0.	0.238	6.529	0.248	5.558

Problem 1693	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	46	103	0	1	68	0	31
normalized size	1	1.	1.18	2.64	0.	0.03	1.74	0.	0.79
time (sec)	N/A	0.066	0.026	0.01	0.	0.238	4.946	0.	6.731

Problem 1694	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	25	19	32	41	112	14
normalized size	1	1.	1.	1.39	1.06	1.78	2.28	6.22	0.78
time (sec)	N/A	0.026	0.017	0.008	1.44	0.223	2.996	0.249	2.225

Problem 1695	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	40	33	41	51	304	155	31
normalized size	1	1.	1.05	0.87	1.08	1.34	8.	4.08	0.82
time (sec)	N/A	0.058	0.025	0.008	1.439	0.227	4.302	0.262	6.789

Problem 1696	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	51	44	63	66	899	197	49
normalized size	1	1.	0.86	0.75	1.07	1.12	15.24	3.34	0.83
time (sec)	N/A	0.078	0.025	0.007	1.441	0.226	6.482	0.256	9.796

Problem 1697	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	62	55	86	81	2297	239	68
normalized size	1	1.	0.78	0.69	1.08	1.01	28.71	2.99	0.85
time (sec)	N/A	0.097	0.032	0.01	1.436	0.225	9.617	0.264	13.176

Problem 1698	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	101	101	73	66	109	96	5095	281	87
normalized size	1	1.	0.72	0.65	1.08	0.95	50.45	2.78	0.86
time (sec)	N/A	0.116	0.035	0.009	1.438	0.223	16.796	0.264	16.079

Problem 1699	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	114	114	90	137	0	1	153	143	94
normalized size	1	1.	0.79	1.2	0.	0.01	1.34	1.25	0.82
time (sec)	N/A	0.162	0.127	0.012	0.	0.238	28.879	0.259	15.697

Problem 1700	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	90	90	79	115	0	1	124	126	70
normalized size	1	1.	0.88	1.28	0.	0.01	1.38	1.4	0.78
time (sec)	N/A	0.124	0.109	0.012	0.	0.24	18.774	0.248	11.916

Problem 1701	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	63	95	0	1	75	107	54
normalized size	1	1.	0.95	1.44	0.	0.02	1.14	1.62	0.82
time (sec)	N/A	0.088	0.089	0.013	0.	0.237	11.265	0.239	8.826

Problem 1702	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	56	94	0	1	92	0	44
normalized size	1	1.	1.04	1.74	0.	0.02	1.7	0.	0.81
time (sec)	N/A	0.084	0.038	0.011	0.	0.236	8.995	0.	7.358

Problem 1703	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	57	115	0	1	71	0	44
normalized size	1	1.	1.04	2.09	0.	0.02	1.29	0.	0.8
time (sec)	N/A	0.087	0.086	0.016	0.	0.237	7.538	0.	8.545

Problem 1704	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	25	19	47	65	196	14
normalized size	1	1.	1.	1.39	1.06	2.61	3.61	10.89	0.78
time (sec)	N/A	0.025	0.022	0.008	1.437	0.222	4.132	0.257	2.189

Problem 1705	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	36	33	41	66	360	239	31
normalized size	1	1.	0.95	0.87	1.08	1.74	9.47	6.29	0.82
time (sec)	N/A	0.057	0.038	0.007	1.446	0.225	5.528	0.261	6.833

Problem 1706	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	47	44	63	81	986	281	49
normalized size	1	1.	0.8	0.75	1.07	1.37	16.71	4.76	0.83
time (sec)	N/A	0.078	0.039	0.008	1.443	0.221	7.546	0.262	10.035

Problem 1707	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	58	55	86	96	2297	323	68
normalized size	1	1.	0.72	0.69	1.08	1.2	28.71	4.04	0.85
time (sec)	N/A	0.093	0.045	0.008	1.438	0.224	11.289	0.267	13.651

Problem 1708	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	101	101	69	66	109	111	5289	365	87
normalized size	1	1.	0.68	0.65	1.08	1.1	52.37	3.61	0.86
time (sec)	N/A	0.113	0.045	0.007	1.455	0.223	19.36	0.268	16.142

Problem 1709	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	80	77	132	126	10344	406	105
normalized size	1	1.	0.66	0.63	1.08	1.03	84.79	3.33	0.86
time (sec)	N/A	0.137	0.056	0.009	1.43	0.223	34.42	0.281	19.622

Problem 1710	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	111	111	90	135	0	1	155	144	94
normalized size	1	1.	0.81	1.22	0.	0.01	1.4	1.3	0.85
time (sec)	N/A	0.156	0.151	0.014	0.	0.237	30.671	0.251	15.237

Problem 1711	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	87	87	74	114	0	1	102	126	73
normalized size	1	1.	0.85	1.31	0.	0.01	1.17	1.45	0.84
time (sec)	N/A	0.119	0.117	0.012	0.	0.239	19.371	0.245	11.717

Problem 1712	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	73	117	0	1	126	0	70
normalized size	1	1.	0.87	1.39	0.	0.01	1.5	0.	0.83
time (sec)	N/A	0.112	0.067	0.017	0.	0.236	15.978	0.	11.061

Problem 1713	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	71	112	0	1	99	0	60
normalized size	1	1.	1.	1.58	0.	0.01	1.39	0.	0.85
time (sec)	N/A	0.114	0.112	0.013	0.	0.239	12.987	0.	9.514

Problem 1714	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	73	73	70	137	0	1	97	0	60
normalized size	1	1.	0.96	1.88	0.	0.01	1.33	0.	0.82
time (sec)	N/A	0.11	0.108	0.015	0.	0.24	13.897	0.	10.685

Problem 1715	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	25	19	62	80	279	14
normalized size	1	1.	1.	1.39	1.06	3.44	4.44	15.5	0.78
time (sec)	N/A	0.026	0.025	0.009	1.426	0.227	10.627	0.264	2.188

Problem 1716	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	36	33	41	81	416	323	31
normalized size	1	1.	0.95	0.87	1.08	2.13	10.95	8.5	0.82
time (sec)	N/A	0.056	0.043	0.007	1.415	0.227	7.775	0.27	6.933

Problem 1717	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	47	44	63	96	1073	365	49
normalized size	1	1.	0.8	0.75	1.07	1.63	18.19	6.19	0.83
time (sec)	N/A	0.08	0.043	0.007	1.424	0.227	9.864	0.273	10.294

Problem 1718	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	58	55	86	111	2562	406	68
normalized size	1	1.	0.72	0.69	1.08	1.39	32.02	5.08	0.85
time (sec)	N/A	0.099	0.053	0.008	1.418	0.22	12.898	0.292	13.381

Problem 1719	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	101	101	69	66	109	126	5482	448	87
normalized size	1	1.	0.68	0.65	1.08	1.25	54.28	4.44	0.86
time (sec)	N/A	0.113	0.051	0.007	1.426	0.224	20.741	0.278	16.358

Problem 1720	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	120	120	90	188	0	1	155	208	104
normalized size	1	1.	0.75	1.57	0.	0.01	1.29	1.73	0.87
time (sec)	N/A	0.166	0.135	0.017	0.	0.243	31.061	0.249	16.352

Problem 1721	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	77	168	0	1	128	169	82
normalized size	1	1.	0.8	1.75	0.	0.01	1.33	1.76	0.85
time (sec)	N/A	0.13	0.119	0.014	0.	0.236	20.749	0.253	12.422

Problem 1722	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	72	72	66	146	0	1	100	120	60
normalized size	1	1.	0.92	2.03	0.	0.01	1.39	1.67	0.83
time (sec)	N/A	0.093	0.1	0.013	0.	0.24	13.224	0.251	9.017

Problem 1723	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	53	70	0	1	44	96	32
normalized size	1	1.	1.23	1.63	0.	0.02	1.02	2.23	0.74
time (sec)	N/A	0.056	0.047	0.009	0.	0.239	7.67	0.249	5.349

Problem 1724	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	34	119	0	1	22	34	20
normalized size	1	1.	1.36	4.76	0.	0.04	0.88	1.36	0.8
time (sec)	N/A	0.051	0.019	0.016	0.	0.238	4.117	0.244	5.075

Problem 1725	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	25	19	22	22	19	12
normalized size	1	1.	1.	1.56	1.19	1.38	1.38	1.19	0.75
time (sec)	N/A	0.026	0.014	0.007	1.44	0.225	2.875	0.23	2.21

Problem 1726	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	29	33	41	36	248	63	29
normalized size	1	1.	0.81	0.92	1.14	1.	6.89	1.75	0.81
time (sec)	N/A	0.058	0.028	0.007	1.447	0.227	4.438	0.249	6.83

Problem 1727	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	57	40	44	63	51	813	103	48
normalized size	1	1.	0.7	0.77	1.11	0.89	14.26	1.81	0.84
time (sec)	N/A	0.078	0.035	0.008	1.446	0.222	6.765	0.251	9.916

Problem 1728	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	76	76	51	55	86	66	2164	142	65
normalized size	1	1.	0.67	0.72	1.13	0.87	28.47	1.87	0.86
time (sec)	N/A	0.098	0.038	0.008	1.45	0.224	10.263	0.249	13.222

Problem 1729	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	99	99	62	66	109	81	4901	181	85
normalized size	1	1.	0.63	0.67	1.1	0.82	49.51	1.83	0.86
time (sec)	N/A	0.114	0.043	0.008	1.446	0.222	17.844	0.255	16.433

Problem 1730	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	115	115	95	462	0	1	133	194	100
normalized size	1	1.	0.83	4.02	0.	0.01	1.16	1.69	0.87
time (sec)	N/A	0.162	0.185	0.023	0.	0.244	27.075	0.26	16.845

Problem 1731	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	91	91	84	397	0	1	105	142	78
normalized size	1	1.	0.92	4.36	0.	0.01	1.15	1.56	0.86
time (sec)	N/A	0.12	0.14	0.018	0.	0.243	18.105	0.261	12.294

Problem 1732	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	67	203	0	1	71	116	51
normalized size	1	1.	1.1	3.33	0.	0.02	1.16	1.9	0.84
time (sec)	N/A	0.081	0.117	0.013	0.	0.256	10.991	0.27	8.134

Problem 1733	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	42	57	198	0	1	148	70	32
normalized size	1	1.	1.36	4.71	0.	0.02	3.52	1.67	0.76
time (sec)	N/A	0.071	0.076	0.011	0.	0.248	6.638	0.264	6.968

Problem 1734	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	25	19	22	20	19	10
normalized size	1	1.	1.	1.56	1.19	1.38	1.25	1.19	0.62
time (sec)	N/A	0.027	0.022	0.008	1.437	0.231	4.435	0.263	2.17

Problem 1735	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	29	31	41	34	42	47	29
normalized size	1	1.	0.85	0.91	1.21	1.	1.24	1.38	0.85
time (sec)	N/A	0.057	0.034	0.008	1.438	0.234	5.732	0.256	6.75

Problem 1736	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	46	44	63	51	457	93	46
normalized size	1	1.	0.84	0.8	1.15	0.93	8.31	1.69	0.84
time (sec)	N/A	0.078	0.041	0.009	1.436	0.237	7.93	0.257	9.746

Problem 1737	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	56	53	86	63	2032	131	63
normalized size	1	1.	0.76	0.72	1.16	0.85	27.46	1.77	0.85
time (sec)	N/A	0.098	0.051	0.009	1.442	0.236	12.936	0.264	12.999

Problem 1738	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	69	66	109	81	4707	171	82
normalized size	1	1.	0.73	0.69	1.15	0.85	49.55	1.8	0.86
time (sec)	N/A	0.115	0.048	0.008	1.443	0.233	19.536	0.266	16.045

Problem 1739	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	80	77	132	96	9534	211	100
normalized size	1	1.	0.69	0.66	1.14	0.83	82.19	1.82	0.86
time (sec)	N/A	0.137	0.056	0.01	1.44	0.239	37.509	0.261	19.445

Problem 1740	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	134	134	106	620	0	1	532	203	117
normalized size	1	1.	0.79	4.63	0.	0.01	3.97	1.51	0.87
time (sec)	N/A	0.198	0.194	0.023	0.	0.257	39.364	0.265	21.146

Problem 1741	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	114	114	95	535	0	1	464	169	99
normalized size	1	1.	0.83	4.69	0.	0.01	4.07	1.48	0.87
time (sec)	N/A	0.152	0.156	0.017	0.	0.259	26.341	0.263	16.353

Problem 1742	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	82	276	0	1	774	132	70
normalized size	1	1.	1.	3.37	0.	0.01	9.44	1.61	0.85
time (sec)	N/A	0.107	0.127	0.014	0.	0.248	17.38	0.27	11.187

Problem 1743	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	60	60	67	279	0	1	700	99	48
normalized size	1	1.	1.12	4.65	0.	0.02	11.67	1.65	0.8
time (sec)	N/A	0.095	0.142	0.014	0.	0.253	11.448	0.262	9.358

Problem 1744	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	25	19	32	39	19	12
normalized size	1	1.	1.	1.39	1.06	1.78	2.17	1.06	0.67
time (sec)	N/A	0.027	0.025	0.007	1.43	0.237	8.508	0.274	2.2

Problem 1745	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	34	33	41	45	82	49	29
normalized size	1	1.	0.94	0.92	1.14	1.25	2.28	1.36	0.81
time (sec)	N/A	0.058	0.038	0.007	1.434	0.233	11.244	0.27	6.804

Problem 1746	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	44	44	63	65	136	78	46
normalized size	1	1.	0.8	0.8	1.15	1.18	2.47	1.42	0.84
time (sec)	N/A	0.078	0.041	0.008	1.436	0.238	14.01	0.27	9.917

Problem 1747	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	76	76	58	55	86	82	187	123	65
normalized size	1	1.	0.76	0.72	1.13	1.08	2.46	1.62	0.86
time (sec)	N/A	0.097	0.047	0.008	1.438	0.235	17.315	0.262	13.004

Problem 1748	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	97	97	69	66	109	97	2032	163	83
normalized size	1	1.	0.71	0.68	1.12	1.	20.95	1.68	0.86
time (sec)	N/A	0.115	0.051	0.009	1.45	0.244	23.179	0.271	15.926

Problem 1749	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	80	77	132	112	9263	203	100
normalized size	1	1.	0.69	0.66	1.14	0.97	79.85	1.75	0.86
time (sec)	N/A	0.135	0.061	0.009	1.464	0.241	43.163	0.271	19.418

Problem 1750	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	64	55	93	81	0	82	87
normalized size	1	1.	0.64	0.55	0.93	0.81	0.	0.82	0.87
time (sec)	N/A	0.116	0.046	0.008	1.437	0.244	0.	0.228	10.246

Problem 1751	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	53	44	70	66	0	68	63
normalized size	1	1.	0.72	0.59	0.95	0.89	0.	0.92	0.85
time (sec)	N/A	0.082	0.038	0.007	1.43	0.247	0.	0.235	6.711

Problem 1752	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	48	41	33	47	50	65	50	39
normalized size	1	1.	0.85	0.69	0.98	1.04	1.35	1.04	0.81
time (sec)	N/A	0.052	0.034	0.004	1.457	0.238	91.033	0.234	4.213

Problem 1753	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	28	25	23	32	39	32	17
normalized size	1	1.	1.22	1.09	1.	1.39	1.7	1.39	0.74
time (sec)	N/A	0.025	0.029	0.003	1.461	0.235	9.02	0.226	2.692

Problem 1754	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	59	50	0	1	68	84	41
normalized size	1	1.	1.2	1.02	0.	0.02	1.39	1.71	0.84
time (sec)	N/A	0.073	0.063	0.015	0.	0.247	8.647	0.242	7.225

Problem 1755	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	64	54	0	1	44	54	41
normalized size	1	1.	1.28	1.08	0.	0.02	0.88	1.08	0.82
time (sec)	N/A	0.065	0.096	0.021	0.	0.251	19.016	0.28	5.437

Problem 1756	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	77	73	0	1	97	78	63
normalized size	1	1.	0.96	0.91	0.	0.01	1.21	0.98	0.79
time (sec)	N/A	0.117	0.222	0.023	0.	0.25	101.326	0.273	11.65

Problem 1757	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	106	106	89	92	0	1	0	100	85
normalized size	1	1.	0.84	0.87	0.	0.01	0.	0.94	0.8
time (sec)	N/A	0.16	0.308	0.025	0.	0.248	0.	0.301	15.751

Problem 1758	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	60	55	93	96	0	186	87
normalized size	1	1.	0.6	0.55	0.93	0.96	0.	1.86	0.87
time (sec)	N/A	0.116	0.06	0.007	1.429	0.239	0.	0.237	9.604

Problem 1759	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	49	44	70	81	0	154	63
normalized size	1	1.	0.66	0.59	0.95	1.09	0.	2.08	0.85
time (sec)	N/A	0.084	0.049	0.008	1.451	0.235	0.	0.242	6.61

Problem 1760	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	48	38	33	47	65	0	122	39
normalized size	1	1.	0.79	0.69	0.98	1.35	0.	2.54	0.81
time (sec)	N/A	0.054	0.045	0.006	1.424	0.232	0.	0.24	4.193

Problem 1761	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	30	25	23	47	0	16	17
normalized size	1	1.	1.3	1.09	1.	2.04	0.	0.7	0.74
time (sec)	N/A	0.026	0.037	0.005	1.44	0.241	0.	0.227	2.671

Problem 1762	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	68	63	0	1	71	59	60
normalized size	1	1.	0.97	0.9	0.	0.01	1.01	0.84	0.86
time (sec)	N/A	0.104	0.111	0.014	0.	0.254	94.217	0.239	10.049

Problem 1763	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	71	70	0	1	92	68	60
normalized size	1	1.	1.03	1.01	0.	0.01	1.33	0.99	0.87
time (sec)	N/A	0.095	0.181	0.022	0.	0.244	48.027	0.268	8.358

Problem 1764	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	80	74	0	1	76	74	66
normalized size	1	1.	1.04	0.96	0.	0.01	0.99	0.96	0.86
time (sec)	N/A	0.086	0.199	0.023	0.	0.254	50.043	0.269	6.99

Problem 1765	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	103	103	89	92	0	1	124	97	82
normalized size	1	1.	0.86	0.89	0.	0.01	1.2	0.94	0.8
time (sec)	N/A	0.154	0.3	0.024	0.	0.247	156.394	0.299	15.458

Problem 1766	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	60	55	93	111	0	309	87
normalized size	1	1.	0.6	0.55	0.93	1.11	0.	3.09	0.87
time (sec)	N/A	0.116	0.064	0.008	1.418	0.243	0.	0.244	9.638

Problem 1767	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	49	44	70	96	0	262	63
normalized size	1	1.	0.66	0.59	0.95	1.3	0.	3.54	0.85
time (sec)	N/A	0.083	0.056	0.007	1.424	0.228	0.	0.241	6.586

Problem 1768	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	48	38	33	47	80	0	212	39
normalized size	1	1.	0.79	0.69	0.98	1.67	0.	4.42	0.81
time (sec)	N/A	0.054	0.049	0.004	1.432	0.236	0.	0.237	4.202

Problem 1769	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	30	25	23	62	0	81	17
normalized size	1	1.	1.3	1.09	1.	2.7	0.	3.52	0.74
time (sec)	N/A	0.026	0.046	0.004	1.438	0.232	0.	0.235	2.656

Problem 1770	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	93	93	80	81	0	1	0	76	80
normalized size	1	1.	0.86	0.87	0.	0.01	0.	0.82	0.86
time (sec)	N/A	0.136	0.138	0.015	0.	0.249	0.	0.237	13.253

Problem 1771	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	85	91	0	1	0	88	82
normalized size	1	1.	0.9	0.97	0.	0.01	0.	0.94	0.87
time (sec)	N/A	0.13	0.232	0.022	0.	0.251	0.	0.295	11.651

Problem 1772	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	97	97	91	93	0	1	0	92	85
normalized size	1	1.	0.94	0.96	0.	0.01	0.	0.95	0.88
time (sec)	N/A	0.123	0.232	0.023	0.	0.246	0.	0.295	10.309

Problem 1773	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	91	92	0	1	0	90	87
normalized size	1	1.	0.91	0.92	0.	0.01	0.	0.9	0.87
time (sec)	N/A	0.111	0.268	0.024	0.	0.249	0.	0.312	8.614

Problem 1774	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	100	110	0	1	0	113	107
normalized size	1	1.	0.79	0.87	0.	0.01	0.	0.9	0.85
time (sec)	N/A	0.192	0.375	0.026	0.	0.25	0.	0.327	19.501

Problem 1775	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	64	66	116	81	0	95	110
normalized size	1	1.	0.51	0.52	0.92	0.64	0.	0.75	0.87
time (sec)	N/A	0.155	0.057	0.007	1.439	0.235	0.	0.229	13.601

Problem 1776	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	53	55	93	66	0	78	87
normalized size	1	1.	0.53	0.55	0.93	0.66	0.	0.78	0.87
time (sec)	N/A	0.114	0.045	0.007	1.444	0.241	0.	0.232	9.848

Problem 1777	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	42	44	70	51	260	62	63
normalized size	1	1.	0.57	0.59	0.95	0.69	3.51	0.84	0.85
time (sec)	N/A	0.082	0.041	0.007	1.439	0.239	43.85	0.228	6.803

Problem 1778	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	48	30	32	46	35	42	43	39
normalized size	1	1.	0.62	0.67	0.96	0.73	0.88	0.9	0.81
time (sec)	N/A	0.052	0.036	0.003	1.44	0.231	5.746	0.228	4.364

Problem 1779	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	23	25	23	26	17	28	15
normalized size	1	1.	1.1	1.19	1.1	1.24	0.81	1.33	0.71
time (sec)	N/A	0.025	0.028	0.003	1.441	0.229	8.943	0.23	3.085

Problem 1780	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	36	39	0	1	24	53	27
normalized size	1	1.	1.2	1.3	0.	0.03	0.8	1.77	0.9
time (sec)	N/A	0.045	0.028	0.014	0.	0.241	25.105	0.23	5.376

Problem 1781	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	64	55	0	1	44	59	41
normalized size	1	1.	1.23	1.06	0.	0.02	0.85	1.13	0.79
time (sec)	N/A	0.079	0.117	0.017	0.	0.251	147.587	0.251	8.202

Problem 1782	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	83	78	74	0	1	0	81	70
normalized size	1	1.	0.94	0.89	0.	0.01	0.	0.98	0.84
time (sec)	N/A	0.118	0.242	0.019	0.	0.254	0.	0.251	11.922

Problem 1783	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	109	109	89	92	0	1	0	97	94
normalized size	1	1.	0.82	0.84	0.	0.01	0.	0.89	0.86
time (sec)	N/A	0.163	0.332	0.018	0.	0.242	0.	0.273	16.38

Problem 1784	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	71	66	122	81	0	95	110
normalized size	1	1.	0.56	0.52	0.97	0.64	0.	0.75	0.87
time (sec)	N/A	0.151	0.062	0.008	1.446	0.235	0.	0.232	13.476

Problem 1785	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	59	54	97	65	320	76	87
normalized size	1	1.	0.59	0.54	0.97	0.65	3.2	0.76	0.87
time (sec)	N/A	0.116	0.052	0.007	1.437	0.24	67.371	0.227	9.789

Problem 1786	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	48	43	74	50	206	59	63
normalized size	1	1.	0.65	0.58	1.	0.68	2.78	0.8	0.85
time (sec)	N/A	0.082	0.051	0.007	1.444	0.228	16.802	0.234	6.731

Problem 1787	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	35	32	49	35	39	42	36
normalized size	1	1.	0.8	0.73	1.11	0.8	0.89	0.95	0.82
time (sec)	N/A	0.053	0.044	0.004	1.449	0.234	26.78	0.229	4.295

Problem 1788	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	30	25	23	26	19	28	17
normalized size	1	1.	1.43	1.19	1.1	1.24	0.9	1.33	0.81
time (sec)	N/A	0.026	0.034	0.004	1.434	0.234	107.435	0.232	2.737

Problem 1789	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	66	52	0	1	0	90	42
normalized size	1	1.	1.27	1.	0.	0.02	0.	1.73	0.81
time (sec)	N/A	0.078	0.146	0.019	0.	0.25	0.	0.229	8.149

Problem 1790	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	79	61	0	1	0	78	63
normalized size	1	1.	1.07	0.82	0.	0.01	0.	1.05	0.85
time (sec)	N/A	0.117	0.396	0.027	0.	0.249	0.	0.251	11.981

Problem 1791	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	104	104	96	78	0	1	0	97	90
normalized size	1	1.	0.92	0.75	0.	0.01	0.	0.93	0.87
time (sec)	N/A	0.158	0.414	0.028	0.	0.249	0.	0.262	16.323

Problem 1792	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	130	130	107	89	0	1	0	113	114
normalized size	1	1.	0.82	0.68	0.	0.01	0.	0.87	0.88
time (sec)	N/A	0.205	0.425	0.028	0.	0.25	0.	0.365	21.182

Problem 1793	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	152	152	82	77	143	109	0	112	134
normalized size	1	1.	0.54	0.51	0.94	0.72	0.	0.74	0.88
time (sec)	N/A	0.194	0.074	0.011	1.501	0.237	0.	0.241	17.896

Problem 1794	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	71	66	120	95	536	96	110
normalized size	1	1.	0.56	0.52	0.95	0.75	4.25	0.76	0.87
time (sec)	N/A	0.154	0.062	0.01	1.436	0.23	163.459	0.234	13.545

Problem 1795	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	59	54	96	78	320	77	83
normalized size	1	1.	0.61	0.56	1.	0.81	3.33	0.8	0.86
time (sec)	N/A	0.115	0.058	0.007	1.436	0.234	90.059	0.234	9.848

Problem 1796	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	49	44	70	65	151	62	60
normalized size	1	1.	0.7	0.63	1.	0.93	2.16	0.89	0.86
time (sec)	N/A	0.082	0.052	0.009	1.432	0.232	171.696	0.233	6.841

Problem 1797	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	38	33	42	50	0	39	39
normalized size	1	1.	0.83	0.72	0.91	1.09	0.	0.85	0.85
time (sec)	N/A	0.053	0.047	0.005	1.45	0.232	0.	0.243	4.4

Problem 1798	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	32	25	23	36	0	28	19
normalized size	1	1.	1.39	1.09	1.	1.57	0.	1.22	0.83
time (sec)	N/A	0.026	0.036	0.004	1.453	0.234	0.	0.229	2.668

Problem 1799	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	79	85	0	1	0	105	63
normalized size	1	1.	1.05	1.13	0.	0.01	0.	1.4	0.84
time (sec)	N/A	0.112	0.248	0.023	0.	0.251	0.	0.237	11.695

Problem 1800	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	99	99	92	102	0	1	0	89	85
normalized size	1	1.	0.93	1.03	0.	0.01	0.	0.9	0.86
time (sec)	N/A	0.154	0.269	0.028	0.	0.252	0.	0.265	16.068

Problem 1801	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	129	129	107	117	0	1	0	109	112
normalized size	1	1.	0.83	0.91	0.	0.01	0.	0.84	0.87
time (sec)	N/A	0.198	0.328	0.031	0.	0.254	0.	0.268	20.996

Problem 1802	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	18	18	12	18	12
normalized size	1	1.	1.	0.82	1.06	1.06	0.71	1.06	0.71
time (sec)	N/A	0.015	0.002	0.001	1.426	0.222	0.071	0.228	2.788

Problem 1803	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	18	18	12	18	12
normalized size	1	1.	1.	0.82	1.06	1.06	0.71	1.06	0.71
time (sec)	N/A	0.016	0.002	0.002	1.432	0.224	0.067	0.227	2.772

Problem 1804	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	18	18	12	18	12
normalized size	1	1.	1.	0.82	1.06	1.06	0.71	1.06	0.71
time (sec)	N/A	0.016	0.002	0.001	1.43	0.223	0.066	0.228	2.779

Problem 1805	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	18	18	12	18	0
normalized size	1	1.	1.	0.82	1.06	1.06	0.71	1.06	0.
time (sec)	N/A	0.016	0.002	0.002	1.434	0.223	0.07	0.227	0.

Problem 1806	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	11	14	14	8	14	0
normalized size	1	1.	1.	0.92	1.17	1.17	0.67	1.17	0.
time (sec)	N/A	0.013	0.001	0.001	1.47	0.221	0.065	0.23	0.

Problem 1807	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	12	19	15	10	16	0
normalized size	1	1.	1.	0.92	1.46	1.15	0.77	1.23	0.
time (sec)	N/A	0.014	0.005	0.003	1.43	0.235	0.143	0.228	0.

Problem 1808	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	10	10	10	11	14	18	5	14	0
normalized size	1	1.	1.	1.1	1.4	1.8	0.5	1.4	0.
time (sec)	N/A	0.009	0.	0.002	1.433	0.217	0.971	0.227	0.

Problem 1809	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	12	19	23	10	27	10
normalized size	1	1.	1.	0.92	1.46	1.77	0.77	2.08	0.77
time (sec)	N/A	0.015	0.004	0.008	1.425	0.22	1.053	0.23	2.789

Problem 1810	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	14	18	18	14	18	10
normalized size	1	1.	1.	0.93	1.2	1.2	0.93	1.2	0.67
time (sec)	N/A	0.016	0.004	0.008	1.531	0.218	1.099	0.225	3.047

Problem 1811	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	19	18	14	18	14
normalized size	1	1.	1.	0.82	1.12	1.06	0.82	1.06	0.82
time (sec)	N/A	0.015	0.004	0.006	1.445	0.219	1.123	0.226	2.871

Problem 1812	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	20	20	15	20	14
normalized size	1	1.	1.	0.82	1.18	1.18	0.88	1.18	0.82
time (sec)	N/A	0.016	0.004	0.006	1.436	0.22	1.17	0.227	2.869

Problem 1813	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	20	20	15	20	14
normalized size	1	1.	1.	0.82	1.18	1.18	0.88	1.18	0.82
time (sec)	N/A	0.016	0.004	0.008	1.442	0.216	1.161	0.223	2.878

Problem 1814	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	20	20	15	20	14
normalized size	1	1.	1.	0.82	1.18	1.18	0.88	1.18	0.82
time (sec)	N/A	0.016	0.003	0.006	1.44	0.216	1.219	0.229	2.938

Problem 1815	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	25	32	32	26	32	26
normalized size	1	1.	1.	0.83	1.07	1.07	0.87	1.07	0.87
time (sec)	N/A	0.046	0.002	0.001	1.438	0.218	0.092	0.228	6.994

Problem 1816	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	25	32	32	24	32	10
normalized size	1	1.	1.	1.56	2.	2.	1.5	2.	0.62
time (sec)	N/A	0.021	0.004	0.001	1.441	0.218	0.088	0.227	3.486

Problem 1817	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	25	22	28	28	22	28	0
normalized size	1	1.	1.	0.88	1.12	1.12	0.88	1.12	0.
time (sec)	N/A	0.03	0.002	0.001	1.444	0.219	0.085	0.228	0.

Problem 1818	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	23	22	32	28	20	30	0
normalized size	1	1.	1.	0.96	1.39	1.22	0.87	1.3	0.
time (sec)	N/A	0.046	0.002	0.003	1.443	0.231	1.075	0.229	0.

Problem 1819	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	24	23	30	34	19	30	19
normalized size	1	1.	1.	0.96	1.25	1.42	0.79	1.25	0.79
time (sec)	N/A	0.04	0.002	0.005	1.441	0.22	1.096	0.226	6.648

Problem 1820	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	27	24	32	36	24	32	0
normalized size	1	1.	1.	0.89	1.19	1.33	0.89	1.19	0.
time (sec)	N/A	0.052	0.009	0.008	1.439	0.222	1.164	0.229	0.

Problem 1821	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	23	22	28	35	20	30	0
normalized size	1	1.	1.	0.96	1.22	1.52	0.87	1.3	0.
time (sec)	N/A	0.033	0.009	0.008	1.435	0.213	1.176	0.228	0.

Problem 1822	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	24	23	35	38	22	46	24
normalized size	1	1.	1.	0.96	1.46	1.58	0.92	1.92	1.
time (sec)	N/A	0.05	0.001	0.009	1.438	0.229	1.282	0.235	8.155

Problem 1823	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	28	25	35	35	27	35	24
normalized size	1	1.	1.	0.89	1.25	1.25	0.96	1.25	0.86
time (sec)	N/A	0.042	0.002	0.007	1.44	0.217	1.327	0.23	6.969

Problem 1824	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	30	25	19	32	26	32	12
normalized size	1	1.	1.88	1.56	1.19	2.	1.62	2.	0.75
time (sec)	N/A	0.019	0.002	0.007	1.438	0.219	1.339	0.226	2.131

Problem 1825	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	25	35	35	27	35	27
normalized size	1	1.	1.	0.83	1.17	1.17	0.9	1.17	0.9
time (sec)	N/A	0.043	0.001	0.007	1.439	0.219	1.405	0.225	6.847

Problem 1826	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	25	35	35	27	35	26
normalized size	1	1.	1.	0.83	1.17	1.17	0.9	1.17	0.87
time (sec)	N/A	0.052	0.002	0.01	1.438	0.216	1.429	0.232	8.192

Problem 1827	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	25	35	35	27	35	27
normalized size	1	1.	1.	0.83	1.17	1.17	0.9	1.17	0.9
time (sec)	N/A	0.041	0.002	0.007	1.438	0.215	1.503	0.224	6.92

Problem 1828	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	35	32	42	42	32	42	0
normalized size	1	1.	1.	0.91	1.2	1.2	0.91	1.2	0.
time (sec)	N/A	0.044	0.002	0.002	1.448	0.217	0.096	0.226	0.

Problem 1829	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	39	34	49	45	37	49	0
normalized size	1	1.	1.	0.87	1.26	1.15	0.95	1.26	0.
time (sec)	N/A	0.062	0.008	0.003	1.435	0.234	1.119	0.226	0.

Problem 1830	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	33	43	49	29	43	29
normalized size	1	1.	1.	0.97	1.26	1.44	0.85	1.26	0.85
time (sec)	N/A	0.049	0.007	0.005	1.441	0.215	1.091	0.228	8.078

Problem 1831	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	40	35	49	51	37	47	0
normalized size	1	1.	1.	0.88	1.22	1.27	0.92	1.18	0.
time (sec)	N/A	0.069	0.013	0.008	1.446	0.22	1.242	0.228	0.

Problem 1832	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	37	37	37	34	46	49	34	46	32
normalized size	1	1.	1.	0.92	1.24	1.32	0.92	1.24	0.86
time (sec)	N/A	0.05	0.008	0.007	1.438	0.211	1.244	0.232	8.182

Problem 1833	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	40	35	50	53	36	49	0
normalized size	1	1.	1.	0.88	1.25	1.32	0.9	1.22	0.
time (sec)	N/A	0.063	0.009	0.008	1.442	0.22	1.351	0.236	0.

Problem 1834	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	33	43	50	32	45	0
normalized size	1	1.	1.	0.97	1.26	1.47	0.94	1.32	0.
time (sec)	N/A	0.042	0.008	0.008	1.443	0.211	1.413	0.226	0.

Problem 1835	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	39	34	53	53	36	63	41
normalized size	1	1.	1.	0.87	1.36	1.36	0.92	1.62	1.05
time (sec)	N/A	0.061	0.007	0.008	1.488	0.219	1.582	0.229	10.185

Problem 1836	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	39	36	50	50	39	50	34
normalized size	1	1.	1.	0.92	1.28	1.28	1.	1.28	0.87
time (sec)	N/A	0.051	0.007	0.007	1.433	0.21	1.555	0.23	8.637

Problem 1837	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	43	36	19	47	37	47	12
normalized size	1	1.	2.69	2.25	1.19	2.94	2.31	2.94	0.75
time (sec)	N/A	0.017	0.013	0.008	1.434	0.22	1.627	0.226	2.111

Problem 1838	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	43	36	50	50	39	50	41
normalized size	1	1.	1.	0.84	1.16	1.16	0.91	1.16	0.95
time (sec)	N/A	0.051	0.007	0.007	1.433	0.217	1.664	0.227	8.569

Problem 1839	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	43	36	50	50	39	50	39
normalized size	1	1.	1.08	0.9	1.25	1.25	0.98	1.25	0.98
time (sec)	N/A	0.064	0.007	0.007	1.482	0.22	1.772	0.221	10.199

Problem 1840	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	43	36	50	50	39	50	39
normalized size	1	1.	1.	0.84	1.16	1.16	0.91	1.16	0.91
time (sec)	N/A	0.051	0.013	0.008	1.435	0.214	1.78	0.22	8.622

Problem 1841	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	68	60	0	1	107	88	0
normalized size	1	1.	1.	0.88	0.	0.01	1.57	1.29	0.
time (sec)	N/A	0.088	0.049	0.004	0.	0.233	1.342	0.23	0.

Problem 1842	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	53	46	62	61	44	63	0
normalized size	1	1.	1.	0.87	1.17	1.15	0.83	1.19	0.
time (sec)	N/A	0.103	0.009	0.004	1.458	0.224	1.323	0.231	0.

Problem 1843	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	55	49	0	1	95	74	0
normalized size	1	1.	1.	0.89	0.	0.02	1.73	1.35	0.
time (sec)	N/A	0.076	0.043	0.003	0.	0.236	1.334	0.221	0.

Problem 1844	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	40	35	46	45	32	47	0
normalized size	1	1.	1.	0.88	1.15	1.12	0.8	1.18	0.
time (sec)	N/A	0.078	0.009	0.005	1.424	0.223	1.212	0.229	0.

Problem 1845	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	42	42	38	0	1	80	54	0
normalized size	1	1.	1.	0.9	0.	0.02	1.9	1.29	0.
time (sec)	N/A	0.065	0.036	0.001	0.	0.229	1.287	0.221	0.

Problem 1846	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	27	24	31	30	20	32	0
normalized size	1	1.	1.	0.89	1.15	1.11	0.74	1.19	0.
time (sec)	N/A	0.058	0.009	0.005	1.452	0.223	1.163	0.227	0.

Problem 1847	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	31	27	0	1	56	35	26
normalized size	1	1.	1.	0.87	0.	0.03	1.81	1.13	0.84
time (sec)	N/A	0.039	0.016	0.002	0.	0.237	1.185	0.226	6.443

Problem 1848	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	14	18	18	10	19	10
normalized size	1	1.	1.	0.93	1.2	1.2	0.67	1.27	0.67
time (sec)	N/A	0.019	0.004	0.002	1.424	0.225	0.235	0.228	3.627

Problem 1849	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	24	16	0	1	53	20	22
normalized size	1	1.	1.	0.67	0.	0.04	2.21	0.83	0.92
time (sec)	N/A	0.028	0.008	0.001	0.	0.231	0.314	0.232	4.11

Problem 1850	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	22	21	18	24	15	32	12
normalized size	1	1.	1.47	1.4	1.2	1.6	1.	2.13	0.8
time (sec)	N/A	0.018	0.01	0.005	1.423	0.227	0.528	0.225	2.13

Problem 1851	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	30	0	1	65	39	29
normalized size	1	1.	1.	0.88	0.	0.03	1.91	1.15	0.85
time (sec)	N/A	0.046	0.023	0.004	0.	0.233	1.32	0.223	7.642

Problem 1852	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	35	32	45	45	31	58	34
normalized size	1	1.	1.	0.91	1.29	1.29	0.89	1.66	0.97
time (sec)	N/A	0.069	0.012	0.009	1.546	0.238	1.579	0.226	9.688

Problem 1853	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	43	39	0	1	87	54	37
normalized size	1	1.	1.	0.91	0.	0.02	2.02	1.26	0.86
time (sec)	N/A	0.064	0.038	0.005	0.	0.239	1.481	0.228	11.187

Problem 1854	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	44	63	61	42	77	48
normalized size	1	1.	1.	0.9	1.29	1.24	0.86	1.57	0.98
time (sec)	N/A	0.084	0.013	0.009	1.435	0.23	1.867	0.223	12.351

Problem 1855	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	58	52	0	1	100	70	49
normalized size	1	1.	1.	0.9	0.	0.02	1.72	1.21	0.84
time (sec)	N/A	0.084	0.05	0.006	0.	0.229	1.797	0.225	15.459

Problem 1856	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	82	78	0	1	134	113	0
normalized size	1	1.	0.89	0.85	0.	0.01	1.46	1.23	0.
time (sec)	N/A	0.111	0.102	0.007	0.	0.24	1.832	0.227	0.

Problem 1857	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	60	63	88	109	66	108	0
normalized size	1	1.	0.86	0.9	1.26	1.56	0.94	1.54	0.
time (sec)	N/A	0.141	0.038	0.014	1.44	0.224	1.694	0.219	0.

Problem 1858	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	79	79	71	68	0	1	124	99	0
normalized size	1	1.	0.9	0.86	0.	0.01	1.57	1.25	0.
time (sec)	N/A	0.1	0.111	0.007	0.	0.235	1.793	0.219	0.

Problem 1859	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	57	49	52	73	95	53	74	0
normalized size	1	1.	0.86	0.91	1.28	1.67	0.93	1.3	0.
time (sec)	N/A	0.115	0.03	0.013	1.446	0.229	1.653	0.235	0.

Problem 1860	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	60	57	0	1	107	82	0
normalized size	1	1.	0.91	0.86	0.	0.02	1.62	1.24	0.
time (sec)	N/A	0.085	0.079	0.006	0.	0.231	1.72	0.22	0.

Problem 1861	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	38	41	58	76	39	55	0
normalized size	1	1.	0.86	0.93	1.32	1.73	0.89	1.25	0.
time (sec)	N/A	0.087	0.029	0.013	1.438	0.225	1.545	0.223	0.

Problem 1862	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	51	43	0	1	83	57	48
normalized size	1	1.	0.93	0.78	0.	0.02	1.51	1.04	0.87
time (sec)	N/A	0.061	0.058	0.01	0.	0.234	1.595	0.221	10.3

Problem 1863	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	27	30	43	47	29	43	26
normalized size	1	1.	0.82	0.91	1.3	1.42	0.88	1.3	0.79
time (sec)	N/A	0.068	0.015	0.01	1.441	0.23	1.36	0.224	9.308

Problem 1864	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	45	36	0	1	78	47	36
normalized size	1	1.	1.	0.8	0.	0.02	1.73	1.04	0.8
time (sec)	N/A	0.051	0.038	0.006	0.	0.232	1.401	0.223	7.605

Problem 1865	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	15	19	20	15	19	10
normalized size	1	1.	1.	0.94	1.19	1.25	0.94	1.19	0.62
time (sec)	N/A	0.019	0.004	0.	1.442	0.215	1.273	0.221	2.135

Problem 1866	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	45	36	0	1	78	47	36
normalized size	1	1.	1.	0.8	0.	0.02	1.73	1.04	0.8
time (sec)	N/A	0.039	0.045	0.004	0.	0.232	1.456	0.233	5.242

Problem 1867	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	33	35	50	63	34	63	34
normalized size	1	1.	0.87	0.92	1.32	1.66	0.89	1.66	0.89
time (sec)	N/A	0.076	0.024	0.015	1.437	0.24	1.691	0.229	10.079

Problem 1868	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	57	54	46	0	1	90	63	48
normalized size	1	1.	0.95	0.81	0.	0.02	1.58	1.11	0.84
time (sec)	N/A	0.066	0.065	0.01	0.	0.234	1.751	0.225	10.988

Problem 1869	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	41	46	70	99	49	69	46
normalized size	1	1.	0.84	0.94	1.43	2.02	1.	1.41	0.94
time (sec)	N/A	0.098	0.063	0.019	1.445	0.224	2.079	0.227	12.15

Problem 1870	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	67	59	0	1	114	80	61
normalized size	1	1.	0.99	0.87	0.	0.01	1.68	1.18	0.9
time (sec)	N/A	0.083	0.073	0.01	0.	0.24	2.153	0.219	14.957

Problem 1871	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	57	61	95	122	68	116	66
normalized size	1	1.	0.86	0.92	1.44	1.85	1.03	1.76	1.
time (sec)	N/A	0.119	0.096	0.019	1.439	0.232	2.629	0.235	16.031

Problem 1872	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	87	87	71	80	120	155	90	124	0
normalized size	1	1.	0.82	0.92	1.38	1.78	1.03	1.43	0.
time (sec)	N/A	0.181	0.091	0.016	1.447	0.228	2.376	0.243	0.

Problem 1873	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	88	88	0	1	144	113	0
normalized size	1	1.	0.9	0.9	0.	0.01	1.47	1.15	0.
time (sec)	N/A	0.129	0.114	0.008	0.	0.231	2.354	0.232	0.

Problem 1874	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	58	69	104	139	78	93	0
normalized size	1	1.	0.78	0.93	1.41	1.88	1.05	1.26	0.
time (sec)	N/A	0.15	0.087	0.015	1.415	0.227	2.182	0.223	0.

Problem 1875	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	77	77	0	1	131	99	0
normalized size	1	1.	0.91	0.91	0.	0.01	1.54	1.16	0.
time (sec)	N/A	0.113	0.102	0.007	0.	0.235	2.26	0.234	0.

Problem 1876	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	65	48	58	89	123	66	72	0
normalized size	1	1.	0.74	0.89	1.37	1.89	1.02	1.11	0.
time (sec)	N/A	0.118	0.099	0.014	1.444	0.221	2.14	0.226	0.

Problem 1877	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	66	63	0	1	107	73	66
normalized size	1	1.	0.89	0.85	0.	0.01	1.45	0.99	0.89
time (sec)	N/A	0.087	0.093	0.008	0.	0.229	2.204	0.221	14.518

Problem 1878	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	39	46	74	93	53	57	41
normalized size	1	1.	0.8	0.94	1.51	1.9	1.08	1.16	0.84
time (sec)	N/A	0.101	0.028	0.012	1.427	0.227	1.894	0.223	13.211

Problem 1879	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	64	64	55	47	0	1	109	61	56
normalized size	1	1.	0.86	0.73	0.	0.02	1.7	0.95	0.88
time (sec)	N/A	0.072	0.091	0.011	0.	0.239	1.933	0.232	11.536

Problem 1880	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	24	31	19	49	36	30	12
normalized size	1	1.	1.5	1.94	1.19	3.06	2.25	1.88	0.75
time (sec)	N/A	0.019	0.013	0.01	1.422	0.218	1.713	0.226	2.142

Problem 1881	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	65	58	49	0	1	110	68	51
normalized size	1	1.	0.89	0.75	0.	0.02	1.69	1.05	0.78
time (sec)	N/A	0.069	0.055	0.006	0.	0.234	1.822	0.225	9.62

Problem 1882	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	15	35	35	27	19	14
normalized size	1	1.	1.	0.94	2.19	2.19	1.69	1.19	0.88
time (sec)	N/A	0.02	0.005	0.001	1.441	0.217	1.595	0.234	3.506

Problem 1883	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	55	51	0	1	105	61	54
normalized size	1	1.	0.89	0.82	0.	0.02	1.69	0.98	0.87
time (sec)	N/A	0.057	0.066	0.005	0.	0.237	1.899	0.229	7.143

Problem 1884	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	43	49	81	122	56	80	49
normalized size	1	1.	0.8	0.91	1.5	2.26	1.04	1.48	0.91
time (sec)	N/A	0.1	0.053	0.016	1.422	0.226	2.25	0.226	12.758

Problem 1885	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	76	76	68	66	0	1	114	77	65
normalized size	1	1.	0.89	0.87	0.	0.01	1.5	1.01	0.86
time (sec)	N/A	0.089	0.082	0.01	0.	0.244	2.502	0.232	14.834

Problem 1886	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	67	67	59	62	104	161	78	111	66
normalized size	1	1.	0.88	0.93	1.55	2.4	1.16	1.66	0.99
time (sec)	N/A	0.127	0.101	0.018	1.438	0.234	3.015	0.236	15.382

Problem 1887	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	87	87	79	79	0	1	138	96	80
normalized size	1	1.	0.91	0.91	0.	0.01	1.59	1.1	0.92
time (sec)	N/A	0.117	0.083	0.01	0.	0.238	3.431	0.225	19.084

Problem 1888	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	74	79	124	181	90	108	85
normalized size	1	1.	0.86	0.92	1.44	2.1	1.05	1.26	0.99
time (sec)	N/A	0.157	0.087	0.018	1.431	0.229	4.457	0.224	19.759

Problem 1889	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	88	82	0	1	92	95	60
normalized size	1	1.	1.24	1.15	0.	0.01	1.3	1.34	0.85
time (sec)	N/A	0.115	0.073	0.017	0.	0.254	13.092	0.231	9.555

Problem 1890	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	26	27	23	36	41	36	15
normalized size	1	1.	1.24	1.29	1.1	1.71	1.95	1.71	0.71
time (sec)	N/A	0.032	0.01	0.006	1.427	0.238	2.626	0.226	2.699

Problem 1891	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	58	62	0	1	41	72	39
normalized size	1	1.	1.23	1.32	0.	0.02	0.87	1.53	0.83
time (sec)	N/A	0.075	0.051	0.007	0.	0.253	6.993	0.234	6.803

Problem 1892	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	42	71	63	0	1	56	92	34
normalized size	1	1.	1.69	1.5	0.	0.02	1.33	2.19	0.81
time (sec)	N/A	0.062	0.05	0.008	0.	0.251	5.27	0.234	5.38

Problem 1893	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	54	81	0	1	56	82	31
normalized size	1	1.	1.42	2.13	0.	0.03	1.47	2.16	0.82
time (sec)	N/A	0.077	0.041	0.01	0.	0.249	5.235	0.247	6.668

Problem 1894	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	86	85	0	1	42	61	41
normalized size	1	1.	1.72	1.7	0.	0.02	0.84	1.22	0.82
time (sec)	N/A	0.063	0.056	0.01	0.	0.248	6.925	0.248	5.013

Problem 1895	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	29	19	38	42	85	14
normalized size	1	1.	1.	1.61	1.06	2.11	2.33	4.72	0.78
time (sec)	N/A	0.029	0.031	0.007	1.577	0.234	3.496	0.244	2.123

Problem 1896	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	98	106	0	1	92	86	60
normalized size	1	1.	1.32	1.43	0.	0.01	1.24	1.16	0.81
time (sec)	N/A	0.11	0.096	0.012	0.	0.261	12.814	0.247	10.59

Problem 1897	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	70	84	0	1	70	93	61
normalized size	1	1.	1.03	1.24	0.	0.01	1.03	1.37	0.9
time (sec)	N/A	0.105	0.102	0.008	0.	0.249	13.75	0.236	9.524

Problem 1898	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	85	78	0	1	78	119	51
normalized size	1	1.	1.39	1.28	0.	0.02	1.28	1.95	0.84
time (sec)	N/A	0.101	0.102	0.01	0.	0.251	9.732	0.238	9.299

Problem 1899	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	79	107	0	1	88	107	56
normalized size	1	1.	1.25	1.7	0.	0.02	1.4	1.7	0.89
time (sec)	N/A	0.091	0.062	0.011	0.	0.253	10.084	0.275	8.682

Problem 1900	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	64	64	95	100	0	1	88	80	56
normalized size	1	1.	1.48	1.56	0.	0.02	1.38	1.25	0.88
time (sec)	N/A	0.086	0.081	0.01	0.	0.254	9.65	0.25	6.275

Problem 1901	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	71	126	0	1	78	165	44
normalized size	1	1.	1.31	2.33	0.	0.02	1.44	3.06	0.81
time (sec)	N/A	0.1	0.073	0.011	0.	0.252	8.237	0.363	8.608

Problem 1902	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	101	125	0	1	71	85	61
normalized size	1	1.	1.42	1.76	0.	0.01	1.	1.2	0.86
time (sec)	N/A	0.083	0.097	0.012	0.	0.258	11.419	0.25	6.221

Problem 1903	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	30	29	19	53	68	124	14
normalized size	1	1.	1.67	1.61	1.06	2.94	3.78	6.89	0.78
time (sec)	N/A	0.03	0.026	0.008	1.437	0.247	4.544	0.251	2.124

Problem 1904	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	111	145	0	1	119	111	78
normalized size	1	1.	1.17	1.53	0.	0.01	1.25	1.17	0.82
time (sec)	N/A	0.144	0.109	0.016	0.	0.259	18.876	0.265	14.146

Problem 1905	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	93	127	0	1	117	128	78
normalized size	1	1.	1.08	1.48	0.	0.01	1.36	1.49	0.91
time (sec)	N/A	0.137	0.085	0.011	0.	0.263	21.634	0.278	11.863

Problem 1906	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	107	122	0	1	112	101	78
normalized size	1	1.	1.22	1.39	0.	0.01	1.27	1.15	0.89
time (sec)	N/A	0.125	0.109	0.012	0.	0.259	17.915	0.263	10.645

Problem 1907	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	83	149	0	1	112	192	73
normalized size	1	1.	1.04	1.86	0.	0.01	1.4	2.4	0.91
time (sec)	N/A	0.125	0.093	0.012	0.	0.251	15.901	0.377	10.849

Problem 1908	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	111	144	0	1	117	105	76
normalized size	1	1.	1.29	1.67	0.	0.01	1.36	1.22	0.88
time (sec)	N/A	0.122	0.106	0.011	0.	0.256	16.474	0.263	7.871

Problem 1909	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	72	72	82	166	0	1	105	243	60
normalized size	1	1.	1.14	2.31	0.	0.01	1.46	3.38	0.83
time (sec)	N/A	0.126	0.094	0.015	0.	0.252	15.628	0.606	10.975

Problem 1910	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	112	166	0	1	99	104	80
normalized size	1	1.	1.22	1.8	0.	0.01	1.08	1.13	0.87
time (sec)	N/A	0.104	0.12	0.018	0.	0.263	18.176	0.284	7.673

Problem 1911	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	30	29	19	68	88	163	14
normalized size	1	1.	1.67	1.61	1.06	3.78	4.89	9.06	0.78
time (sec)	N/A	0.027	0.033	0.008	1.442	0.251	12.623	0.254	2.14

Problem 1912	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	122	186	0	1	150	130	104
normalized size	1	1.	1.05	1.6	0.	0.01	1.29	1.12	0.9
time (sec)	N/A	0.182	0.139	0.026	0.	0.27	27.37	0.275	17.904

Problem 1913	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	90	87	0	1	95	134	66
normalized size	1	1.	1.22	1.18	0.	0.01	1.28	1.81	0.89
time (sec)	N/A	0.112	0.068	0.013	0.	0.259	13.776	0.248	9.889

Problem 1914	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	74	66	0	1	42	90	41
normalized size	1	1.	1.48	1.32	0.	0.02	0.84	1.8	0.82
time (sec)	N/A	0.076	0.045	0.013	0.	0.258	7.914	0.241	6.873

Problem 1915	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	50	46	0	1	17	0	20
normalized size	1	1.	2.08	1.92	0.	0.04	0.71	0.	0.83
time (sec)	N/A	0.057	0.029	0.008	0.	0.242	4.258	0.	5.131

Problem 1916	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	29	19	24	26	19	12
normalized size	1	1.	1.	1.81	1.19	1.5	1.62	1.19	0.75
time (sec)	N/A	0.029	0.026	0.007	1.436	0.226	4.082	0.221	2.114

Problem 1917	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	31	39	39	42	231	0	29
normalized size	1	1.	0.89	1.11	1.11	1.2	6.6	0.	0.83
time (sec)	N/A	0.065	0.038	0.008	1.437	0.234	5.979	0.	6.993

Problem 1918	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	57	42	50	63	57	750	0	49
normalized size	1	1.	0.74	0.88	1.11	1.	13.16	0.	0.86
time (sec)	N/A	0.089	0.044	0.01	1.436	0.238	9.626	0.	10.505

Problem 1919	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	53	61	85	72	1969	0	66
normalized size	1	1.	0.71	0.81	1.13	0.96	26.25	0.	0.88
time (sec)	N/A	0.116	0.046	0.009	1.439	0.247	15.298	0.	14.104

Problem 1920	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	40	50	68	54	279	0	60
normalized size	1	1.	0.61	0.76	1.03	0.82	4.23	0.	0.91
time (sec)	N/A	0.078	0.038	0.008	1.454	0.232	4.025	0.	6.094

Problem 1921	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	42	28	38	43	38	46	0	36
normalized size	1	1.	0.67	0.9	1.02	0.9	1.1	0.	0.86
time (sec)	N/A	0.044	0.031	0.008	1.429	0.234	2.595	0.	3.567

Problem 1922	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	28	19	24	17	38	12
normalized size	1	1.	1.	1.75	1.19	1.5	1.06	2.38	0.75
time (sec)	N/A	0.011	0.011	0.003	1.442	0.23	2.076	0.224	1.247

Problem 1923	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	56	52	0	1	19	0	24
normalized size	1	1.	2.	1.86	0.	0.04	0.68	0.	0.86
time (sec)	N/A	0.047	0.045	0.011	0.	0.241	4.501	0.	4.347

Problem 1924	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	93	73	0	1	42	0	41
normalized size	1	1.	1.75	1.38	0.	0.02	0.79	0.	0.77
time (sec)	N/A	0.078	0.075	0.01	0.	0.252	9.003	0.	7.406

Problem 1925	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	56	50	0	1	46	0	22
normalized size	1	1.	2.07	1.85	0.	0.04	1.7	0.	0.81
time (sec)	N/A	0.057	0.061	0.013	0.	0.247	4.49	0.	5.559

Problem 1926	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	56	52	0	1	20	0	20
normalized size	1	1.	2.8	2.6	0.	0.05	1.	0.	1.
time (sec)	N/A	0.034	0.047	0.013	0.	0.247	4.332	0.	3.742

Problem 1927	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	64	64	0	1	49	0	20
normalized size	1	1.	3.2	3.2	0.	0.05	2.45	0.	1.
time (sec)	N/A	0.034	0.055	0.015	0.	0.251	4.629	0.	4.134

Problem 1928	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	93	93	90	87	0	1	100	158	85
normalized size	1	1.	0.97	0.94	0.	0.01	1.08	1.7	0.91
time (sec)	N/A	0.148	0.075	0.015	0.	0.257	19.043	0.264	13.34

Problem 1929	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	76	73	0	1	71	131	61
normalized size	1	1.	1.1	1.06	0.	0.01	1.03	1.9	0.88
time (sec)	N/A	0.104	0.051	0.013	0.	0.246	11.655	0.269	9.617

Problem 1930	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	41	41	63	63	0	1	187	0	34
normalized size	1	1.	1.54	1.54	0.	0.02	4.56	0.	0.83
time (sec)	N/A	0.081	0.04	0.012	0.	0.244	6.931	0.	7.222

Problem 1931	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	28	18	39	26	0	12
normalized size	1	1.	1.	1.87	1.2	2.6	1.73	0.	0.8
time (sec)	N/A	0.029	0.017	0.006	1.438	0.237	6.966	0.	2.135

Problem 1932	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	28	37	41	50	48	0	29
normalized size	1	1.	0.82	1.09	1.21	1.47	1.41	0.	0.85
time (sec)	N/A	0.065	0.028	0.008	1.428	0.235	11.124	0.	6.949

Problem 1933	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	42	50	62	73	423	0	48
normalized size	1	1.	0.78	0.93	1.15	1.35	7.83	0.	0.89
time (sec)	N/A	0.091	0.033	0.008	1.437	0.237	12.939	0.	10.447

Problem 1934	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	73	73	53	59	85	85	1844	0	65
normalized size	1	1.	0.73	0.81	1.16	1.16	25.26	0.	0.89
time (sec)	N/A	0.115	0.04	0.009	1.423	0.244	21.346	0.	14.002

Problem 1935	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	52	60	93	84	337	0	82
normalized size	1	1.	0.59	0.68	1.06	0.95	3.83	0.	0.93
time (sec)	N/A	0.1	0.034	0.009	1.446	0.239	5.091	0.	7.912

Problem 1936	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	41	49	72	69	219	0	56
normalized size	1	1.	0.66	0.79	1.16	1.11	3.53	0.	0.9
time (sec)	N/A	0.06	0.031	0.008	1.422	0.238	3.775	0.	4.893

Problem 1937	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	27	37	43	53	42	0	29
normalized size	1	1.	0.77	1.06	1.23	1.51	1.2	0.	0.83
time (sec)	N/A	0.024	0.022	0.006	1.43	0.231	2.949	0.	1.963

Problem 1938	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	29	23	39	20	0	15
normalized size	1	1.	1.	1.53	1.21	2.05	1.05	0.	0.79
time (sec)	N/A	0.03	0.011	0.006	1.432	0.231	3.571	0.	2.791

Problem 1939	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	73	65	0	1	184	0	37
normalized size	1	1.	1.55	1.38	0.	0.02	3.91	0.	0.79
time (sec)	N/A	0.076	0.06	0.012	0.	0.249	9.503	0.	7.37

Problem 1940	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	95	79	0	1	73	0	63
normalized size	1	1.	1.34	1.11	0.	0.01	1.03	0.	0.89
time (sec)	N/A	0.111	0.075	0.012	0.	0.249	16.665	0.	10.855

Problem 1941	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	111	94	0	1	102	0	87
normalized size	1	1.	1.17	0.99	0.	0.01	1.07	0.	0.92
time (sec)	N/A	0.153	0.093	0.013	0.	0.258	27.764	0.	14.796

Problem 1942	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	110	98	0	1	432	193	107
normalized size	1	1.	0.95	0.84	0.	0.01	3.72	1.66	0.92
time (sec)	N/A	0.184	0.106	0.02	0.	0.278	26.95	0.273	17.26

Problem 1943	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	97	85	0	1	819	151	83
normalized size	1	1.	1.05	0.92	0.	0.01	8.9	1.64	0.9
time (sec)	N/A	0.136	0.081	0.015	0.	0.272	18.755	0.273	12.815

Problem 1944	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	86	73	0	1	743	0	51
normalized size	1	1.	1.46	1.24	0.	0.02	12.59	0.	0.86
time (sec)	N/A	0.106	0.069	0.013	0.	0.258	12.428	0.	9.643

Problem 1945	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	30	29	19	55	48	0	14
normalized size	1	1.	1.67	1.61	1.06	3.06	2.67	0.	0.78
time (sec)	N/A	0.029	0.031	0.008	1.441	0.241	13.287	0.	2.115

Problem 1946	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	37	39	39	72	94	0	31
normalized size	1	1.	1.06	1.11	1.11	2.06	2.69	0.	0.89
time (sec)	N/A	0.066	0.026	0.005	1.448	0.245	21.068	0.	7.008

Problem 1947	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	48	50	63	82	153	0	48
normalized size	1	1.	0.87	0.91	1.15	1.49	2.78	0.	0.87
time (sec)	N/A	0.093	0.049	0.008	1.45	0.243	31.211	0.	10.499

Problem 1948	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	76	76	62	61	86	103	201	0	68
normalized size	1	1.	0.82	0.8	1.13	1.36	2.64	0.	0.89
time (sec)	N/A	0.115	0.044	0.01	1.444	0.256	55.061	0.	14.

Problem 1949	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	61	60	96	99	337	0	76
normalized size	1	1.	0.74	0.73	1.17	1.21	4.11	0.	0.93
time (sec)	N/A	0.079	0.038	0.01	1.437	0.247	6.566	0.	6.546

Problem 1950	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	51	50	69	85	163	0	51
normalized size	1	1.	0.88	0.86	1.19	1.47	2.81	0.	0.88
time (sec)	N/A	0.039	0.034	0.007	1.443	0.234	5.475	0.	3.218

Problem 1951	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	42	38	39	45	70	105	0	37
normalized size	1	1.	0.9	0.93	1.07	1.67	2.5	0.	0.88
time (sec)	N/A	0.062	0.041	0.01	1.444	0.255	6.981	0.	4.581

Problem 1952	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	28	29	23	54	48	0	19
normalized size	1	1.	1.33	1.38	1.1	2.57	2.29	0.	0.9
time (sec)	N/A	0.03	0.014	0.004	1.439	0.244	9.496	0.	2.673

Problem 1953	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	97	77	0	1	740	0	58
normalized size	1	1.	1.43	1.13	0.	0.01	10.88	0.	0.85
time (sec)	N/A	0.108	0.124	0.01	0.	0.259	21.783	0.	10.765

Problem 1954	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	117	92	0	1	864	0	85
normalized size	1	1.	1.23	0.97	0.	0.01	9.09	0.	0.89
time (sec)	N/A	0.148	0.131	0.012	0.	0.262	35.235	0.	14.753

Problem 1955	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	22	12	28	31	0	14
normalized size	1	1.	1.	1.69	0.92	2.15	2.38	0.	1.08
time (sec)	N/A	0.016	0.019	0.005	1.435	0.233	3.36	0.	1.634

Problem 1956	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	23	22	12	35	48	0	14
normalized size	1	1.	1.77	1.69	0.92	2.69	3.69	0.	1.08
time (sec)	N/A	0.017	0.02	0.004	1.435	0.242	8.544	0.	1.67

Problem 1957	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	100	0	0	0	56	0	44
normalized size	1	1.	2.27	0.	0.	0.	1.27	0.	1.
time (sec)	N/A	0.07	0.112	0.024	0.	0.	76.22	0.	6.588

Problem 1958	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	58	0	0	0	48	0	44
normalized size	1	1.	1.32	0.	0.	0.	1.09	0.	1.
time (sec)	N/A	0.057	0.025	0.017	0.	0.	7.903	0.	6.31

Problem 1959	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	64	0	0	0	54	0	42
normalized size	1	1.	1.45	0.	0.	0.	1.23	0.	0.95
time (sec)	N/A	0.062	0.051	0.02	0.	0.	4.971	0.	6.415

Problem 1960	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	91	0	0	0	54	0	42
normalized size	1	1.	2.07	0.	0.	0.	1.23	0.	0.95
time (sec)	N/A	0.061	0.086	0.02	0.	0.	15.085	0.	6.282

Problem 1961	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	71	0	0	0	54	0	42
normalized size	1	1.	1.61	0.	0.	0.	1.23	0.	0.95
time (sec)	N/A	0.053	0.056	0.152	0.	0.	83.708	0.	6.775

Problem 1962	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	73	0	0	0	60	0	63
normalized size	1	1.	1.04	0.	0.	0.	0.86	0.	0.9
time (sec)	N/A	0.087	0.063	0.11	0.	0.	106.656	0.	11.658

Problem 1963	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	40	35	46	45	32	47	0
normalized size	1	1.	1.	0.88	1.15	1.12	0.8	1.18	0.
time (sec)	N/A	0.081	0.011	0.004	1.425	0.229	1.376	0.226	0.

Problem 1964	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	136	136	122	117	0	220	44	178	0
normalized size	1	1.	0.9	0.86	0.	1.62	0.32	1.31	0.
time (sec)	N/A	0.235	0.069	0.008	0.	0.239	1.351	0.231	0.

Problem 1965	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	132	132	120	115	0	163	37	174	0
normalized size	1	1.	0.91	0.87	0.	1.23	0.28	1.32	0.
time (sec)	N/A	0.202	0.04	0.004	0.	0.243	1.359	0.23	0.

Problem 1966	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	27	24	31	30	20	32	0
normalized size	1	1.	1.	0.89	1.15	1.11	0.74	1.19	0.
time (sec)	N/A	0.062	0.008	0.003	1.416	0.233	1.271	0.227	0.

Problem 1967	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	111	102	0	190	32	154	116
normalized size	1	1.	0.9	0.82	0.	1.53	0.26	1.24	0.94
time (sec)	N/A	0.166	0.034	0.004	0.	0.231	1.279	0.229	29.699

Problem 1968	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	119	119	108	99	0	157	22	150	112
normalized size	1	1.	0.91	0.83	0.	1.32	0.18	1.26	0.94
time (sec)	N/A	0.156	0.029	0.003	0.	0.232	1.272	0.224	29.52

Problem 1969	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	14	18	18	10	19	10
normalized size	1	1.	1.	0.93	1.2	1.2	0.67	1.27	0.67
time (sec)	N/A	0.02	0.005	0.003	1.424	0.221	0.323	0.232	3.687

Problem 1970	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	115	115	89	91	0	134	24	151	109
normalized size	1	1.	0.77	0.79	0.	1.17	0.21	1.31	0.95
time (sec)	N/A	0.131	0.022	0.004	0.	0.234	0.339	0.243	25.189

Problem 1971	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	115	115	89	91	0	120	20	151	109
normalized size	1	1.	0.77	0.79	0.	1.04	0.17	1.31	0.95
time (sec)	N/A	0.126	0.027	0.002	0.	0.231	0.366	0.226	25.61

Problem 1972	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	22	21	18	24	15	30	12
normalized size	1	1.	1.47	1.4	1.2	1.6	1.	2.	0.8
time (sec)	N/A	0.018	0.01	0.007	1.427	0.236	0.608	0.226	2.139

Problem 1973	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	114	99	0	171	29	163	114
normalized size	1	1.	0.93	0.81	0.	1.4	0.24	1.34	0.93
time (sec)	N/A	0.162	0.042	0.006	0.	0.229	1.34	0.227	29.775

Problem 1974	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	119	99	0	217	32	155	117
normalized size	1	1.	0.96	0.8	0.	1.75	0.26	1.25	0.94
time (sec)	N/A	0.159	0.038	0.005	0.	0.224	1.455	0.244	30.843

Problem 1975	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	35	32	45	45	31	57	34
normalized size	1	1.	1.	0.91	1.29	1.29	0.89	1.63	0.97
time (sec)	N/A	0.066	0.013	0.008	1.428	0.225	1.868	0.222	9.214

Problem 1976	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	49	51	72	95	53	73	0
normalized size	1	1.	0.88	0.91	1.29	1.7	0.95	1.3	0.
time (sec)	N/A	0.115	0.032	0.008	1.438	0.221	1.842	0.236	0.

Problem 1977	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	157	157	144	137	0	288	70	204	0
normalized size	1	1.	0.92	0.87	0.	1.83	0.45	1.3	0.
time (sec)	N/A	0.24	0.187	0.012	0.	0.228	1.929	0.245	0.

Problem 1978	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	155	155	140	133	0	232	65	198	0
normalized size	1	1.	0.9	0.86	0.	1.5	0.42	1.28	0.
time (sec)	N/A	0.225	0.171	0.011	0.	0.226	1.93	0.229	0.

Problem 1979	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	38	41	58	76	42	55	0
normalized size	1	1.	0.83	0.89	1.26	1.65	0.91	1.2	0.
time (sec)	N/A	0.093	0.028	0.008	1.427	0.233	1.745	0.23	0.

Problem 1980	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	146	146	131	120	0	248	58	178	138
normalized size	1	1.	0.9	0.82	0.	1.7	0.4	1.22	0.95
time (sec)	N/A	0.196	0.15	0.012	0.	0.234	1.828	0.229	35.246

Problem 1981	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	144	144	127	115	0	216	48	171	136
normalized size	1	1.	0.88	0.8	0.	1.5	0.33	1.19	0.94
time (sec)	N/A	0.186	0.147	0.013	0.	0.232	1.777	0.227	35.017

Problem 1982	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	27	30	43	47	29	43	26
normalized size	1	1.	0.82	0.91	1.3	1.42	0.88	1.3	0.79
time (sec)	N/A	0.072	0.016	0.007	1.436	0.221	1.565	0.231	10.071

Problem 1983	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	136	136	119	108	0	201	44	178	126
normalized size	1	1.	0.88	0.79	0.	1.48	0.32	1.31	0.93
time (sec)	N/A	0.167	0.153	0.01	0.	0.237	1.581	0.233	30.279

Problem 1984	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	134	134	118	106	0	184	39	176	121
normalized size	1	1.	0.88	0.79	0.	1.37	0.29	1.31	0.9
time (sec)	N/A	0.165	0.123	0.01	0.	0.231	1.554	0.233	30.739

Problem 1985	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	15	19	20	15	19	10
normalized size	1	1.	1.	0.94	1.19	1.25	0.94	1.19	0.62
time (sec)	N/A	0.019	0.009	0.002	1.435	0.221	1.389	0.234	2.128

Problem 1986	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	136	136	119	117	0	201	44	174	122
normalized size	1	1.	0.88	0.86	0.	1.48	0.32	1.28	0.9
time (sec)	N/A	0.168	0.125	0.005	0.	0.236	1.592	0.232	29.645

Problem 1987	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	134	134	118	115	0	182	39	171	124
normalized size	1	1.	0.88	0.86	0.	1.36	0.29	1.28	0.93
time (sec)	N/A	0.16	0.117	0.007	0.	0.238	1.644	0.234	28.664

Problem 1988	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	33	35	50	63	34	61	34
normalized size	1	1.	0.87	0.92	1.32	1.66	0.89	1.61	0.89
time (sec)	N/A	0.076	0.022	0.011	1.441	0.236	1.939	0.227	9.662

Problem 1989	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	95	3560	0	1	100	74	60
normalized size	1	1.	1.34	50.14	0.	0.01	1.41	1.04	0.85
time (sec)	N/A	0.117	0.111	0.362	0.	0.367	14.621	0.251	9.578

Problem 1990	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	67	3340	0	1	48	53	39
normalized size	1	1.	1.43	71.06	0.	0.02	1.02	1.13	0.83
time (sec)	N/A	0.083	0.072	0.037	0.	0.367	7.519	0.253	6.974

Problem 1991	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	75	3339	0	1	76	49	37
normalized size	1	1.	1.74	77.65	0.	0.02	1.77	1.14	0.86
time (sec)	N/A	0.077	0.047	0.042	0.	0.364	5.531	0.322	6.643

Problem 1992	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	29	19	38	46	19	15
normalized size	1	1.	1.	1.61	1.06	2.11	2.56	1.06	0.83
time (sec)	N/A	0.03	0.034	0.008	1.443	0.243	4.294	0.237	2.1

Problem 1993	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	42	39	41	57	313	39	34
normalized size	1	1.	1.11	1.03	1.08	1.5	8.24	1.03	0.89
time (sec)	N/A	0.068	0.03	0.009	1.44	0.236	7.914	0.237	6.97

Problem 1994	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	53	50	63	72	913	58	54
normalized size	1	1.	0.9	0.85	1.07	1.22	15.47	0.98	0.92
time (sec)	N/A	0.087	0.038	0.01	1.439	0.231	14.467	0.233	10.514

Problem 1995	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	64	61	86	86	2317	77	75
normalized size	1	1.	0.8	0.76	1.08	1.08	28.96	0.96	0.94
time (sec)	N/A	0.114	0.046	0.011	1.436	0.231	25.044	0.232	14.134

Problem 1996	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	291	291	207	2226	0	0	48	0	246
normalized size	1	1.	0.71	7.65	0.	0.	0.16	0.	0.85
time (sec)	N/A	0.468	0.723	0.039	0.	0.	7.313	0.	23.894

Problem 1997	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	267	267	196	2010	0	0	48	0	219
normalized size	1	1.	0.73	7.53	0.	0.	0.18	0.	0.82
time (sec)	N/A	0.372	0.656	0.036	0.	0.	4.49	0.	17.645

Problem 1998	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	242	242	162	1786	0	0	44	0	197
normalized size	1	1.	0.67	7.38	0.	0.	0.18	0.	0.81
time (sec)	N/A	0.258	0.956	0.037	0.	0.	2.992	0.	11.294

Problem 1999	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	243	243	164	1785	0	0	39	0	202
normalized size	1	1.	0.67	7.35	0.	0.	0.16	0.	0.83
time (sec)	N/A	0.254	1.439	0.041	0.	0.	3.094	0.	10.229

Problem 2000	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	267	267	192	2002	0	0	41	0	223
normalized size	1	1.	0.72	7.5	0.	0.	0.15	0.	0.84
time (sec)	N/A	0.359	0.79	0.045	0.	0.	4.621	0.	17.833

Problem 2001	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	291	291	203	2222	0	0	41	0	246
normalized size	1	1.	0.7	7.64	0.	0.	0.14	0.	0.85
time (sec)	N/A	0.438	0.575	0.053	0.	0.	7.474	0.	23.955

Problem 2002	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	563	563	375	2799	0	0	48	0	473
normalized size	1	1.	0.67	4.97	0.	0.	0.09	0.	0.84
time (sec)	N/A	0.904	1.879	0.037	0.	0.	6.289	0.	56.59

Problem 2003	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	539	539	359	2579	0	0	48	0	445
normalized size	1	1.	0.67	4.78	0.	0.	0.09	0.	0.83
time (sec)	N/A	0.773	1.408	0.037	0.	0.	3.69	0.	46.211

Problem 2004	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	507	507	351	2864	0	0	42	0	418
normalized size	1	1.	0.69	5.65	0.	0.	0.08	0.	0.82
time (sec)	N/A	0.648	1.344	0.037	0.	0.	2.791	0.	34.355

Problem 2005	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	517	517	366	3309	0	0	41	0	430
normalized size	1	1.	0.71	6.4	0.	0.	0.08	0.	0.83
time (sec)	N/A	0.66	1.952	0.049	0.	0.	3.416	0.	35.472

Problem 2006	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	541	541	377	3556	0	0	41	0	452
normalized size	1	1.	0.7	6.57	0.	0.	0.08	0.	0.84
time (sec)	N/A	0.797	1.781	0.049	0.	0.	5.363	0.	45.748

Problem 2007	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	565	565	388	3788	0	0	41	0	476
normalized size	1	1.	0.69	6.7	0.	0.	0.07	0.	0.84
time (sec)	N/A	0.938	1.827	0.05	0.	0.	9.063	0.	56.818

Problem 2008	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	81	3569	0	1	76	69	58
normalized size	1	1.	1.19	52.49	0.	0.01	1.12	1.01	0.85
time (sec)	N/A	0.113	0.147	0.019	0.	0.372	18.638	0.251	9.612

Problem 2009	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	71	3559	0	1	100	72	49
normalized size	1	1.	1.22	61.36	0.	0.02	1.72	1.24	0.84
time (sec)	N/A	0.106	0.094	0.025	0.	0.377	12.098	0.262	8.87

Problem 2010	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	86	3535	0	1	83	68	53
normalized size	1	1.	1.46	59.92	0.	0.02	1.41	1.15	0.9
time (sec)	N/A	0.103	0.082	0.049	0.	0.365	8.922	0.321	8.56

Problem 2011	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	30	29	19	53	71	19	15
normalized size	1	1.	1.67	1.61	1.06	2.94	3.94	1.06	0.83
time (sec)	N/A	0.029	0.03	0.008	1.491	0.236	6.103	0.233	2.1

Problem 2012	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	40	39	41	72	371	105	34
normalized size	1	1.	1.05	1.03	1.08	1.89	9.76	2.76	0.89
time (sec)	N/A	0.068	0.039	0.007	1.445	0.236	10.787	0.242	7.021

Problem 2013	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	51	50	63	86	1001	143	54
normalized size	1	1.	0.86	0.85	1.07	1.46	16.97	2.42	0.92
time (sec)	N/A	0.095	0.046	0.009	1.426	0.239	19.33	0.246	10.574

Problem 2014	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	62	61	86	101	2317	181	75
normalized size	1	1.	0.78	0.76	1.08	1.26	28.96	2.26	0.94
time (sec)	N/A	0.12	0.054	0.01	1.418	0.241	33.072	0.242	14.266

Problem 2015	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	97	3567	0	1	102	134	63
normalized size	1	1.	1.31	48.2	0.	0.01	1.38	1.81	0.85
time (sec)	N/A	0.119	0.072	0.043	0.	0.369	15.302	0.256	9.883

Problem 2016	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	81	3347	0	1	49	90	41
normalized size	1	1.	1.62	66.94	0.	0.02	0.98	1.8	0.82
time (sec)	N/A	0.084	0.056	0.018	0.	0.372	8.217	0.246	7.046

Problem 2017	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	C	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	59	480	0	1	24	0	24
normalized size	1	1.	2.19	17.78	0.	0.04	0.89	0.	0.89
time (sec)	N/A	0.058	0.04	0.016	0.	0.369	4.492	0.	5.143

Problem 2018	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	29	19	24	29	19	15
normalized size	1	1.	1.	1.61	1.06	1.33	1.61	1.06	0.83
time (sec)	N/A	0.03	0.021	0.007	1.423	0.241	6.284	0.225	2.119

Problem 2019	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	31	39	41	42	255	0	34
normalized size	1	1.	0.82	1.03	1.08	1.11	6.71	0.	0.89
time (sec)	N/A	0.066	0.038	0.009	1.415	0.242	9.116	0.	6.99

Problem 2020	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	42	50	63	57	824	0	54
normalized size	1	1.	0.71	0.85	1.07	0.97	13.97	0.	0.92
time (sec)	N/A	0.084	0.046	0.01	1.462	0.245	16.559	0.	10.509

Problem 2021	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	53	61	86	72	2183	0	75
normalized size	1	1.	0.66	0.76	1.08	0.9	27.29	0.	0.94
time (sec)	N/A	0.114	0.056	0.009	1.438	0.245	28.733	0.	14.196

Problem 2022	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	294	294	199	2233	0	0	46	0	250
normalized size	1	1.	0.68	7.6	0.	0.	0.16	0.	0.85
time (sec)	N/A	0.457	0.578	0.042	0.	0.	6.376	0.	24.079

Problem 2023	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	270	270	188	2017	0	0	46	0	226
normalized size	1	1.	0.7	7.47	0.	0.	0.17	0.	0.84
time (sec)	N/A	0.368	0.38	0.018	0.	0.	3.731	0.	17.904

Problem 2024	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	248	248	174	1793	0	0	42	0	201
normalized size	1	1.	0.7	7.23	0.	0.	0.17	0.	0.81
time (sec)	N/A	0.264	0.392	0.015	0.	0.	2.814	0.	12.051

Problem 2025	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	221	221	142	437	0	0	37	0	185
normalized size	1	1.	0.64	1.98	0.	0.	0.17	0.	0.84
time (sec)	N/A	0.192	0.21	0.021	0.	0.	3.322	0.	6.87

Problem 2026	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	246	246	170	1795	0	0	39	0	202
normalized size	1	1.	0.69	7.3	0.	0.	0.16	0.	0.82
time (sec)	N/A	0.282	0.492	0.02	0.	0.	5.428	0.	12.293

Problem 2027	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	270	270	184	2009	0	0	39	0	226
normalized size	1	1.	0.68	7.44	0.	0.	0.14	0.	0.84
time (sec)	N/A	0.355	0.561	0.025	0.	0.	9.093	0.	18.201

Problem 2028	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	566	566	372	2806	0	0	46	0	476
normalized size	1	1.	0.66	4.96	0.	0.	0.08	0.	0.84
time (sec)	N/A	0.896	1.716	0.043	0.	0.	5.46	0.	57.619

Problem 2029	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	542	542	356	2586	0	0	46	0	452
normalized size	1	1.	0.66	4.77	0.	0.	0.08	0.	0.83
time (sec)	N/A	0.809	1.432	0.019	0.	0.	3.369	0.	46.392

Problem 2030	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	513	513	334	2374	0	0	41	0	420
normalized size	1	1.	0.65	4.63	0.	0.	0.08	0.	0.82
time (sec)	N/A	0.643	1.415	0.014	0.	0.	2.794	0.	34.764

Problem 2031	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	491	491	335	2860	0	0	39	0	406
normalized size	1	1.	0.68	5.82	0.	0.	0.08	0.	0.83
time (sec)	N/A	0.558	1.265	0.022	0.	0.	3.754	0.	26.836

Problem 2032	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	520	520	363	3300	0	0	39	0	432
normalized size	1	1.	0.7	6.35	0.	0.	0.08	0.	0.83
time (sec)	N/A	0.673	1.73	0.027	0.	0.	6.395	0.	36.435

Problem 2033	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	544	544	377	3547	0	0	39	0	456
normalized size	1	1.	0.69	6.52	0.	0.	0.07	0.	0.84
time (sec)	N/A	0.812	1.773	0.028	0.	0.	10.962	0.	46.34

Problem 2034	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	568	568	387	3779	0	0	39	0	479
normalized size	1	1.	0.68	6.65	0.	0.	0.07	0.	0.84
time (sec)	N/A	0.945	1.889	0.029	0.	0.	18.826	0.	57.74

Problem 2035	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	97	3910	0	1	110	158	88
normalized size	1	1.	1.02	41.16	0.	0.01	1.16	1.66	0.93
time (sec)	N/A	0.159	0.092	0.058	0.	0.402	20.402	0.283	13.251

Problem 2036	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	83	3664	0	1	73	131	58
normalized size	1	1.	1.26	55.52	0.	0.02	1.11	1.98	0.88
time (sec)	N/A	0.115	0.061	0.024	0.	0.383	11.941	0.281	9.717

Problem 2037	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	73	3438	0	1	187	0	39
normalized size	1	1.	1.59	74.74	0.	0.02	4.07	0.	0.85
time (sec)	N/A	0.083	0.05	0.023	0.	0.375	7.442	0.	7.105

Problem 2038	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	29	19	41	27	0	14
normalized size	1	1.	1.	1.61	1.06	2.28	1.5	0.	0.78
time (sec)	N/A	0.03	0.02	0.01	1.437	0.252	10.975	0.	2.125

Problem 2039	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	29	37	41	50	51	0	36
normalized size	1	1.	0.76	0.97	1.08	1.32	1.34	0.	0.95
time (sec)	N/A	0.07	0.028	0.007	1.446	0.241	21.116	0.	7.002

Problem 2040	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	42	50	63	73	466	0	54
normalized size	1	1.	0.71	0.85	1.07	1.24	7.9	0.	0.92
time (sec)	N/A	0.096	0.042	0.009	1.442	0.241	25.015	0.	10.478

Problem 2041	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	78	78	51	59	86	85	2048	0	73
normalized size	1	1.	0.65	0.76	1.1	1.09	26.26	0.	0.94
time (sec)	N/A	0.118	0.054	0.01	1.438	0.247	57.37	0.	14.017

Problem 2042	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	315	315	199	2540	0	0	46	0	272
normalized size	1	1.	0.63	8.06	0.	0.	0.15	0.	0.86
time (sec)	N/A	0.538	0.59	0.053	0.	0.	7.158	0.	31.079

Problem 2043	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	291	291	188	2302	0	0	46	0	248
normalized size	1	1.	0.65	7.91	0.	0.	0.16	0.	0.85
time (sec)	N/A	0.457	0.448	0.023	0.	0.	4.082	0.	23.98

Problem 2044	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	269	269	175	2052	0	0	42	0	226
normalized size	1	1.	0.65	7.63	0.	0.	0.16	0.	0.84
time (sec)	N/A	0.347	0.487	0.022	0.	0.	3.672	0.	17.654

Problem 2045	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	248	248	164	1822	0	0	37	0	204
normalized size	1	1.	0.66	7.35	0.	0.	0.15	0.	0.82
time (sec)	N/A	0.282	0.346	0.016	0.	0.	5.04	0.	10.703

Problem 2046	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	245	245	161	1825	0	0	39	0	201
normalized size	1	1.	0.66	7.45	0.	0.	0.16	0.	0.82
time (sec)	N/A	0.276	0.352	0.025	0.	0.	8.56	0.	12.213

Problem 2047	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	267	267	173	2056	0	0	39	0	223
normalized size	1	1.	0.65	7.7	0.	0.	0.15	0.	0.84
time (sec)	N/A	0.356	0.401	0.028	0.	0.	15.198	0.	18.066

Problem 2048	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	587	587	390	3182	0	0	46	0	498
normalized size	1	1.	0.66	5.42	0.	0.	0.08	0.	0.85
time (sec)	N/A	1.056	1.848	0.055	0.	0.	6.003	0.	69.095

Problem 2049	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	563	563	370	2936	0	0	46	0	474
normalized size	1	1.	0.66	5.21	0.	0.	0.08	0.	0.84
time (sec)	N/A	0.943	1.766	0.025	0.	0.	3.639	0.	57.306

Problem 2050	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	539	539	353	2700	0	0	41	0	450
normalized size	1	1.	0.65	5.01	0.	0.	0.08	0.	0.83
time (sec)	N/A	0.77	1.479	0.021	0.	0.	3.581	0.	45.377

Problem 2051	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	520	520	352	2703	0	0	39	0	430
normalized size	1	1.	0.68	5.2	0.	0.	0.08	0.	0.83
time (sec)	N/A	0.662	1.441	0.017	0.	0.	6.031	0.	36.462

Problem 2052	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	517	517	362	2867	0	0	39	0	430
normalized size	1	1.	0.7	5.55	0.	0.	0.08	0.	0.83
time (sec)	N/A	0.684	1.707	0.026	0.	0.	10.215	0.	36.233

Problem 2053	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	541	541	380	3307	0	0	39	0	452
normalized size	1	1.	0.7	6.11	0.	0.	0.07	0.	0.84
time (sec)	N/A	0.805	1.897	0.029	0.	0.	18.216	0.	47.08

Problem 2054	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	565	565	400	3554	0	0	39	0	476
normalized size	1	1.	0.71	6.29	0.	0.	0.07	0.	0.84
time (sec)	N/A	0.95	1.924	0.032	0.	0.	31.677	0.	57.637

Problem 2055	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	190	190	173	133	0	136	22	232	175
normalized size	1	1.	0.91	0.7	0.	0.72	0.12	1.22	0.92
time (sec)	N/A	0.317	0.085	0.011	0.	0.246	1.313	0.236	52.862

Problem 2056	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	64	68	0	1	44	55	39
normalized size	1	1.	1.36	1.45	0.	0.02	0.94	1.17	0.83
time (sec)	N/A	0.087	0.068	0.024	0.	0.255	8.701	0.233	6.949

Problem 2057	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	66	65	0	1	66	49	41
normalized size	1	1.	1.35	1.33	0.	0.02	1.35	1.	0.84
time (sec)	N/A	0.107	0.091	0.017	0.	0.247	6.19	0.227	8.448

Problem 2058	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	71	80	0	1	66	49	34
normalized size	1	1.	1.65	1.86	0.	0.02	1.53	1.14	0.79
time (sec)	N/A	0.081	0.056	0.017	0.	0.255	5.845	0.232	6.694

Problem 2059	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	60	90	0	1	46	58	44
normalized size	1	1.	1.2	1.8	0.	0.02	0.92	1.16	0.88
time (sec)	N/A	0.099	0.084	0.018	0.	0.258	8.017	0.232	6.815

Problem 2060	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	107	107	93	130	0	0	44	0	94
normalized size	1	1.	0.87	1.21	0.	0.	0.41	0.	0.88
time (sec)	N/A	0.137	0.303	0.052	0.	0.	3.797	0.	8.715

Problem 2061	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	224	224	119	201	0	0	42	0	201
normalized size	1	1.	0.53	0.9	0.	0.	0.19	0.	0.9
time (sec)	N/A	0.289	0.73	0.021	0.	0.	3.065	0.	23.102

Problem 2062	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	107	107	96	132	0	0	39	0	94
normalized size	1	1.	0.9	1.23	0.	0.	0.36	0.	0.88
time (sec)	N/A	0.122	0.291	0.023	0.	0.	3.427	0.	7.219

Problem 2063	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	236	236	138	234	0	0	41	0	211
normalized size	1	1.	0.58	0.99	0.	0.	0.17	0.	0.89
time (sec)	N/A	0.309	0.83	0.026	0.	0.	4.697	0.	24.314

Problem 2064	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	80	82	0	1	95	105	56
normalized size	1	1.	1.27	1.3	0.	0.02	1.51	1.67	0.89
time (sec)	N/A	0.11	0.098	0.028	0.	0.255	14.617	0.246	8.871

Problem 2065	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	79	85	0	1	95	77	63
normalized size	1	1.	1.14	1.23	0.	0.01	1.38	1.12	0.91
time (sec)	N/A	0.139	0.113	0.026	0.	0.25	12.241	0.224	9.635

Problem 2066	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	82	79	0	1	80	68	48
normalized size	1	1.	1.39	1.34	0.	0.02	1.36	1.15	0.81
time (sec)	N/A	0.103	0.088	0.028	0.	0.255	9.805	0.239	8.637

Problem 2067	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	70	93	0	1	75	82	66
normalized size	1	1.	0.99	1.31	0.	0.01	1.06	1.15	0.93
time (sec)	N/A	0.132	0.141	0.028	0.	0.252	13.076	0.234	8.356

Problem 2068	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	128	138	0	0	44	0	112
normalized size	1	1.	1.02	1.1	0.	0.	0.35	0.	0.89
time (sec)	N/A	0.165	0.173	0.024	0.	0.	7.783	0.	10.64

Problem 2069	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	250	250	196	228	0	0	42	0	228
normalized size	1	1.	0.78	0.91	0.	0.	0.17	0.	0.91
time (sec)	N/A	0.358	0.307	0.023	0.	0.	5.683	0.	28.238

Problem 2070	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	135	157	0	0	39	0	112
normalized size	1	1.	1.07	1.25	0.	0.	0.31	0.	0.89
time (sec)	N/A	0.153	0.193	0.028	0.	0.	5.596	0.	9.157

Problem 2071	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	257	257	213	257	0	0	41	0	233
normalized size	1	1.	0.83	1.	0.	0.	0.16	0.	0.91
time (sec)	N/A	0.374	0.34	0.031	0.	0.	6.927	0.	29.846

Problem 2072	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	95	103	0	1	112	192	73
normalized size	1	1.	1.19	1.29	0.	0.01	1.4	2.4	0.91
time (sec)	N/A	0.137	0.118	0.029	0.	0.262	26.164	0.243	10.98

Problem 2073	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	91	91	94	108	0	1	124	103	85
normalized size	1	1.	1.03	1.19	0.	0.01	1.36	1.13	0.93
time (sec)	N/A	0.18	0.132	0.027	0.	0.254	22.264	0.232	11.541

Problem 2074	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	81	99	0	1	107	86	63
normalized size	1	1.	1.05	1.29	0.	0.01	1.39	1.12	0.82
time (sec)	N/A	0.133	0.137	0.028	0.	0.265	19.171	0.236	10.997

Problem 2075	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	81	113	0	1	102	101	87
normalized size	1	1.	0.88	1.23	0.	0.01	1.11	1.1	0.95
time (sec)	N/A	0.166	0.171	0.031	0.	0.253	22.029	0.233	10.087

Problem 2076	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	146	146	149	181	0	0	44	0	131
normalized size	1	1.	1.02	1.24	0.	0.	0.3	0.	0.9
time (sec)	N/A	0.199	0.238	0.027	0.	0.	15.665	0.	12.695

Problem 2077	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	272	272	207	250	0	0	42	0	250
normalized size	1	1.	0.76	0.92	0.	0.	0.15	0.	0.92
time (sec)	N/A	0.447	0.334	0.028	0.	0.	10.848	0.	33.966

Problem 2078	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	147	147	148	180	0	0	39	0	131
normalized size	1	1.	1.01	1.22	0.	0.	0.27	0.	0.89
time (sec)	N/A	0.189	0.241	0.031	0.	0.	10.987	0.	11.428

Problem 2079	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	278	278	223	279	0	0	41	0	253
normalized size	1	1.	0.8	1.	0.	0.	0.15	0.	0.91
time (sec)	N/A	0.445	0.42	0.034	0.	0.	11.081	0.	35.992

Problem 2080	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	78	70	0	1	46	90	41
normalized size	1	1.	1.56	1.4	0.	0.02	0.92	1.8	0.82
time (sec)	N/A	0.094	0.062	0.02	0.	0.254	9.007	0.257	6.991

Problem 2081	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	29	23	28	19	0	15
normalized size	1	1.	1.	1.38	1.1	1.33	0.9	0.	0.71
time (sec)	N/A	0.025	0.019	0.01	1.436	0.237	2.55	0.	2.546

Problem 2082	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	55	49	0	1	20	0	22
normalized size	1	1.	2.04	1.81	0.	0.04	0.74	0.	0.81
time (sec)	N/A	0.061	0.031	0.013	0.	0.252	4.956	0.	5.156

Problem 2083	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	52	52	0	1	22	0	27
normalized size	1	1.	1.73	1.73	0.	0.03	0.73	0.	0.9
time (sec)	N/A	0.075	0.077	0.017	0.	0.255	6.209	0.	5.998

Problem 2084	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	110	110	113	124	0	0	42	0	95
normalized size	1	1.	1.03	1.13	0.	0.	0.38	0.	0.86
time (sec)	N/A	0.141	0.129	0.016	0.	0.	3.427	0.	9.186

Problem 2085	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	231	231	107	113	0	0	41	0	202
normalized size	1	1.	0.46	0.49	0.	0.	0.18	0.	0.87
time (sec)	N/A	0.297	0.095	0.014	0.	0.	3.056	0.	23.509

Problem 2086	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	77	86	0	0	37	0	80
normalized size	1	1.	0.88	0.98	0.	0.	0.42	0.	0.91
time (sec)	N/A	0.092	0.058	0.012	0.	0.	3.758	0.	5.614

Problem 2087	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	212	212	173	198	0	0	39	0	187
normalized size	1	1.	0.82	0.93	0.	0.	0.18	0.	0.88
time (sec)	N/A	0.255	0.223	0.02	0.	0.	5.475	0.	19.492

Problem 2088	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	80	80	0	1	75	131	63
normalized size	1	1.	1.13	1.13	0.	0.01	1.06	1.85	0.89
time (sec)	N/A	0.122	0.058	0.022	0.	0.256	12.434	0.313	9.795

Problem 2089	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	30	38	49	57	42	0	32
normalized size	1	1.	0.75	0.95	1.22	1.42	1.05	0.	0.8
time (sec)	N/A	0.051	0.028	0.01	1.419	0.24	3.88	0.	4.344

Problem 2090	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	70	67	0	1	187	0	37
normalized size	1	1.	1.52	1.46	0.	0.02	4.07	0.	0.8
time (sec)	N/A	0.088	0.04	0.02	0.	0.26	8.51	0.	7.128

Problem 2091	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	29	23	42	22	0	19
normalized size	1	1.	1.	1.38	1.1	2.	1.05	0.	0.9
time (sec)	N/A	0.032	0.01	0.007	1.429	0.236	6.776	0.	2.677

Problem 2092	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	131	131	116	133	0	0	42	0	117
normalized size	1	1.	0.89	1.02	0.	0.	0.32	0.	0.89
time (sec)	N/A	0.187	0.135	0.027	0.	0.	4.113	0.	12.876

Problem 2093	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	258	258	166	187	0	0	41	0	233
normalized size	1	1.	0.64	0.72	0.	0.	0.16	0.	0.9
time (sec)	N/A	0.366	0.172	0.018	0.	0.	4.188	0.	29.907

Problem 2094	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	110	110	105	113	0	0	37	0	97
normalized size	1	1.	0.95	1.03	0.	0.	0.34	0.	0.88
time (sec)	N/A	0.127	0.139	0.02	0.	0.	6.01	0.	7.479

Problem 2095	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	241	241	166	187	0	0	39	0	211
normalized size	1	1.	0.69	0.78	0.	0.	0.16	0.	0.88
time (sec)	N/A	0.32	0.178	0.021	0.	0.	8.596	0.	25.218

Problem 2096	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	101	282	0	1	819	151	83
normalized size	1	1.	1.1	3.07	0.	0.01	8.9	1.64	0.9
time (sec)	N/A	0.154	0.087	0.08	0.	0.262	20.948	0.279	12.981

Problem 2097	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	64	64	51	50	73	88	163	0	56
normalized size	1	1.	0.8	0.78	1.14	1.38	2.55	0.	0.88
time (sec)	N/A	0.08	0.036	0.012	1.444	0.241	7.893	0.	6.74

Problem 2098	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	64	64	90	221	0	1	743	0	54
normalized size	1	1.	1.41	3.45	0.	0.02	11.61	0.	0.84
time (sec)	N/A	0.116	0.068	0.036	0.	0.261	15.439	0.	9.738

Problem 2099	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	40	39	45	73	105	0	39
normalized size	1	1.	0.91	0.89	1.02	1.66	2.39	0.	0.89
time (sec)	N/A	0.066	0.03	0.01	1.465	0.245	12.607	0.	4.395

Problem 2100	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	152	152	118	304	0	0	42	0	138
normalized size	1	1.	0.78	2.	0.	0.	0.28	0.	0.91
time (sec)	N/A	0.236	0.379	0.031	0.	0.	7.394	0.	17.04

Problem 2101	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	277	277	153	503	0	0	41	0	252
normalized size	1	1.	0.55	1.82	0.	0.	0.15	0.	0.91
time (sec)	N/A	0.433	0.408	0.03	0.	0.	7.199	0.	36.458

Problem 2102	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	131	131	107	279	0	0	37	0	117
normalized size	1	1.	0.82	2.13	0.	0.	0.28	0.	0.89
time (sec)	N/A	0.163	0.307	0.031	0.	0.	10.299	0.	10.007

Problem 2103	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	262	262	155	503	0	0	39	0	233
normalized size	1	1.	0.59	1.92	0.	0.	0.15	0.	0.89
time (sec)	N/A	0.391	0.416	0.03	0.	0.	15.453	0.	31.473

Problem 2104	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	F(-2)	A	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	310	310	267	911	441	0	22	362	0
normalized size	1	1.	0.86	2.94	1.42	0.	0.07	1.17	0.
time (sec)	N/A	1.422	0.37	0.089	1.598	0.	1.334	0.227	0.

Problem 2105	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	A	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	0	0	0	1	24	0	24
normalized size	1	1.	0.	0.	0.	0.04	0.89	0.	0.89
time (sec)	N/A	0.062	0.052	0.053	0.	0.725	5.474	0.	5.123

Problem 2106	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	A	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	0	0	0	1	60	0	26
normalized size	1	1.	0.	0.	0.	0.03	2.07	0.	0.9
time (sec)	N/A	0.067	0.066	0.052	0.	0.737	5.717	0.	5.582

Problem 2107	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	220	220	182	167	0	389	22	243	0
normalized size	1	1.	0.83	0.76	0.	1.77	0.1	1.1	0.
time (sec)	N/A	0.988	0.092	0.089	0.	0.253	1.341	0.218	0.

Problem 2108	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	272	272	367	34	0	478	22	586	250
normalized size	1	1.	1.35	0.12	0.	1.76	0.08	2.15	0.92
time (sec)	N/A	0.609	0.407	0.023	0.	0.253	1.457	0.227	102.358

Problem 2109	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	14	224	18	15	18	15
normalized size	1	1.	1.	0.74	11.79	0.95	0.79	0.95	0.79
time (sec)	N/A	0.017	0.006	0.001	1.44	0.229	2.28	0.213	2.78

Problem 2110	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	14	178	18	15	18	15
normalized size	1	1.	1.	0.74	9.37	0.95	0.79	0.95	0.79
time (sec)	N/A	0.016	0.006	0.002	1.445	0.233	1.685	0.216	2.811

Problem 2111	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	14	132	18	15	18	15
normalized size	1	1.	1.	0.74	6.95	0.95	0.79	0.95	0.79
time (sec)	N/A	0.016	0.005	0.002	1.447	0.236	1.466	0.216	2.785

Problem 2112	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	14	86	18	15	18	0
normalized size	1	1.	1.	0.74	4.53	0.95	0.79	0.95	0.
time (sec)	N/A	0.016	0.005	0.002	1.436	0.231	1.18	0.214	0.

Problem 2113	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	11	14	14	12	14	0
normalized size	1	1.	1.	0.79	1.	1.	0.86	1.	0.
time (sec)	N/A	0.011	0.003	0.002	1.429	0.242	0.064	0.214	0.

Problem 2114	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	12	15	19	12	16	12
normalized size	1	1.	1.	0.92	1.15	1.46	0.92	1.23	0.92
time (sec)	N/A	0.014	0.008	0.004	1.441	0.237	0.453	0.215	2.761

Problem 2115	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	14	18	18	12	18	12
normalized size	1	1.	1.	0.93	1.2	1.2	0.8	1.2	0.8
time (sec)	N/A	0.016	0.006	0.002	1.437	0.233	1.558	0.217	2.813

Problem 2116	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	14	20	20	17	20	17
normalized size	1	1.	1.	0.74	1.05	1.05	0.89	1.05	0.89
time (sec)	N/A	0.016	0.007	0.003	1.441	0.237	2.105	0.214	2.834

Problem 2117	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	14	20	20	17	20	17
normalized size	1	1.	1.	0.74	1.05	1.05	0.89	1.05	0.89
time (sec)	N/A	0.017	0.007	0.003	1.435	0.239	3.077	0.215	2.818

Problem 2118	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	28	25	224	32	27	32	27
normalized size	1	1.	0.88	0.78	7.	1.	0.84	1.	0.84
time (sec)	N/A	0.072	0.013	0.002	1.451	0.233	4.023	0.216	9.497

Problem 2119	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	32	25	178	32	27	32	27
normalized size	1	1.	1.	0.78	5.56	1.	0.84	1.	0.84
time (sec)	N/A	0.067	0.008	0.004	1.445	0.231	2.173	0.216	8.673

Problem 2120	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	28	25	132	32	27	32	27
normalized size	1	1.	0.88	0.78	4.12	1.	0.84	1.	0.84
time (sec)	N/A	0.059	0.013	0.001	1.441	0.236	1.151	0.216	7.914

Problem 2121	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	28	25	86	32	27	32	27
normalized size	1	1.	0.88	0.78	2.69	1.	0.84	1.	0.84
time (sec)	N/A	0.055	0.012	0.002	1.442	0.231	1.271	0.216	7.148

Problem 2122	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	27	22	28	28	24	28	0
normalized size	1	1.	1.	0.81	1.04	1.04	0.89	1.04	0.
time (sec)	N/A	0.044	0.008	0.002	1.438	0.231	0.354	0.216	0.

Problem 2123	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	20	26	30	20	27	0
normalized size	1	1.	1.	0.95	1.24	1.43	0.95	1.29	0.
time (sec)	N/A	0.038	0.01	0.002	1.452	0.236	0.474	0.218	0.

Problem 2124	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	23	23	31	36	20	32	26
normalized size	1	1.	0.96	0.96	1.29	1.5	0.83	1.33	1.08
time (sec)	N/A	0.041	0.022	0.003	1.44	0.234	1.609	0.216	6.143

Problem 2125	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	25	32	32	26	32	26
normalized size	1	1.	1.	0.83	1.07	1.07	0.87	1.07	0.87
time (sec)	N/A	0.043	0.011	0.003	1.415	0.232	2.164	0.221	6.334

Problem 2126	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	28	25	32	32	29	32	29
normalized size	1	1.	0.88	0.78	1.	1.	0.91	1.	0.91
time (sec)	N/A	0.043	0.013	0.001	1.426	0.234	3.247	0.218	6.489

Problem 2127	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	28	25	32	32	29	32	29
normalized size	1	1.	0.88	0.78	1.	1.	0.91	1.	0.91
time (sec)	N/A	0.043	0.011	0.002	1.418	0.237	4.883	0.215	6.496

Problem 2128	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	47	36	224	55	42	47	42
normalized size	1	1.	1.	0.77	4.77	1.17	0.89	1.	0.89
time (sec)	N/A	0.08	0.01	0.002	1.441	0.232	3.346	0.215	11.723

Problem 2129	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	47	36	178	55	44	47	44
normalized size	1	1.	1.	0.77	3.79	1.17	0.94	1.	0.94
time (sec)	N/A	0.074	0.011	0.002	1.45	0.245	2.425	0.213	10.786

Problem 2130	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	47	36	132	55	44	47	44
normalized size	1	1.	1.	0.77	2.81	1.17	0.94	1.	0.94
time (sec)	N/A	0.07	0.011	0.003	1.426	0.233	1.838	0.215	10.005

Problem 2131	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	44	35	86	54	41	46	41
normalized size	1	1.	1.	0.8	1.95	1.23	0.93	1.05	0.93
time (sec)	N/A	0.064	0.011	0.002	1.428	0.233	1.439	0.217	9.171

Problem 2132	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	40	33	43	47	39	43	32
normalized size	1	1.	1.05	0.87	1.13	1.24	1.03	1.13	0.84
time (sec)	N/A	0.045	0.009	0.002	1.421	0.233	1.215	0.215	6.779

Problem 2133	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	37	37	37	32	42	46	37	43	0
normalized size	1	1.	1.	0.86	1.14	1.24	1.	1.16	0.
time (sec)	N/A	0.049	0.015	0.003	1.43	0.236	0.665	0.217	0.

Problem 2134	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	39	35	47	51	36	49	0
normalized size	1	1.	1.03	0.92	1.24	1.34	0.95	1.29	0.
time (sec)	N/A	0.053	0.03	0.003	1.432	0.234	1.686	0.222	0.

Problem 2135	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	41	36	45	43	39	45	17
normalized size	1	1.	1.95	1.71	2.14	2.05	1.86	2.14	0.81
time (sec)	N/A	0.016	0.016	0.003	1.48	0.239	2.288	0.22	2.707

Problem 2136	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	41	36	47	49	46	47	46
normalized size	1	1.	0.87	0.77	1.	1.04	0.98	1.	0.98
time (sec)	N/A	0.056	0.015	0.001	1.421	0.234	3.353	0.214	8.446

Problem 2137	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	41	36	47	49	42	47	42
normalized size	1	1.	0.91	0.8	1.04	1.09	0.93	1.04	0.93
time (sec)	N/A	0.055	0.016	0.003	1.44	0.242	5.045	0.216	8.588

Problem 2138	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	41	36	47	49	46	47	46
normalized size	1	1.	0.87	0.77	1.	1.04	0.98	1.	0.98
time (sec)	N/A	0.055	0.016	0.003	1.533	0.234	7.582	0.217	8.571

Problem 2139	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	75	58	224	85	73	77	73
normalized size	1	1.	1.	0.77	2.99	1.13	0.97	1.03	0.97
time (sec)	N/A	0.114	0.015	0.004	1.43	0.23	4.735	0.214	17.154

Problem 2140	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	73	73	73	58	178	85	71	77	71
normalized size	1	1.	1.	0.79	2.44	1.16	0.97	1.05	0.97
time (sec)	N/A	0.104	0.014	0.003	1.447	0.232	3.418	0.216	16.011

Problem 2141	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	72	72	72	57	132	84	70	76	70
normalized size	1	1.	1.	0.79	1.83	1.17	0.97	1.06	0.97
time (sec)	N/A	0.101	0.014	0.003	1.435	0.235	2.485	0.222	15.195

Problem 2142	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	73	58	86	85	71	77	71
normalized size	1	1.	0.91	0.72	1.08	1.06	0.89	0.96	0.89
time (sec)	N/A	0.101	0.014	0.003	1.547	0.237	1.653	0.22	14.231

Problem 2143	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	66	55	73	78	66	73	32
normalized size	1	1.	1.74	1.45	1.92	2.05	1.74	1.92	0.84
time (sec)	N/A	0.045	0.013	0.003	1.44	0.229	1.432	0.214	8.072

Problem 2144	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	65	65	54	72	77	66	73	0
normalized size	1	1.	1.	0.83	1.11	1.18	1.02	1.12	0.
time (sec)	N/A	0.078	0.019	0.003	1.451	0.236	1.315	0.215	0.

Problem 2145	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	62	55	74	82	61	76	0
normalized size	1	1.	1.	0.89	1.19	1.32	0.98	1.23	0.
time (sec)	N/A	0.088	0.039	0.003	1.445	0.236	2.069	0.219	0.

Problem 2146	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	67	57	77	84	65	78	0
normalized size	1	1.	1.02	0.86	1.17	1.27	0.98	1.18	0.
time (sec)	N/A	0.084	0.039	0.005	1.44	0.232	2.437	0.219	0.

Problem 2147	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	63	58	74	76	66	74	17
normalized size	1	1.	3.	2.76	3.52	3.62	3.14	3.52	0.81
time (sec)	N/A	0.017	0.02	0.004	1.437	0.236	3.428	0.213	2.667

Problem 2148	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	65	58	77	78	73	77	73
normalized size	1	1.	0.93	0.83	1.1	1.11	1.04	1.1	1.04
time (sec)	N/A	0.076	0.022	0.003	1.442	0.234	5.32	0.214	13.593

Problem 2149	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	65	58	77	78	75	77	75
normalized size	1	1.	0.87	0.77	1.03	1.04	1.	1.03	1.
time (sec)	N/A	0.086	0.022	0.004	1.445	0.237	7.827	0.215	13.62

Problem 2150	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	73	73	65	58	77	78	73	77	73
normalized size	1	1.	0.89	0.79	1.05	1.07	1.	1.05	1.
time (sec)	N/A	0.087	0.023	0.003	1.436	0.232	12.078	0.218	14.009

Problem 2151	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	140	140	140	113	224	159	139	151	139
normalized size	1	1.	1.	0.81	1.6	1.14	0.99	1.08	0.99
time (sec)	N/A	0.231	0.029	0.004	1.436	0.232	26.678	0.219	34.298

Problem 2152	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	162	162	136	113	178	159	136	151	136
normalized size	1	1.	0.84	0.7	1.1	0.98	0.84	0.93	0.84
time (sec)	N/A	0.218	0.021	0.004	1.438	0.236	17.731	0.218	32.833

Problem 2153	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	140	113	132	159	139	151	114
normalized size	1	1.	1.15	0.93	1.08	1.3	1.14	1.24	0.93
time (sec)	N/A	0.172	0.029	0.004	1.435	0.237	11.922	0.214	29.351

Problem 2154	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	136	113	86	159	136	151	71
normalized size	1	1.	1.7	1.41	1.08	1.99	1.7	1.89	0.89
time (sec)	N/A	0.133	0.022	0.004	1.442	0.233	3.494	0.217	21.76

Problem 2155	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	131	110	41	153	133	147	32
normalized size	1	1.	3.45	2.89	1.08	4.03	3.5	3.87	0.84
time (sec)	N/A	0.051	0.019	0.003	1.439	0.231	4.782	0.218	13.386

Problem 2156	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	128	128	128	109	146	151	131	147	0
normalized size	1	1.	1.	0.85	1.14	1.18	1.02	1.15	0.
time (sec)	N/A	0.162	0.03	0.005	1.442	0.238	6.175	0.218	0.

Problem 2157	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	123	123	123	110	149	158	124	150	0
normalized size	1	1.	1.	0.89	1.21	1.28	1.01	1.22	0.
time (sec)	N/A	0.184	0.065	0.004	1.438	0.233	6.557	0.217	0.

Problem 2158	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	127	127	127	110	149	158	128	150	0
normalized size	1	1.	1.	0.87	1.17	1.24	1.01	1.18	0.
time (sec)	N/A	0.182	0.053	0.005	1.441	0.24	6.243	0.22	0.

Problem 2159	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	127	127	124	110	149	158	128	150	0
normalized size	1	1.	0.98	0.87	1.17	1.24	1.01	1.18	0.
time (sec)	N/A	0.18	0.09	0.006	1.441	0.24	6.14	0.221	0.

Problem 2160	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	126	109	147	158	124	149	0
normalized size	1	1.	1.03	0.89	1.2	1.3	1.02	1.22	0.
time (sec)	N/A	0.177	0.131	0.006	1.441	0.235	5.846	0.221	0.

Problem 2161	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	130	130	130	111	150	158	131	151	136
normalized size	1	1.	1.	0.85	1.15	1.22	1.01	1.16	1.05
time (sec)	N/A	0.176	0.103	0.005	1.441	0.235	8.849	0.219	29.184

Problem 2162	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	124	113	151	153	134	151	37
normalized size	1	1.	2.7	2.46	3.28	3.33	2.91	3.28	0.8
time (sec)	N/A	0.052	0.036	0.004	1.438	0.233	13.235	0.219	5.777

Problem 2163	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	124	113	151	153	138	151	85
normalized size	1	1.	1.29	1.18	1.57	1.59	1.44	1.57	0.89
time (sec)	N/A	0.107	0.044	0.004	1.448	0.234	18.497	0.216	12.058

Problem 2164	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	146	146	140	113	151	153	141	151	129
normalized size	1	1.	0.96	0.77	1.03	1.05	0.97	1.03	0.88
time (sec)	N/A	0.167	0.047	0.004	1.44	0.239	26.544	0.221	21.296

Problem 2165	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	136	136	136	113	151	153	138	151	138
normalized size	1	1.	1.	0.83	1.11	1.12	1.01	1.11	1.01
time (sec)	N/A	0.183	0.044	0.005	1.438	0.243	36.775	0.218	31.11

Problem 2166	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	140	140	140	113	151	153	141	151	141
normalized size	1	1.	1.	0.81	1.08	1.09	1.01	1.08	1.01
time (sec)	N/A	0.181	0.046	0.004	1.444	0.24	45.354	0.223	31.082

Problem 2167	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	242	242	211	168	270	234	214	225	214
normalized size	1	1.	0.87	0.69	1.12	0.97	0.88	0.93	0.88
time (sec)	N/A	0.369	0.039	0.004	1.456	0.235	29.96	0.221	59.018

Problem 2168	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	202	202	207	168	224	234	211	225	192
normalized size	1	1.	1.02	0.83	1.11	1.16	1.04	1.11	0.95
time (sec)	N/A	0.313	0.031	0.006	1.44	0.243	22.705	0.218	58.726

Problem 2169	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	162	162	205	168	178	234	209	225	153
normalized size	1	1.	1.27	1.04	1.1	1.44	1.29	1.39	0.94
time (sec)	N/A	0.266	0.033	0.006	1.457	0.232	17.016	0.221	50.973

Problem 2170	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	209	168	132	234	212	225	112
normalized size	1	1.	1.71	1.38	1.08	1.92	1.74	1.84	0.92
time (sec)	N/A	0.227	0.031	0.004	1.42	0.232	14.153	0.217	41.822

Problem 2171	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	199	168	86	234	204	225	71
normalized size	1	1.	2.49	2.1	1.08	2.92	2.55	2.81	0.89
time (sec)	N/A	0.186	0.032	0.005	1.437	0.234	8.442	0.218	33.494

Problem 2172	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	190	165	41	225	197	221	32
normalized size	1	1.	5.	4.34	1.08	5.92	5.18	5.82	0.84
time (sec)	N/A	0.052	0.027	0.005	1.415	0.231	6.78	0.222	24.69

Problem 2173	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	205	205	205	164	220	225	211	221	0
normalized size	1	1.	1.	0.8	1.07	1.1	1.03	1.08	0.
time (sec)	N/A	0.255	0.045	0.006	1.42	0.24	19.035	0.219	0.

Problem 2174	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	192	192	192	165	223	232	197	224	0
normalized size	1	1.	1.	0.86	1.16	1.21	1.03	1.17	0.
time (sec)	N/A	0.316	0.088	0.005	1.432	0.24	18.87	0.222	0.

Problem 2175	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	190	190	190	165	220	232	196	221	0
normalized size	1	1.	1.	0.87	1.16	1.22	1.03	1.16	0.
time (sec)	N/A	0.31	0.107	0.008	1.429	0.235	18.027	0.224	0.

Problem 2176	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	196	196	196	165	223	231	201	224	0
normalized size	1	1.	1.	0.84	1.14	1.18	1.03	1.14	0.
time (sec)	N/A	0.311	0.104	0.006	1.43	0.239	17.536	0.219	0.

Problem 2177	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	194	194	194	165	223	232	199	224	0
normalized size	1	1.	1.	0.85	1.15	1.2	1.03	1.15	0.
time (sec)	N/A	0.307	0.131	0.006	1.42	0.236	16.837	0.225	0.

Problem 2178	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	196	196	196	165	223	232	201	224	0
normalized size	1	1.	1.	0.84	1.14	1.18	1.03	1.14	0.
time (sec)	N/A	0.308	0.132	0.006	1.43	0.241	16.665	0.228	0.

Problem 2179	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	198	198	198	167	225	232	202	227	0
normalized size	1	1.	1.	0.84	1.14	1.17	1.02	1.15	0.
time (sec)	N/A	0.305	0.124	0.008	1.431	0.242	19.718	0.22	0.

Problem 2180	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	183	168	223	221	197	223	17
normalized size	1	1.	8.71	8.	10.62	10.52	9.38	10.62	0.81
time (sec)	N/A	0.016	0.054	0.006	1.434	0.24	27.72	0.222	2.795

Problem 2181	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	185	168	225	227	209	225	61
normalized size	1	1.	2.64	2.4	3.21	3.24	2.99	3.21	0.87
time (sec)	N/A	0.081	0.059	0.006	1.428	0.238	38.677	0.222	8.726

Problem 2182	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	120	120	205	168	225	227	211	225	109
normalized size	1	1.	1.71	1.4	1.88	1.89	1.76	1.88	0.91
time (sec)	N/A	0.139	0.07	0.005	1.438	0.24	47.322	0.223	16.507

Problem 2183	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	170	170	209	168	225	227	214	225	156
normalized size	1	1.	1.23	0.99	1.32	1.34	1.26	1.32	0.92
time (sec)	N/A	0.211	0.071	0.005	1.443	0.246	63.055	0.222	27.612

Problem 2184	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	220	220	209	168	225	227	214	225	206
normalized size	1	1.	0.95	0.76	1.02	1.03	0.97	1.02	0.94
time (sec)	N/A	0.287	0.07	0.005	1.431	0.241	81.902	0.224	41.858

Problem 2185	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	270	270	207	168	225	227	212	225	212
normalized size	1	1.	0.77	0.62	0.83	0.84	0.79	0.83	0.79
time (sec)	N/A	0.4	0.068	0.007	1.565	0.241	105.758	0.22	53.18

Problem 2186	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	211	211	211	168	225	227	216	225	216
normalized size	1	1.	1.	0.8	1.07	1.08	1.02	1.07	1.02
time (sec)	N/A	0.32	0.07	0.006	1.45	0.244	146.774	0.222	51.986

Problem 2187	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	211	211	211	168	225	227	0	225	216
normalized size	1	1.	1.	0.8	1.07	1.08	0.	1.07	1.02
time (sec)	N/A	0.316	0.072	0.006	1.45	0.239	0.	0.222	52.824

Problem 2188	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	207	207	207	168	225	227	0	225	212
normalized size	1	1.	1.	0.81	1.09	1.1	0.	1.09	1.02
time (sec)	N/A	0.314	0.071	0.006	1.447	0.24	0.	0.222	53.764

Problem 2189	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	107	107	99	88	174	119	109	120	0
normalized size	1	1.	0.93	0.82	1.63	1.11	1.02	1.12	0.
time (sec)	N/A	0.168	0.039	0.006	1.448	0.241	3.21	0.214	0.

Problem 2190	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	79	79	75	66	128	89	82	90	0
normalized size	1	1.	0.95	0.84	1.62	1.13	1.04	1.14	0.
time (sec)	N/A	0.116	0.024	0.005	1.443	0.24	1.47	0.221	0.

Problem 2191	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	51	51	51	44	82	58	49	61	0
normalized size	1	1.	1.	0.86	1.61	1.14	0.96	1.2	0.
time (sec)	N/A	0.076	0.016	0.004	1.442	0.238	12.642	0.22	0.

Problem 2192	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	27	57	36	30	27	32	0
normalized size	1	1.	1.	2.11	1.33	1.11	1.	1.19	0.
time (sec)	N/A	0.039	0.011	0.013	1.448	0.234	0.425	0.216	0.

Problem 2193	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	27	21	27	27	37	30	22
normalized size	1	1.	1.23	0.95	1.23	1.23	1.68	1.36	1.
time (sec)	N/A	0.03	0.008	0.008	1.44	0.237	1.169	0.218	5.638

Problem 2194	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	44	44	58	58	68	65	49
normalized size	1	1.	0.94	0.94	1.23	1.23	1.45	1.38	1.04
time (sec)	N/A	0.074	0.025	0.013	1.439	0.251	4.611	0.223	10.741

Problem 2195	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	69	66	86	93	99	93	76
normalized size	1	1.	0.92	0.88	1.15	1.24	1.32	1.24	1.01
time (sec)	N/A	0.1	0.059	0.014	1.442	0.241	10.354	0.255	15.153

Problem 2196	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	103	103	93	88	116	124	126	123	104
normalized size	1	1.	0.9	0.85	1.13	1.2	1.22	1.19	1.01
time (sec)	N/A	0.129	0.069	0.016	1.447	0.246	25.92	0.26	19.722

Problem 2197	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	111	111	102	94	174	154	272	135	0
normalized size	1	1.	0.92	0.85	1.57	1.39	2.45	1.22	0.
time (sec)	N/A	0.193	0.054	0.011	1.45	0.238	6.462	0.246	0.

Problem 2198	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	83	78	72	128	124	212	105	0
normalized size	1	1.	0.94	0.87	1.54	1.49	2.55	1.27	0.
time (sec)	N/A	0.138	0.05	0.011	1.443	0.246	3.288	0.278	0.

Problem 2199	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	50	49	81	93	158	70	0
normalized size	1	1.	0.93	0.91	1.5	1.72	2.93	1.3	0.
time (sec)	N/A	0.093	0.035	0.01	1.437	0.235	12.28	0.269	0.

Problem 2200	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	29	96	39	47	80	41	29
normalized size	1	1.	0.88	2.91	1.18	1.42	2.42	1.24	0.88
time (sec)	N/A	0.05	0.021	0.027	1.447	0.229	1.61	0.254	6.366

Problem 2201	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	37	35	46	66	151	49	37
normalized size	1	1.	0.97	0.92	1.21	1.74	3.97	1.29	0.97
time (sec)	N/A	0.059	0.049	0.012	1.442	0.239	3.06	0.265	8.603

Problem 2202	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	67	67	60	62	85	112	238	90	68
normalized size	1	1.	0.9	0.93	1.27	1.67	3.55	1.34	1.01
time (sec)	N/A	0.104	0.115	0.017	1.444	0.247	5.609	0.274	15.042

Problem 2203	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	91	84	119	151	333	122	97
normalized size	1	1.	0.96	0.88	1.25	1.59	3.51	1.28	1.02
time (sec)	N/A	0.143	0.131	0.016	1.44	0.247	15.008	0.272	20.319

Problem 2204	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	123	123	115	106	149	182	396	151	126
normalized size	1	1.	0.93	0.86	1.21	1.48	3.22	1.23	1.02
time (sec)	N/A	0.182	0.174	0.02	1.443	0.245	19.722	0.243	26.834

Problem 2205	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	114	114	107	99	173	178	450	136	0
normalized size	1	1.	0.94	0.87	1.52	1.56	3.95	1.19	0.
time (sec)	N/A	0.211	0.077	0.013	1.439	0.238	8.283	0.275	0.

Problem 2206	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	83	77	127	147	371	107	0
normalized size	1	1.	0.94	0.88	1.44	1.67	4.22	1.22	0.
time (sec)	N/A	0.151	0.056	0.011	1.435	0.234	4.161	0.291	0.

Problem 2207	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	64	64	57	57	81	113	230	72	0
normalized size	1	1.	0.89	0.89	1.27	1.77	3.59	1.12	0.
time (sec)	N/A	0.098	0.042	0.01	1.445	0.24	2.944	0.274	0.

Problem 2208	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	26	131	39	46	34	30	12
normalized size	1	1.	1.62	8.19	2.44	2.88	2.12	1.88	0.75
time (sec)	N/A	0.019	0.015	0.036	1.432	0.23	2.551	0.216	1.281

Problem 2209	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	44	48	73	115	364	65	53
normalized size	1	1.	0.83	0.91	1.38	2.17	6.87	1.23	1.
time (sec)	N/A	0.078	0.076	0.014	1.44	0.245	6.586	0.25	11.283

Problem 2210	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	77	78	115	171	481	100	85
normalized size	1	1.	0.91	0.92	1.35	2.01	5.66	1.18	1.
time (sec)	N/A	0.135	0.134	0.017	1.448	0.244	15.339	0.241	19.197

Problem 2211	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	111	111	104	100	149	211	612	136	112
normalized size	1	1.	0.94	0.9	1.34	1.9	5.51	1.23	1.01
time (sec)	N/A	0.18	0.205	0.018	1.446	0.24	38.478	0.295	25.814

Problem 2212	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	139	139	128	122	178	242	0	166	141
normalized size	1	1.	0.92	0.88	1.28	1.74	0.	1.19	1.01
time (sec)	N/A	0.234	0.277	0.019	1.442	0.245	0.	0.279	39.753

Problem 2213	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	155	155	150	134	220	263	1013	163	0
normalized size	1	1.	0.97	0.86	1.42	1.7	6.54	1.05	0.
time (sec)	N/A	0.31	0.065	0.015	1.43	0.246	26.473	0.259	0.

Problem 2214	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	131	131	126	112	174	234	882	134	0
normalized size	1	1.	0.96	0.85	1.33	1.79	6.73	1.02	0.
time (sec)	N/A	0.229	0.055	0.014	1.456	0.245	10.242	0.28	0.

Problem 2215	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	107	107	100	92	128	203	687	99	0
normalized size	1	1.	0.93	0.86	1.2	1.9	6.42	0.93	0.
time (sec)	N/A	0.16	0.07	0.013	1.452	0.24	7.071	0.247	0.

Problem 2216	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	50	65	86	100	253	57	15
normalized size	1	1.	2.38	3.1	4.1	4.76	12.05	2.71	0.71
time (sec)	N/A	0.015	0.024	0.007	1.432	0.231	6.606	0.259	2.719

Problem 2217	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	28	200	41	74	121	30	48
normalized size	1	1.	0.74	5.26	1.08	1.95	3.18	0.79	1.26
time (sec)	N/A	0.052	0.016	0.063	1.432	0.239	6.151	0.263	3.363

Problem 2218	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	89	89	71	76	131	230	1049	93	87
normalized size	1	1.	0.8	0.85	1.47	2.58	11.79	1.04	0.98
time (sec)	N/A	0.12	0.102	0.014	1.442	0.244	18.351	0.278	17.385

Problem 2219	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	104	113	176	301	1232	136	124
normalized size	1	1.	0.83	0.9	1.4	2.39	9.78	1.08	0.98
time (sec)	N/A	0.209	0.13	0.018	1.441	0.247	55.202	0.253	31.484

Problem 2220	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	156	156	128	135	208	346	0	161	155
normalized size	1	1.	0.82	0.87	1.33	2.22	0.	1.03	0.99
time (sec)	N/A	0.268	0.155	0.02	1.46	0.255	0.	0.252	67.058

Problem 2221	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	203	203	174	174	266	386	2154	193	0
normalized size	1	1.	0.86	0.86	1.31	1.9	10.61	0.95	0.
time (sec)	N/A	0.433	0.076	0.018	1.461	0.242	156.991	0.235	0.

Problem 2222	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	172	172	150	151	219	356	1945	161	0
normalized size	1	1.	0.87	0.88	1.27	2.07	11.31	0.94	0.
time (sec)	N/A	0.331	0.069	0.016	1.442	0.244	34.914	0.219	0.

Problem 2223	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	157	157	102	132	177	309	1629	128	150
normalized size	1	1.	0.65	0.84	1.13	1.97	10.38	0.82	0.96
time (sec)	N/A	0.245	0.066	0.013	1.456	0.237	32.669	0.242	37.638

Problem 2224	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	74	99	132	177	619	86	36
normalized size	1	1.	1.72	2.3	3.07	4.12	14.4	2.	0.84
time (sec)	N/A	0.048	0.035	0.01	1.442	0.239	30.213	0.26	6.582

Problem 2225	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	78	78	50	65	86	147	410	57	71
normalized size	1	1.	0.64	0.83	1.1	1.88	5.26	0.73	0.91
time (sec)	N/A	0.109	0.021	0.009	1.444	0.227	30.257	0.225	17.151

Problem 2226	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	28	399	41	120	199	30	105
normalized size	1	1.	0.74	10.5	1.08	3.16	5.24	0.79	2.76
time (sec)	N/A	0.051	0.014	0.102	1.443	0.237	29.274	0.261	9.795

Problem 2227	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	143	143	106	118	220	412	2684	138	138
normalized size	1	1.	0.74	0.83	1.54	2.88	18.77	0.97	0.97
time (sec)	N/A	0.185	0.148	0.018	1.438	0.259	160.334	0.278	29.808

Problem 2228	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	184	184	139	163	265	483	0	181	0
normalized size	1	1.	0.76	0.89	1.44	2.62	0.	0.98	0.
time (sec)	N/A	0.344	0.228	0.022	1.468	0.255	0.	0.239	0.

Problem 2229	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	217	217	163	186	297	528	0	211	0
normalized size	1	1.	0.75	0.86	1.37	2.43	0.	0.97	0.
time (sec)	N/A	0.436	0.249	0.022	1.476	0.258	0.	0.221	0.

Problem 2230	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	16	20	20	19	23	15
normalized size	1	1.	1.	0.84	1.05	1.05	1.	1.21	0.79
time (sec)	N/A	0.028	0.009	0.01	1.434	0.242	1.789	0.241	4.448

Problem 2231	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	132	132	89	85	132	104	8588	115	124
normalized size	1	1.	0.67	0.64	1.	0.79	65.06	0.87	0.94
time (sec)	N/A	0.148	0.033	0.008	1.446	0.252	30.395	0.276	22.067

Problem 2232	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	65	58	86	74	1987	77	82
normalized size	1	1.	0.74	0.66	0.98	0.84	22.58	0.88	0.93
time (sec)	N/A	0.099	0.028	0.003	1.442	0.244	8.591	0.26	14.387

Problem 2233	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	42	40	30	41	43	272	39	37
normalized size	1	1.	0.95	0.71	0.98	1.02	6.48	0.93	0.88
time (sec)	N/A	0.047	0.019	0.004	1.451	0.247	3.972	0.251	6.043

Problem 2234	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	43	32	0	1	75	49	37
normalized size	1	1.	1.	0.74	0.	0.02	1.74	1.14	0.86
time (sec)	N/A	0.067	0.025	0.005	0.	0.258	5.201	0.253	7.032

Problem 2235	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	66	59	0	1	105	84	63
normalized size	1	1.	0.86	0.77	0.	0.01	1.36	1.09	0.82
time (sec)	N/A	0.102	0.061	0.011	0.	0.268	13.425	0.26	10.058

Problem 2236	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	133	133	90	87	0	1	170	127	119
normalized size	1	1.	0.68	0.65	0.	0.01	1.28	0.95	0.89
time (sec)	N/A	0.173	0.088	0.015	0.	0.256	35.648	0.229	17.962

Problem 2237	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	130	130	78	86	132	90	8356	115	122
normalized size	1	1.	0.6	0.66	1.02	0.69	64.28	0.88	0.94
time (sec)	N/A	0.144	0.036	0.003	1.439	0.244	28.649	0.256	21.894

Problem 2238	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	54	57	86	61	1872	77	78
normalized size	1	1.	0.64	0.68	1.02	0.73	22.29	0.92	0.93
time (sec)	N/A	0.098	0.028	0.003	1.438	0.244	8.661	0.3	14.478

Problem 2239	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	31	30	41	31	219	36	36
normalized size	1	1.	0.78	0.75	1.02	0.78	5.48	0.9	0.9
time (sec)	N/A	0.047	0.019	0.006	1.443	0.244	3.761	0.258	6.033

Problem 2240	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	27	20	0	1	24	31	26
normalized size	1	1.	1.	0.74	0.	0.04	0.89	1.15	0.96
time (sec)	N/A	0.052	0.018	0.005	0.	0.259	4.545	0.268	5.357

Problem 2241	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	69	72	0	1	110	89	70
normalized size	1	1.	0.86	0.9	0.	0.01	1.38	1.11	0.88
time (sec)	N/A	0.105	0.065	0.007	0.	0.259	16.703	0.256	10.331

Problem 2242	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	136	136	90	124	0	1	173	127	124
normalized size	1	1.	0.66	0.91	0.	0.01	1.27	0.93	0.91
time (sec)	N/A	0.175	0.098	0.008	0.	0.256	43.134	0.277	18.634

Problem 2243	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	64	0	96	132	5039	336	65
normalized size	1	1.	0.86	0.	1.3	1.78	68.09	4.54	0.88
time (sec)	N/A	0.1	0.054	0.024	1.455	0.271	12.924	0.23	17.191

Problem 2244	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	23	22	0	34	51	28	17
normalized size	1	1.	1.	0.96	0.	1.48	2.22	1.22	0.74
time (sec)	N/A	0.021	0.014	0.005	0.	0.277	4.744	0.218	2.644

Problem 2245	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	9	9	9	8	9	9	7	9	7
normalized size	1	1.	1.	0.89	1.	1.	0.78	1.	0.78
time (sec)	N/A	0.009	0.002	0.001	1.434	0.237	0.313	0.215	2.068

Problem 2246	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	20	15	12	16	17	19	10
normalized size	1	1.	1.54	1.15	0.92	1.23	1.31	1.46	0.77
time (sec)	N/A	0.01	0.004	0.003	1.434	0.236	0.328	0.258	1.667

Problem 2247	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	25	20	12	23	20	26	8
normalized size	1	1.	1.92	1.54	0.92	1.77	1.54	2.	0.62
time (sec)	N/A	0.01	0.007	0.002	1.435	0.237	0.446	0.242	1.663

Problem 2248	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	16	30	20	17	20	0
normalized size	1	1.	1.	0.84	1.58	1.05	0.89	1.05	0.
time (sec)	N/A	0.029	0.006	0.003	1.443	0.236	0.328	0.257	0.

Problem 2249	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	10	10	10	9	11	11	8	11	8
normalized size	1	1.	1.	0.9	1.1	1.1	0.8	1.1	0.8
time (sec)	N/A	0.011	0.003	0.003	1.437	0.238	0.348	0.234	1.7

Problem 2250	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	11	11	11	10	12	12	8	12	8
normalized size	1	1.	1.	0.91	1.09	1.09	0.73	1.09	0.73
time (sec)	N/A	0.011	0.003	0.001	1.416	0.234	1.402	0.248	1.727

Problem 2251	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	11	11	11	10	12	16	12	12	10
normalized size	1	1.	1.	0.91	1.09	1.45	1.09	1.09	0.91
time (sec)	N/A	0.01	0.004	0.002	1.446	0.234	1.707	0.245	1.685

Problem 2252	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	34	29	38	31	398	38	39
normalized size	1	1.	0.74	0.63	0.83	0.67	8.65	0.83	0.85
time (sec)	N/A	0.035	0.013	0.007	1.469	0.242	4.353	0.272	4.327

Problem 2253	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	10	12	12	31	12	12
normalized size	1	1.	1.	0.67	0.8	0.8	2.07	0.8	0.8
time (sec)	N/A	0.012	0.005	0.003	1.42	0.243	0.5	0.223	1.685

Problem 2254	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	65	49	65	65	138	65	58
normalized size	1	1.	1.12	0.84	1.12	1.12	2.38	1.12	1.
time (sec)	N/A	0.079	0.027	0.007	1.58	0.254	2.561	0.279	5.893

Problem 2255	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	87	87	83	0	0	351	0	150	76
normalized size	1	1.	0.95	0.	0.	4.03	0.	1.72	0.87
time (sec)	N/A	0.107	0.097	0.028	0.	0.255	0.	0.277	15.83

Problem 2256	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	69	0	0	225	0	119	61
normalized size	1	1.	0.99	0.	0.	3.21	0.	1.7	0.87
time (sec)	N/A	0.072	0.056	0.015	0.	0.259	0.	0.277	12.074

Problem 2257	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	49	0	0	120	0	82	39
normalized size	1	1.	1.04	0.	0.	2.55	0.	1.74	0.83
time (sec)	N/A	0.051	0.066	0.014	0.	0.252	0.	0.258	8.328

Problem 2258	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	28	0	0	50	0	51	24
normalized size	1	1.	0.93	0.	0.	1.67	0.	1.7	0.8
time (sec)	N/A	0.024	0.041	0.007	0.	0.254	0.	0.27	4.469

Problem 2259	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	37	37	42	0	0	0	82	0	27
normalized size	1	1.	1.14	0.	0.	0.	2.22	0.	0.73
time (sec)	N/A	0.05	0.056	0.021	0.	0.	3.491	0.	6.614

Problem 2260	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	37	37	71	0	0	0	473	0	29
normalized size	1	1.	1.92	0.	0.	0.	12.78	0.	0.78
time (sec)	N/A	0.047	0.065	0.022	0.	0.	11.09	0.	6.062

Problem 2261	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	63	65	0	0	0	0	0	49
normalized size	1	1.21	1.25	0.	0.	0.	0.	0.	0.94
time (sec)	N/A	0.071	0.074	0.024	0.	0.	0.	0.	9.573

Problem 2262	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	204	204	265	0	386	618	0	1	184
normalized size	1	1.	1.3	0.	1.89	3.03	0.	0.	0.9
time (sec)	N/A	0.273	0.342	0.022	1.485	0.328	0.	0.267	50.028

Problem 2263	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	152	152	170	0	250	379	0	1	136
normalized size	1	1.	1.12	0.	1.64	2.49	0.	0.01	0.89
time (sec)	N/A	0.184	0.199	0.022	1.435	0.292	0.	0.267	36.382

Problem 2264	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	95	0	140	200	0	597	88
normalized size	1	1.	0.95	0.	1.4	2.	0.	5.97	0.88
time (sec)	N/A	0.121	0.075	0.021	1.432	0.276	0.	0.243	23.233

Problem 2265	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	48	42	0	61	76	823	138	41
normalized size	1	1.	0.88	0.	1.27	1.58	17.15	2.88	0.85
time (sec)	N/A	0.057	0.029	0.021	1.449	0.271	5.808	0.269	9.215

Problem 2266	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	55	0	0	0	41	0	34
normalized size	1	1.	1.28	0.	0.	0.	0.95	0.	0.79
time (sec)	N/A	0.047	0.034	0.022	0.	0.	7.175	0.	5.658

Problem 2267	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	62	0	0	0	42	0	39
normalized size	1	1.	1.35	0.	0.	0.	0.91	0.	0.85
time (sec)	N/A	0.054	0.032	0.023	0.	0.	18.198	0.	6.833

Problem 2268	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	57	103	0	0	0	41	0	48
normalized size	1	1.36	2.45	0.	0.	0.	0.98	0.	1.14
time (sec)	N/A	0.099	0.082	0.023	0.	0.	22.966	0.	9.036

Problem 2269	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	F(-1)	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	198	198	87	0	0	0	41	0	187
normalized size	1	1.	0.44	0.	0.	0.	0.21	0.	0.94
time (sec)	N/A	0.374	0.053	0.023	0.	0.	11.437	0.	32.399

Problem 2270	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	31	30	41	31	49	0	34
normalized size	1	1.	0.78	0.75	1.02	0.78	1.22	0.	0.85
time (sec)	N/A	0.062	0.022	0.004	1.441	0.436	5.143	0.	7.149

Problem 2271	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	57	71	0	0	0	41	0	48
normalized size	1	1.36	1.69	0.	0.	0.	0.98	0.	1.14
time (sec)	N/A	0.095	0.051	0.022	0.	0.	2.483	0.	9.064

Problem 2272	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	F(-1)	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	140	140	53	0	0	0	39	0	133
normalized size	1	1.	0.38	0.	0.	0.	0.28	0.	0.95
time (sec)	N/A	0.201	0.026	0.021	0.	0.	3.99	0.	20.612

Problem 2273	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F(-2)	F(-1)	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	52	85	0	0	41	0	83
normalized size	1	1.	0.61	1.	0.	0.	0.48	0.	0.98
time (sec)	N/A	0.14	0.035	0.011	0.	0.	5.602	0.	7.607

Problem 2274	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	55	77	0	0	0	42	0	48
normalized size	1	1.38	1.92	0.	0.	0.	1.05	0.	1.2
time (sec)	N/A	0.093	0.052	0.02	0.	0.	10.634	0.	8.857

Problem 2275	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	33	0	47	36	76	0	42
normalized size	1	1.	0.66	0.	0.94	0.72	1.52	0.	0.84
time (sec)	N/A	0.048	0.023	0.023	1.432	0.443	25.773	0.	4.462

Problem 2276	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	F(-1)	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	148	148	91	0	0	0	42	0	143
normalized size	1	1.	0.61	0.	0.	0.	0.28	0.	0.97
time (sec)	N/A	0.21	0.059	0.023	0.	0.	109.3	0.	16.018

Problem 2277	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	9	11	11	24	27	10
normalized size	1	1.	1.	0.75	0.92	0.92	2.	2.25	0.83
time (sec)	N/A	0.012	0.003	0.003	1.428	0.227	0.52	0.234	1.689

Problem 2278	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	14	339	18	15	18	15
normalized size	1	1.	1.	0.74	17.84	0.95	0.79	0.95	0.79
time (sec)	N/A	0.017	0.006	0.002	1.448	0.222	5.631	0.26	2.917

Problem 2279	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	14	270	18	15	18	15
normalized size	1	1.	1.	0.74	14.21	0.95	0.79	0.95	0.79
time (sec)	N/A	0.016	0.005	0.001	1.442	0.211	3.243	0.291	2.895

Problem 2280	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	14	201	18	15	18	15
normalized size	1	1.	1.	0.74	10.58	0.95	0.79	0.95	0.79
time (sec)	N/A	0.015	0.006	0.001	1.437	0.213	1.897	0.256	2.899

Problem 2281	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	14	132	18	15	18	0
normalized size	1	1.	1.	0.74	6.95	0.95	0.79	0.95	0.
time (sec)	N/A	0.016	0.005	0.002	1.439	0.211	1.208	0.248	0.

Problem 2282	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	11	14	14	12	14	0
normalized size	1	1.	1.	0.79	1.	1.	0.86	1.	0.
time (sec)	N/A	0.011	0.002	0.001	1.44	0.213	0.063	0.281	0.

Problem 2283	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	12	15	19	12	16	12
normalized size	1	1.	1.	0.92	1.15	1.46	0.92	1.23	0.92
time (sec)	N/A	0.016	0.008	0.004	1.44	0.218	0.71	0.269	2.817

Problem 2284	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	20	20	14	20	14
normalized size	1	1.	1.	0.82	1.18	1.18	0.82	1.18	0.82
time (sec)	N/A	0.016	0.008	0.008	1.444	0.213	2.51	0.246	3.032

Problem 2285	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	14	20	20	17	20	17
normalized size	1	1.	1.	0.74	1.05	1.05	0.89	1.05	0.89
time (sec)	N/A	0.016	0.008	0.008	1.44	0.215	4.792	0.237	2.946

Problem 2286	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	14	20	20	17	20	17
normalized size	1	1.	1.	0.74	1.05	1.05	0.89	1.05	0.89
time (sec)	N/A	0.016	0.006	0.008	1.446	0.213	9.	0.248	2.893

Problem 2287	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	25	338	32	31	32	31
normalized size	1	1.	1.	0.74	9.94	0.94	0.91	0.94	0.91
time (sec)	N/A	0.076	0.012	0.002	1.447	0.212	5.673	0.251	12.727

Problem 2288	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	25	270	32	31	32	31
normalized size	1	1.	1.	0.74	7.94	0.94	0.91	0.94	0.91
time (sec)	N/A	0.071	0.011	0.001	1.446	0.212	3.395	0.254	10.876

Problem 2289	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	25	200	32	31	32	31
normalized size	1	1.	1.	0.74	5.88	0.94	0.91	0.94	0.91
time (sec)	N/A	0.063	0.013	0.003	1.446	0.216	2.004	0.264	9.299

Problem 2290	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	25	132	32	31	32	31
normalized size	1	1.	1.	0.74	3.88	0.94	0.91	0.94	0.91
time (sec)	N/A	0.054	0.01	0.002	1.442	0.212	1.306	0.259	8.038

Problem 2291	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	29	22	28	28	27	28	0
normalized size	1	1.	1.	0.76	0.97	0.97	0.93	0.97	0.
time (sec)	N/A	0.044	0.008	0.002	1.436	0.211	1.114	0.286	0.

Problem 2292	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	28	23	30	34	27	31	0
normalized size	1	1.	1.	0.82	1.07	1.21	0.96	1.11	0.
time (sec)	N/A	0.035	0.014	0.004	1.443	0.219	0.629	0.251	0.

Problem 2293	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	28	25	32	32	26	32	14
normalized size	1	1.	1.47	1.32	1.68	1.68	1.37	1.68	0.74
time (sec)	N/A	0.016	0.015	0.008	1.472	0.213	2.145	0.261	2.86

Problem 2294	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	25	35	35	32	35	32
normalized size	1	1.	1.	0.74	1.03	1.03	0.94	1.03	0.94
time (sec)	N/A	0.043	0.013	0.008	1.424	0.213	3.996	0.254	6.767

Problem 2295	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	25	35	35	32	35	32
normalized size	1	1.	1.	0.74	1.03	1.03	0.94	1.03	0.94
time (sec)	N/A	0.044	0.015	0.008	1.418	0.212	7.371	0.22	6.902

Problem 2296	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	47	36	339	47	42	47	42
normalized size	1	1.	1.	0.77	7.21	1.	0.89	1.	0.89
time (sec)	N/A	0.088	0.011	0.002	1.432	0.212	6.885	0.217	15.276

Problem 2297	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	47	36	270	47	42	47	42
normalized size	1	1.	1.	0.77	5.74	1.	0.89	1.	0.89
time (sec)	N/A	0.082	0.011	0.002	1.432	0.213	3.909	0.219	13.322

Problem 2298	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	41	36	201	47	42	47	42
normalized size	1	1.	0.87	0.77	4.28	1.	0.89	1.	0.89
time (sec)	N/A	0.075	0.012	0.002	1.456	0.212	2.383	0.219	11.603

Problem 2299	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	47	36	132	47	42	47	42
normalized size	1	1.	1.	0.77	2.81	1.	0.89	1.	0.89
time (sec)	N/A	0.068	0.011	0.001	1.421	0.211	1.415	0.221	10.366

Problem 2300	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	42	42	33	43	43	39	43	39
normalized size	1	1.	1.	0.79	1.02	1.02	0.93	1.02	0.93
time (sec)	N/A	0.061	0.009	0.002	1.447	0.214	1.181	0.213	8.297

Problem 2301	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	36	31	41	45	36	42	0
normalized size	1	1.	1.	0.86	1.14	1.25	1.	1.17	0.
time (sec)	N/A	0.049	0.014	0.004	1.436	0.219	0.636	0.218	0.

Problem 2302	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	40	34	49	53	36	50	41
normalized size	1	1.	1.03	0.87	1.26	1.36	0.92	1.28	1.05
time (sec)	N/A	0.054	0.032	0.009	1.43	0.219	2.279	0.219	8.481

Problem 2303	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	41	36	47	47	41	47	41
normalized size	1	1.	0.91	0.8	1.04	1.04	0.91	1.04	0.91
time (sec)	N/A	0.055	0.016	0.008	1.448	0.214	4.106	0.22	8.978

Problem 2304	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	41	36	47	47	44	47	44
normalized size	1	1.	0.87	0.77	1.	1.	0.94	1.	0.94
time (sec)	N/A	0.056	0.014	0.008	1.466	0.214	7.549	0.219	9.093

Problem 2305	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	77	58	339	93	75	77	75
normalized size	1	1.	1.	0.75	4.4	1.21	0.97	1.	0.97
time (sec)	N/A	0.12	0.016	0.003	1.435	0.213	9.914	0.241	21.344

Problem 2306	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	75	58	270	93	73	77	73
normalized size	1	1.	1.	0.77	3.6	1.24	0.97	1.03	0.97
time (sec)	N/A	0.111	0.014	0.003	1.441	0.212	5.793	0.25	18.788

Problem 2307	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	77	58	201	93	75	77	75
normalized size	1	1.	1.	0.75	2.61	1.21	0.97	1.	0.97
time (sec)	N/A	0.105	0.014	0.003	1.439	0.212	3.461	0.224	17.111

Problem 2308	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	77	58	132	93	75	77	75
normalized size	1	1.	1.	0.75	1.71	1.21	0.97	1.	0.97
time (sec)	N/A	0.096	0.015	0.003	1.45	0.212	1.664	0.246	15.555

Problem 2309	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	68	55	73	82	68	73	53
normalized size	1	1.	1.15	0.93	1.24	1.39	1.15	1.24	0.9
time (sec)	N/A	0.08	0.013	0.003	1.436	0.209	1.425	0.229	12.173

Problem 2310	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	65	65	54	72	76	66	73	0
normalized size	1	1.	1.	0.83	1.11	1.17	1.02	1.12	0.
time (sec)	N/A	0.077	0.02	0.004	1.524	0.218	3.527	0.24	0.

Problem 2311	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	69	57	80	84	66	81	0
normalized size	1	1.	1.01	0.84	1.18	1.24	0.97	1.19	0.
time (sec)	N/A	0.084	0.023	0.01	1.437	0.219	2.371	0.243	0.

Problem 2312	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	65	58	74	77	70	74	17
normalized size	1	1.	3.1	2.76	3.52	3.67	3.33	3.52	0.81
time (sec)	N/A	0.016	0.02	0.01	1.449	0.215	4.225	0.259	2.79

Problem 2313	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	73	73	67	58	77	80	73	77	73
normalized size	1	1.	0.92	0.79	1.05	1.1	1.	1.05	1.
time (sec)	N/A	0.086	0.022	0.01	1.441	0.218	7.894	0.24	14.281

Problem 2314	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	67	58	77	78	75	77	75
normalized size	1	1.	0.89	0.77	1.03	1.04	1.	1.03	1.
time (sec)	N/A	0.084	0.024	0.009	1.446	0.223	14.693	0.242	14.322

Problem 2315	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	67	58	77	80	76	77	76
normalized size	1	1.	0.87	0.75	1.	1.04	0.99	1.	0.99
time (sec)	N/A	0.086	0.023	0.009	1.442	0.234	25.38	0.233	14.699

Problem 2316	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	67	58	77	80	75	77	75
normalized size	1	1.	0.89	0.77	1.03	1.07	1.	1.03	1.
time (sec)	N/A	0.084	0.023	0.01	1.442	0.22	37.616	0.25	14.873

Problem 2317	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	144	144	144	113	339	167	144	151	144
normalized size	1	1.	1.	0.78	2.35	1.16	1.	1.05	1.
time (sec)	N/A	0.226	0.031	0.003	1.45	0.224	19.482	0.248	39.589

Problem 2318	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	144	144	144	113	270	167	144	151	144
normalized size	1	1.	1.	0.78	1.88	1.16	1.	1.05	1.
time (sec)	N/A	0.212	0.024	0.003	1.428	0.242	14.125	0.234	36.77

Problem 2319	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	179	179	140	113	201	167	141	151	141
normalized size	1	1.	0.78	0.63	1.12	0.93	0.79	0.84	0.79
time (sec)	N/A	0.228	0.03	0.003	1.444	0.239	8.563	0.237	34.784

Problem 2320	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	120	120	142	113	132	167	143	151	112
normalized size	1	1.	1.18	0.94	1.1	1.39	1.19	1.26	0.93
time (sec)	N/A	0.166	0.022	0.003	1.443	0.237	3.532	0.247	30.04

Problem 2321	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	133	110	63	158	136	147	53
normalized size	1	1.	2.25	1.86	1.07	2.68	2.31	2.49	0.9
time (sec)	N/A	0.107	0.02	0.004	1.445	0.238	2.804	0.26	17.677

Problem 2322	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	136	136	136	109	146	153	139	147	0
normalized size	1	1.	1.	0.8	1.07	1.12	1.02	1.08	0.
time (sec)	N/A	0.157	0.032	0.006	1.446	0.245	10.18	0.227	0.

Problem 2323	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	125	125	125	110	149	157	128	150	0
normalized size	1	1.	1.	0.88	1.19	1.26	1.02	1.2	0.
time (sec)	N/A	0.178	0.078	0.01	1.445	0.229	10.019	0.256	0.

Problem 2324	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	131	131	130	110	149	158	133	150	0
normalized size	1	1.	0.99	0.84	1.14	1.21	1.02	1.15	0.
time (sec)	N/A	0.178	0.048	0.014	1.438	0.242	10.2	0.236	0.

Problem 2325	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	131	131	131	112	151	159	133	153	0
normalized size	1	1.	1.	0.85	1.15	1.21	1.02	1.17	0.
time (sec)	N/A	0.175	0.094	0.012	1.45	0.222	8.701	0.268	0.

Problem 2326	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	128	113	151	154	139	151	37
normalized size	1	1.	2.78	2.46	3.28	3.35	3.02	3.28	0.8
time (sec)	N/A	0.05	0.043	0.011	1.447	0.219	15.589	0.257	5.724

Problem 2327	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	140	113	151	154	143	151	110
normalized size	1	1.	1.15	0.93	1.24	1.26	1.17	1.24	0.9
time (sec)	N/A	0.133	0.054	0.01	1.444	0.218	26.537	0.262	16.111

Problem 2328	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	144	144	144	113	151	154	146	151	146
normalized size	1	1.	1.	0.78	1.05	1.07	1.01	1.05	1.01
time (sec)	N/A	0.187	0.051	0.01	1.44	0.218	39.793	0.27	31.609

Problem 2329	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	144	144	144	113	151	154	146	151	146
normalized size	1	1.	1.	0.78	1.05	1.07	1.01	1.05	1.01
time (sec)	N/A	0.179	0.057	0.011	1.445	0.218	60.175	0.22	31.778

Problem 2330	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	144	144	144	113	151	154	146	151	146
normalized size	1	1.	1.	0.78	1.05	1.07	1.01	1.05	1.01
time (sec)	N/A	0.182	0.05	0.011	1.446	0.218	90.58	0.222	31.68

Problem 2331	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	142	142	142	113	151	154	144	151	144
normalized size	1	1.	1.	0.8	1.06	1.08	1.01	1.06	1.01
time (sec)	N/A	0.182	0.051	0.011	1.446	0.216	144.63	0.22	32.708

Problem 2332	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	217	217	217	168	408	242	218	225	218
normalized size	1	1.	1.	0.77	1.88	1.12	1.	1.04	1.
time (sec)	N/A	0.362	0.038	0.004	1.462	0.215	68.346	0.224	68.25

Problem 2333	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	217	217	217	168	339	242	218	225	218
normalized size	1	1.	1.	0.77	1.56	1.12	1.	1.04	1.
time (sec)	N/A	0.351	0.031	0.004	1.448	0.215	40.256	0.22	61.975

Problem 2334	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	244	244	215	168	270	242	216	225	216
normalized size	1	1.	0.88	0.69	1.11	0.99	0.89	0.92	0.89
time (sec)	N/A	0.348	0.035	0.004	1.443	0.216	26.35	0.22	58.207

Problem 2335	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	183	183	213	168	201	242	214	225	173
normalized size	1	1.	1.16	0.92	1.1	1.32	1.17	1.23	0.95
time (sec)	N/A	0.289	0.034	0.004	1.457	0.214	17.32	0.223	53.743

Problem 2336	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	213	168	132	242	214	225	114
normalized size	1	1.	1.75	1.38	1.08	1.98	1.75	1.84	0.93
time (sec)	N/A	0.222	0.034	0.004	1.424	0.214	8.661	0.22	41.155

Problem 2337	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	204	165	63	232	207	221	53
normalized size	1	1.	3.46	2.8	1.07	3.93	3.51	3.75	0.9
time (sec)	N/A	0.16	0.03	0.033	1.456	0.214	7.082	0.219	27.83

Problem 2338	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	209	209	209	164	220	227	212	221	0
normalized size	1	1.	1.	0.78	1.05	1.09	1.01	1.06	0.
time (sec)	N/A	0.243	0.047	0.006	1.42	0.221	17.184	0.225	0.

Problem 2339	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	202	202	202	165	225	234	204	227	0
normalized size	1	1.	1.	0.82	1.11	1.16	1.01	1.12	0.
time (sec)	N/A	0.304	0.108	0.013	1.439	0.222	17.691	0.225	0.

Problem 2340	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	200	200	200	165	223	234	202	224	0
normalized size	1	1.	1.	0.82	1.12	1.17	1.01	1.12	0.
time (sec)	N/A	0.308	0.108	0.013	1.422	0.222	17.251	0.223	0.

Problem 2341	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	200	200	200	165	223	234	202	224	0
normalized size	1	1.	1.	0.82	1.12	1.17	1.01	1.12	0.
time (sec)	N/A	0.301	0.112	0.014	1.443	0.222	17.	0.222	0.

Problem 2342	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	211	211	211	166	224	234	212	225	218
normalized size	1	1.	1.	0.79	1.06	1.11	1.	1.07	1.03
time (sec)	N/A	0.301	0.184	0.014	1.441	0.221	28.666	0.223	51.606

Problem 2343	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	72	72	189	168	225	228	209	225	61
normalized size	1	1.	2.62	2.33	3.12	3.17	2.9	3.12	0.85
time (sec)	N/A	0.079	0.059	0.011	1.441	0.217	41.295	0.221	8.468

Problem 2344	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	148	148	213	168	225	228	216	225	131
normalized size	1	1.	1.44	1.14	1.52	1.54	1.46	1.52	0.89
time (sec)	N/A	0.175	0.071	0.011	1.437	0.218	62.906	0.222	21.965

Problem 2345	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	224	224	213	168	225	228	216	225	202
normalized size	1	1.	0.95	0.75	1.	1.02	0.96	1.	0.9
time (sec)	N/A	0.296	0.074	0.011	1.444	0.218	93.46	0.222	42.192

Problem 2346	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	215	215	215	168	225	228	218	225	218
normalized size	1	1.	1.	0.78	1.05	1.06	1.01	1.05	1.01
time (sec)	N/A	0.313	0.08	0.012	1.438	0.217	148.517	0.221	52.537

Problem 2347	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	217	217	217	168	225	228	0	225	219
normalized size	1	1.	1.	0.77	1.04	1.05	0.	1.04	1.01
time (sec)	N/A	0.31	0.076	0.011	1.43	0.216	0.	0.222	52.554

Problem 2348	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	217	217	217	168	225	228	0	225	219
normalized size	1	1.	1.	0.77	1.04	1.05	0.	1.04	1.01
time (sec)	N/A	0.312	0.076	0.012	1.44	0.216	0.	0.227	53.565

Problem 2349	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	166	166	166	131	266	180	165	180	0
normalized size	1	1.	1.	0.79	1.6	1.08	0.99	1.08	0.
time (sec)	N/A	0.248	0.119	0.007	1.425	0.219	129.273	0.219	0.

Problem 2350	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	124	99	197	135	122	135	0
normalized size	1	1.	1.	0.8	1.59	1.09	0.98	1.09	0.
time (sec)	N/A	0.164	0.079	0.005	1.432	0.218	64.396	0.227	0.

Problem 2351	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	77	65	128	89	80	90	0
normalized size	1	1.	0.96	0.81	1.6	1.11	1.	1.12	0.
time (sec)	N/A	0.106	0.027	0.003	1.433	0.216	24.922	0.22	0.

Problem 2352	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	42	42	79	59	45	42	47	0
normalized size	1	1.	1.	1.88	1.4	1.07	1.	1.12	0.
time (sec)	N/A	0.053	0.02	0.023	1.443	0.215	0.464	0.215	0.

Problem 2353	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	27	21	27	27	37	30	22
normalized size	1	1.	1.23	0.95	1.23	1.23	1.68	1.36	1.
time (sec)	N/A	0.032	0.008	0.003	1.442	0.223	1.607	0.218	6.587

Problem 2354	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	62	56	76	76	83	82	65
normalized size	1	1.	0.98	0.89	1.21	1.21	1.32	1.3	1.03
time (sec)	N/A	0.089	0.032	0.014	1.435	0.226	8.673	0.224	12.998

Problem 2355	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	104	104	95	87	116	126	129	123	107
normalized size	1	1.	0.91	0.84	1.12	1.21	1.24	1.18	1.03
time (sec)	N/A	0.129	0.07	0.003	1.439	0.226	30.454	0.223	20.258

Problem 2356	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	149	149	132	122	162	170	172	169	150
normalized size	1	1.	0.89	0.82	1.09	1.14	1.15	1.13	1.01
time (sec)	N/A	0.182	0.091	0.017	1.444	0.227	87.823	0.218	28.153

Problem 2357	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	25	16	20	23	22	23	22
normalized size	1	1.	1.19	0.76	0.95	1.1	1.05	1.1	1.05
time (sec)	N/A	0.028	0.009	0.004	1.438	0.22	2.265	0.22	4.597

Problem 2358	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	171	171	171	138	266	215	444	194	0
normalized size	1	1.	1.	0.81	1.56	1.26	2.6	1.13	0.
time (sec)	N/A	0.297	0.12	0.012	1.443	0.22	138.042	0.224	0.

Problem 2359	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	122	105	197	170	343	150	0
normalized size	1	1.	1.	0.86	1.61	1.39	2.81	1.23	0.
time (sec)	N/A	0.21	0.087	0.012	1.443	0.219	63.61	0.222	0.

Problem 2360	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	80	72	128	124	243	105	0
normalized size	1	1.	0.94	0.85	1.51	1.46	2.86	1.24	0.
time (sec)	N/A	0.131	0.047	0.003	1.444	0.219	24.974	0.216	0.

Problem 2361	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	42	257	59	76	109	55	0
normalized size	1	1.	0.91	5.59	1.28	1.65	2.37	1.2	0.
time (sec)	N/A	0.062	0.031	0.071	1.433	0.216	1.687	0.217	0.

Problem 2362	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	37	35	46	66	160	49	37
normalized size	1	1.	0.97	0.92	1.21	1.74	4.21	1.29	0.97
time (sec)	N/A	0.057	0.05	0.003	1.441	0.225	4.596	0.221	8.602

Problem 2363	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	77	73	99	126	272	104	82
normalized size	1	1.	0.96	0.91	1.24	1.58	3.4	1.3	1.02
time (sec)	N/A	0.121	0.154	0.017	1.433	0.227	17.202	0.221	17.436

Problem 2364	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	125	125	117	106	149	184	0	151	128
normalized size	1	1.	0.94	0.85	1.19	1.47	0.	1.21	1.02
time (sec)	N/A	0.188	0.237	0.003	1.446	0.228	0.	0.218	27.422

Problem 2365	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	162	162	154	139	193	228	0	196	167
normalized size	1	1.	0.95	0.86	1.19	1.41	0.	1.21	1.03
time (sec)	N/A	0.261	0.356	0.022	1.441	0.228	0.	0.224	45.441

Problem 2366	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	171	171	157	144	266	243	624	196	0
normalized size	1	1.	0.92	0.84	1.56	1.42	3.65	1.15	0.
time (sec)	N/A	0.326	0.103	0.013	1.444	0.234	21.612	0.224	0.

Problem 2367	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	134	134	120	111	197	198	493	151	0
normalized size	1	1.	0.9	0.83	1.47	1.48	3.68	1.13	0.
time (sec)	N/A	0.226	0.08	0.013	1.456	0.226	7.338	0.223	0.

Problem 2368	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	90	90	83	77	127	154	622	107	0
normalized size	1	1.	0.92	0.86	1.41	1.71	6.91	1.19	0.
time (sec)	N/A	0.147	0.061	0.004	1.437	0.227	25.548	0.218	0.

Problem 2369	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	45	330	62	93	228	59	49
normalized size	1	1.	0.83	6.11	1.15	1.72	4.22	1.09	0.91
time (sec)	N/A	0.076	0.037	0.101	1.442	0.221	2.434	0.22	10.588

Problem 2370	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	51	49	77	124	386	66	54
normalized size	1	1.	0.91	0.88	1.38	2.21	6.89	1.18	0.96
time (sec)	N/A	0.079	0.067	0.003	1.44	0.228	6.453	0.224	11.086

Problem 2371	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	103	103	93	90	131	189	561	122	104
normalized size	1	1.	0.9	0.87	1.27	1.83	5.45	1.18	1.01
time (sec)	N/A	0.154	0.215	0.017	1.442	0.238	28.345	0.226	21.388

Problem 2372	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	146	146	130	123	178	243	0	166	148
normalized size	1	1.	0.89	0.84	1.22	1.66	0.	1.14	1.01
time (sec)	N/A	0.233	0.28	0.003	1.457	0.23	0.	0.223	39.33

Problem 2373	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	183	183	167	156	223	288	0	211	0
normalized size	1	1.	0.91	0.85	1.22	1.57	0.	1.15	0.
time (sec)	N/A	0.317	0.42	0.021	1.456	0.233	0.	0.224	0.

Problem 2374	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	42	31	29	38	28	359	38	36
normalized size	1	1.	0.74	0.69	0.9	0.67	8.55	0.9	0.86
time (sec)	N/A	0.031	0.014	0.009	1.433	0.225	4.197	0.215	3.113

Problem 2375	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	23	18	26	28	20	26	20
normalized size	1	1.	1.	0.78	1.13	1.22	0.87	1.13	0.87
time (sec)	N/A	0.031	0.02	0.01	1.599	0.224	3.543	0.218	4.853

Problem 2376	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	39	28	57	34	34	36	0
normalized size	1	1.	1.	0.72	1.46	0.87	0.87	0.92	0.
time (sec)	N/A	0.043	0.011	0.003	1.431	0.222	0.598	0.224	0.

Problem 2377	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	41	16	16	14	16	14
normalized size	1	1.	1.	2.56	1.	1.	0.88	1.	0.88
time (sec)	N/A	0.019	0.007	0.01	1.612	0.224	0.377	0.218	3.58

Problem 2378	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	9	11	11	10	11	10
normalized size	1	1.	1.	0.75	0.92	0.92	0.83	0.92	0.83
time (sec)	N/A	0.012	0.003	0.004	1.485	0.22	0.452	0.215	1.715

Problem 2379	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	8	8	8	7	8	8	7	8	7
normalized size	1	1.	1.	0.88	1.	1.	0.88	1.	0.88
time (sec)	N/A	0.015	0.006	0.003	1.567	0.225	0.919	0.216	2.826

Problem 2380	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	11	11	11	8	9	9	24	9	8
normalized size	1	1.	1.	0.73	0.82	0.82	2.18	0.82	0.73
time (sec)	N/A	0.012	0.006	0.008	1.49	0.917	0.539	0.218	1.64

Problem 2381	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	10	12	26	49	12	12
normalized size	1	1.	1.	0.67	0.8	1.73	3.27	0.8	0.8
time (sec)	N/A	0.014	0.009	0.008	1.436	0.935	3.941	0.221	1.669

Problem 2382	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	117	117	115	76	119	163	187	119	112
normalized size	1	1.	0.98	0.65	1.02	1.39	1.6	1.02	0.96
time (sec)	N/A	0.183	0.053	0.006	1.597	0.239	2.864	0.223	21.828

Problem 2383	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	F(-2)	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	188	200	180	175	367	0	0	188	0
normalized size	1	1.06	0.96	0.93	1.95	0.	0.	1.	0.
time (sec)	N/A	0.744	0.25	0.033	1.591	0.	0.	0.312	0.

Problem 2384	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	67	67	63	91	105	100	165	0	58
normalized size	1	1.	0.94	1.36	1.57	1.49	2.46	0.	0.87
time (sec)	N/A	0.075	0.097	0.02	1.615	0.234	10.071	0.	6.196

Problem 2385	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	54	65	84	89	60	0	49
normalized size	1	1.	1.08	1.3	1.68	1.78	1.2	0.	0.98
time (sec)	N/A	0.048	0.046	0.02	1.43	0.229	10.7	0.	4.74

Problem 2386	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	F(-1)	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	53	0	0	0	46	0	146
normalized size	1	1.	0.56	0.	0.	0.	0.48	0.	1.54
time (sec)	N/A	0.19	0.088	0.025	0.	0.	46.995	0.	21.26

Problem 2387	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	14	20	18	15	18	15
normalized size	1	1.	1.	0.74	1.05	0.95	0.79	0.95	0.79
time (sec)	N/A	0.017	0.008	0.002	1.418	0.227	7.547	0.219	2.802

Problem 2388	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	14	20	18	15	18	15
normalized size	1	1.	1.	0.74	1.05	0.95	0.79	0.95	0.79
time (sec)	N/A	0.015	0.005	0.002	1.42	0.225	3.599	0.218	2.827

Problem 2389	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	14	20	18	15	18	15
normalized size	1	1.	1.	0.74	1.05	0.95	0.79	0.95	0.79
time (sec)	N/A	0.016	0.005	0.002	1.426	0.224	1.381	0.217	2.936

Problem 2390	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	14	20	18	15	18	0
normalized size	1	1.	1.	0.74	1.05	0.95	0.79	0.95	0.
time (sec)	N/A	0.016	0.005	0.002	1.419	0.217	2.59	0.22	0.

Problem 2391	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	11	14	14	12	14	0
normalized size	1	1.	1.	0.79	1.	1.	0.86	1.	0.
time (sec)	N/A	0.011	0.003	0.001	1.423	0.216	0.066	0.221	0.

Problem 2392	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	12	15	24	12	16	12
normalized size	1	1.	1.	0.92	1.15	1.85	0.92	1.23	0.92
time (sec)	N/A	0.015	0.011	0.009	1.425	0.224	1.567	0.219	2.866

Problem 2393	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	63	20	14	20	14
normalized size	1	1.	1.	0.82	3.71	1.18	0.82	1.18	0.82
time (sec)	N/A	0.016	0.009	0.008	1.453	0.223	2.467	0.21	2.901

Problem 2394	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	14	132	20	17	20	17
normalized size	1	1.	1.	0.74	6.95	1.05	0.89	1.05	0.89
time (sec)	N/A	0.016	0.01	0.008	1.446	0.221	4.78	0.209	2.925

Problem 2395	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	14	201	20	17	20	17
normalized size	1	1.	1.	0.74	10.58	1.05	0.89	1.05	0.89
time (sec)	N/A	0.016	0.01	0.008	1.585	0.22	9.079	0.21	2.854

Problem 2396	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	25	35	32	31	32	31
normalized size	1	1.	1.	0.74	1.03	0.94	0.91	0.94	0.91
time (sec)	N/A	0.081	0.015	0.001	1.446	0.217	11.625	0.21	12.869

Problem 2397	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	25	35	32	31	32	31
normalized size	1	1.	1.	0.74	1.03	0.94	0.91	0.94	0.91
time (sec)	N/A	0.073	0.009	0.002	1.432	0.22	5.704	0.21	11.495

Problem 2398	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	25	35	32	31	32	31
normalized size	1	1.	1.	0.74	1.03	0.94	0.91	0.94	0.91
time (sec)	N/A	0.065	0.016	0.001	1.437	0.219	2.399	0.21	9.855

Problem 2399	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	25	35	32	31	32	31
normalized size	1	1.	1.	0.74	1.03	0.94	0.91	0.94	0.91
time (sec)	N/A	0.059	0.011	0.001	1.436	0.221	1.975	0.211	8.85

Problem 2400	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	25	14	28	28	24	28	12
normalized size	1	1.	1.56	0.88	1.75	1.75	1.5	1.75	0.75
time (sec)	N/A	0.025	0.007	0.002	1.441	0.218	0.422	0.211	1.286

Problem 2401	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	27	23	30	41	27	32	32
normalized size	1	1.	0.96	0.82	1.07	1.46	0.96	1.14	1.14
time (sec)	N/A	0.049	0.037	0.008	1.44	0.225	1.962	0.213	7.946

Problem 2402	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	32	25	63	35	29	35	29
normalized size	1	1.	1.	0.78	1.97	1.09	0.91	1.09	0.91
time (sec)	N/A	0.048	0.02	0.009	1.431	0.22	3.119	0.211	8.011

Problem 2403	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	25	131	35	32	35	32
normalized size	1	1.	1.	0.74	3.85	1.03	0.94	1.03	0.94
time (sec)	N/A	0.051	0.017	0.008	1.446	0.219	6.056	0.212	8.043

Problem 2404	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	25	201	35	32	35	32
normalized size	1	1.	1.	0.74	5.91	1.03	0.94	1.03	0.94
time (sec)	N/A	0.05	0.018	0.008	1.441	0.222	11.402	0.211	8.281

Problem 2405	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	47	36	50	47	42	47	42
normalized size	1	1.	1.	0.77	1.06	1.	0.89	1.	0.89
time (sec)	N/A	0.093	0.014	0.002	1.44	0.22	14.423	0.21	14.647

Problem 2406	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	41	36	50	47	42	47	42
normalized size	1	1.	0.87	0.77	1.06	1.	0.89	1.	0.89
time (sec)	N/A	0.084	0.012	0.003	1.438	0.219	7.314	0.212	13.124

Problem 2407	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	47	36	50	47	42	47	42
normalized size	1	1.	1.	0.77	1.06	1.	0.89	1.	0.89
time (sec)	N/A	0.077	0.012	0.002	1.437	0.217	3.513	0.209	11.731

Problem 2408	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	42	42	33	50	43	39	43	39
normalized size	1	1.	1.	0.79	1.19	1.02	0.93	1.02	0.93
time (sec)	N/A	0.067	0.01	0.003	1.438	0.218	2.486	0.211	9.73

Problem 2409	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	36	31	41	45	36	42	0
normalized size	1	1.	1.	0.86	1.14	1.25	1.	1.17	0.
time (sec)	N/A	0.054	0.015	0.004	1.435	0.223	0.625	0.21	0.

Problem 2410	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	40	34	45	53	36	50	41
normalized size	1	1.	1.03	0.87	1.15	1.36	0.92	1.28	1.05
time (sec)	N/A	0.06	0.036	0.01	1.428	0.226	2.32	0.215	9.862

Problem 2411	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	41	36	63	47	41	47	41
normalized size	1	1.	0.91	0.8	1.4	1.04	0.91	1.04	0.91
time (sec)	N/A	0.062	0.018	0.008	1.438	0.225	4.213	0.213	10.259

Problem 2412	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	41	36	132	47	44	47	44
normalized size	1	1.	0.87	0.77	2.81	1.	0.94	1.	0.94
time (sec)	N/A	0.063	0.014	0.008	1.432	0.228	7.593	0.211	10.286

Problem 2413	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	41	36	201	47	44	47	44
normalized size	1	1.	0.87	0.77	4.28	1.	0.94	1.	0.94
time (sec)	N/A	0.063	0.016	0.009	1.44	0.223	14.157	0.212	10.586

Problem 2414	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	136	136	136	109	165	150	143	150	0
normalized size	1	1.	1.	0.8	1.21	1.1	1.05	1.1	0.
time (sec)	N/A	0.213	0.08	0.007	1.445	0.231	13.788	0.216	0.

Problem 2415	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	88	77	119	104	92	105	0
normalized size	1	1.	0.94	0.82	1.27	1.11	0.98	1.12	0.
time (sec)	N/A	0.136	0.025	0.005	1.437	0.226	35.301	0.216	0.

Problem 2416	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	60	60	50	43	73	58	58	61	0
normalized size	1	1.	0.83	0.72	1.22	0.97	0.97	1.02	0.
time (sec)	N/A	0.088	0.013	0.004	1.459	0.225	1.575	0.214	0.

Problem 2417	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	14	27	18	20	19	12
normalized size	1	1.	1.	0.93	1.8	1.2	1.33	1.27	0.8
time (sec)	N/A	0.023	0.007	0.001	1.418	0.229	2.355	0.214	4.042

Problem 2418	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	51	51	48	44	59	63	73	66	54
normalized size	1	1.	0.94	0.86	1.16	1.24	1.43	1.29	1.06
time (sec)	N/A	0.082	0.055	0.013	1.442	0.236	5.865	0.215	12.291

Problem 2419	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	93	93	84	78	128	109	116	109	94
normalized size	1	1.	0.9	0.84	1.38	1.17	1.25	1.17	1.01
time (sec)	N/A	0.126	0.103	0.014	1.442	0.238	18.578	0.218	18.943

Problem 2420	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	134	134	121	109	197	155	158	153	136
normalized size	1	1.	0.9	0.81	1.47	1.16	1.18	1.14	1.01
time (sec)	N/A	0.182	0.152	0.016	1.442	0.237	61.877	0.217	26.558

Problem 2421	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	179	179	158	144	266	200	0	198	178
normalized size	1	1.	0.88	0.8	1.49	1.12	0.	1.11	0.99
time (sec)	N/A	0.234	0.332	0.016	1.438	0.236	0.	0.217	35.958

Problem 2422	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	150	150	150	127	196	200	367	180	0
normalized size	1	1.	1.	0.85	1.31	1.33	2.45	1.2	0.
time (sec)	N/A	0.282	0.104	0.012	1.442	0.229	23.519	0.215	0.

Problem 2423	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	113	113	104	94	151	154	415	135	0
normalized size	1	1.	0.92	0.83	1.34	1.36	3.67	1.19	0.
time (sec)	N/A	0.195	0.061	0.011	1.427	0.23	48.066	0.216	0.

Problem 2424	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	63	60	103	108	165	88	0
normalized size	1	1.	0.82	0.78	1.34	1.4	2.14	1.14	0.
time (sec)	N/A	0.124	0.043	0.01	1.447	0.227	2.261	0.215	0.

Problem 2425	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	29	30	46	47	99	41	29
normalized size	1	1.	0.88	0.91	1.39	1.42	3.	1.24	0.88
time (sec)	N/A	0.06	0.021	0.003	1.44	0.229	3.955	0.215	9.145

Problem 2426	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	49	47	59	101	211	69	54
normalized size	1	1.	0.94	0.9	1.13	1.94	4.06	1.33	1.04
time (sec)	N/A	0.088	0.101	0.016	1.432	0.238	10.258	0.222	12.097

Problem 2427	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	97	97	89	84	128	151	0	122	99
normalized size	1	1.	0.92	0.87	1.32	1.56	0.	1.26	1.02
time (sec)	N/A	0.157	0.23	0.017	1.439	0.237	0.	0.218	21.607

Problem 2428	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	133	133	132	116	197	198	0	166	136
normalized size	1	1.	0.99	0.87	1.48	1.49	0.	1.25	1.02
time (sec)	N/A	0.221	0.36	0.02	1.45	0.239	0.	0.217	32.742

Problem 2429	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	183	183	169	150	266	243	0	211	187
normalized size	1	1.	0.92	0.82	1.45	1.33	0.	1.15	1.02
time (sec)	N/A	0.304	0.455	0.021	1.432	0.24	0.	0.218	59.14

Problem 2430	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	171	171	157	144	225	243	624	196	0
normalized size	1	1.	0.92	0.84	1.32	1.42	3.65	1.15	0.
time (sec)	N/A	0.34	0.103	0.013	1.44	0.231	21.126	0.224	0.

Problem 2431	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	134	134	120	111	181	198	1069	151	0
normalized size	1	1.	0.9	0.83	1.35	1.48	7.98	1.13	0.
time (sec)	N/A	0.236	0.074	0.012	1.466	0.227	62.654	0.218	0.

Problem 2432	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	83	77	136	154	364	107	0
normalized size	1	1.	0.83	0.77	1.36	1.54	3.64	1.07	0.
time (sec)	N/A	0.16	0.053	0.011	1.42	0.226	2.903	0.216	0.

Problem 2433	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	45	330	77	93	240	59	49
normalized size	1	1.	0.83	6.11	1.43	1.72	4.44	1.09	0.91
time (sec)	N/A	0.084	0.041	0.112	1.426	0.229	6.248	0.216	12.109

Problem 2434	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	51	49	62	124	406	66	54
normalized size	1	1.	0.91	0.88	1.11	2.21	7.25	1.18	0.96
time (sec)	N/A	0.085	0.068	0.013	1.424	0.242	27.435	0.217	13.021

Problem 2435	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	103	103	93	90	128	189	0	122	104
normalized size	1	1.	0.9	0.87	1.24	1.83	0.	1.18	1.01
time (sec)	N/A	0.169	0.209	0.018	1.448	0.237	0.	0.217	22.212

Problem 2436	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	146	146	130	123	197	243	0	166	148
normalized size	1	1.	0.89	0.84	1.35	1.66	0.	1.14	1.01
time (sec)	N/A	0.244	0.277	0.019	1.445	0.239	0.	0.218	42.669

Problem 2437	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	183	183	167	156	266	288	0	211	0
normalized size	1	1.	0.91	0.85	1.45	1.57	0.	1.15	0.
time (sec)	N/A	0.338	0.481	0.021	1.438	0.24	0.	0.219	0.

Problem 2438	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	35	28	54	36	34	38	0
normalized size	1	1.	0.8	0.64	1.23	0.82	0.77	0.86	0.
time (sec)	N/A	0.06	0.013	0.005	1.483	0.229	0.408	0.213	0.

Problem 2439	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	F(-1)	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	10	12	0	31	0	12
normalized size	1	1.	1.	0.67	0.8	0.	2.07	0.	0.8
time (sec)	N/A	0.014	0.008	0.003	1.438	0.	6.244	0.	1.663

Problem 2440	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	F(-1)	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	14	18	0	0	0	17
normalized size	1	1.	1.	0.67	0.86	0.	0.	0.	0.81
time (sec)	N/A	0.019	0.019	0.003	1.438	0.	0.	0.	2.105

Problem 2441	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	45	79	57	39	41	39	0
normalized size	1	1.	1.	1.76	1.27	0.87	0.91	0.87	0.
time (sec)	N/A	0.04	0.016	0.065	1.44	0.238	12.842	0.214	0.

Problem 2442	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	F(-1)	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	10	12	0	12	12	12
normalized size	1	1.	1.	0.67	0.8	0.	0.8	0.8	0.8
time (sec)	N/A	0.017	0.007	0.006	1.439	0.	1.809	0.212	1.704

Problem 2443	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	F(-1)	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	28	0	19	0	0	0	14
normalized size	1	1.	1.56	0.	1.06	0.	0.	0.	0.78
time (sec)	N/A	0.013	0.035	0.023	1.447	0.	0.	0.	1.349

Problem 2444	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	23	0	38	51	42	15
normalized size	1	1.	1.	1.1	0.	1.81	2.43	2.	0.71
time (sec)	N/A	0.027	0.017	0.015	0.	0.239	1.407	0.213	3.572

Problem 2445	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	23	0	38	51	42	15
normalized size	1	1.	1.	1.1	0.	1.81	2.43	2.	0.71
time (sec)	N/A	0.022	0.016	0.014	0.	0.236	1.025	0.213	3.662

Problem 2446	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	23	0	38	51	42	0
normalized size	1	1.	1.	1.1	0.	1.81	2.43	2.	0.
time (sec)	N/A	0.023	0.016	0.012	0.	0.238	0.714	0.214	0.

Problem 2447	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	17	0	27	17	22	0
normalized size	1	1.	1.	1.06	0.	1.69	1.06	1.38	0.
time (sec)	N/A	0.016	0.009	0.002	0.	0.237	0.065	0.21	0.

Problem 2448	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	19	24	20	17	0	10
normalized size	1	1.	1.	1.46	1.85	1.54	1.31	0.	0.77
time (sec)	N/A	0.02	0.007	0.007	1.438	0.238	0.47	0.	3.275

Problem 2449	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	19	21	0	31	32	0	14
normalized size	1	1.	0.86	0.95	0.	1.41	1.45	0.	0.64
time (sec)	N/A	0.03	0.014	0.014	0.	0.243	1.569	0.	3.694

Problem 2450	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	21	21	0	31	60	0	17
normalized size	1	1.	0.88	0.88	0.	1.29	2.5	0.	0.71
time (sec)	N/A	0.028	0.02	0.014	0.	0.237	1.99	0.	3.716

Problem 2451	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	38	47	0	100	202	127	36
normalized size	1	1.	0.86	1.07	0.	2.27	4.59	2.89	0.82
time (sec)	N/A	0.057	0.058	0.019	0.	0.239	2.746	0.216	8.149

Problem 2452	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	40	48	0	105	211	131	36
normalized size	1	1.	0.93	1.12	0.	2.44	4.91	3.05	0.84
time (sec)	N/A	0.054	0.054	0.017	0.	0.239	6.197	0.214	8.432

Problem 2453	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	37	47	0	97	201	126	0
normalized size	1	1.	0.84	1.07	0.	2.2	4.57	2.86	0.
time (sec)	N/A	0.049	0.056	0.014	0.	0.243	1.457	0.214	0.

Problem 2454	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	34	41	0	88	182	107	0
normalized size	1	1.	0.89	1.08	0.	2.32	4.79	2.82	0.
time (sec)	N/A	0.04	0.042	0.012	0.	0.241	1.16	0.215	0.

Problem 2455	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	27	36	46	41	36	0	0
normalized size	1	1.	0.84	1.12	1.44	1.28	1.12	0.	0.
time (sec)	N/A	0.043	0.028	0.003	1.443	0.239	0.71	0.	0.

Problem 2456	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	38	43	0	92	190	0	34
normalized size	1	1.	0.86	0.98	0.	2.09	4.32	0.	0.77
time (sec)	N/A	0.062	0.049	0.016	0.	0.241	2.462	0.	8.958

Problem 2457	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	39	42	0	89	245	0	37
normalized size	1	1.	0.78	0.84	0.	1.78	4.9	0.	0.74
time (sec)	N/A	0.058	0.043	0.019	0.	0.239	2.348	0.	8.673

Problem 2458	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	65	58	65	0	196	507	270	56
normalized size	1	1.	0.89	1.	0.	3.02	7.8	4.15	0.86
time (sec)	N/A	0.081	0.069	0.017	0.	0.243	41.53	0.218	11.854

Problem 2459	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	57	72	0	194	500	270	56
normalized size	1	1.	0.86	1.09	0.	2.94	7.58	4.09	0.85
time (sec)	N/A	0.085	0.06	0.019	0.	0.239	11.777	0.217	12.237

Problem 2460	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-2)	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	65	58	71	0	196	0	270	0
normalized size	1	1.	0.89	1.09	0.	3.02	0.	4.15	0.
time (sec)	N/A	0.074	0.061	0.018	0.	0.243	0.	0.218	0.

Problem 2461	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	60	60	54	64	0	176	469	231	0
normalized size	1	1.	0.9	1.07	0.	2.93	7.82	3.85	0.
time (sec)	N/A	0.06	0.04	0.015	0.	0.239	2.164	0.216	0.

Problem 2462	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	41	52	65	59	53	0	0
normalized size	1	1.	0.82	1.04	1.3	1.18	1.06	0.	0.
time (sec)	N/A	0.06	0.041	0.003	1.439	0.238	1.143	0.	0.

Problem 2463	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	58	65	0	177	508	0	54
normalized size	1	1.	0.88	0.98	0.	2.68	7.7	0.	0.82
time (sec)	N/A	0.088	0.047	0.021	0.	0.243	4.118	0.	12.299

Problem 2464	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	72	72	60	65	0	181	627	0	58
normalized size	1	1.	0.83	0.9	0.	2.51	8.71	0.	0.81
time (sec)	N/A	0.09	0.05	0.03	0.	0.241	5.662	0.	12.061

Problem 2465	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	33	0	0	0	0	0	20
normalized size	1	1.	1.	0.	0.	0.	0.	0.	0.61
time (sec)	N/A	0.031	0.014	0.054	0.	0.	0.	0.	3.663

Problem 2466	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	24	0	0	0	0	0	17
normalized size	1	1.	1.	0.	0.	0.	0.	0.	0.71
time (sec)	N/A	0.02	0.008	0.046	0.	0.	0.	0.	1.779

Problem 2467	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	22	29	38	30	41	0	19
normalized size	1	1.	0.96	1.26	1.65	1.3	1.78	0.	0.83
time (sec)	N/A	0.036	0.016	0.003	1.445	0.245	2.2	0.	6.364

Problem 2468	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	31	0	0	0	0	0	20
normalized size	1	1.	0.91	0.	0.	0.	0.	0.	0.59
time (sec)	N/A	0.036	0.012	0.052	0.	0.	0.	0.	4.025

Problem 2469	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	33	0	0	0	0	0	24
normalized size	1	1.	0.92	0.	0.	0.	0.	0.	0.67
time (sec)	N/A	0.03	0.012	0.073	0.	0.	0.	0.	4.136

Problem 2470	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	53	0	0	0	0	0	22
normalized size	1	1.	1.61	0.	0.	0.	0.	0.	0.67
time (sec)	N/A	0.027	0.052	0.074	0.	0.	0.	0.	3.298

Problem 2471	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	49	0	0	0	0	0	19
normalized size	1	1.	2.04	0.	0.	0.	0.	0.	0.79
time (sec)	N/A	0.019	0.044	0.063	0.	0.	0.	0.	1.838

Problem 2472	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	34	45	58	68	160	0	34
normalized size	1	1.	0.87	1.15	1.49	1.74	4.1	0.	0.87
time (sec)	N/A	0.065	0.07	0.002	1.43	0.229	3.542	0.	10.012

Problem 2473	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	56	0	0	0	0	0	22
normalized size	1	1.	1.65	0.	0.	0.	0.	0.	0.65
time (sec)	N/A	0.03	0.06	0.075	0.	0.	0.	0.	4.085

Problem 2474	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	61	0	0	0	0	0	26
normalized size	1	1.	1.69	0.	0.	0.	0.	0.	0.72
time (sec)	N/A	0.03	0.05	0.084	0.	0.	0.	0.	3.784

Problem 2475	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	74	0	0	0	0	0	22
normalized size	1	1.	2.24	0.	0.	0.	0.	0.	0.67
time (sec)	N/A	0.027	0.098	0.084	0.	0.	0.	0.	3.439

Problem 2476	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	71	0	0	0	0	0	19
normalized size	1	1.	2.96	0.	0.	0.	0.	0.	0.79
time (sec)	N/A	0.019	0.086	0.073	0.	0.	0.	0.	1.798

Problem 2477	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	48	62	96	143	406	0	51
normalized size	1	1.	0.83	1.07	1.66	2.47	7.	0.	0.88
time (sec)	N/A	0.084	0.171	0.004	1.442	0.227	5.561	0.	12.96

Problem 2478	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	76	0	0	0	0	0	22
normalized size	1	1.	2.24	0.	0.	0.	0.	0.	0.65
time (sec)	N/A	0.03	0.1	0.094	0.	0.	0.	0.	3.668

Problem 2479	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	75	0	0	0	0	0	26
normalized size	1	1.	2.08	0.	0.	0.	0.	0.	0.72
time (sec)	N/A	0.03	0.102	0.065	0.	0.	0.	0.	3.787

Problem 2480	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	57	75	0	0	0	0	0	44
normalized size	1	1.19	1.56	0.	0.	0.	0.	0.	0.92
time (sec)	N/A	0.055	0.089	0.072	0.	0.	0.	0.	6.221

Problem 2481	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	48	66	0	0	0	0	0	41
normalized size	1	1.23	1.69	0.	0.	0.	0.	0.	1.05
time (sec)	N/A	0.041	0.06	0.06	0.	0.	0.	0.	3.442

Problem 2482	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	42	36	0	1	0	0	37
normalized size	1	1.	0.93	0.8	0.	0.02	0.	0.	0.82
time (sec)	N/A	0.08	0.033	0.002	0.	0.229	0.	0.	7.616

Problem 2483	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	58	73	0	0	0	0	0	44
normalized size	1	1.18	1.49	0.	0.	0.	0.	0.	0.9
time (sec)	N/A	0.067	0.071	0.067	0.	0.	0.	0.	6.715

Problem 2484	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	51	60	76	0	0	0	0	0	48
normalized size	1	1.18	1.49	0.	0.	0.	0.	0.	0.94
time (sec)	N/A	0.064	0.069	0.069	0.	0.	0.	0.	6.865

Problem 2485	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	58	102	0	0	0	0	0	46
normalized size	1	1.21	2.12	0.	0.	0.	0.	0.	0.96
time (sec)	N/A	0.056	0.147	0.052	0.	0.	0.	0.	6.255

Problem 2486	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	49	94	0	0	0	0	0	42
normalized size	1	1.26	2.41	0.	0.	0.	0.	0.	1.08
time (sec)	N/A	0.033	0.122	0.049	0.	0.	0.	0.	3.53

Problem 2487	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	64	64	55	48	0	1	0	0	54
normalized size	1	1.	0.86	0.75	0.	0.02	0.	0.	0.84
time (sec)	N/A	0.098	0.059	0.004	0.	0.228	0.	0.	9.756

Problem 2488	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	59	100	0	0	0	0	0	46
normalized size	1	1.2	2.04	0.	0.	0.	0.	0.	0.94
time (sec)	N/A	0.066	0.146	0.061	0.	0.	0.	0.	6.881

Problem 2489	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	51	61	102	0	0	0	0	0	49
normalized size	1	1.2	2.	0.	0.	0.	0.	0.	0.96
time (sec)	N/A	0.075	0.139	0.062	0.	0.	0.	0.	6.95

Problem 2490	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	60	144	0	0	0	0	0	48
normalized size	1	1.25	3.	0.	0.	0.	0.	0.	1.
time (sec)	N/A	0.059	0.286	0.054	0.	0.	0.	0.	6.485

Problem 2491	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	51	135	0	0	0	0	0	44
normalized size	1	1.31	3.46	0.	0.	0.	0.	0.	1.13
time (sec)	N/A	0.034	0.222	0.053	0.	0.	0.	0.	3.8

Problem 2492	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	69	62	0	1	0	0	73
normalized size	1	1.	0.81	0.73	0.	0.01	0.	0.	0.86
time (sec)	N/A	0.116	0.093	0.006	0.	0.231	0.	0.	12.9

Problem 2493	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	61	141	0	0	0	0	0	48
normalized size	1	1.24	2.88	0.	0.	0.	0.	0.	0.98
time (sec)	N/A	0.061	0.237	0.067	0.	0.	0.	0.	7.223

Problem 2494	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	51	63	144	0	0	0	0	0	51
normalized size	1	1.24	2.82	0.	0.	0.	0.	0.	1.
time (sec)	N/A	0.066	0.253	0.069	0.	0.	0.	0.	7.133

Problem 2495	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	57	58	0	0	0	0	0	44
normalized size	1	1.19	1.21	0.	0.	0.	0.	0.	0.92
time (sec)	N/A	0.055	0.047	0.042	0.	0.	0.	0.	6.368

Problem 2496	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	48	49	0	0	0	0	0	41
normalized size	1	1.23	1.26	0.	0.	0.	0.	0.	1.05
time (sec)	N/A	0.032	0.031	0.041	0.	0.	0.	0.	3.756

Problem 2497	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	28	23	0	1	0	0	26
normalized size	1	1.	1.	0.82	0.	0.04	0.	0.	0.93
time (sec)	N/A	0.053	0.024	0.006	0.	0.227	0.	0.	5.721

Problem 2498	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	58	56	0	0	0	0	0	44
normalized size	1	1.18	1.14	0.	0.	0.	0.	0.	0.9
time (sec)	N/A	0.065	0.041	0.04	0.	0.	0.	0.	7.158

Problem 2499	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	51	60	58	0	0	0	0	0	48
normalized size	1	1.18	1.14	0.	0.	0.	0.	0.	0.94
time (sec)	N/A	0.064	0.042	0.043	0.	0.	0.	0.	7.074

Problem 2500	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	60	69	0	0	0	0	0	46
normalized size	1	1.25	1.44	0.	0.	0.	0.	0.	0.96
time (sec)	N/A	0.056	0.101	0.042	0.	0.	0.	0.	6.569

Problem 2501	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	51	60	0	0	0	0	0	42
normalized size	1	1.31	1.54	0.	0.	0.	0.	0.	1.08
time (sec)	N/A	0.034	0.067	0.04	0.	0.	0.	0.	3.81

Problem 2502	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	48	48	39	0	1	0	0	39
normalized size	1	1.	1.	0.81	0.	0.02	0.	0.	0.81
time (sec)	N/A	0.078	0.066	0.008	0.	0.229	0.	0.	8.015

Problem 2503	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	61	67	0	0	0	0	0	46
normalized size	1	1.24	1.37	0.	0.	0.	0.	0.	0.94
time (sec)	N/A	0.067	0.094	0.041	0.	0.	0.	0.	7.119

Problem 2504	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	51	63	70	0	0	0	0	0	49
normalized size	1	1.24	1.37	0.	0.	0.	0.	0.	0.96
time (sec)	N/A	0.067	0.087	0.04	0.	0.	0.	0.	7.128

Problem 2505	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	60	100	0	0	0	0	0	46
normalized size	1	1.25	2.08	0.	0.	0.	0.	0.	0.96
time (sec)	N/A	0.056	0.159	0.041	0.	0.	0.	0.	6.669

Problem 2506	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	51	94	0	0	0	0	0	42
normalized size	1	1.31	2.41	0.	0.	0.	0.	0.	1.08
time (sec)	N/A	0.035	0.149	0.04	0.	0.	0.	0.	3.885

Problem 2507	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	60	53	0	1	0	0	58
normalized size	1	1.	0.87	0.77	0.	0.01	0.	0.	0.84
time (sec)	N/A	0.103	0.153	0.01	0.	0.23	0.	0.	11.065

Problem 2508	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	61	101	0	0	0	0	0	46
normalized size	1	1.24	2.06	0.	0.	0.	0.	0.	0.94
time (sec)	N/A	0.066	0.153	0.04	0.	0.	0.	0.	7.15

Problem 2509	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	51	63	101	0	0	0	0	0	49
normalized size	1	1.24	1.98	0.	0.	0.	0.	0.	0.96
time (sec)	N/A	0.069	0.153	0.04	0.	0.	0.	0.	7.087

Problem 2510	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F(-2)	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	106	106	68	107	0	136	0	0	97
normalized size	1	1.	0.64	1.01	0.	1.28	0.	0.	0.92
time (sec)	N/A	0.173	0.067	0.008	0.	0.228	0.	0.	11.466

Problem 2511	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	22	28	0	30	26	0	19
normalized size	1	1.	0.81	1.04	0.	1.11	0.96	0.	0.7
time (sec)	N/A	0.023	0.01	0.027	0.	0.223	14.546	0.	4.013

Problem 2512	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	22	28	0	30	26	0	19
normalized size	1	1.	0.81	1.04	0.	1.11	0.96	0.	0.7
time (sec)	N/A	0.022	0.011	0.025	0.	0.222	14.734	0.	4.027

Problem 2513	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	22	28	0	30	26	0	19
normalized size	1	1.	0.81	1.04	0.	1.11	0.96	0.	0.7
time (sec)	N/A	0.022	0.01	0.022	0.	0.224	14.269	0.	4.018

Problem 2514	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	19	25	23	26	22	26	15
normalized size	1	1.	0.86	1.14	1.05	1.18	1.	1.18	0.68
time (sec)	N/A	0.021	0.008	0.02	1.433	0.222	4.062	0.211	3.791

Problem 2515	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	19	24	20	17	0	10
normalized size	1	1.	1.	1.46	1.85	1.54	1.31	0.	0.77
time (sec)	N/A	0.019	0.007	0.	1.42	0.225	0.473	0.	3.289

Problem 2516	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	25	0	28	107	32	10
normalized size	1	1.	1.	1.56	0.	1.75	6.69	2.	0.62
time (sec)	N/A	0.018	0.013	0.018	0.	0.224	40.475	0.216	3.536

Problem 2517	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	20	27	0	27	24	28	17
normalized size	1	1.	0.8	1.08	0.	1.08	0.96	1.12	0.68
time (sec)	N/A	0.022	0.011	0.023	0.	0.222	16.204	0.214	3.958

Problem 2518	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	22	27	0	30	27	31	20
normalized size	1	1.	0.81	1.	0.	1.11	1.	1.15	0.74
time (sec)	N/A	0.022	0.011	0.023	0.	0.223	15.982	0.214	4.049

Problem 2519	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	22	27	0	30	27	31	20
normalized size	1	1.	0.81	1.	0.	1.11	1.	1.15	0.74
time (sec)	N/A	0.023	0.012	0.026	0.	0.223	15.857	0.215	3.976

Problem 2520	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	22	27	0	30	27	31	20
normalized size	1	1.	0.81	1.	0.	1.11	1.	1.15	0.74
time (sec)	N/A	0.022	0.012	0.028	0.	0.224	15.787	0.214	4.087

Problem 2521	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	35	40	0	47	44	0	36
normalized size	1	1.	0.78	0.89	0.	1.04	0.98	0.	0.8
time (sec)	N/A	0.063	0.021	0.03	0.	0.224	37.378	0.	8.868

Problem 2522	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	35	46	0	47	42	0	34
normalized size	1	1.	0.78	1.02	0.	1.04	0.93	0.	0.76
time (sec)	N/A	0.055	0.019	0.027	0.	0.223	37.11	0.	8.596

Problem 2523	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	35	46	0	47	44	0	0
normalized size	1	1.	0.78	1.02	0.	1.04	0.98	0.	0.
time (sec)	N/A	0.053	0.019	0.025	0.	0.225	37.535	0.	0.

Problem 2524	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	42	23	43	37	43	12
normalized size	1	1.	1.	2.21	1.21	2.26	1.95	2.26	0.63
time (sec)	N/A	0.019	0.011	0.023	1.433	0.225	8.793	0.215	2.433

Problem 2525	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	27	36	46	41	36	0	0
normalized size	1	1.	0.84	1.12	1.44	1.28	1.12	0.	0.
time (sec)	N/A	0.041	0.028	0.	1.435	0.226	0.696	0.	0.

Problem 2526	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	43	0	46	175	51	0
normalized size	1	1.	1.	1.43	0.	1.53	5.83	1.7	0.
time (sec)	N/A	0.046	0.028	0.021	0.	0.225	137.979	0.221	0.

Problem 2527	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	28	43	0	51	0	54	31
normalized size	1	1.	0.82	1.26	0.	1.5	0.	1.59	0.91
time (sec)	N/A	0.048	0.059	0.021	0.	0.225	0.	0.219	7.66

Problem 2528	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	33	45	0	45	39	47	19
normalized size	1	1.	1.38	1.88	0.	1.88	1.62	1.96	0.79
time (sec)	N/A	0.021	0.022	0.023	0.	0.226	38.667	0.22	3.113

Problem 2529	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	35	45	0	47	46	50	37
normalized size	1	1.	0.78	1.	0.	1.04	1.02	1.11	0.82
time (sec)	N/A	0.053	0.023	0.025	0.	0.224	38.636	0.219	8.103

Problem 2530	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	35	45	0	47	44	50	36
normalized size	1	1.	0.78	1.	0.	1.04	0.98	1.11	0.8
time (sec)	N/A	0.053	0.023	0.028	0.	0.224	37.415	0.221	8.098

Problem 2531	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	35	40	0	47	46	50	37
normalized size	1	1.	0.78	0.89	0.	1.04	1.02	1.11	0.82
time (sec)	N/A	0.052	0.024	0.031	0.	0.225	38.795	0.219	8.305

Problem 2532	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	48	56	0	65	60	0	51
normalized size	1	1.	0.76	0.89	0.	1.03	0.95	0.	0.81
time (sec)	N/A	0.077	0.027	0.031	0.	0.224	115.963	0.	11.898

Problem 2533	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	48	56	0	65	61	0	53
normalized size	1	1.	0.76	0.89	0.	1.03	0.97	0.	0.84
time (sec)	N/A	0.072	0.023	0.03	0.	0.225	116.467	0.	11.29

Problem 2534	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	48	63	0	65	58	0	31
normalized size	1	1.	1.2	1.58	0.	1.62	1.45	0.	0.78
time (sec)	N/A	0.058	0.023	0.026	0.	0.224	116.127	0.	9.046

Problem 2535	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	60	23	61	54	61	12
normalized size	1	1.	1.	3.16	1.21	3.21	2.84	3.21	0.63
time (sec)	N/A	0.019	0.012	0.024	1.446	0.226	16.731	0.216	2.456

Problem 2536	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	41	52	65	59	53	0	0
normalized size	1	1.	0.82	1.04	1.3	1.18	1.06	0.	0.
time (sec)	N/A	0.055	0.04	0.	1.441	0.226	1.15	0.	0.

Problem 2537	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	46	62	0	65	0	72	0
normalized size	1	1.	0.94	1.27	0.	1.33	0.	1.47	0.
time (sec)	N/A	0.064	0.05	0.023	0.	0.226	0.	0.223	0.

Problem 2538	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	48	45	61	0	69	0	73	0
normalized size	1	1.	0.94	1.27	0.	1.44	0.	1.52	0.
time (sec)	N/A	0.062	0.07	0.023	0.	0.225	0.	0.22	0.

Problem 2539	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	43	61	0	69	0	73	48
normalized size	1	1.	0.83	1.17	0.	1.33	0.	1.4	0.92
time (sec)	N/A	0.063	0.047	0.024	0.	0.225	0.	0.221	10.602

Problem 2540	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	46	63	0	62	56	66	19
normalized size	1	1.	1.92	2.62	0.	2.58	2.33	2.75	0.79
time (sec)	N/A	0.022	0.027	0.026	0.	0.224	117.792	0.221	3.133

Problem 2541	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	48	63	0	65	60	69	51
normalized size	1	1.	0.96	1.26	0.	1.3	1.2	1.38	1.02
time (sec)	N/A	0.056	0.027	0.029	0.	0.224	118.366	0.223	10.946

Problem 2542	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	48	56	0	65	63	69	54
normalized size	1	1.	0.76	0.89	0.	1.03	1.	1.1	0.86
time (sec)	N/A	0.067	0.028	0.031	0.	0.224	117.865	0.222	10.865

Problem 2543	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	48	56	0	65	61	69	53
normalized size	1	1.	0.76	0.89	0.	1.03	0.97	1.1	0.84
time (sec)	N/A	0.069	0.028	0.032	0.	0.224	118.801	0.222	10.692

Problem 2544	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	74	87	0	100	0	0	83
normalized size	1	1.	0.88	1.04	0.	1.19	0.	0.	0.99
time (sec)	N/A	0.114	0.036	0.036	0.	0.226	0.	0.	12.146

Problem 2545	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	74	88	0	100	0	0	51
normalized size	1	1.	1.19	1.42	0.	1.61	0.	0.	0.82
time (sec)	N/A	0.094	0.032	0.034	0.	0.225	0.	0.	7.554

Problem 2546	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	74	88	0	100	0	0	31
normalized size	1	1.	1.85	2.2	0.	2.5	0.	0.	0.78
time (sec)	N/A	0.057	0.031	0.036	0.	0.226	0.	0.	5.187

Problem 2547	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	84	23	96	88	96	12
normalized size	1	1.	1.	4.42	1.21	5.05	4.63	5.05	0.63
time (sec)	N/A	0.019	0.015	0.036	1.434	0.225	49.307	0.215	1.226

Problem 2548	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	67	84	100	95	85	0	0
normalized size	1	1.	0.8	1.	1.19	1.13	1.01	0.	0.
time (sec)	N/A	0.089	0.057	0.003	1.426	0.228	2.324	0.	0.

Problem 2549	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	83	72	98	0	101	0	111	0
normalized size	1	1.	0.87	1.18	0.	1.22	0.	1.34	0.
time (sec)	N/A	0.096	0.042	0.027	0.	0.226	0.	0.23	0.

Problem 2550	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	72	98	0	104	0	111	0
normalized size	1	1.	0.85	1.15	0.	1.22	0.	1.31	0.
time (sec)	N/A	0.096	0.073	0.027	0.	0.228	0.	0.227	0.

Problem 2551	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	72	98	0	104	0	111	0
normalized size	1	1.	0.85	1.15	0.	1.22	0.	1.31	0.
time (sec)	N/A	0.096	0.083	0.028	0.	0.227	0.	0.226	0.

Problem 2552	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	72	97	0	104	0	111	0
normalized size	1	1.	0.88	1.18	0.	1.27	0.	1.35	0.
time (sec)	N/A	0.097	0.101	0.028	0.	0.226	0.	0.229	0.

Problem 2553	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	69	97	0	104	0	111	80
normalized size	1	1.	0.8	1.13	0.	1.21	0.	1.29	0.93
time (sec)	N/A	0.096	0.066	0.029	0.	0.226	0.	0.227	16.5

Problem 2554	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	72	88	0	97	0	104	19
normalized size	1	1.	3.	3.67	0.	4.04	0.	4.33	0.79
time (sec)	N/A	0.021	0.038	0.036	0.	0.226	0.	0.228	3.092

Problem 2555	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	74	88	0	100	0	107	39
normalized size	1	1.	1.48	1.76	0.	2.	0.	2.14	0.78
time (sec)	N/A	0.056	0.038	0.036	0.	0.227	0.	0.227	6.857

Problem 2556	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	74	88	0	100	0	107	87
normalized size	1	1.	0.96	1.14	0.	1.3	0.	1.39	1.13
time (sec)	N/A	0.084	0.038	0.036	0.	0.226	0.	0.229	17.499

Problem 2557	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	97	97	74	88	0	100	0	107	85
normalized size	1	1.	0.76	0.91	0.	1.03	0.	1.1	0.88
time (sec)	N/A	0.104	0.037	0.035	0.	0.226	0.	0.227	16.983

Problem 2558	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	99	99	74	88	0	100	0	107	88
normalized size	1	1.	0.75	0.89	0.	1.01	0.	1.08	0.89
time (sec)	N/A	0.104	0.038	0.037	0.	0.227	0.	0.228	16.915

Problem 2559	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	151	151	113	136	0	153	0	0	134
normalized size	1	1.	0.75	0.9	0.	1.01	0.	0.	0.89
time (sec)	N/A	0.193	0.045	0.041	0.	0.227	0.	0.	31.174

Problem 2560	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	151	151	113	136	0	153	0	0	136
normalized size	1	1.	0.75	0.9	0.	1.01	0.	0.	0.9
time (sec)	N/A	0.185	0.044	0.04	0.	0.226	0.	0.	30.515

Problem 2561	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	150	150	113	135	0	153	0	0	134
normalized size	1	1.	0.75	0.9	0.	1.02	0.	0.	0.89
time (sec)	N/A	0.194	0.042	0.041	0.	0.239	0.	0.	30.313

Problem 2562	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	128	128	113	136	0	153	0	0	110
normalized size	1	1.	0.88	1.06	0.	1.2	0.	0.	0.86
time (sec)	N/A	0.171	0.043	0.041	0.	0.227	0.	0.	30.619

Problem 2563	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	106	106	113	136	0	153	0	0	90
normalized size	1	1.	1.07	1.28	0.	1.44	0.	0.	0.85
time (sec)	N/A	0.151	0.043	0.043	0.	0.227	0.	0.	25.841

Problem 2564	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	113	136	0	153	0	0	71
normalized size	1	1.	1.35	1.62	0.	1.82	0.	0.	0.85
time (sec)	N/A	0.126	0.046	0.04	0.	0.226	0.	0.	22.11

Problem 2565	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	113	136	0	153	0	0	49
normalized size	1	1.	1.82	2.19	0.	2.47	0.	0.	0.79
time (sec)	N/A	0.106	0.041	0.04	0.	0.227	0.	0.	17.55

Problem 2566	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F(-2)	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	113	136	0	153	0	0	31
normalized size	1	1.	2.82	3.4	0.	3.82	0.	0.	0.78
time (sec)	N/A	0.06	0.041	0.04	0.	0.226	0.	0.	13.266

Problem 2567	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	132	23	149	0	149	12
normalized size	1	1.	1.	6.95	1.21	7.84	0.	7.84	0.63
time (sec)	N/A	0.019	0.013	0.04	1.435	0.225	0.	0.216	2.489

Problem 2568	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	138	138	106	132	153	147	136	0	0
normalized size	1	1.	0.77	0.96	1.11	1.07	0.99	0.	0.
time (sec)	N/A	0.14	0.084	0.003	1.45	0.227	6.771	0.	0.

Problem 2569	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	135	135	116	128	0	154	0	167	0
normalized size	1	1.	0.86	0.95	0.	1.14	0.	1.24	0.
time (sec)	N/A	0.153	0.053	0.044	0.	0.228	0.	0.233	0.

Problem 2570	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	135	135	116	128	0	157	0	167	0
normalized size	1	1.	0.86	0.95	0.	1.16	0.	1.24	0.
time (sec)	N/A	0.152	0.052	0.045	0.	0.228	0.	0.233	0.

Problem 2571	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	133	133	116	128	0	157	0	167	0
normalized size	1	1.	0.87	0.96	0.	1.18	0.	1.26	0.
time (sec)	N/A	0.155	0.051	0.045	0.	0.229	0.	0.235	0.

Problem 2572	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	135	135	111	128	0	157	0	167	0
normalized size	1	1.	0.82	0.95	0.	1.16	0.	1.24	0.
time (sec)	N/A	0.157	0.056	0.044	0.	0.227	0.	0.233	0.

Problem 2573	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	133	133	111	128	0	157	0	167	0
normalized size	1	1.	0.83	0.96	0.	1.18	0.	1.26	0.
time (sec)	N/A	0.155	0.152	0.045	0.	0.228	0.	0.236	0.

Problem 2574	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	135	135	111	128	0	157	0	167	0
normalized size	1	1.	0.82	0.95	0.	1.16	0.	1.24	0.
time (sec)	N/A	0.159	0.155	0.043	0.	0.229	0.	0.237	0.

Problem 2575	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	134	134	111	127	0	157	0	167	0
normalized size	1	1.	0.83	0.95	0.	1.17	0.	1.25	0.
time (sec)	N/A	0.157	0.19	0.043	0.	0.229	0.	0.236	0.

Problem 2576	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	140	140	108	129	0	157	0	167	131
normalized size	1	1.	0.77	0.92	0.	1.12	0.	1.19	0.94
time (sec)	N/A	0.159	0.098	0.043	0.	0.23	0.	0.236	27.309

Problem 2577	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	111	136	0	150	0	161	19
normalized size	1	1.	4.62	5.67	0.	6.25	0.	6.71	0.79
time (sec)	N/A	0.022	0.051	0.041	0.	0.226	0.	0.235	3.11

Problem 2578	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	113	136	0	153	0	163	39
normalized size	1	1.	2.26	2.72	0.	3.06	0.	3.26	0.78
time (sec)	N/A	0.06	0.052	0.042	0.	0.227	0.	0.235	6.861

Problem 2579	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	113	136	0	153	0	163	63
normalized size	1	1.	1.47	1.77	0.	1.99	0.	2.12	0.82
time (sec)	N/A	0.087	0.053	0.041	0.	0.227	0.	0.232	10.042

Problem 2580	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	104	104	113	136	0	153	0	163	87
normalized size	1	1.	1.09	1.31	0.	1.47	0.	1.57	0.84
time (sec)	N/A	0.118	0.052	0.043	0.	0.229	0.	0.233	14.363

Problem 2581	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	131	131	113	136	0	153	0	163	136
normalized size	1	1.	0.86	1.04	0.	1.17	0.	1.24	1.04
time (sec)	N/A	0.151	0.052	0.04	0.	0.227	0.	0.234	27.939

Problem 2582	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	151	151	113	136	0	153	0	163	138
normalized size	1	1.	0.75	0.9	0.	1.01	0.	1.08	0.91
time (sec)	N/A	0.171	0.053	0.042	0.	0.227	0.	0.236	28.08

Problem 2583	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	151	151	113	136	0	153	0	163	136
normalized size	1	1.	0.75	0.9	0.	1.01	0.	1.08	0.9
time (sec)	N/A	0.165	0.051	0.042	0.	0.227	0.	0.233	28.268

Problem 2584	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	260	23	289	0	289	12
normalized size	1	1.	1.	13.68	1.21	15.21	0.	15.21	0.63
time (sec)	N/A	0.019	0.017	0.056	1.427	0.23	0.	0.218	2.44

Problem 2585	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	160	135	19	1	160	19	10
normalized size	1	1.	10.	8.44	1.19	0.06	10.	1.19	0.62
time (sec)	N/A	0.016	0.008	0.004	1.432	0.181	0.225	0.214	2.216

Problem 2586	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	160	135	19	1	160	19	10
normalized size	1	1.	10.	8.44	1.19	0.06	10.	1.19	0.62
time (sec)	N/A	0.016	0.01	0.003	1.421	0.181	0.232	0.215	2.155

Problem 2587	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	160	135	19	1	160	19	10
normalized size	1	1.	10.	8.44	1.19	0.06	10.	1.19	0.62
time (sec)	N/A	0.016	0.012	0.003	1.425	0.181	0.248	0.215	2.219

Problem 2588	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	24	311	34	262	0	294	19
normalized size	1	1.	0.89	11.52	1.26	9.7	0.	10.89	0.7
time (sec)	N/A	0.027	0.03	0.046	1.454	0.229	0.	0.245	2.724

Problem 2589	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	24	311	34	262	0	294	19
normalized size	1	1.	0.89	11.52	1.26	9.7	0.	10.89	0.7
time (sec)	N/A	0.023	0.01	0.	1.434	0.227	0.	0.242	2.721

Problem 2590	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	65	87	97	88	0	0	0
normalized size	1	1.	0.79	1.06	1.18	1.07	0.	0.	0.
time (sec)	N/A	0.116	0.047	0.041	1.454	0.228	0.	0.	0.

Problem 2591	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	64	64	52	69	81	70	0	0	0
normalized size	1	1.	0.81	1.08	1.27	1.09	0.	0.	0.
time (sec)	N/A	0.087	0.037	0.035	1.449	0.227	0.	0.	0.

Problem 2592	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	38	51	61	51	0	0	0
normalized size	1	1.	0.83	1.11	1.33	1.11	0.	0.	0.
time (sec)	N/A	0.068	0.028	0.031	1.436	0.227	0.	0.	0.

Problem 2593	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	24	33	43	32	41	0	0
normalized size	1	1.	0.86	1.18	1.54	1.14	1.46	0.	0.
time (sec)	N/A	0.049	0.018	0.026	1.429	0.226	46.084	0.	0.

Problem 2594	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	18	20	20	27	22	10
normalized size	1	1.	1.	1.2	1.33	1.33	1.8	1.47	0.67
time (sec)	N/A	0.02	0.004	0.021	1.438	0.219	8.184	0.215	2.467

Problem 2595	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	22	29	38	30	41	0	19
normalized size	1	1.	0.96	1.26	1.65	1.3	1.78	0.	0.83
time (sec)	N/A	0.035	0.014	0.002	1.42	0.227	2.273	0.	6.48

Problem 2596	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	32	50	57	50	0	0	34
normalized size	1	1.	0.84	1.32	1.5	1.32	0.	0.	0.89
time (sec)	N/A	0.063	0.025	0.027	1.438	0.228	0.	0.	9.733

Problem 2597	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	57	46	69	76	80	0	0	51
normalized size	1	1.	0.81	1.21	1.33	1.4	0.	0.	0.89
time (sec)	N/A	0.08	0.039	0.032	1.463	0.23	0.	0.	12.997

Problem 2598	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	76	76	61	88	93	97	0	0	66
normalized size	1	1.	0.8	1.16	1.22	1.28	0.	0.	0.87
time (sec)	N/A	0.095	0.04	0.038	1.422	0.228	0.	0.	15.55

Problem 2599	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	65	87	97	88	0	0	0
normalized size	1	1.	0.79	1.06	1.18	1.07	0.	0.	0.
time (sec)	N/A	0.106	0.044	0.	1.429	0.231	0.	0.	0.

Problem 2600	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	64	64	52	69	81	70	0	0	0
normalized size	1	1.	0.81	1.08	1.27	1.09	0.	0.	0.
time (sec)	N/A	0.081	0.037	0.	1.422	0.227	0.	0.	0.

Problem 2601	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	38	51	61	51	0	0	0
normalized size	1	1.	0.83	1.11	1.33	1.11	0.	0.	0.
time (sec)	N/A	0.066	0.025	0.001	1.454	0.227	0.	0.	0.

Problem 2602	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	24	33	43	32	41	0	0
normalized size	1	1.	0.86	1.18	1.54	1.14	1.46	0.	0.
time (sec)	N/A	0.047	0.014	0.	1.45	0.227	45.857	0.	0.

Problem 2603	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	18	20	20	27	22	10
normalized size	1	1.	1.	1.2	1.33	1.33	1.8	1.47	0.67
time (sec)	N/A	0.019	0.004	0.	1.444	0.222	8.143	0.216	2.45

Problem 2604	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	22	29	38	30	41	0	19
normalized size	1	1.	0.96	1.26	1.65	1.3	1.78	0.	0.83
time (sec)	N/A	0.035	0.014	0.	1.438	0.226	2.224	0.	6.372

Problem 2605	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	32	50	57	50	0	0	34
normalized size	1	1.	0.84	1.32	1.5	1.32	0.	0.	0.89
time (sec)	N/A	0.06	0.016	0.	1.449	0.228	0.	0.	9.675

Problem 2606	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	57	46	69	76	80	0	0	51
normalized size	1	1.	0.81	1.21	1.33	1.4	0.	0.	0.89
time (sec)	N/A	0.077	0.03	0.	1.445	0.228	0.	0.	12.949

Problem 2607	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	76	76	61	88	93	97	0	0	66
normalized size	1	1.	0.8	1.16	1.22	1.28	0.	0.	0.87
time (sec)	N/A	0.094	0.016	0.	1.446	0.23	0.	0.	15.722

Problem 2608	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	54	78	85	74	0	0	0
normalized size	1	1.	0.76	1.1	1.2	1.04	0.	0.	0.
time (sec)	N/A	0.092	0.036	0.041	1.439	0.227	0.	0.	0.

Problem 2609	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	43	63	70	59	0	0	0
normalized size	1	1.	0.77	1.12	1.25	1.05	0.	0.	0.
time (sec)	N/A	0.073	0.028	0.034	1.447	0.226	0.	0.	0.

Problem 2610	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	33	48	57	46	0	0	0
normalized size	1	1.	0.77	1.12	1.33	1.07	0.	0.	0.
time (sec)	N/A	0.059	0.022	0.032	1.444	0.226	0.	0.	0.

Problem 2611	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	23	32	42	31	39	0	0
normalized size	1	1.	0.85	1.19	1.56	1.15	1.44	0.	0.
time (sec)	N/A	0.044	0.015	0.026	1.444	0.226	45.476	0.	0.

Problem 2612	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	18	20	20	27	22	10
normalized size	1	1.	1.	1.2	1.33	1.33	1.8	1.47	0.67
time (sec)	N/A	0.019	0.004	0.021	1.436	0.218	8.261	0.219	2.416

Problem 2613	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	24	31	27	31	0	19
normalized size	1	1.	1.	1.09	1.41	1.23	1.41	0.	0.86
time (sec)	N/A	0.029	0.012	0.004	1.422	0.224	2.176	0.	5.012

Problem 2614	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	31	42	46	46	0	0	31
normalized size	1	1.	0.86	1.17	1.28	1.28	0.	0.	0.86
time (sec)	N/A	0.051	0.019	0.026	1.443	0.229	0.	0.	7.528

Problem 2615	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	39	59	61	68	0	0	44
normalized size	1	1.	0.74	1.11	1.15	1.28	0.	0.	0.83
time (sec)	N/A	0.064	0.024	0.031	1.442	0.228	0.	0.	9.386

Problem 2616	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	50	74	76	82	0	0	56
normalized size	1	1.	0.74	1.09	1.12	1.21	0.	0.	0.82
time (sec)	N/A	0.075	0.023	0.037	1.444	0.228	0.	0.	11.359

Problem 2617	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	54	78	105	103	0	0	0
normalized size	1	1.	0.82	1.18	1.59	1.56	0.	0.	0.
time (sec)	N/A	0.104	0.059	0.035	1.452	0.228	0.	0.	0.

Problem 2618	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	48	38	59	82	80	0	0	0
normalized size	1	1.	0.79	1.23	1.71	1.67	0.	0.	0.
time (sec)	N/A	0.078	0.051	0.031	1.451	0.228	0.	0.	0.

Problem 2619	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	33	38	53	49	0	0	26
normalized size	1	1.	1.	1.15	1.61	1.48	0.	0.	0.79
time (sec)	N/A	0.059	0.029	0.027	1.445	0.219	0.	0.	8.417

Problem 2620	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	24	23	23	51	23	12
normalized size	1	1.	1.	1.41	1.35	1.35	3.	1.35	0.71
time (sec)	N/A	0.021	0.014	0.027	1.442	0.214	36.228	0.215	2.434

Problem 2621	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	34	45	58	68	160	0	34
normalized size	1	1.	0.87	1.15	1.49	1.74	4.1	0.	0.87
time (sec)	N/A	0.064	0.07	0.	1.435	0.227	3.656	0.	9.596

Problem 2622	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	57	45	97	84	111	0	0	53
normalized size	1	1.	0.79	1.7	1.47	1.95	0.	0.	0.93
time (sec)	N/A	0.088	0.079	0.033	1.452	0.231	0.	0.	13.116

Problem 2623	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	78	78	62	117	0	142	0	0	73
normalized size	1	1.	0.79	1.5	0.	1.82	0.	0.	0.94
time (sec)	N/A	0.115	0.161	0.039	0.	0.233	0.	0.	17.73

Problem 2624	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	77	135	127	157	0	0	87
normalized size	1	1.	0.82	1.44	1.35	1.67	0.	0.	0.93
time (sec)	N/A	0.138	0.138	0.042	1.454	0.232	0.	0.	20.2

Problem 2625	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	70	75	123	138	0	0	0
normalized size	1	1.	1.	1.07	1.76	1.97	0.	0.	0.
time (sec)	N/A	0.102	0.057	0.049	1.458	0.226	0.	0.	0.

Problem 2626	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	42	57	89	103	0	0	46
normalized size	1	1.	0.75	1.02	1.59	1.84	0.	0.	0.82
time (sec)	N/A	0.089	0.055	0.039	1.456	0.221	0.	0.	13.009

Problem 2627	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	27	36	55	55	0	0	17
normalized size	1	1.	1.12	1.5	2.29	2.29	0.	0.	0.71
time (sec)	N/A	0.023	0.021	0.039	1.516	0.217	0.	0.	3.083

Problem 2628	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	20	23	42	109	23	15
normalized size	1	1.	1.	1.05	1.21	2.21	5.74	1.21	0.79
time (sec)	N/A	0.02	0.011	0.039	1.441	0.215	87.276	0.213	2.452

Problem 2629	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	48	62	96	143	406	0	51
normalized size	1	1.	0.83	1.07	1.66	2.47	7.	0.	0.88
time (sec)	N/A	0.087	0.173	0.	1.434	0.23	5.625	0.	12.621

Problem 2630	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	79	132	123	188	0	0	71
normalized size	1	1.	1.03	1.71	1.6	2.44	0.	0.	0.92
time (sec)	N/A	0.114	0.066	0.05	1.453	0.232	0.	0.	16.912

Problem 2631	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	101	101	97	152	149	216	0	0	94
normalized size	1	1.	0.96	1.5	1.48	2.14	0.	0.	0.93
time (sec)	N/A	0.142	0.082	0.058	1.437	0.232	0.	0.	22.664

Problem 2632	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	50	79	0	1	0	0	39
normalized size	1	1.	1.	1.58	0.	0.02	0.	0.	0.78
time (sec)	N/A	0.071	0.04	0.086	0.	0.238	0.	0.	11.238

Problem 2633	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F(-2)	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	160	160	60	54	0	250	0	0	138
normalized size	1	1.	0.38	0.34	0.	1.56	0.	0.	0.86
time (sec)	N/A	0.26	0.042	0.32	0.	0.302	0.	0.	38.163

Problem 2634	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F(-2)	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	236	236	60	54	0	324	0	0	206
normalized size	1	1.	0.25	0.23	0.	1.37	0.	0.	0.87
time (sec)	N/A	0.441	0.044	0.089	0.	0.342	0.	0.	65.322

Problem 2635	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	32	50	57	50	0	0	34
normalized size	1	1.	0.84	1.32	1.5	1.32	0.	0.	0.89
time (sec)	N/A	0.065	0.024	0.	1.441	0.227	0.	0.	9.764

Problem 2636	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	50	79	0	1	0	0	39
normalized size	1	1.	1.	1.58	0.	0.02	0.	0.	0.78
time (sec)	N/A	0.066	0.014	0.	0.	0.241	0.	0.	11.663

Problem 2637	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F(-2)	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	158	158	59	57	0	194	0	0	134
normalized size	1	1.	0.37	0.36	0.	1.23	0.	0.	0.85
time (sec)	N/A	0.253	0.037	0.079	0.	0.237	0.	0.	38.641

Problem 2638	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F(-2)	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	234	234	59	56	0	254	0	0	202
normalized size	1	1.	0.25	0.24	0.	1.09	0.	0.	0.86
time (sec)	N/A	0.409	0.038	0.085	0.	0.246	0.	0.	62.902

Problem 2639	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	62	97	0	1	0	0	56
normalized size	1	1.	0.91	1.43	0.	0.01	0.	0.	0.82
time (sec)	N/A	0.098	0.091	0.12	0.	0.261	0.	0.	15.526

Problem 2640	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F(-2)	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	176	176	70	73	0	236	0	0	151
normalized size	1	1.	0.4	0.41	0.	1.34	0.	0.	0.86
time (sec)	N/A	0.293	0.08	0.102	0.	0.267	0.	0.	45.348

Problem 2641	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F(-2)	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	252	252	70	73	0	331	0	0	219
normalized size	1	1.	0.28	0.29	0.	1.31	0.	0.	0.87
time (sec)	N/A	0.446	0.08	0.115	0.	0.282	0.	0.	74.48

Problem 2642	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	70	67	89	89	0	0	82
normalized size	1	1.	0.76	0.73	0.97	0.97	0.	0.	0.89
time (sec)	N/A	0.116	0.052	0.035	1.465	0.22	0.	0.	16.837

Problem 2643	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	57	54	72	72	0	0	60
normalized size	1	1.	0.84	0.79	1.06	1.06	0.	0.	0.88
time (sec)	N/A	0.092	0.042	0.032	1.467	0.222	0.	0.	12.326

Problem 2644	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	43	41	53	53	0	0	37
normalized size	1	1.	0.98	0.93	1.2	1.2	0.	0.	0.84
time (sec)	N/A	0.062	0.036	0.031	1.477	0.218	0.	0.	8.306

Problem 2645	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	18	23	23	0	23	15
normalized size	1	1.	1.	0.86	1.1	1.1	0.	1.1	0.71
time (sec)	N/A	0.024	0.017	0.029	1.433	0.218	0.	0.216	2.454

Problem 2646	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	42	36	0	1	0	0	37
normalized size	1	1.	0.93	0.8	0.	0.02	0.	0.	0.82
time (sec)	N/A	0.072	0.033	0.	0.	0.231	0.	0.	7.844

Problem 2647	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	51	51	67	0	0	1	0	0	41
normalized size	1	1.	1.31	0.	0.	0.02	0.	0.	0.8
time (sec)	N/A	0.078	0.12	0.071	0.	0.231	0.	0.	8.455

Problem 2648	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	83	0	0	1	0	0	66
normalized size	1	1.	0.99	0.	0.	0.01	0.	0.	0.79
time (sec)	N/A	0.113	0.115	0.066	0.	0.231	0.	0.	11.543

Problem 2649	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	113	113	98	0	0	1	0	0	92
normalized size	1	1.	0.87	0.	0.	0.01	0.	0.	0.81
time (sec)	N/A	0.147	0.137	0.068	0.	0.237	0.	0.	16.599

Problem 2650	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	142	142	111	0	0	1	0	0	122
normalized size	1	1.	0.78	0.	0.	0.01	0.	0.	0.86
time (sec)	N/A	0.192	0.183	0.068	0.	0.243	0.	0.	21.064

Problem 2651	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	57	54	89	72	0	0	78
normalized size	1	1.	0.65	0.61	1.01	0.82	0.	0.	0.89
time (sec)	N/A	0.115	0.052	0.035	1.469	0.23	0.	0.	16.508

Problem 2652	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	44	41	72	54	0	0	58
normalized size	1	1.	0.67	0.62	1.09	0.82	0.	0.	0.88
time (sec)	N/A	0.09	0.042	0.032	1.469	0.231	0.	0.	12.322

Problem 2653	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	42	30	28	53	35	0	0	36
normalized size	1	1.	0.71	0.67	1.26	0.83	0.	0.	0.86
time (sec)	N/A	0.063	0.037	0.031	1.463	0.232	0.	0.	8.216

Problem 2654	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	18	23	23	41	23	14
normalized size	1	1.	1.	0.95	1.21	1.21	2.16	1.21	0.74
time (sec)	N/A	0.025	0.014	0.029	1.429	0.231	21.629	0.217	2.433

Problem 2655	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	28	23	0	1	0	0	26
normalized size	1	1.	1.	0.82	0.	0.04	0.	0.	0.93
time (sec)	N/A	0.053	0.021	0.	0.	0.24	0.	0.	5.685

Problem 2656	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	72	0	0	1	0	0	41
normalized size	1	1.	1.36	0.	0.	0.02	0.	0.	0.77
time (sec)	N/A	0.079	0.089	0.068	0.	0.242	0.	0.	8.214

Problem 2657	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	87	87	85	0	0	1	0	0	73
normalized size	1	1.	0.98	0.	0.	0.01	0.	0.	0.84
time (sec)	N/A	0.112	0.128	0.069	0.	0.244	0.	0.	11.833

Problem 2658	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	98	0	0	1	0	0	100
normalized size	1	1.	0.84	0.	0.	0.01	0.	0.	0.86
time (sec)	N/A	0.148	0.145	0.079	0.	0.244	0.	0.	16.372

Problem 2659	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	145	145	111	0	0	1	0	0	128
normalized size	1	1.	0.77	0.	0.	0.01	0.	0.	0.88
time (sec)	N/A	0.194	0.182	0.068	0.	0.244	0.	0.	21.164

Problem 2660	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	67	92	0	489	0	988	70
normalized size	1	1.	0.89	1.23	0.	6.52	0.	13.17	0.93
time (sec)	N/A	0.089	0.067	0.027	0.	0.243	0.	0.235	13.785

Problem 2661	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	51	51	46	63	0	204	0	385	46
normalized size	1	1.	0.9	1.24	0.	4.	0.	7.55	0.9
time (sec)	N/A	0.052	0.049	0.023	0.	0.238	0.	0.223	8.996

Problem 2662	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	27	34	0	58	165	93	22
normalized size	1	1.	1.	1.26	0.	2.15	6.11	3.44	0.81
time (sec)	N/A	0.025	0.027	0.021	0.	0.237	12.365	0.219	4.402

Problem 2663	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	41	0	0	0	0	0	27
normalized size	1	1.	1.02	0.	0.	0.	0.	0.	0.68
time (sec)	N/A	0.036	0.025	0.066	0.	0.	0.	0.	4.653

Problem 2664	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	73	0	0	0	0	0	29
normalized size	1	1.	1.82	0.	0.	0.	0.	0.	0.72
time (sec)	N/A	0.034	0.086	0.097	0.	0.	0.	0.	4.28

Problem 2665	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	100	0	0	0	0	0	29
normalized size	1	1.	2.5	0.	0.	0.	0.	0.	0.72
time (sec)	N/A	0.033	0.116	0.115	0.	0.	0.	0.	4.329

Problem 2666	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	F	F	F(-2)	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	65	124	0	0	0	0	0	53
normalized size	1	1.18	2.25	0.	0.	0.	0.	0.	0.96
time (sec)	N/A	0.07	0.276	0.107	0.	0.	0.	0.	7.563

Problem 2667	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	64	88	0	0	0	0	0	51
normalized size	1	1.16	1.6	0.	0.	0.	0.	0.	0.93
time (sec)	N/A	0.067	0.115	0.091	0.	0.	0.	0.	7.487

Problem 2668	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	64	66	0	0	0	0	0	51
normalized size	1	1.16	1.2	0.	0.	0.	0.	0.	0.93
time (sec)	N/A	0.067	0.051	0.051	0.	0.	0.	0.	8.087

Problem 2669	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	67	83	0	0	0	0	0	53
normalized size	1	1.22	1.51	0.	0.	0.	0.	0.	0.96
time (sec)	N/A	0.07	0.133	0.051	0.	0.	0.	0.	7.96

Problem 2670	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	F	F	F(-2)	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	67	129	0	0	0	0	0	53
normalized size	1	1.22	2.35	0.	0.	0.	0.	0.	0.96
time (sec)	N/A	0.069	0.269	0.051	0.	0.	0.	0.	8.497

Problem 2671	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	70	104	0	0	0	0	0	53
normalized size	1	1.19	1.76	0.	0.	0.	0.	0.	0.9
time (sec)	N/A	0.077	0.205	0.081	0.	0.	0.	0.	8.037

Problem 2672	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	65	73	0	0	0	0	0	49
normalized size	1	1.16	1.3	0.	0.	0.	0.	0.	0.88
time (sec)	N/A	0.073	0.082	0.064	0.	0.	0.	0.	7.835

Problem 2673	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	65	83	0	0	0	0	0	49
normalized size	1	1.16	1.48	0.	0.	0.	0.	0.	0.88
time (sec)	N/A	0.075	0.249	0.062	0.	0.	0.	0.	8.022

Problem 2674	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	72	116	0	0	0	0	0	54
normalized size	1	1.18	1.9	0.	0.	0.	0.	0.	0.89
time (sec)	N/A	0.08	0.418	0.061	0.	0.	0.	0.	8.143

Problem 2675	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	75	75	0	0	0	0	0	63
normalized size	1	1.14	1.14	0.	0.	0.	0.	0.	0.95
time (sec)	N/A	0.08	0.066	0.062	0.	0.	0.	0.	8.423

Problem 2676	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	60	69	70	0	0	0	0	0	58
normalized size	1	1.15	1.17	0.	0.	0.	0.	0.	0.97
time (sec)	N/A	0.077	0.058	0.075	0.	0.	0.	0.	8.299

Problem 2677	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	72	72	0	0	0	0	0	54
normalized size	1	1.14	1.14	0.	0.	0.	0.	0.	0.86
time (sec)	N/A	0.079	0.058	0.062	0.	0.	0.	0.	8.403

Problem 2678	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	75	75	0	0	0	0	0	61
normalized size	1	1.14	1.14	0.	0.	0.	0.	0.	0.92
time (sec)	N/A	0.082	0.064	0.061	0.	0.	0.	0.	8.551

Problem 2679	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	C	A	F	A	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	126	15	0	18	0	0	0	100
normalized size	1	8.4	1.	0.	1.2	0.	0.	0.	6.67
time (sec)	N/A	0.2	0.094	0.095	1.702	0.	0.	0.	19.181

Problem 2680	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	129	129	93	98	0	1	0	0	160
normalized size	1	1.	0.72	0.76	0.	0.01	0.	0.	1.24
time (sec)	N/A	0.16	0.122	0.088	0.	0.265	0.	0.	20.6

Problem 2681	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	80	82	0	1	0	0	116
normalized size	1	1.	0.82	0.84	0.	0.01	0.	0.	1.18
time (sec)	N/A	0.108	0.085	0.051	0.	0.254	0.	0.	15.304

Problem 2682	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	65	64	0	1	0	0	63
normalized size	1	1.	1.05	1.03	0.	0.02	0.	0.	1.02
time (sec)	N/A	0.072	0.05	0.049	0.	0.249	0.	0.	9.11

Problem 2683	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	38	0	0	0	0	0	29
normalized size	1	1.	1.09	0.	0.	0.	0.	0.	0.83
time (sec)	N/A	0.049	0.03	0.072	0.	0.	0.	0.	5.31

Problem 2684	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	F(-2)	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	26	26	26	0	30	0	0	0	20
normalized size	1	1.	1.	0.	1.15	0.	0.	0.	0.77
time (sec)	N/A	0.027	0.035	0.083	1.536	0.	0.	0.	3.098

Problem 2685	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	36	0	62	0	0	0	48
normalized size	1	1.	0.62	0.	1.07	0.	0.	0.	0.83
time (sec)	N/A	0.056	0.047	0.083	1.53	0.	0.	0.	5.364

Problem 2686	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	89	89	51	0	96	0	0	0	76
normalized size	1	1.	0.57	0.	1.08	0.	0.	0.	0.85
time (sec)	N/A	0.089	0.054	0.085	1.541	0.	0.	0.	8.757

Problem 2687	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	120	120	64	0	130	0	0	0	105
normalized size	1	1.	0.53	0.	1.08	0.	0.	0.	0.88
time (sec)	N/A	0.126	0.067	0.085	1.55	0.	0.	0.	13.454

Problem 2688	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	80	110	0	0	0	0	0	60
normalized size	1	1.23	1.69	0.	0.	0.	0.	0.	0.92
time (sec)	N/A	0.103	0.199	0.137	0.	0.	0.	0.	8.568

Problem 2689	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	67	81	79	0	0	0	0	0	60
normalized size	1	1.21	1.18	0.	0.	0.	0.	0.	0.9
time (sec)	N/A	0.106	0.229	0.074	0.	0.	0.	0.	8.406

Problem 2690	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	C	A	A	A	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	26	160	26	40	50	0	0	0	117
normalized size	1	6.15	1.	1.54	1.92	0.	0.	0.	4.5
time (sec)	N/A	0.257	0.091	0.053	1.558	0.	0.	0.	18.886

Problem 2691	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	0	18	22	0	0	12
normalized size	1	1.	1.	0.	1.2	1.47	0.	0.	0.8
time (sec)	N/A	0.064	0.084	0.053	1.632	0.239	0.	0.	7.569

Problem 2692	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	C	A	F	A	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	126	15	0	18	0	0	0	100
normalized size	1	8.4	1.	0.	1.2	0.	0.	0.	6.67
time (sec)	N/A	0.191	0.066	0.	1.642	0.	0.	0.	19.093

Problem 2693	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	97	97	68	0	0	0	0	0	56
normalized size	1	1.	0.7	0.	0.	0.	0.	0.	0.58
time (sec)	N/A	0.115	0.081	0.069	0.	0.	0.	0.	7.524

Problem 2694	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F(-2)	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	139	139	73	0	0	0	0	0	107
normalized size	1	1.	0.53	0.	0.	0.	0.	0.	0.77
time (sec)	N/A	0.279	0.184	0.095	0.	0.	0.	0.	11.744

Problem 2695	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	89	89	57	0	0	0	0	0	129
normalized size	1	1.	0.64	0.	0.	0.	0.	0.	1.45
time (sec)	N/A	0.101	0.056	0.086	0.	0.	0.	0.	19.185

Problem 2696	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	F(-2)	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	114	114	71	0	0	0	0	0	151
normalized size	1	1.	0.62	0.	0.	0.	0.	0.	1.32
time (sec)	N/A	0.129	0.097	0.082	0.	0.	0.	0.	24.098

Problem 2697	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	54	62	63	0	0	0	0	0	46
normalized size	1	1.15	1.17	0.	0.	0.	0.	0.	0.85
time (sec)	N/A	0.06	0.065	0.158	0.	0.	0.	0.	8.2

Problem 2698	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	146	146	55	0	0	259	0	0	124
normalized size	1	1.	0.38	0.	0.	1.77	0.	0.	0.85
time (sec)	N/A	0.207	0.068	0.171	0.	0.24	0.	0.	21.732

Problem 2699	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	55	0	0	170	0	0	80
normalized size	1	1.	0.57	0.	0.	1.77	0.	0.	0.83
time (sec)	N/A	0.095	0.051	0.15	0.	0.242	0.	0.	10.605

Problem 2700	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	55	0	0	92	0	0	39
normalized size	1	1.	1.1	0.	0.	1.84	0.	0.	0.78
time (sec)	N/A	0.041	0.041	0.132	0.	0.242	0.	0.	3.774

Problem 2701	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	53	0	42	0	0	12
normalized size	1	1.	1.	2.94	0.	2.33	0.	0.	0.67
time (sec)	N/A	0.012	0.036	0.036	0.	0.24	0.	0.	1.395

Problem 2702	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	50	0	0	0	0	0	39
normalized size	1	1.	1.	0.	0.	0.	0.	0.	0.78
time (sec)	N/A	0.034	0.023	0.092	0.	0.	0.	0.	4.024

Problem 2703	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	53	0	0	0	0	0	42
normalized size	1	1.	1.	0.	0.	0.	0.	0.	0.79
time (sec)	N/A	0.035	0.037	0.105	0.	0.	0.	0.	4.402

Problem 2704	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	55	0	0	0	0	0	44
normalized size	1	1.	1.	0.	0.	0.	0.	0.	0.8
time (sec)	N/A	0.036	0.049	0.108	0.	0.	0.	0.	4.586

Problem 2705	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	22	34	32	0	34	26
normalized size	1	1.	1.	1.05	1.62	1.52	0.	1.62	1.24
time (sec)	N/A	0.018	0.009	0.003	1.379	0.234	0.	0.219	3.038

Problem 2706	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	19	26	30	0	30	22
normalized size	1	1.	1.	1.06	1.44	1.67	0.	1.67	1.22
time (sec)	N/A	0.018	0.005	0.002	1.437	0.237	0.	0.219	2.917

Problem 2707	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	19	26	30	0	30	22
normalized size	1	1.	1.	1.06	1.44	1.67	0.	1.67	1.22
time (sec)	N/A	0.016	0.004	0.001	1.43	0.232	0.	0.218	2.79

Problem 2708	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	17	23	27	0	27	22
normalized size	1	1.	1.	1.06	1.44	1.69	0.	1.69	1.38
time (sec)	N/A	0.016	0.003	0.002	1.374	0.232	0.	0.218	2.064

Problem 2709	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	15	20	24	22	0	8
normalized size	1	1.	1.	1.07	1.43	1.71	1.57	0.	0.57
time (sec)	N/A	0.014	0.003	0.002	1.37	0.233	0.77	0.	3.023

Problem 2710	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	18	19	26	30	0	0	24
normalized size	1	1.	0.9	0.95	1.3	1.5	0.	0.	1.2
time (sec)	N/A	0.02	0.006	0.001	1.401	0.236	0.	0.	2.988

Problem 2711	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	18	19	26	30	0	0	24
normalized size	1	1.	0.9	0.95	1.3	1.5	0.	0.	1.2
time (sec)	N/A	0.02	0.004	0.001	1.375	0.233	0.	0.	2.927

Problem 2712	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	18	19	26	30	0	0	24
normalized size	1	1.	0.9	0.95	1.3	1.5	0.	0.	1.2
time (sec)	N/A	0.02	0.004	0.002	1.401	0.231	0.	0.	2.953

Problem 2713	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	22	29	0	36	0	31	15
normalized size	1	1.	0.96	1.26	0.	1.57	0.	1.35	0.65
time (sec)	N/A	0.028	0.034	0.069	0.	0.237	0.	0.216	3.008

Problem 2714	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	40	61	69	84	0	0	37
normalized size	1	1.	0.82	1.24	1.41	1.71	0.	0.	0.76
time (sec)	N/A	0.078	0.051	0.083	1.407	0.239	0.	0.	11.59

Problem 2715	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	66	105	107	146	0	0	61
normalized size	1	1.	0.88	1.4	1.43	1.95	0.	0.	0.81
time (sec)	N/A	0.113	0.072	0.097	1.398	0.239	0.	0.	18.493

Problem 2716	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	103	103	97	171	154	213	0	0	85
normalized size	1	1.	0.94	1.66	1.5	2.07	0.	0.	0.83
time (sec)	N/A	0.148	0.093	0.114	1.378	0.239	0.	0.	25.449

Problem 2717	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	32	0	0	72	0	0	24
normalized size	1	1.	1.	0.	0.	2.25	0.	0.	0.75
time (sec)	N/A	0.034	0.081	0.108	0.	0.239	0.	0.	3.936

Problem 2718	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	111	136	0	150	0	161	19
normalized size	1	1.	4.62	5.67	0.	6.25	0.	6.71	0.79
time (sec)	N/A	0.022	0.053	0.	0.	0.24	0.	0.232	3.1

Problem 2719	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	29	50	46	0	0	26
normalized size	1	1.	1.	0.97	1.67	1.53	0.	0.	0.87
time (sec)	N/A	0.027	0.045	0.004	1.382	0.241	0.	0.	3.422

Problem 2720	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	108	91	122	122	97	122	15
normalized size	1	1.	5.68	4.79	6.42	6.42	5.11	6.42	0.79
time (sec)	N/A	0.019	0.014	0.002	1.345	0.206	4.91	0.217	2.742

Problem 2721	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	22	29	38	30	41	0	19
normalized size	1	1.	0.96	1.26	1.65	1.3	1.78	0.	0.83
time (sec)	N/A	0.036	0.017	0.	1.381	0.246	2.157	0.	6.28

Problem 2722	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	21	31	24	15	30	19
normalized size	1	1.	1.	0.95	1.41	1.09	0.68	1.36	0.86
time (sec)	N/A	0.038	0.009	0.001	1.344	0.216	0.572	0.217	5.438

Problem 2723	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	147	147	55	0	0	259	0	0	46
normalized size	1	1.	0.37	0.	0.	1.76	0.	0.	0.31
time (sec)	N/A	0.236	0.071	0.17	0.	0.239	0.	0.	4.624

Problem 2724	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	97	97	55	0	0	170	0	0	46
normalized size	1	1.	0.57	0.	0.	1.75	0.	0.	0.47
time (sec)	N/A	0.124	0.047	0.149	0.	0.239	0.	0.	4.66

Problem 2725	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	51	51	55	0	0	92	0	0	46
normalized size	1	1.	1.08	0.	0.	1.8	0.	0.	0.9
time (sec)	N/A	0.049	0.037	0.128	0.	0.24	0.	0.	4.633

Problem 2726	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	35	0	42	0	0	12
normalized size	1	1.	1.	1.94	0.	2.33	0.	0.	0.67
time (sec)	N/A	0.013	0.033	0.036	0.	0.237	0.	0.	1.439

Problem 2727	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	50	0	0	0	0	0	39
normalized size	1	1.	1.	0.	0.	0.	0.	0.	0.78
time (sec)	N/A	0.034	0.022	0.	0.	0.	0.	0.	4.02

Problem 2728	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	53	0	0	0	0	0	46
normalized size	1	1.	0.9	0.	0.	0.	0.	0.	0.78
time (sec)	N/A	0.038	0.036	0.103	0.	0.	0.	0.	4.939

Problem 2729	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	55	0	0	0	0	0	44
normalized size	1	1.	0.98	0.	0.	0.	0.	0.	0.79
time (sec)	N/A	0.04	0.046	0.116	0.	0.	0.	0.	4.749

Problem 2730	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	15	16	43	20	39	0	10
normalized size	1	1.	1.	1.07	2.87	1.33	2.6	0.	0.67
time (sec)	N/A	0.034	0.006	0.003	1.384	0.228	2.373	0.	4.105

Problem 2731	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	21	26	24	37	26	14
normalized size	1	1.	1.	1.11	1.37	1.26	1.95	1.37	0.74
time (sec)	N/A	0.024	0.01	0.022	1.41	0.23	2.607	0.217	2.798

Problem 2732	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	28	60	0	47	0	36	19
normalized size	1	1.	1.04	2.22	0.	1.74	0.	1.33	0.7
time (sec)	N/A	0.029	0.045	0.044	0.	0.237	0.	0.214	3.396

Problem 2733	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	57	70	0	78	0	85	60
normalized size	1	1.	0.8	0.99	0.	1.1	0.	1.2	0.85
time (sec)	N/A	0.088	0.054	0.031	0.	0.236	0.	0.225	13.174

Problem 2734	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	42	50	0	57	0	62	42
normalized size	1	1.	0.81	0.96	0.	1.1	0.	1.19	0.81
time (sec)	N/A	0.058	0.032	0.029	0.	0.232	0.	0.22	9.575

Problem 2735	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	26	33	0	34	36	38	22
normalized size	1	1.	0.87	1.1	0.	1.13	1.2	1.27	0.73
time (sec)	N/A	0.026	0.016	0.025	0.	0.231	40.692	0.217	4.55

Problem 2736	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	33	61	0	1	0	0	26
normalized size	1	1.	1.	1.85	0.	0.03	0.	0.	0.79
time (sec)	N/A	0.05	0.018	0.069	0.	0.24	0.	0.	5.26

Problem 2737	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	67	67	59	95	0	1	0	0	27
normalized size	1	1.	0.88	1.42	0.	0.01	0.	0.	0.4
time (sec)	N/A	0.074	0.115	0.056	0.	0.238	0.	0.	4.982

Problem 2738	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	97	97	77	110	0	1	0	0	27
normalized size	1	1.	0.79	1.13	0.	0.01	0.	0.	0.28
time (sec)	N/A	0.098	0.124	0.06	0.	0.241	0.	0.	4.933

Problem 2739	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	136	136	127	0	0	0	0	0	60
normalized size	1	1.	0.93	0.	0.	0.	0.	0.	0.44
time (sec)	N/A	0.132	0.241	0.116	0.	0.	0.	0.	7.468

Problem 2740	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	104	104	112	0	0	0	0	0	58
normalized size	1	1.	1.08	0.	0.	0.	0.	0.	0.56
time (sec)	N/A	0.099	0.191	0.077	0.	0.	0.	0.	6.896

Problem 2741	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	72	72	93	0	0	0	0	0	56
normalized size	1	1.	1.29	0.	0.	0.	0.	0.	0.78
time (sec)	N/A	0.074	0.14	0.087	0.	0.	0.	0.	6.854

Problem 2742	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	66	0	0	0	0	0	56
normalized size	1	1.	1.74	0.	0.	0.	0.	0.	1.47
time (sec)	N/A	0.052	0.084	0.057	0.	0.	0.	0.	7.411

Problem 2743	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	29	0	0	63	0	0	22
normalized size	1	1.	1.	0.	0.	2.17	0.	0.	0.76
time (sec)	N/A	0.032	0.044	0.055	0.	0.228	0.	0.	3.316

Problem 2744	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	65	46	0	0	126	0	0	58
normalized size	1	1.	0.71	0.	0.	1.94	0.	0.	0.89
time (sec)	N/A	0.08	0.064	0.055	0.	0.229	0.	0.	7.424

Problem 2745	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	102	102	61	0	0	182	0	0	58
normalized size	1	1.	0.6	0.	0.	1.78	0.	0.	0.57
time (sec)	N/A	0.143	0.092	0.056	0.	0.23	0.	0.	7.459

Problem 2746	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	20	17	22	22	48	22	15
normalized size	1	1.	1.	0.85	1.1	1.1	2.4	1.1	0.75
time (sec)	N/A	0.02	0.02	0.043	1.336	0.221	16.529	0.215	1.988

Problem 2747	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	19	24	24	58	24	17
normalized size	1	1.	1.	0.86	1.09	1.09	2.64	1.09	0.77
time (sec)	N/A	0.02	0.022	0.039	1.35	0.223	16.524	0.215	2.163

Problem 2748	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F(-2)	A	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	64	64	47	234	0	232	0	841	73
normalized size	1	1.	0.73	3.66	0.	3.62	0.	13.14	1.14
time (sec)	N/A	0.088	0.054	0.075	0.	0.235	0.	0.231	12.675

Problem 2749	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	41	94	0	117	352	207	49
normalized size	1	1.	0.71	1.62	0.	2.02	6.07	3.57	0.84
time (sec)	N/A	0.078	0.029	0.014	0.	0.228	4.319	0.22	13.085

Problem 2750	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	41	94	0	117	345	207	49
normalized size	1	1.	0.71	1.62	0.	2.02	5.95	3.57	0.84
time (sec)	N/A	0.075	0.027	0.008	0.	0.229	2.656	0.219	13.487

Problem 2751	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	41	88	0	117	338	207	49
normalized size	1	1.	0.71	1.52	0.	2.02	5.83	3.57	0.84
time (sec)	N/A	0.07	0.028	0.007	0.	0.228	1.466	0.22	12.738

Problem 2752	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	36	68	0	85	202	0	41
normalized size	1	1.	0.69	1.31	0.	1.63	3.88	0.	0.79
time (sec)	N/A	0.063	0.04	0.006	0.	0.23	1.504	0.	11.597

Problem 2753	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	62	90	0	109	401	0	48
normalized size	1	1.	1.02	1.48	0.	1.79	6.57	0.	0.79
time (sec)	N/A	0.077	0.052	0.007	0.	0.23	3.6	0.	13.469

Problem 2754	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	62	96	0	117	464	0	49
normalized size	1	1.	0.98	1.52	0.	1.86	7.37	0.	0.78
time (sec)	N/A	0.08	0.055	0.007	0.	0.23	5.45	0.	14.062

Problem 2755	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	61	0	0	1	0	0	56
normalized size	1	1.	0.82	0.	0.	0.01	0.	0.	0.76
time (sec)	N/A	0.104	0.041	0.089	0.	0.249	0.	0.	16.828

Problem 2756	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	222	222	72	0	0	451	0	0	192
normalized size	1	1.	0.32	0.	0.	2.03	0.	0.	0.86
time (sec)	N/A	0.325	0.048	0.089	0.	0.461	0.	0.	47.869

Problem 2757	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	317	317	72	0	0	525	0	0	277
normalized size	1	1.	0.23	0.	0.	1.66	0.	0.	0.87
time (sec)	N/A	0.549	0.049	0.091	0.	0.598	0.	0.	76.926

Problem 2758	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	36	0	85	80	0	0	58
normalized size	1	1.	0.52	0.	1.23	1.16	0.	0.	0.84
time (sec)	N/A	0.099	0.036	0.084	1.357	0.236	0.	0.	14.466

Problem 2759	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	61	0	0	1	0	0	56
normalized size	1	1.	0.82	0.	0.	0.01	0.	0.	0.76
time (sec)	N/A	0.099	0.019	0.	0.	0.249	0.	0.	16.512

Problem 2760	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	220	220	71	0	0	331	0	0	178
normalized size	1	1.	0.32	0.	0.	1.5	0.	0.	0.81
time (sec)	N/A	0.325	0.043	0.096	0.	0.249	0.	0.	47.23

Problem 2761	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	315	315	71	0	0	381	0	0	260
normalized size	1	1.	0.23	0.	0.	1.21	0.	0.	0.83
time (sec)	N/A	0.506	0.045	0.089	0.	0.257	0.	0.	77.15

Problem 2762	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	72	0	0	1	0	0	85
normalized size	1	1.	0.72	0.	0.	0.01	0.	0.	0.85
time (sec)	N/A	0.141	0.058	0.09	0.	0.313	0.	0.	23.175

Problem 2763	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	246	246	82	0	0	455	0	0	214
normalized size	1	1.	0.33	0.	0.	1.85	0.	0.	0.87
time (sec)	N/A	0.366	0.053	0.09	0.	0.336	0.	0.	57.454

Problem 2764	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F(-2)	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	341	341	82	0	0	549	0	0	299
normalized size	1	1.	0.24	0.	0.	1.61	0.	0.	0.88
time (sec)	N/A	0.552	0.059	0.086	0.	0.375	0.	0.	87.691

Problem 2765	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	47	0	0	0	0	0	29
normalized size	1	1.	1.07	0.	0.	0.	0.	0.	0.66
time (sec)	N/A	0.047	0.039	0.085	0.	0.	0.	0.	4.676

Problem 2766	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	47	0	0	0	0	0	29
normalized size	1	1.	1.02	0.	0.	0.	0.	0.	0.63
time (sec)	N/A	0.047	0.034	0.086	0.	0.	0.	0.	4.742

Problem 2767	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	47	0	0	0	0	0	29
normalized size	1	1.	1.07	0.	0.	0.	0.	0.	0.66
time (sec)	N/A	0.045	0.037	0.085	0.	0.	0.	0.	4.677

Problem 2768	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	45	0	0	0	0	0	29
normalized size	1	1.	1.02	0.	0.	0.	0.	0.	0.66
time (sec)	N/A	0.046	0.034	0.085	0.	0.	0.	0.	4.721

Problem 2769	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	38	0	0	0	0	0	29
normalized size	1	1.	0.95	0.	0.	0.	0.	0.	0.72
time (sec)	N/A	0.04	0.021	0.085	0.	0.	0.	0.	4.749

Problem 2770	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	29	0	32	27	0	0	20
normalized size	1	1.	1.04	0.	1.14	0.96	0.	0.	0.71
time (sec)	N/A	0.041	0.011	0.084	1.372	0.233	0.	0.	4.763

Problem 2771	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	44	0	0	0	0	0	31
normalized size	1	1.	0.88	0.	0.	0.	0.	0.	0.62
time (sec)	N/A	0.051	0.034	0.1	0.	0.	0.	0.	4.934

Problem 2772	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	47	0	0	0	0	0	31
normalized size	1	1.	0.9	0.	0.	0.	0.	0.	0.6
time (sec)	N/A	0.051	0.034	0.096	0.	0.	0.	0.	4.981

Problem 2773	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	31	99	30	30	0	0	15
normalized size	1	1.	1.29	4.12	1.25	1.25	0.	0.	0.62
time (sec)	N/A	0.026	0.026	0.038	1.454	0.223	0.	0.	3.683

Problem 2774	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	178	178	112	0	0	1	0	0	202
normalized size	1	1.	0.63	0.	0.	0.01	0.	0.	1.13
time (sec)	N/A	0.226	0.157	0.073	0.	0.263	0.	0.	30.937

Problem 2775	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	137	137	99	0	0	1	0	0	150
normalized size	1	1.	0.72	0.	0.	0.01	0.	0.	1.09
time (sec)	N/A	0.159	0.105	0.072	0.	0.249	0.	0.	23.199

Problem 2776	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	91	91	84	0	0	1	0	0	88
normalized size	1	1.	0.92	0.	0.	0.01	0.	0.	0.97
time (sec)	N/A	0.114	0.069	0.075	0.	0.247	0.	0.	14.31

Problem 2777	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	54	0	0	0	0	0	42
normalized size	1	1.	1.	0.	0.	0.	0.	0.	0.78
time (sec)	N/A	0.078	0.076	0.069	0.	0.	0.	0.	8.646

Problem 2778	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	31	0	39	0	0	0	24
normalized size	1	1.	1.	0.	1.26	0.	0.	0.	0.77
time (sec)	N/A	0.034	0.039	0.073	1.442	0.	0.	0.	3.781

Problem 2779	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	65	41	0	74	0	0	0	53
normalized size	1	1.	0.63	0.	1.14	0.	0.	0.	0.82
time (sec)	N/A	0.067	0.051	0.07	1.446	0.	0.	0.	7.283

Problem 2780	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	56	0	108	0	0	0	82
normalized size	1	1.	0.57	0.	1.1	0.	0.	0.	0.84
time (sec)	N/A	0.104	0.058	0.083	1.442	0.	0.	0.	12.521

Problem 2781	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	F(-2)	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	129	129	69	0	142	0	0	0	109
normalized size	1	1.	0.53	0.	1.1	0.	0.	0.	0.84
time (sec)	N/A	0.149	0.072	0.074	1.441	0.	0.	0.	17.994

Problem 2782	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	67	64	0	0	0	0	0	49
normalized size	1	1.14	1.08	0.	0.	0.	0.	0.	0.83
time (sec)	N/A	0.067	0.059	0.102	0.	0.	0.	0.	9.067

Problem 2783	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	66	62	0	0	0	0	0	51
normalized size	1	1.18	1.11	0.	0.	0.	0.	0.	0.91
time (sec)	N/A	0.069	0.15	0.1	0.	0.	0.	0.	9.059

Problem 2784	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	66	62	0	0	0	0	0	51
normalized size	1	1.18	1.11	0.	0.	0.	0.	0.	0.91
time (sec)	N/A	0.068	0.099	0.101	0.	0.	0.	0.	9.

Problem 2785	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	62	58	0	0	0	0	0	48
normalized size	1	1.19	1.12	0.	0.	0.	0.	0.	0.92
time (sec)	N/A	0.061	0.07	0.104	0.	0.	0.	0.	8.932

Problem 2786	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	46	46	0	0	0	0	0	36
normalized size	1	1.21	1.21	0.	0.	0.	0.	0.	0.95
time (sec)	N/A	0.034	0.028	0.094	0.	0.	0.	0.	3.85

Problem 2787	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	64	59	0	0	0	0	0	48
normalized size	1	1.21	1.11	0.	0.	0.	0.	0.	0.91
time (sec)	N/A	0.063	0.132	0.097	0.	0.	0.	0.	9.326

Problem 2788	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	66	63	0	0	0	0	0	53
normalized size	1	1.18	1.12	0.	0.	0.	0.	0.	0.95
time (sec)	N/A	0.068	0.2	0.101	0.	0.	0.	0.	9.453

Problem 2789	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	66	63	0	0	0	0	0	51
normalized size	1	1.18	1.12	0.	0.	0.	0.	0.	0.91
time (sec)	N/A	0.068	0.322	0.102	0.	0.	0.	0.	9.524

Problem 2790	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	63	0	0	0	0	0	46
normalized size	1	1.	1.	0.	0.	0.	0.	0.	0.73
time (sec)	N/A	0.066	0.06	0.104	0.	0.	0.	0.	8.536

Problem 2791	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	37	37	37	0	0	101	0	0	27
normalized size	1	1.	1.	0.	0.	2.73	0.	0.	0.73
time (sec)	N/A	0.045	0.081	0.104	0.	0.235	0.	0.	4.668

Problem 2792	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	79	79	69	0	0	194	0	0	53
normalized size	1	1.	0.87	0.	0.	2.46	0.	0.	0.67
time (sec)	N/A	0.104	0.089	0.105	0.	0.237	0.	0.	9.345

Problem 2793	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	127	127	69	0	0	290	0	0	53
normalized size	1	1.	0.54	0.	0.	2.28	0.	0.	0.42
time (sec)	N/A	0.195	0.089	0.105	0.	0.237	0.	0.	9.424

Problem 2794	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	179	179	69	0	0	397	0	0	53
normalized size	1	1.	0.39	0.	0.	2.22	0.	0.	0.3
time (sec)	N/A	0.317	0.091	0.104	0.	0.239	0.	0.	9.401

Problem 2795	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	25	73	0	139	0	174	36
normalized size	1	1.	0.83	2.43	0.	4.63	0.	5.8	1.2
time (sec)	N/A	0.032	0.035	0.007	0.	0.21	0.	0.218	2.746

Problem 2796	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	25	51	0	90	0	28	36
normalized size	1	1.	0.89	1.82	0.	3.21	0.	1.	1.29
time (sec)	N/A	0.029	0.019	0.005	0.	0.212	0.	0.217	2.766

Problem 2797	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	31	29	0	55	0	49	36
normalized size	1	1.	1.24	1.16	0.	2.2	0.	1.96	1.44
time (sec)	N/A	0.026	0.022	0.004	0.	0.212	0.	0.217	2.75

Problem 2798	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	28	27	24	57	0	45	37
normalized size	1	1.	1.	0.96	0.86	2.04	0.	1.61	1.32
time (sec)	N/A	0.029	0.011	0.011	1.353	0.214	0.	0.218	4.035

Problem 2799	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	25	22	24	93	0	4	37
normalized size	1	1.	0.83	0.73	0.8	3.1	0.	0.13	1.23
time (sec)	N/A	0.03	0.015	0.005	1.344	0.215	0.	0.555	2.782

Problem 2800	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	25	22	24	131	0	4	37
normalized size	1	1.	0.83	0.73	0.8	4.37	0.	0.13	1.23
time (sec)	N/A	0.031	0.022	0.007	1.412	0.215	0.	0.563	2.748

Problem 2801	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	25	25	41	12	8	35	19
normalized size	1	1.	1.25	1.25	2.05	0.6	0.4	1.75	0.95
time (sec)	N/A	0.014	0.015	0.004	1.52	0.208	0.095	0.218	1.387

Problem 2802	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	25	24	39	12	7	34	19
normalized size	1	1.	1.25	1.2	1.95	0.6	0.35	1.7	0.95
time (sec)	N/A	0.013	0.009	0.003	1.494	0.209	0.099	0.217	1.427

Problem 2803	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	26	26	26	23	8	11	7	20	26
normalized size	1	1.	1.	0.88	0.31	0.42	0.27	0.77	1.
time (sec)	N/A	0.016	0.013	0.008	1.482	0.214	0.107	0.216	1.754

Problem 2804	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	26	26	26	26	8	11	7	20	26
normalized size	1	1.	1.	1.	0.31	0.42	0.27	0.77	1.
time (sec)	N/A	0.017	0.012	0.005	1.479	0.211	0.101	0.215	1.774

Problem 2805	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	28	25	8	8	0	31	27
normalized size	1	1.	1.	0.89	0.29	0.29	0.	1.11	0.96
time (sec)	N/A	0.021	0.011	0.009	7.137	0.209	0.	0.219	1.863

Problem 2806	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	25	22	146	182	0	1	51
normalized size	1	1.	0.83	0.73	4.87	6.07	0.	0.03	1.7
time (sec)	N/A	0.035	0.052	0.006	1.423	0.215	0.	0.234	9.254

Problem 2807	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	25	22	89	112	0	477	51
normalized size	1	1.	0.89	0.79	3.18	4.	0.	17.04	1.82
time (sec)	N/A	0.031	0.023	0.004	1.412	0.213	0.	0.226	9.262

Problem 2808	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	25	22	32	59	0	89	51
normalized size	1	1.	1.	0.88	1.28	2.36	0.	3.56	2.04
time (sec)	N/A	0.029	0.011	0.004	1.395	0.214	0.	0.22	9.292

Problem 2809	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	23	22	36	82	0	31	51
normalized size	1	1.	1.	0.96	1.57	3.57	0.	1.35	2.22
time (sec)	N/A	0.029	0.015	0.004	1.367	0.213	0.	0.217	9.325

Problem 2810	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	25	22	58	147	0	4	51
normalized size	1	1.	0.83	0.73	1.93	4.9	0.	0.13	1.7
time (sec)	N/A	0.033	0.017	0.003	1.423	0.216	0.	0.569	9.259

Problem 2811	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	25	22	115	204	0	4	51
normalized size	1	1.	0.83	0.73	3.83	6.8	0.	0.13	1.7
time (sec)	N/A	0.034	0.028	0.003	1.452	0.216	0.	0.529	9.29

Problem 2812	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	21	22	23	36	51	32	24
normalized size	1	1.	0.7	0.73	0.77	1.2	1.7	1.07	0.8
time (sec)	N/A	0.025	0.019	0.002	1.376	0.216	8.792	0.218	2.592

Problem 2813	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	22	23	23	48	32	15
normalized size	1	1.	1.	1.16	1.21	1.21	2.53	1.68	0.79
time (sec)	N/A	0.019	0.008	0.005	1.35	0.216	2.614	0.22	1.98

Problem 2814	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	19	22	23	23	46	28	17
normalized size	1	1.	0.83	0.96	1.	1.	2.	1.22	0.74
time (sec)	N/A	0.021	0.016	0.005	1.375	0.217	0.714	0.218	1.936

Problem 2815	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	21	22	23	28	49	84	22
normalized size	1	1.	0.84	0.88	0.92	1.12	1.96	3.36	0.88
time (sec)	N/A	0.02	0.02	0.004	1.481	0.217	3.318	0.217	2.618

Problem 2816	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	21	22	23	47	49	35	24
normalized size	1	1.	0.7	0.73	0.77	1.57	1.63	1.17	0.8
time (sec)	N/A	0.024	0.022	0.004	1.341	0.216	4.116	0.218	2.563

Problem 2817	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	21	22	23	62	49	35	24
normalized size	1	1.	0.7	0.73	0.77	2.07	1.63	1.17	0.8
time (sec)	N/A	0.024	0.027	0.003	1.374	0.214	6.425	0.217	2.537

Problem 2818	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	25	22	66	81	0	1	26
normalized size	1	1.	0.83	0.73	2.2	2.7	0.	0.03	0.87
time (sec)	N/A	0.027	0.017	0.005	1.396	0.218	0.	0.216	2.57

Problem 2819	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	25	22	36	49	0	28	22
normalized size	1	1.	0.89	0.79	1.29	1.75	0.	1.	0.79
time (sec)	N/A	0.025	0.014	0.006	1.438	0.215	0.	0.215	2.142

Problem 2820	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	28	27	18	50	0	27	24
normalized size	1	1.	1.	0.96	0.64	1.79	0.	0.96	0.86
time (sec)	N/A	0.027	0.012	0.007	1.425	0.217	0.	0.22	2.019

Problem 2821	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	32	29	20	65	0	45	0
normalized size	1	1.	1.28	1.16	0.8	2.6	0.	1.8	0.
time (sec)	N/A	0.022	0.022	0.005	1.396	0.214	0.	0.217	0.

Problem 2822	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	25	51	50	95	0	0	24
normalized size	1	1.	0.83	1.7	1.67	3.17	0.	0.	0.8
time (sec)	N/A	0.026	0.025	0.004	1.391	0.216	0.	0.	2.561

Problem 2823	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	25	73	80	124	0	0	24
normalized size	1	1.	0.83	2.43	2.67	4.13	0.	0.	0.8
time (sec)	N/A	0.026	0.029	0.005	1.405	0.219	0.	0.	2.553

Problem 2824	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	25	22	32	126	0	70	27
normalized size	1	1.	0.83	0.73	1.07	4.2	0.	2.33	0.9
time (sec)	N/A	0.027	0.021	0.004	1.544	0.221	0.	0.223	2.586

Problem 2825	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	25	22	32	78	0	70	26
normalized size	1	1.	0.89	0.79	1.14	2.79	0.	2.5	0.93
time (sec)	N/A	0.025	0.015	0.002	1.476	0.218	0.	0.222	2.099

Problem 2826	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	23	22	32	58	97	68	20
normalized size	1	1.	1.	0.96	1.39	2.52	4.22	2.96	0.87
time (sec)	N/A	0.023	0.012	0.004	1.415	0.216	3.101	0.219	1.989

Problem 2827	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	25	22	36	107	0	217	24
normalized size	1	1.	1.	0.88	1.44	4.28	0.	8.68	0.96
time (sec)	N/A	0.022	0.026	0.003	1.543	0.218	0.	0.22	2.53

Problem 2828	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	25	22	36	151	0	0	26
normalized size	1	1.	0.83	0.73	1.2	5.03	0.	0.	0.87
time (sec)	N/A	0.026	0.033	0.004	1.437	0.218	0.	0.	2.532

Problem 2829	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	25	22	36	196	0	0	26
normalized size	1	1.	0.83	0.73	1.2	6.53	0.	0.	0.87
time (sec)	N/A	0.027	0.024	0.004	1.446	0.219	0.	0.	2.6

Problem 2830	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	34	29	28	50	0	20	0
normalized size	1	1.	1.26	1.07	1.04	1.85	0.	0.74	0.
time (sec)	N/A	0.025	0.027	0.003	1.339	0.322	0.	0.22	0.

Problem 2831	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	34	29	20	23	65	20	0
normalized size	1	1.	1.06	0.91	0.62	0.72	2.03	0.62	0.
time (sec)	N/A	0.026	0.027	0.006	1.339	0.211	20.122	0.212	0.

Problem 2832	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	34	29	28	59	0	0	0
normalized size	1	1.	1.26	1.07	1.04	2.19	0.	0.	0.
time (sec)	N/A	0.027	0.035	0.002	1.336	0.337	0.	0.	0.

Problem 2833	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	29	20	20	134	20	0
normalized size	1	1.	1.	0.85	0.59	0.59	3.94	0.59	0.
time (sec)	N/A	0.03	0.034	0.004	1.341	0.211	9.37	0.213	0.

Problem 2834	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	77	112	116	1	99	126	22
normalized size	1	1.	2.48	3.61	3.74	0.03	3.19	4.06	0.71
time (sec)	N/A	0.071	0.033	0.003	1.341	0.186	0.136	0.212	7.09

Problem 2835	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	51	51	172	324	238	1	209	279	0
normalized size	1	1.	3.37	6.35	4.67	0.02	4.1	5.47	0.
time (sec)	N/A	0.169	0.042	0.001	1.412	0.186	0.245	0.214	0.

Problem 2836	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	48	249	960	383	1	357	479	37
normalized size	1	1.	5.19	20.	7.98	0.02	7.44	9.98	0.77
time (sec)	N/A	0.427	0.06	0.002	1.434	0.189	0.366	0.213	15.301

Problem 2837	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	12	14	15	10	15	8
normalized size	1	1.	1.	1.	1.17	1.25	0.83	1.25	0.67
time (sec)	N/A	0.008	0.004	0.001	1.377	0.206	0.143	0.216	2.156

Problem 2838	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	13	15	16	12	16	10
normalized size	1	1.	1.	1.	1.15	1.23	0.92	1.23	0.77
time (sec)	N/A	0.009	0.004	0.002	1.372	0.202	0.198	0.215	2.159

Problem 2839	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	13	13	15	30	22	16	12
normalized size	1	1.	1.	1.	1.15	2.31	1.69	1.23	0.92
time (sec)	N/A	0.008	0.004	0.	1.424	0.201	0.267	0.217	2.172

Problem 2840	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	93	93	91	289	405	591	0	1	73
normalized size	1	1.	0.98	3.11	4.35	6.35	0.	0.01	0.78
time (sec)	N/A	0.212	0.132	0.022	1.507	0.232	0.	0.221	25.737

Problem 2841	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	68	68	0	0	0	0	0	53
normalized size	1	1.24	1.24	0.	0.	0.	0.	0.	0.96
time (sec)	N/A	0.123	0.058	0.224	0.	0.	0.	0.	12.063

Problem 2842	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	51	91	189	247	0	699	48
normalized size	1	1.	0.82	1.47	3.05	3.98	0.	11.27	0.77
time (sec)	N/A	0.139	0.052	0.012	1.474	0.23	0.	0.222	16.784

Problem 2843	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	68	68	0	0	0	0	0	53
normalized size	1	1.24	1.24	0.	0.	0.	0.	0.	0.96
time (sec)	N/A	0.118	0.035	0.152	0.	0.	0.	0.	13.456

Problem 2844	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	29	39	0	76	0	181	20
normalized size	1	1.	0.97	1.3	0.	2.53	0.	6.03	0.67
time (sec)	N/A	0.025	0.014	0.005	0.	0.229	0.	0.22	4.866

Problem 2845	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	66	0	0	0	0	0	39
normalized size	1	1.	1.27	0.	0.	0.	0.	0.	0.75
time (sec)	N/A	0.117	0.048	0.154	0.	0.	0.	0.	10.171

Problem 2846	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	98	124	128	1	107	142	22
normalized size	1	1.	3.16	4.	4.13	0.03	3.45	4.58	0.71
time (sec)	N/A	0.074	0.025	0.001	1.411	0.186	0.146	0.213	7.418

Problem 2847	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	51	51	203	470	284	1	252	335	41
normalized size	1	1.	3.98	9.22	5.57	0.02	4.94	6.57	0.8
time (sec)	N/A	0.168	0.047	0.002	1.47	0.187	0.271	0.214	12.421

Problem 2848	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	323	1948	485	1	437	597	60
normalized size	1	1.	4.55	27.44	6.83	0.01	6.15	8.41	0.85
time (sec)	N/A	0.261	0.076	0.003	1.352	0.186	0.411	0.216	15.943

Problem 2849	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	37	37	102	154	157	1	144	171	29
normalized size	1	1.	2.76	4.16	4.24	0.03	3.89	4.62	0.78
time (sec)	N/A	0.081	0.009	0.001	1.346	0.188	0.184	0.213	9.027

Problem 2850	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	60	60	207	536	324	1	323	392	51
normalized size	1	1.	3.45	8.93	5.4	0.02	5.38	6.53	0.85
time (sec)	N/A	0.172	0.049	0.002	1.349	0.186	0.319	0.219	14.163

Problem 2851	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	83	327	2050	537	1	552	689	73
normalized size	1	1.	3.94	24.7	6.47	0.01	6.65	8.3	0.88
time (sec)	N/A	0.257	0.071	0.002	1.382	0.188	0.456	0.218	17.302

Problem 2852	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	156	156	159	93	0	246	46	0	146
normalized size	1	1.	1.02	0.6	0.	1.58	0.29	0.	0.94
time (sec)	N/A	0.369	0.082	0.009	0.	0.217	1.965	0.	38.4

Problem 2853	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	144	144	142	78	0	194	27	0	143
normalized size	1	1.	0.99	0.54	0.	1.35	0.19	0.	0.99
time (sec)	N/A	0.312	0.032	0.006	0.	0.218	1.716	0.	39.36

Problem 2854	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	43	27	57	42	28	15
normalized size	1	1.	1.	1.95	1.23	2.59	1.91	1.27	0.68
time (sec)	N/A	0.016	0.012	0.003	1.41	0.207	1.595	0.219	3.898

Problem 2855	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	140	140	114	76	0	177	29	0	134
normalized size	1	1.	0.81	0.54	0.	1.26	0.21	0.	0.96
time (sec)	N/A	0.264	0.024	0.002	0.	0.215	0.72	0.	31.879

Problem 2856	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	140	140	116	71	0	161	26	0	134
normalized size	1	1.	0.83	0.51	0.	1.15	0.19	0.	0.96
time (sec)	N/A	0.25	0.022	0.002	0.	0.211	0.715	0.	30.487

Problem 2857	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	36	57	76	69	49	78	29
normalized size	1	1.	1.	1.58	2.11	1.92	1.36	2.17	0.81
time (sec)	N/A	0.084	0.014	0.007	1.366	0.206	1.397	0.22	10.433

Problem 2858	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	154	154	140	92	0	236	44	236	144
normalized size	1	1.	0.91	0.6	0.	1.53	0.29	1.53	0.94
time (sec)	N/A	0.299	0.075	0.006	0.	0.217	2.951	0.232	38.033

Problem 2859	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	156	156	139	87	0	343	61	0	148
normalized size	1	1.	0.89	0.56	0.	2.2	0.39	0.	0.95
time (sec)	N/A	0.294	0.068	0.007	0.	0.218	4.379	0.	39.342

Problem 2860	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	44	75	132	213	100	55	49
normalized size	1	1.	0.79	1.34	2.36	3.8	1.79	0.98	0.88
time (sec)	N/A	0.114	0.037	0.012	1.356	0.212	7.534	0.222	14.28

Problem 2861	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	172	172	152	141	0	413	107	0	160
normalized size	1	1.	0.88	0.82	0.	2.4	0.62	0.	0.93
time (sec)	N/A	0.33	0.175	0.018	0.	0.219	9.892	0.	39.585

Problem 2862	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	170	170	151	124	0	381	90	0	155
normalized size	1	1.	0.89	0.73	0.	2.24	0.53	0.	0.91
time (sec)	N/A	0.319	0.114	0.016	0.	0.221	8.191	0.	39.541

Problem 2863	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	23	44	28	70	58	28	17
normalized size	1	1.	1.	1.91	1.22	3.04	2.52	1.22	0.74
time (sec)	N/A	0.017	0.024	0.001	1.426	0.204	6.758	0.215	3.984

Problem 2864	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	172	172	152	144	0	408	105	0	156
normalized size	1	1.	0.88	0.84	0.	2.37	0.61	0.	0.91
time (sec)	N/A	0.314	0.15	0.016	0.	0.22	6.106	0.	37.98

Problem 2865	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	170	170	151	127	0	375	92	0	158
normalized size	1	1.	0.89	0.75	0.	2.21	0.54	0.	0.93
time (sec)	N/A	0.291	0.098	0.013	0.	0.218	4.94	0.	35.455

Problem 2866	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	48	100	140	228	110	136	49
normalized size	1	1.	0.81	1.69	2.37	3.86	1.86	2.31	0.83
time (sec)	N/A	0.138	0.04	0.023	1.859	0.214	8.831	0.217	14.187

Problem 2867	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	189	189	168	227	0	555	168	275	175
normalized size	1	1.	0.89	1.2	0.	2.94	0.89	1.46	0.93
time (sec)	N/A	0.365	0.168	0.021	0.	0.23	29.363	0.23	44.401

Problem 2868	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	189	189	166	174	0	716	197	0	178
normalized size	1	1.	0.88	0.92	0.	3.79	1.04	0.	0.94
time (sec)	N/A	0.369	0.144	0.02	0.	0.245	167.694	0.	45.117

Problem 2869	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	60	119	300	582	0	88	73
normalized size	1	1.	0.75	1.49	3.75	7.28	0.	1.1	0.91
time (sec)	N/A	0.168	0.117	0.026	1.476	0.248	0.	0.225	17.453

Problem 2870	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	205	205	182	214	0	952	287	0	182
normalized size	1	1.	0.89	1.04	0.	4.64	1.4	0.	0.89
time (sec)	N/A	0.406	0.339	0.028	0.	0.242	118.13	0.	45.454

Problem 2871	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	201	201	179	186	0	905	260	0	178
normalized size	1	1.	0.89	0.93	0.	4.5	1.29	0.	0.89
time (sec)	N/A	0.395	0.225	0.025	0.	0.244	99.51	0.	45.306

Problem 2872	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	23	44	28	180	153	28	19
normalized size	1	1.	1.	1.91	1.22	7.83	6.65	1.22	0.83
time (sec)	N/A	0.017	0.024	0.001	1.338	0.227	84.02	0.215	4.044

Problem 2873	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	202	202	180	214	0	957	296	0	187
normalized size	1	1.	0.89	1.06	0.	4.74	1.47	0.	0.93
time (sec)	N/A	0.38	0.214	0.024	0.	0.242	70.146	0.	45.093

Problem 2874	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	198	198	176	185	0	914	267	0	187
normalized size	1	1.	0.89	0.93	0.	4.62	1.35	0.	0.94
time (sec)	N/A	0.361	0.176	0.023	0.	0.243	54.109	0.	39.969

Problem 2875	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	63	283	331	630	0	194	70
normalized size	1	1.	0.77	3.45	4.04	7.68	0.	2.37	0.85
time (sec)	N/A	0.187	0.084	0.036	1.385	0.263	0.	0.219	17.511

Problem 2876	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	219	219	196	524	0	1191	0	301	201
normalized size	1	1.	0.89	2.39	0.	5.44	0.	1.37	0.92
time (sec)	N/A	0.436	0.258	0.035	0.	0.305	0.	0.23	50.607

Problem 2877	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	219	219	192	419	0	1411	0	0	206
normalized size	1	1.	0.88	1.91	0.	6.44	0.	0.	0.94
time (sec)	N/A	0.436	0.27	0.033	0.	0.341	0.	0.	52.78

Problem 2878	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	101	101	80	311	591	1200	0	108	88
normalized size	1	1.	0.79	3.08	5.85	11.88	0.	1.07	0.87
time (sec)	N/A	0.226	0.187	0.041	1.584	0.38	0.	0.223	22.108

Problem 2879	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	168	168	163	102	0	266	66	0	160
normalized size	1	1.	0.97	0.61	0.	1.58	0.39	0.	0.95
time (sec)	N/A	0.35	0.07	0.004	0.	0.213	2.248	0.	41.847

Problem 2880	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	156	156	145	84	0	211	44	0	156
normalized size	1	1.	0.93	0.54	0.	1.35	0.28	0.	1.
time (sec)	N/A	0.328	0.036	0.004	0.	0.213	1.984	0.	41.978

Problem 2881	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	25	46	61	61	46	61	19
normalized size	1	1.	1.	1.84	2.44	2.44	1.84	2.44	0.76
time (sec)	N/A	0.021	0.014	0.002	1.346	0.203	1.821	0.217	5.315

Problem 2882	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	143	143	115	77	0	181	41	0	139
normalized size	1	1.	0.8	0.54	0.	1.27	0.29	0.	0.97
time (sec)	N/A	0.287	0.023	0.002	0.	0.214	1.77	0.	33.895

Problem 2883	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	42	42	63	84	73	53	84	32
normalized size	1	1.	1.	1.5	2.	1.74	1.26	2.	0.76
time (sec)	N/A	0.098	0.016	0.006	1.412	0.204	1.781	0.221	11.685

Problem 2884	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	166	166	143	98	0	244	54	305	158
normalized size	1	1.	0.86	0.59	0.	1.47	0.33	1.84	0.95
time (sec)	N/A	0.328	0.082	0.006	0.	0.219	3.389	0.235	40.168

Problem 2885	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	168	168	142	93	0	355	75	0	162
normalized size	1	1.	0.85	0.55	0.	2.11	0.45	0.	0.96
time (sec)	N/A	0.324	0.074	0.005	0.	0.219	5.184	0.	41.009

Problem 2886	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	65	47	84	157	230	121	111	60
normalized size	1	1.	0.72	1.29	2.42	3.54	1.86	1.71	0.92
time (sec)	N/A	0.126	0.041	0.006	1.354	0.217	8.96	0.22	15.408

Problem 2887	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	184	184	155	221	0	483	131	0	173
normalized size	1	1.	0.84	1.2	0.	2.62	0.71	0.	0.94
time (sec)	N/A	0.352	0.181	0.007	0.	0.219	10.832	0.	41.433

Problem 2888	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	182	182	154	166	0	447	110	0	168
normalized size	1	1.	0.85	0.91	0.	2.46	0.6	0.	0.92
time (sec)	N/A	0.351	0.124	0.007	0.	0.221	8.94	0.	41.545

Problem 2889	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	26	26	26	47	74	74	60	61	19
normalized size	1	1.	1.	1.81	2.85	2.85	2.31	2.35	0.73
time (sec)	N/A	0.021	0.03	0.	1.348	0.204	7.29	0.216	5.408

Problem 2890	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	176	176	153	216	0	437	122	0	163
normalized size	1	1.	0.87	1.23	0.	2.48	0.69	0.	0.93
time (sec)	N/A	0.351	0.156	0.007	0.	0.221	6.605	0.	39.931

Problem 2891	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	51	109	154	234	122	144	54
normalized size	1	1.	0.75	1.6	2.26	3.44	1.79	2.12	0.79
time (sec)	N/A	0.156	0.042	0.013	1.384	0.216	10.189	0.22	15.798

Problem 2892	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	204	204	171	242	0	575	196	363	192
normalized size	1	1.	0.84	1.19	0.	2.82	0.96	1.78	0.94
time (sec)	N/A	0.391	0.177	0.013	0.	0.232	33.817	0.235	47.089

Problem 2893	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	204	204	169	186	0	740	0	0	196
normalized size	1	1.	0.83	0.91	0.	3.63	0.	0.	0.96
time (sec)	N/A	0.392	0.157	0.011	0.	0.24	0.	0.	47.932

Problem 2894	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	63	131	336	610	0	213	87
normalized size	1	1.	0.68	1.42	3.65	6.63	0.	2.32	0.95
time (sec)	N/A	0.19	0.125	0.015	1.42	0.251	0.	0.219	19.933

Problem 2895	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	220	220	185	521	0	1072	332	0	199
normalized size	1	1.	0.84	2.37	0.	4.87	1.51	0.	0.9
time (sec)	N/A	0.439	0.33	0.011	0.	0.244	117.098	0.	49.281

Problem 2896	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	216	216	182	414	0	1021	298	0	196
normalized size	1	1.	0.84	1.92	0.	4.73	1.38	0.	0.91
time (sec)	N/A	0.42	0.231	0.008	0.	0.245	99.319	0.	48.57

Problem 2897	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	26	26	26	47	184	184	155	61	20
normalized size	1	1.	1.	1.81	7.08	7.08	5.96	2.35	0.77
time (sec)	N/A	0.021	0.031	0.002	1.432	0.227	83.721	0.217	5.46

Problem 2898	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	207	207	181	507	0	1004	323	0	196
normalized size	1	1.	0.87	2.45	0.	4.85	1.56	0.	0.95
time (sec)	N/A	0.422	0.219	0.009	0.	0.244	69.453	0.	47.199

Problem 2899	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	66	304	348	640	0	203	76
normalized size	1	1.	0.7	3.23	3.7	6.81	0.	2.16	0.81
time (sec)	N/A	0.212	0.088	0.017	1.445	0.263	0.	0.22	19.373

Problem 2900	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	237	237	199	557	0	1223	0	398	221
normalized size	1	1.	0.84	2.35	0.	5.16	0.	1.68	0.93
time (sec)	N/A	0.468	0.264	0.018	0.	0.304	0.	0.235	52.826

Problem 2901	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F	A	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	237	237	195	446	0	1447	0	0	226
normalized size	1	1.	0.82	1.88	0.	6.11	0.	0.	0.95
time (sec)	N/A	0.463	0.266	0.014	0.	0.341	0.	0.	53.303

Problem 2902	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	83	335	640	1241	0	350	105
normalized size	1	1.	0.72	2.89	5.52	10.7	0.	3.02	0.91
time (sec)	N/A	0.249	0.19	0.02	1.43	0.392	0.	0.221	23.765

Problem 2903	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	32	63	0	140	0	38	20
normalized size	1	1.	1.07	2.1	0.	4.67	0.	1.27	0.67
time (sec)	N/A	0.027	0.033	0.01	0.	0.224	0.	0.217	4.943

Problem 2904	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	80	136	28	1	126	34	0
normalized size	1	1.	3.48	5.91	1.22	0.04	5.48	1.48	0.
time (sec)	N/A	0.023	0.032	0.001	1.361	0.181	0.166	0.213	0.

Problem 2905	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	172	622	28	1	299	28	15
normalized size	1	1.	7.48	27.04	1.22	0.04	13.	1.22	0.65
time (sec)	N/A	0.03	0.066	0.001	1.399	0.182	0.317	0.215	5.245

Problem 2906	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	308	3262	28	1	541	28	15
normalized size	1	1.	13.39	141.83	1.22	0.04	23.52	1.22	0.65
time (sec)	N/A	0.043	0.158	0.003	1.346	0.182	0.472	0.216	5.995

Problem 2907	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	22	55	27	73	56	28	15
normalized size	1	1.	1.	2.5	1.23	3.32	2.55	1.27	0.68
time (sec)	N/A	0.02	0.015	0.002	1.371	0.201	1.84	0.217	3.967

Problem 2908	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	23	56	28	89	73	28	17
normalized size	1	1.	1.	2.43	1.22	3.87	3.17	1.22	0.74
time (sec)	N/A	0.021	0.019	0.	1.394	0.209	22.26	0.214	3.903

Problem 2909	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	23	56	28	232	0	28	19
normalized size	1	1.	1.	2.43	1.22	10.09	0.	1.22	0.83
time (sec)	N/A	0.02	0.018	0.001	1.485	0.277	0.	0.214	3.897

Problem 2910	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	111	111	90	1036	0	0	46	0	97
normalized size	1	1.	0.81	9.33	0.	0.	0.41	0.	0.87
time (sec)	N/A	0.206	0.093	0.345	0.	0.	2.998	0.	6.972

Problem 2911	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	C	F	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	154	154	330	1528	0	0	0	0	138
normalized size	1	1.	2.14	9.92	0.	0.	0.	0.	0.9
time (sec)	N/A	0.37	0.896	0.038	0.	0.	0.	0.	18.727

Problem 2912	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	78	78	79	0	0	0	0	0	80
normalized size	1	1.	1.01	0.	0.	0.	0.	0.	1.03
time (sec)	N/A	0.197	0.087	0.067	0.	0.	0.	0.	13.822

Problem 2913	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	72	0	0	0	0	0	66
normalized size	1	1.	0.97	0.	0.	0.	0.	0.	0.89
time (sec)	N/A	0.162	0.072	0.053	0.	0.	0.	0.	14.04

Problem 2914	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	76	76	79	0	0	0	0	0	83
normalized size	1	1.	1.04	0.	0.	0.	0.	0.	1.09
time (sec)	N/A	0.251	0.097	0.065	0.	0.	0.	0.	19.311

Problem 2915	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	78	78	86	0	0	0	0	0	100
normalized size	1	1.	1.1	0.	0.	0.	0.	0.	1.28
time (sec)	N/A	0.287	0.114	0.064	0.	0.	0.	0.	17.322

Problem 2916	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	73	73	70	0	0	0	0	0	65
normalized size	1	1.	0.96	0.	0.	0.	0.	0.	0.89
time (sec)	N/A	0.116	0.123	0.467	0.	0.	0.	0.	12.137

Problem 2917	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	61	0	0	0	0	0	44
normalized size	1	1.	1.	0.	0.	0.	0.	0.	0.72
time (sec)	N/A	0.096	0.045	0.071	0.	0.	0.	0.	10.085

Problem 2918	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	61	0	0	0	0	0	44
normalized size	1	1.	1.	0.	0.	0.	0.	0.	0.72
time (sec)	N/A	0.086	0.039	0.069	0.	0.	0.	0.	9.207

Problem 2919	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	52	0	0	0	0	0	41
normalized size	1	1.	1.	0.	0.	0.	0.	0.	0.79
time (sec)	N/A	0.058	0.03	0.087	0.	0.	0.	0.	5.314

Problem 2920	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	61	0	0	0	0	0	34
normalized size	1	1.	1.33	0.	0.	0.	0.	0.	0.74
time (sec)	N/A	0.101	0.049	0.073	0.	0.	0.	0.	7.803

Problem 2921	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	59	0	0	0	0	0	44
normalized size	1	1.	0.95	0.	0.	0.	0.	0.	0.71
time (sec)	N/A	0.091	0.044	0.071	0.	0.	0.	0.	10.077

Problem 2922	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	83	83	0	106	46	74	41	146	78
normalized size	1	1.	0.	1.28	0.55	0.89	0.49	1.76	0.94
time (sec)	N/A	0.086	0.044	0.011	1.623	0.215	0.369	0.238	7.587

Problem 2923	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	174	174	103	92	171	139	0	176	165
normalized size	1	1.	0.59	0.53	0.98	0.8	0.	1.01	0.95
time (sec)	N/A	0.205	0.086	0.011	1.382	0.209	0.	0.22	25.523

Problem 2924	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	86	63	115	101	0	119	109
normalized size	1	1.	0.74	0.54	0.99	0.87	0.	1.03	0.94
time (sec)	N/A	0.14	0.046	0.008	1.378	0.208	0.	0.221	17.363

Problem 2925	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	54	36	58	62	0	46	48
normalized size	1	1.	0.96	0.64	1.04	1.11	0.	0.82	0.86
time (sec)	N/A	0.076	0.028	0.007	1.342	0.207	0.	0.216	9.286

Problem 2926	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F	A	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	51	51	0	40	0	1	0	51	44
normalized size	1	1.	0.	0.78	0.	0.02	0.	1.	0.86
time (sec)	N/A	0.076	0.033	0.009	0.	0.225	0.	0.218	7.768

Problem 2927	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F	A	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	97	97	0	72	0	1	0	122	83
normalized size	1	1.	0.	0.74	0.	0.01	0.	1.26	0.86
time (sec)	N/A	0.124	0.032	0.008	0.	0.224	0.	0.219	11.592

Problem 2928	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F	A	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	171	171	0	114	0	1	0	182	156
normalized size	1	1.	0.	0.67	0.	0.01	0.	1.06	0.91
time (sec)	N/A	0.218	0.033	0.008	0.	0.225	0.	0.222	21.468

Problem 2929	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	191	191	0	84	2959	132	0	147	180
normalized size	1	1.	0.	0.44	15.49	0.69	0.	0.77	0.94
time (sec)	N/A	0.171	0.259	0.009	2.031	0.208	0.	0.217	20.088

Problem 2930	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	113	113	0	55	522	95	0	90	105
normalized size	1	1.	0.	0.49	4.62	0.84	0.	0.8	0.93
time (sec)	N/A	0.114	0.178	0.008	1.459	0.208	0.	0.217	12.501

Problem 2931	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	27	57	54	0	24	29
normalized size	1	1.	1.	0.79	1.68	1.59	0.	0.71	0.85
time (sec)	N/A	0.026	0.006	0.004	1.38	0.207	0.	0.213	2.156

Problem 2932	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F	A	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	67	67	0	54	0	1	0	73	56
normalized size	1	1.	0.	0.81	0.	0.01	0.	1.09	0.84
time (sec)	N/A	0.084	0.034	0.016	0.	0.224	0.	0.219	8.53

Problem 2933	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F	A	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	144	144	0	97	0	1	0	154	124
normalized size	1	1.	0.	0.67	0.	0.01	0.	1.07	0.86
time (sec)	N/A	0.165	0.032	0.019	0.	0.225	0.	0.221	15.686

Problem 2934	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F	A	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	219	219	0	133	0	1	0	211	201
normalized size	1	1.	0.	0.61	0.	0.	0.	0.96	0.92
time (sec)	N/A	0.266	0.033	0.021	0.	0.227	0.	0.222	26.526

Problem 2935	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	A	F	A	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	113	113	0	0	1091	105	0	74	105
normalized size	1	1.	0.	0.	9.65	0.93	0.	0.65	0.93
time (sec)	N/A	0.161	0.072	0.052	1.445	0.211	0.	0.219	15.19

Problem 2936	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	A	F	A	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	0	0	58	76	0	51	51
normalized size	1	1.	0.	0.	1.04	1.36	0.	0.91	0.91
time (sec)	N/A	0.115	0.09	0.05	1.341	0.21	0.	0.218	11.964

Problem 2937	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	37	29	81	62	0	27	31
normalized size	1	1.	1.03	0.81	2.25	1.72	0.	0.75	0.86
time (sec)	N/A	0.048	0.037	0.009	1.357	0.212	0.	0.218	5.14

Problem 2938	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	F	A	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	0	0	0	1	0	57	48
normalized size	1	1.	0.	0.	0.	0.02	0.	1.04	0.87
time (sec)	N/A	0.109	0.047	0.049	0.	0.223	0.	0.218	9.674

Problem 2939	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	F	A	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	0	0	0	1	0	74	63
normalized size	1	1.	0.	0.	0.	0.01	0.	1.04	0.89
time (sec)	N/A	0.125	0.042	0.049	0.	0.226	0.	0.222	10.342

Problem 2940	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	340	340	132	0	0	0	0	0	301
normalized size	1	1.	0.39	0.	0.	0.	0.	0.	0.89
time (sec)	N/A	0.503	0.257	0.049	0.	0.	0.	0.	24.65

Problem 2941	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	306	306	0	0	0	0	0	0	270
normalized size	1	1.	0.	0.	0.	0.	0.	0.	0.88
time (sec)	N/A	0.319	0.015	0.049	0.	0.	0.	0.	13.44

Problem 2942	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	298	298	0	0	0	0	0	0	258
normalized size	1	1.	0.	0.	0.	0.	0.	0.	0.87
time (sec)	N/A	0.339	0.048	0.051	0.	0.	0.	0.	15.96

Problem 2943	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	352	352	0	0	0	0	0	0	308
normalized size	1	1.	0.	0.	0.	0.	0.	0.	0.88
time (sec)	N/A	0.439	0.043	0.051	0.	0.	0.	0.	23.27

Problem 2944	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	709	709	0	0	0	0	0	0	629
normalized size	1	1.	0.	0.	0.	0.	0.	0.	0.89
time (sec)	N/A	0.988	0.054	0.049	0.	0.	0.	0.	56.859

Problem 2945	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	642	642	89	495	0	0	0	0	561
normalized size	1	1.	0.14	0.77	0.	0.	0.	0.	0.87
time (sec)	N/A	1.04	0.119	0.015	0.	0.	0.	0.	46.179

Problem 2946	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	661	661	0	0	0	0	0	0	575
normalized size	1	1.	0.	0.	0.	0.	0.	0.	0.87
time (sec)	N/A	0.814	0.044	0.05	0.	0.	0.	0.	44.886

Problem 2947	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	681	681	0	0	0	0	0	0	597
normalized size	1	1.	0.	0.	0.	0.	0.	0.	0.88
time (sec)	N/A	0.99	0.043	0.049	0.	0.	0.	0.	58.023

Problem 2948	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	0	0	0	0	0	0	0
normalized size	1	1.	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.144	0.049	0.044	0.	0.	0.	0.	0.

Problem 2949	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	74	0	0	0	0	0	0
normalized size	1	1.	0.84	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.109	0.062	0.046	0.	0.	0.	0.	0.

Problem 2950	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	87	87	81	0	0	0	0	0	0
normalized size	1	1.	0.93	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.183	0.1	0.061	0.	0.	0.	0.	0.

Problem 2951	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	90	90	0	0	0	0	0	0	0
normalized size	1	1.	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.216	0.07	0.067	0.	0.	0.	0.	0.

Problem 2952	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	0	14	3	8	2	3	15
normalized size	1	1.	0.	0.82	0.18	0.47	0.12	0.18	0.88
time (sec)	N/A	0.012	0.03	0.053	1.512	0.209	0.16	0.216	1.133

Problem 2953	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	86	103	115	101	0	155	0
normalized size	1	1.	0.74	0.89	0.99	0.87	0.	1.34	0.
time (sec)	N/A	0.196	0.054	0.192	1.367	0.348	0.	0.222	0.

Problem 2954	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	54	65	58	62	0	89	48
normalized size	1	1.	0.96	1.16	1.04	1.11	0.	1.59	0.86
time (sec)	N/A	0.086	0.029	0.171	1.346	0.3	0.	0.221	8.417

Problem 2955	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	F(-1)	F	A	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	0	40	0	0	0	124	0
normalized size	1	1.	0.	0.73	0.	0.	0.	2.25	0.
time (sec)	N/A	0.105	0.034	0.171	0.	0.	0.	0.223	0.

Problem 2956	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	F(-1)	F	A	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	97	97	0	81	0	0	0	127	0
normalized size	1	1.	0.	0.84	0.	0.	0.	1.31	0.
time (sec)	N/A	0.155	0.033	0.181	0.	0.	0.	0.243	0.

Problem 2957	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	400	400	0	350	0	0	0	0	0
normalized size	1	1.	0.	0.88	0.	0.	0.	0.	0.
time (sec)	N/A	0.645	0.044	0.238	0.	0.	0.	0.	0.

Problem 2958	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	355	355	0	306	0	0	0	0	0
normalized size	1	1.	0.	0.86	0.	0.	0.	0.	0.
time (sec)	N/A	0.443	0.033	0.177	0.	0.	0.	0.	0.

Problem 2959	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	434	434	0	346	0	0	0	0	0
normalized size	1	1.	0.	0.8	0.	0.	0.	0.	0.
time (sec)	N/A	0.677	0.032	0.188	0.	0.	0.	0.	0.

Problem 2960	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	F	F	F
verified	N/A	NO	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	843	843	0	932	0	0	0	0	0
normalized size	1	1.	0.	1.11	0.	0.	0.	0.	0.
time (sec)	N/A	1.507	0.042	0.177	0.	0.	0.	0.	0.

Problem 2961	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	770	770	0	860	0	0	0	0	0
normalized size	1	1.	0.	1.12	0.	0.	0.	0.	0.
time (sec)	N/A	1.047	0.013	0.173	0.	0.	0.	0.	0.

Problem 2962	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	810	810	0	869	0	0	0	0	0
normalized size	1	1.	0.	1.07	0.	0.	0.	0.	0.
time (sec)	N/A	1.066	0.033	0.183	0.	0.	0.	0.	0.

Problem 2963	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	A	F(-1)	A	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	0	0	115	117	0	193	0
normalized size	1	1.	0.	0.	0.99	1.01	0.	1.66	0.
time (sec)	N/A	0.169	0.106	0.073	1.342	2.304	0.	0.223	0.

Problem 2964	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	A	F	A	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	0	0	58	76	0	115	0
normalized size	1	1.	0.	0.	1.04	1.36	0.	2.05	0.
time (sec)	N/A	0.098	0.089	0.064	1.398	1.254	0.	0.222	0.

Problem 2965	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	F(-1)	F	A	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	0	0	0	0	0	159	0
normalized size	1	1.	0.	0.	0.	0.	0.	2.89	0.
time (sec)	N/A	0.098	0.047	0.065	0.	0.	0.	0.227	0.

Problem 2966	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	F(-1)	F	A	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	101	104	0	0	0	0	0	158	0
normalized size	1	1.03	0.	0.	0.	0.	0.	1.56	0.
time (sec)	N/A	0.142	0.044	0.067	0.	0.	0.	0.741	0.

Problem 2967	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	642	642	89	495	0	0	0	0	561
normalized size	1	1.	0.14	0.77	0.	0.	0.	0.	0.87
time (sec)	N/A	0.936	0.142	0.02	0.	0.	0.	0.	53.613

Problem 2968	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-1)	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	170	170	0	0	0	0	0	0	0
normalized size	1	1.	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.316	0.054	0.066	0.	0.	0.	0.	0.

Problem 2969	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-1)	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	91	91	0	0	0	0	0	0	0
normalized size	1	1.	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.124	0.016	0.065	0.	0.	0.	0.	0.

Problem 2970	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-1)	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	139	141	0	0	0	0	0	0	0
normalized size	1	1.01	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.216	0.043	0.072	0.	0.	0.	0.	0.

Problem 2971	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	0	0	0	0	0	0	0
normalized size	1	1.	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.165	0.049	0.051	0.	0.	0.	0.	0.

Problem 2972	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	84	0	0	0	0	0	0
normalized size	1	1.	1.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.171	0.067	0.053	0.	0.	0.	0.	0.

Problem 2973	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	89	0	0	0	0	0	0
normalized size	1	1.	1.06	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.3	0.107	0.067	0.	0.	0.	0.	0.

Problem 2974	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	102	102	0	0	0	0	0	0	0
normalized size	1	1.	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.306	0.072	0.067	0.	0.	0.	0.	0.

Problem 2975	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	169	172	111	211	0	1	0	0	143
normalized size	1	1.02	0.66	1.25	0.	0.01	0.	0.	0.85
time (sec)	N/A	0.242	0.186	0.039	0.	0.305	0.	0.	24.072

Problem 2976	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	79	147	0	1	0	0	73
normalized size	1	1.	0.86	1.6	0.	0.01	0.	0.	0.79
time (sec)	N/A	0.113	0.105	0.031	0.	0.292	0.	0.	11.682

Problem 2977	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	51	51	52	150	0	1	0	0	41
normalized size	1	1.	1.02	2.94	0.	0.02	0.	0.	0.8
time (sec)	N/A	0.098	0.046	0.032	0.	0.266	0.	0.	9.128

Problem 2978	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	43	70	58	65	0	0	44
normalized size	1	1.	0.77	1.25	1.04	1.16	0.	0.	0.79
time (sec)	N/A	0.096	0.043	0.03	1.332	0.249	0.	0.	9.951

Problem 2979	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	75	97	115	104	0	0	102
normalized size	1	1.	0.65	0.84	0.99	0.9	0.	0.	0.88
time (sec)	N/A	0.165	0.057	0.03	1.427	0.256	0.	0.	20.208

Problem 2980	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	174	174	111	133	171	142	0	0	155
normalized size	1	1.	0.64	0.76	0.98	0.82	0.	0.	0.89
time (sec)	N/A	0.232	0.073	0.031	1.346	0.253	0.	0.	30.07

Problem 2981	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	172	175	126	302	0	1	0	0	148
normalized size	1	1.02	0.73	1.76	0.	0.01	0.	0.	0.86
time (sec)	N/A	0.236	0.209	0.062	0.	0.26	0.	0.	25.588

Problem 2982	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	89	233	0	1	0	0	80
normalized size	1	1.	0.94	2.45	0.	0.01	0.	0.	0.84
time (sec)	N/A	0.11	0.167	0.054	0.	0.261	0.	0.	12.088

Problem 2983	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	31	200	0	1	0	0	26
normalized size	1	1.	1.	6.45	0.	0.03	0.	0.	0.84
time (sec)	N/A	0.078	0.06	0.059	0.	0.262	0.	0.	7.682

Problem 2984	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	42	266	57	46	0	51	42
normalized size	1	1.	0.78	4.93	1.06	0.85	0.	0.94	0.78
time (sec)	N/A	0.096	0.076	0.069	1.341	0.256	0.	0.225	9.859

Problem 2985	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	112	112	75	328	115	82	0	0	99
normalized size	1	1.	0.67	2.93	1.03	0.73	0.	0.	0.88
time (sec)	N/A	0.162	0.094	0.07	1.343	0.25	0.	0.	20.182

Problem 2986	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	172	172	111	392	171	120	0	0	153
normalized size	1	1.	0.65	2.28	0.99	0.7	0.	0.	0.89
time (sec)	N/A	0.224	0.12	0.072	1.335	0.247	0.	0.	29.658

Problem 2987	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	F	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	70	92	84	89	0	0	51
normalized size	1	1.	1.21	1.59	1.45	1.53	0.	0.	0.88
time (sec)	N/A	0.044	0.225	0.036	1.36	0.23	0.	0.	4.847

Problem 2988	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	102	102	0	0	0	0	0	0	83
normalized size	1	1.	0.	0.	0.	0.	0.	0.	0.81
time (sec)	N/A	0.262	0.107	0.061	0.	0.	0.	0.	13.989

Problem 2989	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	60	80	78	0	0	0	0	0	65
normalized size	1	1.33	1.3	0.	0.	0.	0.	0.	1.08
time (sec)	N/A	0.221	0.069	0.056	0.	0.	0.	0.	15.82

Problem 2990	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	78	78	85	0	0	0	0	0	85
normalized size	1	1.	1.09	0.	0.	0.	0.	0.	1.09
time (sec)	N/A	0.206	0.099	0.068	0.	0.	0.	0.	17.93

Problem 2991	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F(-1)	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	102	102	0	0	0	0	0	0	100
normalized size	1	1.	0.	0.	0.	0.	0.	0.	0.98
time (sec)	N/A	0.24	0.116	0.068	0.	0.	0.	0.	17.812

Problem 2992	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	102	102	0	0	0	0	0	0	83
normalized size	1	1.	0.	0.	0.	0.	0.	0.	0.81
time (sec)	N/A	0.267	0.178	0.058	0.	0.	0.	0.	15.586

Problem 2993	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	78	96	0	0	0	0	0	63
normalized size	1	1.34	1.66	0.	0.	0.	0.	0.	1.09
time (sec)	N/A	0.221	0.289	0.056	0.	0.	0.	0.	16.068

Problem 2994	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	76	76	116	0	0	0	0	0	83
normalized size	1	1.	1.53	0.	0.	0.	0.	0.	1.09
time (sec)	N/A	0.206	0.571	0.06	0.	0.	0.	0.	28.001

Problem 2995	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	102	102	0	0	0	0	0	0	100
normalized size	1	1.	0.	0.	0.	0.	0.	0.	0.98
time (sec)	N/A	0.227	0.222	0.061	0.	0.	0.	0.	20.703

Problem 2996	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	22	20	20	19	23	0
normalized size	1	1.	1.	1.16	1.05	1.05	1.	1.21	0.
time (sec)	N/A	0.015	0.01	0.029	1.424	0.233	0.614	0.225	0.

Problem 2997	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	0	43	43	39	47	26
normalized size	1	1.	1.	0.	1.26	1.26	1.15	1.38	0.76
time (sec)	N/A	0.022	0.024	0.043	1.425	0.233	1.191	0.227	2.304

Problem 2998	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	0	68	68	63	73	26
normalized size	1	1.	1.	0.	2.	2.	1.85	2.15	0.76
time (sec)	N/A	0.022	0.017	0.038	1.455	0.252	2.281	0.231	2.298

Problem 2999	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	101	101	0	553	99	100	0	0	0
normalized size	1	1.	0.	5.48	0.98	0.99	0.	0.	0.
time (sec)	N/A	0.092	4.825	0.279	22.599	0.257	0.	0.	0.

Problem 3000	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	0	439	72	74	0	0	0
normalized size	1	1.	0.	5.7	0.94	0.96	0.	0.	0.
time (sec)	N/A	0.071	4.741	0.099	23.029	0.256	0.	0.	0.

Problem 3001	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	0	325	50	49	0	0	0
normalized size	1	1.	0.	6.13	0.94	0.92	0.	0.	0.
time (sec)	N/A	0.049	4.649	0.084	22.667	0.254	0.	0.	0.

Problem 3002	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	214	30	30	0	0	24
normalized size	1	1.	1.	7.13	1.	1.	0.	0.	0.8
time (sec)	N/A	0.019	0.007	0.097	22.253	0.253	0.	0.	2.275

Problem 3003	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	26	26	23	35	54	28	0	0	26
normalized size	1	1.	0.88	1.35	2.08	1.08	0.	0.	1.
time (sec)	N/A	0.031	0.097	0.015	1.487	0.233	0.	0.	6.02

Problem 3004	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	60	60	0	331	45	55	0	0	58
normalized size	1	1.	0.	5.52	0.75	0.92	0.	0.	0.97
time (sec)	N/A	0.062	4.775	0.096	21.905	0.237	0.	0.	9.708

Problem 3005	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	87	87	0	446	86	88	0	0	85
normalized size	1	1.	0.	5.13	0.99	1.01	0.	0.	0.98
time (sec)	N/A	0.077	4.8	0.1	22.039	0.237	0.	0.	12.529

Problem 3006	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	114	114	0	662	136	142	0	0	0
normalized size	1	1.	0.	5.81	1.19	1.25	0.	0.	0.
time (sec)	N/A	0.103	4.382	0.06	22.716	0.232	0.	0.	0.

Problem 3007	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	90	90	0	548	108	112	0	0	0
normalized size	1	1.	0.	6.09	1.2	1.24	0.	0.	0.
time (sec)	N/A	0.083	4.353	0.051	22.86	0.231	0.	0.	0.

Problem 3008	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	67	67	0	435	86	70	0	0	56
normalized size	1	1.	0.	6.49	1.28	1.04	0.	0.	0.84
time (sec)	N/A	0.06	4.192	0.052	22.489	0.229	0.	0.	8.602

Problem 3009	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	32	33	107	31	34	0	0	24
normalized size	1	1.6	1.65	5.35	1.55	1.7	0.	0.	1.2
time (sec)	N/A	0.021	0.021	0.037	1.367	0.232	0.	0.	2.33

Problem 3010	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	40	54	82	77	0	0	44
normalized size	1	1.	0.89	1.2	1.82	1.71	0.	0.	0.98
time (sec)	N/A	0.054	0.106	0.003	1.372	0.237	0.	0.	8.57

Problem 3011	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	0	440	78	134	0	0	90
normalized size	1	1.	0.	4.68	0.83	1.43	0.	0.	0.96
time (sec)	N/A	0.089	4.333	0.048	21.976	0.237	0.	0.	12.839

Problem 3012	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	125	125	0	556	126	177	0	0	122
normalized size	1	1.	0.	4.45	1.01	1.42	0.	0.	0.98
time (sec)	N/A	0.114	4.365	0.051	22.193	0.238	0.	0.	16.591

Problem 3013	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	34	209	93	58	0	0	27
normalized size	1	1.	1.	6.15	2.74	1.71	0.	0.	0.79
time (sec)	N/A	0.021	0.021	0.041	1.418	0.232	0.	0.	2.289

Problem 3014	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	48	48	0	76	31	22	19	15	37
normalized size	1	1.	0.	1.58	0.65	0.46	0.4	0.31	0.77
time (sec)	N/A	0.03	2.123	0.058	22.182	0.222	0.136	0.224	4.297

Problem 3015	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	171	171	263	2923	188	247	0	599	146
normalized size	1	1.	1.54	17.09	1.1	1.44	0.	3.5	0.85
time (sec)	N/A	0.146	0.443	0.593	1.801	0.24	0.	23.768	25.435

Problem 3016	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	207	2258	134	174	0	381	107
normalized size	1	1.	1.64	17.92	1.06	1.38	0.	3.02	0.85
time (sec)	N/A	0.105	0.355	140.953	7.565	0.24	0.	23.53	18.539

Problem 3017	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	83	156	1007	89	107	0	215	68
normalized size	1	1.	1.88	12.13	1.07	1.29	0.	2.59	0.82
time (sec)	N/A	0.069	0.211	0.244	1.826	0.242	0.	23.381	11.377

Problem 3018	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	64	336	51	50	0	92	29
normalized size	1	1.	1.68	8.84	1.34	1.32	0.	2.42	0.76
time (sec)	N/A	0.028	0.193	0.192	1.849	0.263	0.	11.938	3.142

Problem 3019	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	51	51	70	0	0	0	0	0	39
normalized size	1	1.	1.37	0.	0.	0.	0.	0.	0.76
time (sec)	N/A	0.044	0.117	0.429	0.	0.	0.	0.	5.533

Problem 3020	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	77	0	0	0	0	0	51
normalized size	1	1.	1.22	0.	0.	0.	0.	0.	0.81
time (sec)	N/A	0.056	0.112	0.334	0.	0.	0.	0.	6.915

Problem 3021	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	62	0	70	70	63	74	0
normalized size	1	1.	1.	0.	1.13	1.13	1.02	1.19	0.
time (sec)	N/A	0.051	0.213	0.042	1.487	0.235	2.327	0.236	0.

Problem 3022	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	43	0	47	47	42	50	0
normalized size	1	1.	1.	0.	1.09	1.09	0.98	1.16	0.
time (sec)	N/A	0.035	0.122	0.04	1.432	0.227	1.242	0.224	0.

Problem 3023	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	23	23	23	19	24	0
normalized size	1	1.	1.	1.1	1.1	1.1	0.9	1.14	0.
time (sec)	N/A	0.015	0.003	0.029	1.418	0.232	0.607	0.221	0.

Problem 3024	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	F	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	0	0	0	1	0	0	39
normalized size	1	1.	0.	0.	0.	0.02	0.	0.	0.89
time (sec)	N/A	0.031	4.692	0.185	0.	0.242	0.	0.	3.999

Problem 3025	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	F	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	73	73	0	0	0	1	0	0	58
normalized size	1	1.	0.	0.	0.	0.01	0.	0.	0.79
time (sec)	N/A	0.055	4.252	0.58	0.	0.258	0.	0.	6.

Problem 3026	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	F	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	0	0	0	1	0	0	82
normalized size	1	1.	0.	0.	0.	0.01	0.	0.	0.84
time (sec)	N/A	0.071	4.403	0.044	0.	0.265	0.	0.	8.313

Problem 3027	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	0	29	8	8	5	8	19
normalized size	1	1.	0.	1.32	0.36	0.36	0.23	0.36	0.86
time (sec)	N/A	0.013	0.041	0.013	1.598	0.237	0.183	0.211	1.258

Problem 3028	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	0	29	23	23	15	20	19
normalized size	1	1.	0.	1.32	1.05	1.05	0.68	0.91	0.86
time (sec)	N/A	0.012	0.034	0.007	1.362	0.246	0.188	0.216	1.287

Problem 3029	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	A	A	A	A	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	142	17	8	8	5	8	19
normalized size	1	1.	6.45	0.77	0.36	0.36	0.23	0.36	0.86
time (sec)	N/A	0.014	0.174	0.091	1.537	0.238	0.176	0.213	1.255

Problem 3030	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	123	17	23	23	15	20	19
normalized size	1	1.	5.59	0.77	1.05	1.05	0.68	0.91	0.86
time (sec)	N/A	0.011	0.173	0.079	1.338	0.242	0.175	0.213	1.258

Problem 3031	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	0	29	8	8	5	8	26
normalized size	1	1.	0.	0.85	0.24	0.24	0.15	0.24	0.76
time (sec)	N/A	0.016	2.179	0.107	22.419	0.25	0.174	0.216	1.57

Problem 3032	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	0	29	31	23	15	20	26
normalized size	1	1.	0.	0.85	0.91	0.68	0.44	0.59	0.76
time (sec)	N/A	0.015	2.168	0.099	33.796	0.254	0.181	0.216	1.587

Problem 3033	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	65	65	0	72	72	66	76	0
normalized size	1	1.	1.	0.	1.11	1.11	1.02	1.17	0.
time (sec)	N/A	0.052	0.21	0.043	1.502	0.25	2.343	0.224	0.

Problem 3034	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	43	0	47	47	41	50	0
normalized size	1	1.	1.	0.	1.09	1.09	0.95	1.16	0.
time (sec)	N/A	0.035	0.124	0.039	1.442	0.248	1.242	0.223	0.

Problem 3035	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	21	23	23	23	19	24	0
normalized size	1	1.	1.	1.1	1.1	1.1	0.9	1.14	0.
time (sec)	N/A	0.015	0.003	0.03	1.411	0.234	0.618	0.218	0.

Problem 3036	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	F	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	183	183	0	0	0	167	0	0	165
normalized size	1	1.	0.	0.	0.	0.91	0.	0.	0.9
time (sec)	N/A	0.171	4.697	0.203	0.	0.237	0.	0.	28.955

Problem 3037	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	F	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	210	210	0	0	0	294	0	0	185
normalized size	1	1.	0.	0.	0.	1.4	0.	0.	0.88
time (sec)	N/A	0.191	4.263	0.658	0.	0.239	0.	0.	32.916

Problem 3038	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F(-2)	A	F	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	235	235	0	0	0	433	0	0	209
normalized size	1	1.	0.	0.	0.	1.84	0.	0.	0.89
time (sec)	N/A	0.221	4.369	0.045	0.	0.239	0.	0.	37.297

Problem 3039	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	82	0	0	0	0	0	0
normalized size	1	1.	0.95	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.109	0.158	2.078	0.	0.	0.	0.	0.

Problem 3040	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	73	73	73	0	0	0	0	0	0
normalized size	1	1.	1.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.077	0.094	0.468	0.	0.	0.	0.	0.

Problem 3041	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	73	73	73	0	0	0	0	0	0
normalized size	1	1.	1.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.067	0.09	0.338	0.	0.	0.	0.	0.

Problem 3042	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	66	0	0	0	0	0	0
normalized size	1	1.	1.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.049	0.079	0.233	0.	0.	0.	0.	0.

Problem 3043	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	70	0	0	0	0	0	0
normalized size	1	1.	1.32	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.084	0.105	0.472	0.	0.	0.	0.	0.

Problem 3044	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	71	0	0	0	0	0	0
normalized size	1	1.	1.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.075	0.093	0.332	0.	0.	0.	0.	0.

Problem 3045	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	230	230	0	0	0	0	0	0	211
normalized size	1	1.	0.	0.	0.	0.	0.	0.	0.92
time (sec)	N/A	1.567	0.114	0.028	0.	0.	0.	0.	75.926

Problem 3046	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	F(-1)	F	A	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	333	333	0	655	0	0	0	558	287
normalized size	1	1.	0.	1.97	0.	0.	0.	1.68	0.86
time (sec)	N/A	1.449	0.095	0.041	0.	0.	0.	0.339	112.808

Problem 3047	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	F(-1)	F	A	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	209	209	0	398	0	0	0	360	172
normalized size	1	1.	0.	1.9	0.	0.	0.	1.72	0.82
time (sec)	N/A	0.692	0.188	0.038	0.	0.	0.	0.333	49.097

Problem 3048	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	F(-1)	F	A	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	113	113	0	213	0	0	0	221	87
normalized size	1	1.	0.	1.88	0.	0.	0.	1.96	0.77
time (sec)	N/A	0.285	0.094	0.039	0.	0.	0.	0.505	23.763

Problem 3049	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	F(-1)	F	F(-2)	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	145	145	0	237	0	0	0	0	117
normalized size	1	1.	0.	1.63	0.	0.	0.	0.	0.81
time (sec)	N/A	0.528	0.078	0.038	0.	0.	0.	0.	39.453

Problem 3050	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	F(-1)	F	F(-1)	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	155	155	0	331	0	0	0	0	126
normalized size	1	1.	0.	2.14	0.	0.	0.	0.	0.81
time (sec)	N/A	0.333	0.071	0.039	0.	0.	0.	0.	26.983

Problem 3051	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	F(-1)	F	F(-1)	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	233	233	0	615	0	0	0	0	201
normalized size	1	1.	0.	2.64	0.	0.	0.	0.	0.86
time (sec)	N/A	0.67	0.075	0.04	0.	0.	0.	0.	47.781

Problem 3052	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	F(-1)	F	F(-1)	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	371	371	0	979	0	0	0	0	332
normalized size	1	1.	0.	2.64	0.	0.	0.	0.	0.89
time (sec)	N/A	1.587	0.076	0.046	0.	0.	0.	0.	109.339

Problem 3053	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F(-2)	F	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	230	230	0	0	0	0	0	0	207
normalized size	1	1.	0.	0.	0.	0.	0.	0.	0.9
time (sec)	N/A	1.321	0.25	0.017	0.	0.	0.	0.	78.113

Problem 3054	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	386	386	0	655	0	0	0	0	0
normalized size	1	1.	0.	1.7	0.	0.	0.	0.	0.
time (sec)	N/A	1.875	0.348	0.049	0.	0.	0.	0.	0.

Problem 3055	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F(-1)	F	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	248	248	0	398	0	0	0	0	211
normalized size	1	1.	0.	1.6	0.	0.	0.	0.	0.85
time (sec)	N/A	1.139	0.253	0.046	0.	0.	0.	0.	90.942

Problem 3056	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F(-1)	F	A	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	135	135	0	213	0	0	0	232	109
normalized size	1	1.	0.	1.58	0.	0.	0.	1.72	0.81
time (sec)	N/A	0.485	0.355	0.043	0.	0.	0.	0.505	34.442

Problem 3057	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	F(-1)	F	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	0	94	0	0	0	0	42
normalized size	1	1.	0.	1.74	0.	0.	0.	0.	0.78
time (sec)	N/A	0.204	0.303	0.044	0.	0.	0.	0.	16.347

Problem 3058	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F(-1)	F	A	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	93	93	0	118	0	0	0	123	75
normalized size	1	1.	0.	1.27	0.	0.	0.	1.32	0.81
time (sec)	N/A	0.228	0.175	0.045	0.	0.	0.	0.458	19.628

Problem 3059	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F(-1)	F	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	165	165	0	267	0	0	0	0	141
normalized size	1	1.	0.	1.62	0.	0.	0.	0.	0.85
time (sec)	N/A	0.509	0.203	0.045	0.	0.	0.	0.	38.28

Problem 3060	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F(-1)	F	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	289	289	0	487	0	0	0	0	257
normalized size	1	1.	0.	1.69	0.	0.	0.	0.	0.89
time (sec)	N/A	1.326	0.227	0.046	0.	0.	0.	0.	95.576

Problem 3061	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	26	26	0	32	12	28	0	15	22
normalized size	1	1.	0.	1.23	0.46	1.08	0.	0.58	0.85
time (sec)	N/A	0.043	0.044	0.029	1.375	0.244	0.	0.214	5.277

Problem 3062	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	A	F	A	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	0	123	0	171	0	100	66
normalized size	1	1.	0.	1.64	0.	2.28	0.	1.33	0.88
time (sec)	N/A	0.089	1.639	0.034	0.	1.518	0.	0.223	9.354

Problem 3063	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	79	79	88	571	89	104	0	211	65
normalized size	1	1.	1.11	7.23	1.13	1.32	0.	2.67	0.82
time (sec)	N/A	0.088	0.263	0.421	1.772	0.227	0.	23.349	21.911

Problem 3064	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	68	0	81	81	76	88	58
normalized size	1	1.	0.97	0.	1.16	1.16	1.09	1.26	0.83
time (sec)	N/A	0.069	0.21	0.042	1.512	0.217	4.413	0.246	18.488

Problem 3065	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	49	0	58	58	56	63	0
normalized size	1	1.	0.89	0.	1.05	1.05	1.02	1.15	0.
time (sec)	N/A	0.059	0.126	0.04	1.477	0.217	2.253	0.227	0.

Problem 3066	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	30	0	34	34	32	38	0
normalized size	1	1.	0.91	0.	1.03	1.03	0.97	1.15	0.
time (sec)	N/A	0.031	0.057	0.026	1.502	0.216	1.162	0.222	0.

Problem 3067	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	0	222	46	46	0	0	0
normalized size	1	1.	0.	5.84	1.21	1.21	0.	0.	0.
time (sec)	N/A	0.056	4.187	0.058	22.855	0.22	0.	0.	0.

Problem 3068	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F	F	A
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	0	322	70	68	0	0	53
normalized size	1	1.	0.	5.11	1.11	1.08	0.	0.	0.84
time (sec)	N/A	0.07	4.2	0.047	23.752	0.219	0.	0.	18.004

Problem 3069	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	32	203	81	76	0	0	26
normalized size	1	1.	1.	6.34	2.53	2.38	0.	0.	0.81
time (sec)	N/A	0.036	0.088	0.042	1.443	0.218	0.	0.	12.488

Problem 3070	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	47	242	147	100	0	0	58
normalized size	1	1.	0.67	3.46	2.1	1.43	0.	0.	0.83
time (sec)	N/A	0.076	0.145	99.751	1.392	0.218	0.	0.	18.089

Problem 3071	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F(-2)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	66	316	213	124	0	0	58
normalized size	1	1.	0.94	4.51	3.04	1.77	0.	0.	0.83
time (sec)	N/A	0.076	0.228	0.079	1.399	0.218	0.	0.	17.943

2.2 Detailed conclusion table specific for Rubi results

The following table is specific to Rubi. It gives additional statistics for each integral. the column **steps** is the number of steps used by Rubi to obtain the antiderivative. The **rules** column is the number of unique rules used. The **integrand size** column is the leaf size of the integrand. Finally the ratio $\frac{\text{number of rules}}{\text{integrand size}}$ is given. The larger this ratio is, the harder the integral was to solve. In this test, problem number [2108] had the largest ratio of [1.333]

Table 1: Rubi specific breakdown of results for each integral

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1	A	2	2	1.	11	0.182
2	A	2	2	1.	13	0.154
3	A	2	2	1.	13	0.154
4	A	2	2	1.	11	0.182
5	A	2	2	1.	9	0.222
6	A	2	2	1.	13	0.154
7	A	2	2	1.	13	0.154
8	A	2	2	1.	13	0.154
9	A	2	2	1.	13	0.154
10	A	2	2	1.	13	0.154
11	A	2	2	1.	7	0.286
12	A	2	2	1.	13	0.154
13	A	2	2	1.	11	0.182
14	A	2	2	1.	9	0.222
15	A	2	2	1.	13	0.154
16	A	2	2	1.	13	0.154
17	A	2	2	1.	13	0.154
18	A	2	2	1.	13	0.154
19	A	2	2	1.	13	0.154
20	A	2	2	1.	13	0.154
21	A	2	2	1.	13	0.154
22	A	2	2	1.	7	0.286
23	A	2	2	1.	11	0.182
24	A	2	2	1.	9	0.222
25	A	2	2	1.	13	0.154
26	A	2	2	1.	13	0.154
27	A	2	2	1.	13	0.154
28	A	2	2	1.	13	0.154
29	A	2	2	1.	13	0.154
30	A	2	2	1.	13	0.154
31	A	2	2	1.	13	0.154
32	A	2	2	1.	13	0.154
33	A	2	2	1.	13	0.154
34	A	2	2	1.	7	0.286
35	A	2	2	1.	13	0.154
36	A	2	2	1.	11	0.182
37	A	2	2	1.	13	0.154
38	A	2	2	1.	13	0.154
39	A	2	2	1.	13	0.154
40	A	2	2	1.	9	0.222
41	A	2	2	1.	13	0.154
42	A	2	2	1.	13	0.154
43	A	2	2	1.	13	0.154
44	A	2	2	1.	11	0.182
45	A	2	2	1.	13	0.154
46	A	2	2	1.	13	0.154
47	A	2	2	1.	13	0.154
48	A	2	2	1.	13	0.154

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
49	A	2	2	1.	13	0.154
50	A	2	2	1.	9	0.222
51	A	2	2	1.	13	0.154
52	A	2	2	1.	13	0.154
53	A	2	2	1.	13	0.154
54	A	2	2	1.	13	0.154
55	A	2	2	1.	11	0.182
56	A	2	2	1.	13	0.154
57	A	2	2	1.	13	0.154
58	A	2	2	1.	13	0.154
59	A	2	2	1.	13	0.154
60	A	2	2	1.	9	0.222
61	A	2	2	1.	13	0.154
62	A	3	3	1.	15	0.2
63	A	3	3	1.	15	0.2
64	A	3	3	1.	15	0.2
65	A	3	3	1.	15	0.2
66	A	2	2	1.	11	0.182
67	A	3	3	1.	13	0.231
68	A	2	2	1.	13	0.154
69	A	2	2	1.	11	0.182
70	A	2	2	1.	11	0.182
71	A	2	2	1.	9	0.222
72	A	2	2	1.	7	0.286
73	A	2	2	1.	11	0.182
74	A	2	2	1.	11	0.182
75	A	2	2	1.	11	0.182
76	A	2	2	1.	11	0.182
77	A	2	2	1.	9	0.222
78	A	2	2	1.	9	0.222
79	A	1	1	1.	7	0.143
80	A	2	2	1.	9	0.222
81	A	2	2	1.	9	0.222
82	A	2	2	1.	9	0.222
83	A	2	2	1.	9	0.222
84	A	2	2	1.	9	0.222
85	A	1	1	1.	7	0.143
86	A	2	2	1.	9	0.222
87	A	2	2	1.	9	0.222
88	A	2	2	1.	9	0.222
89	A	2	2	1.	9	0.222
90	A	2	2	1.	9	0.222
91	A	1	1	1.	7	0.143
92	A	2	2	1.	9	0.222
93	A	2	2	1.	9	0.222
94	A	2	2	1.	9	0.222
95	A	2	2	1.	9	0.222
96	A	2	2	1.	9	0.222
97	A	1	1	1.	7	0.143

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
98	A	2	2	1.	9	0.222
99	A	2	2	1.	9	0.222
100	A	2	2	1.	9	0.222
101	A	2	2	1.	9	0.222
102	A	2	2	1.	9	0.222
103	A	2	2	1.	9	0.222
104	A	1	1	1.	7	0.143
105	A	2	2	1.	9	0.222
106	A	2	2	1.	9	0.222
107	A	2	2	1.	9	0.222
108	A	2	2	1.	9	0.222
109	A	2	2	1.	9	0.222
110	A	2	2	1.	9	0.222
111	A	1	1	1.	7	0.143
112	A	2	2	1.	9	0.222
113	A	2	2	1.	9	0.222
114	A	2	2	1.	9	0.222
115	A	2	2	1.	9	0.222
116	A	2	2	1.	9	0.222
117	A	2	2	1.	9	0.222
118	A	2	2	1.	9	0.222
119	A	2	2	1.	9	0.222
120	A	1	1	1.	7	0.143
121	A	2	2	1.	9	0.222
122	A	2	2	1.	9	0.222
123	A	2	2	1.	9	0.222
124	A	2	2	1.	9	0.222
125	A	2	2	1.	9	0.222
126	A	2	2	1.	9	0.222
127	A	1	1	1.	7	0.143
128	A	2	2	1.	9	0.222
129	A	2	2	1.	9	0.222
130	A	2	2	1.	9	0.222
131	A	2	2	1.	13	0.154
132	A	2	2	1.	11	0.182
133	A	2	2	1.	9	0.222
134	A	2	2	1.	13	0.154
135	A	2	2	1.	13	0.154
136	A	2	2	1.	13	0.154
137	A	2	2	1.	11	0.182
138	A	2	2	1.	9	0.222
139	A	2	2	1.	13	0.154
140	A	2	2	1.	13	0.154
141	A	2	2	1.	13	0.154
142	A	2	2	1.	13	0.154
143	A	2	2	1.	13	0.154
144	A	2	2	1.	11	0.182
145	A	2	2	1.	9	0.222
146	A	2	2	1.	13	0.154

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
147	A	2	2	1.	13	0.154
148	A	2	2	1.	13	0.154
149	A	2	2	1.	13	0.154
150	A	2	2	1.	11	0.182
151	A	2	2	1.	9	0.222
152	A	2	2	1.	13	0.154
153	A	2	2	1.	13	0.154
154	A	2	2	1.	13	0.154
155	A	2	2	1.	13	0.154
156	A	2	2	1.	13	0.154
157	A	3	3	1.	15	0.2
158	A	2	2	1.	13	0.154
159	A	2	2	1.	13	0.154
160	A	2	2	1.	13	0.154
161	A	2	2	1.	13	0.154
162	A	3	3	1.16	15	0.2
163	A	3	3	1.	15	0.2
164	A	3	3	0.86	15	0.2
165	A	3	3	1.	15	0.2
166	A	3	3	1.	15	0.2
167	A	3	3	1.	15	0.2
168	A	2	2	1.	19	0.105
169	A	2	2	1.	19	0.105
170	A	2	2	1.	19	0.105
171	A	2	2	1.	19	0.105
172	A	2	2	1.	11	0.182
173	A	3	3	0.85	13	0.231
174	A	2	2	1.	11	0.182
175	A	2	2	1.	9	0.222
176	A	2	2	1.	7	0.286
177	A	2	2	1.	11	0.182
178	A	2	2	1.	11	0.182
179	A	2	2	1.	11	0.182
180	A	2	2	1.	15	0.133
181	A	3	3	1.	17	0.176
182	A	2	2	1.	15	0.133
183	A	2	2	1.	13	0.154
184	A	2	2	1.	11	0.182
185	A	2	2	1.	15	0.133
186	A	2	2	1.	15	0.133
187	A	2	2	1.	18	0.111
188	A	2	2	1.	16	0.125
189	A	2	2	1.	15	0.133
190	A	2	2	1.	15	0.133
191	A	2	2	1.	13	0.154
192	A	2	2	1.	11	0.182
193	A	2	2	1.	15	0.133
194	A	2	2	1.	15	0.133
195	A	2	2	1.	15	0.133

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
196	A	2	2	1.	22	0.091
197	A	2	2	1.	20	0.1
198	A	2	2	1.	18	0.111
199	A	2	2	1.	22	0.091
200	A	2	2	1.	22	0.091
201	A	2	2	1.	21	0.095
202	A	2	2	1.	21	0.095
203	A	2	2	1.	19	0.105
204	A	2	2	1.	21	0.095
205	A	2	2	1.	21	0.095
206	A	2	1	1.	11	0.091
207	A	2	1	1.	11	0.091
208	A	2	1	1.	9	0.111
209	A	1	0	1.	7	0.
210	A	2	1	1.	11	0.091
211	A	2	1	1.	11	0.091
212	A	2	1	1.	11	0.091
213	A	2	1	1.	11	0.091
214	A	2	1	1.	11	0.091
215	A	2	1	1.	11	0.091
216	A	2	1	1.	11	0.091
217	A	2	1	1.	11	0.091
218	A	2	1	1.	13	0.077
219	A	2	1	1.	13	0.077
220	A	1	1	1.	13	0.077
221	A	2	1	1.	11	0.091
222	A	2	1	1.	9	0.111
223	A	3	2	1.	13	0.154
224	A	2	1	1.	13	0.077
225	A	2	1	1.	13	0.077
226	A	3	2	1.	13	0.154
227	A	2	1	1.	13	0.077
228	A	2	1	1.	13	0.077
229	A	3	2	1.	13	0.154
230	A	2	1	1.	13	0.077
231	A	2	1	1.	13	0.077
232	A	1	1	1.	13	0.077
233	A	2	1	1.	13	0.077
234	A	2	1	1.	13	0.077
235	A	3	2	1.	13	0.154
236	A	3	2	1.	13	0.154
237	A	3	2	1.	13	0.154
238	A	3	2	1.	13	0.154
239	A	3	2	1.	13	0.154
240	A	1	1	1.	13	0.077
241	A	3	2	1.	13	0.154
242	A	3	2	1.	13	0.154
243	A	3	2	1.	13	0.154
244	A	3	2	1.	13	0.154

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
245	A	1	1	1.	13	0.077
246	A	3	3	1.	13	0.231
247	A	3	2	1.	13	0.154
248	A	3	2	1.	13	0.154
249	A	2	1	1.	13	0.077
250	A	2	1	1.	13	0.077
251	A	2	1	1.	11	0.091
252	A	2	1	1.	9	0.111
253	A	2	1	1.	13	0.077
254	A	2	1	1.	13	0.077
255	A	2	1	1.	13	0.077
256	A	2	1	1.	13	0.077
257	A	2	1	1.	13	0.077
258	A	3	2	1.	13	0.154
259	A	3	2	1.	13	0.154
260	A	3	2	1.	13	0.154
261	A	3	2	1.	13	0.154
262	A	3	2	1.	13	0.154
263	A	1	1	1.	13	0.077
264	A	3	2	1.	13	0.154
265	A	3	2	1.	13	0.154
266	A	3	2	1.	13	0.154
267	A	3	2	1.	13	0.154
268	A	3	2	1.	13	0.154
269	A	3	2	1.	13	0.154
270	A	1	1	1.	13	0.077
271	A	3	3	1.	13	0.231
272	A	4	3	1.	13	0.231
273	A	3	2	1.	13	0.154
274	A	3	2	1.	13	0.154
275	A	2	1	1.	13	0.077
276	A	2	1	1.	13	0.077
277	A	2	1	1.	11	0.091
278	A	2	1	1.	9	0.111
279	A	2	1	1.	13	0.077
280	A	2	1	1.	13	0.077
281	A	2	1	1.	13	0.077
282	A	2	1	1.	13	0.077
283	A	2	1	1.	13	0.077
284	A	2	1	1.	13	0.077
285	A	3	2	1.	13	0.154
286	A	3	2	1.	13	0.154
287	A	3	2	1.	13	0.154
288	A	3	2	1.	13	0.154
289	A	3	2	1.	13	0.154
290	A	3	2	1.	13	0.154
291	A	1	1	1.	13	0.077
292	A	3	2	1.	13	0.154
293	A	3	2	1.	13	0.154

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
294	A	3	2	1.	13	0.154
295	A	3	2	1.	13	0.154
296	A	3	2	1.	13	0.154
297	A	3	2	1.	13	0.154
298	A	3	2	1.	13	0.154
299	A	3	2	1.	13	0.154
300	A	3	2	1.	13	0.154
301	A	1	1	1.	13	0.077
302	A	3	3	1.	13	0.231
303	A	4	3	1.	13	0.231
304	A	5	3	1.	13	0.231
305	A	6	3	1.	13	0.231
306	A	3	2	1.	13	0.154
307	A	3	2	1.	13	0.154
308	A	2	1	1.	13	0.077
309	A	2	1	1.	13	0.077
310	A	2	1	1.	11	0.091
311	A	2	1	1.	9	0.111
312	A	2	1	1.	13	0.077
313	A	2	1	1.	13	0.077
314	A	2	1	1.	13	0.077
315	A	2	1	1.	13	0.077
316	A	2	1	1.	13	0.077
317	A	2	1	1.	13	0.077
318	A	3	2	1.	13	0.154
319	A	3	2	1.	13	0.154
320	A	1	1	1.	13	0.077
321	A	4	4	1.	13	0.308
322	A	3	2	1.	13	0.154
323	A	7	7	1.	13	0.538
324	A	7	7	1.	13	0.538
325	A	6	6	1.	11	0.546
326	A	6	6	1.	9	0.667
327	A	7	7	1.	13	0.538
328	A	7	7	1.	13	0.538
329	A	3	2	1.	13	0.154
330	A	3	2	1.	13	0.154
331	A	1	1	1.	13	0.077
332	A	3	2	1.	13	0.154
333	A	3	2	1.	13	0.154
334	A	7	7	1.	13	0.538
335	A	7	7	1.	13	0.538
336	A	7	7	1.	11	0.636
337	A	7	7	1.	9	0.778
338	A	8	8	1.	13	0.615
339	A	8	8	1.	13	0.615
340	A	3	2	1.	13	0.154
341	A	3	2	1.	13	0.154
342	A	1	1	1.	13	0.077

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
343	A	1	1	1.	13	0.077
344	A	3	2	1.	13	0.154
345	A	3	2	1.	13	0.154
346	A	8	7	1.	13	0.538
347	A	8	7	1.	13	0.538
348	A	8	8	1.	13	0.615
349	A	8	8	1.	13	0.615
350	A	8	7	1.	11	0.636
351	A	8	7	1.	9	0.778
352	A	3	2	1.	14	0.143
353	A	3	2	1.	14	0.143
354	A	1	1	1.	14	0.071
355	A	4	4	1.	14	0.286
356	A	3	2	1.	14	0.143
357	A	7	7	1.	14	0.5
358	A	7	7	1.	14	0.5
359	A	6	6	1.	12	0.5
360	A	6	6	1.	10	0.6
361	A	7	7	1.	14	0.5
362	A	7	7	1.	14	0.5
363	A	6	6	1.	10	0.6
364	A	6	6	1.	11	0.546
365	A	6	6	1.	10	0.6
366	A	6	6	1.	11	0.546
367	A	3	3	1.	13	0.231
368	A	3	2	1.	15	0.133
369	A	3	2	1.	15	0.133
370	A	3	2	1.	15	0.133
371	A	1	1	1.	15	0.067
372	A	4	4	1.	15	0.267
373	A	4	4	1.	15	0.267
374	A	5	5	1.	15	0.333
375	A	6	5	1.	15	0.333
376	A	4	3	1.	15	0.2
377	A	3	3	1.	15	0.2
378	A	2	2	1.	11	0.182
379	A	2	2	1.	15	0.133
380	A	3	3	1.	15	0.2
381	A	4	3	1.	15	0.2
382	A	6	5	1.	15	0.333
383	A	5	5	1.	15	0.333
384	A	4	4	1.	13	0.308
385	A	4	4	1.	15	0.267
386	A	5	5	1.	15	0.333
387	A	3	2	1.	15	0.133
388	A	3	2	1.	15	0.133
389	A	3	2	1.	15	0.133
390	A	1	1	1.	15	0.067
391	A	5	4	1.	15	0.267

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
392	A	5	5	1.	15	0.333
393	A	5	4	1.	15	0.267
394	A	5	3	1.	15	0.2
395	A	4	3	1.	15	0.2
396	A	3	2	1.	11	0.182
397	A	3	3	1.	15	0.2
398	A	3	2	1.	15	0.133
399	A	7	5	1.	15	0.333
400	A	6	5	1.	15	0.333
401	A	5	4	1.	13	0.308
402	A	5	5	1.	15	0.333
403	A	5	4	1.	15	0.267
404	A	3	2	1.	15	0.133
405	A	3	2	1.	15	0.133
406	A	3	2	1.	15	0.133
407	A	1	1	1.	15	0.067
408	A	3	3	1.	15	0.2
409	A	4	4	1.	15	0.267
410	A	5	4	1.	15	0.267
411	A	3	2	1.	15	0.133
412	A	2	2	1.	15	0.133
413	A	1	1	1.	11	0.091
414	A	2	2	1.	15	0.133
415	A	3	2	1.	15	0.133
416	A	5	4	1.	15	0.267
417	A	4	4	1.	15	0.267
418	A	3	3	1.	13	0.231
419	A	4	4	1.	15	0.267
420	A	5	4	1.	15	0.267
421	A	3	2	1.	15	0.133
422	A	3	2	1.	15	0.133
423	A	3	2	1.	15	0.133
424	A	1	1	1.	15	0.067
425	A	4	4	1.	15	0.267
426	A	5	4	1.	15	0.267
427	A	6	4	1.	15	0.267
428	A	3	3	1.	15	0.2
429	A	2	2	1.	15	0.133
430	A	2	2	1.	11	0.182
431	A	3	3	1.	15	0.2
432	A	4	3	1.	15	0.2
433	A	5	5	1.	15	0.333
434	A	4	4	1.	15	0.267
435	A	4	4	1.	13	0.308
436	A	5	5	1.	15	0.333
437	A	6	5	1.	15	0.333
438	A	3	2	1.	13	0.154
439	A	3	2	1.	13	0.154
440	A	3	2	1.	13	0.154

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
441	A	1	1	1.	13	0.077
442	A	3	3	1.	13	0.231
443	A	4	4	1.	13	0.308
444	A	5	4	1.	13	0.308
445	A	6	4	1.	13	0.308
446	A	3	2	1.	13	0.154
447	A	2	2	1.	13	0.154
448	A	1	1	1.	9	0.111
449	A	2	2	1.	13	0.154
450	A	3	2	1.	13	0.154
451	A	5	4	1.	13	0.308
452	A	4	4	1.	13	0.308
453	A	3	3	1.	11	0.273
454	A	4	4	1.	13	0.308
455	A	5	4	1.	13	0.308
456	A	3	2	1.	15	0.133
457	A	3	2	1.	15	0.133
458	A	3	2	1.	15	0.133
459	A	1	1	1.	15	0.067
460	A	3	3	1.	15	0.2
461	A	4	4	1.	15	0.267
462	A	5	4	1.	15	0.267
463	A	6	4	1.	15	0.267
464	A	3	2	1.	15	0.133
465	A	2	2	1.	15	0.133
466	A	1	1	1.	11	0.091
467	A	2	2	1.	15	0.133
468	A	3	2	1.	15	0.133
469	A	5	4	1.	15	0.267
470	A	4	4	1.	15	0.267
471	A	3	3	1.	13	0.231
472	A	4	4	1.	15	0.267
473	A	5	4	1.	15	0.267
474	A	3	2	1.	13	0.154
475	A	3	2	1.	13	0.154
476	A	3	2	1.	13	0.154
477	A	1	1	1.	13	0.077
478	A	3	3	1.	13	0.231
479	A	4	4	1.	13	0.308
480	A	5	4	1.	13	0.308
481	A	6	4	1.	13	0.308
482	A	3	2	1.	13	0.154
483	A	2	2	1.	13	0.154
484	A	1	1	1.	9	0.111
485	A	2	2	1.	13	0.154
486	A	3	2	1.	13	0.154
487	A	5	4	1.	13	0.308
488	A	4	4	1.	13	0.308
489	A	3	3	1.	11	0.273

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
490	A	4	4	1.	13	0.308
491	A	5	4	1.	13	0.308
492	A	3	2	1.	15	0.133
493	A	3	2	1.	15	0.133
494	A	3	2	1.	15	0.133
495	A	1	1	1.	15	0.067
496	A	3	3	1.	15	0.2
497	A	4	4	1.	15	0.267
498	A	5	4	1.	15	0.267
499	A	6	4	1.	15	0.267
500	A	3	2	1.	15	0.133
501	A	2	2	1.	15	0.133
502	A	1	1	1.	11	0.091
503	A	2	2	1.	15	0.133
504	A	3	2	1.	15	0.133
505	A	5	4	1.	15	0.267
506	A	4	4	1.	15	0.267
507	A	3	3	1.	13	0.231
508	A	4	4	1.	15	0.267
509	A	5	4	1.	15	0.267
510	A	3	2	1.	15	0.133
511	A	3	2	1.	15	0.133
512	A	3	2	1.	15	0.133
513	A	1	1	1.	15	0.067
514	A	6	6	1.	15	0.4
515	A	6	6	1.	15	0.4
516	A	9	9	1.	15	0.6
517	A	8	8	1.	13	0.615
518	A	8	8	1.	15	0.533
519	A	1	1	1.	15	0.067
520	A	2	2	1.	15	0.133
521	A	3	2	1.	15	0.133
522	A	2	2	1.34	15	0.133
523	A	2	2	1.39	11	0.182
524	A	2	2	1.34	15	0.133
525	A	2	2	1.34	15	0.133
526	A	3	2	1.	15	0.133
527	A	3	2	1.	15	0.133
528	A	3	2	1.	15	0.133
529	A	1	1	1.	15	0.067
530	A	6	6	1.	15	0.4
531	A	6	6	1.	15	0.4
532	A	2	2	1.34	15	0.133
533	A	2	2	1.34	13	0.154
534	A	2	2	1.36	15	0.133
535	A	2	2	1.34	15	0.133
536	A	3	3	1.	15	0.2
537	A	2	2	1.	11	0.182
538	A	2	2	1.	15	0.133

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
539	A	1	1	1.	15	0.067
540	A	2	2	1.	15	0.133
541	A	3	2	1.	15	0.133
542	A	3	2	1.	15	0.133
543	A	3	2	1.	15	0.133
544	A	3	2	1.	15	0.133
545	A	3	2	1.	15	0.133
546	A	1	1	1.	15	0.067
547	A	5	5	1.	15	0.333
548	A	6	6	1.	15	0.4
549	A	2	2	1.34	15	0.133
550	A	2	2	1.34	15	0.133
551	A	2	2	1.34	13	0.154
552	A	2	2	1.36	15	0.133
553	A	2	2	1.34	15	0.133
554	A	2	2	1.	15	0.133
555	A	1	1	1.	11	0.091
556	A	1	1	1.	15	0.067
557	A	2	2	1.	15	0.133
558	A	3	2	1.	15	0.133
559	A	4	2	1.	15	0.133
560	A	3	2	1.	15	0.133
561	A	3	2	1.	15	0.133
562	A	3	2	1.	15	0.133
563	A	1	1	1.	15	0.067
564	A	5	5	1.	15	0.333
565	A	6	6	1.	15	0.4
566	A	8	8	1.	15	0.533
567	A	7	7	1.69	13	0.538
568	A	1	1	1.	15	0.067
569	A	2	2	1.	15	0.133
570	A	3	2	1.	15	0.133
571	A	4	2	1.	15	0.133
572	A	2	2	1.34	15	0.133
573	A	2	2	1.34	15	0.133
574	A	2	2	1.39	11	0.182
575	A	2	2	1.34	15	0.133
576	A	2	2	1.34	15	0.133
577	A	1	1	1.	12	0.083
578	A	1	1	1.	9	0.111
579	A	7	7	1.78	13	0.538
580	A	1	1	1.	13	0.077
581	A	2	1	1.	13	0.077
582	A	2	1	1.	13	0.077
583	A	2	1	1.	13	0.077
584	A	2	1	1.	13	0.077
585	A	2	1	1.	11	0.091
586	A	1	1	1.	13	0.077
587	A	1	1	1.	13	0.077

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
588	A	1	1	1.	13	0.077
589	A	2	2	1.	15	0.133
590	A	2	2	1.	15	0.133
591	A	2	2	1.21	15	0.133
592	A	2	2	1.	15	0.133
593	A	2	2	1.	17	0.118
594	A	2	2	1.11	17	0.118
595	A	2	2	1.11	17	0.118
596	A	2	2	1.	15	0.133
597	A	1	1	1.	13	0.077
598	A	3	2	1.	13	0.154
599	A	3	2	1.	13	0.154
600	A	3	2	1.	13	0.154
601	A	2	1	1.	11	0.091
602	A	2	1	1.	11	0.091
603	A	2	1	1.	11	0.091
604	A	2	1	1.	11	0.091
605	A	2	1	1.	11	0.091
606	A	2	1	1.	9	0.111
607	A	1	0	1.	7	0.
608	A	2	1	1.	11	0.091
609	A	2	1	1.	11	0.091
610	A	2	1	1.	11	0.091
611	A	2	1	1.	11	0.091
612	A	2	1	1.	11	0.091
613	A	2	1	1.	11	0.091
614	A	2	1	1.	11	0.091
615	A	2	1	1.	11	0.091
616	A	2	1	1.	11	0.091
617	A	2	1	1.	11	0.091
618	A	2	1	1.	13	0.077
619	A	2	1	1.	13	0.077
620	A	2	1	1.	13	0.077
621	A	1	1	1.	13	0.077
622	A	2	1	1.	13	0.077
623	A	2	1	1.	11	0.091
624	A	2	1	1.	9	0.111
625	A	3	2	1.	13	0.154
626	A	2	1	1.	13	0.077
627	A	2	1	1.	13	0.077
628	A	2	1	1.	13	0.077
629	A	3	2	1.	13	0.154
630	A	2	1	1.	13	0.077
631	A	2	1	1.	13	0.077
632	A	2	1	1.	13	0.077
633	A	1	1	1.	13	0.077
634	A	2	1	1.	13	0.077
635	A	2	1	1.	11	0.091
636	A	2	1	1.	9	0.111

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
637	A	3	2	1.	13	0.154
638	A	2	1	1.	13	0.077
639	A	2	1	1.	13	0.077
640	A	2	1	1.	13	0.077
641	A	3	2	1.	13	0.154
642	A	4	3	1.	13	0.231
643	A	3	2	1.	13	0.154
644	A	3	3	1.	13	0.231
645	A	1	1	1.	13	0.077
646	A	2	2	1.	11	0.182
647	A	4	4	1.	13	0.308
648	A	3	3	1.	13	0.231
649	A	3	2	1.	13	0.154
650	A	4	3	1.	13	0.231
651	A	10	7	1.	13	0.538
652	A	9	6	1.	13	0.462
653	A	9	6	1.	9	0.667
654	A	10	7	1.	13	0.538
655	A	10	7	1.	13	0.538
656	A	3	2	1.	13	0.154
657	A	4	4	1.	13	0.308
658	A	3	2	1.	13	0.154
659	A	3	3	1.	13	0.231
660	A	1	1	1.	13	0.077
661	A	3	3	1.	11	0.273
662	A	3	2	1.	13	0.154
663	A	4	4	1.	13	0.308
664	A	10	7	1.	13	0.538
665	A	10	7	1.	13	0.538
666	A	10	7	1.	13	0.538
667	A	10	7	1.	9	0.778
668	A	11	8	1.	13	0.615
669	A	11	8	1.	13	0.615
670	A	3	2	1.	13	0.154
671	A	4	3	1.	13	0.231
672	A	1	1	1.	13	0.077
673	A	4	4	1.	13	0.308
674	A	1	1	1.	13	0.077
675	A	4	3	1.	11	0.273
676	A	3	2	1.	13	0.154
677	A	5	4	1.	13	0.308
678	A	11	7	1.	13	0.538
679	A	11	7	1.	13	0.538
680	A	11	8	1.	13	0.615
681	A	11	8	1.	13	0.615
682	A	11	7	1.	13	0.538
683	A	11	7	1.	9	0.778
684	A	12	8	1.	13	0.615
685	A	4	3	1.	13	0.231

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
686	A	3	2	1.	13	0.154
687	A	3	3	1.	13	0.231
688	A	1	1	1.	13	0.077
689	A	2	2	1.	11	0.182
690	A	4	4	1.	13	0.308
691	A	3	3	1.	13	0.231
692	A	10	7	0.85	13	0.538
693	A	10	7	0.85	13	0.538
694	A	9	6	0.84	13	0.462
695	A	9	6	0.84	9	0.667
696	A	10	7	0.87	13	0.538
697	A	1	1	1.	13	0.077
698	A	3	3	1.	11	0.273
699	A	3	2	1.	13	0.154
700	A	4	4	1.	13	0.308
701	A	10	7	0.86	13	0.538
702	A	10	7	0.86	13	0.538
703	A	10	7	0.88	9	0.778
704	A	11	8	0.89	13	0.615
705	A	9	6	1.	11	0.546
706	A	3	3	1.	12	0.25
707	A	3	3	1.	12	0.25
708	A	3	3	1.	11	0.273
709	A	2	2	1.	14	0.143
710	A	2	2	1.	13	0.154
711	A	3	3	1.	16	0.188
712	A	3	3	1.	15	0.2
713	A	1	1	1.	16	0.062
714	A	1	1	1.	15	0.067
715	A	2	1	1.	13	0.077
716	A	2	1	1.	13	0.077
717	A	2	1	1.	13	0.077
718	A	2	1	1.	13	0.077
719	A	2	1	1.	13	0.077
720	A	2	1	1.	13	0.077
721	A	2	1	1.	13	0.077
722	A	2	1	1.	15	0.067
723	A	2	1	1.	15	0.067
724	A	2	1	1.	15	0.067
725	A	2	1	1.	15	0.067
726	A	2	1	1.	15	0.067
727	A	2	1	1.	15	0.067
728	A	2	1	1.	15	0.067
729	A	2	1	1.	15	0.067
730	A	2	1	1.	15	0.067
731	A	2	1	1.	15	0.067
732	A	2	1	1.	15	0.067
733	A	2	1	1.	15	0.067
734	A	2	1	1.	15	0.067

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
735	A	2	1	1.	15	0.067
736	A	15	12	1.	15	0.8
737	A	15	12	1.	15	0.8
738	A	14	11	1.	15	0.733
739	A	14	11	1.	15	0.733
740	A	14	11	1.	15	0.733
741	A	14	11	1.	15	0.733
742	A	15	12	1.	15	0.8
743	A	15	12	1.	15	0.8
744	A	15	12	1.	15	0.8
745	A	15	12	1.	15	0.8
746	A	15	12	1.	15	0.8
747	A	15	12	1.	15	0.8
748	A	15	12	1.	15	0.8
749	A	15	12	1.	15	0.8
750	A	15	12	1.	15	0.8
751	A	15	12	1.	15	0.8
752	A	16	13	1.	15	0.867
753	A	16	12	1.	15	0.8
754	A	16	13	1.	15	0.867
755	A	16	13	1.	15	0.867
756	A	16	13	1.	15	0.867
757	A	16	13	1.	15	0.867
758	A	16	12	1.	15	0.8
759	A	16	12	1.	15	0.8
760	A	16	12	1.	15	0.8
761	A	16	12	1.	15	0.8
762	A	3	2	1.	15	0.133
763	A	3	2	1.	15	0.133
764	A	1	1	1.	15	0.067
765	A	4	4	1.	15	0.267
766	A	4	4	1.	15	0.267
767	A	5	5	1.	15	0.333
768	A	5	5	1.	15	0.333
769	A	4	4	1.	13	0.308
770	A	4	4	1.	15	0.267
771	A	1	1	1.	15	0.067
772	A	2	2	1.	15	0.133
773	A	3	2	1.	15	0.133
774	A	3	3	1.	15	0.2
775	A	2	2	1.	11	0.182
776	A	2	2	1.	15	0.133
777	A	3	3	1.	15	0.2
778	A	4	4	1.	15	0.267
779	A	4	4	1.	15	0.267
780	A	5	5	1.	15	0.333
781	A	3	2	1.	15	0.133
782	A	3	2	1.	15	0.133
783	A	1	1	1.	15	0.067

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
784	A	5	4	1.	15	0.267
785	A	5	5	1.	15	0.333
786	A	5	4	1.	15	0.267
787	A	6	5	1.	15	0.333
788	A	5	4	1.	13	0.308
789	A	5	5	1.	15	0.333
790	A	5	4	1.	15	0.267
791	A	1	1	1.	15	0.067
792	A	2	2	1.	15	0.133
793	A	3	2	1.	15	0.133
794	A	4	3	1.	15	0.2
795	A	3	2	1.	11	0.182
796	A	3	3	1.	15	0.2
797	A	3	2	1.	15	0.133
798	A	5	4	1.	15	0.267
799	A	5	5	1.	15	0.333
800	A	5	4	1.	15	0.267
801	A	3	2	1.	9	0.222
802	A	3	2	1.	11	0.182
803	A	3	2	1.	15	0.133
804	A	1	1	1.	13	0.077
805	A	3	3	1.	13	0.231
806	A	4	4	1.	11	0.364
807	A	2	2	1.	9	0.222
808	A	2	2	1.	11	0.182
809	A	3	2	1.	15	0.133
810	A	3	2	1.	15	0.133
811	A	1	1	1.	15	0.067
812	A	3	3	1.	15	0.2
813	A	4	4	1.	15	0.267
814	A	4	4	1.	15	0.267
815	A	3	3	1.	13	0.231
816	A	1	1	1.	15	0.067
817	A	2	2	1.	15	0.133
818	A	3	2	1.	15	0.133
819	A	3	2	1.	15	0.133
820	A	2	2	1.	15	0.133
821	A	1	1	1.	11	0.091
822	A	2	2	1.	15	0.133
823	A	3	2	1.	15	0.133
824	A	5	4	1.	15	0.267
825	A	4	4	1.	15	0.267
826	A	3	3	1.	15	0.2
827	A	4	4	1.	15	0.267
828	A	5	4	1.	15	0.267
829	A	3	2	1.	16	0.125
830	A	3	2	1.	16	0.125
831	A	1	1	1.	16	0.062
832	A	3	3	1.	16	0.188

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
833	A	4	4	1.	16	0.25
834	A	4	4	1.	16	0.25
835	A	3	3	1.	14	0.214
836	A	1	1	1.	16	0.062
837	A	2	2	1.	16	0.125
838	A	3	2	1.	16	0.125
839	A	4	3	1.	16	0.188
840	A	3	3	1.	16	0.188
841	A	2	2	1.	12	0.167
842	A	3	3	1.	16	0.188
843	A	4	3	1.	16	0.188
844	A	8	7	1.	16	0.438
845	A	7	7	1.	16	0.438
846	A	6	6	1.	16	0.375
847	A	7	7	1.	16	0.438
848	A	8	7	1.	16	0.438
849	A	3	2	1.	15	0.133
850	A	3	2	1.	15	0.133
851	A	1	1	1.	15	0.067
852	A	4	4	1.	15	0.267
853	A	5	4	1.	15	0.267
854	A	5	5	1.	15	0.333
855	A	4	4	1.	15	0.267
856	A	1	1	1.	13	0.077
857	A	2	2	1.	15	0.133
858	A	3	2	1.	15	0.133
859	A	4	3	1.	15	0.2
860	A	3	3	1.	15	0.2
861	A	2	2	1.	15	0.133
862	A	2	2	1.	11	0.182
863	A	3	3	1.	15	0.2
864	A	4	3	1.	15	0.2
865	A	6	5	1.	15	0.333
866	A	5	5	1.	15	0.333
867	A	4	4	1.	15	0.267
868	A	4	4	1.	15	0.267
869	A	5	5	1.	15	0.333
870	A	6	5	1.	15	0.333
871	A	3	2	1.	11	0.182
872	A	3	2	1.	15	0.133
873	A	3	2	1.	15	0.133
874	A	1	1	1.	15	0.067
875	A	3	3	1.	15	0.2
876	A	4	4	1.	15	0.267
877	A	3	3	1.	15	0.2
878	A	2	2	1.	13	0.154
879	A	1	1	1.	15	0.067
880	A	2	2	1.	15	0.133
881	A	3	2	1.	15	0.133

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
882	A	3	2	1.	15	0.133
883	A	2	2	1.	15	0.133
884	A	1	1	1.	11	0.091
885	A	2	2	1.	15	0.133
886	A	3	2	1.	15	0.133
887	A	6	5	1.	15	0.333
888	A	5	5	1.	15	0.333
889	A	4	4	1.	15	0.267
890	A	5	5	1.	15	0.333
891	A	6	5	1.	15	0.333
892	A	3	2	1.	15	0.133
893	A	3	2	1.	15	0.133
894	A	1	1	1.	15	0.067
895	A	4	4	1.	15	0.267
896	A	5	4	1.	15	0.267
897	A	4	4	1.	15	0.267
898	A	3	3	1.	15	0.2
899	A	1	1	1.	13	0.077
900	A	2	2	1.	15	0.133
901	A	3	2	1.	15	0.133
902	A	4	3	1.	15	0.2
903	A	3	3	1.	15	0.2
904	A	2	2	1.	15	0.133
905	A	2	2	1.	11	0.182
906	A	3	3	1.	15	0.2
907	A	4	3	1.	15	0.2
908	A	7	6	1.	15	0.4
909	A	6	6	1.	15	0.4
910	A	5	5	1.	15	0.333
911	A	5	5	1.	15	0.333
912	A	6	6	1.	15	0.4
913	A	7	6	1.	15	0.4
914	A	3	2	1.	11	0.182
915	A	3	2	1.	13	0.154
916	A	3	2	1.	13	0.154
917	A	1	1	1.	13	0.077
918	A	3	3	1.	13	0.231
919	A	4	4	1.	13	0.308
920	A	3	3	1.	13	0.231
921	A	2	2	1.	11	0.182
922	A	1	1	1.	13	0.077
923	A	2	2	1.	13	0.154
924	A	3	2	1.	13	0.154
925	A	3	2	1.	13	0.154
926	A	2	2	1.	13	0.154
927	A	1	1	1.	9	0.111
928	A	2	2	1.	13	0.154
929	A	3	2	1.	13	0.154
930	A	5	4	1.	13	0.308

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
931	A	4	4	1.	13	0.308
932	A	3	3	1.	13	0.231
933	A	4	4	1.	13	0.308
934	A	5	4	1.	13	0.308
935	A	3	2	1.	13	0.154
936	A	3	2	1.	13	0.154
937	A	1	1	1.	13	0.077
938	A	4	4	1.	13	0.308
939	A	5	4	1.	13	0.308
940	A	4	4	1.	13	0.308
941	A	3	3	1.	13	0.231
942	A	1	1	1.	11	0.091
943	A	2	2	1.	13	0.154
944	A	3	2	1.	13	0.154
945	A	4	3	1.	13	0.231
946	A	3	3	1.	13	0.231
947	A	2	2	1.	13	0.154
948	A	2	2	1.	9	0.222
949	A	3	3	1.	13	0.231
950	A	4	3	1.	13	0.231
951	A	6	5	1.	13	0.385
952	A	5	5	1.	13	0.385
953	A	4	4	1.	13	0.308
954	A	4	4	1.	13	0.308
955	A	5	5	1.	13	0.385
956	A	6	5	1.	13	0.385
957	A	3	2	1.	9	0.222
958	A	3	2	1.	15	0.133
959	A	3	3	1.	15	0.2
960	A	1	1	1.	15	0.067
961	A	2	2	1.	13	0.154
962	A	3	3	1.	15	0.2
963	A	1	1	1.	15	0.067
964	A	4	4	1.	15	0.267
965	A	2	2	1.	15	0.133
966	A	6	6	1.	15	0.4
967	A	2	2	1.	15	0.133
968	A	5	5	1.	15	0.333
969	A	1	1	1.	11	0.091
970	A	6	6	1.	15	0.4
971	A	2	2	1.	15	0.133
972	A	3	3	1.	11	0.273
973	A	2	2	1.	11	0.182
974	A	3	3	1.	13	0.231
975	A	2	2	1.	13	0.154
976	A	1	1	1.	9	0.111
977	A	2	2	1.	13	0.154
978	A	4	4	1.	13	0.308
979	A	3	3	1.	13	0.231

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
980	A	4	4	1.	13	0.308
981	A	5	5	1.	15	0.333
982	A	4	4	1.	16	0.25
983	A	3	2	1.	13	0.154
984	A	1	1	1.	13	0.077
985	A	1	1	1.	13	0.077
986	A	3	2	1.	15	0.133
987	A	3	2	1.	15	0.133
988	A	3	2	1.	15	0.133
989	A	3	2	1.	15	0.133
990	A	1	1	1.	15	0.067
991	A	6	6	1.	15	0.4
992	A	6	6	1.	15	0.4
993	A	7	7	1.	15	0.467
994	A	6	5	1.	15	0.333
995	A	5	5	1.	15	0.333
996	A	4	4	1.	13	0.308
997	A	4	4	1.	15	0.267
998	A	5	5	1.	15	0.333
999	A	6	5	1.	15	0.333
1000	A	6	6	1.	15	0.4
1001	A	5	5	1.	15	0.333
1002	A	5	5	1.	15	0.333
1003	A	1	1	1.	15	0.067
1004	A	2	2	1.	15	0.133
1005	A	3	2	1.	15	0.133
1006	A	4	2	1.	15	0.133
1007	A	8	6	1.	15	0.4
1008	A	7	6	1.	15	0.4
1009	A	6	6	1.	15	0.4
1010	A	5	5	1.	11	0.454
1011	A	5	5	1.	15	0.333
1012	A	6	6	1.	15	0.4
1013	A	7	6	1.	15	0.4
1014	A	8	6	1.	15	0.4
1015	A	3	2	1.	15	0.133
1016	A	3	2	1.	15	0.133
1017	A	3	2	1.	15	0.133
1018	A	3	2	1.	15	0.133
1019	A	1	1	1.	15	0.067
1020	A	6	6	1.	15	0.4
1021	A	6	6	1.	15	0.4
1022	A	7	7	1.	15	0.467
1023	A	7	6	1.	15	0.4
1024	A	6	6	1.	15	0.4
1025	A	5	5	1.	13	0.385
1026	A	5	5	1.	15	0.333
1027	A	6	6	1.	15	0.4
1028	A	7	6	1.	15	0.4

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1029	A	8	6	1.	15	0.4
1030	A	7	6	1.	15	0.4
1031	A	6	6	1.	15	0.4
1032	A	5	5	1.	11	0.454
1033	A	5	5	1.	15	0.333
1034	A	1	1	1.	15	0.067
1035	A	2	2	1.	15	0.133
1036	A	3	2	1.	15	0.133
1037	A	4	2	1.	15	0.133
1038	A	8	7	1.	15	0.467
1039	A	7	7	1.	15	0.467
1040	A	6	6	1.	15	0.4
1041	A	6	6	1.	15	0.4
1042	A	6	6	1.	15	0.4
1043	A	7	7	1.	15	0.467
1044	A	8	7	1.	15	0.467
1045	A	3	2	1.	15	0.133
1046	A	3	2	1.	15	0.133
1047	A	3	2	1.	15	0.133
1048	A	3	2	1.	15	0.133
1049	A	1	1	1.	15	0.067
1050	A	7	6	1.	15	0.4
1051	A	7	7	1.	15	0.467
1052	A	7	6	1.	15	0.4
1053	A	7	5	1.	15	0.333
1054	A	6	5	1.	15	0.333
1055	A	5	4	1.	13	0.308
1056	A	5	5	1.	15	0.333
1057	A	5	4	1.	15	0.267
1058	A	6	5	1.	15	0.333
1059	A	7	5	1.	15	0.333
1060	A	8	6	1.	15	0.4
1061	A	7	6	1.	15	0.4
1062	A	6	5	1.	15	0.333
1063	A	6	6	1.	15	0.4
1064	A	6	5	1.	15	0.333
1065	A	1	1	1.	15	0.067
1066	A	2	2	1.	15	0.133
1067	A	3	2	1.	15	0.133
1068	A	4	2	1.	15	0.133
1069	A	9	6	1.	15	0.4
1070	A	8	6	1.	15	0.4
1071	A	7	6	1.	15	0.4
1072	A	6	5	1.	11	0.454
1073	A	6	6	1.	15	0.4
1074	A	6	5	1.	15	0.333
1075	A	7	6	1.	15	0.4
1076	A	8	6	1.	15	0.4
1077	A	6	5	1.	11	0.454

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1078	A	3	2	1.	15	0.133
1079	A	3	2	1.	15	0.133
1080	A	3	2	1.	15	0.133
1081	A	3	2	1.	15	0.133
1082	A	1	1	1.	15	0.067
1083	A	5	5	1.	15	0.333
1084	A	6	6	1.	15	0.4
1085	A	7	6	1.	15	0.4
1086	A	7	5	1.	15	0.333
1087	A	6	5	1.	15	0.333
1088	A	5	5	1.	15	0.333
1089	A	4	4	1.	13	0.308
1090	A	5	5	1.	15	0.333
1091	A	6	5	1.	15	0.333
1092	A	7	5	1.	15	0.333
1093	A	6	5	1.	15	0.333
1094	A	5	5	1.	15	0.333
1095	A	4	4	1.	11	0.364
1096	A	1	1	1.	15	0.067
1097	A	2	2	1.	15	0.133
1098	A	3	2	1.	15	0.133
1099	A	4	2	1.	15	0.133
1100	A	5	2	1.	15	0.133
1101	A	7	6	1.	15	0.4
1102	A	6	6	1.	15	0.4
1103	A	5	5	1.	15	0.333
1104	A	5	5	1.	15	0.333
1105	A	6	6	1.	15	0.4
1106	A	7	6	1.	15	0.4
1107	A	8	6	1.	15	0.4
1108	A	3	2	1.	15	0.133
1109	A	3	2	1.	15	0.133
1110	A	3	2	1.	15	0.133
1111	A	3	2	1.	15	0.133
1112	A	1	1	1.	15	0.067
1113	A	5	5	1.	15	0.333
1114	A	6	6	1.	15	0.4
1115	A	7	6	1.	15	0.4
1116	A	6	4	1.	15	0.267
1117	A	5	4	1.	15	0.267
1118	A	4	4	1.	15	0.267
1119	A	3	3	1.	13	0.231
1120	A	4	4	1.	15	0.267
1121	A	5	4	1.	15	0.267
1122	A	6	4	1.	15	0.267
1123	A	6	5	1.	15	0.333
1124	A	5	5	1.	15	0.333
1125	A	4	4	1.	15	0.267
1126	A	1	1	1.	15	0.067

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
1127	A	2	2	1.	15	0.133
1128	A	3	2	1.	15	0.133
1129	A	4	2	1.	15	0.133
1130	A	7	5	1.	15	0.333
1131	A	6	5	1.	15	0.333
1132	A	5	5	1.	15	0.333
1133	A	4	4	1.	11	0.364
1134	A	5	5	1.	15	0.333
1135	A	6	5	1.	15	0.333
1136	A	7	5	1.	15	0.333
1137	A	3	2	1.	15	0.133
1138	A	3	2	1.	15	0.133
1139	A	3	2	1.	15	0.133
1140	A	3	2	1.	15	0.133
1141	A	1	1	1.	15	0.067
1142	A	6	6	1.	15	0.4
1143	A	7	6	1.	15	0.4
1144	A	8	6	1.	15	0.4
1145	A	6	4	1.	15	0.267
1146	A	5	4	1.	15	0.267
1147	A	4	4	1.	15	0.267
1148	A	3	3	1.	13	0.231
1149	A	4	4	1.	15	0.267
1150	A	5	4	1.	15	0.267
1151	A	6	4	1.	15	0.267
1152	A	7	6	1.	15	0.4
1153	A	6	6	1.	15	0.4
1154	A	5	5	1.	15	0.333
1155	A	1	1	1.	11	0.091
1156	A	2	2	1.	15	0.133
1157	A	3	2	1.	15	0.133
1158	A	4	2	1.	15	0.133
1159	A	5	2	1.	15	0.133
1160	A	7	5	1.	15	0.333
1161	A	6	5	1.	15	0.333
1162	A	5	5	1.	15	0.333
1163	A	4	4	1.	15	0.267
1164	A	5	5	1.	15	0.333
1165	A	6	5	1.	15	0.333
1166	A	7	5	1.	15	0.333
1167	A	8	5	1.	15	0.333
1168	A	5	5	1.	11	0.454
1169	A	2	2	1.	11	0.182
1170	A	6	5	1.	11	0.454
1171	A	3	2	1.	11	0.182
1172	A	4	2	1.	11	0.182
1173	A	3	2	1.	16	0.125
1174	A	3	2	1.	16	0.125
1175	A	3	2	1.	16	0.125

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1176	A	3	2	1.	16	0.125
1177	A	1	1	1.	16	0.062
1178	A	6	6	1.	16	0.375
1179	A	6	6	1.	16	0.375
1180	A	7	7	1.	16	0.438
1181	A	6	5	1.	16	0.312
1182	A	5	5	1.	16	0.312
1183	A	4	4	1.	14	0.286
1184	A	4	4	1.	16	0.25
1185	A	5	5	1.	16	0.312
1186	A	6	5	1.	16	0.312
1187	A	12	9	1.	16	0.562
1188	A	11	8	1.	16	0.5
1189	A	11	8	1.	16	0.5
1190	A	1	1	1.	16	0.062
1191	A	2	2	1.	16	0.125
1192	A	3	2	1.	16	0.125
1193	A	4	2	1.	16	0.125
1194	A	8	6	1.	16	0.375
1195	A	7	6	1.	16	0.375
1196	A	6	6	1.	16	0.375
1197	A	5	5	1.	12	0.417
1198	A	5	5	1.	16	0.312
1199	A	6	6	1.	16	0.375
1200	A	7	6	1.	16	0.375
1201	A	8	6	1.	16	0.375
1202	A	3	2	1.	16	0.125
1203	A	3	2	1.	16	0.125
1204	A	3	2	1.	16	0.125
1205	A	3	2	1.	16	0.125
1206	A	1	1	1.	16	0.062
1207	A	5	5	1.	16	0.312
1208	A	6	6	1.	16	0.375
1209	A	7	6	1.	16	0.375
1210	A	6	4	1.	16	0.25
1211	A	5	4	1.	16	0.25
1212	A	4	4	1.	16	0.25
1213	A	3	3	1.	14	0.214
1214	A	4	4	1.	16	0.25
1215	A	5	4	1.	16	0.25
1216	A	6	4	1.	16	0.25
1217	A	12	8	1.	16	0.5
1218	A	11	8	1.	16	0.5
1219	A	10	7	1.	12	0.583
1220	A	1	1	1.	16	0.062
1221	A	2	2	1.	16	0.125
1222	A	3	2	1.	16	0.125
1223	A	4	2	1.	16	0.125
1224	A	5	2	1.	16	0.125

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
1225	A	7	6	1.	16	0.375
1226	A	6	6	1.	16	0.375
1227	A	5	5	1.	16	0.312
1228	A	4	4	1.	16	0.25
1229	A	5	5	1.	16	0.312
1230	A	6	5	1.	16	0.312
1231	A	7	5	1.	16	0.312
1232	A	3	2	1.	16	0.125
1233	A	3	2	1.	16	0.125
1234	A	3	2	1.	16	0.125
1235	A	3	2	1.	16	0.125
1236	A	1	1	1.	16	0.062
1237	A	5	5	1.	16	0.312
1238	A	6	6	1.	16	0.375
1239	A	7	6	1.	16	0.375
1240	A	6	4	1.	16	0.25
1241	A	5	4	1.	16	0.25
1242	A	4	4	1.	16	0.25
1243	A	3	3	1.	14	0.214
1244	A	4	4	1.	16	0.25
1245	A	5	4	1.	16	0.25
1246	A	6	4	1.	16	0.25
1247	A	12	8	1.	16	0.5
1248	A	11	8	1.	16	0.5
1249	A	10	7	1.	16	0.438
1250	A	1	1	1.	16	0.062
1251	A	2	2	1.	16	0.125
1252	A	3	2	1.	16	0.125
1253	A	4	2	1.	16	0.125
1254	A	7	5	1.	16	0.312
1255	A	6	5	1.	16	0.312
1256	A	5	5	1.	16	0.312
1257	A	4	4	1.	12	0.333
1258	A	5	5	1.	16	0.312
1259	A	6	5	1.	16	0.312
1260	A	7	5	1.	16	0.312
1261	A	5	5	1.	16	0.312
1262	A	3	2	1.	13	0.154
1263	A	1	1	1.	13	0.077
1264	A	2	2	1.	13	0.154
1265	A	3	2	1.	13	0.154
1266	A	3	2	1.	13	0.154
1267	A	3	2	1.	13	0.154
1268	A	3	2	1.	13	0.154
1269	A	1	1	1.	13	0.077
1270	A	4	4	1.	13	0.308
1271	A	3	2	1.	13	0.154
1272	A	3	2	1.	13	0.154
1273	A	3	2	1.	13	0.154

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1274	A	6	6	1.01	9	0.667
1275	A	3	2	1.	13	0.154
1276	A	3	2	1.	13	0.154
1277	A	3	2	1.	13	0.154
1278	A	3	2	1.	13	0.154
1279	A	1	1	1.	13	0.077
1280	A	3	2	1.	13	0.154
1281	A	3	2	1.	13	0.154
1282	A	3	2	1.	13	0.154
1283	A	3	2	1.	15	0.133
1284	A	3	2	1.	15	0.133
1285	A	1	1	1.	15	0.067
1286	A	4	4	1.	15	0.267
1287	A	3	2	1.	15	0.133
1288	A	3	2	1.	13	0.154
1289	A	3	2	1.	13	0.154
1290	A	1	1	1.	13	0.077
1291	A	4	4	1.	13	0.308
1292	A	3	2	1.	13	0.154
1293	A	3	2	1.	11	0.182
1294	A	3	2	1.	11	0.182
1295	A	1	1	1.	11	0.091
1296	A	4	4	1.	11	0.364
1297	A	3	2	1.	11	0.182
1298	A	7	7	1.	11	0.636
1299	A	6	6	1.	11	0.546
1300	A	6	6	1.	11	0.546
1301	A	6	6	1.	9	0.667
1302	A	6	6	1.1	7	0.857
1303	A	7	7	1.	11	0.636
1304	A	7	7	1.	11	0.636
1305	A	7	7	1.	11	0.636
1306	A	6	5	1.	17	0.294
1307	A	5	5	1.	17	0.294
1308	A	4	4	1.	17	0.235
1309	A	1	1	1.	17	0.059
1310	A	2	2	1.	17	0.118
1311	A	5	4	1.	15	0.267
1312	A	4	4	1.	15	0.267
1313	A	3	3	1.	15	0.2
1314	A	1	1	1.	15	0.067
1315	A	2	2	1.	15	0.133
1316	A	3	3	1.	13	0.231
1317	A	8	8	1.	13	0.615
1318	A	11	7	1.	13	0.538
1319	A	1	1	1.	13	0.077
1320	A	10	6	1.	13	0.462
1321	A	7	7	1.	13	0.538
1322	A	2	2	1.	13	0.154

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1323	A	7	7	1.	11	0.636
1324	A	10	6	1.	9	0.667
1325	A	4	4	1.	13	0.308
1326	A	11	7	1.	13	0.538
1327	A	8	8	1.	13	0.615
1328	A	3	3	1.	13	0.231
1329	A	3	3	1.	13	0.231
1330	A	8	8	1.	13	0.615
1331	A	11	7	1.	13	0.538
1332	A	1	1	1.	13	0.077
1333	A	11	7	1.	13	0.538
1334	A	8	8	1.	13	0.615
1335	A	3	3	1.	13	0.231
1336	A	8	8	1.	11	0.727
1337	A	11	7	1.	9	0.778
1338	A	3	2	1.	13	0.154
1339	A	12	8	1.	13	0.615
1340	A	9	9	1.	13	0.692
1341	A	4	4	1.	13	0.308
1342	A	3	3	1.	13	0.231
1343	A	8	8	1.	13	0.615
1344	A	11	7	1.52	13	0.538
1345	A	1	1	1.	13	0.077
1346	A	10	6	1.55	13	0.462
1347	A	7	7	1.	13	0.538
1348	A	2	2	1.	13	0.154
1349	A	7	7	1.	11	0.636
1350	A	10	6	1.55	9	0.667
1351	A	4	4	1.	13	0.308
1352	A	11	7	1.5	13	0.538
1353	A	8	8	1.	13	0.615
1354	A	3	3	1.	13	0.231
1355	A	8	8	1.	13	0.615
1356	A	11	7	1.	13	0.538
1357	A	3	2	1.	13	0.154
1358	A	12	7	1.	13	0.538
1359	A	3	3	1.	11	0.273
1360	A	8	8	1.	11	0.727
1361	A	11	7	1.	11	0.636
1362	A	1	1	1.	11	0.091
1363	A	10	6	1.	11	0.546
1364	A	7	7	1.	11	0.636
1365	A	2	2	1.	11	0.182
1366	A	7	7	1.	9	0.778
1367	A	10	6	1.	7	0.857
1368	A	4	4	1.	11	0.364
1369	A	11	7	1.	11	0.636
1370	A	8	8	1.	11	0.727
1371	A	3	3	1.	11	0.273

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1372	A	8	8	1.	11	0.727
1373	A	11	7	1.	11	0.636
1374	A	3	2	1.	11	0.182
1375	A	12	7	1.	11	0.636
1376	A	10	6	0.93	9	0.667
1377	A	8	8	1.	15	0.533
1378	A	5	5	1.	15	0.333
1379	A	1	1	1.	17	0.059
1380	A	4	4	1.	13	0.308
1381	A	3	2	1.	13	0.154
1382	A	3	2	1.	13	0.154
1383	A	3	2	1.	13	0.154
1384	A	1	1	1.	13	0.077
1385	A	3	3	1.	13	0.231
1386	A	4	4	1.	13	0.308
1387	A	5	4	1.	13	0.308
1388	A	4	3	1.	13	0.231
1389	A	3	3	1.	13	0.231
1390	A	2	2	1.	13	0.154
1391	A	1	1	1.	13	0.077
1392	A	2	2	1.	13	0.154
1393	A	3	2	1.	13	0.154
1394	A	3	3	1.	13	0.231
1395	A	2	2	1.	11	0.182
1396	A	3	3	1.	13	0.231
1397	A	2	2	1.	13	0.154
1398	A	1	1	1.	9	0.111
1399	A	2	2	1.	13	0.154
1400	A	5	5	1.	13	0.385
1401	A	4	4	1.	13	0.308
1402	A	5	5	1.	13	0.385
1403	A	4	4	1.	13	0.308
1404	A	3	3	1.	13	0.231
1405	A	4	4	1.	13	0.308
1406	A	3	2	1.	13	0.154
1407	A	3	2	1.	13	0.154
1408	A	3	2	1.	13	0.154
1409	A	1	1	1.	13	0.077
1410	A	4	4	1.	13	0.308
1411	A	5	4	1.	13	0.308
1412	A	6	4	1.	13	0.308
1413	A	4	4	1.	13	0.308
1414	A	3	3	1.	13	0.231
1415	A	1	1	1.	13	0.077
1416	A	2	2	1.	13	0.154
1417	A	3	2	1.	13	0.154
1418	A	4	4	1.	13	0.308
1419	A	3	3	1.	13	0.231
1420	A	3	3	1.	11	0.273

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
1421	A	4	4	1.	13	0.308
1422	A	3	3	1.	13	0.231
1423	A	2	2	1.	13	0.154
1424	A	2	2	1.	9	0.222
1425	A	3	3	1.	13	0.231
1426	A	6	6	1.	13	0.462
1427	A	5	5	1.	13	0.385
1428	A	5	5	1.	13	0.385
1429	A	6	6	1.	13	0.462
1430	A	4	4	1.	13	0.308
1431	A	4	4	1.	13	0.308
1432	A	5	5	1.	13	0.385
1433	A	2	1	1.	11	0.091
1434	A	2	1	1.	11	0.091
1435	A	2	1	1.	11	0.091
1436	A	2	1	1.	13	0.077
1437	A	2	1	1.	13	0.077
1438	A	3	2	1.	13	0.154
1439	A	1	1	1.	13	0.077
1440	A	1	1	1.	13	0.077
1441	A	6	6	1.	9	0.667
1442	A	4	4	1.	13	0.308
1443	A	1	1	1.	14	0.071
1444	A	1	1	1.	14	0.071
1445	A	6	6	1.	10	0.6
1446	A	4	4	1.	14	0.286
1447	A	6	6	1.	9	0.667
1448	A	6	6	1.	7	0.857
1449	A	11	8	1.	13	0.615
1450	A	1	1	1.	13	0.077
1451	A	10	7	1.	13	0.538
1452	A	2	2	1.	13	0.154
1453	A	10	7	1.	11	0.636
1454	A	4	4	1.	13	0.308
1455	A	11	8	1.	13	0.615
1456	A	3	3	1.	13	0.231
1457	A	11	8	1.	13	0.615
1458	A	3	2	1.	13	0.154
1459	A	14	11	1.	13	0.846
1460	A	13	10	1.	13	0.769
1461	A	13	10	1.	13	0.769
1462	A	13	10	1.	13	0.769
1463	A	13	10	1.	9	1.111
1464	A	14	11	1.	13	0.846
1465	A	14	11	1.	13	0.846
1466	A	14	11	1.	13	0.846
1467	A	14	11	1.	13	0.846
1468	A	13	10	1.	10	1.
1469	A	5	5	1.	13	0.385

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
1470	A	1	1	1.	13	0.077
1471	A	4	4	1.	13	0.308
1472	A	2	2	1.	13	0.154
1473	A	4	4	1.	11	0.364
1474	A	4	4	1.	13	0.308
1475	A	5	5	1.	13	0.385
1476	A	3	3	1.	13	0.231
1477	A	5	5	1.	13	0.385
1478	A	3	2	1.	13	0.154
1479	A	14	11	1.	13	0.846
1480	A	13	10	1.	13	0.769
1481	A	13	10	1.	13	0.769
1482	A	13	10	1.	13	0.769
1483	A	13	10	1.	9	1.111
1484	A	14	11	1.	13	0.846
1485	A	14	11	1.	13	0.846
1486	A	14	11	1.	13	0.846
1487	A	14	11	1.	13	0.846
1488	A	11	8	1.	11	0.727
1489	A	1	1	1.	11	0.091
1490	A	10	7	1.	11	0.636
1491	A	2	2	1.	11	0.182
1492	A	10	7	1.	9	0.778
1493	A	4	4	1.	11	0.364
1494	A	11	8	1.	11	0.727
1495	A	3	3	1.	11	0.273
1496	A	11	8	1.	11	0.727
1497	A	3	2	1.	11	0.182
1498	A	20	7	1.	11	0.636
1499	A	21	7	1.	11	0.636
1500	A	19	7	1.	11	0.636
1501	A	19	6	1.	11	0.546
1502	A	19	6	1.	7	0.857
1503	A	22	8	1.	11	0.727
1504	A	20	8	1.	11	0.727
1505	A	20	7	1.	11	0.636
1506	A	20	7	1.	11	0.636
1507	A	3	3	1.	13	0.231
1508	A	3	3	1.	11	0.273
1509	A	4	4	1.	13	0.308
1510	A	5	5	1.	13	0.385
1511	A	4	4	1.	13	0.308
1512	A	4	3	1.	13	0.231
1513	A	3	2	1.	13	0.154
1514	A	3	3	1.	13	0.231
1515	A	1	1	1.	13	0.077
1516	A	2	2	1.	13	0.154
1517	A	3	3	1.	13	0.231
1518	A	1	1	1.	13	0.077

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
1519	A	4	4	1.	13	0.308
1520	A	2	2	1.	13	0.154
1521	A	5	4	1.	13	0.308
1522	A	5	5	1.	13	0.385
1523	A	3	3	1.	13	0.231
1524	A	4	4	1.	13	0.308
1525	A	2	2	1.	11	0.182
1526	A	5	5	1.	13	0.385
1527	A	3	3	1.	13	0.231
1528	A	4	3	1.	13	0.231
1529	A	4	3	1.	13	0.231
1530	A	1	1	1.	13	0.077
1531	A	1	1	1.	13	0.077
1532	A	3	2	1.	13	0.154
1533	A	3	2	1.	9	0.222
1534	A	2	2	1.	13	0.154
1535	A	2	2	1.	13	0.154
1536	A	4	3	1.	13	0.231
1537	A	4	3	1.	13	0.231
1538	A	10	6	1.99	9	0.667
1539	A	2	2	1.	15	0.133
1540	A	3	3	1.	13	0.231
1541	A	2	2	1.	11	0.182
1542	A	2	2	1.	13	0.154
1543	A	3	3	1.	13	0.231
1544	A	2	1	1.	11	0.091
1545	A	2	1	1.	11	0.091
1546	A	2	1	1.	11	0.091
1547	A	2	1	1.	11	0.091
1548	A	2	1	1.	11	0.091
1549	A	2	1	1.	9	0.111
1550	A	1	0	1.	7	0.
1551	A	2	1	1.	11	0.091
1552	A	2	1	1.	11	0.091
1553	A	2	1	1.	11	0.091
1554	A	2	1	1.	11	0.091
1555	A	2	1	1.	11	0.091
1556	A	2	1	1.	11	0.091
1557	A	3	2	1.	13	0.154
1558	A	3	2	1.	13	0.154
1559	A	3	2	1.	13	0.154
1560	A	2	2	1.	13	0.154
1561	A	3	2	1.	11	0.182
1562	A	3	2	1.	9	0.222
1563	A	3	2	1.	13	0.154
1564	A	1	1	1.	13	0.077
1565	A	3	2	1.	13	0.154
1566	A	3	2	1.	13	0.154
1567	A	3	2	1.	13	0.154

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1568	A	3	2	1.	13	0.154
1569	A	3	2	1.	13	0.154
1570	A	3	2	1.	13	0.154
1571	A	2	2	1.	13	0.154
1572	A	3	2	1.	13	0.154
1573	A	3	2	1.	11	0.182
1574	A	3	2	1.	9	0.222
1575	A	3	2	1.	13	0.154
1576	A	1	1	1.	13	0.077
1577	A	3	3	1.	13	0.231
1578	A	3	2	1.	13	0.154
1579	A	3	2	1.	13	0.154
1580	A	3	2	1.	13	0.154
1581	A	3	2	1.	13	0.154
1582	A	3	2	1.	13	0.154
1583	A	3	2	1.	13	0.154
1584	A	3	2	1.	13	0.154
1585	A	3	2	1.	13	0.154
1586	A	3	2	1.	13	0.154
1587	A	3	2	1.	13	0.154
1588	A	2	2	1.	13	0.154
1589	A	3	2	1.	13	0.154
1590	A	3	2	1.	13	0.154
1591	A	3	2	1.	13	0.154
1592	A	3	2	1.	13	0.154
1593	A	3	2	1.	13	0.154
1594	A	3	2	1.	13	0.154
1595	A	3	2	1.	11	0.182
1596	A	3	2	1.	9	0.222
1597	A	3	2	1.	13	0.154
1598	A	1	1	1.	13	0.077
1599	A	3	3	1.	13	0.231
1600	A	4	3	1.	13	0.231
1601	A	5	3	1.	13	0.231
1602	A	6	3	1.	13	0.231
1603	A	3	2	1.	13	0.154
1604	A	3	2	1.	13	0.154
1605	A	3	2	1.	13	0.154
1606	A	3	2	1.	13	0.154
1607	A	3	2	1.	13	0.154
1608	A	3	2	1.	11	0.182
1609	A	3	2	1.	9	0.222
1610	A	2	2	1.	13	0.154
1611	A	1	1	1.	13	0.077
1612	A	3	2	1.	13	0.154
1613	A	3	2	1.	13	0.154
1614	A	3	2	1.	13	0.154
1615	A	3	2	1.	13	0.154
1616	A	3	2	1.	13	0.154

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1617	A	3	2	1.	13	0.154
1618	A	3	2	1.	13	0.154
1619	A	3	2	1.	13	0.154
1620	A	3	2	1.	13	0.154
1621	A	3	2	1.	11	0.182
1622	A	4	3	1.	9	0.333
1623	A	3	2	1.	13	0.154
1624	A	1	1	1.	13	0.077
1625	A	3	2	1.	13	0.154
1626	A	3	2	1.	13	0.154
1627	A	3	2	1.	13	0.154
1628	A	3	2	1.	13	0.154
1629	A	3	2	1.	13	0.154
1630	A	3	2	1.	13	0.154
1631	A	3	2	1.	13	0.154
1632	A	3	2	1.	13	0.154
1633	A	3	2	1.	13	0.154
1634	A	3	2	1.	11	0.182
1635	A	5	3	1.	9	0.333
1636	A	3	2	1.	13	0.154
1637	A	1	1	1.	13	0.077
1638	A	2	2	1.	13	0.154
1639	A	3	2	1.	13	0.154
1640	A	3	2	1.	13	0.154
1641	A	3	2	1.	13	0.154
1642	A	3	2	1.	13	0.154
1643	A	3	2	1.	13	0.154
1644	A	3	2	1.	13	0.154
1645	A	2	1	1.	13	0.077
1646	A	2	1	1.	13	0.077
1647	A	2	1	1.	13	0.077
1648	A	2	1	1.	13	0.077
1649	A	2	1	1.	13	0.077
1650	A	2	1	1.	13	0.077
1651	A	3	2	1.	15	0.133
1652	A	3	2	1.	15	0.133
1653	A	3	2	1.	15	0.133
1654	A	3	2	1.	15	0.133
1655	A	3	2	1.	15	0.133
1656	A	3	2	1.	15	0.133
1657	A	3	2	1.	15	0.133
1658	A	3	2	1.	15	0.133
1659	A	3	2	1.	15	0.133
1660	A	3	2	1.	15	0.133
1661	A	3	2	1.	15	0.133
1662	A	3	2	1.	15	0.133
1663	A	7	4	1.	15	0.267
1664	A	6	4	1.	15	0.267
1665	A	5	4	1.	15	0.267

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
1666	A	4	4	1.	15	0.267
1667	A	3	3	1.	15	0.2
1668	A	4	4	1.	15	0.267
1669	A	5	4	1.	15	0.267
1670	A	6	4	1.	15	0.267
1671	A	8	5	1.	15	0.333
1672	A	7	5	1.	15	0.333
1673	A	6	5	1.	15	0.333
1674	A	5	5	1.	15	0.333
1675	A	4	4	1.	15	0.267
1676	A	4	4	1.	15	0.267
1677	A	5	5	1.	15	0.333
1678	A	6	5	1.	15	0.333
1679	A	7	5	1.	15	0.333
1680	A	8	5	1.	15	0.333
1681	A	7	5	1.	15	0.333
1682	A	6	5	1.	15	0.333
1683	A	5	4	1.	15	0.267
1684	A	5	5	1.	15	0.333
1685	A	5	4	1.	15	0.267
1686	A	6	5	1.	15	0.333
1687	A	7	5	1.	15	0.333
1688	A	8	5	1.	15	0.333
1689	A	7	5	1.	15	0.333
1690	A	6	5	1.	15	0.333
1691	A	5	5	1.	13	0.385
1692	A	4	4	1.	11	0.364
1693	A	4	4	1.	15	0.267
1694	A	1	1	1.	15	0.067
1695	A	3	2	1.	15	0.133
1696	A	3	2	1.	15	0.133
1697	A	3	2	1.	15	0.133
1698	A	3	2	1.	15	0.133
1699	A	7	5	1.	15	0.333
1700	A	6	5	1.	15	0.333
1701	A	5	4	1.	13	0.308
1702	A	5	5	1.	11	0.454
1703	A	5	4	1.	15	0.267
1704	A	1	1	1.	15	0.067
1705	A	3	2	1.	15	0.133
1706	A	3	2	1.	15	0.133
1707	A	3	2	1.	15	0.133
1708	A	3	2	1.	15	0.133
1709	A	3	2	1.	15	0.133
1710	A	7	5	1.	15	0.333
1711	A	6	4	1.	15	0.267
1712	A	6	5	1.	13	0.385
1713	A	6	5	1.	11	0.454
1714	A	6	4	1.	15	0.267

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1715	A	1	1	1.	15	0.067
1716	A	3	2	1.	15	0.133
1717	A	3	2	1.	15	0.133
1718	A	3	2	1.	15	0.133
1719	A	3	2	1.	15	0.133
1720	A	7	4	1.	15	0.267
1721	A	6	4	1.	15	0.267
1722	A	5	4	1.	13	0.308
1723	A	4	4	1.	11	0.364
1724	A	3	3	1.	15	0.2
1725	A	1	1	1.	15	0.067
1726	A	3	2	1.	15	0.133
1727	A	3	2	1.	15	0.133
1728	A	3	2	1.	15	0.133
1729	A	3	2	1.	15	0.133
1730	A	7	4	1.	15	0.267
1731	A	6	4	1.	13	0.308
1732	A	5	4	1.	11	0.364
1733	A	4	4	1.	15	0.267
1734	A	1	1	1.	15	0.067
1735	A	3	2	1.	15	0.133
1736	A	3	2	1.	15	0.133
1737	A	3	2	1.	15	0.133
1738	A	3	2	1.	15	0.133
1739	A	3	2	1.	15	0.133
1740	A	8	4	1.	15	0.267
1741	A	7	4	1.	13	0.308
1742	A	6	4	1.	11	0.364
1743	A	5	4	1.	15	0.267
1744	A	1	1	1.	15	0.067
1745	A	3	2	1.	15	0.133
1746	A	3	2	1.	15	0.133
1747	A	3	2	1.	15	0.133
1748	A	3	2	1.	15	0.133
1749	A	3	2	1.	15	0.133
1750	A	4	2	1.	17	0.118
1751	A	3	2	1.	17	0.118
1752	A	2	2	1.	17	0.118
1753	A	1	1	1.	17	0.059
1754	A	4	4	1.	17	0.235
1755	A	4	4	1.	17	0.235
1756	A	5	5	1.	17	0.294
1757	A	6	5	1.	17	0.294
1758	A	4	2	1.	17	0.118
1759	A	3	2	1.	17	0.118
1760	A	2	2	1.	17	0.118
1761	A	1	1	1.	17	0.059
1762	A	5	4	1.	17	0.235
1763	A	5	5	1.	17	0.294

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
1764	A	5	4	1.	17	0.235
1765	A	6	5	1.	17	0.294
1766	A	4	2	1.	17	0.118
1767	A	3	2	1.	17	0.118
1768	A	2	2	1.	17	0.118
1769	A	1	1	1.	17	0.059
1770	A	6	4	1.	17	0.235
1771	A	6	5	1.	17	0.294
1772	A	6	5	1.	17	0.294
1773	A	6	4	1.	17	0.235
1774	A	7	5	1.	17	0.294
1775	A	5	2	1.	17	0.118
1776	A	4	2	1.	17	0.118
1777	A	3	2	1.	17	0.118
1778	A	2	2	1.	17	0.118
1779	A	1	1	1.	17	0.059
1780	A	3	3	1.	17	0.176
1781	A	4	4	1.	17	0.235
1782	A	5	4	1.	17	0.235
1783	A	6	4	1.	17	0.235
1784	A	5	2	1.	17	0.118
1785	A	4	2	1.	17	0.118
1786	A	3	2	1.	17	0.118
1787	A	2	2	1.	17	0.118
1788	A	1	1	1.	17	0.059
1789	A	4	4	1.	17	0.235
1790	A	5	5	1.	17	0.294
1791	A	6	5	1.	17	0.294
1792	A	7	5	1.	17	0.294
1793	A	6	2	1.	17	0.118
1794	A	5	2	1.	17	0.118
1795	A	4	2	1.	17	0.118
1796	A	3	2	1.	17	0.118
1797	A	2	2	1.	17	0.118
1798	A	1	1	1.	17	0.059
1799	A	5	4	1.	17	0.235
1800	A	6	5	1.	17	0.294
1801	A	7	5	1.	17	0.294
1802	A	2	1	1.	11	0.091
1803	A	2	1	1.	11	0.091
1804	A	2	1	1.	11	0.091
1805	A	2	1	1.	11	0.091
1806	A	2	1	1.	11	0.091
1807	A	2	1	1.	9	0.111
1808	A	1	0	1.	7	0.
1809	A	2	1	1.	11	0.091
1810	A	2	1	1.	11	0.091
1811	A	2	1	1.	11	0.091
1812	A	2	1	1.	11	0.091

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
1813	A	2	1	1.	11	0.091
1814	A	2	1	1.	11	0.091
1815	A	3	2	1.	13	0.154
1816	A	2	2	1.	13	0.154
1817	A	3	2	1.	13	0.154
1818	A	4	3	1.	13	0.231
1819	A	3	2	1.	13	0.154
1820	A	4	3	1.	11	0.273
1821	A	3	2	1.	9	0.222
1822	A	4	3	1.	13	0.231
1823	A	3	2	1.	13	0.154
1824	A	1	1	1.	13	0.077
1825	A	3	2	1.	13	0.154
1826	A	4	3	1.	13	0.231
1827	A	3	2	1.	13	0.154
1828	A	3	2	1.	13	0.154
1829	A	4	3	1.	13	0.231
1830	A	3	2	1.	13	0.154
1831	A	4	3	1.	13	0.231
1832	A	3	2	1.	13	0.154
1833	A	4	3	1.	11	0.273
1834	A	3	2	1.	9	0.222
1835	A	4	3	1.	13	0.231
1836	A	3	2	1.	13	0.154
1837	A	1	1	1.	13	0.077
1838	A	3	2	1.	13	0.154
1839	A	4	4	1.	13	0.308
1840	A	3	2	1.	13	0.154
1841	A	4	3	1.	13	0.231
1842	A	4	3	1.	13	0.231
1843	A	4	3	1.	13	0.231
1844	A	4	3	1.	13	0.231
1845	A	4	3	1.	13	0.231
1846	A	4	3	1.	11	0.273
1847	A	3	3	1.	9	0.333
1848	A	2	2	1.	13	0.154
1849	A	2	2	1.	13	0.154
1850	A	1	1	1.	13	0.077
1851	A	3	3	1.	13	0.231
1852	A	4	3	1.	13	0.231
1853	A	4	3	1.	13	0.231
1854	A	4	3	1.	13	0.231
1855	A	5	3	1.	13	0.231
1856	A	5	4	1.	13	0.308
1857	A	4	3	1.	13	0.231
1858	A	5	4	1.	13	0.308
1859	A	4	3	1.	13	0.231
1860	A	5	4	1.	13	0.308
1861	A	4	3	1.	11	0.273

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1862	A	4	4	1.	9	0.444
1863	A	4	3	1.	13	0.231
1864	A	3	3	1.	13	0.231
1865	A	1	1	1.	13	0.077
1866	A	3	3	1.	13	0.231
1867	A	4	3	1.	13	0.231
1868	A	4	4	1.	13	0.308
1869	A	4	3	1.	13	0.231
1870	A	5	4	1.	13	0.308
1871	A	4	3	1.	13	0.231
1872	A	4	3	1.	13	0.231
1873	A	6	4	1.	13	0.308
1874	A	4	3	1.	13	0.231
1875	A	6	4	1.	13	0.308
1876	A	4	3	1.	11	0.273
1877	A	5	4	1.	9	0.444
1878	A	4	3	1.	13	0.231
1879	A	4	3	1.	13	0.231
1880	A	1	1	1.	13	0.077
1881	A	4	4	1.	13	0.308
1882	A	2	2	1.	13	0.154
1883	A	4	3	1.	13	0.231
1884	A	4	3	1.	13	0.231
1885	A	5	4	1.	13	0.308
1886	A	4	3	1.	13	0.231
1887	A	6	4	1.	13	0.308
1888	A	4	3	1.	13	0.231
1889	A	5	5	1.	15	0.333
1890	A	1	1	1.	15	0.067
1891	A	4	4	1.	13	0.308
1892	A	4	4	1.	11	0.364
1893	A	4	4	1.	15	0.267
1894	A	4	4	1.	15	0.267
1895	A	1	1	1.	15	0.067
1896	A	5	5	1.	15	0.333
1897	A	5	4	1.	15	0.267
1898	A	5	4	1.	15	0.267
1899	A	5	5	1.	13	0.385
1900	A	5	5	1.	11	0.454
1901	A	5	4	1.	15	0.267
1902	A	5	4	1.	15	0.267
1903	A	1	1	1.	15	0.067
1904	A	6	5	1.	15	0.333
1905	A	6	5	1.	15	0.333
1906	A	6	5	1.	15	0.333
1907	A	6	5	1.	13	0.385
1908	A	6	5	1.	11	0.454
1909	A	6	4	1.	15	0.267
1910	A	6	4	1.	15	0.267

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1911	A	1	1	1.	15	0.067
1912	A	7	5	1.	15	0.333
1913	A	5	4	1.	15	0.267
1914	A	4	4	1.	13	0.308
1915	A	3	3	1.	15	0.2
1916	A	1	1	1.	15	0.067
1917	A	3	2	1.	15	0.133
1918	A	3	2	1.	15	0.133
1919	A	3	2	1.	15	0.133
1920	A	3	2	1.	15	0.133
1921	A	2	2	1.	15	0.133
1922	A	1	1	1.	11	0.091
1923	A	3	3	1.	15	0.2
1924	A	4	4	1.	15	0.267
1925	A	3	3	1.	17	0.176
1926	A	2	2	1.	15	0.133
1927	A	2	2	1.	16	0.125
1928	A	6	4	1.	15	0.267
1929	A	5	4	1.	13	0.308
1930	A	4	4	1.	15	0.267
1931	A	1	1	1.	15	0.067
1932	A	3	2	1.	15	0.133
1933	A	3	2	1.	15	0.133
1934	A	3	2	1.	15	0.133
1935	A	4	3	1.	15	0.2
1936	A	3	3	1.	15	0.2
1937	A	2	2	1.	11	0.182
1938	A	1	1	1.	15	0.067
1939	A	4	4	1.	15	0.267
1940	A	5	5	1.	15	0.333
1941	A	6	5	1.	15	0.333
1942	A	7	4	1.	15	0.267
1943	A	6	4	1.	13	0.308
1944	A	5	4	1.	15	0.267
1945	A	1	1	1.	15	0.067
1946	A	3	2	1.	15	0.133
1947	A	3	2	1.	15	0.133
1948	A	3	2	1.	15	0.133
1949	A	4	3	1.	15	0.2
1950	A	3	2	1.	11	0.182
1951	A	2	2	1.	15	0.133
1952	A	1	1	1.	15	0.067
1953	A	5	4	1.	15	0.267
1954	A	6	5	1.	15	0.333
1955	A	1	1	1.	13	0.077
1956	A	1	1	1.	13	0.077
1957	A	2	2	1.	17	0.118
1958	A	2	2	1.	17	0.118
1959	A	2	2	1.	17	0.118

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1960	A	2	2	1.	17	0.118
1961	A	2	2	1.	15	0.133
1962	A	3	3	1.	15	0.2
1963	A	4	3	1.	13	0.231
1964	A	9	8	1.	13	0.615
1965	A	9	8	1.	13	0.615
1966	A	4	3	1.	13	0.231
1967	A	8	8	1.	11	0.727
1968	A	8	8	1.	9	0.889
1969	A	2	2	1.	13	0.154
1970	A	7	7	1.	13	0.538
1971	A	7	7	1.	13	0.538
1972	A	1	1	1.	13	0.077
1973	A	8	8	1.	13	0.615
1974	A	8	8	1.	13	0.615
1975	A	4	3	1.	13	0.231
1976	A	4	3	1.	13	0.231
1977	A	10	9	1.	13	0.692
1978	A	10	9	1.	13	0.692
1979	A	4	3	1.	13	0.231
1980	A	9	9	1.	11	0.818
1981	A	9	9	1.	9	1.
1982	A	4	3	1.	13	0.231
1983	A	8	8	1.	13	0.615
1984	A	8	8	1.	13	0.615
1985	A	1	1	1.	13	0.077
1986	A	8	8	1.	13	0.615
1987	A	8	8	1.	13	0.615
1988	A	4	3	1.	13	0.231
1989	A	5	5	1.	15	0.333
1990	A	4	4	1.	15	0.267
1991	A	4	4	1.	15	0.267
1992	A	1	1	1.	15	0.067
1993	A	3	2	1.	15	0.133
1994	A	3	2	1.	15	0.133
1995	A	3	2	1.	15	0.133
1996	A	5	4	1.	15	0.267
1997	A	4	4	1.	15	0.267
1998	A	3	3	1.	13	0.231
1999	A	3	3	1.	15	0.2
2000	A	4	4	1.	15	0.267
2001	A	5	4	1.	15	0.267
2002	A	7	6	1.	15	0.4
2003	A	6	6	1.	15	0.4
2004	A	5	5	1.	11	0.454
2005	A	5	5	1.	15	0.333
2006	A	6	6	1.	15	0.4
2007	A	7	6	1.	15	0.4
2008	A	5	4	1.	15	0.267

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
2009	A	5	5	1.	15	0.333
2010	A	5	4	1.	15	0.267
2011	A	1	1	1.	15	0.067
2012	A	3	2	1.	15	0.133
2013	A	3	2	1.	15	0.133
2014	A	3	2	1.	15	0.133
2015	A	5	4	1.	15	0.267
2016	A	4	4	1.	15	0.267
2017	A	3	3	1.	15	0.2
2018	A	1	1	1.	15	0.067
2019	A	3	2	1.	15	0.133
2020	A	3	2	1.	15	0.133
2021	A	3	2	1.	15	0.133
2022	A	5	3	1.	15	0.2
2023	A	4	3	1.	15	0.2
2024	A	3	3	1.	13	0.231
2025	A	2	2	1.	15	0.133
2026	A	3	3	1.	15	0.2
2027	A	4	3	1.	15	0.2
2028	A	7	5	1.	15	0.333
2029	A	6	5	1.	15	0.333
2030	A	5	5	1.	11	0.454
2031	A	4	4	1.	15	0.267
2032	A	5	5	1.	15	0.333
2033	A	6	5	1.	15	0.333
2034	A	7	5	1.	15	0.333
2035	A	6	4	1.	15	0.267
2036	A	5	4	1.	15	0.267
2037	A	4	4	1.	15	0.267
2038	A	1	1	1.	15	0.067
2039	A	3	2	1.	15	0.133
2040	A	3	2	1.	15	0.133
2041	A	3	2	1.	15	0.133
2042	A	6	4	1.	15	0.267
2043	A	5	4	1.	15	0.267
2044	A	4	4	1.	13	0.308
2045	A	3	3	1.	15	0.2
2046	A	3	3	1.	15	0.2
2047	A	4	4	1.	15	0.267
2048	A	8	6	1.	15	0.4
2049	A	7	6	1.	15	0.4
2050	A	6	6	1.	11	0.546
2051	A	5	5	1.	15	0.333
2052	A	5	5	1.	15	0.333
2053	A	6	6	1.	15	0.4
2054	A	7	6	1.	15	0.4
2055	A	11	8	1.	9	0.889
2056	A	4	4	1.	15	0.267
2057	A	5	5	1.	13	0.385

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
2058	A	4	4	1.	15	0.267
2059	A	5	5	1.	15	0.333
2060	A	3	3	1.	15	0.2
2061	A	5	5	1.	11	0.454
2062	A	3	3	1.	15	0.2
2063	A	5	5	1.	15	0.333
2064	A	5	5	1.	15	0.333
2065	A	6	6	1.	13	0.462
2066	A	5	4	1.	15	0.267
2067	A	6	5	1.	15	0.333
2068	A	4	4	1.	15	0.267
2069	A	6	6	1.	11	0.546
2070	A	4	3	1.	15	0.2
2071	A	6	5	1.	15	0.333
2072	A	6	5	1.	15	0.333
2073	A	7	6	1.	13	0.462
2074	A	6	4	1.	15	0.267
2075	A	7	5	1.	15	0.333
2076	A	5	4	1.	15	0.267
2077	A	7	6	1.	11	0.546
2078	A	5	3	1.	15	0.2
2079	A	7	5	1.	15	0.333
2080	A	4	4	1.	15	0.267
2081	A	1	1	1.	13	0.077
2082	A	3	3	1.	15	0.2
2083	A	4	4	1.	15	0.267
2084	A	3	3	1.	15	0.2
2085	A	5	5	1.	11	0.454
2086	A	2	2	1.	15	0.133
2087	A	4	4	1.	15	0.267
2088	A	5	4	1.	15	0.267
2089	A	2	2	1.	13	0.154
2090	A	4	4	1.	15	0.267
2091	A	1	1	1.	15	0.067
2092	A	4	4	1.	15	0.267
2093	A	6	6	1.	11	0.546
2094	A	3	3	1.	15	0.2
2095	A	5	5	1.	15	0.333
2096	A	6	4	1.	15	0.267
2097	A	3	2	1.	13	0.154
2098	A	5	4	1.	15	0.267
2099	A	2	2	1.	15	0.133
2100	A	5	4	1.	15	0.267
2101	A	7	6	1.	11	0.546
2102	A	4	3	1.	15	0.2
2103	A	6	5	1.	15	0.333
2104	A	8	8	1.	9	0.889
2105	A	3	3	1.	15	0.2
2106	A	3	3	1.	17	0.176

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
2107	A	12	8	1.	9	0.889
2108	A	15	12	1.	9	1.333
2109	A	2	1	1.	13	0.077
2110	A	2	1	1.	13	0.077
2111	A	2	1	1.	13	0.077
2112	A	2	1	1.	11	0.091
2113	A	1	0	1.	9	0.
2114	A	2	1	1.	13	0.077
2115	A	2	1	1.	13	0.077
2116	A	2	1	1.	13	0.077
2117	A	2	1	1.	13	0.077
2118	A	3	2	1.	15	0.133
2119	A	3	2	1.	15	0.133
2120	A	3	2	1.	15	0.133
2121	A	3	2	1.	13	0.154
2122	A	3	2	1.	11	0.182
2123	A	3	2	1.	15	0.133
2124	A	3	2	1.	15	0.133
2125	A	3	2	1.	15	0.133
2126	A	3	2	1.	15	0.133
2127	A	3	2	1.	15	0.133
2128	A	3	2	1.	15	0.133
2129	A	3	2	1.	15	0.133
2130	A	3	2	1.	15	0.133
2131	A	3	2	1.	13	0.154
2132	A	3	2	1.	11	0.182
2133	A	3	2	1.	15	0.133
2134	A	3	2	1.	15	0.133
2135	A	1	1	1.	15	0.067
2136	A	3	2	1.	15	0.133
2137	A	3	2	1.	15	0.133
2138	A	3	2	1.	15	0.133
2139	A	3	2	1.	15	0.133
2140	A	3	2	1.	15	0.133
2141	A	3	2	1.	15	0.133
2142	A	3	2	1.	13	0.154
2143	A	3	2	1.	11	0.182
2144	A	3	2	1.	15	0.133
2145	A	3	2	1.	15	0.133
2146	A	3	2	1.	15	0.133
2147	A	1	1	1.	15	0.067
2148	A	4	3	1.	15	0.2
2149	A	3	2	1.	15	0.133
2150	A	3	2	1.	15	0.133
2151	A	3	2	1.	15	0.133
2152	A	3	2	1.	15	0.133
2153	A	3	2	1.	15	0.133
2154	A	3	2	1.	13	0.154
2155	A	3	2	1.	11	0.182

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
2156	A	3	2	1.	15	0.133
2157	A	3	2	1.	15	0.133
2158	A	3	2	1.	15	0.133
2159	A	3	2	1.	15	0.133
2160	A	3	2	1.	15	0.133
2161	A	3	2	1.	15	0.133
2162	A	3	3	1.	15	0.2
2163	A	5	3	1.	15	0.2
2164	A	7	3	1.	15	0.2
2165	A	3	2	1.	15	0.133
2166	A	3	2	1.	15	0.133
2167	A	3	2	1.	15	0.133
2168	A	3	2	1.	15	0.133
2169	A	3	2	1.	15	0.133
2170	A	3	2	1.	15	0.133
2171	A	3	2	1.	13	0.154
2172	A	3	2	1.	11	0.182
2173	A	3	2	1.	15	0.133
2174	A	3	2	1.	15	0.133
2175	A	3	2	1.	15	0.133
2176	A	3	2	1.	15	0.133
2177	A	3	2	1.	15	0.133
2178	A	3	2	1.	15	0.133
2179	A	3	2	1.	15	0.133
2180	A	1	1	1.	15	0.067
2181	A	4	3	1.	15	0.2
2182	A	6	3	1.	15	0.2
2183	A	8	3	1.	15	0.2
2184	A	10	3	1.	15	0.2
2185	A	12	3	1.	15	0.2
2186	A	3	2	1.	15	0.133
2187	A	3	2	1.	15	0.133
2188	A	3	2	1.	15	0.133
2189	A	3	2	1.	15	0.133
2190	A	3	2	1.	15	0.133
2191	A	3	2	1.	13	0.154
2192	A	3	2	1.	11	0.182
2193	A	4	4	1.	15	0.267
2194	A	3	2	1.	15	0.133
2195	A	3	2	1.	15	0.133
2196	A	3	2	1.	15	0.133
2197	A	3	2	1.	15	0.133
2198	A	3	2	1.	15	0.133
2199	A	3	2	1.	13	0.154
2200	A	3	2	1.	11	0.182
2201	A	3	2	1.	15	0.133
2202	A	3	2	1.	15	0.133
2203	A	3	2	1.	15	0.133
2204	A	3	2	1.	15	0.133

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
2205	A	3	2	1.	15	0.133
2206	A	3	2	1.	15	0.133
2207	A	3	2	1.	13	0.154
2208	A	2	2	1.	11	0.182
2209	A	3	2	1.	15	0.133
2210	A	3	2	1.	15	0.133
2211	A	3	2	1.	15	0.133
2212	A	3	2	1.	15	0.133
2213	A	3	2	1.	15	0.133
2214	A	3	2	1.	15	0.133
2215	A	3	2	1.	15	0.133
2216	A	1	1	1.	13	0.077
2217	A	3	2	1.	11	0.182
2218	A	3	2	1.	15	0.133
2219	A	3	2	1.	15	0.133
2220	A	3	2	1.	15	0.133
2221	A	3	2	1.	15	0.133
2222	A	3	2	1.	15	0.133
2223	A	3	2	1.	15	0.133
2224	A	3	3	1.	15	0.2
2225	A	3	2	1.	13	0.154
2226	A	3	2	1.	11	0.182
2227	A	3	2	1.	15	0.133
2228	A	3	2	1.	15	0.133
2229	A	3	2	1.	15	0.133
2230	A	4	4	1.	15	0.267
2231	A	3	2	1.	17	0.118
2232	A	3	2	1.	15	0.133
2233	A	3	2	1.	13	0.154
2234	A	4	4	1.	17	0.235
2235	A	5	5	1.	17	0.294
2236	A	7	5	1.	17	0.294
2237	A	3	2	1.	17	0.118
2238	A	3	2	1.	15	0.133
2239	A	3	2	1.	13	0.154
2240	A	3	3	1.	17	0.176
2241	A	5	4	1.	17	0.235
2242	A	7	4	1.	17	0.235
2243	A	3	2	1.	17	0.118
2244	A	1	1	1.	17	0.059
2245	A	2	1	1.	13	0.077
2246	A	1	1	1.	15	0.067
2247	A	1	1	1.	15	0.067
2248	A	3	2	1.	15	0.133
2249	A	1	1	1.	15	0.067
2250	A	1	1	1.	15	0.067
2251	A	1	1	1.	15	0.067
2252	A	3	2	1.	17	0.118
2253	A	1	1	1.	17	0.059

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
2254	A	7	6	1.	15	0.4
2255	A	2	1	1.	15	0.067
2256	A	2	1	1.	15	0.067
2257	A	2	1	1.	15	0.067
2258	A	2	1	1.	13	0.077
2259	A	2	2	1.	15	0.133
2260	A	2	2	1.	15	0.133
2261	A	3	3	1.21	15	0.2
2262	A	3	2	1.	15	0.133
2263	A	3	2	1.	15	0.133
2264	A	3	2	1.	13	0.154
2265	A	3	2	1.	11	0.182
2266	A	2	2	1.	15	0.133
2267	A	2	2	1.	15	0.133
2268	A	3	3	1.36	17	0.176
2269	A	10	9	1.	17	0.529
2270	A	3	2	1.	17	0.118
2271	A	3	3	1.36	15	0.2
2272	A	8	8	1.	13	0.615
2273	A	5	5	1.	17	0.294
2274	A	3	3	1.38	17	0.176
2275	A	2	2	1.	17	0.118
2276	A	7	6	1.	17	0.353
2277	A	1	1	1.	15	0.067
2278	A	2	1	1.	13	0.077
2279	A	2	1	1.	13	0.077
2280	A	2	1	1.	13	0.077
2281	A	2	1	1.	11	0.091
2282	A	1	0	1.	9	0.
2283	A	2	1	1.	13	0.077
2284	A	2	1	1.	13	0.077
2285	A	2	1	1.	13	0.077
2286	A	2	1	1.	13	0.077
2287	A	3	2	1.	15	0.133
2288	A	3	2	1.	15	0.133
2289	A	3	2	1.	15	0.133
2290	A	3	2	1.	13	0.154
2291	A	3	2	1.	11	0.182
2292	A	3	2	1.	15	0.133
2293	A	1	1	1.	15	0.067
2294	A	3	2	1.	15	0.133
2295	A	3	2	1.	15	0.133
2296	A	3	2	1.	15	0.133
2297	A	3	2	1.	15	0.133
2298	A	3	2	1.	15	0.133
2299	A	3	2	1.	13	0.154
2300	A	3	2	1.	11	0.182
2301	A	3	2	1.	15	0.133
2302	A	3	2	1.	15	0.133

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
2303	A	3	2	1.	15	0.133
2304	A	3	2	1.	15	0.133
2305	A	3	2	1.	15	0.133
2306	A	3	2	1.	15	0.133
2307	A	3	2	1.	15	0.133
2308	A	3	2	1.	13	0.154
2309	A	3	2	1.	11	0.182
2310	A	3	2	1.	15	0.133
2311	A	3	2	1.	15	0.133
2312	A	1	1	1.	15	0.067
2313	A	3	2	1.	15	0.133
2314	A	3	2	1.	15	0.133
2315	A	3	2	1.	15	0.133
2316	A	3	2	1.	15	0.133
2317	A	3	2	1.	15	0.133
2318	A	3	2	1.	15	0.133
2319	A	3	2	1.	15	0.133
2320	A	3	2	1.	13	0.154
2321	A	3	2	1.	11	0.182
2322	A	3	2	1.	15	0.133
2323	A	3	2	1.	15	0.133
2324	A	3	2	1.	15	0.133
2325	A	3	2	1.	15	0.133
2326	A	3	3	1.	15	0.2
2327	A	6	3	1.	15	0.2
2328	A	3	2	1.	15	0.133
2329	A	3	2	1.	15	0.133
2330	A	3	2	1.	15	0.133
2331	A	3	2	1.	15	0.133
2332	A	3	2	1.	15	0.133
2333	A	3	2	1.	15	0.133
2334	A	3	2	1.	15	0.133
2335	A	3	2	1.	15	0.133
2336	A	3	2	1.	13	0.154
2337	A	3	2	1.	11	0.182
2338	A	3	2	1.	15	0.133
2339	A	3	2	1.	15	0.133
2340	A	3	2	1.	15	0.133
2341	A	3	2	1.	15	0.133
2342	A	3	2	1.	15	0.133
2343	A	4	3	1.	15	0.2
2344	A	7	3	1.	15	0.2
2345	A	10	3	1.	15	0.2
2346	A	3	2	1.	15	0.133
2347	A	3	2	1.	15	0.133
2348	A	3	2	1.	15	0.133
2349	A	3	2	1.	15	0.133
2350	A	3	2	1.	15	0.133
2351	A	3	2	1.	13	0.154

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
2352	A	3	2	1.	11	0.182
2353	A	4	4	1.	15	0.267
2354	A	3	2	1.	15	0.133
2355	A	3	2	1.	15	0.133
2356	A	3	2	1.	15	0.133
2357	A	4	4	1.	15	0.267
2358	A	3	2	1.	15	0.133
2359	A	3	2	1.	15	0.133
2360	A	3	2	1.	13	0.154
2361	A	3	2	1.	11	0.182
2362	A	3	2	1.	15	0.133
2363	A	3	2	1.	15	0.133
2364	A	3	2	1.	15	0.133
2365	A	3	2	1.	15	0.133
2366	A	3	2	1.	15	0.133
2367	A	3	2	1.	15	0.133
2368	A	3	2	1.	13	0.154
2369	A	3	2	1.	11	0.182
2370	A	3	2	1.	15	0.133
2371	A	3	2	1.	15	0.133
2372	A	3	2	1.	15	0.133
2373	A	3	2	1.	15	0.133
2374	A	3	2	1.	11	0.182
2375	A	5	4	1.	15	0.267
2376	A	3	2	1.	15	0.133
2377	A	3	3	1.	9	0.333
2378	A	1	1	1.	15	0.067
2379	A	2	2	1.	15	0.133
2380	A	1	1	1.	17	0.059
2381	A	1	1	1.	17	0.059
2382	A	13	9	1.	15	0.6
2383	A	8	8	1.06	15	0.533
2384	A	5	5	1.	13	0.385
2385	A	5	4	1.	11	0.364
2386	A	4	4	1.	13	0.308
2387	A	2	1	1.	13	0.077
2388	A	2	1	1.	13	0.077
2389	A	2	1	1.	13	0.077
2390	A	2	1	1.	11	0.091
2391	A	1	0	1.	9	0.
2392	A	2	1	1.	13	0.077
2393	A	2	1	1.	13	0.077
2394	A	2	1	1.	13	0.077
2395	A	2	1	1.	13	0.077
2396	A	4	3	1.	15	0.2
2397	A	4	3	1.	15	0.2
2398	A	4	3	1.	15	0.2
2399	A	4	3	1.	13	0.231
2400	A	2	2	1.	11	0.182

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
2401	A	4	3	1.	15	0.2
2402	A	4	3	1.	15	0.2
2403	A	4	3	1.	15	0.2
2404	A	4	3	1.	15	0.2
2405	A	4	3	1.	15	0.2
2406	A	4	3	1.	15	0.2
2407	A	4	3	1.	15	0.2
2408	A	4	3	1.	13	0.231
2409	A	3	2	1.	11	0.182
2410	A	4	3	1.	15	0.2
2411	A	4	3	1.	15	0.2
2412	A	4	3	1.	15	0.2
2413	A	4	3	1.	15	0.2
2414	A	4	3	1.	15	0.2
2415	A	4	3	1.	13	0.231
2416	A	3	2	1.	11	0.182
2417	A	2	2	1.	15	0.133
2418	A	4	3	1.	15	0.2
2419	A	4	3	1.	15	0.2
2420	A	4	3	1.	15	0.2
2421	A	4	3	1.	15	0.2
2422	A	4	3	1.	15	0.2
2423	A	4	3	1.	13	0.231
2424	A	3	2	1.	11	0.182
2425	A	4	3	1.	15	0.2
2426	A	4	3	1.	15	0.2
2427	A	4	3	1.	15	0.2
2428	A	4	3	1.	15	0.2
2429	A	4	3	1.	15	0.2
2430	A	4	3	1.	15	0.2
2431	A	4	3	1.	13	0.231
2432	A	3	2	1.	11	0.182
2433	A	4	3	1.	15	0.2
2434	A	4	3	1.	15	0.2
2435	A	4	3	1.	15	0.2
2436	A	4	3	1.	15	0.2
2437	A	4	3	1.	15	0.2
2438	A	3	2	1.	11	0.182
2439	A	1	1	1.	17	0.059
2440	A	1	1	1.	23	0.043
2441	A	3	2	1.	9	0.222
2442	A	1	1	1.	17	0.059
2443	A	1	1	1.	13	0.077
2444	A	2	1	1.	11	0.091
2445	A	2	1	1.	11	0.091
2446	A	2	1	1.	9	0.111
2447	A	1	0	1.	7	0.
2448	A	2	1	1.	11	0.091
2449	A	2	1	1.	11	0.091

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
2450	A	2	1	1.	11	0.091
2451	A	2	1	1.	13	0.077
2452	A	2	1	1.	13	0.077
2453	A	2	1	1.	11	0.091
2454	A	2	1	1.	9	0.111
2455	A	3	2	1.	13	0.154
2456	A	2	1	1.	13	0.077
2457	A	2	1	1.	13	0.077
2458	A	2	1	1.	13	0.077
2459	A	2	1	1.	13	0.077
2460	A	2	1	1.	11	0.091
2461	A	2	1	1.	9	0.111
2462	A	3	2	1.	13	0.154
2463	A	2	1	1.	13	0.077
2464	A	2	1	1.	13	0.077
2465	A	1	1	1.	11	0.091
2466	A	1	1	1.	9	0.111
2467	A	4	4	1.	13	0.308
2468	A	1	1	1.	13	0.077
2469	A	1	1	1.	13	0.077
2470	A	1	1	1.	11	0.091
2471	A	1	1	1.	9	0.111
2472	A	3	2	1.	13	0.154
2473	A	1	1	1.	13	0.077
2474	A	1	1	1.	13	0.077
2475	A	1	1	1.	11	0.091
2476	A	1	1	1.	9	0.111
2477	A	3	2	1.	13	0.154
2478	A	1	1	1.	13	0.077
2479	A	1	1	1.	13	0.077
2480	A	2	2	1.19	13	0.154
2481	A	2	2	1.23	11	0.182
2482	A	4	4	1.	15	0.267
2483	A	2	2	1.18	15	0.133
2484	A	2	2	1.18	15	0.133
2485	A	2	2	1.21	13	0.154
2486	A	2	2	1.26	11	0.182
2487	A	5	4	1.	15	0.267
2488	A	2	2	1.2	15	0.133
2489	A	2	2	1.2	15	0.133
2490	A	2	2	1.25	13	0.154
2491	A	2	2	1.31	11	0.182
2492	A	6	4	1.	15	0.267
2493	A	2	2	1.24	15	0.133
2494	A	2	2	1.24	15	0.133
2495	A	2	2	1.19	13	0.154
2496	A	2	2	1.23	11	0.182
2497	A	3	3	1.	15	0.2
2498	A	2	2	1.18	15	0.133

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
2499	A	2	2	1.18	15	0.133
2500	A	2	2	1.25	13	0.154
2501	A	2	2	1.31	11	0.182
2502	A	4	4	1.	15	0.267
2503	A	2	2	1.24	15	0.133
2504	A	2	2	1.24	15	0.133
2505	A	2	2	1.25	13	0.154
2506	A	2	2	1.31	11	0.182
2507	A	5	4	1.	15	0.267
2508	A	2	2	1.24	15	0.133
2509	A	2	2	1.24	15	0.133
2510	A	6	6	1.	15	0.4
2511	A	2	1	1.	15	0.067
2512	A	2	1	1.	15	0.067
2513	A	2	1	1.	15	0.067
2514	A	2	1	1.	13	0.077
2515	A	2	1	1.	11	0.091
2516	A	2	1	1.	15	0.067
2517	A	2	1	1.	15	0.067
2518	A	2	1	1.	15	0.067
2519	A	2	1	1.	15	0.067
2520	A	2	1	1.	15	0.067
2521	A	3	2	1.	17	0.118
2522	A	3	2	1.	17	0.118
2523	A	3	2	1.	17	0.118
2524	A	1	1	1.	15	0.067
2525	A	3	2	1.	13	0.154
2526	A	3	2	1.	17	0.118
2527	A	3	2	1.	17	0.118
2528	A	1	1	1.	17	0.059
2529	A	3	2	1.	17	0.118
2530	A	3	2	1.	17	0.118
2531	A	3	2	1.	17	0.118
2532	A	3	2	1.	17	0.118
2533	A	3	2	1.	17	0.118
2534	A	3	2	1.	17	0.118
2535	A	1	1	1.	15	0.067
2536	A	3	2	1.	13	0.154
2537	A	3	2	1.	17	0.118
2538	A	3	2	1.	17	0.118
2539	A	3	2	1.	17	0.118
2540	A	1	1	1.	17	0.059
2541	A	3	3	1.	17	0.176
2542	A	3	2	1.	17	0.118
2543	A	3	2	1.	17	0.118
2544	A	3	2	1.	17	0.118
2545	A	3	2	1.	17	0.118
2546	A	3	2	1.	17	0.118
2547	A	1	1	1.	15	0.067

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
2548	A	3	2	1.	13	0.154
2549	A	3	2	1.	17	0.118
2550	A	3	2	1.	17	0.118
2551	A	3	2	1.	17	0.118
2552	A	3	2	1.	17	0.118
2553	A	3	2	1.	17	0.118
2554	A	1	1	1.	17	0.059
2555	A	3	3	1.	17	0.176
2556	A	4	3	1.	17	0.176
2557	A	3	2	1.	17	0.118
2558	A	3	2	1.	17	0.118
2559	A	3	2	1.	17	0.118
2560	A	3	2	1.	17	0.118
2561	A	3	2	1.	17	0.118
2562	A	3	2	1.	17	0.118
2563	A	3	2	1.	17	0.118
2564	A	3	2	1.	17	0.118
2565	A	3	2	1.	17	0.118
2566	A	3	2	1.	17	0.118
2567	A	1	1	1.	15	0.067
2568	A	3	2	1.	13	0.154
2569	A	3	2	1.	17	0.118
2570	A	3	2	1.	17	0.118
2571	A	3	2	1.	17	0.118
2572	A	3	2	1.	17	0.118
2573	A	3	2	1.	17	0.118
2574	A	3	2	1.	17	0.118
2575	A	3	2	1.	17	0.118
2576	A	3	2	1.	17	0.118
2577	A	1	1	1.	17	0.059
2578	A	3	3	1.	17	0.176
2579	A	4	3	1.	17	0.176
2580	A	5	3	1.	17	0.176
2581	A	6	3	1.	17	0.176
2582	A	3	2	1.	17	0.118
2583	A	3	2	1.	17	0.118
2584	A	1	1	1.	15	0.067
2585	A	1	1	1.	13	0.077
2586	A	1	1	1.	13	0.077
2587	A	1	1	1.	13	0.077
2588	A	1	1	1.	19	0.053
2589	A	1	1	1.	23	0.043
2590	A	3	2	1.	17	0.118
2591	A	3	2	1.	17	0.118
2592	A	3	2	1.	17	0.118
2593	A	3	2	1.	17	0.118
2594	A	1	1	1.	15	0.067
2595	A	4	4	1.	13	0.308
2596	A	3	2	1.	17	0.118

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
2597	A	3	2	1.	17	0.118
2598	A	3	2	1.	17	0.118
2599	A	3	2	1.	19	0.105
2600	A	3	2	1.	19	0.105
2601	A	3	2	1.	19	0.105
2602	A	3	2	1.	19	0.105
2603	A	1	1	1.	15	0.067
2604	A	4	4	1.	13	0.308
2605	A	3	2	1.	17	0.118
2606	A	3	2	1.	19	0.105
2607	A	3	2	1.	19	0.105
2608	A	3	2	1.	17	0.118
2609	A	3	2	1.	17	0.118
2610	A	3	2	1.	17	0.118
2611	A	3	2	1.	17	0.118
2612	A	1	1	1.	15	0.067
2613	A	4	4	1.	13	0.308
2614	A	3	2	1.	17	0.118
2615	A	3	2	1.	17	0.118
2616	A	3	2	1.	17	0.118
2617	A	3	2	1.	17	0.118
2618	A	3	2	1.	17	0.118
2619	A	3	2	1.	17	0.118
2620	A	1	1	1.	15	0.067
2621	A	3	2	1.	13	0.154
2622	A	3	2	1.	17	0.118
2623	A	3	2	1.	17	0.118
2624	A	3	2	1.	17	0.118
2625	A	3	2	1.	17	0.118
2626	A	3	2	1.	17	0.118
2627	A	1	1	1.	17	0.059
2628	A	1	1	1.	15	0.067
2629	A	3	2	1.	13	0.154
2630	A	3	2	1.	17	0.118
2631	A	3	2	1.	17	0.118
2632	A	4	4	1.	19	0.21
2633	A	8	8	1.	19	0.421
2634	A	11	8	1.	19	0.421
2635	A	3	2	1.	17	0.118
2636	A	4	4	1.	19	0.21
2637	A	9	9	1.	19	0.474
2638	A	12	9	1.	19	0.474
2639	A	5	5	1.	19	0.263
2640	A	10	10	1.	19	0.526
2641	A	13	10	1.	19	0.526
2642	A	3	2	1.	19	0.105
2643	A	3	2	1.	19	0.105
2644	A	3	2	1.	19	0.105
2645	A	1	1	1.	17	0.059

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
2646	A	4	4	1.	15	0.267
2647	A	4	4	1.	19	0.21
2648	A	5	5	1.	19	0.263
2649	A	6	5	1.	19	0.263
2650	A	7	5	1.	19	0.263
2651	A	3	2	1.	19	0.105
2652	A	3	2	1.	19	0.105
2653	A	3	2	1.	19	0.105
2654	A	1	1	1.	17	0.059
2655	A	3	3	1.	15	0.2
2656	A	4	4	1.	19	0.21
2657	A	5	4	1.	19	0.21
2658	A	6	4	1.	19	0.21
2659	A	7	4	1.	19	0.21
2660	A	2	1	1.	13	0.077
2661	A	2	1	1.	13	0.077
2662	A	2	1	1.	11	0.091
2663	A	1	1	1.	13	0.077
2664	A	1	1	1.	13	0.077
2665	A	1	1	1.	13	0.077
2666	A	2	2	1.18	15	0.133
2667	A	2	2	1.16	15	0.133
2668	A	2	2	1.16	15	0.133
2669	A	2	2	1.22	15	0.133
2670	A	2	2	1.22	15	0.133
2671	A	2	2	1.19	19	0.105
2672	A	2	2	1.16	17	0.118
2673	A	2	2	1.16	19	0.105
2674	A	2	2	1.18	19	0.105
2675	A	2	2	1.14	19	0.105
2676	A	2	2	1.15	17	0.118
2677	A	2	2	1.14	19	0.105
2678	A	2	2	1.14	19	0.105
2679	C	5	2	8.4	42	0.048
2680	A	5	3	1.	21	0.143
2681	A	4	3	1.	21	0.143
2682	A	3	3	1.	21	0.143
2683	A	3	3	1.	21	0.143
2684	A	1	1	1.	21	0.048
2685	A	2	2	1.	21	0.095
2686	A	3	2	1.	21	0.095
2687	A	4	2	1.	21	0.095
2688	A	2	2	1.23	17	0.118
2689	A	2	2	1.21	19	0.105
2690	C	5	2	6.15	45	0.044
2691	A	2	2	1.	37	0.054
2692	C	5	2	8.4	42	0.048
2693	A	2	2	1.	19	0.105
2694	A	3	3	1.	21	0.143

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
2695	A	2	2	1.	21	0.095
2696	A	3	3	1.	21	0.143
2697	A	2	2	1.15	13	0.154
2698	A	4	2	1.	15	0.133
2699	A	3	2	1.	15	0.133
2700	A	2	2	1.	15	0.133
2701	A	1	1	1.	15	0.067
2702	A	2	2	1.	13	0.154
2703	A	2	2	1.	15	0.133
2704	A	2	2	1.	15	0.133
2705	A	2	2	1.	11	0.182
2706	A	2	2	1.	11	0.182
2707	A	2	2	1.	9	0.222
2708	A	2	2	1.	7	0.286
2709	A	2	2	1.	11	0.182
2710	A	2	2	1.	11	0.182
2711	A	2	2	1.	11	0.182
2712	A	2	2	1.	11	0.182
2713	A	1	1	1.	15	0.067
2714	A	3	2	1.	17	0.118
2715	A	3	2	1.	17	0.118
2716	A	3	2	1.	17	0.118
2717	A	1	1	1.	21	0.048
2718	A	1	1	1.	17	0.059
2719	A	1	1	1.	17	0.059
2720	A	1	1	1.	13	0.077
2721	A	4	4	1.	13	0.308
2722	A	4	4	1.	13	0.308
2723	A	4	2	1.	18	0.111
2724	A	3	2	1.	18	0.111
2725	A	2	2	1.	18	0.111
2726	A	1	1	1.	16	0.062
2727	A	2	2	1.	13	0.154
2728	A	2	2	1.	18	0.111
2729	A	2	2	1.	18	0.111
2730	A	2	2	1.	15	0.133
2731	A	1	1	1.	15	0.067
2732	A	1	1	1.	15	0.067
2733	A	2	1	1.	17	0.059
2734	A	2	1	1.	17	0.059
2735	A	2	1	1.	15	0.067
2736	A	2	2	1.	17	0.118
2737	A	3	3	1.	17	0.176
2738	A	4	3	1.	17	0.176
2739	A	6	4	1.	19	0.21
2740	A	5	4	1.	19	0.21
2741	A	4	4	1.	19	0.21
2742	A	3	3	1.	19	0.158
2743	A	1	1	1.	19	0.053

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
2744	A	2	2	1.	19	0.105
2745	A	3	2	1.	19	0.105
2746	A	1	1	1.	15	0.067
2747	A	1	1	1.	17	0.059
2748	A	6	3	1.	15	0.2
2749	A	2	1	1.	15	0.067
2750	A	2	1	1.	15	0.067
2751	A	2	1	1.	13	0.077
2752	A	2	1	1.	15	0.067
2753	A	2	1	1.	15	0.067
2754	A	2	1	1.	15	0.067
2755	A	5	5	1.	21	0.238
2756	A	9	9	1.	21	0.429
2757	A	12	9	1.	21	0.429
2758	A	4	3	1.	19	0.158
2759	A	5	5	1.	21	0.238
2760	A	10	10	1.	21	0.476
2761	A	13	10	1.	21	0.476
2762	A	6	6	1.	21	0.286
2763	A	11	11	1.	21	0.524
2764	A	14	11	1.	21	0.524
2765	A	1	1	1.	17	0.059
2766	A	1	1	1.	17	0.059
2767	A	1	1	1.	17	0.059
2768	A	1	1	1.	17	0.059
2769	A	1	1	1.	15	0.067
2770	A	2	2	1.	17	0.118
2771	A	1	1	1.	17	0.059
2772	A	1	1	1.	17	0.059
2773	A	1	1	1.	17	0.059
2774	A	6	4	1.	23	0.174
2775	A	5	4	1.	23	0.174
2776	A	4	4	1.	23	0.174
2777	A	4	4	1.	23	0.174
2778	A	1	1	1.	23	0.043
2779	A	2	2	1.	23	0.087
2780	A	3	2	1.	23	0.087
2781	A	4	2	1.	23	0.087
2782	A	2	2	1.14	15	0.133
2783	A	2	2	1.18	17	0.118
2784	A	2	2	1.18	17	0.118
2785	A	2	2	1.19	15	0.133
2786	A	2	2	1.21	9	0.222
2787	A	2	2	1.21	17	0.118
2788	A	2	2	1.18	17	0.118
2789	A	2	2	1.18	17	0.118
2790	A	2	2	1.	20	0.1
2791	A	1	1	1.	23	0.043
2792	A	2	2	1.	23	0.087

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
2793	A	3	2	1.	23	0.087
2794	A	4	2	1.	23	0.087
2795	A	3	3	1.	13	0.231
2796	A	3	3	1.	13	0.231
2797	A	3	3	1.	13	0.231
2798	A	3	3	1.	13	0.231
2799	A	3	3	1.	13	0.231
2800	A	3	3	1.	13	0.231
2801	A	3	3	1.	11	0.273
2802	A	3	3	1.	11	0.273
2803	A	3	3	1.	11	0.273
2804	A	3	3	1.	11	0.273
2805	A	3	3	1.	13	0.231
2806	A	3	3	1.	13	0.231
2807	A	3	3	1.	13	0.231
2808	A	3	3	1.	13	0.231
2809	A	3	3	1.	13	0.231
2810	A	3	3	1.	13	0.231
2811	A	3	3	1.	13	0.231
2812	A	3	3	1.	13	0.231
2813	A	3	3	1.	13	0.231
2814	A	3	3	1.	13	0.231
2815	A	3	3	1.	13	0.231
2816	A	3	3	1.	13	0.231
2817	A	3	3	1.	13	0.231
2818	A	3	3	1.	13	0.231
2819	A	3	3	1.	13	0.231
2820	A	3	3	1.	13	0.231
2821	A	3	3	1.	13	0.231
2822	A	3	3	1.	13	0.231
2823	A	3	3	1.	13	0.231
2824	A	3	3	1.	13	0.231
2825	A	3	3	1.	13	0.231
2826	A	3	3	1.	13	0.231
2827	A	3	3	1.	13	0.231
2828	A	3	3	1.	13	0.231
2829	A	3	3	1.	13	0.231
2830	A	3	3	1.	15	0.2
2831	A	3	3	1.	15	0.2
2832	A	3	3	1.	15	0.2
2833	A	3	3	1.	15	0.2
2834	A	3	2	1.	19	0.105
2835	A	4	3	1.	21	0.143
2836	A	4	3	1.	21	0.143
2837	A	1	1	1.	13	0.077
2838	A	1	1	1.	13	0.077
2839	A	1	1	1.	13	0.077
2840	A	4	3	1.	21	0.143
2841	A	3	3	1.24	21	0.143

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
2842	A	4	3	1.	21	0.143
2843	A	3	3	1.24	21	0.143
2844	A	1	1	1.	19	0.053
2845	A	3	3	1.	21	0.143
2846	A	3	2	1.	19	0.105
2847	A	3	2	1.	21	0.095
2848	A	3	2	1.	21	0.095
2849	A	3	2	1.	22	0.091
2850	A	3	2	1.	24	0.083
2851	A	3	2	1.	24	0.083
2852	A	8	8	1.	21	0.381
2853	A	8	8	1.	21	0.381
2854	A	1	1	1.	21	0.048
2855	A	7	7	1.	19	0.368
2856	A	7	7	1.	13	0.538
2857	A	5	5	1.	21	0.238
2858	A	8	8	1.	21	0.381
2859	A	8	8	1.	21	0.381
2860	A	4	3	1.	21	0.143
2861	A	8	8	1.	21	0.381
2862	A	8	8	1.	21	0.381
2863	A	1	1	1.	21	0.048
2864	A	8	8	1.	19	0.421
2865	A	8	8	1.	13	0.615
2866	A	4	3	1.	21	0.143
2867	A	9	9	1.	21	0.429
2868	A	9	9	1.	21	0.429
2869	A	4	3	1.	21	0.143
2870	A	9	9	1.	21	0.429
2871	A	9	9	1.	21	0.429
2872	A	1	1	1.	21	0.048
2873	A	9	8	1.	19	0.421
2874	A	9	8	1.	13	0.615
2875	A	4	3	1.	21	0.143
2876	A	10	9	1.	21	0.429
2877	A	10	9	1.	21	0.429
2878	A	4	3	1.	21	0.143
2879	A	8	8	1.	24	0.333
2880	A	8	8	1.	24	0.333
2881	A	1	1	1.	24	0.042
2882	A	7	7	1.	22	0.318
2883	A	5	5	1.	24	0.208
2884	A	8	8	1.	24	0.333
2885	A	8	8	1.	24	0.333
2886	A	4	3	1.	24	0.125
2887	A	8	8	1.	24	0.333
2888	A	8	8	1.	24	0.333
2889	A	1	1	1.	24	0.042
2890	A	8	8	1.	22	0.364

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
2891	A	4	3	1.	24	0.125
2892	A	9	9	1.	24	0.375
2893	A	9	9	1.	24	0.375
2894	A	4	3	1.	24	0.125
2895	A	9	9	1.	24	0.375
2896	A	9	9	1.	24	0.375
2897	A	1	1	1.	24	0.042
2898	A	9	8	1.	22	0.364
2899	A	4	3	1.	24	0.125
2900	A	10	9	1.	24	0.375
2901	A	10	9	1.	24	0.375
2902	A	4	3	1.	24	0.125
2903	A	1	1	1.	21	0.048
2904	A	1	1	1.	19	0.053
2905	A	1	1	1.	21	0.048
2906	A	1	1	1.	21	0.048
2907	A	1	1	1.	21	0.048
2908	A	1	1	1.	21	0.048
2909	A	1	1	1.	21	0.048
2910	A	2	2	1.	15	0.133
2911	A	7	6	1.	17	0.353
2912	A	5	5	1.	21	0.238
2913	A	5	5	1.	21	0.238
2914	A	6	6	1.	21	0.286
2915	A	6	6	1.	21	0.286
2916	A	3	3	1.	17	0.176
2917	A	4	4	1.	15	0.267
2918	A	4	4	1.	13	0.308
2919	A	3	3	1.	11	0.273
2920	A	4	4	1.	15	0.267
2921	A	4	4	1.	15	0.267
2922	A	7	7	1.	11	0.636
2923	A	3	2	1.	21	0.095
2924	A	3	2	1.	21	0.095
2925	A	4	3	1.	19	0.158
2926	A	4	4	1.	21	0.19
2927	A	5	5	1.	21	0.238
2928	A	7	5	1.	21	0.238
2929	A	3	2	1.	21	0.095
2930	A	3	2	1.	21	0.095
2931	A	2	2	1.	17	0.118
2932	A	4	4	1.	21	0.19
2933	A	6	5	1.	21	0.238
2934	A	8	5	1.	21	0.238
2935	A	4	3	1.	21	0.143
2936	A	4	3	1.	21	0.143
2937	A	2	2	1.	21	0.095
2938	A	5	5	1.	21	0.238
2939	A	5	5	1.	21	0.238

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
2940	A	4	4	1.	21	0.19
2941	A	3	3	1.	17	0.176
2942	A	3	3	1.	21	0.143
2943	A	4	4	1.	21	0.19
2944	A	6	6	1.	21	0.286
2945	A	6	6	1.	19	0.316
2946	A	5	5	1.	21	0.238
2947	A	6	6	1.	21	0.286
2948	A	3	3	1.	23	0.13
2949	A	3	3	1.	23	0.13
2950	A	4	4	1.	23	0.174
2951	A	4	4	1.	23	0.174
2952	A	2	2	1.	11	0.182
2953	A	4	3	1.	21	0.143
2954	A	4	3	1.	21	0.143
2955	A	5	5	1.	21	0.238
2956	A	6	6	1.	21	0.286
2957	A	5	5	1.	19	0.263
2958	A	4	4	1.	21	0.19
2959	A	6	5	1.	21	0.238
2960	A	8	7	1.	21	0.333
2961	A	6	6	1.	17	0.353
2962	A	7	7	1.	21	0.333
2963	A	4	3	1.	21	0.143
2964	A	4	3	1.	21	0.143
2965	A	5	5	1.	21	0.238
2966	A	6	6	1.03	21	0.286
2967	A	6	6	1.	21	0.286
2968	A	7	6	1.	21	0.286
2969	A	5	5	1.	17	0.294
2970	A	6	6	1.01	21	0.286
2971	A	5	5	1.	23	0.217
2972	A	5	5	1.	23	0.217
2973	A	6	6	1.	23	0.261
2974	A	6	6	1.	23	0.261
2975	A	8	6	1.02	19	0.316
2976	A	6	6	1.	17	0.353
2977	A	5	5	1.	21	0.238
2978	A	4	3	1.	21	0.143
2979	A	4	3	1.	21	0.143
2980	A	4	3	1.	21	0.143
2981	A	8	5	1.02	19	0.263
2982	A	6	5	1.	17	0.294
2983	A	4	4	1.	21	0.19
2984	A	4	3	1.	21	0.143
2985	A	4	3	1.	21	0.143
2986	A	4	3	1.	21	0.143
2987	A	6	5	1.	13	0.385
2988	A	6	6	1.	23	0.261

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
2989	A	6	6	1.33	23	0.261
2990	A	5	5	1.	23	0.217
2991	A	5	5	1.	23	0.217
2992	A	6	6	1.	23	0.261
2993	A	6	6	1.34	23	0.261
2994	A	5	5	1.	23	0.217
2995	A	5	5	1.	23	0.217
2996	A	3	2	1.	13	0.154
2997	A	2	2	1.	15	0.133
2998	A	2	2	1.	15	0.133
2999	A	3	2	1.	19	0.105
3000	A	3	2	1.	19	0.105
3001	A	3	2	1.	17	0.118
3002	A	2	2	1.	15	0.133
3003	A	4	4	1.	19	0.21
3004	A	3	2	1.	19	0.105
3005	A	3	2	1.	19	0.105
3006	A	3	2	1.	19	0.105
3007	A	3	2	1.	19	0.105
3008	A	3	2	1.	17	0.118
3009	A	2	2	1.6	15	0.133
3010	A	3	2	1.	19	0.105
3011	A	3	2	1.	19	0.105
3012	A	3	2	1.	19	0.105
3013	A	2	2	1.	15	0.133
3014	A	3	2	1.	13	0.154
3015	A	3	2	1.	19	0.105
3016	A	3	2	1.	19	0.105
3017	A	3	2	1.	17	0.118
3018	A	2	2	1.	15	0.133
3019	A	2	2	1.	19	0.105
3020	A	2	2	1.	19	0.105
3021	A	3	2	1.	17	0.118
3022	A	3	2	1.	17	0.118
3023	A	3	2	1.	15	0.133
3024	A	2	2	1.	17	0.118
3025	A	3	3	1.	17	0.176
3026	A	4	3	1.	17	0.176
3027	A	2	2	1.	13	0.154
3028	A	2	2	1.	13	0.154
3029	A	2	2	1.	13	0.154
3030	A	2	2	1.	13	0.154
3031	A	2	2	1.	15	0.133
3032	A	2	2	1.	15	0.133
3033	A	3	2	1.	17	0.118
3034	A	3	2	1.	17	0.118
3035	A	3	2	1.	15	0.133
3036	A	7	7	1.	17	0.412
3037	A	8	8	1.	17	0.471

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
3038	A	9	8	1.	17	0.471
3039	A	3	3	1.	19	0.158
3040	A	3	3	1.	17	0.176
3041	A	3	3	1.	15	0.2
3042	A	3	3	1.	13	0.231
3043	A	3	3	1.	17	0.176
3044	A	3	3	1.	17	0.176
3045	A	4	4	1.	26	0.154
3046	A	9	8	1.	26	0.308
3047	A	7	7	1.	24	0.292
3048	A	5	5	1.	22	0.227
3049	A	8	7	1.	26	0.269
3050	A	6	6	1.	26	0.231
3051	A	7	7	1.	26	0.269
3052	A	9	8	1.	26	0.308
3053	A	4	4	1.	26	0.154
3054	A	10	7	1.	26	0.269
3055	A	8	7	1.	24	0.292
3056	A	6	6	1.	22	0.273
3057	A	4	4	1.	26	0.154
3058	A	5	5	1.	26	0.192
3059	A	6	6	1.	26	0.231
3060	A	8	7	1.	26	0.269
3061	A	2	2	1.	15	0.133
3062	A	5	5	1.	16	0.312
3063	A	4	3	1.	25	0.12
3064	A	4	3	1.	25	0.12
3065	A	4	3	1.	25	0.12
3066	A	5	3	1.	23	0.13
3067	A	4	3	1.	25	0.12
3068	A	4	3	1.	25	0.12
3069	A	3	3	1.	25	0.12
3070	A	4	3	1.	25	0.12
3071	A	4	3	1.	25	0.12

3 Listing of integrals

3.1 $\int (bx)^p(cx)^m\,dx$

Optimal. Leaf size=22

$$\frac{(bx)^{p+1}(cx)^m}{b(m+p+1)}$$

```
[Out] ((b*x)^(1 + p)*(c*x)^m)/(b*(1 + m + p))
```

Rubi [A] time = 0.0227751, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{(bx)^{p+1}(cx)^m}{b(m+p+1)}$$

Antiderivative was successfully verified.

```
[In] Int[(b*x)^p*(c*x)^m,x]
```

```
[Out] ((b*x)^(1 + p)*(c*x)^m)/(b*(1 + m + p))
```

Rubi in Sympy [A] time = 3.4361, size = 24, normalized size = 1.09

$$\frac{(bx)^{-m}\,(bx)^{m+p+1}\,(cx)^m}{b\,(m+p+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x)**p*(c*x)**m,x)
```

```
[Out] (b*x)**(-m)*(b*x)**(m + p + 1)*(c*x)**m/(b*(m + p + 1))
```

Mathematica [A] time = 0.00695899, size = 18, normalized size = 0.82

$$\frac{x(bx)^p(cx)^m}{m+p+1}$$

Antiderivative was successfully verified.

```
[In] Integrate[(b*x)^p*(c*x)^m,x]
```

```
[Out] (x*(b*x)^p*(c*x)^m)/(1 + m + p)
```

Maple [A] time = 0.002, size = 19, normalized size = 0.9

$$\frac{x\,(bx)^p\,(cx)^m}{1+m+p}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x)^p*(c*x)^m,x)
```

```
[Out] x/(1+m+p)*(b*x)^p*(c*x)^m
```

Maxima [A] time = 1.44001, size = 32, normalized size = 1.45

$$\frac{b^p c^m x e^{(m\log(x)+p\log(x))}}{m+p+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x)^p*(c*x)^m,x, algorithm="maxima")

[Out] b^p*c^m*x*e^(m*log(x) + p*log(x))/(m + p + 1)
```

Fricas [A] time = 0.2681, size = 39, normalized size = 1.77

$$\frac{(bx)^p xe^{\left(m\log(bx)+m\log\left(\frac{c}{b}\right)\right)}}{m+p+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x)^p*(c*x)^m,x, algorithm="fricas")

[Out] (b*x)^p*x*e^(m*log(b*x) + m*log(c/b))/(m + p + 1)
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x)**p*(c*x)**m,x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [A] time = 0.210412, size = 35, normalized size = 1.59

$$\frac{xe^{(p\ln(b)+m\ln(c)+m\ln(x)+p\ln(x))}}{m+p+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x)^p*(c*x)^m,x, algorithm="giac")

[Out] x*e^(p*ln(b) + m*ln(c) + m*ln(x) + p*ln(x))/(m + p + 1)
```

3.2 $\int x^3\sqrt{bx^2}\,dx$

Optimal. Leaf size=16

$$\frac{1}{5}x^4\sqrt{bx^2}$$

```
[Out] (x^4*Sqrt[b*x^2])/5
```

Rubi [A] time = 0.00647422, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{1}{5}x^4\sqrt{bx^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3*Sqrt[b*x^2],x]

[Out] (x^4*Sqrt[b*x^2])/5
```

Rubi in Sympy [A] time = 2.56971, size = 12, normalized size = 0.75

$$\frac{(bx^2)^{\frac{5}{2}}}{5b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3*(b*x**2)**(1/2),x)

[Out] (b*x**2)**(5/2)/(5*b**2)
```

Mathematica [A] time = 0.00312335, size = 16, normalized size = 1.

$$\frac{1}{5}x^4\sqrt{bx^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3*Sqrt[b*x^2],x]

[Out] (x^4*Sqrt[b*x^2])/5
```

Maple [A] time = 0.004, size = 13, normalized size = 0.8

$$\frac{x^4}{5}\sqrt{bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3*(b*x^2)^(1/2),x)

[Out] 1/5*x^4*(b*x^2)^(1/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2)*x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.229734, size = 16, normalized size = 1.

$$\frac{1}{5}\sqrt{bx^2}x^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2)*x^3,x, algorithm="fricas")
```

```
[Out] 1/5*sqrt(b*x^2)*x^4
```

Sympy [A] time = 0.917808, size = 15, normalized size = 0.94

$$\frac{\sqrt{b}x^4\sqrt{x^2}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(b*x**2)**(1/2),x)
```

```
[Out] sqrt(b)*x**4*sqrt(x**2)/5
```

GIAC/XCAS [A] time = 0.217069, size = 14, normalized size = 0.88

$$\frac{1}{5}\sqrt{b}x^5\operatorname{sign}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2)*x^3,x, algorithm="giac")
```

```
[Out] 1/5*sqrt(b)*x^5*sign(x)
```

3.3 $\int x^2\sqrt{bx^2}\,dx$

Optimal. Leaf size=16

$$\frac{1}{4}x^3\sqrt{bx^2}$$

```
[Out] (x^3*Sqrt[b*x^2])/4
```

Rubi [A] time = 0.00663837, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{1}{4}x^3\sqrt{bx^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*Sqrt[b*x^2],x]

[Out] (x^3*Sqrt[b*x^2])/4
```

Rubi in Sympy [A] time = 1.93493, size = 12, normalized size = 0.75

$$\frac{x^3\sqrt{bx^2}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**2*(b*x**2)**(1/2),x)

[Out] x**3*sqrt(b*x**2)/4
```

Mathematica [A] time = 0.00193494, size = 16, normalized size = 1.

$$\frac{1}{4}x^3\sqrt{bx^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*Sqrt[b*x^2],x]

[Out] (x^3*Sqrt[b*x^2])/4
```

Maple [A] time = 0.004, size = 13, normalized size = 0.8

$$\frac{x^3}{4}\sqrt{bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(b*x^2)^(1/2),x)

[Out] 1/4*x^3*(b*x^2)^(1/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2)*x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.233431, size = 16, normalized size = 1.

$$\frac{1}{4}\sqrt{bx^2}x^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2)*x^2,x, algorithm="fricas")
```

```
[Out] 1/4*sqrt(b*x^2)*x^3
```

Sympy [A] time = 0.670121, size = 15, normalized size = 0.94

$$\frac{\sqrt{b}x^3\sqrt{x^2}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(b*x**2)**(1/2),x)
```

```
[Out] sqrt(b)*x**3*sqrt(x**2)/4
```

GIAC/XCAS [A] time = 0.212732, size = 14, normalized size = 0.88

$$\frac{1}{4}\sqrt{b}x^4\operatorname{sign}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2)*x^2,x, algorithm="giac")
```

```
[Out] 1/4*sqrt(b)*x^4*sign(x)
```

3.4 $\int x\sqrt{bx^2}\,dx$

Optimal. Leaf size=16

$$\frac{1}{3}x^2\sqrt{bx^2}$$

```
[Out] (x^2*Sqrt[b*x^2])/3
```

Rubi [A] time = 0.00729945, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{1}{3}x^2\sqrt{bx^2}$$

Antiderivative was successfully verified.

```
[In] Int[x*Sqrt[b*x^2],x]

[Out] (x^2*Sqrt[b*x^2])/3
```

Rubi in Sympy [A] time = 2.11791, size = 10, normalized size = 0.62

$$\frac{(bx^2)^{\frac{3}{2}}}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x*(b*x**2)**(1/2),x)

[Out] (b*x**2)**(3/2)/(3*b)
```

Mathematica [A] time = 0.00201301, size = 16, normalized size = 1.

$$\frac{1}{3}x^2\sqrt{bx^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*Sqrt[b*x^2],x]

[Out] (x^2*Sqrt[b*x^2])/3
```

Maple [A] time = 0.003, size = 13, normalized size = 0.8

$$\frac{x^2}{3}\sqrt{bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(b*x^2)^(1/2),x)

[Out] 1/3*x^2*(b*x^2)^(1/2)
```

Maxima [A] time = 1.44502, size = 16, normalized size = 1.

$$\frac{(bx^2)^{\frac{3}{2}}}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2)*x,x, algorithm="maxima")
```

```
[Out] 1/3*(b*x^2)^(3/2)/b
```

Fricas [A] time = 0.224265, size = 16, normalized size = 1.

$$\frac{1}{3}\sqrt{bx^2}x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2)*x,x, algorithm="fricas")
```

```
[Out] 1/3*sqrt(b*x^2)*x^2
```

Sympy [A] time = 0.507729, size = 15, normalized size = 0.94

$$\frac{\sqrt{b}x^2\sqrt{x^2}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(b*x**2)**(1/2),x)
```

```
[Out] sqrt(b)*x**2*sqrt(x**2)/3
```

GIAC/XCAS [A] time = 0.218895, size = 14, normalized size = 0.88

$$\frac{1}{3}\sqrt{b}x^3\mathrm{sign}\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2)*x,x, algorithm="giac")
```

```
[Out] 1/3*sqrt(b)*x^3*sign(x)
```

3.5 $\int \sqrt{bx^2}\, dx$

Optimal. Leaf size=14

$$\frac{1}{2}x\sqrt{bx^2}$$

```
[Out] (x*Sqrt[b*x^2])/2
```

Rubi [A] time = 0.00703291, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$

$$\frac{1}{2}x\sqrt{bx^2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[b*x^2],x]

[Out] (x*Sqrt[b*x^2])/2
```

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

$$\frac{\sqrt{bx^2}\int x\, dx}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**2)**(1/2),x)

[Out] sqrt(b*x**2)*Integral(x, x)/x
```

Mathematica [A] time = 0.00142296, size = 14, normalized size = 1.

$$\frac{1}{2}x\sqrt{bx^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[b*x^2],x]

[Out] (x*Sqrt[b*x^2])/2
```

Maple [A] time = 0.002, size = 11, normalized size = 0.8

$$\frac{x}{2}\sqrt{bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^2)^(1/2),x)

[Out] 1/2*x*(b*x^2)^(1/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [A] time = 0.237769, size = 14, normalized size = 1.

$$\frac{1}{2}\sqrt{bx^2}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2),x, algorithm="fricas")

[Out] 1/2*sqrt(b*x^2)*x
```

Sympy [A] time = 0.410708, size = 14, normalized size = 1.

$$\frac{\sqrt{b}x\sqrt{x^2}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**2)**(1/2),x)

[Out] sqrt(b)*x*sqrt(x**2)/2
```

GIAC/XCAS [A] time = 0.217012, size = 14, normalized size = 1.

$$\frac{1}{2}\sqrt{b}x^2\text{sign}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2),x, algorithm="giac")

[Out] 1/2*sqrt(b)*x^2*sign(x)
```

3.6 $\int \frac{\sqrt{bx^2}}{x}\,dx$

Optimal. Leaf size=9

$$\sqrt{bx^2}$$

```
[Out] Sqrt[b*x^2]
```

Rubi [A] time = 0.00514821, antiderivative size = 9, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\sqrt{bx^2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[b*x^2]/x,x]

[Out] Sqrt[b*x^2]
```

Rubi in Sympy [A] time = 2.27226, size = 7, normalized size = 0.78

$$\sqrt{bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**2)**(1/2)/x,x)

[Out] sqrt(b*x**2)
```

Mathematica [A] time = 0.0033611, size = 14, normalized size = 1.56

$$\frac{bx^2}{\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[b*x^2]/x,x]

[Out] (b*x^2)/Sqrt[b*x^2]
```

Maple [A] time = 0.002, size = 8, normalized size = 0.9

$$\sqrt{bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^2)^(1/2)/x,x)

[Out] (b*x^2)^(1/2)
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2)/x,x, algorithm="maxima")

[Out] Exception raised: RuntimeError
```

Fricas [A] time = 0.234135, size = 9, normalized size = 1.

$$\sqrt{bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2)/x,x, algorithm="fricas")

[Out] sqrt(b*x^2)
```

Sympy [A] time = 0.390247, size = 10, normalized size = 1.11

$$\sqrt{b}\sqrt{x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**2)**(1/2)/x,x)

[Out] sqrt(b)*sqrt(x**2)
```

GIAC/XCAS [A] time = 0.207244, size = 9, normalized size = 1.

$$\sqrt{b}x\text{sign}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2)/x,x, algorithm="giac")

[Out] sqrt(b)*x*sign(x)
```

3.7 $\int \frac{\sqrt{bx^2}}{x^2}\,dx$

Optimal. Leaf size=15

$$\frac{\sqrt{bx^2}\log(x)}{x}$$

```
[Out] (Sqrt[b*x^2]*Log[x])/x
```

Rubi [A] time = 0.00696891, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{\sqrt{bx^2}\log(x)}{x}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[b*x^2]/x^2,x]

[Out] (Sqrt[b*x^2]*Log[x])/x
```

Rubi in Sympy [A] time = 1.91304, size = 12, normalized size = 0.8

$$\frac{\sqrt{bx^2}\log(x)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**2)**(1/2)/x**2,x)

[Out] sqrt(b*x**2)*log(x)/x
```

Mathematica [A] time = 0.0026693, size = 14, normalized size = 0.93

$$\frac{bx\log(x)}{\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[b*x^2]/x^2,x]

[Out] (b*x*Log[x])/Sqrt[b*x^2]
```

Maple [A] time = 0.005, size = 14, normalized size = 0.9

$$\frac{\ln(x)}{x}\sqrt{bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^2)^(1/2)/x^2,x)

[Out] ln(x)*(b*x^2)^(1/2)/x
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2)/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [A] time = 0.226209, size = 18, normalized size = 1.2

$$\frac{\sqrt{bx^2}\log(x)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2)/x^2,x, algorithm="fricas")
```

```
[Out] sqrt(b*x^2)*log(x)/x
```

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

$$\int\frac{\sqrt{bx^2}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**2)**(1/2)/x**2,x)
```

```
[Out] Integral(sqrt(b*x**2)/x**2, x)
```

GIAC/XCAS [A] time = 0.211894, size = 12, normalized size = 0.8

$$\sqrt{b}\ln(|x|)\operatorname{sign}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2)/x^2,x, algorithm="giac")
```

```
[Out] sqrt(b)*ln(abs(x))*sign(x)
```

3.8 $\int \frac{\sqrt{bx^2}}{x^3}\,dx$

Optimal. Leaf size=14

$$-\frac{\sqrt{bx^2}}{x^2}$$

```
[Out] -(Sqrt[b*x^2]/x^2)
```

Rubi [A] time = 0.00675452, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{\sqrt{bx^2}}{x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[b*x^2]/x^3,x]
```

```
[Out] -(Sqrt[b*x^2]/x^2)
```

Rubi in Sympy [A] time = 2.43338, size = 10, normalized size = 0.71

$$-\frac{b}{\sqrt{bx^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**2)**(1/2)/x**3,x)
```

```
[Out] -b/sqrt(b*x**2)
```

Mathematica [A] time = 0.00349005, size = 14, normalized size = 1.

$$-\frac{\sqrt{bx^2}}{x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[b*x^2]/x^3,x]
```

```
[Out] -(Sqrt[b*x^2]/x^2)
```

Maple [A] time = 0.003, size = 13, normalized size = 0.9

$$-\frac{1}{x^2}\sqrt{bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^2)^(1/2)/x^3,x)
```

```
[Out] -(b*x^2)^(1/2)/x^2
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2)/x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [A] time = 0.247893, size = 16, normalized size = 1.14

$$-\frac{\sqrt{bx^2}}{x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2)/x^3,x, algorithm="fricas")
```

```
[Out] -sqrt(b*x^2)/x^2
```

Sympy [A] time = 1.60944, size = 15, normalized size = 1.07

$$-\frac{\sqrt{b}\sqrt{x^2}}{x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**2)**(1/2)/x**3,x)
```

```
[Out] -sqrt(b)*sqrt(x**2)/x**2
```

GIAC/XCAS [A] time = 0.212573, size = 14, normalized size = 1.

$$-\frac{\sqrt{b}\operatorname{sign}(x)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2)/x^3,x, algorithm="giac")
```

```
[Out] -sqrt(b)*sign(x)/x
```

3.9 $\int \frac{\sqrt{bx^2}}{x^4} dx$

Optimal. Leaf size=16

$$-\frac{\sqrt{bx^2}}{2x^3}$$

```
[Out] -Sqrt[b*x^2]/(2*x^3)
```

Rubi [A] time = 0.00678716, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{\sqrt{bx^2}}{2x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[b*x^2]/x^4,x]

[Out] -Sqrt[b*x^2]/(2*x^3)
```

Rubi in Sympy [A] time = 1.92961, size = 14, normalized size = 0.88

$$-\frac{\sqrt{bx^2}}{2x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**2)**(1/2)/x**4,x)

[Out] -sqrt(b*x**2)/(2*x**3)
```

Mathematica [A] time = 0.00207829, size = 16, normalized size = 1.

$$-\frac{\sqrt{bx^2}}{2x^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[b*x^2]/x^4,x]

[Out] -Sqrt[b*x^2]/(2*x^3)
```

Maple [A] time = 0.003, size = 13, normalized size = 0.8

$$-\frac{1}{2\,x^3}\sqrt{bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^2)^(1/2)/x^4,x)

[Out] -1/2*(b*x^2)^(1/2)/x^3
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2)/x^4,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [A] time = 0.253553, size = 16, normalized size = 1.

$$-\frac{\sqrt{bx^2}}{2\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2)/x^4,x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(b*x^2)/x^3
```

Sympy [A] time = 1.90889, size = 17, normalized size = 1.06

$$-\frac{\sqrt{b}\sqrt{x^2}}{2x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**2)**(1/2)/x**4,x)
```

```
[Out] -sqrt(b)*sqrt(x**2)/(2*x**3)
```

GIAC/XCAS [A] time = 0.214985, size = 14, normalized size = 0.88

$$-\frac{\sqrt{b}\mathrm{sign}\left(x\right)}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2)/x^4,x, algorithm="giac")
```

```
[Out] -1/2*sqrt(b)*sign(x)/x^2
```

3.10 $\int \frac{\sqrt{bx^2}}{x^5} dx$

Optimal. Leaf size=16

$$-\frac{\sqrt{bx^2}}{3x^4}$$

```
[Out] -Sqrt[b*x^2]/(3*x^4)
```

Rubi [A] time = 0.00668604, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{\sqrt{bx^2}}{3x^4}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[b*x^2]/x^5,x]

[Out] -Sqrt[b*x^2]/(3*x^4)
```

Rubi in Sympy [A] time = 2.49698, size = 14, normalized size = 0.88

$$-\frac{b^2}{3\left(bx^2\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**2)**(1/2)/x**5,x)

[Out] -b**2/(3*(b*x**2)**(3/2))
```

Mathematica [A] time = 0.00206005, size = 16, normalized size = 1.

$$-\frac{\sqrt{bx^2}}{3x^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[b*x^2]/x^5,x]

[Out] -Sqrt[b*x^2]/(3*x^4)
```

Maple [A] time = 0.003, size = 13, normalized size = 0.8

$$-\frac{1}{3\,x^4}\sqrt{bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^2)^(1/2)/x^5,x)

[Out] -1/3*(b*x^2)^(1/2)/x^4
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2)/x^5,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [A] time = 0.254202, size = 16, normalized size = 1.

$$-\frac{\sqrt{bx^2}}{3\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2)/x^5,x, algorithm="fricas")
```

```
[Out] -1/3*sqrt(b*x^2)/x^4
```

Sympy [A] time = 2.11264, size = 17, normalized size = 1.06

$$-\frac{\sqrt{b}\sqrt{x^2}}{3x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**2)**(1/2)/x**5,x)
```

```
[Out] -sqrt(b)*sqrt(x**2)/(3*x**4)
```

GIAC/XCAS [A] time = 0.22118, size = 14, normalized size = 0.88

$$-\frac{\sqrt{b}\operatorname{sign}(x)}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2)/x^5,x, algorithm="giac")
```

```
[Out] -1/3*sqrt(b)*sign(x)/x^3
```

3.11 $\int \left(x^2\right)^{3/2} dx$

Optimal. Leaf size=14

$$\frac{1}{4}x^3\sqrt{x^2}$$

```
[Out] (x^3*Sqrt[x^2])/4
```

Rubi [A] time = 0.00505157, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286

$$\frac{1}{4}x^3\sqrt{x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(x^2)^(3/2),x]
```

```
[Out] (x^3*Sqrt[x^2])/4
```

Rubi in Sympy [A] time = 1.80833, size = 10, normalized size = 0.71

$$\frac{x^3\sqrt{x^2}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(x**2)**(1/2),x)
```

```
[Out] x**3*sqrt(x**2)/4
```

Mathematica [A] time = 0.00625599, size = 12, normalized size = 0.86

$$\frac{1}{4}x\left(x^2\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(x^2)^(3/2),x]
```

```
[Out] (x*(x^2)^(3/2))/4
```

Maple [A] time = 0.003, size = 11, normalized size = 0.8

$$\frac{x^3}{4}\sqrt{x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(x^2)^(1/2),x)
```

```
[Out] 1/4*x^3*(x^2)^(1/2)
```

Maxima [A] time = 1.43339, size = 11, normalized size = 0.79

$$\frac{1}{4}\left(x^2\right)^{\frac{3}{2}}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^2)*x^2,x, algorithm="maxima")
```

```
[Out] 1/4*(x^2)^(3/2)*x
```

Fricas [A] time = 0.247358, size = 7, normalized size = 0.5

$$\frac{1}{4}x^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^2)*x^2,x, algorithm="fricas")
```

```
[Out] 1/4*x^4
```

Sympy [A] time = 0.091945, size = 3, normalized size = 0.21

$$\frac{x^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(x**2)**(1/2),x)
```

```
[Out] x**4/4
```

GIAC/XCAS [A] time = 0.208861, size = 9, normalized size = 0.64

$$\frac{1}{4}x^4\operatorname{sign}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^2)*x^2,x, algorithm="giac")
```

```
[Out] 1/4*x^4*sign(x)
```

3.12 $\int x^2 \left(bx^2\right)^{3/2} dx$

Optimal. Leaf size=17

$$\frac{1}{6}bx^5\sqrt{bx^2}$$

```
[Out] (b*x^5*Sqrt[b*x^2])/6
```

Rubi [A] time = 0.00803669, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{1}{6}bx^5\sqrt{bx^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2*(b*x^2)^(3/2),x]

[Out] (b*x^5*Sqrt[b*x^2])/6
```

Rubi in Sympy [A] time = 2.28528, size = 14, normalized size = 0.82

$$\frac{bx^5\sqrt{bx^2}}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(b*x**2)**(3/2),x)

[Out] b*x**5*sqrt(b*x**2)/6
```

Mathematica [A] time = 0.00311503, size = 16, normalized size = 0.94

$$\frac{1}{6}x^3\left(bx^2\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2*(b*x^2)^(3/2),x]

[Out] (x^3*(b*x^2)^(3/2))/6
```

Maple [A] time = 0.003, size = 13, normalized size = 0.8

$$\frac{x^3}{6}\left(bx^2\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(b*x^2)^(3/2),x)

[Out] 1/6*x^3*(b*x^2)^(3/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2)*x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.28918, size = 18, normalized size = 1.06

$$\frac{1}{6}\sqrt{bx^2}bx^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2)*x^2,x, algorithm="fricas")
```

```
[Out] 1/6*sqrt(b*x^2)*b*x^5
```

Sympy [A] time = 1.96922, size = 15, normalized size = 0.88

$$\frac{b^{\frac{3}{2}}x^3\left(x^2\right)^{\frac{3}{2}}}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(b*x**2)**(3/2),x)
```

```
[Out] b**(3/2)*x**3*(x**2)**(3/2)/6
```

GIAC/XCAS [A] time = 0.214332, size = 14, normalized size = 0.82

$$\frac{1}{6}b^{\frac{3}{2}}x^6\text{sign}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2)*x^2,x, algorithm="giac")
```

```
[Out] 1/6*b^(3/2)*x^6*sign(x)
```

3.13 $\int x \left(bx^2\right)^{3/2} \, dx$

Optimal. Leaf size=17

$$\frac{1}{5}bx^4\sqrt{bx^2}$$

```
[Out] (b*x^4*Sqrt[b*x^2])/5
```

Rubi [A] time = 0.00780087, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{1}{5}bx^4\sqrt{bx^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x*(b*x^2)^(3/2),x]

[Out] (b*x^4*Sqrt[b*x^2])/5
```

Rubi in Sympy [A] time = 2.14279, size = 10, normalized size = 0.59

$$\frac{\left(bx^2\right)^{\frac{5}{2}}}{5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(b*x**2)**(3/2),x)

[Out] (b*x**2)**(5/2)/(5*b)
```

Mathematica [A] time = 0.00272786, size = 16, normalized size = 0.94

$$\frac{1}{5}x^2\left(bx^2\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x*(b*x^2)^(3/2),x]

[Out] (x^2*(b*x^2)^(3/2))/5
```

Maple [A] time = 0.003, size = 13, normalized size = 0.8

$$\frac{x^2}{5}\left(bx^2\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(b*x^2)^(3/2),x)

[Out] 1/5*x^2*(b*x^2)^(3/2)
```

Maxima [A] time = 1.45459, size = 16, normalized size = 0.94

$$\frac{(bx^2)^{\frac{5}{2}}}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2)*x,x, algorithm="maxima")
```

```
[Out] 1/5*(b*x^2)^(5/2)/b
```

Fricas [A] time = 0.265858, size = 18, normalized size = 1.06

$$\frac{1}{5}\sqrt{bx^2}bx^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2)*x,x, algorithm="fricas")
```

```
[Out] 1/5*sqrt(b*x^2)*b*x^4
```

Sympy [A] time = 1.56005, size = 15, normalized size = 0.88

$$\frac{b^{\frac{3}{2}}x^2\left(x^2\right)^{\frac{3}{2}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(b*x**2)**(3/2),x)
```

```
[Out] b**(3/2)*x**2*(x**2)**(3/2)/5
```

GIAC/XCAS [A] time = 0.212536, size = 14, normalized size = 0.82

$$\frac{1}{5}\,b^{\frac{3}{2}}x^5\mathrm{sign}\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2)*x,x, algorithm="giac")
```

```
[Out] 1/5*b^(3/2)*x^5*sign(x)
```

3.14 $\int \left(bx^2\right)^{3/2} dx$

Optimal. Leaf size=17

$$\frac{1}{4}bx^3\sqrt{bx^2}$$

```
[Out] (b*x^3*Sqrt[b*x^2])/4
```

Rubi [A] time = 0.00743225, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$

$$\frac{1}{4}bx^3\sqrt{bx^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^2)^(3/2),x]

[Out] (b*x^3*Sqrt[b*x^2])/4
```

Rubi in Sympy [A] time = 1.21657, size = 14, normalized size = 0.82

$$\frac{bx^3\sqrt{bx^2}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**2)**(3/2),x)

[Out] b*x**3*sqrt(b*x**2)/4
```

Mathematica [A] time = 0.00134681, size = 14, normalized size = 0.82

$$\frac{1}{4}x\left(bx^2\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^2)^(3/2),x]

[Out] (x*(b*x^2)^(3/2))/4
```

Maple [A] time = 0.002, size = 11, normalized size = 0.7

$$\frac{x}{4}\left(bx^2\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^2)^(3/2),x)

[Out] 1/4*x*(b*x^2)^(3/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.240521, size = 18, normalized size = 1.06

$$\frac{1}{4}\sqrt{bx^2}bx^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/4*sqrt(b*x^2)*b*x^3
```

Sympy [A] time = 1.16193, size = 14, normalized size = 0.82

$$\frac{b^{\frac{3}{2}}x\left(x^2\right)^{\frac{3}{2}}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**2)**(3/2),x)
```

```
[Out] b**(3/2)*x*(x**2)**(3/2)/4
```

GIAC/XCAS [A] time = 0.210435, size = 14, normalized size = 0.82

$$\frac{1}{4}b^{\frac{3}{2}}x^4\mathrm{sign}\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2),x, algorithm="giac")
```

```
[Out] 1/4*b^(3/2)*x^4*sign(x)
```

3.15 $\int \frac{(bx^2)^{3/2}}{x} \, dx$

Optimal. Leaf size=17

$$\frac{1}{3}bx^2\sqrt{bx^2}$$

```
[Out] (b*x^2*Sqrt[b*x^2])/3
```

Rubi [A] time = 0.00756472, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{1}{3}bx^2\sqrt{bx^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^2)^(3/2)/x,x]

[Out] (b*x^2*Sqrt[b*x^2])/3
```

Rubi in Sympy [A] time = 2.29272, size = 8, normalized size = 0.47

$$\frac{(bx^2)^{\frac{3}{2}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**2)**(3/2)/x,x)

[Out] (b*x**2)**(3/2)/3
```

Mathematica [A] time = 0.0014124, size = 17, normalized size = 1.

$$\frac{1}{3}bx^2\sqrt{bx^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^2)^(3/2)/x,x]

[Out] (b*x^2*Sqrt[b*x^2])/3
```

Maple [A] time = 0.003, size = 10, normalized size = 0.6

$$\frac{1}{3}(bx^2)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^2)^(3/2)/x,x)

[Out] 1/3*(b*x^2)^(3/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.246629, size = 18, normalized size = 1.06

$$\frac{1}{3}\sqrt{bx^2}bx^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2)/x,x, algorithm="fricas")
```

```
[Out] 1/3*sqrt(b*x^2)*b*x^2
```

Sympy [A] time = 1.15799, size = 12, normalized size = 0.71

$$\frac{b^{\frac{3}{2}}\left(x^2\right)^{\frac{3}{2}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**2)**(3/2)/x,x)
```

```
[Out] b**(3/2)*(x**2)**(3/2)/3
```

GIAC/XCAS [A] time = 0.211269, size = 14, normalized size = 0.82

$$\frac{1}{3}b^{\frac{3}{2}}x^3\text{sign}\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2)/x,x, algorithm="giac")
```

```
[Out] 1/3*b^(3/2)*x^3*sign(x)
```

3.16 $\int \frac{(bx^2)^{3/2}}{x^2}\,dx$

Optimal. Leaf size=15

$$\frac{1}{2}bx\sqrt{bx^2}$$

```
[Out] (b*x*Sqrt[b*x^2])/2
```

Rubi [A] time = 0.00760952, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{1}{2}bx\sqrt{bx^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^2)^(3/2)/x^2,x]

[Out] (b*x*Sqrt[b*x^2])/2
```

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

$$\frac{b\sqrt{bx^2}\int x\,dx}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**2)**(3/2)/x**2,x)

[Out] b*sqrt(b*x**2)*Integral(x, x)/x
```

Mathematica [A] time = 0.00164343, size = 15, normalized size = 1.

$$\frac{1}{2}bx\sqrt{bx^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^2)^(3/2)/x^2,x]

[Out] (b*x*Sqrt[b*x^2])/2
```

Maple [A] time = 0.002, size = 13, normalized size = 0.9

$$\frac{1}{2x}\left(bx^2\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^2)^(3/2)/x^2,x)

[Out] 1/2*(b*x^2)^(3/2)/x
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2)/x^2,x, algorithm="maxima")

[Out] Exception raised: RuntimeError
```

Fricas [A] time = 0.244749, size = 15, normalized size = 1.

$$\frac{1}{2}\sqrt{bx^2}bx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2)/x^2,x, algorithm="fricas")

[Out] 1/2*sqrt(b*x^2)*b*x
```

Sympy [A] time = 1.17319, size = 14, normalized size = 0.93

$$\frac{b^{\frac{3}{2}}\left(x^2\right)^{\frac{3}{2}}}{2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**2)**(3/2)/x**2,x)

[Out] b**(3/2)*(x**2)**(3/2)/(2*x)
```

GIAC/XCAS [A] time = 0.212813, size = 14, normalized size = 0.93

$$\frac{1}{2}b^{\frac{3}{2}}x^2\mathrm{sign}\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2)/x^2,x, algorithm="giac")

[Out] 1/2*b^(3/2)*x^2*sign(x)
```

3.17 $\int \frac{(bx^2)^{3/2}}{x^3} \, dx$

Optimal. Leaf size=11

$$b\sqrt{bx^2}$$

```
[Out] b*Sqrt[b*x^2]
```

Rubi [A] time = 0.00624031, antiderivative size = 11, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$b\sqrt{bx^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^2)^(3/2)/x^3,x]

[Out] b*Sqrt[b*x^2]
```

Rubi in Sympy [A] time = 2.4231, size = 8, normalized size = 0.73

$$b\sqrt{bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**2)**(3/2)/x**3,x)

[Out] b*sqrt(b*x**2)
```

Mathematica [A] time = 0.00184982, size = 13, normalized size = 1.18

$$\frac{(bx^2)^{3/2}}{x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^2)^(3/2)/x^3,x]

[Out] (b*x^2)^(3/2)/x^2
```

Maple [A] time = 0.002, size = 12, normalized size = 1.1

$$\frac{1}{x^2}(bx^2)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^2)^(3/2)/x^3,x)

[Out] (b*x^2)^(3/2)/x^2
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2)/x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [A] time = 0.243445, size = 12, normalized size = 1.09

$$\sqrt{bx^2}b$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2)/x^3,x, algorithm="fricas")
```

```
[Out] sqrt(b*x^2)*b
```

Sympy [A] time = 2.07942, size = 14, normalized size = 1.27

$$\frac{b^{\frac{3}{2}}\left(x^2\right)^{\frac{3}{2}}}{x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**2)**(3/2)/x**3,x)
```

```
[Out] b**(3/2)*(x**2)**(3/2)/x**2
```

GIAC/XCAS [A] time = 0.212526, size = 9, normalized size = 0.82

$$b^{\frac{3}{2}}x\operatorname{sign}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2)/x^3,x, algorithm="giac")
```

```
[Out] b^(3/2)*x*sign(x)
```

3.18 $\int \frac{(bx^2)^{3/2}}{x^4}\,dx$

Optimal. Leaf size=16

$$\frac{b\sqrt{bx^2}\log(x)}{x}$$

```
[Out] (b*Sqrt[b*x^2]*Log[x])/x
```

Rubi [A] time = 0.00736345, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{b\sqrt{bx^2}\log(x)}{x}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^2)^(3/2)/x^4,x]
```

```
[Out] (b*Sqrt[b*x^2]*Log[x])/x
```

Rubi in Sympy [A] time = 2.06738, size = 14, normalized size = 0.88

$$\frac{b\sqrt{bx^2}\log(x)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**2)**(3/2)/x**4,x)
```

```
[Out] b*sqrt(b*x**2)*log(x)/x
```

Mathematica [A] time = 0.00313391, size = 15, normalized size = 0.94

$$\frac{(bx^2)^{3/2}\log(x)}{x^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^2)^(3/2)/x^4,x]
```

```
[Out] ((b*x^2)^(3/2)*Log[x])/x^3
```

Maple [A] time = 0.004, size = 14, normalized size = 0.9

$$\frac{\ln(x)}{x^3}(bx^2)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^2)^(3/2)/x^4,x)
```

```
[Out] (b*x^2)^(3/2)/x^3*ln(x)
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2)/x^4,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [A] time = 0.235542, size = 19, normalized size = 1.19

$$\frac{\sqrt{bx^2}b\log(x)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2)/x^4,x, algorithm="fricas")
```

```
[Out] sqrt(b*x^2)*b*log(x)/x
```

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

$$\int \frac{(bx^2)^{\frac{3}{2}}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**2)**(3/2)/x**4,x)
```

```
[Out] Integral((b*x**2)**(3/2)/x**4, x)
```

GIAC/XCAS [A] time = 0.215071, size = 12, normalized size = 0.75

$$b^{\frac{3}{2}}\ln(|x|)\,\mathrm{sign}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2)/x^4,x, algorithm="giac")
```

```
[Out] b^(3/2)*ln(abs(x))*sign(x)
```

3.19 $\int \frac{(bx^2)^{3/2}}{x^5}\,dx$

Optimal. Leaf size=15

$$-\frac{b\sqrt{bx^2}}{x^2}$$

[Out] -((b*Sqrt[b*x^2])/x^2)

Rubi [A] time = 0.00769047, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{b\sqrt{bx^2}}{x^2}$$

Antiderivative was successfully verified.

[In] Int[(b*x^2)^(3/2)/x^5,x]

[Out] -((b*Sqrt[b*x^2])/x^2)

Rubi in Sympy [A] time = 2.54001, size = 12, normalized size = 0.8

$$-\frac{b^2}{\sqrt{bx^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((b*x**2)**(3/2)/x**5,x)

[Out] -b**2/sqrt(b*x**2)

Mathematica [A] time = 0.00304656, size = 14, normalized size = 0.93

$$-\frac{(bx^2)^{3/2}}{x^4}$$

Antiderivative was successfully verified.

[In] Integrate[(b*x^2)^(3/2)/x^5,x]

[Out] -((b*x^2)^(3/2)/x^4)

Maple [A] time = 0.003, size = 13, normalized size = 0.9

$$-\frac{1}{x^4}\left(bx^2\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b*x^2)^(3/2)/x^5,x)

[Out] -(b*x^2)^(3/2)/x^4

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2)/x^5,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [A] time = 0.224722, size = 18, normalized size = 1.2

$$-\frac{\sqrt{bx^2}b}{x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2)/x^5,x, algorithm="fricas")
```

```
[Out] -sqrt(b*x^2)*b/x^2
```

Sympy [A] time = 2.95135, size = 15, normalized size = 1.

$$-\frac{b^{\frac{3}{2}}\left(x^2\right)^{\frac{3}{2}}}{x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**2)**(3/2)/x**5,x)
```

```
[Out] -b**(3/2)*(x**2)**(3/2)/x**4
```

GIAC/XCAS [A] time = 0.215226, size = 14, normalized size = 0.93

$$-\frac{b^{\frac{3}{2}}\operatorname{sign}(x)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2)/x^5,x, algorithm="giac")
```

```
[Out] -b^(3/2)*sign(x)/x
```

3.20 $\int \frac{(bx^2)^{3/2}}{x^6} \, dx$

Optimal. Leaf size=17

$$-\frac{b\sqrt{bx^2}}{2x^3}$$

```
[Out] -(b*Sqrt[b*x^2])/(2*x^3)
```

Rubi [A] time = 0.00726617, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{b\sqrt{bx^2}}{2x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^2)^(3/2)/x^6,x]

[Out] -(b*Sqrt[b*x^2])/(2*x^3)
```

Rubi in Sympy [A] time = 2.0487, size = 15, normalized size = 0.88

$$-\frac{b\sqrt{bx^2}}{2x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**2)**(3/2)/x**6,x)

[Out] -b*sqrt(b*x**2)/(2*x**3)
```

Mathematica [A] time = 0.00254386, size = 16, normalized size = 0.94

$$-\frac{(bx^2)^{3/2}}{2x^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^2)^(3/2)/x^6,x]

[Out] -(b*x^2)^(3/2)/(2*x^5)
```

Maple [A] time = 0.003, size = 13, normalized size = 0.8

$$-\frac{1}{2x^5}(bx^2)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^2)^(3/2)/x^6,x)

[Out] -1/2*(b*x^2)^(3/2)/x^5
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2)/x^6,x, algorithm="maxima")

[Out] Exception raised: RuntimeError
```

Fricas [A] time = 0.233537, size = 18, normalized size = 1.06

$$-\frac{\sqrt{bx^2}b}{2\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2)/x^6,x, algorithm="fricas")

[Out] -1/2*sqrt(b*x^2)*b/x^3
```

Sympy [A] time = 3.88315, size = 17, normalized size = 1.

$$-\frac{b^{\frac{3}{2}}\left(x^2\right)^{\frac{3}{2}}}{2x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**2)**(3/2)/x**6,x)

[Out] -b**(3/2)*(x**2)**(3/2)/(2*x**5)
```

GIAC/XCAS [A] time = 0.218368, size = 14, normalized size = 0.82

$$-\frac{b^{\frac{3}{2}}\operatorname{sign}(x)}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2)/x^6,x, algorithm="giac")

[Out] -1/2*b^(3/2)*sign(x)/x^2
```

3.21 $\int \frac{(bx^2)^{3/2}}{x^7}\,dx$

Optimal. Leaf size=17

$$-\frac{b\sqrt{bx^2}}{3x^4}$$

```
[Out] -(b*Sqrt[b*x^2])/(3*x^4)
```

Rubi [A] time = 0.00762647, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$-\frac{b\sqrt{bx^2}}{3x^4}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^2)^(3/2)/x^7,x]

[Out] -(b*Sqrt[b*x^2])/(3*x^4)
```

Rubi in Sympy [A] time = 2.54998, size = 14, normalized size = 0.82

$$-\frac{b^3}{3\,(bx^2)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**2)**(3/2)/x**7,x)

[Out] -b**3/(3*(b*x**2)**(3/2))
```

Mathematica [A] time = 0.00230196, size = 16, normalized size = 0.94

$$-\frac{(bx^2)^{3/2}}{3x^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^2)^(3/2)/x^7,x]

[Out] -(b*x^2)^(3/2)/(3*x^6)
```

Maple [A] time = 0.003, size = 13, normalized size = 0.8

$$-\frac{1}{3\,x^6}\,(bx^2)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^2)^(3/2)/x^7,x)

[Out] -1/3*(b*x^2)^(3/2)/x^6
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2)/x^7,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [A] time = 0.232634, size = 18, normalized size = 1.06

$$-\frac{\sqrt{bx^2}b}{3\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2)/x^7,x, algorithm="fricas")
```

```
[Out] -1/3*sqrt(b*x^2)*b/x^4
```

Sympy [A] time = 4.84306, size = 17, normalized size = 1.

$$-\frac{b^{\frac{3}{2}}\left(x^2\right)^{\frac{3}{2}}}{3x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**2)**(3/2)/x**7,x)
```

```
[Out] -b**(3/2)*(x**2)**(3/2)/(3*x**6)
```

GIAC/XCAS [A] time = 0.232382, size = 14, normalized size = 0.82

$$-\frac{b^{\frac{3}{2}}\operatorname{sign}\left(x\right)}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2)/x^7,x, algorithm="giac")
```

```
[Out] -1/3*b^(3/2)*sign(x)/x^3
```

3.22 $\int \left(x^2\right)^{5/2} dx$

Optimal. Leaf size=14

$$\frac{1}{6}x^5\sqrt{x^2}$$

```
[Out] (x^5*Sqrt[x^2])/6
```

Rubi [A] time = 0.00524484, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286

$$\frac{1}{6}x^5\sqrt{x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(x^2)^(5/2),x]

[Out] (x^5*Sqrt[x^2])/6
```

Rubi in Sympy [A] time = 1.09859, size = 10, normalized size = 0.71

$$\frac{x^5\sqrt{x^2}}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((x**2)**(5/2),x)

[Out] x**5*sqrt(x**2)/6
```

Mathematica [A] time = 0.00570274, size = 12, normalized size = 0.86

$$\frac{1}{6}x\left(x^2\right)^{5/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(x^2)^(5/2),x]

[Out] (x*(x^2)^(5/2))/6
```

Maple [A] time = 0.003, size = 9, normalized size = 0.6

$$\frac{x}{6}\left(x^2\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((x^2)^(5/2),x)

[Out] 1/6*x*(x^2)^(5/2)
```

Maxima [A] time = 1.44188, size = 11, normalized size = 0.79

$$\frac{1}{6}\left(x^2\right)^{\frac{5}{2}}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x^2)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/6*(x^2)^(5/2)*x
```

Fricas [A] time = 0.226688, size = 7, normalized size = 0.5

$$\frac{1}{6}x^6$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x^2)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/6*x^6
```

Sympy [A] time = 0.089224, size = 3, normalized size = 0.21

$$\frac{x^6}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x**2)**(5/2),x)
```

```
[Out] x**6/6
```

GIAC/XCAS [A] time = 0.220911, size = 9, normalized size = 0.64

$$\frac{1}{6}x^6\operatorname{sign}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x^2)^(5/2),x, algorithm="giac")
```

```
[Out] 1/6*x^6*sign(x)
```

3.23 $\int x \left(bx^2\right)^{5/2} \, dx$

Optimal. Leaf size=19

$$\frac{1}{7}b^2x^6\sqrt{bx^2}$$

```
[Out] (b^2*x^6*Sqrt[b*x^2])/7
```

Rubi [A] time = 0.00849907, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{1}{7}b^2x^6\sqrt{bx^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x*(b*x^2)^(5/2),x]

[Out] (b^2*x^6*Sqrt[b*x^2])/7
```

Rubi in Sympy [A] time = 2.14828, size = 10, normalized size = 0.53

$$\frac{\left(bx^2\right)^{\frac{7}{2}}}{7b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(b*x**2)**(5/2),x)

[Out] (b*x**2)**(7/2)/(7*b)
```

Mathematica [A] time = 0.00304912, size = 16, normalized size = 0.84

$$\frac{1}{7}x^2\left(bx^2\right)^{5/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x*(b*x^2)^(5/2),x]

[Out] (x^2*(b*x^2)^(5/2))/7
```

Maple [A] time = 0.005, size = 13, normalized size = 0.7

$$\frac{x^2}{7}\left(bx^2\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(b*x^2)^(5/2),x)

[Out] 1/7*x^2*(b*x^2)^(5/2)
```

Maxima [A] time = 1.43312, size = 16, normalized size = 0.84

$$\frac{(bx^2)^{\frac{7}{2}}}{7\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2)*x,x, algorithm="maxima")
```

```
[Out] 1/7*(b*x^2)^(7/2)/b
```

Fricas [A] time = 0.219742, size = 20, normalized size = 1.05

$$\frac{1}{7}\sqrt{bx^2}b^2x^6$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2)*x,x, algorithm="fricas")
```

```
[Out] 1/7*sqrt(b*x^2)*b^2*x^6
```

Sympy [A] time = 4.93474, size = 15, normalized size = 0.79

$$\frac{b^{\frac{5}{2}}x^2\left(x^2\right)^{\frac{5}{2}}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(b*x**2)**(5/2),x)
```

```
[Out] b**(5/2)*x**2*(x**2)**(5/2)/7
```

GIAC/XCAS [A] time = 0.227917, size = 14, normalized size = 0.74

$$\frac{1}{7}\,b^{\frac{5}{2}}x^7\operatorname{sign}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2)*x,x, algorithm="giac")
```

```
[Out] 1/7*b^(5/2)*x^7*sign(x)
```

3.24 $\int (bx^2)^{5/2} \, dx$

Optimal. Leaf size=19

$$\frac{1}{6}b^2x^5\sqrt{bx^2}$$

```
[Out] (b^2*x^5*Sqrt[b*x^2])/6
```

Rubi [A] time = 0.00806645, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{1}{6}b^2x^5\sqrt{bx^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^2)^(5/2),x]

[Out] (b^2*x^5*Sqrt[b*x^2])/6
```

Rubi in Sympy [A] time = 1.48504, size = 15, normalized size = 0.79

$$\frac{b^2x^5\sqrt{bx^2}}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**2)**(5/2),x)

[Out] b**2*x**5*sqrt(b*x**2)/6
```

Mathematica [A] time = 0.00191318, size = 14, normalized size = 0.74

$$\frac{1}{6}x\left(bx^2\right)^{5/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^2)^(5/2),x]

[Out] (x*(b*x^2)^(5/2))/6
```

Maple [A] time = 0.002, size = 11, normalized size = 0.6

$$\frac{x}{6}\left(bx^2\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^2)^(5/2),x)

[Out] 1/6*x*(b*x^2)^(5/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.217386, size = 20, normalized size = 1.05

$$\frac{1}{6}\sqrt{bx^2}b^2x^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/6*sqrt(b*x^2)*b^2*x^5
```

Sympy [A] time = 3.70095, size = 14, normalized size = 0.74

$$\frac{b^{\frac{5}{2}}x\left(x^2\right)^{\frac{5}{2}}}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**2)**(5/2),x)
```

```
[Out] b**(5/2)*x*(x**2)**(5/2)/6
```

GIAC/XCAS [A] time = 0.217813, size = 14, normalized size = 0.74

$$\frac{1}{6}b^{\frac{5}{2}}x^6\mathrm{sign}\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2),x, algorithm="giac")
```

```
[Out] 1/6*b^(5/2)*x^6*sign(x)
```

3.25 $\int \frac{(bx^2)^{5/2}}{x} \, dx$

Optimal. Leaf size=19

$$\frac{1}{5}b^2x^4\sqrt{bx^2}$$

```
[Out] (b^2*x^4*Sqrt[b*x^2])/5
```

Rubi [A] time = 0.00831636, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{1}{5}b^2x^4\sqrt{bx^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^2)^(5/2)/x,x]

[Out] (b^2*x^4*Sqrt[b*x^2])/5
```

Rubi in Sympy [A] time = 2.34462, size = 8, normalized size = 0.42

$$\frac{(bx^2)^{\frac{5}{2}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**2)**(5/2)/x,x)

[Out] (b*x**2)**(5/2)/5
```

Mathematica [A] time = 0.00279089, size = 17, normalized size = 0.89

$$\frac{1}{5}bx^2\left(bx^2\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^2)^(5/2)/x,x]

[Out] (b*x^2*(b*x^2)^(3/2))/5
```

Maple [A] time = 0.003, size = 10, normalized size = 0.5

$$\frac{1}{5}\left(bx^2\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^2)^(5/2)/x,x)

[Out] 1/5*(b*x^2)^(5/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.220359, size = 20, normalized size = 1.05

$$\frac{1}{5}\sqrt{bx^2}b^2x^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2)/x,x, algorithm="fricas")
```

```
[Out] 1/5*sqrt(b*x^2)*b^2*x^4
```

Sympy [A] time = 3.49188, size = 12, normalized size = 0.63

$$\frac{b^{\frac{5}{2}}\left(x^2\right)^{\frac{5}{2}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**2)**(5/2)/x,x)
```

```
[Out] b**(5/2)*(x**2)**(5/2)/5
```

GIAC/XCAS [A] time = 0.215434, size = 14, normalized size = 0.74

$$\frac{1}{5}b^{\frac{5}{2}}x^5\mathrm{sign}\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2)/x,x, algorithm="giac")
```

```
[Out] 1/5*b^(5/2)*x^5*sign(x)
```

3.26 $\int \frac{(bx^2)^{5/2}}{x^2} \, dx$

Optimal. Leaf size=19

$$\frac{1}{4}b^2x^3\sqrt{bx^2}$$

```
[Out] (b^2*x^3*Sqrt[b*x^2])/4
```

Rubi [A] time = 0.00771991, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{1}{4}b^2x^3\sqrt{bx^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^2)^(5/2)/x^2,x]

[Out] (b^2*x^3*Sqrt[b*x^2])/4
```

Rubi in Sympy [A] time = 2.29541, size = 15, normalized size = 0.79

$$\frac{b^2x^3\sqrt{bx^2}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**2)**(5/2)/x**2,x)

[Out] b**2*x**3*sqrt(b*x**2)/4
```

Mathematica [A] time = 0.00173271, size = 15, normalized size = 0.79

$$\frac{1}{4}bx\left(bx^2\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^2)^(5/2)/x^2,x]

[Out] (b*x*(b*x^2)^(3/2))/4
```

Maple [A] time = 0.003, size = 13, normalized size = 0.7

$$\frac{1}{4x}\left(bx^2\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^2)^(5/2)/x^2,x)

[Out] 1/4*(b*x^2)^(5/2)/x
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2)/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.253092, size = 20, normalized size = 1.05

$$\frac{1}{4}\sqrt{bx^2}b^2x^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2)/x^2,x, algorithm="fricas")
```

```
[Out] 1/4*sqrt(b*x^2)*b^2*x^3
```

Sympy [A] time = 3.66137, size = 14, normalized size = 0.74

$$\frac{b^{\frac{5}{2}}\left(x^2\right)^{\frac{5}{2}}}{4x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**2)**(5/2)/x**2,x)
```

```
[Out] b**(5/2)*(x**2)**(5/2)/(4*x)
```

GIAC/XCAS [A] time = 0.212302, size = 14, normalized size = 0.74

$$\frac{1}{4}b^{\frac{5}{2}}x^4\mathrm{sign}\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2)/x^2,x, algorithm="giac")
```

```
[Out] 1/4*b^(5/2)*x^4*sign(x)
```

3.27 $\int \frac{(bx^2)^{5/2}}{x^3}\,dx$

Optimal. Leaf size=19

$$\frac{1}{3}b^2x^2\sqrt{bx^2}$$

```
[Out] (b^2*x^2*Sqrt[b*x^2])/3
```

Rubi [A] time = 0.00790422, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{1}{3}b^2x^2\sqrt{bx^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^2)^(5/2)/x^3,x]

[Out] (b^2*x^2*Sqrt[b*x^2])/3
```

Rubi in Sympy [A] time = 2.4331, size = 10, normalized size = 0.53

$$\frac{b\left(bx^2\right)^{\frac{3}{2}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**2)**(5/2)/x**3,x)

[Out] b*(b*x**2)**(3/2)/3
```

Mathematica [A] time = 0.00347502, size = 16, normalized size = 0.84

$$\frac{\left(bx^2\right)^{5/2}}{3x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^2)^(5/2)/x^3,x]

[Out] (b*x^2)^(5/2)/(3*x^2)
```

Maple [A] time = 0.003, size = 13, normalized size = 0.7

$$\frac{1}{3\,x^2}\left(bx^2\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^2)^(5/2)/x^3,x)

[Out] 1/3*(b*x^2)^(5/2)/x^2
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2)/x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [A] time = 0.249422, size = 20, normalized size = 1.05

$$\frac{1}{3}\sqrt{bx^2}b^2x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2)/x^3,x, algorithm="fricas")
```

```
[Out] 1/3*sqrt(b*x^2)*b^2*x^2
```

Sympy [A] time = 4.6241, size = 15, normalized size = 0.79

$$\frac{b^{\frac{5}{2}}\left(x^2\right)^{\frac{5}{2}}}{3x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**2)**(5/2)/x**3,x)
```

```
[Out] b**(5/2)*(x**2)**(5/2)/(3*x**2)
```

GIAC/XCAS [A] time = 0.225925, size = 14, normalized size = 0.74

$$\frac{1}{3}b^{\frac{5}{2}}x^3\operatorname{sign}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2)/x^3,x, algorithm="giac")
```

```
[Out] 1/3*b^(5/2)*x^3*sign(x)
```

3.28 $\int \frac{(bx^2)^{5/2}}{x^4}\,dx$

Optimal. Leaf size=17

$$\frac{1}{2}b^2x\sqrt{bx^2}$$

```
[Out] (b^2*x*Sqrt[b*x^2])/2
```

Rubi [A] time = 0.00791702, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{1}{2}b^2x\sqrt{bx^2}$$

Antiderivative was successfully verified.

```
[In] Int[(b*x^2)^(5/2)/x^4,x]

[Out] (b^2*x*Sqrt[b*x^2])/2
```

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

$$\frac{b^2\sqrt{bx^2}\int x\,dx}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**2)**(5/2)/x**4,x)

[Out] b**2*sqrt(b*x**2)*Integral(x, x)/x
```

Mathematica [A] time = 0.00193942, size = 17, normalized size = 1.

$$\frac{1}{2}b^2x\sqrt{bx^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(b*x^2)^(5/2)/x^4,x]

[Out] (b^2*x*Sqrt[b*x^2])/2
```

Maple [A] time = 0.001, size = 13, normalized size = 0.8

$$\frac{1}{2x^3}\left(bx^2\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x^2)^(5/2)/x^4,x)

[Out] 1/2*(b*x^2)^(5/2)/x^3
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2)/x^4,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [A] time = 0.247291, size = 18, normalized size = 1.06

$$\frac{1}{2}\sqrt{bx^2}b^2x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2)/x^4,x, algorithm="fricas")
```

```
[Out] 1/2*sqrt(b*x^2)*b^2*x
```

Sympy [A] time = 4.66929, size = 15, normalized size = 0.88

$$\frac{b^{\frac{5}{2}}\left(x^2\right)^{\frac{5}{2}}}{2x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**2)**(5/2)/x**4,x)
```

```
[Out] b**(5/2)*(x**2)**(5/2)/(2*x**3)
```

GIAC/XCAS [A] time = 0.212449, size = 14, normalized size = 0.82

$$\frac{1}{2}b^{\frac{5}{2}}x^2\mathrm{sign}\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2)/x^4,x, algorithm="giac")
```

```
[Out] 1/2*b^(5/2)*x^2*sign(x)
```

3.29 $\int \frac{(bx^2)^{5/2}}{x^5}\,dx$

Optimal. Leaf size=13

$$b^2\sqrt{bx^2}$$

```
[Out] b^2*Sqrt[b*x^2]
```

Rubi [A] time = 0.00704443, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$b^2\sqrt{bx^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^2)^(5/2)/x^5,x]

[Out] b^2*Sqrt[b*x^2]
```

Rubi in Sympy [A] time = 2.62398, size = 10, normalized size = 0.77

$$b^2\sqrt{bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**2)**(5/2)/x**5,x)

[Out] b**2*sqrt(b*x**2)
```

Mathematica [A] time = 0.00256498, size = 13, normalized size = 1.

$$\frac{(bx^2)^{5/2}}{x^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^2)^(5/2)/x^5,x]

[Out] (b*x^2)^(5/2)/x^4
```

Maple [A] time = 0.003, size = 12, normalized size = 0.9

$$\frac{1}{x^4}\left(bx^2\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^2)^(5/2)/x^5,x)

[Out] (b*x^2)^(5/2)/x^4
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2)/x^5,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [A] time = 0.216556, size = 15, normalized size = 1.15

$$\sqrt{bx^2}b^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2)/x^5,x, algorithm="fricas")
```

```
[Out] sqrt(b*x^2)*b^2
```

Sympy [A] time = 4.72937, size = 14, normalized size = 1.08

$$\frac{b^{\frac{5}{2}}\left(x^2\right)^{\frac{5}{2}}}{x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**2)**(5/2)/x**5,x)
```

```
[Out] b**(5/2)*(x**2)**(5/2)/x**4
```

GIAC/XCAS [A] time = 0.218944, size = 9, normalized size = 0.69

$$b^{\frac{5}{2}}x\mathrm{sign}\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2)/x^5,x, algorithm="giac")
```

```
[Out] b^(5/2)*x*sign(x)
```

3.30 $\int \frac{(bx^2)^{5/2}}{x^6}\,dx$

Optimal. Leaf size=18

$$\frac{b^2\sqrt{bx^2}\log(x)}{x}$$

```
[Out] (b^2*Sqrt[b*x^2]*Log[x])/x
```

Rubi [A] time = 0.00749944, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{b^2\sqrt{bx^2}\log(x)}{x}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^2)^(5/2)/x^6,x]

[Out] (b^2*Sqrt[b*x^2]*Log[x])/x
```

Rubi in Sympy [A] time = 2.31369, size = 15, normalized size = 0.83

$$\frac{b^2\sqrt{bx^2}\log(x)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**2)**(5/2)/x**6,x)

[Out] b**2*sqrt(b*x**2)*log(x)/x
```

Mathematica [A] time = 0.00357357, size = 15, normalized size = 0.83

$$\frac{(bx^2)^{5/2}\log(x)}{x^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^2)^(5/2)/x^6,x]

[Out] ((b*x^2)^(5/2)*Log[x])/x^5
```

Maple [A] time = 0.004, size = 14, normalized size = 0.8

$$\frac{\ln(x)}{x^5}(bx^2)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^2)^(5/2)/x^6,x)

[Out] (b*x^2)^(5/2)/x^5*ln(x)
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2)/x^6,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [A] time = 0.273451, size = 22, normalized size = 1.22

$$\frac{\sqrt{bx^2}b^2\log(x)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2)/x^6,x, algorithm="fricas")
```

```
[Out] sqrt(b*x^2)*b^2*log(x)/x
```

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

$$\int \frac{(bx^2)^{\frac{5}{2}}}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**2)**(5/2)/x**6,x)
```

```
[Out] Integral((b*x**2)**(5/2)/x**6, x)
```

GIAC/XCAS [A] time = 0.212495, size = 12, normalized size = 0.67

$$b^{\frac{5}{2}}\ln(|x|)\operatorname{sign}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2)/x^6,x, algorithm="giac")
```

```
[Out] b^(5/2)*ln(abs(x))*sign(x)
```

3.31 $\int \frac{(bx^2)^{5/2}}{x^7} \, dx$

Optimal. Leaf size=17

$$-\frac{b^2\sqrt{bx^2}}{x^2}$$

```
[Out] -((b^2*Sqrt[b*x^2])/x^2)
```

Rubi [A] time = 0.00841907, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{b^2\sqrt{bx^2}}{x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^2)^(5/2)/x^7,x]

[Out] -((b^2*Sqrt[b*x^2])/x^2)
```

Rubi in Sympy [A] time = 2.51637, size = 12, normalized size = 0.71

$$-\frac{b^3}{\sqrt{bx^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**2)**(5/2)/x**7,x)

[Out] -b**3/sqrt(b*x**2)
```

Mathematica [A] time = 0.00360493, size = 14, normalized size = 0.82

$$-\frac{(bx^2)^{5/2}}{x^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^2)^(5/2)/x^7,x]

[Out] -((b*x^2)^(5/2)/x^6)
```

Maple [A] time = 0.003, size = 13, normalized size = 0.8

$$-\frac{1}{x^6}\left(bx^2\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^2)^(5/2)/x^7,x)

[Out] -(b*x^2)^(5/2)/x^6
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2)/x^7,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [A] time = 0.239668, size = 20, normalized size = 1.18

$$-\frac{\sqrt{bx^2}b^2}{x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2)/x^7,x, algorithm="fricas")
```

```
[Out] -sqrt(b*x^2)*b^2/x^2
```

Sympy [A] time = 7.02758, size = 15, normalized size = 0.88

$$-\frac{b^{\frac{5}{2}}\left(x^2\right)^{\frac{5}{2}}}{x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**2)**(5/2)/x**7,x)
```

```
[Out] -b**(5/2)*(x**2)**(5/2)/x**6
```

GIAC/XCAS [A] time = 0.215353, size = 14, normalized size = 0.82

$$-\frac{b^{\frac{5}{2}}\,\mathrm{sign}\left(x\right)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2)/x^7,x, algorithm="giac")
```

```
[Out] -b^(5/2)*sign(x)/x
```

3.32 $\int \frac{(bx^2)^{5/2}}{x^8} \, dx$

Optimal. Leaf size=19

$$-\frac{b^2\sqrt{bx^2}}{2x^3}$$

```
[Out] -(b^2*Sqrt[b*x^2])/(2*x^3)
```

Rubi [A] time = 0.0083058, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{b^2\sqrt{bx^2}}{2x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^2)^(5/2)/x^8,x]

[Out] -(b^2*Sqrt[b*x^2])/(2*x^3)
```

Rubi in Sympy [A] time = 2.28584, size = 17, normalized size = 0.89

$$-\frac{b^2\sqrt{bx^2}}{2x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**2)**(5/2)/x**8,x)

[Out] -b**2*sqrt(b*x**2)/(2*x**3)
```

Mathematica [A] time = 0.00287313, size = 16, normalized size = 0.84

$$-\frac{(bx^2)^{5/2}}{2x^7}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^2)^(5/2)/x^8,x]

[Out] -(b*x^2)^(5/2)/(2*x^7)
```

Maple [A] time = 0.003, size = 13, normalized size = 0.7

$$-\frac{1}{2\,x^7}\left(bx^2\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^2)^(5/2)/x^8,x)

[Out] -1/2*(b*x^2)^(5/2)/x^7
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2)/x^8,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [A] time = 0.262848, size = 20, normalized size = 1.05

$$-\frac{\sqrt{bx^2}b^2}{2\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2)/x^8,x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(b*x^2)*b^2/x^3
```

Sympy [A] time = 8.65853, size = 17, normalized size = 0.89

$$-\frac{b^{\frac{5}{2}}\left(x^2\right)^{\frac{5}{2}}}{2x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**2)**(5/2)/x**8,x)
```

```
[Out] -b**(5/2)*(x**2)**(5/2)/(2*x**7)
```

GIAC/XCAS [A] time = 0.232869, size = 14, normalized size = 0.74

$$-\frac{b^{\frac{5}{2}}\operatorname{sign}(x)}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2)/x^8,x, algorithm="giac")
```

```
[Out] -1/2*b^(5/2)*sign(x)/x^2
```

3.33 $\int \frac{(bx^2)^{5/2}}{x^9}\,dx$

Optimal. Leaf size=19

$$-\frac{b^2\sqrt{bx^2}}{3x^4}$$

```
[Out] -(b^2*Sqrt[b*x^2])/(3*x^4)
```

Rubi [A] time = 0.00830388, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$-\frac{b^2\sqrt{bx^2}}{3x^4}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^2)^(5/2)/x^9,x]

[Out] -(b^2*Sqrt[b*x^2])/(3*x^4)
```

Rubi in Sympy [A] time = 2.50493, size = 14, normalized size = 0.74

$$-\frac{b^4}{3\left(bx^2\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**2)**(5/2)/x**9,x)

[Out] -b**4/(3*(b*x**2)**(3/2))
```

Mathematica [A] time = 0.00313231, size = 16, normalized size = 0.84

$$-\frac{(bx^2)^{5/2}}{3x^8}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^2)^(5/2)/x^9,x]

[Out] -(b*x^2)^(5/2)/(3*x^8)
```

Maple [A] time = 0.003, size = 13, normalized size = 0.7

$$-\frac{1}{3\,x^8}\left(bx^2\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^2)^(5/2)/x^9,x)

[Out] -1/3*(b*x^2)^(5/2)/x^8
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2)/x^9,x, algorithm="maxima")

[Out] Exception raised: RuntimeError
```

Fricas [A] time = 0.222104, size = 20, normalized size = 1.05

$$-\frac{\sqrt{bx^2}b^2}{3\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2)/x^9,x, algorithm="fricas")

[Out] -1/3*sqrt(b*x^2)*b^2/x^4
```

Sympy [A] time = 10.8659, size = 17, normalized size = 0.89

$$-\frac{b^{\frac{5}{2}}\left(x^2\right)^{\frac{5}{2}}}{3x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**2)**(5/2)/x**9,x)

[Out] -b**(5/2)*(x**2)**(5/2)/(3*x**8)
```

GIAC/XCAS [A] time = 0.210712, size = 14, normalized size = 0.74

$$-\frac{b^{\frac{5}{2}}\operatorname{sign}(x)}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(5/2)/x^9,x, algorithm="giac")

[Out] -1/3*b^(5/2)*sign(x)/x^3
```

3.34 $\int (x^2)^{7/2}\,dx$

Optimal. Leaf size=14

$$\frac{1}{8}x^7\sqrt{x^2}$$

```
[Out] (x^7*Sqrt[x^2])/8
```

Rubi [A] time = 0.00515077, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286

$$\frac{1}{8}x^7\sqrt{x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(x^2)^(7/2),x]
```

```
[Out] (x^7*Sqrt[x^2])/8
```

Rubi in Sympy [A] time = 1.08604, size = 10, normalized size = 0.71

$$\frac{x^7\sqrt{x^2}}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((x**2)**(7/2),x)
```

```
[Out] x**7*sqrt(x**2)/8
```

Mathematica [A] time = 0.00591073, size = 12, normalized size = 0.86

$$\frac{1}{8}x\left(x^2\right)^{7/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(x^2)^(7/2),x]
```

```
[Out] (x*(x^2)^(7/2))/8
```

Maple [A] time = 0.003, size = 9, normalized size = 0.6

$$\frac{x}{8}\left(x^2\right)^{\frac{7}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((x^2)^(7/2),x)
```

```
[Out] 1/8*x*(x^2)^(7/2)
```

Maxima [A] time = 1.43946, size = 11, normalized size = 0.79

$$\frac{1}{8}\left(x^2\right)^{\frac{7}{2}}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x^2)^(7/2),x, algorithm="maxima")
```

```
[Out] 1/8*(x^2)^(7/2)*x
```

Fricas [A] time = 0.217439, size = 7, normalized size = 0.5

$$\frac{1}{8}x^8$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x^2)^(7/2),x, algorithm="fricas")
```

```
[Out] 1/8*x^8
```

Sympy [A] time = 0.105236, size = 3, normalized size = 0.21

$$\frac{x^8}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x**2)**(7/2),x)
```

```
[Out] x**8/8
```

GIAC/XCAS [A] time = 0.220829, size = 9, normalized size = 0.64

$$\frac{1}{8}x^8\mathrm{sign}\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x^2)^(7/2),x, algorithm="giac")
```

```
[Out] 1/8*x^8*sign(x)
```

3.35 $\int \frac{x^3}{\sqrt{bx^2}}\,dx$

Optimal. Leaf size=16

$$\frac{x^4}{3\sqrt{bx^2}}$$

```
[Out] x^4/(3*Sqrt[b*x^2])
```

Rubi [A] time = 0.00708122, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{x^4}{3\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/Sqrt[b*x^2],x]

[Out] x^4/(3*Sqrt[b*x^2])
```

Rubi in Sympy [A] time = 2.55473, size = 12, normalized size = 0.75

$$\frac{(bx^2)^{\frac{3}{2}}}{3b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(b*x**2)**(1/2),x)

[Out] (b*x**2)**(3/2)/(3*b**2)
```

Mathematica [A] time = 0.0034347, size = 16, normalized size = 1.

$$\frac{x^4}{3\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/Sqrt[b*x^2],x]

[Out] x^4/(3*Sqrt[b*x^2])
```

Maple [A] time = 0.002, size = 13, normalized size = 0.8

$$\frac{x^4}{3}\frac{1}{\sqrt{bx^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(b*x^2)^(1/2),x)
```

```
[Out] 1/3*x^4/(b*x^2)^(1/2)
```

Maxima [A] time = 1.43558, size = 20, normalized size = 1.25

$$\frac{\sqrt{bx^2}x^2}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(b*x^2),x, algorithm="maxima")
```

```
[Out] 1/3*sqrt(b*x^2)*x^2/b
```

Fricas [A] time = 0.234714, size = 20, normalized size = 1.25

$$\frac{\sqrt{bx^2}x^2}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(b*x^2),x, algorithm="fricas")
```

```
[Out] 1/3*sqrt(b*x^2)*x^2/b
```

Sympy [A] time = 1.91037, size = 15, normalized size = 0.94

$$\frac{x^4}{3\sqrt{b}\sqrt{x^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(b*x**2)**(1/2),x)
```

```
[Out] x**4/(3*sqrt(b)*sqrt(x**2))
```

GIAC/XCAS [A] time = 0.212475, size = 20, normalized size = 1.25

$$\frac{\sqrt{bx^2}x^2}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(b*x^2),x, algorithm="giac")
```

```
[Out] 1/3*sqrt(b*x^2)*x^2/b
```

3.36 $\int \frac{x}{\sqrt{bx^2}}\,dx$

Optimal. Leaf size=13

$$\frac{x^2}{\sqrt{bx^2}}$$

```
[Out] x^2/Sqrt[b*x^2]
```

Rubi [A] time = 0.00611616, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{x^2}{\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x/Sqrt[b*x^2],x]

[Out] x^2/Sqrt[b*x^2]
```

Rubi in Sympy [A] time = 2.21755, size = 8, normalized size = 0.62

$$\frac{\sqrt{bx^2}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x/(b*x**2)**(1/2),x)

[Out] sqrt(b*x**2)/b
```

Mathematica [A] time = 0.00177911, size = 13, normalized size = 1.

$$\frac{x^2}{\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/Sqrt[b*x^2],x]

[Out] x^2/Sqrt[b*x^2]
```

Maple [A] time = 0.003, size = 12, normalized size = 0.9

$$x^2\frac{1}{\sqrt{bx^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(b*x^2)^(1/2),x)

[Out] x^2/(b*x^2)^(1/2)
```

Maxima [A] time = 1.43337, size = 15, normalized size = 1.15

$$\frac{\sqrt{bx^2}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(b*x^2),x, algorithm="maxima")
```

```
[Out] sqrt(b*x^2)/b
```

Fricas [A] time = 0.219946, size = 15, normalized size = 1.15

$$\frac{\sqrt{bx^2}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(b*x^2),x, algorithm="fricas")
```

```
[Out] sqrt(b*x^2)/b
```

Sympy [A] time = 1.63737, size = 14, normalized size = 1.08

$$\frac{x^2}{\sqrt{b}\sqrt{x^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x**2)**(1/2),x)
```

```
[Out] x**2/(sqrt(b)*sqrt(x**2))
```

GIAC/XCAS [A] time = 0.213015, size = 15, normalized size = 1.15

$$\frac{\sqrt{bx^2}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(b*x^2),x, algorithm="giac")
```

```
[Out] sqrt(b*x^2)/b
```

3.37 $\int \frac{1}{x\sqrt{bx^2}}\,dx$

Optimal. Leaf size=11

$$-\frac{1}{\sqrt{bx^2}}$$

```
[Out] -(1/Sqrt[b*x^2])
```

Rubi [A] time = 0.00628959, antiderivative size = 11, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{1}{\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*Sqrt[b*x^2]),x]

[Out] -(1/Sqrt[b*x^2])
```

Rubi in Sympy [A] time = 2.33053, size = 10, normalized size = 0.91

$$-\frac{1}{\sqrt{bx^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(b*x**2)**(1/2),x)

[Out] -1/sqrt(b*x**2)
```

Mathematica [A] time = 0.00367085, size = 15, normalized size = 1.36

$$-\frac{bx^2}{(bx^2)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*Sqrt[b*x^2]),x]

[Out] -((b*x^2)/(b*x^2)^(3/2))
```

Maple [A] time = 0.003, size = 10, normalized size = 0.9

$$-\frac{1}{\sqrt{bx^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(b*x^2)^(1/2),x)

[Out] -1/(b*x^2)^(1/2)
```

Maxima [A] time = 1.44515, size = 11, normalized size = 1.

$$-\frac{1}{\sqrt{b}x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^2)*x),x, algorithm="maxima")
```

```
[Out] -1/(sqrt(b)*x)
```

Fricas [A] time = 0.232776, size = 20, normalized size = 1.82

$$-\frac{\sqrt{bx^2}}{bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^2)*x),x, algorithm="fricas")
```

```
[Out] -sqrt(b*x^2)/(b*x^2)
```

Sympy [A] time = 1.75118, size = 14, normalized size = 1.27

$$-\frac{1}{\sqrt{b}\sqrt{x^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(b*x**2)**(1/2),x)
```

```
[Out] -1/(sqrt(b)*sqrt(x**2))
```

GIAC/XCAS [A] time = 0.218588, size = 12, normalized size = 1.09

$$-\frac{1}{\sqrt{bx^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^2)*x),x, algorithm="giac")
```

```
[Out] -1/sqrt(b*x^2)
```

3.38 $\int \frac{1}{x^3\sqrt{bx^2}}\,dx$

Optimal. Leaf size=16

$$-\frac{1}{3x^2\sqrt{bx^2}}$$

```
[Out] -1/(3*x^2*Sqrt[b*x^2])
```

Rubi [A] time = 0.00631486, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{1}{3x^2\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*Sqrt[b*x^2]),x]

[Out] -1/(3*x^2*Sqrt[b*x^2])
```

Rubi in Sympy [A] time = 2.48876, size = 12, normalized size = 0.75

$$-\frac{b}{3\,(bx^2)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(b*x**2)**(1/2),x)

[Out] -b/(3*(b*x**2)**(3/2))
```

Mathematica [A] time = 0.00404139, size = 16, normalized size = 1.

$$-\frac{1}{3x^2\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*Sqrt[b*x^2]),x]

[Out] -1/(3*x^2*Sqrt[b*x^2])
```

Maple [A] time = 0.002, size = 13, normalized size = 0.8

$$-\frac{1}{3\,x^2}\frac{1}{\sqrt{bx^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(b*x^2)^(1/2),x)

[Out] -1/3/x^2/(b*x^2)^(1/2)
```

Maxima [A] time = 1.43133, size = 11, normalized size = 0.69

$$-\frac{1}{3\sqrt{b}x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^2)*x^3),x, algorithm="maxima")
```

```
[Out] -1/3/(sqrt(b)*x^3)
```

Fricas [A] time = 0.240641, size = 20, normalized size = 1.25

$$-\frac{\sqrt{bx^2}}{3\,bx^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^2)*x^3),x, algorithm="fricas")
```

```
[Out] -1/3*sqrt(b*x^2)/(b*x^4)
```

Sympy [A] time = 2.31415, size = 19, normalized size = 1.19

$$-\frac{1}{3\sqrt{b}x^2\sqrt{x^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(b*x**2)**(1/2),x)
```

```
[Out] -1/(3*sqrt(b)*x**2*sqrt(x**2))
```

GIAC/XCAS [A] time = 0.209753, size = 16, normalized size = 1.

$$-\frac{1}{3\sqrt{bx^2}x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^2)*x^3),x, algorithm="giac")
```

```
[Out] -1/3/(sqrt(b*x^2)*x^2)
```

3.39 $\int \frac{x^2}{\sqrt{bx^2}}\,dx$

Optimal. Leaf size=16

$$\frac{x^3}{2\sqrt{bx^2}}$$

```
[Out] x^3/(2*Sqrt[b*x^2])
```

Rubi [A] time = 0.00664445, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{x^3}{2\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/Sqrt[b*x^2],x]

[Out] x^3/(2*Sqrt[b*x^2])
```

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

$$\frac{\sqrt{bx^2}\int x\,dx}{bx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**2/(b*x**2)**(1/2),x)

[Out] sqrt(b*x**2)*Integral(x, x)/(b*x)
```

Mathematica [A] time = 0.00253715, size = 16, normalized size = 1.

$$\frac{x^3}{2\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/Sqrt[b*x^2],x]

[Out] x^3/(2*Sqrt[b*x^2])
```

Maple [A] time = 0.002, size = 13, normalized size = 0.8

$$\frac{x^3}{2}\frac{1}{\sqrt{bx^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(b*x^2)^(1/2),x)
```

```
[Out] 1/2*x^3/(b*x^2)^(1/2)
```

Maxima [A] time = 1.4336, size = 11, normalized size = 0.69

$$\frac{x^2}{2\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(b*x^2),x, algorithm="maxima")
```

```
[Out] 1/2*x^2/sqrt(b)
```

Fricas [A] time = 0.214799, size = 18, normalized size = 1.12

$$\frac{\sqrt{bx^2}x}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(b*x^2),x, algorithm="fricas")
```

```
[Out] 1/2*sqrt(b*x^2)*x/b
```

Sympy [A] time = 1.66752, size = 15, normalized size = 0.94

$$\frac{x^3}{2\sqrt{b}\sqrt{x^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(b*x**2)**(1/2),x)
```

```
[Out] x**3/(2*sqrt(b)*sqrt(x**2))
```

GIAC/XCAS [A] time = 0.220003, size = 18, normalized size = 1.12

$$\frac{\sqrt{bx^2}x}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(b*x^2),x, algorithm="giac")
```

```
[Out] 1/2*sqrt(b*x^2)*x/b
```

3.40 $\int \frac{1}{\sqrt{bx^2}} dx$

Optimal. Leaf size=13

$$\frac{x\log(x)}{\sqrt{bx^2}}$$

```
[Out] (x*Log[x])/Sqrt[b*x^2]
```

Rubi [A] time = 0.00581185, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{x\log(x)}{\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[b*x^2],x]

[Out] (x*Log[x])/Sqrt[b*x^2]
```

Rubi in Sympy [A] time = 1.51314, size = 14, normalized size = 1.08

$$\frac{\sqrt{bx^2}\log{(x)}}{bx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**2)**(1/2),x)

[Out] sqrt(b*x**2)*log(x)/(b*x)
```

Mathematica [A] time = 0.000366701, size = 13, normalized size = 1.

$$\frac{x\log(x)}{\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/Sqrt[b*x^2],x]

[Out] (x*Log[x])/Sqrt[b*x^2]
```

Maple [A] time = 0.004, size = 12, normalized size = 0.9

$$x\ln{(x)}\frac{1}{\sqrt{bx^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^2)^(1/2),x)

[Out] x*ln(x)/(b*x^2)^(1/2)
```

Maxima [A] time = 1.42865, size = 8, normalized size = 0.62

$$\frac{\log(x)}{\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*x^2),x, algorithm="maxima")
```

```
[Out] log(x)/sqrt(b)
```

Fricas [A] time = 0.21632, size = 22, normalized size = 1.69

$$\frac{\sqrt{bx^2}\log(x)}{bx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*x^2),x, algorithm="fricas")
```

```
[Out] sqrt(b*x^2)*log(x)/(b*x)
```

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

$$\int \frac{1}{\sqrt{bx^2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**2)**(1/2),x)
```

```
[Out] Integral(1/sqrt(b*x**2), x)
```

GIAC/XCAS [A] time = 0.223689, size = 24, normalized size = 1.85

$$\frac{\ln\left(\sqrt{b}|x||\mathrm{sign}(x)|\right)}{\sqrt{b}\mathrm{sign}(x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*x^2),x, algorithm="giac")
```

```
[Out] ln(sqrt(b)*abs(x)*abs(sign(x)))/(sqrt(b)*sign(x))
```

3.41 $\int \frac{1}{x^2\sqrt{bx^2}}\,dx$

Optimal. Leaf size=16

$$-\frac{1}{2x\sqrt{bx^2}}$$

```
[Out] -1/(2*x*Sqrt[b*x^2])
```

Rubi [A] time = 0.00664285, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{1}{2x\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^2*Sqrt[b*x^2]),x]

[Out] -1/(2*x*Sqrt[b*x^2])
```

Rubi in Sympy [A] time = 2.49238, size = 15, normalized size = 0.94

$$-\frac{\sqrt{bx^2}}{2bx^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**2/(b*x**2)**(1/2),x)

[Out] -sqrt(b*x**2)/(2*b*x**3)
```

Mathematica [A] time = 0.00420618, size = 15, normalized size = 0.94

$$-\frac{bx}{2\left(bx^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^2*Sqrt[b*x^2]),x]

[Out] -(b*x)/(2*(b*x^2)^(3/2))
```

Maple [A] time = 0.002, size = 13, normalized size = 0.8

$$-\frac{1}{2\,x}\frac{1}{\sqrt{bx^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(b*x^2)^(1/2),x)

[Out] -1/2/x/(b*x^2)^(1/2)
```

Maxima [A] time = 1.41343, size = 11, normalized size = 0.69

$$-\frac{1}{2\sqrt{b}x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^2)*x^2),x, algorithm="maxima")
```

```
[Out] -1/2/(sqrt(b)*x^2)
```

Fricas [A] time = 0.21336, size = 20, normalized size = 1.25

$$-\frac{\sqrt{bx^2}}{2\,bx^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^2)*x^2),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(b*x^2)/(b*x^3)
```

Sympy [A] time = 1.91366, size = 17, normalized size = 1.06

$$-\frac{1}{2\sqrt{b}x\sqrt{x^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(b*x**2)**(1/2),x)
```

```
[Out] -1/(2*sqrt(b)*x*sqrt(x**2))
```

GIAC/XCAS [A] time = 0.572773, size = 4, normalized size = 0.25

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^2)*x^2),x, algorithm="giac")
```

```
[Out] sage0*x
```

3.42 $\int \frac{x^5}{(bx^2)^{3/2}}\,dx$

Optimal. Leaf size=19

$$\frac{x^4}{3b\sqrt{bx^2}}$$

```
[Out] x^4/(3*b*Sqrt[b*x^2])
```

Rubi [A] time = 0.00846771, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{x^4}{3b\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/(b*x^2)^(3/2),x]

[Out] x^4/(3*b*Sqrt[b*x^2])
```

Rubi in Sympy [A] time = 2.77255, size = 12, normalized size = 0.63

$$\frac{(bx^2)^{\frac{3}{2}}}{3b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(b*x**2)**(3/2),x)

[Out] (b*x**2)**(3/2)/(3*b**3)
```

Mathematica [A] time = 0.00202773, size = 16, normalized size = 0.84

$$\frac{x^6}{3\,(bx^2)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/(b*x^2)^(3/2),x]

[Out] x^6/(3*(b*x^2)^(3/2))
```

Maple [A] time = 0.003, size = 13, normalized size = 0.7

$$\frac{x^6}{3}\left(bx^2\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(b*x^2)^(3/2),x)
```

```
[Out] 1/3*x^6/(b*x^2)^(3/2)
```

Maxima [A] time = 1.41437, size = 20, normalized size = 1.05

$$\frac{x^4}{3\sqrt{bx^2}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^2)^(3/2),x, algorithm="maxima")
```

```
[Out] 1/3*x^4/(sqrt(b*x^2)*b)
```

Fricas [A] time = 0.262061, size = 20, normalized size = 1.05

$$\frac{\sqrt{bx^2}x^2}{3\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^2)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/3*sqrt(b*x^2)*x^2/b^2
```

Sympy [A] time = 2.52758, size = 15, normalized size = 0.79

$$\frac{x^6}{3b^{\frac{3}{2}}\left(x^2\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(b*x**2)**(3/2),x)
```

```
[Out] x**6/(3*b**(3/2)*(x**2)**(3/2))
```

GIAC/XCAS [A] time = 0.218827, size = 20, normalized size = 1.05

$$\frac{\sqrt{bx^2}x^2}{3\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^2)^(3/2),x, algorithm="giac")
```

```
[Out] 1/3*sqrt(b*x^2)*x^2/b^2
```

3.43 $\int \frac{x^3}{(bx^2)^{3/2}}\,dx$

Optimal. Leaf size=16

$$\frac{x^2}{b\sqrt{bx^2}}$$

[Out] x^2/(b*Sqrt[b*x^2])

Rubi [A] time = 0.00733273, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{x^2}{b\sqrt{bx^2}}$$

Antiderivative was successfully verified.

[In] Int[x^3/(b*x^2)^(3/2),x]

[Out] x^2/(b*Sqrt[b*x^2])

Rubi in Sympy [A] time = 2.58571, size = 10, normalized size = 0.62

$$\frac{\sqrt{bx^2}}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(x**3/(b*x**2)**(3/2),x)

[Out] sqrt(b*x**2)/b**2

Mathematica [A] time = 0.00212405, size = 13, normalized size = 0.81

$$\frac{x^4}{(bx^2)^{3/2}}$$

Antiderivative was successfully verified.

[In] Integrate[x^3/(b*x^2)^(3/2),x]

[Out] x^4/(b*x^2)^(3/2)

Maple [A] time = 0.002, size = 12, normalized size = 0.8

$$x^4\left(bx^2\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^3/(b*x^2)^(3/2),x)

[Out] x^4/(b*x^2)^(3/2)

Maxima [A] time = 1.44046, size = 19, normalized size = 1.19

$$\frac{x^2}{\sqrt{bx^2}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^2)^(3/2),x, algorithm="maxima")
```

```
[Out] x^2/(sqrt(b*x^2)*b)
```

Fricas [A] time = 0.232458, size = 15, normalized size = 0.94

$$\frac{\sqrt{bx^2}}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^2)^(3/2),x, algorithm="fricas")
```

```
[Out] sqrt(b*x^2)/b^2
```

Sympy [A] time = 1.9739, size = 14, normalized size = 0.88

$$\frac{x^4}{b^{\frac{3}{2}}\left(x^2\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(b*x**2)**(3/2),x)
```

```
[Out] x**4/(b**(3/2)*(x**2)**(3/2))
```

GIAC/XCAS [A] time = 0.213096, size = 15, normalized size = 0.94

$$\frac{\sqrt{bx^2}}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^2)^(3/2),x, algorithm="giac")
```

```
[Out] sqrt(b*x^2)/b^2
```

3.44 $\int \frac{x}{(bx^2)^{3/2}} \, dx$

Optimal. Leaf size=14

$$-\frac{1}{b\sqrt{bx^2}}$$

```
[Out] -(1/(b*Sqrt[b*x^2]))
```

Rubi [A] time = 0.00728729, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$-\frac{1}{b\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x/(b*x^2)^(3/2),x]

[Out] -(1/(b*Sqrt[b*x^2]))
```

Rubi in Sympy [A] time = 2.1282, size = 12, normalized size = 0.86

$$-\frac{1}{b\sqrt{bx^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x/(b*x**2)**(3/2),x)

[Out] -1/(b*sqrt(b*x**2))
```

Mathematica [A] time = 0.00166711, size = 14, normalized size = 1.

$$-\frac{x^2}{(bx^2)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(b*x^2)^(3/2),x]

[Out] -(x^2/(b*x^2)^(3/2))
```

Maple [A] time = 0.004, size = 13, normalized size = 0.9

$$-x^2\left(bx^2\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(b*x^2)^(3/2),x)

[Out] -x^2/(b*x^2)^(3/2)
```

Maxima [A] time = 1.42954, size = 16, normalized size = 1.14

$$-\frac{1}{\sqrt{bx^2}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^2)^(3/2),x, algorithm="maxima")
```

```
[Out] -1/(sqrt(b*x^2)*b)
```

Fricas [A] time = 0.216547, size = 20, normalized size = 1.43

$$-\frac{\sqrt{bx^2}}{b^2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^2)^(3/2),x, algorithm="fricas")
```

```
[Out] -sqrt(b*x^2)/(b^2*x^2)
```

Sympy [A] time = 1.96215, size = 15, normalized size = 1.07

$$-\frac{x^2}{b^{\frac{3}{2}}\left(x^2\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x**2)**(3/2),x)
```

```
[Out] -x**2/(b**(3/2)*(x**2)**(3/2))
```

GIAC/XCAS [A] time = 0.209495, size = 16, normalized size = 1.14

$$-\frac{1}{\sqrt{bx^2}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^2)^(3/2),x, algorithm="giac")
```

```
[Out] -1/(sqrt(b*x^2)*b)
```

3.45 $\int \frac{1}{x(bx^2)^{3/2}} \, dx$

Optimal. Leaf size=19

$$-\frac{1}{3bx^2\sqrt{bx^2}}$$

```
[Out] -1/(3*b*x^2*Sqrt[b*x^2])
```

Rubi [A] time = 0.00816629, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$-\frac{1}{3bx^2\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(b*x^2)^(3/2)),x]

[Out] -1/(3*b*x^2*Sqrt[b*x^2])
```

Rubi in Sympy [A] time = 2.28735, size = 12, normalized size = 0.63

$$-\frac{1}{3\left(bx^2\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(b*x**2)**(3/2),x)

[Out] -1/(3*(b*x**2)**(3/2))
```

Mathematica [A] time = 0.00503237, size = 17, normalized size = 0.89

$$-\frac{bx^2}{3\left(bx^2\right)^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(b*x^2)^(3/2)),x]

[Out] -(b*x^2)/(3*(b*x^2)^(5/2))
```

Maple [A] time = 0.004, size = 10, normalized size = 0.5

$$-\frac{1}{3}\left(bx^2\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(b*x^2)^(3/2),x)

[Out] -1/3/(b*x^2)^(3/2)
```

Maxima [A] time = 1.41441, size = 11, normalized size = 0.58

$$-\frac{1}{3\,b^{\frac{3}{2}}x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^2)^(3/2)*x),x, algorithm="maxima")
```

```
[Out] -1/3/(b^(3/2)*x^3)
```

Fricas [A] time = 0.216853, size = 20, normalized size = 1.05

$$-\frac{\sqrt{bx^2}}{3\,b^2x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^2)^(3/2)*x),x, algorithm="fricas")
```

```
[Out] -1/3*sqrt(b*x^2)/(b^2*x^4)
```

Sympy [A] time = 2.26645, size = 15, normalized size = 0.79

$$-\frac{1}{3b^{\frac{3}{2}}\left(x^2\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(b*x**2)**(3/2),x)
```

```
[Out] -1/(3*b**(3/2)*(x**2)**(3/2))
```

GIAC/XCAS [A] time = 0.221404, size = 20, normalized size = 1.05

$$-\frac{1}{3\,\sqrt{bx^2}bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^2)^(3/2)*x),x, algorithm="giac")
```

```
[Out] -1/3/(sqrt(b*x^2)*b*x^2)
```

3.46 $\int \frac{1}{x^3 (bx^2)^{3/2}} \, dx$

Optimal. Leaf size=19

$$-\frac{1}{5bx^4\sqrt{bx^2}}$$

```
[Out] -1/(5*b*x^4*Sqrt[b*x^2])
```

Rubi [A] time = 0.00850547, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{1}{5bx^4\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(b*x^2)^(3/2)),x]

[Out] -1/(5*b*x^4*Sqrt[b*x^2])
```

Rubi in Sympy [A] time = 2.50083, size = 12, normalized size = 0.63

$$-\frac{b}{5\left(bx^2\right)^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(b*x**2)**(3/2),x)

[Out] -b/(5*(b*x**2)**(5/2))
```

Mathematica [A] time = 0.00471399, size = 16, normalized size = 0.84

$$-\frac{1}{5x^2\left(bx^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*(b*x^2)^(3/2)),x]

[Out] -1/(5*x^2*(b*x^2)^(3/2))
```

Maple [A] time = 0.003, size = 13, normalized size = 0.7

$$-\frac{1}{5\,x^2}\left(bx^2\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(b*x^2)^(3/2),x)

[Out] -1/5/x^2/(b*x^2)^(3/2)
```

Maxima [A] time = 1.41939, size = 11, normalized size = 0.58

$$-\frac{1}{5\,b^{\frac{3}{2}}x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^2)^(3/2)*x^3),x, algorithm="maxima")
```

```
[Out] -1/5/(b^(3/2)*x^5)
```

Fricas [A] time = 0.215718, size = 20, normalized size = 1.05

$$-\frac{\sqrt{bx^2}}{5\,b^2x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^2)^(3/2)*x^3),x, algorithm="fricas")
```

```
[Out] -1/5*sqrt(b*x^2)/(b^2*x^6)
```

Sympy [A] time = 3.00533, size = 19, normalized size = 1.

$$-\frac{1}{5b^{\frac{3}{2}}x^2\left(x^2\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(b*x**2)**(3/2),x)
```

```
[Out] -1/(5*b**(3/2)*x**2*(x**2)**(3/2))
```

GIAC/XCAS [A] time = 0.211928, size = 20, normalized size = 1.05

$$-\frac{1}{5\,\sqrt{bx^2}bx^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^2)^(3/2)*x^3),x, algorithm="giac")
```

```
[Out] -1/5/(sqrt(b*x^2)*b*x^4)
```

3.47 $\int \frac{x^6}{(bx^2)^{3/2}}\,dx$

Optimal. Leaf size=19

$$\frac{x^5}{4b\sqrt{bx^2}}$$

[Out] x^5/(4*b*Sqrt[b*x^2])

Rubi [A] time = 0.00853267, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$\frac{x^5}{4b\sqrt{bx^2}}$$

Antiderivative was successfully verified.

[In] Int[x^6/(b*x^2)^(3/2),x]

[Out] x^5/(4*b*Sqrt[b*x^2])

Rubi in Sympy [A] time = 2.43532, size = 15, normalized size = 0.79

$$\frac{x^3\sqrt{bx^2}}{4b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(x**6/(b*x**2)**(3/2),x)

[Out] x**3*sqrt(b*x**2)/(4*b**2)

Mathematica [A] time = 0.00334574, size = 16, normalized size = 0.84

$$\frac{x^7}{4\,(bx^2)^{3/2}}$$

Antiderivative was successfully verified.

[In] Integrate[x^6/(b*x^2)^(3/2),x]

[Out] x^7/(4*(b*x^2)^(3/2))

Maple [A] time = 0.004, size = 13, normalized size = 0.7

$$\frac{x^7}{4}\left(bx^2\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^6/(b*x^2)^(3/2),x)

```
[Out] 1/4*x^7/(b*x^2)^(3/2)
```

Maxima [A] time = 1.425, size = 20, normalized size = 1.05

$$\frac{x^5}{4\sqrt{bx^2}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(b*x^2)^(3/2),x, algorithm="maxima")
```

```
[Out] 1/4*x^5/(sqrt(b*x^2)*b)
```

Fricas [A] time = 0.210852, size = 20, normalized size = 1.05

$$\frac{\sqrt{bx^2}x^3}{4b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(b*x^2)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/4*sqrt(b*x^2)*x^3/b^2
```

Sympy [A] time = 3.11139, size = 15, normalized size = 0.79

$$\frac{x^7}{4b^{\frac{3}{2}}\left(x^2\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(b*x**2)**(3/2),x)
```

```
[Out] x**7/(4*b**(3/2)*(x**2)**(3/2))
```

GIAC/XCAS [A] time = 0.220189, size = 20, normalized size = 1.05

$$\frac{\sqrt{bx^2}x^3}{4b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(b*x^2)^(3/2),x, algorithm="giac")
```

```
[Out] 1/4*sqrt(b*x^2)*x^3/b^2
```

3.48 $\int \frac{x^4}{(bx^2)^{3/2}}\,dx$

Optimal. Leaf size=19

$$\frac{x^3}{2b\sqrt{bx^2}}$$

```
[Out] x^3/(2*b*Sqrt[b*x^2])
```

Rubi [A] time = 0.00866098, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$\frac{x^3}{2b\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(b*x^2)^(3/2),x]

[Out] x^3/(2*b*Sqrt[b*x^2])
```

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

$$\frac{\sqrt{bx^2}\int x\,dx}{b^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(b*x**2)**(3/2),x)

[Out] sqrt(b*x**2)*Integral(x, x)/(b**2*x)
```

Mathematica [A] time = 0.00224436, size = 16, normalized size = 0.84

$$\frac{x^5}{2\left(bx^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(b*x^2)^(3/2),x]

[Out] x^5/(2*(b*x^2)^(3/2))
```

Maple [A] time = 0.001, size = 13, normalized size = 0.7

$$\frac{x^5}{2}\left(bx^2\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(b*x^2)^(3/2),x)
```

```
[Out] 1/2*x^5/(b*x^2)^(3/2)
```

Maxima [A] time = 1.42246, size = 20, normalized size = 1.05

$$\frac{x^3}{2\sqrt{bx^2}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^2)^(3/2),x, algorithm="maxima")
```

```
[Out] 1/2*x^3/(sqrt(b*x^2)*b)
```

Fricas [A] time = 0.260822, size = 18, normalized size = 0.95

$$\frac{\sqrt{bx^2}x}{2\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^2)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/2*sqrt(b*x^2)*x/b^2
```

Sympy [A] time = 2.34851, size = 15, normalized size = 0.79

$$\frac{x^5}{2b^{\frac{3}{2}}\left(x^2\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(b*x**2)**(3/2),x)
```

```
[Out] x**5/(2*b**(3/2)*(x**2)**(3/2))
```

GIAC/XCAS [A] time = 0.218145, size = 18, normalized size = 0.95

$$\frac{\sqrt{bx^2}x}{2\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^2)^(3/2),x, algorithm="giac")
```

```
[Out] 1/2*sqrt(b*x^2)*x/b^2
```

3.49 $\int \frac{x^2}{(bx^2)^{3/2}}\,dx$

Optimal. Leaf size=16

$$\frac{x\log(x)}{b\sqrt{bx^2}}$$

```
[Out] (x*Log[x])/(b*Sqrt[b*x^2])
```

Rubi [A] time = 0.00725945, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{x\log(x)}{b\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(b*x^2)^(3/2),x]

[Out] (x*Log[x])/(b*Sqrt[b*x^2])
```

Rubi in Sympy [A] time = 2.31844, size = 15, normalized size = 0.94

$$\frac{\sqrt{bx^2}\log(x)}{b^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(b*x**2)**(3/2),x)

[Out] sqrt(b*x**2)*log(x)/(b**2*x)
```

Mathematica [A] time = 0.00254674, size = 15, normalized size = 0.94

$$\frac{x^3\log(x)}{(bx^2)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(b*x^2)^(3/2),x]

[Out] (x^3*Log[x])/(b*x^2)^(3/2)
```

Maple [A] time = 0.004, size = 14, normalized size = 0.9

$$x^3\ln(x)\left(bx^2\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(b*x^2)^(3/2),x)

[Out] 1/(b*x^2)^(3/2)*x^3*ln(x)
```

Maxima [A] time = 1.4396, size = 8, normalized size = 0.5

$$\frac{\log\left(x\right)}{b^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^2)^(3/2),x, algorithm="maxima")
```

```
[Out] log(x)/b^(3/2)
```

Fricas [A] time = 0.241001, size = 22, normalized size = 1.38

$$\frac{\sqrt{bx^2}\log\left(x\right)}{b^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^2)^(3/2),x, algorithm="fricas")
```

```
[Out] sqrt(b*x^2)*log(x)/(b^2*x)
```

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

$$\int \frac{x^2}{\left(bx^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(b*x**2)**(3/2),x)
```

```
[Out] Integral(x**2/(b*x**2)**(3/2), x)
```

GIAC/XCAS [A] time = 0.217083, size = 28, normalized size = 1.75

$$-\frac{\ln\left(\left|-\sqrt{b}x+\sqrt{bx^2}\right|\right)}{b^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^2)^(3/2),x, algorithm="giac")
```

```
[Out] -ln(abs(-sqrt(b)*x + sqrt(b*x^2)))/b^(3/2)
```

3.50 $\int \frac{1}{(bx^2)^{3/2}}\,dx$

Optimal. Leaf size=19

$$-\frac{1}{2bx\sqrt{bx^2}}$$

```
[Out] -1/(2*b*x*Sqrt[b*x^2])
```

Rubi [A] time = 0.00862066, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$-\frac{1}{2bx\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^2)^(-3/2),x]

[Out] -1/(2*b*x*Sqrt[b*x^2])
```

Rubi in Sympy [A] time = 1.48201, size = 17, normalized size = 0.89

$$-\frac{\sqrt{bx^2}}{2b^2x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**2)**(3/2),x)

[Out] -sqrt(b*x**2)/(2*b**2*x**3)
```

Mathematica [A] time = 0.000325103, size = 14, normalized size = 0.74

$$-\frac{x}{2\,(bx^2)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^2)^(-3/2),x]

[Out] -x/(2*(b*x^2)^(3/2))
```

Maple [A] time = 0.003, size = 11, normalized size = 0.6

$$-\frac{x}{2}\left(bx^2\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^2)^(3/2),x)

[Out] -1/2*x/(b*x^2)^(3/2)
```

Maxima [A] time = 1.42175, size = 11, normalized size = 0.58

$$-\frac{1}{2\,b^{\frac{3}{2}}x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(-3/2),x, algorithm="maxima")
```

```
[Out] -1/2/(b^(3/2)*x^2)
```

Fricas [A] time = 0.217125, size = 20, normalized size = 1.05

$$-\frac{\sqrt{bx^2}}{2\,b^2x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(-3/2),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(b*x^2)/(b^2*x^3)
```

Sympy [A] time = 1.9581, size = 15, normalized size = 0.79

$$-\frac{x}{2b^{\frac{3}{2}}\left(x^2\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**2)**(3/2),x)
```

```
[Out] -x/(2*b**(3/2)*(x**2)**(3/2))
```

GIAC/XCAS [A] time = 0.538692, size = 4, normalized size = 0.21

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(-3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

3.51 $\int \frac{1}{x^2(bx^2)^{3/2}}\,dx$

Optimal. Leaf size=19

$$-\frac{1}{4bx^3\sqrt{bx^2}}$$

```
[Out] -1/(4*b*x^3*Sqrt[b*x^2])
```

Rubi [A] time = 0.00937006, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{1}{4bx^3\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(b*x^2)^(3/2)),x]

[Out] -1/(4*b*x^3*Sqrt[b*x^2])
```

Rubi in Sympy [A] time = 2.37632, size = 17, normalized size = 0.89

$$-\frac{\sqrt{bx^2}}{4b^2x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(b*x**2)**(3/2),x)

[Out] -sqrt(b*x**2)/(4*b**2*x**5)
```

Mathematica [A] time = 0.00325231, size = 15, normalized size = 0.79

$$-\frac{bx}{4\left(bx^2\right)^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*(b*x^2)^(3/2)),x]

[Out] -(b*x)/(4*(b*x^2)^(5/2))
```

Maple [A] time = 0.003, size = 13, normalized size = 0.7

$$-\frac{1}{4\,x}\left(bx^2\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(b*x^2)^(3/2),x)

[Out] -1/4/x/(b*x^2)^(3/2)
```

Maxima [A] time = 1.41225, size = 11, normalized size = 0.58

$$-\frac{1}{4\,b^{\frac{3}{2}}x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^2)^(3/2)*x^2),x, algorithm="maxima")
```

```
[Out] -1/4/(b^(3/2)*x^4)
```

Fricas [A] time = 0.21902, size = 20, normalized size = 1.05

$$-\frac{\sqrt{bx^2}}{4\,b^2x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^2)^(3/2)*x^2),x, algorithm="fricas")
```

```
[Out] -1/4*sqrt(b*x^2)/(b^2*x^5)
```

Sympy [A] time = 2.56247, size = 17, normalized size = 0.89

$$-\frac{1}{4b^{\frac{3}{2}}x\,(x^2)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(b*x**2)**(3/2),x)
```

```
[Out] -1/(4*b**(3/2)*x*(x**2)**(3/2))
```

GIAC/XCAS [A] time = 0.562998, size = 4, normalized size = 0.21

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^2)^(3/2)*x^2),x, algorithm="giac")
```

```
[Out] sage0*x
```

3.52 $\int \frac{x^7}{(bx^2)^{5/2}}\, dx$

Optimal. Leaf size=19

$$\frac{x^4}{3b^2\sqrt{bx^2}}$$

```
[Out] x^4/(3*b^2*Sqrt[b*x^2])
```

Rubi [A] time = 0.00886065, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{x^4}{3b^2\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7/(b*x^2)^(5/2),x]

[Out] x^4/(3*b^2*Sqrt[b*x^2])
```

Rubi in Sympy [A] time = 2.63678, size = 12, normalized size = 0.63

$$\frac{(bx^2)^{\frac{3}{2}}}{3b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7/(b*x**2)**(5/2),x)

[Out] (b*x**2)**(3/2)/(3*b**4)
```

Mathematica [A] time = 0.00240339, size = 16, normalized size = 0.84

$$\frac{x^8}{3(bx^2)^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^7/(b*x^2)^(5/2),x]

[Out] x^8/(3*(b*x^2)^(5/2))
```

Maple [A] time = 0.003, size = 13, normalized size = 0.7

$$\frac{x^8}{3}(bx^2)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7/(b*x^2)^(5/2),x)
```

```
[Out] 1/3*x^8/(b*x^2)^(5/2)
```

Maxima [A] time = 1.41522, size = 20, normalized size = 1.05

$$\frac{x^6}{3\,(bx^2)^{\frac{3}{2}}\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(b*x^2)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/3*x^6/((b*x^2)^(3/2)*b)
```

Fricas [A] time = 0.219929, size = 20, normalized size = 1.05

$$\frac{\sqrt{bx^2}x^2}{3\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(b*x^2)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/3*sqrt(b*x^2)*x^2/b^3
```

Sympy [A] time = 4.65107, size = 15, normalized size = 0.79

$$\frac{x^8}{3b^{\frac{5}{2}}\,(x^2)^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(b*x**2)**(5/2),x)
```

```
[Out] x**8/(3*b**(5/2)*(x**2)**(5/2))
```

GIAC/XCAS [A] time = 0.213655, size = 20, normalized size = 1.05

$$\frac{\sqrt{bx^2}x^2}{3\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(b*x^2)^(5/2),x, algorithm="giac")
```

```
[Out] 1/3*sqrt(b*x^2)*x^2/b^3
```

3.53 $\int \frac{x^5}{(bx^2)^{5/2}}\,dx$

Optimal. Leaf size=16

$$\frac{x^2}{b^2\sqrt{bx^2}}$$

```
[Out] x^2/(b^2*Sqrt[b*x^2])
```

Rubi [A] time = 0.0075292, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{x^2}{b^2\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^5/(b*x^2)^(5/2),x]

[Out] x^2/(b^2*Sqrt[b*x^2])
```

Rubi in Sympy [A] time = 2.6918, size = 10, normalized size = 0.62

$$\frac{\sqrt{bx^2}}{b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**5/(b*x**2)**(5/2),x)

[Out] sqrt(b*x**2)/b**3
```

Mathematica [A] time = 0.00207733, size = 13, normalized size = 0.81

$$\frac{x^6}{(bx^2)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5/(b*x^2)^(5/2),x]

[Out] x^6/(b*x^2)^(5/2)
```

Maple [A] time = 0.003, size = 12, normalized size = 0.8

$$x^6\left(bx^2\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5/(b*x^2)^(5/2),x)

[Out] x^6/(b*x^2)^(5/2)
```

Maxima [A] time = 1.44348, size = 19, normalized size = 1.19

$$\frac{x^4}{(bx^2)^{\frac{3}{2}}\, b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^2)^(5/2),x, algorithm="maxima")
```

```
[Out] x^4/((b*x^2)^(3/2)*b)
```

Fricas [A] time = 0.212822, size = 15, normalized size = 0.94

$$\frac{\sqrt{bx^2}}{b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^2)^(5/2),x, algorithm="fricas")
```

```
[Out] sqrt(b*x^2)/b^3
```

Sympy [A] time = 3.08571, size = 14, normalized size = 0.88

$$\frac{x^6}{b^{\frac{5}{2}}\, (x^2)^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(b*x**2)**(5/2),x)
```

```
[Out] x**6/(b**(5/2)*(x**2)**(5/2))
```

GIAC/XCAS [A] time = 0.211248, size = 15, normalized size = 0.94

$$\frac{\sqrt{bx^2}}{b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^2)^(5/2),x, algorithm="giac")
```

```
[Out] sqrt(b*x^2)/b^3
```

3.54 $\int \frac{x^3}{(bx^2)^{5/2}}\,dx$

Optimal. Leaf size=14

$$-\frac{1}{b^2\sqrt{bx^2}}$$

```
[Out] -(1/(b^2*Sqrt[b*x^2]))
```

Rubi [A] time = 0.00763735, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{1}{b^2\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(b*x^2)^(5/2),x]

[Out] -(1/(b^2*Sqrt[b*x^2]))
```

Rubi in Sympy [A] time = 2.70136, size = 14, normalized size = 1.

$$-\frac{1}{b^2\sqrt{bx^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(b*x**2)**(5/2),x)

[Out] -1/(b**2*sqrt(b*x**2))
```

Mathematica [A] time = 0.00240115, size = 14, normalized size = 1.

$$-\frac{x^4}{(bx^2)^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(b*x^2)^(5/2),x]

[Out] -(x^4/(b*x^2)^(5/2))
```

Maple [A] time = 0.004, size = 13, normalized size = 0.9

$$-x^4\left(bx^2\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(b*x^2)^(5/2),x)

[Out] -x^4/(b*x^2)^(5/2)
```

Maxima [A] time = 1.43591, size = 20, normalized size = 1.43

$$-\frac{x^2}{(bx^2)^{\frac{3}{2}}\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^2)^(5/2),x, algorithm="maxima")
```

```
[Out] -x^2/((b*x^2)^(3/2)*b)
```

Fricas [A] time = 0.243757, size = 20, normalized size = 1.43

$$-\frac{\sqrt{bx^2}}{b^3x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^2)^(5/2),x, algorithm="fricas")
```

```
[Out] -sqrt(b*x^2)/(b^3*x^2)
```

Sympy [A] time = 3.11036, size = 15, normalized size = 1.07

$$-\frac{x^4}{b^{\frac{5}{2}}\,(x^2)^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(b*x**2)**(5/2),x)
```

```
[Out] -x**4/(b**(5/2)*(x**2)**(5/2))
```

GIAC/XCAS [A] time = 0.225123, size = 16, normalized size = 1.14

$$-\frac{1}{\sqrt{bx^2}b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^2)^(5/2),x, algorithm="giac")
```

```
[Out] -1/(sqrt(b*x^2)*b^2)
```

3.55 $\int \frac{x}{(bx^2)^{5/2}}\,dx$

Optimal. Leaf size=19

$$-\frac{1}{3b^2x^2\sqrt{bx^2}}$$

```
[Out] -1/(3*b^2*x^2*Sqrt[b*x^2])
```

Rubi [A] time = 0.00903984, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$-\frac{1}{3b^2x^2\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(b*x^2)^(5/2),x]

[Out] -1/(3*b^2*x^2*Sqrt[b*x^2])
```

Rubi in Sympy [A] time = 2.17288, size = 14, normalized size = 0.74

$$-\frac{1}{3b\,(bx^2)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(b*x**2)**(5/2),x)

[Out] -1/(3*b*(b*x**2)**(3/2))
```

Mathematica [A] time = 0.00137081, size = 16, normalized size = 0.84

$$-\frac{x^2}{3\,(bx^2)^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(b*x^2)^(5/2),x]

[Out] -x^2/(3*(b*x^2)^(5/2))
```

Maple [A] time = 0.004, size = 13, normalized size = 0.7

$$-\frac{x^2}{3}\left(bx^2\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(b*x^2)^(5/2),x)

[Out] -1/3*x^2/(b*x^2)^(5/2)
```

Maxima [A] time = 1.41008, size = 16, normalized size = 0.84

$$-\frac{1}{3\,(bx^2)^{\frac{3}{2}}\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^2)^(5/2),x, algorithm="maxima")
```

```
[Out] -1/3/((b*x^2)^(3/2)*b)
```

Fricas [A] time = 0.238555, size = 20, normalized size = 1.05

$$-\frac{\sqrt{bx^2}}{3\,b^3x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^2)^(5/2),x, algorithm="fricas")
```

```
[Out] -1/3*sqrt(b*x^2)/(b^3*x^4)
```

Sympy [A] time = 3.09319, size = 17, normalized size = 0.89

$$-\frac{x^2}{3b^{\frac{5}{2}}\,(x^2)^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x**2)**(5/2),x)
```

```
[Out] -x**2/(3*b**(5/2)*(x**2)**(5/2))
```

GIAC/XCAS [A] time = 0.221392, size = 20, normalized size = 1.05

$$-\frac{1}{3\,\sqrt{bx^2}b^2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^2)^(5/2),x, algorithm="giac")
```

```
[Out] -1/3/(sqrt(b*x^2)*b^2*x^2)
```

3.56 $\int \frac{1}{x(bx^2)^{5/2}}\,dx$

Optimal. Leaf size=19

$$-\frac{1}{5b^2x^4\sqrt{bx^2}}$$

```
[Out] -1/(5*b^2*x^4*Sqrt[b*x^2])
```

Rubi [A] time = 0.00882833, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{1}{5b^2x^4\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(b*x^2)^(5/2)),x]

[Out] -1/(5*b^2*x^4*Sqrt[b*x^2])
```

Rubi in Sympy [A] time = 2.30691, size = 12, normalized size = 0.63

$$-\frac{1}{5\left(bx^2\right)^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(b*x**2)**(5/2),x)

[Out] -1/(5*(b*x**2)**(5/2))
```

Mathematica [A] time = 0.00503461, size = 17, normalized size = 0.89

$$-\frac{bx^2}{5\left(bx^2\right)^{7/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(b*x^2)^(5/2)),x]

[Out] -(b*x^2)/(5*(b*x^2)^(7/2))
```

Maple [A] time = 0.005, size = 10, normalized size = 0.5

$$-\frac{1}{5}\left(bx^2\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(b*x^2)^(5/2),x)

[Out] -1/5/(b*x^2)^(5/2)
```

Maxima [A] time = 1.4302, size = 11, normalized size = 0.58

$$-\frac{1}{5\,b^{\frac{5}{2}}x^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^2)^(5/2)*x),x, algorithm="maxima")
```

```
[Out] -1/5/(b^(5/2)*x^5)
```

Fricas [A] time = 0.227003, size = 20, normalized size = 1.05

$$-\frac{\sqrt{bx^{2}}}{5\,b^{3}x^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^2)^(5/2)*x),x, algorithm="fricas")
```

```
[Out] -1/5*sqrt(b*x^2)/(b^3*x^6)
```

Sympy [A] time = 3.52245, size = 15, normalized size = 0.79

$$-\frac{1}{5b^{\frac{5}{2}}\,(x^{2})^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(b*x**2)**(5/2),x)
```

```
[Out] -1/(5*b**(5/2)*(x**2)**(5/2))
```

GIAC/XCAS [A] time = 0.215113, size = 20, normalized size = 1.05

$$-\frac{1}{5\,\sqrt{bx^{2}}b^{2}x^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^2)^(5/2)*x),x, algorithm="giac")
```

```
[Out] -1/5/(sqrt(b*x^2)*b^2*x^4)
```

3.57 $\int \frac{x^6}{(bx^2)^{5/2}}\,dx$

Optimal. Leaf size=19

$$\frac{x^3}{2b^2\sqrt{bx^2}}$$

```
[Out] x^3/(2*b^2*Sqrt[b*x^2])
```

Rubi [A] time = 0.00844947, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{x^3}{2b^2\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^6/(b*x^2)^(5/2),x]

[Out] x^3/(2*b^2*Sqrt[b*x^2])
```

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

$$\frac{\sqrt{bx^2}\int x\,dx}{b^3x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**6/(b*x**2)**(5/2),x)

[Out] sqrt(b*x**2)*Integral(x, x)/(b**3*x)
```

Mathematica [A] time = 0.00324527, size = 16, normalized size = 0.84

$$\frac{x^7}{2\,(bx^2)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^6/(b*x^2)^(5/2),x]

[Out] x^7/(2*(b*x^2)^(5/2))
```

Maple [A] time = 0.004, size = 13, normalized size = 0.7

$$\frac{x^7}{2}\left(bx^2\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^6/(b*x^2)^(5/2),x)
```

```
[Out] 1/2*x^7/(b*x^2)^(5/2)
```

Maxima [A] time = 1.44846, size = 20, normalized size = 1.05

$$\frac{x^5}{2\,(bx^2)^{\frac{3}{2}}\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^6/(b*x^2)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/2*x^5/((b*x^2)^(3/2)*b)
```

Fricas [A] time = 0.251903, size = 18, normalized size = 0.95

$$\frac{\sqrt{bx^2}x}{2\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^6/(b*x^2)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/2*sqrt(b*x^2)*x/b^3
```

Sympy [A] time = 3.72003, size = 15, normalized size = 0.79

$$\frac{x^7}{2b^{\frac{5}{2}}\,(x^2)^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**6/(b*x**2)**(5/2),x)
```

```
[Out] x**7/(2*b**(5/2)*(x**2)**(5/2))
```

GIAC/XCAS [A] time = 0.219603, size = 18, normalized size = 0.95

$$\frac{\sqrt{bx^2}x}{2\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^6/(b*x^2)^(5/2),x, algorithm="giac")
```

```
[Out] 1/2*sqrt(b*x^2)*x/b^3
```

3.58 $\int \frac{x^4}{(bx^2)^{5/2}} \, dx$

Optimal. Leaf size=16

$$\frac{x \log(x)}{b^2 \sqrt{bx^2}}$$

```
[Out] (x*Log[x])/(b^2*Sqrt[b*x^2])
```

Rubi [A] time = 0.00763255, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$\frac{x \log(x)}{b^2 \sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(b*x^2)^(5/2),x]
```

```
[Out] (x*Log[x])/(b^2*Sqrt[b*x^2])
```

Rubi in Sympy [A] time = 2.35479, size = 15, normalized size = 0.94

$$\frac{\sqrt{bx^2} \log(x)}{b^3 x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(b*x**2)**(5/2),x)
```

```
[Out] sqrt(b*x**2)*log(x)/(b**3*x)
```

Mathematica [A] time = 0.00234548, size = 15, normalized size = 0.94

$$\frac{x^5 \log(x)}{(bx^2)^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(b*x^2)^(5/2),x]
```

```
[Out] (x^5*Log[x])/(b*x^2)^(5/2)
```

Maple [A] time = 0.006, size = 14, normalized size = 0.9

$$x^5 \ln(x) \left(bx^2\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(b*x^2)^(5/2),x)
```

```
[Out] 1/(b*x^2)^(5/2)*x^5*ln(x)
```

Maxima [A] time = 1.43954, size = 8, normalized size = 0.5

$$\frac{\log(x)}{b^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^2)^(5/2),x, algorithm="maxima")
```

```
[Out] log(x)/b^(5/2)
```

Fricas [A] time = 0.242377, size = 22, normalized size = 1.38

$$\frac{\sqrt{bx^2}\log(x)}{b^3x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^2)^(5/2),x, algorithm="fricas")
```

```
[Out] sqrt(b*x^2)*log(x)/(b^3*x)
```

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

$$\int \frac{x^4}{(bx^2)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(b*x**2)**(5/2),x)
```

```
[Out] Integral(x**4/(b*x**2)**(5/2), x)
```

GIAC/XCAS [A] time = 0.234759, size = 28, normalized size = 1.75

$$-\frac{\ln\left(\left|-\sqrt{b}x + \sqrt{bx^2}\right|\right)}{b^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^2)^(5/2),x, algorithm="giac")
```

```
[Out] -ln(abs(-sqrt(b)*x + sqrt(b*x^2)))/b^(5/2)
```

3.59 $\int \frac{x^2}{(bx^2)^{5/2}}\,dx$

Optimal. Leaf size=19

$$-\frac{1}{2b^2x\sqrt{bx^2}}$$

```
[Out] -1/(2*b^2*x*Sqrt[b*x^2])
```

Rubi [A] time = 0.00884721, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{1}{2b^2x\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(b*x^2)^(5/2),x]

[Out] -1/(2*b^2*x*Sqrt[b*x^2])
```

Rubi in Sympy [A] time = 2.37507, size = 17, normalized size = 0.89

$$-\frac{\sqrt{bx^2}}{2b^3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(b*x**2)**(5/2),x)

[Out] -sqrt(b*x**2)/(2*b**3*x**3)
```

Mathematica [A] time = 0.00283697, size = 16, normalized size = 0.84

$$-\frac{x^3}{2\left(bx^2\right)^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(b*x^2)^(5/2),x]

[Out] -x^3/(2*(b*x^2)^(5/2))
```

Maple [A] time = 0.004, size = 13, normalized size = 0.7

$$-\frac{x^3}{2}\left(bx^2\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(b*x^2)^(5/2),x)

[Out] -1/2*x^3/(b*x^2)^(5/2)
```

Maxima [A] time = 1.43291, size = 11, normalized size = 0.58

$$-\frac{1}{2\, b^{\frac{5}{2}} x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^2)^(5/2),x, algorithm="maxima")
```

```
[Out] -1/2/(b^(5/2)*x^2)
```

Fricas [A] time = 0.216139, size = 20, normalized size = 1.05

$$-\frac{\sqrt{bx^{2}}}{2\, b^{3} x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^2)^(5/2),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(b*x^2)/(b^3*x^3)
```

Sympy [A] time = 3.0454, size = 17, normalized size = 0.89

$$-\frac{x^{3}}{2b^{\frac{5}{2}} \left(x^{2}\right)^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(b*x**2)**(5/2),x)
```

```
[Out] -x**3/(2*b**(5/2)*(x**2)**(5/2))
```

GIAC/XCAS [A] time = 0.527038, size = 4, normalized size = 0.21

$$sage_{0}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^2)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

3.60 $\int \frac{1}{(bx^2)^{5/2}}\,dx$

Optimal. Leaf size=19

$$-\frac{1}{4b^2x^3\sqrt{bx^2}}$$

```
[Out] -1/(4*b^2*x^3*Sqrt[b*x^2])
```

Rubi [A] time = 0.00827732, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$-\frac{1}{4b^2x^3\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^2)^(-5/2),x]

[Out] -1/(4*b^2*x^3*Sqrt[b*x^2])
```

Rubi in Sympy [A] time = 1.47175, size = 17, normalized size = 0.89

$$-\frac{\sqrt{bx^2}}{4b^3x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**2)**(5/2),x)

[Out] -sqrt(b*x**2)/(4*b**3*x**5)
```

Mathematica [A] time = 0.0003683, size = 14, normalized size = 0.74

$$-\frac{x}{4\left(bx^2\right)^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^2)^(-5/2),x]

[Out] -x/(4*(b*x^2)^(5/2))
```

Maple [A] time = 0.004, size = 11, normalized size = 0.6

$$-\frac{x}{4}\left(bx^2\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^2)^(5/2),x)

[Out] -1/4*x/(b*x^2)^(5/2)
```

Maxima [A] time = 1.43807, size = 11, normalized size = 0.58

$$-\frac{1}{4\,b^{\frac{5}{2}}x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(-5/2),x, algorithm="maxima")

[Out] -1/4/(b^(5/2)*x^4)
```

Fricas [A] time = 0.224721, size = 20, normalized size = 1.05

$$-\frac{\sqrt{bx^2}}{4\,b^3x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(-5/2),x, algorithm="fricas")

[Out] -1/4*sqrt(b*x^2)/(b^3*x^5)
```

Sympy [A] time = 3.06762, size = 15, normalized size = 0.79

$$-\frac{x}{4b^{\frac{5}{2}}\left(x^2\right)^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**2)**(5/2),x)

[Out] -x/(4*b**(5/2)*(x**2)**(5/2))
```

GIAC/XCAS [A] time = 0.544794, size = 4, normalized size = 0.21

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(-5/2),x, algorithm="giac")

[Out] sage0*x
```

3.61 $\int \frac{1}{x^2(bx^2)^{5/2}}\,dx$

Optimal. Leaf size=19

$$-\frac{1}{6b^2x^5\sqrt{bx^2}}$$

```
[Out] -1/(6*b^2*x^5*Sqrt[b*x^2])
```

Rubi [A] time = 0.00847571, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{1}{6b^2x^5\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(b*x^2)^(5/2)),x]

[Out] -1/(6*b^2*x^5*Sqrt[b*x^2])
```

Rubi in Sympy [A] time = 2.29816, size = 17, normalized size = 0.89

$$-\frac{\sqrt{bx^2}}{6b^3x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(b*x**2)**(5/2),x)

[Out] -sqrt(b*x**2)/(6*b**3*x**7)
```

Mathematica [A] time = 0.00357741, size = 15, normalized size = 0.79

$$-\frac{bx}{6\left(bx^2\right)^{7/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*(b*x^2)^(5/2)),x]

[Out] -(b*x)/(6*(b*x^2)^(7/2))
```

Maple [A] time = 0.003, size = 13, normalized size = 0.7

$$-\frac{1}{6\,x}\left(bx^2\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(b*x^2)^(5/2),x)

[Out] -1/6/x/(b*x^2)^(5/2)
```

Maxima [A] time = 1.4426, size = 11, normalized size = 0.58

$$-\frac{1}{6\,b^{\frac{5}{2}}x^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^2)^(5/2)*x^2),x, algorithm="maxima")
```

```
[Out] -1/6/(b^(5/2)*x^6)
```

Fricas [A] time = 0.216142, size = 20, normalized size = 1.05

$$-\frac{\sqrt{bx^{2}}}{6\,b^{3}x^{7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^2)^(5/2)*x^2),x, algorithm="fricas")
```

```
[Out] -1/6*sqrt(b*x^2)/(b^3*x^7)
```

Sympy [A] time = 4.635, size = 17, normalized size = 0.89

$$-\frac{1}{6b^{\frac{5}{2}}x\,(x^{2})^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(b*x**2)**(5/2),x)
```

```
[Out] -1/(6*b**(5/2)*x*(x**2)**(5/2))
```

GIAC/XCAS [A] time = 0.535131, size = 4, normalized size = 0.21

$$sage_{0}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^2)^(5/2)*x^2),x, algorithm="giac")
```

```
[Out] sage0*x
```

3.62 $\int (cx)^m \left(bx^2\right)^{3/2} \, dx$

Optimal. Leaf size=29

$$\frac{b\sqrt{bx^2}(cx)^{m+4}}{c^4(m+4)x}$$

```
[Out] (b*(c*x)^(4 + m)*Sqrt[b*x^2])/(c^4*(4 + m)*x)
```

Rubi [A] time = 0.0280846, antiderivative size = 29, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{b\sqrt{bx^2}(cx)^{m+4}}{c^4(m+4)x}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^m*(b*x^2)^(3/2),x]

[Out] (b*(c*x)^(4 + m)*Sqrt[b*x^2])/(c^4*(4 + m)*x)
```

Rubi in Sympy [A] time = 4.05319, size = 27, normalized size = 0.93

$$\frac{bx^{-m}x^{m+4}\sqrt{bx^2}\,(cx)^m}{x\,(m+4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**m*(b*x**2)**(3/2),x)

[Out] b*x**(-m)*x**(m + 4)*sqrt(b*x**2)*(c*x)**m/(x*(m + 4))
```

Mathematica [A] time = 0.00882833, size = 21, normalized size = 0.72

$$\frac{x\left(bx^2\right)^{3/2}(cx)^m}{m+4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^m*(b*x^2)^(3/2),x]

[Out] (x*(c*x)^m*(b*x^2)^(3/2))/(4 + m)
```

Maple [A] time = 0.003, size = 20, normalized size = 0.7

$$\frac{x\,(cx)^m}{4+m}\left(bx^2\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^m*(b*x^2)^(3/2),x)

[Out] x/(4+m)*(c*x)^m*(b*x^2)^(3/2)
```

Maxima [A] time = 1.45965, size = 24, normalized size = 0.83

$$\frac{b^{\frac{3}{2}}c^m x^4 x^m}{m+4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] b^(3/2)*c^m*x^4*x^m/(m + 4)
```

Fricas [A] time = 0.269558, size = 30, normalized size = 1.03

$$\frac{\sqrt{bx^2}\,(cx)^m\,bx^3}{m+4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] sqrt(b*x^2)*(c*x)^m*b*x^3/(m + 4)
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**m*(b*x**2)**(3/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Exception raised: TypeError
```

3.63 $\int (cx)^m \sqrt{bx^2}\, dx$

Optimal. Leaf size=28

$$\frac{\sqrt{bx^2}(cx)^{m+2}}{c^2(m+2)x}$$

```
[Out] ((c*x)^(2 + m)*Sqrt[b*x^2])/(c^2*(2 + m)*x)
```

Rubi [A] time = 0.0256201, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$\frac{\sqrt{bx^2}(cx)^{m+2}}{c^2(m+2)x}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^m*Sqrt[b*x^2],x]
```

```
[Out] ((c*x)^(2 + m)*Sqrt[b*x^2])/(c^2*(2 + m)*x)
```

Rubi in Sympy [A] time = 3.92424, size = 26, normalized size = 0.93

$$\frac{x^{-m}x^{m+2}\sqrt{bx^2}\,(cx)^m}{x\,(m+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**m*(b*x**2)**(1/2),x)
```

```
[Out] x**(-m)*x**(m + 2)*sqrt(b*x**2)*(c*x)**m/(x*(m + 2))
```

Mathematica [A] time = 0.00616127, size = 21, normalized size = 0.75

$$\frac{x\sqrt{bx^2}(cx)^m}{m+2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^m*Sqrt[b*x^2],x]
```

```
[Out] (x*(c*x)^m*Sqrt[b*x^2])/(2 + m)
```

Maple [A] time = 0.003, size = 20, normalized size = 0.7

$$\frac{x\,(cx)^m}{2+m}\sqrt{bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^m*(b*x^2)^(1/2),x)
```

```
[Out] x/(2+m)*(c*x)^m*(b*x^2)^(1/2)
```

Maxima [A] time = 1.45679, size = 24, normalized size = 0.86

$$\frac{\sqrt{b}c^m x^2 x^m}{m+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2)*(c*x)^m,x, algorithm="maxima")

[Out] sqrt(b)*c^m*x^2*x^m/(m + 2)
```

Fricas [A] time = 0.275655, size = 26, normalized size = 0.93

$$\frac{\sqrt{bx^2}\,(cx)^m\,x}{m+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2)*(c*x)^m,x, algorithm="fricas")

[Out] sqrt(b*x^2)*(c*x)^m*x/(m + 2)
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**m*(b*x**2)**(1/2),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2)*(c*x)^m,x, algorithm="giac")

[Out] Exception raised: TypeError
```

3.64 $\int \frac{(cx)^m}{\sqrt{bx^2}}\,dx$

Optimal. Leaf size=19

$$\frac{x(cx)^m}{m\sqrt{bx^2}}$$

```
[Out] (x*(c*x)^m)/(m*Sqrt[b*x^2])
```

Rubi [A] time = 0.0148562, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{x(cx)^m}{m\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(c*x)^m/Sqrt[b*x^2],x]
```

```
[Out] (x*(c*x)^m)/(m*Sqrt[b*x^2])
```

Rubi in Sympy [A] time = 4.2583, size = 17, normalized size = 0.89

$$\frac{\sqrt{bx^2}\,(cx)^m}{bmx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((c*x)**m/(b*x**2)**(1/2),x)
```

```
[Out] sqrt(b*x**2)*(c*x)**m/(b*m*x)
```

Mathematica [A] time = 0.00452264, size = 19, normalized size = 1.

$$\frac{x(cx)^m}{m\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*x)^m/Sqrt[b*x^2],x]
```

```
[Out] (x*(c*x)^m)/(m*Sqrt[b*x^2])
```

Maple [A] time = 0.004, size = 18, normalized size = 1.

$$\frac{x\,(cx)^m}{m}\frac{1}{\sqrt{bx^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*x)^m/(b*x^2)^(1/2),x)
```

```
[Out] x*(c*x)^m/m/(b*x^2)^(1/2)
```

Maxima [A] time = 1.46272, size = 18, normalized size = 0.95

$$\frac{c^m x^m}{\sqrt{b}m}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m/sqrt(b*x^2),x, algorithm="maxima")
```

```
[Out] c^m*x^m/(sqrt(b)*m)
```

Fricas [A] time = 0.239581, size = 30, normalized size = 1.58

$$\frac{\sqrt{bx^2}\,(cx)^m}{bmx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m/sqrt(b*x^2),x, algorithm="fricas")
```

```
[Out] sqrt(b*x^2)*(c*x)^m/(b*m*x)
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**m/(b*x**2)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

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

$$\int \frac{(cx)^m}{\sqrt{bx^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m/sqrt(b*x^2),x, algorithm="giac")
```

```
[Out] integrate((c*x)^m/sqrt(b*x^2), x)
```

3.65 $\int \frac{(cx)^m}{(bx^2)^{3/2}} dx$

Optimal. Leaf size=32

$$-\frac{c^2x(cx)^{m-2}}{b(2-m)\sqrt{bx^2}}$$

```
[Out] -((c^2*x*(c*x)^(-2 + m))/(b*(2 - m)*Sqrt[b*x^2]))
```

Rubi [A] time = 0.0317743, antiderivative size = 32, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$-\frac{c^2x(cx)^{m-2}}{b(2-m)\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^m/(b*x^2)^(3/2),x]
```

```
[Out] -((c^2*x*(c*x)^(-2 + m))/(b*(2 - m)*Sqrt[b*x^2]))
```

Rubi in Sympy [A] time = 4.87524, size = 31, normalized size = 0.97

$$-\frac{x^{-m}x^{m-2}\sqrt{bx^2}\,(cx)^m}{b^2x\,(-m+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**m/(b*x**2)**(3/2),x)
```

```
[Out] -x**(-m)*x**(m - 2)*sqrt(b*x**2)*(c*x)**m/(b**2*x*(-m + 2))
```

Mathematica [A] time = 0.00724154, size = 21, normalized size = 0.66

$$\frac{x(cx)^m}{(m-2)\,(bx^2)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^m/(b*x^2)^(3/2),x]
```

```
[Out] (x*(c*x)^m)/((-2 + m)*(b*x^2)^(3/2))
```

Maple [A] time = 0.003, size = 20, normalized size = 0.6

$$\frac{x\,(cx)^m}{-2+m}\left(bx^2\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^m/(b*x^2)^(3/2),x)
```

```
[Out] x/(-2+m)*(c*x)^m/(b*x^2)^(3/2)
```

Maxima [A] time = 1.46008, size = 24, normalized size = 0.75

$$\frac{c^m x^m}{b^{\frac{3}{2}}(m-2)x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] c^m*x^m/(b^(3/2)*(m - 2)*x^2)
```

Fricas [A] time = 0.23211, size = 39, normalized size = 1.22

$$\frac{\sqrt{bx^2}\,(cx)^m}{(b^2m-2\,b^2)x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] sqrt(b*x^2)*(c*x)^m/((b^2*m - 2*b^2)*x^3)
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**m/(b*x**2)**(3/2),x)
```

```
[Out] Exception raised: TypeError
```

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

$$\int \frac{(cx)^m}{(bx^2)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((c*x)^m/(b*x^2)^(3/2), x)
```

3.66 $\int x^m \left(bx^2\right)^p \, dx$

Optimal. Leaf size=21

$$\frac{x^{m+1}\left(bx^2\right)^p}{m+2p+1}$$

```
[Out] (x^(1 + m)*(b*x^2)^p)/(1 + m + 2*p)
```

Rubi [A] time = 0.0154517, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{x^{m+1}\left(bx^2\right)^p}{m+2p+1}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m*(b*x^2)^p,x]

[Out] (x^(1 + m)*(b*x^2)^p)/(1 + m + 2*p)
```

Rubi in Sympy [A] time = 3.10991, size = 26, normalized size = 1.24

$$\frac{x^{-2p}x^{m+2p+1}\left(bx^2\right)^p}{m+2p+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(b*x**2)**p,x)

[Out] x**(-2*p)*x**(m + 2*p + 1)*(b*x**2)**p/(m + 2*p + 1)
```

Mathematica [A] time = 0.00699259, size = 21, normalized size = 1.

$$\frac{x^{m+1}\left(bx^2\right)^p}{m+2p+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m*(b*x^2)^p,x]

[Out] (x^(1 + m)*(b*x^2)^p)/(1 + m + 2*p)
```

Maple [A] time = 0.004, size = 22, normalized size = 1.1

$$\frac{x^{1+m}\left(bx^2\right)^p}{1+m+2p}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(b*x^2)^p,x)
```

```
[Out] x^(1+m)*(b*x^2)^p/(1+m+2*p)
```

Maxima [A] time = 1.44795, size = 32, normalized size = 1.52

$$\frac{b^p x e^{(m\log(x)+2\,p\log(x))}}{m+2\,p+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^p*x^m,x, algorithm="maxima")
```

```
[Out] b^p*x*e^(m*log(x) + 2*p*log(x))/(m + 2*p + 1)
```

Fricas [A] time = 0.234499, size = 32, normalized size = 1.52

$$\frac{xx^m e^{(p\log(b)+2\,p\log(x))}}{m+2\,p+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^p*x^m,x, algorithm="fricas")
```

```
[Out] x*x^m*e^(p*log(b) + 2*p*log(x))/(m + 2*p + 1)
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(b*x**2)**p,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [A] time = 0.213962, size = 34, normalized size = 1.62

$$\frac{xe^{(p\ln(b)+m\ln(x)+2\,p\ln(x))}}{m+2\,p+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^p*x^m,x, algorithm="giac")
```

```
[Out] x*e^(p*ln(b) + m*ln(x) + 2*p*ln(x))/(m + 2*p + 1)
```

3.67 $\int (cx)^m \left(bx^2\right)^p \, dx$

Optimal. Leaf size=22

$$\frac{x \left(bx^2\right)^p (cx)^m}{m+2p+1}$$

```
[Out] (x*(c*x)^m*(b*x^2)^p)/(1 + m + 2*p)
```

Rubi [A] time = 0.01594, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{x \left(bx^2\right)^p (cx)^m}{m+2p+1}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^m*(b*x^2)^p,x]
```

```
[Out] (x*(c*x)^m*(b*x^2)^p)/(1 + m + 2*p)
```

Rubi in Sympy [A] time = 4.52286, size = 34, normalized size = 1.55

$$\frac{x^{-m} x^{-2p} x^{m+2p+1} \left(bx^2\right)^p (cx)^m}{m+2p+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**m*(b*x**2)**p,x)
```

```
[Out] x**(-m)*x**(-2*p)*x**(m + 2*p + 1)*(b*x**2)**p*(c*x)**m/(m + 2*p
+ 1)
```

Mathematica [A] time = 0.00617215, size = 22, normalized size = 1.

$$\frac{x \left(bx^2\right)^p (cx)^m}{m+2p+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^m*(b*x^2)^p,x]
```

```
[Out] (x*(c*x)^m*(b*x^2)^p)/(1 + m + 2*p)
```

Maple [A] time = 0.001, size = 23, normalized size = 1.1

$$\frac{x (cx)^m \left(bx^2\right)^p}{1+m+2p}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^m*(b*x^2)^p,x)
```

```
[Out] x*(c*x)^m*(b*x^2)^p/(1+m+2*p)
```

Maxima [A] time = 1.45728, size = 36, normalized size = 1.64

$$\frac{b^p c^m x e^{(m \log(x)+2 p \log(x))}}{m+2 p+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^2)^p*(c*x)^m,x, algorithm="maxima")
```

```
[Out] b^p*c^m*x*e^(m*log(x) + 2*p*log(x))/(m + 2*p + 1)
```

Fricas [A] time = 0.238384, size = 43, normalized size = 1.95

$$\frac{(cx)^m x e^{\left(2 p \log(cx)+p \log\left(\frac{b}{c^2}\right)\right)}}{m+2 p+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^2)^p*(c*x)^m,x, algorithm="fricas")
```

```
[Out] (c*x)^m*x*e^(2*p*log(c*x) + p*log(b/c^2))/(m + 2*p + 1)
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*x)**m*(b*x**2)**p,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [A] time = 0.218912, size = 39, normalized size = 1.77

$$\frac{x e^{(p \ln(b)+m \ln(c)+m \ln(x)+2 p \ln(x))}}{m+2 p+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^2)^p*(c*x)^m,x, algorithm="giac")
```

```
[Out] x*e^(p*ln(b) + m*ln(c) + m*ln(x) + 2*p*ln(x))/(m + 2*p + 1)
```

3.68 $\int x^{-1-2p} \left(x^2\right)^p \, dx$

Optimal. Leaf size=13

$$x^{-2p} \left(x^2\right)^p \log(x)$$

```
[Out] ((x^2)^p*Log[x])/x^(2*p)
```

Rubi [A] time = 0.00830932, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$x^{-2p} \left(x^2\right)^p \log(x)$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 2*p)*(x^2)^p,x]

[Out] ((x^2)^p*Log[x])/x^(2*p)
```

Rubi in Sympy [A] time = 1.93873, size = 12, normalized size = 0.92

$$x^{-2p} \left(x^2\right)^p \log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-2*p)*(x**2)**p,x)

[Out] x**(-2*p)*(x**2)**p*log(x)
```

Mathematica [A] time = 0.00957261, size = 13, normalized size = 1.

$$x^{-2p} \left(x^2\right)^p \log(x)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 2*p)*(x^2)^p,x]

[Out] ((x^2)^p*Log[x])/x^(2*p)
```

Maple [A] time = 0.035, size = 21, normalized size = 1.6

$$x \ln(x) e^{p \ln(x^2)} e^{(-1-2p) \ln(x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-2*p)*(x^2)^p,x)

[Out] x*ln(x)*exp(p*ln(x^2))*exp((-1-2*p)*ln(x))
```

Maxima [A] time = 1.44193, size = 3, normalized size = 0.23

$$\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x^2)^p*x^(-2*p - 1),x, algorithm="maxima")
```

```
[Out] log(x)
```

Fricas [A] time = 0.260038, size = 3, normalized size = 0.23

$$\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x^2)^p*x^(-2*p - 1),x, algorithm="fricas")
```

```
[Out] log(x)
```

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

$$\int x^{-2p-1} \left(x^2\right)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-2*p)*(x**2)**p,x)
```

```
[Out] Integral(x**(-2*p - 1)*(x**2)**p, x)
```

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

$$\int \left(x^2\right)^p x^{-2\,p-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x^2)^p*x^(-2*p - 1),x, algorithm="giac")
```

```
[Out] integrate((x^2)^p*x^(-2*p - 1), x)
```

3.69 $\int x^3 \left(bx^2\right)^p \, dx$

Optimal. Leaf size=19

$$\frac{x^4 \left(bx^2\right)^p}{2(p+2)}$$

```
[Out] (x^4*(b*x^2)^p)/(2*(2 + p))
```

Rubi [A] time = 0.0143023, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{x^4 \left(bx^2\right)^p}{2(p+2)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3*(b*x^2)^p,x]

[Out] (x^4*(b*x^2)^p)/(2*(2 + p))
```

Rubi in Sympy [A] time = 3.56362, size = 15, normalized size = 0.79

$$\frac{\left(bx^2\right)^{p+2}}{2b^2\left(p+2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3*(b*x**2)**p,x)

[Out] (b*x**2)**(p + 2)/(2*b**2*(p + 2))
```

Mathematica [A] time = 0.00425513, size = 18, normalized size = 0.95

$$\frac{x^4 \left(bx^2\right)^p}{2p+4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3*(b*x^2)^p,x]

[Out] (x^4*(b*x^2)^p)/(4 + 2*p)
```

Maple [A] time = 0.001, size = 18, normalized size = 1.

$$\frac{x^4 \left(bx^2\right)^p}{4+2\,p}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3*(b*x^2)^p,x)
```

```
[Out] 1/2*x^4*(b*x^2)^p/(2+p)
```

Maxima [A] time = 1.44136, size = 24, normalized size = 1.26

$$\frac{b^p (x^2)^p x^4}{2 (p + 2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^p*x^3,x, algorithm="maxima")
```

```
[Out] 1/2*b^p*(x^2)^p*x^4/(p + 2)
```

Fricas [A] time = 0.249202, size = 23, normalized size = 1.21

$$\frac{(bx^2)^p x^4}{2 (p + 2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^p*x^3,x, algorithm="fricas")
```

```
[Out] 1/2*(b*x^2)^p*x^4/(p + 2)
```

Sympy [A] time = 1.19385, size = 24, normalized size = 1.26

$$\begin{cases} \frac{b^p x^4 (x^2)^p}{2p+4} & \text{for } p \neq -2 \\ \frac{\log(x)}{b^2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(b*x**2)**p,x)
```

```
[Out] Piecewise((b**p*x**4*(x**2)**p/(2*p + 4), Ne(p, -2)), (log(x)/b**
2, True))
```

GIAC/XCAS [A] time = 0.231338, size = 26, normalized size = 1.37

$$\frac{x^4 e^{(p \ln(bx^2))}}{2 (p + 2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^p*x^3,x, algorithm="giac")
```

```
[Out] 1/2*x^4*e^(p*ln(b*x^2))/(p + 2)
```

3.70 $\int x^2 (bx^2)^p \, dx$

Optimal. Leaf size=18

$$\frac{x^3 (bx^2)^p}{2p+3}$$

```
[Out] (x^3*(b*x^2)^p)/(3 + 2*p)
```

Rubi [A] time = 0.013493, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{x^3 (bx^2)^p}{2p+3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2*(b*x^2)^p,x]

[Out] (x^3*(b*x^2)^p)/(3 + 2*p)
```

Rubi in Sympy [A] time = 3.18907, size = 22, normalized size = 1.22

$$\frac{x^{-2p} x^{2p+3} (bx^2)^p}{2p+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(b*x**2)**p,x)

[Out] x**(-2*p)*x**(2*p + 3)*(b*x**2)**p/(2*p + 3)
```

Mathematica [A] time = 0.00362381, size = 18, normalized size = 1.

$$\frac{x^3 (bx^2)^p}{2p+3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2*(b*x^2)^p,x]

[Out] (x^3*(b*x^2)^p)/(3 + 2*p)
```

Maple [A] time = 0.002, size = 19, normalized size = 1.1

$$\frac{x^3 (bx^2)^p}{3+2p}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(b*x^2)^p,x)
```

```
[Out] x^3*(b*x^2)^p/(3+2*p)
```

Maxima [A] time = 1.44536, size = 26, normalized size = 1.44

$$\frac{b^p x^3 x^{2p}}{2p + 3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^p*x^2,x, algorithm="maxima")
```

```
[Out] b^p*x^3*x^(2*p)/(2*p + 3)
```

Fricas [A] time = 0.231987, size = 24, normalized size = 1.33

$$\frac{(bx^2)^p x^3}{2p + 3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^p*x^2,x, algorithm="fricas")
```

```
[Out] (b*x^2)^p*x^3/(2*p + 3)
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(b*x**2)**p,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [A] time = 0.218028, size = 27, normalized size = 1.5

$$\frac{x^3 e^{(p\ln(bx^2))}}{2p + 3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^p*x^2,x, algorithm="giac")
```

```
[Out] x^3*e^(p*ln(b*x^2))/(2*p + 3)
```

3.71 $\int x \left(bx^2\right)^p \, dx$

Optimal. Leaf size=19

$$\frac{x^2 \left(bx^2\right)^p}{2(p+1)}$$

```
[Out] (x^2*(b*x^2)^p)/(2*(1 + p))
```

Rubi [A] time = 0.0143378, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{x^2 \left(bx^2\right)^p}{2(p+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[x*(b*x^2)^p,x]
```

```
[Out] (x^2*(b*x^2)^p)/(2*(1 + p))
```

Rubi in Sympy [A] time = 2.98443, size = 14, normalized size = 0.74

$$\frac{\left(bx^2\right)^{p+1}}{2b(p+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(b*x**2)**p,x)
```

```
[Out] (b*x**2)**(p + 1)/(2*b*(p + 1))
```

Mathematica [A] time = 0.00399403, size = 18, normalized size = 0.95

$$\frac{x^2 \left(bx^2\right)^p}{2p+2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x*(b*x^2)^p,x]
```

```
[Out] (x^2*(b*x^2)^p)/(2 + 2*p)
```

Maple [A] time = 0.002, size = 18, normalized size = 1.

$$\frac{x^2 \left(bx^2\right)^p}{2+2p}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(b*x^2)^p,x)
```

```
[Out] 1/2*x^2*(b*x^2)^p/(1+p)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^p*x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.235345, size = 23, normalized size = 1.21

$$\frac{(bx^2)^p x^2}{2(p+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^p*x,x, algorithm="fricas")
```

```
[Out] 1/2*(b*x^2)^p*x^2/(p + 1)
```

Sympy [A] time = 0.582597, size = 22, normalized size = 1.16

$$\begin{cases} \frac{b^p x^2 (x^2)^p}{2p+2} & \text{for } p \neq -1 \\ \frac{\log(x)}{b} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(b*x**2)**p,x)
```

```
[Out] Piecewise((b**p*x**2*(x**2)**p/(2*p + 2), Ne(p, -1)), (log(x)/b,
True))
```

GIAC/XCAS [A] time = 0.222965, size = 26, normalized size = 1.37

$$\frac{(bx^2)^{p+1}}{2b(p+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^p*x,x, algorithm="giac")
```

```
[Out] 1/2*(b*x^2)^(p + 1)/(b*(p + 1))
```

3.72 $\int \left(bx^2\right)^p \, dx$

Optimal. Leaf size=16

$$\frac{x\left(bx^2\right)^p}{2p+1}$$

```
[Out] (x*(b*x^2)^p)/(1 + 2*p)
```

Rubi [A] time = 0.012752, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286

$$\frac{x\left(bx^2\right)^p}{2p+1}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^2)^p,x]

[Out] (x*(b*x^2)^p)/(1 + 2*p)
```

Rubi in Sympy [A] time = 2.0107, size = 22, normalized size = 1.38

$$\frac{x^{-2p}x^{2p+1}\left(bx^2\right)^p}{2p+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**2)**p,x)

[Out] x**(-2*p)*x**(2*p + 1)*(b*x**2)**p/(2*p + 1)
```

Mathematica [A] time = 0.0026293, size = 16, normalized size = 1.

$$\frac{x\left(bx^2\right)^p}{2p+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^2)^p,x]

[Out] (x*(b*x^2)^p)/(1 + 2*p)
```

Maple [A] time = 0.003, size = 17, normalized size = 1.1

$$\frac{x\left(bx^2\right)^p}{1+2p}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^2)^p,x)
```

```
[Out] x*(b*x^2)^p/(1+2*p)
```

Maxima [A] time = 1.44597, size = 23, normalized size = 1.44

$$\frac{b^{p}xx^{2p}}{2p+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^p,x, algorithm="maxima")
```

```
[Out] b^p*x*x^(2*p)/(2*p + 1)
```

Fricas [A] time = 0.253608, size = 22, normalized size = 1.38

$$\frac{\left(bx^{2}\right)^{p}x}{2p+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^p,x, algorithm="fricas")
```

```
[Out] (b*x^2)^p*x/(2*p + 1)
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**2)**p,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [A] time = 0.223256, size = 24, normalized size = 1.5

$$\frac{xe^{\left(p\ln\left(bx^{2}\right)\right)}}{2p+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^p,x, algorithm="giac")
```

```
[Out] x*e^(p*ln(b*x^2))/(2*p + 1)
```

3.73 $\int \frac{(bx^2)^p}{x} dx$

Optimal. Leaf size=14

$$\frac{(bx^2)^p}{2p}$$

```
[Out] (b*x^2)^p/(2*p)
```

Rubi [A] time = 0.00984844, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{(bx^2)^p}{2p}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^2)^p/x,x]

[Out] (b*x^2)^p/(2*p)
```

Rubi in Sympy [A] time = 2.73557, size = 8, normalized size = 0.57

$$\frac{(bx^2)^p}{2p}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**2)**p/x,x)

[Out] (b*x**2)**p/(2*p)
```

Mathematica [A] time = 0.0019327, size = 14, normalized size = 1.

$$\frac{(bx^2)^p}{2p}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^2)^p/x,x]

[Out] (b*x^2)^p/(2*p)
```

Maple [A] time = 0.002, size = 13, normalized size = 0.9

$$\frac{(bx^2)^p}{2p}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^2)^p/x,x)
```

```
[Out] 1/2*(b*x^2)^p/p
```

Maxima [A] time = 1.43914, size = 18, normalized size = 1.29

$$\frac{b^p (x^2)^p}{2\,p}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^p/x,x, algorithm="maxima")
```

```
[Out] 1/2*b^p*(x^2)^p/p
```

Fricas [A] time = 0.26879, size = 16, normalized size = 1.14

$$\frac{(bx^2)^p}{2\,p}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^p/x,x, algorithm="fricas")
```

```
[Out] 1/2*(b*x^2)^p/p
```

Sympy [A] time = 0.463908, size = 14, normalized size = 1.

$$\begin{cases} \frac{b^p (x^2)^p}{2p} & \text{for } p \neq 0 \\ \log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**2)**p/x,x)
```

```
[Out] Piecewise((b**p*(x**2)**p/(2*p), Ne(p, 0)), (log(x), True))
```

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

$$\int \frac{(bx^2)^p}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^p/x,x, algorithm="giac")
```

```
[Out] integrate((b*x^2)^p/x, x)
```

3.74 $\int \frac{(bx^2)^p}{x^2}\,dx$

Optimal. Leaf size=19

$$-\frac{(bx^2)^p}{(1-2p)x}$$

```
[Out] -((b*x^2)^p/((1 - 2*p)*x))
```

Rubi [A] time = 0.0160033, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$-\frac{(bx^2)^p}{(1-2p)x}$$

Antiderivative was successfully verified.

```
[In] Int[(b*x^2)^p/x^2,x]
```

```
[Out] -((b*x^2)^p/((1 - 2*p)*x))
```

Rubi in Sympy [A] time = 2.90858, size = 24, normalized size = 1.26

$$-\frac{x^{-2p}x^{2p-1}(bx^2)^p}{-2p+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**2)**p/x**2,x)
```

```
[Out] -x**(-2*p)*x**(2*p - 1)*(b*x**2)**p/(-2*p + 1)
```

Mathematica [A] time = 0.00583361, size = 18, normalized size = 0.95

$$\frac{(bx^2)^p}{(2p-1)x}$$

Antiderivative was successfully verified.

```
[In] Integrate[(b*x^2)^p/x^2,x]
```

```
[Out] (b*x^2)^p/((-1 + 2*p)*x)
```

Maple [A] time = 0.002, size = 19, normalized size = 1.

$$\frac{(bx^2)^p}{x(2p-1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x^2)^p/x^2,x)
```

```
[Out] 1/x/(2*p-1)*(b*x^2)^p
```

Maxima [A] time = 1.4446, size = 26, normalized size = 1.37

$$\frac{b^p x^{2p}}{(2p-1)x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^p/x^2,x, algorithm="maxima")
```

```
[Out] b^p*x^(2*p)/((2*p - 1)*x)
```

Fricas [A] time = 0.243604, size = 24, normalized size = 1.26

$$\frac{(bx^2)^p}{(2p-1)x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^p/x^2,x, algorithm="fricas")
```

```
[Out] (b*x^2)^p/((2*p - 1)*x)
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**2)**p/x**2,x)
```

```
[Out] Exception raised: TypeError
```

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

$$\int \frac{(bx^2)^p}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^p/x^2,x, algorithm="giac")
```

```
[Out] integrate((b*x^2)^p/x^2, x)
```

3.75 $\int \frac{(bx^2)^p}{x^3} \, dx$

Optimal. Leaf size=21

$$-\frac{(bx^2)^p}{2(1-p)x^2}$$

```
[Out] -(b*x^2)^p/(2*(1 - p)*x^2)
```

Rubi [A] time = 0.0145627, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$

$$-\frac{(bx^2)^p}{2(1-p)x^2}$$

Antiderivative was successfully verified.

```
[In] Int[(b*x^2)^p/x^3,x]

[Out] -(b*x^2)^p/(2*(1 - p)*x^2)
```

Rubi in Sympy [A] time = 3.27109, size = 15, normalized size = 0.71

$$-\frac{b\left(bx^2\right)^{p-1}}{2\left(-p+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**2)**p/x**3,x)

[Out] -b*(b*x**2)**(p - 1)/(2*(-p + 1))
```

Mathematica [A] time = 0.00453064, size = 18, normalized size = 0.86

$$\frac{(bx^2)^p}{(2p-2)x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(b*x^2)^p/x^3,x]

[Out] (b*x^2)^p/((-2 + 2*p)*x^2)
```

Maple [A] time = 0.003, size = 18, normalized size = 0.9

$$\frac{(bx^2)^p}{2\,x^2\left(-1+p\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x^2)^p/x^3,x)
```

```
[Out] 1/2/x^2/(-1+p)*(b*x^2)^p
```

Maxima [A] time = 1.45204, size = 24, normalized size = 1.14

$$\frac{b^p (x^2)^p}{2 (p-1)x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^2)^p/x^3,x, algorithm="maxima")
```

```
[Out] 1/2*b^p*(x^2)^p/((p - 1)*x^2)
```

Fricas [A] time = 0.231593, size = 23, normalized size = 1.1

$$\frac{(bx^2)^p}{2 (p-1)x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^2)^p/x^3,x, algorithm="fricas")
```

```
[Out] 1/2*(b*x^2)^p/((p - 1)*x^2)
```

Sympy [A] time = 1.84948, size = 24, normalized size = 1.14

$$\begin{cases} \frac{b^p (x^2)^p}{2px^2-2x^2} & \text{for } p \neq 1 \\ b \log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x**2)**p/x**3,x)
```

```
[Out] Piecewise((b**p*(x**2)**p/(2*p*x**2 - 2*x**2), Ne(p, 1)), (b*log(
x), True))
```

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

$$\int \frac{(bx^2)^p}{x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^2)^p/x^3,x, algorithm="giac")
```

```
[Out] integrate((b*x^2)^p/x^3, x)
```

3.76 $\int \frac{(bx^2)^p}{x^4}\,dx$

Optimal. Leaf size=19

$$-\frac{(bx^2)^p}{(3-2p)x^3}$$

```
[Out] -((b*x^2)^p/((3 - 2*p)*x^3))
```

Rubi [A] time = 0.0159492, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$-\frac{(bx^2)^p}{(3-2p)x^3}$$

Antiderivative was successfully verified.

```
[In] Int[(b*x^2)^p/x^4,x]

[Out] -((b*x^2)^p/((3 - 2*p)*x^3))
```

Rubi in Sympy [A] time = 3.03222, size = 24, normalized size = 1.26

$$-\frac{x^{-2p}x^{2p-3}(bx^2)^p}{-2p+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**2)**p/x**4,x)

[Out] -x**(-2*p)*x**(2*p - 3)*(b*x**2)**p/(-2*p + 3)
```

Mathematica [A] time = 0.00373292, size = 18, normalized size = 0.95

$$\frac{(bx^2)^p}{(2p-3)x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(b*x^2)^p/x^4,x]

[Out] (b*x^2)^p/((-3 + 2*p)*x^3)
```

Maple [A] time = 0.002, size = 19, normalized size = 1.

$$\frac{(bx^2)^p}{x^3(2p-3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x^2)^p/x^4,x)
```

```
[Out] 1/x^3/(2*p-3)*(b*x^2)^p
```

Maxima [A] time = 1.45182, size = 26, normalized size = 1.37

$$\frac{b^p x^{2p}}{(2p-3)x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^2)^p/x^4,x, algorithm="maxima")
```

```
[Out] b^p*x^(2*p)/((2*p - 3)*x^3)
```

Fricas [A] time = 0.236238, size = 24, normalized size = 1.26

$$\frac{(bx^2)^p}{(2p-3)x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^2)^p/x^4,x, algorithm="fricas")
```

```
[Out] (b*x^2)^p/((2*p - 3)*x^3)
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x**2)**p/x**4,x)
```

```
[Out] Exception raised: TypeError
```

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

$$\int \frac{(bx^2)^p}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^2)^p/x^4,x, algorithm="giac")
```

```
[Out] integrate((b*x^2)^p/x^4, x)
```

3.77 $\int \sqrt{bx^3}\, dx$

Optimal. Leaf size=14

$$\frac{2}{5}x\sqrt{bx^3}$$

```
[Out] (2*x*Sqrt[b*x^3])/5
```

Rubi [A] time = 0.00659037, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{2}{5}x\sqrt{bx^3}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[b*x^3],x]

[Out] (2*x*Sqrt[b*x^3])/5
```

Rubi in Sympy [A] time = 1.16916, size = 12, normalized size = 0.86

$$\frac{2x\sqrt{bx^3}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3)**(1/2),x)

[Out] 2*x*sqrt(b*x**3)/5
```

Mathematica [A] time = 0.00226548, size = 14, normalized size = 1.

$$\frac{2}{5}x\sqrt{bx^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[b*x^3],x]

[Out] (2*x*Sqrt[b*x^3])/5
```

Maple [A] time = 0.003, size = 11, normalized size = 0.8

$$\frac{2\,x}{5}\sqrt{bx^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3)^(1/2),x)

[Out] 2/5*x*(b*x^3)^(1/2)
```

Maxima [A] time = 1.43633, size = 14, normalized size = 1.

$$\frac{2}{5}\sqrt{bx^3}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3),x, algorithm="maxima")

[Out] 2/5*sqrt(b*x^3)*x
```

Fricas [A] time = 0.256495, size = 14, normalized size = 1.

$$\frac{2}{5}\sqrt{bx^3}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3),x, algorithm="fricas")

[Out] 2/5*sqrt(b*x^3)*x
```

Sympy [A] time = 0.378517, size = 15, normalized size = 1.07

$$\frac{2\sqrt{b}x\sqrt{x^3}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3)**(1/2),x)

[Out] 2*sqrt(b)*x*sqrt(x**3)/5
```

GIAC/XCAS [A] time = 0.227197, size = 16, normalized size = 1.14

$$\frac{2}{5}\sqrt{bx}x^2\mathrm{sign}\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3),x, algorithm="giac")

[Out] 2/5*sqrt(b*x)*x^2*sign(x)
```

3.78 $\int \sqrt{bx^2}\,dx$

Optimal. Leaf size=14

$$\frac{1}{2}x\sqrt{bx^2}$$

```
[Out] (x*Sqrt[b*x^2])/2
```

Rubi [A] time = 0.00716154, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{1}{2}x\sqrt{bx^2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[b*x^2],x]

[Out] (x*Sqrt[b*x^2])/2
```

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

$$\frac{\sqrt{bx^2}\int x\,dx}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**2)**(1/2),x)

[Out] sqrt(b*x**2)*Integral(x, x)/x
```

Mathematica [A] time = 0.00192438, size = 14, normalized size = 1.

$$\frac{1}{2}x\sqrt{bx^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[b*x^2],x]

[Out] (x*Sqrt[b*x^2])/2
```

Maple [A] time = 0., size = 11, normalized size = 0.8

$$\frac{x}{2}\sqrt{bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^2)^(1/2),x)

[Out] 1/2*x*(b*x^2)^(1/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.23373, size = 14, normalized size = 1.

$$\frac{1}{2}\sqrt{bx^2}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2),x, algorithm="fricas")
```

```
[Out] 1/2*sqrt(b*x^2)*x
```

Sympy [A] time = 0.36748, size = 14, normalized size = 1.

$$\frac{\sqrt{b}x\sqrt{x^2}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**2)**(1/2),x)
```

```
[Out] sqrt(b)*x*sqrt(x**2)/2
```

GIAC/XCAS [A] time = 0.225727, size = 14, normalized size = 1.

$$\frac{1}{2}\sqrt{b}x^2\text{sign}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^2),x, algorithm="giac")
```

```
[Out] 1/2*sqrt(b)*x^2*sign(x)
```

3.79 $\int \sqrt{bx}\, dx$

Optimal. Leaf size=14

$$\frac{2(bx)^{3/2}}{3b}$$

```
[Out] (2*(b*x)^(3/2))/(3*b)
```

Rubi [A] time = 0.00671228, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$

$$\frac{2(bx)^{3/2}}{3b}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[b*x],x]

[Out] (2*(b*x)^(3/2))/(3*b)
```

Rubi in Sympy [A] time = 1.24162, size = 10, normalized size = 0.71

$$\frac{2\,(bx)^{\frac{3}{2}}}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x)**(1/2),x)

[Out] 2*(b*x)**(3/2)/(3*b)
```

Mathematica [A] time = 0.00163255, size = 12, normalized size = 0.86

$$\frac{2}{3}x\sqrt{bx}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[b*x],x]

[Out] (2*x*Sqrt[b*x])/3
```

Maple [A] time = 0.003, size = 9, normalized size = 0.6

$$\frac{2\,x}{3}\sqrt{bx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x)^(1/2),x)

[Out] 2/3*x*(b*x)^(1/2)
```

Maxima [A] time = 1.44189, size = 14, normalized size = 1.

$$\frac{2\,(bx)^{\frac{3}{2}}}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x),x, algorithm="maxima")
```

```
[Out] 2/3*(b*x)^(3/2)/b
```

Fricas [A] time = 0.222253, size = 11, normalized size = 0.79

$$\frac{2}{3}\sqrt{bx}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x),x, algorithm="fricas")
```

```
[Out] 2/3*sqrt(b*x)*x
```

Sympy [A] time = 0.060724, size = 10, normalized size = 0.71

$$\frac{2(bx)^{\frac{3}{2}}}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x)**(1/2),x)
```

```
[Out] 2*(b*x)**(3/2)/(3*b)
```

GIAC/XCAS [A] time = 0.228, size = 11, normalized size = 0.79

$$\frac{2}{3}\sqrt{bx}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x),x, algorithm="giac")
```

```
[Out] 2/3*sqrt(b*x)*x
```

3.80 $\int \sqrt{\frac{b}{x}}\,dx$

Optimal. Leaf size=12

$$2x\sqrt{\frac{b}{x}}$$

```
[Out] 2*Sqrt[b/x]*x
```

Rubi [A] time = 0.00703931, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$2x\sqrt{\frac{b}{x}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[b/x],x]

[Out] 2*Sqrt[b/x]*x
```

Rubi in Sympy [A] time = 1.14967, size = 8, normalized size = 0.67

$$2x\sqrt{\frac{b}{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b/x)**(1/2),x)

[Out] 2*x*sqrt(b/x)
```

Mathematica [A] time = 0.00205493, size = 12, normalized size = 1.

$$2x\sqrt{\frac{b}{x}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[b/x],x]

[Out] 2*Sqrt[b/x]*x
```

Maple [A] time = 0.003, size = 11, normalized size = 0.9

$$2\,x\sqrt{\frac{b}{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b/x)^(1/2),x)
```

```
[Out] 2*x*(b/x)^(1/2)
```

Maxima [A] time = 1.43619, size = 14, normalized size = 1.17

$$2x\sqrt{\frac{b}{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b/x),x, algorithm="maxima")
```

```
[Out] 2*x*sqrt(b/x)
```

Fricas [A] time = 0.226164, size = 14, normalized size = 1.17

$$\frac{2b}{\sqrt{\frac{b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b/x),x, algorithm="fricas")
```

```
[Out] 2*b/sqrt(b/x)
```

Sympy [A] time = 0.377444, size = 14, normalized size = 1.17

$$2\sqrt{b}x\sqrt{\frac{1}{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x)**(1/2),x)
```

```
[Out] 2*sqrt(b)*x*sqrt(1/x)
```

GIAC/XCAS [A] time = 0.224363, size = 12, normalized size = 1.

$$2\sqrt{bx}\operatorname{sign}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b/x),x, algorithm="giac")
```

```
[Out] 2*sqrt(b*x)*sign(x)
```

3.81 $\int \sqrt{\frac{b}{x^2}}\,dx$

Optimal. Leaf size=13

$$x\sqrt{\frac{b}{x^2}}\log(x)$$

```
[Out] Sqrt[b/x^2]*x*Log[x]
```

Rubi [A] time = 0.00848211, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$x\sqrt{\frac{b}{x^2}}\log(x)$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[b/x^2],x]

[Out] Sqrt[b/x^2]*x*Log[x]
```

Rubi in Sympy [A] time = 1.15439, size = 12, normalized size = 0.92

$$x\sqrt{\frac{b}{x^2}}\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b/x**2)**(1/2),x)

[Out] x*sqrt(b/x**2)*log(x)
```

Mathematica [A] time = 0.00248467, size = 13, normalized size = 1.

$$x\sqrt{\frac{b}{x^2}}\log(x)$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[b/x^2],x]

[Out] Sqrt[b/x^2]*x*Log[x]
```

Maple [A] time = 0.007, size = 12, normalized size = 0.9

$$x\ln(x)\sqrt{\frac{b}{x^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b/x^2)^(1/2),x)
```

```
[Out] x*ln(x)*(b/x^2)^(1/2)
```

Maxima [A] time = 1.43562, size = 15, normalized size = 1.15

$$x\sqrt{\frac{b}{x^2}}\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b/x^2),x, algorithm="maxima")

[Out] x*sqrt(b/x^2)*log(x)
```

Fricas [A] time = 0.22476, size = 15, normalized size = 1.15

$$x\sqrt{\frac{b}{x^2}}\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b/x^2),x, algorithm="fricas")

[Out] x*sqrt(b/x^2)*log(x)
```

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

$$\int\sqrt{\frac{b}{x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x**2)**(1/2),x)

[Out] Integral(sqrt(b/x**2), x)
```

GIAC/XCAS [A] time = 0.239839, size = 12, normalized size = 0.92

$$\sqrt{b}\ln(|x|)\,\mathrm{sign}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b/x^2),x, algorithm="giac")

[Out] sqrt(b)*ln(abs(x))*sign(x)
```

3.82 $\int \sqrt{\frac{b}{x^3}}\,dx$

Optimal. Leaf size=12

$$-2x\sqrt{\frac{b}{x^3}}$$

[Out] -2*Sqrt[b/x^3]*x

Rubi [A] time = 0.00691419, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$-2x\sqrt{\frac{b}{x^3}}$$

Antiderivative was successfully verified.

[In] Int[Sqrt[b/x^3],x]

[Out] -2*Sqrt[b/x^3]*x

Rubi in Sympy [A] time = 1.22009, size = 12, normalized size = 1.

$$-2x\sqrt{\frac{b}{x^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((b/x**3)**(1/2),x)

[Out] -2*x*sqrt(b/x**3)

Mathematica [A] time = 0.00254706, size = 12, normalized size = 1.

$$-2x\sqrt{\frac{b}{x^3}}$$

Antiderivative was successfully verified.

[In] Integrate[Sqrt[b/x^3],x]

[Out] -2*Sqrt[b/x^3]*x

Maple [A] time = 0.003, size = 11, normalized size = 0.9

$$-2\,x\sqrt{\frac{b}{x^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b/x^3)^(1/2),x)

```
[Out] -2*x*(b/x^3)^(1/2)
```

Maxima [A] time = 1.47617, size = 14, normalized size = 1.17

$$-2\,x\sqrt{\frac{b}{x^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b/x^3),x, algorithm="maxima")
```

```
[Out] -2*x*sqrt(b/x^3)
```

Fricas [A] time = 0.218621, size = 14, normalized size = 1.17

$$-2\,x\sqrt{\frac{b}{x^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b/x^3),x, algorithm="fricas")
```

```
[Out] -2*x*sqrt(b/x^3)
```

Sympy [A] time = 1.23959, size = 17, normalized size = 1.42

$$-2\sqrt{b}x\sqrt{\frac{1}{x^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x**3)**(1/2),x)
```

```
[Out] -2*sqrt(b)*x*sqrt(x**(-3))
```

GIAC/XCAS [A] time = 0.228015, size = 11, normalized size = 0.92

$$-\frac{2\,b}{\sqrt{bx}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b/x^3),x, algorithm="giac")
```

```
[Out] -2*b/sqrt(b*x)
```

3.83 $\int \left(bx^3\right)^{3/2} dx$

Optimal. Leaf size=17

$$\frac{2}{11}bx^4\sqrt{bx^3}$$

```
[Out] (2*b*x^4*Sqrt[b*x^3])/11
```

Rubi [A] time = 0.00774167, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{2}{11}bx^4\sqrt{bx^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^3)^(3/2),x]

[Out] (2*b*x^4*Sqrt[b*x^3])/11
```

Rubi in Sympy [A] time = 1.30868, size = 15, normalized size = 0.88

$$\frac{2bx^4\sqrt{bx^3}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3)**(3/2),x)

[Out] 2*b*x**4*sqrt(b*x**3)/11
```

Mathematica [A] time = 0.00273681, size = 14, normalized size = 0.82

$$\frac{2}{11}x\left(bx^3\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^3)^(3/2),x]

[Out] (2*x*(b*x^3)^(3/2))/11
```

Maple [A] time = 0.003, size = 11, normalized size = 0.7

$$\frac{2\,x}{11}\left(bx^3\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3)^(3/2),x)

[Out] 2/11*x*(b*x^3)^(3/2)
```

Maxima [A] time = 1.4247, size = 14, normalized size = 0.82

$$\frac{2}{11}\left(bx^3\right)^{\frac{3}{2}}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3)^(3/2),x, algorithm="maxima")
```

```
[Out] 2/11*(b*x^3)^(3/2)*x
```

Fricas [A] time = 0.225569, size = 18, normalized size = 1.06

$$\frac{2}{11}\sqrt{bx^3}bx^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3)^(3/2),x, algorithm="fricas")
```

```
[Out] 2/11*sqrt(b*x^3)*b*x^4
```

Sympy [A] time = 1.12844, size = 15, normalized size = 0.88

$$\frac{2b^{\frac{3}{2}}x\left(x^3\right)^{\frac{3}{2}}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3)**(3/2),x)
```

```
[Out] 2*b**(3/2)*x*(x**3)**(3/2)/11
```

GIAC/XCAS [A] time = 0.216178, size = 18, normalized size = 1.06

$$\frac{2}{11}\sqrt{bx}bx^5\operatorname{sign}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3)^(3/2),x, algorithm="giac")
```

```
[Out] 2/11*sqrt(b*x)*b*x^5*sign(x)
```

3.84 $\int \left(bx^2\right)^{3/2}\,dx$

Optimal. Leaf size=17

$$\frac{1}{4}bx^3\sqrt{bx^2}$$

```
[Out] (b*x^3*Sqrt[b*x^2])/4
```

Rubi [A] time = 0.00752696, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{1}{4}bx^3\sqrt{bx^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^2)^(3/2),x]
```

```
[Out] (b*x^3*Sqrt[b*x^2])/4
```

Rubi in Sympy [A] time = 1.29937, size = 14, normalized size = 0.82

$$\frac{bx^3\sqrt{bx^2}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**2)**(3/2),x)
```

```
[Out] b*x**3*sqrt(b*x**2)/4
```

Mathematica [A] time = 0.000888273, size = 14, normalized size = 0.82

$$\frac{1}{4}x\left(bx^2\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^2)^(3/2),x]
```

```
[Out] (x*(b*x^2)^(3/2))/4
```

Maple [A] time = 0., size = 11, normalized size = 0.7

$$\frac{x}{4}\left(bx^2\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^2)^(3/2),x)
```

```
[Out] 1/4*x*(b*x^2)^(3/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [A] time = 0.245576, size = 18, normalized size = 1.06

$$\frac{1}{4}\sqrt{bx^2}bx^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2),x, algorithm="fricas")

[Out] 1/4*sqrt(b*x^2)*b*x^3
```

Sympy [A] time = 1.09338, size = 14, normalized size = 0.82

$$\frac{b^{\frac{3}{2}}x\left(x^2\right)^{\frac{3}{2}}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**2)**(3/2),x)

[Out] b**(3/2)*x*(x**2)**(3/2)/4
```

GIAC/XCAS [A] time = 0.226456, size = 14, normalized size = 0.82

$$\frac{1}{4}b^{\frac{3}{2}}x^4\text{sign}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(3/2),x, algorithm="giac")

[Out] 1/4*b^(3/2)*x^4*sign(x)
```

3.85 $\int (bx)^{3/2}\,dx$

Optimal. Leaf size=14

$$\frac{2(bx)^{5/2}}{5b}$$

```
[Out] (2*(b*x)^(5/2))/(5*b)
```

Rubi [A] time = 0.00678556, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$\frac{2(bx)^{5/2}}{5b}$$

Antiderivative was successfully verified.

```
[In] Int[(b*x)^(3/2),x]

[Out] (2*(b*x)^(5/2))/(5*b)
```

Rubi in Sympy [A] time = 1.34173, size = 10, normalized size = 0.71

$$\frac{2\,(bx)^{\frac{5}{2}}}{5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x)**(3/2),x)

[Out] 2*(b*x)**(5/2)/(5*b)
```

Mathematica [A] time = 0.00177495, size = 12, normalized size = 0.86

$$\frac{2}{5}x(bx)^{3/2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(b*x)^(3/2),x]

[Out] (2*x*(b*x)^(3/2))/5
```

Maple [A] time = 0.003, size = 9, normalized size = 0.6

$$\frac{2\,x}{5}\,(bx)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x)^(3/2),x)

[Out] 2/5*x*(b*x)^(3/2)
```

Maxima [A] time = 1.43371, size = 14, normalized size = 1.

$$\frac{2\,(bx)^{\frac{5}{2}}}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x)^(3/2),x, algorithm="maxima")

[Out] 2/5*(b*x)^(5/2)/b
```

Fricas [A] time = 0.249105, size = 15, normalized size = 1.07

$$\frac{2}{5}\,\sqrt{bx}bx^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x)^(3/2),x, algorithm="fricas")

[Out] 2/5*sqrt(b*x)*b*x^2
```

Sympy [A] time = 0.061012, size = 10, normalized size = 0.71

$$\frac{2\,(bx)^{\frac{5}{2}}}{5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x)**(3/2),x)

[Out] 2*(b*x)**(5/2)/(5*b)
```

GIAC/XCAS [A] time = 0.227453, size = 15, normalized size = 1.07

$$\frac{2}{5}\,\sqrt{bx}bx^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x)^(3/2),x, algorithm="giac")

[Out] 2/5*sqrt(b*x)*b*x^2
```

3.86 $\int \left(\frac{b}{x}\right)^{3/2} dx$

Optimal. Leaf size=12

$$-2b\sqrt{\frac{b}{x}}$$

```
[Out] -2*b*Sqrt[b/x]
```

Rubi [A] time = 0.00738873, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$-2b\sqrt{\frac{b}{x}}$$

Antiderivative was successfully verified.

```
[In] Int[(b/x)^(3/2),x]

[Out] -2*b*Sqrt[b/x]
```

Rubi in Sympy [A] time = 1.27488, size = 10, normalized size = 0.83

$$-2b\sqrt{\frac{b}{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b/x)**(3/2),x)

[Out] -2*b*sqrt(b/x)
```

Mathematica [A] time = 0.00243123, size = 12, normalized size = 1.

$$-2x\left(\frac{b}{x}\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(b/x)^(3/2),x]

[Out] -2*(b/x)^(3/2)*x
```

Maple [A] time = 0.003, size = 11, normalized size = 0.9

$$-2\,x\left(\frac{b}{x}\right)^{3/2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b/x)^(3/2),x)
```

```
[Out] -2*x*(b/x)^(3/2)
```

Maxima [A] time = 1.44042, size = 14, normalized size = 1.17

$$-2x\left(\frac{b}{x}\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b/x)^(3/2),x, algorithm="maxima")
```

```
[Out] -2*x*(b/x)^(3/2)
```

Fricas [A] time = 0.244867, size = 14, normalized size = 1.17

$$-2b\sqrt{\frac{b}{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b/x)^(3/2),x, algorithm="fricas")
```

```
[Out] -2*b*sqrt(b/x)
```

Sympy [A] time = 1.08561, size = 15, normalized size = 1.25

$$-2b^{\frac{3}{2}}x\left(\frac{1}{x}\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b/x)**(3/2),x)
```

```
[Out] -2*b**(3/2)*x*(1/x)**(3/2)
```

GIAC/XCAS [A] time = 0.227414, size = 16, normalized size = 1.33

$$-\frac{2b^2\operatorname{sign}(x)}{\sqrt{bx}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b/x)^(3/2),x, algorithm="giac")
```

```
[Out] -2*b^2*sign(x)/sqrt(b*x)
```

3.87 $\int \left(\frac{b}{x^2}\right)^{3/2} dx$

Optimal. Leaf size=17

$$-\frac{b\sqrt{\frac{b}{x^2}}}{2x}$$

```
[Out] -(b*Sqrt[b/x^2])/(2*x)
```

Rubi [A] time = 0.00790038, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$-\frac{b\sqrt{\frac{b}{x^2}}}{2x}$$

Antiderivative was successfully verified.

```
[In]  Int[(b/x^2)^(3/2),x]

[Out] -(b*Sqrt[b/x^2])/(2*x)
```

Rubi in Sympy [A] time = 1.32254, size = 14, normalized size = 0.82

$$-\frac{b\sqrt{\frac{b}{x^2}}}{2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b/x**2)**(3/2),x)

[Out] -b*sqrt(b/x**2)/(2*x)
```

Mathematica [A] time = 0.00207925, size = 14, normalized size = 0.82

$$-\frac{1}{2}x\left(\frac{b}{x^2}\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b/x^2)^(3/2),x]

[Out] -((b/x^2)^(3/2)*x)/2
```

Maple [A] time = 0.003, size = 11, normalized size = 0.7

$$-\frac{x}{2}\left(\frac{b}{x^2}\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b/x^2)^(3/2),x)
```

```
[Out] -1/2*x*(b/x^2)^(3/2)
```

Maxima [A] time = 1.45163, size = 14, normalized size = 0.82

$$-\frac{1}{2}\,x\left(\frac{b}{x^2}\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^2)^(3/2),x, algorithm="maxima")

[Out] -1/2*x*(b/x^2)^(3/2)
```

Fricas [A] time = 0.242181, size = 18, normalized size = 1.06

$$-\frac{b\sqrt{\frac{b}{x^2}}}{2\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^2)^(3/2),x, algorithm="fricas")

[Out] -1/2*b*sqrt(b/x^2)/x
```

Sympy [A] time = 1.94604, size = 17, normalized size = 1.

$$-\frac{b^{\frac{3}{2}}x\left(\frac{1}{x^2}\right)^{\frac{3}{2}}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x**2)**(3/2),x)

[Out] -b**(3/2)*x*(x**(-2))**(3/2)/2
```

GIAC/XCAS [A] time = 0.230104, size = 14, normalized size = 0.82

$$-\frac{b^{\frac{3}{2}}\,\mathrm{sign}\left(x\right)}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^2)^(3/2),x, algorithm="giac")

[Out] -1/2*b^(3/2)*sign(x)/x^2
```

3.88 $\int \left(\frac{b}{x^3}\right)^{3/2} dx$

Optimal. Leaf size=17

$$-\frac{2b\sqrt{\frac{b}{x^3}}}{7x^2}$$

```
[Out] (-2*b*Sqrt[b/x^3])/(7*x^2)
```

Rubi [A] time = 0.00794486, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$-\frac{2b\sqrt{\frac{b}{x^3}}}{7x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(b/x^3)^(3/2),x]

[Out] (-2*b*Sqrt[b/x^3])/(7*x^2)
```

Rubi in Sympy [A] time = 1.33267, size = 17, normalized size = 1.

$$-\frac{2b\sqrt{\frac{b}{x^3}}}{7x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b/x**3)**(3/2),x)

[Out] -2*b*sqrt(b/x**3)/(7*x**2)
```

Mathematica [A] time = 0.0023298, size = 14, normalized size = 0.82

$$-\frac{2}{7}x\left(\frac{b}{x^3}\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b/x^3)^(3/2),x]

[Out] (-2*(b/x^3)^(3/2)*x)/7
```

Maple [A] time = 0.003, size = 11, normalized size = 0.7

$$-\frac{2x}{7}\left(\frac{b}{x^3}\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b/x^3)^(3/2),x)
```

```
[Out] -2/7*x*(b/x^3)^(3/2)
```

Maxima [A] time = 1.43417, size = 14, normalized size = 0.82

$$-\frac{2}{7}\,x\left(\frac{b}{x^3}\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^3)^(3/2),x, algorithm="maxima")

[Out] -2/7*x*(b/x^3)^(3/2)
```

Fricas [A] time = 0.251366, size = 18, normalized size = 1.06

$$-\frac{2\,b\sqrt{\frac{b}{x^3}}}{7\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^3)^(3/2),x, algorithm="fricas")

[Out] -2/7*b*sqrt(b/x^3)/x^2
```

Sympy [A] time = 1.9308, size = 19, normalized size = 1.12

$$-\frac{2b^{\frac{3}{2}}x\left(\frac{1}{x^3}\right)^{\frac{3}{2}}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x**3)**(3/2),x)

[Out] -2*b**(3/2)*x*(x**(-3))**(3/2)/7
```

GIAC/XCAS [A] time = 0.225932, size = 18, normalized size = 1.06

$$-\frac{2\,b^2}{7\,\sqrt{bx}x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^3)^(3/2),x, algorithm="giac")

[Out] -2/7*b^2/(sqrt(b*x)*x^3)
```

3.89 $\int \frac{1}{\sqrt{bx^3}}\,dx$

Optimal. Leaf size=12

$$-\frac{2x}{\sqrt{bx^3}}$$

```
[Out] (-2*x)/Sqrt[b*x^3]
```

Rubi [A] time = 0.00703099, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$-\frac{2x}{\sqrt{bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[b*x^3],x]
```

```
[Out] (-2*x)/Sqrt[b*x^3]
```

Rubi in Sympy [A] time = 1.57971, size = 15, normalized size = 1.25

$$-\frac{2\sqrt{bx^3}}{bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**3)**(1/2),x)
```

```
[Out] -2*sqrt(b*x**3)/(b*x**2)
```

Mathematica [A] time = 0.0026245, size = 12, normalized size = 1.

$$-\frac{2x}{\sqrt{bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/Sqrt[b*x^3],x]
```

```
[Out] (-2*x)/Sqrt[b*x^3]
```

Maple [A] time = 0.003, size = 11, normalized size = 0.9

$$-2\,\frac{x}{\sqrt{bx^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^3)^(1/2),x)
```

```
[Out] -2*x/(b*x^3)^(1/2)
```

Maxima [A] time = 1.42588, size = 14, normalized size = 1.17

$$-\frac{2\,x}{\sqrt{bx^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*x^3),x, algorithm="maxima")
```

```
[Out] -2*x/sqrt(b*x^3)
```

Fricas [A] time = 0.236745, size = 20, normalized size = 1.67

$$-\frac{2\,\sqrt{bx^3}}{bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*x^3),x, algorithm="fricas")
```

```
[Out] -2*sqrt(b*x^3)/(b*x^2)
```

Sympy [A] time = 1.48262, size = 15, normalized size = 1.25

$$-\frac{2x}{\sqrt{b}\sqrt{x^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**3)**(1/2),x)
```

```
[Out] -2*x/(sqrt(b)*sqrt(x**3))
```

GIAC/XCAS [A] time = 0.226637, size = 15, normalized size = 1.25

$$-\frac{2}{\sqrt{bx}\mathrm{sign}\left(x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*x^3),x, algorithm="giac")
```

```
[Out] -2/(sqrt(b*x)*sign(x))
```

3.90 $\int \frac{1}{\sqrt{bx^2}} \, dx$

Optimal. Leaf size=13

$$\frac{x \log(x)}{\sqrt{bx^2}}$$

```
[Out] (x*Log[x])/Sqrt[b*x^2]
```

Rubi [A] time = 0.00678204, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$

$$\frac{x \log(x)}{\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[b*x^2],x]

[Out] (x*Log[x])/Sqrt[b*x^2]
```

Rubi in Sympy [A] time = 1.48988, size = 14, normalized size = 1.08

$$\frac{\sqrt{bx^2} \log(x)}{bx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**2)**(1/2),x)

[Out] sqrt(b*x**2)*log(x)/(b*x)
```

Mathematica [A] time = 0.0026933, size = 13, normalized size = 1.

$$\frac{x \log(x)}{\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/Sqrt[b*x^2],x]

[Out] (x*Log[x])/Sqrt[b*x^2]
```

Maple [A] time = 0., size = 12, normalized size = 0.9

$$x \ln(x) \frac{1}{\sqrt{bx^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^2)^(1/2),x)

[Out] x*ln(x)/(b*x^2)^(1/2)
```

Maxima [A] time = 1.43424, size = 8, normalized size = 0.62

$$\frac{\log(x)}{\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*x^2),x, algorithm="maxima")
```

```
[Out] log(x)/sqrt(b)
```

Fricas [A] time = 0.243999, size = 22, normalized size = 1.69

$$\frac{\sqrt{bx^2}\log(x)}{bx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*x^2),x, algorithm="fricas")
```

```
[Out] sqrt(b*x^2)*log(x)/(b*x)
```

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

$$\int \frac{1}{\sqrt{bx^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**2)**(1/2),x)
```

```
[Out] Integral(1/sqrt(b*x**2), x)
```

GIAC/XCAS [A] time = 0.247026, size = 24, normalized size = 1.85

$$\frac{\ln\left(\sqrt{b}|x||\mathrm{sign}(x)|\right)}{\sqrt{b}\mathrm{sign}(x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*x^2),x, algorithm="giac")
```

```
[Out] ln(sqrt(b)*abs(x)*abs(sign(x)))/(sqrt(b)*sign(x))
```

3.91 $\int \frac{1}{\sqrt{bx}} \, dx$

Optimal. Leaf size=12

$$\frac{2\sqrt{bx}}{b}$$

```
[Out] (2*Sqrt[b*x])/b
```

Rubi [A] time = 0.00701051, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$\frac{2\sqrt{bx}}{b}$$

Antiderivative was successfully verified.

```
[In] Int[1/Sqrt[b*x],x]

[Out] (2*Sqrt[b*x])/b
```

Rubi in Sympy [A] time = 1.37099, size = 8, normalized size = 0.67

$$\frac{2\sqrt{bx}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(b*x)**(1/2),x)

[Out] 2*sqrt(b*x)/b
```

Mathematica [A] time = 0.00250163, size = 10, normalized size = 0.83

$$\frac{2x}{\sqrt{bx}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/Sqrt[b*x],x]

[Out] (2*x)/Sqrt[b*x]
```

Maple [A] time = 0.003, size = 9, normalized size = 0.8

$$2\,\frac{x}{\sqrt{bx}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*x)^(1/2),x)

[Out] 2*x/(b*x)^(1/2)
```

Maxima [A] time = 1.45594, size = 14, normalized size = 1.17

$$\frac{2\sqrt{bx}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*x),x, algorithm="maxima")
```

```
[Out] 2*sqrt(b*x)/b
```

Fricas [A] time = 0.2521, size = 14, normalized size = 1.17

$$\frac{2\sqrt{bx}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*x),x, algorithm="fricas")
```

```
[Out] 2*sqrt(b*x)/b
```

Sympy [A] time = 0.064073, size = 8, normalized size = 0.67

$$\frac{2\sqrt{bx}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x)**(1/2),x)
```

```
[Out] 2*sqrt(b*x)/b
```

GIAC/XCAS [A] time = 0.216261, size = 14, normalized size = 1.17

$$\frac{2\sqrt{bx}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*x),x, algorithm="giac")
```

```
[Out] 2*sqrt(b*x)/b
```

3.92 $\int \frac{1}{\sqrt{\frac{b}{x}}} dx$

Optimal. Leaf size=14

$$\frac{2x}{3\sqrt{\frac{b}{x}}}$$

```
[Out] (2*x)/(3*Sqrt[b/x])
```

Rubi [A] time = 0.00605984, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{2x}{3\sqrt{\frac{b}{x}}}$$

Antiderivative was successfully verified.

```
[In] Int[1/Sqrt[b/x],x]

[Out] (2*x)/(3*Sqrt[b/x])
```

Rubi in Sympy [A] time = 1.57558, size = 14, normalized size = 1.

$$\frac{2x^2\sqrt{\frac{b}{x}}}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(b/x)**(1/2),x)

[Out] 2*x**2*sqrt(b/x)/(3*b)
```

Mathematica [A] time = 0.0029528, size = 14, normalized size = 1.

$$\frac{2x}{3\sqrt{\frac{b}{x}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/Sqrt[b/x],x]

[Out] (2*x)/(3*Sqrt[b/x])
```

Maple [A] time = 0.003, size = 11, normalized size = 0.8

$$\frac{2x}{3}\frac{1}{\sqrt{\frac{b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b/x)^(1/2),x)

[Out] 2/3*x/(b/x)^(1/2)
```

Maxima [A] time = 1.41779, size = 14, normalized size = 1.

$$\frac{2x}{3\sqrt{\frac{b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b/x),x, algorithm="maxima")

[Out] 2/3*x/sqrt(b/x)
```

Fricas [A] time = 0.267758, size = 14, normalized size = 1.

$$\frac{2x}{3\sqrt{\frac{b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b/x),x, algorithm="fricas")

[Out] 2/3*x/sqrt(b/x)
```

Sympy [A] time = 1.53416, size = 15, normalized size = 1.07

$$\frac{2x}{3\sqrt{b}\sqrt{\frac{1}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b/x)**(1/2),x)

[Out] 2*x/(3*sqrt(b)*sqrt(1/x))
```

GIAC/XCAS [A] time = 0.220319, size = 20, normalized size = 1.43

$$\frac{2\sqrt{bx}x}{3\,b\mathrm{sign}\left(x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b/x),x, algorithm="giac")

[Out] 2/3*sqrt(b*x)*x/(b*sign(x))
```

3.93 $\int \frac{1}{\sqrt{\frac{b}{x^2}}} \, dx$

Optimal. Leaf size=14

$$\frac{x}{2\sqrt{\frac{b}{x^2}}}$$

```
[Out] x/(2*Sqrt[b/x^2])
```

Rubi [A] time = 0.00683868, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{x}{2\sqrt{\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In] Int[1/Sqrt[b/x^2],x]
```

```
[Out] x/(2*Sqrt[b/x^2])
```

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

$$\frac{x\sqrt{\frac{b}{x^2}} \int x \, dx}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(b/x**2)**(1/2),x)
```

```
[Out] x*sqrt(b/x**2)*Integral(x, x)/b
```

Mathematica [A] time = 0.0036718, size = 14, normalized size = 1.

$$\frac{x}{2\sqrt{\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/Sqrt[b/x^2],x]
```

```
[Out] x/(2*Sqrt[b/x^2])
```

Maple [A] time = 0.003, size = 11, normalized size = 0.8

$$\frac{x}{2}\frac{1}{\sqrt{\frac{b}{x^2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b/x^2)^(1/2),x)
```

[Out] 1/2*x/(b/x^2)^(1/2)

Maxima [A] time = 1.46196, size = 14, normalized size = 1.

$$\frac{x}{2\sqrt{\frac{b}{x^2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b/x^2),x, algorithm="maxima")
```

```
[Out] 1/2*x/sqrt(b/x^2)
```

Fricas [A] time = 0.250505, size = 20, normalized size = 1.43

$$\frac{x^3\sqrt{\frac{b}{x^2}}}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b/x^2),x, algorithm="fricas")
```

```
[Out] 1/2*x^3*sqrt(b/x^2)/b
```

Sympy [A] time = 1.57395, size = 15, normalized size = 1.07

$$\frac{x}{2\sqrt{b}\sqrt{\frac{1}{x^2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b/x**2)**(1/2),x)
```

```
[Out] x/(2*sqrt(b)*sqrt(x**(-2)))
```

GIAC/XCAS [A] time = 0.221745, size = 16, normalized size = 1.14

$$\frac{x^2}{2\sqrt{b}\operatorname{sign}(x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b/x^2),x, algorithm="giac")
```

```
[Out] 1/2*x^2/(sqrt(b)*sign(x))
```

3.94 $\int \frac{1}{\sqrt{\frac{b}{x^3}}} dx$

Optimal. Leaf size=14

$$\frac{2x}{5\sqrt{\frac{b}{x^3}}}$$

```
[Out] (2*x)/(5*Sqrt[b/x^3])
```

Rubi [A] time = 0.00715514, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{2x}{5\sqrt{\frac{b}{x^3}}}$$

Antiderivative was successfully verified.

```
[In] Int[1/Sqrt[b/x^3],x]

[Out] (2*x)/(5*Sqrt[b/x^3])
```

Rubi in Sympy [A] time = 1.58655, size = 15, normalized size = 1.07

$$\frac{2x^4\sqrt{\frac{b}{x^3}}}{5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(b/x**3)**(1/2),x)

[Out] 2*x**4*sqrt(b/x**3)/(5*b)
```

Mathematica [A] time = 0.00303792, size = 14, normalized size = 1.

$$\frac{2x}{5\sqrt{\frac{b}{x^3}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/Sqrt[b/x^3],x]

[Out] (2*x)/(5*Sqrt[b/x^3])
```

Maple [A] time = 0.003, size = 11, normalized size = 0.8

$$\frac{2\,x}{5}\frac{1}{\sqrt{\frac{b}{x^3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b/x^3)^(1/2),x)

[Out] 2/5*x/(b/x^3)^(1/2)
```

Maxima [A] time = 1.43397, size = 14, normalized size = 1.

$$\frac{2\,x}{5\,\sqrt{\frac{b}{x^3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b/x^3),x, algorithm="maxima")

[Out] 2/5*x/sqrt(b/x^3)
```

Fricas [A] time = 0.257295, size = 20, normalized size = 1.43

$$\frac{2\,x^4\sqrt{\frac{b}{x^3}}}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b/x^3),x, algorithm="fricas")

[Out] 2/5*x^4*sqrt(b/x^3)/b
```

Sympy [A] time = 1.59988, size = 17, normalized size = 1.21

$$\frac{2x}{5\sqrt{b}\sqrt{\frac{1}{x^3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b/x**3)**(1/2),x)

[Out] 2*x/(5*sqrt(b)*sqrt(x**(-3)))
```

GIAC/XCAS [A] time = 0.230453, size = 18, normalized size = 1.29

$$\frac{2\,\sqrt{bx}x^2}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b/x^3),x, algorithm="giac")

[Out] 2/5*sqrt(b*x)*x^2/b
```

3.95 $\int \frac{1}{(bx^3)^{3/2}}\,dx$

Optimal. Leaf size=19

$$-\frac{2}{7bx^2\sqrt{bx^3}}$$

```
[Out] -2/(7*b*x^2*Sqrt[b*x^3])
```

Rubi [A] time = 0.00827412, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$-\frac{2}{7bx^2\sqrt{bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^3)^(-3/2),x]

[Out] -2/(7*b*x^2*Sqrt[b*x^3])
```

Rubi in Sympy [A] time = 1.58104, size = 19, normalized size = 1.

$$-\frac{2\sqrt{bx^3}}{7b^2x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**3)**(3/2),x)

[Out] -2*sqrt(b*x**3)/(7*b**2*x**5)
```

Mathematica [A] time = 0.00311791, size = 14, normalized size = 0.74

$$-\frac{2x}{7\left(bx^3\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^3)^(-3/2),x]

[Out] (-2*x)/(7*(b*x^3)^(3/2))
```

Maple [A] time = 0.002, size = 11, normalized size = 0.6

$$-\frac{2\,x}{7}\left(bx^3\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^3)^(3/2),x)

[Out] -2/7*x/(b*x^3)^(3/2)
```

Maxima [A] time = 1.41801, size = 14, normalized size = 0.74

$$-\frac{2\,x}{7\,\left(bx^3\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3)^(-3/2),x, algorithm="maxima")
```

```
[Out] -2/7*x/(b*x^3)^(3/2)
```

Fricas [A] time = 0.30623, size = 20, normalized size = 1.05

$$-\frac{2\,\sqrt{bx^3}}{7\,b^2x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3)^(-3/2),x, algorithm="fricas")
```

```
[Out] -2/7*sqrt(b*x^3)/(b^2*x^5)
```

Sympy [A] time = 1.87081, size = 17, normalized size = 0.89

$$-\frac{2x}{7b^{\frac{3}{2}}\left(x^3\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**3)**(3/2),x)
```

```
[Out] -2*x/(7*b**(3/2)*(x**3)**(3/2))
```

GIAC/XCAS [A] time = 0.589754, size = 4, normalized size = 0.21

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3)^(-3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

3.96 $\int \frac{1}{(bx^2)^{3/2}}\,dx$

Optimal. Leaf size=19

$$-\frac{1}{2bx\sqrt{bx^2}}$$

```
[Out] -1/(2*b*x*Sqrt[b*x^2])
```

Rubi [A] time = 0.00802965, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$-\frac{1}{2bx\sqrt{bx^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^2)^(-3/2),x]

[Out] -1/(2*b*x*Sqrt[b*x^2])
```

Rubi in Sympy [A] time = 1.56596, size = 17, normalized size = 0.89

$$-\frac{\sqrt{bx^2}}{2b^2x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**2)**(3/2),x)

[Out] -sqrt(b*x**2)/(2*b**2*x**3)
```

Mathematica [A] time = 0.00151832, size = 14, normalized size = 0.74

$$-\frac{x}{2\left(bx^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^2)^(-3/2),x]

[Out] -x/(2*(b*x^2)^(3/2))
```

Maple [A] time = 0., size = 11, normalized size = 0.6

$$-\frac{x}{2}\left(bx^2\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^2)^(3/2),x)

[Out] -1/2*x/(b*x^2)^(3/2)
```

Maxima [A] time = 1.44336, size = 11, normalized size = 0.58

$$-\frac{1}{2\,b^{\frac{3}{2}}x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(-3/2),x, algorithm="maxima")
```

```
[Out] -1/2/(b^(3/2)*x^2)
```

Fricas [A] time = 0.229916, size = 20, normalized size = 1.05

$$-\frac{\sqrt{bx^2}}{2\,b^2x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(-3/2),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(b*x^2)/(b^2*x^3)
```

Sympy [A] time = 2.01922, size = 15, normalized size = 0.79

$$-\frac{x}{2b^{\frac{3}{2}}\left(x^2\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**2)**(3/2),x)
```

```
[Out] -x/(2*b**(3/2)*(x**2)**(3/2))
```

GIAC/XCAS [A] time = 0.55815, size = 4, normalized size = 0.21

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(-3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

3.97 $\int \frac{1}{(bx)^{3/2}} dx$

Optimal. Leaf size=12

$$-\frac{2}{b\sqrt{bx}}$$

[Out] -2/(b*Sqrt[b*x])

Rubi [A] time = 0.00656573, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$-\frac{2}{b\sqrt{bx}}$$

Antiderivative was successfully verified.

[In] Int[(b*x)^(-3/2),x]

[Out] -2/(b*Sqrt[b*x])

Rubi in Sympy [A] time = 1.33349, size = 10, normalized size = 0.83

$$-\frac{2}{b\sqrt{bx}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(1/(b*x)**(3/2),x)

[Out] -2/(b*sqrt(b*x))

Mathematica [A] time = 0.00202389, size = 10, normalized size = 0.83

$$-\frac{2x}{(bx)^{3/2}}$$

Antiderivative was successfully verified.

[In] Integrate[(b*x)^(-3/2),x]

[Out] (-2*x)/(b*x)^(3/2)

Maple [A] time = 0.003, size = 9, normalized size = 0.8

$$-2\frac{x}{(bx)^{3/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(b*x)^(3/2),x)

[Out] -2*x/(b*x)^(3/2)

Maxima [A] time = 1.42175, size = 14, normalized size = 1.17

$$-\frac{2}{\sqrt{bx}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x)^(-3/2),x, algorithm="maxima")
```

```
[Out] -2/(sqrt(b*x)*b)
```

Fricas [A] time = 0.216931, size = 14, normalized size = 1.17

$$-\frac{2}{\sqrt{bx}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x)^(-3/2),x, algorithm="fricas")
```

```
[Out] -2/(sqrt(b*x)*b)
```

Sympy [A] time = 0.070462, size = 10, normalized size = 0.83

$$-\frac{2}{b\sqrt{bx}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x)**(3/2),x)
```

```
[Out] -2/(b*sqrt(b*x))
```

GIAC/XCAS [A] time = 0.227453, size = 14, normalized size = 1.17

$$-\frac{2}{\sqrt{bx}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x)^(-3/2),x, algorithm="giac")
```

```
[Out] -2/(sqrt(b*x)*b)
```

3.98 $\int \frac{1}{\left(\frac{b}{x}\right)^{3/2}} dx$

Optimal. Leaf size=19

$$\frac{2x^2}{5b\sqrt{\frac{b}{x}}}$$

[Out] (2*x^2)/(5*b*Sqrt[b/x])

Rubi [A] time = 0.00865234, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{2x^2}{5b\sqrt{\frac{b}{x}}}$$

Antiderivative was successfully verified.

[In] Int[(b/x)^(-3/2),x]

[Out] (2*x^2)/(5*b*Sqrt[b/x])

Rubi in Sympy [A] time = 1.61813, size = 15, normalized size = 0.79

$$\frac{2x^3\sqrt{\frac{b}{x}}}{5b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(1/(b/x)**(3/2),x)

[Out] 2*x**3*sqrt(b/x)/(5*b**2)

Mathematica [A] time = 0.00404491, size = 14, normalized size = 0.74

$$\frac{2x}{5\left(\frac{b}{x}\right)^{3/2}}$$

Antiderivative was successfully verified.

[In] Integrate[(b/x)^(-3/2),x]

[Out] (2*x)/(5*(b/x)^(3/2))

Maple [A] time = 0.003, size = 11, normalized size = 0.6

$$\frac{2\,x}{5}\left(\frac{b}{x}\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b/x)^(3/2),x)

[Out] 2/5*x/(b/x)^(3/2)
```

Maxima [A] time = 1.45064, size = 14, normalized size = 0.74

$$\frac{2\,x}{5\,\left(\frac{b}{x}\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x)^(-3/2),x, algorithm="maxima")

[Out] 2/5*x/(b/x)^(3/2)
```

Fricas [A] time = 0.22845, size = 20, normalized size = 1.05

$$\frac{2\,x^2}{5\,b\sqrt{\frac{b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x)^(-3/2),x, algorithm="fricas")

[Out] 2/5*x^2/(b*sqrt(b/x))
```

Sympy [A] time = 1.85114, size = 15, normalized size = 0.79

$$\frac{2x}{5b^{\frac{3}{2}}\left(\frac{1}{x}\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b/x)**(3/2),x)

[Out] 2*x/(5*b**(3/2)*(1/x)**(3/2))
```

GIAC/XCAS [A] time = 0.235003, size = 20, normalized size = 1.05

$$\frac{2\,x^2}{5\,b\sqrt{\frac{b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x)^(-3/2),x, algorithm="giac")

[Out] 2/5*x^2/(b*sqrt(b/x))
```

3.99 $\int \frac{1}{\left(\frac{b}{x^2}\right)^{3/2}} \, dx$

Optimal. Leaf size=19

$$\frac{x^3}{4b\sqrt{\frac{b}{x^2}}}$$

```
[Out] x^3/(4*b*Sqrt[b/x^2])
```

Rubi [A] time = 0.00855059, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{x^3}{4b\sqrt{\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In]  Int[(b/x^2)^(-3/2),x]
```

```
[Out] x^3/(4*b*Sqrt[b/x^2])
```

Rubi in Sympy [A] time = 1.55625, size = 15, normalized size = 0.79

$$\frac{x^5\sqrt{\frac{b}{x^2}}}{4b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b/x**2)**(3/2),x)
```

```
[Out] x**5*sqrt(b/x**2)/(4*b**2)
```

Mathematica [A] time = 0.00366509, size = 14, normalized size = 0.74

$$\frac{x}{4\left(\frac{b}{x^2}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b/x^2)^(-3/2),x]
```

```
[Out] x/(4*(b/x^2)^(3/2))
```

Maple [A] time = 0.003, size = 11, normalized size = 0.6

$$\frac{x}{4}\left(\frac{b}{x^2}\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/(b/x^2)^(3/2),x)

[Out] 1/4*x/(b/x^2)^(3/2)
```

Maxima [A] time = 1.52109, size = 14, normalized size = 0.74

$$\frac{x}{4\left(\frac{b}{x^2}\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b/x^2)^(-3/2),x, algorithm="maxima")

[Out] 1/4*x/(b/x^2)^(3/2)
```

Fricas [A] time = 0.222122, size = 20, normalized size = 1.05

$$\frac{x^5\sqrt{\frac{b}{x^2}}}{4\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b/x^2)^(-3/2),x, algorithm="fricas")

[Out] 1/4*x^5*sqrt(b/x^2)/b^2
```

Sympy [A] time = 1.88348, size = 15, normalized size = 0.79

$$\frac{x}{4b^{\frac{3}{2}}\left(\frac{1}{x^2}\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(b/x**2)**(3/2),x)

[Out] x/(4*b**(3/2)*(x**(-2))**(3/2))
```

GIAC/XCAS [A] time = 0.222346, size = 11, normalized size = 0.58

$$\frac{x^4}{4\,b^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b/x^2)^(-3/2),x, algorithm="giac")

[Out] 1/4*x^4/b^(3/2)
```

3.100 $\int \frac{1}{\left(\frac{b}{x^3}\right)^{3/2}} \, dx$

Optimal. Leaf size=19

$$\frac{2x^4}{11b\sqrt{\frac{b}{x^3}}}$$

```
[Out] (2*x^4)/(11*b*Sqrt[b/x^3])
```

Rubi [A] time = 0.00925679, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{2x^4}{11b\sqrt{\frac{b}{x^3}}}$$

Antiderivative was successfully verified.

```
[In]  Int[(b/x^3)^(-3/2),x]

[Out] (2*x^4)/(11*b*Sqrt[b/x^3])
```

Rubi in Sympy [A] time = 1.59001, size = 17, normalized size = 0.89

$$\frac{2x^7\sqrt{\frac{b}{x^3}}}{11b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b/x**3)**(3/2),x)

[Out] 2*x**7*sqrt(b/x**3)/(11*b**2)
```

Mathematica [A] time = 0.00371564, size = 14, normalized size = 0.74

$$\frac{2x}{11\left(\frac{b}{x^3}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b/x^3)^(-3/2),x]

[Out] (2*x)/(11*(b/x^3)^(3/2))
```

Maple [A] time = 0.003, size = 11, normalized size = 0.6

$$\frac{2\,x}{11}\left(\frac{b}{x^3}\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b/x^3)^(3/2),x)

[Out] 2/11*x/(b/x^3)^(3/2)
```

Maxima [A] time = 1.44128, size = 14, normalized size = 0.74

$$\frac{2\,x}{11\,\left(\frac{b}{x^3}\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^3)^(-3/2),x, algorithm="maxima")

[Out] 2/11*x/(b/x^3)^(3/2)
```

Fricas [A] time = 0.221238, size = 20, normalized size = 1.05

$$\frac{2\,x^7\sqrt{\frac{b}{x^3}}}{11\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^3)^(-3/2),x, algorithm="fricas")

[Out] 2/11*x^7*sqrt(b/x^3)/b^2
```

Sympy [A] time = 1.88407, size = 17, normalized size = 0.89

$$\frac{2x}{11b^{\frac{3}{2}}\left(\frac{1}{x^3}\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b/x**3)**(3/2),x)

[Out] 2*x/(11*b**(3/2)*(x**(-3))**(3/2))
```

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

$$\int \frac{1}{\left(\frac{b}{x^3}\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^3)^(-3/2),x, algorithm="giac")

[Out] integrate((b/x^3)^(-3/2), x)
```

3.101 $\int \sqrt[3]{bx^n}\,dx$

Optimal. Leaf size=17

$$\frac{3x\sqrt[3]{bx^n}}{n+3}$$

```
[Out] (3*x*(b*x^n)^(1/3))/(3 + n)
```

Rubi [A] time = 0.014436, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$

$$\frac{3x\sqrt[3]{bx^n}}{n+3}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^n)^(1/3),x]
```

```
[Out] (3*x*(b*x^n)^(1/3))/(3 + n)
```

Rubi in Sympy [A] time = 2.07228, size = 24, normalized size = 1.41

$$\frac{3x^{-\frac{n}{3}}x^{\frac{n}{3}+1}\sqrt[3]{bx^n}}{n+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**n)**(1/3),x)
```

```
[Out] 3*x**(-n/3)*x**(n/3 + 1)*(b*x**n)**(1/3)/(n + 3)
```

Mathematica [A] time = 0.00467975, size = 17, normalized size = 1.

$$\frac{3x\sqrt[3]{bx^n}}{n+3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^n)^(1/3),x]
```

```
[Out] (3*x*(b*x^n)^(1/3))/(3 + n)
```

Maple [A] time = 0.002, size = 16, normalized size = 0.9

$$3\,\frac{x\sqrt[3]{bx^n}}{3+n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^n)^(1/3),x)
```

```
[Out] 3*x*(b*x^n)^(1/3)/(3+n)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(1/3),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(1/3),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**n)**(1/3),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [A] time = 0.227159, size = 23, normalized size = 1.35

$$\frac{3\,b^{\frac{1}{3}}xe^{\left(\frac{1}{3}\,n\ln(x)\right)}}{n+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(1/3),x, algorithm="giac")

[Out] 3*b^(1/3)*x*e^(1/3*n*ln(x))/(n + 3)
```

3.102 $\int \sqrt[3]{bx^3}\,dx$

Optimal. Leaf size=14

$$\frac{1}{2}x\sqrt[3]{bx^3}$$

```
[Out] (x*(b*x^3)^(1/3))/2
```

Rubi [A] time = 0.00681788, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$

$$\frac{1}{2}x\sqrt[3]{bx^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^3)^(1/3),x]

[Out] (x*(b*x^3)^(1/3))/2
```

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

$$\frac{\sqrt[3]{bx^3}\int x\,dx}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3)**(1/3),x)

[Out] (b*x**3)**(1/3)*Integral(x, x)/x
```

Mathematica [A] time = 0.00215541, size = 14, normalized size = 1.

$$\frac{1}{2}x\sqrt[3]{bx^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^3)^(1/3),x]

[Out] (x*(b*x^3)^(1/3))/2
```

Maple [A] time = 0.002, size = 11, normalized size = 0.8

$$\frac{x}{2}\sqrt[3]{bx^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3)^(1/3),x)

[Out] 1/2*x*(b*x^3)^(1/3)
```

Maxima [A] time = 1.44048, size = 14, normalized size = 1.

$$\frac{1}{2} \left(bx^3\right)^{\frac{1}{3}} x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3)^(1/3),x, algorithm="maxima")
```

```
[Out] 1/2*(b*x^3)^(1/3)*x
```

Fricas [A] time = 0.212435, size = 14, normalized size = 1.

$$\frac{1}{2} \left(bx^3\right)^{\frac{1}{3}} x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3)^(1/3),x, algorithm="fricas")
```

```
[Out] 1/2*(b*x^3)^(1/3)*x
```

Sympy [A] time = 0.491524, size = 14, normalized size = 1.

$$\frac{\sqrt[3]{b}x\sqrt[3]{x^3}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3)**(1/3),x)
```

```
[Out] b**(1/3)*x*(x**3)**(1/3)/2
```

GIAC/XCAS [A] time = 0.232182, size = 11, normalized size = 0.79

$$\frac{1}{2} b^{\frac{1}{3}} x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3)^(1/3),x, algorithm="giac")
```

```
[Out] 1/2*b^(1/3)*x^2
```

3.103 $\int \sqrt[3]{bx^2}\,dx$

Optimal. Leaf size=14

$$\frac{3}{5}x\sqrt[3]{bx^2}$$

```
[Out] (3*x*(b*x^2)^(1/3))/5
```

Rubi [A] time = 0.00720474, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{3}{5}x\sqrt[3]{bx^2}$$

Antiderivative was successfully verified.

```
[In] Int[(b*x^2)^(1/3),x]
```

```
[Out] (3*x*(b*x^2)^(1/3))/5
```

Rubi in Sympy [A] time = 1.22868, size = 12, normalized size = 0.86

$$\frac{3x\sqrt[3]{bx^2}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**2)**(1/3),x)
```

```
[Out] 3*x*(b*x**2)**(1/3)/5
```

Mathematica [A] time = 0.00205365, size = 14, normalized size = 1.

$$\frac{3}{5}x\sqrt[3]{bx^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(b*x^2)^(1/3),x]
```

```
[Out] (3*x*(b*x^2)^(1/3))/5
```

Maple [A] time = 0.002, size = 11, normalized size = 0.8

$$\frac{3\,x}{5}\sqrt[3]{bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x^2)^(1/3),x)
```

```
[Out] 3/5*x*(b*x^2)^(1/3)
```

Maxima [A] time = 1.44057, size = 14, normalized size = 1.

$$\frac{3}{5}\,\left(bx^2\right)^{\frac{1}{3}}\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(1/3),x, algorithm="maxima")
```

```
[Out] 3/5*(b*x^2)^(1/3)*x
```

Fricas [A] time = 0.222534, size = 18, normalized size = 1.29

$$\frac{3\,bx^3}{5\,\left(bx^2\right)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(1/3),x, algorithm="fricas")
```

```
[Out] 3/5*b*x^3/(b*x^2)^(2/3)
```

Sympy [A] time = 0.493636, size = 15, normalized size = 1.07

$$\frac{3\sqrt[3]{b}x\sqrt[3]{x^2}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**2)**(1/3),x)
```

```
[Out] 3*b**(1/3)*x*(x**2)**(1/3)/5
```

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

$$\int \left(bx^2\right)^{\frac{1}{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(1/3),x, algorithm="giac")
```

```
[Out] integrate((b*x^2)^(1/3), x)
```

3.104 $\int \sqrt[3]{bx}\,dx$

Optimal. Leaf size=14

$$\frac{3(bx)^{4/3}}{4b}$$

```
[Out] (3*(b*x)^(4/3))/(4*b)
```

Rubi [A] time = 0.00702459, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$\frac{3(bx)^{4/3}}{4b}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x)^(1/3),x]

[Out] (3*(b*x)^(4/3))/(4*b)
```

Rubi in Sympy [A] time = 1.33672, size = 10, normalized size = 0.71

$$\frac{3\,(bx)^{\frac{4}{3}}}{4b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x)**(1/3),x)

[Out] 3*(b*x)**(4/3)/(4*b)
```

Mathematica [A] time = 0.00168791, size = 12, normalized size = 0.86

$$\frac{3}{4}x\sqrt[3]{bx}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x)^(1/3),x]

[Out] (3*x*(b*x)^(1/3))/4
```

Maple [A] time = 0.003, size = 9, normalized size = 0.6

$$\frac{3\,x}{4}\sqrt[3]{bx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x)^(1/3),x)

[Out] 3/4*x*(b*x)^(1/3)
```

Maxima [A] time = 1.43427, size = 14, normalized size = 1.

$$\frac{3\,(bx)^{\frac{4}{3}}}{4\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x)^(1/3),x, algorithm="maxima")

[Out] 3/4*(b*x)^(4/3)/b
```

Fricas [A] time = 0.216398, size = 11, normalized size = 0.79

$$\frac{3}{4}\,(bx)^{\frac{1}{3}}\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x)^(1/3),x, algorithm="fricas")

[Out] 3/4*(b*x)^(1/3)*x
```

Sympy [A] time = 0.063848, size = 10, normalized size = 0.71

$$\frac{3\,(bx)^{\frac{4}{3}}}{4b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x)**(1/3),x)

[Out] 3*(b*x)**(4/3)/(4*b)
```

GIAC/XCAS [A] time = 0.249309, size = 11, normalized size = 0.79

$$\frac{3}{4}\,(bx)^{\frac{1}{3}}\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x)^(1/3),x, algorithm="giac")

[Out] 3/4*(b*x)^(1/3)*x
```

3.105 $\int \sqrt[3]{\frac{b}{x}}\,dx$

Optimal. Leaf size=14

$$\frac{3}{2}x\sqrt[3]{\frac{b}{x}}$$

```
[Out] (3*(b/x)^(1/3)*x)/2
```

Rubi [A] time = 0.00703803, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{3}{2}x\sqrt[3]{\frac{b}{x}}$$

Antiderivative was successfully verified.

```
[In]  Int[(b/x)^(1/3),x]

[Out] (3*(b/x)^(1/3)*x)/2
```

Rubi in Sympy [A] time = 1.20638, size = 10, normalized size = 0.71

$$\frac{3x\sqrt[3]{\frac{b}{x}}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b/x)**(1/3),x)

[Out] 3*x*(b/x)**(1/3)/2
```

Mathematica [A] time = 0.002181, size = 14, normalized size = 1.

$$\frac{3}{2}x\sqrt[3]{\frac{b}{x}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b/x)^(1/3),x]

[Out] (3*(b/x)^(1/3)*x)/2
```

Maple [A] time = 0.003, size = 11, normalized size = 0.8

$$\frac{3x}{2}\sqrt[3]{\frac{b}{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b/x)^(1/3),x)
```

```
[Out] 3/2*(b/x)^(1/3)*x
```

Maxima [A] time = 1.44106, size = 14, normalized size = 1.

$$\frac{3}{2}\,x\left(\frac{b}{x}\right)^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x)^(1/3),x, algorithm="maxima")
```

```
[Out] 3/2*x*(b/x)^(1/3)
```

Fricas [A] time = 0.21905, size = 14, normalized size = 1.

$$\frac{3\,b}{2\,\left(\frac{b}{x}\right)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x)^(1/3),x, algorithm="fricas")
```

```
[Out] 3/2*b/(b/x)^(2/3)
```

Sympy [A] time = 0.475068, size = 15, normalized size = 1.07

$$\frac{3\sqrt[3]{b}x\sqrt[3]{\frac{1}{x}}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x)**(1/3),x)
```

```
[Out] 3*b**(1/3)*x*(1/x)**(1/3)/2
```

GIAC/XCAS [A] time = 0.23422, size = 14, normalized size = 1.

$$\frac{3\,b}{2\,\left(\frac{b}{x}\right)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x)^(1/3),x, algorithm="giac")
```

```
[Out] 3/2*b/(b/x)^(2/3)
```

3.106 $\int \sqrt[3]{\frac{b}{x^2}}\,dx$

Optimal. Leaf size=12

$$3x\sqrt[3]{\frac{b}{x^2}}$$

```
[Out] 3*(b/x^2)^(1/3)*x
```

Rubi [A] time = 0.00693723, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$3x\sqrt[3]{\frac{b}{x^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(b/x^2)^(1/3),x]

[Out] 3*(b/x^2)^(1/3)*x
```

Rubi in Sympy [A] time = 1.20164, size = 10, normalized size = 0.83

$$3x\sqrt[3]{\frac{b}{x^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b/x**2)**(1/3),x)

[Out] 3*x*(b/x**2)**(1/3)
```

Mathematica [A] time = 0.00208693, size = 12, normalized size = 1.

$$3x\sqrt[3]{\frac{b}{x^2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b/x^2)^(1/3),x]

[Out] 3*(b/x^2)^(1/3)*x
```

Maple [A] time = 0.003, size = 11, normalized size = 0.9

$$3\sqrt[3]{\frac{b}{x^2}}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b/x^2)^(1/3),x)
```

```
[Out] 3*(b/x^2)^(1/3)*x
```

Maxima [A] time = 1.43522, size = 14, normalized size = 1.17

$$3x\left(\frac{b}{x^2}\right)^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^2)^(1/3),x, algorithm="maxima")
```

```
[Out] 3*x*(b/x^2)^(1/3)
```

Fricas [A] time = 0.24498, size = 14, normalized size = 1.17

$$3x\left(\frac{b}{x^2}\right)^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^2)^(1/3),x, algorithm="fricas")
```

```
[Out] 3*x*(b/x^2)^(1/3)
```

Sympy [A] time = 1.3171, size = 15, normalized size = 1.25

$$3\sqrt[3]{b}x\sqrt[3]{\frac{1}{x^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x**2)**(1/3),x)
```

```
[Out] 3*b**(1/3)*x*(x**(-2))**(1/3)
```

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

$$\int \left(\frac{b}{x^2}\right)^{\frac{1}{3}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^2)^(1/3),x, algorithm="giac")
```

```
[Out] integrate((b/x^2)^(1/3), x)
```

3.107 $\int \sqrt[3]{\frac{b}{x^3}}\,dx$

Optimal. Leaf size=13

$$x\sqrt[3]{\frac{b}{x^3}}\log(x)$$

```
[Out] (b/x^3)^(1/3)*x*Log[x]
```

Rubi [A] time = 0.00884017, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$x\sqrt[3]{\frac{b}{x^3}}\log(x)$$

Antiderivative was successfully verified.

```
[In]  Int[(b/x^3)^(1/3),x]

[Out] (b/x^3)^(1/3)*x*Log[x]
```

Rubi in Sympy [A] time = 1.17914, size = 12, normalized size = 0.92

$$x\sqrt[3]{\frac{b}{x^3}}\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b/x**3)**(1/3),x)

[Out] x*(b/x**3)**(1/3)*log(x)
```

Mathematica [A] time = 0.00202677, size = 13, normalized size = 1.

$$x\sqrt[3]{\frac{b}{x^3}}\log(x)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b/x^3)^(1/3),x]

[Out] (b/x^3)^(1/3)*x*Log[x]
```

Maple [A] time = 0.017, size = 12, normalized size = 0.9

$$\sqrt[3]{\frac{b}{x^3}}x\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b/x^3)^(1/3),x)
```

```
[Out] (b/x^3)^(1/3)*x*ln(x)
```

Maxima [A] time = 1.43394, size = 15, normalized size = 1.15

$$x\left(\frac{b}{x^3}\right)^{\frac{1}{3}}\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^3)^(1/3),x, algorithm="maxima")
```

```
[Out] x*(b/x^3)^(1/3)*log(x)
```

Fricas [A] time = 0.22838, size = 15, normalized size = 1.15

$$x\left(\frac{b}{x^3}\right)^{\frac{1}{3}}\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^3)^(1/3),x, algorithm="fricas")
```

```
[Out] x*(b/x^3)^(1/3)*log(x)
```

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

$$\int\sqrt[3]{\frac{b}{x^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x**3)**(1/3),x)
```

```
[Out] Integral((b/x**3)**(1/3), x)
```

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

$$\int\left(\frac{b}{x^3}\right)^{\frac{1}{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^3)^(1/3),x, algorithm="giac")
```

```
[Out] integrate((b/x^3)^(1/3), x)
```

3.108 $\int \sqrt[3]{\frac{b}{x^4}}\,dx$

Optimal. Leaf size=12

$$-3x\sqrt[3]{\frac{b}{x^4}}$$

```
[Out] -3*(b/x^4)^(1/3)*x
```

Rubi [A] time = 0.00681372, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$

$$-3x\sqrt[3]{\frac{b}{x^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[(b/x^4)^(1/3),x]
```

```
[Out] -3*(b/x^4)^(1/3)*x
```

Rubi in Sympy [A] time = 1.22732, size = 12, normalized size = 1.

$$-3x\sqrt[3]{\frac{b}{x^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b/x**4)**(1/3),x)
```

```
[Out] -3*x*(b/x**4)**(1/3)
```

Mathematica [A] time = 0.00234708, size = 12, normalized size = 1.

$$-3x\sqrt[3]{\frac{b}{x^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b/x^4)^(1/3),x]
```

```
[Out] -3*(b/x^4)^(1/3)*x
```

Maple [A] time = 0.003, size = 11, normalized size = 0.9

$$-3\sqrt[3]{\frac{b}{x^4}}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b/x^4)^(1/3),x)
```

```
[Out] -3*(b/x^4)^(1/3)*x
```

Maxima [A] time = 1.43381, size = 14, normalized size = 1.17

$$-3\,x\left(\frac{b}{x^4}\right)^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^4)^(1/3),x, algorithm="maxima")
```

```
[Out] -3*x*(b/x^4)^(1/3)
```

Fricas [A] time = 0.223739, size = 14, normalized size = 1.17

$$-3\,x\left(\frac{b}{x^4}\right)^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^4)^(1/3),x, algorithm="fricas")
```

```
[Out] -3*x*(b/x^4)^(1/3)
```

Sympy [A] time = 1.40561, size = 17, normalized size = 1.42

$$-3\sqrt[3]{b}x\sqrt[3]{\frac{1}{x^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x**4)**(1/3),x)
```

```
[Out] -3*b**(1/3)*x*(x**(-4))**(1/3)
```

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

$$\int\left(\frac{b}{x^4}\right)^{\frac{1}{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^4)^(1/3),x, algorithm="giac")
```

```
[Out] integrate((b/x^4)^(1/3), x)
```

3.109 $\int (bx^n)^{2/3}\,dx$

Optimal. Leaf size=19

$$\frac{3x\,(bx^n)^{2/3}}{2n+3}$$

```
[Out] (3*x*(b*x^n)^(2/3))/(3 + 2*n)
```

Rubi [A] time = 0.0150834, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$

$$\frac{3x\,(bx^n)^{2/3}}{2n+3}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^n)^(2/3),x]

[Out] (3*x*(b*x^n)^(2/3))/(3 + 2*n)
```

Rubi in Sympy [A] time = 2.25012, size = 29, normalized size = 1.53

$$\frac{3x^{-\frac{2n}{3}}x^{\frac{2n}{3}+1}\,(bx^n)^{\frac{2}{3}}}{2n+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**n)**(2/3),x)

[Out] 3*x**(-2*n/3)*x**(2*n/3 + 1)*(b*x**n)**(2/3)/(2*n + 3)
```

Mathematica [A] time = 0.00462759, size = 20, normalized size = 1.05

$$\frac{x\,(bx^n)^{2/3}}{\frac{2n}{3}+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^n)^(2/3),x]

[Out] (x*(b*x^n)^(2/3))/(1 + (2*n)/3)
```

Maple [A] time = 0.002, size = 18, normalized size = 1.

$$3\,\frac{x\,(bx^n)^{2/3}}{3+2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^n)^(2/3),x)

[Out] 3*x*(b*x^n)^(2/3)/(3+2*n)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(2/3),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(2/3),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**n)**(2/3),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [A] time = 0.247843, size = 26, normalized size = 1.37

$$\frac{3\, b^{\frac{2}{3}} x e^{\left(\frac{2}{3}\, n \ln\left(x\right)\right)}}{2\, n + 3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(2/3),x, algorithm="giac")

[Out] 3*b^(2/3)*x*e^(2/3*n*ln(x))/(2*n + 3)
```

3.110 $\int \left(bx^2\right)^{2/3}\,dx$

Optimal. Leaf size=14

$$\frac{3}{7}x\left(bx^2\right)^{2/3}$$

```
[Out] (3*x*(b*x^2)^(2/3))/7
```

Rubi [A] time = 0.00718682, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{3}{7}x\left(bx^2\right)^{2/3}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^2)^(2/3),x]
```

```
[Out] (3*x*(b*x^2)^(2/3))/7
```

Rubi in Sympy [A] time = 1.26672, size = 12, normalized size = 0.86

$$\frac{3x\left(bx^2\right)^{\frac{2}{3}}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**2)**(2/3),x)
```

```
[Out] 3*x*(b*x**2)**(2/3)/7
```

Mathematica [A] time = 0.00208693, size = 14, normalized size = 1.

$$\frac{3}{7}x\left(bx^2\right)^{2/3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^2)^(2/3),x]
```

```
[Out] (3*x*(b*x^2)^(2/3))/7
```

Maple [A] time = 0.002, size = 11, normalized size = 0.8

$$\frac{3\,x}{7}\left(bx^2\right)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^2)^(2/3),x)
```

```
[Out] 3/7*x*(b*x^2)^(2/3)
```

Maxima [A] time = 1.43286, size = 14, normalized size = 1.

$$\frac{3}{7}\left(bx^2\right)^{\frac{2}{3}}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(2/3),x, algorithm="maxima")
```

```
[Out] 3/7*(b*x^2)^(2/3)*x
```

Fricas [A] time = 0.218329, size = 18, normalized size = 1.29

$$\frac{3\,bx^3}{7\,(bx^2)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(2/3),x, algorithm="fricas")
```

```
[Out] 3/7*b*x^3/(b*x^2)^(1/3)
```

Sympy [A] time = 0.85381, size = 15, normalized size = 1.07

$$\frac{3b^{\frac{2}{3}}x\left(x^2\right)^{\frac{2}{3}}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**2)**(2/3),x)
```

```
[Out] 3*b**(2/3)*x*(x**2)**(2/3)/7
```

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

$$\int\left(bx^2\right)^{\frac{2}{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(2/3),x, algorithm="giac")
```

```
[Out] integrate((b*x^2)^(2/3), x)
```

3.111 $\int (bx)^{2/3} \, dx$

Optimal. Leaf size=14

$$\frac{3(bx)^{5/3}}{5b}$$

```
[Out] (3*(b*x)^(5/3))/(5*b)
```

Rubi [A] time = 0.0067686, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$\frac{3(bx)^{5/3}}{5b}$$

Antiderivative was successfully verified.

```
[In] Int[(b*x)^(2/3),x]

[Out] (3*(b*x)^(5/3))/(5*b)
```

Rubi in Sympy [A] time = 1.3932, size = 10, normalized size = 0.71

$$\frac{3\,(bx)^{\frac{5}{3}}}{5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x)**(2/3),x)

[Out] 3*(b*x)**(5/3)/(5*b)
```

Mathematica [A] time = 0.00172695, size = 12, normalized size = 0.86

$$\frac{3}{5}x(bx)^{2/3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(b*x)^(2/3),x]

[Out] (3*x*(b*x)^(2/3))/5
```

Maple [A] time = 0.004, size = 9, normalized size = 0.6

$$\frac{3\,x}{5}\,(bx)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x)^(2/3),x)

[Out] 3/5*x*(b*x)^(2/3)
```

Maxima [A] time = 1.44325, size = 14, normalized size = 1.

$$\frac{3\,(bx)^{\frac{5}{3}}}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x)^(2/3),x, algorithm="maxima")
```

```
[Out] 3/5*(b*x)^(5/3)/b
```

Fricas [A] time = 0.216908, size = 11, normalized size = 0.79

$$\frac{3}{5}\,(bx)^{\frac{2}{3}}\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x)^(2/3),x, algorithm="fricas")
```

```
[Out] 3/5*(b*x)^(2/3)*x
```

Sympy [A] time = 0.071018, size = 10, normalized size = 0.71

$$\frac{3\,(bx)^{\frac{5}{3}}}{5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x)**(2/3),x)
```

```
[Out] 3*(b*x)**(5/3)/(5*b)
```

GIAC/XCAS [A] time = 0.233713, size = 11, normalized size = 0.79

$$\frac{3}{5}\,(bx)^{\frac{2}{3}}\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x)^(2/3),x, algorithm="giac")
```

```
[Out] 3/5*(b*x)^(2/3)*x
```

3.112 $\int \left(\frac{b}{x}\right)^{2/3} dx$

Optimal. Leaf size=12

$$3x\left(\frac{b}{x}\right)^{2/3}$$

```
[Out] 3*(b/x)^(2/3)*x
```

Rubi [A] time = 0.0071097, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$3x\left(\frac{b}{x}\right)^{2/3}$$

Antiderivative was successfully verified.

```
[In] Int[(b/x)^(2/3),x]

[Out] 3*(b/x)^(2/3)*x
```

Rubi in Sympy [A] time = 1.24779, size = 8, normalized size = 0.67

$$3x\left(\frac{b}{x}\right)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b/x)**(2/3),x)

[Out] 3*x*(b/x)**(2/3)
```

Mathematica [A] time = 0.00213525, size = 12, normalized size = 1.

$$3x\left(\frac{b}{x}\right)^{2/3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(b/x)^(2/3),x]

[Out] 3*(b/x)^(2/3)*x
```

Maple [A] time = 0.003, size = 11, normalized size = 0.9

$$3\left(\frac{b}{x}\right)^{2/3}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b/x)^(2/3),x)
```

```
[Out] 3*(b/x)^(2/3)*x
```

Maxima [A] time = 1.44371, size = 14, normalized size = 1.17

$$3x\left(\frac{b}{x}\right)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x)^(2/3),x, algorithm="maxima")

[Out] 3*x*(b/x)^(2/3)
```

Fricas [A] time = 0.21562, size = 14, normalized size = 1.17

$$\frac{3b}{\left(\frac{b}{x}\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x)^(2/3),x, algorithm="fricas")

[Out] 3*b/(b/x)^(1/3)
```

Sympy [A] time = 0.93577, size = 14, normalized size = 1.17

$$3b^{\frac{2}{3}}x\left(\frac{1}{x}\right)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x)**(2/3),x)

[Out] 3*b**(2/3)*x*(1/x)**(2/3)
```

GIAC/XCAS [A] time = 0.247711, size = 14, normalized size = 1.17

$$\frac{3b}{\left(\frac{b}{x}\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x)^(2/3),x, algorithm="giac")

[Out] 3*b/(b/x)^(1/3)
```

3.113 $\int \left(\frac{b}{x^2}\right)^{2/3} dx$

Optimal. Leaf size=12

$$-3x\left(\frac{b}{x^2}\right)^{2/3}$$

```
[Out] -3*(b/x^2)^(2/3)*x
```

Rubi [A] time = 0.00705723, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$-3x\left(\frac{b}{x^2}\right)^{2/3}$$

Antiderivative was successfully verified.

```
[In]  Int[(b/x^2)^(2/3),x]
```

```
[Out] -3*(b/x^2)^(2/3)*x
```

Rubi in Sympy [A] time = 1.27232, size = 12, normalized size = 1.

$$-3x\left(\frac{b}{x^2}\right)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b/x**2)**(2/3),x)
```

```
[Out] -3*x*(b/x**2)**(2/3)
```

Mathematica [A] time = 0.00251667, size = 12, normalized size = 1.

$$-3x\left(\frac{b}{x^2}\right)^{2/3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b/x^2)^(2/3),x]
```

```
[Out] -3*(b/x^2)^(2/3)*x
```

Maple [A] time = 0.003, size = 11, normalized size = 0.9

$$-3\left(\frac{b}{x^2}\right)^{2/3}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b/x^2)^(2/3),x)
```

```
[Out] -3*(b/x^2)^(2/3)*x
```

Maxima [A] time = 1.43588, size = 14, normalized size = 1.17

$$-3\,x\left(\frac{b}{x^2}\right)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b/x^2)^(2/3),x, algorithm="maxima")
```

```
[Out] -3*x*(b/x^2)^(2/3)
```

Fricas [A] time = 0.24798, size = 18, normalized size = 1.5

$$-\frac{3\,b}{x\left(\frac{b}{x^2}\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b/x^2)^(2/3),x, algorithm="fricas")
```

```
[Out] -3*b/(x*(b/x^2)^(1/3))
```

Sympy [A] time = 1.69643, size = 17, normalized size = 1.42

$$-3b^{\frac{2}{3}}x\left(\frac{1}{x^2}\right)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b/x**2)**(2/3),x)
```

```
[Out] -3*b**(2/3)*x*(x**(-2))**(2/3)
```

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

$$\int\left(\frac{b}{x^2}\right)^{\frac{2}{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b/x^2)^(2/3),x, algorithm="giac")
```

```
[Out] integrate((b/x^2)^(2/3), x)
```

3.114 $\int \left(\frac{b}{x^3}\right)^{2/3} dx$

Optimal. Leaf size=12

$$x\left(-\left(\frac{b}{x^3}\right)^{2/3}\right)$$

```
[Out] -((b/x^3)^(2/3)*x)
```

Rubi [A] time = 0.00688379, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$x\left(-\left(\frac{b}{x^3}\right)^{2/3}\right)$$

Antiderivative was successfully verified.

```
[In] Int[(b/x^3)^(2/3),x]
```

```
[Out] -((b/x^3)^(2/3)*x)
```

Rubi in Sympy [A] time = 1.2107, size = 10, normalized size = 0.83

$$-x\left(\frac{b}{x^3}\right)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b/x**3)**(2/3),x)
```

```
[Out] -x*(b/x**3)**(2/3)
```

Mathematica [A] time = 0.00209269, size = 12, normalized size = 1.

$$x\left(-\left(\frac{b}{x^3}\right)^{2/3}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(b/x^3)^(2/3),x]
```

```
[Out] -((b/x^3)^(2/3)*x)
```

Maple [A] time = 0.003, size = 11, normalized size = 0.9

$$-\left(\frac{b}{x^3}\right)^{\frac{2}{3}} x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b/x^3)^(2/3),x)
```

```
[Out] -(b/x^3)^(2/3)*x
```

Maxima [A] time = 1.44037, size = 14, normalized size = 1.17

$$-x\left(\frac{b}{x^3}\right)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^3)^(2/3),x, algorithm="maxima")
```

```
[Out] -x*(b/x^3)^(2/3)
```

Fricas [A] time = 0.212811, size = 14, normalized size = 1.17

$$-x\left(\frac{b}{x^3}\right)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^3)^(2/3),x, algorithm="fricas")
```

```
[Out] -x*(b/x^3)^(2/3)
```

Sympy [A] time = 1.69691, size = 15, normalized size = 1.25

$$-b^{\frac{2}{3}}x\left(\frac{1}{x^3}\right)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x**3)**(2/3),x)
```

```
[Out] -b**(2/3)*x*(x**(-3))**(2/3)
```

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

$$\int\left(\frac{b}{x^3}\right)^{\frac{2}{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^3)^(2/3),x, algorithm="giac")
```

```
[Out] integrate((b/x^3)^(2/3), x)
```

3.115 $\int \left(\frac{b}{x^4}\right)^{2/3} dx$

Optimal. Leaf size=14

$$-\frac{3}{5}x\left(\frac{b}{x^4}\right)^{2/3}$$

```
[Out] (-3*(b/x^4)^(2/3)*x)/5
```

Rubi [A] time = 0.00728345, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$-\frac{3}{5}x\left(\frac{b}{x^4}\right)^{2/3}$$

Antiderivative was successfully verified.

```
[In]  Int[(b/x^4)^(2/3),x]

[Out] (-3*(b/x^4)^(2/3)*x)/5
```

Rubi in Sympy [A] time = 1.25607, size = 14, normalized size = 1.

$$-\frac{3x\left(\frac{b}{x^4}\right)^{\frac{2}{3}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b/x**4)**(2/3),x)

[Out] -3*x*(b/x**4)**(2/3)/5
```

Mathematica [A] time = 0.00203797, size = 14, normalized size = 1.

$$-\frac{3}{5}x\left(\frac{b}{x^4}\right)^{2/3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b/x^4)^(2/3),x]

[Out] (-3*(b/x^4)^(2/3)*x)/5
```

Maple [A] time = 0.003, size = 11, normalized size = 0.8

$$-\frac{3\,x}{5}\left(\frac{b}{x^4}\right)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b/x^4)^(2/3),x)
```

```
[Out] -3/5*(b/x^4)^(2/3)*x
```

Maxima [A] time = 1.43787, size = 14, normalized size = 1.

$$-\frac{3}{5}x\left(\frac{b}{x^4}\right)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^4)^(2/3),x, algorithm="maxima")
```

```
[Out] -3/5*x*(b/x^4)^(2/3)
```

Fricas [A] time = 0.220657, size = 14, normalized size = 1.

$$-\frac{3}{5}x\left(\frac{b}{x^4}\right)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^4)^(2/3),x, algorithm="fricas")
```

```
[Out] -3/5*x*(b/x^4)^(2/3)
```

Sympy [A] time = 1.69174, size = 19, normalized size = 1.36

$$-\frac{3b^{\frac{2}{3}}x\left(\frac{1}{x^4}\right)^{\frac{2}{3}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x**4)**(2/3),x)
```

```
[Out] -3*b**(2/3)*x*(x**(-4))**(2/3)/5
```

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

$$\int\left(\frac{b}{x^4}\right)^{\frac{2}{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^4)^(2/3),x, algorithm="giac")
```

```
[Out] integrate((b/x^4)^(2/3), x)
```

3.116 $\int \frac{1}{\sqrt[3]{bx^n}} dx$

Optimal. Leaf size=19

$$\frac{3x}{(3-n)\sqrt[3]{bx^n}}$$

```
[Out] (3*x)/((3 - n)*(b*x^n)^(1/3))
```

Rubi [A] time = 0.0142028, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{3x}{(3-n)\sqrt[3]{bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^n)^(-1/3),x]
```

```
[Out] (3*x)/((3 - n)*(b*x^n)^(1/3))
```

Rubi in Sympy [A] time = 2.83268, size = 27, normalized size = 1.42

$$\frac{3x^{-\frac{2n}{3}}x^{-\frac{n}{3}+1}(bx^n)^{\frac{2}{3}}}{b(-n+3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**n)**(1/3),x)
```

```
[Out] 3*x**(-2*n/3)*x**(-n/3 + 1)*(b*x**n)**(2/3)/(b*(-n + 3))
```

Mathematica [A] time = 0.0082226, size = 17, normalized size = 0.89

$$-\frac{3x}{(n-3)\sqrt[3]{bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^n)^(-1/3),x]
```

```
[Out] (-3*x)/((-3 + n)*(b*x^n)^(1/3))
```

Maple [A] time = 0.002, size = 16, normalized size = 0.8

$$-3\frac{x}{(-3+n)\sqrt[3]{bx^n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^n)^(1/3),x)
```

```
[Out] -3*x/(-3+n)/(b*x^n)^(1/3)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(-1/3),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(-1/3),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**n)**(1/3),x)

[Out] Exception raised: TypeError
```

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

$$\int \frac{1}{(bx^n)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(-1/3),x, algorithm="giac")

[Out] integrate((b*x^n)^(-1/3), x)
```

3.117 $\int \frac{1}{\sqrt[3]{bx^4}}\,dx$

Optimal. Leaf size=12

$$-\frac{3x}{\sqrt[3]{bx^4}}$$

```
[Out] (-3*x)/(b*x^4)^(1/3)
```

Rubi [A] time = 0.00715354, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$-\frac{3x}{\sqrt[3]{bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^4)^(-1/3),x]
```

```
[Out] (-3*x)/(b*x^4)^(1/3)
```

Rubi in Sympy [A] time = 1.58078, size = 15, normalized size = 1.25

$$-\frac{3\left(bx^4\right)^{\frac{2}{3}}}{bx^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**4)**(1/3),x)
```

```
[Out] -3*(b*x**4)**(2/3)/(b*x**3)
```

Mathematica [A] time = 0.00360877, size = 12, normalized size = 1.

$$-\frac{3x}{\sqrt[3]{bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^4)^(-1/3),x]
```

```
[Out] (-3*x)/(b*x^4)^(1/3)
```

Maple [A] time = 0.001, size = 11, normalized size = 0.9

$$-3\,\frac{x}{\sqrt[3]{bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^4)^(1/3),x)
```

```
[Out] -3*x/(b*x^4)^(1/3)
```

Maxima [A] time = 1.44035, size = 14, normalized size = 1.17

$$-\frac{3\,x}{(bx^4)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4)^(-1/3),x, algorithm="maxima")
```

```
[Out] -3*x/(b*x^4)^(1/3)
```

Fricas [A] time = 0.21686, size = 20, normalized size = 1.67

$$-\frac{3\left(bx^4\right)^{\frac{2}{3}}}{bx^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4)^(-1/3),x, algorithm="fricas")
```

```
[Out] -3*(b*x^4)^(2/3)/(b*x^3)
```

Sympy [A] time = 1.52865, size = 15, normalized size = 1.25

$$-\frac{3x}{\sqrt[3]{b}\sqrt[3]{x^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**4)**(1/3),x)
```

```
[Out] -3*x/(b**(1/3)*(x**4)**(1/3))
```

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

$$\int \frac{1}{(bx^4)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4)^(-1/3),x, algorithm="giac")
```

```
[Out] integrate((b*x^4)^(-1/3), x)
```

3.118 $\int \frac{1}{\sqrt[3]{bx^3}}\,dx$

Optimal. Leaf size=13

$$\frac{x\log(x)}{\sqrt[3]{bx^3}}$$

[Out] (x*Log[x])/(b*x^3)^(1/3)

Rubi [A] time = 0.00639038, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{x\log(x)}{\sqrt[3]{bx^3}}$$

Antiderivative was successfully verified.

[In] Int[(b*x^3)^(-1/3),x]

[Out] (x*Log[x])/(b*x^3)^(1/3)

Rubi in Sympy [A] time = 1.55394, size = 15, normalized size = 1.15

$$\frac{(bx^3)^{\frac{2}{3}}\log(x)}{bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(1/(b*x**3)**(1/3),x)

[Out] (b*x**3)**(2/3)*log(x)/(b*x**2)

Mathematica [A] time = 0.00315503, size = 13, normalized size = 1.

$$\frac{x\log(x)}{\sqrt[3]{bx^3}}$$

Antiderivative was successfully verified.

[In] Integrate[(b*x^3)^(-1/3),x]

[Out] (x*Log[x])/(b*x^3)^(1/3)

Maple [A] time = 0.013, size = 12, normalized size = 0.9

$$x\ln(x)\frac{1}{\sqrt[3]{bx^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(b*x^3)^(1/3),x)

```
[Out] x*ln(x)/(b*x^3)^(1/3)
```

Maxima [A] time = 1.43088, size = 15, normalized size = 1.15

$$\frac{x\log(x)}{(bx^3)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3)^(-1/3),x, algorithm="maxima")
```

```
[Out] x*log(x)/(b*x^3)^(1/3)
```

Fricas [A] time = 0.226334, size = 22, normalized size = 1.69

$$\frac{(bx^3)^{\frac{2}{3}}\log(x)}{bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3)^(-1/3),x, algorithm="fricas")
```

```
[Out] (b*x^3)^(2/3)*log(x)/(b*x^2)
```

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

$$\int \frac{1}{\sqrt[3]{bx^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**3)**(1/3),x)
```

```
[Out] Integral((b*x**3)**(-1/3), x)
```

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

$$\int \frac{1}{(bx^3)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3)^(-1/3),x, algorithm="giac")
```

```
[Out] integrate((b*x^3)^(-1/3), x)
```

3.119 $\int \frac{1}{\sqrt[3]{bx^2}} \, dx$

Optimal. Leaf size=12

$$\frac{3x}{\sqrt[3]{bx^2}}$$

```
[Out] (3*x)/(b*x^2)^(1/3)
```

Rubi [A] time = 0.00692539, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{3x}{\sqrt[3]{bx^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^2)^(-1/3),x]

[Out] (3*x)/(b*x^2)^(1/3)
```

Rubi in Sympy [A] time = 1.57355, size = 12, normalized size = 1.

$$\frac{3\left(bx^2\right)^{\frac{2}{3}}}{bx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**2)**(1/3),x)

[Out] 3*(b*x**2)**(2/3)/(b*x)
```

Mathematica [A] time = 0.00214037, size = 12, normalized size = 1.

$$\frac{3x}{\sqrt[3]{bx^2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^2)^(-1/3),x]

[Out] (3*x)/(b*x^2)^(1/3)
```

Maple [A] time = 0.003, size = 11, normalized size = 0.9

$$3\,\frac{x}{\sqrt[3]{bx^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^2)^(1/3),x)

[Out] 3*x/(b*x^2)^(1/3)
```

Maxima [A] time = 1.44015, size = 14, normalized size = 1.17

$$\frac{3x}{(bx^2)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(-1/3),x, algorithm="maxima")
```

```
[Out] 3*x/(b*x^2)^(1/3)
```

Fricas [A] time = 0.213629, size = 14, normalized size = 1.17

$$\frac{3x}{(bx^2)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(-1/3),x, algorithm="fricas")
```

```
[Out] 3*x/(b*x^2)^(1/3)
```

Sympy [A] time = 1.46492, size = 14, normalized size = 1.17

$$\frac{3x}{\sqrt[3]{b}\sqrt[3]{x^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**2)**(1/3),x)
```

```
[Out] 3*x/(b**(1/3)*(x**2)**(1/3))
```

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

$$\int \frac{1}{(bx^2)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(-1/3),x, algorithm="giac")
```

```
[Out] integrate((b*x^2)^(-1/3), x)
```

3.120 $\int \frac{1}{\sqrt[3]{bx}} \, dx$

Optimal. Leaf size=14

$$\frac{3(bx)^{2/3}}{2b}$$

```
[Out] (3*(b*x)^(2/3))/(2*b)
```

Rubi [A] time = 0.00616831, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$\frac{3(bx)^{2/3}}{2b}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x)^(-1/3),x]

[Out] (3*(b*x)^(2/3))/(2*b)
```

Rubi in Sympy [A] time = 1.31558, size = 10, normalized size = 0.71

$$\frac{3\,(bx)^{\frac{2}{3}}}{2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x)**(1/3),x)

[Out] 3*(b*x)**(2/3)/(2*b)
```

Mathematica [A] time = 0.00249843, size = 12, normalized size = 0.86

$$\frac{3x}{2\sqrt[3]{bx}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x)^(-1/3),x]

[Out] (3*x)/(2*(b*x)^(1/3))
```

Maple [A] time = 0.003, size = 9, normalized size = 0.6

$$\frac{3\,x}{2}\frac{1}{\sqrt[3]{bx}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x)^(1/3),x)

[Out] 3/2*x/(b*x)^(1/3)
```

Maxima [A] time = 1.43621, size = 14, normalized size = 1.

$$\frac{3 (bx)^{\frac{2}{3}}}{2 b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x)^(-1/3),x, algorithm="maxima")

[Out] 3/2*(b*x)^(2/3)/b
```

Fricas [A] time = 0.227519, size = 14, normalized size = 1.

$$\frac{3 (bx)^{\frac{2}{3}}}{2 b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x)^(-1/3),x, algorithm="fricas")

[Out] 3/2*(b*x)^(2/3)/b
```

Sympy [A] time = 0.063773, size = 10, normalized size = 0.71

$$\frac{3 (bx)^{\frac{2}{3}}}{2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x)**(1/3),x)

[Out] 3*(b*x)**(2/3)/(2*b)
```

GIAC/XCAS [A] time = 0.22523, size = 14, normalized size = 1.

$$\frac{3 (bx)^{\frac{2}{3}}}{2 b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x)^(-1/3),x, algorithm="giac")

[Out] 3/2*(b*x)^(2/3)/b
```

3.121 $\int \frac{1}{\sqrt[3]{\frac{b}{x}}} \, dx$

Optimal. Leaf size=14

$$\frac{3x}{4\sqrt[3]{\frac{b}{x}}}$$

```
[Out] (3*x)/(4*(b/x)^(1/3))
```

Rubi [A] time = 0.00652189, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{3x}{4\sqrt[3]{\frac{b}{x}}}$$

Antiderivative was successfully verified.

```
[In] Int[(b/x)^(-1/3),x]

[Out] (3*x)/(4*(b/x)^(1/3))
```

Rubi in Sympy [A] time = 1.55098, size = 14, normalized size = 1.

$$\frac{3x^2\left(\frac{b}{x}\right)^{\frac{2}{3}}}{4b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(b/x)**(1/3),x)

[Out] 3*x**2*(b/x)**(2/3)/(4*b)
```

Mathematica [A] time = 0.00291345, size = 14, normalized size = 1.

$$\frac{3x}{4\sqrt[3]{\frac{b}{x}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(b/x)^(-1/3),x]

[Out] (3*x)/(4*(b/x)^(1/3))
```

Maple [A] time = 0.003, size = 11, normalized size = 0.8

$$\frac{3x}{4}\frac{1}{\sqrt[3]{\frac{b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b/x)^(1/3),x)

[Out] 3/4*x/(b/x)^(1/3)
```

Maxima [A] time = 1.4399, size = 14, normalized size = 1.

$$\frac{3x}{4\left(\frac{b}{x}\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x)^(-1/3),x, algorithm="maxima")

[Out] 3/4*x/(b/x)^(1/3)
```

Fricas [A] time = 0.216844, size = 14, normalized size = 1.

$$\frac{3x}{4\left(\frac{b}{x}\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x)^(-1/3),x, algorithm="fricas")

[Out] 3/4*x/(b/x)^(1/3)
```

Sympy [A] time = 1.56895, size = 15, normalized size = 1.07

$$\frac{3x}{4\sqrt[3]{b}\sqrt[3]{\frac{1}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b/x)**(1/3),x)

[Out] 3*x/(4*b**(1/3)*(1/x)**(1/3))
```

GIAC/XCAS [A] time = 0.228809, size = 14, normalized size = 1.

$$\frac{3x}{4\left(\frac{b}{x}\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x)^(-1/3),x, algorithm="giac")

[Out] 3/4*x/(b/x)^(1/3)
```

3.122 $\int \frac{1}{\sqrt[3]{\frac{b}{x^2}}} \, dx$

Optimal. Leaf size=14

$$\frac{3x}{5\sqrt[3]{\frac{b}{x^2}}}$$

```
[Out] (3*x)/(5*(b/x^2)^(1/3))
```

Rubi [A] time = 0.00650845, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{3x}{5\sqrt[3]{\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In]  Int[(b/x^2)^(-1/3),x]
```

```
[Out] (3*x)/(5*(b/x^2)^(1/3))
```

Rubi in Sympy [A] time = 1.53033, size = 15, normalized size = 1.07

$$\frac{3x^3\left(\frac{b}{x^2}\right)^{\frac{2}{3}}}{5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b/x**2)**(1/3),x)
```

```
[Out] 3*x**3*(b/x**2)**(2/3)/(5*b)
```

Mathematica [A] time = 0.00333646, size = 14, normalized size = 1.

$$\frac{3x}{5\sqrt[3]{\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b/x^2)^(-1/3),x]
```

```
[Out] (3*x)/(5*(b/x^2)^(1/3))
```

Maple [A] time = 0.003, size = 11, normalized size = 0.8

$$\frac{3x}{5}\frac{1}{\sqrt[3]{\frac{b}{x^2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b/x^2)^(1/3),x)
```

```
[Out] 3/5*x/(b/x^2)^(1/3)
```

Maxima [A] time = 1.43944, size = 14, normalized size = 1.

$$\frac{3\,x}{5\,\left(\frac{b}{x^2}\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^2)^(-1/3),x, algorithm="maxima")
```

```
[Out] 3/5*x/(b/x^2)^(1/3)
```

Fricas [A] time = 0.21559, size = 20, normalized size = 1.43

$$\frac{3\,x^3\left(\frac{b}{x^2}\right)^{\frac{2}{3}}}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^2)^(-1/3),x, algorithm="fricas")
```

```
[Out] 3/5*x^3*(b/x^2)^(2/3)/b
```

Sympy [A] time = 1.54498, size = 17, normalized size = 1.21

$$\frac{3x}{5\sqrt[3]{b}\sqrt[3]{\frac{1}{x^2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b/x**2)**(1/3),x)
```

```
[Out] 3*x/(5*b**(1/3)*(x**(-2))**(1/3))
```

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

$$\int \frac{1}{\left(\frac{b}{x^2}\right)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^2)^(-1/3),x, algorithm="giac")
```

```
[Out] integrate((b/x^2)^(-1/3), x)
```

3.123 $\int \frac{1}{\sqrt[3]{\frac{b}{x^3}}}\,dx$

Optimal. Leaf size=14

$$\frac{x}{2\sqrt[3]{\frac{b}{x^3}}}$$

[Out] x/(2*(b/x^3)^(1/3))

Rubi [A] time = 0.0064643, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{x}{2\sqrt[3]{\frac{b}{x^3}}}$$

Antiderivative was successfully verified.

[In] Int[(b/x^3)^(-1/3),x]

[Out] x/(2*(b/x^3)^(1/3))

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

$$\frac{x^2\left(\frac{b}{x^3}\right)^{\frac{2}{3}}\int x\,dx}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(1/(b/x**3)**(1/3),x)

[Out] x**2*(b/x**3)**(2/3)*Integral(x, x)/b

Mathematica [A] time = 0.00306992, size = 14, normalized size = 1.

$$\frac{x}{2\sqrt[3]{\frac{b}{x^3}}}$$

Antiderivative was successfully verified.

[In] Integrate[(b/x^3)^(-1/3),x]

[Out] x/(2*(b/x^3)^(1/3))

Maple [A] time = 0.001, size = 11, normalized size = 0.8

$$\frac{x}{2}\frac{1}{\sqrt[3]{\frac{b}{x^3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/(b/x^3)^(1/3),x)
```

```
[Out] 1/2*x/(b/x^3)^(1/3)
```

Maxima [A] time = 1.43781, size = 14, normalized size = 1.

$$\frac{x}{2\left(\frac{b}{x^3}\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b/x^3)^(-1/3),x, algorithm="maxima")
```

```
[Out] 1/2*x/(b/x^3)^(1/3)
```

Fricas [A] time = 0.214957, size = 20, normalized size = 1.43

$$\frac{x^4\left(\frac{b}{x^3}\right)^{\frac{2}{3}}}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b/x^3)^(-1/3),x, algorithm="fricas")
```

```
[Out] 1/2*x^4*(b/x^3)^(2/3)/b
```

Sympy [A] time = 1.54985, size = 15, normalized size = 1.07

$$\frac{x}{2\sqrt[3]{b}\sqrt[3]{\frac{1}{x^3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(b/x**3)**(1/3),x)
```

```
[Out] x/(2*b**(1/3)*(x**(-3))**(1/3))
```

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

$$\int\frac{1}{\left(\frac{b}{x^3}\right)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b/x^3)^(-1/3),x, algorithm="giac")
```

```
[Out] integrate((b/x^3)^(-1/3), x)
```

3.124 $\int \frac{1}{(bx^n)^{2/3}} \, dx$

Optimal. Leaf size=19

$$\frac{3x}{(3-2n)(bx^n)^{2/3}}$$

```
[Out] (3*x)/((3 - 2*n)*(b*x^n)^(2/3))
```

Rubi [A] time = 0.0159956, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$

$$\frac{3x}{(3-2n)(bx^n)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^n)^(-2/3),x]
```

```
[Out] (3*x)/((3 - 2*n)*(b*x^n)^(2/3))
```

Rubi in Sympy [A] time = 2.76107, size = 29, normalized size = 1.53

$$\frac{3x^{-\frac{n}{3}}x^{-\frac{2n}{3}+1}\sqrt[3]{bx^n}}{b(-2n+3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**n)**(2/3),x)
```

```
[Out] 3*x**(-n/3)*x**(-2*n/3 + 1)*(b*x**n)**(1/3)/(b*(-2*n + 3))
```

Mathematica [A] time = 0.00954605, size = 20, normalized size = 1.05

$$\frac{x}{\left(1-\frac{2n}{3}\right)(bx^n)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^n)^(-2/3),x]
```

```
[Out] x/((1 - (2*n)/3)*(b*x^n)^(2/3))
```

Maple [A] time = 0.002, size = 18, normalized size = 1.

$$-3\,\frac{x}{(2\,n-3)(bx^n)^{2/3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^n)^(2/3),x)
```

```
[Out] -3*x/(2*n-3)/(b*x^n)^(2/3)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(-2/3),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(-2/3),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

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

$$\int \frac{1}{(bx^n)^{\frac{2}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**n)**(2/3),x)

[Out] Integral((b*x**n)**(-2/3), x)
```

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

$$\int \frac{1}{(bx^n)^{\frac{2}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(-2/3),x, algorithm="giac")

[Out] integrate((b*x^n)^(-2/3), x)
```

3.125 $\int \frac{1}{(bx^3)^{2/3}}\,dx$

Optimal. Leaf size=12

$$-\frac{x}{(bx^3)^{2/3}}$$

```
[Out] -(x/(b*x^3)^(2/3))
```

Rubi [A] time = 0.00673084, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$

$$-\frac{x}{(bx^3)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Int[(b*x^3)^(-2/3),x]

[Out] -(x/(b*x^3)^(2/3))
```

Rubi in Sympy [A] time = 1.52953, size = 14, normalized size = 1.17

$$-\frac{\sqrt[3]{bx^3}}{bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(b*x**3)**(2/3),x)

[Out] -(b*x**3)**(1/3)/(b*x**2)
```

Mathematica [A] time = 0.00327759, size = 12, normalized size = 1.

$$-\frac{x}{(bx^3)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(b*x^3)^(-2/3),x]

[Out] -(x/(b*x^3)^(2/3))
```

Maple [A] time = 0.002, size = 11, normalized size = 0.9

$$-x\left(bx^3\right)^{-\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*x^3)^(2/3),x)

[Out] -x/(b*x^3)^(2/3)
```

Maxima [A] time = 1.44463, size = 14, normalized size = 1.17

$$-\frac{x}{\left(bx^3\right)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3)^(-2/3),x, algorithm="maxima")
```

```
[Out] -x/(b*x^3)^(2/3)
```

Fricas [A] time = 0.23482, size = 20, normalized size = 1.67

$$-\frac{\left(bx^3\right)^{\frac{1}{3}}}{bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3)^(-2/3),x, algorithm="fricas")
```

```
[Out] -(b*x^3)^(1/3)/(b*x^2)
```

Sympy [A] time = 1.69686, size = 14, normalized size = 1.17

$$-\frac{x}{b^{\frac{2}{3}}\left(x^3\right)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**3)**(2/3),x)
```

```
[Out] -x/(b**(2/3)*(x**3)**(2/3))
```

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

$$\int \frac{1}{\left(bx^3\right)^{\frac{2}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3)^(-2/3),x, algorithm="giac")
```

```
[Out] integrate((b*x^3)^(-2/3), x)
```

3.126 $\int \frac{1}{(bx^2)^{2/3}}\,dx$

Optimal. Leaf size=12

$$-\frac{3x}{(bx^2)^{2/3}}$$

```
[Out] (-3*x)/(b*x^2)^(2/3)
```

Rubi [A] time = 0.00658077, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$

$$-\frac{3x}{(bx^2)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^2)^(-2/3),x]

[Out] (-3*x)/(b*x^2)^(2/3)
```

Rubi in Sympy [A] time = 1.54412, size = 14, normalized size = 1.17

$$-\frac{3\sqrt[3]{bx^2}}{bx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**2)**(2/3),x)

[Out] -3*(b*x**2)**(1/3)/(b*x)
```

Mathematica [A] time = 0.00275569, size = 12, normalized size = 1.

$$-\frac{3x}{(bx^2)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^2)^(-2/3),x]

[Out] (-3*x)/(b*x^2)^(2/3)
```

Maple [A] time = 0.001, size = 11, normalized size = 0.9

$$-3\,\frac{x}{(bx^2)^{2/3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^2)^(2/3),x)

[Out] -3*x/(b*x^2)^(2/3)
```

Maxima [A] time = 1.42898, size = 14, normalized size = 1.17

$$-\frac{3x}{(bx^2)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(-2/3),x, algorithm="maxima")
```

```
[Out] -3*x/(b*x^2)^(2/3)
```

Fricas [A] time = 0.251385, size = 20, normalized size = 1.67

$$-\frac{3\,(bx^2)^{\frac{1}{3}}}{bx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(-2/3),x, algorithm="fricas")
```

```
[Out] -3*(b*x^2)^(1/3)/(b*x)
```

Sympy [A] time = 1.61082, size = 15, normalized size = 1.25

$$-\frac{3x}{b^{\frac{2}{3}}\,(x^2)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**2)**(2/3),x)
```

```
[Out] -3*x/(b**(2/3)*(x**2)**(2/3))
```

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

$$\int \frac{1}{(bx^2)^{\frac{2}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2)^(-2/3),x, algorithm="giac")
```

```
[Out] integrate((b*x^2)^(-2/3), x)
```

3.127 $\int \frac{1}{(bx)^{2/3}} \, dx$

Optimal. Leaf size=12

$$\frac{3\sqrt[3]{bx}}{b}$$

```
[Out] (3*(b*x)^(1/3))/b
```

Rubi [A] time = 0.00648606, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$

$$\frac{3\sqrt[3]{bx}}{b}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x)^(-2/3),x]

[Out] (3*(b*x)^(1/3))/b
```

Rubi in Sympy [A] time = 1.33885, size = 8, normalized size = 0.67

$$\frac{3\sqrt[3]{bx}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x)**(2/3),x)

[Out] 3*(b*x)**(1/3)/b
```

Mathematica [A] time = 0.00224052, size = 10, normalized size = 0.83

$$\frac{3x}{(bx)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x)^(-2/3),x]

[Out] (3*x)/(b*x)^(2/3)
```

Maple [A] time = 0.003, size = 9, normalized size = 0.8

$$3\,{\frac {x}{(bx)^{2/3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x)^(2/3),x)

[Out] 3*x/(b*x)^(2/3)
```

Maxima [A] time = 1.43494, size = 14, normalized size = 1.17

$$\frac{3\,(bx)^{\frac{1}{3}}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x)^(-2/3),x, algorithm="maxima")
```

```
[Out] 3*(b*x)^(1/3)/b
```

Fricas [A] time = 0.213626, size = 14, normalized size = 1.17

$$\frac{3\,(bx)^{\frac{1}{3}}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x)^(-2/3),x, algorithm="fricas")
```

```
[Out] 3*(b*x)^(1/3)/b
```

Sympy [A] time = 0.064299, size = 8, normalized size = 0.67

$$\frac{3\sqrt[3]{bx}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x)**(2/3),x)
```

```
[Out] 3*(b*x)**(1/3)/b
```

GIAC/XCAS [A] time = 0.221352, size = 14, normalized size = 1.17

$$\frac{3\,(bx)^{\frac{1}{3}}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x)^(-2/3),x, algorithm="giac")
```

```
[Out] 3*(b*x)^(1/3)/b
```

3.128 $\int \frac{1}{\left(\frac{b}{x}\right)^{2/3}} dx$

Optimal. Leaf size=14

$$\frac{3x}{5\left(\frac{b}{x}\right)^{2/3}}$$

```
[Out] (3*x)/(5*(b/x)^(2/3))
```

Rubi [A] time = 0.00624799, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$

$$\frac{3x}{5\left(\frac{b}{x}\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[(b/x)^(-2/3),x]

[Out] (3*x)/(5*(b/x)^(2/3))
```

Rubi in Sympy [A] time = 1.64763, size = 14, normalized size = 1.

$$\frac{3x^2\sqrt[3]{\frac{b}{x}}}{5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b/x)**(2/3),x)

[Out] 3*x**2*(b/x)**(1/3)/(5*b)
```

Mathematica [A] time = 0.00299024, size = 14, normalized size = 1.

$$\frac{3x}{5\left(\frac{b}{x}\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b/x)^(-2/3),x]

[Out] (3*x)/(5*(b/x)^(2/3))
```

Maple [A] time = 0.003, size = 11, normalized size = 0.8

$$\frac{3x}{5}\left(\frac{b}{x}\right)^{-\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b/x)^(2/3),x)

[Out] 3/5*x/(b/x)^(2/3)
```

Maxima [A] time = 1.42295, size = 14, normalized size = 1.

$$\frac{3x}{5\left(\frac{b}{x}\right)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x)^(-2/3),x, algorithm="maxima")

[Out] 3/5*x/(b/x)^(2/3)
```

Fricas [A] time = 0.220801, size = 14, normalized size = 1.

$$\frac{3x}{5\left(\frac{b}{x}\right)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x)^(-2/3),x, algorithm="fricas")

[Out] 3/5*x/(b/x)^(2/3)
```

Sympy [A] time = 1.5718, size = 15, normalized size = 1.07

$$\frac{3x}{5b^{\frac{2}{3}}\left(\frac{1}{x}\right)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b/x)**(2/3),x)

[Out] 3*x/(5*b**(2/3)*(1/x)**(2/3))
```

GIAC/XCAS [A] time = 0.229404, size = 14, normalized size = 1.

$$\frac{3x}{5\left(\frac{b}{x}\right)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x)^(-2/3),x, algorithm="giac")

[Out] 3/5*x/(b/x)^(2/3)
```

3.129 $\int \frac{1}{\left(\frac{b}{x^2}\right)^{2/3}} \, dx$

Optimal. Leaf size=14

$$\frac{3x}{7\left(\frac{b}{x^2}\right)^{2/3}}$$

```
[Out] (3*x)/(7*(b/x^2)^(2/3))
```

Rubi [A] time = 0.00704731, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{3x}{7\left(\frac{b}{x^2}\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[(b/x^2)^(-2/3),x]

[Out] (3*x)/(7*(b/x^2)^(2/3))
```

Rubi in Sympy [A] time = 1.55972, size = 15, normalized size = 1.07

$$\frac{3x^3\sqrt[3]{\frac{b}{x^2}}}{7b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b/x**2)**(2/3),x)

[Out] 3*x**3*(b/x**2)**(1/3)/(7*b)
```

Mathematica [A] time = 0.00366445, size = 14, normalized size = 1.

$$\frac{3x}{7\left(\frac{b}{x^2}\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b/x^2)^(-2/3),x]

[Out] (3*x)/(7*(b/x^2)^(2/3))
```

Maple [A] time = 0.003, size = 11, normalized size = 0.8

$$\frac{3\,x}{7}\left(\frac{b}{x^2}\right)^{-\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b/x^2)^(2/3),x)

[Out] 3/7*x/(b/x^2)^(2/3)
```

Maxima [A] time = 1.43679, size = 14, normalized size = 1.

$$\frac{3\,x}{7\,\left(\frac{b}{x^2}\right)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^2)^(-2/3),x, algorithm="maxima")

[Out] 3/7*x/(b/x^2)^(2/3)
```

Fricas [A] time = 0.21873, size = 20, normalized size = 1.43

$$\frac{3\,x^3\,\left(\frac{b}{x^2}\right)^{\frac{1}{3}}}{7\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^2)^(-2/3),x, algorithm="fricas")

[Out] 3/7*x^3*(b/x^2)^(1/3)/b
```

Sympy [A] time = 1.65656, size = 17, normalized size = 1.21

$$\frac{3x}{7b^{\frac{2}{3}}\left(\frac{1}{x^2}\right)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b/x**2)**(2/3),x)

[Out] 3*x/(7*b**(2/3)*(x**(-2))**(2/3))
```

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

$$\int \frac{1}{\left(\frac{b}{x^2}\right)^{\frac{2}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^2)^(-2/3),x, algorithm="giac")

[Out] integrate((b/x^2)^(-2/3), x)
```

3.130 $\int \frac{1}{\left(\frac{b}{x^3}\right)^{2/3}}\,dx$

Optimal. Leaf size=14

$$\frac{x}{3\left(\frac{b}{x^3}\right)^{2/3}}$$

```
[Out] x/(3*(b/x^3)^(2/3))
```

Rubi [A] time = 0.00676988, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$

$$\frac{x}{3\left(\frac{b}{x^3}\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[(b/x^3)^(-2/3),x]
```

```
[Out] x/(3*(b/x^3)^(2/3))
```

Rubi in Sympy [A] time = 1.54476, size = 14, normalized size = 1.

$$\frac{x^4\sqrt[3]{\frac{b}{x^3}}}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b/x**3)**(2/3),x)
```

```
[Out] x**4*(b/x**3)**(1/3)/(3*b)
```

Mathematica [A] time = 0.00309968, size = 14, normalized size = 1.

$$\frac{x}{3\left(\frac{b}{x^3}\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b/x^3)^(-2/3),x]
```

```
[Out] x/(3*(b/x^3)^(2/3))
```

Maple [A] time = 0.003, size = 11, normalized size = 0.8

$$\frac{x}{3}\left(\frac{b}{x^3}\right)^{-\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b/x^3)^(2/3),x)

[Out] 1/3*x/(b/x^3)^(2/3)
```

Maxima [A] time = 1.44673, size = 14, normalized size = 1.

$$\frac{x}{3\left(\frac{b}{x^3}\right)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^3)^(-2/3),x, algorithm="maxima")

[Out] 1/3*x/(b/x^3)^(2/3)
```

Fricas [A] time = 0.216707, size = 20, normalized size = 1.43

$$\frac{x^4\left(\frac{b}{x^3}\right)^{\frac{1}{3}}}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^3)^(-2/3),x, algorithm="fricas")

[Out] 1/3*x^4*(b/x^3)^(1/3)/b
```

Sympy [A] time = 1.66463, size = 15, normalized size = 1.07

$$\frac{x}{3b^{\frac{2}{3}}\left(\frac{1}{x^3}\right)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b/x**3)**(2/3),x)

[Out] x/(3*b**(2/3)*(x**(-3))**(2/3))
```

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

$$\int \frac{1}{\left(\frac{b}{x^3}\right)^{\frac{2}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b/x^3)^(-2/3),x, algorithm="giac")

[Out] integrate((b/x^3)^(-2/3), x)
```

3.131 $\int x^2\sqrt{bx^n}\,dx$

Optimal. Leaf size=19

$$\frac{2x^3\sqrt{bx^n}}{n+6}$$

```
[Out] (2*x^3*Sqrt[b*x^n])/(6 + n)
```

Rubi [A] time = 0.015164, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$\frac{2x^3\sqrt{bx^n}}{n+6}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2*Sqrt[b*x^n],x]

[Out] (2*x^3*Sqrt[b*x^n])/(6 + n)
```

Rubi in Sympy [A] time = 3.01567, size = 24, normalized size = 1.26

$$\frac{2x^{-\frac{n}{2}}x^{\frac{n}{2}+3}\sqrt{bx^n}}{n+6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(b*x**n)**(1/2),x)

[Out] 2*x**(-n/2)*x**(n/2 + 3)*sqrt(b*x**n)/(n + 6)
```

Mathematica [A] time = 0.00592225, size = 19, normalized size = 1.

$$\frac{2x^3\sqrt{bx^n}}{n+6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2*Sqrt[b*x^n],x]

[Out] (2*x^3*Sqrt[b*x^n])/(6 + n)
```

Maple [A] time = 0.003, size = 18, normalized size = 1.

$$2\,\frac{x^3\sqrt{bx^n}}{6+n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(b*x^n)^(1/2),x)

[Out] 2*x^3*(b*x^n)^(1/2)/(6+n)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n)*x^2,x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n)*x^2,x, algorithm="fricas")

[Out] Exception raised: TypeError
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(b*x**n)**(1/2),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [A] time = 0.226392, size = 26, normalized size = 1.37

$$\frac{2\sqrt{b}x^3e^{\left(\frac{1}{2}\,n\ln(x)\right)}}{n+6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n)*x^2,x, algorithm="giac")

[Out] 2*sqrt(b)*x^3*e^(1/2*n*ln(x))/(n + 6)
```

3.132 $\int x\sqrt{bx^n}\,dx$

Optimal. Leaf size=19

$$\frac{2x^2\sqrt{bx^n}}{n+4}$$

```
[Out] (2*x^2*Sqrt[b*x^n])/(4 + n)
```

Rubi [A] time = 0.0144024, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$

$$\frac{2x^2\sqrt{bx^n}}{n+4}$$

Antiderivative was successfully verified.

```
[In]  Int[x*Sqrt[b*x^n],x]
```

```
[Out] (2*x^2*Sqrt[b*x^n])/(4 + n)
```

Rubi in Sympy [A] time = 2.79127, size = 24, normalized size = 1.26

$$\frac{2x^{-\frac{n}{2}}x^{\frac{n}{2}+2}\sqrt{bx^n}}{n+4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(b*x**n)**(1/2),x)
```

```
[Out] 2*x**(-n/2)*x**(n/2 + 2)*sqrt(b*x**n)/(n + 4)
```

Mathematica [A] time = 0.00473799, size = 19, normalized size = 1.

$$\frac{2x^2\sqrt{bx^n}}{n+4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x*Sqrt[b*x^n],x]
```

```
[Out] (2*x^2*Sqrt[b*x^n])/(4 + n)
```

Maple [A] time = 0.001, size = 18, normalized size = 1.

$$2\,\frac{x^2\sqrt{bx^n}}{4+n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(b*x^n)^(1/2),x)
```

```
[Out] 2*x^2*(b*x^n)^(1/2)/(4+n)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n)*x,x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n)*x,x, algorithm="fricas")

[Out] Exception raised: TypeError
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(b*x**n)**(1/2),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [A] time = 0.224839, size = 26, normalized size = 1.37

$$\frac{2\sqrt{b}x^2e^{\left(\frac{1}{2}n\ln(x)\right)}}{n+4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n)*x,x, algorithm="giac")

[Out] 2*sqrt(b)*x^2*e^(1/2*n*ln(x))/(n + 4)
```

3.133 $\int \sqrt{bx^n}\,dx$

Optimal. Leaf size=17

$$\frac{2x\sqrt{bx^n}}{n+2}$$

```
[Out] (2*x*Sqrt[b*x^n])/(2 + n)
```

Rubi [A] time = 0.0138313, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{2x\sqrt{bx^n}}{n+2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[b*x^n],x]

[Out] (2*x*Sqrt[b*x^n])/(2 + n)
```

Rubi in Sympy [A] time = 1.98656, size = 24, normalized size = 1.41

$$\frac{2x^{-\frac{n}{2}}x^{\frac{n}{2}+1}\sqrt{bx^n}}{n+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**n)**(1/2),x)

[Out] 2*x**(-n/2)*x**(n/2 + 1)*sqrt(b*x**n)/(n + 2)
```

Mathematica [A] time = 0.00337966, size = 17, normalized size = 1.

$$\frac{2x\sqrt{bx^n}}{n+2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[b*x^n],x]

[Out] (2*x*Sqrt[b*x^n])/(2 + n)
```

Maple [A] time = 0.002, size = 16, normalized size = 0.9

$$2\,\frac{x\sqrt{bx^n}}{2+n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^n)^(1/2),x)

[Out] 2*x*(b*x^n)^(1/2)/(2+n)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**n)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [A] time = 0.227862, size = 23, normalized size = 1.35

$$\frac{2\sqrt{b}xe^{\left(\frac{1}{2}n\ln(x)\right)}}{n+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n),x, algorithm="giac")
```

```
[Out] 2*sqrt(b)*x*e^(1/2*n*ln(x))/(n + 2)
```

3.134 $\int \frac{\sqrt{bx^n}}{x} \, dx$

Optimal. Leaf size=14

$$\frac{2\sqrt{bx^n}}{n}$$

[Out] (2*Sqrt[b*x^n])/n

Rubi [A] time = 0.00976556, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{2\sqrt{bx^n}}{n}$$

Antiderivative was successfully verified.

[In] Int[Sqrt[b*x^n]/x,x]

[Out] (2*Sqrt[b*x^n])/n

Rubi in Sympy [A] time = 2.7267, size = 10, normalized size = 0.71

$$\frac{2\sqrt{bx^n}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((b*x**n)**(1/2)/x,x)

[Out] 2*sqrt(b*x**n)/n

Mathematica [A] time = 0.00293232, size = 14, normalized size = 1.

$$\frac{2\sqrt{bx^n}}{n}$$

Antiderivative was successfully verified.

[In] Integrate[Sqrt[b*x^n]/x,x]

[Out] (2*Sqrt[b*x^n])/n

Maple [A] time = 0.003, size = 13, normalized size = 0.9

$$2\,\frac{\sqrt{bx^n}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b*x^n)^(1/2)/x,x)

[Out] 2*(b*x^n)^(1/2)/n

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.226632, size = 16, normalized size = 1.14

$$\frac{2\sqrt{bx^n}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n)/x,x, algorithm="fricas")
```

```
[Out] 2*sqrt(b*x^n)/n
```

Sympy [A] time = 0.752516, size = 22, normalized size = 1.57

$$\begin{cases} \frac{2\sqrt{b}\sqrt{x^n}}{n} & \text{for}\ n \neq 0 \\ \sqrt{b}\log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**n)**(1/2)/x,x)
```

```
[Out] Piecewise((2*sqrt(b)*sqrt(x**n)/n, Ne(n, 0)), (sqrt(b)*log(x), Tr
ue))
```

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

$$\int \frac{\sqrt{bx^n}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n)/x,x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*x^n)/x, x)
```

3.135 $\int \frac{\sqrt{bx^n}}{x^2}\,dx$

Optimal. Leaf size=21

$$-\frac{2\sqrt{bx^n}}{(2-n)x}$$

```
[Out] (-2*Sqrt[b*x^n])/((2 - n)*x)
```

Rubi [A] time = 0.0153905, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{2\sqrt{bx^n}}{(2-n)x}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[b*x^n]/x^2,x]

[Out] (-2*Sqrt[b*x^n])/((2 - n)*x)
```

Rubi in Sympy [A] time = 2.9047, size = 26, normalized size = 1.24

$$-\frac{2x^{-\frac{n}{2}}x^{\frac{n}{2}-1}\sqrt{bx^n}}{-n+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**n)**(1/2)/x**2,x)

[Out] -2*x**(-n/2)*x**(n/2 - 1)*sqrt(b*x**n)/(-n + 2)
```

Mathematica [A] time = 0.00386763, size = 19, normalized size = 0.9

$$\frac{2\sqrt{bx^n}}{(n-2)x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[b*x^n]/x^2,x]

[Out] (2*Sqrt[b*x^n])/((-2 + n)*x)
```

Maple [A] time = 0.002, size = 18, normalized size = 0.9

$$2\,\frac{\sqrt{bx^n}}{x\left(-2+n\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^n)^(1/2)/x^2,x)
```

```
[Out] 2/x/(-2+n)*(b*x^n)^(1/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n)/x^2,x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n)/x^2,x, algorithm="fricas")

[Out] Exception raised: TypeError
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**n)**(1/2)/x**2,x)

[Out] Exception raised: TypeError
```

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

$$\int \frac{\sqrt{bx^n}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n)/x^2,x, algorithm="giac")

[Out] integrate(sqrt(b*x^n)/x^2, x)
```

3.136 $\int \frac{\sqrt{bx^n}}{x^3}\,dx$

Optimal. Leaf size=21

$$-\frac{2\sqrt{bx^n}}{(4-n)x^2}$$

```
[Out] (-2*Sqrt[b*x^n])/((4 - n)*x^2)
```

Rubi [A] time = 0.015444, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$-\frac{2\sqrt{bx^n}}{(4-n)x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[b*x^n]/x^3,x]

[Out] (-2*Sqrt[b*x^n])/((4 - n)*x^2)
```

Rubi in Sympy [A] time = 3.07906, size = 26, normalized size = 1.24

$$-\frac{2x^{-\frac{n}{2}}x^{\frac{n}{2}-2}\sqrt{bx^n}}{-n+4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**n)**(1/2)/x**3,x)

[Out] -2*x**(-n/2)*x**(n/2 - 2)*sqrt(b*x**n)/(-n + 4)
```

Mathematica [A] time = 0.00420874, size = 19, normalized size = 0.9

$$\frac{2\sqrt{bx^n}}{(n-4)x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[b*x^n]/x^3,x]

[Out] (2*Sqrt[b*x^n])/((-4 + n)*x^2)
```

Maple [A] time = 0.003, size = 18, normalized size = 0.9

$$2\,\frac{\sqrt{bx^n}}{x^2\,(n-4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^n)^(1/2)/x^3,x)
```

```
[Out] 2/x^2/(n-4)*(b*x^n)^(1/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n)/x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n)/x^3,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**n)**(1/2)/x**3,x)
```

```
[Out] Exception raised: TypeError
```

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

$$\int \frac{\sqrt{bx^n}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n)/x^3,x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*x^n)/x^3, x)
```

3.137 $\int x\left(bx^n\right)^{3/2}\,dx$

Optimal. Leaf size=24

$$\frac{2bx^{n+2}\sqrt{bx^n}}{3n+4}$$

```
[Out] (2*b*x^(2 + n)*Sqrt[b*x^n])/(4 + 3*n)
```

Rubi [A] time = 0.017304, antiderivative size = 24, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$

$$\frac{2bx^{n+2}\sqrt{bx^n}}{3n+4}$$

Antiderivative was successfully verified.

```
[In]  Int[x*(b*x^n)^(3/2),x]

[Out] (2*b*x^(2 + n)*Sqrt[b*x^n])/(4 + 3*n)
```

Rubi in Sympy [A] time = 2.95375, size = 29, normalized size = 1.21

$$\frac{2bx^{-\frac{n}{2}}x^{\frac{3n}{2}+2}\sqrt{bx^n}}{3n+4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(b*x**n)**(3/2),x)

[Out] 2*b*x**(-n/2)*x**(3*n/2 + 2)*sqrt(b*x**n)/(3*n + 4)
```

Mathematica [A] time = 0.00963597, size = 22, normalized size = 0.92

$$\frac{x^2\left(bx^n\right)^{3/2}}{\frac{3n}{2}+2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x*(b*x^n)^(3/2),x]

[Out] (x^2*(b*x^n)^(3/2))/(2 + (3*n)/2)
```

Maple [A] time = 0.004, size = 20, normalized size = 0.8

$$2\,\frac{x^2\left(bx^n\right)^{3/2}}{4+3\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(b*x^n)^(3/2),x)

[Out] 2*x^2/(4+3*n)*(b*x^n)^(3/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(3/2)*x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(3/2)*x,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(b*x**n)**(3/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [A] time = 0.229467, size = 28, normalized size = 1.17

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(3/2)*x,x, algorithm="giac")
```

```
[Out] 2*b^(3/2)*x^2*e^(3/2*n*ln(x))/(3*n + 4)
```

3.138 $\int (bx^n)^{3/2}\, dx$

Optimal. Leaf size=24

$$\frac{2bx^{n+1}\sqrt{bx^n}}{3n+2}$$

```
[Out] (2*b*x^(1 + n)*Sqrt[b*x^n])/(2 + 3*n)
```

Rubi [A] time = 0.01689, antiderivative size = 24, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$

$$\frac{2bx^{n+1}\sqrt{bx^n}}{3n+2}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^n)^(3/2),x]
```

```
[Out] (2*b*x^(1 + n)*Sqrt[b*x^n])/(2 + 3*n)
```

Rubi in Sympy [A] time = 2.28161, size = 29, normalized size = 1.21

$$\frac{2bx^{-\frac{n}{2}}x^{\frac{3n}{2}+1}\sqrt{bx^n}}{3n+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**n)**(3/2),x)
```

```
[Out] 2*b*x**(-n/2)*x**(3*n/2 + 1)*sqrt(b*x**n)/(3*n + 2)
```

Mathematica [A] time = 0.00640926, size = 20, normalized size = 0.83

$$\frac{x\left(bx^n\right)^{3/2}}{\frac{3n}{2}+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^n)^(3/2),x]
```

```
[Out] (x*(b*x^n)^(3/2))/(1 + (3*n)/2)
```

Maple [A] time = 0.001, size = 18, normalized size = 0.8

$$2\,\frac{x\left(bx^n\right)^{3/2}}{2+3\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^n)^(3/2),x)
```

```
[Out] 2*x/(2+3*n)*(b*x^n)^(3/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(3/2),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(3/2),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**n)**(3/2),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [A] time = 0.227146, size = 26, normalized size = 1.08

$$\frac{2\, b^{\frac{3}{2}} x e^{\left(\frac{3}{2}\, n \ln\left(x\right)\right)}}{3\, n + 2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(3/2),x, algorithm="giac")

[Out] 2*b^(3/2)*x*e^(3/2*n*ln(x))/(3*n + 2)
```

3.139 $\int \frac{(bx^n)^{3/2}}{x}\,dx$

Optimal. Leaf size=20

$$\frac{2bx^n\sqrt{bx^n}}{3n}$$

```
[Out] (2*b*x^n*Sqrt[b*x^n])/(3*n)
```

Rubi [A] time = 0.0114605, antiderivative size = 20, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$\frac{2bx^n\sqrt{bx^n}}{3n}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^n)^(3/2)/x,x]

[Out] (2*b*x^n*Sqrt[b*x^n])/(3*n)
```

Rubi in Sympy [A] time = 2.80194, size = 12, normalized size = 0.6

$$\frac{2\left(bx^n\right)^{\frac{3}{2}}}{3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**n)**(3/2)/x,x)

[Out] 2*(b*x**n)**(3/2)/(3*n)
```

Mathematica [A] time = 0.0042129, size = 16, normalized size = 0.8

$$\frac{2\left(bx^n\right)^{3/2}}{3n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^n)^(3/2)/x,x]

[Out] (2*(b*x^n)^(3/2))/(3*n)
```

Maple [A] time = 0.002, size = 13, normalized size = 0.7

$$\frac{2}{3\,n}\left(bx^n\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^n)^(3/2)/x,x)

[Out] 2/3/n*(b*x^n)^(3/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(3/2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.229261, size = 22, normalized size = 1.1

$$\frac{2\sqrt{bx^n}bx^n}{3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(3/2)/x,x, algorithm="fricas")
```

```
[Out] 2/3*sqrt(b*x^n)*b*x^n/n
```

Sympy [A] time = 12.4628, size = 24, normalized size = 1.2

$$\begin{cases} \frac{2b^{\frac{3}{2}}(x^n)^{\frac{3}{2}}}{3n} & \text{for } n \neq 0 \\ b^{\frac{3}{2}} \log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**n)**(3/2)/x,x)
```

```
[Out] Piecewise((2*b**(3/2)*(x**n)**(3/2)/(3*n), Ne(n, 0)), (b**(3/2)*l
og(x), True))
```

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

$$\int \frac{(bx^n)^{\frac{3}{2}}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(3/2)/x,x, algorithm="giac")
```

```
[Out] integrate((b*x^n)^(3/2)/x, x)
```

3.140 $\int \frac{(bx^n)^{3/2}}{x^2}\,dx$

Optimal. Leaf size=24

$$-\frac{2bx^{n-1}\sqrt{bx^n}}{2-3n}$$

```
[Out] (-2*b*x^(-1 + n)*Sqrt[b*x^n])/(2 - 3*n)
```

Rubi [A] time = 0.0185558, antiderivative size = 24, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{2bx^{n-1}\sqrt{bx^n}}{2-3n}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^n)^(3/2)/x^2,x]

[Out] (-2*b*x^(-1 + n)*Sqrt[b*x^n])/(2 - 3*n)
```

Rubi in Sympy [A] time = 3.25365, size = 31, normalized size = 1.29

$$-\frac{2bx^{-\frac{n}{2}}x^{\frac{3n}{2}-1}\sqrt{bx^n}}{-3n+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**n)**(3/2)/x**2,x)

[Out] -2*b*x**(-n/2)*x**(3*n/2 - 1)*sqrt(b*x**n)/(-3*n + 2)
```

Mathematica [A] time = 0.0117847, size = 22, normalized size = 0.92

$$\frac{(bx^n)^{3/2}}{\left(\frac{3n}{2}-1\right)x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^n)^(3/2)/x^2,x]

[Out] (b*x^n)^(3/2)/((-1 + (3*n)/2)*x)
```

Maple [A] time = 0.002, size = 20, normalized size = 0.8

$$2\,\frac{(bx^n)^{3/2}}{x(-2+3\,n)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^n)^(3/2)/x^2,x)

[Out] 2/x/(-2+3*n)*(b*x^n)^(3/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(3/2)/x^2,x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(3/2)/x^2,x, algorithm="fricas")

[Out] Exception raised: TypeError
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**n)**(3/2)/x**2,x)

[Out] Exception raised: TypeError
```

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

$$\int \frac{(bx^n)^{\frac{3}{2}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(3/2)/x^2,x, algorithm="giac")

[Out] integrate((b*x^n)^(3/2)/x^2, x)
```

3.141 $\int \frac{(bx^n)^{3/2}}{x^3} dx$

Optimal. Leaf size=24

$$-\frac{2bx^{n-2}\sqrt{bx^n}}{4-3n}$$

```
[Out] (-2*b*x^(-2 + n)*Sqrt[b*x^n])/(4 - 3*n)
```

Rubi [A] time = 0.0189459, antiderivative size = 24, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{2bx^{n-2}\sqrt{bx^n}}{4-3n}$$

Antiderivative was successfully verified.

```
[In] Int[(b*x^n)^(3/2)/x^3,x]

[Out] (-2*b*x^(-2 + n)*Sqrt[b*x^n])/(4 - 3*n)
```

Rubi in Sympy [A] time = 3.28617, size = 31, normalized size = 1.29

$$-\frac{2bx^{-\frac{n}{2}}x^{\frac{3n}{2}-2}\sqrt{bx^n}}{-3n+4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**n)**(3/2)/x**3,x)

[Out] -2*b*x**(-n/2)*x**(3*n/2 - 2)*sqrt(b*x**n)/(-3*n + 4)
```

Mathematica [A] time = 0.0109716, size = 22, normalized size = 0.92

$$\frac{(bx^n)^{3/2}}{\left(\frac{3n}{2}-2\right)x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(b*x^n)^(3/2)/x^3,x]

[Out] (b*x^n)^(3/2)/((-2 + (3*n)/2)*x^2)
```

Maple [A] time = 0.001, size = 20, normalized size = 0.8

$$2\,\frac{(bx^n)^{3/2}}{x^2\,(3\,n-4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x^n)^(3/2)/x^3,x)

[Out] 2/x^2/(3*n-4)*(b*x^n)^(3/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(3/2)/x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(3/2)/x^3,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**n)**(3/2)/x**3,x)
```

```
[Out] Timed out
```

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

$$\int \frac{(bx^n)^{\frac{3}{2}}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(3/2)/x^3,x, algorithm="giac")
```

```
[Out] integrate((b*x^n)^(3/2)/x^3, x)
```

3.142 $\int \frac{(bx^n)^{3/2}}{x^4} \, dx$

Optimal. Leaf size=26

$$-\frac{2bx^{n-3}\sqrt{bx^n}}{3(2-n)}$$

```
[Out] (-2*b*x^(-3 + n)*Sqrt[b*x^n])/(3*(2 - n))
```

Rubi [A] time = 0.0166263, antiderivative size = 26, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{2bx^{n-3}\sqrt{bx^n}}{3(2-n)}$$

Antiderivative was successfully verified.

```
[In] Int[(b*x^n)^(3/2)/x^4,x]
```

```
[Out] (-2*b*x^(-3 + n)*Sqrt[b*x^n])/(3*(2 - n))
```

Rubi in Sympy [A] time = 3.22656, size = 31, normalized size = 1.19

$$-\frac{2bx^{-\frac{n}{2}}x^{\frac{3n}{2}-3}\sqrt{bx^n}}{3(-n+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**n)**(3/2)/x**4,x)
```

```
[Out] -2*b*x**(-n/2)*x**(3*n/2 - 3)*sqrt(b*x**n)/(3*(-n + 2))
```

Mathematica [A] time = 0.0103886, size = 22, normalized size = 0.85

$$\frac{(bx^n)^{3/2}}{\left(\frac{3n}{2}-3\right)x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(b*x^n)^(3/2)/x^4,x]
```

```
[Out] (b*x^n)^(3/2)/((-3 + (3*n)/2)*x^3)
```

Maple [A] time = 0.002, size = 18, normalized size = 0.7

$$\frac{2}{3x^3(-2+n)}(bx^n)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x^n)^(3/2)/x^4,x)
```

```
[Out] 2/3/x^3/(-2+n)*(b*x^n)^(3/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(3/2)/x^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(3/2)/x^4,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**n)**(3/2)/x**4,x)
```

```
[Out] Exception raised: TypeError
```

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

$$\int \frac{(bx^n)^{\frac{3}{2}}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(3/2)/x^4,x, algorithm="giac")
```

```
[Out] integrate((b*x^n)^(3/2)/x^4, x)
```

3.143 $\int \frac{x^2}{\sqrt{bx^n}}\,dx$

Optimal. Leaf size=21

$$\frac{2x^3}{(6-n)\sqrt{bx^n}}$$

```
[Out] (2*x^3)/((6 - n)*Sqrt[b*x^n])
```

Rubi [A] time = 0.0152149, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{2x^3}{(6-n)\sqrt{bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/Sqrt[b*x^n],x]

[Out] (2*x^3)/((6 - n)*Sqrt[b*x^n])
```

Rubi in Sympy [A] time = 3.6296, size = 26, normalized size = 1.24

$$\frac{2x^{-\frac{n}{2}}x^{-\frac{n}{2}+3}\sqrt{bx^n}}{b(-n+6)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(b*x**n)**(1/2),x)

[Out] 2*x**(-n/2)*x**(-n/2 + 3)*sqrt(b*x**n)/(b*(-n + 6))
```

Mathematica [A] time = 0.00890801, size = 19, normalized size = 0.9

$$-\frac{2x^3}{(n-6)\sqrt{bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/Sqrt[b*x^n],x]

[Out] (-2*x^3)/((-6 + n)*Sqrt[b*x^n])
```

Maple [A] time = 0.002, size = 18, normalized size = 0.9

$$-2\,{\frac{x^3}{(n-6)\sqrt{bx^n}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(b*x^n)^(1/2),x)
```

```
[Out] -2*x^3/(n-6)/(b*x^n)^(1/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/sqrt(b*x^n),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/sqrt(b*x^n),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(b*x**n)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

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

$$\int \frac{x^2}{\sqrt{bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/sqrt(b*x^n),x, algorithm="giac")
```

```
[Out] integrate(x^2/sqrt(b*x^n), x)
```

3.144 $\int \frac{x}{\sqrt{bx^n}}\,dx$

Optimal. Leaf size=21

$$\frac{2x^2}{(4-n)\sqrt{bx^n}}$$

```
[Out] (2*x^2)/((4 - n)*Sqrt[b*x^n])
```

Rubi [A] time = 0.0134409, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{2x^2}{(4-n)\sqrt{bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/Sqrt[b*x^n],x]

[Out] (2*x^2)/((4 - n)*Sqrt[b*x^n])
```

Rubi in Sympy [A] time = 3.41738, size = 26, normalized size = 1.24

$$\frac{2x^{-\frac{n}{2}}x^{-\frac{n}{2}+2}\sqrt{bx^n}}{b\,(-n+4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(b*x**n)**(1/2),x)

[Out] 2*x**(-n/2)*x**(-n/2 + 2)*sqrt(b*x**n)/(b*(-n + 4))
```

Mathematica [A] time = 0.00654173, size = 19, normalized size = 0.9

$$-\frac{2x^2}{(n-4)\sqrt{bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/Sqrt[b*x^n],x]

[Out] (-2*x^2)/((-4 + n)*Sqrt[b*x^n])
```

Maple [A] time = 0.002, size = 18, normalized size = 0.9

$$-2\,\frac{x^2}{(n-4)\,\sqrt{bx^n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(b*x^n)^(1/2),x)
```

```
[Out] -2*x^2/(n-4)/(b*x^n)^(1/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/sqrt(b*x^n),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/sqrt(b*x^n),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(b*x**n)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

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

$$\int \frac{x}{\sqrt{bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/sqrt(b*x^n),x, algorithm="giac")
```

```
[Out] integrate(x/sqrt(b*x^n), x)
```

3.145 $\int \frac{1}{\sqrt{bx^n}}\,dx$

Optimal. Leaf size=19

$$\frac{2x}{(2-n)\sqrt{bx^n}}$$

```
[Out] (2*x)/((2 - n)*Sqrt[b*x^n])
```

Rubi [A] time = 0.0126432, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{2x}{(2-n)\sqrt{bx^n}}$$

Antiderivative was successfully verified.

```
[In] Int[1/Sqrt[b*x^n],x]

[Out] (2*x)/((2 - n)*Sqrt[b*x^n])
```

Rubi in Sympy [A] time = 2.62409, size = 26, normalized size = 1.37

$$\frac{2x^{-\frac{n}{2}}x^{-\frac{n}{2}+1}\sqrt{bx^n}}{b\,(-n+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(b*x**n)**(1/2),x)

[Out] 2*x**(-n/2)*x**(-n/2 + 1)*sqrt(b*x**n)/(b*(-n + 2))
```

Mathematica [A] time = 0.00474119, size = 17, normalized size = 0.89

$$-\frac{2x}{(n-2)\sqrt{bx^n}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/Sqrt[b*x^n],x]

[Out] (-2*x)/((-2 + n)*Sqrt[b*x^n])
```

Maple [A] time = 0.001, size = 16, normalized size = 0.8

$$-2\,\frac{x}{(-2+n)\,\sqrt{bx^n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*x^n)^(1/2),x)

[Out] -2*x/(-2+n)/(b*x^n)^(1/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*x^n),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*x^n),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**n)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

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

$$\int \frac{1}{\sqrt{bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*x^n),x, algorithm="giac")
```

```
[Out] integrate(1/sqrt(b*x^n), x)
```

3.146 $\int \frac{1}{x\sqrt{bx^n}}\,dx$

Optimal. Leaf size=14

$$-\frac{2}{n\sqrt{bx^n}}$$

```
[Out] -2/(n*Sqrt[b*x^n])
```

Rubi [A] time = 0.00903984, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{2}{n\sqrt{bx^n}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x*Sqrt[b*x^n]),x]
```

```
[Out] -2/(n*Sqrt[b*x^n])
```

Rubi in Sympy [A] time = 2.79048, size = 12, normalized size = 0.86

$$-\frac{2}{n\sqrt{bx^n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x/(b*x**n)**(1/2),x)
```

```
[Out] -2/(n*sqrt(b*x**n))
```

Mathematica [A] time = 0.00456392, size = 14, normalized size = 1.

$$-\frac{2}{n\sqrt{bx^n}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x*Sqrt[b*x^n]),x]
```

```
[Out] -2/(n*Sqrt[b*x^n])
```

Maple [A] time = 0.002, size = 13, normalized size = 0.9

$$-2\,\frac{1}{n\sqrt{bx^n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(b*x^n)^(1/2),x)
```

```
[Out] -2/n/(b*x^n)^(1/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^n)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.22817, size = 16, normalized size = 1.14

$$-\frac{2}{\sqrt{bx^n}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^n)*x),x, algorithm="fricas")
```

```
[Out] -2/(sqrt(b*x^n)*n)
```

Sympy [A] time = 3.72571, size = 24, normalized size = 1.71

$$\begin{cases} -\frac{2}{\sqrt{b}n\sqrt{x^n}} & \text{for } n \neq 0 \\ \frac{\log(x)}{\sqrt{b}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(b*x**n)**(1/2),x)
```

```
[Out] Piecewise((-2/(sqrt(b)*n*sqrt(x**n)), Ne(n, 0)), (log(x)/sqrt(b),
 True))
```

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

$$\int \frac{1}{\sqrt{bx^n}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^n)*x),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(b*x^n)*x), x)
```

3.147 $\int \frac{1}{x^2\sqrt{bx^n}}\,dx$

Optimal. Leaf size=19

$$-\frac{2}{(n+2)x\sqrt{bx^n}}$$

```
[Out] -2/((2 + n)*x*Sqrt[b*x^n])
```

Rubi [A] time = 0.0137036, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$-\frac{2}{(n+2)x\sqrt{bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*Sqrt[b*x^n]),x]

[Out] -2/((2 + n)*x*Sqrt[b*x^n])
```

Rubi in Sympy [A] time = 3.59663, size = 29, normalized size = 1.53

$$-\frac{2x^{-\frac{n}{2}}x^{-\frac{n}{2}-1}\sqrt{bx^n}}{b\,(n+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(b*x**n)**(1/2),x)

[Out] -2*x**(-n/2)*x**(-n/2 - 1)*sqrt(b*x**n)/(b*(n + 2))
```

Mathematica [A] time = 0.00719642, size = 19, normalized size = 1.

$$-\frac{2}{(n+2)x\sqrt{bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*Sqrt[b*x^n]),x]

[Out] -2/((2 + n)*x*Sqrt[b*x^n])
```

Maple [A] time = 0.002, size = 18, normalized size = 1.

$$-2\,\frac{1}{(2+n)\,x\sqrt{bx^n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(b*x^n)^(1/2),x)

[Out] -2/(2+n)/x/(b*x^n)^(1/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^n)*x^2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^n)*x^2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(b*x**n)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

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

$$\int \frac{1}{\sqrt{bx^n}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^n)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(b*x^n)*x^2), x)
```

3.148 $\int \frac{1}{x^3\sqrt{bx^n}}\,dx$

Optimal. Leaf size=19

$$-\frac{2}{(n+4)x^2\sqrt{bx^n}}$$

```
[Out] -2/((4 + n)*x^2*Sqrt[b*x^n])
```

Rubi [A] time = 0.0132876, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{2}{(n+4)x^2\sqrt{bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*Sqrt[b*x^n]),x]

[Out] -2/((4 + n)*x^2*Sqrt[b*x^n])
```

Rubi in Sympy [A] time = 3.73828, size = 29, normalized size = 1.53

$$-\frac{2x^{-\frac{n}{2}}x^{-\frac{n}{2}-2}\sqrt{bx^n}}{b\,(n+4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(b*x**n)**(1/2),x)

[Out] -2*x**(-n/2)*x**(-n/2 - 2)*sqrt(b*x**n)/(b*(n + 4))
```

Mathematica [A] time = 0.00812885, size = 19, normalized size = 1.

$$-\frac{2}{(n+4)x^2\sqrt{bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*Sqrt[b*x^n]),x]

[Out] -2/((4 + n)*x^2*Sqrt[b*x^n])
```

Maple [A] time = 0.002, size = 18, normalized size = 1.

$$-2\,\frac{1}{(4+n)\,x^2\sqrt{bx^n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(b*x^n)^(1/2),x)

[Out] -2/(4+n)/x^2/(b*x^n)^(1/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^n)*x^3),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^n)*x^3),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(b*x**n)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

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

$$\int \frac{1}{\sqrt{bx^n}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^n)*x^3),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(b*x^n)*x^3), x)
```

3.149 $\int \frac{x^2}{(bx^n)^{3/2}}\,dx$

Optimal. Leaf size=30

$$\frac{2x^{3-n}}{3b(2-n)\sqrt{bx^n}}$$

```
[Out] (2*x^(3 - n))/(3*b*(2 - n)*Sqrt[b*x^n])
```

Rubi [A] time = 0.0239139, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{2x^{3-n}}{3b(2-n)\sqrt{bx^n}}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(b*x^n)^(3/2),x]

[Out] (2*x^(3 - n))/(3*b*(2 - n)*Sqrt[b*x^n])
```

Rubi in Sympy [A] time = 3.77391, size = 31, normalized size = 1.03

$$\frac{2x^{-\frac{n}{2}}x^{-\frac{3n}{2}+3}\sqrt{bx^n}}{3b^2(-n+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**2/(b*x**n)**(3/2),x)

[Out] 2*x**(-n/2)*x**(-3*n/2 + 3)*sqrt(b*x**n)/(3*b**2*(-n + 2))
```

Mathematica [A] time = 0.0139887, size = 22, normalized size = 0.73

$$\frac{x^3}{\left(3-\frac{3n}{2}\right)(bx^n)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(b*x^n)^(3/2),x]

[Out] x^3/((3 - (3*n)/2)*(b*x^n)^(3/2))
```

Maple [A] time = 0.003, size = 18, normalized size = 0.6

$$-\frac{2x^3}{-6+3n}(bx^n)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(b*x^n)^(3/2),x)
```

```
[Out] -2/3*x^3/(-2+n)/(b*x^n)^(3/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^n)^(3/2),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^n)^(3/2),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(b*x**n)**(3/2),x)

[Out] Exception raised: TypeError
```

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

$$\int \frac{x^2}{(bx^n)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^n)^(3/2),x, algorithm="giac")

[Out] integrate(x^2/(b*x^n)^(3/2), x)
```

3.150 $\int \frac{x}{(bx^n)^{3/2}} dx$

Optimal. Leaf size=28

$$\frac{2x^{2-n}}{b(4-3n)\sqrt{bx^n}}$$

```
[Out] (2*x^(2 - n))/(b*(4 - 3*n)*Sqrt[b*x^n])
```

Rubi [A] time = 0.0207925, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{2x^{2-n}}{b(4-3n)\sqrt{bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(b*x^n)^(3/2),x]

[Out] (2*x^(2 - n))/(b*(4 - 3*n)*Sqrt[b*x^n])
```

Rubi in Sympy [A] time = 3.62614, size = 31, normalized size = 1.11

$$\frac{2x^{-\frac{n}{2}}x^{-\frac{3n}{2}+2}\sqrt{bx^n}}{b^2(-3n+4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(b*x**n)**(3/2),x)

[Out] 2*x**(-n/2)*x**(-3*n/2 + 2)*sqrt(b*x**n)/(b**2*(-3*n + 4))
```

Mathematica [A] time = 0.0120141, size = 22, normalized size = 0.79

$$\frac{x^2}{\left(2-\frac{3n}{2}\right)(bx^n)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(b*x^n)^(3/2),x]

[Out] x^2/((2 - (3*n)/2)*(b*x^n)^(3/2))
```

Maple [A] time = 0.003, size = 20, normalized size = 0.7

$$-2\frac{x^2}{(3n-4)(bx^n)^{3/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(b*x^n)^(3/2),x)
```

```
[Out] -2*x^2/(3*n-4)/(b*x^n)^(3/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(b*x^n)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(b*x^n)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(b*x**n)**(3/2),x)
```

```
[Out] Exception raised: TypeError
```

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

$$\int \frac{x}{(bx^n)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(b*x^n)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x/(b*x^n)^(3/2), x)
```

3.151 $\int \frac{1}{(bx^n)^{3/2}}\,dx$

Optimal. Leaf size=28

$$\frac{2x^{1-n}}{b(2-3n)\sqrt{bx^n}}$$

```
[Out] (2*x^(1 - n))/(b*(2 - 3*n)*Sqrt[b*x^n])
```

Rubi [A] time = 0.0201196, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{2x^{1-n}}{b(2-3n)\sqrt{bx^n}}$$

Antiderivative was successfully verified.

```
[In] Int[(b*x^n)^(-3/2),x]
```

```
[Out] (2*x^(1 - n))/(b*(2 - 3*n)*Sqrt[b*x^n])
```

Rubi in Sympy [A] time = 2.88221, size = 31, normalized size = 1.11

$$\frac{2x^{-\frac{n}{2}}x^{-\frac{3n}{2}+1}\sqrt{bx^n}}{b^2\left(-3n+2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(b*x**n)**(3/2),x)
```

```
[Out] 2*x**(-n/2)*x**(-3*n/2 + 1)*sqrt(b*x**n)/(b**2*(-3*n + 2))
```

Mathematica [A] time = 0.0117402, size = 20, normalized size = 0.71

$$\frac{x}{\left(1-\frac{3n}{2}\right)\left(bx^n\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(b*x^n)^(-3/2),x]
```

```
[Out] x/((1 - (3*n)/2)*(b*x^n)^(3/2))
```

Maple [A] time = 0.001, size = 18, normalized size = 0.6

$$-2\,\frac{x}{\left(-2+3\,n\right)\left(bx^n\right)^{3/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*x^n)^(3/2),x)
```

```
[Out] -2*x/(-2+3*n)/(b*x^n)^(3/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(-3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(-3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**n)**(3/2),x)
```

```
[Out] Exception raised: TypeError
```

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

$$\int \frac{1}{(bx^n)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(-3/2),x, algorithm="giac")
```

```
[Out] integrate((b*x^n)^(-3/2), x)
```

3.152 $\int \frac{1}{x(bx^n)^{3/2}}\,dx$

Optimal. Leaf size=24

$$-\frac{2x^{-n}}{3bn\sqrt{bx^n}}$$

```
[Out] -2/(3*b*n*x^n*Sqrt[b*x^n])
```

Rubi [A] time = 0.0134057, antiderivative size = 24, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{2x^{-n}}{3bn\sqrt{bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(b*x^n)^(3/2)),x]

[Out] -2/(3*b*n*x^n*Sqrt[b*x^n])
```

Rubi in Sympy [A] time = 2.811, size = 14, normalized size = 0.58

$$-\frac{2}{3n\left(bx^n\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(b*x**n)**(3/2),x)

[Out] -2/(3*n*(b*x**n)**(3/2))
```

Mathematica [A] time = 0.00612223, size = 16, normalized size = 0.67

$$-\frac{2}{3n\left(bx^n\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(b*x^n)^(3/2)),x]

[Out] -2/(3*n*(b*x^n)^(3/2))
```

Maple [A] time = 0.003, size = 13, normalized size = 0.5

$$-\frac{2}{3\,n}\left(bx^n\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(b*x^n)^(3/2),x)

[Out] -2/3/n/(b*x^n)^(3/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n)^(3/2)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.279358, size = 27, normalized size = 1.12

$$-\frac{2}{3\,\sqrt{bx^{n}}bnx^{n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n)^(3/2)*x),x, algorithm="fricas")
```

```
[Out] -2/3/(sqrt(b*x^n)*b*n*x^n)
```

Sympy [A] time = 9.45232, size = 26, normalized size = 1.08

$$\begin{cases} -\frac{2}{3b^{\frac{3}{2}}n(x^{n})^{\frac{3}{2}}} & \text{for } n \neq 0 \\ \frac{\log(x)}{b^{\frac{3}{2}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(b*x**n)**(3/2),x)
```

```
[Out] Piecewise((-2/(3*b**(3/2)*n*(x**n)**(3/2)), Ne(n, 0)), (log(x)/b*
*(3/2), True))
```

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

$$\int \frac{1}{(bx^{n})^{\frac{3}{2}}\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n)^(3/2)*x),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^n)^(3/2)*x), x)
```

3.153 $\int \frac{1}{x^2(bx^n)^{3/2}}\,dx$

Optimal. Leaf size=28

$$-\frac{2x^{-n-1}}{b(3n+2)\sqrt{bx^n}}$$

```
[Out] (-2*x^(-1 - n))/(b*(2 + 3*n)*Sqrt[b*x^n])
```

Rubi [A] time = 0.0199551, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$-\frac{2x^{-n-1}}{b(3n+2)\sqrt{bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(b*x^n)^(3/2)),x]

[Out] (-2*x^(-1 - n))/(b*(2 + 3*n)*Sqrt[b*x^n])
```

Rubi in Sympy [A] time = 3.69021, size = 34, normalized size = 1.21

$$-\frac{2x^{-\frac{n}{2}}x^{-\frac{3n}{2}-1}\sqrt{bx^n}}{b^2\,(3n+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(b*x**n)**(3/2),x)

[Out] -2*x**(-n/2)*x**(-3*n/2 - 1)*sqrt(b*x**n)/(b**2*(3*n + 2))
```

Mathematica [A] time = 0.0199225, size = 22, normalized size = 0.79

$$\frac{1}{\left(-\frac{3n}{2}-1\right)x\,(bx^n)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*(b*x^n)^(3/2)),x]

[Out] 1/((-1 - (3*n)/2)*x*(b*x^n)^(3/2))
```

Maple [A] time = 0.003, size = 20, normalized size = 0.7

$$-2\,\frac{1}{x\,(2+3\,n)\,(bx^n)^{3/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(b*x^n)^(3/2),x)
```

```
[Out] -2/x/(2+3*n)/(b*x^n)^(3/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n)^(3/2)*x^2),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n)^(3/2)*x^2),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(b*x**n)**(3/2),x)

[Out] Timed out
```

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

$$\int \frac{1}{(bx^n)^{\frac{3}{2}} x^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n)^(3/2)*x^2),x, algorithm="giac")

[Out] integrate(1/((b*x^n)^(3/2)*x^2), x)
```

3.154 $\int \frac{1}{x^3(bx^n)^{3/2}}\,dx$

Optimal. Leaf size=28

$$-\frac{2x^{-n-2}}{b(3n+4)\sqrt{bx^n}}$$

```
[Out] (-2*x^(-2 - n))/(b*(4 + 3*n)*Sqrt[b*x^n])
```

Rubi [A] time = 0.0193791, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$-\frac{2x^{-n-2}}{b(3n+4)\sqrt{bx^n}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^3*(b*x^n)^(3/2)),x]
```

```
[Out] (-2*x^(-2 - n))/(b*(4 + 3*n)*Sqrt[b*x^n])
```

Rubi in Sympy [A] time = 3.76249, size = 34, normalized size = 1.21

$$-\frac{2x^{-\frac{n}{2}}x^{-\frac{3n}{2}-2}\sqrt{bx^n}}{b^2(3n+4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**3/(b*x**n)**(3/2),x)
```

```
[Out] -2*x**(-n/2)*x**(-3*n/2 - 2)*sqrt(b*x**n)/(b**2*(3*n + 4))
```

Mathematica [A] time = 0.0175594, size = 22, normalized size = 0.79

$$\frac{1}{\left(-\frac{3n}{2}-2\right)x^2(bx^n)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^3*(b*x^n)^(3/2)),x]
```

```
[Out] 1/((-2 - (3*n)/2)*x^2*(b*x^n)^(3/2))
```

Maple [A] time = 0.003, size = 20, normalized size = 0.7

$$-2\,\frac{1}{x^2(4+3\,n)(bx^n)^{3/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^3/(b*x^n)^(3/2),x)
```

```
[Out] -2/x^2/(4+3*n)/(b*x^n)^(3/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n)^(3/2)*x^3),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n)^(3/2)*x^3),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(b*x**n)**(3/2),x)

[Out] Timed out
```

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

$$\int \frac{1}{\left(bx^n\right)^{\frac{3}{2}} x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n)^(3/2)*x^3),x, algorithm="giac")

[Out] integrate(1/((b*x^n)^(3/2)*x^3), x)
```

3.155 $\int \frac{1}{x^4(bx^n)^{3/2}}\,dx$

Optimal. Leaf size=28

$$-\frac{2x^{-n-3}}{3b(n+2)\sqrt{bx^n}}$$

```
[Out] (-2*x^(-3 - n))/(3*b*(2 + n)*Sqrt[b*x^n])
```

Rubi [A] time = 0.0197548, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{2x^{-n-3}}{3b(n+2)\sqrt{bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*(b*x^n)^(3/2)),x]
```

```
[Out] (-2*x^(-3 - n))/(3*b*(2 + n)*Sqrt[b*x^n])
```

Rubi in Sympy [A] time = 3.61729, size = 34, normalized size = 1.21

$$-\frac{2x^{-\frac{n}{2}}x^{-\frac{3n}{2}-3}\sqrt{bx^n}}{3b^2\,(n+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(b*x**n)**(3/2),x)
```

```
[Out] -2*x**(-n/2)*x**(-3*n/2 - 3)*sqrt(b*x**n)/(3*b**2*(n + 2))
```

Mathematica [A] time = 0.0144876, size = 22, normalized size = 0.79

$$\frac{1}{\left(-\frac{3n}{2}-3\right)\,x^3\,(bx^n)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*(b*x^n)^(3/2)),x]
```

```
[Out] 1/((-3 - (3*n)/2)*x^3*(b*x^n)^(3/2))
```

Maple [A] time = 0.002, size = 18, normalized size = 0.6

$$-\frac{2}{3\,x^3\,(2+n)}\,(bx^n)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(b*x^n)^(3/2),x)
```

```
[Out] -2/3/x^3/(2+n)/(b*x^n)^(3/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n)^(3/2)*x^4),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n)^(3/2)*x^4),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(b*x**n)**(3/2),x)

[Out] Exception raised: TypeError
```

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

$$\int \frac{1}{(bx^n)^{\frac{3}{2}} x^4} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n)^(3/2)*x^4),x, algorithm="giac")

[Out] integrate(1/((b*x^n)^(3/2)*x^4), x)
```

3.156 $\int \frac{x^m}{(ax^n)^{3/2}}\,dx$

Optimal. Leaf size=32

$$\frac{2x^{m-n+1}}{a(2m-3n+2)\sqrt{ax^n}}$$

```
[Out] (2*x^(1 + m - n))/(a*(2 + 2*m - 3*n)*Sqrt[a*x^n])
```

Rubi [A] time = 0.0241837, antiderivative size = 32, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{2x^{m-n+1}}{a(2m-3n+2)\sqrt{ax^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m/(a*x^n)^(3/2),x]
```

```
[Out] (2*x^(1 + m - n))/(a*(2 + 2*m - 3*n)*Sqrt[a*x^n])
```

Rubi in Sympy [A] time = 4.08501, size = 36, normalized size = 1.12

$$\frac{2x^{-\frac{n}{2}}x^{m-\frac{3n}{2}+1}\sqrt{ax^n}}{a^2(2m-3n+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m/(a*x**n)**(3/2),x)
```

```
[Out] 2*x**(-n/2)*x**(m - 3*n/2 + 1)*sqrt(a*x**n)/(a**2*(2*m - 3*n + 2)
)
```

Mathematica [A] time = 0.0175706, size = 25, normalized size = 0.78

$$\frac{x^{m+1}}{\left(m-\frac{3n}{2}+1\right)(ax^n)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m/(a*x^n)^(3/2),x]
```

```
[Out] x^(1 + m)/((1 + m - (3*n)/2)*(a*x^n)^(3/2))
```

Maple [A] time = 0.003, size = 25, normalized size = 0.8

$$2\,{\frac{x^{1+m}}{(2+2\,m-3\,n)(ax^n)^{3/2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m/(a*x^n)^(3/2),x)
```

```
[Out] 2*x^(1+m)/(2+2*m-3*n)/(a*x^n)^(3/2)
```

Maxima [A] time = 1.4603, size = 32, normalized size = 1.

$$\frac{2\,xx^m}{a^{\frac{3}{2}}(2\,m-3\,n+2)(x^n)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(a*x^n)^(3/2),x, algorithm="maxima")

[Out] 2*x*x^m/(a^(3/2)*(2*m - 3*n + 2)*(x^n)^(3/2))
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(a*x^n)^(3/2),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m/(a*x**n)**(3/2),x)

[Out] Timed out
```

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

$$\int \frac{x^m}{(ax^n)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(a*x^n)^(3/2),x, algorithm="giac")

[Out] integrate(x^m/(a*x^n)^(3/2), x)
```

3.157 $\int \frac{(cx)^m}{(ax^n)^{3/2}} \, dx$

Optimal. Leaf size=36

$$\frac{2x^{1-n}(cx)^m}{a(2m-3n+2)\sqrt{ax^n}}$$

```
[Out] (2*x^(1 - n)*(c*x)^m)/(a*(2 + 2*m - 3*n)*Sqrt[a*x^n])
```

Rubi [A] time = 0.0204434, antiderivative size = 36, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$\frac{2x^{1-n}(cx)^m}{a(2m-3n+2)\sqrt{ax^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^m/(a*x^n)^(3/2),x]
```

```
[Out] (2*x^(1 - n)*(c*x)^m)/(a*(2 + 2*m - 3*n)*Sqrt[a*x^n])
```

Rubi in Sympy [A] time = 6.20105, size = 44, normalized size = 1.22

$$\frac{2x^{-m}x^{-\frac{n}{2}}x^{m-\frac{3n}{2}+1}\sqrt{ax^n}\,(cx)^m}{a^2\,(2m-3n+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**m/(a*x**n)**(3/2),x)
```

```
[Out] 2*x**(-m)*x**(-n/2)*x**(m - 3*n/2 + 1)*sqrt(a*x**n)*(c*x)**m/(a**
2*(2*m - 3*n + 2))
```

Mathematica [A] time = 0.0108436, size = 26, normalized size = 0.72

$$\frac{x(cx)^m}{\left(m-\frac{3n}{2}+1\right)(ax^n)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^m/(a*x^n)^(3/2),x]
```

```
[Out] (x*(c*x)^m)/((1 + m - (3*n)/2)*(a*x^n)^(3/2))
```

Maple [A] time = 0.003, size = 26, normalized size = 0.7

$$2\,{\frac{x\,(cx)^m}{(2+2\,m-3\,n)\,(ax^n)^{3/2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^m/(a*x^n)^(3/2),x)
```

```
[Out] 2*x/(2+2*m-3*n)*(c*x)^m/(a*x^n)^(3/2)
```

Maxima [A] time = 1.47307, size = 36, normalized size = 1.

$$\frac{2\,c^{m}xx^{m}}{a^{\frac{3}{2}}(2\,m-3\,n+2)(x^{n})^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m/(a*x^n)^(3/2),x, algorithm="maxima")
```

```
[Out] 2*c^m*x*x^m/(a^(3/2)*(2*m - 3*n + 2)*(x^n)^(3/2))
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m/(a*x^n)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**m/(a*x**n)**(3/2),x)
```

```
[Out] Timed out
```

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

$$\int \frac{(cx)^{m}}{(ax^{n})^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m/(a*x^n)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((c*x)^m/(a*x^n)^(3/2), x)
```

3.158 $\int x^m (bx^n)^{3/2} \, dx$

Optimal. Leaf size=28

$$\frac{2b\sqrt{bx^n}x^{m+n+1}}{2m+3n+2}$$

```
[Out] (2*b*x^(1 + m + n)*Sqrt[b*x^n])/(2 + 2*m + 3*n)
```

Rubi [A] time = 0.0196735, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{2b\sqrt{bx^n}x^{m+n+1}}{2m+3n+2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m*(b*x^n)^(3/2),x]

[Out] (2*b*x^(1 + m + n)*Sqrt[b*x^n])/(2 + 2*m + 3*n)
```

Rubi in Sympy [A] time = 3.54806, size = 34, normalized size = 1.21

$$\frac{2bx^{-\frac{n}{2}}x^{m+\frac{3n}{2}+1}\sqrt{bx^n}}{2m+3n+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(b*x**n)**(3/2),x)

[Out] 2*b*x**(-n/2)*x**(m + 3*n/2 + 1)*sqrt(b*x**n)/(2*m + 3*n + 2)
```

Mathematica [A] time = 0.0124342, size = 25, normalized size = 0.89

$$\frac{x^{m+1}(bx^n)^{3/2}}{m+\frac{3n}{2}+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m*(b*x^n)^(3/2),x]

[Out] (x^(1 + m)*(b*x^n)^(3/2))/(1 + m + (3*n)/2)
```

Maple [A] time = 0.001, size = 25, normalized size = 0.9

$$2\,\frac{x^{1+m}(bx^n)^{3/2}}{2+2\,m+3\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(b*x^n)^(3/2),x)

[Out] 2*x^(1+m)/(2+2*m+3*n)*(b*x^n)^(3/2)
```

Maxima [A] time = 1.45279, size = 32, normalized size = 1.14

$$\frac{2 b^{\frac{3}{2}} x x^{m} (x^{n})^{\frac{3}{2}}}{2 m + 3 n + 2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(3/2)*x^m,x, algorithm="maxima")

[Out] 2*b^(3/2)*x*x^m*(x^n)^(3/2)/(2*m + 3*n + 2)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(3/2)*x^m,x, algorithm="fricas")

[Out] Exception raised: TypeError
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(b*x**n)**(3/2),x)

[Out] Timed out
```

GIAC/XCAS [A] time = 0.227339, size = 36, normalized size = 1.29

$$\frac{2 b^{\frac{3}{2}} x e^{\left(m \ln(x) + \frac{3}{2} n \ln(x)\right)}}{2 m + 3 n + 2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(3/2)*x^m,x, algorithm="giac")

[Out] 2*b^(3/2)*x*e^(m*ln(x) + 3/2*n*ln(x))/(2*m + 3*n + 2)
```

3.159 $\int x^m \sqrt{bx^n} \, dx$

Optimal. Leaf size=24

$$\frac{2x^{m+1}\sqrt{bx^n}}{2m+n+2}$$

```
[Out] (2*x^(1 + m)*Sqrt[b*x^n])/(2 + 2*m + n)
```

Rubi [A] time = 0.017473, antiderivative size = 24, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{2x^{m+1}\sqrt{bx^n}}{2m+n+2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m*Sqrt[b*x^n],x]

[Out] (2*x^(1 + m)*Sqrt[b*x^n])/(2 + 2*m + n)
```

Rubi in Sympy [A] time = 3.38072, size = 29, normalized size = 1.21

$$\frac{2x^{-\frac{n}{2}}x^{m+\frac{n}{2}+1}\sqrt{bx^n}}{2m+n+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(b*x**n)**(1/2),x)

[Out] 2*x**(-n/2)*x**(m + n/2 + 1)*sqrt(b*x**n)/(2*m + n + 2)
```

Mathematica [A] time = 0.00817237, size = 25, normalized size = 1.04

$$\frac{x^{m+1}\sqrt{bx^n}}{m+\frac{n}{2}+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m*Sqrt[b*x^n],x]

[Out] (x^(1 + m)*Sqrt[b*x^n])/(1 + m + n/2)
```

Maple [A] time = 0.003, size = 23, normalized size = 1.

$$2\,\frac{x^{1+m}\sqrt{bx^n}}{2+2\,m+n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(b*x^n)^(1/2),x)

[Out] 2*x^(1+m)*(b*x^n)^(1/2)/(2+2*m+n)
```

Maxima [A] time = 1.45467, size = 30, normalized size = 1.25

$$\frac{2\sqrt{b}xx^m\sqrt{x^n}}{2m+n+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n)*x^m,x, algorithm="maxima")
```

```
[Out] 2*sqrt(b)*x*x^m*sqrt(x^n)/(2*m + n + 2)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n)*x^m,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(b*x**n)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.227212, size = 34, normalized size = 1.42

$$\frac{2\sqrt{b}xe^{\left(m\ln(x)+\frac{1}{2}n\ln(x)\right)}}{2m+n+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n)*x^m,x, algorithm="giac")
```

```
[Out] 2*sqrt(b)*x*e^(m*ln(x) + 1/2*n*ln(x))/(2*m + n + 2)
```

3.160 $\int \frac{x^m}{\sqrt{bx^n}}\,dx$

Optimal. Leaf size=26

$$\frac{2x^{m+1}}{(2m-n+2)\sqrt{bx^n}}$$

```
[Out] (2*x^(1 + m))/((2 + 2*m - n)*Sqrt[b*x^n])
```

Rubi [A] time = 0.0186377, antiderivative size = 26, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{2x^{m+1}}{(2m-n+2)\sqrt{bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m/Sqrt[b*x^n],x]

[Out] (2*x^(1 + m))/((2 + 2*m - n)*Sqrt[b*x^n])
```

Rubi in Sympy [A] time = 3.92869, size = 31, normalized size = 1.19

$$\frac{2x^{-\frac{n}{2}}x^{m-\frac{n}{2}+1}\sqrt{bx^n}}{b\,(2m-n+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m/(b*x**n)**(1/2),x)

[Out] 2*x**(-n/2)*x**(m - n/2 + 1)*sqrt(b*x**n)/(b*(2*m - n + 2))
```

Mathematica [A] time = 0.0123315, size = 25, normalized size = 0.96

$$\frac{x^{m+1}}{\left(m-\frac{n}{2}+1\right)\sqrt{bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m/Sqrt[b*x^n],x]

[Out] x^(1 + m)/((1 + m - n/2)*Sqrt[b*x^n])
```

Maple [A] time = 0.003, size = 25, normalized size = 1.

$$2\,{\frac{x^{1+m}}{(2+2\,m-n)\sqrt{bx^n}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m/(b*x^n)^(1/2),x)
```

```
[Out] 2*x^(1+m)/(2+2*m-n)/(b*x^n)^(1/2)
```

Maxima [A] time = 1.46164, size = 32, normalized size = 1.23

$$\frac{2\,xx^m}{\sqrt{b}(2\,m-n+2)\sqrt{x^n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/sqrt(b*x^n),x, algorithm="maxima")
```

```
[Out] 2*x*x^m/(sqrt(b)*(2*m - n + 2)*sqrt(x^n))
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/sqrt(b*x^n),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m/(b*x**n)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

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

$$\int \frac{x^m}{\sqrt{bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/sqrt(b*x^n),x, algorithm="giac")
```

```
[Out] integrate(x^m/sqrt(b*x^n), x)
```

3.161 $\int \frac{x^m}{(bx^n)^{3/2}}\,dx$

Optimal. Leaf size=32

$$\frac{2x^{m-n+1}}{b(2m-3n+2)\sqrt{bx^n}}$$

```
[Out] (2*x^(1 + m - n))/(b*(2 + 2*m - 3*n)*Sqrt[b*x^n])
```

Rubi [A] time = 0.0186732, antiderivative size = 32, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$\frac{2x^{m-n+1}}{b(2m-3n+2)\sqrt{bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m/(b*x^n)^(3/2),x]
```

```
[Out] (2*x^(1 + m - n))/(b*(2 + 2*m - 3*n)*Sqrt[b*x^n])
```

Rubi in Sympy [A] time = 4.05299, size = 36, normalized size = 1.12

$$\frac{2x^{-\frac{n}{2}}x^{m-\frac{3n}{2}+1}\sqrt{bx^n}}{b^2(2m-3n+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m/(b*x**n)**(3/2),x)
```

```
[Out] 2*x**(-n/2)*x**(m - 3*n/2 + 1)*sqrt(b*x**n)/(b**2*(2*m - 3*n + 2)
)
```

Mathematica [A] time = 0.0137839, size = 25, normalized size = 0.78

$$\frac{x^{m+1}}{\left(m-\frac{3n}{2}+1\right)(bx^n)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m/(b*x^n)^(3/2),x]
```

```
[Out] x^(1 + m)/((1 + m - (3*n)/2)*(b*x^n)^(3/2))
```

Maple [A] time = 0.002, size = 25, normalized size = 0.8

$$2\,\frac{x^{1+m}}{(2+2\,m-3\,n)(bx^n)^{3/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m/(b*x^n)^(3/2),x)
```

```
[Out] 2*x^(1+m)/(2+2*m-3*n)/(b*x^n)^(3/2)
```

Maxima [A] time = 1.46074, size = 32, normalized size = 1.

$$\frac{2\,xx^{m}}{b^{\frac{3}{2}}(2\,m-3\,n+2)(x^{n})^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^n)^(3/2),x, algorithm="maxima")

[Out] 2*x*x^m/(b^(3/2)*(2*m - 3*n + 2)*(x^n)^(3/2))
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^n)^(3/2),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m/(b*x**n)**(3/2),x)

[Out] Timed out
```

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

$$\int \frac{x^{m}}{(bx^{n})^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^n)^(3/2),x, algorithm="giac")

[Out] integrate(x^m/(b*x^n)^(3/2), x)
```

3.162 $\int (cx)^m (bx^n)^{5/2} \, dx$

Optimal. Leaf size=31

$$\frac{2 (bx^n)^{5/2} (cx)^{m+1}}{c(2m+5n+2)}$$

[Out] (2*(c*x)^(1 + m)*(b*x^n)^(5/2))/(c*(2 + 2*m + 5*n))

Rubi [A] time = 0.0301622, antiderivative size = 36, normalized size of antiderivative = 1.16, number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$\frac{2b^2 x^{2n+1} \sqrt{bx^n} (cx)^m}{2m+5n+2}$$

Antiderivative was successfully verified.

[In] Int[(c*x)^m*(b*x^n)^(5/2),x]

[Out] (2*b^2*x^(1 + 2*n)*(c*x)^m*Sqrt[b*x^n])/(2 + 2*m + 5*n)

Rubi in Sympy [A] time = 5.96833, size = 44, normalized size = 1.42

$$\frac{2b^2 x^{-m} x^{-\frac{n}{2}} x^{m+\frac{5n}{2}+1} \sqrt{bx^n} (cx)^m}{2m+5n+2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((c*x)**m*(b*x**n)**(5/2),x)

[Out] 2*b**2*x**(-m)*x**(-n/2)*x**(m + 5*n/2 + 1)*sqrt(b*x**n)*(c*x)**m /(2*m + 5*n + 2)

Mathematica [A] time = 0.0190281, size = 26, normalized size = 0.84

$$\frac{x (bx^n)^{5/2} (cx)^m}{m+\frac{5n}{2}+1}$$

Antiderivative was successfully verified.

[In] Integrate[(c*x)^m*(b*x^n)^(5/2),x]

[Out] (x*(c*x)^m*(b*x^n)^(5/2))/(1 + m + (5*n)/2)

Maple [A] time = 0.003, size = 26, normalized size = 0.8

$$2\,\frac{x (cx)^m (bx^n)^{5/2}}{2+2\,m+5\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((c*x)^m*(b*x^n)^(5/2),x)

```
[Out] 2*x/(2+2*m+5*n)*(c*x)^m*(b*x^n)^(5/2)
```

Maxima [A] time = 1.4643, size = 36, normalized size = 1.16

$$\frac{2\,b^{\frac{5}{2}}c^{m}xx^{m}(x^{n})^{\frac{5}{2}}}{2\,m+5\,n+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(5/2)*(c*x)^m,x, algorithm="maxima")
```

```
[Out] 2*b^(5/2)*c^m*x*x^m*(x^n)^(5/2)/(2*m + 5*n + 2)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(5/2)*(c*x)^m,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**m*(b*x**n)**(5/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.237539, size = 42, normalized size = 1.35

$$\frac{2\,b^{\frac{5}{2}}xe^{\left(m\ln(c)+m\ln(x)+\frac{5}{2}\,n\ln(x)\right)}}{2\,m+5\,n+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(5/2)*(c*x)^m,x, algorithm="giac")
```

```
[Out] 2*b^(5/2)*x*e^(m*ln(c) + m*ln(x) + 5/2*n*ln(x))/(2*m + 5*n + 2)
```

3.163 $\int (cx)^m (bx^n)^{3/2} \, dx$

Optimal. Leaf size=32

$$\frac{2bx^{n+1}\sqrt{bx^n}(cx)^m}{2m+3n+2}$$

```
[Out] (2*b*x^(1 + n)*(c*x)^m*Sqrt[b*x^n])/(2 + 2*m + 3*n)
```

Rubi [A] time = 0.0205336, antiderivative size = 32, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$\frac{2bx^{n+1}\sqrt{bx^n}(cx)^m}{2m+3n+2}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^m*(b*x^n)^(3/2),x]
```

```
[Out] (2*b*x^(1 + n)*(c*x)^m*Sqrt[b*x^n])/(2 + 2*m + 3*n)
```

Rubi in Sympy [A] time = 5.27682, size = 42, normalized size = 1.31

$$\frac{2bx^{-m}x^{-\frac{n}{2}}x^{m+\frac{3n}{2}+1}\sqrt{bx^n}\,(cx)^m}{2m+3n+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**m*(b*x**n)**(3/2),x)
```

```
[Out] 2*b*x**(-m)*x**(-n/2)*x**(m + 3*n/2 + 1)*sqrt(b*x**n)*(c*x)**m/(2
*m + 3*n + 2)
```

Mathematica [A] time = 0.0113741, size = 26, normalized size = 0.81

$$\frac{x\,(bx^n)^{3/2}\,(cx)^m}{m+\frac{3n}{2}+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^m*(b*x^n)^(3/2),x]
```

```
[Out] (x*(c*x)^m*(b*x^n)^(3/2))/(1 + m + (3*n)/2)
```

Maple [A] time = 0.002, size = 26, normalized size = 0.8

$$2\,\frac{x\,(cx)^m\,(bx^n)^{3/2}}{2+2\,m+3\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^m*(b*x^n)^(3/2),x)
```

```
[Out] 2*x/(2+2*m+3*n)*(c*x)^m*(b*x^n)^(3/2)
```

Maxima [A] time = 1.45865, size = 36, normalized size = 1.12

$$\frac{2\,b^{\frac{3}{2}}c^{m}xx^{m}(x^{n})^{\frac{3}{2}}}{2\,m+3\,n+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(3/2)*(c*x)^m,x, algorithm="maxima")
```

```
[Out] 2*b^(3/2)*c^m*x*x^m*(x^n)^(3/2)/(2*m + 3*n + 2)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(3/2)*(c*x)^m,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**m*(b*x**n)**(3/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.23334, size = 42, normalized size = 1.31

$$\frac{2\,b^{\frac{3}{2}}xe^{\left(m\ln(c)+m\ln(x)+\frac{3}{2}\,n\ln(x)\right)}}{2\,m+3\,n+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(3/2)*(c*x)^m,x, algorithm="giac")
```

```
[Out] 2*b^(3/2)*x*e^(m*ln(c) + m*ln(x) + 3/2*n*ln(x))/(2*m + 3*n + 2)
```

3.164 $\int (cx)^m \sqrt{bx^n}\, dx$

Optimal. Leaf size=29

$$\frac{2\sqrt{bx^n}(cx)^{m+1}}{c(2m+n+2)}$$

```
[Out] (2*(c*x)^(1 + m)*Sqrt[b*x^n])/(c*(2 + 2*m + n))
```

Rubi [A] time = 0.017384, antiderivative size = 25, normalized size of antiderivative = 0.86, number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$\frac{2x\sqrt{bx^n}(cx)^m}{2m+n+2}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^m*Sqrt[b*x^n],x]
```

```
[Out] (2*x*(c*x)^m*Sqrt[b*x^n])/(2 + 2*m + n)
```

Rubi in Sympy [A] time = 4.94397, size = 37, normalized size = 1.28

$$\frac{2x^{-m}x^{-\frac{n}{2}}x^{m+\frac{n}{2}+1}\sqrt{bx^n}\,(cx)^m}{2m+n+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**m*(b*x**n)**(1/2),x)
```

```
[Out] 2*x**(-m)*x**(-n/2)*x**(m + n/2 + 1)*sqrt(b*x**n)*(c*x)**m/(2*m +
 n + 2)
```

Mathematica [A] time = 0.00890545, size = 26, normalized size = 0.9

$$\frac{x\sqrt{bx^n}(cx)^m}{m+\frac{n}{2}+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^m*Sqrt[b*x^n],x]
```

```
[Out] (x*(c*x)^m*Sqrt[b*x^n])/(1 + m + n/2)
```

Maple [A] time = 0.002, size = 24, normalized size = 0.8

$$2\,{\frac{x\left(cx\right)^{m}\sqrt{b{x}^{n}}}{2+2\,m+n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^m*(b*x^n)^(1/2),x)
```

```
[Out] 2*x*(c*x)^m*(b*x^n)^(1/2)/(2+2*m+n)
```

Maxima [A] time = 1.45972, size = 34, normalized size = 1.17

$$\frac{2\sqrt{b}c^{m}xx^{m}\sqrt{x^{n}}}{2m+n+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n)*(c*x)^m,x, algorithm="maxima")
```

```
[Out] 2*sqrt(b)*c^m*x*x^m*sqrt(x^n)/(2*m + n + 2)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n)*(c*x)^m,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**m*(b*x**n)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [A] time = 0.222928, size = 39, normalized size = 1.34

$$\frac{2\sqrt{b}xe^{\left(m\ln(c)+m\ln(x)+\frac{1}{2}n\ln(x)\right)}}{2m+n+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n)*(c*x)^m,x, algorithm="giac")
```

```
[Out] 2*sqrt(b)*x*e^(m*ln(c) + m*ln(x) + 1/2*n*ln(x))/(2*m + n + 2)
```

3.165 $\int \frac{(cx)^m}{\sqrt{bx^n}}\,dx$

Optimal. Leaf size=27

$$\frac{2x(cx)^m}{(2m-n+2)\sqrt{bx^n}}$$

```
[Out] (2*x*(c*x)^m)/((2 + 2*m - n)*Sqrt[b*x^n])
```

Rubi [A] time = 0.0183033, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{2x(cx)^m}{(2m-n+2)\sqrt{bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^m/Sqrt[b*x^n],x]
```

```
[Out] (2*x*(c*x)^m)/((2 + 2*m - n)*Sqrt[b*x^n])
```

Rubi in Sympy [A] time = 6.05094, size = 39, normalized size = 1.44

$$\frac{2x^{-m}x^{-\frac{n}{2}}x^{m-\frac{n}{2}+1}\sqrt{bx^n}\,(cx)^m}{b\,(2m-n+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**m/(b*x**n)**(1/2),x)
```

```
[Out] 2*x**(-m)*x**(-n/2)*x**(m - n/2 + 1)*sqrt(b*x**n)*(c*x)**m/(b*(2*
m - n + 2))
```

Mathematica [A] time = 0.00952749, size = 26, normalized size = 0.96

$$\frac{x(cx)^m}{\left(m-\frac{n}{2}+1\right)\sqrt{bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^m/Sqrt[b*x^n],x]
```

```
[Out] (x*(c*x)^m)/((1 + m - n/2)*Sqrt[b*x^n])
```

Maple [A] time = 0.002, size = 26, normalized size = 1.

$$2\,\frac{x\,(cx)^m}{(2+2\,m-n)\,\sqrt{bx^n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^m/(b*x^n)^(1/2),x)
```

```
[Out] 2*x*(c*x)^m/(2+2*m-n)/(b*x^n)^(1/2)
```

Maxima [A] time = 1.46602, size = 36, normalized size = 1.33

$$\frac{2\, c^m x x^m}{\sqrt{b}(2\, m - n + 2)\sqrt{x^n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m/sqrt(b*x^n),x, algorithm="maxima")
```

```
[Out] 2*c^m*x*x^m/(sqrt(b)*(2*m - n + 2)*sqrt(x^n))
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m/sqrt(b*x^n),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**m/(b*x**n)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

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

$$\int \frac{(cx)^m}{\sqrt{bx^n}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m/sqrt(b*x^n),x, algorithm="giac")
```

```
[Out] integrate((c*x)^m/sqrt(b*x^n), x)
```

3.166 $\int \frac{(cx)^m}{(bx^n)^{3/2}}\,dx$

Optimal. Leaf size=36

$$\frac{2x^{1-n}(cx)^m}{b(2m-3n+2)\sqrt{bx^n}}$$

```
[Out] (2*x^(1 - n)*(c*x)^m)/(b*(2 + 2*m - 3*n)*Sqrt[b*x^n])
```

Rubi [A] time = 0.0212993, antiderivative size = 36, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$\frac{2x^{1-n}(cx)^m}{b(2m-3n+2)\sqrt{bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^m/(b*x^n)^(3/2),x]
```

```
[Out] (2*x^(1 - n)*(c*x)^m)/(b*(2 + 2*m - 3*n)*Sqrt[b*x^n])
```

Rubi in Sympy [A] time = 6.05171, size = 44, normalized size = 1.22

$$\frac{2x^{-m}x^{-\frac{n}{2}}x^{m-\frac{3n}{2}+1}\sqrt{bx^n}\,(cx)^m}{b^2\,(2m-3n+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**m/(b*x**n)**(3/2),x)
```

```
[Out] 2*x**(-m)*x**(-n/2)*x**(m - 3*n/2 + 1)*sqrt(b*x**n)*(c*x)**m/(b**
2*(2*m - 3*n + 2))
```

Mathematica [A] time = 0.0119936, size = 26, normalized size = 0.72

$$\frac{x(cx)^m}{\left(m-\frac{3n}{2}+1\right)(bx^n)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^m/(b*x^n)^(3/2),x]
```

```
[Out] (x*(c*x)^m)/((1 + m - (3*n)/2)*(b*x^n)^(3/2))
```

Maple [A] time = 0.001, size = 26, normalized size = 0.7

$$2\,\frac{x\,(cx)^m}{(2+2\,m-3\,n)\,(bx^n)^{3/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^m/(b*x^n)^(3/2),x)
```

```
[Out] 2*x/(2+2*m-3*n)*(c*x)^m/(b*x^n)^(3/2)
```

Maxima [A] time = 1.45976, size = 36, normalized size = 1.

$$\frac{2\,c^{m}xx^{m}}{b^{\frac{3}{2}}(2\,m-3\,n+2)(x^{n})^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m/(b*x^n)^(3/2),x, algorithm="maxima")
```

```
[Out] 2*c^m*x*x^m/(b^(3/2)*(2*m - 3*n + 2)*(x^n)^(3/2))
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m/(b*x^n)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**m/(b*x**n)**(3/2),x)
```

```
[Out] Timed out
```

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

$$\int \frac{(cx)^{m}}{(bx^{n})^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m/(b*x^n)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((c*x)^m/(b*x^n)^(3/2), x)
```

3.167 $\int \frac{(cx)^m}{(bx^n)^{5/2}}\,dx$

Optimal. Leaf size=36

$$\frac{2x^{1-2n}(cx)^m}{b^2(2m-5n+2)\sqrt{bx^n}}$$

```
[Out] (2*x^(1 - 2*n)*(c*x)^m)/(b^2*(2 + 2*m - 5*n)*Sqrt[b*x^n])
```

Rubi [A] time = 0.0308284, antiderivative size = 36, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{2x^{1-2n}(cx)^m}{b^2(2m-5n+2)\sqrt{bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^m/(b*x^n)^(5/2),x]
```

```
[Out] (2*x^(1 - 2*n)*(c*x)^m)/(b^2*(2 + 2*m - 5*n)*Sqrt[b*x^n])
```

Rubi in Sympy [A] time = 6.17589, size = 44, normalized size = 1.22

$$\frac{2x^{-m}x^{-\frac{n}{2}}x^{m-\frac{5n}{2}+1}\sqrt{bx^n}\,(cx)^m}{b^3\,(2m-5n+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**m/(b*x**n)**(5/2),x)
```

```
[Out] 2*x**(-m)*x**(-n/2)*x**(m - 5*n/2 + 1)*sqrt(b*x**n)*(c*x)**m/(b**
3*(2*m - 5*n + 2))
```

Mathematica [A] time = 0.018104, size = 26, normalized size = 0.72

$$\frac{x(cx)^m}{\left(m-\frac{5n}{2}+1\right)(bx^n)^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^m/(b*x^n)^(5/2),x]
```

```
[Out] (x*(c*x)^m)/((1 + m - (5*n)/2)*(b*x^n)^(5/2))
```

Maple [A] time = 0.003, size = 26, normalized size = 0.7

$$2\,\frac{x\,(cx)^m}{(2+2\,m-5\,n)\,(bx^n)^{5/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^m/(b*x^n)^(5/2),x)
```

```
[Out] 2*x/(2+2*m-5*n)*(c*x)^m/(b*x^n)^(5/2)
```

Maxima [A] time = 1.46683, size = 36, normalized size = 1.

$$\frac{2\,c^m x x^m}{b^{\frac{5}{2}}(2\,m-5\,n+2)(x^n)^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m/(b*x^n)^(5/2),x, algorithm="maxima")
```

```
[Out] 2*c^m*x*x^m/(b^(5/2)*(2*m - 5*n + 2)*(x^n)^(5/2))
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m/(b*x^n)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**m/(b*x**n)**(5/2),x)
```

```
[Out] Timed out
```

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

$$\int \frac{(cx)^m}{(bx^n)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m/(b*x^n)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((c*x)^m/(b*x^n)^(5/2), x)
```

3.168 $\int x^{-1-\frac{3n}{2}} (bx^n)^{3/2} \, dx$

Optimal. Leaf size=20

$$bx^{-n/2}\log(x)\sqrt{bx^n}$$

```
[Out] (b*Sqrt[b*x^n]*Log[x])/x^(n/2)
```

Rubi [A] time = 0.0086117, antiderivative size = 20, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.105$

$$bx^{-n/2}\log(x)\sqrt{bx^n}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 - (3*n)/2)*(b*x^n)^(3/2),x]
```

```
[Out] (b*Sqrt[b*x^n]*Log[x])/x^(n/2)
```

Rubi in Sympy [A] time = 2.41357, size = 17, normalized size = 0.85

$$bx^{-\frac{n}{2}}\sqrt{bx^n}\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1-3/2*n)*(b*x**n)**(3/2),x)
```

```
[Out] b*x**(-n/2)*sqrt(b*x**n)*log(x)
```

Mathematica [A] time = 0.0079647, size = 19, normalized size = 0.95

$$x^{-3n/2}\log(x)(bx^n)^{3/2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 - (3*n)/2)*(b*x^n)^(3/2),x]
```

```
[Out] ((b*x^n)^(3/2)*Log[x])/x^((3*n)/2)
```

Maple [A] time = 0.054, size = 23, normalized size = 1.2

$$b\ln(x)\sqrt{b\left(x^{\frac{n}{2}}\right)^2}\left(x^{\frac{n}{2}}\right)^{-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-1-3/2*n)*(b*x^n)^(3/2),x)
```

```
[Out] b/(x^(1/2*n))*(b*(x^(1/2*n))^2)^(1/2)*ln(x)
```

Maxima [A] time = 1.49516, size = 8, normalized size = 0.4

$$b^{\frac{3}{2}} \log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(3/2)*x^(-3/2*n - 1),x, algorithm="maxima")
```

```
[Out] b^(3/2)*log(x)
```

Fricas [A] time = 0.239329, size = 8, normalized size = 0.4

$$b^{\frac{3}{2}} \log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(3/2)*x^(-3/2*n - 1),x, algorithm="fricas")
```

```
[Out] b^(3/2)*log(x)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-3/2*n)*(b*x**n)**(3/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.247724, size = 8, normalized size = 0.4

$$b^{\frac{3}{2}} \ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^(3/2)*x^(-3/2*n - 1),x, algorithm="giac")
```

```
[Out] b^(3/2)*ln(x)
```

3.169 $\int x^{-1-\frac{n}{2}}\sqrt{bx^n}\,dx$

Optimal. Leaf size=19

$$x^{-n/2}\log(x)\sqrt{bx^n}$$

```
[Out] (Sqrt[b*x^n]*Log[x])/x^(n/2)
```

Rubi [A] time = 0.0093851, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$x^{-n/2}\log(x)\sqrt{bx^n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - n/2)*Sqrt[b*x^n],x]
```

```
[Out] (Sqrt[b*x^n]*Log[x])/x^(n/2)
```

Rubi in Sympy [A] time = 2.32132, size = 15, normalized size = 0.79

$$x^{-\frac{n}{2}}\sqrt{bx^n}\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-1/2*n)*(b*x**n)**(1/2),x)
```

```
[Out] x**(-n/2)*sqrt(b*x**n)*log(x)
```

Mathematica [A] time = 0.00699099, size = 19, normalized size = 1.

$$x^{-n/2}\log(x)\sqrt{bx^n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - n/2)*Sqrt[b*x^n],x]
```

```
[Out] (Sqrt[b*x^n]*Log[x])/x^(n/2)
```

Maple [A] time = 0.044, size = 22, normalized size = 1.2

$$\ln(x)\sqrt{b\left(x^{\frac{n}{2}}\right)^2}\left(x^{\frac{n}{2}}\right)^{-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-1/2*n)*(b*x^n)^(1/2),x)
```

```
[Out] (b*(x^(1/2*n))^2)^(1/2)/(x^(1/2*n))*ln(x)
```

Maxima [A] time = 1.51002, size = 8, normalized size = 0.42

$$\sqrt{b}\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n)*x^(-1/2*n - 1),x, algorithm="maxima")
```

```
[Out] sqrt(b)*log(x)
```

Fricas [A] time = 0.226512, size = 36, normalized size = 1.89

$$xx^{-\frac{1}{2}\,n-1}\sqrt{\frac{b}{x^2x^{-n-2}}}\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n)*x^(-1/2*n - 1),x, algorithm="fricas")
```

```
[Out] x*x^(-1/2*n - 1)*sqrt(b/(x^2*x^(-n - 2)))*log(x)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-1/2*n)*(b*x**n)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.23396, size = 8, normalized size = 0.42

$$\sqrt{b}\ln\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n)*x^(-1/2*n - 1),x, algorithm="giac")
```

```
[Out] sqrt(b)*ln(x)
```

3.170 $\int \frac{x^{-1+\frac{n}{2}}}{\sqrt{bx^n}}\,dx$

Optimal. Leaf size=19

$$\frac{x^{n/2}\log(x)}{\sqrt{bx^n}}$$

```
[Out] (x^(n/2)*Log[x])/Sqrt[b*x^n]
```

Rubi [A] time = 0.00991851, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$\frac{x^{n/2}\log(x)}{\sqrt{bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + n/2)/Sqrt[b*x^n],x]

[Out] (x^(n/2)*Log[x])/Sqrt[b*x^n]
```

Rubi in Sympy [A] time = 2.64999, size = 17, normalized size = 0.89

$$\frac{x^{-\frac{n}{2}}\sqrt{bx^n}\log(x)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+1/2*n)/(b*x**n)**(1/2),x)

[Out] x**(-n/2)*sqrt(b*x**n)*log(x)/b
```

Mathematica [A] time = 0.00572642, size = 19, normalized size = 1.

$$\frac{x^{n/2}\log(x)}{\sqrt{bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + n/2)/Sqrt[b*x^n],x]

[Out] (x^(n/2)*Log[x])/Sqrt[b*x^n]
```

Maple [A] time = 0.044, size = 20, normalized size = 1.1

$$\ln(x)\,x^{\frac{n}{2}}\frac{1}{\sqrt{b\left(x^{\frac{n}{2}}\right)^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+1/2*n)/(b*x^n)^(1/2),x)
```

```
[Out] 1/(b*(x^(1/2*n))^2)^(1/2)*x^(1/2*n)*ln(x)
```

Maxima [A] time = 1.51275, size = 8, normalized size = 0.42

$$\frac{\log(x)}{\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(1/2*n - 1)/sqrt(b*x^n),x, algorithm="maxima")
```

```
[Out] log(x)/sqrt(b)
```

Fricas [A] time = 0.229689, size = 41, normalized size = 2.16

$$\frac{\sqrt{bx^2x^{n-2}}\log(x)}{bxx^{\frac{1}{2}n-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(1/2*n - 1)/sqrt(b*x^n),x, algorithm="fricas")
```

```
[Out] sqrt(b*x^2*x^(n - 2))*log(x)/(b*x*x^(1/2*n - 1))
```

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

$$\int \frac{x^{\frac{n}{2}-1}}{\sqrt{bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+1/2*n)/(b*x**n)**(1/2),x)
```

```
[Out] Integral(x**(n/2 - 1)/sqrt(b*x**n), x)
```

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

$$\int \frac{x^{\frac{1}{2}n-1}}{\sqrt{bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(1/2*n - 1)/sqrt(b*x^n),x, algorithm="giac")
```

```
[Out] integrate(x^(1/2*n - 1)/sqrt(b*x^n), x)
```

3.171 $\int \frac{x^{-1+\frac{3n}{2}}}{(bx^n)^{3/2}}\,dx$

Optimal. Leaf size=22

$$\frac{x^{n/2}\log(x)}{b\sqrt{bx^n}}$$

```
[Out] (x^(n/2)*Log[x])/(b*Sqrt[b*x^n])
```

Rubi [A] time = 0.00877873, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$\frac{x^{n/2}\log(x)}{b\sqrt{bx^n}}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 + (3*n)/2)/(b*x^n)^(3/2),x]

[Out] (x^(n/2)*Log[x])/(b*Sqrt[b*x^n])
```

Rubi in Sympy [A] time = 2.65139, size = 19, normalized size = 0.86

$$\frac{x^{-\frac{n}{2}}\sqrt{bx^n}\log(x)}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1+3/2*n)/(b*x**n)**(3/2),x)

[Out] x**(-n/2)*sqrt(b*x**n)*log(x)/b**2
```

Mathematica [A] time = 0.00662045, size = 19, normalized size = 0.86

$$\frac{x^{3n/2}\log(x)}{(bx^n)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 + (3*n)/2)/(b*x^n)^(3/2),x]

[Out] (x^((3*n)/2)*Log[x])/(b*x^n)^(3/2)
```

Maple [A] time = 0.045, size = 23, normalized size = 1.1

$$\frac{\ln(x)}{b}x^{\frac{n}{2}}\frac{1}{\sqrt{b\left(x^{\frac{n}{2}}\right)^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-1+3/2*n)/(b*x^n)^(3/2),x)
```

```
[Out] 1/b*x^(1/2*n)/(b*(x^(1/2*n))^2)^(1/2)*ln(x)
```

Maxima [A] time = 1.53026, size = 8, normalized size = 0.36

$$\frac{\log(x)}{b^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2*n - 1)/(b*x^n)^(3/2),x, algorithm="maxima")
```

```
[Out] log(x)/b^(3/2)
```

Fricas [A] time = 0.237995, size = 27, normalized size = 1.23

$$\frac{\sqrt{bx^n}\log(x)}{b^2x^{\frac{1}{2}n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2*n - 1)/(b*x^n)^(3/2),x, algorithm="fricas")
```

```
[Out] sqrt(b*x^n)*log(x)/(b^2*x^(1/2*n))
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+3/2*n)/(b*x**n)**(3/2),x)
```

```
[Out] Timed out
```

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

$$\int \frac{x^{\frac{3}{2}n-1}}{(bx^n)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2*n - 1)/(b*x^n)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^(3/2*n - 1)/(b*x^n)^(3/2), x)
```

3.172 $\int x^m (bx^n)^p \, dx$

Optimal. Leaf size=21

$$\frac{x^{m+1}(bx^n)^p}{m+np+1}$$

```
[Out] (x^(1 + m)*(b*x^n)^p)/(1 + m + n*p)
```

Rubi [A] time = 0.0157806, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{x^{m+1}(bx^n)^p}{m+np+1}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m*(b*x^n)^p,x]
```

```
[Out] (x^(1 + m)*(b*x^n)^p)/(1 + m + n*p)
```

Rubi in Sympy [A] time = 3.3874, size = 26, normalized size = 1.24

$$\frac{x^{-np}x^{m+np+1}(bx^n)^p}{m+np+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(b*x**n)**p,x)
```

```
[Out] x**(-n*p)*x**(m + n*p + 1)*(b*x**n)**p/(m + n*p + 1)
```

Mathematica [A] time = 0.0079071, size = 21, normalized size = 1.

$$\frac{x^{m+1}(bx^n)^p}{m+np+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m*(b*x^n)^p,x]
```

```
[Out] (x^(1 + m)*(b*x^n)^p)/(1 + m + n*p)
```

Maple [A] time = 0.003, size = 22, normalized size = 1.1

$$\frac{x^{1+m}(bx^n)^p}{np+m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(b*x^n)^p,x)
```

```
[Out] x^(1+m)*(b*x^n)^p/(n*p+m+1)
```

Maxima [A] time = 1.45394, size = 34, normalized size = 1.62

$$\frac{b^p x e^{(m \log(x) + p \log(x^n))}}{np + m + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p*x^m,x, algorithm="maxima")
```

```
[Out] b^p*x*e^(m*log(x) + p*log(x^n))/(n*p + m + 1)
```

Fricas [A] time = 0.235055, size = 32, normalized size = 1.52

$$\frac{x x^m e^{(np \log(x) + p \log(b))}}{np + m + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p*x^m,x, algorithm="fricas")
```

```
[Out] x*x^m*e^(n*p*log(x) + p*log(b))/(n*p + m + 1)
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(b*x**n)**p,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [A] time = 0.230086, size = 34, normalized size = 1.62

$$\frac{x e^{(np \ln(x) + p \ln(b) + m \ln(x))}}{np + m + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p*x^m,x, algorithm="giac")
```

```
[Out] x*e^(n*p*ln(x) + p*ln(b) + m*ln(x))/(n*p + m + 1)
```

3.173 $\int (cx)^m (bx^n)^p \, dx$

Optimal. Leaf size=26

$$\frac{(cx)^{m+1}(bx^n)^p}{c(m+np+1)}$$

```
[Out] ((c*x)^(1 + m)*(b*x^n)^p)/(c*(1 + m + n*p))
```

Rubi [A] time = 0.016426, antiderivative size = 22, normalized size of antiderivative = 0.85, number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{x(cx)^m(bx^n)^p}{m+np+1}$$

Antiderivative was successfully verified.

```
[In] Int[(c*x)^m*(b*x^n)^p,x]
```

```
[Out] (x*(c*x)^m*(b*x^n)^p)/(1 + m + n*p)
```

Rubi in Sympy [A] time = 4.97659, size = 34, normalized size = 1.31

$$\frac{x^{-m}x^{-np}x^{m+np+1}(bx^n)^p(cx)^m}{m+np+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((c*x)**m*(b*x**n)**p,x)
```

```
[Out] x**(-m)*x**(-n*p)*x**(m + n*p + 1)*(b*x**n)**p*(c*x)**m/(m + n*p
+ 1)
```

Mathematica [A] time = 0.0072297, size = 22, normalized size = 0.85

$$\frac{x(cx)^m(bx^n)^p}{m+np+1}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*x)^m*(b*x^n)^p,x]
```

```
[Out] (x*(c*x)^m*(b*x^n)^p)/(1 + m + n*p)
```

Maple [A] time = 0.001, size = 23, normalized size = 0.9

$$\frac{x(cx)^m(bx^n)^p}{np+m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*x)^m*(b*x^n)^p,x)
```

```
[Out] x*(c*x)^m*(b*x^n)^p/(n*p+m+1)
```

Maxima [A] time = 1.44685, size = 38, normalized size = 1.46

$$\frac{b^p c^m x e^{(m\log(x)+p\log(x^n))}}{np+m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m*(b*x^n)^p,x, algorithm="maxima")
```

```
[Out] b^p*c^m*x*e^(m*log(x) + p*log(x^n))/(n*p + m + 1)
```

Fricas [A] time = 0.252716, size = 39, normalized size = 1.5

$$\frac{xe^{(np\log(x)+p\log(b)+m\log(c)+m\log(x))}}{np+m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m*(b*x^n)^p,x, algorithm="fricas")
```

```
[Out] x*e^(n*p*log(x) + p*log(b) + m*log(c) + m*log(x))/(n*p + m + 1)
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**m*(b*x**n)**p,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [A] time = 0.231311, size = 39, normalized size = 1.5

$$\frac{xe^{(np\ln(x)+p\ln(b)+m\ln(c)+m\ln(x))}}{np+m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m*(b*x^n)^p,x, algorithm="giac")
```

```
[Out] x*e^(n*p*ln(x) + p*ln(b) + m*ln(c) + m*ln(x))/(n*p + m + 1)
```

3.174 $\int x^2 (bx^n)^p \, dx$

Optimal. Leaf size=18

$$\frac{x^3 (bx^n)^p}{np + 3}$$

```
[Out] (x^3*(b*x^n)^p)/(3 + n*p)
```

Rubi [A] time = 0.0144764, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$

$$\frac{x^3 (bx^n)^p}{np + 3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2*(b*x^n)^p,x]

[Out] (x^3*(b*x^n)^p)/(3 + n*p)
```

Rubi in Sympy [A] time = 3.17748, size = 22, normalized size = 1.22

$$\frac{x^{-np} x^{np+3} (bx^n)^p}{np + 3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(b*x**n)**p,x)

[Out] x**(-n*p)*x**(n*p + 3)*(b*x**n)**p/(n*p + 3)
```

Mathematica [A] time = 0.00502661, size = 18, normalized size = 1.

$$\frac{x^3 (bx^n)^p}{np + 3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2*(b*x^n)^p,x]

[Out] (x^3*(b*x^n)^p)/(3 + n*p)
```

Maple [A] time = 0.001, size = 19, normalized size = 1.1

$$\frac{x^3 (bx^n)^p}{np + 3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(b*x^n)^p,x)

[Out] x^3*(b*x^n)^p/(n*p+3)
```

Maxima [A] time = 1.45142, size = 26, normalized size = 1.44

$$\frac{b^p x^3 (x^n)^p}{np + 3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p*x^2,x, algorithm="maxima")
```

```
[Out] b^p*x^3*(x^n)^p/(n*p + 3)
```

Fricas [A] time = 0.229639, size = 30, normalized size = 1.67

$$\frac{x^3 e^{(np \log(x) + p \log(b))}}{np + 3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p*x^2,x, algorithm="fricas")
```

```
[Out] x^3*e^(n*p*log(x) + p*log(b))/(n*p + 3)
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(b*x**n)**p,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [A] time = 0.229729, size = 30, normalized size = 1.67

$$\frac{x^3 e^{(np\ln(x) + p\ln(b))}}{np + 3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p*x^2,x, algorithm="giac")
```

```
[Out] x^3*e^(n*p*ln(x) + p*ln(b))/(n*p + 3)
```

3.175 $\int x (bx^n)^p \, dx$

Optimal. Leaf size=18

$$\frac{x^2 (bx^n)^p}{np+2}$$

```
[Out] (x^2*(b*x^n)^p)/(2 + n*p)
```

Rubi [A] time = 0.0137439, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$

$$\frac{x^2 (bx^n)^p}{np+2}$$

Antiderivative was successfully verified.

```
[In]  Int[x*(b*x^n)^p,x]

[Out] (x^2*(b*x^n)^p)/(2 + n*p)
```

Rubi in Sympy [A] time = 3.02263, size = 22, normalized size = 1.22

$$\frac{x^{-np} x^{np+2} (bx^n)^p}{np+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(b*x**n)**p,x)

[Out] x**(-n*p)*x**(n*p + 2)*(b*x**n)**p/(n*p + 2)
```

Mathematica [A] time = 0.0046004, size = 18, normalized size = 1.

$$\frac{x^2 (bx^n)^p}{np+2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x*(b*x^n)^p,x]

[Out] (x^2*(b*x^n)^p)/(2 + n*p)
```

Maple [A] time = 0.002, size = 19, normalized size = 1.1

$$\frac{x^2 (bx^n)^p}{np+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(b*x^n)^p,x)

[Out] x^2*(b*x^n)^p/(n*p+2)
```

Maxima [A] time = 1.45155, size = 26, normalized size = 1.44

$$\frac{b^p x^2 (x^n)^p}{np+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p*x,x, algorithm="maxima")
```

```
[Out] b^p*x^2*(x^n)^p/(n*p + 2)
```

Fricas [A] time = 0.228599, size = 30, normalized size = 1.67

$$\frac{x^2 e^{(np\log(x)+p\log(b))}}{np+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p*x,x, algorithm="fricas")
```

```
[Out] x^2*e^(n*p*log(x) + p*log(b))/(n*p + 2)
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(b*x**n)**p,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [A] time = 0.238916, size = 30, normalized size = 1.67

$$\frac{x^2 e^{(np\ln(x)+p\ln(b))}}{np+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p*x,x, algorithm="giac")
```

```
[Out] x^2*e^(n*p*ln(x) + p*ln(b))/(n*p + 2)
```

3.176 $\int (bx^n)^p \, dx$

Optimal. Leaf size=16

$$\frac{x (bx^n)^p}{np + 1}$$

```
[Out] (x*(b*x^n)^p)/(1 + n*p)
```

Rubi [A] time = 0.0138719, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$

$$\frac{x (bx^n)^p}{np + 1}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^n)^p,x]
```

```
[Out] (x*(b*x^n)^p)/(1 + n*p)
```

Rubi in Sympy [A] time = 2.30183, size = 22, normalized size = 1.38

$$\frac{x^{-np} x^{np+1} (bx^n)^p}{np + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**n)**p,x)
```

```
[Out] x**(-n*p)*x**(n*p + 1)*(b*x**n)**p/(n*p + 1)
```

Mathematica [A] time = 0.0033931, size = 16, normalized size = 1.

$$\frac{x (bx^n)^p}{np + 1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^n)^p,x]
```

```
[Out] (x*(b*x^n)^p)/(1 + n*p)
```

Maple [A] time = 0.002, size = 17, normalized size = 1.1

$$\frac{x (bx^n)^p}{np + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^n)^p,x)
```

```
[Out] x*(b*x^n)^p/(n*p+1)
```

Maxima [A] time = 1.48493, size = 23, normalized size = 1.44

$$\frac{b^p x (x^n)^p}{np + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p,x, algorithm="maxima")
```

```
[Out] b^p*x*(x^n)^p/(n*p + 1)
```

Fricas [A] time = 0.2296, size = 27, normalized size = 1.69

$$\frac{x e^{(np \log(x) + p \log(b))}}{np + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p,x, algorithm="fricas")
```

```
[Out] x*e^(n*p*log(x) + p*log(b))/(n*p + 1)
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**n)**p,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [A] time = 0.229151, size = 27, normalized size = 1.69

$$\frac{x e^{(np \ln(x) + p \ln(b))}}{np + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p,x, algorithm="giac")
```

```
[Out] x*e^(n*p*ln(x) + p*ln(b))/(n*p + 1)
```

3.177 $\int \frac{(bx^n)^p}{x} dx$

Optimal. Leaf size=14

$$\frac{(bx^n)^p}{np}$$

```
[Out] (b*x^n)^p/(n*p)
```

Rubi [A] time = 0.0122112, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{(bx^n)^p}{np}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^n)^p/x,x]

[Out] (b*x^n)^p/(n*p)
```

Rubi in Sympy [A] time = 3.3885, size = 8, normalized size = 0.57

$$\frac{(bx^n)^p}{np}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**n)**p/x,x)

[Out] (b*x**n)**p/(n*p)
```

Mathematica [A] time = 0.00305712, size = 14, normalized size = 1.

$$\frac{(bx^n)^p}{np}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^n)^p/x,x]

[Out] (b*x^n)^p/(n*p)
```

Maple [A] time = 0.002, size = 15, normalized size = 1.1

$$\frac{(bx^n)^p}{np}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^n)^p/x,x)

[Out] (b*x^n)^p/n/p
```

Maxima [A] time = 1.46178, size = 20, normalized size = 1.43

$$\frac{b^p (x^n)^p}{np}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p/x,x, algorithm="maxima")
```

```
[Out] b^p*(x^n)^p/(n*p)
```

Fricas [A] time = 0.232064, size = 24, normalized size = 1.71

$$\frac{e^{(np\log(x)+p\log(b))}}{np}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p/x,x, algorithm="fricas")
```

```
[Out] e^(n*p*log(x) + p*log(b))/(n*p)
```

Sympy [A] time = 0.794148, size = 22, normalized size = 1.57

$$\begin{cases} \log(x) & \text{for } n = 0 \wedge p = 0 \\ b^p \log(x) & \text{for } n = 0 \\ \log(x) & \text{for } p = 0 \\ \frac{b^p (x^n)^p}{np} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**n)**p/x,x)
```

```
[Out] Piecewise((log(x), Eq(n, 0) & Eq(p, 0)), (b**p*log(x), Eq(n, 0)),
 (log(x), Eq(p, 0)), (b**p*(x**n)**p/(n*p), True))
```

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

$$\int \frac{(bx^n)^p}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p/x,x, algorithm="giac")
```

```
[Out] integrate((b*x^n)^p/x, x)
```

3.178 $\int \frac{(bx^n)^p}{x^2}\,dx$

Optimal. Leaf size=20

$$-\frac{(bx^n)^p}{x(1-np)}$$

```
[Out] -((b*x^n)^p/((1 - n*p)*x))
```

Rubi [A] time = 0.0175562, antiderivative size = 20, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$-\frac{(bx^n)^p}{x(1-np)}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^n)^p/x^2,x]

[Out] -((b*x^n)^p/((1 - n*p)*x))
```

Rubi in Sympy [A] time = 3.27455, size = 24, normalized size = 1.2

$$-\frac{x^{-np}x^{np-1}(bx^n)^p}{-np+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**n)**p/x**2,x)

[Out] -x**(-n*p)*x**(n*p - 1)*(b*x**n)**p/(-n*p + 1)
```

Mathematica [A] time = 0.0063347, size = 18, normalized size = 0.9

$$\frac{(bx^n)^p}{x(np-1)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^n)^p/x^2,x]

[Out] (b*x^n)^p/((-1 + n*p)*x)
```

Maple [A] time = 0.002, size = 19, normalized size = 1.

$$\frac{(bx^n)^p}{x(np-1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^n)^p/x^2,x)

[Out] 1/x/(n*p-1)*(b*x^n)^p
```

Maxima [A] time = 1.47447, size = 26, normalized size = 1.3

$$\frac{b^p (x^n)^p}{(np-1)x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p/x^2,x, algorithm="maxima")
```

```
[Out] b^p*(x^n)^p/((n*p - 1)*x)
```

Fricas [A] time = 0.242311, size = 30, normalized size = 1.5

$$\frac{e^{(np\log(x)+p\log(b))}}{(np-1)x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p/x^2,x, algorithm="fricas")
```

```
[Out] e^(n*p*log(x) + p*log(b))/((n*p - 1)*x)
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**n)**p/x**2,x)
```

```
[Out] Exception raised: TypeError
```

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

$$\int \frac{(bx^n)^p}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p/x^2,x, algorithm="giac")
```

```
[Out] integrate((b*x^n)^p/x^2, x)
```

3.179 $\int \frac{(bx^n)^p}{x^3} dx$

Optimal. Leaf size=20

$$-\frac{(bx^n)^p}{x^2(2-np)}$$

```
[Out] -((b*x^n)^p/((2 - n*p)*x^2))
```

Rubi [A] time = 0.0184787, antiderivative size = 20, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$-\frac{(bx^n)^p}{x^2(2-np)}$$

Antiderivative was successfully verified.

```
[In] Int[(b*x^n)^p/x^3,x]

[Out] -((b*x^n)^p/((2 - n*p)*x^2))
```

Rubi in Sympy [A] time = 3.31089, size = 24, normalized size = 1.2

$$-\frac{x^{-np}x^{np-2}(bx^n)^p}{-np+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**n)**p/x**3,x)

[Out] -x**(-n*p)*x**(n*p - 2)*(b*x**n)**p/(-n*p + 2)
```

Mathematica [A] time = 0.00461895, size = 18, normalized size = 0.9

$$\frac{(bx^n)^p}{x^2(np-2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(b*x^n)^p/x^3,x]

[Out] (b*x^n)^p/((-2 + n*p)*x^2)
```

Maple [A] time = 0.002, size = 19, normalized size = 1.

$$\frac{(bx^n)^p}{x^2(np-2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x^n)^p/x^3,x)

[Out] 1/x^2/(n*p-2)*(b*x^n)^p
```

Maxima [A] time = 1.46415, size = 26, normalized size = 1.3

$$\frac{b^p (x^n)^p}{(np-2)x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p/x^3,x, algorithm="maxima")
```

```
[Out] b^p*(x^n)^p/((n*p - 2)*x^2)
```

Fricas [A] time = 0.230327, size = 30, normalized size = 1.5

$$\frac{e^{(np\log(x)+p\log(b))}}{(np-2)x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p/x^3,x, algorithm="fricas")
```

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

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**n)**p/x**3,x)
```

```
[Out] Exception raised: TypeError
```

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

$$\int \frac{(bx^n)^p}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p/x^3,x, algorithm="giac")
```

```
[Out] integrate((b*x^n)^p/x^3, x)
```

3.180 $\int x^m (ax^n)^{-1/n} \, dx$

Optimal. Leaf size=20

$$\frac{x^{m+1}(ax^n)^{-1/n}}{m}$$

```
[Out] x^(1 + m)/(m*(a*x^n)^n^(-1))
```

Rubi [A] time = 0.0112106, antiderivative size = 20, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{x^{m+1}(ax^n)^{-1/n}}{m}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m/(a*x^n)^n^(-1),x]

[Out] x^(1 + m)/(m*(a*x^n)^n^(-1))
```

Rubi in Sympy [A] time = 2.74113, size = 14, normalized size = 0.7

$$\frac{xx^m(ax^n)^{-\frac{1}{n}}}{m}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m/((a*x**n)**(1/n)),x)

[Out] x*x**m*(a*x**n)**(-1/n)/m
```

Mathematica [A] time = 0.00847059, size = 20, normalized size = 1.

$$\frac{x^{m+1}(ax^n)^{-1/n}}{m}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m/(a*x^n)^n^(-1),x]

[Out] x^(1 + m)/(m*(a*x^n)^n^(-1))
```

Maple [A] time = 0.002, size = 21, normalized size = 1.1

$$\frac{x^{1+m}}{m\sqrt[n]{ax^n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m/((a*x^n)^(1/n)),x)

[Out] x^(1+m)/m/((a*x^n)^(1/n))
```

Maxima [A] time = 1.46318, size = 36, normalized size = 1.8

$$\frac{a^{-\frac{1}{n}}xe^{\left(m\log(x)-\frac{\log(x^n)}{n}\right)}}{m}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(a*x^n)^(1/n),x, algorithm="maxima")
```

```
[Out] a^(-1/n)*x*e^(m*log(x) - log(x^n)/n)/m
```

Fricas [A] time = 0.231711, size = 19, normalized size = 0.95

$$\frac{x^m}{a^{\left(\frac{1}{n}\right)}m}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(a*x^n)^(1/n),x, algorithm="fricas")
```

```
[Out] x^m/(a^(1/n)*m)
```

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

Exception raised: RecursionError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m/((a*x**n)**(1/n)),x)
```

```
[Out] Exception raised: RecursionError
```

GIAC/XCAS [A] time = 0.224273, size = 23, normalized size = 1.15

$$\frac{e^{\left(m\ln(x)-\frac{\ln(a)}{n}\right)}}{m}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(a*x^n)^(1/n),x, algorithm="giac")
```

```
[Out] e^(m*ln(x) - ln(a)/n)/m
```

3.181 $\int (cx)^m (ax^n)^{-1/n} \, dx$

Optimal. Leaf size=21

$$\frac{x (ax^n)^{-1/n} (cx)^m}{m}$$

```
[Out] (x*(c*x)^m)/(m*(a*x^n)^n^(-1))
```

Rubi [A] time = 0.0146271, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.176$

$$\frac{x (ax^n)^{-1/n} (cx)^m}{m}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^m/(a*x^n)^n^(-1),x]

[Out] (x*(c*x)^m)/(m*(a*x^n)^n^(-1))
```

Rubi in Sympy [A] time = 4.08082, size = 15, normalized size = 0.71

$$\frac{x (ax^n)^{-\frac{1}{n}} (cx)^m}{m}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**m/((a*x**n)**(1/n)),x)

[Out] x*(a*x**n)**(-1/n)*(c*x)**m/m
```

Mathematica [A] time = 0.00497446, size = 21, normalized size = 1.

$$\frac{x (ax^n)^{-1/n} (cx)^m}{m}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^m/(a*x^n)^n^(-1),x]

[Out] (x*(c*x)^m)/(m*(a*x^n)^n^(-1))
```

Maple [A] time = 0.002, size = 22, normalized size = 1.1

$$\frac{x (cx)^m}{m \sqrt[n]{ax^n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^m/((a*x^n)^(1/n)),x)

[Out] x*(c*x)^m/m/((a*x^n)^(1/n))
```

Maxima [A] time = 1.4973, size = 41, normalized size = 1.95

$$\frac{a^{-\frac{1}{n}}c^m x e^{\left(m\log(x)-\frac{\log(x^n)}{n}\right)}}{m}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m/(a*x^n)^(1/n),x, algorithm="maxima")
```

```
[Out] a^(-1/n)*c^m*x*e^(m*log(x) - log(x^n)/n)/m
```

Fricas [A] time = 0.235837, size = 28, normalized size = 1.33

$$\frac{e^{(m\log(c)+m\log(x))}}{a^{\left(\frac{1}{n}\right)}m}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m/(a*x^n)^(1/n),x, algorithm="fricas")
```

```
[Out] e^(m*log(c) + m*log(x))/(a^(1/n)*m)
```

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

Exception raised: RecursionError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**m/((a*x**n)**(1/n)),x)
```

```
[Out] Exception raised: RecursionError
```

GIAC/XCAS [A] time = 0.231642, size = 28, normalized size = 1.33

$$\frac{e^{\left(m\ln(c)+m\ln(x)-\frac{\ln(a)}{n}\right)}}{m}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m/(a*x^n)^(1/n),x, algorithm="giac")
```

```
[Out] e^(m*ln(c) + m*ln(x) - ln(a)/n)/m
```

3.182 $\int x^2 (ax^n)^{-1/n} \, dx$

Optimal. Leaf size=18

$$\frac{1}{2}x^3 (ax^n)^{-1/n}$$

```
[Out] x^3/(2*(a*x^n)^n^(-1))
```

Rubi [A] time = 0.0079695, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{1}{2}x^3 (ax^n)^{-1/n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a*x^n)^n^(-1),x]

[Out] x^3/(2*(a*x^n)^n^(-1))
```

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

$$x (ax^n)^{-\frac{1}{n}} \int x \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/((a*x**n)**(1/n)),x)

[Out] x*(a*x**n)**(-1/n)*Integral(x, x)
```

Mathematica [A] time = 0.00417418, size = 18, normalized size = 1.

$$\frac{1}{2}x^3 (ax^n)^{-1/n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a*x^n)^n^(-1),x]

[Out] x^3/(2*(a*x^n)^n^(-1))
```

Maple [A] time = 0.002, size = 17, normalized size = 0.9

$$\frac{x^3}{2 \sqrt[n]{ax^n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/((a*x^n)^(1/n)),x)

[Out] 1/2*x^3/((a*x^n)^(1/n))
```

Maxima [A] time = 1.45075, size = 28, normalized size = 1.56

$$\frac{1}{2}\,a^{-\frac{1}{n}}x^3(x^n)^{-\frac{1}{n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a*x^n)^(1/n),x, algorithm="maxima")
```

```
[Out] 1/2*a^(-1/n)*x^3*(x^n)^(-1/n)
```

Fricas [A] time = 0.226091, size = 16, normalized size = 0.89

$$\frac{x^2}{2\,a^{\left(\frac{1}{n}\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a*x^n)^(1/n),x, algorithm="fricas")
```

```
[Out] 1/2*x^2/a^(1/n)
```

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

Exception raised: RecursionError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/((a*x**n)**(1/n)),x)
```

```
[Out] Exception raised: RecursionError
```

GIAC/XCAS [A] time = 0.222881, size = 18, normalized size = 1.

$$\frac{1}{2}\,x^2e^{\left(-\frac{\ln(a)}{n}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a*x^n)^(1/n),x, algorithm="giac")
```

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

3.183 $\int x (ax^n)^{-1/n} \, dx$

Optimal. Leaf size=15

$$x^2 (ax^n)^{-1/n}$$

```
[Out] x^2/(a*x^n)^n^(-1)
```

Rubi [A] time = 0.00696795, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$x^2 (ax^n)^{-1/n}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a*x^n)^n^(-1),x]

[Out] x^2/(a*x^n)^n^(-1)
```

Rubi in Sympy [A] time = 2.12268, size = 10, normalized size = 0.67

$$x^2 (ax^n)^{-\frac{1}{n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/((a*x**n)**(1/n)),x)

[Out] x**2*(a*x**n)**(-1/n)
```

Mathematica [A] time = 0.0022866, size = 15, normalized size = 1.

$$x^2 (ax^n)^{-1/n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a*x^n)^n^(-1),x]

[Out] x^2/(a*x^n)^n^(-1)
```

Maple [F] time = 0.029, size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt[n]{ax^n}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/((a*x^n)^(1/n)),x)

[Out] int(x/((a*x^n)^(1/n)),x)
```

Maxima [A] time = 1.46423, size = 27, normalized size = 1.8

$$a^{-\frac{1}{n}}x^2(x^n)^{-\frac{1}{n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a*x^n)^(1/n),x, algorithm="maxima")
```

```
[Out] a^(-1/n)*x^2*(x^n)^(-1/n)
```

Fricas [A] time = 0.224897, size = 12, normalized size = 0.8

$$\frac{x}{a^{\left(\frac{1}{n}\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a*x^n)^(1/n),x, algorithm="fricas")
```

```
[Out] x/a^(1/n)
```

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

Exception raised: RecursionError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/((a*x**n)**(1/n)),x)
```

```
[Out] Exception raised: RecursionError
```

GIAC/XCAS [A] time = 0.238496, size = 14, normalized size = 0.93

$$xe^{\left(-\frac{\ln(a)}{n}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a*x^n)^(1/n),x, algorithm="giac")
```

```
[Out] x*e^(-ln(a)/n)
```

3.184 $\int (ax^n)^{-1/n}\, dx$

Optimal. Leaf size=15

$$x\log(x)\left(ax^n\right)^{-1/n}$$

```
[Out] (x*Log[x])/(a*x^n)^n^(-1)
```

Rubi [A] time = 0.00702907, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$x\log(x)\left(ax^n\right)^{-1/n}$$

Antiderivative was successfully verified.

```
[In]  Int[(a*x^n)^(-n^(-1)),x]
```

```
[Out] (x*Log[x])/(a*x^n)^n^(-1)
```

Rubi in Sympy [A] time = 1.35889, size = 12, normalized size = 0.8

$$x\left(ax^n\right)^{-\frac{1}{n}}\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/((a*x**n)**(1/n)),x)
```

```
[Out] x*(a*x**n)**(-1/n)*log(x)
```

Mathematica [A] time = 0.00207765, size = 15, normalized size = 1.

$$x\log(x)\left(ax^n\right)^{-1/n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a*x^n)^(-n^(-1)),x]
```

```
[Out] (x*Log[x])/(a*x^n)^n^(-1)
```

Maple [A] time = 0.029, size = 29, normalized size = 1.9

$$\frac{x\ln\left(a e^{n\ln(x)}\right)}{n}\left(e^{\frac{\ln\left(a e^{n\ln(x)}\right)}{n}}\right)^{-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/((a*x^n)^(1/n)),x)
```

```
[Out] 1/n*x*ln(a*exp(n*ln(x)))/exp(1/n*ln(a*exp(n*ln(x))))
```

Maxima [A] time = 1.57134, size = 14, normalized size = 0.93

$$a^{-\frac{1}{n}} \log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a*x^n)^(1/n)),x, algorithm="maxima")
```

```
[Out] a^(-1/n)*log(x)
```

Fricas [A] time = 0.231388, size = 14, normalized size = 0.93

$$\frac{\log(x)}{a^{\left(\frac{1}{n}\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a*x^n)^(1/n)),x, algorithm="fricas")
```

```
[Out] log(x)/a^(1/n)
```

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

$$\int (ax^n)^{-\frac{1}{n}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a*x**n)**(1/n)),x)
```

```
[Out] Integral((a*x**n)**(-1/n), x)
```

GIAC/XCAS [A] time = 0.232602, size = 15, normalized size = 1.

$$e^{\left(-\frac{\ln(a)}{n}\right)} \ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a*x^n)^(1/n)),x, algorithm="giac")
```

```
[Out] e^(-ln(a)/n)*ln(x)
```

3.185 $\int \frac{(ax^n)^{-1/n}}{x}\,dx$

Optimal. Leaf size=13

$$-(ax^n)^{-1/n}$$

```
[Out] -(a*x^n)^(-n^(-1))
```

Rubi [A] time = 0.00704155, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-(ax^n)^{-1/n}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x*(a*x^n)^n^(-1)),x]
```

```
[Out] -(a*x^n)^(-n^(-1))
```

Rubi in Sympy [A] time = 3.00404, size = 10, normalized size = 0.77

$$-(ax^n)^{-\frac{1}{n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x/((a*x**n)**(1/n)),x)
```

```
[Out] -(a*x**n)**(-1/n)
```

Mathematica [A] time = 0.00242291, size = 13, normalized size = 1.

$$-(ax^n)^{-1/n}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x*(a*x^n)^n^(-1)),x]
```

```
[Out] -(a*x^n)^(-n^(-1))
```

Maple [A] time = 0.003, size = 14, normalized size = 1.1

$$-\left(\sqrt[n]{ax^n}\right)^{-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/((a*x^n)^(1/n)),x)
```

```
[Out] -1/((a*x^n)^(1/n))
```

Maxima [A] time = 1.45968, size = 24, normalized size = 1.85

$$-a^{-\frac{1}{n}}(x^n)^{-\frac{1}{n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a*x^n)^(1/n)*x),x, algorithm="maxima")
```

```
[Out] -a^(-1/n)*(x^n)^(-1/n)
```

Fricas [A] time = 0.225973, size = 16, normalized size = 1.23

$$-\frac{1}{a^{\left(\frac{1}{n}\right)}x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a*x^n)^(1/n)*x),x, algorithm="fricas")
```

```
[Out] -1/(a^(1/n)*x)
```

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

Exception raised: RecursionError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/((a*x**n)**(1/n)),x)
```

```
[Out] Exception raised: RecursionError
```

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

$$\int \frac{1}{(ax^n)^{\left(\frac{1}{n}\right)}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a*x^n)^(1/n)*x),x, algorithm="giac")
```

```
[Out] integrate(1/((a*x^n)^(1/n)*x), x)
```

3.186 $\int \frac{(ax^n)^{-1/n}}{x^2} dx$

Optimal. Leaf size=18

$$-\frac{(ax^n)^{-1/n}}{2x}$$

```
[Out] -1/(2*x*(a*x^n)^n^(-1))
```

Rubi [A] time = 0.00792918, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{(ax^n)^{-1/n}}{2x}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(a*x^n)^n^(-1)),x]

[Out] -1/(2*x*(a*x^n)^n^(-1))
```

Rubi in Sympy [A] time = 2.41362, size = 14, normalized size = 0.78

$$-\frac{(ax^n)^{-\frac{1}{n}}}{2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/((a*x**n)**(1/n)),x)

[Out] -(a*x**n)**(-1/n)/(2*x)
```

Mathematica [A] time = 0.00333774, size = 18, normalized size = 1.

$$-\frac{(ax^n)^{-1/n}}{2x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*(a*x^n)^n^(-1)),x]

[Out] -1/(2*x*(a*x^n)^n^(-1))
```

Maple [A] time = 0.002, size = 17, normalized size = 0.9

$$-\frac{1}{2x\sqrt[n]{ax^n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/((a*x^n)^(1/n)),x)

[Out] -1/2/x/((a*x^n)^(1/n))
```

Maxima [A] time = 1.48477, size = 16, normalized size = 0.89

$$-\frac{a^{-\frac{1}{n}}}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a*x^n)^(1/n)*x^2),x, algorithm="maxima")
```

```
[Out] -1/2*a^(-1/n)/x^2
```

Fricas [A] time = 0.221657, size = 16, normalized size = 0.89

$$-\frac{1}{2\,a^{\left(\frac{1}{n}\right)}x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a*x^n)^(1/n)*x^2),x, algorithm="fricas")
```

```
[Out] -1/2/(a^(1/n)*x^2)
```

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

Exception raised: RecursionError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/((a*x**n)**(1/n)),x)
```

```
[Out] Exception raised: RecursionError
```

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

$$\int \frac{1}{(ax^n)^{\left(\frac{1}{n}\right)}\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a*x^n)^(1/n)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/((a*x^n)^(1/n)*x^2), x)
```

3.187 $\int x^m (ax^n)^{-\frac{1+m}{n}} \, dx$

Optimal. Leaf size=22

$$x^{m+1}\log(x)\,(ax^n)^{-\frac{m+1}{n}}$$

```
[Out] (x^(1 + m)*Log[x])/(a*x^n)^((1 + m)/n)
```

Rubi [A] time = 0.0118048, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111

$$x^{m+1}\log(x)\,(ax^n)^{-\frac{m+1}{n}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m/(a*x^n)^((1 + m)/n),x]

[Out] (x^(1 + m)*Log[x])/(a*x^n)^((1 + m)/n)
```

Rubi in Sympy [A] time = 2.81269, size = 17, normalized size = 0.77

$$x^{m+1}\,(ax^n)^{-\frac{m+1}{n}}\log{(x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m/((a*x**n)**((1+m)/n)),x)

[Out] x**(m + 1)*(a*x**n)**(-(m + 1)/n)*log(x)
```

Mathematica [A] time = 0.0148402, size = 22, normalized size = 1.

$$x^{m+1}\log(x)\,(ax^n)^{-\frac{m+1}{n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m/(a*x^n)^((1 + m)/n),x]

[Out] (x^(1 + m)*Log[x])/(a*x^n)^((1 + m)/n)
```

Maple [F] time = 0.069, size = 0, normalized size = 0.

$$\int x^m \left((ax^n)^{\frac{1+m}{n}}\right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m/((a*x^n)^((1+m)/n)),x)

[Out] int(x^m/((a*x^n)^((1+m)/n)),x)
```

Maxima [A] time = 1.51359, size = 23, normalized size = 1.05

$$a^{-\frac{m}{n}-\frac{1}{n}}\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(a*x^n)^((m + 1)/n),x, algorithm="maxima")
```

```
[Out] a^(-m/n - 1/n)*log(x)
```

Fricas [A] time = 0.238728, size = 19, normalized size = 0.86

$$\frac{\log\left(x\right)}{a^{\frac{m+1}{n}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(a*x^n)^((m + 1)/n),x, algorithm="fricas")
```

```
[Out] log(x)/a^((m + 1)/n)
```

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

$$\int x^{m}\left(ax^{n}\right)^{-\frac{m+1}{n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m/((a*x**n)**((1+m)/n)),x)
```

```
[Out] Integral(x**m*(a*x**n)**(-(m + 1)/n), x)
```

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

$$\int \frac{x^{m}}{\left(ax^{n}\right)^{\frac{m+1}{n}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(a*x^n)^((m + 1)/n),x, algorithm="giac")
```

```
[Out] integrate(x^m/(a*x^n)^((m + 1)/n), x)
```

3.188 $\int x^{-1-np} (ax^n)^p \, dx$

Optimal. Leaf size=16

$$\log(x)x^{-np} (ax^n)^p$$

```
[Out] ((a*x^n)^p*Log[x])/x^(n*p)
```

Rubi [A] time = 0.00998475, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125

$$\log(x)x^{-np} (ax^n)^p$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 - n*p)*(a*x^n)^p,x]
```

```
[Out] ((a*x^n)^p*Log[x])/x^(n*p)
```

Rubi in Sympy [A] time = 2.36821, size = 14, normalized size = 0.88

$$x^{-np} (ax^n)^p \log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-n*p-1)*(a*x**n)**p,x)
```

```
[Out] x**(-n*p)*(a*x**n)**p*log(x)
```

Mathematica [A] time = 0.0082386, size = 16, normalized size = 1.

$$\log(x)x^{-np} (ax^n)^p$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 - n*p)*(a*x^n)^p,x]
```

```
[Out] ((a*x^n)^p*Log[x])/x^(n*p)
```

Maple [F] time = 0.061, size = 0, normalized size = 0.

$$\int x^{-np-1} (ax^n)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-n*p-1)*(a*x^n)^p,x)
```

```
[Out] int(x^(-n*p-1)*(a*x^n)^p,x)
```

Maxima [A] time = 1.50487, size = 8, normalized size = 0.5

$$a^p \log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a*x^n)^p*x^(-n*p - 1),x, algorithm="maxima")
```

```
[Out] a^p*log(x)
```

Fricas [A] time = 0.226825, size = 8, normalized size = 0.5

$$a^p \log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a*x^n)^p*x^(-n*p - 1),x, algorithm="fricas")
```

```
[Out] a^p*log(x)
```

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

$$\int x^{-np-1} (ax^n)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-n*p-1)*(a*x**n)**p,x)
```

```
[Out] Integral(x**(-n*p - 1)*(a*x**n)**p, x)
```

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

$$\int (ax^n)^p x^{-np-1} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a*x^n)^p*x^(-n*p - 1),x, algorithm="giac")
```

```
[Out] integrate((a*x^n)^p*x^(-n*p - 1), x)
```

3.189 $\int x^m \left(a (b x^n)^p\right)^q \, dx$

Optimal. Leaf size=26

$$\frac{x^{m+1} \left(a (bx^n)^p\right)^q}{m+npq+1}$$

```
[Out] (x^(1 + m)*(a*(b*x^n)^p)^q)/(1 + m + n*p*q)
```

Rubi [A] time = 0.080876, antiderivative size = 26, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{x^{m+1} \left(a (bx^n)^p\right)^q}{m+npq+1}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m*(a*(b*x^n)^p)^q,x]

[Out] (x^(1 + m)*(a*(b*x^n)^p)^q)/(1 + m + n*p*q)
```

Rubi in Sympy [A] time = 7.05711, size = 34, normalized size = 1.31

$$\frac{x^{-npq} x^{m+npq+1} \left(a (bx^n)^p\right)^q}{m+npq+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(a*(b*x**n)**p)**q,x)

[Out] x**(-n*p*q)*x**(m + n*p*q + 1)*(a*(b*x**n)**p)**q/(m + n*p*q + 1)
```

Mathematica [A] time = 0.0172672, size = 26, normalized size = 1.

$$\frac{x^{m+1} \left(a (bx^n)^p\right)^q}{m+npq+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m*(a*(b*x^n)^p)^q,x]

[Out] (x^(1 + m)*(a*(b*x^n)^p)^q)/(1 + m + n*p*q)
```

Maple [A] time = 0.003, size = 27, normalized size = 1.

$$\frac{x^{1+m} \left(a (bx^n)^p\right)^q}{npq+m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(a*(b*x^n)^p)^q,x)

[Out] x^(1+m)*(a*(b*x^n)^p)^q/(n*p*q+m+1)
```

Maxima [A] time = 1.64882, size = 45, normalized size = 1.73

$$\frac{a^q (b^p)^q x e^{\left(m \log(x) + q \log\left((x^n)^p\right)\right)}}{npq + m + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q*x^m,x, algorithm="maxima")

[Out] a^q*(b^p)^q*x*e^(m*log(x) + q*log((x^n)^p))/(n*p*q + m + 1)
```

Fricas [A] time = 0.235759, size = 42, normalized size = 1.62

$$\frac{x x^m e^{(npq \log(x) + pq \log(b) + q \log(a))}}{npq + m + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q*x^m,x, algorithm="fricas")

[Out] x*x^m*e^(n*p*q*log(x) + p*q*log(b) + q*log(a))/(n*p*q + m + 1)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(a*(b*x**n)**p)**q,x)

[Out] Timed out
```

GIAC/XCAS [A] time = 0.224601, size = 43, normalized size = 1.65

$$\frac{x e^{(npq \ln(x) + pq \ln(b) + q \ln(a) + m \ln(x))}}{npq + m + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q*x^m,x, algorithm="giac")

[Out] x*e^(n*p*q*ln(x) + p*q*ln(b) + q*ln(a) + m*ln(x))/(n*p*q + m + 1)
```

3.190 $\int x^2 \left(a \left(b x^n\right)^p\right)^q \, dx$

Optimal. Leaf size=23

$$\frac{x^3 \left(a \left(b x^n\right)^p\right)^q}{n p q+3}$$

```
[Out] (x^3*(a*(b*x^n)^p)^q)/(3 + n*p*q)
```

Rubi [A] time = 0.082746, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{x^3 \left(a \left(b x^n\right)^p\right)^q}{n p q+3}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(a*(b*x^n)^p)^q,x]

[Out] (x^3*(a*(b*x^n)^p)^q)/(3 + n*p*q)
```

Rubi in Sympy [A] time = 7.21918, size = 31, normalized size = 1.35

$$\frac{x^{-n p q} x^{n p q+3} \left(a \left(b x^n\right)^p\right)^q}{n p q+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**2*(a*(b*x**n)**p)**q,x)

[Out] x**(-n*p*q)*x**(n*p*q + 3)*(a*(b*x**n)**p)**q/(n*p*q + 3)
```

Mathematica [A] time = 0.00874674, size = 23, normalized size = 1.

$$\frac{x^3 \left(a \left(b x^n\right)^p\right)^q}{n p q+3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(a*(b*x^n)^p)^q,x]

[Out] (x^3*(a*(b*x^n)^p)^q)/(3 + n*p*q)
```

Maple [A] time = 0.002, size = 24, normalized size = 1.

$$\frac{x^3 \left(a \left(b x^n\right)^p\right)^q}{n p q+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a*(b*x^n)^p)^q,x)

[Out] x^3*(a*(b*x^n)^p)^q/(n*p*q+3)
```

Maxima [A] time = 1.65175, size = 36, normalized size = 1.57

$$\frac{a^q (b^p)^q x^3 \left((x^n)^p\right)^q}{npq + 3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q*x^2,x, algorithm="maxima")
```

```
[Out] a^q*(b^p)^q*x^3*((x^n)^p)^q/(n*p*q + 3)
```

Fricas [A] time = 0.24272, size = 39, normalized size = 1.7

$$\frac{x^3 e^{(npq \log(x) + pq \log(b) + q \log(a))}}{npq + 3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q*x^2,x, algorithm="fricas")
```

```
[Out] x^3*e^(n*p*q*log(x) + p*q*log(b) + q*log(a))/(n*p*q + 3)
```

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

$$\int x^2 \left(a (bx^n)^p\right)^q \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(a*(b*x**n)**p)**q,x)
```

```
[Out] Integral(x**2*(a*(b*x**n)**p)**q, x)
```

GIAC/XCAS [A] time = 0.22734, size = 39, normalized size = 1.7

$$\frac{x^3 e^{(npq\ln(x) + pq\ln(b) + q\ln(a))}}{npq + 3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q*x^2,x, algorithm="giac")
```

```
[Out] x^3*e^(n*p*q*ln(x) + p*q*ln(b) + q*ln(a))/(n*p*q + 3)
```

3.191 $\int x \left(a \left(b x^n\right)^p\right)^q \, dx$

Optimal. Leaf size=23

$$\frac{x^2 \left(a \left(b x^n\right)^p\right)^q}{n p q+2}$$

```
[Out] (x^2*(a*(b*x^n)^p)^q)/(2 + n*p*q)
```

Rubi [A] time = 0.0536583, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{x^2 \left(a \left(b x^n\right)^p\right)^q}{n p q+2}$$

Antiderivative was successfully verified.

```
[In] Int[x*(a*(b*x^n)^p)^q,x]

[Out] (x^2*(a*(b*x^n)^p)^q)/(2 + n*p*q)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x*(a*(b*x**n)**p)**q,x)

[Out] Timed out
```

Mathematica [A] time = 0.00864146, size = 23, normalized size = 1.

$$\frac{x^2 \left(a \left(b x^n\right)^p\right)^q}{n p q+2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(a*(b*x^n)^p)^q,x]

[Out] (x^2*(a*(b*x^n)^p)^q)/(2 + n*p*q)
```

Maple [A] time = 0.003, size = 24, normalized size = 1.

$$\frac{x^2 \left(a \left(b x^n\right)^p\right)^q}{n p q+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a*(b*x^n)^p)^q,x)

[Out] x^2*(a*(b*x^n)^p)^q/(n*p*q+2)
```

Maxima [A] time = 1.65826, size = 36, normalized size = 1.57

$$\frac{a^q (b^p)^q x^2 \left((x^n)^p\right)^q}{npq + 2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q*x,x, algorithm="maxima")
```

```
[Out] a^q*(b^p)^q*x^2*((x^n)^p)^q/(n*p*q + 2)
```

Fricas [A] time = 0.248069, size = 39, normalized size = 1.7

$$\frac{x^2 e^{(npq \log(x) + pq \log(b) + q \log(a))}}{npq + 2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q*x,x, algorithm="fricas")
```

```
[Out] x^2*e^(n*p*q*log(x) + p*q*log(b) + q*log(a))/(n*p*q + 2)
```

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

$$\int x \left(a \left(bx^n\right)^p\right)^q \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(a*(b*x**n)**p)**q,x)
```

```
[Out] Integral(x*(a*(b*x**n)**p)**q, x)
```

GIAC/XCAS [A] time = 0.246837, size = 39, normalized size = 1.7

$$\frac{x^2 e^{(npq\ln(x) + pq\ln(b) + q\ln(a))}}{npq + 2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q*x,x, algorithm="giac")
```

```
[Out] x^2*e^(n*p*q*ln(x) + p*q*ln(b) + q*ln(a))/(n*p*q + 2)
```

3.192 $\int (a(bx^n)^p)^q \, dx$

Optimal. Leaf size=21

$$\frac{x\left(a\left(bx^n\right)^p\right)^q}{npq+1}$$

```
[Out] (x*(a*(b*x^n)^p)^q)/(1 + n*p*q)
```

Rubi [A] time = 0.0304483, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{x\left(a\left(bx^n\right)^p\right)^q}{npq+1}$$

Antiderivative was successfully verified.

```
[In] Int[(a*(b*x^n)^p)^q,x]

[Out] (x*(a*(b*x^n)^p)^q)/(1 + n*p*q)
```

Rubi in Sympy [A] time = 2.51704, size = 31, normalized size = 1.48

$$\frac{x^{-npq}x^{npq+1}\left(a\left(bx^n\right)^p\right)^q}{npq+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a*(b*x**n)**p)**q,x)

[Out] x**(-n*p*q)*x**(n*p*q + 1)*(a*(b*x**n)**p)**q/(n*p*q + 1)
```

Mathematica [A] time = 0.00541827, size = 21, normalized size = 1.

$$\frac{x\left(a\left(bx^n\right)^p\right)^q}{npq+1}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*(b*x^n)^p)^q,x]

[Out] (x*(a*(b*x^n)^p)^q)/(1 + n*p*q)
```

Maple [A] time = 0.002, size = 22, normalized size = 1.1

$$\frac{x\left(a\left(bx^n\right)^p\right)^q}{npq+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*(b*x^n)^p)^q,x)

[Out] x*(a*(b*x^n)^p)^q/(n*p*q+1)
```

Maxima [A] time = 1.65177, size = 34, normalized size = 1.62

$$\frac{a^q (b^p)^q x \left((x^n)^p\right)^q}{npq + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q,x, algorithm="maxima")
```

```
[Out] a^q*(b^p)^q*x*((x^n)^p)^q/(n*p*q + 1)
```

Fricas [A] time = 0.236525, size = 36, normalized size = 1.71

$$\frac{x e^{(npq \log(x) + pq \log(b) + q \log(a))}}{npq + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q,x, algorithm="fricas")
```

```
[Out] x*e^(n*p*q*log(x) + p*q*log(b) + q*log(a))/(n*p*q + 1)
```

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

$$\int \left(a (b x^n)^p\right)^q \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a*(b*x**n)**p)**q,x)
```

```
[Out] Integral((a*(b*x**n)**p)**q, x)
```

GIAC/XCAS [A] time = 0.238163, size = 36, normalized size = 1.71

$$\frac{x e^{(npq \ln(x) + pq \ln(b) + q \ln(a))}}{npq + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q,x, algorithm="giac")
```

```
[Out] x*e^(n*p*q*ln(x) + p*q*ln(b) + q*ln(a))/(n*p*q + 1)
```

3.193 $\int \frac{(a(bx^n)^p)^q}{x}\,dx$

Optimal. Leaf size=21

$$\frac{(a(bx^n)^p)^q}{npq}$$

```
[Out] (a*(b*x^n)^p)^q/(n*p*q)
```

Rubi [A] time = 0.0803711, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{(a(bx^n)^p)^q}{npq}$$

Antiderivative was successfully verified.

```
[In] Int[(a*(b*x^n)^p)^q/x,x]
```

```
[Out] (a*(b*x^n)^p)^q/(n*p*q)
```

Rubi in Sympy [A] time = 7.26835, size = 14, normalized size = 0.67

$$\frac{(a(bx^n)^p)^q}{npq}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a*(b*x**n)**p)**q/x,x)
```

```
[Out] (a*(b*x**n)**p)**q/(n*p*q)
```

Mathematica [A] time = 0.00478247, size = 21, normalized size = 1.

$$\frac{(a(bx^n)^p)^q}{npq}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*(b*x^n)^p)^q/x,x]
```

```
[Out] (a*(b*x^n)^p)^q/(n*p*q)
```

Maple [A] time = 0.002, size = 22, normalized size = 1.1

$$\frac{(a(bx^n)^p)^q}{npq}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*(b*x^n)^p)^q/x,x)
```

```
[Out] (a*(b*x^n)^p)^q/n/p/q
```

Maxima [A] time = 1.65262, size = 34, normalized size = 1.62

$$\frac{a^q (b^p)^q \left((x^n)^p\right)^q}{npq}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((b*x^n)^p*a)^q/x,x, algorithm="maxima")
```

```
[Out] a^q*(b^p)^q*((x^n)^p)^q/(n*p*q)
```

Fricas [A] time = 0.241137, size = 36, normalized size = 1.71

$$\frac{e^{(npq\log(x)+pq\log(b)+q\log(a))}}{npq}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((b*x^n)^p*a)^q/x,x, algorithm="fricas")
```

```
[Out] e^(n*p*q*log(x) + p*q*log(b) + q*log(a))/(n*p*q)
```

Sympy [A] time = 1.61234, size = 42, normalized size = 2.

$$\begin{cases} \log(x) & \text{for } q = 0 \wedge (n = 0 \vee q = 0) \wedge (p = 0 \vee q = 0) \\ (ab^p)^q \log(x) & \text{for } n = 0 \\ a^q \log(x) & \text{for } p = 0 \\ \frac{a^q (b^p)^q \left((x^n)^p\right)^q}{npq} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a*(b*x**n)**p)**q/x,x)
```

```
[Out] Piecewise((log(x), Eq(q, 0) & (Eq(n, 0) | Eq(q, 0)) & (Eq(p, 0) |
 Eq(q, 0))), ((a*b**p)**q*log(x), Eq(n, 0)), (a**q*log(x), Eq(p,
0)), (a**q*(b**p)**q*((x**n)**p)**q/(n*p*q), True))
```

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

$$\int \frac{\left((bx^n)^p a\right)^q}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((b*x^n)^p*a)^q/x,x, algorithm="giac")
```

```
[Out] integrate(((b*x^n)^p*a)^q/x, x)
```

3.194 $\int \frac{(a(bx^n)^p)^q}{x^2}\,dx$

Optimal. Leaf size=25

$$-\frac{\left(a\left(bx^n\right)^p\right)^q}{x(1-npq)}$$

```
[Out] -((a*(b*x^n)^p)^q/((1 - n*p*q)*x))
```

Rubi [A] time = 0.0829921, antiderivative size = 25, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{\left(a\left(bx^n\right)^p\right)^q}{x(1-npq)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a*(b*x^n)^p)^q/x^2,x]

[Out] -((a*(b*x^n)^p)^q/((1 - n*p*q)*x))
```

Rubi in Sympy [A] time = 6.61968, size = 32, normalized size = 1.28

$$-\frac{x^{-npq}x^{npq-1}\left(a\left(bx^n\right)^p\right)^q}{-npq+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a*(b*x**n)**p)**q/x**2,x)

[Out] -x**(-n*p*q)*x**(n*p*q - 1)*(a*(b*x**n)**p)**q/(-n*p*q + 1)
```

Mathematica [A] time = 0.0101476, size = 23, normalized size = 0.92

$$\frac{\left(a\left(bx^n\right)^p\right)^q}{x(npq-1)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a*(b*x^n)^p)^q/x^2,x]

[Out] (a*(b*x^n)^p)^q/((-1 + n*p*q)*x)
```

Maple [A] time = 0.003, size = 24, normalized size = 1.

$$\frac{\left(a\left(bx^n\right)^p\right)^q}{x\left(npq-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a*(b*x^n)^p)^q/x^2,x)
```

```
[Out] 1/x/(n*p*q-1)*(a*(b*x^n)^p)^q
```

Maxima [A] time = 1.64015, size = 36, normalized size = 1.44

$$\frac{a^q (b^p)^q \left((x^n)^p\right)^q}{(npq-1)x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q/x^2,x, algorithm="maxima")
```

```
[Out] a^q*(b^p)^q*((x^n)^p)^q/((n*p*q - 1)*x)
```

Fricas [A] time = 0.274529, size = 39, normalized size = 1.56

$$\frac{e^{(npq\log(x)+pq\log(b)+q\log(a))}}{(npq-1)x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q/x^2,x, algorithm="fricas")
```

```
[Out] e^(n*p*q*log(x) + p*q*log(b) + q*log(a))/((n*p*q - 1)*x)
```

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

$$\int \frac{\left(a\,(bx^n)^p\right)^q}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a*(b*x**n)**p)**q/x**2,x)
```

```
[Out] Integral((a*(b*x**n)**p)**q/x**2, x)
```

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

$$\int \frac{\left((bx^n)^p\,a\right)^q}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q/x^2,x, algorithm="giac")
```

```
[Out] integrate(((b*x^n)^p*a)^q/x^2, x)
```

3.195 $\int \frac{(a(bx^n)^p)^q}{x^3} dx$

Optimal. Leaf size=25

$$-\frac{\left(a\left(bx^n\right)^p\right)^q}{x^2(2-npq)}$$

```
[Out] -((a*(b*x^n)^p)^q/((2 - n*p*q)*x^2))
```

Rubi [A] time = 0.082515, antiderivative size = 25, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{\left(a\left(bx^n\right)^p\right)^q}{x^2(2-npq)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a*(b*x^n)^p)^q/x^3,x]
```

```
[Out] -((a*(b*x^n)^p)^q/((2 - n*p*q)*x^2))
```

Rubi in Sympy [A] time = 6.77883, size = 32, normalized size = 1.28

$$-\frac{x^{-npq}x^{npq-2}\left(a\left(bx^n\right)^p\right)^q}{-npq+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a*(b*x**n)**p)**q/x**3,x)
```

```
[Out] -x**(-n*p*q)*x**(n*p*q - 2)*(a*(b*x**n)**p)**q/(-n*p*q + 2)
```

Mathematica [A] time = 0.00684508, size = 23, normalized size = 0.92

$$\frac{\left(a\left(bx^n\right)^p\right)^q}{x^2(npq-2)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a*(b*x^n)^p)^q/x^3,x]
```

```
[Out] (a*(b*x^n)^p)^q/((-2 + n*p*q)*x^2)
```

Maple [A] time = 0.003, size = 24, normalized size = 1.

$$\frac{\left(a\left(bx^n\right)^p\right)^q}{x^2\left(npq-2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a*(b*x^n)^p)^q/x^3,x)
```

```
[Out] 1/x^2/(n*p*q-2)*(a*(b*x^n)^p)^q
```

Maxima [A] time = 1.64351, size = 36, normalized size = 1.44

$$\frac{a^q (b^p)^q \left((x^n)^p\right)^q}{(npq-2)x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q/x^3,x, algorithm="maxima")
```

```
[Out] a^q*(b^p)^q*((x^n)^p)^q/((n*p*q - 2)*x^2)
```

Fricas [A] time = 0.240321, size = 39, normalized size = 1.56

$$\frac{e^{(npq\log(x)+pq\log(b)+q\log(a))}}{(npq-2)x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q/x^3,x, algorithm="fricas")
```

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

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

$$\int \frac{\left(a\,(bx^n)^p\right)^q}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a*(b*x**n)**p)**q/x**3,x)
```

```
[Out] Integral((a*(b*x**n)**p)**q/x**3, x)
```

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

$$\int \frac{\left((bx^n)^p\,a\right)^q}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q/x^3,x, algorithm="giac")
```

```
[Out] integrate(((b*x^n)^p*a)^q/x^3, x)
```

3.196 $\int x^2 \left(a \left(b x^m\right)^n\right)^{-\frac{1}{mn}} dx$

Optimal. Leaf size=25

$$\frac{1}{2} x^3 \left(a \left(b x^m\right)^n\right)^{-\frac{1}{mn}}$$

```
[Out] x^3/(2*(a*(b*x^m)^n)^(1/(m*n)))
```

Rubi [A] time = 0.085973, antiderivative size = 25, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{1}{2} x^3 \left(a \left(b x^m\right)^n\right)^{-\frac{1}{mn}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a*(b*x^m)^n)^(1/(m*n)),x]

[Out] x^3/(2*(a*(b*x^m)^n)^(1/(m*n)))
```

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

$$x \left(a \left(b x^m\right)^n\right)^{-\frac{1}{mn}} \int x\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/((a*(b*x**m)**n)**(1/m/n)),x)

[Out] x*(a*(b*x**m)**n)**(-1/(m*n))*Integral(x, x)
```

Mathematica [A] time = 0.0175664, size = 25, normalized size = 1.

$$\frac{1}{2} x^3 \left(a \left(b x^m\right)^n\right)^{-\frac{1}{mn}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a*(b*x^m)^n)^(1/(m*n)),x]

[Out] x^3/(2*(a*(b*x^m)^n)^(1/(m*n)))
```

Maple [A] time = 0.003, size = 25, normalized size = 1.

$$\frac{x^3}{2} \left(\left(a \left(b x^m\right)^n\right)^{\frac{1}{mn}}\right)^{-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/((a*(b*x^m)^n)^(1/m/n)),x)

[Out] 1/2*x^3/((a*(b*x^m)^n)^(1/m/n))
```

Maxima [A] time = 1.71287, size = 55, normalized size = 2.2

$$\frac{1}{2}\,a^{-\frac{1}{mn}}\left(b^{n}\right)^{-\frac{1}{mn}}x^{3}\left(\left(x^{m}\right)^{n}\right)^{-\frac{1}{mn}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/((b*x^m)^n*a)^(1/(m*n)),x, algorithm="maxima")

[Out] 1/2*a^(-1/(m*n))*(b^n)^(-1/(m*n))*x^3*((x^m)^n)^(-1/(m*n))
```

Fricas [A] time = 0.236403, size = 28, normalized size = 1.12

$$\frac{1}{2}\,x^{2}e^{\left(-\frac{n\log(b)+\log(a)}{mn}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/((b*x^m)^n*a)^(1/(m*n)),x, algorithm="fricas")

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

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

Exception raised: RecursionError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/((a*(b*x**m)**n)**(1/m/n)),x)

[Out] Exception raised: RecursionError
```

GIAC/XCAS [A] time = 0.276686, size = 28, normalized size = 1.12

$$\frac{1}{2}\,x^{2}e^{\left(-\frac{n\ln(b)+\ln(a)}{mn}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/((b*x^m)^n*a)^(1/(m*n)),x, algorithm="giac")

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

3.197 $\int x \left(a \left(b x^m\right)^n\right)^{-\frac{1}{mn}} \, dx$

Optimal. Leaf size=22

$$x^2 \left(a \left(b x^m\right)^n\right)^{-\frac{1}{m n}}$$

```
[Out] x^2/(a*(b*x^m)^n)^(1/(m*n))
```

Rubi [A] time = 0.0534592, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.1$

$$x^2 \left(a \left(b x^m\right)^n\right)^{-\frac{1}{m n}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a*(b*x^m)^n)^(1/(m*n)),x]

[Out] x^2/(a*(b*x^m)^n)^(1/(m*n))
```

Rubi in Sympy [A] time = 4.87992, size = 15, normalized size = 0.68

$$x^2 \left(a \left(b x^m\right)^n\right)^{-\frac{1}{m n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/((a*(b*x**m)**n)**(1/m/n)),x)

[Out] x**2*(a*(b*x**m)**n)**(-1/(m*n))
```

Mathematica [A] time = 0.00506245, size = 22, normalized size = 1.

$$x^2 \left(a \left(b x^m\right)^n\right)^{-\frac{1}{m n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a*(b*x^m)^n)^(1/(m*n)),x]

[Out] x^2/(a*(b*x^m)^n)^(1/(m*n))
```

Maple [F] time = 0.156, size = 0, normalized size = 0.

$$\int x \left(\left(a \left(b x^m\right)^n\right)^{\frac{1}{m n}}\right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/((a*(b*x^m)^n)^(1/m/n)),x)

[Out] int(x/((a*(b*x^m)^n)^(1/m/n)),x)
```

Maxima [A] time = 1.70536, size = 54, normalized size = 2.45

$$a^{-\frac{1}{mn}}(b^n)^{-\frac{1}{mn}}x^2\left((x^m)^n\right)^{-\frac{1}{mn}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/((b*x^m)^n*a)^(1/(m*n)),x, algorithm="maxima")
```

```
[Out] a^(-1/(m*n))*(b^n)^(-1/(m*n))*x^2*((x^m)^n)^(-1/(m*n))
```

Fricas [A] time = 0.231631, size = 24, normalized size = 1.09

$$xe^{\left(-\frac{n\log(b)+\log(a)}{mn}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/((b*x^m)^n*a)^(1/(m*n)),x, algorithm="fricas")
```

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

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

Exception raised: RecursionError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/((a*(b*x**m)**n)**(1/m/n)),x)
```

```
[Out] Exception raised: RecursionError
```

GIAC/XCAS [A] time = 0.265597, size = 24, normalized size = 1.09

$$xe^{\left(-\frac{n\ln(b)+\ln(a)}{mn}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/((b*x^m)^n*a)^(1/(m*n)),x, algorithm="giac")
```

```
[Out] x*e^(-(n*ln(b) + ln(a))/(m*n))
```

3.198 $\int (a (bx^m)^n)^{-\frac{1}{mn}} dx$

Optimal. Leaf size=22

$$x\log(x)\left(a\left(bx^m\right)^n\right)^{-\frac{1}{mn}}$$

```
[Out] (x*Log[x])/(a*(b*x^m)^n)^(1/(m*n))
```

Rubi [A] time = 0.02475, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111

$$x\log(x)\left(a\left(bx^m\right)^n\right)^{-\frac{1}{mn}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a*(b*x^m)^n)^(-(1/(m*n))),x]

[Out] (x*Log[x])/(a*(b*x^m)^n)^(1/(m*n))
```

Rubi in Sympy [A] time = 2.15424, size = 17, normalized size = 0.77

$$x\left(a\left(bx^m\right)^n\right)^{-\frac{1}{mn}}\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/((a*(b*x**m)**n)**(1/m/n)),x)

[Out] x*(a*(b*x**m)**n)**(-1/(m*n))*log(x)
```

Mathematica [A] time = 0.0029464, size = 22, normalized size = 1.

$$x\log(x)\left(a\left(bx^m\right)^n\right)^{-\frac{1}{mn}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a*(b*x^m)^n)^(-(1/(m*n))),x]

[Out] (x*Log[x])/(a*(b*x^m)^n)^(1/(m*n))
```

Maple [F] time = 0.069, size = 0, normalized size = 0.

$$\int \left(\left(a\left(bx^m\right)^n\right)^{\frac{1}{mn}}\right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/((a*(b*x^m)^n)^(1/m/n)),x)

[Out] int(1/((a*(b*x^m)^n)^(1/m/n)),x)
```

Maxima [A] time = 1.81124, size = 34, normalized size = 1.55

$$a^{-\frac{1}{mn}}(b^n)^{-\frac{1}{mn}}\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((((b*x^m)^n*a)^(1/(m*n))),x, algorithm="maxima")
```

```
[Out] a^(-1/(m*n))*(b^n)^(-1/(m*n))*log(x)
```

Fricas [A] time = 0.232732, size = 26, normalized size = 1.18

$$e^{\left(-\frac{n\log(b)+\log(a)}{mn}\right)}\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((((b*x^m)^n*a)^(1/(m*n))),x, algorithm="fricas")
```

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

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

$$\int \left(a\left(bx^m\right)^n\right)^{-\frac{1}{mn}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a*(b*x**m)**n)**(1/m/n)),x)
```

```
[Out] Integral((a*(b*x**m)**n)**(-1/(m*n)), x)
```

GIAC/XCAS [A] time = 0.253465, size = 26, normalized size = 1.18

$$e^{\left(-\frac{n\ln(b)+\ln(a)}{mn}\right)}\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((((b*x^m)^n*a)^(1/(m*n))),x, algorithm="giac")
```

```
[Out] e^(-(n*ln(b) + ln(a))/(m*n))*ln(x)
```

3.199 $\int \frac{(a(bx^m)^n)^{-\frac{1}{mn}}}{x}\,dx$

Optimal. Leaf size=20

$$-\left(a\left(bx^m\right)^n\right)^{-\frac{1}{mn}}$$

```
[Out] -(a*(b*x^m)^n)^(-(1/(m*n)))
```

Rubi [A] time = 0.0772868, antiderivative size = 20, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$-\left(a\left(bx^m\right)^n\right)^{-\frac{1}{mn}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a*(b*x^m)^n)^(1/(m*n))),x]
```

```
[Out] -(a*(b*x^m)^n)^(-(1/(m*n)))
```

Rubi in Sympy [A] time = 6.5018, size = 15, normalized size = 0.75

$$-\left(a\left(bx^m\right)^n\right)^{-\frac{1}{mn}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/((a*(b*x**m)**n)**(1/m/n)),x)
```

```
[Out] -(a*(b*x**m)**n)**(-1/(m*n))
```

Mathematica [A] time = 0.00405322, size = 20, normalized size = 1.

$$-\left(a\left(bx^m\right)^n\right)^{-\frac{1}{mn}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a*(b*x^m)^n)^(1/(m*n))),x]
```

```
[Out] -(a*(b*x^m)^n)^(-(1/(m*n)))
```

Maple [A] time = 0.003, size = 22, normalized size = 1.1

$$-\left(\left(a\left(bx^m\right)^n\right)^{\frac{1}{mn}}\right)^{-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/((a*(b*x^m)^n)^(1/m/n)),x)
```

```
[Out] -1/((a*(b*x^m)^n)^(1/m/n))
```

Maxima [A] time = 1.7097, size = 51, normalized size = 2.55

$$-a^{-\frac{1}{mn}}(b^n)^{-\frac{1}{mn}}\left((x^m)^n\right)^{-\frac{1}{mn}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((b*x^m)^n*a)^(1/(m*n))*x),x, algorithm="maxima")

[Out] -a^(-1/(m*n))*(b^n)^(-1/(m*n))*((x^m)^n)^(-1/(m*n))
```

Fricas [A] time = 0.231991, size = 28, normalized size = 1.4

$$-\frac{e^{\left(-\frac{n\log(b)+\log(a)}{mn}\right)}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((b*x^m)^n*a)^(1/(m*n))*x),x, algorithm="fricas")

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

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

Exception raised: RecursionError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/((a*(b*x**m)**n)**(1/m/n)),x)

[Out] Exception raised: RecursionError
```

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

$$\int \frac{1}{((bx^m)^n a)^{\frac{1}{mn}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((b*x^m)^n*a)^(1/(m*n))*x),x, algorithm="giac")

[Out] integrate(1/(((b*x^m)^n*a)^(1/(m*n))*x), x)
```

3.200 $\int \frac{(a(bx^m)^n)^{-\frac{1}{mn}}}{x^2}\,dx$

Optimal. Leaf size=25

$$-\frac{(a\,(bx^m)^n)^{-\frac{1}{mn}}}{2x}$$

```
[Out] -1/(2*x*(a*(b*x^m)^n)^(1/(m*n)))
```

Rubi [A] time = 0.0763703, antiderivative size = 25, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$-\frac{(a\,(bx^m)^n)^{-\frac{1}{mn}}}{2x}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(a*(b*x^m)^n)^(1/(m*n))),x]
```

```
[Out] -1/(2*x*(a*(b*x^m)^n)^(1/(m*n)))
```

Rubi in Sympy [A] time = 6.56648, size = 19, normalized size = 0.76

$$-\frac{(a\,(bx^m)^n)^{-\frac{1}{mn}}}{2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/((a*(b*x**m)**n)**(1/m/n)),x)
```

```
[Out] -(a*(b*x**m)**n)**(-1/(m*n))/(2*x)
```

Mathematica [A] time = 0.00662301, size = 25, normalized size = 1.

$$-\frac{(a\,(bx^m)^n)^{-\frac{1}{mn}}}{2x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*(a*(b*x^m)^n)^(1/(m*n))),x]
```

```
[Out] -1/(2*x*(a*(b*x^m)^n)^(1/(m*n)))
```

Maple [A] time = 0.003, size = 25, normalized size = 1.

$$-\frac{1}{2\,x}\left(\left(a\,(bx^m)^n\right)^{\frac{1}{mn}}\right)^{-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/((a*(b*x^m)^n)^(1/m/n)),x)
```

```
[Out] -1/2/x/((a*(b*x^m)^n)^(1/m/n))
```

Maxima [A] time = 1.90162, size = 36, normalized size = 1.44

$$-\frac{a^{-\frac{1}{mn}}(b^n)^{-\frac{1}{mn}}}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((b*x^m)^n*a)^(1/(m*n))*x^2),x, algorithm="maxima")
```

```
[Out] -1/2*a^(-1/(m*n))*(b^n)^(-1/(m*n))/x^2
```

Fricas [A] time = 0.235276, size = 28, normalized size = 1.12

$$-\frac{e^{\left(-\frac{n\log(b)+\log(a)}{mn}\right)}}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((b*x^m)^n*a)^(1/(m*n))*x^2),x, algorithm="fricas")
```

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

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

Exception raised: RecursionError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/((a*(b*x**m)**n)**(1/m/n)),x)
```

```
[Out] Exception raised: RecursionError
```

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

$$\int \frac{1}{((bx^m)^n\,a)^{\frac{1}{mn}}\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((b*x^m)^n*a)^(1/(m*n))*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/(((b*x^m)^n*a)^(1/(m*n))*x^2), x)
```

3.201 $\int x^{2-npq} \left(a (bx^n)^p\right)^q \, dx$

Optimal. Leaf size=24

$$\frac{1}{3} x^{3-npq} \left(a (bx^n)^p\right)^q$$

```
[Out] (x^(3 - n*p*q)*(a*(b*x^n)^p)^q)/3
```

Rubi [A] time = 0.0733942, antiderivative size = 24, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$

$$\frac{1}{3} x^{3-npq} \left(a (bx^n)^p\right)^q$$

Antiderivative was successfully verified.

```
[In]  Int[x^(2 - n*p*q)*(a*(b*x^n)^p)^q,x]

[Out] (x^(3 - n*p*q)*(a*(b*x^n)^p)^q)/3
```

Rubi in Sympy [A] time = 8.85048, size = 20, normalized size = 0.83

$$\frac{x^3 x^{-npq} \left(a (bx^n)^p\right)^q}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-n*p*q+2)*(a*(b*x**n)**p)**q,x)

[Out] x**3*x**(-n*p*q)*(a*(b*x**n)**p)**q/3
```

Mathematica [A] time = 0.00978924, size = 24, normalized size = 1.

$$\frac{1}{3} x^{3-npq} \left(a (bx^n)^p\right)^q$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(2 - n*p*q)*(a*(b*x^n)^p)^q,x]

[Out] (x^(3 - n*p*q)*(a*(b*x^n)^p)^q)/3
```

Maple [A] time = 0.003, size = 23, normalized size = 1.

$$\frac{x^{-npq+3} \left(a (bx^n)^p\right)^q}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-n*p*q+2)*(a*(b*x^n)^p)^q,x)

[Out] 1/3*x^(-n*p*q+3)*(a*(b*x^n)^p)^q
```

Maxima [A] time = 1.84018, size = 18, normalized size = 0.75

$$\frac{1}{3}\,a^{q}\left(b^{p}\right)^{q}x^{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q*x^(-n*p*q + 2),x, algorithm="maxima")

[Out] 1/3*a^q*(b^p)^q*x^3
```

Fricas [A] time = 0.229507, size = 22, normalized size = 0.92

$$\frac{1}{3}\,x^{3}e^{\left(pq\log\left(b\right)+q\log\left(a\right)\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q*x^(-n*p*q + 2),x, algorithm="fricas")

[Out] 1/3*x^3*e^(p*q*log(b) + q*log(a))
```

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

$$\int x^{-npq+2}\left(a\left(bx^{n}\right)^{p}\right)^{q}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-n*p*q+2)*(a*(b*x**n)**p)**q,x)

[Out] Integral(x**(-n*p*q + 2)*(a*(b*x**n)**p)**q, x)
```

GIAC/XCAS [A] time = 0.25519, size = 24, normalized size = 1.

$$\frac{1}{3}\,xe^{\left(pq\ln\left(b\right)+q\ln\left(a\right)+2\,\ln\left(x\right)\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q*x^(-n*p*q + 2),x, algorithm="giac")

[Out] 1/3*x*e^(p*q*ln(b) + q*ln(a) + 2*ln(x))
```

3.202 $\int x^{1-npq} \left(a \left(b x^n\right)^p\right)^q \, dx$

Optimal. Leaf size=24

$$\frac{1}{2} x^{2-npq} \left(a \left(b x^n\right)^p\right)^q$$

```
[Out] (x^(2 - n*p*q)*(a*(b*x^n)^p)^q)/2
```

Rubi [A] time = 0.0750715, antiderivative size = 24, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095

$$\frac{1}{2} x^{2-npq} \left(a \left(b x^n\right)^p\right)^q$$

Antiderivative was successfully verified.

```
[In]  Int[x^(1 - n*p*q)*(a*(b*x^n)^p)^q,x]

[Out] (x^(2 - n*p*q)*(a*(b*x^n)^p)^q)/2
```

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

$$x^{-npq} \left(a \left(b x^n\right)^p\right)^q \int x \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-n*p*q+1)*(a*(b*x**n)**p)**q,x)

[Out] x**(-n*p*q)*(a*(b*x**n)**p)**q*Integral(x, x)
```

Mathematica [A] time = 0.00752536, size = 24, normalized size = 1.

$$\frac{1}{2} x^{2-npq} \left(a \left(b x^n\right)^p\right)^q$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(1 - n*p*q)*(a*(b*x^n)^p)^q,x]

[Out] (x^(2 - n*p*q)*(a*(b*x^n)^p)^q)/2
```

Maple [A] time = 0.002, size = 23, normalized size = 1.

$$\frac{x^{-npq+2} \left(a \left(b x^n\right)^p\right)^q}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-n*p*q+1)*(a*(b*x^n)^p)^q,x)

[Out] 1/2*x^(-n*p*q+2)*(a*(b*x^n)^p)^q
```

Maxima [A] time = 1.77212, size = 18, normalized size = 0.75

$$\frac{1}{2}\,a^{q}\left(b^{p}\right)^{q}x^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q*x^(-n*p*q + 1),x, algorithm="maxima")
```

```
[Out] 1/2*a^q*(b^p)^q*x^2
```

Fricas [A] time = 0.229152, size = 22, normalized size = 0.92

$$\frac{1}{2}\,x^{2}e^{\left(pq\log\left(b\right)+q\log\left(a\right)\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q*x^(-n*p*q + 1),x, algorithm="fricas")
```

```
[Out] 1/2*x^2*e^(p*q*log(b) + q*log(a))
```

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

$$\int x^{-npq+1}\left(a\left(bx^{n}\right)^{p}\right)^{q}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-n*p*q+1)*(a*(b*x**n)**p)**q,x)
```

```
[Out] Integral(x**(-n*p*q + 1)*(a*(b*x**n)**p)**q, x)
```

GIAC/XCAS [A] time = 0.280279, size = 22, normalized size = 0.92

$$\frac{1}{2}\,xe^{\left(pq\ln\left(b\right)+q\ln\left(a\right)+\ln\left(x\right)\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q*x^(-n*p*q + 1),x, algorithm="giac")
```

```
[Out] 1/2*x*e^(p*q*ln(b) + q*ln(a) + ln(x))
```

3.203 $\int x^{-npq} \left(a (bx^n)^p\right)^q \, dx$

Optimal. Leaf size=21

$$x^{1-npq} \left(a (bx^n)^p\right)^q$$

```
[Out] x^(1 - n*p*q)*(a*(b*x^n)^p)^q
```

Rubi [A] time = 0.0748248, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$x^{1-npq} \left(a (bx^n)^p\right)^q$$

Antiderivative was successfully verified.

```
[In]  Int[(a*(b*x^n)^p)^q/x^(n*p*q),x]
```

```
[Out] x^(1 - n*p*q)*(a*(b*x^n)^p)^q
```

Rubi in Sympy [A] time = 8.17677, size = 17, normalized size = 0.81

$$xx^{-npq} \left(a (bx^n)^p\right)^q$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a*(b*x**n)**p)**q/(x**(n*p*q)),x)
```

```
[Out] x*x**(-n*p*q)*(a*(b*x**n)**p)**q
```

Mathematica [A] time = 0.00583489, size = 21, normalized size = 1.

$$x^{1-npq} \left(a (bx^n)^p\right)^q$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a*(b*x^n)^p)^q/x^(n*p*q),x]
```

```
[Out] x^(1 - n*p*q)*(a*(b*x^n)^p)^q
```

Maple [F] time = 0.29, size = 0, normalized size = 0.

$$\int \frac{\left(a (bx^n)^p\right)^q}{x^{npq}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a*(b*x^n)^p)^q/(x^(n*p*q)),x)
```

```
[Out] int((a*(b*x^n)^p)^q/(x^(n*p*q)),x)
```

Maxima [A] time = 1.74871, size = 14, normalized size = 0.67

$$a^q (b^p)^q x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q/x^(n*p*q),x, algorithm="maxima")
```

```
[Out] a^q*(b^p)^q*x
```

Fricas [A] time = 0.228433, size = 18, normalized size = 0.86

$$xe^{(pq \log(b) + q \log(a))}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q/x^(n*p*q),x, algorithm="fricas")
```

```
[Out] x*e^(p*q*log(b) + q*log(a))
```

Sympy [A] time = 10.0414, size = 22, normalized size = 1.05

$$a^q x x^{-npq} (b^p)^q ((x^n)^p)^q$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a*(b*x**n)**p)**q/(x**(n*p*q)),x)
```

```
[Out] a**q*x*x**(-n*p*q)*(b**p)**q*((x**n)**p)**q
```

GIAC/XCAS [A] time = 0.306185, size = 18, normalized size = 0.86

$$xe^{(pq\ln(b) + q\ln(a))}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q/x^(n*p*q),x, algorithm="giac")
```

```
[Out] x*e^(p*q*ln(b) + q*ln(a))
```

3.204 $\int x^{-1-npq} \left(a (bx^n)^p\right)^q \, dx$

Optimal. Leaf size=21

$$\log(x)x^{-npq} \left(a (bx^n)^p\right)^q$$

```
[Out] ((a*(b*x^n)^p)^q*Log[x])/x^(n*p*q)
```

Rubi [A] time = 0.0757675, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095

$$\log(x)x^{-npq} \left(a (bx^n)^p\right)^q$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 - n*p*q)*(a*(b*x^n)^p)^q,x]

[Out] ((a*(b*x^n)^p)^q*Log[x])/x^(n*p*q)
```

Rubi in Sympy [A] time = 8.69296, size = 19, normalized size = 0.9

$$x^{-npq} \left(a (bx^n)^p\right)^q \log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-n*p*q-1)*(a*(b*x**n)**p)**q,x)

[Out] x**(-n*p*q)*(a*(b*x**n)**p)**q*log(x)
```

Mathematica [A] time = 0.0114324, size = 21, normalized size = 1.

$$\log(x)x^{-npq} \left(a (bx^n)^p\right)^q$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 - n*p*q)*(a*(b*x^n)^p)^q,x]

[Out] ((a*(b*x^n)^p)^q*Log[x])/x^(n*p*q)
```

Maple [F] time = 0.252, size = 0, normalized size = 0.

$$\int x^{-npq-1} \left(a (bx^n)^p\right)^q \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-n*p*q-1)*(a*(b*x^n)^p)^q,x)

[Out] int(x^(-n*p*q-1)*(a*(b*x^n)^p)^q,x)
```

Maxima [A] time = 1.83342, size = 15, normalized size = 0.71

$$a^q (b^p)^q \log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q*x^(-n*p*q - 1),x, algorithm="maxima")
```

```
[Out] a^q*(b^p)^q*log(x)
```

Fricas [A] time = 0.233747, size = 19, normalized size = 0.9

$$e^{(pq\log(b)+q\log(a))}\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q*x^(-n*p*q - 1),x, algorithm="fricas")
```

```
[Out] e^(p*q*log(b) + q*log(a))*log(x)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-n*p*q-1)*(a*(b*x**n)**p)**q,x)
```

```
[Out] Timed out
```

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

$$\int \left((bx^n)^p a\right)^q x^{-npq-1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q*x^(-n*p*q - 1),x, algorithm="giac")
```

```
[Out] integrate(((b*x^n)^p*a)^q*x^(-n*p*q - 1), x)
```

3.205 $\int x^{-2-npq} \left(a \left(bx^n\right)^p\right)^q \, dx$

Optimal. Leaf size=22

$$-x^{-npq-1} \left(a \left(bx^n\right)^p\right)^q$$

```
[Out] -(x^(-1 - n*p*q)*(a*(b*x^n)^p)^q)
```

Rubi [A] time = 0.0743356, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$

$$-x^{-npq-1} \left(a \left(bx^n\right)^p\right)^q$$

Antiderivative was successfully verified.

```
[In] Int[x^(-2 - n*p*q)*(a*(b*x^n)^p)^q,x]

[Out] -(x^(-1 - n*p*q)*(a*(b*x^n)^p)^q)
```

Rubi in Sympy [A] time = 8.78086, size = 19, normalized size = 0.86

$$-\frac{x^{-npq} \left(a \left(bx^n\right)^p\right)^q}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-n*p*q-2)*(a*(b*x**n)**p)**q,x)

[Out] -x**(-n*p*q)*(a*(b*x**n)**p)**q/x
```

Mathematica [A] time = 0.01136, size = 22, normalized size = 1.

$$-x^{-npq-1} \left(a \left(bx^n\right)^p\right)^q$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-2 - n*p*q)*(a*(b*x^n)^p)^q,x]

[Out] -(x^(-1 - n*p*q)*(a*(b*x^n)^p)^q)
```

Maple [A] time = 0.003, size = 23, normalized size = 1.1

$$-x^{-npq-1} \left(a \left(bx^n\right)^p\right)^q$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-n*p*q-2)*(a*(b*x^n)^p)^q,x)

[Out] -x^(-n*p*q-1)*(a*(b*x^n)^p)^q
```

Maxima [A] time = 1.8285, size = 18, normalized size = 0.82

$$-\frac{a^q (b^p)^q}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q*x^(-n*p*q - 2),x, algorithm="maxima")
```

```
[Out] -a^q*(b^p)^q/x
```

Fricas [A] time = 0.230161, size = 22, normalized size = 1.

$$-\frac{e^{(pq\log(b)+q\log(a))}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q*x^(-n*p*q - 2),x, algorithm="fricas")
```

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-n*p*q-2)*(a*(b*x**n)**p)**q,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.333306, size = 24, normalized size = 1.09

$$-xe^{(pq\ln(b)+q\ln(a)-2\ln(x))}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x^n)^p*a)^q*x^(-n*p*q - 2),x, algorithm="giac")
```

```
[Out] -x*e^(p*q*ln(b) + q*ln(a) - 2*ln(x))
```

3.206 $\int x^3 \left(a+bx^3\right) \, dx$

Optimal. Leaf size=17

$$\frac{ax^4}{4}+\frac{bx^7}{7}$$

```
[Out] (a*x^4)/4 + (b*x^7)/7
```

Rubi [A] time = 0.0131811, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$

$$\frac{ax^4}{4}+\frac{bx^7}{7}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3*(a + b*x^3),x]

[Out] (a*x^4)/4 + (b*x^7)/7
```

Rubi in Sympy [A] time = 3.16566, size = 12, normalized size = 0.71

$$\frac{ax^4}{4}+\frac{bx^7}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3*(b*x**3+a),x)

[Out] a*x**4/4 + b*x**7/7
```

Mathematica [A] time = 0.00238163, size = 17, normalized size = 1.

$$\frac{ax^4}{4}+\frac{bx^7}{7}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3*(a + b*x^3),x]

[Out] (a*x^4)/4 + (b*x^7)/7
```

Maple [A] time = 0.001, size = 14, normalized size = 0.8

$$\frac{ax^4}{4}+\frac{bx^7}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3*(b*x^3+a),x)

[Out] 1/4*a*x^4+1/7*b*x^7
```

Maxima [A] time = 1.48572, size = 18, normalized size = 1.06

$$\frac{1}{7}bx^7 + \frac{1}{4}ax^4$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/7*b*x^7 + 1/4*a*x^4
```

Fricas [A] time = 0.191135, size = 1, normalized size = 0.06

$$\frac{1}{7}x^7b + \frac{1}{4}x^4a$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/7*x^7*b + 1/4*x^4*a
```

Sympy [A] time = 0.064027, size = 12, normalized size = 0.71

$$\frac{ax^4}{4} + \frac{bx^7}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(b*x**3+a),x)
```

```
[Out] a*x**4/4 + b*x**7/7
```

GIAC/XCAS [A] time = 0.258227, size = 18, normalized size = 1.06

$$\frac{1}{7}bx^7 + \frac{1}{4}ax^4$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/7*b*x^7 + 1/4*a*x^4
```

3.207 $\int x^2 \left(a + bx^3\right) \, dx$

Optimal. Leaf size=17

$$\frac{ax^3}{3} + \frac{bx^6}{6}$$

```
[Out] (a*x^3)/3 + (b*x^6)/6
```

Rubi [A] time = 0.0129008, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$

$$\frac{ax^3}{3} + \frac{bx^6}{6}$$

Antiderivative was successfully verified.

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

[Out] (a*x^3)/3 + (b*x^6)/6
```

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

$$\frac{b \int^{x^3} x \, dx}{3} + \frac{\int^{x^3} a \, dx}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(b*x**3+a),x)

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

Mathematica [A] time = 0.00232148, size = 17, normalized size = 1.

$$\frac{ax^3}{3} + \frac{bx^6}{6}$$

Antiderivative was successfully verified.

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

[Out] (a*x^3)/3 + (b*x^6)/6
```

Maple [A] time = 0.001, size = 14, normalized size = 0.8

$$\frac{ax^3}{3} + \frac{bx^6}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 1/3*a*x^3+1/6*b*x^6
```

Maxima [A] time = 1.42471, size = 19, normalized size = 1.12

$$\frac{\left(bx^3 + a\right)^2}{6\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/6*(b*x^3 + a)^2/b
```

Fricas [A] time = 0.188441, size = 1, normalized size = 0.06

$$\frac{1}{6}x^6b + \frac{1}{3}x^3a$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/6*x^6*b + 1/3*x^3*a
```

Sympy [A] time = 0.06611, size = 12, normalized size = 0.71

$$\frac{ax^3}{3} + \frac{bx^6}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(b*x**3+a),x)
```

```
[Out] a*x**3/3 + b*x**6/6
```

GIAC/XCAS [A] time = 0.272919, size = 18, normalized size = 1.06

$$\frac{1}{6}\,bx^6 + \frac{1}{3}\,ax^3$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/6*b*x^6 + 1/3*a*x^3
```

3.208 $\int x\left(a+bx^3\right)\,dx$

Optimal. Leaf size=17

$$\frac{ax^2}{2}+\frac{bx^5}{5}$$

```
[Out] (a*x^2)/2 + (b*x^5)/5
```

Rubi [A] time = 0.0124925, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111

$$\frac{ax^2}{2}+\frac{bx^5}{5}$$

Antiderivative was successfully verified.

```
[In]  Int[x*(a + b*x^3),x]
```

```
[Out] (a*x^2)/2 + (b*x^5)/5
```

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

$$a\int x\,dx+\frac{bx^5}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(b*x**3+a),x)
```

```
[Out] a*Integral(x, x) + b*x**5/5
```

Mathematica [A] time = 0.00173015, size = 17, normalized size = 1.

$$\frac{ax^2}{2}+\frac{bx^5}{5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x*(a + b*x^3),x]
```

```
[Out] (a*x^2)/2 + (b*x^5)/5
```

Maple [A] time = 0., size = 14, normalized size = 0.8

$$\frac{ax^2}{2}+\frac{bx^5}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(b*x^3+a),x)
```

```
[Out] 1/2*a*x^2+1/5*b*x^5
```

Maxima [A] time = 1.44005, size = 18, normalized size = 1.06

$$\frac{1}{5}\,bx^5 + \frac{1}{2}\,ax^2$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/5*b*x^5 + 1/2*a*x^2
```

Fricas [A] time = 0.189776, size = 1, normalized size = 0.06

$$\frac{1}{5}x^5b + \frac{1}{2}x^2a$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/5*x^5*b + 1/2*x^2*a
```

Sympy [A] time = 0.061796, size = 12, normalized size = 0.71

$$\frac{ax^2}{2} + \frac{bx^5}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(b*x**3+a),x)
```

```
[Out] a*x**2/2 + b*x**5/5
```

GIAC/XCAS [A] time = 0.248871, size = 18, normalized size = 1.06

$$\frac{1}{5}\,bx^5 + \frac{1}{2}\,ax^2$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/5*b*x^5 + 1/2*a*x^2
```

3.209 $\int (a + bx^3)\, dx$

Optimal. Leaf size=12

$$ax + \frac{bx^4}{4}$$

```
[Out] a*x + (b*x^4)/4
```

Rubi [A] time = 0.00813269, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 0, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.

$$ax + \frac{bx^4}{4}$$

Antiderivative was successfully verified.

```
[In]  Int[a + b*x^3,x]

[Out] a*x + (b*x^4)/4
```

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

$$\frac{bx^4}{4} + \int a\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(b*x**3+a,x)

[Out] b*x**4/4 + Integral(a, x)
```

Mathematica [A] time = 0.0000825556, size = 12, normalized size = 1.

$$ax + \frac{bx^4}{4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[a + b*x^3,x]

[Out] a*x + (b*x^4)/4
```

Maple [A] time = 0.001, size = 11, normalized size = 0.9

$$ax + \frac{bx^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(b*x^3+a,x)

[Out] a*x+1/4*b*x^4
```

Maxima [A] time = 1.42435, size = 14, normalized size = 1.17

$$\frac{1}{4}\,bx^4 + ax$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*b*x^4 + a*x
```

Fricas [A] time = 0.193459, size = 1, normalized size = 0.08

$$\frac{1}{4}x^4b + xa$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*x^4*b + x*a
```

Sympy [A] time = 0.05472, size = 8, normalized size = 0.67

$$ax + \frac{bx^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(b*x**3+a,x)
```

```
[Out] a*x + b*x**4/4
```

GIAC/XCAS [A] time = 0.264962, size = 14, normalized size = 1.17

$$\frac{1}{4}\,bx^4 + ax$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*b*x^4 + a*x
```

3.210 $\int \frac{a+bx^3}{x} \, dx$

Optimal. Leaf size=13

$$a\log(x) + \frac{bx^3}{3}$$

```
[Out] (b*x^3)/3 + a*Log[x]
```

Rubi [A] time = 0.0109953, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$a\log(x) + \frac{bx^3}{3}$$

Antiderivative was successfully verified.

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

[Out] (b*x^3)/3 + a*Log[x]
```

Rubi in Sympy [A] time = 2.75585, size = 10, normalized size = 0.77

$$a\log(x) + \frac{bx^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] a*log(x) + b*x**3/3
```

Mathematica [A] time = 0.00304368, size = 13, normalized size = 1.

$$a\log(x) + \frac{bx^3}{3}$$

Antiderivative was successfully verified.

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

[Out] (b*x^3)/3 + a*Log[x]
```

Maple [A] time = 0.003, size = 12, normalized size = 0.9

$$\frac{bx^3}{3} + a\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 1/3*b*x^3+a*ln(x)
```

Maxima [A] time = 1.42253, size = 19, normalized size = 1.46

$$\frac{1}{3}bx^3 + \frac{1}{3}a\log\left(x^3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 1/3*b*x^3 + 1/3*a*log(x^3)
```

Fricas [A] time = 0.211994, size = 15, normalized size = 1.15

$$\frac{1}{3}bx^3 + a\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 1/3*b*x^3 + a*log(x)
```

Sympy [A] time = 0.154558, size = 10, normalized size = 0.77

$$a\log(x) + \frac{bx^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] a*log(x) + b*x**3/3
```

GIAC/XCAS [A] time = 0.26586, size = 16, normalized size = 1.23

$$\frac{1}{3}bx^3 + a\ln(|x|)$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 1/3*b*x^3 + a*ln(abs(x))
```

3.211 $\int \frac{a+bx^3}{x^2} dx$

Optimal. Leaf size=15

$$\frac{bx^2}{2} - \frac{a}{x}$$

```
[Out] -(a/x) + (b*x^2)/2
```

Rubi [A] time = 0.0130924, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{bx^2}{2} - \frac{a}{x}$$

Antiderivative was successfully verified.

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

[Out] -(a/x) + (b*x^2)/2
```

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

$$-\frac{a}{x} + b \int x \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] -a/x + b*Integral(x, x)
```

Mathematica [A] time = 0.00187862, size = 15, normalized size = 1.

$$\frac{bx^2}{2} - \frac{a}{x}$$

Antiderivative was successfully verified.

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

[Out] -(a/x) + (b*x^2)/2
```

Maple [A] time = 0.005, size = 14, normalized size = 0.9

$$-\frac{a}{x} + \frac{bx^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] -a/x+1/2*b*x^2
```

Maxima [A] time = 1.44221, size = 18, normalized size = 1.2

$$\frac{1}{2}bx^2 - \frac{a}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*b*x^2 - a/x
```

Fricas [A] time = 0.211457, size = 19, normalized size = 1.27

$$\frac{bx^3 - 2a}{2x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*(b*x^3 - 2*a)/x
```

Sympy [A] time = 1.02542, size = 8, normalized size = 0.53

$$-\frac{a}{x} + \frac{bx^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a/x + b*x**2/2
```

GIAC/XCAS [A] time = 0.233351, size = 18, normalized size = 1.2

$$\frac{1}{2}bx^2 - \frac{a}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*b*x^2 - a/x
```

3.212 $\int \frac{a+bx^3}{x^3} dx$

Optimal. Leaf size=12

$$bx - \frac{a}{2x^2}$$

```
[Out] -a/(2*x^2) + b*x
```

Rubi [A] time = 0.0119194, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$bx - \frac{a}{2x^2}$$

Antiderivative was successfully verified.

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

[Out] -a/(2*x^2) + b*x
```

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

$$-\frac{a}{2x^2} + \int b\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Mathematica [A] time = 0.00161559, size = 12, normalized size = 1.

$$bx - \frac{a}{2x^2}$$

Antiderivative was successfully verified.

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

[Out] -a/(2*x^2) + b*x
```

Maple [A] time = 0.003, size = 11, normalized size = 0.9

$$-\frac{a}{2\,x^2} + bx$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] -1/2*a/x^2+b*x
```

Maxima [A] time = 1.4471, size = 14, normalized size = 1.17

$$bx - \frac{a}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] b*x - 1/2*a/x^2
```

Fricas [A] time = 0.208041, size = 20, normalized size = 1.67

$$\frac{2\,bx^3 - a}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*(2*b*x^3 - a)/x^2
```

Sympy [A] time = 1.00311, size = 8, normalized size = 0.67

$$-\frac{a}{2x^2} + bx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a/(2*x**2) + b*x
```

GIAC/XCAS [A] time = 0.217769, size = 14, normalized size = 1.17

$$bx - \frac{a}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] b*x - 1/2*a/x^2
```

3.213 $\int \frac{a+bx^3}{x^4} \, dx$

Optimal. Leaf size=13

$$b\log(x) - \frac{a}{3x^3}$$

```
[Out] -a/(3*x^3) + b*Log[x]
```

Rubi [A] time = 0.0123584, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$

$$b\log(x) - \frac{a}{3x^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^3)/x^4,x]

[Out] -a/(3*x^3) + b*Log[x]
```

Rubi in Sympy [A] time = 2.8014, size = 10, normalized size = 0.77

$$-\frac{a}{3x^3} + b\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**3+a)/x**4,x)

[Out] -a/(3*x**3) + b*log(x)
```

Mathematica [A] time = 0.00540515, size = 13, normalized size = 1.

$$b\log(x) - \frac{a}{3x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^3)/x^4,x]

[Out] -a/(3*x^3) + b*Log[x]
```

Maple [A] time = 0.007, size = 12, normalized size = 0.9

$$-\frac{a}{3\,x^3} + b\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x^3+a)/x^4,x)

[Out] -1/3*a/x^3+b*ln(x)
```

Maxima [A] time = 1.47933, size = 19, normalized size = 1.46

$$\frac{1}{3}\,b\log\left(x^{3}\right)-\frac{a}{3\,x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)/x^4,x, algorithm="maxima")

[Out] 1/3*b*log(x^3) - 1/3*a/x^3
```

Fricas [A] time = 0.217902, size = 23, normalized size = 1.77

$$\frac{3\,bx^{3}\log\left(x\right)-a}{3\,x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)/x^4,x, algorithm="fricas")

[Out] 1/3*(3*b*x^3*log(x) - a)/x^3
```

Sympy [A] time = 1.08496, size = 10, normalized size = 0.77

$$-\frac{a}{3x^{3}}+b\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)/x**4,x)

[Out] -a/(3*x**3) + b*log(x)
```

GIAC/XCAS [A] time = 0.219801, size = 24, normalized size = 1.85

$$b\ln\left(|x|\right)-\frac{bx^{3}+a}{3\,x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)/x^4,x, algorithm="giac")

[Out] b*ln(abs(x)) - 1/3*(b*x^3 + a)/x^3
```

3.214 $\int \frac{a+bx^3}{x^5} \, dx$

Optimal. Leaf size=15

$$-\frac{a}{4x^4}-\frac{b}{x}$$

```
[Out] -a/(4*x^4) - b/x
```

Rubi [A] time = 0.0130067, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$-\frac{a}{4x^4}-\frac{b}{x}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)/x^5,x]

[Out] -a/(4*x^4) - b/x
```

Rubi in Sympy [A] time = 2.93023, size = 10, normalized size = 0.67

$$-\frac{a}{4x^4}-\frac{b}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)/x**5,x)

[Out] -a/(4*x**4) - b/x
```

Mathematica [A] time = 0.00348301, size = 15, normalized size = 1.

$$-\frac{a}{4x^4}-\frac{b}{x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)/x^5,x]

[Out] -a/(4*x^4) - b/x
```

Maple [A] time = 0.006, size = 14, normalized size = 0.9

$$-\frac{a}{4\,x^4}-\frac{b}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)/x^5,x)

[Out] -1/4*a/x^4-b/x
```

Maxima [A] time = 1.43768, size = 18, normalized size = 1.2

$$-\frac{4\,bx^3+a}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)/x^5,x, algorithm="maxima")
```

```
[Out] -1/4*(4*b*x^3 + a)/x^4
```

Fricas [A] time = 0.210331, size = 18, normalized size = 1.2

$$-\frac{4\,bx^3+a}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)/x^5,x, algorithm="fricas")
```

```
[Out] -1/4*(4*b*x^3 + a)/x^4
```

Sympy [A] time = 1.14706, size = 14, normalized size = 0.93

$$-\frac{a+4bx^3}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)/x**5,x)
```

```
[Out] -(a + 4*b*x**3)/(4*x**4)
```

GIAC/XCAS [A] time = 0.213547, size = 18, normalized size = 1.2

$$-\frac{4\,bx^3+a}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)/x^5,x, algorithm="giac")
```

```
[Out] -1/4*(4*b*x^3 + a)/x^4
```

3.215 $\int \frac{a+bx^3}{x^6} dx$

Optimal. Leaf size=17

$$-\frac{a}{5x^5}-\frac{b}{2x^2}$$

```
[Out] -a/(5*x^5) - b/(2*x^2)
```

Rubi [A] time = 0.0128473, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$-\frac{a}{5x^5}-\frac{b}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)/x^6,x]

[Out] -a/(5*x^5) - b/(2*x^2)
```

Rubi in Sympy [A] time = 2.9771, size = 14, normalized size = 0.82

$$-\frac{a}{5x^5}-\frac{b}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)/x**6,x)

[Out] -a/(5*x**5) - b/(2*x**2)
```

Mathematica [A] time = 0.00342574, size = 17, normalized size = 1.

$$-\frac{a}{5x^5}-\frac{b}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)/x^6,x]

[Out] -a/(5*x^5) - b/(2*x^2)
```

Maple [A] time = 0.008, size = 14, normalized size = 0.8

$$-\frac{a}{5\,x^5}-\frac{b}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)/x^6,x)

[Out] -1/5*a/x^5-1/2*b/x^2
```

Maxima [A] time = 1.41984, size = 20, normalized size = 1.18

$$-\frac{5\,bx^3 + 2\,a}{10\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)/x^6,x, algorithm="maxima")
```

```
[Out] -1/10*(5*b*x^3 + 2*a)/x^5
```

Fricas [A] time = 0.213696, size = 20, normalized size = 1.18

$$-\frac{5\,bx^3 + 2\,a}{10\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)/x^6,x, algorithm="fricas")
```

```
[Out] -1/10*(5*b*x^3 + 2*a)/x^5
```

Sympy [A] time = 1.19228, size = 15, normalized size = 0.88

$$-\frac{2a + 5bx^3}{10x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)/x**6,x)
```

```
[Out] -(2*a + 5*b*x**3)/(10*x**5)
```

GIAC/XCAS [A] time = 0.21805, size = 20, normalized size = 1.18

$$-\frac{5\,bx^3 + 2\,a}{10\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)/x^6,x, algorithm="giac")
```

```
[Out] -1/10*(5*b*x^3 + 2*a)/x^5
```

3.216 $\int \frac{a+bx^3}{x^7} \, dx$

Optimal. Leaf size=17

$$-\frac{a}{6x^6}-\frac{b}{3x^3}$$

```
[Out] -a/(6*x^6) - b/(3*x^3)
```

Rubi [A] time = 0.0133107, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$-\frac{a}{6x^6}-\frac{b}{3x^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^3)/x^7,x]

[Out] -a/(6*x^6) - b/(3*x^3)
```

Rubi in Sympy [A] time = 2.97224, size = 14, normalized size = 0.82

$$-\frac{a}{6x^6}-\frac{b}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**3+a)/x**7,x)

[Out] -a/(6*x**6) - b/(3*x**3)
```

Mathematica [A] time = 0.00375596, size = 17, normalized size = 1.

$$-\frac{a}{6x^6}-\frac{b}{3x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^3)/x^7,x]

[Out] -a/(6*x^6) - b/(3*x^3)
```

Maple [A] time = 0.006, size = 14, normalized size = 0.8

$$-\frac{a}{6\,x^6}-\frac{b}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x^3+a)/x^7,x)

[Out] -1/6*a/x^6-1/3*b/x^3
```

Maxima [A] time = 1.43564, size = 18, normalized size = 1.06

$$-\frac{2\,bx^3 + a}{6\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)/x^7,x, algorithm="maxima")

[Out] -1/6*(2*b*x^3 + a)/x^6
```

Fricas [A] time = 0.207749, size = 18, normalized size = 1.06

$$-\frac{2\,bx^3 + a}{6\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)/x^7,x, algorithm="fricas")

[Out] -1/6*(2*b*x^3 + a)/x^6
```

Sympy [A] time = 1.19903, size = 14, normalized size = 0.82

$$-\frac{a + 2bx^3}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)/x**7,x)

[Out] -(a + 2*b*x**3)/(6*x**6)
```

GIAC/XCAS [A] time = 0.215202, size = 18, normalized size = 1.06

$$-\frac{2\,bx^3 + a}{6\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)/x^7,x, algorithm="giac")

[Out] -1/6*(2*b*x^3 + a)/x^6
```

3.217 $\int \frac{a+bx^3}{x^8}\,dx$

Optimal. Leaf size=17

$$-\frac{a}{7x^7}-\frac{b}{4x^4}$$

```
[Out] -a/(7*x^7) - b/(4*x^4)
```

Rubi [A] time = 0.0129049, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$-\frac{a}{7x^7}-\frac{b}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)/x^8,x]

[Out] -a/(7*x^7) - b/(4*x^4)
```

Rubi in Sympy [A] time = 3.03938, size = 14, normalized size = 0.82

$$-\frac{a}{7x^7}-\frac{b}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)/x**8,x)

[Out] -a/(7*x**7) - b/(4*x**4)
```

Mathematica [A] time = 0.00395147, size = 17, normalized size = 1.

$$-\frac{a}{7x^7}-\frac{b}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)/x^8,x]

[Out] -a/(7*x^7) - b/(4*x^4)
```

Maple [A] time = 0.006, size = 14, normalized size = 0.8

$$-\frac{a}{7\,x^7}-\frac{b}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)/x^8,x)

[Out] -1/7*a/x^7-1/4*b/x^4
```

Maxima [A] time = 1.42145, size = 20, normalized size = 1.18

$$-\frac{7\,bx^3+4\,a}{28\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)/x^8,x, algorithm="maxima")
```

```
[Out] -1/28*(7*b*x^3 + 4*a)/x^7
```

Fricas [A] time = 0.210809, size = 20, normalized size = 1.18

$$-\frac{7\,bx^3+4\,a}{28\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)/x^8,x, algorithm="fricas")
```

```
[Out] -1/28*(7*b*x^3 + 4*a)/x^7
```

Sympy [A] time = 1.21268, size = 15, normalized size = 0.88

$$-\frac{4a+7bx^3}{28x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)/x**8,x)
```

```
[Out] -(4*a + 7*b*x**3)/(28*x**7)
```

GIAC/XCAS [A] time = 0.215813, size = 20, normalized size = 1.18

$$-\frac{7\,bx^3+4\,a}{28\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)/x^8,x, algorithm="giac")
```

```
[Out] -1/28*(7*b*x^3 + 4*a)/x^7
```

3.218 $\int x^4 \left(a+bx^3\right)^2 dx$

Optimal. Leaf size=30

$$\frac{a^2x^5}{5}+\frac{1}{4}abx^8+\frac{b^2x^{11}}{11}$$

```
[Out] (a^2*x^5)/5 + (a*b*x^8)/4 + (b^2*x^11)/11
```

Rubi [A] time = 0.0336449, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{a^2x^5}{5}+\frac{1}{4}abx^8+\frac{b^2x^{11}}{11}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4*(a + b*x^3)^2,x]

[Out] (a^2*x^5)/5 + (a*b*x^8)/4 + (b^2*x^11)/11
```

Rubi in Sympy [A] time = 5.36491, size = 24, normalized size = 0.8

$$\frac{a^2x^5}{5}+\frac{abx^8}{4}+\frac{b^2x^{11}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4*(b*x**3+a)**2,x)

[Out] a**2*x**5/5 + a*b*x**8/4 + b**2*x**11/11
```

Mathematica [A] time = 0.00191926, size = 30, normalized size = 1.

$$\frac{a^2x^5}{5}+\frac{1}{4}abx^8+\frac{b^2x^{11}}{11}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4*(a + b*x^3)^2,x]

[Out] (a^2*x^5)/5 + (a*b*x^8)/4 + (b^2*x^11)/11
```

Maple [A] time = 0.001, size = 25, normalized size = 0.8

$$\frac{x^5a^2}{5}+\frac{abx^8}{4}+\frac{b^2x^{11}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4*(b*x^3+a)^2,x)

[Out] 1/5*x^5*a^2+1/4*a*b*x^8+1/11*b^2*x^11
```

Maxima [A] time = 1.45128, size = 32, normalized size = 1.07

$$\frac{1}{11}\,b^2x^{11} + \frac{1}{4}\,abx^8 + \frac{1}{5}\,a^2x^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2*x^4,x, algorithm="maxima")
```

```
[Out] 1/11*b^2*x^11 + 1/4*a*b*x^8 + 1/5*a^2*x^5
```

Fricas [A] time = 0.189076, size = 1, normalized size = 0.03

$$\frac{1}{11}x^{11}b^2 + \frac{1}{4}x^8ba + \frac{1}{5}x^5a^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2*x^4,x, algorithm="fricas")
```

```
[Out] 1/11*x^11*b^2 + 1/4*x^8*b*a + 1/5*x^5*a^2
```

Sympy [A] time = 0.087088, size = 24, normalized size = 0.8

$$\frac{a^2x^5}{5} + \frac{abx^8}{4} + \frac{b^2x^{11}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4*(b*x**3+a)**2,x)
```

```
[Out] a**2*x**5/5 + a*b*x**8/4 + b**2*x**11/11
```

GIAC/XCAS [A] time = 0.212664, size = 32, normalized size = 1.07

$$\frac{1}{11}\,b^2x^{11} + \frac{1}{4}\,abx^8 + \frac{1}{5}\,a^2x^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2*x^4,x, algorithm="giac")
```

```
[Out] 1/11*b^2*x^11 + 1/4*a*b*x^8 + 1/5*a^2*x^5
```

3.219 $\int x^3 (a + bx^3)^2 \, dx$

Optimal. Leaf size=30

$$\frac{a^2x^4}{4} + \frac{2}{7}abx^7 + \frac{b^2x^{10}}{10}$$

```
[Out] (a^2*x^4)/4 + (2*a*b*x^7)/7 + (b^2*x^10)/10
```

Rubi [A] time = 0.0313023, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$\frac{a^2x^4}{4} + \frac{2}{7}abx^7 + \frac{b^2x^{10}}{10}$$

Antiderivative was successfully verified.

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

```
[Out] (a^2*x^4)/4 + (2*a*b*x^7)/7 + (b^2*x^10)/10
```

Rubi in Sympy [A] time = 5.41749, size = 26, normalized size = 0.87

$$\frac{a^2x^4}{4} + \frac{2abx^7}{7} + \frac{b^2x^{10}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3*(b*x**3+a)**2,x)
```

```
[Out] a**2*x**4/4 + 2*a*b*x**7/7 + b**2*x**10/10
```

Mathematica [A] time = 0.00123225, size = 30, normalized size = 1.

$$\frac{a^2x^4}{4} + \frac{2}{7}abx^7 + \frac{b^2x^{10}}{10}$$

Antiderivative was successfully verified.

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

```
[Out] (a^2*x^4)/4 + (2*a*b*x^7)/7 + (b^2*x^10)/10
```

Maple [A] time = 0.001, size = 25, normalized size = 0.8

$$\frac{x^4a^2}{4} + \frac{2\,abx^7}{7} + \frac{b^2x^{10}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*x^4*a^2+2/7*a*b*x^7+1/10*b^2*x^10
```

Maxima [A] time = 1.4359, size = 32, normalized size = 1.07

$$\frac{1}{10}\,b^2x^{10} + \frac{2}{7}\,abx^7 + \frac{1}{4}\,a^2x^4$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/10*b^2*x^10 + 2/7*a*b*x^7 + 1/4*a^2*x^4
```

Fricas [A] time = 0.192328, size = 1, normalized size = 0.03

$$\frac{1}{10}x^{10}b^2 + \frac{2}{7}x^7ba + \frac{1}{4}x^4a^2$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/10*x^10*b^2 + 2/7*x^7*b*a + 1/4*x^4*a^2
```

Sympy [A] time = 0.087815, size = 26, normalized size = 0.87

$$\frac{a^2x^4}{4} + \frac{2abx^7}{7} + \frac{b^2x^{10}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(b*x**3+a)**2,x)
```

```
[Out] a**2*x**4/4 + 2*a*b*x**7/7 + b**2*x**10/10
```

GIAC/XCAS [A] time = 0.217565, size = 32, normalized size = 1.07

$$\frac{1}{10}\,b^2x^{10} + \frac{2}{7}\,abx^7 + \frac{1}{4}\,a^2x^4$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/10*b^2*x^10 + 2/7*a*b*x^7 + 1/4*a^2*x^4
```

3.220 $\int x^2 \left(a+bx^3\right)^2 \, dx$

Optimal. Leaf size=16

$$\frac{\left(a+bx^3\right)^3}{9b}$$

```
[Out] (a + b*x^3)^3/(9*b)
```

Rubi [A] time = 0.0110733, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$\frac{\left(a+bx^3\right)^3}{9b}$$

Antiderivative was successfully verified.

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

[Out] (a + b*x^3)^3/(9*b)
```

Rubi in Sympy [A] time = 2.1535, size = 10, normalized size = 0.62

$$\frac{\left(a+bx^3\right)^3}{9b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(b*x**3+a)**2,x)

[Out] (a + b*x**3)**3/(9*b)
```

Mathematica [A] time = 0.00129401, size = 30, normalized size = 1.88

$$\frac{a^2x^3}{3}+\frac{1}{3}abx^6+\frac{b^2x^9}{9}$$

Antiderivative was successfully verified.

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

[Out] (a^2*x^3)/3 + (a*b*x^6)/3 + (b^2*x^9)/9
```

Maple [A] time = 0.001, size = 25, normalized size = 1.6

$$\frac{b^2x^9}{9}+\frac{abx^6}{3}+\frac{x^3a^2}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 1/9*b^2*x^9+1/3*a*b*x^6+1/3*x^3*a^2
```

Maxima [A] time = 1.42649, size = 19, normalized size = 1.19

$$\frac{(bx^3+a)^3}{9\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/9*(b*x^3 + a)^3/b
```

Fricas [A] time = 0.201224, size = 1, normalized size = 0.06

$$\frac{1}{9}x^9b^2 + \frac{1}{3}x^6ba + \frac{1}{3}x^3a^2$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/9*x^9*b^2 + 1/3*x^6*b*a + 1/3*x^3*a^2
```

Sympy [A] time = 0.089508, size = 24, normalized size = 1.5

$$\frac{a^2x^3}{3} + \frac{abx^6}{3} + \frac{b^2x^9}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(b*x**3+a)**2,x)
```

```
[Out] a**2*x**3/3 + a*b*x**6/3 + b**2*x**9/9
```

GIAC/XCAS [A] time = 0.213153, size = 19, normalized size = 1.19

$$\frac{(bx^3+a)^3}{9\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/9*(b*x^3 + a)^3/b
```

3.221 $\int x\left(a+bx^3\right)^2\,dx$

Optimal. Leaf size=30

$$\frac{a^2x^2}{2}+\frac{2}{5}abx^5+\frac{b^2x^8}{8}$$

```
[Out] (a^2*x^2)/2 + (2*a*b*x^5)/5 + (b^2*x^8)/8
```

Rubi [A] time = 0.0300272, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{a^2x^2}{2}+\frac{2}{5}abx^5+\frac{b^2x^8}{8}$$

Antiderivative was successfully verified.

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

[Out] (a^2*x^2)/2 + (2*a*b*x^5)/5 + (b^2*x^8)/8
```

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

$$a^2\int x\,dx+\frac{2abx^5}{5}+\frac{b^2x^8}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x*(b*x**3+a)**2,x)

[Out] a**2*Integral(x, x) + 2*a*b*x**5/5 + b**2*x**8/8
```

Mathematica [A] time = 0.00237939, size = 30, normalized size = 1.

$$\frac{a^2x^2}{2}+\frac{2}{5}abx^5+\frac{b^2x^8}{8}$$

Antiderivative was successfully verified.

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

[Out] (a^2*x^2)/2 + (2*a*b*x^5)/5 + (b^2*x^8)/8
```

Maple [A] time = 0., size = 25, normalized size = 0.8

$$\frac{a^2x^2}{2}+\frac{2\,x^5ab}{5}+\frac{b^2x^8}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 1/2*a^2*x^2+2/5*x^5*a*b+1/8*b^2*x^8
```

Maxima [A] time = 1.4479, size = 32, normalized size = 1.07

$$\frac{1}{8}\,b^2x^8 + \frac{2}{5}\,abx^5 + \frac{1}{2}\,a^2x^2$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/8*b^2*x^8 + 2/5*a*b*x^5 + 1/2*a^2*x^2
```

Fricas [A] time = 0.213689, size = 1, normalized size = 0.03

$$\frac{1}{8}x^8b^2 + \frac{2}{5}x^5ba + \frac{1}{2}x^2a^2$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/8*x^8*b^2 + 2/5*x^5*b*a + 1/2*x^2*a^2
```

Sympy [A] time = 0.083848, size = 26, normalized size = 0.87

$$\frac{a^2x^2}{2} + \frac{2abx^5}{5} + \frac{b^2x^8}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(b*x**3+a)**2,x)
```

```
[Out] a**2*x**2/2 + 2*a*b*x**5/5 + b**2*x**8/8
```

GIAC/XCAS [A] time = 0.217683, size = 32, normalized size = 1.07

$$\frac{1}{8}\,b^2x^8 + \frac{2}{5}\,abx^5 + \frac{1}{2}\,a^2x^2$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/8*b^2*x^8 + 2/5*a*b*x^5 + 1/2*a^2*x^2
```

3.222 $\int \left(a+bx^3\right)^2 dx$

Optimal. Leaf size=25

$$a^2x+\frac{1}{2}abx^4+\frac{b^2x^7}{7}$$

```
[Out] a^2*x + (a*b*x^4)/2 + (b^2*x^7)/7
```

Rubi [A] time = 0.019294, antiderivative size = 25, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111

$$a^2x+\frac{1}{2}abx^4+\frac{b^2x^7}{7}$$

Antiderivative was successfully verified.

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

[Out] a^2*x + (a*b*x^4)/2 + (b^2*x^7)/7
```

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

$$\frac{abx^4}{2}+\frac{b^2x^7}{7}+\int a^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**2,x)

[Out] a*b*x**4/2 + b**2*x**7/7 + Integral(a**2, x)
```

Mathematica [A] time = 0.00138265, size = 25, normalized size = 1.

$$a^2x+\frac{1}{2}abx^4+\frac{b^2x^7}{7}$$

Antiderivative was successfully verified.

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

[Out] a^2*x + (a*b*x^4)/2 + (b^2*x^7)/7
```

Maple [A] time = 0.002, size = 22, normalized size = 0.9

$$xa^2+\frac{abx^4}{2}+\frac{b^2x^7}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] x*a^2+1/2*a*b*x^4+1/7*b^2*x^7
```

Maxima [A] time = 1.43386, size = 28, normalized size = 1.12

$$\frac{1}{7}\,b^2x^7 + \frac{1}{2}\,abx^4 + a^2x$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/7*b^2*x^7 + 1/2*a*b*x^4 + a^2*x
```

Fricas [A] time = 0.230754, size = 1, normalized size = 0.04

$$\frac{1}{7}x^7b^2 + \frac{1}{2}x^4ba + xa^2$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/7*x^7*b^2 + 1/2*x^4*b*a + x*a^2
```

Sympy [A] time = 0.08248, size = 20, normalized size = 0.8

$$a^2x + \frac{abx^4}{2} + \frac{b^2x^7}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**2,x)
```

```
[Out] a**2*x + a*b*x**4/2 + b**2*x**7/7
```

GIAC/XCAS [A] time = 0.22073, size = 28, normalized size = 1.12

$$\frac{1}{7}\,b^2x^7 + \frac{1}{2}\,abx^4 + a^2x$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/7*b^2*x^7 + 1/2*a*b*x^4 + a^2*x
```

3.223 $\int \frac{(a+bx^3)^2}{x} dx$

Optimal. Leaf size=26

$$a^2\log(x)+\frac{2}{3}abx^3+\frac{b^2x^6}{6}$$

```
[Out] (2*a*b*x^3)/3 + (b^2*x^6)/6 + a^2*Log[x]
```

Rubi [A] time = 0.0338788, antiderivative size = 26, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$a^2\log(x)+\frac{2}{3}abx^3+\frac{b^2x^6}{6}$$

Antiderivative was successfully verified.

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

[Out] (2*a*b*x^3)/3 + (b^2*x^6)/6 + a^2*Log[x]
```

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

$$\frac{a^2\log\left(x^3\right)}{3}+\frac{2abx^3}{3}+\frac{b^2\int^{x^3}x\,dx}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] a**2*log(x**3)/3 + 2*a*b*x**3/3 + b**2*Integral(x, (x, x**3))/3
```

Mathematica [A] time = 0.00127193, size = 26, normalized size = 1.

$$a^2\log(x)+\frac{2}{3}abx^3+\frac{b^2x^6}{6}$$

Antiderivative was successfully verified.

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

[Out] (2*a*b*x^3)/3 + (b^2*x^6)/6 + a^2*Log[x]
```

Maple [A] time = 0.002, size = 23, normalized size = 0.9

$$\frac{2\,abx^3}{3}+\frac{b^2x^6}{6}+a^2\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 2/3*a*b*x^3+1/6*b^2*x^6+a^2*ln(x)
```

Maxima [A] time = 1.42346, size = 34, normalized size = 1.31

$$\frac{1}{6}\,b^2x^6 + \frac{2}{3}\,abx^3 + \frac{1}{3}\,a^2\log\left(x^3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 1/6*b^2*x^6 + 2/3*a*b*x^3 + 1/3*a^2*log(x^3)
```

Fricas [A] time = 0.243299, size = 30, normalized size = 1.15

$$\frac{1}{6}\,b^2x^6 + \frac{2}{3}\,abx^3 + a^2\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 1/6*b^2*x^6 + 2/3*a*b*x^3 + a^2*log(x)
```

Sympy [A] time = 1.05256, size = 24, normalized size = 0.92

$$a^2\log\left(x\right) + \frac{2abx^3}{3} + \frac{b^2x^6}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] a**2*log(x) + 2*a*b*x**3/3 + b**2*x**6/6
```

GIAC/XCAS [A] time = 0.224094, size = 31, normalized size = 1.19

$$\frac{1}{6}\,b^2x^6 + \frac{2}{3}\,abx^3 + a^2\ln\left(|x|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 1/6*b^2*x^6 + 2/3*a*b*x^3 + a^2*ln(abs(x))
```

3.224 $\int \frac{(a+bx^3)^2}{x^2} dx$

Optimal. Leaf size=25

$$-\frac{a^2}{x} + abx^2 + \frac{b^2x^5}{5}$$

```
[Out] -(a^2/x) + a*b*x^2 + (b^2*x^5)/5
```

Rubi [A] time = 0.0284023, antiderivative size = 25, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a^2}{x} + abx^2 + \frac{b^2x^5}{5}$$

Antiderivative was successfully verified.

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

[Out] -(a^2/x) + a*b*x^2 + (b^2*x^5)/5
```

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

$$-\frac{a^2}{x} + 2ab\int x\,dx + \frac{b^2x^5}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] -a**2/x + 2*a*b*Integral(x, x) + b**2*x**5/5
```

Mathematica [A] time = 0.00167607, size = 25, normalized size = 1.

$$-\frac{a^2}{x} + abx^2 + \frac{b^2x^5}{5}$$

Antiderivative was successfully verified.

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

[Out] -(a^2/x) + a*b*x^2 + (b^2*x^5)/5
```

Maple [A] time = 0.006, size = 24, normalized size = 1.

$$-\frac{a^2}{x} + abx^2 + \frac{b^2x^5}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] -a^2/x+a*b*x^2+1/5*b^2*x^5
```

Maxima [A] time = 1.42661, size = 31, normalized size = 1.24

$$\frac{1}{5}\,b^2x^5 + abx^2 - \frac{a^2}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 1/5*b^2*x^5 + a*b*x^2 - a^2/x
```

Fricas [A] time = 0.237587, size = 34, normalized size = 1.36

$$\frac{b^2x^6 + 5\,abx^3 - 5\,a^2}{5\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 1/5*(b^2*x^6 + 5*a*b*x^3 - 5*a^2)/x
```

Sympy [A] time = 1.07695, size = 19, normalized size = 0.76

$$-\frac{a^2}{x} + abx^2 + \frac{b^2x^5}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] -a**2/x + a*b*x**2 + b**2*x**5/5
```

GIAC/XCAS [A] time = 0.216628, size = 31, normalized size = 1.24

$$\frac{1}{5}\,b^2x^5 + abx^2 - \frac{a^2}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 1/5*b^2*x^5 + a*b*x^2 - a^2/x
```

3.225 $\int \frac{(a+bx^3)^2}{x^3} \, dx$

Optimal. Leaf size=26

$$-\frac{a^2}{2x^2} + 2abx + \frac{b^2x^4}{4}$$

```
[Out] -a^2/(2*x^2) + 2*a*b*x + (b^2*x^4)/4
```

Rubi [A] time = 0.0278619, antiderivative size = 26, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a^2}{2x^2} + 2abx + \frac{b^2x^4}{4}$$

Antiderivative was successfully verified.

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

[Out] -a^2/(2*x^2) + 2*a*b*x + (b^2*x^4)/4
```

Rubi in Sympy [A] time = 5.12623, size = 22, normalized size = 0.85

$$-\frac{a^2}{2x^2} + 2abx + \frac{b^2x^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] -a**2/(2*x**2) + 2*a*b*x + b**2*x**4/4
```

Mathematica [A] time = 0.00145368, size = 26, normalized size = 1.

$$-\frac{a^2}{2x^2} + 2abx + \frac{b^2x^4}{4}$$

Antiderivative was successfully verified.

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

[Out] -a^2/(2*x^2) + 2*a*b*x + (b^2*x^4)/4
```

Maple [A] time = 0.004, size = 23, normalized size = 0.9

$$-\frac{a^2}{2\,x^2} + 2\,abx + \frac{b^2x^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] -1/2*a^2/x^2+2*a*b*x+1/4*b^2*x^4
```

Maxima [A] time = 1.43635, size = 30, normalized size = 1.15

$$\frac{1}{4}\,b^2x^4 + 2\,abx - \frac{a^2}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*b^2*x^4 + 2*a*b*x - 1/2*a^2/x^2
```

Fricas [A] time = 0.242334, size = 34, normalized size = 1.31

$$\frac{b^2x^6 + 8\,abx^3 - 2\,a^2}{4\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*(b^2*x^6 + 8*a*b*x^3 - 2*a^2)/x^2
```

Sympy [A] time = 1.11765, size = 22, normalized size = 0.85

$$-\frac{a^2}{2x^2} + 2abx + \frac{b^2x^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a**2/(2*x**2) + 2*a*b*x + b**2*x**4/4
```

GIAC/XCAS [A] time = 0.216043, size = 30, normalized size = 1.15

$$\frac{1}{4}\,b^2x^4 + 2\,abx - \frac{a^2}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*b^2*x^4 + 2*a*b*x - 1/2*a^2/x^2
```

3.226 $\int \frac{(a+bx^3)^2}{x^4}\,dx$

Optimal. Leaf size=27

$$-\frac{a^2}{3x^3}+2ab\log(x)+\frac{b^2x^3}{3}$$

```
[Out] -a^2/(3*x^3) + (b^2*x^3)/3 + 2*a*b*Log[x]
```

Rubi [A] time = 0.0396798, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$-\frac{a^2}{3x^3}+2ab\log(x)+\frac{b^2x^3}{3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^2/x^4,x]

[Out] -a^2/(3*x^3) + (b^2*x^3)/3 + 2*a*b*Log[x]
```

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

$$-\frac{a^2}{3x^3}+\frac{2ab\log\left(x^3\right)}{3}+\frac{\int^{x^3} b^2\,dx}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**2/x**4,x)

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

Mathematica [A] time = 0.00138169, size = 27, normalized size = 1.

$$-\frac{a^2}{3x^3}+2ab\log(x)+\frac{b^2x^3}{3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^2/x^4,x]

[Out] -a^2/(3*x^3) + (b^2*x^3)/3 + 2*a*b*Log[x]
```

Maple [A] time = 0.007, size = 24, normalized size = 0.9

$$-\frac{a^2}{3\,x^3}+\frac{b^2x^3}{3}+2\,ab\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^2/x^4,x)

[Out] -1/3*a^2/x^3+1/3*b^2*x^3+2*a*b*ln(x)
```

Maxima [A] time = 1.43302, size = 34, normalized size = 1.26

$$\frac{1}{3}\,b^2x^3 + \frac{2}{3}\,ab\log\left(x^3\right) - \frac{a^2}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2/x^4,x, algorithm="maxima")
```

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

Fricas [A] time = 0.255162, size = 36, normalized size = 1.33

$$\frac{b^2x^6 + 6\,abx^3\log(x) - a^2}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2/x^4,x, algorithm="fricas")
```

```
[Out] 1/3*(b^2*x^6 + 6*a*b*x^3*log(x) - a^2)/x^3
```

Sympy [A] time = 1.21082, size = 24, normalized size = 0.89

$$-\frac{a^2}{3x^3} + 2ab\log(x) + \frac{b^2x^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**2/x**4,x)
```

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

GIAC/XCAS [A] time = 0.219086, size = 43, normalized size = 1.59

$$\frac{1}{3}\,b^2x^3 + 2\,ab\ln(|x|) - \frac{2\,abx^3 + a^2}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2/x^4,x, algorithm="giac")
```

```
[Out] 1/3*b^2*x^3 + 2*a*b*ln(abs(x)) - 1/3*(2*a*b*x^3 + a^2)/x^3
```

3.227 $\int \frac{(a+bx^3)^2}{x^5}\,dx$

Optimal. Leaf size=28

$$-\frac{a^2}{4x^4}-\frac{2ab}{x}+\frac{b^2x^2}{2}$$

```
[Out] -a^2/(4*x^4) - (2*a*b)/x + (b^2*x^2)/2
```

Rubi [A] time = 0.0290321, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a^2}{4x^4}-\frac{2ab}{x}+\frac{b^2x^2}{2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^2/x^5,x]

[Out] -a^2/(4*x^4) - (2*a*b)/x + (b^2*x^2)/2
```

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

$$-\frac{a^2}{4x^4}-\frac{2ab}{x}+b^2\int x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**2/x**5,x)

[Out] -a**2/(4*x**4) - 2*a*b/x + b**2*Integral(x, x)
```

Mathematica [A] time = 0.00172151, size = 28, normalized size = 1.

$$-\frac{a^2}{4x^4}-\frac{2ab}{x}+\frac{b^2x^2}{2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^2/x^5,x]

[Out] -a^2/(4*x^4) - (2*a*b)/x + (b^2*x^2)/2
```

Maple [A] time = 0.009, size = 25, normalized size = 0.9

$$-\frac{a^2}{4\,x^4}-2\,\frac{ab}{x}+\frac{b^2x^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^2/x^5,x)

[Out] -1/4*a^2/x^4-2*a*b/x+1/2*b^2*x^2
```

Maxima [A] time = 1.43037, size = 34, normalized size = 1.21

$$\frac{1}{2}\,b^2x^2 - \frac{8\,abx^3 + a^2}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*b^2*x^2 - 1/4*(8*a*b*x^3 + a^2)/x^4
```

Fricas [A] time = 0.268495, size = 35, normalized size = 1.25

$$\frac{2\,b^2x^6 - 8\,abx^3 - a^2}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*(2*b^2*x^6 - 8*a*b*x^3 - a^2)/x^4
```

Sympy [A] time = 1.2407, size = 24, normalized size = 0.86

$$\frac{b^2x^2}{2} - \frac{a^2 + 8abx^3}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**2/x**5,x)
```

```
[Out] b**2*x**2/2 - (a**2 + 8*a*b*x**3)/(4*x**4)
```

GIAC/XCAS [A] time = 0.229314, size = 34, normalized size = 1.21

$$\frac{1}{2}\,b^2x^2 - \frac{8\,abx^3 + a^2}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*b^2*x^2 - 1/4*(8*a*b*x^3 + a^2)/x^4
```

3.228 $\int \frac{(a+bx^3)^2}{x^6}\,dx$

Optimal. Leaf size=23

$$-\frac{a^2}{5x^5}-\frac{ab}{x^2}+b^2x$$

```
[Out] -a^2/(5*x^5) - (a*b)/x^2 + b^2*x
```

Rubi [A] time = 0.0280289, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a^2}{5x^5}-\frac{ab}{x^2}+b^2x$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^3)^2/x^6,x]

[Out] -a^2/(5*x^5) - (a*b)/x^2 + b^2*x
```

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

$$-\frac{a^2}{5x^5}-\frac{ab}{x^2}+\int b^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**3+a)**2/x**6,x)

[Out] -a**2/(5*x**5) - a*b/x**2 + Integral(b**2, x)
```

Mathematica [A] time = 0.00125369, size = 23, normalized size = 1.

$$-\frac{a^2}{5x^5}-\frac{ab}{x^2}+b^2x$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^3)^2/x^6,x]

[Out] -a^2/(5*x^5) - (a*b)/x^2 + b^2*x
```

Maple [A] time = 0.007, size = 22, normalized size = 1.

$$-\frac{a^2}{5\,x^5}-\frac{ab}{x^2}+b^2x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x^3+a)^2/x^6,x)

[Out] -1/5*a^2/x^5-a*b/x^2+b^2*x
```

Maxima [A] time = 1.44031, size = 30, normalized size = 1.3

$$b^2x - \frac{5\,abx^3 + a^2}{5\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2/x^6,x, algorithm="maxima")
```

```
[Out] b^2*x - 1/5*(5*a*b*x^3 + a^2)/x^5
```

Fricas [A] time = 0.256298, size = 35, normalized size = 1.52

$$\frac{5\,b^2x^6 - 5\,abx^3 - a^2}{5\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2/x^6,x, algorithm="fricas")
```

```
[Out] 1/5*(5*b^2*x^6 - 5*a*b*x^3 - a^2)/x^5
```

Sympy [A] time = 1.30997, size = 20, normalized size = 0.87

$$b^2x - \frac{a^2 + 5abx^3}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**2/x**6,x)
```

```
[Out] b**2*x - (a**2 + 5*a*b*x**3)/(5*x**5)
```

GIAC/XCAS [A] time = 0.243837, size = 30, normalized size = 1.3

$$b^2x - \frac{5\,abx^3 + a^2}{5\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2/x^6,x, algorithm="giac")
```

```
[Out] b^2*x - 1/5*(5*a*b*x^3 + a^2)/x^5
```

3.229 $\int \frac{(a+bx^3)^2}{x^7} dx$

Optimal. Leaf size=26

$$-\frac{a^2}{6x^6}-\frac{2ab}{3x^3}+b^2\log(x)$$

```
[Out] -a^2/(6*x^6) - (2*a*b)/(3*x^3) + b^2*Log[x]
```

Rubi [A] time = 0.0375561, antiderivative size = 26, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^2}{6x^6}-\frac{2ab}{3x^3}+b^2\log(x)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^2/x^7,x]

[Out] -a^2/(6*x^6) - (2*a*b)/(3*x^3) + b^2*Log[x]
```

Rubi in Sympy [A] time = 6.44806, size = 27, normalized size = 1.04

$$-\frac{a^2}{6x^6}-\frac{2ab}{3x^3}+\frac{b^2\log\left(x^3\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**2/x**7,x)

[Out] -a**2/(6*x**6) - 2*a*b/(3*x**3) + b**2*log(x**3)/3
```

Mathematica [A] time = 0.00134169, size = 26, normalized size = 1.

$$-\frac{a^2}{6x^6}-\frac{2ab}{3x^3}+b^2\log(x)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^2/x^7,x]

[Out] -a^2/(6*x^6) - (2*a*b)/(3*x^3) + b^2*Log[x]
```

Maple [A] time = 0.008, size = 23, normalized size = 0.9

$$-\frac{a^2}{6\,x^6}-\frac{2\,ab}{3\,x^3}+b^2\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^2/x^7,x)

[Out] -1/6*a^2/x^6-2/3*a*b/x^3+b^2*ln(x)
```

Maxima [A] time = 1.44112, size = 35, normalized size = 1.35

$$\frac{1}{3}\,b^2\log\left(x^3\right)-\frac{4\,abx^3+a^2}{6\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2/x^7,x, algorithm="maxima")

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

Fricas [A] time = 0.28273, size = 38, normalized size = 1.46

$$\frac{6\,b^2x^6\log\left(x\right)-4\,abx^3-a^2}{6\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2/x^7,x, algorithm="fricas")

[Out] 1/6*(6*b^2*x^6*log(x) - 4*a*b*x^3 - a^2)/x^6
```

Sympy [A] time = 1.3735, size = 22, normalized size = 0.85

$$b^2\log\left(x\right)-\frac{a^2+4abx^3}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**2/x**7,x)

[Out] b**2*log(x) - (a**2 + 4*a*b*x**3)/(6*x**6)
```

GIAC/XCAS [A] time = 0.258013, size = 43, normalized size = 1.65

$$b^2\ln\left(|x|\right)-\frac{3\,b^2x^6+4\,abx^3+a^2}{6\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2/x^7,x, algorithm="giac")

[Out] b^2*ln(abs(x)) - 1/6*(3*b^2*x^6 + 4*a*b*x^3 + a^2)/x^6
```

3.230 $\int \frac{(a+bx^3)^2}{x^8} dx$

Optimal. Leaf size=28

$$-\frac{a^2}{7x^7}-\frac{ab}{2x^4}-\frac{b^2}{x}$$

```
[Out] -a^2/(7*x^7) - (a*b)/(2*x^4) - b^2/x
```

Rubi [A] time = 0.0290298, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a^2}{7x^7}-\frac{ab}{2x^4}-\frac{b^2}{x}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^2/x^8,x]

[Out] -a^2/(7*x^7) - (a*b)/(2*x^4) - b^2/x
```

Rubi in Sympy [A] time = 5.2482, size = 22, normalized size = 0.79

$$-\frac{a^2}{7x^7}-\frac{ab}{2x^4}-\frac{b^2}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**2/x**8,x)

[Out] -a**2/(7*x**7) - a*b/(2*x**4) - b**2/x
```

Mathematica [A] time = 0.00132857, size = 28, normalized size = 1.

$$-\frac{a^2}{7x^7}-\frac{ab}{2x^4}-\frac{b^2}{x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^2/x^8,x]

[Out] -a^2/(7*x^7) - (a*b)/(2*x^4) - b^2/x
```

Maple [A] time = 0.008, size = 25, normalized size = 0.9

$$-\frac{a^2}{7\,x^7}-\frac{ab}{2\,x^4}-\frac{b^2}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^2/x^8,x)

[Out] -1/7*a^2/x^7-1/2*a*b/x^4-b^2/x
```

Maxima [A] time = 1.46754, size = 35, normalized size = 1.25

$$-\frac{14\,b^2x^6 + 7\,abx^3 + 2\,a^2}{14\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2/x^8,x, algorithm="maxima")
```

```
[Out] -1/14*(14*b^2*x^6 + 7*a*b*x^3 + 2*a^2)/x^7
```

Fricas [A] time = 0.259495, size = 35, normalized size = 1.25

$$-\frac{14\,b^2x^6 + 7\,abx^3 + 2\,a^2}{14\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2/x^8,x, algorithm="fricas")
```

```
[Out] -1/14*(14*b^2*x^6 + 7*a*b*x^3 + 2*a^2)/x^7
```

Sympy [A] time = 1.36199, size = 27, normalized size = 0.96

$$-\frac{2a^2 + 7abx^3 + 14b^2x^6}{14x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**2/x**8,x)
```

```
[Out] -(2*a**2 + 7*a*b*x**3 + 14*b**2*x**6)/(14*x**7)
```

GIAC/XCAS [A] time = 0.216221, size = 35, normalized size = 1.25

$$-\frac{14\,b^2x^6 + 7\,abx^3 + 2\,a^2}{14\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2/x^8,x, algorithm="giac")
```

```
[Out] -1/14*(14*b^2*x^6 + 7*a*b*x^3 + 2*a^2)/x^7
```

3.231 $\int \frac{(a+bx^3)^2}{x^9} dx$

Optimal. Leaf size=30

$$-\frac{a^2}{8x^8}-\frac{2ab}{5x^5}-\frac{b^2}{2x^2}$$

```
[Out] -a^2/(8*x^8) - (2*a*b)/(5*x^5) - b^2/(2*x^2)
```

Rubi [A] time = 0.0292484, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$-\frac{a^2}{8x^8}-\frac{2ab}{5x^5}-\frac{b^2}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^2/x^9,x]

[Out] -a^2/(8*x^8) - (2*a*b)/(5*x^5) - b^2/(2*x^2)
```

Rubi in Sympy [A] time = 5.28071, size = 27, normalized size = 0.9

$$-\frac{a^2}{8x^8}-\frac{2ab}{5x^5}-\frac{b^2}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**2/x**9,x)

[Out] -a**2/(8*x**8) - 2*a*b/(5*x**5) - b**2/(2*x**2)
```

Mathematica [A] time = 0.00148088, size = 30, normalized size = 1.

$$-\frac{a^2}{8x^8}-\frac{2ab}{5x^5}-\frac{b^2}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^2/x^9,x]

[Out] -a^2/(8*x^8) - (2*a*b)/(5*x^5) - b^2/(2*x^2)
```

Maple [A] time = 0.007, size = 25, normalized size = 0.8

$$-\frac{a^2}{8\,x^8}-\frac{2\,ab}{5\,x^5}-\frac{b^2}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^2/x^9,x)

[Out] -1/8*a^2/x^8-2/5*a*b/x^5-1/2*b^2/x^2
```

Maxima [A] time = 1.44218, size = 35, normalized size = 1.17

$$-\frac{20\, b^{2} x^{6} + 16\, a b x^{3} + 5\, a^{2}}{40\, x^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2/x^9,x, algorithm="maxima")
```

```
[Out] -1/40*(20*b^2*x^6 + 16*a*b*x^3 + 5*a^2)/x^8
```

Fricas [A] time = 0.261563, size = 35, normalized size = 1.17

$$-\frac{20\, b^{2} x^{6} + 16\, a b x^{3} + 5\, a^{2}}{40\, x^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2/x^9,x, algorithm="fricas")
```

```
[Out] -1/40*(20*b^2*x^6 + 16*a*b*x^3 + 5*a^2)/x^8
```

Sympy [A] time = 1.39588, size = 27, normalized size = 0.9

$$-\frac{5a^{2} + 16abx^{3} + 20b^{2}x^{6}}{40x^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**2/x**9,x)
```

```
[Out] -(5*a**2 + 16*a*b*x**3 + 20*b**2*x**6)/(40*x**8)
```

GIAC/XCAS [A] time = 0.2248, size = 35, normalized size = 1.17

$$-\frac{20\, b^{2} x^{6} + 16\, a b x^{3} + 5\, a^{2}}{40\, x^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2/x^9,x, algorithm="giac")
```

```
[Out] -1/40*(20*b^2*x^6 + 16*a*b*x^3 + 5*a^2)/x^8
```

3.232 $\int \frac{(a+bx^3)^2}{x^{10}}\,dx$

Optimal. Leaf size=19

$$-\frac{(a+bx^3)^3}{9ax^9}$$

```
[Out] -(a + b*x^3)^3/(9*a*x^9)
```

Rubi [A] time = 0.015052, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$-\frac{(a+bx^3)^3}{9ax^9}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^2/x^10,x]

[Out] -(a + b*x^3)^3/(9*a*x^9)
```

Rubi in Sympy [A] time = 2.79778, size = 15, normalized size = 0.79

$$-\frac{(a+bx^3)^3}{9ax^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**2/x**10,x)

[Out] -(a + b*x**3)**3/(9*a*x**9)
```

Mathematica [A] time = 0.00154264, size = 30, normalized size = 1.58

$$-\frac{a^2}{9x^9}-\frac{ab}{3x^6}-\frac{b^2}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^2/x^10,x]

[Out] -a^2/(9*x^9) - (a*b)/(3*x^6) - b^2/(3*x^3)
```

Maple [A] time = 0.008, size = 25, normalized size = 1.3

$$-\frac{ab}{3x^6}-\frac{a^2}{9x^9}-\frac{b^2}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^2/x^10,x)

[Out] -1/3*a*b/x^6-1/9*a^2/x^9-1/3*b^2/x^3
```

Maxima [A] time = 1.43897, size = 32, normalized size = 1.68

$$-\frac{3\,b^2x^6 + 3\,abx^3 + a^2}{9\,x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2/x^10,x, algorithm="maxima")
```

```
[Out] -1/9*(3*b^2*x^6 + 3*a*b*x^3 + a^2)/x^9
```

Fricas [A] time = 0.224049, size = 32, normalized size = 1.68

$$-\frac{3\,b^2x^6 + 3\,abx^3 + a^2}{9\,x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2/x^10,x, algorithm="fricas")
```

```
[Out] -1/9*(3*b^2*x^6 + 3*a*b*x^3 + a^2)/x^9
```

Sympy [A] time = 1.46979, size = 26, normalized size = 1.37

$$-\frac{a^2 + 3abx^3 + 3b^2x^6}{9x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**2/x**10,x)
```

```
[Out] -(a**2 + 3*a*b*x**3 + 3*b**2*x**6)/(9*x**9)
```

GIAC/XCAS [A] time = 0.224431, size = 32, normalized size = 1.68

$$-\frac{3\,b^2x^6 + 3\,abx^3 + a^2}{9\,x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2/x^10,x, algorithm="giac")
```

```
[Out] -1/9*(3*b^2*x^6 + 3*a*b*x^3 + a^2)/x^9
```

3.233 $\int \frac{(a+bx^3)^2}{x^{11}}\,dx$

Optimal. Leaf size=30

$$-\frac{a^2}{10x^{10}}-\frac{2ab}{7x^7}-\frac{b^2}{4x^4}$$

```
[Out] -a^2/(10*x^10) - (2*a*b)/(7*x^7) - b^2/(4*x^4)
```

Rubi [A] time = 0.0290253, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a^2}{10x^{10}}-\frac{2ab}{7x^7}-\frac{b^2}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^2/x^11,x]

[Out] -a^2/(10*x^10) - (2*a*b)/(7*x^7) - b^2/(4*x^4)
```

Rubi in Sympy [A] time = 5.30766, size = 27, normalized size = 0.9

$$-\frac{a^2}{10x^{10}}-\frac{2ab}{7x^7}-\frac{b^2}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**2/x**11,x)

[Out] -a**2/(10*x**10) - 2*a*b/(7*x**7) - b**2/(4*x**4)
```

Mathematica [A] time = 0.00155064, size = 30, normalized size = 1.

$$-\frac{a^2}{10x^{10}}-\frac{2ab}{7x^7}-\frac{b^2}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^2/x^11,x]

[Out] -a^2/(10*x^10) - (2*a*b)/(7*x^7) - b^2/(4*x^4)
```

Maple [A] time = 0.007, size = 25, normalized size = 0.8

$$-\frac{a^2}{10\,x^{10}}-\frac{2\,ab}{7\,x^7}-\frac{b^2}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^2/x^11,x)

[Out] -1/10*a^2/x^10-2/7*a*b/x^7-1/4*b^2/x^4
```

Maxima [A] time = 1.43557, size = 35, normalized size = 1.17

$$-\frac{35\,b^2x^6+40\,abx^3+14\,a^2}{140\,x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2/x^11,x, algorithm="maxima")
```

```
[Out] -1/140*(35*b^2*x^6 + 40*a*b*x^3 + 14*a^2)/x^10
```

Fricas [A] time = 0.233408, size = 35, normalized size = 1.17

$$-\frac{35\,b^2x^6+40\,abx^3+14\,a^2}{140\,x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2/x^11,x, algorithm="fricas")
```

```
[Out] -1/140*(35*b^2*x^6 + 40*a*b*x^3 + 14*a^2)/x^10
```

Sympy [A] time = 1.51925, size = 27, normalized size = 0.9

$$-\frac{14a^2+40abx^3+35b^2x^6}{140x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**2/x**11,x)
```

```
[Out] -(14*a**2 + 40*a*b*x**3 + 35*b**2*x**6)/(140*x**10)
```

GIAC/XCAS [A] time = 0.218428, size = 35, normalized size = 1.17

$$-\frac{35\,b^2x^6+40\,abx^3+14\,a^2}{140\,x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2/x^11,x, algorithm="giac")
```

```
[Out] -1/140*(35*b^2*x^6 + 40*a*b*x^3 + 14*a^2)/x^10
```

3.234 $\int \frac{(a+bx^3)^2}{x^{12}} \, dx$

Optimal. Leaf size=30

$$-\frac{a^2}{11x^{11}}-\frac{ab}{4x^8}-\frac{b^2}{5x^5}$$

```
[Out] -a^2/(11*x^11) - (a*b)/(4*x^8) - b^2/(5*x^5)
```

Rubi [A] time = 0.0292567, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a^2}{11x^{11}}-\frac{ab}{4x^8}-\frac{b^2}{5x^5}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^2/x^12,x]
```

```
[Out] -a^2/(11*x^11) - (a*b)/(4*x^8) - b^2/(5*x^5)
```

Rubi in Sympy [A] time = 5.38379, size = 26, normalized size = 0.87

$$-\frac{a^2}{11x^{11}}-\frac{ab}{4x^8}-\frac{b^2}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**2/x**12,x)
```

```
[Out] -a**2/(11*x**11) - a*b/(4*x**8) - b**2/(5*x**5)
```

Mathematica [A] time = 0.00162999, size = 30, normalized size = 1.

$$-\frac{a^2}{11x^{11}}-\frac{ab}{4x^8}-\frac{b^2}{5x^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^2/x^12,x]
```

```
[Out] -a^2/(11*x^11) - (a*b)/(4*x^8) - b^2/(5*x^5)
```

Maple [A] time = 0.007, size = 25, normalized size = 0.8

$$-\frac{a^2}{11\,x^{11}}-\frac{ab}{4\,x^8}-\frac{b^2}{5\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^2/x^12,x)
```

```
[Out] -1/11*a^2/x^11-1/4*a*b/x^8-1/5*b^2/x^5
```

Maxima [A] time = 1.44194, size = 35, normalized size = 1.17

$$-\frac{44\,b^2x^6 + 55\,abx^3 + 20\,a^2}{220\,x^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2/x^12,x, algorithm="maxima")
```

```
[Out] -1/220*(44*b^2*x^6 + 55*a*b*x^3 + 20*a^2)/x^11
```

Fricas [A] time = 0.225305, size = 35, normalized size = 1.17

$$-\frac{44\,b^2x^6 + 55\,abx^3 + 20\,a^2}{220\,x^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2/x^12,x, algorithm="fricas")
```

```
[Out] -1/220*(44*b^2*x^6 + 55*a*b*x^3 + 20*a^2)/x^11
```

Sympy [A] time = 1.52127, size = 27, normalized size = 0.9

$$-\frac{20a^2 + 55abx^3 + 44b^2x^6}{220x^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**2/x**12,x)
```

```
[Out] -(20*a**2 + 55*a*b*x**3 + 44*b**2*x**6)/(220*x**11)
```

GIAC/XCAS [A] time = 0.219293, size = 35, normalized size = 1.17

$$-\frac{44\,b^2x^6 + 55\,abx^3 + 20\,a^2}{220\,x^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2/x^12,x, algorithm="giac")
```

```
[Out] -1/220*(44*b^2*x^6 + 55*a*b*x^3 + 20*a^2)/x^11
```

3.235 $\int \frac{(a+bx^3)^2}{x^{13}}\,dx$

Optimal. Leaf size=30

$$-\frac{a^2}{12x^{12}}-\frac{2ab}{9x^9}-\frac{b^2}{6x^6}$$

```
[Out] -a^2/(12*x^12) - (2*a*b)/(9*x^9) - b^2/(6*x^6)
```

Rubi [A] time = 0.0394555, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^2}{12x^{12}}-\frac{2ab}{9x^9}-\frac{b^2}{6x^6}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^3)^2/x^13,x]

[Out] -a^2/(12*x^12) - (2*a*b)/(9*x^9) - b^2/(6*x^6)
```

Rubi in Sympy [A] time = 6.68423, size = 27, normalized size = 0.9

$$-\frac{a^2}{12x^{12}}-\frac{2ab}{9x^9}-\frac{b^2}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**3+a)**2/x**13,x)

[Out] -a**2/(12*x**12) - 2*a*b/(9*x**9) - b**2/(6*x**6)
```

Mathematica [A] time = 0.00149272, size = 30, normalized size = 1.

$$-\frac{a^2}{12x^{12}}-\frac{2ab}{9x^9}-\frac{b^2}{6x^6}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^3)^2/x^13,x]

[Out] -a^2/(12*x^12) - (2*a*b)/(9*x^9) - b^2/(6*x^6)
```

Maple [A] time = 0.008, size = 25, normalized size = 0.8

$$-\frac{a^2}{12\,x^{12}}-\frac{2\,ab}{9\,x^9}-\frac{b^2}{6\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x^3+a)^2/x^13,x)

[Out] -1/12*a^2/x^12-2/9*a*b/x^9-1/6*b^2/x^6
```

Maxima [A] time = 1.44052, size = 35, normalized size = 1.17

$$-\frac{6\,b^2x^6+8\,abx^3+3\,a^2}{36\,x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2/x^13,x, algorithm="maxima")
```

```
[Out] -1/36*(6*b^2*x^6 + 8*a*b*x^3 + 3*a^2)/x^12
```

Fricas [A] time = 0.206616, size = 35, normalized size = 1.17

$$-\frac{6\,b^2x^6+8\,abx^3+3\,a^2}{36\,x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2/x^13,x, algorithm="fricas")
```

```
[Out] -1/36*(6*b^2*x^6 + 8*a*b*x^3 + 3*a^2)/x^12
```

Sympy [A] time = 1.5772, size = 27, normalized size = 0.9

$$-\frac{3a^2+8abx^3+6b^2x^6}{36x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**2/x**13,x)
```

```
[Out] -(3*a**2 + 8*a*b*x**3 + 6*b**2*x**6)/(36*x**12)
```

GIAC/XCAS [A] time = 0.224473, size = 35, normalized size = 1.17

$$-\frac{6\,b^2x^6+8\,abx^3+3\,a^2}{36\,x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2/x^13,x, algorithm="giac")
```

```
[Out] -1/36*(6*b^2*x^6 + 8*a*b*x^3 + 3*a^2)/x^12
```

3.236 $\int x^{14} \left(a+bx^3\right)^3 \, dx$

Optimal. Leaf size=43

$$\frac{a^3x^{15}}{15}+\frac{1}{6}a^2bx^{18}+\frac{1}{7}ab^2x^{21}+\frac{b^3x^{24}}{24}$$

```
[Out] (a^3*x^15)/15 + (a^2*b*x^18)/6 + (a*b^2*x^21)/7 + (b^3*x^24)/24
```

Rubi [A] time = 0.078271, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$\frac{a^3x^{15}}{15}+\frac{1}{6}a^2bx^{18}+\frac{1}{7}ab^2x^{21}+\frac{b^3x^{24}}{24}$$

Antiderivative was successfully verified.

```
[In]  Int[x^14*(a + b*x^3)^3,x]

[Out] (a^3*x^15)/15 + (a^2*b*x^18)/6 + (a*b^2*x^21)/7 + (b^3*x^24)/24
```

Rubi in Sympy [A] time = 10.1258, size = 36, normalized size = 0.84

$$\frac{a^3x^{15}}{15}+\frac{a^2bx^{18}}{6}+\frac{ab^2x^{21}}{7}+\frac{b^3x^{24}}{24}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**14*(b*x**3+a)**3,x)

[Out] a**3*x**15/15 + a**2*b*x**18/6 + a*b**2*x**21/7 + b**3*x**24/24
```

Mathematica [A] time = 0.00345326, size = 43, normalized size = 1.

$$\frac{a^3x^{15}}{15}+\frac{1}{6}a^2bx^{18}+\frac{1}{7}ab^2x^{21}+\frac{b^3x^{24}}{24}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^14*(a + b*x^3)^3,x]

[Out] (a^3*x^15)/15 + (a^2*b*x^18)/6 + (a*b^2*x^21)/7 + (b^3*x^24)/24
```

Maple [A] time = 0.002, size = 36, normalized size = 0.8

$$\frac{a^3x^{15}}{15}+\frac{a^2bx^{18}}{6}+\frac{ab^2x^{21}}{7}+\frac{b^3x^{24}}{24}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^14*(b*x^3+a)^3,x)

[Out] 1/15*a^3*x^15+1/6*a^2*b*x^18+1/7*a*b^2*x^21+1/24*b^3*x^24
```

Maxima [A] time = 1.43878, size = 47, normalized size = 1.09

$$\frac{1}{24}\,b^3x^{24} + \frac{1}{7}\,ab^2x^{21} + \frac{1}{6}\,a^2bx^{18} + \frac{1}{15}\,a^3x^{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3*x^14,x, algorithm="maxima")
```

```
[Out] 1/24*b^3*x^24 + 1/7*a*b^2*x^21 + 1/6*a^2*b*x^18 + 1/15*a^3*x^15
```

Fricas [A] time = 0.195559, size = 1, normalized size = 0.02

$$\frac{1}{24}x^{24}b^3 + \frac{1}{7}x^{21}b^2a + \frac{1}{6}x^{18}ba^2 + \frac{1}{15}x^{15}a^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3*x^14,x, algorithm="fricas")
```

```
[Out] 1/24*x^24*b^3 + 1/7*x^21*b^2*a + 1/6*x^18*b*a^2 + 1/15*x^15*a^3
```

Sympy [A] time = 0.102098, size = 36, normalized size = 0.84

$$\frac{a^3x^{15}}{15} + \frac{a^2bx^{18}}{6} + \frac{ab^2x^{21}}{7} + \frac{b^3x^{24}}{24}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**14*(b*x**3+a)**3,x)
```

```
[Out] a**3*x**15/15 + a**2*b*x**18/6 + a*b**2*x**21/7 + b**3*x**24/24
```

GIAC/XCAS [A] time = 0.216466, size = 47, normalized size = 1.09

$$\frac{1}{24}\,b^3x^{24} + \frac{1}{7}\,ab^2x^{21} + \frac{1}{6}\,a^2bx^{18} + \frac{1}{15}\,a^3x^{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3*x^14,x, algorithm="giac")
```

```
[Out] 1/24*b^3*x^24 + 1/7*a*b^2*x^21 + 1/6*a^2*b*x^18 + 1/15*a^3*x^15
```

3.237 $\int x^{11} \left(a+bx^3\right)^3 \, dx$

Optimal. Leaf size=43

$$\frac{a^3x^{12}}{12}+\frac{1}{5}a^2bx^{15}+\frac{1}{6}ab^2x^{18}+\frac{b^3x^{21}}{21}$$

```
[Out] (a^3*x^12)/12 + (a^2*b*x^15)/5 + (a*b^2*x^18)/6 + (b^3*x^21)/21
```

Rubi [A] time = 0.072255, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$\frac{a^3x^{12}}{12}+\frac{1}{5}a^2bx^{15}+\frac{1}{6}ab^2x^{18}+\frac{b^3x^{21}}{21}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11*(a + b*x^3)^3,x]
```

```
[Out] (a^3*x^12)/12 + (a^2*b*x^15)/5 + (a*b^2*x^18)/6 + (b^3*x^21)/21
```

Rubi in Sympy [A] time = 9.84814, size = 36, normalized size = 0.84

$$\frac{a^3x^{12}}{12}+\frac{a^2bx^{15}}{5}+\frac{ab^2x^{18}}{6}+\frac{b^3x^{21}}{21}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11*(b*x**3+a)**3,x)
```

```
[Out] a**3*x**12/12 + a**2*b*x**15/5 + a*b**2*x**18/6 + b**3*x**21/21
```

Mathematica [A] time = 0.00312111, size = 43, normalized size = 1.

$$\frac{a^3x^{12}}{12}+\frac{1}{5}a^2bx^{15}+\frac{1}{6}ab^2x^{18}+\frac{b^3x^{21}}{21}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11*(a + b*x^3)^3,x]
```

```
[Out] (a^3*x^12)/12 + (a^2*b*x^15)/5 + (a*b^2*x^18)/6 + (b^3*x^21)/21
```

Maple [A] time = 0., size = 36, normalized size = 0.8

$$\frac{a^3x^{12}}{12}+\frac{a^2bx^{15}}{5}+\frac{ab^2x^{18}}{6}+\frac{b^3x^{21}}{21}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11*(b*x^3+a)^3,x)
```

```
[Out] 1/12*a^3*x^12+1/5*a^2*b*x^15+1/6*a*b^2*x^18+1/21*b^3*x^21
```

Maxima [A] time = 1.4392, size = 47, normalized size = 1.09

$$\frac{1}{21}\,b^3x^{21} + \frac{1}{6}\,ab^2x^{18} + \frac{1}{5}\,a^2bx^{15} + \frac{1}{12}\,a^3x^{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3*x^11,x, algorithm="maxima")
```

```
[Out] 1/21*b^3*x^21 + 1/6*a*b^2*x^18 + 1/5*a^2*b*x^15 + 1/12*a^3*x^12
```

Fricas [A] time = 0.19088, size = 1, normalized size = 0.02

$$\frac{1}{21}x^{21}b^3 + \frac{1}{6}x^{18}b^2a + \frac{1}{5}x^{15}ba^2 + \frac{1}{12}x^{12}a^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3*x^11,x, algorithm="fricas")
```

```
[Out] 1/21*x^21*b^3 + 1/6*x^18*b^2*a + 1/5*x^15*b*a^2 + 1/12*x^12*a^3
```

Sympy [A] time = 0.098185, size = 36, normalized size = 0.84

$$\frac{a^3x^{12}}{12} + \frac{a^2bx^{15}}{5} + \frac{ab^2x^{18}}{6} + \frac{b^3x^{21}}{21}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11*(b*x**3+a)**3,x)
```

```
[Out] a**3*x**12/12 + a**2*b*x**15/5 + a*b**2*x**18/6 + b**3*x**21/21
```

GIAC/XCAS [A] time = 0.220302, size = 47, normalized size = 1.09

$$\frac{1}{21}\,b^3x^{21} + \frac{1}{6}\,ab^2x^{18} + \frac{1}{5}\,a^2bx^{15} + \frac{1}{12}\,a^3x^{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3*x^11,x, algorithm="giac")
```

```
[Out] 1/21*b^3*x^21 + 1/6*a*b^2*x^18 + 1/5*a^2*b*x^15 + 1/12*a^3*x^12
```

3.238 $\int x^8 \left(a+bx^3\right)^3 \, dx$

Optimal. Leaf size=43

$$\frac{a^3x^9}{9}+\frac{1}{4}a^2bx^{12}+\frac{1}{5}ab^2x^{15}+\frac{b^3x^{18}}{18}$$

```
[Out] (a^3*x^9)/9 + (a^2*b*x^12)/4 + (a*b^2*x^15)/5 + (b^3*x^18)/18
```

Rubi [A] time = 0.0719805, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$\frac{a^3x^9}{9}+\frac{1}{4}a^2bx^{12}+\frac{1}{5}ab^2x^{15}+\frac{b^3x^{18}}{18}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8*(a + b*x^3)^3,x]
```

```
[Out] (a^3*x^9)/9 + (a^2*b*x^12)/4 + (a*b^2*x^15)/5 + (b^3*x^18)/18
```

Rubi in Sympy [A] time = 9.59963, size = 36, normalized size = 0.84

$$\frac{a^3x^9}{9}+\frac{a^2bx^{12}}{4}+\frac{ab^2x^{15}}{5}+\frac{b^3x^{18}}{18}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8*(b*x**3+a)**3,x)
```

```
[Out] a**3*x**9/9 + a**2*b*x**12/4 + a*b**2*x**15/5 + b**3*x**18/18
```

Mathematica [A] time = 0.00303536, size = 43, normalized size = 1.

$$\frac{a^3x^9}{9}+\frac{1}{4}a^2bx^{12}+\frac{1}{5}ab^2x^{15}+\frac{b^3x^{18}}{18}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8*(a + b*x^3)^3,x]
```

```
[Out] (a^3*x^9)/9 + (a^2*b*x^12)/4 + (a*b^2*x^15)/5 + (b^3*x^18)/18
```

Maple [A] time = 0.001, size = 36, normalized size = 0.8

$$\frac{a^3x^9}{9}+\frac{a^2bx^{12}}{4}+\frac{ab^2x^{15}}{5}+\frac{b^3x^{18}}{18}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8*(b*x^3+a)^3,x)
```

```
[Out] 1/9*a^3*x^9+1/4*a^2*b*x^12+1/5*a*b^2*x^15+1/18*b^3*x^18
```

Maxima [A] time = 1.43753, size = 47, normalized size = 1.09

$$\frac{1}{18}\,b^3x^{18}+\frac{1}{5}\,ab^2x^{15}+\frac{1}{4}\,a^2bx^{12}+\frac{1}{9}\,a^3x^9$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3*x^8,x, algorithm="maxima")
```

```
[Out] 1/18*b^3*x^18 + 1/5*a*b^2*x^15 + 1/4*a^2*b*x^12 + 1/9*a^3*x^9
```

Fricas [A] time = 0.193969, size = 1, normalized size = 0.02

$$\frac{1}{18}x^{18}b^3+\frac{1}{5}x^{15}b^2a+\frac{1}{4}x^{12}ba^2+\frac{1}{9}x^9a^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3*x^8,x, algorithm="fricas")
```

```
[Out] 1/18*x^18*b^3 + 1/5*x^15*b^2*a + 1/4*x^12*b*a^2 + 1/9*x^9*a^3
```

Sympy [A] time = 0.098762, size = 36, normalized size = 0.84

$$\frac{a^3x^9}{9}+\frac{a^2bx^{12}}{4}+\frac{ab^2x^{15}}{5}+\frac{b^3x^{18}}{18}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8*(b*x**3+a)**3,x)
```

```
[Out] a**3*x**9/9 + a**2*b*x**12/4 + a*b**2*x**15/5 + b**3*x**18/18
```

GIAC/XCAS [A] time = 0.213882, size = 47, normalized size = 1.09

$$\frac{1}{18}\,b^3x^{18}+\frac{1}{5}\,ab^2x^{15}+\frac{1}{4}\,a^2bx^{12}+\frac{1}{9}\,a^3x^9$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3*x^8,x, algorithm="giac")
```

```
[Out] 1/18*b^3*x^18 + 1/5*a*b^2*x^15 + 1/4*a^2*b*x^12 + 1/9*a^3*x^9
```

3.239 $\int x^5 \left(a+bx^3\right)^3 \, dx$

Optimal. Leaf size=34

$$\frac{\left(a+bx^3\right)^5}{15b^2}-\frac{a\left(a+bx^3\right)^4}{12b^2}$$

```
[Out] -(a*(a + b*x^3)^4)/(12*b^2) + (a + b*x^3)^5/(15*b^2)
```

Rubi [A] time = 0.0814258, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{\left(a+bx^3\right)^5}{15b^2}-\frac{a\left(a+bx^3\right)^4}{12b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5*(a + b*x^3)^3,x]

[Out] -(a*(a + b*x^3)^4)/(12*b^2) + (a + b*x^3)^5/(15*b^2)
```

Rubi in Sympy [A] time = 8.36067, size = 27, normalized size = 0.79

$$-\frac{a\left(a+bx^3\right)^4}{12b^2}+\frac{\left(a+bx^3\right)^5}{15b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5*(b*x**3+a)**3,x)

[Out] -a*(a + b*x**3)**4/(12*b**2) + (a + b*x**3)**5/(15*b**2)
```

Mathematica [A] time = 0.00291824, size = 43, normalized size = 1.26

$$\frac{a^3x^6}{6}+\frac{1}{3}a^2bx^9+\frac{1}{4}ab^2x^{12}+\frac{b^3x^{15}}{15}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5*(a + b*x^3)^3,x]

[Out] (a^3*x^6)/6 + (a^2*b*x^9)/3 + (a*b^2*x^12)/4 + (b^3*x^15)/15
```

Maple [A] time = 0.001, size = 36, normalized size = 1.1

$$\frac{b^3x^{15}}{15}+\frac{ab^2x^{12}}{4}+\frac{a^2bx^9}{3}+\frac{a^3x^6}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5*(b*x^3+a)^3,x)

[Out] 1/15*b^3*x^15+1/4*a*b^2*x^12+1/3*a^2*b*x^9+1/6*a^3*x^6
```

Maxima [A] time = 1.44424, size = 47, normalized size = 1.38

$$\frac{1}{15}\,b^3x^{15}+\frac{1}{4}\,ab^2x^{12}+\frac{1}{3}\,a^2bx^9+\frac{1}{6}\,a^3x^6$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3*x^5,x, algorithm="maxima")

[Out] 1/15*b^3*x^15 + 1/4*a*b^2*x^12 + 1/3*a^2*b*x^9 + 1/6*a^3*x^6
```

Fricas [A] time = 0.191886, size = 1, normalized size = 0.03

$$\frac{1}{15}x^{15}b^3+\frac{1}{4}x^{12}b^2a+\frac{1}{3}x^9ba^2+\frac{1}{6}x^6a^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3*x^5,x, algorithm="fricas")

[Out] 1/15*x^15*b^3 + 1/4*x^12*b^2*a + 1/3*x^9*b*a^2 + 1/6*x^6*a^3
```

Sympy [A] time = 0.096421, size = 36, normalized size = 1.06

$$\frac{a^3x^6}{6}+\frac{a^2bx^9}{3}+\frac{ab^2x^{12}}{4}+\frac{b^3x^{15}}{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5*(b*x**3+a)**3,x)

[Out] a**3*x**6/6 + a**2*b*x**9/3 + a*b**2*x**12/4 + b**3*x**15/15
```

GIAC/XCAS [A] time = 0.224984, size = 47, normalized size = 1.38

$$\frac{1}{15}\,b^3x^{15}+\frac{1}{4}\,ab^2x^{12}+\frac{1}{3}\,a^2bx^9+\frac{1}{6}\,a^3x^6$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3*x^5,x, algorithm="giac")

[Out] 1/15*b^3*x^15 + 1/4*a*b^2*x^12 + 1/3*a^2*b*x^9 + 1/6*a^3*x^6
```

3.240 $\int x^2 \left(a+bx^3\right)^3 \, dx$

Optimal. Leaf size=16

$$\frac{\left(a+bx^3\right)^4}{12b}$$

```
[Out] (a + b*x^3)^4/(12*b)
```

Rubi [A] time = 0.0118032, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{\left(a+bx^3\right)^4}{12b}$$

Antiderivative was successfully verified.

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

[Out] (a + b*x^3)^4/(12*b)
```

Rubi in Sympy [A] time = 2.13982, size = 10, normalized size = 0.62

$$\frac{\left(a+bx^3\right)^4}{12b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(b*x**3+a)**3,x)

[Out] (a + b*x**3)**4/(12*b)
```

Mathematica [B] time = 0.00303376, size = 43, normalized size = 2.69

$$\frac{a^3x^3}{3}+\frac{1}{2}a^2bx^6+\frac{1}{3}ab^2x^9+\frac{b^3x^{12}}{12}$$

Antiderivative was successfully verified.

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

[Out] (a^3*x^3)/3 + (a^2*b*x^6)/2 + (a*b^2*x^9)/3 + (b^3*x^12)/12
```

Maple [B] time = 0.001, size = 36, normalized size = 2.3

$$\frac{b^3x^{12}}{12}+\frac{ab^2x^9}{3}+\frac{a^2bx^6}{2}+\frac{a^3x^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 1/12*b^3*x^12+1/3*a*b^2*x^9+1/2*a^2*b*x^6+1/3*a^3*x^3
```

Maxima [A] time = 1.4367, size = 19, normalized size = 1.19

$$\frac{\left(bx^3 + a\right)^4}{12\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/12*(b*x^3 + a)^4/b
```

Fricas [A] time = 0.190483, size = 1, normalized size = 0.06

$$\frac{1}{12}x^{12}b^3 + \frac{1}{3}x^9b^2a + \frac{1}{2}x^6ba^2 + \frac{1}{3}x^3a^3$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/12*x^12*b^3 + 1/3*x^9*b^2*a + 1/2*x^6*b*a^2 + 1/3*x^3*a^3
```

Sympy [A] time = 0.099199, size = 36, normalized size = 2.25

$$\frac{a^3x^3}{3} + \frac{a^2bx^6}{2} + \frac{ab^2x^9}{3} + \frac{b^3x^{12}}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(b*x**3+a)**3,x)
```

```
[Out] a**3*x**3/3 + a**2*b*x**6/2 + a*b**2*x**9/3 + b**3*x**12/12
```

GIAC/XCAS [A] time = 0.21897, size = 19, normalized size = 1.19

$$\frac{\left(bx^3 + a\right)^4}{12\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/12*(b*x^3 + a)^4/b
```

3.241 $\int \frac{(a+bx^3)^3}{x}\,dx$

Optimal. Leaf size=36

$$a^3\log(x)+a^2bx^3+\frac{1}{2}ab^2x^6+\frac{b^3x^9}{9}$$

```
[Out] a^2*b*x^3 + (a*b^2*x^6)/2 + (b^3*x^9)/9 + a^3*Log[x]
```

Rubi [A] time = 0.0483984, antiderivative size = 36, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$a^3\log(x)+a^2bx^3+\frac{1}{2}ab^2x^6+\frac{b^3x^9}{9}$$

Antiderivative was successfully verified.

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

```
[Out] a^2*b*x^3 + (a*b^2*x^6)/2 + (b^3*x^9)/9 + a^3*Log[x]
```

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

$$\frac{a^3\log\left(x^3\right)}{3}+a^2bx^3+ab^2\int^{x^3}x\,dx+\frac{b^3x^9}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a**3*log(x**3)/3 + a**2*b*x**3 + a*b**2*Integral(x, (x, x**3)) +
b**3*x**9/9
```

Mathematica [A] time = 0.00714778, size = 36, normalized size = 1.

$$a^3\log(x)+a^2bx^3+\frac{1}{2}ab^2x^6+\frac{b^3x^9}{9}$$

Antiderivative was successfully verified.

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

```
[Out] a^2*b*x^3 + (a*b^2*x^6)/2 + (b^3*x^9)/9 + a^3*Log[x]
```

Maple [A] time = 0.003, size = 33, normalized size = 0.9

$$a^2bx^3+\frac{ab^2x^6}{2}+\frac{b^3x^9}{9}+a^3\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a^2*b*x^3+1/2*a*b^2*x^6+1/9*b^3*x^9+a^3*ln(x)
```

Maxima [A] time = 1.43885, size = 47, normalized size = 1.31

$$\frac{1}{9}b^3x^9 + \frac{1}{2}ab^2x^6 + a^2bx^3 + \frac{1}{3}a^3\log\left(x^3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/9*b^3*x^9 + 1/2*a*b^2*x^6 + a^2*b*x^3 + 1/3*a^3*log(x^3)
```

Fricas [A] time = 0.216513, size = 43, normalized size = 1.19

$$\frac{1}{9}b^3x^9 + \frac{1}{2}ab^2x^6 + a^2bx^3 + a^3\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/9*b^3*x^9 + 1/2*a*b^2*x^6 + a^2*b*x^3 + a^3*log(x)
```

Sympy [A] time = 1.07773, size = 32, normalized size = 0.89

$$a^3\log(x) + a^2bx^3 + \frac{ab^2x^6}{2} + \frac{b^3x^9}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a**3*log(x) + a**2*b*x**3 + a*b**2*x**6/2 + b**3*x**9/9
```

GIAC/XCAS [A] time = 0.217218, size = 45, normalized size = 1.25

$$\frac{1}{9}b^3x^9 + \frac{1}{2}ab^2x^6 + a^2bx^3 + a^3\ln(|x|)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/9*b^3*x^9 + 1/2*a*b^2*x^6 + a^2*b*x^3 + a^3*ln(abs(x))
```

3.242 $\int \frac{(a+bx^3)^3}{x^4}\,dx$

Optimal. Leaf size=37

$$-\frac{a^3}{3x^3}+3a^2b\log(x)+ab^2x^3+\frac{b^3x^6}{6}$$

```
[Out] -a^3/(3*x^3) + a*b^2*x^3 + (b^3*x^6)/6 + 3*a^2*b*Log[x]
```

Rubi [A] time = 0.0556364, antiderivative size = 37, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$-\frac{a^3}{3x^3}+3a^2b\log(x)+ab^2x^3+\frac{b^3x^6}{6}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^3/x^4,x]
```

```
[Out] -a^3/(3*x^3) + a*b^2*x^3 + (b^3*x^6)/6 + 3*a^2*b*Log[x]
```

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

$$-\frac{a^3}{3x^3}+a^2b\log\left(x^3\right)+ab^2x^3+\frac{b^3\int^{x^3}x\,dx}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**3/x**4,x)
```

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

Mathematica [A] time = 0.00743577, size = 37, normalized size = 1.

$$-\frac{a^3}{3x^3}+3a^2b\log(x)+ab^2x^3+\frac{b^3x^6}{6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^3/x^4,x]
```

```
[Out] -a^3/(3*x^3) + a*b^2*x^3 + (b^3*x^6)/6 + 3*a^2*b*Log[x]
```

Maple [A] time = 0.01, size = 34, normalized size = 0.9

$$-\frac{a^3}{3\,x^3}+ab^2x^3+\frac{b^3x^6}{6}+3\,a^2b\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^3/x^4,x)
```

```
[Out] -1/3*a^3/x^3+a*b^2*x^3+1/6*b^3*x^6+3*a^2*b*ln(x)
```

Maxima [A] time = 1.44406, size = 46, normalized size = 1.24

$$\frac{1}{6}b^3x^6 + ab^2x^3 + a^2b\log\left(x^3\right) - \frac{a^3}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^3 + a)^3/x^4,x, algorithm="maxima")
```

```
[Out] 1/6*b^3*x^6 + a*b^2*x^3 + a^2*b*log(x^3) - 1/3*a^3/x^3
```

Fricas [A] time = 0.218447, size = 51, normalized size = 1.38

$$\frac{b^3x^9 + 6ab^2x^6 + 18a^2bx^3\log(x) - 2a^3}{6x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^3 + a)^3/x^4,x, algorithm="fricas")
```

```
[Out] 1/6*(b^3*x^9 + 6*a*b^2*x^6 + 18*a^2*b*x^3*log(x) - 2*a^3)/x^3
```

Sympy [A] time = 1.20823, size = 34, normalized size = 0.92

$$-\frac{a^3}{3x^3} + 3a^2b\log(x) + ab^2x^3 + \frac{b^3x^6}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x**3+a)**3/x**4,x)
```

```
[Out] -a**3/(3*x**3) + 3*a**2*b*log(x) + a*b**2*x**3 + b**3*x**6/6
```

GIAC/XCAS [A] time = 0.218194, size = 59, normalized size = 1.59

$$\frac{1}{6}b^3x^6 + ab^2x^3 + 3a^2b\ln(|x|) - \frac{3a^2bx^3 + a^3}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^3 + a)^3/x^4,x, algorithm="giac")
```

```
[Out] 1/6*b^3*x^6 + a*b^2*x^3 + 3*a^2*b*ln(abs(x)) - 1/3*(3*a^2*b*x^3 +
 a^3)/x^3
```

3.243 $\int \frac{(a+bx^3)^3}{x^7}\,dx$

Optimal. Leaf size=38

$$-\frac{a^3}{6x^6}-\frac{a^2b}{x^3}+3ab^2\log(x)+\frac{b^3x^3}{3}$$

```
[Out] -a^3/(6*x^6) - (a^2*b)/x^3 + (b^3*x^3)/3 + 3*a*b^2*Log[x]
```

Rubi [A] time = 0.052123, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^3}{6x^6}-\frac{a^2b}{x^3}+3ab^2\log(x)+\frac{b^3x^3}{3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^3/x^7,x]
```

```
[Out] -a^3/(6*x^6) - (a^2*b)/x^3 + (b^3*x^3)/3 + 3*a*b^2*Log[x]
```

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

$$-\frac{a^3}{6x^6}-\frac{a^2b}{x^3}+ab^2\log\left(x^3\right)+\frac{\int^{x^3} b^3\,dx}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**3/x**7,x)
```

```
[Out] -a**3/(6*x**6) - a**2*b/x**3 + a*b**2*log(x**3) + Integral(b**3,
(x, x**3))/3
```

Mathematica [A] time = 0.00733977, size = 38, normalized size = 1.

$$-\frac{a^3}{6x^6}-\frac{a^2b}{x^3}+3ab^2\log(x)+\frac{b^3x^3}{3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^3/x^7,x]
```

```
[Out] -a^3/(6*x^6) - (a^2*b)/x^3 + (b^3*x^3)/3 + 3*a*b^2*Log[x]
```

Maple [A] time = 0.008, size = 35, normalized size = 0.9

$$-\frac{a^3}{6\,x^6}-\frac{a^2b}{x^3}+\frac{b^3x^3}{3}+3\,ab^2\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^3/x^7,x)
```

```
[Out] -1/6*a^3/x^6-a^2*b/x^3+1/3*b^3*x^3+3*a*b^2*ln(x)
```

Maxima [A] time = 1.4371, size = 49, normalized size = 1.29

$$\frac{1}{3}\,b^3x^3+ab^2\log\left(x^3\right)-\frac{6\,a^2bx^3+a^3}{6\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3/x^7,x, algorithm="maxima")
```

```
[Out] 1/3*b^3*x^3 + a*b^2*log(x^3) - 1/6*(6*a^2*b*x^3 + a^3)/x^6
```

Fricas [A] time = 0.220965, size = 53, normalized size = 1.39

$$\frac{2\,b^3x^9+18\,ab^2x^6\log\left(x\right)-6\,a^2bx^3-a^3}{6\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3/x^7,x, algorithm="fricas")
```

```
[Out] 1/6*(2*b^3*x^9 + 18*a*b^2*x^6*log(x) - 6*a^2*b*x^3 - a^3)/x^6
```

Sympy [A] time = 1.42477, size = 36, normalized size = 0.95

$$3ab^2\log\left(x\right)+\frac{b^3x^3}{3}-\frac{a^3+6a^2bx^3}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**3/x**7,x)
```

```
[Out] 3*a*b**2*log(x) + b**3*x**3/3 - (a**3 + 6*a**2*b*x**3)/(6*x**6)
```

GIAC/XCAS [A] time = 0.220231, size = 61, normalized size = 1.61

$$\frac{1}{3}\,b^3x^3+3\,ab^2\ln\left(|x|\right)-\frac{9\,ab^2x^6+6\,a^2bx^3+a^3}{6\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3/x^7,x, algorithm="giac")
```

```
[Out] 1/3*b^3*x^3 + 3*a*b^2*ln(abs(x)) - 1/6*(9*a*b^2*x^6 + 6*a^2*b*x^3
 + a^3)/x^6
```

3.244 $\int \frac{(a+bx^3)^3}{x^{10}}\,dx$

Optimal. Leaf size=37

$$-\frac{a^3}{9x^9}-\frac{a^2b}{2x^6}-\frac{ab^2}{x^3}+b^3\log(x)$$

```
[Out] -a^3/(9*x^9) - (a^2*b)/(2*x^6) - (a*b^2)/x^3 + b^3*Log[x]
```

Rubi [A] time = 0.0490019, antiderivative size = 37, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^3}{9x^9}-\frac{a^2b}{2x^6}-\frac{ab^2}{x^3}+b^3\log(x)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^3/x^10,x]

[Out] -a^3/(9*x^9) - (a^2*b)/(2*x^6) - (a*b^2)/x^3 + b^3*Log[x]
```

Rubi in Sympy [A] time = 8.55606, size = 36, normalized size = 0.97

$$-\frac{a^3}{9x^9}-\frac{a^2b}{2x^6}-\frac{ab^2}{x^3}+\frac{b^3\log\left(x^3\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**3/x**10,x)

[Out] -a**3/(9*x**9) - a**2*b/(2*x**6) - a*b**2/x**3 + b**3*log(x**3)/3
```

Mathematica [A] time = 0.00738745, size = 37, normalized size = 1.

$$-\frac{a^3}{9x^9}-\frac{a^2b}{2x^6}-\frac{ab^2}{x^3}+b^3\log(x)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^3/x^10,x]

[Out] -a^3/(9*x^9) - (a^2*b)/(2*x^6) - (a*b^2)/x^3 + b^3*Log[x]
```

Maple [A] time = 0.008, size = 34, normalized size = 0.9

$$-\frac{a^3}{9\,x^9}-\frac{a^2b}{2\,x^6}-\frac{ab^2}{x^3}+b^3\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^3/x^10,x)

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

Maxima [A] time = 1.44151, size = 53, normalized size = 1.43

$$\frac{1}{3}\,b^3\log\left(x^3\right) - \frac{18\,ab^2x^6 + 9\,a^2bx^3 + 2\,a^3}{18\,x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3/x^10,x, algorithm="maxima")
```

```
[Out] 1/3*b^3*log(x^3) - 1/18*(18*a*b^2*x^6 + 9*a^2*b*x^3 + 2*a^3)/x^9
```

Fricas [A] time = 0.230198, size = 53, normalized size = 1.43

$$\frac{18\,b^3x^9\log\left(x\right) - 18\,ab^2x^6 - 9\,a^2bx^3 - 2\,a^3}{18\,x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3/x^10,x, algorithm="fricas")
```

```
[Out] 1/18*(18*b^3*x^9*log(x) - 18*a*b^2*x^6 - 9*a^2*b*x^3 - 2*a^3)/x^9
```

Sympy [A] time = 1.71132, size = 36, normalized size = 0.97

$$b^3\log\left(x\right) - \frac{2a^3 + 9a^2bx^3 + 18ab^2x^6}{18x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**3/x**10,x)
```

```
[Out] b**3*log(x) - (2*a**3 + 9*a**2*b*x**3 + 18*a*b**2*x**6)/(18*x**9)
```

GIAC/XCAS [A] time = 0.220312, size = 61, normalized size = 1.65

$$b^3\ln\left(|x|\right) - \frac{11\,b^3x^9 + 18\,ab^2x^6 + 9\,a^2bx^3 + 2\,a^3}{18\,x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3/x^10,x, algorithm="giac")
```

```
[Out] b^3*ln(abs(x)) - 1/18*(11*b^3*x^9 + 18*a*b^2*x^6 + 9*a^2*b*x^3 +
2*a^3)/x^9
```

3.245 $\int \frac{(a+bx^3)^3}{x^{13}}\,dx$

Optimal. Leaf size=19

$$-\frac{(a+bx^3)^4}{12ax^{12}}$$

```
[Out] -(a + b*x^3)^4/(12*a*x^12)
```

Rubi [A] time = 0.0160891, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{(a+bx^3)^4}{12ax^{12}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^3/x^13,x]

[Out] -(a + b*x^3)^4/(12*a*x^12)
```

Rubi in Sympy [A] time = 2.75094, size = 15, normalized size = 0.79

$$-\frac{(a+bx^3)^4}{12ax^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**3/x**13,x)

[Out] -(a + b*x**3)**4/(12*a*x**12)
```

Mathematica [B] time = 0.00630495, size = 43, normalized size = 2.26

$$-\frac{a^3}{12x^{12}}-\frac{a^2b}{3x^9}-\frac{ab^2}{2x^6}-\frac{b^3}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^3/x^13,x]

[Out] -a^3/(12*x^12) - (a^2*b)/(3*x^9) - (a*b^2)/(2*x^6) - b^3/(3*x^3)
```

Maple [B] time = 0.008, size = 36, normalized size = 1.9

$$-\frac{a^3}{12\,x^{12}}-\frac{ab^2}{2\,x^6}-\frac{a^2b}{3\,x^9}-\frac{b^3}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^3/x^13,x)

[Out] -1/12*a^3/x^12-1/2*a*b^2/x^6-1/3*a^2*b/x^9-1/3*b^3/x^3
```

Maxima [A] time = 1.44204, size = 47, normalized size = 2.47

$$-\frac{4\,b^3x^9+6\,ab^2x^6+4\,a^2bx^3+a^3}{12\,x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3/x^13,x, algorithm="maxima")
```

```
[Out] -1/12*(4*b^3*x^9 + 6*a*b^2*x^6 + 4*a^2*b*x^3 + a^3)/x^12
```

Fricas [A] time = 0.222255, size = 47, normalized size = 2.47

$$-\frac{4\,b^3x^9+6\,ab^2x^6+4\,a^2bx^3+a^3}{12\,x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3/x^13,x, algorithm="fricas")
```

```
[Out] -1/12*(4*b^3*x^9 + 6*a*b^2*x^6 + 4*a^2*b*x^3 + a^3)/x^12
```

Sympy [A] time = 1.82933, size = 37, normalized size = 1.95

$$-\frac{a^3+4a^2bx^3+6ab^2x^6+4b^3x^9}{12x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**3/x**13,x)
```

```
[Out] -(a**3 + 4*a**2*b*x**3 + 6*a*b**2*x**6 + 4*b**3*x**9)/(12*x**12)
```

GIAC/XCAS [A] time = 0.216427, size = 47, normalized size = 2.47

$$-\frac{4\,b^3x^9+6\,ab^2x^6+4\,a^2bx^3+a^3}{12\,x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3/x^13,x, algorithm="giac")
```

```
[Out] -1/12*(4*b^3*x^9 + 6*a*b^2*x^6 + 4*a^2*b*x^3 + a^3)/x^12
```

3.246 $\int \frac{(a+bx^3)^3}{x^{16}}\,dx$

Optimal. Leaf size=40

$$\frac{b\left(a+bx^3\right)^4}{60a^2x^{12}}-\frac{\left(a+bx^3\right)^4}{15ax^{15}}$$

```
[Out] -(a + b*x^3)^4/(15*a*x^15) + (b*(a + b*x^3)^4)/(60*a^2*x^12)
```

Rubi [A] time = 0.0522817, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{b\left(a+bx^3\right)^4}{60a^2x^{12}}-\frac{\left(a+bx^3\right)^4}{15ax^{15}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^3/x^16,x]
```

```
[Out] -(a + b*x^3)^4/(15*a*x^15) + (b*(a + b*x^3)^4)/(60*a^2*x^12)
```

Rubi in Sympy [A] time = 8.75949, size = 37, normalized size = 0.92

$$-\frac{a^3}{15x^{15}}-\frac{a^2b}{4x^{12}}-\frac{ab^2}{3x^9}-\frac{b^3}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**3/x**16,x)
```

```
[Out] -a**3/(15*x**15) - a**2*b/(4*x**12) - a*b**2/(3*x**9) - b**3/(6*x
**6)
```

Mathematica [A] time = 0.00671068, size = 43, normalized size = 1.08

$$-\frac{a^3}{15x^{15}}-\frac{a^2b}{4x^{12}}-\frac{ab^2}{3x^9}-\frac{b^3}{6x^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^3/x^16,x]
```

```
[Out] -a^3/(15*x^15) - (a^2*b)/(4*x^12) - (a*b^2)/(3*x^9) - b^3/(6*x^6)
```

Maple [A] time = 0.008, size = 36, normalized size = 0.9

$$-\frac{a^2b}{4\,x^{12}}-\frac{a^3}{15\,x^{15}}-\frac{b^3}{6\,x^6}-\frac{ab^2}{3\,x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^3/x^16,x)
```

```
[Out] -1/4*a^2*b/x^12-1/15*a^3/x^15-1/6*b^3/x^6-1/3*a*b^2/x^9
```

Maxima [A] time = 1.4368, size = 50, normalized size = 1.25

$$-\frac{10\,b^3x^9+20\,ab^2x^6+15\,a^2bx^3+4\,a^3}{60\,x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^3 + a)^3/x^16,x, algorithm="maxima")
```

```
[Out] -1/60*(10*b^3*x^9 + 20*a*b^2*x^6 + 15*a^2*b*x^3 + 4*a^3)/x^15
```

Fricas [A] time = 0.205513, size = 50, normalized size = 1.25

$$-\frac{10\,b^3x^9+20\,ab^2x^6+15\,a^2bx^3+4\,a^3}{60\,x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^3 + a)^3/x^16,x, algorithm="fricas")
```

```
[Out] -1/60*(10*b^3*x^9 + 20*a*b^2*x^6 + 15*a^2*b*x^3 + 4*a^3)/x^15
```

Sympy [A] time = 1.96989, size = 39, normalized size = 0.98

$$-\frac{4a^3+15a^2bx^3+20ab^2x^6+10b^3x^9}{60x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x**3+a)**3/x**16,x)
```

```
[Out] -(4*a**3 + 15*a**2*b*x**3 + 20*a*b**2*x**6 + 10*b**3*x**9)/(60*x*
*15)
```

GIAC/XCAS [A] time = 0.214195, size = 50, normalized size = 1.25

$$-\frac{10\,b^3x^9+20\,ab^2x^6+15\,a^2bx^3+4\,a^3}{60\,x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^3 + a)^3/x^16,x, algorithm="giac")
```

```
[Out] -1/60*(10*b^3*x^9 + 20*a*b^2*x^6 + 15*a^2*b*x^3 + 4*a^3)/x^15
```

3.247 $\int \frac{(a+bx^3)^3}{x^{19}}\,dx$

Optimal. Leaf size=43

$$-\frac{a^3}{18x^{18}}-\frac{a^2b}{5x^{15}}-\frac{ab^2}{4x^{12}}-\frac{b^3}{9x^9}$$

```
[Out] -a^3/(18*x^18) - (a^2*b)/(5*x^15) - (a*b^2)/(4*x^12) - b^3/(9*x^9
)
```

Rubi [A] time = 0.0530241, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^3}{18x^{18}}-\frac{a^2b}{5x^{15}}-\frac{ab^2}{4x^{12}}-\frac{b^3}{9x^9}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^3/x^19,x]
```

```
[Out] -a^3/(18*x^18) - (a^2*b)/(5*x^15) - (a*b^2)/(4*x^12) - b^3/(9*x^9
)
```

Rubi in Sympy [A] time = 8.88161, size = 37, normalized size = 0.86

$$-\frac{a^3}{18x^{18}}-\frac{a^2b}{5x^{15}}-\frac{ab^2}{4x^{12}}-\frac{b^3}{9x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**3/x**19,x)
```

```
[Out] -a**3/(18*x**18) - a**2*b/(5*x**15) - a*b**2/(4*x**12) - b**3/(9*
x**9)
```

Mathematica [A] time = 0.00680988, size = 43, normalized size = 1.

$$-\frac{a^3}{18x^{18}}-\frac{a^2b}{5x^{15}}-\frac{ab^2}{4x^{12}}-\frac{b^3}{9x^9}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^3/x^19,x]
```

```
[Out] -a^3/(18*x^18) - (a^2*b)/(5*x^15) - (a*b^2)/(4*x^12) - b^3/(9*x^9
)
```

Maple [A] time = 0.009, size = 36, normalized size = 0.8

$$-\frac{a^3}{18\,x^{18}}-\frac{a^2b}{5\,x^{15}}-\frac{ab^2}{4\,x^{12}}-\frac{b^3}{9\,x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^3/x^19,x)
```

```
[Out] -1/18*a^3/x^18-1/5*a^2*b/x^15-1/4*a*b^2/x^12-1/9*b^3/x^9
```

Maxima [A] time = 1.44141, size = 50, normalized size = 1.16

$$-\frac{20\,b^3x^9 + 45\,ab^2x^6 + 36\,a^2bx^3 + 10\,a^3}{180\,x^{18}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3/x^19,x, algorithm="maxima")
```

```
[Out] -1/180*(20*b^3*x^9 + 45*a*b^2*x^6 + 36*a^2*b*x^3 + 10*a^3)/x^18
```

Fricas [A] time = 0.204639, size = 50, normalized size = 1.16

$$-\frac{20\,b^3x^9 + 45\,ab^2x^6 + 36\,a^2bx^3 + 10\,a^3}{180\,x^{18}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3/x^19,x, algorithm="fricas")
```

```
[Out] -1/180*(20*b^3*x^9 + 45*a*b^2*x^6 + 36*a^2*b*x^3 + 10*a^3)/x^18
```

Sympy [A] time = 2.11828, size = 39, normalized size = 0.91

$$-\frac{10a^3 + 36a^2bx^3 + 45ab^2x^6 + 20b^3x^9}{180x^{18}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**3/x**19,x)
```

```
[Out] -(10*a**3 + 36*a**2*b*x**3 + 45*a*b**2*x**6 + 20*b**3*x**9)/(180*
x**18)
```

GIAC/XCAS [A] time = 0.221604, size = 50, normalized size = 1.16

$$-\frac{20\,b^3x^9 + 45\,ab^2x^6 + 36\,a^2bx^3 + 10\,a^3}{180\,x^{18}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3/x^19,x, algorithm="giac")
```

```
[Out] -1/180*(20*b^3*x^9 + 45*a*b^2*x^6 + 36*a^2*b*x^3 + 10*a^3)/x^18
```

3.248 $\int \frac{(a+bx^3)^3}{x^{22}} dx$

Optimal. Leaf size=43

$$-\frac{a^3}{21x^{21}}-\frac{a^2b}{6x^{18}}-\frac{ab^2}{5x^{15}}-\frac{b^3}{12x^{12}}$$

```
[Out] -a^3/(21*x^21) - (a^2*b)/(6*x^18) - (a*b^2)/(5*x^15) - b^3/(12*x^
12)
```

Rubi [A] time = 0.0503132, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^3}{21x^{21}}-\frac{a^2b}{6x^{18}}-\frac{ab^2}{5x^{15}}-\frac{b^3}{12x^{12}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^3/x^22,x]
```

```
[Out] -a^3/(21*x^21) - (a^2*b)/(6*x^18) - (a*b^2)/(5*x^15) - b^3/(12*x^
12)
```

Rubi in Sympy [A] time = 8.77914, size = 37, normalized size = 0.86

$$-\frac{a^3}{21x^{21}}-\frac{a^2b}{6x^{18}}-\frac{ab^2}{5x^{15}}-\frac{b^3}{12x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**3/x**22,x)
```

```
[Out] -a**3/(21*x**21) - a**2*b/(6*x**18) - a*b**2/(5*x**15) - b**3/(12
*x**12)
```

Mathematica [A] time = 0.00678364, size = 43, normalized size = 1.

$$-\frac{a^3}{21x^{21}}-\frac{a^2b}{6x^{18}}-\frac{ab^2}{5x^{15}}-\frac{b^3}{12x^{12}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^3/x^22,x]
```

```
[Out] -a^3/(21*x^21) - (a^2*b)/(6*x^18) - (a*b^2)/(5*x^15) - b^3/(12*x^
12)
```

Maple [A] time = 0.009, size = 36, normalized size = 0.8

$$-\frac{a^3}{21\,x^{21}}-\frac{a^2b}{6\,x^{18}}-\frac{ab^2}{5\,x^{15}}-\frac{b^3}{12\,x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^3/x^22,x)
```

```
[Out] -1/21*a^3/x^21-1/6*a^2*b/x^18-1/5*a*b^2/x^15-1/12*b^3/x^12
```

Maxima [A] time = 1.46574, size = 50, normalized size = 1.16

$$-\frac{35\,b^3x^9 + 84\,ab^2x^6 + 70\,a^2bx^3 + 20\,a^3}{420\,x^{21}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3/x^22,x, algorithm="maxima")
```

```
[Out] -1/420*(35*b^3*x^9 + 84*a*b^2*x^6 + 70*a^2*b*x^3 + 20*a^3)/x^21
```

Fricas [A] time = 0.203003, size = 50, normalized size = 1.16

$$-\frac{35\,b^3x^9 + 84\,ab^2x^6 + 70\,a^2bx^3 + 20\,a^3}{420\,x^{21}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3/x^22,x, algorithm="fricas")
```

```
[Out] -1/420*(35*b^3*x^9 + 84*a*b^2*x^6 + 70*a^2*b*x^3 + 20*a^3)/x^21
```

Sympy [A] time = 2.30862, size = 39, normalized size = 0.91

$$-\frac{20a^3 + 70a^2bx^3 + 84ab^2x^6 + 35b^3x^9}{420x^{21}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**3/x**22,x)
```

```
[Out] -(20*a**3 + 70*a**2*b*x**3 + 84*a*b**2*x**6 + 35*b**3*x**9)/(420*
x**21)
```

GIAC/XCAS [A] time = 0.215303, size = 50, normalized size = 1.16

$$-\frac{35\,b^3x^9 + 84\,ab^2x^6 + 70\,a^2bx^3 + 20\,a^3}{420\,x^{21}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3/x^22,x, algorithm="giac")
```

```
[Out] -1/420*(35*b^3*x^9 + 84*a*b^2*x^6 + 70*a^2*b*x^3 + 20*a^3)/x^21
```

3.249 $\int x^4 (a + bx^3)^3 \, dx$

Optimal. Leaf size=43

$$\frac{a^3x^5}{5} + \frac{3}{8}a^2bx^8 + \frac{3}{11}ab^2x^{11} + \frac{b^3x^{14}}{14}$$

```
[Out] (a^3*x^5)/5 + (3*a^2*b*x^8)/8 + (3*a*b^2*x^11)/11 + (b^3*x^14)/14
```

Rubi [A] time = 0.0438092, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$\frac{a^3x^5}{5} + \frac{3}{8}a^2bx^8 + \frac{3}{11}ab^2x^{11} + \frac{b^3x^{14}}{14}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(a + b*x^3)^3,x]
```

```
[Out] (a^3*x^5)/5 + (3*a^2*b*x^8)/8 + (3*a*b^2*x^11)/11 + (b^3*x^14)/14
```

Rubi in Sympy [A] time = 7.01594, size = 39, normalized size = 0.91

$$\frac{a^3x^5}{5} + \frac{3a^2bx^8}{8} + \frac{3ab^2x^{11}}{11} + \frac{b^3x^{14}}{14}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**4*(b*x**3+a)**3,x)
```

```
[Out] a**3*x**5/5 + 3*a**2*b*x**8/8 + 3*a*b**2*x**11/11 + b**3*x**14/14
```

Mathematica [A] time = 0.00298864, size = 43, normalized size = 1.

$$\frac{a^3x^5}{5} + \frac{3}{8}a^2bx^8 + \frac{3}{11}ab^2x^{11} + \frac{b^3x^{14}}{14}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(a + b*x^3)^3,x]
```

```
[Out] (a^3*x^5)/5 + (3*a^2*b*x^8)/8 + (3*a*b^2*x^11)/11 + (b^3*x^14)/14
```

Maple [A] time = 0., size = 36, normalized size = 0.8

$$\frac{a^3x^5}{5} + \frac{3\,a^2bx^8}{8} + \frac{3\,ab^2x^{11}}{11} + \frac{b^3x^{14}}{14}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(b*x^3+a)^3,x)
```

```
[Out] 1/5*a^3*x^5+3/8*a^2*b*x^8+3/11*a*b^2*x^11+1/14*b^3*x^14
```

Maxima [A] time = 1.42313, size = 47, normalized size = 1.09

$$\frac{1}{14}\,b^{3}x^{14} + \frac{3}{11}\,ab^{2}x^{11} + \frac{3}{8}\,a^{2}bx^{8} + \frac{1}{5}\,a^{3}x^{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3*x^4,x, algorithm="maxima")
```

```
[Out] 1/14*b^3*x^14 + 3/11*a*b^2*x^11 + 3/8*a^2*b*x^8 + 1/5*a^3*x^5
```

Fricas [A] time = 0.189261, size = 1, normalized size = 0.02

$$\frac{1}{14}x^{14}b^{3} + \frac{3}{11}x^{11}b^{2}a + \frac{3}{8}x^{8}ba^{2} + \frac{1}{5}x^{5}a^{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3*x^4,x, algorithm="fricas")
```

```
[Out] 1/14*x^14*b^3 + 3/11*x^11*b^2*a + 3/8*x^8*b*a^2 + 1/5*x^5*a^3
```

Sympy [A] time = 0.099047, size = 39, normalized size = 0.91

$$\frac{a^{3}x^{5}}{5} + \frac{3a^{2}bx^{8}}{8} + \frac{3ab^{2}x^{11}}{11} + \frac{b^{3}x^{14}}{14}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4*(b*x**3+a)**3,x)
```

```
[Out] a**3*x**5/5 + 3*a**2*b*x**8/8 + 3*a*b**2*x**11/11 + b**3*x**14/14
```

GIAC/XCAS [A] time = 0.224252, size = 47, normalized size = 1.09

$$\frac{1}{14}\,b^{3}x^{14} + \frac{3}{11}\,ab^{2}x^{11} + \frac{3}{8}\,a^{2}bx^{8} + \frac{1}{5}\,a^{3}x^{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3*x^4,x, algorithm="giac")
```

```
[Out] 1/14*b^3*x^14 + 3/11*a*b^2*x^11 + 3/8*a^2*b*x^8 + 1/5*a^3*x^5
```

3.250 $\int x^3 (a + bx^3)^3 \, dx$

Optimal. Leaf size=43

$$\frac{a^3x^4}{4} + \frac{3}{7}a^2bx^7 + \frac{3}{10}ab^2x^{10} + \frac{b^3x^{13}}{13}$$

```
[Out] (a^3*x^4)/4 + (3*a^2*b*x^7)/7 + (3*a*b^2*x^10)/10 + (b^3*x^13)/13
```

Rubi [A] time = 0.0410954, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$\frac{a^3x^4}{4} + \frac{3}{7}a^2bx^7 + \frac{3}{10}ab^2x^{10} + \frac{b^3x^{13}}{13}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3*(a + b*x^3)^3,x]

[Out] (a^3*x^4)/4 + (3*a^2*b*x^7)/7 + (3*a*b^2*x^10)/10 + (b^3*x^13)/13
```

Rubi in Sympy [A] time = 7.19518, size = 39, normalized size = 0.91

$$\frac{a^3x^4}{4} + \frac{3a^2bx^7}{7} + \frac{3ab^2x^{10}}{10} + \frac{b^3x^{13}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3*(b*x**3+a)**3,x)

[Out] a**3*x**4/4 + 3*a**2*b*x**7/7 + 3*a*b**2*x**10/10 + b**3*x**13/13
```

Mathematica [A] time = 0.00349005, size = 43, normalized size = 1.

$$\frac{a^3x^4}{4} + \frac{3}{7}a^2bx^7 + \frac{3}{10}ab^2x^{10} + \frac{b^3x^{13}}{13}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3*(a + b*x^3)^3,x]

[Out] (a^3*x^4)/4 + (3*a^2*b*x^7)/7 + (3*a*b^2*x^10)/10 + (b^3*x^13)/13
```

Maple [A] time = 0., size = 36, normalized size = 0.8

$$\frac{a^3x^4}{4} + \frac{3\,a^2bx^7}{7} + \frac{3\,ab^2x^{10}}{10} + \frac{b^3x^{13}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3*(b*x^3+a)^3,x)

[Out] 1/4*a^3*x^4+3/7*a^2*b*x^7+3/10*a*b^2*x^10+1/13*b^3*x^13
```

Maxima [A] time = 1.41373, size = 47, normalized size = 1.09

$$\frac{1}{13}\,b^3x^{13} + \frac{3}{10}\,ab^2x^{10} + \frac{3}{7}\,a^2bx^7 + \frac{1}{4}\,a^3x^4$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/13*b^3*x^13 + 3/10*a*b^2*x^10 + 3/7*a^2*b*x^7 + 1/4*a^3*x^4
```

Fricas [A] time = 0.190789, size = 1, normalized size = 0.02

$$\frac{1}{13}x^{13}b^3 + \frac{3}{10}x^{10}b^2a + \frac{3}{7}x^7ba^2 + \frac{1}{4}x^4a^3$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/13*x^13*b^3 + 3/10*x^10*b^2*a + 3/7*x^7*b*a^2 + 1/4*x^4*a^3
```

Sympy [A] time = 0.097898, size = 39, normalized size = 0.91

$$\frac{a^3x^4}{4} + \frac{3a^2bx^7}{7} + \frac{3ab^2x^{10}}{10} + \frac{b^3x^{13}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(b*x**3+a)**3,x)
```

```
[Out] a**3*x**4/4 + 3*a**2*b*x**7/7 + 3*a*b**2*x**10/10 + b**3*x**13/13
```

GIAC/XCAS [A] time = 0.214087, size = 47, normalized size = 1.09

$$\frac{1}{13}\,b^3x^{13} + \frac{3}{10}\,ab^2x^{10} + \frac{3}{7}\,a^2bx^7 + \frac{1}{4}\,a^3x^4$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/13*b^3*x^13 + 3/10*a*b^2*x^10 + 3/7*a^2*b*x^7 + 1/4*a^3*x^4
```

3.251 $\int x\left(a+bx^3\right)^3\,dx$

Optimal. Leaf size=43

$$\frac{a^3x^2}{2}+\frac{3}{5}a^2bx^5+\frac{3}{8}ab^2x^8+\frac{b^3x^{11}}{11}$$

```
[Out] (a^3*x^2)/2 + (3*a^2*b*x^5)/5 + (3*a*b^2*x^8)/8 + (b^3*x^11)/11
```

Rubi [A] time = 0.0386325, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{a^3x^2}{2}+\frac{3}{5}a^2bx^5+\frac{3}{8}ab^2x^8+\frac{b^3x^{11}}{11}$$

Antiderivative was successfully verified.

```
[In]  Int[x*(a + b*x^3)^3,x]

[Out] (a^3*x^2)/2 + (3*a^2*b*x^5)/5 + (3*a*b^2*x^8)/8 + (b^3*x^11)/11
```

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

$$a^3\int x\,dx+\frac{3a^2bx^5}{5}+\frac{3ab^2x^8}{8}+\frac{b^3x^{11}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(b*x**3+a)**3,x)

[Out] a**3*Integral(x, x) + 3*a**2*b*x**5/5 + 3*a*b**2*x**8/8 + b**3*x*
*11/11
```

Mathematica [A] time = 0.0026725, size = 43, normalized size = 1.

$$\frac{a^3x^2}{2}+\frac{3}{5}a^2bx^5+\frac{3}{8}ab^2x^8+\frac{b^3x^{11}}{11}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x*(a + b*x^3)^3,x]

[Out] (a^3*x^2)/2 + (3*a^2*b*x^5)/5 + (3*a*b^2*x^8)/8 + (b^3*x^11)/11
```

Maple [A] time = 0.001, size = 36, normalized size = 0.8

$$\frac{x^2a^3}{2}+\frac{3\,a^2bx^5}{5}+\frac{3\,ab^2x^8}{8}+\frac{b^3x^{11}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(b*x^3+a)^3,x)

[Out] 1/2*x^2*a^3+3/5*a^2*b*x^5+3/8*a*b^2*x^8+1/11*b^3*x^11
```

Maxima [A] time = 1.41354, size = 47, normalized size = 1.09

$$\frac{1}{11}\,b^3x^{11} + \frac{3}{8}\,ab^2x^8 + \frac{3}{5}\,a^2bx^5 + \frac{1}{2}\,a^3x^2$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/11*b^3*x^11 + 3/8*a*b^2*x^8 + 3/5*a^2*b*x^5 + 1/2*a^3*x^2
```

Fricas [A] time = 0.18834, size = 1, normalized size = 0.02

$$\frac{1}{11}x^{11}b^3 + \frac{3}{8}x^8b^2a + \frac{3}{5}x^5ba^2 + \frac{1}{2}x^2a^3$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/11*x^11*b^3 + 3/8*x^8*b^2*a + 3/5*x^5*b*a^2 + 1/2*x^2*a^3
```

Sympy [A] time = 0.095663, size = 39, normalized size = 0.91

$$\frac{a^3x^2}{2} + \frac{3a^2bx^5}{5} + \frac{3ab^2x^8}{8} + \frac{b^3x^{11}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(b*x**3+a)**3,x)
```

```
[Out] a**3*x**2/2 + 3*a**2*b*x**5/5 + 3*a*b**2*x**8/8 + b**3*x**11/11
```

GIAC/XCAS [A] time = 0.213947, size = 47, normalized size = 1.09

$$\frac{1}{11}\,b^3x^{11} + \frac{3}{8}\,ab^2x^8 + \frac{3}{5}\,a^2bx^5 + \frac{1}{2}\,a^3x^2$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/11*b^3*x^11 + 3/8*a*b^2*x^8 + 3/5*a^2*b*x^5 + 1/2*a^3*x^2
```

3.252 $\int (a + bx^3)^3 \, dx$

Optimal. Leaf size=38

$$a^3x + \frac{3}{4}a^2bx^4 + \frac{3}{7}ab^2x^7 + \frac{b^3x^{10}}{10}$$

```
[Out] a^3*x + (3*a^2*b*x^4)/4 + (3*a*b^2*x^7)/7 + (b^3*x^10)/10
```

Rubi [A] time = 0.0275176, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111

$$a^3x + \frac{3}{4}a^2bx^4 + \frac{3}{7}ab^2x^7 + \frac{b^3x^{10}}{10}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^3,x]

[Out] a^3*x + (3*a^2*b*x^4)/4 + (3*a*b^2*x^7)/7 + (b^3*x^10)/10
```

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

$$\frac{3a^2bx^4}{4} + \frac{3ab^2x^7}{7} + \frac{b^3x^{10}}{10} + \int a^3\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**3,x)

[Out] 3*a**2*b*x**4/4 + 3*a*b**2*x**7/7 + b**3*x**10/10 + Integral(a**3
, x)
```

Mathematica [A] time = 0.00176727, size = 38, normalized size = 1.

$$a^3x + \frac{3}{4}a^2bx^4 + \frac{3}{7}ab^2x^7 + \frac{b^3x^{10}}{10}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^3,x]

[Out] a^3*x + (3*a^2*b*x^4)/4 + (3*a*b^2*x^7)/7 + (b^3*x^10)/10
```

Maple [A] time = 0.001, size = 33, normalized size = 0.9

$$a^3x + \frac{3\,a^2bx^4}{4} + \frac{3\,ab^2x^7}{7} + \frac{b^3x^{10}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^3,x)

[Out] a^3*x+3/4*a^2*b*x^4+3/7*a*b^2*x^7+1/10*b^3*x^10
```

Maxima [A] time = 1.43028, size = 43, normalized size = 1.13

$$\frac{1}{10}\,b^{3}x^{10}+\frac{3}{7}\,ab^{2}x^{7}+\frac{3}{4}\,a^{2}bx^{4}+a^{3}x$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/10*b^3*x^10 + 3/7*a*b^2*x^7 + 3/4*a^2*b*x^4 + a^3*x
```

Fricas [A] time = 0.189061, size = 1, normalized size = 0.03

$$\frac{1}{10}x^{10}b^{3}+\frac{3}{7}x^{7}b^{2}a+\frac{3}{4}x^{4}ba^{2}+xa^{3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/10*x^10*b^3 + 3/7*x^7*b^2*a + 3/4*x^4*b*a^2 + x*a^3
```

Sympy [A] time = 0.091346, size = 36, normalized size = 0.95

$$a^{3}x+\frac{3a^{2}bx^{4}}{4}+\frac{3ab^{2}x^{7}}{7}+\frac{b^{3}x^{10}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**3,x)
```

```
[Out] a**3*x + 3*a**2*b*x**4/4 + 3*a*b**2*x**7/7 + b**3*x**10/10
```

GIAC/XCAS [A] time = 0.215539, size = 43, normalized size = 1.13

$$\frac{1}{10}\,b^{3}x^{10}+\frac{3}{7}\,ab^{2}x^{7}+\frac{3}{4}\,a^{2}bx^{4}+a^{3}x$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/10*b^3*x^10 + 3/7*a*b^2*x^7 + 3/4*a^2*b*x^4 + a^3*x
```

3.253 $\int \frac{(a+bx^3)^3}{x^2}\,dx$

Optimal. Leaf size=41

$$-\frac{a^3}{x}+\frac{3}{2}a^2bx^2+\frac{3}{5}ab^2x^5+\frac{b^3x^8}{8}$$

```
[Out] -(a^3/x) + (3*a^2*b*x^2)/2 + (3*a*b^2*x^5)/5 + (b^3*x^8)/8
```

Rubi [A] time = 0.0377094, antiderivative size = 41, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a^3}{x}+\frac{3}{2}a^2bx^2+\frac{3}{5}ab^2x^5+\frac{b^3x^8}{8}$$

Antiderivative was successfully verified.

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

[Out] -(a^3/x) + (3*a^2*b*x^2)/2 + (3*a*b^2*x^5)/5 + (b^3*x^8)/8
```

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

$$-\frac{a^3}{x}+3a^2b\int x\,dx+\frac{3ab^2x^5}{5}+\frac{b^3x^8}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] -a**3/x + 3*a**2*b*Integral(x, x) + 3*a*b**2*x**5/5 + b**3*x**8/8
```

Mathematica [A] time = 0.00616447, size = 41, normalized size = 1.

$$-\frac{a^3}{x}+\frac{3}{2}a^2bx^2+\frac{3}{5}ab^2x^5+\frac{b^3x^8}{8}$$

Antiderivative was successfully verified.

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

[Out] -(a^3/x) + (3*a^2*b*x^2)/2 + (3*a*b^2*x^5)/5 + (b^3*x^8)/8
```

Maple [A] time = 0.005, size = 36, normalized size = 0.9

$$-\frac{a^3}{x}+\frac{3\,a^2bx^2}{2}+\frac{3\,ab^2x^5}{5}+\frac{b^3x^8}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] -a^3/x+3/2*a^2*b*x^2+3/5*a*b^2*x^5+1/8*b^3*x^8
```

Maxima [A] time = 1.41588, size = 47, normalized size = 1.15

$$\frac{1}{8}\,b^{3}x^{8}+\frac{3}{5}\,ab^{2}x^{5}+\frac{3}{2}\,a^{2}bx^{2}-\frac{a^{3}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/8*b^3*x^8 + 3/5*a*b^2*x^5 + 3/2*a^2*b*x^2 - a^3/x
```

Fricas [A] time = 0.202621, size = 50, normalized size = 1.22

$$\frac{5\,b^{3}x^{9}+24\,ab^{2}x^{6}+60\,a^{2}bx^{3}-40\,a^{3}}{40\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/40*(5*b^3*x^9 + 24*a*b^2*x^6 + 60*a^2*b*x^3 - 40*a^3)/x
```

Sympy [A] time = 1.05114, size = 36, normalized size = 0.88

$$-\frac{a^{3}}{x}+\frac{3a^{2}bx^{2}}{2}+\frac{3ab^{2}x^{5}}{5}+\frac{b^{3}x^{8}}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a**3/x + 3*a**2*b*x**2/2 + 3*a*b**2*x**5/5 + b**3*x**8/8
```

GIAC/XCAS [A] time = 0.217225, size = 47, normalized size = 1.15

$$\frac{1}{8}\,b^{3}x^{8}+\frac{3}{5}\,ab^{2}x^{5}+\frac{3}{2}\,a^{2}bx^{2}-\frac{a^{3}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/8*b^3*x^8 + 3/5*a*b^2*x^5 + 3/2*a^2*b*x^2 - a^3/x
```

3.254 $\int \frac{(a+bx^3)^3}{x^3}\,dx$

Optimal. Leaf size=39

$$-\frac{a^3}{2x^2}+3a^2bx+\frac{3}{4}ab^2x^4+\frac{b^3x^7}{7}$$

```
[Out] -a^3/(2*x^2) + 3*a^2*b*x + (3*a*b^2*x^4)/4 + (b^3*x^7)/7
```

Rubi [A] time = 0.0377036, antiderivative size = 39, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a^3}{2x^2}+3a^2bx+\frac{3}{4}ab^2x^4+\frac{b^3x^7}{7}$$

Antiderivative was successfully verified.

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

[Out] -a^3/(2*x^2) + 3*a^2*b*x + (3*a*b^2*x^4)/4 + (b^3*x^7)/7
```

Rubi in Sympy [A] time = 6.634, size = 36, normalized size = 0.92

$$-\frac{a^3}{2x^2}+3a^2bx+\frac{3ab^2x^4}{4}+\frac{b^3x^7}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] -a**3/(2*x**2) + 3*a**2*b*x + 3*a*b**2*x**4/4 + b**3*x**7/7
```

Mathematica [A] time = 0.0115453, size = 39, normalized size = 1.

$$-\frac{a^3}{2x^2}+3a^2bx+\frac{3}{4}ab^2x^4+\frac{b^3x^7}{7}$$

Antiderivative was successfully verified.

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

[Out] -a^3/(2*x^2) + 3*a^2*b*x + (3*a*b^2*x^4)/4 + (b^3*x^7)/7
```

Maple [A] time = 0.005, size = 34, normalized size = 0.9

$$-\frac{a^3}{2\,x^2}+3\,a^2bx+\frac{3\,ab^2x^4}{4}+\frac{b^3x^7}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] -1/2*a^3/x^2+3*a^2*b*x+3/4*a*b^2*x^4+1/7*b^3*x^7
```

Maxima [A] time = 1.42231, size = 45, normalized size = 1.15

$$\frac{1}{7}\,b^{3}x^{7} + \frac{3}{4}\,ab^{2}x^{4} + 3\,a^{2}bx - \frac{a^{3}}{2\,x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/7*b^3*x^7 + 3/4*a*b^2*x^4 + 3*a^2*b*x - 1/2*a^3/x^2
```

Fricas [A] time = 0.224288, size = 50, normalized size = 1.28

$$\frac{4\,b^{3}x^{9} + 21\,ab^{2}x^{6} + 84\,a^{2}bx^{3} - 14\,a^{3}}{28\,x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/28*(4*b^3*x^9 + 21*a*b^2*x^6 + 84*a^2*b*x^3 - 14*a^3)/x^2
```

Sympy [A] time = 1.08596, size = 36, normalized size = 0.92

$$-\frac{a^{3}}{2x^{2}} + 3a^{2}bx + \frac{3ab^{2}x^{4}}{4} + \frac{b^{3}x^{7}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a**3/(2*x**2) + 3*a**2*b*x + 3*a*b**2*x**4/4 + b**3*x**7/7
```

GIAC/XCAS [A] time = 0.212582, size = 45, normalized size = 1.15

$$\frac{1}{7}\,b^{3}x^{7} + \frac{3}{4}\,ab^{2}x^{4} + 3\,a^{2}bx - \frac{a^{3}}{2\,x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/7*b^3*x^7 + 3/4*a*b^2*x^4 + 3*a^2*b*x - 1/2*a^3/x^2
```

3.255 $\int \frac{(a+bx^3)^3}{x^5} dx$

Optimal. Leaf size=41

$$-\frac{a^3}{4x^4}-\frac{3a^2b}{x}+\frac{3}{2}ab^2x^2+\frac{b^3x^5}{5}$$

```
[Out] -a^3/(4*x^4) - (3*a^2*b)/x + (3*a*b^2*x^2)/2 + (b^3*x^5)/5
```

Rubi [A] time = 0.0383592, antiderivative size = 41, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a^3}{4x^4}-\frac{3a^2b}{x}+\frac{3}{2}ab^2x^2+\frac{b^3x^5}{5}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^3)^3/x^5,x]
```

```
[Out] -a^3/(4*x^4) - (3*a^2*b)/x + (3*a*b^2*x^2)/2 + (b^3*x^5)/5
```

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

$$-\frac{a^3}{4x^4}-\frac{3a^2b}{x}+3ab^2\int x\,dx+\frac{b^3x^5}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**3+a)**3/x**5,x)
```

```
[Out] -a**3/(4*x**4) - 3*a**2*b/x + 3*a*b**2*Integral(x, x) + b**3*x**5
/5
```

Mathematica [A] time = 0.00676732, size = 41, normalized size = 1.

$$-\frac{a^3}{4x^4}-\frac{3a^2b}{x}+\frac{3}{2}ab^2x^2+\frac{b^3x^5}{5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^3)^3/x^5,x]
```

```
[Out] -a^3/(4*x^4) - (3*a^2*b)/x + (3*a*b^2*x^2)/2 + (b^3*x^5)/5
```

Maple [A] time = 0.006, size = 36, normalized size = 0.9

$$-\frac{a^3}{4\,x^4}-3\,\frac{a^2b}{x}+\frac{3\,ab^2x^2}{2}+\frac{b^3x^5}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x^3+a)^3/x^5,x)
```

```
[Out] -1/4*a^3/x^4-3*a^2*b/x+3/2*a*b^2*x^2+1/5*b^3*x^5
```

Maxima [A] time = 1.41794, size = 49, normalized size = 1.2

$$\frac{1}{5}\,b^3x^5+\frac{3}{2}\,ab^2x^2-\frac{12\,a^2bx^3+a^3}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3/x^5,x, algorithm="maxima")

[Out] 1/5*b^3*x^5 + 3/2*a*b^2*x^2 - 1/4*(12*a^2*b*x^3 + a^3)/x^4
```

Fricas [A] time = 0.206785, size = 50, normalized size = 1.22

$$\frac{4\,b^3x^9+30\,ab^2x^6-60\,a^2bx^3-5\,a^3}{20\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3/x^5,x, algorithm="fricas")

[Out] 1/20*(4*b^3*x^9 + 30*a*b^2*x^6 - 60*a^2*b*x^3 - 5*a^3)/x^4
```

Sympy [A] time = 1.2622, size = 37, normalized size = 0.9

$$\frac{3ab^2x^2}{2}+\frac{b^3x^5}{5}-\frac{a^3+12a^2bx^3}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**3/x**5,x)

[Out] 3*a*b**2*x**2/2 + b**3*x**5/5 - (a**3 + 12*a**2*b*x**3)/(4*x**4)
```

GIAC/XCAS [A] time = 0.216464, size = 49, normalized size = 1.2

$$\frac{1}{5}\,b^3x^5+\frac{3}{2}\,ab^2x^2-\frac{12\,a^2bx^3+a^3}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3/x^5,x, algorithm="giac")

[Out] 1/5*b^3*x^5 + 3/2*a*b^2*x^2 - 1/4*(12*a^2*b*x^3 + a^3)/x^4
```

3.256 $\int \frac{(a+bx^3)^3}{x^6}\,dx$

Optimal. Leaf size=39

$$-\frac{a^3}{5x^5}-\frac{3a^2b}{2x^2}+3ab^2x+\frac{b^3x^4}{4}$$

```
[Out] -a^3/(5*x^5) - (3*a^2*b)/(2*x^2) + 3*a*b^2*x + (b^3*x^4)/4
```

Rubi [A] time = 0.0376578, antiderivative size = 39, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a^3}{5x^5}-\frac{3a^2b}{2x^2}+3ab^2x+\frac{b^3x^4}{4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^3/x^6,x]

[Out] -a^3/(5*x^5) - (3*a^2*b)/(2*x^2) + 3*a*b^2*x + (b^3*x^4)/4
```

Rubi in Sympy [A] time = 6.71569, size = 36, normalized size = 0.92

$$-\frac{a^3}{5x^5}-\frac{3a^2b}{2x^2}+3ab^2x+\frac{b^3x^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**3/x**6,x)

[Out] -a**3/(5*x**5) - 3*a**2*b/(2*x**2) + 3*a*b**2*x + b**3*x**4/4
```

Mathematica [A] time = 0.0112957, size = 39, normalized size = 1.

$$-\frac{a^3}{5x^5}-\frac{3a^2b}{2x^2}+3ab^2x+\frac{b^3x^4}{4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^3/x^6,x]

[Out] -a^3/(5*x^5) - (3*a^2*b)/(2*x^2) + 3*a*b^2*x + (b^3*x^4)/4
```

Maple [A] time = 0.009, size = 34, normalized size = 0.9

$$-\frac{a^3}{5\,x^5}-\frac{3\,a^2b}{2\,x^2}+3\,ab^2x+\frac{b^3x^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^3/x^6,x)

[Out] -1/5*a^3/x^5-3/2*a^2*b/x^2+3*a*b^2*x+1/4*b^3*x^4
```

Maxima [A] time = 1.42654, size = 49, normalized size = 1.26

$$\frac{1}{4}\,b^3x^4 + 3\,ab^2x - \frac{15\,a^2bx^3 + 2\,a^3}{10\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3/x^6,x, algorithm="maxima")
```

```
[Out] 1/4*b^3*x^4 + 3*a*b^2*x - 1/10*(15*a^2*b*x^3 + 2*a^3)/x^5
```

Fricas [A] time = 0.201744, size = 50, normalized size = 1.28

$$\frac{5\,b^3x^9 + 60\,ab^2x^6 - 30\,a^2bx^3 - 4\,a^3}{20\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3/x^6,x, algorithm="fricas")
```

```
[Out] 1/20*(5*b^3*x^9 + 60*a*b^2*x^6 - 30*a^2*b*x^3 - 4*a^3)/x^5
```

Sympy [A] time = 1.27288, size = 36, normalized size = 0.92

$$3ab^2x + \frac{b^3x^4}{4} - \frac{2a^3 + 15a^2bx^3}{10x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**3/x**6,x)
```

```
[Out] 3*a*b**2*x + b**3*x**4/4 - (2*a**3 + 15*a**2*b*x**3)/(10*x**5)
```

GIAC/XCAS [A] time = 0.229381, size = 49, normalized size = 1.26

$$\frac{1}{4}\,b^3x^4 + 3\,ab^2x - \frac{15\,a^2bx^3 + 2\,a^3}{10\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3/x^6,x, algorithm="giac")
```

```
[Out] 1/4*b^3*x^4 + 3*a*b^2*x - 1/10*(15*a^2*b*x^3 + 2*a^3)/x^5
```

3.257 $\int \frac{(a+bx^3)^3}{x^8}\,dx$

Optimal. Leaf size=41

$$-\frac{a^3}{7x^7}-\frac{3a^2b}{4x^4}-\frac{3ab^2}{x}+\frac{b^3x^2}{2}$$

```
[Out] -a^3/(7*x^7) - (3*a^2*b)/(4*x^4) - (3*a*b^2)/x + (b^3*x^2)/2
```

Rubi [A] time = 0.0374444, antiderivative size = 41, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a^3}{7x^7}-\frac{3a^2b}{4x^4}-\frac{3ab^2}{x}+\frac{b^3x^2}{2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^3/x^8,x]
```

```
[Out] -a^3/(7*x^7) - (3*a^2*b)/(4*x^4) - (3*a*b^2)/x + (b^3*x^2)/2
```

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

$$-\frac{a^3}{7x^7}-\frac{3a^2b}{4x^4}-\frac{3ab^2}{x}+b^3\int x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**3/x**8,x)
```

```
[Out] -a**3/(7*x**7) - 3*a**2*b/(4*x**4) - 3*a*b**2/x + b**3*Integral(x
, x)
```

Mathematica [A] time = 0.0072041, size = 41, normalized size = 1.

$$-\frac{a^3}{7x^7}-\frac{3a^2b}{4x^4}-\frac{3ab^2}{x}+\frac{b^3x^2}{2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^3/x^8,x]
```

```
[Out] -a^3/(7*x^7) - (3*a^2*b)/(4*x^4) - (3*a*b^2)/x + (b^3*x^2)/2
```

Maple [A] time = 0.008, size = 36, normalized size = 0.9

$$-\frac{a^3}{7\,x^7}-\frac{3\,a^2b}{4\,x^4}-3\,\frac{ab^2}{x}+\frac{b^3x^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^3/x^8,x)
```

```
[Out] -1/7*a^3/x^7-3/4*a^2*b/x^4-3*a*b^2/x+1/2*b^3*x^2
```

Maxima [A] time = 1.41785, size = 51, normalized size = 1.24

$$\frac{1}{2}\,b^3x^2 - \frac{84\,ab^2x^6 + 21\,a^2bx^3 + 4\,a^3}{28\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3/x^8,x, algorithm="maxima")
```

```
[Out] 1/2*b^3*x^2 - 1/28*(84*a*b^2*x^6 + 21*a^2*b*x^3 + 4*a^3)/x^7
```

Fricas [A] time = 0.202771, size = 50, normalized size = 1.22

$$\frac{14\,b^3x^9 - 84\,ab^2x^6 - 21\,a^2bx^3 - 4\,a^3}{28\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3/x^8,x, algorithm="fricas")
```

```
[Out] 1/28*(14*b^3*x^9 - 84*a*b^2*x^6 - 21*a^2*b*x^3 - 4*a^3)/x^7
```

Sympy [A] time = 1.46135, size = 37, normalized size = 0.9

$$\frac{b^3x^2}{2} - \frac{4a^3 + 21a^2bx^3 + 84ab^2x^6}{28x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**3/x**8,x)
```

```
[Out] b**3*x**2/2 - (4*a**3 + 21*a**2*b*x**3 + 84*a*b**2*x**6)/(28*x**7
)
```

GIAC/XCAS [A] time = 0.222172, size = 51, normalized size = 1.24

$$\frac{1}{2}\,b^3x^2 - \frac{84\,ab^2x^6 + 21\,a^2bx^3 + 4\,a^3}{28\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3/x^8,x, algorithm="giac")
```

```
[Out] 1/2*b^3*x^2 - 1/28*(84*a*b^2*x^6 + 21*a^2*b*x^3 + 4*a^3)/x^7
```

3.258 $\int x^{17} \left(a+bx^3\right)^5 \, dx$

Optimal. Leaf size=69

$$\frac{a^5x^{18}}{18}+\frac{5}{21}a^4bx^{21}+\frac{5}{12}a^3b^2x^{24}+\frac{10}{27}a^2b^3x^{27}+\frac{1}{6}ab^4x^{30}+\frac{b^5x^{33}}{33}$$

```
[Out] (a^5*x^18)/18 + (5*a^4*b*x^21)/21 + (5*a^3*b^2*x^24)/12 + (10*a^2
*b^3*x^27)/27 + (a*b^4*x^30)/6 + (b^5*x^33)/33
```

Rubi [A] time = 0.11091, antiderivative size = 69, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$\frac{a^5x^{18}}{18}+\frac{5}{21}a^4bx^{21}+\frac{5}{12}a^3b^2x^{24}+\frac{10}{27}a^2b^3x^{27}+\frac{1}{6}ab^4x^{30}+\frac{b^5x^{33}}{33}$$

Antiderivative was successfully verified.

```
[In] Int[x^17*(a + b*x^3)^5,x]
```

```
[Out] (a^5*x^18)/18 + (5*a^4*b*x^21)/21 + (5*a^3*b^2*x^24)/12 + (10*a^2
*b^3*x^27)/27 + (a*b^4*x^30)/6 + (b^5*x^33)/33
```

Rubi in Sympy [A] time = 15.8097, size = 65, normalized size = 0.94

$$\frac{a^5x^{18}}{18}+\frac{5a^4bx^{21}}{21}+\frac{5a^3b^2x^{24}}{12}+\frac{10a^2b^3x^{27}}{27}+\frac{ab^4x^{30}}{6}+\frac{b^5x^{33}}{33}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**17*(b*x**3+a)**5,x)
```

```
[Out] a**5*x**18/18 + 5*a**4*b*x**21/21 + 5*a**3*b**2*x**24/12 + 10*a**
2*b**3*x**27/27 + a*b**4*x**30/6 + b**5*x**33/33
```

Mathematica [A] time = 0.00487206, size = 69, normalized size = 1.

$$\frac{a^5x^{18}}{18}+\frac{5}{21}a^4bx^{21}+\frac{5}{12}a^3b^2x^{24}+\frac{10}{27}a^2b^3x^{27}+\frac{1}{6}ab^4x^{30}+\frac{b^5x^{33}}{33}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^17*(a + b*x^3)^5,x]
```

```
[Out] (a^5*x^18)/18 + (5*a^4*b*x^21)/21 + (5*a^3*b^2*x^24)/12 + (10*a^2
*b^3*x^27)/27 + (a*b^4*x^30)/6 + (b^5*x^33)/33
```

Maple [A] time = 0.002, size = 58, normalized size = 0.8

$$\frac{a^5x^{18}}{18}+\frac{5\,a^4bx^{21}}{21}+\frac{5\,a^3b^2x^{24}}{12}+\frac{10\,a^2b^3x^{27}}{27}+\frac{ab^4x^{30}}{6}+\frac{b^5x^{33}}{33}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^17*(b*x^3+a)^5,x)
```

```
[Out] 1/18*a^5*x^18+5/21*a^4*b*x^21+5/12*a^3*b^2*x^24+10/27*a^2*b^3*x^2
7+1/6*a*b^4*x^30+1/33*b^5*x^33
```

Maxima [A] time = 1.42825, size = 77, normalized size = 1.12

$$\frac{1}{33}\,b^5x^{33}+\frac{1}{6}\,ab^4x^{30}+\frac{10}{27}\,a^2b^3x^{27}+\frac{5}{12}\,a^3b^2x^{24}+\frac{5}{21}\,a^4bx^{21}+\frac{1}{18}\,a^5x^{18}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5*x^17,x, algorithm="maxima")
```

```
[Out] 1/33*b^5*x^33 + 1/6*a*b^4*x^30 + 10/27*a^2*b^3*x^27 + 5/12*a^3*b^
2*x^24 + 5/21*a^4*b*x^21 + 1/18*a^5*x^18
```

Fricas [A] time = 0.187771, size = 1, normalized size = 0.01

$$\frac{1}{33}x^{33}b^5+\frac{1}{6}x^{30}b^4a+\frac{10}{27}x^{27}b^3a^2+\frac{5}{12}x^{24}b^2a^3+\frac{5}{21}x^{21}ba^4+\frac{1}{18}x^{18}a^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5*x^17,x, algorithm="fricas")
```

```
[Out] 1/33*x^33*b^5 + 1/6*x^30*b^4*a + 10/27*x^27*b^3*a^2 + 5/12*x^24*b
^2*a^3 + 5/21*x^21*b*a^4 + 1/18*x^18*a^5
```

Sympy [A] time = 0.131157, size = 65, normalized size = 0.94

$$\frac{a^5x^{18}}{18}+\frac{5a^4bx^{21}}{21}+\frac{5a^3b^2x^{24}}{12}+\frac{10a^2b^3x^{27}}{27}+\frac{ab^4x^{30}}{6}+\frac{b^5x^{33}}{33}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**17*(b*x**3+a)**5,x)
```

```
[Out] a**5*x**18/18 + 5*a**4*b*x**21/21 + 5*a**3*b**2*x**24/12 + 10*a**
2*b**3*x**27/27 + a*b**4*x**30/6 + b**5*x**33/33
```

GIAC/XCAS [A] time = 0.229444, size = 77, normalized size = 1.12

$$\frac{1}{33}\,b^5x^{33}+\frac{1}{6}\,ab^4x^{30}+\frac{10}{27}\,a^2b^3x^{27}+\frac{5}{12}\,a^3b^2x^{24}+\frac{5}{21}\,a^4bx^{21}+\frac{1}{18}\,a^5x^{18}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5*x^17,x, algorithm="giac")
```

```
[Out] 1/33*b^5*x^33 + 1/6*a*b^4*x^30 + 10/27*a^2*b^3*x^27 + 5/12*a^3*b^
2*x^24 + 5/21*a^4*b*x^21 + 1/18*a^5*x^18
```

3.259 $\int x^{14} \left(a+bx^3\right)^5 \, dx$

Optimal. Leaf size=69

$$\frac{a^5x^{15}}{15}+\frac{5}{18}a^4bx^{18}+\frac{10}{21}a^3b^2x^{21}+\frac{5}{12}a^2b^3x^{24}+\frac{5}{27}ab^4x^{27}+\frac{b^5x^{30}}{30}$$

```
[Out] (a^5*x^15)/15 + (5*a^4*b*x^18)/18 + (10*a^3*b^2*x^21)/21 + (5*a^2
*b^3*x^24)/12 + (5*a*b^4*x^27)/27 + (b^5*x^30)/30
```

Rubi [A] time = 0.106399, antiderivative size = 69, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^5x^{15}}{15}+\frac{5}{18}a^4bx^{18}+\frac{10}{21}a^3b^2x^{21}+\frac{5}{12}a^2b^3x^{24}+\frac{5}{27}ab^4x^{27}+\frac{b^5x^{30}}{30}$$

Antiderivative was successfully verified.

```
[In]  Int[x^14*(a + b*x^3)^5,x]
```

```
[Out] (a^5*x^15)/15 + (5*a^4*b*x^18)/18 + (10*a^3*b^2*x^21)/21 + (5*a^2
*b^3*x^24)/12 + (5*a*b^4*x^27)/27 + (b^5*x^30)/30
```

Rubi in Sympy [A] time = 15.5162, size = 66, normalized size = 0.96

$$\frac{a^5x^{15}}{15}+\frac{5a^4bx^{18}}{18}+\frac{10a^3b^2x^{21}}{21}+\frac{5a^2b^3x^{24}}{12}+\frac{5ab^4x^{27}}{27}+\frac{b^5x^{30}}{30}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**14*(b*x**3+a)**5,x)
```

```
[Out] a**5*x**15/15 + 5*a**4*b*x**18/18 + 10*a**3*b**2*x**21/21 + 5*a**
2*b**3*x**24/12 + 5*a*b**4*x**27/27 + b**5*x**30/30
```

Mathematica [A] time = 0.00404075, size = 69, normalized size = 1.

$$\frac{a^5x^{15}}{15}+\frac{5}{18}a^4bx^{18}+\frac{10}{21}a^3b^2x^{21}+\frac{5}{12}a^2b^3x^{24}+\frac{5}{27}ab^4x^{27}+\frac{b^5x^{30}}{30}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^14*(a + b*x^3)^5,x]
```

```
[Out] (a^5*x^15)/15 + (5*a^4*b*x^18)/18 + (10*a^3*b^2*x^21)/21 + (5*a^2
*b^3*x^24)/12 + (5*a*b^4*x^27)/27 + (b^5*x^30)/30
```

Maple [A] time = 0.003, size = 58, normalized size = 0.8

$$\frac{a^5x^{15}}{15}+\frac{5\,a^4bx^{18}}{18}+\frac{10\,a^3b^2x^{21}}{21}+\frac{5\,a^2b^3x^{24}}{12}+\frac{5\,ab^4x^{27}}{27}+\frac{b^5x^{30}}{30}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^14*(b*x^3+a)^5,x)
```

```
[Out] 1/15*a^5*x^15+5/18*a^4*b*x^18+10/21*a^3*b^2*x^21+5/12*a^2*b^3*x^2
4+5/27*a*b^4*x^27+1/30*b^5*x^30
```

Maxima [A] time = 1.42186, size = 77, normalized size = 1.12

$$\frac{1}{30}\,b^{5}x^{30} + \frac{5}{27}\,ab^{4}x^{27} + \frac{5}{12}\,a^{2}b^{3}x^{24} + \frac{10}{21}\,a^{3}b^{2}x^{21} + \frac{5}{18}\,a^{4}bx^{18} + \frac{1}{15}\,a^{5}x^{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5*x^14,x, algorithm="maxima")
```

```
[Out] 1/30*b^5*x^30 + 5/27*a*b^4*x^27 + 5/12*a^2*b^3*x^24 + 10/21*a^3*b
^2*x^21 + 5/18*a^4*b*x^18 + 1/15*a^5*x^15
```

Fricas [A] time = 0.188498, size = 1, normalized size = 0.01

$$\frac{1}{30}x^{30}b^{5} + \frac{5}{27}x^{27}b^{4}a + \frac{5}{12}x^{24}b^{3}a^{2} + \frac{10}{21}x^{21}b^{2}a^{3} + \frac{5}{18}x^{18}ba^{4} + \frac{1}{15}x^{15}a^{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5*x^14,x, algorithm="fricas")
```

```
[Out] 1/30*x^30*b^5 + 5/27*x^27*b^4*a + 5/12*x^24*b^3*a^2 + 10/21*x^21*
b^2*a^3 + 5/18*x^18*b*a^4 + 1/15*x^15*a^5
```

Sympy [A] time = 0.125735, size = 66, normalized size = 0.96

$$\frac{a^{5}x^{15}}{15} + \frac{5a^{4}bx^{18}}{18} + \frac{10a^{3}b^{2}x^{21}}{21} + \frac{5a^{2}b^{3}x^{24}}{12} + \frac{5ab^{4}x^{27}}{27} + \frac{b^{5}x^{30}}{30}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**14*(b*x**3+a)**5,x)
```

```
[Out] a**5*x**15/15 + 5*a**4*b*x**18/18 + 10*a**3*b**2*x**21/21 + 5*a**
2*b**3*x**24/12 + 5*a*b**4*x**27/27 + b**5*x**30/30
```

GIAC/XCAS [A] time = 0.214245, size = 77, normalized size = 1.12

$$\frac{1}{30}\,b^{5}x^{30} + \frac{5}{27}\,ab^{4}x^{27} + \frac{5}{12}\,a^{2}b^{3}x^{24} + \frac{10}{21}\,a^{3}b^{2}x^{21} + \frac{5}{18}\,a^{4}bx^{18} + \frac{1}{15}\,a^{5}x^{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5*x^14,x, algorithm="giac")
```

```
[Out] 1/30*b^5*x^30 + 5/27*a*b^4*x^27 + 5/12*a^2*b^3*x^24 + 10/21*a^3*b
^2*x^21 + 5/18*a^4*b*x^18 + 1/15*a^5*x^15
```

3.260 $\int x^{11} \left(a+bx^3\right)^5 \, dx$

Optimal. Leaf size=72

$$-\frac{a^3\left(a+bx^3\right)^6}{18b^4}+\frac{a^2\left(a+bx^3\right)^7}{7b^4}+\frac{\left(a+bx^3\right)^9}{27b^4}-\frac{a\left(a+bx^3\right)^8}{8b^4}$$

```
[Out] -(a^3*(a + b*x^3)^6)/(18*b^4) + (a^2*(a + b*x^3)^7)/(7*b^4) - (a*
(a + b*x^3)^8)/(8*b^4) + (a + b*x^3)^9/(27*b^4)
```

Rubi [A] time = 0.189253, antiderivative size = 72, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$-\frac{a^3\left(a+bx^3\right)^6}{18b^4}+\frac{a^2\left(a+bx^3\right)^7}{7b^4}+\frac{\left(a+bx^3\right)^9}{27b^4}-\frac{a\left(a+bx^3\right)^8}{8b^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11*(a + b*x^3)^5,x]
```

```
[Out] -(a^3*(a + b*x^3)^6)/(18*b^4) + (a^2*(a + b*x^3)^7)/(7*b^4) - (a*
(a + b*x^3)^8)/(8*b^4) + (a + b*x^3)^9/(27*b^4)
```

Rubi in Sympy [A] time = 15.0275, size = 65, normalized size = 0.9

$$\frac{a^5x^{12}}{12}+\frac{a^4bx^{15}}{3}+\frac{5a^3b^2x^{18}}{9}+\frac{10a^2b^3x^{21}}{21}+\frac{5ab^4x^{24}}{24}+\frac{b^5x^{27}}{27}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11*(b*x**3+a)**5,x)
```

```
[Out] a**5*x**12/12 + a**4*b*x**15/3 + 5*a**3*b**2*x**18/9 + 10*a**2*b*
*3*x**21/21 + 5*a*b**4*x**24/24 + b**5*x**27/27
```

Mathematica [A] time = 0.00385388, size = 69, normalized size = 0.96

$$\frac{a^5x^{12}}{12}+\frac{1}{3}a^4bx^{15}+\frac{5}{9}a^3b^2x^{18}+\frac{10}{21}a^2b^3x^{21}+\frac{5}{24}ab^4x^{24}+\frac{b^5x^{27}}{27}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11*(a + b*x^3)^5,x]
```

```
[Out] (a^5*x^12)/12 + (a^4*b*x^15)/3 + (5*a^3*b^2*x^18)/9 + (10*a^2*b^3
*x^21)/21 + (5*a*b^4*x^24)/24 + (b^5*x^27)/27
```

Maple [A] time = 0.001, size = 58, normalized size = 0.8

$$\frac{b^5x^{27}}{27}+\frac{5\,ab^4x^{24}}{24}+\frac{10\,a^2b^3x^{21}}{21}+\frac{5\,a^3b^2x^{18}}{9}+\frac{a^4bx^{15}}{3}+\frac{a^5x^{12}}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11*(b*x^3+a)^5,x)
```

```
[Out] 1/27*b^5*x^27+5/24*a*b^4*x^24+10/21*a^2*b^3*x^21+5/9*a^3*b^2*x^18
+1/3*a^4*b*x^15+1/12*a^5*x^12
```

Maxima [A] time = 1.43417, size = 77, normalized size = 1.07

$$\frac{1}{27}\,b^5x^{27} + \frac{5}{24}\,ab^4x^{24} + \frac{10}{21}\,a^2b^3x^{21} + \frac{5}{9}\,a^3b^2x^{18} + \frac{1}{3}\,a^4bx^{15} + \frac{1}{12}\,a^5x^{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5*x^11,x, algorithm="maxima")
```

```
[Out] 1/27*b^5*x^27 + 5/24*a*b^4*x^24 + 10/21*a^2*b^3*x^21 + 5/9*a^3*b^
2*x^18 + 1/3*a^4*b*x^15 + 1/12*a^5*x^12
```

Fricas [A] time = 0.192928, size = 1, normalized size = 0.01

$$\frac{1}{27}x^{27}b^5 + \frac{5}{24}x^{24}b^4a + \frac{10}{21}x^{21}b^3a^2 + \frac{5}{9}x^{18}b^2a^3 + \frac{1}{3}x^{15}ba^4 + \frac{1}{12}x^{12}a^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5*x^11,x, algorithm="fricas")
```

```
[Out] 1/27*x^27*b^5 + 5/24*x^24*b^4*a + 10/21*x^21*b^3*a^2 + 5/9*x^18*b
^2*a^3 + 1/3*x^15*b*a^4 + 1/12*x^12*a^5
```

Sympy [A] time = 0.122263, size = 65, normalized size = 0.9

$$\frac{a^5x^{12}}{12} + \frac{a^4bx^{15}}{3} + \frac{5a^3b^2x^{18}}{9} + \frac{10a^2b^3x^{21}}{21} + \frac{5ab^4x^{24}}{24} + \frac{b^5x^{27}}{27}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11*(b*x**3+a)**5,x)
```

```
[Out] a**5*x**12/12 + a**4*b*x**15/3 + 5*a**3*b**2*x**18/9 + 10*a**2*b*
*3*x**21/21 + 5*a*b**4*x**24/24 + b**5*x**27/27
```

GIAC/XCAS [A] time = 0.215621, size = 77, normalized size = 1.07

$$\frac{1}{27}\,b^5x^{27} + \frac{5}{24}\,ab^4x^{24} + \frac{10}{21}\,a^2b^3x^{21} + \frac{5}{9}\,a^3b^2x^{18} + \frac{1}{3}\,a^4bx^{15} + \frac{1}{12}\,a^5x^{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5*x^11,x, algorithm="giac")
```

```
[Out] 1/27*b^5*x^27 + 5/24*a*b^4*x^24 + 10/21*a^2*b^3*x^21 + 5/9*a^3*b^
2*x^18 + 1/3*a^4*b*x^15 + 1/12*a^5*x^12
```

3.261 $\int x^8 \left(a+bx^3\right)^5 \, dx$

Optimal. Leaf size=53

$$\frac{a^2\left(a+bx^3\right)^6}{18b^3}+\frac{\left(a+bx^3\right)^8}{24b^3}-\frac{2a\left(a+bx^3\right)^7}{21b^3}$$

```
[Out] (a^2*(a + b*x^3)^6)/(18*b^3) - (2*a*(a + b*x^3)^7)/(21*b^3) + (a
+ b*x^3)^8/(24*b^3)
```

Rubi [A] time = 0.143505, antiderivative size = 53, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^2\left(a+bx^3\right)^6}{18b^3}+\frac{\left(a+bx^3\right)^8}{24b^3}-\frac{2a\left(a+bx^3\right)^7}{21b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8*(a + b*x^3)^5,x]
```

```
[Out] (a^2*(a + b*x^3)^6)/(18*b^3) - (2*a*(a + b*x^3)^7)/(21*b^3) + (a
+ b*x^3)^8/(24*b^3)
```

Rubi in Sympy [A] time = 13.5983, size = 46, normalized size = 0.87

$$\frac{a^2\left(a+bx^3\right)^6}{18b^3}-\frac{2a\left(a+bx^3\right)^7}{21b^3}+\frac{\left(a+bx^3\right)^8}{24b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8*(b*x**3+a)**5,x)
```

```
[Out] a**2*(a + b*x**3)**6/(18*b**3) - 2*a*(a + b*x**3)**7/(21*b**3) +
(a + b*x**3)**8/(24*b**3)
```

Mathematica [A] time = 0.00372556, size = 69, normalized size = 1.3

$$\frac{a^5x^9}{9}+\frac{5}{12}a^4bx^{12}+\frac{2}{3}a^3b^2x^{15}+\frac{5}{9}a^2b^3x^{18}+\frac{5}{21}ab^4x^{21}+\frac{b^5x^{24}}{24}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8*(a + b*x^3)^5,x]
```

```
[Out] (a^5*x^9)/9 + (5*a^4*b*x^12)/12 + (2*a^3*b^2*x^15)/3 + (5*a^2*b^3
*x^18)/9 + (5*a*b^4*x^21)/21 + (b^5*x^24)/24
```

Maple [A] time = 0.002, size = 58, normalized size = 1.1

$$\frac{b^5x^{24}}{24}+\frac{5\,ab^4x^{21}}{21}+\frac{5\,a^2b^3x^{18}}{9}+\frac{2\,a^3b^2x^{15}}{3}+\frac{5\,a^4bx^{12}}{12}+\frac{a^5x^9}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8*(b*x^3+a)^5,x)
```

```
[Out] 1/24*b^5*x^24+5/21*a*b^4*x^21+5/9*a^2*b^3*x^18+2/3*a^3*b^2*x^15+5
/12*a^4*b*x^12+1/9*a^5*x^9
```

Maxima [A] time = 1.42127, size = 77, normalized size = 1.45

$$\frac{1}{24}\,b^5x^{24}+\frac{5}{21}\,ab^4x^{21}+\frac{5}{9}\,a^2b^3x^{18}+\frac{2}{3}\,a^3b^2x^{15}+\frac{5}{12}\,a^4bx^{12}+\frac{1}{9}\,a^5x^9$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5*x^8,x, algorithm="maxima")
```

```
[Out] 1/24*b^5*x^24 + 5/21*a*b^4*x^21 + 5/9*a^2*b^3*x^18 + 2/3*a^3*b^2*
x^15 + 5/12*a^4*b*x^12 + 1/9*a^5*x^9
```

Fricas [A] time = 0.189437, size = 1, normalized size = 0.02

$$\frac{1}{24}x^{24}b^5+\frac{5}{21}x^{21}b^4a+\frac{5}{9}x^{18}b^3a^2+\frac{2}{3}x^{15}b^2a^3+\frac{5}{12}x^{12}ba^4+\frac{1}{9}x^9a^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5*x^8,x, algorithm="fricas")
```

```
[Out] 1/24*x^24*b^5 + 5/21*x^21*b^4*a + 5/9*x^18*b^3*a^2 + 2/3*x^15*b^2
*a^3 + 5/12*x^12*b*a^4 + 1/9*x^9*a^5
```

Sympy [A] time = 0.124328, size = 66, normalized size = 1.25

$$\frac{a^5x^9}{9}+\frac{5a^4bx^{12}}{12}+\frac{2a^3b^2x^{15}}{3}+\frac{5a^2b^3x^{18}}{9}+\frac{5ab^4x^{21}}{21}+\frac{b^5x^{24}}{24}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8*(b*x**3+a)**5,x)
```

```
[Out] a**5*x**9/9 + 5*a**4*b*x**12/12 + 2*a**3*b**2*x**15/3 + 5*a**2*b*
*3*x**18/9 + 5*a*b**4*x**21/21 + b**5*x**24/24
```

GIAC/XCAS [A] time = 0.215942, size = 77, normalized size = 1.45

$$\frac{1}{24}\,b^5x^{24}+\frac{5}{21}\,ab^4x^{21}+\frac{5}{9}\,a^2b^3x^{18}+\frac{2}{3}\,a^3b^2x^{15}+\frac{5}{12}\,a^4bx^{12}+\frac{1}{9}\,a^5x^9$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5*x^8,x, algorithm="giac")
```

```
[Out] 1/24*b^5*x^24 + 5/21*a*b^4*x^21 + 5/9*a^2*b^3*x^18 + 2/3*a^3*b^2*
x^15 + 5/12*a^4*b*x^12 + 1/9*a^5*x^9
```

3.262 $\int x^5 \left(a+bx^3\right)^5 \, dx$

Optimal. Leaf size=34

$$\frac{\left(a+bx^3\right)^7}{21b^2}-\frac{a\left(a+bx^3\right)^6}{18b^2}$$

```
[Out] -(a*(a + b*x^3)^6)/(18*b^2) + (a + b*x^3)^7/(21*b^2)
```

Rubi [A] time = 0.0874293, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{\left(a+bx^3\right)^7}{21b^2}-\frac{a\left(a+bx^3\right)^6}{18b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5*(a + b*x^3)^5,x]

[Out] -(a*(a + b*x^3)^6)/(18*b^2) + (a + b*x^3)^7/(21*b^2)
```

Rubi in Sympy [A] time = 9.69195, size = 27, normalized size = 0.79

$$-\frac{a\left(a+bx^3\right)^6}{18b^2}+\frac{\left(a+bx^3\right)^7}{21b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5*(b*x**3+a)**5,x)

[Out] -a*(a + b*x**3)**6/(18*b**2) + (a + b*x**3)**7/(21*b**2)
```

Mathematica [B] time = 0.00392075, size = 69, normalized size = 2.03

$$\frac{a^5x^6}{6}+\frac{5}{9}a^4bx^9+\frac{5}{6}a^3b^2x^{12}+\frac{2}{3}a^2b^3x^{15}+\frac{5}{18}ab^4x^{18}+\frac{b^5x^{21}}{21}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5*(a + b*x^3)^5,x]

[Out] (a^5*x^6)/6 + (5*a^4*b*x^9)/9 + (5*a^3*b^2*x^12)/6 + (2*a^2*b^3*x
^15)/3 + (5*a*b^4*x^18)/18 + (b^5*x^21)/21
```

Maple [A] time = 0.002, size = 58, normalized size = 1.7

$$\frac{b^5x^{21}}{21}+\frac{5\,ab^4x^{18}}{18}+\frac{2\,a^2b^3x^{15}}{3}+\frac{5\,a^3b^2x^{12}}{6}+\frac{5\,a^4bx^9}{9}+\frac{a^5x^6}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5*(b*x^3+a)^5,x)
```

```
[Out] 1/21*b^5*x^21+5/18*a*b^4*x^18+2/3*a^2*b^3*x^15+5/6*a^3*b^2*x^12+5
/9*a^4*b*x^9+1/6*a^5*x^6
```

Maxima [A] time = 1.45522, size = 77, normalized size = 2.26

$$\frac{1}{21}\,b^5x^{21} + \frac{5}{18}\,ab^4x^{18} + \frac{2}{3}\,a^2b^3x^{15} + \frac{5}{6}\,a^3b^2x^{12} + \frac{5}{9}\,a^4bx^9 + \frac{1}{6}\,a^5x^6$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5*x^5,x, algorithm="maxima")
```

```
[Out] 1/21*b^5*x^21 + 5/18*a*b^4*x^18 + 2/3*a^2*b^3*x^15 + 5/6*a^3*b^2*
x^12 + 5/9*a^4*b*x^9 + 1/6*a^5*x^6
```

Fricas [A] time = 0.190599, size = 1, normalized size = 0.03

$$\frac{1}{21}x^{21}b^5 + \frac{5}{18}x^{18}b^4a + \frac{2}{3}x^{15}b^3a^2 + \frac{5}{6}x^{12}b^2a^3 + \frac{5}{9}x^9ba^4 + \frac{1}{6}x^6a^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5*x^5,x, algorithm="fricas")
```

```
[Out] 1/21*x^21*b^5 + 5/18*x^18*b^4*a + 2/3*x^15*b^3*a^2 + 5/6*x^12*b^2
*a^3 + 5/9*x^9*b*a^4 + 1/6*x^6*a^5
```

Sympy [A] time = 0.120176, size = 66, normalized size = 1.94

$$\frac{a^5x^6}{6} + \frac{5a^4bx^9}{9} + \frac{5a^3b^2x^{12}}{6} + \frac{2a^2b^3x^{15}}{3} + \frac{5ab^4x^{18}}{18} + \frac{b^5x^{21}}{21}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5*(b*x**3+a)**5,x)
```

```
[Out] a**5*x**6/6 + 5*a**4*b*x**9/9 + 5*a**3*b**2*x**12/6 + 2*a**2*b**3
*x**15/3 + 5*a*b**4*x**18/18 + b**5*x**21/21
```

GIAC/XCAS [A] time = 0.219966, size = 77, normalized size = 2.26

$$\frac{1}{21}\,b^5x^{21} + \frac{5}{18}\,ab^4x^{18} + \frac{2}{3}\,a^2b^3x^{15} + \frac{5}{6}\,a^3b^2x^{12} + \frac{5}{9}\,a^4bx^9 + \frac{1}{6}\,a^5x^6$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5*x^5,x, algorithm="giac")
```

```
[Out] 1/21*b^5*x^21 + 5/18*a*b^4*x^18 + 2/3*a^2*b^3*x^15 + 5/6*a^3*b^2*
x^12 + 5/9*a^4*b*x^9 + 1/6*a^5*x^6
```

3.263 $\int x^2 \left(a+bx^3\right)^5 \, dx$

Optimal. Leaf size=16

$$\frac{\left(a+bx^3\right)^6}{18b}$$

```
[Out] (a + b*x^3)^6/(18*b)
```

Rubi [A] time = 0.0120618, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{\left(a+bx^3\right)^6}{18b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2*(a + b*x^3)^5,x]

[Out] (a + b*x^3)^6/(18*b)
```

Rubi in Sympy [A] time = 2.14747, size = 10, normalized size = 0.62

$$\frac{\left(a+bx^3\right)^6}{18b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(b*x**3+a)**5,x)

[Out] (a + b*x**3)**6/(18*b)
```

Mathematica [B] time = 0.00407114, size = 69, normalized size = 4.31

$$\frac{a^5x^3}{3}+\frac{5}{6}a^4bx^6+\frac{10}{9}a^3b^2x^9+\frac{5}{6}a^2b^3x^{12}+\frac{1}{3}ab^4x^{15}+\frac{b^5x^{18}}{18}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2*(a + b*x^3)^5,x]

[Out] (a^5*x^3)/3 + (5*a^4*b*x^6)/6 + (10*a^3*b^2*x^9)/9 + (5*a^2*b^3*x
^12)/6 + (a*b^4*x^15)/3 + (b^5*x^18)/18
```

Maple [B] time = 0.002, size = 58, normalized size = 3.6

$$\frac{b^5x^{18}}{18}+\frac{ab^4x^{15}}{3}+\frac{5\,a^2b^3x^{12}}{6}+\frac{10\,a^3b^2x^9}{9}+\frac{5\,a^4bx^6}{6}+\frac{a^5x^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(b*x^3+a)^5,x)
```

```
[Out] 1/18*b^5*x^18+1/3*a*b^4*x^15+5/6*a^2*b^3*x^12+10/9*a^3*b^2*x^9+5/
6*a^4*b*x^6+1/3*a^5*x^3
```

Maxima [A] time = 1.45524, size = 19, normalized size = 1.19

$$\frac{(bx^3+a)^6}{18\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5*x^2,x, algorithm="maxima")
```

```
[Out] 1/18*(b*x^3 + a)^6/b
```

Fricas [A] time = 0.188821, size = 1, normalized size = 0.06

$$\frac{1}{18}x^{18}b^5+\frac{1}{3}x^{15}b^4a+\frac{5}{6}x^{12}b^3a^2+\frac{10}{9}x^9b^2a^3+\frac{5}{6}x^6ba^4+\frac{1}{3}x^3a^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5*x^2,x, algorithm="fricas")
```

```
[Out] 1/18*x^18*b^5 + 1/3*x^15*b^4*a + 5/6*x^12*b^3*a^2 + 10/9*x^9*b^2*
a^3 + 5/6*x^6*b*a^4 + 1/3*x^3*a^5
```

Sympy [A] time = 0.119176, size = 65, normalized size = 4.06

$$\frac{a^5x^3}{3}+\frac{5a^4bx^6}{6}+\frac{10a^3b^2x^9}{9}+\frac{5a^2b^3x^{12}}{6}+\frac{ab^4x^{15}}{3}+\frac{b^5x^{18}}{18}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(b*x**3+a)**5,x)
```

```
[Out] a**5*x**3/3 + 5*a**4*b*x**6/6 + 10*a**3*b**2*x**9/9 + 5*a**2*b**3
*x**12/6 + a*b**4*x**15/3 + b**5*x**18/18
```

GIAC/XCAS [A] time = 0.212291, size = 19, normalized size = 1.19

$$\frac{(bx^3+a)^6}{18\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5*x^2,x, algorithm="giac")
```

```
[Out] 1/18*(b*x^3 + a)^6/b
```

3.264 $\int \frac{(a+bx^3)^5}{x}\,dx$

Optimal. Leaf size=65

$$a^5\log(x)+\frac{5}{3}a^4bx^3+\frac{5}{3}a^3b^2x^6+\frac{10}{9}a^2b^3x^9+\frac{5}{12}ab^4x^{12}+\frac{b^5x^{15}}{15}$$

```
[Out] (5*a^4*b*x^3)/3 + (5*a^3*b^2*x^6)/3 + (10*a^2*b^3*x^9)/9 + (5*a*b
^4*x^12)/12 + (b^5*x^15)/15 + a^5*Log[x]
```

Rubi [A] time = 0.0751672, antiderivative size = 65, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$a^5\log(x)+\frac{5}{3}a^4bx^3+\frac{5}{3}a^3b^2x^6+\frac{10}{9}a^2b^3x^9+\frac{5}{12}ab^4x^{12}+\frac{b^5x^{15}}{15}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^5/x,x]
```

```
[Out] (5*a^4*b*x^3)/3 + (5*a^3*b^2*x^6)/3 + (10*a^2*b^3*x^9)/9 + (5*a*b
^4*x^12)/12 + (b^5*x^15)/15 + a^5*Log[x]
```

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

$$\frac{a^5\log\left(x^3\right)}{3}+\frac{5a^4bx^3}{3}+\frac{10a^3b^2\int^{x^3}x\,dx}{3}+\frac{10a^2b^3x^9}{9}+\frac{5ab^4x^{12}}{12}+\frac{b^5x^{15}}{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**5/x,x)
```

```
[Out] a**5*log(x**3)/3 + 5*a**4*b*x**3/3 + 10*a**3*b**2*Integral(x, (x,
 x**3))/3 + 10*a**2*b**3*x**9/9 + 5*a*b**4*x**12/12 + b**5*x**15/
15
```

Mathematica [A] time = 0.00738425, size = 65, normalized size = 1.

$$a^5\log(x)+\frac{5}{3}a^4bx^3+\frac{5}{3}a^3b^2x^6+\frac{10}{9}a^2b^3x^9+\frac{5}{12}ab^4x^{12}+\frac{b^5x^{15}}{15}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^5/x,x]
```

```
[Out] (5*a^4*b*x^3)/3 + (5*a^3*b^2*x^6)/3 + (10*a^2*b^3*x^9)/9 + (5*a*b
^4*x^12)/12 + (b^5*x^15)/15 + a^5*Log[x]
```

Maple [A] time = 0.003, size = 56, normalized size = 0.9

$$\frac{5\,a^4bx^3}{3}+\frac{5\,a^3b^2x^6}{3}+\frac{10\,a^2b^3x^9}{9}+\frac{5\,ab^4x^{12}}{12}+\frac{b^5x^{15}}{15}+a^5\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^5/x,x)
```

```
[Out] 5/3*a^4*b*x^3+5/3*a^3*b^2*x^6+10/9*a^2*b^3*x^9+5/12*a*b^4*x^12+1/
15*b^5*x^15+a^5*ln(x)
```

Maxima [A] time = 1.42712, size = 78, normalized size = 1.2

$$\frac{1}{15}\,b^5x^{15} + \frac{5}{12}\,ab^4x^{12} + \frac{10}{9}\,a^2b^3x^9 + \frac{5}{3}\,a^3b^2x^6 + \frac{5}{3}\,a^4bx^3 + \frac{1}{3}\,a^5\log\left(x^3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x,x, algorithm="maxima")
```

```
[Out] 1/15*b^5*x^15 + 5/12*a*b^4*x^12 + 10/9*a^2*b^3*x^9 + 5/3*a^3*b^2*
x^6 + 5/3*a^4*b*x^3 + 1/3*a^5*log(x^3)
```

Fricas [A] time = 0.216725, size = 74, normalized size = 1.14

$$\frac{1}{15}\,b^5x^{15} + \frac{5}{12}\,ab^4x^{12} + \frac{10}{9}\,a^2b^3x^9 + \frac{5}{3}\,a^3b^2x^6 + \frac{5}{3}\,a^4bx^3 + a^5\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x,x, algorithm="fricas")
```

```
[Out] 1/15*b^5*x^15 + 5/12*a*b^4*x^12 + 10/9*a^2*b^3*x^9 + 5/3*a^3*b^2*
x^6 + 5/3*a^4*b*x^3 + a^5*log(x)
```

Sympy [A] time = 1.1515, size = 65, normalized size = 1.

$$a^5\log\left(x\right) + \frac{5a^4bx^3}{3} + \frac{5a^3b^2x^6}{3} + \frac{10a^2b^3x^9}{9} + \frac{5ab^4x^{12}}{12} + \frac{b^5x^{15}}{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**5/x,x)
```

```
[Out] a**5*log(x) + 5*a**4*b*x**3/3 + 5*a**3*b**2*x**6/3 + 10*a**2*b**3
*x**9/9 + 5*a*b**4*x**12/12 + b**5*x**15/15
```

GIAC/XCAS [A] time = 0.223728, size = 76, normalized size = 1.17

$$\frac{1}{15}\,b^5x^{15} + \frac{5}{12}\,ab^4x^{12} + \frac{10}{9}\,a^2b^3x^9 + \frac{5}{3}\,a^3b^2x^6 + \frac{5}{3}\,a^4bx^3 + a^5\ln\left(|x|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x,x, algorithm="giac")
```

```
[Out] 1/15*b^5*x^15 + 5/12*a*b^4*x^12 + 10/9*a^2*b^3*x^9 + 5/3*a^3*b^2*
x^6 + 5/3*a^4*b*x^3 + a^5*ln(abs(x))
```

3.265 $\int \frac{(a+bx^3)^5}{x^4} \, dx$

Optimal. Leaf size=66

$$-\frac{a^5}{3x^3}+5a^4b\log(x)+\frac{10}{3}a^3b^2x^3+\frac{5}{3}a^2b^3x^6+\frac{5}{9}ab^4x^9+\frac{b^5x^{12}}{12}$$

```
[Out] -a^5/(3*x^3) + (10*a^3*b^2*x^3)/3 + (5*a^2*b^3*x^6)/3 + (5*a*b^4*
x^9)/9 + (b^5*x^12)/12 + 5*a^4*b*Log[x]
```

Rubi [A] time = 0.0851849, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^5}{3x^3}+5a^4b\log(x)+\frac{10}{3}a^3b^2x^3+\frac{5}{3}a^2b^3x^6+\frac{5}{9}ab^4x^9+\frac{b^5x^{12}}{12}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^5/x^4,x]
```

```
[Out] -a^5/(3*x^3) + (10*a^3*b^2*x^3)/3 + (5*a^2*b^3*x^6)/3 + (5*a*b^4*
x^9)/9 + (b^5*x^12)/12 + 5*a^4*b*Log[x]
```

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

$$-\frac{a^5}{3x^3}+\frac{5a^4b\log\left(x^3\right)}{3}+\frac{10a^3b^2x^3}{3}+\frac{10a^2b^3\int^{x^3}x\,dx}{3}+\frac{5ab^4x^9}{9}+\frac{b^5x^{12}}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**5/x**4,x)
```

```
[Out] -a**5/(3*x**3) + 5*a**4*b*log(x**3)/3 + 10*a**3*b**2*x**3/3 + 10*
a**2*b**3*Integral(x, (x, x**3))/3 + 5*a*b**4*x**9/9 + b**5*x**12
/12
```

Mathematica [A] time = 0.00827476, size = 66, normalized size = 1.

$$-\frac{a^5}{3x^3}+5a^4b\log(x)+\frac{10}{3}a^3b^2x^3+\frac{5}{3}a^2b^3x^6+\frac{5}{9}ab^4x^9+\frac{b^5x^{12}}{12}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^5/x^4,x]
```

```
[Out] -a^5/(3*x^3) + (10*a^3*b^2*x^3)/3 + (5*a^2*b^3*x^6)/3 + (5*a*b^4*
x^9)/9 + (b^5*x^12)/12 + 5*a^4*b*Log[x]
```

Maple [A] time = 0.009, size = 57, normalized size = 0.9

$$-\frac{a^5}{3\,x^3}+\frac{10\,a^3b^2x^3}{3}+\frac{5\,a^2b^3x^6}{3}+\frac{5\,ab^4x^9}{9}+\frac{b^5x^{12}}{12}+5\,a^4b\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^5/x^4,x)
```

```
[Out] -1/3*a^5/x^3+10/3*a^3*b^2*x^3+5/3*a^2*b^3*x^6+5/9*a*b^4*x^9+1/12*
b^5*x^12+5*a^4*b*ln(x)
```

Maxima [A] time = 1.43869, size = 78, normalized size = 1.18

$$\frac{1}{12}\,b^{5}x^{12}+\frac{5}{9}\,ab^{4}x^{9}+\frac{5}{3}\,a^{2}b^{3}x^{6}+\frac{10}{3}\,a^{3}b^{2}x^{3}+\frac{5}{3}\,a^{4}b\log\left(x^{3}\right)-\frac{a^{5}}{3\,x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^4,x, algorithm="maxima")
```

```
[Out] 1/12*b^5*x^12 + 5/9*a*b^4*x^9 + 5/3*a^2*b^3*x^6 + 10/3*a^3*b^2*x^
3 + 5/3*a^4*b*log(x^3) - 1/3*a^5/x^3
```

Fricas [A] time = 0.210984, size = 82, normalized size = 1.24

$$\frac{3\,b^{5}x^{15}+20\,ab^{4}x^{12}+60\,a^{2}b^{3}x^{9}+120\,a^{3}b^{2}x^{6}+180\,a^{4}bx^{3}\log\left(x\right)-12\,a^{5}}{36\,x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^4,x, algorithm="fricas")
```

```
[Out] 1/36*(3*b^5*x^15 + 20*a*b^4*x^12 + 60*a^2*b^3*x^9 + 120*a^3*b^2*x
^6 + 180*a^4*b*x^3*log(x) - 12*a^5)/x^3
```

Sympy [A] time = 1.31039, size = 65, normalized size = 0.98

$$-\frac{a^{5}}{3x^{3}}+5a^{4}b\log\left(x\right)+\frac{10a^{3}b^{2}x^{3}}{3}+\frac{5a^{2}b^{3}x^{6}}{3}+\frac{5ab^{4}x^{9}}{9}+\frac{b^{5}x^{12}}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**5/x**4,x)
```

```
[Out] -a**5/(3*x**3) + 5*a**4*b*log(x) + 10*a**3*b**2*x**3/3 + 5*a**2*b
**3*x**6/3 + 5*a*b**4*x**9/9 + b**5*x**12/12
```

GIAC/XCAS [A] time = 0.223545, size = 90, normalized size = 1.36

$$\frac{1}{12}\,b^{5}x^{12}+\frac{5}{9}\,ab^{4}x^{9}+\frac{5}{3}\,a^{2}b^{3}x^{6}+\frac{10}{3}\,a^{3}b^{2}x^{3}+5\,a^{4}b\ln\left(|x|\right)-\frac{5\,a^{4}bx^{3}+a^{5}}{3\,x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^4,x, algorithm="giac")
```

```
[Out] 1/12*b^5*x^12 + 5/9*a*b^4*x^9 + 5/3*a^2*b^3*x^6 + 10/3*a^3*b^2*x^
3 + 5*a^4*b*ln(abs(x)) - 1/3*(5*a^4*b*x^3 + a^5)/x^3
```

3.266 $\int \frac{(a+bx^3)^5}{x^7} dx$

Optimal. Leaf size=66

$$-\frac{a^5}{6x^6} - \frac{5a^4b}{3x^3} + 10a^3b^2\log(x) + \frac{10}{3}a^2b^3x^3 + \frac{5}{6}ab^4x^6 + \frac{b^5x^9}{9}$$

```
[Out] -a^5/(6*x^6) - (5*a^4*b)/(3*x^3) + (10*a^2*b^3*x^3)/3 + (5*a*b^4*
x^6)/6 + (b^5*x^9)/9 + 10*a^3*b^2*Log[x]
```

Rubi [A] time = 0.0857663, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$-\frac{a^5}{6x^6} - \frac{5a^4b}{3x^3} + 10a^3b^2\log(x) + \frac{10}{3}a^2b^3x^3 + \frac{5}{6}ab^4x^6 + \frac{b^5x^9}{9}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^5/x^7,x]
```

```
[Out] -a^5/(6*x^6) - (5*a^4*b)/(3*x^3) + (10*a^2*b^3*x^3)/3 + (5*a*b^4*
x^6)/6 + (b^5*x^9)/9 + 10*a^3*b^2*Log[x]
```

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

$$-\frac{a^5}{6x^6} - \frac{5a^4b}{3x^3} + \frac{10a^3b^2\log\left(x^3\right)}{3} + \frac{10a^2b^3x^3}{3} + \frac{5ab^4\int^{x^3} x\,dx}{3} + \frac{b^5x^9}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**5/x**7,x)
```

```
[Out] -a**5/(6*x**6) - 5*a**4*b/(3*x**3) + 10*a**3*b**2*log(x**3)/3 + 1
0*a**2*b**3*x**3/3 + 5*a*b**4*Integral(x, (x, x**3))/3 + b**5*x**
9/9
```

Mathematica [A] time = 0.0083586, size = 66, normalized size = 1.

$$-\frac{a^5}{6x^6} - \frac{5a^4b}{3x^3} + 10a^3b^2\log(x) + \frac{10}{3}a^2b^3x^3 + \frac{5}{6}ab^4x^6 + \frac{b^5x^9}{9}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^5/x^7,x]
```

```
[Out] -a^5/(6*x^6) - (5*a^4*b)/(3*x^3) + (10*a^2*b^3*x^3)/3 + (5*a*b^4*
x^6)/6 + (b^5*x^9)/9 + 10*a^3*b^2*Log[x]
```

Maple [A] time = 0.009, size = 57, normalized size = 0.9

$$-\frac{a^5}{6\,x^6} - \frac{5\,a^4b}{3\,x^3} + \frac{10\,a^2b^3x^3}{3} + \frac{5\,ab^4x^6}{6} + \frac{b^5x^9}{9} + 10\,a^3b^2\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^5/x^7,x)

[Out] -1/6*a^5/x^6-5/3*a^4*b/x^3+10/3*a^2*b^3*x^3+5/6*a*b^4*x^6+1/9*b^5
*x^9+10*a^3*b^2*ln(x)
```

Maxima [A] time = 1.44025, size = 80, normalized size = 1.21

$$\frac{1}{9}\,b^5x^9+\frac{5}{6}\,ab^4x^6+\frac{10}{3}\,a^2b^3x^3+\frac{10}{3}\,a^3b^2\log\left(x^3\right)-\frac{10\,a^4bx^3+a^5}{6\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^7,x, algorithm="maxima")

[Out] 1/9*b^5*x^9 + 5/6*a*b^4*x^6 + 10/3*a^2*b^3*x^3 + 10/3*a^3*b^2*log
(x^3) - 1/6*(10*a^4*b*x^3 + a^5)/x^6
```

Fricas [A] time = 0.212785, size = 82, normalized size = 1.24

$$\frac{2\,b^5x^{15}+15\,ab^4x^{12}+60\,a^2b^3x^9+180\,a^3b^2x^6\log\left(x\right)-30\,a^4bx^3-3\,a^5}{18\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^7,x, algorithm="fricas")

[Out] 1/18*(2*b^5*x^15 + 15*a*b^4*x^12 + 60*a^2*b^3*x^9 + 180*a^3*b^2*x
^6*log(x) - 30*a^4*b*x^3 - 3*a^5)/x^6
```

Sympy [A] time = 1.56623, size = 63, normalized size = 0.95

$$10a^3b^2\log\left(x\right)+\frac{10a^2b^3x^3}{3}+\frac{5ab^4x^6}{6}+\frac{b^5x^9}{9}-\frac{a^5+10a^4bx^3}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**5/x**7,x)

[Out] 10*a**3*b**2*log(x) + 10*a**2*b**3*x**3/3 + 5*a*b**4*x**6/6 + b**
5*x**9/9 - (a**5 + 10*a**4*b*x**3)/(6*x**6)
```

GIAC/XCAS [A] time = 0.225594, size = 93, normalized size = 1.41

$$\frac{1}{9}\,b^5x^9+\frac{5}{6}\,ab^4x^6+\frac{10}{3}\,a^2b^3x^3+10\,a^3b^2\ln\left(|x|\right)-\frac{30\,a^3b^2x^6+10\,a^4bx^3+a^5}{6\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^7,x, algorithm="giac")

[Out] 1/9*b^5*x^9 + 5/6*a*b^4*x^6 + 10/3*a^2*b^3*x^3 + 10*a^3*b^2*ln(ab
s(x)) - 1/6*(30*a^3*b^2*x^6 + 10*a^4*b*x^3 + a^5)/x^6
```

3.267 $\int \frac{(a+bx^3)^5}{x^{10}}\,dx$

Optimal. Leaf size=66

$$-\frac{a^5}{9x^9}-\frac{5a^4b}{6x^6}-\frac{10a^3b^2}{3x^3}+10a^2b^3\log(x)+\frac{5}{3}ab^4x^3+\frac{b^5x^6}{6}$$

```
[Out] -a^5/(9*x^9) - (5*a^4*b)/(6*x^6) - (10*a^3*b^2)/(3*x^3) + (5*a*b^
4*x^3)/3 + (b^5*x^6)/6 + 10*a^2*b^3*Log[x]
```

Rubi [A] time = 0.0822964, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$-\frac{a^5}{9x^9}-\frac{5a^4b}{6x^6}-\frac{10a^3b^2}{3x^3}+10a^2b^3\log(x)+\frac{5}{3}ab^4x^3+\frac{b^5x^6}{6}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^3)^5/x^10,x]
```

```
[Out] -a^5/(9*x^9) - (5*a^4*b)/(6*x^6) - (10*a^3*b^2)/(3*x^3) + (5*a*b^
4*x^3)/3 + (b^5*x^6)/6 + 10*a^2*b^3*Log[x]
```

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

$$-\frac{a^5}{9x^9}-\frac{5a^4b}{6x^6}-\frac{10a^3b^2}{3x^3}+\frac{10a^2b^3\log\left(x^3\right)}{3}+\frac{5ab^4x^3}{3}+\frac{b^5\int^{x^3}x\,dx}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**3+a)**5/x**10,x)
```

```
[Out] -a**5/(9*x**9) - 5*a**4*b/(6*x**6) - 10*a**3*b**2/(3*x**3) + 10*a
**2*b**3*log(x**3)/3 + 5*a*b**4*x**3/3 + b**5*Integral(x, (x, x**
3))/3
```

Mathematica [A] time = 0.0116637, size = 66, normalized size = 1.

$$-\frac{a^5}{9x^9}-\frac{5a^4b}{6x^6}-\frac{10a^3b^2}{3x^3}+10a^2b^3\log(x)+\frac{5}{3}ab^4x^3+\frac{b^5x^6}{6}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^3)^5/x^10,x]
```

```
[Out] -a^5/(9*x^9) - (5*a^4*b)/(6*x^6) - (10*a^3*b^2)/(3*x^3) + (5*a*b^
4*x^3)/3 + (b^5*x^6)/6 + 10*a^2*b^3*Log[x]
```

Maple [A] time = 0.009, size = 57, normalized size = 0.9

$$-\frac{a^5}{9\,x^9}-\frac{5\,a^4b}{6\,x^6}-\frac{10\,a^3b^2}{3\,x^3}+\frac{5\,ab^4x^3}{3}+\frac{b^5x^6}{6}+10\,a^2b^3\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^5/x^10,x)
```

```
[Out] -1/9*a^5/x^9-5/6*a^4*b/x^6-10/3*a^3*b^2/x^3+5/3*a*b^4*x^3+1/6*b^5
*x^6+10*a^2*b^3*ln(x)
```

Maxima [A] time = 1.44055, size = 82, normalized size = 1.24

$$\frac{1}{6}\,b^5x^6 + \frac{5}{3}\,ab^4x^3 + \frac{10}{3}\,a^2b^3\log\left(x^3\right) - \frac{60\,a^3b^2x^6 + 15\,a^4bx^3 + 2\,a^5}{18\,x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^10,x, algorithm="maxima")
```

```
[Out] 1/6*b^5*x^6 + 5/3*a*b^4*x^3 + 10/3*a^2*b^3*log(x^3) - 1/18*(60*a^
3*b^2*x^6 + 15*a^4*b*x^3 + 2*a^5)/x^9
```

Fricas [A] time = 0.213293, size = 82, normalized size = 1.24

$$\frac{3\,b^5x^{15} + 30\,ab^4x^{12} + 180\,a^2b^3x^9\log\left(x\right) - 60\,a^3b^2x^6 - 15\,a^4bx^3 - 2\,a^5}{18\,x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^10,x, algorithm="fricas")
```

```
[Out] 1/18*(3*b^5*x^15 + 30*a*b^4*x^12 + 180*a^2*b^3*x^9*log(x) - 60*a^
3*b^2*x^6 - 15*a^4*b*x^3 - 2*a^5)/x^9
```

Sympy [A] time = 1.88879, size = 63, normalized size = 0.95

$$10a^2b^3\log\left(x\right) + \frac{5ab^4x^3}{3} + \frac{b^5x^6}{6} - \frac{2a^5 + 15a^4bx^3 + 60a^3b^2x^6}{18x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**5/x**10,x)
```

```
[Out] 10*a**2*b**3*log(x) + 5*a*b**4*x**3/3 + b**5*x**6/6 - (2*a**5 + 1
5*a**4*b*x**3 + 60*a**3*b**2*x**6)/(18*x**9)
```

GIAC/XCAS [A] time = 0.225811, size = 96, normalized size = 1.45

$$\frac{1}{6}\,b^5x^6 + \frac{5}{3}\,ab^4x^3 + 10\,a^2b^3\ln\left(|x|\right) - \frac{110\,a^2b^3x^9 + 60\,a^3b^2x^6 + 15\,a^4bx^3 + 2\,a^5}{18\,x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^10,x, algorithm="giac")
```

```
[Out] 1/6*b^5*x^6 + 5/3*a*b^4*x^3 + 10*a^2*b^3*ln(abs(x)) - 1/18*(110*a
^2*b^3*x^9 + 60*a^3*b^2*x^6 + 15*a^4*b*x^3 + 2*a^5)/x^9
```

3.268 $\int \frac{(a+bx^3)^5}{x^{13}}\,dx$

Optimal. Leaf size=66

$$-\frac{a^5}{12x^{12}}-\frac{5a^4b}{9x^9}-\frac{5a^3b^2}{3x^6}-\frac{10a^2b^3}{3x^3}+5ab^4\log(x)+\frac{b^5x^3}{3}$$

```
[Out] -a^5/(12*x^12) - (5*a^4*b)/(9*x^9) - (5*a^3*b^2)/(3*x^6) - (10*a^
2*b^3)/(3*x^3) + (b^5*x^3)/3 + 5*a*b^4*Log[x]
```

Rubi [A] time = 0.0855881, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^5}{12x^{12}}-\frac{5a^4b}{9x^9}-\frac{5a^3b^2}{3x^6}-\frac{10a^2b^3}{3x^3}+5ab^4\log(x)+\frac{b^5x^3}{3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^5/x^13,x]
```

```
[Out] -a^5/(12*x^12) - (5*a^4*b)/(9*x^9) - (5*a^3*b^2)/(3*x^6) - (10*a^
2*b^3)/(3*x^3) + (b^5*x^3)/3 + 5*a*b^4*Log[x]
```

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

$$-\frac{a^5}{12x^{12}}-\frac{5a^4b}{9x^9}-\frac{5a^3b^2}{3x^6}-\frac{10a^2b^3}{3x^3}+\frac{5ab^4\log\left(x^3\right)}{3}+\frac{\int^{x^3} b^5\,dx}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**5/x**13,x)
```

```
[Out] -a**5/(12*x**12) - 5*a**4*b/(9*x**9) - 5*a**3*b**2/(3*x**6) - 10*
a**2*b**3/(3*x**3) + 5*a*b**4*log(x**3)/3 + Integral(b**5, (x, x*
*3))/3
```

Mathematica [A] time = 0.00889649, size = 66, normalized size = 1.

$$-\frac{a^5}{12x^{12}}-\frac{5a^4b}{9x^9}-\frac{5a^3b^2}{3x^6}-\frac{10a^2b^3}{3x^3}+5ab^4\log(x)+\frac{b^5x^3}{3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^5/x^13,x]
```

```
[Out] -a^5/(12*x^12) - (5*a^4*b)/(9*x^9) - (5*a^3*b^2)/(3*x^6) - (10*a^
2*b^3)/(3*x^3) + (b^5*x^3)/3 + 5*a*b^4*Log[x]
```

Maple [A] time = 0.01, size = 57, normalized size = 0.9

$$-\frac{a^5}{12\,x^{12}}-\frac{5\,a^4b}{9\,x^9}-\frac{5\,a^3b^2}{3\,x^6}-\frac{10\,a^2b^3}{3\,x^3}+\frac{b^5x^3}{3}+5\,ab^4\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^5/x^13,x)

[Out] -1/12*a^5/x^12-5/9*a^4*b/x^9-5/3*a^3*b^2/x^6-10/3*a^2*b^3/x^3+1/3
*b^5*x^3+5*a*b^4*ln(x)
```

Maxima [A] time = 1.43249, size = 82, normalized size = 1.24

$$\frac{1}{3}\,b^5x^3+\frac{5}{3}\,ab^4\log\left(x^3\right)-\frac{120\,a^2b^3x^9+60\,a^3b^2x^6+20\,a^4bx^3+3\,a^5}{36\,x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^13,x, algorithm="maxima")

[Out] 1/3*b^5*x^3 + 5/3*a*b^4*log(x^3) - 1/36*(120*a^2*b^3*x^9 + 60*a^3
*b^2*x^6 + 20*a^4*b*x^3 + 3*a^5)/x^12
```

Fricas [A] time = 0.214519, size = 82, normalized size = 1.24

$$\frac{12\,b^5x^{15}+180\,ab^4x^{12}\log\left(x\right)-120\,a^2b^3x^9-60\,a^3b^2x^6-20\,a^4bx^3-3\,a^5}{36\,x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^13,x, algorithm="fricas")

[Out] 1/36*(12*b^5*x^15 + 180*a*b^4*x^12*log(x) - 120*a^2*b^3*x^9 - 60*
a^3*b^2*x^6 - 20*a^4*b*x^3 - 3*a^5)/x^12
```

Sympy [A] time = 2.18914, size = 61, normalized size = 0.92

$$5ab^4\log\left(x\right)+\frac{b^5x^3}{3}-\frac{3a^5+20a^4bx^3+60a^3b^2x^6+120a^2b^3x^9}{36x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**5/x**13,x)

[Out] 5*a*b**4*log(x) + b**5*x**3/3 - (3*a**5 + 20*a**4*b*x**3 + 60*a**
3*b**2*x**6 + 120*a**2*b**3*x**9)/(36*x**12)
```

GIAC/XCAS [A] time = 0.222356, size = 93, normalized size = 1.41

$$\frac{1}{3}\,b^5x^3+5\,ab^4\ln\left(|x|\right)-\frac{125\,ab^4x^{12}+120\,a^2b^3x^9+60\,a^3b^2x^6+20\,a^4bx^3+3\,a^5}{36\,x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^13,x, algorithm="giac")

[Out] 1/3*b^5*x^3 + 5*a*b^4*ln(abs(x)) - 1/36*(125*a*b^4*x^12 + 120*a^2
*b^3*x^9 + 60*a^3*b^2*x^6 + 20*a^4*b*x^3 + 3*a^5)/x^12
```

3.269 $\int \frac{(a+bx^3)^5}{x^{16}}\, dx$

Optimal. Leaf size=65

$$-\frac{a^5}{15x^{15}}-\frac{5a^4b}{12x^{12}}-\frac{10a^3b^2}{9x^9}-\frac{5a^2b^3}{3x^6}-\frac{5ab^4}{3x^3}+b^5\log(x)$$

```
[Out] -a^5/(15*x^15) - (5*a^4*b)/(12*x^12) - (10*a^3*b^2)/(9*x^9) - (5*
a^2*b^3)/(3*x^6) - (5*a*b^4)/(3*x^3) + b^5*Log[x]
```

Rubi [A] time = 0.0741138, antiderivative size = 65, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^5}{15x^{15}}-\frac{5a^4b}{12x^{12}}-\frac{10a^3b^2}{9x^9}-\frac{5a^2b^3}{3x^6}-\frac{5ab^4}{3x^3}+b^5\log(x)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^5/x^16,x]
```

```
[Out] -a^5/(15*x^15) - (5*a^4*b)/(12*x^12) - (10*a^3*b^2)/(9*x^9) - (5*
a^2*b^3)/(3*x^6) - (5*a*b^4)/(3*x^3) + b^5*Log[x]
```

Rubi in Sympy [A] time = 13.5681, size = 68, normalized size = 1.05

$$-\frac{a^5}{15x^{15}}-\frac{5a^4b}{12x^{12}}-\frac{10a^3b^2}{9x^9}-\frac{5a^2b^3}{3x^6}-\frac{5ab^4}{3x^3}+\frac{b^5\log\left(x^3\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**5/x**16,x)
```

```
[Out] -a**5/(15*x**15) - 5*a**4*b/(12*x**12) - 10*a**3*b**2/(9*x**9) -
5*a**2*b**3/(3*x**6) - 5*a*b**4/(3*x**3) + b**5*log(x**3)/3
```

Mathematica [A] time = 0.00807765, size = 65, normalized size = 1.

$$-\frac{a^5}{15x^{15}}-\frac{5a^4b}{12x^{12}}-\frac{10a^3b^2}{9x^9}-\frac{5a^2b^3}{3x^6}-\frac{5ab^4}{3x^3}+b^5\log(x)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^5/x^16,x]
```

```
[Out] -a^5/(15*x^15) - (5*a^4*b)/(12*x^12) - (10*a^3*b^2)/(9*x^9) - (5*
a^2*b^3)/(3*x^6) - (5*a*b^4)/(3*x^3) + b^5*Log[x]
```

Maple [A] time = 0.01, size = 56, normalized size = 0.9

$$-\frac{a^5}{15\,x^{15}}-\frac{5\,a^4b}{12\,x^{12}}-\frac{10\,a^3b^2}{9\,x^9}-\frac{5\,a^2b^3}{3\,x^6}-\frac{5\,ab^4}{3\,x^3}+b^5\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^5/x^16,x)
```

```
[Out] -1/15*a^5/x^15-5/12*a^4*b/x^12-10/9*a^3*b^2/x^9-5/3*a^2*b^3/x^6-5
/3*a*b^4/x^3+b^5*ln(x)
```

Maxima [A] time = 1.43772, size = 82, normalized size = 1.26

$$\frac{1}{3}\,b^5\log\left(x^3\right)-\frac{300\,ab^4x^{12}+300\,a^2b^3x^9+200\,a^3b^2x^6+75\,a^4bx^3+12\,a^5}{180\,x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^16,x, algorithm="maxima")
```

```
[Out] 1/3*b^5*log(x^3) - 1/180*(300*a*b^4*x^12 + 300*a^2*b^3*x^9 + 200*
a^3*b^2*x^6 + 75*a^4*b*x^3 + 12*a^5)/x^15
```

Fricas [A] time = 0.210876, size = 82, normalized size = 1.26

$$\frac{180\,b^5x^{15}\log\left(x\right)-300\,ab^4x^{12}-300\,a^2b^3x^9-200\,a^3b^2x^6-75\,a^4bx^3-12\,a^5}{180\,x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^16,x, algorithm="fricas")
```

```
[Out] 1/180*(180*b^5*x^15*log(x) - 300*a*b^4*x^12 - 300*a^2*b^3*x^9 - 2
00*a^3*b^2*x^6 - 75*a^4*b*x^3 - 12*a^5)/x^15
```

Sympy [A] time = 2.56291, size = 60, normalized size = 0.92

$$b^5\log\left(x\right)-\frac{12a^5+75a^4bx^3+200a^3b^2x^6+300a^2b^3x^9+300ab^4x^{12}}{180x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**5/x**16,x)
```

```
[Out] b**5*log(x) - (12*a**5 + 75*a**4*b*x**3 + 200*a**3*b**2*x**6 + 30
0*a**2*b**3*x**9 + 300*a*b**4*x**12)/(180*x**15)
```

GIAC/XCAS [A] time = 0.220102, size = 90, normalized size = 1.38

$$b^5\ln\left(|x|\right)-\frac{137\,b^5x^{15}+300\,ab^4x^{12}+300\,a^2b^3x^9+200\,a^3b^2x^6+75\,a^4bx^3+12\,a^5}{180\,x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^16,x, algorithm="giac")
```

```
[Out] b^5*ln(abs(x)) - 1/180*(137*b^5*x^15 + 300*a*b^4*x^12 + 300*a^2*b
^3*x^9 + 200*a^3*b^2*x^6 + 75*a^4*b*x^3 + 12*a^5)/x^15
```

3.270 $\int \frac{(a+bx^3)^5}{x^{19}}\,dx$

Optimal. Leaf size=19

$$-\frac{(a+bx^3)^6}{18ax^{18}}$$

```
[Out] -(a + b*x^3)^6/(18*a*x^18)
```

Rubi [A] time = 0.0163713, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$-\frac{(a+bx^3)^6}{18ax^{18}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^5/x^19,x]

[Out] -(a + b*x^3)^6/(18*a*x^18)
```

Rubi in Sympy [A] time = 2.7323, size = 15, normalized size = 0.79

$$-\frac{(a+bx^3)^6}{18ax^{18}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**5/x**19,x)

[Out] -(a + b*x**3)**6/(18*a*x**18)
```

Mathematica [B] time = 0.00793846, size = 69, normalized size = 3.63

$$-\frac{a^5}{18x^{18}}-\frac{a^4b}{3x^{15}}-\frac{5a^3b^2}{6x^{12}}-\frac{10a^2b^3}{9x^9}-\frac{5ab^4}{6x^6}-\frac{b^5}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^5/x^19,x]

[Out] -a^5/(18*x^18) - (a^4*b)/(3*x^15) - (5*a^3*b^2)/(6*x^12) - (10*a^
2*b^3)/(9*x^9) - (5*a*b^4)/(6*x^6) - b^5/(3*x^3)
```

Maple [B] time = 0.009, size = 58, normalized size = 3.1

$$-\frac{5\,a^3b^2}{6\,x^{12}}-\frac{a^4b}{3\,x^{15}}-\frac{5\,ab^4}{6\,x^6}-\frac{10\,a^2b^3}{9\,x^9}-\frac{b^5}{3\,x^3}-\frac{a^5}{18\,x^{18}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^5/x^19,x)
```

```
[Out] -5/6*a^3*b^2/x^12-1/3*a^4*b/x^15-5/6*a*b^4/x^6-10/9*a^2*b^3/x^9-1
/3*b^5/x^3-1/18*a^5/x^18
```

Maxima [A] time = 1.42936, size = 77, normalized size = 4.05

$$-\frac{6\,b^5x^{15} + 15\,ab^4x^{12} + 20\,a^2b^3x^9 + 15\,a^3b^2x^6 + 6\,a^4bx^3 + a^5}{18\,x^{18}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^19,x, algorithm="maxima")
```

```
[Out] -1/18*(6*b^5*x^15 + 15*a*b^4*x^12 + 20*a^2*b^3*x^9 + 15*a^3*b^2*x
^6 + 6*a^4*b*x^3 + a^5)/x^18
```

Fricas [A] time = 0.20435, size = 77, normalized size = 4.05

$$-\frac{6\,b^5x^{15} + 15\,ab^4x^{12} + 20\,a^2b^3x^9 + 15\,a^3b^2x^6 + 6\,a^4bx^3 + a^5}{18\,x^{18}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^19,x, algorithm="fricas")
```

```
[Out] -1/18*(6*b^5*x^15 + 15*a*b^4*x^12 + 20*a^2*b^3*x^9 + 15*a^3*b^2*x
^6 + 6*a^4*b*x^3 + a^5)/x^18
```

Sympy [A] time = 2.86197, size = 61, normalized size = 3.21

$$-\frac{a^5 + 6a^4bx^3 + 15a^3b^2x^6 + 20a^2b^3x^9 + 15ab^4x^{12} + 6b^5x^{15}}{18x^{18}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**5/x**19,x)
```

```
[Out] -(a**5 + 6*a**4*b*x**3 + 15*a**3*b**2*x**6 + 20*a**2*b**3*x**9 +
15*a*b**4*x**12 + 6*b**5*x**15)/(18*x**18)
```

GIAC/XCAS [A] time = 0.220862, size = 77, normalized size = 4.05

$$-\frac{6\,b^5x^{15} + 15\,ab^4x^{12} + 20\,a^2b^3x^9 + 15\,a^3b^2x^6 + 6\,a^4bx^3 + a^5}{18\,x^{18}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^19,x, algorithm="giac")
```

```
[Out] -1/18*(6*b^5*x^15 + 15*a*b^4*x^12 + 20*a^2*b^3*x^9 + 15*a^3*b^2*x
^6 + 6*a^4*b*x^3 + a^5)/x^18
```

3.271 $\int \frac{(a+bx^3)^5}{x^{22}} dx$

Optimal. Leaf size=40

$$\frac{b(a+bx^3)^6}{126a^2x^{18}} - \frac{(a+bx^3)^6}{21ax^{21}}$$

```
[Out] -(a + b*x^3)^6/(21*a*x^21) + (b*(a + b*x^3)^6)/(126*a^2*x^18)
```

Rubi [A] time = 0.0521835, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{b(a+bx^3)^6}{126a^2x^{18}} - \frac{(a+bx^3)^6}{21ax^{21}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^3)^5/x^22,x]
```

```
[Out] -(a + b*x^3)^6/(21*a*x^21) + (b*(a + b*x^3)^6)/(126*a^2*x^18)
```

Rubi in Sympy [A] time = 5.79237, size = 32, normalized size = 0.8

$$-\frac{(a+bx^3)^6}{21ax^{21}} + \frac{b(a+bx^3)^6}{126a^2x^{18}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**3+a)**5/x**22,x)
```

```
[Out] -(a + b*x**3)**6/(21*a*x**21) + b*(a + b*x**3)**6/(126*a**2*x**18
)
```

Mathematica [A] time = 0.00747992, size = 69, normalized size = 1.72

$$-\frac{a^5}{21x^{21}} - \frac{5a^4b}{18x^{18}} - \frac{2a^3b^2}{3x^{15}} - \frac{5a^2b^3}{6x^{12}} - \frac{5ab^4}{9x^9} - \frac{b^5}{6x^6}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^3)^5/x^22,x]
```

```
[Out] -a^5/(21*x^21) - (5*a^4*b)/(18*x^18) - (2*a^3*b^2)/(3*x^15) - (5*
a^2*b^3)/(6*x^12) - (5*a*b^4)/(9*x^9) - b^5/(6*x^6)
```

Maple [A] time = 0.008, size = 58, normalized size = 1.5

$$-\frac{5a^2b^3}{6x^{12}} - \frac{2a^3b^2}{3x^{15}} - \frac{5a^4b}{18x^{18}} - \frac{b^5}{6x^6} - \frac{a^5}{21x^{21}} - \frac{5ab^4}{9x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x^3+a)^5/x^22,x)
```

```
[Out] -5/6*a^2*b^3/x^12-2/3*a^3*b^2/x^15-5/18*a^4*b/x^18-1/6*b^5/x^6-1/
21*a^5/x^21-5/9*a*b^4/x^9
```

Maxima [A] time = 1.44937, size = 80, normalized size = 2.

$$-\frac{21\, b^5 x^{15} + 70\, a b^4 x^{12} + 105\, a^2 b^3 x^9 + 84\, a^3 b^2 x^6 + 35\, a^4 b x^3 + 6\, a^5}{126\, x^{21}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^22,x, algorithm="maxima")
```

```
[Out] -1/126*(21*b^5*x^15 + 70*a*b^4*x^12 + 105*a^2*b^3*x^9 + 84*a^3*b^
2*x^6 + 35*a^4*b*x^3 + 6*a^5)/x^21
```

Fricas [A] time = 0.209432, size = 80, normalized size = 2.

$$-\frac{21\, b^5 x^{15} + 70\, a b^4 x^{12} + 105\, a^2 b^3 x^9 + 84\, a^3 b^2 x^6 + 35\, a^4 b x^3 + 6\, a^5}{126\, x^{21}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^22,x, algorithm="fricas")
```

```
[Out] -1/126*(21*b^5*x^15 + 70*a*b^4*x^12 + 105*a^2*b^3*x^9 + 84*a^3*b^
2*x^6 + 35*a^4*b*x^3 + 6*a^5)/x^21
```

Sympy [A] time = 3.07306, size = 63, normalized size = 1.58

$$-\frac{6a^5 + 35a^4 b x^3 + 84a^3 b^2 x^6 + 105a^2 b^3 x^9 + 70ab^4 x^{12} + 21b^5 x^{15}}{126x^{21}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**5/x**22,x)
```

```
[Out] -(6*a**5 + 35*a**4*b*x**3 + 84*a**3*b**2*x**6 + 105*a**2*b**3*x**
9 + 70*a*b**4*x**12 + 21*b**5*x**15)/(126*x**21)
```

GIAC/XCAS [A] time = 0.225787, size = 80, normalized size = 2.

$$-\frac{21\, b^5 x^{15} + 70\, a b^4 x^{12} + 105\, a^2 b^3 x^9 + 84\, a^3 b^2 x^6 + 35\, a^4 b x^3 + 6\, a^5}{126\, x^{21}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^22,x, algorithm="giac")
```

```
[Out] -1/126*(21*b^5*x^15 + 70*a*b^4*x^12 + 105*a^2*b^3*x^9 + 84*a^3*b^
2*x^6 + 35*a^4*b*x^3 + 6*a^5)/x^21
```

3.272 $\int \frac{(a+bx^3)^5}{x^{25}}\,dx$

Optimal. Leaf size=62

$$-\frac{b^2\left(a+bx^3\right)^6}{504a^3x^{18}}+\frac{b\left(a+bx^3\right)^6}{84a^2x^{21}}-\frac{\left(a+bx^3\right)^6}{24ax^{24}}$$

```
[Out] -(a + b*x^3)^6/(24*a*x^24) + (b*(a + b*x^3)^6)/(84*a^2*x^21) - (b
^2*(a + b*x^3)^6)/(504*a^3*x^18)
```

Rubi [A] time = 0.077408, antiderivative size = 62, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{b^2\left(a+bx^3\right)^6}{504a^3x^{18}}+\frac{b\left(a+bx^3\right)^6}{84a^2x^{21}}-\frac{\left(a+bx^3\right)^6}{24ax^{24}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^3)^5/x^25,x]
```

```
[Out] -(a + b*x^3)^6/(24*a*x^24) + (b*(a + b*x^3)^6)/(84*a^2*x^21) - (b
^2*(a + b*x^3)^6)/(504*a^3*x^18)
```

Rubi in Sympy [A] time = 14.0305, size = 68, normalized size = 1.1

$$-\frac{a^5}{24x^{24}}-\frac{5a^4b}{21x^{21}}-\frac{5a^3b^2}{9x^{18}}-\frac{2a^2b^3}{3x^{15}}-\frac{5ab^4}{12x^{12}}-\frac{b^5}{9x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**3+a)**5/x**25,x)
```

```
[Out] -a**5/(24*x**24) - 5*a**4*b/(21*x**21) - 5*a**3*b**2/(9*x**18) -
2*a**2*b**3/(3*x**15) - 5*a*b**4/(12*x**12) - b**5/(9*x**9)
```

Mathematica [A] time = 0.0128134, size = 69, normalized size = 1.11

$$-\frac{a^5}{24x^{24}}-\frac{5a^4b}{21x^{21}}-\frac{5a^3b^2}{9x^{18}}-\frac{2a^2b^3}{3x^{15}}-\frac{5ab^4}{12x^{12}}-\frac{b^5}{9x^9}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^3)^5/x^25,x]
```

```
[Out] -a^5/(24*x^24) - (5*a^4*b)/(21*x^21) - (5*a^3*b^2)/(9*x^18) - (2*
a^2*b^3)/(3*x^15) - (5*a*b^4)/(12*x^12) - b^5/(9*x^9)
```

Maple [A] time = 0.009, size = 58, normalized size = 0.9

$$-\frac{5\,a^3b^2}{9\,x^{18}}-\frac{5\,ab^4}{12\,x^{12}}-\frac{2\,a^2b^3}{3\,x^{15}}-\frac{a^5}{24\,x^{24}}-\frac{b^5}{9\,x^9}-\frac{5\,a^4b}{21\,x^{21}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^5/x^25,x)
```

```
[Out] -5/9*a^3*b^2/x^18-5/12*a*b^4/x^12-2/3*a^2*b^3/x^15-1/24*a^5/x^24-
1/9*b^5/x^9-5/21*a^4*b/x^21
```

Maxima [A] time = 1.44933, size = 80, normalized size = 1.29

$$-\frac{56\,b^{5}x^{15} + 210\,ab^{4}x^{12} + 336\,a^{2}b^{3}x^{9} + 280\,a^{3}b^{2}x^{6} + 120\,a^{4}bx^{3} + 21\,a^{5}}{504\,x^{24}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^25,x, algorithm="maxima")
```

```
[Out] -1/504*(56*b^5*x^15 + 210*a*b^4*x^12 + 336*a^2*b^3*x^9 + 280*a^3*
b^2*x^6 + 120*a^4*b*x^3 + 21*a^5)/x^24
```

Fricas [A] time = 0.207343, size = 80, normalized size = 1.29

$$-\frac{56\,b^{5}x^{15} + 210\,ab^{4}x^{12} + 336\,a^{2}b^{3}x^{9} + 280\,a^{3}b^{2}x^{6} + 120\,a^{4}bx^{3} + 21\,a^{5}}{504\,x^{24}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^25,x, algorithm="fricas")
```

```
[Out] -1/504*(56*b^5*x^15 + 210*a*b^4*x^12 + 336*a^2*b^3*x^9 + 280*a^3*
b^2*x^6 + 120*a^4*b*x^3 + 21*a^5)/x^24
```

Sympy [A] time = 3.23828, size = 63, normalized size = 1.02

$$-\frac{21a^{5} + 120a^{4}bx^{3} + 280a^{3}b^{2}x^{6} + 336a^{2}b^{3}x^{9} + 210ab^{4}x^{12} + 56b^{5}x^{15}}{504x^{24}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**5/x**25,x)
```

```
[Out] -(21*a**5 + 120*a**4*b*x**3 + 280*a**3*b**2*x**6 + 336*a**2*b**3*
x**9 + 210*a*b**4*x**12 + 56*b**5*x**15)/(504*x**24)
```

GIAC/XCAS [A] time = 0.222404, size = 80, normalized size = 1.29

$$-\frac{56\,b^{5}x^{15} + 210\,ab^{4}x^{12} + 336\,a^{2}b^{3}x^{9} + 280\,a^{3}b^{2}x^{6} + 120\,a^{4}bx^{3} + 21\,a^{5}}{504\,x^{24}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^25,x, algorithm="giac")
```

```
[Out] -1/504*(56*b^5*x^15 + 210*a*b^4*x^12 + 336*a^2*b^3*x^9 + 280*a^3*
b^2*x^6 + 120*a^4*b*x^3 + 21*a^5)/x^24
```

3.273 $\int \frac{(a+bx^3)^5}{x^{28}}\,dx$

Optimal. Leaf size=69

$$-\frac{a^5}{27x^{27}}-\frac{5a^4b}{24x^{24}}-\frac{10a^3b^2}{21x^{21}}-\frac{5a^2b^3}{9x^{18}}-\frac{ab^4}{3x^{15}}-\frac{b^5}{12x^{12}}$$

```
[Out] -a^5/(27*x^27) - (5*a^4*b)/(24*x^24) - (10*a^3*b^2)/(21*x^21) - (
5*a^2*b^3)/(9*x^18) - (a*b^4)/(3*x^15) - b^5/(12*x^12)
```

Rubi [A] time = 0.0801097, antiderivative size = 69, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$-\frac{a^5}{27x^{27}}-\frac{5a^4b}{24x^{24}}-\frac{10a^3b^2}{21x^{21}}-\frac{5a^2b^3}{9x^{18}}-\frac{ab^4}{3x^{15}}-\frac{b^5}{12x^{12}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^5/x^28,x]
```

```
[Out] -a^5/(27*x^27) - (5*a^4*b)/(24*x^24) - (10*a^3*b^2)/(21*x^21) - (
5*a^2*b^3)/(9*x^18) - (a*b^4)/(3*x^15) - b^5/(12*x^12)
```

Rubi in Sympy [A] time = 13.9344, size = 66, normalized size = 0.96

$$-\frac{a^5}{27x^{27}}-\frac{5a^4b}{24x^{24}}-\frac{10a^3b^2}{21x^{21}}-\frac{5a^2b^3}{9x^{18}}-\frac{ab^4}{3x^{15}}-\frac{b^5}{12x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**5/x**28,x)
```

```
[Out] -a**5/(27*x**27) - 5*a**4*b/(24*x**24) - 10*a**3*b**2/(21*x**21)
- 5*a**2*b**3/(9*x**18) - a*b**4/(3*x**15) - b**5/(12*x**12)
```

Mathematica [A] time = 0.00780375, size = 69, normalized size = 1.

$$-\frac{a^5}{27x^{27}}-\frac{5a^4b}{24x^{24}}-\frac{10a^3b^2}{21x^{21}}-\frac{5a^2b^3}{9x^{18}}-\frac{ab^4}{3x^{15}}-\frac{b^5}{12x^{12}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^5/x^28,x]
```

```
[Out] -a^5/(27*x^27) - (5*a^4*b)/(24*x^24) - (10*a^3*b^2)/(21*x^21) - (
5*a^2*b^3)/(9*x^18) - (a*b^4)/(3*x^15) - b^5/(12*x^12)
```

Maple [A] time = 0.008, size = 58, normalized size = 0.8

$$-\frac{a^5}{27\,x^{27}}-\frac{5\,a^4b}{24\,x^{24}}-\frac{10\,a^3b^2}{21\,x^{21}}-\frac{5\,a^2b^3}{9\,x^{18}}-\frac{ab^4}{3\,x^{15}}-\frac{b^5}{12\,x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^5/x^28,x)
```

```
[Out] -1/27*a^5/x^27-5/24*a^4*b/x^24-10/21*a^3*b^2/x^21-5/9*a^2*b^3/x^1
8-1/3*a*b^4/x^15-1/12*b^5/x^12
```

Maxima [A] time = 1.45702, size = 80, normalized size = 1.16

$$-\frac{126\, b^5 x^{15} + 504\, a b^4 x^{12} + 840\, a^2 b^3 x^9 + 720\, a^3 b^2 x^6 + 315\, a^4 b x^3 + 56\, a^5}{1512\, x^{27}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^28,x, algorithm="maxima")
```

```
[Out] -1/1512*(126*b^5*x^15 + 504*a*b^4*x^12 + 840*a^2*b^3*x^9 + 720*a^
3*b^2*x^6 + 315*a^4*b*x^3 + 56*a^5)/x^27
```

Fricas [A] time = 0.202732, size = 80, normalized size = 1.16

$$-\frac{126\, b^5 x^{15} + 504\, a b^4 x^{12} + 840\, a^2 b^3 x^9 + 720\, a^3 b^2 x^6 + 315\, a^4 b x^3 + 56\, a^5}{1512\, x^{27}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^28,x, algorithm="fricas")
```

```
[Out] -1/1512*(126*b^5*x^15 + 504*a*b^4*x^12 + 840*a^2*b^3*x^9 + 720*a^
3*b^2*x^6 + 315*a^4*b*x^3 + 56*a^5)/x^27
```

Sympy [A] time = 3.46091, size = 63, normalized size = 0.91

$$-\frac{56a^5 + 315a^4bx^3 + 720a^3b^2x^6 + 840a^2b^3x^9 + 504ab^4x^{12} + 126b^5x^{15}}{1512x^{27}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**5/x**28,x)
```

```
[Out] -(56*a**5 + 315*a**4*b*x**3 + 720*a**3*b**2*x**6 + 840*a**2*b**3*
x**9 + 504*a*b**4*x**12 + 126*b**5*x**15)/(1512*x**27)
```

GIAC/XCAS [A] time = 0.218413, size = 80, normalized size = 1.16

$$-\frac{126\, b^5 x^{15} + 504\, a b^4 x^{12} + 840\, a^2 b^3 x^9 + 720\, a^3 b^2 x^6 + 315\, a^4 b x^3 + 56\, a^5}{1512\, x^{27}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^28,x, algorithm="giac")
```

```
[Out] -1/1512*(126*b^5*x^15 + 504*a*b^4*x^12 + 840*a^2*b^3*x^9 + 720*a^
3*b^2*x^6 + 315*a^4*b*x^3 + 56*a^5)/x^27
```

3.274 $\int \frac{(a+bx^3)^5}{x^{31}}\,dx$

Optimal. Leaf size=69

$$-\frac{a^5}{30x^{30}}-\frac{5a^4b}{27x^{27}}-\frac{5a^3b^2}{12x^{24}}-\frac{10a^2b^3}{21x^{21}}-\frac{5ab^4}{18x^{18}}-\frac{b^5}{15x^{15}}$$

```
[Out] -a^5/(30*x^30) - (5*a^4*b)/(27*x^27) - (5*a^3*b^2)/(12*x^24) - (1
0*a^2*b^3)/(21*x^21) - (5*a*b^4)/(18*x^18) - b^5/(15*x^15)
```

Rubi [A] time = 0.0857615, antiderivative size = 69, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^5}{30x^{30}}-\frac{5a^4b}{27x^{27}}-\frac{5a^3b^2}{12x^{24}}-\frac{10a^2b^3}{21x^{21}}-\frac{5ab^4}{18x^{18}}-\frac{b^5}{15x^{15}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^5/x^31,x]
```

```
[Out] -a^5/(30*x^30) - (5*a^4*b)/(27*x^27) - (5*a^3*b^2)/(12*x^24) - (1
0*a^2*b^3)/(21*x^21) - (5*a*b^4)/(18*x^18) - b^5/(15*x^15)
```

Rubi in Sympy [A] time = 14.0146, size = 68, normalized size = 0.99

$$-\frac{a^5}{30x^{30}}-\frac{5a^4b}{27x^{27}}-\frac{5a^3b^2}{12x^{24}}-\frac{10a^2b^3}{21x^{21}}-\frac{5ab^4}{18x^{18}}-\frac{b^5}{15x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**5/x**31,x)
```

```
[Out] -a**5/(30*x**30) - 5*a**4*b/(27*x**27) - 5*a**3*b**2/(12*x**24) -
 10*a**2*b**3/(21*x**21) - 5*a*b**4/(18*x**18) - b**5/(15*x**15)
```

Mathematica [A] time = 0.00830836, size = 69, normalized size = 1.

$$-\frac{a^5}{30x^{30}}-\frac{5a^4b}{27x^{27}}-\frac{5a^3b^2}{12x^{24}}-\frac{10a^2b^3}{21x^{21}}-\frac{5ab^4}{18x^{18}}-\frac{b^5}{15x^{15}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^5/x^31,x]
```

```
[Out] -a^5/(30*x^30) - (5*a^4*b)/(27*x^27) - (5*a^3*b^2)/(12*x^24) - (1
0*a^2*b^3)/(21*x^21) - (5*a*b^4)/(18*x^18) - b^5/(15*x^15)
```

Maple [A] time = 0.01, size = 58, normalized size = 0.8

$$-\frac{a^5}{30\,x^{30}}-\frac{5\,a^4b}{27\,x^{27}}-\frac{5\,a^3b^2}{12\,x^{24}}-\frac{10\,a^2b^3}{21\,x^{21}}-\frac{5\,ab^4}{18\,x^{18}}-\frac{b^5}{15\,x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^5/x^31,x)
```

```
[Out] -1/30*a^5/x^30-5/27*a^4*b/x^27-5/12*a^3*b^2/x^24-10/21*a^2*b^3/x^
21-5/18*a*b^4/x^18-1/15*b^5/x^15
```

Maxima [A] time = 1.43795, size = 80, normalized size = 1.16

$$-\frac{252\,b^5x^{15} + 1050\,ab^4x^{12} + 1800\,a^2b^3x^9 + 1575\,a^3b^2x^6 + 700\,a^4bx^3 + 126\,a^5}{3780\,x^{30}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^31,x, algorithm="maxima")
```

```
[Out] -1/3780*(252*b^5*x^15 + 1050*a*b^4*x^12 + 1800*a^2*b^3*x^9 + 1575
*a^3*b^2*x^6 + 700*a^4*b*x^3 + 126*a^5)/x^30
```

Fricas [A] time = 0.205213, size = 80, normalized size = 1.16

$$-\frac{252\,b^5x^{15} + 1050\,ab^4x^{12} + 1800\,a^2b^3x^9 + 1575\,a^3b^2x^6 + 700\,a^4bx^3 + 126\,a^5}{3780\,x^{30}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^31,x, algorithm="fricas")
```

```
[Out] -1/3780*(252*b^5*x^15 + 1050*a*b^4*x^12 + 1800*a^2*b^3*x^9 + 1575
*a^3*b^2*x^6 + 700*a^4*b*x^3 + 126*a^5)/x^30
```

Sympy [A] time = 3.72539, size = 63, normalized size = 0.91

$$-\frac{126a^5 + 700a^4bx^3 + 1575a^3b^2x^6 + 1800a^2b^3x^9 + 1050ab^4x^{12} + 252b^5x^{15}}{3780x^{30}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**5/x**31,x)
```

```
[Out] -(126*a**5 + 700*a**4*b*x**3 + 1575*a**3*b**2*x**6 + 1800*a**2*b*
*3*x**9 + 1050*a*b**4*x**12 + 252*b**5*x**15)/(3780*x**30)
```

GIAC/XCAS [A] time = 0.218659, size = 80, normalized size = 1.16

$$-\frac{252\,b^5x^{15} + 1050\,ab^4x^{12} + 1800\,a^2b^3x^9 + 1575\,a^3b^2x^6 + 700\,a^4bx^3 + 126\,a^5}{3780\,x^{30}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^31,x, algorithm="giac")
```

```
[Out] -1/3780*(252*b^5*x^15 + 1050*a*b^4*x^12 + 1800*a^2*b^3*x^9 + 1575
*a^3*b^2*x^6 + 700*a^4*b*x^3 + 126*a^5)/x^30
```

3.275 $\int x^4 \left(a+bx^3\right)^5 \, dx$

Optimal. Leaf size=69

$$\frac{a^5x^5}{5}+\frac{5}{8}a^4bx^8+\frac{10}{11}a^3b^2x^{11}+\frac{5}{7}a^2b^3x^{14}+\frac{5}{17}ab^4x^{17}+\frac{b^5x^{20}}{20}$$

```
[Out] (a^5*x^5)/5 + (5*a^4*b*x^8)/8 + (10*a^3*b^2*x^11)/11 + (5*a^2*b^3
*x^14)/7 + (5*a*b^4*x^17)/17 + (b^5*x^20)/20
```

Rubi [A] time = 0.0747336, antiderivative size = 69, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{a^5x^5}{5}+\frac{5}{8}a^4bx^8+\frac{10}{11}a^3b^2x^{11}+\frac{5}{7}a^2b^3x^{14}+\frac{5}{17}ab^4x^{17}+\frac{b^5x^{20}}{20}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4*(a + b*x^3)^5,x]
```

```
[Out] (a^5*x^5)/5 + (5*a^4*b*x^8)/8 + (10*a^3*b^2*x^11)/11 + (5*a^2*b^3
*x^14)/7 + (5*a*b^4*x^17)/17 + (b^5*x^20)/20
```

Rubi in Sympy [A] time = 11.2364, size = 66, normalized size = 0.96

$$\frac{a^5x^5}{5}+\frac{5a^4bx^8}{8}+\frac{10a^3b^2x^{11}}{11}+\frac{5a^2b^3x^{14}}{7}+\frac{5ab^4x^{17}}{17}+\frac{b^5x^{20}}{20}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4*(b*x**3+a)**5,x)
```

```
[Out] a**5*x**5/5 + 5*a**4*b*x**8/8 + 10*a**3*b**2*x**11/11 + 5*a**2*b*
*3*x**14/7 + 5*a*b**4*x**17/17 + b**5*x**20/20
```

Mathematica [A] time = 0.00366893, size = 69, normalized size = 1.

$$\frac{a^5x^5}{5}+\frac{5}{8}a^4bx^8+\frac{10}{11}a^3b^2x^{11}+\frac{5}{7}a^2b^3x^{14}+\frac{5}{17}ab^4x^{17}+\frac{b^5x^{20}}{20}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4*(a + b*x^3)^5,x]
```

```
[Out] (a^5*x^5)/5 + (5*a^4*b*x^8)/8 + (10*a^3*b^2*x^11)/11 + (5*a^2*b^3
*x^14)/7 + (5*a*b^4*x^17)/17 + (b^5*x^20)/20
```

Maple [A] time = 0.002, size = 58, normalized size = 0.8

$$\frac{a^5x^5}{5}+\frac{5\,a^4bx^8}{8}+\frac{10\,a^3b^2x^{11}}{11}+\frac{5\,a^2b^3x^{14}}{7}+\frac{5\,ab^4x^{17}}{17}+\frac{b^5x^{20}}{20}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4*(b*x^3+a)^5,x)
```

```
[Out] 1/5*a^5*x^5+5/8*a^4*b*x^8+10/11*a^3*b^2*x^11+5/7*a^2*b^3*x^14+5/1
7*a*b^4*x^17+1/20*b^5*x^20
```

Maxima [A] time = 1.4535, size = 77, normalized size = 1.12

$$\frac{1}{20}\,b^5x^{20}+\frac{5}{17}\,ab^4x^{17}+\frac{5}{7}\,a^2b^3x^{14}+\frac{10}{11}\,a^3b^2x^{11}+\frac{5}{8}\,a^4bx^8+\frac{1}{5}\,a^5x^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5*x^4,x, algorithm="maxima")
```

```
[Out] 1/20*b^5*x^20 + 5/17*a*b^4*x^17 + 5/7*a^2*b^3*x^14 + 10/11*a^3*b^
2*x^11 + 5/8*a^4*b*x^8 + 1/5*a^5*x^5
```

Fricas [A] time = 0.188881, size = 1, normalized size = 0.01

$$\frac{1}{20}x^{20}b^5+\frac{5}{17}x^{17}b^4a+\frac{5}{7}x^{14}b^3a^2+\frac{10}{11}x^{11}b^2a^3+\frac{5}{8}x^8ba^4+\frac{1}{5}x^5a^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5*x^4,x, algorithm="fricas")
```

```
[Out] 1/20*x^20*b^5 + 5/17*x^17*b^4*a + 5/7*x^14*b^3*a^2 + 10/11*x^11*b
^2*a^3 + 5/8*x^8*b*a^4 + 1/5*x^5*a^5
```

Sympy [A] time = 0.130314, size = 66, normalized size = 0.96

$$\frac{a^5x^5}{5}+\frac{5a^4bx^8}{8}+\frac{10a^3b^2x^{11}}{11}+\frac{5a^2b^3x^{14}}{7}+\frac{5ab^4x^{17}}{17}+\frac{b^5x^{20}}{20}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4*(b*x**3+a)**5,x)
```

```
[Out] a**5*x**5/5 + 5*a**4*b*x**8/8 + 10*a**3*b**2*x**11/11 + 5*a**2*b*
*3*x**14/7 + 5*a*b**4*x**17/17 + b**5*x**20/20
```

GIAC/XCAS [A] time = 0.218754, size = 77, normalized size = 1.12

$$\frac{1}{20}\,b^5x^{20}+\frac{5}{17}\,ab^4x^{17}+\frac{5}{7}\,a^2b^3x^{14}+\frac{10}{11}\,a^3b^2x^{11}+\frac{5}{8}\,a^4bx^8+\frac{1}{5}\,a^5x^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5*x^4,x, algorithm="giac")
```

```
[Out] 1/20*b^5*x^20 + 5/17*a*b^4*x^17 + 5/7*a^2*b^3*x^14 + 10/11*a^3*b^
2*x^11 + 5/8*a^4*b*x^8 + 1/5*a^5*x^5
```

3.276 $\int x^3 \left(a+bx^3\right)^5 \, dx$

Optimal. Leaf size=66

$$\frac{a^5x^4}{4}+\frac{5}{7}a^4bx^7+a^3b^2x^{10}+\frac{10}{13}a^2b^3x^{13}+\frac{5}{16}ab^4x^{16}+\frac{b^5x^{19}}{19}$$

```
[Out] (a^5*x^4)/4 + (5*a^4*b*x^7)/7 + a^3*b^2*x^10 + (10*a^2*b^3*x^13)/
13 + (5*a*b^4*x^16)/16 + (b^5*x^19)/19
```

Rubi [A] time = 0.0705057, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{a^5x^4}{4}+\frac{5}{7}a^4bx^7+a^3b^2x^{10}+\frac{10}{13}a^2b^3x^{13}+\frac{5}{16}ab^4x^{16}+\frac{b^5x^{19}}{19}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3*(a + b*x^3)^5,x]
```

```
[Out] (a^5*x^4)/4 + (5*a^4*b*x^7)/7 + a^3*b^2*x^10 + (10*a^2*b^3*x^13)/
13 + (5*a*b^4*x^16)/16 + (b^5*x^19)/19
```

Rubi in Sympy [A] time = 11.4048, size = 63, normalized size = 0.95

$$\frac{a^5x^4}{4}+\frac{5a^4bx^7}{7}+a^3b^2x^{10}+\frac{10a^2b^3x^{13}}{13}+\frac{5ab^4x^{16}}{16}+\frac{b^5x^{19}}{19}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3*(b*x**3+a)**5,x)
```

```
[Out] a**5*x**4/4 + 5*a**4*b*x**7/7 + a**3*b**2*x**10 + 10*a**2*b**3*x*
*13/13 + 5*a*b**4*x**16/16 + b**5*x**19/19
```

Mathematica [A] time = 0.00375532, size = 66, normalized size = 1.

$$\frac{a^5x^4}{4}+\frac{5}{7}a^4bx^7+a^3b^2x^{10}+\frac{10}{13}a^2b^3x^{13}+\frac{5}{16}ab^4x^{16}+\frac{b^5x^{19}}{19}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3*(a + b*x^3)^5,x]
```

```
[Out] (a^5*x^4)/4 + (5*a^4*b*x^7)/7 + a^3*b^2*x^10 + (10*a^2*b^3*x^13)/
13 + (5*a*b^4*x^16)/16 + (b^5*x^19)/19
```

Maple [A] time = 0.002, size = 57, normalized size = 0.9

$$\frac{a^5x^4}{4}+\frac{5\,a^4bx^7}{7}+a^3b^2x^{10}+\frac{10\,a^2b^3x^{13}}{13}+\frac{5\,ab^4x^{16}}{16}+\frac{b^5x^{19}}{19}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3*(b*x^3+a)^5,x)
```

```
[Out] 1/4*a^5*x^4+5/7*a^4*b*x^7+a^3*b^2*x^10+10/13*a^2*b^3*x^13+5/16*a*
b^4*x^16+1/19*b^5*x^19
```

Maxima [A] time = 1.44216, size = 76, normalized size = 1.15

$$\frac{1}{19}\,b^5x^{19}+\frac{5}{16}\,ab^4x^{16}+\frac{10}{13}\,a^2b^3x^{13}+a^3b^2x^{10}+\frac{5}{7}\,a^4bx^7+\frac{1}{4}\,a^5x^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5*x^3,x, algorithm="maxima")
```

```
[Out] 1/19*b^5*x^19 + 5/16*a*b^4*x^16 + 10/13*a^2*b^3*x^13 + a^3*b^2*x^
10 + 5/7*a^4*b*x^7 + 1/4*a^5*x^4
```

Fricas [A] time = 0.188246, size = 1, normalized size = 0.02

$$\frac{1}{19}x^{19}b^5+\frac{5}{16}x^{16}b^4a+\frac{10}{13}x^{13}b^3a^2+x^{10}b^2a^3+\frac{5}{7}x^7ba^4+\frac{1}{4}x^4a^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5*x^3,x, algorithm="fricas")
```

```
[Out] 1/19*x^19*b^5 + 5/16*x^16*b^4*a + 10/13*x^13*b^3*a^2 + x^10*b^2*a
^3 + 5/7*x^7*b*a^4 + 1/4*x^4*a^5
```

Sympy [A] time = 0.121037, size = 63, normalized size = 0.95

$$\frac{a^5x^4}{4}+\frac{5a^4bx^7}{7}+a^3b^2x^{10}+\frac{10a^2b^3x^{13}}{13}+\frac{5ab^4x^{16}}{16}+\frac{b^5x^{19}}{19}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(b*x**3+a)**5,x)
```

```
[Out] a**5*x**4/4 + 5*a**4*b*x**7/7 + a**3*b**2*x**10 + 10*a**2*b**3*x*
*13/13 + 5*a*b**4*x**16/16 + b**5*x**19/19
```

GIAC/XCAS [A] time = 0.221913, size = 76, normalized size = 1.15

$$\frac{1}{19}\,b^5x^{19}+\frac{5}{16}\,ab^4x^{16}+\frac{10}{13}\,a^2b^3x^{13}+a^3b^2x^{10}+\frac{5}{7}\,a^4bx^7+\frac{1}{4}\,a^5x^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5*x^3,x, algorithm="giac")
```

```
[Out] 1/19*b^5*x^19 + 5/16*a*b^4*x^16 + 10/13*a^2*b^3*x^13 + a^3*b^2*x^
10 + 5/7*a^4*b*x^7 + 1/4*a^5*x^4
```

3.277 $\int x\left(a+bx^3\right)^5\,dx$

Optimal. Leaf size=66

$$\frac{a^5x^2}{2}+a^4bx^5+\frac{5}{4}a^3b^2x^8+\frac{10}{11}a^2b^3x^{11}+\frac{5}{14}ab^4x^{14}+\frac{b^5x^{17}}{17}$$

```
[Out] (a^5*x^2)/2 + a^4*b*x^5 + (5*a^3*b^2*x^8)/4 + (10*a^2*b^3*x^11)/1
1 + (5*a*b^4*x^14)/14 + (b^5*x^17)/17
```

Rubi [A] time = 0.0646452, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{a^5x^2}{2}+a^4bx^5+\frac{5}{4}a^3b^2x^8+\frac{10}{11}a^2b^3x^{11}+\frac{5}{14}ab^4x^{14}+\frac{b^5x^{17}}{17}$$

Antiderivative was successfully verified.

```
[In]  Int[x*(a + b*x^3)^5,x]
```

```
[Out] (a^5*x^2)/2 + a^4*b*x^5 + (5*a^3*b^2*x^8)/4 + (10*a^2*b^3*x^11)/1
1 + (5*a*b^4*x^14)/14 + (b^5*x^17)/17
```

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

$$a^5\int x\,dx+a^4bx^5+\frac{5a^3b^2x^8}{4}+\frac{10a^2b^3x^{11}}{11}+\frac{5ab^4x^{14}}{14}+\frac{b^5x^{17}}{17}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(b*x**3+a)**5,x)
```

```
[Out] a**5*Integral(x, x) + a**4*b*x**5 + 5*a**3*b**2*x**8/4 + 10*a**2*
b**3*x**11/11 + 5*a*b**4*x**14/14 + b**5*x**17/17
```

Mathematica [A] time = 0.00360333, size = 66, normalized size = 1.

$$\frac{a^5x^2}{2}+a^4bx^5+\frac{5}{4}a^3b^2x^8+\frac{10}{11}a^2b^3x^{11}+\frac{5}{14}ab^4x^{14}+\frac{b^5x^{17}}{17}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x*(a + b*x^3)^5,x]
```

```
[Out] (a^5*x^2)/2 + a^4*b*x^5 + (5*a^3*b^2*x^8)/4 + (10*a^2*b^3*x^11)/1
1 + (5*a*b^4*x^14)/14 + (b^5*x^17)/17
```

Maple [A] time = 0.001, size = 57, normalized size = 0.9

$$\frac{a^5x^2}{2}+a^4bx^5+\frac{5\,a^3b^2x^8}{4}+\frac{10\,a^2b^3x^{11}}{11}+\frac{5\,ab^4x^{14}}{14}+\frac{b^5x^{17}}{17}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(b*x^3+a)^5,x)
```

```
[Out] 1/2*a^5*x^2+a^4*b*x^5+5/4*a^3*b^2*x^8+10/11*a^2*b^3*x^11+5/14*a*b
^4*x^14+1/17*b^5*x^17
```

Maxima [A] time = 1.43203, size = 76, normalized size = 1.15

$$\frac{1}{17}\,b^5x^{17} + \frac{5}{14}\,ab^4x^{14} + \frac{10}{11}\,a^2b^3x^{11} + \frac{5}{4}\,a^3b^2x^8 + a^4bx^5 + \frac{1}{2}\,a^5x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5*x,x, algorithm="maxima")
```

```
[Out] 1/17*b^5*x^17 + 5/14*a*b^4*x^14 + 10/11*a^2*b^3*x^11 + 5/4*a^3*b^
2*x^8 + a^4*b*x^5 + 1/2*a^5*x^2
```

Fricas [A] time = 0.187279, size = 1, normalized size = 0.02

$$\frac{1}{17}x^{17}b^5 + \frac{5}{14}x^{14}b^4a + \frac{10}{11}x^{11}b^3a^2 + \frac{5}{4}x^8b^2a^3 + x^5ba^4 + \frac{1}{2}x^2a^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5*x,x, algorithm="fricas")
```

```
[Out] 1/17*x^17*b^5 + 5/14*x^14*b^4*a + 10/11*x^11*b^3*a^2 + 5/4*x^8*b^
2*a^3 + x^5*b*a^4 + 1/2*x^2*a^5
```

Sympy [A] time = 0.12257, size = 63, normalized size = 0.95

$$\frac{a^5x^2}{2} + a^4bx^5 + \frac{5a^3b^2x^8}{4} + \frac{10a^2b^3x^{11}}{11} + \frac{5ab^4x^{14}}{14} + \frac{b^5x^{17}}{17}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(b*x**3+a)**5,x)
```

```
[Out] a**5*x**2/2 + a**4*b*x**5 + 5*a**3*b**2*x**8/4 + 10*a**2*b**3*x**
11/11 + 5*a*b**4*x**14/14 + b**5*x**17/17
```

GIAC/XCAS [A] time = 0.221125, size = 76, normalized size = 1.15

$$\frac{1}{17}\,b^5x^{17} + \frac{5}{14}\,ab^4x^{14} + \frac{10}{11}\,a^2b^3x^{11} + \frac{5}{4}\,a^3b^2x^8 + a^4bx^5 + \frac{1}{2}\,a^5x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5*x,x, algorithm="giac")
```

```
[Out] 1/17*b^5*x^17 + 5/14*a*b^4*x^14 + 10/11*a^2*b^3*x^11 + 5/4*a^3*b^
2*x^8 + a^4*b*x^5 + 1/2*a^5*x^2
```

3.278 $\int (a + bx^3)^5 \, dx$

Optimal. Leaf size=61

$$a^5x + \frac{5}{4}a^4bx^4 + \frac{10}{7}a^3b^2x^7 + a^2b^3x^{10} + \frac{5}{13}ab^4x^{13} + \frac{b^5x^{16}}{16}$$

```
[Out] a^5*x + (5*a^4*b*x^4)/4 + (10*a^3*b^2*x^7)/7 + a^2*b^3*x^10 + (5*
a*b^4*x^13)/13 + (b^5*x^16)/16
```

Rubi [A] time = 0.0473088, antiderivative size = 61, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111

$$a^5x + \frac{5}{4}a^4bx^4 + \frac{10}{7}a^3b^2x^7 + a^2b^3x^{10} + \frac{5}{13}ab^4x^{13} + \frac{b^5x^{16}}{16}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^3)^5,x]
```

```
[Out] a^5*x + (5*a^4*b*x^4)/4 + (10*a^3*b^2*x^7)/7 + a^2*b^3*x^10 + (5*
a*b^4*x^13)/13 + (b^5*x^16)/16
```

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

$$\frac{5a^4bx^4}{4} + \frac{10a^3b^2x^7}{7} + a^2b^3x^{10} + \frac{5ab^4x^{13}}{13} + \frac{b^5x^{16}}{16} + \int a^5 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**3+a)**5,x)
```

```
[Out] 5*a**4*b*x**4/4 + 10*a**3*b**2*x**7/7 + a**2*b**3*x**10 + 5*a*b**
4*x**13/13 + b**5*x**16/16 + Integral(a**5, x)
```

Mathematica [A] time = 0.00195414, size = 61, normalized size = 1.

$$a^5x + \frac{5}{4}a^4bx^4 + \frac{10}{7}a^3b^2x^7 + a^2b^3x^{10} + \frac{5}{13}ab^4x^{13} + \frac{b^5x^{16}}{16}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^3)^5,x]
```

```
[Out] a^5*x + (5*a^4*b*x^4)/4 + (10*a^3*b^2*x^7)/7 + a^2*b^3*x^10 + (5*
a*b^4*x^13)/13 + (b^5*x^16)/16
```

Maple [A] time = 0.002, size = 54, normalized size = 0.9

$$xa^5 + \frac{5\,a^4bx^4}{4} + \frac{10\,a^3b^2x^7}{7} + a^2b^3x^{10} + \frac{5\,ab^4x^{13}}{13} + \frac{b^5x^{16}}{16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^5,x)
```

```
[Out] x*a^5+5/4*a^4*b*x^4+10/7*a^3*b^2*x^7+a^2*b^3*x^10+5/13*a*b^4*x^13
+1/16*b^5*x^16
```

Maxima [A] time = 1.44357, size = 72, normalized size = 1.18

$$\frac{1}{16}\,b^5x^{16}+\frac{5}{13}\,ab^4x^{13}+a^2b^3x^{10}+\frac{10}{7}\,a^3b^2x^7+\frac{5}{4}\,a^4bx^4+a^5x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5,x, algorithm="maxima")
```

```
[Out] 1/16*b^5*x^16 + 5/13*a*b^4*x^13 + a^2*b^3*x^10 + 10/7*a^3*b^2*x^7
 + 5/4*a^4*b*x^4 + a^5*x
```

Fricas [A] time = 0.188272, size = 1, normalized size = 0.02

$$\frac{1}{16}x^{16}b^5+\frac{5}{13}x^{13}b^4a+x^{10}b^3a^2+\frac{10}{7}x^7b^2a^3+\frac{5}{4}x^4ba^4+xa^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5,x, algorithm="fricas")
```

```
[Out] 1/16*x^16*b^5 + 5/13*x^13*b^4*a + x^10*b^3*a^2 + 10/7*x^7*b^2*a^3
 + 5/4*x^4*b*a^4 + x*a^5
```

Sympy [A] time = 0.11651, size = 60, normalized size = 0.98

$$a^5x+\frac{5a^4bx^4}{4}+\frac{10a^3b^2x^7}{7}+a^2b^3x^{10}+\frac{5ab^4x^{13}}{13}+\frac{b^5x^{16}}{16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**5,x)
```

```
[Out] a**5*x + 5*a**4*b*x**4/4 + 10*a**3*b**2*x**7/7 + a**2*b**3*x**10
+ 5*a*b**4*x**13/13 + b**5*x**16/16
```

GIAC/XCAS [A] time = 0.222414, size = 72, normalized size = 1.18

$$\frac{1}{16}\,b^5x^{16}+\frac{5}{13}\,ab^4x^{13}+a^2b^3x^{10}+\frac{10}{7}\,a^3b^2x^7+\frac{5}{4}\,a^4bx^4+a^5x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5,x, algorithm="giac")
```

```
[Out] 1/16*b^5*x^16 + 5/13*a*b^4*x^13 + a^2*b^3*x^10 + 10/7*a^3*b^2*x^7
 + 5/4*a^4*b*x^4 + a^5*x
```

3.279 $\int \frac{(a+bx^3)^5}{x^2} dx$

Optimal. Leaf size=65

$$-\frac{a^5}{x}+\frac{5}{2}a^4bx^2+2a^3b^2x^5+\frac{5}{4}a^2b^3x^8+\frac{5}{11}ab^4x^{11}+\frac{b^5x^{14}}{14}$$

```
[Out] -(a^5/x) + (5*a^4*b*x^2)/2 + 2*a^3*b^2*x^5 + (5*a^2*b^3*x^8)/4 +
(5*a*b^4*x^11)/11 + (b^5*x^14)/14
```

Rubi [A] time = 0.0585079, antiderivative size = 65, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a^5}{x}+\frac{5}{2}a^4bx^2+2a^3b^2x^5+\frac{5}{4}a^2b^3x^8+\frac{5}{11}ab^4x^{11}+\frac{b^5x^{14}}{14}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^5/x^2,x]
```

```
[Out] -(a^5/x) + (5*a^4*b*x^2)/2 + 2*a^3*b^2*x^5 + (5*a^2*b^3*x^8)/4 +
(5*a*b^4*x^11)/11 + (b^5*x^14)/14
```

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

$$-\frac{a^5}{x}+5a^4b\int x\,dx+2a^3b^2x^5+\frac{5a^2b^3x^8}{4}+\frac{5ab^4x^{11}}{11}+\frac{b^5x^{14}}{14}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**5/x**2,x)
```

```
[Out] -a**5/x + 5*a**4*b*Integral(x, x) + 2*a**3*b**2*x**5 + 5*a**2*b**
3*x**8/4 + 5*a*b**4*x**11/11 + b**5*x**14/14
```

Mathematica [A] time = 0.00713306, size = 65, normalized size = 1.

$$-\frac{a^5}{x}+\frac{5}{2}a^4bx^2+2a^3b^2x^5+\frac{5}{4}a^2b^3x^8+\frac{5}{11}ab^4x^{11}+\frac{b^5x^{14}}{14}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^5/x^2,x]
```

```
[Out] -(a^5/x) + (5*a^4*b*x^2)/2 + 2*a^3*b^2*x^5 + (5*a^2*b^3*x^8)/4 +
(5*a*b^4*x^11)/11 + (b^5*x^14)/14
```

Maple [A] time = 0.005, size = 58, normalized size = 0.9

$$-\frac{a^5}{x}+\frac{5\,a^4bx^2}{2}+2\,a^3b^2x^5+\frac{5\,a^2b^3x^8}{4}+\frac{5\,ab^4x^{11}}{11}+\frac{b^5x^{14}}{14}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^5/x^2,x)
```

```
[Out] -a^5/x+5/2*a^4*b*x^2+2*a^3*b^2*x^5+5/4*a^2*b^3*x^8+5/11*a*b^4*x^1
1+1/14*b^5*x^14
```

Maxima [A] time = 1.43463, size = 77, normalized size = 1.18

$$\frac{1}{14}\, b^{5} x^{14} + \frac{5}{11}\, a b^{4} x^{11} + \frac{5}{4}\, a^{2} b^{3} x^{8} + 2\, a^{3} b^{2} x^{5} + \frac{5}{2}\, a^{4} b x^{2} - \frac{a^{5}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/14*b^5*x^14 + 5/11*a*b^4*x^11 + 5/4*a^2*b^3*x^8 + 2*a^3*b^2*x^5
 + 5/2*a^4*b*x^2 - a^5/x
```

Fricas [A] time = 0.205099, size = 80, normalized size = 1.23

$$\frac{22\, b^{5} x^{15} + 140\, a b^{4} x^{12} + 385\, a^{2} b^{3} x^{9} + 616\, a^{3} b^{2} x^{6} + 770\, a^{4} b x^{3} - 308\, a^{5}}{308\, x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/308*(22*b^5*x^15 + 140*a*b^4*x^12 + 385*a^2*b^3*x^9 + 616*a^3*b
^2*x^6 + 770*a^4*b*x^3 - 308*a^5)/x
```

Sympy [A] time = 1.17163, size = 61, normalized size = 0.94

$$- \frac{a^{5}}{x} + \frac{5 a^{4} b x^{2}}{2} + 2 a^{3} b^{2} x^{5} + \frac{5 a^{2} b^{3} x^{8}}{4} + \frac{5 a b^{4} x^{11}}{11} + \frac{b^{5} x^{14}}{14}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**5/x**2,x)
```

```
[Out] -a**5/x + 5*a**4*b*x**2/2 + 2*a**3*b**2*x**5 + 5*a**2*b**3*x**8/4
 + 5*a*b**4*x**11/11 + b**5*x**14/14
```

GIAC/XCAS [A] time = 0.226459, size = 77, normalized size = 1.18

$$\frac{1}{14}\, b^{5} x^{14} + \frac{5}{11}\, a b^{4} x^{11} + \frac{5}{4}\, a^{2} b^{3} x^{8} + 2\, a^{3} b^{2} x^{5} + \frac{5}{2}\, a^{4} b x^{2} - \frac{a^{5}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/14*b^5*x^14 + 5/11*a*b^4*x^11 + 5/4*a^2*b^3*x^8 + 2*a^3*b^2*x^5
 + 5/2*a^4*b*x^2 - a^5/x
```

3.280 $\int \frac{(a+bx^3)^5}{x^3} \, dx$

Optimal. Leaf size=65

$$-\frac{a^5}{2x^2}+5a^4bx+\frac{5}{2}a^3b^2x^4+\frac{10}{7}a^2b^3x^7+\frac{1}{2}ab^4x^{10}+\frac{b^5x^{13}}{13}$$

```
[Out] -a^5/(2*x^2) + 5*a^4*b*x + (5*a^3*b^2*x^4)/2 + (10*a^2*b^3*x^7)/7
 + (a*b^4*x^10)/2 + (b^5*x^13)/13
```

Rubi [A] time = 0.0562805, antiderivative size = 65, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a^5}{2x^2}+5a^4bx+\frac{5}{2}a^3b^2x^4+\frac{10}{7}a^2b^3x^7+\frac{1}{2}ab^4x^{10}+\frac{b^5x^{13}}{13}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^5/x^3,x]
```

```
[Out] -a^5/(2*x^2) + 5*a^4*b*x + (5*a^3*b^2*x^4)/2 + (10*a^2*b^3*x^7)/7
 + (a*b^4*x^10)/2 + (b^5*x^13)/13
```

Rubi in Sympy [A] time = 10.864, size = 61, normalized size = 0.94

$$-\frac{a^5}{2x^2}+5a^4bx+\frac{5a^3b^2x^4}{2}+\frac{10a^2b^3x^7}{7}+\frac{ab^4x^{10}}{2}+\frac{b^5x^{13}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**5/x**3,x)
```

```
[Out] -a**5/(2*x**2) + 5*a**4*b*x + 5*a**3*b**2*x**4/2 + 10*a**2*b**3*x
**7/7 + a*b**4*x**10/2 + b**5*x**13/13
```

Mathematica [A] time = 0.00778775, size = 65, normalized size = 1.

$$-\frac{a^5}{2x^2}+5a^4bx+\frac{5}{2}a^3b^2x^4+\frac{10}{7}a^2b^3x^7+\frac{1}{2}ab^4x^{10}+\frac{b^5x^{13}}{13}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^5/x^3,x]
```

```
[Out] -a^5/(2*x^2) + 5*a^4*b*x + (5*a^3*b^2*x^4)/2 + (10*a^2*b^3*x^7)/7
 + (a*b^4*x^10)/2 + (b^5*x^13)/13
```

Maple [A] time = 0.005, size = 56, normalized size = 0.9

$$-\frac{a^5}{2\,x^2}+5\,a^4bx+\frac{5\,a^3b^2x^4}{2}+\frac{10\,a^2b^3x^7}{7}+\frac{ab^4x^{10}}{2}+\frac{b^5x^{13}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^5/x^3,x)
```

```
[Out] -1/2*a^5/x^2+5*a^4*b*x+5/2*a^3*b^2*x^4+10/7*a^2*b^3*x^7+1/2*a*b^4
*x^10+1/13*b^5*x^13
```

Maxima [A]   time = 1.44252, size = 74, normalized size = 1.14

$$\frac{1}{13}\,b^5x^{13}+\frac{1}{2}\,ab^4x^{10}+\frac{10}{7}\,a^2b^3x^7+\frac{5}{2}\,a^3b^2x^4+5\,a^4bx-\frac{a^5}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^3,x, algorithm="maxima")
```

```
[Out] 1/13*b^5*x^13 + 1/2*a*b^4*x^10 + 10/7*a^2*b^3*x^7 + 5/2*a^3*b^2*x
^4 + 5*a^4*b*x - 1/2*a^5/x^2
```

Fricas [A]   time = 0.203451, size = 80, normalized size = 1.23

$$\frac{14\,b^5x^{15}+91\,ab^4x^{12}+260\,a^2b^3x^9+455\,a^3b^2x^6+910\,a^4bx^3-91\,a^5}{182\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^3,x, algorithm="fricas")
```

```
[Out] 1/182*(14*b^5*x^15 + 91*a*b^4*x^12 + 260*a^2*b^3*x^9 + 455*a^3*b^
2*x^6 + 910*a^4*b*x^3 - 91*a^5)/x^2
```

Sympy [A]   time = 1.20857, size = 61, normalized size = 0.94

$$-\frac{a^5}{2x^2}+5a^4bx+\frac{5a^3b^2x^4}{2}+\frac{10a^2b^3x^7}{7}+\frac{ab^4x^{10}}{2}+\frac{b^5x^{13}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**5/x**3,x)
```

```
[Out] -a**5/(2*x**2) + 5*a**4*b*x + 5*a**3*b**2*x**4/2 + 10*a**2*b**3*x
**7/7 + a*b**4*x**10/2 + b**5*x**13/13
```

GIAC/XCAS [A]   time = 0.224384, size = 74, normalized size = 1.14

$$\frac{1}{13}\,b^5x^{13}+\frac{1}{2}\,ab^4x^{10}+\frac{10}{7}\,a^2b^3x^7+\frac{5}{2}\,a^3b^2x^4+5\,a^4bx-\frac{a^5}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^3,x, algorithm="giac")
```

```
[Out] 1/13*b^5*x^13 + 1/2*a*b^4*x^10 + 10/7*a^2*b^3*x^7 + 5/2*a^3*b^2*x
^4 + 5*a^4*b*x - 1/2*a^5/x^2
```

3.281 $\int \frac{(a+bx^3)^5}{x^5}\,dx$

Optimal. Leaf size=63

$$-\frac{a^5}{4x^4}-\frac{5a^4b}{x}+5a^3b^2x^2+2a^2b^3x^5+\frac{5}{8}ab^4x^8+\frac{b^5x^{11}}{11}$$

```
[Out] -a^5/(4*x^4) - (5*a^4*b)/x + 5*a^3*b^2*x^2 + 2*a^2*b^3*x^5 + (5*a
*b^4*x^8)/8 + (b^5*x^11)/11
```

Rubi [A] time = 0.0579662, antiderivative size = 63, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a^5}{4x^4}-\frac{5a^4b}{x}+5a^3b^2x^2+2a^2b^3x^5+\frac{5}{8}ab^4x^8+\frac{b^5x^{11}}{11}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^5/x^5,x]
```

```
[Out] -a^5/(4*x^4) - (5*a^4*b)/x + 5*a^3*b^2*x^2 + 2*a^2*b^3*x^5 + (5*a
*b^4*x^8)/8 + (b^5*x^11)/11
```

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

$$-\frac{a^5}{4x^4}-\frac{5a^4b}{x}+10a^3b^2\int x\,dx+2a^2b^3x^5+\frac{5ab^4x^8}{8}+\frac{b^5x^{11}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**5/x**5,x)
```

```
[Out] -a**5/(4*x**4) - 5*a**4*b/x + 10*a**3*b**2*Integral(x, x) + 2*a**
2*b**3*x**5 + 5*a*b**4*x**8/8 + b**5*x**11/11
```

Mathematica [A] time = 0.0112509, size = 63, normalized size = 1.

$$-\frac{a^5}{4x^4}-\frac{5a^4b}{x}+5a^3b^2x^2+2a^2b^3x^5+\frac{5}{8}ab^4x^8+\frac{b^5x^{11}}{11}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^5/x^5,x]
```

```
[Out] -a^5/(4*x^4) - (5*a^4*b)/x + 5*a^3*b^2*x^2 + 2*a^2*b^3*x^5 + (5*a
*b^4*x^8)/8 + (b^5*x^11)/11
```

Maple [A] time = 0.008, size = 58, normalized size = 0.9

$$-\frac{a^5}{4\,x^4}-5\,\frac{a^4b}{x}+5\,a^3b^2x^2+2\,a^2b^3x^5+\frac{5\,ab^4x^8}{8}+\frac{b^5x^{11}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^5/x^5,x)
```

```
[Out] -1/4*a^5/x^4-5*a^4*b/x+5*a^3*b^2*x^2+2*a^2*b^3*x^5+5/8*a*b^4*x^8+
1/11*b^5*x^11
```

Maxima [A] time = 1.42435, size = 78, normalized size = 1.24

$$\frac{1}{11}\,b^5x^{11}+\frac{5}{8}\,ab^4x^8+2\,a^2b^3x^5+5\,a^3b^2x^2-\frac{20\,a^4bx^3+a^5}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^5,x, algorithm="maxima")
```

```
[Out] 1/11*b^5*x^11 + 5/8*a*b^4*x^8 + 2*a^2*b^3*x^5 + 5*a^3*b^2*x^2 - 1
/4*(20*a^4*b*x^3 + a^5)/x^4
```

Fricas [A] time = 0.205073, size = 80, normalized size = 1.27

$$\frac{8\,b^5x^{15}+55\,ab^4x^{12}+176\,a^2b^3x^9+440\,a^3b^2x^6-440\,a^4bx^3-22\,a^5}{88\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^5,x, algorithm="fricas")
```

```
[Out] 1/88*(8*b^5*x^15 + 55*a*b^4*x^12 + 176*a^2*b^3*x^9 + 440*a^3*b^2*
x^6 - 440*a^4*b*x^3 - 22*a^5)/x^4
```

Sympy [A] time = 1.39178, size = 61, normalized size = 0.97

$$5a^3b^2x^2+2a^2b^3x^5+\frac{5ab^4x^8}{8}+\frac{b^5x^{11}}{11}-\frac{a^5+20a^4bx^3}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**5/x**5,x)
```

```
[Out] 5*a**3*b**2*x**2 + 2*a**2*b**3*x**5 + 5*a*b**4*x**8/8 + b**5*x**1
1/11 - (a**5 + 20*a**4*b*x**3)/(4*x**4)
```

GIAC/XCAS [A] time = 0.21861, size = 78, normalized size = 1.24

$$\frac{1}{11}\,b^5x^{11}+\frac{5}{8}\,ab^4x^8+2\,a^2b^3x^5+5\,a^3b^2x^2-\frac{20\,a^4bx^3+a^5}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^5,x, algorithm="giac")
```

```
[Out] 1/11*b^5*x^11 + 5/8*a*b^4*x^8 + 2*a^2*b^3*x^5 + 5*a^3*b^2*x^2 - 1
/4*(20*a^4*b*x^3 + a^5)/x^4
```

3.282 $\int \frac{(a+bx^3)^5}{x^6} dx$

Optimal. Leaf size=65

$$-\frac{a^5}{5x^5} - \frac{5a^4b}{2x^2} + 10a^3b^2x + \frac{5}{2}a^2b^3x^4 + \frac{5}{7}ab^4x^7 + \frac{b^5x^{10}}{10}$$

```
[Out] -a^5/(5*x^5) - (5*a^4*b)/(2*x^2) + 10*a^3*b^2*x + (5*a^2*b^3*x^4)
/2 + (5*a*b^4*x^7)/7 + (b^5*x^10)/10
```

Rubi [A] time = 0.0567029, antiderivative size = 65, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$-\frac{a^5}{5x^5} - \frac{5a^4b}{2x^2} + 10a^3b^2x + \frac{5}{2}a^2b^3x^4 + \frac{5}{7}ab^4x^7 + \frac{b^5x^{10}}{10}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^5/x^6,x]
```

```
[Out] -a^5/(5*x^5) - (5*a^4*b)/(2*x^2) + 10*a^3*b^2*x + (5*a^2*b^3*x^4)
/2 + (5*a*b^4*x^7)/7 + (b^5*x^10)/10
```

Rubi in Sympy [A] time = 10.9506, size = 63, normalized size = 0.97

$$-\frac{a^5}{5x^5} - \frac{5a^4b}{2x^2} + 10a^3b^2x + \frac{5a^2b^3x^4}{2} + \frac{5ab^4x^7}{7} + \frac{b^5x^{10}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**5/x**6,x)
```

```
[Out] -a**5/(5*x**5) - 5*a**4*b/(2*x**2) + 10*a**3*b**2*x + 5*a**2*b**3
*x**4/2 + 5*a*b**4*x**7/7 + b**5*x**10/10
```

Mathematica [A] time = 0.00733881, size = 65, normalized size = 1.

$$-\frac{a^5}{5x^5} - \frac{5a^4b}{2x^2} + 10a^3b^2x + \frac{5}{2}a^2b^3x^4 + \frac{5}{7}ab^4x^7 + \frac{b^5x^{10}}{10}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^5/x^6,x]
```

```
[Out] -a^5/(5*x^5) - (5*a^4*b)/(2*x^2) + 10*a^3*b^2*x + (5*a^2*b^3*x^4)
/2 + (5*a*b^4*x^7)/7 + (b^5*x^10)/10
```

Maple [A] time = 0.008, size = 56, normalized size = 0.9

$$-\frac{a^5}{5\,x^5} - \frac{5\,a^4b}{2\,x^2} + 10\,a^3b^2x + \frac{5\,a^2b^3x^4}{2} + \frac{5\,ab^4x^7}{7} + \frac{b^5x^{10}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^5/x^6,x)
```

```
[Out] -1/5*a^5/x^5-5/2*a^4*b/x^2+10*a^3*b^2*x+5/2*a^2*b^3*x^4+5/7*a*b^4
*x^7+1/10*b^5*x^10
```

Maxima [A] time = 1.43288, size = 78, normalized size = 1.2

$$\frac{1}{10}\,b^5x^{10} + \frac{5}{7}\,ab^4x^7 + \frac{5}{2}\,a^2b^3x^4 + 10\,a^3b^2x - \frac{25\,a^4bx^3 + 2\,a^5}{10\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^6,x, algorithm="maxima")
```

```
[Out] 1/10*b^5*x^10 + 5/7*a*b^4*x^7 + 5/2*a^2*b^3*x^4 + 10*a^3*b^2*x -
1/10*(25*a^4*b*x^3 + 2*a^5)/x^5
```

Fricas [A] time = 0.203039, size = 80, normalized size = 1.23

$$\frac{7\,b^5x^{15} + 50\,ab^4x^{12} + 175\,a^2b^3x^9 + 700\,a^3b^2x^6 - 175\,a^4bx^3 - 14\,a^5}{70\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^6,x, algorithm="fricas")
```

```
[Out] 1/70*(7*b^5*x^15 + 50*a*b^4*x^12 + 175*a^2*b^3*x^9 + 700*a^3*b^2*
x^6 - 175*a^4*b*x^3 - 14*a^5)/x^5
```

Sympy [A] time = 1.36714, size = 63, normalized size = 0.97

$$10a^3b^2x + \frac{5a^2b^3x^4}{2} + \frac{5ab^4x^7}{7} + \frac{b^5x^{10}}{10} - \frac{2a^5 + 25a^4bx^3}{10x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**5/x**6,x)
```

```
[Out] 10*a**3*b**2*x + 5*a**2*b**3*x**4/2 + 5*a*b**4*x**7/7 + b**5*x**1
0/10 - (2*a**5 + 25*a**4*b*x**3)/(10*x**5)
```

GIAC/XCAS [A] time = 0.220677, size = 78, normalized size = 1.2

$$\frac{1}{10}\,b^5x^{10} + \frac{5}{7}\,ab^4x^7 + \frac{5}{2}\,a^2b^3x^4 + 10\,a^3b^2x - \frac{25\,a^4bx^3 + 2\,a^5}{10\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^6,x, algorithm="giac")
```

```
[Out] 1/10*b^5*x^10 + 5/7*a*b^4*x^7 + 5/2*a^2*b^3*x^4 + 10*a^3*b^2*x -
1/10*(25*a^4*b*x^3 + 2*a^5)/x^5
```

3.283 $\int \frac{(a+bx^3)^5}{x^8} dx$

Optimal. Leaf size=62

$$-\frac{a^5}{7x^7}-\frac{5a^4b}{4x^4}-\frac{10a^3b^2}{x}+5a^2b^3x^2+ab^4x^5+\frac{b^5x^8}{8}$$

```
[Out] -a^5/(7*x^7) - (5*a^4*b)/(4*x^4) - (10*a^3*b^2)/x + 5*a^2*b^3*x^2
 + a*b^4*x^5 + (b^5*x^8)/8
```

Rubi [A] time = 0.0671913, antiderivative size = 62, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a^5}{7x^7}-\frac{5a^4b}{4x^4}-\frac{10a^3b^2}{x}+5a^2b^3x^2+ab^4x^5+\frac{b^5x^8}{8}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^3)^5/x^8,x]
```

```
[Out] -a^5/(7*x^7) - (5*a^4*b)/(4*x^4) - (10*a^3*b^2)/x + 5*a^2*b^3*x^2
 + a*b^4*x^5 + (b^5*x^8)/8
```

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

$$-\frac{a^5}{7x^7}-\frac{5a^4b}{4x^4}-\frac{10a^3b^2}{x}+10a^2b^3\int x\,dx+ab^4x^5+\frac{b^5x^8}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**3+a)**5/x**8,x)
```

```
[Out] -a**5/(7*x**7) - 5*a**4*b/(4*x**4) - 10*a**3*b**2/x + 10*a**2*b**
3*Integral(x, x) + a*b**4*x**5 + b**5*x**8/8
```

Mathematica [A] time = 0.00724857, size = 62, normalized size = 1.

$$-\frac{a^5}{7x^7}-\frac{5a^4b}{4x^4}-\frac{10a^3b^2}{x}+5a^2b^3x^2+ab^4x^5+\frac{b^5x^8}{8}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^3)^5/x^8,x]
```

```
[Out] -a^5/(7*x^7) - (5*a^4*b)/(4*x^4) - (10*a^3*b^2)/x + 5*a^2*b^3*x^2
 + a*b^4*x^5 + (b^5*x^8)/8
```

Maple [A] time = 0.008, size = 57, normalized size = 0.9

$$-\frac{a^5}{7\,x^7}-\frac{5\,a^4b}{4\,x^4}-10\,\frac{a^3b^2}{x}+5\,a^2b^3x^2+ab^4x^5+\frac{b^5x^8}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^5/x^8,x)
```

```
[Out] -1/7*a^5/x^7-5/4*a^4*b/x^4-10*a^3*b^2/x+5*a^2*b^3*x^2+a*b^4*x^5+1
/8*b^5*x^8
```

Maxima [A] time = 1.42869, size = 80, normalized size = 1.29

$$\frac{1}{8}\,b^5x^8 + ab^4x^5 + 5\,a^2b^3x^2 - \frac{280\,a^3b^2x^6 + 35\,a^4bx^3 + 4\,a^5}{28\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^8,x, algorithm="maxima")
```

```
[Out] 1/8*b^5*x^8 + a*b^4*x^5 + 5*a^2*b^3*x^2 - 1/28*(280*a^3*b^2*x^6 +
 35*a^4*b*x^3 + 4*a^5)/x^7
```

Fricas [A] time = 0.206535, size = 80, normalized size = 1.29

$$\frac{7\,b^5x^{15} + 56\,ab^4x^{12} + 280\,a^2b^3x^9 - 560\,a^3b^2x^6 - 70\,a^4bx^3 - 8\,a^5}{56\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^8,x, algorithm="fricas")
```

```
[Out] 1/56*(7*b^5*x^15 + 56*a*b^4*x^12 + 280*a^2*b^3*x^9 - 560*a^3*b^2*
x^6 - 70*a^4*b*x^3 - 8*a^5)/x^7
```

Sympy [A] time = 1.6108, size = 60, normalized size = 0.97

$$5a^2b^3x^2 + ab^4x^5 + \frac{b^5x^8}{8} - \frac{4a^5 + 35a^4bx^3 + 280a^3b^2x^6}{28x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**5/x**8,x)
```

```
[Out] 5*a**2*b**3*x**2 + a*b**4*x**5 + b**5*x**8/8 - (4*a**5 + 35*a**4*
b*x**3 + 280*a**3*b**2*x**6)/(28*x**7)
```

GIAC/XCAS [A] time = 0.217634, size = 80, normalized size = 1.29

$$\frac{1}{8}\,b^5x^8 + ab^4x^5 + 5\,a^2b^3x^2 - \frac{280\,a^3b^2x^6 + 35\,a^4bx^3 + 4\,a^5}{28\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^8,x, algorithm="giac")
```

```
[Out] 1/8*b^5*x^8 + a*b^4*x^5 + 5*a^2*b^3*x^2 - 1/28*(280*a^3*b^2*x^6 +
 35*a^4*b*x^3 + 4*a^5)/x^7
```

3.284 $\int \frac{(a+bx^3)^5}{x^9} dx$

Optimal. Leaf size=61

$$-\frac{a^5}{8x^8}-\frac{a^4b}{x^5}-\frac{5a^3b^2}{x^2}+10a^2b^3x+\frac{5}{4}ab^4x^4+\frac{b^5x^7}{7}$$

```
[Out] -a^5/(8*x^8) - (a^4*b)/x^5 - (5*a^3*b^2)/x^2 + 10*a^2*b^3*x + (5*
a*b^4*x^4)/4 + (b^5*x^7)/7
```

Rubi [A] time = 0.0602035, antiderivative size = 61, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a^5}{8x^8}-\frac{a^4b}{x^5}-\frac{5a^3b^2}{x^2}+10a^2b^3x+\frac{5}{4}ab^4x^4+\frac{b^5x^7}{7}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^5/x^9,x]
```

```
[Out] -a^5/(8*x^8) - (a^4*b)/x^5 - (5*a^3*b^2)/x^2 + 10*a^2*b^3*x + (5*
a*b^4*x^4)/4 + (b^5*x^7)/7
```

Rubi in Sympy [A] time = 11.0784, size = 58, normalized size = 0.95

$$-\frac{a^5}{8x^8}-\frac{a^4b}{x^5}-\frac{5a^3b^2}{x^2}+10a^2b^3x+\frac{5ab^4x^4}{4}+\frac{b^5x^7}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**5/x**9,x)
```

```
[Out] -a**5/(8*x**8) - a**4*b/x**5 - 5*a**3*b**2/x**2 + 10*a**2*b**3*x
+ 5*a*b**4*x**4/4 + b**5*x**7/7
```

Mathematica [A] time = 0.00747608, size = 61, normalized size = 1.

$$-\frac{a^5}{8x^8}-\frac{a^4b}{x^5}-\frac{5a^3b^2}{x^2}+10a^2b^3x+\frac{5}{4}ab^4x^4+\frac{b^5x^7}{7}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^5/x^9,x]
```

```
[Out] -a^5/(8*x^8) - (a^4*b)/x^5 - (5*a^3*b^2)/x^2 + 10*a^2*b^3*x + (5*
a*b^4*x^4)/4 + (b^5*x^7)/7
```

Maple [A] time = 0.008, size = 56, normalized size = 0.9

$$-\frac{a^5}{8\,x^8}-\frac{a^4b}{x^5}-5\,\frac{a^3b^2}{x^2}+10\,a^2b^3x+\frac{5\,ab^4x^4}{4}+\frac{b^5x^7}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^5/x^9,x)
```

```
[Out] -1/8*a^5/x^8-a^4*b/x^5-5*a^3*b^2/x^2+10*a^2*b^3*x+5/4*a*b^4*x^4+1
/7*b^5*x^7
```

Maxima [A] time = 1.4396, size = 76, normalized size = 1.25

$$\frac{1}{7}\,b^{5}x^{7}+\frac{5}{4}\,ab^{4}x^{4}+10\,a^{2}b^{3}x-\frac{40\,a^{3}b^{2}x^{6}+8\,a^{4}bx^{3}+a^{5}}{8\,x^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^9,x, algorithm="maxima")
```

```
[Out] 1/7*b^5*x^7 + 5/4*a*b^4*x^4 + 10*a^2*b^3*x - 1/8*(40*a^3*b^2*x^6
+ 8*a^4*b*x^3 + a^5)/x^8
```

Fricas [A] time = 0.205113, size = 80, normalized size = 1.31

$$\frac{8\,b^{5}x^{15}+70\,ab^{4}x^{12}+560\,a^{2}b^{3}x^{9}-280\,a^{3}b^{2}x^{6}-56\,a^{4}bx^{3}-7\,a^{5}}{56\,x^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^9,x, algorithm="fricas")
```

```
[Out] 1/56*(8*b^5*x^15 + 70*a*b^4*x^12 + 560*a^2*b^3*x^9 - 280*a^3*b^2*
x^6 - 56*a^4*b*x^3 - 7*a^5)/x^8
```

Sympy [A] time = 1.61977, size = 60, normalized size = 0.98

$$10a^{2}b^{3}x+\frac{5ab^{4}x^{4}}{4}+\frac{b^{5}x^{7}}{7}-\frac{a^{5}+8a^{4}bx^{3}+40a^{3}b^{2}x^{6}}{8x^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**5/x**9,x)
```

```
[Out] 10*a**2*b**3*x + 5*a*b**4*x**4/4 + b**5*x**7/7 - (a**5 + 8*a**4*b
*x**3 + 40*a**3*b**2*x**6)/(8*x**8)
```

GIAC/XCAS [A] time = 0.21905, size = 76, normalized size = 1.25

$$\frac{1}{7}\,b^{5}x^{7}+\frac{5}{4}\,ab^{4}x^{4}+10\,a^{2}b^{3}x-\frac{40\,a^{3}b^{2}x^{6}+8\,a^{4}bx^{3}+a^{5}}{8\,x^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5/x^9,x, algorithm="giac")
```

```
[Out] 1/7*b^5*x^7 + 5/4*a*b^4*x^4 + 10*a^2*b^3*x - 1/8*(40*a^3*b^2*x^6
+ 8*a^4*b*x^3 + a^5)/x^8
```

3.285 $\int x^{20}\left(a+bx^3\right)^8\,dx$

Optimal. Leaf size=129

$$\frac{a^6\left(a+bx^3\right)^9}{27b^7}-\frac{a^5\left(a+bx^3\right)^{10}}{5b^7}+\frac{5a^4\left(a+bx^3\right)^{11}}{11b^7}-\frac{5a^3\left(a+bx^3\right)^{12}}{9b^7}+\frac{5a^2\left(a+bx^3\right)^{13}}{13b^7}+\frac{\left(a+bx^3\right)^{15}}{45b^7}-\frac{a\left(a+bx^3\right)^{14}}{7b^7}$$

```
[Out] (a^6*(a + b*x^3)^9)/(27*b^7) - (a^5*(a + b*x^3)^10)/(5*b^7) + (5*
a^4*(a + b*x^3)^11)/(11*b^7) - (5*a^3*(a + b*x^3)^12)/(9*b^7) + (
5*a^2*(a + b*x^3)^13)/(13*b^7) - (a*(a + b*x^3)^14)/(7*b^7) + (a
+ b*x^3)^15/(45*b^7)
```

Rubi [A] time = 0.43871, antiderivative size = 129, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^6\left(a+bx^3\right)^9}{27b^7}-\frac{a^5\left(a+bx^3\right)^{10}}{5b^7}+\frac{5a^4\left(a+bx^3\right)^{11}}{11b^7}-\frac{5a^3\left(a+bx^3\right)^{12}}{9b^7}+\frac{5a^2\left(a+bx^3\right)^{13}}{13b^7}+\frac{\left(a+bx^3\right)^{15}}{45b^7}-\frac{a\left(a+bx^3\right)^{14}}{7b^7}$$

Antiderivative was successfully verified.

```
[In]  Int[x^20*(a + b*x^3)^8,x]
```

```
[Out] (a^6*(a + b*x^3)^9)/(27*b^7) - (a^5*(a + b*x^3)^10)/(5*b^7) + (5*
a^4*(a + b*x^3)^11)/(11*b^7) - (5*a^3*(a + b*x^3)^12)/(9*b^7) + (
5*a^2*(a + b*x^3)^13)/(13*b^7) - (a*(a + b*x^3)^14)/(7*b^7) + (a
+ b*x^3)^15/(45*b^7)
```

Rubi in Sympy [A] time = 25.2957, size = 105, normalized size = 0.81

$$\frac{a^8x^{21}}{21}+\frac{a^7bx^{24}}{3}+\frac{28a^6b^2x^{27}}{27}+\frac{28a^5b^3x^{30}}{15}+\frac{70a^4b^4x^{33}}{33}+\frac{14a^3b^5x^{36}}{9}+\frac{28a^2b^6x^{39}}{39}+\frac{4ab^7x^{42}}{21}+\frac{b^8x^{45}}{45}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**20*(b*x**3+a)**8,x)
```

```
[Out] a**8*x**21/21 + a**7*b*x**24/3 + 28*a**6*b**2*x**27/27 + 28*a**5*
b**3*x**30/15 + 70*a**4*b**4*x**33/33 + 14*a**3*b**5*x**36/9 + 28
*a**2*b**6*x**39/39 + 4*a*b**7*x**42/21 + b**8*x**45/45
```

Mathematica [A] time = 0.00513093, size = 108, normalized size = 0.84

$$\frac{a^8x^{21}}{21}+\frac{1}{3}a^7bx^{24}+\frac{28}{27}a^6b^2x^{27}+\frac{28}{15}a^5b^3x^{30}+\frac{70}{33}a^4b^4x^{33}+\frac{14}{9}a^3b^5x^{36}+\frac{28}{39}a^2b^6x^{39}+\frac{4}{21}ab^7x^{42}+\frac{b^8x^{45}}{45}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^20*(a + b*x^3)^8,x]
```

```
[Out] (a^8*x^21)/21 + (a^7*b*x^24)/3 + (28*a^6*b^2*x^27)/27 + (28*a^5*b
^3*x^30)/15 + (70*a^4*b^4*x^33)/33 + (14*a^3*b^5*x^36)/9 + (28*a^
2*b^6*x^39)/39 + (4*a*b^7*x^42)/21 + (b^8*x^45)/45
```

Maple [A] time = 0.003, size = 91, normalized size = 0.7

$$\frac{b^8x^{45}}{45}+\frac{4\,ab^7x^{42}}{21}+\frac{28\,a^2b^6x^{39}}{39}+\frac{14\,a^3b^5x^{36}}{9}+\frac{70\,a^4b^4x^{33}}{33}+\frac{28\,a^5b^3x^{30}}{15}+\frac{28\,a^6b^2x^{27}}{27}+\frac{a^7bx^{24}}{3}+\frac{a^8x^{21}}{21}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^20*(b*x^3+a)^8,x)
```

```
[Out] 1/45*b^8*x^45+4/21*a*b^7*x^42+28/39*a^2*b^6*x^39+14/9*a^3*b^5*x^3
6+70/33*a^4*b^4*x^33+28/15*a^5*b^3*x^30+28/27*a^6*b^2*x^27+1/3*a^
7*b*x^24+1/21*a^8*x^21
```

Maxima [A] time = 1.429, size = 122, normalized size = 0.95

$$\frac{1}{45}\,b^8x^{45}+\frac{4}{21}\,ab^7x^{42}+\frac{28}{39}\,a^2b^6x^{39}+\frac{14}{9}\,a^3b^5x^{36}+\frac{70}{33}\,a^4b^4x^{33}+\frac{28}{15}\,a^5b^3x^{30}+\frac{28}{27}\,a^6b^2x^{27}+\frac{1}{3}\,a^7bx^{24}+\frac{1}{21}\,a^8x^{21}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8*x^20,x, algorithm="maxima")
```

```
[Out] 1/45*b^8*x^45 + 4/21*a*b^7*x^42 + 28/39*a^2*b^6*x^39 + 14/9*a^3*b
^5*x^36 + 70/33*a^4*b^4*x^33 + 28/15*a^5*b^3*x^30 + 28/27*a^6*b^2
*x^27 + 1/3*a^7*b*x^24 + 1/21*a^8*x^21
```

Fricas [A] time = 0.190702, size = 1, normalized size = 0.01

$$\frac{1}{45}x^{45}b^8+\frac{4}{21}x^{42}b^7a+\frac{28}{39}x^{39}b^6a^2+\frac{14}{9}x^{36}b^5a^3+\frac{70}{33}x^{33}b^4a^4+\frac{28}{15}x^{30}b^3a^5+\frac{28}{27}x^{27}b^2a^6+\frac{1}{3}x^{24}ba^7+\frac{1}{21}x^{21}a^8$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8*x^20,x, algorithm="fricas")
```

```
[Out] 1/45*x^45*b^8 + 4/21*x^42*b^7*a + 28/39*x^39*b^6*a^2 + 14/9*x^36*
b^5*a^3 + 70/33*x^33*b^4*a^4 + 28/15*x^30*b^3*a^5 + 28/27*x^27*b^
2*a^6 + 1/3*x^24*b*a^7 + 1/21*x^21*a^8
```

Sympy [A] time = 0.179298, size = 105, normalized size = 0.81

$$\frac{a^8x^{21}}{21}+\frac{a^7bx^{24}}{3}+\frac{28a^6b^2x^{27}}{27}+\frac{28a^5b^3x^{30}}{15}+\frac{70a^4b^4x^{33}}{33}+\frac{14a^3b^5x^{36}}{9}+\frac{28a^2b^6x^{39}}{39}+\frac{4ab^7x^{42}}{21}+\frac{b^8x^{45}}{45}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**20*(b*x**3+a)**8,x)
```

```
[Out] a**8*x**21/21 + a**7*b*x**24/3 + 28*a**6*b**2*x**27/27 + 28*a**5*
b**3*x**30/15 + 70*a**4*b**4*x**33/33 + 14*a**3*b**5*x**36/9 + 28
*a**2*b**6*x**39/39 + 4*a*b**7*x**42/21 + b**8*x**45/45
```

GIAC/XCAS [A] time = 0.217363, size = 122, normalized size = 0.95

$$\frac{1}{45}\,b^8x^{45} + \frac{4}{21}\,ab^7x^{42} + \frac{28}{39}\,a^2b^6x^{39} + \frac{14}{9}\,a^3b^5x^{36} + \frac{70}{33}\,a^4b^4x^{33} + \frac{28}{15}\,a^5b^3x^{30} + \frac{28}{27}\,a^6b^2x^{27} + \frac{1}{3}\,a^7bx^{24} + \frac{1}{21}\,a^8x^{21}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8*x^20,x, algorithm="giac")
```

```
[Out] 1/45*b^8*x^45 + 4/21*a*b^7*x^42 + 28/39*a^2*b^6*x^39 + 14/9*a^3*b
^5*x^36 + 70/33*a^4*b^4*x^33 + 28/15*a^5*b^3*x^30 + 28/27*a^6*b^2
*x^27 + 1/3*a^7*b*x^24 + 1/21*a^8*x^21
```

3.286 $\int x^{17} \left(a+bx^3\right)^8 \, dx$

Optimal. Leaf size=110

$$-\frac{a^5 \left(a+bx^3\right)^9}{27b^6}+\frac{a^4 \left(a+bx^3\right)^{10}}{6b^6}-\frac{10a^3 \left(a+bx^3\right)^{11}}{33b^6}+\frac{5a^2 \left(a+bx^3\right)^{12}}{18b^6}+\frac{\left(a+bx^3\right)^{14}}{42b^6}-\frac{5a \left(a+bx^3\right)^{13}}{39b^6}$$

```
[Out] -(a^5*(a + b*x^3)^9)/(27*b^6) + (a^4*(a + b*x^3)^10)/(6*b^6) - (1
0*a^3*(a + b*x^3)^11)/(33*b^6) + (5*a^2*(a + b*x^3)^12)/(18*b^6)
- (5*a*(a + b*x^3)^13)/(39*b^6) + (a + b*x^3)^14/(42*b^6)
```

Rubi [A] time = 0.346615, antiderivative size = 110, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$-\frac{a^5 \left(a+bx^3\right)^9}{27b^6}+\frac{a^4 \left(a+bx^3\right)^{10}}{6b^6}-\frac{10a^3 \left(a+bx^3\right)^{11}}{33b^6}+\frac{5a^2 \left(a+bx^3\right)^{12}}{18b^6}+\frac{\left(a+bx^3\right)^{14}}{42b^6}-\frac{5a \left(a+bx^3\right)^{13}}{39b^6}$$

Antiderivative was successfully verified.

```
[In]  Int[x^17*(a + b*x^3)^8,x]
```

```
[Out] -(a^5*(a + b*x^3)^9)/(27*b^6) + (a^4*(a + b*x^3)^10)/(6*b^6) - (1
0*a^3*(a + b*x^3)^11)/(33*b^6) + (5*a^2*(a + b*x^3)^12)/(18*b^6)
- (5*a*(a + b*x^3)^13)/(39*b^6) + (a + b*x^3)^14/(42*b^6)
```

Rubi in Sympy [A] time = 27.7336, size = 100, normalized size = 0.91

$$-\frac{a^5 \left(a+bx^3\right)^9}{27b^6}+\frac{a^4 \left(a+bx^3\right)^{10}}{6b^6}-\frac{10a^3 \left(a+bx^3\right)^{11}}{33b^6}+\frac{5a^2 \left(a+bx^3\right)^{12}}{18b^6}-\frac{5a \left(a+bx^3\right)^{13}}{39b^6}+\frac{\left(a+bx^3\right)^{14}}{42b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**17*(b*x**3+a)**8,x)
```

```
[Out] -a**5*(a + b*x**3)**9/(27*b**6) + a**4*(a + b*x**3)**10/(6*b**6)
- 10*a**3*(a + b*x**3)**11/(33*b**6) + 5*a**2*(a + b*x**3)**12/(1
8*b**6) - 5*a*(a + b*x**3)**13/(39*b**6) + (a + b*x**3)**14/(42*b
**6)
```

Mathematica [A] time = 0.00473479, size = 108, normalized size = 0.98

$$\frac{a^8x^{18}}{18}+\frac{8}{21}a^7bx^{21}+\frac{7}{6}a^6b^2x^{24}+\frac{56}{27}a^5b^3x^{27}+\frac{7}{3}a^4b^4x^{30}+\frac{56}{33}a^3b^5x^{33}+\frac{7}{9}a^2b^6x^{36}+\frac{8}{39}ab^7x^{39}+\frac{b^8x^{42}}{42}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^17*(a + b*x^3)^8,x]
```

```
[Out] (a^8*x^18)/18 + (8*a^7*b*x^21)/21 + (7*a^6*b^2*x^24)/6 + (56*a^5*
b^3*x^27)/27 + (7*a^4*b^4*x^30)/3 + (56*a^3*b^5*x^33)/33 + (7*a^2
*b^6*x^36)/9 + (8*a*b^7*x^39)/39 + (b^8*x^42)/42
```

Maple [A] time = 0.003, size = 91, normalized size = 0.8

$$\frac{b^8x^{42}}{42}+\frac{8\,ab^7x^{39}}{39}+\frac{7\,a^2b^6x^{36}}{9}+\frac{56\,a^3b^5x^{33}}{33}+\frac{7\,a^4b^4x^{30}}{3}+\frac{56\,a^5b^3x^{27}}{27}+\frac{7\,a^6b^2x^{24}}{6}+\frac{8\,a^7bx^{21}}{21}+\frac{a^8x^{18}}{18}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^17*(b*x^3+a)^8,x)
```

```
[Out] 1/42*b^8*x^42+8/39*a*b^7*x^39+7/9*a^2*b^6*x^36+56/33*a^3*b^5*x^33
+7/3*a^4*b^4*x^30+56/27*a^5*b^3*x^27+7/6*a^6*b^2*x^24+8/21*a^7*b*
x^21+1/18*a^8*x^18
```

Maxima [A] time = 1.43434, size = 122, normalized size = 1.11

$$\frac{1}{42}\,b^8x^{42}+\frac{8}{39}\,ab^7x^{39}+\frac{7}{9}\,a^2b^6x^{36}+\frac{56}{33}\,a^3b^5x^{33}+\frac{7}{3}\,a^4b^4x^{30}+\frac{56}{27}\,a^5b^3x^{27}+\frac{7}{6}\,a^6b^2x^{24}+\frac{8}{21}\,a^7bx^{21}+\frac{1}{18}\,a^8x^{18}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^3 + a)^8*x^17,x, algorithm="maxima")
```

```
[Out] 1/42*b^8*x^42 + 8/39*a*b^7*x^39 + 7/9*a^2*b^6*x^36 + 56/33*a^3*b^
5*x^33 + 7/3*a^4*b^4*x^30 + 56/27*a^5*b^3*x^27 + 7/6*a^6*b^2*x^24
 + 8/21*a^7*b*x^21 + 1/18*a^8*x^18
```

Fricas [A] time = 0.192949, size = 1, normalized size = 0.01

$$\frac{1}{42}x^{42}b^8+\frac{8}{39}x^{39}b^7a+\frac{7}{9}x^{36}b^6a^2+\frac{56}{33}x^{33}b^5a^3+\frac{7}{3}x^{30}b^4a^4+\frac{56}{27}x^{27}b^3a^5+\frac{7}{6}x^{24}b^2a^6+\frac{8}{21}x^{21}ba^7+\frac{1}{18}x^{18}a^8$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^3 + a)^8*x^17,x, algorithm="fricas")
```

```
[Out] 1/42*x^42*b^8 + 8/39*x^39*b^7*a + 7/9*x^36*b^6*a^2 + 56/33*x^33*b
^5*a^3 + 7/3*x^30*b^4*a^4 + 56/27*x^27*b^3*a^5 + 7/6*x^24*b^2*a^6
 + 8/21*x^21*b*a^7 + 1/18*x^18*a^8
```

Sympy [A] time = 0.162676, size = 107, normalized size = 0.97

$$\frac{a^8x^{18}}{18}+\frac{8a^7bx^{21}}{21}+\frac{7a^6b^2x^{24}}{6}+\frac{56a^5b^3x^{27}}{27}+\frac{7a^4b^4x^{30}}{3}+\frac{56a^3b^5x^{33}}{33}+\frac{7a^2b^6x^{36}}{9}+\frac{8ab^7x^{39}}{39}+\frac{b^8x^{42}}{42}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**17*(b*x**3+a)**8,x)
```

```
[Out] a**8*x**18/18 + 8*a**7*b*x**21/21 + 7*a**6*b**2*x**24/6 + 56*a**5
*b**3*x**27/27 + 7*a**4*b**4*x**30/3 + 56*a**3*b**5*x**33/33 + 7*
a**2*b**6*x**36/9 + 8*a*b**7*x**39/39 + b**8*x**42/42
```

GIAC/XCAS [A] time = 0.21549, size = 122, normalized size = 1.11

$$\frac{1}{42}\,b^8x^{42}+\frac{8}{39}\,ab^7x^{39}+\frac{7}{9}\,a^2b^6x^{36}+\frac{56}{33}\,a^3b^5x^{33}+\frac{7}{3}\,a^4b^4x^{30}+\frac{56}{27}\,a^5b^3x^{27}+\frac{7}{6}\,a^6b^2x^{24}+\frac{8}{21}\,a^7bx^{21}+\frac{1}{18}\,a^8x^{18}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^3 + a)^8*x^17,x, algorithm="giac")
```

```
[Out] 1/42*b^8*x^42 + 8/39*a*b^7*x^39 + 7/9*a^2*b^6*x^36 + 56/33*a^3*b^
5*x^33 + 7/3*a^4*b^4*x^30 + 56/27*a^5*b^3*x^27 + 7/6*a^6*b^2*x^24
 + 8/21*a^7*b*x^21 + 1/18*a^8*x^18
```

3.287 $\int x^{14} \left(a+bx^3\right)^8 \, dx$

Optimal. Leaf size=91

$$\frac{a^4\left(a+bx^3\right)^9}{27b^5}-\frac{2a^3\left(a+bx^3\right)^{10}}{15b^5}+\frac{2a^2\left(a+bx^3\right)^{11}}{11b^5}+\frac{\left(a+bx^3\right)^{13}}{39b^5}-\frac{a\left(a+bx^3\right)^{12}}{9b^5}$$

```
[Out] (a^4*(a + b*x^3)^9)/(27*b^5) - (2*a^3*(a + b*x^3)^10)/(15*b^5) +
(2*a^2*(a + b*x^3)^11)/(11*b^5) - (a*(a + b*x^3)^12)/(9*b^5) + (a
 + b*x^3)^13/(39*b^5)
```

Rubi [A] time = 0.289569, antiderivative size = 91, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^4\left(a+bx^3\right)^9}{27b^5}-\frac{2a^3\left(a+bx^3\right)^{10}}{15b^5}+\frac{2a^2\left(a+bx^3\right)^{11}}{11b^5}+\frac{\left(a+bx^3\right)^{13}}{39b^5}-\frac{a\left(a+bx^3\right)^{12}}{9b^5}$$

Antiderivative was successfully verified.

```
[In]  Int[x^14*(a + b*x^3)^8,x]
```

```
[Out] (a^4*(a + b*x^3)^9)/(27*b^5) - (2*a^3*(a + b*x^3)^10)/(15*b^5) +
(2*a^2*(a + b*x^3)^11)/(11*b^5) - (a*(a + b*x^3)^12)/(9*b^5) + (a
 + b*x^3)^13/(39*b^5)
```

Rubi in Sympy [A] time = 23.79, size = 82, normalized size = 0.9

$$\frac{a^4\left(a+bx^3\right)^9}{27b^5}-\frac{2a^3\left(a+bx^3\right)^{10}}{15b^5}+\frac{2a^2\left(a+bx^3\right)^{11}}{11b^5}-\frac{a\left(a+bx^3\right)^{12}}{9b^5}+\frac{\left(a+bx^3\right)^{13}}{39b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**14*(b*x**3+a)**8,x)
```

```
[Out] a**4*(a + b*x**3)**9/(27*b**5) - 2*a**3*(a + b*x**3)**10/(15*b**5
) + 2*a**2*(a + b*x**3)**11/(11*b**5) - a*(a + b*x**3)**12/(9*b**
5) + (a + b*x**3)**13/(39*b**5)
```

Mathematica [A] time = 0.00473191, size = 108, normalized size = 1.19

$$\frac{a^8x^{15}}{15}+\frac{4}{9}a^7bx^{18}+\frac{4}{3}a^6b^2x^{21}+\frac{7}{3}a^5b^3x^{24}+\frac{70}{27}a^4b^4x^{27}+\frac{28}{15}a^3b^5x^{30}+\frac{28}{33}a^2b^6x^{33}+\frac{2}{9}ab^7x^{36}+\frac{b^8x^{39}}{39}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^14*(a + b*x^3)^8,x]
```

```
[Out] (a^8*x^15)/15 + (4*a^7*b*x^18)/9 + (4*a^6*b^2*x^21)/3 + (7*a^5*b^
3*x^24)/3 + (70*a^4*b^4*x^27)/27 + (28*a^3*b^5*x^30)/15 + (28*a^2
*b^6*x^33)/33 + (2*a*b^7*x^36)/9 + (b^8*x^39)/39
```

Maple [A] time = 0.001, size = 91, normalized size = 1.

$$\frac{b^8x^{39}}{39}+\frac{2\,ab^7x^{36}}{9}+\frac{28\,a^2b^6x^{33}}{33}+\frac{28\,a^3b^5x^{30}}{15}+\frac{70\,a^4b^4x^{27}}{27}+\frac{7\,a^5b^3x^{24}}{3}+\frac{4\,a^6b^2x^{21}}{3}+\frac{4\,a^7bx^{18}}{9}+\frac{a^8x^{15}}{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^14*(b*x^3+a)^8,x)
```

```
[Out] 1/39*b^8*x^39+2/9*a*b^7*x^36+28/33*a^2*b^6*x^33+28/15*a^3*b^5*x^3
0+70/27*a^4*b^4*x^27+7/3*a^5*b^3*x^24+4/3*a^6*b^2*x^21+4/9*a^7*b*
x^18+1/15*a^8*x^15
```

Maxima [A] time = 1.44251, size = 122, normalized size = 1.34

$$\frac{1}{39}\,b^8x^{39}+\frac{2}{9}\,ab^7x^{36}+\frac{28}{33}\,a^2b^6x^{33}+\frac{28}{15}\,a^3b^5x^{30}+\frac{70}{27}\,a^4b^4x^{27}+\frac{7}{3}\,a^5b^3x^{24}+\frac{4}{3}\,a^6b^2x^{21}+\frac{4}{9}\,a^7bx^{18}+\frac{1}{15}\,a^8x^{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8*x^14,x, algorithm="maxima")
```

```
[Out] 1/39*b^8*x^39 + 2/9*a*b^7*x^36 + 28/33*a^2*b^6*x^33 + 28/15*a^3*b
^5*x^30 + 70/27*a^4*b^4*x^27 + 7/3*a^5*b^3*x^24 + 4/3*a^6*b^2*x^2
1 + 4/9*a^7*b*x^18 + 1/15*a^8*x^15
```

Fricas [A] time = 0.190995, size = 1, normalized size = 0.01

$$\frac{1}{39}x^{39}b^8+\frac{2}{9}x^{36}b^7a+\frac{28}{33}x^{33}b^6a^2+\frac{28}{15}x^{30}b^5a^3+\frac{70}{27}x^{27}b^4a^4+\frac{7}{3}x^{24}b^3a^5+\frac{4}{3}x^{21}b^2a^6+\frac{4}{9}x^{18}ba^7+\frac{1}{15}x^{15}a^8$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8*x^14,x, algorithm="fricas")
```

```
[Out] 1/39*x^39*b^8 + 2/9*x^36*b^7*a + 28/33*x^33*b^6*a^2 + 28/15*x^30*
b^5*a^3 + 70/27*x^27*b^4*a^4 + 7/3*x^24*b^3*a^5 + 4/3*x^21*b^2*a^
6 + 4/9*x^18*b*a^7 + 1/15*x^15*a^8
```

Sympy [A] time = 0.158714, size = 107, normalized size = 1.18

$$\frac{a^8x^{15}}{15}+\frac{4a^7bx^{18}}{9}+\frac{4a^6b^2x^{21}}{3}+\frac{7a^5b^3x^{24}}{3}+\frac{70a^4b^4x^{27}}{27}+\frac{28a^3b^5x^{30}}{15}+\frac{28a^2b^6x^{33}}{33}+\frac{2ab^7x^{36}}{9}+\frac{b^8x^{39}}{39}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**14*(b*x**3+a)**8,x)
```

```
[Out] a**8*x**15/15 + 4*a**7*b*x**18/9 + 4*a**6*b**2*x**21/3 + 7*a**5*b
**3*x**24/3 + 70*a**4*b**4*x**27/27 + 28*a**3*b**5*x**30/15 + 28*
a**2*b**6*x**33/33 + 2*a*b**7*x**36/9 + b**8*x**39/39
```

GIAC/XCAS [A] time = 0.213722, size = 122, normalized size = 1.34

$$\frac{1}{39}\,b^8x^{39}+\frac{2}{9}\,ab^7x^{36}+\frac{28}{33}\,a^2b^6x^{33}+\frac{28}{15}\,a^3b^5x^{30}+\frac{70}{27}\,a^4b^4x^{27}+\frac{7}{3}\,a^5b^3x^{24}+\frac{4}{3}\,a^6b^2x^{21}+\frac{4}{9}\,a^7bx^{18}+\frac{1}{15}\,a^8x^{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8*x^14,x, algorithm="giac")
```

```
[Out] 1/39*b^8*x^39 + 2/9*a*b^7*x^36 + 28/33*a^2*b^6*x^33 + 28/15*a^3*b
^5*x^30 + 70/27*a^4*b^4*x^27 + 7/3*a^5*b^3*x^24 + 4/3*a^6*b^2*x^2
1 + 4/9*a^7*b*x^18 + 1/15*a^8*x^15
```

3.288 $\int x^{11} \left(a+bx^3\right)^8 \, dx$

Optimal. Leaf size=72

$$-\frac{a^3 \left(a+bx^3\right)^9}{27b^4}+\frac{a^2 \left(a+bx^3\right)^{10}}{10b^4}+\frac{\left(a+bx^3\right)^{12}}{36b^4}-\frac{a \left(a+bx^3\right)^{11}}{11b^4}$$

```
[Out] -(a^3*(a + b*x^3)^9)/(27*b^4) + (a^2*(a + b*x^3)^10)/(10*b^4) - (
a*(a + b*x^3)^11)/(11*b^4) + (a + b*x^3)^12/(36*b^4)
```

Rubi [A] time = 0.236018, antiderivative size = 72, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$-\frac{a^3 \left(a+bx^3\right)^9}{27b^4}+\frac{a^2 \left(a+bx^3\right)^{10}}{10b^4}+\frac{\left(a+bx^3\right)^{12}}{36b^4}-\frac{a \left(a+bx^3\right)^{11}}{11b^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11*(a + b*x^3)^8,x]
```

```
[Out] -(a^3*(a + b*x^3)^9)/(27*b^4) + (a^2*(a + b*x^3)^10)/(10*b^4) - (
a*(a + b*x^3)^11)/(11*b^4) + (a + b*x^3)^12/(36*b^4)
```

Rubi in Sympy [A] time = 20.2975, size = 61, normalized size = 0.85

$$-\frac{a^3 \left(a+bx^3\right)^9}{27b^4}+\frac{a^2 \left(a+bx^3\right)^{10}}{10b^4}-\frac{a \left(a+bx^3\right)^{11}}{11b^4}+\frac{\left(a+bx^3\right)^{12}}{36b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11*(b*x**3+a)**8,x)
```

```
[Out] -a**3*(a + b*x**3)**9/(27*b**4) + a**2*(a + b*x**3)**10/(10*b**4)
 - a*(a + b*x**3)**11/(11*b**4) + (a + b*x**3)**12/(36*b**4)
```

Mathematica [A] time = 0.00481734, size = 108, normalized size = 1.5

$$\frac{a^8x^{12}}{12}+\frac{8}{15}a^7bx^{15}+\frac{14}{9}a^6b^2x^{18}+\frac{8}{3}a^5b^3x^{21}+\frac{35}{12}a^4b^4x^{24}+\frac{56}{27}a^3b^5x^{27}+\frac{14}{15}a^2b^6x^{30}+\frac{8}{33}ab^7x^{33}+\frac{b^8x^{36}}{36}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11*(a + b*x^3)^8,x]
```

```
[Out] (a^8*x^12)/12 + (8*a^7*b*x^15)/15 + (14*a^6*b^2*x^18)/9 + (8*a^5*
b^3*x^21)/3 + (35*a^4*b^4*x^24)/12 + (56*a^3*b^5*x^27)/27 + (14*a
^2*b^6*x^30)/15 + (8*a*b^7*x^33)/33 + (b^8*x^36)/36
```

Maple [A] time = 0.001, size = 91, normalized size = 1.3

$$\frac{b^8x^{36}}{36}+\frac{8\,ab^7x^{33}}{33}+\frac{14\,a^2b^6x^{30}}{15}+\frac{56\,a^3b^5x^{27}}{27}+\frac{35\,a^4b^4x^{24}}{12}+\frac{8\,a^5b^3x^{21}}{3}+\frac{14\,a^6b^2x^{18}}{9}+\frac{8\,a^7bx^{15}}{15}+\frac{a^8x^{12}}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^11*(b*x^3+a)^8,x)
```

```
[Out] 1/36*b^8*x^36+8/33*a*b^7*x^33+14/15*a^2*b^6*x^30+56/27*a^3*b^5*x^
27+35/12*a^4*b^4*x^24+8/3*a^5*b^3*x^21+14/9*a^6*b^2*x^18+8/15*a^7
*b*x^15+1/12*a^8*x^12
```

Maxima [A] time = 1.45139, size = 122, normalized size = 1.69

$$\frac{1}{36}\,b^8x^{36}+\frac{8}{33}\,ab^7x^{33}+\frac{14}{15}\,a^2b^6x^{30}+\frac{56}{27}\,a^3b^5x^{27}+\frac{35}{12}\,a^4b^4x^{24}+\frac{8}{3}\,a^5b^3x^{21}+\frac{14}{9}\,a^6b^2x^{18}+\frac{8}{15}\,a^7bx^{15}+\frac{1}{12}\,a^8x^{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^3 + a)^8*x^11,x, algorithm="maxima")
```

```
[Out] 1/36*b^8*x^36 + 8/33*a*b^7*x^33 + 14/15*a^2*b^6*x^30 + 56/27*a^3*
b^5*x^27 + 35/12*a^4*b^4*x^24 + 8/3*a^5*b^3*x^21 + 14/9*a^6*b^2*x
^18 + 8/15*a^7*b*x^15 + 1/12*a^8*x^12
```

Fricas [A] time = 0.191385, size = 1, normalized size = 0.01

$$\frac{1}{36}x^{36}b^8+\frac{8}{33}x^{33}b^7a+\frac{14}{15}x^{30}b^6a^2+\frac{56}{27}x^{27}b^5a^3+\frac{35}{12}x^{24}b^4a^4+\frac{8}{3}x^{21}b^3a^5+\frac{14}{9}x^{18}b^2a^6+\frac{8}{15}x^{15}ba^7+\frac{1}{12}x^{12}a^8$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^3 + a)^8*x^11,x, algorithm="fricas")
```

```
[Out] 1/36*x^36*b^8 + 8/33*x^33*b^7*a + 14/15*x^30*b^6*a^2 + 56/27*x^27
*b^5*a^3 + 35/12*x^24*b^4*a^4 + 8/3*x^21*b^3*a^5 + 14/9*x^18*b^2*
a^6 + 8/15*x^15*b*a^7 + 1/12*x^12*a^8
```

Sympy [A] time = 0.172578, size = 107, normalized size = 1.49

$$\frac{a^8x^{12}}{12}+\frac{8a^7bx^{15}}{15}+\frac{14a^6b^2x^{18}}{9}+\frac{8a^5b^3x^{21}}{3}+\frac{35a^4b^4x^{24}}{12}+\frac{56a^3b^5x^{27}}{27}+\frac{14a^2b^6x^{30}}{15}+\frac{8ab^7x^{33}}{33}+\frac{b^8x^{36}}{36}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**11*(b*x**3+a)**8,x)
```

```
[Out] a**8*x**12/12 + 8*a**7*b*x**15/15 + 14*a**6*b**2*x**18/9 + 8*a**5
*b**3*x**21/3 + 35*a**4*b**4*x**24/12 + 56*a**3*b**5*x**27/27 + 1
4*a**2*b**6*x**30/15 + 8*a*b**7*x**33/33 + b**8*x**36/36
```

GIAC/XCAS [A] time = 0.216599, size = 122, normalized size = 1.69

$$\frac{1}{36}\,b^8x^{36}+\frac{8}{33}\,ab^7x^{33}+\frac{14}{15}\,a^2b^6x^{30}+\frac{56}{27}\,a^3b^5x^{27}+\frac{35}{12}\,a^4b^4x^{24}+\frac{8}{3}\,a^5b^3x^{21}+\frac{14}{9}\,a^6b^2x^{18}+\frac{8}{15}\,a^7bx^{15}+\frac{1}{12}\,a^8x^{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8*x^11,x, algorithm="giac")
```

```
[Out] 1/36*b^8*x^36 + 8/33*a*b^7*x^33 + 14/15*a^2*b^6*x^30 + 56/27*a^3*
b^5*x^27 + 35/12*a^4*b^4*x^24 + 8/3*a^5*b^3*x^21 + 14/9*a^6*b^2*x
^18 + 8/15*a^7*b*x^15 + 1/12*a^8*x^12
```

3.289 $\int x^8 \left(a + bx^3\right)^8 dx$

Optimal. Leaf size=53

$$\frac{a^2 \left(a + bx^3\right)^9}{27b^3} + \frac{\left(a + bx^3\right)^{11}}{33b^3} - \frac{a \left(a + bx^3\right)^{10}}{15b^3}$$

```
[Out] (a^2*(a + b*x^3)^9)/(27*b^3) - (a*(a + b*x^3)^10)/(15*b^3) + (a +
 b*x^3)^11/(33*b^3)
```

Rubi [A] time = 0.183065, antiderivative size = 53, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$\frac{a^2 \left(a + bx^3\right)^9}{27b^3} + \frac{\left(a + bx^3\right)^{11}}{33b^3} - \frac{a \left(a + bx^3\right)^{10}}{15b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8*(a + b*x^3)^8,x]
```

```
[Out] (a^2*(a + b*x^3)^9)/(27*b^3) - (a*(a + b*x^3)^10)/(15*b^3) + (a +
 b*x^3)^11/(33*b^3)
```

Rubi in Sympy [A] time = 16.5377, size = 44, normalized size = 0.83

$$\frac{a^2 \left(a + bx^3\right)^9}{27b^3} - \frac{a \left(a + bx^3\right)^{10}}{15b^3} + \frac{\left(a + bx^3\right)^{11}}{33b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8*(b*x**3+a)**8,x)
```

```
[Out] a**2*(a + b*x**3)**9/(27*b**3) - a*(a + b*x**3)**10/(15*b**3) + (
a + b*x**3)**11/(33*b**3)
```

Mathematica [B] time = 0.00499077, size = 108, normalized size = 2.04

$$\frac{a^8x^9}{9} + \frac{2}{3}a^7bx^{12} + \frac{28}{15}a^6b^2x^{15} + \frac{28}{9}a^5b^3x^{18} + \frac{10}{3}a^4b^4x^{21} + \frac{7}{3}a^3b^5x^{24} + \frac{28}{27}a^2b^6x^{27} + \frac{4}{15}ab^7x^{30} + \frac{b^8x^{33}}{33}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8*(a + b*x^3)^8,x]
```

```
[Out] (a^8*x^9)/9 + (2*a^7*b*x^12)/3 + (28*a^6*b^2*x^15)/15 + (28*a^5*b
^3*x^18)/9 + (10*a^4*b^4*x^21)/3 + (7*a^3*b^5*x^24)/3 + (28*a^2*b
^6*x^27)/27 + (4*a*b^7*x^30)/15 + (b^8*x^33)/33
```

Maple [A] time = 0.003, size = 91, normalized size = 1.7

$$\frac{b^8x^{33}}{33} + \frac{4\,ab^7x^{30}}{15} + \frac{28\,a^2b^6x^{27}}{27} + \frac{7\,a^3b^5x^{24}}{3} + \frac{10\,a^4b^4x^{21}}{3} + \frac{28\,a^5b^3x^{18}}{9} + \frac{28\,a^6b^2x^{15}}{15} + \frac{2\,a^7bx^{12}}{3} + \frac{a^8x^9}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8*(b*x^3+a)^8,x)
```

```
[Out] 1/33*b^8*x^33+4/15*a*b^7*x^30+28/27*a^2*b^6*x^27+7/3*a^3*b^5*x^24
+10/3*a^4*b^4*x^21+28/9*a^5*b^3*x^18+28/15*a^6*b^2*x^15+2/3*a^7*b
*x^12+1/9*a^8*x^9
```

Maxima [A] time = 1.43502, size = 122, normalized size = 2.3

$$\frac{1}{33}\,b^{8}x^{33} + \frac{4}{15}\,ab^{7}x^{30} + \frac{28}{27}\,a^{2}b^{6}x^{27} + \frac{7}{3}\,a^{3}b^{5}x^{24} + \frac{10}{3}\,a^{4}b^{4}x^{21} + \frac{28}{9}\,a^{5}b^{3}x^{18} + \frac{28}{15}\,a^{6}b^{2}x^{15} + \frac{2}{3}\,a^{7}bx^{12} + \frac{1}{9}\,a^{8}x^{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8*x^8,x, algorithm="maxima")
```

```
[Out] 1/33*b^8*x^33 + 4/15*a*b^7*x^30 + 28/27*a^2*b^6*x^27 + 7/3*a^3*b^
5*x^24 + 10/3*a^4*b^4*x^21 + 28/9*a^5*b^3*x^18 + 28/15*a^6*b^2*x^
15 + 2/3*a^7*b*x^12 + 1/9*a^8*x^9
```

Fricas [A] time = 0.191034, size = 1, normalized size = 0.02

$$\frac{1}{33}x^{33}b^{8} + \frac{4}{15}x^{30}b^{7}a + \frac{28}{27}x^{27}b^{6}a^{2} + \frac{7}{3}x^{24}b^{5}a^{3} + \frac{10}{3}x^{21}b^{4}a^{4} + \frac{28}{9}x^{18}b^{3}a^{5} + \frac{28}{15}x^{15}b^{2}a^{6} + \frac{2}{3}x^{12}ba^{7} + \frac{1}{9}x^{9}a^{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8*x^8,x, algorithm="fricas")
```

```
[Out] 1/33*x^33*b^8 + 4/15*x^30*b^7*a + 28/27*x^27*b^6*a^2 + 7/3*x^24*b
^5*a^3 + 10/3*x^21*b^4*a^4 + 28/9*x^18*b^3*a^5 + 28/15*x^15*b^2*a
^6 + 2/3*x^12*b*a^7 + 1/9*x^9*a^8
```

Sympy [A] time = 0.16353, size = 107, normalized size = 2.02

$$\frac{a^{8}x^{9}}{9} + \frac{2a^{7}bx^{12}}{3} + \frac{28a^{6}b^{2}x^{15}}{15} + \frac{28a^{5}b^{3}x^{18}}{9} + \frac{10a^{4}b^{4}x^{21}}{3} + \frac{7a^{3}b^{5}x^{24}}{3} + \frac{28a^{2}b^{6}x^{27}}{27} + \frac{4ab^{7}x^{30}}{15} + \frac{b^{8}x^{33}}{33}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8*(b*x**3+a)**8,x)
```

```
[Out] a**8*x**9/9 + 2*a**7*b*x**12/3 + 28*a**6*b**2*x**15/15 + 28*a**5*
b**3*x**18/9 + 10*a**4*b**4*x**21/3 + 7*a**3*b**5*x**24/3 + 28*a*
*2*b**6*x**27/27 + 4*a*b**7*x**30/15 + b**8*x**33/33
```

GIAC/XCAS [A] time = 0.210636, size = 122, normalized size = 2.3

$$\frac{1}{33}\,b^{8}x^{33} + \frac{4}{15}\,ab^{7}x^{30} + \frac{28}{27}\,a^{2}b^{6}x^{27} + \frac{7}{3}\,a^{3}b^{5}x^{24} + \frac{10}{3}\,a^{4}b^{4}x^{21} + \frac{28}{9}\,a^{5}b^{3}x^{18} + \frac{28}{15}\,a^{6}b^{2}x^{15} + \frac{2}{3}\,a^{7}bx^{12} + \frac{1}{9}\,a^{8}x^{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8*x^8,x, algorithm="giac")
```

```
[Out] 1/33*b^8*x^33 + 4/15*a*b^7*x^30 + 28/27*a^2*b^6*x^27 + 7/3*a^3*b^
5*x^24 + 10/3*a^4*b^4*x^21 + 28/9*a^5*b^3*x^18 + 28/15*a^6*b^2*x^
15 + 2/3*a^7*b*x^12 + 1/9*a^8*x^9
```

3.290 $\int x^5 \left(a+bx^3\right)^8 \, dx$

Optimal. Leaf size=34

$$\frac{\left(a+bx^3\right)^{10}}{30b^2}-\frac{a\left(a+bx^3\right)^9}{27b^2}$$

```
[Out] -(a*(a + b*x^3)^9)/(27*b^2) + (a + b*x^3)^10/(30*b^2)
```

Rubi [A] time = 0.121589, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{\left(a+bx^3\right)^{10}}{30b^2}-\frac{a\left(a+bx^3\right)^9}{27b^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^5*(a + b*x^3)^8,x]
```

```
[Out] -(a*(a + b*x^3)^9)/(27*b^2) + (a + b*x^3)^10/(30*b^2)
```

Rubi in Sympy [A] time = 12.6277, size = 27, normalized size = 0.79

$$-\frac{a\left(a+bx^3\right)^9}{27b^2}+\frac{\left(a+bx^3\right)^{10}}{30b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**5*(b*x**3+a)**8,x)
```

```
[Out] -a*(a + b*x**3)**9/(27*b**2) + (a + b*x**3)**10/(30*b**2)
```

Mathematica [B] time = 0.00464487, size = 108, normalized size = 3.18

$$\frac{a^8x^6}{6}+\frac{8}{9}a^7bx^9+\frac{7}{3}a^6b^2x^{12}+\frac{56}{15}a^5b^3x^{15}+\frac{35}{9}a^4b^4x^{18}+\frac{8}{3}a^3b^5x^{21}+\frac{7}{6}a^2b^6x^{24}+\frac{8}{27}ab^7x^{27}+\frac{b^8x^{30}}{30}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5*(a + b*x^3)^8,x]
```

```
[Out] (a^8*x^6)/6 + (8*a^7*b*x^9)/9 + (7*a^6*b^2*x^12)/3 + (56*a^5*b^3*
x^15)/15 + (35*a^4*b^4*x^18)/9 + (8*a^3*b^5*x^21)/3 + (7*a^2*b^6*
x^24)/6 + (8*a*b^7*x^27)/27 + (b^8*x^30)/30
```

Maple [B] time = 0.003, size = 91, normalized size = 2.7

$$\frac{b^8x^{30}}{30}+\frac{8\,ab^7x^{27}}{27}+\frac{7\,a^2b^6x^{24}}{6}+\frac{8\,a^3b^5x^{21}}{3}+\frac{35\,a^4b^4x^{18}}{9}+\frac{56\,a^5b^3x^{15}}{15}+\frac{7\,a^6b^2x^{12}}{3}+\frac{8\,a^7bx^9}{9}+\frac{a^8x^6}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(b*x^3+a)^8,x)
```

```
[Out] 1/30*b^8*x^30+8/27*a*b^7*x^27+7/6*a^2*b^6*x^24+8/3*a^3*b^5*x^21+3
5/9*a^4*b^4*x^18+56/15*a^5*b^3*x^15+7/3*a^6*b^2*x^12+8/9*a^7*b*x^
9+1/6*a^8*x^6
```

Maxima [A] time = 1.45016, size = 122, normalized size = 3.59

$$\frac{1}{30}\,b^{8}x^{30}+\frac{8}{27}\,ab^{7}x^{27}+\frac{7}{6}\,a^{2}b^{6}x^{24}+\frac{8}{3}\,a^{3}b^{5}x^{21}+\frac{35}{9}\,a^{4}b^{4}x^{18}+\frac{56}{15}\,a^{5}b^{3}x^{15}+\frac{7}{3}\,a^{6}b^{2}x^{12}+\frac{8}{9}\,a^{7}bx^{9}+\frac{1}{6}\,a^{8}x^{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8*x^5,x, algorithm="maxima")
```

```
[Out] 1/30*b^8*x^30 + 8/27*a*b^7*x^27 + 7/6*a^2*b^6*x^24 + 8/3*a^3*b^5*
x^21 + 35/9*a^4*b^4*x^18 + 56/15*a^5*b^3*x^15 + 7/3*a^6*b^2*x^12
+ 8/9*a^7*b*x^9 + 1/6*a^8*x^6
```

Fricas [A] time = 0.19261, size = 1, normalized size = 0.03

$$\frac{1}{30}x^{30}b^{8}+\frac{8}{27}x^{27}b^{7}a+\frac{7}{6}x^{24}b^{6}a^{2}+\frac{8}{3}x^{21}b^{5}a^{3}+\frac{35}{9}x^{18}b^{4}a^{4}+\frac{56}{15}x^{15}b^{3}a^{5}+\frac{7}{3}x^{12}b^{2}a^{6}+\frac{8}{9}x^{9}ba^{7}+\frac{1}{6}x^{6}a^{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8*x^5,x, algorithm="fricas")
```

```
[Out] 1/30*x^30*b^8 + 8/27*x^27*b^7*a + 7/6*x^24*b^6*a^2 + 8/3*x^21*b^5
*a^3 + 35/9*x^18*b^4*a^4 + 56/15*x^15*b^3*a^5 + 7/3*x^12*b^2*a^6
+ 8/9*x^9*b*a^7 + 1/6*x^6*a^8
```

Sympy [A] time = 0.159232, size = 107, normalized size = 3.15

$$\frac{a^{8}x^{6}}{6}+\frac{8a^{7}bx^{9}}{9}+\frac{7a^{6}b^{2}x^{12}}{3}+\frac{56a^{5}b^{3}x^{15}}{15}+\frac{35a^{4}b^{4}x^{18}}{9}+\frac{8a^{3}b^{5}x^{21}}{3}+\frac{7a^{2}b^{6}x^{24}}{6}+\frac{8ab^{7}x^{27}}{27}+\frac{b^{8}x^{30}}{30}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5*(b*x**3+a)**8,x)
```

```
[Out] a**8*x**6/6 + 8*a**7*b*x**9/9 + 7*a**6*b**2*x**12/3 + 56*a**5*b**
3*x**15/15 + 35*a**4*b**4*x**18/9 + 8*a**3*b**5*x**21/3 + 7*a**2*
b**6*x**24/6 + 8*a*b**7*x**27/27 + b**8*x**30/30
```

GIAC/XCAS [A] time = 0.217471, size = 122, normalized size = 3.59

$$\frac{1}{30}\,b^{8}x^{30}+\frac{8}{27}\,ab^{7}x^{27}+\frac{7}{6}\,a^{2}b^{6}x^{24}+\frac{8}{3}\,a^{3}b^{5}x^{21}+\frac{35}{9}\,a^{4}b^{4}x^{18}+\frac{56}{15}\,a^{5}b^{3}x^{15}+\frac{7}{3}\,a^{6}b^{2}x^{12}+\frac{8}{9}\,a^{7}bx^{9}+\frac{1}{6}\,a^{8}x^{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8*x^5,x, algorithm="giac")
```

```
[Out] 1/30*b^8*x^30 + 8/27*a*b^7*x^27 + 7/6*a^2*b^6*x^24 + 8/3*a^3*b^5*
x^21 + 35/9*a^4*b^4*x^18 + 56/15*a^5*b^3*x^15 + 7/3*a^6*b^2*x^12
+ 8/9*a^7*b*x^9 + 1/6*a^8*x^6
```

3.291 $\int x^2 \left(a+bx^3\right)^8 \, dx$

Optimal. Leaf size=16

$$\frac{\left(a+bx^3\right)^9}{27b}$$

```
[Out] (a + b*x^3)^9/(27*b)
```

Rubi [A] time = 0.0127875, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{\left(a+bx^3\right)^9}{27b}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(a + b*x^3)^8,x]

[Out] (a + b*x^3)^9/(27*b)
```

Rubi in Sympy [A] time = 2.16829, size = 10, normalized size = 0.62

$$\frac{\left(a+bx^3\right)^9}{27b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**2*(b*x**3+a)**8,x)

[Out] (a + b*x**3)**9/(27*b)
```

Mathematica [B] time = 0.00466759, size = 108, normalized size = 6.75

$$\frac{a^8x^3}{3}+\frac{4}{3}a^7bx^6+\frac{28}{9}a^6b^2x^9+\frac{14}{3}a^5b^3x^{12}+\frac{14}{3}a^4b^4x^{15}+\frac{28}{9}a^3b^5x^{18}+\frac{4}{3}a^2b^6x^{21}+\frac{1}{3}ab^7x^{24}+\frac{b^8x^{27}}{27}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(a + b*x^3)^8,x]

[Out] (a^8*x^3)/3 + (4*a^7*b*x^6)/3 + (28*a^6*b^2*x^9)/9 + (14*a^5*b^3*
x^12)/3 + (14*a^4*b^4*x^15)/3 + (28*a^3*b^5*x^18)/9 + (4*a^2*b^6*
x^21)/3 + (a*b^7*x^24)/3 + (b^8*x^27)/27
```

Maple [B] time = 0.003, size = 91, normalized size = 5.7

$$\frac{b^8x^{27}}{27}+\frac{ab^7x^{24}}{3}+\frac{4\,a^2b^6x^{21}}{3}+\frac{28\,a^3b^5x^{18}}{9}+\frac{14\,a^4b^4x^{15}}{3}+\frac{14\,a^5b^3x^{12}}{3}+\frac{28\,a^6b^2x^9}{9}+\frac{4\,a^7bx^6}{3}+\frac{a^8x^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(b*x^3+a)^8,x)
```

```
[Out] 1/27*b^8*x^27+1/3*a*b^7*x^24+4/3*a^2*b^6*x^21+28/9*a^3*b^5*x^18+1
4/3*a^4*b^4*x^15+14/3*a^5*b^3*x^12+28/9*a^6*b^2*x^9+4/3*a^7*b*x^6
+1/3*a^8*x^3
```

Maxima [A] time = 1.46471, size = 19, normalized size = 1.19

$$\frac{(bx^3+a)^9}{27\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8*x^2,x, algorithm="maxima")
```

```
[Out] 1/27*(b*x^3 + a)^9/b
```

Fricas [A] time = 0.191555, size = 1, normalized size = 0.06

$$\frac{1}{27}x^{27}b^8+\frac{1}{3}x^{24}b^7a+\frac{4}{3}x^{21}b^6a^2+\frac{28}{9}x^{18}b^5a^3+\frac{14}{3}x^{15}b^4a^4+\frac{14}{3}x^{12}b^3a^5+\frac{28}{9}x^9b^2a^6+\frac{4}{3}x^6ba^7+\frac{1}{3}x^3a^8$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8*x^2,x, algorithm="fricas")
```

```
[Out] 1/27*x^27*b^8 + 1/3*x^24*b^7*a + 4/3*x^21*b^6*a^2 + 28/9*x^18*b^5
*a^3 + 14/3*x^15*b^4*a^4 + 14/3*x^12*b^3*a^5 + 28/9*x^9*b^2*a^6 +
 4/3*x^6*b*a^7 + 1/3*x^3*a^8
```

Sympy [A] time = 0.156872, size = 105, normalized size = 6.56

$$\frac{a^8x^3}{3}+\frac{4a^7bx^6}{3}+\frac{28a^6b^2x^9}{9}+\frac{14a^5b^3x^{12}}{3}+\frac{14a^4b^4x^{15}}{3}+\frac{28a^3b^5x^{18}}{9}+\frac{4a^2b^6x^{21}}{3}+\frac{ab^7x^{24}}{3}+\frac{b^8x^{27}}{27}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(b*x**3+a)**8,x)
```

```
[Out] a**8*x**3/3 + 4*a**7*b*x**6/3 + 28*a**6*b**2*x**9/9 + 14*a**5*b**
3*x**12/3 + 14*a**4*b**4*x**15/3 + 28*a**3*b**5*x**18/9 + 4*a**2*
b**6*x**21/3 + a*b**7*x**24/3 + b**8*x**27/27
```

GIAC/XCAS [A] time = 0.217166, size = 19, normalized size = 1.19

$$\frac{(bx^3+a)^9}{27\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8*x^2,x, algorithm="giac")
```

```
[Out] 1/27*(b*x^3 + a)^9/b
```

3.292 $\int \frac{(a+bx^3)^8}{x} \, dx$

Optimal. Leaf size=104

$$a^8\log(x)+\frac{8}{3}a^7bx^3+\frac{14}{3}a^6b^2x^6+\frac{56}{9}a^5b^3x^9+\frac{35}{6}a^4b^4x^{12}+\frac{56}{15}a^3b^5x^{15}+\frac{14}{9}a^2b^6x^{18}+\frac{8}{21}ab^7x^{21}+\frac{b^8x^{24}}{24}$$

```
[Out] (8*a^7*b*x^3)/3 + (14*a^6*b^2*x^6)/3 + (56*a^5*b^3*x^9)/9 + (35*a
^4*b^4*x^12)/6 + (56*a^3*b^5*x^15)/15 + (14*a^2*b^6*x^18)/9 + (8*
a*b^7*x^21)/21 + (b^8*x^24)/24 + a^8*Log[x]
```

Rubi [A] time = 0.11985, antiderivative size = 104, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$a^8\log(x)+\frac{8}{3}a^7bx^3+\frac{14}{3}a^6b^2x^6+\frac{56}{9}a^5b^3x^9+\frac{35}{6}a^4b^4x^{12}+\frac{56}{15}a^3b^5x^{15}+\frac{14}{9}a^2b^6x^{18}+\frac{8}{21}ab^7x^{21}+\frac{b^8x^{24}}{24}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^8/x,x]
```

```
[Out] (8*a^7*b*x^3)/3 + (14*a^6*b^2*x^6)/3 + (56*a^5*b^3*x^9)/9 + (35*a
^4*b^4*x^12)/6 + (56*a^3*b^5*x^15)/15 + (14*a^2*b^6*x^18)/9 + (8*
a*b^7*x^21)/21 + (b^8*x^24)/24 + a^8*Log[x]
```

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

$$\frac{a^8\log(x^3)}{3}+\frac{8a^7bx^3}{3}+\frac{28a^6b^2\int^{x^3}x\,dx}{3}+\frac{56a^5b^3x^9}{9}+\frac{35a^4b^4x^{12}}{6}+\frac{56a^3b^5x^{15}}{15}+\frac{14a^2b^6x^{18}}{9}+\frac{8ab^7x^{21}}{21}+\frac{b^8x^{24}}{24}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**8/x,x)
```

```
[Out] a**8*log(x**3)/3 + 8*a**7*b*x**3/3 + 28*a**6*b**2*Integral(x, (x,
 x**3))/3 + 56*a**5*b**3*x**9/9 + 35*a**4*b**4*x**12/6 + 56*a**3*
b**5*x**15/15 + 14*a**2*b**6*x**18/9 + 8*a*b**7*x**21/21 + b**8*x
**24/24
```

Mathematica [A] time = 0.00811701, size = 104, normalized size = 1.

$$a^8\log(x)+\frac{8}{3}a^7bx^3+\frac{14}{3}a^6b^2x^6+\frac{56}{9}a^5b^3x^9+\frac{35}{6}a^4b^4x^{12}+\frac{56}{15}a^3b^5x^{15}+\frac{14}{9}a^2b^6x^{18}+\frac{8}{21}ab^7x^{21}+\frac{b^8x^{24}}{24}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^8/x,x]
```

```
[Out] (8*a^7*b*x^3)/3 + (14*a^6*b^2*x^6)/3 + (56*a^5*b^3*x^9)/9 + (35*a
^4*b^4*x^12)/6 + (56*a^3*b^5*x^15)/15 + (14*a^2*b^6*x^18)/9 + (8*
a*b^7*x^21)/21 + (b^8*x^24)/24 + a^8*Log[x]
```

Maple [A] time = 0.005, size = 89, normalized size = 0.9

$$\frac{8 a^7 b x^3}{3}+\frac{14 a^6 b^2 x^6}{3}+\frac{56 a^5 b^3 x^9}{9}+\frac{35 a^4 b^4 x^{12}}{6}+\frac{56 a^3 b^5 x^{15}}{15}+\frac{14 a^2 b^6 x^{18}}{9}+\frac{8 a b^7 x^{21}}{21}+\frac{b^8 x^{24}}{24}+a^8 \ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^8/x,x)
```

```
[Out] 8/3*a^7*b*x^3+14/3*a^6*b^2*x^6+56/9*a^5*b^3*x^9+35/6*a^4*b^4*x^12
+56/15*a^3*b^5*x^15+14/9*a^2*b^6*x^18+8/21*a*b^7*x^21+1/24*b^8*x^
24+a^8*ln(x)
```

Maxima [A] time = 1.44793, size = 123, normalized size = 1.18

$$\frac{1}{24} b^8 x^{24}+\frac{8}{21} a b^7 x^{21}+\frac{14}{9} a^2 b^6 x^{18}+\frac{56}{15} a^3 b^5 x^{15}+\frac{35}{6} a^4 b^4 x^{12}+\frac{56}{9} a^5 b^3 x^9+\frac{14}{3} a^6 b^2 x^6+\frac{8}{3} a^7 b x^3+\frac{1}{3} a^8 \log\left(x^3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x,x, algorithm="maxima")
```

```
[Out] 1/24*b^8*x^24 + 8/21*a*b^7*x^21 + 14/9*a^2*b^6*x^18 + 56/15*a^3*b
^5*x^15 + 35/6*a^4*b^4*x^12 + 56/9*a^5*b^3*x^9 + 14/3*a^6*b^2*x^6
 + 8/3*a^7*b*x^3 + 1/3*a^8*log(x^3)
```

Fricas [A] time = 0.213882, size = 119, normalized size = 1.14

$$\frac{1}{24} b^8 x^{24}+\frac{8}{21} a b^7 x^{21}+\frac{14}{9} a^2 b^6 x^{18}+\frac{56}{15} a^3 b^5 x^{15}+\frac{35}{6} a^4 b^4 x^{12}+\frac{56}{9} a^5 b^3 x^9+\frac{14}{3} a^6 b^2 x^6+\frac{8}{3} a^7 b x^3+a^8 \log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x,x, algorithm="fricas")
```

```
[Out] 1/24*b^8*x^24 + 8/21*a*b^7*x^21 + 14/9*a^2*b^6*x^18 + 56/15*a^3*b
^5*x^15 + 35/6*a^4*b^4*x^12 + 56/9*a^5*b^3*x^9 + 14/3*a^6*b^2*x^6
 + 8/3*a^7*b*x^3 + a^8*log(x)
```

Sympy [A] time = 1.32147, size = 105, normalized size = 1.01

$$a^8 \log(x)+\frac{8a^7 b x^3}{3}+\frac{14a^6 b^2 x^6}{3}+\frac{56a^5 b^3 x^9}{9}+\frac{35a^4 b^4 x^{12}}{6}+\frac{56a^3 b^5 x^{15}}{15}+\frac{14a^2 b^6 x^{18}}{9}+\frac{8ab^7 x^{21}}{21}+\frac{b^8 x^{24}}{24}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**8/x,x)
```

```
[Out] a**8*log(x) + 8*a**7*b*x**3/3 + 14*a**6*b**2*x**6/3 + 56*a**5*b**
3*x**9/9 + 35*a**4*b**4*x**12/6 + 56*a**3*b**5*x**15/15 + 14*a**2
*b**6*x**18/9 + 8*a*b**7*x**21/21 + b**8*x**24/24
```

GIAC/XCAS [A] time = 0.215843, size = 120, normalized size = 1.15

$$\frac{1}{24} b^8 x^{24}+\frac{8}{21} a b^7 x^{21}+\frac{14}{9} a^2 b^6 x^{18}+\frac{56}{15} a^3 b^5 x^{15}+\frac{35}{6} a^4 b^4 x^{12}+\frac{56}{9} a^5 b^3 x^9+\frac{14}{3} a^6 b^2 x^6+\frac{8}{3} a^7 b x^3+a^8 \ln(|x|)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x,x, algorithm="giac")
```

```
[Out] 1/24*b^8*x^24 + 8/21*a*b^7*x^21 + 14/9*a^2*b^6*x^18 + 56/15*a^3*b
^5*x^15 + 35/6*a^4*b^4*x^12 + 56/9*a^5*b^3*x^9 + 14/3*a^6*b^2*x^6
 + 8/3*a^7*b*x^3 + a^8*ln(abs(x))
```

3.293 $\int \frac{(a+bx^3)^8}{x^4}\,dx$

Optimal. Leaf size=105

$$-\frac{a^8}{3x^3}+8a^7b\log(x)+\frac{28}{3}a^6b^2x^3+\frac{28}{3}a^5b^3x^6+\frac{70}{9}a^4b^4x^9+\frac{14}{3}a^3b^5x^{12}+\frac{28}{15}a^2b^6x^{15}+\frac{4}{9}ab^7x^{18}+\frac{b^8x^{21}}{21}$$

```
[Out] -a^8/(3*x^3) + (28*a^6*b^2*x^3)/3 + (28*a^5*b^3*x^6)/3 + (70*a^4*
b^4*x^9)/9 + (14*a^3*b^5*x^12)/3 + (28*a^2*b^6*x^15)/15 + (4*a*b^
7*x^18)/9 + (b^8*x^21)/21 + 8*a^7*b*Log[x]
```

Rubi [A] time = 0.155611, antiderivative size = 105, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^8}{3x^3}+8a^7b\log(x)+\frac{28}{3}a^6b^2x^3+\frac{28}{3}a^5b^3x^6+\frac{70}{9}a^4b^4x^9+\frac{14}{3}a^3b^5x^{12}+\frac{28}{15}a^2b^6x^{15}+\frac{4}{9}ab^7x^{18}+\frac{b^8x^{21}}{21}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^8/x^4,x]
```

```
[Out] -a^8/(3*x^3) + (28*a^6*b^2*x^3)/3 + (28*a^5*b^3*x^6)/3 + (70*a^4*
b^4*x^9)/9 + (14*a^3*b^5*x^12)/3 + (28*a^2*b^6*x^15)/15 + (4*a*b^
7*x^18)/9 + (b^8*x^21)/21 + 8*a^7*b*Log[x]
```

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

$$-\frac{a^8}{3x^3}+\frac{8a^7b\log\left(x^3\right)}{3}+\frac{28a^6b^2x^3}{3}+\frac{56a^5b^3\int^{x^3}x\,dx}{3}+\frac{70a^4b^4x^9}{9}+\frac{14a^3b^5x^{12}}{3}+\frac{28a^2b^6x^{15}}{15}+\frac{4ab^7x^{18}}{9}+\frac{b^8x^{21}}{21}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**8/x**4,x)
```

```
[Out] -a**8/(3*x**3) + 8*a**7*b*log(x**3)/3 + 28*a**6*b**2*x**3/3 + 56*
a**5*b**3*Integral(x, (x, x**3))/3 + 70*a**4*b**4*x**9/9 + 14*a**
3*b**5*x**12/3 + 28*a**2*b**6*x**15/15 + 4*a*b**7*x**18/9 + b**8*
x**21/21
```

Mathematica [A] time = 0.0166772, size = 105, normalized size = 1.

$$-\frac{a^8}{3x^3}+8a^7b\log(x)+\frac{28}{3}a^6b^2x^3+\frac{28}{3}a^5b^3x^6+\frac{70}{9}a^4b^4x^9+\frac{14}{3}a^3b^5x^{12}+\frac{28}{15}a^2b^6x^{15}+\frac{4}{9}ab^7x^{18}+\frac{b^8x^{21}}{21}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^8/x^4,x]
```

```
[Out] -a^8/(3*x^3) + (28*a^6*b^2*x^3)/3 + (28*a^5*b^3*x^6)/3 + (70*a^4*
b^4*x^9)/9 + (14*a^3*b^5*x^12)/3 + (28*a^2*b^6*x^15)/15 + (4*a*b^
7*x^18)/9 + (b^8*x^21)/21 + 8*a^7*b*Log[x]
```

Maple [A] time = 0.009, size = 90, normalized size = 0.9

$$-\frac{a^8}{3\,x^3}+\frac{28\,a^6b^2x^3}{3}+\frac{28\,a^5b^3x^6}{3}+\frac{70\,a^4b^4x^9}{9}+\frac{14\,a^3b^5x^{12}}{3}+\frac{28\,a^2b^6x^{15}}{15}+\frac{4\,ab^7x^{18}}{9}+\frac{b^8x^{21}}{21}+8\,a^7b\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^8/x^4,x)
```

```
[Out] -1/3*a^8/x^3+28/3*a^6*b^2*x^3+28/3*a^5*b^3*x^6+70/9*a^4*b^4*x^9+1
4/3*a^3*b^5*x^12+28/15*a^2*b^6*x^15+4/9*a*b^7*x^18+1/21*b^8*x^21+
8*a^7*b*ln(x)
```

Maxima [A] time = 1.4256, size = 123, normalized size = 1.17

$$\frac{1}{21}\,b^{8}x^{21}+\frac{4}{9}\,ab^{7}x^{18}+\frac{28}{15}\,a^{2}b^{6}x^{15}+\frac{14}{3}\,a^{3}b^{5}x^{12}+\frac{70}{9}\,a^{4}b^{4}x^{9}+\frac{28}{3}\,a^{5}b^{3}x^{6}+\frac{28}{3}\,a^{6}b^{2}x^{3}+\frac{8}{3}\,a^{7}b\log\left(x^{3}\right)-\frac{a^{8}}{3\,x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^4,x, algorithm="maxima")
```

```
[Out] 1/21*b^8*x^21 + 4/9*a*b^7*x^18 + 28/15*a^2*b^6*x^15 + 14/3*a^3*b^
5*x^12 + 70/9*a^4*b^4*x^9 + 28/3*a^5*b^3*x^6 + 28/3*a^6*b^2*x^3 +
 8/3*a^7*b*log(x^3) - 1/3*a^8/x^3
```

Fricas [A] time = 0.210162, size = 127, normalized size = 1.21

$$\frac{15\,b^{8}x^{24}+140\,ab^{7}x^{21}+588\,a^{2}b^{6}x^{18}+1470\,a^{3}b^{5}x^{15}+2450\,a^{4}b^{4}x^{12}+2940\,a^{5}b^{3}x^{9}+2940\,a^{6}b^{2}x^{6}+2520\,a^{7}bx^{3}\log\left(x\right)-105}{315\,x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^4,x, algorithm="fricas")
```

```
[Out] 1/315*(15*b^8*x^24 + 140*a*b^7*x^21 + 588*a^2*b^6*x^18 + 1470*a^3
*b^5*x^15 + 2450*a^4*b^4*x^12 + 2940*a^5*b^3*x^9 + 2940*a^6*b^2*x
^6 + 2520*a^7*b*x^3*log(x) - 105*a^8)/x^3
```

Sympy [A] time = 1.52058, size = 105, normalized size = 1.

$$-\frac{a^{8}}{3x^{3}}+8a^{7}b\log\left(x\right)+\frac{28a^{6}b^{2}x^{3}}{3}+\frac{28a^{5}b^{3}x^{6}}{3}+\frac{70a^{4}b^{4}x^{9}}{9}+\frac{14a^{3}b^{5}x^{12}}{3}+\frac{28a^{2}b^{6}x^{15}}{15}+\frac{4ab^{7}x^{18}}{9}+\frac{b^{8}x^{21}}{21}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**8/x**4,x)
```

```
[Out] -a**8/(3*x**3) + 8*a**7*b*log(x) + 28*a**6*b**2*x**3/3 + 28*a**5*
b**3*x**6/3 + 70*a**4*b**4*x**9/9 + 14*a**3*b**5*x**12/3 + 28*a**
2*b**6*x**15/15 + 4*a*b**7*x**18/9 + b**8*x**21/21
```

GIAC/XCAS [A] time = 0.224818, size = 135, normalized size = 1.29

$$\frac{1}{21}\,b^{8}x^{21}+\frac{4}{9}\,ab^{7}x^{18}+\frac{28}{15}\,a^{2}b^{6}x^{15}+\frac{14}{3}\,a^{3}b^{5}x^{12}+\frac{70}{9}\,a^{4}b^{4}x^{9}+\frac{28}{3}\,a^{5}b^{3}x^{6}+\frac{28}{3}\,a^{6}b^{2}x^{3}+8\,a^{7}b\ln\left(|x|\right)-\frac{8\,a^{7}bx^{3}+a^{8}}{3\,x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^4,x, algorithm="giac")
```

```
[Out] 1/21*b^8*x^21 + 4/9*a*b^7*x^18 + 28/15*a^2*b^6*x^15 + 14/3*a^3*b^
5*x^12 + 70/9*a^4*b^4*x^9 + 28/3*a^5*b^3*x^6 + 28/3*a^6*b^2*x^3 +
 8*a^7*b*ln(abs(x)) - 1/3*(8*a^7*b*x^3 + a^8)/x^3
```

3.294 $\int \frac{(a+bx^3)^8}{x^7} dx$

Optimal. Leaf size=105

$$-\frac{a^8}{6x^6}-\frac{8a^7b}{3x^3}+28a^6b^2\log(x)+\frac{56}{3}a^5b^3x^3+\frac{35}{3}a^4b^4x^6+\frac{56}{9}a^3b^5x^9+\frac{7}{3}a^2b^6x^{12}+\frac{8}{15}ab^7x^{15}+\frac{b^8x^{18}}{18}$$

```
[Out] -a^8/(6*x^6) - (8*a^7*b)/(3*x^3) + (56*a^5*b^3*x^3)/3 + (35*a^4*b
^4*x^6)/3 + (56*a^3*b^5*x^9)/9 + (7*a^2*b^6*x^12)/3 + (8*a*b^7*x^
15)/15 + (b^8*x^18)/18 + 28*a^6*b^2*Log[x]
```

Rubi [A] time = 0.133875, antiderivative size = 105, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^8}{6x^6}-\frac{8a^7b}{3x^3}+28a^6b^2\log(x)+\frac{56}{3}a^5b^3x^3+\frac{35}{3}a^4b^4x^6+\frac{56}{9}a^3b^5x^9+\frac{7}{3}a^2b^6x^{12}+\frac{8}{15}ab^7x^{15}+\frac{b^8x^{18}}{18}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^8/x^7,x]
```

```
[Out] -a^8/(6*x^6) - (8*a^7*b)/(3*x^3) + (56*a^5*b^3*x^3)/3 + (35*a^4*b
^4*x^6)/3 + (56*a^3*b^5*x^9)/9 + (7*a^2*b^6*x^12)/3 + (8*a*b^7*x^
15)/15 + (b^8*x^18)/18 + 28*a^6*b^2*Log[x]
```

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

$$-\frac{a^8}{6x^6}-\frac{8a^7b}{3x^3}+\frac{28a^6b^2\log\left(x^3\right)}{3}+\frac{56a^5b^3x^3}{3}+\frac{70a^4b^4\int^{x^3}x\,dx}{3}+\frac{56a^3b^5x^9}{9}+\frac{7a^2b^6x^{12}}{3}+\frac{8ab^7x^{15}}{15}+\frac{b^8x^{18}}{18}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**8/x**7,x)
```

```
[Out] -a**8/(6*x**6) - 8*a**7*b/(3*x**3) + 28*a**6*b**2*log(x**3)/3 + 5
6*a**5*b**3*x**3/3 + 70*a**4*b**4*Integral(x, (x, x**3))/3 + 56*a
**3*b**5*x**9/9 + 7*a**2*b**6*x**12/3 + 8*a*b**7*x**15/15 + b**8*
x**18/18
```

Mathematica [A] time = 0.00911952, size = 105, normalized size = 1.

$$-\frac{a^8}{6x^6}-\frac{8a^7b}{3x^3}+28a^6b^2\log(x)+\frac{56}{3}a^5b^3x^3+\frac{35}{3}a^4b^4x^6+\frac{56}{9}a^3b^5x^9+\frac{7}{3}a^2b^6x^{12}+\frac{8}{15}ab^7x^{15}+\frac{b^8x^{18}}{18}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^8/x^7,x]
```

```
[Out] -a^8/(6*x^6) - (8*a^7*b)/(3*x^3) + (56*a^5*b^3*x^3)/3 + (35*a^4*b
^4*x^6)/3 + (56*a^3*b^5*x^9)/9 + (7*a^2*b^6*x^12)/3 + (8*a*b^7*x^
15)/15 + (b^8*x^18)/18 + 28*a^6*b^2*Log[x]
```

Maple [A] time = 0.009, size = 90, normalized size = 0.9

$$-\frac{a^8}{6\,x^6}-\frac{8\,a^7b}{3\,x^3}+\frac{56\,a^5b^3x^3}{3}+\frac{35\,a^4b^4x^6}{3}+\frac{56\,a^3b^5x^9}{9}+\frac{7\,a^2b^6x^{12}}{3}+\frac{8\,ab^7x^{15}}{15}+\frac{b^8x^{18}}{18}+28\,a^6b^2\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^8/x^7,x)
```

```
[Out] -1/6*a^8/x^6-8/3*a^7*b/x^3+56/3*a^5*b^3*x^3+35/3*a^4*b^4*x^6+56/9
*a^3*b^5*x^9+7/3*a^2*b^6*x^12+8/15*a*b^7*x^15+1/18*b^8*x^18+28*a^
6*b^2*ln(x)
```

Maxima [A] time = 1.43207, size = 124, normalized size = 1.18

$$\frac{1}{18}\,b^8x^{18}+\frac{8}{15}\,ab^7x^{15}+\frac{7}{3}\,a^2b^6x^{12}+\frac{56}{9}\,a^3b^5x^9+\frac{35}{3}\,a^4b^4x^6+\frac{56}{3}\,a^5b^3x^3+\frac{28}{3}\,a^6b^2\log\left(x^3\right)-\frac{16\,a^7bx^3+a^8}{6\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^7,x, algorithm="maxima")
```

```
[Out] 1/18*b^8*x^18 + 8/15*a*b^7*x^15 + 7/3*a^2*b^6*x^12 + 56/9*a^3*b^5
*x^9 + 35/3*a^4*b^4*x^6 + 56/3*a^5*b^3*x^3 + 28/3*a^6*b^2*log(x^3
) - 1/6*(16*a^7*b*x^3 + a^8)/x^6
```

Fricas [A] time = 0.215054, size = 127, normalized size = 1.21

$$\frac{5\,b^8x^{24}+48\,ab^7x^{21}+210\,a^2b^6x^{18}+560\,a^3b^5x^{15}+1050\,a^4b^4x^{12}+1680\,a^5b^3x^9+2520\,a^6b^2x^6\log\left(x\right)-240\,a^7bx^3-15\,a^8}{90\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^7,x, algorithm="fricas")
```

```
[Out] 1/90*(5*b^8*x^24 + 48*a*b^7*x^21 + 210*a^2*b^6*x^18 + 560*a^3*b^5
*x^15 + 1050*a^4*b^4*x^12 + 1680*a^5*b^3*x^9 + 2520*a^6*b^2*x^6*l
og(x) - 240*a^7*b*x^3 - 15*a^8)/x^6
```

Sympy [A] time = 1.75869, size = 104, normalized size = 0.99

$$28a^6b^2\log\left(x\right)+\frac{56a^5b^3x^3}{3}+\frac{35a^4b^4x^6}{3}+\frac{56a^3b^5x^9}{9}+\frac{7a^2b^6x^{12}}{3}+\frac{8ab^7x^{15}}{15}+\frac{b^8x^{18}}{18}-\frac{a^8+16a^7bx^3}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**8/x**7,x)
```

```
[Out] 28*a**6*b**2*log(x) + 56*a**5*b**3*x**3/3 + 35*a**4*b**4*x**6/3 +
 56*a**3*b**5*x**9/9 + 7*a**2*b**6*x**12/3 + 8*a*b**7*x**15/15 +
b**8*x**18/18 - (a**8 + 16*a**7*b*x**3)/(6*x**6)
```

GIAC/XCAS [A] time = 0.216023, size = 138, normalized size = 1.31

$$\frac{1}{18}\,b^8x^{18}+\frac{8}{15}\,ab^7x^{15}+\frac{7}{3}\,a^2b^6x^{12}+\frac{56}{9}\,a^3b^5x^9+\frac{35}{3}\,a^4b^4x^6+\frac{56}{3}\,a^5b^3x^3+28\,a^6b^2\ln\left(|x|\right)-\frac{84\,a^6b^2x^6+16\,a^7bx^3+a^8}{6\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^7,x, algorithm="giac")
```

```
[Out] 1/18*b^8*x^18 + 8/15*a*b^7*x^15 + 7/3*a^2*b^6*x^12 + 56/9*a^3*b^5
*x^9 + 35/3*a^4*b^4*x^6 + 56/3*a^5*b^3*x^3 + 28*a^6*b^2*ln(abs(x)
) - 1/6*(84*a^6*b^2*x^6 + 16*a^7*b*x^3 + a^8)/x^6
```

3.295 $\int \frac{(a+bx^3)^8}{x^{10}}\,dx$

Optimal. Leaf size=105

$$-\frac{a^8}{9x^9}-\frac{4a^7b}{3x^6}-\frac{28a^6b^2}{3x^3}+56a^5b^3\log(x)+\frac{70}{3}a^4b^4x^3+\frac{28}{3}a^3b^5x^6+\frac{28}{9}a^2b^6x^9+\frac{2}{3}ab^7x^{12}+\frac{b^8x^{15}}{15}$$

```
[Out] -a^8/(9*x^9) - (4*a^7*b)/(3*x^6) - (28*a^6*b^2)/(3*x^3) + (70*a^4
*b^4*x^3)/3 + (28*a^3*b^5*x^6)/3 + (28*a^2*b^6*x^9)/9 + (2*a*b^7*
x^12)/3 + (b^8*x^15)/15 + 56*a^5*b^3*Log[x]
```

Rubi [A] time = 0.130433, antiderivative size = 105, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^8}{9x^9}-\frac{4a^7b}{3x^6}-\frac{28a^6b^2}{3x^3}+56a^5b^3\log(x)+\frac{70}{3}a^4b^4x^3+\frac{28}{3}a^3b^5x^6+\frac{28}{9}a^2b^6x^9+\frac{2}{3}ab^7x^{12}+\frac{b^8x^{15}}{15}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^8/x^10,x]
```

```
[Out] -a^8/(9*x^9) - (4*a^7*b)/(3*x^6) - (28*a^6*b^2)/(3*x^3) + (70*a^4
*b^4*x^3)/3 + (28*a^3*b^5*x^6)/3 + (28*a^2*b^6*x^9)/9 + (2*a*b^7*
x^12)/3 + (b^8*x^15)/15 + 56*a^5*b^3*Log[x]
```

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

$$-\frac{a^8}{9x^9}-\frac{4a^7b}{3x^6}-\frac{28a^6b^2}{3x^3}+\frac{56a^5b^3\log\left(x^3\right)}{3}+\frac{70a^4b^4x^3}{3}+\frac{56a^3b^5\int^{x^3}x\,dx}{3}+\frac{28a^2b^6x^9}{9}+\frac{2ab^7x^{12}}{3}+\frac{b^8x^{15}}{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**8/x**10,x)
```

```
[Out] -a**8/(9*x**9) - 4*a**7*b/(3*x**6) - 28*a**6*b**2/(3*x**3) + 56*a
**5*b**3*log(x**3)/3 + 70*a**4*b**4*x**3/3 + 56*a**3*b**5*Integra
l(x, (x, x**3))/3 + 28*a**2*b**6*x**9/9 + 2*a*b**7*x**12/3 + b**8
*x**15/15
```

Mathematica [A] time = 0.0182771, size = 105, normalized size = 1.

$$-\frac{a^8}{9x^9}-\frac{4a^7b}{3x^6}-\frac{28a^6b^2}{3x^3}+56a^5b^3\log(x)+\frac{70}{3}a^4b^4x^3+\frac{28}{3}a^3b^5x^6+\frac{28}{9}a^2b^6x^9+\frac{2}{3}ab^7x^{12}+\frac{b^8x^{15}}{15}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^8/x^10,x]
```

```
[Out] -a^8/(9*x^9) - (4*a^7*b)/(3*x^6) - (28*a^6*b^2)/(3*x^3) + (70*a^4
*b^4*x^3)/3 + (28*a^3*b^5*x^6)/3 + (28*a^2*b^6*x^9)/9 + (2*a*b^7*
x^12)/3 + (b^8*x^15)/15 + 56*a^5*b^3*Log[x]
```

Maple [A] time = 0.01, size = 90, normalized size = 0.9

$$-\frac{a^8}{9\,x^9}-\frac{4\,a^7b}{3\,x^6}-\frac{28\,a^6b^2}{3\,x^3}+\frac{70\,a^4b^4x^3}{3}+\frac{28\,a^3b^5x^6}{3}+\frac{28\,a^2b^6x^9}{9}+\frac{2\,ab^7x^{12}}{3}+\frac{b^8x^{15}}{15}+56\,a^5b^3\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^8/x^10,x)
```

```
[Out] -1/9*a^8/x^9-4/3*a^7*b/x^6-28/3*a^6*b^2/x^3+70/3*a^4*b^4*x^3+28/3
*a^3*b^5*x^6+28/9*a^2*b^6*x^9+2/3*a*b^7*x^12+1/15*b^8*x^15+56*a^5
*b^3*ln(x)
```

Maxima [A] time = 1.42643, size = 124, normalized size = 1.18

$$\frac{1}{15}\,b^8x^{15}+\frac{2}{3}\,ab^7x^{12}+\frac{28}{9}\,a^2b^6x^9+\frac{28}{3}\,a^3b^5x^6+\frac{70}{3}\,a^4b^4x^3+\frac{56}{3}\,a^5b^3\log\left(x^3\right)-\frac{84\,a^6b^2x^6+12\,a^7bx^3+a^8}{9\,x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^10,x, algorithm="maxima")
```

```
[Out] 1/15*b^8*x^15 + 2/3*a*b^7*x^12 + 28/9*a^2*b^6*x^9 + 28/3*a^3*b^5*
x^6 + 70/3*a^4*b^4*x^3 + 56/3*a^5*b^3*log(x^3) - 1/9*(84*a^6*b^2*
x^6 + 12*a^7*b*x^3 + a^8)/x^9
```

Fricas [A] time = 0.215436, size = 127, normalized size = 1.21

$$\frac{3\,b^8x^{24}+30\,ab^7x^{21}+140\,a^2b^6x^{18}+420\,a^3b^5x^{15}+1050\,a^4b^4x^{12}+2520\,a^5b^3x^9\log\left(x\right)-420\,a^6b^2x^6-60\,a^7bx^3-5\,a^8}{45\,x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^10,x, algorithm="fricas")
```

```
[Out] 1/45*(3*b^8*x^24 + 30*a*b^7*x^21 + 140*a^2*b^6*x^18 + 420*a^3*b^5
*x^15 + 1050*a^4*b^4*x^12 + 2520*a^5*b^3*x^9*log(x) - 420*a^6*b^2
*x^6 - 60*a^7*b*x^3 - 5*a^8)/x^9
```

Sympy [A] time = 2.04845, size = 102, normalized size = 0.97

$$56a^5b^3\log\left(x\right)+\frac{70a^4b^4x^3}{3}+\frac{28a^3b^5x^6}{3}+\frac{28a^2b^6x^9}{9}+\frac{2ab^7x^{12}}{3}+\frac{b^8x^{15}}{15}-\frac{a^8+12a^7bx^3+84a^6b^2x^6}{9x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**8/x**10,x)
```

```
[Out] 56*a**5*b**3*log(x) + 70*a**4*b**4*x**3/3 + 28*a**3*b**5*x**6/3 +
 28*a**2*b**6*x**9/9 + 2*a*b**7*x**12/3 + b**8*x**15/15 - (a**8 +
 12*a**7*b*x**3 + 84*a**6*b**2*x**6)/(9*x**9)
```

GIAC/XCAS [A] time = 0.223587, size = 138, normalized size = 1.31

$$\frac{1}{15}\,b^8x^{15}+\frac{2}{3}\,ab^7x^{12}+\frac{28}{9}\,a^2b^6x^9+\frac{28}{3}\,a^3b^5x^6+\frac{70}{3}\,a^4b^4x^3+56\,a^5b^3\ln\left(|x|\right)-\frac{308\,a^5b^3x^9+84\,a^6b^2x^6+12\,a^7bx^3+a^8}{9\,x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^10,x, algorithm="giac")
```

```
[Out] 1/15*b^8*x^15 + 2/3*a*b^7*x^12 + 28/9*a^2*b^6*x^9 + 28/3*a^3*b^5*
x^6 + 70/3*a^4*b^4*x^3 + 56*a^5*b^3*ln(abs(x)) - 1/9*(308*a^5*b^3
*x^9 + 84*a^6*b^2*x^6 + 12*a^7*b*x^3 + a^8)/x^9
```

3.296 $\int \frac{(a+bx^3)^8}{x^{13}} dx$

Optimal. Leaf size=105

$$-\frac{a^8}{12x^{12}}-\frac{8a^7b}{9x^9}-\frac{14a^6b^2}{3x^6}-\frac{56a^5b^3}{3x^3}+70a^4b^4\log(x)+\frac{56}{3}a^3b^5x^3+\frac{14}{3}a^2b^6x^6+\frac{8}{9}ab^7x^9+\frac{b^8x^{12}}{12}$$

```
[Out] -a^8/(12*x^12) - (8*a^7*b)/(9*x^9) - (14*a^6*b^2)/(3*x^6) - (56*a
^5*b^3)/(3*x^3) + (56*a^3*b^5*x^3)/3 + (14*a^2*b^6*x^6)/3 + (8*a*
b^7*x^9)/9 + (b^8*x^12)/12 + 70*a^4*b^4*Log[x]
```

Rubi [A] time = 0.127354, antiderivative size = 105, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$-\frac{a^8}{12x^{12}}-\frac{8a^7b}{9x^9}-\frac{14a^6b^2}{3x^6}-\frac{56a^5b^3}{3x^3}+70a^4b^4\log(x)+\frac{56}{3}a^3b^5x^3+\frac{14}{3}a^2b^6x^6+\frac{8}{9}ab^7x^9+\frac{b^8x^{12}}{12}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^8/x^13,x]
```

```
[Out] -a^8/(12*x^12) - (8*a^7*b)/(9*x^9) - (14*a^6*b^2)/(3*x^6) - (56*a
^5*b^3)/(3*x^3) + (56*a^3*b^5*x^3)/3 + (14*a^2*b^6*x^6)/3 + (8*a*
b^7*x^9)/9 + (b^8*x^12)/12 + 70*a^4*b^4*Log[x]
```

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

$$-\frac{a^8}{12x^{12}}-\frac{8a^7b}{9x^9}-\frac{14a^6b^2}{3x^6}-\frac{56a^5b^3}{3x^3}+\frac{70a^4b^4\log\left(x^3\right)}{3}+\frac{56a^3b^5x^3}{3}+\frac{28a^2b^6\int^{x^3}x\,dx}{3}+\frac{8ab^7x^9}{9}+\frac{b^8x^{12}}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**8/x**13,x)
```

```
[Out] -a**8/(12*x**12) - 8*a**7*b/(9*x**9) - 14*a**6*b**2/(3*x**6) - 56
*a**5*b**3/(3*x**3) + 70*a**4*b**4*log(x**3)/3 + 56*a**3*b**5*x**
3/3 + 28*a**2*b**6*Integral(x, (x, x**3))/3 + 8*a*b**7*x**9/9 + b
**8*x**12/12
```

Mathematica [A] time = 0.00874738, size = 105, normalized size = 1.

$$-\frac{a^8}{12x^{12}}-\frac{8a^7b}{9x^9}-\frac{14a^6b^2}{3x^6}-\frac{56a^5b^3}{3x^3}+70a^4b^4\log(x)+\frac{56}{3}a^3b^5x^3+\frac{14}{3}a^2b^6x^6+\frac{8}{9}ab^7x^9+\frac{b^8x^{12}}{12}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^8/x^13,x]
```

```
[Out] -a^8/(12*x^12) - (8*a^7*b)/(9*x^9) - (14*a^6*b^2)/(3*x^6) - (56*a
^5*b^3)/(3*x^3) + (56*a^3*b^5*x^3)/3 + (14*a^2*b^6*x^6)/3 + (8*a*
b^7*x^9)/9 + (b^8*x^12)/12 + 70*a^4*b^4*Log[x]
```

Maple [A] time = 0.01, size = 90, normalized size = 0.9

$$-\frac{a^8}{12\,x^{12}}-\frac{8\,a^7b}{9\,x^9}-\frac{14\,a^6b^2}{3\,x^6}-\frac{56\,a^5b^3}{3\,x^3}+\frac{56\,a^3b^5x^3}{3}+\frac{14\,a^2b^6x^6}{3}+\frac{8\,ab^7x^9}{9}+\frac{b^8x^{12}}{12}+70\,a^4b^4\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((b*x^3+a)^8/x^13,x)
```

```
[Out] -1/12*a^8/x^12-8/9*a^7*b/x^9-14/3*a^6*b^2/x^6-56/3*a^5*b^3/x^3+56
/3*a^3*b^5*x^3+14/3*a^2*b^6*x^6+8/9*a*b^7*x^9+1/12*b^8*x^12+70*a^
4*b^4*ln(x)
```

Maxima [A] time = 1.45092, size = 127, normalized size = 1.21

$$\frac{1}{12}\,b^8x^{12}+\frac{8}{9}\,ab^7x^9+\frac{14}{3}\,a^2b^6x^6+\frac{56}{3}\,a^3b^5x^3+\frac{70}{3}\,a^4b^4\log\left(x^3\right)-\frac{672\,a^5b^3x^9+168\,a^6b^2x^6+32\,a^7bx^3+3\,a^8}{36\,x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^3 + a)^8/x^13,x, algorithm="maxima")
```

```
[Out] 1/12*b^8*x^12 + 8/9*a*b^7*x^9 + 14/3*a^2*b^6*x^6 + 56/3*a^3*b^5*x
^3 + 70/3*a^4*b^4*log(x^3) - 1/36*(672*a^5*b^3*x^9 + 168*a^6*b^2*
x^6 + 32*a^7*b*x^3 + 3*a^8)/x^12
```

Fricas [A] time = 0.212814, size = 127, normalized size = 1.21

$$\frac{3\,b^8x^{24}+32\,ab^7x^{21}+168\,a^2b^6x^{18}+672\,a^3b^5x^{15}+2520\,a^4b^4x^{12}\log\left(x\right)-672\,a^5b^3x^9-168\,a^6b^2x^6-32\,a^7bx^3-3\,a^8}{36\,x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^3 + a)^8/x^13,x, algorithm="fricas")
```

```
[Out] 1/36*(3*b^8*x^24 + 32*a*b^7*x^21 + 168*a^2*b^6*x^18 + 672*a^3*b^5
*x^15 + 2520*a^4*b^4*x^12*log(x) - 672*a^5*b^3*x^9 - 168*a^6*b^2*
x^6 - 32*a^7*b*x^3 - 3*a^8)/x^12
```

Sympy [A] time = 2.50088, size = 102, normalized size = 0.97

$$70a^4b^4\log\left(x\right)+\frac{56a^3b^5x^3}{3}+\frac{14a^2b^6x^6}{3}+\frac{8ab^7x^9}{9}+\frac{b^8x^{12}}{12}-\frac{3a^8+32a^7bx^3+168a^6b^2x^6+672a^5b^3x^9}{36x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x**3+a)**8/x**13,x)
```

```
[Out] 70*a**4*b**4*log(x) + 56*a**3*b**5*x**3/3 + 14*a**2*b**6*x**6/3 +
 8*a*b**7*x**9/9 + b**8*x**12/12 - (3*a**8 + 32*a**7*b*x**3 + 168
*a**6*b**2*x**6 + 672*a**5*b**3*x**9)/(36*x**12)
```

GIAC/XCAS [A] time = 0.219508, size = 140, normalized size = 1.33

$$\frac{1}{12}\,b^8x^{12}+\frac{8}{9}\,ab^7x^9+\frac{14}{3}\,a^2b^6x^6+\frac{56}{3}\,a^3b^5x^3+70\,a^4b^4\ln\left(|x|\right)-\frac{1750\,a^4b^4x^{12}+672\,a^5b^3x^9+168\,a^6b^2x^6+32\,a^7bx^3+3\,a^8}{36\,x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^13,x, algorithm="giac")
```

```
[Out] 1/12*b^8*x^12 + 8/9*a*b^7*x^9 + 14/3*a^2*b^6*x^6 + 56/3*a^3*b^5*x
^3 + 70*a^4*b^4*ln(abs(x)) - 1/36*(1750*a^4*b^4*x^12 + 672*a^5*b^
3*x^9 + 168*a^6*b^2*x^6 + 32*a^7*b*x^3 + 3*a^8)/x^12
```

3.297 $\int \frac{(a+bx^3)^8}{x^{16}}\,dx$

Optimal. Leaf size=105

$$-\frac{a^8}{15x^{15}}-\frac{2a^7b}{3x^{12}}-\frac{28a^6b^2}{9x^9}-\frac{28a^5b^3}{3x^6}-\frac{70a^4b^4}{3x^3}+56a^3b^5\log(x)+\frac{28}{3}a^2b^6x^3+\frac{4}{3}ab^7x^6+\frac{b^8x^9}{9}$$

```
[Out] -a^8/(15*x^15) - (2*a^7*b)/(3*x^12) - (28*a^6*b^2)/(9*x^9) - (28*
a^5*b^3)/(3*x^6) - (70*a^4*b^4)/(3*x^3) + (28*a^2*b^6*x^3)/3 + (4
*a*b^7*x^6)/3 + (b^8*x^9)/9 + 56*a^3*b^5*Log[x]
```

Rubi [A] time = 0.126611, antiderivative size = 105, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^8}{15x^{15}}-\frac{2a^7b}{3x^{12}}-\frac{28a^6b^2}{9x^9}-\frac{28a^5b^3}{3x^6}-\frac{70a^4b^4}{3x^3}+56a^3b^5\log(x)+\frac{28}{3}a^2b^6x^3+\frac{4}{3}ab^7x^6+\frac{b^8x^9}{9}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^8/x^16,x]
```

```
[Out] -a^8/(15*x^15) - (2*a^7*b)/(3*x^12) - (28*a^6*b^2)/(9*x^9) - (28*
a^5*b^3)/(3*x^6) - (70*a^4*b^4)/(3*x^3) + (28*a^2*b^6*x^3)/3 + (4
*a*b^7*x^6)/3 + (b^8*x^9)/9 + 56*a^3*b^5*Log[x]
```

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

$$-\frac{a^8}{15x^{15}}-\frac{2a^7b}{3x^{12}}-\frac{28a^6b^2}{9x^9}-\frac{28a^5b^3}{3x^6}-\frac{70a^4b^4}{3x^3}+\frac{56a^3b^5\log\left(x^3\right)}{3}+\frac{28a^2b^6x^3}{3}+\frac{8ab^7\int^{x^3}x\,dx}{3}+\frac{b^8x^9}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**8/x**16,x)
```

```
[Out] -a**8/(15*x**15) - 2*a**7*b/(3*x**12) - 28*a**6*b**2/(9*x**9) - 2
8*a**5*b**3/(3*x**6) - 70*a**4*b**4/(3*x**3) + 56*a**3*b**5*log(x
**3)/3 + 28*a**2*b**6*x**3/3 + 8*a*b**7*Integral(x, (x, x**3))/3
+ b**8*x**9/9
```

Mathematica [A] time = 0.0122083, size = 105, normalized size = 1.

$$-\frac{a^8}{15x^{15}}-\frac{2a^7b}{3x^{12}}-\frac{28a^6b^2}{9x^9}-\frac{28a^5b^3}{3x^6}-\frac{70a^4b^4}{3x^3}+56a^3b^5\log(x)+\frac{28}{3}a^2b^6x^3+\frac{4}{3}ab^7x^6+\frac{b^8x^9}{9}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^8/x^16,x]
```

```
[Out] -a^8/(15*x^15) - (2*a^7*b)/(3*x^12) - (28*a^6*b^2)/(9*x^9) - (28*
a^5*b^3)/(3*x^6) - (70*a^4*b^4)/(3*x^3) + (28*a^2*b^6*x^3)/3 + (4
*a*b^7*x^6)/3 + (b^8*x^9)/9 + 56*a^3*b^5*Log[x]
```

Maple [A] time = 0.012, size = 90, normalized size = 0.9

$$-\frac{a^8}{15\,x^{15}}-\frac{2\,a^7b}{3\,x^{12}}-\frac{28\,a^6b^2}{9\,x^9}-\frac{28\,a^5b^3}{3\,x^6}-\frac{70\,a^4b^4}{3\,x^3}+\frac{28\,a^2b^6x^3}{3}+\frac{4\,ab^7x^6}{3}+\frac{b^8x^9}{9}+56\,a^3b^5\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^8/x^16,x)
```

```
[Out] -1/15*a^8/x^15-2/3*a^7*b/x^12-28/9*a^6*b^2/x^9-28/3*a^5*b^3/x^6-7
0/3*a^4*b^4/x^3+28/3*a^2*b^6*x^3+4/3*a*b^7*x^6+1/9*b^8*x^9+56*a^3
*b^5*ln(x)
```

Maxima [A] time = 1.4247, size = 127, normalized size = 1.21

$$\frac{1}{9}\,b^8x^9+\frac{4}{3}\,ab^7x^6+\frac{28}{3}\,a^2b^6x^3+\frac{56}{3}\,a^3b^5\log\left(x^3\right)-\frac{1050\,a^4b^4x^{12}+420\,a^5b^3x^9+140\,a^6b^2x^6+30\,a^7bx^3+3\,a^8}{45\,x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^16,x, algorithm="maxima")
```

```
[Out] 1/9*b^8*x^9 + 4/3*a*b^7*x^6 + 28/3*a^2*b^6*x^3 + 56/3*a^3*b^5*log
(x^3) - 1/45*(1050*a^4*b^4*x^12 + 420*a^5*b^3*x^9 + 140*a^6*b^2*x
^6 + 30*a^7*b*x^3 + 3*a^8)/x^15
```

Fricas [A] time = 0.213781, size = 127, normalized size = 1.21

$$\frac{5\,b^8x^{24}+60\,ab^7x^{21}+420\,a^2b^6x^{18}+2520\,a^3b^5x^{15}\log\left(x\right)-1050\,a^4b^4x^{12}-420\,a^5b^3x^9-140\,a^6b^2x^6-30\,a^7bx^3-3\,a^8}{45\,x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^16,x, algorithm="fricas")
```

```
[Out] 1/45*(5*b^8*x^24 + 60*a*b^7*x^21 + 420*a^2*b^6*x^18 + 2520*a^3*b^
5*x^15*log(x) - 1050*a^4*b^4*x^12 - 420*a^5*b^3*x^9 - 140*a^6*b^2
*x^6 - 30*a^7*b*x^3 - 3*a^8)/x^15
```

Sympy [A] time = 2.86569, size = 100, normalized size = 0.95

$$56a^3b^5\log\left(x\right)+\frac{28a^2b^6x^3}{3}+\frac{4ab^7x^6}{3}+\frac{b^8x^9}{9}-\frac{3a^8+30a^7bx^3+140a^6b^2x^6+420a^5b^3x^9+1050a^4b^4x^{12}}{45x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**8/x**16,x)
```

```
[Out] 56*a**3*b**5*log(x) + 28*a**2*b**6*x**3/3 + 4*a*b**7*x**6/3 + b**
8*x**9/9 - (3*a**8 + 30*a**7*b*x**3 + 140*a**6*b**2*x**6 + 420*a*
*5*b**3*x**9 + 1050*a**4*b**4*x**12)/(45*x**15)
```

GIAC/XCAS [A] time = 0.222698, size = 140, normalized size = 1.33

$$\frac{1}{9}\,b^8x^9+\frac{4}{3}\,ab^7x^6+\frac{28}{3}\,a^2b^6x^3+56\,a^3b^5\ln\left(|x|\right)-\frac{1918\,a^3b^5x^{15}+1050\,a^4b^4x^{12}+420\,a^5b^3x^9+140\,a^6b^2x^6+30\,a^7bx^3+3\,a^8}{45\,x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^16,x, algorithm="giac")
```

```
[Out] 1/9*b^8*x^9 + 4/3*a*b^7*x^6 + 28/3*a^2*b^6*x^3 + 56*a^3*b^5*ln(ab
s(x)) - 1/45*(1918*a^3*b^5*x^15 + 1050*a^4*b^4*x^12 + 420*a^5*b^3
*x^9 + 140*a^6*b^2*x^6 + 30*a^7*b*x^3 + 3*a^8)/x^15
```

3.298 $\int \frac{(a+bx^3)^8}{x^{19}} dx$

Optimal. Leaf size=105

$$-\frac{a^8}{18x^{18}}-\frac{8a^7b}{15x^{15}}-\frac{7a^6b^2}{3x^{12}}-\frac{56a^5b^3}{9x^9}-\frac{35a^4b^4}{3x^6}-\frac{56a^3b^5}{3x^3}+28a^2b^6\log(x)+\frac{8}{3}ab^7x^3+\frac{b^8x^6}{6}$$

```
[Out] -a^8/(18*x^18) - (8*a^7*b)/(15*x^15) - (7*a^6*b^2)/(3*x^12) - (56
*a^5*b^3)/(9*x^9) - (35*a^4*b^4)/(3*x^6) - (56*a^3*b^5)/(3*x^3) +
 (8*a*b^7*x^3)/3 + (b^8*x^6)/6 + 28*a^2*b^6*Log[x]
```

Rubi [A] time = 0.125017, antiderivative size = 105, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$-\frac{a^8}{18x^{18}}-\frac{8a^7b}{15x^{15}}-\frac{7a^6b^2}{3x^{12}}-\frac{56a^5b^3}{9x^9}-\frac{35a^4b^4}{3x^6}-\frac{56a^3b^5}{3x^3}+28a^2b^6\log(x)+\frac{8}{3}ab^7x^3+\frac{b^8x^6}{6}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^8/x^19,x]
```

```
[Out] -a^8/(18*x^18) - (8*a^7*b)/(15*x^15) - (7*a^6*b^2)/(3*x^12) - (56
*a^5*b^3)/(9*x^9) - (35*a^4*b^4)/(3*x^6) - (56*a^3*b^5)/(3*x^3) +
 (8*a*b^7*x^3)/3 + (b^8*x^6)/6 + 28*a^2*b^6*Log[x]
```

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

$$-\frac{a^8}{18x^{18}}-\frac{8a^7b}{15x^{15}}-\frac{7a^6b^2}{3x^{12}}-\frac{56a^5b^3}{9x^9}-\frac{35a^4b^4}{3x^6}-\frac{56a^3b^5}{3x^3}+\frac{28a^2b^6\log\left(x^3\right)}{3}+\frac{8ab^7x^3}{3}+\frac{b^8\int^{x^3} x\,dx}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**8/x**19,x)
```

```
[Out] -a**8/(18*x**18) - 8*a**7*b/(15*x**15) - 7*a**6*b**2/(3*x**12) -
56*a**5*b**3/(9*x**9) - 35*a**4*b**4/(3*x**6) - 56*a**3*b**5/(3*x
**3) + 28*a**2*b**6*log(x**3)/3 + 8*a*b**7*x**3/3 + b**8*Integral
(x, (x, x**3))/3
```

Mathematica [A] time = 0.00877233, size = 105, normalized size = 1.

$$-\frac{a^8}{18x^{18}}-\frac{8a^7b}{15x^{15}}-\frac{7a^6b^2}{3x^{12}}-\frac{56a^5b^3}{9x^9}-\frac{35a^4b^4}{3x^6}-\frac{56a^3b^5}{3x^3}+28a^2b^6\log(x)+\frac{8}{3}ab^7x^3+\frac{b^8x^6}{6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^8/x^19,x]
```

```
[Out] -a^8/(18*x^18) - (8*a^7*b)/(15*x^15) - (7*a^6*b^2)/(3*x^12) - (56
*a^5*b^3)/(9*x^9) - (35*a^4*b^4)/(3*x^6) - (56*a^3*b^5)/(3*x^3) +
 (8*a*b^7*x^3)/3 + (b^8*x^6)/6 + 28*a^2*b^6*Log[x]
```

Maple [A] time = 0.013, size = 90, normalized size = 0.9

$$-\frac{a^8}{18\,x^{18}}-\frac{8\,a^7b}{15\,x^{15}}-\frac{7\,a^6b^2}{3\,x^{12}}-\frac{56\,a^5b^3}{9\,x^9}-\frac{35\,a^4b^4}{3\,x^6}-\frac{56\,a^3b^5}{3\,x^3}+\frac{8\,ab^7x^3}{3}+\frac{b^8x^6}{6}+28\,a^2b^6\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^8/x^19,x)
```

```
[Out] -1/18*a^8/x^18-8/15*a^7*b/x^15-7/3*a^6*b^2/x^12-56/9*a^5*b^3/x^9-
35/3*a^4*b^4/x^6-56/3*a^3*b^5/x^3+8/3*a*b^7*x^3+1/6*b^8*x^6+28*a^
2*b^6*ln(x)
```

Maxima [A] time = 1.45279, size = 127, normalized size = 1.21

$$\frac{1}{6}\,b^8x^6 + \frac{8}{3}\,ab^7x^3 + \frac{28}{3}\,a^2b^6\log\left(x^3\right) - \frac{1680\,a^3b^5x^{15} + 1050\,a^4b^4x^{12} + 560\,a^5b^3x^9 + 210\,a^6b^2x^6 + 48\,a^7bx^3 + 5\,a^8}{90\,x^{18}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^19,x, algorithm="maxima")
```

```
[Out] 1/6*b^8*x^6 + 8/3*a*b^7*x^3 + 28/3*a^2*b^6*log(x^3) - 1/90*(1680*
a^3*b^5*x^15 + 1050*a^4*b^4*x^12 + 560*a^5*b^3*x^9 + 210*a^6*b^2*
x^6 + 48*a^7*b*x^3 + 5*a^8)/x^18
```

Fricas [A] time = 0.213185, size = 127, normalized size = 1.21

$$\frac{15\,b^8x^{24} + 240\,ab^7x^{21} + 2520\,a^2b^6x^{18}\log\left(x\right) - 1680\,a^3b^5x^{15} - 1050\,a^4b^4x^{12} - 560\,a^5b^3x^9 - 210\,a^6b^2x^6 - 48\,a^7bx^3 - 5\,a^8}{90\,x^{18}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^19,x, algorithm="fricas")
```

```
[Out] 1/90*(15*b^8*x^24 + 240*a*b^7*x^21 + 2520*a^2*b^6*x^18*log(x) - 1
680*a^3*b^5*x^15 - 1050*a^4*b^4*x^12 - 560*a^5*b^3*x^9 - 210*a^6*
b^2*x^6 - 48*a^7*b*x^3 - 5*a^8)/x^18
```

Sympy [A] time = 3.41052, size = 99, normalized size = 0.94

$$28a^2b^6\log\left(x\right) + \frac{8ab^7x^3}{3} + \frac{b^8x^6}{6} - \frac{5a^8 + 48a^7bx^3 + 210a^6b^2x^6 + 560a^5b^3x^9 + 1050a^4b^4x^{12} + 1680a^3b^5x^{15}}{90x^{18}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**8/x**19,x)
```

```
[Out] 28*a**2*b**6*log(x) + 8*a*b**7*x**3/3 + b**8*x**6/6 - (5*a**8 + 4
8*a**7*b*x**3 + 210*a**6*b**2*x**6 + 560*a**5*b**3*x**9 + 1050*a*
*4*b**4*x**12 + 1680*a**3*b**5*x**15)/(90*x**18)
```

GIAC/XCAS [A] time = 0.218566, size = 140, normalized size = 1.33

$$\frac{1}{6}\,b^8x^6 + \frac{8}{3}\,ab^7x^3 + 28\,a^2b^6\ln\left(|x|\right) - \frac{2058\,a^2b^6x^{18} + 1680\,a^3b^5x^{15} + 1050\,a^4b^4x^{12} + 560\,a^5b^3x^9 + 210\,a^6b^2x^6 + 48\,a^7bx^3 + 5\,a^8}{90\,x^{18}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^19,x, algorithm="giac")
```

```
[Out] 1/6*b^8*x^6 + 8/3*a*b^7*x^3 + 28*a^2*b^6*ln(abs(x)) - 1/90*(2058*
a^2*b^6*x^18 + 1680*a^3*b^5*x^15 + 1050*a^4*b^4*x^12 + 560*a^5*b^
3*x^9 + 210*a^6*b^2*x^6 + 48*a^7*b*x^3 + 5*a^8)/x^18
```

3.299 $\int \frac{(a+bx^3)^8}{x^{22}}\,dx$

Optimal. Leaf size=105

$$-\frac{a^8}{21x^{21}}-\frac{4a^7b}{9x^{18}}-\frac{28a^6b^2}{15x^{15}}-\frac{14a^5b^3}{3x^{12}}-\frac{70a^4b^4}{9x^9}-\frac{28a^3b^5}{3x^6}-\frac{28a^2b^6}{3x^3}+8ab^7\log(x)+\frac{b^8x^3}{3}$$

```
[Out] -a^8/(21*x^21) - (4*a^7*b)/(9*x^18) - (28*a^6*b^2)/(15*x^15) - (1
4*a^5*b^3)/(3*x^12) - (70*a^4*b^4)/(9*x^9) - (28*a^3*b^5)/(3*x^6)
 - (28*a^2*b^6)/(3*x^3) + (b^8*x^3)/3 + 8*a*b^7*Log[x]
```

Rubi [A] time = 0.121104, antiderivative size = 105, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^8}{21x^{21}}-\frac{4a^7b}{9x^{18}}-\frac{28a^6b^2}{15x^{15}}-\frac{14a^5b^3}{3x^{12}}-\frac{70a^4b^4}{9x^9}-\frac{28a^3b^5}{3x^6}-\frac{28a^2b^6}{3x^3}+8ab^7\log(x)+\frac{b^8x^3}{3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^8/x^22,x]
```

```
[Out] -a^8/(21*x^21) - (4*a^7*b)/(9*x^18) - (28*a^6*b^2)/(15*x^15) - (1
4*a^5*b^3)/(3*x^12) - (70*a^4*b^4)/(9*x^9) - (28*a^3*b^5)/(3*x^6)
 - (28*a^2*b^6)/(3*x^3) + (b^8*x^3)/3 + 8*a*b^7*Log[x]
```

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

$$-\frac{a^8}{21x^{21}}-\frac{4a^7b}{9x^{18}}-\frac{28a^6b^2}{15x^{15}}-\frac{14a^5b^3}{3x^{12}}-\frac{70a^4b^4}{9x^9}-\frac{28a^3b^5}{3x^6}-\frac{28a^2b^6}{3x^3}+\frac{8ab^7\log\left(x^3\right)}{3}+\frac{\int^{x^3} b^8\,dx}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**8/x**22,x)
```

```
[Out] -a**8/(21*x**21) - 4*a**7*b/(9*x**18) - 28*a**6*b**2/(15*x**15) -
 14*a**5*b**3/(3*x**12) - 70*a**4*b**4/(9*x**9) - 28*a**3*b**5/(3
*x**6) - 28*a**2*b**6/(3*x**3) + 8*a*b**7*log(x**3)/3 + Integral(
b**8, (x, x**3))/3
```

Mathematica [A] time = 0.0181568, size = 105, normalized size = 1.

$$-\frac{a^8}{21x^{21}}-\frac{4a^7b}{9x^{18}}-\frac{28a^6b^2}{15x^{15}}-\frac{14a^5b^3}{3x^{12}}-\frac{70a^4b^4}{9x^9}-\frac{28a^3b^5}{3x^6}-\frac{28a^2b^6}{3x^3}+8ab^7\log(x)+\frac{b^8x^3}{3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^8/x^22,x]
```

```
[Out] -a^8/(21*x^21) - (4*a^7*b)/(9*x^18) - (28*a^6*b^2)/(15*x^15) - (1
4*a^5*b^3)/(3*x^12) - (70*a^4*b^4)/(9*x^9) - (28*a^3*b^5)/(3*x^6)
 - (28*a^2*b^6)/(3*x^3) + (b^8*x^3)/3 + 8*a*b^7*Log[x]
```

Maple [A] time = 0.013, size = 90, normalized size = 0.9

$$-\frac{a^8}{21\,x^{21}}-\frac{4\,a^7b}{9\,x^{18}}-\frac{28\,a^6b^2}{15\,x^{15}}-\frac{14\,a^5b^3}{3\,x^{12}}-\frac{70\,a^4b^4}{9\,x^9}-\frac{28\,a^3b^5}{3\,x^6}-\frac{28\,a^2b^6}{3\,x^3}+\frac{b^8x^3}{3}+8\,ab^7\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^8/x^22,x)
```

```
[Out] -1/21*a^8/x^21-4/9*a^7*b/x^18-28/15*a^6*b^2/x^15-14/3*a^5*b^3/x^1
2-70/9*a^4*b^4/x^9-28/3*a^3*b^5/x^6-28/3*a^2*b^6/x^3+1/3*b^8*x^3+
8*a*b^7*ln(x)
```

Maxima [A] time = 1.42445, size = 127, normalized size = 1.21

$$\frac{1}{3}\,b^{8}x^{3}+\frac{8}{3}\,ab^{7}\log\left(x^{3}\right)-\frac{2940\,a^{2}b^{6}x^{18}+2940\,a^{3}b^{5}x^{15}+2450\,a^{4}b^{4}x^{12}+1470\,a^{5}b^{3}x^{9}+588\,a^{6}b^{2}x^{6}+140\,a^{7}bx^{3}+15\,a^{8}}{315\,x^{21}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^22,x, algorithm="maxima")
```

```
[Out] 1/3*b^8*x^3 + 8/3*a*b^7*log(x^3) - 1/315*(2940*a^2*b^6*x^18 + 294
0*a^3*b^5*x^15 + 2450*a^4*b^4*x^12 + 1470*a^5*b^3*x^9 + 588*a^6*b
^2*x^6 + 140*a^7*b*x^3 + 15*a^8)/x^21
```

Fricas [A] time = 0.210282, size = 127, normalized size = 1.21

$$\frac{105\,b^{8}x^{24}+2520\,ab^{7}x^{21}\log\left(x\right)-2940\,a^{2}b^{6}x^{18}-2940\,a^{3}b^{5}x^{15}-2450\,a^{4}b^{4}x^{12}-1470\,a^{5}b^{3}x^{9}-588\,a^{6}b^{2}x^{6}-140\,a^{7}bx^{3}-1}{315\,x^{21}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^22,x, algorithm="fricas")
```

```
[Out] 1/315*(105*b^8*x^24 + 2520*a*b^7*x^21*log(x) - 2940*a^2*b^6*x^18
- 2940*a^3*b^5*x^15 - 2450*a^4*b^4*x^12 - 1470*a^5*b^3*x^9 - 588*
a^6*b^2*x^6 - 140*a^7*b*x^3 - 15*a^8)/x^21
```

Sympy [A] time = 3.95809, size = 97, normalized size = 0.92

$$8ab^{7}\log\left(x\right)+\frac{b^{8}x^{3}}{3}-\frac{15a^{8}+140a^{7}bx^{3}+588a^{6}b^{2}x^{6}+1470a^{5}b^{3}x^{9}+2450a^{4}b^{4}x^{12}+2940a^{3}b^{5}x^{15}+2940a^{2}b^{6}x^{18}}{315x^{21}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**8/x**22,x)
```

```
[Out] 8*a*b**7*log(x) + b**8*x**3/3 - (15*a**8 + 140*a**7*b*x**3 + 588*
a**6*b**2*x**6 + 1470*a**5*b**3*x**9 + 2450*a**4*b**4*x**12 + 294
0*a**3*b**5*x**15 + 2940*a**2*b**6*x**18)/(315*x**21)
```

GIAC/XCAS [A] time = 0.216382, size = 138, normalized size = 1.31

$$\frac{1}{3}\,b^{8}x^{3}+8\,ab^{7}\ln\left(|x|\right)-\frac{2178\,ab^{7}x^{21}+2940\,a^{2}b^{6}x^{18}+2940\,a^{3}b^{5}x^{15}+2450\,a^{4}b^{4}x^{12}+1470\,a^{5}b^{3}x^{9}+588\,a^{6}b^{2}x^{6}+140\,a^{7}bx^{3}+15\,a^{8}}{315\,x^{21}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^22,x, algorithm="giac")
```

```
[Out] 1/3*b^8*x^3 + 8*a*b^7*ln(abs(x)) - 1/315*(2178*a*b^7*x^21 + 2940*
a^2*b^6*x^18 + 2940*a^3*b^5*x^15 + 2450*a^4*b^4*x^12 + 1470*a^5*b
^3*x^9 + 588*a^6*b^2*x^6 + 140*a^7*b*x^3 + 15*a^8)/x^21
```

3.300 $\int \frac{(a+bx^3)^8}{x^{25}}\,dx$

Optimal. Leaf size=104

$$-\frac{a^8}{24x^{24}}-\frac{8a^7b}{21x^{21}}-\frac{14a^6b^2}{9x^{18}}-\frac{56a^5b^3}{15x^{15}}-\frac{35a^4b^4}{6x^{12}}-\frac{56a^3b^5}{9x^9}-\frac{14a^2b^6}{3x^6}-\frac{8ab^7}{3x^3}+b^8\log(x)$$

```
[Out] -a^8/(24*x^24) - (8*a^7*b)/(21*x^21) - (14*a^6*b^2)/(9*x^18) - (5
6*a^5*b^3)/(15*x^15) - (35*a^4*b^4)/(6*x^12) - (56*a^3*b^5)/(9*x^
9) - (14*a^2*b^6)/(3*x^6) - (8*a*b^7)/(3*x^3) + b^8*Log[x]
```

Rubi [A] time = 0.116233, antiderivative size = 104, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^8}{24x^{24}}-\frac{8a^7b}{21x^{21}}-\frac{14a^6b^2}{9x^{18}}-\frac{56a^5b^3}{15x^{15}}-\frac{35a^4b^4}{6x^{12}}-\frac{56a^3b^5}{9x^9}-\frac{14a^2b^6}{3x^6}-\frac{8ab^7}{3x^3}+b^8\log(x)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^8/x^25,x]
```

```
[Out] -a^8/(24*x^24) - (8*a^7*b)/(21*x^21) - (14*a^6*b^2)/(9*x^18) - (5
6*a^5*b^3)/(15*x^15) - (35*a^4*b^4)/(6*x^12) - (56*a^3*b^5)/(9*x^
9) - (14*a^2*b^6)/(3*x^6) - (8*a*b^7)/(3*x^3) + b^8*Log[x]
```

Rubi in Sympy [A] time = 23.0771, size = 109, normalized size = 1.05

$$-\frac{a^8}{24x^{24}}-\frac{8a^7b}{21x^{21}}-\frac{14a^6b^2}{9x^{18}}-\frac{56a^5b^3}{15x^{15}}-\frac{35a^4b^4}{6x^{12}}-\frac{56a^3b^5}{9x^9}-\frac{14a^2b^6}{3x^6}-\frac{8ab^7}{3x^3}+\frac{b^8\log\left(x^3\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**8/x**25,x)
```

```
[Out] -a**8/(24*x**24) - 8*a**7*b/(21*x**21) - 14*a**6*b**2/(9*x**18) -
 56*a**5*b**3/(15*x**15) - 35*a**4*b**4/(6*x**12) - 56*a**3*b**5/
(9*x**9) - 14*a**2*b**6/(3*x**6) - 8*a*b**7/(3*x**3) + b**8*log(x
**3)/3
```

Mathematica [A] time = 0.00877809, size = 104, normalized size = 1.

$$-\frac{a^8}{24x^{24}}-\frac{8a^7b}{21x^{21}}-\frac{14a^6b^2}{9x^{18}}-\frac{56a^5b^3}{15x^{15}}-\frac{35a^4b^4}{6x^{12}}-\frac{56a^3b^5}{9x^9}-\frac{14a^2b^6}{3x^6}-\frac{8ab^7}{3x^3}+b^8\log(x)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^8/x^25,x]
```

```
[Out] -a^8/(24*x^24) - (8*a^7*b)/(21*x^21) - (14*a^6*b^2)/(9*x^18) - (5
6*a^5*b^3)/(15*x^15) - (35*a^4*b^4)/(6*x^12) - (56*a^3*b^5)/(9*x^
9) - (14*a^2*b^6)/(3*x^6) - (8*a*b^7)/(3*x^3) + b^8*Log[x]
```

Maple [A] time = 0.011, size = 89, normalized size = 0.9

$$-\frac{a^8}{24\,x^{24}}-\frac{8\,a^7b}{21\,x^{21}}-\frac{14\,a^6b^2}{9\,x^{18}}-\frac{56\,a^5b^3}{15\,x^{15}}-\frac{35\,a^4b^4}{6\,x^{12}}-\frac{56\,a^3b^5}{9\,x^9}-\frac{14\,a^2b^6}{3\,x^6}-\frac{8\,ab^7}{3\,x^3}+b^8\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^8/x^25,x)
```

```
[Out] -1/24*a^8/x^24-8/21*a^7*b/x^21-14/9*a^6*b^2/x^18-56/15*a^5*b^3/x^
15-35/6*a^4*b^4/x^12-56/9*a^3*b^5/x^9-14/3*a^2*b^6/x^6-8/3*a*b^7/
x^3+b^8*ln(x)
```

Maxima [A] time = 1.44212, size = 127, normalized size = 1.22

$$\frac{1}{3}\,b^{8}\log\left(x^{3}\right) - \frac{6720\,ab^{7}x^{21} + 11760\,a^{2}b^{6}x^{18} + 15680\,a^{3}b^{5}x^{15} + 14700\,a^{4}b^{4}x^{12} + 9408\,a^{5}b^{3}x^{9} + 3920\,a^{6}b^{2}x^{6} + 960\,a^{7}bx^{3} + 105\,a^{8}}{2520\,x^{24}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^25,x, algorithm="maxima")
```

```
[Out] 1/3*b^8*log(x^3) - 1/2520*(6720*a*b^7*x^21 + 11760*a^2*b^6*x^18 +
 15680*a^3*b^5*x^15 + 14700*a^4*b^4*x^12 + 9408*a^5*b^3*x^9 + 392
0*a^6*b^2*x^6 + 960*a^7*b*x^3 + 105*a^8)/x^24
```

Fricas [A] time = 0.210662, size = 127, normalized size = 1.22

$$\frac{2520\,b^{8}x^{24}\log\left(x\right) - 6720\,ab^{7}x^{21} - 11760\,a^{2}b^{6}x^{18} - 15680\,a^{3}b^{5}x^{15} - 14700\,a^{4}b^{4}x^{12} - 9408\,a^{5}b^{3}x^{9} - 3920\,a^{6}b^{2}x^{6} - 960\,a^{7}b}{2520\,x^{24}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^25,x, algorithm="fricas")
```

```
[Out] 1/2520*(2520*b^8*x^24*log(x) - 6720*a*b^7*x^21 - 11760*a^2*b^6*x^
18 - 15680*a^3*b^5*x^15 - 14700*a^4*b^4*x^12 - 9408*a^5*b^3*x^9 -
 3920*a^6*b^2*x^6 - 960*a^7*b*x^3 - 105*a^8)/x^24
```

Sympy [A] time = 4.64219, size = 95, normalized size = 0.91

$$b^{8}\log\left(x\right) - \frac{105a^{8} + 960a^{7}bx^{3} + 3920a^{6}b^{2}x^{6} + 9408a^{5}b^{3}x^{9} + 14700a^{4}b^{4}x^{12} + 15680a^{3}b^{5}x^{15} + 11760a^{2}b^{6}x^{18} + 6720ab^{7}x^{21}}{2520x^{24}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**8/x**25,x)
```

```
[Out] b**8*log(x) - (105*a**8 + 960*a**7*b*x**3 + 3920*a**6*b**2*x**6 +
 9408*a**5*b**3*x**9 + 14700*a**4*b**4*x**12 + 15680*a**3*b**5*x*
*15 + 11760*a**2*b**6*x**18 + 6720*a*b**7*x**21)/(2520*x**24)
```

GIAC/XCAS [A] time = 0.218652, size = 135, normalized size = 1.3

$$b^{8}\ln\left(|x|\right) - \frac{2283\,b^{8}x^{24} + 6720\,ab^{7}x^{21} + 11760\,a^{2}b^{6}x^{18} + 15680\,a^{3}b^{5}x^{15} + 14700\,a^{4}b^{4}x^{12} + 9408\,a^{5}b^{3}x^{9} + 3920\,a^{6}b^{2}x^{6} + 960\,a^{7}bx^{3} + 10}{2520\,x^{24}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^25,x, algorithm="giac")
```

```
[Out] b^8*ln(abs(x)) - 1/2520*(2283*b^8*x^24 + 6720*a*b^7*x^21 + 11760*
a^2*b^6*x^18 + 15680*a^3*b^5*x^15 + 14700*a^4*b^4*x^12 + 9408*a^5
*b^3*x^9 + 3920*a^6*b^2*x^6 + 960*a^7*b*x^3 + 105*a^8)/x^24
```

3.301 $\int \frac{(a+bx^3)^8}{x^{28}} \, dx$

Optimal. Leaf size=19

$$-\frac{(a+bx^3)^9}{27ax^{27}}$$

```
[Out] -(a + b*x^3)^9/(27*a*x^27)
```

Rubi [A] time = 0.0178224, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{(a+bx^3)^9}{27ax^{27}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^3)^8/x^28,x]

[Out] -(a + b*x^3)^9/(27*a*x^27)
```

Rubi in Sympy [A] time = 2.82834, size = 15, normalized size = 0.79

$$-\frac{(a+bx^3)^9}{27ax^{27}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**3+a)**8/x**28,x)

[Out] -(a + b*x**3)**9/(27*a*x**27)
```

Mathematica [B] time = 0.0159739, size = 108, normalized size = 5.68

$$-\frac{a^8}{27x^{27}}-\frac{a^7b}{3x^{24}}-\frac{4a^6b^2}{3x^{21}}-\frac{28a^5b^3}{9x^{18}}-\frac{14a^4b^4}{3x^{15}}-\frac{14a^3b^5}{3x^{12}}-\frac{28a^2b^6}{9x^9}-\frac{4ab^7}{3x^6}-\frac{b^8}{3x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^3)^8/x^28,x]

[Out] -a^8/(27*x^27) - (a^7*b)/(3*x^24) - (4*a^6*b^2)/(3*x^21) - (28*a^
5*b^3)/(9*x^18) - (14*a^4*b^4)/(3*x^15) - (14*a^3*b^5)/(3*x^12) -
 (28*a^2*b^6)/(9*x^9) - (4*a*b^7)/(3*x^6) - b^8/(3*x^3)
```

Maple [B] time = 0.01, size = 91, normalized size = 4.8

$$-\frac{14\,a^3b^5}{3\,x^{12}}-\frac{14\,a^4b^4}{3\,x^{15}}-\frac{4\,a^6b^2}{3\,x^{21}}-\frac{28\,a^5b^3}{9\,x^{18}}-\frac{4\,ab^7}{3\,x^6}-\frac{a^7b}{3\,x^{24}}-\frac{28\,a^2b^6}{9\,x^9}-\frac{b^8}{3\,x^3}-\frac{a^8}{27\,x^{27}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x^3+a)^8/x^28,x)
```

```
[Out] -14/3*a^3*b^5/x^12-14/3*a^4*b^4/x^15-4/3*a^6*b^2/x^21-28/9*a^5*b^
3/x^18-4/3*a*b^7/x^6-1/3*a^7*b/x^24-28/9*a^2*b^6/x^9-1/3*b^8/x^3-
1/27*a^8/x^27
```

Maxima [A] time = 1.47444, size = 122, normalized size = 6.42

$$-\frac{9\,b^8x^{24} + 36\,ab^7x^{21} + 84\,a^2b^6x^{18} + 126\,a^3b^5x^{15} + 126\,a^4b^4x^{12} + 84\,a^5b^3x^9 + 36\,a^6b^2x^6 + 9\,a^7bx^3 + a^8}{27\,x^{27}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^28,x, algorithm="maxima")
```

```
[Out] -1/27*(9*b^8*x^24 + 36*a*b^7*x^21 + 84*a^2*b^6*x^18 + 126*a^3*b^5
*x^15 + 126*a^4*b^4*x^12 + 84*a^5*b^3*x^9 + 36*a^6*b^2*x^6 + 9*a^
7*b*x^3 + a^8)/x^27
```

Fricas [A] time = 0.204153, size = 122, normalized size = 6.42

$$-\frac{9\,b^8x^{24} + 36\,ab^7x^{21} + 84\,a^2b^6x^{18} + 126\,a^3b^5x^{15} + 126\,a^4b^4x^{12} + 84\,a^5b^3x^9 + 36\,a^6b^2x^6 + 9\,a^7bx^3 + a^8}{27\,x^{27}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^28,x, algorithm="fricas")
```

```
[Out] -1/27*(9*b^8*x^24 + 36*a*b^7*x^21 + 84*a^2*b^6*x^18 + 126*a^3*b^5
*x^15 + 126*a^4*b^4*x^12 + 84*a^5*b^3*x^9 + 36*a^6*b^2*x^6 + 9*a^
7*b*x^3 + a^8)/x^27
```

Sympy [A] time = 5.12271, size = 97, normalized size = 5.11

$$-\frac{a^8 + 9a^7bx^3 + 36a^6b^2x^6 + 84a^5b^3x^9 + 126a^4b^4x^{12} + 126a^3b^5x^{15} + 84a^2b^6x^{18} + 36ab^7x^{21} + 9b^8x^{24}}{27x^{27}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**8/x**28,x)
```

```
[Out] -(a**8 + 9*a**7*b*x**3 + 36*a**6*b**2*x**6 + 84*a**5*b**3*x**9 +
126*a**4*b**4*x**12 + 126*a**3*b**5*x**15 + 84*a**2*b**6*x**18 +
36*a*b**7*x**21 + 9*b**8*x**24)/(27*x**27)
```

GIAC/XCAS [A] time = 0.220104, size = 122, normalized size = 6.42

$$-\frac{9\,b^8x^{24} + 36\,ab^7x^{21} + 84\,a^2b^6x^{18} + 126\,a^3b^5x^{15} + 126\,a^4b^4x^{12} + 84\,a^5b^3x^9 + 36\,a^6b^2x^6 + 9\,a^7bx^3 + a^8}{27\,x^{27}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^28,x, algorithm="giac")
```

```
[Out] -1/27*(9*b^8*x^24 + 36*a*b^7*x^21 + 84*a^2*b^6*x^18 + 126*a^3*b^5
*x^15 + 126*a^4*b^4*x^12 + 84*a^5*b^3*x^9 + 36*a^6*b^2*x^6 + 9*a^
7*b*x^3 + a^8)/x^27
```

3.302 $\int \frac{(a+bx^3)^8}{x^{31}}\,dx$

Optimal. Leaf size=40

$$\frac{b\left(a+bx^3\right)^9}{270a^2x^{27}}-\frac{\left(a+bx^3\right)^9}{30ax^{30}}$$

```
[Out] -(a + b*x^3)^9/(30*a*x^30) + (b*(a + b*x^3)^9)/(270*a^2*x^27)
```

Rubi [A] time = 0.0538423, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{b\left(a+bx^3\right)^9}{270a^2x^{27}}-\frac{\left(a+bx^3\right)^9}{30ax^{30}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^8/x^31,x]

[Out] -(a + b*x^3)^9/(30*a*x^30) + (b*(a + b*x^3)^9)/(270*a^2*x^27)
```

Rubi in Sympy [A] time = 5.96497, size = 32, normalized size = 0.8

$$-\frac{\left(a+bx^3\right)^9}{30ax^{30}}+\frac{b\left(a+bx^3\right)^9}{270a^2x^{27}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**8/x**31,x)

[Out] -(a + b*x**3)**9/(30*a*x**30) + b*(a + b*x**3)**9/(270*a**2*x**27
)
```

Mathematica [B] time = 0.0086869, size = 108, normalized size = 2.7

$$-\frac{a^8}{30x^{30}}-\frac{8a^7b}{27x^{27}}-\frac{7a^6b^2}{6x^{24}}-\frac{8a^5b^3}{3x^{21}}-\frac{35a^4b^4}{9x^{18}}-\frac{56a^3b^5}{15x^{15}}-\frac{7a^2b^6}{3x^{12}}-\frac{8ab^7}{9x^9}-\frac{b^8}{6x^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^8/x^31,x]

[Out] -a^8/(30*x^30) - (8*a^7*b)/(27*x^27) - (7*a^6*b^2)/(6*x^24) - (8*
a^5*b^3)/(3*x^21) - (35*a^4*b^4)/(9*x^18) - (56*a^3*b^5)/(15*x^15
) - (7*a^2*b^6)/(3*x^12) - (8*a*b^7)/(9*x^9) - b^8/(6*x^6)
```

Maple [B] time = 0.01, size = 91, normalized size = 2.3

$$-\frac{7\,a^2b^6}{3\,x^{12}}-\frac{56\,a^3b^5}{15\,x^{15}}-\frac{7\,a^6b^2}{6\,x^{24}}-\frac{8\,a^7b}{27\,x^{27}}-\frac{b^8}{6\,x^6}-\frac{8\,a^5b^3}{3\,x^{21}}-\frac{a^8}{30\,x^{30}}-\frac{8\,ab^7}{9\,x^9}-\frac{35\,a^4b^4}{9\,x^{18}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^8/x^31,x)
```

```
[Out] -7/3*a^2*b^6/x^12-56/15*a^3*b^5/x^15-7/6*a^6*b^2/x^24-8/27*a^7*b/
x^27-1/6*b^8/x^6-8/3*a^5*b^3/x^21-1/30*a^8/x^30-8/9*a*b^7/x^9-35/
9*a^4*b^4/x^18
```

Maxima [A] time = 1.42595, size = 124, normalized size = 3.1

$$-\frac{45\,b^8x^{24}+240\,ab^7x^{21}+630\,a^2b^6x^{18}+1008\,a^3b^5x^{15}+1050\,a^4b^4x^{12}+720\,a^5b^3x^9+315\,a^6b^2x^6+80\,a^7bx^3+9\,a^8}{270\,x^{30}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^31,x, algorithm="maxima")
```

```
[Out] -1/270*(45*b^8*x^24 + 240*a*b^7*x^21 + 630*a^2*b^6*x^18 + 1008*a^
3*b^5*x^15 + 1050*a^4*b^4*x^12 + 720*a^5*b^3*x^9 + 315*a^6*b^2*x^
6 + 80*a^7*b*x^3 + 9*a^8)/x^30
```

Fricas [A] time = 0.203772, size = 124, normalized size = 3.1

$$-\frac{45\,b^8x^{24}+240\,ab^7x^{21}+630\,a^2b^6x^{18}+1008\,a^3b^5x^{15}+1050\,a^4b^4x^{12}+720\,a^5b^3x^9+315\,a^6b^2x^6+80\,a^7bx^3+9\,a^8}{270\,x^{30}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^31,x, algorithm="fricas")
```

```
[Out] -1/270*(45*b^8*x^24 + 240*a*b^7*x^21 + 630*a^2*b^6*x^18 + 1008*a^
3*b^5*x^15 + 1050*a^4*b^4*x^12 + 720*a^5*b^3*x^9 + 315*a^6*b^2*x^
6 + 80*a^7*b*x^3 + 9*a^8)/x^30
```

Sympy [A] time = 5.53035, size = 99, normalized size = 2.48

$$-\frac{9a^8+80a^7bx^3+315a^6b^2x^6+720a^5b^3x^9+1050a^4b^4x^{12}+1008a^3b^5x^{15}+630a^2b^6x^{18}+240ab^7x^{21}+45b^8x^{24}}{270x^{30}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**8/x**31,x)
```

```
[Out] -(9*a**8 + 80*a**7*b*x**3 + 315*a**6*b**2*x**6 + 720*a**5*b**3*x*
*9 + 1050*a**4*b**4*x**12 + 1008*a**3*b**5*x**15 + 630*a**2*b**6*
x**18 + 240*a*b**7*x**21 + 45*b**8*x**24)/(270*x**30)
```

GIAC/XCAS [A] time = 0.227689, size = 124, normalized size = 3.1

$$-\frac{45\,b^8x^{24}+240\,ab^7x^{21}+630\,a^2b^6x^{18}+1008\,a^3b^5x^{15}+1050\,a^4b^4x^{12}+720\,a^5b^3x^9+315\,a^6b^2x^6+80\,a^7bx^3+9\,a^8}{270\,x^{30}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^31,x, algorithm="giac")
```

```
[Out] -1/270*(45*b^8*x^24 + 240*a*b^7*x^21 + 630*a^2*b^6*x^18 + 1008*a^
3*b^5*x^15 + 1050*a^4*b^4*x^12 + 720*a^5*b^3*x^9 + 315*a^6*b^2*x^
6 + 80*a^7*b*x^3 + 9*a^8)/x^30
```

3.303 $\int \frac{(a+bx^3)^8}{x^{34}}\,dx$

Optimal. Leaf size=62

$$-\frac{b^2\left(a+bx^3\right)^9}{1485a^3x^{27}}+\frac{b\left(a+bx^3\right)^9}{165a^2x^{30}}-\frac{\left(a+bx^3\right)^9}{33ax^{33}}$$

```
[Out] -(a + b*x^3)^9/(33*a*x^33) + (b*(a + b*x^3)^9)/(165*a^2*x^30) - (
b^2*(a + b*x^3)^9)/(1485*a^3*x^27)
```

Rubi [A] time = 0.0783642, antiderivative size = 62, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{b^2\left(a+bx^3\right)^9}{1485a^3x^{27}}+\frac{b\left(a+bx^3\right)^9}{165a^2x^{30}}-\frac{\left(a+bx^3\right)^9}{33ax^{33}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^8/x^34,x]
```

```
[Out] -(a + b*x^3)^9/(33*a*x^33) + (b*(a + b*x^3)^9)/(165*a^2*x^30) - (
b^2*(a + b*x^3)^9)/(1485*a^3*x^27)
```

Rubi in Sympy [A] time = 8.76503, size = 53, normalized size = 0.85

$$-\frac{\left(a+bx^3\right)^9}{33ax^{33}}+\frac{b\left(a+bx^3\right)^9}{165a^2x^{30}}-\frac{b^2\left(a+bx^3\right)^9}{1485a^3x^{27}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**8/x**34,x)
```

```
[Out] -(a + b*x**3)**9/(33*a*x**33) + b*(a + b*x**3)**9/(165*a**2*x**30
) - b**2*(a + b*x**3)**9/(1485*a**3*x**27)
```

Mathematica [A] time = 0.0178311, size = 108, normalized size = 1.74

$$-\frac{a^8}{33x^{33}}-\frac{4a^7b}{15x^{30}}-\frac{28a^6b^2}{27x^{27}}-\frac{7a^5b^3}{3x^{24}}-\frac{10a^4b^4}{3x^{21}}-\frac{28a^3b^5}{9x^{18}}-\frac{28a^2b^6}{15x^{15}}-\frac{2ab^7}{3x^{12}}-\frac{b^8}{9x^9}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^8/x^34,x]
```

```
[Out] -a^8/(33*x^33) - (4*a^7*b)/(15*x^30) - (28*a^6*b^2)/(27*x^27) - (
7*a^5*b^3)/(3*x^24) - (10*a^4*b^4)/(3*x^21) - (28*a^3*b^5)/(9*x^1
8) - (28*a^2*b^6)/(15*x^15) - (2*a*b^7)/(3*x^12) - b^8/(9*x^9)
```

Maple [A] time = 0.01, size = 91, normalized size = 1.5

$$-\frac{2\,ab^7}{3\,x^{12}}-\frac{28\,a^2b^6}{15\,x^{15}}-\frac{28\,a^6b^2}{27\,x^{27}}-\frac{10\,a^4b^4}{3\,x^{21}}-\frac{a^8}{33\,x^{33}}-\frac{7\,a^5b^3}{3\,x^{24}}-\frac{b^8}{9\,x^9}-\frac{4\,a^7b}{15\,x^{30}}-\frac{28\,a^3b^5}{9\,x^{18}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^8/x^34,x)
```

```
[Out] -2/3*a*b^7/x^12-28/15*a^2*b^6/x^15-28/27*a^6*b^2/x^27-10/3*a^4*b^
4/x^21-1/33*a^8/x^33-7/3*a^5*b^3/x^24-1/9*b^8/x^9-4/15*a^7*b/x^30
-28/9*a^3*b^5/x^18
```

Maxima [A] time = 1.43362, size = 124, normalized size = 2.

$$-\frac{165\,b^8x^{24}+990\,ab^7x^{21}+2772\,a^2b^6x^{18}+4620\,a^3b^5x^{15}+4950\,a^4b^4x^{12}+3465\,a^5b^3x^9+1540\,a^6b^2x^6+396\,a^7bx^3+45\,a^8}{1485\,x^{33}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^34,x, algorithm="maxima")
```

```
[Out] -1/1485*(165*b^8*x^24 + 990*a*b^7*x^21 + 2772*a^2*b^6*x^18 + 4620
*a^3*b^5*x^15 + 4950*a^4*b^4*x^12 + 3465*a^5*b^3*x^9 + 1540*a^6*b
^2*x^6 + 396*a^7*b*x^3 + 45*a^8)/x^33
```

Fricas [A] time = 0.202246, size = 124, normalized size = 2.

$$-\frac{165\,b^8x^{24}+990\,ab^7x^{21}+2772\,a^2b^6x^{18}+4620\,a^3b^5x^{15}+4950\,a^4b^4x^{12}+3465\,a^5b^3x^9+1540\,a^6b^2x^6+396\,a^7bx^3+45\,a^8}{1485\,x^{33}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^34,x, algorithm="fricas")
```

```
[Out] -1/1485*(165*b^8*x^24 + 990*a*b^7*x^21 + 2772*a^2*b^6*x^18 + 4620
*a^3*b^5*x^15 + 4950*a^4*b^4*x^12 + 3465*a^5*b^3*x^9 + 1540*a^6*b
^2*x^6 + 396*a^7*b*x^3 + 45*a^8)/x^33
```

Sympy [A] time = 5.7222, size = 99, normalized size = 1.6

$$-\frac{45a^8+396a^7bx^3+1540a^6b^2x^6+3465a^5b^3x^9+4950a^4b^4x^{12}+4620a^3b^5x^{15}+2772a^2b^6x^{18}+990ab^7x^{21}+165b^8x^{24}}{1485x^{33}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**8/x**34,x)
```

```
[Out] -(45*a**8 + 396*a**7*b*x**3 + 1540*a**6*b**2*x**6 + 3465*a**5*b**
3*x**9 + 4950*a**4*b**4*x**12 + 4620*a**3*b**5*x**15 + 2772*a**2*
b**6*x**18 + 990*a*b**7*x**21 + 165*b**8*x**24)/(1485*x**33)
```

GIAC/XCAS [A] time = 0.218899, size = 124, normalized size = 2.

$$-\frac{165\,b^8x^{24}+990\,ab^7x^{21}+2772\,a^2b^6x^{18}+4620\,a^3b^5x^{15}+4950\,a^4b^4x^{12}+3465\,a^5b^3x^9+1540\,a^6b^2x^6+396\,a^7bx^3+45\,a^8}{1485\,x^{33}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^34,x, algorithm="giac")
```

```
[Out] -1/1485*(165*b^8*x^24 + 990*a*b^7*x^21 + 2772*a^2*b^6*x^18 + 4620
*a^3*b^5*x^15 + 4950*a^4*b^4*x^12 + 3465*a^5*b^3*x^9 + 1540*a^6*b
^2*x^6 + 396*a^7*b*x^3 + 45*a^8)/x^33
```

3.304 $\int \frac{(a+bx^3)^8}{x^{37}}\,dx$

Optimal. Leaf size=84

$$\frac{b^3(a+bx^3)^9}{5940a^4x^{27}}-\frac{b^2(a+bx^3)^9}{660a^3x^{30}}+\frac{b(a+bx^3)^9}{132a^2x^{33}}-\frac{(a+bx^3)^9}{36ax^{36}}$$

```
[Out] -(a + b*x^3)^9/(36*a*x^36) + (b*(a + b*x^3)^9)/(132*a^2*x^33) - (
b^2*(a + b*x^3)^9)/(660*a^3*x^30) + (b^3*(a + b*x^3)^9)/(5940*a^4
*x^27)
```

Rubi [A] time = 0.10607, antiderivative size = 84, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{b^3(a+bx^3)^9}{5940a^4x^{27}}-\frac{b^2(a+bx^3)^9}{660a^3x^{30}}+\frac{b(a+bx^3)^9}{132a^2x^{33}}-\frac{(a+bx^3)^9}{36ax^{36}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^8/x^37,x]
```

```
[Out] -(a + b*x^3)^9/(36*a*x^36) + (b*(a + b*x^3)^9)/(132*a^2*x^33) - (
b^2*(a + b*x^3)^9)/(660*a^3*x^30) + (b^3*(a + b*x^3)^9)/(5940*a^4
*x^27)
```

Rubi in Sympy [A] time = 12.6375, size = 73, normalized size = 0.87

$$-\frac{(a+bx^3)^9}{36ax^{36}}+\frac{b(a+bx^3)^9}{132a^2x^{33}}-\frac{b^2(a+bx^3)^9}{660a^3x^{30}}+\frac{b^3(a+bx^3)^9}{5940a^4x^{27}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**8/x**37,x)
```

```
[Out] -(a + b*x**3)**9/(36*a*x**36) + b*(a + b*x**3)**9/(132*a**2*x**33
) - b**2*(a + b*x**3)**9/(660*a**3*x**30) + b**3*(a + b*x**3)**9/
(5940*a**4*x**27)
```

Mathematica [A] time = 0.00787638, size = 108, normalized size = 1.29

$$-\frac{a^8}{36x^{36}}-\frac{8a^7b}{33x^{33}}-\frac{14a^6b^2}{15x^{30}}-\frac{56a^5b^3}{27x^{27}}-\frac{35a^4b^4}{12x^{24}}-\frac{8a^3b^5}{3x^{21}}-\frac{14a^2b^6}{9x^{18}}-\frac{8ab^7}{15x^{15}}-\frac{b^8}{12x^{12}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^8/x^37,x]
```

```
[Out] -a^8/(36*x^36) - (8*a^7*b)/(33*x^33) - (14*a^6*b^2)/(15*x^30) - (
56*a^5*b^3)/(27*x^27) - (35*a^4*b^4)/(12*x^24) - (8*a^3*b^5)/(3*x
^21) - (14*a^2*b^6)/(9*x^18) - (8*a*b^7)/(15*x^15) - b^8/(12*x^12
)
```

Maple [A] time = 0.01, size = 91, normalized size = 1.1

$$-\frac{b^8}{12\,x^{12}}-\frac{8\,ab^7}{15\,x^{15}}-\frac{14\,a^2b^6}{9\,x^{18}}-\frac{35\,a^4b^4}{12\,x^{24}}-\frac{56\,a^5b^3}{27\,x^{27}}-\frac{14\,a^6b^2}{15\,x^{30}}-\frac{8\,a^3b^5}{3\,x^{21}}-\frac{8\,a^7b}{33\,x^{33}}-\frac{a^8}{36\,x^{36}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^8/x^37,x)
```

```
[Out] -1/12*b^8/x^12-8/15*a*b^7/x^15-14/9*a^2*b^6/x^18-35/12*a^4*b^4/x^
24-56/27*a^5*b^3/x^27-14/15*a^6*b^2/x^30-8/3*a^3*b^5/x^21-8/33*a^
7*b/x^33-1/36*a^8/x^36
```

Maxima [A] time = 1.42196, size = 124, normalized size = 1.48

$$-\frac{495\,b^8x^{24} + 3168\,ab^7x^{21} + 9240\,a^2b^6x^{18} + 15840\,a^3b^5x^{15} + 17325\,a^4b^4x^{12} + 12320\,a^5b^3x^9 + 5544\,a^6b^2x^6 + 1440\,a^7bx^3 + 16}{5940\,x^{36}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^37,x, algorithm="maxima")
```

```
[Out] -1/5940*(495*b^8*x^24 + 3168*a*b^7*x^21 + 9240*a^2*b^6*x^18 + 158
40*a^3*b^5*x^15 + 17325*a^4*b^4*x^12 + 12320*a^5*b^3*x^9 + 5544*a
^6*b^2*x^6 + 1440*a^7*b*x^3 + 165*a^8)/x^36
```

Fricas [A] time = 0.20289, size = 124, normalized size = 1.48

$$-\frac{495\,b^8x^{24} + 3168\,ab^7x^{21} + 9240\,a^2b^6x^{18} + 15840\,a^3b^5x^{15} + 17325\,a^4b^4x^{12} + 12320\,a^5b^3x^9 + 5544\,a^6b^2x^6 + 1440\,a^7bx^3 + 16}{5940\,x^{36}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^37,x, algorithm="fricas")
```

```
[Out] -1/5940*(495*b^8*x^24 + 3168*a*b^7*x^21 + 9240*a^2*b^6*x^18 + 158
40*a^3*b^5*x^15 + 17325*a^4*b^4*x^12 + 12320*a^5*b^3*x^9 + 5544*a
^6*b^2*x^6 + 1440*a^7*b*x^3 + 165*a^8)/x^36
```

Sympy [A] time = 6.09571, size = 99, normalized size = 1.18

$$-\frac{165a^8 + 1440a^7bx^3 + 5544a^6b^2x^6 + 12320a^5b^3x^9 + 17325a^4b^4x^{12} + 15840a^3b^5x^{15} + 9240a^2b^6x^{18} + 3168ab^7x^{21} + 495b^8x^{24}}{5940x^{36}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**8/x**37,x)
```

```
[Out] -(165*a**8 + 1440*a**7*b*x**3 + 5544*a**6*b**2*x**6 + 12320*a**5*
b**3*x**9 + 17325*a**4*b**4*x**12 + 15840*a**3*b**5*x**15 + 9240*
a**2*b**6*x**18 + 3168*a*b**7*x**21 + 495*b**8*x**24)/(5940*x**36
)
```

GIAC/XCAS [A] time = 0.222435, size = 124, normalized size = 1.48

$$-\frac{495\,b^8x^{24} + 3168\,ab^7x^{21} + 9240\,a^2b^6x^{18} + 15840\,a^3b^5x^{15} + 17325\,a^4b^4x^{12} + 12320\,a^5b^3x^9 + 5544\,a^6b^2x^6 + 1440\,a^7bx^3 + 16}{5940\,x^{36}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^37,x, algorithm="giac")
```

```
[Out] -1/5940*(495*b^8*x^24 + 3168*a*b^7*x^21 + 9240*a^2*b^6*x^18 + 158
40*a^3*b^5*x^15 + 17325*a^4*b^4*x^12 + 12320*a^5*b^3*x^9 + 5544*a
^6*b^2*x^6 + 1440*a^7*b*x^3 + 165*a^8)/x^36
```

3.305 $\int \frac{(a+bx^3)^8}{x^{40}}\,dx$

Optimal. Leaf size=106

$$-\frac{b^4 (a+bx^3)^9}{19305a^5x^{27}}+\frac{b^3 (a+bx^3)^9}{2145a^4x^{30}}-\frac{b^2 (a+bx^3)^9}{429a^3x^{33}}+\frac{b (a+bx^3)^9}{117a^2x^{36}}-\frac{(a+bx^3)^9}{39ax^{39}}$$

```
[Out] -(a + b*x^3)^9/(39*a*x^39) + (b*(a + b*x^3)^9)/(117*a^2*x^36) - (
b^2*(a + b*x^3)^9)/(429*a^3*x^33) + (b^3*(a + b*x^3)^9)/(2145*a^4
*x^30) - (b^4*(a + b*x^3)^9)/(19305*a^5*x^27)
```

Rubi [A] time = 0.137152, antiderivative size = 106, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$

$$-\frac{b^4 (a+bx^3)^9}{19305a^5x^{27}}+\frac{b^3 (a+bx^3)^9}{2145a^4x^{30}}-\frac{b^2 (a+bx^3)^9}{429a^3x^{33}}+\frac{b (a+bx^3)^9}{117a^2x^{36}}-\frac{(a+bx^3)^9}{39ax^{39}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^8/x^40,x]
```

```
[Out] -(a + b*x^3)^9/(39*a*x^39) + (b*(a + b*x^3)^9)/(117*a^2*x^36) - (
b^2*(a + b*x^3)^9)/(429*a^3*x^33) + (b^3*(a + b*x^3)^9)/(2145*a^4
*x^30) - (b^4*(a + b*x^3)^9)/(19305*a^5*x^27)
```

Rubi in Sympy [A] time = 23.7686, size = 109, normalized size = 1.03

$$-\frac{a^8}{39x^{39}}-\frac{2a^7b}{9x^{36}}-\frac{28a^6b^2}{33x^{33}}-\frac{28a^5b^3}{15x^{30}}-\frac{70a^4b^4}{27x^{27}}-\frac{7a^3b^5}{3x^{24}}-\frac{4a^2b^6}{3x^{21}}-\frac{4ab^7}{9x^{18}}-\frac{b^8}{15x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**8/x**40,x)
```

```
[Out] -a**8/(39*x**39) - 2*a**7*b/(9*x**36) - 28*a**6*b**2/(33*x**33) -
 28*a**5*b**3/(15*x**30) - 70*a**4*b**4/(27*x**27) - 7*a**3*b**5/
(3*x**24) - 4*a**2*b**6/(3*x**21) - 4*a*b**7/(9*x**18) - b**8/(15
*x**15)
```

Mathematica [A] time = 0.0121738, size = 108, normalized size = 1.02

$$-\frac{a^8}{39x^{39}}-\frac{2a^7b}{9x^{36}}-\frac{28a^6b^2}{33x^{33}}-\frac{28a^5b^3}{15x^{30}}-\frac{70a^4b^4}{27x^{27}}-\frac{7a^3b^5}{3x^{24}}-\frac{4a^2b^6}{3x^{21}}-\frac{4ab^7}{9x^{18}}-\frac{b^8}{15x^{15}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^8/x^40,x]
```

```
[Out] -a^8/(39*x^39) - (2*a^7*b)/(9*x^36) - (28*a^6*b^2)/(33*x^33) - (2
8*a^5*b^3)/(15*x^30) - (70*a^4*b^4)/(27*x^27) - (7*a^3*b^5)/(3*x^
24) - (4*a^2*b^6)/(3*x^21) - (4*a*b^7)/(9*x^18) - b^8/(15*x^15)
```

Maple [A] time = 0.01, size = 91, normalized size = 0.9

$$-\frac{b^8}{15\,x^{15}}-\frac{28\,a^5b^3}{15\,x^{30}}-\frac{2\,a^7b}{9\,x^{36}}-\frac{a^8}{39\,x^{39}}-\frac{28\,a^6b^2}{33\,x^{33}}-\frac{4\,ab^7}{9\,x^{18}}-\frac{7\,a^3b^5}{3\,x^{24}}-\frac{70\,a^4b^4}{27\,x^{27}}-\frac{4\,a^2b^6}{3\,x^{21}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^8/x^40,x)
```

```
[Out] -1/15*b^8/x^15-28/15*a^5*b^3/x^30-2/9*a^7*b/x^36-1/39*a^8/x^39-28
/33*a^6*b^2/x^33-4/9*a*b^7/x^18-7/3*a^3*b^5/x^24-70/27*a^4*b^4/x^
27-4/3*a^2*b^6/x^21
```

Maxima [A] time = 1.45825, size = 124, normalized size = 1.17

$$-\frac{1287\, b^{8} x^{24} + 8580\, a b^{7} x^{21} + 25740\, a^{2} b^{6} x^{18} + 45045\, a^{3} b^{5} x^{15} + 50050\, a^{4} b^{4} x^{12} + 36036\, a^{5} b^{3} x^{9} + 16380\, a^{6} b^{2} x^{6} + 4290\, a^{7} b x^{3} + \cdots}{19305\, x^{39}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^40,x, algorithm="maxima")
```

```
[Out] -1/19305*(1287*b^8*x^24 + 8580*a*b^7*x^21 + 25740*a^2*b^6*x^18 +
45045*a^3*b^5*x^15 + 50050*a^4*b^4*x^12 + 36036*a^5*b^3*x^9 + 163
80*a^6*b^2*x^6 + 4290*a^7*b*x^3 + 495*a^8)/x^39
```

Fricas [A] time = 0.204735, size = 124, normalized size = 1.17

$$-\frac{1287\, b^{8} x^{24} + 8580\, a b^{7} x^{21} + 25740\, a^{2} b^{6} x^{18} + 45045\, a^{3} b^{5} x^{15} + 50050\, a^{4} b^{4} x^{12} + 36036\, a^{5} b^{3} x^{9} + 16380\, a^{6} b^{2} x^{6} + 4290\, a^{7} b x^{3} + \cdots}{19305\, x^{39}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^40,x, algorithm="fricas")
```

```
[Out] -1/19305*(1287*b^8*x^24 + 8580*a*b^7*x^21 + 25740*a^2*b^6*x^18 +
45045*a^3*b^5*x^15 + 50050*a^4*b^4*x^12 + 36036*a^5*b^3*x^9 + 163
80*a^6*b^2*x^6 + 4290*a^7*b*x^3 + 495*a^8)/x^39
```

Sympy [A] time = 6.49634, size = 99, normalized size = 0.93

$$-\frac{495a^{8} + 4290a^{7}bx^{3} + 16380a^{6}b^{2}x^{6} + 36036a^{5}b^{3}x^{9} + 50050a^{4}b^{4}x^{12} + 45045a^{3}b^{5}x^{15} + 25740a^{2}b^{6}x^{18} + 8580ab^{7}x^{21} + 1287b^{8} \cdots}{19305x^{39}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**8/x**40,x)
```

```
[Out] -(495*a**8 + 4290*a**7*b*x**3 + 16380*a**6*b**2*x**6 + 36036*a**5
*b**3*x**9 + 50050*a**4*b**4*x**12 + 45045*a**3*b**5*x**15 + 2574
0*a**2*b**6*x**18 + 8580*a*b**7*x**21 + 1287*b**8*x**24)/(19305*x
**39)
```

GIAC/XCAS [A] time = 0.217514, size = 124, normalized size = 1.17

$$-\frac{1287\, b^{8} x^{24} + 8580\, a b^{7} x^{21} + 25740\, a^{2} b^{6} x^{18} + 45045\, a^{3} b^{5} x^{15} + 50050\, a^{4} b^{4} x^{12} + 36036\, a^{5} b^{3} x^{9} + 16380\, a^{6} b^{2} x^{6} + 4290\, a^{7} b x^{3} + \cdots}{19305\, x^{39}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^40,x, algorithm="giac")
```

```
[Out] -1/19305*(1287*b^8*x^24 + 8580*a*b^7*x^21 + 25740*a^2*b^6*x^18 +
45045*a^3*b^5*x^15 + 50050*a^4*b^4*x^12 + 36036*a^5*b^3*x^9 + 163
80*a^6*b^2*x^6 + 4290*a^7*b*x^3 + 495*a^8)/x^39
```

3.306 $\int \frac{(a+bx^3)^8}{x^{43}}\,dx$

Optimal. Leaf size=108

$$-\frac{a^8}{42x^{42}}-\frac{8a^7b}{39x^{39}}-\frac{7a^6b^2}{9x^{36}}-\frac{56a^5b^3}{33x^{33}}-\frac{7a^4b^4}{3x^{30}}-\frac{56a^3b^5}{27x^{27}}-\frac{7a^2b^6}{6x^{24}}-\frac{8ab^7}{21x^{21}}-\frac{b^8}{18x^{18}}$$

```
[Out] -a^8/(42*x^42) - (8*a^7*b)/(39*x^39) - (7*a^6*b^2)/(9*x^36) - (56
*a^5*b^3)/(33*x^33) - (7*a^4*b^4)/(3*x^30) - (56*a^3*b^5)/(27*x^2
7) - (7*a^2*b^6)/(6*x^24) - (8*a*b^7)/(21*x^21) - b^8/(18*x^18)
```

Rubi [A] time = 0.126977, antiderivative size = 108, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^8}{42x^{42}}-\frac{8a^7b}{39x^{39}}-\frac{7a^6b^2}{9x^{36}}-\frac{56a^5b^3}{33x^{33}}-\frac{7a^4b^4}{3x^{30}}-\frac{56a^3b^5}{27x^{27}}-\frac{7a^2b^6}{6x^{24}}-\frac{8ab^7}{21x^{21}}-\frac{b^8}{18x^{18}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^8/x^43,x]
```

```
[Out] -a^8/(42*x^42) - (8*a^7*b)/(39*x^39) - (7*a^6*b^2)/(9*x^36) - (56
*a^5*b^3)/(33*x^33) - (7*a^4*b^4)/(3*x^30) - (56*a^3*b^5)/(27*x^2
7) - (7*a^2*b^6)/(6*x^24) - (8*a*b^7)/(21*x^21) - b^8/(18*x^18)
```

Rubi in Sympy [A] time = 23.5891, size = 109, normalized size = 1.01

$$-\frac{a^8}{42x^{42}}-\frac{8a^7b}{39x^{39}}-\frac{7a^6b^2}{9x^{36}}-\frac{56a^5b^3}{33x^{33}}-\frac{7a^4b^4}{3x^{30}}-\frac{56a^3b^5}{27x^{27}}-\frac{7a^2b^6}{6x^{24}}-\frac{8ab^7}{21x^{21}}-\frac{b^8}{18x^{18}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**8/x**43,x)
```

```
[Out] -a**8/(42*x**42) - 8*a**7*b/(39*x**39) - 7*a**6*b**2/(9*x**36) -
56*a**5*b**3/(33*x**33) - 7*a**4*b**4/(3*x**30) - 56*a**3*b**5/(2
7*x**27) - 7*a**2*b**6/(6*x**24) - 8*a*b**7/(21*x**21) - b**8/(18
*x**18)
```

Mathematica [A] time = 0.00798422, size = 108, normalized size = 1.

$$-\frac{a^8}{42x^{42}}-\frac{8a^7b}{39x^{39}}-\frac{7a^6b^2}{9x^{36}}-\frac{56a^5b^3}{33x^{33}}-\frac{7a^4b^4}{3x^{30}}-\frac{56a^3b^5}{27x^{27}}-\frac{7a^2b^6}{6x^{24}}-\frac{8ab^7}{21x^{21}}-\frac{b^8}{18x^{18}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^8/x^43,x]
```

```
[Out] -a^8/(42*x^42) - (8*a^7*b)/(39*x^39) - (7*a^6*b^2)/(9*x^36) - (56
*a^5*b^3)/(33*x^33) - (7*a^4*b^4)/(3*x^30) - (56*a^3*b^5)/(27*x^2
7) - (7*a^2*b^6)/(6*x^24) - (8*a*b^7)/(21*x^21) - b^8/(18*x^18)
```

Maple [A] time = 0.009, size = 91, normalized size = 0.8

$$-\frac{a^8}{42\,x^{42}}-\frac{8\,a^7b}{39\,x^{39}}-\frac{7\,a^6b^2}{9\,x^{36}}-\frac{56\,a^5b^3}{33\,x^{33}}-\frac{7\,a^4b^4}{3\,x^{30}}-\frac{56\,a^3b^5}{27\,x^{27}}-\frac{7\,a^2b^6}{6\,x^{24}}-\frac{8\,ab^7}{21\,x^{21}}-\frac{b^8}{18\,x^{18}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^8/x^43,x)
```

```
[Out] -1/42*a^8/x^42-8/39*a^7*b/x^39-7/9*a^6*b^2/x^36-56/33*a^5*b^3/x^3
3-7/3*a^4*b^4/x^30-56/27*a^3*b^5/x^27-7/6*a^2*b^6/x^24-8/21*a*b^7
/x^21-1/18*b^8/x^18
```

Maxima [A] time = 1.42031, size = 124, normalized size = 1.15

$$-\frac{3003\,b^8x^{24} + 20592\,ab^7x^{21} + 63063\,a^2b^6x^{18} + 112112\,a^3b^5x^{15} + 126126\,a^4b^4x^{12} + 91728\,a^5b^3x^9 + 42042\,a^6b^2x^6 + 11088\,a^7}{54054\,x^{42}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^43,x, algorithm="maxima")
```

```
[Out] -1/54054*(3003*b^8*x^24 + 20592*a*b^7*x^21 + 63063*a^2*b^6*x^18 +
 112112*a^3*b^5*x^15 + 126126*a^4*b^4*x^12 + 91728*a^5*b^3*x^9 +
42042*a^6*b^2*x^6 + 11088*a^7*b*x^3 + 1287*a^8)/x^42
```

Fricas [A] time = 0.204259, size = 124, normalized size = 1.15

$$-\frac{3003\,b^8x^{24} + 20592\,ab^7x^{21} + 63063\,a^2b^6x^{18} + 112112\,a^3b^5x^{15} + 126126\,a^4b^4x^{12} + 91728\,a^5b^3x^9 + 42042\,a^6b^2x^6 + 11088\,a^7}{54054\,x^{42}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^43,x, algorithm="fricas")
```

```
[Out] -1/54054*(3003*b^8*x^24 + 20592*a*b^7*x^21 + 63063*a^2*b^6*x^18 +
 112112*a^3*b^5*x^15 + 126126*a^4*b^4*x^12 + 91728*a^5*b^3*x^9 +
42042*a^6*b^2*x^6 + 11088*a^7*b*x^3 + 1287*a^8)/x^42
```

Sympy [A] time = 7.04777, size = 99, normalized size = 0.92

$$-\frac{1287a^8 + 11088a^7bx^3 + 42042a^6b^2x^6 + 91728a^5b^3x^9 + 126126a^4b^4x^{12} + 112112a^3b^5x^{15} + 63063a^2b^6x^{18} + 20592ab^7x^{21} + 3}{54054x^{42}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**8/x**43,x)
```

```
[Out] -(1287*a**8 + 11088*a**7*b*x**3 + 42042*a**6*b**2*x**6 + 91728*a*
*5*b**3*x**9 + 126126*a**4*b**4*x**12 + 112112*a**3*b**5*x**15 +
63063*a**2*b**6*x**18 + 20592*a*b**7*x**21 + 3003*b**8*x**24)/(54
054*x**42)
```

GIAC/XCAS [A] time = 0.219103, size = 124, normalized size = 1.15

$$-\frac{3003\,b^8x^{24} + 20592\,ab^7x^{21} + 63063\,a^2b^6x^{18} + 112112\,a^3b^5x^{15} + 126126\,a^4b^4x^{12} + 91728\,a^5b^3x^9 + 42042\,a^6b^2x^6 + 11088\,a^7}{54054\,x^{42}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^43,x, algorithm="giac")
```

```
[Out] -1/54054*(3003*b^8*x^24 + 20592*a*b^7*x^21 + 63063*a^2*b^6*x^18 +
 112112*a^3*b^5*x^15 + 126126*a^4*b^4*x^12 + 91728*a^5*b^3*x^9 +
42042*a^6*b^2*x^6 + 11088*a^7*b*x^3 + 1287*a^8)/x^42
```

3.307 $\int \frac{(a+bx^3)^8}{x^{46}}\,dx$

Optimal. Leaf size=108

$$-\frac{a^8}{45x^{45}}-\frac{4a^7b}{21x^{42}}-\frac{28a^6b^2}{39x^{39}}-\frac{14a^5b^3}{9x^{36}}-\frac{70a^4b^4}{33x^{33}}-\frac{28a^3b^5}{15x^{30}}-\frac{28a^2b^6}{27x^{27}}-\frac{ab^7}{3x^{24}}-\frac{b^8}{21x^{21}}$$

```
[Out] -a^8/(45*x^45) - (4*a^7*b)/(21*x^42) - (28*a^6*b^2)/(39*x^39) - (
14*a^5*b^3)/(9*x^36) - (70*a^4*b^4)/(33*x^33) - (28*a^3*b^5)/(15*
x^30) - (28*a^2*b^6)/(27*x^27) - (a*b^7)/(3*x^24) - b^8/(21*x^21)
```

Rubi [A] time = 0.126723, antiderivative size = 108, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$-\frac{a^8}{45x^{45}}-\frac{4a^7b}{21x^{42}}-\frac{28a^6b^2}{39x^{39}}-\frac{14a^5b^3}{9x^{36}}-\frac{70a^4b^4}{33x^{33}}-\frac{28a^3b^5}{15x^{30}}-\frac{28a^2b^6}{27x^{27}}-\frac{ab^7}{3x^{24}}-\frac{b^8}{21x^{21}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^8/x^46,x]
```

```
[Out] -a^8/(45*x^45) - (4*a^7*b)/(21*x^42) - (28*a^6*b^2)/(39*x^39) - (
14*a^5*b^3)/(9*x^36) - (70*a^4*b^4)/(33*x^33) - (28*a^3*b^5)/(15*
x^30) - (28*a^2*b^6)/(27*x^27) - (a*b^7)/(3*x^24) - b^8/(21*x^21)
```

Rubi in Sympy [A] time = 24.1669, size = 107, normalized size = 0.99

$$-\frac{a^8}{45x^{45}}-\frac{4a^7b}{21x^{42}}-\frac{28a^6b^2}{39x^{39}}-\frac{14a^5b^3}{9x^{36}}-\frac{70a^4b^4}{33x^{33}}-\frac{28a^3b^5}{15x^{30}}-\frac{28a^2b^6}{27x^{27}}-\frac{ab^7}{3x^{24}}-\frac{b^8}{21x^{21}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**8/x**46,x)
```

```
[Out] -a**8/(45*x**45) - 4*a**7*b/(21*x**42) - 28*a**6*b**2/(39*x**39)
- 14*a**5*b**3/(9*x**36) - 70*a**4*b**4/(33*x**33) - 28*a**3*b**5
/(15*x**30) - 28*a**2*b**6/(27*x**27) - a*b**7/(3*x**24) - b**8/(
21*x**21)
```

Mathematica [A] time = 0.0173524, size = 108, normalized size = 1.

$$-\frac{a^8}{45x^{45}}-\frac{4a^7b}{21x^{42}}-\frac{28a^6b^2}{39x^{39}}-\frac{14a^5b^3}{9x^{36}}-\frac{70a^4b^4}{33x^{33}}-\frac{28a^3b^5}{15x^{30}}-\frac{28a^2b^6}{27x^{27}}-\frac{ab^7}{3x^{24}}-\frac{b^8}{21x^{21}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^8/x^46,x]
```

```
[Out] -a^8/(45*x^45) - (4*a^7*b)/(21*x^42) - (28*a^6*b^2)/(39*x^39) - (
14*a^5*b^3)/(9*x^36) - (70*a^4*b^4)/(33*x^33) - (28*a^3*b^5)/(15*
x^30) - (28*a^2*b^6)/(27*x^27) - (a*b^7)/(3*x^24) - b^8/(21*x^21)
```

Maple [A] time = 0.01, size = 91, normalized size = 0.8

$$-\frac{a^8}{45\,x^{45}}-\frac{4\,a^7b}{21\,x^{42}}-\frac{28\,a^6b^2}{39\,x^{39}}-\frac{14\,a^5b^3}{9\,x^{36}}-\frac{70\,a^4b^4}{33\,x^{33}}-\frac{28\,a^3b^5}{15\,x^{30}}-\frac{28\,a^2b^6}{27\,x^{27}}-\frac{ab^7}{3\,x^{24}}-\frac{b^8}{21\,x^{21}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^8/x^46,x)
```

```
[Out] -1/45*a^8/x^45-4/21*a^7*b/x^42-28/39*a^6*b^2/x^39-14/9*a^5*b^3/x^
36-70/33*a^4*b^4/x^33-28/15*a^3*b^5/x^30-28/27*a^2*b^6/x^27-1/3*a
*b^7/x^24-1/21*b^8/x^21
```

Maxima [A] time = 1.43901, size = 124, normalized size = 1.15

$$-\frac{6435\,b^8x^{24} + 45045\,ab^7x^{21} + 140140\,a^2b^6x^{18} + 252252\,a^3b^5x^{15} + 286650\,a^4b^4x^{12} + 210210\,a^5b^3x^9 + 97020\,a^6b^2x^6 + 25740}{135135\,x^{45}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^46,x, algorithm="maxima")
```

```
[Out] -1/135135*(6435*b^8*x^24 + 45045*a*b^7*x^21 + 140140*a^2*b^6*x^18
 + 252252*a^3*b^5*x^15 + 286650*a^4*b^4*x^12 + 210210*a^5*b^3*x^9
 + 97020*a^6*b^2*x^6 + 25740*a^7*b*x^3 + 3003*a^8)/x^45
```

Fricas [A] time = 0.206179, size = 124, normalized size = 1.15

$$-\frac{6435\,b^8x^{24} + 45045\,ab^7x^{21} + 140140\,a^2b^6x^{18} + 252252\,a^3b^5x^{15} + 286650\,a^4b^4x^{12} + 210210\,a^5b^3x^9 + 97020\,a^6b^2x^6 + 25740}{135135\,x^{45}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^46,x, algorithm="fricas")
```

```
[Out] -1/135135*(6435*b^8*x^24 + 45045*a*b^7*x^21 + 140140*a^2*b^6*x^18
 + 252252*a^3*b^5*x^15 + 286650*a^4*b^4*x^12 + 210210*a^5*b^3*x^9
 + 97020*a^6*b^2*x^6 + 25740*a^7*b*x^3 + 3003*a^8)/x^45
```

Sympy [A] time = 7.41878, size = 99, normalized size = 0.92

$$-\frac{3003a^8 + 25740a^7bx^3 + 97020a^6b^2x^6 + 210210a^5b^3x^9 + 286650a^4b^4x^{12} + 252252a^3b^5x^{15} + 140140a^2b^6x^{18} + 45045ab^7x^{21}}{135135x^{45}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**8/x**46,x)
```

```
[Out] -(3003*a**8 + 25740*a**7*b*x**3 + 97020*a**6*b**2*x**6 + 210210*a
**5*b**3*x**9 + 286650*a**4*b**4*x**12 + 252252*a**3*b**5*x**15 +
 140140*a**2*b**6*x**18 + 45045*a*b**7*x**21 + 6435*b**8*x**24)/(
135135*x**45)
```

GIAC/XCAS [A] time = 0.217836, size = 124, normalized size = 1.15

$$-\frac{6435\,b^8x^{24} + 45045\,ab^7x^{21} + 140140\,a^2b^6x^{18} + 252252\,a^3b^5x^{15} + 286650\,a^4b^4x^{12} + 210210\,a^5b^3x^9 + 97020\,a^6b^2x^6 + 25740}{135135\,x^{45}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^46,x, algorithm="giac")
```

```
[Out] -1/135135*(6435*b^8*x^24 + 45045*a*b^7*x^21 + 140140*a^2*b^6*x^18
 + 252252*a^3*b^5*x^15 + 286650*a^4*b^4*x^12 + 210210*a^5*b^3*x^9
 + 97020*a^6*b^2*x^6 + 25740*a^7*b*x^3 + 3003*a^8)/x^45
```

3.308 $\int x^4 (a + bx^3)^8 \, dx$

Optimal. Leaf size=103

$$\frac{a^8x^5}{5} + a^7bx^8 + \frac{28}{11}a^6b^2x^{11} + 4a^5b^3x^{14} + \frac{70}{17}a^4b^4x^{17} + \frac{14}{5}a^3b^5x^{20} + \frac{28}{23}a^2b^6x^{23} + \frac{4}{13}ab^7x^{26} + \frac{b^8x^{29}}{29}$$

```
[Out] (a^8*x^5)/5 + a^7*b*x^8 + (28*a^6*b^2*x^11)/11 + 4*a^5*b^3*x^14 +
 (70*a^4*b^4*x^17)/17 + (14*a^3*b^5*x^20)/5 + (28*a^2*b^6*x^23)/2
3 + (4*a*b^7*x^26)/13 + (b^8*x^29)/29
```

Rubi [A] time = 0.1126, antiderivative size = 103, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{a^8x^5}{5} + a^7bx^8 + \frac{28}{11}a^6b^2x^{11} + 4a^5b^3x^{14} + \frac{70}{17}a^4b^4x^{17} + \frac{14}{5}a^3b^5x^{20} + \frac{28}{23}a^2b^6x^{23} + \frac{4}{13}ab^7x^{26} + \frac{b^8x^{29}}{29}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4*(a + b*x^3)^8,x]
```

```
[Out] (a^8*x^5)/5 + a^7*b*x^8 + (28*a^6*b^2*x^11)/11 + 4*a^5*b^3*x^14 +
 (70*a^4*b^4*x^17)/17 + (14*a^3*b^5*x^20)/5 + (28*a^2*b^6*x^23)/2
3 + (4*a*b^7*x^26)/13 + (b^8*x^29)/29
```

Rubi in Sympy [A] time = 18.7621, size = 102, normalized size = 0.99

$$\frac{a^8x^5}{5} + a^7bx^8 + \frac{28a^6b^2x^{11}}{11} + 4a^5b^3x^{14} + \frac{70a^4b^4x^{17}}{17} + \frac{14a^3b^5x^{20}}{5} + \frac{28a^2b^6x^{23}}{23} + \frac{4ab^7x^{26}}{13} + \frac{b^8x^{29}}{29}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4*(b*x**3+a)**8,x)
```

```
[Out] a**8*x**5/5 + a**7*b*x**8 + 28*a**6*b**2*x**11/11 + 4*a**5*b**3*x
**14 + 70*a**4*b**4*x**17/17 + 14*a**3*b**5*x**20/5 + 28*a**2*b**
6*x**23/23 + 4*a*b**7*x**26/13 + b**8*x**29/29
```

Mathematica [A] time = 0.00509893, size = 103, normalized size = 1.

$$\frac{a^8x^5}{5} + a^7bx^8 + \frac{28}{11}a^6b^2x^{11} + 4a^5b^3x^{14} + \frac{70}{17}a^4b^4x^{17} + \frac{14}{5}a^3b^5x^{20} + \frac{28}{23}a^2b^6x^{23} + \frac{4}{13}ab^7x^{26} + \frac{b^8x^{29}}{29}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4*(a + b*x^3)^8,x]
```

```
[Out] (a^8*x^5)/5 + a^7*b*x^8 + (28*a^6*b^2*x^11)/11 + 4*a^5*b^3*x^14 +
 (70*a^4*b^4*x^17)/17 + (14*a^3*b^5*x^20)/5 + (28*a^2*b^6*x^23)/2
3 + (4*a*b^7*x^26)/13 + (b^8*x^29)/29
```

Maple [A] time = 0.002, size = 90, normalized size = 0.9

$$\frac{a^8x^5}{5} + a^7bx^8 + \frac{28\,a^6b^2x^{11}}{11} + 4\,a^5b^3x^{14} + \frac{70\,a^4b^4x^{17}}{17} + \frac{14\,a^3b^5x^{20}}{5} + \frac{28\,a^2b^6x^{23}}{23} + \frac{4\,ab^7x^{26}}{13} + \frac{b^8x^{29}}{29}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4*(b*x^3+a)^8,x)
```

```
[Out] 1/5*a^8*x^5+a^7*b*x^8+28/11*a^6*b^2*x^11+4*a^5*b^3*x^14+70/17*a^4
*b^4*x^17+14/5*a^3*b^5*x^20+28/23*a^2*b^6*x^23+4/13*a*b^7*x^26+1/
29*b^8*x^29
```

Maxima [A] time = 1.55321, size = 120, normalized size = 1.17

$$\frac{1}{29}\,b^{8}x^{29}+\frac{4}{13}\,ab^{7}x^{26}+\frac{28}{23}\,a^{2}b^{6}x^{23}+\frac{14}{5}\,a^{3}b^{5}x^{20}+\frac{70}{17}\,a^{4}b^{4}x^{17}+4\,a^{5}b^{3}x^{14}+\frac{28}{11}\,a^{6}b^{2}x^{11}+a^{7}bx^{8}+\frac{1}{5}\,a^{8}x^{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8*x^4,x, algorithm="maxima")
```

```
[Out] 1/29*b^8*x^29 + 4/13*a*b^7*x^26 + 28/23*a^2*b^6*x^23 + 14/5*a^3*b
^5*x^20 + 70/17*a^4*b^4*x^17 + 4*a^5*b^3*x^14 + 28/11*a^6*b^2*x^1
1 + a^7*b*x^8 + 1/5*a^8*x^5
```

Fricas [A] time = 0.189609, size = 1, normalized size = 0.01

$$\frac{1}{29}x^{29}b^{8}+\frac{4}{13}x^{26}b^{7}a+\frac{28}{23}x^{23}b^{6}a^{2}+\frac{14}{5}x^{20}b^{5}a^{3}+\frac{70}{17}x^{17}b^{4}a^{4}+4x^{14}b^{3}a^{5}+\frac{28}{11}x^{11}b^{2}a^{6}+x^{8}ba^{7}+\frac{1}{5}x^{5}a^{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8*x^4,x, algorithm="fricas")
```

```
[Out] 1/29*x^29*b^8 + 4/13*x^26*b^7*a + 28/23*x^23*b^6*a^2 + 14/5*x^20*
b^5*a^3 + 70/17*x^17*b^4*a^4 + 4*x^14*b^3*a^5 + 28/11*x^11*b^2*a^
6 + x^8*b*a^7 + 1/5*x^5*a^8
```

Sympy [A] time = 0.159928, size = 102, normalized size = 0.99

$$\frac{a^{8}x^{5}}{5}+a^{7}bx^{8}+\frac{28a^{6}b^{2}x^{11}}{11}+4a^{5}b^{3}x^{14}+\frac{70a^{4}b^{4}x^{17}}{17}+\frac{14a^{3}b^{5}x^{20}}{5}+\frac{28a^{2}b^{6}x^{23}}{23}+\frac{4ab^{7}x^{26}}{13}+\frac{b^{8}x^{29}}{29}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4*(b*x**3+a)**8,x)
```

```
[Out] a**8*x**5/5 + a**7*b*x**8 + 28*a**6*b**2*x**11/11 + 4*a**5*b**3*x
**14 + 70*a**4*b**4*x**17/17 + 14*a**3*b**5*x**20/5 + 28*a**2*b**
6*x**23/23 + 4*a*b**7*x**26/13 + b**8*x**29/29
```

GIAC/XCAS [A] time = 0.218183, size = 120, normalized size = 1.17

$$\frac{1}{29}\,b^{8}x^{29}+\frac{4}{13}\,ab^{7}x^{26}+\frac{28}{23}\,a^{2}b^{6}x^{23}+\frac{14}{5}\,a^{3}b^{5}x^{20}+\frac{70}{17}\,a^{4}b^{4}x^{17}+4\,a^{5}b^{3}x^{14}+\frac{28}{11}\,a^{6}b^{2}x^{11}+a^{7}bx^{8}+\frac{1}{5}\,a^{8}x^{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8*x^4,x, algorithm="giac")
```

```
[Out] 1/29*b^8*x^29 + 4/13*a*b^7*x^26 + 28/23*a^2*b^6*x^23 + 14/5*a^3*b
^5*x^20 + 70/17*a^4*b^4*x^17 + 4*a^5*b^3*x^14 + 28/11*a^6*b^2*x^1
1 + a^7*b*x^8 + 1/5*a^8*x^5
```

3.309 $\int x^3 \left(a+bx^3\right)^8 \, dx$

Optimal. Leaf size=108

$$\frac{a^8x^4}{4}+\frac{8}{7}a^7bx^7+\frac{14}{5}a^6b^2x^{10}+\frac{56}{13}a^5b^3x^{13}+\frac{35}{8}a^4b^4x^{16}+\frac{56}{19}a^3b^5x^{19}+\frac{14}{11}a^2b^6x^{22}+\frac{8}{25}ab^7x^{25}+\frac{b^8x^{28}}{28}$$

```
[Out] (a^8*x^4)/4 + (8*a^7*b*x^7)/7 + (14*a^6*b^2*x^10)/5 + (56*a^5*b^3
*x^13)/13 + (35*a^4*b^4*x^16)/8 + (56*a^3*b^5*x^19)/19 + (14*a^2*
b^6*x^22)/11 + (8*a*b^7*x^25)/25 + (b^8*x^28)/28
```

Rubi [A] time = 0.103921, antiderivative size = 108, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{a^8x^4}{4}+\frac{8}{7}a^7bx^7+\frac{14}{5}a^6b^2x^{10}+\frac{56}{13}a^5b^3x^{13}+\frac{35}{8}a^4b^4x^{16}+\frac{56}{19}a^3b^5x^{19}+\frac{14}{11}a^2b^6x^{22}+\frac{8}{25}ab^7x^{25}+\frac{b^8x^{28}}{28}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3*(a + b*x^3)^8,x]
```

```
[Out] (a^8*x^4)/4 + (8*a^7*b*x^7)/7 + (14*a^6*b^2*x^10)/5 + (56*a^5*b^3
*x^13)/13 + (35*a^4*b^4*x^16)/8 + (56*a^3*b^5*x^19)/19 + (14*a^2*
b^6*x^22)/11 + (8*a*b^7*x^25)/25 + (b^8*x^28)/28
```

Rubi in Sympy [A] time = 18.8808, size = 107, normalized size = 0.99

$$\frac{a^8x^4}{4}+\frac{8a^7bx^7}{7}+\frac{14a^6b^2x^{10}}{5}+\frac{56a^5b^3x^{13}}{13}+\frac{35a^4b^4x^{16}}{8}+\frac{56a^3b^5x^{19}}{19}+\frac{14a^2b^6x^{22}}{11}+\frac{8ab^7x^{25}}{25}+\frac{b^8x^{28}}{28}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3*(b*x**3+a)**8,x)
```

```
[Out] a**8*x**4/4 + 8*a**7*b*x**7/7 + 14*a**6*b**2*x**10/5 + 56*a**5*b*
*3*x**13/13 + 35*a**4*b**4*x**16/8 + 56*a**3*b**5*x**19/19 + 14*a
**2*b**6*x**22/11 + 8*a*b**7*x**25/25 + b**8*x**28/28
```

Mathematica [A] time = 0.0052026, size = 108, normalized size = 1.

$$\frac{a^8x^4}{4}+\frac{8}{7}a^7bx^7+\frac{14}{5}a^6b^2x^{10}+\frac{56}{13}a^5b^3x^{13}+\frac{35}{8}a^4b^4x^{16}+\frac{56}{19}a^3b^5x^{19}+\frac{14}{11}a^2b^6x^{22}+\frac{8}{25}ab^7x^{25}+\frac{b^8x^{28}}{28}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3*(a + b*x^3)^8,x]
```

```
[Out] (a^8*x^4)/4 + (8*a^7*b*x^7)/7 + (14*a^6*b^2*x^10)/5 + (56*a^5*b^3
*x^13)/13 + (35*a^4*b^4*x^16)/8 + (56*a^3*b^5*x^19)/19 + (14*a^2*
b^6*x^22)/11 + (8*a*b^7*x^25)/25 + (b^8*x^28)/28
```

Maple [A] time = 0.002, size = 91, normalized size = 0.8

$$\frac{a^8x^4}{4}+\frac{8\,a^7bx^7}{7}+\frac{14\,a^6b^2x^{10}}{5}+\frac{56\,a^5b^3x^{13}}{13}+\frac{35\,a^4b^4x^{16}}{8}+\frac{56\,a^3b^5x^{19}}{19}+\frac{14\,a^2b^6x^{22}}{11}+\frac{8\,ab^7x^{25}}{25}+\frac{b^8x^{28}}{28}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3*(b*x^3+a)^8,x)
```

```
[Out] 1/4*a^8*x^4+8/7*a^7*b*x^7+14/5*a^6*b^2*x^10+56/13*a^5*b^3*x^13+35
/8*a^4*b^4*x^16+56/19*a^3*b^5*x^19+14/11*a^2*b^6*x^22+8/25*a*b^7*
x^25+1/28*b^8*x^28
```

Maxima [A] time = 1.43547, size = 122, normalized size = 1.13

$$\frac{1}{28}\,b^8x^{28}+\frac{8}{25}\,ab^7x^{25}+\frac{14}{11}\,a^2b^6x^{22}+\frac{56}{19}\,a^3b^5x^{19}+\frac{35}{8}\,a^4b^4x^{16}+\frac{56}{13}\,a^5b^3x^{13}+\frac{14}{5}\,a^6b^2x^{10}+\frac{8}{7}\,a^7bx^7+\frac{1}{4}\,a^8x^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8*x^3,x, algorithm="maxima")
```

```
[Out] 1/28*b^8*x^28 + 8/25*a*b^7*x^25 + 14/11*a^2*b^6*x^22 + 56/19*a^3*
b^5*x^19 + 35/8*a^4*b^4*x^16 + 56/13*a^5*b^3*x^13 + 14/5*a^6*b^2*
x^10 + 8/7*a^7*b*x^7 + 1/4*a^8*x^4
```

Fricas [A] time = 0.189996, size = 1, normalized size = 0.01

$$\frac{1}{28}x^{28}b^8+\frac{8}{25}x^{25}b^7a+\frac{14}{11}x^{22}b^6a^2+\frac{56}{19}x^{19}b^5a^3+\frac{35}{8}x^{16}b^4a^4+\frac{56}{13}x^{13}b^3a^5+\frac{14}{5}x^{10}b^2a^6+\frac{8}{7}x^7ba^7+\frac{1}{4}x^4a^8$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8*x^3,x, algorithm="fricas")
```

```
[Out] 1/28*x^28*b^8 + 8/25*x^25*b^7*a + 14/11*x^22*b^6*a^2 + 56/19*x^19
*b^5*a^3 + 35/8*x^16*b^4*a^4 + 56/13*x^13*b^3*a^5 + 14/5*x^10*b^2
*a^6 + 8/7*x^7*b*a^7 + 1/4*x^4*a^8
```

Sympy [A] time = 0.159482, size = 107, normalized size = 0.99

$$\frac{a^8x^4}{4}+\frac{8a^7bx^7}{7}+\frac{14a^6b^2x^{10}}{5}+\frac{56a^5b^3x^{13}}{13}+\frac{35a^4b^4x^{16}}{8}+\frac{56a^3b^5x^{19}}{19}+\frac{14a^2b^6x^{22}}{11}+\frac{8ab^7x^{25}}{25}+\frac{b^8x^{28}}{28}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(b*x**3+a)**8,x)
```

```
[Out] a**8*x**4/4 + 8*a**7*b*x**7/7 + 14*a**6*b**2*x**10/5 + 56*a**5*b*
*3*x**13/13 + 35*a**4*b**4*x**16/8 + 56*a**3*b**5*x**19/19 + 14*a
**2*b**6*x**22/11 + 8*a*b**7*x**25/25 + b**8*x**28/28
```

GIAC/XCAS [A] time = 0.213711, size = 122, normalized size = 1.13

$$\frac{1}{28}\,b^8x^{28}+\frac{8}{25}\,ab^7x^{25}+\frac{14}{11}\,a^2b^6x^{22}+\frac{56}{19}\,a^3b^5x^{19}+\frac{35}{8}\,a^4b^4x^{16}+\frac{56}{13}\,a^5b^3x^{13}+\frac{14}{5}\,a^6b^2x^{10}+\frac{8}{7}\,a^7bx^7+\frac{1}{4}\,a^8x^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8*x^3,x, algorithm="giac")
```

```
[Out] 1/28*b^8*x^28 + 8/25*a*b^7*x^25 + 14/11*a^2*b^6*x^22 + 56/19*a^3*
b^5*x^19 + 35/8*a^4*b^4*x^16 + 56/13*a^5*b^3*x^13 + 14/5*a^6*b^2*
x^10 + 8/7*a^7*b*x^7 + 1/4*a^8*x^4
```

3.310 $\int x\left(a+bx^3\right)^8\,dx$

Optimal. Leaf size=106

$$\frac{a^8x^2}{2}+\frac{8}{5}a^7bx^5+\frac{7}{2}a^6b^2x^8+\frac{56}{11}a^5b^3x^{11}+5a^4b^4x^{14}+\frac{56}{17}a^3b^5x^{17}+\frac{7}{5}a^2b^6x^{20}+\frac{8}{23}ab^7x^{23}+\frac{b^8x^{26}}{26}$$

```
[Out] (a^8*x^2)/2 + (8*a^7*b*x^5)/5 + (7*a^6*b^2*x^8)/2 + (56*a^5*b^3*x
^11)/11 + 5*a^4*b^4*x^14 + (56*a^3*b^5*x^17)/17 + (7*a^2*b^6*x^20
)/5 + (8*a*b^7*x^23)/23 + (b^8*x^26)/26
```

Rubi [A] time = 0.102032, antiderivative size = 106, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{a^8x^2}{2}+\frac{8}{5}a^7bx^5+\frac{7}{2}a^6b^2x^8+\frac{56}{11}a^5b^3x^{11}+5a^4b^4x^{14}+\frac{56}{17}a^3b^5x^{17}+\frac{7}{5}a^2b^6x^{20}+\frac{8}{23}ab^7x^{23}+\frac{b^8x^{26}}{26}$$

Antiderivative was successfully verified.

```
[In]  Int[x*(a + b*x^3)^8,x]
```

```
[Out] (a^8*x^2)/2 + (8*a^7*b*x^5)/5 + (7*a^6*b^2*x^8)/2 + (56*a^5*b^3*x
^11)/11 + 5*a^4*b^4*x^14 + (56*a^3*b^5*x^17)/17 + (7*a^2*b^6*x^20
)/5 + (8*a*b^7*x^23)/23 + (b^8*x^26)/26
```

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

$$a^8\int x\,dx+\frac{8a^7bx^5}{5}+\frac{7a^6b^2x^8}{2}+\frac{56a^5b^3x^{11}}{11}+5a^4b^4x^{14}+\frac{56a^3b^5x^{17}}{17}+\frac{7a^2b^6x^{20}}{5}+\frac{8ab^7x^{23}}{23}+\frac{b^8x^{26}}{26}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(b*x**3+a)**8,x)
```

```
[Out] a**8*Integral(x, x) + 8*a**7*b*x**5/5 + 7*a**6*b**2*x**8/2 + 56*a
**5*b**3*x**11/11 + 5*a**4*b**4*x**14 + 56*a**3*b**5*x**17/17 + 7
*a**2*b**6*x**20/5 + 8*a*b**7*x**23/23 + b**8*x**26/26
```

Mathematica [A] time = 0.00422346, size = 106, normalized size = 1.

$$\frac{a^8x^2}{2}+\frac{8}{5}a^7bx^5+\frac{7}{2}a^6b^2x^8+\frac{56}{11}a^5b^3x^{11}+5a^4b^4x^{14}+\frac{56}{17}a^3b^5x^{17}+\frac{7}{5}a^2b^6x^{20}+\frac{8}{23}ab^7x^{23}+\frac{b^8x^{26}}{26}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x*(a + b*x^3)^8,x]
```

```
[Out] (a^8*x^2)/2 + (8*a^7*b*x^5)/5 + (7*a^6*b^2*x^8)/2 + (56*a^5*b^3*x
^11)/11 + 5*a^4*b^4*x^14 + (56*a^3*b^5*x^17)/17 + (7*a^2*b^6*x^20
)/5 + (8*a*b^7*x^23)/23 + (b^8*x^26)/26
```

Maple [A] time = 0.002, size = 91, normalized size = 0.9

$$\frac{a^8x^2}{2}+\frac{8\,a^7bx^5}{5}+\frac{7\,a^6b^2x^8}{2}+\frac{56\,a^5b^3x^{11}}{11}+5\,a^4b^4x^{14}+\frac{56\,a^3b^5x^{17}}{17}+\frac{7\,a^2b^6x^{20}}{5}+\frac{8\,ab^7x^{23}}{23}+\frac{b^8x^{26}}{26}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(b*x^3+a)^8,x)
```

```
[Out] 1/2*a^8*x^2+8/5*a^7*b*x^5+7/2*a^6*b^2*x^8+56/11*a^5*b^3*x^11+5*a^
4*b^4*x^14+56/17*a^3*b^5*x^17+7/5*a^2*b^6*x^20+8/23*a*b^7*x^23+1/
26*b^8*x^26
```

Maxima [A] time = 1.43848, size = 122, normalized size = 1.15

$$\frac{1}{26}\,b^{8}x^{26}+\frac{8}{23}\,ab^{7}x^{23}+\frac{7}{5}\,a^{2}b^{6}x^{20}+\frac{56}{17}\,a^{3}b^{5}x^{17}+5\,a^{4}b^{4}x^{14}+\frac{56}{11}\,a^{5}b^{3}x^{11}+\frac{7}{2}\,a^{6}b^{2}x^{8}+\frac{8}{5}\,a^{7}bx^{5}+\frac{1}{2}\,a^{8}x^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8*x,x, algorithm="maxima")
```

```
[Out] 1/26*b^8*x^26 + 8/23*a*b^7*x^23 + 7/5*a^2*b^6*x^20 + 56/17*a^3*b^
5*x^17 + 5*a^4*b^4*x^14 + 56/11*a^5*b^3*x^11 + 7/2*a^6*b^2*x^8 +
8/5*a^7*b*x^5 + 1/2*a^8*x^2
```

Fricas [A] time = 0.189635, size = 1, normalized size = 0.01

$$\frac{1}{26}x^{26}b^{8}+\frac{8}{23}x^{23}b^{7}a+\frac{7}{5}x^{20}b^{6}a^{2}+\frac{56}{17}x^{17}b^{5}a^{3}+5x^{14}b^{4}a^{4}+\frac{56}{11}x^{11}b^{3}a^{5}+\frac{7}{2}x^{8}b^{2}a^{6}+\frac{8}{5}x^{5}ba^{7}+\frac{1}{2}x^{2}a^{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8*x,x, algorithm="fricas")
```

```
[Out] 1/26*x^26*b^8 + 8/23*x^23*b^7*a + 7/5*x^20*b^6*a^2 + 56/17*x^17*b
^5*a^3 + 5*x^14*b^4*a^4 + 56/11*x^11*b^3*a^5 + 7/2*x^8*b^2*a^6 +
8/5*x^5*b*a^7 + 1/2*x^2*a^8
```

Sympy [A] time = 0.172866, size = 105, normalized size = 0.99

$$\frac{a^{8}x^{2}}{2}+\frac{8a^{7}bx^{5}}{5}+\frac{7a^{6}b^{2}x^{8}}{2}+\frac{56a^{5}b^{3}x^{11}}{11}+5a^{4}b^{4}x^{14}+\frac{56a^{3}b^{5}x^{17}}{17}+\frac{7a^{2}b^{6}x^{20}}{5}+\frac{8ab^{7}x^{23}}{23}+\frac{b^{8}x^{26}}{26}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(b*x**3+a)**8,x)
```

```
[Out] a**8*x**2/2 + 8*a**7*b*x**5/5 + 7*a**6*b**2*x**8/2 + 56*a**5*b**3
*x**11/11 + 5*a**4*b**4*x**14 + 56*a**3*b**5*x**17/17 + 7*a**2*b*
*6*x**20/5 + 8*a*b**7*x**23/23 + b**8*x**26/26
```

GIAC/XCAS [A] time = 0.22281, size = 122, normalized size = 1.15

$$\frac{1}{26}\,b^{8}x^{26}+\frac{8}{23}\,ab^{7}x^{23}+\frac{7}{5}\,a^{2}b^{6}x^{20}+\frac{56}{17}\,a^{3}b^{5}x^{17}+5\,a^{4}b^{4}x^{14}+\frac{56}{11}\,a^{5}b^{3}x^{11}+\frac{7}{2}\,a^{6}b^{2}x^{8}+\frac{8}{5}\,a^{7}bx^{5}+\frac{1}{2}\,a^{8}x^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8*x,x, algorithm="giac")
```

```
[Out] 1/26*b^8*x^26 + 8/23*a*b^7*x^23 + 7/5*a^2*b^6*x^20 + 56/17*a^3*b^
5*x^17 + 5*a^4*b^4*x^14 + 56/11*a^5*b^3*x^11 + 7/2*a^6*b^2*x^8 +
8/5*a^7*b*x^5 + 1/2*a^8*x^2
```

3.311 $\int (a + bx^3)^8 \, dx$

Optimal. Leaf size=99

$$a^8x + 2a^7bx^4 + 4a^6b^2x^7 + \frac{28}{5}a^5b^3x^{10} + \frac{70}{13}a^4b^4x^{13} + \frac{7}{2}a^3b^5x^{16} + \frac{28}{19}a^2b^6x^{19} + \frac{4}{11}ab^7x^{22} + \frac{b^8x^{25}}{25}$$

```
[Out] a^8*x + 2*a^7*b*x^4 + 4*a^6*b^2*x^7 + (28*a^5*b^3*x^10)/5 + (70*a
^4*b^4*x^13)/13 + (7*a^3*b^5*x^16)/2 + (28*a^2*b^6*x^19)/19 + (4*
a*b^7*x^22)/11 + (b^8*x^25)/25
```

Rubi [A] time = 0.0851808, antiderivative size = 99, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111

$$a^8x + 2a^7bx^4 + 4a^6b^2x^7 + \frac{28}{5}a^5b^3x^{10} + \frac{70}{13}a^4b^4x^{13} + \frac{7}{2}a^3b^5x^{16} + \frac{28}{19}a^2b^6x^{19} + \frac{4}{11}ab^7x^{22} + \frac{b^8x^{25}}{25}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^8,x]
```

```
[Out] a^8*x + 2*a^7*b*x^4 + 4*a^6*b^2*x^7 + (28*a^5*b^3*x^10)/5 + (70*a
^4*b^4*x^13)/13 + (7*a^3*b^5*x^16)/2 + (28*a^2*b^6*x^19)/19 + (4*
a*b^7*x^22)/11 + (b^8*x^25)/25
```

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

$$2a^7bx^4 + 4a^6b^2x^7 + \frac{28a^5b^3x^{10}}{5} + \frac{70a^4b^4x^{13}}{13} + \frac{7a^3b^5x^{16}}{2} + \frac{28a^2b^6x^{19}}{19} + \frac{4ab^7x^{22}}{11} + \frac{b^8x^{25}}{25} + \int a^8\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**8,x)
```

```
[Out] 2*a**7*b*x**4 + 4*a**6*b**2*x**7 + 28*a**5*b**3*x**10/5 + 70*a**4
*b**4*x**13/13 + 7*a**3*b**5*x**16/2 + 28*a**2*b**6*x**19/19 + 4*
a*b**7*x**22/11 + b**8*x**25/25 + Integral(a**8, x)
```

Mathematica [A] time = 0.00239507, size = 99, normalized size = 1.

$$a^8x + 2a^7bx^4 + 4a^6b^2x^7 + \frac{28}{5}a^5b^3x^{10} + \frac{70}{13}a^4b^4x^{13} + \frac{7}{2}a^3b^5x^{16} + \frac{28}{19}a^2b^6x^{19} + \frac{4}{11}ab^7x^{22} + \frac{b^8x^{25}}{25}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^8,x]
```

```
[Out] a^8*x + 2*a^7*b*x^4 + 4*a^6*b^2*x^7 + (28*a^5*b^3*x^10)/5 + (70*a
^4*b^4*x^13)/13 + (7*a^3*b^5*x^16)/2 + (28*a^2*b^6*x^19)/19 + (4*
a*b^7*x^22)/11 + (b^8*x^25)/25
```

Maple [A] time = 0.002, size = 88, normalized size = 0.9

$$a^8x + 2\,a^7bx^4 + 4\,a^6b^2x^7 + \frac{28\,a^5b^3x^{10}}{5} + \frac{70\,a^4b^4x^{13}}{13} + \frac{7\,a^3b^5x^{16}}{2} + \frac{28\,a^2b^6x^{19}}{19} + \frac{4\,ab^7x^{22}}{11} + \frac{b^8x^{25}}{25}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^8,x)
```

```
[Out] a^8*x+2*a^7*b*x^4+4*a^6*b^2*x^7+28/5*a^5*b^3*x^10+70/13*a^4*b^4*x
^13+7/2*a^3*b^5*x^16+28/19*a^2*b^6*x^19+4/11*a*b^7*x^22+1/25*b^8*
x^25
```

Maxima [A] time = 1.44076, size = 117, normalized size = 1.18

$$\frac{1}{25}\,b^8x^{25} + \frac{4}{11}\,ab^7x^{22} + \frac{28}{19}\,a^2b^6x^{19} + \frac{7}{2}\,a^3b^5x^{16} + \frac{70}{13}\,a^4b^4x^{13} + \frac{28}{5}\,a^5b^3x^{10} + 4\,a^6b^2x^7 + 2\,a^7bx^4 + a^8x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8,x, algorithm="maxima")
```

```
[Out] 1/25*b^8*x^25 + 4/11*a*b^7*x^22 + 28/19*a^2*b^6*x^19 + 7/2*a^3*b^
5*x^16 + 70/13*a^4*b^4*x^13 + 28/5*a^5*b^3*x^10 + 4*a^6*b^2*x^7 +
 2*a^7*b*x^4 + a^8*x
```

Fricas [A] time = 0.204859, size = 1, normalized size = 0.01

$$\frac{1}{25}x^{25}b^8 + \frac{4}{11}x^{22}b^7a + \frac{28}{19}x^{19}b^6a^2 + \frac{7}{2}x^{16}b^5a^3 + \frac{70}{13}x^{13}b^4a^4 + \frac{28}{5}x^{10}b^3a^5 + 4x^7b^2a^6 + 2x^4ba^7 + xa^8$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8,x, algorithm="fricas")
```

```
[Out] 1/25*x^25*b^8 + 4/11*x^22*b^7*a + 28/19*x^19*b^6*a^2 + 7/2*x^16*b
^5*a^3 + 70/13*x^13*b^4*a^4 + 28/5*x^10*b^3*a^5 + 4*x^7*b^2*a^6 +
 2*x^4*b*a^7 + x*a^8
```

Sympy [A] time = 0.158597, size = 100, normalized size = 1.01

$$a^8x + 2a^7bx^4 + 4a^6b^2x^7 + \frac{28a^5b^3x^{10}}{5} + \frac{70a^4b^4x^{13}}{13} + \frac{7a^3b^5x^{16}}{2} + \frac{28a^2b^6x^{19}}{19} + \frac{4ab^7x^{22}}{11} + \frac{b^8x^{25}}{25}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**8,x)
```

```
[Out] a**8*x + 2*a**7*b*x**4 + 4*a**6*b**2*x**7 + 28*a**5*b**3*x**10/5
+ 70*a**4*b**4*x**13/13 + 7*a**3*b**5*x**16/2 + 28*a**2*b**6*x**1
9/19 + 4*a*b**7*x**22/11 + b**8*x**25/25
```

GIAC/XCAS [A] time = 0.21205, size = 117, normalized size = 1.18

$$\frac{1}{25}\,b^8x^{25} + \frac{4}{11}\,ab^7x^{22} + \frac{28}{19}\,a^2b^6x^{19} + \frac{7}{2}\,a^3b^5x^{16} + \frac{70}{13}\,a^4b^4x^{13} + \frac{28}{5}\,a^5b^3x^{10} + 4\,a^6b^2x^7 + 2\,a^7bx^4 + a^8x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8,x, algorithm="giac")
```

```
[Out] 1/25*b^8*x^25 + 4/11*a*b^7*x^22 + 28/19*a^2*b^6*x^19 + 7/2*a^3*b^
5*x^16 + 70/13*a^4*b^4*x^13 + 28/5*a^5*b^3*x^10 + 4*a^6*b^2*x^7 +
 2*a^7*b*x^4 + a^8*x
```

3.312 $\int \frac{(a+bx^3)^8}{x^2}\,dx$

Optimal. Leaf size=100

$$-\frac{a^8}{x}+4a^7bx^2+\frac{28}{5}a^6b^2x^5+7a^5b^3x^8+\frac{70}{11}a^4b^4x^{11}+4a^3b^5x^{14}+\frac{28}{17}a^2b^6x^{17}+\frac{2}{5}ab^7x^{20}+\frac{b^8x^{23}}{23}$$

```
[Out] -(a^8/x) + 4*a^7*b*x^2 + (28*a^6*b^2*x^5)/5 + 7*a^5*b^3*x^8 + (70
*a^4*b^4*x^11)/11 + 4*a^3*b^5*x^14 + (28*a^2*b^6*x^17)/17 + (2*a*
b^7*x^20)/5 + (b^8*x^23)/23
```

Rubi [A] time = 0.0974143, antiderivative size = 100, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a^8}{x}+4a^7bx^2+\frac{28}{5}a^6b^2x^5+7a^5b^3x^8+\frac{70}{11}a^4b^4x^{11}+4a^3b^5x^{14}+\frac{28}{17}a^2b^6x^{17}+\frac{2}{5}ab^7x^{20}+\frac{b^8x^{23}}{23}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^8/x^2,x]
```

```
[Out] -(a^8/x) + 4*a^7*b*x^2 + (28*a^6*b^2*x^5)/5 + 7*a^5*b^3*x^8 + (70
*a^4*b^4*x^11)/11 + 4*a^3*b^5*x^14 + (28*a^2*b^6*x^17)/17 + (2*a*
b^7*x^20)/5 + (b^8*x^23)/23
```

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

$$-\frac{a^8}{x}+8a^7b\int x\,dx+\frac{28a^6b^2x^5}{5}+7a^5b^3x^8+\frac{70a^4b^4x^{11}}{11}+4a^3b^5x^{14}+\frac{28a^2b^6x^{17}}{17}+\frac{2ab^7x^{20}}{5}+\frac{b^8x^{23}}{23}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**8/x**2,x)
```

```
[Out] -a**8/x + 8*a**7*b*Integral(x, x) + 28*a**6*b**2*x**5/5 + 7*a**5*
b**3*x**8 + 70*a**4*b**4*x**11/11 + 4*a**3*b**5*x**14 + 28*a**2*b
**6*x**17/17 + 2*a*b**7*x**20/5 + b**8*x**23/23
```

Mathematica [A] time = 0.017154, size = 100, normalized size = 1.

$$-\frac{a^8}{x}+4a^7bx^2+\frac{28}{5}a^6b^2x^5+7a^5b^3x^8+\frac{70}{11}a^4b^4x^{11}+4a^3b^5x^{14}+\frac{28}{17}a^2b^6x^{17}+\frac{2}{5}ab^7x^{20}+\frac{b^8x^{23}}{23}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^8/x^2,x]
```

```
[Out] -(a^8/x) + 4*a^7*b*x^2 + (28*a^6*b^2*x^5)/5 + 7*a^5*b^3*x^8 + (70
*a^4*b^4*x^11)/11 + 4*a^3*b^5*x^14 + (28*a^2*b^6*x^17)/17 + (2*a*
b^7*x^20)/5 + (b^8*x^23)/23
```

Maple [A] time = 0.004, size = 91, normalized size = 0.9

$$-\frac{a^8}{x}+4\,a^7bx^2+\frac{28\,a^6b^2x^5}{5}+7\,a^5b^3x^8+\frac{70\,a^4b^4x^{11}}{11}+4\,a^3b^5x^{14}+\frac{28\,a^2b^6x^{17}}{17}+\frac{2\,ab^7x^{20}}{5}+\frac{b^8x^{23}}{23}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^8/x^2,x)
```

```
[Out] -a^8/x+4*a^7*b*x^2+28/5*a^6*b^2*x^5+7*a^5*b^3*x^8+70/11*a^4*b^4*x
^11+4*a^3*b^5*x^14+28/17*a^2*b^6*x^17+2/5*a*b^7*x^20+1/23*b^8*x^2
3
```

Maxima [A] time = 1.44545, size = 122, normalized size = 1.22

$$\frac{1}{23}\,b^{8}x^{23}+\frac{2}{5}\,ab^{7}x^{20}+\frac{28}{17}\,a^{2}b^{6}x^{17}+4\,a^{3}b^{5}x^{14}+\frac{70}{11}\,a^{4}b^{4}x^{11}+7\,a^{5}b^{3}x^{8}+\frac{28}{5}\,a^{6}b^{2}x^{5}+4\,a^{7}bx^{2}-\frac{a^{8}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^2,x, algorithm="maxima")
```

```
[Out] 1/23*b^8*x^23 + 2/5*a*b^7*x^20 + 28/17*a^2*b^6*x^17 + 4*a^3*b^5*x
^14 + 70/11*a^4*b^4*x^11 + 7*a^5*b^3*x^8 + 28/5*a^6*b^2*x^5 + 4*a
^7*b*x^2 - a^8/x
```

Fricas [A] time = 0.204184, size = 124, normalized size = 1.24

$$\frac{935\,b^{8}x^{24}+8602\,ab^{7}x^{21}+35420\,a^{2}b^{6}x^{18}+86020\,a^{3}b^{5}x^{15}+136850\,a^{4}b^{4}x^{12}+150535\,a^{5}b^{3}x^{9}+120428\,a^{6}b^{2}x^{6}+86020\,a^{7}bx^{3}}{21505\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^2,x, algorithm="fricas")
```

```
[Out] 1/21505*(935*b^8*x^24 + 8602*a*b^7*x^21 + 35420*a^2*b^6*x^18 + 86
020*a^3*b^5*x^15 + 136850*a^4*b^4*x^12 + 150535*a^5*b^3*x^9 + 120
428*a^6*b^2*x^6 + 86020*a^7*b*x^3 - 21505*a^8)/x
```

Sympy [A] time = 1.31347, size = 99, normalized size = 0.99

$$-\frac{a^{8}}{x}+4a^{7}bx^{2}+\frac{28a^{6}b^{2}x^{5}}{5}+7a^{5}b^{3}x^{8}+\frac{70a^{4}b^{4}x^{11}}{11}+4a^{3}b^{5}x^{14}+\frac{28a^{2}b^{6}x^{17}}{17}+\frac{2ab^{7}x^{20}}{5}+\frac{b^{8}x^{23}}{23}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**8/x**2,x)
```

```
[Out] -a**8/x + 4*a**7*b*x**2 + 28*a**6*b**2*x**5/5 + 7*a**5*b**3*x**8
+ 70*a**4*b**4*x**11/11 + 4*a**3*b**5*x**14 + 28*a**2*b**6*x**17/
17 + 2*a*b**7*x**20/5 + b**8*x**23/23
```

GIAC/XCAS [A] time = 0.212731, size = 122, normalized size = 1.22

$$\frac{1}{23}\,b^{8}x^{23}+\frac{2}{5}\,ab^{7}x^{20}+\frac{28}{17}\,a^{2}b^{6}x^{17}+4\,a^{3}b^{5}x^{14}+\frac{70}{11}\,a^{4}b^{4}x^{11}+7\,a^{5}b^{3}x^{8}+\frac{28}{5}\,a^{6}b^{2}x^{5}+4\,a^{7}bx^{2}-\frac{a^{8}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^2,x, algorithm="giac")
```

```
[Out] 1/23*b^8*x^23 + 2/5*a*b^7*x^20 + 28/17*a^2*b^6*x^17 + 4*a^3*b^5*x
^14 + 70/11*a^4*b^4*x^11 + 7*a^5*b^3*x^8 + 28/5*a^6*b^2*x^5 + 4*a
^7*b*x^2 - a^8/x
```

3.313 $\int \frac{(a+bx^3)^8}{x^3}\,dx$

Optimal. Leaf size=98

$$-\frac{a^8}{2x^2}+8a^7bx+7a^6b^2x^4+8a^5b^3x^7+7a^4b^4x^{10}+\frac{56}{13}a^3b^5x^{13}+\frac{7}{4}a^2b^6x^{16}+\frac{8}{19}ab^7x^{19}+\frac{b^8x^{22}}{22}$$

```
[Out] -a^8/(2*x^2) + 8*a^7*b*x + 7*a^6*b^2*x^4 + 8*a^5*b^3*x^7 + 7*a^4*
b^4*x^10 + (56*a^3*b^5*x^13)/13 + (7*a^2*b^6*x^16)/4 + (8*a*b^7*x
^19)/19 + (b^8*x^22)/22
```

Rubi [A] time = 0.0945575, antiderivative size = 98, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a^8}{2x^2}+8a^7bx+7a^6b^2x^4+8a^5b^3x^7+7a^4b^4x^{10}+\frac{56}{13}a^3b^5x^{13}+\frac{7}{4}a^2b^6x^{16}+\frac{8}{19}ab^7x^{19}+\frac{b^8x^{22}}{22}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^3)^8/x^3,x]
```

```
[Out] -a^8/(2*x^2) + 8*a^7*b*x + 7*a^6*b^2*x^4 + 8*a^5*b^3*x^7 + 7*a^4*
b^4*x^10 + (56*a^3*b^5*x^13)/13 + (7*a^2*b^6*x^16)/4 + (8*a*b^7*x
^19)/19 + (b^8*x^22)/22
```

Rubi in Sympy [A] time = 19.4265, size = 99, normalized size = 1.01

$$-\frac{a^8}{2x^2}+8a^7bx+7a^6b^2x^4+8a^5b^3x^7+7a^4b^4x^{10}+\frac{56a^3b^5x^{13}}{13}+\frac{7a^2b^6x^{16}}{4}+\frac{8ab^7x^{19}}{19}+\frac{b^8x^{22}}{22}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**3+a)**8/x**3,x)
```

```
[Out] -a**8/(2*x**2) + 8*a**7*b*x + 7*a**6*b**2*x**4 + 8*a**5*b**3*x**7
 + 7*a**4*b**4*x**10 + 56*a**3*b**5*x**13/13 + 7*a**2*b**6*x**16/
4 + 8*a*b**7*x**19/19 + b**8*x**22/22
```

Mathematica [A] time = 0.00805301, size = 98, normalized size = 1.

$$-\frac{a^8}{2x^2}+8a^7bx+7a^6b^2x^4+8a^5b^3x^7+7a^4b^4x^{10}+\frac{56}{13}a^3b^5x^{13}+\frac{7}{4}a^2b^6x^{16}+\frac{8}{19}ab^7x^{19}+\frac{b^8x^{22}}{22}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^3)^8/x^3,x]
```

```
[Out] -a^8/(2*x^2) + 8*a^7*b*x + 7*a^6*b^2*x^4 + 8*a^5*b^3*x^7 + 7*a^4*
b^4*x^10 + (56*a^3*b^5*x^13)/13 + (7*a^2*b^6*x^16)/4 + (8*a*b^7*x
^19)/19 + (b^8*x^22)/22
```

Maple [A] time = 0.006, size = 89, normalized size = 0.9

$$-\frac{a^8}{2\,x^2}+8\,a^7bx+7\,a^6b^2x^4+8\,a^5b^3x^7+7\,a^4b^4x^{10}+\frac{56\,a^3b^5x^{13}}{13}+\frac{7\,a^2b^6x^{16}}{4}+\frac{8\,ab^7x^{19}}{19}+\frac{b^8x^{22}}{22}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^8/x^3,x)
```

```
[Out] -1/2*a^8/x^2+8*a^7*b*x+7*a^6*b^2*x^4+8*a^5*b^3*x^7+7*a^4*b^4*x^10
+56/13*a^3*b^5*x^13+7/4*a^2*b^6*x^16+8/19*a*b^7*x^19+1/22*b^8*x^2
2
```

Maxima [A] time = 1.43704, size = 119, normalized size = 1.21

$$\frac{1}{22}\,b^8x^{22}+\frac{8}{19}\,ab^7x^{19}+\frac{7}{4}\,a^2b^6x^{16}+\frac{56}{13}\,a^3b^5x^{13}+7\,a^4b^4x^{10}+8\,a^5b^3x^7+7\,a^6b^2x^4+8\,a^7bx-\frac{a^8}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^3,x, algorithm="maxima")
```

```
[Out] 1/22*b^8*x^22 + 8/19*a*b^7*x^19 + 7/4*a^2*b^6*x^16 + 56/13*a^3*b^
5*x^13 + 7*a^4*b^4*x^10 + 8*a^5*b^3*x^7 + 7*a^6*b^2*x^4 + 8*a^7*b
*x - 1/2*a^8/x^2
```

Fricas [A] time = 0.207998, size = 124, normalized size = 1.27

$$\frac{494\,b^8x^{24}+4576\,ab^7x^{21}+19019\,a^2b^6x^{18}+46816\,a^3b^5x^{15}+76076\,a^4b^4x^{12}+86944\,a^5b^3x^9+76076\,a^6b^2x^6+86944\,a^7bx^3-}{10868\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^3,x, algorithm="fricas")
```

```
[Out] 1/10868*(494*b^8*x^24 + 4576*a*b^7*x^21 + 19019*a^2*b^6*x^18 + 46
816*a^3*b^5*x^15 + 76076*a^4*b^4*x^12 + 86944*a^5*b^3*x^9 + 76076
*a^6*b^2*x^6 + 86944*a^7*b*x^3 - 5434*a^8)/x^2
```

Sympy [A] time = 1.35968, size = 99, normalized size = 1.01

$$-\frac{a^8}{2x^2}+8a^7bx+7a^6b^2x^4+8a^5b^3x^7+7a^4b^4x^{10}+\frac{56a^3b^5x^{13}}{13}+\frac{7a^2b^6x^{16}}{4}+\frac{8ab^7x^{19}}{19}+\frac{b^8x^{22}}{22}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**8/x**3,x)
```

```
[Out] -a**8/(2*x**2) + 8*a**7*b*x + 7*a**6*b**2*x**4 + 8*a**5*b**3*x**7
 + 7*a**4*b**4*x**10 + 56*a**3*b**5*x**13/13 + 7*a**2*b**6*x**16/
4 + 8*a*b**7*x**19/19 + b**8*x**22/22
```

GIAC/XCAS [A] time = 0.216426, size = 119, normalized size = 1.21

$$\frac{1}{22}\,b^8x^{22}+\frac{8}{19}\,ab^7x^{19}+\frac{7}{4}\,a^2b^6x^{16}+\frac{56}{13}\,a^3b^5x^{13}+7\,a^4b^4x^{10}+8\,a^5b^3x^7+7\,a^6b^2x^4+8\,a^7bx-\frac{a^8}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^3,x, algorithm="giac")
```

```
[Out] 1/22*b^8*x^22 + 8/19*a*b^7*x^19 + 7/4*a^2*b^6*x^16 + 56/13*a^3*b^
5*x^13 + 7*a^4*b^4*x^10 + 8*a^5*b^3*x^7 + 7*a^6*b^2*x^4 + 8*a^7*b
*x - 1/2*a^8/x^2
```

3.314 $\int \frac{(a+bx^3)^8}{x^5} dx$

Optimal. Leaf size=102

$$-\frac{a^8}{4x^4}-\frac{8a^7b}{x}+14a^6b^2x^2+\frac{56}{5}a^5b^3x^5+\frac{35}{4}a^4b^4x^8+\frac{56}{11}a^3b^5x^{11}+2a^2b^6x^{14}+\frac{8}{17}ab^7x^{17}+\frac{b^8x^{20}}{20}$$

```
[Out] -a^8/(4*x^4) - (8*a^7*b)/x + 14*a^6*b^2*x^2 + (56*a^5*b^3*x^5)/5
+ (35*a^4*b^4*x^8)/4 + (56*a^3*b^5*x^11)/11 + 2*a^2*b^6*x^14 + (8
*a*b^7*x^17)/17 + (b^8*x^20)/20
```

Rubi [A] time = 0.0973903, antiderivative size = 102, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a^8}{4x^4}-\frac{8a^7b}{x}+14a^6b^2x^2+\frac{56}{5}a^5b^3x^5+\frac{35}{4}a^4b^4x^8+\frac{56}{11}a^3b^5x^{11}+2a^2b^6x^{14}+\frac{8}{17}ab^7x^{17}+\frac{b^8x^{20}}{20}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^8/x^5,x]
```

```
[Out] -a^8/(4*x^4) - (8*a^7*b)/x + 14*a^6*b^2*x^2 + (56*a^5*b^3*x^5)/5
+ (35*a^4*b^4*x^8)/4 + (56*a^3*b^5*x^11)/11 + 2*a^2*b^6*x^14 + (8
*a*b^7*x^17)/17 + (b^8*x^20)/20
```

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

$$-\frac{a^8}{4x^4}-\frac{8a^7b}{x}+28a^6b^2\int x\,dx+\frac{56a^5b^3x^5}{5}+\frac{35a^4b^4x^8}{4}+\frac{56a^3b^5x^{11}}{11}+2a^2b^6x^{14}+\frac{8ab^7x^{17}}{17}+\frac{b^8x^{20}}{20}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**8/x**5,x)
```

```
[Out] -a**8/(4*x**4) - 8*a**7*b/x + 28*a**6*b**2*Integral(x, x) + 56*a*
*5*b**3*x**5/5 + 35*a**4*b**4*x**8/4 + 56*a**3*b**5*x**11/11 + 2*
a**2*b**6*x**14 + 8*a*b**7*x**17/17 + b**8*x**20/20
```

Mathematica [A] time = 0.00835476, size = 102, normalized size = 1.

$$-\frac{a^8}{4x^4}-\frac{8a^7b}{x}+14a^6b^2x^2+\frac{56}{5}a^5b^3x^5+\frac{35}{4}a^4b^4x^8+\frac{56}{11}a^3b^5x^{11}+2a^2b^6x^{14}+\frac{8}{17}ab^7x^{17}+\frac{b^8x^{20}}{20}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^8/x^5,x]
```

```
[Out] -a^8/(4*x^4) - (8*a^7*b)/x + 14*a^6*b^2*x^2 + (56*a^5*b^3*x^5)/5
+ (35*a^4*b^4*x^8)/4 + (56*a^3*b^5*x^11)/11 + 2*a^2*b^6*x^14 + (8
*a*b^7*x^17)/17 + (b^8*x^20)/20
```

Maple [A] time = 0.008, size = 91, normalized size = 0.9

$$-\frac{a^8}{4\,x^4}-8\,\frac{a^7b}{x}+14\,a^6b^2x^2+\frac{56\,a^5b^3x^5}{5}+\frac{35\,a^4b^4x^8}{4}+\frac{56\,a^3b^5x^{11}}{11}+2\,a^2b^6x^{14}+\frac{8\,ab^7x^{17}}{17}+\frac{b^8x^{20}}{20}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^8/x^5,x)
```

```
[Out] -1/4*a^8/x^4-8*a^7*b/x+14*a^6*b^2*x^2+56/5*a^5*b^3*x^5+35/4*a^4*b
^4*x^8+56/11*a^3*b^5*x^11+2*a^2*b^6*x^14+8/17*a*b^7*x^17+1/20*b^8
*x^20
```

Maxima [A] time = 1.43346, size = 123, normalized size = 1.21

$$\frac{1}{20}\,b^{8}x^{20}+\frac{8}{17}\,ab^{7}x^{17}+2\,a^{2}b^{6}x^{14}+\frac{56}{11}\,a^{3}b^{5}x^{11}+\frac{35}{4}\,a^{4}b^{4}x^{8}+\frac{56}{5}\,a^{5}b^{3}x^{5}+14\,a^{6}b^{2}x^{2}-\frac{32\,a^{7}bx^{3}+a^{8}}{4\,x^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^5,x, algorithm="maxima")
```

```
[Out] 1/20*b^8*x^20 + 8/17*a*b^7*x^17 + 2*a^2*b^6*x^14 + 56/11*a^3*b^5*
x^11 + 35/4*a^4*b^4*x^8 + 56/5*a^5*b^3*x^5 + 14*a^6*b^2*x^2 - 1/4
*(32*a^7*b*x^3 + a^8)/x^4
```

Fricas [A] time = 0.206897, size = 124, normalized size = 1.22

$$\frac{187\,b^{8}x^{24}+1760\,ab^{7}x^{21}+7480\,a^{2}b^{6}x^{18}+19040\,a^{3}b^{5}x^{15}+32725\,a^{4}b^{4}x^{12}+41888\,a^{5}b^{3}x^{9}+52360\,a^{6}b^{2}x^{6}-29920\,a^{7}bx^{3}-9}{3740\,x^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^5,x, algorithm="fricas")
```

```
[Out] 1/3740*(187*b^8*x^24 + 1760*a*b^7*x^21 + 7480*a^2*b^6*x^18 + 1904
0*a^3*b^5*x^15 + 32725*a^4*b^4*x^12 + 41888*a^5*b^3*x^9 + 52360*a
^6*b^2*x^6 - 29920*a^7*b*x^3 - 935*a^8)/x^4
```

Sympy [A] time = 1.59148, size = 102, normalized size = 1.

$$14a^{6}b^{2}x^{2}+\frac{56a^{5}b^{3}x^{5}}{5}+\frac{35a^{4}b^{4}x^{8}}{4}+\frac{56a^{3}b^{5}x^{11}}{11}+2a^{2}b^{6}x^{14}+\frac{8ab^{7}x^{17}}{17}+\frac{b^{8}x^{20}}{20}-\frac{a^{8}+32a^{7}bx^{3}}{4x^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**8/x**5,x)
```

```
[Out] 14*a**6*b**2*x**2 + 56*a**5*b**3*x**5/5 + 35*a**4*b**4*x**8/4 + 5
6*a**3*b**5*x**11/11 + 2*a**2*b**6*x**14 + 8*a*b**7*x**17/17 + b*
*8*x**20/20 - (a**8 + 32*a**7*b*x**3)/(4*x**4)
```

GIAC/XCAS [A] time = 0.219807, size = 123, normalized size = 1.21

$$\frac{1}{20}\,b^{8}x^{20}+\frac{8}{17}\,ab^{7}x^{17}+2\,a^{2}b^{6}x^{14}+\frac{56}{11}\,a^{3}b^{5}x^{11}+\frac{35}{4}\,a^{4}b^{4}x^{8}+\frac{56}{5}\,a^{5}b^{3}x^{5}+14\,a^{6}b^{2}x^{2}-\frac{32\,a^{7}bx^{3}+a^{8}}{4\,x^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^5,x, algorithm="giac")
```

```
[Out] 1/20*b^8*x^20 + 8/17*a*b^7*x^17 + 2*a^2*b^6*x^14 + 56/11*a^3*b^5*
x^11 + 35/4*a^4*b^4*x^8 + 56/5*a^5*b^3*x^5 + 14*a^6*b^2*x^2 - 1/4
*(32*a^7*b*x^3 + a^8)/x^4
```

3.315 $\int \frac{(a+bx^3)^8}{x^6}\,dx$

Optimal. Leaf size=98

$$-\frac{a^8}{5x^5}-\frac{4a^7b}{x^2}+28a^6b^2x+14a^5b^3x^4+10a^4b^4x^7+\frac{28}{5}a^3b^5x^{10}+\frac{28}{13}a^2b^6x^{13}+\frac{1}{2}ab^7x^{16}+\frac{b^8x^{19}}{19}$$

```
[Out] -a^8/(5*x^5) - (4*a^7*b)/x^2 + 28*a^6*b^2*x + 14*a^5*b^3*x^4 + 10
*a^4*b^4*x^7 + (28*a^3*b^5*x^10)/5 + (28*a^2*b^6*x^13)/13 + (a*b^
7*x^16)/2 + (b^8*x^19)/19
```

Rubi [A] time = 0.0937793, antiderivative size = 98, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a^8}{5x^5}-\frac{4a^7b}{x^2}+28a^6b^2x+14a^5b^3x^4+10a^4b^4x^7+\frac{28}{5}a^3b^5x^{10}+\frac{28}{13}a^2b^6x^{13}+\frac{1}{2}ab^7x^{16}+\frac{b^8x^{19}}{19}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^8/x^6,x]
```

```
[Out] -a^8/(5*x^5) - (4*a^7*b)/x^2 + 28*a^6*b^2*x + 14*a^5*b^3*x^4 + 10
*a^4*b^4*x^7 + (28*a^3*b^5*x^10)/5 + (28*a^2*b^6*x^13)/13 + (a*b^
7*x^16)/2 + (b^8*x^19)/19
```

Rubi in Sympy [A] time = 19.5843, size = 97, normalized size = 0.99

$$-\frac{a^8}{5x^5}-\frac{4a^7b}{x^2}+28a^6b^2x+14a^5b^3x^4+10a^4b^4x^7+\frac{28a^3b^5x^{10}}{5}+\frac{28a^2b^6x^{13}}{13}+\frac{ab^7x^{16}}{2}+\frac{b^8x^{19}}{19}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**8/x**6,x)
```

```
[Out] -a**8/(5*x**5) - 4*a**7*b/x**2 + 28*a**6*b**2*x + 14*a**5*b**3*x*
*4 + 10*a**4*b**4*x**7 + 28*a**3*b**5*x**10/5 + 28*a**2*b**6*x**1
3/13 + a*b**7*x**16/2 + b**8*x**19/19
```

Mathematica [A] time = 0.0167118, size = 98, normalized size = 1.

$$-\frac{a^8}{5x^5}-\frac{4a^7b}{x^2}+28a^6b^2x+14a^5b^3x^4+10a^4b^4x^7+\frac{28}{5}a^3b^5x^{10}+\frac{28}{13}a^2b^6x^{13}+\frac{1}{2}ab^7x^{16}+\frac{b^8x^{19}}{19}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^8/x^6,x]
```

```
[Out] -a^8/(5*x^5) - (4*a^7*b)/x^2 + 28*a^6*b^2*x + 14*a^5*b^3*x^4 + 10
*a^4*b^4*x^7 + (28*a^3*b^5*x^10)/5 + (28*a^2*b^6*x^13)/13 + (a*b^
7*x^16)/2 + (b^8*x^19)/19
```

Maple [A] time = 0.009, size = 89, normalized size = 0.9

$$-\frac{a^8}{5\,x^5}-4\,\frac{a^7b}{x^2}+28\,a^6b^2x+14\,a^5b^3x^4+10\,a^4b^4x^7+\frac{28\,a^3b^5x^{10}}{5}+\frac{28\,a^2b^6x^{13}}{13}+\frac{ab^7x^{16}}{2}+\frac{b^8x^{19}}{19}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^8/x^6,x)
```

```
[Out] -1/5*a^8/x^5-4*a^7*b/x^2+28*a^6*b^2*x+14*a^5*b^3*x^4+10*a^4*b^4*x
^7+28/5*a^3*b^5*x^10+28/13*a^2*b^6*x^13+1/2*a*b^7*x^16+1/19*b^8*x
^19
```

Maxima [A] time = 1.43842, size = 120, normalized size = 1.22

$$\frac{1}{19}\,b^8x^{19} + \frac{1}{2}\,ab^7x^{16} + \frac{28}{13}\,a^2b^6x^{13} + \frac{28}{5}\,a^3b^5x^{10} + 10\,a^4b^4x^7 + 14\,a^5b^3x^4 + 28\,a^6b^2x - \frac{20\,a^7bx^3 + a^8}{5\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^6,x, algorithm="maxima")
```

```
[Out] 1/19*b^8*x^19 + 1/2*a*b^7*x^16 + 28/13*a^2*b^6*x^13 + 28/5*a^3*b^
5*x^10 + 10*a^4*b^4*x^7 + 14*a^5*b^3*x^4 + 28*a^6*b^2*x - 1/5*(20
*a^7*b*x^3 + a^8)/x^5
```

Fricas [A] time = 0.207483, size = 124, normalized size = 1.27

$$\frac{130\,b^8x^{24} + 1235\,ab^7x^{21} + 5320\,a^2b^6x^{18} + 13832\,a^3b^5x^{15} + 24700\,a^4b^4x^{12} + 34580\,a^5b^3x^9 + 69160\,a^6b^2x^6 - 9880\,a^7bx^3 - 49}{2470\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^6,x, algorithm="fricas")
```

```
[Out] 1/2470*(130*b^8*x^24 + 1235*a*b^7*x^21 + 5320*a^2*b^6*x^18 + 1383
2*a^3*b^5*x^15 + 24700*a^4*b^4*x^12 + 34580*a^5*b^3*x^9 + 69160*a
^6*b^2*x^6 - 9880*a^7*b*x^3 - 494*a^8)/x^5
```

Sympy [A] time = 1.54025, size = 97, normalized size = 0.99

$$28a^6b^2x + 14a^5b^3x^4 + 10a^4b^4x^7 + \frac{28a^3b^5x^{10}}{5} + \frac{28a^2b^6x^{13}}{13} + \frac{ab^7x^{16}}{2} + \frac{b^8x^{19}}{19} - \frac{a^8 + 20a^7bx^3}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**8/x**6,x)
```

```
[Out] 28*a**6*b**2*x + 14*a**5*b**3*x**4 + 10*a**4*b**4*x**7 + 28*a**3*
b**5*x**10/5 + 28*a**2*b**6*x**13/13 + a*b**7*x**16/2 + b**8*x**1
9/19 - (a**8 + 20*a**7*b*x**3)/(5*x**5)
```

GIAC/XCAS [A] time = 0.218127, size = 120, normalized size = 1.22

$$\frac{1}{19}\,b^8x^{19} + \frac{1}{2}\,ab^7x^{16} + \frac{28}{13}\,a^2b^6x^{13} + \frac{28}{5}\,a^3b^5x^{10} + 10\,a^4b^4x^7 + 14\,a^5b^3x^4 + 28\,a^6b^2x - \frac{20\,a^7bx^3 + a^8}{5\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^6,x, algorithm="giac")
```

```
[Out] 1/19*b^8*x^19 + 1/2*a*b^7*x^16 + 28/13*a^2*b^6*x^13 + 28/5*a^3*b^
5*x^10 + 10*a^4*b^4*x^7 + 14*a^5*b^3*x^4 + 28*a^6*b^2*x - 1/5*(20
*a^7*b*x^3 + a^8)/x^5
```

3.316 $\int \frac{(a+bx^3)^8}{x^8} dx$

Optimal. Leaf size=98

$$-\frac{a^8}{7x^7}-\frac{2a^7b}{x^4}-\frac{28a^6b^2}{x}+28a^5b^3x^2+14a^4b^4x^5+7a^3b^5x^8+\frac{28}{11}a^2b^6x^{11}+\frac{4}{7}ab^7x^{14}+\frac{b^8x^{17}}{17}$$

```
[Out] -a^8/(7*x^7) - (2*a^7*b)/x^4 - (28*a^6*b^2)/x + 28*a^5*b^3*x^2 +
14*a^4*b^4*x^5 + 7*a^3*b^5*x^8 + (28*a^2*b^6*x^11)/11 + (4*a*b^7*
x^14)/7 + (b^8*x^17)/17
```

Rubi [A] time = 0.0974345, antiderivative size = 98, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$-\frac{a^8}{7x^7}-\frac{2a^7b}{x^4}-\frac{28a^6b^2}{x}+28a^5b^3x^2+14a^4b^4x^5+7a^3b^5x^8+\frac{28}{11}a^2b^6x^{11}+\frac{4}{7}ab^7x^{14}+\frac{b^8x^{17}}{17}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^3)^8/x^8,x]
```

```
[Out] -a^8/(7*x^7) - (2*a^7*b)/x^4 - (28*a^6*b^2)/x + 28*a^5*b^3*x^2 +
14*a^4*b^4*x^5 + 7*a^3*b^5*x^8 + (28*a^2*b^6*x^11)/11 + (4*a*b^7*
x^14)/7 + (b^8*x^17)/17
```

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

$$-\frac{a^8}{7x^7}-\frac{2a^7b}{x^4}-\frac{28a^6b^2}{x}+56a^5b^3\int x\,dx+14a^4b^4x^5+7a^3b^5x^8+\frac{28a^2b^6x^{11}}{11}+\frac{4ab^7x^{14}}{7}+\frac{b^8x^{17}}{17}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**3+a)**8/x**8,x)
```

```
[Out] -a**8/(7*x**7) - 2*a**7*b/x**4 - 28*a**6*b**2/x + 56*a**5*b**3*In
tegral(x, x) + 14*a**4*b**4*x**5 + 7*a**3*b**5*x**8 + 28*a**2*b**
6*x**11/11 + 4*a*b**7*x**14/7 + b**8*x**17/17
```

Mathematica [A] time = 0.0119747, size = 98, normalized size = 1.

$$-\frac{a^8}{7x^7}-\frac{2a^7b}{x^4}-\frac{28a^6b^2}{x}+28a^5b^3x^2+14a^4b^4x^5+7a^3b^5x^8+\frac{28}{11}a^2b^6x^{11}+\frac{4}{7}ab^7x^{14}+\frac{b^8x^{17}}{17}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^3)^8/x^8,x]
```

```
[Out] -a^8/(7*x^7) - (2*a^7*b)/x^4 - (28*a^6*b^2)/x + 28*a^5*b^3*x^2 +
14*a^4*b^4*x^5 + 7*a^3*b^5*x^8 + (28*a^2*b^6*x^11)/11 + (4*a*b^7*
x^14)/7 + (b^8*x^17)/17
```

Maple [A] time = 0.009, size = 91, normalized size = 0.9

$$-\frac{a^8}{7\,x^7}-2\,\frac{a^7b}{x^4}-28\,\frac{a^6b^2}{x}+28\,a^5b^3x^2+14\,a^4b^4x^5+7\,a^3b^5x^8+\frac{28\,a^2b^6x^{11}}{11}+\frac{4\,ab^7x^{14}}{7}+\frac{b^8x^{17}}{17}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^8/x^8,x)
```

```
[Out] -1/7*a^8/x^7-2*a^7*b/x^4-28*a^6*b^2/x+28*a^5*b^3*x^2+14*a^4*b^4*x
^5+7*a^3*b^5*x^8+28/11*a^2*b^6*x^11+4/7*a*b^7*x^14+1/17*b^8*x^17
```

Maxima [A] time = 1.4392, size = 123, normalized size = 1.26

$$\frac{1}{17}\,b^{8}x^{17}+\frac{4}{7}\,ab^{7}x^{14}+\frac{28}{11}\,a^{2}b^{6}x^{11}+7\,a^{3}b^{5}x^{8}+14\,a^{4}b^{4}x^{5}+28\,a^{5}b^{3}x^{2}-\frac{196\,a^{6}b^{2}x^{6}+14\,a^{7}bx^{3}+a^{8}}{7\,x^{7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^8,x, algorithm="maxima")
```

```
[Out] 1/17*b^8*x^17 + 4/7*a*b^7*x^14 + 28/11*a^2*b^6*x^11 + 7*a^3*b^5*x
^8 + 14*a^4*b^4*x^5 + 28*a^5*b^3*x^2 - 1/7*(196*a^6*b^2*x^6 + 14*
a^7*b*x^3 + a^8)/x^7
```

Fricas [A] time = 0.208425, size = 124, normalized size = 1.27

$$\frac{77\,b^{8}x^{24}+748\,ab^{7}x^{21}+3332\,a^{2}b^{6}x^{18}+9163\,a^{3}b^{5}x^{15}+18326\,a^{4}b^{4}x^{12}+36652\,a^{5}b^{3}x^{9}-36652\,a^{6}b^{2}x^{6}-2618\,a^{7}bx^{3}-187\,a^{8}}{1309\,x^{7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^8,x, algorithm="fricas")
```

```
[Out] 1/1309*(77*b^8*x^24 + 748*a*b^7*x^21 + 3332*a^2*b^6*x^18 + 9163*a
^3*b^5*x^15 + 18326*a^4*b^4*x^12 + 36652*a^5*b^3*x^9 - 36652*a^6*
b^2*x^6 - 2618*a^7*b*x^3 - 187*a^8)/x^7
```

Sympy [A] time = 1.8183, size = 99, normalized size = 1.01

$$28a^{5}b^{3}x^{2}+14a^{4}b^{4}x^{5}+7a^{3}b^{5}x^{8}+\frac{28a^{2}b^{6}x^{11}}{11}+\frac{4ab^{7}x^{14}}{7}+\frac{b^{8}x^{17}}{17}-\frac{a^{8}+14a^{7}bx^{3}+196a^{6}b^{2}x^{6}}{7x^{7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**8/x**8,x)
```

```
[Out] 28*a**5*b**3*x**2 + 14*a**4*b**4*x**5 + 7*a**3*b**5*x**8 + 28*a**
2*b**6*x**11/11 + 4*a*b**7*x**14/7 + b**8*x**17/17 - (a**8 + 14*a
**7*b*x**3 + 196*a**6*b**2*x**6)/(7*x**7)
```

GIAC/XCAS [A] time = 0.213426, size = 123, normalized size = 1.26

$$\frac{1}{17}\,b^{8}x^{17}+\frac{4}{7}\,ab^{7}x^{14}+\frac{28}{11}\,a^{2}b^{6}x^{11}+7\,a^{3}b^{5}x^{8}+14\,a^{4}b^{4}x^{5}+28\,a^{5}b^{3}x^{2}-\frac{196\,a^{6}b^{2}x^{6}+14\,a^{7}bx^{3}+a^{8}}{7\,x^{7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^8,x, algorithm="giac")
```

```
[Out] 1/17*b^8*x^17 + 4/7*a*b^7*x^14 + 28/11*a^2*b^6*x^11 + 7*a^3*b^5*x
^8 + 14*a^4*b^4*x^5 + 28*a^5*b^3*x^2 - 1/7*(196*a^6*b^2*x^6 + 14*
a^7*b*x^3 + a^8)/x^7
```

3.317 $\int \frac{(a+bx^3)^8}{x^9} dx$

Optimal. Leaf size=100

$$-\frac{a^8}{8x^8}-\frac{8a^7b}{5x^5}-\frac{14a^6b^2}{x^2}+56a^5b^3x+\frac{35}{2}a^4b^4x^4+8a^3b^5x^7+\frac{14}{5}a^2b^6x^{10}+\frac{8}{13}ab^7x^{13}+\frac{b^8x^{16}}{16}$$

```
[Out] -a^8/(8*x^8) - (8*a^7*b)/(5*x^5) - (14*a^6*b^2)/x^2 + 56*a^5*b^3*
x + (35*a^4*b^4*x^4)/2 + 8*a^3*b^5*x^7 + (14*a^2*b^6*x^10)/5 + (8
*a*b^7*x^13)/13 + (b^8*x^16)/16
```

Rubi [A] time = 0.0914809, antiderivative size = 100, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a^8}{8x^8}-\frac{8a^7b}{5x^5}-\frac{14a^6b^2}{x^2}+56a^5b^3x+\frac{35}{2}a^4b^4x^4+8a^3b^5x^7+\frac{14}{5}a^2b^6x^{10}+\frac{8}{13}ab^7x^{13}+\frac{b^8x^{16}}{16}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^8/x^9,x]
```

```
[Out] -a^8/(8*x^8) - (8*a^7*b)/(5*x^5) - (14*a^6*b^2)/x^2 + 56*a^5*b^3*
x + (35*a^4*b^4*x^4)/2 + 8*a^3*b^5*x^7 + (14*a^2*b^6*x^10)/5 + (8
*a*b^7*x^13)/13 + (b^8*x^16)/16
```

Rubi in Sympy [A] time = 19.3875, size = 100, normalized size = 1.

$$-\frac{a^8}{8x^8}-\frac{8a^7b}{5x^5}-\frac{14a^6b^2}{x^2}+56a^5b^3x+\frac{35a^4b^4x^4}{2}+8a^3b^5x^7+\frac{14a^2b^6x^{10}}{5}+\frac{8ab^7x^{13}}{13}+\frac{b^8x^{16}}{16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**8/x**9,x)
```

```
[Out] -a**8/(8*x**8) - 8*a**7*b/(5*x**5) - 14*a**6*b**2/x**2 + 56*a**5*
b**3*x + 35*a**4*b**4*x**4/2 + 8*a**3*b**5*x**7 + 14*a**2*b**6*x*
*10/5 + 8*a*b**7*x**13/13 + b**8*x**16/16
```

Mathematica [A] time = 0.0082674, size = 100, normalized size = 1.

$$-\frac{a^8}{8x^8}-\frac{8a^7b}{5x^5}-\frac{14a^6b^2}{x^2}+56a^5b^3x+\frac{35}{2}a^4b^4x^4+8a^3b^5x^7+\frac{14}{5}a^2b^6x^{10}+\frac{8}{13}ab^7x^{13}+\frac{b^8x^{16}}{16}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^8/x^9,x]
```

```
[Out] -a^8/(8*x^8) - (8*a^7*b)/(5*x^5) - (14*a^6*b^2)/x^2 + 56*a^5*b^3*
x + (35*a^4*b^4*x^4)/2 + 8*a^3*b^5*x^7 + (14*a^2*b^6*x^10)/5 + (8
*a*b^7*x^13)/13 + (b^8*x^16)/16
```

Maple [A] time = 0.009, size = 89, normalized size = 0.9

$$-\frac{a^8}{8\,x^8}-\frac{8\,a^7b}{5\,x^5}-14\,\frac{a^6b^2}{x^2}+56\,a^5b^3x+\frac{35\,a^4b^4x^4}{2}+8\,a^3b^5x^7+\frac{14\,a^2b^6x^{10}}{5}+\frac{8\,ab^7x^{13}}{13}+\frac{b^8x^{16}}{16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^8/x^9,x)
```

```
[Out] -1/8*a^8/x^8-8/5*a^7*b/x^5-14*a^6*b^2/x^2+56*a^5*b^3*x+35/2*a^4*b
^4*x^4+8*a^3*b^5*x^7+14/5*a^2*b^6*x^10+8/13*a*b^7*x^13+1/16*b^8*x
^16
```

Maxima [A] time = 1.43786, size = 123, normalized size = 1.23

$$\frac{1}{16}\,b^8x^{16}+\frac{8}{13}\,ab^7x^{13}+\frac{14}{5}\,a^2b^6x^{10}+8\,a^3b^5x^7+\frac{35}{2}\,a^4b^4x^4+56\,a^5b^3x-\frac{560\,a^6b^2x^6+64\,a^7bx^3+5\,a^8}{40\,x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^9,x, algorithm="maxima")
```

```
[Out] 1/16*b^8*x^16 + 8/13*a*b^7*x^13 + 14/5*a^2*b^6*x^10 + 8*a^3*b^5*x
^7 + 35/2*a^4*b^4*x^4 + 56*a^5*b^3*x - 1/40*(560*a^6*b^2*x^6 + 64
*a^7*b*x^3 + 5*a^8)/x^8
```

Fricas [A] time = 0.205959, size = 124, normalized size = 1.24

$$\frac{65\,b^8x^{24}+640\,ab^7x^{21}+2912\,a^2b^6x^{18}+8320\,a^3b^5x^{15}+18200\,a^4b^4x^{12}+58240\,a^5b^3x^9-14560\,a^6b^2x^6-1664\,a^7bx^3-130\,a^8}{1040\,x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^9,x, algorithm="fricas")
```

```
[Out] 1/1040*(65*b^8*x^24 + 640*a*b^7*x^21 + 2912*a^2*b^6*x^18 + 8320*a
^3*b^5*x^15 + 18200*a^4*b^4*x^12 + 58240*a^5*b^3*x^9 - 14560*a^6*
b^2*x^6 - 1664*a^7*b*x^3 - 130*a^8)/x^8
```

Sympy [A] time = 1.79854, size = 100, normalized size = 1.

$$56a^5b^3x+\frac{35a^4b^4x^4}{2}+8a^3b^5x^7+\frac{14a^2b^6x^{10}}{5}+\frac{8ab^7x^{13}}{13}+\frac{b^8x^{16}}{16}-\frac{5a^8+64a^7bx^3+560a^6b^2x^6}{40x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**8/x**9,x)
```

```
[Out] 56*a**5*b**3*x + 35*a**4*b**4*x**4/2 + 8*a**3*b**5*x**7 + 14*a**2
*b**6*x**10/5 + 8*a*b**7*x**13/13 + b**8*x**16/16 - (5*a**8 + 64*
a**7*b*x**3 + 560*a**6*b**2*x**6)/(40*x**8)
```

GIAC/XCAS [A] time = 0.214902, size = 123, normalized size = 1.23

$$\frac{1}{16}\,b^8x^{16}+\frac{8}{13}\,ab^7x^{13}+\frac{14}{5}\,a^2b^6x^{10}+8\,a^3b^5x^7+\frac{35}{2}\,a^4b^4x^4+56\,a^5b^3x-\frac{560\,a^6b^2x^6+64\,a^7bx^3+5\,a^8}{40\,x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^9,x, algorithm="giac")
```

```
[Out] 1/16*b^8*x^16 + 8/13*a*b^7*x^13 + 14/5*a^2*b^6*x^10 + 8*a^3*b^5*x
^7 + 35/2*a^4*b^4*x^4 + 56*a^5*b^3*x - 1/40*(560*a^6*b^2*x^6 + 64
*a^7*b*x^3 + 5*a^8)/x^8
```

3.318 $\int \frac{x^8}{a+bx^3} dx$

Optimal. Leaf size=40

$$\frac{a^2 \log(a+bx^3)}{3b^3} - \frac{ax^3}{3b^2} + \frac{x^6}{6b}$$

```
[Out] -(a*x^3)/(3*b^2) + x^6/(6*b) + (a^2*Log[a + b*x^3])/(3*b^3)
```

Rubi [A] time = 0.0643188, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^2 \log(a+bx^3)}{3b^3} - \frac{ax^3}{3b^2} + \frac{x^6}{6b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8/(a + b*x^3),x]
```

```
[Out] -(a*x^3)/(3*b^2) + x^6/(6*b) + (a^2*Log[a + b*x^3])/(3*b^3)
```

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

$$\frac{a^2 \log(a+bx^3)}{3b^3} + \frac{\int^{x^3} x\,dx}{3b} - \frac{\int^{x^3} a\,dx}{3b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8/(b*x**3+a),x)
```

```
[Out] a**2*log(a + b*x**3)/(3*b**3) + Integral(x, (x, x**3))/(3*b) - In
tegral(a, (x, x**3))/(3*b**2)
```

Mathematica [A] time = 0.00997771, size = 40, normalized size = 1.

$$\frac{a^2 \log(a+bx^3)}{3b^3} - \frac{ax^3}{3b^2} + \frac{x^6}{6b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8/(a + b*x^3),x]
```

```
[Out] -(a*x^3)/(3*b^2) + x^6/(6*b) + (a^2*Log[a + b*x^3])/(3*b^3)
```

Maple [A] time = 0.004, size = 35, normalized size = 0.9

$$-\frac{ax^3}{3\,b^2} + \frac{x^6}{6\,b} + \frac{a^2 \ln(bx^3+a)}{3\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8/(b*x^3+a),x)
```

```
[Out] -1/3*a*x^3/b^2+1/6*x^6/b+1/3*a^2*ln(b*x^3+a)/b^3
```

Maxima [A] time = 1.44188, size = 46, normalized size = 1.15

$$\frac{a^2 \log\left(bx^3 + a\right)}{3\,b^3} + \frac{bx^6 - 2\,ax^3}{6\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^3 + a),x, algorithm="maxima")
```

```
[Out] 1/3*a^2*log(b*x^3 + a)/b^3 + 1/6*(b*x^6 - 2*a*x^3)/b^2
```

Fricas [A] time = 0.209634, size = 45, normalized size = 1.12

$$\frac{b^2x^6 - 2\,abx^3 + 2\,a^2 \log\left(bx^3 + a\right)}{6\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^3 + a),x, algorithm="fricas")
```

```
[Out] 1/6*(b^2*x^6 - 2*a*b*x^3 + 2*a^2*log(b*x^3 + a))/b^3
```

Sympy [A] time = 1.29637, size = 32, normalized size = 0.8

$$\frac{a^2 \log\left(a + bx^3\right)}{3b^3} - \frac{ax^3}{3b^2} + \frac{x^6}{6b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8/(b*x**3+a),x)
```

```
[Out] a**2*log(a + b*x**3)/(3*b**3) - a*x**3/(3*b**2) + x**6/(6*b)
```

GIAC/XCAS [A] time = 0.225013, size = 47, normalized size = 1.18

$$\frac{a^2 \ln\left(\left|bx^3 + a\right|\right)}{3\,b^3} + \frac{bx^6 - 2\,ax^3}{6\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^3 + a),x, algorithm="giac")
```

```
[Out] 1/3*a^2*ln(abs(b*x^3 + a))/b^3 + 1/6*(b*x^6 - 2*a*x^3)/b^2
```

3.319 $\int \frac{x^5}{a+bx^3}\,dx$

Optimal. Leaf size=27

$$\frac{x^3}{3b} - \frac{a\log\left(a+bx^3\right)}{3b^2}$$

```
[Out] x^3/(3*b) - (a*Log[a + b*x^3])/(3*b^2)
```

Rubi [A] time = 0.0440447, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$\frac{x^3}{3b} - \frac{a\log\left(a+bx^3\right)}{3b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/(a + b*x^3),x]

[Out] x^3/(3*b) - (a*Log[a + b*x^3])/(3*b^2)
```

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

$$-\frac{a\log\left(a+bx^3\right)}{3b^2} + \frac{\int^{x^3} \frac{1}{b}\,dx}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(b*x**3+a),x)

[Out] -a*log(a + b*x**3)/(3*b**2) + Integral(1/b, (x, x**3))/3
```

Mathematica [A] time = 0.00711098, size = 27, normalized size = 1.

$$\frac{x^3}{3b} - \frac{a\log\left(a+bx^3\right)}{3b^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/(a + b*x^3),x]

[Out] x^3/(3*b) - (a*Log[a + b*x^3])/(3*b^2)
```

Maple [A] time = 0.003, size = 24, normalized size = 0.9

$$\frac{x^3}{3\,b} - \frac{a\ln\left(bx^3+a\right)}{3\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(b*x^3+a),x)

[Out] 1/3*x^3/b-1/3*a*ln(b*x^3+a)/b^2
```

Maxima [A] time = 1.44499, size = 31, normalized size = 1.15

$$\frac{x^3}{3\,b} - \frac{a\log\left(bx^3 + a\right)}{3\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^3 + a),x, algorithm="maxima")
```

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

Fricas [A] time = 0.223957, size = 30, normalized size = 1.11

$$\frac{bx^3 - a\log\left(bx^3 + a\right)}{3\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^3 + a),x, algorithm="fricas")
```

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

Sympy [A] time = 1.25572, size = 20, normalized size = 0.74

$$-\frac{a\log\left(a + bx^3\right)}{3b^2} + \frac{x^3}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(b*x**3+a),x)
```

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

GIAC/XCAS [A] time = 0.220352, size = 32, normalized size = 1.19

$$\frac{x^3}{3\,b} - \frac{a\ln\left(\left|bx^3 + a\right|\right)}{3\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^3 + a),x, algorithm="giac")
```

```
[Out] 1/3*x^3/b - 1/3*a*ln(abs(b*x^3 + a))/b^2
```

3.320 $\int \frac{x^2}{a+bx^3} \, dx$

Optimal. Leaf size=15

$$\frac{\log(a+bx^3)}{3b}$$

```
[Out] Log[a + b*x^3]/(3*b)
```

Rubi [A] time = 0.00897648, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{\log(a+bx^3)}{3b}$$

Antiderivative was successfully verified.

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

[Out] Log[a + b*x^3]/(3*b)
```

Rubi in Sympy [A] time = 2.21244, size = 10, normalized size = 0.67

$$\frac{\log(a+bx^3)}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] log(a + b*x**3)/(3*b)
```

Mathematica [A] time = 0.00437929, size = 15, normalized size = 1.

$$\frac{\log(a+bx^3)}{3b}$$

Antiderivative was successfully verified.

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

[Out] Log[a + b*x^3]/(3*b)
```

Maple [A] time = 0.001, size = 14, normalized size = 0.9

$$\frac{\ln(bx^3+a)}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 1/3*ln(b*x^3+a)/b
```

Maxima [A] time = 1.43207, size = 18, normalized size = 1.2

$$\frac{\log\left(bx^3 + a\right)}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*log(b*x^3 + a)/b
```

Fricas [A] time = 0.2163, size = 18, normalized size = 1.2

$$\frac{\log\left(bx^3 + a\right)}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*log(b*x^3 + a)/b
```

Sympy [A] time = 0.296338, size = 10, normalized size = 0.67

$$\frac{\log\left(a + bx^3\right)}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] log(a + b*x**3)/(3*b)
```

GIAC/XCAS [A] time = 0.214722, size = 19, normalized size = 1.27

$$\frac{\ln\left(\left|bx^3 + a\right|\right)}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*ln(abs(b*x^3 + a))/b
```

3.321 $\int \frac{1}{x(a+bx^3)} dx$

Optimal. Leaf size=22

$$\frac{\log(x)}{a} - \frac{\log(a+bx^3)}{3a}$$

```
[Out] Log[x]/a - Log[a + b*x^3]/(3*a)
```

Rubi [A] time = 0.032262, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$

$$\frac{\log(x)}{a} - \frac{\log(a+bx^3)}{3a}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a + b*x^3)),x]

[Out] Log[x]/a - Log[a + b*x^3]/(3*a)
```

Rubi in Sympy [A] time = 5.8517, size = 19, normalized size = 0.86

$$\frac{\log(x^3)}{3a} - \frac{\log(a+bx^3)}{3a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(b*x**3+a),x)

[Out] log(x**3)/(3*a) - log(a + b*x**3)/(3*a)
```

Mathematica [A] time = 0.00829044, size = 22, normalized size = 1.

$$\frac{\log(x)}{a} - \frac{\log(a+bx^3)}{3a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a + b*x^3)),x]

[Out] Log[x]/a - Log[a + b*x^3]/(3*a)
```

Maple [A] time = 0.007, size = 21, normalized size = 1.

$$\frac{\ln(x)}{a} - \frac{\ln(bx^3+a)}{3a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(b*x^3+a),x)

[Out] ln(x)/a-1/3*ln(b*x^3+a)/a
```

Maxima [A] time = 1.43251, size = 31, normalized size = 1.41

$$-\frac{\log\left(bx^3+a\right)}{3\,a}+\frac{\log\left(x^3\right)}{3\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)*x),x, algorithm="maxima")

[Out] -1/3*log(b*x^3 + a)/a + 1/3*log(x^3)/a
```

Fricas [A] time = 0.214896, size = 24, normalized size = 1.09

$$-\frac{\log\left(bx^3+a\right)-3\,\log\left(x\right)}{3\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)*x),x, algorithm="fricas")

[Out] -1/3*(log(b*x^3 + a) - 3*log(x))/a
```

Sympy [A] time = 0.57828, size = 15, normalized size = 0.68

$$\frac{\log\left(x\right)}{a}-\frac{\log\left(\frac{a}{b}+x^3\right)}{3a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(b*x**3+a),x)

[Out] log(x)/a - log(a/b + x**3)/(3*a)
```

GIAC/XCAS [A] time = 0.22223, size = 30, normalized size = 1.36

$$-\frac{\ln\left(\left|bx^3+a\right|\right)}{3\,a}+\frac{\ln\left(\left|x\right|\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)*x),x, algorithm="giac")

[Out] -1/3*ln(abs(b*x^3 + a))/a + ln(abs(x))/a
```

3.322 $\int \frac{1}{x^4(a+bx^3)}\,dx$

Optimal. Leaf size=35

$$\frac{b\log\left(a+bx^3\right)}{3a^2}-\frac{b\log(x)}{a^2}-\frac{1}{3ax^3}$$

```
[Out] -1/(3*a*x^3) - (b*Log[x])/a^2 + (b*Log[a + b*x^3])/(3*a^2)
```

Rubi [A] time = 0.0537031, antiderivative size = 35, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{b\log\left(a+bx^3\right)}{3a^2}-\frac{b\log(x)}{a^2}-\frac{1}{3ax^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*(a + b*x^3)),x]

[Out] -1/(3*a*x^3) - (b*Log[x])/a^2 + (b*Log[a + b*x^3])/(3*a^2)
```

Rubi in Sympy [A] time = 8.32935, size = 34, normalized size = 0.97

$$-\frac{1}{3ax^3}-\frac{b\log\left(x^3\right)}{3a^2}+\frac{b\log\left(a+bx^3\right)}{3a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(b*x**3+a),x)

[Out] -1/(3*a*x**3) - b*log(x**3)/(3*a**2) + b*log(a + b*x**3)/(3*a**2)
```

Mathematica [A] time = 0.0116304, size = 35, normalized size = 1.

$$\frac{b\log\left(a+bx^3\right)}{3a^2}-\frac{b\log(x)}{a^2}-\frac{1}{3ax^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*(a + b*x^3)),x]

[Out] -1/(3*a*x^3) - (b*Log[x])/a^2 + (b*Log[a + b*x^3])/(3*a^2)
```

Maple [A] time = 0.009, size = 32, normalized size = 0.9

$$-\frac{1}{3\,ax^3}-\frac{b\ln(x)}{a^2}+\frac{b\ln\left(bx^3+a\right)}{3\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(b*x^3+a),x)

[Out] -1/3/a/x^3-b*ln(x)/a^2+1/3*b*ln(b*x^3+a)/a^2
```

Maxima [A] time = 1.43135, size = 45, normalized size = 1.29

$$\frac{b \log\left(bx^3 + a\right)}{3\,a^2} - \frac{b \log\left(x^3\right)}{3\,a^2} - \frac{1}{3\,ax^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)*x^4),x, algorithm="maxima")
```

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

Fricas [A] time = 0.218282, size = 45, normalized size = 1.29

$$\frac{bx^3 \log\left(bx^3 + a\right) - 3\,bx^3 \log\left(x\right) - a}{3\,a^2x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)*x^4),x, algorithm="fricas")
```

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

Sympy [A] time = 1.79027, size = 31, normalized size = 0.89

$$-\frac{1}{3ax^3} - \frac{b \log\left(x\right)}{a^2} + \frac{b \log\left(\frac{a}{b} + x^3\right)}{3a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(b*x**3+a),x)
```

```
[Out] -1/(3*a*x**3) - b*log(x)/a**2 + b*log(a/b + x**3)/(3*a**2)
```

GIAC/XCAS [A] time = 0.220272, size = 57, normalized size = 1.63

$$\frac{b\ln\left(\left|bx^3 + a\right|\right)}{3\,a^2} - \frac{b\ln\left(\left|x\right|\right)}{a^2} + \frac{bx^3 - a}{3\,a^2x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)*x^4),x, algorithm="giac")
```

```
[Out] 1/3*b*ln(abs(b*x^3 + a))/a^2 - b*ln(abs(x))/a^2 + 1/3*(b*x^3 - a)
/(a^2*x^3)
```

3.323 $\int \frac{x^4}{a+bx^3}\,dx$

Optimal. Leaf size=124

$$-\frac{a^{2/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{6b^{5/3}}+\frac{a^{2/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{3b^{5/3}}+\frac{a^{2/3}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}b^{5/3}}+\frac{x^2}{2b}$$

```
[Out] x^2/(2*b) + (a^(2/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*x)/(Sqrt[3]*a^(1
/3))])/(Sqrt[3]*b^(5/3)) + (a^(2/3)*Log[a^(1/3) + b^(1/3)*x])/(3*
b^(5/3)) - (a^(2/3)*Log[a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2
])/(6*b^(5/3))
```

Rubi [A] time = 0.174805, antiderivative size = 124, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538

$$-\frac{a^{2/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{6b^{5/3}}+\frac{a^{2/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{3b^{5/3}}+\frac{a^{2/3}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}b^{5/3}}+\frac{x^2}{2b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a + b*x^3),x]
```

```
[Out] x^2/(2*b) + (a^(2/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*x)/(Sqrt[3]*a^(1
/3))])/(Sqrt[3]*b^(5/3)) + (a^(2/3)*Log[a^(1/3) + b^(1/3)*x])/(3*
b^(5/3)) - (a^(2/3)*Log[a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2
])/(6*b^(5/3))
```

Rubi in Sympy [A] time = 30.0274, size = 116, normalized size = 0.94

$$\frac{a^{\frac{2}{3}}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{3b^{\frac{5}{3}}}-\frac{a^{\frac{2}{3}}\log\left(a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2\right)}{6b^{\frac{5}{3}}}+\frac{\sqrt{3}a^{\frac{2}{3}}\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}-\frac{2\sqrt[3]{b}x}{3}\right)}{\sqrt[3]{a}}\right)}{3b^{\frac{5}{3}}}+\frac{x^2}{2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(b*x**3+a),x)
```

```
[Out] a**(2/3)*log(a**(1/3) + b**(1/3)*x)/(3*b**(5/3)) - a**(2/3)*log(a
**(2/3) - a**(1/3)*b**(1/3)*x + b**(2/3)*x**2)/(6*b**(5/3)) + sqr
t(3)*a**(2/3)*atan(sqrt(3)*(a**(1/3)/3 - 2*b**(1/3)*x/3)/a**(1/3)
)/(3*b**(5/3)) + x**2/(2*b)
```

Mathematica [A] time = 0.0614524, size = 111, normalized size = 0.9

$$\frac{-a^{2/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)+2a^{2/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)+2\sqrt{3}a^{2/3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{b}x}{\sqrt[3]{a}}}{\sqrt{3}}\right)+3b^{2/3}x^2}{6b^{5/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(a + b*x^3),x]
```

```
[Out] (3*b^(2/3)*x^2 + 2*Sqrt[3]*a^(2/3)*ArcTan[(1 - (2*b^(1/3)*x)/a^(1
/3))/Sqrt[3]] + 2*a^(2/3)*Log[a^(1/3) + b^(1/3)*x] - a^(2/3)*Log[
a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2])/(6*b^(5/3))
```

Maple [A] time = 0.009, size = 102, normalized size = 0.8

$$\frac{x^2}{2\,b}+\frac{a}{3\,b^2}\ln\left(x+\sqrt[3]{\frac{a}{b}}\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}-\frac{a}{6\,b^2}\ln\left(x^2-x\sqrt[3]{\frac{a}{b}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}-\frac{a\sqrt{3}}{3\,b^2}\arctan\left(\frac{\sqrt{3}}{3}\left(2\,x\frac{1}{\sqrt[3]{\frac{a}{b}}}-1\right)\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(b*x^3+a),x)
```

```
[Out] 1/2*x^2/b+1/3*a/b^2/(a/b)^(1/3)*ln(x+(a/b)^(1/3))-1/6*a/b^2/(a/b)
^(1/3)*ln(x^2-x*(a/b)^(1/3)+(a/b)^(2/3))-1/3*a/b^2*3^(1/2)/(a/b)^
(1/3)*arctan(1/3*3^(1/2)*(2/(a/b)^(1/3)*x-1))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^3 + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.220925, size = 190, normalized size = 1.53

$$\frac{\sqrt{3}\left(3\,\sqrt{3}x^2-\sqrt{3}\left(\frac{a^2}{b^2}\right)^{\frac{1}{3}}\log\left(ax^2-bx\left(\frac{a^2}{b^2}\right)^{\frac{2}{3}}+a\left(\frac{a^2}{b^2}\right)^{\frac{1}{3}}\right)+2\,\sqrt{3}\left(\frac{a^2}{b^2}\right)^{\frac{1}{3}}\log\left(ax+b\left(\frac{a^2}{b^2}\right)^{\frac{2}{3}}\right)+6\,\left(\frac{a^2}{b^2}\right)^{\frac{1}{3}}\arctan\left(-\frac{2\,\sqrt{3}ax-\sqrt{3}b\left(\right.}{3\,b\left(\frac{a^2}{b^2}\right)^{\frac{2}{3}}}\right.\right.}{18\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^3 + a),x, algorithm="fricas")
```

```
[Out] 1/18*sqrt(3)*(3*sqrt(3)*x^2 - sqrt(3)*(a^2/b^2)^(1/3)*log(a*x^2 -
 b*x*(a^2/b^2)^(2/3) + a*(a^2/b^2)^(1/3)) + 2*sqrt(3)*(a^2/b^2)^(
1/3)*log(a*x + b*(a^2/b^2)^(2/3)) + 6*(a^2/b^2)^(1/3)*arctan(-1/3
*(2*sqrt(3)*a*x - sqrt(3)*b*(a^2/b^2)^(2/3))/(b*(a^2/b^2)^(2/3)))
)/b
```

Sympy [A] time = 1.25563, size = 32, normalized size = 0.26

$$\operatorname{RootSum}\left(27t^3b^5-a^2,\left(t\mapsto t\log\left(\frac{9t^2b^3}{a}+x\right)\right)\right)+\frac{x^2}{2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(b*x**3+a),x)
```

```
[Out] RootSum(27*_t**3*b**5 - a**2, Lambda(_t, _t*log(9*_t**2*b**3/a +
x))) + x**2/(2*b)
```

GIAC/XCAS [A] time = 0.222057, size = 154, normalized size = 1.24

$$\frac{x^2}{2\,b} + \frac{\left(-\frac{a}{b}\right)^{\frac{2}{3}} \ln\left(\left|x - \left(-\frac{a}{b}\right)^{\frac{1}{3}}\right|\right)}{3\,b} + \frac{\sqrt{3}\left(-ab^2\right)^{\frac{2}{3}} \arctan\left(\frac{\sqrt{3}\left(2\,x + \left(-\frac{a}{b}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{a}{b}\right)^{\frac{1}{3}}}\right)}{3\,b^3} - \frac{\left(-ab^2\right)^{\frac{2}{3}} \ln\left(x^2 + x\left(-\frac{a}{b}\right)^{\frac{1}{3}} + \left(-\frac{a}{b}\right)^{\frac{2}{3}}\right)}{6\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^3 + a),x, algorithm="giac")
```

```
[Out] 1/2*x^2/b + 1/3*(-a/b)^(2/3)*ln(abs(x - (-a/b)^(1/3)))/b + 1/3*sq
rt(3)*(-a*b^2)^(2/3)*arctan(1/3*sqrt(3)*(2*x + (-a/b)^(1/3))/(-a/
b)^(1/3))/b^3 - 1/6*(-a*b^2)^(2/3)*ln(x^2 + x*(-a/b)^(1/3) + (-a/
b)^(2/3))/b^3
```

3.324 $\int \frac{x^3}{a+bx^3}\,dx$

Optimal. Leaf size=119

$$\frac{\sqrt[3]{a}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{6b^{4/3}}-\frac{\sqrt[3]{a}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{3b^{4/3}}+\frac{\sqrt[3]{a}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}b^{4/3}}+\frac{x}{b}$$

```
[Out] x/b + (a^(1/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*x)/(Sqrt[3]*a^(1/3))])
/(Sqrt[3]*b^(4/3)) - (a^(1/3)*Log[a^(1/3) + b^(1/3)*x])/(3*b^(4/3
)) + (a^(1/3)*Log[a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2])/(6*
b^(4/3))
```

Rubi [A] time = 0.146383, antiderivative size = 119, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538

$$\frac{\sqrt[3]{a}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{6b^{4/3}}-\frac{\sqrt[3]{a}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{3b^{4/3}}+\frac{\sqrt[3]{a}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}b^{4/3}}+\frac{x}{b}$$

Antiderivative was successfully verified.

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

```
[Out] x/b + (a^(1/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*x)/(Sqrt[3]*a^(1/3))])
/(Sqrt[3]*b^(4/3)) - (a^(1/3)*Log[a^(1/3) + b^(1/3)*x])/(3*b^(4/3
)) + (a^(1/3)*Log[a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2])/(6*
b^(4/3))
```

Rubi in Sympy [A] time = 31.1975, size = 112, normalized size = 0.94

$$-\frac{\sqrt[3]{a}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{3b^{\frac{4}{3}}}+\frac{\sqrt[3]{a}\log\left(a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2\right)}{6b^{\frac{4}{3}}}+\frac{\sqrt{3}\sqrt[3]{a}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}-\frac{2\sqrt[3]{b}x}{3}\right)}{\sqrt[3]{a}}\right)}{3b^{\frac{4}{3}}}+\frac{x}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a**(1/3)*log(a**(1/3) + b**(1/3)*x)/(3*b**(4/3)) + a**(1/3)*log(
a**(2/3) - a**(1/3)*b**(1/3)*x + b**(2/3)*x**2)/(6*b**(4/3)) + sq
rt(3)*a**(1/3)*atan(sqrt(3)*(a**(1/3)/3 - 2*b**(1/3)*x/3)/a**(1/3
))/(3*b**(4/3)) + x/b
```

Mathematica [A] time = 0.0288017, size = 108, normalized size = 0.91

$$\frac{\sqrt[3]{a}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)-2\sqrt[3]{a}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)+2\sqrt{3}\sqrt[3]{a}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{b}x}{\sqrt[3]{a}}}{\sqrt{3}}\right)+6\sqrt[3]{b}x}{6b^{4/3}}$$

Antiderivative was successfully verified.

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

```
[Out] (6*b^(1/3)*x + 2*Sqrt[3]*a^(1/3)*ArcTan[(1 - (2*b^(1/3)*x)/a^(1/3
))/Sqrt[3]] - 2*a^(1/3)*Log[a^(1/3) + b^(1/3)*x] + a^(1/3)*Log[a^
(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2])/(6*b^(4/3))
```

Maple [A] time = 0.003, size = 99, normalized size = 0.8

$$\frac{x}{b}-\frac{a}{3\,b^{2}}\ln\left(x+\sqrt[3]{\frac{a}{b}}\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}+\frac{a}{6\,b^{2}}\ln\left(x^{2}-x\sqrt[3]{\frac{a}{b}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}-\frac{a\sqrt{3}}{3\,b^{2}}\arctan\left(\frac{\sqrt{3}}{3}\left(2\,x\frac{1}{\sqrt[3]{\frac{a}{b}}}-1\right)\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x/b-1/3*a/b^2/(a/b)^(2/3)*ln(x+(a/b)^(1/3))+1/6*a/b^2/(a/b)^(2/3)
*ln(x^2-x*(a/b)^(1/3)+(a/b)^(2/3))-1/3*a/b^2/(a/b)^(2/3)*3^(1/2)*
arctan(1/3*3^(1/2)*(2/(a/b)^(1/3)*x-1))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.222932, size = 157, normalized size = 1.32

$$-\frac{\sqrt{3}\left(\sqrt{3}\left(-\frac{a}{b}\right)^{\frac{1}{3}}\log\left(x^{2}+x\left(-\frac{a}{b}\right)^{\frac{1}{3}}+\left(-\frac{a}{b}\right)^{\frac{2}{3}}\right)-2\,\sqrt{3}\left(-\frac{a}{b}\right)^{\frac{1}{3}}\log\left(x-\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right)-6\,\sqrt{3}x+6\,\left(-\frac{a}{b}\right)^{\frac{1}{3}}\arctan\left(\frac{2\,\sqrt{3}x+\sqrt{3}\left(-\frac{a}{b}\right)^{\frac{1}{3}}}{3\left(-\frac{a}{b}\right)^{\frac{1}{3}}}\right)\right)}{18\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/18*sqrt(3)*(sqrt(3)*(-a/b)^(1/3)*log(x^2 + x*(-a/b)^(1/3) + (-
a/b)^(2/3)) - 2*sqrt(3)*(-a/b)^(1/3)*log(x - (-a/b)^(1/3)) - 6*sq
rt(3)*x + 6*(-a/b)^(1/3)*arctan(1/3*(2*sqrt(3)*x + sqrt(3)*(-a/b)
^(1/3))/(-a/b)^(1/3)))/b
```

Sympy [A] time = 1.20084, size = 22, normalized size = 0.18

$$\operatorname{RootSum}\left(27t^{3}b^{4}+a,\left(t\mapsto t\log\left(-3tb+x\right)\right)\right)+\frac{x}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] RootSum(27*_t**3*b**4 + a, Lambda(_t, _t*log(-3*_t*b + x))) + x/b
```

GIAC/XCAS [A] time = 0.217019, size = 150, normalized size = 1.26

$$\frac{\left(-\frac{a}{b}\right)^{\frac{1}{3}}\ln\left(\left|x-\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right|\right)}{3\,b}+\frac{x}{b}-\frac{\sqrt{3}\left(-ab^{2}\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{a}{b}\right)^{\frac{1}{3}}}\right)}{3\,b^{2}}-\frac{\left(-ab^{2}\right)^{\frac{1}{3}}\ln\left(x^{2}+x\left(-\frac{a}{b}\right)^{\frac{1}{3}}+\left(-\frac{a}{b}\right)^{\frac{2}{3}}\right)}{6\,b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*(-a/b)^(1/3)*ln(abs(x - (-a/b)^(1/3)))/b + x/b - 1/3*sqrt(3)*
(-a*b^2)^(1/3)*arctan(1/3*sqrt(3)*(2*x + (-a/b)^(1/3))/(-a/b)^(1/
3))/b^2 - 1/6*(-a*b^2)^(1/3)*ln(x^2 + x*(-a/b)^(1/3) + (-a/b)^(2/
3))/b^2
```

3.325 $\int \frac{x}{a+bx^3}\,dx$

Optimal. Leaf size=115

$$\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{6\sqrt[3]{a}b^{2/3}}-\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{3\sqrt[3]{a}b^{2/3}}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}\sqrt[3]{a}b^{2/3}}$$

```
[Out] -(ArcTan[(a^(1/3) - 2*b^(1/3)*x)/(Sqrt[3]*a^(1/3))]/(Sqrt[3]*a^(1
/3)*b^(2/3))) - Log[a^(1/3) + b^(1/3)*x]/(3*a^(1/3)*b^(2/3)) + Lo
g[a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2]/(6*a^(1/3)*b^(2/3))
```

Rubi [A] time = 0.110444, antiderivative size = 115, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.546

$$\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{6\sqrt[3]{a}b^{2/3}}-\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{3\sqrt[3]{a}b^{2/3}}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}\sqrt[3]{a}b^{2/3}}$$

Antiderivative was successfully verified.

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

```
[Out] -(ArcTan[(a^(1/3) - 2*b^(1/3)*x)/(Sqrt[3]*a^(1/3))]/(Sqrt[3]*a^(1
/3)*b^(2/3))) - Log[a^(1/3) + b^(1/3)*x]/(3*a^(1/3)*b^(2/3)) + Lo
g[a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2]/(6*a^(1/3)*b^(2/3))
```

Rubi in Sympy [A] time = 24.4464, size = 109, normalized size = 0.95

$$-\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{3\sqrt[3]{a}b^{\frac{2}{3}}}+\frac{\log\left(a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2\right)}{6\sqrt[3]{a}b^{\frac{2}{3}}}-\frac{\sqrt{3}\,\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}-\frac{2\sqrt[3]{b}x}{3}\right)}{\sqrt[3]{a}}\right)}{3\sqrt[3]{a}b^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -log(a**(1/3) + b**(1/3)*x)/(3*a**(1/3)*b**(2/3)) + log(a**(2/3)
- a**(1/3)*b**(1/3)*x + b**(2/3)*x**2)/(6*a**(1/3)*b**(2/3)) - sq
rt(3)*atan(sqrt(3)*(a**(1/3)/3 - 2*b**(1/3)*x/3)/a**(1/3))/(3*a**
(1/3)*b**(2/3))
```

Mathematica [A] time = 0.0239056, size = 89, normalized size = 0.77

$$\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)-2\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)-2\sqrt{3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{b}x}{\sqrt[3]{a}}}{\sqrt{3}}\right)}{6\sqrt[3]{a}b^{2/3}}$$

Antiderivative was successfully verified.

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

```
[Out] (-2*Sqrt[3]*ArcTan[(1 - (2*b^(1/3)*x)/a^(1/3))/Sqrt[3]] - 2*Log[a
^(1/3) + b^(1/3)*x] + Log[a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x
^2])/(6*a^(1/3)*b^(2/3))
```

Maple [A] time = 0.003, size = 91, normalized size = 0.8

$$-\frac{1}{3b}\ln\left(x+\sqrt[3]{\frac{a}{b}}\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}+\frac{1}{6b}\ln\left(x^2-x\sqrt[3]{\frac{a}{b}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}+\frac{\sqrt{3}}{3b}\arctan\left(\frac{\sqrt{3}}{3}\left(2x\frac{1}{\sqrt[3]{\frac{a}{b}}}-1\right)\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/3/b/(a/b)^(1/3)*ln(x+(a/b)^(1/3))+1/6/b/(a/b)^(1/3)*ln(x^2-x*(
a/b)^(1/3)+(a/b)^(2/3))+1/3*3^(1/2)/b/(a/b)^(1/3)*arctan(1/3*3^(1
/2)*(2/(a/b)^(1/3)*x-1))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.21954, size = 134, normalized size = 1.17

$$-\frac{\sqrt{3}\left(\sqrt{3}\log\left(\left(-ab^2\right)^{\frac{1}{3}}bx^2-ab+\left(-ab^2\right)^{\frac{2}{3}}x\right)-2\sqrt{3}\log\left(ab+\left(-ab^2\right)^{\frac{2}{3}}x\right)+6\arctan\left(-\frac{\sqrt{3}ab-2\sqrt{3}\left(-ab^2\right)^{\frac{2}{3}}x}{3ab}\right)\right)}{18\left(-ab^2\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/18*sqrt(3)*(sqrt(3)*log((-a*b^2)^(1/3)*b*x^2 - a*b + (-a*b^2)^
(2/3)*x) - 2*sqrt(3)*log(a*b + (-a*b^2)^(2/3)*x) + 6*arctan(-1/3*
(sqrt(3)*a*b - 2*sqrt(3)*(-a*b^2)^(2/3)*x)/(a*b)))/(-a*b^2)^(1/3)
```

Sympy [A] time = 0.302729, size = 24, normalized size = 0.21

$$\operatorname{RootSum}\left(27t^3ab^2+1,\left(t\mapsto t\log\left(9t^2ab+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] RootSum(27*_t**3*a*b**2 + 1, Lambda(_t, _t*log(9*_t**2*a*b + x)))
```

GIAC/XCAS [A] time = 0.221828, size = 151, normalized size = 1.31

$$-\frac{\left(-\frac{a}{b}\right)^{\frac{2}{3}}\ln\left(\left|x-\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right|\right)}{3\,a}-\frac{\sqrt{3}\left(-ab^{2}\right)^{\frac{2}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{a}{b}\right)^{\frac{1}{3}}}\right)}{3\,ab^{2}}+\frac{\left(-ab^{2}\right)^{\frac{2}{3}}\ln\left(x^{2}+x\left(-\frac{a}{b}\right)^{\frac{1}{3}}+\left(-\frac{a}{b}\right)^{\frac{2}{3}}\right)}{6\,ab^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/3*(-a/b)^(2/3)*ln(abs(x - (-a/b)^(1/3)))/a - 1/3*sqrt(3)*(-a*b
^2)^(2/3)*arctan(1/3*sqrt(3)*(2*x + (-a/b)^(1/3))/(-a/b)^(1/3))/(
a*b^2) + 1/6*(-a*b^2)^(2/3)*ln(x^2 + x*(-a/b)^(1/3) + (-a/b)^(2/3
))/(a*b^2)
```

3.326 $\int \frac{1}{a+bx^3}\,dx$

Optimal. Leaf size=115

$$-\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{6a^{2/3}\sqrt[3]{b}}+\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{3a^{2/3}\sqrt[3]{b}}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}a^{2/3}\sqrt[3]{b}}$$

```
[Out] -(ArcTan[(a^(1/3) - 2*b^(1/3)*x)/(Sqrt[3]*a^(1/3))]/(Sqrt[3]*a^(2
/3)*b^(1/3))) + Log[a^(1/3) + b^(1/3)*x]/(3*a^(2/3)*b^(1/3)) - Lo
g[a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2]/(6*a^(2/3)*b^(1/3))
```

Rubi [A] time = 0.105793, antiderivative size = 115, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667

$$-\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{6a^{2/3}\sqrt[3]{b}}+\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{3a^{2/3}\sqrt[3]{b}}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}a^{2/3}\sqrt[3]{b}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^(-1),x]
```

```
[Out] -(ArcTan[(a^(1/3) - 2*b^(1/3)*x)/(Sqrt[3]*a^(1/3))]/(Sqrt[3]*a^(2
/3)*b^(1/3))) + Log[a^(1/3) + b^(1/3)*x]/(3*a^(2/3)*b^(1/3)) - Lo
g[a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2]/(6*a^(2/3)*b^(1/3))
```

Rubi in Sympy [A] time = 24.9216, size = 109, normalized size = 0.95

$$\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{3a^{\frac{2}{3}}\sqrt[3]{b}}-\frac{\log\left(a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2\right)}{6a^{\frac{2}{3}}\sqrt[3]{b}}-\frac{\sqrt{3}\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}-\frac{2\sqrt[3]{b}x}{3}\right)}{\sqrt[3]{a}}\right)}{3a^{\frac{2}{3}}\sqrt[3]{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**3+a),x)
```

```
[Out] log(a**(1/3) + b**(1/3)*x)/(3*a**(2/3)*b**(1/3)) - log(a**(2/3) -
 a**(1/3)*b**(1/3)*x + b**(2/3)*x**2)/(6*a**(2/3)*b**(1/3)) - sqr
t(3)*atan(sqrt(3)*(a**(1/3)/3 - 2*b**(1/3)*x/3)/a**(1/3))/(3*a**(
2/3)*b**(1/3))
```

Mathematica [A] time = 0.0217544, size = 89, normalized size = 0.77

$$-\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)-2\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)+2\sqrt{3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{b}x}{\sqrt[3]{a}}}{\sqrt{3}}\right)}{6a^{2/3}\sqrt[3]{b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^(-1),x]
```

```
[Out] -(2*Sqrt[3]*ArcTan[(1 - (2*b^(1/3)*x)/a^(1/3))/Sqrt[3]] - 2*Log[a
^(1/3) + b^(1/3)*x] + Log[a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x
^2])/(6*a^(2/3)*b^(1/3))
```

Maple [A] time = 0.002, size = 91, normalized size = 0.8

$$\frac{1}{3b}\ln\left(x+\sqrt[3]{\frac{a}{b}}\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}-\frac{1}{6b}\ln\left(x^2-x\sqrt[3]{\frac{a}{b}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}+\frac{\sqrt{3}}{3b}\arctan\left(\frac{\sqrt{3}}{3}\left(2x\frac{1}{\sqrt[3]{\frac{a}{b}}}-1\right)\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^3+a),x)
```

```
[Out] 1/3/b/(a/b)^(2/3)*ln(x+(a/b)^(1/3))-1/6/b/(a/b)^(2/3)*ln(x^2-x*(a
/b)^(1/3)+(a/b)^(2/3))+1/3/b/(a/b)^(2/3)*3^(1/2)*arctan(1/3*3^(1/
2)*(2/(a/b)^(1/3)*x-1))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x^3 + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.246363, size = 120, normalized size = 1.04

$$-\frac{\sqrt{3}\left(\sqrt{3}\log\left(\left(a^2b\right)^{\frac{2}{3}}x^2-\left(a^2b\right)^{\frac{1}{3}}ax+a^2\right)-2\sqrt{3}\log\left(\left(a^2b\right)^{\frac{1}{3}}x+a\right)-6\arctan\left(\frac{2\sqrt{3}\left(a^2b\right)^{\frac{1}{3}}x-\sqrt{3}a}{3a}\right)\right)}{18\left(a^2b\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x^3 + a),x, algorithm="fricas")
```

```
[Out] -1/18*sqrt(3)*(sqrt(3)*log((a^2*b)^(2/3)*x^2 - (a^2*b)^(1/3)*a*x
+ a^2) - 2*sqrt(3)*log((a^2*b)^(1/3)*x + a) - 6*arctan(1/3*(2*sqr
t(3)*(a^2*b)^(1/3)*x - sqrt(3)*a)/a))/(a^2*b)^(1/3)
```

Sympy [A] time = 0.347146, size = 20, normalized size = 0.17

$$\operatorname{RootSum}\left(27t^3a^2b-1,\left(t\mapsto t\log\left(3ta+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**3+a),x)
```

```
[Out] RootSum(27*_t**3*a**2*b - 1, Lambda(_t, _t*log(3*_t*a + x)))
```

GIAC/XCAS [A] time = 0.21968, size = 151, normalized size = 1.31

$$-\frac{\left(-\frac{a}{b}\right)^{\frac{1}{3}} \ln\left(\left|x-\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right|\right)}{3\,a}+\frac{\sqrt{3}\left(-ab^{2}\right)^{\frac{1}{3}} \arctan\left(\frac{\sqrt{3}\left(2\,x+\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{a}{b}\right)^{\frac{1}{3}}}\right)}{3\,ab}+\frac{\left(-ab^{2}\right)^{\frac{1}{3}} \ln\left(x^{2}+x\left(-\frac{a}{b}\right)^{\frac{1}{3}}+\left(-\frac{a}{b}\right)^{\frac{2}{3}}\right)}{6\,ab}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x^3 + a),x, algorithm="giac")
```

```
[Out] -1/3*(-a/b)^(1/3)*ln(abs(x - (-a/b)^(1/3)))/a + 1/3*sqrt(3)*(-a*b
^2)^(1/3)*arctan(1/3*sqrt(3)*(2*x + (-a/b)^(1/3))/(-a/b)^(1/3))/(
a*b) + 1/6*(-a*b^2)^(1/3)*ln(x^2 + x*(-a/b)^(1/3) + (-a/b)^(2/3))
/(a*b)
```

3.327 $\int \frac{1}{x^2(a+bx^3)}\,dx$

Optimal. Leaf size=122

$$-\frac{\sqrt[3]{b}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{6a^{4/3}}+\frac{\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{3a^{4/3}}+\frac{\sqrt[3]{b}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}a^{4/3}}-\frac{1}{ax}$$

```
[Out] -(1/(a*x)) + (b^(1/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*x)/(Sqrt[3]*a^(
1/3))])/(Sqrt[3]*a^(4/3)) + (b^(1/3)*Log[a^(1/3) + b^(1/3)*x])/(3
*a^(4/3)) - (b^(1/3)*Log[a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^
2])/(6*a^(4/3))
```

Rubi [A] time = 0.139298, antiderivative size = 122, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538

$$-\frac{\sqrt[3]{b}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{6a^{4/3}}+\frac{\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{3a^{4/3}}+\frac{\sqrt[3]{b}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}a^{4/3}}-\frac{1}{ax}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(a + b*x^3)),x]
```

```
[Out] -(1/(a*x)) + (b^(1/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*x)/(Sqrt[3]*a^(
1/3))])/(Sqrt[3]*a^(4/3)) + (b^(1/3)*Log[a^(1/3) + b^(1/3)*x])/(3
*a^(4/3)) - (b^(1/3)*Log[a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^
2])/(6*a^(4/3))
```

Rubi in Sympy [A] time = 30.4971, size = 114, normalized size = 0.93

$$-\frac{1}{ax}+\frac{\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{3a^{\frac{4}{3}}}-\frac{\sqrt[3]{b}\log\left(a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2\right)}{6a^{\frac{4}{3}}}+\frac{\sqrt{3}\sqrt[3]{b}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}-\frac{2\sqrt[3]{b}x}{3}\right)}{\sqrt[3]{a}}\right)}{3a^{\frac{4}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(b*x**3+a),x)
```

```
[Out] -1/(a*x) + b**(1/3)*log(a**(1/3) + b**(1/3)*x)/(3*a**(4/3)) - b**
(1/3)*log(a**(2/3) - a**(1/3)*b**(1/3)*x + b**(2/3)*x**2)/(6*a**(
4/3)) + sqrt(3)*b**(1/3)*atan(sqrt(3)*(a**(1/3)/3 - 2*b**(1/3)*x/
3)/a**(1/3))/(3*a**(4/3))
```

Mathematica [A] time = 0.0362019, size = 114, normalized size = 0.93

$$\frac{-\sqrt[3]{b}x\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)+2\sqrt[3]{b}x\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)+2\sqrt{3}\sqrt[3]{b}x\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{b}x}{\sqrt[3]{a}}}{\sqrt{3}}\right)-6\sqrt[3]{a}}{6a^{4/3}x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*(a + b*x^3)),x]
```

```
[Out] (-6*a^(1/3) + 2*Sqrt[3]*b^(1/3)*x*ArcTan[(1 - (2*b^(1/3)*x)/a^(1/
3))/Sqrt[3]] + 2*b^(1/3)*x*Log[a^(1/3) + b^(1/3)*x] - b^(1/3)*x*L
og[a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2])/(6*a^(4/3)*x)
```

Maple [A] time = 0.007, size = 99, normalized size = 0.8

$$\frac{1}{3a}\ln\left(x+\sqrt[3]{\frac{a}{b}}\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}-\frac{1}{6a}\ln\left(x^2-x\sqrt[3]{\frac{a}{b}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}-\frac{\sqrt{3}}{3a}\arctan\left(\frac{\sqrt{3}}{3}\left(2x\frac{1}{\sqrt[3]{\frac{a}{b}}}-1\right)\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}-\frac{1}{ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(b*x^3+a),x)
```

```
[Out] 1/3/a/(a/b)^(1/3)*ln(x+(a/b)^(1/3))-1/6/a/(a/b)^(1/3)*ln(x^2-x*(a
/b)^(1/3)+(a/b)^(2/3))-1/3/a*3^(1/2)/(a/b)^(1/3)*arctan(1/3*3^(1/
2)*(2/(a/b)^(1/3)*x-1))-1/a/x
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)*x^2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.236147, size = 171, normalized size = 1.4

$$-\frac{\sqrt{3}\left(\sqrt{3}x\left(\frac{b}{a}\right)^{\frac{1}{3}}\log\left(bx^2-ax\left(\frac{b}{a}\right)^{\frac{2}{3}}+a\left(\frac{b}{a}\right)^{\frac{1}{3}}\right)-2\sqrt{3}x\left(\frac{b}{a}\right)^{\frac{1}{3}}\log\left(bx+a\left(\frac{b}{a}\right)^{\frac{2}{3}}\right)-6x\left(\frac{b}{a}\right)^{\frac{1}{3}}\arctan\left(-\frac{2\sqrt{3}bx-\sqrt{3}a\left(\frac{b}{a}\right)^{\frac{2}{3}}}{3a\left(\frac{b}{a}\right)^{\frac{2}{3}}}\right)+\cdots}{18ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)*x^2),x, algorithm="fricas")
```

```
[Out] -1/18*sqrt(3)*(sqrt(3)*x*(b/a)^(1/3)*log(b*x^2 - a*x*(b/a)^(2/3)
+ a*(b/a)^(1/3)) - 2*sqrt(3)*x*(b/a)^(1/3)*log(b*x + a*(b/a)^(2/3
)) - 6*x*(b/a)^(1/3)*arctan(-1/3*(2*sqrt(3)*b*x - sqrt(3)*a*(b/a)
^(2/3))/(a*(b/a)^(2/3))) + 6*sqrt(3))/(a*x)
```

Sympy [A] time = 1.32724, size = 29, normalized size = 0.24

$$\operatorname{RootSum}\left(27t^3a^4-b,\left(t\mapsto t\log\left(\frac{9t^2a^3}{b}+x\right)\right)\right)-\frac{1}{ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(b*x**3+a),x)
```

```
[Out] RootSum(27*_t**3*a**4 - b, Lambda(_t, _t*log(9*_t**2*a**3/b + x))
) - 1/(a*x)
```

GIAC/XCAS [A] time = 0.223756, size = 163, normalized size = 1.34

$$\frac{b\left(-\frac{a}{b}\right)^{\frac{2}{3}}\ln\left(\left|x-\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right|\right)}{3\,a^2}+\frac{\sqrt{3}\left(-ab^2\right)^{\frac{2}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{a}{b}\right)^{\frac{1}{3}}}\right)}{3\,a^2b}-\frac{\left(-ab^2\right)^{\frac{2}{3}}\ln\left(x^2+x\left(-\frac{a}{b}\right)^{\frac{1}{3}}+\left(-\frac{a}{b}\right)^{\frac{2}{3}}\right)}{6\,a^2b}-\frac{1}{ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)*x^2),x, algorithm="giac")
```

```
[Out] 1/3*b*(-a/b)^(2/3)*ln(abs(x - (-a/b)^(1/3)))/a^2 + 1/3*sqrt(3)*(-
a*b^2)^(2/3)*arctan(1/3*sqrt(3)*(2*x + (-a/b)^(1/3))/(-a/b)^(1/3)
)/(a^2*b) - 1/6*(-a*b^2)^(2/3)*ln(x^2 + x*(-a/b)^(1/3) + (-a/b)^(
2/3))/(a^2*b) - 1/(a*x)
```

3.328 $\int \frac{1}{x^3(a+bx^3)}\,dx$

Optimal. Leaf size=124

$$\frac{b^{2/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{6a^{5/3}}-\frac{b^{2/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{3a^{5/3}}+\frac{b^{2/3}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}a^{5/3}}-\frac{1}{2ax^2}$$

```
[Out] -1/(2*a*x^2) + (b^(2/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*x)/(Sqrt[3]*a
^(1/3))])/(Sqrt[3]*a^(5/3)) - (b^(2/3)*Log[a^(1/3) + b^(1/3)*x])/
(3*a^(5/3)) + (b^(2/3)*Log[a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*
x^2])/(6*a^(5/3))
```

Rubi [A] time = 0.139338, antiderivative size = 124, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538

$$\frac{b^{2/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{6a^{5/3}}-\frac{b^{2/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{3a^{5/3}}+\frac{b^{2/3}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}a^{5/3}}-\frac{1}{2ax^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(a + b*x^3)),x]
```

```
[Out] -1/(2*a*x^2) + (b^(2/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*x)/(Sqrt[3]*a
^(1/3))])/(Sqrt[3]*a^(5/3)) - (b^(2/3)*Log[a^(1/3) + b^(1/3)*x])/
(3*a^(5/3)) + (b^(2/3)*Log[a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*
x^2])/(6*a^(5/3))
```

Rubi in Sympy [A] time = 33.0151, size = 117, normalized size = 0.94

$$-\frac{1}{2ax^2}-\frac{b^{\frac{2}{3}}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{3a^{\frac{5}{3}}}+\frac{b^{\frac{2}{3}}\log\left(a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2\right)}{6a^{\frac{5}{3}}}+\frac{\sqrt{3}b^{\frac{2}{3}}\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}-\frac{2\sqrt[3]{b}x}{3}\right)}{\sqrt[3]{a}}\right)}{3a^{\frac{5}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(b*x**3+a),x)
```

```
[Out] -1/(2*a*x**2) - b**(2/3)*log(a**(1/3) + b**(1/3)*x)/(3*a**(5/3))
+ b**(2/3)*log(a**(2/3) - a**(1/3)*b**(1/3)*x + b**(2/3)*x**2)/(6
*a**(5/3)) + sqrt(3)*b**(2/3)*atan(sqrt(3)*(a**(1/3)/3 - 2*b**(1/
3)*x/3)/a**(1/3))/(3*a**(5/3))
```

Mathematica [A] time = 0.036944, size = 119, normalized size = 0.96

$$\frac{b^{2/3}x^2\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)-3a^{2/3}-2b^{2/3}x^2\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)+2\sqrt{3}b^{2/3}x^2\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{b}x}{\sqrt[3]{a}}}{\sqrt{3}}\right)}{6a^{5/3}x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*(a + b*x^3)),x]
```

```
[Out] (-3*a^(2/3) + 2*Sqrt[3]*b^(2/3)*x^2*ArcTan[(1 - (2*b^(1/3)*x)/a^(
1/3))/Sqrt[3]] - 2*b^(2/3)*x^2*Log[a^(1/3) + b^(1/3)*x] + b^(2/3)
*x^2*Log[a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2])/(6*a^(5/3)*x
^2)
```

Maple [A] time = 0.007, size = 99, normalized size = 0.8

$$-\frac{1}{3\,a}\ln\left(x+\sqrt[3]{\frac{a}{b}}\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}+\frac{1}{6\,a}\ln\left(x^2-x\sqrt[3]{\frac{a}{b}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}-\frac{\sqrt{3}}{3\,a}\arctan\left(\frac{\sqrt{3}}{3}\left(2\,x\frac{1}{\sqrt[3]{\frac{a}{b}}}-1\right)\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}-\frac{1}{2\,ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(b*x^3+a),x)
```

```
[Out] -1/3/a/(a/b)^(2/3)*ln(x+(a/b)^(1/3))+1/6/a/(a/b)^(2/3)*ln(x^2-x*(
a/b)^(1/3)+(a/b)^(2/3))-1/3/a/(a/b)^(2/3)*3^(1/2)*arctan(1/3*3^(1
/2)*(2/(a/b)^(1/3)*x-1))-1/2/a/x^2
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)*x^3),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.225481, size = 217, normalized size = 1.75

$$-\frac{\sqrt{3}\left(\sqrt{3}x^2\left(-\frac{b^2}{a^2}\right)^{\frac{1}{3}}\log\left(b^2x^2+abx\left(-\frac{b^2}{a^2}\right)^{\frac{1}{3}}+a^2\left(-\frac{b^2}{a^2}\right)^{\frac{2}{3}}\right)-2\sqrt{3}x^2\left(-\frac{b^2}{a^2}\right)^{\frac{1}{3}}\log\left(bx-a\left(-\frac{b^2}{a^2}\right)^{\frac{1}{3}}\right)+6x^2\left(-\frac{b^2}{a^2}\right)^{\frac{1}{3}}\arctan\right.}{18\,ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)*x^3),x, algorithm="fricas")
```

```
[Out] -1/18*sqrt(3)*(sqrt(3)*x^2*(-b^2/a^2)^(1/3)*log(b^2*x^2 + a*b*x*(
-b^2/a^2)^(1/3) + a^2*(-b^2/a^2)^(2/3)) - 2*sqrt(3)*x^2*(-b^2/a^2
)^(1/3)*log(b*x - a*(-b^2/a^2)^(1/3)) + 6*x^2*(-b^2/a^2)^(1/3)*ar
ctan(1/3*(2*sqrt(3)*b*x + sqrt(3)*a*(-b^2/a^2)^(1/3))/(a*(-b^2/a^
2)^(1/3))) + 3*sqrt(3))/(a*x^2)
```

Sympy [A] time = 1.49114, size = 32, normalized size = 0.26

$$\operatorname{RootSum}\left(27t^3a^5+b^2,\left(t\mapsto t\log\left(-\frac{3ta^2}{b}+x\right)\right)\right)-\frac{1}{2ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(b*x**3+a),x)
```

```
[Out] RootSum(27*_t**3*a**5 + b**2, Lambda(_t, _t*log(-3*_t*a**2/b + x)
)) - 1/(2*a*x**2)
```

GIAC/XCAS [A] time = 0.222499, size = 155, normalized size = 1.25

$$\frac{b\left(-\frac{a}{b}\right)^{\frac{1}{3}}\ln\left(\left|x-\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right|\right)}{3\,a^2}-\frac{\sqrt{3}\left(-ab^2\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{a}{b}\right)^{\frac{1}{3}}}\right)}{3\,a^2}-\frac{\left(-ab^2\right)^{\frac{1}{3}}\ln\left(x^2+x\left(-\frac{a}{b}\right)^{\frac{1}{3}}+\left(-\frac{a}{b}\right)^{\frac{2}{3}}\right)}{6\,a^2}-\frac{1}{2\,ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)*x^3),x, algorithm="giac")
```

```
[Out] 1/3*b*(-a/b)^(1/3)*ln(abs(x - (-a/b)^(1/3)))/a^2 - 1/3*sqrt(3)*(-
a*b^2)^(1/3)*arctan(1/3*sqrt(3)*(2*x + (-a/b)^(1/3))/(-a/b)^(1/3)
)/a^2 - 1/6*(-a*b^2)^(1/3)*ln(x^2 + x*(-a/b)^(1/3) + (-a/b)^(2/3)
)/a^2 - 1/2/(a*x^2)
```

3.329 $\int \frac{x^8}{(a+bx^3)^2} \, dx$

Optimal. Leaf size=46

$$-\frac{a^2}{3b^3(a+bx^3)}-\frac{2a\log(a+bx^3)}{3b^3}+\frac{x^3}{3b^2}$$

```
[Out] x^3/(3*b^2) - a^2/(3*b^3*(a + b*x^3)) - (2*a*Log[a + b*x^3])/(3*b
^3)
```

Rubi [A] time = 0.0739244, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^2}{3b^3(a+bx^3)}-\frac{2a\log(a+bx^3)}{3b^3}+\frac{x^3}{3b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8/(a + b*x^3)^2,x]
```

```
[Out] x^3/(3*b^2) - a^2/(3*b^3*(a + b*x^3)) - (2*a*Log[a + b*x^3])/(3*b
^3)
```

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

$$-\frac{a^2}{3b^3(a+bx^3)}-\frac{2a\log(a+bx^3)}{3b^3}+\frac{\int^{x^3}\frac{1}{b^2}\,dx}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8/(b*x**3+a)**2,x)
```

```
[Out] -a**2/(3*b**3*(a + b*x**3)) - 2*a*log(a + b*x**3)/(3*b**3) + Inte
gral(b**(-2), (x, x**3))/3
```

Mathematica [A] time = 0.0322786, size = 38, normalized size = 0.83

$$\frac{-\frac{a^2}{a+bx^3}-2a\log(a+bx^3)+bx^3}{3b^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8/(a + b*x^3)^2,x]
```

```
[Out] (b*x^3 - a^2/(a + b*x^3) - 2*a*Log[a + b*x^3])/(3*b^3)
```

Maple [A] time = 0.007, size = 41, normalized size = 0.9

$$\frac{x^3}{3\,b^2}-\frac{a^2}{3\,b^3(bx^3+a)}-\frac{2\,a\ln(bx^3+a)}{3\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8/(b*x^3+a)^2,x)

[Out] 1/3*x^3/b^2-1/3*a^2/b^3/(b*x^3+a)-2/3*a*ln(b*x^3+a)/b^3
```

Maxima [A] time = 1.43601, size = 58, normalized size = 1.26

$$-\frac{a^2}{3\,(b^4x^3+ab^3)}+\frac{x^3}{3\,b^2}-\frac{2\,a\log\left(bx^3+a\right)}{3\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^3 + a)^2,x, algorithm="maxima")

[Out] -1/3*a^2/(b^4*x^3 + a*b^3) + 1/3*x^3/b^2 - 2/3*a*log(b*x^3 + a)/b
^3
```

Fricas [A] time = 0.211139, size = 76, normalized size = 1.65

$$\frac{b^2x^6+abx^3-a^2-2\left(abx^3+a^2\right)\log\left(bx^3+a\right)}{3\,(b^4x^3+ab^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^3 + a)^2,x, algorithm="fricas")

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

Sympy [A] time = 1.76444, size = 42, normalized size = 0.91

$$-\frac{a^2}{3ab^3+3b^4x^3}-\frac{2a\log\left(a+bx^3\right)}{3b^3}+\frac{x^3}{3b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8/(b*x**3+a)**2,x)

[Out] -a**2/(3*a*b**3 + 3*b**4*x**3) - 2*a*log(a + b*x**3)/(3*b**3) + x
**3/(3*b**2)
```

GIAC/XCAS [A] time = 0.222052, size = 66, normalized size = 1.43

$$\frac{x^3}{3\,b^2}-\frac{2\,a\ln\left(\left|bx^3+a\right|\right)}{3\,b^3}+\frac{2\,abx^3+a^2}{3\,(bx^3+a)b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^3 + a)^2,x, algorithm="giac")

[Out] 1/3*x^3/b^2 - 2/3*a*ln(abs(b*x^3 + a))/b^3 + 1/3*(2*a*b*x^3 + a^2
)/((b*x^3 + a)*b^3)
```

3.330 $\int \frac{x^5}{(a+bx^3)^2}\,dx$

Optimal. Leaf size=33

$$\frac{a}{3b^2(a+bx^3)}+\frac{\log(a+bx^3)}{3b^2}$$

```
[Out] a/(3*b^2*(a + b*x^3)) + Log[a + b*x^3]/(3*b^2)
```

Rubi [A] time = 0.0566092, antiderivative size = 33, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a}{3b^2(a+bx^3)}+\frac{\log(a+bx^3)}{3b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/(a + b*x^3)^2,x]

[Out] a/(3*b^2*(a + b*x^3)) + Log[a + b*x^3]/(3*b^2)
```

Rubi in Sympy [A] time = 8.29711, size = 26, normalized size = 0.79

$$\frac{a}{3b^2(a+bx^3)}+\frac{\log(a+bx^3)}{3b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(b*x**3+a)**2,x)

[Out] a/(3*b**2*(a + b*x**3)) + log(a + b*x**3)/(3*b**2)
```

Mathematica [A] time = 0.0159, size = 27, normalized size = 0.82

$$\frac{\frac{a}{a+bx^3}+\log(a+bx^3)}{3b^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/(a + b*x^3)^2,x]

[Out] (a/(a + b*x^3) + Log[a + b*x^3])/(3*b^2)
```

Maple [A] time = 0.007, size = 30, normalized size = 0.9

$$\frac{a}{3\,b^2(bx^3+a)}+\frac{\ln(bx^3+a)}{3\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(b*x^3+a)^2,x)
```

```
[Out] 1/3*a/b^2/(b*x^3+a)+1/3*ln(b*x^3+a)/b^2
```

Maxima [A] time = 1.44014, size = 43, normalized size = 1.3

$$\frac{a}{3\left(b^3x^3+ab^2\right)}+\frac{\log\left(bx^3+a\right)}{3\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*a/(b^3*x^3 + a*b^2) + 1/3*log(b*x^3 + a)/b^2
```

Fricas [A] time = 0.210681, size = 47, normalized size = 1.42

$$\frac{\left(bx^3+a\right)\log\left(bx^3+a\right)+a}{3\left(b^3x^3+ab^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*((b*x^3 + a)*log(b*x^3 + a) + a)/(b^3*x^3 + a*b^2)
```

Sympy [A] time = 1.59763, size = 29, normalized size = 0.88

$$\frac{a}{3ab^2+3b^3x^3}+\frac{\log\left(a+bx^3\right)}{3b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5/(b*x**3+a)**2,x)
```

```
[Out] a/(3*a*b**2 + 3*b**3*x**3) + log(a + b*x**3)/(3*b**2)
```

GIAC/XCAS [A] time = 0.215381, size = 65, normalized size = 1.97

$$-\frac{\frac{\ln\left(\frac{\left|bx^3+a\right|}{\left(bx^3+a\right)^2|b|}\right)}{b}-\frac{a}{\left(bx^3+a\right)b}}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/3*(ln(abs(b*x^3 + a)/((b*x^3 + a)^2*abs(b)))/b - a/((b*x^3 + a
)*b))/b
```

3.331 $\int \frac{x^2}{(a+bx^3)^2}\,dx$

Optimal. Leaf size=16

$$-\frac{1}{3b(a+bx^3)}$$

```
[Out] -1/(3*b*(a + b*x^3))
```

Rubi [A] time = 0.00967853, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$-\frac{1}{3b(a+bx^3)}$$

Antiderivative was successfully verified.

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

[Out] -1/(3*b*(a + b*x^3))
```

Rubi in Sympy [A] time = 2.34826, size = 12, normalized size = 0.75

$$-\frac{1}{3b(a+bx^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] -1/(3*b*(a + b*x**3))
```

Mathematica [A] time = 0.00877585, size = 16, normalized size = 1.

$$-\frac{1}{3b(a+bx^3)}$$

Antiderivative was successfully verified.

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

[Out] -1/(3*b*(a + b*x^3))
```

Maple [A] time = 0.001, size = 15, normalized size = 0.9

$$-\frac{1}{3\,b\,(bx^3+a)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] -1/3/b/(b*x^3+a)
```

Maxima [A] time = 1.43843, size = 19, normalized size = 1.19

$$-\frac{1}{3\,(bx^3+a)b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/3/((b*x^3 + a)*b)
```

Fricas [A] time = 0.205677, size = 20, normalized size = 1.25

$$-\frac{1}{3\,(b^2x^3+ab)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/3/(b^2*x^3 + a*b)
```

Sympy [A] time = 1.37364, size = 15, normalized size = 0.94

$$-\frac{1}{3ab+3b^2x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/(3*a*b + 3*b**2*x**3)
```

GIAC/XCAS [A] time = 0.219017, size = 19, normalized size = 1.19

$$-\frac{1}{3\,(bx^3+a)b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/3/((b*x^3 + a)*b)
```

3.332 $\int \frac{1}{x(a+bx^3)^2} \, dx$

Optimal. Leaf size=38

$$-\frac{\log\left(a+bx^3\right)}{3a^2}+\frac{\log(x)}{a^2}+\frac{1}{3a\left(a+bx^3\right)}$$

```
[Out] 1/(3*a*(a + b*x^3)) + Log[x]/a^2 - Log[a + b*x^3]/(3*a^2)
```

Rubi [A] time = 0.0612067, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$-\frac{\log\left(a+bx^3\right)}{3a^2}+\frac{\log(x)}{a^2}+\frac{1}{3a\left(a+bx^3\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a + b*x^3)^2),x]
```

```
[Out] 1/(3*a*(a + b*x^3)) + Log[x]/a^2 - Log[a + b*x^3]/(3*a^2)
```

Rubi in Sympy [A] time = 9.23427, size = 34, normalized size = 0.89

$$\frac{1}{3a\left(a+bx^3\right)}+\frac{\log\left(x^3\right)}{3a^2}-\frac{\log\left(a+bx^3\right)}{3a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(b*x**3+a)**2,x)
```

```
[Out] 1/(3*a*(a + b*x**3)) + log(x**3)/(3*a**2) - log(a + b*x**3)/(3*a*
*2)
```

Mathematica [A] time = 0.0226193, size = 33, normalized size = 0.87

$$\frac{\frac{a}{a+bx^3}-\log\left(a+bx^3\right)+3\log(x)}{3a^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a + b*x^3)^2),x]
```

```
[Out] (a/(a + b*x^3) + 3*Log[x] - Log[a + b*x^3])/(3*a^2)
```

Maple [A] time = 0.011, size = 35, normalized size = 0.9

$$\frac{1}{3\,a\left(bx^3+a\right)}+\frac{\ln(x)}{a^2}-\frac{\ln\left(bx^3+a\right)}{3\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(b*x^3+a)^2,x)
```

```
[Out] 1/3/a/(b*x^3+a)+ln(x)/a^2-1/3*ln(b*x^3+a)/a^2
```

Maxima [A] time = 1.44106, size = 50, normalized size = 1.32

$$\frac{1}{3\,(abx^3+a^2)}-\frac{\log\left(bx^3+a\right)}{3\,a^2}+\frac{\log\left(x^3\right)}{3\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^2*x),x, algorithm="maxima")
```

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

Fricas [A] time = 0.22826, size = 63, normalized size = 1.66

$$-\frac{\left(bx^3+a\right)\log\left(bx^3+a\right)-3\left(bx^3+a\right)\log\left(x\right)-a}{3\,(a^2bx^3+a^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^2*x),x, algorithm="fricas")
```

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

Sympy [A] time = 1.9075, size = 34, normalized size = 0.89

$$\frac{1}{3a^2+3abx^3}+\frac{\log\left(x\right)}{a^2}-\frac{\log\left(\frac{a}{b}+x^3\right)}{3a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(b*x**3+a)**2,x)
```

```
[Out] 1/(3*a**2 + 3*a*b*x**3) + log(x)/a**2 - log(a/b + x**3)/(3*a**2)
```

GIAC/XCAS [A] time = 0.224295, size = 61, normalized size = 1.61

$$-\frac{\ln\left(\left|bx^3+a\right|\right)}{3\,a^2}+\frac{\ln\left(\left|x\right|\right)}{a^2}+\frac{bx^3+2\,a}{3\,(bx^3+a)a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^2*x),x, algorithm="giac")
```

```
[Out] -1/3*ln(abs(b*x^3 + a))/a^2 + ln(abs(x))/a^2 + 1/3*(b*x^3 + 2*a)/
((b*x^3 + a)*a^2)
```

3.333 $\int \frac{1}{x^4(a+bx^3)^2}\,dx$

Optimal. Leaf size=52

$$\frac{2b\log(a+bx^3)}{3a^3}-\frac{2b\log(x)}{a^3}-\frac{b}{3a^2(a+bx^3)}-\frac{1}{3a^2x^3}$$

```
[Out] -1/(3*a^2*x^3) - b/(3*a^2*(a + b*x^3)) - (2*b*Log[x])/a^3 + (2*b*
Log[a + b*x^3])/(3*a^3)
```

Rubi [A] time = 0.0788349, antiderivative size = 52, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{2b\log(a+bx^3)}{3a^3}-\frac{2b\log(x)}{a^3}-\frac{b}{3a^2(a+bx^3)}-\frac{1}{3a^2x^3}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^4*(a + b*x^3)^2),x]
```

```
[Out] -1/(3*a^2*x^3) - b/(3*a^2*(a + b*x^3)) - (2*b*Log[x])/a^3 + (2*b*
Log[a + b*x^3])/(3*a^3)
```

Rubi in Sympy [A] time = 11.5762, size = 53, normalized size = 1.02

$$-\frac{b}{3a^2(a+bx^3)}-\frac{1}{3a^2x^3}-\frac{2b\log(x^3)}{3a^3}+\frac{2b\log(a+bx^3)}{3a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**4/(b*x**3+a)**2,x)
```

```
[Out] -b/(3*a**2*(a + b*x**3)) - 1/(3*a**2*x**3) - 2*b*log(x**3)/(3*a**
3) + 2*b*log(a + b*x**3)/(3*a**3)
```

Mathematica [A] time = 0.0847641, size = 41, normalized size = 0.79

$$-\frac{a\left(\frac{b}{a+bx^3}+\frac{1}{x^3}\right)-2b\log(a+bx^3)+6b\log(x)}{3a^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^4*(a + b*x^3)^2),x]
```

```
[Out] -(a*(x^(-3) + b/(a + b*x^3)) + 6*b*Log[x] - 2*b*Log[a + b*x^3])/(
3*a^3)
```

Maple [A] time = 0.013, size = 47, normalized size = 0.9

$$-\frac{1}{3\,x^3a^2}-\frac{b}{3\,a^2\,(bx^3+a)}-2\,\frac{b\ln(x)}{a^3}+\frac{2\,b\ln(bx^3+a)}{3\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(b*x^3+a)^2,x)
```

```
[Out] -1/3/x^3/a^2-1/3*b/a^2/(b*x^3+a)-2*b*ln(x)/a^3+2/3*b*ln(b*x^3+a)/
a^3
```

Maxima [A] time = 1.45801, size = 72, normalized size = 1.38

$$-\frac{2\,bx^3+a}{3\,(a^2bx^6+a^3x^3)}+\frac{2\,b\log\left(bx^3+a\right)}{3\,a^3}-\frac{2\,b\log\left(x^3\right)}{3\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^2*x^4),x, algorithm="maxima")
```

```
[Out] -1/3*(2*b*x^3 + a)/(a^2*b*x^6 + a^3*x^3) + 2/3*b*log(b*x^3 + a)/a
^3 - 2/3*b*log(x^3)/a^3
```

Fricas [A] time = 0.238807, size = 99, normalized size = 1.9

$$-\frac{2\,abx^3+a^2-2\,\left(b^2x^6+abx^3\right)\log\left(bx^3+a\right)+6\,\left(b^2x^6+abx^3\right)\log\left(x\right)}{3\,(a^3bx^6+a^4x^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^2*x^4),x, algorithm="fricas")
```

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

Sympy [A] time = 3.13246, size = 53, normalized size = 1.02

$$-\frac{a+2bx^3}{3a^3x^3+3a^2bx^6}-\frac{2b\log\left(x\right)}{a^3}+\frac{2b\log\left(\frac{a}{b}+x^3\right)}{3a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(b*x**3+a)**2,x)
```

```
[Out] -(a + 2*b*x**3)/(3*a**3*x**3 + 3*a**2*b*x**6) - 2*b*log(x)/a**3 +
 2*b*log(a/b + x**3)/(3*a**3)
```

GIAC/XCAS [A] time = 0.220423, size = 69, normalized size = 1.33

$$\frac{2\,b\ln\left(\left|bx^3+a\right|\right)}{3\,a^3}-\frac{2\,b\ln\left(|x|\right)}{a^3}-\frac{2\,bx^3+a}{3\,(bx^6+ax^3)a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^2*x^4),x, algorithm="giac")
```

```
[Out] 2/3*b*ln(abs(b*x^3 + a))/a^3 - 2*b*ln(abs(x))/a^3 - 1/3*(2*b*x^3
+ a)/((b*x^6 + a*x^3)*a^2)
```

3.334 $\int \frac{x^4}{(a+bx^3)^2} dx$

Optimal. Leaf size=136

$$\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{9\sqrt[3]{a}b^{5/3}}-\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{9\sqrt[3]{a}b^{5/3}}-\frac{2\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}\sqrt[3]{a}b^{5/3}}-\frac{x^2}{3b\left(a+bx^3\right)}$$

```
[Out] -x^2/(3*b*(a + b*x^3)) - (2*ArcTan[(a^(1/3) - 2*b^(1/3)*x)/(Sqrt[
3]*a^(1/3))])/(3*Sqrt[3]*a^(1/3)*b^(5/3)) - (2*Log[a^(1/3) + b^(1
/3)*x])/(9*a^(1/3)*b^(5/3)) + Log[a^(2/3) - a^(1/3)*b^(1/3)*x + b
^(2/3)*x^2]/(9*a^(1/3)*b^(5/3))
```

Rubi [A] time = 0.150278, antiderivative size = 136, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538

$$\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{9\sqrt[3]{a}b^{5/3}}-\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{9\sqrt[3]{a}b^{5/3}}-\frac{2\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}\sqrt[3]{a}b^{5/3}}-\frac{x^2}{3b\left(a+bx^3\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a + b*x^3)^2,x]
```

```
[Out] -x^2/(3*b*(a + b*x^3)) - (2*ArcTan[(a^(1/3) - 2*b^(1/3)*x)/(Sqrt[
3]*a^(1/3))])/(3*Sqrt[3]*a^(1/3)*b^(5/3)) - (2*Log[a^(1/3) + b^(1
/3)*x])/(9*a^(1/3)*b^(5/3)) + Log[a^(2/3) - a^(1/3)*b^(1/3)*x + b
^(2/3)*x^2]/(9*a^(1/3)*b^(5/3))
```

Rubi in Sympy [A] time = 29.693, size = 126, normalized size = 0.93

$$-\frac{x^2}{3b\left(a+bx^3\right)}-\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{9\sqrt[3]{a}b^{\frac{5}{3}}}+\frac{\log\left(a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2\right)}{9\sqrt[3]{a}b^{\frac{5}{3}}}-\frac{2\sqrt{3}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}-\frac{2\sqrt[3]{b}x}{3}\right)}{\sqrt[3]{a}}\right)}{9\sqrt[3]{a}b^{\frac{5}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(b*x**3+a)**2,x)
```

```
[Out] -x**2/(3*b*(a + b*x**3)) - 2*log(a**(1/3) + b**(1/3)*x)/(9*a**(1/
3)*b**(5/3)) + log(a**(2/3) - a**(1/3)*b**(1/3)*x + b**(2/3)*x**2
)/(9*a**(1/3)*b**(5/3)) - 2*sqrt(3)*atan(sqrt(3)*(a**(1/3)/3 - 2*
b**(1/3)*x/3)/a**(1/3))/(9*a**(1/3)*b**(5/3))
```

Mathematica [A] time = 0.163187, size = 119, normalized size = 0.88

$$\frac{\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{\sqrt[3]{a}}-\frac{3b^{2/3}x^2}{a+bx^3}-\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\sqrt[3]{a}}-\frac{2\sqrt{3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{b}x}{\sqrt[3]{a}}}{\sqrt{3}}\right)}{\sqrt[3]{a}}}{9b^{5/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(a + b*x^3)^2,x]
```

```
[Out] ((-3*b^(2/3)*x^2)/(a + b*x^3) - (2*Sqrt[3]*ArcTan[(1 - (2*b^(1/3)
*x)/a^(1/3))/Sqrt[3]])/a^(1/3) - (2*Log[a^(1/3) + b^(1/3)*x])/a^(
1/3) + Log[a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2]/a^(1/3))/(9
*b^(5/3))
```

Maple [A] time = 0.01, size = 108, normalized size = 0.8

$$-\frac{x^2}{3\,b\,(bx^3+a)}-\frac{2}{9\,b^2}\ln\left(x+\sqrt[3]{\frac{a}{b}}\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}+\frac{1}{9\,b^2}\ln\left(x^2-x\sqrt[3]{\frac{a}{b}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}+\frac{2\sqrt{3}}{9\,b^2}\arctan\left(\frac{\sqrt{3}}{3}\left(2\,x\frac{1}{\sqrt[3]{\frac{a}{b}}}-1\right)\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(b*x^3+a)^2,x)
```

```
[Out] -1/3*x^2/b/(b*x^3+a)-2/9/b^2/(a/b)^(1/3)*ln(x+(a/b)^(1/3))+1/9/b^
2/(a/b)^(1/3)*ln(x^2-x*(a/b)^(1/3)+(a/b)^(2/3))+2/9/b^2*3^(1/2)/(
a/b)^(1/3)*arctan(1/3*3^(1/2)*(2/(a/b)^(1/3)*x-1))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^3 + a)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.225993, size = 201, normalized size = 1.48

$$-\frac{\sqrt{3}\left(3\sqrt{3}\left(-ab^2\right)^{\frac{1}{3}}x^2+\sqrt{3}\left(bx^3+a\right)\log\left(\left(-ab^2\right)^{\frac{1}{3}}bx^2-ab+\left(-ab^2\right)^{\frac{2}{3}}x\right)-2\sqrt{3}\left(bx^3+a\right)\log\left(ab+\left(-ab^2\right)^{\frac{2}{3}}x\right)+6\left(bx^3\right.\right.}{27\left(b^2x^3+ab\right)\left(-ab^2\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^3 + a)^2,x, algorithm="fricas")
```

```
[Out] -1/27*sqrt(3)*(3*sqrt(3)*(-a*b^2)^(1/3)*x^2 + sqrt(3)*(b*x^3 + a)
*log((-a*b^2)^(1/3)*b*x^2 - a*b + (-a*b^2)^(2/3)*x) - 2*sqrt(3)*(
b*x^3 + a)*log(a*b + (-a*b^2)^(2/3)*x) + 6*(b*x^3 + a)*arctan(-1/
3*(sqrt(3)*a*b - 2*sqrt(3)*(-a*b^2)^(2/3)*x)/(a*b)))/((b^2*x^3 +
a*b)*(-a*b^2)^(1/3))
```

Sympy [A] time = 1.60661, size = 44, normalized size = 0.32

$$-\frac{x^2}{3ab+3b^2x^3}+\operatorname{RootSum}\left(729t^3ab^5+8,\left(t\mapsto t\log\left(\frac{81t^2ab^3}{4}+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(b*x**3+a)**2,x)
```

```
[Out] -x**2/(3*a*b + 3*b**2*x**3) + RootSum(729*_t**3*a*b**5 + 8, Lambd
a(_t, _t*log(81*_t**2*a*b**3/4 + x)))
```

GIAC/XCAS [A] time = 0.226157, size = 178, normalized size = 1.31

$$-\frac{x^{2}}{3\,(bx^{3}+a)b}-\frac{2\,\left(-\frac{a}{b}\right)^{\frac{2}{3}}\ln\left(\left|x-\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right|\right)}{9\,ab}-\frac{2\,\sqrt{3}\,\left(-ab^{2}\right)^{\frac{2}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{a}{b}\right)^{\frac{1}{3}}}\right)}{9\,ab^{3}}+\frac{\left(-ab^{2}\right)^{\frac{2}{3}}\ln\left(x^{2}+x\left(-\frac{a}{b}\right)^{\frac{1}{3}}+\left(-\frac{a}{b}\right)^{\frac{2}{3}}\right)}{9\,ab^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^3 + a)^2,x, algorithm="giac")
```

```
[Out] -1/3*x^2/((b*x^3 + a)*b) - 2/9*(-a/b)^(2/3)*ln(abs(x - (-a/b)^(1/
3)))/(a*b) - 2/9*sqrt(3)*(-a*b^2)^(2/3)*arctan(1/3*sqrt(3)*(2*x +
 (-a/b)^(1/3))/(-a/b)^(1/3))/(a*b^3) + 1/9*(-a*b^2)^(2/3)*ln(x^2
+ x*(-a/b)^(1/3) + (-a/b)^(2/3))/(a*b^3)
```

3.335 $\int \frac{x^3}{(a+bx^3)^2}\,dx$

Optimal. Leaf size=134

$$-\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{18a^{2/3}b^{4/3}}+\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{9a^{2/3}b^{4/3}}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{2/3}b^{4/3}}-\frac{x}{3b\left(a+bx^3\right)}$$

```
[Out] -x/(3*b*(a + b*x^3)) - ArcTan[(a^(1/3) - 2*b^(1/3)*x)/(Sqrt[3]*a^
(1/3))]/(3*Sqrt[3]*a^(2/3)*b^(4/3)) + Log[a^(1/3) + b^(1/3)*x]/(9
*a^(2/3)*b^(4/3)) - Log[a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2
]/(18*a^(2/3)*b^(4/3))
```

Rubi [A] time = 0.141962, antiderivative size = 134, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538

$$-\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{18a^{2/3}b^{4/3}}+\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{9a^{2/3}b^{4/3}}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{2/3}b^{4/3}}-\frac{x}{3b\left(a+bx^3\right)}$$

Antiderivative was successfully verified.

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

```
[Out] -x/(3*b*(a + b*x^3)) - ArcTan[(a^(1/3) - 2*b^(1/3)*x)/(Sqrt[3]*a^
(1/3))]/(3*Sqrt[3]*a^(2/3)*b^(4/3)) + Log[a^(1/3) + b^(1/3)*x]/(9
*a^(2/3)*b^(4/3)) - Log[a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2
]/(18*a^(2/3)*b^(4/3))
```

Rubi in Sympy [A] time = 30.4444, size = 121, normalized size = 0.9

$$-\frac{x}{3b\left(a+bx^3\right)}+\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{9a^{\frac{2}{3}}b^{\frac{4}{3}}}-\frac{\log\left(a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2\right)}{18a^{\frac{2}{3}}b^{\frac{4}{3}}}-\frac{\sqrt{3}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}-\frac{2\sqrt[3]{b}x}{3}\right)}{\sqrt[3]{a}}\right)}{9a^{\frac{2}{3}}b^{\frac{4}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -x/(3*b*(a + b*x**3)) + log(a**(1/3) + b**(1/3)*x)/(9*a**(2/3)*b*
*(4/3)) - log(a**(2/3) - a**(1/3)*b**(1/3)*x + b**(2/3)*x**2)/(18
*a**(2/3)*b**(4/3)) - sqrt(3)*atan(sqrt(3)*(a**(1/3)/3 - 2*b**(1/
3)*x/3)/a**(1/3))/(9*a**(2/3)*b**(4/3))
```

Mathematica [A] time = 0.129832, size = 118, normalized size = 0.88

$$\frac{-\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{a^{2/3}}+\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{a^{2/3}}-\frac{2\sqrt{3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{b}x}{\sqrt[3]{a}}}{\sqrt{3}}\right)}{a^{2/3}}-\frac{6\sqrt[3]{b}x}{a+bx^3}}{18b^{4/3}}$$

Antiderivative was successfully verified.

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

```
[Out] ((-6*b^(1/3)*x)/(a + b*x^3) - (2*Sqrt[3]*ArcTan[(1 - (2*b^(1/3)*x
)/a^(1/3))/Sqrt[3]])/a^(2/3) + (2*Log[a^(1/3) + b^(1/3)*x])/a^(2/
3) - Log[a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2]/a^(2/3))/(18*
b^(4/3))
```

Maple [A] time = 0.01, size = 106, normalized size = 0.8

$$-\frac{x}{3\,b\,(bx^3+a)}+\frac{1}{9\,b^2}\ln\left(x+\sqrt[3]{\frac{a}{b}}\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}-\frac{1}{18\,b^2}\ln\left(x^2-x\sqrt[3]{\frac{a}{b}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}+\frac{\sqrt{3}}{9\,b^2}\arctan\left(\frac{\sqrt{3}}{3}\left(2\,x\frac{1}{\sqrt[3]{\frac{a}{b}}}-1\right)\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/3*x/b/(b*x^3+a)+1/9/b^2/(a/b)^(2/3)*ln(x+(a/b)^(1/3))-1/18/b^2
/(a/b)^(2/3)*ln(x^2-x*(a/b)^(1/3)+(a/b)^(2/3))+1/9/b^2/(a/b)^(2/3
)*3^(1/2)*arctan(1/3*3^(1/2)*(2/(a/b)^(1/3)*x-1))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.232871, size = 184, normalized size = 1.37

$$-\frac{\sqrt{3}\left(\sqrt{3}(bx^3+a)\log\left(\left(a^2b\right)^{\frac{2}{3}}x^2-\left(a^2b\right)^{\frac{1}{3}}ax+a^2\right)-2\sqrt{3}(bx^3+a)\log\left(\left(a^2b\right)^{\frac{1}{3}}x+a\right)-6\left(bx^3+a\right)\arctan\left(\frac{2\sqrt{3}\left(a^2b\right)^{\frac{1}{3}}x-}{3a}\right.\right.}{54\left(b^2x^3+ab\right)\left(a^2b\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/54*sqrt(3)*(sqrt(3)*(b*x^3 + a)*log((a^2*b)^(2/3)*x^2 - (a^2*b
)^(1/3)*a*x + a^2) - 2*sqrt(3)*(b*x^3 + a)*log((a^2*b)^(1/3)*x +
a) - 6*(b*x^3 + a)*arctan(1/3*(2*sqrt(3)*(a^2*b)^(1/3)*x - sqrt(3
)*a)/a) + 6*sqrt(3)*(a^2*b)^(1/3)*x)/((b^2*x^3 + a*b)*(a^2*b)^(1/
3))
```

Sympy [A] time = 1.58304, size = 39, normalized size = 0.29

$$-\frac{x}{3ab+3b^2x^3}+\operatorname{RootSum}\left(729t^3a^2b^4-1,\left(t\mapsto t\log\left(9tab+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -x/(3*a*b + 3*b**2*x**3) + RootSum(729*_t**3*a**2*b**4 - 1, Lambd
a(_t, _t*log(9*_t*a*b + x)))
```

GIAC/XCAS [A] time = 0.223201, size = 176, normalized size = 1.31

$$-\frac{\left(-\frac{a}{b}\right)^{\frac{1}{3}}\ln\left(\left|x-\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right|\right)}{9\,ab}-\frac{x}{3\,(bx^3+a)b}+\frac{\sqrt{3}\left(-ab^2\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{a}{b}\right)^{\frac{1}{3}}}\right)}{9\,ab^2}+\frac{\left(-ab^2\right)^{\frac{1}{3}}\ln\left(x^2+x\left(-\frac{a}{b}\right)^{\frac{1}{3}}+\left(-\frac{a}{b}\right)^{\frac{2}{3}}\right)}{18\,ab^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/9*(-a/b)^(1/3)*ln(abs(x - (-a/b)^(1/3)))/(a*b) - 1/3*x/((b*x^3
 + a)*b) + 1/9*sqrt(3)*(-a*b^2)^(1/3)*arctan(1/3*sqrt(3)*(2*x + (
-a/b)^(1/3))/(-a/b)^(1/3))/(a*b^2) + 1/18*(-a*b^2)^(1/3)*ln(x^2 +
 x*(-a/b)^(1/3) + (-a/b)^(2/3))/(a*b^2)
```

3.336 $\int \frac{x}{(a+bx^3)^2}\,dx$

Optimal. Leaf size=136

$$\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{18a^{4/3}b^{2/3}}-\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{9a^{4/3}b^{2/3}}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{4/3}b^{2/3}}+\frac{x^2}{3a\left(a+bx^3\right)}$$

```
[Out] x^2/(3*a*(a + b*x^3)) - ArcTan[(a^(1/3) - 2*b^(1/3)*x)/(Sqrt[3]*a
^(1/3))]/(3*Sqrt[3]*a^(4/3)*b^(2/3)) - Log[a^(1/3) + b^(1/3)*x]/(
9*a^(4/3)*b^(2/3)) + Log[a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^
2]/(18*a^(4/3)*b^(2/3))
```

Rubi [A] time = 0.138034, antiderivative size = 136, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.636$

$$\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{18a^{4/3}b^{2/3}}-\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{9a^{4/3}b^{2/3}}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{4/3}b^{2/3}}+\frac{x^2}{3a\left(a+bx^3\right)}$$

Antiderivative was successfully verified.

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

```
[Out] x^2/(3*a*(a + b*x^3)) - ArcTan[(a^(1/3) - 2*b^(1/3)*x)/(Sqrt[3]*a
^(1/3))]/(3*Sqrt[3]*a^(4/3)*b^(2/3)) - Log[a^(1/3) + b^(1/3)*x]/(
9*a^(4/3)*b^(2/3)) + Log[a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^
2]/(18*a^(4/3)*b^(2/3))
```

Rubi in Sympy [A] time = 29.9145, size = 122, normalized size = 0.9

$$\frac{x^2}{3a\left(a+bx^3\right)}-\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{9a^{\frac{4}{3}}b^{\frac{2}{3}}}+\frac{\log\left(a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2\right)}{18a^{\frac{4}{3}}b^{\frac{2}{3}}}-\frac{\sqrt{3}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}-\frac{2\sqrt[3]{b}x}{3}\right)}{\sqrt[3]{a}}\right)}{9a^{\frac{4}{3}}b^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x**2/(3*a*(a + b*x**3)) - log(a**(1/3) + b**(1/3)*x)/(9*a**(4/3)*
b**(2/3)) + log(a**(2/3) - a**(1/3)*b**(1/3)*x + b**(2/3)*x**2)/(
18*a**(4/3)*b**(2/3)) - sqrt(3)*atan(sqrt(3)*(a**(1/3)/3 - 2*b**(
1/3)*x/3)/a**(1/3))/(9*a**(4/3)*b**(2/3))
```

Mathematica [A] time = 0.12746, size = 119, normalized size = 0.88

$$\frac{\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{b^{2/3}}-\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{b^{2/3}}-\frac{2\sqrt{3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{b}x}{\sqrt[3]{a}}}{\sqrt{3}}\right)}{b^{2/3}}+\frac{6\sqrt[3]{a}x^2}{a+bx^3}}{18a^{4/3}}$$

Antiderivative was successfully verified.

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

```
[Out] ((6*a^(1/3)*x^2)/(a + b*x^3) - (2*Sqrt[3]*ArcTan[(1 - (2*b^(1/3)*
x)/a^(1/3))/Sqrt[3]])/b^(2/3) - (2*Log[a^(1/3) + b^(1/3)*x])/b^(2
/3) + Log[a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2]/b^(2/3))/(18
*a^(4/3))
```

Maple [A] time = 0.006, size = 117, normalized size = 0.9

$$\frac{x^2}{3\,a\,(bx^3+a)} - \frac{1}{9\,ab}\ln\left(x+\sqrt[3]{\frac{a}{b}}\right)\frac{1}{\sqrt[3]{\frac{a}{b}}} + \frac{1}{18\,ab}\ln\left(x^2-x\sqrt[3]{\frac{a}{b}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)\frac{1}{\sqrt[3]{\frac{a}{b}}} + \frac{\sqrt{3}}{9\,ab}\arctan\left(\frac{\sqrt{3}}{3}\left(2\,x\frac{1}{\sqrt[3]{\frac{a}{b}}}-1\right)\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*x^2/a/(b*x^3+a)-1/9/a/b/(a/b)^(1/3)*ln(x+(a/b)^(1/3))+1/18/a/
b/(a/b)^(1/3)*ln(x^2-x*(a/b)^(1/3)+(a/b)^(2/3))+1/9/a*3^(1/2)/b/(
a/b)^(1/3)*arctan(1/3*3^(1/2)*(2/(a/b)^(1/3)*x-1))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.235544, size = 201, normalized size = 1.48

$$\frac{\sqrt{3}\left(6\sqrt{3}\left(-ab^2\right)^{\frac{1}{3}}x^2-\sqrt{3}(bx^3+a)\log\left(\left(-ab^2\right)^{\frac{1}{3}}bx^2-ab+\left(-ab^2\right)^{\frac{2}{3}}x\right)+2\sqrt{3}(bx^3+a)\log\left(ab+\left(-ab^2\right)^{\frac{2}{3}}x\right)-6\left(bx^3\right.\right.}{54\left(abx^3+a^2\right)\left(-ab^2\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/54*sqrt(3)*(6*sqrt(3)*(-a*b^2)^(1/3)*x^2 - sqrt(3)*(b*x^3 + a)*
log((-a*b^2)^(1/3)*b*x^2 - a*b + (-a*b^2)^(2/3)*x) + 2*sqrt(3)*(b
*x^3 + a)*log(a*b + (-a*b^2)^(2/3)*x) - 6*(b*x^3 + a)*arctan(-1/3
*(sqrt(3)*a*b - 2*sqrt(3)*(-a*b^2)^(2/3)*x)/(a*b)))/((a*b*x^3 + a
^2)*(-a*b^2)^(1/3))
```

Sympy [A] time = 1.55576, size = 44, normalized size = 0.32

$$\frac{x^2}{3a^2+3abx^3} + \operatorname{RootSum}\left(729t^3a^4b^2+1,\left(t\mapsto t\log\left(81t^2a^3b+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x**2/(3*a**2 + 3*a*b*x**3) + RootSum(729*_t**3*a**4*b**2 + 1, Lam
bda(_t, _t*log(81*_t**2*a**3*b + x)))
```

GIAC/XCAS [A] time = 0.219194, size = 174, normalized size = 1.28

$$\frac{x^2}{3\,(bx^3+a)a} - \frac{\left(-\frac{a}{b}\right)^{\frac{2}{3}} \ln\left(\left|x - \left(-\frac{a}{b}\right)^{\frac{1}{3}}\right|\right)}{9\,a^2} - \frac{\sqrt{3}\left(-ab^2\right)^{\frac{2}{3}} \arctan\left(\frac{\sqrt{3}\left(2\,x+\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{a}{b}\right)^{\frac{1}{3}}}\right)}{9\,a^2b^2} + \frac{\left(-ab^2\right)^{\frac{2}{3}} \ln\left(x^2 + x\left(-\frac{a}{b}\right)^{\frac{1}{3}} + \left(-\frac{a}{b}\right)^{\frac{2}{3}}\right)}{18\,a^2b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*x^2/((b*x^3 + a)*a) - 1/9*(-a/b)^(2/3)*ln(abs(x - (-a/b)^(1/3
)))/a^2 - 1/9*sqrt(3)*(-a*b^2)^(2/3)*arctan(1/3*sqrt(3)*(2*x + (-
a/b)^(1/3))/(-a/b)^(1/3))/(a^2*b^2) + 1/18*(-a*b^2)^(2/3)*ln(x^2
+ x*(-a/b)^(1/3) + (-a/b)^(2/3))/(a^2*b^2)
```

3.337 $\int \frac{1}{(a+bx^3)^2} \, dx$

Optimal. Leaf size=134

$$-\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{9a^{5/3}\sqrt[3]{b}}+\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{9a^{5/3}\sqrt[3]{b}}-\frac{2\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{5/3}\sqrt[3]{b}}+\frac{x}{3a\left(a+bx^3\right)}$$

```
[Out] x/(3*a*(a + b*x^3)) - (2*ArcTan[(a^(1/3) - 2*b^(1/3)*x)/(Sqrt[3]*
a^(1/3))])/(3*Sqrt[3]*a^(5/3)*b^(1/3)) + (2*Log[a^(1/3) + b^(1/3)
*x])/(9*a^(5/3)*b^(1/3)) - Log[a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2
/3)*x^2]/(9*a^(5/3)*b^(1/3))
```

Rubi [A] time = 0.132016, antiderivative size = 134, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.778

$$-\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{9a^{5/3}\sqrt[3]{b}}+\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{9a^{5/3}\sqrt[3]{b}}-\frac{2\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{5/3}\sqrt[3]{b}}+\frac{x}{3a\left(a+bx^3\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^(-2),x]
```

```
[Out] x/(3*a*(a + b*x^3)) - (2*ArcTan[(a^(1/3) - 2*b^(1/3)*x)/(Sqrt[3]*
a^(1/3))])/(3*Sqrt[3]*a^(5/3)*b^(1/3)) + (2*Log[a^(1/3) + b^(1/3)
*x])/(9*a^(5/3)*b^(1/3)) - Log[a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2
/3)*x^2]/(9*a^(5/3)*b^(1/3))
```

Rubi in Sympy [A] time = 29.9418, size = 124, normalized size = 0.93

$$\frac{x}{3a\left(a+bx^3\right)}+\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{9a^{\frac{5}{3}}\sqrt[3]{b}}-\frac{\log\left(a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2\right)}{9a^{\frac{5}{3}}\sqrt[3]{b}}-\frac{2\sqrt{3}\,\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}-\frac{2\sqrt[3]{b}x}{3}\right)}{\sqrt[3]{a}}\right)}{9a^{\frac{5}{3}}\sqrt[3]{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**3+a)**2,x)
```

```
[Out] x/(3*a*(a + b*x**3)) + 2*log(a**(1/3) + b**(1/3)*x)/(9*a**(5/3)*b
**(1/3)) - log(a**(2/3) - a**(1/3)*b**(1/3)*x + b**(2/3)*x**2)/(9
*a**(5/3)*b**(1/3)) - 2*sqrt(3)*atan(sqrt(3)*(a**(1/3)/3 - 2*b**(
1/3)*x/3)/a**(1/3))/(9*a**(5/3)*b**(1/3))
```

Mathematica [A] time = 0.128712, size = 118, normalized size = 0.88

$$\frac{-\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{\sqrt[3]{b}}+\frac{3a^{2/3}x}{a+bx^3}+\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\sqrt[3]{b}}-\frac{2\sqrt{3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{b}x}{\sqrt[3]{a}}}{\sqrt{3}}\right)}{\sqrt[3]{b}}}{9a^{5/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^(-2),x]
```

```
[Out] ((3*a^(2/3)*x)/(a + b*x^3) - (2*Sqrt[3]*ArcTan[(1 - (2*b^(1/3)*x)
/a^(1/3))/Sqrt[3]])/b^(1/3) + (2*Log[a^(1/3) + b^(1/3)*x])/b^(1/3
) - Log[a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2]/b^(1/3))/(9*a^
(5/3))
```

Maple [A] time = 0.007, size = 115, normalized size = 0.9

$$\frac{x}{3\,a\,(bx^3+a)} + \frac{2}{9\,ab}\ln\left(x+\sqrt[3]{\frac{a}{b}}\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}} - \frac{1}{9\,ab}\ln\left(x^2-x\sqrt[3]{\frac{a}{b}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}} + \frac{2\sqrt{3}}{9\,ab}\arctan\left(\frac{\sqrt{3}}{3}\left(2\,x\frac{1}{\sqrt[3]{\frac{a}{b}}}-1\right)\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^3+a)^2,x)
```

```
[Out] 1/3*x/a/(b*x^3+a)+2/9/a/b/(a/b)^(2/3)*ln(x+(a/b)^(1/3))-1/9/a/b/(
a/b)^(2/3)*ln(x^2-x*(a/b)^(1/3)+(a/b)^(2/3))+2/9/a/b/(a/b)^(2/3)*
3^(1/2)*arctan(1/3*3^(1/2)*(2/(a/b)^(1/3)*x-1))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.238362, size = 182, normalized size = 1.36

$$-\frac{\sqrt{3}\left(\sqrt{3}(bx^3+a)\log\left(\left(a^2b\right)^{\frac{2}{3}}x^2-\left(a^2b\right)^{\frac{1}{3}}ax+a^2\right)-2\sqrt{3}(bx^3+a)\log\left(\left(a^2b\right)^{\frac{1}{3}}x+a\right)-6\left(bx^3+a\right)\arctan\left(\frac{2\sqrt{3}\left(a^2b\right)^{\frac{1}{3}}x-}{3\,a}\right.\right.}{27\left(abx^3+a^2\right)\left(a^2b\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/27*sqrt(3)*(sqrt(3)*(b*x^3 + a)*log((a^2*b)^(2/3)*x^2 - (a^2*b
)^(1/3)*a*x + a^2) - 2*sqrt(3)*(b*x^3 + a)*log((a^2*b)^(1/3)*x +
a) - 6*(b*x^3 + a)*arctan(1/3*(2*sqrt(3)*(a^2*b)^(1/3)*x - sqrt(3
)*a)/a) - 3*sqrt(3)*(a^2*b)^(1/3)*x)/((a*b*x^3 + a^2)*(a^2*b)^(1/
3))
```

Sympy [A] time = 1.62998, size = 39, normalized size = 0.29

$$\frac{x}{3a^2+3abx^3}+\operatorname{RootSum}\left(729t^3a^5b-8,\left(t\mapsto t\log\left(\frac{9ta^2}{2}+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**3+a)**2,x)
```

```
[Out] x/(3*a**2 + 3*a*b*x**3) + RootSum(729*_t**3*a**5*b - 8, Lambda(_t
, _t*log(9*_t*a**2/2 + x)))
```

GIAC/XCAS [A] time = 0.217102, size = 171, normalized size = 1.28

$$-\frac{2 \left(-\frac{a}{b}\right)^{\frac{1}{3}} \ln\left(\left|x - \left(-\frac{a}{b}\right)^{\frac{1}{3}}\right|\right)}{9 a^2} + \frac{x}{3 (bx^3 + a)a} + \frac{2 \sqrt{3} \left(-ab^2\right)^{\frac{1}{3}} \arctan\left(\frac{\sqrt{3}\left(2 x + \left(-\frac{a}{b}\right)^{\frac{1}{3}}\right)}{3 \left(-\frac{a}{b}\right)^{\frac{1}{3}}}\right)}{9 a^2 b} + \frac{\left(-ab^2\right)^{\frac{1}{3}} \ln\left(x^2 + x \left(-\frac{a}{b}\right)^{\frac{1}{3}} + \left(-\frac{a}{b}\right)^{\frac{2}{3}}\right)}{9 a^2 b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -2/9*(-a/b)^(1/3)*ln(abs(x - (-a/b)^(1/3)))/a^2 + 1/3*x/((b*x^3 +
 a)*a) + 2/9*sqrt(3)*(-a*b^2)^(1/3)*arctan(1/3*sqrt(3)*(2*x + (-a
/b)^(1/3))/(-a/b)^(1/3))/(a^2*b) + 1/9*(-a*b^2)^(1/3)*ln(x^2 + x*
(-a/b)^(1/3) + (-a/b)^(2/3))/(a^2*b)
```

3.338 $\int \frac{1}{x^2(a+bx^3)^2}\,dx$

Optimal. Leaf size=146

$$-\frac{2\sqrt[3]{b}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{9a^{7/3}}+\frac{4\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{9a^{7/3}}+\frac{4\sqrt[3]{b}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{7/3}}-\frac{4}{3a^2x}+\frac{1}{3ax\left(a+bx^3\right)}$$

```
[Out] -4/(3*a^2*x) + 1/(3*a*x*(a + b*x^3)) + (4*b^(1/3)*ArcTan[(a^(1/3)
 - 2*b^(1/3)*x)/(Sqrt[3]*a^(1/3))])/(3*Sqrt[3]*a^(7/3)) + (4*b^(1
/3)*Log[a^(1/3) + b^(1/3)*x])/(9*a^(7/3)) - (2*b^(1/3)*Log[a^(2/3
) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2])/(9*a^(7/3))
```

Rubi [A] time = 0.171969, antiderivative size = 146, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615

$$-\frac{2\sqrt[3]{b}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{9a^{7/3}}+\frac{4\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{9a^{7/3}}+\frac{4\sqrt[3]{b}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{7/3}}-\frac{4}{3a^2x}+\frac{1}{3ax\left(a+bx^3\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(a + b*x^3)^2),x]
```

```
[Out] -4/(3*a^2*x) + 1/(3*a*x*(a + b*x^3)) + (4*b^(1/3)*ArcTan[(a^(1/3)
 - 2*b^(1/3)*x)/(Sqrt[3]*a^(1/3))])/(3*Sqrt[3]*a^(7/3)) + (4*b^(1
/3)*Log[a^(1/3) + b^(1/3)*x])/(9*a^(7/3)) - (2*b^(1/3)*Log[a^(2/3
) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2])/(9*a^(7/3))
```

Rubi in Sympy [A] time = 34.9992, size = 136, normalized size = 0.93

$$\frac{1}{3ax\left(a+bx^3\right)}-\frac{4}{3a^2x}+\frac{4\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{9a^{\frac{7}{3}}}-\frac{2\sqrt[3]{b}\log\left(a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2\right)}{9a^{\frac{7}{3}}}+\frac{4\sqrt{3}\sqrt[3]{b}\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}-\frac{2\sqrt[3]{b}x}{3}\right)}{\sqrt[3]{a}}\right)}{9a^{\frac{7}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(b*x**3+a)**2,x)
```

```
[Out] 1/(3*a*x*(a + b*x**3)) - 4/(3*a**2*x) + 4*b**(1/3)*log(a**(1/3) +
 b**(1/3)*x)/(9*a**(7/3)) - 2*b**(1/3)*log(a**(2/3) - a**(1/3)*b*
*(1/3)*x + b**(2/3)*x**2)/(9*a**(7/3)) + 4*sqrt(3)*b**(1/3)*atan(
sqrt(3)*(a**(1/3)/3 - 2*b**(1/3)*x/3)/a**(1/3))/(9*a**(7/3))
```

Mathematica [A] time = 0.21496, size = 131, normalized size = 0.9

$$\frac{-2\sqrt[3]{b}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)-\frac{3\sqrt[3]{a}bx^2}{a+bx^3}+4\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)+4\sqrt{3}\sqrt[3]{b}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{b}x}{\sqrt[3]{a}}}{\sqrt{3}}\right)-\frac{9\sqrt[3]{a}}{x}}{9a^{7/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*(a + b*x^3)^2),x]
```

```
[Out] ((-9*a^(1/3))/x - (3*a^(1/3)*b*x^2)/(a + b*x^3) + 4*Sqrt[3]*b^(1/
3)*ArcTan[(1 - (2*b^(1/3)*x)/a^(1/3))/Sqrt[3]] + 4*b^(1/3)*Log[a^
(1/3) + b^(1/3)*x] - 2*b^(1/3)*Log[a^(2/3) - a^(1/3)*b^(1/3)*x +
b^(2/3)*x^2])/(9*a^(7/3))
```

Maple [A] time = 0.015, size = 117, normalized size = 0.8

$$-\frac{1}{xa^2}-\frac{bx^2}{3\,a^2\,(bx^3+a)}+\frac{4}{9\,a^2}\ln\left(x+\sqrt[3]{\frac{a}{b}}\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}-\frac{2}{9\,a^2}\ln\left(x^2-x\sqrt[3]{\frac{a}{b}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}-\frac{4\sqrt{3}}{9\,a^2}\arctan\left(\frac{\sqrt{3}}{3}\left(2\,x\frac{1}{\sqrt[3]{\frac{a}{b}}}-1\right)\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(b*x^3+a)^2,x)
```

```
[Out] -1/a^2/x-1/3*b/a^2*x^2/(b*x^3+a)+4/9/a^2/(a/b)^(1/3)*ln(x+(a/b)^(
1/3))-2/9/a^2/(a/b)^(1/3)*ln(x^2-x*(a/b)^(1/3)+(a/b)^(2/3))-4/9/a
^2*3^(1/2)/(a/b)^(1/3)*arctan(1/3*3^(1/2)*(2/(a/b)^(1/3)*x-1))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^2*x^2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.242484, size = 232, normalized size = 1.59

$$-\frac{\sqrt{3}\left(2\sqrt{3}(bx^4+ax)\left(\frac{b}{a}\right)^{\frac{1}{3}}\log\left(bx^2-ax\left(\frac{b}{a}\right)^{\frac{2}{3}}+a\left(\frac{b}{a}\right)^{\frac{1}{3}}\right)-4\sqrt{3}(bx^4+ax)\left(\frac{b}{a}\right)^{\frac{1}{3}}\log\left(bx+a\left(\frac{b}{a}\right)^{\frac{2}{3}}\right)-12\left(bx^4+ax\right)\left(\frac{b}{a}\right)\right.}{27\left(a^2bx^4+a^3x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^2*x^2),x, algorithm="fricas")
```

```
[Out] -1/27*sqrt(3)*(2*sqrt(3)*(b*x^4 + a*x)*(b/a)^(1/3)*log(b*x^2 - a*
x*(b/a)^(2/3) + a*(b/a)^(1/3)) - 4*sqrt(3)*(b*x^4 + a*x)*(b/a)^(1
/3)*log(b*x + a*(b/a)^(2/3)) - 12*(b*x^4 + a*x)*(b/a)^(1/3)*arcta
n(-1/3*(2*sqrt(3)*b*x - sqrt(3)*a*(b/a)^(2/3))/(a*(b/a)^(2/3))) +
 3*sqrt(3)*(4*b*x^3 + 3*a))/(a^2*b*x^4 + a^3*x)
```

Sympy [A] time = 2.04035, size = 54, normalized size = 0.37

$$-\frac{3a+4bx^3}{3a^3x+3a^2bx^4}+\operatorname{RootSum}\left(729t^3a^7-64b,\left(t\mapsto t\log\left(\frac{81t^2a^5}{16b}+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(b*x**3+a)**2,x)
```

```
[Out] -(3*a + 4*b*x**3)/(3*a**3*x + 3*a**2*b*x**4) + RootSum(729*_t**3*
a**7 - 64*b, Lambda(_t, _t*log(81*_t**2*a**5/(16*b) + x)))
```

GIAC/XCAS [A] time = 0.224913, size = 188, normalized size = 1.29

$$\frac{4\,b\left(-\frac{a}{b}\right)^{\frac{2}{3}}\ln\left(\left|x-\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right|\right)}{9\,a^{3}}+\frac{4\,\sqrt{3}\left(-ab^{2}\right)^{\frac{2}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{a}{b}\right)^{\frac{1}{3}}}\right)}{9\,a^{3}b}-\frac{4\,bx^{3}+3\,a}{3\,(bx^{4}+ax)a^{2}}-\frac{2\,\left(-ab^{2}\right)^{\frac{2}{3}}\ln\left(x^{2}+x\left(-\frac{a}{b}\right)^{\frac{1}{3}}+\left(-\frac{a}{b}\right)^{\frac{2}{3}}\right)}{9\,a^{3}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^2*x^2),x, algorithm="giac")
```

```
[Out] 4/9*b*(-a/b)^(2/3)*ln(abs(x - (-a/b)^(1/3)))/a^3 + 4/9*sqrt(3)*(-
a*b^2)^(2/3)*arctan(1/3*sqrt(3)*(2*x + (-a/b)^(1/3))/(-a/b)^(1/3)
)/(a^3*b) - 1/3*(4*b*x^3 + 3*a)/((b*x^4 + a*x)*a^2) - 2/9*(-a*b^2
)^(2/3)*ln(x^2 + x*(-a/b)^(1/3) + (-a/b)^(2/3))/(a^3*b)
```

3.339 $\int \frac{1}{x^3(a+bx^3)^2}\,dx$

Optimal. Leaf size=146

$$\frac{5b^{2/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{18a^{8/3}}-\frac{5b^{2/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{9a^{8/3}}+\frac{5b^{2/3}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{8/3}}-\frac{5}{6a^2x^2}+\frac{1}{3ax^2\left(a+bx^3\right)}$$

```
[Out] -5/(6*a^2*x^2) + 1/(3*a*x^2*(a + b*x^3)) + (5*b^(2/3)*ArcTan[(a^(
1/3) - 2*b^(1/3)*x)/(Sqrt[3]*a^(1/3))])/(3*Sqrt[3]*a^(8/3)) - (5*
b^(2/3)*Log[a^(1/3) + b^(1/3)*x])/(9*a^(8/3)) + (5*b^(2/3)*Log[a^
(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2])/(18*a^(8/3))
```

Rubi [A] time = 0.171395, antiderivative size = 146, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615

$$\frac{5b^{2/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{18a^{8/3}}-\frac{5b^{2/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{9a^{8/3}}+\frac{5b^{2/3}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{8/3}}-\frac{5}{6a^2x^2}+\frac{1}{3ax^2\left(a+bx^3\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(a + b*x^3)^2),x]
```

```
[Out] -5/(6*a^2*x^2) + 1/(3*a*x^2*(a + b*x^3)) + (5*b^(2/3)*ArcTan[(a^(
1/3) - 2*b^(1/3)*x)/(Sqrt[3]*a^(1/3))])/(3*Sqrt[3]*a^(8/3)) - (5*
b^(2/3)*Log[a^(1/3) + b^(1/3)*x])/(9*a^(8/3)) + (5*b^(2/3)*Log[a^
(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2])/(18*a^(8/3))
```

Rubi in Sympy [A] time = 38.7411, size = 139, normalized size = 0.95

$$\frac{1}{3ax^2\left(a+bx^3\right)}-\frac{5}{6a^2x^2}-\frac{5b^{\frac{2}{3}}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{9a^{\frac{8}{3}}}+\frac{5b^{\frac{2}{3}}\log\left(a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2\right)}{18a^{\frac{8}{3}}}+\frac{5\sqrt{3}b^{\frac{2}{3}}\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}-\frac{2\sqrt[3]{b}x}{3}\right)}{\sqrt[3]{a}}\right)}{9a^{\frac{8}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(b*x**3+a)**2,x)
```

```
[Out] 1/(3*a*x**2*(a + b*x**3)) - 5/(6*a**2*x**2) - 5*b**(2/3)*log(a**(
1/3) + b**(1/3)*x)/(9*a**(8/3)) + 5*b**(2/3)*log(a**(2/3) - a**(1
/3)*b**(1/3)*x + b**(2/3)*x**2)/(18*a**(8/3)) + 5*sqrt(3)*b**(2/3
)*atan(sqrt(3)*(a**(1/3)/3 - 2*b**(1/3)*x/3)/a**(1/3))/(9*a**(8/3
))
```

Mathematica [A] time = 0.174567, size = 129, normalized size = 0.88

$$\frac{5b^{2/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)-\frac{6a^{2/3}bx}{a+bx^3}-\frac{9a^{2/3}}{x^2}-10b^{2/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)+10\sqrt{3}b^{2/3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{b}x}{\sqrt[3]{a}}}{\sqrt{3}}\right)}{18a^{8/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*(a + b*x^3)^2),x]
```

```
[Out] ((-9*a^(2/3))/x^2 - (6*a^(2/3)*b*x)/(a + b*x^3) + 10*Sqrt[3]*b^(2
/3)*ArcTan[(1 - (2*b^(1/3)*x)/a^(1/3))/Sqrt[3]] - 10*b^(2/3)*Log[
a^(1/3) + b^(1/3)*x] + 5*b^(2/3)*Log[a^(2/3) - a^(1/3)*b^(1/3)*x
+ b^(2/3)*x^2])/(18*a^(8/3))
```

Maple [A] time = 0.014, size = 115, normalized size = 0.8

$$-\frac{1}{2\,a^2x^2}-\frac{bx}{3\,a^2\,(bx^3+a)}-\frac{5}{9\,a^2}\ln\left(x+\sqrt[3]{\frac{a}{b}}\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}$$
$$+\frac{5}{18\,a^2}\ln\left(x^2-x\sqrt[3]{\frac{a}{b}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}-\frac{5\sqrt{3}}{9\,a^2}\arctan\left(\frac{\sqrt{3}}{3}\left(2\,x\frac{1}{\sqrt[3]{\frac{a}{b}}}-1\right)\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(b*x^3+a)^2,x)
```

```
[Out] -1/2/a^2/x^2-1/3*b/a^2*x/(b*x^3+a)-5/9/a^2/(a/b)^(2/3)*ln(x+(a/b)
^(1/3))+5/18/a^2/(a/b)^(2/3)*ln(x^2-x*(a/b)^(1/3)+(a/b)^(2/3))-5/
9/a^2/(a/b)^(2/3)*3^(1/2)*arctan(1/3*3^(1/2)*(2/(a/b)^(1/3)*x-1))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^2*x^3),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.239256, size = 281, normalized size = 1.92

$$-\frac{\sqrt{3}\left(5\sqrt{3}(bx^5+ax^2)\left(-\frac{b^2}{a^2}\right)^{\frac{1}{3}}\log\left(b^2x^2+abx\left(-\frac{b^2}{a^2}\right)^{\frac{1}{3}}+a^2\left(-\frac{b^2}{a^2}\right)^{\frac{2}{3}}\right)-10\sqrt{3}(bx^5+ax^2)\left(-\frac{b^2}{a^2}\right)^{\frac{1}{3}}\log\left(bx-a\left(-\frac{b^2}{a^2}\right)^{\frac{1}{3}}\right)+\right.}{54\,(a^2bx^5+a^3x^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^2*x^3),x, algorithm="fricas")
```

```
[Out] -1/54*sqrt(3)*(5*sqrt(3)*(b*x^5 + a*x^2)*(-b^2/a^2)^(1/3)*log(b^2
*x^2 + a*b*x*(-b^2/a^2)^(1/3) + a^2*(-b^2/a^2)^(2/3)) - 10*sqrt(3
```

```
)*(b*x^5 + a*x^2)*(-b^2/a^2)^(1/3)*log(b*x - a*(-b^2/a^2)^(1/3))
+ 30*(b*x^5 + a*x^2)*(-b^2/a^2)^(1/3)*arctan(1/3*(2*sqrt(3)*b*x +
 sqrt(3)*a*(-b^2/a^2)^(1/3))/(a*(-b^2/a^2)^(1/3))) + 3*sqrt(3)*(5
*b*x^3 + 3*a))/(a^2*b*x^5 + a^3*x^2)
```

Sympy [A] time = 2.38208, size = 56, normalized size = 0.38

$$-\frac{3a+5bx^3}{6a^3x^2+6a^2bx^5}+\operatorname{RootSum}\left(729t^3a^8+125b^2,\left(t\mapsto t\log\left(-\frac{9ta^3}{5b}+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(b*x**3+a)**2,x)
```

```
[Out] -(3*a + 5*b*x**3)/(6*a**3*x**2 + 6*a**2*b*x**5) + RootSum(729*_t*
*3*a**8 + 125*b**2, Lambda(_t, _t*log(-9*_t*a**3/(5*b) + x)))
```

GIAC/XCAS [A] time = 0.220951, size = 177, normalized size = 1.21

$$\frac{5\,b\left(-\frac{a}{b}\right)^{\frac{1}{3}}\ln\left(\left|x-\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right|\right)}{9\,a^3}-\frac{bx}{3\,(bx^3+a)a^2}-\frac{5\,\sqrt{3}\,\left(-ab^2\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{a}{b}\right)^{\frac{1}{3}}}\right)}{9\,a^3}-\frac{5\,\left(-ab^2\right)^{\frac{1}{3}}\ln\left(x^2+x\left(-\frac{a}{b}\right)^{\frac{1}{3}}+\left(-\frac{a}{b}\right)^{\frac{2}{3}}\right)}{18\,a^3}-\frac{1}{2\,a^2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^2*x^3),x, algorithm="giac")
```

```
[Out] 5/9*b*(-a/b)^(1/3)*ln(abs(x - (-a/b)^(1/3)))/a^3 - 1/3*b*x/((b*x^
3 + a)*a^2) - 5/9*sqrt(3)*(-a*b^2)^(1/3)*arctan(1/3*sqrt(3)*(2*x
+ (-a/b)^(1/3))/(-a/b)^(1/3))/a^3 - 5/18*(-a*b^2)^(1/3)*ln(x^2 +
x*(-a/b)^(1/3) + (-a/b)^(2/3))/a^3 - 1/2/(a^2*x^2)
```

3.340 $\int \frac{x^{11}}{(a+bx^3)^3}\,dx$

Optimal. Leaf size=61

$$\frac{a^3}{6b^4\left(a+bx^3\right)^2}-\frac{a^2}{b^4\left(a+bx^3\right)}-\frac{a\log\left(a+bx^3\right)}{b^4}+\frac{x^3}{3b^3}$$

```
[Out] x^3/(3*b^3) + a^3/(6*b^4*(a + b*x^3)^2) - a^2/(b^4*(a + b*x^3)) -
 (a*Log[a + b*x^3])/b^4
```

Rubi [A] time = 0.104342, antiderivative size = 61, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^3}{6b^4\left(a+bx^3\right)^2}-\frac{a^2}{b^4\left(a+bx^3\right)}-\frac{a\log\left(a+bx^3\right)}{b^4}+\frac{x^3}{3b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11/(a + b*x^3)^3,x]
```

```
[Out] x^3/(3*b^3) + a^3/(6*b^4*(a + b*x^3)^2) - a^2/(b^4*(a + b*x^3)) -
 (a*Log[a + b*x^3])/b^4
```

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

$$\frac{a^3}{6b^4\left(a+bx^3\right)^2}-\frac{a^2}{b^4\left(a+bx^3\right)}-\frac{a\log\left(a+bx^3\right)}{b^4}+\frac{\int^{x^3}\frac{1}{b^3}\,dx}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11/(b*x**3+a)**3,x)
```

```
[Out] a**3/(6*b**4*(a + b*x**3)**2) - a**2/(b**4*(a + b*x**3)) - a*log(
a + b*x**3)/b**4 + Integral(b**(-3), (x, x**3))/3
```

Mathematica [A] time = 0.106542, size = 48, normalized size = 0.79

$$-\frac{\frac{a^2\left(5a+6bx^3\right)}{\left(a+bx^3\right)^2}+6a\log\left(a+bx^3\right)-2bx^3}{6b^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11/(a + b*x^3)^3,x]
```

```
[Out] -(-2*b*x^3 + (a^2*(5*a + 6*b*x^3))/(a + b*x^3)^2 + 6*a*Log[a + b*
x^3])/(6*b^4)
```

Maple [A] time = 0.008, size = 58, normalized size = 1.

$$\frac{x^3}{3\,b^3}+\frac{a^3}{6\,b^4\left(bx^3+a\right)^2}-\frac{a^2}{b^4\left(bx^3+a\right)}-\frac{a\ln\left(bx^3+a\right)}{b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11/(b*x^3+a)^3,x)
```

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

Maxima [A] time = 1.44451, size = 89, normalized size = 1.46

$$-\frac{6\,a^2bx^3+5\,a^3}{6\,(b^6x^6+2\,ab^5x^3+a^2b^4)}+\frac{x^3}{3\,b^3}-\frac{a\log\left(bx^3+a\right)}{b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(b*x^3 + a)^3,x, algorithm="maxima")
```

```
[Out] -1/6*(6*a^2*b*x^3 + 5*a^3)/(b^6*x^6 + 2*a*b^5*x^3 + a^2*b^4) + 1/
3*x^3/b^3 - a*log(b*x^3 + a)/b^4
```

Fricas [A] time = 0.227307, size = 123, normalized size = 2.02

$$\frac{2\,b^3x^9+4\,ab^2x^6-4\,a^2bx^3-5\,a^3-6\,\left(ab^2x^6+2\,a^2bx^3+a^3\right)\log\left(bx^3+a\right)}{6\,(b^6x^6+2\,ab^5x^3+a^2b^4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(b*x^3 + a)^3,x, algorithm="fricas")
```

```
[Out] 1/6*(2*b^3*x^9 + 4*a*b^2*x^6 - 4*a^2*b*x^3 - 5*a^3 - 6*(a*b^2*x^6
 + 2*a^2*b*x^3 + a^3)*log(b*x^3 + a))/(b^6*x^6 + 2*a*b^5*x^3 + a^
2*b^4)
```

Sympy [A] time = 2.75012, size = 63, normalized size = 1.03

$$-\frac{a\log\left(a+bx^3\right)}{b^4}-\frac{5a^3+6a^2bx^3}{6a^2b^4+12ab^5x^3+6b^6x^6}+\frac{x^3}{3b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11/(b*x**3+a)**3,x)
```

```
[Out] -a*log(a + b*x**3)/b**4 - (5*a**3 + 6*a**2*b*x**3)/(6*a**2*b**4 +
 12*a*b**5*x**3 + 6*b**6*x**6) + x**3/(3*b**3)
```

GIAC/XCAS [A] time = 0.231129, size = 84, normalized size = 1.38

$$\frac{x^3}{3\,b^3}-\frac{a\ln\left(\left|bx^3+a\right|\right)}{b^4}+\frac{9\,ab^2x^6+12\,a^2bx^3+4\,a^3}{6\,(bx^3+a)^2b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(b*x^3 + a)^3,x, algorithm="giac")
```

```
[Out] 1/3*x^3/b^3 - a*ln(abs(b*x^3 + a))/b^4 + 1/6*(9*a*b^2*x^6 + 12*a^
2*b*x^3 + 4*a^3)/((b*x^3 + a)^2*b^4)
```

3.341 $\int \frac{x^8}{(a+bx^3)^3} dx$

Optimal. Leaf size=52

$$-\frac{a^2}{6b^3(a+bx^3)^2}+\frac{2a}{3b^3(a+bx^3)}+\frac{\log(a+bx^3)}{3b^3}$$

```
[Out] -a^2/(6*b^3*(a + b*x^3)^2) + (2*a)/(3*b^3*(a + b*x^3)) + Log[a + b*x^3]/(3*b^3)
```

Rubi [A] time = 0.0835866, antiderivative size = 52, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^2}{6b^3(a+bx^3)^2}+\frac{2a}{3b^3(a+bx^3)}+\frac{\log(a+bx^3)}{3b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8/(a + b*x^3)^3,x]

[Out] -a^2/(6*b^3*(a + b*x^3)^2) + (2*a)/(3*b^3*(a + b*x^3)) + Log[a + b*x^3]/(3*b^3)
```

Rubi in Sympy [A] time = 12.7433, size = 44, normalized size = 0.85

$$-\frac{a^2}{6b^3(a+bx^3)^2}+\frac{2a}{3b^3(a+bx^3)}+\frac{\log(a+bx^3)}{3b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8/(b*x**3+a)**3,x)

[Out] -a**2/(6*b**3*(a + b*x**3)**2) + 2*a/(3*b**3*(a + b*x**3)) + log(a + b*x**3)/(3*b**3)
```

Mathematica [A] time = 0.028595, size = 39, normalized size = 0.75

$$\frac{\frac{a(3a+4bx^3)}{(a+bx^3)^2}+2\log(a+bx^3)}{6b^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8/(a + b*x^3)^3,x]

[Out] ((a*(3*a + 4*b*x^3))/(a + b*x^3)^2 + 2*Log[a + b*x^3])/(6*b^3)
```

Maple [A] time = 0.007, size = 47, normalized size = 0.9

$$-\frac{a^2}{6\,b^3(bx^3+a)^2}+\frac{2\,a}{3\,b^3(bx^3+a)}+\frac{\ln(bx^3+a)}{3\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8/(b*x^3+a)^3,x)
```

```
[Out] -1/6*a^2/b^3/(b*x^3+a)^2+2/3*a/b^3/(b*x^3+a)+1/3*ln(b*x^3+a)/b^3
```

Maxima [A] time = 1.44092, size = 74, normalized size = 1.42

$$\frac{4\,abx^3+3\,a^2}{6\,(b^5x^6+2\,ab^4x^3+a^2b^3)}+\frac{\log\left(bx^3+a\right)}{3\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^3 + a)^3,x, algorithm="maxima")
```

```
[Out] 1/6*(4*a*b*x^3 + 3*a^2)/(b^5*x^6 + 2*a*b^4*x^3 + a^2*b^3) + 1/3*l
og(b*x^3 + a)/b^3
```

Fricas [A] time = 0.225079, size = 93, normalized size = 1.79

$$\frac{4\,abx^3+3\,a^2+2\,\left(b^2x^6+2\,abx^3+a^2\right)\log\left(bx^3+a\right)}{6\,(b^5x^6+2\,ab^4x^3+a^2b^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^3 + a)^3,x, algorithm="fricas")
```

```
[Out] 1/6*(4*a*b*x^3 + 3*a^2 + 2*(b^2*x^6 + 2*a*b*x^3 + a^2)*log(b*x^3
+ a))/(b^5*x^6 + 2*a*b^4*x^3 + a^2*b^3)
```

Sympy [A] time = 2.51762, size = 53, normalized size = 1.02

$$\frac{3a^2+4abx^3}{6a^2b^3+12ab^4x^3+6b^5x^6}+\frac{\log\left(a+bx^3\right)}{3b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8/(b*x**3+a)**3,x)
```

```
[Out] (3*a**2 + 4*a*b*x**3)/(6*a**2*b**3 + 12*a*b**4*x**3 + 6*b**5*x**6
) + log(a + b*x**3)/(3*b**3)
```

GIAC/XCAS [A] time = 0.218201, size = 57, normalized size = 1.1

$$\frac{\ln\left(\left|bx^3+a\right|\right)}{3\,b^3}-\frac{3\,bx^6+2\,ax^3}{6\,(bx^3+a)^2b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^3 + a)^3,x, algorithm="giac")
```

```
[Out] 1/3*ln(abs(b*x^3 + a))/b^3 - 1/6*(3*b*x^6 + 2*a*x^3)/((b*x^3 + a)
^2*b^2)
```

3.342 $\int \frac{x^5}{(a+bx^3)^3} dx$

Optimal. Leaf size=19

$$\frac{x^6}{6a(a+bx^3)^2}$$

```
[Out] x^6/(6*a*(a + b*x^3)^2)
```

Rubi [A] time = 0.0165156, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$\frac{x^6}{6a(a+bx^3)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/(a + b*x^3)^3,x]

[Out] x^6/(6*a*(a + b*x^3)^2)
```

Rubi in Sympy [A] time = 2.95561, size = 14, normalized size = 0.74

$$\frac{x^6}{6a(a+bx^3)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(b*x**3+a)**3,x)

[Out] x**6/(6*a*(a + b*x**3)**2)
```

Mathematica [A] time = 0.0130143, size = 24, normalized size = 1.26

$$-\frac{a+2bx^3}{6b^2(a+bx^3)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/(a + b*x^3)^3,x]

[Out] -(a + 2*b*x^3)/(6*b^2*(a + b*x^3)^2)
```

Maple [A] time = 0.006, size = 31, normalized size = 1.6

$$\frac{a}{6\,b^2(bx^3+a)^2}-\frac{1}{(3\,bx^3+3\,a)\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(b*x^3+a)^3,x)
```

```
[Out] 1/6*a/b^2/(b*x^3+a)^2-1/3/(b*x^3+a)/b^2
```

Maxima [A] time = 1.43355, size = 49, normalized size = 2.58

$$-\frac{2\,bx^3+a}{6\,(b^4x^6+2\,ab^3x^3+a^2b^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^3 + a)^3,x, algorithm="maxima")
```

```
[Out] -1/6*(2*b*x^3 + a)/(b^4*x^6 + 2*a*b^3*x^3 + a^2*b^2)
```

Fricas [A] time = 0.245814, size = 49, normalized size = 2.58

$$-\frac{2\,bx^3+a}{6\,(b^4x^6+2\,ab^3x^3+a^2b^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^3 + a)^3,x, algorithm="fricas")
```

```
[Out] -1/6*(2*b*x^3 + a)/(b^4*x^6 + 2*a*b^3*x^3 + a^2*b^2)
```

Sympy [A] time = 2.25337, size = 36, normalized size = 1.89

$$-\frac{a+2bx^3}{6a^2b^2+12ab^3x^3+6b^4x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(b*x**3+a)**3,x)
```

```
[Out] -(a + 2*b*x**3)/(6*a**2*b**2 + 12*a*b**3*x**3 + 6*b**4*x**6)
```

GIAC/XCAS [A] time = 0.219196, size = 30, normalized size = 1.58

$$-\frac{2\,bx^3+a}{6\,(bx^3+a)^2b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^3 + a)^3,x, algorithm="giac")
```

```
[Out] -1/6*(2*b*x^3 + a)/((b*x^3 + a)^2*b^2)
```

3.343 $\int \frac{x^2}{(a+bx^3)^3} \, dx$

Optimal. Leaf size=16

$$-\frac{1}{6b\,(a+bx^3)^2}$$

```
[Out] -1/(6*b*(a + b*x^3)^2)
```

Rubi [A] time = 0.00903664, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$-\frac{1}{6b\,(a+bx^3)^2}$$

Antiderivative was successfully verified.

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

[Out] -1/(6*b*(a + b*x^3)^2)
```

Rubi in Sympy [A] time = 2.19093, size = 14, normalized size = 0.88

$$-\frac{1}{6b\,(a+bx^3)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] -1/(6*b*(a + b*x**3)**2)
```

Mathematica [A] time = 0.00865362, size = 16, normalized size = 1.

$$-\frac{1}{6b\,(a+bx^3)^2}$$

Antiderivative was successfully verified.

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

[Out] -1/(6*b*(a + b*x^3)^2)
```

Maple [A] time = 0.002, size = 15, normalized size = 0.9

$$-\frac{1}{6\,b\,(bx^3+a)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] -1/6/b/(b*x^3+a)^2
```

Maxima [A] time = 1.42751, size = 19, normalized size = 1.19

$$-\frac{1}{6\,(bx^3+a)^2 b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/6/((b*x^3 + a)^2*b)
```

Fricas [A] time = 0.242473, size = 35, normalized size = 2.19

$$-\frac{1}{6\,(b^3x^6+2\,ab^2x^3+a^2b)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/6/(b^3*x^6 + 2*a*b^2*x^3 + a^2*b)
```

Sympy [A] time = 2.11547, size = 27, normalized size = 1.69

$$-\frac{1}{6a^2b+12ab^2x^3+6b^3x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/(6*a**2*b + 12*a*b**2*x**3 + 6*b**3*x**6)
```

GIAC/XCAS [A] time = 0.219005, size = 19, normalized size = 1.19

$$-\frac{1}{6\,(bx^3+a)^2 b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/6/((b*x^3 + a)^2*b)
```

3.344 $\int \frac{1}{x(a+bx^3)^3}\,dx$

Optimal. Leaf size=54

$$-\frac{\log\left(a+bx^3\right)}{3a^3}+\frac{\log(x)}{a^3}+\frac{1}{3a^2\left(a+bx^3\right)}+\frac{1}{6a\left(a+bx^3\right)^2}$$

```
[Out] 1/(6*a*(a + b*x^3)^2) + 1/(3*a^2*(a + b*x^3)) + Log[x]/a^3 - Log[
a + b*x^3]/(3*a^3)
```

Rubi [A] time = 0.080797, antiderivative size = 54, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{\log\left(a+bx^3\right)}{3a^3}+\frac{\log(x)}{a^3}+\frac{1}{3a^2\left(a+bx^3\right)}+\frac{1}{6a\left(a+bx^3\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a + b*x^3)^3),x]
```

```
[Out] 1/(6*a*(a + b*x^3)^2) + 1/(3*a^2*(a + b*x^3)) + Log[x]/a^3 - Log[
a + b*x^3]/(3*a^3)
```

Rubi in Sympy [A] time = 11.3455, size = 49, normalized size = 0.91

$$\frac{1}{6a\left(a+bx^3\right)^2}+\frac{1}{3a^2\left(a+bx^3\right)}+\frac{\log\left(x^3\right)}{3a^3}-\frac{\log\left(a+bx^3\right)}{3a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(b*x**3+a)**3,x)
```

```
[Out] 1/(6*a*(a + b*x**3)**2) + 1/(3*a**2*(a + b*x**3)) + log(x**3)/(3*
a**3) - log(a + b*x**3)/(3*a**3)
```

Mathematica [A] time = 0.0559465, size = 43, normalized size = 0.8

$$\frac{\frac{a\left(3a+2bx^3\right)}{\left(a+bx^3\right)^2}-2\log\left(a+bx^3\right)+6\log(x)}{6a^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a + b*x^3)^3),x]
```

```
[Out] ((a*(3*a + 2*b*x^3))/(a + b*x^3)^2 + 6*Log[x] - 2*Log[a + b*x^3])
/(6*a^3)
```

Maple [A] time = 0.011, size = 49, normalized size = 0.9

$$\frac{1}{6\,a\left(bx^3+a\right)^2}+\frac{1}{3\,a^2\left(bx^3+a\right)}+\frac{\ln(x)}{a^3}-\frac{\ln\left(bx^3+a\right)}{3\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(b*x^3+a)^3,x)
```

```
[Out] 1/6/a/(b*x^3+a)^2+1/3/a^2/(b*x^3+a)+ln(x)/a^3-1/3*ln(b*x^3+a)/a^3
```

Maxima [A] time = 1.42738, size = 81, normalized size = 1.5

$$\frac{2\,bx^3 + 3\,a}{6\,(a^2b^2x^6 + 2\,a^3bx^3 + a^4)} - \frac{\log\left(bx^3 + a\right)}{3\,a^3} + \frac{\log\left(x^3\right)}{3\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^3*x),x, algorithm="maxima")
```

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

Fricas [A] time = 0.219627, size = 122, normalized size = 2.26

$$\frac{2\,abx^3 + 3\,a^2 - 2\left(b^2x^6 + 2\,abx^3 + a^2\right)\log\left(bx^3 + a\right) + 6\left(b^2x^6 + 2\,abx^3 + a^2\right)\log\left(x\right)}{6\,(a^3b^2x^6 + 2\,a^4bx^3 + a^5)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^3*x),x, algorithm="fricas")
```

```
[Out] 1/6*(2*a*b*x^3 + 3*a^2 - 2*(b^2*x^6 + 2*a*b*x^3 + a^2)*log(b*x^3
+ a) + 6*(b^2*x^6 + 2*a*b*x^3 + a^2)*log(x))/(a^3*b^2*x^6 + 2*a^4
*b*x^3 + a^5)
```

Sympy [A] time = 3.47081, size = 56, normalized size = 1.04

$$\frac{3a + 2bx^3}{6a^4 + 12a^3bx^3 + 6a^2b^2x^6} + \frac{\log\left(x\right)}{a^3} - \frac{\log\left(\frac{a}{b} + x^3\right)}{3a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(b*x**3+a)**3,x)
```

```
[Out] (3*a + 2*b*x**3)/(6*a**4 + 12*a**3*b*x**3 + 6*a**2*b**2*x**6) + l
og(x)/a**3 - log(a/b + x**3)/(3*a**3)
```

GIAC/XCAS [A] time = 0.228363, size = 77, normalized size = 1.43

$$-\frac{\ln\left(\left|bx^3 + a\right|\right)}{3\,a^3} + \frac{\ln\left(\left|x\right|\right)}{a^3} + \frac{3\,b^2x^6 + 8\,abx^3 + 6\,a^2}{6\,(bx^3 + a)^2a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^3*x),x, algorithm="giac")
```

```
[Out] -1/3*ln(abs(b*x^3 + a))/a^3 + ln(abs(x))/a^3 + 1/6*(3*b^2*x^6 + 8
*a*b*x^3 + 6*a^2)/((b*x^3 + a)^2*a^3)
```

3.345 $\int \frac{1}{x^4(a+bx^3)^3} dx$

Optimal. Leaf size=66

$$\frac{b\log\left(a+bx^3\right)}{a^4}-\frac{3b\log(x)}{a^4}-\frac{2b}{3a^3\left(a+bx^3\right)}-\frac{1}{3a^3x^3}-\frac{b}{6a^2\left(a+bx^3\right)^2}$$

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

Rubi [A] time = 0.103139, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{b\log\left(a+bx^3\right)}{a^4}-\frac{3b\log(x)}{a^4}-\frac{2b}{3a^3\left(a+bx^3\right)}-\frac{1}{3a^3x^3}-\frac{b}{6a^2\left(a+bx^3\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*(a + b*x^3)^3),x]
```

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

Rubi in Sympy [A] time = 15.545, size = 63, normalized size = 0.95

$$-\frac{b}{6a^2\left(a+bx^3\right)^2}-\frac{2b}{3a^3\left(a+bx^3\right)}-\frac{1}{3a^3x^3}-\frac{b\log\left(x^3\right)}{a^4}+\frac{b\log\left(a+bx^3\right)}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(b*x**3+a)**3,x)
```

```
[Out] -b/(6*a**2*(a + b*x**3)**2) - 2*b/(3*a**3*(a + b*x**3)) - 1/(3*a*
*3*x**3) - b*log(x**3)/a**4 + b*log(a + b*x**3)/a**4
```

Mathematica [A] time = 0.0985324, size = 59, normalized size = 0.89

$$-\frac{\frac{a\left(2a^2+9abx^3+6b^2x^6\right)}{x^3\left(a+bx^3\right)^2}-6b\log\left(a+bx^3\right)+18b\log(x)}{6a^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*(a + b*x^3)^3),x]
```

```
[Out] -((a*(2*a^2 + 9*a*b*x^3 + 6*b^2*x^6))/(x^3*(a + b*x^3)^2) + 18*b*
Log[x] - 6*b*Log[a + b*x^3])/(6*a^4)
```

Maple [A] time = 0.014, size = 61, normalized size = 0.9

$$-\frac{1}{3\,a^3x^3}-\frac{b}{6\,a^2\left(bx^3+a\right)^2}-\frac{2\,b}{3\,a^3\left(bx^3+a\right)}-3\,\frac{b\ln(x)}{a^4}+\frac{b\ln\left(bx^3+a\right)}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(b*x^3+a)^3,x)
```

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

Maxima [A] time = 1.45083, size = 103, normalized size = 1.56

$$-\frac{6\,b^2x^6+9\,abx^3+2\,a^2}{6\,(a^3b^2x^9+2\,a^4bx^6+a^5x^3)}+\frac{b\log\left(bx^3+a\right)}{a^4}-\frac{b\log\left(x^3\right)}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^3*x^4),x, algorithm="maxima")
```

```
[Out] -1/6*(6*b^2*x^6 + 9*a*b*x^3 + 2*a^2)/(a^3*b^2*x^9 + 2*a^4*b*x^6 +
 a^5*x^3) + b*log(b*x^3 + a)/a^4 - b*log(x^3)/a^4
```

Fricas [A] time = 0.220969, size = 161, normalized size = 2.44

$$-\frac{6\,ab^2x^6+9\,a^2bx^3+2\,a^3-6\left(b^3x^9+2\,ab^2x^6+a^2bx^3\right)\log\left(bx^3+a\right)+18\left(b^3x^9+2\,ab^2x^6+a^2bx^3\right)\log\left(x\right)}{6\,(a^4b^2x^9+2\,a^5bx^6+a^6x^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^3*x^4),x, algorithm="fricas")
```

```
[Out] -1/6*(6*a*b^2*x^6 + 9*a^2*b*x^3 + 2*a^3 - 6*(b^3*x^9 + 2*a*b^2*x^
6 + a^2*b*x^3)*log(b*x^3 + a) + 18*(b^3*x^9 + 2*a*b^2*x^6 + a^2*b
*x^3)*log(x))/(a^4*b^2*x^9 + 2*a^5*b*x^6 + a^6*x^3)
```

Sympy [A] time = 10.7012, size = 75, normalized size = 1.14

$$-\frac{2a^2+9abx^3+6b^2x^6}{6a^5x^3+12a^4bx^6+6a^3b^2x^9}-\frac{3b\log\left(x\right)}{a^4}+\frac{b\log\left(\frac{a}{b}+x^3\right)}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(b*x**3+a)**3,x)
```

```
[Out] -(2*a**2 + 9*a*b*x**3 + 6*b**2*x**6)/(6*a**5*x**3 + 12*a**4*b*x**
6 + 6*a**3*b**2*x**9) - 3*b*log(x)/a**4 + b*log(a/b + x**3)/a**4
```

GIAC/XCAS [A] time = 0.217764, size = 108, normalized size = 1.64

$$\frac{b\ln\left(\left|bx^3+a\right|\right)}{a^4}-\frac{3\,b\ln\left(\left|x\right|\right)}{a^4}-\frac{9\,b^3x^6+22\,ab^2x^3+14\,a^2b}{6\,(bx^3+a)^2a^4}+\frac{3\,bx^3-a}{3\,a^4x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^3*x^4),x, algorithm="giac")
```

```
[Out] b*ln(abs(b*x^3 + a))/a^4 - 3*b*ln(abs(x))/a^4 - 1/6*(9*b^3*x^6 +
22*a*b^2*x^3 + 14*a^2*b)/((b*x^3 + a)^2*a^4) + 1/3*(3*b*x^3 - a)/
(a^4*x^3)
```

3.346 $\int \frac{x^7}{(a+bx^3)^3} \, dx$

Optimal. Leaf size=155

$$\frac{5\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{54\sqrt[3]{a}b^{8/3}}-\frac{5\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{27\sqrt[3]{a}b^{8/3}}-\frac{5\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}\sqrt[3]{a}b^{8/3}}-\frac{5x^2}{18b^2(a+bx^3)}-\frac{x^5}{6b(a+bx^3)^2}$$

```
[Out] -x^5/(6*b*(a + b*x^3)^2) - (5*x^2)/(18*b^2*(a + b*x^3)) - (5*ArcT
an[(a^(1/3) - 2*b^(1/3)*x)/(Sqrt[3]*a^(1/3))])/(9*Sqrt[3]*a^(1/3)
*b^(8/3)) - (5*Log[a^(1/3) + b^(1/3)*x])/(27*a^(1/3)*b^(8/3)) + (
5*Log[a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2])/(54*a^(1/3)*b^(
8/3))
```

Rubi [A] time = 0.191731, antiderivative size = 155, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.538$

$$\frac{5\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{54\sqrt[3]{a}b^{8/3}}-\frac{5\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{27\sqrt[3]{a}b^{8/3}}-\frac{5\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}\sqrt[3]{a}b^{8/3}}-\frac{5x^2}{18b^2(a+bx^3)}-\frac{x^5}{6b(a+bx^3)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7/(a + b*x^3)^3,x]
```

```
[Out] -x^5/(6*b*(a + b*x^3)^2) - (5*x^2)/(18*b^2*(a + b*x^3)) - (5*ArcT
an[(a^(1/3) - 2*b^(1/3)*x)/(Sqrt[3]*a^(1/3))])/(9*Sqrt[3]*a^(1/3)
*b^(8/3)) - (5*Log[a^(1/3) + b^(1/3)*x])/(27*a^(1/3)*b^(8/3)) + (
5*Log[a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2])/(54*a^(1/3)*b^(
8/3))
```

Rubi in Sympy [A] time = 35.8815, size = 146, normalized size = 0.94

$$-\frac{x^5}{6b(a+bx^3)^2}-\frac{5x^2}{18b^2(a+bx^3)}-\frac{5\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{27\sqrt[3]{a}b^{\frac{8}{3}}}+\frac{5\log\left(a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2\right)}{54\sqrt[3]{a}b^{\frac{8}{3}}}-\frac{5\sqrt{3}\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}-\frac{2\sqrt[3]{b}x}{3}\right)}{\sqrt[3]{a}}\right)}{27\sqrt[3]{a}b^{\frac{8}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7/(b*x**3+a)**3,x)
```

```
[Out] -x**5/(6*b*(a + b*x**3)**2) - 5*x**2/(18*b**2*(a + b*x**3)) - 5*l
og(a**(1/3) + b**(1/3)*x)/(27*a**(1/3)*b**(8/3)) + 5*log(a**(2/3)
 - a**(1/3)*b**(1/3)*x + b**(2/3)*x**2)/(54*a**(1/3)*b**(8/3)) -
5*sqrt(3)*atan(sqrt(3)*(a**(1/3)/3 - 2*b**(1/3)*x/3)/a**(1/3))/(2
7*a**(1/3)*b**(8/3))
```

Mathematica [A] time = 0.160078, size = 140, normalized size = 0.9

$$\frac{\frac{5\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{\sqrt[3]{a}}-\frac{24b^{2/3}x^2}{a+bx^3}+\frac{9ab^{2/3}x^2}{(a+bx^3)^2}-\frac{10\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\sqrt[3]{a}}-\frac{10\sqrt{3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{b}x}{\sqrt[3]{a}}}{\sqrt{3}}\right)}{\sqrt[3]{a}}}{54b^{8/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^7/(a + b*x^3)^3,x]
```

```
[Out] ((9*a*b^(2/3)*x^2)/(a + b*x^3)^2 - (24*b^(2/3)*x^2)/(a + b*x^3) -
 (10*Sqrt[3]*ArcTan[(1 - (2*b^(1/3)*x)/a^(1/3))/Sqrt[3]])/a^(1/3)
 - (10*Log[a^(1/3) + b^(1/3)*x])/a^(1/3) + (5*Log[a^(2/3) - a^(1/
3)*b^(1/3)*x + b^(2/3)*x^2])/a^(1/3))/(54*b^(8/3))
```

Maple [A] time = 0.013, size = 119, normalized size = 0.8

$$\frac{1}{(bx^3+a)^2}\left(-\frac{4x^5}{9b}-\frac{5ax^2}{18b^2}\right)-\frac{5}{27b^3}\ln\left(x+\sqrt[3]{\frac{a}{b}}\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}+\frac{5}{54b^3}\ln\left(x^2-x\sqrt[3]{\frac{a}{b}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}+\frac{5\sqrt{3}}{27b^3}\arctan\left(\frac{\sqrt{3}}{3}\left(2x\frac{1}{\sqrt[3]{\frac{a}{b}}}-1\right)\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7/(b*x^3+a)^3,x)
```

```
[Out] (-4/9*x^5/b-5/18*a*x^2/b^2)/(b*x^3+a)^2-5/27/b^3/(a/b)^(1/3)*ln(x
+(a/b)^(1/3))+5/54/b^3/(a/b)^(1/3)*ln(x^2-x*(a/b)^(1/3)+(a/b)^(2/
3))+5/27/b^3*3^(1/2)/(a/b)^(1/3)*arctan(1/3*3^(1/2)*(2/(a/b)^(1/3
)*x-1))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(b*x^3 + a)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.22308, size = 278, normalized size = 1.79

$$-\frac{\sqrt{3}\left(5\sqrt{3}\left(b^2x^6+2abx^3+a^2\right)\log\left(\left(-ab^2\right)^{\frac{1}{3}}bx^2-ab+\left(-ab^2\right)^{\frac{2}{3}}x\right)-10\sqrt{3}\left(b^2x^6+2abx^3+a^2\right)\log\left(ab+\left(-ab^2\right)^{\frac{2}{3}}x\right)+\cdots\right.}{162\left(b^4x^6+2ab^3x^3+a^2b^2\right)\left(-ab^2\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(b*x^3 + a)^3,x, algorithm="fricas")
```

```
[Out] -1/162*sqrt(3)*(5*sqrt(3)*(b^2*x^6 + 2*a*b*x^3 + a^2)*log((-a*b^2
)^(1/3)*b*x^2 - a*b + (-a*b^2)^(2/3)*x) - 10*sqrt(3)*(b^2*x^6 + 2
*a*b*x^3 + a^2)*log(a*b + (-a*b^2)^(2/3)*x) + 30*(b^2*x^6 + 2*a*b
*x^3 + a^2)*arctan(-1/3*(sqrt(3)*a*b - 2*sqrt(3)*(-a*b^2)^(2/3)*x
)/(a*b)) + 3*sqrt(3)*(8*b*x^5 + 5*a*x^2)*(-a*b^2)^(1/3))/((b^4*x^
6 + 2*a*b^3*x^3 + a^2*b^2)*(-a*b^2)^(1/3))
```

Sympy [A] time = 2.5454, size = 68, normalized size = 0.44

$$-\frac{5ax^2+8bx^5}{18a^2b^2+36ab^3x^3+18b^4x^6}+\operatorname{RootSum}\left(19683t^3ab^8+125,\left(t\mapsto t\log\left(\frac{729t^2ab^5}{25}+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(b*x**3+a)**3,x)
```

```
[Out] -(5*a*x**2 + 8*b*x**5)/(18*a**2*b**2 + 36*a*b**3*x**3 + 18*b**4*x
**6) + RootSum(19683*_t**3*a*b**8 + 125, Lambda(_t, _t*log(729*_t
**2*a*b**5/25 + x)))
```

GIAC/XCAS [A] time = 0.237299, size = 192, normalized size = 1.24

$$-\frac{5\left(-\frac{a}{b}\right)^{\frac{2}{3}}\ln\left(\left|x-\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right|\right)}{27\,ab^2}-\frac{5\sqrt{3}\left(-ab^2\right)^{\frac{2}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{a}{b}\right)^{\frac{1}{3}}}\right)}{27\,ab^4}-\frac{8\,bx^5+5\,ax^2}{18\left(bx^3+a\right)^2b^2}+\frac{5\left(-ab^2\right)^{\frac{2}{3}}\ln\left(x^2+x\left(-\frac{a}{b}\right)^{\frac{1}{3}}+\left(-\frac{a}{b}\right)^{\frac{2}{3}}\right)}{54\,ab^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(b*x^3 + a)^3,x, algorithm="giac")
```

```
[Out] -5/27*(-a/b)^(2/3)*ln(abs(x - (-a/b)^(1/3)))/(a*b^2) - 5/27*sqrt(
3)*(-a*b^2)^(2/3)*arctan(1/3*sqrt(3)*(2*x + (-a/b)^(1/3))/(-a/b)^
(1/3))/(a*b^4) - 1/18*(8*b*x^5 + 5*a*x^2)/((b*x^3 + a)^2*b^2) + 5
/54*(-a*b^2)^(2/3)*ln(x^2 + x*(-a/b)^(1/3) + (-a/b)^(2/3))/(a*b^4
)
```

3.347 $\int \frac{x^6}{(a+bx^3)^3}\,dx$

Optimal. Leaf size=153

$$-\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{27a^{2/3}b^{7/3}}+\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{27a^{2/3}b^{7/3}}-\frac{2\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{2/3}b^{7/3}}-\frac{2x}{9b^2(a+bx^3)}-\frac{x^4}{6b(a+bx^3)^2}$$

```
[Out] -x^4/(6*b*(a + b*x^3)^2) - (2*x)/(9*b^2*(a + b*x^3)) - (2*ArcTan[
(a^(1/3) - 2*b^(1/3)*x)/(Sqrt[3]*a^(1/3))])/(9*Sqrt[3]*a^(2/3)*b^
(7/3)) + (2*Log[a^(1/3) + b^(1/3)*x])/(27*a^(2/3)*b^(7/3)) - Log[
a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2]/(27*a^(2/3)*b^(7/3))
```

Rubi [A] time = 0.181624, antiderivative size = 153, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538

$$-\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{27a^{2/3}b^{7/3}}+\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{27a^{2/3}b^{7/3}}-\frac{2\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{2/3}b^{7/3}}-\frac{2x}{9b^2(a+bx^3)}-\frac{x^4}{6b(a+bx^3)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/(a + b*x^3)^3,x]
```

```
[Out] -x^4/(6*b*(a + b*x^3)^2) - (2*x)/(9*b^2*(a + b*x^3)) - (2*ArcTan[
(a^(1/3) - 2*b^(1/3)*x)/(Sqrt[3]*a^(1/3))])/(9*Sqrt[3]*a^(2/3)*b^
(7/3)) + (2*Log[a^(1/3) + b^(1/3)*x])/(27*a^(2/3)*b^(7/3)) - Log[
a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2]/(27*a^(2/3)*b^(7/3))
```

Rubi in Sympy [A] time = 38.213, size = 143, normalized size = 0.93

$$-\frac{x^4}{6b(a+bx^3)^2}-\frac{2x}{9b^2(a+bx^3)}+\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{27a^{\frac{2}{3}}b^{\frac{7}{3}}}-\frac{\log\left(a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2\right)}{27a^{\frac{2}{3}}b^{\frac{7}{3}}}-\frac{2\sqrt{3}\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}-\frac{2\sqrt[3]{b}x}{3}\right)}{\sqrt[3]{a}}\right)}{27a^{\frac{2}{3}}b^{\frac{7}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(b*x**3+a)**3,x)
```

```
[Out] -x**4/(6*b*(a + b*x**3)**2) - 2*x/(9*b**2*(a + b*x**3)) + 2*log(a
**(1/3) + b**(1/3)*x)/(27*a**(2/3)*b**(7/3)) - log(a**(2/3) - a**
(1/3)*b**(1/3)*x + b**(2/3)*x**2)/(27*a**(2/3)*b**(7/3)) - 2*sqrt
(3)*atan(sqrt(3)*(a**(1/3)/3 - 2*b**(1/3)*x/3)/a**(1/3))/(27*a**(
2/3)*b**(7/3))
```

Mathematica [A] time = 0.137863, size = 136, normalized size = 0.89

$$\frac{-\frac{2\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{a^{2/3}}+\frac{4\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{a^{2/3}}-\frac{4\sqrt{3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{b}x}{\sqrt[3]{a}}}{\sqrt{3}}\right)}{a^{2/3}}-\frac{21\sqrt[3]{b}x}{a+bx^3}+\frac{9a\sqrt[3]{b}x}{(a+bx^3)^2}}{54b^{7/3}}$$

Antiderivative was successfully verified.

```
[In]   Integrate[x^6/(a + b*x^3)^3,x]
```

```
[Out] ((9*a*b^(1/3)*x)/(a + b*x^3)^2 - (21*b^(1/3)*x)/(a + b*x^3) - (4*
Sqrt[3]*ArcTan[(1 - (2*b^(1/3)*x)/a^(1/3))/Sqrt[3]])/a^(2/3) + (4
*Log[a^(1/3) + b^(1/3)*x])/a^(2/3) - (2*Log[a^(2/3) - a^(1/3)*b^(
1/3)*x + b^(2/3)*x^2])/a^(2/3))/(54*b^(7/3))
```

Maple [A] time = 0.013, size = 117, normalized size = 0.8

$$\frac{1}{(bx^3+a)^2}\left(-\frac{7x^4}{18b}-\frac{2ax}{9b^2}\right)+\frac{2}{27b^3}\ln\left(x+\sqrt[3]{\frac{a}{b}}\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}} -\frac{1}{27b^3}\ln\left(x^2-x\sqrt[3]{\frac{a}{b}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}+\frac{2\sqrt{3}}{27b^3}\arctan\left(\frac{\sqrt{3}}{3}\left(2x\frac{1}{\sqrt[3]{\frac{a}{b}}}-1\right)\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^6/(b*x^3+a)^3,x)
```

```
[Out] (-7/18/b*x^4-2/9*a*x/b^2)/(b*x^3+a)^2+2/27/b^3/(a/b)^(2/3)*ln(x+(
a/b)^(1/3))-1/27/b^3/(a/b)^(2/3)*ln(x^2-x*(a/b)^(1/3)+(a/b)^(2/3)
)+2/27/b^3/(a/b)^(2/3)*3^(1/2)*arctan(1/3*3^(1/2)*(2/(a/b)^(1/3)*
x-1))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^6/(b*x^3 + a)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.245386, size = 261, normalized size = 1.71

$$-\frac{\sqrt{3}\left(2\sqrt{3}\left(b^2x^6+2abx^3+a^2\right)\log\left(\left(a^2b\right)^{\frac{2}{3}}x^2-\left(a^2b\right)^{\frac{1}{3}}ax+a^2\right)-4\sqrt{3}\left(b^2x^6+2abx^3+a^2\right)\log\left(\left(a^2b\right)^{\frac{1}{3}}x+a\right)-12\left(b^2x\right.}{162\left(b^4x^6+2ab^3x^3+a^2b^2\right)\left(a^2b\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^6/(b*x^3 + a)^3,x, algorithm="fricas")
```

```
[Out] -1/162*sqrt(3)*(2*sqrt(3)*(b^2*x^6 + 2*a*b*x^3 + a^2)*log((a^2*b)
^(2/3)*x^2 - (a^2*b)^(1/3)*a*x + a^2) - 4*sqrt(3)*(b^2*x^6 + 2*a*
b*x^3 + a^2)*log((a^2*b)^(1/3)*x + a) - 12*(b^2*x^6 + 2*a*b*x^3 +
 a^2)*arctan(1/3*(2*sqrt(3)*(a^2*b)^(1/3)*x - sqrt(3)*a)/a) + 3*s
qrt(3)*(7*b*x^4 + 4*a*x)*(a^2*b)^(1/3))/((b^4*x^6 + 2*a*b^3*x^3 +
 a^2*b^2)*(a^2*b)^(1/3))
```

Sympy [A] time = 2.52239, size = 66, normalized size = 0.43

$$-\frac{4ax+7bx^4}{18a^2b^2+36ab^3x^3+18b^4x^6}+\operatorname{RootSum}\left(19683t^3a^2b^7-8,\left(t\mapsto t\log\left(\frac{27tab^2}{2}+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(b*x**3+a)**3,x)
```

```
[Out] -(4*a*x + 7*b*x**4)/(18*a**2*b**2 + 36*a*b**3*x**3 + 18*b**4*x**6
) + RootSum(19683*_t**3*a**2*b**7 - 8, Lambda(_t, _t*log(27*_t*a*
b**2/2 + x)))
```

GIAC/XCAS [A] time = 0.225175, size = 189, normalized size = 1.24

$$-\frac{2\left(-\frac{a}{b}\right)^{\frac{1}{3}}\ln\left(\left|x-\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right|\right)}{27\,ab^2}+\frac{2\sqrt{3}\left(-ab^2\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(2x+\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{a}{b}\right)^{\frac{1}{3}}}\right)}{27\,ab^3}+\frac{\left(-ab^2\right)^{\frac{1}{3}}\ln\left(x^2+x\left(-\frac{a}{b}\right)^{\frac{1}{3}}+\left(-\frac{a}{b}\right)^{\frac{2}{3}}\right)}{27\,ab^3}-\frac{7\,bx^4+4\,ax}{18\,(bx^3+a)^2b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(b*x^3 + a)^3,x, algorithm="giac")
```

```
[Out] -2/27*(-a/b)^(1/3)*ln(abs(x - (-a/b)^(1/3)))/(a*b^2) + 2/27*sqrt(
3)*(-a*b^2)^(1/3)*arctan(1/3*sqrt(3)*(2*x + (-a/b)^(1/3))/(-a/b)^
(1/3))/(a*b^3) + 1/27*(-a*b^2)^(1/3)*ln(x^2 + x*(-a/b)^(1/3) + (-
a/b)^(2/3))/(a*b^3) - 1/18*(7*b*x^4 + 4*a*x)/((b*x^3 + a)^2*b^2)
```

3.348 $\int \frac{x^4}{(a+bx^3)^3} dx$

Optimal. Leaf size=158

$$\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{54a^{4/3}b^{5/3}}-\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{27a^{4/3}b^{5/3}}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{4/3}b^{5/3}}+\frac{x^2}{9ab(a+bx^3)}-\frac{x^2}{6b(a+bx^3)^2}$$

```
[Out] -x^2/(6*b*(a + b*x^3)^2) + x^2/(9*a*b*(a + b*x^3)) - ArcTan[(a^(1
/3) - 2*b^(1/3)*x)/(Sqrt[3]*a^(1/3))]/(9*Sqrt[3]*a^(4/3)*b^(5/3))
 - Log[a^(1/3) + b^(1/3)*x]/(27*a^(4/3)*b^(5/3)) + Log[a^(2/3) -
a^(1/3)*b^(1/3)*x + b^(2/3)*x^2]/(54*a^(4/3)*b^(5/3))
```

Rubi [A] time = 0.1716, antiderivative size = 158, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615

$$\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{54a^{4/3}b^{5/3}}-\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{27a^{4/3}b^{5/3}}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{4/3}b^{5/3}}+\frac{x^2}{9ab(a+bx^3)}-\frac{x^2}{6b(a+bx^3)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a + b*x^3)^3,x]
```

```
[Out] -x^2/(6*b*(a + b*x^3)^2) + x^2/(9*a*b*(a + b*x^3)) - ArcTan[(a^(1
/3) - 2*b^(1/3)*x)/(Sqrt[3]*a^(1/3))]/(9*Sqrt[3]*a^(4/3)*b^(5/3))
 - Log[a^(1/3) + b^(1/3)*x]/(27*a^(4/3)*b^(5/3)) + Log[a^(2/3) -
a^(1/3)*b^(1/3)*x + b^(2/3)*x^2]/(54*a^(4/3)*b^(5/3))
```

Rubi in Sympy [A] time = 38.0752, size = 139, normalized size = 0.88

$$-\frac{x^2}{6b(a+bx^3)^2}+\frac{x^2}{9ab(a+bx^3)}-\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{27a^{\frac{4}{3}}b^{\frac{5}{3}}}+\frac{\log\left(a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2\right)}{54a^{\frac{4}{3}}b^{\frac{5}{3}}}-\frac{\sqrt{3}\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}-\frac{2\sqrt[3]{b}x}{3}\right)}{\sqrt[3]{a}}\right)}{27a^{\frac{4}{3}}b^{\frac{5}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(b*x**3+a)**3,x)
```

```
[Out] -x**2/(6*b*(a + b*x**3)**2) + x**2/(9*a*b*(a + b*x**3)) - log(a**
(1/3) + b**(1/3)*x)/(27*a**(4/3)*b**(5/3)) + log(a**(2/3) - a**(1
/3)*b**(1/3)*x + b**(2/3)*x**2)/(54*a**(4/3)*b**(5/3)) - sqrt(3)*
atan(sqrt(3)*(a**(1/3)/3 - 2*b**(1/3)*x/3)/a**(1/3))/(27*a**(4/3)
*b**(5/3))
```

Mathematica [A] time = 0.205564, size = 141, normalized size = 0.89

$$\frac{\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{a^{4/3}}-\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{a^{4/3}}-\frac{2\sqrt{3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{b}x}{\sqrt[3]{a}}}{\sqrt{3}}\right)}{a^{4/3}}+\frac{6b^{2/3}x^2}{a^2+abx^3}-\frac{9b^{2/3}x^2}{(a+bx^3)^2}}{54b^{5/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(a + b*x^3)^3,x]
```

```
[Out] ((-9*b^(2/3)*x^2)/(a + b*x^3)^2 + (6*b^(2/3)*x^2)/(a^2 + a*b*x^3)
 - (2*Sqrt[3]*ArcTan[(1 - (2*b^(1/3)*x)/a^(1/3))/Sqrt[3]])/a^(4/3
) - (2*Log[a^(1/3) + b^(1/3)*x])/a^(4/3) + Log[a^(2/3) - a^(1/3)*
b^(1/3)*x + b^(2/3)*x^2]/a^(4/3))/(54*b^(5/3))
```

Maple [A] time = 0.013, size = 127, normalized size = 0.8

$$\frac{1}{(bx^3+a)^2}\left(\frac{x^5}{9a}-\frac{x^2}{18b}\right)-\frac{1}{27ab^2}\ln\left(x+\sqrt[3]{\frac{a}{b}}\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}+\frac{1}{54ab^2}\ln\left(x^2-x\sqrt[3]{\frac{a}{b}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}+\frac{\sqrt{3}}{27ab^2}\arctan\left(\frac{\sqrt{3}}{3}\left(2x\frac{1}{\sqrt[3]{\frac{a}{b}}}-1\right)\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(b*x^3+a)^3,x)
```

```
[Out] (1/9*x^5/a-1/18*x^2/b)/(b*x^3+a)^2-1/27/b^2/a/(a/b)^(1/3)*ln(x+(a
/b)^(1/3))+1/54/b^2/a/(a/b)^(1/3)*ln(x^2-x*(a/b)^(1/3)+(a/b)^(2/3
))+1/27/b^2/a*3^(1/2)/(a/b)^(1/3)*arctan(1/3*3^(1/2)*(2/(a/b)^(1/
3)*x-1))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^3 + a)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.241312, size = 278, normalized size = 1.76

$$-\frac{\sqrt{3}\left(\sqrt{3}\left(b^2x^6+2abx^3+a^2\right)\log\left(\left(-ab^2\right)^{\frac{1}{3}}bx^2-ab+\left(-ab^2\right)^{\frac{2}{3}}x\right)-2\sqrt{3}\left(b^2x^6+2abx^3+a^2\right)\log\left(ab+\left(-ab^2\right)^{\frac{2}{3}}x\right)+6\left(\right.\right.}{162\left(ab^3x^6+2a^2b^2x^3+a^3b\right)\left(-ab^2\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^3 + a)^3,x, algorithm="fricas")
```

```
[Out] -1/162*sqrt(3)*(sqrt(3)*(b^2*x^6 + 2*a*b*x^3 + a^2)*log((-a*b^2)^
(1/3)*b*x^2 - a*b + (-a*b^2)^(2/3)*x) - 2*sqrt(3)*(b^2*x^6 + 2*a*
b*x^3 + a^2)*log(a*b + (-a*b^2)^(2/3)*x) + 6*(b^2*x^6 + 2*a*b*x^3
 + a^2)*arctan(-1/3*(sqrt(3)*a*b - 2*sqrt(3)*(-a*b^2)^(2/3)*x)/(a
*b)) - 3*sqrt(3)*(2*b*x^5 - a*x^2)*(-a*b^2)^(1/3))/((a*b^3*x^6 +
2*a^2*b^2*x^3 + a^3*b)*(-a*b^2)^(1/3))
```

Sympy [A] time = 2.48766, size = 70, normalized size = 0.44

$$\frac{-ax^2+2bx^5}{18a^3b+36a^2b^2x^3+18ab^3x^6}+\operatorname{RootSum}\left(19683t^3a^4b^5+1,\left(t\mapsto t\log\left(729t^2a^3b^3+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(b*x**3+a)**3,x)
```

```
[Out] (-a*x**2 + 2*b*x**5)/(18*a**3*b + 36*a**2*b**2*x**3 + 18*a*b**3*x
**6) + RootSum(19683*_t**3*a**4*b**5 + 1, Lambda(_t, _t*log(729*_
t**2*a**3*b**3 + x)))
```

GIAC/XCAS [A] time = 0.224805, size = 196, normalized size = 1.24

$$-\frac{\left(-\frac{a}{b}\right)^{\frac{2}{3}}\ln\left(\left|x-\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right|\right)}{27\,a^2b}-\frac{\sqrt{3}\left(-ab^2\right)^{\frac{2}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{a}{b}\right)^{\frac{1}{3}}}\right)}{27\,a^2b^3}+\frac{2\,bx^5-ax^2}{18\left(bx^3+a\right)^2ab}+\frac{\left(-ab^2\right)^{\frac{2}{3}}\ln\left(x^2+x\left(-\frac{a}{b}\right)^{\frac{1}{3}}+\left(-\frac{a}{b}\right)^{\frac{2}{3}}\right)}{54\,a^2b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^3 + a)^3,x, algorithm="giac")
```

```
[Out] -1/27*(-a/b)^(2/3)*ln(abs(x - (-a/b)^(1/3)))/(a^2*b) - 1/27*sqrt(
3)*(-a*b^2)^(2/3)*arctan(1/3*sqrt(3)*(2*x + (-a/b)^(1/3))/(-a/b)^
(1/3))/(a^2*b^3) + 1/18*(2*b*x^5 - a*x^2)/((b*x^3 + a)^2*a*b) + 1
/54*(-a*b^2)^(2/3)*ln(x^2 + x*(-a/b)^(1/3) + (-a/b)^(2/3))/(a^2*b
^3)
```

3.349 $\int \frac{x^3}{(a+bx^3)^3}\,dx$

Optimal. Leaf size=154

$$-\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{54a^{5/3}b^{4/3}}+\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{27a^{5/3}b^{4/3}}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{5/3}b^{4/3}}+\frac{x}{18ab\left(a+bx^3\right)}-\frac{x}{6b\left(a+bx^3\right)^2}$$

```
[Out] -x/(6*b*(a + b*x^3)^2) + x/(18*a*b*(a + b*x^3)) - ArcTan[(a^(1/3)
 - 2*b^(1/3)*x)/(Sqrt[3]*a^(1/3))]/(9*Sqrt[3]*a^(5/3)*b^(4/3)) +
Log[a^(1/3) + b^(1/3)*x]/(27*a^(5/3)*b^(4/3)) - Log[a^(2/3) - a^(
1/3)*b^(1/3)*x + b^(2/3)*x^2]/(54*a^(5/3)*b^(4/3))
```

Rubi [A] time = 0.163812, antiderivative size = 154, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615

$$-\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{54a^{5/3}b^{4/3}}+\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{27a^{5/3}b^{4/3}}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{5/3}b^{4/3}}+\frac{x}{18ab\left(a+bx^3\right)}-\frac{x}{6b\left(a+bx^3\right)^2}$$

Antiderivative was successfully verified.

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

```
[Out] -x/(6*b*(a + b*x^3)^2) + x/(18*a*b*(a + b*x^3)) - ArcTan[(a^(1/3)
 - 2*b^(1/3)*x)/(Sqrt[3]*a^(1/3))]/(9*Sqrt[3]*a^(5/3)*b^(4/3)) +
Log[a^(1/3) + b^(1/3)*x]/(27*a^(5/3)*b^(4/3)) - Log[a^(2/3) - a^(
1/3)*b^(1/3)*x + b^(2/3)*x^2]/(54*a^(5/3)*b^(4/3))
```

Rubi in Sympy [A] time = 39.1272, size = 136, normalized size = 0.88

$$-\frac{x}{6b\left(a+bx^3\right)^2}+\frac{x}{18ab\left(a+bx^3\right)}+\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{27a^{\frac{5}{3}}b^{\frac{4}{3}}}-\frac{\log\left(a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2\right)}{54a^{\frac{5}{3}}b^{\frac{4}{3}}}-\frac{\sqrt{3}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}-\frac{2\sqrt[3]{b}x}{3}\right)}{\sqrt[3]{a}}\right)}{27a^{\frac{5}{3}}b^{\frac{4}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -x/(6*b*(a + b*x**3)**2) + x/(18*a*b*(a + b*x**3)) + log(a**(1/3)
 + b**(1/3)*x)/(27*a**(5/3)*b**(4/3)) - log(a**(2/3) - a**(1/3)*b
**(1/3)*x + b**(2/3)*x**2)/(54*a**(5/3)*b**(4/3)) - sqrt(3)*atan(
sqrt(3)*(a**(1/3)/3 - 2*b**(1/3)*x/3)/a**(1/3))/(27*a**(5/3)*b**(
4/3))
```

Mathematica [A] time = 0.164854, size = 138, normalized size = 0.9

$$\frac{-\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{a^{5/3}}+\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{a^{5/3}}-\frac{2\sqrt{3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{b}x}{\sqrt[3]{a}}}{\sqrt{3}}\right)}{a^{5/3}}+\frac{3\sqrt[3]{b}x}{a^2+abx^3}-\frac{9\sqrt[3]{b}x}{\left(a+bx^3\right)^2}}{54b^{4/3}}$$

Antiderivative was successfully verified.

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

```
[Out] ((-9*b^(1/3)*x)/(a + b*x^3)^2 + (3*b^(1/3)*x)/(a^2 + a*b*x^3) - (
2*Sqrt[3]*ArcTan[(1 - (2*b^(1/3)*x)/a^(1/3))/Sqrt[3]])/a^(5/3) +
(2*Log[a^(1/3) + b^(1/3)*x])/a^(5/3) - Log[a^(2/3) - a^(1/3)*b^(1
/3)*x + b^(2/3)*x^2]/a^(5/3))/(54*b^(4/3))
```

Maple [A] time = 0.014, size = 125, normalized size = 0.8

$$\frac{1}{(bx^3+a)^2}\left(\frac{x^4}{18\,a}-\frac{x}{9\,b}\right)+\frac{1}{27\,ab^2}\ln\left(x+\sqrt[3]{\frac{a}{b}}\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}-\frac{1}{54\,ab^2}\ln\left(x^2-x\sqrt[3]{\frac{a}{b}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}+\frac{\sqrt{3}}{27\,ab^2}\arctan\left(\frac{\sqrt{3}}{3}\left(2\,x\frac{1}{\sqrt[3]{\frac{a}{b}}}-1\right)\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (1/18*x^4/a-1/9*x/b)/(b*x^3+a)^2+1/27/b^2/a/(a/b)^(2/3)*ln(x+(a/b
)^(1/3))-1/54/b^2/a/(a/b)^(2/3)*ln(x^2-x*(a/b)^(1/3)+(a/b)^(2/3))
+1/27/b^2/a/(a/b)^(2/3)*3^(1/2)*arctan(1/3*3^(1/2)*(2/(a/b)^(1/3)
*x-1))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.233108, size = 259, normalized size = 1.68

$$-\frac{\sqrt{3}\left(\sqrt{3}\left(b^2x^6+2\,abx^3+a^2\right)\log\left(\left(a^2b\right)^{\frac{2}{3}}x^2-\left(a^2b\right)^{\frac{1}{3}}ax+a^2\right)-2\,\sqrt{3}\left(b^2x^6+2\,abx^3+a^2\right)\log\left(\left(a^2b\right)^{\frac{1}{3}}x+a\right)-6\,\left(b^2x^6+\right.\right.}{162\,\left(ab^3x^6+2\,a^2b^2x^3+a^3b\right)\left(a^2b\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/162*sqrt(3)*(sqrt(3)*(b^2*x^6 + 2*a*b*x^3 + a^2)*log((a^2*b)^(
2/3)*x^2 - (a^2*b)^(1/3)*a*x + a^2) - 2*sqrt(3)*(b^2*x^6 + 2*a*b*
x^3 + a^2)*log((a^2*b)^(1/3)*x + a) - 6*(b^2*x^6 + 2*a*b*x^3 + a^
2)*arctan(1/3*(2*sqrt(3)*(a^2*b)^(1/3)*x - sqrt(3)*a)/a) - 3*sqrt
(3)*(b*x^4 - 2*a*x)*(a^2*b)^(1/3))/((a*b^3*x^6 + 2*a^2*b^2*x^3 +
a^3*b)*(a^2*b)^(1/3))
```

Sympy [A] time = 2.39234, size = 65, normalized size = 0.42

$$\frac{-2ax+bx^4}{18a^3b+36a^2b^2x^3+18ab^3x^6}+\operatorname{RootSum}\left(19683t^3a^5b^4-1,\left(t\mapsto t\log\left(27ta^2b+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (-2*a*x + b*x**4)/(18*a**3*b + 36*a**2*b**2*x**3 + 18*a*b**3*x**6
) + RootSum(19683*_t**3*a**5*b**4 - 1, Lambda(_t, _t*log(27*_t*a*
*2*b + x)))
```

GIAC/XCAS [A] time = 0.250812, size = 192, normalized size = 1.25

$$-\frac{\left(-\frac{a}{b}\right)^{\frac{1}{3}}\ln\left(\left|x-\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right|\right)}{27\,a^{2}b}+\frac{\sqrt{3}\left(-ab^{2}\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{a}{b}\right)^{\frac{1}{3}}}\right)}{27\,a^{2}b^{2}}+\frac{\left(-ab^{2}\right)^{\frac{1}{3}}\ln\left(x^{2}+x\left(-\frac{a}{b}\right)^{\frac{1}{3}}+\left(-\frac{a}{b}\right)^{\frac{2}{3}}\right)}{54\,a^{2}b^{2}}+\frac{bx^{4}-2\,ax}{18\left(bx^{3}+a\right)^{2}ab}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/27*(-a/b)^(1/3)*ln(abs(x - (-a/b)^(1/3)))/(a^2*b) + 1/27*sqrt(
3)*(-a*b^2)^(1/3)*arctan(1/3*sqrt(3)*(2*x + (-a/b)^(1/3))/(-a/b)^
(1/3))/(a^2*b^2) + 1/54*(-a*b^2)^(1/3)*ln(x^2 + x*(-a/b)^(1/3) +
(-a/b)^(2/3))/(a^2*b^2) + 1/18*(b*x^4 - 2*a*x)/((b*x^3 + a)^2*a*b
)
```

3.350 $\int \frac{x}{(a+bx^3)^3}\,dx$

Optimal. Leaf size=155

$$\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{27a^{7/3}b^{2/3}}-\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{27a^{7/3}b^{2/3}}-\frac{2\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{7/3}b^{2/3}}+\frac{2x^2}{9a^2(a+bx^3)}+\frac{x^2}{6a(a+bx^3)^2}$$

```
[Out] x^2/(6*a*(a + b*x^3)^2) + (2*x^2)/(9*a^2*(a + b*x^3)) - (2*ArcTan
[(a^(1/3) - 2*b^(1/3)*x)/(Sqrt[3]*a^(1/3))])/(9*Sqrt[3]*a^(7/3)*b
^(2/3)) - (2*Log[a^(1/3) + b^(1/3)*x])/(27*a^(7/3)*b^(2/3)) + Log
[a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2]/(27*a^(7/3)*b^(2/3))
```

Rubi [A] time = 0.167625, antiderivative size = 155, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.636

$$\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{27a^{7/3}b^{2/3}}-\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{27a^{7/3}b^{2/3}}-\frac{2\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{7/3}b^{2/3}}+\frac{2x^2}{9a^2(a+bx^3)}+\frac{x^2}{6a(a+bx^3)^2}$$

Antiderivative was successfully verified.

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

```
[Out] x^2/(6*a*(a + b*x^3)^2) + (2*x^2)/(9*a^2*(a + b*x^3)) - (2*ArcTan
[(a^(1/3) - 2*b^(1/3)*x)/(Sqrt[3]*a^(1/3))])/(9*Sqrt[3]*a^(7/3)*b
^(2/3)) - (2*Log[a^(1/3) + b^(1/3)*x])/(27*a^(7/3)*b^(2/3)) + Log
[a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2]/(27*a^(7/3)*b^(2/3))
```

Rubi in Sympy [A] time = 36.4453, size = 144, normalized size = 0.93

$$\frac{x^2}{6a(a+bx^3)^2}+\frac{2x^2}{9a^2(a+bx^3)}-\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{27a^{\frac{7}{3}}b^{\frac{2}{3}}}+\frac{\log\left(a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2\right)}{27a^{\frac{7}{3}}b^{\frac{2}{3}}}-\frac{2\sqrt{3}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}-\frac{2\sqrt[3]{b}x}{3}\right)}{\sqrt[3]{a}}\right)}{27a^{\frac{7}{3}}b^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x**2/(6*a*(a + b*x**3)**2) + 2*x**2/(9*a**2*(a + b*x**3)) - 2*log
(a**(1/3) + b**(1/3)*x)/(27*a**(7/3)*b**(2/3)) + log(a**(2/3) - a
**(1/3)*b**(1/3)*x + b**(2/3)*x**2)/(27*a**(7/3)*b**(2/3)) - 2*sq
rt(3)*atan(sqrt(3)*(a**(1/3)/3 - 2*b**(1/3)*x/3)/a**(1/3))/(27*a*
*(7/3)*b**(2/3))
```

Mathematica [A] time = 0.125709, size = 139, normalized size = 0.9

$$\frac{\frac{2\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{b^{2/3}}+\frac{9a^{4/3}x^2}{(a+bx^3)^2}-\frac{4\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{b^{2/3}}-\frac{4\sqrt{3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{b}x}{\sqrt[3]{a}}}{\sqrt{3}}\right)}{b^{2/3}}+\frac{12\sqrt[3]{a}x^2}{a+bx^3}}{54a^{7/3}}$$

Antiderivative was successfully verified.

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

```
[Out] ((9*a^(4/3)*x^2)/(a + b*x^3)^2 + (12*a^(1/3)*x^2)/(a + b*x^3) - (
4*Sqrt[3]*ArcTan[(1 - (2*b^(1/3)*x)/a^(1/3))/Sqrt[3]])/b^(2/3) -
(4*Log[a^(1/3) + b^(1/3)*x])/b^(2/3) + (2*Log[a^(2/3) - a^(1/3)*b
^(1/3)*x + b^(2/3)*x^2])/b^(2/3))/(54*a^(7/3))
```

Maple [A] time = 0.006, size = 134, normalized size = 0.9

$$\frac{x^2}{6\,a\,(bx^3+a)^2}+\frac{2\,x^2}{9\,a^2\,(bx^3+a)}-\frac{2}{27\,a^2b}\ln\left(x+\sqrt[3]{\frac{a}{b}}\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}$$
$$+\frac{1}{27\,a^2b}\ln\left(x^2-x\sqrt[3]{\frac{a}{b}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}+\frac{2\sqrt{3}}{27\,a^2b}\arctan\left(\frac{\sqrt{3}}{3}\left(2\,x\frac{1}{\sqrt[3]{\frac{a}{b}}}-1\right)\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/6*x^2/a/(b*x^3+a)^2+2/9*x^2/a^2/(b*x^3+a)-2/27/a^2/b/(a/b)^(1/3
)*ln(x+(a/b)^(1/3))+1/27/a^2/b/(a/b)^(1/3)*ln(x^2-x*(a/b)^(1/3)+(
a/b)^(2/3))+2/27/a^2*3^(1/2)/b/(a/b)^(1/3)*arctan(1/3*3^(1/2)*(2/
(a/b)^(1/3)*x-1))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.225905, size = 277, normalized size = 1.79

$$-\frac{\sqrt{3}\left(2\sqrt{3}\left(b^2x^6+2\,abx^3+a^2\right)\log\left(\left(-ab^2\right)^{\frac{1}{3}}bx^2-ab+\left(-ab^2\right)^{\frac{2}{3}}x\right)-4\sqrt{3}\left(b^2x^6+2\,abx^3+a^2\right)\log\left(ab+\left(-ab^2\right)^{\frac{2}{3}}x\right)+1\right.}{162\left(a^2b^2x^6+2\,a^3bx^3+a^4\right)\left(-ab^2\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/162*sqrt(3)*(2*sqrt(3)*(b^2*x^6 + 2*a*b*x^3 + a^2)*log((-a*b^2
)^(1/3)*b*x^2 - a*b + (-a*b^2)^(2/3)*x) - 4*sqrt(3)*(b^2*x^6 + 2*
a*b*x^3 + a^2)*log(a*b + (-a*b^2)^(2/3)*x) + 12*(b^2*x^6 + 2*a*b*
x^3 + a^2)*arctan(-1/3*(sqrt(3)*a*b - 2*sqrt(3)*(-a*b^2)^(2/3)*x)
/(a*b)) - 3*sqrt(3)*(4*b*x^5 + 7*a*x^2)*(-a*b^2)^(1/3))/((a^2*b^2
*x^6 + 2*a^3*b*x^3 + a^4)*(-a*b^2)^(1/3))
```

Sympy [A] time = 2.38758, size = 70, normalized size = 0.45

$$\frac{7ax^2+4bx^5}{18a^4+36a^3bx^3+18a^2b^2x^6}+\operatorname{RootSum}\left(19683t^3a^7b^2+8,\left(t\mapsto t\log\left(\frac{729t^2a^5b}{4}+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (7*a*x**2 + 4*b*x**5)/(18*a**4 + 36*a**3*b*x**3 + 18*a**2*b**2*x*
*6) + RootSum(19683*_t**3*a**7*b**2 + 8, Lambda(_t, _t*log(729*_t
**2*a**5*b/4 + x)))
```

GIAC/XCAS [A] time = 0.252784, size = 188, normalized size = 1.21

$$-\frac{2\left(-\frac{a}{b}\right)^{\frac{2}{3}}\ln\left(\left|x-\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right|\right)}{27\,a^{3}}-\frac{2\,\sqrt{3}\left(-ab^{2}\right)^{\frac{2}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{a}{b}\right)^{\frac{1}{3}}}\right)}{27\,a^{3}b^{2}}+\frac{4\,bx^{5}+7\,ax^{2}}{18\left(bx^{3}+a\right)^{2}a^{2}}+\frac{\left(-ab^{2}\right)^{\frac{2}{3}}\ln\left(x^{2}+x\left(-\frac{a}{b}\right)^{\frac{1}{3}}+\left(-\frac{a}{b}\right)^{\frac{2}{3}}\right)}{27\,a^{3}b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -2/27*(-a/b)^(2/3)*ln(abs(x - (-a/b)^(1/3)))/a^3 - 2/27*sqrt(3)*(
-a*b^2)^(2/3)*arctan(1/3*sqrt(3)*(2*x + (-a/b)^(1/3))/(-a/b)^(1/3
))/(a^3*b^2) + 1/18*(4*b*x^5 + 7*a*x^2)/((b*x^3 + a)^2*a^2) + 1/2
7*(-a*b^2)^(2/3)*ln(x^2 + x*(-a/b)^(1/3) + (-a/b)^(2/3))/(a^3*b^2
)
```

3.351 $\int \frac{1}{(a+bx^3)^3}\,dx$

Optimal. Leaf size=151

$$-\frac{5\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{54a^{8/3}\sqrt[3]{b}}+\frac{5\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{27a^{8/3}\sqrt[3]{b}}-\frac{5\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{8/3}\sqrt[3]{b}}+\frac{5x}{18a^2\left(a+bx^3\right)}+\frac{x}{6a\left(a+bx^3\right)^2}$$

```
[Out] x/(6*a*(a + b*x^3)^2) + (5*x)/(18*a^2*(a + b*x^3)) - (5*ArcTan[(a
^(1/3) - 2*b^(1/3)*x)/(Sqrt[3]*a^(1/3))])/(9*Sqrt[3]*a^(8/3)*b^(1
/3)) + (5*Log[a^(1/3) + b^(1/3)*x])/(27*a^(8/3)*b^(1/3)) - (5*Log
[a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2])/(54*a^(8/3)*b^(1/3))
```

Rubi [A] time = 0.158257, antiderivative size = 151, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.778

$$-\frac{5\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{54a^{8/3}\sqrt[3]{b}}+\frac{5\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{27a^{8/3}\sqrt[3]{b}}-\frac{5\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{8/3}\sqrt[3]{b}}+\frac{5x}{18a^2\left(a+bx^3\right)}+\frac{x}{6a\left(a+bx^3\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^(-3),x]
```

```
[Out] x/(6*a*(a + b*x^3)^2) + (5*x)/(18*a^2*(a + b*x^3)) - (5*ArcTan[(a
^(1/3) - 2*b^(1/3)*x)/(Sqrt[3]*a^(1/3))])/(9*Sqrt[3]*a^(8/3)*b^(1
/3)) + (5*Log[a^(1/3) + b^(1/3)*x])/(27*a^(8/3)*b^(1/3)) - (5*Log
[a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2])/(54*a^(8/3)*b^(1/3))
```

Rubi in Sympy [A] time = 34.1366, size = 143, normalized size = 0.95

$$\frac{x}{6a\left(a+bx^3\right)^2}+\frac{5x}{18a^2\left(a+bx^3\right)}+\frac{5\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{27a^{\frac{8}{3}}\sqrt[3]{b}}-\frac{5\log\left(a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2\right)}{54a^{\frac{8}{3}}\sqrt[3]{b}}-\frac{5\sqrt{3}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}-\frac{2\sqrt[3]{b}x}{3}\right)}{\sqrt[3]{a}}\right)}{27a^{\frac{8}{3}}\sqrt[3]{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**3+a)**3,x)
```

```
[Out] x/(6*a*(a + b*x**3)**2) + 5*x/(18*a**2*(a + b*x**3)) + 5*log(a**(
1/3) + b**(1/3)*x)/(27*a**(8/3)*b**(1/3)) - 5*log(a**(2/3) - a**(
1/3)*b**(1/3)*x + b**(2/3)*x**2)/(54*a**(8/3)*b**(1/3)) - 5*sqrt(
3)*atan(sqrt(3)*(a**(1/3)/3 - 2*b**(1/3)*x/3)/a**(1/3))/(27*a**(8
/3)*b**(1/3))
```

Mathematica [A] time = 0.121147, size = 135, normalized size = 0.89

$$\frac{-\frac{5\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{\sqrt[3]{b}}+\frac{9a^{5/3}x}{\left(a+bx^3\right)^2}+\frac{15a^{2/3}x}{a+bx^3}+\frac{10\log\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\sqrt[3]{b}}-\frac{10\sqrt{3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{b}x}{\sqrt[3]{a}}}{\sqrt{3}}\right)}{\sqrt[3]{b}}}{54a^{8/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^(-3),x]
```

```
[Out] ((9*a^(5/3)*x)/(a + b*x^3)^2 + (15*a^(2/3)*x)/(a + b*x^3) - (10*S
qrt[3]*ArcTan[(1 - (2*b^(1/3)*x)/a^(1/3))/Sqrt[3]])/b^(1/3) + (10
*Log[a^(1/3) + b^(1/3)*x])/b^(1/3) - (5*Log[a^(2/3) - a^(1/3)*b^(
1/3)*x + b^(2/3)*x^2])/b^(1/3))/(54*a^(8/3))
```

Maple [A] time = 0.006, size = 130, normalized size = 0.9

$$\frac{x}{6a(bx^3+a)^2}+\frac{5x}{18a^2(bx^3+a)}+\frac{5}{27a^2b}\ln\left(x+\sqrt[3]{\frac{a}{b}}\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}-\frac{5}{54a^2b}\ln\left(x^2-x\sqrt[3]{\frac{a}{b}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}+\frac{5\sqrt{3}}{27a^2b}\arctan\left(\frac{\sqrt{3}}{3}\left(2x\frac{1}{\sqrt[3]{\frac{a}{b}}}-1\right)\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^3+a)^3,x)
```

```
[Out] 1/6*x/a/(b*x^3+a)^2+5/18*x/a^2/(b*x^3+a)+5/27/a^2/b/(a/b)^(2/3)*l
n(x+(a/b)^(1/3))-5/54/a^2/b/(a/b)^(2/3)*ln(x^2-x*(a/b)^(1/3)+(a/b
)^(2/3))+5/27/a^2/b/(a/b)^(2/3)*3^(1/2)*arctan(1/3*3^(1/2)*(2/(a/
b)^(1/3)*x-1))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(-3),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.239543, size = 259, normalized size = 1.72

$$-\frac{\sqrt{3}\left(5\sqrt{3}\left(b^2x^6+2abx^3+a^2\right)\log\left(\left(a^2b\right)^{\frac{2}{3}}x^2-\left(a^2b\right)^{\frac{1}{3}}ax+a^2\right)-10\sqrt{3}\left(b^2x^6+2abx^3+a^2\right)\log\left(\left(a^2b\right)^{\frac{1}{3}}x+a\right)-30\left(b^2\right.\right.}{162\left(a^2b^2x^6+2a^3bx^3+a^4\right)\left(a^2b\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(-3),x, algorithm="fricas")
```

```
[Out] -1/162*sqrt(3)*(5*sqrt(3)*(b^2*x^6 + 2*a*b*x^3 + a^2)*log((a^2*b)
^(2/3)*x^2 - (a^2*b)^(1/3)*a*x + a^2) - 10*sqrt(3)*(b^2*x^6 + 2*a
*b*x^3 + a^2)*log((a^2*b)^(1/3)*x + a) - 30*(b^2*x^6 + 2*a*b*x^3
+ a^2)*arctan(1/3*(2*sqrt(3)*(a^2*b)^(1/3)*x - sqrt(3)*a)/a) - 3*
sqrt(3)*(5*b*x^4 + 8*a*x)*(a^2*b)^(1/3))/((a^2*b^2*x^6 + 2*a^3*b*
x^3 + a^4)*(a^2*b)^(1/3))
```

Sympy [A] time = 2.44892, size = 63, normalized size = 0.42

$$\frac{8ax + 5bx^4}{18a^4 + 36a^3bx^3 + 18a^2b^2x^6} + \text{RootSum}\left(19683t^3a^8b - 125, \left(t \mapsto t\log\left(\frac{27ta^3}{5} + x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**3+a)**3,x)
```

```
[Out] (8*a*x + 5*b*x**4)/(18*a**4 + 36*a**3*b*x**3 + 18*a**2*b**2*x**6)
 + RootSum(19683*_t**3*a**8*b - 125, Lambda(_t, _t*log(27*_t*a**3
/5 + x)))
```

GIAC/XCAS [A] time = 0.249143, size = 185, normalized size = 1.23

$$-\frac{5\left(-\frac{a}{b}\right)^{\frac{1}{3}}\ln\left(\left|x-\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right|\right)}{27\,a^3}+\frac{5\sqrt{3}\left(-ab^2\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{a}{b}\right)^{\frac{1}{3}}}\right)}{27\,a^3b}+\frac{5\left(-ab^2\right)^{\frac{1}{3}}\ln\left(x^2+x\left(-\frac{a}{b}\right)^{\frac{1}{3}}+\left(-\frac{a}{b}\right)^{\frac{2}{3}}\right)}{54\,a^3b}+\frac{5\,bx^4+8\,ax}{18\left(bx^3+a\right)^2a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(-3),x, algorithm="giac")
```

```
[Out] -5/27*(-a/b)^(1/3)*ln(abs(x - (-a/b)^(1/3)))/a^3 + 5/27*sqrt(3)*(
-a*b^2)^(1/3)*arctan(1/3*sqrt(3)*(2*x + (-a/b)^(1/3))/(-a/b)^(1/3
))/(a^3*b) + 5/54*(-a*b^2)^(1/3)*ln(x^2 + x*(-a/b)^(1/3) + (-a/b)
^(2/3))/(a^3*b) + 1/18*(5*b*x^4 + 8*a*x)/((b*x^3 + a)^2*a^2)
```

3.352 $\int \frac{x^8}{a-bx^3}\,dx$

Optimal. Leaf size=41

$$-\frac{a^2\log\left(a-bx^3\right)}{3b^3}-\frac{ax^3}{3b^2}-\frac{x^6}{6b}$$

```
[Out] -(a*x^3)/(3*b^2) - x^6/(6*b) - (a^2*Log[a - b*x^3])/(3*b^3)
```

Rubi [A] time = 0.0724208, antiderivative size = 41, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$-\frac{a^2\log\left(a-bx^3\right)}{3b^3}-\frac{ax^3}{3b^2}-\frac{x^6}{6b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8/(a - b*x^3),x]
```

```
[Out] -(a*x^3)/(3*b^2) - x^6/(6*b) - (a^2*Log[a - b*x^3])/(3*b^3)
```

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

$$-\frac{a^2\log\left(a-bx^3\right)}{3b^3}-\frac{\int^{x^3} x\,dx}{3b}-\frac{\int^{x^3} a\,dx}{3b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8/(-b*x**3+a),x)
```

```
[Out] -a**2*log(a - b*x**3)/(3*b**3) - Integral(x, (x, x**3))/(3*b) - I
ntegral(a, (x, x**3))/(3*b**2)
```

Mathematica [A] time = 0.0125734, size = 41, normalized size = 1.

$$-\frac{a^2\log\left(a-bx^3\right)}{3b^3}-\frac{ax^3}{3b^2}-\frac{x^6}{6b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8/(a - b*x^3),x]
```

```
[Out] -(a*x^3)/(3*b^2) - x^6/(6*b) - (a^2*Log[a - b*x^3])/(3*b^3)
```

Maple [A] time = 0.004, size = 37, normalized size = 0.9

$$-\frac{x^6}{6\,b}-\frac{ax^3}{3\,b^2}-\frac{a^2\ln\left(bx^3-a\right)}{3\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8/(-b*x^3+a),x)
```

```
[Out] -1/6*x^6/b-1/3*a*x^3/b^2-1/3*a^2/b^3*ln(b*x^3-a)
```

Maxima [A] time = 1.43897, size = 49, normalized size = 1.2

$$-\frac{a^2 \log\left(bx^3 - a\right)}{3\,b^3} - \frac{bx^6 + 2\,ax^3}{6\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^8/(b*x^3 - a),x, algorithm="maxima")
```

```
[Out] -1/3*a^2*log(b*x^3 - a)/b^3 - 1/6*(b*x^6 + 2*a*x^3)/b^2
```

Fricas [A] time = 0.278301, size = 47, normalized size = 1.15

$$-\frac{b^2x^6 + 2\,abx^3 + 2\,a^2 \log\left(bx^3 - a\right)}{6\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^8/(b*x^3 - a),x, algorithm="fricas")
```

```
[Out] -1/6*(b^2*x^6 + 2*a*b*x^3 + 2*a^2*log(b*x^3 - a))/b^3
```

Sympy [A] time = 1.34021, size = 34, normalized size = 0.83

$$-\frac{a^2 \log\left(-a + bx^3\right)}{3b^3} - \frac{ax^3}{3b^2} - \frac{x^6}{6b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8/(-b*x**3+a),x)
```

```
[Out] -a**2*log(-a + b*x**3)/(3*b**3) - a*x**3/(3*b**2) - x**6/(6*b)
```

GIAC/XCAS [A] time = 0.245768, size = 50, normalized size = 1.22

$$-\frac{a^2 \ln\left(\left|bx^3 - a\right|\right)}{3\,b^3} - \frac{bx^6 + 2\,ax^3}{6\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^8/(b*x^3 - a),x, algorithm="giac")
```

```
[Out] -1/3*a^2*ln(abs(b*x^3 - a))/b^3 - 1/6*(b*x^6 + 2*a*x^3)/b^2
```

3.353 $\int \frac{x^5}{a-bx^3} \, dx$

Optimal. Leaf size=28

$$-\frac{a \log \left(a-bx^3\right)}{3b^2}-\frac{x^3}{3b}$$

```
[Out] -x^3/(3*b) - (a*Log[a - b*x^3])/(3*b^2)
```

Rubi [A] time = 0.0492844, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$

$$-\frac{a \log \left(a-bx^3\right)}{3b^2}-\frac{x^3}{3b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/(a - b*x^3),x]

[Out] -x^3/(3*b) - (a*Log[a - b*x^3])/(3*b^2)
```

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

$$-\frac{a \log \left(a-bx^3\right)}{3b^2}-\frac{\int^{x^3} \frac{1}{b} \, dx}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(-b*x**3+a),x)

[Out] -a*log(a - b*x**3)/(3*b**2) - Integral(1/b, (x, x**3))/3
```

Mathematica [A] time = 0.00812949, size = 28, normalized size = 1.

$$-\frac{a \log \left(a-bx^3\right)}{3b^2}-\frac{x^3}{3b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/(a - b*x^3),x]

[Out] -x^3/(3*b) - (a*Log[a - b*x^3])/(3*b^2)
```

Maple [A] time = 0.003, size = 26, normalized size = 0.9

$$-\frac{x^3}{3\,b}-\frac{a \ln \left(bx^3-a\right)}{3\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(-b*x^3+a),x)

[Out] -1/3*x^3/b-1/3*a/b^2*ln(b*x^3-a)
```

Maxima [A] time = 1.43349, size = 34, normalized size = 1.21

$$-\frac{x^3}{3\,b} - \frac{a\log\left(bx^3 - a\right)}{3\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^5/(b*x^3 - a),x, algorithm="maxima")
```

```
[Out] -1/3*x^3/b - 1/3*a*log(b*x^3 - a)/b^2
```

Fricas [A] time = 0.241833, size = 31, normalized size = 1.11

$$-\frac{bx^3 + a\log\left(bx^3 - a\right)}{3\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^5/(b*x^3 - a),x, algorithm="fricas")
```

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

Sympy [A] time = 1.26995, size = 22, normalized size = 0.79

$$-\frac{a\log\left(-a + bx^3\right)}{3b^2} - \frac{x^3}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(-b*x**3+a),x)
```

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

GIAC/XCAS [A] time = 0.241904, size = 35, normalized size = 1.25

$$-\frac{x^3}{3\,b} - \frac{a\ln\left(\left|bx^3 - a\right|\right)}{3\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^5/(b*x^3 - a),x, algorithm="giac")
```

```
[Out] -1/3*x^3/b - 1/3*a*ln(abs(b*x^3 - a))/b^2
```

3.354 $\int \frac{x^2}{a-bx^3} dx$

Optimal. Leaf size=16

$$-\frac{\log(a-bx^3)}{3b}$$

```
[Out] -Log[a - b*x^3]/(3*b)
```

Rubi [A] time = 0.00930703, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}} = 0.071$

$$-\frac{\log(a-bx^3)}{3b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a - b*x^3),x]

[Out] -Log[a - b*x^3]/(3*b)
```

Rubi in Sympy [A] time = 2.43986, size = 12, normalized size = 0.75

$$-\frac{\log(a-bx^3)}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] -log(a - b*x**3)/(3*b)
```

Mathematica [A] time = 0.00482246, size = 16, normalized size = 1.

$$-\frac{\log(a-bx^3)}{3b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a - b*x^3),x]

[Out] -Log[a - b*x^3]/(3*b)
```

Maple [A] time = 0.002, size = 16, normalized size = 1.

$$-\frac{\ln(bx^3-a)}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] -1/3/b*ln(b*x^3-a)
```

Maxima [A] time = 1.4387, size = 20, normalized size = 1.25

$$-\frac{\log\left(bx^3 - a\right)}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/3*log(b*x^3 - a)/b
```

Fricas [A] time = 0.221694, size = 20, normalized size = 1.25

$$-\frac{\log\left(bx^3 - a\right)}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/3*log(b*x^3 - a)/b
```

Sympy [A] time = 0.326634, size = 12, normalized size = 0.75

$$-\frac{\log\left(-a + bx^3\right)}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -log(-a + b*x**3)/(3*b)
```

GIAC/XCAS [A] time = 0.240908, size = 22, normalized size = 1.38

$$-\frac{\ln\left(\left|bx^3 - a\right|\right)}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/3*ln(abs(b*x^3 - a))/b
```

3.355 $\int \frac{1}{x(a-bx^3)}\,dx$

Optimal. Leaf size=23

$$\frac{\log(x)}{a}-\frac{\log\left(a-bx^3\right)}{3a}$$

```
[Out] Log[x]/a - Log[a - b*x^3]/(3*a)
```

Rubi [A] time = 0.0339012, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286

$$\frac{\log(x)}{a}-\frac{\log\left(a-bx^3\right)}{3a}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a - b*x^3)),x]

[Out] Log[x]/a - Log[a - b*x^3]/(3*a)
```

Rubi in Sympy [A] time = 6.21322, size = 19, normalized size = 0.83

$$\frac{\log\left(x^3\right)}{3a}-\frac{\log\left(a-bx^3\right)}{3a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(-b*x**3+a),x)

[Out] log(x**3)/(3*a) - log(a - b*x**3)/(3*a)
```

Mathematica [A] time = 0.0112752, size = 23, normalized size = 1.

$$\frac{\log(x)}{a}-\frac{\log\left(a-bx^3\right)}{3a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a - b*x^3)),x]

[Out] Log[x]/a - Log[a - b*x^3]/(3*a)
```

Maple [A] time = 0.005, size = 23, normalized size = 1.

$$\frac{\ln(x)}{a}-\frac{\ln\left(bx^3-a\right)}{3\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(-b*x^3+a),x)

[Out] ln(x)/a-1/3/a*ln(b*x^3-a)
```

Maxima [A] time = 1.43427, size = 34, normalized size = 1.48

$$-\frac{\log\left(bx^3-a\right)}{3\,a}+\frac{\log\left(x^3\right)}{3\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((b*x^3 - a)*x),x, algorithm="maxima")
```

```
[Out] -1/3*log(b*x^3 - a)/a + 1/3*log(x^3)/a
```

Fricas [A] time = 0.241599, size = 27, normalized size = 1.17

$$-\frac{\log\left(bx^3-a\right)-3\,\log\left(x\right)}{3\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((b*x^3 - a)*x),x, algorithm="fricas")
```

```
[Out] -1/3*(log(b*x^3 - a) - 3*log(x))/a
```

Sympy [A] time = 0.667913, size = 15, normalized size = 0.65

$$\frac{\log\left(x\right)}{a}-\frac{\log\left(-\frac{a}{b}+x^3\right)}{3a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(-b*x**3+a),x)
```

```
[Out] log(x)/a - log(-a/b + x**3)/(3*a)
```

GIAC/XCAS [A] time = 0.242507, size = 32, normalized size = 1.39

$$-\frac{\ln\left(\left|bx^3-a\right|\right)}{3\,a}+\frac{\ln\left(\left|x\right|\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((b*x^3 - a)*x),x, algorithm="giac")
```

```
[Out] -1/3*ln(abs(b*x^3 - a))/a + ln(abs(x))/a
```

3.356 $\int \frac{1}{x^4(a-bx^3)}\,dx$

Optimal. Leaf size=35

$$-\frac{b\log\left(a-bx^3\right)}{3a^2}+\frac{b\log(x)}{a^2}-\frac{1}{3ax^3}$$

```
[Out] -1/(3*a*x^3) + (b*Log[x])/a^2 - (b*Log[a - b*x^3])/(3*a^2)
```

Rubi [A] time = 0.0547398, antiderivative size = 35, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$-\frac{b\log\left(a-bx^3\right)}{3a^2}+\frac{b\log(x)}{a^2}-\frac{1}{3ax^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*(a - b*x^3)),x]
```

```
[Out] -1/(3*a*x^3) + (b*Log[x])/a^2 - (b*Log[a - b*x^3])/(3*a^2)
```

Rubi in Sympy [A] time = 8.91449, size = 34, normalized size = 0.97

$$-\frac{1}{3ax^3}+\frac{b\log\left(x^3\right)}{3a^2}-\frac{b\log\left(a-bx^3\right)}{3a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(-b*x**3+a),x)
```

```
[Out] -1/(3*a*x**3) + b*log(x**3)/(3*a**2) - b*log(a - b*x**3)/(3*a**2)
```

Mathematica [A] time = 0.0146619, size = 35, normalized size = 1.

$$-\frac{b\log\left(a-bx^3\right)}{3a^2}+\frac{b\log(x)}{a^2}-\frac{1}{3ax^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*(a - b*x^3)),x]
```

```
[Out] -1/(3*a*x^3) + (b*Log[x])/a^2 - (b*Log[a - b*x^3])/(3*a^2)
```

Maple [A] time = 0.009, size = 33, normalized size = 0.9

$$-\frac{1}{3\,ax^3}+\frac{b\ln(x)}{a^2}-\frac{b\ln\left(bx^3-a\right)}{3\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(-b*x^3+a),x)
```

```
[Out] -1/3/a/x^3+b*ln(x)/a^2-1/3*b/a^2*ln(b*x^3-a)
```

Maxima [A] time = 1.45052, size = 47, normalized size = 1.34

$$-\frac{b\log\left(bx^3-a\right)}{3\,a^2}+\frac{b\log\left(x^3\right)}{3\,a^2}-\frac{1}{3\,ax^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((b*x^3 - a)*x^4),x, algorithm="maxima")
```

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

Fricas [A] time = 0.257425, size = 45, normalized size = 1.29

$$-\frac{bx^3\log\left(bx^3-a\right)-3\,bx^3\log\left(x\right)+a}{3\,a^2x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((b*x^3 - a)*x^4),x, algorithm="fricas")
```

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

Sympy [A] time = 1.83954, size = 31, normalized size = 0.89

$$-\frac{1}{3ax^3}+\frac{b\log\left(x\right)}{a^2}-\frac{b\log\left(-\frac{a}{b}+x^3\right)}{3a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(-b*x**3+a),x)
```

```
[Out] -1/(3*a*x**3) + b*log(x)/a**2 - b*log(-a/b + x**3)/(3*a**2)
```

GIAC/XCAS [A] time = 0.25075, size = 55, normalized size = 1.57

$$-\frac{b\ln\left(\left|bx^3-a\right|\right)}{3\,a^2}+\frac{b\ln\left(\left|x\right|\right)}{a^2}-\frac{bx^3+a}{3\,a^2x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((b*x^3 - a)*x^4),x, algorithm="giac")
```

```
[Out] -1/3*b*ln(abs(b*x^3 - a))/a^2 + b*ln(abs(x))/a^2 - 1/3*(b*x^3 + a
)/(a^2*x^3)
```

3.357 $\int \frac{x^4}{a-bx^3}\,dx$

Optimal. Leaf size=125

$$\frac{a^{2/3}\log\left(a^{2/3}+\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{6b^{5/3}}-\frac{a^{2/3}\log\left(\sqrt[3]{a}-\sqrt[3]{b}x\right)}{3b^{5/3}}-\frac{a^{2/3}\tan^{-1}\left(\frac{\sqrt[3]{a}+2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}b^{5/3}}-\frac{x^2}{2b}$$

```
[Out] -x^2/(2*b) - (a^(2/3)*ArcTan[(a^(1/3) + 2*b^(1/3)*x)/(Sqrt[3]*a^(
1/3))])/(Sqrt[3]*b^(5/3)) - (a^(2/3)*Log[a^(1/3) - b^(1/3)*x])/(3
*b^(5/3)) + (a^(2/3)*Log[a^(2/3) + a^(1/3)*b^(1/3)*x + b^(2/3)*x^
2])/(6*b^(5/3))
```

Rubi [A] time = 0.153958, antiderivative size = 125, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5

$$\frac{a^{2/3}\log\left(a^{2/3}+\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{6b^{5/3}}-\frac{a^{2/3}\log\left(\sqrt[3]{a}-\sqrt[3]{b}x\right)}{3b^{5/3}}-\frac{a^{2/3}\tan^{-1}\left(\frac{\sqrt[3]{a}+2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}b^{5/3}}-\frac{x^2}{2b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a - b*x^3),x]
```

```
[Out] -x^2/(2*b) - (a^(2/3)*ArcTan[(a^(1/3) + 2*b^(1/3)*x)/(Sqrt[3]*a^(
1/3))])/(Sqrt[3]*b^(5/3)) - (a^(2/3)*Log[a^(1/3) - b^(1/3)*x])/(3
*b^(5/3)) + (a^(2/3)*Log[a^(2/3) + a^(1/3)*b^(1/3)*x + b^(2/3)*x^
2])/(6*b^(5/3))
```

Rubi in Sympy [A] time = 30.4006, size = 116, normalized size = 0.93

$$-\frac{a^{\frac{2}{3}}\log\left(\sqrt[3]{a}-\sqrt[3]{b}x\right)}{3b^{\frac{5}{3}}}+\frac{a^{\frac{2}{3}}\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2\right)}{6b^{\frac{5}{3}}}-\frac{\sqrt{3}a^{\frac{2}{3}}\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\frac{2\sqrt[3]{b}x}{3}\right)}{\sqrt[3]{a}}\right)}{3b^{\frac{5}{3}}}-\frac{x^2}{2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(-b*x**3+a),x)
```

```
[Out] -a**(2/3)*log(a**(1/3) - b**(1/3)*x)/(3*b**(5/3)) + a**(2/3)*log(
a**(2/3) + a**(1/3)*b**(1/3)*x + b**(2/3)*x**2)/(6*b**(5/3)) - sq
rt(3)*a**(2/3)*atan(sqrt(3)*(a**(1/3)/3 + 2*b**(1/3)*x/3)/a**(1/3
))/(3*b**(5/3)) - x**2/(2*b)
```

Mathematica [A] time = 0.0698926, size = 111, normalized size = 0.89

$$-\frac{-a^{2/3}\log\left(a^{2/3}+\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)+2a^{2/3}\log\left(\sqrt[3]{a}-\sqrt[3]{b}x\right)+2\sqrt{3}a^{2/3}\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a}}+1}{\sqrt{3}}\right)+3b^{2/3}x^2}{6b^{5/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(a - b*x^3),x]
```

```
[Out] -(3*b^(2/3)*x^2 + 2*Sqrt[3]*a^(2/3)*ArcTan[(1 + (2*b^(1/3)*x)/a^(
1/3))/Sqrt[3]] + 2*a^(2/3)*Log[a^(1/3) - b^(1/3)*x] - a^(2/3)*Log
[a^(2/3) + a^(1/3)*b^(1/3)*x + b^(2/3)*x^2])/(6*b^(5/3))
```

Maple [A] time = 0.007, size = 103, normalized size = 0.8

$$-\frac{x^2}{2b}-\frac{a}{3b^2}\ln\left(x-\sqrt[3]{\frac{a}{b}}\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}+\frac{a}{6b^2}\ln\left(x^2+x\sqrt[3]{\frac{a}{b}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}-\frac{a\sqrt{3}}{3b^2}\arctan\left(\frac{\sqrt{3}}{3}\left(2x\frac{1}{\sqrt[3]{\frac{a}{b}}}+1\right)\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(-b*x^3+a),x)
```

```
[Out] -1/2*x^2/b-1/3*a/b^2/(a/b)^(1/3)*ln(x-(a/b)^(1/3))+1/6*a/b^2/(a/b
)^(1/3)*ln(x^2+x*(a/b)^(1/3)+(a/b)^(2/3))-1/3*a/b^2*3^(1/2)/(a/b)
^(1/3)*arctan(1/3*3^(1/2)*(2/(a/b)^(1/3)*x+1))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^4/(b*x^3 - a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.233852, size = 200, normalized size = 1.6

$$-\frac{\sqrt{3}\left(3\sqrt{3}x^2+\sqrt{3}\left(-\frac{a^2}{b^2}\right)^{\frac{1}{3}}\log\left(ax^2+bx\left(-\frac{a^2}{b^2}\right)^{\frac{2}{3}}-a\left(-\frac{a^2}{b^2}\right)^{\frac{1}{3}}\right)-2\sqrt{3}\left(-\frac{a^2}{b^2}\right)^{\frac{1}{3}}\log\left(ax-b\left(-\frac{a^2}{b^2}\right)^{\frac{2}{3}}\right)-6\left(-\frac{a^2}{b^2}\right)^{\frac{1}{3}}\arctan\left(\right.\right.}{18b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^4/(b*x^3 - a),x, algorithm="fricas")
```

```
[Out] -1/18*sqrt(3)*(3*sqrt(3)*x^2 + sqrt(3)*(-a^2/b^2)^(1/3)*log(a*x^2
 + b*x*(-a^2/b^2)^(2/3) - a*(-a^2/b^2)^(1/3)) - 2*sqrt(3)*(-a^2/b
^2)^(1/3)*log(a*x - b*(-a^2/b^2)^(2/3)) - 6*(-a^2/b^2)^(1/3)*arct
an(1/3*(2*sqrt(3)*a*x + sqrt(3)*b*(-a^2/b^2)^(2/3))/(b*(-a^2/b^2)
^(2/3))))/b
```

Sympy [A] time = 1.25902, size = 34, normalized size = 0.27

$$-\operatorname{RootSum}\left(27t^3b^5-a^2,\left(t\mapsto t\log\left(-\frac{9t^2b^3}{a}+x\right)\right)\right)-\frac{x^2}{2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(-b*x**3+a),x)
```

```
[Out] -RootSum(27*_t**3*b**5 - a**2, Lambda(_t, _t*log(-9*_t**2*b**3/a
+ x))) - x**2/(2*b)
```

GIAC/XCAS [A] time = 0.236371, size = 143, normalized size = 1.14

$$-\frac{x^2}{2\,b}-\frac{\left(\frac{a}{b}\right)^{\frac{2}{3}}\ln\left(\left|x-\left(\frac{a}{b}\right)^{\frac{1}{3}}\right|\right)}{3\,b}-\frac{\sqrt{3}\left(ab^2\right)^{\frac{2}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(\frac{a}{b}\right)^{\frac{1}{3}}\right)}{3\left(\frac{a}{b}\right)^{\frac{1}{3}}}\right)}{3\,b^3}+\frac{\left(ab^2\right)^{\frac{2}{3}}\ln\left(x^2+x\left(\frac{a}{b}\right)^{\frac{1}{3}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)}{6\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^4/(b*x^3 - a),x, algorithm="giac")
```

```
[Out] -1/2*x^2/b - 1/3*(a/b)^(2/3)*ln(abs(x - (a/b)^(1/3)))/b - 1/3*sqr
t(3)*(a*b^2)^(2/3)*arctan(1/3*sqrt(3)*(2*x + (a/b)^(1/3))/(a/b)^(
1/3))/b^3 + 1/6*(a*b^2)^(2/3)*ln(x^2 + x*(a/b)^(1/3) + (a/b)^(2/3
))/b^3
```

3.358 $\int \frac{x^3}{a-bx^3}\,dx$

Optimal. Leaf size=120

$$\frac{\sqrt[3]{a}\log\left(a^{2/3}+\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{6b^{4/3}}-\frac{\sqrt[3]{a}\log\left(\sqrt[3]{a}-\sqrt[3]{b}x\right)}{3b^{4/3}}+\frac{\sqrt[3]{a}\tan^{-1}\left(\frac{\sqrt[3]{a}+2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}b^{4/3}}-\frac{x}{b}$$

```
[Out] -(x/b) + (a^(1/3)*ArcTan[(a^(1/3) + 2*b^(1/3)*x)/(Sqrt[3]*a^(1/3)
)])/(Sqrt[3]*b^(4/3)) - (a^(1/3)*Log[a^(1/3) - b^(1/3)*x])/(3*b^(
4/3)) + (a^(1/3)*Log[a^(2/3) + a^(1/3)*b^(1/3)*x + b^(2/3)*x^2])/
(6*b^(4/3))
```

Rubi [A] time = 0.13795, antiderivative size = 120, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5

$$\frac{\sqrt[3]{a}\log\left(a^{2/3}+\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{6b^{4/3}}-\frac{\sqrt[3]{a}\log\left(\sqrt[3]{a}-\sqrt[3]{b}x\right)}{3b^{4/3}}+\frac{\sqrt[3]{a}\tan^{-1}\left(\frac{\sqrt[3]{a}+2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}b^{4/3}}-\frac{x}{b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(a - b*x^3),x]
```


```
[Out] -(x/b) + (a^(1/3)*ArcTan[(a^(1/3) + 2*b^(1/3)*x)/(Sqrt[3]*a^(1/3)
)])/(Sqrt[3]*b^(4/3)) - (a^(1/3)*Log[a^(1/3) - b^(1/3)*x])/(3*b^(
4/3)) + (a^(1/3)*Log[a^(2/3) + a^(1/3)*b^(1/3)*x + b^(2/3)*x^2])/
(6*b^(4/3))
```

Rubi in Sympy [A] time = 28.1144, size = 112, normalized size = 0.93

$$-\frac{\sqrt[3]{a}\log\left(\sqrt[3]{a}-\sqrt[3]{b}x\right)}{3b^{\frac{4}{3}}}+\frac{\sqrt[3]{a}\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2\right)}{6b^{\frac{4}{3}}}+\frac{\sqrt{3}\sqrt[3]{a}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\frac{2\sqrt[3]{b}x}{3}\right)}{\sqrt[3]{a}}\right)}{3b^{\frac{4}{3}}}-\frac{x}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(-b*x**3+a),x)
```

```
[Out] -a**(1/3)*log(a**(1/3) - b**(1/3)*x)/(3*b**(4/3)) + a**(1/3)*log(
a**(2/3) + a**(1/3)*b**(1/3)*x + b**(2/3)*x**2)/(6*b**(4/3)) + sq
rt(3)*a**(1/3)*atan(sqrt(3)*(a**(1/3)/3 + 2*b**(1/3)*x/3)/a**(1/3
))/(3*b**(4/3)) - x/b
```

Mathematica [A] time = 0.0291933, size = 108, normalized size = 0.9

$$\frac{\sqrt[3]{a}\log\left(a^{2/3}+\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)-2\sqrt[3]{a}\log\left(\sqrt[3]{a}-\sqrt[3]{b}x\right)+2\sqrt{3}\sqrt[3]{a}\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a}}+1}{\sqrt{3}}\right)-6\sqrt[3]{b}x}{6b^{4/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(a - b*x^3),x]
```

```
[Out] (-6*b^(1/3)*x + 2*Sqrt[3]*a^(1/3)*ArcTan[(1 + (2*b^(1/3)*x)/a^(1/
3))/Sqrt[3]] - 2*a^(1/3)*Log[a^(1/3) - b^(1/3)*x] + a^(1/3)*Log[a
^(2/3) + a^(1/3)*b^(1/3)*x + b^(2/3)*x^2])/(6*b^(4/3))
```

Maple [A] time = 0.004, size = 101, normalized size = 0.8

$$-\frac{x}{b}-\frac{a}{3\,b^{2}}\ln\left(x-\sqrt[3]{\frac{a}{b}}\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}+\frac{a}{6\,b^{2}}\ln\left(x^{2}+x\sqrt[3]{\frac{a}{b}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}+\frac{a\sqrt{3}}{3\,b^{2}}\arctan\left(\frac{\sqrt{3}}{3}\left(2\,x\frac{1}{\sqrt[3]{\frac{a}{b}}}+1\right)\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -x/b-1/3*a/b^2/(a/b)^(2/3)*ln(x-(a/b)^(1/3))+1/6*a/b^2/(a/b)^(2/3
)*ln(x^2+x*(a/b)^(1/3)+(a/b)^(2/3))+1/3*a/b^2/(a/b)^(2/3)*3^(1/2)
*arctan(1/3*3^(1/2)*(2/(a/b)^(1/3)*x+1))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^3/(b*x^3 - a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.243661, size = 157, normalized size = 1.31

$$-\frac{\sqrt{3}\left(\sqrt{3}\left(-\frac{a}{b}\right)^{\frac{1}{3}}\log\left(x^{2}-x\left(-\frac{a}{b}\right)^{\frac{1}{3}}+\left(-\frac{a}{b}\right)^{\frac{2}{3}}\right)-2\,\sqrt{3}\left(-\frac{a}{b}\right)^{\frac{1}{3}}\log\left(x+\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right)+6\,\sqrt{3}x+6\,\left(-\frac{a}{b}\right)^{\frac{1}{3}}\arctan\left(-\frac{2\,\sqrt{3}x-\sqrt{3}\left(-\frac{a}{b}\right)^{\frac{1}{3}}}{3\left(-\frac{a}{b}\right)^{\frac{1}{3}}}\right.\right.}{18\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^3/(b*x^3 - a),x, algorithm="fricas")
```

```
[Out] -1/18*sqrt(3)*(sqrt(3)*(-a/b)^(1/3)*log(x^2 - x*(-a/b)^(1/3) + (-
a/b)^(2/3)) - 2*sqrt(3)*(-a/b)^(1/3)*log(x + (-a/b)^(1/3)) + 6*sq
rt(3)*x + 6*(-a/b)^(1/3)*arctan(-1/3*(2*sqrt(3)*x - sqrt(3)*(-a/b
)^(1/3))/(-a/b)^(1/3)))/b
```

Sympy [A] time = 1.25044, size = 24, normalized size = 0.2

$$-\operatorname{RootSum}\left(27t^{3}b^{4}-a,\left(t\mapsto t\log\left(-3tb+x\right)\right)\right)-\frac{x}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(-b*x**3+a),x)
```

```
[Out] -RootSum(27*_t**3*b**4 - a, Lambda(_t, _t*log(-3*_t*b + x))) - x/
b
```

GIAC/XCAS [A] time = 0.231407, size = 140, normalized size = 1.17

$$-\frac{\left(\frac{a}{b}\right)^{\frac{1}{3}}\ln\left(\left|x-\left(\frac{a}{b}\right)^{\frac{1}{3}}\right|\right)}{3\,b}-\frac{x}{b}+\frac{\sqrt{3}\left(ab^{2}\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(\frac{a}{b}\right)^{\frac{1}{3}}\right)}{3\left(\frac{a}{b}\right)^{\frac{1}{3}}}\right)}{3\,b^{2}}+\frac{\left(ab^{2}\right)^{\frac{1}{3}}\ln\left(x^{2}+x\left(\frac{a}{b}\right)^{\frac{1}{3}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)}{6\,b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^3/(b*x^3 - a),x, algorithm="giac")
```

```
[Out] -1/3*(a/b)^(1/3)*ln(abs(x - (a/b)^(1/3)))/b - x/b + 1/3*sqrt(3)*(
a*b^2)^(1/3)*arctan(1/3*sqrt(3)*(2*x + (a/b)^(1/3))/(a/b)^(1/3))/
b^2 + 1/6*(a*b^2)^(1/3)*ln(x^2 + x*(a/b)^(1/3) + (a/b)^(2/3))/b^2
```

3.359 $\int \frac{x}{a-bx^3}\,dx$

Optimal. Leaf size=115

$$\frac{\log\left(a^{2/3}+\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{6\sqrt[3]{a}b^{2/3}}-\frac{\log\left(\sqrt[3]{a}-\sqrt[3]{b}x\right)}{3\sqrt[3]{a}b^{2/3}}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}+2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}\sqrt[3]{a}b^{2/3}}$$

```
[Out] -(ArcTan[(a^(1/3) + 2*b^(1/3)*x)/(Sqrt[3]*a^(1/3))]/(Sqrt[3]*a^(1
/3)*b^(2/3))) - Log[a^(1/3) - b^(1/3)*x]/(3*a^(1/3)*b^(2/3)) + Lo
g[a^(2/3) + a^(1/3)*b^(1/3)*x + b^(2/3)*x^2]/(6*a^(1/3)*b^(2/3))
```

Rubi [A] time = 0.110498, antiderivative size = 115, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5

$$\frac{\log\left(a^{2/3}+\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{6\sqrt[3]{a}b^{2/3}}-\frac{\log\left(\sqrt[3]{a}-\sqrt[3]{b}x\right)}{3\sqrt[3]{a}b^{2/3}}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}+2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}\sqrt[3]{a}b^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a - b*x^3),x]
```

```
[Out] -(ArcTan[(a^(1/3) + 2*b^(1/3)*x)/(Sqrt[3]*a^(1/3))]/(Sqrt[3]*a^(1
/3)*b^(2/3))) - Log[a^(1/3) - b^(1/3)*x]/(3*a^(1/3)*b^(2/3)) + Lo
g[a^(2/3) + a^(1/3)*b^(1/3)*x + b^(2/3)*x^2]/(6*a^(1/3)*b^(2/3))
```

Rubi in Sympy [A] time = 24.7164, size = 109, normalized size = 0.95

$$-\frac{\log\left(\sqrt[3]{a}-\sqrt[3]{b}x\right)}{3\sqrt[3]{a}b^{\frac{2}{3}}}+\frac{\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2\right)}{6\sqrt[3]{a}b^{\frac{2}{3}}}-\frac{\sqrt{3}\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\frac{2\sqrt[3]{b}x}{3}\right)}{\sqrt[3]{a}}\right)}{3\sqrt[3]{a}b^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(-b*x**3+a),x)
```

```
[Out] -log(a**(1/3) - b**(1/3)*x)/(3*a**(1/3)*b**(2/3)) + log(a**(2/3)
+ a**(1/3)*b**(1/3)*x + b**(2/3)*x**2)/(6*a**(1/3)*b**(2/3)) - sq
rt(3)*atan(sqrt(3)*(a**(1/3)/3 + 2*b**(1/3)*x/3)/a**(1/3))/(3*a**
(1/3)*b**(2/3))
```

Mathematica [A] time = 0.0263807, size = 89, normalized size = 0.77

$$\frac{\log\left(a^{2/3}+\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)-2\log\left(\sqrt[3]{a}-\sqrt[3]{b}x\right)-2\sqrt{3}\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a}}+1}{\sqrt{3}}\right)}{6\sqrt[3]{a}b^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a - b*x^3),x]
```

```
[Out] (-2*Sqrt[3]*ArcTan[(1 + (2*b^(1/3)*x)/a^(1/3))/Sqrt[3]] - 2*Log[a
^(1/3) - b^(1/3)*x] + Log[a^(2/3) + a^(1/3)*b^(1/3)*x + b^(2/3)*x
^2])/(6*a^(1/3)*b^(2/3))
```

Maple [A] time = 0.003, size = 92, normalized size = 0.8

$$-\frac{1}{3b}\ln\left(x-\sqrt[3]{\frac{a}{b}}\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}+\frac{1}{6b}\ln\left(x^2+x\sqrt[3]{\frac{a}{b}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}-\frac{\sqrt{3}}{3b}\arctan\left(\frac{\sqrt{3}}{3}\left(2x\frac{1}{\sqrt[3]{\frac{a}{b}}}+1\right)\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/3/b/(a/b)^(1/3)*ln(x-(a/b)^(1/3))+1/6/b/(a/b)^(1/3)*ln(x^2+x*(
a/b)^(1/3)+(a/b)^(2/3))-1/3*3^(1/2)/b/(a/b)^(1/3)*arctan(1/3*3^(1
/2)*(2/(a/b)^(1/3)*x+1))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x/(b*x^3 - a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.222023, size = 136, normalized size = 1.18

$$-\frac{\sqrt{3}\left(\sqrt{3}\log\left(\left(-ab^2\right)^{\frac{1}{3}}bx^2-ab-\left(-ab^2\right)^{\frac{2}{3}}x\right)-2\sqrt{3}\log\left(-ab+\left(-ab^2\right)^{\frac{2}{3}}x\right)-6\arctan\left(\frac{\sqrt{3}ab+2\sqrt{3}\left(-ab^2\right)^{\frac{2}{3}}x}{3ab}\right)\right)}{18\left(-ab^2\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x/(b*x^3 - a),x, algorithm="fricas")
```

```
[Out] -1/18*sqrt(3)*(sqrt(3)*log((-a*b^2)^(1/3)*b*x^2 - a*b - (-a*b^2)^
(2/3)*x) - 2*sqrt(3)*log(-a*b + (-a*b^2)^(2/3)*x) - 6*arctan(1/3*
(sqrt(3)*a*b + 2*sqrt(3)*(-a*b^2)^(2/3)*x)/(a*b)))/(-a*b^2)^(1/3)
```

Sympy [A] time = 0.336863, size = 26, normalized size = 0.23

$$-\operatorname{RootSum}\left(27t^3ab^2-1,\left(t\mapsto t\log\left(-9t^2ab+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(-b*x**3+a),x)
```

```
[Out] -RootSum(27*_t**3*a*b**2 - 1, Lambda(_t, _t*log(-9*_t**2*a*b + x)
))
```

GIAC/XCAS [A] time = 0.252477, size = 140, normalized size = 1.22

$$-\frac{\left(\frac{a}{b}\right)^{\frac{2}{3}}\ln\left(\left|x-\left(\frac{a}{b}\right)^{\frac{1}{3}}\right|\right)}{3\,a}-\frac{\sqrt{3}\left(ab^{2}\right)^{\frac{2}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(\frac{a}{b}\right)^{\frac{1}{3}}\right)}{3\left(\frac{a}{b}\right)^{\frac{1}{3}}}\right)}{3\,ab^{2}}+\frac{\left(ab^{2}\right)^{\frac{2}{3}}\ln\left(x^{2}+x\left(\frac{a}{b}\right)^{\frac{1}{3}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)}{6\,ab^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x/(b*x^3 - a),x, algorithm="giac")
```

```
[Out] -1/3*(a/b)^(2/3)*ln(abs(x - (a/b)^(1/3)))/a - 1/3*sqrt(3)*(a*b^2)
^(2/3)*arctan(1/3*sqrt(3)*(2*x + (a/b)^(1/3))/(a/b)^(1/3))/(a*b^2
) + 1/6*(a*b^2)^(2/3)*ln(x^2 + x*(a/b)^(1/3) + (a/b)^(2/3))/(a*b^
2)
```

3.360 $\int \frac{1}{a-bx^3}\,dx$

Optimal. Leaf size=114

$$\frac{\log\left(a^{2/3}+\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{6a^{2/3}\sqrt[3]{b}}-\frac{\log\left(\sqrt[3]{a}-\sqrt[3]{b}x\right)}{3a^{2/3}\sqrt[3]{b}}+\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}+2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}a^{2/3}\sqrt[3]{b}}$$

```
[Out] ArcTan[(a^(1/3) + 2*b^(1/3)*x)/(Sqrt[3]*a^(1/3))]/(Sqrt[3]*a^(2/3
)*b^(1/3)) - Log[a^(1/3) - b^(1/3)*x]/(3*a^(2/3)*b^(1/3)) + Log[a
^(2/3) + a^(1/3)*b^(1/3)*x + b^(2/3)*x^2]/(6*a^(2/3)*b^(1/3))
```

Rubi [A] time = 0.102366, antiderivative size = 114, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.6

$$\frac{\log\left(a^{2/3}+\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{6a^{2/3}\sqrt[3]{b}}-\frac{\log\left(\sqrt[3]{a}-\sqrt[3]{b}x\right)}{3a^{2/3}\sqrt[3]{b}}+\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}+2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}a^{2/3}\sqrt[3]{b}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a - b*x^3)^(-1),x]
```

```
[Out] ArcTan[(a^(1/3) + 2*b^(1/3)*x)/(Sqrt[3]*a^(1/3))]/(Sqrt[3]*a^(2/3
)*b^(1/3)) - Log[a^(1/3) - b^(1/3)*x]/(3*a^(2/3)*b^(1/3)) + Log[a
^(2/3) + a^(1/3)*b^(1/3)*x + b^(2/3)*x^2]/(6*a^(2/3)*b^(1/3))
```

Rubi in Sympy [A] time = 22.0585, size = 109, normalized size = 0.96

$$-\frac{\log\left(\sqrt[3]{a}-\sqrt[3]{b}x\right)}{3a^{\frac{2}{3}}\sqrt[3]{b}}+\frac{\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2\right)}{6a^{\frac{2}{3}}\sqrt[3]{b}}+\frac{\sqrt{3}\,\text{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\frac{2\sqrt[3]{b}x}{3}\right)}{\sqrt[3]{a}}\right)}{3a^{\frac{2}{3}}\sqrt[3]{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(-b*x**3+a),x)
```

```
[Out] -log(a**(1/3) - b**(1/3)*x)/(3*a**(2/3)*b**(1/3)) + log(a**(2/3)
+ a**(1/3)*b**(1/3)*x + b**(2/3)*x**2)/(6*a**(2/3)*b**(1/3)) + sq
rt(3)*atan(sqrt(3)*(a**(1/3)/3 + 2*b**(1/3)*x/3)/a**(1/3))/(3*a**
(2/3)*b**(1/3))
```

Mathematica [A] time = 0.0192223, size = 89, normalized size = 0.78

$$\frac{\log\left(a^{2/3}+\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)-2\log\left(\sqrt[3]{a}-\sqrt[3]{b}x\right)+2\sqrt{3}\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a}}+1}{\sqrt{3}}\right)}{6a^{2/3}\sqrt[3]{b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a - b*x^3)^(-1),x]
```

```
[Out] (2*Sqrt[3]*ArcTan[(1 + (2*b^(1/3)*x)/a^(1/3))/Sqrt[3]] - 2*Log[a^
(1/3) - b^(1/3)*x] + Log[a^(2/3) + a^(1/3)*b^(1/3)*x + b^(2/3)*x^
2])/(6*a^(2/3)*b^(1/3))
```

Maple [A] time = 0.002, size = 92, normalized size = 0.8

$$-\frac{1}{3b}\ln\left(x-\sqrt[3]{\frac{a}{b}}\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}+\frac{1}{6b}\ln\left(x^2+x\sqrt[3]{\frac{a}{b}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}+\frac{\sqrt{3}}{3b}\arctan\left(\frac{\sqrt{3}}{3}\left(2x\frac{1}{\sqrt[3]{\frac{a}{b}}}+1\right)\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(-b*x^3+a),x)
```

```
[Out] -1/3/b/(a/b)^(2/3)*ln(x-(a/b)^(1/3))+1/6/b/(a/b)^(2/3)*ln(x^2+x*(
a/b)^(1/3)+(a/b)^(2/3))+1/3/b/(a/b)^(2/3)*3^(1/2)*arctan(1/3*3^(1
/2)*(2/(a/b)^(1/3)*x+1))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(b*x^3 - a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.220552, size = 127, normalized size = 1.11

$$-\frac{\sqrt{3}\left(\sqrt{3}\log\left(\left(-a^2b\right)^{\frac{2}{3}}x^2-\left(-a^2b\right)^{\frac{1}{3}}ax+a^2\right)-2\sqrt{3}\log\left(\left(-a^2b\right)^{\frac{1}{3}}x+a\right)-6\arctan\left(\frac{2\sqrt{3}\left(-a^2b\right)^{\frac{1}{3}}x-\sqrt{3}a}{3a}\right)\right)}{18\left(-a^2b\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(b*x^3 - a),x, algorithm="fricas")
```

```
[Out] -1/18*sqrt(3)*(sqrt(3)*log((-a^2*b)^(2/3)*x^2 - (-a^2*b)^(1/3)*a*
x + a^2) - 2*sqrt(3)*log((-a^2*b)^(1/3)*x + a) - 6*arctan(1/3*(2*
sqrt(3)*(-a^2*b)^(1/3)*x - sqrt(3)*a)/a))/(-a^2*b)^(1/3)
```

Sympy [A] time = 0.368792, size = 22, normalized size = 0.19

$$-\operatorname{RootSum}\left(27t^3a^2b-1,\left(t\mapsto t\log\left(-3ta+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(-b*x**3+a),x)
```

```
[Out] -RootSum(27*_t**3*a**2*b - 1, Lambda(_t, _t*log(-3*_t*a + x)))
```

GIAC/XCAS [A] time = 0.220828, size = 140, normalized size = 1.23

$$-\frac{\left(\frac{a}{b}\right)^{\frac{1}{3}}\ln\left(\left|x-\left(\frac{a}{b}\right)^{\frac{1}{3}}\right|\right)}{3\,a}+\frac{\sqrt{3}\left(ab^{2}\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(\frac{a}{b}\right)^{\frac{1}{3}}\right)}{3\left(\frac{a}{b}\right)^{\frac{1}{3}}}\right)}{3\,ab}+\frac{\left(ab^{2}\right)^{\frac{1}{3}}\ln\left(x^{2}+x\left(\frac{a}{b}\right)^{\frac{1}{3}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)}{6\,ab}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(b*x^3 - a),x, algorithm="giac")
```

```
[Out] -1/3*(a/b)^(1/3)*ln(abs(x - (a/b)^(1/3)))/a + 1/3*sqrt(3)*(a*b^2)
^(1/3)*arctan(1/3*sqrt(3)*(2*x + (a/b)^(1/3))/(a/b)^(1/3))/(a*b)
+ 1/6*(a*b^2)^(1/3)*ln(x^2 + x*(a/b)^(1/3) + (a/b)^(2/3))/(a*b)
```

3.361 $\int \frac{1}{x^2(a-bx^3)}\,dx$

Optimal. Leaf size=123

$$\frac{\sqrt[3]{b}\log\left(a^{2/3}+\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{6a^{4/3}}-\frac{\sqrt[3]{b}\log\left(\sqrt[3]{a}-\sqrt[3]{b}x\right)}{3a^{4/3}}-\frac{\sqrt[3]{b}\tan^{-1}\left(\frac{\sqrt[3]{a}+2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}a^{4/3}}-\frac{1}{ax}$$

```
[Out] -(1/(a*x)) - (b^(1/3)*ArcTan[(a^(1/3) + 2*b^(1/3)*x)/(Sqrt[3]*a^(
1/3))])/(Sqrt[3]*a^(4/3)) - (b^(1/3)*Log[a^(1/3) - b^(1/3)*x])/(3
*a^(4/3)) + (b^(1/3)*Log[a^(2/3) + a^(1/3)*b^(1/3)*x + b^(2/3)*x^
2])/(6*a^(4/3))
```

Rubi [A] time = 0.136664, antiderivative size = 123, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5

$$\frac{\sqrt[3]{b}\log\left(a^{2/3}+\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{6a^{4/3}}-\frac{\sqrt[3]{b}\log\left(\sqrt[3]{a}-\sqrt[3]{b}x\right)}{3a^{4/3}}-\frac{\sqrt[3]{b}\tan^{-1}\left(\frac{\sqrt[3]{a}+2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}a^{4/3}}-\frac{1}{ax}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(a - b*x^3)),x]
```

```
[Out] -(1/(a*x)) - (b^(1/3)*ArcTan[(a^(1/3) + 2*b^(1/3)*x)/(Sqrt[3]*a^(
1/3))])/(Sqrt[3]*a^(4/3)) - (b^(1/3)*Log[a^(1/3) - b^(1/3)*x])/(3
*a^(4/3)) + (b^(1/3)*Log[a^(2/3) + a^(1/3)*b^(1/3)*x + b^(2/3)*x^
2])/(6*a^(4/3))
```

Rubi in Sympy [A] time = 30.8007, size = 114, normalized size = 0.93

$$-\frac{1}{ax}-\frac{\sqrt[3]{b}\log\left(\sqrt[3]{a}-\sqrt[3]{b}x\right)}{3a^{\frac{4}{3}}}+\frac{\sqrt[3]{b}\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2\right)}{6a^{\frac{4}{3}}}-\frac{\sqrt{3}\sqrt[3]{b}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\frac{2\sqrt[3]{b}x}{3}\right)}{\sqrt[3]{a}}\right)}{3a^{\frac{4}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(-b*x**3+a),x)
```

```
[Out] -1/(a*x) - b**(1/3)*log(a**(1/3) - b**(1/3)*x)/(3*a**(4/3)) + b**
(1/3)*log(a**(2/3) + a**(1/3)*b**(1/3)*x + b**(2/3)*x**2)/(6*a**(
4/3)) - sqrt(3)*b**(1/3)*atan(sqrt(3)*(a**(1/3)/3 + 2*b**(1/3)*x/
3)/a**(1/3))/(3*a**(4/3))
```

Mathematica [A] time = 0.056062, size = 114, normalized size = 0.93

$$-\frac{-\sqrt[3]{b}x\log\left(a^{2/3}+\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)+2\sqrt[3]{b}x\log\left(\sqrt[3]{a}-\sqrt[3]{b}x\right)+2\sqrt{3}\sqrt[3]{b}x\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a}}+1}{\sqrt{3}}\right)+6\sqrt[3]{a}}{6a^{4/3}x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*(a - b*x^3)),x]
```

```
[Out] -(6*a^(1/3) + 2*Sqrt[3]*b^(1/3)*x*ArcTan[(1 + (2*b^(1/3)*x)/a^(1/
3))/Sqrt[3]] + 2*b^(1/3)*x*Log[a^(1/3) - b^(1/3)*x] - b^(1/3)*x*L
og[a^(2/3) + a^(1/3)*b^(1/3)*x + b^(2/3)*x^2])/(6*a^(4/3)*x)
```

Maple [A] time = 0.007, size = 100, normalized size = 0.8

$$-\frac{1}{3\,a}\ln\left(x-\sqrt[3]{\frac{a}{b}}\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}+\frac{1}{6\,a}\ln\left(x^{2}+x\sqrt[3]{\frac{a}{b}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}-\frac{\sqrt{3}}{3\,a}\arctan\left(\frac{\sqrt{3}}{3}\left(2\,x\frac{1}{\sqrt[3]{\frac{a}{b}}}+1\right)\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}-\frac{1}{ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(-b*x^3+a),x)
```

```
[Out] -1/3/a/(a/b)^(1/3)*ln(x-(a/b)^(1/3))+1/6/a/(a/b)^(1/3)*ln(x^2+x*(
a/b)^(1/3)+(a/b)^(2/3))-1/3/a*3^(1/2)/(a/b)^(1/3)*arctan(1/3*3^(1
/2)*(2/(a/b)^(1/3)*x+1))-1/a/x
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((b*x^3 - a)*x^2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.215844, size = 182, normalized size = 1.48

$$-\frac{\sqrt{3}\left(\sqrt{3}x\left(-\frac{b}{a}\right)^{\frac{1}{3}}\log\left(bx^{2}+ax\left(-\frac{b}{a}\right)^{\frac{2}{3}}-a\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right)-2\sqrt{3}x\left(-\frac{b}{a}\right)^{\frac{1}{3}}\log\left(bx-a\left(-\frac{b}{a}\right)^{\frac{2}{3}}\right)-6\,x\left(-\frac{b}{a}\right)^{\frac{1}{3}}\arctan\left(\frac{2\sqrt{3}bx+\sqrt{3}a\left(\cdots\right)}{3\,a\left(-\frac{b}{a}\right)}\right)\cdots\right)}{18\,ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((b*x^3 - a)*x^2),x, algorithm="fricas")
```

```
[Out] -1/18*sqrt(3)*(sqrt(3)*x*(-b/a)^(1/3)*log(b*x^2 + a*x*(-b/a)^(2/3
) - a*(-b/a)^(1/3)) - 2*sqrt(3)*x*(-b/a)^(1/3)*log(b*x - a*(-b/a)
^(2/3)) - 6*x*(-b/a)^(1/3)*arctan(1/3*(2*sqrt(3)*b*x + sqrt(3)*a*
(-b/a)^(2/3))/(a*(-b/a)^(2/3))) + 6*sqrt(3))/(a*x)
```

Sympy [A] time = 1.36311, size = 31, normalized size = 0.25

$$-\operatorname{RootSum}\left(27t^{3}a^{4}-b,\left(t\mapsto t\log\left(-\frac{9t^{2}a^{3}}{b}+x\right)\right)\right)-\frac{1}{ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(-b*x**3+a),x)
```

```
[Out] -RootSum(27*_t**3*a**4 - b, Lambda(_t, _t*log(-9*_t**2*a**3/b + x
))) - 1/(a*x)
```

GIAC/XCAS [A] time = 0.255555, size = 153, normalized size = 1.24

$$-\frac{b\left(\frac{a}{b}\right)^{\frac{2}{3}}\ln\left(\left|x-\left(\frac{a}{b}\right)^{\frac{1}{3}}\right|\right)}{3\,a^2}-\frac{\sqrt{3}\left(ab^2\right)^{\frac{2}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(\frac{a}{b}\right)^{\frac{1}{3}}\right)}{3\left(\frac{a}{b}\right)^{\frac{1}{3}}}\right)}{3\,a^2b}+\frac{\left(ab^2\right)^{\frac{2}{3}}\ln\left(x^2+x\left(\frac{a}{b}\right)^{\frac{1}{3}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)}{6\,a^2b}-\frac{1}{ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((b*x^3 - a)*x^2),x, algorithm="giac")
```

```
[Out] -1/3*b*(a/b)^(2/3)*ln(abs(x - (a/b)^(1/3)))/a^2 - 1/3*sqrt(3)*(a*
b^2)^(2/3)*arctan(1/3*sqrt(3)*(2*x + (a/b)^(1/3))/(a/b)^(1/3))/(a
^2*b) + 1/6*(a*b^2)^(2/3)*ln(x^2 + x*(a/b)^(1/3) + (a/b)^(2/3))/(
a^2*b) - 1/(a*x)
```

3.362 $\int \frac{1}{x^3(a-bx^3)}\,dx$

Optimal. Leaf size=124

$$\frac{b^{2/3}\log\left(a^{2/3}+\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{6a^{5/3}}-\frac{b^{2/3}\log\left(\sqrt[3]{a}-\sqrt[3]{b}x\right)}{3a^{5/3}}+\frac{b^{2/3}\tan^{-1}\left(\frac{\sqrt[3]{a}+2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}a^{5/3}}-\frac{1}{2ax^2}$$

```
[Out] -1/(2*a*x^2) + (b^(2/3)*ArcTan[(a^(1/3) + 2*b^(1/3)*x)/(Sqrt[3]*a
^(1/3))])/(Sqrt[3]*a^(5/3)) - (b^(2/3)*Log[a^(1/3) - b^(1/3)*x])/
(3*a^(5/3)) + (b^(2/3)*Log[a^(2/3) + a^(1/3)*b^(1/3)*x + b^(2/3)*
x^2])/(6*a^(5/3))
```

Rubi [A] time = 0.127931, antiderivative size = 124, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5

$$\frac{b^{2/3}\log\left(a^{2/3}+\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)}{6a^{5/3}}-\frac{b^{2/3}\log\left(\sqrt[3]{a}-\sqrt[3]{b}x\right)}{3a^{5/3}}+\frac{b^{2/3}\tan^{-1}\left(\frac{\sqrt[3]{a}+2\sqrt[3]{b}x}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}a^{5/3}}-\frac{1}{2ax^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(a - b*x^3)),x]
```

```
[Out] -1/(2*a*x^2) + (b^(2/3)*ArcTan[(a^(1/3) + 2*b^(1/3)*x)/(Sqrt[3]*a
^(1/3))])/(Sqrt[3]*a^(5/3)) - (b^(2/3)*Log[a^(1/3) - b^(1/3)*x])/
(3*a^(5/3)) + (b^(2/3)*Log[a^(2/3) + a^(1/3)*b^(1/3)*x + b^(2/3)*
x^2])/(6*a^(5/3))
```

Rubi in Sympy [A] time = 27.8654, size = 117, normalized size = 0.94

$$-\frac{1}{2ax^2}-\frac{b^{\frac{2}{3}}\log\left(\sqrt[3]{a}-\sqrt[3]{b}x\right)}{3a^{\frac{5}{3}}}+\frac{b^{\frac{2}{3}}\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2\right)}{6a^{\frac{5}{3}}}+\frac{\sqrt{3}b^{\frac{2}{3}}\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\frac{2\sqrt[3]{b}x}{3}\right)}{\sqrt[3]{a}}\right)}{3a^{\frac{5}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(-b*x**3+a),x)
```

```
[Out] -1/(2*a*x**2) - b**(2/3)*log(a**(1/3) - b**(1/3)*x)/(3*a**(5/3))
+ b**(2/3)*log(a**(2/3) + a**(1/3)*b**(1/3)*x + b**(2/3)*x**2)/(6
*a**(5/3)) + sqrt(3)*b**(2/3)*atan(sqrt(3)*(a**(1/3)/3 + 2*b**(1/
3)*x/3)/a**(1/3))/(3*a**(5/3))
```

Mathematica [A] time = 0.0380303, size = 119, normalized size = 0.96

$$\frac{b^{2/3}x^2\log\left(a^{2/3}+\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2\right)-3a^{2/3}-2b^{2/3}x^2\log\left(\sqrt[3]{a}-\sqrt[3]{b}x\right)+2\sqrt{3}b^{2/3}x^2\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a}}+1}{\sqrt{3}}\right)}{6a^{5/3}x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*(a - b*x^3)),x]
```

```
[Out] (-3*a^(2/3) + 2*Sqrt[3]*b^(2/3)*x^2*ArcTan[(1 + (2*b^(1/3)*x)/a^(
1/3))/Sqrt[3]] - 2*b^(2/3)*x^2*Log[a^(1/3) - b^(1/3)*x] + b^(2/3)
*x^2*Log[a^(2/3) + a^(1/3)*b^(1/3)*x + b^(2/3)*x^2])/(6*a^(5/3)*x
^2)
```

Maple [A] time = 0.006, size = 100, normalized size = 0.8

$$-\frac{1}{3\,a}\ln\left(x-\sqrt[3]{\frac{a}{b}}\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}+\frac{1}{6\,a}\ln\left(x^{2}+x\sqrt[3]{\frac{a}{b}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}+\frac{\sqrt{3}}{3\,a}\arctan\left(\frac{\sqrt{3}}{3}\left(2\,x\frac{1}{\sqrt[3]{\frac{a}{b}}}+1\right)\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}-\frac{1}{2\,ax^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(-b*x^3+a),x)
```

```
[Out] -1/3/a/(a/b)^(2/3)*ln(x-(a/b)^(1/3))+1/6/a/(a/b)^(2/3)*ln(x^2+x*(
a/b)^(1/3)+(a/b)^(2/3))+1/3/a/(a/b)^(2/3)*3^(1/2)*arctan(1/3*3^(1
/2)*(2/(a/b)^(1/3)*x+1))-1/2/a/x^2
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((b*x^3 - a)*x^3),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.220261, size = 219, normalized size = 1.77

$$-\frac{\sqrt{3}\left(\sqrt{3}x^{2}\left(-\frac{b^{2}}{a^{2}}\right)^{\frac{1}{3}}\log\left(b^{2}x^{2}-abx\left(-\frac{b^{2}}{a^{2}}\right)^{\frac{1}{3}}+a^{2}\left(-\frac{b^{2}}{a^{2}}\right)^{\frac{2}{3}}\right)-2\sqrt{3}x^{2}\left(-\frac{b^{2}}{a^{2}}\right)^{\frac{1}{3}}\log\left(bx+a\left(-\frac{b^{2}}{a^{2}}\right)^{\frac{1}{3}}\right)+6\,x^{2}\left(-\frac{b^{2}}{a^{2}}\right)^{\frac{1}{3}}\arctan\left(\cdots\right.\right.}{18\,ax^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((b*x^3 - a)*x^3),x, algorithm="fricas")
```

```
[Out] -1/18*sqrt(3)*(sqrt(3)*x^2*(-b^2/a^2)^(1/3)*log(b^2*x^2 - a*b*x*(
-b^2/a^2)^(1/3) + a^2*(-b^2/a^2)^(2/3)) - 2*sqrt(3)*x^2*(-b^2/a^2
)^(1/3)*log(b*x + a*(-b^2/a^2)^(1/3)) + 6*x^2*(-b^2/a^2)^(1/3)*ar
ctan(-1/3*(2*sqrt(3)*b*x - sqrt(3)*a*(-b^2/a^2)^(1/3))/(a*(-b^2/a
^2)^(1/3))) + 3*sqrt(3))/(a*x^2)
```

Sympy [A] time = 1.4595, size = 34, normalized size = 0.27

$$-\operatorname{RootSum}\left(27t^{3}a^{5}-b^{2},\left(t\mapsto t\log\left(-\frac{3ta^{2}}{b}+x\right)\right)\right)-\frac{1}{2ax^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(-b*x**3+a),x)
```

```
[Out] -RootSum(27*_t**3*a**5 - b**2, Lambda(_t, _t*log(-3*_t*a**2/b + x
))) - 1/(2*a*x**2)
```

GIAC/XCAS [A] time = 0.237612, size = 144, normalized size = 1.16

$$-\frac{b\left(\frac{a}{b}\right)^{\frac{1}{3}}\ln\left(\left|x-\left(\frac{a}{b}\right)^{\frac{1}{3}}\right|\right)}{3\,a^2}+\frac{\sqrt{3}\left(ab^2\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(\frac{a}{b}\right)^{\frac{1}{3}}\right)}{3\left(\frac{a}{b}\right)^{\frac{1}{3}}}\right)}{3\,a^2}+\frac{\left(ab^2\right)^{\frac{1}{3}}\ln\left(x^2+x\left(\frac{a}{b}\right)^{\frac{1}{3}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)}{6\,a^2}-\frac{1}{2\,ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((b*x^3 - a)*x^3),x, algorithm="giac")
```

```
[Out] -1/3*b*(a/b)^(1/3)*ln(abs(x - (a/b)^(1/3)))/a^2 + 1/3*sqrt(3)*(a*
b^2)^(1/3)*arctan(1/3*sqrt(3)*(2*x + (a/b)^(1/3))/(a/b)^(1/3))/a^
2 + 1/6*(a*b^2)^(1/3)*ln(x^2 + x*(a/b)^(1/3) + (a/b)^(2/3))/a^2 -
 1/2/(a*x^2)
```

3.363 $\int \frac{1}{1+a+bx^3}\,dx$

Optimal. Leaf size=125

$$-\frac{\log\left(-\sqrt[3]{a+1}\sqrt[3]{b}x+(a+1)^{2/3}+b^{2/3}x^2\right)}{6(a+1)^{2/3}\sqrt[3]{b}}+\frac{\log\left(\sqrt[3]{a+1}+\sqrt[3]{b}x\right)}{3(a+1)^{2/3}\sqrt[3]{b}}-\frac{\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{b}x}{\sqrt[3]{a+1}}}{\sqrt{3}}\right)}{\sqrt{3}(a+1)^{2/3}\sqrt[3]{b}}$$

```
[Out] -(ArcTan[(1 - (2*b^(1/3)*x)/(1 + a)^(1/3))/Sqrt[3]]/(Sqrt[3]*(1 +
 a)^(2/3)*b^(1/3))) + Log[(1 + a)^(1/3) + b^(1/3)*x]/(3*(1 + a)^(
2/3)*b^(1/3)) - Log[(1 + a)^(2/3) - (1 + a)^(1/3)*b^(1/3)*x + b^(
2/3)*x^2]/(6*(1 + a)^(2/3)*b^(1/3))
```

Rubi [A] time = 0.177987, antiderivative size = 125, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.6$

$$-\frac{\log\left(-\sqrt[3]{a+1}\sqrt[3]{b}x+(a+1)^{2/3}+b^{2/3}x^2\right)}{6(a+1)^{2/3}\sqrt[3]{b}}+\frac{\log\left(\sqrt[3]{a+1}+\sqrt[3]{b}x\right)}{3(a+1)^{2/3}\sqrt[3]{b}}-\frac{\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{b}x}{\sqrt[3]{a+1}}}{\sqrt{3}}\right)}{\sqrt{3}(a+1)^{2/3}\sqrt[3]{b}}$$

Antiderivative was successfully verified.

```
[In]  Int[(1 + a + b*x^3)^(-1),x]
```

```
[Out] -(ArcTan[(1 - (2*b^(1/3)*x)/(1 + a)^(1/3))/Sqrt[3]]/(Sqrt[3]*(1 +
 a)^(2/3)*b^(1/3))) + Log[(1 + a)^(1/3) + b^(1/3)*x]/(3*(1 + a)^(
2/3)*b^(1/3)) - Log[(1 + a)^(2/3) - (1 + a)^(1/3)*b^(1/3)*x + b^(
2/3)*x^2]/(6*(1 + a)^(2/3)*b^(1/3))
```

Rubi in Sympy [A] time = 28.7938, size = 117, normalized size = 0.94

$$\frac{\log\left(\sqrt[3]{b}x+\sqrt[3]{a+1}\right)}{3\sqrt[3]{b}\,(a+1)^{\frac{2}{3}}}-\frac{\log\left(b^{\frac{2}{3}}x^2-\sqrt[3]{b}x\sqrt[3]{a+1}+(a+1)^{\frac{2}{3}}\right)}{6\sqrt[3]{b}\,(a+1)^{\frac{2}{3}}}-\frac{\sqrt{3}\,\mathrm{atan}\left(\sqrt{3}\left(-\frac{2\sqrt[3]{b}x}{3\sqrt[3]{a+1}}+\frac{1}{3}\right)\right)}{3\sqrt[3]{b}\,(a+1)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**3+a+1),x)
```

```
[Out] log(b**(1/3)*x + (a + 1)**(1/3))/(3*b**(1/3)*(a + 1)**(2/3)) - lo
g(b**(2/3)*x**2 - b**(1/3)*x*(a + 1)**(1/3) + (a + 1)**(2/3))/(6*
b**(1/3)*(a + 1)**(2/3)) - sqrt(3)*atan(sqrt(3)*(-2*b**(1/3)*x/(3
*(a + 1)**(1/3)) + 1/3))/(3*b**(1/3)*(a + 1)**(2/3))
```

Mathematica [A] time = 0.0604058, size = 101, normalized size = 0.81

$$\frac{-\log\left(-\sqrt[3]{a+1}\sqrt[3]{b}x+(a+1)^{2/3}+b^{2/3}x^2\right)+2\log\left(\sqrt[3]{a+1}+\sqrt[3]{b}x\right)+2\sqrt{3}\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a+1}}-1}{\sqrt{3}}\right)}{6(a+1)^{2/3}\sqrt[3]{b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(1 + a + b*x^3)^(-1),x]
```

```
[Out] (2*Sqrt[3]*ArcTan[(-1 + (2*b^(1/3)*x)/(1 + a)^(1/3))/Sqrt[3]] + 2
*Log[(1 + a)^(1/3) + b^(1/3)*x] - Log[(1 + a)^(2/3) - (1 + a)^(1/
3)*b^(1/3)*x + b^(2/3)*x^2])/(6*(1 + a)^(2/3)*b^(1/3))
```

Maple [A] time = 0.009, size = 105, normalized size = 0.8

$$\frac{1}{3b}\ln\left(x+\sqrt[3]{\frac{1+a}{b}}\right)\left(\frac{1+a}{b}\right)^{-\frac{2}{3}}-\frac{1}{6b}\ln\left(x^2-x\sqrt[3]{\frac{1+a}{b}}+\left(\frac{1+a}{b}\right)^{\frac{2}{3}}\right)\left(\frac{1+a}{b}\right)^{-\frac{2}{3}}+\frac{\sqrt{3}}{3b}\arctan\left(\frac{\sqrt{3}}{3}\left(2x\frac{1}{\sqrt[3]{\frac{1+a}{b}}}-1\right)\right)\left(\frac{1+a}{b}\right)^{-\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^3+a+1),x)
```

```
[Out] 1/3/b/((1+a)/b)^(2/3)*ln(x+((1+a)/b)^(1/3))-1/6/b/((1+a)/b)^(2/3)
*ln(x^2-x*((1+a)/b)^(1/3)+((1+a)/b)^(2/3))+1/3/b/((1+a)/b)^(2/3)*
3^(1/2)*arctan(1/3*3^(1/2)*(2/((1+a)/b)^(1/3)*x-1))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x^3 + a + 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.216612, size = 169, normalized size = 1.35

$$-\frac{\sqrt{3}\left(\sqrt{3}\log\left(\left(\left(a^2+2a+1\right)b\right)^{\frac{2}{3}}x^2-\left(\left(a^2+2a+1\right)b\right)^{\frac{1}{3}}(a+1)x+a^2+2a+1\right)-2\sqrt{3}\log\left(\left(\left(a^2+2a+1\right)b\right)^{\frac{1}{3}}x+a+1\right)\right.}{18\left(\left(a^2+2a+1\right)b\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x^3 + a + 1),x, algorithm="fricas")
```

```
[Out] -1/18*sqrt(3)*(sqrt(3)*log(((a^2 + 2*a + 1)*b)^(2/3)*x^2 - ((a^2
+ 2*a + 1)*b)^(1/3)*(a + 1)*x + a^2 + 2*a + 1) - 2*sqrt(3)*log(((
a^2 + 2*a + 1)*b)^(1/3)*x + a + 1) - 6*arctan(1/3*(2*sqrt(3)*((a^
2 + 2*a + 1)*b)^(1/3)*x - sqrt(3)*(a + 1))/(a + 1)))/((a^2 + 2*a
+ 1)*b)^(1/3)
```

Sympy [A] time = 0.620472, size = 32, normalized size = 0.26

$$\operatorname{RootSum}\left(t^3\left(27a^2b+54ab+27b\right)-1,\left(t\mapsto t\log\left(3ta+3t+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**3+a+1),x)
```

```
[Out] RootSum(_t**3*(27*a**2*b + 54*a*b + 27*b) - 1, Lambda(_t, _t*log(
3*_t*a + 3*_t + x)))
```

GIAC/XCAS [A] time = 0.248967, size = 193, normalized size = 1.54

$$\frac{\left(-ab^2-b^2\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(-\frac{a+1}{b}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{a+1}{b}\right)^{\frac{1}{3}}}\right)}{\sqrt{3}ab+\sqrt{3}b}+\frac{\left(-ab^2-b^2\right)^{\frac{1}{3}}\ln\left(x^2+x\left(-\frac{a+1}{b}\right)^{\frac{1}{3}}+\left(-\frac{a+1}{b}\right)^{\frac{2}{3}}\right)}{6\,(ab+b)}-\frac{\left(-\frac{a+1}{b}\right)^{\frac{1}{3}}\ln\left(\left|x-\left(-\frac{a+1}{b}\right)^{\frac{1}{3}}\right|\right)}{3\,(a+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x^3 + a + 1),x, algorithm="giac")
```

```
[Out] (-a*b^2 - b^2)^(1/3)*arctan(1/3*sqrt(3)*(2*x + (-(a + 1)/b)^(1/3)
)/(-(a + 1)/b)^(1/3))/(sqrt(3)*a*b + sqrt(3)*b) + 1/6*(-a*b^2 - b
^2)^(1/3)*ln(x^2 + x*(-(a + 1)/b)^(1/3) + (-(a + 1)/b)^(2/3))/(a*
b + b) - 1/3*(-(a + 1)/b)^(1/3)*ln(abs(x - (-(a + 1)/b)^(1/3)))/(
a + 1)
```

3.364 $\int \frac{1}{1+a-bx^3}\,dx$

Optimal. Leaf size=124

$$\frac{\log\left(\sqrt[3]{a+1}\sqrt[3]{b}x+(a+1)^{2/3}+b^{2/3}x^2\right)}{6(a+1)^{2/3}\sqrt[3]{b}}-\frac{\log\left(\sqrt[3]{a+1}-\sqrt[3]{b}x\right)}{3(a+1)^{2/3}\sqrt[3]{b}}+\frac{\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a+1}}+1}{\sqrt{3}}\right)}{\sqrt{3}(a+1)^{2/3}\sqrt[3]{b}}$$

```
[Out] ArcTan[(1 + (2*b^(1/3)*x)/(1 + a)^(1/3))/Sqrt[3]]/(Sqrt[3]*(1 + a
)^(2/3)*b^(1/3)) - Log[(1 + a)^(1/3) - b^(1/3)*x]/(3*(1 + a)^(2/3
)*b^(1/3)) + Log[(1 + a)^(2/3) + (1 + a)^(1/3)*b^(1/3)*x + b^(2/3
)*x^2]/(6*(1 + a)^(2/3)*b^(1/3))
```

Rubi [A] time = 0.13763, antiderivative size = 124, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.546

$$\frac{\log\left(\sqrt[3]{a+1}\sqrt[3]{b}x+(a+1)^{2/3}+b^{2/3}x^2\right)}{6(a+1)^{2/3}\sqrt[3]{b}}-\frac{\log\left(\sqrt[3]{a+1}-\sqrt[3]{b}x\right)}{3(a+1)^{2/3}\sqrt[3]{b}}+\frac{\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a+1}}+1}{\sqrt{3}}\right)}{\sqrt{3}(a+1)^{2/3}\sqrt[3]{b}}$$

Antiderivative was successfully verified.

```
[In]  Int[(1 + a - b*x^3)^(-1),x]
```

```
[Out] ArcTan[(1 + (2*b^(1/3)*x)/(1 + a)^(1/3))/Sqrt[3]]/(Sqrt[3]*(1 + a
)^(2/3)*b^(1/3)) - Log[(1 + a)^(1/3) - b^(1/3)*x]/(3*(1 + a)^(2/3
)*b^(1/3)) + Log[(1 + a)^(2/3) + (1 + a)^(1/3)*b^(1/3)*x + b^(2/3
)*x^2]/(6*(1 + a)^(2/3)*b^(1/3))
```

Rubi in Sympy [A] time = 25.1931, size = 117, normalized size = 0.94

$$-\frac{\log\left(\sqrt[3]{b}x-\sqrt[3]{a+1}\right)}{3\sqrt[3]{b}\,(a+1)^{\frac{2}{3}}}+\frac{\log\left(b^{\frac{2}{3}}x^2+\sqrt[3]{b}x\sqrt[3]{a+1}+(a+1)^{\frac{2}{3}}\right)}{6\sqrt[3]{b}\,(a+1)^{\frac{2}{3}}}+\frac{\sqrt{3}\,\mathrm{atan}\left(\sqrt{3}\left(\frac{2\sqrt[3]{b}x}{3\sqrt[3]{a+1}}+\frac{1}{3}\right)\right)}{3\sqrt[3]{b}\,(a+1)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(-b*x**3+a+1),x)
```

```
[Out] -log(b**(1/3)*x - (a + 1)**(1/3))/(3*b**(1/3)*(a + 1)**(2/3)) + l
og(b**(2/3)*x**2 + b**(1/3)*x*(a + 1)**(1/3) + (a + 1)**(2/3))/(6
*b**(1/3)*(a + 1)**(2/3)) + sqrt(3)*atan(sqrt(3)*(2*b**(1/3)*x/(3
*(a + 1)**(1/3)) + 1/3))/(3*b**(1/3)*(a + 1)**(2/3))
```

Mathematica [A] time = 0.114059, size = 124, normalized size = 1.

$$\frac{(-1)^{2/3}\left(\log\left(-\sqrt[3]{-1}\sqrt[3]{a+1}\sqrt[3]{b}x+(a+1)^{2/3}+(-1)^{2/3}b^{2/3}x^2\right)-2\log\left(\sqrt[3]{a+1}+\sqrt[3]{-1}\sqrt[3]{b}x\right)-2\sqrt{3}\tan^{-1}\left(\frac{\frac{2\sqrt[3]{-1}\sqrt[3]{b}x}{\sqrt[3]{a+1}}-1}{\sqrt{3}}\right)\right)}{6(a+1)^{2/3}\sqrt[3]{b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(1 + a - b*x^3)^(-1),x]
```

```
[Out] ((-1)^(2/3)*(-2*Sqrt[3]*ArcTan[(-1 + (2*(-1)^(1/3)*b^(1/3)*x)/(1
+ a)^(1/3))/Sqrt[3]] - 2*Log[(1 + a)^(1/3) + (-1)^(1/3)*b^(1/3)*x
] + Log[(1 + a)^(2/3) - (-1)^(1/3)*(1 + a)^(1/3)*b^(1/3)*x + (-1)
^(2/3)*b^(2/3)*x^2]))/(6*(1 + a)^(2/3)*b^(1/3))
```

Maple [A] time = 0.007, size = 106, normalized size = 0.9

$$-\frac{1}{3\,b}\ln\left(x-\sqrt[3]{\frac{1+a}{b}}\right)\left(\frac{1+a}{b}\right)^{-\frac{2}{3}}+\frac{1}{6\,b}\ln\left(x^2+x\sqrt[3]{\frac{1+a}{b}}+\left(\frac{1+a}{b}\right)^{\frac{2}{3}}\right)\left(\frac{1+a}{b}\right)^{-\frac{2}{3}}+\frac{\sqrt{3}}{3\,b}\arctan\left(\frac{\sqrt{3}}{3}\left(2\,x\frac{1}{\sqrt[3]{\frac{1+a}{b}}}+1\right)\right)\left(\frac{1+a}{b}\right)^{-\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(-b*x^3+a+1),x)
```

```
[Out] -1/3/b/((1+a)/b)^(2/3)*ln(x-((1+a)/b)^(1/3))+1/6/b/((1+a)/b)^(2/3
)*ln(x^2+x*((1+a)/b)^(1/3)+((1+a)/b)^(2/3))+1/3/b/((1+a)/b)^(2/3)
*3^(1/2)*arctan(1/3*3^(1/2)*(2/((1+a)/b)^(1/3)*x+1))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(b*x^3 - a - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.218992, size = 176, normalized size = 1.42

$$-\frac{\sqrt{3}\left(\sqrt{3}\log\left(\left(-(a^2+2\,a+1)\,b\right)^{\frac{2}{3}}x^2-\left(-(a^2+2\,a+1)\,b\right)^{\frac{1}{3}}(a+1)x+a^2+2\,a+1\right)-2\,\sqrt{3}\log\left(\left(-(a^2+2\,a+1)\,b\right)^{\frac{1}{3}}x+a\right.\right.}{18\,\left(-(a^2+2\,a+1)b\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(b*x^3 - a - 1),x, algorithm="fricas")
```

```
[Out] -1/18*sqrt(3)*(sqrt(3)*log((-(a^2 + 2*a + 1)*b)^(2/3)*x^2 - (-(a^
2 + 2*a + 1)*b)^(1/3)*(a + 1)*x + a^2 + 2*a + 1) - 2*sqrt(3)*log(
(-(a^2 + 2*a + 1)*b)^(1/3)*x + a + 1) - 6*arctan(1/3*(2*sqrt(3)*(
-(a^2 + 2*a + 1)*b)^(1/3)*x - sqrt(3)*(a + 1))/(a + 1)))/(-(a^2 +
 2*a + 1)*b)^(1/3)
```

Sympy [A] time = 0.652328, size = 34, normalized size = 0.27

$$-\operatorname{RootSum}\left(t^3\left(27a^2b+54ab+27b\right)-1,\left(t\mapsto t\log\left(-3ta-3t+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(-b*x**3+a+1),x)
```

```
[Out] -RootSum(_t**3*(27*a**2*b + 54*a*b + 27*b) - 1, Lambda(_t, _t*log
(-3*_t*a - 3*_t + x)))
```

GIAC/XCAS [A] time = 0.240769, size = 177, normalized size = 1.43

$$\frac{\left(ab^{2}+b^{2}\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(\frac{a+1}{b}\right)^{\frac{1}{3}}\right)}{3\left(\frac{a+1}{b}\right)^{\frac{1}{3}}}\right)}{\sqrt{3}ab+\sqrt{3}b}+\frac{\left(ab^{2}+b^{2}\right)^{\frac{1}{3}}\ln\left(x^{2}+x\left(\frac{a+1}{b}\right)^{\frac{1}{3}}+\left(\frac{a+1}{b}\right)^{\frac{2}{3}}\right)}{6\,(ab+b)}-\frac{\left(\frac{a+1}{b}\right)^{\frac{1}{3}}\ln\left(\left|x-\left(\frac{a+1}{b}\right)^{\frac{1}{3}}\right|\right)}{3\,(a+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(b*x^3 - a - 1),x, algorithm="giac")
```

```
[Out] (a*b^2 + b^2)^(1/3)*arctan(1/3*sqrt(3)*(2*x + ((a + 1)/b)^(1/3))/
((a + 1)/b)^(1/3))/(sqrt(3)*a*b + sqrt(3)*b) + 1/6*(a*b^2 + b^2)^
(1/3)*ln(x^2 + x*((a + 1)/b)^(1/3) + ((a + 1)/b)^(2/3))/(a*b + b)
 - 1/3*((a + 1)/b)^(1/3)*ln(abs(x - ((a + 1)/b)^(1/3)))/(a + 1)
```

3.365 $\int \frac{1}{-1+a+bx^3}\,dx$

Optimal. Leaf size=139

$$-\frac{\log\left(\sqrt[3]{1-a}\sqrt[3]{b}x+(1-a)^{2/3}+b^{2/3}x^2\right)}{6(1-a)^{2/3}\sqrt[3]{b}}+\frac{\log\left(\sqrt[3]{1-a}-\sqrt[3]{b}x\right)}{3(1-a)^{2/3}\sqrt[3]{b}}-\frac{\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{1-a}}+1}{\sqrt{3}}\right)}{\sqrt{3}(1-a)^{2/3}\sqrt[3]{b}}$$

```
[Out] -(ArcTan[(1 + (2*b^(1/3)*x)/(1 - a)^(1/3))/Sqrt[3]]/(Sqrt[3]*(1 -
 a)^(2/3)*b^(1/3))) + Log[(1 - a)^(1/3) - b^(1/3)*x]/(3*(1 - a)^(
2/3)*b^(1/3)) - Log[(1 - a)^(2/3) + (1 - a)^(1/3)*b^(1/3)*x + b^(
2/3)*x^2]/(6*(1 - a)^(2/3)*b^(1/3))
```

Rubi [A] time = 0.202373, antiderivative size = 139, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.6

$$-\frac{\log\left(\sqrt[3]{1-a}\sqrt[3]{b}x+(1-a)^{2/3}+b^{2/3}x^2\right)}{6(1-a)^{2/3}\sqrt[3]{b}}+\frac{\log\left(\sqrt[3]{1-a}-\sqrt[3]{b}x\right)}{3(1-a)^{2/3}\sqrt[3]{b}}-\frac{\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{1-a}}+1}{\sqrt{3}}\right)}{\sqrt{3}(1-a)^{2/3}\sqrt[3]{b}}$$

Antiderivative was successfully verified.

```
[In]  Int[(-1 + a + b*x^3)^(-1),x]
```

```
[Out] -(ArcTan[(1 + (2*b^(1/3)*x)/(1 - a)^(1/3))/Sqrt[3]]/(Sqrt[3]*(1 -
 a)^(2/3)*b^(1/3))) + Log[(1 - a)^(1/3) - b^(1/3)*x]/(3*(1 - a)^(
2/3)*b^(1/3)) - Log[(1 - a)^(2/3) + (1 - a)^(1/3)*b^(1/3)*x + b^(
2/3)*x^2]/(6*(1 - a)^(2/3)*b^(1/3))
```

Rubi in Sympy [A] time = 27.2954, size = 117, normalized size = 0.84

$$\frac{\log\left(\sqrt[3]{b}x-\sqrt[3]{-a+1}\right)}{3\sqrt[3]{b}\left(-a+1\right)^{\frac{2}{3}}}-\frac{\log\left(b^{\frac{2}{3}}x^2+\sqrt[3]{b}x\sqrt[3]{-a+1}+\left(-a+1\right)^{\frac{2}{3}}\right)}{6\sqrt[3]{b}\left(-a+1\right)^{\frac{2}{3}}}-\frac{\sqrt{3}\,\mathrm{atan}\left(\sqrt{3}\left(\frac{2\sqrt[3]{b}x}{3\sqrt[3]{-a+1}}+\frac{1}{3}\right)\right)}{3\sqrt[3]{b}\left(-a+1\right)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**3+a-1),x)
```

```
[Out] log(b**(1/3)*x - (-a + 1)**(1/3))/(3*b**(1/3)*(-a + 1)**(2/3)) -
log(b**(2/3)*x**2 + b**(1/3)*x*(-a + 1)**(1/3) + (-a + 1)**(2/3))
/(6*b**(1/3)*(-a + 1)**(2/3)) - sqrt(3)*atan(sqrt(3)*(2*b**(1/3)*
x/(3*(-a + 1)**(1/3)) + 1/3))/(3*b**(1/3)*(-a + 1)**(2/3))
```

Mathematica [A] time = 0.0607405, size = 101, normalized size = 0.73

$$\frac{-\log\left(-\sqrt[3]{a-1}\sqrt[3]{b}x+(a-1)^{2/3}+b^{2/3}x^2\right)+2\log\left(\sqrt[3]{a-1}+\sqrt[3]{b}x\right)+2\sqrt{3}\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a-1}}-1}{\sqrt{3}}\right)}{6(a-1)^{2/3}\sqrt[3]{b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(-1 + a + b*x^3)^(-1),x]
```

```
[Out] (2*Sqrt[3]*ArcTan[(-1 + (2*b^(1/3)*x)/(-1 + a)^(1/3))/Sqrt[3]] +
2*Log[(-1 + a)^(1/3) + b^(1/3)*x] - Log[(-1 + a)^(2/3) - (-1 + a)
^(1/3)*b^(1/3)*x + b^(2/3)*x^2])/(6*(-1 + a)^(2/3)*b^(1/3))
```

Maple [A] time = 0.006, size = 105, normalized size = 0.8

$$\frac{1}{3b}\ln\left(x+\sqrt[3]{\frac{-1+a}{b}}\right)\left(\frac{-1+a}{b}\right)^{-\frac{2}{3}}-\frac{1}{6b}\ln\left(x^2-x\sqrt[3]{\frac{-1+a}{b}}+\left(\frac{-1+a}{b}\right)^{\frac{2}{3}}\right)\left(\frac{-1+a}{b}\right)^{-\frac{2}{3}}$$
$$+\frac{\sqrt{3}}{3b}\arctan\left(\frac{\sqrt{3}}{3}\left(2x\frac{1}{\sqrt[3]{\frac{-1+a}{b}}}-1\right)\right)\left(\frac{-1+a}{b}\right)^{-\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^3+a-1),x)
```

```
[Out] 1/3/b/((-1+a)/b)^(2/3)*ln(x+((-1+a)/b)^(1/3))-1/6/b/((-1+a)/b)^(2
/3)*ln(x^2-x*((-1+a)/b)^(1/3)+((-1+a)/b)^(2/3))+1/3/b/((-1+a)/b)^
(2/3)*3^(1/2)*arctan(1/3*3^(1/2)*(2/((-1+a)/b)^(1/3)*x-1))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x^3 + a - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.216338, size = 169, normalized size = 1.22

$$-\frac{\sqrt{3}\left(\sqrt{3}\log\left(\left((a^2-2a+1)b\right)^{\frac{2}{3}}x^2-\left((a^2-2a+1)b\right)^{\frac{1}{3}}(a-1)x+a^2-2a+1\right)-2\sqrt{3}\log\left(\left((a^2-2a+1)b\right)^{\frac{1}{3}}x+a-1\right)\right.}{18\left((a^2-2a+1)b\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x^3 + a - 1),x, algorithm="fricas")
```

```
[Out] -1/18*sqrt(3)*(sqrt(3)*log(((a^2 - 2*a + 1)*b)^(2/3)*x^2 - ((a^2
- 2*a + 1)*b)^(1/3)*(a - 1)*x + a^2 - 2*a + 1) - 2*sqrt(3)*log(((
a^2 - 2*a + 1)*b)^(1/3)*x + a - 1) - 6*arctan(1/3*(2*sqrt(3)*((a^
2 - 2*a + 1)*b)^(1/3)*x - sqrt(3)*(a - 1))/(a - 1)))/((a^2 - 2*a
+ 1)*b)^(1/3)
```

Sympy [A] time = 0.689669, size = 32, normalized size = 0.23

$$\operatorname{RootSum}\left(t^3\left(27a^2b-54ab+27b\right)-1,\left(t\mapsto t\log\left(3ta-3t+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**3+a-1),x)
```

```
[Out] RootSum(_t**3*(27*a**2*b - 54*a*b + 27*b) - 1, Lambda(_t, _t*log(
3*_t*a - 3*_t + x)))
```

GIAC/XCAS [A] time = 0.254717, size = 192, normalized size = 1.38

$$\frac{\left(-ab^2+b^2\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(2x+\left(-\frac{a-1}{b}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{a-1}{b}\right)^{\frac{1}{3}}}\right)}{\sqrt{3}ab-\sqrt{3}b}+\frac{\left(-ab^2+b^2\right)^{\frac{1}{3}}\ln\left(x^2+x\left(-\frac{a-1}{b}\right)^{\frac{1}{3}}+\left(-\frac{a-1}{b}\right)^{\frac{2}{3}}\right)}{6\left(ab-b\right)}-\frac{\left(-\frac{a-1}{b}\right)^{\frac{1}{3}}\ln\left(\left|x-\left(-\frac{a-1}{b}\right)^{\frac{1}{3}}\right|\right)}{3\left(a-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x^3 + a - 1),x, algorithm="giac")
```

```
[Out] (-a*b^2 + b^2)^(1/3)*arctan(1/3*sqrt(3)*(2*x + (-(a - 1)/b)^(1/3)
)/(-(a - 1)/b)^(1/3))/(sqrt(3)*a*b - sqrt(3)*b) + 1/6*(-a*b^2 + b
^2)^(1/3)*ln(x^2 + x*(-(a - 1)/b)^(1/3) + (-(a - 1)/b)^(2/3))/(a*
b - b) - 1/3*(-(a - 1)/b)^(1/3)*ln(abs(x - (-(a - 1)/b)^(1/3)))/(
a - 1)
```

3.366 $\int \frac{1}{-1+a-bx^3}\,dx$

Optimal. Leaf size=138

$$\frac{\log\left(-\sqrt[3]{1-a}\sqrt[3]{b}x+(1-a)^{2/3}+b^{2/3}x^2\right)}{6(1-a)^{2/3}\sqrt[3]{b}}-\frac{\log\left(\sqrt[3]{1-a}+\sqrt[3]{b}x\right)}{3(1-a)^{2/3}\sqrt[3]{b}}+\frac{\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{b}x}{\sqrt[3]{1-a}}}{\sqrt{3}}\right)}{\sqrt{3}(1-a)^{2/3}\sqrt[3]{b}}$$

```
[Out] ArcTan[(1 - (2*b^(1/3)*x)/(1 - a)^(1/3))/Sqrt[3]]/(Sqrt[3]*(1 - a
)^(2/3)*b^(1/3)) - Log[(1 - a)^(1/3) + b^(1/3)*x]/(3*(1 - a)^(2/3
)*b^(1/3)) + Log[(1 - a)^(2/3) - (1 - a)^(1/3)*b^(1/3)*x + b^(2/3
)*x^2]/(6*(1 - a)^(2/3)*b^(1/3))
```

Rubi [A] time = 0.154104, antiderivative size = 138, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.546

$$\frac{\log\left(-\sqrt[3]{1-a}\sqrt[3]{b}x+(1-a)^{2/3}+b^{2/3}x^2\right)}{6(1-a)^{2/3}\sqrt[3]{b}}-\frac{\log\left(\sqrt[3]{1-a}+\sqrt[3]{b}x\right)}{3(1-a)^{2/3}\sqrt[3]{b}}+\frac{\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{b}x}{\sqrt[3]{1-a}}}{\sqrt{3}}\right)}{\sqrt{3}(1-a)^{2/3}\sqrt[3]{b}}$$

Antiderivative was successfully verified.

```
[In]  Int[(-1 + a - b*x^3)^(-1),x]
```

```
[Out] ArcTan[(1 - (2*b^(1/3)*x)/(1 - a)^(1/3))/Sqrt[3]]/(Sqrt[3]*(1 - a
)^(2/3)*b^(1/3)) - Log[(1 - a)^(1/3) + b^(1/3)*x]/(3*(1 - a)^(2/3
)*b^(1/3)) + Log[(1 - a)^(2/3) - (1 - a)^(1/3)*b^(1/3)*x + b^(2/3
)*x^2]/(6*(1 - a)^(2/3)*b^(1/3))
```

Rubi in Sympy [A] time = 28.645, size = 117, normalized size = 0.85

$$-\frac{\log\left(\sqrt[3]{b}x+\sqrt[3]{-a+1}\right)}{3\sqrt[3]{b}\left(-a+1\right)^{\frac{2}{3}}}+\frac{\log\left(b^{\frac{2}{3}}x^2-\sqrt[3]{b}x\sqrt[3]{-a+1}+\left(-a+1\right)^{\frac{2}{3}}\right)}{6\sqrt[3]{b}\left(-a+1\right)^{\frac{2}{3}}}+\frac{\sqrt{3}\,\mathrm{atan}\left(\sqrt{3}\left(-\frac{2\sqrt[3]{b}x}{3\sqrt[3]{-a+1}}+\frac{1}{3}\right)\right)}{3\sqrt[3]{b}\left(-a+1\right)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(-b*x**3+a-1),x)
```

```
[Out] -log(b**(1/3)*x + (-a + 1)**(1/3))/(3*b**(1/3)*(-a + 1)**(2/3)) +
 log(b**(2/3)*x**2 - b**(1/3)*x*(-a + 1)**(1/3) + (-a + 1)**(2/3)
)/(6*b**(1/3)*(-a + 1)**(2/3)) + sqrt(3)*atan(sqrt(3)*(-2*b**(1/3
)*x/(3*(-a + 1)**(1/3)) + 1/3))/(3*b**(1/3)*(-a + 1)**(2/3))
```

Mathematica [A] time = 0.103293, size = 124, normalized size = 0.9

$$\frac{(-1)^{2/3}\left(\log\left(-\sqrt[3]{-1}\sqrt[3]{a-1}\sqrt[3]{b}x+(a-1)^{2/3}+(-1)^{2/3}b^{2/3}x^2\right)-2\log\left(\sqrt[3]{a-1}+\sqrt[3]{-1}\sqrt[3]{b}x\right)-2\sqrt{3}\tan^{-1}\left(\frac{\frac{2\sqrt[3]{-1}\sqrt[3]{b}x}{\sqrt[3]{a-1}}-1}{\sqrt{3}}\right)\right)}{6(a-1)^{2/3}\sqrt[3]{b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(-1 + a - b*x^3)^(-1),x]
```

```
[Out] ((-1)^(2/3)*(-2*Sqrt[3]*ArcTan[(-1 + (2*(-1)^(1/3)*b^(1/3)*x)/(-1
 + a)^(1/3))/Sqrt[3]] - 2*Log[(-1 + a)^(1/3) + (-1)^(1/3)*b^(1/3)
*x] + Log[(-1 + a)^(2/3) - (-1)^(1/3)*(-1 + a)^(1/3)*b^(1/3)*x +
(-1)^(2/3)*b^(2/3)*x^2]))/(6*(-1 + a)^(2/3)*b^(1/3))
```

Maple [A] time = 0.006, size = 106, normalized size = 0.8

$$-\frac{1}{3\,b}\ln\left(x-\sqrt[3]{\frac{-1+a}{b}}\right)\left(\frac{-1+a}{b}\right)^{-\frac{2}{3}}+\frac{1}{6\,b}\ln\left(x^2+x\sqrt[3]{\frac{-1+a}{b}}+\left(\frac{-1+a}{b}\right)^{\frac{2}{3}}\right)\left(\frac{-1+a}{b}\right)^{-\frac{2}{3}} +\frac{\sqrt{3}}{3\,b}\arctan\left(\frac{\sqrt{3}}{3}\left(2\,x\frac{1}{\sqrt[3]{\frac{-1+a}{b}}}+1\right)\right)\left(\frac{-1+a}{b}\right)^{-\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(-b*x^3+a-1),x)
```

```
[Out] -1/3/b/((-1+a)/b)^(2/3)*ln(x-((-1+a)/b)^(1/3))+1/6/b/((-1+a)/b)^(
2/3)*ln(x^2+x*((-1+a)/b)^(1/3)+((-1+a)/b)^(2/3))+1/3/b/((-1+a)/b)
^(2/3)*3^(1/2)*arctan(1/3*3^(1/2)*(2/((-1+a)/b)^(1/3)*x+1))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(b*x^3 - a + 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.21829, size = 176, normalized size = 1.28

$$-\frac{\sqrt{3}\left(\sqrt{3}\log\left(\left(-\left(a^2-2\,a+1\right)b\right)^{\frac{2}{3}}x^2-\left(-\left(a^2-2\,a+1\right)b\right)^{\frac{1}{3}}(a-1)x+a^2-2\,a+1\right)-2\,\sqrt{3}\log\left(\left(-\left(a^2-2\,a+1\right)b\right)^{\frac{1}{3}}x+a\right.\right.}{18\,\left(-(a^2-2\,a+1)b\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(b*x^3 - a + 1),x, algorithm="fricas")
```

```
[Out] -1/18*sqrt(3)*(sqrt(3)*log((-(a^2 - 2*a + 1)*b)^(2/3)*x^2 - (-(a^
2 - 2*a + 1)*b)^(1/3)*(a - 1)*x + a^2 - 2*a + 1) - 2*sqrt(3)*log(
(-(a^2 - 2*a + 1)*b)^(1/3)*x + a - 1) - 6*arctan(1/3*(2*sqrt(3)*(
-(a^2 - 2*a + 1)*b)^(1/3)*x - sqrt(3)*(a - 1))/(a - 1)))/(-(a^2 -
 2*a + 1)*b)^(1/3)
```

Sympy [A] time = 0.736023, size = 34, normalized size = 0.25

$$-\operatorname{RootSum}\left(t^3\left(27a^2b-54ab+27b\right)-1,\left(t\mapsto t\log\left(-3ta+3t+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(-b*x**3+a-1),x)
```

```
[Out] -RootSum(_t**3*(27*a**2*b - 54*a*b + 27*b) - 1, Lambda(_t, _t*log
(-3*_t*a + 3*_t + x)))
```

GIAC/XCAS [A] time = 0.253216, size = 186, normalized size = 1.35

$$\frac{\left(ab^2-b^2\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(\frac{a-1}{b}\right)^{\frac{1}{3}}\right)}{3\left(\frac{a-1}{b}\right)^{\frac{1}{3}}}\right)}{\sqrt{3}ab-\sqrt{3}b}+\frac{\left(ab^2-b^2\right)^{\frac{1}{3}}\ln\left(x^2+x\left(\frac{a-1}{b}\right)^{\frac{1}{3}}+\left(\frac{a-1}{b}\right)^{\frac{2}{3}}\right)}{6\,(ab-b)}-\frac{\left(\frac{a-1}{b}\right)^{\frac{1}{3}}\ln\left(\left|x-\left(\frac{a-1}{b}\right)^{\frac{1}{3}}\right|\right)}{3\,(a-1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(b*x^3 - a + 1),x, algorithm="giac")
```

```
[Out] (a*b^2 - b^2)^(1/3)*arctan(1/3*sqrt(3)*(2*x + ((a - 1)/b)^(1/3))/
((a - 1)/b)^(1/3))/(sqrt(3)*a*b - sqrt(3)*b) + 1/6*(a*b^2 - b^2)^
(1/3)*ln(x^2 + x*((a - 1)/b)^(1/3) + ((a - 1)/b)^(2/3))/(a*b - b)
 - 1/3*((a - 1)/b)^(1/3)*ln(abs(x - ((a - 1)/b)^(1/3)))/(a - 1)
```

3.367 $\int \frac{\sqrt{x}}{1+x^3} \, dx$

Optimal. Leaf size=10

$$\frac{2}{3}\tan^{-1}\left(x^{3/2}\right)$$

```
[Out] (2*ArcTan[x^(3/2)])/3
```

Rubi [A] time = 0.0201628, antiderivative size = 10, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{2}{3}\tan^{-1}\left(x^{3/2}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[x]/(1 + x^3),x]

[Out] (2*ArcTan[x^(3/2)])/3
```

Rubi in Sympy [A] time = 4.16914, size = 8, normalized size = 0.8

$$\frac{2\,\text{atan}\left(x^{\frac{3}{2}}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(1/2)/(x**3+1),x)

[Out] 2*atan(x**(3/2))/3
```

Mathematica [A] time = 0.00759896, size = 10, normalized size = 1.

$$-\frac{2}{3}\tan^{-1}\left(\frac{1}{x^{3/2}}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[x]/(1 + x^3),x]

[Out] (-2*ArcTan[x^(-3/2)])/3
```

Maple [A] time = 0.008, size = 7, normalized size = 0.7

$$\frac{2}{3}\arctan\left(x^{\frac{3}{2}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(1/2)/(x^3+1),x)

[Out] 2/3*arctan(x^(3/2))
```

Maxima [A] time = 1.57841, size = 8, normalized size = 0.8

$$\frac{2}{3}\arctan\left(x^{\frac{3}{2}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(x^3 + 1),x, algorithm="maxima")
```

```
[Out] 2/3*arctan(x^(3/2))
```

Fricas [A] time = 0.222299, size = 8, normalized size = 0.8

$$\frac{2}{3}\arctan\left(x^{\frac{3}{2}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(x^3 + 1),x, algorithm="fricas")
```

```
[Out] 2/3*arctan(x^(3/2))
```

Sympy [A] time = 5.24713, size = 42, normalized size = 4.2

$$-\frac{2\operatorname{atan}\left(\sqrt{x}\right)}{3}+\frac{2\operatorname{atan}\left(2\sqrt{x}-\sqrt{3}\right)}{3}+\frac{2\operatorname{atan}\left(2\sqrt{x}+\sqrt{3}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(1/2)/(x**3+1),x)
```

```
[Out] -2*atan(sqrt(x))/3 + 2*atan(2*sqrt(x) - sqrt(3))/3 + 2*atan(2*sqr
t(x) + sqrt(3))/3
```

GIAC/XCAS [A] time = 0.217923, size = 8, normalized size = 0.8

$$\frac{2}{3}\arctan\left(x^{\frac{3}{2}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(x^3 + 1),x, algorithm="giac")
```

```
[Out] 2/3*arctan(x^(3/2))
```

3.368 $\int x^{11}\sqrt{a+bx^3}\,dx$

Optimal. Leaf size=80

$$-\frac{2a^3\left(a+bx^3\right)^{3/2}}{9b^4}+\frac{2a^2\left(a+bx^3\right)^{5/2}}{5b^4}+\frac{2\left(a+bx^3\right)^{9/2}}{27b^4}-\frac{2a\left(a+bx^3\right)^{7/2}}{7b^4}$$

```
[Out] (-2*a^3*(a + b*x^3)^(3/2))/(9*b^4) + (2*a^2*(a + b*x^3)^(5/2))/(5
*b^4) - (2*a*(a + b*x^3)^(7/2))/(7*b^4) + (2*(a + b*x^3)^(9/2))/(
27*b^4)
```

Rubi [A] time = 0.109074, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$-\frac{2a^3\left(a+bx^3\right)^{3/2}}{9b^4}+\frac{2a^2\left(a+bx^3\right)^{5/2}}{5b^4}+\frac{2\left(a+bx^3\right)^{9/2}}{27b^4}-\frac{2a\left(a+bx^3\right)^{7/2}}{7b^4}$$

Antiderivative was successfully verified.

```
[In] Int[x^11*Sqrt[a + b*x^3],x]
```

```
[Out] (-2*a^3*(a + b*x^3)^(3/2))/(9*b^4) + (2*a^2*(a + b*x^3)^(5/2))/(5
*b^4) - (2*a*(a + b*x^3)^(7/2))/(7*b^4) + (2*(a + b*x^3)^(9/2))/(
27*b^4)
```

Rubi in Sympy [A] time = 14.7656, size = 75, normalized size = 0.94

$$-\frac{2a^3\left(a+bx^3\right)^{\frac{3}{2}}}{9b^4}+\frac{2a^2\left(a+bx^3\right)^{\frac{5}{2}}}{5b^4}-\frac{2a\left(a+bx^3\right)^{\frac{7}{2}}}{7b^4}+\frac{2\left(a+bx^3\right)^{\frac{9}{2}}}{27b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**11*(b*x**3+a)**(1/2),x)
```

```
[Out] -2*a**3*(a + b*x**3)**(3/2)/(9*b**4) + 2*a**2*(a + b*x**3)**(5/2)
/(5*b**4) - 2*a*(a + b*x**3)**(7/2)/(7*b**4) + 2*(a + b*x**3)**(9
/2)/(27*b**4)
```

Mathematica [A] time = 0.0299107, size = 61, normalized size = 0.76

$$\frac{2\sqrt{a+bx^3}\left(-16a^4+8a^3bx^3-6a^2b^2x^6+5ab^3x^9+35b^4x^{12}\right)}{945b^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^11*Sqrt[a + b*x^3],x]
```

```
[Out] (2*Sqrt[a + b*x^3]*(-16*a^4 + 8*a^3*b*x^3 - 6*a^2*b^2*x^6 + 5*a*b
^3*x^9 + 35*b^4*x^12))/(945*b^4)
```

Maple [A] time = 0.01, size = 47, normalized size = 0.6

$$-\frac{-70\,b^3x^9+60\,ab^2x^6-48\,a^2bx^3+32\,a^3}{945\,b^4}\left(bx^3+a\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^11*(b*x^3+a)^(1/2),x)
```

```
[Out] -2/945*(b*x^3+a)^(3/2)*(-35*b^3*x^9+30*a*b^2*x^6-24*a^2*b*x^3+16*
a^3)/b^4
```

Maxima [A] time = 1.43903, size = 86, normalized size = 1.08

$$\frac{2\left(bx^3+a\right)^{\frac{9}{2}}}{27\,b^4}-\frac{2\left(bx^3+a\right)^{\frac{7}{2}}a}{7\,b^4}+\frac{2\left(bx^3+a\right)^{\frac{5}{2}}a^2}{5\,b^4}-\frac{2\left(bx^3+a\right)^{\frac{3}{2}}a^3}{9\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(b*x^3 + a)*x^11,x, algorithm="maxima")
```

```
[Out] 2/27*(b*x^3 + a)^(9/2)/b^4 - 2/7*(b*x^3 + a)^(7/2)*a/b^4 + 2/5*(b
*x^3 + a)^(5/2)*a^2/b^4 - 2/9*(b*x^3 + a)^(3/2)*a^3/b^4
```

Fricas [A] time = 0.214362, size = 77, normalized size = 0.96

$$\frac{2\left(35\,b^4x^{12}+5\,ab^3x^9-6\,a^2b^2x^6+8\,a^3bx^3-16\,a^4\right)\sqrt{bx^3+a}}{945\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(b*x^3 + a)*x^11,x, algorithm="fricas")
```

```
[Out] 2/945*(35*b^4*x^12 + 5*a*b^3*x^9 - 6*a^2*b^2*x^6 + 8*a^3*b*x^3 -
16*a^4)*sqrt(b*x^3 + a)/b^4
```

Sympy [A] time = 10.5404, size = 114, normalized size = 1.42

$$\begin{cases} -\frac{32a^4\sqrt{a+bx^3}}{945b^4}+\frac{16a^3x^3\sqrt{a+bx^3}}{945b^3}-\frac{4a^2x^6\sqrt{a+bx^3}}{315b^2}+\frac{2ax^9\sqrt{a+bx^3}}{189b}+\frac{2x^{12}\sqrt{a+bx^3}}{27} & \text{for}\ b\neq 0\\ \frac{\sqrt{a}x^{12}}{12} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**11*(b*x**3+a)**(1/2),x)
```

```
[Out] Piecewise((-32*a**4*sqrt(a + b*x**3)/(945*b**4) + 16*a**3*x**3*sq
rt(a + b*x**3)/(945*b**3) - 4*a**2*x**6*sqrt(a + b*x**3)/(315*b**
2) + 2*a*x**9*sqrt(a + b*x**3)/(189*b) + 2*x**12*sqrt(a + b*x**3)
/27, Ne(b, 0)), (sqrt(a)*x**12/12, True))
```

GIAC/XCAS [A] time = 0.229034, size = 77, normalized size = 0.96

$$\frac{2\left(35\left(bx^3+a\right)^{\frac{9}{2}}-135\left(bx^3+a\right)^{\frac{7}{2}}a+189\left(bx^3+a\right)^{\frac{5}{2}}a^2-105\left(bx^3+a\right)^{\frac{3}{2}}a^3\right)}{945\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(b*x^3 + a)*x^11,x, algorithm="giac")
```

```
[Out] 2/945*(35*(b*x^3 + a)^(9/2) - 135*(b*x^3 + a)^(7/2)*a + 189*(b*x^
3 + a)^(5/2)*a^2 - 105*(b*x^3 + a)^(3/2)*a^3)/b^4
```

3.369 $\int x^8\sqrt{a+bx^3}\,dx$

Optimal. Leaf size=59

$$\frac{2a^2\left(a+bx^3\right)^{3/2}}{9b^3}+\frac{2\left(a+bx^3\right)^{7/2}}{21b^3}-\frac{4a\left(a+bx^3\right)^{5/2}}{15b^3}$$

```
[Out] (2*a^2*(a + b*x^3)^(3/2))/(9*b^3) - (4*a*(a + b*x^3)^(5/2))/(15*b
^3) + (2*(a + b*x^3)^(7/2))/(21*b^3)
```

Rubi [A] time = 0.0842506, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2a^2\left(a+bx^3\right)^{3/2}}{9b^3}+\frac{2\left(a+bx^3\right)^{7/2}}{21b^3}-\frac{4a\left(a+bx^3\right)^{5/2}}{15b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8*Sqrt[a + b*x^3],x]
```

```
[Out] (2*a^2*(a + b*x^3)^(3/2))/(9*b^3) - (4*a*(a + b*x^3)^(5/2))/(15*b
^3) + (2*(a + b*x^3)^(7/2))/(21*b^3)
```

Rubi in Sympy [A] time = 11.0251, size = 54, normalized size = 0.92

$$\frac{2a^2\left(a+bx^3\right)^{\frac{3}{2}}}{9b^3}-\frac{4a\left(a+bx^3\right)^{\frac{5}{2}}}{15b^3}+\frac{2\left(a+bx^3\right)^{\frac{7}{2}}}{21b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8*(b*x**3+a)**(1/2),x)
```

```
[Out] 2*a**2*(a + b*x**3)**(3/2)/(9*b**3) - 4*a*(a + b*x**3)**(5/2)/(15
*b**3) + 2*(a + b*x**3)**(7/2)/(21*b**3)
```

Mathematica [A] time = 0.0239034, size = 50, normalized size = 0.85

$$\frac{2\sqrt{a+bx^3}\left(8a^3-4a^2bx^3+3ab^2x^6+15b^3x^9\right)}{315b^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8*Sqrt[a + b*x^3],x]
```

```
[Out] (2*Sqrt[a + b*x^3]*(8*a^3 - 4*a^2*b*x^3 + 3*a*b^2*x^6 + 15*b^3*x^
9))/(315*b^3)
```

Maple [A] time = 0.009, size = 36, normalized size = 0.6

$$\frac{30\,b^2x^6-24\,abx^3+16\,a^2}{315\,b^3}\left(bx^3+a\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8*(b*x^3+a)^(1/2),x)
```

```
[Out] 2/315*(b*x^3+a)^(3/2)*(15*b^2*x^6-12*a*b*x^3+8*a^2)/b^3
```

Maxima [A] time = 1.44107, size = 63, normalized size = 1.07

$$\frac{2 \left(bx^3 + a\right)^{\frac{7}{2}}}{21 \, b^3} - \frac{4 \left(bx^3 + a\right)^{\frac{5}{2}} a}{15 \, b^3} + \frac{2 \left(bx^3 + a\right)^{\frac{3}{2}} a^2}{9 \, b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)*x^8,x, algorithm="maxima")
```

```
[Out] 2/21*(b*x^3 + a)^(7/2)/b^3 - 4/15*(b*x^3 + a)^(5/2)*a/b^3 + 2/9*(
b*x^3 + a)^(3/2)*a^2/b^3
```

Fricas [A] time = 0.211916, size = 62, normalized size = 1.05

$$\frac{2 \left(15 \, b^3 x^9 + 3 \, ab^2 x^6 - 4 \, a^2 bx^3 + 8 \, a^3\right) \sqrt{bx^3 + a}}{315 \, b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)*x^8,x, algorithm="fricas")
```

```
[Out] 2/315*(15*b^3*x^9 + 3*a*b^2*x^6 - 4*a^2*b*x^3 + 8*a^3)*sqrt(b*x^3
 + a)/b^3
```

Sympy [A] time = 4.43762, size = 90, normalized size = 1.53

$$\begin{cases} \frac{16a^3\sqrt{a+bx^3}}{315b^3} - \frac{8a^2x^3\sqrt{a+bx^3}}{315b^2} + \frac{2ax^6\sqrt{a+bx^3}}{105b} + \frac{2x^9\sqrt{a+bx^3}}{21} & \text{for } b \neq 0 \\ \frac{\sqrt{a}x^9}{9} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8*(b*x**3+a)**(1/2),x)
```

```
[Out] Piecewise((16*a**3*sqrt(a + b*x**3)/(315*b**3) - 8*a**2*x**3*sqrt
(a + b*x**3)/(315*b**2) + 2*a*x**6*sqrt(a + b*x**3)/(105*b) + 2*x
**9*sqrt(a + b*x**3)/21, Ne(b, 0)), (sqrt(a)*x**9/9, True))
```

GIAC/XCAS [A] time = 0.261105, size = 58, normalized size = 0.98

$$\frac{2 \left(15 \left(bx^3 + a\right)^{\frac{7}{2}} - 42 \left(bx^3 + a\right)^{\frac{5}{2}} a + 35 \left(bx^3 + a\right)^{\frac{3}{2}} a^2\right)}{315 \, b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)*x^8,x, algorithm="giac")
```

```
[Out] 2/315*(15*(b*x^3 + a)^(7/2) - 42*(b*x^3 + a)^(5/2)*a + 35*(b*x^3
+ a)^(3/2)*a^2)/b^3
```

3.370 $\int x^5\sqrt{a+bx^3}\,dx$

Optimal. Leaf size=38

$$\frac{2\left(a+bx^3\right)^{5/2}}{15b^2}-\frac{2a\left(a+bx^3\right)^{3/2}}{9b^2}$$

```
[Out] (-2*a*(a + b*x^3)^(3/2))/(9*b^2) + (2*(a + b*x^3)^(5/2))/(15*b^2)
```

Rubi [A] time = 0.0585054, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2\left(a+bx^3\right)^{5/2}}{15b^2}-\frac{2a\left(a+bx^3\right)^{3/2}}{9b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5*Sqrt[a + b*x^3],x]

[Out] (-2*a*(a + b*x^3)^(3/2))/(9*b^2) + (2*(a + b*x^3)^(5/2))/(15*b^2)
```

Rubi in Sympy [A] time = 7.35061, size = 34, normalized size = 0.89

$$-\frac{2a\left(a+bx^3\right)^{\frac{3}{2}}}{9b^2}+\frac{2\left(a+bx^3\right)^{\frac{5}{2}}}{15b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5*(b*x**3+a)**(1/2),x)

[Out] -2*a*(a + b*x**3)**(3/2)/(9*b**2) + 2*(a + b*x**3)**(5/2)/(15*b**
2)
```

Mathematica [A] time = 0.0189852, size = 38, normalized size = 1.

$$\frac{2\sqrt{a+bx^3}\left(-2a^2+abx^3+3b^2x^6\right)}{45b^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5*Sqrt[a + b*x^3],x]

[Out] (2*Sqrt[a + b*x^3]*(-2*a^2 + a*b*x^3 + 3*b^2*x^6))/(45*b^2)
```

Maple [A] time = 0.008, size = 25, normalized size = 0.7

$$-\frac{-6\,bx^3+4\,a}{45\,b^2}\left(bx^3+a\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5*(b*x^3+a)^(1/2),x)
```

```
[Out] -2/45*(b*x^3+a)^(3/2)*(-3*b*x^3+2*a)/b^2
```

Maxima [A] time = 1.44205, size = 41, normalized size = 1.08

$$\frac{2\left(bx^3+a\right)^{\frac{5}{2}}}{15\,b^2}-\frac{2\left(bx^3+a\right)^{\frac{3}{2}}a}{9\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)*x^5,x, algorithm="maxima")
```

```
[Out] 2/15*(b*x^3 + a)^(5/2)/b^2 - 2/9*(b*x^3 + a)^(3/2)*a/b^2
```

Fricas [A] time = 0.217539, size = 46, normalized size = 1.21

$$\frac{2\left(3\,b^2x^6+abx^3-2\,a^2\right)\sqrt{bx^3+a}}{45\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)*x^5,x, algorithm="fricas")
```

```
[Out] 2/45*(3*b^2*x^6 + a*b*x^3 - 2*a^2)*sqrt(b*x^3 + a)/b^2
```

Sympy [A] time = 1.62163, size = 66, normalized size = 1.74

$$\begin{cases} -\frac{4a^2\sqrt{a+bx^3}}{45b^2}+\frac{2ax^3\sqrt{a+bx^3}}{45b}+\frac{2x^6\sqrt{a+bx^3}}{15} & \text{for}\ b\neq 0\\ \frac{\sqrt{a}x^6}{6} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5*(b*x**3+a)**(1/2),x)
```

```
[Out] Piecewise((-4*a**2*sqrt(a + b*x**3)/(45*b**2) + 2*a*x**3*sqrt(a +
 b*x**3)/(45*b) + 2*x**6*sqrt(a + b*x**3)/15, Ne(b, 0)), (sqrt(a)
*x**6/6, True))
```

GIAC/XCAS [A] time = 0.264269, size = 39, normalized size = 1.03

$$\frac{2\left(3\left(bx^3+a\right)^{\frac{5}{2}}-5\left(bx^3+a\right)^{\frac{3}{2}}a\right)}{45\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)*x^5,x, algorithm="giac")
```

```
[Out] 2/45*(3*(b*x^3 + a)^(5/2) - 5*(b*x^3 + a)^(3/2)*a)/b^2
```

3.371 $\int x^2\sqrt{a+bx^3}\,dx$

Optimal. Leaf size=18

$$\frac{2\left(a+bx^3\right)^{3/2}}{9b}$$

```
[Out] (2*(a + b*x^3)^(3/2))/(9*b)
```

Rubi [A] time = 0.0109946, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{2\left(a+bx^3\right)^{3/2}}{9b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2*Sqrt[a + b*x^3],x]

[Out] (2*(a + b*x^3)^(3/2))/(9*b)
```

Rubi in Sympy [A] time = 2.23492, size = 14, normalized size = 0.78

$$\frac{2\left(a+bx^3\right)^{\frac{3}{2}}}{9b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(b*x**3+a)**(1/2),x)

[Out] 2*(a + b*x**3)**(3/2)/(9*b)
```

Mathematica [A] time = 0.0121421, size = 18, normalized size = 1.

$$\frac{2\left(a+bx^3\right)^{3/2}}{9b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2*Sqrt[a + b*x^3],x]

[Out] (2*(a + b*x^3)^(3/2))/(9*b)
```

Maple [A] time = 0.005, size = 15, normalized size = 0.8

$$\frac{2}{9\,b}\left(bx^3+a\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(b*x^3+a)^(1/2),x)

[Out] 2/9*(b*x^3+a)^(3/2)/b
```

Maxima [A] time = 1.44515, size = 19, normalized size = 1.06

$$\frac{2\left(bx^3+a\right)^{\frac{3}{2}}}{9\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 2/9*(b*x^3 + a)^(3/2)/b
```

Fricas [A] time = 0.21223, size = 19, normalized size = 1.06

$$\frac{2\left(bx^3+a\right)^{\frac{3}{2}}}{9\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 2/9*(b*x^3 + a)^(3/2)/b
```

Sympy [A] time = 0.513824, size = 42, normalized size = 2.33

$$\begin{cases} \frac{2a\sqrt{a+bx^3}}{9b} + \frac{2x^3\sqrt{a+bx^3}}{9} & \text{for } b \neq 0 \\ \frac{\sqrt{a}x^3}{3} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(b*x**3+a)**(1/2),x)
```

```
[Out] Piecewise((2*a*sqrt(a + b*x**3)/(9*b) + 2*x**3*sqrt(a + b*x**3)/9
, Ne(b, 0)), (sqrt(a)*x**3/3, True))
```

GIAC/XCAS [A] time = 0.259558, size = 19, normalized size = 1.06

$$\frac{2\left(bx^3+a\right)^{\frac{3}{2}}}{9\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 2/9*(b*x^3 + a)^(3/2)/b
```

3.372 $\int \frac{\sqrt{a+bx^3}}{x}\,dx$

Optimal. Leaf size=43

$$\frac{2}{3}\sqrt{a+bx^3}-\frac{2}{3}\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)$$

```
[Out] (2*Sqrt[a + b*x^3])/3 - (2*Sqrt[a]*ArcTanh[Sqrt[a + b*x^3]/Sqrt[a
]])/3
```

Rubi [A] time = 0.0699796, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{2}{3}\sqrt{a+bx^3}-\frac{2}{3}\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*x^3]/x,x]
```

```
[Out] (2*Sqrt[a + b*x^3])/3 - (2*Sqrt[a]*ArcTanh[Sqrt[a + b*x^3]/Sqrt[a
]])/3
```

Rubi in Sympy [A] time = 6.95605, size = 37, normalized size = 0.86

$$-\frac{2\sqrt{a}\,\mathrm{atanh}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)}{3}+\frac{2\sqrt{a+bx^3}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**(1/2)/x,x)
```

```
[Out] -2*sqrt(a)*atanh(sqrt(a + b*x**3)/sqrt(a))/3 + 2*sqrt(a + b*x**3)
/3
```

Mathematica [A] time = 0.101235, size = 48, normalized size = 1.12

$$\frac{2}{3}\sqrt{a+bx^3}\left(1-\frac{\tanh^{-1}\left(\sqrt{\frac{bx^3}{a}+1}\right)}{\sqrt{\frac{bx^3}{a}+1}}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b*x^3]/x,x]
```

```
[Out] (2*Sqrt[a + b*x^3]*(1 - ArcTanh[Sqrt[1 + (b*x^3)/a]]/Sqrt[1 + (b*
x^3)/a]))/3
```

Maple [A] time = 0.158, size = 32, normalized size = 0.7

$$-\frac{2}{3}\mathit{Artanh}\left(1\sqrt{bx^3+a}\frac{1}{\sqrt{a}}\right)\sqrt{a}+\frac{2}{3}\sqrt{bx^3+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^(1/2)/x,x)
```

```
[Out] -2/3*arctanh((b*x^3+a)^(1/2)/a^(1/2))*a^(1/2)+2/3*(b*x^3+a)^(1/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.230027, size = 1, normalized size = 0.02

$$\left[\frac{1}{3}\sqrt{a}\log\left(\frac{bx^3 - 2\sqrt{bx^3+a}\sqrt{a} + 2a}{x^3}\right) + \frac{2}{3}\sqrt{bx^3+a}, -\frac{2}{3}\sqrt{-a}\arctan\left(\frac{\sqrt{bx^3+a}}{\sqrt{-a}}\right) + \frac{2}{3}\sqrt{bx^3+a}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] [1/3*sqrt(a)*log((b*x^3 - 2*sqrt(b*x^3 + a)*sqrt(a) + 2*a)/x^3) +
 2/3*sqrt(b*x^3 + a), -2/3*sqrt(-a)*arctan(sqrt(b*x^3 + a)/sqrt(-
a)) + 2/3*sqrt(b*x^3 + a)]
```

Sympy [A] time = 5.01579, size = 76, normalized size = 1.77

$$-\frac{2\sqrt{a}\operatorname{asinh}\left(\frac{\sqrt{a}}{\sqrt{b}x^{\frac{3}{2}}}\right)}{3} + \frac{2a}{3\sqrt{b}x^{\frac{3}{2}}\sqrt{\frac{a}{bx^3}+1}} + \frac{2\sqrt{b}x^{\frac{3}{2}}}{3\sqrt{\frac{a}{bx^3}+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**(1/2)/x,x)
```

```
[Out] -2*sqrt(a)*asinh(sqrt(a)/(sqrt(b)*x**(3/2)))/3 + 2*a/(3*sqrt(b)*x
**(3/2)*sqrt(a/(b*x**3) + 1)) + 2*sqrt(b)*x**(3/2)/(3*sqrt(a/(b*x
**3) + 1))
```

GIAC/XCAS [A] time = 0.269739, size = 49, normalized size = 1.14

$$\frac{2\,a\arctan\left(\frac{\sqrt{bx^3+a}}{\sqrt{-a}}\right)}{3\sqrt{-a}} + \frac{2}{3}\sqrt{bx^3+a}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 2/3*a*arctan(sqrt(b*x^3 + a)/sqrt(-a))/sqrt(-a) + 2/3*sqrt(b*x^3
+ a)
```

3.373 $\int \frac{\sqrt{a+bx^3}}{x^4}\,dx$

Optimal. Leaf size=47

$$-\frac{\sqrt{a+bx^3}}{3x^3}-\frac{b\tanh^{-1}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)}{3\sqrt{a}}$$

```
[Out] -Sqrt[a + b*x^3]/(3*x^3) - (b*ArcTanh[Sqrt[a + b*x^3]/Sqrt[a]])/(
3*Sqrt[a])
```

Rubi [A] time = 0.0718749, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{\sqrt{a+bx^3}}{3x^3}-\frac{b\tanh^{-1}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)}{3\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*x^3]/x^4,x]
```

```
[Out] -Sqrt[a + b*x^3]/(3*x^3) - (b*ArcTanh[Sqrt[a + b*x^3]/Sqrt[a]])/(
3*Sqrt[a])
```

Rubi in Sympy [A] time = 7.28328, size = 41, normalized size = 0.87

$$-\frac{\sqrt{a+bx^3}}{3x^3}-\frac{b\,\text{atanh}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)}{3\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**(1/2)/x**4,x)
```

```
[Out] -sqrt(a + b*x**3)/(3*x**3) - b*atanh(sqrt(a + b*x**3)/sqrt(a))/(3
*sqrt(a))
```

Mathematica [A] time = 0.105519, size = 59, normalized size = 1.26

$$-\frac{bx^3\sqrt{\frac{bx^3}{a}+1}\tanh^{-1}\left(\sqrt{\frac{bx^3}{a}+1}\right)+a+bx^3}{3x^3\sqrt{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b*x^3]/x^4,x]
```

```
[Out] -(a + b*x^3 + b*x^3*Sqrt[1 + (b*x^3)/a]*ArcTanh[Sqrt[1 + (b*x^3)/
a]])/(3*x^3*Sqrt[a + b*x^3])
```

Maple [A] time = 0.026, size = 36, normalized size = 0.8

$$-\frac{b}{3}Artanh\left(1\sqrt{bx^3+a}\frac{1}{\sqrt{a}}\right)\frac{1}{\sqrt{a}}-\frac{1}{3\,x^3}\sqrt{bx^3+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^(1/2)/x^4,x)
```

```
[Out] -1/3*b*arctanh((b*x^3+a)^(1/2)/a^(1/2))/a^(1/2)-1/3*(b*x^3+a)^(1/
2)/x^3
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)/x^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.225095, size = 1, normalized size = 0.02

$$\left[\frac{bx^3\log\left(\frac{(bx^3+2a)\sqrt{a}-2\sqrt{bx^3+a}a}{x^3}\right)-2\sqrt{bx^3+a}\sqrt{a}}{6\sqrt{a}x^3}, \frac{bx^3\arctan\left(\frac{a}{\sqrt{bx^3+a}\sqrt{-a}}\right)-\sqrt{bx^3+a}\sqrt{-a}}{3\sqrt{-a}x^3}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)/x^4,x, algorithm="fricas")
```

```
[Out] [1/6*(b*x^3*log(((b*x^3 + 2*a)*sqrt(a) - 2*sqrt(b*x^3 + a)*a)/x^3
) - 2*sqrt(b*x^3 + a)*sqrt(a))/(sqrt(a)*x^3), 1/3*(b*x^3*arctan(a
/(sqrt(b*x^3 + a)*sqrt(-a))) - sqrt(b*x^3 + a)*sqrt(-a))/(sqrt(-a
)*x^3)]
```

Sympy [A] time = 6.70303, size = 49, normalized size = 1.04

$$-\frac{\sqrt{b}\sqrt{\frac{a}{bx^3}+1}}{3x^{\frac{3}{2}}}-\frac{b\operatorname{asinh}\left(\frac{\sqrt{a}}{\sqrt{b}x^{\frac{3}{2}}}\right)}{3\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**(1/2)/x**4,x)
```

```
[Out] -sqrt(b)*sqrt(a/(b*x**3) + 1)/(3*x**(3/2)) - b*asinh(sqrt(a)/(sqr
t(b)*x**(3/2)))/(3*sqrt(a))
```

GIAC/XCAS [A] time = 0.260943, size = 58, normalized size = 1.23

$$\frac{1}{3}b\left(\frac{\arctan\left(\frac{\sqrt{bx^3+a}}{\sqrt{-a}}\right)}{\sqrt{-a}}-\frac{\sqrt{bx^3+a}}{bx^3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)/x^4,x, algorithm="giac")
```

```
[Out] 1/3*b*(arctan(sqrt(b*x^3 + a)/sqrt(-a))/sqrt(-a) - sqrt(b*x^3 + a
)/(b*x^3))
```

3.374 $\int \frac{\sqrt{a+bx^3}}{x^7} \, dx$

Optimal. Leaf size=71

$$\frac{b^2 \tanh^{-1}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)}{12a^{3/2}} - \frac{b\sqrt{a+bx^3}}{12ax^3} - \frac{\sqrt{a+bx^3}}{6x^6}$$

```
[Out] -Sqrt[a + b*x^3]/(6*x^6) - (b*Sqrt[a + b*x^3])/(12*a*x^3) + (b^2*
ArcTanh[Sqrt[a + b*x^3]/Sqrt[a]])/(12*a^(3/2))
```

Rubi [A] time = 0.104662, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$

$$\frac{b^2 \tanh^{-1}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)}{12a^{3/2}} - \frac{b\sqrt{a+bx^3}}{12ax^3} - \frac{\sqrt{a+bx^3}}{6x^6}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*x^3]/x^7,x]
```

```
[Out] -Sqrt[a + b*x^3]/(6*x^6) - (b*Sqrt[a + b*x^3])/(12*a*x^3) + (b^2*
ArcTanh[Sqrt[a + b*x^3]/Sqrt[a]])/(12*a^(3/2))
```

Rubi in Sympy [A] time = 9.88967, size = 60, normalized size = 0.85

$$-\frac{\sqrt{a+bx^3}}{6x^6} - \frac{b\sqrt{a+bx^3}}{12ax^3} + \frac{b^2 \operatorname{atanh}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)}{12a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**(1/2)/x**7,x)
```

```
[Out] -sqrt(a + b*x**3)/(6*x**6) - b*sqrt(a + b*x**3)/(12*a*x**3) + b**
2*atanh(sqrt(a + b*x**3)/sqrt(a))/(12*a**(3/2))
```

Mathematica [A] time = 0.195269, size = 67, normalized size = 0.94

$$\frac{\sqrt{a+bx^3}\left(\frac{b^2 \tanh^{-1}\left(\sqrt{\frac{bx^3}{a}+1}\right)}{\sqrt{\frac{bx^3}{a}+1}} - \frac{a(2a+bx^3)}{x^6}\right)}{12a^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b*x^3]/x^7,x]
```

```
[Out] (Sqrt[a + b*x^3]*(-((a*(2*a + b*x^3))/x^6) + (b^2*ArcTanh[Sqrt[1
+ (b*x^3)/a]])/Sqrt[1 + (b*x^3)/a]))/(12*a^2)
```

Maple [A] time = 0.03, size = 56, normalized size = 0.8

$$\frac{b^2}{12} Artanh\left(1\sqrt{bx^3+a}\frac{1}{\sqrt{a}}\right) a^{-\frac{3}{2}} - \frac{1}{6\,x^6}\sqrt{bx^3+a} - \frac{b}{12\,ax^3}\sqrt{bx^3+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^(1/2)/x^7,x)
```

```
[Out] 1/12*b^2*arctanh((b*x^3+a)^(1/2)/a^(1/2))/a^(3/2)-1/6*(b*x^3+a)^(
1/2)/x^6-1/12*b*(b*x^3+a)^(1/2)/a/x^3
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)/x^7,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.224143, size = 1, normalized size = 0.01

$$\left[\frac{b^2x^6\log\left(\frac{(bx^3+2\,a)\sqrt{a}+2\,\sqrt{bx^3+a}a}{x^3}\right)-2\,(bx^3+2\,a)\,\sqrt{bx^3+a}\sqrt{a}}{24\,a^{\frac{3}{2}}x^6},\right.$$
$$\left.-\frac{b^2x^6\arctan\left(\frac{a}{\sqrt{bx^3+a}\sqrt{-a}}\right)+(bx^3+2\,a)\,\sqrt{bx^3+a}\sqrt{-a}}{12\,\sqrt{-a}ax^6}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)/x^7,x, algorithm="fricas")
```

```
[Out] [1/24*(b^2*x^6*log(((b*x^3 + 2*a)*sqrt(a) + 2*sqrt(b*x^3 + a)*a)/
x^3) - 2*(b*x^3 + 2*a)*sqrt(b*x^3 + a)*sqrt(a))/(a^(3/2)*x^6), -1
/12*(b^2*x^6*arctan(a/(sqrt(b*x^3 + a)*sqrt(-a))) + (b*x^3 + 2*a)
*sqrt(b*x^3 + a)*sqrt(-a))/(sqrt(-a)*a*x^6)]
```

Sympy [A] time = 12.7865, size = 100, normalized size = 1.41

$$-\frac{a}{6\sqrt{b}x^{\frac{15}{2}}\sqrt{\frac{a}{bx^3}+1}}-\frac{\sqrt{b}}{4x^{\frac{9}{2}}\sqrt{\frac{a}{bx^3}+1}}-\frac{b^{\frac{3}{2}}}{12ax^{\frac{3}{2}}\sqrt{\frac{a}{bx^3}+1}}+\frac{b^2\operatorname{asinh}\left(\frac{\sqrt{a}}{\sqrt{b}x^{\frac{3}{2}}}\right)}{12a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**(1/2)/x**7,x)
```

```
[Out] -a/(6*sqrt(b)*x**(15/2)*sqrt(a/(b*x**3) + 1)) - sqrt(b)/(4*x**(9/
2)*sqrt(a/(b*x**3) + 1)) - b**(3/2)/(12*a*x**(3/2)*sqrt(a/(b*x**3
) + 1)) + b**2*asinh(sqrt(a)/(sqrt(b)*x**(3/2)))/(12*a**(3/2))
```

GIAC/XCAS [A] time = 0.246616, size = 84, normalized size = 1.18

$$-\frac{1}{12}b^2\left(\frac{\arctan\left(\frac{\sqrt{bx^3+a}}{\sqrt{-a}}\right)}{\sqrt{-a}a}+\frac{(bx^3+a)^{\frac{3}{2}}+\sqrt{bx^3+a}a}{ab^2x^6}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)/x^7,x, algorithm="giac")
```

```
[Out] -1/12*b^2*(arctan(sqrt(b*x^3 + a)/sqrt(-a))/(sqrt(-a)*a) + ((b*x^
3 + a)^(3/2) + sqrt(b*x^3 + a)*a)/(a*b^2*x^6))
```

3.375 $\int \frac{\sqrt{a+bx^3}}{x^{10}}\,dx$

Optimal. Leaf size=95

$$-\frac{b^3\tanh^{-1}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)}{24a^{5/2}}+\frac{b^2\sqrt{a+bx^3}}{24a^2x^3}-\frac{\sqrt{a+bx^3}}{9x^9}-\frac{b\sqrt{a+bx^3}}{36ax^6}$$

```
[Out] -Sqrt[a + b*x^3]/(9*x^9) - (b*Sqrt[a + b*x^3])/(36*a*x^6) + (b^2*
Sqrt[a + b*x^3])/(24*a^2*x^3) - (b^3*ArcTanh[Sqrt[a + b*x^3]/Sqrt
[a]])/(24*a^(5/2))
```

Rubi [A] time = 0.137731, antiderivative size = 95, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{b^3\tanh^{-1}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)}{24a^{5/2}}+\frac{b^2\sqrt{a+bx^3}}{24a^2x^3}-\frac{\sqrt{a+bx^3}}{9x^9}-\frac{b\sqrt{a+bx^3}}{36ax^6}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*x^3]/x^10,x]
```

```
[Out] -Sqrt[a + b*x^3]/(9*x^9) - (b*Sqrt[a + b*x^3])/(36*a*x^6) + (b^2*
Sqrt[a + b*x^3])/(24*a^2*x^3) - (b^3*ArcTanh[Sqrt[a + b*x^3]/Sqrt
[a]])/(24*a^(5/2))
```

Rubi in Sympy [A] time = 13.5744, size = 82, normalized size = 0.86

$$-\frac{\sqrt{a+bx^3}}{9x^9}-\frac{b\sqrt{a+bx^3}}{36ax^6}+\frac{b^2\sqrt{a+bx^3}}{24a^2x^3}-\frac{b^3\,\text{atanh}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)}{24a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**(1/2)/x**10,x)
```

```
[Out] -sqrt(a + b*x**3)/(9*x**9) - b*sqrt(a + b*x**3)/(36*a*x**6) + b**
2*sqrt(a + b*x**3)/(24*a**2*x**3) - b**3*atanh(sqrt(a + b*x**3)/s
qrt(a))/(24*a**(5/2))
```

Mathematica [A] time = 0.276076, size = 79, normalized size = 0.83

$$\frac{\sqrt{a+bx^3}\left(\frac{a\left(-8a^2-2abx^3+3b^2x^6\right)}{x^9}-\frac{3b^3\tanh^{-1}\left(\sqrt{\frac{bx^3}{a}+1}\right)}{\sqrt{\frac{bx^3}{a}+1}}\right)}{72a^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b*x^3]/x^10,x]
```

```
[Out] (Sqrt[a + b*x^3]*((a*(-8*a^2 - 2*a*b*x^3 + 3*b^2*x^6))/x^9 - (3*b
^3*ArcTanh[Sqrt[1 + (b*x^3)/a]])/Sqrt[1 + (b*x^3)/a]))/(72*a^3)
```

Maple [A] time = 0.031, size = 76, normalized size = 0.8

$$-\frac{b^3}{24}Artanh\left(1\sqrt{bx^3+a}\frac{1}{\sqrt{a}}\right)a^{-\frac{5}{2}}-\frac{1}{9x^9}\sqrt{bx^3+a}-\frac{b}{36x^6a}\sqrt{bx^3+a}+\frac{b^2}{24x^3a^2}\sqrt{bx^3+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^(1/2)/x^10,x)
```

```
[Out] -1/24*b^3*arctanh((b*x^3+a)^(1/2)/a^(1/2))/a^(5/2)-1/9*(b*x^3+a)^
(1/2)/x^9-1/36*b*(b*x^3+a)^(1/2)/x^6/a+1/24*b^2*(b*x^3+a)^(1/2)/x
^3/a^2
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)/x^10,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.22812, size = 1, normalized size = 0.01

$$\left[\frac{3\,b^3x^9\log\left(\frac{(bx^3+2\,a)\sqrt{a}-2\,\sqrt{bx^3+a}a}{x^3}\right)+2\left(3\,b^2x^6-2\,abx^3-8\,a^2\right)\sqrt{bx^3+a}\sqrt{a}}{144\,a^{\frac{5}{2}}x^9},\frac{3\,b^3x^9\arctan\left(\frac{a}{\sqrt{bx^3+a}\sqrt{-a}}\right)+\left(3\,b^2x^6-2\,abx^3\right.}{72\,\sqrt{-a}a^2x^9}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)/x^10,x, algorithm="fricas")
```

```
[Out] [1/144*(3*b^3*x^9*log(((b*x^3 + 2*a)*sqrt(a) - 2*sqrt(b*x^3 + a)*
a)/x^3) + 2*(3*b^2*x^6 - 2*a*b*x^3 - 8*a^2)*sqrt(b*x^3 + a)*sqrt(
a))/(a^(5/2)*x^9), 1/72*(3*b^3*x^9*arctan(a/(sqrt(b*x^3 + a)*sqrt
(-a))) + (3*b^2*x^6 - 2*a*b*x^3 - 8*a^2)*sqrt(b*x^3 + a)*sqrt(-a)
)/(sqrt(-a)*a^2*x^9)]
```

Sympy [A] time = 21.4166, size = 129, normalized size = 1.36

$$-\frac{a}{9\sqrt{b}x^{\frac{21}{2}}\sqrt{\frac{a}{bx^3}+1}}-\frac{5\sqrt{b}}{36x^{\frac{15}{2}}\sqrt{\frac{a}{bx^3}+1}}+\frac{b^{\frac{3}{2}}}{72ax^{\frac{9}{2}}\sqrt{\frac{a}{bx^3}+1}}+\frac{b^{\frac{5}{2}}}{24a^2x^{\frac{3}{2}}\sqrt{\frac{a}{bx^3}+1}}-\frac{b^3\operatorname{asinh}\left(\frac{\sqrt{a}}{\sqrt{b}x^{\frac{3}{2}}}\right)}{24a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**(1/2)/x**10,x)
```

```
[Out] -a/(9*sqrt(b)*x**(21/2)*sqrt(a/(b*x**3) + 1)) - 5*sqrt(b)/(36*x**
(15/2)*sqrt(a/(b*x**3) + 1)) + b**(3/2)/(72*a*x**(9/2)*sqrt(a/(b*
x**3) + 1)) + b**(5/2)/(24*a**2*x**(3/2)*sqrt(a/(b*x**3) + 1)) -
b**3*asinh(sqrt(a)/(sqrt(b)*x**(3/2)))/(24*a**(5/2))
```

GIAC/XCAS [A] time = 0.232973, size = 108, normalized size = 1.14

$$\frac{1}{72}\,b^3\left(\frac{3\,\arctan\left(\frac{\sqrt{bx^3+a}}{\sqrt{-a}}\right)}{\sqrt{-a}a^2}+\frac{3\,\left(bx^3+a\right)^{\frac{5}{2}}-8\,\left(bx^3+a\right)^{\frac{3}{2}}a-3\,\sqrt{bx^3+a}a^2}{a^2b^3x^9}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)/x^10,x, algorithm="giac")
```

```
[Out] 1/72*b^3*(3*arctan(sqrt(b*x^3 + a)/sqrt(-a))/(sqrt(-a)*a^2) + (3*
(b*x^3 + a)^(5/2) - 8*(b*x^3 + a)^(3/2)*a - 3*sqrt(b*x^3 + a)*a^2
)/(a^2*b^3*x^9))
```

3.376 $\int x^6\sqrt{a+bx^3}\,dx$

Optimal. Leaf size=275

$$-\frac{48a^2x\sqrt{a+bx^3}}{935b^2}+\frac{32\,3^{3/4}\sqrt{2+\sqrt{3}}a^3\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{935b^{7/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{2}{17}x^7\sqrt{a+bx^3}+\frac{6ax^4\sqrt{a+bx^3}}{187b}$$

```
[Out] (-48*a^2*x*Sqrt[a + b*x^3])/(935*b^2) + (6*a*x^4*Sqrt[a + b*x^3])
/(187*b) + (2*x^7*Sqrt[a + b*x^3])/17 + (32*3^(3/4)*Sqrt[2 + Sqrt
[3]]*a^3*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x
+ b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[A
rcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3)
+ b^(1/3)*x)], -7 - 4*Sqrt[3]])/(935*b^(7/3)*Sqrt[(a^(1/3)*(a^(1/
3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a +
b*x^3])
```

Rubi [A] time = 0.298456, antiderivative size = 275, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{48a^2x\sqrt{a+bx^3}}{935b^2}+\frac{32\,3^{3/4}\sqrt{2+\sqrt{3}}a^3\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{935b^{7/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{2}{17}x^7\sqrt{a+bx^3}+\frac{6ax^4\sqrt{a+bx^3}}{187b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6*Sqrt[a + b*x^3],x]
```


```
[Out] (-48*a^2*x*Sqrt[a + b*x^3])/(935*b^2) + (6*a*x^4*Sqrt[a + b*x^3])
/(187*b) + (2*x^7*Sqrt[a + b*x^3])/17 + (32*3^(3/4)*Sqrt[2 + Sqrt
[3]]*a^3*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x
+ b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[A
rcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3)
+ b^(1/3)*x)], -7 - 4*Sqrt[3]])/(935*b^(7/3)*Sqrt[(a^(1/3)*(a^(1/
3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a +
b*x^3])
```

Rubi in Sympy [A] time = 23.0929, size = 246, normalized size = 0.89

$$\frac{32\cdot 3^{\frac{3}{4}}a^3\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{935b^{\frac{7}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{48a^2x\sqrt{a+bx^3}}{935b^2}+\frac{6ax^4\sqrt{a+bx^3}}{187b}+\frac{2x^7\sqrt{a+bx^3}}{17}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6*(b*x**3+a)**(1/2),x)
```

```
[Out] 32*3**(3/4)*a**3*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b**(2/3)*
x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(sqrt(3) + 2)
*(a**(1/3) + b**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)
) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4*sq
rt(3))/(935*b**(7/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1
/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) - 48*a**2*x
*sqrt(a + b*x**3)/(935*b**2) + 6*a*x**4*sqrt(a + b*x**3)/(187*b)
+ 2*x**7*sqrt(a + b*x**3)/17
```

Mathematica [C] time = 0.508152, size = 184, normalized size = 0.67

$$\sqrt{a+bx^3}\left(-\frac{48a^2x}{935b^2}+\frac{6ax^4}{187b}+\frac{2x^7}{17}\right)+\frac{32i3^{3/4}a^{10/3}\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)}{935\sqrt[3]{-b}b^2\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^6*Sqrt[a + b*x^3],x]
```

```
[Out] Sqrt[a + b*x^3]*((-48*a^2*x)/(935*b^2) + (6*a*x^4)/(187*b) + (2*x
^7)/17) + (((32*I)/935)*3^(3/4)*a^(10/3)*Sqrt[(-1)^(5/6)*(-1 + ((
-b)^(1/3)*x)/a^(1/3))]*Sqrt[1 + ((-b)^(1/3)*x)/a^(1/3) + ((-b)^(2
/3)*x^2)/a^(2/3)]*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/
3)*x)/a^(1/3)]/3^(1/4)], (-1)^(1/3)])/((-b)^(1/3)*b^2*Sqrt[a + b*
x^3])
```

Maple [A] time = 0.024, size = 337, normalized size = 1.2

$$\frac{2\,x^7}{17}\sqrt{bx^3+a}+\frac{6\,ax^4}{187\,b}\sqrt{bx^3+a}-\frac{48\,xa^2}{935\,b^2}\sqrt{bx^3+a}-\frac{\frac{32\,i}{935}a^3\sqrt{3}}{b^3}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2\,b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2\,b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6*(b*x^3+a)^(1/2),x)
```

```
[Out] 2/17*x^7*(b*x^3+a)^(1/2)+6/187*a*x^4*(b*x^3+a)^(1/2)/b-48/935*a^2
*x*(b*x^3+a)^(1/2)/b^2-32/935*I*a^3/b^3*3^(1/2)*(-a*b^2)^(1/3)*(I
```

```
*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*
b/(-a*b^2)^(1/3))^(1/2)*((x-1/b*(-a*b^2)^(1/3))/(-3/2/b*(-a*b^2)^
(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2)*(-I*(x+1/2/b*(-a*b^2
)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))
^(1/2)/(b*x^3+a)^(1/2)*EllipticF(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)
^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^
(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^
(1/2)/b*(-a*b^2)^(1/3)))^(1/2))
```

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

$$\int \sqrt{bx^3 + a}x^6 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)*x^6,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*x^3 + a)*x^6, x)
```

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

$$\text{integral}\left(\sqrt{bx^3 + a}x^6, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)*x^6,x, algorithm="fricas")
```

```
[Out] integral(sqrt(b*x^3 + a)*x^6, x)
```

Sympy [A] time = 2.86875, size = 39, normalized size = 0.14

$$\frac{\sqrt{a}x^7\,\Gamma\left(\frac{7}{3}\right)\,{}_2F_1\left(\begin{matrix}-\frac{1}{2},\frac{7}{3}\\ \frac{10}{3}\end{matrix}\middle|\frac{bx^3e^{i\pi}}{a}\right)}{3\,\Gamma\left(\frac{10}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6*(b*x**3+a)**(1/2),x)
```

```
[Out] sqrt(a)*x**7*gamma(7/3)*hyper((-1/2, 7/3), (10/3,), b*x**3*exp_po
lar(I*pi)/a)/(3*gamma(10/3))
```

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

$$\int \sqrt{bx^3 + a}x^6 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)*x^6,x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*x^3 + a)*x^6, x)
```

3.377 $\int x^3\sqrt{a+bx^3}\,dx$

Optimal. Leaf size=251

$$-\frac{4\,3^{3/4}\sqrt{2+\sqrt{3}}a^2\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{55b^{4/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{6ax\sqrt{a+bx^3}}{55b}+\frac{2}{11}x^4\sqrt{a+bx^3}$$

```
[Out] (6*a*x*Sqrt[a + b*x^3])/(55*b) + (2*x^4*Sqrt[a + b*x^3])/11 - (4*
3^(3/4)*Sqrt[2 + Sqrt[3]]*a^2*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3)
 - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1
/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((
1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(55*b^(4/3)*
Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(
1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi [A] time = 0.190715, antiderivative size = 251, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$-\frac{4\,3^{3/4}\sqrt{2+\sqrt{3}}a^2\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{55b^{4/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{6ax\sqrt{a+bx^3}}{55b}+\frac{2}{11}x^4\sqrt{a+bx^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3*Sqrt[a + b*x^3],x]
```

```
[Out] (6*a*x*Sqrt[a + b*x^3])/(55*b) + (2*x^4*Sqrt[a + b*x^3])/11 - (4*
3^(3/4)*Sqrt[2 + Sqrt[3]]*a^2*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3)
 - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1
/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((
1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(55*b^(4/3)*
Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(
1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 16.617, size = 223, normalized size = 0.89

$$-\frac{4\cdot 3^{\frac{3}{4}}a^2\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{55b^{\frac{4}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{6ax\sqrt{a+bx^3}}{55b}+\frac{2x^4\sqrt{a+bx^3}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3*(b*x**3+a)**(1/2),x)
```

```
[Out] -4*3**(3/4)*a**2*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b**(2/3)*
x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(sqrt(3) + 2)
*(a**(1/3) + b**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)
) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4*sq
rt(3))/(55*b**(4/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1/
3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) + 6*a*x*sqrt
(a + b*x**3)/(55*b) + 2*x**4*sqrt(a + b*x**3)/11
```

Mathematica [C] time = 0.838304, size = 168, normalized size = 0.67

$$\frac{2x\sqrt{a+bx^3}\left(3a+5bx^3\right)}{55b}+\frac{4i3^{3/4}a^{7/3}\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)}{55(-b)^{4/3}\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^3*Sqrt[a + b*x^3],x]
```

```
[Out] (2*x*Sqrt[a + b*x^3]*(3*a + 5*b*x^3))/(55*b) + (((4*I)/55)*3^(3/4
)*a^(7/3)*Sqrt[(-1)^(5/6)*(-1 + ((-b)^(1/3)*x)/a^(1/3))]*Sqrt[1 +
 ((-b)^(1/3)*x)/a^(1/3) + ((-b)^(2/3)*x^2)/a^(2/3)]*EllipticF[Arc
Sin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)^(
1/3)])/((-b)^(4/3)*Sqrt[a + b*x^3])
```

Maple [A] time = 0.023, size = 317, normalized size = 1.3

$$\frac{2x^4}{11}\sqrt{bx^3+a}+\frac{6ax}{55b}\sqrt{bx^3+a}+\frac{\frac{4i}{55}a^2\sqrt{3}}{b^2}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3*(b*x^3+a)^(1/2),x)
```

```
[Out] 2/11*x^4*(b*x^3+a)^(1/2)+6/55*a*x*(b*x^3+a)^(1/2)/b+4/55*I/b^2*a^
2*3^(1/2)*(-a*b^2)^(1/3)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)
/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)*((x-1/b*(-a*b^
2)^(1/3))/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))
^(1/2)*(-I*(x+1/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)
)*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)/(b*x^3+a)^(1/2)*EllipticF(1/3*3
^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))
*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/
2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2))
```

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

$$\int \sqrt{bx^3+a}x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)*x^3,x, algorithm="maxima")

[Out] integrate(sqrt(b*x^3 + a)*x^3, x)
```

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

$$\text{integral}\left(\sqrt{bx^3 + a}x^3, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)*x^3,x, algorithm="fricas")

[Out] integral(sqrt(b*x^3 + a)*x^3, x)
```

Sympy [A] time = 2.33172, size = 39, normalized size = 0.16

$$\frac{\sqrt{a}x^4\,\Gamma\left(\frac{4}{3}\right)\,{}_2F_1\left(\begin{matrix}-\frac{1}{2},\frac{4}{3}\\ \frac{7}{3}\end{matrix}\middle|\frac{bx^3e^{i\pi}}{a}\right)}{3\,\Gamma\left(\frac{7}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(b*x**3+a)**(1/2),x)

[Out] sqrt(a)*x**4*gamma(4/3)*hyper((-1/2, 4/3), (7/3,), b*x**3*exp_pol
ar(I*pi)/a)/(3*gamma(7/3))
```

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

$$\int \sqrt{bx^3 + a}x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)*x^3,x, algorithm="giac")

[Out] integrate(sqrt(b*x^3 + a)*x^3, x)
```

3.378 $\int \sqrt{a+bx^3}\,dx$

Optimal. Leaf size=227

$$\frac{2\,3^{3/4}\sqrt{2+\sqrt{3}}\,a\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\,F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{5\sqrt[3]{b}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{2}{5}x\sqrt{a+bx^3}$$

```
[Out] (2*x*Sqrt[a + b*x^3])/5 + (2*3^(3/4)*Sqrt[2 + Sqrt[3]]*a*(a^(1/3)
 + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((
1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[
3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7
 - 4*Sqrt[3]])/(5*b^(1/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((
1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi [A] time = 0.114175, antiderivative size = 227, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$

$$\frac{2\,3^{3/4}\sqrt{2+\sqrt{3}}\,a\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\,F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{5\sqrt[3]{b}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{2}{5}x\sqrt{a+bx^3}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*x^3],x]
```

```
[Out] (2*x*Sqrt[a + b*x^3])/5 + (2*3^(3/4)*Sqrt[2 + Sqrt[3]]*a*(a^(1/3)
 + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((
1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[
3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7
 - 4*Sqrt[3]])/(5*b^(1/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((
1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 8.32425, size = 201, normalized size = 0.89

$$\frac{2\cdot 3^{\frac{3}{4}}a\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{5\sqrt[3]{b}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{2x\sqrt{a+bx^3}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**(1/2),x)
```

```
[Out] 2*3**(3/4)*a*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b**(2/3)*x**2
)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(sqrt(3) + 2)*(a*
*(1/3) + b**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) +
b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4*sqrt(3
))/(5*b**(1/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1/3)*(1
 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) + 2*x*sqrt(a + b*
```

```
x**3)/5
```

Mathematica [C] time = 0.560453, size = 155, normalized size = 0.68

$$\frac{2}{5}x\sqrt{a+bx^3}+\frac{2i3^{3/4}a^{4/3}\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)}{5\sqrt[3]{-b}\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[Sqrt[a + b*x^3],x]
```

```
[Out] (2*x*Sqrt[a + b*x^3])/5 + (((2*I)/5)*3^(3/4)*a^(4/3)*Sqrt[(-1)^(5
/6)*(-1 + ((-b)^(1/3)*x)/a^(1/3))]*Sqrt[1 + ((-b)^(1/3)*x)/a^(1/3
) + ((-b)^(2/3)*x^2)/a^(2/3)]*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) -
 (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)^(1/3)])/((-b)^(1/3)*Sqr
t[a + b*x^3])
```

Maple [A] time = 0.018, size = 297, normalized size = 1.3

$$\frac{2x}{5}\sqrt{bx^3+a}$$
$$-\frac{\frac{2i}{5}a\sqrt{3}}{b}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}b$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^(1/2),x)
```

```
[Out] 2/5*x*(b*x^3+a)^(1/2)-2/5*I*a*3^(1/2)/b*(-a*b^2)^(1/3)*(I*(x+1/2/
b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^
2)^(1/3))^(1/2)*((x-1/b*(-a*b^2)^(1/3))/(-3/2/b*(-a*b^2)^(1/3)+1/
2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2)*(-I*(x+1/2/b*(-a*b^2)^(1/3)+
1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)/(
b*x^3+a)^(1/2)*EllipticF(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1
/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I
*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*
(-a*b^2)^(1/3)))^(1/2))
```

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

$$\int\sqrt{bx^3+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*x^3 + a), x)
```

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

$$\text{integral}\left(\sqrt{bx^3+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a),x, algorithm="fricas")
```

```
[Out] integral(sqrt(b*x^3 + a), x)
```

Sympy [A] time = 2.17004, size = 37, normalized size = 0.16

$$\frac{\sqrt{a}x\Gamma\left(\frac{1}{3}\right){}_2F_1\left(\begin{matrix}-\frac{1}{2},\frac{1}{3}\\ \frac{4}{3}\end{matrix}\middle|\frac{bx^3e^{i\pi}}{a}\right)}{3\Gamma\left(\frac{4}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**(1/2),x)
```

```
[Out] sqrt(a)*x*gamma(1/3)*hyper((-1/2, 1/3), (4/3,), b*x**3*exp_polar(
I*pi)/a)/(3*gamma(4/3))
```

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

$$\int\sqrt{bx^3+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a),x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*x^3 + a), x)
```

3.379 $\int \frac{\sqrt{a+bx^3}}{x^3}\,dx$

Optimal. Leaf size=228

$$\frac{3^{3/4}\sqrt{2+\sqrt{3}}\,b^{2/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\,F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{2\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{\sqrt{a+bx^3}}{2x^2}$$

```
[Out] -Sqrt[a + b*x^3]/(2*x^2) + (3^(3/4)*Sqrt[2 + Sqrt[3]]*b^(2/3)*(a^
(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^
2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSin[((1 -
Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)
], -7 - 4*Sqrt[3]])/(2*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 +
 Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi [A] time = 0.125294, antiderivative size = 228, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{3^{3/4}\sqrt{2+\sqrt{3}}\,b^{2/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\,F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{2\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{\sqrt{a+bx^3}}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*x^3]/x^3,x]
```

```
[Out] -Sqrt[a + b*x^3]/(2*x^2) + (3^(3/4)*Sqrt[2 + Sqrt[3]]*b^(2/3)*(a^
(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^
2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSin[((1 -
Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)
], -7 - 4*Sqrt[3]])/(2*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 +
 Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 9.89692, size = 197, normalized size = 0.86

$$\frac{3^{\frac{3}{4}}b^{\frac{2}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{2\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{\sqrt{a+bx^3}}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**(1/2)/x**3,x)
```

```
[Out] 3**(3/4)*b**(2/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b**(2/3)
*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(sqrt(3) + 2
)*(a**(1/3) + b**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3
)) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4*s
qrt(3))/(2*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1/3)*(1 + s
qrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) - sqrt(a + b*x**3)/(2
```

```
*x**2)
```

Mathematica [C] time = 0.762465, size = 158, normalized size = 0.69

$$-\frac{\sqrt{a+bx^3}}{2x^2}+\frac{i3^{3/4}\sqrt[3]{a}b\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)}{2\sqrt[3]{-b}\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[Sqrt[a + b*x^3]/x^3,x]
```

```
[Out] -Sqrt[a + b*x^3]/(2*x^2) + ((I/2)*3^(3/4)*a^(1/3)*b*Sqrt[(-1)^(5/
6)*(-1 + ((-b)^(1/3)*x)/a^(1/3))]*Sqrt[1 + ((-b)^(1/3)*x)/a^(1/3)
 + ((-b)^(2/3)*x^2)/a^(2/3)]*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) -
(I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)^(1/3)])/((-b)^(1/3)*Sqrt
[a + b*x^3])
```

Maple [A] time = 0.026, size = 295, normalized size = 1.3

$$-\frac{1}{2x^2}\sqrt{bx^3+a}$$
$$-\frac{i}{2}\sqrt{3}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}b\left(x\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^(1/2)/x^3,x)
```

```
[Out] -1/2*(b*x^3+a)^(1/2)/x^2-1/2*I*3^(1/2)*(-a*b^2)^(1/3)*(I*(x+1/2/b
*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2
)^(1/3))^(1/2)*((x-1/b*(-a*b^2)^(1/3))/(-3/2/b*(-a*b^2)^(1/3)+1/2
*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2)*(-I*(x+1/2/b*(-a*b^2)^(1/3)+1
/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)/(b
*x^3+a)^(1/2)*EllipticF(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/
2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*
3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(
-a*b^2)^(1/3)))^(1/2))
```

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

$$\int\frac{\sqrt{bx^3+a}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{\sqrt{bx^3+a}}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral(sqrt(b*x^3 + a)/x^3, x)
```

Sympy [A] time = 2.45973, size = 42, normalized size = 0.18

$$\frac{\sqrt{a}\,\Gamma\left(-\frac{2}{3}\right)\,{}_2F_1\left(\begin{matrix}-\frac{2}{3},-\frac{1}{2}\\ \frac{1}{3}\end{matrix}\middle|\frac{bx^3e^{i\pi}}{a}\right)}{3x^2\,\Gamma\left(\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**(1/2)/x**3,x)
```

```
[Out] sqrt(a)*gamma(-2/3)*hyper((-2/3, -1/2), (1/3,), b*x**3*exp_polar(
I*pi)/a)/(3*x**2*gamma(1/3))
```

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

$$\int \frac{\sqrt{bx^3+a}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.380 $\int \frac{\sqrt{a+bx^3}}{x^6} \, dx$

Optimal. Leaf size=253

$$-\frac{3^{3/4}\sqrt{2+\sqrt{3}}b^{5/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{20a\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{\sqrt{a+bx^3}}{5x^5}-\frac{3b\sqrt{a+bx^3}}{20ax^2}$$

```
[Out] -Sqrt[a + b*x^3]/(5*x^5) - (3*b*Sqrt[a + b*x^3])/(20*a*x^2) - (3^
(3/4)*Sqrt[2 + Sqrt[3]]*b^(5/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/
3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^
(1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/
((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(20*a*Sqrt
[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)
*x)^2]*Sqrt[a + b*x^3])
```

Rubi [A] time = 0.189046, antiderivative size = 253, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$-\frac{3^{3/4}\sqrt{2+\sqrt{3}}b^{5/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{20a\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{\sqrt{a+bx^3}}{5x^5}-\frac{3b\sqrt{a+bx^3}}{20ax^2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*x^3]/x^6,x]
```

```
[Out] -Sqrt[a + b*x^3]/(5*x^5) - (3*b*Sqrt[a + b*x^3])/(20*a*x^2) - (3^
(3/4)*Sqrt[2 + Sqrt[3]]*b^(5/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/
3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^
(1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/
((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(20*a*Sqrt
[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)
*x)^2]*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 16.1211, size = 221, normalized size = 0.87

$$-\frac{\sqrt{a+bx^3}}{5x^5}-\frac{3^{\frac{3}{4}}b^{\frac{5}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{20a\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{3b\sqrt{a+bx^3}}{20ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate((b*x**3+a)**(1/2)/x**6,x)
```

```
[Out] -sqrt(a + b*x**3)/(5*x**5) - 3**(3/4)*b**(5/3)*sqrt((a**(2/3) - a
**(1/3)*b**(1/3)*x + b**(2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**
(1/3)*x)**2)*sqrt(sqrt(3) + 2)*(a**(1/3) + b**(1/3)*x)*elliptic_f
(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt
(3)) + b**(1/3)*x)), -7 - 4*sqrt(3))/(20*a*sqrt(a**(1/3)*(a**(1/3
) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a
+ b*x**3)) - 3*b*sqrt(a + b*x**3)/(20*a*x**2)
```

Mathematica [C] time = 0.90993, size = 173, normalized size = 0.68

$$\left(-\frac{3b}{20ax^2}-\frac{1}{5x^5}\right)\sqrt{a+bx^3}-\frac{i3^{3/4}b^2\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)}{20a^{2/3}\sqrt[3]{-b}\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]   Integrate[Sqrt[a + b*x^3]/x^6,x]
```

```
[Out] (-1/(5*x^5) - (3*b)/(20*a*x^2))*Sqrt[a + b*x^3] - ((I/20)*3^(3/4)
*b^2*Sqrt[(-1)^(5/6)*(-1 + ((-b)^(1/3)*x)/a^(1/3))]*Sqrt[1 + ((-b
)^(1/3)*x)/a^(1/3) + ((-b)^(2/3)*x^2)/a^(2/3)]*EllipticF[ArcSin[S
qrt[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)^(1/3)]
)/(a^(2/3)*(-b)^(1/3)*Sqrt[a + b*x^3])
```

Maple [A] time = 0.037, size = 317, normalized size = 1.3

$$-\frac{1}{5x^5}\sqrt{bx^3+a}-\frac{3b}{20ax^2}\sqrt{bx^3+a}+\frac{\frac{i}{20}b\sqrt{3}}{a}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((b*x^3+a)^(1/2)/x^6,x)
```

```
[Out] -1/5*(b*x^3+a)^(1/2)/x^5-3/20*b*(b*x^3+a)^(1/2)/a/x^2+1/20*I/a*b*
3^(1/2)*(-a*b^2)^(1/3)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b
*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)*((x-1/b*(-a*b^2)
^(1/3))/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(
1/2)*(-I*(x+1/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*
3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)/(b*x^3+a)^(1/2)*EllipticF(1/3*3^(
1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3
^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/
b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2))
```

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

$$\int\frac{\sqrt{bx^3+a}}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)/x^6,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*x^3 + a)/x^6, x)
```

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

$$\text{integral}\left(\frac{\sqrt{bx^3+a}}{x^6},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)/x^6,x, algorithm="fricas")
```

```
[Out] integral(sqrt(b*x^3 + a)/x^6, x)
```

Sympy [A] time = 3.08069, size = 46, normalized size = 0.18

$$\frac{\sqrt{a}\,\Gamma\left(-\frac{5}{3}\right){}_{2}F_{1}\left(\begin{matrix}-\frac{5}{3},-\frac{1}{2}\\-\frac{2}{3}\end{matrix}\middle|\frac{bx^3e^{i\pi}}{a}\right)}{3x^5\,\Gamma\left(-\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**(1/2)/x**6,x)
```

```
[Out] sqrt(a)*gamma(-5/3)*hyper((-5/3, -1/2), (-2/3,), b*x**3*exp_polar
(I*pi)/a)/(3*x**5*gamma(-2/3))
```

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

$$\int \frac{\sqrt{bx^3+a}}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)/x^6,x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*x^3 + a)/x^6, x)
```

3.381 $\int \frac{\sqrt{a+bx^3}}{x^9}\,dx$

Optimal. Leaf size=277

$$\frac{21b^2\sqrt{a+bx^3}}{320a^2x^2}+\frac{7\,3^{3/4}\sqrt{2+\sqrt{3}}\,b^{8/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\,F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{320a^2\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{\sqrt{a+bx^3}}{8x^8}-\frac{3b\sqrt{a+bx^3}}{80ax^5}$$

```
[Out] -Sqrt[a + b*x^3]/(8*x^8) - (3*b*Sqrt[a + b*x^3])/(80*a*x^5) + (21
*b^2*Sqrt[a + b*x^3])/(320*a^2*x^2) + (7*3^(3/4)*Sqrt[2 + Sqrt[3]
]*b^(8/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x
 + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[
ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3)
 + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(320*a^2*Sqrt[(a^(1/3)*(a^(1/3)
+ b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x
^3])
```

Rubi [A] time = 0.250237, antiderivative size = 277, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{21b^2\sqrt{a+bx^3}}{320a^2x^2}+\frac{7\,3^{3/4}\sqrt{2+\sqrt{3}}\,b^{8/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\,F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{320a^2\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{\sqrt{a+bx^3}}{8x^8}-\frac{3b\sqrt{a+bx^3}}{80ax^5}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*x^3]/x^9,x]
```


```
[Out] -Sqrt[a + b*x^3]/(8*x^8) - (3*b*Sqrt[a + b*x^3])/(80*a*x^5) + (21
*b^2*Sqrt[a + b*x^3])/(320*a^2*x^2) + (7*3^(3/4)*Sqrt[2 + Sqrt[3]
]*b^(8/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x
 + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[
ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3)
 + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(320*a^2*Sqrt[(a^(1/3)*(a^(1/3)
+ b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x
^3])
```

Rubi in Sympy [A] time = 22.2791, size = 246, normalized size = 0.89

$$-\frac{\sqrt{a+bx^3}}{8x^8}-\frac{3b\sqrt{a+bx^3}}{80ax^5}+\frac{7\cdot 3^{\frac{3}{4}}b^{\frac{8}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{320a^2\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{21b^2\sqrt{a+bx^3}}{320a^2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate((b*x**3+a)**(1/2)/x**9,x)
```

```
[Out] -sqrt(a + b*x**3)/(8*x**8) - 3*b*sqrt(a + b*x**3)/(80*a*x**5) + 7
*3**(3/4)*b**(8/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b**(2/3
)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(sqrt(3) +
2)*(a**(1/3) + b**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(
3)) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4*
sqrt(3))/(320*a**2*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1/3
)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) + 21*b**2*sqr
t(a + b*x**3)/(320*a**2*x**2)
```

Mathematica [C] time = 0.829841, size = 181, normalized size = 0.65

$$\frac{-7i3^{3/4}\sqrt[3]{a}(-b)^{8/3}x^8\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)-40a^3-52a^2bx^3+9\cdots}{320a^2x^8\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]   Integrate[Sqrt[a + b*x^3]/x^9,x]
```

```
[Out] (-40*a^3 - 52*a^2*b*x^3 + 9*a*b^2*x^6 + 21*b^3*x^9 - (7*I)*3^(3/4
)*a^(1/3)*(-b)^(8/3)*x^8*Sqrt[(-1)^(5/6)*(-1 + ((-b)^(1/3)*x)/a^(
1/3))]*Sqrt[1 + ((-b)^(1/3)*x)/a^(1/3) + ((-b)^(2/3)*x^2)/a^(2/3)
]*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3
^(1/4)], (-1)^(1/3)])/(320*a^2*x^8*Sqrt[a + b*x^3])
```

Maple [A] time = 0.031, size = 339, normalized size = 1.2

$$-\frac{1}{8x^8}\sqrt{bx^3+a}-\frac{3b}{80ax^5}\sqrt{bx^3+a}+\frac{21b^2}{320a^2x^2}\sqrt{bx^3+a}$$
$$-\frac{\frac{7i}{320}b^2\sqrt{3}}{a^2}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((b*x^3+a)^(1/2)/x^9,x)
```

```
[Out] -1/8*(b*x^3+a)^(1/2)/x^8-3/80*b*(b*x^3+a)^(1/2)/a/x^5+21/320*b^2*
(b*x^3+a)^(1/2)/a^2/x^2-7/320*I/a^2*b^2*3^(1/2)*(-a*b^2)^(1/3)*(I
*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*
```

```
b/(-a*b^2)^(1/3))^(1/2)*((x-1/b*(-a*b^2)^(1/3))/(-3/2/b*(-a*b^2)^
(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2)*(-I*(x+1/2/b*(-a*b^2
)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))
^(1/2)/(b*x^3+a)^(1/2)*EllipticF(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)
^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^
(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^
(1/2)/b*(-a*b^2)^(1/3)))^(1/2))
```

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

$$\int \frac{\sqrt{bx^3 + a}}{x^9}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)/x^9,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*x^3 + a)/x^9, x)
```

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

$$\text{integral}\left(\frac{\sqrt{bx^3 + a}}{x^9}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)/x^9,x, algorithm="fricas")
```

```
[Out] integral(sqrt(b*x^3 + a)/x^9, x)
```

Sympy [A] time = 4.55748, size = 46, normalized size = 0.17

$$\frac{\sqrt{a}\,\Gamma\left(-\frac{8}{3}\right) {}_2F_1\left(\begin{matrix} -\frac{8}{3}, -\frac{1}{2} \\ -\frac{5}{3} \end{matrix}\middle| \frac{bx^3 e^{i\pi}}{a}\right)}{3x^8\,\Gamma\left(-\frac{5}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**(1/2)/x**9,x)
```

```
[Out] sqrt(a)*gamma(-8/3)*hyper((-8/3, -1/2), (-5/3,), b*x**3*exp_polar
(I*pi)/a)/(3*x**8*gamma(-5/3))
```

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

$$\int \frac{\sqrt{bx^3 + a}}{x^9}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)/x^9,x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*x^3 + a)/x^9, x)
```

3.382 $\int x^7\sqrt{a+bx^3}\,dx$

Optimal. Leaf size=535

$$\frac{80\sqrt{2}3^{3/4}a^{10/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{1729b^{8/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{120\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{10/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{1729b^{8/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{240a^3\sqrt{a+bx^3}}{1729b^{8/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)}-\frac{60a^2x^2\sqrt{a+bx^3}}{1729b^2}+\frac{2}{19}x^8\sqrt{a+bx^3}+\frac{6ax^5\sqrt{a+bx^3}}{247b}$$

```
[Out] (-60*a^2*x^2*Sqrt[a + b*x^3])/(1729*b^2) + (6*a*x^5*Sqrt[a + b*x^
3])/(247*b) + (2*x^8*Sqrt[a + b*x^3])/19 + (240*a^3*Sqrt[a + b*x^
3])/(1729*b^(8/3)*((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)) - (120*3^(
1/4)*Sqrt[2 - Sqrt[3]]*a^(10/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/
3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^
(1/3)*x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/
((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]]])/(1729*b^(8
/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) +
 b^(1/3)*x)^2]*Sqrt[a + b*x^3]) + (80*Sqrt[2]*3^(3/4)*a^(10/3)*(a
^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x
^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSin[((1 -
 Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x
)], -7 - 4*Sqrt[3]]])/(1729*b^(8/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/
3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi [A] time = 0.653251, antiderivative size = 535, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{80\sqrt{2}3^{3/4}a^{10/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{1729b^{8/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{120\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{10/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{1729b^{8/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{240a^3\sqrt{a+bx^3}}{1729b^{8/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)}-\frac{60a^2x^2\sqrt{a+bx^3}}{1729b^2}+\frac{2}{19}x^8\sqrt{a+bx^3}+\frac{6ax^5\sqrt{a+bx^3}}{247b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7*Sqrt[a + b*x^3],x]
```


```
[Out] (-60*a^2*x^2*Sqrt[a + b*x^3])/(1729*b^2) + (6*a*x^5*Sqrt[a + b*x^
3])/(247*b) + (2*x^8*Sqrt[a + b*x^3])/19 + (240*a^3*Sqrt[a + b*x^
3])/(1729*b^(8/3)*((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)) - (120*3^(
```

```
1/4)*Sqrt[2 - Sqrt[3]]*a^(10/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/
3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^
(1/3)*x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/
((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(1729*b^(8
/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) +
 b^(1/3)*x)^2]*Sqrt[a + b*x^3]) + (80*Sqrt[2]*3^(3/4)*a^(10/3)*(a
^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x
^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSin[((1 -
 Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x
)], -7 - 4*Sqrt[3]])/(1729*b^(8/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/
3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 55.7303, size = 476, normalized size = 0.89

$$-\frac{120\sqrt[4]{3}a^{\frac{10}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{1729b^{\frac{8}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{80\sqrt{2}\cdot 3^{\frac{3}{4}}a^{\frac{10}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{1729b^{\frac{8}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{240a^3\sqrt{a+bx^3}}{1729b^{\frac{8}{3}}\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)}-\frac{60a^2x^2\sqrt{a+bx^3}}{1729b^2}+\frac{6ax^5\sqrt{a+bx^3}}{247b}+\frac{2x^8\sqrt{a+bx^3}}{19}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7*(b*x**3+a)**(1/2),x)
```

```
[Out] -120*3**(1/4)*a**(10/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b*
*(2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(-sqrt
(3) + 2)*(a**(1/3) + b**(1/3)*x)*elliptic_e(asin((-a**(1/3)*(-1 +
 sqrt(3)) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -
7 - 4*sqrt(3))/(1729*b**(8/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*
x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) +
80*sqrt(2)*3**(3/4)*a**(10/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*
x + b**(2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*(a**
(1/3) + b**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b
**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4*sqrt(3)
)/(1729*b**(8/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1/3)*
(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) + 240*a**3*sqrt
(a + b*x**3)/(1729*b**(8/3)*(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)
) - 60*a**2*x**2*sqrt(a + b*x**3)/(1729*b**2) + 6*a*x**5*sqrt(a +
 b*x**3)/(247*b) + 2*x**8*sqrt(a + b*x**3)/19
```

Mathematica [C] time = 1.38066, size = 238, normalized size = 0.44

$$-\frac{2\left((-b)^{2/3}\left(a+bx^3\right)\left(30a^2x^2-21abx^5-91b^2x^8\right)+40(-1)^{2/3}3^{3/4}a^{11/3}\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}\left((-1\right.\right.}{1729(-b)^{8/3}\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^7*Sqrt[a + b*x^3],x]
```

```
[Out] (-2*((-b)^(2/3)*(a + b*x^3)*(30*a^2*x^2 - 21*a*b*x^5 - 91*b^2*x^8
) + 40*(-1)^(2/3)*3^(3/4)*a^(11/3)*Sqrt[(-1)^(5/6)*(-1 + ((-b)^(1
/3)*x)/a^(1/3))]*Sqrt[1 + ((-b)^(1/3)*x)/a^(1/3) + ((-b)^(2/3)*x^
2)/a^(2/3)]*(Sqrt[3]*EllipticE[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^
(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)^(1/3)] + (-1)^(5/6)*EllipticF[Ar
cSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)^
(1/3)])))/(1729*(-b)^(8/3)*Sqrt[a + b*x^3])
```

Maple [A] time = 0.025, size = 491, normalized size = 0.9

$$\frac{2x^8}{19}\sqrt{bx^3+a}+\frac{6ax^5}{247b}\sqrt{bx^3+a}-\frac{60a^2x^2}{1729b^2}\sqrt{bx^3+a}$$
$$-\frac{\frac{80i}{1729}a^3\sqrt{3}}{b^3}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{\ }}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7*(b*x^3+a)^(1/2),x)
```

```
[Out] 2/19*x^8*(b*x^3+a)^(1/2)+6/247*a*x^5*(b*x^3+a)^(1/2)/b-60/1729*a^
2*x^2*(b*x^3+a)^(1/2)/b^2-80/1729*I*a^3/b^3*3^(1/2)*(-a*b^2)^(1/3
)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1
/2)*b/(-a*b^2)^(1/3))^(1/2)*((x-1/b*(-a*b^2)^(1/3))/(-3/2/b*(-a*b
^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2)*(-I*(x+1/2/b*(-a
*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1
/3))^(1/2)/(b*x^3+a)^(1/2)*((-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/
b*(-a*b^2)^(1/3))*EllipticE(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3
)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)
,(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)
/b*(-a*b^2)^(1/3)))^(1/2))+1/b*(-a*b^2)^(1/3)*EllipticF(1/3*3^(1/
2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(
1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*
(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2)))
```

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

$$\int \sqrt{bx^3+a}\,x^7\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)*x^7,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*x^3 + a)*x^7, x)
```

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

$$\text{integral}\left(\sqrt{bx^3+a}\,x^7, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)*x^7,x, algorithm="fricas")
```

```
[Out] integral(sqrt(b*x^3 + a)*x^7, x)
```

Sympy [A] time = 3.16944, size = 39, normalized size = 0.07

$$\frac{\sqrt{a}x^{8}\Gamma\left(\frac{8}{3}\right){}_{2}F_{1}\left(\begin{matrix}-\frac{1}{2},\frac{8}{3}\\ \frac{11}{3}\end{matrix}\middle|\frac{bx^{3}e^{i\pi}}{a}\right)}{3\Gamma\left(\frac{11}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7*(b*x**3+a)**(1/2),x)
```

```
[Out] sqrt(a)*x**8*gamma(8/3)*hyper((-1/2, 8/3), (11/3,), b*x**3*exp_po
lar(I*pi)/a)/(3*gamma(11/3))
```

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

$$\int \sqrt{bx^3 + a}x^7\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)*x^7,x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*x^3 + a)*x^7, x)
```

3.383 $\int x^4\sqrt{a+bx^3}\,dx$

Optimal. Leaf size=511

$$-\frac{8\sqrt{2}3^{3/4}a^{7/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{91b^{5/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{12\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{7/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{91b^{5/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{24a^2\sqrt{a+bx^3}}{91b^{5/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)}+\frac{2}{13}x^5\sqrt{a+bx^3}+\frac{6ax^2\sqrt{a+bx^3}}{91b}$$

```
[Out] (6*a*x^2*Sqrt[a + b*x^3])/(91*b) + (2*x^5*Sqrt[a + b*x^3])/13 - (
24*a^2*Sqrt[a + b*x^3])/(91*b^(5/3)*((1 + Sqrt[3])*a^(1/3) + b^(1
/3)*x)) + (12*3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(7/3)*(a^(1/3) + b^(1/3
)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[
3])*a^(1/3) + b^(1/3)*x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/
3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt
[3]])/(91*b^(5/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt
[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3]) - (8*Sqrt[2]*3^(3/4
)*a^(7/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x
 + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[
ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3)
 + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(91*b^(5/3)*Sqrt[(a^(1/3)*(a^(1/
3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a +
b*x^3])
```

Rubi [A] time = 0.533464, antiderivative size = 511, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{8\sqrt{2}3^{3/4}a^{7/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{91b^{5/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{12\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{7/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{91b^{5/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{24a^2\sqrt{a+bx^3}}{91b^{5/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)}+\frac{2}{13}x^5\sqrt{a+bx^3}+\frac{6ax^2\sqrt{a+bx^3}}{91b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4*Sqrt[a + b*x^3],x]
```



```
[Out] (6*a*x^2*Sqrt[a + b*x^3])/(91*b) + (2*x^5*Sqrt[a + b*x^3])/13 - (
24*a^2*Sqrt[a + b*x^3])/(91*b^(5/3)*((1 + Sqrt[3])*a^(1/3) + b^(1
/3)*x)) + (12*3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(7/3)*(a^(1/3) + b^(1/3
```

```
)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[
3])*a^(1/3) + b^(1/3)*x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/
3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt
[3]])/(91*b^(5/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt
[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3]) - (8*Sqrt[2]*3^(3/4
)*a^(7/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x
 + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[
ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3)
 + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(91*b^(5/3)*Sqrt[(a^(1/3)*(a^(1/
3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a +
b*x^3])
```

Rubi in Sympy [A] time = 46.6584, size = 452, normalized size = 0.88

$$\frac{12\sqrt[4]{3}a^{\frac{7}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{91b^{\frac{5}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}} - \frac{8\sqrt{2}\cdot 3^{\frac{3}{4}}a^{\frac{7}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{91b^{\frac{5}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}} - \frac{24a^2\sqrt{a+bx^3}}{91b^{\frac{5}{3}}\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)} + \frac{6ax^2\sqrt{a+bx^3}}{91b} + \frac{2x^5\sqrt{a+bx^3}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4*(b*x**3+a)**(1/2),x)
```

```
[Out] 12*3**(1/4)*a**(7/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b**(2
/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(-sqrt(3)
 + 2)*(a**(1/3) + b**(1/3)*x)*elliptic_e(asin((-a**(1/3)*(-1 + sq
rt(3)) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 -
 4*sqrt(3))/(91*b**(5/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a
**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) - 8*sqr
t(2)*3**(3/4)*a**(7/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b**
(2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*(a**(1/3) +
 b**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)
*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4*sqrt(3))/(91*b
**(5/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt
(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) - 24*a**2*sqrt(a + b*x**
3)/(91*b**(5/3)*(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)) + 6*a*x**2
*sqrt(a + b*x**3)/(91*b) + 2*x**5*sqrt(a + b*x**3)/13
```

Mathematica [C] time = 1.63531, size = 231, normalized size = 0.45

$$\frac{2\sqrt{a+bx^3}\left(3ax^2+7bx^5\right)}{91b} + \frac{8\sqrt[6]{-1}3^{3/4}a^{8/3}\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}\left(\sqrt[3]{-1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)-i\sqrt{3}E\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i}{\ldots}}}{\ldots}\right.\right.\right.}{91(-b)^{5/3}\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^4*Sqrt[a + b*x^3],x]
```

```
[Out] (2*Sqrt[a + b*x^3]*(3*a*x^2 + 7*b*x^5))/(91*b) + (8*(-1)^(1/6)*3^
(3/4)*a^(8/3)*Sqrt[(-1)^(5/6)*(-1 + ((-b)^(1/3)*x)/a^(1/3))]*Sqrt
[1 + ((-b)^(1/3)*x)/a^(1/3) + ((-b)^(2/3)*x^2)/a^(2/3)]*((-I)*Sqr
t[3]*EllipticE[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)
]/3^(1/4)], (-1)^(1/3)] + (-1)^(1/3)*EllipticF[ArcSin[Sqrt[-(-1)^
(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)^(1/3)]))/(91*(-b
)^(5/3)*Sqrt[a + b*x^3])
```

Maple [A] time = 0.023, size = 471, normalized size = 0.9

$$\frac{2\,x^5}{13}\sqrt{bx^3+a}+\frac{6\,ax^2}{91\,b}\sqrt{bx^3+a}$$
$$+\frac{\frac{8\,i}{91}a^2\sqrt{3}}{b^2}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2\,b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2\,b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}b$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4*(b*x^3+a)^(1/2),x)
```

```
[Out] 2/13*x^5*(b*x^3+a)^(1/2)+6/91*a*x^2*(b*x^3+a)^(1/2)/b+8/91*I/b^2*
a^2*3^(1/2)*(-a*b^2)^(1/3)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/
2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)*((x-1/b*(-a*
b^2)^(1/3))/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)
))^(1/2)*(-I*(x+1/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/
3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)/(b*x^3+a)^(1/2)*((-3/2/b*(-a*
b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*EllipticE(1/3*3^(1/2)*
(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2
)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a
*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2))+1/b*(-a*b^2)^
(1/3)*EllipticF(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1
/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/
b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^
(1/3)))^(1/2)))
```

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

$$\int\sqrt{bx^3+a}x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)*x^4,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*x^3 + a)*x^4, x)
```

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

$$\text{integral}\left(\sqrt{bx^3+a}x^4,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)*x^4,x, algorithm="fricas")
```

```
[Out] integral(sqrt(b*x^3 + a)*x^4, x)
```

Sympy [A] time = 2.51758, size = 39, normalized size = 0.08

$$\frac{\sqrt{a}x^5\,\Gamma\left(\frac{5}{3}\right)\,{}_2F_1\left(\begin{matrix}-\frac{1}{2},\frac{5}{3}\\ \frac{8}{3}\end{matrix}\middle|\frac{bx^3e^{i\pi}}{a}\right)}{3\,\Gamma\left(\frac{8}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4*(b*x**3+a)**(1/2),x)
```

```
[Out] sqrt(a)*x**5*gamma(5/3)*hyper((-1/2, 5/3), (8/3,), b*x**3*exp_pol
ar(I*pi)/a)/(3*gamma(8/3))
```

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

$$\int \sqrt{bx^3 + a}x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)*x^4,x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*x^3 + a)*x^4, x)
```

3.384 $\int x\sqrt{a+bx^3}\,dx$

Optimal. Leaf size=487

$$\frac{2\sqrt{2}3^{3/4}a^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{7b^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{3\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{7b^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{6a\sqrt{a+bx^3}}{7b^{2/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)}+\frac{2}{7}x^2\sqrt{a+bx^3}$$

```
[Out] (2*x^2*Sqrt[a + b*x^3])/7 + (6*a*Sqrt[a + b*x^3])/(7*b^(2/3)*((1
+ Sqrt[3])*a^(1/3) + b^(1/3)*x)) - (3*3^(1/4)*Sqrt[2 - Sqrt[3]]*a
^(4/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x +
b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticE[Arc
Sin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) +
b^(1/3)*x)], -7 - 4*Sqrt[3]])/(7*b^(2/3)*Sqrt[(a^(1/3)*(a^(1/3) +
 b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^
3]) + (2*Sqrt[2]*3^(3/4)*a^(4/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2
/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b
^(1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)
/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(7*b^(2/3
)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b
^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi [A] time = 0.373938, antiderivative size = 487, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$

$$\frac{2\sqrt{2}3^{3/4}a^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{7b^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{3\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{7b^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{6a\sqrt{a+bx^3}}{7b^{2/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)}+\frac{2}{7}x^2\sqrt{a+bx^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x*Sqrt[a + b*x^3],x]
```

```
[Out] (2*x^2*Sqrt[a + b*x^3])/7 + (6*a*Sqrt[a + b*x^3])/(7*b^(2/3)*((1
+ Sqrt[3])*a^(1/3) + b^(1/3)*x)) - (3*3^(1/4)*Sqrt[2 - Sqrt[3]]*a
^(4/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x +
b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticE[Arc
```

```
Sin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) +
b^(1/3)*x)], -7 - 4*Sqrt[3]])/(7*b^(2/3)*Sqrt[(a^(1/3)*(a^(1/3) +
 b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^
3]) + (2*Sqrt[2]*3^(3/4)*a^(4/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2
/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b
^(1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)
/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(7*b^(2/3
)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b
^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 36.2833, size = 430, normalized size = 0.88

$$-\frac{3\sqrt[4]{3}a^{\frac{4}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{7b^{\frac{2}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{2\sqrt{2}\cdot 3^{\frac{3}{4}}a^{\frac{4}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{7b^{\frac{2}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{6a\sqrt{a+bx^3}}{7b^{\frac{2}{3}}\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)}+\frac{2x^2\sqrt{a+bx^3}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(b*x**3+a)**(1/2),x)
```

```
[Out] -3*3**(1/4)*a**(4/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b**(2
/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(-sqrt(3)
 + 2)*(a**(1/3) + b**(1/3)*x)*elliptic_e(asin((-a**(1/3)*(-1 + sq
rt(3)) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 -
 4*sqrt(3))/(7*b**(2/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a*
*(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) + 2*sqrt
(2)*3**(3/4)*a**(4/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b**(
2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*(a**(1/3) +
b**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)*
x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4*sqrt(3))/(7*b**
(2/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3
)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) + 6*a*sqrt(a + b*x**3)/(7*
b**(2/3)*(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)) + 2*x**2*sqrt(a +
 b*x**3)/7
```

Mathematica [C] time = 1.31425, size = 218, normalized size = 0.45

$$\frac{2}{7}x^2\sqrt{a+bx^3}+\frac{2\sqrt[6]{-1}3^{3/4}a^{5/3}\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}\left(\sqrt[3]{-1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)-i\sqrt{3}E\left(\sin^{-1}\left(\cdots\right.\right.\right.}{7(-b)^{2/3}\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x*Sqrt[a + b*x^3],x]
```

```
[Out] (2*x^2*Sqrt[a + b*x^3])/7 + (2*(-1)^(1/6)*3^(3/4)*a^(5/3)*Sqrt[(-
1)^(5/6)*(-1 + ((-b)^(1/3)*x)/a^(1/3))]*Sqrt[1 + ((-b)^(1/3)*x)/a
^(1/3) + ((-b)^(2/3)*x^2)/a^(2/3)]*((-I)*Sqrt[3]*EllipticE[ArcSin
[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)^(1/3
)] + (-1)^(1/3)*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)
*x)/a^(1/3)]/3^(1/4)], (-1)^(1/3)]))/(7*(-b)^(2/3)*Sqrt[a + b*x^3
])
```

Maple [A] time = 0.02, size = 451, normalized size = 0.9

$$\frac{2x^2}{7}\sqrt{bx^3+a}$$
$$-\frac{\frac{2i}{7}a\sqrt{3}}{b}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(b*x^3+a)^(1/2),x)
```

```
[Out] 2/7*x^2*(b*x^3+a)^(1/2)-2/7*I*a*3^(1/2)/b*(-a*b^2)^(1/3)*(I*(x+1/
2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*
b^2)^(1/3))^(1/2)*((x-1/b*(-a*b^2)^(1/3))/(-3/2/b*(-a*b^2)^(1/3)+
1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2)*(-I*(x+1/2/b*(-a*b^2)^(1/3
)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)
/(b*x^3+a)^(1/2)*((-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)
^(1/3))*EllipticE(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^
(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2
)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2
)^(1/3)))^(1/2))+1/b*(-a*b^2)^(1/3)*EllipticF(1/3*3^(1/2)*(I*(x+1
/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a
*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(
1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2)))
```

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

$$\int \sqrt{bx^3+a}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)*x,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*x^3 + a)*x, x)
```

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

$$\text{integral}\left(\sqrt{bx^3+a}x, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)*x,x, algorithm="fricas")
```

```
[Out] integral(sqrt(b*x^3 + a)*x, x)
```

Sympy [A] time = 2.1657, size = 39, normalized size = 0.08

$$\frac{\sqrt{a}x^{2}\left(\frac{2}{3}\right)\,{}_{2}F_{1}\left(\begin{matrix}-\frac{1}{2},\frac{2}{3}\\ \frac{5}{3}\end{matrix}\middle|\frac{bx^{3}e^{i\pi}}{a}\right)}{3\left(\frac{5}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(b*x**3+a)**(1/2),x)
```

```
[Out] sqrt(a)*x**2*gamma(2/3)*hyper((-1/2, 2/3), (5/3,), b*x**3*exp_pol
ar(I*pi)/a)/(3*gamma(5/3))
```

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

$$\int \sqrt{bx^{3} + a}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)*x,x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*x^3 + a)*x, x)
```

3.385 $\int \frac{\sqrt{a+bx^3}}{x^2}\,dx$

Optimal. Leaf size=479

$$\frac{\sqrt{2}3^{3/4}\sqrt[3]{a}\sqrt[3]{b}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}$$
$$-\frac{3\sqrt[4]{3}\sqrt{2-\sqrt{3}}\sqrt[3]{a}\sqrt[3]{b}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{2\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}$$
$$-\frac{\sqrt{a+bx^3}}{x}+\frac{3\sqrt[3]{b}\sqrt{a+bx^3}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x}$$

```
[Out] -(Sqrt[a + b*x^3]/x) + (3*b^(1/3)*Sqrt[a + b*x^3])/((1 + Sqrt[3])
*a^(1/3) + b^(1/3)*x) - (3*3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(1/3)*b^(1
/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(
2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticE[ArcSin
[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(
1/3)*x)], -7 - 4*Sqrt[3]])/(2*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x)
)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3]) + (Sqrt
[2]*3^(3/4)*a^(1/3)*b^(1/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) -
 a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3
)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1
+ Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(Sqrt[(a^(1/3)
*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sq
rt[a + b*x^3])
```

Rubi [A] time = 0.373799, antiderivative size = 479, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$

$$\frac{\sqrt{2}3^{3/4}\sqrt[3]{a}\sqrt[3]{b}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}$$
$$-\frac{3\sqrt[4]{3}\sqrt{2-\sqrt{3}}\sqrt[3]{a}\sqrt[3]{b}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{2\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}$$
$$-\frac{\sqrt{a+bx^3}}{x}+\frac{3\sqrt[3]{b}\sqrt{a+bx^3}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*x^3]/x^2,x]
```

```
[Out] -(Sqrt[a + b*x^3]/x) + (3*b^(1/3)*Sqrt[a + b*x^3])/((1 + Sqrt[3])
*a^(1/3) + b^(1/3)*x) - (3*3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(1/3)*b^(1
/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(
```

```
2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticE[ArcSin
[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(
1/3)*x)], -7 - 4*Sqrt[3]])/(2*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x)
)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3]) + (Sqrt
[2]*3^(3/4)*a^(1/3)*b^(1/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) -
 a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3
)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1
+ Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(Sqrt[(a^(1/3)
*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sq
rt[a + b*x^3])
```

Rubi in Sympy [A] time = 34.958, size = 418, normalized size = 0.87

$$-\frac{3\sqrt[4]{3}\sqrt[3]{a}\sqrt[3]{b}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^{2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^{2}}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{2\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^{2}}}\sqrt{a+bx^{3}}}+\frac{\sqrt{2}\cdot 3^{\frac{3}{4}}\sqrt[3]{a}\sqrt[3]{b}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^{2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^{2}}}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^{2}}}\sqrt{a+bx^{3}}}+\frac{3\sqrt[3]{b}\sqrt{a+bx^{3}}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}-\frac{\sqrt{a+bx^{3}}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**(1/2)/x**2,x)
```

```
[Out] -3*3**(1/4)*a**(1/3)*b**(1/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*
x + b**(2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt
(-sqrt(3) + 2)*(a**(1/3) + b**(1/3)*x)*elliptic_e(asin((-a**(1/3)
*(-1 + sqrt(3)) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*
x)), -7 - 4*sqrt(3))/(2*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a*
*(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) + sqrt(2
)*3**(3/4)*a**(1/3)*b**(1/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x
 + b**(2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*(a**(
1/3) + b**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b*
*(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4*sqrt(3))
/(sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) +
 b**(1/3)*x)**2)*sqrt(a + b*x**3)) + 3*b**(1/3)*sqrt(a + b*x**3)/
(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x) - sqrt(a + b*x**3)/x
```

Mathematica [C] time = 1.21296, size = 214, normalized size = 0.45

$$-\frac{\sqrt{a+bx^{3}}}{x}+\frac{\sqrt[6]{-1}3^{3/4}a^{2/3}b\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^{2}}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}\left(\sqrt[3]{-1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)-i\sqrt{3}E\left(\sin^{-1}\left(\ldots\right.\right.\right.}{(-b)^{2/3}\sqrt{a+bx^{3}}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[Sqrt[a + b*x^3]/x^2,x]
```

```
[Out] -(Sqrt[a + b*x^3]/x) + ((-1)^(1/6)*3^(3/4)*a^(2/3)*b*Sqrt[(-1)^(5
/6)*(-1 + ((-b)^(1/3)*x)/a^(1/3))]*Sqrt[1 + ((-b)^(1/3)*x)/a^(1/3
) + ((-b)^(2/3)*x^2)/a^(2/3)]*((-I)*Sqrt[3]*EllipticE[ArcSin[Sqrt
[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)^(1/3)] +
(-1)^(1/3)*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a
^(1/3)]/3^(1/4)], (-1)^(1/3)]))/((-b)^(2/3)*Sqrt[a + b*x^3])
```

Maple [A] time = 0.025, size = 447, normalized size = 0.9

$$-\frac{1}{x}\sqrt{bx^3+a}$$

$$-i\sqrt{3}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}b\left(x\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^(1/2)/x^2,x)
```

```
[Out] -(b*x^3+a)^(1/2)/x-I*3^(1/2)*(-a*b^2)^(1/3)*(I*(x+1/2/b*(-a*b^2)^
(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(
1/2)*((x-1/b*(-a*b^2)^(1/3))/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)
/b*(-a*b^2)^(1/3)))^(1/2)*(-I*(x+1/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/
2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)/(b*x^3+a)^(1
/2)*((-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*Ellip
ticE(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b
^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^
(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/
2))+1/b*(-a*b^2)^(1/3)*EllipticF(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)
^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^
(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^
(1/2)/b*(-a*b^2)^(1/3)))^(1/2)))
```

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

$$\int \frac{\sqrt{bx^3+a}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\mathrm{integral}\left(\frac{\sqrt{bx^3+a}}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral(sqrt(b*x^3 + a)/x^2, x)
```

Sympy [A] time = 2.29522, size = 41, normalized size = 0.09

$$\frac{\sqrt{a}\,\Gamma\left(-\frac{1}{3}\right)\,{}_2F_1\left(\begin{matrix}-\frac{1}{2}, -\frac{1}{3}\\ \frac{2}{3}\end{matrix}\middle|\frac{bx^3e^{i\pi}}{a}\right)}{3x\,\Gamma\left(\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**(1/2)/x**2,x)
```

```
[Out] sqrt(a)*gamma(-1/3)*hyper((-1/2, -1/3), (2/3,), b*x**3*exp_polar(
I*pi)/a)/(3*x*gamma(2/3))
```

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

$$\int \frac{\sqrt{bx^3 + a}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.386 $\int \frac{\sqrt{a+bx^3}}{x^5}\,dx$

Optimal. Leaf size=511

$$\frac{3^{3/4}b^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{4\sqrt{2}a^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}} - \frac{3\sqrt[4]{3}\sqrt{2-\sqrt{3}}b^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{16a^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}} + \frac{3b^{4/3}\sqrt{a+bx^3}}{8a\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)} - \frac{3b\sqrt{a+bx^3}}{8ax} - \frac{\sqrt{a+bx^3}}{4x^4}$$

```
[Out] -Sqrt[a + b*x^3]/(4*x^4) - (3*b*Sqrt[a + b*x^3])/(8*a*x) + (3*b^(
4/3)*Sqrt[a + b*x^3])/(8*a*((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)) -
 (3*3^(1/4)*Sqrt[2 - Sqrt[3]]*b^(4/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[
(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3
) + b^(1/3)*x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/
3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(16*
a^(2/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/
3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3]) + (3^(3/4)*b^(4/3)*(a^(1/3) +
 b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1
+ Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3]
)*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 -
 4*Sqrt[3]])/(4*Sqrt[2]*a^(2/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*
x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi [A] time = 0.482037, antiderivative size = 511, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{3^{3/4}b^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{4\sqrt{2}a^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}} - \frac{3\sqrt[4]{3}\sqrt{2-\sqrt{3}}b^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{16a^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}} + \frac{3b^{4/3}\sqrt{a+bx^3}}{8a\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)} - \frac{3b\sqrt{a+bx^3}}{8ax} - \frac{\sqrt{a+bx^3}}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*x^3]/x^5,x]
```


```
[Out] -Sqrt[a + b*x^3]/(4*x^4) - (3*b*Sqrt[a + b*x^3])/(8*a*x) + (3*b^(
4/3)*Sqrt[a + b*x^3])/(8*a*((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)) -
 (3*3^(1/4)*Sqrt[2 - Sqrt[3]]*b^(4/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[
(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3
```

```
) + b^(1/3)*x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/
3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(16*
a^(2/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/
3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3]) + (3^(3/4)*b^(4/3)*(a^(1/3) +
 b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1
+ Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3]
)*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 -
 4*Sqrt[3]])/(4*Sqrt[2]*a^(2/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*
x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 46.2808, size = 445, normalized size = 0.87

$$-\frac{\sqrt{a+bx^3}}{4x^4}+\frac{3b^{\frac{4}{3}}\sqrt{a+bx^3}}{8a\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)}-\frac{3b\sqrt{a+bx^3}}{8ax}-\frac{3\sqrt[4]{3}b^{\frac{4}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{16a^{\frac{2}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{\sqrt{2}\cdot 3^{\frac{3}{4}}b^{\frac{4}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{8a^{\frac{2}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**(1/2)/x**5,x)
```

```
[Out] -sqrt(a + b*x**3)/(4*x**4) + 3*b**(4/3)*sqrt(a + b*x**3)/(8*a*(a*
*(1/3)*(1 + sqrt(3)) + b**(1/3)*x)) - 3*b*sqrt(a + b*x**3)/(8*a*x
) - 3*3**(1/4)*b**(4/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b*
*(2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(-sqrt
(3) + 2)*(a**(1/3) + b**(1/3)*x)*elliptic_e(asin((-a**(1/3)*(-1 +
 sqrt(3)) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -
7 - 4*sqrt(3))/(16*a**(2/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)
/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) + sq
rt(2)*3**(3/4)*b**(4/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b*
*(2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*(a**(1/3)
+ b**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3
)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4*sqrt(3))/(8*a
**(2/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt
(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3))
```

Mathematica [C] time = 1.87912, size = 231, normalized size = 0.45

$$-\frac{\sqrt{a+bx^3}\left(2a+3bx^3\right)}{8ax^4}+\frac{\sqrt[6]{-1}3^{3/4}(-b)^{4/3}\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}\left(\sqrt[3]{-1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)-i\sqrt{3}E\left(\sin^{-1}\left(\cdots\right)\right)\right)}{8\sqrt[3]{a}\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[Sqrt[a + b*x^3]/x^5,x]
```

```
[Out] -(Sqrt[a + b*x^3]*(2*a + 3*b*x^3))/(8*a*x^4) + ((-1)^(1/6)*3^(3/4
)*(-b)^(4/3)*Sqrt[(-1)^(5/6)*(-1 + ((-b)^(1/3)*x)/a^(1/3))]*Sqrt[
1 + ((-b)^(1/3)*x)/a^(1/3) + ((-b)^(2/3)*x^2)/a^(2/3)]*((-I)*Sqrt
[3]*EllipticE[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]
/3^(1/4)], (-1)^(1/3)] + (-1)^(1/3)*EllipticF[ArcSin[Sqrt[-(-1)^(
5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)^(1/3)]))/(8*a^(1/
3)*Sqrt[a + b*x^3])
```

Maple [A] time = 0.027, size = 469, normalized size = 0.9

$$-\frac{1}{4x^4}\sqrt{bx^3+a}-\frac{3b}{8ax}\sqrt{bx^3+a}$$
$$-\frac{\frac{i}{8}b\sqrt{3}}{a}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}b\left(\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^(1/2)/x^5,x)
```

```
[Out] -1/4*(b*x^3+a)^(1/2)/x^4-3/8*b*(b*x^3+a)^(1/2)/a/x-1/8*I/a*b*3^(1
/2)*(-a*b^2)^(1/3)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a
*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)*((x-1/b*(-a*b^2)^(1/
3))/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2)
*(-I*(x+1/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1
/2)*b/(-a*b^2)^(1/3))^(1/2)/(b*x^3+a)^(1/2)*((-3/2/b*(-a*b^2)^(1/
3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*EllipticE(1/3*3^(1/2)*(I*(x+1/
2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*
b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1
/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2))+1/b*(-a*b^2)^(1/3)*El
lipticF(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-
a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^
2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^
(1/2)))
```

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

$$\int \frac{\sqrt{bx^3+a}}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)/x^5,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*x^3 + a)/x^5, x)
```

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

$$\text{integral}\left(\frac{\sqrt{bx^3+a}}{x^5}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)/x^5,x, algorithm="fricas")
```

```
[Out] integral(sqrt(b*x^3 + a)/x^5, x)
```

Sympy [A] time = 2.77177, size = 46, normalized size = 0.09

$$\frac{\sqrt{a}\,\Gamma\left(-\frac{4}{3}\right)\,{}_{2}F_{1}\left(\begin{matrix}-\frac{4}{3},-\frac{1}{2}\\-\frac{1}{3}\end{matrix}\middle|\frac{bx^{3}e^{i\pi}}{a}\right)}{3x^{4}\,\Gamma\left(-\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**(1/2)/x**5,x)
```

```
[Out] sqrt(a)*gamma(-4/3)*hyper((-4/3, -1/2), (-1/3,), b*x**3*exp_polar
(I*pi)/a)/(3*x**4*gamma(-1/3))
```

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

$$\int \frac{\sqrt{bx^{3}+a}}{x^{5}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)/x^5,x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*x^3 + a)/x^5, x)
```

3.387 $\int x^{11} \left(a+bx^3\right)^{3/2} dx$

Optimal. Leaf size=80

$$-\frac{2a^3\left(a+bx^3\right)^{5/2}}{15b^4}+\frac{2a^2\left(a+bx^3\right)^{7/2}}{7b^4}+\frac{2\left(a+bx^3\right)^{11/2}}{33b^4}-\frac{2a\left(a+bx^3\right)^{9/2}}{9b^4}$$

```
[Out] (-2*a^3*(a + b*x^3)^(5/2))/(15*b^4) + (2*a^2*(a + b*x^3)^(7/2))/(
7*b^4) - (2*a*(a + b*x^3)^(9/2))/(9*b^4) + (2*(a + b*x^3)^(11/2))
/(33*b^4)
```

Rubi [A] time = 0.110949, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$-\frac{2a^3\left(a+bx^3\right)^{5/2}}{15b^4}+\frac{2a^2\left(a+bx^3\right)^{7/2}}{7b^4}+\frac{2\left(a+bx^3\right)^{11/2}}{33b^4}-\frac{2a\left(a+bx^3\right)^{9/2}}{9b^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11*(a + b*x^3)^(3/2),x]
```

```
[Out] (-2*a^3*(a + b*x^3)^(5/2))/(15*b^4) + (2*a^2*(a + b*x^3)^(7/2))/(
7*b^4) - (2*a*(a + b*x^3)^(9/2))/(9*b^4) + (2*(a + b*x^3)^(11/2))
/(33*b^4)
```

Rubi in Sympy [A] time = 14.8682, size = 75, normalized size = 0.94

$$-\frac{2a^3\left(a+bx^3\right)^{\frac{5}{2}}}{15b^4}+\frac{2a^2\left(a+bx^3\right)^{\frac{7}{2}}}{7b^4}-\frac{2a\left(a+bx^3\right)^{\frac{9}{2}}}{9b^4}+\frac{2\left(a+bx^3\right)^{\frac{11}{2}}}{33b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11*(b*x**3+a)**(3/2),x)
```

```
[Out] -2*a**3*(a + b*x**3)**(5/2)/(15*b**4) + 2*a**2*(a + b*x**3)**(7/2
)/(7*b**4) - 2*a*(a + b*x**3)**(9/2)/(9*b**4) + 2*(a + b*x**3)**(
11/2)/(33*b**4)
```

Mathematica [A] time = 0.050446, size = 50, normalized size = 0.62

$$\frac{2\left(a+bx^3\right)^{5/2}\left(-16a^3+40a^2bx^3-70ab^2x^6+105b^3x^9\right)}{3465b^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11*(a + b*x^3)^(3/2),x]
```

```
[Out] (2*(a + b*x^3)^(5/2)*(-16*a^3 + 40*a^2*b*x^3 - 70*a*b^2*x^6 + 105
*b^3*x^9))/(3465*b^4)
```

Maple [A] time = 0.009, size = 47, normalized size = 0.6

$$-\frac{-210\,b^3x^9+140\,ab^2x^6-80\,a^2bx^3+32\,a^3}{3465\,b^4}\left(bx^3+a\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11*(b*x^3+a)^(3/2),x)
```

```
[Out] -2/3465*(b*x^3+a)^(5/2)*(-105*b^3*x^9+70*a*b^2*x^6-40*a^2*b*x^3+1
6*a^3)/b^4
```

Maxima [A] time = 1.45739, size = 86, normalized size = 1.08

$$\frac{2\left(bx^{3}+a\right)^{\frac{11}{2}}}{33\,b^{4}}-\frac{2\left(bx^{3}+a\right)^{\frac{9}{2}}a}{9\,b^{4}}+\frac{2\left(bx^{3}+a\right)^{\frac{7}{2}}a^{2}}{7\,b^{4}}-\frac{2\left(bx^{3}+a\right)^{\frac{5}{2}}a^{3}}{15\,b^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(3/2)*x^11,x, algorithm="maxima")
```

```
[Out] 2/33*(b*x^3 + a)^(11/2)/b^4 - 2/9*(b*x^3 + a)^(9/2)*a/b^4 + 2/7*(
b*x^3 + a)^(7/2)*a^2/b^4 - 2/15*(b*x^3 + a)^(5/2)*a^3/b^4
```

Fricas [A] time = 0.242898, size = 92, normalized size = 1.15

$$\frac{2\left(105\,b^{5}x^{15}+140\,ab^{4}x^{12}+5\,a^{2}b^{3}x^{9}-6\,a^{3}b^{2}x^{6}+8\,a^{4}bx^{3}-16\,a^{5}\right)\sqrt{bx^{3}+a}}{3465\,b^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(3/2)*x^11,x, algorithm="fricas")
```

```
[Out] 2/3465*(105*b^5*x^15 + 140*a*b^4*x^12 + 5*a^2*b^3*x^9 - 6*a^3*b^2
*x^6 + 8*a^4*b*x^3 - 16*a^5)*sqrt(b*x^3 + a)/b^4
```

Sympy [A] time = 24.8052, size = 136, normalized size = 1.7

$$\begin{cases}-\frac{32a^{5}\sqrt{a+bx^{3}}}{3465b^{4}}+\frac{16a^{4}x^{3}\sqrt{a+bx^{3}}}{3465b^{3}}-\frac{4a^{3}x^{6}\sqrt{a+bx^{3}}}{1155b^{2}}+\frac{2a^{2}x^{9}\sqrt{a+bx^{3}}}{693b}+\frac{8ax^{12}\sqrt{a+bx^{3}}}{99}+\frac{2bx^{15}\sqrt{a+bx^{3}}}{33} & \text{for } b\neq 0\\ \frac{a^{\frac{3}{2}}x^{12}}{12} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11*(b*x**3+a)**(3/2),x)
```

```
[Out] Piecewise((-32*a**5*sqrt(a + b*x**3)/(3465*b**4) + 16*a**4*x**3*s
qrt(a + b*x**3)/(3465*b**3) - 4*a**3*x**6*sqrt(a + b*x**3)/(1155*
b**2) + 2*a**2*x**9*sqrt(a + b*x**3)/(693*b) + 8*a*x**12*sqrt(a +
 b*x**3)/99 + 2*b*x**15*sqrt(a + b*x**3)/33, Ne(b, 0)), (a**(3/2)
*x**12/12, True))
```

GIAC/XCAS [A] time = 0.245447, size = 181, normalized size = 2.26

$$\frac{2\left(\frac{11\left(35\left(bx^{3}+a\right)^{\frac{9}{2}}-135\left(bx^{3}+a\right)^{\frac{7}{2}}a+189\left(bx^{3}+a\right)^{\frac{5}{2}}a^{2}-105\left(bx^{3}+a\right)^{\frac{3}{2}}a^{3}\right)a}{b^{3}}+\frac{315\left(bx^{3}+a\right)^{\frac{11}{2}}-1540\left(bx^{3}+a\right)^{\frac{9}{2}}a+2970\left(bx^{3}+a\right)^{\frac{7}{2}}a^{2}-2772\left(bx^{3}+a\right)^{\frac{5}{2}}a^{3}+1155}{b^{3}}\right.}{10395\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(3/2)*x^11,x, algorithm="giac")
```

```
[Out] 2/10395*(11*(35*(b*x^3 + a)^(9/2) - 135*(b*x^3 + a)^(7/2)*a + 189
*(b*x^3 + a)^(5/2)*a^2 - 105*(b*x^3 + a)^(3/2)*a^3)*a/b^3 + (315*
(b*x^3 + a)^(11/2) - 1540*(b*x^3 + a)^(9/2)*a + 2970*(b*x^3 + a)^
(7/2)*a^2 - 2772*(b*x^3 + a)^(5/2)*a^3 + 1155*(b*x^3 + a)^(3/2)*a
^4)/b^3)/b
```

3.388 $\int x^8 \left(a+bx^3\right)^{3/2} dx$

Optimal. Leaf size=59

$$\frac{2a^2\left(a+bx^3\right)^{5/2}}{15b^3}+\frac{2\left(a+bx^3\right)^{9/2}}{27b^3}-\frac{4a\left(a+bx^3\right)^{7/2}}{21b^3}$$

```
[Out] (2*a^2*(a + b*x^3)^(5/2))/(15*b^3) - (4*a*(a + b*x^3)^(7/2))/(21*
b^3) + (2*(a + b*x^3)^(9/2))/(27*b^3)
```

Rubi [A] time = 0.0869064, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2a^2\left(a+bx^3\right)^{5/2}}{15b^3}+\frac{2\left(a+bx^3\right)^{9/2}}{27b^3}-\frac{4a\left(a+bx^3\right)^{7/2}}{21b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8*(a + b*x^3)^(3/2),x]
```

```
[Out] (2*a^2*(a + b*x^3)^(5/2))/(15*b^3) - (4*a*(a + b*x^3)^(7/2))/(21*
b^3) + (2*(a + b*x^3)^(9/2))/(27*b^3)
```

Rubi in Sympy [A] time = 10.9935, size = 54, normalized size = 0.92

$$\frac{2a^2\left(a+bx^3\right)^{\frac{5}{2}}}{15b^3}-\frac{4a\left(a+bx^3\right)^{\frac{7}{2}}}{21b^3}+\frac{2\left(a+bx^3\right)^{\frac{9}{2}}}{27b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8*(b*x**3+a)**(3/2),x)
```

```
[Out] 2*a**2*(a + b*x**3)**(5/2)/(15*b**3) - 4*a*(a + b*x**3)**(7/2)/(2
1*b**3) + 2*(a + b*x**3)**(9/2)/(27*b**3)
```

Mathematica [A] time = 0.038141, size = 39, normalized size = 0.66

$$\frac{2\left(a+bx^3\right)^{5/2}\left(8a^2-20abx^3+35b^2x^6\right)}{945b^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8*(a + b*x^3)^(3/2),x]
```

```
[Out] (2*(a + b*x^3)^(5/2)*(8*a^2 - 20*a*b*x^3 + 35*b^2*x^6))/(945*b^3)
```

Maple [A] time = 0.007, size = 36, normalized size = 0.6

$$\frac{70\,b^2x^6-40\,abx^3+16\,a^2}{945\,b^3}\left(bx^3+a\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^8*(b*x^3+a)^(3/2),x)
```

```
[Out] 2/945*(b*x^3+a)^(5/2)*(35*b^2*x^6-20*a*b*x^3+8*a^2)/b^3
```

Maxima [A] time = 1.43586, size = 63, normalized size = 1.07

$$\frac{2\,{\left(b x^{3} + a\right)}^{\frac{9}{2}}}{27\,b^{3}} - \frac{4\,{\left(b x^{3} + a\right)}^{\frac{7}{2}} a}{21\,b^{3}} + \frac{2\,{\left(b x^{3} + a\right)}^{\frac{5}{2}} a^{2}}{15\,b^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^3 + a)^(3/2)*x^8,x, algorithm="maxima")
```

```
[Out] 2/27*(b*x^3 + a)^(9/2)/b^3 - 4/21*(b*x^3 + a)^(7/2)*a/b^3 + 2/15*
(b*x^3 + a)^(5/2)*a^2/b^3
```

Fricas [A] time = 0.211186, size = 77, normalized size = 1.31

$$\frac{2\,{\left(35\,b^{4} x^{12} + 50\,a b^{3} x^{9} + 3\,a^{2} b^{2} x^{6} - 4\,a^{3} b x^{3} + 8\,a^{4}\right)} \sqrt{b x^{3} + a}}{945\,b^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^3 + a)^(3/2)*x^8,x, algorithm="fricas")
```

```
[Out] 2/945*(35*b^4*x^12 + 50*a*b^3*x^9 + 3*a^2*b^2*x^6 - 4*a^3*b*x^3 +
 8*a^4)*sqrt(b*x^3 + a)/b^3
```

Sympy [A] time = 12.7318, size = 112, normalized size = 1.9

$$\begin{cases} \frac{16a^{4}\sqrt{a+bx^{3}}}{945b^{3}} - \frac{8a^{3}x^{3}\sqrt{a+bx^{3}}}{945b^{2}} + \frac{2a^{2}x^{6}\sqrt{a+bx^{3}}}{315b} + \frac{20ax^{9}\sqrt{a+bx^{3}}}{189} + \frac{2bx^{12}\sqrt{a+bx^{3}}}{27} & \text{for}\: b \neq 0 \\ \frac{a^{\frac{3}{2}} x^{9}}{9} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**8*(b*x**3+a)**(3/2),x)
```

```
[Out] Piecewise((16*a**4*sqrt(a + b*x**3)/(945*b**3) - 8*a**3*x**3*sqrt
(a + b*x**3)/(945*b**2) + 2*a**2*x**6*sqrt(a + b*x**3)/(315*b) +
20*a*x**9*sqrt(a + b*x**3)/189 + 2*b*x**12*sqrt(a + b*x**3)/27, N
e(b, 0)), (a**(3/2)*x**9/9, True))
```

GIAC/XCAS [A] time = 0.224002, size = 143, normalized size = 2.42

$$\frac{2\,{\left(\frac{3\,{\left(15\,{\left(b x^{3} + a\right)}^{\frac{7}{2}} - 42\,{\left(b x^{3} + a\right)}^{\frac{5}{2}} a + 35\,{\left(b x^{3} + a\right)}^{\frac{3}{2}} a^{2}\right)} a}{b^{2}} + \frac{35\,{\left(b x^{3} + a\right)}^{\frac{9}{2}} - 135\,{\left(b x^{3} + a\right)}^{\frac{7}{2}} a + 189\,{\left(b x^{3} + a\right)}^{\frac{5}{2}} a^{2} - 105\,{\left(b x^{3} + a\right)}^{\frac{3}{2}} a^{3}}{b^{2}}\right)}}{945\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^3 + a)^(3/2)*x^8,x, algorithm="giac")
```

```
[Out] 2/945*(3*(15*(b*x^3 + a)^(7/2) - 42*(b*x^3 + a)^(5/2)*a + 35*(b*x
^3 + a)^(3/2)*a^2)*a/b^2 + (35*(b*x^3 + a)^(9/2) - 135*(b*x^3 + a
)^(7/2)*a + 189*(b*x^3 + a)^(5/2)*a^2 - 105*(b*x^3 + a)^(3/2)*a^3
)/b^2)/b
```

3.389 $\int x^5 \left(a+bx^3\right)^{3/2} dx$

Optimal. Leaf size=38

$$\frac{2\left(a+bx^3\right)^{7/2}}{21b^2}-\frac{2a\left(a+bx^3\right)^{5/2}}{15b^2}$$

```
[Out] (-2*a*(a + b*x^3)^(5/2))/(15*b^2) + (2*(a + b*x^3)^(7/2))/(21*b^2
)
```

Rubi [A] time = 0.0601747, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2\left(a+bx^3\right)^{7/2}}{21b^2}-\frac{2a\left(a+bx^3\right)^{5/2}}{15b^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^5*(a + b*x^3)^(3/2),x]
```

```
[Out] (-2*a*(a + b*x^3)^(5/2))/(15*b^2) + (2*(a + b*x^3)^(7/2))/(21*b^2
)
```

Rubi in Sympy [A] time = 7.3807, size = 34, normalized size = 0.89

$$-\frac{2a\left(a+bx^3\right)^{\frac{5}{2}}}{15b^2}+\frac{2\left(a+bx^3\right)^{\frac{7}{2}}}{21b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**5*(b*x**3+a)**(3/2),x)
```

```
[Out] -2*a*(a + b*x**3)**(5/2)/(15*b**2) + 2*(a + b*x**3)**(7/2)/(21*b*
*2)
```

Mathematica [A] time = 0.0330856, size = 28, normalized size = 0.74

$$\frac{2\left(a+bx^3\right)^{5/2}\left(5bx^3-2a\right)}{105b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5*(a + b*x^3)^(3/2),x]
```

```
[Out] (2*(a + b*x^3)^(5/2)*(-2*a + 5*b*x^3))/(105*b^2)
```

Maple [A] time = 0.008, size = 25, normalized size = 0.7

$$-\frac{-10\,bx^3+4\,a}{105\,b^2}\left(bx^3+a\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(b*x^3+a)^(3/2),x)
```

```
[Out] -2/105*(b*x^3+a)^(5/2)*(-5*b*x^3+2*a)/b^2
```

Maxima [A] time = 1.42802, size = 41, normalized size = 1.08

$$\frac{2\,\left(bx^3+a\right)^{\frac{7}{2}}}{21\,b^2}-\frac{2\,\left(bx^3+a\right)^{\frac{5}{2}}a}{15\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 2/21*(b*x^3 + a)^(7/2)/b^2 - 2/15*(b*x^3 + a)^(5/2)*a/b^2
```

Fricas [A] time = 0.2125, size = 61, normalized size = 1.61

$$\frac{2\,\left(5\,b^3x^9+8\,ab^2x^6+a^2bx^3-2\,a^3\right)\sqrt{bx^3+a}}{105\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 2/105*(5*b^3*x^9 + 8*a*b^2*x^6 + a^2*b*x^3 - 2*a^3)*sqrt(b*x^3 +
a)/b^2
```

Sympy [A] time = 5.66199, size = 88, normalized size = 2.32

$$\begin{cases} -\frac{4a^3\sqrt{a+bx^3}}{105b^2}+\frac{2a^2x^3\sqrt{a+bx^3}}{105b}+\frac{16ax^6\sqrt{a+bx^3}}{105}+\frac{2bx^9\sqrt{a+bx^3}}{21} & \text{for } b\neq 0 \\ \frac{a^{\frac{3}{2}}x^6}{6} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5*(b*x**3+a)**(3/2),x)

[Out] Piecewise((-4*a**3*sqrt(a + b*x**3)/(105*b**2) + 2*a**2*x**3*sqrt
(a + b*x**3)/(105*b) + 16*a*x**6*sqrt(a + b*x**3)/105 + 2*b*x**9*
sqrt(a + b*x**3)/21, Ne(b, 0)), (a**(3/2)*x**6/6, True))
```

GIAC/XCAS [A] time = 0.231698, size = 105, normalized size = 2.76

$$\frac{2\left(\frac{7\left(3\left(bx^3+a\right)^{\frac{5}{2}}-5\left(bx^3+a\right)^{\frac{3}{2}}a\right)a}{b}+\frac{15\left(bx^3+a\right)^{\frac{7}{2}}-42\left(bx^3+a\right)^{\frac{5}{2}}a+35\left(bx^3+a\right)^{\frac{3}{2}}a^2}{b}\right)}{315\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 2/315*(7*(3*(b*x^3 + a)^(5/2) - 5*(b*x^3 + a)^(3/2)*a)*a/b + (15*
(b*x^3 + a)^(7/2) - 42*(b*x^3 + a)^(5/2)*a + 35*(b*x^3 + a)^(3/2)
*a^2)/b)/b
```

3.390 $\int x^2 \left(a+bx^3\right)^{3/2} dx$

Optimal. Leaf size=18

$$\frac{2\left(a+bx^3\right)^{5/2}}{15b}$$

```
[Out] (2*(a + b*x^3)^(5/2))/(15*b)
```

Rubi [A] time = 0.0108311, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$\frac{2\left(a+bx^3\right)^{5/2}}{15b}$$

Antiderivative was successfully verified.

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

[Out] (2*(a + b*x^3)^(5/2))/(15*b)
```

Rubi in Sympy [A] time = 2.26303, size = 14, normalized size = 0.78

$$\frac{2\left(a+bx^3\right)^{\frac{5}{2}}}{15b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 2*(a + b*x**3)**(5/2)/(15*b)
```

Mathematica [A] time = 0.0144207, size = 18, normalized size = 1.

$$\frac{2\left(a+bx^3\right)^{5/2}}{15b}$$

Antiderivative was successfully verified.

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

[Out] (2*(a + b*x^3)^(5/2))/(15*b)
```

Maple [A] time = 0.006, size = 15, normalized size = 0.8

$$\frac{2}{15\,b}\left(bx^3+a\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 2/15*(b*x^3+a)^(5/2)/b
```

Maxima [A] time = 1.42774, size = 19, normalized size = 1.06

$$\frac{2\left(bx^3+a\right)^{\frac{5}{2}}}{15\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 2/15*(b*x^3 + a)^(5/2)/b
```

Fricas [A] time = 0.216869, size = 43, normalized size = 2.39

$$\frac{2\left(b^2x^6+2\,abx^3+a^2\right)\sqrt{bx^3+a}}{15\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 2/15*(b^2*x^6 + 2*a*b*x^3 + a^2)*sqrt(b*x^3 + a)/b
```

Sympy [A] time = 2.02559, size = 65, normalized size = 3.61

$$\begin{cases} \frac{2a^2\sqrt{a+bx^3}}{15b}+\frac{4ax^3\sqrt{a+bx^3}}{15}+\frac{2bx^6\sqrt{a+bx^3}}{15} & \text{for } b\neq 0 \\ \frac{a^{\frac{3}{2}}x^3}{3} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Piecewise((2*a**2*sqrt(a + b*x**3)/(15*b) + 4*a*x**3*sqrt(a + b*x
**3)/15 + 2*b*x**6*sqrt(a + b*x**3)/15, Ne(b, 0)), (a**(3/2)*x**3
/3, True))
```

GIAC/XCAS [A] time = 0.239484, size = 19, normalized size = 1.06

$$\frac{2\left(bx^3+a\right)^{\frac{5}{2}}}{15\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 2/15*(b*x^3 + a)^(5/2)/b
```

3.391 $\int \frac{(a+bx^3)^{3/2}}{x}\,dx$

Optimal. Leaf size=59

$$-\frac{2}{3}a^{3/2}\tanh^{-1}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)+\frac{2}{3}a\sqrt{a+bx^3}+\frac{2}{9}\left(a+bx^3\right)^{3/2}$$

```
[Out] (2*a*Sqrt[a + b*x^3])/3 + (2*(a + b*x^3)^(3/2))/9 - (2*a^(3/2)*Ar
cTanh[Sqrt[a + b*x^3]/Sqrt[a]])/3
```

Rubi [A] time = 0.0928763, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{2}{3}a^{3/2}\tanh^{-1}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)+\frac{2}{3}a\sqrt{a+bx^3}+\frac{2}{9}\left(a+bx^3\right)^{3/2}$$

Antiderivative was successfully verified.

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

```
[Out] (2*a*Sqrt[a + b*x^3])/3 + (2*(a + b*x^3)^(3/2))/9 - (2*a^(3/2)*Ar
cTanh[Sqrt[a + b*x^3]/Sqrt[a]])/3
```

Rubi in Sympy [A] time = 8.95038, size = 53, normalized size = 0.9

$$-\frac{2a^{\frac{3}{2}}\operatorname{atanh}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)}{3}+\frac{2a\sqrt{a+bx^3}}{3}+\frac{2\left(a+bx^3\right)^{\frac{3}{2}}}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -2*a**(3/2)*atanh(sqrt(a + b*x**3)/sqrt(a))/3 + 2*a*sqrt(a + b*x*
*3)/3 + 2*(a + b*x**3)**(3/2)/9
```

Mathematica [A] time = 0.176983, size = 61, normalized size = 1.03

$$\frac{1}{3}\sqrt{a+bx^3}\left(\frac{2}{3}\left(4a+bx^3\right)-\frac{2a\tanh^{-1}\left(\sqrt{\frac{bx^3}{a}+1}\right)}{\sqrt{\frac{bx^3}{a}+1}}\right)$$

Antiderivative was successfully verified.

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

```
[Out] (Sqrt[a + b*x^3]*((2*(4*a + b*x^3))/3 - (2*a*ArcTanh[Sqrt[1 + (b*
x^3)/a]])/Sqrt[1 + (b*x^3)/a]))/3
```

Maple [A] time = 0.023, size = 48, normalized size = 0.8

$$\frac{2\,bx^3}{9}\sqrt{bx^3+a}+\frac{8\,a}{9}\sqrt{bx^3+a}-\frac{2}{3}a^{\frac{3}{2}}\mathit{Artanh}\left(1\sqrt{bx^3+a}\frac{1}{\sqrt{a}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 2/9*b*x^3*(b*x^3+a)^(1/2)+8/9*a*(b*x^3+a)^(1/2)-2/3*a^(3/2)*arcta
nh((b*x^3+a)^(1/2)/a^(1/2))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.230769, size = 1, normalized size = 0.02

$$\left[\frac{1}{3}\,a^{\frac{3}{2}}\log\left(\frac{bx^3 - 2\,\sqrt{bx^3+a}\sqrt{a} + 2\,a}{x^3}\right) + \frac{2}{9}\left(bx^3 + 4\,a\right)\sqrt{bx^3+a},\right.$$
$$\left.-\frac{2}{3}\,\sqrt{-a}a\arctan\left(\frac{\sqrt{bx^3+a}}{\sqrt{-a}}\right) + \frac{2}{9}\left(bx^3 + 4\,a\right)\sqrt{bx^3+a}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] [1/3*a^(3/2)*log((b*x^3 - 2*sqrt(b*x^3 + a)*sqrt(a) + 2*a)/x^3) +
 2/9*(b*x^3 + 4*a)*sqrt(b*x^3 + a), -2/3*sqrt(-a)*a*arctan(sqrt(b
*x^3 + a)/sqrt(-a)) + 2/9*(b*x^3 + 4*a)*sqrt(b*x^3 + a)]
```

Sympy [A] time = 7.00038, size = 83, normalized size = 1.41

$$\frac{8a^{\frac{3}{2}}\sqrt{1+\frac{bx^3}{a}}}{9} + \frac{a^{\frac{3}{2}}\log\left(\frac{bx^3}{a}\right)}{3} - \frac{2a^{\frac{3}{2}}\log\left(\sqrt{1+\frac{bx^3}{a}}+1\right)}{3} + \frac{2\sqrt{a}bx^3\sqrt{1+\frac{bx^3}{a}}}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 8*a**(3/2)*sqrt(1 + b*x**3/a)/9 + a**(3/2)*log(b*x**3/a)/3 - 2*a*
*(3/2)*log(sqrt(1 + b*x**3/a) + 1)/3 + 2*sqrt(a)*b*x**3*sqrt(1 +
b*x**3/a)/9
```

GIAC/XCAS [A] time = 0.260912, size = 68, normalized size = 1.15

$$\frac{2\,a^2\arctan\left(\frac{\sqrt{bx^3+a}}{\sqrt{-a}}\right)}{3\,\sqrt{-a}} + \frac{2}{9}\left(bx^3+a\right)^{\frac{3}{2}} + \frac{2}{3}\,\sqrt{bx^3+a}a$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 2/3*a^2*arctan(sqrt(b*x^3 + a)/sqrt(-a))/sqrt(-a) + 2/9*(b*x^3 +
a)^(3/2) + 2/3*sqrt(b*x^3 + a)*a
```

3.392 $\int \frac{(a+bx^3)^{3/2}}{x^4} dx$

Optimal. Leaf size=58

$$-\frac{(a+bx^3)^{3/2}}{3x^3}+b\sqrt{a+bx^3}-\sqrt{a}b\tanh^{-1}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)$$

```
[Out] b*Sqrt[a + b*x^3] - (a + b*x^3)^(3/2)/(3*x^3) - Sqrt[a]*b*ArcTanh
[Sqrt[a + b*x^3]/Sqrt[a]]
```

Rubi [A] time = 0.0917193, antiderivative size = 58, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{(a+bx^3)^{3/2}}{3x^3}+b\sqrt{a+bx^3}-\sqrt{a}b\tanh^{-1}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^3)^(3/2)/x^4,x]
```

```
[Out] b*Sqrt[a + b*x^3] - (a + b*x^3)^(3/2)/(3*x^3) - Sqrt[a]*b*ArcTanh
[Sqrt[a + b*x^3]/Sqrt[a]]
```

Rubi in Sympy [A] time = 9.43797, size = 49, normalized size = 0.84

$$-\sqrt{a}b\,\text{atanh}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)+b\sqrt{a+bx^3}-\frac{(a+bx^3)^{\frac{3}{2}}}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**3+a)**(3/2)/x**4,x)
```

```
[Out] -sqrt(a)*b*atanh(sqrt(a + b*x**3)/sqrt(a)) + b*sqrt(a + b*x**3) -
 (a + b*x**3)**(3/2)/(3*x**3)
```

Mathematica [A] time = 0.18158, size = 58, normalized size = 1.

$$\sqrt{a+bx^3}\left(-\frac{b\tanh^{-1}\left(\sqrt{\frac{bx^3}{a}+1}\right)}{\sqrt{\frac{bx^3}{a}+1}}-\frac{a}{3x^3}+\frac{2b}{3}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^3)^(3/2)/x^4,x]
```

```
[Out] Sqrt[a + b*x^3]*((2*b)/3 - a/(3*x^3) - (b*ArcTanh[Sqrt[1 + (b*x^3
)/a]])/Sqrt[1 + (b*x^3)/a])
```

Maple [A] time = 0.027, size = 49, normalized size = 0.8

$$-\frac{a}{3\,x^3}\sqrt{bx^3+a}+\frac{2\,b}{3}\sqrt{bx^3+a}-bArtanh\left(1\sqrt{bx^3+a}\frac{1}{\sqrt{a}}\right)\sqrt{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^(3/2)/x^4,x)
```

```
[Out] -1/3*a*(b*x^3+a)^(1/2)/x^3+2/3*b*(b*x^3+a)^(1/2)-b*arctanh((b*x^3
+a)^(1/2)/a^(1/2))*a^(1/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(3/2)/x^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.222428, size = 1, normalized size = 0.02

$$\left[\frac{3\,\sqrt{a}bx^3\log\left(\frac{bx^3-2\,\sqrt{bx^3+a}\sqrt{a}+2\,a}{x^3}\right)+2\,\left(2\,bx^3-a\right)\sqrt{bx^3+a}}{6\,x^3},\right.$$
$$\left.-\frac{3\,\sqrt{-a}bx^3\arctan\left(\frac{\sqrt{bx^3+a}}{\sqrt{-a}}\right)-\left(2\,bx^3-a\right)\sqrt{bx^3+a}}{3\,x^3}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(3/2)/x^4,x, algorithm="fricas")
```

```
[Out] [1/6*(3*sqrt(a)*b*x^3*log((b*x^3 - 2*sqrt(b*x^3 + a)*sqrt(a) + 2*
a)/x^3) + 2*(2*b*x^3 - a)*sqrt(b*x^3 + a))/x^3, -1/3*(3*sqrt(-a)*
b*x^3*arctan(sqrt(b*x^3 + a)/sqrt(-a)) - (2*b*x^3 - a)*sqrt(b*x^3
 + a))/x^3]
```

Sympy [A] time = 8.82524, size = 100, normalized size = 1.72

$$-\sqrt{a}b\operatorname{asinh}\left(\frac{\sqrt{a}}{\sqrt{b}x^{\frac{3}{2}}}\right)-\frac{a^2}{3\sqrt{b}x^{\frac{9}{2}}\sqrt{\frac{a}{bx^3}+1}}+\frac{a\sqrt{b}}{3x^{\frac{3}{2}}\sqrt{\frac{a}{bx^3}+1}}+\frac{2b^{\frac{3}{2}}x^{\frac{3}{2}}}{3\sqrt{\frac{a}{bx^3}+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**(3/2)/x**4,x)
```

```
[Out] -sqrt(a)*b*asinh(sqrt(a)/(sqrt(b)*x**(3/2))) - a**2/(3*sqrt(b)*x*
*(9/2)*sqrt(a/(b*x**3) + 1)) + a*sqrt(b)/(3*x**(3/2)*sqrt(a/(b*x*
*3) + 1)) + 2*b**(3/2)*x**(3/2)/(3*sqrt(a/(b*x**3) + 1))
```

GIAC/XCAS [A] time = 0.252048, size = 77, normalized size = 1.33

$$\frac{1}{3}\left(\frac{3\,a\arctan\left(\frac{\sqrt{bx^3+a}}{\sqrt{-a}}\right)}{\sqrt{-a}}+2\,\sqrt{bx^3+a}-\frac{\sqrt{bx^3+a}a}{bx^3}\right)b$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(3/2)/x^4,x, algorithm="giac")
```

```
[Out] 1/3*(3*a*arctan(sqrt(b*x^3 + a)/sqrt(-a))/sqrt(-a) + 2*sqrt(b*x^3
 + a) - sqrt(b*x^3 + a)*a/(b*x^3))*b
```

3.393 $\int \frac{(a+bx^3)^{3/2}}{x^7}\,dx$

Optimal. Leaf size=68

$$-\frac{b^2\tanh^{-1}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)}{4\sqrt{a}}-\frac{b\sqrt{a+bx^3}}{4x^3}-\frac{(a+bx^3)^{3/2}}{6x^6}$$

```
[Out] -(b*Sqrt[a + b*x^3])/(4*x^3) - (a + b*x^3)^(3/2)/(6*x^6) - (b^2*A
rcTanh[Sqrt[a + b*x^3]/Sqrt[a]])/(4*Sqrt[a])
```

Rubi [A] time = 0.0964115, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{b^2\tanh^{-1}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)}{4\sqrt{a}}-\frac{b\sqrt{a+bx^3}}{4x^3}-\frac{(a+bx^3)^{3/2}}{6x^6}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^(3/2)/x^7,x]
```

```
[Out] -(b*Sqrt[a + b*x^3])/(4*x^3) - (a + b*x^3)^(3/2)/(6*x^6) - (b^2*A
rcTanh[Sqrt[a + b*x^3]/Sqrt[a]])/(4*Sqrt[a])
```

Rubi in Sympy [A] time = 10.0394, size = 60, normalized size = 0.88

$$-\frac{b\sqrt{a+bx^3}}{4x^3}-\frac{(a+bx^3)^{\frac{3}{2}}}{6x^6}-\frac{b^2\,\mathrm{atanh}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)}{4\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**(3/2)/x**7,x)
```

```
[Out] -b*sqrt(a + b*x**3)/(4*x**3) - (a + b*x**3)**(3/2)/(6*x**6) - b**
2*atanh(sqrt(a + b*x**3)/sqrt(a))/(4*sqrt(a))
```

Mathematica [A] time = 0.196606, size = 70, normalized size = 1.03

$$\frac{1}{4}\sqrt{a+bx^3}\left(-\frac{b^2\tanh^{-1}\left(\sqrt{\frac{bx^3}{a}+1}\right)}{a\sqrt{\frac{bx^3}{a}+1}}-\frac{2a+5bx^3}{3x^6}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^(3/2)/x^7,x]
```

```
[Out] (Sqrt[a + b*x^3]*(-(2*a + 5*b*x^3)/(3*x^6) - (b^2*ArcTanh[Sqrt[1
+ (b*x^3)/a]])/(a*Sqrt[1 + (b*x^3)/a])))/4
```

Maple [A] time = 0.03, size = 54, normalized size = 0.8

$$-\frac{a}{6\,x^6}\sqrt{bx^3+a}-\frac{5\,b}{12\,x^3}\sqrt{bx^3+a}-\frac{b^2}{4}Artanh\left(1\sqrt{bx^3+a}\frac{1}{\sqrt{a}}\right)\frac{1}{\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^(3/2)/x^7,x)
```

```
[Out] -1/6*a*(b*x^3+a)^(1/2)/x^6-5/12*b*(b*x^3+a)^(1/2)/x^3-1/4*b^2*arc
tanh((b*x^3+a)^(1/2)/a^(1/2))/a^(1/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(3/2)/x^7,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.235056, size = 1, normalized size = 0.01

$$\left[\frac{3\,b^2x^6\log\left(\frac{(bx^3+2\,a)\sqrt{a}-2\,\sqrt{bx^3+a}a}{x^3}\right)-2\left(5\,bx^3+2\,a\right)\sqrt{bx^3+a}\sqrt{a}}{24\,\sqrt{a}x^6},\frac{3\,b^2x^6\arctan\left(\frac{a}{\sqrt{bx^3+a}\sqrt{-a}}\right)-\left(5\,bx^3+2\,a\right)\sqrt{bx^3+a}\sqrt{-a}}{12\,\sqrt{-a}x^6}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(3/2)/x^7,x, algorithm="fricas")
```

```
[Out] [1/24*(3*b^2*x^6*log(((b*x^3 + 2*a)*sqrt(a) - 2*sqrt(b*x^3 + a)*a
)/x^3) - 2*(5*b*x^3 + 2*a)*sqrt(b*x^3 + a)*sqrt(a))/(sqrt(a)*x^6)
, 1/12*(3*b^2*x^6*arctan(a/(sqrt(b*x^3 + a)*sqrt(-a))) - (5*b*x^3
 + 2*a)*sqrt(b*x^3 + a)*sqrt(-a))/(sqrt(-a)*x^6)]
```

Sympy [A] time = 12.0387, size = 78, normalized size = 1.15

$$-\frac{a\sqrt{b}\sqrt{\frac{a}{bx^3}+1}}{6x^{\frac{9}{2}}}-\frac{5b^{\frac{3}{2}}\sqrt{\frac{a}{bx^3}+1}}{12x^{\frac{3}{2}}}-\frac{b^2\operatorname{asinh}\left(\frac{\sqrt{a}}{\sqrt{b}x^{\frac{3}{2}}}\right)}{4\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**(3/2)/x**7,x)
```

```
[Out] -a*sqrt(b)*sqrt(a/(b*x**3) + 1)/(6*x**(9/2)) - 5*b**(3/2)*sqrt(a/
(b*x**3) + 1)/(12*x**(3/2)) - b**2*asinh(sqrt(a)/(sqrt(b)*x**(3/2
)))/(4*sqrt(a))
```

GIAC/XCAS [A] time = 0.219138, size = 82, normalized size = 1.21

$$\frac{1}{12}\,b^2\left(\frac{3\,\arctan\left(\frac{\sqrt{bx^3+a}}{\sqrt{-a}}\right)}{\sqrt{-a}}-\frac{5\left(bx^3+a\right)^{\frac{3}{2}}-3\,\sqrt{bx^3+a}a}{b^2x^6}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(3/2)/x^7,x, algorithm="giac")
```

```
[Out] 1/12*b^2*(3*arctan(sqrt(b*x^3 + a)/sqrt(-a))/sqrt(-a) - (5*(b*x^3
 + a)^(3/2) - 3*sqrt(b*x^3 + a)*a)/(b^2*x^6))
```

3.394 $\int x^6 \left(a+bx^3\right)^{3/2}\,dx$

Optimal. Leaf size=296

$$-\frac{432a^3x\sqrt{a+bx^3}}{21505b^2}+\frac{54a^2x^4\sqrt{a+bx^3}}{4301b}+\frac{288\,3^{3/4}\sqrt{2+\sqrt{3}}a^4\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{21505b^{7/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{2}{23}x^7\left(a+bx^3\right)^{3/2}+\frac{18}{391}ax^7\sqrt{a+bx^3}$$

```
[Out] (-432*a^3*x*Sqrt[a + b*x^3])/(21505*b^2) + (54*a^2*x^4*Sqrt[a + b
*x^3])/(4301*b) + (18*a*x^7*Sqrt[a + b*x^3])/391 + (2*x^7*(a + b*
x^3)^(3/2))/23 + (288*3^(3/4)*Sqrt[2 + Sqrt[3]]*a^4*(a^(1/3) + b^
(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + S
qrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a
^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*
Sqrt[3]])/(21505*b^(7/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1
 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi [A] time = 0.322909, antiderivative size = 296, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{432a^3x\sqrt{a+bx^3}}{21505b^2}+\frac{54a^2x^4\sqrt{a+bx^3}}{4301b}+\frac{288\,3^{3/4}\sqrt{2+\sqrt{3}}a^4\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{21505b^{7/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{2}{23}x^7\left(a+bx^3\right)^{3/2}+\frac{18}{391}ax^7\sqrt{a+bx^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6*(a + b*x^3)^(3/2),x]
```

```
[Out] (-432*a^3*x*Sqrt[a + b*x^3])/(21505*b^2) + (54*a^2*x^4*Sqrt[a + b
*x^3])/(4301*b) + (18*a*x^7*Sqrt[a + b*x^3])/391 + (2*x^7*(a + b*
x^3)^(3/2))/23 + (288*3^(3/4)*Sqrt[2 + Sqrt[3]]*a^4*(a^(1/3) + b^
(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + S
qrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a
^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*
Sqrt[3]])/(21505*b^(7/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1
 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 29.3998, size = 267, normalized size = 0.9

$$\frac{288\cdot 3^{\frac{3}{4}}a^4\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{21505b^{\frac{7}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{432a^3x\sqrt{a+bx^3}}{21505b^2}+\frac{54a^2x^4\sqrt{a+bx^3}}{4301b}+\frac{18ax^7\sqrt{a+bx^3}}{391}+\frac{2x^7\left(a+bx^3\right)^{\frac{3}{2}}}{23}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6*(b*x**3+a)**(3/2),x)
```

```
[Out] 288*3**(3/4)*a**4*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b**(2/3)
*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(sqrt(3) + 2
)*(a**(1/3) + b**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3
)) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4*s
qrt(3))/(21505*b**(7/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a*
*(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) - 432*a*
*3*x*sqrt(a + b*x**3)/(21505*b**2) + 54*a**2*x**4*sqrt(a + b*x**3
)/(4301*b) + 18*a*x**7*sqrt(a + b*x**3)/391 + 2*x**7*(a + b*x**3)
**(3/2)/23
```

Mathematica [C] time = 0.423289, size = 195, normalized size = 0.66

$$\sqrt{a+bx^3}\left(-\frac{432a^3x}{21505b^2}+\frac{54a^2x^4}{4301b}+\frac{52ax^7}{391}+\frac{2bx^{10}}{23}\right)+\frac{288i3^{3/4}a^{13/3}\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}\,F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)}{21505\sqrt[3]{-b}b^2\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^6*(a + b*x^3)^(3/2),x]
```

```
[Out] Sqrt[a + b*x^3]*((-432*a^3*x)/(21505*b^2) + (54*a^2*x^4)/(4301*b)
 + (52*a*x^7)/391 + (2*b*x^10)/23) + (((288*I)/21505)*3^(3/4)*a^(
13/3)*Sqrt[(-1)^(5/6)*(-1 + ((-b)^(1/3)*x)/a^(1/3))]*Sqrt[1 + ((-
b)^(1/3)*x)/a^(1/3) + ((-b)^(2/3)*x^2)/a^(2/3)]*EllipticF[ArcSin[
Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)^(1/3)
])/((-b)^(1/3)*b^2*Sqrt[a + b*x^3])
```

Maple [A] time = 0.024, size = 355, normalized size = 1.2

$$\frac{2\,bx^{10}}{23}\sqrt{bx^3+a}+\frac{52\,ax^7}{391}\sqrt{bx^3+a}+\frac{54\,x^4a^2}{4301\,b}\sqrt{bx^3+a}-\frac{432\,a^3x}{21505\,b^2}\sqrt{bx^3+a}-\frac{\frac{288\,i}{21505}a^4\sqrt{3}}{b^3}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2\,b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2\,b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6*(b*x^3+a)^(3/2),x)
```

```
[Out] 2/23*b*x^10*(b*x^3+a)^(1/2)+52/391*a*x^7*(b*x^3+a)^(1/2)+54/4301*
a^2*x^4*(b*x^3+a)^(1/2)/b-432/21505*a^3*x*(b*x^3+a)^(1/2)/b^2-288
/21505*I*a^4/b^3*3^(1/2)*(-a*b^2)^(1/3)*(I*(x+1/2/b*(-a*b^2)^(1/3
)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)
*((x-1/b*(-a*b^2)^(1/3))/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(
-a*b^2)^(1/3)))^(1/2)*(-I*(x+1/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b
*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)/(b*x^3+a)^(1/2)*
EllipticF(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*
(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*
b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))
)^(1/2))
```

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

$$\int (bx^3 + a)^{\frac{3}{2}} x^6 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(3/2)*x^6,x, algorithm="maxima")
```

```
[Out] integrate((b*x^3 + a)^(3/2)*x^6, x)
```

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

$$\text{integral}\left((bx^9 + ax^6)\sqrt{bx^3 + a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(3/2)*x^6,x, algorithm="fricas")
```

```
[Out] integral((b*x^9 + a*x^6)*sqrt(b*x^3 + a), x)
```

Sympy [A] time = 5.35204, size = 39, normalized size = 0.13

$$\frac{a^{\frac{3}{2}} x^7 \Gamma\left(\frac{7}{3}\right) {}_2F_1\left(\begin{matrix} -\frac{3}{2}, \frac{7}{3} \\ \frac{10}{3} \end{matrix}\middle| \frac{bx^3 e^{i\pi}}{a}\right)}{3\Gamma\left(\frac{10}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6*(b*x**3+a)**(3/2),x)
```

```
[Out] a**(3/2)*x**7*gamma(7/3)*hyper((-3/2, 7/3), (10/3,), b*x**3*exp_p
olar(I*pi)/a)/(3*gamma(10/3))
```

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

$$\int (bx^3 + a)^{\frac{3}{2}} x^6 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(3/2)*x^6,x, algorithm="giac")
```

```
[Out] integrate((b*x^3 + a)^(3/2)*x^6, x)
```

3.395 $\int x^3 \left(a+bx^3\right)^{3/2}\,dx$

Optimal. Leaf size=272

$$\frac{54a^2x\sqrt{a+bx^3}}{935b} - \frac{36\,3^{3/4}\sqrt{2+\sqrt{3}}a^3\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{935b^{4/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}} + \frac{2}{17}x^4\left(a+bx^3\right)^{3/2} + \frac{18}{187}ax^4\sqrt{a+bx^3}$$

```
[Out] (54*a^2*x*Sqrt[a + b*x^3])/(935*b) + (18*a*x^4*Sqrt[a + b*x^3])/1
87 + (2*x^4*(a + b*x^3)^(3/2))/17 - (36*3^(3/4)*Sqrt[2 + Sqrt[3]]
*a^3*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^
(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSi
n[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^
(1/3)*x)], -7 - 4*Sqrt[3]])/(935*b^(4/3)*Sqrt[(a^(1/3)*(a^(1/3) +
 b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^
3])
```

Rubi [A] time = 0.240692, antiderivative size = 272, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{54a^2x\sqrt{a+bx^3}}{935b} - \frac{36\,3^{3/4}\sqrt{2+\sqrt{3}}a^3\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{935b^{4/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}} + \frac{2}{17}x^4\left(a+bx^3\right)^{3/2} + \frac{18}{187}ax^4\sqrt{a+bx^3}$$

Antiderivative was successfully verified.

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


```
[Out] (54*a^2*x*Sqrt[a + b*x^3])/(935*b) + (18*a*x^4*Sqrt[a + b*x^3])/1
87 + (2*x^4*(a + b*x^3)^(3/2))/17 - (36*3^(3/4)*Sqrt[2 + Sqrt[3]]
*a^3*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^
(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSi
n[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^
(1/3)*x)], -7 - 4*Sqrt[3]])/(935*b^(4/3)*Sqrt[(a^(1/3)*(a^(1/3) +
 b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^
3])
```

Rubi in Sympy [A] time = 22.6226, size = 243, normalized size = 0.89

$$-\frac{36\cdot 3^{\frac{3}{4}}a^3\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{935b^{\frac{4}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}} + \frac{54a^2x\sqrt{a+bx^3}}{935b} + \frac{18ax^4\sqrt{a+bx^3}}{187} + \frac{2x^4\left(a+bx^3\right)^{\frac{3}{2}}}{17}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -36*3**(3/4)*a**3*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b**(2/3)
*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(sqrt(3) + 2
)*(a**(1/3) + b**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3
)) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4*s
qrt(3))/(935*b**(4/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(
1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) + 54*a**2*
x*sqrt(a + b*x**3)/(935*b) + 18*a*x**4*sqrt(a + b*x**3)/187 + 2*x
**4*(a + b*x**3)**(3/2)/17
```

Mathematica [C] time = 0.706306, size = 178, normalized size = 0.65

$$-\frac{2\left(\sqrt[3]{-b}\left(a+bx^3\right)\left(27a^2x+100abx^4+55b^2x^7\right)-18i3^{3/4}a^{10/3}\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}F\left(\sin^{-1}\left(\sqrt{-\ldots}\right.\right.\right.}{935(-b)^{4/3}\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

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

```
[Out] (-2*((-b)^(1/3)*(a + b*x^3)*(27*a^2*x + 100*a*b*x^4 + 55*b^2*x^7)
 - (18*I)*3^(3/4)*a^(10/3)*Sqrt[(-1)^(5/6)*(-1 + ((-b)^(1/3)*x)/a
^(1/3))]*Sqrt[1 + ((-b)^(1/3)*x)/a^(1/3) + ((-b)^(2/3)*x^2)/a^(2/
3)]*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]
/3^(1/4)], (-1)^(1/3)]))/(935*(-b)^(4/3)*Sqrt[a + b*x^3])
```

Maple [A] time = 0.023, size = 335, normalized size = 1.2

$$\frac{2\,bx^7}{17}\sqrt{bx^3+a}+\frac{40\,ax^4}{187}\sqrt{bx^3+a}+\frac{54\,xa^2}{935\,b}\sqrt{bx^3+a}$$
$$+\frac{\frac{36\,i}{935}a^3\sqrt{3}}{b^2}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2\,b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2\,b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}\ldots}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 2/17*b*x^7*(b*x^3+a)^(1/2)+40/187*a*x^4*(b*x^3+a)^(1/2)+54/935*a^
2*x*(b*x^3+a)^(1/2)/b+36/935*I/b^2*a^3*3^(1/2)*(-a*b^2)^(1/3)*(I*
(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b
/(-a*b^2)^(1/3))^(1/2)*((x-1/b*(-a*b^2)^(1/3))/(-3/2/b*(-a*b^2)^(
1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2)*(-I*(x+1/2/b*(-a*b^2)
^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^
(1/2)/(b*x^3+a)^(1/2)*EllipticF(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^
(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(
1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(
1/2)/b*(-a*b^2)^(1/3)))^(1/2))
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\left(bx^6 + ax^3\right)\sqrt{bx^3 + a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((b*x^6 + a*x^3)*sqrt(b*x^3 + a), x)
```

Sympy [A] time = 3.54201, size = 39, normalized size = 0.14

$$\frac{a^{\frac{3}{2}}x^4\left(\frac{4}{3}\right){}_2F_1\left(\begin{matrix}-\frac{3}{2},\frac{4}{3}\\ \frac{7}{3}\end{matrix}\middle|\frac{bx^3e^{i\pi}}{a}\right)}{3\left(\frac{7}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a**(3/2)*x**4*gamma(4/3)*hyper((-3/2, 4/3), (7/3,), b*x**3*exp_po
lar(I*pi)/a)/(3*gamma(7/3))
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.396 $\int \left(a+bx^3\right)^{3/2}\,dx$

Optimal. Leaf size=246

$$\frac{18\,3^{3/4}\sqrt{2+\sqrt{3}}a^2\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{55\sqrt[3]{b}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{18}{55}ax\sqrt{a+bx^3}+\frac{2}{11}x\left(a+bx^3\right)^{3/2}$$

```
[Out] (18*a*x*Sqrt[a + b*x^3])/55 + (2*x*(a + b*x^3)^(3/2))/11 + (18*3^
(3/4)*Sqrt[2 + Sqrt[3]]*a^2*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) -
 a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3
)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1
+ Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(55*b^(1/3)*Sq
rt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/
3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi [A] time = 0.157489, antiderivative size = 246, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$

$$\frac{18\,3^{3/4}\sqrt{2+\sqrt{3}}a^2\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{55\sqrt[3]{b}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{18}{55}ax\sqrt{a+bx^3}+\frac{2}{11}x\left(a+bx^3\right)^{3/2}$$

Antiderivative was successfully verified.

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


```
[Out] (18*a*x*Sqrt[a + b*x^3])/55 + (2*x*(a + b*x^3)^(3/2))/11 + (18*3^
(3/4)*Sqrt[2 + Sqrt[3]]*a^2*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) -
 a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3
)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1
+ Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(55*b^(1/3)*Sq
rt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/
3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 12.4916, size = 219, normalized size = 0.89

$$\frac{18\cdot 3^{\frac{3}{4}}a^2\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{55\sqrt[3]{b}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{18ax\sqrt{a+bx^3}}{55}+\frac{2x\left(a+bx^3\right)^{\frac{3}{2}}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 18*3**(3/4)*a**2*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b**(2/3)*
x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(sqrt(3) + 2)
*(a**(1/3) + b**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)
) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4*sq
rt(3))/(55*b**(1/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1/
3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) + 18*a*x*sqr
t(a + b*x**3)/55 + 2*x*(a + b*x**3)**(3/2)/11
```

Mathematica [C] time = 0.937842, size = 166, normalized size = 0.67

$$\sqrt{a+bx^3}\left(\frac{28ax}{55}+\frac{2bx^4}{11}\right)+\frac{18i3^{3/4}a^{7/3}\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)}{55\sqrt[3]{-b}\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

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

```
[Out] Sqrt[a + b*x^3]*((28*a*x)/55 + (2*b*x^4)/11) + (((18*I)/55)*3^(3/
4)*a^(7/3)*Sqrt[(-1)^(5/6)*(-1 + ((-b)^(1/3)*x)/a^(1/3))]*Sqrt[1
+ ((-b)^(1/3)*x)/a^(1/3) + ((-b)^(2/3)*x^2)/a^(2/3)]*EllipticF[Ar
cSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)^
(1/3)])/((-b)^(1/3)*Sqrt[a + b*x^3])
```

Maple [A] time = 0.019, size = 315, normalized size = 1.3

$$\frac{2bx^4}{11}\sqrt{bx^3+a}+\frac{28ax}{55}\sqrt{bx^3+a}-\frac{\frac{18i}{55}a^2\sqrt{3}}{b}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 2/11*b*x^4*(b*x^3+a)^(1/2)+28/55*a*x*(b*x^3+a)^(1/2)-18/55*I*a^2*
3^(1/2)/b*(-a*b^2)^(1/3)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)
/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)*((x-1/b*(-a*b^
2)^(1/3))/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))
^(1/2)*(-I*(x+1/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)
)*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)/(b*x^3+a)^(1/2)*EllipticF(1/3*3
^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))
*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/
2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2))
```

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

$$\int (bx^3+a)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\left(bx^3+a\right)^{\frac{3}{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((b*x^3 + a)^(3/2), x)
```

Sympy [A] time = 2.87523, size = 37, normalized size = 0.15

$$\frac{a^{\frac{3}{2}}x\,\Gamma\left(\frac{1}{3}\right)\,{}_2F_1\left(\begin{matrix}-\frac{3}{2},\frac{1}{3}\\ \frac{4}{3}\end{matrix}\middle|\frac{bx^3e^{i\pi}}{a}\right)}{3\,\Gamma\left(\frac{4}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a**(3/2)*x*gamma(1/3)*hyper((-3/2, 1/3), (4/3,), b*x**3*exp_polar
(I*pi)/a)/(3*gamma(4/3))
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.397 $\int \frac{(a+bx^3)^{3/2}}{x^3}\,dx$

Optimal. Leaf size=246

$$\frac{9\, 3^{3/4}\sqrt{2+\sqrt{3}}\, a b^{2/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\, F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{10\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}} + \frac{9}{10}bx\sqrt{a+bx^3} - \frac{\left(a+bx^3\right)^{3/2}}{2x^2}$$

```
[Out] (9*b*x*Sqrt[a + b*x^3])/10 - (a + b*x^3)^(3/2)/(2*x^2) + (9*3^(3/
4)*Sqrt[2 + Sqrt[3]]*a*b^(2/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3
) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(
1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/(
(1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(10*Sqrt[(a
^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)
^2]*Sqrt[a + b*x^3])
```

Rubi [A] time = 0.16615, antiderivative size = 246, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$\frac{9\, 3^{3/4}\sqrt{2+\sqrt{3}}\, a b^{2/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\, F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{10\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}} + \frac{9}{10}bx\sqrt{a+bx^3} - \frac{\left(a+bx^3\right)^{3/2}}{2x^2}$$

Antiderivative was successfully verified.

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


```
[Out] (9*b*x*Sqrt[a + b*x^3])/10 - (a + b*x^3)^(3/2)/(2*x^2) + (9*3^(3/
4)*Sqrt[2 + Sqrt[3]]*a*b^(2/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3
) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(
1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/(
(1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(10*Sqrt[(a
^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)
^2]*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 13.8055, size = 218, normalized size = 0.89

$$\frac{9\cdot 3^{\frac{3}{4}} a b^{\frac{2}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{10\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}} + \frac{9bx\sqrt{a+bx^3}}{10} - \frac{\left(a+bx^3\right)^{\frac{3}{2}}}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 9*3**(3/4)*a*b**(2/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b**(
2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(sqrt(3)
 + 2)*(a**(1/3) + b**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 + sq
rt(3)) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 -
 4*sqrt(3))/(10*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1/3)*(
1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) + 9*b*x*sqrt(a +
 b*x**3)/10 - (a + b*x**3)**(3/2)/(2*x**2)
```

Mathematica [C] time = 0.811346, size = 167, normalized size = 0.68

$$\left(\frac{2bx}{5}-\frac{a}{2x^2}\right)\sqrt{a+bx^3} + \frac{9i3^{3/4}a^{4/3}b\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)}{10\sqrt[3]{-b}\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

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

```
[Out] (-a/(2*x^2) + (2*b*x)/5)*Sqrt[a + b*x^3] + (((9*I)/10)*3^(3/4)*a^
(4/3)*b*Sqrt[(-1)^(5/6)*(-1 + ((-b)^(1/3)*x)/a^(1/3))]*Sqrt[1 + (
(-b)^(1/3)*x)/a^(1/3) + ((-b)^(2/3)*x^2)/a^(2/3)]*EllipticF[ArcSi
n[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)^(1/
3)])/((-b)^(1/3)*Sqrt[a + b*x^3])
```

Maple [A] time = 0.026, size = 310, normalized size = 1.3

$$-\frac{a}{2x^2}\sqrt{bx^3+a}+\frac{2bx}{5}\sqrt{bx^3+a} -\frac{9i}{10}a\sqrt{3}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}b$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*a*(b*x^3+a)^(1/2)/x^2+2/5*b*x*(b*x^3+a)^(1/2)-9/10*I*a*3^(1/
2)*(-a*b^2)^(1/3)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*
b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)*((x-1/b*(-a*b^2)^(1/3
))/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2)*
(-I*(x+1/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/
2)*b/(-a*b^2)^(1/3))^(1/2)/(b*x^3+a)^(1/2)*EllipticF(1/3*3^(1/2)*
(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2
)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a
*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2))
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{\left(bx^3+a\right)^{\frac{3}{2}}}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((b*x^3 + a)^(3/2)/x^3, x)
```

Sympy [A] time = 3.10803, size = 42, normalized size = 0.17

$$\frac{a^{\frac{3}{2}}\Gamma\left(-\frac{2}{3}\right){}_2F_1\left(\left.\begin{matrix}-\frac{3}{2},-\frac{2}{3}\\ \frac{1}{3}\end{matrix}\right|\frac{bx^3e^{i\pi}}{a}\right)}{3x^2\Gamma\left(\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a**(3/2)*gamma(-2/3)*hyper((-3/2, -2/3), (1/3,), b*x**3*exp_polar
(I*pi)/a)/(3*x**2*gamma(1/3))
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.398 $\int \frac{(a+bx^3)^{3/2}}{x^6}\,dx$

Optimal. Leaf size=247

$$\frac{9\,3^{3/4}\sqrt{2+\sqrt{3}}\,b^{5/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\,F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{20\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{\left(a+bx^3\right)^{3/2}}{5x^5}-\frac{9b\sqrt{a+bx^3}}{20x^2}$$

```
[Out] (-9*b*Sqrt[a + b*x^3])/(20*x^2) - (a + b*x^3)^(3/2)/(5*x^5) + (9*
3^(3/4)*Sqrt[2 + Sqrt[3]]*b^(5/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(
2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) +
b^(1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x
)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(20*Sqrt
[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)
*x)^2]*Sqrt[a + b*x^3])
```

Rubi [A] time = 0.171776, antiderivative size = 247, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{9\,3^{3/4}\sqrt{2+\sqrt{3}}\,b^{5/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\,F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{20\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{\left(a+bx^3\right)^{3/2}}{5x^5}-\frac{9b\sqrt{a+bx^3}}{20x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^(3/2)/x^6,x]
```

```
[Out] (-9*b*Sqrt[a + b*x^3])/(20*x^2) - (a + b*x^3)^(3/2)/(5*x^5) + (9*
3^(3/4)*Sqrt[2 + Sqrt[3]]*b^(5/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(
2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) +
b^(1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x
)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(20*Sqrt
[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)
*x)^2]*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 15.0643, size = 218, normalized size = 0.88

$$\frac{9\cdot 3^{\frac{3}{4}}b^{\frac{5}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{20\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{9b\sqrt{a+bx^3}}{20x^2}-\frac{\left(a+bx^3\right)^{\frac{3}{2}}}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate((b*x**3+a)**(3/2)/x**6,x)
```

```
[Out] 9*3**(3/4)*b**(5/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b**(2/
3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(sqrt(3) +
 2)*(a**(1/3) + b**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt
(3)) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4
*sqrt(3))/(20*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1/3)*(1
+ sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) - 9*b*sqrt(a + b*x
**3)/(20*x**2) - (a + b*x**3)**(3/2)/(5*x**5)
```

Mathematica [C] time = 1.02787, size = 167, normalized size = 0.68

$$-\frac{\sqrt{a+bx^3}\left(4a+13bx^3\right)}{20x^5}+\frac{9i3^{3/4}\sqrt[3]{a}(-b)^{5/3}\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)}{20\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]   Integrate[(a + b*x^3)^(3/2)/x^6,x]
```

```
[Out] -(Sqrt[a + b*x^3]*(4*a + 13*b*x^3))/(20*x^5) + (((9*I)/20)*3^(3/4
)*a^(1/3)*(-b)^(5/3)*Sqrt[(-1)^(5/6)*(-1 + ((-b)^(1/3)*x)/a^(1/3)
)]*Sqrt[1 + ((-b)^(1/3)*x)/a^(1/3) + ((-b)^(2/3)*x^2)/a^(2/3)]*El
lipticF[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/
4)], (-1)^(1/3)])/Sqrt[a + b*x^3]
```

Maple [A] time = 0.029, size = 312, normalized size = 1.3

$$-\frac{a}{5\,x^5}\sqrt{bx^3+a}-\frac{13\,b}{20\,x^2}\sqrt{bx^3+a}$$
$$-\frac{9\,i}{20}b\sqrt{3}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2\,b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2\,b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}b$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((b*x^3+a)^(3/2)/x^6,x)
```

```
[Out] -1/5*a*(b*x^3+a)^(1/2)/x^5-13/20*b*(b*x^3+a)^(1/2)/x^2-9/20*I*b*3
^(1/2)*(-a*b^2)^(1/3)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*
(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)*((x-1/b*(-a*b^2)^
(1/3))/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1
/2)*(-I*(x+1/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3
^(1/2)*b/(-a*b^2)^(1/3))^(1/2)/(b*x^3+a)^(1/2)*EllipticF(1/3*3^(1
/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^
(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b
*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2))
```

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

$$\int \frac{\left(bx^3+a\right)^{\frac{3}{2}}}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(3/2)/x^6,x, algorithm="maxima")

[Out] integrate((b*x^3 + a)^(3/2)/x^6, x)
```

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

$$\text{integral}\left(\frac{\left(bx^3+a\right)^{\frac{3}{2}}}{x^6},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(3/2)/x^6,x, algorithm="fricas")

[Out] integral((b*x^3 + a)^(3/2)/x^6, x)
```

Sympy [A] time = 4.11548, size = 46, normalized size = 0.19

$$\frac{a^{\frac{3}{2}}\Gamma\left(-\frac{5}{3}\right){}_{2}F_{1}\left(\begin{matrix}-\frac{5}{3},-\frac{3}{2}\\-\frac{2}{3}\end{matrix}\middle|\frac{bx^3e^{i\pi}}{a}\right)}{3x^5\Gamma\left(-\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**(3/2)/x**6,x)

[Out] a**(3/2)*gamma(-5/3)*hyper((-5/3, -3/2), (-2/3,), b*x**3*exp_pola
r(I*pi)/a)/(3*x**5*gamma(-2/3))
```

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

$$\int\frac{\left(bx^3+a\right)^{\frac{3}{2}}}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(3/2)/x^6,x, algorithm="giac")

[Out] integrate((b*x^3 + a)^(3/2)/x^6, x)
```

3.399 $\int x^7 \left(a+bx^3\right)^{3/2} dx$

Optimal. Leaf size=556

$$\frac{144\sqrt{2}3^{3/4}a^{13/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{8645b^{8/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}$$
$$-\frac{216\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{13/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{8645b^{8/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}$$
$$+\frac{432a^4\sqrt{a+bx^3}}{8645b^{8/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)}-\frac{108a^3x^2\sqrt{a+bx^3}}{8645b^2}$$
$$+\frac{54a^2x^5\sqrt{a+bx^3}}{6175b}+\frac{2}{25}x^8\left(a+bx^3\right)^{3/2}+\frac{18}{475}ax^8\sqrt{a+bx^3}$$

```
[Out] (-108*a^3*x^2*Sqrt[a + b*x^3])/(8645*b^2) + (54*a^2*x^5*Sqrt[a +
b*x^3])/(6175*b) + (18*a*x^8*Sqrt[a + b*x^3])/475 + (432*a^4*Sqrt
[a + b*x^3])/(8645*b^(8/3)*((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)) +
 (2*x^8*(a + b*x^3)^(3/2))/25 - (216*3^(1/4)*Sqrt[2 - Sqrt[3]]*a^
(13/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x +
b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticE[Arc
Sin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) +
b^(1/3)*x)], -7 - 4*Sqrt[3]])/(8645*b^(8/3)*Sqrt[(a^(1/3)*(a^(1/3
) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b
*x^3]) + (144*Sqrt[2]*3^(3/4)*a^(13/3)*(a^(1/3) + b^(1/3)*x)*Sqrt
[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/
3) + b^(1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1
/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(86
45*b^(8/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^
(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi [A] time = 0.704905, antiderivative size = 556, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{144\sqrt{2}3^{3/4}a^{13/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{8645b^{8/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}$$
$$-\frac{216\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{13/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{8645b^{8/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}$$
$$+\frac{432a^4\sqrt{a+bx^3}}{8645b^{8/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)}-\frac{108a^3x^2\sqrt{a+bx^3}}{8645b^2}$$
$$+\frac{54a^2x^5\sqrt{a+bx^3}}{6175b}+\frac{2}{25}x^8\left(a+bx^3\right)^{3/2}+\frac{18}{475}ax^8\sqrt{a+bx^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7*(a + b*x^3)^(3/2),x]
```

```
[Out] (-108*a^3*x^2*Sqrt[a + b*x^3])/(8645*b^2) + (54*a^2*x^5*Sqrt[a +
b*x^3])/(6175*b) + (18*a*x^8*Sqrt[a + b*x^3])/475 + (432*a^4*Sqrt
[a + b*x^3])/(8645*b^(8/3)*((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)) +
 (2*x^8*(a + b*x^3)^(3/2))/25 - (216*3^(1/4)*Sqrt[2 - Sqrt[3]]*a^
(13/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x +
b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticE[Arc
Sin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) +
b^(1/3)*x)], -7 - 4*Sqrt[3]])/(8645*b^(8/3)*Sqrt[(a^(1/3)*(a^(1/3
) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b
*x^3]) + (144*Sqrt[2]*3^(3/4)*a^(13/3)*(a^(1/3) + b^(1/3)*x)*Sqrt
[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/
3) + b^(1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1
/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(86
45*b^(8/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^
(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 67.1891, size = 496, normalized size = 0.89

$$- \frac{216 \sqrt[4]{3} a^{\frac{13}{3}} \sqrt{\frac{a^{\frac{2}{3}} - \sqrt[3]{a} \sqrt[3]{b} x + b^{\frac{2}{3}} x^{2}}{\left(\sqrt[3]{a} \left(1 + \sqrt{3}\right) + \sqrt[3]{b} x\right)^{2}}} \sqrt{- \sqrt{3} + 2} \left(\sqrt[3]{a} + \sqrt[3]{b} x\right) E\left(\operatorname{asin}{\left(\frac{- \sqrt[3]{a} \left(-1 + \sqrt{3}\right) + \sqrt[3]{b} x}{\sqrt[3]{a} \left(1 + \sqrt{3}\right) + \sqrt[3]{b} x} \right)}\middle| -7 - 4 \sqrt{3}\right)}{8645 b^{\frac{8}{3}} \sqrt{\frac{\sqrt[3]{a} \left(\sqrt[3]{a} + \sqrt[3]{b} x\right)}{\left(\sqrt[3]{a} \left(1 + \sqrt{3}\right) + \sqrt[3]{b} x\right)^{2}}} \sqrt{a + b x^{3}}} + \frac{144 \sqrt{2} \cdot 3^{\frac{3}{4}} a^{\frac{13}{3}} \sqrt{\frac{a^{\frac{2}{3}} - \sqrt[3]{a} \sqrt[3]{b} x + b^{\frac{2}{3}} x^{2}}{\left(\sqrt[3]{a} \left(1 + \sqrt{3}\right) + \sqrt[3]{b} x\right)^{2}}} \left(\sqrt[3]{a} + \sqrt[3]{b} x\right) F\left(\operatorname{asin}{\left(\frac{- \sqrt[3]{a} \left(-1 + \sqrt{3}\right) + \sqrt[3]{b} x}{\sqrt[3]{a} \left(1 + \sqrt{3}\right) + \sqrt[3]{b} x} \right)}\middle| -7 - 4 \sqrt{3}\right)}{8645 b^{\frac{8}{3}} \sqrt{\frac{\sqrt[3]{a} \left(\sqrt[3]{a} + \sqrt[3]{b} x\right)}{\left(\sqrt[3]{a} \left(1 + \sqrt{3}\right) + \sqrt[3]{b} x\right)^{2}}} \sqrt{a + b x^{3}}} + \frac{432 a^{4} \sqrt{a + b x^{3}}}{8645 b^{\frac{8}{3}} \left(\sqrt[3]{a} \left(1 + \sqrt{3}\right) + \sqrt[3]{b} x\right)} - \frac{108 a^{3} x^{2} \sqrt{a + b x^{3}}}{8645 b^{2}} + \frac{54 a^{2} x^{5} \sqrt{a + b x^{3}}}{6175 b} + \frac{18 a x^{8} \sqrt{a + b x^{3}}}{475} + \frac{2 x^{8} \left(a + b x^{3}\right)^{\frac{3}{2}}}{25}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7*(b*x**3+a)**(3/2),x)
```

```
[Out] -216*3**(1/4)*a**(13/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b*
*(2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(-sqrt
(3) + 2)*(a**(1/3) + b**(1/3)*x)*elliptic_e(asin((-a**(1/3)*(-1 +
 sqrt(3)) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -
7 - 4*sqrt(3))/(8645*b**(8/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*
x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) +
144*sqrt(2)*3**(3/4)*a**(13/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)
*x + b**(2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*(a*
*(1/3) + b**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) +
b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4*sqrt(3
))/(8645*b**(8/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1/3)
*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) + 432*a**4*sqr
t(a + b*x**3)/(8645*b**(8/3)*(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x
)) - 108*a**3*x**2*sqrt(a + b*x**3)/(8645*b**2) + 54*a**2*x**5*sq
rt(a + b*x**3)/(6175*b) + 18*a*x**8*sqrt(a + b*x**3)/475 + 2*x**8
*(a + b*x**3)**(3/2)/25
```

Mathematica [C] time = 1.65339, size = 253, normalized size = 0.46

$$\frac{2x^2\sqrt{a+bx^3}\left(-270a^3+189a^2bx^3+2548ab^2x^6+1729b^3x^9\right)}{43225b^2}+\frac{144\sqrt[6]{-1}3^{3/4}a^{14/3}\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}\left(\sqrt[3]{-1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)-i\sqrt{3}E\left(\sin^{-1}\left(\cdots\right.\right.\right.}{8645(-b)^{8/3}\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^7*(a + b*x^3)^(3/2),x]
```

```
[Out] (2*x^2*Sqrt[a + b*x^3]*(-270*a^3 + 189*a^2*b*x^3 + 2548*a*b^2*x^6
 + 1729*b^3*x^9))/(43225*b^2) + (144*(-1)^(1/6)*3^(3/4)*a^(14/3)*
Sqrt[(-1)^(5/6)*(-1 + ((-b)^(1/3)*x)/a^(1/3))]*Sqrt[1 + ((-b)^(1/
3)*x)/a^(1/3) + ((-b)^(2/3)*x^2)/a^(2/3)]*((-I)*Sqrt[3]*EllipticE
[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-
1)^(1/3)] + (-1)^(1/3)*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b
)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)^(1/3)]))/(8645*(-b)^(8/3)*Sqrt
[a + b*x^3])
```

Maple [A] time = 0.026, size = 509, normalized size = 0.9

$$\frac{2\,bx^{11}}{25}\sqrt{bx^3+a}+\frac{56\,ax^8}{475}\sqrt{bx^3+a}+\frac{54\,x^5a^2}{6175\,b}\sqrt{bx^3+a}-\frac{108\,x^2a^3}{8645\,b^2}\sqrt{bx^3+a}-\frac{\frac{144\,i}{8645}a^4\sqrt{3}}{b^3}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2\,b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2\,b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7*(b*x^3+a)^(3/2),x)
```

```
[Out] 2/25*b*x^11*(b*x^3+a)^(1/2)+56/475*a*x^8*(b*x^3+a)^(1/2)+54/6175*
a^2*x^5*(b*x^3+a)^(1/2)/b-108/8645*a^3*x^2*(b*x^3+a)^(1/2)/b^2-14
4/8645*I*a^4/b^3*3^(1/2)*(-a*b^2)^(1/3)*(I*(x+1/2/b*(-a*b^2)^(1/3
)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)
*((x-1/b*(-a*b^2)^(1/3))/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(
-a*b^2)^(1/3)))^(1/2)*(-I*(x+1/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b
*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)/(b*x^3+a)^(1/2)*
((-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*EllipticE
(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^
(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3
)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2))+
1/b*(-a*b^2)^(1/3)*EllipticF(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/
3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2
),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2
)/b*(-a*b^2)^(1/3)))^(1/2)))
```

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

$$\int\left(bx^3+a\right)^{\frac{3}{2}}x^7\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(3/2)*x^7,x, algorithm="maxima")
```

```
[Out] integrate((b*x^3 + a)^(3/2)*x^7, x)
```

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

$$\text{integral}\left(\left(bx^{10}+ax^{7}\right)\sqrt{bx^{3}+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(3/2)*x^7,x, algorithm="fricas")
```

```
[Out] integral((b*x^10 + a*x^7)*sqrt(b*x^3 + a), x)
```

Sympy [A] time = 6.11365, size = 39, normalized size = 0.07

$$\frac{a^{\frac{3}{2}}x^{8}\Gamma\left(\frac{8}{3}\right){}_{2}F_{1}\left(\begin{matrix}-\frac{3}{2},\frac{8}{3}\\ \frac{11}{3}\end{matrix}\middle|\frac{bx^{3}e^{i\pi}}{a}\right)}{3\Gamma\left(\frac{11}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7*(b*x**3+a)**(3/2),x)
```

```
[Out] a**(3/2)*x**8*gamma(8/3)*hyper((-3/2, 8/3), (11/3,), b*x**3*exp_p
olar(I*pi)/a)/(3*gamma(11/3))
```

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

$$\int\left(bx^{3}+a\right)^{\frac{3}{2}}x^{7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(3/2)*x^7,x, algorithm="giac")
```

```
[Out] integrate((b*x^3 + a)^(3/2)*x^7, x)
```

3.400 $\int x^4 \left(a+bx^3\right)^{3/2} dx$

Optimal. Leaf size=532

$$-\frac{72\sqrt{2}\,3^{3/4}a^{10/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\,F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{1729b^{5/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{108\sqrt[4]{3}\sqrt{2-\sqrt{3}}\,a^{10/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\,E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{1729b^{5/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{216a^3\sqrt{a+bx^3}}{1729b^{5/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)}+\frac{54a^2x^2\sqrt{a+bx^3}}{1729b}+\frac{2}{19}x^5\left(a+bx^3\right)^{3/2}+\frac{18}{247}ax^5\sqrt{a+bx^3}$$

```
[Out] (54*a^2*x^2*Sqrt[a + b*x^3])/(1729*b) + (18*a*x^5*Sqrt[a + b*x^3]
)/247 - (216*a^3*Sqrt[a + b*x^3])/(1729*b^(5/3)*((1 + Sqrt[3])*a^
(1/3) + b^(1/3)*x)) + (2*x^5*(a + b*x^3)^(3/2))/19 + (108*3^(1/4)
*Sqrt[2 - Sqrt[3]]*a^(10/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) -
 a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3
)*x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1
+ Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(1729*b^(5/3)*
Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(
1/3)*x)^2]*Sqrt[a + b*x^3]) - (72*Sqrt[2]*3^(3/4)*a^(10/3)*(a^(1/
3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/
((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqr
t[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)],
-7 - 4*Sqrt[3]])/(1729*b^(5/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x
))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi [A] time = 0.591333, antiderivative size = 532, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{72\sqrt{2}\,3^{3/4}a^{10/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\,F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{1729b^{5/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{108\sqrt[4]{3}\sqrt{2-\sqrt{3}}\,a^{10/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\,E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{1729b^{5/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{216a^3\sqrt{a+bx^3}}{1729b^{5/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)}+\frac{54a^2x^2\sqrt{a+bx^3}}{1729b}+\frac{2}{19}x^5\left(a+bx^3\right)^{3/2}+\frac{18}{247}ax^5\sqrt{a+bx^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4*(a + b*x^3)^(3/2),x]
```

```
[Out] (54*a^2*x^2*Sqrt[a + b*x^3])/(1729*b) + (18*a*x^5*Sqrt[a + b*x^3]
)/247 - (216*a^3*Sqrt[a + b*x^3])/(1729*b^(5/3)*((1 + Sqrt[3])*a^
(1/3) + b^(1/3)*x)) + (2*x^5*(a + b*x^3)^(3/2))/19 + (108*3^(1/4)
```

```
*Sqrt[2 - Sqrt[3]]*a^(10/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) -
 a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3
)*x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1
+ Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(1729*b^(5/3)*
Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(
1/3)*x)^2]*Sqrt[a + b*x^3]) - (72*Sqrt[2]*3^(3/4)*a^(10/3)*(a^(1/
3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/
((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqr
t[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)],
-7 - 4*Sqrt[3]])/(1729*b^(5/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x
))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 55.4277, size = 473, normalized size = 0.89

$$\frac{108\sqrt[4]{3}a^{\frac{10}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{1729b^{\frac{5}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}$$
$$-\frac{72\sqrt{2}\cdot 3^{\frac{3}{4}}a^{\frac{10}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{1729b^{\frac{5}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}$$
$$-\frac{216a^3\sqrt{a+bx^3}}{1729b^{\frac{5}{3}}\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)}+\frac{54a^2x^2\sqrt{a+bx^3}}{1729b}+\frac{18ax^5\sqrt{a+bx^3}}{247}+\frac{2x^5\left(a+bx^3\right)^{\frac{3}{2}}}{19}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4*(b*x**3+a)**(3/2),x)
```

```
[Out] 108*3**(1/4)*a**(10/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b**
(2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(-sqrt(
3) + 2)*(a**(1/3) + b**(1/3)*x)*elliptic_e(asin((-a**(1/3)*(-1 +
sqrt(3)) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7
 - 4*sqrt(3))/(1729*b**(5/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x
)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) - 7
2*sqrt(2)*3**(3/4)*a**(10/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x
 + b**(2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*(a**(
1/3) + b**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b*
*(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4*sqrt(3))
/(1729*b**(5/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1/3)*(
1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) - 216*a**3*sqrt(
a + b*x**3)/(1729*b**(5/3)*(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x))
 + 54*a**2*x**2*sqrt(a + b*x**3)/(1729*b) + 18*a*x**5*sqrt(a + b*
x**3)/247 + 2*x**5*(a + b*x**3)**(3/2)/19
```

Mathematica [C] time = 1.72206, size = 238, normalized size = 0.45

$$-\frac{2\left((-b)^{2/3}\left(a+bx^3\right)\left(27a^2x^2+154abx^5+91b^2x^8\right)+36(-1)^{2/3}3^{3/4}a^{11/3}\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}\left(\cdots\right.\right.}{1729(-b)^{5/3}\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^4*(a + b*x^3)^(3/2),x]
```

```
[Out] (-2*((-b)^(2/3)*(a + b*x^3)*(27*a^2*x^2 + 154*a*b*x^5 + 91*b^2*x^
8) + 36*(-1)^(2/3)*3^(3/4)*a^(11/3)*Sqrt[(-1)^(5/6)*(-1 + ((-b)^(
1/3)*x)/a^(1/3))]*Sqrt[1 + ((-b)^(1/3)*x)/a^(1/3) + ((-b)^(2/3)*x
^2)/a^(2/3)]*(Sqrt[3]*EllipticE[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)
^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)^(1/3)] + (-1)^(5/6)*EllipticF[A
rcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)
^(1/3)])))/(1729*(-b)^(5/3)*Sqrt[a + b*x^3])
```

Maple [A] time = 0.023, size = 489, normalized size = 0.9

$$\frac{2\,bx^8}{19}\sqrt{bx^3+a}+\frac{44\,ax^5}{247}\sqrt{bx^3+a}+\frac{54\,a^2x^2}{1729\,b}\sqrt{bx^3+a}$$
$$+\frac{\frac{72\,i}{1729}a^3\sqrt{3}}{b^2}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2\,b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2\,b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4*(b*x^3+a)^(3/2),x)
```

```
[Out] 2/19*b*x^8*(b*x^3+a)^(1/2)+44/247*a*x^5*(b*x^3+a)^(1/2)+54/1729*a
^2*x^2*(b*x^3+a)^(1/2)/b+72/1729*I/b^2*a^3*3^(1/2)*(-a*b^2)^(1/3)
*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/
2)*b/(-a*b^2)^(1/3))^(1/2)*((x-1/b*(-a*b^2)^(1/3))/(-3/2/b*(-a*b^
2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2)*(-I*(x+1/2/b*(-a*
b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/
3))^(1/2)/(b*x^3+a)^(1/2)*((-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b
*(-a*b^2)^(1/3))*EllipticE(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)
-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),
(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/
b*(-a*b^2)^(1/3)))^(1/2))+1/b*(-a*b^2)^(1/3)*EllipticF(1/3*3^(1/2
)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1
/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(
-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2)))
```

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

$$\int \left(bx^3+a\right)^{\frac{3}{2}}x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(3/2)*x^4,x, algorithm="maxima")
```

```
[Out] integrate((b*x^3 + a)^(3/2)*x^4, x)
```

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

$$\text{integral}\left(\left(bx^7+ax^4\right)\sqrt{bx^3+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(3/2)*x^4,x, algorithm="fricas")
```

```
[Out] integral((b*x^7 + a*x^4)*sqrt(b*x^3 + a), x)
```

Sympy [A] time = 3.9977, size = 39, normalized size = 0.07

$$\frac{a^{\frac{3}{2}}x^5\,\Gamma\left(\frac{5}{3}\right)\,{}_2F_1\left(\begin{matrix}-\frac{3}{2},\frac{5}{3}\\ \frac{8}{3}\end{matrix}\middle|\frac{bx^3e^{i\pi}}{a}\right)}{3\,\Gamma\left(\frac{8}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4*(b*x**3+a)**(3/2),x)
```

```
[Out] a**(3/2)*x**5*gamma(5/3)*hyper((-3/2, 5/3), (8/3,), b*x**3*exp_po
lar(I*pi)/a)/(3*gamma(8/3))
```

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

$$\int \left(bx^3+a\right)^{\frac{3}{2}}x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(3/2)*x^4,x, algorithm="giac")
```

```
[Out] integrate((b*x^3 + a)^(3/2)*x^4, x)
```

3.401 $\int x \left(a+bx^3\right)^{3/2}\,dx$

Optimal. Leaf size=508

$$\frac{18\sqrt{2}3^{3/4}a^{7/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{91b^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{27\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{7/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{91b^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{54a^2\sqrt{a+bx^3}}{91b^{2/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)}+\frac{18}{91}ax^2\sqrt{a+bx^3}+\frac{2}{13}x^2\left(a+bx^3\right)^{3/2}$$

```
[Out] (18*a*x^2*Sqrt[a + b*x^3])/91 + (54*a^2*Sqrt[a + b*x^3])/(91*b^(2
/3)*((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)) + (2*x^2*(a + b*x^3)^(3/
2))/13 - (27*3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(7/3)*(a^(1/3) + b^(1/3)
*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3
])*a^(1/3) + b^(1/3)*x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3
) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[
3]])/(91*b^(2/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[
3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3]) + (18*Sqrt[2]*3^(3/4
)*a^(7/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x
 + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[
ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3)
 + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(91*b^(2/3)*Sqrt[(a^(1/3)*(a^(1/
3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a +
b*x^3])
```

Rubi [A] time = 0.473379, antiderivative size = 508, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{18\sqrt{2}3^{3/4}a^{7/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{91b^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{27\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{7/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{91b^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{54a^2\sqrt{a+bx^3}}{91b^{2/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)}+\frac{18}{91}ax^2\sqrt{a+bx^3}+\frac{2}{13}x^2\left(a+bx^3\right)^{3/2}$$

Antiderivative was successfully verified.

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

```
[Out] (18*a*x^2*Sqrt[a + b*x^3])/91 + (54*a^2*Sqrt[a + b*x^3])/(91*b^(2
/3)*((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)) + (2*x^2*(a + b*x^3)^(3/
2))/13 - (27*3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(7/3)*(a^(1/3) + b^(1/3)
```

```
*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3
])*a^(1/3) + b^(1/3)*x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3
) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[
3]])/(91*b^(2/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[
3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3]) + (18*Sqrt[2]*3^(3/4
)*a^(7/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x
 + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[
ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3)
 + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(91*b^(2/3)*Sqrt[(a^(1/3)*(a^(1/
3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a +
b*x^3])
```

Rubi in Sympy [A] time = 43.6883, size = 450, normalized size = 0.89

$$-\frac{27\sqrt[4]{3}a^{\frac{7}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{91b^{\frac{2}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{18\sqrt{2}\cdot 3^{\frac{3}{4}}a^{\frac{7}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{91b^{\frac{2}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{54a^2\sqrt{a+bx^3}}{91b^{\frac{2}{3}}\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)}+\frac{18ax^2\sqrt{a+bx^3}}{91}+\frac{2x^2\left(a+bx^3\right)^{\frac{3}{2}}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -27*3**(1/4)*a**(7/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b**(
2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(-sqrt(3
) + 2)*(a**(1/3) + b**(1/3)*x)*elliptic_e(asin((-a**(1/3)*(-1 + s
qrt(3)) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7
- 4*sqrt(3))/(91*b**(2/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(
a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) + 18*s
qrt(2)*3**(3/4)*a**(7/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b
**(2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*(a**(1/3)
 + b**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/
3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4*sqrt(3))/(91
*b**(2/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1/3)*(1 + sq
rt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) + 54*a**2*sqrt(a + b*x
**3)/(91*b**(2/3)*(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)) + 18*a*x
**2*sqrt(a + b*x**3)/91 + 2*x**2*(a + b*x**3)**(3/2)/13
```

Mathematica [C] time = 1.35371, size = 229, normalized size = 0.45

$$\sqrt{a+bx^3}\left(\frac{32ax^2}{91}+\frac{2bx^5}{13}\right)+\frac{18\sqrt[6]{-1}3^{3/4}a^{8/3}\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}\left(\sqrt[3]{-1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)-i\sqrt{3}E\left(\sin^{-1}\left(\frac{\sqrt{-}}{}\right.\right.\right.}{91(-b)^{2/3}\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

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

```
[Out] Sqrt[a + b*x^3]*((32*a*x^2)/91 + (2*b*x^5)/13) + (18*(-1)^(1/6)*3
^(3/4)*a^(8/3)*Sqrt[(-1)^(5/6)*(-1 + ((-b)^(1/3)*x)/a^(1/3))]*Sqr
t[1 + ((-b)^(1/3)*x)/a^(1/3) + ((-b)^(2/3)*x^2)/a^(2/3)]*((-I)*Sq
rt[3]*EllipticE[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3
)]/3^(1/4)], (-1)^(1/3)] + (-1)^(1/3)*EllipticF[ArcSin[Sqrt[-(-1)
^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)^(1/3)]))/(91*(-
b)^(2/3)*Sqrt[a + b*x^3])
```

Maple [A] time = 0.02, size = 469, normalized size = 0.9

$$\frac{2\,bx^5}{13}\sqrt{bx^3+a}+\frac{32\,ax^2}{91}\sqrt{bx^3+a}$$
$$-\frac{\frac{18\,i}{91}a^2\sqrt{3}}{b}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2\,b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2\,b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 2/13*b*x^5*(b*x^3+a)^(1/2)+32/91*a*x^2*(b*x^3+a)^(1/2)-18/91*I*a^
2*3^(1/2)/b*(-a*b^2)^(1/3)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/
2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)*((x-1/b*(-a*
b^2)^(1/3))/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)
))^(1/2)*(-I*(x+1/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/
3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)/(b*x^3+a)^(1/2)*((-3/2/b*(-a*
b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*EllipticE(1/3*3^(1/2)*
(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2
)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a
*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2))+1/b*(-a*b^2)^
(1/3)*EllipticF(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1
/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/
b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^
(1/3)))^(1/2)))
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\mathrm{integral}\left(\left(bx^4+ax\right)\sqrt{bx^3+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((b*x^4 + a*x)*sqrt(b*x^3 + a), x)
```

Sympy [A] time = 2.90879, size = 39, normalized size = 0.08

$$\frac{a^{\frac{3}{2}}x^2\Gamma\left(\frac{2}{3}\right){}_2F_1\left(\begin{matrix}-\frac{3}{2},\frac{2}{3}\\ \frac{5}{3}\end{matrix}\middle|\frac{bx^3e^{i\pi}}{a}\right)}{3\Gamma\left(\frac{5}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a**(3/2)*x**2*gamma(2/3)*hyper((-3/2, 2/3), (5/3,), b*x**3*exp_po
lar(I*pi)/a)/(3*gamma(5/3))
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.402 $\int \frac{\left(a+bx^3\right)^{3/2}}{x^2}\,dx$

Optimal. Leaf size=504

$$\frac{9\sqrt{2}3^{3/4}a^{4/3}\sqrt[3]{b}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{7\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}$$
$$-\frac{27\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{4/3}\sqrt[3]{b}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{14\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}$$
$$+\frac{27a\sqrt[3]{b}\sqrt{a+bx^3}}{7\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)}-\frac{\left(a+bx^3\right)^{3/2}}{x}+\frac{9}{7}bx^2\sqrt{a+bx^3}$$

```
[Out] (9*b*x^2*Sqrt[a + b*x^3])/7 + (27*a*b^(1/3)*Sqrt[a + b*x^3])/(7*(
(1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)) - (a + b*x^3)^(3/2)/x - (27*3
^(1/4)*Sqrt[2 - Sqrt[3]]*a^(4/3)*b^(1/3)*(a^(1/3) + b^(1/3)*x)*Sq
rt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(
1/3) + b^(1/3)*x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^
(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(
14*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) +
b^(1/3)*x)^2]*Sqrt[a + b*x^3]) + (9*Sqrt[2]*3^(3/4)*a^(4/3)*b^(1/
3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2
/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSin[
((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1
/3)*x)], -7 - 4*Sqrt[3]])/(7*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))
/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi [A] time = 0.468742, antiderivative size = 504, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{9\sqrt{2}3^{3/4}a^{4/3}\sqrt[3]{b}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{7\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}$$
$$-\frac{27\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{4/3}\sqrt[3]{b}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{14\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}$$
$$+\frac{27a\sqrt[3]{b}\sqrt{a+bx^3}}{7\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)}-\frac{\left(a+bx^3\right)^{3/2}}{x}+\frac{9}{7}bx^2\sqrt{a+bx^3}$$

Antiderivative was successfully verified.

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


```
[Out] (9*b*x^2*Sqrt[a + b*x^3])/7 + (27*a*b^(1/3)*Sqrt[a + b*x^3])/(7*(
(1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)) - (a + b*x^3)^(3/2)/x - (27*3
^(1/4)*Sqrt[2 - Sqrt[3]]*a^(4/3)*b^(1/3)*(a^(1/3) + b^(1/3)*x)*Sq
```

```
rt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(
1/3) + b^(1/3)*x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^
(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(
14*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) +
b^(1/3)*x)^2]*Sqrt[a + b*x^3]) + (9*Sqrt[2]*3^(3/4)*a^(4/3)*b^(1/
3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2
/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSin[
((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1
/3)*x)], -7 - 4*Sqrt[3]])/(7*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))
/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 43.393, size = 445, normalized size = 0.88

$$-\frac{27\sqrt[4]{3}a^{\frac{4}{3}}\sqrt[3]{b}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^{2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^{2}}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{14\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^{2}}}\sqrt{a+bx^{3}}}+\frac{9\sqrt{2}\cdot 3^{\frac{3}{4}}a^{\frac{4}{3}}\sqrt[3]{b}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^{2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^{2}}}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{7\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^{2}}}\sqrt{a+bx^{3}}}+\frac{27a\sqrt[3]{b}\sqrt{a+bx^{3}}}{7\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)}+\frac{9bx^{2}\sqrt{a+bx^{3}}}{7}-\frac{\left(a+bx^{3}\right)^{\frac{3}{2}}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -27*3**(1/4)*a**(4/3)*b**(1/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)
*x + b**(2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqr
t(-sqrt(3) + 2)*(a**(1/3) + b**(1/3)*x)*elliptic_e(asin((-a**(1/3
)*(-1 + sqrt(3)) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)
*x)), -7 - 4*sqrt(3))/(14*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(
a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) + 9*sq
rt(2)*3**(3/4)*a**(4/3)*b**(1/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/
3)*x + b**(2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*(
a**(1/3) + b**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3))
+ b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4*sqrt
(3))/(7*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt
(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) + 27*a*b**(1/3)*sqrt(a +
 b*x**3)/(7*(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)) + 9*b*x**2*sqr
t(a + b*x**3)/7 - (a + b*x**3)**(3/2)/x
```

Mathematica [C] time = 1.58489, size = 228, normalized size = 0.45

$$\left(\frac{2bx^{2}}{7}-\frac{a}{x}\right)\sqrt{a+bx^{3}}+\frac{9\sqrt[6]{-1}3^{3/4}a^{5/3}b\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^{2}}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}\left(\sqrt[3]{-1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)-i\sqrt{3}E\left(\sin^{-1}\left(\sqrt{\cdots}\right.\right.\right.}{7(-b)^{2/3}\sqrt{a+bx^{3}}}$$

Warning: Unable to verify antiderivative.

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

```
[Out] (-(a/x) + (2*b*x^2)/7)*Sqrt[a + b*x^3] + (9*(-1)^(1/6)*3^(3/4)*a^
(5/3)*b*Sqrt[(-1)^(5/6)*(-1 + ((-b)^(1/3)*x)/a^(1/3))]*Sqrt[1 + (
(-b)^(1/3)*x)/a^(1/3) + ((-b)^(2/3)*x^2)/a^(2/3)]*((-I)*Sqrt[3]*E
llipticE[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1
/4)], (-1)^(1/3)] + (-1)^(1/3)*EllipticF[ArcSin[Sqrt[-(-1)^(5/6)
- (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)^(1/3)]))/(7*(-b)^(2/3)
*Sqrt[a + b*x^3])
```

Maple [A] time = 0.024, size = 464, normalized size = 0.9

$$-\frac{a}{x}\sqrt{bx^3+a}+\frac{2\,bx^2}{7}\sqrt{bx^3+a}$$
$$-\frac{9\,i}{7}a\sqrt{3}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2\,b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2\,b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}b$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a*(b*x^3+a)^(1/2)/x+2/7*b*x^2*(b*x^3+a)^(1/2)-9/7*I*a*3^(1/2)*(-
a*b^2)^(1/3)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^
(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)*((x-1/b*(-a*b^2)^(1/3))/(-
3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2)*(-I*(
x+1/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/
(-a*b^2)^(1/3))^(1/2)/(b*x^3+a)^(1/2)*((-3/2/b*(-a*b^2)^(1/3)+1/2
*I*3^(1/2)/b*(-a*b^2)^(1/3))*EllipticE(1/3*3^(1/2)*(I*(x+1/2/b*(-
a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(
1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/
2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2))+1/b*(-a*b^2)^(1/3)*Elliptic
F(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)
^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/
3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2))
)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{(bx^3+a)^{\frac{3}{2}}}{x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((b*x^3 + a)^(3/2)/x^2, x)
```

Sympy [A] time = 3.1417, size = 41, normalized size = 0.08

$$\frac{a^{\frac{3}{2}}\Gamma\left(-\frac{1}{3}\right){}_2F_1\left(\begin{matrix}-\frac{3}{2},-\frac{1}{3}\\ \frac{2}{3}\end{matrix}\middle|\frac{bx^3e^{i\pi}}{a}\right)}{3x\Gamma\left(\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a**(3/2)*gamma(-1/3)*hyper((-3/2, -1/3), (2/3,), b*x**3*exp_polar
(I*pi)/a)/(3*x*gamma(2/3))
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.403 $\int \frac{(a+bx^3)^{3/2}}{x^5}\,dx$

Optimal. Leaf size=505

$$\frac{9\,3^{3/4}\sqrt[3]{a}b^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{4\sqrt{2}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}} - \frac{27\sqrt[4]{3}\sqrt{2-\sqrt{3}}\sqrt[3]{a}b^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{16\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}} + \frac{27b^{4/3}\sqrt{a+bx^3}}{8\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)} - \frac{9b\sqrt{a+bx^3}}{8x} - \frac{\left(a+bx^3\right)^{3/2}}{4x^4}$$

```
[Out] (-9*b*Sqrt[a + b*x^3])/(8*x) + (27*b^(4/3)*Sqrt[a + b*x^3])/(8*((
1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)) - (a + b*x^3)^(3/2)/(4*x^4) -
(27*3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(1/3)*b^(4/3)*(a^(1/3) + b^(1/3)*
x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3]
)*a^(1/3) + b^(1/3)*x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3)
 + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3
]])/(16*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/
3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3]) + (9*3^(3/4)*a^(1/3)*b^(4/3)*
(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)
*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSin[((1
 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)
*x)], -7 - 4*Sqrt[3]])/(4*Sqrt[2]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3
)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi [A] time = 0.465312, antiderivative size = 505, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{9\,3^{3/4}\sqrt[3]{a}b^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{4\sqrt{2}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}} - \frac{27\sqrt[4]{3}\sqrt{2-\sqrt{3}}\sqrt[3]{a}b^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{16\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}} + \frac{27b^{4/3}\sqrt{a+bx^3}}{8\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)} - \frac{9b\sqrt{a+bx^3}}{8x} - \frac{\left(a+bx^3\right)^{3/2}}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^(3/2)/x^5,x]
```


```
[Out] (-9*b*Sqrt[a + b*x^3])/(8*x) + (27*b^(4/3)*Sqrt[a + b*x^3])/(8*((
1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)) - (a + b*x^3)^(3/2)/(4*x^4) -
(27*3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(1/3)*b^(4/3)*(a^(1/3) + b^(1/3)*
```

```
x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3]
)*a^(1/3) + b^(1/3)*x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3)
 + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3
]])/(16*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/
3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3]) + (9*3^(3/4)*a^(1/3)*b^(4/3)*
(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)
*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSin[((1
 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)
*x)], -7 - 4*Sqrt[3]])/(4*Sqrt[2]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3
)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 43.7244, size = 445, normalized size = 0.88

$$-\frac{27\sqrt[4]{3}\sqrt[3]{a}b^{\frac{4}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^{2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^{2}}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{16\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^{2}}}\sqrt{a+bx^{3}}}+\frac{9\sqrt{2}\cdot3^{\frac{3}{4}}\sqrt[3]{a}b^{\frac{4}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^{2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^{2}}}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{8\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^{2}}}\sqrt{a+bx^{3}}}+\frac{27b^{\frac{4}{3}}\sqrt{a+bx^{3}}}{8\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)}-\frac{9b\sqrt{a+bx^{3}}}{8x}-\frac{\left(a+bx^{3}\right)^{\frac{3}{2}}}{4x^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**(3/2)/x**5,x)
```

```
[Out] -27*3**(1/4)*a**(1/3)*b**(4/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)
*x + b**(2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqr
t(-sqrt(3) + 2)*(a**(1/3) + b**(1/3)*x)*elliptic_e(asin((-a**(1/3
)*(-1 + sqrt(3)) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)
*x)), -7 - 4*sqrt(3))/(16*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(
a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) + 9*sq
rt(2)*3**(3/4)*a**(1/3)*b**(4/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/
3)*x + b**(2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*(
a**(1/3) + b**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3))
+ b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4*sqrt
(3))/(8*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt
(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) + 27*b**(4/3)*sqrt(a + b
*x**3)/(8*(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)) - 9*b*sqrt(a + b
*x**3)/(8*x) - (a + b*x**3)**(3/2)/(4*x**4)
```

Mathematica [C] time = 1.87593, size = 228, normalized size = 0.45

$$-\frac{\sqrt{a+bx^{3}}\left(2a+11bx^{3}\right)}{8x^{4}}+\frac{9\sqrt[6]{-1}3^{3/4}a^{2/3}(-b)^{4/3}\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^{2}}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}\left(\sqrt[3]{-1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)-i\sqrt{3}E\left(\sin^{-1}\right.\right.}{8\sqrt{a+bx^{3}}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[(a + b*x^3)^(3/2)/x^5,x]
```

```
[Out] -(Sqrt[a + b*x^3]*(2*a + 11*b*x^3))/(8*x^4) + (9*(-1)^(1/6)*3^(3/
4)*a^(2/3)*(-b)^(4/3)*Sqrt[(-1)^(5/6)*(-1 + ((-b)^(1/3)*x)/a^(1/3
))]*Sqrt[1 + ((-b)^(1/3)*x)/a^(1/3) + ((-b)^(2/3)*x^2)/a^(2/3)]*(
(-I)*Sqrt[3]*EllipticE[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)*x)
/a^(1/3)]/3^(1/4)], (-1)^(1/3)] + (-1)^(1/3)*EllipticF[ArcSin[Sqr
t[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)^(1/3)]))
/(8*Sqrt[a + b*x^3])
```

Maple [A] time = 0.027, size = 464, normalized size = 0.9

$$-\frac{a}{4\,x^4}\sqrt{bx^3+a}-\frac{11\,b}{8\,x}\sqrt{bx^3+a}$$

$$-\frac{9\,i}{8}b\sqrt{3}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2\,b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2\,b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^(3/2)/x^5,x)
```

```
[Out] -1/4*a*(b*x^3+a)^(1/2)/x^4-11/8*b*(b*x^3+a)^(1/2)/x-9/8*I*b*3^(1/
2)*(-a*b^2)^(1/3)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*
b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)*((x-1/b*(-a*b^2)^(1/3
))/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2)*
(-I*(x+1/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/
2)*b/(-a*b^2)^(1/3))^(1/2)/(b*x^3+a)^(1/2)*((-3/2/b*(-a*b^2)^(1/3
)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*EllipticE(1/3*3^(1/2)*(I*(x+1/2
/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b
^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/
3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2))+1/b*(-a*b^2)^(1/3)*Ell
ipticF(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a
*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2
)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(
1/2)))
```

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

$$\int \frac{\left(bx^3+a\right)^{\frac{3}{2}}}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((b*x^3 + a)^(3/2)/x^5, x)
```

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

$$\text{integral}\left(\frac{\left(bx^3+a\right)^{\frac{3}{2}}}{x^5},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((b*x^3 + a)^(3/2)/x^5, x)
```

Sympy [A] time = 3.73262, size = 46, normalized size = 0.09

$$\frac{a^{\frac{3}{2}}\Gamma\left(-\frac{4}{3}\right) {}_{2}F_{1}\left(\begin{matrix} -\frac{3}{2}, -\frac{4}{3} \\ -\frac{1}{3} \end{matrix}\middle| \frac{bx^{3}e^{i\pi}}{a}\right)}{3x^{4}\Gamma\left(-\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**(3/2)/x**5,x)
```

```
[Out] a**(3/2)*gamma(-4/3)*hyper((-3/2, -4/3), (-1/3,), b*x**3*exp_pola
r(I*pi)/a)/(3*x**4*gamma(-1/3))
```

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

$$\int \frac{\left(bx^{3} + a\right)^{\frac{3}{2}}}{x^{5}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((b*x^3 + a)^(3/2)/x^5, x)
```

3.404 $\int \frac{x^{11}}{\sqrt{a+bx^3}}\,dx$

Optimal. Leaf size=80

$$-\frac{2a^3\sqrt{a+bx^3}}{3b^4}+\frac{2a^2\left(a+bx^3\right)^{3/2}}{3b^4}+\frac{2\left(a+bx^3\right)^{7/2}}{21b^4}-\frac{2a\left(a+bx^3\right)^{5/2}}{5b^4}$$

```
[Out] (-2*a^3*Sqrt[a + b*x^3])/(3*b^4) + (2*a^2*(a + b*x^3)^(3/2))/(3*b
^4) - (2*a*(a + b*x^3)^(5/2))/(5*b^4) + (2*(a + b*x^3)^(7/2))/(21
*b^4)
```

Rubi [A] time = 0.114762, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$-\frac{2a^3\sqrt{a+bx^3}}{3b^4}+\frac{2a^2\left(a+bx^3\right)^{3/2}}{3b^4}+\frac{2\left(a+bx^3\right)^{7/2}}{21b^4}-\frac{2a\left(a+bx^3\right)^{5/2}}{5b^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11/Sqrt[a + b*x^3],x]
```

```
[Out] (-2*a^3*Sqrt[a + b*x^3])/(3*b^4) + (2*a^2*(a + b*x^3)^(3/2))/(3*b
^4) - (2*a*(a + b*x^3)^(5/2))/(5*b^4) + (2*(a + b*x^3)^(7/2))/(21
*b^4)
```

Rubi in Sympy [A] time = 14.4943, size = 75, normalized size = 0.94

$$-\frac{2a^3\sqrt{a+bx^3}}{3b^4}+\frac{2a^2\left(a+bx^3\right)^{\frac{3}{2}}}{3b^4}-\frac{2a\left(a+bx^3\right)^{\frac{5}{2}}}{5b^4}+\frac{2\left(a+bx^3\right)^{\frac{7}{2}}}{21b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11/(b*x**3+a)**(1/2),x)
```

```
[Out] -2*a**3*sqrt(a + b*x**3)/(3*b**4) + 2*a**2*(a + b*x**3)**(3/2)/(3
*b**4) - 2*a*(a + b*x**3)**(5/2)/(5*b**4) + 2*(a + b*x**3)**(7/2)
/(21*b**4)
```

Mathematica [A] time = 0.0301971, size = 50, normalized size = 0.62

$$\frac{2\sqrt{a+bx^3}\left(-16a^3+8a^2bx^3-6ab^2x^6+5b^3x^9\right)}{105b^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11/Sqrt[a + b*x^3],x]
```

```
[Out] (2*Sqrt[a + b*x^3]*(-16*a^3 + 8*a^2*b*x^3 - 6*a*b^2*x^6 + 5*b^3*x
^9))/(105*b^4)
```

Maple [A] time = 0.008, size = 47, normalized size = 0.6

$$-\frac{-10\,b^3x^9+12\,ab^2x^6-16\,a^2bx^3+32\,a^3}{105\,b^4}\sqrt{bx^3+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^11/(b*x^3+a)^(1/2),x)
```

```
[Out] -2/105*(b*x^3+a)^(1/2)*(-5*b^3*x^9+6*a*b^2*x^6-8*a^2*b*x^3+16*a^3
)/b^4
```

Maxima [A] time = 1.44446, size = 86, normalized size = 1.08

$$\frac{2\left(bx^3+a\right)^{\frac{7}{2}}}{21\,b^4}-\frac{2\left(bx^3+a\right)^{\frac{5}{2}}a}{5\,b^4}+\frac{2\left(bx^3+a\right)^{\frac{3}{2}}a^2}{3\,b^4}-\frac{2\sqrt{bx^3+a}a^3}{3\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^11/sqrt(b*x^3 + a),x, algorithm="maxima")
```

```
[Out] 2/21*(b*x^3 + a)^(7/2)/b^4 - 2/5*(b*x^3 + a)^(5/2)*a/b^4 + 2/3*(b
*x^3 + a)^(3/2)*a^2/b^4 - 2/3*sqrt(b*x^3 + a)*a^3/b^4
```

Fricas [A] time = 0.226418, size = 62, normalized size = 0.78

$$\frac{2\left(5\,b^3x^9-6\,ab^2x^6+8\,a^2bx^3-16\,a^3\right)\sqrt{bx^3+a}}{105\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^11/sqrt(b*x^3 + a),x, algorithm="fricas")
```

```
[Out] 2/105*(5*b^3*x^9 - 6*a*b^2*x^6 + 8*a^2*b*x^3 - 16*a^3)*sqrt(b*x^3
 + a)/b^4
```

Sympy [A] time = 10.0795, size = 94, normalized size = 1.18

$$\begin{cases} -\frac{32a^3\sqrt{a+bx^3}}{105b^4}+\frac{16a^2x^3\sqrt{a+bx^3}}{105b^3}-\frac{4ax^6\sqrt{a+bx^3}}{35b^2}+\frac{2x^9\sqrt{a+bx^3}}{21b} & \text{for } b\neq 0 \\ \frac{x^{12}}{12\sqrt{a}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**11/(b*x**3+a)**(1/2),x)
```

```
[Out] Piecewise((-32*a**3*sqrt(a + b*x**3)/(105*b**4) + 16*a**2*x**3*sq
rt(a + b*x**3)/(105*b**3) - 4*a*x**6*sqrt(a + b*x**3)/(35*b**2) +
 2*x**9*sqrt(a + b*x**3)/(21*b), Ne(b, 0)), (x**12/(12*sqrt(a)),
True))
```

GIAC/XCAS [A] time = 0.210911, size = 77, normalized size = 0.96

$$\frac{2\left(5\left(bx^3+a\right)^{\frac{7}{2}}-21\left(bx^3+a\right)^{\frac{5}{2}}a+35\left(bx^3+a\right)^{\frac{3}{2}}a^2-35\sqrt{bx^3+a}a^3\right)}{105\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^11/sqrt(b*x^3 + a),x, algorithm="giac")
```

```
[Out] 2/105*(5*(b*x^3 + a)^(7/2) - 21*(b*x^3 + a)^(5/2)*a + 35*(b*x^3 +
 a)^(3/2)*a^2 - 35*sqrt(b*x^3 + a)*a^3)/b^4
```

3.405 $\int \frac{x^8}{\sqrt{a+bx^3}}\,dx$

Optimal. Leaf size=59

$$\frac{2a^2\sqrt{a+bx^3}}{3b^3}+\frac{2\left(a+bx^3\right)^{5/2}}{15b^3}-\frac{4a\left(a+bx^3\right)^{3/2}}{9b^3}$$

```
[Out] (2*a^2*Sqrt[a + b*x^3])/(3*b^3) - (4*a*(a + b*x^3)^(3/2))/(9*b^3)
 + (2*(a + b*x^3)^(5/2))/(15*b^3)
```

Rubi [A] time = 0.0878251, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2a^2\sqrt{a+bx^3}}{3b^3}+\frac{2\left(a+bx^3\right)^{5/2}}{15b^3}-\frac{4a\left(a+bx^3\right)^{3/2}}{9b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8/Sqrt[a + b*x^3],x]
```

```
[Out] (2*a^2*Sqrt[a + b*x^3])/(3*b^3) - (4*a*(a + b*x^3)^(3/2))/(9*b^3)
 + (2*(a + b*x^3)^(5/2))/(15*b^3)
```

Rubi in Sympy [A] time = 10.8279, size = 54, normalized size = 0.92

$$\frac{2a^2\sqrt{a+bx^3}}{3b^3}-\frac{4a\left(a+bx^3\right)^{\frac{3}{2}}}{9b^3}+\frac{2\left(a+bx^3\right)^{\frac{5}{2}}}{15b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8/(b*x**3+a)**(1/2),x)
```

```
[Out] 2*a**2*sqrt(a + b*x**3)/(3*b**3) - 4*a*(a + b*x**3)**(3/2)/(9*b**
3) + 2*(a + b*x**3)**(5/2)/(15*b**3)
```

Mathematica [A] time = 0.0264136, size = 39, normalized size = 0.66

$$\frac{2\sqrt{a+bx^3}\left(8a^2-4abx^3+3b^2x^6\right)}{45b^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8/Sqrt[a + b*x^3],x]
```

```
[Out] (2*Sqrt[a + b*x^3]*(8*a^2 - 4*a*b*x^3 + 3*b^2*x^6))/(45*b^3)
```

Maple [A] time = 0.008, size = 36, normalized size = 0.6

$$\frac{6\,b^2x^6-8\,abx^3+16\,a^2}{45\,b^3}\sqrt{bx^3+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8/(b*x^3+a)^(1/2),x)
```

```
[Out] 2/45*(b*x^3+a)^(1/2)*(3*b^2*x^6-4*a*b*x^3+8*a^2)/b^3
```

Maxima [A] time = 1.43605, size = 63, normalized size = 1.07

$$\frac{2\left(bx^{3}+a\right)^{\frac{5}{2}}}{15\,b^{3}}-\frac{4\left(bx^{3}+a\right)^{\frac{3}{2}}a}{9\,b^{3}}+\frac{2\,\sqrt{bx^{3}+a}a^{2}}{3\,b^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/sqrt(b*x^3 + a),x, algorithm="maxima")
```

```
[Out] 2/15*(b*x^3 + a)^(5/2)/b^3 - 4/9*(b*x^3 + a)^(3/2)*a/b^3 + 2/3*sq
rt(b*x^3 + a)*a^2/b^3
```

Fricas [A] time = 0.223603, size = 47, normalized size = 0.8

$$\frac{2\left(3\,b^{2}x^{6}-4\,abx^{3}+8\,a^{2}\right)\sqrt{bx^{3}+a}}{45\,b^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/sqrt(b*x^3 + a),x, algorithm="fricas")
```

```
[Out] 2/45*(3*b^2*x^6 - 4*a*b*x^3 + 8*a^2)*sqrt(b*x^3 + a)/b^3
```

Sympy [A] time = 4.84583, size = 70, normalized size = 1.19

$$\begin{cases}\frac{16a^{2}\sqrt{a+bx^{3}}}{45b^{3}}-\frac{8ax^{3}\sqrt{a+bx^{3}}}{45b^{2}}+\frac{2x^{6}\sqrt{a+bx^{3}}}{15b} & \text{for}\ b\neq 0\\ \frac{x^{9}}{9\sqrt{a}} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8/(b*x**3+a)**(1/2),x)
```

```
[Out] Piecewise((16*a**2*sqrt(a + b*x**3)/(45*b**3) - 8*a*x**3*sqrt(a +
 b*x**3)/(45*b**2) + 2*x**6*sqrt(a + b*x**3)/(15*b), Ne(b, 0)), (
x**9/(9*sqrt(a)), True))
```

GIAC/XCAS [A] time = 0.225241, size = 58, normalized size = 0.98

$$\frac{2\left(3\left(bx^{3}+a\right)^{\frac{5}{2}}-10\left(bx^{3}+a\right)^{\frac{3}{2}}a+15\,\sqrt{bx^{3}+a}a^{2}\right)}{45\,b^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/sqrt(b*x^3 + a),x, algorithm="giac")
```

```
[Out] 2/45*(3*(b*x^3 + a)^(5/2) - 10*(b*x^3 + a)^(3/2)*a + 15*sqrt(b*x^
3 + a)*a^2)/b^3
```

3.406 $\int \frac{x^5}{\sqrt{a+bx^3}}\,dx$

Optimal. Leaf size=38

$$\frac{2\left(a+bx^3\right)^{3/2}}{9b^2}-\frac{2a\sqrt{a+bx^3}}{3b^2}$$

```
[Out] (-2*a*Sqrt[a + b*x^3])/(3*b^2) + (2*(a + b*x^3)^(3/2))/(9*b^2)
```

Rubi [A] time = 0.0626581, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2\left(a+bx^3\right)^{3/2}}{9b^2}-\frac{2a\sqrt{a+bx^3}}{3b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/Sqrt[a + b*x^3],x]

[Out] (-2*a*Sqrt[a + b*x^3])/(3*b^2) + (2*(a + b*x^3)^(3/2))/(9*b^2)
```

Rubi in Sympy [A] time = 7.30435, size = 34, normalized size = 0.89

$$-\frac{2a\sqrt{a+bx^3}}{3b^2}+\frac{2\left(a+bx^3\right)^{\frac{3}{2}}}{9b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(b*x**3+a)**(1/2),x)

[Out] -2*a*sqrt(a + b*x**3)/(3*b**2) + 2*(a + b*x**3)**(3/2)/(9*b**2)
```

Mathematica [A] time = 0.0202988, size = 27, normalized size = 0.71

$$\frac{2\left(bx^3-2a\right)\sqrt{a+bx^3}}{9b^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/Sqrt[a + b*x^3],x]

[Out] (2*(-2*a + b*x^3)*Sqrt[a + b*x^3])/(9*b^2)
```

Maple [A] time = 0.007, size = 25, normalized size = 0.7

$$-\frac{-2\,bx^3+4\,a}{9\,b^2}\sqrt{bx^3+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(b*x^3+a)^(1/2),x)
```

```
[Out] -2/9*(b*x^3+a)^(1/2)*(-b*x^3+2*a)/b^2
```

Maxima [A] time = 1.43941, size = 41, normalized size = 1.08

$$\frac{2\left(bx^3+a\right)^{\frac{3}{2}}}{9\,b^2}-\frac{2\,\sqrt{bx^3+a}a}{3\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(b*x^3 + a),x, algorithm="maxima")
```

```
[Out] 2/9*(b*x^3 + a)^(3/2)/b^2 - 2/3*sqrt(b*x^3 + a)*a/b^2
```

Fricas [A] time = 0.231148, size = 31, normalized size = 0.82

$$\frac{2\,\sqrt{bx^3+a}\left(bx^3-2\,a\right)}{9\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(b*x^3 + a),x, algorithm="fricas")
```

```
[Out] 2/9*sqrt(b*x^3 + a)*(b*x^3 - 2*a)/b^2
```

Sympy [A] time = 2.55223, size = 46, normalized size = 1.21

$$\begin{cases} -\frac{4a\sqrt{a+bx^3}}{9b^2}+\frac{2x^3\sqrt{a+bx^3}}{9b} & \text{for } b\neq 0 \\ \frac{x^6}{6\sqrt{a}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(b*x**3+a)**(1/2),x)
```

```
[Out] Piecewise((-4*a*sqrt(a + b*x**3)/(9*b**2) + 2*x**3*sqrt(a + b*x**
3)/(9*b), Ne(b, 0)), (x**6/(6*sqrt(a)), True))
```

GIAC/XCAS [A] time = 0.212993, size = 36, normalized size = 0.95

$$\frac{2\left(\left(bx^3+a\right)^{\frac{3}{2}}-3\,\sqrt{bx^3+a}a\right)}{9\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(b*x^3 + a),x, algorithm="giac")
```

```
[Out] 2/9*((b*x^3 + a)^(3/2) - 3*sqrt(b*x^3 + a)*a)/b^2
```

3.407 $\int \frac{x^2}{\sqrt{a+bx^3}}\,dx$

Optimal. Leaf size=18

$$\frac{2\sqrt{a+bx^3}}{3b}$$

```
[Out] (2*Sqrt[a + b*x^3])/(3*b)
```

Rubi [A] time = 0.0113335, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$\frac{2\sqrt{a+bx^3}}{3b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/Sqrt[a + b*x^3],x]

[Out] (2*Sqrt[a + b*x^3])/(3*b)
```

Rubi in Sympy [A] time = 2.17225, size = 14, normalized size = 0.78

$$\frac{2\sqrt{a+bx^3}}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(b*x**3+a)**(1/2),x)

[Out] 2*sqrt(a + b*x**3)/(3*b)
```

Mathematica [A] time = 0.00920303, size = 18, normalized size = 1.

$$\frac{2\sqrt{a+bx^3}}{3b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/Sqrt[a + b*x^3],x]

[Out] (2*Sqrt[a + b*x^3])/(3*b)
```

Maple [A] time = 0.007, size = 15, normalized size = 0.8

$$\frac{2}{3\,b}\sqrt{bx^3+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(b*x^3+a)^(1/2),x)

[Out] 2/3*(b*x^3+a)^(1/2)/b
```

Maxima [A] time = 1.43358, size = 19, normalized size = 1.06

$$\frac{2\,\sqrt{bx^3+a}}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 2/3*sqrt(b*x^3 + a)/b
```

Fricas [A] time = 0.221886, size = 19, normalized size = 1.06

$$\frac{2\,\sqrt{bx^3+a}}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 2/3*sqrt(b*x^3 + a)/b
```

Sympy [A] time = 1.59361, size = 24, normalized size = 1.33

$$\begin{cases} \frac{2\sqrt{a+bx^3}}{3b} & \text{for}\ b \neq 0 \\ \frac{x^3}{3\sqrt{a}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(b*x**3+a)**(1/2),x)
```

```
[Out] Piecewise((2*sqrt(a + b*x**3)/(3*b), Ne(b, 0)), (x**3/(3*sqrt(a))
, True))
```

GIAC/XCAS [A] time = 0.218793, size = 19, normalized size = 1.06

$$\frac{2\,\sqrt{bx^3+a}}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 2/3*sqrt(b*x^3 + a)/b
```

3.408 $\int \frac{1}{x\sqrt{a+bx^3}}\,dx$

Optimal. Leaf size=27

$$-\frac{2\tanh^{-1}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)}{3\sqrt{a}}$$

```
[Out] (-2*ArcTanh[Sqrt[a + b*x^3]/Sqrt[a]])/(3*Sqrt[a])
```

Rubi [A] time = 0.0496006, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{2\tanh^{-1}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)}{3\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*Sqrt[a + b*x^3]),x]

[Out] (-2*ArcTanh[Sqrt[a + b*x^3]/Sqrt[a]])/(3*Sqrt[a])
```

Rubi in Sympy [A] time = 5.23633, size = 26, normalized size = 0.96

$$-\frac{2\,\mathrm{atanh}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)}{3\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(b*x**3+a)**(1/2),x)

[Out] -2*atanh(sqrt(a + b*x**3)/sqrt(a))/(3*sqrt(a))
```

Mathematica [A] time = 0.047194, size = 44, normalized size = 1.63

$$-\frac{2\sqrt{\frac{bx^3}{a}+1}\tanh^{-1}\left(\sqrt{\frac{bx^3}{a}+1}\right)}{3\sqrt{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*Sqrt[a + b*x^3]),x]

[Out] (-2*Sqrt[1 + (b*x^3)/a]*ArcTanh[Sqrt[1 + (b*x^3)/a]])/(3*Sqrt[a +
 b*x^3])
```

Maple [A] time = 0.022, size = 20, normalized size = 0.7

$$-\frac{2}{3}Artanh\left(1\sqrt{bx^3+a}\frac{1}{\sqrt{a}}\right)\frac{1}{\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(b*x^3+a)^(1/2),x)
```

```
[Out] -2/3*arctanh((b*x^3+a)^(1/2)/a^(1/2))/a^(1/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^3 + a)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.235079, size = 1, normalized size = 0.04

$$\left[\frac{\log\left(\frac{(bx^3+2a)\sqrt{a}-2\sqrt{bx^3+a}a}{x^3}\right)}{3\sqrt{a}}, \frac{2\arctan\left(\frac{a}{\sqrt{bx^3+a}\sqrt{-a}}\right)}{3\sqrt{-a}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^3 + a)*x),x, algorithm="fricas")
```

```
[Out] [1/3*log(((b*x^3 + 2*a)*sqrt(a) - 2*sqrt(b*x^3 + a)*a)/x^3)/sqrt(
a), 2/3*arctan(a/(sqrt(b*x^3 + a)*sqrt(-a)))/sqrt(-a)]
```

Sympy [A] time = 3.72377, size = 26, normalized size = 0.96

$$-\frac{2\operatorname{asinh}\left(\frac{\sqrt{a}}{\sqrt{b}x^{\frac{3}{2}}}\right)}{3\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(b*x**3+a)**(1/2),x)
```

```
[Out] -2*asinh(sqrt(a)/(sqrt(b)*x**(3/2)))/(3*sqrt(a))
```

GIAC/XCAS [A] time = 0.257831, size = 31, normalized size = 1.15

$$\frac{2\arctan\left(\frac{\sqrt{bx^3+a}}{\sqrt{-a}}\right)}{3\sqrt{-a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^3 + a)*x),x, algorithm="giac")
```

```
[Out] 2/3*arctan(sqrt(b*x^3 + a)/sqrt(-a))/sqrt(-a)
```

3.409 $\int \frac{1}{x^4\sqrt{a+bx^3}}\,dx$

Optimal. Leaf size=50

$$\frac{b\tanh^{-1}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)}{3a^{3/2}}-\frac{\sqrt{a+bx^3}}{3ax^3}$$

```
[Out] -Sqrt[a + b*x^3]/(3*a*x^3) + (b*ArcTanh[Sqrt[a + b*x^3]/Sqrt[a]])
/(3*a^(3/2))
```

Rubi [A] time = 0.0751714, antiderivative size = 50, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{b\tanh^{-1}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)}{3a^{3/2}}-\frac{\sqrt{a+bx^3}}{3ax^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*Sqrt[a + b*x^3]),x]
```

```
[Out] -Sqrt[a + b*x^3]/(3*a*x^3) + (b*ArcTanh[Sqrt[a + b*x^3]/Sqrt[a]])
/(3*a^(3/2))
```

Rubi in Sympy [A] time = 7.11963, size = 41, normalized size = 0.82

$$-\frac{\sqrt{a+bx^3}}{3ax^3}+\frac{b\,\mathrm{atanh}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)}{3a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(b*x**3+a)**(1/2),x)
```

```
[Out] -sqrt(a + b*x**3)/(3*a*x**3) + b*atanh(sqrt(a + b*x**3)/sqrt(a))/
(3*a**(3/2))
```

Mathematica [A] time = 0.16101, size = 56, normalized size = 1.12

$$\frac{\sqrt{a+bx^3}\left(\frac{b\tanh^{-1}\left(\sqrt{\frac{bx^3}{a}+1}\right)}{\sqrt{\frac{bx^3}{a}+1}}-\frac{a}{x^3}\right)}{3a^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*Sqrt[a + b*x^3]),x]
```

```
[Out] (Sqrt[a + b*x^3]*(-(a/x^3) + (b*ArcTanh[Sqrt[1 + (b*x^3)/a]])/Sqr
t[1 + (b*x^3)/a]))/(3*a^2)
```

Maple [A] time = 0.028, size = 39, normalized size = 0.8

$$\frac{b}{3}Artanh\left(1\sqrt{bx^3+a}\frac{1}{\sqrt{a}}\right)a^{-\frac{3}{2}}-\frac{1}{3\,ax^3}\sqrt{bx^3+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(b*x^3+a)^(1/2),x)
```

```
[Out] 1/3*b*arctanh((b*x^3+a)^(1/2)/a^(1/2))/a^(3/2)-1/3*(b*x^3+a)^(1/2
)/a/x^3
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^3 + a)*x^4),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.245458, size = 1, normalized size = 0.02

$$\left[\frac{bx^3\log\left(\frac{(bx^3+2a)\sqrt{a}+2\sqrt{bx^3+a}a}{x^3}\right)-2\sqrt{bx^3+a}\sqrt{a}}{6a^{\frac{3}{2}}x^3}, -\frac{bx^3\arctan\left(\frac{a}{\sqrt{bx^3+a}\sqrt{-a}}\right)+\sqrt{bx^3+a}\sqrt{-a}}{3\sqrt{-a}ax^3}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^3 + a)*x^4),x, algorithm="fricas")
```

```
[Out] [1/6*(b*x^3*log(((b*x^3 + 2*a)*sqrt(a) + 2*sqrt(b*x^3 + a)*a)/x^3
) - 2*sqrt(b*x^3 + a)*sqrt(a))/(a^(3/2)*x^3), -1/3*(b*x^3*arctan(
a/(sqrt(b*x^3 + a)*sqrt(-a))) + sqrt(b*x^3 + a)*sqrt(-a))/(sqrt(-
a)*a*x^3)]
```

Sympy [A] time = 8.07056, size = 49, normalized size = 0.98

$$-\frac{\sqrt{b}\sqrt{\frac{a}{bx^3}+1}}{3ax^{\frac{3}{2}}}+\frac{b\operatorname{asinh}\left(\frac{\sqrt{a}}{\sqrt{b}x^{\frac{3}{2}}}\right)}{3a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(b*x**3+a)**(1/2),x)
```

```
[Out] -sqrt(b)*sqrt(a/(b*x**3) + 1)/(3*a*x**(3/2)) + b*asinh(sqrt(a)/(s
qrt(b)*x**(3/2)))/(3*a**(3/2))
```

GIAC/XCAS [A] time = 0.229392, size = 65, normalized size = 1.3

$$-\frac{1}{3}b\left(\frac{\arctan\left(\frac{\sqrt{bx^3+a}}{\sqrt{-a}}\right)}{\sqrt{-a}a}+\frac{\sqrt{bx^3+a}}{abx^3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^3 + a)*x^4),x, algorithm="giac")
```

```
[Out] -1/3*b*(arctan(sqrt(b*x^3 + a)/sqrt(-a))/(sqrt(-a)*a) + sqrt(b*x^
3 + a)/(a*b*x^3))
```

3.410 $\int \frac{1}{x^7\sqrt{a+bx^3}}\,dx$

Optimal. Leaf size=74

$$-\frac{b^2\tanh^{-1}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)}{4a^{5/2}}+\frac{b\sqrt{a+bx^3}}{4a^2x^3}-\frac{\sqrt{a+bx^3}}{6ax^6}$$

```
[Out] -Sqrt[a + b*x^3]/(6*a*x^6) + (b*Sqrt[a + b*x^3])/(4*a^2*x^3) - (b
^2*ArcTanh[Sqrt[a + b*x^3]/Sqrt[a]])/(4*a^(5/2))
```

Rubi [A] time = 0.105396, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{b^2\tanh^{-1}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)}{4a^{5/2}}+\frac{b\sqrt{a+bx^3}}{4a^2x^3}-\frac{\sqrt{a+bx^3}}{6ax^6}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^7*Sqrt[a + b*x^3]),x]
```

```
[Out] -Sqrt[a + b*x^3]/(6*a*x^6) + (b*Sqrt[a + b*x^3])/(4*a^2*x^3) - (b
^2*ArcTanh[Sqrt[a + b*x^3]/Sqrt[a]])/(4*a^(5/2))
```

Rubi in Sympy [A] time = 10.1412, size = 63, normalized size = 0.85

$$-\frac{\sqrt{a+bx^3}}{6ax^6}+\frac{b\sqrt{a+bx^3}}{4a^2x^3}-\frac{b^2\,\mathrm{atanh}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)}{4a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**7/(b*x**3+a)**(1/2),x)
```

```
[Out] -sqrt(a + b*x**3)/(6*a*x**6) + b*sqrt(a + b*x**3)/(4*a**2*x**3) -
 b**2*atanh(sqrt(a + b*x**3)/sqrt(a))/(4*a**(5/2))
```

Mathematica [A] time = 0.201573, size = 68, normalized size = 0.92

$$\frac{\sqrt{a+bx^3}\left(\frac{a(3bx^3-2a)}{x^6}-\frac{3b^2\tanh^{-1}\left(\sqrt{\frac{bx^3}{a}+1}\right)}{\sqrt{\frac{bx^3}{a}+1}}\right)}{12a^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^7*Sqrt[a + b*x^3]),x]
```

```
[Out] (Sqrt[a + b*x^3]*((a*(-2*a + 3*b*x^3))/x^6 - (3*b^2*ArcTanh[Sqrt[
1 + (b*x^3)/a]])/Sqrt[1 + (b*x^3)/a]))/(12*a^3)
```

Maple [A] time = 0.028, size = 59, normalized size = 0.8

$$-\frac{b^2}{4}\mathit{Artanh}\left(1\sqrt{bx^3+a}\frac{1}{\sqrt{a}}\right)a^{-\frac{5}{2}}-\frac{1}{6\,x^6a}\sqrt{bx^3+a}+\frac{b}{4\,x^3a^2}\sqrt{bx^3+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^7/(b*x^3+a)^(1/2),x)
```

```
[Out] -1/4*b^2*arctanh((b*x^3+a)^(1/2)/a^(1/2))/a^(5/2)-1/6*(b*x^3+a)^(
1/2)/x^6/a+1/4*b*(b*x^3+a)^(1/2)/x^3/a^2
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^3 + a)*x^7),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.246884, size = 1, normalized size = 0.01

$$\left[\frac{3\,b^2x^6\log\left(\frac{(bx^3+2\,a)\,\sqrt{a}-2\,\sqrt{bx^3+a}a}{x^3}\right)+2\,\left(3\,bx^3-2\,a\right)\sqrt{bx^3+a}\sqrt{a}}{24\,a^{\frac{5}{2}}x^6},\ \frac{3\,b^2x^6\arctan\left(\frac{a}{\sqrt{bx^3+a}\sqrt{-a}}\right)+\left(3\,bx^3-2\,a\right)\sqrt{bx^3+a}\sqrt{-a}}{12\,\sqrt{-a}a^2x^6}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^3 + a)*x^7),x, algorithm="fricas")
```

```
[Out] [1/24*(3*b^2*x^6*log(((b*x^3 + 2*a)*sqrt(a) - 2*sqrt(b*x^3 + a)*a
)/x^3) + 2*(3*b*x^3 - 2*a)*sqrt(b*x^3 + a)*sqrt(a))/(a^(5/2)*x^6)
, 1/12*(3*b^2*x^6*arctan(a/(sqrt(b*x^3 + a)*sqrt(-a))) + (3*b*x^3
 - 2*a)*sqrt(b*x^3 + a)*sqrt(-a))/(sqrt(-a)*a^2*x^6)]
```

Sympy [A] time = 14.5315, size = 104, normalized size = 1.41

$$-\frac{1}{6\sqrt{b}x^{\frac{15}{2}}\sqrt{\frac{a}{bx^3}+1}}+\frac{\sqrt{b}}{12ax^{\frac{9}{2}}\sqrt{\frac{a}{bx^3}+1}}+\frac{b^{\frac{3}{2}}}{4a^2x^{\frac{3}{2}}\sqrt{\frac{a}{bx^3}+1}}-\frac{b^2\operatorname{asinh}\left(\frac{\sqrt{a}}{\sqrt{b}x^{\frac{3}{2}}}\right)}{4a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**7/(b*x**3+a)**(1/2),x)
```

```
[Out] -1/(6*sqrt(b)*x**(15/2)*sqrt(a/(b*x**3) + 1)) + sqrt(b)/(12*a*x**
(9/2)*sqrt(a/(b*x**3) + 1)) + b**(3/2)/(4*a**2*x**(3/2)*sqrt(a/(b
*x**3) + 1)) - b**2*asinh(sqrt(a)/(sqrt(b)*x**(3/2)))/(4*a**(5/2)
)
```

GIAC/XCAS [A] time = 0.2193, size = 89, normalized size = 1.2

$$\frac{1}{12}\,b^2\left(\frac{3\,\arctan\left(\frac{\sqrt{bx^3+a}}{\sqrt{-a}}\right)}{\sqrt{-a}a^2}+\frac{3\,\left(bx^3+a\right)^{\frac{3}{2}}-5\,\sqrt{bx^3+a}a}{a^2b^2x^6}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^3 + a)*x^7),x, algorithm="giac")
```

```
[Out] 1/12*b^2*(3*arctan(sqrt(b*x^3 + a)/sqrt(-a))/(sqrt(-a)*a^2) + (3*
(b*x^3 + a)^(3/2) - 5*sqrt(b*x^3 + a)*a)/(a^2*b^2*x^6))
```

3.411 $\int \frac{x^6}{\sqrt{a+bx^3}}\,dx$

Optimal. Leaf size=254

$$\frac{32\sqrt{2+\sqrt{3}}a^2\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{55\sqrt[4]{3}b^{7/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{16ax\sqrt{a+bx^3}}{55b^2}+\frac{2x^4\sqrt{a+bx^3}}{11b}$$

```
[Out] (-16*a*x*Sqrt[a + b*x^3])/(55*b^2) + (2*x^4*Sqrt[a + b*x^3])/(11*
b) + (32*Sqrt[2 + Sqrt[3]]*a^2*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3
) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(
1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/(
(1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(55*3^(1/4)
*b^(7/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1
/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi [A] time = 0.197009, antiderivative size = 254, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{32\sqrt{2+\sqrt{3}}a^2\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{55\sqrt[4]{3}b^{7/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{16ax\sqrt{a+bx^3}}{55b^2}+\frac{2x^4\sqrt{a+bx^3}}{11b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/Sqrt[a + b*x^3],x]
```

```
[Out] (-16*a*x*Sqrt[a + b*x^3])/(55*b^2) + (2*x^4*Sqrt[a + b*x^3])/(11*
b) + (32*Sqrt[2 + Sqrt[3]]*a^2*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3
) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(
1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/(
(1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(55*3^(1/4)
*b^(7/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1
/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 16.547, size = 226, normalized size = 0.89

$$\frac{32\cdot 3^{\frac{3}{4}}a^2\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{165b^{\frac{7}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{16ax\sqrt{a+bx^3}}{55b^2}+\frac{2x^4\sqrt{a+bx^3}}{11b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(b*x**3+a)**(1/2),x)
```

```
[Out] 32*3**(3/4)*a**2*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b**(2/3)*
x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(sqrt(3) + 2)
*(a**(1/3) + b**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)
) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4*sq
rt(3))/(165*b**(7/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1
/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) - 16*a*x*sq
rt(a + b*x**3)/(55*b**2) + 2*x**4*sqrt(a + b*x**3)/(11*b)
```

Mathematica [C] time = 0.496031, size = 174, normalized size = 0.69

$$\sqrt{a+bx^3}\left(\frac{2x^4}{11b}-\frac{16ax}{55b^2}\right)+\frac{32ia^{7/3}\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}\,F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)}{55\sqrt[4]{3}\sqrt[3]{-b}b^2\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^6/Sqrt[a + b*x^3],x]
```

```
[Out] Sqrt[a + b*x^3]*((-16*a*x)/(55*b^2) + (2*x^4)/(11*b)) + (((32*I)/
55)*a^(7/3)*Sqrt[(-1)^(5/6)*(-1 + ((-b)^(1/3)*x)/a^(1/3))]*Sqrt[1
 + ((-b)^(1/3)*x)/a^(1/3) + ((-b)^(2/3)*x^2)/a^(2/3)]*EllipticF[A
rcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)
^(1/3)])/(3^(1/4)*(-b)^(1/3)*b^2*Sqrt[a + b*x^3])
```

Maple [A] time = 0.025, size = 320, normalized size = 1.3

$$\frac{2x^4}{11b}\sqrt{bx^3+a}-\frac{16ax}{55b^2}\sqrt{bx^3+a}-\frac{\frac{32i}{165}a^2\sqrt{3}}{b^3}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(b*x^3+a)^(1/2),x)
```

```
[Out] 2/11*x^4*(b*x^3+a)^(1/2)/b-16/55*a*x*(b*x^3+a)^(1/2)/b^2-32/165*I
*a^2/b^3*3^(1/2)*(-a*b^2)^(1/3)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*
3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)*((x-1/b
*(-a*b^2)^(1/3))/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^
(1/3)))^(1/2)*(-I*(x+1/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2
)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)/(b*x^3+a)^(1/2)*Elliptic
F(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)
^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/
3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2))
```

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

$$\int \frac{x^6}{\sqrt{bx^3+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(b*x^3 + a),x, algorithm="maxima")
```

```
[Out] integrate(x^6/sqrt(b*x^3 + a), x)
```

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

$$\text{integral}\left(\frac{x^6}{\sqrt{bx^3+a}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(b*x^3 + a),x, algorithm="fricas")
```

```
[Out] integral(x^6/sqrt(b*x^3 + a), x)
```

Sympy [A] time = 2.70022, size = 37, normalized size = 0.15

$$\frac{x^7\Gamma\left(\frac{7}{3}\right){}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{7}{3}\\ \frac{10}{3}\end{matrix}\middle|\frac{bx^3e^{i\pi}}{a}\right)}{3\sqrt{a}\,\Gamma\left(\frac{10}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(b*x**3+a)**(1/2),x)
```

```
[Out] x**7*gamma(7/3)*hyper((1/2, 7/3), (10/3,), b*x**3*exp_polar(I*pi)
/a)/(3*sqrt(a)*gamma(10/3))
```

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

$$\int \frac{x^6}{\sqrt{bx^3+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(b*x^3 + a),x, algorithm="giac")
```

```
[Out] integrate(x^6/sqrt(b*x^3 + a), x)
```

3.412 $\int \frac{x^3}{\sqrt{a+bx^3}}\,dx$

Optimal. Leaf size=230

$$\frac{2x\sqrt{a+bx^3}}{5b}-\frac{4\sqrt{2+\sqrt{3}}\,a\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\,F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{5\sqrt[4]{3}\,b^{4/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}$$

```
[Out] (2*x*Sqrt[a + b*x^3])/(5*b) - (4*Sqrt[2 + Sqrt[3]]*a*(a^(1/3) + b
^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 +
Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*
a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4
*Sqrt[3]])/(5*3^(1/4)*b^(4/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x)
)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi [A] time = 0.133263, antiderivative size = 230, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{2x\sqrt{a+bx^3}}{5b}-\frac{4\sqrt{2+\sqrt{3}}\,a\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\,F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{5\sqrt[4]{3}\,b^{4/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/Sqrt[a + b*x^3],x]
```

```
[Out] (2*x*Sqrt[a + b*x^3])/(5*b) - (4*Sqrt[2 + Sqrt[3]]*a*(a^(1/3) + b
^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 +
Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*
a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4
*Sqrt[3]])/(5*3^(1/4)*b^(4/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x)
)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 10.6137, size = 202, normalized size = 0.88

$$-\frac{4\cdot 3^{\frac{3}{4}}a\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{15b^{\frac{4}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{2x\sqrt{a+bx^3}}{5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(b*x**3+a)**(1/2),x)
```

```
[Out] -4*3**(3/4)*a*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b**(2/3)*x**
2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(sqrt(3) + 2)*(a
**(1/3) + b**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) +
 b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4*sqrt(
3))/(15*b**(4/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1/3)*
(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) + 2*x*sqrt(a +
```

```
b*x**3)/(5*b)
```

Mathematica [C] time = 0.670579, size = 158, normalized size = 0.69

$$\frac{2x\sqrt{a+bx^3}}{5b}+\frac{4ia^{4/3}\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)}{5\sqrt[4]{3}(-b)^{4/3}\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]   Integrate[x^3/Sqrt[a + b*x^3],x]
```

```
[Out] (2*x*Sqrt[a + b*x^3])/(5*b) + (((4*I)/5)*a^(4/3)*Sqrt[(-1)^(5/6)*
(-1 + ((-b)^(1/3)*x)/a^(1/3))]*Sqrt[1 + ((-b)^(1/3)*x)/a^(1/3) +
((-b)^(2/3)*x^2)/a^(2/3)]*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - (I*
(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)^(1/3)])/(3^(1/4)*(-b)^(4/3)
*Sqrt[a + b*x^3])
```

Maple [A] time = 0.023, size = 300, normalized size = 1.3

$$\frac{2x}{5b}\sqrt{bx^3+a}+\frac{\frac{4i}{15}a\sqrt{3}}{b^2}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^3/(b*x^3+a)^(1/2),x)
```

```
[Out] 2/5*x*(b*x^3+a)^(1/2)/b+4/15*I*a/b^2*3^(1/2)*(-a*b^2)^(1/3)*(I*(x
+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(
-a*b^2)^(1/3))^(1/2)*((x-1/b*(-a*b^2)^(1/3))/(-3/2/b*(-a*b^2)^(1/
3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2)*(-I*(x+1/2/b*(-a*b^2)^(
1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1
/2)/(b*x^3+a)^(1/2)*EllipticF(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1
/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/
2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/
2)/b*(-a*b^2)^(1/3)))^(1/2))
```

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

$$\int \frac{x^3}{\sqrt{bx^3+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^3}{\sqrt{bx^3+a}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(b*x^3 + a),x, algorithm="fricas")
```

```
[Out] integral(x^3/sqrt(b*x^3 + a), x)
```

Sympy [A] time = 2.29545, size = 37, normalized size = 0.16

$$\frac{x^4\,\Gamma\left(\frac{4}{3}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{4}{3}\\ \frac{7}{3}\end{matrix}\middle|\frac{bx^3e^{i\pi}}{a}\right)}{3\sqrt{a}\,\Gamma\left(\frac{7}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(b*x**3+a)**(1/2),x)
```

```
[Out] x**4*gamma(4/3)*hyper((1/2, 4/3), (7/3,), b*x**3*exp_polar(I*pi)/
a)/(3*sqrt(a)*gamma(7/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{\sqrt{bx^3+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(b*x^3 + a),x, algorithm="giac")
```

```
[Out] integrate(x^3/sqrt(b*x^3 + a), x)
```

3.413 $\int \frac{1}{\sqrt{a+bx^3}}\,dx$

Optimal. Leaf size=207

$$\frac{2\sqrt{2+\sqrt{3}}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{\sqrt[4]{3}\sqrt[3]{b}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}$$

```
[Out] (2*Sqrt[2 + Sqrt[3]]*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3
)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]
*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[
3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(3^(1/4)*b^(1/3)*Sqrt
[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)
*x)^2]*Sqrt[a + b*x^3])
```

Rubi [A] time = 0.0680377, antiderivative size = 207, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{2\sqrt{2+\sqrt{3}}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{\sqrt[4]{3}\sqrt[3]{b}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[a + b*x^3],x]
```


```
[Out] (2*Sqrt[2 + Sqrt[3]]*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3
)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]
*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[
3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(3^(1/4)*b^(1/3)*Sqrt
[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)
*x)^2]*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 4.98563, size = 184, normalized size = 0.89

$$\frac{2\cdot 3^{\frac{3}{4}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{3\sqrt[3]{b}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**3+a)**(1/2),x)
```

```
[Out] 2*3**(3/4)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b**(2/3)*x**2)/
(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(sqrt(3) + 2)*(a**(
1/3) + b**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b*
*(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4*sqrt(3))
/(3*b**(1/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1/3)*(1 +
 sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3))
```

Mathematica [C] time = 0.130598, size = 136, normalized size = 0.66

$$\frac{2i\sqrt[3]{a}\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)}{\sqrt[4]{3}\sqrt[3]{-b}\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/Sqrt[a + b*x^3],x]
```

```
[Out] ((2*I)*a^(1/3)*Sqrt[(-1)^(5/6)*(-1 + ((-b)^(1/3)*x)/a^(1/3))]*Sqr
t[1 + ((-b)^(1/3)*x)/a^(1/3) + ((-b)^(2/3)*x^2)/a^(2/3)]*Elliptic
F[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (
-1)^(1/3)])/(3^(1/4)*(-b)^(1/3)*Sqrt[a + b*x^3])
```

Maple [A] time = 0.019, size = 283, normalized size = 1.4

$$\frac{-\frac{2i}{3}\sqrt{3}}{b}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}b\left(\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^3+a)^(1/2),x)
```

```
[Out] -2/3*I*3^(1/2)/b*(-a*b^2)^(1/3)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*
3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)*((x-1/b
*(-a*b^2)^(1/3))/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^
(1/3)))^(1/2)*(-I*(x+1/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2
)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)/(b*x^3+a)^(1/2)*Elliptic
F(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)
^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/
3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{bx^3+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*x^3 + a),x, algorithm="maxima")
```

```
[Out] integrate(1/sqrt(b*x^3 + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{bx^3+a}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*x^3 + a),x, algorithm="fricas")
```

```
[Out] integral(1/sqrt(b*x^3 + a), x)
```

Sympy [A] time = 2.10745, size = 36, normalized size = 0.17

$$\frac{x\Gamma\left(\frac{1}{3}\right) {}_2F_1\left(\begin{matrix}\frac{1}{3}, \frac{1}{2}\\ \frac{4}{3}\end{matrix}\middle|\frac{bx^3e^{i\pi}}{a}\right)}{3\sqrt{a}\,\Gamma\left(\frac{4}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**3+a)**(1/2),x)
```

```
[Out] x*gamma(1/3)*hyper((1/3, 1/2), (4/3,), b*x**3*exp_polar(I*pi)/a)/
(3*sqrt(a)*gamma(4/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{bx^3 + a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*x^3 + a),x, algorithm="giac")
```

```
[Out] integrate(1/sqrt(b*x^3 + a), x)
```

3.414 $\int \frac{1}{x^3\sqrt{a+bx^3}}\,dx$

Optimal. Leaf size=234

$$-\frac{\sqrt{2+\sqrt{3}}\,b^{2/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\,F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{2\sqrt[4]{3}\,a\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{\sqrt{a+bx^3}}{2ax^2}$$

```
[Out] -Sqrt[a + b*x^3]/(2*a*x^2) - (Sqrt[2 + Sqrt[3]]*b^(2/3)*(a^(1/3)
+ b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1
 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3
])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7
- 4*Sqrt[3]])/(2*3^(1/4)*a*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/(
(1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi [A] time = 0.141535, antiderivative size = 234, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{\sqrt{2+\sqrt{3}}\,b^{2/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\,F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{2\sqrt[4]{3}\,a\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{\sqrt{a+bx^3}}{2ax^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*Sqrt[a + b*x^3]),x]
```


```
[Out] -Sqrt[a + b*x^3]/(2*a*x^2) - (Sqrt[2 + Sqrt[3]]*b^(2/3)*(a^(1/3)
+ b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1
 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3
])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7
- 4*Sqrt[3]])/(2*3^(1/4)*a*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/(
(1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 10.7303, size = 202, normalized size = 0.86

$$-\frac{3^{\frac{3}{4}}b^{\frac{2}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{6a\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{\sqrt{a+bx^3}}{2ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(b*x**3+a)**(1/2),x)
```

```
[Out] -3**(3/4)*b**(2/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b**(2/3
)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(sqrt(3) +
2)*(a**(1/3) + b**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(
3)) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4*
sqrt(3))/(6*a*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1/3)*(1
+ sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) - sqrt(a + b*x**3)
```

```
/(2*a*x**2)
```

Mathematica [C] time = 0.701077, size = 161, normalized size = 0.69

$$-\frac{\sqrt{a+bx^3}}{2ax^2}-\frac{ib\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)}{2\sqrt[4]{3}a^{2/3}\sqrt[3]{-b}\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/(x^3*Sqrt[a + b*x^3]),x]
```

```
[Out] -Sqrt[a + b*x^3]/(2*a*x^2) - ((I/2)*b*Sqrt[(-1)^(5/6)*(-1 + ((-b)
^(1/3)*x)/a^(1/3))]*Sqrt[1 + ((-b)^(1/3)*x)/a^(1/3) + ((-b)^(2/3)
*x^2)/a^(2/3)]*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)*
x)/a^(1/3)]/3^(1/4)], (-1)^(1/3)])/(3^(1/4)*a^(2/3)*(-b)^(1/3)*Sq
rt[a + b*x^3])
```

Maple [A] time = 0.025, size = 301, normalized size = 1.3

$$-\frac{1}{2\,ax^2}\sqrt{bx^3+a}$$
$$+\frac{\frac{i}{6}\sqrt{3}}{a}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2\,b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2\,b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}b\left(x\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(b*x^3+a)^(1/2),x)
```

```
[Out] -1/2*(b*x^3+a)^(1/2)/a/x^2+1/6*I/a*3^(1/2)*(-a*b^2)^(1/3)*(I*(x+1
/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a
*b^2)^(1/3))^(1/2)*((x-1/b*(-a*b^2)^(1/3))/(-3/2/b*(-a*b^2)^(1/3)
+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2)*(-I*(x+1/2/b*(-a*b^2)^(1/
3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2
)/(b*x^3+a)^(1/2)*EllipticF(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3
)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)
,(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)
/b*(-a*b^2)^(1/3)))^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\sqrt{bx^3+a}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^3 + a)*x^3),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(b*x^3 + a)*x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{bx^3+a}x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(b*x^3 + a)*x^3),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(b*x^3 + a)*x^3), x)
```

Sympy [A] time = 2.6064, size = 41, normalized size = 0.18

$$\frac{\Gamma\left(-\frac{2}{3}\right) {}_2F_1\left(\begin{matrix} -\frac{2}{3}, \frac{1}{2} \\ \frac{1}{3} \end{matrix}\middle| \frac{bx^3 e^{i\pi}}{a}\right)}{3\sqrt{a}x^2\,\Gamma\left(\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/x**3/(b*x**3+a)**(1/2),x)
```

```
[Out] gamma(-2/3)*hyper((-2/3, 1/2), (1/3,), b*x**3*exp_polar(I*pi)/a)/
(3*sqrt(a)*x**2*gamma(1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{bx^3 + a}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(b*x^3 + a)*x^3),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(b*x^3 + a)*x^3), x)
```

3.415 $\int \frac{1}{x^6\sqrt{a+bx^3}}\,dx$

Optimal. Leaf size=256

$$\frac{7b\sqrt{a+bx^3}}{20a^2x^2}+\frac{7\sqrt{2+\sqrt{3}}\,b^{5/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\,F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{20\sqrt[4]{3}a^2\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{\sqrt{a+bx^3}}{5ax^5}$$

```
[Out] -Sqrt[a + b*x^3]/(5*a*x^5) + (7*b*Sqrt[a + b*x^3])/(20*a^2*x^2) +
 (7*Sqrt[2 + Sqrt[3]]*b^(5/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3)
 - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1
/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((
1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(20*3^(1/4)*
a^2*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) +
 b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi [A] time = 0.186547, antiderivative size = 256, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{7b\sqrt{a+bx^3}}{20a^2x^2}+\frac{7\sqrt{2+\sqrt{3}}\,b^{5/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\,F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{20\sqrt[4]{3}a^2\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{\sqrt{a+bx^3}}{5ax^5}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^6*Sqrt[a + b*x^3]),x]
```

```
[Out] -Sqrt[a + b*x^3]/(5*a*x^5) + (7*b*Sqrt[a + b*x^3])/(20*a^2*x^2) +
 (7*Sqrt[2 + Sqrt[3]]*b^(5/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3)
 - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1
/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((
1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(20*3^(1/4)*
a^2*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) +
 b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 16.2525, size = 226, normalized size = 0.88

$$-\frac{\sqrt{a+bx^3}}{5ax^5}+\frac{7\cdot 3^{\frac{3}{4}}b^{\frac{5}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{60a^2\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{7b\sqrt{a+bx^3}}{20a^2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**6/(b*x**3+a)**(1/2),x)
```

```
[Out] -sqrt(a + b*x**3)/(5*a*x**5) + 7*3**(3/4)*b**(5/3)*sqrt((a**(2/3)
 - a**(1/3)*b**(1/3)*x + b**(2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) +
 b**(1/3)*x)**2)*sqrt(sqrt(3) + 2)*(a**(1/3) + b**(1/3)*x)*ellipt
ic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)*x)/(a**(1/3)*(1 +
sqrt(3)) + b**(1/3)*x)), -7 - 4*sqrt(3))/(60*a**2*sqrt(a**(1/3)*(
a**(1/3) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*
sqrt(a + b*x**3)) + 7*b*sqrt(a + b*x**3)/(20*a**2*x**2)
```

Mathematica [C] time = 0.796149, size = 170, normalized size = 0.66

$$\frac{7i3^{3/4}\sqrt[3]{a}(-b)^{5/3}x^5\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)-12a^2+9abx^3+21b^2}{60a^2x^5\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/(x^6*Sqrt[a + b*x^3]),x]
```

```
[Out] (-12*a^2 + 9*a*b*x^3 + 21*b^2*x^6 + (7*I)*3^(3/4)*a^(1/3)*(-b)^(5
/3)*x^5*Sqrt[(-1)^(5/6)*(-1 + ((-b)^(1/3)*x)/a^(1/3))]*Sqrt[1 + (
(-b)^(1/3)*x)/a^(1/3) + ((-b)^(2/3)*x^2)/a^(2/3)]*EllipticF[ArcSi
n[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)^(1/
3)])/(60*a^2*x^5*Sqrt[a + b*x^3])
```

Maple [A] time = 0.028, size = 320, normalized size = 1.3

$$-\frac{1}{5\,ax^5}\sqrt{bx^3+a}+\frac{7\,b}{20\,a^2x^2}\sqrt{bx^3+a}$$

$$-\frac{\frac{7\,i}{60}b\sqrt{3}}{a^2}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2\,b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2\,b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}b$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^6/(b*x^3+a)^(1/2),x)
```

```
[Out] -1/5*(b*x^3+a)^(1/2)/a/x^5+7/20*b*(b*x^3+a)^(1/2)/a^2/x^2-7/60*I/
a^2*b*3^(1/2)*(-a*b^2)^(1/3)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(
1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)*((x-1/b*(-
a*b^2)^(1/3))/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/
```

```
3)))^(1/2)*(-I*(x+1/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(
1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)/(b*x^3+a)^(1/2)*EllipticF(1
/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1
/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/
(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{bx^3 + ax^6}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^3 + a)*x^6),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(b*x^3 + a)*x^6), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{bx^3 + ax^6}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^3 + a)*x^6),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(b*x^3 + a)*x^6), x)
```

Sympy [A] time = 3.4238, size = 44, normalized size = 0.17

$$\frac{\Gamma\left(-\frac{5}{3}\right) {}_{2}F_{1}\left(\begin{matrix} -\frac{5}{3}, \frac{1}{2} \\ -\frac{2}{3} \end{matrix}\middle| \frac{bx^3 e^{i\pi}}{a}\right)}{3\sqrt{a}x^5 \Gamma\left(-\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**6/(b*x**3+a)**(1/2),x)
```

```
[Out] gamma(-5/3)*hyper((-5/3, 1/2), (-2/3,), b*x**3*exp_polar(I*pi)/a)
/(3*sqrt(a)*x**5*gamma(-2/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{bx^3 + ax^6}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^3 + a)*x^6),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(b*x^3 + a)*x^6), x)
```

3.416 $\int \frac{x^7}{\sqrt{a+bx^3}}\,dx$

Optimal. Leaf size=514

$$\frac{80\sqrt{2}a^{7/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{91\sqrt[4]{3}b^{8/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}} - \frac{40\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{7/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{91b^{8/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}} + \frac{80a^2\sqrt{a+bx^3}}{91b^{8/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)} - \frac{20ax^2\sqrt{a+bx^3}}{91b^2} + \frac{2x^5\sqrt{a+bx^3}}{13b}$$

```
[Out] (-20*a*x^2*Sqrt[a + b*x^3])/(91*b^2) + (2*x^5*Sqrt[a + b*x^3])/(1
3*b) + (80*a^2*Sqrt[a + b*x^3])/(91*b^(8/3)*((1 + Sqrt[3])*a^(1/3
) + b^(1/3)*x)) - (40*3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(7/3)*(a^(1/3)
+ b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1
 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticE[ArcSin[((1 - Sqrt[3
])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7
- 4*Sqrt[3]])/(91*b^(8/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((
1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3]) + (80*Sqrt[
2]*a^(7/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*
x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF
[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3
) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(91*3^(1/4)*b^(8/3)*Sqrt[(a^(1/
3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*
Sqrt[a + b*x^3])
```

Rubi [A] time = 0.495944, antiderivative size = 514, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$

$$\frac{80\sqrt{2}a^{7/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{91\sqrt[4]{3}b^{8/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}} - \frac{40\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{7/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{91b^{8/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}} + \frac{80a^2\sqrt{a+bx^3}}{91b^{8/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)} - \frac{20ax^2\sqrt{a+bx^3}}{91b^2} + \frac{2x^5\sqrt{a+bx^3}}{13b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7/Sqrt[a + b*x^3],x]
```

```
[Out] (-20*a*x^2*Sqrt[a + b*x^3])/(91*b^2) + (2*x^5*Sqrt[a + b*x^3])/(1
3*b) + (80*a^2*Sqrt[a + b*x^3])/(91*b^(8/3)*((1 + Sqrt[3])*a^(1/3
```

```
) + b^(1/3)*x)) - (40*3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(7/3)*(a^(1/3)
+ b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1
 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticE[ArcSin[((1 - Sqrt[3
])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7
- 4*Sqrt[3]])/(91*b^(8/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((
1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3]) + (80*Sqrt[
2]*a^(7/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*
x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF
[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3
) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(91*3^(1/4)*b^(8/3)*Sqrt[(a^(1/
3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*
Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 45.5826, size = 456, normalized size = 0.89

$$-\frac{40\sqrt[4]{3}a^{\frac{7}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{91b^{\frac{8}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{80\sqrt{2}\cdot 3^{\frac{3}{4}}a^{\frac{7}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{273b^{\frac{8}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{80a^2\sqrt{a+bx^3}}{91b^{\frac{8}{3}}\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)}-\frac{20ax^2\sqrt{a+bx^3}}{91b^2}+\frac{2x^5\sqrt{a+bx^3}}{13b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7/(b*x**3+a)**(1/2),x)
```

```
[Out] -40*3**(1/4)*a**(7/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b**(
2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(-sqrt(3
) + 2)*(a**(1/3) + b**(1/3)*x)*elliptic_e(asin((-a**(1/3)*(-1 + s
qrt(3)) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7
- 4*sqrt(3))/(91*b**(8/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(
a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) + 80*s
qrt(2)*3**(3/4)*a**(7/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b
**(2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*(a**(1/3)
 + b**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/
3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4*sqrt(3))/(27
3*b**(8/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1/3)*(1 + s
qrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) + 80*a**2*sqrt(a + b*
x**3)/(91*b**(8/3)*(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)) - 20*a*
x**2*sqrt(a + b*x**3)/(91*b**2) + 2*x**5*sqrt(a + b*x**3)/(13*b)
```

Mathematica [C] time = 1.44454, size = 228, normalized size = 0.44

$$-\frac{2\left(3(-b)^{2/3}\left(a+bx^3\right)\left(10ax^2-7bx^5\right)+40(-1)^{2/3}3^{3/4}a^{8/3}\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}\left((-1)^{5/6}F\left(\sin^{-1}\right.\right.\right.}{273(-b)^{8/3}\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^7/Sqrt[a + b*x^3],x]
```

```
[Out] (-2*(3*(-b)^(2/3)*(a + b*x^3)*(10*a*x^2 - 7*b*x^5) + 40*(-1)^(2/3
)*3^(3/4)*a^(8/3)*Sqrt[(-1)^(5/6)*(-1 + ((-b)^(1/3)*x)/a^(1/3))]*
Sqrt[1 + ((-b)^(1/3)*x)/a^(1/3) + ((-b)^(2/3)*x^2)/a^(2/3)]*(Sqrt
[3]*EllipticE[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]
/3^(1/4)], (-1)^(1/3)] + (-1)^(5/6)*EllipticF[ArcSin[Sqrt[-(-1)^(
5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)^(1/3)])))/(273*(-
b)^(8/3)*Sqrt[a + b*x^3])
```

Maple [A] time = 0.024, size = 474, normalized size = 0.9

$$\frac{2x^5}{13b}\sqrt{bx^3+a}-\frac{20ax^2}{91b^2}\sqrt{bx^3+a}$$
$$-\frac{\frac{80i}{273}a^2\sqrt{3}}{b^3}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7/(b*x^3+a)^(1/2),x)
```

```
[Out] 2/13*x^5*(b*x^3+a)^(1/2)/b-20/91*a*x^2*(b*x^3+a)^(1/2)/b^2-80/273
*I*a^2/b^3*3^(1/2)*(-a*b^2)^(1/3)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*
I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)*((x-1
/b*(-a*b^2)^(1/3))/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2
)^(1/3)))^(1/2)*(-I*(x+1/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b
^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)/(b*x^3+a)^(1/2)*((-3/2
/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*EllipticE(1/3*3
^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))
*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/
2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2))+1/b*(-
a*b^2)^(1/3)*EllipticF(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2
*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3
^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-
a*b^2)^(1/3)))^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^7}{\sqrt{bx^3+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(b*x^3 + a),x, algorithm="maxima")
```

```
[Out] integrate(x^7/sqrt(b*x^3 + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x^7}{\sqrt{bx^3+a}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(b*x^3 + a),x, algorithm="fricas")
```

```
[Out] integral(x^7/sqrt(b*x^3 + a), x)
```

Sympy [A] time = 3.02313, size = 37, normalized size = 0.07

$$\frac{x^{8}\Gamma\left(\frac{8}{3}\right){}_{2}F_{1}\left(\begin{matrix}\frac{1}{2},\frac{8}{3}\\\frac{11}{3}\end{matrix}\middle|\frac{bx^{3}e^{i\pi}}{a}\right)}{3\sqrt{a}\,\Gamma\left(\frac{11}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(b*x**3+a)**(1/2),x)
```

```
[Out] x**8*gamma(8/3)*hyper((1/2, 8/3), (11/3,), b*x**3*exp_polar(I*pi)
/a)/(3*sqrt(a)*gamma(11/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{7}}{\sqrt{bx^{3}+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(b*x^3 + a),x, algorithm="giac")
```

```
[Out] integrate(x^7/sqrt(b*x^3 + a), x)
```

3.417 $\int \frac{x^4}{\sqrt{a+bx^3}}\,dx$

Optimal. Leaf size=490

$$-\frac{8\sqrt{2}a^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{7\sqrt[4]{3}b^{5/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}$$
$$+\frac{4\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{7b^{5/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}$$
$$-\frac{8a\sqrt{a+bx^3}}{7b^{5/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)}+\frac{2x^2\sqrt{a+bx^3}}{7b}$$

```
[Out] (2*x^2*Sqrt[a + b*x^3])/(7*b) - (8*a*Sqrt[a + b*x^3])/(7*b^(5/3)*
((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)) + (4*3^(1/4)*Sqrt[2 - Sqrt[3
]]*a^(4/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*
x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticE
[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3
) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(7*b^(5/3)*Sqrt[(a^(1/3)*(a^(1/
3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a +
b*x^3]) - (8*Sqrt[2]*a^(4/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3)
- a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/
3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1
 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(7*3^(1/4)*b^
(5/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3)
 + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi [A] time = 0.390097, antiderivative size = 490, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{8\sqrt{2}a^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{7\sqrt[4]{3}b^{5/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}$$
$$+\frac{4\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{7b^{5/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}$$
$$-\frac{8a\sqrt{a+bx^3}}{7b^{5/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)}+\frac{2x^2\sqrt{a+bx^3}}{7b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/Sqrt[a + b*x^3],x]
```

```
[Out] (2*x^2*Sqrt[a + b*x^3])/(7*b) - (8*a*Sqrt[a + b*x^3])/(7*b^(5/3)*
((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)) + (4*3^(1/4)*Sqrt[2 - Sqrt[3
]]*a^(4/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*
```

```
x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticE
[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3
) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(7*b^(5/3)*Sqrt[(a^(1/3)*(a^(1/
3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a +
b*x^3]) - (8*Sqrt[2]*a^(4/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3)
- a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/
3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1
 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(7*3^(1/4)*b^
(5/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3)
 + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 34.8407, size = 432, normalized size = 0.88

$$\frac{4\sqrt[4]{3}a^{\frac{4}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{7b^{\frac{5}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}} - \frac{8\sqrt{2}\cdot 3^{\frac{3}{4}}a^{\frac{4}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{21b^{\frac{5}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}} - \frac{8a\sqrt{a+bx^3}}{7b^{\frac{5}{3}}\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)} + \frac{2x^2\sqrt{a+bx^3}}{7b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate(x**4/(b*x**3+a)**(1/2),x)
```

```
[Out] 4*3**(1/4)*a**(4/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b**(2/
3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(-sqrt(3)
+ 2)*(a**(1/3) + b**(1/3)*x)*elliptic_e(asin((-a**(1/3)*(-1 + sqr
t(3)) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 -
4*sqrt(3))/(7*b**(5/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**
(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) - 8*sqrt(
2)*3**(3/4)*a**(4/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b**(2
/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*(a**(1/3) + b
**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)*x
)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4*sqrt(3))/(21*b**
(5/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3
)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) - 8*a*sqrt(a + b*x**3)/(7*
b**(5/3)*(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)) + 2*x**2*sqrt(a +
 b*x**3)/(7*b)
```

Mathematica [C] time = 1.91365, size = 221, normalized size = 0.45

$$\frac{2x^2\sqrt{a+bx^3}}{7b} + \frac{8\sqrt[6]{-1}a^{5/3}\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}\left(\sqrt[3]{-1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)-i\sqrt{3}E\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-}\ldots}{\sqrt[3]{a}}}\ldots}{}\right)\right)\ldots\right)}{7\sqrt[4]{3}(-b)^{5/3}\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]   Integrate[x^4/Sqrt[a + b*x^3],x]
```

```
[Out] (2*x^2*Sqrt[a + b*x^3])/(7*b) + (8*(-1)^(1/6)*a^(5/3)*Sqrt[(-1)^(
5/6)*(-1 + ((-b)^(1/3)*x)/a^(1/3))]*Sqrt[1 + ((-b)^(1/3)*x)/a^(1/
3) + ((-b)^(2/3)*x^2)/a^(2/3)]*((-I)*Sqrt[3]*EllipticE[ArcSin[Sqr
t[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)^(1/3)] +
 (-1)^(1/3)*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/
a^(1/3)]/3^(1/4)], (-1)^(1/3)]))/(7*3^(1/4)*(-b)^(5/3)*Sqrt[a + b
*x^3])
```

Maple [A] time = 0.022, size = 454, normalized size = 0.9

$$\frac{2x^2}{7b}\sqrt{bx^3+a} + \frac{\frac{8i}{21}a\sqrt{3}}{b^2}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(b*x^3+a)^(1/2),x)
```

```
[Out] 2/7*x^2*(b*x^3+a)^(1/2)/b+8/21*I*a/b^2*3^(1/2)*(-a*b^2)^(1/3)*(I*
(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b
/(-a*b^2)^(1/3))^(1/2)*((x-1/b*(-a*b^2)^(1/3))/(-3/2/b*(-a*b^2)^(
1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2)*(-I*(x+1/2/b*(-a*b^2)
^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^
(1/2)/(b*x^3+a)^(1/2)*((-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a
*b^2)^(1/3))*EllipticE(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2
*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3
^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-
a*b^2)^(1/3)))^(1/2))+1/b*(-a*b^2)^(1/3)*EllipticF(1/3*3^(1/2)*(I
*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*
b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b
^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\sqrt{bx^3+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(b*x^3 + a),x, algorithm="maxima")
```

```
[Out] integrate(x^4/sqrt(b*x^3 + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^4}{\sqrt{bx^3+a}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(b*x^3 + a),x, algorithm="fricas")
```

```
[Out] integral(x^4/sqrt(b*x^3 + a), x)
```

Sympy [A] time = 2.36929, size = 37, normalized size = 0.08

$$\frac{x^5\,\Gamma\left(\frac{5}{3}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{5}{3}\\ \frac{8}{3}\end{matrix}\middle|\frac{bx^3e^{i\pi}}{a}\right)}{3\sqrt{a}\,\Gamma\left(\frac{8}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(b*x**3+a)**(1/2),x)
```

```
[Out] x**5*gamma(5/3)*hyper((1/2, 5/3), (8/3,), b*x**3*exp_polar(I*pi)/
a)/(3*sqrt(a)*gamma(8/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\sqrt{bx^3+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(b*x^3 + a),x, algorithm="giac")
```

```
[Out] integrate(x^4/sqrt(b*x^3 + a), x)
```

3.418 $\int \frac{x}{\sqrt{a+bx^3}}\,dx$

Optimal. Leaf size=462

$$\frac{2\sqrt{2}\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{\sqrt[4]{3}b^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{\sqrt[4]{3}\sqrt{2-\sqrt{3}}\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{b^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{2\sqrt{a+bx^3}}{b^{2/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)}$$

```
[Out] (2*Sqrt[a + b*x^3])/(b^(2/3)*((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x))
 - (3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(1/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[
(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3
) + b^(1/3)*x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/
3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(b^(
2/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3)
+ b^(1/3)*x)^2]*Sqrt[a + b*x^3]) + (2*Sqrt[2]*a^(1/3)*(a^(1/3) +
b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 +
 Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])
*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 -
4*Sqrt[3]])/(3^(1/4)*b^(2/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))
/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi [A] time = 0.283156, antiderivative size = 462, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{2\sqrt{2}\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{\sqrt[4]{3}b^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{\sqrt[4]{3}\sqrt{2-\sqrt{3}}\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{b^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{2\sqrt{a+bx^3}}{b^{2/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[x/Sqrt[a + b*x^3],x]
```


```
[Out] (2*Sqrt[a + b*x^3])/(b^(2/3)*((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x))
 - (3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(1/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[
(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3
) + b^(1/3)*x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/
3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(b^(
```

```
2/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3)
+ b^(1/3)*x)^2]*Sqrt[a + b*x^3]) + (2*Sqrt[2]*a^(1/3)*(a^(1/3) +
b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 +
 Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])
*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 -
4*Sqrt[3]])/(3^(1/4)*b^(2/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))
/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 25.5137, size = 406, normalized size = 0.88

$$-\frac{\sqrt[4]{3}\sqrt[3]{a}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{b^{\frac{2}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{2\sqrt{2}\cdot 3^{\frac{3}{4}}\sqrt[3]{a}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{3b^{\frac{2}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{2\sqrt{a+bx^3}}{b^{\frac{2}{3}}\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(b*x**3+a)**(1/2),x)
```

```
[Out] -3**(1/4)*a**(1/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b**(2/3
)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(-sqrt(3) +
 2)*(a**(1/3) + b**(1/3)*x)*elliptic_e(asin((-a**(1/3)*(-1 + sqrt
(3)) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4
*sqrt(3))/(b**(2/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1/
3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) + 2*sqrt(2)*
3**(3/4)*a**(1/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b**(2/3)
*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*(a**(1/3) + b**(
1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)*x)/(
a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4*sqrt(3))/(3*b**(2/3
)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) +
 b**(1/3)*x)**2)*sqrt(a + b*x**3)) + 2*sqrt(a + b*x**3)/(b**(2/3)
*(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x))
```

Mathematica [C] time = 0.229024, size = 197, normalized size = 0.43

$$\frac{2\sqrt[6]{-1}a^{2/3}\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}\left(\sqrt[3]{-1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)-i\sqrt{3}E\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)\right)}{\sqrt[4]{3}(-b)^{2/3}\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x/Sqrt[a + b*x^3],x]
```

```
[Out] (2*(-1)^(1/6)*a^(2/3)*Sqrt[(-1)^(5/6)*(-1 + ((-b)^(1/3)*x)/a^(1/3
))]*Sqrt[1 + ((-b)^(1/3)*x)/a^(1/3) + ((-b)^(2/3)*x^2)/a^(2/3)]*(
(-I)*Sqrt[3]*EllipticE[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)*x)
/a^(1/3)]/3^(1/4)], (-1)^(1/3)] + (-1)^(1/3)*EllipticF[ArcSin[Sqr
t[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)^(1/3)]))
```

```
/(3^(1/4)*(-b)^(2/3)*Sqrt[a + b*x^3])
```

Maple [A] time = 0.021, size = 435, normalized size = 0.9

$$\frac{-\frac{2i}{3}\sqrt{3}}{b}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}b\left(\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(b*x^3+a)^(1/2),x)
```

```
[Out] -2/3*I*3^(1/2)/b*(-a*b^2)^(1/3)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*
3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)*((x-1/b
*(-a*b^2)^(1/3))/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^
(1/3)))^(1/2)*(-I*(x+1/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2
)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)/(b*x^3+a)^(1/2)*((-3/2/b
*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*EllipticE(1/3*3^(
1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3
^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/
b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2))+1/b*(-a*
b^2)^(1/3)*EllipticF(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I
*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(
1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*
b^2)^(1/3)))^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt{bx^3+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(b*x^3 + a),x, algorithm="maxima")
```

```
[Out] integrate(x/sqrt(b*x^3 + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x}{\sqrt{bx^3+a}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(b*x^3 + a),x, algorithm="fricas")
```

```
[Out] integral(x/sqrt(b*x^3 + a), x)
```

Sympy [A] time = 2.18658, size = 37, normalized size = 0.08

$$\frac{x^2\,\Gamma\left(\frac{2}{3}\right)\,{}_2F_1\left(\left.\begin{matrix}\frac{1}{2},\frac{2}{3}\\\frac{5}{3}\end{matrix}\right|\frac{bx^3e^{i\pi}}{a}\right)}{3\sqrt{a}\,\Gamma\left(\frac{5}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x**3+a)**(1/2),x)
```

```
[Out] x**2*gamma(2/3)*hyper((1/2, 2/3), (5/3,), b*x**3*exp_polar(I*pi)/
a)/(3*sqrt(a)*gamma(5/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt{bx^3 + a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(b*x^3 + a),x, algorithm="giac")
```

```
[Out] integrate(x/sqrt(b*x^3 + a), x)
```

3.419 $\int \frac{1}{x^2\sqrt{a+bx^3}}\,dx$

Optimal. Leaf size=484

$$\frac{\sqrt{2}\sqrt[3]{b}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{\sqrt[4]{3}a^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{\sqrt[4]{3}\sqrt{2-\sqrt{3}}\sqrt[3]{b}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{2a^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{\sqrt{a+bx^3}}{ax}+\frac{\sqrt[3]{b}\sqrt{a+bx^3}}{a\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)}$$

```
[Out] -(Sqrt[a + b*x^3]/(a*x)) + (b^(1/3)*Sqrt[a + b*x^3])/(a*((1 + Sqr
t[3])*a^(1/3) + b^(1/3)*x)) - (3^(1/4)*Sqrt[2 - Sqrt[3]]*b^(1/3)*
(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)
*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticE[ArcSin[((1
 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)
*x)], -7 - 4*Sqrt[3]])/(2*a^(2/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3
)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3]) + (
Sqrt[2]*b^(1/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(
1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Elli
pticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a
^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(3^(1/4)*a^(2/3)*Sqrt[(a^(
1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2
]*Sqrt[a + b*x^3])
```

Rubi [A] time = 0.379856, antiderivative size = 484, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$

$$\frac{\sqrt{2}\sqrt[3]{b}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{\sqrt[4]{3}a^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{\sqrt[4]{3}\sqrt{2-\sqrt{3}}\sqrt[3]{b}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{2a^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{\sqrt{a+bx^3}}{ax}+\frac{\sqrt[3]{b}\sqrt{a+bx^3}}{a\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*Sqrt[a + b*x^3]),x]
```


```
[Out] -(Sqrt[a + b*x^3]/(a*x)) + (b^(1/3)*Sqrt[a + b*x^3])/(a*((1 + Sqr
t[3])*a^(1/3) + b^(1/3)*x)) - (3^(1/4)*Sqrt[2 - Sqrt[3]]*b^(1/3)*
(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)
```

```
*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticE[ArcSin[((1
 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)
*x)], -7 - 4*Sqrt[3]])/(2*a^(2/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3
)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3]) + (
Sqrt[2]*b^(1/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(
1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Elli
pticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a
^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(3^(1/4)*a^(2/3)*Sqrt[(a^(
1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2
]*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 35.6804, size = 420, normalized size = 0.87

$$\frac{\sqrt[3]{b}\sqrt{a+bx^3}}{a\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)}-\frac{\sqrt{a+bx^3}}{ax}-\frac{\sqrt[4]{3}\sqrt[3]{b}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{2a^{\frac{2}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{\sqrt{2}\cdot 3^{\frac{3}{4}}\sqrt[3]{b}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{3a^{\frac{2}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(b*x**3+a)**(1/2),x)
```

```
[Out] b**(1/3)*sqrt(a + b*x**3)/(a*(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x
)) - sqrt(a + b*x**3)/(a*x) - 3**(1/4)*b**(1/3)*sqrt((a**(2/3) -
a**(1/3)*b**(1/3)*x + b**(2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b*
*(1/3)*x)**2)*sqrt(-sqrt(3) + 2)*(a**(1/3) + b**(1/3)*x)*elliptic
_e(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)*x)/(a**(1/3)*(1 + sq
rt(3)) + b**(1/3)*x)), -7 - 4*sqrt(3))/(2*a**(2/3)*sqrt(a**(1/3)*
(a**(1/3) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)
*sqrt(a + b*x**3)) + sqrt(2)*3**(3/4)*b**(1/3)*sqrt((a**(2/3) - a
**(1/3)*b**(1/3)*x + b**(2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**
(1/3)*x)**2)*(a**(1/3) + b**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(
-1 + sqrt(3)) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)
), -7 - 4*sqrt(3))/(3*a**(2/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)
*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3))
```

Mathematica [C] time = 1.22628, size = 217, normalized size = 0.45

$$-\frac{\sqrt{a+bx^3}}{ax}+\frac{\sqrt[6]{-1}b\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}\left(\sqrt[3]{-1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)-i\sqrt{3}E\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-\cdots}}{\sqrt[4]{3}}\right.\right.\right.}{\sqrt[4]{3}\sqrt[3]{a}(-b)^{2/3}\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/(x^2*Sqrt[a + b*x^3]),x]
```

```
[Out] -(Sqrt[a + b*x^3]/(a*x)) + ((-1)^(1/6)*b*Sqrt[(-1)^(5/6)*(-1 + ((
-b)^(1/3)*x)/a^(1/3))]*Sqrt[1 + ((-b)^(1/3)*x)/a^(1/3) + ((-b)^(2
/3)*x^2)/a^(2/3)]*((-I)*Sqrt[3]*EllipticE[ArcSin[Sqrt[-(-1)^(5/6)
 - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)^(1/3)] + (-1)^(1/3)*E
llipticF[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1
/4)], (-1)^(1/3)]))/(3^(1/4)*a^(1/3)*(-b)^(2/3)*Sqrt[a + b*x^3])
```

Maple [A] time = 0.023, size = 453, normalized size = 0.9

$$-\frac{1}{ax}\sqrt{bx^3+a}$$
$$-\frac{\frac{i}{3}\sqrt{3}}{a}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}b\left(x\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(b*x^3+a)^(1/2),x)
```

```
[Out] -(b*x^3+a)^(1/2)/a/x-1/3*I/a*3^(1/2)*(-a*b^2)^(1/3)*(I*(x+1/2/b*(
-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^
(1/3))^(1/2)*((x-1/b*(-a*b^2)^(1/3))/(-3/2/b*(-a*b^2)^(1/3)+1/2*I
*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2)*(-I*(x+1/2/b*(-a*b^2)^(1/3)+1/2
*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)/(b*x
^3+a)^(1/2)*((-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3
))*EllipticE(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)
/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(
-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/
3)))^(1/2))+1/b*(-a*b^2)^(1/3)*EllipticF(1/3*3^(1/2)*(I*(x+1/2/b*
(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)
^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+
1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{bx^3+ax^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^3 + a)*x^2),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(b*x^3 + a)*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{bx^3+ax^2}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^3 + a)*x^2),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(b*x^3 + a)*x^2), x)
```

Sympy [A] time = 2.42789, size = 39, normalized size = 0.08

$$\frac{\Gamma\left(-\frac{1}{3}\right) {}_2F_1\left(\begin{matrix} -\frac{1}{3}, \frac{1}{2} \\ \frac{2}{3} \end{matrix}\middle| \frac{bx^3e^{i\pi}}{a}\right)}{3\sqrt{a}x\,\Gamma\left(\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(b*x**3+a)**(1/2),x)
```

```
[Out] gamma(-1/3)*hyper((-1/3, 1/2), (2/3,), b*x**3*exp_polar(I*pi)/a)/
(3*sqrt(a)*x*gamma(2/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{bx^3 + a}x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^3 + a)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(b*x^3 + a)*x^2), x)
```

3.420 $\int \frac{1}{x^5\sqrt{a+bx^3}}\,dx$

Optimal. Leaf size=514

$$-\frac{5b^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{4\sqrt{2}\sqrt[4]{3}a^{5/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{5\sqrt[4]{3}\sqrt{2-\sqrt{3}}b^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{16a^{5/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{5b^{4/3}\sqrt{a+bx^3}}{8a^2\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)}+\frac{5b\sqrt{a+bx^3}}{8a^2x}-\frac{\sqrt{a+bx^3}}{4ax^4}$$

```
[Out] -Sqrt[a + b*x^3]/(4*a*x^4) + (5*b*Sqrt[a + b*x^3])/(8*a^2*x) - (5
*b^(4/3)*Sqrt[a + b*x^3])/(8*a^2*((1 + Sqrt[3])*a^(1/3) + b^(1/3)
*x)) + (5*3^(1/4)*Sqrt[2 - Sqrt[3]]*b^(4/3)*(a^(1/3) + b^(1/3)*x)
*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*
a^(1/3) + b^(1/3)*x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) +
 b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]]
)/(16*a^(5/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])
*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3]) - (5*b^(4/3)*(a^(1/3) +
 b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1
+ Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3]
)*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 -
 4*Sqrt[3]])/(4*Sqrt[2]*3^(1/4)*a^(5/3)*Sqrt[(a^(1/3)*(a^(1/3) +
b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3
])
```

Rubi [A] time = 0.497995, antiderivative size = 514, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{5b^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{4\sqrt{2}\sqrt[4]{3}a^{5/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{5\sqrt[4]{3}\sqrt{2-\sqrt{3}}b^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{16a^{5/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{5b^{4/3}\sqrt{a+bx^3}}{8a^2\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)}+\frac{5b\sqrt{a+bx^3}}{8a^2x}-\frac{\sqrt{a+bx^3}}{4ax^4}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^5*Sqrt[a + b*x^3]),x]
```


```
[Out] -Sqrt[a + b*x^3]/(4*a*x^4) + (5*b*Sqrt[a + b*x^3])/(8*a^2*x) - (5
*b^(4/3)*Sqrt[a + b*x^3])/(8*a^2*((1 + Sqrt[3])*a^(1/3) + b^(1/3)
*x)) + (5*3^(1/4)*Sqrt[2 - Sqrt[3]]*b^(4/3)*(a^(1/3) + b^(1/3)*x)
```

```
*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*
a^(1/3) + b^(1/3)*x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) +
 b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]]
)/(16*a^(5/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])
*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3]) - (5*b^(4/3)*(a^(1/3) +
 b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1
+ Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3]
)*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 -
 4*Sqrt[3]])/(4*Sqrt[2]*3^(1/4)*a^(5/3)*Sqrt[(a^(1/3)*(a^(1/3) +
b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3
])
```

Rubi in Sympy [A] time = 45.9393, size = 452, normalized size = 0.88

$$-\frac{\sqrt{a+bx^3}}{4ax^4}-\frac{5b^{\frac{4}{3}}\sqrt{a+bx^3}}{8a^2\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)}+\frac{5b\sqrt{a+bx^3}}{8a^2x}+\frac{5\sqrt[4]{3}b^{\frac{4}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{16a^{\frac{5}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{5\sqrt{2}\cdot 3^{\frac{3}{4}}b^{\frac{4}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{24a^{\frac{5}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate(1/x**5/(b*x**3+a)**(1/2),x)
```

```
[Out] -sqrt(a + b*x**3)/(4*a*x**4) - 5*b**(4/3)*sqrt(a + b*x**3)/(8*a**
2*(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)) + 5*b*sqrt(a + b*x**3)/(
8*a**2*x) + 5*3**(1/4)*b**(4/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3
)*x + b**(2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sq
rt(-sqrt(3) + 2)*(a**(1/3) + b**(1/3)*x)*elliptic_e(asin((-a**(1/
3)*(-1 + sqrt(3)) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3
)*x)), -7 - 4*sqrt(3))/(16*a**(5/3)*sqrt(a**(1/3)*(a**(1/3) + b**
(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**
3)) - 5*sqrt(2)*3**(3/4)*b**(4/3)*sqrt((a**(2/3) - a**(1/3)*b**(1
/3)*x + b**(2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*
(a**(1/3) + b**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3))
 + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4*sqr
t(3))/(24*a**(5/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1/3
)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3))
```

Mathematica [C] time = 2.08462, size = 231, normalized size = 0.45

$$\frac{\sqrt{a+bx^3}\left(5bx^3-2a\right)}{8a^2x^4}-\frac{5\sqrt[6]{-1}(-b)^{4/3}\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}\left(\sqrt[3]{-1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)-i\sqrt{3}E\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i}{}}}{}\right.\right.\right.}{8\sqrt[4]{3}a^{4/3}\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/(x^5*Sqrt[a + b*x^3]),x]
```

```
[Out] (Sqrt[a + b*x^3]*(-2*a + 5*b*x^3))/(8*a^2*x^4) - (5*(-1)^(1/6)*(-
b)^(4/3)*Sqrt[(-1)^(5/6)*(-1 + ((-b)^(1/3)*x)/a^(1/3))]*Sqrt[1 +
((-b)^(1/3)*x)/a^(1/3) + ((-b)^(2/3)*x^2)/a^(2/3)]*((-I)*Sqrt[3]*
EllipticE[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(
1/4)], (-1)^(1/3)] + (-1)^(1/3)*EllipticF[ArcSin[Sqrt[-(-1)^(5/6)
 - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)^(1/3)]))/(8*3^(1/4)*a
^(4/3)*Sqrt[a + b*x^3])
```

Maple [A] time = 0.026, size = 472, normalized size = 0.9

$$-\frac{1}{4\,ax^4}\sqrt{bx^3+a}+\frac{5\,b}{8\,xa^2}\sqrt{bx^3+a}$$
$$+\frac{\frac{5\,i}{24}b\sqrt{3}}{a^2}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2\,b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2\,b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^5/(b*x^3+a)^(1/2),x)
```

```
[Out] -1/4*(b*x^3+a)^(1/2)/a/x^4+5/8*b*(b*x^3+a)^(1/2)/x/a^2+5/24*I/a^2
*b*3^(1/2)*(-a*b^2)^(1/3)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2
)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)*((x-1/b*(-a*b
^2)^(1/3))/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))
)^(1/2)*(-I*(x+1/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3
))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)/(b*x^3+a)^(1/2)*((-3/2/b*(-a*b
^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*EllipticE(1/3*3^(1/2)*(
I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)
*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*
b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2))+1/b*(-a*b^2)^(
1/3)*EllipticF(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/
2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b
*(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(
1/3)))^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{bx^3+ax^5}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^3 + a)*x^5),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(b*x^3 + a)*x^5), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{bx^3+ax^5}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^3 + a)*x^5),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(b*x^3 + a)*x^5), x)
```

Sympy [A] time = 3.0495, size = 44, normalized size = 0.09

$$\frac{\Gamma\left(-\frac{4}{3}\right) {}_2F_1\left(\begin{matrix} -\frac{4}{3}, \frac{1}{2} \\ -\frac{1}{3} \end{matrix}\middle| \frac{bx^3e^{i\pi}}{a}\right)}{3\sqrt{a}x^4\,\Gamma\left(-\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**5/(b*x**3+a)**(1/2),x)
```

```
[Out] gamma(-4/3)*hyper((-4/3, 1/2), (-1/3,), b*x**3*exp_polar(I*pi)/a)
/(3*sqrt(a)*x**4*gamma(-1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{bx^3 + a}x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^3 + a)*x^5),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(b*x^3 + a)*x^5), x)
```

3.421 $\int \frac{x^{11}}{(a+bx^3)^{3/2}}\,dx$

Optimal. Leaf size=78

$$\frac{2a^3}{3b^4\sqrt{a+bx^3}}+\frac{2a^2\sqrt{a+bx^3}}{b^4}-\frac{2a\left(a+bx^3\right)^{3/2}}{3b^4}+\frac{2\left(a+bx^3\right)^{5/2}}{15b^4}$$

```
[Out] (2*a^3)/(3*b^4*Sqrt[a + b*x^3]) + (2*a^2*Sqrt[a + b*x^3])/b^4 - (
2*a*(a + b*x^3)^(3/2))/(3*b^4) + (2*(a + b*x^3)^(5/2))/(15*b^4)
```

Rubi [A] time = 0.111452, antiderivative size = 78, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2a^3}{3b^4\sqrt{a+bx^3}}+\frac{2a^2\sqrt{a+bx^3}}{b^4}-\frac{2a\left(a+bx^3\right)^{3/2}}{3b^4}+\frac{2\left(a+bx^3\right)^{5/2}}{15b^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11/(a + b*x^3)^(3/2),x]
```

```
[Out] (2*a^3)/(3*b^4*Sqrt[a + b*x^3]) + (2*a^2*Sqrt[a + b*x^3])/b^4 - (
2*a*(a + b*x^3)^(3/2))/(3*b^4) + (2*(a + b*x^3)^(5/2))/(15*b^4)
```

Rubi in Sympy [A] time = 14.9627, size = 73, normalized size = 0.94

$$\frac{2a^3}{3b^4\sqrt{a+bx^3}}+\frac{2a^2\sqrt{a+bx^3}}{b^4}-\frac{2a\left(a+bx^3\right)^{\frac{3}{2}}}{3b^4}+\frac{2\left(a+bx^3\right)^{\frac{5}{2}}}{15b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11/(b*x**3+a)**(3/2),x)
```

```
[Out] 2*a**3/(3*b**4*sqrt(a + b*x**3)) + 2*a**2*sqrt(a + b*x**3)/b**4 -
 2*a*(a + b*x**3)**(3/2)/(3*b**4) + 2*(a + b*x**3)**(5/2)/(15*b**
4)
```

Mathematica [A] time = 0.0370566, size = 49, normalized size = 0.63

$$\frac{2\left(16a^3+8a^2bx^3-2ab^2x^6+b^3x^9\right)}{15b^4\sqrt{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11/(a + b*x^3)^(3/2),x]
```

```
[Out] (2*(16*a^3 + 8*a^2*b*x^3 - 2*a*b^2*x^6 + b^3*x^9))/(15*b^4*Sqrt[a
 + b*x^3])
```

Maple [A] time = 0.01, size = 46, normalized size = 0.6

$$\frac{2\,b^3x^9-4\,ab^2x^6+16\,a^2bx^3+32\,a^3}{15\,b^4}\frac{1}{\sqrt{bx^3+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11/(b*x^3+a)^(3/2),x)
```

```
[Out] 2/15/(b*x^3+a)^(1/2)*(b^3*x^9-2*a*b^2*x^6+8*a^2*b*x^3+16*a^3)/b^4
```

Maxima [A] time = 1.41945, size = 86, normalized size = 1.1

$$\frac{2\left(bx^3+a\right)^{\frac{5}{2}}}{15\,b^4}-\frac{2\left(bx^3+a\right)^{\frac{3}{2}}a}{3\,b^4}+\frac{2\,\sqrt{bx^3+a}a^2}{b^4}+\frac{2\,a^3}{3\,\sqrt{bx^3+a}b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(b*x^3 + a)^(3/2),x, algorithm="maxima")
```

```
[Out] 2/15*(b*x^3 + a)^(5/2)/b^4 - 2/3*(b*x^3 + a)^(3/2)*a/b^4 + 2*sqrt
(b*x^3 + a)*a^2/b^4 + 2/3*a^3/(sqrt(b*x^3 + a)*b^4)
```

Fricas [A] time = 0.229177, size = 61, normalized size = 0.78

$$\frac{2\left(b^3x^9-2\,ab^2x^6+8\,a^2bx^3+16\,a^3\right)}{15\,\sqrt{bx^3+a}b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(b*x^3 + a)^(3/2),x, algorithm="fricas")
```

```
[Out] 2/15*(b^3*x^9 - 2*a*b^2*x^6 + 8*a^2*b*x^3 + 16*a^3)/(sqrt(b*x^3 +
 a)*b^4)
```

Sympy [A] time = 11.2718, size = 94, normalized size = 1.21

$$\begin{cases} \frac{32a^3}{15b^4\sqrt{a+bx^3}}+\frac{16a^2x^3}{15b^3\sqrt{a+bx^3}}-\frac{4ax^6}{15b^2\sqrt{a+bx^3}}+\frac{2x^9}{15b\sqrt{a+bx^3}} & \text{for } b\neq 0 \\ \frac{x^{12}}{12a^{\frac{3}{2}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11/(b*x**3+a)**(3/2),x)
```

```
[Out] Piecewise((32*a**3/(15*b**4*sqrt(a + b*x**3)) + 16*a**2*x**3/(15*
b**3*sqrt(a + b*x**3)) - 4*a*x**6/(15*b**2*sqrt(a + b*x**3)) + 2*
x**9/(15*b*sqrt(a + b*x**3)), Ne(b, 0)), (x**12/(12*a**(3/2)), Tr
ue))
```

GIAC/XCAS [A] time = 0.214355, size = 74, normalized size = 0.95

$$\frac{2\left(\left(bx^3+a\right)^{\frac{5}{2}}-5\left(bx^3+a\right)^{\frac{3}{2}}a+15\,\sqrt{bx^3+a}a^2+\frac{5\,a^3}{\sqrt{bx^3+a}}\right)}{15\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(b*x^3 + a)^(3/2),x, algorithm="giac")
```

```
[Out] 2/15*((b*x^3 + a)^(5/2) - 5*(b*x^3 + a)^(3/2)*a + 15*sqrt(b*x^3 +
 a)*a^2 + 5*a^3/sqrt(b*x^3 + a))/b^4
```

3.422 $\int \frac{x^8}{(a+bx^3)^{3/2}}\,dx$

Optimal. Leaf size=59

$$-\frac{2a^2}{3b^3\sqrt{a+bx^3}}-\frac{4a\sqrt{a+bx^3}}{3b^3}+\frac{2\left(a+bx^3\right)^{3/2}}{9b^3}$$

```
[Out] (-2*a^2)/(3*b^3*Sqrt[a + b*x^3]) - (4*a*Sqrt[a + b*x^3])/(3*b^3)
+ (2*(a + b*x^3)^(3/2))/(9*b^3)
```

Rubi [A] time = 0.0886321, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2a^2}{3b^3\sqrt{a+bx^3}}-\frac{4a\sqrt{a+bx^3}}{3b^3}+\frac{2\left(a+bx^3\right)^{3/2}}{9b^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^8/(a + b*x^3)^(3/2),x]
```

```
[Out] (-2*a^2)/(3*b^3*Sqrt[a + b*x^3]) - (4*a*Sqrt[a + b*x^3])/(3*b^3)
+ (2*(a + b*x^3)^(3/2))/(9*b^3)
```

Rubi in Sympy [A] time = 10.8284, size = 54, normalized size = 0.92

$$-\frac{2a^2}{3b^3\sqrt{a+bx^3}}-\frac{4a\sqrt{a+bx^3}}{3b^3}+\frac{2\left(a+bx^3\right)^{\frac{3}{2}}}{9b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**8/(b*x**3+a)**(3/2),x)
```

```
[Out] -2*a**2/(3*b**3*sqrt(a + b*x**3)) - 4*a*sqrt(a + b*x**3)/(3*b**3)
 + 2*(a + b*x**3)**(3/2)/(9*b**3)
```

Mathematica [A] time = 0.0301514, size = 38, normalized size = 0.64

$$\frac{2\left(-8a^2-4abx^3+b^2x^6\right)}{9b^3\sqrt{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^8/(a + b*x^3)^(3/2),x]
```

```
[Out] (2*(-8*a^2 - 4*a*b*x^3 + b^2*x^6))/(9*b^3*Sqrt[a + b*x^3])
```

Maple [A] time = 0.007, size = 36, normalized size = 0.6

$$-\frac{-2\,b^2x^6+8\,abx^3+16\,a^2}{9\,b^3}\frac{1}{\sqrt{bx^3+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8/(b*x^3+a)^(3/2),x)
```

```
[Out] -2/9/(b*x^3+a)^(1/2)*(-b^2*x^6+4*a*b*x^3+8*a^2)/b^3
```

Maxima [A] time = 1.43941, size = 63, normalized size = 1.07

$$\frac{2\left(bx^3+a\right)^{\frac{3}{2}}}{9\,b^3}-\frac{4\,\sqrt{bx^3+a}a}{3\,b^3}-\frac{2\,a^2}{3\,\sqrt{bx^3+a}b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^3 + a)^(3/2),x, algorithm="maxima")
```

```
[Out] 2/9*(b*x^3 + a)^(3/2)/b^3 - 4/3*sqrt(b*x^3 + a)*a/b^3 - 2/3*a^2/(
sqrt(b*x^3 + a)*b^3)
```

Fricas [A] time = 0.227429, size = 46, normalized size = 0.78

$$\frac{2\left(b^2x^6-4\,abx^3-8\,a^2\right)}{9\,\sqrt{bx^3+a}b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^3 + a)^(3/2),x, algorithm="fricas")
```

```
[Out] 2/9*(b^2*x^6 - 4*a*b*x^3 - 8*a^2)/(sqrt(b*x^3 + a)*b^3)
```

Sympy [A] time = 5.48458, size = 70, normalized size = 1.19

$$\begin{cases} -\frac{16a^2}{9b^3\sqrt{a+bx^3}}-\frac{8ax^3}{9b^2\sqrt{a+bx^3}}+\frac{2x^6}{9b\sqrt{a+bx^3}} & \text{for } b\neq 0 \\ \frac{x^9}{9a^{\frac{3}{2}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8/(b*x**3+a)**(3/2),x)
```

```
[Out] Piecewise((-16*a**2/(9*b**3*sqrt(a + b*x**3)) - 8*a*x**3/(9*b**2*
sqrt(a + b*x**3)) + 2*x**6/(9*b*sqrt(a + b*x**3)), Ne(b, 0)), (x*
*9/(9*a**(3/2)), True))
```

GIAC/XCAS [A] time = 0.235441, size = 55, normalized size = 0.93

$$\frac{2\left(\left(bx^3+a\right)^{\frac{3}{2}}-6\,\sqrt{bx^3+a}a-\frac{3\,a^2}{\sqrt{bx^3+a}}\right)}{9\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^3 + a)^(3/2),x, algorithm="giac")
```

```
[Out] 2/9*((b*x^3 + a)^(3/2) - 6*sqrt(b*x^3 + a)*a - 3*a^2/sqrt(b*x^3 +
 a))/b^3
```

3.423 $\int \frac{x^5}{(a+bx^3)^{3/2}}\,dx$

Optimal. Leaf size=38

$$\frac{2a}{3b^2\sqrt{a+bx^3}}+\frac{2\sqrt{a+bx^3}}{3b^2}$$

```
[Out] (2*a)/(3*b^2*Sqrt[a + b*x^3]) + (2*Sqrt[a + b*x^3])/(3*b^2)
```

Rubi [A] time = 0.0608243, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2a}{3b^2\sqrt{a+bx^3}}+\frac{2\sqrt{a+bx^3}}{3b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/(a + b*x^3)^(3/2),x]

[Out] (2*a)/(3*b^2*Sqrt[a + b*x^3]) + (2*Sqrt[a + b*x^3])/(3*b^2)
```

Rubi in Sympy [A] time = 7.3163, size = 34, normalized size = 0.89

$$\frac{2a}{3b^2\sqrt{a+bx^3}}+\frac{2\sqrt{a+bx^3}}{3b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(b*x**3+a)**(3/2),x)

[Out] 2*a/(3*b**2*sqrt(a + b*x**3)) + 2*sqrt(a + b*x**3)/(3*b**2)
```

Mathematica [A] time = 0.0213304, size = 27, normalized size = 0.71

$$\frac{2\left(2a+bx^3\right)}{3b^2\sqrt{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/(a + b*x^3)^(3/2),x]

[Out] (2*(2*a + b*x^3))/(3*b^2*Sqrt[a + b*x^3])
```

Maple [A] time = 0.008, size = 24, normalized size = 0.6

$$\frac{2\,bx^3+4\,a}{3\,b^2}\frac{1}{\sqrt{bx^3+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(b*x^3+a)^(3/2),x)
```

```
[Out] 2/3/(b*x^3+a)^(1/2)*(b*x^3+2*a)/b^2
```

Maxima [A] time = 1.42177, size = 41, normalized size = 1.08

$$\frac{2\,\sqrt{bx^3+a}}{3\,b^2}+\frac{2\,a}{3\,\sqrt{bx^3+a}b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^3 + a)^(3/2),x, algorithm="maxima")
```

```
[Out] 2/3*sqrt(b*x^3 + a)/b^2 + 2/3*a/(sqrt(b*x^3 + a)*b^2)
```

Fricas [A] time = 0.228181, size = 31, normalized size = 0.82

$$\frac{2\,(bx^3+2\,a)}{3\,\sqrt{bx^3+a}b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^3 + a)^(3/2),x, algorithm="fricas")
```

```
[Out] 2/3*(b*x^3 + 2*a)/(sqrt(b*x^3 + a)*b^2)
```

Sympy [A] time = 3.00017, size = 46, normalized size = 1.21

$$\begin{cases} \frac{4a}{3b^2\sqrt{a+bx^3}}+\frac{2x^3}{3b\sqrt{a+bx^3}} & \text{for } b \neq 0 \\ \frac{x^6}{6a^{\frac{3}{2}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(b*x**3+a)**(3/2),x)
```

```
[Out] Piecewise((4*a/(3*b**2*sqrt(a + b*x**3)) + 2*x**3/(3*b*sqrt(a + b
*x**3)), Ne(b, 0)), (x**6/(6*a**(3/2)), True))
```

GIAC/XCAS [A] time = 0.245199, size = 35, normalized size = 0.92

$$\frac{2\left(\sqrt{bx^3+a}+\frac{a}{\sqrt{bx^3+a}}\right)}{3\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^3 + a)^(3/2),x, algorithm="giac")
```

```
[Out] 2/3*(sqrt(b*x^3 + a) + a/sqrt(b*x^3 + a))/b^2
```

3.424 $\int \frac{x^2}{(a+bx^3)^{3/2}}\,dx$

Optimal. Leaf size=18

$$-\frac{2}{3b\sqrt{a+bx^3}}$$

[Out] -2/(3*b*Sqrt[a + b*x^3])

Rubi [A] time = 0.0107943, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{2}{3b\sqrt{a+bx^3}}$$

Antiderivative was successfully verified.

[In] Int[x^2/(a + b*x^3)^(3/2),x]

[Out] -2/(3*b*Sqrt[a + b*x^3])

Rubi in Sympy [A] time = 2.19983, size = 15, normalized size = 0.83

$$-\frac{2}{3b\sqrt{a+bx^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(x**2/(b*x**3+a)**(3/2),x)

[Out] -2/(3*b*sqrt(a + b*x**3))

Mathematica [A] time = 0.0104929, size = 18, normalized size = 1.

$$-\frac{2}{3b\sqrt{a+bx^3}}$$

Antiderivative was successfully verified.

[In] Integrate[x^2/(a + b*x^3)^(3/2),x]

[Out] -2/(3*b*Sqrt[a + b*x^3])

Maple [A] time = 0.005, size = 15, normalized size = 0.8

$$-\frac{2}{3\,b}\frac{1}{\sqrt{bx^3+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^2/(b*x^3+a)^(3/2),x)

[Out] -2/3/b/(b*x^3+a)^(1/2)

Maxima [A] time = 1.44872, size = 19, normalized size = 1.06

$$-\frac{2}{3\sqrt{bx^3+a}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^3 + a)^(3/2),x, algorithm="maxima")
```

```
[Out] -2/3/(sqrt(b*x^3 + a)*b)
```

Fricas [A] time = 0.222588, size = 19, normalized size = 1.06

$$-\frac{2}{3\sqrt{bx^3+a}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^3 + a)^(3/2),x, algorithm="fricas")
```

```
[Out] -2/3/(sqrt(b*x^3 + a)*b)
```

Sympy [A] time = 2.04845, size = 26, normalized size = 1.44

$$\begin{cases} -\frac{2}{3b\sqrt{a+bx^3}} & \text{for } b \neq 0 \\ \frac{x^3}{3a^{\frac{3}{2}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(b*x**3+a)**(3/2),x)
```

```
[Out] Piecewise((-2/(3*b*sqrt(a + b*x**3)), Ne(b, 0)), (x**3/(3*a**(3/2
)), True))
```

GIAC/XCAS [A] time = 0.209972, size = 19, normalized size = 1.06

$$-\frac{2}{3\sqrt{bx^3+a}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^3 + a)^(3/2),x, algorithm="giac")
```

```
[Out] -2/3/(sqrt(b*x^3 + a)*b)
```

3.425 $\int \frac{1}{x(a+bx^3)^{3/2}}\,dx$

Optimal. Leaf size=46

$$\frac{2}{3a\sqrt{a+bx^3}}-\frac{2\tanh^{-1}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)}{3a^{3/2}}$$

```
[Out] 2/(3*a*Sqrt[a + b*x^3]) - (2*ArcTanh[Sqrt[a + b*x^3]/Sqrt[a]])/(3
*a^(3/2))
```

Rubi [A] time = 0.0749307, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{2}{3a\sqrt{a+bx^3}}-\frac{2\tanh^{-1}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)}{3a^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a + b*x^3)^(3/2)),x]
```

```
[Out] 2/(3*a*Sqrt[a + b*x^3]) - (2*ArcTanh[Sqrt[a + b*x^3]/Sqrt[a]])/(3
*a^(3/2))
```

Rubi in Sympy [A] time = 7.52561, size = 39, normalized size = 0.85

$$\frac{2}{3a\sqrt{a+bx^3}}-\frac{2\,\text{atanh}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)}{3a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(b*x**3+a)**(3/2),x)
```

```
[Out] 2/(3*a*sqrt(a + b*x**3)) - 2*atanh(sqrt(a + b*x**3)/sqrt(a))/(3*a
**(3/2))
```

Mathematica [A] time = 0.134817, size = 51, normalized size = 1.11

$$\frac{2-2\sqrt{\frac{bx^3}{a}+1}\tanh^{-1}\left(\sqrt{\frac{bx^3}{a}+1}\right)}{3a\sqrt{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a + b*x^3)^(3/2)),x]
```

```
[Out] (2 - 2*Sqrt[1 + (b*x^3)/a]*ArcTanh[Sqrt[1 + (b*x^3)/a]])/(3*a*Sqr
t[a + b*x^3])
```

Maple [A] time = 0.035, size = 39, normalized size = 0.9

$$\frac{2}{3\,a}\frac{1}{\sqrt{\left(x^3+\frac{a}{b}\right)b}}-\frac{2}{3}Artanh\left(1\sqrt{bx^3+a}\frac{1}{\sqrt{a}}\right)a^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x/(b*x^3+a)^(3/2),x)
```

```
[Out] 2/3/a/((x^3+a/b)*b)^(1/2)-2/3*arctanh((b*x^3+a)^(1/2)/a^(1/2))/a^
(3/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((b*x^3 + a)^(3/2)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.238317, size = 1, normalized size = 0.02

$$\left[\frac{\sqrt{bx^3+a}\log\left(\frac{(bx^3+2a)\sqrt{a}-2\sqrt{bx^3+a}a}{x^3}\right)+2\sqrt{a}}{3\sqrt{bx^3+a}a^{\frac{3}{2}}}, \frac{2\left(\sqrt{bx^3+a}\arctan\left(\frac{a}{\sqrt{bx^3+a}\sqrt{-a}}\right)+\sqrt{-a}\right)}{3\sqrt{bx^3+a}\sqrt{-a}a}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((b*x^3 + a)^(3/2)*x),x, algorithm="fricas")
```

```
[Out] [1/3*(sqrt(b*x^3 + a)*log(((b*x^3 + 2*a)*sqrt(a) - 2*sqrt(b*x^3 +
 a)*a)/x^3) + 2*sqrt(a))/(sqrt(b*x^3 + a)*a^(3/2)), 2/3*(sqrt(b*x
^3 + a)*arctan(a/(sqrt(b*x^3 + a)*sqrt(-a))) + sqrt(-a))/(sqrt(b*
x^3 + a)*sqrt(-a)*a)]
```

Sympy [A] time = 6.03013, size = 184, normalized size = 4.

$$\frac{2a^3\sqrt{1+\frac{bx^3}{a}}}{3a^{\frac{9}{2}}+3a^{\frac{7}{2}}bx^3}+\frac{a^3\log\left(\frac{bx^3}{a}\right)}{3a^{\frac{9}{2}}+3a^{\frac{7}{2}}bx^3}-\frac{2a^3\log\left(\sqrt{1+\frac{bx^3}{a}}+1\right)}{3a^{\frac{9}{2}}+3a^{\frac{7}{2}}bx^3}+\frac{a^2bx^3\log\left(\frac{bx^3}{a}\right)}{3a^{\frac{9}{2}}+3a^{\frac{7}{2}}bx^3}-\frac{2a^2bx^3\log\left(\sqrt{1+\frac{bx^3}{a}}+1\right)}{3a^{\frac{9}{2}}+3a^{\frac{7}{2}}bx^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/x/(b*x**3+a)**(3/2),x)
```

```
[Out] 2*a**3*sqrt(1 + b*x**3/a)/(3*a**(9/2) + 3*a**(7/2)*b*x**3) + a**3
*log(b*x**3/a)/(3*a**(9/2) + 3*a**(7/2)*b*x**3) - 2*a**3*log(sqrt
(1 + b*x**3/a) + 1)/(3*a**(9/2) + 3*a**(7/2)*b*x**3) + a**2*b*x**
3*log(b*x**3/a)/(3*a**(9/2) + 3*a**(7/2)*b*x**3) - 2*a**2*b*x**3*
log(sqrt(1 + b*x**3/a) + 1)/(3*a**(9/2) + 3*a**(7/2)*b*x**3)
```

GIAC/XCAS [A] time = 0.212907, size = 55, normalized size = 1.2

$$\frac{2\arctan\left(\frac{\sqrt{bx^3+a}}{\sqrt{-a}}\right)}{3\sqrt{-a}a}+\frac{2}{3\sqrt{bx^3+a}a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(3/2)*x),x, algorithm="giac")
```

```
[Out] 2/3*arctan(sqrt(b*x^3 + a)/sqrt(-a))/(sqrt(-a)*a) + 2/3/(sqrt(b*x
^3 + a)*a)
```

3.426 $\int \frac{1}{x^4(a+bx^3)^{3/2}}\,dx$

Optimal. Leaf size=66

$$\frac{b\tanh^{-1}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)}{a^{5/2}}-\frac{\sqrt{a+bx^3}}{a^2x^3}+\frac{2}{3ax^3\sqrt{a+bx^3}}$$

```
[Out] 2/(3*a*x^3*Sqrt[a + b*x^3]) - Sqrt[a + b*x^3]/(a^2*x^3) + (b*ArcT
anh[Sqrt[a + b*x^3]/Sqrt[a]])/a^(5/2)
```

Rubi [A] time = 0.102586, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{b\tanh^{-1}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)}{a^{5/2}}-\frac{\sqrt{a+bx^3}}{a^2x^3}+\frac{2}{3ax^3\sqrt{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*(a + b*x^3)^(3/2)),x]
```

```
[Out] 2/(3*a*x^3*Sqrt[a + b*x^3]) - Sqrt[a + b*x^3]/(a^2*x^3) + (b*ArcT
anh[Sqrt[a + b*x^3]/Sqrt[a]])/a^(5/2)
```

Rubi in Sympy [A] time = 10.1661, size = 58, normalized size = 0.88

$$\frac{2}{3ax^3\sqrt{a+bx^3}}-\frac{\sqrt{a+bx^3}}{a^2x^3}+\frac{b\operatorname{atanh}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)}{a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(b*x**3+a)**(3/2),x)
```

```
[Out] 2/(3*a*x**3*sqrt(a + b*x**3)) - sqrt(a + b*x**3)/(a**2*x**3) + b*
atanh(sqrt(a + b*x**3)/sqrt(a))/a**(5/2)
```

Mathematica [A] time = 0.338247, size = 64, normalized size = 0.97

$$-\frac{-3bx^3\sqrt{\frac{bx^3}{a}+1}\tanh^{-1}\left(\sqrt{\frac{bx^3}{a}+1}\right)+a+3bx^3}{3a^2x^3\sqrt{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*(a + b*x^3)^(3/2)),x]
```

```
[Out] -(a + 3*b*x^3 - 3*b*x^3*Sqrt[1 + (b*x^3)/a]*ArcTanh[Sqrt[1 + (b*x
^3)/a]])/(3*a^2*x^3*Sqrt[a + b*x^3])
```

Maple [A] time = 0.033, size = 57, normalized size = 0.9

$$-\frac{1}{3x^3a^2}\sqrt{bx^3+a}-\frac{2b}{3a^2}\frac{1}{\sqrt{\left(x^3+\frac{a}{b}\right)b}}+b\mathit{Artanh}\left(1\sqrt{bx^3+a}\frac{1}{\sqrt{a}}\right)a^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(b*x^3+a)^(3/2),x)
```

```
[Out] -1/3*(b*x^3+a)^(1/2)/x^3/a^2-2/3*b/a^2/((x^3+a/b)*b)^(1/2)+b*arct
anh((b*x^3+a)^(1/2)/a^(1/2))/a^(5/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(3/2)*x^4),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.244232, size = 1, normalized size = 0.02

$$\left[\frac{3\sqrt{bx^3+a}\,bx^3\log\left(\frac{(bx^3+2\,a)\sqrt{a}+2\sqrt{bx^3+a}a}{x^3}\right)-2\left(3\,bx^3+a\right)\sqrt{a}}{6\sqrt{bx^3+a}a^{\frac{5}{2}}x^3},\ -\frac{3\sqrt{bx^3+a}\,bx^3\arctan\left(\frac{a}{\sqrt{bx^3+a}\sqrt{-a}}\right)+\left(3\,bx^3+a\right)\sqrt{-a}}{3\sqrt{bx^3+a}\sqrt{-a}a^2x^3}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(3/2)*x^4),x, algorithm="fricas")
```

```
[Out] [1/6*(3*sqrt(b*x^3 + a)*b*x^3*log(((b*x^3 + 2*a)*sqrt(a) + 2*sqrt
(b*x^3 + a)*a)/x^3) - 2*(3*b*x^3 + a)*sqrt(a))/(sqrt(b*x^3 + a)*a
^(5/2)*x^3), -1/3*(3*sqrt(b*x^3 + a)*b*x^3*arctan(a/(sqrt(b*x^3 +
 a)*sqrt(-a))) + (3*b*x^3 + a)*sqrt(-a))/(sqrt(b*x^3 + a)*sqrt(-a
)*a^2*x^3)]
```

Sympy [A] time = 11.9643, size = 75, normalized size = 1.14

$$-\frac{1}{3a\sqrt{b}x^{\frac{9}{2}}\sqrt{\frac{a}{bx^3}+1}}-\frac{\sqrt{b}}{a^2x^{\frac{3}{2}}\sqrt{\frac{a}{bx^3}+1}}+\frac{b\operatorname{asinh}\left(\frac{\sqrt{a}}{\sqrt{b}x^{\frac{3}{2}}}\right)}{a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(b*x**3+a)**(3/2),x)
```

```
[Out] -1/(3*a*sqrt(b)*x**(9/2)*sqrt(a/(b*x**3) + 1)) - sqrt(b)/(a**2*x*
*(3/2)*sqrt(a/(b*x**3) + 1)) + b*asinh(sqrt(a)/(sqrt(b)*x**(3/2))
)/a**(5/2)
```

<u>**GIAC/XCAS**</u> **[A]** time = 0.212928, size = 89, normalized size = 1.35

$$-\frac{1}{3}\,b\left(\frac{3\,\arctan\left(\frac{\sqrt{bx^3+a}}{\sqrt{-a}}\right)}{\sqrt{-a}a^2}+\frac{3\,bx^3+a}{\left((bx^3+a)^{\frac{3}{2}}-\sqrt{bx^3+a}a\right)a^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(3/2)*x^4),x, algorithm="giac")
```

```
[Out] -1/3*b*(3*arctan(sqrt(b*x^3 + a)/sqrt(-a))/(sqrt(-a)*a^2) + (3*b*
x^3 + a)/(((b*x^3 + a)^(3/2) - sqrt(b*x^3 + a)*a)*a^2))
```

3.427 $\int \frac{1}{x^7(a+bx^3)^{3/2}}\,dx$

Optimal. Leaf size=95

$$-\frac{5b^2\tanh^{-1}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)}{4a^{7/2}}+\frac{5b\sqrt{a+bx^3}}{4a^3x^3}-\frac{5\sqrt{a+bx^3}}{6a^2x^6}+\frac{2}{3ax^6\sqrt{a+bx^3}}$$

```
[Out] 2/(3*a*x^6*Sqrt[a + b*x^3]) - (5*Sqrt[a + b*x^3])/(6*a^2*x^6) + (
5*b*Sqrt[a + b*x^3])/(4*a^3*x^3) - (5*b^2*ArcTanh[Sqrt[a + b*x^3]
/Sqrt[a]])/(4*a^(7/2))
```

Rubi [A] time = 0.138171, antiderivative size = 95, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{5b^2\tanh^{-1}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)}{4a^{7/2}}+\frac{5b\sqrt{a+bx^3}}{4a^3x^3}-\frac{5\sqrt{a+bx^3}}{6a^2x^6}+\frac{2}{3ax^6\sqrt{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^7*(a + b*x^3)^(3/2)),x]
```

```
[Out] 2/(3*a*x^6*Sqrt[a + b*x^3]) - (5*Sqrt[a + b*x^3])/(6*a^2*x^6) + (
5*b*Sqrt[a + b*x^3])/(4*a^3*x^3) - (5*b^2*ArcTanh[Sqrt[a + b*x^3]
/Sqrt[a]])/(4*a^(7/2))
```

Rubi in Sympy [A] time = 14.0509, size = 88, normalized size = 0.93

$$\frac{2}{3ax^6\sqrt{a+bx^3}}-\frac{5\sqrt{a+bx^3}}{6a^2x^6}+\frac{5b\sqrt{a+bx^3}}{4a^3x^3}-\frac{5b^2\,\mathrm{atanh}\left(\frac{\sqrt{a+bx^3}}{\sqrt{a}}\right)}{4a^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**7/(b*x**3+a)**(3/2),x)
```

```
[Out] 2/(3*a*x**6*sqrt(a + b*x**3)) - 5*sqrt(a + b*x**3)/(6*a**2*x**6)
+ 5*b*sqrt(a + b*x**3)/(4*a**3*x**3) - 5*b**2*atanh(sqrt(a + b*x*
*3)/sqrt(a))/(4*a**(7/2))
```

Mathematica [A] time = 0.331747, size = 73, normalized size = 0.77

$$\frac{-\frac{2a^2}{x^6}-15b^2\sqrt{\frac{bx^3}{a}+1}\tanh^{-1}\left(\sqrt{\frac{bx^3}{a}+1}\right)+\frac{5ab}{x^3}+15b^2}{12a^3\sqrt{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^7*(a + b*x^3)^(3/2)),x]
```

```
[Out] (15*b^2 - (2*a^2)/x^6 + (5*a*b)/x^3 - 15*b^2*Sqrt[1 + (b*x^3)/a]*
ArcTanh[Sqrt[1 + (b*x^3)/a]])/(12*a^3*Sqrt[a + b*x^3])
```

Maple [A] time = 0.038, size = 80, normalized size = 0.8

$$-\frac{1}{6\,a^2x^6}\sqrt{bx^3+a}+\frac{7\,b}{12\,a^3x^3}\sqrt{bx^3+a}+\frac{2\,b^2}{3\,a^3}\frac{1}{\sqrt{\left(x^3+\frac{a}{b}\right)\,b}}-\frac{5\,b^2}{4}Artanh\left(1\sqrt{bx^3+a}\frac{1}{\sqrt{a}}\right)a^{-\frac{7}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^7/(b*x^3+a)^(3/2),x)
```

```
[Out] -1/6*(b*x^3+a)^(1/2)/a^2/x^6+7/12*b*(b*x^3+a)^(1/2)/a^3/x^3+2/3*b
^2/a^3/((x^3+a/b)*b)^(1/2)-5/4*b^2*arctanh((b*x^3+a)^(1/2)/a^(1/2
))/a^(7/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(3/2)*x^7),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.242336, size = 1, normalized size = 0.01

$$\left[\frac{15\,\sqrt{bx^3+a}b^2x^6\log\left(\frac{(bx^3+2\,a)\,\sqrt{a}-2\,\sqrt{bx^3+a}a}{x^3}\right)+2\left(15\,b^2x^6+5\,abx^3-2\,a^2\right)\sqrt{a}}{24\,\sqrt{bx^3+a}a^{\frac{7}{2}}x^6},\ \frac{15\,\sqrt{bx^3+a}b^2x^6\arctan\left(\frac{a}{\sqrt{bx^3+a}\sqrt{-a}}\right)+(15}{12\,\sqrt{bx^3+a}\sqrt{-a}a^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(3/2)*x^7),x, algorithm="fricas")
```

```
[Out] [1/24*(15*sqrt(b*x^3 + a)*b^2*x^6*log(((b*x^3 + 2*a)*sqrt(a) - 2*
sqrt(b*x^3 + a)*a)/x^3) + 2*(15*b^2*x^6 + 5*a*b*x^3 - 2*a^2)*sqrt
(a))/(sqrt(b*x^3 + a)*a^(7/2)*x^6), 1/12*(15*sqrt(b*x^3 + a)*b^2*
x^6*arctan(a/(sqrt(b*x^3 + a)*sqrt(-a))) + (15*b^2*x^6 + 5*a*b*x^
3 - 2*a^2)*sqrt(-a))/(sqrt(b*x^3 + a)*sqrt(-a)*a^3*x^6)]
```

Sympy [A] time = 21.4905, size = 112, normalized size = 1.18

$$-\frac{1}{6a\sqrt{b}x^{\frac{15}{2}}\sqrt{\frac{a}{bx^3}+1}}+\frac{5\sqrt{b}}{12a^2x^{\frac{9}{2}}\sqrt{\frac{a}{bx^3}+1}}+\frac{5b^{\frac{3}{2}}}{4a^3x^{\frac{3}{2}}\sqrt{\frac{a}{bx^3}+1}}-\frac{5b^2\operatorname{asinh}\left(\frac{\sqrt{a}}{\sqrt{b}x^{\frac{3}{2}}}\right)}{4a^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**7/(b*x**3+a)**(3/2),x)
```

```
[Out] -1/(6*a*sqrt(b)*x**(15/2)*sqrt(a/(b*x**3) + 1)) + 5*sqrt(b)/(12*a
**2*x**(9/2)*sqrt(a/(b*x**3) + 1)) + 5*b**(3/2)/(4*a**3*x**(3/2)*
sqrt(a/(b*x**3) + 1)) - 5*b**2*asinh(sqrt(a)/(sqrt(b)*x**(3/2)))/
(4*a**(7/2))
```

GIAC/XCAS [A] time = 0.212856, size = 108, normalized size = 1.14

$$\frac{1}{12}\,b^{2}\left(\frac{15\,\arctan\left(\frac{\sqrt{bx^{3}+a}}{\sqrt{-a}}\right)}{\sqrt{-a}a^{3}}+\frac{8}{\sqrt{bx^{3}+a}a^{3}}+\frac{7\,\left(bx^{3}+a\right)^{\frac{3}{2}}-9\,\sqrt{bx^{3}+a}a}{a^{3}b^{2}x^{6}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(3/2)*x^7),x, algorithm="giac")
```

```
[Out] 1/12*b^2*(15*arctan(sqrt(b*x^3 + a)/sqrt(-a))/(sqrt(-a)*a^3) + 8/
(sqrt(b*x^3 + a)*a^3) + (7*(b*x^3 + a)^(3/2) - 9*sqrt(b*x^3 + a)*
a)/(a^3*b^2*x^6))
```

3.428 $\int \frac{x^6}{(a+bx^3)^{3/2}}\,dx$

Optimal. Leaf size=251

$$-\frac{32\sqrt{2+\sqrt{3}}\,a\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\,F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{15\sqrt[4]{3}\,b^{7/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{16x\sqrt{a+bx^3}}{15b^2}-\frac{2x^4}{3b\sqrt{a+bx^3}}$$

```
[Out] (-2*x^4)/(3*b*Sqrt[a + b*x^3]) + (16*x*Sqrt[a + b*x^3])/(15*b^2)
- (32*Sqrt[2 + Sqrt[3]]*a*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a
^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*
x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 +
Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(15*3^(1/4)*b^(7
/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) +
 b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi [A] time = 0.195076, antiderivative size = 251, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$-\frac{32\sqrt{2+\sqrt{3}}\,a\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\,F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{15\sqrt[4]{3}\,b^{7/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{16x\sqrt{a+bx^3}}{15b^2}-\frac{2x^4}{3b\sqrt{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/(a + b*x^3)^(3/2),x]
```


```
[Out] (-2*x^4)/(3*b*Sqrt[a + b*x^3]) + (16*x*Sqrt[a + b*x^3])/(15*b^2)
- (32*Sqrt[2 + Sqrt[3]]*a*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a
^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*
x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 +
Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(15*3^(1/4)*b^(7
/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) +
 b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 16.8297, size = 223, normalized size = 0.89

$$-\frac{32\cdot 3^{\frac{3}{4}}a\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{45b^{\frac{7}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{2x^4}{3b\sqrt{a+bx^3}}+\frac{16x\sqrt{a+bx^3}}{15b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(b*x**3+a)**(3/2),x)
```

```
[Out] -32*3**(3/4)*a*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b**(2/3)*x*
*2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(sqrt(3) + 2)*(
a**(1/3) + b**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3))
+ b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4*sqrt
(3))/(45*b**(7/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1/3)
*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) - 2*x**4/(3*b*
sqrt(a + b*x**3)) + 16*x*sqrt(a + b*x**3)/(15*b**2)
```

Mathematica [C] time = 0.385139, size = 161, normalized size = 0.64

$$\frac{6\sqrt[3]{-b}x\left(8a+3bx^3\right)-32i3^{3/4}a^{4/3}\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)}{45(-b)^{7/3}\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^6/(a + b*x^3)^(3/2),x]
```

```
[Out] (6*(-b)^(1/3)*x*(8*a + 3*b*x^3) - (32*I)*3^(3/4)*a^(4/3)*Sqrt[(-1
)^(5/6)*(-1 + ((-b)^(1/3)*x)/a^(1/3))]*Sqrt[1 + ((-b)^(1/3)*x)/a^
(1/3) + ((-b)^(2/3)*x^2)/a^(2/3)]*EllipticF[ArcSin[Sqrt[-(-1)^(5/
6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)^(1/3)])/(45*(-b)^(7
/3)*Sqrt[a + b*x^3])
```

Maple [A] time = 0.027, size = 320, normalized size = 1.3

$$\frac{2ax}{3b^2}\frac{1}{\sqrt{\left(x^3+\frac{a}{b}\right)b}}+\frac{2x}{5b^2}\sqrt{bx^3+a}$$

$$+\frac{\frac{32i}{45}a\sqrt{3}}{b^3}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(b*x^3+a)^(3/2),x)
```

```
[Out] 2/3/b^2*a*x/((x^3+a/b)*b)^(1/2)+2/5*x*(b*x^3+a)^(1/2)/b^2+32/45*I
*a/b^3*3^(1/2)*(-a*b^2)^(1/3)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^
(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)*((x-1/b*(
-a*b^2)^(1/3))/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1
/3)))^(1/2)*(-I*(x+1/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^
(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)/(b*x^3+a)^(1/2)*EllipticF(
1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(
1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)
/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{\left(bx^3+a\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(b*x^3 + a)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^6/(b*x^3 + a)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^6}{(bx^3+a)^{\frac{3}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(b*x^3 + a)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^6/(b*x^3 + a)^(3/2), x)
```

Sympy [A] time = 3.01672, size = 37, normalized size = 0.15

$$\frac{x^7\,\Gamma\left(\frac{7}{3}\right)\,{}_2F_1\left(\begin{matrix}\frac{3}{2},\frac{7}{3}\\ \frac{10}{3}\end{matrix}\middle|\frac{bx^3e^{i\pi}}{a}\right)}{3a^{\frac{3}{2}}\,\Gamma\left(\frac{10}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(b*x**3+a)**(3/2),x)
```

```
[Out] x**7*gamma(7/3)*hyper((3/2, 7/3), (10/3,), b*x**3*exp_polar(I*pi)
/a)/(3*a**(3/2)*gamma(10/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^6}{(bx^3+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(b*x^3 + a)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^6/(b*x^3 + a)^(3/2), x)
```

3.429 $\int \frac{x^3}{(a+bx^3)^{3/2}}\,dx$

Optimal. Leaf size=229

$$\frac{4\sqrt{2+\sqrt{3}}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{3\sqrt[4]{3}b^{4/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{2x}{3b\sqrt{a+bx^3}}$$

```
[Out] (-2*x)/(3*b*Sqrt[a + b*x^3]) + (4*Sqrt[2 + Sqrt[3]]*(a^(1/3) + b^
(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + S
qrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a
^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*
Sqrt[3]])/(3*3^(1/4)*b^(4/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))
/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi [A] time = 0.133431, antiderivative size = 229, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{4\sqrt{2+\sqrt{3}}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{3\sqrt[4]{3}b^{4/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{2x}{3b\sqrt{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(a + b*x^3)^(3/2),x]
```


```
[Out] (-2*x)/(3*b*Sqrt[a + b*x^3]) + (4*Sqrt[2 + Sqrt[3]]*(a^(1/3) + b^
(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + S
qrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a
^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*
Sqrt[3]])/(3*3^(1/4)*b^(4/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))
/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 10.9569, size = 201, normalized size = 0.88

$$-\frac{2x}{3b\sqrt{a+bx^3}}+\frac{4\cdot 3^{\frac{3}{4}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{9b^{\frac{4}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(b*x**3+a)**(3/2),x)
```

```
[Out] -2*x/(3*b*sqrt(a + b*x**3)) + 4*3**(3/4)*sqrt((a**(2/3) - a**(1/3
)*b**(1/3)*x + b**(2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*
x)**2)*sqrt(sqrt(3) + 2)*(a**(1/3) + b**(1/3)*x)*elliptic_f(asin(
(-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) +
 b**(1/3)*x)), -7 - 4*sqrt(3))/(9*b**(4/3)*sqrt(a**(1/3)*(a**(1/3
) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a
```

```
+ b*x**3))
```

Mathematica [C] time = 0.554036, size = 151, normalized size = 0.66

$$\frac{6\sqrt[3]{-b}x-4i3^{3/4}\sqrt[3]{a}\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)}{9(-b)^{4/3}\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^3/(a + b*x^3)^(3/2),x]
```

```
[Out] (6*(-b)^(1/3)*x - (4*I)*3^(3/4)*a^(1/3)*Sqrt[(-1)^(5/6)*(-1 + ((-
b)^(1/3)*x)/a^(1/3))]*Sqrt[1 + ((-b)^(1/3)*x)/a^(1/3) + ((-b)^(2/
3)*x^2)/a^(2/3)]*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3
)*x)/a^(1/3)]/3^(1/4)], (-1)^(1/3)])/(9*(-b)^(4/3)*Sqrt[a + b*x^3
])
```

Maple [A] time = 0.026, size = 303, normalized size = 1.3

$$-\frac{2x}{3b}\frac{1}{\sqrt{\left(x^3+\frac{a}{b}\right)b}}$$

$$-\frac{\frac{4i}{9}\sqrt{3}}{b^2}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}b\left(\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(b*x^3+a)^(3/2),x)
```

```
[Out] -2/3/b*x/((x^3+a/b)*b)^(1/2)-4/9*I/b^2*3^(1/2)*(-a*b^2)^(1/3)*(I*
(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b
/(-a*b^2)^(1/3))^(1/2)*((x-1/b*(-a*b^2)^(1/3))/(-3/2/b*(-a*b^2)^(
1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2)*(-I*(x+1/2/b*(-a*b^2)
^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^
(1/2)/(b*x^3+a)^(1/2)*EllipticF(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^
(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(
1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(
1/2)/b*(-a*b^2)^(1/3)))^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{(bx^3+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^3 + a)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^3/(b*x^3 + a)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^3}{(bx^3+a)^{\frac{3}{2}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^3 + a)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^3/(b*x^3 + a)^(3/2), x)
```

Sympy [A] time = 2.45077, size = 37, normalized size = 0.16

$$\frac{x^4\Gamma\left(\frac{4}{3}\right){}_2F_1\left(\begin{matrix}\frac{4}{3},\frac{3}{2}\\ \frac{7}{3}\end{matrix}\middle|\frac{bx^3e^{i\pi}}{a}\right)}{3a^{\frac{3}{2}}\Gamma\left(\frac{7}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(b*x**3+a)**(3/2),x)
```

```
[Out] x**4*gamma(4/3)*hyper((4/3, 3/2), (7/3,), b*x**3*exp_polar(I*pi)/
a)/(3*a**(3/2)*gamma(7/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{(bx^3+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^3 + a)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^3/(b*x^3 + a)^(3/2), x)
```

3.430 $\int \frac{1}{(a+bx^3)^{3/2}}\,dx$

Optimal. Leaf size=232

$$\frac{2\sqrt{2+\sqrt{3}}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{3\sqrt[4]{3}a\sqrt[3]{b}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{2x}{3a\sqrt{a+bx^3}}$$

```
[Out] (2*x)/(3*a*Sqrt[a + b*x^3]) + (2*Sqrt[2 + Sqrt[3]]*(a^(1/3) + b^(
1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sq
rt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^
(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*S
qrt[3]])/(3*3^(1/4)*a*b^(1/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x)
)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi [A] time = 0.118925, antiderivative size = 232, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{2\sqrt{2+\sqrt{3}}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{3\sqrt[4]{3}a\sqrt[3]{b}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{2x}{3a\sqrt{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^3)^(-3/2),x]
```

```
[Out] (2*x)/(3*a*Sqrt[a + b*x^3]) + (2*Sqrt[2 + Sqrt[3]]*(a^(1/3) + b^(
1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sq
rt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^
(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*S
qrt[3]])/(3*3^(1/4)*a*b^(1/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x)
)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 9.12205, size = 202, normalized size = 0.87

$$\frac{2x}{3a\sqrt{a+bx^3}}+\frac{2\cdot 3^{\frac{3}{4}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{9a\sqrt[3]{b}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(b*x**3+a)**(3/2),x)
```

```
[Out] 2*x/(3*a*sqrt(a + b*x**3)) + 2*3**(3/4)*sqrt((a**(2/3) - a**(1/3)
*b**(1/3)*x + b**(2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x
)**2)*sqrt(sqrt(3) + 2)*(a**(1/3) + b**(1/3)*x)*elliptic_f(asin((
-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) +
b**(1/3)*x)), -7 - 4*sqrt(3))/(9*a*b**(1/3)*sqrt(a**(1/3)*(a**(1/
3) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a
```

```
+ b*x**3))
```

Mathematica [C] time = 0.416519, size = 154, normalized size = 0.66

$$\frac{6\sqrt[3]{-b}x+2i3^{3/4}\sqrt[3]{a}\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)}{9a\sqrt[3]{-b}\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[(a + b*x^3)^(-3/2),x]
```

```
[Out] (6*(-b)^(1/3)*x + (2*I)*3^(3/4)*a^(1/3)*Sqrt[(-1)^(5/6)*(-1 + ((-
b)^(1/3)*x)/a^(1/3))]*Sqrt[1 + ((-b)^(1/3)*x)/a^(1/3) + ((-b)^(2/
3)*x^2)/a^(2/3)]*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3
)*x)/a^(1/3)]/3^(1/4)], (-1)^(1/3)])/(9*a*(-b)^(1/3)*Sqrt[a + b*x
^3])
```

Maple [A] time = 0.023, size = 306, normalized size = 1.3

$$\frac{2x}{3a}\frac{1}{\sqrt{\left(x^3+\frac{a}{b}\right)b}}$$

$$-\frac{\frac{2i}{9}\sqrt{3}}{ab}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}b\left(\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^3+a)^(3/2),x)
```

```
[Out] 2/3/a*x/((x^3+a/b)*b)^(1/2)-2/9*I/a*3^(1/2)/b*(-a*b^2)^(1/3)*(I*(
x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/
(-a*b^2)^(1/3))^(1/2)*((x-1/b*(-a*b^2)^(1/3))/(-3/2/b*(-a*b^2)^(1
/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2)*(-I*(x+1/2/b*(-a*b^2)^
(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(
1/2)/(b*x^3+a)^(1/2)*EllipticF(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^(
1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1
/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1
/2)/b*(-a*b^2)^(1/3)))^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^3+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(-3/2),x, algorithm="maxima")
```

```
[Out] integrate((b*x^3 + a)^(-3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(bx^3+a)^{\frac{3}{2}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(-3/2),x, algorithm="fricas")
```

```
[Out] integral((b*x^3 + a)^(-3/2), x)
```

Sympy [A] time = 2.35098, size = 36, normalized size = 0.16

$$\frac{x\Gamma\left(\frac{1}{3}\right){}_{2}F_{1}\left(\begin{matrix}\frac{1}{3},\frac{3}{2}\\\frac{4}{3}\end{matrix}\middle|\frac{bx^{3}e^{i\pi}}{a}\right)}{3a^{\frac{3}{2}}\Gamma\left(\frac{4}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**3+a)**(3/2),x)
```

```
[Out] x*gamma(1/3)*hyper((1/3, 3/2), (4/3,), b*x**3*exp_polar(I*pi)/a)/
(3*a**(3/2)*gamma(4/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^{3}+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(-3/2),x, algorithm="giac")
```

```
[Out] integrate((b*x^3 + a)^(-3/2), x)
```

3.431 $\int \frac{1}{x^3(a+bx^3)^{3/2}}\,dx$

Optimal. Leaf size=255

$$-\frac{7\sqrt{a+bx^3}}{6a^2x^2}-\frac{7\sqrt{2+\sqrt{3}}\,b^{2/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\,F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{6\sqrt[4]{3}\,a^2\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{2}{3ax^2\sqrt{a+bx^3}}$$

```
[Out] 2/(3*a*x^2*Sqrt[a + b*x^3]) - (7*Sqrt[a + b*x^3])/(6*a^2*x^2) - (
7*Sqrt[2 + Sqrt[3]]*b^(2/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) -
 a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3
)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1
+ Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(6*3^(1/4)*a^2
*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^
(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi [A] time = 0.186159, antiderivative size = 255, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$-\frac{7\sqrt{a+bx^3}}{6a^2x^2}-\frac{7\sqrt{2+\sqrt{3}}\,b^{2/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\,F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{6\sqrt[4]{3}\,a^2\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{2}{3ax^2\sqrt{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(a + b*x^3)^(3/2)),x]
```


```
[Out] 2/(3*a*x^2*Sqrt[a + b*x^3]) - (7*Sqrt[a + b*x^3])/(6*a^2*x^2) - (
7*Sqrt[2 + Sqrt[3]]*b^(2/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) -
 a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3
)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1
+ Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(6*3^(1/4)*a^2
*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^
(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 17.1195, size = 226, normalized size = 0.89

$$\frac{2}{3ax^2\sqrt{a+bx^3}} - \frac{7\cdot 3^{\frac{3}{4}}b^{\frac{2}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{18a^2\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}} - \frac{7\sqrt{a+bx^3}}{6a^2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate(1/x**3/(b*x**3+a)**(3/2),x)
```

```
[Out] 2/(3*a*x**2*sqrt(a + b*x**3)) - 7*3**(3/4)*b**(2/3)*sqrt((a**(2/3
) - a**(1/3)*b**(1/3)*x + b**(2/3)*x**2)/(a**(1/3)*(1 + sqrt(3))
+ b**(1/3)*x)**2)*sqrt(sqrt(3) + 2)*(a**(1/3) + b**(1/3)*x)*ellip
tic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)*x)/(a**(1/3)*(1 +
 sqrt(3)) + b**(1/3)*x)), -7 - 4*sqrt(3))/(18*a**2*sqrt(a**(1/3)*
(a**(1/3) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)
*sqrt(a + b*x**3)) - 7*sqrt(a + b*x**3)/(6*a**2*x**2)
```

Mathematica [C] time = 0.511934, size = 170, normalized size = 0.67

$$\frac{-3\sqrt[3]{-b}\left(3a+7bx^3\right)-7i3^{3/4}\sqrt[3]{a}bx^2\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)}{18a^2\sqrt[3]{-b}x^2\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]   Integrate[1/(x^3*(a + b*x^3)^(3/2)),x]
```

```
[Out] (-3*(-b)^(1/3)*(3*a + 7*b*x^3) - (7*I)*3^(3/4)*a^(1/3)*b*x^2*Sqrt
[(-1)^(5/6)*(-1 + ((-b)^(1/3)*x)/a^(1/3))]*Sqrt[1 + ((-b)^(1/3)*x
)/a^(1/3) + ((-b)^(2/3)*x^2)/a^(2/3)]*EllipticF[ArcSin[Sqrt[-(-1)
^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)^(1/3)])/(18*a^2
*(-b)^(1/3)*x^2*Sqrt[a + b*x^3])
```

Maple [A] time = 0.03, size = 321, normalized size = 1.3

$$-\frac{2\,bx}{3\,a^2}\frac{1}{\sqrt{\left(x^3+\frac{a}{b}\right)b}}-\frac{1}{2\,a^2x^2}\sqrt{bx^3+a}$$

$$+\frac{\frac{7\,i}{18}\sqrt{3}}{a^2}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2\,b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2\,b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}b\left(\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^3/(b*x^3+a)^(3/2),x)
```

```
[Out] -2/3*b/a^2*x/((x^3+a/b)*b)^(1/2)-1/2*(b*x^3+a)^(1/2)/a^2/x^2+7/18
*I/a^2*3^(1/2)*(-a*b^2)^(1/3)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^
(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)*((x-1/b*(
```

```
-a*b^2)^(1/3))/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1
/3)))^(1/2)*(-I*(x+1/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^
(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)/(b*x^3+a)^(1/2)*EllipticF(
1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(
1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)
/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^3+a)^{\frac{3}{2}}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(3/2)*x^3),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x^3 + a)^(3/2)*x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(bx^6+ax^3)\sqrt{bx^3+a}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(3/2)*x^3),x, algorithm="fricas")
```

```
[Out] integral(1/((b*x^6 + a*x^3)*sqrt(b*x^3 + a)), x)
```

Sympy [A] time = 3.12073, size = 41, normalized size = 0.16

$$\frac{\Gamma\left(-\frac{2}{3}\right) {}_{2}F_{1}\left(\begin{matrix} -\frac{2}{3}, \frac{3}{2} \\ \frac{1}{3} \end{matrix}\middle| \frac{bx^3 e^{i\pi}}{a}\right)}{3a^{\frac{3}{2}}x^2\,\Gamma\left(\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(b*x**3+a)**(3/2),x)
```

```
[Out] gamma(-2/3)*hyper((-2/3, 3/2), (1/3,), b*x**3*exp_polar(I*pi)/a)/
(3*a**(3/2)*x**2*gamma(1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^3+a)^{\frac{3}{2}}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(3/2)*x^3),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^3 + a)^(3/2)*x^3), x)
```

3.432 $\int \frac{1}{x^6(a+bx^3)^{3/2}} \, dx$

Optimal. Leaf size=277

$$\frac{91b\sqrt{a+bx^3}}{60a^3x^2}-\frac{13\sqrt{a+bx^3}}{15a^2x^5}+\frac{91\sqrt{2+\sqrt{3}}\,b^{5/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\,F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{60\sqrt[4]{3}a^3\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{2}{3ax^5\sqrt{a+bx^3}}$$

```
[Out] 2/(3*a*x^5*Sqrt[a + b*x^3]) - (13*Sqrt[a + b*x^3])/(15*a^2*x^5) +
 (91*b*Sqrt[a + b*x^3])/(60*a^3*x^2) + (91*Sqrt[2 + Sqrt[3]]*b^(5
/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(
2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSin
[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(
1/3)*x)], -7 - 4*Sqrt[3]])/(60*3^(1/4)*a^3*Sqrt[(a^(1/3)*(a^(1/3)
 + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*
x^3])
```

Rubi [A] time = 0.244577, antiderivative size = 277, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{91b\sqrt{a+bx^3}}{60a^3x^2}-\frac{13\sqrt{a+bx^3}}{15a^2x^5}+\frac{91\sqrt{2+\sqrt{3}}\,b^{5/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\,F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{60\sqrt[4]{3}a^3\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{2}{3ax^5\sqrt{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^6*(a + b*x^3)^(3/2)),x]
```

```
[Out] 2/(3*a*x^5*Sqrt[a + b*x^3]) - (13*Sqrt[a + b*x^3])/(15*a^2*x^5) +
 (91*b*Sqrt[a + b*x^3])/(60*a^3*x^2) + (91*Sqrt[2 + Sqrt[3]]*b^(5
/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(
2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSin
[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(
1/3)*x)], -7 - 4*Sqrt[3]])/(60*3^(1/4)*a^3*Sqrt[(a^(1/3)*(a^(1/3)
 + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*
x^3])
```

Rubi in Sympy [A] time = 22.7489, size = 248, normalized size = 0.9

$$\frac{2}{3ax^5\sqrt{a+bx^3}}-\frac{13\sqrt{a+bx^3}}{15a^2x^5}+\frac{91\cdot 3^{\frac{3}{4}}b^{\frac{5}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{180a^3\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{91b\sqrt{a+bx^3}}{60a^3x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate(1/x**6/(b*x**3+a)**(3/2),x)
```

```
[Out] 2/(3*a*x**5*sqrt(a + b*x**3)) - 13*sqrt(a + b*x**3)/(15*a**2*x**5
) + 91*3**(3/4)*b**(5/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b
**(2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(sqrt
(3) + 2)*(a**(1/3) + b**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 +
 sqrt(3)) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -
7 - 4*sqrt(3))/(180*a**3*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a
**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) + 91*b*
sqrt(a + b*x**3)/(60*a**3*x**2)
```

Mathematica [C] time = 0.524007, size = 183, normalized size = 0.66

$$\frac{3\sqrt[3]{-b}\left(-12a^2+39abx^3+91b^2x^6\right)+91i3^{3/4}\sqrt[3]{a}b^2x^5\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5}}}{\sqrt[4]{3}}\right.\right.}{180a^3\sqrt[3]{-b}x^5\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]   Integrate[1/(x^6*(a + b*x^3)^(3/2)),x]
```

```
[Out] (3*(-b)^(1/3)*(-12*a^2 + 39*a*b*x^3 + 91*b^2*x^6) + (91*I)*3^(3/4
)*a^(1/3)*b^2*x^5*Sqrt[(-1)^(5/6)*(-1 + ((-b)^(1/3)*x)/a^(1/3))]*
Sqrt[1 + ((-b)^(1/3)*x)/a^(1/3) + ((-b)^(2/3)*x^2)/a^(2/3)]*Ellip
ticF[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)]
, (-1)^(1/3)])/(180*a^3*(-b)^(1/3)*x^5*Sqrt[a + b*x^3])
```

Maple [A] time = 0.035, size = 342, normalized size = 1.2

$$\frac{2b^2x}{3a^3}\frac{1}{\sqrt{\left(x^3+\frac{a}{b}\right)b}}-\frac{1}{5x^5a^2}\sqrt{bx^3+a}+\frac{17b}{20x^2a^3}\sqrt{bx^3+a}$$
$$-\frac{\frac{91i}{180}b\sqrt{3}}{a^3}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^6/(b*x^3+a)^(3/2),x)
```

```
[Out] 2/3*b^2/a^3*x/((x^3+a/b)*b)^(1/2)-1/5*(b*x^3+a)^(1/2)/x^5/a^2+17/
20*b*(b*x^3+a)^(1/2)/x^2/a^3-91/180*I/a^3*b*3^(1/2)*(-a*b^2)^(1/3
```

```
)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1
/2)*b/(-a*b^2)^(1/3))^(1/2)*((x-1/b*(-a*b^2)^(1/3))/(-3/2/b*(-a*b
^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2)*(-I*(x+1/2/b*(-a
*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1
/3))^(1/2)/(b*x^3+a)^(1/2)*EllipticF(1/3*3^(1/2)*(I*(x+1/2/b*(-a*
b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/
3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*
I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^3+a)^{\frac{3}{2}}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(3/2)*x^6),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x^3 + a)^(3/2)*x^6), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(bx^9+ax^6)\sqrt{bx^3+a}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(3/2)*x^6),x, algorithm="fricas")
```

```
[Out] integral(1/((b*x^9 + a*x^6)*sqrt(b*x^3 + a)), x)
```

Sympy [A] time = 5.02851, size = 44, normalized size = 0.16

$$\frac{\Gamma\left(-\frac{5}{3}\right) {}_2F_1\left(\begin{matrix} -\frac{5}{3}, \frac{3}{2} \\ -\frac{2}{3} \end{matrix}\middle| \frac{bx^3e^{i\pi}}{a}\right)}{3a^{\frac{3}{2}}x^5\,\Gamma\left(-\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**6/(b*x**3+a)**(3/2),x)
```

```
[Out] gamma(-5/3)*hyper((-5/3, 3/2), (-2/3,), b*x**3*exp_polar(I*pi)/a)
/(3*a**(3/2)*x**5*gamma(-2/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^3+a)^{\frac{3}{2}}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(3/2)*x^6),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^3 + a)^(3/2)*x^6), x)
```

3.433 $\int \frac{x^7}{(a+bx^3)^{3/2}}\,dx$

Optimal. Leaf size=511

$$-\frac{80\sqrt{2}a^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{21\sqrt[4]{3}b^{8/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{40\sqrt{2-\sqrt{3}}a^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{7\ 3^{3/4}b^{8/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{80a\sqrt{a+bx^3}}{21b^{8/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)}+\frac{20x^2\sqrt{a+bx^3}}{21b^2}-\frac{2x^5}{3b\sqrt{a+bx^3}}$$

```
[Out] (-2*x^5)/(3*b*Sqrt[a + b*x^3]) + (20*x^2*Sqrt[a + b*x^3])/(21*b^2
) - (80*a*Sqrt[a + b*x^3])/(21*b^(8/3)*((1 + Sqrt[3])*a^(1/3) + b
^(1/3)*x)) + (40*Sqrt[2 - Sqrt[3]]*a^(4/3)*(a^(1/3) + b^(1/3)*x)*
Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a
^(1/3) + b^(1/3)*x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) +
b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])
/(7*3^(3/4)*b^(8/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sq
rt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3]) - (80*Sqrt[2]*a^(
4/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^
(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSi
n[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^
(1/3)*x)], -7 - 4*Sqrt[3]])/(21*3^(1/4)*b^(8/3)*Sqrt[(a^(1/3)*(a^
(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a
 + b*x^3])
```

Rubi [A] time = 0.481907, antiderivative size = 511, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{80\sqrt{2}a^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{21\sqrt[4]{3}b^{8/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{40\sqrt{2-\sqrt{3}}a^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{7\ 3^{3/4}b^{8/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{80a\sqrt{a+bx^3}}{21b^{8/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)}+\frac{20x^2\sqrt{a+bx^3}}{21b^2}-\frac{2x^5}{3b\sqrt{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In] Int[x^7/(a + b*x^3)^(3/2),x]
```

```
[Out] (-2*x^5)/(3*b*Sqrt[a + b*x^3]) + (20*x^2*Sqrt[a + b*x^3])/(21*b^2
) - (80*a*Sqrt[a + b*x^3])/(21*b^(8/3)*((1 + Sqrt[3])*a^(1/3) + b
```

```
^(1/3)*x)) + (40*Sqrt[2 - Sqrt[3]]*a^(4/3)*(a^(1/3) + b^(1/3)*x)*
Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a
^(1/3) + b^(1/3)*x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) +
b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])
/(7*3^(3/4)*b^(8/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sq
rt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3]) - (80*Sqrt[2]*a^(
4/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^
(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSi
n[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^
(1/3)*x)], -7 - 4*Sqrt[3]])/(21*3^(1/4)*b^(8/3)*Sqrt[(a^(1/3)*(a^
(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a
 + b*x^3])
```

Rubi in Sympy [A] time = 46.7805, size = 452, normalized size = 0.88

$$\frac{40\sqrt[4]{3}a^{\frac{4}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{21b^{\frac{8}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}} - \frac{80\sqrt{2}\cdot 3^{\frac{3}{4}}a^{\frac{4}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{63b^{\frac{8}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}} - \frac{80a\sqrt{a+bx^3}}{21b^{\frac{8}{3}}\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)} - \frac{2x^5}{3b\sqrt{a+bx^3}} + \frac{20x^2\sqrt{a+bx^3}}{21b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7/(b*x**3+a)**(3/2),x)
```

```
[Out] 40*3**(1/4)*a**(4/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b**(2
/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(-sqrt(3)
 + 2)*(a**(1/3) + b**(1/3)*x)*elliptic_e(asin((-a**(1/3)*(-1 + sq
rt(3)) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 -
 4*sqrt(3))/(21*b**(8/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a
**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) - 80*sq
rt(2)*3**(3/4)*a**(4/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b*
*(2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*(a**(1/3)
+ b**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3
)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4*sqrt(3))/(63*
b**(8/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1/3)*(1 + sqr
t(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) - 80*a*sqrt(a + b*x**3)
/(21*b**(8/3)*(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)) - 2*x**5/(3*
b*sqrt(a + b*x**3)) + 20*x**2*sqrt(a + b*x**3)/(21*b**2)
```

Mathematica [C] time = 1.83933, size = 221, normalized size = 0.43

$$\frac{2\left(3(-b)^{2/3}x^2\left(10a+3bx^3\right)+40(-1)^{2/3}3^{3/4}a^{5/3}\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}\left((-1)^{5/6}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}\cdots}}{\sqrt[4]{3}}\cdots\right.\right.\right.\right.}{63(-b)^{8/3}\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^7/(a + b*x^3)^(3/2),x]
```

```
[Out] (2*(3*(-b)^(2/3)*x^2*(10*a + 3*b*x^3) + 40*(-1)^(2/3)*3^(3/4)*a^(
5/3)*Sqrt[(-1)^(5/6)*(-1 + ((-b)^(1/3)*x)/a^(1/3))]*Sqrt[1 + ((-b
)^(1/3)*x)/a^(1/3) + ((-b)^(2/3)*x^2)/a^(2/3)]*(Sqrt[3]*EllipticE
[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-
1)^(1/3)] + (-1)^(5/6)*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b
)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)^(1/3)])))/(63*(-b)^(8/3)*Sqrt[
a + b*x^3])
```

Maple [A] time = 0.027, size = 476, normalized size = 0.9

$$\frac{2ax^2}{3b^2}\frac{1}{\sqrt{\left(x^3+\frac{a}{b}\right)b}}+\frac{2x^2}{7b^2}\sqrt{bx^3+a}$$

$$+\frac{\frac{80i}{63}a\sqrt{3}}{b^3}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}b$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^7/(b*x^3+a)^(3/2),x)
```

```
[Out] 2/3/b^2*a*x^2/((x^3+a/b)*b)^(1/2)+2/7*x^2*(b*x^3+a)^(1/2)/b^2+80/
63*I*a/b^3*3^(1/2)*(-a*b^2)^(1/3)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*
I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)*((x-1
/b*(-a*b^2)^(1/3))/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2
)^(1/3)))^(1/2)*(-I*(x+1/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b
^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)/(b*x^3+a)^(1/2)*((-3/2
/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*EllipticE(1/3*3
^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))
*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/
2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2))+1/b*(-
a*b^2)^(1/3)*EllipticF(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2
*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3
^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-
a*b^2)^(1/3)))^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^7}{(bx^3+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^7/(b*x^3 + a)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^7/(b*x^3 + a)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^7}{(bx^3+a)^{\frac{3}{2}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^7/(b*x^3 + a)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^7/(b*x^3 + a)^(3/2), x)
```

Sympy [A] time = 3.25937, size = 37, normalized size = 0.07

$$\frac{x^8 \Gamma\left(\frac{8}{3}\right) {}_2F_1\left(\begin{matrix} \frac{3}{2}, \frac{8}{3} \\ \frac{11}{3} \end{matrix}\middle| \frac{bx^3e^{i\pi}}{a}\right)}{3a^{\frac{3}{2}}\Gamma\left(\frac{11}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(b*x**3+a)**(3/2),x)
```

```
[Out] x**8*gamma(8/3)*hyper((3/2, 8/3), (11/3,), b*x**3*exp_polar(I*pi)
/a)/(3*a**(3/2)*gamma(11/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^7}{(bx^3 + a)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(b*x^3 + a)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^7/(b*x^3 + a)^(3/2), x)
```

3.434 $\int \frac{x^4}{(a+bx^3)^{3/2}}\,dx$

Optimal. Leaf size=487

$$\frac{8\sqrt{2}\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{3\sqrt[4]{3}b^{5/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}} - \frac{4\sqrt{2-\sqrt{3}}\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{3^{3/4}b^{5/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}} + \frac{8\sqrt{a+bx^3}}{3b^{5/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)} - \frac{2x^2}{3b\sqrt{a+bx^3}}$$

```
[Out] (-2*x^2)/(3*b*Sqrt[a + b*x^3]) + (8*Sqrt[a + b*x^3])/(3*b^(5/3)*(
(1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)) - (4*Sqrt[2 - Sqrt[3]]*a^(1/3
)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/
3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticE[ArcSin[(
(1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/
3)*x)], -7 - 4*Sqrt[3]])/(3^(3/4)*b^(5/3)*Sqrt[(a^(1/3)*(a^(1/3)
+ b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x
^3]) + (8*Sqrt[2]*a^(1/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a
^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*
x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 +
Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(3*3^(1/4)*b^(5/
3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) +
b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi [A] time = 0.38601, antiderivative size = 487, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$

$$\frac{8\sqrt{2}\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{3\sqrt[4]{3}b^{5/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}} - \frac{4\sqrt{2-\sqrt{3}}\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{3^{3/4}b^{5/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}} + \frac{8\sqrt{a+bx^3}}{3b^{5/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)} - \frac{2x^2}{3b\sqrt{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a + b*x^3)^(3/2),x]
```

```
[Out] (-2*x^2)/(3*b*Sqrt[a + b*x^3]) + (8*Sqrt[a + b*x^3])/(3*b^(5/3)*(
(1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)) - (4*Sqrt[2 - Sqrt[3]]*a^(1/3
)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/
```

```
3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticE[ArcSin[(
(1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/
3)*x)], -7 - 4*Sqrt[3]])/(3^(3/4)*b^(5/3)*Sqrt[(a^(1/3)*(a^(1/3)
+ b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x
^3]) + (8*Sqrt[2]*a^(1/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a
^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*
x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 +
Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(3*3^(1/4)*b^(5/
3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) +
b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 36.054, size = 430, normalized size = 0.88

$$-\frac{4\sqrt[4]{3}\sqrt[3]{a}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^{2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^{2}}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{3b^{\frac{5}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^{2}}}\sqrt{a+bx^{3}}}$$
$$+\frac{8\sqrt{2}\cdot3^{\frac{3}{4}}\sqrt[3]{a}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^{2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^{2}}}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{9b^{\frac{5}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^{2}}}\sqrt{a+bx^{3}}}$$
$$-\frac{2x^{2}}{3b\sqrt{a+bx^{3}}}+\frac{8\sqrt{a+bx^{3}}}{3b^{\frac{5}{3}}\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(b*x**3+a)**(3/2),x)
```

```
[Out] -4*3**(1/4)*a**(1/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b**(2
/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(-sqrt(3)
 + 2)*(a**(1/3) + b**(1/3)*x)*elliptic_e(asin((-a**(1/3)*(-1 + sq
rt(3)) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 -
 4*sqrt(3))/(3*b**(5/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a*
*(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) + 8*sqrt
(2)*3**(3/4)*a**(1/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b**(
2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*(a**(1/3) +
b**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)*
x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4*sqrt(3))/(9*b**
(5/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3
)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) - 2*x**2/(3*b*sqrt(a + b*x
**3)) + 8*sqrt(a + b*x**3)/(3*b**(5/3)*(a**(1/3)*(1 + sqrt(3)) +
b**(1/3)*x))
```

Mathematica [C] time = 1.73966, size = 216, normalized size = 0.44

$$\frac{2\left(-3x^{2}+\frac{4\sqrt[6]{-1}3^{3/4}a^{2/3}\sqrt{\frac{(-1)^{5/6}\left(\sqrt[3]{-b}x-\sqrt[3]{a}\right)}{\sqrt[3]{a}}}\sqrt{\frac{(-b)^{2/3}x^{2}}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}\left(\sqrt[3]{-1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)-i\sqrt{3}E\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\right.\right.}{(-b)^{2/3}}\right)}{9b\sqrt{a+bx^{3}}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^4/(a + b*x^3)^(3/2),x]
```

```
[Out] (2*(-3*x^2 + (4*(-1)^(1/6)*3^(3/4)*a^(2/3)*Sqrt[((-1)^(5/6)*(-a^(
1/3) + (-b)^(1/3)*x))/a^(1/3)]*Sqrt[1 + ((-b)^(1/3)*x)/a^(1/3) +
((-b)^(2/3)*x^2)/a^(2/3)]*((-I)*Sqrt[3]*EllipticE[ArcSin[Sqrt[-(-
1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)^(1/3)] + (-1)
^(1/3)*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/
3)]/3^(1/4)], (-1)^(1/3)]))/(-b)^(2/3)))/(9*b*Sqrt[a + b*x^3])
```

Maple [A] time = 0.028, size = 457, normalized size = 0.9

$$-\frac{2x^2}{3b}\frac{1}{\sqrt{\left(x^3+\frac{a}{b}\right)b}}$$

$$-\frac{\frac{8i}{9}\sqrt{3}}{b^2}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}b\left(\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(b*x^3+a)^(3/2),x)
```

```
[Out] -2/3/b*x^2/((x^3+a/b)*b)^(1/2)-8/9*I/b^2*3^(1/2)*(-a*b^2)^(1/3)*(
I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)
*b/(-a*b^2)^(1/3))^(1/2)*((x-1/b*(-a*b^2)^(1/3))/(-3/2/b*(-a*b^2)
^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2)*(-I*(x+1/2/b*(-a*b^
2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3)
)^(1/2)/(b*x^3+a)^(1/2)*((-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(
-a*b^2)^(1/3))*EllipticE(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1
/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I
*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*
(-a*b^2)^(1/3)))^(1/2))+1/b*(-a*b^2)^(1/3)*EllipticF(1/3*3^(1/2)*
(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2
)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a
*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{(bx^3+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^3 + a)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^4/(b*x^3 + a)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x^4}{(bx^3+a)^{\frac{3}{2}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^3 + a)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^4/(b*x^3 + a)^(3/2), x)
```

Sympy [A] time = 2.52044, size = 37, normalized size = 0.08

$$\frac{x^5\Gamma\left(\frac{5}{3}\right){}_2F_1\left(\begin{matrix}\frac{3}{2},\frac{5}{3}\\\frac{8}{3}\end{matrix}\middle|\frac{bx^3e^{i\pi}}{a}\right)}{3a^{\frac{3}{2}}\Gamma\left(\frac{8}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(b*x**3+a)**(3/2),x)
```

```
[Out] x**5*gamma(5/3)*hyper((3/2, 5/3), (8/3,), b*x**3*exp_polar(I*pi)/
a)/(3*a**(3/2)*gamma(8/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{(bx^3+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^3 + a)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^4/(b*x^3 + a)^(3/2), x)
```

3.435 $\int \frac{x}{(a+bx^3)^{3/2}}\,dx$

Optimal. Leaf size=489

$$-\frac{2\sqrt{2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{3\sqrt[4]{3}a^{2/3}b^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{\sqrt{2-\sqrt{3}}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{3^{3/4}a^{2/3}b^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{2\sqrt{a+bx^3}}{3ab^{2/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)}+\frac{2x^2}{3a\sqrt{a+bx^3}}$$

```
[Out] (2*x^2)/(3*a*Sqrt[a + b*x^3]) - (2*Sqrt[a + b*x^3])/(3*a*b^(2/3)*
((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)) + (Sqrt[2 - Sqrt[3]]*(a^(1/3
) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/(
(1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticE[ArcSin[((1 - Sqrt
[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -
7 - 4*Sqrt[3]])/(3^(3/4)*a^(2/3)*b^(2/3)*Sqrt[(a^(1/3)*(a^(1/3) +
 b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^
3]) - (2*Sqrt[2]*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^
(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Ell
ipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*
a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(3*3^(1/4)*a^(2/3)*b^(2/3
)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b
^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi [A] time = 0.373742, antiderivative size = 489, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$

$$-\frac{2\sqrt{2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{3\sqrt[4]{3}a^{2/3}b^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{\sqrt{2-\sqrt{3}}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{3^{3/4}a^{2/3}b^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{2\sqrt{a+bx^3}}{3ab^{2/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)}+\frac{2x^2}{3a\sqrt{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b*x^3)^(3/2),x]
```

```
[Out] (2*x^2)/(3*a*Sqrt[a + b*x^3]) - (2*Sqrt[a + b*x^3])/(3*a*b^(2/3)*
((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)) + (Sqrt[2 - Sqrt[3]]*(a^(1/3
) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/(
```

```
(1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticE[ArcSin[((1 - Sqrt
[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -
7 - 4*Sqrt[3]])/(3^(3/4)*a^(2/3)*b^(2/3)*Sqrt[(a^(1/3)*(a^(1/3) +
 b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^
3]) - (2*Sqrt[2]*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^
(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Ell
ipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*
a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(3*3^(1/4)*a^(2/3)*b^(2/3
)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b
^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 35.3337, size = 430, normalized size = 0.88

$$\frac{2x^2}{3a\sqrt{a+bx^3}} - \frac{2\sqrt{a+bx^3}}{3ab^{\frac{2}{3}}\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)} + \frac{\sqrt[4]{3}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{3a^{\frac{2}{3}}b^{\frac{2}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}} - \frac{2\sqrt{2}\cdot3^{\frac{3}{4}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{9a^{\frac{2}{3}}b^{\frac{2}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(b*x**3+a)**(3/2),x)
```

```
[Out] 2*x**2/(3*a*sqrt(a + b*x**3)) - 2*sqrt(a + b*x**3)/(3*a*b**(2/3)*
(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)) + 3**(1/4)*sqrt((a**(2/3)
- a**(1/3)*b**(1/3)*x + b**(2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) +
b**(1/3)*x)**2)*sqrt(-sqrt(3) + 2)*(a**(1/3) + b**(1/3)*x)*ellipt
ic_e(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)*x)/(a**(1/3)*(1 +
sqrt(3)) + b**(1/3)*x)), -7 - 4*sqrt(3))/(3*a**(2/3)*b**(2/3)*sqr
t(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(
1/3)*x)**2)*sqrt(a + b*x**3)) - 2*sqrt(2)*3**(3/4)*sqrt((a**(2/3)
 - a**(1/3)*b**(1/3)*x + b**(2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) +
 b**(1/3)*x)**2)*(a**(1/3) + b**(1/3)*x)*elliptic_f(asin((-a**(1/
3)*(-1 + sqrt(3)) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3
)*x)), -7 - 4*sqrt(3))/(9*a**(2/3)*b**(2/3)*sqrt(a**(1/3)*(a**(1/
3) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a
 + b*x**3))
```

Mathematica [C] time = 2.51003, size = 212, normalized size = 0.43

$$\frac{2\left(3x^2+\frac{(-1)^{2/3}3^{3/4}a^{2/3}\sqrt{\frac{(-1)^{5/6}\left(\sqrt[3]{-b}x-\sqrt[3]{a}\right)}{\sqrt[3]{a}}}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}\left((-1)^{5/6}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)+\sqrt{3}E\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{\right.\right.}{(-b)^{2/3}}\right.}{9a\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x/(a + b*x^3)^(3/2),x]
```

```
[Out] (2*(3*x^2 + ((-1)^(2/3)*3^(3/4)*a^(2/3)*Sqrt[((-1)^(5/6)*(-a^(1/3
) + (-b)^(1/3)*x))/a^(1/3)]*Sqrt[1 + ((-b)^(1/3)*x)/a^(1/3) + ((-
b)^(2/3)*x^2)/a^(2/3)]*(Sqrt[3]*EllipticE[ArcSin[Sqrt[-(-1)^(5/6)
 - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)^(1/3)] + (-1)^(5/6)*E
llipticF[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1
/4)], (-1)^(1/3)]))/(-b)^(2/3)))/(9*a*Sqrt[a + b*x^3])
```

Maple [A] time = 0.023, size = 460, normalized size = 0.9

$$\frac{2x^2}{3a}\frac{1}{\sqrt{\left(x^3+\frac{a}{b}\right)b}}$$

$$+\frac{\frac{2i}{9}\sqrt{3}}{ab}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}b\left(\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(b*x^3+a)^(3/2),x)
```

```
[Out] 2/3/a*x^2/((x^3+a/b)*b)^(1/2)+2/9*I/a*3^(1/2)/b*(-a*b^2)^(1/3)*(I
*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*
b/(-a*b^2)^(1/3))^(1/2)*((x-1/b*(-a*b^2)^(1/3))/(-3/2/b*(-a*b^2)^
(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2)*(-I*(x+1/2/b*(-a*b^2
)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))
^(1/2)/(b*x^3+a)^(1/2)*((-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-
a*b^2)^(1/3))*EllipticE(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/
2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*
3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(
-a*b^2)^(1/3)))^(1/2))+1/b*(-a*b^2)^(1/3)*EllipticF(1/3*3^(1/2)*(
I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)
*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*
b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{(bx^3+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^3 + a)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x/(b*x^3 + a)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x}{(bx^3+a)^{\frac{3}{2}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^3 + a)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x/(b*x^3 + a)^(3/2), x)
```

Sympy [A] time = 2.36345, size = 37, normalized size = 0.08

$$\frac{x^{2}\Gamma\left(\frac{2}{3}\right){}_{2}F_{1}\left(\begin{matrix}\frac{2}{3},\frac{3}{2}\\\frac{5}{3}\end{matrix}\middle|\frac{bx^{3}e^{i\pi}}{a}\right)}{3a^{\frac{3}{2}}\Gamma\left(\frac{5}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x**3+a)**(3/2),x)
```

```
[Out] x**2*gamma(2/3)*hyper((2/3, 3/2), (5/3,), b*x**3*exp_polar(I*pi)/
a)/(3*a**(3/2)*gamma(5/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{(bx^{3}+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^3 + a)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x/(b*x^3 + a)^(3/2), x)
```

3.436 $\int \frac{1}{x^2(a+bx^3)^{3/2}}\,dx$

Optimal. Leaf size=513

$$\frac{5\sqrt{2}\sqrt[3]{b}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{3\sqrt[4]{3}a^{5/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{5\sqrt{2-\sqrt{3}}\sqrt[3]{b}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{2\,3^{3/4}a^{5/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{5\sqrt{a+bx^3}}{3a^2x}+\frac{5\sqrt[3]{b}\sqrt{a+bx^3}}{3a^2\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)}+\frac{2}{3ax\sqrt{a+bx^3}}$$

```
[Out] 2/(3*a*x*Sqrt[a + b*x^3]) - (5*Sqrt[a + b*x^3])/(3*a^2*x) + (5*b^
(1/3)*Sqrt[a + b*x^3])/(3*a^2*((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)
) - (5*Sqrt[2 - Sqrt[3]]*b^(1/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2
/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b
^(1/3)*x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)
/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(2*3^(3/4
)*a^(5/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(
1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3]) + (5*Sqrt[2]*b^(1/3)*(a^(1/
3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/
((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqr
t[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)],
-7 - 4*Sqrt[3]])/(3*3^(1/4)*a^(5/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1
/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi [A] time = 0.478558, antiderivative size = 513, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$

$$\frac{5\sqrt{2}\sqrt[3]{b}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{3\sqrt[4]{3}a^{5/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{5\sqrt{2-\sqrt{3}}\sqrt[3]{b}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{2\,3^{3/4}a^{5/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{5\sqrt{a+bx^3}}{3a^2x}+\frac{5\sqrt[3]{b}\sqrt{a+bx^3}}{3a^2\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)}+\frac{2}{3ax\sqrt{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(a + b*x^3)^(3/2)),x]
```

```
[Out] 2/(3*a*x*Sqrt[a + b*x^3]) - (5*Sqrt[a + b*x^3])/(3*a^2*x) + (5*b^
(1/3)*Sqrt[a + b*x^3])/(3*a^2*((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)
) - (5*Sqrt[2 - Sqrt[3]]*b^(1/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2
```

```
/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b
^(1/3)*x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)
/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(2*3^(3/4
)*a^(5/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(
1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3]) + (5*Sqrt[2]*b^(1/3)*(a^(1/
3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/
((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqr
t[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)],
-7 - 4*Sqrt[3]])/(3*3^(1/4)*a^(5/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1
/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 46.5021, size = 450, normalized size = 0.88

$$\frac{2}{3ax\sqrt{a+bx^3}}+\frac{5\sqrt[3]{b}\sqrt{a+bx^3}}{3a^2\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)}-\frac{5\sqrt{a+bx^3}}{3a^2x}-\frac{5\sqrt[4]{3}\sqrt[3]{b}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{6a^{\frac{5}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{5\sqrt{2}\cdot 3^{\frac{3}{4}}\sqrt[3]{b}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{9a^{\frac{5}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate(1/x**2/(b*x**3+a)**(3/2),x)
```

```
[Out] 2/(3*a*x*sqrt(a + b*x**3)) + 5*b**(1/3)*sqrt(a + b*x**3)/(3*a**2*
(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)) - 5*sqrt(a + b*x**3)/(3*a*
*2*x) - 5*3**(1/4)*b**(1/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x
+ b**(2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(-
sqrt(3) + 2)*(a**(1/3) + b**(1/3)*x)*elliptic_e(asin((-a**(1/3)*(
-1 + sqrt(3)) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)
), -7 - 4*sqrt(3))/(6*a**(5/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)
*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) +
 5*sqrt(2)*3**(3/4)*b**(1/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x
 + b**(2/3)*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*(a**(
1/3) + b**(1/3)*x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b*
*(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4*sqrt(3))
/(9*a**(5/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1/3)*(1 +
 sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3))
```

Mathematica [C] time = 0.96551, size = 226, normalized size = 0.44

$$\frac{-3(-b)^{2/3}\left(3a+5bx^3\right)-5(-1)^{2/3}3^{3/4}a^{2/3}bx\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}\left((-1)^{5/6}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}x}{\sqrt[3]{a}}-(-1\cdots}}{\sqrt[4]{3}}\cdots\right.\right.\right.}{9a^2(-b)^{2/3}x\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]   Integrate[1/(x^2*(a + b*x^3)^(3/2)),x]
```

```
[Out] (-3*(-b)^(2/3)*(3*a + 5*b*x^3) - 5*(-1)^(2/3)*3^(3/4)*a^(2/3)*b*x
*Sqrt[(-1)^(5/6)*(-1 + ((-b)^(1/3)*x)/a^(1/3))]*Sqrt[1 + ((-b)^(1
```

```
/3)*x)/a^(1/3) + ((-b)^(2/3)*x^2)/a^(2/3)]*(Sqrt[3]*EllipticE[Arc
Sin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)^(
1/3)] + (-1)^(5/6)*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1
/3)*x)/a^(1/3)]/3^(1/4)], (-1)^(1/3)]))/(9*a^2*(-b)^(2/3)*x*Sqrt[
a + b*x^3])
```

Maple [A] time = 0.03, size = 475, normalized size = 0.9

$$-\frac{2\,bx^2}{3\,a^2}\frac{1}{\sqrt{\left(x^3+\frac{a}{b}\right)b}}-\frac{1}{xa^2}\sqrt{bx^3+a}$$

$$-\frac{\frac{5\,i}{9}\sqrt{3}}{a^2}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2\,b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2\,b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}b\left(\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(b*x^3+a)^(3/2),x)
```

```
[Out] -2/3*b/a^2*x^2/((x^3+a/b)*b)^(1/2)-(b*x^3+a)^(1/2)/x/a^2-5/9*I/a^
2*3^(1/2)*(-a*b^2)^(1/3)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)
/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)*((x-1/b*(-a*b^
2)^(1/3))/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))
^(1/2)*(-I*(x+1/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)
)*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)/(b*x^3+a)^(1/2)*((-3/2/b*(-a*b^
2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*EllipticE(1/3*3^(1/2)*(I
*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*
b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b
^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2))+1/b*(-a*b^2)^(1
/3)*EllipticF(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2
)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*
(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1
/3)))^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^3+a)^{\frac{3}{2}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(3/2)*x^2),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x^3 + a)^(3/2)*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(bx^5+ax^2)\sqrt{bx^3+a}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(3/2)*x^2),x, algorithm="fricas")
```

```
[Out] integral(1/((b*x^5 + a*x^2)*sqrt(b*x^3 + a)), x)
```

Sympy [A] time = 3.0005, size = 39, normalized size = 0.08

$$\frac{\Gamma\left(-\frac{1}{3}\right) {}_{2}F_{1}\left(\begin{matrix} -\frac{1}{3}, \frac{3}{2} \\ \frac{2}{3} \end{matrix}\middle| \frac{bx^{3}e^{i\pi}}{a}\right)}{3a^{\frac{3}{2}}x\,\Gamma\left(\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(b*x**3+a)**(3/2),x)
```

```
[Out] gamma(-1/3)*hyper((-1/3, 3/2), (2/3,), b*x**3*exp_polar(I*pi)/a)/
(3*a**(3/2)*x*gamma(2/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bx^{3} + a\right)^{\frac{3}{2}} x^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(3/2)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^3 + a)^(3/2)*x^2), x)
```

3.437 $\int \frac{1}{x^5(a+bx^3)^{3/2}}\,dx$

Optimal. Leaf size=535

$$-\frac{55b^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{12\sqrt{2}\sqrt[4]{3}a^{8/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{55\sqrt{2-\sqrt{3}}b^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{16\ 3^{3/4}a^{8/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{55b^{4/3}\sqrt{a+bx^3}}{24a^3\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)}+\frac{55b\sqrt{a+bx^3}}{24a^3x}-\frac{11\sqrt{a+bx^3}}{12a^2x^4}+\frac{2}{3ax^4\sqrt{a+bx^3}}$$

```
[Out] 2/(3*a*x^4*Sqrt[a + b*x^3]) - (11*Sqrt[a + b*x^3])/(12*a^2*x^4) +
 (55*b*Sqrt[a + b*x^3])/(24*a^3*x) - (55*b^(4/3)*Sqrt[a + b*x^3])
/(24*a^3*((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)) + (55*Sqrt[2 - Sqrt
[3]]*b^(4/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3
)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Ellipti
cE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1
/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(16*3^(3/4)*a^(8/3)*Sqrt[(a^(
1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2
]*Sqrt[a + b*x^3]) - (55*b^(4/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2
/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b
^(1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)
/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(12*Sqrt[
2]*3^(1/4)*a^(8/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqr
t[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi [A] time = 0.591699, antiderivative size = 535, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$

$$-\frac{55b^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{12\sqrt{2}\sqrt[4]{3}a^{8/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}+\frac{55\sqrt{2-\sqrt{3}}b^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}x+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}x+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{16\ 3^{3/4}a^{8/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}-\frac{55b^{4/3}\sqrt{a+bx^3}}{24a^3\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}x\right)}+\frac{55b\sqrt{a+bx^3}}{24a^3x}-\frac{11\sqrt{a+bx^3}}{12a^2x^4}+\frac{2}{3ax^4\sqrt{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^5*(a + b*x^3)^(3/2)),x]
```


```
[Out] 2/(3*a*x^4*Sqrt[a + b*x^3]) - (11*Sqrt[a + b*x^3])/(12*a^2*x^4) +
 (55*b*Sqrt[a + b*x^3])/(24*a^3*x) - (55*b^(4/3)*Sqrt[a + b*x^3])
```

```
/(24*a^3*((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)) + (55*Sqrt[2 - Sqrt
[3]]*b^(4/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2/3) - a^(1/3)*b^(1/3
)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2]*Ellipti
cE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)/((1 + Sqrt[3])*a^(1
/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(16*3^(3/4)*a^(8/3)*Sqrt[(a^(
1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)^2
]*Sqrt[a + b*x^3]) - (55*b^(4/3)*(a^(1/3) + b^(1/3)*x)*Sqrt[(a^(2
/3) - a^(1/3)*b^(1/3)*x + b^(2/3)*x^2)/((1 + Sqrt[3])*a^(1/3) + b
^(1/3)*x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*x)
/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*x)], -7 - 4*Sqrt[3]])/(12*Sqrt[
2]*3^(1/4)*a^(8/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*x))/((1 + Sqr
t[3])*a^(1/3) + b^(1/3)*x)^2]*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 57.6825, size = 474, normalized size = 0.89

$$\frac{2}{3ax^4\sqrt{a+bx^3}} - \frac{11\sqrt{a+bx^3}}{12a^2x^4} - \frac{55b^{\frac{4}{3}}\sqrt{a+bx^3}}{24a^3\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)} + \frac{55b\sqrt{a+bx^3}}{24a^3x} + \frac{55\sqrt[4]{3}b^{\frac{4}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{48a^{\frac{8}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}} - \frac{55\sqrt{2}\cdot 3^{\frac{3}{4}}b^{\frac{4}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}x^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}x}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x}\right)\middle|-7-4\sqrt{3}\right)}{72a^{\frac{8}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}x\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}x\right)^2}}\sqrt{a+bx^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**5/(b*x**3+a)**(3/2),x)
```

```
[Out] 2/(3*a*x**4*sqrt(a + b*x**3)) - 11*sqrt(a + b*x**3)/(12*a**2*x**4
) - 55*b**(4/3)*sqrt(a + b*x**3)/(24*a**3*(a**(1/3)*(1 + sqrt(3))
 + b**(1/3)*x)) + 55*b*sqrt(a + b*x**3)/(24*a**3*x) + 55*3**(1/4)
*b**(4/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b**(2/3)*x**2)/(
a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*sqrt(-sqrt(3) + 2)*(a**(
1/3) + b**(1/3)*x)*elliptic_e(asin((-a**(1/3)*(-1 + sqrt(3)) + b*
*(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4*sqrt(3))
/(48*a**(8/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1/3)*(1
+ sqrt(3)) + b**(1/3)*x)**2)*sqrt(a + b*x**3)) - 55*sqrt(2)*3**(3
/4)*b**(4/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*x + b**(2/3)*x**2
)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*x)**2)*(a**(1/3) + b**(1/3)*
x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)*x)/(a**(1
/3)*(1 + sqrt(3)) + b**(1/3)*x)), -7 - 4*sqrt(3))/(72*a**(8/3)*sq
rt(a**(1/3)*(a**(1/3) + b**(1/3)*x)/(a**(1/3)*(1 + sqrt(3)) + b**
(1/3)*x)**2)*sqrt(a + b*x**3))
```

Mathematica [C] time = 1.66037, size = 241, normalized size = 0.45

$$\frac{3(-b)^{2/3}\left(-6a^2+33abx^3+55b^2x^6\right)+55(-1)^{2/3}3^{3/4}a^{2/3}b^2x^4\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}-1\right)}\sqrt{\frac{(-b)^{2/3}x^2}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+1}\left((-1)^{5/6}F\left(\sin^{-1}\right.\right.}{72a^3(-b)^{2/3}x^4\sqrt{a+bx^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/(x^5*(a + b*x^3)^(3/2)),x]
```

```
[Out] (3*(-b)^(2/3)*(-6*a^2 + 33*a*b*x^3 + 55*b^2*x^6) + 55*(-1)^(2/3)*
3^(3/4)*a^(2/3)*b^2*x^4*Sqrt[(-1)^(5/6)*(-1 + ((-b)^(1/3)*x)/a^(1
/3))]*Sqrt[1 + ((-b)^(1/3)*x)/a^(1/3) + ((-b)^(2/3)*x^2)/a^(2/3)]
*(Sqrt[3]*EllipticE[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^
(1/3)]/3^(1/4)], (-1)^(1/3)] + (-1)^(5/6)*EllipticF[ArcSin[Sqrt[-
(-1)^(5/6) - (I*(-b)^(1/3)*x)/a^(1/3)]/3^(1/4)], (-1)^(1/3)]))/(7
2*a^3*(-b)^(2/3)*x^4*Sqrt[a + b*x^3])
```

Maple [A] time = 0.035, size = 496, normalized size = 0.9

$$-\frac{1}{4x^4a^2}\sqrt{bx^3+a}+\frac{13b}{8a^3x}\sqrt{bx^3+a}+\frac{2b^2x^2}{3a^3}\frac{1}{\sqrt{\left(x^3+\frac{a}{b}\right)b}}$$
$$+\frac{\frac{55i}{72}b\sqrt{3}}{a^3}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(x+\frac{1}{2b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(x-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2b}\sqrt[3]{-ab^2}+\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)^{-1}}\sqrt{-i\sqrt{3}b$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^5/(b*x^3+a)^(3/2),x)
```

```
[Out] -1/4*(b*x^3+a)^(1/2)/x^4/a^2+13/8*b*(b*x^3+a)^(1/2)/a^3/x+2/3*b^2
/a^3*x^2/((x^3+a/b)*b)^(1/2)+55/72*I/a^3*b*3^(1/2)*(-a*b^2)^(1/3)
*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/
2)*b/(-a*b^2)^(1/3))^(1/2)*((x-1/b*(-a*b^2)^(1/3))/(-3/2/b*(-a*b^
2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2)*(-I*(x+1/2/b*(-a*
b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/
3))^(1/2)/(b*x^3+a)^(1/2)*((-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b
*(-a*b^2)^(1/3))*EllipticE(1/3*3^(1/2)*(I*(x+1/2/b*(-a*b^2)^(1/3)
-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),
(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/
b*(-a*b^2)^(1/3)))^(1/2))+1/b*(-a*b^2)^(1/3)*EllipticF(1/3*3^(1/2
)*(I*(x+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1
/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(
-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^3+a)^{\frac{3}{2}}x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(3/2)*x^5),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x^3 + a)^(3/2)*x^5), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(bx^8+ax^5)\sqrt{bx^3+a}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(3/2)*x^5),x, algorithm="fricas")
```

```
[Out] integral(1/((b*x^8 + a*x^5)*sqrt(b*x^3 + a)), x)
```

Sympy [A] time = 4.11881, size = 44, normalized size = 0.08

$$\frac{\Gamma\left(-\frac{4}{3}\right) {}_2F_1\left(\begin{matrix} -\frac{4}{3}, \frac{3}{2} \\ -\frac{1}{3} \end{matrix}\middle| \frac{bx^3 e^{i\pi}}{a}\right)}{3a^{\frac{3}{2}} x^4 \Gamma\left(-\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**5/(b*x**3+a)**(3/2),x)
```

```
[Out] gamma(-4/3)*hyper((-4/3, 3/2), (-1/3,), b*x**3*exp_polar(I*pi)/a)
/(3*a**(3/2)*x**4*gamma(-1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^3 + a)^{\frac{3}{2}} x^5}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(3/2)*x^5),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^3 + a)^(3/2)*x^5), x)
```

3.438 $\int \frac{x^{11}}{\sqrt{1+x^3}}\,dx$

Optimal. Leaf size=53

$$\frac{2}{21}\left(x^3+1\right)^{7/2}-\frac{2}{5}\left(x^3+1\right)^{5/2}+\frac{2}{3}\left(x^3+1\right)^{3/2}-\frac{2\sqrt{x^3+1}}{3}$$

```
[Out] (-2*Sqrt[1 + x^3])/3 + (2*(1 + x^3)^(3/2))/3 - (2*(1 + x^3)^(5/2)
)/5 + (2*(1 + x^3)^(7/2))/21
```

Rubi [A] time = 0.0481933, antiderivative size = 53, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{2}{21}\left(x^3+1\right)^{7/2}-\frac{2}{5}\left(x^3+1\right)^{5/2}+\frac{2}{3}\left(x^3+1\right)^{3/2}-\frac{2\sqrt{x^3+1}}{3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11/Sqrt[1 + x^3],x]
```

```
[Out] (-2*Sqrt[1 + x^3])/3 + (2*(1 + x^3)^(3/2))/3 - (2*(1 + x^3)^(5/2)
)/5 + (2*(1 + x^3)^(7/2))/21
```

Rubi in Sympy [A] time = 5.04519, size = 46, normalized size = 0.87

$$\frac{2\left(x^3+1\right)^{\frac{7}{2}}}{21}-\frac{2\left(x^3+1\right)^{\frac{5}{2}}}{5}+\frac{2\left(x^3+1\right)^{\frac{3}{2}}}{3}-\frac{2\sqrt{x^3+1}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11/(x**3+1)**(1/2),x)
```

```
[Out] 2*(x**3 + 1)**(7/2)/21 - 2*(x**3 + 1)**(5/2)/5 + 2*(x**3 + 1)**(3
/2)/3 - 2*sqrt(x**3 + 1)/3
```

Mathematica [A] time = 0.015044, size = 30, normalized size = 0.57

$$\frac{2}{105}\sqrt{x^3+1}\left(5x^9-6x^6+8x^3-16\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11/Sqrt[1 + x^3],x]
```

```
[Out] (2*Sqrt[1 + x^3]*(-16 + 8*x^3 - 6*x^6 + 5*x^9))/105
```

Maple [A] time = 0.008, size = 38, normalized size = 0.7

$$\frac{(2+2x)\left(x^2-x+1\right)\left(5x^9-6x^6+8x^3-16\right)}{105}\frac{1}{\sqrt{x^3+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11/(x^3+1)^(1/2),x)

[Out] 2/105*(1+x)*(x^2-x+1)*(5*x^9-6*x^6+8*x^3-16)/(x^3+1)^(1/2)
```

Maxima [A] time = 1.42324, size = 50, normalized size = 0.94

$$\frac{2}{21}\left(x^{3}+1\right)^{\frac{7}{2}}-\frac{2}{5}\left(x^{3}+1\right)^{\frac{5}{2}}+\frac{2}{3}\left(x^{3}+1\right)^{\frac{3}{2}}-\frac{2}{3}\sqrt{x^{3}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/sqrt(x^3 + 1),x, algorithm="maxima")

[Out] 2/21*(x^3 + 1)^(7/2) - 2/5*(x^3 + 1)^(5/2) + 2/3*(x^3 + 1)^(3/2)
- 2/3*sqrt(x^3 + 1)
```

Fricas [A] time = 0.231384, size = 35, normalized size = 0.66

$$\frac{2}{105}\left(5\,x^{9}-6\,x^{6}+8\,x^{3}-16\right)\sqrt{x^{3}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/sqrt(x^3 + 1),x, algorithm="fricas")

[Out] 2/105*(5*x^9 - 6*x^6 + 8*x^3 - 16)*sqrt(x^3 + 1)
```

Sympy [A] time = 4.49298, size = 56, normalized size = 1.06

$$\frac{2x^{9}\sqrt{x^{3}+1}}{21}-\frac{4x^{6}\sqrt{x^{3}+1}}{35}+\frac{16x^{3}\sqrt{x^{3}+1}}{105}-\frac{32\sqrt{x^{3}+1}}{105}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11/(x**3+1)**(1/2),x)

[Out] 2*x**9*sqrt(x**3 + 1)/21 - 4*x**6*sqrt(x**3 + 1)/35 + 16*x**3*sqr
t(x**3 + 1)/105 - 32*sqrt(x**3 + 1)/105
```

GIAC/XCAS [A] time = 0.241595, size = 50, normalized size = 0.94

$$\frac{2}{21}\left(x^{3}+1\right)^{\frac{7}{2}}-\frac{2}{5}\left(x^{3}+1\right)^{\frac{5}{2}}+\frac{2}{3}\left(x^{3}+1\right)^{\frac{3}{2}}-\frac{2}{3}\sqrt{x^{3}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/sqrt(x^3 + 1),x, algorithm="giac")

[Out] 2/21*(x^3 + 1)^(7/2) - 2/5*(x^3 + 1)^(5/2) + 2/3*(x^3 + 1)^(3/2)
- 2/3*sqrt(x^3 + 1)
```

3.439 $\int \frac{x^8}{\sqrt{1+x^3}} \, dx$

Optimal. Leaf size=40

$$\frac{2}{15}\left(x^3+1\right)^{5/2}-\frac{4}{9}\left(x^3+1\right)^{3/2}+\frac{2\sqrt{x^3+1}}{3}$$

```
[Out] (2*Sqrt[1 + x^3])/3 - (4*(1 + x^3)^(3/2))/9 + (2*(1 + x^3)^(5/2))
/15
```

Rubi [A] time = 0.0423354, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{2}{15}\left(x^3+1\right)^{5/2}-\frac{4}{9}\left(x^3+1\right)^{3/2}+\frac{2\sqrt{x^3+1}}{3}$$

Antiderivative was successfully verified.

```
[In] Int[x^8/Sqrt[1 + x^3],x]
```

```
[Out] (2*Sqrt[1 + x^3])/3 - (4*(1 + x^3)^(3/2))/9 + (2*(1 + x^3)^(5/2))
/15
```

Rubi in Sympy [A] time = 4.17593, size = 34, normalized size = 0.85

$$\frac{2\left(x^3+1\right)^{\frac{5}{2}}}{15}-\frac{4\left(x^3+1\right)^{\frac{3}{2}}}{9}+\frac{2\sqrt{x^3+1}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**8/(x**3+1)**(1/2),x)
```

```
[Out] 2*(x**3 + 1)**(5/2)/15 - 4*(x**3 + 1)**(3/2)/9 + 2*sqrt(x**3 + 1)
/3
```

Mathematica [A] time = 0.0130601, size = 25, normalized size = 0.62

$$\frac{2}{45}\sqrt{x^3+1}\left(3x^6-4x^3+8\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^8/Sqrt[1 + x^3],x]
```

```
[Out] (2*Sqrt[1 + x^3]*(8 - 4*x^3 + 3*x^6))/45
```

Maple [A] time = 0.006, size = 33, normalized size = 0.8

$$\frac{(2+2x)\left(x^2-x+1\right)\left(3x^6-4x^3+8\right)}{45}\frac{1}{\sqrt{x^3+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^8/(x^3+1)^(1/2),x)
```

```
[Out] 2/45*(1+x)*(x^2-x+1)*(3*x^6-4*x^3+8)/(x^3+1)^(1/2)
```

Maxima [A] time = 1.43205, size = 38, normalized size = 0.95

$$\frac{2}{15}\left(x^3+1\right)^{\frac{5}{2}}-\frac{4}{9}\left(x^3+1\right)^{\frac{3}{2}}+\frac{2}{3}\sqrt{x^3+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/sqrt(x^3 + 1),x, algorithm="maxima")
```

```
[Out] 2/15*(x^3 + 1)^(5/2) - 4/9*(x^3 + 1)^(3/2) + 2/3*sqrt(x^3 + 1)
```

Fricas [A] time = 0.220791, size = 28, normalized size = 0.7

$$\frac{2}{45}\left(3x^6-4x^3+8\right)\sqrt{x^3+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/sqrt(x^3 + 1),x, algorithm="fricas")
```

```
[Out] 2/45*(3*x^6 - 4*x^3 + 8)*sqrt(x^3 + 1)
```

Sympy [A] time = 1.91906, size = 41, normalized size = 1.02

$$\frac{2x^6\sqrt{x^3+1}}{15}-\frac{8x^3\sqrt{x^3+1}}{45}+\frac{16\sqrt{x^3+1}}{45}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8/(x**3+1)**(1/2),x)
```

```
[Out] 2*x**6*sqrt(x**3 + 1)/15 - 8*x**3*sqrt(x**3 + 1)/45 + 16*sqrt(x**
3 + 1)/45
```

GIAC/XCAS [A] time = 0.223494, size = 38, normalized size = 0.95

$$\frac{2}{15}\left(x^3+1\right)^{\frac{5}{2}}-\frac{4}{9}\left(x^3+1\right)^{\frac{3}{2}}+\frac{2}{3}\sqrt{x^3+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/sqrt(x^3 + 1),x, algorithm="giac")
```

```
[Out] 2/15*(x^3 + 1)^(5/2) - 4/9*(x^3 + 1)^(3/2) + 2/3*sqrt(x^3 + 1)
```

3.440 $\int \frac{x^5}{\sqrt{1+x^3}}\,dx$

Optimal. Leaf size=27

$$\frac{2}{9}\left(x^3+1\right)^{3/2}-\frac{2\sqrt{x^3+1}}{3}$$

```
[Out] (-2*Sqrt[1 + x^3])/3 + (2*(1 + x^3)^(3/2))/9
```

Rubi [A] time = 0.0321717, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{2}{9}\left(x^3+1\right)^{3/2}-\frac{2\sqrt{x^3+1}}{3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/Sqrt[1 + x^3],x]

[Out] (-2*Sqrt[1 + x^3])/3 + (2*(1 + x^3)^(3/2))/9
```

Rubi in Sympy [A] time = 3.50721, size = 22, normalized size = 0.81

$$\frac{2\left(x^3+1\right)^{\frac{3}{2}}}{9}-\frac{2\sqrt{x^3+1}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(x**3+1)**(1/2),x)

[Out] 2*(x**3 + 1)**(3/2)/9 - 2*sqrt(x**3 + 1)/3
```

Mathematica [A] time = 0.00727513, size = 18, normalized size = 0.67

$$\frac{2}{9}\left(x^3-2\right)\sqrt{x^3+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/Sqrt[1 + x^3],x]

[Out] (2*(-2 + x^3)*Sqrt[1 + x^3])/9
```

Maple [A] time = 0.006, size = 26, normalized size = 1.

$$\frac{(2+2x)\left(x^2-x+1\right)\left(x^3-2\right)}{9}\frac{1}{\sqrt{x^3+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(x^3+1)^(1/2),x)

[Out] 2/9*(1+x)*(x^2-x+1)*(x^3-2)/(x^3+1)^(1/2)
```

Maxima [A] time = 1.44389, size = 26, normalized size = 0.96

$$\frac{2}{9}\left(x^3+1\right)^{\frac{3}{2}}-\frac{2}{3}\sqrt{x^3+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(x^3 + 1),x, algorithm="maxima")
```

```
[Out] 2/9*(x^3 + 1)^(3/2) - 2/3*sqrt(x^3 + 1)
```

Fricas [A] time = 0.22043, size = 19, normalized size = 0.7

$$\frac{2}{9}\sqrt{x^3+1}\left(x^3-2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(x^3 + 1),x, algorithm="fricas")
```

```
[Out] 2/9*sqrt(x^3 + 1)*(x^3 - 2)
```

Sympy [A] time = 0.769349, size = 26, normalized size = 0.96

$$\frac{2x^3\sqrt{x^3+1}}{9}-\frac{4\sqrt{x^3+1}}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(x**3+1)**(1/2),x)
```

```
[Out] 2*x**3*sqrt(x**3 + 1)/9 - 4*sqrt(x**3 + 1)/9
```

GIAC/XCAS [A] time = 0.215379, size = 26, normalized size = 0.96

$$\frac{2}{9}\left(x^3+1\right)^{\frac{3}{2}}-\frac{2}{3}\sqrt{x^3+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(x^3 + 1),x, algorithm="giac")
```

```
[Out] 2/9*(x^3 + 1)^(3/2) - 2/3*sqrt(x^3 + 1)
```

3.441 $\int \frac{x^2}{\sqrt{1+x^3}}\,dx$

Optimal. Leaf size=13

$$\frac{2\sqrt{x^3+1}}{3}$$

```
[Out] (2*Sqrt[1 + x^3])/3
```

Rubi [A] time = 0.00726425, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{2\sqrt{x^3+1}}{3}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/Sqrt[1 + x^3],x]

[Out] (2*Sqrt[1 + x^3])/3
```

Rubi in Sympy [A] time = 1.70602, size = 10, normalized size = 0.77

$$\frac{2\sqrt{x^3+1}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**2/(x**3+1)**(1/2),x)

[Out] 2*sqrt(x**3 + 1)/3
```

Mathematica [A] time = 0.00542211, size = 13, normalized size = 1.

$$\frac{2\sqrt{x^3+1}}{3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/Sqrt[1 + x^3],x]

[Out] (2*Sqrt[1 + x^3])/3
```

Maple [B] time = 0.005, size = 21, normalized size = 1.6

$$\frac{(2+2x)\left(x^2-x+1\right)}{3}\frac{1}{\sqrt{x^3+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(x^3+1)^(1/2),x)

[Out] 2/3*(1+x)*(x^2-x+1)/(x^3+1)^(1/2)
```

Maxima [A] time = 1.43362, size = 12, normalized size = 0.92

$$\frac{2}{3}\sqrt{x^3+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(x^3 + 1),x, algorithm="maxima")
```

```
[Out] 2/3*sqrt(x^3 + 1)
```

Fricas [A] time = 0.226285, size = 12, normalized size = 0.92

$$\frac{2}{3}\sqrt{x^3+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(x^3 + 1),x, algorithm="fricas")
```

```
[Out] 2/3*sqrt(x^3 + 1)
```

Sympy [A] time = 0.323849, size = 10, normalized size = 0.77

$$\frac{2\sqrt{x^3+1}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(x**3+1)**(1/2),x)
```

```
[Out] 2*sqrt(x**3 + 1)/3
```

GIAC/XCAS [A] time = 0.212169, size = 12, normalized size = 0.92

$$\frac{2}{3}\sqrt{x^3+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(x^3 + 1),x, algorithm="giac")
```

```
[Out] 2/3*sqrt(x^3 + 1)
```

3.442 $\int \frac{1}{x\sqrt{1+x^3}}\,dx$

Optimal. Leaf size=14

$$-\frac{2}{3}\tanh^{-1}\left(\sqrt{x^3+1}\right)$$

```
[Out] (-2*ArcTanh[Sqrt[1 + x^3]])/3
```

Rubi [A] time = 0.0240662, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{2}{3}\tanh^{-1}\left(\sqrt{x^3+1}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*Sqrt[1 + x^3]),x]

[Out] (-2*ArcTanh[Sqrt[1 + x^3]])/3
```

Rubi in Sympy [A] time = 3.27789, size = 14, normalized size = 1.

$$-\frac{2\,\operatorname{atanh}\left(\sqrt{x^3+1}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(x**3+1)**(1/2),x)

[Out] -2*atanh(sqrt(x**3 + 1))/3
```

Mathematica [A] time = 0.0167783, size = 14, normalized size = 1.

$$-\frac{2}{3}\tanh^{-1}\left(\sqrt{x^3+1}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*Sqrt[1 + x^3]),x]

[Out] (-2*ArcTanh[Sqrt[1 + x^3]])/3
```

Maple [A] time = 0.17, size = 11, normalized size = 0.8

$$-\frac{2}{3}\mathit{Artanh}\left(\sqrt{x^3+1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(x^3+1)^(1/2),x)

[Out] -2/3*arctanh((x^3+1)^(1/2))
```

Maxima [A] time = 1.43723, size = 34, normalized size = 2.43

$$-\frac{1}{3}\log\left(\sqrt{x^3+1}+1\right)+\frac{1}{3}\log\left(\sqrt{x^3+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 + 1)*x),x, algorithm="maxima")

[Out] -1/3*log(sqrt(x^3 + 1) + 1) + 1/3*log(sqrt(x^3 + 1) - 1)
```

Fricas [A] time = 0.227784, size = 34, normalized size = 2.43

$$-\frac{1}{3}\log\left(\sqrt{x^3+1}+1\right)+\frac{1}{3}\log\left(\sqrt{x^3+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 + 1)*x),x, algorithm="fricas")

[Out] -1/3*log(sqrt(x^3 + 1) + 1) + 1/3*log(sqrt(x^3 + 1) - 1)
```

Sympy [A] time = 3.3641, size = 12, normalized size = 0.86

$$-\frac{2\operatorname{asinh}\left(\frac{1}{x^{\frac{3}{2}}}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(x**3+1)**(1/2),x)

[Out] -2*asinh(x**(-3/2))/3
```

GIAC/XCAS [A] time = 0.214755, size = 35, normalized size = 2.5

$$-\frac{1}{3}\ln\left(\sqrt{x^3+1}+1\right)+\frac{1}{3}\ln\left(\left|\sqrt{x^3+1}-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 + 1)*x),x, algorithm="giac")

[Out] -1/3*ln(sqrt(x^3 + 1) + 1) + 1/3*ln(abs(sqrt(x^3 + 1) - 1))
```

3.443 $\int \frac{1}{x^4\sqrt{1+x^3}}\,dx$

Optimal. Leaf size=31

$$\frac{1}{3}\tanh^{-1}\left(\sqrt{x^3+1}\right)-\frac{\sqrt{x^3+1}}{3x^3}$$

```
[Out] -Sqrt[1 + x^3]/(3*x^3) + ArcTanh[Sqrt[1 + x^3]]/3
```

Rubi [A] time = 0.0376508, antiderivative size = 31, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{1}{3}\tanh^{-1}\left(\sqrt{x^3+1}\right)-\frac{\sqrt{x^3+1}}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*Sqrt[1 + x^3]),x]

[Out] -Sqrt[1 + x^3]/(3*x^3) + ArcTanh[Sqrt[1 + x^3]]/3
```

Rubi in Sympy [A] time = 4.13414, size = 24, normalized size = 0.77

$$\frac{\operatorname{atanh}\left(\sqrt{x^3+1}\right)}{3}-\frac{\sqrt{x^3+1}}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(x**3+1)**(1/2),x)

[Out] atanh(sqrt(x**3 + 1))/3 - sqrt(x**3 + 1)/(3*x**3)
```

Mathematica [A] time = 0.0282817, size = 31, normalized size = 1.

$$\frac{1}{3}\tanh^{-1}\left(\sqrt{x^3+1}\right)-\frac{\sqrt{x^3+1}}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*Sqrt[1 + x^3]),x]

[Out] -Sqrt[1 + x^3]/(3*x^3) + ArcTanh[Sqrt[1 + x^3]]/3
```

Maple [A] time = 0.029, size = 24, normalized size = 0.8

$$\frac{1}{3}\mathit{Artanh}\left(\sqrt{x^3+1}\right)-\frac{1}{3\,x^3}\sqrt{x^3+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(x^3+1)^(1/2),x)

[Out] 1/3*arctanh((x^3+1)^(1/2))-1/3*(x^3+1)^(1/2)/x^3
```

Maxima [A] time = 1.44629, size = 50, normalized size = 1.61

$$-\frac{\sqrt{x^3+1}}{3\,x^3}+\frac{1}{6}\,\log\left(\sqrt{x^3+1}+1\right)-\frac{1}{6}\,\log\left(\sqrt{x^3+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 + 1)*x^4),x, algorithm="maxima")
```

```
[Out] -1/3*sqrt(x^3 + 1)/x^3 + 1/6*log(sqrt(x^3 + 1) + 1) - 1/6*log(sqr
t(x^3 + 1) - 1)
```

Fricas [A] time = 0.228784, size = 59, normalized size = 1.9

$$\frac{x^3\log\left(\sqrt{x^3+1}+1\right)-x^3\log\left(\sqrt{x^3+1}-1\right)-2\sqrt{x^3+1}}{6\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 + 1)*x^4),x, algorithm="fricas")
```

```
[Out] 1/6*(x^3*log(sqrt(x^3 + 1) + 1) - x^3*log(sqrt(x^3 + 1) - 1) - 2*
sqrt(x^3 + 1))/x^3
```

Sympy [A] time = 6.32317, size = 26, normalized size = 0.84

$$\frac{\operatorname{asinh}\left(\frac{1}{x^{\frac{3}{2}}}\right)}{3}-\frac{\sqrt{1+\frac{1}{x^3}}}{3x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(x**3+1)**(1/2),x)
```

```
[Out] asinh(x**(-3/2))/3 - sqrt(1 + x**(-3))/(3*x**(3/2))
```

GIAC/XCAS [A] time = 0.217323, size = 51, normalized size = 1.65

$$-\frac{\sqrt{x^3+1}}{3\,x^3}+\frac{1}{6}\ln\left(\sqrt{x^3+1}+1\right)-\frac{1}{6}\ln\left(\left|\sqrt{x^3+1}-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 + 1)*x^4),x, algorithm="giac")
```

```
[Out] -1/3*sqrt(x^3 + 1)/x^3 + 1/6*ln(sqrt(x^3 + 1) + 1) - 1/6*ln(abs(s
qrt(x^3 + 1) - 1))
```

3.444 $\int \frac{1}{x^7\sqrt{1+x^3}}\,dx$

Optimal. Leaf size=47

$$\frac{\sqrt{x^3+1}}{4x^3}-\frac{1}{4}\tanh^{-1}\left(\sqrt{x^3+1}\right)-\frac{\sqrt{x^3+1}}{6x^6}$$

```
[Out] -Sqrt[1 + x^3]/(6*x^6) + Sqrt[1 + x^3]/(4*x^3) - ArcTanh[Sqrt[1 +
 x^3]]/4
```

Rubi [A] time = 0.0495388, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{\sqrt{x^3+1}}{4x^3}-\frac{1}{4}\tanh^{-1}\left(\sqrt{x^3+1}\right)-\frac{\sqrt{x^3+1}}{6x^6}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^7*Sqrt[1 + x^3]),x]
```

```
[Out] -Sqrt[1 + x^3]/(6*x^6) + Sqrt[1 + x^3]/(4*x^3) - ArcTanh[Sqrt[1 +
 x^3]]/4
```

Rubi in Sympy [A] time = 4.8524, size = 37, normalized size = 0.79

$$-\frac{\operatorname{atanh}\left(\sqrt{x^3+1}\right)}{4}+\frac{\sqrt{x^3+1}}{4x^3}-\frac{\sqrt{x^3+1}}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**7/(x**3+1)**(1/2),x)
```

```
[Out] -atanh(sqrt(x**3 + 1))/4 + sqrt(x**3 + 1)/(4*x**3) - sqrt(x**3 +
1)/(6*x**6)
```

Mathematica [A] time = 0.0419965, size = 37, normalized size = 0.79

$$\frac{1}{12}\left(\frac{\sqrt{x^3+1}\left(3x^3-2\right)}{x^6}-3\tanh^{-1}\left(\sqrt{x^3+1}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^7*Sqrt[1 + x^3]),x]
```

```
[Out] ((Sqrt[1 + x^3]*(-2 + 3*x^3))/x^6 - 3*ArcTanh[Sqrt[1 + x^3]])/12
```

Maple [A] time = 0.03, size = 36, normalized size = 0.8

$$-\frac{1}{4}Artanh\left(\sqrt{x^3+1}\right)-\frac{1}{6\,x^6}\sqrt{x^3+1}+\frac{1}{4\,x^3}\sqrt{x^3+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^7/(x^3+1)^(1/2),x)
```

```
[Out] -1/4*arctanh((x^3+1)^(1/2))-1/6*(x^3+1)^(1/2)/x^6+1/4*(x^3+1)^(1/
2)/x^3
```

Maxima [A] time = 1.43456, size = 86, normalized size = 1.83

$$-\frac{3\left(x^3+1\right)^{\frac{3}{2}}-5\sqrt{x^3+1}}{12\left(2\,x^3-\left(x^3+1\right)^2+1\right)}-\frac{1}{8}\,\log\left(\sqrt{x^3+1}+1\right)+\frac{1}{8}\,\log\left(\sqrt{x^3+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 + 1)*x^7),x, algorithm="maxima")
```

```
[Out] -1/12*(3*(x^3 + 1)^(3/2) - 5*sqrt(x^3 + 1))/(2*x^3 - (x^3 + 1)^2
+ 1) - 1/8*log(sqrt(x^3 + 1) + 1) + 1/8*log(sqrt(x^3 + 1) - 1)
```

Fricas [A] time = 0.228907, size = 70, normalized size = 1.49

$$-\frac{3\,x^6\log\left(\sqrt{x^3+1}+1\right)-3\,x^6\log\left(\sqrt{x^3+1}-1\right)-2\left(3\,x^3-2\right)\sqrt{x^3+1}}{24\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 + 1)*x^7),x, algorithm="fricas")
```

```
[Out] -1/24*(3*x^6*log(sqrt(x^3 + 1) + 1) - 3*x^6*log(sqrt(x^3 + 1) - 1
) - 2*(3*x^3 - 2)*sqrt(x^3 + 1))/x^6
```

Sympy [A] time = 10.5292, size = 65, normalized size = 1.38

$$-\frac{\operatorname{asinh}\left(\frac{1}{x^{\frac{3}{2}}}\right)}{4}+\frac{1}{4x^{\frac{3}{2}}\sqrt{1+\frac{1}{x^3}}}+\frac{1}{12x^{\frac{9}{2}}\sqrt{1+\frac{1}{x^3}}}-\frac{1}{6x^{\frac{15}{2}}\sqrt{1+\frac{1}{x^3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**7/(x**3+1)**(1/2),x)
```

```
[Out] -asinh(x**(-3/2))/4 + 1/(4*x**(3/2)*sqrt(1 + x**(-3))) + 1/(12*x*
*(9/2)*sqrt(1 + x**(-3))) - 1/(6*x**(15/2)*sqrt(1 + x**(-3)))
```

GIAC/XCAS [A] time = 0.246308, size = 68, normalized size = 1.45

$$\frac{3\left(x^3+1\right)^{\frac{3}{2}}-5\sqrt{x^3+1}}{12\,x^6}-\frac{1}{8}\ln\left(\sqrt{x^3+1}+1\right)+\frac{1}{8}\ln\left(\left|\sqrt{x^3+1}-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 + 1)*x^7),x, algorithm="giac")
```

```
[Out] 1/12*(3*(x^3 + 1)^(3/2) - 5*sqrt(x^3 + 1))/x^6 - 1/8*ln(sqrt(x^3
+ 1) + 1) + 1/8*ln(abs(sqrt(x^3 + 1) - 1))
```

3.445 $\int \frac{1}{x^{10}\sqrt{1+x^3}}\,dx$

Optimal. Leaf size=63

$$-\frac{5\sqrt{x^3+1}}{24x^3}+\frac{5}{24}\tanh^{-1}\left(\sqrt{x^3+1}\right)-\frac{\sqrt{x^3+1}}{9x^9}+\frac{5\sqrt{x^3+1}}{36x^6}$$

```
[Out] -Sqrt[1 + x^3]/(9*x^9) + (5*Sqrt[1 + x^3])/(36*x^6) - (5*Sqrt[1 +
 x^3])/(24*x^3) + (5*ArcTanh[Sqrt[1 + x^3]])/24
```

Rubi [A] time = 0.0615414, antiderivative size = 63, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$-\frac{5\sqrt{x^3+1}}{24x^3}+\frac{5}{24}\tanh^{-1}\left(\sqrt{x^3+1}\right)-\frac{\sqrt{x^3+1}}{9x^9}+\frac{5\sqrt{x^3+1}}{36x^6}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^10*Sqrt[1 + x^3]),x]
```

```
[Out] -Sqrt[1 + x^3]/(9*x^9) + (5*Sqrt[1 + x^3])/(36*x^6) - (5*Sqrt[1 +
 x^3])/(24*x^3) + (5*ArcTanh[Sqrt[1 + x^3]])/24
```

Rubi in Sympy [A] time = 5.72421, size = 56, normalized size = 0.89

$$\frac{5\operatorname{atanh}\left(\sqrt{x^3+1}\right)}{24}-\frac{5\sqrt{x^3+1}}{24x^3}+\frac{5\sqrt{x^3+1}}{36x^6}-\frac{\sqrt{x^3+1}}{9x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**10/(x**3+1)**(1/2),x)
```

```
[Out] 5*atanh(sqrt(x**3 + 1))/24 - 5*sqrt(x**3 + 1)/(24*x**3) + 5*sqrt(
x**3 + 1)/(36*x**6) - sqrt(x**3 + 1)/(9*x**9)
```

Mathematica [A] time = 0.0457752, size = 42, normalized size = 0.67

$$\frac{1}{72}\left(15\tanh^{-1}\left(\sqrt{x^3+1}\right)+\frac{\sqrt{x^3+1}\left(-15x^6+10x^3-8\right)}{x^9}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^10*Sqrt[1 + x^3]),x]
```

```
[Out] ((Sqrt[1 + x^3]*(-8 + 10*x^3 - 15*x^6))/x^9 + 15*ArcTanh[Sqrt[1 +
 x^3]])/72
```

Maple [A] time = 0.033, size = 48, normalized size = 0.8

$$\frac{5}{24}\mathit{Artanh}\left(\sqrt{x^3+1}\right)-\frac{1}{9\,x^9}\sqrt{x^3+1}+\frac{5}{36\,x^6}\sqrt{x^3+1}-\frac{5}{24\,x^3}\sqrt{x^3+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^10/(x^3+1)^(1/2),x)
```

```
[Out] 5/24*arctanh((x^3+1)^(1/2))-1/9*(x^3+1)^(1/2)/x^9+5/36*(x^3+1)^(1
/2)/x^6-5/24*(x^3+1)^(1/2)/x^3
```

Maxima [A] time = 1.43967, size = 108, normalized size = 1.71

$$-\frac{15\left(x^{3}+1\right)^{\frac{5}{2}}-40\left(x^{3}+1\right)^{\frac{3}{2}}+33\sqrt{x^{3}+1}}{72\left(\left(x^{3}+1\right)^{3}+3x^{3}-3\left(x^{3}+1\right)^{2}+2\right)}+\frac{5}{48}\log\left(\sqrt{x^{3}+1}+1\right)-\frac{5}{48}\log\left(\sqrt{x^{3}+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 + 1)*x^10),x, algorithm="maxima")
```

```
[Out] -1/72*(15*(x^3 + 1)^(5/2) - 40*(x^3 + 1)^(3/2) + 33*sqrt(x^3 + 1)
)/((x^3 + 1)^3 + 3*x^3 - 3*(x^3 + 1)^2 + 2) + 5/48*log(sqrt(x^3 +
 1) + 1) - 5/48*log(sqrt(x^3 + 1) - 1)
```

Fricas [A] time = 0.227765, size = 77, normalized size = 1.22

$$\frac{15x^{9}\log\left(\sqrt{x^{3}+1}+1\right)-15x^{9}\log\left(\sqrt{x^{3}+1}-1\right)-2\left(15x^{6}-10x^{3}+8\right)\sqrt{x^{3}+1}}{144x^{9}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 + 1)*x^10),x, algorithm="fricas")
```

```
[Out] 1/144*(15*x^9*log(sqrt(x^3 + 1) + 1) - 15*x^9*log(sqrt(x^3 + 1) -
 1) - 2*(15*x^6 - 10*x^3 + 8)*sqrt(x^3 + 1))/x^9
```

Sympy [A] time = 17.4923, size = 85, normalized size = 1.35

$$\frac{5\operatorname{asinh}\left(\frac{1}{x^{\frac{3}{2}}}\right)}{24}-\frac{5}{24x^{\frac{3}{2}}\sqrt{1+\frac{1}{x^{3}}}}-\frac{5}{72x^{\frac{9}{2}}\sqrt{1+\frac{1}{x^{3}}}}+\frac{1}{36x^{\frac{15}{2}}\sqrt{1+\frac{1}{x^{3}}}}-\frac{1}{9x^{\frac{21}{2}}\sqrt{1+\frac{1}{x^{3}}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**10/(x**3+1)**(1/2),x)
```

```
[Out] 5*asinh(x**(-3/2))/24 - 5/(24*x**(3/2)*sqrt(1 + x**(-3))) - 5/(72
*x**(9/2)*sqrt(1 + x**(-3))) + 1/(36*x**(15/2)*sqrt(1 + x**(-3)))
 - 1/(9*x**(21/2)*sqrt(1 + x**(-3)))
```

GIAC/XCAS [A] time = 0.245071, size = 80, normalized size = 1.27

$$-\frac{15\left(x^{3}+1\right)^{\frac{5}{2}}-40\left(x^{3}+1\right)^{\frac{3}{2}}+33\sqrt{x^{3}+1}}{72x^{9}}+\frac{5}{48}\ln\left(\sqrt{x^{3}+1}+1\right)-\frac{5}{48}\ln\left(\left|\sqrt{x^{3}+1}-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 + 1)*x^10),x, algorithm="giac")
```

```
[Out] -1/72*(15*(x^3 + 1)^(5/2) - 40*(x^3 + 1)^(3/2) + 33*sqrt(x^3 + 1)
)/x^9 + 5/48*ln(sqrt(x^3 + 1) + 1) - 5/48*ln(abs(sqrt(x^3 + 1) -
1))
```

3.446 $\int \frac{x^6}{\sqrt{1+x^3}}\,dx$

Optimal. Leaf size=136

$$-\frac{16}{55}\sqrt{x^3+1}x+\frac{2}{11}\sqrt{x^3+1}x^4+\frac{32\sqrt{2+\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x-\sqrt{3}+1}{x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{55\sqrt[4]{3}\sqrt{\frac{x+1}{\left(x+\sqrt{3}+1\right)^2}}\sqrt{x^3+1}}$$

```
[Out] (-16*x*Sqrt[1 + x^3])/55 + (2*x^4*Sqrt[1 + x^3])/11 + (32*Sqrt[2
+ Sqrt[3]]*(1 + x)*Sqrt[(1 - x + x^2)/(1 + Sqrt[3] + x)^2]*Ellipt
icF[ArcSin[(1 - Sqrt[3] + x)/(1 + Sqrt[3] + x)], -7 - 4*Sqrt[3]])
/(55*3^(1/4)*Sqrt[(1 + x)/(1 + Sqrt[3] + x)^2]*Sqrt[1 + x^3])
```

Rubi [A] time = 0.0971414, antiderivative size = 136, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{16}{55}\sqrt{x^3+1}x+\frac{2}{11}\sqrt{x^3+1}x^4+\frac{32\sqrt{2+\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x-\sqrt{3}+1}{x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{55\sqrt[4]{3}\sqrt{\frac{x+1}{\left(x+\sqrt{3}+1\right)^2}}\sqrt{x^3+1}}$$

Antiderivative was successfully verified.

```
[In] Int[x^6/Sqrt[1 + x^3],x]
```

```
[Out] (-16*x*Sqrt[1 + x^3])/55 + (2*x^4*Sqrt[1 + x^3])/11 + (32*Sqrt[2
+ Sqrt[3]]*(1 + x)*Sqrt[(1 - x + x^2)/(1 + Sqrt[3] + x)^2]*Ellipt
icF[ArcSin[(1 - Sqrt[3] + x)/(1 + Sqrt[3] + x)], -7 - 4*Sqrt[3]])
/(55*3^(1/4)*Sqrt[(1 + x)/(1 + Sqrt[3] + x)^2]*Sqrt[1 + x^3])
```

Rubi in Sympy [A] time = 5.70981, size = 124, normalized size = 0.91

$$\frac{2x^4\sqrt{x^3+1}}{11}-\frac{16x\sqrt{x^3+1}}{55}+\frac{32\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2-x+1}{\left(x+1+\sqrt{3}\right)^2}}\sqrt{\sqrt{3}+2}\,(x+1)\,F\left(\operatorname{asin}\left(\frac{x-\sqrt{3}+1}{x+1+\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{165\sqrt{\frac{x+1}{\left(x+1+\sqrt{3}\right)^2}}\sqrt{x^3+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**6/(x**3+1)**(1/2),x)
```

```
[Out] 2*x**4*sqrt(x**3 + 1)/11 - 16*x*sqrt(x**3 + 1)/55 + 32*3**(3/4)*s
qrt((x**2 - x + 1)/(x + 1 + sqrt(3))**2)*sqrt(sqrt(3) + 2)*(x + 1
)*elliptic_f(asin((x - sqrt(3) + 1)/(x + 1 + sqrt(3))), -7 - 4*sq
rt(3))/(165*sqrt((x + 1)/(x + 1 + sqrt(3))**2)*sqrt(x**3 + 1))
```

Mathematica [A] time = 0.23599, size = 108, normalized size = 0.79

$$\frac{2\left(16\sqrt[6]{-1}3^{3/4}\sqrt{-\sqrt[6]{-1}\left(x+(-1)^{2/3}\right)}\sqrt{(-1)^{2/3}x^2+\sqrt[3]{-1}x+1}F\left(\sin^{-1}\left(\frac{\sqrt{-(-1)^{5/6}(x+1)}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)+3x\left(5x^6-3x^3-8\right)\right)}{165\sqrt{x^3+1}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^6/Sqrt[1 + x^3],x]
```

```
[Out] (2*(3*x*(-8 - 3*x^3 + 5*x^6) + 16*(-1)^(1/6)*3^(3/4)*Sqrt[-((-1)^
(1/6)*((-1)^(2/3) + x))]*Sqrt[1 + (-1)^(1/3)*x + (-1)^(2/3)*x^2]*
EllipticF[ArcSin[Sqrt[-((-1)^(5/6)*(1 + x))]/3^(1/4)], (-1)^(1/3)
]))/(165*Sqrt[1 + x^3])
```

Maple [A] time = 0.025, size = 139, normalized size = 1.

$$\frac{2x^4}{11}\sqrt{x^3+1}-\frac{16x}{55}\sqrt{x^3+1}$$
$$+\frac{48-16i\sqrt{3}}{55}\sqrt{\frac{1+x}{\frac{3}{2}-\frac{i}{2}\sqrt{3}}}\sqrt{\frac{1}{-\frac{3}{2}-\frac{i}{2}\sqrt{3}}\left(x-\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)}\sqrt{\frac{1}{-\frac{3}{2}+\frac{i}{2}\sqrt{3}}\left(x-\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)}\,EllipticF\left(\sqrt{\frac{1+x}{\frac{3}{2}-\frac{i}{2}\sqrt{3}}},\sqrt{\frac{-\frac{3}{2}+\frac{i}{2}\sqrt{3}}{-\frac{3}{2}-\frac{i}{2}\sqrt{3}}}\right)\frac{}{\sqrt{}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(x^3+1)^(1/2),x)
```

```
[Out] 2/11*x^4*(x^3+1)^(1/2)-16/55*x*(x^3+1)^(1/2)+32/55*(3/2-1/2*I*3^(
1/2))*((1+x)/(3/2-1/2*I*3^(1/2)))^(1/2)*((x-1/2-1/2*I*3^(1/2))/(-
3/2-1/2*I*3^(1/2)))^(1/2)*((x-1/2+1/2*I*3^(1/2))/(-3/2+1/2*I*3^(1
/2)))^(1/2)/(x^3+1)^(1/2)*EllipticF(((1+x)/(3/2-1/2*I*3^(1/2)))^(
1/2),((-3/2+1/2*I*3^(1/2))/(-3/2-1/2*I*3^(1/2)))^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{\sqrt{x^3+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(x^3 + 1),x, algorithm="maxima")
```

```
[Out] integrate(x^6/sqrt(x^3 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^6}{\sqrt{x^3+1}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(x^3 + 1),x, algorithm="fricas")
```

```
[Out] integral(x^6/sqrt(x^3 + 1), x)
```

Sympy [A] time = 2.21569, size = 29, normalized size = 0.21

$$\frac{x^7\,\Gamma\left(\frac{7}{3}\right)\,{}_2F_1\left(\left.\begin{matrix}\frac{1}{2},\frac{7}{3}\\\frac{10}{3}\end{matrix}\right|x^3e^{i\pi}\right)}{3\,\Gamma\left(\frac{10}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(x**3+1)**(1/2),x)
```

```
[Out] x**7*gamma(7/3)*hyper((1/2, 7/3), (10/3,), x**3*exp_polar(I*pi))/
(3*gamma(10/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{\sqrt{x^3+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(x^3 + 1),x, algorithm="giac")
```

```
[Out] integrate(x^6/sqrt(x^3 + 1), x)
```

3.447 $\int \frac{x^3}{\sqrt{1+x^3}}\,dx$

Optimal. Leaf size=120

$$\frac{2}{5}x\sqrt{x^3+1}-\frac{4\sqrt{2+\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x-\sqrt{3}+1}{x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{5\sqrt[4]{3}\sqrt{\frac{x+1}{\left(x+\sqrt{3}+1\right)^2}}\sqrt{x^3+1}}$$

```
[Out] (2*x*Sqrt[1 + x^3])/5 - (4*Sqrt[2 + Sqrt[3]]*(1 + x)*Sqrt[(1 - x
+ x^2)/(1 + Sqrt[3] + x)^2]*EllipticF[ArcSin[(1 - Sqrt[3] + x)/(1
 + Sqrt[3] + x)], -7 - 4*Sqrt[3]])/(5*3^(1/4)*Sqrt[(1 + x)/(1 + S
qrt[3] + x)^2]*Sqrt[1 + x^3])
```

Rubi [A] time = 0.0572018, antiderivative size = 120, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{2}{5}x\sqrt{x^3+1}-\frac{4\sqrt{2+\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x-\sqrt{3}+1}{x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{5\sqrt[4]{3}\sqrt{\frac{x+1}{\left(x+\sqrt{3}+1\right)^2}}\sqrt{x^3+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/Sqrt[1 + x^3],x]
```

```
[Out] (2*x*Sqrt[1 + x^3])/5 - (4*Sqrt[2 + Sqrt[3]]*(1 + x)*Sqrt[(1 - x
+ x^2)/(1 + Sqrt[3] + x)^2]*EllipticF[ArcSin[(1 - Sqrt[3] + x)/(1
 + Sqrt[3] + x)], -7 - 4*Sqrt[3]])/(5*3^(1/4)*Sqrt[(1 + x)/(1 + S
qrt[3] + x)^2]*Sqrt[1 + x^3])
```

Rubi in Sympy [A] time = 4.17955, size = 109, normalized size = 0.91

$$\frac{2x\sqrt{x^3+1}}{5}-\frac{4\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2-x+1}{\left(x+1+\sqrt{3}\right)^2}}\sqrt{\sqrt{3}+2}\,(x+1)\,F\left(\operatorname{asin}\left(\frac{x-\sqrt{3}+1}{x+1+\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{15\sqrt{\frac{x+1}{\left(x+1+\sqrt{3}\right)^2}}\sqrt{x^3+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(x**3+1)**(1/2),x)
```

```
[Out] 2*x*sqrt(x**3 + 1)/5 - 4*3**(3/4)*sqrt((x**2 - x + 1)/(x + 1 + sq
rt(3))**2)*sqrt(sqrt(3) + 2)*(x + 1)*elliptic_f(asin((x - sqrt(3)
 + 1)/(x + 1 + sqrt(3))), -7 - 4*sqrt(3))/(15*sqrt((x + 1)/(x + 1
 + sqrt(3))**2)*sqrt(x**3 + 1))
```

Mathematica [A] time = 0.208855, size = 100, normalized size = 0.83

$$\frac{6\left(x^4+x\right)-4\sqrt[6]{-1}3^{3/4}\sqrt{-\sqrt[6]{-1}\left(x+(-1)^{2/3}\right)}\sqrt{(-1)^{2/3}x^2+\sqrt[3]{-1}x+1}F\left(\sin^{-1}\left(\frac{\sqrt{-(-1)^{5/6}(x+1)}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)}{15\sqrt{x^3+1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^3/Sqrt[1 + x^3],x]
```

```
[Out] (6*(x + x^4) - 4*(-1)^(1/6)*3^(3/4)*Sqrt[-((-1)^(1/6)*((-1)^(2/3)
 + x))]*Sqrt[1 + (-1)^(1/3)*x + (-1)^(2/3)*x^2]*EllipticF[ArcSin[
Sqrt[-((-1)^(5/6)*(1 + x))]/3^(1/4)], (-1)^(1/3)])/(15*Sqrt[1 + x
^3])
```

Maple [A] time = 0.025, size = 127, normalized size = 1.1

$$\frac{2x}{5}\sqrt{x^3+1}$$
$$-\frac{6-2i\sqrt{3}}{5}\sqrt{\frac{1+x}{\frac{3}{2}-\frac{i}{2}\sqrt{3}}}\sqrt{\frac{1}{-\frac{3}{2}-\frac{i}{2}\sqrt{3}}\left(x-\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)}\sqrt{\frac{1}{-\frac{3}{2}+\frac{i}{2}\sqrt{3}}\left(x-\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)}\mathit{EllipticF}\left(\sqrt{\frac{1+x}{\frac{3}{2}-\frac{i}{2}\sqrt{3}}},\sqrt{\frac{-\frac{3}{2}+\frac{i}{2}\sqrt{3}}{-\frac{3}{2}-\frac{i}{2}\sqrt{3}}}\right)\frac{1}{\sqrt{x^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(x^3+1)^(1/2),x)
```

```
[Out] 2/5*x*(x^3+1)^(1/2)-4/5*(3/2-1/2*I*3^(1/2))*((1+x)/(3/2-1/2*I*3^(
1/2)))^(1/2)*((x-1/2-1/2*I*3^(1/2))/(-3/2-1/2*I*3^(1/2)))^(1/2)*(
(x-1/2+1/2*I*3^(1/2))/(-3/2+1/2*I*3^(1/2)))^(1/2)/(x^3+1)^(1/2)*E
llipticF(((1+x)/(3/2-1/2*I*3^(1/2)))^(1/2),((-3/2+1/2*I*3^(1/2))/
(-3/2-1/2*I*3^(1/2)))^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{\sqrt{x^3+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(x^3 + 1),x, algorithm="maxima")
```

```
[Out] integrate(x^3/sqrt(x^3 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^3}{\sqrt{x^3+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(x^3 + 1),x, algorithm="fricas")
```

```
[Out] integral(x^3/sqrt(x^3 + 1), x)
```

Sympy [A] time = 1.89312, size = 29, normalized size = 0.24

$$\frac{x^4\left(\frac{4}{3}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{4}{3}\\\frac{7}{3}\end{matrix}\middle| x^3e^{i\pi}\right)}{3\left(\frac{7}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(x**3+1)**(1/2),x)
```

```
[Out] x**4*gamma(4/3)*hyper((1/2, 4/3), (7/3,), x**3*exp_polar(I*pi))/(
3*gamma(7/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{\sqrt{x^3+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(x^3 + 1),x, algorithm="giac")
```

```
[Out] integrate(x^3/sqrt(x^3 + 1), x)
```

3.448 $\int \frac{1}{\sqrt{1+x^3}}\,dx$

Optimal. Leaf size=103

$$\frac{2\sqrt{2+\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x-\sqrt{3}+1}{x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{\sqrt[4]{3}\sqrt{\frac{x+1}{\left(x+\sqrt{3}+1\right)^2}}\sqrt{x^3+1}}$$

```
[Out] (2*Sqrt[2 + Sqrt[3]]*(1 + x)*Sqrt[(1 - x + x^2)/(1 + Sqrt[3] + x)
^2]*EllipticF[ArcSin[(1 - Sqrt[3] + x)/(1 + Sqrt[3] + x)], -7 - 4
*Sqrt[3]])/(3^(1/4)*Sqrt[(1 + x)/(1 + Sqrt[3] + x)^2]*Sqrt[1 + x^
3])
```

Rubi [A] time = 0.0284474, antiderivative size = 103, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111

$$\frac{2\sqrt{2+\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x-\sqrt{3}+1}{x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{\sqrt[4]{3}\sqrt{\frac{x+1}{\left(x+\sqrt{3}+1\right)^2}}\sqrt{x^3+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[1 + x^3],x]
```

```
[Out] (2*Sqrt[2 + Sqrt[3]]*(1 + x)*Sqrt[(1 - x + x^2)/(1 + Sqrt[3] + x)
^2]*EllipticF[ArcSin[(1 - Sqrt[3] + x)/(1 + Sqrt[3] + x)], -7 - 4
*Sqrt[3]])/(3^(1/4)*Sqrt[(1 + x)/(1 + Sqrt[3] + x)^2]*Sqrt[1 + x^
3])
```

Rubi in Sympy [A] time = 1.94914, size = 95, normalized size = 0.92

$$\frac{2\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2-x+1}{\left(x+1+\sqrt{3}\right)^2}}\sqrt{\sqrt{3}+2}\,(x+1)\,F\left(\operatorname{asin}\left(\frac{x-\sqrt{3}+1}{x+1+\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{3\sqrt{\frac{x+1}{\left(x+1+\sqrt{3}\right)^2}}\sqrt{x^3+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(x**3+1)**(1/2),x)
```

```
[Out] 2*3**(3/4)*sqrt((x**2 - x + 1)/(x + 1 + sqrt(3))**2)*sqrt(sqrt(3)
 + 2)*(x + 1)*elliptic_f(asin((x - sqrt(3) + 1)/(x + 1 + sqrt(3))
), -7 - 4*sqrt(3))/(3*sqrt((x + 1)/(x + 1 + sqrt(3))**2)*sqrt(x**
3 + 1))
```

Mathematica [A] time = 0.0723485, size = 88, normalized size = 0.85

$$\frac{2\sqrt[6]{-1}\sqrt{-\sqrt[6]{-1}\left(x+(-1)^{2/3}\right)}\sqrt{(-1)^{2/3}x^2+\sqrt[3]{-1}x+1}F\left(\sin^{-1}\left(\frac{\sqrt{-(-1)^{5/6}(x+1)}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)}{\sqrt[4]{3}\sqrt{x^3+1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/Sqrt[1 + x^3],x]
```

```
[Out] (2*(-1)^(1/6)*Sqrt[-((-1)^(1/6)*((-1)^(2/3) + x))]*Sqrt[1 + (-1)^
(1/3)*x + (-1)^(2/3)*x^2]*EllipticF[ArcSin[Sqrt[-((-1)^(5/6)*(1 +
 x))]/3^(1/4)], (-1)^(1/3)])/(3^(1/4)*Sqrt[1 + x^3])
```

Maple [A] time = 0.02, size = 116, normalized size = 1.1

$$2\,\frac{3/2-i/2\sqrt{3}}{\sqrt{x^3+1}}\sqrt{\frac{1+x}{3/2-i/2\sqrt{3}}}\sqrt{\frac{x-1/2-i/2\sqrt{3}}{-3/2-i/2\sqrt{3}}}\sqrt{\frac{x-1/2+i/2\sqrt{3}}{-3/2+i/2\sqrt{3}}}\,EllipticF\left(\sqrt{\frac{1+x}{3/2-i/2\sqrt{3}}},\sqrt{\frac{-3/2+i/2\sqrt{3}}{-3/2-i/2\sqrt{3}}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^3+1)^(1/2),x)
```

```
[Out] 2*(3/2-1/2*I*3^(1/2))*((1+x)/(3/2-1/2*I*3^(1/2)))^(1/2)*((x-1/2-1
/2*I*3^(1/2))/(-3/2-1/2*I*3^(1/2)))^(1/2)*((x-1/2+1/2*I*3^(1/2))/
(-3/2+1/2*I*3^(1/2)))^(1/2)/(x^3+1)^(1/2)*EllipticF(((1+x)/(3/2-1
/2*I*3^(1/2)))^(1/2),((-3/2+1/2*I*3^(1/2))/(-3/2-1/2*I*3^(1/2)))^
(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\sqrt{x^3+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/sqrt(x^3 + 1),x, algorithm="maxima")
```

```
[Out] integrate(1/sqrt(x^3 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{\sqrt{x^3+1}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/sqrt(x^3 + 1),x, algorithm="fricas")
```

```
[Out] integral(1/sqrt(x^3 + 1), x)
```

Sympy [A] time = 1.67638, size = 27, normalized size = 0.26

$$\frac{x\,\Gamma\left(\frac{1}{3}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{3},\frac{1}{2}\\\frac{4}{3}\end{matrix}\middle|x^3e^{i\pi}\right)}{3\,\Gamma\left(\frac{4}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(x**3+1)**(1/2),x)
```

```
[Out] x*gamma(1/3)*hyper((1/3, 1/2), (4/3,), x**3*exp_polar(I*pi))/(3*g
amma(4/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^3 + 1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(x^3 + 1),x, algorithm="giac")
```

```
[Out] integrate(1/sqrt(x^3 + 1), x)
```

3.449 $\int \frac{1}{x^3\sqrt{1+x^3}}\,dx$

Optimal. Leaf size=122

$$-\frac{\sqrt{x^3+1}}{2x^2}-\frac{\sqrt{2+\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x-\sqrt{3}+1}{x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{2\sqrt[4]{3}\sqrt{\frac{x+1}{\left(x+\sqrt{3}+1\right)^2}}\sqrt{x^3+1}}$$

```
[Out] -Sqrt[1 + x^3]/(2*x^2) - (Sqrt[2 + Sqrt[3]]*(1 + x)*Sqrt[(1 - x +
 x^2)/(1 + Sqrt[3] + x)^2]*EllipticF[ArcSin[(1 - Sqrt[3] + x)/(1
+ Sqrt[3] + x)], -7 - 4*Sqrt[3]])/(2*3^(1/4)*Sqrt[(1 + x)/(1 + Sq
rt[3] + x)^2]*Sqrt[1 + x^3])
```

Rubi [A] time = 0.0563906, antiderivative size = 122, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$-\frac{\sqrt{x^3+1}}{2x^2}-\frac{\sqrt{2+\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x-\sqrt{3}+1}{x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{2\sqrt[4]{3}\sqrt{\frac{x+1}{\left(x+\sqrt{3}+1\right)^2}}\sqrt{x^3+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*Sqrt[1 + x^3]),x]
```

```
[Out] -Sqrt[1 + x^3]/(2*x^2) - (Sqrt[2 + Sqrt[3]]*(1 + x)*Sqrt[(1 - x +
 x^2)/(1 + Sqrt[3] + x)^2]*EllipticF[ArcSin[(1 - Sqrt[3] + x)/(1
+ Sqrt[3] + x)], -7 - 4*Sqrt[3]])/(2*3^(1/4)*Sqrt[(1 + x)/(1 + Sq
rt[3] + x)^2]*Sqrt[1 + x^3])
```

Rubi in Sympy [A] time = 4.084, size = 109, normalized size = 0.89

$$-\frac{3^{\frac{3}{4}}\sqrt{\frac{x^2-x+1}{\left(x+1+\sqrt{3}\right)^2}}\sqrt{\sqrt{3}+2}\,(x+1)\,F\left(\operatorname{asin}\left(\frac{x-\sqrt{3}+1}{x+1+\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{6\sqrt{\frac{x+1}{\left(x+1+\sqrt{3}\right)^2}}\sqrt{x^3+1}}-\frac{\sqrt{x^3+1}}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(x**3+1)**(1/2),x)
```

```
[Out] -3**(3/4)*sqrt((x**2 - x + 1)/(x + 1 + sqrt(3))**2)*sqrt(sqrt(3)
+ 2)*(x + 1)*elliptic_f(asin((x - sqrt(3) + 1)/(x + 1 + sqrt(3)))
, -7 - 4*sqrt(3))/(6*sqrt((x + 1)/(x + 1 + sqrt(3))**2)*sqrt(x**3
 + 1)) - sqrt(x**3 + 1)/(2*x**2)
```

Mathematica [A] time = 0.183252, size = 104, normalized size = 0.85

$$-\frac{3x^3+\sqrt[6]{-1}3^{3/4}\sqrt{-\sqrt[6]{-1}\left(x+(-1)^{2/3}\right)}\sqrt{(-1)^{2/3}x^2+\sqrt[3]{-1}x+1}x^2F\left(\sin^{-1}\left(\frac{\sqrt{-(-1)^{5/6}(x+1)}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)+3}{6x^2\sqrt{x^3+1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/(x^3*Sqrt[1 + x^3]),x]
```

```
[Out] -(3 + 3*x^3 + (-1)^(1/6)*3^(3/4)*x^2*Sqrt[-((-1)^(1/6)*((-1)^(2/3
) + x))]*Sqrt[1 + (-1)^(1/3)*x + (-1)^(2/3)*x^2]*EllipticF[ArcSin
[Sqrt[-((-1)^(5/6)*(1 + x))]/3^(1/4)], (-1)^(1/3)])/(6*x^2*Sqrt[1
 + x^3])
```

Maple [A] time = 0.028, size = 129, normalized size = 1.1

$$-\frac{1}{2\,x^2}\sqrt{x^3+1}$$
$$-\frac{\frac{3}{2}-\frac{i}{2}\sqrt{3}}{2}\sqrt{\frac{1+x}{\frac{3}{2}-\frac{i}{2}\sqrt{3}}}\sqrt{\frac{1}{-\frac{3}{2}-\frac{i}{2}\sqrt{3}}\left(x-\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)}\sqrt{\frac{1}{-\frac{3}{2}+\frac{i}{2}\sqrt{3}}\left(x-\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)}\,EllipticF\left(\sqrt{\frac{1+x}{\frac{3}{2}-\frac{i}{2}\sqrt{3}}},\sqrt{\frac{-\frac{3}{2}+\frac{i}{2}\sqrt{3}}{-\frac{3}{2}-\frac{i}{2}\sqrt{3}}}\right)\frac{1}{\sqrt{x^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(x^3+1)^(1/2),x)
```

```
[Out] -1/2*(x^3+1)^(1/2)/x^2-1/2*(3/2-1/2*I*3^(1/2))*((1+x)/(3/2-1/2*I*
3^(1/2)))^(1/2)*((x-1/2-1/2*I*3^(1/2))/(-3/2-1/2*I*3^(1/2)))^(1/2
)*((x-1/2+1/2*I*3^(1/2))/(-3/2+1/2*I*3^(1/2)))^(1/2)/(x^3+1)^(1/2
)*EllipticF(((1+x)/(3/2-1/2*I*3^(1/2)))^(1/2),((-3/2+1/2*I*3^(1/2
))/(-3/2-1/2*I*3^(1/2)))^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^3+1}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 + 1)*x^3),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(x^3 + 1)*x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{x^3+1}x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 + 1)*x^3),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(x^3 + 1)*x^3), x)
```

Sympy [A] time = 2.18446, size = 32, normalized size = 0.26

$$\frac{\Gamma\left(-\frac{2}{3}\right)\,{}_2F_1\left(\begin{matrix}-\frac{2}{3},\frac{1}{2}\\ \frac{1}{3}\end{matrix}\middle|x^3e^{i\pi}\right)}{3x^2\,\Gamma\left(\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(x**3+1)**(1/2),x)
```

```
[Out] gamma(-2/3)*hyper((-2/3, 1/2), (1/3,), x**3*exp_polar(I*pi))/(3*x
**2*gamma(1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^3 + 1}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 + 1)*x^3),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(x^3 + 1)*x^3), x)
```

3.450 $\int \frac{1}{x^6\sqrt{1+x^3}}\,dx$

Optimal. Leaf size=138

$$-\frac{\sqrt{x^3+1}}{5x^5}+\frac{7\sqrt{x^3+1}}{20x^2}+\frac{7\sqrt{2+\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x-\sqrt{3}+1}{x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{20\sqrt[4]{3}\sqrt{\frac{x+1}{\left(x+\sqrt{3}+1\right)^2}}\sqrt{x^3+1}}$$

```
[Out] -Sqrt[1 + x^3]/(5*x^5) + (7*Sqrt[1 + x^3])/(20*x^2) + (7*Sqrt[2 +
 Sqrt[3]]*(1 + x)*Sqrt[(1 - x + x^2)/(1 + Sqrt[3] + x)^2]*Ellipti
cF[ArcSin[(1 - Sqrt[3] + x)/(1 + Sqrt[3] + x)], -7 - 4*Sqrt[3]])/
(20*3^(1/4)*Sqrt[(1 + x)/(1 + Sqrt[3] + x)^2]*Sqrt[1 + x^3])
```

Rubi [A] time = 0.081315, antiderivative size = 138, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{\sqrt{x^3+1}}{5x^5}+\frac{7\sqrt{x^3+1}}{20x^2}+\frac{7\sqrt{2+\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x-\sqrt{3}+1}{x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{20\sqrt[4]{3}\sqrt{\frac{x+1}{\left(x+\sqrt{3}+1\right)^2}}\sqrt{x^3+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^6*Sqrt[1 + x^3]),x]
```

```
[Out] -Sqrt[1 + x^3]/(5*x^5) + (7*Sqrt[1 + x^3])/(20*x^2) + (7*Sqrt[2 +
 Sqrt[3]]*(1 + x)*Sqrt[(1 - x + x^2)/(1 + Sqrt[3] + x)^2]*Ellipti
cF[ArcSin[(1 - Sqrt[3] + x)/(1 + Sqrt[3] + x)], -7 - 4*Sqrt[3]])/
(20*3^(1/4)*Sqrt[(1 + x)/(1 + Sqrt[3] + x)^2]*Sqrt[1 + x^3])
```

Rubi in Sympy [A] time = 5.68369, size = 124, normalized size = 0.9

$$\frac{7\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2-x+1}{\left(x+1+\sqrt{3}\right)^2}}\sqrt{\sqrt{3}+2}\,(x+1)\,F\left(\operatorname{asin}\left(\frac{x-\sqrt{3}+1}{x+1+\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{60\sqrt{\frac{x+1}{\left(x+1+\sqrt{3}\right)^2}}\sqrt{x^3+1}}+\frac{7\sqrt{x^3+1}}{20x^2}-\frac{\sqrt{x^3+1}}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**6/(x**3+1)**(1/2),x)
```

```
[Out] 7*3**(3/4)*sqrt((x**2 - x + 1)/(x + 1 + sqrt(3))**2)*sqrt(sqrt(3)
 + 2)*(x + 1)*elliptic_f(asin((x - sqrt(3) + 1)/(x + 1 + sqrt(3))
), -7 - 4*sqrt(3))/(60*sqrt((x + 1)/(x + 1 + sqrt(3))**2)*sqrt(x*
*3 + 1)) + 7*sqrt(x**3 + 1)/(20*x**2) - sqrt(x**3 + 1)/(5*x**5)
```

Mathematica [A] time = 0.136498, size = 110, normalized size = 0.8

$$\frac{21x^6+9x^3+7\sqrt[6]{-1}3^{3/4}\sqrt{-\sqrt[6]{-1}\left(x+(-1)^{2/3}\right)}\sqrt{(-1)^{2/3}x^2+\sqrt[3]{-1}x+1}x^5F\left(\sin^{-1}\left(\frac{\sqrt{-(-1)^{5/6}(x+1)}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)-12}{60x^5\sqrt{x^3+1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/(x^6*Sqrt[1 + x^3]),x]
```

```
[Out] (-12 + 9*x^3 + 21*x^6 + 7*(-1)^(1/6)*3^(3/4)*x^5*Sqrt[-((-1)^(1/6
)*((-1)^(2/3) + x))]*Sqrt[1 + (-1)^(1/3)*x + (-1)^(2/3)*x^2]*Elli
pticF[ArcSin[Sqrt[-((-1)^(5/6)*(1 + x))]/3^(1/4)], (-1)^(1/3)])/(
60*x^5*Sqrt[1 + x^3])
```

Maple [A] time = 0.029, size = 141, normalized size = 1.

$$-\frac{1}{5x^5}\sqrt{x^3+1}+\frac{7}{20x^2}\sqrt{x^3+1}+\frac{\frac{21}{2}-\frac{7i}{2}\sqrt{3}}{20}\sqrt{\frac{1+x}{\frac{3}{2}-\frac{i}{2}\sqrt{3}}}\sqrt{\frac{1}{-\frac{3}{2}-\frac{i}{2}\sqrt{3}}\left(x-\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)}\sqrt{\frac{1}{-\frac{3}{2}+\frac{i}{2}\sqrt{3}}\left(x-\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)}EllipticF\left(\sqrt{\frac{1+x}{\frac{3}{2}-\frac{i}{2}\sqrt{3}}},\sqrt{\frac{-\frac{3}{2}+\frac{i}{2}\sqrt{3}}{-\frac{3}{2}-\frac{i}{2}\sqrt{3}}}\right)\frac{}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^6/(x^3+1)^(1/2),x)
```

```
[Out] -1/5*(x^3+1)^(1/2)/x^5+7/20*(x^3+1)^(1/2)/x^2+7/20*(3/2-1/2*I*3^(
1/2))*((1+x)/(3/2-1/2*I*3^(1/2)))^(1/2)*((x-1/2-1/2*I*3^(1/2))/(-
3/2-1/2*I*3^(1/2)))^(1/2)*((x-1/2+1/2*I*3^(1/2))/(-3/2+1/2*I*3^(1
/2)))^(1/2)/(x^3+1)^(1/2)*EllipticF(((1+x)/(3/2-1/2*I*3^(1/2)))^(
1/2),((-3/2+1/2*I*3^(1/2))/(-3/2-1/2*I*3^(1/2)))^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^3+1}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 + 1)*x^6),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(x^3 + 1)*x^6), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{x^3+1}x^6},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 + 1)*x^6),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(x^3 + 1)*x^6), x)
```

Sympy [A] time = 2.85182, size = 36, normalized size = 0.26

$$\frac{\Gamma\left(-\frac{5}{3}\right) {}_2F_1\left(\begin{matrix}-\frac{5}{3},\frac{1}{2}\\-\frac{2}{3}\end{matrix}\middle| x^3e^{i\pi}\right)}{3x^5\Gamma\left(-\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**6/(x**3+1)**(1/2),x)
```

```
[Out] gamma(-5/3)*hyper((-5/3, 1/2), (-2/3,), x**3*exp_polar(I*pi))/(3*
x**5*gamma(-2/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^3 + 1}x^6}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 + 1)*x^6),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(x^3 + 1)*x^6), x)
```

3.451 $\int \frac{x^7}{\sqrt{1+x^3}}\,dx$

Optimal. Leaf size=262

$$\frac{80\sqrt{x^3+1}}{91\left(x+\sqrt{3}+1\right)}+\frac{2}{13}\sqrt{x^3+1}x^5-\frac{20}{91}\sqrt{x^3+1}x^2+\frac{80\sqrt{2}(x+1)\sqrt{\frac{x^2-x+1}{\left(x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x-\sqrt{3}+1}{x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{91\sqrt[4]{3}\sqrt{\frac{x+1}{\left(x+\sqrt{3}+1\right)^2}}\sqrt{x^3+1}}-\frac{40\sqrt[4]{3}\sqrt{2-\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x+\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{x-\sqrt{3}+1}{x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{91\sqrt{\frac{x+1}{\left(x+\sqrt{3}+1\right)^2}}\sqrt{x^3+1}}$$

```
[Out] (-20*x^2*Sqrt[1 + x^3])/91 + (2*x^5*Sqrt[1 + x^3])/13 + (80*Sqrt[
1 + x^3])/(91*(1 + Sqrt[3] + x)) - (40*3^(1/4)*Sqrt[2 - Sqrt[3]]*
(1 + x)*Sqrt[(1 - x + x^2)/(1 + Sqrt[3] + x)^2]*EllipticE[ArcSin[
(1 - Sqrt[3] + x)/(1 + Sqrt[3] + x)], -7 - 4*Sqrt[3]])/(91*Sqrt[(
1 + x)/(1 + Sqrt[3] + x)^2]*Sqrt[1 + x^3]) + (80*Sqrt[2]*(1 + x)*
Sqrt[(1 - x + x^2)/(1 + Sqrt[3] + x)^2]*EllipticF[ArcSin[(1 - Sqr
t[3] + x)/(1 + Sqrt[3] + x)], -7 - 4*Sqrt[3]])/(91*3^(1/4)*Sqrt[(
1 + x)/(1 + Sqrt[3] + x)^2]*Sqrt[1 + x^3])
```

Rubi [A] time = 0.179624, antiderivative size = 262, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$

$$\frac{80\sqrt{x^3+1}}{91\left(x+\sqrt{3}+1\right)}+\frac{2}{13}\sqrt{x^3+1}x^5-\frac{20}{91}\sqrt{x^3+1}x^2+\frac{80\sqrt{2}(x+1)\sqrt{\frac{x^2-x+1}{\left(x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x-\sqrt{3}+1}{x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{91\sqrt[4]{3}\sqrt{\frac{x+1}{\left(x+\sqrt{3}+1\right)^2}}\sqrt{x^3+1}}-\frac{40\sqrt[4]{3}\sqrt{2-\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x+\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{x-\sqrt{3}+1}{x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{91\sqrt{\frac{x+1}{\left(x+\sqrt{3}+1\right)^2}}\sqrt{x^3+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7/Sqrt[1 + x^3],x]
```


```
[Out] (-20*x^2*Sqrt[1 + x^3])/91 + (2*x^5*Sqrt[1 + x^3])/13 + (80*Sqrt[
1 + x^3])/(91*(1 + Sqrt[3] + x)) - (40*3^(1/4)*Sqrt[2 - Sqrt[3]]*
(1 + x)*Sqrt[(1 - x + x^2)/(1 + Sqrt[3] + x)^2]*EllipticE[ArcSin[
(1 - Sqrt[3] + x)/(1 + Sqrt[3] + x)], -7 - 4*Sqrt[3]])/(91*Sqrt[(
1 + x)/(1 + Sqrt[3] + x)^2]*Sqrt[1 + x^3]) + (80*Sqrt[2]*(1 + x)*
Sqrt[(1 - x + x^2)/(1 + Sqrt[3] + x)^2]*EllipticF[ArcSin[(1 - Sqr
t[3] + x)/(1 + Sqrt[3] + x)], -7 - 4*Sqrt[3]])/(91*3^(1/4)*Sqrt[(
1 + x)/(1 + Sqrt[3] + x)^2]*Sqrt[1 + x^3])
```

Rubi in Sympy [A] time = 13.6716, size = 240, normalized size = 0.92

$$\frac{2x^5\sqrt{x^3+1}}{13}-\frac{20x^2\sqrt{x^3+1}}{91}+\frac{80\sqrt{x^3+1}}{91\left(x+1+\sqrt{3}\right)}-\frac{40\sqrt[4]{3}\sqrt{\frac{x^2-x+1}{\left(x+1+\sqrt{3}\right)^2}}\sqrt{-\sqrt{3}+2}\,(x+1)\,E\left(\operatorname{asin}\left(\frac{x-\sqrt{3}+1}{x+1+\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{91\sqrt{\frac{x+1}{\left(x+1+\sqrt{3}\right)^2}}\sqrt{x^3+1}}+\frac{80\sqrt{2}\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2-x+1}{\left(x+1+\sqrt{3}\right)^2}}\,(x+1)\,F\left(\operatorname{asin}\left(\frac{x-\sqrt{3}+1}{x+1+\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{273\sqrt{\frac{x+1}{\left(x+1+\sqrt{3}\right)^2}}\sqrt{x^3+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7/(x**3+1)**(1/2),x)
```

```
[Out] 2*x**5*sqrt(x**3 + 1)/13 - 20*x**2*sqrt(x**3 + 1)/91 + 80*sqrt(x*
*3 + 1)/(91*(x + 1 + sqrt(3))) - 40*3**(1/4)*sqrt((x**2 - x + 1)/
(x + 1 + sqrt(3))**2)*sqrt(-sqrt(3) + 2)*(x + 1)*elliptic_e(asin(
(x - sqrt(3) + 1)/(x + 1 + sqrt(3))), -7 - 4*sqrt(3))/(91*sqrt((x
 + 1)/(x + 1 + sqrt(3))**2)*sqrt(x**3 + 1)) + 80*sqrt(2)*3**(3/4)
*sqrt((x**2 - x + 1)/(x + 1 + sqrt(3))**2)*(x + 1)*elliptic_f(asi
n((x - sqrt(3) + 1)/(x + 1 + sqrt(3))), -7 - 4*sqrt(3))/(273*sqrt
((x + 1)/(x + 1 + sqrt(3))**2)*sqrt(x**3 + 1))
```

Mathematica [A] time = 0.457826, size = 145, normalized size = 0.55

$$\frac{2\left(3x^2\left(x^3+1\right)\left(7x^3-10\right)-40\,3^{3/4}\sqrt{-\sqrt[6]{-1}\left(x+(-1)^{2/3}\right)}\sqrt{(-1)^{2/3}x^2+\sqrt[3]{-1}x+1}\left((-1)^{5/6}F\left(\sin^{-1}\left(\frac{\sqrt{-(-1)^{5/6}(x+1)}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)\right.\right.}{273\sqrt{x^3+1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^7/Sqrt[1 + x^3],x]
```

```
[Out] (2*(3*x^2*(1 + x^3)*(-10 + 7*x^3) - 40*3^(3/4)*Sqrt[-((-1)^(1/6)*
((-1)^(2/3) + x))]*Sqrt[1 + (-1)^(1/3)*x + (-1)^(2/3)*x^2]*(Sqrt[
3]*EllipticE[ArcSin[Sqrt[-((-1)^(5/6)*(1 + x))]/3^(1/4)], (-1)^(1
/3)] + (-1)^(5/6)*EllipticF[ArcSin[Sqrt[-((-1)^(5/6)*(1 + x))]/3^
(1/4)], (-1)^(1/3)])))/(273*Sqrt[1 + x^3])
```

Maple [A] time = 0.026, size = 198, normalized size = 0.8

$$\frac{2x^5}{13}\sqrt{x^3+1}-\frac{20x^2}{91}\sqrt{x^3+1}+\frac{120-40i\sqrt{3}}{91}\sqrt{\frac{1+x}{\frac{3}{2}-\frac{i}{2}\sqrt{3}}}\sqrt{\frac{1}{-\frac{3}{2}-\frac{i}{2}\sqrt{3}}\left(x-\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)}\sqrt{\frac{1}{-\frac{3}{2}+\frac{i}{2}\sqrt{3}}\left(x-\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)}\left(\left(-\frac{3}{2}-\frac{i}{2}\sqrt{3}\right)\mathit{EllipticE}\left(\sqrt{\frac{1+x}{\frac{3}{2}-\frac{i}{2}\sqrt{3}}},\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7/(x^3+1)^(1/2),x)
```

```
[Out] 2/13*x^5*(x^3+1)^(1/2)-20/91*x^2*(x^3+1)^(1/2)+80/91*(3/2-1/2*I*3
^(1/2))*((1+x)/(3/2-1/2*I*3^(1/2)))^(1/2)*((x-1/2-1/2*I*3^(1/2))/
(-3/2-1/2*I*3^(1/2)))^(1/2)*((x-1/2+1/2*I*3^(1/2))/(-3/2+1/2*I*3^
(1/2)))^(1/2)/(x^3+1)^(1/2)*((-3/2-1/2*I*3^(1/2))*EllipticE(((1+x
```

```
)/(3/2-1/2*I*3^(1/2)))^(1/2),((-3/2+1/2*I*3^(1/2))/(-3/2-1/2*I*3^
(1/2)))^(1/2))+(1/2+1/2*I*3^(1/2))*EllipticF(((1+x)/(3/2-1/2*I*3^
(1/2)))^(1/2),((-3/2+1/2*I*3^(1/2))/(-3/2-1/2*I*3^(1/2)))^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^7}{\sqrt{x^3+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(x^3 + 1),x, algorithm="maxima")
```

```
[Out] integrate(x^7/sqrt(x^3 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^7}{\sqrt{x^3+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(x^3 + 1),x, algorithm="fricas")
```

```
[Out] integral(x^7/sqrt(x^3 + 1), x)
```

Sympy [A] time = 2.43256, size = 29, normalized size = 0.11

$$\frac{x^8 \Gamma\left(\frac{8}{3}\right) {}_2F_1\left(\begin{matrix}\frac{1}{2}, \frac{8}{3} \\ \frac{11}{3}\end{matrix}\middle| x^3 e^{i\pi}\right)}{3\Gamma\left(\frac{11}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(x**3+1)**(1/2),x)
```

```
[Out] x**8*gamma(8/3)*hyper((1/2, 8/3), (11/3,), x**3*exp_polar(I*pi))/
(3*gamma(11/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^7}{\sqrt{x^3+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(x^3 + 1),x, algorithm="giac")
```

```
[Out] integrate(x^7/sqrt(x^3 + 1), x)
```

3.452 $\int \frac{x^4}{\sqrt{1+x^3}}\,dx$

Optimal. Leaf size=246

$$-\frac{8\sqrt{x^3+1}}{7\left(x+\sqrt{3}+1\right)}+\frac{2}{7}\sqrt{x^3+1}x^2-\frac{8\sqrt{2}(x+1)\sqrt{\frac{x^2-x+1}{\left(x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x-\sqrt{3}+1}{x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{7\sqrt[4]{3}\sqrt{\frac{x+1}{\left(x+\sqrt{3}+1\right)^2}}\sqrt{x^3+1}}+\frac{4\sqrt[4]{3}\sqrt{2-\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x+\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{x-\sqrt{3}+1}{x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{7\sqrt{\frac{x+1}{\left(x+\sqrt{3}+1\right)^2}}\sqrt{x^3+1}}$$

```
[Out] (2*x^2*Sqrt[1 + x^3])/7 - (8*Sqrt[1 + x^3])/(7*(1 + Sqrt[3] + x))
 + (4*3^(1/4)*Sqrt[2 - Sqrt[3]]*(1 + x)*Sqrt[(1 - x + x^2)/(1 + S
qrt[3] + x)^2]*EllipticE[ArcSin[(1 - Sqrt[3] + x)/(1 + Sqrt[3] +
x)], -7 - 4*Sqrt[3]])/(7*Sqrt[(1 + x)/(1 + Sqrt[3] + x)^2]*Sqrt[1
 + x^3]) - (8*Sqrt[2]*(1 + x)*Sqrt[(1 - x + x^2)/(1 + Sqrt[3] + x
)^2]*EllipticF[ArcSin[(1 - Sqrt[3] + x)/(1 + Sqrt[3] + x)], -7 -
4*Sqrt[3]])/(7*3^(1/4)*Sqrt[(1 + x)/(1 + Sqrt[3] + x)^2]*Sqrt[1 +
 x^3])
```

Rubi [A] time = 0.141592, antiderivative size = 246, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$-\frac{8\sqrt{x^3+1}}{7\left(x+\sqrt{3}+1\right)}+\frac{2}{7}\sqrt{x^3+1}x^2-\frac{8\sqrt{2}(x+1)\sqrt{\frac{x^2-x+1}{\left(x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x-\sqrt{3}+1}{x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{7\sqrt[4]{3}\sqrt{\frac{x+1}{\left(x+\sqrt{3}+1\right)^2}}\sqrt{x^3+1}}+\frac{4\sqrt[4]{3}\sqrt{2-\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x+\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{x-\sqrt{3}+1}{x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{7\sqrt{\frac{x+1}{\left(x+\sqrt{3}+1\right)^2}}\sqrt{x^3+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/Sqrt[1 + x^3],x]
```

```
[Out] (2*x^2*Sqrt[1 + x^3])/7 - (8*Sqrt[1 + x^3])/(7*(1 + Sqrt[3] + x))
 + (4*3^(1/4)*Sqrt[2 - Sqrt[3]]*(1 + x)*Sqrt[(1 - x + x^2)/(1 + S
qrt[3] + x)^2]*EllipticE[ArcSin[(1 - Sqrt[3] + x)/(1 + Sqrt[3] +
x)], -7 - 4*Sqrt[3]])/(7*Sqrt[(1 + x)/(1 + Sqrt[3] + x)^2]*Sqrt[1
 + x^3]) - (8*Sqrt[2]*(1 + x)*Sqrt[(1 - x + x^2)/(1 + Sqrt[3] + x
)^2]*EllipticF[ArcSin[(1 - Sqrt[3] + x)/(1 + Sqrt[3] + x)], -7 -
4*Sqrt[3]])/(7*3^(1/4)*Sqrt[(1 + x)/(1 + Sqrt[3] + x)^2]*Sqrt[1 +
 x^3])
```

Rubi in Sympy [A] time = 11.2357, size = 224, normalized size = 0.91

$$\frac{2x^2\sqrt{x^3+1}}{7}-\frac{8\sqrt{x^3+1}}{7\left(x+1+\sqrt{3}\right)}+\frac{4\sqrt[4]{3}\sqrt{\frac{x^2-x+1}{\left(x+1+\sqrt{3}\right)^2}}\sqrt{-\sqrt{3}+2}\,(x+1)\,E\left(\operatorname{asin}\left(\frac{x-\sqrt{3}+1}{x+1+\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{7\sqrt{\frac{x+1}{\left(x+1+\sqrt{3}\right)^2}}\sqrt{x^3+1}}-\frac{8\sqrt{2}\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2-x+1}{\left(x+1+\sqrt{3}\right)^2}}\,(x+1)\,F\left(\operatorname{asin}\left(\frac{x-\sqrt{3}+1}{x+1+\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{21\sqrt{\frac{x+1}{\left(x+1+\sqrt{3}\right)^2}}\sqrt{x^3+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(x**3+1)**(1/2),x)
```

```
[Out] 2*x**2*sqrt(x**3 + 1)/7 - 8*sqrt(x**3 + 1)/(7*(x + 1 + sqrt(3)))
+ 4*3**(1/4)*sqrt((x**2 - x + 1)/(x + 1 + sqrt(3))**2)*sqrt(-sqrt
(3) + 2)*(x + 1)*elliptic_e(asin((x - sqrt(3) + 1)/(x + 1 + sqrt(
3))), -7 - 4*sqrt(3))/(7*sqrt((x + 1)/(x + 1 + sqrt(3))**2)*sqrt(
x**3 + 1)) - 8*sqrt(2)*3**(3/4)*sqrt((x**2 - x + 1)/(x + 1 + sqrt
(3))**2)*(x + 1)*elliptic_f(asin((x - sqrt(3) + 1)/(x + 1 + sqrt(
3))), -7 - 4*sqrt(3))/(21*sqrt((x + 1)/(x + 1 + sqrt(3))**2)*sqrt
(x**3 + 1))
```

Mathematica [A] time = 0.58398, size = 138, normalized size = 0.56

$$\frac{2\left(4\,3^{3/4}\sqrt{-\sqrt[6]{-1}\left(x+(-1)^{2/3}\right)}\sqrt{(-1)^{2/3}x^2+\sqrt[3]{-1}x+1}\left((-1)^{5/6}F\left(\sin^{-1}\left(\frac{\sqrt{-(-1)^{5/6}(x+1)}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)+\sqrt{3}E\left(\sin^{-1}\left(\frac{\sqrt{-(-1)^{5/6}(x+1)}}{\sqrt[4]{3}}\right.\right.\right.\right.}{21\sqrt{x^3+1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^4/Sqrt[1 + x^3],x]
```

```
[Out] (2*(3*x^2*(1 + x^3) + 4*3^(3/4)*Sqrt[-((-1)^(1/6)*((-1)^(2/3) + x
))]*Sqrt[1 + (-1)^(1/3)*x + (-1)^(2/3)*x^2]*(Sqrt[3]*EllipticE[Ar
cSin[Sqrt[-((-1)^(5/6)*(1 + x))]/3^(1/4)], (-1)^(1/3)] + (-1)^(5/
6)*EllipticF[ArcSin[Sqrt[-((-1)^(5/6)*(1 + x))]/3^(1/4)], (-1)^(1
/3)])))/(21*Sqrt[1 + x^3])
```

Maple [A] time = 0.024, size = 186, normalized size = 0.8

$$\frac{2\,x^2}{7}\sqrt{x^3+1}$$
$$-\frac{-4\,i\sqrt{3}+12}{7}\sqrt{\frac{1+x}{\frac{3}{2}-\frac{i}{2}\sqrt{3}}}\sqrt{\frac{1}{-\frac{3}{2}-\frac{i}{2}\sqrt{3}}\left(x-\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)}\sqrt{\frac{1}{-\frac{3}{2}+\frac{i}{2}\sqrt{3}}\left(x-\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)}\left(\left(-\frac{3}{2}-\frac{i}{2}\sqrt{3}\right)\mathit{EllipticE}\left(\sqrt{\frac{1+x}{\frac{3}{2}-\frac{i}{2}\sqrt{3}}},\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(x^3+1)^(1/2),x)
```

```
[Out] 2/7*x^2*(x^3+1)^(1/2)-8/7*(3/2-1/2*I*3^(1/2))*((1+x)/(3/2-1/2*I*3
^(1/2)))^(1/2)*((x-1/2-1/2*I*3^(1/2))/(-3/2-1/2*I*3^(1/2)))^(1/2)
*((x-1/2+1/2*I*3^(1/2))/(-3/2+1/2*I*3^(1/2)))^(1/2)/(x^3+1)^(1/2)
*((-3/2-1/2*I*3^(1/2))*EllipticE(((1+x)/(3/2-1/2*I*3^(1/2)))^(1/2
),((-3/2+1/2*I*3^(1/2))/(-3/2-1/2*I*3^(1/2)))^(1/2))+(1/2+1/2*I*3
^(1/2))*EllipticF(((1+x)/(3/2-1/2*I*3^(1/2)))^(1/2),((-3/2+1/2*I*
3^(1/2))/(-3/2-1/2*I*3^(1/2)))^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\sqrt{x^3+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(x^3 + 1),x, algorithm="maxima")
```

```
[Out] integrate(x^4/sqrt(x^3 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^4}{\sqrt{x^3+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(x^3 + 1),x, algorithm="fricas")
```

```
[Out] integral(x^4/sqrt(x^3 + 1), x)
```

Sympy [A] time = 1.95516, size = 29, normalized size = 0.12

$$\frac{x^5\,\Gamma\left(\frac{5}{3}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{5}{3}\\ \frac{8}{3}\end{matrix}\middle|x^3e^{i\pi}\right)}{3\,\Gamma\left(\frac{8}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(x**3+1)**(1/2),x)
```

```
[Out] x**5*gamma(5/3)*hyper((1/2, 5/3), (8/3,), x**3*exp_polar(I*pi))/(
3*gamma(8/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\sqrt{x^3+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(x^3 + 1),x, algorithm="giac")
```

```
[Out] integrate(x^4/sqrt(x^3 + 1), x)
```

3.453 $\int \frac{x}{\sqrt{1+x^3}}\,dx$

Optimal. Leaf size=224

$$\frac{2\sqrt{x^3+1}}{x+\sqrt{3}+1}+\frac{2\sqrt{2}(x+1)\sqrt{\frac{x^2-x+1}{\left(x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x-\sqrt{3}+1}{x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{\sqrt[4]{3}\sqrt{\frac{x+1}{\left(x+\sqrt{3}+1\right)^2}}\sqrt{x^3+1}}-\frac{\sqrt[4]{3}\sqrt{2-\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x+\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{x-\sqrt{3}+1}{x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{\sqrt{\frac{x+1}{\left(x+\sqrt{3}+1\right)^2}}\sqrt{x^3+1}}$$

```
[Out] (2*Sqrt[1 + x^3])/(1 + Sqrt[3] + x) - (3^(1/4)*Sqrt[2 - Sqrt[3]]*
(1 + x)*Sqrt[(1 - x + x^2)/(1 + Sqrt[3] + x)^2]*EllipticE[ArcSin[
(1 - Sqrt[3] + x)/(1 + Sqrt[3] + x)], -7 - 4*Sqrt[3]])/(Sqrt[(1 +
 x)/(1 + Sqrt[3] + x)^2]*Sqrt[1 + x^3]) + (2*Sqrt[2]*(1 + x)*Sqrt
[(1 - x + x^2)/(1 + Sqrt[3] + x)^2]*EllipticF[ArcSin[(1 - Sqrt[3]
 + x)/(1 + Sqrt[3] + x)], -7 - 4*Sqrt[3]])/(3^(1/4)*Sqrt[(1 + x)/
(1 + Sqrt[3] + x)^2]*Sqrt[1 + x^3])
```

Rubi [A] time = 0.106389, antiderivative size = 224, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.273$

$$\frac{2\sqrt{x^3+1}}{x+\sqrt{3}+1}+\frac{2\sqrt{2}(x+1)\sqrt{\frac{x^2-x+1}{\left(x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x-\sqrt{3}+1}{x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{\sqrt[4]{3}\sqrt{\frac{x+1}{\left(x+\sqrt{3}+1\right)^2}}\sqrt{x^3+1}}-\frac{\sqrt[4]{3}\sqrt{2-\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x+\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{x-\sqrt{3}+1}{x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{\sqrt{\frac{x+1}{\left(x+\sqrt{3}+1\right)^2}}\sqrt{x^3+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/Sqrt[1 + x^3],x]
```

```
[Out] (2*Sqrt[1 + x^3])/(1 + Sqrt[3] + x) - (3^(1/4)*Sqrt[2 - Sqrt[3]]*
(1 + x)*Sqrt[(1 - x + x^2)/(1 + Sqrt[3] + x)^2]*EllipticE[ArcSin[
(1 - Sqrt[3] + x)/(1 + Sqrt[3] + x)], -7 - 4*Sqrt[3]])/(Sqrt[(1 +
 x)/(1 + Sqrt[3] + x)^2]*Sqrt[1 + x^3]) + (2*Sqrt[2]*(1 + x)*Sqrt
[(1 - x + x^2)/(1 + Sqrt[3] + x)^2]*EllipticF[ArcSin[(1 - Sqrt[3]
 + x)/(1 + Sqrt[3] + x)], -7 - 4*Sqrt[3]])/(3^(1/4)*Sqrt[(1 + x)/
(1 + Sqrt[3] + x)^2]*Sqrt[1 + x^3])
```

Rubi in Sympy [A] time = 9.07724, size = 202, normalized size = 0.9

$$\frac{2\sqrt{x^3+1}}{x+1+\sqrt{3}}-\frac{\sqrt[4]{3}\sqrt{\frac{x^2-x+1}{\left(x+1+\sqrt{3}\right)^2}}\sqrt{-\sqrt{3}+2}\,(x+1)\,E\left(\operatorname{asin}\left(\frac{x-\sqrt{3}+1}{x+1+\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{\sqrt{\frac{x+1}{\left(x+1+\sqrt{3}\right)^2}}\sqrt{x^3+1}}+\frac{2\sqrt{2}\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2-x+1}{\left(x+1+\sqrt{3}\right)^2}}\,(x+1)\,F\left(\operatorname{asin}\left(\frac{x-\sqrt{3}+1}{x+1+\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{3\sqrt{\frac{x+1}{\left(x+1+\sqrt{3}\right)^2}}\sqrt{x^3+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(x**3+1)**(1/2),x)
```

```
[Out] 2*sqrt(x**3 + 1)/(x + 1 + sqrt(3)) - 3**(1/4)*sqrt((x**2 - x + 1)
/(x + 1 + sqrt(3))**2)*sqrt(-sqrt(3) + 2)*(x + 1)*elliptic_e(asin
((x - sqrt(3) + 1)/(x + 1 + sqrt(3))), -7 - 4*sqrt(3))/(sqrt((x +
 1)/(x + 1 + sqrt(3))**2)*sqrt(x**3 + 1)) + 2*sqrt(2)*3**(3/4)*sq
rt((x**2 - x + 1)/(x + 1 + sqrt(3))**2)*(x + 1)*elliptic_f(asin((
x - sqrt(3) + 1)/(x + 1 + sqrt(3))), -7 - 4*sqrt(3))/(3*sqrt((x +
 1)/(x + 1 + sqrt(3))**2)*sqrt(x**3 + 1))
```

Mathematica [A] time = 0.0991525, size = 123, normalized size = 0.55

$$-\frac{2\sqrt{-\sqrt[6]{-1}\left(x+(-1)^{2/3}\right)}\sqrt{(-1)^{2/3}x^2+\sqrt[3]{-1}x+1}\left((-1)^{5/6}F\left(\sin^{-1}\left(\frac{\sqrt{-(-1)^{5/6}(x+1)}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)+\sqrt{3}E\left(\sin^{-1}\left(\frac{\sqrt{-(-1)^{5/6}(x+1)}}{\sqrt[4]{3}}\right)|\sqrt[3]{-\right.\right.}{\sqrt[4]{3}\sqrt{x^3+1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x/Sqrt[1 + x^3],x]
```

```
[Out] (-2*Sqrt[-((-1)^(1/6)*((-1)^(2/3) + x))]*Sqrt[1 + (-1)^(1/3)*x +
(-1)^(2/3)*x^2]*(Sqrt[3]*EllipticE[ArcSin[Sqrt[-((-1)^(5/6)*(1 +
x))]/3^(1/4)], (-1)^(1/3)] + (-1)^(5/6)*EllipticF[ArcSin[Sqrt[-((
-1)^(5/6)*(1 + x))]/3^(1/4)], (-1)^(1/3)]))/(3^(1/4)*Sqrt[1 + x^3
])
```

Maple [A] time = 0.023, size = 173, normalized size = 0.8

$$2\,\frac{3/2-i/2\sqrt{3}}{\sqrt{x^3+1}}\sqrt{\frac{1+x}{3/2-i/2\sqrt{3}}}\sqrt{\frac{x-1/2-i/2\sqrt{3}}{-3/2-i/2\sqrt{3}}}\sqrt{\frac{x-1/2+i/2\sqrt{3}}{-3/2+i/2\sqrt{3}}}\left(\left(-3/2-i/2\sqrt{3}\right)EllipticE\left(\sqrt{\frac{1+x}{3/2-i/2\sqrt{3}}},\sqrt{\frac{-3/2+}{-3/2-}}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(x^3+1)^(1/2),x)
```

```
[Out] 2*(3/2-1/2*I*3^(1/2))*((1+x)/(3/2-1/2*I*3^(1/2)))^(1/2)*((x-1/2-1
/2*I*3^(1/2))/(-3/2-1/2*I*3^(1/2)))^(1/2)*((x-1/2+1/2*I*3^(1/2))/
(-3/2+1/2*I*3^(1/2)))^(1/2)/(x^3+1)^(1/2)*((-3/2-1/2*I*3^(1/2))*E
llipticE(((1+x)/(3/2-1/2*I*3^(1/2)))^(1/2),((-3/2+1/2*I*3^(1/2))/
(-3/2-1/2*I*3^(1/2)))^(1/2))+(1/2+1/2*I*3^(1/2))*EllipticF(((1+x)
/(3/2-1/2*I*3^(1/2)))^(1/2),((-3/2+1/2*I*3^(1/2))/(-3/2-1/2*I*3^(
1/2)))^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt{x^3+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(x^3 + 1),x, algorithm="maxima")
```

```
[Out] integrate(x/sqrt(x^3 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x}{\sqrt{x^3+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(x^3 + 1),x, algorithm="fricas")
```

```
[Out] integral(x/sqrt(x^3 + 1), x)
```

Sympy [A] time = 1.72708, size = 29, normalized size = 0.13

$$\frac{x^2\Gamma\left(\frac{2}{3}\right){}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{2}{3}\\ \frac{5}{3}\end{matrix}\middle| x^3e^{i\pi}\right)}{3\Gamma\left(\frac{5}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(x**3+1)**(1/2),x)
```

```
[Out] x**2*gamma(2/3)*hyper((1/2, 2/3), (5/3,), x**3*exp_polar(I*pi))/(
3*gamma(5/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt{x^3+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(x^3 + 1),x, algorithm="giac")
```

```
[Out] integrate(x/sqrt(x^3 + 1), x)
```

3.454 $\int \frac{1}{x^2\sqrt{1+x^3}}\,dx$

Optimal. Leaf size=238

$$-\frac{\sqrt{x^3+1}}{x}+\frac{\sqrt{x^3+1}}{x+\sqrt{3}+1}+\frac{\sqrt{2}(x+1)\sqrt{\frac{x^2-x+1}{\left(x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x-\sqrt{3}+1}{x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{\sqrt[4]{3}\sqrt{\frac{x+1}{\left(x+\sqrt{3}+1\right)^2}}\sqrt{x^3+1}}-\frac{\sqrt[4]{3}\sqrt{2-\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x+\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{x-\sqrt{3}+1}{x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{2\sqrt{\frac{x+1}{\left(x+\sqrt{3}+1\right)^2}}\sqrt{x^3+1}}$$

```
[Out] -(Sqrt[1 + x^3]/x) + Sqrt[1 + x^3]/(1 + Sqrt[3] + x) - (3^(1/4)*S
qrt[2 - Sqrt[3]]*(1 + x)*Sqrt[(1 - x + x^2)/(1 + Sqrt[3] + x)^2]*
EllipticE[ArcSin[(1 - Sqrt[3] + x)/(1 + Sqrt[3] + x)], -7 - 4*Sqr
t[3]])/(2*Sqrt[(1 + x)/(1 + Sqrt[3] + x)^2]*Sqrt[1 + x^3]) + (Sqr
t[2]*(1 + x)*Sqrt[(1 - x + x^2)/(1 + Sqrt[3] + x)^2]*EllipticF[Ar
cSin[(1 - Sqrt[3] + x)/(1 + Sqrt[3] + x)], -7 - 4*Sqrt[3]])/(3^(1
/4)*Sqrt[(1 + x)/(1 + Sqrt[3] + x)^2]*Sqrt[1 + x^3])
```

Rubi [A] time = 0.148566, antiderivative size = 238, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$

$$-\frac{\sqrt{x^3+1}}{x}+\frac{\sqrt{x^3+1}}{x+\sqrt{3}+1}+\frac{\sqrt{2}(x+1)\sqrt{\frac{x^2-x+1}{\left(x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x-\sqrt{3}+1}{x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{\sqrt[4]{3}\sqrt{\frac{x+1}{\left(x+\sqrt{3}+1\right)^2}}\sqrt{x^3+1}}-\frac{\sqrt[4]{3}\sqrt{2-\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x+\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{x-\sqrt{3}+1}{x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{2\sqrt{\frac{x+1}{\left(x+\sqrt{3}+1\right)^2}}\sqrt{x^3+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*Sqrt[1 + x^3]),x]
```

```
[Out] -(Sqrt[1 + x^3]/x) + Sqrt[1 + x^3]/(1 + Sqrt[3] + x) - (3^(1/4)*S
qrt[2 - Sqrt[3]]*(1 + x)*Sqrt[(1 - x + x^2)/(1 + Sqrt[3] + x)^2]*
EllipticE[ArcSin[(1 - Sqrt[3] + x)/(1 + Sqrt[3] + x)], -7 - 4*Sqr
t[3]])/(2*Sqrt[(1 + x)/(1 + Sqrt[3] + x)^2]*Sqrt[1 + x^3]) + (Sqr
t[2]*(1 + x)*Sqrt[(1 - x + x^2)/(1 + Sqrt[3] + x)^2]*EllipticF[Ar
cSin[(1 - Sqrt[3] + x)/(1 + Sqrt[3] + x)], -7 - 4*Sqrt[3]])/(3^(1
/4)*Sqrt[(1 + x)/(1 + Sqrt[3] + x)^2]*Sqrt[1 + x^3])
```

Rubi in Sympy [A] time = 11.3834, size = 211, normalized size = 0.89

$$\frac{\sqrt{x^3+1}}{x+1+\sqrt{3}}-\frac{\sqrt[4]{3}\sqrt{\frac{x^2-x+1}{\left(x+1+\sqrt{3}\right)^2}}\sqrt{-\sqrt{3}+2}\,(x+1)\,E\left(\operatorname{asin}\left(\frac{x-\sqrt{3}+1}{x+1+\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{2\sqrt{\frac{x+1}{\left(x+1+\sqrt{3}\right)^2}}\sqrt{x^3+1}}+\frac{\sqrt{2}\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2-x+1}{\left(x+1+\sqrt{3}\right)^2}}\,(x+1)\,F\left(\operatorname{asin}\left(\frac{x-\sqrt{3}+1}{x+1+\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{3\sqrt{\frac{x+1}{\left(x+1+\sqrt{3}\right)^2}}\sqrt{x^3+1}}-\frac{\sqrt{x^3+1}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(x**3+1)**(1/2),x)
```

```
[Out] sqrt(x**3 + 1)/(x + 1 + sqrt(3)) - 3**(1/4)*sqrt((x**2 - x + 1)/(
x + 1 + sqrt(3))**2)*sqrt(-sqrt(3) + 2)*(x + 1)*elliptic_e(asin((
x - sqrt(3) + 1)/(x + 1 + sqrt(3))), -7 - 4*sqrt(3))/(2*sqrt((x +
 1)/(x + 1 + sqrt(3))**2)*sqrt(x**3 + 1)) + sqrt(2)*3**(3/4)*sqrt
((x**2 - x + 1)/(x + 1 + sqrt(3))**2)*(x + 1)*elliptic_f(asin((x
- sqrt(3) + 1)/(x + 1 + sqrt(3))), -7 - 4*sqrt(3))/(3*sqrt((x + 1
)/(x + 1 + sqrt(3))**2)*sqrt(x**3 + 1)) - sqrt(x**3 + 1)/x
```

Mathematica [A] time = 0.427147, size = 138, normalized size = 0.58

$$\frac{-\frac{3(x^3+1)}{x} - 3^{3/4}\sqrt{-\sqrt[6]{-1}\left(x+(-1)^{2/3}\right)}\sqrt{(-1)^{2/3}x^2+\sqrt[3]{-1}x+1}\left((-1)^{5/6}F\left(\sin^{-1}\left(\frac{\sqrt{-(-1)^{5/6}(x+1)}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)+\sqrt{3}E\left(\sin^{-1}\left(\frac{\sqrt{-(-1)}}{\sqrt[4]{}}\right.\right.\right.}{3\sqrt{x^3+1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/(x^2*Sqrt[1 + x^3]),x]
```

```
[Out] ((-3*(1 + x^3))/x - 3^(3/4)*Sqrt[-((-1)^(1/6)*((-1)^(2/3) + x))]*
Sqrt[1 + (-1)^(1/3)*x + (-1)^(2/3)*x^2]*(Sqrt[3]*EllipticE[ArcSin
[Sqrt[-((-1)^(5/6)*(1 + x))]/3^(1/4)], (-1)^(1/3)] + (-1)^(5/6)*E
llipticF[ArcSin[Sqrt[-((-1)^(5/6)*(1 + x))]/3^(1/4)], (-1)^(1/3)]
))/(3*Sqrt[1 + x^3])
```

Maple [A] time = 0.026, size = 185, normalized size = 0.8

$$-\frac{1}{x}\sqrt{x^3+1}$$
$$+\left(\frac{3}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{\frac{1+x}{\frac{3}{2}-\frac{i}{2}\sqrt{3}}}\sqrt{\frac{1}{-\frac{3}{2}-\frac{i}{2}\sqrt{3}}\left(x-\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)}\sqrt{\frac{1}{-\frac{3}{2}+\frac{i}{2}\sqrt{3}}\left(x-\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)}\left(\left(-\frac{3}{2}-\frac{i}{2}\sqrt{3}\right)\mathit{EllipticE}\left(\sqrt{\frac{1+x}{\frac{3}{2}-\frac{i}{2}\sqrt{3}}},\sqrt{\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(x^3+1)^(1/2),x)
```

```
[Out] -(x^3+1)^(1/2)/x+(3/2-1/2*I*3^(1/2))*((1+x)/(3/2-1/2*I*3^(1/2)))^
(1/2)*((x-1/2-1/2*I*3^(1/2))/(-3/2-1/2*I*3^(1/2)))^(1/2)*((x-1/2+
1/2*I*3^(1/2))/(-3/2+1/2*I*3^(1/2)))^(1/2)/(x^3+1)^(1/2)*((-3/2-1
/2*I*3^(1/2))*EllipticE(((1+x)/(3/2-1/2*I*3^(1/2)))^(1/2),((-3/2+
1/2*I*3^(1/2))/(-3/2-1/2*I*3^(1/2)))^(1/2))+(1/2+1/2*I*3^(1/2))*E
llipticF(((1+x)/(3/2-1/2*I*3^(1/2)))^(1/2),((-3/2+1/2*I*3^(1/2))/
(-3/2-1/2*I*3^(1/2)))^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^3+1}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 + 1)*x^2),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(x^3 + 1)*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{x^3+1}x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 + 1)*x^2),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(x^3 + 1)*x^2), x)
```

Sympy [A] time = 2.00424, size = 31, normalized size = 0.13

$$\frac{\Gamma\left(-\frac{1}{3}\right) {}_{2}F_{1}\left(\begin{matrix} -\frac{1}{3}, \frac{1}{2} \\ \frac{2}{3} \end{matrix}\middle| x^{3} e^{i\pi}\right)}{3x\,\Gamma\left(\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(x**3+1)**(1/2),x)
```

```
[Out] gamma(-1/3)*hyper((-1/3, 1/2), (2/3,), x**3*exp_polar(I*pi))/(3*x
*gamma(2/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^3+1}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 + 1)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(x^3 + 1)*x^2), x)
```

3.455 $\int \frac{1}{x^5\sqrt{1+x^3}}\,dx$

Optimal. Leaf size=262

$$\frac{5\sqrt{x^3+1}}{8x}-\frac{5\sqrt{x^3+1}}{8\left(x+\sqrt{3}+1\right)}-\frac{\sqrt{x^3+1}}{4x^4}-\frac{5(x+1)\sqrt{\frac{x^2-x+1}{\left(x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x-\sqrt{3}+1}{x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{4\sqrt{2}\sqrt[4]{3}\sqrt{\frac{x+1}{\left(x+\sqrt{3}+1\right)^2}}\sqrt{x^3+1}}+\frac{5\sqrt[4]{3}\sqrt{2-\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x+\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{x-\sqrt{3}+1}{x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{16\sqrt{\frac{x+1}{\left(x+\sqrt{3}+1\right)^2}}\sqrt{x^3+1}}$$

```
[Out] -Sqrt[1 + x^3]/(4*x^4) + (5*Sqrt[1 + x^3])/(8*x) - (5*Sqrt[1 + x^
3])/(8*(1 + Sqrt[3] + x)) + (5*3^(1/4)*Sqrt[2 - Sqrt[3]]*(1 + x)*
Sqrt[(1 - x + x^2)/(1 + Sqrt[3] + x)^2]*EllipticE[ArcSin[(1 - Sqr
t[3] + x)/(1 + Sqrt[3] + x)], -7 - 4*Sqrt[3]])/(16*Sqrt[(1 + x)/(
1 + Sqrt[3] + x)^2]*Sqrt[1 + x^3]) - (5*(1 + x)*Sqrt[(1 - x + x^2
)/(1 + Sqrt[3] + x)^2]*EllipticF[ArcSin[(1 - Sqrt[3] + x)/(1 + Sq
rt[3] + x)], -7 - 4*Sqrt[3]])/(4*Sqrt[2]*3^(1/4)*Sqrt[(1 + x)/(1
+ Sqrt[3] + x)^2]*Sqrt[1 + x^3])
```

Rubi [A] time = 0.180969, antiderivative size = 262, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$

$$\frac{5\sqrt{x^3+1}}{8x}-\frac{5\sqrt{x^3+1}}{8\left(x+\sqrt{3}+1\right)}-\frac{\sqrt{x^3+1}}{4x^4}-\frac{5(x+1)\sqrt{\frac{x^2-x+1}{\left(x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x-\sqrt{3}+1}{x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{4\sqrt{2}\sqrt[4]{3}\sqrt{\frac{x+1}{\left(x+\sqrt{3}+1\right)^2}}\sqrt{x^3+1}}+\frac{5\sqrt[4]{3}\sqrt{2-\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x+\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{x-\sqrt{3}+1}{x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{16\sqrt{\frac{x+1}{\left(x+\sqrt{3}+1\right)^2}}\sqrt{x^3+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^5*Sqrt[1 + x^3]),x]
```

```
[Out] -Sqrt[1 + x^3]/(4*x^4) + (5*Sqrt[1 + x^3])/(8*x) - (5*Sqrt[1 + x^
3])/(8*(1 + Sqrt[3] + x)) + (5*3^(1/4)*Sqrt[2 - Sqrt[3]]*(1 + x)*
Sqrt[(1 - x + x^2)/(1 + Sqrt[3] + x)^2]*EllipticE[ArcSin[(1 - Sqr
t[3] + x)/(1 + Sqrt[3] + x)], -7 - 4*Sqrt[3]])/(16*Sqrt[(1 + x)/(
1 + Sqrt[3] + x)^2]*Sqrt[1 + x^3]) - (5*(1 + x)*Sqrt[(1 - x + x^2
)/(1 + Sqrt[3] + x)^2]*EllipticF[ArcSin[(1 - Sqrt[3] + x)/(1 + Sq
rt[3] + x)], -7 - 4*Sqrt[3]])/(4*Sqrt[2]*3^(1/4)*Sqrt[(1 + x)/(1
+ Sqrt[3] + x)^2]*Sqrt[1 + x^3])
```

Rubi in Sympy [A] time = 14.3702, size = 236, normalized size = 0.9

$$-\frac{5\sqrt{x^3+1}}{8\left(x+1+\sqrt{3}\right)}+\frac{5\sqrt[4]{3}\sqrt{\frac{x^2-x+1}{\left(x+1+\sqrt{3}\right)^2}}\sqrt{-\sqrt{3}+2}\,(x+1)\,E\left(\operatorname{asin}\left(\frac{x-\sqrt{3}+1}{x+1+\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{16\sqrt{\frac{x+1}{\left(x+1+\sqrt{3}\right)^2}}\sqrt{x^3+1}}-\frac{5\sqrt{2}\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2-x+1}{\left(x+1+\sqrt{3}\right)^2}}\,(x+1)\,F\left(\operatorname{asin}\left(\frac{x-\sqrt{3}+1}{x+1+\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{24\sqrt{\frac{x+1}{\left(x+1+\sqrt{3}\right)^2}}\sqrt{x^3+1}}+\frac{5\sqrt{x^3+1}}{8x}-\frac{\sqrt{x^3+1}}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**5/(x**3+1)**(1/2),x)
```

```
[Out] -5*sqrt(x**3 + 1)/(8*(x + 1 + sqrt(3))) + 5*3**(1/4)*sqrt((x**2 -
 x + 1)/(x + 1 + sqrt(3))**2)*sqrt(-sqrt(3) + 2)*(x + 1)*elliptic
_e(asin((x - sqrt(3) + 1)/(x + 1 + sqrt(3))), -7 - 4*sqrt(3))/(16
*sqrt((x + 1)/(x + 1 + sqrt(3))**2)*sqrt(x**3 + 1)) - 5*sqrt(2)*3
**(3/4)*sqrt((x**2 - x + 1)/(x + 1 + sqrt(3))**2)*(x + 1)*ellipti
c_f(asin((x - sqrt(3) + 1)/(x + 1 + sqrt(3))), -7 - 4*sqrt(3))/(2
4*sqrt((x + 1)/(x + 1 + sqrt(3))**2)*sqrt(x**3 + 1)) + 5*sqrt(x**
3 + 1)/(8*x) - sqrt(x**3 + 1)/(4*x**4)
```

Mathematica [A] time = 0.366755, size = 145, normalized size = 0.55

$$\frac{5\,3^{3/4}\sqrt{-\sqrt[6]{-1}\left(x+(-1)^{2/3}\right)}\sqrt{(-1)^{2/3}x^2+\sqrt[3]{-1}x+1}\left((-1)^{5/6}F\left(\sin^{-1}\left(\frac{\sqrt{-(-1)^{5/6}(x+1)}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)+\sqrt{3}E\left(\sin^{-1}\left(\frac{\sqrt{-(-1)^{5/6}(x+1)}}{\sqrt[4]{3}}\right)\middle|\cdots\right.\right.}{24\sqrt{x^3+1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/(x^5*Sqrt[1 + x^3]),x]
```

```
[Out] ((3*(1 + x^3)*(-2 + 5*x^3))/x^4 + 5*3^(3/4)*Sqrt[-((-1)^(1/6)*((-
1)^(2/3) + x))]*Sqrt[1 + (-1)^(1/3)*x + (-1)^(2/3)*x^2]*(Sqrt[3]*
EllipticE[ArcSin[Sqrt[-((-1)^(5/6)*(1 + x))]/3^(1/4)], (-1)^(1/3)
] + (-1)^(5/6)*EllipticF[ArcSin[Sqrt[-((-1)^(5/6)*(1 + x))]/3^(1/
4)], (-1)^(1/3)]))/(24*Sqrt[1 + x^3])
```

Maple [A] time = 0.029, size = 198, normalized size = 0.8

$$-\frac{1}{4\,x^4}\sqrt{x^3+1}+\frac{5}{8\,x}\sqrt{x^3+1}$$
$$-\frac{\frac{15}{2}-\frac{5\,i}{2}\sqrt{3}}{8}\sqrt{\frac{1+x}{\frac{3}{2}-\frac{i}{2}\sqrt{3}}}\sqrt{\frac{1}{-\frac{3}{2}-\frac{i}{2}\sqrt{3}}\left(x-\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)}\sqrt{\frac{1}{-\frac{3}{2}+\frac{i}{2}\sqrt{3}}\left(x-\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)}\left(\left(-\frac{3}{2}-\frac{i}{2}\sqrt{3}\right)\mathit{EllipticE}\left(\sqrt{\frac{1+x}{\frac{3}{2}-\frac{i}{2}\sqrt{3}}},\sqrt{\cdots}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^5/(x^3+1)^(1/2),x)
```

```
[Out] -1/4*(x^3+1)^(1/2)/x^4+5/8*(x^3+1)^(1/2)/x-5/8*(3/2-1/2*I*3^(1/2)
)*((1+x)/(3/2-1/2*I*3^(1/2)))^(1/2)*((x-1/2-1/2*I*3^(1/2))/(-3/2-
1/2*I*3^(1/2)))^(1/2)*((x-1/2+1/2*I*3^(1/2))/(-3/2+1/2*I*3^(1/2))
)^(1/2)/(x^3+1)^(1/2)*((-3/2-1/2*I*3^(1/2))*EllipticE(((1+x)/(3/2
-1/2*I*3^(1/2)))^(1/2),((-3/2+1/2*I*3^(1/2))/(-3/2-1/2*I*3^(1/2))
)^(1/2))+(1/2+1/2*I*3^(1/2))*EllipticF(((1+x)/(3/2-1/2*I*3^(1/2))
)^(1/2),((-3/2+1/2*I*3^(1/2))/(-3/2-1/2*I*3^(1/2)))^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^3+1}x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 + 1)*x^5),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(x^3 + 1)*x^5), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{x^3+1}x^5},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 + 1)*x^5),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(x^3 + 1)*x^5), x)
```

Sympy [A] time = 2.50536, size = 36, normalized size = 0.14

$$\frac{\left(-\frac{4}{3}\right) {}_2F_1\left(\begin{matrix}-\frac{4}{3},\frac{1}{2}\\-\frac{1}{3}\end{matrix}\middle| x^3e^{i\pi}\right)}{3x^4\left(-\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**5/(x**3+1)**(1/2),x)
```

```
[Out] gamma(-4/3)*hyper((-4/3, 1/2), (-1/3,), x**3*exp_polar(I*pi))/(3*
x**4*gamma(-1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^3+1}x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 + 1)*x^5),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(x^3 + 1)*x^5), x)
```

3.456 $\int \frac{x^{11}}{\sqrt{1-x^3}}\,dx$

Optimal. Leaf size=61

$$\frac{2}{21}\left(1-x^3\right)^{7/2}-\frac{2}{5}\left(1-x^3\right)^{5/2}+\frac{2}{3}\left(1-x^3\right)^{3/2}-\frac{2\sqrt{1-x^3}}{3}$$

```
[Out] (-2*Sqrt[1 - x^3])/3 + (2*(1 - x^3)^(3/2))/3 - (2*(1 - x^3)^(5/2)
)/5 + (2*(1 - x^3)^(7/2))/21
```

Rubi [A] time = 0.0662118, antiderivative size = 61, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2}{21}\left(1-x^3\right)^{7/2}-\frac{2}{5}\left(1-x^3\right)^{5/2}+\frac{2}{3}\left(1-x^3\right)^{3/2}-\frac{2\sqrt{1-x^3}}{3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11/Sqrt[1 - x^3],x]
```

```
[Out] (-2*Sqrt[1 - x^3])/3 + (2*(1 - x^3)^(3/2))/3 - (2*(1 - x^3)^(5/2)
)/5 + (2*(1 - x^3)^(7/2))/21
```

Rubi in Sympy [A] time = 7.03368, size = 46, normalized size = 0.75

$$\frac{2\left(-x^3+1\right)^{\frac{7}{2}}}{21}-\frac{2\left(-x^3+1\right)^{\frac{5}{2}}}{5}+\frac{2\left(-x^3+1\right)^{\frac{3}{2}}}{3}-\frac{2\sqrt{-x^3+1}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11/(-x**3+1)**(1/2),x)
```

```
[Out] 2*(-x**3 + 1)**(7/2)/21 - 2*(-x**3 + 1)**(5/2)/5 + 2*(-x**3 + 1)*
*(3/2)/3 - 2*sqrt(-x**3 + 1)/3
```

Mathematica [A] time = 0.0165934, size = 32, normalized size = 0.52

$$-\frac{2}{105}\sqrt{1-x^3}\left(5x^9+6x^6+8x^3+16\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11/Sqrt[1 - x^3],x]
```

```
[Out] (-2*Sqrt[1 - x^3]*(16 + 8*x^3 + 6*x^6 + 5*x^9))/105
```

Maple [A] time = 0.007, size = 38, normalized size = 0.6

$$\frac{(-2+2x)\left(x^2+x+1\right)\left(5x^9+6x^6+8x^3+16\right)}{105}\frac{1}{\sqrt{-x^3+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11/(-x^3+1)^(1/2),x)
```

```
[Out] 2/105*(-1+x)*(x^2+x+1)*(5*x^9+6*x^6+8*x^3+16)/(-x^3+1)^(1/2)
```

Maxima [A] time = 1.50514, size = 61, normalized size = 1.

$$\frac{2}{21}\left(-x^3+1\right)^{\frac{7}{2}}-\frac{2}{5}\left(-x^3+1\right)^{\frac{5}{2}}+\frac{2}{3}\left(-x^3+1\right)^{\frac{3}{2}}-\frac{2}{3}\sqrt{-x^3+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/sqrt(-x^3 + 1),x, algorithm="maxima")
```

```
[Out] 2/21*(-x^3 + 1)^(7/2) - 2/5*(-x^3 + 1)^(5/2) + 2/3*(-x^3 + 1)^(3/
2) - 2/3*sqrt(-x^3 + 1)
```

Fricas [A] time = 0.230866, size = 38, normalized size = 0.62

$$-\frac{2}{105}\left(5x^9+6x^6+8x^3+16\right)\sqrt{-x^3+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/sqrt(-x^3 + 1),x, algorithm="fricas")
```

```
[Out] -2/105*(5*x^9 + 6*x^6 + 8*x^3 + 16)*sqrt(-x^3 + 1)
```

Sympy [A] time = 4.52808, size = 58, normalized size = 0.95

$$-\frac{2x^9\sqrt{-x^3+1}}{21}-\frac{4x^6\sqrt{-x^3+1}}{35}-\frac{16x^3\sqrt{-x^3+1}}{105}-\frac{32\sqrt{-x^3+1}}{105}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11/(-x**3+1)**(1/2),x)
```

```
[Out] -2*x**9*sqrt(-x**3 + 1)/21 - 4*x**6*sqrt(-x**3 + 1)/35 - 16*x**3*
sqrt(-x**3 + 1)/105 - 32*sqrt(-x**3 + 1)/105
```

GIAC/XCAS [A] time = 0.228702, size = 80, normalized size = 1.31

$$-\frac{2}{21}\left(x^3-1\right)^3\sqrt{-x^3+1}-\frac{2}{5}\left(x^3-1\right)^2\sqrt{-x^3+1}+\frac{2}{3}\left(-x^3+1\right)^{\frac{3}{2}}-\frac{2}{3}\sqrt{-x^3+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/sqrt(-x^3 + 1),x, algorithm="giac")
```

```
[Out] -2/21*(x^3 - 1)^3*sqrt(-x^3 + 1) - 2/5*(x^3 - 1)^2*sqrt(-x^3 + 1)
 + 2/3*(-x^3 + 1)^(3/2) - 2/3*sqrt(-x^3 + 1)
```

3.457 $\int \frac{x^8}{\sqrt{1-x^3}} \, dx$

Optimal. Leaf size=46

$$-\frac{2}{15}\left(1-x^3\right)^{5/2}+\frac{4}{9}\left(1-x^3\right)^{3/2}-\frac{2\sqrt{1-x^3}}{3}$$

```
[Out] (-2*Sqrt[1 - x^3])/3 + (4*(1 - x^3)^(3/2))/9 - (2*(1 - x^3)^(5/2)
)/15
```

Rubi [A] time = 0.0550406, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2}{15}\left(1-x^3\right)^{5/2}+\frac{4}{9}\left(1-x^3\right)^{3/2}-\frac{2\sqrt{1-x^3}}{3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8/Sqrt[1 - x^3],x]
```

```
[Out] (-2*Sqrt[1 - x^3])/3 + (4*(1 - x^3)^(3/2))/9 - (2*(1 - x^3)^(5/2)
)/15
```

Rubi in Sympy [A] time = 5.35509, size = 34, normalized size = 0.74

$$-\frac{2\left(-x^3+1\right)^{\frac{5}{2}}}{15}+\frac{4\left(-x^3+1\right)^{\frac{3}{2}}}{9}-\frac{2\sqrt{-x^3+1}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8/(-x**3+1)**(1/2),x)
```

```
[Out] -2*(-x**3 + 1)**(5/2)/15 + 4*(-x**3 + 1)**(3/2)/9 - 2*sqrt(-x**3
+ 1)/3
```

Mathematica [A] time = 0.0137353, size = 27, normalized size = 0.59

$$-\frac{2}{45}\sqrt{1-x^3}\left(3x^6+4x^3+8\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8/Sqrt[1 - x^3],x]
```

```
[Out] (-2*Sqrt[1 - x^3]*(8 + 4*x^3 + 3*x^6))/45
```

Maple [A] time = 0.007, size = 33, normalized size = 0.7

$$\frac{\left(-2+2\,x\right)\left(x^2+x+1\right)\left(3\,x^6+4\,x^3+8\right)}{45}\frac{1}{\sqrt{-x^3+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8/(-x^3+1)^(1/2),x)
```

```
[Out] 2/45*(-1+x)*(x^2+x+1)*(3*x^6+4*x^3+8)/(-x^3+1)^(1/2)
```

Maxima [A] time = 1.4231, size = 46, normalized size = 1.

$$-\frac{2}{15}\left(-x^3+1\right)^{\frac{5}{2}}+\frac{4}{9}\left(-x^3+1\right)^{\frac{3}{2}}-\frac{2}{3}\sqrt{-x^3+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/sqrt(-x^3 + 1),x, algorithm="maxima")
```

```
[Out] -2/15*(-x^3 + 1)^(5/2) + 4/9*(-x^3 + 1)^(3/2) - 2/3*sqrt(-x^3 + 1
)
```

Fricas [A] time = 0.226518, size = 31, normalized size = 0.67

$$-\frac{2}{45}\left(3x^6+4x^3+8\right)\sqrt{-x^3+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/sqrt(-x^3 + 1),x, algorithm="fricas")
```

```
[Out] -2/45*(3*x^6 + 4*x^3 + 8)*sqrt(-x^3 + 1)
```

Sympy [A] time = 1.84666, size = 42, normalized size = 0.91

$$-\frac{2x^6\sqrt{-x^3+1}}{15}-\frac{8x^3\sqrt{-x^3+1}}{45}-\frac{16\sqrt{-x^3+1}}{45}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8/(-x**3+1)**(1/2),x)
```

```
[Out] -2*x**6*sqrt(-x**3 + 1)/15 - 8*x**3*sqrt(-x**3 + 1)/45 - 16*sqrt(
-x**3 + 1)/45
```

GIAC/XCAS [A] time = 0.218454, size = 55, normalized size = 1.2

$$-\frac{2}{15}\left(x^3-1\right)^2\sqrt{-x^3+1}+\frac{4}{9}\left(-x^3+1\right)^{\frac{3}{2}}-\frac{2}{3}\sqrt{-x^3+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/sqrt(-x^3 + 1),x, algorithm="giac")
```

```
[Out] -2/15*(x^3 - 1)^2*sqrt(-x^3 + 1) + 4/9*(-x^3 + 1)^(3/2) - 2/3*sqr
t(-x^3 + 1)
```

3.458 $\int \frac{x^5}{\sqrt{1-x^3}} dx$

Optimal. Leaf size=31

$$\frac{2}{9}\left(1-x^3\right)^{3/2}-\frac{2\sqrt{1-x^3}}{3}$$

```
[Out] (-2*Sqrt[1 - x^3])/3 + (2*(1 - x^3)^(3/2))/9
```

Rubi [A] time = 0.0410548, antiderivative size = 31, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2}{9}\left(1-x^3\right)^{3/2}-\frac{2\sqrt{1-x^3}}{3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/Sqrt[1 - x^3],x]

[Out] (-2*Sqrt[1 - x^3])/3 + (2*(1 - x^3)^(3/2))/9
```

Rubi in Sympy [A] time = 4.68414, size = 22, normalized size = 0.71

$$\frac{2\left(-x^3+1\right)^{\frac{3}{2}}}{9}-\frac{2\sqrt{-x^3+1}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(-x**3+1)**(1/2),x)

[Out] 2*(-x**3 + 1)**(3/2)/9 - 2*sqrt(-x**3 + 1)/3
```

Mathematica [A] time = 0.00845523, size = 20, normalized size = 0.65

$$-\frac{2}{9}\sqrt{1-x^3}\left(x^3+2\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/Sqrt[1 - x^3],x]

[Out] (-2*Sqrt[1 - x^3]*(2 + x^3))/9
```

Maple [A] time = 0.006, size = 26, normalized size = 0.8

$$\frac{(-2+2x)\left(x^2+x+1\right)\left(x^3+2\right)}{9}\frac{1}{\sqrt{-x^3+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(-x^3+1)^(1/2),x)

[Out] 2/9*(-1+x)*(x^2+x+1)*(x^3+2)/(-x^3+1)^(1/2)
```

Maxima [A] time = 1.42288, size = 31, normalized size = 1.

$$\frac{2}{9}\left(-x^{3}+1\right)^{\frac{3}{2}}-\frac{2}{3}\sqrt{-x^{3}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(-x^3 + 1),x, algorithm="maxima")
```

```
[Out] 2/9*(-x^3 + 1)^(3/2) - 2/3*sqrt(-x^3 + 1)
```

Fricas [A] time = 0.227605, size = 22, normalized size = 0.71

$$-\frac{2}{9}\left(x^{3}+2\right)\sqrt{-x^{3}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(-x^3 + 1),x, algorithm="fricas")
```

```
[Out] -2/9*(x^3 + 2)*sqrt(-x^3 + 1)
```

Sympy [A] time = 0.780375, size = 27, normalized size = 0.87

$$-\frac{2x^{3}\sqrt{-x^{3}+1}}{9}-\frac{4\sqrt{-x^{3}+1}}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(-x**3+1)**(1/2),x)
```

```
[Out] -2*x**3*sqrt(-x**3 + 1)/9 - 4*sqrt(-x**3 + 1)/9
```

GIAC/XCAS [A] time = 0.218833, size = 31, normalized size = 1.

$$\frac{2}{9}\left(-x^{3}+1\right)^{\frac{3}{2}}-\frac{2}{3}\sqrt{-x^{3}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(-x^3 + 1),x, algorithm="giac")
```

```
[Out] 2/9*(-x^3 + 1)^(3/2) - 2/3*sqrt(-x^3 + 1)
```

3.459 $\int \frac{x^2}{\sqrt{1-x^3}} dx$

Optimal. Leaf size=15

$$-\frac{2}{3}\sqrt{1-x^3}$$

```
[Out] (-2*Sqrt[1 - x^3])/3
```

Rubi [A] time = 0.00860274, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$-\frac{2}{3}\sqrt{1-x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/Sqrt[1 - x^3],x]

[Out] (-2*Sqrt[1 - x^3])/3
```

Rubi in Sympy [A] time = 1.99641, size = 12, normalized size = 0.8

$$-\frac{2\sqrt{-x^3+1}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(-x**3+1)**(1/2),x)

[Out] -2*sqrt(-x**3 + 1)/3
```

Mathematica [A] time = 0.0056685, size = 15, normalized size = 1.

$$-\frac{2}{3}\sqrt{1-x^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/Sqrt[1 - x^3],x]

[Out] (-2*Sqrt[1 - x^3])/3
```

Maple [A] time = 0.006, size = 21, normalized size = 1.4

$$\frac{(-2+2x)(x^2+x+1)}{3}\frac{1}{\sqrt{-x^3+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(-x^3+1)^(1/2),x)

[Out] 2/3*(-1+x)*(x^2+x+1)/(-x^3+1)^(1/2)
```

Maxima [A] time = 1.42379, size = 15, normalized size = 1.

$$-\frac{2}{3}\sqrt{-x^3+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(-x^3 + 1),x, algorithm="maxima")
```

```
[Out] -2/3*sqrt(-x^3 + 1)
```

Fricas [A] time = 0.222621, size = 15, normalized size = 1.

$$-\frac{2}{3}\sqrt{-x^3+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(-x^3 + 1),x, algorithm="fricas")
```

```
[Out] -2/3*sqrt(-x^3 + 1)
```

Sympy [A] time = 0.342876, size = 12, normalized size = 0.8

$$-\frac{2\sqrt{-x^3+1}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(-x**3+1)**(1/2),x)
```

```
[Out] -2*sqrt(-x**3 + 1)/3
```

GIAC/XCAS [A] time = 0.218291, size = 15, normalized size = 1.

$$-\frac{2}{3}\sqrt{-x^3+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(-x^3 + 1),x, algorithm="giac")
```

```
[Out] -2/3*sqrt(-x^3 + 1)
```

3.460 $\int \frac{1}{x\sqrt{1-x^3}} \, dx$

Optimal. Leaf size=16

$$-\frac{2}{3}\tanh^{-1}\left(\sqrt{1-x^3}\right)$$

```
[Out] (-2*ArcTanh[Sqrt[1 - x^3]])/3
```

Rubi [A] time = 0.029688, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{2}{3}\tanh^{-1}\left(\sqrt{1-x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Int[1/(x*Sqrt[1 - x^3]),x]

[Out] (-2*ArcTanh[Sqrt[1 - x^3]])/3
```

Rubi in Sympy [A] time = 3.89293, size = 14, normalized size = 0.88

$$-\frac{2\,\text{atanh}\left(\sqrt{-x^3+1}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x/(-x**3+1)**(1/2),x)

[Out] -2*atanh(sqrt(-x**3 + 1))/3
```

Mathematica [A] time = 0.0199535, size = 16, normalized size = 1.

$$-\frac{2}{3}\tanh^{-1}\left(\sqrt{1-x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x*Sqrt[1 - x^3]),x]

[Out] (-2*ArcTanh[Sqrt[1 - x^3]])/3
```

Maple [A] time = 0.118, size = 13, normalized size = 0.8

$$-\frac{2}{3}Artanh\left(\sqrt{-x^3+1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(-x^3+1)^(1/2),x)

[Out] -2/3*arctanh((-x^3+1)^(1/2))
```

Maxima [A] time = 1.43147, size = 39, normalized size = 2.44

$$-\frac{1}{3}\log\left(\sqrt{-x^3+1}+1\right)+\frac{1}{3}\log\left(\sqrt{-x^3+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 + 1)*x),x, algorithm="maxima")

[Out] -1/3*log(sqrt(-x^3 + 1) + 1) + 1/3*log(sqrt(-x^3 + 1) - 1)
```

Fricas [A] time = 0.23471, size = 39, normalized size = 2.44

$$-\frac{1}{3}\log\left(\sqrt{-x^3+1}+1\right)+\frac{1}{3}\log\left(\sqrt{-x^3+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 + 1)*x),x, algorithm="fricas")

[Out] -1/3*log(sqrt(-x^3 + 1) + 1) + 1/3*log(sqrt(-x^3 + 1) - 1)
```

Sympy [A] time = 3.45071, size = 31, normalized size = 1.94

$$\begin{cases} -\frac{2\operatorname{acosh}\left(\frac{1}{x^{\frac{3}{2}}}\right)}{3} & \text{for } \left|\frac{1}{x^3}\right|>1 \\ \frac{2i\operatorname{asin}\left(\frac{1}{x^{\frac{3}{2}}}\right)}{3} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(-x**3+1)**(1/2),x)

[Out] Piecewise((-2*acosh(x**(-3/2))/3, Abs(x**(-3)) > 1), (2*I*asin(x*
*(-3/2))/3, True))
```

GIAC/XCAS [A] time = 0.218494, size = 41, normalized size = 2.56

$$-\frac{1}{3}\ln\left(\sqrt{-x^3+1}+1\right)+\frac{1}{3}\ln\left(\left|\sqrt{-x^3+1}-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 + 1)*x),x, algorithm="giac")

[Out] -1/3*ln(sqrt(-x^3 + 1) + 1) + 1/3*ln(abs(sqrt(-x^3 + 1) - 1))
```

3.461 $\int \frac{1}{x^4\sqrt{1-x^3}}\,dx$

Optimal. Leaf size=35

$$-\frac{\sqrt{1-x^3}}{3x^3}-\frac{1}{3}\tanh^{-1}\left(\sqrt{1-x^3}\right)$$

```
[Out] -Sqrt[1 - x^3]/(3*x^3) - ArcTanh[Sqrt[1 - x^3]]/3
```

Rubi [A] time = 0.0461495, antiderivative size = 35, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{\sqrt{1-x^3}}{3x^3}-\frac{1}{3}\tanh^{-1}\left(\sqrt{1-x^3}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*Sqrt[1 - x^3]),x]

[Out] -Sqrt[1 - x^3]/(3*x^3) - ArcTanh[Sqrt[1 - x^3]]/3
```

Rubi in Sympy [A] time = 4.80611, size = 26, normalized size = 0.74

$$-\frac{\operatorname{atanh}\left(\sqrt{-x^3+1}\right)}{3}-\frac{\sqrt{-x^3+1}}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(-x**3+1)**(1/2),x)

[Out] -atanh(sqrt(-x**3 + 1))/3 - sqrt(-x**3 + 1)/(3*x**3)
```

Mathematica [A] time = 0.0292647, size = 35, normalized size = 1.

$$-\frac{\sqrt{1-x^3}}{3x^3}-\frac{1}{3}\tanh^{-1}\left(\sqrt{1-x^3}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*Sqrt[1 - x^3]),x]

[Out] -Sqrt[1 - x^3]/(3*x^3) - ArcTanh[Sqrt[1 - x^3]]/3
```

Maple [A] time = 0.034, size = 28, normalized size = 0.8

$$-\frac{1}{3}Artanh\left(\sqrt{-x^3+1}\right)-\frac{1}{3\,x^3}\sqrt{-x^3+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(-x^3+1)^(1/2),x)

[Out] -1/3*arctanh((-x^3+1)^(1/2))-1/3*(-x^3+1)^(1/2)/x^3
```

Maxima [A] time = 1.43616, size = 58, normalized size = 1.66

$$-\frac{\sqrt{-x^3+1}}{3\,x^3}-\frac{1}{6}\,\log\left(\sqrt{-x^3+1}+1\right)+\frac{1}{6}\,\log\left(\sqrt{-x^3+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 + 1)*x^4),x, algorithm="maxima")
```

```
[Out] -1/3*sqrt(-x^3 + 1)/x^3 - 1/6*log(sqrt(-x^3 + 1) + 1) + 1/6*log(s
qrt(-x^3 + 1) - 1)
```

Fricas [A] time = 0.234011, size = 68, normalized size = 1.94

$$-\frac{x^3\log\left(\sqrt{-x^3+1}+1\right)-x^3\log\left(\sqrt{-x^3+1}-1\right)+2\,\sqrt{-x^3+1}}{6\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 + 1)*x^4),x, algorithm="fricas")
```

```
[Out] -1/6*(x^3*log(sqrt(-x^3 + 1) + 1) - x^3*log(sqrt(-x^3 + 1) - 1) +
 2*sqrt(-x^3 + 1))/x^3
```

Sympy [A] time = 6.46167, size = 82, normalized size = 2.34

$$\begin{cases} -\frac{\operatorname{acosh}\left(\frac{1}{x^{\frac{3}{2}}}\right)}{3}-\frac{\sqrt{-1+\frac{1}{x^3}}}{3x^{\frac{3}{2}}} & \text{for}\ \left|\frac{1}{x^3}\right|>1\\ \frac{i\operatorname{asin}\left(\frac{1}{x^{\frac{3}{2}}}\right)}{3}-\frac{i}{3x^{\frac{3}{2}}\sqrt{1-\frac{1}{x^3}}}+\frac{i}{3x^{\frac{9}{2}}\sqrt{1-\frac{1}{x^3}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(-x**3+1)**(1/2),x)
```

```
[Out] Piecewise((-acosh(x**(-3/2))/3 - sqrt(-1 + x**(-3))/(3*x**(3/2)),
 Abs(x**(-3)) > 1), (I*asin(x**(-3/2))/3 - I/(3*x**(3/2)*sqrt(1 -
 1/x**3)) + I/(3*x**(9/2)*sqrt(1 - 1/x**3)), True))
```

GIAC/XCAS [A] time = 0.221617, size = 59, normalized size = 1.69

$$-\frac{\sqrt{-x^3+1}}{3\,x^3}-\frac{1}{6}\ln\left(\sqrt{-x^3+1}+1\right)+\frac{1}{6}\ln\left(\left|\sqrt{-x^3+1}-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 + 1)*x^4),x, algorithm="giac")
```

```
[Out] -1/3*sqrt(-x^3 + 1)/x^3 - 1/6*ln(sqrt(-x^3 + 1) + 1) + 1/6*ln(abs
(sqrt(-x^3 + 1) - 1))
```

3.462 $\int \frac{1}{x^7\sqrt{1-x^3}}\,dx$

Optimal. Leaf size=53

$$-\frac{\sqrt{1-x^3}}{4x^3}-\frac{1}{4}\tanh^{-1}\left(\sqrt{1-x^3}\right)-\frac{\sqrt{1-x^3}}{6x^6}$$

```
[Out] -Sqrt[1 - x^3]/(6*x^6) - Sqrt[1 - x^3]/(4*x^3) - ArcTanh[Sqrt[1 -
 x^3]]/4
```

Rubi [A] time = 0.0620185, antiderivative size = 53, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{\sqrt{1-x^3}}{4x^3}-\frac{1}{4}\tanh^{-1}\left(\sqrt{1-x^3}\right)-\frac{\sqrt{1-x^3}}{6x^6}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^7*Sqrt[1 - x^3]),x]
```

```
[Out] -Sqrt[1 - x^3]/(6*x^6) - Sqrt[1 - x^3]/(4*x^3) - ArcTanh[Sqrt[1 -
 x^3]]/4
```

Rubi in Sympy [A] time = 5.91617, size = 39, normalized size = 0.74

$$-\frac{\operatorname{atanh}\left(\sqrt{-x^3+1}\right)}{4}-\frac{\sqrt{-x^3+1}}{4x^3}-\frac{\sqrt{-x^3+1}}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**7/(-x**3+1)**(1/2),x)
```

```
[Out] -atanh(sqrt(-x**3 + 1))/4 - sqrt(-x**3 + 1)/(4*x**3) - sqrt(-x**3
 + 1)/(6*x**6)
```

Mathematica [A] time = 0.045899, size = 44, normalized size = 0.83

$$\left(-\frac{1}{6x^6}-\frac{1}{4x^3}\right)\sqrt{1-x^3}-\frac{1}{4}\tanh^{-1}\left(\sqrt{1-x^3}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^7*Sqrt[1 - x^3]),x]
```

```
[Out] (-1/(6*x^6) - 1/(4*x^3))*Sqrt[1 - x^3] - ArcTanh[Sqrt[1 - x^3]]/4
```

Maple [A] time = 0.036, size = 42, normalized size = 0.8

$$-\frac{1}{4}\mathit{Artanh}\left(\sqrt{-x^3+1}\right)-\frac{1}{6\,x^6}\sqrt{-x^3+1}-\frac{1}{4\,x^3}\sqrt{-x^3+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^7/(-x^3+1)^(1/2),x)
```

```
[Out] -1/4*arctanh((-x^3+1)^(1/2))-1/6*(-x^3+1)^(1/2)/x^6-1/4*(-x^3+1)^
(1/2)/x^3
```

Maxima [A] time = 1.50524, size = 95, normalized size = 1.79

$$\frac{3\left(-x^{3}+1\right)^{\frac{3}{2}}-5\sqrt{-x^{3}+1}}{12\left(2x^{3}+\left(x^{3}-1\right)^{2}-1\right)}-\frac{1}{8}\log\left(\sqrt{-x^{3}+1}+1\right)+\frac{1}{8}\log\left(\sqrt{-x^{3}+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 + 1)*x^7),x, algorithm="maxima")
```

```
[Out] 1/12*(3*(-x^3 + 1)^(3/2) - 5*sqrt(-x^3 + 1))/(2*x^3 + (x^3 - 1)^2
 - 1) - 1/8*log(sqrt(-x^3 + 1) + 1) + 1/8*log(sqrt(-x^3 + 1) - 1)
```

Fricas [A] time = 0.235052, size = 78, normalized size = 1.47

$$-\frac{3x^{6}\log\left(\sqrt{-x^{3}+1}+1\right)-3x^{6}\log\left(\sqrt{-x^{3}+1}-1\right)+2\left(3x^{3}+2\right)\sqrt{-x^{3}+1}}{24x^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 + 1)*x^7),x, algorithm="fricas")
```

```
[Out] -1/24*(3*x^6*log(sqrt(-x^3 + 1) + 1) - 3*x^6*log(sqrt(-x^3 + 1) -
 1) + 2*(3*x^3 + 2)*sqrt(-x^3 + 1))/x^6
```

Sympy [A] time = 10.6667, size = 138, normalized size = 2.6

$$\begin{cases} -\frac{\operatorname{acosh}\left(\frac{1}{x^{\frac{3}{2}}}\right)}{4}+\frac{1}{4x^{\frac{3}{2}}\sqrt{-1+\frac{1}{x^{3}}}}-\frac{1}{12x^{\frac{9}{2}}\sqrt{-1+\frac{1}{x^{3}}}}-\frac{1}{6x^{\frac{15}{2}}\sqrt{-1+\frac{1}{x^{3}}}} & \text{for } \left|\frac{1}{x^{3}}\right|>1 \\ \frac{i\operatorname{asin}\left(\frac{1}{x^{\frac{3}{2}}}\right)}{4}-\frac{i}{4x^{\frac{3}{2}}\sqrt{1-\frac{1}{x^{3}}}}+\frac{i}{12x^{\frac{9}{2}}\sqrt{1-\frac{1}{x^{3}}}}+\frac{i}{6x^{\frac{15}{2}}\sqrt{1-\frac{1}{x^{3}}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**7/(-x**3+1)**(1/2),x)
```

```
[Out] Piecewise((-acosh(x**(-3/2))/4 + 1/(4*x**(3/2)*sqrt(-1 + x**(-3))
) - 1/(12*x**(9/2)*sqrt(-1 + x**(-3))) - 1/(6*x**(15/2)*sqrt(-1 +
 x**(-3))), Abs(x**(-3)) > 1), (I*asin(x**(-3/2))/4 - I/(4*x**(3/
2)*sqrt(1 - 1/x**3)) + I/(12*x**(9/2)*sqrt(1 - 1/x**3)) + I/(6*x*
*(15/2)*sqrt(1 - 1/x**3)), True))
```

GIAC/XCAS [A] time = 0.218147, size = 78, normalized size = 1.47

$$\frac{3\left(-x^{3}+1\right)^{\frac{3}{2}}-5\sqrt{-x^{3}+1}}{12x^{6}}-\frac{1}{8}\ln\left(\sqrt{-x^{3}+1}+1\right)+\frac{1}{8}\ln\left(\left|\sqrt{-x^{3}+1}-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 + 1)*x^7),x, algorithm="giac")
```

```
[Out] 1/12*(3*(-x^3 + 1)^(3/2) - 5*sqrt(-x^3 + 1))/x^6 - 1/8*ln(sqrt(-x
^3 + 1) + 1) + 1/8*ln(abs(sqrt(-x^3 + 1) - 1))
```

3.463 $\int \frac{1}{x^{10}\sqrt{1-x^3}}\,dx$

Optimal. Leaf size=71

$$-\frac{5\sqrt{1-x^3}}{24x^3}-\frac{5}{24}\tanh^{-1}\left(\sqrt{1-x^3}\right)-\frac{\sqrt{1-x^3}}{9x^9}-\frac{5\sqrt{1-x^3}}{36x^6}$$

```
[Out] -Sqrt[1 - x^3]/(9*x^9) - (5*Sqrt[1 - x^3])/(36*x^6) - (5*Sqrt[1 - x^3])/(24*x^3) - (5*ArcTanh[Sqrt[1 - x^3]])/24
```

Rubi [A] time = 0.0816325, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$

$$-\frac{5\sqrt{1-x^3}}{24x^3}-\frac{5}{24}\tanh^{-1}\left(\sqrt{1-x^3}\right)-\frac{\sqrt{1-x^3}}{9x^9}-\frac{5\sqrt{1-x^3}}{36x^6}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^10*Sqrt[1 - x^3]),x]
```

```
[Out] -Sqrt[1 - x^3]/(9*x^9) - (5*Sqrt[1 - x^3])/(36*x^6) - (5*Sqrt[1 - x^3])/(24*x^3) - (5*ArcTanh[Sqrt[1 - x^3]])/24
```

Rubi in Sympy [A] time = 6.81766, size = 58, normalized size = 0.82

$$-\frac{5\operatorname{atanh}\left(\sqrt{-x^3+1}\right)}{24}-\frac{5\sqrt{-x^3+1}}{24x^3}-\frac{5\sqrt{-x^3+1}}{36x^6}-\frac{\sqrt{-x^3+1}}{9x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**10/(-x**3+1)**(1/2),x)
```

```
[Out] -5*atanh(sqrt(-x**3 + 1))/24 - 5*sqrt(-x**3 + 1)/(24*x**3) - 5*sqrt(-x**3 + 1)/(36*x**6) - sqrt(-x**3 + 1)/(9*x**9)
```

Mathematica [A] time = 0.0465588, size = 47, normalized size = 0.66

$$-\frac{5}{24}\tanh^{-1}\left(\sqrt{1-x^3}\right)-\frac{\sqrt{1-x^3}\left(15x^6+10x^3+8\right)}{72x^9}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^10*Sqrt[1 - x^3]),x]
```

```
[Out] -(Sqrt[1 - x^3]*(8 + 10*x^3 + 15*x^6))/(72*x^9) - (5*ArcTanh[Sqrt[1 - x^3]])/24
```

Maple [A] time = 0.037, size = 56, normalized size = 0.8

$$-\frac{5}{24}Artanh\left(\sqrt{-x^3+1}\right)-\frac{1}{9\,x^9}\sqrt{-x^3+1}-\frac{5}{36\,x^6}\sqrt{-x^3+1}-\frac{5}{24\,x^3}\sqrt{-x^3+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^10/(-x^3+1)^(1/2),x)
```

```
[Out] -5/24*arctanh((-x^3+1)^(1/2))-1/9*(-x^3+1)^(1/2)/x^9-5/36*(-x^3+1
)^(1/2)/x^6-5/24*(-x^3+1)^(1/2)/x^3
```

Maxima [A] time = 1.44533, size = 122, normalized size = 1.72

$$-\frac{15\left(-x^3+1\right)^{\frac{5}{2}}-40\left(-x^3+1\right)^{\frac{3}{2}}+33\sqrt{-x^3+1}}{72\left(\left(x^3-1\right)^3+3x^3+3\left(x^3-1\right)^2-2\right)}-\frac{5}{48}\log\left(\sqrt{-x^3+1}+1\right)+\frac{5}{48}\log\left(\sqrt{-x^3+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(-x^3 + 1)*x^10),x, algorithm="maxima")
```

```
[Out] -1/72*(15*(-x^3 + 1)^(5/2) - 40*(-x^3 + 1)^(3/2) + 33*sqrt(-x^3 +
 1))/((x^3 - 1)^3 + 3*x^3 + 3*(x^3 - 1)^2 - 2) - 5/48*log(sqrt(-x
^3 + 1) + 1) + 5/48*log(sqrt(-x^3 + 1) - 1)
```

Fricas [A] time = 0.228063, size = 85, normalized size = 1.2

$$-\frac{15x^9\log\left(\sqrt{-x^3+1}+1\right)-15x^9\log\left(\sqrt{-x^3+1}-1\right)+2\left(15x^6+10x^3+8\right)\sqrt{-x^3+1}}{144x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(-x^3 + 1)*x^10),x, algorithm="fricas")
```

```
[Out] -1/144*(15*x^9*log(sqrt(-x^3 + 1) + 1) - 15*x^9*log(sqrt(-x^3 + 1
) - 1) + 2*(15*x^6 + 10*x^3 + 8)*sqrt(-x^3 + 1))/x^9
```

Sympy [A] time = 17.6547, size = 182, normalized size = 2.56

$$\begin{cases} -\frac{5\operatorname{acosh}\left(\frac{1}{x^{\frac{3}{2}}}\right)}{24}+\frac{5}{24x^{\frac{3}{2}}\sqrt{-1+\frac{1}{x^3}}}-\frac{5}{72x^{\frac{9}{2}}\sqrt{-1+\frac{1}{x^3}}}-\frac{1}{36x^{\frac{15}{2}}\sqrt{-1+\frac{1}{x^3}}}-\frac{1}{9x^{\frac{21}{2}}\sqrt{-1+\frac{1}{x^3}}} & \text{for}\ \left|\frac{1}{x^3}\right|>1 \\ \frac{5i\operatorname{asin}\left(\frac{1}{x^{\frac{3}{2}}}\right)}{24}-\frac{5i}{24x^{\frac{3}{2}}\sqrt{1-\frac{1}{x^3}}}+\frac{5i}{72x^{\frac{9}{2}}\sqrt{1-\frac{1}{x^3}}}+\frac{i}{36x^{\frac{15}{2}}\sqrt{1-\frac{1}{x^3}}}+\frac{i}{9x^{\frac{21}{2}}\sqrt{1-\frac{1}{x^3}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/x**10/(-x**3+1)**(1/2),x)
```

```
[Out] Piecewise((-5*acosh(x**(-3/2))/24 + 5/(24*x**(3/2)*sqrt(-1 + x**(
-3))) - 5/(72*x**(9/2)*sqrt(-1 + x**(-3))) - 1/(36*x**(15/2)*sqrt
(-1 + x**(-3))) - 1/(9*x**(21/2)*sqrt(-1 + x**(-3))), Abs(x**(-3)
) > 1), (5*I*asin(x**(-3/2))/24 - 5*I/(24*x**(3/2)*sqrt(1 - 1/x**
3)) + 5*I/(72*x**(9/2)*sqrt(1 - 1/x**3)) + I/(36*x**(15/2)*sqrt(1
 - 1/x**3)) + I/(9*x**(21/2)*sqrt(1 - 1/x**3)), True))
```

GIAC/XCAS [A] time = 0.215833, size = 103, normalized size = 1.45

$$-\frac{15\left(x^3-1\right)^2\sqrt{-x^3+1}-40\left(-x^3+1\right)^{\frac{3}{2}}+33\sqrt{-x^3+1}}{72x^9}-\frac{5}{48}\ln\left(\sqrt{-x^3+1}+1\right)+\frac{5}{48}\ln\left(\left|\sqrt{-x^3+1}-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 + 1)*x^10),x, algorithm="giac")
```

```
[Out] -1/72*(15*(x^3 - 1)^2*sqrt(-x^3 + 1) - 40*(-x^3 + 1)^(3/2) + 33*s
qrt(-x^3 + 1))/x^9 - 5/48*ln(sqrt(-x^3 + 1) + 1) + 5/48*ln(abs(sq
rt(-x^3 + 1) - 1))
```

3.464 $\int \frac{x^6}{\sqrt{1-x^3}}\,dx$

Optimal. Leaf size=152

$$-\frac{16}{55}\sqrt{1-x^3}x-\frac{2}{11}\sqrt{1-x^3}x^4-\frac{32\sqrt{2+\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x-\sqrt{3}+1}{-x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{55\sqrt[4]{3}\sqrt{\frac{1-x}{\left(-x+\sqrt{3}+1\right)^2}}\sqrt{1-x^3}}$$

```
[Out] (-16*x*Sqrt[1 - x^3])/55 - (2*x^4*Sqrt[1 - x^3])/11 - (32*Sqrt[2
+ Sqrt[3]]*(1 - x)*Sqrt[(1 + x + x^2)/(1 + Sqrt[3] - x)^2]*Ellipt
icF[ArcSin[(1 - Sqrt[3] - x)/(1 + Sqrt[3] - x)], -7 - 4*Sqrt[3]])
/(55*3^(1/4)*Sqrt[(1 - x)/(1 + Sqrt[3] - x)^2]*Sqrt[1 - x^3])
```

Rubi [A] time = 0.109633, antiderivative size = 152, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{16}{55}\sqrt{1-x^3}x-\frac{2}{11}\sqrt{1-x^3}x^4-\frac{32\sqrt{2+\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x-\sqrt{3}+1}{-x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{55\sqrt[4]{3}\sqrt{\frac{1-x}{\left(-x+\sqrt{3}+1\right)^2}}\sqrt{1-x^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/Sqrt[1 - x^3],x]
```

```
[Out] (-16*x*Sqrt[1 - x^3])/55 - (2*x^4*Sqrt[1 - x^3])/11 - (32*Sqrt[2
+ Sqrt[3]]*(1 - x)*Sqrt[(1 + x + x^2)/(1 + Sqrt[3] - x)^2]*Ellipt
icF[ArcSin[(1 - Sqrt[3] - x)/(1 + Sqrt[3] - x)], -7 - 4*Sqrt[3]])
/(55*3^(1/4)*Sqrt[(1 - x)/(1 + Sqrt[3] - x)^2]*Sqrt[1 - x^3])
```

Rubi in Sympy [A] time = 6.6533, size = 126, normalized size = 0.83

$$-\frac{2x^4\sqrt{-x^3+1}}{11}-\frac{16x\sqrt{-x^3+1}}{55}-\frac{32\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2+x+1}{\left(-x+1+\sqrt{3}\right)^2}}\sqrt{\sqrt{3}+2}\,(-x+1)\,F\left(\operatorname{asin}\left(\frac{-x-\sqrt{3}+1}{-x+1+\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{165\sqrt{\frac{-x+1}{\left(-x+1+\sqrt{3}\right)^2}}\sqrt{-x^3+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(-x**3+1)**(1/2),x)
```

```
[Out] -2*x**4*sqrt(-x**3 + 1)/11 - 16*x*sqrt(-x**3 + 1)/55 - 32*3**(3/4
)*sqrt((x**2 + x + 1)/(-x + 1 + sqrt(3))**2)*sqrt(sqrt(3) + 2)*(-
x + 1)*elliptic_f(asin((-x - sqrt(3) + 1)/(-x + 1 + sqrt(3))), -7
 - 4*sqrt(3))/(165*sqrt((-x + 1)/(-x + 1 + sqrt(3))**2)*sqrt(-x**
3 + 1))
```

Mathematica [C] time = 0.124205, size = 93, normalized size = 0.61

$$\frac{2\left(3x\left(5x^6+3x^3-8\right)+16i3^{3/4}\sqrt{(-1)^{5/6}(x-1)}\sqrt{x^2+x+1}F\left(\sin^{-1}\left(\frac{\sqrt{-ix-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)\right)}{165\sqrt{1-x^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^6/Sqrt[1 - x^3],x]
```

```
[Out] (2*(3*x*(-8 + 3*x^3 + 5*x^6) + (16*I)*3^(3/4)*Sqrt[(-1)^(5/6)*(-1
 + x)]*Sqrt[1 + x + x^2]*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - I*x]
/3^(1/4)], (-1)^(1/3)]))/(165*Sqrt[1 - x^3])
```

Maple [A] time = 0.031, size = 134, normalized size = 0.9

$$-\frac{2x^4}{11}\sqrt{-x^3+1}-\frac{16x}{55}\sqrt{-x^3+1}$$
$$-\frac{32i}{165}\sqrt{3}\sqrt{i\left(x+\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\sqrt{\frac{-1+x}{-\frac{3}{2}+\frac{i}{2}\sqrt{3}}}\sqrt{-i\left(x+\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\,EllipticF\left(\frac{\sqrt{3}}{3}\sqrt{i\left(x+\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}},\sqrt{\frac{i\sqrt{3}}{-\frac{3}{2}+\frac{i}{2}\sqrt{3}}}\right)\frac{1}{\sqrt{-}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(-x^3+1)^(1/2),x)
```

```
[Out] -2/11*x^4*(-x^3+1)^(1/2)-16/55*x*(-x^3+1)^(1/2)-32/165*I*3^(1/2)*
(I*(x+1/2-1/2*I*3^(1/2))*3^(1/2))^(1/2)*((-1+x)/(-3/2+1/2*I*3^(1/
2)))^(1/2)*(-I*(x+1/2+1/2*I*3^(1/2))*3^(1/2))^(1/2)/(-x^3+1)^(1/2
)*EllipticF(1/3*3^(1/2)*(I*(x+1/2-1/2*I*3^(1/2))*3^(1/2))^(1/2),(
I*3^(1/2)/(-3/2+1/2*I*3^(1/2)))^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{\sqrt{-x^3+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(-x^3 + 1),x, algorithm="maxima")
```

```
[Out] integrate(x^6/sqrt(-x^3 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^6}{\sqrt{-x^3+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(-x^3 + 1),x, algorithm="fricas")
```

```
[Out] integral(x^6/sqrt(-x^3 + 1), x)
```

Sympy [A] time = 2.28792, size = 31, normalized size = 0.2

$$\frac{x^7\,\Gamma\left(\frac{7}{3}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{7}{3}\\ \frac{10}{3}\end{matrix}\middle|\,x^3e^{2i\pi}\right)}{3\,\Gamma\left(\frac{10}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(-x**3+1)**(1/2),x)
```

```
[Out] x**7*gamma(7/3)*hyper((1/2, 7/3), (10/3,), x**3*exp_polar(2*I*pi)
)/(3*gamma(10/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{\sqrt{-x^3+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(-x^3 + 1),x, algorithm="giac")
```

```
[Out] integrate(x^6/sqrt(-x^3 + 1), x)
```

3.465 $\int \frac{x^3}{\sqrt{1-x^3}}\,dx$

Optimal. Leaf size=134

$$-\frac{2}{5}\sqrt{1-x^3}x-\frac{4\sqrt{2+\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x-\sqrt{3}+1}{-x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{5\sqrt[4]{3}\sqrt{\frac{1-x}{\left(-x+\sqrt{3}+1\right)^2}}\sqrt{1-x^3}}$$

```
[Out] (-2*x*Sqrt[1 - x^3])/5 - (4*Sqrt[2 + Sqrt[3]]*(1 - x)*Sqrt[(1 + x
 + x^2)/(1 + Sqrt[3] - x)^2]*EllipticF[ArcSin[(1 - Sqrt[3] - x)/(
1 + Sqrt[3] - x)], -7 - 4*Sqrt[3]])/(5*3^(1/4)*Sqrt[(1 - x)/(1 +
Sqrt[3] - x)^2]*Sqrt[1 - x^3])
```

Rubi [A] time = 0.0691941, antiderivative size = 134, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2}{5}\sqrt{1-x^3}x-\frac{4\sqrt{2+\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x-\sqrt{3}+1}{-x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{5\sqrt[4]{3}\sqrt{\frac{1-x}{\left(-x+\sqrt{3}+1\right)^2}}\sqrt{1-x^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/Sqrt[1 - x^3],x]
```

```
[Out] (-2*x*Sqrt[1 - x^3])/5 - (4*Sqrt[2 + Sqrt[3]]*(1 - x)*Sqrt[(1 + x
 + x^2)/(1 + Sqrt[3] - x)^2]*EllipticF[ArcSin[(1 - Sqrt[3] - x)/(
1 + Sqrt[3] - x)], -7 - 4*Sqrt[3]])/(5*3^(1/4)*Sqrt[(1 - x)/(1 +
Sqrt[3] - x)^2]*Sqrt[1 - x^3])
```

Rubi in Sympy [A] time = 4.78659, size = 110, normalized size = 0.82

$$-\frac{2x\sqrt{-x^3+1}}{5}-\frac{4\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2+x+1}{\left(-x+1+\sqrt{3}\right)^2}}\sqrt{\sqrt{3}+2}\,(-x+1)\,F\left(\operatorname{asin}\left(\frac{-x-\sqrt{3}+1}{-x+1+\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{15\sqrt{\frac{-x+1}{\left(-x+1+\sqrt{3}\right)^2}}\sqrt{-x^3+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(-x**3+1)**(1/2),x)
```

```
[Out] -2*x*sqrt(-x**3 + 1)/5 - 4*3**(3/4)*sqrt((x**2 + x + 1)/(-x + 1 +
 sqrt(3))**2)*sqrt(sqrt(3) + 2)*(-x + 1)*elliptic_f(asin((-x - sq
rt(3) + 1)/(-x + 1 + sqrt(3))), -7 - 4*sqrt(3))/(15*sqrt((-x + 1)
/(-x + 1 + sqrt(3))**2)*sqrt(-x**3 + 1))
```

Mathematica [C] time = 0.108618, size = 86, normalized size = 0.64

$$\frac{2\left(3x\left(x^3-1\right)+2i3^{3/4}\sqrt{(-1)^{5/6}(x-1)}\sqrt{x^2+x+1}F\left(\sin^{-1}\left(\frac{\sqrt{-ix-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)\right)}{15\sqrt{1-x^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^3/Sqrt[1 - x^3],x]
```

```
[Out] (2*(3*x*(-1 + x^3) + (2*I)*3^(3/4)*Sqrt[(-1)^(5/6)*(-1 + x)]*Sqrt
[1 + x + x^2]*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - I*x]/3^(1/4)],
(-1)^(1/3)]))/(15*Sqrt[1 - x^3])
```

Maple [A] time = 0.031, size = 120, normalized size = 0.9

$$-\frac{2x}{5}\sqrt{-x^3+1} -\frac{4i}{15}\sqrt{3}\sqrt{i\left(x+\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\sqrt{\frac{-1+x}{-\frac{3}{2}+\frac{i}{2}\sqrt{3}}}\sqrt{-i\left(x+\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\,\sqrt{3}EllipticF\left(\frac{\sqrt{3}}{3}\sqrt{i\left(x+\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}},\sqrt{\frac{i\sqrt{3}}{-\frac{3}{2}+\frac{i}{2}\sqrt{3}}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(-x^3+1)^(1/2),x)
```

```
[Out] -2/5*x*(-x^3+1)^(1/2)-4/15*I*3^(1/2)*(I*(x+1/2-1/2*I*3^(1/2))*3^(
1/2))^(1/2)*((-1+x)/(-3/2+1/2*I*3^(1/2)))^(1/2)*(-I*(x+1/2+1/2*I*
3^(1/2))*3^(1/2))^(1/2)/(-x^3+1)^(1/2)*EllipticF(1/3*3^(1/2)*(I*(
x+1/2-1/2*I*3^(1/2))*3^(1/2))^(1/2),(I*3^(1/2)/(-3/2+1/2*I*3^(1/2
)))^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{\sqrt{-x^3+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(-x^3 + 1),x, algorithm="maxima")
```

```
[Out] integrate(x^3/sqrt(-x^3 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^3}{\sqrt{-x^3+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(-x^3 + 1),x, algorithm="fricas")
```

```
[Out] integral(x^3/sqrt(-x^3 + 1), x)
```

Sympy [A] time = 1.92866, size = 31, normalized size = 0.23

$$\frac{x^4\left(\frac{4}{3}\right){}_2F_1\left(\left.\begin{matrix}\frac{1}{2},\frac{4}{3}\\ \frac{7}{3}\end{matrix}\right| x^3e^{2i\pi}\right)}{3\left(\frac{7}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(-x**3+1)**(1/2),x)
```

```
[Out] x**4*gamma(4/3)*hyper((1/2, 4/3), (7/3,), x**3*exp_polar(2*I*pi))
/(3*gamma(7/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{\sqrt{-x^3+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(-x^3 + 1),x, algorithm="giac")
```

```
[Out] integrate(x^3/sqrt(-x^3 + 1), x)
```

3.466 $\int \frac{1}{\sqrt{1-x^3}} \, dx$

Optimal. Leaf size=115

$$-\frac{2\sqrt{2+\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x-\sqrt{3}+1}{-x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{\sqrt[4]{3}\sqrt{\frac{1-x}{\left(-x+\sqrt{3}+1\right)^2}}\sqrt{1-x^3}}$$

```
[Out] (-2*Sqrt[2 + Sqrt[3]]*(1 - x)*Sqrt[(1 + x + x^2)/(1 + Sqrt[3] - x
)^2]*EllipticF[ArcSin[(1 - Sqrt[3] - x)/(1 + Sqrt[3] - x)], -7 -
4*Sqrt[3]])/(3^(1/4)*Sqrt[(1 - x)/(1 + Sqrt[3] - x)^2]*Sqrt[1 - x
^3])
```

Rubi [A] time = 0.0351965, antiderivative size = 115, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$-\frac{2\sqrt{2+\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x-\sqrt{3}+1}{-x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{\sqrt[4]{3}\sqrt{\frac{1-x}{\left(-x+\sqrt{3}+1\right)^2}}\sqrt{1-x^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[1 - x^3],x]
```

```
[Out] (-2*Sqrt[2 + Sqrt[3]]*(1 - x)*Sqrt[(1 + x + x^2)/(1 + Sqrt[3] - x
)^2]*EllipticF[ArcSin[(1 - Sqrt[3] - x)/(1 + Sqrt[3] - x)], -7 -
4*Sqrt[3]])/(3^(1/4)*Sqrt[(1 - x)/(1 + Sqrt[3] - x)^2]*Sqrt[1 - x
^3])
```

Rubi in Sympy [A] time = 1.92371, size = 97, normalized size = 0.84

$$-\frac{2\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2+x+1}{\left(-x+1+\sqrt{3}\right)^2}}\sqrt{\sqrt{3}+2}\,(-x+1)\,F\left(\operatorname{asin}\left(\frac{-x-\sqrt{3}+1}{-x+1+\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{3\sqrt{\frac{-x+1}{\left(-x+1+\sqrt{3}\right)^2}}\sqrt{-x^3+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(-x**3+1)**(1/2),x)
```

```
[Out] -2*3**(3/4)*sqrt((x**2 + x + 1)/(-x + 1 + sqrt(3))**2)*sqrt(sqrt(
3) + 2)*(-x + 1)*elliptic_f(asin((-x - sqrt(3) + 1)/(-x + 1 + sqr
t(3))), -7 - 4*sqrt(3))/(3*sqrt((-x + 1)/(-x + 1 + sqrt(3))**2)*s
qrt(-x**3 + 1))
```

Mathematica [C] time = 0.0404407, size = 73, normalized size = 0.63

$$\frac{2i\sqrt{(-1)^{5/6}(x-1)}\sqrt{x^2+x+1}F\left(\sin^{-1}\left(\frac{\sqrt{-ix-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)}{\sqrt[4]{3}\sqrt{1-x^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/Sqrt[1 - x^3],x]
```

```
[Out] ((2*I)*Sqrt[(-1)^(5/6)*(-1 + x)]*Sqrt[1 + x + x^2]*EllipticF[ArcS
in[Sqrt[-(-1)^(5/6) - I*x]/3^(1/4)], (-1)^(1/3)])/(3^(1/4)*Sqrt[1
 - x^3])
```

Maple [A] time = 0.028, size = 107, normalized size = 0.9

$$-\frac{2i}{3}\sqrt{3}\sqrt{i\left(x+\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\sqrt{\frac{-1+x}{-\frac{3}{2}+\frac{i}{2}\sqrt{3}}}\sqrt{-i\left(x+\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\,EllipticF\left(\frac{\sqrt{3}}{3}\sqrt{i\left(x+\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}},\sqrt{\frac{i\sqrt{3}}{-\frac{3}{2}+\frac{i}{2}\sqrt{3}}}\right)\frac{1}{\sqrt{-}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(-x^3+1)^(1/2),x)
```

```
[Out] -2/3*I*3^(1/2)*(I*(x+1/2-1/2*I*3^(1/2))*3^(1/2))^(1/2)*((-1+x)/(-
3/2+1/2*I*3^(1/2)))^(1/2)*(-I*(x+1/2+1/2*I*3^(1/2))*3^(1/2))^(1/2
)/(-x^3+1)^(1/2)*EllipticF(1/3*3^(1/2)*(I*(x+1/2-1/2*I*3^(1/2))*3
^(1/2))^(1/2),(I*3^(1/2)/(-3/2+1/2*I*3^(1/2)))^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^3+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(-x^3 + 1),x, algorithm="maxima")
```

```
[Out] integrate(1/sqrt(-x^3 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{-x^3+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(-x^3 + 1),x, algorithm="fricas")
```

```
[Out] integral(1/sqrt(-x^3 + 1), x)
```

Sympy [A] time = 1.80034, size = 29, normalized size = 0.25

$$\frac{x\,\Gamma\left(\frac{1}{3}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{3},\frac{1}{2}\\ \frac{4}{3}\end{matrix}\middle|\,x^3e^{2i\pi}\right)}{3\,\Gamma\left(\frac{4}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(-x**3+1)**(1/2),x)
```

```
[Out] x*gamma(1/3)*hyper((1/3, 1/2), (4/3,), x**3*exp_polar(2*I*pi))/(3
*gamma(4/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^3+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(-x^3 + 1),x, algorithm="giac")
```

```
[Out] integrate(1/sqrt(-x^3 + 1), x)
```

3.467 $\int \frac{1}{x^3\sqrt{1-x^3}}\,dx$

Optimal. Leaf size=136

$$-\frac{\sqrt{1-x^3}}{2x^2}-\frac{\sqrt{2+\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x-\sqrt{3}+1}{-x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{2\sqrt[4]{3}\sqrt{\frac{1-x}{\left(-x+\sqrt{3}+1\right)^2}}\sqrt{1-x^3}}$$

```
[Out] -Sqrt[1 - x^3]/(2*x^2) - (Sqrt[2 + Sqrt[3]]*(1 - x)*Sqrt[(1 + x +
 x^2)/(1 + Sqrt[3] - x)^2]*EllipticF[ArcSin[(1 - Sqrt[3] - x)/(1
+ Sqrt[3] - x)], -7 - 4*Sqrt[3]])/(2*3^(1/4)*Sqrt[(1 - x)/(1 + Sq
rt[3] - x)^2]*Sqrt[1 - x^3])
```

Rubi [A] time = 0.0680137, antiderivative size = 136, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{\sqrt{1-x^3}}{2x^2}-\frac{\sqrt{2+\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x-\sqrt{3}+1}{-x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{2\sqrt[4]{3}\sqrt{\frac{1-x}{\left(-x+\sqrt{3}+1\right)^2}}\sqrt{1-x^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*Sqrt[1 - x^3]),x]
```

```
[Out] -Sqrt[1 - x^3]/(2*x^2) - (Sqrt[2 + Sqrt[3]]*(1 - x)*Sqrt[(1 + x +
 x^2)/(1 + Sqrt[3] - x)^2]*EllipticF[ArcSin[(1 - Sqrt[3] - x)/(1
+ Sqrt[3] - x)], -7 - 4*Sqrt[3]])/(2*3^(1/4)*Sqrt[(1 - x)/(1 + Sq
rt[3] - x)^2]*Sqrt[1 - x^3])
```

Rubi in Sympy [A] time = 4.58009, size = 109, normalized size = 0.8

$$-\frac{3^{\frac{3}{4}}\sqrt{\frac{x^2+x+1}{\left(-x+1+\sqrt{3}\right)^2}}\sqrt{\sqrt{3}+2}\,(-x+1)\,F\left(\operatorname{asin}\left(\frac{-x-\sqrt{3}+1}{-x+1+\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{6\sqrt{\frac{-x+1}{\left(-x+1+\sqrt{3}\right)^2}}\sqrt{-x^3+1}}-\frac{\sqrt{-x^3+1}}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(-x**3+1)**(1/2),x)
```

```
[Out] -3**(3/4)*sqrt((x**2 + x + 1)/(-x + 1 + sqrt(3))**2)*sqrt(sqrt(3)
 + 2)*(-x + 1)*elliptic_f(asin((-x - sqrt(3) + 1)/(-x + 1 + sqrt(
3))), -7 - 4*sqrt(3))/(6*sqrt((-x + 1)/(-x + 1 + sqrt(3))**2)*sqr
t(-x**3 + 1)) - sqrt(-x**3 + 1)/(2*x**2)
```

Mathematica [C] time = 0.0730972, size = 90, normalized size = 0.66

$$\frac{3x^3+i3^{3/4}\sqrt{(-1)^{5/6}(x-1)}\sqrt{x^2+x+1}x^2F\left(\sin^{-1}\left(\frac{\sqrt{-ix-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)-3}{6x^2\sqrt{1-x^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/(x^3*Sqrt[1 - x^3]),x]
```

```
[Out] (-3 + 3*x^3 + I*3^(3/4)*Sqrt[(-1)^(5/6)*(-1 + x)]*x^2*Sqrt[1 + x
+ x^2]*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - I*x]/3^(1/4)], (-1)^(1
/3)])/(6*x^2*Sqrt[1 - x^3])
```

Maple [A] time = 0.033, size = 122, normalized size = 0.9

$$-\frac{1}{2\,x^{2}}\sqrt{-x^{3}+1}$$
$$-\frac{i}{6}\sqrt{3}\sqrt{i\left(x+\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\sqrt{\frac{-1+x}{-\frac{3}{2}+\frac{i}{2}\sqrt{3}}}\sqrt{-i\left(x+\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\,EllipticF\left(\frac{\sqrt{3}}{3}\sqrt{i\left(x+\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}},\sqrt{\frac{i\sqrt{3}}{-\frac{3}{2}+\frac{i}{2}\sqrt{3}}}\right)\frac{1}{\sqrt{-x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(-x^3+1)^(1/2),x)
```

```
[Out] -1/2*(-x^3+1)^(1/2)/x^2-1/6*I*3^(1/2)*(I*(x+1/2-1/2*I*3^(1/2))*3^
(1/2))^(1/2)*((-1+x)/(-3/2+1/2*I*3^(1/2)))^(1/2)*(-I*(x+1/2+1/2*I
*3^(1/2))*3^(1/2))^(1/2)/(-x^3+1)^(1/2)*EllipticF(1/3*3^(1/2)*(I*
(x+1/2-1/2*I*3^(1/2))*3^(1/2))^(1/2),(I*3^(1/2)/(-3/2+1/2*I*3^(1/
2)))^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^{3}+1}x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 + 1)*x^3),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(-x^3 + 1)*x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{-x^{3}+1}x^{3}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 + 1)*x^3),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(-x^3 + 1)*x^3), x)
```

Sympy [A] time = 2.20834, size = 34, normalized size = 0.25

$$\frac{\left(-\frac{2}{3}\right)\,{}_{2}F_{1}\left(\begin{matrix}-\frac{2}{3},\frac{1}{2}\\ \frac{1}{3}\end{matrix}\middle|x^{3}e^{2i\pi}\right)}{3x^{2}\left(\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(-x**3+1)**(1/2),x)
```

```
[Out] gamma(-2/3)*hyper((-2/3, 1/2), (1/3,), x**3*exp_polar(2*I*pi))/(3
*x**2*gamma(1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^3+1}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 + 1)*x^3),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(-x^3 + 1)*x^3), x)
```

3.468 $\int \frac{1}{x^6\sqrt{1-x^3}}\,dx$

Optimal. Leaf size=154

$$-\frac{\sqrt{1-x^3}}{5x^5}-\frac{7\sqrt{1-x^3}}{20x^2}-\frac{7\sqrt{2+\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x-\sqrt{3}+1}{-x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{20\sqrt[4]{3}\sqrt{\frac{1-x}{\left(-x+\sqrt{3}+1\right)^2}}\sqrt{1-x^3}}$$

```
[Out] -Sqrt[1 - x^3]/(5*x^5) - (7*Sqrt[1 - x^3])/(20*x^2) - (7*Sqrt[2 +
 Sqrt[3]]*(1 - x)*Sqrt[(1 + x + x^2)/(1 + Sqrt[3] - x)^2]*Ellipti
cF[ArcSin[(1 - Sqrt[3] - x)/(1 + Sqrt[3] - x)], -7 - 4*Sqrt[3]])/
(20*3^(1/4)*Sqrt[(1 - x)/(1 + Sqrt[3] - x)^2]*Sqrt[1 - x^3])
```

Rubi [A] time = 0.096367, antiderivative size = 154, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{\sqrt{1-x^3}}{5x^5}-\frac{7\sqrt{1-x^3}}{20x^2}-\frac{7\sqrt{2+\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x-\sqrt{3}+1}{-x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{20\sqrt[4]{3}\sqrt{\frac{1-x}{\left(-x+\sqrt{3}+1\right)^2}}\sqrt{1-x^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^6*Sqrt[1 - x^3]),x]
```

```
[Out] -Sqrt[1 - x^3]/(5*x^5) - (7*Sqrt[1 - x^3])/(20*x^2) - (7*Sqrt[2 +
 Sqrt[3]]*(1 - x)*Sqrt[(1 + x + x^2)/(1 + Sqrt[3] - x)^2]*Ellipti
cF[ArcSin[(1 - Sqrt[3] - x)/(1 + Sqrt[3] - x)], -7 - 4*Sqrt[3]])/
(20*3^(1/4)*Sqrt[(1 - x)/(1 + Sqrt[3] - x)^2]*Sqrt[1 - x^3])
```

Rubi in Sympy [A] time = 6.53093, size = 126, normalized size = 0.82

$$-\frac{7\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2+x+1}{\left(-x+1+\sqrt{3}\right)^2}}\sqrt{\sqrt{3}+2}\,(-x+1)\,F\left(\operatorname{asin}\left(\frac{-x-\sqrt{3}+1}{-x+1+\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{60\sqrt{\frac{-x+1}{\left(-x+1+\sqrt{3}\right)^2}}\sqrt{-x^3+1}}-\frac{7\sqrt{-x^3+1}}{20x^2}-\frac{\sqrt{-x^3+1}}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**6/(-x**3+1)**(1/2),x)
```

```
[Out] -7*3**(3/4)*sqrt((x**2 + x + 1)/(-x + 1 + sqrt(3))**2)*sqrt(sqrt(
3) + 2)*(-x + 1)*elliptic_f(asin((-x - sqrt(3) + 1)/(-x + 1 + sqr
t(3))), -7 - 4*sqrt(3))/(60*sqrt((-x + 1)/(-x + 1 + sqrt(3))**2)*
sqrt(-x**3 + 1)) - 7*sqrt(-x**3 + 1)/(20*x**2) - sqrt(-x**3 + 1)/
(5*x**5)
```

Mathematica [C] time = 0.0726323, size = 95, normalized size = 0.62

$$\frac{21x^6-9x^3+7i3^{3/4}\sqrt{(-1)^{5/6}(x-1)}\sqrt{x^2+x+1}x^5F\left(\sin^{-1}\left(\frac{\sqrt{-ix-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)-12}{60x^5\sqrt{1-x^3}}$$

Warning: Unable to verify antiderivative.

```
[In]   Integrate[1/(x^6*Sqrt[1 - x^3]),x]
```

```
[Out] (-12 - 9*x^3 + 21*x^6 + (7*I)*3^(3/4)*Sqrt[(-1)^(5/6)*(-1 + x)]*x
^5*Sqrt[1 + x + x^2]*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - I*x]/3^(
1/4)], (-1)^(1/3)])/(60*x^5*Sqrt[1 - x^3])
```

Maple [A] time = 0.035, size = 136, normalized size = 0.9

$$-\frac{1}{5x^5}\sqrt{-x^3+1}-\frac{7}{20x^2}\sqrt{-x^3+1}$$
$$-\frac{7i}{60}\sqrt{3}\sqrt{i\left(x+\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\sqrt{\frac{-1+x}{-\frac{3}{2}+\frac{i}{2}\sqrt{3}}}\sqrt{-i\left(x+\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)\sqrt{3}}EllipticF\left(\frac{\sqrt{3}}{3}\sqrt{i\left(x+\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}},\sqrt{\frac{i\sqrt{3}}{-\frac{3}{2}+\frac{i}{2}\sqrt{3}}}\right)\frac{1}{\sqrt{-\ldots}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^6/(-x^3+1)^(1/2),x)
```

```
[Out] -1/5*(-x^3+1)^(1/2)/x^5-7/20*(-x^3+1)^(1/2)/x^2-7/60*I*3^(1/2)*(I
*(x+1/2-1/2*I*3^(1/2))*3^(1/2))^(1/2)*((-1+x)/(-3/2+1/2*I*3^(1/2)
))^(1/2)*(-I*(x+1/2+1/2*I*3^(1/2))*3^(1/2))^(1/2)/(-x^3+1)^(1/2)*
EllipticF(1/3*3^(1/2)*(I*(x+1/2-1/2*I*3^(1/2))*3^(1/2))^(1/2),(I*
3^(1/2)/(-3/2+1/2*I*3^(1/2)))^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^3+1}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(-x^3 + 1)*x^6),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(-x^3 + 1)*x^6), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{\sqrt{-x^3+1}x^6}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(-x^3 + 1)*x^6),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(-x^3 + 1)*x^6), x)
```

Sympy [A] time = 2.89434, size = 37, normalized size = 0.24

$$\frac{\left(-\frac{5}{3}\right)\,{}_2F_1\left(\begin{matrix}-\frac{5}{3},\frac{1}{2}\\-\frac{2}{3}\end{matrix}\middle|x^3e^{2i\pi}\right)}{3x^5\left(-\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**6/(-x**3+1)**(1/2),x)
```

```
[Out] gamma(-5/3)*hyper((-5/3, 1/2), (-2/3,), x**3*exp_polar(2*I*pi))/(
3*x**5*gamma(-2/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^3 + 1}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 + 1)*x^6),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(-x^3 + 1)*x^6), x)
```

3.469 $\int \frac{x^7}{\sqrt{1-x^3}}\,dx$

Optimal. Leaf size=294

$$\frac{80\sqrt{1-x^3}}{91\left(-x+\sqrt{3}+1\right)}-\frac{2}{13}\sqrt{1-x^3}x^5-\frac{20}{91}\sqrt{1-x^3}x^2+\frac{80\sqrt{2}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x-\sqrt{3}+1}{-x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{91\sqrt[4]{3}\sqrt{\frac{1-x}{\left(-x+\sqrt{3}+1\right)^2}}\sqrt{1-x^3}}-\frac{40\sqrt[4]{3}\sqrt{2-\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x+\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{-x-\sqrt{3}+1}{-x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{91\sqrt{\frac{1-x}{\left(-x+\sqrt{3}+1\right)^2}}\sqrt{1-x^3}}$$

```
[Out] (80*Sqrt[1 - x^3])/(91*(1 + Sqrt[3] - x)) - (20*x^2*Sqrt[1 - x^3]
)/91 - (2*x^5*Sqrt[1 - x^3])/13 - (40*3^(1/4)*Sqrt[2 - Sqrt[3]]*(
1 - x)*Sqrt[(1 + x + x^2)/(1 + Sqrt[3] - x)^2]*EllipticE[ArcSin[(
1 - Sqrt[3] - x)/(1 + Sqrt[3] - x)], -7 - 4*Sqrt[3]])/(91*Sqrt[(1
 - x)/(1 + Sqrt[3] - x)^2]*Sqrt[1 - x^3]) + (80*Sqrt[2]*(1 - x)*S
qrt[(1 + x + x^2)/(1 + Sqrt[3] - x)^2]*EllipticF[ArcSin[(1 - Sqrt
[3] - x)/(1 + Sqrt[3] - x)], -7 - 4*Sqrt[3]])/(91*3^(1/4)*Sqrt[(1
 - x)/(1 + Sqrt[3] - x)^2]*Sqrt[1 - x^3])
```

Rubi [A] time = 0.214793, antiderivative size = 294, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{80\sqrt{1-x^3}}{91\left(-x+\sqrt{3}+1\right)}-\frac{2}{13}\sqrt{1-x^3}x^5-\frac{20}{91}\sqrt{1-x^3}x^2+\frac{80\sqrt{2}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x-\sqrt{3}+1}{-x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{91\sqrt[4]{3}\sqrt{\frac{1-x}{\left(-x+\sqrt{3}+1\right)^2}}\sqrt{1-x^3}}-\frac{40\sqrt[4]{3}\sqrt{2-\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x+\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{-x-\sqrt{3}+1}{-x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{91\sqrt{\frac{1-x}{\left(-x+\sqrt{3}+1\right)^2}}\sqrt{1-x^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7/Sqrt[1 - x^3],x]
```



```
[Out] (80*Sqrt[1 - x^3])/(91*(1 + Sqrt[3] - x)) - (20*x^2*Sqrt[1 - x^3]
)/91 - (2*x^5*Sqrt[1 - x^3])/13 - (40*3^(1/4)*Sqrt[2 - Sqrt[3]]*(
1 - x)*Sqrt[(1 + x + x^2)/(1 + Sqrt[3] - x)^2]*EllipticE[ArcSin[(
1 - Sqrt[3] - x)/(1 + Sqrt[3] - x)], -7 - 4*Sqrt[3]])/(91*Sqrt[(1
 - x)/(1 + Sqrt[3] - x)^2]*Sqrt[1 - x^3]) + (80*Sqrt[2]*(1 - x)*S
qrt[(1 + x + x^2)/(1 + Sqrt[3] - x)^2]*EllipticF[ArcSin[(1 - Sqrt
[3] - x)/(1 + Sqrt[3] - x)], -7 - 4*Sqrt[3]])/(91*3^(1/4)*Sqrt[(1
 - x)/(1 + Sqrt[3] - x)^2]*Sqrt[1 - x^3])
```

Rubi in Sympy [A] time = 17.0492, size = 240, normalized size = 0.82

$$-\frac{2x^5\sqrt{-x^3+1}}{13}-\frac{20x^2\sqrt{-x^3+1}}{91}+\frac{80\sqrt{-x^3+1}}{91\left(-x+1+\sqrt{3}\right)}-\frac{40\sqrt[4]{3}\sqrt{\frac{x^2+x+1}{\left(-x+1+\sqrt{3}\right)^2}}\sqrt{-\sqrt{3}+2}\,(-x+1)\,E\left(\operatorname{asin}\left(\frac{-x-\sqrt{3}+1}{-x+1+\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{91\sqrt{\frac{-x+1}{\left(-x+1+\sqrt{3}\right)^2}}\sqrt{-x^3+1}}+\frac{80\sqrt{2}\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2+x+1}{\left(-x+1+\sqrt{3}\right)^2}}\,(-x+1)\,F\left(\operatorname{asin}\left(\frac{-x-\sqrt{3}+1}{-x+1+\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{273\sqrt{\frac{-x+1}{\left(-x+1+\sqrt{3}\right)^2}}\sqrt{-x^3+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7/(-x**3+1)**(1/2),x)
```

```
[Out] -2*x**5*sqrt(-x**3 + 1)/13 - 20*x**2*sqrt(-x**3 + 1)/91 + 80*sqrt
(-x**3 + 1)/(91*(-x + 1 + sqrt(3))) - 40*3**(1/4)*sqrt((x**2 + x
+ 1)/(-x + 1 + sqrt(3))**2)*sqrt(-sqrt(3) + 2)*(-x + 1)*elliptic_
e(asin((-x - sqrt(3) + 1)/(-x + 1 + sqrt(3))), -7 - 4*sqrt(3))/(9
1*sqrt((-x + 1)/(-x + 1 + sqrt(3))**2)*sqrt(-x**3 + 1)) + 80*sqrt
(2)*3**(3/4)*sqrt((x**2 + x + 1)/(-x + 1 + sqrt(3))**2)*(-x + 1)*
elliptic_f(asin((-x - sqrt(3) + 1)/(-x + 1 + sqrt(3))), -7 - 4*sq
rt(3))/(273*sqrt((-x + 1)/(-x + 1 + sqrt(3))**2)*sqrt(-x**3 + 1))
```

Mathematica [C] time = 0.26666, size = 144, normalized size = 0.49

$$\frac{2\left(3\left(x^3-1\right)\left(7x^3+10\right)x^2+40\sqrt[6]{-1}3^{3/4}\sqrt{(-1)^{5/6}(x-1)}\sqrt{x^2+x+1}\left(\sqrt[3]{-1}F\left(\sin^{-1}\left(\frac{\sqrt{-ix-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)-i\sqrt{3}E\left(\sin^{-1}\left(\frac{\sqrt{}}{}\right.\right.\right.\right.}{273\sqrt{1-x^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^7/Sqrt[1 - x^3],x]
```

```
[Out] (2*(3*x^2*(-1 + x^3)*(10 + 7*x^3) + 40*(-1)^(1/6)*3^(3/4)*Sqrt[(-
1)^(5/6)*(-1 + x)]*Sqrt[1 + x + x^2]*((-I)*Sqrt[3]*EllipticE[ArcS
in[Sqrt[-(-1)^(5/6) - I*x]/3^(1/4)], (-1)^(1/3)] + (-1)^(1/3)*Ell
ipticF[ArcSin[Sqrt[-(-1)^(5/6) - I*x]/3^(1/4)], (-1)^(1/3)])))/(2
73*Sqrt[1 - x^3])
```

Maple [A] time = 0.031, size = 187, normalized size = 0.6

$$-\frac{2x^5}{13}\sqrt{-x^3+1}-\frac{20x^2}{91}\sqrt{-x^3+1}-\frac{80i}{273}\sqrt{3}\sqrt{i\left(x+\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\sqrt{\frac{-1+x}{-\frac{3}{2}+\frac{i}{2}\sqrt{3}}}\sqrt{-i\left(x+\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\left(\left(-\frac{3}{2}+\frac{i}{2}\sqrt{3}\right)\mathit{EllipticE}\left(\frac{\sqrt{3}}{3}\sqrt{i\left(x+\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}},\sqrt{}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7/(-x^3+1)^(1/2),x)
```

```
[Out] -2/13*x^5*(-x^3+1)^(1/2)-20/91*x^2*(-x^3+1)^(1/2)-80/273*I*3^(1/2
)*(I*(x+1/2-1/2*I*3^(1/2))*3^(1/2))^(1/2)*((-1+x)/(-3/2+1/2*I*3^(
1/2)))^(1/2)*(-I*(x+1/2+1/2*I*3^(1/2))*3^(1/2))^(1/2)/(-x^3+1)^(1
/2)*((-3/2+1/2*I*3^(1/2))*EllipticE(1/3*3^(1/2)*(I*(x+1/2-1/2*I*3
```

```
^(1/2))*3^(1/2))^(1/2),(I*3^(1/2)/(-3/2+1/2*I*3^(1/2)))^(1/2))+El
lipticF(1/3*3^(1/2)*(I*(x+1/2-1/2*I*3^(1/2))*3^(1/2))^(1/2),(I*3^
(1/2)/(-3/2+1/2*I*3^(1/2)))^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^7}{\sqrt{-x^3+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(-x^3 + 1),x, algorithm="maxima")
```

```
[Out] integrate(x^7/sqrt(-x^3 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^7}{\sqrt{-x^3+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(-x^3 + 1),x, algorithm="fricas")
```

```
[Out] integral(x^7/sqrt(-x^3 + 1), x)
```

Sympy [A] time = 2.53454, size = 31, normalized size = 0.11

$$\frac{x^8 \Gamma\left(\frac{8}{3}\right) {}_2F_1\left(\left.\begin{matrix}\frac{1}{2}, \frac{8}{3}\\ \frac{11}{3}\end{matrix}\right| x^3 e^{2i\pi}\right)}{3\Gamma\left(\frac{11}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(-x**3+1)**(1/2),x)
```

```
[Out] x**8*gamma(8/3)*hyper((1/2, 8/3), (11/3,), x**3*exp_polar(2*I*pi)
)/(3*gamma(11/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^7}{\sqrt{-x^3+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(-x^3 + 1),x, algorithm="giac")
```

```
[Out] integrate(x^7/sqrt(-x^3 + 1), x)
```

3.470 $\int \frac{x^4}{\sqrt{1-x^3}}\,dx$

Optimal. Leaf size=276

$$\frac{8\sqrt{1-x^3}}{7\left(-x+\sqrt{3}+1\right)}-\frac{2}{7}\sqrt{1-x^3}x^2+\frac{8\sqrt{2}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x-\sqrt{3}+1}{-x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{7\sqrt[4]{3}\sqrt{\frac{1-x}{\left(-x+\sqrt{3}+1\right)^2}}\sqrt{1-x^3}}-\frac{4\sqrt[4]{3}\sqrt{2-\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x+\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{-x-\sqrt{3}+1}{-x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{7\sqrt{\frac{1-x}{\left(-x+\sqrt{3}+1\right)^2}}\sqrt{1-x^3}}$$

```
[Out] (8*Sqrt[1 - x^3])/(7*(1 + Sqrt[3] - x)) - (2*x^2*Sqrt[1 - x^3])/7
 - (4*3^(1/4)*Sqrt[2 - Sqrt[3]]*(1 - x)*Sqrt[(1 + x + x^2)/(1 + S
qrt[3] - x)^2]*EllipticE[ArcSin[(1 - Sqrt[3] - x)/(1 + Sqrt[3] -
x)], -7 - 4*Sqrt[3]])/(7*Sqrt[(1 - x)/(1 + Sqrt[3] - x)^2]*Sqrt[1
 - x^3]) + (8*Sqrt[2]*(1 - x)*Sqrt[(1 + x + x^2)/(1 + Sqrt[3] - x
)^2]*EllipticF[ArcSin[(1 - Sqrt[3] - x)/(1 + Sqrt[3] - x)], -7 -
4*Sqrt[3]])/(7*3^(1/4)*Sqrt[(1 - x)/(1 + Sqrt[3] - x)^2]*Sqrt[1 -
 x^3])
```

Rubi [A] time = 0.174844, antiderivative size = 276, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$

$$\frac{8\sqrt{1-x^3}}{7\left(-x+\sqrt{3}+1\right)}-\frac{2}{7}\sqrt{1-x^3}x^2+\frac{8\sqrt{2}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x-\sqrt{3}+1}{-x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{7\sqrt[4]{3}\sqrt{\frac{1-x}{\left(-x+\sqrt{3}+1\right)^2}}\sqrt{1-x^3}}-\frac{4\sqrt[4]{3}\sqrt{2-\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x+\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{-x-\sqrt{3}+1}{-x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{7\sqrt{\frac{1-x}{\left(-x+\sqrt{3}+1\right)^2}}\sqrt{1-x^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/Sqrt[1 - x^3],x]
```

```
[Out] (8*Sqrt[1 - x^3])/(7*(1 + Sqrt[3] - x)) - (2*x^2*Sqrt[1 - x^3])/7
 - (4*3^(1/4)*Sqrt[2 - Sqrt[3]]*(1 - x)*Sqrt[(1 + x + x^2)/(1 + S
qrt[3] - x)^2]*EllipticE[ArcSin[(1 - Sqrt[3] - x)/(1 + Sqrt[3] -
x)], -7 - 4*Sqrt[3]])/(7*Sqrt[(1 - x)/(1 + Sqrt[3] - x)^2]*Sqrt[1
 - x^3]) + (8*Sqrt[2]*(1 - x)*Sqrt[(1 + x + x^2)/(1 + Sqrt[3] - x
)^2]*EllipticF[ArcSin[(1 - Sqrt[3] - x)/(1 + Sqrt[3] - x)], -7 -
4*Sqrt[3]])/(7*3^(1/4)*Sqrt[(1 - x)/(1 + Sqrt[3] - x)^2]*Sqrt[1 -
 x^3])
```

Rubi in Sympy [A] time = 14.0515, size = 224, normalized size = 0.81

$$-\frac{2x^2\sqrt{-x^3+1}}{7}+\frac{8\sqrt{-x^3+1}}{7\left(-x+1+\sqrt{3}\right)}-\frac{4\sqrt[4]{3}\sqrt{\frac{x^2+x+1}{\left(-x+1+\sqrt{3}\right)^2}}\sqrt{-\sqrt{3}+2}\,(-x+1)\,E\left(\operatorname{asin}\left(\frac{-x-\sqrt{3}+1}{-x+1+\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{7\sqrt{\frac{-x+1}{\left(-x+1+\sqrt{3}\right)^2}}\sqrt{-x^3+1}}+\frac{8\sqrt{2}\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2+x+1}{\left(-x+1+\sqrt{3}\right)^2}}\,(-x+1)\,F\left(\operatorname{asin}\left(\frac{-x-\sqrt{3}+1}{-x+1+\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{21\sqrt{\frac{-x+1}{\left(-x+1+\sqrt{3}\right)^2}}\sqrt{-x^3+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(-x**3+1)**(1/2),x)
```

```
[Out] -2*x**2*sqrt(-x**3 + 1)/7 + 8*sqrt(-x**3 + 1)/(7*(-x + 1 + sqrt(3
))) - 4*3**(1/4)*sqrt((x**2 + x + 1)/(-x + 1 + sqrt(3))**2)*sqrt(
-sqrt(3) + 2)*(-x + 1)*elliptic_e(asin((-x - sqrt(3) + 1)/(-x + 1
 + sqrt(3))), -7 - 4*sqrt(3))/(7*sqrt((-x + 1)/(-x + 1 + sqrt(3))
**2)*sqrt(-x**3 + 1)) + 8*sqrt(2)*3**(3/4)*sqrt((x**2 + x + 1)/(-
x + 1 + sqrt(3))**2)*(-x + 1)*elliptic_f(asin((-x - sqrt(3) + 1)/
(-x + 1 + sqrt(3))), -7 - 4*sqrt(3))/(21*sqrt((-x + 1)/(-x + 1 +
sqrt(3))**2)*sqrt(-x**3 + 1))
```

Mathematica [C] time = 0.296948, size = 137, normalized size = 0.5

$$\frac{2\left(3\left(x^3-1\right)x^2+4\sqrt[6]{-1}3^{3/4}\sqrt{(-1)^{5/6}(x-1)}\sqrt{x^2+x+1}\left(\sqrt[3]{-1}F\left(\sin^{-1}\left(\frac{\sqrt{-ix-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)-i\sqrt{3}E\left(\sin^{-1}\left(\frac{\sqrt{-ix-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\right.\right.\right.}{21\sqrt{1-x^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^4/Sqrt[1 - x^3],x]
```

```
[Out] (2*(3*x^2*(-1 + x^3) + 4*(-1)^(1/6)*3^(3/4)*Sqrt[(-1)^(5/6)*(-1 +
 x)]*Sqrt[1 + x + x^2]*((-I)*Sqrt[3]*EllipticE[ArcSin[Sqrt[-(-1)^
(5/6) - I*x]/3^(1/4)], (-1)^(1/3)] + (-1)^(1/3)*EllipticF[ArcSin[
Sqrt[-(-1)^(5/6) - I*x]/3^(1/4)], (-1)^(1/3)])))/(21*Sqrt[1 - x^3
])
```

Maple [A] time = 0.031, size = 173, normalized size = 0.6

$$-\frac{2x^2}{7}\sqrt{-x^3+1}$$
$$-\frac{8i}{21}\sqrt{3}\sqrt{i\left(x+\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\sqrt{\frac{-1+x}{-\frac{3}{2}+\frac{i}{2}\sqrt{3}}}\sqrt{-i\left(x+\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\left(\left(-\frac{3}{2}+\frac{i}{2}\sqrt{3}\right)EllipticE\left(\frac{\sqrt{3}}{3}\sqrt{i\left(x+\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}},\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(-x^3+1)^(1/2),x)
```

```
[Out] -2/7*x^2*(-x^3+1)^(1/2)-8/21*I*3^(1/2)*(I*(x+1/2-1/2*I*3^(1/2))*3
^(1/2))^(1/2)*((-1+x)/(-3/2+1/2*I*3^(1/2)))^(1/2)*(-I*(x+1/2+1/2*
I*3^(1/2))*3^(1/2))^(1/2)/(-x^3+1)^(1/2)*((-3/2+1/2*I*3^(1/2))*El
lipticE(1/3*3^(1/2)*(I*(x+1/2-1/2*I*3^(1/2))*3^(1/2))^(1/2),(I*3^
(1/2)/(-3/2+1/2*I*3^(1/2)))^(1/2))+EllipticF(1/3*3^(1/2)*(I*(x+1/
2-1/2*I*3^(1/2))*3^(1/2))^(1/2),(I*3^(1/2)/(-3/2+1/2*I*3^(1/2)))^
(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\sqrt{-x^3+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(-x^3 + 1),x, algorithm="maxima")
```

```
[Out] integrate(x^4/sqrt(-x^3 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^4}{\sqrt{-x^3+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(-x^3 + 1),x, algorithm="fricas")
```

```
[Out] integral(x^4/sqrt(-x^3 + 1), x)
```

Sympy [A] time = 2.05211, size = 31, normalized size = 0.11

$$\frac{x^5 \Gamma\left(\frac{5}{3}\right) {}_2F_1\left(\begin{matrix} \frac{1}{2}, \frac{5}{3} \\ \frac{8}{3} \end{matrix}\middle| x^3 e^{2i\pi}\right)}{3\Gamma\left(\frac{8}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(-x**3+1)**(1/2),x)
```

```
[Out] x**5*gamma(5/3)*hyper((1/2, 5/3), (8/3,), x**3*exp_polar(2*I*pi))
/(3*gamma(8/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\sqrt{-x^3+1}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(-x^3 + 1),x, algorithm="giac")
```

```
[Out] integrate(x^4/sqrt(-x^3 + 1), x)
```

3.471 $\int \frac{x}{\sqrt{1-x^3}}\,dx$

Optimal. Leaf size=252

$$\frac{2\sqrt{1-x^3}}{-x+\sqrt{3}+1}+\frac{2\sqrt{2}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x-\sqrt{3}+1}{-x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{\sqrt[4]{3}\sqrt{\frac{1-x}{\left(-x+\sqrt{3}+1\right)^2}}\sqrt{1-x^3}}-\frac{\sqrt[4]{3}\sqrt{2-\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x+\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{-x-\sqrt{3}+1}{-x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{\sqrt{\frac{1-x}{\left(-x+\sqrt{3}+1\right)^2}}\sqrt{1-x^3}}$$

```
[Out] (2*Sqrt[1 - x^3])/(1 + Sqrt[3] - x) - (3^(1/4)*Sqrt[2 - Sqrt[3]]*
(1 - x)*Sqrt[(1 + x + x^2)/(1 + Sqrt[3] - x)^2]*EllipticE[ArcSin[
(1 - Sqrt[3] - x)/(1 + Sqrt[3] - x)], -7 - 4*Sqrt[3]])/(Sqrt[(1 -
 x)/(1 + Sqrt[3] - x)^2]*Sqrt[1 - x^3]) + (2*Sqrt[2]*(1 - x)*Sqrt
[(1 + x + x^2)/(1 + Sqrt[3] - x)^2]*EllipticF[ArcSin[(1 - Sqrt[3]
 - x)/(1 + Sqrt[3] - x)], -7 - 4*Sqrt[3]])/(3^(1/4)*Sqrt[(1 - x)/
(1 + Sqrt[3] - x)^2]*Sqrt[1 - x^3])
```

Rubi [A] time = 0.127575, antiderivative size = 252, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{2\sqrt{1-x^3}}{-x+\sqrt{3}+1}+\frac{2\sqrt{2}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x-\sqrt{3}+1}{-x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{\sqrt[4]{3}\sqrt{\frac{1-x}{\left(-x+\sqrt{3}+1\right)^2}}\sqrt{1-x^3}}-\frac{\sqrt[4]{3}\sqrt{2-\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x+\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{-x-\sqrt{3}+1}{-x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{\sqrt{\frac{1-x}{\left(-x+\sqrt{3}+1\right)^2}}\sqrt{1-x^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/Sqrt[1 - x^3],x]
```

```
[Out] (2*Sqrt[1 - x^3])/(1 + Sqrt[3] - x) - (3^(1/4)*Sqrt[2 - Sqrt[3]]*
(1 - x)*Sqrt[(1 + x + x^2)/(1 + Sqrt[3] - x)^2]*EllipticE[ArcSin[
(1 - Sqrt[3] - x)/(1 + Sqrt[3] - x)], -7 - 4*Sqrt[3]])/(Sqrt[(1 -
 x)/(1 + Sqrt[3] - x)^2]*Sqrt[1 - x^3]) + (2*Sqrt[2]*(1 - x)*Sqrt
[(1 + x + x^2)/(1 + Sqrt[3] - x)^2]*EllipticF[ArcSin[(1 - Sqrt[3]
 - x)/(1 + Sqrt[3] - x)], -7 - 4*Sqrt[3]])/(3^(1/4)*Sqrt[(1 - x)/
(1 + Sqrt[3] - x)^2]*Sqrt[1 - x^3])
```

Rubi in Sympy [A] time = 11.3228, size = 202, normalized size = 0.8

$$\frac{2\sqrt{-x^3+1}}{-x+1+\sqrt{3}}-\frac{\sqrt[4]{3}\sqrt{\frac{x^2+x+1}{\left(-x+1+\sqrt{3}\right)^2}}\sqrt{-\sqrt{3}+2}\,(-x+1)\,E\left(\operatorname{asin}\left(\frac{-x-\sqrt{3}+1}{-x+1+\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{\sqrt{\frac{-x+1}{\left(-x+1+\sqrt{3}\right)^2}}\sqrt{-x^3+1}}+\frac{2\sqrt{2}\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2+x+1}{\left(-x+1+\sqrt{3}\right)^2}}\,(-x+1)\,F\left(\operatorname{asin}\left(\frac{-x-\sqrt{3}+1}{-x+1+\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{3\sqrt{\frac{-x+1}{\left(-x+1+\sqrt{3}\right)^2}}\sqrt{-x^3+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(-x**3+1)**(1/2),x)
```

```
[Out] 2*sqrt(-x**3 + 1)/(-x + 1 + sqrt(3)) - 3**(1/4)*sqrt((x**2 + x +
1)/(-x + 1 + sqrt(3))**2)*sqrt(-sqrt(3) + 2)*(-x + 1)*elliptic_e(
asin((-x - sqrt(3) + 1)/(-x + 1 + sqrt(3))), -7 - 4*sqrt(3))/(sqr
t((-x + 1)/(-x + 1 + sqrt(3))**2)*sqrt(-x**3 + 1)) + 2*sqrt(2)*3*
*(3/4)*sqrt((x**2 + x + 1)/(-x + 1 + sqrt(3))**2)*(-x + 1)*ellipt
ic_f(asin((-x - sqrt(3) + 1)/(-x + 1 + sqrt(3))), -7 - 4*sqrt(3))
/(3*sqrt((-x + 1)/(-x + 1 + sqrt(3))**2)*sqrt(-x**3 + 1))
```

Mathematica [C] time = 0.0678889, size = 122, normalized size = 0.48

$$\frac{2\sqrt[6]{-1}\sqrt{(-1)^{5/6}(x-1)}\sqrt{x^2+x+1}\left(\sqrt[3]{-1}F\left(\sin^{-1}\left(\frac{\sqrt{-ix-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)-i\sqrt{3}E\left(\sin^{-1}\left(\frac{\sqrt{-ix-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)\right)}{\sqrt[4]{3}\sqrt{1-x^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x/Sqrt[1 - x^3],x]
```

```
[Out] (2*(-1)^(1/6)*Sqrt[(-1)^(5/6)*(-1 + x)]*Sqrt[1 + x + x^2]*((-I)*S
qrt[3]*EllipticE[ArcSin[Sqrt[-(-1)^(5/6) - I*x]/3^(1/4)], (-1)^(1
/3)] + (-1)^(1/3)*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - I*x]/3^(1/4
)], (-1)^(1/3)]))/(3^(1/4)*Sqrt[1 - x^3])
```

Maple [A] time = 0.029, size = 158, normalized size = 0.6

$$-\frac{2i}{3}\sqrt{3}\sqrt{i\left(x+\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\sqrt{\frac{-1+x}{-\frac{3}{2}+\frac{i}{2}\sqrt{3}}}\sqrt{-i\left(x+\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\left(\left(-\frac{3}{2}+\frac{i}{2}\sqrt{3}\right)EllipticE\left(\frac{\sqrt{3}}{3}\sqrt{i\left(x+\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}},\sqrt{\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(-x^3+1)^(1/2),x)
```

```
[Out] -2/3*I*3^(1/2)*(I*(x+1/2-1/2*I*3^(1/2))*3^(1/2))^(1/2)*((-1+x)/(-
3/2+1/2*I*3^(1/2)))^(1/2)*(-I*(x+1/2+1/2*I*3^(1/2))*3^(1/2))^(1/2
)/(-x^3+1)^(1/2)*((-3/2+1/2*I*3^(1/2))*EllipticE(1/3*3^(1/2)*(I*(
x+1/2-1/2*I*3^(1/2))*3^(1/2))^(1/2),(I*3^(1/2)/(-3/2+1/2*I*3^(1/2
)))^(1/2))+EllipticF(1/3*3^(1/2)*(I*(x+1/2-1/2*I*3^(1/2))*3^(1/2)
)^(1/2),(I*3^(1/2)/(-3/2+1/2*I*3^(1/2)))^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt{-x^3+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(-x^3 + 1),x, algorithm="maxima")
```

```
[Out] integrate(x/sqrt(-x^3 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x}{\sqrt{-x^3+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(-x^3 + 1),x, algorithm="fricas")
```

```
[Out] integral(x/sqrt(-x^3 + 1), x)
```

Sympy [A] time = 1.86983, size = 31, normalized size = 0.12

$$\frac{x^2 \Gamma\left(\frac{2}{3}\right) {}_2F_1\left(\begin{matrix}\frac{1}{2}, \frac{2}{3}\\ \frac{5}{3}\end{matrix}\middle| x^3 e^{2i\pi}\right)}{3\Gamma\left(\frac{5}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(-x**3+1)**(1/2),x)
```

```
[Out] x**2*gamma(2/3)*hyper((1/2, 2/3), (5/3,), x**3*exp_polar(2*I*pi))
/(3*gamma(5/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt{-x^3 + 1}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(-x^3 + 1),x, algorithm="giac")
```

```
[Out] integrate(x/sqrt(-x^3 + 1), x)
```

3.472 $\int \frac{1}{x^2\sqrt{1-x^3}}\,dx$

Optimal. Leaf size=270

$$-\frac{\sqrt{1-x^3}}{-x+\sqrt{3}+1}-\frac{\sqrt{1-x^3}}{x}-\frac{\sqrt{2}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x-\sqrt{3}+1}{-x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{\sqrt[4]{3}\sqrt{\frac{1-x}{\left(-x+\sqrt{3}+1\right)^2}}\sqrt{1-x^3}}+\frac{\sqrt[4]{3}\sqrt{2-\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x+\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{-x-\sqrt{3}+1}{-x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{2\sqrt{\frac{1-x}{\left(-x+\sqrt{3}+1\right)^2}}\sqrt{1-x^3}}$$

```
[Out] -(Sqrt[1 - x^3]/(1 + Sqrt[3] - x)) - Sqrt[1 - x^3]/x + (3^(1/4)*S
qrt[2 - Sqrt[3]]*(1 - x)*Sqrt[(1 + x + x^2)/(1 + Sqrt[3] - x)^2]*
EllipticE[ArcSin[(1 - Sqrt[3] - x)/(1 + Sqrt[3] - x)], -7 - 4*Sqr
t[3]])/(2*Sqrt[(1 - x)/(1 + Sqrt[3] - x)^2]*Sqrt[1 - x^3]) - (Sqr
t[2]*(1 - x)*Sqrt[(1 + x + x^2)/(1 + Sqrt[3] - x)^2]*EllipticF[Ar
cSin[(1 - Sqrt[3] - x)/(1 + Sqrt[3] - x)], -7 - 4*Sqrt[3]])/(3^(1
/4)*Sqrt[(1 - x)/(1 + Sqrt[3] - x)^2]*Sqrt[1 - x^3])
```

Rubi [A] time = 0.177862, antiderivative size = 270, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$

$$-\frac{\sqrt{1-x^3}}{-x+\sqrt{3}+1}-\frac{\sqrt{1-x^3}}{x}-\frac{\sqrt{2}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x-\sqrt{3}+1}{-x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{\sqrt[4]{3}\sqrt{\frac{1-x}{\left(-x+\sqrt{3}+1\right)^2}}\sqrt{1-x^3}}+\frac{\sqrt[4]{3}\sqrt{2-\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x+\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{-x-\sqrt{3}+1}{-x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{2\sqrt{\frac{1-x}{\left(-x+\sqrt{3}+1\right)^2}}\sqrt{1-x^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*Sqrt[1 - x^3]),x]
```

```
[Out] -(Sqrt[1 - x^3]/(1 + Sqrt[3] - x)) - Sqrt[1 - x^3]/x + (3^(1/4)*S
qrt[2 - Sqrt[3]]*(1 - x)*Sqrt[(1 + x + x^2)/(1 + Sqrt[3] - x)^2]*
EllipticE[ArcSin[(1 - Sqrt[3] - x)/(1 + Sqrt[3] - x)], -7 - 4*Sqr
t[3]])/(2*Sqrt[(1 - x)/(1 + Sqrt[3] - x)^2]*Sqrt[1 - x^3]) - (Sqr
t[2]*(1 - x)*Sqrt[(1 + x + x^2)/(1 + Sqrt[3] - x)^2]*EllipticF[Ar
cSin[(1 - Sqrt[3] - x)/(1 + Sqrt[3] - x)], -7 - 4*Sqrt[3]])/(3^(1
/4)*Sqrt[(1 - x)/(1 + Sqrt[3] - x)^2]*Sqrt[1 - x^3])
```

Rubi in Sympy [A] time = 13.8493, size = 211, normalized size = 0.78

$$-\frac{\sqrt{-x^3+1}}{-x+1+\sqrt{3}}+\frac{\sqrt[4]{3}\sqrt{\frac{x^2+x+1}{\left(-x+1+\sqrt{3}\right)^2}}\sqrt{-\sqrt{3}+2}\,(-x+1)\,E\left(\operatorname{asin}\left(\frac{-x-\sqrt{3}+1}{-x+1+\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{2\sqrt{\frac{-x+1}{\left(-x+1+\sqrt{3}\right)^2}}\sqrt{-x^3+1}}-\frac{\sqrt{2}\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2+x+1}{\left(-x+1+\sqrt{3}\right)^2}}\,(-x+1)\,F\left(\operatorname{asin}\left(\frac{-x-\sqrt{3}+1}{-x+1+\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{3\sqrt{\frac{-x+1}{\left(-x+1+\sqrt{3}\right)^2}}\sqrt{-x^3+1}}-\frac{\sqrt{-x^3+1}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(-x**3+1)**(1/2),x)
```

```
[Out] -sqrt(-x**3 + 1)/(-x + 1 + sqrt(3)) + 3**(1/4)*sqrt((x**2 + x + 1
)/(-x + 1 + sqrt(3))**2)*sqrt(-sqrt(3) + 2)*(-x + 1)*elliptic_e(a
sin((-x - sqrt(3) + 1)/(-x + 1 + sqrt(3))), -7 - 4*sqrt(3))/(2*sq
rt((-x + 1)/(-x + 1 + sqrt(3))**2)*sqrt(-x**3 + 1)) - sqrt(2)*3**
(3/4)*sqrt((x**2 + x + 1)/(-x + 1 + sqrt(3))**2)*(-x + 1)*ellipti
c_f(asin((-x - sqrt(3) + 1)/(-x + 1 + sqrt(3))), -7 - 4*sqrt(3))/
(3*sqrt((-x + 1)/(-x + 1 + sqrt(3))**2)*sqrt(-x**3 + 1)) - sqrt(-
x**3 + 1)/x
```

Mathematica [C] time = 0.244517, size = 133, normalized size = 0.49

$$\frac{\frac{3(x^3-1)}{x} + (-1)^{2/3}3^{3/4}\sqrt{(-1)^{5/6}(x-1)}\sqrt{x^2+x+1}\left((-1)^{5/6}F\left(\sin^{-1}\left(\frac{\sqrt{-ix-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right) + \sqrt{3}E\left(\sin^{-1}\left(\frac{\sqrt{-ix-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)\right)}{3\sqrt{1-x^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/(x^2*Sqrt[1 - x^3]),x]
```

```
[Out] ((3*(-1 + x^3))/x + (-1)^(2/3)*3^(3/4)*Sqrt[(-1)^(5/6)*(-1 + x)]*
Sqrt[1 + x + x^2]*(Sqrt[3]*EllipticE[ArcSin[Sqrt[-(-1)^(5/6) - I*
x]/3^(1/4)], (-1)^(1/3)] + (-1)^(5/6)*EllipticF[ArcSin[Sqrt[-(-1)
^(5/6) - I*x]/3^(1/4)], (-1)^(1/3)]))/(3*Sqrt[1 - x^3])
```

Maple [A] time = 0.033, size = 173, normalized size = 0.6

$$-\frac{1}{x}\sqrt{-x^3+1}$$
$$+\frac{i}{3}\sqrt{3}\sqrt{i\left(x+\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\sqrt{\frac{-1+x}{-\frac{3}{2}+\frac{i}{2}\sqrt{3}}}\sqrt{-i\left(x+\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\left(\left(-\frac{3}{2}+\frac{i}{2}\sqrt{3}\right)\mathit{EllipticE}\left(\frac{\sqrt{3}}{3}\sqrt{i\left(x+\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}},\sqrt{-\ldots}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(-x^3+1)^(1/2),x)
```

```
[Out] -(-x^3+1)^(1/2)/x+1/3*I*3^(1/2)*(I*(x+1/2-1/2*I*3^(1/2))*3^(1/2))
^(1/2)*((-1+x)/(-3/2+1/2*I*3^(1/2)))^(1/2)*(-I*(x+1/2+1/2*I*3^(1/
2))*3^(1/2))^(1/2)/(-x^3+1)^(1/2)*((-3/2+1/2*I*3^(1/2))*EllipticE
(1/3*3^(1/2)*(I*(x+1/2-1/2*I*3^(1/2))*3^(1/2))^(1/2),(I*3^(1/2)/(
-3/2+1/2*I*3^(1/2)))^(1/2))+EllipticF(1/3*3^(1/2)*(I*(x+1/2-1/2*I
*3^(1/2))*3^(1/2))^(1/2),(I*3^(1/2)/(-3/2+1/2*I*3^(1/2)))^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^3+1}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 + 1)*x^2),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(-x^3 + 1)*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{-x^3+1}x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 + 1)*x^2),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(-x^3 + 1)*x^2), x)
```

Sympy [A] time = 2.14919, size = 32, normalized size = 0.12

$$\frac{\left(-\frac{1}{3}\right)\,{}_2F_1\left(\begin{matrix}-\frac{1}{3},\frac{1}{2}\\\frac{2}{3}\end{matrix}\middle|x^3e^{2i\pi}\right)}{3x\left(\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(-x**3+1)**(1/2),x)
```

```
[Out] gamma(-1/3)*hyper((-1/3, 1/2), (2/3,), x**3*exp_polar(2*I*pi))/(3
*x*gamma(2/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\sqrt{-x^3+1}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 + 1)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(-x^3 + 1)*x^2), x)
```

3.473 $\int \frac{1}{x^5\sqrt{1-x^3}}\,dx$

Optimal. Leaf size=294

$$-\frac{5\sqrt{1-x^3}}{8\left(-x+\sqrt{3}+1\right)}-\frac{5\sqrt{1-x^3}}{8x}-\frac{\sqrt{1-x^3}}{4x^4}-\frac{5(1-x)\sqrt{\frac{x^2+x+1}{\left(-x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x-\sqrt{3}+1}{-x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{4\sqrt{2}\sqrt[4]{3}\sqrt{\frac{1-x}{\left(-x+\sqrt{3}+1\right)^2}}\sqrt{1-x^3}}+\frac{5\sqrt[4]{3}\sqrt{2-\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x+\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{-x-\sqrt{3}+1}{-x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{16\sqrt{\frac{1-x}{\left(-x+\sqrt{3}+1\right)^2}}\sqrt{1-x^3}}$$

```
[Out] (-5*Sqrt[1 - x^3])/(8*(1 + Sqrt[3] - x)) - Sqrt[1 - x^3]/(4*x^4)
- (5*Sqrt[1 - x^3])/(8*x) + (5*3^(1/4)*Sqrt[2 - Sqrt[3]]*(1 - x)*
Sqrt[(1 + x + x^2)/(1 + Sqrt[3] - x)^2]*EllipticE[ArcSin[(1 - Sqr
t[3] - x)/(1 + Sqrt[3] - x)], -7 - 4*Sqrt[3]])/(16*Sqrt[(1 - x)/(
1 + Sqrt[3] - x)^2]*Sqrt[1 - x^3]) - (5*(1 - x)*Sqrt[(1 + x + x^2
)/(1 + Sqrt[3] - x)^2]*EllipticF[ArcSin[(1 - Sqrt[3] - x)/(1 + Sq
rt[3] - x)], -7 - 4*Sqrt[3]])/(4*Sqrt[2]*3^(1/4)*Sqrt[(1 - x)/(1
+ Sqrt[3] - x)^2]*Sqrt[1 - x^3])
```

Rubi [A] time = 0.217124, antiderivative size = 294, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{5\sqrt{1-x^3}}{8\left(-x+\sqrt{3}+1\right)}-\frac{5\sqrt{1-x^3}}{8x}-\frac{\sqrt{1-x^3}}{4x^4}-\frac{5(1-x)\sqrt{\frac{x^2+x+1}{\left(-x+\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x-\sqrt{3}+1}{-x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{4\sqrt{2}\sqrt[4]{3}\sqrt{\frac{1-x}{\left(-x+\sqrt{3}+1\right)^2}}\sqrt{1-x^3}}+\frac{5\sqrt[4]{3}\sqrt{2-\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x+\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{-x-\sqrt{3}+1}{-x+\sqrt{3}+1}\right)|-7-4\sqrt{3}\right)}{16\sqrt{\frac{1-x}{\left(-x+\sqrt{3}+1\right)^2}}\sqrt{1-x^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^5*Sqrt[1 - x^3]),x]
```


```
[Out] (-5*Sqrt[1 - x^3])/(8*(1 + Sqrt[3] - x)) - Sqrt[1 - x^3]/(4*x^4)
- (5*Sqrt[1 - x^3])/(8*x) + (5*3^(1/4)*Sqrt[2 - Sqrt[3]]*(1 - x)*
Sqrt[(1 + x + x^2)/(1 + Sqrt[3] - x)^2]*EllipticE[ArcSin[(1 - Sqr
t[3] - x)/(1 + Sqrt[3] - x)], -7 - 4*Sqrt[3]])/(16*Sqrt[(1 - x)/(
1 + Sqrt[3] - x)^2]*Sqrt[1 - x^3]) - (5*(1 - x)*Sqrt[(1 + x + x^2
)/(1 + Sqrt[3] - x)^2]*EllipticF[ArcSin[(1 - Sqrt[3] - x)/(1 + Sq
rt[3] - x)], -7 - 4*Sqrt[3]])/(4*Sqrt[2]*3^(1/4)*Sqrt[(1 - x)/(1
+ Sqrt[3] - x)^2]*Sqrt[1 - x^3])
```

Rubi in Sympy [A] time = 16.4198, size = 236, normalized size = 0.8

$$-\frac{5\sqrt{-x^3+1}}{8\left(-x+1+\sqrt{3}\right)}+\frac{5\sqrt[4]{3}\sqrt{\frac{x^2+x+1}{\left(-x+1+\sqrt{3}\right)^2}}\sqrt{-\sqrt{3}+2}\,(-x+1)\,E\left(\operatorname{asin}\left(\frac{-x-\sqrt{3}+1}{-x+1+\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{16\sqrt{\frac{-x+1}{\left(-x+1+\sqrt{3}\right)^2}}\sqrt{-x^3+1}}-\frac{5\sqrt{2}\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2+x+1}{\left(-x+1+\sqrt{3}\right)^2}}\,(-x+1)\,F\left(\operatorname{asin}\left(\frac{-x-\sqrt{3}+1}{-x+1+\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{24\sqrt{\frac{-x+1}{\left(-x+1+\sqrt{3}\right)^2}}\sqrt{-x^3+1}}-\frac{5\sqrt{-x^3+1}}{8x}-\frac{\sqrt{-x^3+1}}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**5/(-x**3+1)**(1/2),x)
```

```
[Out] -5*sqrt(-x**3 + 1)/(8*(-x + 1 + sqrt(3))) + 5*3**(1/4)*sqrt((x**2
 + x + 1)/(-x + 1 + sqrt(3))**2)*sqrt(-sqrt(3) + 2)*(-x + 1)*elli
ptic_e(asin((-x - sqrt(3) + 1)/(-x + 1 + sqrt(3))), -7 - 4*sqrt(3
))/(16*sqrt((-x + 1)/(-x + 1 + sqrt(3))**2)*sqrt(-x**3 + 1)) - 5*
sqrt(2)*3**(3/4)*sqrt((x**2 + x + 1)/(-x + 1 + sqrt(3))**2)*(-x +
 1)*elliptic_f(asin((-x - sqrt(3) + 1)/(-x + 1 + sqrt(3))), -7 -
4*sqrt(3))/(24*sqrt((-x + 1)/(-x + 1 + sqrt(3))**2)*sqrt(-x**3 +
1)) - 5*sqrt(-x**3 + 1)/(8*x) - sqrt(-x**3 + 1)/(4*x**4)
```

Mathematica [C] time = 0.257495, size = 145, normalized size = 0.49

$$\frac{3\left(x^3-1\right)\left(5x^3+2\right)+\frac{5\ 3^{3/4}(x-1)\sqrt{x^2+x+1}x^4\left(\sqrt[3]{-1}F\left(\sin^{-1}\left(\frac{\sqrt{-ix-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)-i\sqrt{3}E\left(\sin^{-1}\left(\frac{\sqrt{-ix-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)\right)}{\sqrt{(-1)^{5/6}(x-1)}}}{24x^4\sqrt{1-x^3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/(x^5*Sqrt[1 - x^3]),x]
```

```
[Out] (3*(-1 + x^3)*(2 + 5*x^3) + (5*3^(3/4)*(-1 + x)*x^4*Sqrt[1 + x +
x^2]*((-I)*Sqrt[3]*EllipticE[ArcSin[Sqrt[-(-1)^(5/6) - I*x]/3^(1/
4)], (-1)^(1/3)] + (-1)^(1/3)*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) -
 I*x]/3^(1/4)], (-1)^(1/3)]))/Sqrt[(-1)^(5/6)*(-1 + x)])/(24*x^4*
Sqrt[1 - x^3])
```

Maple [A] time = 0.035, size = 187, normalized size = 0.6

$$-\frac{1}{4x^4}\sqrt{-x^3+1}-\frac{5}{8x}\sqrt{-x^3+1}$$
$$+\frac{5i}{24}\sqrt{3}\sqrt{i\left(x+\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\sqrt{\frac{-1+x}{-\frac{3}{2}+\frac{i}{2}\sqrt{3}}}\sqrt{-i\left(x+\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\left(\left(-\frac{3}{2}+\frac{i}{2}\sqrt{3}\right)EllipticE\left(\frac{\sqrt{3}}{3}\sqrt{i\left(x+\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}},\sqrt{\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^5/(-x^3+1)^(1/2),x)
```

```
[Out] -1/4*(-x^3+1)^(1/2)/x^4-5/8*(-x^3+1)^(1/2)/x+5/24*I*3^(1/2)*(I*(x
+1/2-1/2*I*3^(1/2))*3^(1/2))^(1/2)*((-1+x)/(-3/2+1/2*I*3^(1/2)))^
(1/2)*(-I*(x+1/2+1/2*I*3^(1/2))*3^(1/2))^(1/2)/(-x^3+1)^(1/2)*((-
3/2+1/2*I*3^(1/2))*EllipticE(1/3*3^(1/2)*(I*(x+1/2-1/2*I*3^(1/2))
*3^(1/2))^(1/2),(I*3^(1/2)/(-3/2+1/2*I*3^(1/2)))^(1/2))+EllipticF
(1/3*3^(1/2)*(I*(x+1/2-1/2*I*3^(1/2))*3^(1/2))^(1/2),(I*3^(1/2)/(
-3/2+1/2*I*3^(1/2)))^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^3+1}x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 + 1)*x^5),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(-x^3 + 1)*x^5), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{-x^3+1}x^5}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 + 1)*x^5),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(-x^3 + 1)*x^5), x)
```

Sympy [A] time = 2.6333, size = 37, normalized size = 0.13

$$\frac{\Gamma\left(-\frac{4}{3}\right) {}_2F_1\left(\begin{matrix} -\frac{4}{3}, \frac{1}{2} \\ -\frac{1}{3} \end{matrix}\middle| x^3 e^{2i\pi}\right)}{3x^4 \Gamma\left(-\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**5/(-x**3+1)**(1/2),x)
```

```
[Out] gamma(-4/3)*hyper((-4/3, 1/2), (-1/3,), x**3*exp_polar(2*I*pi))/(
3*x**4*gamma(-1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^3+1}x^5}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 + 1)*x^5),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(-x^3 + 1)*x^5), x)
```

3.474 $\int \frac{x^{11}}{\sqrt{-1+x^3}}\,dx$

Optimal. Leaf size=53

$$\frac{2}{21}\left(x^3-1\right)^{7/2}+\frac{2}{5}\left(x^3-1\right)^{5/2}+\frac{2}{3}\left(x^3-1\right)^{3/2}+\frac{2\sqrt{x^3-1}}{3}$$

```
[Out] (2*Sqrt[-1 + x^3])/3 + (2*(-1 + x^3)^(3/2))/3 + (2*(-1 + x^3)^(5/
2))/5 + (2*(-1 + x^3)^(7/2))/21
```

Rubi [A] time = 0.0489584, antiderivative size = 53, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{2}{21}\left(x^3-1\right)^{7/2}+\frac{2}{5}\left(x^3-1\right)^{5/2}+\frac{2}{3}\left(x^3-1\right)^{3/2}+\frac{2\sqrt{x^3-1}}{3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11/Sqrt[-1 + x^3],x]
```

```
[Out] (2*Sqrt[-1 + x^3])/3 + (2*(-1 + x^3)^(3/2))/3 + (2*(-1 + x^3)^(5/
2))/5 + (2*(-1 + x^3)^(7/2))/21
```

Rubi in Sympy [A] time = 4.77472, size = 46, normalized size = 0.87

$$\frac{2\left(x^3-1\right)^{\frac{7}{2}}}{21}+\frac{2\left(x^3-1\right)^{\frac{5}{2}}}{5}+\frac{2\left(x^3-1\right)^{\frac{3}{2}}}{3}+\frac{2\sqrt{x^3-1}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11/(x**3-1)**(1/2),x)
```

```
[Out] 2*(x**3 - 1)**(7/2)/21 + 2*(x**3 - 1)**(5/2)/5 + 2*(x**3 - 1)**(3
/2)/3 + 2*sqrt(x**3 - 1)/3
```

Mathematica [A] time = 0.014509, size = 30, normalized size = 0.57

$$\frac{2}{105}\sqrt{x^3-1}\left(5x^9+6x^6+8x^3+16\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11/Sqrt[-1 + x^3],x]
```

```
[Out] (2*Sqrt[-1 + x^3]*(16 + 8*x^3 + 6*x^6 + 5*x^9))/105
```

Maple [A] time = 0.007, size = 36, normalized size = 0.7

$$\frac{(-2+2x)\left(x^2+x+1\right)\left(5x^9+6x^6+8x^3+16\right)}{105}\frac{1}{\sqrt{x^3-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11/(x^3-1)^(1/2),x)
```

```
[Out] 2/105*(-1+x)*(x^2+x+1)*(5*x^9+6*x^6+8*x^3+16)/(x^3-1)^(1/2)
```

Maxima [A] time = 1.44141, size = 50, normalized size = 0.94

$$\frac{2}{21}\left(x^{3}-1\right)^{\frac{7}{2}}+\frac{2}{5}\left(x^{3}-1\right)^{\frac{5}{2}}+\frac{2}{3}\left(x^{3}-1\right)^{\frac{3}{2}}+\frac{2}{3}\sqrt{x^{3}-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/sqrt(x^3 - 1),x, algorithm="maxima")
```

```
[Out] 2/21*(x^3 - 1)^(7/2) + 2/5*(x^3 - 1)^(5/2) + 2/3*(x^3 - 1)^(3/2)
+ 2/3*sqrt(x^3 - 1)
```

Fricas [A] time = 0.230948, size = 35, normalized size = 0.66

$$\frac{2}{105}\left(5\,x^{9}+6\,x^{6}+8\,x^{3}+16\right)\sqrt{x^{3}-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/sqrt(x^3 - 1),x, algorithm="fricas")
```

```
[Out] 2/105*(5*x^9 + 6*x^6 + 8*x^3 + 16)*sqrt(x^3 - 1)
```

Sympy [A] time = 4.54106, size = 56, normalized size = 1.06

$$\frac{2x^{9}\sqrt{x^{3}-1}}{21}+\frac{4x^{6}\sqrt{x^{3}-1}}{35}+\frac{16x^{3}\sqrt{x^{3}-1}}{105}+\frac{32\sqrt{x^{3}-1}}{105}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11/(x**3-1)**(1/2),x)
```

```
[Out] 2*x**9*sqrt(x**3 - 1)/21 + 4*x**6*sqrt(x**3 - 1)/35 + 16*x**3*sqr
t(x**3 - 1)/105 + 32*sqrt(x**3 - 1)/105
```

GIAC/XCAS [A] time = 0.221385, size = 50, normalized size = 0.94

$$\frac{2}{21}\left(x^{3}-1\right)^{\frac{7}{2}}+\frac{2}{5}\left(x^{3}-1\right)^{\frac{5}{2}}+\frac{2}{3}\left(x^{3}-1\right)^{\frac{3}{2}}+\frac{2}{3}\sqrt{x^{3}-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/sqrt(x^3 - 1),x, algorithm="giac")
```

```
[Out] 2/21*(x^3 - 1)^(7/2) + 2/5*(x^3 - 1)^(5/2) + 2/3*(x^3 - 1)^(3/2)
+ 2/3*sqrt(x^3 - 1)
```

3.475 $\int \frac{x^8}{\sqrt{-1+x^3}}\,dx$

Optimal. Leaf size=40

$$\frac{2}{15}\left(x^3-1\right)^{5/2}+\frac{4}{9}\left(x^3-1\right)^{3/2}+\frac{2\sqrt{x^3-1}}{3}$$

```
[Out] (2*Sqrt[-1 + x^3])/3 + (4*(-1 + x^3)^(3/2))/9 + (2*(-1 + x^3)^(5/
2))/15
```

Rubi [A] time = 0.0413709, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{2}{15}\left(x^3-1\right)^{5/2}+\frac{4}{9}\left(x^3-1\right)^{3/2}+\frac{2\sqrt{x^3-1}}{3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8/Sqrt[-1 + x^3],x]
```

```
[Out] (2*Sqrt[-1 + x^3])/3 + (4*(-1 + x^3)^(3/2))/9 + (2*(-1 + x^3)^(5/
2))/15
```

Rubi in Sympy [A] time = 4.19718, size = 34, normalized size = 0.85

$$\frac{2\left(x^3-1\right)^{\frac{5}{2}}}{15}+\frac{4\left(x^3-1\right)^{\frac{3}{2}}}{9}+\frac{2\sqrt{x^3-1}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8/(x**3-1)**(1/2),x)
```

```
[Out] 2*(x**3 - 1)**(5/2)/15 + 4*(x**3 - 1)**(3/2)/9 + 2*sqrt(x**3 - 1)
/3
```

Mathematica [A] time = 0.0134002, size = 25, normalized size = 0.62

$$\frac{2}{45}\sqrt{x^3-1}\left(3x^6+4x^3+8\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8/Sqrt[-1 + x^3],x]
```

```
[Out] (2*Sqrt[-1 + x^3]*(8 + 4*x^3 + 3*x^6))/45
```

Maple [A] time = 0.006, size = 31, normalized size = 0.8

$$\frac{(-2+2x)\left(x^2+x+1\right)\left(3x^6+4x^3+8\right)}{45}\frac{1}{\sqrt{x^3-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8/(x^3-1)^(1/2),x)
```

```
[Out] 2/45*(-1+x)*(x^2+x+1)*(3*x^6+4*x^3+8)/(x^3-1)^(1/2)
```

Maxima [A] time = 1.43903, size = 38, normalized size = 0.95

$$\frac{2}{15}\left(x^3-1\right)^{\frac{5}{2}}+\frac{4}{9}\left(x^3-1\right)^{\frac{3}{2}}+\frac{2}{3}\sqrt{x^3-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/sqrt(x^3 - 1),x, algorithm="maxima")
```

```
[Out] 2/15*(x^3 - 1)^(5/2) + 4/9*(x^3 - 1)^(3/2) + 2/3*sqrt(x^3 - 1)
```

Fricas [A] time = 0.228316, size = 28, normalized size = 0.7

$$\frac{2}{45}\left(3x^6+4x^3+8\right)\sqrt{x^3-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/sqrt(x^3 - 1),x, algorithm="fricas")
```

```
[Out] 2/45*(3*x^6 + 4*x^3 + 8)*sqrt(x^3 - 1)
```

Sympy [A] time = 1.88879, size = 41, normalized size = 1.02

$$\frac{2x^6\sqrt{x^3-1}}{15}+\frac{8x^3\sqrt{x^3-1}}{45}+\frac{16\sqrt{x^3-1}}{45}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8/(x**3-1)**(1/2),x)
```

```
[Out] 2*x**6*sqrt(x**3 - 1)/15 + 8*x**3*sqrt(x**3 - 1)/45 + 16*sqrt(x**
3 - 1)/45
```

GIAC/XCAS [A] time = 0.212981, size = 38, normalized size = 0.95

$$\frac{2}{15}\left(x^3-1\right)^{\frac{5}{2}}+\frac{4}{9}\left(x^3-1\right)^{\frac{3}{2}}+\frac{2}{3}\sqrt{x^3-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/sqrt(x^3 - 1),x, algorithm="giac")
```

```
[Out] 2/15*(x^3 - 1)^(5/2) + 4/9*(x^3 - 1)^(3/2) + 2/3*sqrt(x^3 - 1)
```

3.476 $\int \frac{x^5}{\sqrt{-1+x^3}}\,dx$

Optimal. Leaf size=27

$$\frac{2}{9}\left(x^3-1\right)^{3/2}+\frac{2\sqrt{x^3-1}}{3}$$

```
[Out] (2*Sqrt[-1 + x^3])/3 + (2*(-1 + x^3)^(3/2))/9
```

Rubi [A] time = 0.0314489, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{2}{9}\left(x^3-1\right)^{3/2}+\frac{2\sqrt{x^3-1}}{3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/Sqrt[-1 + x^3],x]

[Out] (2*Sqrt[-1 + x^3])/3 + (2*(-1 + x^3)^(3/2))/9
```

Rubi in Sympy [A] time = 3.30721, size = 22, normalized size = 0.81

$$\frac{2\left(x^3-1\right)^{\frac{3}{2}}}{9}+\frac{2\sqrt{x^3-1}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(x**3-1)**(1/2),x)

[Out] 2*(x**3 - 1)**(3/2)/9 + 2*sqrt(x**3 - 1)/3
```

Mathematica [A] time = 0.00748952, size = 18, normalized size = 0.67

$$\frac{2}{9}\sqrt{x^3-1}\left(x^3+2\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/Sqrt[-1 + x^3],x]

[Out] (2*Sqrt[-1 + x^3]*(2 + x^3))/9
```

Maple [A] time = 0.007, size = 24, normalized size = 0.9

$$\frac{(-2+2x)\left(x^2+x+1\right)\left(x^3+2\right)}{9}\frac{1}{\sqrt{x^3-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(x^3-1)^(1/2),x)

[Out] 2/9*(-1+x)*(x^2+x+1)*(x^3+2)/(x^3-1)^(1/2)
```

Maxima [A] time = 1.43466, size = 26, normalized size = 0.96

$$\frac{2}{9}\left(x^3-1\right)^{\frac{3}{2}}+\frac{2}{3}\sqrt{x^3-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(x^3 - 1),x, algorithm="maxima")
```

```
[Out] 2/9*(x^3 - 1)^(3/2) + 2/3*sqrt(x^3 - 1)
```

Fricas [A] time = 0.22923, size = 19, normalized size = 0.7

$$\frac{2}{9}\left(x^3+2\right)\sqrt{x^3-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(x^3 - 1),x, algorithm="fricas")
```

```
[Out] 2/9*(x^3 + 2)*sqrt(x^3 - 1)
```

Sympy [A] time = 0.779196, size = 26, normalized size = 0.96

$$\frac{2x^3\sqrt{x^3-1}}{9}+\frac{4\sqrt{x^3-1}}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(x**3-1)**(1/2),x)
```

```
[Out] 2*x**3*sqrt(x**3 - 1)/9 + 4*sqrt(x**3 - 1)/9
```

GIAC/XCAS [A] time = 0.216749, size = 26, normalized size = 0.96

$$\frac{2}{9}\left(x^3-1\right)^{\frac{3}{2}}+\frac{2}{3}\sqrt{x^3-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(x^3 - 1),x, algorithm="giac")
```

```
[Out] 2/9*(x^3 - 1)^(3/2) + 2/3*sqrt(x^3 - 1)
```

3.477 $\int \frac{x^2}{\sqrt{-1+x^3}}\,dx$

Optimal. Leaf size=13

$$\frac{2\sqrt{x^3-1}}{3}$$

```
[Out] (2*Sqrt[-1 + x^3])/3
```

Rubi [A] time = 0.00691803, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$\frac{2\sqrt{x^3-1}}{3}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/Sqrt[-1 + x^3],x]

[Out] (2*Sqrt[-1 + x^3])/3
```

Rubi in Sympy [A] time = 1.65482, size = 10, normalized size = 0.77

$$\frac{2\sqrt{x^3-1}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**2/(x**3-1)**(1/2),x)

[Out] 2*sqrt(x**3 - 1)/3
```

Mathematica [A] time = 0.00507269, size = 13, normalized size = 1.

$$\frac{2\sqrt{x^3-1}}{3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/Sqrt[-1 + x^3],x]

[Out] (2*Sqrt[-1 + x^3])/3
```

Maple [A] time = 0.006, size = 19, normalized size = 1.5

$$\frac{(-2+2x)\left(x^2+x+1\right)}{3}\frac{1}{\sqrt{x^3-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(x^3-1)^(1/2),x)

[Out] 2/3*(-1+x)*(x^2+x+1)/(x^3-1)^(1/2)
```

Maxima [A] time = 1.4261, size = 12, normalized size = 0.92

$$\frac{2}{3}\sqrt{x^3-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(x^3 - 1),x, algorithm="maxima")
```

```
[Out] 2/3*sqrt(x^3 - 1)
```

Fricas [A] time = 0.224821, size = 12, normalized size = 0.92

$$\frac{2}{3}\sqrt{x^3-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(x^3 - 1),x, algorithm="fricas")
```

```
[Out] 2/3*sqrt(x^3 - 1)
```

Sympy [A] time = 0.343646, size = 10, normalized size = 0.77

$$\frac{2\sqrt{x^3-1}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(x**3-1)**(1/2),x)
```

```
[Out] 2*sqrt(x**3 - 1)/3
```

GIAC/XCAS [A] time = 0.218604, size = 12, normalized size = 0.92

$$\frac{2}{3}\sqrt{x^3-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(x^3 - 1),x, algorithm="giac")
```

```
[Out] 2/3*sqrt(x^3 - 1)
```

3.478 $\int \frac{1}{x\sqrt{-1+x^3}}\,dx$

Optimal. Leaf size=14

$$\frac{2}{3}\tan^{-1}\left(\sqrt{x^3-1}\right)$$

```
[Out] (2*ArcTan[Sqrt[-1 + x^3]])/3
```

Rubi [A] time = 0.0239718, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{2}{3}\tan^{-1}\left(\sqrt{x^3-1}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*Sqrt[-1 + x^3]),x]

[Out] (2*ArcTan[Sqrt[-1 + x^3]])/3
```

Rubi in Sympy [A] time = 3.26201, size = 12, normalized size = 0.86

$$\frac{2\,\mathrm{atan}\left(\sqrt{x^3-1}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(x**3-1)**(1/2),x)

[Out] 2*atan(sqrt(x**3 - 1))/3
```

Mathematica [B] time = 0.0230429, size = 36, normalized size = 2.57

$$\frac{2\sqrt{x^3-1}\tanh^{-1}\left(\sqrt{1-x^3}\right)}{3\sqrt{1-x^3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*Sqrt[-1 + x^3]),x]

[Out] (2*Sqrt[-1 + x^3]*ArcTanh[Sqrt[1 - x^3]])/(3*Sqrt[1 - x^3])
```

Maple [A] time = 0.029, size = 11, normalized size = 0.8

$$\frac{2}{3}\arctan\left(\sqrt{x^3-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(x^3-1)^(1/2),x)

[Out] 2/3*arctan((x^3-1)^(1/2))
```

Maxima [A] time = 1.59016, size = 14, normalized size = 1.

$$\frac{2}{3} \arctan\left(\sqrt{x^3 - 1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 - 1)*x),x, algorithm="maxima")
```

```
[Out] 2/3*arctan(sqrt(x^3 - 1))
```

Fricas [A] time = 0.230918, size = 14, normalized size = 1.

$$\frac{2}{3} \arctan\left(\sqrt{x^3 - 1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 - 1)*x),x, algorithm="fricas")
```

```
[Out] 2/3*arctan(sqrt(x^3 - 1))
```

Sympy [A] time = 3.45547, size = 31, normalized size = 2.21

$$\begin{cases} \frac{2 i \operatorname{acosh}\left(\frac{1}{x^{\frac{3}{2}}}\right)}{3} & \text{for}\ \left|\frac{1}{x^3}\right| > 1 \\ -\frac{2 \operatorname{asin}\left(\frac{1}{x^{\frac{3}{2}}}\right)}{3} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(x**3-1)**(1/2),x)
```

```
[Out] Piecewise((2*I*acosh(x**(-3/2))/3, Abs(x**(-3)) > 1), (-2*asin(x*
*(-3/2))/3, True))
```

GIAC/XCAS [A] time = 0.214851, size = 14, normalized size = 1.

$$\frac{2}{3} \arctan\left(\sqrt{x^3 - 1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 - 1)*x),x, algorithm="giac")
```

```
[Out] 2/3*arctan(sqrt(x^3 - 1))
```

3.479 $\int \frac{1}{x^4\sqrt{-1+x^3}}\,dx$

Optimal. Leaf size=31

$$\frac{\sqrt{x^3-1}}{3x^3}+\frac{1}{3}\tan^{-1}\left(\sqrt{x^3-1}\right)$$

```
[Out] Sqrt[-1 + x^3]/(3*x^3) + ArcTan[Sqrt[-1 + x^3]]/3
```

Rubi [A] time = 0.0368371, antiderivative size = 31, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{\sqrt{x^3-1}}{3x^3}+\frac{1}{3}\tan^{-1}\left(\sqrt{x^3-1}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*Sqrt[-1 + x^3]),x]

[Out] Sqrt[-1 + x^3]/(3*x^3) + ArcTan[Sqrt[-1 + x^3]]/3
```

Rubi in Sympy [A] time = 4.08683, size = 24, normalized size = 0.77

$$\frac{\operatorname{atan}\left(\sqrt{x^3-1}\right)}{3}+\frac{\sqrt{x^3-1}}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(x**3-1)**(1/2),x)

[Out] atan(sqrt(x**3 - 1))/3 + sqrt(x**3 - 1)/(3*x**3)
```

Mathematica [A] time = 0.0374508, size = 41, normalized size = 1.32

$$\frac{1}{3}\sqrt{x^3-1}\left(\frac{1}{x^3}+\frac{\tanh^{-1}\left(\sqrt{1-x^3}\right)}{\sqrt{1-x^3}}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*Sqrt[-1 + x^3]),x]

[Out] (Sqrt[-1 + x^3]*(x^(-3) + ArcTanh[Sqrt[1 - x^3]]/Sqrt[1 - x^3]))/
3
```

Maple [A] time = 0.033, size = 24, normalized size = 0.8

$$\frac{1}{3}\arctan\left(\sqrt{x^3-1}\right)+\frac{1}{3\,x^3}\sqrt{x^3-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(x^3-1)^(1/2),x)
```

```
[Out] 1/3*arctan((x^3-1)^(1/2))+1/3*(x^3-1)^(1/2)/x^3
```

Maxima [A] time = 1.59887, size = 31, normalized size = 1.

$$\frac{\sqrt{x^3-1}}{3\,x^3}+\frac{1}{3}\,\arctan\left(\sqrt{x^3-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 - 1)*x^4),x, algorithm="maxima")
```

```
[Out] 1/3*sqrt(x^3 - 1)/x^3 + 1/3*arctan(sqrt(x^3 - 1))
```

Fricas [A] time = 0.234763, size = 34, normalized size = 1.1

$$\frac{x^3\arctan\left(\sqrt{x^3-1}\right)+\sqrt{x^3-1}}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 - 1)*x^4),x, algorithm="fricas")
```

```
[Out] 1/3*(x^3*arctan(sqrt(x^3 - 1)) + sqrt(x^3 - 1))/x^3
```

Sympy [A] time = 6.35515, size = 82, normalized size = 2.65

$$\begin{cases} \frac{i\,\mathrm{acosh}\left(\frac{1}{x^{\frac{3}{2}}}\right)}{3}+\frac{i\sqrt{-1+\frac{1}{x^3}}}{3x^{\frac{3}{2}}} & \text{for } \left|\frac{1}{x^3}\right|>1 \\ -\frac{\mathrm{asin}\left(\frac{1}{x^{\frac{3}{2}}}\right)}{3}+\frac{1}{3x^{\frac{3}{2}}\sqrt{1-\frac{1}{x^3}}}-\frac{1}{3x^{\frac{9}{2}}\sqrt{1-\frac{1}{x^3}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(x**3-1)**(1/2),x)
```

```
[Out] Piecewise((I*acosh(x**(-3/2))/3 + I*sqrt(-1 + x**(-3))/(3*x**(3/2
)), Abs(x**(-3)) > 1), (-asin(x**(-3/2))/3 + 1/(3*x**(3/2)*sqrt(1
 - 1/x**3)) - 1/(3*x**(9/2)*sqrt(1 - 1/x**3)), True))
```

GIAC/XCAS [A] time = 0.211367, size = 31, normalized size = 1.

$$\frac{\sqrt{x^3-1}}{3\,x^3}+\frac{1}{3}\,\arctan\left(\sqrt{x^3-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 - 1)*x^4),x, algorithm="giac")
```

```
[Out] 1/3*sqrt(x^3 - 1)/x^3 + 1/3*arctan(sqrt(x^3 - 1))
```

3.480 $\int \frac{1}{x^7\sqrt{-1+x^3}}\,dx$

Optimal. Leaf size=47

$$\frac{\sqrt{x^3-1}}{4x^3}+\frac{1}{4}\tan^{-1}\left(\sqrt{x^3-1}\right)+\frac{\sqrt{x^3-1}}{6x^6}$$

```
[Out] Sqrt[-1 + x^3]/(6*x^6) + Sqrt[-1 + x^3]/(4*x^3) + ArcTan[Sqrt[-1
+ x^3]]/4
```

Rubi [A] time = 0.0495756, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{\sqrt{x^3-1}}{4x^3}+\frac{1}{4}\tan^{-1}\left(\sqrt{x^3-1}\right)+\frac{\sqrt{x^3-1}}{6x^6}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^7*Sqrt[-1 + x^3]),x]
```

```
[Out] Sqrt[-1 + x^3]/(6*x^6) + Sqrt[-1 + x^3]/(4*x^3) + ArcTan[Sqrt[-1
+ x^3]]/4
```

Rubi in Sympy [A] time = 4.84446, size = 37, normalized size = 0.79

$$\frac{\operatorname{atan}\left(\sqrt{x^3-1}\right)}{4}+\frac{\sqrt{x^3-1}}{4x^3}+\frac{\sqrt{x^3-1}}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**7/(x**3-1)**(1/2),x)
```

```
[Out] atan(sqrt(x**3 - 1))/4 + sqrt(x**3 - 1)/(4*x**3) + sqrt(x**3 - 1)
/(6*x**6)
```

Mathematica [A] time = 0.0597511, size = 48, normalized size = 1.02

$$\frac{1}{4}\sqrt{x^3-1}\left(\frac{2}{3x^6}+\frac{1}{x^3}+\frac{\tanh^{-1}\left(\sqrt{1-x^3}\right)}{\sqrt{1-x^3}}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^7*Sqrt[-1 + x^3]),x]
```

```
[Out] (Sqrt[-1 + x^3]*(2/(3*x^6) + x^(-3) + ArcTanh[Sqrt[1 - x^3]]/Sqrt
[1 - x^3]))/4
```

Maple [A] time = 0.03, size = 36, normalized size = 0.8

$$\frac{1}{4}\arctan\left(\sqrt{x^3-1}\right)+\frac{1}{6\,x^6}\sqrt{x^3-1}+\frac{1}{4\,x^3}\sqrt{x^3-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^7/(x^3-1)^(1/2),x)
```

```
[Out] 1/4*arctan((x^3-1)^(1/2))+1/6*(x^3-1)^(1/2)/x^6+1/4*(x^3-1)^(1/2)
/x^3
```

Maxima [A] time = 1.58574, size = 65, normalized size = 1.38

$$\frac{3\left(x^3-1\right)^{\frac{3}{2}}+5\sqrt{x^3-1}}{12\left(2x^3+\left(x^3-1\right)^2-1\right)}+\frac{1}{4}\arctan\left(\sqrt{x^3-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 - 1)*x^7),x, algorithm="maxima")
```

```
[Out] 1/12*(3*(x^3 - 1)^(3/2) + 5*sqrt(x^3 - 1))/(2*x^3 + (x^3 - 1)^2 -
 1) + 1/4*arctan(sqrt(x^3 - 1))
```

Fricas [A] time = 0.239076, size = 46, normalized size = 0.98

$$\frac{3x^6\arctan\left(\sqrt{x^3-1}\right)+\left(3x^3+2\right)\sqrt{x^3-1}}{12x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 - 1)*x^7),x, algorithm="fricas")
```

```
[Out] 1/12*(3*x^6*arctan(sqrt(x^3 - 1)) + (3*x^3 + 2)*sqrt(x^3 - 1))/x^
6
```

Sympy [A] time = 10.6037, size = 138, normalized size = 2.94

$$\begin{cases}\frac{i\operatorname{acosh}\left(\frac{1}{x^{\frac{3}{2}}}\right)}{4}-\frac{i}{4x^{\frac{3}{2}}\sqrt{-1+\frac{1}{x^3}}}+\frac{i}{12x^{\frac{9}{2}}\sqrt{-1+\frac{1}{x^3}}}+\frac{i}{6x^{\frac{15}{2}}\sqrt{-1+\frac{1}{x^3}}} & \text{for}\ \left|\frac{1}{x^3}\right|>1\\ -\frac{\operatorname{asin}\left(\frac{1}{x^{\frac{3}{2}}}\right)}{4}+\frac{1}{4x^{\frac{3}{2}}\sqrt{1-\frac{1}{x^3}}}-\frac{1}{12x^{\frac{9}{2}}\sqrt{1-\frac{1}{x^3}}}-\frac{1}{6x^{\frac{15}{2}}\sqrt{1-\frac{1}{x^3}}} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**7/(x**3-1)**(1/2),x)
```

```
[Out] Piecewise((I*acosh(x**(-3/2))/4 - I/(4*x**(3/2)*sqrt(-1 + x**(-3)
)) + I/(12*x**(9/2)*sqrt(-1 + x**(-3))) + I/(6*x**(15/2)*sqrt(-1
+ x**(-3))), Abs(x**(-3)) > 1), (-asin(x**(-3/2))/4 + 1/(4*x**(3/
2)*sqrt(1 - 1/x**3)) - 1/(12*x**(9/2)*sqrt(1 - 1/x**3)) - 1/(6*x*
*(15/2)*sqrt(1 - 1/x**3)), True))
```

GIAC/XCAS [A] time = 0.221712, size = 47, normalized size = 1.

$$\frac{3\left(x^3-1\right)^{\frac{3}{2}}+5\sqrt{x^3-1}}{12x^6}+\frac{1}{4}\arctan\left(\sqrt{x^3-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 - 1)*x^7),x, algorithm="giac")
```

```
[Out] 1/12*(3*(x^3 - 1)^(3/2) + 5*sqrt(x^3 - 1))/x^6 + 1/4*arctan(sqrt(
x^3 - 1))
```

3.481 $\int \frac{1}{x^{10}\sqrt{-1+x^3}}\,dx$

Optimal. Leaf size=63

$$\frac{5\sqrt{x^3-1}}{24x^3}+\frac{5}{24}\tan^{-1}\left(\sqrt{x^3-1}\right)+\frac{\sqrt{x^3-1}}{9x^9}+\frac{5\sqrt{x^3-1}}{36x^6}$$

```
[Out] Sqrt[-1 + x^3]/(9*x^9) + (5*Sqrt[-1 + x^3])/(36*x^6) + (5*Sqrt[-1
 + x^3])/(24*x^3) + (5*ArcTan[Sqrt[-1 + x^3]])/24
```

Rubi [A] time = 0.0619961, antiderivative size = 63, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{5\sqrt{x^3-1}}{24x^3}+\frac{5}{24}\tan^{-1}\left(\sqrt{x^3-1}\right)+\frac{\sqrt{x^3-1}}{9x^9}+\frac{5\sqrt{x^3-1}}{36x^6}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^10*Sqrt[-1 + x^3]),x]
```

```
[Out] Sqrt[-1 + x^3]/(9*x^9) + (5*Sqrt[-1 + x^3])/(36*x^6) + (5*Sqrt[-1
 + x^3])/(24*x^3) + (5*ArcTan[Sqrt[-1 + x^3]])/24
```

Rubi in Sympy [A] time = 5.62511, size = 56, normalized size = 0.89

$$\frac{5\,\mathrm{atan}\left(\sqrt{x^3-1}\right)}{24}+\frac{5\sqrt{x^3-1}}{24x^3}+\frac{5\sqrt{x^3-1}}{36x^6}+\frac{\sqrt{x^3-1}}{9x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**10/(x**3-1)**(1/2),x)
```

```
[Out] 5*atan(sqrt(x**3 - 1))/24 + 5*sqrt(x**3 - 1)/(24*x**3) + 5*sqrt(x
**3 - 1)/(36*x**6) + sqrt(x**3 - 1)/(9*x**9)
```

Mathematica [A] time = 0.0646474, size = 55, normalized size = 0.87

$$\frac{1}{72}\sqrt{x^3-1}\left(\frac{15\tanh^{-1}\left(\sqrt{1-x^3}\right)}{\sqrt{1-x^3}}+\frac{15x^6+10x^3+8}{x^9}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^10*Sqrt[-1 + x^3]),x]
```

```
[Out] (Sqrt[-1 + x^3]*((8 + 10*x^3 + 15*x^6)/x^9 + (15*ArcTanh[Sqrt[1 -
 x^3]])/Sqrt[1 - x^3]))/72
```

Maple [A] time = 0.034, size = 48, normalized size = 0.8

$$\frac{5}{24}\arctan\left(\sqrt{x^3-1}\right)+\frac{1}{9\,x^9}\sqrt{x^3-1}+\frac{5}{36\,x^6}\sqrt{x^3-1}+\frac{5}{24\,x^3}\sqrt{x^3-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^10/(x^3-1)^(1/2),x)
```

```
[Out] 5/24*arctan((x^3-1)^(1/2))+1/9*(x^3-1)^(1/2)/x^9+5/36*(x^3-1)^(1/
2)/x^6+5/24*(x^3-1)^(1/2)/x^3
```

Maxima [A] time = 1.59138, size = 89, normalized size = 1.41

$$\frac{15\left(x^3-1\right)^{\frac{5}{2}}+40\left(x^3-1\right)^{\frac{3}{2}}+33\sqrt{x^3-1}}{72\left(\left(x^3-1\right)^3+3\,x^3+3\left(x^3-1\right)^2-2\right)}+\frac{5}{24}\arctan\left(\sqrt{x^3-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 - 1)*x^10),x, algorithm="maxima")
```

```
[Out] 1/72*(15*(x^3 - 1)^(5/2) + 40*(x^3 - 1)^(3/2) + 33*sqrt(x^3 - 1))
/((x^3 - 1)^3 + 3*x^3 + 3*(x^3 - 1)^2 - 2) + 5/24*arctan(sqrt(x^3
 - 1))
```

Fricas [A] time = 0.233206, size = 53, normalized size = 0.84

$$\frac{15\,x^9\arctan\left(\sqrt{x^3-1}\right)+\left(15\,x^6+10\,x^3+8\right)\sqrt{x^3-1}}{72\,x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 - 1)*x^10),x, algorithm="fricas")
```

```
[Out] 1/72*(15*x^9*arctan(sqrt(x^3 - 1)) + (15*x^6 + 10*x^3 + 8)*sqrt(x
^3 - 1))/x^9
```

Sympy [A] time = 16.869, size = 182, normalized size = 2.89

$$\begin{cases} \frac{5i\operatorname{acosh}\left(\frac{1}{x^{\frac{3}{2}}}\right)}{24}-\frac{5i}{24x^{\frac{3}{2}}\sqrt{-1+\frac{1}{x^3}}}+\frac{5i}{72x^{\frac{9}{2}}\sqrt{-1+\frac{1}{x^3}}}+\frac{i}{36x^{\frac{15}{2}}\sqrt{-1+\frac{1}{x^3}}}+\frac{i}{9x^{\frac{21}{2}}\sqrt{-1+\frac{1}{x^3}}} & \text{for}\ \left|\frac{1}{x^3}\right|>1 \\ -\frac{5\operatorname{asin}\left(\frac{1}{x^{\frac{3}{2}}}\right)}{24}+\frac{5}{24x^{\frac{3}{2}}\sqrt{1-\frac{1}{x^3}}}-\frac{5}{72x^{\frac{9}{2}}\sqrt{1-\frac{1}{x^3}}}-\frac{1}{36x^{\frac{15}{2}}\sqrt{1-\frac{1}{x^3}}}-\frac{1}{9x^{\frac{21}{2}}\sqrt{1-\frac{1}{x^3}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**10/(x**3-1)**(1/2),x)
```

```
[Out] Piecewise((5*I*acosh(x**(-3/2))/24 - 5*I/(24*x**(3/2)*sqrt(-1 + x
**(-3))) + 5*I/(72*x**(9/2)*sqrt(-1 + x**(-3))) + I/(36*x**(15/2)
*sqrt(-1 + x**(-3))) + I/(9*x**(21/2)*sqrt(-1 + x**(-3))), Abs(x*
*(-3)) > 1), (-5*asin(x**(-3/2))/24 + 5/(24*x**(3/2)*sqrt(1 - 1/x
**3)) - 5/(72*x**(9/2)*sqrt(1 - 1/x**3)) - 1/(36*x**(15/2)*sqrt(1
 - 1/x**3)) - 1/(9*x**(21/2)*sqrt(1 - 1/x**3)), True))
```

GIAC/XCAS [A] time = 0.214667, size = 59, normalized size = 0.94

$$\frac{15\left(x^3-1\right)^{\frac{5}{2}}+40\left(x^3-1\right)^{\frac{3}{2}}+33\sqrt{x^3-1}}{72\,x^9}+\frac{5}{24}\arctan\left(\sqrt{x^3-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 - 1)*x^10),x, algorithm="giac")
```

```
[Out] 1/72*(15*(x^3 - 1)^(5/2) + 40*(x^3 - 1)^(3/2) + 33*sqrt(x^3 - 1))
/x^9 + 5/24*arctan(sqrt(x^3 - 1))
```

3.482 $\int \frac{x^6}{\sqrt{-1+x^3}}\,dx$

Optimal. Leaf size=153

$$\frac{16}{55}\sqrt{x^3-1}x+\frac{2}{11}\sqrt{x^3-1}x^4-\frac{32\sqrt{2-\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x+\sqrt{3}+1}{-x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{55\sqrt[4]{3}\sqrt{-\frac{1-x}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}$$

```
[Out] (16*x*Sqrt[-1 + x^3])/55 + (2*x^4*Sqrt[-1 + x^3])/11 - (32*Sqrt[2
 - Sqrt[3]]*(1 - x)*Sqrt[(1 + x + x^2)/(1 - Sqrt[3] - x)^2]*Ellip
ticF[ArcSin[(1 + Sqrt[3] - x)/(1 - Sqrt[3] - x)], -7 + 4*Sqrt[3]]
)/(55*3^(1/4)*Sqrt[-((1 - x)/(1 - Sqrt[3] - x)^2)]*Sqrt[-1 + x^3]
)
```

Rubi [A] time = 0.112022, antiderivative size = 153, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{16}{55}\sqrt{x^3-1}x+\frac{2}{11}\sqrt{x^3-1}x^4-\frac{32\sqrt{2-\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x+\sqrt{3}+1}{-x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{55\sqrt[4]{3}\sqrt{-\frac{1-x}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/Sqrt[-1 + x^3],x]
```

```
[Out] (16*x*Sqrt[-1 + x^3])/55 + (2*x^4*Sqrt[-1 + x^3])/11 - (32*Sqrt[2
 - Sqrt[3]]*(1 - x)*Sqrt[(1 + x + x^2)/(1 - Sqrt[3] - x)^2]*Ellip
ticF[ArcSin[(1 + Sqrt[3] - x)/(1 - Sqrt[3] - x)], -7 + 4*Sqrt[3]]
)/(55*3^(1/4)*Sqrt[-((1 - x)/(1 - Sqrt[3] - x)^2)]*Sqrt[-1 + x^3]
)
```

Rubi in Sympy [A] time = 5.90734, size = 122, normalized size = 0.8

$$\frac{2x^4\sqrt{x^3-1}}{11}+\frac{16x\sqrt{x^3-1}}{55}-\frac{32\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{-\sqrt{3}+2}\,(-x+1)\,F\left(\operatorname{asin}\left(\frac{-x+1+\sqrt{3}}{-x-\sqrt{3}+1}\right)\middle|-7+4\sqrt{3}\right)}{165\sqrt{\frac{x-1}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(x**3-1)**(1/2),x)
```

```
[Out] 2*x**4*sqrt(x**3 - 1)/11 + 16*x*sqrt(x**3 - 1)/55 - 32*3**(3/4)*s
qrt((x**2 + x + 1)/(-x - sqrt(3) + 1)**2)*sqrt(-sqrt(3) + 2)*(-x
+ 1)*elliptic_f(asin((-x + 1 + sqrt(3))/(-x - sqrt(3) + 1)), -7 +
 4*sqrt(3))/(165*sqrt((x - 1)/(-x - sqrt(3) + 1)**2)*sqrt(x**3 -
1))
```

Mathematica [C] time = 0.12806, size = 91, normalized size = 0.59

$$\frac{2\left(3x\left(5x^6+3x^3-8\right)+16i3^{3/4}\sqrt{(-1)^{5/6}(x-1)}\sqrt{x^2+x+1}F\left(\sin^{-1}\left(\frac{\sqrt{-ix-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)\right)}{165\sqrt{x^3-1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^6/Sqrt[-1 + x^3],x]
```

```
[Out] (2*(3*x*(-8 + 3*x^3 + 5*x^6) + (16*I)*3^(3/4)*Sqrt[(-1)^(5/6)*(-1
 + x)]*Sqrt[1 + x + x^2]*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - I*x]
/3^(1/4)], (-1)^(1/3)]))/(165*Sqrt[-1 + x^3])
```

Maple [A] time = 0.025, size = 139, normalized size = 0.9

$$\frac{2x^4}{11}\sqrt{x^3-1}+\frac{16x}{55}\sqrt{x^3-1}$$
$$+\frac{-48-16i\sqrt{3}}{55}\sqrt{\frac{-1+x}{-\frac{3}{2}-\frac{i}{2}\sqrt{3}}}\sqrt{\frac{1}{\frac{3}{2}-\frac{i}{2}\sqrt{3}}\left(x+\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)}\sqrt{\frac{1}{\frac{3}{2}+\frac{i}{2}\sqrt{3}}\left(x+\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)}EllipticF\left(\sqrt{\frac{-1+x}{-\frac{3}{2}-\frac{i}{2}\sqrt{3}}},\sqrt{\frac{\frac{3}{2}+\frac{i}{2}\sqrt{3}}{\frac{3}{2}-\frac{i}{2}\sqrt{3}}}\right)\frac{}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(x^3-1)^(1/2),x)
```

```
[Out] 2/11*x^4*(x^3-1)^(1/2)+16/55*x*(x^3-1)^(1/2)+32/55*(-3/2-1/2*I*3^
(1/2))*((-1+x)/(-3/2-1/2*I*3^(1/2)))^(1/2)*((x+1/2-1/2*I*3^(1/2))
/(3/2-1/2*I*3^(1/2)))^(1/2)*((x+1/2+1/2*I*3^(1/2))/(3/2+1/2*I*3^(
1/2)))^(1/2)/(x^3-1)^(1/2)*EllipticF(((-1+x)/(-3/2-1/2*I*3^(1/2))
)^(1/2),((3/2+1/2*I*3^(1/2))/(3/2-1/2*I*3^(1/2)))^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{\sqrt{x^3-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(x^3 - 1),x, algorithm="maxima")
```

```
[Out] integrate(x^6/sqrt(x^3 - 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^6}{\sqrt{x^3-1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(x^3 - 1),x, algorithm="fricas")
```

```
[Out] integral(x^6/sqrt(x^3 - 1), x)
```

Sympy [A] time = 2.24828, size = 27, normalized size = 0.18

$$-\frac{ix^7\,\Gamma\left(\frac{7}{3}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{7}{3}\\ \frac{10}{3}\end{matrix}\middle| x^3\right)}{3\,\Gamma\left(\frac{10}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(x**3-1)**(1/2),x)
```

```
[Out] -I*x**7*gamma(7/3)*hyper((1/2, 7/3), (10/3,), x**3)/(3*gamma(10/3
))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{\sqrt{x^3-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(x^3 - 1),x, algorithm="giac")
```

```
[Out] integrate(x^6/sqrt(x^3 - 1), x)
```

3.483 $\int \frac{x^3}{\sqrt{-1+x^3}}\,dx$

Optimal. Leaf size=137

$$\frac{2}{5}x\sqrt{x^3-1}-\frac{4\sqrt{2-\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x+\sqrt{3}+1}{-x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{5\sqrt[4]{3}\sqrt{-\frac{1-x}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}$$

```
[Out] (2*x*Sqrt[-1 + x^3])/5 - (4*Sqrt[2 - Sqrt[3]]*(1 - x)*Sqrt[(1 + x
 + x^2)/(1 - Sqrt[3] - x)^2]*EllipticF[ArcSin[(1 + Sqrt[3] - x)/(
1 - Sqrt[3] - x)], -7 + 4*Sqrt[3]])/(5*3^(1/4)*Sqrt[-((1 - x)/(1
- Sqrt[3] - x)^2)]*Sqrt[-1 + x^3])
```

Rubi [A] time = 0.0716452, antiderivative size = 137, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{2}{5}x\sqrt{x^3-1}-\frac{4\sqrt{2-\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x+\sqrt{3}+1}{-x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{5\sqrt[4]{3}\sqrt{-\frac{1-x}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/Sqrt[-1 + x^3],x]
```


```
[Out] (2*x*Sqrt[-1 + x^3])/5 - (4*Sqrt[2 - Sqrt[3]]*(1 - x)*Sqrt[(1 + x
 + x^2)/(1 - Sqrt[3] - x)^2]*EllipticF[ArcSin[(1 + Sqrt[3] - x)/(
1 - Sqrt[3] - x)], -7 + 4*Sqrt[3]])/(5*3^(1/4)*Sqrt[-((1 - x)/(1
- Sqrt[3] - x)^2)]*Sqrt[-1 + x^3])
```

Rubi in Sympy [A] time = 4.21705, size = 107, normalized size = 0.78

$$\frac{2x\sqrt{x^3-1}}{5}-\frac{4\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{-\sqrt{3}+2}\,(-x+1)\,F\left(\operatorname{asin}\left(\frac{-x+1+\sqrt{3}}{-x-\sqrt{3}+1}\right)\middle|-7+4\sqrt{3}\right)}{15\sqrt{\frac{x-1}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(x**3-1)**(1/2),x)
```

```
[Out] 2*x*sqrt(x**3 - 1)/5 - 4*3**(3/4)*sqrt((x**2 + x + 1)/(-x - sqrt(
3) + 1)**2)*sqrt(-sqrt(3) + 2)*(-x + 1)*elliptic_f(asin((-x + 1 +
 sqrt(3))/(-x - sqrt(3) + 1)), -7 + 4*sqrt(3))/(15*sqrt((x - 1)/(
-x - sqrt(3) + 1)**2)*sqrt(x**3 - 1))
```

Mathematica [C] time = 0.103438, size = 84, normalized size = 0.61

$$\frac{2\left(3x\left(x^3-1\right)+2i3^{3/4}\sqrt{(-1)^{5/6}(x-1)}\sqrt{x^2+x+1}F\left(\sin^{-1}\left(\frac{\sqrt{-ix-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)\right)}{15\sqrt{x^3-1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^3/Sqrt[-1 + x^3],x]
```

```
[Out] (2*(3*x*(-1 + x^3) + (2*I)*3^(3/4)*Sqrt[(-1)^(5/6)*(-1 + x)]*Sqrt
[1 + x + x^2]*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - I*x]/3^(1/4)],
(-1)^(1/3)]))/(15*Sqrt[-1 + x^3])
```

Maple [A] time = 0.024, size = 127, normalized size = 0.9

$$\frac{2x}{5}\sqrt{x^3-1} + \frac{-6-2i\sqrt{3}}{5}\sqrt{\frac{-1+x}{-\frac{3}{2}-\frac{i}{2}\sqrt{3}}}\sqrt{\frac{1}{\frac{3}{2}-\frac{i}{2}\sqrt{3}}\left(x+\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)}\sqrt{\frac{1}{\frac{3}{2}+\frac{i}{2}\sqrt{3}}\left(x+\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)}\,EllipticF\left(\sqrt{\frac{-1+x}{-\frac{3}{2}-\frac{i}{2}\sqrt{3}}},\sqrt{\frac{\frac{3}{2}+\frac{i}{2}\sqrt{3}}{\frac{3}{2}-\frac{i}{2}\sqrt{3}}}\right)\frac{1}{\sqrt{x^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(x^3-1)^(1/2),x)
```

```
[Out] 2/5*x*(x^3-1)^(1/2)+4/5*(-3/2-1/2*I*3^(1/2))*((-1+x)/(-3/2-1/2*I*
3^(1/2)))^(1/2)*((x+1/2-1/2*I*3^(1/2))/(3/2-1/2*I*3^(1/2)))^(1/2)
*((x+1/2+1/2*I*3^(1/2))/(3/2+1/2*I*3^(1/2)))^(1/2)/(x^3-1)^(1/2)*
EllipticF(((-1+x)/(-3/2-1/2*I*3^(1/2)))^(1/2),((3/2+1/2*I*3^(1/2)
)/(3/2-1/2*I*3^(1/2)))^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{\sqrt{x^3-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(x^3 - 1),x, algorithm="maxima")
```

```
[Out] integrate(x^3/sqrt(x^3 - 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^3}{\sqrt{x^3-1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(x^3 - 1),x, algorithm="fricas")
```

```
[Out] integral(x^3/sqrt(x^3 - 1), x)
```

Sympy [A] time = 1.91851, size = 27, normalized size = 0.2

$$-\frac{ix^4\,\Gamma\left(\frac{4}{3}\right)\,{}_2F_1\left(\left.\begin{matrix}\frac{1}{2},\frac{4}{3}\\ \frac{7}{3}\end{matrix}\right|x^3\right)}{3\,\Gamma\left(\frac{7}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(x**3-1)**(1/2),x)
```

```
[Out] -I*x**4*gamma(4/3)*hyper((1/2, 4/3), (7/3,), x**3)/(3*gamma(7/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{\sqrt{x^3-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(x^3 - 1),x, algorithm="giac")

[Out] integrate(x^3/sqrt(x^3 - 1), x)
```

3.484 $\int \frac{1}{\sqrt{-1+x^3}}\,dx$

Optimal. Leaf size=120

$$-\frac{2\sqrt{2-\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x+\sqrt{3}+1}{-x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{\sqrt[4]{3}\sqrt{-\frac{1-x}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}$$

```
[Out] (-2*Sqrt[2 - Sqrt[3]]*(1 - x)*Sqrt[(1 + x + x^2)/(1 - Sqrt[3] - x
)^2]*EllipticF[ArcSin[(1 + Sqrt[3] - x)/(1 - Sqrt[3] - x)], -7 +
4*Sqrt[3]])/(3^(1/4)*Sqrt[-((1 - x)/(1 - Sqrt[3] - x)^2)]*Sqrt[-1
 + x^3])
```

Rubi [A] time = 0.0354077, antiderivative size = 120, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$

$$-\frac{2\sqrt{2-\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x+\sqrt{3}+1}{-x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{\sqrt[4]{3}\sqrt{-\frac{1-x}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[-1 + x^3],x]
```

```
[Out] (-2*Sqrt[2 - Sqrt[3]]*(1 - x)*Sqrt[(1 + x + x^2)/(1 - Sqrt[3] - x
)^2]*EllipticF[ArcSin[(1 + Sqrt[3] - x)/(1 - Sqrt[3] - x)], -7 +
4*Sqrt[3]])/(3^(1/4)*Sqrt[-((1 - x)/(1 - Sqrt[3] - x)^2)]*Sqrt[-1
 + x^3])
```

Rubi in Sympy [A] time = 1.89606, size = 95, normalized size = 0.79

$$-\frac{2\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{-\sqrt{3}+2}\,(-x+1)\,F\left(\operatorname{asin}\left(\frac{-x+1+\sqrt{3}}{-x-\sqrt{3}+1}\right)\middle|-7+4\sqrt{3}\right)}{3\sqrt{\frac{x-1}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(x**3-1)**(1/2),x)
```

```
[Out] -2*3**(3/4)*sqrt((x**2 + x + 1)/(-x - sqrt(3) + 1)**2)*sqrt(-sqrt
(3) + 2)*(-x + 1)*elliptic_f(asin((-x + 1 + sqrt(3))/(-x - sqrt(3
) + 1)), -7 + 4*sqrt(3))/(3*sqrt((x - 1)/(-x - sqrt(3) + 1)**2)*s
qrt(x**3 - 1))
```

Mathematica [C] time = 0.0421034, size = 71, normalized size = 0.59

$$\frac{2i\sqrt{(-1)^{5/6}(x-1)}\sqrt{x^2+x+1}F\left(\sin^{-1}\left(\frac{\sqrt{-ix-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)}{\sqrt[4]{3}\sqrt{x^3-1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/Sqrt[-1 + x^3],x]
```

```
[Out] ((2*I)*Sqrt[(-1)^(5/6)*(-1 + x)]*Sqrt[1 + x + x^2]*EllipticF[ArcS
in[Sqrt[-(-1)^(5/6) - I*x]/3^(1/4)], (-1)^(1/3)])/(3^(1/4)*Sqrt[-
1 + x^3])
```

Maple [A] time = 0.022, size = 116, normalized size = 1.

$$2\,\frac{-3/2-i/2\sqrt{3}}{\sqrt{x^3-1}}\sqrt{\frac{-1+x}{-3/2-i/2\sqrt{3}}}\sqrt{\frac{x+1/2-i/2\sqrt{3}}{3/2-i/2\sqrt{3}}}\sqrt{\frac{x+1/2+i/2\sqrt{3}}{3/2+i/2\sqrt{3}}}\mathit{EllipticF}\left(\sqrt{\frac{-1+x}{-3/2-i/2\sqrt{3}}},\sqrt{\frac{3/2+i/2\sqrt{3}}{3/2-i/2\sqrt{3}}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(x^3-1)^(1/2),x)
```

```
[Out] 2*(-3/2-1/2*I*3^(1/2))*((-1+x)/(-3/2-1/2*I*3^(1/2)))^(1/2)*((x+1/
2-1/2*I*3^(1/2))/(3/2-1/2*I*3^(1/2)))^(1/2)*((x+1/2+1/2*I*3^(1/2)
)/(3/2+1/2*I*3^(1/2)))^(1/2)/(x^3-1)^(1/2)*EllipticF(((-1+x)/(-3/
2-1/2*I*3^(1/2)))^(1/2),((3/2+1/2*I*3^(1/2))/(3/2-1/2*I*3^(1/2)))
^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^3-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(x^3 - 1),x, algorithm="maxima")
```

```
[Out] integrate(1/sqrt(x^3 - 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{x^3-1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(x^3 - 1),x, algorithm="fricas")
```

```
[Out] integral(1/sqrt(x^3 - 1), x)
```

Sympy [A] time = 1.76128, size = 26, normalized size = 0.22

$$-\frac{ix\,\Gamma\left(\frac{1}{3}\right)\,{}_2F_1\left(\left.\begin{matrix}\frac{1}{3},\frac{1}{2}\\ \frac{4}{3}\end{matrix}\right|x^3\right)}{3\,\Gamma\left(\frac{4}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x**3-1)**(1/2),x)
```

```
[Out] -I*x*gamma(1/3)*hyper((1/3, 1/2), (4/3,), x**3)/(3*gamma(4/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^3-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(x^3 - 1),x, algorithm="giac")
```

```
[Out] integrate(1/sqrt(x^3 - 1), x)
```

3.485 $\int \frac{1}{x^3\sqrt{-1+x^3}}\,dx$

Optimal. Leaf size=139

$$\frac{\sqrt{x^3-1}}{2x^2}-\frac{\sqrt{2-\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x+\sqrt{3}+1}{-x-\sqrt{3}+1}\right)\middle|-7+4\sqrt{3}\right)}{2\sqrt[4]{3}\sqrt{-\frac{1-x}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}$$

```
[Out] Sqrt[-1 + x^3]/(2*x^2) - (Sqrt[2 - Sqrt[3]]*(1 - x)*Sqrt[(1 + x +
 x^2)/(1 - Sqrt[3] - x)^2]*EllipticF[ArcSin[(1 + Sqrt[3] - x)/(1
- Sqrt[3] - x)], -7 + 4*Sqrt[3]])/(2*3^(1/4)*Sqrt[-((1 - x)/(1 -
Sqrt[3] - x)^2)]*Sqrt[-1 + x^3])
```

Rubi [A] time = 0.0672633, antiderivative size = 139, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{\sqrt{x^3-1}}{2x^2}-\frac{\sqrt{2-\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x+\sqrt{3}+1}{-x-\sqrt{3}+1}\right)\middle|-7+4\sqrt{3}\right)}{2\sqrt[4]{3}\sqrt{-\frac{1-x}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*Sqrt[-1 + x^3]),x]
```

```
[Out] Sqrt[-1 + x^3]/(2*x^2) - (Sqrt[2 - Sqrt[3]]*(1 - x)*Sqrt[(1 + x +
 x^2)/(1 - Sqrt[3] - x)^2]*EllipticF[ArcSin[(1 + Sqrt[3] - x)/(1
- Sqrt[3] - x)], -7 + 4*Sqrt[3]])/(2*3^(1/4)*Sqrt[-((1 - x)/(1 -
Sqrt[3] - x)^2)]*Sqrt[-1 + x^3])
```

Rubi in Sympy [A] time = 4.08005, size = 105, normalized size = 0.76

$$-\frac{3^{\frac{3}{4}}\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{-\sqrt{3}+2}\,(-x+1)\,F\left(\operatorname{asin}\left(\frac{-x+1+\sqrt{3}}{-x-\sqrt{3}+1}\right)\middle|-7+4\sqrt{3}\right)}{6\sqrt{\frac{x-1}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}+\frac{\sqrt{x^3-1}}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(x**3-1)**(1/2),x)
```

```
[Out] -3**(3/4)*sqrt((x**2 + x + 1)/(-x - sqrt(3) + 1)**2)*sqrt(-sqrt(3
) + 2)*(-x + 1)*elliptic_f(asin((-x + 1 + sqrt(3))/(-x - sqrt(3)
+ 1)), -7 + 4*sqrt(3))/(6*sqrt((x - 1)/(-x - sqrt(3) + 1)**2)*sqr
t(x**3 - 1)) + sqrt(x**3 - 1)/(2*x**2)
```

Mathematica [C] time = 0.0582846, size = 90, normalized size = 0.65

$$\frac{\sqrt{x^3-1}}{2x^2}+\frac{i\sqrt{(-1)^{5/6}(x-1)}\sqrt{x^2+x+1}F\left(\sin^{-1}\left(\frac{\sqrt{-ix-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)}{2\sqrt[4]{3}\sqrt{x^3-1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/(x^3*Sqrt[-1 + x^3]),x]
```

```
[Out] Sqrt[-1 + x^3]/(2*x^2) + ((I/2)*Sqrt[(-1)^(5/6)*(-1 + x)]*Sqrt[1
+ x + x^2]*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - I*x]/3^(1/4)], (-1
)^(1/3)])/(3^(1/4)*Sqrt[-1 + x^3])
```

Maple [A] time = 0.027, size = 129, normalized size = 0.9

$$\frac{1}{2x^2}\sqrt{x^3-1} + \frac{-\frac{3}{2}-\frac{i}{2}\sqrt{3}}{2}\sqrt{\frac{-1+x}{-\frac{3}{2}-\frac{i}{2}\sqrt{3}}}\sqrt{\frac{1}{\frac{3}{2}-\frac{i}{2}\sqrt{3}}\left(x+\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)}\sqrt{\frac{1}{\frac{3}{2}+\frac{i}{2}\sqrt{3}}\left(x+\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)}EllipticF\left(\sqrt{\frac{-1+x}{-\frac{3}{2}-\frac{i}{2}\sqrt{3}}},\sqrt{\frac{\frac{3}{2}+\frac{i}{2}\sqrt{3}}{\frac{3}{2}-\frac{i}{2}\sqrt{3}}}\right)\frac{1}{\sqrt{x^3-}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^3/(x^3-1)^(1/2),x)
```

```
[Out] 1/2*(x^3-1)^(1/2)/x^2+1/2*(-3/2-1/2*I*3^(1/2))*((-1+x)/(-3/2-1/2*
I*3^(1/2)))^(1/2)*((x+1/2-1/2*I*3^(1/2))/(3/2-1/2*I*3^(1/2)))^(1/
2)*((x+1/2+1/2*I*3^(1/2))/(3/2+1/2*I*3^(1/2)))^(1/2)/(x^3-1)^(1/2
)*EllipticF(((-1+x)/(-3/2-1/2*I*3^(1/2)))^(1/2),((3/2+1/2*I*3^(1/
2))/(3/2-1/2*I*3^(1/2)))^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^3-1}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(x^3 - 1)*x^3),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(x^3 - 1)*x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{x^3-1}x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(x^3 - 1)*x^3),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(x^3 - 1)*x^3), x)
```

Sympy [A] time = 2.18907, size = 31, normalized size = 0.22

$$-\frac{i\Gamma\left(-\frac{2}{3}\right){}_2F_1\left(\begin{matrix}-\frac{2}{3},\frac{1}{2}\\ \frac{1}{3}\end{matrix}\middle| x^3\right)}{3x^2\Gamma\left(\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**3/(x**3-1)**(1/2),x)
```

```
[Out] -I*gamma(-2/3)*hyper((-2/3, 1/2), (1/3,), x**3)/(3*x**2*gamma(1/3
))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^3 - 1}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 - 1)*x^3),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(x^3 - 1)*x^3), x)
```

3.486 $\int \frac{1}{x^6\sqrt{-1+x^3}}\,dx$

Optimal. Leaf size=155

$$\frac{\sqrt{x^3-1}}{5x^5}+\frac{7\sqrt{x^3-1}}{20x^2}-\frac{7\sqrt{2-\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x+\sqrt{3}+1}{-x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{20\sqrt[4]{3}\sqrt{-\frac{1-x}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}$$

```
[Out] Sqrt[-1 + x^3]/(5*x^5) + (7*Sqrt[-1 + x^3])/(20*x^2) - (7*Sqrt[2
- Sqrt[3]]*(1 - x)*Sqrt[(1 + x + x^2)/(1 - Sqrt[3] - x)^2]*Ellipt
icF[ArcSin[(1 + Sqrt[3] - x)/(1 - Sqrt[3] - x)], -7 + 4*Sqrt[3]])
/(20*3^(1/4)*Sqrt[-((1 - x)/(1 - Sqrt[3] - x)^2)]*Sqrt[-1 + x^3])
```

Rubi [A] time = 0.0925096, antiderivative size = 155, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{\sqrt{x^3-1}}{5x^5}+\frac{7\sqrt{x^3-1}}{20x^2}-\frac{7\sqrt{2-\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x+\sqrt{3}+1}{-x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{20\sqrt[4]{3}\sqrt{-\frac{1-x}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^6*Sqrt[-1 + x^3]),x]
```

```
[Out] Sqrt[-1 + x^3]/(5*x^5) + (7*Sqrt[-1 + x^3])/(20*x^2) - (7*Sqrt[2
- Sqrt[3]]*(1 - x)*Sqrt[(1 + x + x^2)/(1 - Sqrt[3] - x)^2]*Ellipt
icF[ArcSin[(1 + Sqrt[3] - x)/(1 - Sqrt[3] - x)], -7 + 4*Sqrt[3]])
/(20*3^(1/4)*Sqrt[-((1 - x)/(1 - Sqrt[3] - x)^2)]*Sqrt[-1 + x^3])
```

Rubi in Sympy [A] time = 5.86791, size = 122, normalized size = 0.79

$$-\frac{7\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{-\sqrt{3}+2}\,(-x+1)\,F\left(\operatorname{asin}\left(\frac{-x+1+\sqrt{3}}{-x-\sqrt{3}+1}\right)\middle|-7+4\sqrt{3}\right)}{60\sqrt{\frac{x-1}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}+\frac{7\sqrt{x^3-1}}{20x^2}+\frac{\sqrt{x^3-1}}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**6/(x**3-1)**(1/2),x)
```

```
[Out] -7*3**(3/4)*sqrt((x**2 + x + 1)/(-x - sqrt(3) + 1)**2)*sqrt(-sqrt
(3) + 2)*(-x + 1)*elliptic_f(asin((-x + 1 + sqrt(3))/(-x - sqrt(3
) + 1)), -7 + 4*sqrt(3))/(60*sqrt((x - 1)/(-x - sqrt(3) + 1)**2)*
sqrt(x**3 - 1)) + 7*sqrt(x**3 - 1)/(20*x**2) + sqrt(x**3 - 1)/(5*
x**5)
```

Mathematica [C] time = 0.0738946, size = 93, normalized size = 0.6

$$\frac{21x^6-9x^3+7i3^{3/4}\sqrt{(-1)^{5/6}(x-1)}\sqrt{x^2+x+1}x^5F\left(\sin^{-1}\left(\frac{\sqrt{-ix-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)-12}{60x^5\sqrt{x^3-1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/(x^6*Sqrt[-1 + x^3]),x]
```

```
[Out] (-12 - 9*x^3 + 21*x^6 + (7*I)*3^(3/4)*Sqrt[(-1)^(5/6)*(-1 + x)]*x
^5*Sqrt[1 + x + x^2]*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - I*x]/3^(
1/4)], (-1)^(1/3)])/(60*x^5*Sqrt[-1 + x^3])
```

Maple [A] time = 0.028, size = 141, normalized size = 0.9

$$\frac{1}{5\,x^{5}}\sqrt{x^{3}-1}+\frac{7}{20\,x^{2}}\sqrt{x^{3}-1} +\frac{-\frac{21}{2}-\frac{7\,i}{2}\sqrt{3}}{20}\sqrt{\frac{-1+x}{-\frac{3}{2}-\frac{i}{2}\sqrt{3}}}\sqrt{\frac{1}{\frac{3}{2}-\frac{i}{2}\sqrt{3}}\left(x+\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)}\sqrt{\frac{1}{\frac{3}{2}+\frac{i}{2}\sqrt{3}}\left(x+\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)}\mathit{EllipticF}\left(\sqrt{\frac{-1+x}{-\frac{3}{2}-\frac{i}{2}\sqrt{3}}},\sqrt{\frac{\frac{3}{2}+\frac{i}{2}\sqrt{3}}{\frac{3}{2}-\frac{i}{2}\sqrt{3}}}\right)\frac{1}{\sqrt{x^{3}-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^6/(x^3-1)^(1/2),x)
```

```
[Out] 1/5*(x^3-1)^(1/2)/x^5+7/20*(x^3-1)^(1/2)/x^2+7/20*(-3/2-1/2*I*3^(
1/2))*((-1+x)/(-3/2-1/2*I*3^(1/2)))^(1/2)*((x+1/2-1/2*I*3^(1/2))/
(3/2-1/2*I*3^(1/2)))^(1/2)*((x+1/2+1/2*I*3^(1/2))/(3/2+1/2*I*3^(1
/2)))^(1/2)/(x^3-1)^(1/2)*EllipticF(((-1+x)/(-3/2-1/2*I*3^(1/2)))
^(1/2),((3/2+1/2*I*3^(1/2))/(3/2-1/2*I*3^(1/2)))^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^{3}-1}x^{6}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 - 1)*x^6),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(x^3 - 1)*x^6), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{x^{3}-1}x^{6}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 - 1)*x^6),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(x^3 - 1)*x^6), x)
```

Sympy [A] time = 2.88296, size = 34, normalized size = 0.22

$$-\frac{i\,\Gamma\left(-\frac{5}{3}\right)\,{}_{2}F_{1}\left(\begin{matrix}-\frac{5}{3},\frac{1}{2}\\-\frac{2}{3}\end{matrix}\middle|x^{3}\right)}{3x^{5}\,\Gamma\left(-\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**6/(x**3-1)**(1/2),x)
```

```
[Out] -I*gamma(-5/3)*hyper((-5/3, 1/2), (-2/3,), x**3)/(3*x**5*gamma(-2
/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^3 - 1}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 - 1)*x^6),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(x^3 - 1)*x^6), x)
```

3.487 $\int \frac{x^7}{\sqrt{-1+x^3}}\,dx$

Optimal. Leaf size=294

$$-\frac{80\sqrt{x^3-1}}{91\left(-x-\sqrt{3}+1\right)}+\frac{2}{13}\sqrt{x^3-1}x^5+\frac{20}{91}\sqrt{x^3-1}x^2-\frac{80\sqrt{2}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x+\sqrt{3}+1}{-x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{91\sqrt[4]{3}\sqrt{-\frac{1-x}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}+\frac{40\sqrt[4]{3}\sqrt{2+\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{-x+\sqrt{3}+1}{-x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{91\sqrt{-\frac{1-x}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}$$

```
[Out] (-80*Sqrt[-1 + x^3])/(91*(1 - Sqrt[3] - x)) + (20*x^2*Sqrt[-1 + x
^3])/91 + (2*x^5*Sqrt[-1 + x^3])/13 + (40*3^(1/4)*Sqrt[2 + Sqrt[3
]]*(1 - x)*Sqrt[(1 + x + x^2)/(1 - Sqrt[3] - x)^2]*EllipticE[ArcS
in[(1 + Sqrt[3] - x)/(1 - Sqrt[3] - x)], -7 + 4*Sqrt[3]])/(91*Sqr
t[-((1 - x)/(1 - Sqrt[3] - x)^2)]*Sqrt[-1 + x^3]) - (80*Sqrt[2]*(
1 - x)*Sqrt[(1 + x + x^2)/(1 - Sqrt[3] - x)^2]*EllipticF[ArcSin[(
1 + Sqrt[3] - x)/(1 - Sqrt[3] - x)], -7 + 4*Sqrt[3]])/(91*3^(1/4)
*Sqrt[-((1 - x)/(1 - Sqrt[3] - x)^2)]*Sqrt[-1 + x^3])
```

Rubi [A] time = 0.205058, antiderivative size = 294, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$-\frac{80\sqrt{x^3-1}}{91\left(-x-\sqrt{3}+1\right)}+\frac{2}{13}\sqrt{x^3-1}x^5+\frac{20}{91}\sqrt{x^3-1}x^2-\frac{80\sqrt{2}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x+\sqrt{3}+1}{-x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{91\sqrt[4]{3}\sqrt{-\frac{1-x}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}+\frac{40\sqrt[4]{3}\sqrt{2+\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{-x+\sqrt{3}+1}{-x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{91\sqrt{-\frac{1-x}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7/Sqrt[-1 + x^3],x]
```

```
[Out] (-80*Sqrt[-1 + x^3])/(91*(1 - Sqrt[3] - x)) + (20*x^2*Sqrt[-1 + x
^3])/91 + (2*x^5*Sqrt[-1 + x^3])/13 + (40*3^(1/4)*Sqrt[2 + Sqrt[3
]]*(1 - x)*Sqrt[(1 + x + x^2)/(1 - Sqrt[3] - x)^2]*EllipticE[ArcS
in[(1 + Sqrt[3] - x)/(1 - Sqrt[3] - x)], -7 + 4*Sqrt[3]])/(91*Sqr
t[-((1 - x)/(1 - Sqrt[3] - x)^2)]*Sqrt[-1 + x^3]) - (80*Sqrt[2]*(
1 - x)*Sqrt[(1 + x + x^2)/(1 - Sqrt[3] - x)^2]*EllipticF[ArcSin[(
1 + Sqrt[3] - x)/(1 - Sqrt[3] - x)], -7 + 4*Sqrt[3]])/(91*3^(1/4)
*Sqrt[-((1 - x)/(1 - Sqrt[3] - x)^2)]*Sqrt[-1 + x^3])
```

Rubi in Sympy [A] time = 14.3131, size = 236, normalized size = 0.8

$$\frac{2x^5\sqrt{x^3-1}}{13}+\frac{20x^2\sqrt{x^3-1}}{91}-\frac{80\sqrt{x^3-1}}{91\left(-x-\sqrt{3}+1\right)}+\frac{40\sqrt[4]{3}\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{\sqrt{3}+2}\,(-x+1)\,E\left(\operatorname{asin}\left(\frac{-x+1+\sqrt{3}}{-x-\sqrt{3}+1}\right)\middle|-7+4\sqrt{3}\right)}{91\sqrt{\frac{x-1}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}-\frac{80\sqrt{2}\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}\,(-x+1)\,F\left(\operatorname{asin}\left(\frac{-x+1+\sqrt{3}}{-x-\sqrt{3}+1}\right)\middle|-7+4\sqrt{3}\right)}{273\sqrt{\frac{x-1}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7/(x**3-1)**(1/2),x)
```

```
[Out] 2*x**5*sqrt(x**3 - 1)/13 + 20*x**2*sqrt(x**3 - 1)/91 - 80*sqrt(x*
*3 - 1)/(91*(-x - sqrt(3) + 1)) + 40*3**(1/4)*sqrt((x**2 + x + 1)
/(-x - sqrt(3) + 1)**2)*sqrt(sqrt(3) + 2)*(-x + 1)*elliptic_e(asi
n((-x + 1 + sqrt(3))/(-x - sqrt(3) + 1)), -7 + 4*sqrt(3))/(91*sqr
t((x - 1)/(-x - sqrt(3) + 1)**2)*sqrt(x**3 - 1)) - 80*sqrt(2)*3**
(3/4)*sqrt((x**2 + x + 1)/(-x - sqrt(3) + 1)**2)*(-x + 1)*ellipti
c_f(asin((-x + 1 + sqrt(3))/(-x - sqrt(3) + 1)), -7 + 4*sqrt(3))/
(273*sqrt((x - 1)/(-x - sqrt(3) + 1)**2)*sqrt(x**3 - 1))
```

Mathematica [C] time = 0.223445, size = 142, normalized size = 0.48

$$\frac{2\left(3\left(x^3-1\right)\left(7x^3+10\right)x^2+40\sqrt[6]{-1}3^{3/4}\sqrt{(-1)^{5/6}(x-1)}\sqrt{x^2+x+1}\left(\sqrt[3]{-1}F\left(\sin^{-1}\left(\frac{\sqrt{-ix-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)-i\sqrt{3}E\left(\sin^{-1}\left(\sqrt{}\right.\right.\right.\right.}{273\sqrt{x^3-1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^7/Sqrt[-1 + x^3],x]
```

```
[Out] (2*(3*x^2*(-1 + x^3)*(10 + 7*x^3) + 40*(-1)^(1/6)*3^(3/4)*Sqrt[(-
1)^(5/6)*(-1 + x)]*Sqrt[1 + x + x^2]*((-I)*Sqrt[3]*EllipticE[ArcS
in[Sqrt[-(-1)^(5/6) - I*x]/3^(1/4)], (-1)^(1/3)] + (-1)^(1/3)*Ell
ipticF[ArcSin[Sqrt[-(-1)^(5/6) - I*x]/3^(1/4)], (-1)^(1/3)])))/(2
73*Sqrt[-1 + x^3])
```

Maple [A] time = 0.026, size = 198, normalized size = 0.7

$$\frac{2\,x^5}{13}\sqrt{x^3-1}+\frac{20\,x^2}{91}\sqrt{x^3-1}+\frac{-120-40\,i\sqrt{3}}{91}\sqrt{\frac{-1+x}{-\frac{3}{2}-\frac{i}{2}\sqrt{3}}}\sqrt{\frac{1}{\frac{3}{2}-\frac{i}{2}\sqrt{3}}\left(x+\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)}\sqrt{\frac{1}{\frac{3}{2}+\frac{i}{2}\sqrt{3}}\left(x+\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)}\left(\left(\frac{3}{2}-\frac{i}{2}\sqrt{3}\right)EllipticE\left(\sqrt{\frac{-1+x}{-\frac{3}{2}-\frac{i}{2}\sqrt{3}}},\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7/(x^3-1)^(1/2),x)
```

```
[Out] 2/13*x^5*(x^3-1)^(1/2)+20/91*x^2*(x^3-1)^(1/2)+80/91*(-3/2-1/2*I*
3^(1/2))*((-1+x)/(-3/2-1/2*I*3^(1/2)))^(1/2)*((x+1/2-1/2*I*3^(1/2
))/(3/2-1/2*I*3^(1/2)))^(1/2)*((x+1/2+1/2*I*3^(1/2))/(3/2+1/2*I*3
^(1/2)))^(1/2)/(x^3-1)^(1/2)*((3/2-1/2*I*3^(1/2))*EllipticE(((-1+
```

```
x)/(-3/2-1/2*I*3^(1/2)))^(1/2),((3/2+1/2*I*3^(1/2))/(3/2-1/2*I*3^
(1/2)))^(1/2))+(-1/2+1/2*I*3^(1/2))*EllipticF(((-1+x)/(-3/2-1/2*I
*3^(1/2)))^(1/2),((3/2+1/2*I*3^(1/2))/(3/2-1/2*I*3^(1/2)))^(1/2))
)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^7}{\sqrt{x^3-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(x^3 - 1),x, algorithm="maxima")
```

```
[Out] integrate(x^7/sqrt(x^3 - 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^7}{\sqrt{x^3-1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(x^3 - 1),x, algorithm="fricas")
```

```
[Out] integral(x^7/sqrt(x^3 - 1), x)
```

Sympy [A] time = 2.56774, size = 27, normalized size = 0.09

$$-\frac{ix^8\,\Gamma\left(\frac{8}{3}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{8}{3}\\\frac{11}{3}\end{matrix}\middle|x^3\right)}{3\,\Gamma\left(\frac{11}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(x**3-1)**(1/2),x)
```

```
[Out] -I*x**8*gamma(8/3)*hyper((1/2, 8/3), (11/3,), x**3)/(3*gamma(11/3
))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^7}{\sqrt{x^3-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(x^3 - 1),x, algorithm="giac")
```

```
[Out] integrate(x^7/sqrt(x^3 - 1), x)
```

3.488 $\int \frac{x^4}{\sqrt{-1+x^3}}\,dx$

Optimal. Leaf size=278

$$-\frac{8\sqrt{x^3-1}}{7\left(-x-\sqrt{3}+1\right)}+\frac{2}{7}\sqrt{x^3-1}x^2-\frac{8\sqrt{2}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x+\sqrt{3}+1}{-x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{7\sqrt[4]{3}\sqrt{-\frac{1-x}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}+\frac{4\sqrt[4]{3}\sqrt{2+\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{-x+\sqrt{3}+1}{-x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{7\sqrt{-\frac{1-x}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}$$

```
[Out] (-8*Sqrt[-1 + x^3])/(7*(1 - Sqrt[3] - x)) + (2*x^2*Sqrt[-1 + x^3]
)/7 + (4*3^(1/4)*Sqrt[2 + Sqrt[3]]*(1 - x)*Sqrt[(1 + x + x^2)/(1
- Sqrt[3] - x)^2]*EllipticE[ArcSin[(1 + Sqrt[3] - x)/(1 - Sqrt[3]
 - x)], -7 + 4*Sqrt[3]])/(7*Sqrt[-((1 - x)/(1 - Sqrt[3] - x)^2)]*
Sqrt[-1 + x^3]) - (8*Sqrt[2]*(1 - x)*Sqrt[(1 + x + x^2)/(1 - Sqrt
[3] - x)^2]*EllipticF[ArcSin[(1 + Sqrt[3] - x)/(1 - Sqrt[3] - x)]
, -7 + 4*Sqrt[3]])/(7*3^(1/4)*Sqrt[-((1 - x)/(1 - Sqrt[3] - x)^2)
]*Sqrt[-1 + x^3])
```

Rubi [A] time = 0.165347, antiderivative size = 278, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$

$$-\frac{8\sqrt{x^3-1}}{7\left(-x-\sqrt{3}+1\right)}+\frac{2}{7}\sqrt{x^3-1}x^2-\frac{8\sqrt{2}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x+\sqrt{3}+1}{-x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{7\sqrt[4]{3}\sqrt{-\frac{1-x}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}+\frac{4\sqrt[4]{3}\sqrt{2+\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{-x+\sqrt{3}+1}{-x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{7\sqrt{-\frac{1-x}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/Sqrt[-1 + x^3],x]
```

```
[Out] (-8*Sqrt[-1 + x^3])/(7*(1 - Sqrt[3] - x)) + (2*x^2*Sqrt[-1 + x^3]
)/7 + (4*3^(1/4)*Sqrt[2 + Sqrt[3]]*(1 - x)*Sqrt[(1 + x + x^2)/(1
- Sqrt[3] - x)^2]*EllipticE[ArcSin[(1 + Sqrt[3] - x)/(1 - Sqrt[3]
 - x)], -7 + 4*Sqrt[3]])/(7*Sqrt[-((1 - x)/(1 - Sqrt[3] - x)^2)]*
Sqrt[-1 + x^3]) - (8*Sqrt[2]*(1 - x)*Sqrt[(1 + x + x^2)/(1 - Sqrt
[3] - x)^2]*EllipticF[ArcSin[(1 + Sqrt[3] - x)/(1 - Sqrt[3] - x)]
, -7 + 4*Sqrt[3]])/(7*3^(1/4)*Sqrt[-((1 - x)/(1 - Sqrt[3] - x)^2)
]*Sqrt[-1 + x^3])
```

Rubi in Sympy [A] time = 11.8666, size = 221, normalized size = 0.79

$$\frac{2x^2\sqrt{x^3-1}}{7}-\frac{8\sqrt{x^3-1}}{7\left(-x-\sqrt{3}+1\right)}+\frac{4\sqrt[4]{3}\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{\sqrt{3}+2}\,(-x+1)\,E\left(\operatorname{asin}\left(\frac{-x+1+\sqrt{3}}{-x-\sqrt{3}+1}\right)\middle|-7+4\sqrt{3}\right)}{7\sqrt{\frac{x-1}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}-\frac{8\sqrt{2}\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}\,(-x+1)\,F\left(\operatorname{asin}\left(\frac{-x+1+\sqrt{3}}{-x-\sqrt{3}+1}\right)\middle|-7+4\sqrt{3}\right)}{21\sqrt{\frac{x-1}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(x**3-1)**(1/2),x)
```

```
[Out] 2*x**2*sqrt(x**3 - 1)/7 - 8*sqrt(x**3 - 1)/(7*(-x - sqrt(3) + 1))
 + 4*3**(1/4)*sqrt((x**2 + x + 1)/(-x - sqrt(3) + 1)**2)*sqrt(sqr
t(3) + 2)*(-x + 1)*elliptic_e(asin((-x + 1 + sqrt(3))/(-x - sqrt(
3) + 1)), -7 + 4*sqrt(3))/(7*sqrt((x - 1)/(-x - sqrt(3) + 1)**2)*
sqrt(x**3 - 1)) - 8*sqrt(2)*3**(3/4)*sqrt((x**2 + x + 1)/(-x - sq
rt(3) + 1)**2)*(-x + 1)*elliptic_f(asin((-x + 1 + sqrt(3))/(-x -
sqrt(3) + 1)), -7 + 4*sqrt(3))/(21*sqrt((x - 1)/(-x - sqrt(3) + 1
)**2)*sqrt(x**3 - 1))
```

Mathematica [C] time = 0.288045, size = 135, normalized size = 0.49

$$\frac{2\left(3\left(x^3-1\right)x^2+4\sqrt[6]{-1}3^{3/4}\sqrt{(-1)^{5/6}(x-1)}\sqrt{x^2+x+1}\left(\sqrt[3]{-1}F\left(\sin^{-1}\left(\frac{\sqrt{-ix-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)-i\sqrt{3}E\left(\sin^{-1}\left(\frac{\sqrt{-ix-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\right.\right.\right.}{21\sqrt{x^3-1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^4/Sqrt[-1 + x^3],x]
```

```
[Out] (2*(3*x^2*(-1 + x^3) + 4*(-1)^(1/6)*3^(3/4)*Sqrt[(-1)^(5/6)*(-1 +
 x)]*Sqrt[1 + x + x^2]*((-I)*Sqrt[3]*EllipticE[ArcSin[Sqrt[-(-1)^
(5/6) - I*x]/3^(1/4)], (-1)^(1/3)] + (-1)^(1/3)*EllipticF[ArcSin[
Sqrt[-(-1)^(5/6) - I*x]/3^(1/4)], (-1)^(1/3)])))/(21*Sqrt[-1 + x^
3])
```

Maple [A] time = 0.024, size = 186, normalized size = 0.7

$$\frac{2x^2}{7}\sqrt{x^3-1}$$
$$+\frac{-4i\sqrt{3}-12}{7}\sqrt{\frac{-1+x}{-\frac{3}{2}-\frac{i}{2}\sqrt{3}}}\sqrt{\frac{1}{\frac{3}{2}-\frac{i}{2}\sqrt{3}}\left(x+\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)}\sqrt{\frac{1}{\frac{3}{2}+\frac{i}{2}\sqrt{3}}\left(x+\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)}\left(\left(\frac{3}{2}-\frac{i}{2}\sqrt{3}\right)EllipticE\left(\sqrt{\frac{-1+x}{-\frac{3}{2}-\frac{i}{2}\sqrt{3}}},\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(x^3-1)^(1/2),x)
```

```
[Out] 2/7*x^2*(x^3-1)^(1/2)+8/7*(-3/2-1/2*I*3^(1/2))*((-1+x)/(-3/2-1/2*
I*3^(1/2)))^(1/2)*((x+1/2-1/2*I*3^(1/2))/(3/2-1/2*I*3^(1/2)))^(1/
2)*((x+1/2+1/2*I*3^(1/2))/(3/2+1/2*I*3^(1/2)))^(1/2)/(x^3-1)^(1/2
)*((3/2-1/2*I*3^(1/2))*EllipticE(((-1+x)/(-3/2-1/2*I*3^(1/2)))^(1
/2),((3/2+1/2*I*3^(1/2))/(3/2-1/2*I*3^(1/2)))^(1/2))+(-1/2+1/2*I*
3^(1/2))*EllipticF(((-1+x)/(-3/2-1/2*I*3^(1/2)))^(1/2),((3/2+1/2*
I*3^(1/2))/(3/2-1/2*I*3^(1/2)))^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\sqrt{x^3-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(x^3 - 1),x, algorithm="maxima")
```

```
[Out] integrate(x^4/sqrt(x^3 - 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^4}{\sqrt{x^3-1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(x^3 - 1),x, algorithm="fricas")
```

```
[Out] integral(x^4/sqrt(x^3 - 1), x)
```

Sympy [A] time = 2.09823, size = 27, normalized size = 0.1

$$-\frac{ix^5\Gamma\left(\frac{5}{3}\right){}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{5}{3}\\\frac{8}{3}\end{matrix}\middle| x^3\right)}{3\Gamma\left(\frac{8}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(x**3-1)**(1/2),x)
```

```
[Out] -I*x**5*gamma(5/3)*hyper((1/2, 5/3), (8/3,), x**3)/(3*gamma(8/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\sqrt{x^3-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(x^3 - 1),x, algorithm="giac")
```

```
[Out] integrate(x^4/sqrt(x^3 - 1), x)
```

3.489 $\int \frac{x}{\sqrt{-1+x^3}}\,dx$

Optimal. Leaf size=255

$$-\frac{2\sqrt{x^3-1}}{-x-\sqrt{3}+1}-\frac{2\sqrt{2}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x+\sqrt{3}+1}{-x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{\sqrt[4]{3}\sqrt{-\frac{1-x}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}+\frac{\sqrt[4]{3}\sqrt{2+\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{-x+\sqrt{3}+1}{-x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{\sqrt{-\frac{1-x}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}$$

```
[Out] (-2*Sqrt[-1 + x^3])/(1 - Sqrt[3] - x) + (3^(1/4)*Sqrt[2 + Sqrt[3]
]*(1 - x)*Sqrt[(1 + x + x^2)/(1 - Sqrt[3] - x)^2]*EllipticE[ArcSi
n[(1 + Sqrt[3] - x)/(1 - Sqrt[3] - x)], -7 + 4*Sqrt[3]])/(Sqrt[-(
(1 - x)/(1 - Sqrt[3] - x)^2)]*Sqrt[-1 + x^3]) - (2*Sqrt[2]*(1 - x
)*Sqrt[(1 + x + x^2)/(1 - Sqrt[3] - x)^2]*EllipticF[ArcSin[(1 + S
qrt[3] - x)/(1 - Sqrt[3] - x)], -7 + 4*Sqrt[3]])/(3^(1/4)*Sqrt[-(
(1 - x)/(1 - Sqrt[3] - x)^2)]*Sqrt[-1 + x^3])
```

Rubi [A] time = 0.1201, antiderivative size = 255, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.273$

$$-\frac{2\sqrt{x^3-1}}{-x-\sqrt{3}+1}-\frac{2\sqrt{2}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x+\sqrt{3}+1}{-x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{\sqrt[4]{3}\sqrt{-\frac{1-x}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}+\frac{\sqrt[4]{3}\sqrt{2+\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{-x+\sqrt{3}+1}{-x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{\sqrt{-\frac{1-x}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/Sqrt[-1 + x^3],x]
```

```
[Out] (-2*Sqrt[-1 + x^3])/(1 - Sqrt[3] - x) + (3^(1/4)*Sqrt[2 + Sqrt[3]
]*(1 - x)*Sqrt[(1 + x + x^2)/(1 - Sqrt[3] - x)^2]*EllipticE[ArcSi
n[(1 + Sqrt[3] - x)/(1 - Sqrt[3] - x)], -7 + 4*Sqrt[3]])/(Sqrt[-(
(1 - x)/(1 - Sqrt[3] - x)^2)]*Sqrt[-1 + x^3]) - (2*Sqrt[2]*(1 - x
)*Sqrt[(1 + x + x^2)/(1 - Sqrt[3] - x)^2]*EllipticF[ArcSin[(1 + S
qrt[3] - x)/(1 - Sqrt[3] - x)], -7 + 4*Sqrt[3]])/(3^(1/4)*Sqrt[-(
(1 - x)/(1 - Sqrt[3] - x)^2)]*Sqrt[-1 + x^3])
```

Rubi in Sympy [A] time = 9.2951, size = 199, normalized size = 0.78

$$-\frac{2\sqrt{x^3-1}}{-x-\sqrt{3}+1}+\frac{\sqrt[4]{3}\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{\sqrt{3}+2}\,(-x+1)\,E\left(\operatorname{asin}\left(\frac{-x+1+\sqrt{3}}{-x-\sqrt{3}+1}\right)\middle|-7+4\sqrt{3}\right)}{\sqrt{\frac{x-1}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}-\frac{2\sqrt{2}\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}\,(-x+1)\,F\left(\operatorname{asin}\left(\frac{-x+1+\sqrt{3}}{-x-\sqrt{3}+1}\right)\middle|-7+4\sqrt{3}\right)}{3\sqrt{\frac{x-1}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(x**3-1)**(1/2),x)
```

```
[Out] -2*sqrt(x**3 - 1)/(-x - sqrt(3) + 1) + 3**(1/4)*sqrt((x**2 + x +
1)/(-x - sqrt(3) + 1)**2)*sqrt(sqrt(3) + 2)*(-x + 1)*elliptic_e(a
sin((-x + 1 + sqrt(3))/(-x - sqrt(3) + 1)), -7 + 4*sqrt(3))/(sqrt
((x - 1)/(-x - sqrt(3) + 1)**2)*sqrt(x**3 - 1)) - 2*sqrt(2)*3**(3
/4)*sqrt((x**2 + x + 1)/(-x - sqrt(3) + 1)**2)*(-x + 1)*elliptic_
f(asin((-x + 1 + sqrt(3))/(-x - sqrt(3) + 1)), -7 + 4*sqrt(3))/(3
*sqrt((x - 1)/(-x - sqrt(3) + 1)**2)*sqrt(x**3 - 1))
```

Mathematica [C] time = 0.0634334, size = 120, normalized size = 0.47

$$\frac{2\sqrt[6]{-1}\sqrt{(-1)^{5/6}(x-1)}\sqrt{x^2+x+1}\left(\sqrt[3]{-1}F\left(\sin^{-1}\left(\frac{\sqrt{-ix-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)-i\sqrt{3}E\left(\sin^{-1}\left(\frac{\sqrt{-ix-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)\right)}{\sqrt[4]{3}\sqrt{x^3-1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x/Sqrt[-1 + x^3],x]
```

```
[Out] (2*(-1)^(1/6)*Sqrt[(-1)^(5/6)*(-1 + x)]*Sqrt[1 + x + x^2]*((-I)*S
qrt[3]*EllipticE[ArcSin[Sqrt[-(-1)^(5/6) - I*x]/3^(1/4)], (-1)^(1
/3)] + (-1)^(1/3)*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - I*x]/3^(1/4
)], (-1)^(1/3)]))/(3^(1/4)*Sqrt[-1 + x^3])
```

Maple [A] time = 0.022, size = 173, normalized size = 0.7

$$2\,\frac{-3/2-i/2\sqrt{3}}{\sqrt{x^3-1}}\sqrt{\frac{-1+x}{-3/2-i/2\sqrt{3}}}\sqrt{\frac{x+1/2-i/2\sqrt{3}}{3/2-i/2\sqrt{3}}}\sqrt{\frac{x+1/2+i/2\sqrt{3}}{3/2+i/2\sqrt{3}}}\left(\left(3/2-i/2\sqrt{3}\right)\mathit{EllipticE}\left(\sqrt{\frac{-1+x}{-3/2-i/2\sqrt{3}}},\sqrt{\frac{3/2+}{3/2-}}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(x^3-1)^(1/2),x)
```

```
[Out] 2*(-3/2-1/2*I*3^(1/2))*((-1+x)/(-3/2-1/2*I*3^(1/2)))^(1/2)*((x+1/
2-1/2*I*3^(1/2))/(3/2-1/2*I*3^(1/2)))^(1/2)*((x+1/2+1/2*I*3^(1/2)
)/(3/2+1/2*I*3^(1/2)))^(1/2)/(x^3-1)^(1/2)*((3/2-1/2*I*3^(1/2))*E
llipticE(((-1+x)/(-3/2-1/2*I*3^(1/2)))^(1/2),((3/2+1/2*I*3^(1/2))
/(3/2-1/2*I*3^(1/2)))^(1/2))+(-1/2+1/2*I*3^(1/2))*EllipticF(((-1+
x)/(-3/2-1/2*I*3^(1/2)))^(1/2),((3/2+1/2*I*3^(1/2))/(3/2-1/2*I*3^
(1/2)))^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt{x^3-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(x^3 - 1),x, algorithm="maxima")
```

```
[Out] integrate(x/sqrt(x^3 - 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x}{\sqrt{x^3-1}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(x^3 - 1),x, algorithm="fricas")
```

```
[Out] integral(x/sqrt(x^3 - 1), x)
```

Sympy [A] time = 1.89028, size = 27, normalized size = 0.11

$$-\frac{ix^2\Gamma\left(\frac{2}{3}\right){}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{2}{3}\\\frac{5}{3}\end{matrix}\middle|x^3\right)}{3\Gamma\left(\frac{5}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(x**3-1)**(1/2),x)
```

```
[Out] -I*x**2*gamma(2/3)*hyper((1/2, 2/3), (5/3,), x**3)/(3*gamma(5/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt{x^3-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(x^3 - 1),x, algorithm="giac")
```

```
[Out] integrate(x/sqrt(x^3 - 1), x)
```

3.490 $\int \frac{1}{x^2\sqrt{-1+x^3}}\,dx$

Optimal. Leaf size=269

$$\frac{\sqrt{x^3-1}}{-x-\sqrt{3}+1}+\frac{\sqrt{x^3-1}}{x}+\frac{\sqrt{2}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x+\sqrt{3}+1}{-x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{\sqrt[4]{3}\sqrt{-\frac{1-x}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}-\frac{\sqrt[4]{3}\sqrt{2+\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{-x+\sqrt{3}+1}{-x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{2\sqrt{-\frac{1-x}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}$$

```
[Out] Sqrt[-1 + x^3]/(1 - Sqrt[3] - x) + Sqrt[-1 + x^3]/x - (3^(1/4)*Sq
rt[2 + Sqrt[3]]*(1 - x)*Sqrt[(1 + x + x^2)/(1 - Sqrt[3] - x)^2]*E
llipticE[ArcSin[(1 + Sqrt[3] - x)/(1 - Sqrt[3] - x)], -7 + 4*Sqrt
[3]])/(2*Sqrt[-((1 - x)/(1 - Sqrt[3] - x)^2)]*Sqrt[-1 + x^3]) + (
Sqrt[2]*(1 - x)*Sqrt[(1 + x + x^2)/(1 - Sqrt[3] - x)^2]*EllipticF
[ArcSin[(1 + Sqrt[3] - x)/(1 - Sqrt[3] - x)], -7 + 4*Sqrt[3]])/(3
^(1/4)*Sqrt[-((1 - x)/(1 - Sqrt[3] - x)^2)]*Sqrt[-1 + x^3])
```

Rubi [A] time = 0.160687, antiderivative size = 269, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$

$$\frac{\sqrt{x^3-1}}{-x-\sqrt{3}+1}+\frac{\sqrt{x^3-1}}{x}+\frac{\sqrt{2}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x+\sqrt{3}+1}{-x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{\sqrt[4]{3}\sqrt{-\frac{1-x}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}-\frac{\sqrt[4]{3}\sqrt{2+\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{-x+\sqrt{3}+1}{-x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{2\sqrt{-\frac{1-x}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*Sqrt[-1 + x^3]),x]
```


```
[Out] Sqrt[-1 + x^3]/(1 - Sqrt[3] - x) + Sqrt[-1 + x^3]/x - (3^(1/4)*Sq
rt[2 + Sqrt[3]]*(1 - x)*Sqrt[(1 + x + x^2)/(1 - Sqrt[3] - x)^2]*E
llipticE[ArcSin[(1 + Sqrt[3] - x)/(1 - Sqrt[3] - x)], -7 + 4*Sqrt
[3]])/(2*Sqrt[-((1 - x)/(1 - Sqrt[3] - x)^2)]*Sqrt[-1 + x^3]) + (
Sqrt[2]*(1 - x)*Sqrt[(1 + x + x^2)/(1 - Sqrt[3] - x)^2]*EllipticF
[ArcSin[(1 + Sqrt[3] - x)/(1 - Sqrt[3] - x)], -7 + 4*Sqrt[3]])/(3
^(1/4)*Sqrt[-((1 - x)/(1 - Sqrt[3] - x)^2)]*Sqrt[-1 + x^3])
```

Rubi in Sympy [A] time = 11.9169, size = 207, normalized size = 0.77

$$\frac{\sqrt{x^3-1}}{-x-\sqrt{3}+1}-\frac{\sqrt[4]{3}\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{\sqrt{3}+2}\,(-x+1)\,E\left(\operatorname{asin}\left(\frac{-x+1+\sqrt{3}}{-x-\sqrt{3}+1}\right)\middle|-7+4\sqrt{3}\right)}{2\sqrt{\frac{x-1}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}+\frac{\sqrt{2}\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}\,(-x+1)\,F\left(\operatorname{asin}\left(\frac{-x+1+\sqrt{3}}{-x-\sqrt{3}+1}\right)\middle|-7+4\sqrt{3}\right)}{3\sqrt{\frac{x-1}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}+\frac{\sqrt{x^3-1}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(x**3-1)**(1/2),x)
```

```
[Out] sqrt(x**3 - 1)/(-x - sqrt(3) + 1) - 3**(1/4)*sqrt((x**2 + x + 1)/
(-x - sqrt(3) + 1)**2)*sqrt(sqrt(3) + 2)*(-x + 1)*elliptic_e(asin
((-x + 1 + sqrt(3))/(-x - sqrt(3) + 1)), -7 + 4*sqrt(3))/(2*sqrt(
(x - 1)/(-x - sqrt(3) + 1)**2)*sqrt(x**3 - 1)) + sqrt(2)*3**(3/4)
*sqrt((x**2 + x + 1)/(-x - sqrt(3) + 1)**2)*(-x + 1)*elliptic_f(a
sin((-x + 1 + sqrt(3))/(-x - sqrt(3) + 1)), -7 + 4*sqrt(3))/(3*sq
rt((x - 1)/(-x - sqrt(3) + 1)**2)*sqrt(x**3 - 1)) + sqrt(x**3 - 1
)/x
```

Mathematica [C] time = 0.242693, size = 130, normalized size = 0.48

$$\frac{\sqrt{x^3-1}}{x}+\frac{(-1)^{2/3}\sqrt{(-1)^{5/6}(x-1)}\sqrt{x^2+x+1}\left((-1)^{5/6}F\left(\sin^{-1}\left(\frac{\sqrt{-ix-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)+\sqrt{3}E\left(\sin^{-1}\left(\frac{\sqrt{-ix-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)\right)}{\sqrt[4]{3}\sqrt{x^3-1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/(x^2*Sqrt[-1 + x^3]),x]
```

```
[Out] Sqrt[-1 + x^3]/x + ((-1)^(2/3)*Sqrt[(-1)^(5/6)*(-1 + x)]*Sqrt[1 +
 x + x^2]*(Sqrt[3]*EllipticE[ArcSin[Sqrt[-(-1)^(5/6) - I*x]/3^(1/
4)], (-1)^(1/3)] + (-1)^(5/6)*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) -
 I*x]/3^(1/4)], (-1)^(1/3)]))/(3^(1/4)*Sqrt[-1 + x^3])
```

Maple [A] time = 0.028, size = 185, normalized size = 0.7

$$\frac{1}{x}\sqrt{x^3-1}$$
$$-(-\frac{3}{2}-\frac{i}{2}\sqrt{3})\sqrt{\frac{-1+x}{-\frac{3}{2}-\frac{i}{2}\sqrt{3}}}\sqrt{\frac{1}{\frac{3}{2}-\frac{i}{2}\sqrt{3}}\left(x+\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)}\sqrt{\frac{1}{\frac{3}{2}+\frac{i}{2}\sqrt{3}}\left(x+\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)}\left(\left(\frac{3}{2}-\frac{i}{2}\sqrt{3}\right)\mathit{EllipticE}\left(\sqrt{\frac{-1+x}{-\frac{3}{2}-\frac{i}{2}\sqrt{3}}},\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(x^3-1)^(1/2),x)
```

```
[Out] (x^3-1)^(1/2)/x-(-3/2-1/2*I*3^(1/2))*((-1+x)/(-3/2-1/2*I*3^(1/2))
)^(1/2)*((x+1/2-1/2*I*3^(1/2))/(3/2-1/2*I*3^(1/2)))^(1/2)*((x+1/2
+1/2*I*3^(1/2))/(3/2+1/2*I*3^(1/2)))^(1/2)/(x^3-1)^(1/2)*((3/2-1/
2*I*3^(1/2))*EllipticE(((-1+x)/(-3/2-1/2*I*3^(1/2)))^(1/2),((3/2+
1/2*I*3^(1/2))/(3/2-1/2*I*3^(1/2)))^(1/2))+(-1/2+1/2*I*3^(1/2))*E
llipticF(((-1+x)/(-3/2-1/2*I*3^(1/2)))^(1/2),((3/2+1/2*I*3^(1/2))
/(3/2-1/2*I*3^(1/2)))^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^3-1}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 - 1)*x^2),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(x^3 - 1)*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{x^3-1}x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 - 1)*x^2),x, algorithm="fricas")

[Out] integral(1/(sqrt(x^3 - 1)*x^2), x)
```

Sympy [A] time = 2.18406, size = 29, normalized size = 0.11

$$-\frac{i\Gamma\left(-\frac{1}{3}\right){}_2F_1\left(\begin{matrix}-\frac{1}{3},\frac{1}{2}\\ \frac{2}{3}\end{matrix}\middle|x^3\right)}{3x\Gamma\left(\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(x**3-1)**(1/2),x)

[Out] -I*gamma(-1/3)*hyper((-1/3, 1/2), (2/3,), x**3)/(3*x*gamma(2/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\sqrt{x^3-1}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 - 1)*x^2),x, algorithm="giac")

[Out] integrate(1/(sqrt(x^3 - 1)*x^2), x)
```

3.491 $\int \frac{1}{x^5\sqrt{-1+x^3}}\,dx$

Optimal. Leaf size=294

$$\frac{5\sqrt{x^3-1}}{8\left(-x-\sqrt{3}+1\right)}+\frac{5\sqrt{x^3-1}}{8x}+\frac{\sqrt{x^3-1}}{4x^4}+\frac{5(1-x)\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x+\sqrt{3}+1}{-x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{4\sqrt{2}\sqrt[4]{3}\sqrt{-\frac{1-x}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}-\frac{5\sqrt[4]{3}\sqrt{2+\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{-x+\sqrt{3}+1}{-x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{16\sqrt{-\frac{1-x}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}$$

```
[Out] (5*Sqrt[-1 + x^3])/(8*(1 - Sqrt[3] - x)) + Sqrt[-1 + x^3]/(4*x^4)
 + (5*Sqrt[-1 + x^3])/(8*x) - (5*3^(1/4)*Sqrt[2 + Sqrt[3]]*(1 - x
)*Sqrt[(1 + x + x^2)/(1 - Sqrt[3] - x)^2]*EllipticE[ArcSin[(1 + S
qrt[3] - x)/(1 - Sqrt[3] - x)], -7 + 4*Sqrt[3]])/(16*Sqrt[-((1 -
x)/(1 - Sqrt[3] - x)^2)]*Sqrt[-1 + x^3]) + (5*(1 - x)*Sqrt[(1 + x
 + x^2)/(1 - Sqrt[3] - x)^2]*EllipticF[ArcSin[(1 + Sqrt[3] - x)/(
1 - Sqrt[3] - x)], -7 + 4*Sqrt[3]])/(4*Sqrt[2]*3^(1/4)*Sqrt[-((1
- x)/(1 - Sqrt[3] - x)^2)]*Sqrt[-1 + x^3])
```

Rubi [A] time = 0.202563, antiderivative size = 294, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$

$$\frac{5\sqrt{x^3-1}}{8\left(-x-\sqrt{3}+1\right)}+\frac{5\sqrt{x^3-1}}{8x}+\frac{\sqrt{x^3-1}}{4x^4}+\frac{5(1-x)\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{-x+\sqrt{3}+1}{-x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{4\sqrt{2}\sqrt[4]{3}\sqrt{-\frac{1-x}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}-\frac{5\sqrt[4]{3}\sqrt{2+\sqrt{3}}(1-x)\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{-x+\sqrt{3}+1}{-x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{16\sqrt{-\frac{1-x}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^5*Sqrt[-1 + x^3]),x]
```

```
[Out] (5*Sqrt[-1 + x^3])/(8*(1 - Sqrt[3] - x)) + Sqrt[-1 + x^3]/(4*x^4)
 + (5*Sqrt[-1 + x^3])/(8*x) - (5*3^(1/4)*Sqrt[2 + Sqrt[3]]*(1 - x
)*Sqrt[(1 + x + x^2)/(1 - Sqrt[3] - x)^2]*EllipticE[ArcSin[(1 + S
qrt[3] - x)/(1 - Sqrt[3] - x)], -7 + 4*Sqrt[3]])/(16*Sqrt[-((1 -
x)/(1 - Sqrt[3] - x)^2)]*Sqrt[-1 + x^3]) + (5*(1 - x)*Sqrt[(1 + x
 + x^2)/(1 - Sqrt[3] - x)^2]*EllipticF[ArcSin[(1 + Sqrt[3] - x)/(
1 - Sqrt[3] - x)], -7 + 4*Sqrt[3]])/(4*Sqrt[2]*3^(1/4)*Sqrt[-((1
- x)/(1 - Sqrt[3] - x)^2)]*Sqrt[-1 + x^3])
```

Rubi in Sympy [A] time = 14.636, size = 233, normalized size = 0.79

$$\frac{5\sqrt{x^3-1}}{8\left(-x-\sqrt{3}+1\right)}-\frac{5\sqrt[4]{3}\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{\sqrt{3}+2}\,(-x+1)\,E\left(\operatorname{asin}\left(\frac{-x+1+\sqrt{3}}{-x-\sqrt{3}+1}\right)\middle|-7+4\sqrt{3}\right)}{16\sqrt{\frac{x-1}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}+\frac{5\sqrt{2}\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2+x+1}{\left(-x-\sqrt{3}+1\right)^2}}\,(-x+1)\,F\left(\operatorname{asin}\left(\frac{-x+1+\sqrt{3}}{-x-\sqrt{3}+1}\right)\middle|-7+4\sqrt{3}\right)}{24\sqrt{\frac{x-1}{\left(-x-\sqrt{3}+1\right)^2}}\sqrt{x^3-1}}+\frac{5\sqrt{x^3-1}}{8x}+\frac{\sqrt{x^3-1}}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**5/(x**3-1)**(1/2),x)
```

```
[Out] 5*sqrt(x**3 - 1)/(8*(-x - sqrt(3) + 1)) - 5*3**(1/4)*sqrt((x**2 +
 x + 1)/(-x - sqrt(3) + 1)**2)*sqrt(sqrt(3) + 2)*(-x + 1)*ellipti
c_e(asin((-x + 1 + sqrt(3))/(-x - sqrt(3) + 1)), -7 + 4*sqrt(3))/
(16*sqrt((x - 1)/(-x - sqrt(3) + 1)**2)*sqrt(x**3 - 1)) + 5*sqrt(
2)*3**(3/4)*sqrt((x**2 + x + 1)/(-x - sqrt(3) + 1)**2)*(-x + 1)*e
lliptic_f(asin((-x + 1 + sqrt(3))/(-x - sqrt(3) + 1)), -7 + 4*sqr
t(3))/(24*sqrt((x - 1)/(-x - sqrt(3) + 1)**2)*sqrt(x**3 - 1)) + 5
*sqrt(x**3 - 1)/(8*x) + sqrt(x**3 - 1)/(4*x**4)
```

Mathematica [C] time = 0.261684, size = 140, normalized size = 0.48

$$\frac{\frac{3(x^3-1)(5x^3+2)}{x^4}+\frac{5\,3^{3/4}(x-1)\sqrt{x^2+x+1}\left(\sqrt[3]{-1}F\left(\sin^{-1}\left(\frac{\sqrt{-ix-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)-i\sqrt{3}E\left(\sin^{-1}\left(\frac{\sqrt{-ix-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)\right)}{\sqrt{(-1)^{5/6}(x-1)}}}{24\sqrt{x^3-1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/(x^5*Sqrt[-1 + x^3]),x]
```

```
[Out] ((3*(-1 + x^3)*(2 + 5*x^3))/x^4 + (5*3^(3/4)*(-1 + x)*Sqrt[1 + x
+ x^2]*((-I)*Sqrt[3]*EllipticE[ArcSin[Sqrt[-(-1)^(5/6) - I*x]/3^(
1/4)], (-1)^(1/3)] + (-1)^(1/3)*EllipticF[ArcSin[Sqrt[-(-1)^(5/6)
 - I*x]/3^(1/4)], (-1)^(1/3)]))/Sqrt[(-1)^(5/6)*(-1 + x)])/(24*Sq
rt[-1 + x^3])
```

Maple [A] time = 0.027, size = 198, normalized size = 0.7

$$\frac{1}{4x^4}\sqrt{x^3-1}+\frac{5}{8x}\sqrt{x^3-1}$$
$$-\frac{-\frac{15}{2}-\frac{5i}{2}\sqrt{3}}{8}\sqrt{\frac{-1+x}{-\frac{3}{2}-\frac{i}{2}\sqrt{3}}}\sqrt{\frac{1}{\frac{3}{2}-\frac{i}{2}\sqrt{3}}\left(x+\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)}\sqrt{\frac{1}{\frac{3}{2}+\frac{i}{2}\sqrt{3}}\left(x+\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)}\left(\left(\frac{3}{2}-\frac{i}{2}\sqrt{3}\right)EllipticE\left(\sqrt{\frac{-1+x}{-\frac{3}{2}-\frac{i}{2}\sqrt{3}}},\sqrt{\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^5/(x^3-1)^(1/2),x)
```

```
[Out] 1/4*(x^3-1)^(1/2)/x^4+5/8*(x^3-1)^(1/2)/x-5/8*(-3/2-1/2*I*3^(1/2)
)*((-1+x)/(-3/2-1/2*I*3^(1/2)))^(1/2)*((x+1/2-1/2*I*3^(1/2))/(3/2
-1/2*I*3^(1/2)))^(1/2)*((x+1/2+1/2*I*3^(1/2))/(3/2+1/2*I*3^(1/2))
)^(1/2)/(x^3-1)^(1/2)*((3/2-1/2*I*3^(1/2))*EllipticE(((-1+x)/(-3/
2-1/2*I*3^(1/2)))^(1/2),((3/2+1/2*I*3^(1/2))/(3/2-1/2*I*3^(1/2)))
^(1/2))+(-1/2+1/2*I*3^(1/2))*EllipticF(((-1+x)/(-3/2-1/2*I*3^(1/2
)))^(1/2),((3/2+1/2*I*3^(1/2))/(3/2-1/2*I*3^(1/2)))^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^3-1}x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 - 1)*x^5),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(x^3 - 1)*x^5), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{x^3-1}x^5},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 - 1)*x^5),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(x^3 - 1)*x^5), x)
```

Sympy [A] time = 2.61475, size = 34, normalized size = 0.12

$$-\frac{i\Gamma\left(-\frac{4}{3}\right){}_2F_1\left(\begin{matrix}-\frac{4}{3},\frac{1}{2}\\-\frac{1}{3}\end{matrix}\middle|x^3\right)}{3x^4\Gamma\left(-\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**5/(x**3-1)**(1/2),x)
```

```
[Out] -I*gamma(-4/3)*hyper((-4/3, 1/2), (-1/3,), x**3)/(3*x**4*gamma(-1
/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\sqrt{x^3-1}x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^3 - 1)*x^5),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(x^3 - 1)*x^5), x)
```

3.492 $\int \frac{x^{11}}{\sqrt{-1-x^3}}\,dx$

Optimal. Leaf size=61

$$\frac{2}{21}\left(-x^3-1\right)^{7/2}+\frac{2}{5}\left(-x^3-1\right)^{5/2}+\frac{2}{3}\left(-x^3-1\right)^{3/2}+\frac{2}{3}\sqrt{-x^3-1}$$

```
[Out] (2*Sqrt[-1 - x^3])/3 + (2*(-1 - x^3)^(3/2))/3 + (2*(-1 - x^3)^(5/
2))/5 + (2*(-1 - x^3)^(7/2))/21
```

Rubi [A] time = 0.0659667, antiderivative size = 61, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2}{21}\left(-x^3-1\right)^{7/2}+\frac{2}{5}\left(-x^3-1\right)^{5/2}+\frac{2}{3}\left(-x^3-1\right)^{3/2}+\frac{2}{3}\sqrt{-x^3-1}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11/Sqrt[-1 - x^3],x]
```

```
[Out] (2*Sqrt[-1 - x^3])/3 + (2*(-1 - x^3)^(3/2))/3 + (2*(-1 - x^3)^(5/
2))/5 + (2*(-1 - x^3)^(7/2))/21
```

Rubi in Sympy [A] time = 7.32734, size = 53, normalized size = 0.87

$$\frac{2\left(-x^3-1\right)^{\frac{7}{2}}}{21}+\frac{2\left(-x^3-1\right)^{\frac{5}{2}}}{5}+\frac{2\left(-x^3-1\right)^{\frac{3}{2}}}{3}+\frac{2\sqrt{-x^3-1}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11/(-x**3-1)**(1/2),x)
```

```
[Out] 2*(-x**3 - 1)**(7/2)/21 + 2*(-x**3 - 1)**(5/2)/5 + 2*(-x**3 - 1)*
*(3/2)/3 + 2*sqrt(-x**3 - 1)/3
```

Mathematica [A] time = 0.0167002, size = 32, normalized size = 0.52

$$-\frac{2}{105}\sqrt{-x^3-1}\left(5x^9-6x^6+8x^3-16\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11/Sqrt[-1 - x^3],x]
```

```
[Out] (-2*Sqrt[-1 - x^3]*(-16 + 8*x^3 - 6*x^6 + 5*x^9))/105
```

Maple [A] time = 0.007, size = 40, normalized size = 0.7

$$\frac{(2+2x)\left(x^2-x+1\right)\left(5x^9-6x^6+8x^3-16\right)}{105}\frac{1}{\sqrt{-x^3-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11/(-x^3-1)^(1/2),x)
```

```
[Out] 2/105*(1+x)*(x^2-x+1)*(5*x^9-6*x^6+8*x^3-16)/(-x^3-1)^(1/2)
```

Maxima [A] time = 1.43992, size = 61, normalized size = 1.

$$\frac{2}{21}\left(-x^3-1\right)^{\frac{7}{2}}+\frac{2}{5}\left(-x^3-1\right)^{\frac{5}{2}}+\frac{2}{3}\left(-x^3-1\right)^{\frac{3}{2}}+\frac{2}{3}\sqrt{-x^3-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/sqrt(-x^3 - 1),x, algorithm="maxima")
```

```
[Out] 2/21*(-x^3 - 1)^(7/2) + 2/5*(-x^3 - 1)^(5/2) + 2/3*(-x^3 - 1)^(3/
2) + 2/3*sqrt(-x^3 - 1)
```

Fricas [A] time = 0.225686, size = 38, normalized size = 0.62

$$-\frac{2}{105}\left(5x^9-6x^6+8x^3-16\right)\sqrt{-x^3-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/sqrt(-x^3 - 1),x, algorithm="fricas")
```

```
[Out] -2/105*(5*x^9 - 6*x^6 + 8*x^3 - 16)*sqrt(-x^3 - 1)
```

Sympy [A] time = 4.50879, size = 63, normalized size = 1.03

$$-\frac{2x^9\sqrt{-x^3-1}}{21}+\frac{4x^6\sqrt{-x^3-1}}{35}-\frac{16x^3\sqrt{-x^3-1}}{105}+\frac{32\sqrt{-x^3-1}}{105}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11/(-x**3-1)**(1/2),x)
```

```
[Out] -2*x**9*sqrt(-x**3 - 1)/21 + 4*x**6*sqrt(-x**3 - 1)/35 - 16*x**3*
sqrt(-x**3 - 1)/105 + 32*sqrt(-x**3 - 1)/105
```

GIAC/XCAS [A] time = 0.212613, size = 80, normalized size = 1.31

$$-\frac{2}{21}\left(x^3+1\right)^3\sqrt{-x^3-1}+\frac{2}{5}\left(x^3+1\right)^2\sqrt{-x^3-1}+\frac{2}{3}\left(-x^3-1\right)^{\frac{3}{2}}+\frac{2}{3}\sqrt{-x^3-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/sqrt(-x^3 - 1),x, algorithm="giac")
```

```
[Out] -2/21*(x^3 + 1)^3*sqrt(-x^3 - 1) + 2/5*(x^3 + 1)^2*sqrt(-x^3 - 1)
 + 2/3*(-x^3 - 1)^(3/2) + 2/3*sqrt(-x^3 - 1)
```

3.493 $\int \frac{x^8}{\sqrt{-1-x^3}} \, dx$

Optimal. Leaf size=46

$$-\frac{2}{15}\left(-x^3-1\right)^{5/2}-\frac{4}{9}\left(-x^3-1\right)^{3/2}-\frac{2}{3}\sqrt{-x^3-1}$$

```
[Out] (-2*Sqrt[-1 - x^3])/3 - (4*(-1 - x^3)^(3/2))/9 - (2*(-1 - x^3)^(5
/2))/15
```

Rubi [A] time = 0.0532925, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2}{15}\left(-x^3-1\right)^{5/2}-\frac{4}{9}\left(-x^3-1\right)^{3/2}-\frac{2}{3}\sqrt{-x^3-1}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8/Sqrt[-1 - x^3],x]
```

```
[Out] (-2*Sqrt[-1 - x^3])/3 - (4*(-1 - x^3)^(3/2))/9 - (2*(-1 - x^3)^(5
/2))/15
```

Rubi in Sympy [A] time = 5.44626, size = 41, normalized size = 0.89

$$-\frac{2\left(-x^3-1\right)^{\frac{5}{2}}}{15}-\frac{4\left(-x^3-1\right)^{\frac{3}{2}}}{9}-\frac{2\sqrt{-x^3-1}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8/(-x**3-1)**(1/2),x)
```

```
[Out] -2*(-x**3 - 1)**(5/2)/15 - 4*(-x**3 - 1)**(3/2)/9 - 2*sqrt(-x**3
- 1)/3
```

Mathematica [A] time = 0.0138172, size = 27, normalized size = 0.59

$$-\frac{2}{45}\sqrt{-x^3-1}\left(3x^6-4x^3+8\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8/Sqrt[-1 - x^3],x]
```

```
[Out] (-2*Sqrt[-1 - x^3]*(8 - 4*x^3 + 3*x^6))/45
```

Maple [A] time = 0.007, size = 35, normalized size = 0.8

$$\frac{(2+2x)\left(x^2-x+1\right)\left(3x^6-4x^3+8\right)}{45}\frac{1}{\sqrt{-x^3-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8/(-x^3-1)^(1/2),x)
```

```
[Out] 2/45*(1+x)*(x^2-x+1)*(3*x^6-4*x^3+8)/(-x^3-1)^(1/2)
```

Maxima [A] time = 1.43819, size = 46, normalized size = 1.

$$-\frac{2}{15}\left(-x^3-1\right)^{\frac{5}{2}}-\frac{4}{9}\left(-x^3-1\right)^{\frac{3}{2}}-\frac{2}{3}\sqrt{-x^3-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^8/sqrt(-x^3 - 1),x, algorithm="maxima")
```

```
[Out] -2/15*(-x^3 - 1)^(5/2) - 4/9*(-x^3 - 1)^(3/2) - 2/3*sqrt(-x^3 - 1
)
```

Fricas [A] time = 0.225062, size = 31, normalized size = 0.67

$$-\frac{2}{45}\left(3x^6-4x^3+8\right)\sqrt{-x^3-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^8/sqrt(-x^3 - 1),x, algorithm="fricas")
```

```
[Out] -2/45*(3*x^6 - 4*x^3 + 8)*sqrt(-x^3 - 1)
```

Sympy [A] time = 1.89103, size = 46, normalized size = 1.

$$-\frac{2x^6\sqrt{-x^3-1}}{15}+\frac{8x^3\sqrt{-x^3-1}}{45}-\frac{16\sqrt{-x^3-1}}{45}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**8/(-x**3-1)**(1/2),x)
```

```
[Out] -2*x**6*sqrt(-x**3 - 1)/15 + 8*x**3*sqrt(-x**3 - 1)/45 - 16*sqrt(
-x**3 - 1)/45
```

GIAC/XCAS [A] time = 0.216902, size = 55, normalized size = 1.2

$$-\frac{2}{15}\left(x^3+1\right)^2\sqrt{-x^3-1}-\frac{4}{9}\left(-x^3-1\right)^{\frac{3}{2}}-\frac{2}{3}\sqrt{-x^3-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^8/sqrt(-x^3 - 1),x, algorithm="giac")
```

```
[Out] -2/15*(x^3 + 1)^2*sqrt(-x^3 - 1) - 4/9*(-x^3 - 1)^(3/2) - 2/3*sqr
t(-x^3 - 1)
```

3.494 $\int \frac{x^5}{\sqrt{-1-x^3}}\,dx$

Optimal. Leaf size=31

$$\frac{2}{9}\left(-x^3-1\right)^{3/2}+\frac{2}{3}\sqrt{-x^3-1}$$

```
[Out] (2*Sqrt[-1 - x^3])/3 + (2*(-1 - x^3)^(3/2))/9
```

Rubi [A] time = 0.0402142, antiderivative size = 31, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{2}{9}\left(-x^3-1\right)^{3/2}+\frac{2}{3}\sqrt{-x^3-1}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/Sqrt[-1 - x^3],x]

[Out] (2*Sqrt[-1 - x^3])/3 + (2*(-1 - x^3)^(3/2))/9
```

Rubi in Sympy [A] time = 5.10509, size = 26, normalized size = 0.84

$$\frac{2\left(-x^3-1\right)^{\frac{3}{2}}}{9}+\frac{2\sqrt{-x^3-1}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(-x**3-1)**(1/2),x)

[Out] 2*(-x**3 - 1)**(3/2)/9 + 2*sqrt(-x**3 - 1)/3
```

Mathematica [A] time = 0.00833844, size = 20, normalized size = 0.65

$$-\frac{2}{9}\sqrt{-x^3-1}\left(x^3-2\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/Sqrt[-1 - x^3],x]

[Out] (-2*Sqrt[-1 - x^3]*(-2 + x^3))/9
```

Maple [A] time = 0.006, size = 28, normalized size = 0.9

$$\frac{(2+2x)\left(x^2-x+1\right)\left(x^3-2\right)}{9}\frac{1}{\sqrt{-x^3-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(-x^3-1)^(1/2),x)

[Out] 2/9*(1+x)*(x^2-x+1)*(x^3-2)/(-x^3-1)^(1/2)
```

Maxima [A] time = 1.46343, size = 31, normalized size = 1.

$$\frac{2}{9}\left(-x^3-1\right)^{\frac{3}{2}}+\frac{2}{3}\sqrt{-x^3-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(-x^3 - 1),x, algorithm="maxima")
```

```
[Out] 2/9*(-x^3 - 1)^(3/2) + 2/3*sqrt(-x^3 - 1)
```

Fricas [A] time = 0.226734, size = 22, normalized size = 0.71

$$-\frac{2}{9}\left(x^3-2\right)\sqrt{-x^3-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(-x^3 - 1),x, algorithm="fricas")
```

```
[Out] -2/9*(x^3 - 2)*sqrt(-x^3 - 1)
```

Sympy [A] time = 0.764559, size = 29, normalized size = 0.94

$$-\frac{2x^3\sqrt{-x^3-1}}{9}+\frac{4\sqrt{-x^3-1}}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(-x**3-1)**(1/2),x)
```

```
[Out] -2*x**3*sqrt(-x**3 - 1)/9 + 4*sqrt(-x**3 - 1)/9
```

GIAC/XCAS [A] time = 0.211061, size = 31, normalized size = 1.

$$\frac{2}{9}\left(-x^3-1\right)^{\frac{3}{2}}+\frac{2}{3}\sqrt{-x^3-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(-x^3 - 1),x, algorithm="giac")
```

```
[Out] 2/9*(-x^3 - 1)^(3/2) + 2/3*sqrt(-x^3 - 1)
```

3.495 $\int \frac{x^2}{\sqrt{-1-x^3}} \, dx$

Optimal. Leaf size=15

$$-\frac{2}{3}\sqrt{-x^3-1}$$

```
[Out] (-2*Sqrt[-1 - x^3])/3
```

Rubi [A] time = 0.00821236, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$-\frac{2}{3}\sqrt{-x^3-1}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/Sqrt[-1 - x^3],x]

[Out] (-2*Sqrt[-1 - x^3])/3
```

Rubi in Sympy [A] time = 2.05736, size = 14, normalized size = 0.93

$$-\frac{2\sqrt{-x^3-1}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(-x**3-1)**(1/2),x)

[Out] -2*sqrt(-x**3 - 1)/3
```

Mathematica [A] time = 0.0052042, size = 15, normalized size = 1.

$$-\frac{2}{3}\sqrt{-x^3-1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/Sqrt[-1 - x^3],x]

[Out] (-2*Sqrt[-1 - x^3])/3
```

Maple [A] time = 0.006, size = 23, normalized size = 1.5

$$\frac{(2+2x)(x^2-x+1)}{3}\frac{1}{\sqrt{-x^3-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(-x^3-1)^(1/2),x)

[Out] 2/3*(1+x)*(x^2-x+1)/(-x^3-1)^(1/2)
```

Maxima [A] time = 1.44408, size = 15, normalized size = 1.

$$-\frac{2}{3}\sqrt{-x^3-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(-x^3 - 1),x, algorithm="maxima")
```

```
[Out] -2/3*sqrt(-x^3 - 1)
```

Fricas [A] time = 0.228327, size = 15, normalized size = 1.

$$-\frac{2}{3}\sqrt{-x^3-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(-x^3 - 1),x, algorithm="fricas")
```

```
[Out] -2/3*sqrt(-x^3 - 1)
```

Sympy [A] time = 0.339684, size = 14, normalized size = 0.93

$$-\frac{2\sqrt{-x^3-1}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(-x**3-1)**(1/2),x)
```

```
[Out] -2*sqrt(-x**3 - 1)/3
```

GIAC/XCAS [A] time = 0.211047, size = 15, normalized size = 1.

$$-\frac{2}{3}\sqrt{-x^3-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(-x^3 - 1),x, algorithm="giac")
```

```
[Out] -2/3*sqrt(-x^3 - 1)
```

3.496 $\int \frac{1}{x\sqrt{-1-x^3}}\,dx$

Optimal. Leaf size=16

$$\frac{2}{3}\tan^{-1}\left(\sqrt{-x^3-1}\right)$$

```
[Out] (2*ArcTan[Sqrt[-1 - x^3]])/3
```

Rubi [A] time = 0.0278808, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$\frac{2}{3}\tan^{-1}\left(\sqrt{-x^3-1}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*Sqrt[-1 - x^3]),x]

[Out] (2*ArcTan[Sqrt[-1 - x^3]])/3
```

Rubi in Sympy [A] time = 4.06261, size = 14, normalized size = 0.88

$$\frac{2\,\mathrm{atan}\left(\sqrt{-x^3-1}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(-x**3-1)**(1/2),x)

[Out] 2*atan(sqrt(-x**3 - 1))/3
```

Mathematica [B] time = 0.0251471, size = 34, normalized size = 2.12

$$\frac{2\sqrt{-x^3-1}\tanh^{-1}\left(\sqrt{x^3+1}\right)}{3\sqrt{x^3+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*Sqrt[-1 - x^3]),x]

[Out] (2*Sqrt[-1 - x^3]*ArcTanh[Sqrt[1 + x^3]])/(3*Sqrt[1 + x^3])
```

Maple [A] time = 0.036, size = 13, normalized size = 0.8

$$\frac{2}{3}\arctan\left(\sqrt{-x^3-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(-x^3-1)^(1/2),x)

[Out] 2/3*arctan((-x^3-1)^(1/2))
```

Maxima [A] time = 1.57058, size = 16, normalized size = 1.

$$\frac{2}{3}\arctan\left(\sqrt{-x^3-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 - 1)*x),x, algorithm="maxima")
```

```
[Out] 2/3*arctan(sqrt(-x^3 - 1))
```

Fricas [A] time = 0.23419, size = 16, normalized size = 1.

$$\frac{2}{3}\arctan\left(\sqrt{-x^3-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 - 1)*x),x, algorithm="fricas")
```

```
[Out] 2/3*arctan(sqrt(-x^3 - 1))
```

Sympy [A] time = 3.46753, size = 12, normalized size = 0.75

$$\frac{2i\operatorname{asinh}\left(\frac{1}{x^{\frac{3}{2}}}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(-x**3-1)**(1/2),x)
```

```
[Out] 2*I*asinh(x**(-3/2))/3
```

GIAC/XCAS [A] time = 0.228708, size = 16, normalized size = 1.

$$\frac{2}{3}\arctan\left(\sqrt{-x^3-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 - 1)*x),x, algorithm="giac")
```

```
[Out] 2/3*arctan(sqrt(-x^3 - 1))
```

3.497 $\int \frac{1}{x^4\sqrt{-1-x^3}}\,dx$

Optimal. Leaf size=35

$$\frac{\sqrt{-x^3-1}}{3x^3}-\frac{1}{3}\tan^{-1}\left(\sqrt{-x^3-1}\right)$$

```
[Out] Sqrt[-1 - x^3]/(3*x^3) - ArcTan[Sqrt[-1 - x^3]]/3
```

Rubi [A] time = 0.046122, antiderivative size = 35, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{\sqrt{-x^3-1}}{3x^3}-\frac{1}{3}\tan^{-1}\left(\sqrt{-x^3-1}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*Sqrt[-1 - x^3]),x]
```

```
[Out] Sqrt[-1 - x^3]/(3*x^3) - ArcTan[Sqrt[-1 - x^3]]/3
```

Rubi in Sympy [A] time = 4.95253, size = 27, normalized size = 0.77

$$-\frac{\operatorname{atan}\left(\sqrt{-x^3-1}\right)}{3}+\frac{\sqrt{-x^3-1}}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(-x**3-1)**(1/2),x)
```

```
[Out] -atan(sqrt(-x**3 - 1))/3 + sqrt(-x**3 - 1)/(3*x**3)
```

Mathematica [A] time = 0.0360163, size = 53, normalized size = 1.51

$$\frac{\sqrt{-x^3-1}}{3x^3}-\frac{\sqrt{-x^3-1}\tanh^{-1}\left(\sqrt{x^3+1}\right)}{3\sqrt{x^3+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*Sqrt[-1 - x^3]),x]
```

```
[Out] Sqrt[-1 - x^3]/(3*x^3) - (Sqrt[-1 - x^3]*ArcTanh[Sqrt[1 + x^3]])/
(3*Sqrt[1 + x^3])
```

Maple [A] time = 0.034, size = 28, normalized size = 0.8

$$-\frac{1}{3}\arctan\left(\sqrt{-x^3-1}\right)+\frac{1}{3x^3}\sqrt{-x^3-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(-x^3-1)^(1/2),x)
```

```
[Out] -1/3*arctan((-x^3-1)^(1/2))+1/3*(-x^3-1)^(1/2)/x^3
```

Maxima [A] time = 1.63732, size = 36, normalized size = 1.03

$$\frac{\sqrt{-x^3-1}}{3\,x^3}-\frac{1}{3}\,\arctan\left(\sqrt{-x^3-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 - 1)*x^4),x, algorithm="maxima")

[Out] 1/3*sqrt(-x^3 - 1)/x^3 - 1/3*arctan(sqrt(-x^3 - 1))
```

Fricas [A] time = 0.234282, size = 42, normalized size = 1.2

$$-\frac{x^3\arctan\left(\sqrt{-x^3-1}\right)-\sqrt{-x^3-1}}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 - 1)*x^4),x, algorithm="fricas")

[Out] -1/3*(x^3*arctan(sqrt(-x^3 - 1)) - sqrt(-x^3 - 1))/x^3
```

Sympy [A] time = 6.32696, size = 29, normalized size = 0.83

$$-\frac{i\operatorname{asinh}\left(\frac{1}{x^{\frac{3}{2}}}\right)}{3}+\frac{i\sqrt{1+\frac{1}{x^3}}}{3x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(-x**3-1)**(1/2),x)

[Out] -I*asinh(x**(-3/2))/3 + I*sqrt(1 + x**(-3))/(3*x**(3/2))
```

GIAC/XCAS [A] time = 0.21876, size = 36, normalized size = 1.03

$$\frac{\sqrt{-x^3-1}}{3\,x^3}-\frac{1}{3}\,\arctan\left(\sqrt{-x^3-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 - 1)*x^4),x, algorithm="giac")

[Out] 1/3*sqrt(-x^3 - 1)/x^3 - 1/3*arctan(sqrt(-x^3 - 1))
```

3.498 $\int \frac{1}{x^7\sqrt{-1-x^3}}\,dx$

Optimal. Leaf size=53

$$-\frac{\sqrt{-x^3-1}}{4x^3}+\frac{1}{4}\tan^{-1}\left(\sqrt{-x^3-1}\right)+\frac{\sqrt{-x^3-1}}{6x^6}$$

```
[Out] Sqrt[-1 - x^3]/(6*x^6) - Sqrt[-1 - x^3]/(4*x^3) + ArcTan[Sqrt[-1
- x^3]]/4
```

Rubi [A] time = 0.0611939, antiderivative size = 53, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{\sqrt{-x^3-1}}{4x^3}+\frac{1}{4}\tan^{-1}\left(\sqrt{-x^3-1}\right)+\frac{\sqrt{-x^3-1}}{6x^6}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^7*Sqrt[-1 - x^3]),x]
```

```
[Out] Sqrt[-1 - x^3]/(6*x^6) - Sqrt[-1 - x^3]/(4*x^3) + ArcTan[Sqrt[-1
- x^3]]/4
```

Rubi in Sympy [A] time = 6.07326, size = 42, normalized size = 0.79

$$\frac{\operatorname{atan}\left(\sqrt{-x^3-1}\right)}{4}-\frac{\sqrt{-x^3-1}}{4x^3}+\frac{\sqrt{-x^3-1}}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**7/(-x**3-1)**(1/2),x)
```

```
[Out] atan(sqrt(-x**3 - 1))/4 - sqrt(-x**3 - 1)/(4*x**3) + sqrt(-x**3 -
1)/(6*x**6)
```

Mathematica [A] time = 0.044372, size = 62, normalized size = 1.17

$$\frac{\sqrt{-x^3-1}\tanh^{-1}\left(\sqrt{x^3+1}\right)}{4\sqrt{x^3+1}}+\sqrt{-x^3-1}\left(\frac{1}{6x^6}-\frac{1}{4x^3}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^7*Sqrt[-1 - x^3]),x]
```

```
[Out] (1/(6*x^6) - 1/(4*x^3))*Sqrt[-1 - x^3] + (Sqrt[-1 - x^3]*ArcTanh[
Sqrt[1 + x^3]])/(4*Sqrt[1 + x^3])
```

Maple [A] time = 0.035, size = 42, normalized size = 0.8

$$\frac{1}{4}\arctan\left(\sqrt{-x^3-1}\right)+\frac{1}{6\,x^6}\sqrt{-x^3-1}-\frac{1}{4\,x^3}\sqrt{-x^3-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^7/(-x^3-1)^(1/2),x)
```

```
[Out] 1/4*arctan((-x^3-1)^(1/2))+1/6*(-x^3-1)^(1/2)/x^6-1/4*(-x^3-1)^(1
/2)/x^3
```

Maxima [A] time = 1.57431, size = 76, normalized size = 1.43

$$-\frac{3\left(-x^{3}-1\right)^{\frac{3}{2}}+5\sqrt{-x^{3}-1}}{12\left(2\,x^{3}-\left(x^{3}+1\right)^{2}+1\right)}+\frac{1}{4}\,\arctan\left(\sqrt{-x^{3}-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 - 1)*x^7),x, algorithm="maxima")
```

```
[Out] -1/12*(3*(-x^3 - 1)^(3/2) + 5*sqrt(-x^3 - 1))/(2*x^3 - (x^3 + 1)^
2 + 1) + 1/4*arctan(sqrt(-x^3 - 1))
```

Fricas [A] time = 0.22738, size = 53, normalized size = 1.

$$\frac{3\,x^{6}\arctan\left(\sqrt{-x^{3}-1}\right)-\left(3\,x^{3}-2\right)\sqrt{-x^{3}-1}}{12\,x^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 - 1)*x^7),x, algorithm="fricas")
```

```
[Out] 1/12*(3*x^6*arctan(sqrt(-x^3 - 1)) - (3*x^3 - 2)*sqrt(-x^3 - 1))/
x^6
```

Sympy [A] time = 10.7799, size = 66, normalized size = 1.25

$$\frac{i\operatorname{asinh}\left(\frac{1}{x^{\frac{3}{2}}}\right)}{4}-\frac{i}{4x^{\frac{3}{2}}\sqrt{1+\frac{1}{x^{3}}}}-\frac{i}{12x^{\frac{9}{2}}\sqrt{1+\frac{1}{x^{3}}}}+\frac{i}{6x^{\frac{15}{2}}\sqrt{1+\frac{1}{x^{3}}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**7/(-x**3-1)**(1/2),x)
```

```
[Out] I*asinh(x**(-3/2))/4 - I/(4*x**(3/2)*sqrt(1 + x**(-3))) - I/(12*x
**(9/2)*sqrt(1 + x**(-3))) + I/(6*x**(15/2)*sqrt(1 + x**(-3)))
```

GIAC/XCAS [A] time = 0.213917, size = 55, normalized size = 1.04

$$\frac{3\left(-x^{3}-1\right)^{\frac{3}{2}}+5\sqrt{-x^{3}-1}}{12\,x^{6}}+\frac{1}{4}\,\arctan\left(\sqrt{-x^{3}-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 - 1)*x^7),x, algorithm="giac")
```

```
[Out] 1/12*(3*(-x^3 - 1)^(3/2) + 5*sqrt(-x^3 - 1))/x^6 + 1/4*arctan(sqr
t(-x^3 - 1))
```

3.499 $\int \frac{1}{x^{10}\sqrt{-1-x^3}}\,dx$

Optimal. Leaf size=71

$$\frac{5\sqrt{-x^3-1}}{24x^3}-\frac{5}{24}\tan^{-1}\left(\sqrt{-x^3-1}\right)+\frac{\sqrt{-x^3-1}}{9x^9}-\frac{5\sqrt{-x^3-1}}{36x^6}$$

```
[Out] Sqrt[-1 - x^3]/(9*x^9) - (5*Sqrt[-1 - x^3])/(36*x^6) + (5*Sqrt[-1
 - x^3])/(24*x^3) - (5*ArcTan[Sqrt[-1 - x^3]])/24
```

Rubi [A] time = 0.0808786, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$

$$\frac{5\sqrt{-x^3-1}}{24x^3}-\frac{5}{24}\tan^{-1}\left(\sqrt{-x^3-1}\right)+\frac{\sqrt{-x^3-1}}{9x^9}-\frac{5\sqrt{-x^3-1}}{36x^6}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^10*Sqrt[-1 - x^3]),x]
```

```
[Out] Sqrt[-1 - x^3]/(9*x^9) - (5*Sqrt[-1 - x^3])/(36*x^6) + (5*Sqrt[-1
 - x^3])/(24*x^3) - (5*ArcTan[Sqrt[-1 - x^3]])/24
```

Rubi in Sympy [A] time = 7.17513, size = 63, normalized size = 0.89

$$-\frac{5\,\mathrm{atan}\left(\sqrt{-x^3-1}\right)}{24}+\frac{5\sqrt{-x^3-1}}{24x^3}-\frac{5\sqrt{-x^3-1}}{36x^6}+\frac{\sqrt{-x^3-1}}{9x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**10/(-x**3-1)**(1/2),x)
```

```
[Out] -5*atan(sqrt(-x**3 - 1))/24 + 5*sqrt(-x**3 - 1)/(24*x**3) - 5*sqr
t(-x**3 - 1)/(36*x**6) + sqrt(-x**3 - 1)/(9*x**9)
```

Mathematica [A] time = 0.0512101, size = 65, normalized size = 0.92

$$-\frac{\sqrt{-x^3-1}\left(15x^9\tanh^{-1}\left(\sqrt{x^3+1}\right)+\sqrt{x^3+1}\left(-15x^6+10x^3-8\right)\right)}{72x^9\sqrt{x^3+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^10*Sqrt[-1 - x^3]),x]
```

```
[Out] -(Sqrt[-1 - x^3]*(Sqrt[1 + x^3]*(-8 + 10*x^3 - 15*x^6) + 15*x^9*A
rcTanh[Sqrt[1 + x^3]]))/(72*x^9*Sqrt[1 + x^3])
```

Maple [A] time = 0.037, size = 56, normalized size = 0.8

$$-\frac{5}{24}\arctan\left(\sqrt{-x^3-1}\right)+\frac{1}{9\,x^9}\sqrt{-x^3-1}-\frac{5}{36\,x^6}\sqrt{-x^3-1}+\frac{5}{24\,x^3}\sqrt{-x^3-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^10/(-x^3-1)^(1/2),x)
```

```
[Out] -5/24*arctan((-x^3-1)^(1/2))+1/9*(-x^3-1)^(1/2)/x^9-5/36*(-x^3-1)
^(1/2)/x^6+5/24*(-x^3-1)^(1/2)/x^3
```

Maxima [A] time = 1.59212, size = 100, normalized size = 1.41

$$\frac{15\left(-x^3-1\right)^{\frac{5}{2}}+40\left(-x^3-1\right)^{\frac{3}{2}}+33\sqrt{-x^3-1}}{72\left(\left(x^3+1\right)^3+3x^3-3\left(x^3+1\right)^2+2\right)}-\frac{5}{24}\arctan\left(\sqrt{-x^3-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 - 1)*x^10),x, algorithm="maxima")
```

```
[Out] 1/72*(15*(-x^3 - 1)^(5/2) + 40*(-x^3 - 1)^(3/2) + 33*sqrt(-x^3 -
1))/((x^3 + 1)^3 + 3*x^3 - 3*(x^3 + 1)^2 + 2) - 5/24*arctan(sqrt(
-x^3 - 1))
```

Fricas [A] time = 0.229508, size = 59, normalized size = 0.83

$$-\frac{15x^9\arctan\left(\sqrt{-x^3-1}\right)-\left(15x^6-10x^3+8\right)\sqrt{-x^3-1}}{72x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 - 1)*x^10),x, algorithm="fricas")
```

```
[Out] -1/72*(15*x^9*arctan(sqrt(-x^3 - 1)) - (15*x^6 - 10*x^3 + 8)*sqrt
(-x^3 - 1))/x^9
```

Sympy [A] time = 17.8202, size = 90, normalized size = 1.27

$$-\frac{5i\operatorname{asinh}\left(\frac{1}{x^{\frac{3}{2}}}\right)}{24}+\frac{5i}{24x^{\frac{3}{2}}\sqrt{1+\frac{1}{x^3}}}+\frac{5i}{72x^{\frac{9}{2}}\sqrt{1+\frac{1}{x^3}}}-\frac{i}{36x^{\frac{15}{2}}\sqrt{1+\frac{1}{x^3}}}+\frac{i}{9x^{\frac{21}{2}}\sqrt{1+\frac{1}{x^3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**10/(-x**3-1)**(1/2),x)
```

```
[Out] -5*I*asinh(x**(-3/2))/24 + 5*I/(24*x**(3/2)*sqrt(1 + x**(-3))) +
5*I/(72*x**(9/2)*sqrt(1 + x**(-3))) - I/(36*x**(15/2)*sqrt(1 + x*
*(-3))) + I/(9*x**(21/2)*sqrt(1 + x**(-3)))
```

GIAC/XCAS [A] time = 0.218358, size = 80, normalized size = 1.13

$$\frac{15\left(x^3+1\right)^2\sqrt{-x^3-1}+40\left(-x^3-1\right)^{\frac{3}{2}}+33\sqrt{-x^3-1}}{72x^9}-\frac{5}{24}\arctan\left(\sqrt{-x^3-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 - 1)*x^10),x, algorithm="giac")
```

```
[Out] 1/72*(15*(x^3 + 1)^2*sqrt(-x^3 - 1) + 40*(-x^3 - 1)^(3/2) + 33*sq
rt(-x^3 - 1))/x^9 - 5/24*arctan(sqrt(-x^3 - 1))
```

3.500 $\int \frac{x^6}{\sqrt{-1-x^3}}\,dx$

Optimal. Leaf size=149

$$\frac{16}{55}\sqrt{-x^3-1}x-\frac{2}{11}\sqrt{-x^3-1}x^4+\frac{32\sqrt{2-\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x+\sqrt{3}+1}{x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{55\sqrt[4]{3}\sqrt{-\frac{x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}$$

```
[Out] (16*x*Sqrt[-1 - x^3])/55 - (2*x^4*Sqrt[-1 - x^3])/11 + (32*Sqrt[2
 - Sqrt[3]]*(1 + x)*Sqrt[(1 - x + x^2)/(1 - Sqrt[3] + x)^2]*Ellip
ticF[ArcSin[(1 + Sqrt[3] + x)/(1 - Sqrt[3] + x)], -7 + 4*Sqrt[3]]
)/(55*3^(1/4)*Sqrt[-((1 + x)/(1 - Sqrt[3] + x)^2)]*Sqrt[-1 - x^3]
)
```

Rubi [A] time = 0.110919, antiderivative size = 149, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{16}{55}\sqrt{-x^3-1}x-\frac{2}{11}\sqrt{-x^3-1}x^4+\frac{32\sqrt{2-\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x+\sqrt{3}+1}{x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{55\sqrt[4]{3}\sqrt{-\frac{x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/Sqrt[-1 - x^3],x]
```

```
[Out] (16*x*Sqrt[-1 - x^3])/55 - (2*x^4*Sqrt[-1 - x^3])/11 + (32*Sqrt[2
 - Sqrt[3]]*(1 + x)*Sqrt[(1 - x + x^2)/(1 - Sqrt[3] + x)^2]*Ellip
ticF[ArcSin[(1 + Sqrt[3] + x)/(1 - Sqrt[3] + x)], -7 + 4*Sqrt[3]]
)/(55*3^(1/4)*Sqrt[-((1 + x)/(1 - Sqrt[3] + x)^2)]*Sqrt[-1 - x^3]
)
```

Rubi in Sympy [A] time = 6.65249, size = 129, normalized size = 0.87

$$-\frac{2x^4\sqrt{-x^3-1}}{11}+\frac{16x\sqrt{-x^3-1}}{55}+\frac{32\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-\sqrt{3}+2}\,(x+1)\,F\left(\operatorname{asin}\left(\frac{x+1+\sqrt{3}}{x-\sqrt{3}+1}\right)\middle|-7+4\sqrt{3}\right)}{165\sqrt{\frac{-x-1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(-x**3-1)**(1/2),x)
```

```
[Out] -2*x**4*sqrt(-x**3 - 1)/11 + 16*x*sqrt(-x**3 - 1)/55 + 32*3**(3/4
)*sqrt((x**2 - x + 1)/(x - sqrt(3) + 1)**2)*sqrt(-sqrt(3) + 2)*(x
 + 1)*elliptic_f(asin((x + 1 + sqrt(3))/(x - sqrt(3) + 1)), -7 +
4*sqrt(3))/(165*sqrt((-x - 1)/(x - sqrt(3) + 1)**2)*sqrt(-x**3 -
1))
```

Mathematica [C] time = 0.216143, size = 115, normalized size = 0.77

$$\frac{2\left(3x\left(5x^6-3x^3-8\right)+16(-1)^{5/6}3^{3/4}\sqrt{-(-1)^{5/6}+ix}\sqrt{-\sqrt[3]{-1}x^2-(-1)^{2/3}x+1}F\left(\sin^{-1}\left(\frac{\sqrt{-\sqrt[6]{-1}\left(x+(-1)^{2/3}\right)}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)\right)}{165\sqrt{-x^3-1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^6/Sqrt[-1 - x^3],x]
```

```
[Out] (2*(3*x*(-8 - 3*x^3 + 5*x^6) + 16*(-1)^(5/6)*3^(3/4)*Sqrt[-(-1)^(
5/6) + I*x]*Sqrt[1 - (-1)^(2/3)*x - (-1)^(1/3)*x^2]*EllipticF[Arc
Sin[Sqrt[-((-1)^(1/6)*((-1)^(2/3) + x))]/3^(1/4)], (-1)^(1/3)]))/
(165*Sqrt[-1 - x^3])
```

Maple [A] time = 0.033, size = 134, normalized size = 0.9

$$-\frac{2x^4}{11}\sqrt{-x^3-1}+\frac{16x}{55}\sqrt{-x^3-1}$$
$$-\frac{32i}{165}\sqrt{3}\sqrt{i\left(x-\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\sqrt{\frac{1+x}{\frac{3}{2}+\frac{i}{2}\sqrt{3}}}\sqrt{-i\left(x-\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\mathit{EllipticF}\left(\frac{\sqrt{3}}{3}\sqrt{i\left(x-\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}},\sqrt{\frac{i\sqrt{3}}{\frac{3}{2}+\frac{i}{2}\sqrt{3}}}\right)\frac{1}{\sqrt{-x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(-x^3-1)^(1/2),x)
```

```
[Out] -2/11*x^4*(-x^3-1)^(1/2)+16/55*x*(-x^3-1)^(1/2)-32/165*I*3^(1/2)*
(I*(x-1/2-1/2*I*3^(1/2))*3^(1/2))^(1/2)*((1+x)/(3/2+1/2*I*3^(1/2)
))^(1/2)*(-I*(x-1/2+1/2*I*3^(1/2))*3^(1/2))^(1/2)/(-x^3-1)^(1/2)*
EllipticF(1/3*3^(1/2)*(I*(x-1/2-1/2*I*3^(1/2))*3^(1/2))^(1/2),(I*
3^(1/2)/(3/2+1/2*I*3^(1/2)))^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{\sqrt{-x^3-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(-x^3 - 1),x, algorithm="maxima")
```

```
[Out] integrate(x^6/sqrt(-x^3 - 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x^6}{\sqrt{-x^3-1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(-x^3 - 1),x, algorithm="fricas")
```

```
[Out] integral(x^6/sqrt(-x^3 - 1), x)
```

Sympy [A] time = 2.27244, size = 32, normalized size = 0.21

$$-\frac{ix^7\,\Gamma\left(\frac{7}{3}\right){}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{7}{3}\\\frac{10}{3}\end{matrix}\middle|x^3e^{i\pi}\right)}{3\,\Gamma\left(\frac{10}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(-x**3-1)**(1/2),x)
```

```
[Out] -I*x**7*gamma(7/3)*hyper((1/2, 7/3), (10/3,), x**3*exp_polar(I*pi
))/(3*gamma(10/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{\sqrt{-x^3-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(-x^3 - 1),x, algorithm="giac")
```

```
[Out] integrate(x^6/sqrt(-x^3 - 1), x)
```

3.501 $\int \frac{x^3}{\sqrt{-1-x^3}}\,dx$

Optimal. Leaf size=131

$$-\frac{2}{5}\sqrt{-x^3-1}x-\frac{4\sqrt{2-\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x+\sqrt{3}+1}{x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{5\sqrt[4]{3}\sqrt{-\frac{x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}$$

```
[Out] (-2*x*Sqrt[-1 - x^3])/5 - (4*Sqrt[2 - Sqrt[3]]*(1 + x)*Sqrt[(1 -
x + x^2)/(1 - Sqrt[3] + x)^2]*EllipticF[ArcSin[(1 + Sqrt[3] + x)/
(1 - Sqrt[3] + x)], -7 + 4*Sqrt[3]])/(5*3^(1/4)*Sqrt[-((1 + x)/(1
 - Sqrt[3] + x)^2)]*Sqrt[-1 - x^3])
```

Rubi [A] time = 0.0637134, antiderivative size = 131, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2}{5}\sqrt{-x^3-1}x-\frac{4\sqrt{2-\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x+\sqrt{3}+1}{x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{5\sqrt[4]{3}\sqrt{-\frac{x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/Sqrt[-1 - x^3],x]
```

```
[Out] (-2*x*Sqrt[-1 - x^3])/5 - (4*Sqrt[2 - Sqrt[3]]*(1 + x)*Sqrt[(1 -
x + x^2)/(1 - Sqrt[3] + x)^2]*EllipticF[ArcSin[(1 + Sqrt[3] + x)/
(1 - Sqrt[3] + x)], -7 + 4*Sqrt[3]])/(5*3^(1/4)*Sqrt[-((1 + x)/(1
 - Sqrt[3] + x)^2)]*Sqrt[-1 - x^3])
```

Rubi in Sympy [A] time = 4.68002, size = 114, normalized size = 0.87

$$-\frac{2x\sqrt{-x^3-1}}{5}-\frac{4\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-\sqrt{3}+2}\,(x+1)\,F\left(\operatorname{asin}\left(\frac{x+1+\sqrt{3}}{x-\sqrt{3}+1}\right)\middle|-7+4\sqrt{3}\right)}{15\sqrt{\frac{-x-1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(-x**3-1)**(1/2),x)
```

```
[Out] -2*x*sqrt(-x**3 - 1)/5 - 4*3**(3/4)*sqrt((x**2 - x + 1)/(x - sqrt
(3) + 1)**2)*sqrt(-sqrt(3) + 2)*(x + 1)*elliptic_f(asin((x + 1 +
sqrt(3))/(x - sqrt(3) + 1)), -7 + 4*sqrt(3))/(15*sqrt((-x - 1)/(x
 - sqrt(3) + 1)**2)*sqrt(-x**3 - 1))
```

Mathematica [C] time = 0.166025, size = 107, normalized size = 0.82

$$\frac{6\left(x^4+x\right)-4(-1)^{5/6}3^{3/4}\sqrt{-(-1)^{5/6}+ix}\sqrt{-\sqrt[3]{-1}x^2-(-1)^{2/3}x+1}F\left(\sin^{-1}\left(\frac{\sqrt{-\sqrt[6]{-1}\left(x+(-1)^{2/3}\right)}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)}{15\sqrt{-x^3-1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^3/Sqrt[-1 - x^3],x]
```

```
[Out] (6*(x + x^4) - 4*(-1)^(5/6)*3^(3/4)*Sqrt[-(-1)^(5/6) + I*x]*Sqrt[
1 - (-1)^(2/3)*x - (-1)^(1/3)*x^2]*EllipticF[ArcSin[Sqrt[-((-1)^(
1/6)*((-1)^(2/3) + x))]/3^(1/4)], (-1)^(1/3)])/(15*Sqrt[-1 - x^3]
)
```

Maple [A] time = 0.031, size = 120, normalized size = 0.9

$$-\frac{2x}{5}\sqrt{-x^3-1} + \frac{4i}{15}\sqrt{3}\sqrt{i\left(x-\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\sqrt{\frac{1+x}{\frac{3}{2}+\frac{i}{2}\sqrt{3}}}\sqrt{-i\left(x-\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)\sqrt{3}}EllipticF\left(\frac{\sqrt{3}}{3}\sqrt{i\left(x-\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}},\sqrt{\frac{i\sqrt{3}}{\frac{3}{2}+\frac{i}{2}\sqrt{3}}}\right)\frac{1}{\sqrt{-x^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(-x^3-1)^(1/2),x)
```

```
[Out] -2/5*x*(-x^3-1)^(1/2)+4/15*I*3^(1/2)*(I*(x-1/2-1/2*I*3^(1/2))*3^(
1/2))^(1/2)*((1+x)/(3/2+1/2*I*3^(1/2)))^(1/2)*(-I*(x-1/2+1/2*I*3^
(1/2))*3^(1/2))^(1/2)/(-x^3-1)^(1/2)*EllipticF(1/3*3^(1/2)*(I*(x-
1/2-1/2*I*3^(1/2))*3^(1/2))^(1/2),(I*3^(1/2)/(3/2+1/2*I*3^(1/2)))
^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{\sqrt{-x^3-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(-x^3 - 1),x, algorithm="maxima")
```

```
[Out] integrate(x^3/sqrt(-x^3 - 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^3}{\sqrt{-x^3-1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(-x^3 - 1),x, algorithm="fricas")
```

```
[Out] integral(x^3/sqrt(-x^3 - 1), x)
```

Sympy [A] time = 1.87727, size = 32, normalized size = 0.24

$$-\frac{ix^4\,\Gamma\left(\frac{4}{3}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{4}{3}\\ \frac{7}{3}\end{matrix}\middle| x^3e^{i\pi}\right)}{3\,\Gamma\left(\frac{7}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(-x**3-1)**(1/2),x)
```

```
[Out] -I*x**4*gamma(4/3)*hyper((1/2, 4/3), (7/3,), x**3*exp_polar(I*pi)
)/(3*gamma(7/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{\sqrt{-x^3-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(-x^3 - 1),x, algorithm="giac")
```

```
[Out] integrate(x^3/sqrt(-x^3 - 1), x)
```

3.502 $\int \frac{1}{\sqrt{-1-x^3}}\,dx$

Optimal. Leaf size=112

$$\frac{2\sqrt{2-\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x+\sqrt{3}+1}{x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{\sqrt[4]{3}\sqrt{-\frac{x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}$$

```
[Out] (2*Sqrt[2 - Sqrt[3]]*(1 + x)*Sqrt[(1 - x + x^2)/(1 - Sqrt[3] + x)
^2]*EllipticF[ArcSin[(1 + Sqrt[3] + x)/(1 - Sqrt[3] + x)], -7 + 4
*Sqrt[3]])/(3^(1/4)*Sqrt[-((1 + x)/(1 - Sqrt[3] + x)^2)]*Sqrt[-1
- x^3])
```

Rubi [A] time = 0.0312755, antiderivative size = 112, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$

$$\frac{2\sqrt{2-\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x+\sqrt{3}+1}{x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{\sqrt[4]{3}\sqrt{-\frac{x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[-1 - x^3],x]
```

```
[Out] (2*Sqrt[2 - Sqrt[3]]*(1 + x)*Sqrt[(1 - x + x^2)/(1 - Sqrt[3] + x)
^2]*EllipticF[ArcSin[(1 + Sqrt[3] + x)/(1 - Sqrt[3] + x)], -7 + 4
*Sqrt[3]])/(3^(1/4)*Sqrt[-((1 + x)/(1 - Sqrt[3] + x)^2)]*Sqrt[-1
- x^3])
```

Rubi in Sympy [A] time = 1.89919, size = 97, normalized size = 0.87

$$\frac{2\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-\sqrt{3}+2}\,(x+1)\,F\left(\operatorname{asin}\left(\frac{x+1+\sqrt{3}}{x-\sqrt{3}+1}\right)\middle|-7+4\sqrt{3}\right)}{3\sqrt{\frac{-x-1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(-x**3-1)**(1/2),x)
```

```
[Out] 2*3**(3/4)*sqrt((x**2 - x + 1)/(x - sqrt(3) + 1)**2)*sqrt(-sqrt(3
) + 2)*(x + 1)*elliptic_f(asin((x + 1 + sqrt(3))/(x - sqrt(3) + 1
)), -7 + 4*sqrt(3))/(3*sqrt((-x - 1)/(x - sqrt(3) + 1)**2)*sqrt(-
x**3 - 1))
```

Mathematica [C] time = 0.0776324, size = 95, normalized size = 0.85

$$\frac{2(-1)^{5/6}\sqrt{-(-1)^{5/6}+ix}\sqrt{-\sqrt[3]{-1}x^2-(-1)^{2/3}x+1}F\left(\sin^{-1}\left(\frac{\sqrt{-\sqrt[6]{-1}\left(x+(-1)^{2/3}\right)}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)}{\sqrt[4]{3}\sqrt{-x^3-1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/Sqrt[-1 - x^3],x]
```

```
[Out] (2*(-1)^(5/6)*Sqrt[-(-1)^(5/6) + I*x]*Sqrt[1 - (-1)^(2/3)*x - (-1
)^(1/3)*x^2]*EllipticF[ArcSin[Sqrt[-((-1)^(1/6)*((-1)^(2/3) + x))
]/3^(1/4)], (-1)^(1/3)])/(3^(1/4)*Sqrt[-1 - x^3])
```

Maple [A] time = 0.027, size = 107, normalized size = 1.

$$-\frac{2i}{3}\sqrt{3}\sqrt{i\left(x-\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\sqrt{\frac{1+x}{\frac{3}{2}+\frac{i}{2}\sqrt{3}}}\sqrt{-i\left(x-\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)\sqrt{3}}EllipticF\left(\frac{\sqrt{3}}{3}\sqrt{i\left(x-\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}},\sqrt{\frac{i\sqrt{3}}{\frac{3}{2}+\frac{i}{2}\sqrt{3}}}\right)\frac{1}{\sqrt{-x^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(-x^3-1)^(1/2),x)
```

```
[Out] -2/3*I*3^(1/2)*(I*(x-1/2-1/2*I*3^(1/2))*3^(1/2))^(1/2)*((1+x)/(3/
2+1/2*I*3^(1/2)))^(1/2)*(-I*(x-1/2+1/2*I*3^(1/2))*3^(1/2))^(1/2)/
(-x^3-1)^(1/2)*EllipticF(1/3*3^(1/2)*(I*(x-1/2-1/2*I*3^(1/2))*3^(
1/2))^(1/2),(I*3^(1/2)/(3/2+1/2*I*3^(1/2)))^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^3-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(-x^3 - 1),x, algorithm="maxima")
```

```
[Out] integrate(1/sqrt(-x^3 - 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{\sqrt{-x^3-1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(-x^3 - 1),x, algorithm="fricas")
```

```
[Out] integral(1/sqrt(-x^3 - 1), x)
```

Sympy [A] time = 1.74335, size = 31, normalized size = 0.28

$$-\frac{ix\,\Gamma\left(\frac{1}{3}\right){}_2F_1\left(\begin{matrix}\frac{1}{3},\frac{1}{2}\\\frac{4}{3}\end{matrix}\middle|x^3e^{i\pi}\right)}{3\,\Gamma\left(\frac{4}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(-x**3-1)**(1/2),x)
```

```
[Out] -I*x*gamma(1/3)*hyper((1/3, 1/2), (4/3,), x**3*exp_polar(I*pi))/(
3*gamma(4/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^3-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(-x^3 - 1),x, algorithm="giac")
```

```
[Out] integrate(1/sqrt(-x^3 - 1), x)
```

3.503 $\int \frac{1}{x^3\sqrt{-1-x^3}}\,dx$

Optimal. Leaf size=133

$$\frac{\sqrt{-x^3-1}}{2x^2}-\frac{\sqrt{2-\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x+\sqrt{3}+1}{x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{2\sqrt[4]{3}\sqrt{-\frac{x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}$$

```
[Out] Sqrt[-1 - x^3]/(2*x^2) - (Sqrt[2 - Sqrt[3]]*(1 + x)*Sqrt[(1 - x +
 x^2)/(1 - Sqrt[3] + x)^2]*EllipticF[ArcSin[(1 + Sqrt[3] + x)/(1
- Sqrt[3] + x)], -7 + 4*Sqrt[3]])/(2*3^(1/4)*Sqrt[-((1 + x)/(1 -
Sqrt[3] + x)^2)]*Sqrt[-1 - x^3])
```

Rubi [A] time = 0.0671414, antiderivative size = 133, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{\sqrt{-x^3-1}}{2x^2}-\frac{\sqrt{2-\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x+\sqrt{3}+1}{x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{2\sqrt[4]{3}\sqrt{-\frac{x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^3*Sqrt[-1 - x^3]),x]
```

```
[Out] Sqrt[-1 - x^3]/(2*x^2) - (Sqrt[2 - Sqrt[3]]*(1 + x)*Sqrt[(1 - x +
 x^2)/(1 - Sqrt[3] + x)^2]*EllipticF[ArcSin[(1 + Sqrt[3] + x)/(1
- Sqrt[3] + x)], -7 + 4*Sqrt[3]])/(2*3^(1/4)*Sqrt[-((1 + x)/(1 -
Sqrt[3] + x)^2)]*Sqrt[-1 - x^3])
```

Rubi in Sympy [A] time = 4.4503, size = 110, normalized size = 0.83

$$-\frac{3^{\frac{3}{4}}\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-\sqrt{3}+2}\,(x+1)\,F\left(\operatorname{asin}\left(\frac{x+1+\sqrt{3}}{x-\sqrt{3}+1}\right)\middle|-7+4\sqrt{3}\right)}{6\sqrt{\frac{-x-1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}+\frac{\sqrt{-x^3-1}}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**3/(-x**3-1)**(1/2),x)
```

```
[Out] -3**(3/4)*sqrt((x**2 - x + 1)/(x - sqrt(3) + 1)**2)*sqrt(-sqrt(3)
 + 2)*(x + 1)*elliptic_f(asin((x + 1 + sqrt(3))/(x - sqrt(3) + 1)
), -7 + 4*sqrt(3))/(6*sqrt((-x - 1)/(x - sqrt(3) + 1)**2)*sqrt(-x
**3 - 1)) + sqrt(-x**3 - 1)/(2*x**2)
```

Mathematica [C] time = 0.163313, size = 111, normalized size = 0.83

$$-\frac{3x^3+(-1)^{5/6}3^{3/4}\sqrt{-(-1)^{5/6}+ix}\sqrt{-\sqrt[3]{-1}x^2-(-1)^{2/3}x+1}x^2F\left(\sin^{-1}\left(\frac{\sqrt{-\sqrt[6]{-1}(x+(-1)^{2/3})}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)+3}{6x^2\sqrt{-x^3-1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/(x^3*Sqrt[-1 - x^3]),x]
```

```
[Out] -(3 + 3*x^3 + (-1)^(5/6)*3^(3/4)*Sqrt[-(-1)^(5/6) + I*x]*x^2*Sqrt
[1 - (-1)^(2/3)*x - (-1)^(1/3)*x^2]*EllipticF[ArcSin[Sqrt[-((-1)^
(1/6)*((-1)^(2/3) + x))]/3^(1/4)], (-1)^(1/3)])/(6*x^2*Sqrt[-1 -
x^3])
```

Maple [A] time = 0.032, size = 122, normalized size = 0.9

$$\frac{1}{2\,x^2}\sqrt{-x^3-1} +\frac{i}{6}\sqrt{3}\sqrt{i\left(x-\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\sqrt{\frac{1+x}{\frac{3}{2}+\frac{i}{2}\sqrt{3}}}\sqrt{-i\left(x-\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\,{\it EllipticF}\left(\frac{\sqrt{3}}{3}\sqrt{i\left(x-\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}},\sqrt{\frac{i\sqrt{3}}{\frac{3}{2}+\frac{i}{2}\sqrt{3}}}\right)\frac{1}{\sqrt{-x^3-}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(-x^3-1)^(1/2),x)
```

```
[Out] 1/2*(-x^3-1)^(1/2)/x^2+1/6*I*3^(1/2)*(I*(x-1/2-1/2*I*3^(1/2))*3^(
1/2))^(1/2)*((1+x)/(3/2+1/2*I*3^(1/2)))^(1/2)*(-I*(x-1/2+1/2*I*3^
(1/2))*3^(1/2))^(1/2)/(-x^3-1)^(1/2)*EllipticF(1/3*3^(1/2)*(I*(x-
1/2-1/2*I*3^(1/2))*3^(1/2))^(1/2),(I*3^(1/2)/(3/2+1/2*I*3^(1/2)))
^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^3-1}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 - 1)*x^3),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(-x^3 - 1)*x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{-x^3-1}x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 - 1)*x^3),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(-x^3 - 1)*x^3), x)
```

Sympy [A] time = 2.19612, size = 36, normalized size = 0.27

$$-\frac{i\,\Gamma\left(-\frac{2}{3}\right)\,{}_2F_1\left(\left.\begin{matrix}-\frac{2}{3},\frac{1}{2}\\\frac{1}{3}\end{matrix}\right|x^3e^{i\pi}\right)}{3x^2\,\Gamma\left(\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(-x**3-1)**(1/2),x)
```

```
[Out] -I*gamma(-2/3)*hyper((-2/3, 1/2), (1/3,), x**3*exp_polar(I*pi))/(
3*x**2*gamma(1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^3 - 1}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 - 1)*x^3),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(-x^3 - 1)*x^3), x)
```

3.504 $\int \frac{1}{x^6\sqrt{-1-x^3}}\,dx$

Optimal. Leaf size=151

$$\frac{\sqrt{-x^3-1}}{5x^5}-\frac{7\sqrt{-x^3-1}}{20x^2}+\frac{7\sqrt{2-\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x+\sqrt{3}+1}{x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{20\sqrt[4]{3}\sqrt{-\frac{x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}$$

```
[Out] Sqrt[-1 - x^3]/(5*x^5) - (7*Sqrt[-1 - x^3])/(20*x^2) + (7*Sqrt[2
- Sqrt[3]]*(1 + x)*Sqrt[(1 - x + x^2)/(1 - Sqrt[3] + x)^2]*Ellipt
icF[ArcSin[(1 + Sqrt[3] + x)/(1 - Sqrt[3] + x)], -7 + 4*Sqrt[3]])
/(20*3^(1/4)*Sqrt[-((1 + x)/(1 - Sqrt[3] + x)^2)]*Sqrt[-1 - x^3])
```

Rubi [A] time = 0.085168, antiderivative size = 151, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{\sqrt{-x^3-1}}{5x^5}-\frac{7\sqrt{-x^3-1}}{20x^2}+\frac{7\sqrt{2-\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x+\sqrt{3}+1}{x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{20\sqrt[4]{3}\sqrt{-\frac{x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^6*Sqrt[-1 - x^3]),x]
```

```
[Out] Sqrt[-1 - x^3]/(5*x^5) - (7*Sqrt[-1 - x^3])/(20*x^2) + (7*Sqrt[2
- Sqrt[3]]*(1 + x)*Sqrt[(1 - x + x^2)/(1 - Sqrt[3] + x)^2]*Ellipt
icF[ArcSin[(1 + Sqrt[3] + x)/(1 - Sqrt[3] + x)], -7 + 4*Sqrt[3]])
/(20*3^(1/4)*Sqrt[-((1 + x)/(1 - Sqrt[3] + x)^2)]*Sqrt[-1 - x^3])
```

Rubi in Sympy [A] time = 6.47314, size = 129, normalized size = 0.85

$$\frac{7\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-\sqrt{3}+2}\,(x+1)\,F\left(\operatorname{asin}\left(\frac{x+1+\sqrt{3}}{x-\sqrt{3}+1}\right)\middle|-7+4\sqrt{3}\right)}{60\sqrt{\frac{-x-1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}-\frac{7\sqrt{-x^3-1}}{20x^2}+\frac{\sqrt{-x^3-1}}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**6/(-x**3-1)**(1/2),x)
```

```
[Out] 7*3**(3/4)*sqrt((x**2 - x + 1)/(x - sqrt(3) + 1)**2)*sqrt(-sqrt(3
) + 2)*(x + 1)*elliptic_f(asin((x + 1 + sqrt(3))/(x - sqrt(3) + 1
)), -7 + 4*sqrt(3))/(60*sqrt((-x - 1)/(x - sqrt(3) + 1)**2)*sqrt(
-x**3 - 1)) - 7*sqrt(-x**3 - 1)/(20*x**2) + sqrt(-x**3 - 1)/(5*x*
*5)
```

Mathematica [C] time = 0.132432, size = 117, normalized size = 0.77

$$\frac{21x^6+9x^3+7(-1)^{5/6}3^{3/4}\sqrt{-(-1)^{5/6}+ix}\sqrt{-\sqrt[3]{-1}x^2-(-1)^{2/3}x+1}x^5F\left(\sin^{-1}\left(\frac{\sqrt{-\sqrt[6]{-1}\left(x+(-1)^{2/3}\right)}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)-12}{60x^5\sqrt{-x^3-1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/(x^6*Sqrt[-1 - x^3]),x]
```

```
[Out] (-12 + 9*x^3 + 21*x^6 + 7*(-1)^(5/6)*3^(3/4)*Sqrt[-(-1)^(5/6) + I
*x]*x^5*Sqrt[1 - (-1)^(2/3)*x - (-1)^(1/3)*x^2]*EllipticF[ArcSin[
Sqrt[-((-1)^(1/6)*((-1)^(2/3) + x))]/3^(1/4)], (-1)^(1/3)])/(60*x
^5*Sqrt[-1 - x^3])
```

Maple [A] time = 0.034, size = 136, normalized size = 0.9

$$\frac{1}{5\,x^5}\sqrt{-x^3-1}-\frac{7}{20\,x^2}\sqrt{-x^3-1}$$
$$-\frac{7\,i}{60}\sqrt{3}\sqrt{i\left(x-\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\sqrt{\frac{1+x}{\frac{3}{2}+\frac{i}{2}\sqrt{3}}}\sqrt{-i\left(x-\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)\sqrt{3}}EllipticF\left(\frac{\sqrt{3}}{3}\sqrt{i\left(x-\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}},\sqrt{\frac{i\sqrt{3}}{\frac{3}{2}+\frac{i}{2}\sqrt{3}}}\right)\frac{1}{\sqrt{-x^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^6/(-x^3-1)^(1/2),x)
```

```
[Out] 1/5*(-x^3-1)^(1/2)/x^5-7/20*(-x^3-1)^(1/2)/x^2-7/60*I*3^(1/2)*(I*
(x-1/2-1/2*I*3^(1/2))*3^(1/2))^(1/2)*((1+x)/(3/2+1/2*I*3^(1/2)))^
(1/2)*(-I*(x-1/2+1/2*I*3^(1/2))*3^(1/2))^(1/2)/(-x^3-1)^(1/2)*Ell
ipticF(1/3*3^(1/2)*(I*(x-1/2-1/2*I*3^(1/2))*3^(1/2))^(1/2),(I*3^(
1/2)/(3/2+1/2*I*3^(1/2)))^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^3-1}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 - 1)*x^6),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(-x^3 - 1)*x^6), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{-x^3-1}x^6},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 - 1)*x^6),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(-x^3 - 1)*x^6), x)
```

Sympy [A] time = 2.77952, size = 39, normalized size = 0.26

$$-\frac{i\,\Gamma\left(-\frac{5}{3}\right){}_2F_1\left(\left.\begin{matrix}-\frac{5}{3},\frac{1}{2}\\-\frac{2}{3}\end{matrix}\right|x^3e^{i\pi}\right)}{3x^5\,\Gamma\left(-\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**6/(-x**3-1)**(1/2),x)
```

```
[Out] -I*gamma(-5/3)*hyper((-5/3, 1/2), (-2/3,), x**3*exp_polar(I*pi))/
(3*x**5*gamma(-2/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^3 - 1}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 - 1)*x^6),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(-x^3 - 1)*x^6), x)
```

3.505 $\int \frac{x^7}{\sqrt{-1-x^3}}\,dx$

Optimal. Leaf size=282

$$-\frac{80\sqrt{-x^3-1}}{91\left(x-\sqrt{3}+1\right)}-\frac{2}{13}\sqrt{-x^3-1}x^5+\frac{20}{91}\sqrt{-x^3-1}x^2-\frac{80\sqrt{2}(x+1)\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x+\sqrt{3}+1}{x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{91\sqrt[4]{3}\sqrt{-\frac{x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}+\frac{40\sqrt[4]{3}\sqrt{2+\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{x+\sqrt{3}+1}{x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{91\sqrt{-\frac{x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}$$

```
[Out] (20*x^2*Sqrt[-1 - x^3])/91 - (2*x^5*Sqrt[-1 - x^3])/13 - (80*Sqrt
[-1 - x^3])/(91*(1 - Sqrt[3] + x)) + (40*3^(1/4)*Sqrt[2 + Sqrt[3]
]*(1 + x)*Sqrt[(1 - x + x^2)/(1 - Sqrt[3] + x)^2]*EllipticE[ArcSi
n[(1 + Sqrt[3] + x)/(1 - Sqrt[3] + x)], -7 + 4*Sqrt[3]])/(91*Sqrt
[-((1 + x)/(1 - Sqrt[3] + x)^2)]*Sqrt[-1 - x^3]) - (80*Sqrt[2]*(1
 + x)*Sqrt[(1 - x + x^2)/(1 - Sqrt[3] + x)^2]*EllipticF[ArcSin[(1
 + Sqrt[3] + x)/(1 - Sqrt[3] + x)], -7 + 4*Sqrt[3]])/(91*3^(1/4)*
Sqrt[-((1 + x)/(1 - Sqrt[3] + x)^2)]*Sqrt[-1 - x^3])
```

Rubi [A] time = 0.195482, antiderivative size = 282, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{80\sqrt{-x^3-1}}{91\left(x-\sqrt{3}+1\right)}-\frac{2}{13}\sqrt{-x^3-1}x^5+\frac{20}{91}\sqrt{-x^3-1}x^2-\frac{80\sqrt{2}(x+1)\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x+\sqrt{3}+1}{x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{91\sqrt[4]{3}\sqrt{-\frac{x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}+\frac{40\sqrt[4]{3}\sqrt{2+\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{x+\sqrt{3}+1}{x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{91\sqrt{-\frac{x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7/Sqrt[-1 - x^3],x]
```

```
[Out] (20*x^2*Sqrt[-1 - x^3])/91 - (2*x^5*Sqrt[-1 - x^3])/13 - (80*Sqrt
[-1 - x^3])/(91*(1 - Sqrt[3] + x)) + (40*3^(1/4)*Sqrt[2 + Sqrt[3]
]*(1 + x)*Sqrt[(1 - x + x^2)/(1 - Sqrt[3] + x)^2]*EllipticE[ArcSi
n[(1 + Sqrt[3] + x)/(1 - Sqrt[3] + x)], -7 + 4*Sqrt[3]])/(91*Sqrt
[-((1 + x)/(1 - Sqrt[3] + x)^2)]*Sqrt[-1 - x^3]) - (80*Sqrt[2]*(1
 + x)*Sqrt[(1 - x + x^2)/(1 - Sqrt[3] + x)^2]*EllipticF[ArcSin[(1
 + Sqrt[3] + x)/(1 - Sqrt[3] + x)], -7 + 4*Sqrt[3]])/(91*3^(1/4)*
Sqrt[-((1 + x)/(1 - Sqrt[3] + x)^2)]*Sqrt[-1 - x^3])
```

Rubi in Sympy [A] time = 14.5118, size = 248, normalized size = 0.88

$$-\frac{2x^5\sqrt{-x^3-1}}{13}+\frac{20x^2\sqrt{-x^3-1}}{91}-\frac{80\sqrt{-x^3-1}}{91\left(x-\sqrt{3}+1\right)}+\frac{40\sqrt[4]{3}\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{\sqrt{3}+2}\,(x+1)\,E\left(\operatorname{asin}\left(\frac{x+1+\sqrt{3}}{x-\sqrt{3}+1}\right)\middle|-7+4\sqrt{3}\right)}{91\sqrt{\frac{-x-1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}-\frac{80\sqrt{2}\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}\,(x+1)\,F\left(\operatorname{asin}\left(\frac{x+1+\sqrt{3}}{x-\sqrt{3}+1}\right)\middle|-7+4\sqrt{3}\right)}{273\sqrt{\frac{-x-1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate(x**7/(-x**3-1)**(1/2),x)
```

```
[Out] -2*x**5*sqrt(-x**3 - 1)/13 + 20*x**2*sqrt(-x**3 - 1)/91 - 80*sqrt
(-x**3 - 1)/(91*(x - sqrt(3) + 1)) + 40*3**(1/4)*sqrt((x**2 - x +
 1)/(x - sqrt(3) + 1)**2)*sqrt(sqrt(3) + 2)*(x + 1)*elliptic_e(as
in((x + 1 + sqrt(3))/(x - sqrt(3) + 1)), -7 + 4*sqrt(3))/(91*sqrt
((-x - 1)/(x - sqrt(3) + 1)**2)*sqrt(-x**3 - 1)) - 80*sqrt(2)*3**
(3/4)*sqrt((x**2 - x + 1)/(x - sqrt(3) + 1)**2)*(x + 1)*elliptic_
f(asin((x + 1 + sqrt(3))/(x - sqrt(3) + 1)), -7 + 4*sqrt(3))/(273
*sqrt((-x - 1)/(x - sqrt(3) + 1)**2)*sqrt(-x**3 - 1))
```

Mathematica [C] time = 0.507829, size = 164, normalized size = 0.58

$$\frac{2\left(3\left(x^3+1\right)\left(7x^3-10\right)x^2+40(-1)^{5/6}3^{3/4}\sqrt{-(-1)^{5/6}+ix}\sqrt{-\sqrt[3]{-1}x^2-(-1)^{2/3}x+1}\left(\sqrt[3]{-1}F\left(\sin^{-1}\left(\frac{\sqrt{-\sqrt[6]{-1}(x+(-1)^{2/3})}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-}\right.\right.\right.}{273\sqrt{-x^3-1}}$$

Warning: Unable to verify antiderivative.

```
[In]   Integrate[x^7/Sqrt[-1 - x^3],x]
```

```
[Out] (2*(3*x^2*(1 + x^3)*(-10 + 7*x^3) + 40*(-1)^(5/6)*3^(3/4)*Sqrt[-(
-1)^(5/6) + I*x]*Sqrt[1 - (-1)^(2/3)*x - (-1)^(1/3)*x^2]*((-I)*Sq
rt[3]*EllipticE[ArcSin[Sqrt[-((-1)^(1/6)*((-1)^(2/3) + x))]/3^(1/
4)], (-1)^(1/3)] + (-1)^(1/3)*EllipticF[ArcSin[Sqrt[-((-1)^(1/6)*
((-1)^(2/3) + x))]/3^(1/4)], (-1)^(1/3)])))/(273*Sqrt[-1 - x^3])
```

Maple [A] time = 0.032, size = 189, normalized size = 0.7

$$-\frac{2x^5}{13}\sqrt{-x^3-1}+\frac{20x^2}{91}\sqrt{-x^3-1}-\frac{80i}{273}\sqrt{3}\sqrt{i\left(x-\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\sqrt{\frac{1+x}{\frac{3}{2}+\frac{i}{2}\sqrt{3}}}\sqrt{-i\left(x-\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\left(\left(\frac{3}{2}+\frac{i}{2}\sqrt{3}\right)EllipticE\left(\frac{\sqrt{3}}{3}\sqrt{i\left(x-\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}},\sqrt{\frac{3}{2}}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^7/(-x^3-1)^(1/2),x)
```

```
[Out] -2/13*x^5*(-x^3-1)^(1/2)+20/91*x^2*(-x^3-1)^(1/2)-80/273*I*3^(1/2
)*(I*(x-1/2-1/2*I*3^(1/2))*3^(1/2))^(1/2)*((1+x)/(3/2+1/2*I*3^(1/
2)))^(1/2)*(-I*(x-1/2+1/2*I*3^(1/2))*3^(1/2))^(1/2)/(-x^3-1)^(1/2
)*((3/2+1/2*I*3^(1/2))*EllipticE(1/3*3^(1/2)*(I*(x-1/2-1/2*I*3^(1
```

```
/2))*3^(1/2))^(1/2),(I*3^(1/2)/(3/2+1/2*I*3^(1/2)))^(1/2))-Ellipt
icF(1/3*3^(1/2)*(I*(x-1/2-1/2*I*3^(1/2))*3^(1/2))^(1/2),(I*3^(1/2
)/(3/2+1/2*I*3^(1/2)))^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^7}{\sqrt{-x^3-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(-x^3 - 1),x, algorithm="maxima")
```

```
[Out] integrate(x^7/sqrt(-x^3 - 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^7}{\sqrt{-x^3-1}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(-x^3 - 1),x, algorithm="fricas")
```

```
[Out] integral(x^7/sqrt(-x^3 - 1), x)
```

Sympy [A] time = 2.40444, size = 32, normalized size = 0.11

$$-\frac{ix^8\,\Gamma\left(\frac{8}{3}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{8}{3}\\ \frac{11}{3}\end{matrix}\middle|x^3e^{i\pi}\right)}{3\,\Gamma\left(\frac{11}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(-x**3-1)**(1/2),x)
```

```
[Out] -I*x**8*gamma(8/3)*hyper((1/2, 8/3), (11/3,), x**3*exp_polar(I*pi
))/(3*gamma(11/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^7}{\sqrt{-x^3-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(-x^3 - 1),x, algorithm="giac")
```

```
[Out] integrate(x^7/sqrt(-x^3 - 1), x)
```

3.506 $\int \frac{x^4}{\sqrt{-1-x^3}}\,dx$

Optimal. Leaf size=264

$$\frac{8\sqrt{-x^3-1}}{7\left(x-\sqrt{3}+1\right)}-\frac{2}{7}\sqrt{-x^3-1}x^2+\frac{8\sqrt{2}(x+1)\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x+\sqrt{3}+1}{x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{7\sqrt[4]{3}\sqrt{-\frac{x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}-\frac{4\sqrt[4]{3}\sqrt{2+\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{x+\sqrt{3}+1}{x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{7\sqrt{-\frac{x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}$$

```
[Out] (-2*x^2*Sqrt[-1 - x^3])/7 + (8*Sqrt[-1 - x^3])/(7*(1 - Sqrt[3] +
x)) - (4*3^(1/4)*Sqrt[2 + Sqrt[3]]*(1 + x)*Sqrt[(1 - x + x^2)/(1
- Sqrt[3] + x)^2]*EllipticE[ArcSin[(1 + Sqrt[3] + x)/(1 - Sqrt[3]
 + x)], -7 + 4*Sqrt[3]])/(7*Sqrt[-((1 + x)/(1 - Sqrt[3] + x)^2)]*
Sqrt[-1 - x^3]) + (8*Sqrt[2]*(1 + x)*Sqrt[(1 - x + x^2)/(1 - Sqrt
[3] + x)^2]*EllipticF[ArcSin[(1 + Sqrt[3] + x)/(1 - Sqrt[3] + x)]
, -7 + 4*Sqrt[3]])/(7*3^(1/4)*Sqrt[-((1 + x)/(1 - Sqrt[3] + x)^2)
]*Sqrt[-1 - x^3])
```

Rubi [A] time = 0.155917, antiderivative size = 264, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{8\sqrt{-x^3-1}}{7\left(x-\sqrt{3}+1\right)}-\frac{2}{7}\sqrt{-x^3-1}x^2+\frac{8\sqrt{2}(x+1)\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x+\sqrt{3}+1}{x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{7\sqrt[4]{3}\sqrt{-\frac{x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}-\frac{4\sqrt[4]{3}\sqrt{2+\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{x+\sqrt{3}+1}{x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{7\sqrt{-\frac{x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/Sqrt[-1 - x^3],x]
```


```
[Out] (-2*x^2*Sqrt[-1 - x^3])/7 + (8*Sqrt[-1 - x^3])/(7*(1 - Sqrt[3] +
x)) - (4*3^(1/4)*Sqrt[2 + Sqrt[3]]*(1 + x)*Sqrt[(1 - x + x^2)/(1
- Sqrt[3] + x)^2]*EllipticE[ArcSin[(1 + Sqrt[3] + x)/(1 - Sqrt[3]
 + x)], -7 + 4*Sqrt[3]])/(7*Sqrt[-((1 + x)/(1 - Sqrt[3] + x)^2)]*
Sqrt[-1 - x^3]) + (8*Sqrt[2]*(1 + x)*Sqrt[(1 - x + x^2)/(1 - Sqrt
[3] + x)^2]*EllipticF[ArcSin[(1 + Sqrt[3] + x)/(1 - Sqrt[3] + x)]
, -7 + 4*Sqrt[3]])/(7*3^(1/4)*Sqrt[-((1 + x)/(1 - Sqrt[3] + x)^2)
]*Sqrt[-1 - x^3])
```

Rubi in Sympy [A] time = 11.7093, size = 231, normalized size = 0.88

$$-\frac{2x^2\sqrt{-x^3-1}}{7}+\frac{8\sqrt{-x^3-1}}{7\left(x-\sqrt{3}+1\right)}-\frac{4\sqrt[4]{3}\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{\sqrt{3}+2}\,(x+1)\,E\left(\operatorname{asin}\left(\frac{x+1+\sqrt{3}}{x-\sqrt{3}+1}\right)\middle|-7+4\sqrt{3}\right)}{7\sqrt{\frac{-x-1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}+\frac{8\sqrt{2}\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}\,(x+1)\,F\left(\operatorname{asin}\left(\frac{x+1+\sqrt{3}}{x-\sqrt{3}+1}\right)\middle|-7+4\sqrt{3}\right)}{21\sqrt{\frac{-x-1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(-x**3-1)**(1/2),x)
```

```
[Out] -2*x**2*sqrt(-x**3 - 1)/7 + 8*sqrt(-x**3 - 1)/(7*(x - sqrt(3) + 1
)) - 4*3**(1/4)*sqrt((x**2 - x + 1)/(x - sqrt(3) + 1)**2)*sqrt(sq
rt(3) + 2)*(x + 1)*elliptic_e(asin((x + 1 + sqrt(3))/(x - sqrt(3)
 + 1)), -7 + 4*sqrt(3))/(7*sqrt((-x - 1)/(x - sqrt(3) + 1)**2)*sq
rt(-x**3 - 1)) + 8*sqrt(2)*3**(3/4)*sqrt((x**2 - x + 1)/(x - sqrt
(3) + 1)**2)*(x + 1)*elliptic_f(asin((x + 1 + sqrt(3))/(x - sqrt(
3) + 1)), -7 + 4*sqrt(3))/(21*sqrt((-x - 1)/(x - sqrt(3) + 1)**2)
*sqrt(-x**3 - 1))
```

Mathematica [C] time = 0.437166, size = 157, normalized size = 0.59

$$\frac{2\left(3x^2\left(x^3+1\right)-4(-1)^{5/6}3^{3/4}\sqrt{-(-1)^{5/6}+ix}\sqrt{-\sqrt[3]{-1}x^2-(-1)^{2/3}x+1}\left(\sqrt[3]{-1}F\left(\sin^{-1}\left(\frac{\sqrt{-\sqrt[6]{-1}(x+(-1)^{2/3})}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)-i\sqrt{3}E\left(\right.\right.\right.}{21\sqrt{-x^3-1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^4/Sqrt[-1 - x^3],x]
```

```
[Out] (2*(3*x^2*(1 + x^3) - 4*(-1)^(5/6)*3^(3/4)*Sqrt[-(-1)^(5/6) + I*x
]*Sqrt[1 - (-1)^(2/3)*x - (-1)^(1/3)*x^2]*((-I)*Sqrt[3]*EllipticE
[ArcSin[Sqrt[-((-1)^(1/6)*((-1)^(2/3) + x))]/3^(1/4)], (-1)^(1/3)
] + (-1)^(1/3)*EllipticF[ArcSin[Sqrt[-((-1)^(1/6)*((-1)^(2/3) + x
))]/3^(1/4)], (-1)^(1/3)])))/(21*Sqrt[-1 - x^3])
```

Maple [A] time = 0.031, size = 175, normalized size = 0.7

$$-\frac{2x^2}{7}\sqrt{-x^3-1}$$
$$+\frac{8i}{21}\sqrt{3}\sqrt{i\left(x-\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\sqrt{\frac{1+x}{\frac{3}{2}+\frac{i}{2}\sqrt{3}}}\sqrt{-i\left(x-\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\left(\left(\frac{3}{2}+\frac{i}{2}\sqrt{3}\right)EllipticE\left(\frac{\sqrt{3}}{3}\sqrt{i\left(x-\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}},\sqrt{\frac{i}{\frac{3}{2}+}}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(-x^3-1)^(1/2),x)
```

```
[Out] -2/7*x^2*(-x^3-1)^(1/2)+8/21*I*3^(1/2)*(I*(x-1/2-1/2*I*3^(1/2))*3
^(1/2))^(1/2)*((1+x)/(3/2+1/2*I*3^(1/2)))^(1/2)*(-I*(x-1/2+1/2*I*
3^(1/2))*3^(1/2))^(1/2)/(-x^3-1)^(1/2)*((3/2+1/2*I*3^(1/2))*Ellip
ticE(1/3*3^(1/2)*(I*(x-1/2-1/2*I*3^(1/2))*3^(1/2))^(1/2),(I*3^(1/
2)/(3/2+1/2*I*3^(1/2)))^(1/2))-EllipticF(1/3*3^(1/2)*(I*(x-1/2-1/
2*I*3^(1/2))*3^(1/2))^(1/2),(I*3^(1/2)/(3/2+1/2*I*3^(1/2)))^(1/2)
))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\sqrt{-x^3-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(-x^3 - 1),x, algorithm="maxima")
```

```
[Out] integrate(x^4/sqrt(-x^3 - 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^4}{\sqrt{-x^3-1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(-x^3 - 1),x, algorithm="fricas")
```

```
[Out] integral(x^4/sqrt(-x^3 - 1), x)
```

Sympy [A] time = 1.94288, size = 32, normalized size = 0.12

$$-\frac{ix^5\Gamma\left(\frac{5}{3}\right){}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{5}{3}\\ \frac{8}{3}\end{matrix}\middle| x^3e^{i\pi}\right)}{3\Gamma\left(\frac{8}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(-x**3-1)**(1/2),x)
```

```
[Out] -I*x**5*gamma(5/3)*hyper((1/2, 5/3), (8/3,), x**3*exp_polar(I*pi)
)/(3*gamma(8/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\sqrt{-x^3-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(-x^3 - 1),x, algorithm="giac")
```

```
[Out] integrate(x^4/sqrt(-x^3 - 1), x)
```

3.507 $\int \frac{x}{\sqrt{-1-x^3}}\,dx$

Optimal. Leaf size=239

$$-\frac{2\sqrt{-x^3-1}}{x-\sqrt{3}+1}-\frac{2\sqrt{2}(x+1)\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x+\sqrt{3}+1}{x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{\sqrt[4]{3}\sqrt{-\frac{x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}+\frac{\sqrt[4]{3}\sqrt{2+\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{x+\sqrt{3}+1}{x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{\sqrt{-\frac{x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}$$

```
[Out] (-2*Sqrt[-1 - x^3])/(1 - Sqrt[3] + x) + (3^(1/4)*Sqrt[2 + Sqrt[3]
]*(1 + x)*Sqrt[(1 - x + x^2)/(1 - Sqrt[3] + x)^2]*EllipticE[ArcSi
n[(1 + Sqrt[3] + x)/(1 - Sqrt[3] + x)], -7 + 4*Sqrt[3]])/(Sqrt[-(
(1 + x)/(1 - Sqrt[3] + x)^2)]*Sqrt[-1 - x^3]) - (2*Sqrt[2]*(1 + x
)*Sqrt[(1 - x + x^2)/(1 - Sqrt[3] + x)^2]*EllipticF[ArcSin[(1 + S
qrt[3] + x)/(1 - Sqrt[3] + x)], -7 + 4*Sqrt[3]])/(3^(1/4)*Sqrt[-(
(1 + x)/(1 - Sqrt[3] + x)^2)]*Sqrt[-1 - x^3])
```

Rubi [A] time = 0.116197, antiderivative size = 239, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{2\sqrt{-x^3-1}}{x-\sqrt{3}+1}-\frac{2\sqrt{2}(x+1)\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x+\sqrt{3}+1}{x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{\sqrt[4]{3}\sqrt{-\frac{x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}+\frac{\sqrt[4]{3}\sqrt{2+\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{x+\sqrt{3}+1}{x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{\sqrt{-\frac{x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/Sqrt[-1 - x^3],x]
```

```
[Out] (-2*Sqrt[-1 - x^3])/(1 - Sqrt[3] + x) + (3^(1/4)*Sqrt[2 + Sqrt[3]
]*(1 + x)*Sqrt[(1 - x + x^2)/(1 - Sqrt[3] + x)^2]*EllipticE[ArcSi
n[(1 + Sqrt[3] + x)/(1 - Sqrt[3] + x)], -7 + 4*Sqrt[3]])/(Sqrt[-(
(1 + x)/(1 - Sqrt[3] + x)^2)]*Sqrt[-1 - x^3]) - (2*Sqrt[2]*(1 + x
)*Sqrt[(1 - x + x^2)/(1 - Sqrt[3] + x)^2]*EllipticF[ArcSin[(1 + S
qrt[3] + x)/(1 - Sqrt[3] + x)], -7 + 4*Sqrt[3]])/(3^(1/4)*Sqrt[-(
(1 + x)/(1 - Sqrt[3] + x)^2)]*Sqrt[-1 - x^3])
```

Rubi in Sympy [A] time = 9.07836, size = 207, normalized size = 0.87

$$-\frac{2\sqrt{-x^3-1}}{x-\sqrt{3}+1}+\frac{\sqrt[4]{3}\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{\sqrt{3}+2}\,(x+1)\,E\left(\operatorname{asin}\left(\frac{x+1+\sqrt{3}}{x-\sqrt{3}+1}\right)\middle|-7+4\sqrt{3}\right)}{\sqrt{\frac{-x-1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}-\frac{2\sqrt{2}\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}\,(x+1)\,F\left(\operatorname{asin}\left(\frac{x+1+\sqrt{3}}{x-\sqrt{3}+1}\right)\middle|-7+4\sqrt{3}\right)}{3\sqrt{\frac{-x-1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(-x**3-1)**(1/2),x)
```

```
[Out] -2*sqrt(-x**3 - 1)/(x - sqrt(3) + 1) + 3**(1/4)*sqrt((x**2 - x +
1)/(x - sqrt(3) + 1)**2)*sqrt(sqrt(3) + 2)*(x + 1)*elliptic_e(asi
n((x + 1 + sqrt(3))/(x - sqrt(3) + 1)), -7 + 4*sqrt(3))/(sqrt((-x
 - 1)/(x - sqrt(3) + 1)**2)*sqrt(-x**3 - 1)) - 2*sqrt(2)*3**(3/4)
*sqrt((x**2 - x + 1)/(x - sqrt(3) + 1)**2)*(x + 1)*elliptic_f(asi
n((x + 1 + sqrt(3))/(x - sqrt(3) + 1)), -7 + 4*sqrt(3))/(3*sqrt((
-x - 1)/(x - sqrt(3) + 1)**2)*sqrt(-x**3 - 1))
```

Mathematica [C] time = 0.100701, size = 142, normalized size = 0.59

$$\frac{2(-1)^{5/6}\sqrt{-(-1)^{5/6}+ix}\sqrt{-\sqrt[3]{-1}x^2-(-1)^{2/3}x+1}\left(\sqrt[3]{-1}F\left(\sin^{-1}\left(\frac{\sqrt{-\sqrt[6]{-1}(x+(-1)^{2/3})}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)-i\sqrt{3}E\left(\sin^{-1}\left(\frac{\sqrt{-\sqrt[6]{-1}(x+(-1)^{2/3})}}{\sqrt[4]{3}}\right.\right.\right.}{\sqrt[4]{3}\sqrt{-x^3-1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x/Sqrt[-1 - x^3],x]
```

```
[Out] (2*(-1)^(5/6)*Sqrt[-(-1)^(5/6) + I*x]*Sqrt[1 - (-1)^(2/3)*x - (-1
)^(1/3)*x^2]*((-I)*Sqrt[3]*EllipticE[ArcSin[Sqrt[-((-1)^(1/6)*((-
1)^(2/3) + x))]/3^(1/4)], (-1)^(1/3)] + (-1)^(1/3)*EllipticF[ArcS
in[Sqrt[-((-1)^(1/6)*((-1)^(2/3) + x))]/3^(1/4)], (-1)^(1/3)]))/(
3^(1/4)*Sqrt[-1 - x^3])
```

Maple [A] time = 0.03, size = 160, normalized size = 0.7

$$-\frac{2i}{3}\sqrt{3}\sqrt{i\left(x-\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\sqrt{\frac{1+x}{\frac{3}{2}+\frac{i}{2}\sqrt{3}}}\sqrt{-i\left(x-\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\left(\left(\frac{3}{2}+\frac{i}{2}\sqrt{3}\right)EllipticE\left(\frac{\sqrt{3}}{3}\sqrt{i\left(x-\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}},\sqrt{\frac{i}{\frac{3}{2}+}}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(-x^3-1)^(1/2),x)
```

```
[Out] -2/3*I*3^(1/2)*(I*(x-1/2-1/2*I*3^(1/2))*3^(1/2))^(1/2)*((1+x)/(3/
2+1/2*I*3^(1/2)))^(1/2)*(-I*(x-1/2+1/2*I*3^(1/2))*3^(1/2))^(1/2)/
(-x^3-1)^(1/2)*((3/2+1/2*I*3^(1/2))*EllipticE(1/3*3^(1/2)*(I*(x-1
/2-1/2*I*3^(1/2))*3^(1/2))^(1/2),(I*3^(1/2)/(3/2+1/2*I*3^(1/2)))^
(1/2))-EllipticF(1/3*3^(1/2)*(I*(x-1/2-1/2*I*3^(1/2))*3^(1/2))^(1
/2),(I*3^(1/2)/(3/2+1/2*I*3^(1/2)))^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt{-x^3-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(-x^3 - 1),x, algorithm="maxima")
```

```
[Out] integrate(x/sqrt(-x^3 - 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x}{\sqrt{-x^3-1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/sqrt(-x^3 - 1),x, algorithm="fricas")
```

```
[Out] integral(x/sqrt(-x^3 - 1), x)
```

Sympy [A] time = 1.73005, size = 32, normalized size = 0.13

$$-\frac{ix^2\Gamma\left(\frac{2}{3}\right){}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{2}{3}\\\frac{5}{3}\end{matrix}\middle|x^3e^{i\pi}\right)}{3\Gamma\left(\frac{5}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(-x**3-1)**(1/2),x)
```

```
[Out] -I*x**2*gamma(2/3)*hyper((1/2, 2/3), (5/3,), x**3*exp_polar(I*pi)
)/(3*gamma(5/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt{-x^3-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/sqrt(-x^3 - 1),x, algorithm="giac")
```

```
[Out] integrate(x/sqrt(-x^3 - 1), x)
```

3.508 $\int \frac{1}{x^2\sqrt{-1-x^3}}\,dx$

Optimal. Leaf size=257

$$\frac{\sqrt{-x^3-1}}{x}-\frac{\sqrt{-x^3-1}}{x-\sqrt{3}+1}-\frac{\sqrt{2}(x+1)\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x+\sqrt{3}+1}{x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{\sqrt[4]{3}\sqrt{-\frac{x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}+\frac{\sqrt[4]{3}\sqrt{2+\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{x+\sqrt{3}+1}{x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{2\sqrt{-\frac{x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}$$

```
[Out] Sqrt[-1 - x^3]/x - Sqrt[-1 - x^3]/(1 - Sqrt[3] + x) + (3^(1/4)*Sq
rt[2 + Sqrt[3]]*(1 + x)*Sqrt[(1 - x + x^2)/(1 - Sqrt[3] + x)^2]*E
llipticE[ArcSin[(1 + Sqrt[3] + x)/(1 - Sqrt[3] + x)], -7 + 4*Sqrt
[3]])/(2*Sqrt[-((1 + x)/(1 - Sqrt[3] + x)^2)]*Sqrt[-1 - x^3]) - (
Sqrt[2]*(1 + x)*Sqrt[(1 - x + x^2)/(1 - Sqrt[3] + x)^2]*EllipticF
[ArcSin[(1 + Sqrt[3] + x)/(1 - Sqrt[3] + x)], -7 + 4*Sqrt[3]])/(3
^(1/4)*Sqrt[-((1 + x)/(1 - Sqrt[3] + x)^2)]*Sqrt[-1 - x^3])
```

Rubi [A] time = 0.162286, antiderivative size = 257, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{\sqrt{-x^3-1}}{x}-\frac{\sqrt{-x^3-1}}{x-\sqrt{3}+1}-\frac{\sqrt{2}(x+1)\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x+\sqrt{3}+1}{x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{\sqrt[4]{3}\sqrt{-\frac{x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}+\frac{\sqrt[4]{3}\sqrt{2+\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{x+\sqrt{3}+1}{x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{2\sqrt{-\frac{x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*Sqrt[-1 - x^3]),x]
```


```
[Out] Sqrt[-1 - x^3]/x - Sqrt[-1 - x^3]/(1 - Sqrt[3] + x) + (3^(1/4)*Sq
rt[2 + Sqrt[3]]*(1 + x)*Sqrt[(1 - x + x^2)/(1 - Sqrt[3] + x)^2]*E
llipticE[ArcSin[(1 + Sqrt[3] + x)/(1 - Sqrt[3] + x)], -7 + 4*Sqrt
[3]])/(2*Sqrt[-((1 + x)/(1 - Sqrt[3] + x)^2)]*Sqrt[-1 - x^3]) - (
Sqrt[2]*(1 + x)*Sqrt[(1 - x + x^2)/(1 - Sqrt[3] + x)^2]*EllipticF
[ArcSin[(1 + Sqrt[3] + x)/(1 - Sqrt[3] + x)], -7 + 4*Sqrt[3]])/(3
^(1/4)*Sqrt[-((1 + x)/(1 - Sqrt[3] + x)^2)]*Sqrt[-1 - x^3])
```

Rubi in Sympy [A] time = 11.8695, size = 218, normalized size = 0.85

$$-\frac{\sqrt{-x^3-1}}{x-\sqrt{3}+1}+\frac{\sqrt[4]{3}\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{\sqrt{3}+2}\,(x+1)\,E\left(\operatorname{asin}\left(\frac{x+1+\sqrt{3}}{x-\sqrt{3}+1}\right)\middle|-7+4\sqrt{3}\right)}{2\sqrt{\frac{-x-1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}-\frac{\sqrt{2}\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}\,(x+1)\,F\left(\operatorname{asin}\left(\frac{x+1+\sqrt{3}}{x-\sqrt{3}+1}\right)\middle|-7+4\sqrt{3}\right)}{3\sqrt{\frac{-x-1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}+\frac{\sqrt{-x^3-1}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(-x**3-1)**(1/2),x)
```

```
[Out] -sqrt(-x**3 - 1)/(x - sqrt(3) + 1) + 3**(1/4)*sqrt((x**2 - x + 1)
/(x - sqrt(3) + 1)**2)*sqrt(sqrt(3) + 2)*(x + 1)*elliptic_e(asin(
(x + 1 + sqrt(3))/(x - sqrt(3) + 1)), -7 + 4*sqrt(3))/(2*sqrt((-x
 - 1)/(x - sqrt(3) + 1)**2)*sqrt(-x**3 - 1)) - sqrt(2)*3**(3/4)*s
qrt((x**2 - x + 1)/(x - sqrt(3) + 1)**2)*(x + 1)*elliptic_f(asin(
(x + 1 + sqrt(3))/(x - sqrt(3) + 1)), -7 + 4*sqrt(3))/(3*sqrt((-x
 - 1)/(x - sqrt(3) + 1)**2)*sqrt(-x**3 - 1)) + sqrt(-x**3 - 1)/x
```

Mathematica [C] time = 0.382241, size = 156, normalized size = 0.61

$$\frac{-\frac{3(x^3+1)}{x}+(-1)^{5/6}3^{3/4}\sqrt{-(-1)^{5/6}+ix}\sqrt{-\sqrt[3]{-1}x^2-(-1)^{2/3}x+1}\left(\sqrt[3]{-1}F\left(\sin^{-1}\left(\frac{\sqrt{-\sqrt[6]{-1}(x+(-1)^{2/3})}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)-i\sqrt{3}E\left(\sin^{-1}\left(\right.\right.\right.}{3\sqrt{-x^3-1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/(x^2*Sqrt[-1 - x^3]),x]
```

```
[Out] ((-3*(1 + x^3))/x + (-1)^(5/6)*3^(3/4)*Sqrt[-(-1)^(5/6) + I*x]*Sq
rt[1 - (-1)^(2/3)*x - (-1)^(1/3)*x^2]*((-I)*Sqrt[3]*EllipticE[Arc
Sin[Sqrt[-((-1)^(1/6)*((-1)^(2/3) + x))]/3^(1/4)], (-1)^(1/3)] +
(-1)^(1/3)*EllipticF[ArcSin[Sqrt[-((-1)^(1/6)*((-1)^(2/3) + x))]/
3^(1/4)], (-1)^(1/3)]))/(3*Sqrt[-1 - x^3])
```

Maple [A] time = 0.033, size = 174, normalized size = 0.7

$$\frac{1}{x}\sqrt{-x^3-1}$$
$$-\frac{i}{3}\sqrt{3}\sqrt{i\left(x-\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\sqrt{\frac{1+x}{\frac{3}{2}+\frac{i}{2}\sqrt{3}}}\sqrt{-i\left(x-\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\left(\left(\frac{3}{2}+\frac{i}{2}\sqrt{3}\right)EllipticE\left(\frac{\sqrt{3}}{3}\sqrt{i\left(x-\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}},\sqrt{\frac{i}{\frac{3}{2}+}}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(-x^3-1)^(1/2),x)
```

```
[Out] (-x^3-1)^(1/2)/x-1/3*I*3^(1/2)*(I*(x-1/2-1/2*I*3^(1/2))*3^(1/2))^
(1/2)*((1+x)/(3/2+1/2*I*3^(1/2)))^(1/2)*(-I*(x-1/2+1/2*I*3^(1/2))
*3^(1/2))^(1/2)/(-x^3-1)^(1/2)*((3/2+1/2*I*3^(1/2))*EllipticE(1/3
*3^(1/2)*(I*(x-1/2-1/2*I*3^(1/2))*3^(1/2))^(1/2),(I*3^(1/2)/(3/2+
1/2*I*3^(1/2)))^(1/2))-EllipticF(1/3*3^(1/2)*(I*(x-1/2-1/2*I*3^(1
/2))*3^(1/2))^(1/2),(I*3^(1/2)/(3/2+1/2*I*3^(1/2)))^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^3-1}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 - 1)*x^2),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(-x^3 - 1)*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{-x^3 - 1}x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 - 1)*x^2),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(-x^3 - 1)*x^2), x)
```

Sympy [A] time = 1.99073, size = 34, normalized size = 0.13

$$-\frac{i\Gamma\left(-\frac{1}{3}\right) {}_2F_1\left(\begin{matrix} -\frac{1}{3}, \frac{1}{2} \\ \frac{2}{3} \end{matrix}\middle| x^3 e^{i\pi}\right)}{3x\Gamma\left(\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(-x**3-1)**(1/2),x)
```

```
[Out] -I*gamma(-1/3)*hyper((-1/3, 1/2), (2/3,), x**3*exp_polar(I*pi))/(
3*x*gamma(2/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^3 - 1}x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 - 1)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(-x^3 - 1)*x^2), x)
```

3.509 $\int \frac{1}{x^5\sqrt{-1-x^3}}\,dx$

Optimal. Leaf size=282

$$-\frac{5\sqrt{-x^3-1}}{8x}+\frac{5\sqrt{-x^3-1}}{8\left(x-\sqrt{3}+1\right)}+\frac{\sqrt{-x^3-1}}{4x^4}+\frac{5(x+1)\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x+\sqrt{3}+1}{x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{4\sqrt{2}\sqrt[4]{3}\sqrt{-\frac{x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}-\frac{5\sqrt[4]{3}\sqrt{2+\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{x+\sqrt{3}+1}{x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{16\sqrt{-\frac{x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}$$

```
[Out] Sqrt[-1 - x^3]/(4*x^4) - (5*Sqrt[-1 - x^3])/(8*x) + (5*Sqrt[-1 -
x^3])/(8*(1 - Sqrt[3] + x)) - (5*3^(1/4)*Sqrt[2 + Sqrt[3]]*(1 + x
)*Sqrt[(1 - x + x^2)/(1 - Sqrt[3] + x)^2]*EllipticE[ArcSin[(1 + S
qrt[3] + x)/(1 - Sqrt[3] + x)], -7 + 4*Sqrt[3]])/(16*Sqrt[-((1 +
x)/(1 - Sqrt[3] + x)^2)]*Sqrt[-1 - x^3]) + (5*(1 + x)*Sqrt[(1 - x
 + x^2)/(1 - Sqrt[3] + x)^2]*EllipticF[ArcSin[(1 + Sqrt[3] + x)/(
1 - Sqrt[3] + x)], -7 + 4*Sqrt[3]])/(4*Sqrt[2]*3^(1/4)*Sqrt[-((1
+ x)/(1 - Sqrt[3] + x)^2)]*Sqrt[-1 - x^3])
```

Rubi [A] time = 0.194743, antiderivative size = 282, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$

$$-\frac{5\sqrt{-x^3-1}}{8x}+\frac{5\sqrt{-x^3-1}}{8\left(x-\sqrt{3}+1\right)}+\frac{\sqrt{-x^3-1}}{4x^4}+\frac{5(x+1)\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}F\left(\sin^{-1}\left(\frac{x+\sqrt{3}+1}{x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{4\sqrt{2}\sqrt[4]{3}\sqrt{-\frac{x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}-\frac{5\sqrt[4]{3}\sqrt{2+\sqrt{3}}(x+1)\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}E\left(\sin^{-1}\left(\frac{x+\sqrt{3}+1}{x-\sqrt{3}+1}\right)|-7+4\sqrt{3}\right)}{16\sqrt{-\frac{x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^5*Sqrt[-1 - x^3]),x]
```

```
[Out] Sqrt[-1 - x^3]/(4*x^4) - (5*Sqrt[-1 - x^3])/(8*x) + (5*Sqrt[-1 -
x^3])/(8*(1 - Sqrt[3] + x)) - (5*3^(1/4)*Sqrt[2 + Sqrt[3]]*(1 + x
)*Sqrt[(1 - x + x^2)/(1 - Sqrt[3] + x)^2]*EllipticE[ArcSin[(1 + S
qrt[3] + x)/(1 - Sqrt[3] + x)], -7 + 4*Sqrt[3]])/(16*Sqrt[-((1 +
x)/(1 - Sqrt[3] + x)^2)]*Sqrt[-1 - x^3]) + (5*(1 + x)*Sqrt[(1 - x
 + x^2)/(1 - Sqrt[3] + x)^2]*EllipticF[ArcSin[(1 + Sqrt[3] + x)/(
1 - Sqrt[3] + x)], -7 + 4*Sqrt[3]])/(4*Sqrt[2]*3^(1/4)*Sqrt[-((1
+ x)/(1 - Sqrt[3] + x)^2)]*Sqrt[-1 - x^3])
```

Rubi in Sympy [A] time = 14.5554, size = 245, normalized size = 0.87

$$\frac{5\sqrt{-x^3-1}}{8\left(x-\sqrt{3}+1\right)}-\frac{5\sqrt[4]{3}\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{\sqrt{3}+2}\,(x+1)\,E\left(\operatorname{asin}\left(\frac{x+1+\sqrt{3}}{x-\sqrt{3}+1}\right)\middle|-7+4\sqrt{3}\right)}{16\sqrt{\frac{-x-1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}+\frac{5\sqrt{2}\cdot 3^{\frac{3}{4}}\sqrt{\frac{x^2-x+1}{\left(x-\sqrt{3}+1\right)^2}}\,(x+1)\,F\left(\operatorname{asin}\left(\frac{x+1+\sqrt{3}}{x-\sqrt{3}+1}\right)\middle|-7+4\sqrt{3}\right)}{24\sqrt{\frac{-x-1}{\left(x-\sqrt{3}+1\right)^2}}\sqrt{-x^3-1}}-\frac{5\sqrt{-x^3-1}}{8x}+\frac{\sqrt{-x^3-1}}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**5/(-x**3-1)**(1/2),x)
```

```
[Out] 5*sqrt(-x**3 - 1)/(8*(x - sqrt(3) + 1)) - 5*3**(1/4)*sqrt((x**2 -
 x + 1)/(x - sqrt(3) + 1)**2)*sqrt(sqrt(3) + 2)*(x + 1)*elliptic_
e(asin((x + 1 + sqrt(3))/(x - sqrt(3) + 1)), -7 + 4*sqrt(3))/(16*
sqrt((-x - 1)/(x - sqrt(3) + 1)**2)*sqrt(-x**3 - 1)) + 5*sqrt(2)*
3**(3/4)*sqrt((x**2 - x + 1)/(x - sqrt(3) + 1)**2)*(x + 1)*ellipt
ic_f(asin((x + 1 + sqrt(3))/(x - sqrt(3) + 1)), -7 + 4*sqrt(3))/(
24*sqrt((-x - 1)/(x - sqrt(3) + 1)**2)*sqrt(-x**3 - 1)) - 5*sqrt(
-x**3 - 1)/(8*x) + sqrt(-x**3 - 1)/(4*x**4)
```

Mathematica [C] time = 0.402487, size = 164, normalized size = 0.58

$$\frac{\frac{3(x^3+1)(5x^3-2)}{x^4} - 5(-1)^{5/6}3^{3/4}\sqrt{-(-1)^{5/6}+ix}\sqrt{-\sqrt[3]{-1}x^2-(-1)^{2/3}x+1}\left(\sqrt[3]{-1}F\left(\sin^{-1}\left(\frac{\sqrt{-\sqrt[6]{-1}(x+(-1)^{2/3})}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)-i\sqrt{3}E\left(\text{si}\right.\right.}{24\sqrt{-x^3-1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/(x^5*Sqrt[-1 - x^3]),x]
```

```
[Out] ((3*(1 + x^3)*(-2 + 5*x^3))/x^4 - 5*(-1)^(5/6)*3^(3/4)*Sqrt[-(-1)
^(5/6) + I*x]*Sqrt[1 - (-1)^(2/3)*x - (-1)^(1/3)*x^2]*((-I)*Sqrt[
3]*EllipticE[ArcSin[Sqrt[-((-1)^(1/6)*((-1)^(2/3) + x))]/3^(1/4)]
, (-1)^(1/3)] + (-1)^(1/3)*EllipticF[ArcSin[Sqrt[-((-1)^(1/6)*((-
1)^(2/3) + x))]/3^(1/4)], (-1)^(1/3)]))/(24*Sqrt[-1 - x^3])
```

Maple [A] time = 0.036, size = 189, normalized size = 0.7

$$\frac{1}{4x^4}\sqrt{-x^3-1}-\frac{5}{8x}\sqrt{-x^3-1}$$
$$+\frac{5i}{24}\sqrt{3}\sqrt{i\left(x-\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\sqrt{\frac{1+x}{\frac{3}{2}+\frac{i}{2}\sqrt{3}}}\sqrt{-i\left(x-\frac{1}{2}+\frac{i}{2}\sqrt{3}\right)\sqrt{3}}\left(\left(\frac{3}{2}+\frac{i}{2}\sqrt{3}\right)\text{EllipticE}\left(\frac{\sqrt{3}}{3}\sqrt{i\left(x-\frac{1}{2}-\frac{i}{2}\sqrt{3}\right)\sqrt{3}},\sqrt{\frac{i}{\frac{3}{2}+}}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^5/(-x^3-1)^(1/2),x)
```

```
[Out] 1/4*(-x^3-1)^(1/2)/x^4-5/8*(-x^3-1)^(1/2)/x+5/24*I*3^(1/2)*(I*(x-
1/2-1/2*I*3^(1/2))*3^(1/2))^(1/2)*((1+x)/(3/2+1/2*I*3^(1/2)))^(1/
2)*(-I*(x-1/2+1/2*I*3^(1/2))*3^(1/2))^(1/2)/(-x^3-1)^(1/2)*((3/2+
1/2*I*3^(1/2))*EllipticE(1/3*3^(1/2)*(I*(x-1/2-1/2*I*3^(1/2))*3^(
1/2))^(1/2),(I*3^(1/2)/(3/2+1/2*I*3^(1/2)))^(1/2))-EllipticF(1/3*
3^(1/2)*(I*(x-1/2-1/2*I*3^(1/2))*3^(1/2))^(1/2),(I*3^(1/2)/(3/2+1
/2*I*3^(1/2)))^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^3-1}x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 - 1)*x^5),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(-x^3 - 1)*x^5), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{-x^3-1}x^5},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 - 1)*x^5),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(-x^3 - 1)*x^5), x)
```

Sympy [A] time = 2.51789, size = 39, normalized size = 0.14

$$-\frac{i\,\Gamma\left(-\frac{4}{3}\right)\,{}_2F_1\left(\begin{matrix}-\frac{4}{3},\frac{1}{2}\\-\frac{1}{3}\end{matrix}\middle|x^3e^{i\pi}\right)}{3x^4\,\Gamma\left(-\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**5/(-x**3-1)**(1/2),x)
```

```
[Out] -I*gamma(-4/3)*hyper((-4/3, 1/2), (-1/3,), x**3*exp_polar(I*pi))/
(3*x**4*gamma(-1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\sqrt{-x^3-1}x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^3 - 1)*x^5),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(-x^3 - 1)*x^5), x)
```

3.510 $\int x^{11}\sqrt[3]{a+bx^3}\,dx$

Optimal. Leaf size=80

$$-\frac{a^3\left(a+bx^3\right)^{4/3}}{4b^4}+\frac{3a^2\left(a+bx^3\right)^{7/3}}{7b^4}+\frac{\left(a+bx^3\right)^{13/3}}{13b^4}-\frac{3a\left(a+bx^3\right)^{10/3}}{10b^4}$$

```
[Out] -(a^3*(a + b*x^3)^(4/3))/(4*b^4) + (3*a^2*(a + b*x^3)^(7/3))/(7*b
^4) - (3*a*(a + b*x^3)^(10/3))/(10*b^4) + (a + b*x^3)^(13/3)/(13*
b^4)
```

Rubi [A] time = 0.108387, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^3\left(a+bx^3\right)^{4/3}}{4b^4}+\frac{3a^2\left(a+bx^3\right)^{7/3}}{7b^4}+\frac{\left(a+bx^3\right)^{13/3}}{13b^4}-\frac{3a\left(a+bx^3\right)^{10/3}}{10b^4}$$

Antiderivative was successfully verified.

```
[In] Int[x^11*(a + b*x^3)^(1/3),x]
```

```
[Out] -(a^3*(a + b*x^3)^(4/3))/(4*b^4) + (3*a^2*(a + b*x^3)^(7/3))/(7*b
^4) - (3*a*(a + b*x^3)^(10/3))/(10*b^4) + (a + b*x^3)^(13/3)/(13*
b^4)
```

Rubi in Sympy [A] time = 14.6444, size = 71, normalized size = 0.89

$$-\frac{a^3\left(a+bx^3\right)^{\frac{4}{3}}}{4b^4}+\frac{3a^2\left(a+bx^3\right)^{\frac{7}{3}}}{7b^4}-\frac{3a\left(a+bx^3\right)^{\frac{10}{3}}}{10b^4}+\frac{\left(a+bx^3\right)^{\frac{13}{3}}}{13b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**11*(b*x**3+a)**(1/3),x)
```

```
[Out] -a**3*(a + b*x**3)**(4/3)/(4*b**4) + 3*a**2*(a + b*x**3)**(7/3)/(
7*b**4) - 3*a*(a + b*x**3)**(10/3)/(10*b**4) + (a + b*x**3)**(13/
3)/(13*b**4)
```

Mathematica [A] time = 0.0309168, size = 61, normalized size = 0.76

$$\frac{\sqrt[3]{a+bx^3}\left(-81a^4+27a^3bx^3-18a^2b^2x^6+14ab^3x^9+140b^4x^{12}\right)}{1820b^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^11*(a + b*x^3)^(1/3),x]
```

```
[Out] ((a + b*x^3)^(1/3)*(-81*a^4 + 27*a^3*b*x^3 - 18*a^2*b^2*x^6 + 14*
a*b^3*x^9 + 140*b^4*x^12))/(1820*b^4)
```

Maple [A] time = 0.009, size = 47, normalized size = 0.6

$$-\frac{-140\,b^3x^9+126\,ab^2x^6-108\,a^2bx^3+81\,a^3}{1820\,b^4}\left(bx^3+a\right)^{\frac{4}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11*(b*x^3+a)^(1/3),x)
```

```
[Out] -1/1820*(b*x^3+a)^(4/3)*(-140*b^3*x^9+126*a*b^2*x^6-108*a^2*b*x^3
+81*a^3)/b^4
```

Maxima [A] time = 1.43915, size = 86, normalized size = 1.08

$$\frac{\left(bx^3+a\right)^{\frac{13}{3}}}{13\,b^4}-\frac{3\,\left(bx^3+a\right)^{\frac{10}{3}}a}{10\,b^4}+\frac{3\,\left(bx^3+a\right)^{\frac{7}{3}}a^2}{7\,b^4}-\frac{\left(bx^3+a\right)^{\frac{4}{3}}a^3}{4\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)*x^11,x, algorithm="maxima")
```

```
[Out] 1/13*(b*x^3 + a)^(13/3)/b^4 - 3/10*(b*x^3 + a)^(10/3)*a/b^4 + 3/7
*(b*x^3 + a)^(7/3)*a^2/b^4 - 1/4*(b*x^3 + a)^(4/3)*a^3/b^4
```

Fricas [A] time = 0.220438, size = 77, normalized size = 0.96

$$\frac{\left(140\,b^4x^{12}+14\,ab^3x^9-18\,a^2b^2x^6+27\,a^3bx^3-81\,a^4\right)\left(bx^3+a\right)^{\frac{1}{3}}}{1820\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)*x^11,x, algorithm="fricas")
```

```
[Out] 1/1820*(140*b^4*x^12 + 14*a*b^3*x^9 - 18*a^2*b^2*x^6 + 27*a^3*b*x
^3 - 81*a^4)*(b*x^3 + a)^(1/3)/b^4
```

Sympy [A] time = 13.3038, size = 110, normalized size = 1.38

$$\begin{cases} -\frac{81a^4\sqrt[3]{a+bx^3}}{1820b^4}+\frac{27a^3x^3\sqrt[3]{a+bx^3}}{1820b^3}-\frac{9a^2x^6\sqrt[3]{a+bx^3}}{910b^2}+\frac{ax^9\sqrt[3]{a+bx^3}}{130b}+\frac{x^{12}\sqrt[3]{a+bx^3}}{13} & \text{for}\ b\neq 0\\ \frac{\sqrt[3]{a}x^{12}}{12} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11*(b*x**3+a)**(1/3),x)
```

```
[Out] Piecewise((-81*a**4*(a + b*x**3)**(1/3)/(1820*b**4) + 27*a**3*x**
3*(a + b*x**3)**(1/3)/(1820*b**3) - 9*a**2*x**6*(a + b*x**3)**(1/
3)/(910*b**2) + a*x**9*(a + b*x**3)**(1/3)/(130*b) + x**12*(a + b
*x**3)**(1/3)/13, Ne(b, 0)), (a**(1/3)*x**12/12, True))
```

GIAC/XCAS [A] time = 0.218857, size = 77, normalized size = 0.96

$$\frac{140\,\left(bx^3+a\right)^{\frac{13}{3}}-546\,\left(bx^3+a\right)^{\frac{10}{3}}a+780\,\left(bx^3+a\right)^{\frac{7}{3}}a^2-455\,\left(bx^3+a\right)^{\frac{4}{3}}a^3}{1820\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)*x^11,x, algorithm="giac")
```

```
[Out] 1/1820*(140*(b*x^3 + a)^(13/3) - 546*(b*x^3 + a)^(10/3)*a + 780*(
b*x^3 + a)^(7/3)*a^2 - 455*(b*x^3 + a)^(4/3)*a^3)/b^4
```

3.511 $\int x^8 \sqrt[3]{a+bx^3}\,dx$

Optimal. Leaf size=59

$$\frac{a^2\left(a+bx^3\right)^{4/3}}{4b^3}+\frac{\left(a+bx^3\right)^{10/3}}{10b^3}-\frac{2a\left(a+bx^3\right)^{7/3}}{7b^3}$$

```
[Out] (a^2*(a + b*x^3)^(4/3))/(4*b^3) - (2*a*(a + b*x^3)^(7/3))/(7*b^3)
 + (a + b*x^3)^(10/3)/(10*b^3)
```

Rubi [A] time = 0.0853631, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^2\left(a+bx^3\right)^{4/3}}{4b^3}+\frac{\left(a+bx^3\right)^{10/3}}{10b^3}-\frac{2a\left(a+bx^3\right)^{7/3}}{7b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8*(a + b*x^3)^(1/3),x]
```

```
[Out] (a^2*(a + b*x^3)^(4/3))/(4*b^3) - (2*a*(a + b*x^3)^(7/3))/(7*b^3)
 + (a + b*x^3)^(10/3)/(10*b^3)
```

Rubi in Sympy [A] time = 10.8997, size = 51, normalized size = 0.86

$$\frac{a^2\left(a+bx^3\right)^{\frac{4}{3}}}{4b^3}-\frac{2a\left(a+bx^3\right)^{\frac{7}{3}}}{7b^3}+\frac{\left(a+bx^3\right)^{\frac{10}{3}}}{10b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8*(b*x**3+a)**(1/3),x)
```

```
[Out] a**2*(a + b*x**3)**(4/3)/(4*b**3) - 2*a*(a + b*x**3)**(7/3)/(7*b*
*3) + (a + b*x**3)**(10/3)/(10*b**3)
```

Mathematica [A] time = 0.0248825, size = 50, normalized size = 0.85

$$\frac{\sqrt[3]{a+bx^3}\left(9a^3-3a^2bx^3+2ab^2x^6+14b^3x^9\right)}{140b^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8*(a + b*x^3)^(1/3),x]
```

```
[Out] ((a + b*x^3)^(1/3)*(9*a^3 - 3*a^2*b*x^3 + 2*a*b^2*x^6 + 14*b^3*x^
9))/(140*b^3)
```

Maple [A] time = 0.009, size = 36, normalized size = 0.6

$$\frac{14\,b^2x^6-12\,abx^3+9\,a^2}{140\,b^3}\left(bx^3+a\right)^{\frac{4}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8*(b*x^3+a)^(1/3),x)
```

```
[Out] 1/140*(b*x^3+a)^(4/3)*(14*b^2*x^6-12*a*b*x^3+9*a^2)/b^3
```

Maxima [A] time = 1.44351, size = 63, normalized size = 1.07

$$\frac{\left(bx^3+a\right)^{\frac{10}{3}}}{10\,b^3}-\frac{2\left(bx^3+a\right)^{\frac{7}{3}}a}{7\,b^3}+\frac{\left(bx^3+a\right)^{\frac{4}{3}}a^2}{4\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)*x^8,x, algorithm="maxima")
```

```
[Out] 1/10*(b*x^3 + a)^(10/3)/b^3 - 2/7*(b*x^3 + a)^(7/3)*a/b^3 + 1/4*(
b*x^3 + a)^(4/3)*a^2/b^3
```

Fricas [A] time = 0.223151, size = 62, normalized size = 1.05

$$\frac{\left(14\,b^3x^9+2\,ab^2x^6-3\,a^2bx^3+9\,a^3\right)\left(bx^3+a\right)^{\frac{1}{3}}}{140\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)*x^8,x, algorithm="fricas")
```

```
[Out] 1/140*(14*b^3*x^9 + 2*a*b^2*x^6 - 3*a^2*b*x^3 + 9*a^3)*(b*x^3 + a
)^(1/3)/b^3
```

Sympy [A] time = 5.81667, size = 87, normalized size = 1.47

$$\begin{cases}\frac{9a^3\sqrt[3]{a+bx^3}}{140b^3}-\frac{3a^2x^3\sqrt[3]{a+bx^3}}{140b^2}+\frac{ax^6\sqrt[3]{a+bx^3}}{70b}+\frac{x^9\sqrt[3]{a+bx^3}}{10} & \text{for } b\neq 0\\ \frac{\sqrt[3]{a}x^9}{9} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8*(b*x**3+a)**(1/3),x)
```

```
[Out] Piecewise((9*a**3*(a + b*x**3)**(1/3)/(140*b**3) - 3*a**2*x**3*(a
 + b*x**3)**(1/3)/(140*b**2) + a*x**6*(a + b*x**3)**(1/3)/(70*b)
+ x**9*(a + b*x**3)**(1/3)/10, Ne(b, 0)), (a**(1/3)*x**9/9, True)
)
```

GIAC/XCAS [A] time = 0.224812, size = 58, normalized size = 0.98

$$\frac{14\left(bx^3+a\right)^{\frac{10}{3}}-40\left(bx^3+a\right)^{\frac{7}{3}}a+35\left(bx^3+a\right)^{\frac{4}{3}}a^2}{140\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)*x^8,x, algorithm="giac")
```

```
[Out] 1/140*(14*(b*x^3 + a)^(10/3) - 40*(b*x^3 + a)^(7/3)*a + 35*(b*x^3
 + a)^(4/3)*a^2)/b^3
```

3.512 $\int x^5 \sqrt[3]{a+bx^3}\,dx$

Optimal. Leaf size=38

$$\frac{(a+bx^3)^{7/3}}{7b^2}-\frac{a(a+bx^3)^{4/3}}{4b^2}$$

```
[Out] -(a*(a + b*x^3)^(4/3))/(4*b^2) + (a + b*x^3)^(7/3)/(7*b^2)
```

Rubi [A] time = 0.0599424, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{(a+bx^3)^{7/3}}{7b^2}-\frac{a(a+bx^3)^{4/3}}{4b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5*(a + b*x^3)^(1/3),x]
```

```
[Out] -(a*(a + b*x^3)^(4/3))/(4*b^2) + (a + b*x^3)^(7/3)/(7*b^2)
```

Rubi in Sympy [A] time = 7.18537, size = 31, normalized size = 0.82

$$-\frac{a(a+bx^3)^{\frac{4}{3}}}{4b^2}+\frac{(a+bx^3)^{\frac{7}{3}}}{7b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5*(b*x**3+a)**(1/3),x)
```

```
[Out] -a*(a + b*x**3)**(4/3)/(4*b**2) + (a + b*x**3)**(7/3)/(7*b**2)
```

Mathematica [A] time = 0.0194639, size = 38, normalized size = 1.

$$\frac{\sqrt[3]{a+bx^3}\left(-3a^2+abx^3+4b^2x^6\right)}{28b^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5*(a + b*x^3)^(1/3),x]
```

```
[Out] ((a + b*x^3)^(1/3)*(-3*a^2 + a*b*x^3 + 4*b^2*x^6))/(28*b^2)
```

Maple [A] time = 0.007, size = 25, normalized size = 0.7

$$-\frac{-4\,bx^3+3\,a}{28\,b^2}\left(bx^3+a\right)^{\frac{4}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5*(b*x^3+a)^(1/3),x)
```

```
[Out] -1/28*(b*x^3+a)^(4/3)*(-4*b*x^3+3*a)/b^2
```

Maxima [A] time = 1.4422, size = 41, normalized size = 1.08

$$\frac{\left(bx^3+a\right)^{\frac{7}{3}}}{7\,b^2}-\frac{\left(bx^3+a\right)^{\frac{4}{3}}a}{4\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)*x^5,x, algorithm="maxima")
```

```
[Out] 1/7*(b*x^3 + a)^(7/3)/b^2 - 1/4*(b*x^3 + a)^(4/3)*a/b^2
```

Fricas [A] time = 0.228234, size = 46, normalized size = 1.21

$$\frac{\left(4\,b^2x^6+abx^3-3\,a^2\right)\left(bx^3+a\right)^{\frac{1}{3}}}{28\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)*x^5,x, algorithm="fricas")
```

```
[Out] 1/28*(4*b^2*x^6 + a*b*x^3 - 3*a^2)*(b*x^3 + a)^(1/3)/b^2
```

Sympy [A] time = 2.11637, size = 63, normalized size = 1.66

$$\begin{cases} -\frac{3a^2\sqrt[3]{a+bx^3}}{28b^2}+\frac{ax^3\sqrt[3]{a+bx^3}}{28b}+\frac{x^6\sqrt[3]{a+bx^3}}{7} & \text{for } b\neq 0 \\ \frac{\sqrt[3]{a}x^6}{6} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5*(b*x**3+a)**(1/3),x)
```

```
[Out] Piecewise((-3*a**2*(a + b*x**3)**(1/3)/(28*b**2) + a*x**3*(a + b*
x**3)**(1/3)/(28*b) + x**6*(a + b*x**3)**(1/3)/7, Ne(b, 0)), (a**
(1/3)*x**6/6, True))
```

GIAC/XCAS [A] time = 0.263729, size = 39, normalized size = 1.03

$$\frac{4\left(bx^3+a\right)^{\frac{7}{3}}-7\left(bx^3+a\right)^{\frac{4}{3}}a}{28\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)*x^5,x, algorithm="giac")
```

```
[Out] 1/28*(4*(b*x^3 + a)^(7/3) - 7*(b*x^3 + a)^(4/3)*a)/b^2
```

3.513 $\int x^2 \sqrt[3]{a+bx^3}\,dx$

Optimal. Leaf size=18

$$\frac{(a+bx^3)^{4/3}}{4b}$$

```
[Out] (a + b*x^3)^(4/3)/(4*b)
```

Rubi [A] time = 0.0110452, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$\frac{(a+bx^3)^{4/3}}{4b}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(a + b*x^3)^(1/3),x]

[Out] (a + b*x^3)^(4/3)/(4*b)
```

Rubi in Sympy [A] time = 2.14579, size = 12, normalized size = 0.67

$$\frac{(a+bx^3)^{\frac{4}{3}}}{4b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**2*(b*x**3+a)**(1/3),x)

[Out] (a + b*x**3)**(4/3)/(4*b)
```

Mathematica [A] time = 0.010697, size = 18, normalized size = 1.

$$\frac{(a+bx^3)^{4/3}}{4b}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(a + b*x^3)^(1/3),x]

[Out] (a + b*x^3)^(4/3)/(4*b)
```

Maple [A] time = 0.006, size = 15, normalized size = 0.8

$$\frac{1}{4b}(bx^3+a)^{\frac{4}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(b*x^3+a)^(1/3),x)

[Out] 1/4*(b*x^3+a)^(4/3)/b
```

Maxima [A] time = 1.43022, size = 19, normalized size = 1.06

$$\frac{\left(bx^3 + a\right)^{\frac{4}{3}}}{4\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)*x^2,x, algorithm="maxima")
```

```
[Out] 1/4*(b*x^3 + a)^(4/3)/b
```

Fricas [A] time = 0.231129, size = 19, normalized size = 1.06

$$\frac{\left(bx^3 + a\right)^{\frac{4}{3}}}{4\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)*x^2,x, algorithm="fricas")
```

```
[Out] 1/4*(b*x^3 + a)^(4/3)/b
```

Sympy [A] time = 0.657702, size = 39, normalized size = 2.17

$$\begin{cases} \frac{a\sqrt[3]{a + bx^3}}{4b} + \frac{x^3\sqrt[3]{a + bx^3}}{4} & \text{for}\ b \neq 0 \\ \frac{\sqrt[3]{a}x^3}{3} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(b*x**3+a)**(1/3),x)
```

```
[Out] Piecewise((a*(a + b*x**3)**(1/3)/(4*b) + x**3*(a + b*x**3)**(1/3)
/4, Ne(b, 0)), (a**(1/3)*x**3/3, True))
```

GIAC/XCAS [A] time = 0.211406, size = 19, normalized size = 1.06

$$\frac{\left(bx^3 + a\right)^{\frac{4}{3}}}{4\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)*x^2,x, algorithm="giac")
```

```
[Out] 1/4*(b*x^3 + a)^(4/3)/b
```

3.514 $\int \frac{\sqrt[3]{a+bx^3}}{x}\,dx$

Optimal. Leaf size=95

$$\sqrt[3]{a+bx^3}+\frac{1}{2}\sqrt[3]{a}\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^3}\right)-\frac{\sqrt[3]{a}\tan^{-1}\left(\frac{2\sqrt[3]{a+bx^3}+\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}}-\frac{1}{2}\sqrt[3]{a}\log(x)$$

```
[Out] (a + b*x^3)^(1/3) - (a^(1/3)*ArcTan[(a^(1/3) + 2*(a + b*x^3)^(1/3
))/(Sqrt[3]*a^(1/3))])/Sqrt[3] - (a^(1/3)*Log[x])/2 + (a^(1/3)*Lo
g[a^(1/3) - (a + b*x^3)^(1/3)])/2
```

Rubi [A] time = 0.165937, antiderivative size = 95, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$\sqrt[3]{a+bx^3}+\frac{1}{2}\sqrt[3]{a}\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^3}\right)-\frac{\sqrt[3]{a}\tan^{-1}\left(\frac{2\sqrt[3]{a+bx^3}+\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}}-\frac{1}{2}\sqrt[3]{a}\log(x)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^(1/3)/x,x]
```

```
[Out] (a + b*x^3)^(1/3) - (a^(1/3)*ArcTan[(a^(1/3) + 2*(a + b*x^3)^(1/3
))/(Sqrt[3]*a^(1/3))])/Sqrt[3] - (a^(1/3)*Log[x])/2 + (a^(1/3)*Lo
g[a^(1/3) - (a + b*x^3)^(1/3)])/2
```

Rubi in Sympy [A] time = 9.9079, size = 88, normalized size = 0.93

$$-\frac{\sqrt[3]{a}\log\left(x^3\right)}{6}+\frac{\sqrt[3]{a}\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^3}\right)}{2}-\frac{\sqrt{3}\sqrt[3]{a}\,\text{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\frac{2\sqrt[3]{a+bx^3}}{3}\right)}{\sqrt[3]{a}}\right)}{3}+\sqrt[3]{a+bx^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**(1/3)/x,x)
```

```
[Out] -a**(1/3)*log(x**3)/6 + a**(1/3)*log(a**(1/3) - (a + b*x**3)**(1/
3))/2 - sqrt(3)*a**(1/3)*atan(sqrt(3)*(a**(1/3)/3 + 2*(a + b*x**3
)**(1/3)/3)/a**(1/3))/3 + (a + b*x**3)**(1/3)
```

Mathematica [C] time = 0.0459076, size = 61, normalized size = 0.64

$$\frac{2\left(a+bx^3\right)-a\left(\frac{a}{bx^3}+1\right)^{2/3}{}_2F_1\left(\frac{2}{3},\frac{2}{3};\frac{5}{3};-\frac{a}{bx^3}\right)}{2\left(a+bx^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^(1/3)/x,x]
```

```
[Out] (2*(a + b*x^3) - a*(1 + a/(b*x^3))^(2/3)*Hypergeometric2F1[2/3, 2
/3, 5/3, -(a/(b*x^3))])/(2*(a + b*x^3)^(2/3))
```

Maple [F] time = 0.044, size = 0, normalized size = 0.

$$\int \frac{1}{x}\sqrt[3]{bx^3+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^(1/3)/x,x)
```

```
[Out] int((b*x^3+a)^(1/3)/x,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.239418, size = 150, normalized size = 1.58

$$-\frac{1}{18}\sqrt{3}\left(\sqrt{3}a^{\frac{1}{3}}\log\left(\left(bx^3+a\right)^{\frac{2}{3}}+\left(bx^3+a\right)^{\frac{1}{3}}a^{\frac{1}{3}}+a^{\frac{2}{3}}\right)-2\sqrt{3}a^{\frac{1}{3}}\log\left(\left(bx^3+a\right)^{\frac{1}{3}}-a^{\frac{1}{3}}\right)+6\,a^{\frac{1}{3}}\arctan\left(\frac{2\sqrt{3}\left(bx^3+a\right)^{\frac{1}{3}}+\sqrt{3}\ldots}{3\,a^{\frac{1}{3}}}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)/x,x, algorithm="fricas")
```

```
[Out] -1/18*sqrt(3)*(sqrt(3)*a^(1/3)*log((b*x^3 + a)^(2/3) + (b*x^3 + a
)^(1/3)*a^(1/3) + a^(2/3)) - 2*sqrt(3)*a^(1/3)*log((b*x^3 + a)^(1
/3) - a^(1/3)) + 6*a^(1/3)*arctan(1/3*(2*sqrt(3)*(b*x^3 + a)^(1/3
) + sqrt(3)*a^(1/3))/a^(1/3)) - 6*sqrt(3)*(b*x^3 + a)^(1/3))
```

Sympy [A] time = 3.82056, size = 42, normalized size = 0.44

$$-\frac{\sqrt[3]{b}x\left(-\frac{1}{3}\right){}_2F_1\left(\begin{matrix}-\frac{1}{3},-\frac{1}{3}\\ \frac{2}{3}\end{matrix}\middle|\frac{ae^{i\pi}}{bx^3}\right)}{3\left(\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**(1/3)/x,x)
```

```
[Out] -b**(1/3)*x*gamma(-1/3)*hyper((-1/3, -1/3), (2/3,), a*exp_polar(I
*pi)/(b*x**3))/(3*gamma(2/3))
```

GIAC/XCAS [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)/x,x, algorithm="giac")
```

```
[Out] Timed out
```

3.515 $\int \frac{\sqrt[3]{a+bx^3}}{x^4}\,dx$

Optimal. Leaf size=107

$$\frac{b\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^3}\right)}{6a^{2/3}}-\frac{b\tan^{-1}\left(\frac{2\sqrt[3]{a+bx^3}+\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{2/3}}-\frac{b\log(x)}{6a^{2/3}}-\frac{\sqrt[3]{a+bx^3}}{3x^3}$$

```
[Out] -(a + b*x^3)^(1/3)/(3*x^3) - (b*ArcTan[(a^(1/3) + 2*(a + b*x^3)^(
1/3))/(Sqrt[3]*a^(1/3))])/(3*Sqrt[3]*a^(2/3)) - (b*Log[x])/(6*a^(
2/3)) + (b*Log[a^(1/3) - (a + b*x^3)^(1/3)])/(6*a^(2/3))
```

Rubi [A] time = 0.152953, antiderivative size = 107, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$\frac{b\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^3}\right)}{6a^{2/3}}-\frac{b\tan^{-1}\left(\frac{2\sqrt[3]{a+bx^3}+\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{2/3}}-\frac{b\log(x)}{6a^{2/3}}-\frac{\sqrt[3]{a+bx^3}}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^(1/3)/x^4,x]
```

```
[Out] -(a + b*x^3)^(1/3)/(3*x^3) - (b*ArcTan[(a^(1/3) + 2*(a + b*x^3)^(
1/3))/(Sqrt[3]*a^(1/3))])/(3*Sqrt[3]*a^(2/3)) - (b*Log[x])/(6*a^(
2/3)) + (b*Log[a^(1/3) - (a + b*x^3)^(1/3)])/(6*a^(2/3))
```

Rubi in Sympy [A] time = 10.3995, size = 99, normalized size = 0.93

$$-\frac{\sqrt[3]{a+bx^3}}{3x^3}-\frac{b\log\left(x^3\right)}{18a^{\frac{2}{3}}}+\frac{b\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^3}\right)}{6a^{\frac{2}{3}}}-\frac{\sqrt{3}b\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\frac{2\sqrt[3]{a+bx^3}}{3}\right)}{\sqrt[3]{a}}\right)}{9a^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**(1/3)/x**4,x)
```

```
[Out] -(a + b*x**3)**(1/3)/(3*x**3) - b*log(x**3)/(18*a**(2/3)) + b*log
(a**(1/3) - (a + b*x**3)**(1/3))/(6*a**(2/3)) - sqrt(3)*b*atan(sq
rt(3)*(a**(1/3)/3 + 2*(a + b*x**3)**(1/3)/3)/a**(1/3))/(9*a**(2/3
))
```

Mathematica [C] time = 0.0433619, size = 67, normalized size = 0.63

$$\frac{-bx^3\left(\frac{a}{bx^3}+1\right)^{2/3}{}_2F_1\left(\frac{2}{3},\frac{2}{3};\frac{5}{3};-\frac{a}{bx^3}\right)-2\left(a+bx^3\right)}{6x^3\left(a+bx^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^(1/3)/x^4,x]
```

```
[Out] (-2*(a + b*x^3) - b*(1 + a/(b*x^3))^(2/3)*x^3*Hypergeometric2F1[2
/3, 2/3, 5/3, -(a/(b*x^3))])/(6*x^3*(a + b*x^3)^(2/3))
```

Maple [F] time = 0.047, size = 0, normalized size = 0.

$$\int \frac{1}{x^4}\sqrt[3]{bx^3+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^(1/3)/x^4,x)
```

```
[Out] int((b*x^3+a)^(1/3)/x^4,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)/x^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.24094, size = 193, normalized size = 1.8

$$-\frac{\sqrt{3}\left(\sqrt{3}bx^3\log\left(a^2+\left(bx^3+a\right)^{\frac{1}{3}}\left(a^2\right)^{\frac{1}{3}}a+\left(bx^3+a\right)^{\frac{2}{3}}\left(a^2\right)^{\frac{2}{3}}\right)-2\sqrt{3}bx^3\log\left(-a+\left(bx^3+a\right)^{\frac{1}{3}}\left(a^2\right)^{\frac{1}{3}}\right)+6\,bx^3\arctan\left(\frac{\sqrt{3}a+2\ldots}{\ldots}\right.\ldots}{54\left(a^2\right)^{\frac{1}{3}}x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)/x^4,x, algorithm="fricas")
```

```
[Out] -1/54*sqrt(3)*(sqrt(3)*b*x^3*log(a^2 + (b*x^3 + a)^(1/3)*(a^2)^(1
/3)*a + (b*x^3 + a)^(2/3)*(a^2)^(2/3)) - 2*sqrt(3)*b*x^3*log(-a +
 (b*x^3 + a)^(1/3)*(a^2)^(1/3)) + 6*b*x^3*arctan(1/3*(sqrt(3)*a +
 2*sqrt(3)*(b*x^3 + a)^(1/3)*(a^2)^(1/3))/a) + 6*sqrt(3)*(b*x^3 +
 a)^(1/3)*(a^2)^(1/3))/((a^2)^(1/3)*x^3)
```

Sympy [A] time = 4.52576, size = 41, normalized size = 0.38

$$-\frac{\sqrt[3]{b}\,\Gamma\left(\frac{2}{3}\right)\,{}_2F_1\left(\begin{matrix}-\frac{1}{3},\frac{2}{3}\\\frac{5}{3}\end{matrix}\middle|\frac{ae^{i\pi}}{bx^3}\right)}{3x^2\,\Gamma\left(\frac{5}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**(1/3)/x**4,x)
```

```
[Out] -b**(1/3)*gamma(2/3)*hyper((-1/3, 2/3), (5/3,), a*exp_polar(I*pi)
/(b*x**3))/(3*x**2*gamma(5/3))
```

GIAC/XCAS [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)/x^4,x, algorithm="giac")
```

```
[Out] Timed out
```

3.516 $\int x^4\sqrt[3]{a+bx^3}\,dx$

Optimal. Leaf size=173

$$\frac{a^2\log\left(1-\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}\right)}{27b^{5/3}}+\frac{a^2\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1}{\sqrt{3}}\right)}{9\sqrt{3}b^{5/3}}-\frac{a^2\log\left(\frac{b^{2/3}x^2}{(a+bx^3)^{2/3}}+\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)}{54b^{5/3}}+\frac{1}{6}x^5\sqrt[3]{a+bx^3}+\frac{ax^2\sqrt[3]{a+bx^3}}{18b}$$

```
[Out] (a*x^2*(a + b*x^3)^(1/3))/(18*b) + (x^5*(a + b*x^3)^(1/3))/6 + (a
^2*ArcTan[(1 + (2*b^(1/3)*x)/(a + b*x^3)^(1/3))/Sqrt[3]])/(9*Sqrt
[3]*b^(5/3)) + (a^2*Log[1 - (b^(1/3)*x)/(a + b*x^3)^(1/3)])/(27*b
^(5/3)) - (a^2*Log[1 + (b^(2/3)*x^2)/(a + b*x^3)^(2/3) + (b^(1/3)
*x)/(a + b*x^3)^(1/3)])/(54*b^(5/3))
```

Rubi [A] time = 0.238675, antiderivative size = 173, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 9, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.6

$$\frac{a^2\log\left(1-\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}\right)}{27b^{5/3}}+\frac{a^2\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1}{\sqrt{3}}\right)}{9\sqrt{3}b^{5/3}}-\frac{a^2\log\left(\frac{b^{2/3}x^2}{(a+bx^3)^{2/3}}+\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)}{54b^{5/3}}+\frac{1}{6}x^5\sqrt[3]{a+bx^3}+\frac{ax^2\sqrt[3]{a+bx^3}}{18b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4*(a + b*x^3)^(1/3),x]
```

```
[Out] (a*x^2*(a + b*x^3)^(1/3))/(18*b) + (x^5*(a + b*x^3)^(1/3))/6 + (a
^2*ArcTan[(1 + (2*b^(1/3)*x)/(a + b*x^3)^(1/3))/Sqrt[3]])/(9*Sqrt
[3]*b^(5/3)) + (a^2*Log[1 - (b^(1/3)*x)/(a + b*x^3)^(1/3)])/(27*b
^(5/3)) - (a^2*Log[1 + (b^(2/3)*x^2)/(a + b*x^3)^(2/3) + (b^(1/3)
*x)/(a + b*x^3)^(1/3)])/(54*b^(5/3))
```

Rubi in Sympy [A] time = 26.3248, size = 158, normalized size = 0.91

$$\frac{a^2\log\left(-\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)}{27b^{\frac{5}{3}}}-\frac{a^2\log\left(\frac{b^{\frac{2}{3}}x^2}{(a+bx^3)^{\frac{2}{3}}}+\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)}{54b^{\frac{5}{3}}}+\frac{\sqrt{3}a^2\operatorname{atan}\left(\sqrt{3}\left(\frac{2\sqrt[3]{b}x}{3\sqrt[3]{a+bx^3}}+\frac{1}{3}\right)\right)}{27b^{\frac{5}{3}}}+\frac{ax^2\sqrt[3]{a+bx^3}}{18b}+\frac{x^5\sqrt[3]{a+bx^3}}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4*(b*x**3+a)**(1/3),x)
```

```
[Out] a**2*log(-b**(1/3)*x/(a + b*x**3)**(1/3) + 1)/(27*b**(5/3)) - a**
2*log(b**(2/3)*x**2/(a + b*x**3)**(2/3) + b**(1/3)*x/(a + b*x**3)
**(1/3) + 1)/(54*b**(5/3)) + sqrt(3)*a**2*atan(sqrt(3)*(2*b**(1/3
)*x/(3*(a + b*x**3)**(1/3)) + 1/3))/(27*b**(5/3)) + a*x**2*(a + b
*x**3)**(1/3)/(18*b) + x**5*(a + b*x**3)**(1/3)/6
```

Mathematica [C] time = 0.0586426, size = 78, normalized size = 0.45

$$\frac{x^2\left(-a^2\left(\frac{bx^3}{a}+1\right)^{2/3}{}_2F_1\left(\frac{2}{3},\frac{2}{3};\frac{5}{3};-\frac{bx^3}{a}\right)+a^2+4abx^3+3b^2x^6\right)}{18b\left(a+bx^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4*(a + b*x^3)^(1/3),x]
```

```
[Out] (x^2*(a^2 + 4*a*b*x^3 + 3*b^2*x^6 - a^2*(1 + (b*x^3)/a)^(2/3)*Hyp
ergeometric2F1[2/3, 2/3, 5/3, -((b*x^3)/a)]))/(18*b*(a + b*x^3)^(
2/3))
```

Maple [F] time = 0.042, size = 0, normalized size = 0.

$$\int x^4\sqrt[3]{bx^3+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4*(b*x^3+a)^(1/3),x)
```

```
[Out] int(x^4*(b*x^3+a)^(1/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)*x^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.242345, size = 232, normalized size = 1.34

$$\frac{\sqrt{3}\left(2\sqrt{3}a^2\log\left(-\frac{bx-\left(bx^3+a\right)^{\frac{1}{3}}\left(b^2\right)^{\frac{1}{3}}}{x}\right)-\sqrt{3}a^2\log\left(\frac{b^2x^2+\left(bx^3+a\right)^{\frac{1}{3}}\left(b^2\right)^{\frac{1}{3}}bx+\left(bx^3+a\right)^{\frac{2}{3}}\left(b^2\right)^{\frac{2}{3}}}{x^2}\right)-6\,a^2\arctan\left(\frac{\sqrt{3}bx+2\sqrt{3}\left(bx^3+a\right)^{\frac{1}{3}}\left(b^2\right)^{\frac{1}{3}}}{3\,bx}\right.\right.}{162\left(b^2\right)^{\frac{1}{3}}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)*x^4,x, algorithm="fricas")
```

```
[Out] 1/162*sqrt(3)*(2*sqrt(3)*a^2*log(-(b*x - (b*x^3 + a)^(1/3)*(b^2)^
(1/3))/x) - sqrt(3)*a^2*log((b^2*x^2 + (b*x^3 + a)^(1/3)*(b^2)^(1
/3)*b*x + (b*x^3 + a)^(2/3)*(b^2)^(2/3))/x^2) - 6*a^2*arctan(1/3*
(sqrt(3)*b*x + 2*sqrt(3)*(b*x^3 + a)^(1/3)*(b^2)^(1/3))/(b*x)) +
3*sqrt(3)*(3*b*x^5 + a*x^2)*(b*x^3 + a)^(1/3)*(b^2)^(1/3))/((b^2)
^(1/3)*b)
```

Sympy [A] time = 5.09841, size = 39, normalized size = 0.23

$$\frac{\sqrt[3]{a}x^5\Gamma\left(\frac{5}{3}\right){}_2F_1\left(\begin{matrix}-\frac{1}{3},\frac{5}{3}\\ \frac{8}{3}\end{matrix}\middle|\frac{bx^3e^{i\pi}}{a}\right)}{3\Gamma\left(\frac{8}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4*(b*x**3+a)**(1/3),x)
```

```
[Out] a**(1/3)*x**5*gamma(5/3)*hyper((-1/3, 5/3), (8/3,), b*x**3*exp_po
lar(I*pi)/a)/(3*gamma(8/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\left(bx^3+a\right)^{\frac{1}{3}}x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)*x^4,x, algorithm="giac")
```

```
[Out] integrate((b*x^3 + a)^(1/3)*x^4, x)
```

3.517 $\int x\sqrt[3]{a+bx^3}\,dx$

Optimal. Leaf size=145

$$-\frac{a\log\left(1-\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}\right)}{9b^{2/3}}-\frac{a\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1}{\sqrt{3}}\right)}{3\sqrt{3}b^{2/3}}+\frac{a\log\left(\frac{b^{2/3}x^2}{(a+bx^3)^{2/3}}+\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)}{18b^{2/3}}+\frac{1}{3}x^2\sqrt[3]{a+bx^3}$$

```
[Out] (x^2*(a + b*x^3)^(1/3))/3 - (a*ArcTan[(1 + (2*b^(1/3)*x)/(a + b*x
^3)^(1/3))/Sqrt[3]])/(3*Sqrt[3]*b^(2/3)) - (a*Log[1 - (b^(1/3)*x)
/(a + b*x^3)^(1/3)])/(9*b^(2/3)) + (a*Log[1 + (b^(2/3)*x^2)/(a +
b*x^3)^(2/3) + (b^(1/3)*x)/(a + b*x^3)^(1/3)])/(18*b^(2/3))
```

Rubi [A] time = 0.15952, antiderivative size = 145, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615

$$-\frac{a\log\left(1-\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}\right)}{9b^{2/3}}-\frac{a\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1}{\sqrt{3}}\right)}{3\sqrt{3}b^{2/3}}+\frac{a\log\left(\frac{b^{2/3}x^2}{(a+bx^3)^{2/3}}+\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)}{18b^{2/3}}+\frac{1}{3}x^2\sqrt[3]{a+bx^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x*(a + b*x^3)^(1/3),x]
```

```
[Out] (x^2*(a + b*x^3)^(1/3))/3 - (a*ArcTan[(1 + (2*b^(1/3)*x)/(a + b*x
^3)^(1/3))/Sqrt[3]])/(3*Sqrt[3]*b^(2/3)) - (a*Log[1 - (b^(1/3)*x)
/(a + b*x^3)^(1/3)])/(9*b^(2/3)) + (a*Log[1 + (b^(2/3)*x^2)/(a +
b*x^3)^(2/3) + (b^(1/3)*x)/(a + b*x^3)^(1/3)])/(18*b^(2/3))
```

Rubi in Sympy [A] time = 21.2556, size = 134, normalized size = 0.92

$$-\frac{a\log\left(-\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)}{9b^{\frac{2}{3}}}+\frac{a\log\left(\frac{b^{\frac{2}{3}}x^2}{(a+bx^3)^{\frac{2}{3}}}+\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)}{18b^{\frac{2}{3}}}-\frac{\sqrt{3}a\,\mathrm{atan}\left(\sqrt{3}\left(\frac{2\sqrt[3]{b}x}{3\sqrt[3]{a+bx^3}}+\frac{1}{3}\right)\right)}{9b^{\frac{2}{3}}}+\frac{x^2\sqrt[3]{a+bx^3}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(b*x**3+a)**(1/3),x)
```

```
[Out] -a*log(-b**(1/3)*x/(a + b*x**3)**(1/3) + 1)/(9*b**(2/3)) + a*log(
b**(2/3)*x**2/(a + b*x**3)**(2/3) + b**(1/3)*x/(a + b*x**3)**(1/3
) + 1)/(18*b**(2/3)) - sqrt(3)*a*atan(sqrt(3)*(2*b**(1/3)*x/(3*(a
 + b*x**3)**(1/3)) + 1/3))/(9*b**(2/3)) + x**2*(a + b*x**3)**(1/3
)/3
```

Mathematica [C] time = 0.0450405, size = 63, normalized size = 0.43

$$\frac{x^2\left(a\left(\frac{bx^3}{a}+1\right)^{2/3}{}_2F_1\left(\frac{2}{3},\frac{2}{3};\frac{5}{3};-\frac{bx^3}{a}\right)+2\left(a+bx^3\right)\right)}{6\left(a+bx^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]   Integrate[x*(a + b*x^3)^(1/3),x]
```

```
[Out] (x^2*(2*(a + b*x^3) + a*(1 + (b*x^3)/a)^(2/3)*Hypergeometric2F1[2
/3, 2/3, 5/3, -((b*x^3)/a)]))/(6*(a + b*x^3)^(2/3))
```

Maple [F] time = 0.033, size = 0, normalized size = 0.

$$\int x\sqrt[3]{bx^3+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x*(b*x^3+a)^(1/3),x)
```

```
[Out] int(x*(b*x^3+a)^(1/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^3 + a)^(1/3)*x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.235518, size = 223, normalized size = 1.54

$$\frac{\sqrt{3}\left(6\sqrt{3}\left(bx^3+a\right)^{\frac{1}{3}}\left(-b^2\right)^{\frac{1}{3}}x^2+2\sqrt{3}a\log\left(\frac{bx+\left(bx^3+a\right)^{\frac{1}{3}}\left(-b^2\right)^{\frac{1}{3}}}{x}\right)-\sqrt{3}a\log\left(\frac{b^2x^2-\left(bx^3+a\right)^{\frac{1}{3}}\left(-b^2\right)^{\frac{1}{3}}bx+\left(bx^3+a\right)^{\frac{2}{3}}\left(-b^2\right)^{\frac{2}{3}}}{x^2}\right)+6\,a\,\mathrm{ar}\ldots}{54\left(-b^2\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^3 + a)^(1/3)*x,x, algorithm="fricas")
```

```
[Out] 1/54*sqrt(3)*(6*sqrt(3)*(b*x^3 + a)^(1/3)*(-b^2)^(1/3)*x^2 + 2*sq
rt(3)*a*log((b*x + (b*x^3 + a)^(1/3)*(-b^2)^(1/3))/x) - sqrt(3)*a
*log((b^2*x^2 - (b*x^3 + a)^(1/3)*(-b^2)^(1/3)*b*x + (b*x^3 + a)^
(2/3)*(-b^2)^(2/3))/x^2) + 6*a*arctan(-1/3*(sqrt(3)*b*x - 2*sqrt(
3)*(b*x^3 + a)^(1/3)*(-b^2)^(1/3))/(b*x)))/(-b^2)^(1/3)
```

Sympy [A] time = 4.08574, size = 39, normalized size = 0.27

$$\frac{\sqrt[3]{a}x^2\,\Gamma\left(\frac{2}{3}\right){}_2F_1\left(\left.\begin{matrix}-\frac{1}{3},\frac{2}{3}\\\frac{5}{3}\end{matrix}\right|\frac{bx^3e^{i\pi}}{a}\right)}{3\,\Gamma\left(\frac{5}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x*(b*x**3+a)**(1/3),x)
```

```
[Out] a**(1/3)*x**2*gamma(2/3)*hyper((-1/3, 2/3), (5/3,), b*x**3*exp_po
lar(I*pi)/a)/(3*gamma(5/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bx^3 + a\right)^{\frac{1}{3}} x \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)*x,x, algorithm="giac")
```

```
[Out] integrate((b*x^3 + a)^(1/3)*x, x)
```

3.518 $\int \frac{\sqrt[3]{a+bx^3}}{x^2}\,dx$

Optimal. Leaf size=138

$$\frac{1}{6}\sqrt[3]{b}\log\left(\frac{b^{2/3}x^2}{(a+bx^3)^{2/3}}+\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)-\frac{\sqrt[3]{a+bx^3}}{x}-\frac{1}{3}\sqrt[3]{b}\log\left(1-\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}\right)-\frac{\sqrt[3]{b}\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1}{\sqrt{3}}\right)}{\sqrt{3}}$$

```
[Out] -((a + b*x^3)^(1/3)/x) - (b^(1/3)*ArcTan[(1 + (2*b^(1/3)*x)/(a +
b*x^3)^(1/3))/Sqrt[3]])/Sqrt[3] - (b^(1/3)*Log[1 - (b^(1/3)*x)/(a
 + b*x^3)^(1/3)])/3 + (b^(1/3)*Log[1 + (b^(2/3)*x^2)/(a + b*x^3)^
(2/3) + (b^(1/3)*x)/(a + b*x^3)^(1/3)])/6
```

Rubi [A] time = 0.151522, antiderivative size = 138, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.533$

$$\frac{1}{6}\sqrt[3]{b}\log\left(\frac{b^{2/3}x^2}{(a+bx^3)^{2/3}}+\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)-\frac{\sqrt[3]{a+bx^3}}{x}-\frac{1}{3}\sqrt[3]{b}\log\left(1-\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}\right)-\frac{\sqrt[3]{b}\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1}{\sqrt{3}}\right)}{\sqrt{3}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^(1/3)/x^2,x]
```

```
[Out] -((a + b*x^3)^(1/3)/x) - (b^(1/3)*ArcTan[(1 + (2*b^(1/3)*x)/(a +
b*x^3)^(1/3))/Sqrt[3]])/Sqrt[3] - (b^(1/3)*Log[1 - (b^(1/3)*x)/(a
 + b*x^3)^(1/3)])/3 + (b^(1/3)*Log[1 + (b^(2/3)*x^2)/(a + b*x^3)^
(2/3) + (b^(1/3)*x)/(a + b*x^3)^(1/3)])/6
```

Rubi in Sympy [A] time = 21.4318, size = 126, normalized size = 0.91

$$-\frac{\sqrt[3]{b}\log\left(-\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)}{3}+\frac{\sqrt[3]{b}\log\left(\frac{b^{\frac{2}{3}}x^2}{(a+bx^3)^{\frac{2}{3}}}+\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)}{6}-\frac{\sqrt{3}\sqrt[3]{b}\,\mathrm{atan}\left(\sqrt{3}\left(\frac{2\sqrt[3]{b}x}{3\sqrt[3]{a+bx^3}}+\frac{1}{3}\right)\right)}{3}-\frac{\sqrt[3]{a+bx^3}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**(1/3)/x**2,x)
```

```
[Out] -b**(1/3)*log(-b**(1/3)*x/(a + b*x**3)**(1/3) + 1)/3 + b**(1/3)*l
og(b**(2/3)*x**2/(a + b*x**3)**(2/3) + b**(1/3)*x/(a + b*x**3)**(
1/3) + 1)/6 - sqrt(3)*b**(1/3)*atan(sqrt(3)*(2*b**(1/3)*x/(3*(a +
 b*x**3)**(1/3)) + 1/3))/3 - (a + b*x**3)**(1/3)/x
```

Mathematica [C] time = 0.0383314, size = 66, normalized size = 0.48

$$\frac{bx^3\left(\frac{bx^3}{a}+1\right)^{2/3}{}_2F_1\left(\frac{2}{3},\frac{2}{3};\frac{5}{3};-\frac{bx^3}{a}\right)-2\left(a+bx^3\right)}{2x\left(a+bx^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^(1/3)/x^2,x]
```

```
[Out] (-2*(a + b*x^3) + b*x^3*(1 + (b*x^3)/a)^(2/3)*Hypergeometric2F1[2
/3, 2/3, 5/3, -((b*x^3)/a)])/(2*x*(a + b*x^3)^(2/3))
```

Maple [F] time = 0.039, size = 0, normalized size = 0.

$$\int \frac{1}{x^2}\sqrt[3]{bx^3+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^(1/3)/x^2,x)
```

```
[Out] int((b*x^3+a)^(1/3)/x^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)/x^2,x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [A] time = 3.93985, size = 41, normalized size = 0.3

$$\frac{\sqrt[3]{a}\,\Gamma\left(-\frac{1}{3}\right)\,{}_2F_1\left(\begin{matrix} -\frac{1}{3}, -\frac{1}{3} \\ \frac{2}{3} \end{matrix}\middle| \frac{bx^3e^{i\pi}}{a}\right)}{3x\,\Gamma\left(\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**(1/3)/x**2,x)
```

```
[Out] a**(1/3)*gamma(-1/3)*hyper((-1/3, -1/3), (2/3,), b*x**3*exp_polar
(I*pi)/a)/(3*x*gamma(2/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bx^3 + a\right)^{\frac{1}{3}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)/x^2,x, algorithm="giac")

[Out] integrate((b*x^3 + a)^(1/3)/x^2, x)
```

3.519 $\int \frac{\sqrt[3]{a+bx^3}}{x^5}\,dx$

Optimal. Leaf size=21

$$-\frac{\left(a+bx^3\right)^{4/3}}{4ax^4}$$

```
[Out] -(a + b*x^3)^(4/3)/(4*a*x^4)
```

Rubi [A] time = 0.019862, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{\left(a+bx^3\right)^{4/3}}{4ax^4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^(1/3)/x^5,x]

[Out] -(a + b*x^3)^(4/3)/(4*a*x^4)
```

Rubi in Sympy [A] time = 2.78255, size = 17, normalized size = 0.81

$$-\frac{\left(a+bx^3\right)^{\frac{4}{3}}}{4ax^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**(1/3)/x**5,x)

[Out] -(a + b*x**3)**(4/3)/(4*a*x**4)
```

Mathematica [A] time = 0.0145823, size = 21, normalized size = 1.

$$-\frac{\left(a+bx^3\right)^{4/3}}{4ax^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^(1/3)/x^5,x]

[Out] -(a + b*x^3)^(4/3)/(4*a*x^4)
```

Maple [A] time = 0.006, size = 18, normalized size = 0.9

$$-\frac{1}{4\,ax^4}\left(bx^3+a\right)^{\frac{4}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^(1/3)/x^5,x)
```

```
[Out] -1/4*(b*x^3+a)^(4/3)/a/x^4
```

Maxima [A] time = 1.43799, size = 23, normalized size = 1.1

$$-\frac{\left(bx^3+a\right)^{\frac{4}{3}}}{4\,ax^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)/x^5,x, algorithm="maxima")
```

```
[Out] -1/4*(b*x^3 + a)^(4/3)/(a*x^4)
```

Fricas [A] time = 0.276113, size = 23, normalized size = 1.1

$$-\frac{\left(bx^3+a\right)^{\frac{4}{3}}}{4\,ax^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)/x^5,x, algorithm="fricas")
```

```
[Out] -1/4*(b*x^3 + a)^(4/3)/(a*x^4)
```

Sympy [A] time = 2.53612, size = 68, normalized size = 3.24

$$\frac{\sqrt[3]{b}\sqrt[3]{\frac{a}{bx^3}+1}\,\Gamma\left(-\frac{4}{3}\right)}{3x^3\,\Gamma\left(-\frac{1}{3}\right)}+\frac{b^{\frac{4}{3}}\sqrt[3]{\frac{a}{bx^3}+1}\,\Gamma\left(-\frac{4}{3}\right)}{3a\,\Gamma\left(-\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**(1/3)/x**5,x)
```

```
[Out] b**(1/3)*(a/(b*x**3) + 1)**(1/3)*gamma(-4/3)/(3*x**3*gamma(-1/3))
 + b**(4/3)*(a/(b*x**3) + 1)**(1/3)*gamma(-4/3)/(3*a*gamma(-1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bx^3+a\right)^{\frac{1}{3}}}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)/x^5,x, algorithm="giac")
```

```
[Out] integrate((b*x^3 + a)^(1/3)/x^5, x)
```

3.520 $\int \frac{\sqrt[3]{a+bx^3}}{x^8}\,dx$

Optimal. Leaf size=44

$$\frac{3b\left(a+bx^3\right)^{4/3}}{28a^2x^4}-\frac{\left(a+bx^3\right)^{4/3}}{7ax^7}$$

```
[Out] -(a + b*x^3)^(4/3)/(7*a*x^7) + (3*b*(a + b*x^3)^(4/3))/(28*a^2*x^
4)
```

Rubi [A] time = 0.0406305, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{3b\left(a+bx^3\right)^{4/3}}{28a^2x^4}-\frac{\left(a+bx^3\right)^{4/3}}{7ax^7}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^(1/3)/x^8,x]
```

```
[Out] -(a + b*x^3)^(4/3)/(7*a*x^7) + (3*b*(a + b*x^3)^(4/3))/(28*a^2*x^
4)
```

Rubi in Sympy [A] time = 4.33625, size = 37, normalized size = 0.84

$$-\frac{\left(a+bx^3\right)^{\frac{4}{3}}}{7ax^7}+\frac{3b\left(a+bx^3\right)^{\frac{4}{3}}}{28a^2x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**(1/3)/x**8,x)
```

```
[Out] -(a + b*x**3)**(4/3)/(7*a*x**7) + 3*b*(a + b*x**3)**(4/3)/(28*a**
2*x**4)
```

Mathematica [A] time = 0.0221793, size = 41, normalized size = 0.93

$$-\frac{\sqrt[3]{a+bx^3}\left(4a^2+abx^3-3b^2x^6\right)}{28a^2x^7}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^(1/3)/x^8,x]
```

```
[Out] -((a + b*x^3)^(1/3)*(4*a^2 + a*b*x^3 - 3*b^2*x^6))/(28*a^2*x^7)
```

Maple [A] time = 0.008, size = 28, normalized size = 0.6

$$-\frac{-3\,bx^3+4\,a}{28\,a^2x^7}\left(bx^3+a\right)^{\frac{4}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^(1/3)/x^8,x)
```

```
[Out] -1/28*(b*x^3+a)^(4/3)*(-3*b*x^3+4*a)/a^2/x^7
```

Maxima [A] time = 1.44141, size = 47, normalized size = 1.07

$$\frac{\frac{7\,(bx^3+a)^{\frac{4}{3}}b}{x^4} - \frac{4\,(bx^3+a)^{\frac{7}{3}}}{x^7}}{28\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)/x^8,x, algorithm="maxima")
```

```
[Out] 1/28*(7*(b*x^3 + a)^(4/3)*b/x^4 - 4*(b*x^3 + a)^(7/3)/x^7)/a^2
```

Fricas [A] time = 0.274259, size = 51, normalized size = 1.16

$$\frac{\left(3\,b^2x^6 - abx^3 - 4\,a^2\right)\left(bx^3 + a\right)^{\frac{1}{3}}}{28\,a^2x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)/x^8,x, algorithm="fricas")
```

```
[Out] 1/28*(3*b^2*x^6 - a*b*x^3 - 4*a^2)*(b*x^3 + a)^(1/3)/(a^2*x^7)
```

Sympy [A] time = 4.38098, size = 109, normalized size = 2.48

$$-\frac{4\sqrt[3]{b}\sqrt[3]{\frac{a}{bx^3}+1}\,\Gamma\left(-\frac{7}{3}\right)}{9x^6\,\Gamma\left(-\frac{1}{3}\right)} - \frac{b^{\frac{4}{3}}\sqrt[3]{\frac{a}{bx^3}+1}\,\Gamma\left(-\frac{7}{3}\right)}{9ax^3\,\Gamma\left(-\frac{1}{3}\right)} + \frac{b^{\frac{7}{3}}\sqrt[3]{\frac{a}{bx^3}+1}\,\Gamma\left(-\frac{7}{3}\right)}{3a^2\,\Gamma\left(-\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**(1/3)/x**8,x)
```

```
[Out] -4*b**(1/3)*(a/(b*x**3) + 1)**(1/3)*gamma(-7/3)/(9*x**6*gamma(-1/
3)) - b**(4/3)*(a/(b*x**3) + 1)**(1/3)*gamma(-7/3)/(9*a*x**3*gamm
a(-1/3)) + b**(7/3)*(a/(b*x**3) + 1)**(1/3)*gamma(-7/3)/(3*a**2*g
amma(-1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bx^3 + a\right)^{\frac{1}{3}}}{x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)/x^8,x, algorithm="giac")
```

```
[Out] integrate((b*x^3 + a)^(1/3)/x^8, x)
```

3.521 $\int \frac{\sqrt[3]{a+bx^3}}{x^{11}}\,dx$

Optimal. Leaf size=68

$$-\frac{9b^2\left(a+bx^3\right)^{4/3}}{140a^3x^4}+\frac{3b\left(a+bx^3\right)^{4/3}}{35a^2x^7}-\frac{\left(a+bx^3\right)^{4/3}}{10ax^{10}}$$

```
[Out] -(a + b*x^3)^(4/3)/(10*a*x^10) + (3*b*(a + b*x^3)^(4/3))/(35*a^2*
x^7) - (9*b^2*(a + b*x^3)^(4/3))/(140*a^3*x^4)
```

Rubi [A] time = 0.0643479, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{9b^2\left(a+bx^3\right)^{4/3}}{140a^3x^4}+\frac{3b\left(a+bx^3\right)^{4/3}}{35a^2x^7}-\frac{\left(a+bx^3\right)^{4/3}}{10ax^{10}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^(1/3)/x^11,x]
```

```
[Out] -(a + b*x^3)^(4/3)/(10*a*x^10) + (3*b*(a + b*x^3)^(4/3))/(35*a^2*
x^7) - (9*b^2*(a + b*x^3)^(4/3))/(140*a^3*x^4)
```

Rubi in Sympy [A] time = 6.76377, size = 61, normalized size = 0.9

$$-\frac{\left(a+bx^3\right)^{\frac{4}{3}}}{10ax^{10}}+\frac{3b\left(a+bx^3\right)^{\frac{4}{3}}}{35a^2x^7}-\frac{9b^2\left(a+bx^3\right)^{\frac{4}{3}}}{140a^3x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**(1/3)/x**11,x)
```

```
[Out] -(a + b*x**3)**(4/3)/(10*a*x**10) + 3*b*(a + b*x**3)**(4/3)/(35*a
**2*x**7) - 9*b**2*(a + b*x**3)**(4/3)/(140*a**3*x**4)
```

Mathematica [A] time = 0.0269378, size = 53, normalized size = 0.78

$$-\frac{\sqrt[3]{a+bx^3}\left(14a^3+2a^2bx^3-3ab^2x^6+9b^3x^9\right)}{140a^3x^{10}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^(1/3)/x^11,x]
```

```
[Out] -((a + b*x^3)^(1/3)*(14*a^3 + 2*a^2*b*x^3 - 3*a*b^2*x^6 + 9*b^3*x
^9))/(140*a^3*x^10)
```

Maple [A] time = 0.008, size = 39, normalized size = 0.6

$$-\frac{9\,b^2x^6-12\,abx^3+14\,a^2}{140\,x^{10}a^3}\left(bx^3+a\right)^{\frac{4}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^(1/3)/x^11,x)
```

```
[Out] -1/140*(b*x^3+a)^(4/3)*(9*b^2*x^6-12*a*b*x^3+14*a^2)/x^10/a^3
```

Maxima [A] time = 1.44004, size = 70, normalized size = 1.03

$$-\frac{\frac{35\,(bx^3+a)^{\frac{4}{3}}b^2}{x^4}-\frac{40\,(bx^3+a)^{\frac{7}{3}}b}{x^7}+\frac{14\,(bx^3+a)^{\frac{10}{3}}}{x^{10}}}{140\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)/x^11,x, algorithm="maxima")
```

```
[Out] -1/140*(35*(b*x^3 + a)^(4/3)*b^2/x^4 - 40*(b*x^3 + a)^(7/3)*b/x^7
 + 14*(b*x^3 + a)^(10/3)/x^10)/a^3
```

Fricas [A] time = 0.291911, size = 66, normalized size = 0.97

$$-\frac{\left(9\,b^3x^9-3\,ab^2x^6+2\,a^2bx^3+14\,a^3\right)\left(bx^3+a\right)^{\frac{1}{3}}}{140\,a^3x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)/x^11,x, algorithm="fricas")
```

```
[Out] -1/140*(9*b^3*x^9 - 3*a*b^2*x^6 + 2*a^2*b*x^3 + 14*a^3)*(b*x^3 +
a)^(1/3)/(a^3*x^10)
```

Sympy [A] time = 7.98144, size = 520, normalized size = 7.65

$$\frac{28a^5b^{\frac{13}{3}}\sqrt[3]{\frac{a}{bx^3}+1}\,\Gamma\left(-\frac{10}{3}\right)}{27a^5b^4x^9\Gamma\left(-\frac{1}{3}\right)+54a^4b^5x^{12}\Gamma\left(-\frac{1}{3}\right)+27a^3b^6x^{15}\Gamma\left(-\frac{1}{3}\right)}+\frac{60a^4b^{\frac{16}{3}}x^3\sqrt[3]{\frac{a}{bx^3}+1}\,\Gamma\left(-\frac{10}{3}\right)}{27a^5b^4x^9\Gamma\left(-\frac{1}{3}\right)+54a^4b^5x^{12}\Gamma\left(-\frac{1}{3}\right)+27a^3b^6x^{15}\Gamma\left(-\frac{1}{3}\right)}+\frac{30a^3b^{\frac{19}{3}}x^6\sqrt[3]{\frac{a}{bx^3}+1}\,\Gamma\left(-\frac{10}{3}\right)}{27a^5b^4x^9\Gamma\left(-\frac{1}{3}\right)+54a^4b^5x^{12}\Gamma\left(-\frac{1}{3}\right)+27a^3b^6x^{15}\Gamma\left(-\frac{1}{3}\right)}+\frac{10a^2b^{\frac{22}{3}}x^9\sqrt[3]{\frac{a}{bx^3}+1}\,\Gamma\left(-\frac{10}{3}\right)}{27a^5b^4x^9\Gamma\left(-\frac{1}{3}\right)+54a^4b^5x^{12}\Gamma\left(-\frac{1}{3}\right)+27a^3b^6x^{15}\Gamma\left(-\frac{1}{3}\right)}+\frac{30ab^{\frac{25}{3}}x^{12}\sqrt[3]{\frac{a}{bx^3}+1}\,\Gamma\left(-\frac{10}{3}\right)}{27a^5b^4x^9\Gamma\left(-\frac{1}{3}\right)+54a^4b^5x^{12}\Gamma\left(-\frac{1}{3}\right)+27a^3b^6x^{15}\Gamma\left(-\frac{1}{3}\right)}+\frac{18b^{\frac{28}{3}}x^{15}\sqrt[3]{\frac{a}{bx^3}+1}\,\Gamma\left(-\frac{10}{3}\right)}{27a^5b^4x^9\Gamma\left(-\frac{1}{3}\right)+54a^4b^5x^{12}\Gamma\left(-\frac{1}{3}\right)+27a^3b^6x^{15}\Gamma\left(-\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**(1/3)/x**11,x)
```

```
[Out] 28*a**5*b**(13/3)*(a/(b*x**3) + 1)**(1/3)*gamma(-10/3)/(27*a**5*b
**4*x**9*gamma(-1/3) + 54*a**4*b**5*x**12*gamma(-1/3) + 27*a**3*b
**6*x**15*gamma(-1/3)) + 60*a**4*b**(16/3)*x**3*(a/(b*x**3) + 1)*
*(1/3)*gamma(-10/3)/(27*a**5*b**4*x**9*gamma(-1/3) + 54*a**4*b**5
*x**12*gamma(-1/3) + 27*a**3*b**6*x**15*gamma(-1/3)) + 30*a**3*b*
*(19/3)*x**6*(a/(b*x**3) + 1)**(1/3)*gamma(-10/3)/(27*a**5*b**4*x
**9*gamma(-1/3) + 54*a**4*b**5*x**12*gamma(-1/3) + 27*a**3*b**6*x
**15*gamma(-1/3)) + 10*a**2*b**(22/3)*x**9*(a/(b*x**3) + 1)**(1/3
)*gamma(-10/3)/(27*a**5*b**4*x**9*gamma(-1/3) + 54*a**4*b**5*x**1
2*gamma(-1/3) + 27*a**3*b**6*x**15*gamma(-1/3)) + 30*a*b**(25/3)*
x**12*(a/(b*x**3) + 1)**(1/3)*gamma(-10/3)/(27*a**5*b**4*x**9*gam
ma(-1/3) + 54*a**4*b**5*x**12*gamma(-1/3) + 27*a**3*b**6*x**15*ga
mma(-1/3)) + 18*b**(28/3)*x**15*(a/(b*x**3) + 1)**(1/3)*gamma(-10
/3)/(27*a**5*b**4*x**9*gamma(-1/3) + 54*a**4*b**5*x**12*gamma(-1/
3) + 27*a**3*b**6*x**15*gamma(-1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bx^3+a\right)^{\frac{1}{3}}}{x^{11}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)/x^11,x, algorithm="giac")
```

```
[Out] integrate((b*x^3 + a)^(1/3)/x^11, x)
```

3.522 $\int x^3 \sqrt[3]{a+bx^3}\,dx$

Optimal. Leaf size=38

$$\frac{x^4\left(a+bx^3\right)^{4/3}\,{}_2F_1\left(1,\frac{8}{3};\frac{7}{3};-\frac{bx^3}{a}\right)}{4a}$$

```
[Out] (x^4*(a + b*x^3)^(4/3)*Hypergeometric2F1[1, 8/3, 7/3, -((b*x^3)/a
)])/(4*a)
```

Rubi [A] time = 0.0562546, antiderivative size = 51, normalized size of antiderivative = 1.34, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{x^4\sqrt[3]{a+bx^3}\,{}_2F_1\left(-\frac{1}{3},\frac{4}{3};\frac{7}{3};-\frac{bx^3}{a}\right)}{4\sqrt[3]{\frac{bx^3}{a}+1}}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(a + b*x^3)^(1/3),x]
```

```
[Out] (x^4*(a + b*x^3)^(1/3)*Hypergeometric2F1[-1/3, 4/3, 7/3, -((b*x^3
)/a)])/(4*(1 + (b*x^3)/a)^(1/3))
```

Rubi in Sympy [A] time = 6.38755, size = 42, normalized size = 1.11

$$\frac{x^4\sqrt[3]{a+bx^3}\,{}_2F_1\left(\begin{matrix}-\frac{1}{3},\frac{4}{3}\\ \frac{7}{3}\end{matrix}\middle|-\frac{bx^3}{a}\right)}{4\sqrt[3]{1+\frac{bx^3}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**3*(b*x**3+a)**(1/3),x)
```

```
[Out] x**4*(a + b*x**3)**(1/3)*hyper((-1/3, 4/3), (7/3,), -b*x**3/a)/(4
*(1 + b*x**3/a)**(1/3))
```

Mathematica [A] time = 0.0543354, size = 76, normalized size = 2.

$$\frac{x\left(-a^2\left(\frac{bx^3}{a}+1\right)^{2/3}\,{}_2F_1\left(\frac{1}{3},\frac{2}{3};\frac{4}{3};-\frac{bx^3}{a}\right)+a^2+3abx^3+2b^2x^6\right)}{10b\left(a+bx^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(a + b*x^3)^(1/3),x]
```

```
[Out] (x*(a^2 + 3*a*b*x^3 + 2*b^2*x^6 - a^2*(1 + (b*x^3)/a)^(2/3)*Hyper
geometric2F1[1/3, 2/3, 4/3, -((b*x^3)/a)]))/(10*b*(a + b*x^3)^(2/
3))
```

Maple [F] time = 0.04, size = 0, normalized size = 0.

$$\int x^{3} \sqrt[3]{b x^{3}+a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3*(b*x^3+a)^(1/3),x)
```

```
[Out] int(x^3*(b*x^3+a)^(1/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b x^{3}+a\right)^{\frac{1}{3}} x^{3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)*x^3,x, algorithm="maxima")
```

```
[Out] integrate((b*x^3 + a)^(1/3)*x^3, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(b x^{3}+a\right)^{\frac{1}{3}} x^{3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)*x^3,x, algorithm="fricas")
```

```
[Out] integral((b*x^3 + a)^(1/3)*x^3, x)
```

Sympy [A] time = 2.52426, size = 39, normalized size = 1.03

$$\frac{\sqrt[3]{a} x^{4} \Gamma\left(\frac{4}{3}\right) {}_{2}F_{1}\left(\begin{matrix} -\frac{1}{3}, \frac{4}{3} \\ \frac{7}{3} \end{matrix}\middle| {\frac{b x^{3} e^{i \pi}}{a}} \right)}{3 \Gamma\left(\frac{7}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(b*x**3+a)**(1/3),x)
```

```
[Out] a**(1/3)*x**4*gamma(4/3)*hyper((-1/3, 4/3), (7/3,), b*x**3*exp_po
lar(I*pi)/a)/(3*gamma(7/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b x^{3}+a\right)^{\frac{1}{3}} x^{3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)*x^3,x, algorithm="giac")
```

```
[Out] integrate((b*x^3 + a)^(1/3)*x^3, x)
```

3.523 $\int \sqrt[3]{a+bx^3}\,dx$

Optimal. Leaf size=33

$$\frac{x\left(a+bx^3\right)^{4/3}\,{}_2F_1\left(1,\frac{5}{3};\frac{4}{3};-\frac{bx^3}{a}\right)}{a}$$

```
[Out] (x*(a + b*x^3)^(4/3)*Hypergeometric2F1[1, 5/3, 4/3, -((b*x^3)/a)]
)/a
```

Rubi [A] time = 0.0250243, antiderivative size = 46, normalized size of antiderivative = 1.39, number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{x\sqrt[3]{a+bx^3}\,{}_2F_1\left(-\frac{1}{3},\frac{1}{3};\frac{4}{3};-\frac{bx^3}{a}\right)}{\sqrt[3]{\frac{bx^3}{a}+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^(1/3),x]
```

```
[Out] (x*(a + b*x^3)^(1/3)*Hypergeometric2F1[-1/3, 1/3, 4/3, -((b*x^3)/
a)])/(1 + (b*x^3)/a)^(1/3)
```

Rubi in Sympy [A] time = 3.37183, size = 39, normalized size = 1.18

$$\frac{x\sqrt[3]{a+bx^3}\,{}_2F_1\left(\begin{matrix}-\frac{1}{3},\frac{1}{3}\\ \frac{4}{3}\end{matrix}\middle|-\frac{bx^3}{a}\right)}{\sqrt[3]{1+\frac{bx^3}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**(1/3),x)
```

```
[Out] x*(a + b*x**3)**(1/3)*hyper((-1/3, 1/3), (4/3,), -b*x**3/a)/(1 +
b*x**3/a)**(1/3)
```

Mathematica [C] time = 0.400137, size = 196, normalized size = 5.94

$$\frac{3\left((-1)^{2/3}\sqrt[3]{a}+\sqrt[3]{b}x\right)\sqrt[3]{a+bx^3}F_1\left(\frac{4}{3};-\frac{1}{3},-\frac{1}{3};\frac{7}{3};-\frac{i\left(\sqrt[3]{b}x+(-1)^{2/3}\sqrt[3]{a}\right)}{\sqrt{3}\sqrt[3]{a}},\frac{-\frac{2i\sqrt[3]{b}x}{\sqrt[3]{a}}+\sqrt{3}+i}{3i+\sqrt{3}}\right)}{4\sqrt[3]{2}\sqrt[3]{b}\sqrt[3]{\frac{\sqrt[3]{a}+(-1)^{2/3}\sqrt[3]{b}x}{\left(1+\sqrt[3]{-1}\right)\sqrt[3]{a}}}\sqrt[3]{\frac{i\left(\frac{\sqrt[3]{b}x}{\sqrt[3]{a}}+1\right)}{\sqrt{3}+3i}}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[(a + b*x^3)^(1/3),x]
```

```
[Out] (3*((-1)^(2/3)*a^(1/3) + b^(1/3)*x)*(a + b*x^3)^(1/3)*AppellF1[4/
3, -1/3, -1/3, 7/3, ((-I)*((-1)^(2/3)*a^(1/3) + b^(1/3)*x))/(Sqrt
```

```
[3]*a^(1/3)), (I + Sqrt[3] - ((2*I)*b^(1/3)*x)/a^(1/3))/(3*I + Sq
rt[3])])/(4*2^(1/3)*b^(1/3)*((a^(1/3) + (-1)^(2/3)*b^(1/3)*x)/((1
 + (-1)^(1/3))*a^(1/3)))^(1/3)*((I*(1 + (b^(1/3)*x)/a^(1/3)))/(3*
I + Sqrt[3]))^(1/3))
```

Maple [F] time = 0.045, size = 0, normalized size = 0.

$$\int \sqrt[3]{bx^3+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^(1/3),x)
```

```
[Out] int((b*x^3+a)^(1/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bx^3+a\right)^{\frac{1}{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3),x, algorithm="maxima")
```

```
[Out] integrate((b*x^3 + a)^(1/3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(bx^3+a\right)^{\frac{1}{3}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3),x, algorithm="fricas")
```

```
[Out] integral((b*x^3 + a)^(1/3), x)
```

Sympy [A] time = 2.2394, size = 37, normalized size = 1.12

$$\frac{\sqrt[3]{a}x\,\Gamma\left(\frac{1}{3}\right)\,{}_{2}F_{1}\left(\begin{matrix}-\frac{1}{3},\frac{1}{3}\\\frac{4}{3}\end{matrix}\middle|\frac{bx^3e^{i\pi}}{a}\right)}{3\,\Gamma\left(\frac{4}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**(1/3),x)
```

```
[Out] a**(1/3)*x*gamma(1/3)*hyper((-1/3, 1/3), (4/3,), b*x**3*exp_polar
(I*pi)/a)/(3*gamma(4/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bx^3+a\right)^{\frac{1}{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3),x, algorithm="giac")

[Out] integrate((b*x^3 + a)^(1/3), x)
```

3.524 $\int \frac{\sqrt[3]{a+bx^3}}{x^3}\,dx$

Optimal. Leaf size=38

$$-\frac{\left(a+bx^3\right)^{4/3}\,{}_2F_1\left(\frac{2}{3},1;\frac{1}{3};-\frac{bx^3}{a}\right)}{2ax^2}$$

```
[Out] -((a + b*x^3)^(4/3)*Hypergeometric2F1[2/3, 1, 1/3, -((b*x^3)/a)])
/(2*a*x^2)
```

Rubi [A] time = 0.0520507, antiderivative size = 51, normalized size of antiderivative = 1.34, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{\sqrt[3]{a+bx^3}\,{}_2F_1\left(-\frac{2}{3},-\frac{1}{3};\frac{1}{3};-\frac{bx^3}{a}\right)}{2x^2\sqrt[3]{\frac{bx^3}{a}+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^(1/3)/x^3,x]
```

```
[Out] -((a + b*x^3)^(1/3)*Hypergeometric2F1[-2/3, -1/3, 1/3, -((b*x^3)/
a)])/(2*x^2*(1 + (b*x^3)/a)^(1/3))
```

Rubi in Sympy [A] time = 5.99749, size = 46, normalized size = 1.21

$$-\frac{\sqrt[3]{a+bx^3}\,{}_2F_1\left(\begin{matrix}-\frac{1}{3},-\frac{2}{3}\\ \frac{1}{3}\end{matrix}\middle|-\frac{bx^3}{a}\right)}{2x^2\sqrt[3]{1+\frac{bx^3}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**(1/3)/x**3,x)
```

```
[Out] -(a + b*x**3)**(1/3)*hyper((-1/3, -2/3), (1/3,), -b*x**3/a)/(2*x*
*2*(1 + b*x**3/a)**(1/3))
```

Mathematica [A] time = 0.0489808, size = 66, normalized size = 1.74

$$\frac{bx^3\left(\frac{bx^3}{a}+1\right)^{2/3}\,{}_2F_1\left(\frac{1}{3},\frac{2}{3};\frac{4}{3};-\frac{bx^3}{a}\right)-a-bx^3}{2x^2\left(a+bx^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^(1/3)/x^3,x]
```

```
[Out] (-a - b*x^3 + b*x^3*(1 + (b*x^3)/a)^(2/3)*Hypergeometric2F1[1/3,
2/3, 4/3, -((b*x^3)/a)])/(2*x^2*(a + b*x^3)^(2/3))
```

Maple [F] time = 0.039, size = 0, normalized size = 0.

$$\int \frac{1}{x^3}\sqrt[3]{b x^3+a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^(1/3)/x^3,x)
```

```
[Out] int((b*x^3+a)^(1/3)/x^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b x^3+a\right)^{\frac{1}{3}}}{x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)/x^3,x, algorithm="maxima")
```

```
[Out] integrate((b*x^3 + a)^(1/3)/x^3, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(b x^3+a\right)^{\frac{1}{3}}}{x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)/x^3,x, algorithm="fricas")
```

```
[Out] integral((b*x^3 + a)^(1/3)/x^3, x)
```

Sympy [A] time = 2.5501, size = 42, normalized size = 1.11

$$\frac{\sqrt[3]{a}\,\Gamma\left(-\frac{2}{3}\right)\, {}_{2}F_{1}\left(\begin{matrix} -\frac{2}{3}, -\frac{1}{3} \\ \frac{1}{3} \end{matrix}\middle| {\frac{b x^3 e^{i\pi}}{a}} \right)}{3 x^2\, \Gamma\left(\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**(1/3)/x**3,x)
```

```
[Out] a**(1/3)*gamma(-2/3)*hyper((-2/3, -1/3), (1/3,), b*x**3*exp_polar
(I*pi)/a)/(3*x**2*gamma(1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b x^3+a\right)^{\frac{1}{3}}}{x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)/x^3,x, algorithm="giac")

[Out] integrate((b*x^3 + a)^(1/3)/x^3, x)
```

3.525 $\int \frac{\sqrt[3]{a+bx^3}}{x^6}\,dx$

Optimal. Leaf size=38

$$-\frac{\left(a+bx^3\right)^{4/3}\,{}_2F_1\left(-\frac{1}{3},1;-\frac{2}{3};-\frac{bx^3}{a}\right)}{5ax^5}$$

```
[Out] -((a + b*x^3)^(4/3)*Hypergeometric2F1[-1/3, 1, -2/3, -((b*x^3)/a)
])/(5*a*x^5)
```

Rubi [A] time = 0.0515083, antiderivative size = 51, normalized size of antiderivative = 1.34, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$-\frac{\sqrt[3]{a+bx^3}\,{}_2F_1\left(-\frac{5}{3},-\frac{1}{3};-\frac{2}{3};-\frac{bx^3}{a}\right)}{5x^5\sqrt[3]{\frac{bx^3}{a}+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^(1/3)/x^6,x]
```

```
[Out] -((a + b*x^3)^(1/3)*Hypergeometric2F1[-5/3, -1/3, -2/3, -((b*x^3)
/a)])/(5*x^5*(1 + (b*x^3)/a)^(1/3))
```

Rubi in Sympy [A] time = 5.98026, size = 48, normalized size = 1.26

$$-\frac{\sqrt[3]{a+bx^3}\,{}_2F_1\left(\begin{matrix}-\frac{1}{3},-\frac{5}{3}\\ -\frac{2}{3}\end{matrix}\middle|-\frac{bx^3}{a}\right)}{5x^5\sqrt[3]{1+\frac{bx^3}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**(1/3)/x**6,x)
```

```
[Out] -(a + b*x**3)**(1/3)*hyper((-1/3, -5/3), (-2/3,), -b*x**3/a)/(5*x
**5*(1 + b*x**3/a)**(1/3))
```

Mathematica [B] time = 0.0463345, size = 83, normalized size = 2.18

$$\frac{-2a^2-b^2x^6\left(\frac{bx^3}{a}+1\right)^{2/3}\,{}_2F_1\left(\frac{1}{3},\frac{2}{3};\frac{4}{3};-\frac{bx^3}{a}\right)-3abx^3-b^2x^6}{10ax^5\left(a+bx^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^(1/3)/x^6,x]
```

```
[Out] (-2*a^2 - 3*a*b*x^3 - b^2*x^6 - b^2*x^6*(1 + (b*x^3)/a)^(2/3)*Hyp
ergeometric2F1[1/3, 2/3, 4/3, -((b*x^3)/a)])/(10*a*x^5*(a + b*x^3
)^(2/3))
```

Maple [F] time = 0.045, size = 0, normalized size = 0.

$$\int \frac{1}{x^6}\sqrt[3]{bx^3+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^(1/3)/x^6,x)
```

```
[Out] int((b*x^3+a)^(1/3)/x^6,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^3+a)^{\frac{1}{3}}}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)/x^6,x, algorithm="maxima")
```

```
[Out] integrate((b*x^3 + a)^(1/3)/x^6, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(bx^3+a)^{\frac{1}{3}}}{x^6}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)/x^6,x, algorithm="fricas")
```

```
[Out] integral((b*x^3 + a)^(1/3)/x^6, x)
```

Sympy [A] time = 3.47, size = 42, normalized size = 1.11

$$\frac{\sqrt[3]{b}\,\Gamma\left(-\frac{4}{3}\right){}_2F_1\left(\begin{matrix}-\frac{1}{3},\frac{4}{3}\\ \frac{7}{3}\end{matrix}\middle|\frac{ae^{i\pi}}{bx^3}\right)}{3x^4\,\Gamma\left(-\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**(1/3)/x**6,x)
```

```
[Out] b**(1/3)*gamma(-4/3)*hyper((-1/3, 4/3), (7/3,), a*exp_polar(I*pi)
/(b*x**3))/(3*x**4*gamma(-1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^3+a)^{\frac{1}{3}}}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)/x^6,x, algorithm="giac")

[Out] integrate((b*x^3 + a)^(1/3)/x^6, x)
```

3.526 $\int x^{11} \left(a+bx^3\right)^{2/3} dx$

Optimal. Leaf size=80

$$-\frac{a^3 \left(a+bx^3\right)^{5/3}}{5b^4}+\frac{3a^2 \left(a+bx^3\right)^{8/3}}{8b^4}+\frac{\left(a+bx^3\right)^{14/3}}{14b^4}-\frac{3a \left(a+bx^3\right)^{11/3}}{11b^4}$$

```
[Out] -(a^3*(a + b*x^3)^(5/3))/(5*b^4) + (3*a^2*(a + b*x^3)^(8/3))/(8*b
^4) - (3*a*(a + b*x^3)^(11/3))/(11*b^4) + (a + b*x^3)^(14/3)/(14*
b^4)
```

Rubi [A] time = 0.105074, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$-\frac{a^3 \left(a+bx^3\right)^{5/3}}{5b^4}+\frac{3a^2 \left(a+bx^3\right)^{8/3}}{8b^4}+\frac{\left(a+bx^3\right)^{14/3}}{14b^4}-\frac{3a \left(a+bx^3\right)^{11/3}}{11b^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11*(a + b*x^3)^(2/3),x]
```

```
[Out] -(a^3*(a + b*x^3)^(5/3))/(5*b^4) + (3*a^2*(a + b*x^3)^(8/3))/(8*b
^4) - (3*a*(a + b*x^3)^(11/3))/(11*b^4) + (a + b*x^3)^(14/3)/(14*
b^4)
```

Rubi in Sympy [A] time = 14.5799, size = 71, normalized size = 0.89

$$-\frac{a^3 \left(a+bx^3\right)^{\frac{5}{3}}}{5b^4}+\frac{3a^2 \left(a+bx^3\right)^{\frac{8}{3}}}{8b^4}-\frac{3a \left(a+bx^3\right)^{\frac{11}{3}}}{11b^4}+\frac{\left(a+bx^3\right)^{\frac{14}{3}}}{14b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11*(b*x**3+a)**(2/3),x)
```

```
[Out] -a**3*(a + b*x**3)**(5/3)/(5*b**4) + 3*a**2*(a + b*x**3)**(8/3)/(
8*b**4) - 3*a*(a + b*x**3)**(11/3)/(11*b**4) + (a + b*x**3)**(14/
3)/(14*b**4)
```

Mathematica [A] time = 0.0304697, size = 61, normalized size = 0.76

$$\frac{\left(a+bx^3\right)^{2/3} \left(-81a^4+54a^3bx^3-45a^2b^2x^6+40ab^3x^9+220b^4x^{12}\right)}{3080b^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11*(a + b*x^3)^(2/3),x]
```

```
[Out] ((a + b*x^3)^(2/3)*(-81*a^4 + 54*a^3*b*x^3 - 45*a^2*b^2*x^6 + 40*
a*b^3*x^9 + 220*b^4*x^12))/(3080*b^4)
```

Maple [A] time = 0.008, size = 47, normalized size = 0.6

$$-\frac{-220\,b^3x^9+180\,ab^2x^6-135\,a^2bx^3+81\,a^3}{3080\,b^4}\left(bx^3+a\right)^{\frac{5}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11*(b*x^3+a)^(2/3),x)
```

```
[Out] -1/3080*(b*x^3+a)^(5/3)*(-220*b^3*x^9+180*a*b^2*x^6-135*a^2*b*x^3
+81*a^3)/b^4
```

Maxima [A] time = 1.44635, size = 86, normalized size = 1.08

$$\frac{\left(bx^3+a\right)^{\frac{14}{3}}}{14\,b^4}-\frac{3\left(bx^3+a\right)^{\frac{11}{3}}a}{11\,b^4}+\frac{3\left(bx^3+a\right)^{\frac{8}{3}}a^2}{8\,b^4}-\frac{\left(bx^3+a\right)^{\frac{5}{3}}a^3}{5\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)*x^11,x, algorithm="maxima")
```

```
[Out] 1/14*(b*x^3 + a)^(14/3)/b^4 - 3/11*(b*x^3 + a)^(11/3)*a/b^4 + 3/8
*(b*x^3 + a)^(8/3)*a^2/b^4 - 1/5*(b*x^3 + a)^(5/3)*a^3/b^4
```

Fricas [A] time = 0.263038, size = 77, normalized size = 0.96

$$\frac{\left(220\,b^4x^{12}+40\,ab^3x^9-45\,a^2b^2x^6+54\,a^3bx^3-81\,a^4\right)\left(bx^3+a\right)^{\frac{2}{3}}}{3080\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)*x^11,x, algorithm="fricas")
```

```
[Out] 1/3080*(220*b^4*x^12 + 40*a*b^3*x^9 - 45*a^2*b^2*x^6 + 54*a^3*b*x
^3 - 81*a^4)*(b*x^3 + a)^(2/3)/b^4
```

Sympy [A] time = 20.9894, size = 110, normalized size = 1.38

$$\begin{cases} -\frac{81a^4(a+bx^3)^{\frac{2}{3}}}{3080b^4}+\frac{27a^3x^3(a+bx^3)^{\frac{2}{3}}}{1540b^3}-\frac{9a^2x^6(a+bx^3)^{\frac{2}{3}}}{616b^2}+\frac{ax^9(a+bx^3)^{\frac{2}{3}}}{77b}+\frac{x^{12}(a+bx^3)^{\frac{2}{3}}}{14} & \text{for } b\neq 0 \\ \frac{a^{\frac{2}{3}}x^{12}}{12} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11*(b*x**3+a)**(2/3),x)
```

```
[Out] Piecewise((-81*a**4*(a + b*x**3)**(2/3)/(3080*b**4) + 27*a**3*x**
3*(a + b*x**3)**(2/3)/(1540*b**3) - 9*a**2*x**6*(a + b*x**3)**(2/
3)/(616*b**2) + a*x**9*(a + b*x**3)**(2/3)/(77*b) + x**12*(a + b*
x**3)**(2/3)/14, Ne(b, 0)), (a**(2/3)*x**12/12, True))
```

GIAC/XCAS [A] time = 0.229222, size = 77, normalized size = 0.96

$$\frac{220\left(bx^3+a\right)^{\frac{14}{3}}-840\left(bx^3+a\right)^{\frac{11}{3}}a+1155\left(bx^3+a\right)^{\frac{8}{3}}a^2-616\left(bx^3+a\right)^{\frac{5}{3}}a^3}{3080\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)*x^11,x, algorithm="giac")
```

```
[Out] 1/3080*(220*(b*x^3 + a)^(14/3) - 840*(b*x^3 + a)^(11/3)*a + 1155*
(b*x^3 + a)^(8/3)*a^2 - 616*(b*x^3 + a)^(5/3)*a^3)/b^4
```

3.527 $\int x^8 \left(a+bx^3\right)^{2/3} dx$

Optimal. Leaf size=59

$$\frac{a^2 \left(a+bx^3\right)^{5/3}}{5b^3}+\frac{\left(a+bx^3\right)^{11/3}}{11b^3}-\frac{a \left(a+bx^3\right)^{8/3}}{4b^3}$$

```
[Out] (a^2*(a + b*x^3)^(5/3))/(5*b^3) - (a*(a + b*x^3)^(8/3))/(4*b^3) +
 (a + b*x^3)^(11/3)/(11*b^3)
```

Rubi [A] time = 0.0854838, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^2 \left(a+bx^3\right)^{5/3}}{5b^3}+\frac{\left(a+bx^3\right)^{11/3}}{11b^3}-\frac{a \left(a+bx^3\right)^{8/3}}{4b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8*(a + b*x^3)^(2/3),x]
```

```
[Out] (a^2*(a + b*x^3)^(5/3))/(5*b^3) - (a*(a + b*x^3)^(8/3))/(4*b^3) +
 (a + b*x^3)^(11/3)/(11*b^3)
```

Rubi in Sympy [A] time = 10.9166, size = 49, normalized size = 0.83

$$\frac{a^2 \left(a+bx^3\right)^{\frac{5}{3}}}{5b^3}-\frac{a \left(a+bx^3\right)^{\frac{8}{3}}}{4b^3}+\frac{\left(a+bx^3\right)^{\frac{11}{3}}}{11b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8*(b*x**3+a)**(2/3),x)
```

```
[Out] a**2*(a + b*x**3)**(5/3)/(5*b**3) - a*(a + b*x**3)**(8/3)/(4*b**3
) + (a + b*x**3)**(11/3)/(11*b**3)
```

Mathematica [A] time = 0.0274366, size = 50, normalized size = 0.85

$$\frac{\left(a+bx^3\right)^{2/3} \left(9a^3-6a^2bx^3+5ab^2x^6+20b^3x^9\right)}{220b^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8*(a + b*x^3)^(2/3),x]
```

```
[Out] ((a + b*x^3)^(2/3)*(9*a^3 - 6*a^2*b*x^3 + 5*a*b^2*x^6 + 20*b^3*x^
9))/(220*b^3)
```

Maple [A] time = 0.009, size = 36, normalized size = 0.6

$$\frac{20\,b^2x^6-15\,abx^3+9\,a^2}{220\,b^3} \left(bx^3+a\right)^{\frac{5}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8*(b*x^3+a)^(2/3),x)
```

```
[Out] 1/220*(b*x^3+a)^(5/3)*(20*b^2*x^6-15*a*b*x^3+9*a^2)/b^3
```

Maxima [A] time = 1.43628, size = 63, normalized size = 1.07

$$\frac{\left(bx^3+a\right)^{\frac{11}{3}}}{11\,b^3}-\frac{\left(bx^3+a\right)^{\frac{8}{3}}a}{4\,b^3}+\frac{\left(bx^3+a\right)^{\frac{5}{3}}a^2}{5\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)*x^8,x, algorithm="maxima")
```

```
[Out] 1/11*(b*x^3 + a)^(11/3)/b^3 - 1/4*(b*x^3 + a)^(8/3)*a/b^3 + 1/5*(
b*x^3 + a)^(5/3)*a^2/b^3
```

Fricas [A] time = 0.264098, size = 62, normalized size = 1.05

$$\frac{\left(20\,b^3x^9+5\,ab^2x^6-6\,a^2bx^3+9\,a^3\right)\left(bx^3+a\right)^{\frac{2}{3}}}{220\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)*x^8,x, algorithm="fricas")
```

```
[Out] 1/220*(20*b^3*x^9 + 5*a*b^2*x^6 - 6*a^2*b*x^3 + 9*a^3)*(b*x^3 + a
)^(2/3)/b^3
```

Sympy [A] time = 10.2438, size = 87, normalized size = 1.47

$$\begin{cases} \frac{9a^3\left(a+bx^3\right)^{\frac{2}{3}}}{220b^3}-\frac{3a^2x^3\left(a+bx^3\right)^{\frac{2}{3}}}{110b^2}+\frac{ax^6\left(a+bx^3\right)^{\frac{2}{3}}}{44b}+\frac{x^9\left(a+bx^3\right)^{\frac{2}{3}}}{11} & \text{for } b\neq 0 \\ \frac{a^{\frac{2}{3}}x^9}{9} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8*(b*x**3+a)**(2/3),x)
```

```
[Out] Piecewise((9*a**3*(a + b*x**3)**(2/3)/(220*b**3) - 3*a**2*x**3*(a
 + b*x**3)**(2/3)/(110*b**2) + a*x**6*(a + b*x**3)**(2/3)/(44*b)
+ x**9*(a + b*x**3)**(2/3)/11, Ne(b, 0)), (a**(2/3)*x**9/9, True)
)
```

GIAC/XCAS [A] time = 0.241586, size = 58, normalized size = 0.98

$$\frac{20\left(bx^3+a\right)^{\frac{11}{3}}-55\left(bx^3+a\right)^{\frac{8}{3}}a+44\left(bx^3+a\right)^{\frac{5}{3}}a^2}{220\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)*x^8,x, algorithm="giac")
```

```
[Out] 1/220*(20*(b*x^3 + a)^(11/3) - 55*(b*x^3 + a)^(8/3)*a + 44*(b*x^3
 + a)^(5/3)*a^2)/b^3
```

3.528 $\int x^5 \left(a+bx^3\right)^{2/3} dx$

Optimal. Leaf size=38

$$\frac{\left(a+bx^3\right)^{8/3}}{8b^2}-\frac{a\left(a+bx^3\right)^{5/3}}{5b^2}$$

```
[Out] -(a*(a + b*x^3)^(5/3))/(5*b^2) + (a + b*x^3)^(8/3)/(8*b^2)
```

Rubi [A] time = 0.0584651, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{\left(a+bx^3\right)^{8/3}}{8b^2}-\frac{a\left(a+bx^3\right)^{5/3}}{5b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5*(a + b*x^3)^(2/3),x]

[Out] -(a*(a + b*x^3)^(5/3))/(5*b^2) + (a + b*x^3)^(8/3)/(8*b^2)
```

Rubi in Sympy [A] time = 7.10591, size = 31, normalized size = 0.82

$$-\frac{a\left(a+bx^3\right)^{\frac{5}{3}}}{5b^2}+\frac{\left(a+bx^3\right)^{\frac{8}{3}}}{8b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5*(b*x**3+a)**(2/3),x)

[Out] -a*(a + b*x**3)**(5/3)/(5*b**2) + (a + b*x**3)**(8/3)/(8*b**2)
```

Mathematica [A] time = 0.0216363, size = 39, normalized size = 1.03

$$\frac{\left(a+bx^3\right)^{2/3}\left(-3a^2+2abx^3+5b^2x^6\right)}{40b^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5*(a + b*x^3)^(2/3),x]

[Out] ((a + b*x^3)^(2/3)*(-3*a^2 + 2*a*b*x^3 + 5*b^2*x^6))/(40*b^2)
```

Maple [A] time = 0.007, size = 25, normalized size = 0.7

$$-\frac{-5\,bx^3+3\,a}{40\,b^2}\left(bx^3+a\right)^{\frac{5}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5*(b*x^3+a)^(2/3),x)

[Out] -1/40*(b*x^3+a)^(5/3)*(-5*b*x^3+3*a)/b^2
```

Maxima [A] time = 1.44162, size = 41, normalized size = 1.08

$$\frac{\left(bx^3+a\right)^{\frac{8}{3}}}{8\,b^2}-\frac{\left(bx^3+a\right)^{\frac{5}{3}}a}{5\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)*x^5,x, algorithm="maxima")
```

```
[Out] 1/8*(b*x^3 + a)^(8/3)/b^2 - 1/5*(b*x^3 + a)^(5/3)*a/b^2
```

Fricas [A] time = 0.256525, size = 47, normalized size = 1.24

$$\frac{\left(5\,b^2x^6+2\,abx^3-3\,a^2\right)\left(bx^3+a\right)^{\frac{2}{3}}}{40\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)*x^5,x, algorithm="fricas")
```

```
[Out] 1/40*(5*b^2*x^6 + 2*a*b*x^3 - 3*a^2)*(b*x^3 + a)^(2/3)/b^2
```

Sympy [A] time = 4.10769, size = 63, normalized size = 1.66

$$\begin{cases} -\frac{3a^2\left(a+bx^3\right)^{\frac{2}{3}}}{40b^2}+\frac{ax^3\left(a+bx^3\right)^{\frac{2}{3}}}{20b}+\frac{x^6\left(a+bx^3\right)^{\frac{2}{3}}}{8} & \text{for } b\neq 0 \\ \frac{a^{\frac{2}{3}}x^6}{6} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5*(b*x**3+a)**(2/3),x)
```

```
[Out] Piecewise((-3*a**2*(a + b*x**3)**(2/3)/(40*b**2) + a*x**3*(a + b*
x**3)**(2/3)/(20*b) + x**6*(a + b*x**3)**(2/3)/8, Ne(b, 0)), (a**
(2/3)*x**6/6, True))
```

GIAC/XCAS [A] time = 0.226293, size = 39, normalized size = 1.03

$$\frac{5\left(bx^3+a\right)^{\frac{8}{3}}-8\left(bx^3+a\right)^{\frac{5}{3}}a}{40\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)*x^5,x, algorithm="giac")
```

```
[Out] 1/40*(5*(b*x^3 + a)^(8/3) - 8*(b*x^3 + a)^(5/3)*a)/b^2
```

3.529 $\int x^2 \left(a+bx^3\right)^{2/3} dx$

Optimal. Leaf size=18

$$\frac{\left(a+bx^3\right)^{5/3}}{5b}$$

```
[Out] (a + b*x^3)^(5/3)/(5*b)
```

Rubi [A] time = 0.0107665, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{\left(a+bx^3\right)^{5/3}}{5b}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(a + b*x^3)^(2/3),x]

[Out] (a + b*x^3)^(5/3)/(5*b)
```

Rubi in Sympy [A] time = 2.13291, size = 12, normalized size = 0.67

$$\frac{\left(a+bx^3\right)^{\frac{5}{3}}}{5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**2*(b*x**3+a)**(2/3),x)

[Out] (a + b*x**3)**(5/3)/(5*b)
```

Mathematica [A] time = 0.0107335, size = 18, normalized size = 1.

$$\frac{\left(a+bx^3\right)^{5/3}}{5b}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(a + b*x^3)^(2/3),x]

[Out] (a + b*x^3)^(5/3)/(5*b)
```

Maple [A] time = 0.006, size = 15, normalized size = 0.8

$$\frac{1}{5\,b}\left(bx^3+a\right)^{\frac{5}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(b*x^3+a)^(2/3),x)

[Out] 1/5*(b*x^3+a)^(5/3)/b
```

Maxima [A] time = 1.4355, size = 19, normalized size = 1.06

$$\frac{\left(bx^3+a\right)^{\frac{5}{3}}}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)*x^2,x, algorithm="maxima")
```

```
[Out] 1/5*(b*x^3 + a)^(5/3)/b
```

Fricas [A] time = 0.385073, size = 19, normalized size = 1.06

$$\frac{\left(bx^3+a\right)^{\frac{5}{3}}}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)*x^2,x, algorithm="fricas")
```

```
[Out] 1/5*(b*x^3 + a)^(5/3)/b
```

Sympy [A] time = 1.43413, size = 39, normalized size = 2.17

$$\begin{cases} \frac{a\left(a+bx^3\right)^{\frac{2}{3}}}{5b}+\frac{x^3\left(a+bx^3\right)^{\frac{2}{3}}}{5} & \text{for } b\neq 0 \\ \frac{a^{\frac{2}{3}}x^3}{3} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(b*x**3+a)**(2/3),x)
```

```
[Out] Piecewise((a*(a + b*x**3)**(2/3)/(5*b) + x**3*(a + b*x**3)**(2/3)
/5, Ne(b, 0)), (a**(2/3)*x**3/3, True))
```

GIAC/XCAS [A] time = 0.254285, size = 19, normalized size = 1.06

$$\frac{\left(bx^3+a\right)^{\frac{5}{3}}}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)*x^2,x, algorithm="giac")
```

```
[Out] 1/5*(b*x^3 + a)^(5/3)/b
```

3.530 $\int \frac{(a+bx^3)^{2/3}}{x}\,dx$

Optimal. Leaf size=98

$$\frac{1}{2}a^{2/3}\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^3}\right)+\frac{a^{2/3}\tan^{-1}\left(\frac{2\sqrt[3]{a+bx^3}+\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}}-\frac{1}{2}a^{2/3}\log(x)+\frac{1}{2}\left(a+bx^3\right)^{2/3}$$

```
[Out] (a + b*x^3)^(2/3)/2 + (a^(2/3)*ArcTan[(a^(1/3) + 2*(a + b*x^3)^(1
/3))/(Sqrt[3]*a^(1/3))])/Sqrt[3] - (a^(2/3)*Log[x])/2 + (a^(2/3)*
Log[a^(1/3) - (a + b*x^3)^(1/3)])/2
```

Rubi [A] time = 0.149635, antiderivative size = 98, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$\frac{1}{2}a^{2/3}\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^3}\right)+\frac{a^{2/3}\tan^{-1}\left(\frac{2\sqrt[3]{a+bx^3}+\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}}-\frac{1}{2}a^{2/3}\log(x)+\frac{1}{2}\left(a+bx^3\right)^{2/3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^(2/3)/x,x]
```

```
[Out] (a + b*x^3)^(2/3)/2 + (a^(2/3)*ArcTan[(a^(1/3) + 2*(a + b*x^3)^(1
/3))/(Sqrt[3]*a^(1/3))])/Sqrt[3] - (a^(2/3)*Log[x])/2 + (a^(2/3)*
Log[a^(1/3) - (a + b*x^3)^(1/3)])/2
```

Rubi in Sympy [A] time = 9.61082, size = 90, normalized size = 0.92

$$-\frac{a^{\frac{2}{3}}\log\left(x^3\right)}{6}+\frac{a^{\frac{2}{3}}\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^3}\right)}{2}+\frac{\sqrt{3}a^{\frac{2}{3}}\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\frac{2\sqrt[3]{a+bx^3}}{3}\right)}{\sqrt[3]{a}}\right)}{3}+\frac{\left(a+bx^3\right)^{\frac{2}{3}}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**(2/3)/x,x)
```

```
[Out] -a**(2/3)*log(x**3)/6 + a**(2/3)*log(a**(1/3) - (a + b*x**3)**(1/
3))/2 + sqrt(3)*a**(2/3)*atan(sqrt(3)*(a**(1/3)/3 + 2*(a + b*x**3
)**(1/3)/3)/a**(1/3))/3 + (a + b*x**3)**(2/3)/2
```

Mathematica [C] time = 0.0491004, size = 58, normalized size = 0.59

$$\frac{-2a\sqrt[3]{\frac{a}{bx^3}+1}\,{}_2F_1\left(\frac{1}{3},\frac{1}{3};\frac{4}{3};-\frac{a}{bx^3}\right)+a+bx^3}{2\sqrt[3]{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^(2/3)/x,x]
```

```
[Out] (a + b*x^3 - 2*a*(1 + a/(b*x^3))^(1/3)*Hypergeometric2F1[1/3, 1/3
, 4/3, -(a/(b*x^3))])/(2*(a + b*x^3)^(1/3))
```

Maple [F] time = 0.034, size = 0, normalized size = 0.

$$\int \frac{1}{x} \left(b x^{3}+a \right)^{\frac{2}{3}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^(2/3)/x,x)

[Out] int((b*x^3+a)^(2/3)/x,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)/x,x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [A] time = 0.276458, size = 181, normalized size = 1.85

$$-\frac{1}{18}\sqrt{3}\left(\sqrt{3}\left(a^{2}\right)^{\frac{1}{3}}\log\left(\left(bx^{3}+a\right)^{\frac{2}{3}}a+\left(a^{2}\right)^{\frac{1}{3}}a+\left(bx^{3}+a\right)^{\frac{1}{3}}\left(a^{2}\right)^{\frac{2}{3}}\right)-2\sqrt{3}\left(a^{2}\right)^{\frac{1}{3}}\log\left(\left(bx^{3}+a\right)^{\frac{1}{3}}a-\left(a^{2}\right)^{\frac{2}{3}}\right)-6\left(a^{2}\right)^{\frac{1}{3}}\text{arctar}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)/x,x, algorithm="fricas")

[Out] -1/18*sqrt(3)*(sqrt(3)*(a^2)^(1/3)*log((b*x^3 + a)^(2/3)*a + (a^2
)^(1/3)*a + (b*x^3 + a)^(1/3)*(a^2)^(2/3)) - 2*sqrt(3)*(a^2)^(1/3
)*log((b*x^3 + a)^(1/3)*a - (a^2)^(2/3)) - 6*(a^2)^(1/3)*arctan(1
/3*(2*sqrt(3)*(b*x^3 + a)^(1/3)*a + sqrt(3)*(a^2)^(2/3))/(a^2)^(2
/3)) - 3*sqrt(3)*(b*x^3 + a)^(2/3))
```

Sympy [A] time = 3.95896, size = 44, normalized size = 0.45

$$-\frac{b^{\frac{2}{3}}x^{2}\Gamma\left(-\frac{2}{3}\right){}_{2}F_{1}\left(\begin{matrix}-\frac{2}{3},-\frac{2}{3}\\ \frac{1}{3}\end{matrix}\middle|\frac{ae^{i\pi}}{bx^{3}}\right)}{3\Gamma\left(\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**(2/3)/x,x)

[Out] -b**(2/3)*x**2*gamma(-2/3)*hyper((-2/3, -2/3), (1/3,), a*exp_pola
r(I*pi)/(b*x**3))/(3*gamma(1/3))
```

GIAC/XCAS [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)/x,x, algorithm="giac")
```

```
[Out] Timed out
```

3.531 $\int \frac{(a+bx^3)^{2/3}}{x^4} dx$

Optimal. Leaf size=107

$$-\frac{(a+bx^3)^{2/3}}{3x^3}+\frac{b\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^3}\right)}{3\sqrt[3]{a}}+\frac{2b\tan^{-1}\left(\frac{2\sqrt[3]{a+bx^3}+\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}\sqrt[3]{a}}-\frac{b\log(x)}{3\sqrt[3]{a}}$$

```
[Out] -(a + b*x^3)^(2/3)/(3*x^3) + (2*b*ArcTan[(a^(1/3) + 2*(a + b*x^3)
^(1/3))/(Sqrt[3]*a^(1/3))])/(3*Sqrt[3]*a^(1/3)) - (b*Log[x])/(3*a
^(1/3)) + (b*Log[a^(1/3) - (a + b*x^3)^(1/3)])/(3*a^(1/3))
```

Rubi [A] time = 0.147619, antiderivative size = 107, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$-\frac{(a+bx^3)^{2/3}}{3x^3}+\frac{b\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^3}\right)}{3\sqrt[3]{a}}+\frac{2b\tan^{-1}\left(\frac{2\sqrt[3]{a+bx^3}+\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}\sqrt[3]{a}}-\frac{b\log(x)}{3\sqrt[3]{a}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^(2/3)/x^4,x]
```

```
[Out] -(a + b*x^3)^(2/3)/(3*x^3) + (2*b*ArcTan[(a^(1/3) + 2*(a + b*x^3)
^(1/3))/(Sqrt[3]*a^(1/3))])/(3*Sqrt[3]*a^(1/3)) - (b*Log[x])/(3*a
^(1/3)) + (b*Log[a^(1/3) - (a + b*x^3)^(1/3)])/(3*a^(1/3))
```

Rubi in Sympy [A] time = 9.97169, size = 100, normalized size = 0.93

$$-\frac{(a+bx^3)^{\frac{2}{3}}}{3x^3}-\frac{b\log\left(x^3\right)}{9\sqrt[3]{a}}+\frac{b\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^3}\right)}{3\sqrt[3]{a}}+\frac{2\sqrt{3}b\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\frac{2\sqrt[3]{a+bx^3}}{3}\right)}{\sqrt[3]{a}}\right)}{9\sqrt[3]{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**(2/3)/x**4,x)
```

```
[Out] -(a + b*x**3)**(2/3)/(3*x**3) - b*log(x**3)/(9*a**(1/3)) + b*log(
a**(1/3) - (a + b*x**3)**(1/3))/(3*a**(1/3)) + 2*sqrt(3)*b*atan(s
qrt(3)*(a**(1/3)/3 + 2*(a + b*x**3)**(1/3)/3)/a**(1/3))/(9*a**(1/
3))
```

Mathematica [C] time = 0.0421171, size = 67, normalized size = 0.63

$$\frac{-2bx^3\sqrt[3]{\frac{a}{bx^3}+1}\,{}_2F_1\left(\frac{1}{3},\frac{1}{3};\frac{4}{3};-\frac{a}{bx^3}\right)-a-bx^3}{3x^3\sqrt[3]{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^(2/3)/x^4,x]
```

```
[Out] (-a - b*x^3 - 2*b*(1 + a/(b*x^3))^(1/3)*x^3*Hypergeometric2F1[1/3
, 1/3, 4/3, -(a/(b*x^3))])/(3*x^3*(a + b*x^3)^(1/3))
```

Maple [F] time = 0.047, size = 0, normalized size = 0.

$$\int \frac{1}{x^4} \left(b x^3 + a\right)^{\frac{2}{3}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^(2/3)/x^4,x)
```

```
[Out] int((b*x^3+a)^(2/3)/x^4,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)/x^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.271424, size = 173, normalized size = 1.62

$$-\frac{\sqrt{3}\left(\sqrt{3} b x^3 \log\left(\left(b x^3 + a\right)^{\frac{2}{3}} a^{\frac{1}{3}} + \left(b x^3 + a\right)^{\frac{1}{3}} a^{\frac{2}{3}} + a\right) - 2 \sqrt{3} b x^3 \log\left(\left(b x^3 + a\right)^{\frac{1}{3}} a^{\frac{2}{3}} - a\right) - 6 b x^3 \arctan\left(\frac{2 \sqrt{3}\left(b x^3 + a\right)^{\frac{1}{3}} a^{\frac{2}{3}} + \sqrt{3} a}{3 a}\right)$$
$$27 a^{\frac{1}{3}} x^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)/x^4,x, algorithm="fricas")
```

```
[Out] -1/27*sqrt(3)*(sqrt(3)*b*x^3*log((b*x^3 + a)^(2/3)*a^(1/3) + (b*x
^3 + a)^(1/3)*a^(2/3) + a) - 2*sqrt(3)*b*x^3*log((b*x^3 + a)^(1/3
)*a^(2/3) - a) - 6*b*x^3*arctan(1/3*(2*sqrt(3)*(b*x^3 + a)^(1/3)*
a^(2/3) + sqrt(3)*a)/a) + 3*sqrt(3)*(b*x^3 + a)^(2/3)*a^(1/3))/(a
^(1/3)*x^3)
```

Sympy [A] time = 4.83783, size = 39, normalized size = 0.36

$$-\frac{b^{\frac{2}{3}} \Gamma\left(\frac{1}{3}\right) {}_{2}F_{1}\left(\begin{matrix} -\frac{2}{3}, \frac{1}{3} \\ \frac{4}{3} \end{matrix}\middle| \frac{a e^{i\pi}}{b x^3}\right)}{3 x \Gamma\left(\frac{4}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**(2/3)/x**4,x)
```

```
[Out] -b**(2/3)*gamma(1/3)*hyper((-2/3, 1/3), (4/3,), a*exp_polar(I*pi)
/(b*x**3))/(3*x*gamma(4/3))
```

GIAC/XCAS [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)/x^4,x, algorithm="giac")
```

```
[Out] Timed out
```

3.532 $\int x^4 \left(a+bx^3\right)^{2/3} dx$

Optimal. Leaf size=38

$$\frac{x^5 \left(a+bx^3\right)^{5/3} {}_2F_1\left(1,\frac{10}{3};\frac{8}{3};-\frac{bx^3}{a}\right)}{5a}$$

```
[Out] (x^5*(a + b*x^3)^(5/3)*Hypergeometric2F1[1, 10/3, 8/3, -((b*x^3)/
a)])/(5*a)
```

Rubi [A] time = 0.0568031, antiderivative size = 51, normalized size of antiderivative = 1.34, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{x^5 \left(a+bx^3\right)^{2/3} {}_2F_1\left(-\frac{2}{3},\frac{5}{3};\frac{8}{3};-\frac{bx^3}{a}\right)}{5\left(\frac{bx^3}{a}+1\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4*(a + b*x^3)^(2/3),x]
```

```
[Out] (x^5*(a + b*x^3)^(2/3)*Hypergeometric2F1[-2/3, 5/3, 8/3, -((b*x^3
)/a)])/(5*(1 + (b*x^3)/a)^(2/3))
```

Rubi in Sympy [A] time = 6.02941, size = 42, normalized size = 1.11

$$\frac{x^5 \left(a+bx^3\right)^{\frac{2}{3}} {}_2F_1\left(\begin{matrix} -\frac{2}{3},\frac{5}{3} \\ \frac{8}{3} \end{matrix}\middle| -\frac{bx^3}{a}\right)}{5\left(1+\frac{bx^3}{a}\right)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4*(b*x**3+a)**(2/3),x)
```

```
[Out] x**5*(a + b*x**3)**(2/3)*hyper((-2/3, 5/3), (8/3,), -b*x**3/a)/(5
*(1 + b*x**3/a)**(2/3))
```

Mathematica [B] time = 0.0582721, size = 78, normalized size = 2.05

$$\frac{x^2 \left(-a^2 \sqrt[3]{\frac{bx^3}{a}+1}\, {}_2F_1\left(\frac{1}{3},\frac{2}{3};\frac{5}{3};-\frac{bx^3}{a}\right)+a^2+3abx^3+2b^2x^6\right)}{14b\sqrt[3]{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4*(a + b*x^3)^(2/3),x]
```

```
[Out] (x^2*(a^2 + 3*a*b*x^3 + 2*b^2*x^6 - a^2*(1 + (b*x^3)/a)^(1/3)*Hyp
ergeometric2F1[1/3, 2/3, 5/3, -((b*x^3)/a)]))/(14*b*(a + b*x^3)^(
1/3))
```

Maple [F] time = 0.041, size = 0, normalized size = 0.

$$\int x^4 \left(b x^3+a\right)^{\frac{2}{3}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4*(b*x^3+a)^(2/3),x)
```

```
[Out] int(x^4*(b*x^3+a)^(2/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b x^3+a\right)^{\frac{2}{3}}x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)*x^4,x, algorithm="maxima")
```

```
[Out] integrate((b*x^3 + a)^(2/3)*x^4, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(b x^3+a\right)^{\frac{2}{3}}x^4, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)*x^4,x, algorithm="fricas")
```

```
[Out] integral((b*x^3 + a)^(2/3)*x^4, x)
```

Sympy [A] time = 3.24243, size = 39, normalized size = 1.03

$$\frac{a^{\frac{2}{3}}x^5\,\Gamma\left(\frac{5}{3}\right)\,{}_2F_1\left(\begin{matrix}-\frac{2}{3},\frac{5}{3}\\ \frac{8}{3}\end{matrix}\middle|\frac{b x^3 e^{i\pi}}{a}\right)}{3\,\Gamma\left(\frac{8}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4*(b*x**3+a)**(2/3),x)
```

```
[Out] a**(2/3)*x**5*gamma(5/3)*hyper((-2/3, 5/3), (8/3,), b*x**3*exp_po
lar(I*pi)/a)/(3*gamma(8/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b x^3+a\right)^{\frac{2}{3}}x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)*x^4,x, algorithm="giac")
```

```
[Out] integrate((b*x^3 + a)^(2/3)*x^4, x)
```

3.533 $\int x\left(a+bx^3\right)^{2/3}\,dx$

Optimal. Leaf size=38

$$\frac{x^2\left(a+bx^3\right)^{5/3}\,{}_2F_1\left(1,\frac{7}{3};\frac{5}{3};-\frac{bx^3}{a}\right)}{2a}$$

```
[Out] (x^2*(a + b*x^3)^(5/3)*Hypergeometric2F1[1, 7/3, 5/3, -((b*x^3)/a
)])/(2*a)
```

Rubi [A] time = 0.0435385, antiderivative size = 51, normalized size of antiderivative = 1.34, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{x^2\left(a+bx^3\right)^{2/3}\,{}_2F_1\left(-\frac{2}{3},\frac{2}{3};\frac{5}{3};-\frac{bx^3}{a}\right)}{2\left(\frac{bx^3}{a}+1\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[x*(a + b*x^3)^(2/3),x]
```

```
[Out] (x^2*(a + b*x^3)^(2/3)*Hypergeometric2F1[-2/3, 2/3, 5/3, -((b*x^3
)/a)])/(2*(1 + (b*x^3)/a)^(2/3))
```

Rubi in Sympy [A] time = 5.38826, size = 42, normalized size = 1.11

$$\frac{x^2\left(a+bx^3\right)^{\frac{2}{3}}\,{}_2F_1\left(\begin{matrix}-\frac{2}{3},\frac{2}{3}\\ \frac{5}{3}\end{matrix}\middle|-\frac{bx^3}{a}\right)}{2\left(1+\frac{bx^3}{a}\right)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(b*x**3+a)**(2/3),x)
```

```
[Out] x**2*(a + b*x**3)**(2/3)*hyper((-2/3, 2/3), (5/3,), -b*x**3/a)/(2
*(1 + b*x**3/a)**(2/3))
```

Mathematica [A] time = 0.0476663, size = 60, normalized size = 1.58

$$\frac{x^2\left(a\sqrt[3]{\frac{bx^3}{a}+1}\,{}_2F_1\left(\frac{1}{3},\frac{2}{3};\frac{5}{3};-\frac{bx^3}{a}\right)+a+bx^3\right)}{4\sqrt[3]{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x*(a + b*x^3)^(2/3),x]
```

```
[Out] (x^2*(a + b*x^3 + a*(1 + (b*x^3)/a)^(1/3)*Hypergeometric2F1[1/3,
2/3, 5/3, -((b*x^3)/a)]))/(4*(a + b*x^3)^(1/3))
```

Maple [F] time = 0.033, size = 0, normalized size = 0.

$$\int x\left(bx^3+a\right)^{\frac{2}{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(b*x^3+a)^(2/3),x)
```

```
[Out] int(x*(b*x^3+a)^(2/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bx^3 + a\right)^{\frac{2}{3}} x \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)*x,x, algorithm="maxima")
```

```
[Out] integrate((b*x^3 + a)^(2/3)*x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(bx^3 + a\right)^{\frac{2}{3}} x, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)*x,x, algorithm="fricas")
```

```
[Out] integral((b*x^3 + a)^(2/3)*x, x)
```

Sympy [A] time = 2.52675, size = 39, normalized size = 1.03

$$\frac{a^{\frac{2}{3}} x^2 \left(\frac{2}{3}\right) {}_2F_1\left(\left.\begin{matrix} -\frac{2}{3}, \frac{2}{3} \\ \frac{5}{3} \end{matrix}\right| \frac{bx^3 e^{i\pi}}{a}\right)}{3\left(\frac{5}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(b*x**3+a)**(2/3),x)
```

```
[Out] a**(2/3)*x**2*gamma(2/3)*hyper((-2/3, 2/3), (5/3,), b*x**3*exp_po
lar(I*pi)/a)/(3*gamma(5/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bx^3 + a\right)^{\frac{2}{3}} x \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)*x,x, algorithm="giac")
```

```
[Out] integrate((b*x^3 + a)^(2/3)*x, x)
```

3.534 $\int \frac{(a+bx^3)^{2/3}}{x^2} dx$

Optimal. Leaf size=36

$$-\frac{(a+bx^3)^{5/3}\ {}_2F_1\left(1,\frac{4}{3};\frac{2}{3};-\frac{bx^3}{a}\right)}{ax}$$

```
[Out] -(((a + b*x^3)^(5/3)*Hypergeometric2F1[1, 4/3, 2/3, -((b*x^3)/a)]
)/(a*x))
```

Rubi [A] time = 0.0515646, antiderivative size = 49, normalized size of antiderivative = 1.36, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{(a+bx^3)^{2/3}\ {}_2F_1\left(-\frac{2}{3},-\frac{1}{3};\frac{2}{3};-\frac{bx^3}{a}\right)}{x\left(\frac{bx^3}{a}+1\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^(2/3)/x^2,x]
```

```
[Out] -(((a + b*x^3)^(2/3)*Hypergeometric2F1[-2/3, -1/3, 2/3, -((b*x^3)
/a)])/(x*(1 + (b*x^3)/a)^(2/3)))
```

Rubi in Sympy [A] time = 5.86368, size = 42, normalized size = 1.17

$$-\frac{(a+bx^3)^{\frac{2}{3}}\ {}_2F_1\left(\begin{matrix} -\frac{2}{3},-\frac{1}{3} \\ \frac{2}{3} \end{matrix}\middle| -\frac{bx^3}{a}\right)}{x\left(1+\frac{bx^3}{a}\right)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**(2/3)/x**2,x)
```

```
[Out] -(a + b*x**3)**(2/3)*hyper((-2/3, -1/3), (2/3,), -b*x**3/a)/(x*(1
 + b*x**3/a)**(2/3))
```

Mathematica [A] time = 0.0358899, size = 63, normalized size = 1.75

$$\frac{bx^3\sqrt[3]{\frac{bx^3}{a}+1}\ {}_2F_1\left(\frac{1}{3},\frac{2}{3};\frac{5}{3};-\frac{bx^3}{a}\right)-a-bx^3}{x\sqrt[3]{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^(2/3)/x^2,x]
```

```
[Out] (-a - b*x^3 + b*x^3*(1 + (b*x^3)/a)^(1/3)*Hypergeometric2F1[1/3,
2/3, 5/3, -((b*x^3)/a)])/(x*(a + b*x^3)^(1/3))
```

Maple [F] time = 0.038, size = 0, normalized size = 0.

$$\int \frac{1}{x^2}\left(bx^3+a\right)^{\frac{2}{3}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^(2/3)/x^2,x)
```

```
[Out] int((b*x^3+a)^(2/3)/x^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^3+a)^{\frac{2}{3}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)/x^2,x, algorithm="maxima")
```

```
[Out] integrate((b*x^3 + a)^(2/3)/x^2, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(bx^3+a)^{\frac{2}{3}}}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)/x^2,x, algorithm="fricas")
```

```
[Out] integral((b*x^3 + a)^(2/3)/x^2, x)
```

Sympy [A] time = 2.52361, size = 41, normalized size = 1.14

$$\frac{a^{\frac{2}{3}}\,\Gamma\left(-\frac{1}{3}\right)\,{}_{2}F_{1}\left(\begin{matrix}-\frac{2}{3}, -\frac{1}{3}\\ \frac{2}{3}\end{matrix}\middle|\,\frac{bx^3e^{i\pi}}{a}\right)}{3x\,\Gamma\left(\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**(2/3)/x**2,x)
```

```
[Out] a**(2/3)*gamma(-1/3)*hyper((-2/3, -1/3), (2/3,), b*x**3*exp_polar
(I*pi)/a)/(3*x*gamma(2/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^3+a)^{\frac{2}{3}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)/x^2,x, algorithm="giac")
```

```
[Out] integrate((b*x^3 + a)^(2/3)/x^2, x)
```

3.535 $\int \frac{(a+bx^3)^{2/3}}{x^5}\,dx$

Optimal. Leaf size=38

$$-\frac{(a+bx^3)^{5/3}\,{}_2F_1\left(\frac{1}{3},1;-\frac{1}{3};-\frac{bx^3}{a}\right)}{4ax^4}$$

```
[Out] -((a + b*x^3)^(5/3)*Hypergeometric2F1[1/3, 1, -1/3, -((b*x^3)/a)]
)/(4*a*x^4)
```

Rubi [A] time = 0.051555, antiderivative size = 51, normalized size of antiderivative = 1.34, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{(a+bx^3)^{2/3}\,{}_2F_1\left(-\frac{4}{3},-\frac{2}{3};-\frac{1}{3};-\frac{bx^3}{a}\right)}{4x^4\left(\frac{bx^3}{a}+1\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^(2/3)/x^5,x]
```

```
[Out] -((a + b*x^3)^(2/3)*Hypergeometric2F1[-4/3, -2/3, -1/3, -((b*x^3)
/a)])/(4*x^4*(1 + (b*x^3)/a)^(2/3))
```

Rubi in Sympy [A] time = 5.87596, size = 48, normalized size = 1.26

$$-\frac{(a+bx^3)^{\frac{2}{3}}\,{}_2F_1\left(\begin{matrix}-\frac{2}{3},-\frac{4}{3}\\ -\frac{1}{3}\end{matrix}\middle|-\frac{bx^3}{a}\right)}{4x^4\left(1+\frac{bx^3}{a}\right)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**(2/3)/x**5,x)
```

```
[Out] -(a + b*x**3)**(2/3)*hyper((-2/3, -4/3), (-1/3,), -b*x**3/a)/(4*x
**4*(1 + b*x**3/a)**(2/3))
```

Mathematica [B] time = 0.0450994, size = 82, normalized size = 2.16

$$\frac{-a^2+b^2x^6\sqrt[3]{\frac{bx^3}{a}+1}\,{}_2F_1\left(\frac{1}{3},\frac{2}{3};\frac{5}{3};-\frac{bx^3}{a}\right)-3abx^3-2b^2x^6}{4ax^4\sqrt[3]{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^(2/3)/x^5,x]
```

```
[Out] (-a^2 - 3*a*b*x^3 - 2*b^2*x^6 + b^2*x^6*(1 + (b*x^3)/a)^(1/3)*Hyp
ergeometric2F1[1/3, 2/3, 5/3, -((b*x^3)/a)])/(4*a*x^4*(a + b*x^3)
^(1/3))
```

Maple [F] time = 0.043, size = 0, normalized size = 0.

$$\int \frac{1}{x^5}\left(b x^3+a\right)^{\frac{2}{3}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^(2/3)/x^5,x)
```

```
[Out] int((b*x^3+a)^(2/3)/x^5,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b x^3+a\right)^{\frac{2}{3}}}{x^5}\, d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)/x^5,x, algorithm="maxima")
```

```
[Out] integrate((b*x^3 + a)^(2/3)/x^5, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{\left(b x^3+a\right)^{\frac{2}{3}}}{x^5}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)/x^5,x, algorithm="fricas")
```

```
[Out] integral((b*x^3 + a)^(2/3)/x^5, x)
```

Sympy [A] time = 3.36184, size = 46, normalized size = 1.21

$$\frac{a^{\frac{2}{3}}\Gamma\left(-\frac{4}{3}\right){}_2F_1\left(\begin{matrix}-\frac{4}{3},-\frac{2}{3}\\-\frac{1}{3}\end{matrix}\middle|\frac{b x^3 e^{i\pi}}{a}\right)}{3x^4\Gamma\left(-\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**(2/3)/x**5,x)
```

```
[Out] a**(2/3)*gamma(-4/3)*hyper((-4/3, -2/3), (-1/3,), b*x**3*exp_pola
r(I*pi)/a)/(3*x**4*gamma(-1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b x^3+a\right)^{\frac{2}{3}}}{x^5}\, d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)/x^5,x, algorithm="giac")

[Out] integrate((b*x^3 + a)^(2/3)/x^5, x)
```

3.536 $\int x^3 \left(a+bx^3\right)^{2/3} dx$

Optimal. Leaf size=117

$$\frac{a^2 \log\left(\sqrt[3]{a+bx^3}-\sqrt[3]{b}x\right)}{18b^{4/3}}-\frac{a^2 \tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1}{\sqrt{3}}\right)}{9\sqrt{3}b^{4/3}}+\frac{ax\left(a+bx^3\right)^{2/3}}{9b}+\frac{1}{6}x^4\left(a+bx^3\right)^{2/3}$$

```
[Out] (a*x*(a + b*x^3)^(2/3))/(9*b) + (x^4*(a + b*x^3)^(2/3))/6 - (a^2*
ArcTan[(1 + (2*b^(1/3)*x)/(a + b*x^3)^(1/3))/Sqrt[3]])/(9*Sqrt[3]
*b^(4/3)) + (a^2*Log[-(b^(1/3)*x) + (a + b*x^3)^(1/3)])/(18*b^(4/
3))
```

Rubi [A] time = 0.096407, antiderivative size = 117, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{a^2 \log\left(\sqrt[3]{a+bx^3}-\sqrt[3]{b}x\right)}{18b^{4/3}}-\frac{a^2 \tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1}{\sqrt{3}}\right)}{9\sqrt{3}b^{4/3}}+\frac{ax\left(a+bx^3\right)^{2/3}}{9b}+\frac{1}{6}x^4\left(a+bx^3\right)^{2/3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3*(a + b*x^3)^(2/3),x]
```

```
[Out] (a*x*(a + b*x^3)^(2/3))/(9*b) + (x^4*(a + b*x^3)^(2/3))/6 - (a^2*
ArcTan[(1 + (2*b^(1/3)*x)/(a + b*x^3)^(1/3))/Sqrt[3]])/(9*Sqrt[3]
*b^(4/3)) + (a^2*Log[-(b^(1/3)*x) + (a + b*x^3)^(1/3)])/(18*b^(4/
3))
```

Rubi in Sympy [A] time = 23.1416, size = 156, normalized size = 1.33

$$\frac{a^2 \log\left(-\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)}{27b^{\frac{4}{3}}}-\frac{a^2 \log\left(\frac{b^{\frac{2}{3}}x^2}{(a+bx^3)^{\frac{2}{3}}}+\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)}{54b^{\frac{4}{3}}}-\frac{\sqrt{3}a^2 \operatorname{atan}\left(\sqrt{3}\left(\frac{2\sqrt[3]{b}x}{3\sqrt[3]{a+bx^3}}+\frac{1}{3}\right)\right)}{27b^{\frac{4}{3}}}+\frac{ax\left(a+bx^3\right)^{\frac{2}{3}}}{9b}+\frac{x^4\left(a+bx^3\right)^{\frac{2}{3}}}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3*(b*x**3+a)**(2/3),x)
```

```
[Out] a**2*log(-b**(1/3)*x/(a + b*x**3)**(1/3) + 1)/(27*b**(4/3)) - a**
2*log(b**(2/3)*x**2/(a + b*x**3)**(2/3) + b**(1/3)*x/(a + b*x**3)
**(1/3) + 1)/(54*b**(4/3)) - sqrt(3)*a**2*atan(sqrt(3)*(2*b**(1/3
)*x/(3*(a + b*x**3)**(1/3)) + 1/3))/(27*b**(4/3)) + a*x*(a + b*x*
*3)**(2/3)/(9*b) + x**4*(a + b*x**3)**(2/3)/6
```

Mathematica [A] time = 0.187884, size = 143, normalized size = 1.22

$$(a+bx^3)^{2/3}\left(\frac{ax}{9b}+\frac{x^4}{6}\right)-\frac{a^2\left(\log\left(\frac{b^{2/3}x^2}{(a+bx^3)^{2/3}}+\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)-2\log\left(1-\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}\right)+2\sqrt{3}\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1}{\sqrt{3}}\right)\right)}{54b^{4/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3*(a + b*x^3)^(2/3),x]
```

```
[Out] (a + b*x^3)^(2/3)*((a*x)/(9*b) + x^4/6) - (a^2*(2*Sqrt[3]*ArcTan[
(1 + (2*b^(1/3)*x)/(a + b*x^3)^(1/3))/Sqrt[3]] - 2*Log[1 - (b^(1/
3)*x)/(a + b*x^3)^(1/3)] + Log[1 + (b^(2/3)*x^2)/(a + b*x^3)^(2/3
) + (b^(1/3)*x)/(a + b*x^3)^(1/3)]))/(54*b^(4/3))
```

Maple [F] time = 0.041, size = 0, normalized size = 0.

$$\int x^3\left(bx^3+a\right)^{\frac{2}{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3*(b*x^3+a)^(2/3),x)
```

```
[Out] int(x^3*(b*x^3+a)^(2/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)*x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.260401, size = 207, normalized size = 1.77

$$\frac{\sqrt{3}\left(2\sqrt{3}a^2\log\left(-\frac{bx-(bx^3+a)^{\frac{1}{3}}b^{\frac{2}{3}}}{x}\right)-\sqrt{3}a^2\log\left(\frac{bx^2+(bx^3+a)^{\frac{1}{3}}b^{\frac{2}{3}}x+(bx^3+a)^{\frac{2}{3}}b^{\frac{1}{3}}}{x^2}\right)+6\,a^2\arctan\left(\frac{\sqrt{3}bx+2\sqrt{3}(bx^3+a)^{\frac{1}{3}}b^{\frac{2}{3}}}{3\,bx}\right)+3\sqrt{3}(3\right.}{162\,b^{\frac{4}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)*x^3,x, algorithm="fricas")
```

```
[Out] 1/162*sqrt(3)*(2*sqrt(3)*a^2*log(-(b*x - (b*x^3 + a)^(1/3)*b^(2/3
))/x) - sqrt(3)*a^2*log((b*x^2 + (b*x^3 + a)^(1/3)*b^(2/3)*x + (b
*x^3 + a)^(2/3)*b^(1/3))/x^2) + 6*a^2*arctan(1/3*(sqrt(3)*b*x + 2
*sqrt(3)*(b*x^3 + a)^(1/3)*b^(2/3))/(b*x)) + 3*sqrt(3)*(3*b*x^4 +
 2*a*x)*(b*x^3 + a)^(2/3)*b^(1/3))/b^(4/3)
```

Sympy [A] time = 5.22199, size = 39, normalized size = 0.33

$$\frac{a^{\frac{2}{3}}x^4\Gamma\left(\frac{4}{3}\right){}_2F_1\left(\begin{matrix}-\frac{2}{3},\frac{4}{3}\\\frac{7}{3}\end{matrix}\middle|\frac{bx^3e^{i\pi}}{a}\right)}{3\Gamma\left(\frac{7}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(b*x**3+a)**(2/3),x)
```

```
[Out] a**(2/3)*x**4*gamma(4/3)*hyper((-2/3, 4/3), (7/3,), b*x**3*exp_po
lar(I*pi)/a)/(3*gamma(7/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bx^3 + a\right)^{\frac{2}{3}} x^3\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)*x^3,x, algorithm="giac")
```

```
[Out] integrate((b*x^3 + a)^(2/3)*x^3, x)
```

3.537 $\int (a+bx^3)^{2/3}\,dx$

Optimal. Leaf size=91

$$\frac{1}{3}x\left(a+bx^3\right)^{2/3}-\frac{a\log\left(\sqrt[3]{a+bx^3}-\sqrt[3]{b}x\right)}{3\sqrt[3]{b}}+\frac{2a\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1}{\sqrt{3}}\right)}{3\sqrt{3}\sqrt[3]{b}}$$

```
[Out] (x*(a + b*x^3)^(2/3))/3 + (2*a*ArcTan[(1 + (2*b^(1/3)*x)/(a + b*x
^3)^(1/3))/Sqrt[3]])/(3*Sqrt[3]*b^(1/3)) - (a*Log[-(b^(1/3)*x) +
(a + b*x^3)^(1/3)])/(3*b^(1/3))
```

Rubi [A] time = 0.0494412, antiderivative size = 91, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{1}{3}x\left(a+bx^3\right)^{2/3}-\frac{a\log\left(\sqrt[3]{a+bx^3}-\sqrt[3]{b}x\right)}{3\sqrt[3]{b}}+\frac{2a\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1}{\sqrt{3}}\right)}{3\sqrt{3}\sqrt[3]{b}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^3)^(2/3),x]
```

```
[Out] (x*(a + b*x^3)^(2/3))/3 + (2*a*ArcTan[(1 + (2*b^(1/3)*x)/(a + b*x
^3)^(1/3))/Sqrt[3]])/(3*Sqrt[3]*b^(1/3)) - (a*Log[-(b^(1/3)*x) +
(a + b*x^3)^(1/3)])/(3*b^(1/3))
```

Rubi in Sympy [A] time = 16.2034, size = 136, normalized size = 1.49

$$-\frac{2a\log\left(-\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)}{9\sqrt[3]{b}}+\frac{a\log\left(\frac{b^{\frac{2}{3}}x^2}{(a+bx^3)^{\frac{2}{3}}}+\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)}{9\sqrt[3]{b}}+\frac{2\sqrt{3}a\,\mathrm{atan}\left(\sqrt{3}\left(\frac{2\sqrt[3]{b}x}{3\sqrt[3]{a+bx^3}}+\frac{1}{3}\right)\right)}{9\sqrt[3]{b}}+\frac{x\left(a+bx^3\right)^{\frac{2}{3}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**3+a)**(2/3),x)
```

```
[Out] -2*a*log(-b**(1/3)*x/(a + b*x**3)**(1/3) + 1)/(9*b**(1/3)) + a*lo
g(b**(2/3)*x**2/(a + b*x**3)**(2/3) + b**(1/3)*x/(a + b*x**3)**(1
/3) + 1)/(9*b**(1/3)) + 2*sqrt(3)*a*atan(sqrt(3)*(2*b**(1/3)*x/(3
*(a + b*x**3)**(1/3)) + 1/3))/(9*b**(1/3)) + x*(a + b*x**3)**(2/3
)/3
```

Mathematica [C] time = 0.35855, size = 196, normalized size = 2.15

$$\frac{3\left((-1)^{2/3}\sqrt[3]{a}+\sqrt[3]{b}x\right)\left(a+bx^3\right)^{2/3}F_1\left(\frac{5}{3};-\frac{2}{3},-\frac{2}{3};\frac{8}{3};-\frac{i\left(\sqrt[3]{b}x+(-1)^{2/3}\sqrt[3]{a}\right)}{\sqrt{3}\sqrt[3]{a}},\frac{-\frac{2i\sqrt[3]{b}x}{\sqrt[3]{a}}+\sqrt{3}+i}{3i+\sqrt{3}}\right)}{5\,2^{2/3}\sqrt[3]{b}\left(\frac{\sqrt[3]{a}+(-1)^{2/3}\sqrt[3]{b}x}{\left(1+\sqrt[3]{-1}\right)\sqrt[3]{a}}\right)^{2/3}\left(\frac{i\left(\frac{\sqrt[3]{b}x}{\sqrt[3]{a}}+1\right)}{\sqrt{3}+3i}\right)^{2/3}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[(a + b*x^3)^(2/3),x]
```

```
[Out] (3*((-1)^(2/3)*a^(1/3) + b^(1/3)*x)*(a + b*x^3)^(2/3)*AppellF1[5/
3, -2/3, -2/3, 8/3, ((-I)*((-1)^(2/3)*a^(1/3) + b^(1/3)*x))/(Sqrt
[3]*a^(1/3)), (I + Sqrt[3] - ((2*I)*b^(1/3)*x)/a^(1/3))/(3*I + Sq
rt[3])])/(5*2^(2/3)*b^(1/3)*((a^(1/3) + (-1)^(2/3)*b^(1/3)*x)/((1
 + (-1)^(1/3))*a^(1/3)))^(2/3)*((I*(1 + (b^(1/3)*x)/a^(1/3)))/(3*
I + Sqrt[3]))^(2/3))
```

Maple [F] time = 0.045, size = 0, normalized size = 0.

$$\int \left(bx^3+a\right)^{\frac{2}{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^(2/3),x)
```

```
[Out] int((b*x^3+a)^(2/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.263755, size = 204, normalized size = 2.24

$$\frac{\sqrt{3}\left(3\sqrt{3}\left(bx^3+a\right)^{\frac{2}{3}}(-b)^{\frac{1}{3}}x+2\sqrt{3}a\log\left(-\frac{bx-\left(bx^3+a\right)^{\frac{1}{3}}(-b)^{\frac{2}{3}}}{x}\right)-\sqrt{3}a\log\left(-\frac{bx^2+\left(bx^3+a\right)^{\frac{1}{3}}(-b)^{\frac{2}{3}}x-\left(bx^3+a\right)^{\frac{2}{3}}(-b)^{\frac{1}{3}}}{x^2}\right)+6\,a\arctan\left(\right.}{27\,(-b)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3),x, algorithm="fricas")
```

```
[Out] 1/27*sqrt(3)*(3*sqrt(3)*(b*x^3 + a)^(2/3)*(-b)^(1/3)*x + 2*sqrt(3
)*a*log(-(b*x - (b*x^3 + a)^(1/3)*(-b)^(2/3))/x) - sqrt(3)*a*log(
-(b*x^2 + (b*x^3 + a)^(1/3)*(-b)^(2/3)*x - (b*x^3 + a)^(2/3)*(-b)
```

```
^(1/3))/x^2) + 6*a*arctan(1/3*(sqrt(3)*b*x + 2*sqrt(3)*(b*x^3 + a
)^(1/3)*(-b)^(2/3))/(b*x)))/(-b)^(1/3)
```

Sympy [A] time = 4.43175, size = 37, normalized size = 0.41

$$\frac{a^{\frac{2}{3}}x\,\Gamma\left(\frac{1}{3}\right)\,{}_2F_1\left(\begin{matrix}-\frac{2}{3},\frac{1}{3}\\ \frac{4}{3}\end{matrix}\middle|\frac{bx^3e^{i\pi}}{a}\right)}{3\,\Gamma\left(\frac{4}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**(2/3),x)
```

```
[Out] a**(2/3)*x*gamma(1/3)*hyper((-2/3, 1/3), (4/3,), b*x**3*exp_polar
(I*pi)/a)/(3*gamma(4/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bx^3 + a\right)^{\frac{2}{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3),x, algorithm="giac")
```

```
[Out] integrate((b*x^3 + a)^(2/3), x)
```

3.538 $\int \frac{(a+bx^3)^{2/3}}{x^3} dx$

Optimal. Leaf size=88

$$-\frac{1}{2}b^{2/3}\log\left(\sqrt[3]{a+bx^3}-\sqrt[3]{b}x\right)+\frac{b^{2/3}\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1}{\sqrt{3}}\right)}{\sqrt{3}}-\frac{(a+bx^3)^{2/3}}{2x^2}$$

```
[Out] -(a + b*x^3)^(2/3)/(2*x^2) + (b^(2/3)*ArcTan[(1 + (2*b^(1/3)*x)/(
a + b*x^3)^(1/3))/Sqrt[3]])/Sqrt[3] - (b^(2/3)*Log[-(b^(1/3)*x) +
 (a + b*x^3)^(1/3)])/2
```

Rubi [A] time = 0.0555762, antiderivative size = 88, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$-\frac{1}{2}b^{2/3}\log\left(\sqrt[3]{a+bx^3}-\sqrt[3]{b}x\right)+\frac{b^{2/3}\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1}{\sqrt{3}}\right)}{\sqrt{3}}-\frac{(a+bx^3)^{2/3}}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^(2/3)/x^3,x]
```

```
[Out] -(a + b*x^3)^(2/3)/(2*x^2) + (b^(2/3)*ArcTan[(1 + (2*b^(1/3)*x)/(
a + b*x^3)^(1/3))/Sqrt[3]])/Sqrt[3] - (b^(2/3)*Log[-(b^(1/3)*x) +
 (a + b*x^3)^(1/3)])/2
```

Rubi in Sympy [A] time = 17.5087, size = 129, normalized size = 1.47

$$-\frac{b^{\frac{2}{3}}\log\left(-\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)}{3}+\frac{b^{\frac{2}{3}}\log\left(\frac{b^{\frac{2}{3}}x^2}{(a+bx^3)^{\frac{2}{3}}}+\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)}{6}+\frac{\sqrt{3}b^{\frac{2}{3}}\operatorname{atan}\left(\sqrt{3}\left(\frac{2\sqrt[3]{b}x}{3\sqrt[3]{a+bx^3}}+\frac{1}{3}\right)\right)}{3}-\frac{(a+bx^3)^{\frac{2}{3}}}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**(2/3)/x**3,x)
```

```
[Out] -b**(2/3)*log(-b**(1/3)*x/(a + b*x**3)**(1/3) + 1)/3 + b**(2/3)*l
og(b**(2/3)*x**2/(a + b*x**3)**(2/3) + b**(1/3)*x/(a + b*x**3)**(
1/3) + 1)/6 + sqrt(3)*b**(2/3)*atan(sqrt(3)*(2*b**(1/3)*x/(3*(a +
 b*x**3)**(1/3)) + 1/3))/3 - (a + b*x**3)**(2/3)/(2*x**2)
```

Mathematica [A] time = 0.17757, size = 129, normalized size = 1.47

$$\frac{1}{6}b^{2/3}\left(\log\left(\frac{b^{2/3}x^2}{(a+bx^3)^{2/3}}+\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)-2\log\left(1-\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}\right)+2\sqrt{3}\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1}{\sqrt{3}}\right)\right)-\frac{(a+bx^3)^{2/3}}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^(2/3)/x^3,x]
```

```
[Out] -(a + b*x^3)^(2/3)/(2*x^2) + (b^(2/3)*(2*Sqrt[3]*ArcTan[(1 + (2*b
^(1/3)*x)/(a + b*x^3)^(1/3))/Sqrt[3]] - 2*Log[1 - (b^(1/3)*x)/(a
+ b*x^3)^(1/3)] + Log[1 + (b^(2/3)*x^2)/(a + b*x^3)^(2/3) + (b^(1
/3)*x)/(a + b*x^3)^(1/3)]))/6
```

Maple [F] time = 0.038, size = 0, normalized size = 0.

$$\int \frac{1}{x^3} \left(b x^3 + a\right)^{\frac{2}{3}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^(2/3)/x^3,x)
```

```
[Out] int((b*x^3+a)^(2/3)/x^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)/x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)/x^3,x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [A] time = 4.26734, size = 42, normalized size = 0.48

$$\frac{a^{\frac{2}{3}} \Gamma\left(-\frac{2}{3}\right) {}_{2}F_{1}\left(\begin{matrix} -\frac{2}{3}, -\frac{2}{3} \\ \frac{1}{3} \end{matrix}\middle| {\frac{b x^{3} e^{i \pi}}{a}} \right)}{3 x^{2} \Gamma\left(\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**(2/3)/x**3,x)
```

```
[Out] a**(2/3)*gamma(-2/3)*hyper((-2/3, -2/3), (1/3,), b*x**3*exp_polar
(I*pi)/a)/(3*x**2*gamma(1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bx^3 + a\right)^{\frac{2}{3}}}{x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)/x^3,x, algorithm="giac")
```

```
[Out] integrate((b*x^3 + a)^(2/3)/x^3, x)
```

3.539 $\int \frac{(a+bx^3)^{2/3}}{x^6} dx$

Optimal. Leaf size=21

$$-\frac{(a+bx^3)^{5/3}}{5ax^5}$$

```
[Out] -(a + b*x^3)^(5/3)/(5*a*x^5)
```

Rubi [A] time = 0.0203909, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{(a+bx^3)^{5/3}}{5ax^5}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^3)^(2/3)/x^6,x]
```

```
[Out] -(a + b*x^3)^(5/3)/(5*a*x^5)
```

Rubi in Sympy [A] time = 2.72961, size = 17, normalized size = 0.81

$$-\frac{(a+bx^3)^{\frac{5}{3}}}{5ax^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**3+a)**(2/3)/x**6,x)
```

```
[Out] -(a + b*x**3)**(5/3)/(5*a*x**5)
```

Mathematica [A] time = 0.0169421, size = 21, normalized size = 1.

$$-\frac{(a+bx^3)^{5/3}}{5ax^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^3)^(2/3)/x^6,x]
```

```
[Out] -(a + b*x^3)^(5/3)/(5*a*x^5)
```

Maple [A] time = 0.007, size = 18, normalized size = 0.9

$$-\frac{1}{5\,ax^5}\left(bx^3+a\right)^{\frac{5}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x^3+a)^(2/3)/x^6,x)
```

```
[Out] -1/5*(b*x^3+a)^(5/3)/a/x^5
```

Maxima [A] time = 1.41636, size = 23, normalized size = 1.1

$$-\frac{\left(bx^3+a\right)^{\frac{5}{3}}}{5\,ax^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)/x^6,x, algorithm="maxima")
```

```
[Out] -1/5*(b*x^3 + a)^(5/3)/(a*x^5)
```

Fricas [A] time = 0.248244, size = 23, normalized size = 1.1

$$-\frac{\left(bx^3+a\right)^{\frac{5}{3}}}{5\,ax^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)/x^6,x, algorithm="fricas")
```

```
[Out] -1/5*(b*x^3 + a)^(5/3)/(a*x^5)
```

Sympy [A] time = 3.24127, size = 68, normalized size = 3.24

$$\frac{b^{\frac{2}{3}}\left(\frac{a}{bx^3}+1\right)^{\frac{2}{3}}\Gamma\left(-\frac{5}{3}\right)}{3x^3\,\Gamma\left(-\frac{2}{3}\right)}+\frac{b^{\frac{5}{3}}\left(\frac{a}{bx^3}+1\right)^{\frac{2}{3}}\Gamma\left(-\frac{5}{3}\right)}{3a\,\Gamma\left(-\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**(2/3)/x**6,x)
```

```
[Out] b**(2/3)*(a/(b*x**3) + 1)**(2/3)*gamma(-5/3)/(3*x**3*gamma(-2/3))
 + b**(5/3)*(a/(b*x**3) + 1)**(2/3)*gamma(-5/3)/(3*a*gamma(-2/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bx^3+a\right)^{\frac{2}{3}}}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)/x^6,x, algorithm="giac")
```

```
[Out] integrate((b*x^3 + a)^(2/3)/x^6, x)
```

3.540 $\int \frac{(a+bx^3)^{2/3}}{x^9}\,dx$

Optimal. Leaf size=44

$$\frac{3b\left(a+bx^3\right)^{5/3}}{40a^2x^5}-\frac{\left(a+bx^3\right)^{5/3}}{8ax^8}$$

```
[Out] -(a + b*x^3)^(5/3)/(8*a*x^8) + (3*b*(a + b*x^3)^(5/3))/(40*a^2*x^
5)
```

Rubi [A] time = 0.0420266, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{3b\left(a+bx^3\right)^{5/3}}{40a^2x^5}-\frac{\left(a+bx^3\right)^{5/3}}{8ax^8}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^(2/3)/x^9,x]
```

```
[Out] -(a + b*x^3)^(5/3)/(8*a*x^8) + (3*b*(a + b*x^3)^(5/3))/(40*a^2*x^
5)
```

Rubi in Sympy [A] time = 4.25496, size = 37, normalized size = 0.84

$$-\frac{\left(a+bx^3\right)^{\frac{5}{3}}}{8ax^8}+\frac{3b\left(a+bx^3\right)^{\frac{5}{3}}}{40a^2x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**(2/3)/x**9,x)
```

```
[Out] -(a + b*x**3)**(5/3)/(8*a*x**8) + 3*b*(a + b*x**3)**(5/3)/(40*a**
2*x**5)
```

Mathematica [A] time = 0.0252886, size = 44, normalized size = 1.

$$\left(\frac{3b^2}{40a^2x^2}-\frac{b}{20ax^5}-\frac{1}{8x^8}\right)\left(a+bx^3\right)^{2/3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^(2/3)/x^9,x]
```

```
[Out] (-1/(8*x^8) - b/(20*a*x^5) + (3*b^2)/(40*a^2*x^2))*(a + b*x^3)^(2
/3)
```

Maple [A] time = 0.007, size = 28, normalized size = 0.6

$$-\frac{-3\,bx^3+5\,a}{40\,x^8a^2}\left(bx^3+a\right)^{\frac{5}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^(2/3)/x^9,x)

[Out] -1/40*(b*x^3+a)^(5/3)*(-3*b*x^3+5*a)/x^8/a^2
```

Maxima [A] time = 1.44913, size = 47, normalized size = 1.07

$$\frac{\frac{8\,(bx^3+a)^{\frac{5}{3}}b}{x^5} - \frac{5\,(bx^3+a)^{\frac{8}{3}}}{x^8}}{40\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)/x^9,x, algorithm="maxima")

[Out] 1/40*(8*(b*x^3 + a)^(5/3)*b/x^5 - 5*(b*x^3 + a)^(8/3)/x^8)/a^2
```

Fricas [A] time = 0.254371, size = 51, normalized size = 1.16

$$\frac{\left(3\,b^2x^6 - 2\,abx^3 - 5\,a^2\right)\left(bx^3 + a\right)^{\frac{2}{3}}}{40\,a^2x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)/x^9,x, algorithm="fricas")

[Out] 1/40*(3*b^2*x^6 - 2*a*b*x^3 - 5*a^2)*(b*x^3 + a)^(2/3)/(a^2*x^8)
```

Sympy [A] time = 6.09448, size = 110, normalized size = 2.5

$$-\frac{5b^{\frac{2}{3}}\left(\frac{a}{bx^3}+1\right)^{\frac{2}{3}}\Gamma\left(-\frac{8}{3}\right)}{9x^6\,\Gamma\left(-\frac{2}{3}\right)} - \frac{2b^{\frac{5}{3}}\left(\frac{a}{bx^3}+1\right)^{\frac{2}{3}}\Gamma\left(-\frac{8}{3}\right)}{9ax^3\,\Gamma\left(-\frac{2}{3}\right)} + \frac{b^{\frac{8}{3}}\left(\frac{a}{bx^3}+1\right)^{\frac{2}{3}}\Gamma\left(-\frac{8}{3}\right)}{3a^2\,\Gamma\left(-\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**(2/3)/x**9,x)

[Out] -5*b**(2/3)*(a/(b*x**3) + 1)**(2/3)*gamma(-8/3)/(9*x**6*gamma(-2/
3)) - 2*b**(5/3)*(a/(b*x**3) + 1)**(2/3)*gamma(-8/3)/(9*a*x**3*ga
mma(-2/3)) + b**(8/3)*(a/(b*x**3) + 1)**(2/3)*gamma(-8/3)/(3*a**2
*gamma(-2/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bx^3 + a\right)^{\frac{2}{3}}}{x^9}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)/x^9,x, algorithm="giac")

[Out] integrate((b*x^3 + a)^(2/3)/x^9, x)
```

3.541 $\int \frac{(a+bx^3)^{2/3}}{x^{12}} dx$

Optimal. Leaf size=68

$$-\frac{9b^2(a+bx^3)^{5/3}}{220a^3x^5}+\frac{3b(a+bx^3)^{5/3}}{44a^2x^8}-\frac{(a+bx^3)^{5/3}}{11ax^{11}}$$

```
[Out] -(a + b*x^3)^(5/3)/(11*a*x^11) + (3*b*(a + b*x^3)^(5/3))/(44*a^2*
x^8) - (9*b^2*(a + b*x^3)^(5/3))/(220*a^3*x^5)
```

Rubi [A] time = 0.0645934, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{9b^2(a+bx^3)^{5/3}}{220a^3x^5}+\frac{3b(a+bx^3)^{5/3}}{44a^2x^8}-\frac{(a+bx^3)^{5/3}}{11ax^{11}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^(2/3)/x^12,x]
```

```
[Out] -(a + b*x^3)^(5/3)/(11*a*x^11) + (3*b*(a + b*x^3)^(5/3))/(44*a^2*
x^8) - (9*b^2*(a + b*x^3)^(5/3))/(220*a^3*x^5)
```

Rubi in Sympy [A] time = 6.7305, size = 61, normalized size = 0.9

$$-\frac{(a+bx^3)^{\frac{5}{3}}}{11ax^{11}}+\frac{3b(a+bx^3)^{\frac{5}{3}}}{44a^2x^8}-\frac{9b^2(a+bx^3)^{\frac{5}{3}}}{220a^3x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**(2/3)/x**12,x)
```

```
[Out] -(a + b*x**3)**(5/3)/(11*a*x**11) + 3*b*(a + b*x**3)**(5/3)/(44*a
**2*x**8) - 9*b**2*(a + b*x**3)**(5/3)/(220*a**3*x**5)
```

Mathematica [A] time = 0.0275681, size = 53, normalized size = 0.78

$$-\frac{(a+bx^3)^{2/3}(20a^3+5a^2bx^3-6ab^2x^6+9b^3x^9)}{220a^3x^{11}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^(2/3)/x^12,x]
```

```
[Out] -((a + b*x^3)^(2/3)*(20*a^3 + 5*a^2*b*x^3 - 6*a*b^2*x^6 + 9*b^3*x
^9))/(220*a^3*x^11)
```

Maple [A] time = 0.008, size = 39, normalized size = 0.6

$$-\frac{9\,b^2x^6-15\,abx^3+20\,a^2}{220\,x^{11}a^3}(bx^3+a)^{\frac{5}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((b*x^3+a)^(2/3)/x^12,x)
```

```
[Out] -1/220*(b*x^3+a)^(5/3)*(9*b^2*x^6-15*a*b*x^3+20*a^2)/x^11/a^3
```

Maxima [A] time = 1.43947, size = 70, normalized size = 1.03

$$-\frac{\frac{44\,\left(bx^3+a\right)^{\frac{5}{3}}b^2}{x^5}-\frac{55\,\left(bx^3+a\right)^{\frac{8}{3}}b}{x^8}+\frac{20\,\left(bx^3+a\right)^{\frac{11}{3}}}{x^{11}}}{220\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^3 + a)^(2/3)/x^12,x, algorithm="maxima")
```

```
[Out] -1/220*(44*(b*x^3 + a)^(5/3)*b^2/x^5 - 55*(b*x^3 + a)^(8/3)*b/x^8
 + 20*(b*x^3 + a)^(11/3)/x^11)/a^3
```

Fricas [A] time = 0.249987, size = 66, normalized size = 0.97

$$-\frac{\left(9\,b^3x^9-6\,ab^2x^6+5\,a^2bx^3+20\,a^3\right)\left(bx^3+a\right)^{\frac{2}{3}}}{220\,a^3x^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^3 + a)^(2/3)/x^12,x, algorithm="fricas")
```

```
[Out] -1/220*(9*b^3*x^9 - 6*a*b^2*x^6 + 5*a^2*b*x^3 + 20*a^3)*(b*x^3 +
a)^(2/3)/(a^3*x^11)
```

Sympy [A] time = 11.2463, size = 520, normalized size = 7.65

$$\frac{40a^5b^{\frac{14}{3}}\left(\frac{a}{bx^3}+1\right)^{\frac{2}{3}}\Gamma\left(-\frac{11}{3}\right)}{27a^5b^4x^9\Gamma\left(-\frac{2}{3}\right)+54a^4b^5x^{12}\Gamma\left(-\frac{2}{3}\right)+27a^3b^6x^{15}\Gamma\left(-\frac{2}{3}\right)}+\frac{90a^4b^{\frac{17}{3}}x^3\left(\frac{a}{bx^3}+1\right)^{\frac{2}{3}}\Gamma\left(-\frac{11}{3}\right)}{27a^5b^4x^9\Gamma\left(-\frac{2}{3}\right)+54a^4b^5x^{12}\Gamma\left(-\frac{2}{3}\right)+27a^3b^6x^{15}\Gamma\left(-\frac{2}{3}\right)}+\frac{48a^3b^{\frac{20}{3}}x^6\left(\frac{a}{bx^3}+1\right)^{\frac{2}{3}}\Gamma\left(-\frac{11}{3}\right)}{27a^5b^4x^9\Gamma\left(-\frac{2}{3}\right)+54a^4b^5x^{12}\Gamma\left(-\frac{2}{3}\right)+27a^3b^6x^{15}\Gamma\left(-\frac{2}{3}\right)}+\frac{4a^2b^{\frac{23}{3}}x^9\left(\frac{a}{bx^3}+1\right)^{\frac{2}{3}}\Gamma\left(-\frac{11}{3}\right)}{27a^5b^4x^9\Gamma\left(-\frac{2}{3}\right)+54a^4b^5x^{12}\Gamma\left(-\frac{2}{3}\right)+27a^3b^6x^{15}\Gamma\left(-\frac{2}{3}\right)}+\frac{24ab^{\frac{26}{3}}x^{12}\left(\frac{a}{bx^3}+1\right)^{\frac{2}{3}}\Gamma\left(-\frac{11}{3}\right)}{27a^5b^4x^9\Gamma\left(-\frac{2}{3}\right)+54a^4b^5x^{12}\Gamma\left(-\frac{2}{3}\right)+27a^3b^6x^{15}\Gamma\left(-\frac{2}{3}\right)}+\frac{18b^{\frac{29}{3}}x^{15}\left(\frac{a}{bx^3}+1\right)^{\frac{2}{3}}\Gamma\left(-\frac{11}{3}\right)}{27a^5b^4x^9\Gamma\left(-\frac{2}{3}\right)+54a^4b^5x^{12}\Gamma\left(-\frac{2}{3}\right)+27a^3b^6x^{15}\Gamma\left(-\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x**3+a)**(2/3)/x**12,x)
```

```
[Out] 40*a**5*b**(14/3)*(a/(b*x**3) + 1)**(2/3)*gamma(-11/3)/(27*a**5*b
**4*x**9*gamma(-2/3) + 54*a**4*b**5*x**12*gamma(-2/3) + 27*a**3*b
```

```
**6*x**15*gamma(-2/3)) + 90*a**4*b**(17/3)*x**3*(a/(b*x**3) + 1)*
*(2/3)*gamma(-11/3)/(27*a**5*b**4*x**9*gamma(-2/3) + 54*a**4*b**5
*x**12*gamma(-2/3) + 27*a**3*b**6*x**15*gamma(-2/3)) + 48*a**3*b*
*(20/3)*x**6*(a/(b*x**3) + 1)**(2/3)*gamma(-11/3)/(27*a**5*b**4*x
**9*gamma(-2/3) + 54*a**4*b**5*x**12*gamma(-2/3) + 27*a**3*b**6*x
**15*gamma(-2/3)) + 4*a**2*b**(23/3)*x**9*(a/(b*x**3) + 1)**(2/3)
*gamma(-11/3)/(27*a**5*b**4*x**9*gamma(-2/3) + 54*a**4*b**5*x**12
*gamma(-2/3) + 27*a**3*b**6*x**15*gamma(-2/3)) + 24*a*b**(26/3)*x
**12*(a/(b*x**3) + 1)**(2/3)*gamma(-11/3)/(27*a**5*b**4*x**9*gamm
a(-2/3) + 54*a**4*b**5*x**12*gamma(-2/3) + 27*a**3*b**6*x**15*gam
ma(-2/3)) + 18*b**(29/3)*x**15*(a/(b*x**3) + 1)**(2/3)*gamma(-11/
3)/(27*a**5*b**4*x**9*gamma(-2/3) + 54*a**4*b**5*x**12*gamma(-2/3
) + 27*a**3*b**6*x**15*gamma(-2/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bx^3 + a\right)^{\frac{2}{3}}}{x^{12}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)/x^12,x, algorithm="giac")
```

```
[Out] integrate((b*x^3 + a)^(2/3)/x^12, x)
```

3.542 $\int x^8 \left(1-x^3\right)^{6/5} dx$

Optimal. Leaf size=46

$$-\frac{5}{63}\left(1-x^3\right)^{21/5}+\frac{5}{24}\left(1-x^3\right)^{16/5}-\frac{5}{33}\left(1-x^3\right)^{11/5}$$

```
[Out] (-5*(1 - x^3)^(11/5))/33 + (5*(1 - x^3)^(16/5))/24 - (5*(1 - x^3)
^(21/5))/63
```

Rubi [A] time = 0.0516766, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{5}{63}\left(1-x^3\right)^{21/5}+\frac{5}{24}\left(1-x^3\right)^{16/5}-\frac{5}{33}\left(1-x^3\right)^{11/5}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8*(1 - x^3)^(6/5),x]

[Out] (-5*(1 - x^3)^(11/5))/33 + (5*(1 - x^3)^(16/5))/24 - (5*(1 - x^3)
^(21/5))/63
```

Rubi in Sympy [A] time = 5.07063, size = 34, normalized size = 0.74

$$-\frac{5\left(-x^3+1\right)^{\frac{21}{5}}}{63}+\frac{5\left(-x^3+1\right)^{\frac{16}{5}}}{24}-\frac{5\left(-x^3+1\right)^{\frac{11}{5}}}{33}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8*(-x**3+1)**(6/5),x)

[Out] -5*(-x**3 + 1)**(21/5)/63 + 5*(-x**3 + 1)**(16/5)/24 - 5*(-x**3 +
 1)**(11/5)/33
```

Mathematica [A] time = 0.0240797, size = 27, normalized size = 0.59

$$-\frac{5\left(1-x^3\right)^{11/5}\left(88x^6+55x^3+25\right)}{5544}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8*(1 - x^3)^(6/5),x]

[Out] (-5*(1 - x^3)^(11/5)*(25 + 55*x^3 + 88*x^6))/5544
```

Maple [A] time = 0.006, size = 33, normalized size = 0.7

$$\frac{(-5+5x)\left(x^2+x+1\right)\left(88x^6+55x^3+25\right)}{5544}\left(-x^3+1\right)^{\frac{6}{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8*(-x^3+1)^(6/5),x)
```

```
[Out] 5/5544*(-1+x)*(x^2+x+1)*(88*x^6+55*x^3+25)*(-x^3+1)^(6/5)
```

Maxima [A] time = 1.43625, size = 46, normalized size = 1.

$$-\frac{5}{63}\left(-x^3+1\right)^{\frac{21}{5}}+\frac{5}{24}\left(-x^3+1\right)^{\frac{16}{5}}-\frac{5}{33}\left(-x^3+1\right)^{\frac{11}{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-x^3 + 1)^(6/5)*x^8,x, algorithm="maxima")
```

```
[Out] -5/63*(-x^3 + 1)^(21/5) + 5/24*(-x^3 + 1)^(16/5) - 5/33*(-x^3 + 1
)^(11/5)
```

Fricas [A] time = 0.240264, size = 45, normalized size = 0.98

$$-\frac{5}{5544}\left(88\,x^{12}-121\,x^9+3\,x^6+5\,x^3+25\right)\left(-x^3+1\right)^{\frac{1}{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-x^3 + 1)^(6/5)*x^8,x, algorithm="fricas")
```

```
[Out] -5/5544*(88*x^12 - 121*x^9 + 3*x^6 + 5*x^3 + 25)*(-x^3 + 1)^(1/5)
```

Sympy [A] time = 34.0241, size = 71, normalized size = 1.54

$$-\frac{5x^{12}\sqrt[5]{-x^3+1}}{63}+\frac{55x^9\sqrt[5]{-x^3+1}}{504}-\frac{5x^6\sqrt[5]{-x^3+1}}{1848}-\frac{25x^3\sqrt[5]{-x^3+1}}{5544}-\frac{125\sqrt[5]{-x^3+1}}{5544}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8*(-x**3+1)**(6/5),x)
```

```
[Out] -5*x**12*(-x**3 + 1)**(1/5)/63 + 55*x**9*(-x**3 + 1)**(1/5)/504 -
 5*x**6*(-x**3 + 1)**(1/5)/1848 - 25*x**3*(-x**3 + 1)**(1/5)/5544
 - 125*(-x**3 + 1)**(1/5)/5544
```

GIAC/XCAS [A] time = 0.322967, size = 74, normalized size = 1.61

$$-\frac{5}{63}\left(x^3-1\right)^4\left(-x^3+1\right)^{\frac{1}{5}}-\frac{5}{24}\left(x^3-1\right)^3\left(-x^3+1\right)^{\frac{1}{5}}-\frac{5}{33}\left(x^3-1\right)^2\left(-x^3+1\right)^{\frac{1}{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-x^3 + 1)^(6/5)*x^8,x, algorithm="giac")
```

```
[Out] -5/63*(x^3 - 1)^4*(-x^3 + 1)^(1/5) - 5/24*(x^3 - 1)^3*(-x^3 + 1)^
(1/5) - 5/33*(x^3 - 1)^2*(-x^3 + 1)^(1/5)
```

3.543 $\int \frac{x^{11}}{\sqrt[3]{a+bx^3}}\,dx$

Optimal. Leaf size=80

$$-\frac{a^3\left(a+bx^3\right)^{2/3}}{2b^4}+\frac{3a^2\left(a+bx^3\right)^{5/3}}{5b^4}+\frac{\left(a+bx^3\right)^{11/3}}{11b^4}-\frac{3a\left(a+bx^3\right)^{8/3}}{8b^4}$$

```
[Out] -(a^3*(a + b*x^3)^(2/3))/(2*b^4) + (3*a^2*(a + b*x^3)^(5/3))/(5*b
^4) - (3*a*(a + b*x^3)^(8/3))/(8*b^4) + (a + b*x^3)^(11/3)/(11*b^
4)
```

Rubi [A] time = 0.107135, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^3\left(a+bx^3\right)^{2/3}}{2b^4}+\frac{3a^2\left(a+bx^3\right)^{5/3}}{5b^4}+\frac{\left(a+bx^3\right)^{11/3}}{11b^4}-\frac{3a\left(a+bx^3\right)^{8/3}}{8b^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11/(a + b*x^3)^(1/3),x]
```

```
[Out] -(a^3*(a + b*x^3)^(2/3))/(2*b^4) + (3*a^2*(a + b*x^3)^(5/3))/(5*b
^4) - (3*a*(a + b*x^3)^(8/3))/(8*b^4) + (a + b*x^3)^(11/3)/(11*b^
4)
```

Rubi in Sympy [A] time = 14.276, size = 71, normalized size = 0.89

$$-\frac{a^3\left(a+bx^3\right)^{\frac{2}{3}}}{2b^4}+\frac{3a^2\left(a+bx^3\right)^{\frac{5}{3}}}{5b^4}-\frac{3a\left(a+bx^3\right)^{\frac{8}{3}}}{8b^4}+\frac{\left(a+bx^3\right)^{\frac{11}{3}}}{11b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11/(b*x**3+a)**(1/3),x)
```

```
[Out] -a**3*(a + b*x**3)**(2/3)/(2*b**4) + 3*a**2*(a + b*x**3)**(5/3)/(
5*b**4) - 3*a*(a + b*x**3)**(8/3)/(8*b**4) + (a + b*x**3)**(11/3)
/(11*b**4)
```

Mathematica [A] time = 0.0323685, size = 50, normalized size = 0.62

$$\frac{\left(a+bx^3\right)^{2/3}\left(-81a^3+54a^2bx^3-45ab^2x^6+40b^3x^9\right)}{440b^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11/(a + b*x^3)^(1/3),x]
```

```
[Out] ((a + b*x^3)^(2/3)*(-81*a^3 + 54*a^2*b*x^3 - 45*a*b^2*x^6 + 40*b^
3*x^9))/(440*b^4)
```

Maple [A] time = 0.009, size = 47, normalized size = 0.6

$$-\frac{-40\,b^3x^9+45\,ab^2x^6-54\,a^2bx^3+81\,a^3}{440\,b^4}\left(bx^3+a\right)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^11/(b*x^3+a)^(1/3),x)
```

```
[Out] -1/440*(b*x^3+a)^(2/3)*(-40*b^3*x^9+45*a*b^2*x^6-54*a^2*b*x^3+81*
a^3)/b^4
```

Maxima [A] time = 1.44075, size = 86, normalized size = 1.08

$$\frac{\left(bx^3+a\right)^{\frac{11}{3}}}{11\,b^4}-\frac{3\left(bx^3+a\right)^{\frac{8}{3}}a}{8\,b^4}+\frac{3\left(bx^3+a\right)^{\frac{5}{3}}a^2}{5\,b^4}-\frac{\left(bx^3+a\right)^{\frac{2}{3}}a^3}{2\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^11/(b*x^3 + a)^(1/3),x, algorithm="maxima")
```

```
[Out] 1/11*(b*x^3 + a)^(11/3)/b^4 - 3/8*(b*x^3 + a)^(8/3)*a/b^4 + 3/5*(
b*x^3 + a)^(5/3)*a^2/b^4 - 1/2*(b*x^3 + a)^(2/3)*a^3/b^4
```

Fricas [A] time = 0.243956, size = 62, normalized size = 0.78

$$\frac{\left(40\,b^3x^9-45\,ab^2x^6+54\,a^2bx^3-81\,a^3\right)\left(bx^3+a\right)^{\frac{2}{3}}}{440\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^11/(b*x^3 + a)^(1/3),x, algorithm="fricas")
```

```
[Out] 1/440*(40*b^3*x^9 - 45*a*b^2*x^6 + 54*a^2*b*x^3 - 81*a^3)*(b*x^3
+ a)^(2/3)/b^4
```

Sympy [A] time = 10.0601, size = 92, normalized size = 1.15

$$\begin{cases} -\frac{81a^3\left(a+bx^3\right)^{\frac{2}{3}}}{440b^4}+\frac{27a^2x^3\left(a+bx^3\right)^{\frac{2}{3}}}{220b^3}-\frac{9ax^6\left(a+bx^3\right)^{\frac{2}{3}}}{88b^2}+\frac{x^9\left(a+bx^3\right)^{\frac{2}{3}}}{11b} & \text{for } b\neq 0 \\ \frac{x^{12}}{12\sqrt[3]{a}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**11/(b*x**3+a)**(1/3),x)
```

```
[Out] Piecewise((-81*a**3*(a + b*x**3)**(2/3)/(440*b**4) + 27*a**2*x**3
*(a + b*x**3)**(2/3)/(220*b**3) - 9*a*x**6*(a + b*x**3)**(2/3)/(8
8*b**2) + x**9*(a + b*x**3)**(2/3)/(11*b), Ne(b, 0)), (x**12/(12*
a**(1/3)), True))
```

GIAC/XCAS [A] time = 0.332248, size = 77, normalized size = 0.96

$$\frac{40\left(bx^3+a\right)^{\frac{11}{3}}-165\left(bx^3+a\right)^{\frac{8}{3}}a+264\left(bx^3+a\right)^{\frac{5}{3}}a^2-220\left(bx^3+a\right)^{\frac{2}{3}}a^3}{440\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^11/(b*x^3 + a)^(1/3),x, algorithm="giac")
```

```
[Out] 1/440*(40*(b*x^3 + a)^(11/3) - 165*(b*x^3 + a)^(8/3)*a + 264*(b*x
^3 + a)^(5/3)*a^2 - 220*(b*x^3 + a)^(2/3)*a^3)/b^4
```

3.544 $\int \frac{x^8}{\sqrt[3]{a+bx^3}}\,dx$

Optimal. Leaf size=59

$$\frac{a^2\left(a+bx^3\right)^{2/3}}{2b^3}+\frac{\left(a+bx^3\right)^{8/3}}{8b^3}-\frac{2a\left(a+bx^3\right)^{5/3}}{5b^3}$$

```
[Out] (a^2*(a + b*x^3)^(2/3))/(2*b^3) - (2*a*(a + b*x^3)^(5/3))/(5*b^3)
 + (a + b*x^3)^(8/3)/(8*b^3)
```

Rubi [A] time = 0.0845142, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^2\left(a+bx^3\right)^{2/3}}{2b^3}+\frac{\left(a+bx^3\right)^{8/3}}{8b^3}-\frac{2a\left(a+bx^3\right)^{5/3}}{5b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8/(a + b*x^3)^(1/3),x]
```

```
[Out] (a^2*(a + b*x^3)^(2/3))/(2*b^3) - (2*a*(a + b*x^3)^(5/3))/(5*b^3)
 + (a + b*x^3)^(8/3)/(8*b^3)
```

Rubi in Sympy [A] time = 10.648, size = 51, normalized size = 0.86

$$\frac{a^2\left(a+bx^3\right)^{\frac{2}{3}}}{2b^3}-\frac{2a\left(a+bx^3\right)^{\frac{5}{3}}}{5b^3}+\frac{\left(a+bx^3\right)^{\frac{8}{3}}}{8b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8/(b*x**3+a)**(1/3),x)
```

```
[Out] a**2*(a + b*x**3)**(2/3)/(2*b**3) - 2*a*(a + b*x**3)**(5/3)/(5*b*
*3) + (a + b*x**3)**(8/3)/(8*b**3)
```

Mathematica [A] time = 0.0278168, size = 39, normalized size = 0.66

$$\frac{\left(a+bx^3\right)^{2/3}\left(9a^2-6abx^3+5b^2x^6\right)}{40b^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8/(a + b*x^3)^(1/3),x]
```

```
[Out] ((a + b*x^3)^(2/3)*(9*a^2 - 6*a*b*x^3 + 5*b^2*x^6))/(40*b^3)
```

Maple [A] time = 0.007, size = 36, normalized size = 0.6

$$\frac{5\,b^2x^6-6\,abx^3+9\,a^2}{40\,b^3}\left(bx^3+a\right)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8/(b*x^3+a)^(1/3),x)
```

```
[Out] 1/40*(b*x^3+a)^(2/3)*(5*b^2*x^6-6*a*b*x^3+9*a^2)/b^3
```

Maxima [A] time = 1.4293, size = 63, normalized size = 1.07

$$\frac{\left(bx^3+a\right)^{\frac{8}{3}}}{8\,b^3}-\frac{2\left(bx^3+a\right)^{\frac{5}{3}}a}{5\,b^3}+\frac{\left(bx^3+a\right)^{\frac{2}{3}}a^2}{2\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^3 + a)^(1/3),x, algorithm="maxima")
```

```
[Out] 1/8*(b*x^3 + a)^(8/3)/b^3 - 2/5*(b*x^3 + a)^(5/3)*a/b^3 + 1/2*(b*
x^3 + a)^(2/3)*a^2/b^3
```

Fricas [A] time = 0.24973, size = 47, normalized size = 0.8

$$\frac{\left(5\,b^2x^6-6\,abx^3+9\,a^2\right)\left(bx^3+a\right)^{\frac{2}{3}}}{40\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^3 + a)^(1/3),x, algorithm="fricas")
```

```
[Out] 1/40*(5*b^2*x^6 - 6*a*b*x^3 + 9*a^2)*(b*x^3 + a)^(2/3)/b^3
```

Sympy [A] time = 4.75244, size = 68, normalized size = 1.15

$$\begin{cases}\frac{9a^2\left(a+bx^3\right)^{\frac{2}{3}}}{40b^3}-\frac{3ax^3\left(a+bx^3\right)^{\frac{2}{3}}}{20b^2}+\frac{x^6\left(a+bx^3\right)^{\frac{2}{3}}}{8b} & \text{for } b\neq 0\\ \frac{x^9}{9\sqrt[3]{a}} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8/(b*x**3+a)**(1/3),x)
```

```
[Out] Piecewise((9*a**2*(a + b*x**3)**(2/3)/(40*b**3) - 3*a*x**3*(a + b
*x**3)**(2/3)/(20*b**2) + x**6*(a + b*x**3)**(2/3)/(8*b), Ne(b, 0
)), (x**9/(9*a**(1/3)), True))
```

GIAC/XCAS [A] time = 0.307921, size = 58, normalized size = 0.98

$$\frac{5\left(bx^3+a\right)^{\frac{8}{3}}-16\left(bx^3+a\right)^{\frac{5}{3}}a+20\left(bx^3+a\right)^{\frac{2}{3}}a^2}{40\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^3 + a)^(1/3),x, algorithm="giac")
```

```
[Out] 1/40*(5*(b*x^3 + a)^(8/3) - 16*(b*x^3 + a)^(5/3)*a + 20*(b*x^3 +
a)^(2/3)*a^2)/b^3
```

3.545 $\int \frac{x^5}{\sqrt[3]{a+bx^3}} \, dx$

Optimal. Leaf size=38

$$\frac{(a+bx^3)^{5/3}}{5b^2} - \frac{a(a+bx^3)^{2/3}}{2b^2}$$

```
[Out] -(a*(a + b*x^3)^(2/3))/(2*b^2) + (a + b*x^3)^(5/3)/(5*b^2)
```

Rubi [A] time = 0.059681, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{(a+bx^3)^{5/3}}{5b^2} - \frac{a(a+bx^3)^{2/3}}{2b^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^5/(a + b*x^3)^(1/3),x]

[Out] -(a*(a + b*x^3)^(2/3))/(2*b^2) + (a + b*x^3)^(5/3)/(5*b^2)
```

Rubi in Sympy [A] time = 7.08692, size = 31, normalized size = 0.82

$$-\frac{a(a+bx^3)^{\frac{2}{3}}}{2b^2} + \frac{(a+bx^3)^{\frac{5}{3}}}{5b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**5/(b*x**3+a)**(1/3),x)

[Out] -a*(a + b*x**3)**(2/3)/(2*b**2) + (a + b*x**3)**(5/3)/(5*b**2)
```

Mathematica [A] time = 0.0223652, size = 28, normalized size = 0.74

$$\frac{(a+bx^3)^{2/3}(2bx^3-3a)}{10b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5/(a + b*x^3)^(1/3),x]

[Out] ((a + b*x^3)^(2/3)*(-3*a + 2*b*x^3))/(10*b^2)
```

Maple [A] time = 0.006, size = 25, normalized size = 0.7

$$-\frac{-2\,bx^3+3\,a}{10\,b^2}(bx^3+a)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5/(b*x^3+a)^(1/3),x)
```

```
[Out] -1/10*(b*x^3+a)^(2/3)*(-2*b*x^3+3*a)/b^2
```

Maxima [A] time = 1.43532, size = 41, normalized size = 1.08

$$\frac{\left(bx^{3}+a\right)^{\frac{5}{3}}}{5\,b^{2}}-\frac{\left(bx^{3}+a\right)^{\frac{2}{3}}a}{2\,b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^3 + a)^(1/3),x, algorithm="maxima")
```

```
[Out] 1/5*(b*x^3 + a)^(5/3)/b^2 - 1/2*(b*x^3 + a)^(2/3)*a/b^2
```

Fricas [A] time = 0.269152, size = 32, normalized size = 0.84

$$\frac{\left(2\,bx^{3}-3\,a\right)\left(bx^{3}+a\right)^{\frac{2}{3}}}{10\,b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^3 + a)^(1/3),x, algorithm="fricas")
```

```
[Out] 1/10*(2*b*x^3 - 3*a)*(b*x^3 + a)^(2/3)/b^2
```

Sympy [A] time = 2.39381, size = 44, normalized size = 1.16

$$\begin{cases} -\frac{3a\left(a+bx^{3}\right)^{\frac{2}{3}}}{10b^{2}}+\frac{x^{3}\left(a+bx^{3}\right)^{\frac{2}{3}}}{5b} & \text{for}\: b\neq 0\\ \frac{x^{6}}{6\sqrt[3]{a}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(b*x**3+a)**(1/3),x)
```

```
[Out] Piecewise((-3*a*(a + b*x**3)**(2/3)/(10*b**2) + x**3*(a + b*x**3)
**(2/3)/(5*b), Ne(b, 0)), (x**6/(6*a**(1/3)), True))
```

GIAC/XCAS [A] time = 0.325993, size = 39, normalized size = 1.03

$$\frac{2\left(bx^{3}+a\right)^{\frac{5}{3}}-5\left(bx^{3}+a\right)^{\frac{2}{3}}a}{10\,b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^3 + a)^(1/3),x, algorithm="giac")
```

```
[Out] 1/10*(2*(b*x^3 + a)^(5/3) - 5*(b*x^3 + a)^(2/3)*a)/b^2
```

3.546 $\int \frac{x^2}{\sqrt[3]{a+bx^3}}\,dx$

Optimal. Leaf size=18

$$\frac{(a+bx^3)^{2/3}}{2b}$$

```
[Out] (a + b*x^3)^(2/3)/(2*b)
```

Rubi [A] time = 0.0106519, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$\frac{(a+bx^3)^{2/3}}{2b}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(a + b*x^3)^(1/3),x]

[Out] (a + b*x^3)^(2/3)/(2*b)
```

Rubi in Sympy [A] time = 2.13689, size = 12, normalized size = 0.67

$$\frac{(a+bx^3)^{\frac{2}{3}}}{2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**2/(b*x**3+a)**(1/3),x)

[Out] (a + b*x**3)**(2/3)/(2*b)
```

Mathematica [A] time = 0.00914191, size = 18, normalized size = 1.

$$\frac{(a+bx^3)^{2/3}}{2b}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(a + b*x^3)^(1/3),x]

[Out] (a + b*x^3)^(2/3)/(2*b)
```

Maple [A] time = 0.006, size = 15, normalized size = 0.8

$$\frac{1}{2\,b}\left(bx^3+a\right)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(b*x^3+a)^(1/3),x)
```

```
[Out] 1/2*(b*x^3+a)^(2/3)/b
```

Maxima [A] time = 1.43111, size = 19, normalized size = 1.06

$$\frac{\left(bx^3+a\right)^{\frac{2}{3}}}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^3 + a)^(1/3),x, algorithm="maxima")
```

```
[Out] 1/2*(b*x^3 + a)^(2/3)/b
```

Fricas [A] time = 0.232776, size = 19, normalized size = 1.06

$$\frac{\left(bx^3+a\right)^{\frac{2}{3}}}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^3 + a)^(1/3),x, algorithm="fricas")
```

```
[Out] 1/2*(b*x^3 + a)^(2/3)/b
```

Sympy [A] time = 1.56841, size = 22, normalized size = 1.22

$$\begin{cases} \frac{\left(a+bx^3\right)^{\frac{2}{3}}}{2b} & \text{for}\ b \neq 0 \\ \frac{x^3}{3\sqrt[3]{a}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(b*x**3+a)**(1/3),x)
```

```
[Out] Piecewise(((a + b*x**3)**(2/3)/(2*b), Ne(b, 0)), (x**3/(3*a**(1/3
)), True))
```

GIAC/XCAS [A] time = 0.255275, size = 19, normalized size = 1.06

$$\frac{\left(bx^3+a\right)^{\frac{2}{3}}}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^3 + a)^(1/3),x, algorithm="giac")
```

```
[Out] 1/2*(b*x^3 + a)^(2/3)/b
```

3.547 $\int \frac{1}{x\sqrt[3]{a+bx^3}}\,dx$

Optimal. Leaf size=83

$$\frac{\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^3}\right)}{2\sqrt[3]{a}}+\frac{\tan^{-1}\left(\frac{2\sqrt[3]{a+bx^3}+\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}\sqrt[3]{a}}-\frac{\log(x)}{2\sqrt[3]{a}}$$

```
[Out] ArcTan[(a^(1/3) + 2*(a + b*x^3)^(1/3))/(Sqrt[3]*a^(1/3))]/(Sqrt[3
]*a^(1/3)) - Log[x]/(2*a^(1/3)) + Log[a^(1/3) - (a + b*x^3)^(1/3)
]/(2*a^(1/3))
```

Rubi [A] time = 0.118945, antiderivative size = 83, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$

$$\frac{\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^3}\right)}{2\sqrt[3]{a}}+\frac{\tan^{-1}\left(\frac{2\sqrt[3]{a+bx^3}+\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}\sqrt[3]{a}}-\frac{\log(x)}{2\sqrt[3]{a}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x*(a + b*x^3)^(1/3)),x]
```

```
[Out] ArcTan[(a^(1/3) + 2*(a + b*x^3)^(1/3))/(Sqrt[3]*a^(1/3))]/(Sqrt[3
]*a^(1/3)) - Log[x]/(2*a^(1/3)) + Log[a^(1/3) - (a + b*x^3)^(1/3)
]/(2*a^(1/3))
```

Rubi in Sympy [A] time = 7.28029, size = 78, normalized size = 0.94

$$-\frac{\log\left(x^3\right)}{6\sqrt[3]{a}}+\frac{\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^3}\right)}{2\sqrt[3]{a}}+\frac{\sqrt{3}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\frac{2\sqrt[3]{a+bx^3}}{3}\right)}{\sqrt[3]{a}}\right)}{3\sqrt[3]{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x/(b*x**3+a)**(1/3),x)
```

```
[Out] -log(x**3)/(6*a**(1/3)) + log(a**(1/3) - (a + b*x**3)**(1/3))/(2*
a**(1/3)) + sqrt(3)*atan(sqrt(3)*(a**(1/3)/3 + 2*(a + b*x**3)**(1
/3)/3)/a**(1/3))/(3*a**(1/3))
```

Mathematica [C] time = 0.0344027, size = 46, normalized size = 0.55

$$-\frac{\sqrt[3]{\frac{a}{bx^3}+1}\,{}_2F_1\left(\frac{1}{3},\frac{1}{3};\frac{4}{3};-\frac{a}{bx^3}\right)}{\sqrt[3]{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x*(a + b*x^3)^(1/3)),x]
```

```
[Out] -(((1 + a/(b*x^3))^(1/3)*Hypergeometric2F1[1/3, 1/3, 4/3, -(a/(b*
x^3))])/(a + b*x^3)^(1/3))
```

Maple [F] time = 0.045, size = 0, normalized size = 0.

$$\int \frac{1}{x}\frac{1}{\sqrt[3]{bx^3+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(b*x^3+a)^(1/3),x)
```

```
[Out] int(1/x/(b*x^3+a)^(1/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(1/3)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.252302, size = 130, normalized size = 1.57

$$-\frac{\sqrt{3}\left(\sqrt{3}\log\left(\left(bx^3+a\right)^{\frac{2}{3}}a^{\frac{1}{3}}+\left(bx^3+a\right)^{\frac{1}{3}}a^{\frac{2}{3}}+a\right)-2\sqrt{3}\log\left(\left(bx^3+a\right)^{\frac{1}{3}}a^{\frac{2}{3}}-a\right)-6\arctan\left(\frac{2\sqrt{3}\left(bx^3+a\right)^{\frac{1}{3}}a^{\frac{2}{3}}+\sqrt{3}a}{3a}\right)\right)}{18a^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(1/3)*x),x, algorithm="fricas")
```

```
[Out] -1/18*sqrt(3)*(sqrt(3)*log((b*x^3 + a)^(2/3)*a^(1/3) + (b*x^3 + a
)^(1/3)*a^(2/3) + a) - 2*sqrt(3)*log((b*x^3 + a)^(1/3)*a^(2/3) -
a) - 6*arctan(1/3*(2*sqrt(3)*(b*x^3 + a)^(1/3)*a^(2/3) + sqrt(3)*
a)/a))/a^(1/3)
```

Sympy [A] time = 3.70844, size = 37, normalized size = 0.45

$$-\frac{\Gamma\left(\frac{1}{3}\right){}_2F_1\left(\begin{matrix}\frac{1}{3},\frac{1}{3}\\ \frac{4}{3}\end{matrix}\middle|\frac{ae^{i\pi}}{bx^3}\right)}{3\sqrt[3]{b}x\,\Gamma\left(\frac{4}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(b*x**3+a)**(1/3),x)
```

```
[Out] -gamma(1/3)*hyper((1/3, 1/3), (4/3,), a*exp_polar(I*pi)/(b*x**3))
/(3*b**(1/3)*x*gamma(4/3))
```

GIAC/XCAS [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(1/3)*x),x, algorithm="giac")
```

```
[Out] Timed out
```

3.548 $\int \frac{1}{x^4 \sqrt[3]{a+bx^3}}\,dx$

Optimal. Leaf size=110

$$-\frac{b\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^3}\right)}{6a^{4/3}}-\frac{b\tan^{-1}\left(\frac{2\sqrt[3]{a+bx^3}+\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{4/3}}+\frac{b\log(x)}{6a^{4/3}}-\frac{\left(a+bx^3\right)^{2/3}}{3ax^3}$$

```
[Out] -(a + b*x^3)^(2/3)/(3*a*x^3) - (b*ArcTan[(a^(1/3) + 2*(a + b*x^3)
^(1/3))/(Sqrt[3]*a^(1/3))])/(3*Sqrt[3]*a^(4/3)) + (b*Log[x])/(6*a
^(4/3)) - (b*Log[a^(1/3) - (a + b*x^3)^(1/3)])/(6*a^(4/3))
```

Rubi [A] time = 0.148132, antiderivative size = 110, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$-\frac{b\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^3}\right)}{6a^{4/3}}-\frac{b\tan^{-1}\left(\frac{2\sqrt[3]{a+bx^3}+\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{4/3}}+\frac{b\log(x)}{6a^{4/3}}-\frac{\left(a+bx^3\right)^{2/3}}{3ax^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*(a + b*x^3)^(1/3)),x]
```

```
[Out] -(a + b*x^3)^(2/3)/(3*a*x^3) - (b*ArcTan[(a^(1/3) + 2*(a + b*x^3)
^(1/3))/(Sqrt[3]*a^(1/3))])/(3*Sqrt[3]*a^(4/3)) + (b*Log[x])/(6*a
^(4/3)) - (b*Log[a^(1/3) - (a + b*x^3)^(1/3)])/(6*a^(4/3))
```

Rubi in Sympy [A] time = 10.4411, size = 100, normalized size = 0.91

$$-\frac{\left(a+bx^3\right)^{\frac{2}{3}}}{3ax^3}+\frac{b\log\left(x^3\right)}{18a^{\frac{4}{3}}}-\frac{b\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^3}\right)}{6a^{\frac{4}{3}}}-\frac{\sqrt{3}b\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\frac{2\sqrt[3]{a+bx^3}}{3}\right)}{\sqrt[3]{a}}\right)}{9a^{\frac{4}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(b*x**3+a)**(1/3),x)
```

```
[Out] -(a + b*x**3)**(2/3)/(3*a*x**3) + b*log(x**3)/(18*a**(4/3)) - b*l
og(a**(1/3) - (a + b*x**3)**(1/3))/(6*a**(4/3)) - sqrt(3)*b*atan(
sqrt(3)*(a**(1/3)/3 + 2*(a + b*x**3)**(1/3)/3)/a**(1/3))/(9*a**(4
/3))
```

Mathematica [C] time = 0.0523134, size = 69, normalized size = 0.63

$$\frac{bx^3\sqrt[3]{\frac{a}{bx^3}+1}\,{}_2F_1\left(\frac{1}{3},\frac{1}{3};\frac{4}{3};-\frac{a}{bx^3}\right)-a-bx^3}{3ax^3\sqrt[3]{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*(a + b*x^3)^(1/3)),x]
```

```
[Out] (-a - b*x^3 + b*(1 + a/(b*x^3))^(1/3)*x^3*Hypergeometric2F1[1/3,
1/3, 4/3, -(a/(b*x^3))])/(3*a*x^3*(a + b*x^3)^(1/3))
```

Maple [F] time = 0.046, size = 0, normalized size = 0.

$$\int \frac{1}{x^4}\frac{1}{\sqrt[3]{bx^3+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(b*x^3+a)^(1/3),x)
```

```
[Out] int(1/x^4/(b*x^3+a)^(1/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(1/3)*x^4),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.256902, size = 197, normalized size = 1.79

$$-\frac{\sqrt{3}\left(\sqrt{3}bx^3\log\left(\left(bx^3+a\right)^{\frac{2}{3}}(-a)^{\frac{1}{3}}-\left(bx^3+a\right)^{\frac{1}{3}}(-a)^{\frac{2}{3}}-a\right)-2\sqrt{3}bx^3\log\left(\left(bx^3+a\right)^{\frac{1}{3}}(-a)^{\frac{2}{3}}-a\right)-6\,bx^3\arctan\left(\frac{2\sqrt{3}(bx^3}{}\right.\right.}{54\,(-a)^{\frac{1}{3}}ax^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(1/3)*x^4),x, algorithm="fricas")
```

```
[Out] -1/54*sqrt(3)*(sqrt(3)*b*x^3*log((b*x^3 + a)^(2/3)*(-a)^(1/3) - (
b*x^3 + a)^(1/3)*(-a)^(2/3) - a) - 2*sqrt(3)*b*x^3*log((b*x^3 + a
)^(1/3)*(-a)^(2/3) - a) - 6*b*x^3*arctan(1/3*(2*sqrt(3)*(b*x^3 +
a)^(1/3)*(-a)^(2/3) + sqrt(3)*a)/a) + 6*sqrt(3)*(b*x^3 + a)^(2/3)
*(-a)^(1/3))/((-a)^(1/3)*a*x^3)
```

Sympy [A] time = 4.67781, size = 39, normalized size = 0.35

$$-\frac{\Gamma\left(\frac{4}{3}\right)\,{}_{2}F_{1}\left(\begin{matrix}\frac{1}{3},\frac{4}{3}\\ \frac{7}{3}\end{matrix}\middle|\frac{ae^{i\pi}}{bx^3}\right)}{3\sqrt[3]{b}x^4\,\Gamma\left(\frac{7}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(b*x**3+a)**(1/3),x)
```

```
[Out] -gamma(4/3)*hyper((1/3, 4/3), (7/3,), a*exp_polar(I*pi)/(b*x**3))
/(3*b**(1/3)*x**4*gamma(7/3))
```

GIAC/XCAS [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(1/3)*x^4),x, algorithm="giac")
```

```
[Out] Timed out
```

3.549 $\int \frac{x^7}{\sqrt[3]{a+bx^3}}\,dx$

Optimal. Leaf size=38

$$\frac{x^8\left(a+bx^3\right)^{2/3}{}_2F_1\left(1,\frac{10}{3};\frac{11}{3};-\frac{bx^3}{a}\right)}{8a}$$

```
[Out] (x^8*(a + b*x^3)^(2/3)*Hypergeometric2F1[1, 10/3, 11/3, -((b*x^3)
/a)])/(8*a)
```

Rubi [A] time = 0.0563154, antiderivative size = 51, normalized size of antiderivative = 1.34, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{x^8\sqrt[3]{\frac{bx^3}{a}+1}\,{}_2F_1\left(\frac{1}{3},\frac{8}{3};\frac{11}{3};-\frac{bx^3}{a}\right)}{8\sqrt[3]{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7/(a + b*x^3)^(1/3),x]
```

```
[Out] (x^8*(1 + (b*x^3)/a)^(1/3)*Hypergeometric2F1[1/3, 8/3, 11/3, -((b
*x^3)/a)])/(8*(a + b*x^3)^(1/3))
```

Rubi in Sympy [A] time = 6.3783, size = 42, normalized size = 1.11

$$\frac{x^8\left(a+bx^3\right)^{\frac{2}{3}}{}_2F_1\left(\left.\begin{matrix}\frac{1}{3},\frac{8}{3}\\\frac{11}{3}\end{matrix}\right|-\frac{bx^3}{a}\right)}{8a\left(1+\frac{bx^3}{a}\right)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7/(b*x**3+a)**(1/3),x)
```

```
[Out] x**8*(a + b*x**3)**(2/3)*hyper((1/3, 8/3), (11/3,), -b*x**3/a)/(8
*a*(1 + b*x**3/a)**(2/3))
```

Mathematica [B] time = 0.0666214, size = 80, normalized size = 2.11

$$\frac{x^2\left(5a^2\sqrt[3]{\frac{bx^3}{a}+1}\,{}_2F_1\left(\frac{1}{3},\frac{2}{3};\frac{5}{3};-\frac{bx^3}{a}\right)-5a^2-abx^3+4b^2x^6\right)}{28b^2\sqrt[3]{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^7/(a + b*x^3)^(1/3),x]
```

```
[Out] (x^2*(-5*a^2 - a*b*x^3 + 4*b^2*x^6 + 5*a^2*(1 + (b*x^3)/a)^(1/3)*
Hypergeometric2F1[1/3, 2/3, 5/3, -((b*x^3)/a)]))/(28*b^2*(a + b*x
^3)^(1/3))
```

Maple [F] time = 0.038, size = 0, normalized size = 0.

$$\int x^{7} \frac{1}{\sqrt[3]{b x^{3}+a}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7/(b*x^3+a)^(1/3),x)

[Out] int(x^7/(b*x^3+a)^(1/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{7}}{(b x^{3}+a)^{\frac{1}{3}}}\, d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(b*x^3 + a)^(1/3),x, algorithm="maxima")

[Out] integrate(x^7/(b*x^3 + a)^(1/3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{7}}{(b x^{3}+a)^{\frac{1}{3}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(b*x^3 + a)^(1/3),x, algorithm="fricas")

[Out] integral(x^7/(b*x^3 + a)^(1/3), x)
```

Sympy [A] time = 2.94983, size = 37, normalized size = 0.97

$$\frac{x^{8} \Gamma\left(\frac{8}{3}\right) {}_{2}F_{1}\left(\begin{matrix} \frac{1}{3}, \frac{8}{3} \\ \frac{11}{3} \end{matrix}\middle| {\frac{b x^{3} e^{i \pi}}{a}} \right)}{3 \sqrt[3]{a} \Gamma\left(\frac{11}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(b*x**3+a)**(1/3),x)

[Out] x**8*gamma(8/3)*hyper((1/3, 8/3), (11/3,), b*x**3*exp_polar(I*pi)
/a)/(3*a**(1/3)*gamma(11/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{7}}{(b x^{3}+a)^{\frac{1}{3}}}\, d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(b*x^3 + a)^(1/3),x, algorithm="giac")

[Out] integrate(x^7/(b*x^3 + a)^(1/3), x)
```

3.550 $\int \frac{x^4}{\sqrt[3]{a+bx^3}}\,dx$

Optimal. Leaf size=38

$$\frac{x^5 \left(a+bx^3\right)^{2/3} {}_2F_1\left(1,\frac{7}{3};\frac{8}{3};-\frac{bx^3}{a}\right)}{5a}$$

```
[Out] (x^5*(a + b*x^3)^(2/3)*Hypergeometric2F1[1, 7/3, 8/3, -((b*x^3)/a
)])/(5*a)
```

Rubi [A] time = 0.0555906, antiderivative size = 51, normalized size of antiderivative = 1.34, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{x^5 \sqrt[3]{\frac{bx^3}{a}+1}\, {}_2F_1\left(\frac{1}{3},\frac{5}{3};\frac{8}{3};-\frac{bx^3}{a}\right)}{5\sqrt[3]{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a + b*x^3)^(1/3),x]
```

```
[Out] (x^5*(1 + (b*x^3)/a)^(1/3)*Hypergeometric2F1[1/3, 5/3, 8/3, -((b*
x^3)/a)])/(5*(a + b*x^3)^(1/3))
```

Rubi in Sympy [A] time = 6.40882, size = 42, normalized size = 1.11

$$\frac{x^5 \left(a+bx^3\right)^{\frac{2}{3}} {}_2F_1\left(\begin{matrix} \frac{1}{3}, \frac{5}{3} \\ \frac{8}{3} \end{matrix}\middle| -\frac{bx^3}{a}\right)}{5a\left(1+\frac{bx^3}{a}\right)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(b*x**3+a)**(1/3),x)
```

```
[Out] x**5*(a + b*x**3)**(2/3)*hyper((1/3, 5/3), (8/3,), -b*x**3/a)/(5*
a*(1 + b*x**3/a)**(2/3))
```

Mathematica [A] time = 0.0475584, size = 64, normalized size = 1.68

$$\frac{x^2 \left(-a\sqrt[3]{\frac{bx^3}{a}+1}\, {}_2F_1\left(\frac{1}{3},\frac{2}{3};\frac{5}{3};-\frac{bx^3}{a}\right)+a+bx^3\right)}{4b\sqrt[3]{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(a + b*x^3)^(1/3),x]
```

```
[Out] (x^2*(a + b*x^3 - a*(1 + (b*x^3)/a)^(1/3)*Hypergeometric2F1[1/3,
2/3, 5/3, -((b*x^3)/a)]))/(4*b*(a + b*x^3)^(1/3))
```

Maple [F] time = 0.053, size = 0, normalized size = 0.

$$\int x^4 \frac{1}{\sqrt[3]{bx^3+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(b*x^3+a)^(1/3),x)
```

```
[Out] int(x^4/(b*x^3+a)^(1/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{(bx^3+a)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^3 + a)^(1/3),x, algorithm="maxima")
```

```
[Out] integrate(x^4/(b*x^3 + a)^(1/3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^4}{(bx^3+a)^{\frac{1}{3}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^3 + a)^(1/3),x, algorithm="fricas")
```

```
[Out] integral(x^4/(b*x^3 + a)^(1/3), x)
```

Sympy [A] time = 2.40587, size = 37, normalized size = 0.97

$$\frac{x^5\,\Gamma\left(\frac{5}{3}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{3},\frac{5}{3}\\ \frac{8}{3}\end{matrix}\middle|\frac{bx^3e^{i\pi}}{a}\right)}{3\sqrt[3]{a}\,\Gamma\left(\frac{8}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(b*x**3+a)**(1/3),x)
```

```
[Out] x**5*gamma(5/3)*hyper((1/3, 5/3), (8/3,), b*x**3*exp_polar(I*pi)/
a)/(3*a**(1/3)*gamma(8/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{(bx^3+a)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^3 + a)^(1/3),x, algorithm="giac")

[Out] integrate(x^4/(b*x^3 + a)^(1/3), x)
```

3.551 $\int \frac{x}{\sqrt[3]{a+bx^3}}\,dx$

Optimal. Leaf size=38

$$\frac{x^2\left(a+bx^3\right)^{2/3}\,{}_2F_1\left(1,\frac{4}{3};\frac{5}{3};-\frac{bx^3}{a}\right)}{2a}$$

```
[Out] (x^2*(a + b*x^3)^(2/3)*Hypergeometric2F1[1, 4/3, 5/3, -((b*x^3)/a
)])/(2*a)
```

Rubi [A] time = 0.043048, antiderivative size = 51, normalized size of antiderivative = 1.34, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{x^2\sqrt[3]{\frac{bx^3}{a}+1}\,{}_2F_1\left(\frac{1}{3},\frac{2}{3};\frac{5}{3};-\frac{bx^3}{a}\right)}{2\sqrt[3]{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b*x^3)^(1/3),x]
```

```
[Out] (x^2*(1 + (b*x^3)/a)^(1/3)*Hypergeometric2F1[1/3, 2/3, 5/3, -((b*
x^3)/a)])/(2*(a + b*x^3)^(1/3))
```

Rubi in Sympy [A] time = 5.70039, size = 42, normalized size = 1.11

$$\frac{x^2\left(a+bx^3\right)^{\frac{2}{3}}\,{}_2F_1\left(\begin{matrix}\frac{1}{3},\frac{2}{3}\\ \frac{5}{3}\end{matrix}\middle|-\frac{bx^3}{a}\right)}{2a\left(1+\frac{bx^3}{a}\right)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(b*x**3+a)**(1/3),x)
```

```
[Out] x**2*(a + b*x**3)**(2/3)*hyper((1/3, 2/3), (5/3,), -b*x**3/a)/(2*
a*(1 + b*x**3/a)**(2/3))
```

Mathematica [A] time = 0.0280993, size = 52, normalized size = 1.37

$$\frac{x^2\sqrt[3]{\frac{a+bx^3}{a}}\,{}_2F_1\left(\frac{1}{3},\frac{2}{3};\frac{5}{3};-\frac{bx^3}{a}\right)}{2\sqrt[3]{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b*x^3)^(1/3),x]
```

```
[Out] (x^2*((a + b*x^3)/a)^(1/3)*Hypergeometric2F1[1/3, 2/3, 5/3, -((b*
x^3)/a)])/(2*(a + b*x^3)^(1/3))
```

Maple [F] time = 0.026, size = 0, normalized size = 0.

$$\int x\frac{1}{\sqrt[3]{bx^3+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(b*x^3+a)^(1/3),x)
```

```
[Out] int(x/(b*x^3+a)^(1/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{(bx^3 + a)^{\frac{1}{3}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^3 + a)^(1/3),x, algorithm="maxima")
```

```
[Out] integrate(x/(b*x^3 + a)^(1/3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x}{(bx^3 + a)^{\frac{1}{3}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^3 + a)^(1/3),x, algorithm="fricas")
```

```
[Out] integral(x/(b*x^3 + a)^(1/3), x)
```

Sympy [A] time = 2.21175, size = 37, normalized size = 0.97

$$\frac{x^2 \Gamma\left(\frac{2}{3}\right) {}_2F_1\left(\begin{matrix} \frac{1}{3}, \frac{2}{3} \\ \frac{5}{3} \end{matrix}\middle| \frac{bx^3 e^{i\pi}}{a}\right)}{3\sqrt[3]{a}\,\Gamma\left(\frac{5}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x**3+a)**(1/3),x)
```

```
[Out] x**2*gamma(2/3)*hyper((1/3, 2/3), (5/3,), b*x**3*exp_polar(I*pi)/
a)/(3*a**(1/3)*gamma(5/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{(bx^3 + a)^{\frac{1}{3}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^3 + a)^(1/3),x, algorithm="giac")
```

```
[Out] integrate(x/(b*x^3 + a)^(1/3), x)
```

3.552 $\int \frac{1}{x^2 \sqrt[3]{a+bx^3}}\,dx$

Optimal. Leaf size=36

$$-\frac{\left(a+bx^3\right)^{2/3} {}_2F_1\left(\frac{1}{3},1;\frac{2}{3};-\frac{bx^3}{a}\right)}{ax}$$

```
[Out] -(((a + b*x^3)^(2/3)*Hypergeometric2F1[1/3, 1, 2/3, -((b*x^3)/a)]
)/(a*x))
```

Rubi [A] time = 0.0520558, antiderivative size = 49, normalized size of antiderivative = 1.36, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$-\frac{\sqrt[3]{\frac{bx^3}{a}+1}\, {}_2F_1\left(-\frac{1}{3},\frac{1}{3};\frac{2}{3};-\frac{bx^3}{a}\right)}{x\sqrt[3]{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(a + b*x^3)^(1/3)),x]
```

```
[Out] -(((1 + (b*x^3)/a)^(1/3)*Hypergeometric2F1[-1/3, 1/3, 2/3, -((b*x
^3)/a)])/(x*(a + b*x^3)^(1/3)))
```

Rubi in Sympy [A] time = 6.11675, size = 42, normalized size = 1.17

$$-\frac{\left(a+bx^3\right)^{\frac{2}{3}} {}_2F_1\left(\begin{matrix}\frac{1}{3},-\frac{1}{3}\\ \frac{2}{3}\end{matrix}\middle| -\frac{bx^3}{a}\right)}{ax\left(1+\frac{bx^3}{a}\right)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(b*x**3+a)**(1/3),x)
```

```
[Out] -(a + b*x**3)**(2/3)*hyper((1/3, -1/3), (2/3,), -b*x**3/a)/(a*x*(
1 + b*x**3/a)**(2/3))
```

Mathematica [A] time = 0.0457416, size = 69, normalized size = 1.92

$$\frac{bx^3\sqrt[3]{\frac{bx^3}{a}+1}\, {}_2F_1\left(\frac{1}{3},\frac{2}{3};\frac{5}{3};-\frac{bx^3}{a}\right)-2\left(a+bx^3\right)}{2ax\sqrt[3]{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*(a + b*x^3)^(1/3)),x]
```

```
[Out] (-2*(a + b*x^3) + b*x^3*(1 + (b*x^3)/a)^(1/3)*Hypergeometric2F1[1
/3, 2/3, 5/3, -((b*x^3)/a)])/(2*a*x*(a + b*x^3)^(1/3))
```

Maple [F] time = 0.037, size = 0, normalized size = 0.

$$\int \frac{1}{x^2}\frac{1}{\sqrt[3]{bx^3+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^2/(b*x^3+a)^(1/3),x)
```

```
[Out] int(1/x^2/(b*x^3+a)^(1/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^3+a)^{\frac{1}{3}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((b*x^3 + a)^(1/3)*x^2),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x^3 + a)^(1/3)*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(bx^3+a)^{\frac{1}{3}}x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((b*x^3 + a)^(1/3)*x^2),x, algorithm="fricas")
```

```
[Out] integral(1/((b*x^3 + a)^(1/3)*x^2), x)
```

Sympy [A] time = 2.45538, size = 39, normalized size = 1.08

$$\frac{\Gamma\left(-\frac{1}{3}\right) {}_2F_1\left(\begin{matrix} -\frac{1}{3}, \frac{1}{3} \\ \frac{2}{3} \end{matrix}\middle| \frac{bx^3 e^{i\pi}}{a}\right)}{3\sqrt[3]{a}x\,\Gamma\left(\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/x**2/(b*x**3+a)**(1/3),x)
```

```
[Out] gamma(-1/3)*hyper((-1/3, 1/3), (2/3,), b*x**3*exp_polar(I*pi)/a)/
(3*a**(1/3)*x*gamma(2/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^3+a)^{\frac{1}{3}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((b*x^3 + a)^(1/3)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^3 + a)^(1/3)*x^2), x)
```

3.553 $\int \frac{1}{x^5 \sqrt[3]{a+bx^3}} \, dx$

Optimal. Leaf size=38

$$-\frac{(a+bx^3)^{2/3} \, {}_2F_1\left(-\frac{2}{3},1;-\frac{1}{3};-\frac{bx^3}{a}\right)}{4ax^4}$$

```
[Out] -((a + b*x^3)^(2/3)*Hypergeometric2F1[-2/3, 1, -1/3, -((b*x^3)/a)
])/(4*a*x^4)
```

Rubi [A] time = 0.0509573, antiderivative size = 51, normalized size of antiderivative = 1.34, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$-\frac{\sqrt[3]{\frac{bx^3}{a}+1} \, {}_2F_1\left(-\frac{4}{3},\frac{1}{3};-\frac{1}{3};-\frac{bx^3}{a}\right)}{4x^4\sqrt[3]{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^5*(a + b*x^3)^(1/3)),x]
```

```
[Out] -((1 + (b*x^3)/a)^(1/3)*Hypergeometric2F1[-4/3, 1/3, -1/3, -((b*x
^3)/a)])/(4*x^4*(a + b*x^3)^(1/3))
```

Rubi in Sympy [A] time = 6.14683, size = 48, normalized size = 1.26

$$-\frac{(a+bx^3)^{\frac{2}{3}} \, {}_2F_1\left(\begin{matrix} \frac{1}{3}, -\frac{4}{3} \\ -\frac{1}{3} \end{matrix}\middle| -\frac{bx^3}{a}\right)}{4ax^4\left(1+\frac{bx^3}{a}\right)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**5/(b*x**3+a)**(1/3),x)
```

```
[Out] -(a + b*x**3)**(2/3)*hyper((1/3, -4/3), (-1/3,), -b*x**3/a)/(4*a*
x**4*(1 + b*x**3/a)**(2/3))
```

Mathematica [B] time = 0.0554079, size = 82, normalized size = 2.16

$$\frac{-a^2-b^2x^6\sqrt[3]{\frac{bx^3}{a}+1} \, {}_2F_1\left(\frac{1}{3},\frac{2}{3};\frac{5}{3};-\frac{bx^3}{a}\right)+abx^3+2b^2x^6}{4a^2x^4\sqrt[3]{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^5*(a + b*x^3)^(1/3)),x]
```

```
[Out] (-a^2 + a*b*x^3 + 2*b^2*x^6 - b^2*x^6*(1 + (b*x^3)/a)^(1/3)*Hyper
geometric2F1[1/3, 2/3, 5/3, -((b*x^3)/a)])/(4*a^2*x^4*(a + b*x^3)
^(1/3))
```

Maple [F] time = 0.043, size = 0, normalized size = 0.

$$\int \frac{1}{x^5}\frac{1}{\sqrt[3]{bx^3+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^5/(b*x^3+a)^(1/3),x)
```

```
[Out] int(1/x^5/(b*x^3+a)^(1/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^3+a)^{\frac{1}{3}}x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(1/3)*x^5),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x^3 + a)^(1/3)*x^5), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(bx^3+a)^{\frac{1}{3}}x^5}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(1/3)*x^5),x, algorithm="fricas")
```

```
[Out] integral(1/((b*x^3 + a)^(1/3)*x^5), x)
```

Sympy [A] time = 3.07627, size = 44, normalized size = 1.16

$$\frac{\Gamma\left(-\frac{4}{3}\right) {}_2F_1\left(\begin{matrix}-\frac{4}{3}, \frac{1}{3}\\ -\frac{1}{3}\end{matrix}\middle| \frac{bx^3e^{i\pi}}{a}\right)}{3\sqrt[3]{a}x^4\,\Gamma\left(-\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**5/(b*x**3+a)**(1/3),x)
```

```
[Out] gamma(-4/3)*hyper((-4/3, 1/3), (-1/3,), b*x**3*exp_polar(I*pi)/a)
/(3*a**(1/3)*x**4*gamma(-1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^3+a)^{\frac{1}{3}}x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(1/3)*x^5),x, algorithm="giac")

[Out] integrate(1/((b*x^3 + a)^(1/3)*x^5), x)
```

3.554 $\int \frac{x^3}{\sqrt[3]{a+bx^3}}\,dx$

Optimal. Leaf size=94

$$\frac{a\log\left(\sqrt[3]{a+bx^3}-\sqrt[3]{b}x\right)}{6b^{4/3}}-\frac{a\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1}{\sqrt{3}}\right)}{3\sqrt{3}b^{4/3}}+\frac{x\left(a+bx^3\right)^{2/3}}{3b}$$

```
[Out] (x*(a + b*x^3)^(2/3))/(3*b) - (a*ArcTan[(1 + (2*b^(1/3)*x)/(a + b
*x^3)^(1/3))/Sqrt[3]])/(3*Sqrt[3]*b^(4/3)) + (a*Log[-(b^(1/3)*x)
+ (a + b*x^3)^(1/3)])/(6*b^(4/3))
```

Rubi [A] time = 0.0599741, antiderivative size = 94, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a\log\left(\sqrt[3]{a+bx^3}-\sqrt[3]{b}x\right)}{6b^{4/3}}-\frac{a\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1}{\sqrt{3}}\right)}{3\sqrt{3}b^{4/3}}+\frac{x\left(a+bx^3\right)^{2/3}}{3b}$$

Antiderivative was successfully verified.

```
[In] Int[x^3/(a + b*x^3)^(1/3),x]
```

```
[Out] (x*(a + b*x^3)^(2/3))/(3*b) - (a*ArcTan[(1 + (2*b^(1/3)*x)/(a + b
*x^3)^(1/3))/Sqrt[3]])/(3*Sqrt[3]*b^(4/3)) + (a*Log[-(b^(1/3)*x)
+ (a + b*x^3)^(1/3)])/(6*b^(4/3))
```

Rubi in Sympy [A] time = 18.4935, size = 134, normalized size = 1.43

$$\frac{a\log\left(-\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)}{9b^{\frac{4}{3}}}-\frac{a\log\left(\frac{b^{\frac{2}{3}}x^2}{(a+bx^3)^{\frac{2}{3}}}+\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)}{18b^{\frac{4}{3}}}-\frac{\sqrt{3}a\,\mathrm{atan}\left(\sqrt{3}\left(\frac{2\sqrt[3]{b}x}{3\sqrt[3]{a+bx^3}}+\frac{1}{3}\right)\right)}{9b^{\frac{4}{3}}}+\frac{x\left(a+bx^3\right)^{\frac{2}{3}}}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**3/(b*x**3+a)**(1/3),x)
```

```
[Out] a*log(-b**(1/3)*x/(a + b*x**3)**(1/3) + 1)/(9*b**(4/3)) - a*log(b
**(2/3)*x**2/(a + b*x**3)**(2/3) + b**(1/3)*x/(a + b*x**3)**(1/3)
 + 1)/(18*b**(4/3)) - sqrt(3)*a*atan(sqrt(3)*(2*b**(1/3)*x/(3*(a
+ b*x**3)**(1/3)) + 1/3))/(9*b**(4/3)) + x*(a + b*x**3)**(2/3)/(3
*b)
```

Mathematica [A] time = 0.122947, size = 131, normalized size = 1.39

$$\frac{x\left(a+bx^3\right)^{2/3}}{3b}-\frac{a\left(\log\left(\frac{b^{2/3}x^2}{(a+bx^3)^{2/3}}+\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)-2\log\left(1-\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}\right)+2\sqrt{3}\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1}{\sqrt{3}}\right)\right)}{18b^{4/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(a + b*x^3)^(1/3),x]
```

```
[Out] (x*(a + b*x^3)^(2/3))/(3*b) - (a*(2*Sqrt[3]*ArcTan[(1 + (2*b^(1/3
)*x)/(a + b*x^3)^(1/3))/Sqrt[3]] - 2*Log[1 - (b^(1/3)*x)/(a + b*x
^3)^(1/3)] + Log[1 + (b^(2/3)*x^2)/(a + b*x^3)^(2/3) + (b^(1/3)*x
)/(a + b*x^3)^(1/3)]))/(18*b^(4/3))
```

Maple [F] time = 0.035, size = 0, normalized size = 0.

$$\int x^3 \frac{1}{\sqrt[3]{bx^3+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(b*x^3+a)^(1/3),x)
```

```
[Out] int(x^3/(b*x^3+a)^(1/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^3 + a)^(1/3),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.243867, size = 185, normalized size = 1.97

$$\frac{\sqrt{3}\left(6\sqrt{3}\left(bx^3+a\right)^{\frac{2}{3}} b^{\frac{1}{3}} x + 2\sqrt{3} a \log\left(-\frac{bx-\left(bx^3+a\right)^{\frac{1}{3}} b^{\frac{2}{3}}}{x}\right) - \sqrt{3} a \log\left(\frac{bx^2+\left(bx^3+a\right)^{\frac{1}{3}} b^{\frac{2}{3}} x+\left(bx^3+a\right)^{\frac{2}{3}} b^{\frac{1}{3}}}{x^2}\right) + 6\, a \arctan\left(\frac{\sqrt{3}bx+2\sqrt{3}(bx}{3\,bx}\right.\right.}{54\, b^{\frac{4}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^3 + a)^(1/3),x, algorithm="fricas")
```

```
[Out] 1/54*sqrt(3)*(6*sqrt(3)*(b*x^3 + a)^(2/3)*b^(1/3)*x + 2*sqrt(3)*a
*log(-(b*x - (b*x^3 + a)^(1/3)*b^(2/3))/x) - sqrt(3)*a*log((b*x^2
 + (b*x^3 + a)^(1/3)*b^(2/3)*x + (b*x^3 + a)^(2/3)*b^(1/3))/x^2)
+ 6*a*arctan(1/3*(sqrt(3)*b*x + 2*sqrt(3)*(b*x^3 + a)^(1/3)*b^(2/
3))/(b*x)))/b^(4/3)
```

Sympy [A] time = 4.11645, size = 37, normalized size = 0.39

$$\frac{x^4 \left(\frac{4}{3}\right) {}_2F_1\left(\begin{matrix}\frac{1}{3}, \frac{4}{3} \\ \frac{7}{3}\end{matrix}\middle| \frac{bx^3 e^{i\pi}}{a}\right)}{3\sqrt[3]{a}\left(\frac{7}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(b*x**3+a)**(1/3),x)
```

```
[Out] x**4*gamma(4/3)*hyper((1/3, 4/3), (7/3,), b*x**3*exp_polar(I*pi)/
a)/(3*a**(1/3)*gamma(7/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{(bx^3+a)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^3 + a)^(1/3),x, algorithm="giac")
```

```
[Out] integrate(x^3/(b*x^3 + a)^(1/3), x)
```

3.555 $\int \frac{1}{\sqrt[3]{a+bx^3}}\,dx$

Optimal. Leaf size=70

$$\frac{\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1}{\sqrt{3}}\right)}{\sqrt{3}\sqrt[3]{b}}-\frac{\log\left(\sqrt[3]{a+bx^3}-\sqrt[3]{b}x\right)}{2\sqrt[3]{b}}$$

```
[Out] ArcTan[(1 + (2*b^(1/3)*x)/(a + b*x^3)^(1/3))/Sqrt[3]]/(Sqrt[3]*b^
(1/3)) - Log[-(b^(1/3)*x) + (a + b*x^3)^(1/3)]/(2*b^(1/3))
```

Rubi [A] time = 0.0277016, antiderivative size = 70, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1}{\sqrt{3}}\right)}{\sqrt{3}\sqrt[3]{b}}-\frac{\log\left(\sqrt[3]{a+bx^3}-\sqrt[3]{b}x\right)}{2\sqrt[3]{b}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^(-1/3),x]
```

```
[Out] ArcTan[(1 + (2*b^(1/3)*x)/(a + b*x^3)^(1/3))/Sqrt[3]]/(Sqrt[3]*b^
(1/3)) - Log[-(b^(1/3)*x) + (a + b*x^3)^(1/3)]/(2*b^(1/3))
```

Rubi in Sympy [A] time = 13.9337, size = 114, normalized size = 1.63

$$-\frac{\log\left(-\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)}{3\sqrt[3]{b}}+\frac{\log\left(\frac{b^{\frac{2}{3}}x^2}{(a+bx^3)^{\frac{2}{3}}}+\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)}{6\sqrt[3]{b}}+\frac{\sqrt{3}\,\mathrm{atan}\left(\sqrt{3}\left(\frac{2\sqrt[3]{b}x}{3\sqrt[3]{a+bx^3}}+\frac{1}{3}\right)\right)}{3\sqrt[3]{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**3+a)**(1/3),x)
```

```
[Out] -log(-b**(1/3)*x/(a + b*x**3)**(1/3) + 1)/(3*b**(1/3)) + log(b**(
2/3)*x**2/(a + b*x**3)**(2/3) + b**(1/3)*x/(a + b*x**3)**(1/3) +
1)/(6*b**(1/3)) + sqrt(3)*atan(sqrt(3)*(2*b**(1/3)*x/(3*(a + b*x*
*3)**(1/3)) + 1/3))/(3*b**(1/3))
```

Mathematica [A] time = 0.0105966, size = 110, normalized size = 1.57

$$\frac{\log\left(\frac{b^{2/3}x^2}{(a+bx^3)^{2/3}}+\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)-2\log\left(1-\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}\right)+2\sqrt{3}\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1}{\sqrt{3}}\right)}{6\sqrt[3]{b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^(-1/3),x]
```

```
[Out] (2*Sqrt[3]*ArcTan[(1 + (2*b^(1/3)*x)/(a + b*x^3)^(1/3))/Sqrt[3]]
- 2*Log[1 - (b^(1/3)*x)/(a + b*x^3)^(1/3)] + Log[1 + (b^(2/3)*x^2
)/(a + b*x^3)^(2/3) + (b^(1/3)*x)/(a + b*x^3)^(1/3)])/(6*b^(1/3))
```

Maple [F] time = 0.037, size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt[3]{bx^3+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^3+a)^(1/3),x)
```

```
[Out] int(1/(b*x^3+a)^(1/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(-1/3),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.238075, size = 173, normalized size = 2.47

$$\frac{\sqrt{3}\left(2\sqrt{3}\log\left(-\frac{bx-(bx^3+a)^{\frac{1}{3}}(-b)^{\frac{2}{3}}}{x}\right)-\sqrt{3}\log\left(-\frac{bx^2+(bx^3+a)^{\frac{1}{3}}(-b)^{\frac{2}{3}}x-(bx^3+a)^{\frac{2}{3}}(-b)^{\frac{1}{3}}}{x^2}\right)+6\arctan\left(\frac{\sqrt{3}bx+2\sqrt{3}(bx^3+a)^{\frac{1}{3}}(-b)^{\frac{2}{3}}}{3\,bx}\right)\right)}{18\,(-b)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(-1/3),x, algorithm="fricas")
```

```
[Out] 1/18*sqrt(3)*(2*sqrt(3)*log(-(b*x - (b*x^3 + a)^(1/3)*(-b)^(2/3))
/x) - sqrt(3)*log(-(b*x^2 + (b*x^3 + a)^(1/3)*(-b)^(2/3)*x - (b*x
^3 + a)^(2/3)*(-b)^(1/3))/x^2) + 6*arctan(1/3*(sqrt(3)*b*x + 2*sq
rt(3)*(b*x^3 + a)^(1/3)*(-b)^(2/3))/(b*x)))/(-b)^(1/3)
```

Sympy [A] time = 3.58087, size = 36, normalized size = 0.51

$$\frac{x\,\Gamma\left(\frac{1}{3}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{3},\frac{1}{3}\\\frac{4}{3}\end{matrix}\middle|\frac{bx^3e^{i\pi}}{a}\right)}{3\sqrt[3]{a}\,\Gamma\left(\frac{4}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**3+a)**(1/3),x)
```

```
[Out] x*gamma(1/3)*hyper((1/3, 1/3), (4/3,), b*x**3*exp_polar(I*pi)/a)/
(3*a**(1/3)*gamma(4/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^3 + a)^{\frac{1}{3}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(-1/3),x, algorithm="giac")
```

```
[Out] integrate((b*x^3 + a)^(-1/3), x)
```

3.556 $\int \frac{1}{x^3 \sqrt[3]{a + bx^3}}\,dx$

Optimal. Leaf size=21

$$-\frac{\left(a+bx^3\right)^{2/3}}{2ax^2}$$

```
[Out] -(a + b*x^3)^(2/3)/(2*a*x^2)
```

Rubi [A] time = 0.0207077, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{\left(a+bx^3\right)^{2/3}}{2ax^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(a + b*x^3)^(1/3)),x]
```

```
[Out] -(a + b*x^3)^(2/3)/(2*a*x^2)
```

Rubi in Sympy [A] time = 2.69498, size = 17, normalized size = 0.81

$$-\frac{\left(a+bx^3\right)^{\frac{2}{3}}}{2ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(b*x**3+a)**(1/3),x)
```

```
[Out] -(a + b*x**3)**(2/3)/(2*a*x**2)
```

Mathematica [A] time = 0.0174928, size = 21, normalized size = 1.

$$-\frac{\left(a+bx^3\right)^{2/3}}{2ax^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*(a + b*x^3)^(1/3)),x]
```

```
[Out] -(a + b*x^3)^(2/3)/(2*a*x^2)
```

Maple [A] time = 0.007, size = 18, normalized size = 0.9

$$-\frac{1}{2\,ax^2}\left(bx^3+a\right)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(b*x^3+a)^(1/3),x)
```

```
[Out] -1/2*(b*x^3+a)^(2/3)/a/x^2
```

Maxima [A] time = 1.44638, size = 23, normalized size = 1.1

$$-\frac{\left(bx^3+a\right)^{\frac{2}{3}}}{2\,ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(1/3)*x^3),x, algorithm="maxima")
```

```
[Out] -1/2*(b*x^3 + a)^(2/3)/(a*x^2)
```

Fricas [A] time = 0.236244, size = 23, normalized size = 1.1

$$-\frac{\left(bx^3+a\right)^{\frac{2}{3}}}{2\,ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(1/3)*x^3),x, algorithm="fricas")
```

```
[Out] -1/2*(b*x^3 + a)^(2/3)/(a*x^2)
```

Sympy [A] time = 2.05887, size = 31, normalized size = 1.48

$$\frac{b^{\frac{2}{3}}\left(\frac{a}{bx^3}+1\right)^{\frac{2}{3}}\Gamma\left(-\frac{2}{3}\right)}{3a\,\Gamma\left(\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(b*x**3+a)**(1/3),x)
```

```
[Out] b**(2/3)*(a/(b*x**3) + 1)**(2/3)*gamma(-2/3)/(3*a*gamma(1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bx^3+a\right)^{\frac{1}{3}}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(1/3)*x^3),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^3 + a)^(1/3)*x^3), x)
```

3.557 $\int \frac{1}{x^6 \sqrt[3]{a+bx^3}} \, dx$

Optimal. Leaf size=44

$$\frac{3b\left(a+bx^3\right)^{2/3}}{10a^2x^2}-\frac{\left(a+bx^3\right)^{2/3}}{5ax^5}$$

```
[Out] -(a + b*x^3)^(2/3)/(5*a*x^5) + (3*b*(a + b*x^3)^(2/3))/(10*a^2*x^
2)
```

Rubi [A] time = 0.0422746, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{3b\left(a+bx^3\right)^{2/3}}{10a^2x^2}-\frac{\left(a+bx^3\right)^{2/3}}{5ax^5}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^6*(a + b*x^3)^(1/3)),x]
```

```
[Out] -(a + b*x^3)^(2/3)/(5*a*x^5) + (3*b*(a + b*x^3)^(2/3))/(10*a^2*x^
2)
```

Rubi in Sympy [A] time = 4.24118, size = 37, normalized size = 0.84

$$-\frac{\left(a+bx^3\right)^{\frac{2}{3}}}{5ax^5}+\frac{3b\left(a+bx^3\right)^{\frac{2}{3}}}{10a^2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**6/(b*x**3+a)**(1/3),x)
```

```
[Out] -(a + b*x**3)**(2/3)/(5*a*x**5) + 3*b*(a + b*x**3)**(2/3)/(10*a**
2*x**2)
```

Mathematica [A] time = 0.0253708, size = 31, normalized size = 0.7

$$\frac{\left(a+bx^3\right)^{2/3}\left(3bx^3-2a\right)}{10a^2x^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^6*(a + b*x^3)^(1/3)),x]
```

```
[Out] ((a + b*x^3)^(2/3)*(-2*a + 3*b*x^3))/(10*a^2*x^5)
```

Maple [A] time = 0.007, size = 28, normalized size = 0.6

$$-\frac{-3\,bx^3+2\,a}{10\,x^5a^2}\left(bx^3+a\right)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^6/(b*x^3+a)^(1/3),x)
```

```
[Out] -1/10*(b*x^3+a)^(2/3)*(-3*b*x^3+2*a)/x^5/a^2
```

Maxima [A] time = 1.4373, size = 47, normalized size = 1.07

$$\frac{\frac{5\left(bx^3+a\right)^{\frac{2}{3}}b}{x^2}-\frac{2\left(bx^3+a\right)^{\frac{5}{3}}}{x^5}}{10\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(1/3)*x^6),x, algorithm="maxima")
```

```
[Out] 1/10*(5*(b*x^3 + a)^(2/3)*b/x^2 - 2*(b*x^3 + a)^(5/3)/x^5)/a^2
```

Fricas [A] time = 0.235654, size = 36, normalized size = 0.82

$$\frac{\left(3\,bx^3-2\,a\right)\left(bx^3+a\right)^{\frac{2}{3}}}{10\,a^2x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(1/3)*x^6),x, algorithm="fricas")
```

```
[Out] 1/10*(3*b*x^3 - 2*a)*(b*x^3 + a)^(2/3)/(a^2*x^5)
```

Sympy [A] time = 3.27328, size = 70, normalized size = 1.59

$$-\frac{2b^{\frac{2}{3}}\left(\frac{a}{bx^3}+1\right)^{\frac{2}{3}}\Gamma\left(-\frac{5}{3}\right)}{9ax^3\Gamma\left(\frac{1}{3}\right)}+\frac{b^{\frac{5}{3}}\left(\frac{a}{bx^3}+1\right)^{\frac{2}{3}}\Gamma\left(-\frac{5}{3}\right)}{3a^2\Gamma\left(\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**6/(b*x**3+a)**(1/3),x)
```

```
[Out] -2*b**(2/3)*(a/(b*x**3) + 1)**(2/3)*gamma(-5/3)/(9*a*x**3*gamma(1
/3)) + b**(5/3)*(a/(b*x**3) + 1)**(2/3)*gamma(-5/3)/(3*a**2*gamma
(1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bx^3+a\right)^{\frac{1}{3}}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(1/3)*x^6),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^3 + a)^(1/3)*x^6), x)
```

3.558 $\int \frac{1}{x^9 \sqrt[3]{a+bx^3}}\,dx$

Optimal. Leaf size=68

$$-\frac{9b^2\left(a+bx^3\right)^{2/3}}{40a^3x^2}+\frac{3b\left(a+bx^3\right)^{2/3}}{20a^2x^5}-\frac{\left(a+bx^3\right)^{2/3}}{8ax^8}$$

```
[Out] -(a + b*x^3)^(2/3)/(8*a*x^8) + (3*b*(a + b*x^3)^(2/3))/(20*a^2*x^
5) - (9*b^2*(a + b*x^3)^(2/3))/(40*a^3*x^2)
```

Rubi [A] time = 0.0661638, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{9b^2\left(a+bx^3\right)^{2/3}}{40a^3x^2}+\frac{3b\left(a+bx^3\right)^{2/3}}{20a^2x^5}-\frac{\left(a+bx^3\right)^{2/3}}{8ax^8}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^9*(a + b*x^3)^(1/3)),x]
```

```
[Out] -(a + b*x^3)^(2/3)/(8*a*x^8) + (3*b*(a + b*x^3)^(2/3))/(20*a^2*x^
5) - (9*b^2*(a + b*x^3)^(2/3))/(40*a^3*x^2)
```

Rubi in Sympy [A] time = 6.71274, size = 61, normalized size = 0.9

$$-\frac{\left(a+bx^3\right)^{\frac{2}{3}}}{8ax^8}+\frac{3b\left(a+bx^3\right)^{\frac{2}{3}}}{20a^2x^5}-\frac{9b^2\left(a+bx^3\right)^{\frac{2}{3}}}{40a^3x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**9/(b*x**3+a)**(1/3),x)
```

```
[Out] -(a + b*x**3)**(2/3)/(8*a*x**8) + 3*b*(a + b*x**3)**(2/3)/(20*a**
2*x**5) - 9*b**2*(a + b*x**3)**(2/3)/(40*a**3*x**2)
```

Mathematica [A] time = 0.0314402, size = 42, normalized size = 0.62

$$-\frac{\left(a+bx^3\right)^{2/3}\left(5a^2-6abx^3+9b^2x^6\right)}{40a^3x^8}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^9*(a + b*x^3)^(1/3)),x]
```

```
[Out] -((a + b*x^3)^(2/3)*(5*a^2 - 6*a*b*x^3 + 9*b^2*x^6))/(40*a^3*x^8)
```

Maple [A] time = 0.008, size = 39, normalized size = 0.6

$$-\frac{9\,b^2x^6-6\,abx^3+5\,a^2}{40\,x^8a^3}\left(bx^3+a\right)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^9/(b*x^3+a)^(1/3),x)

[Out] -1/40*(b*x^3+a)^(2/3)*(9*b^2*x^6-6*a*b*x^3+5*a^2)/x^8/a^3
```

Maxima [A] time = 1.44011, size = 70, normalized size = 1.03

$$-\frac{\frac{20\,(bx^3+a)^{\frac{2}{3}}b^2}{x^2} - \frac{16\,(bx^3+a)^{\frac{5}{3}}b}{x^5} + \frac{5\,(bx^3+a)^{\frac{8}{3}}}{x^8}}{40\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(1/3)*x^9),x, algorithm="maxima")

[Out] -1/40*(20*(b*x^3 + a)^(2/3)*b^2/x^2 - 16*(b*x^3 + a)^(5/3)*b/x^5
+ 5*(b*x^3 + a)^(8/3)/x^8)/a^3
```

Fricas [A] time = 0.236752, size = 51, normalized size = 0.75

$$-\frac{\left(9\,b^2x^6 - 6\,abx^3 + 5\,a^2\right)\left(bx^3 + a\right)^{\frac{2}{3}}}{40\,a^3x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(1/3)*x^9),x, algorithm="fricas")

[Out] -1/40*(9*b^2*x^6 - 6*a*b*x^3 + 5*a^2)*(b*x^3 + a)^(2/3)/(a^3*x^8)
```

Sympy [A] time = 6.02433, size = 406, normalized size = 5.97

$$\frac{10a^4b^{\frac{14}{3}}\left(\frac{a}{bx^3}+1\right)^{\frac{2}{3}}\Gamma\left(-\frac{8}{3}\right)}{27a^5b^4x^6\Gamma\left(\frac{1}{3}\right)+54a^4b^5x^9\Gamma\left(\frac{1}{3}\right)+27a^3b^6x^{12}\Gamma\left(\frac{1}{3}\right)} + \frac{8a^3b^{\frac{17}{3}}x^3\left(\frac{a}{bx^3}+1\right)^{\frac{2}{3}}\Gamma\left(-\frac{8}{3}\right)}{27a^5b^4x^6\Gamma\left(\frac{1}{3}\right)+54a^4b^5x^9\Gamma\left(\frac{1}{3}\right)+27a^3b^6x^{12}\Gamma\left(\frac{1}{3}\right)} + \frac{4a^2b^{\frac{20}{3}}x^6\left(\frac{a}{bx^3}+1\right)^{\frac{2}{3}}\Gamma\left(-\frac{8}{3}\right)}{27a^5b^4x^6\Gamma\left(\frac{1}{3}\right)+54a^4b^5x^9\Gamma\left(\frac{1}{3}\right)+27a^3b^6x^{12}\Gamma\left(\frac{1}{3}\right)} + \frac{24ab^{\frac{23}{3}}x^9\left(\frac{a}{bx^3}+1\right)^{\frac{2}{3}}\Gamma\left(-\frac{8}{3}\right)}{27a^5b^4x^6\Gamma\left(\frac{1}{3}\right)+54a^4b^5x^9\Gamma\left(\frac{1}{3}\right)+27a^3b^6x^{12}\Gamma\left(\frac{1}{3}\right)} + \frac{18b^{\frac{26}{3}}x^{12}\left(\frac{a}{bx^3}+1\right)^{\frac{2}{3}}\Gamma\left(-\frac{8}{3}\right)}{27a^5b^4x^6\Gamma\left(\frac{1}{3}\right)+54a^4b^5x^9\Gamma\left(\frac{1}{3}\right)+27a^3b^6x^{12}\Gamma\left(\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**9/(b*x**3+a)**(1/3),x)

[Out] 10*a**4*b**(14/3)*(a/(b*x**3) + 1)**(2/3)*gamma(-8/3)/(27*a**5*b*
*4*x**6*gamma(1/3) + 54*a**4*b**5*x**9*gamma(1/3) + 27*a**3*b**6*
x**12*gamma(1/3)) + 8*a**3*b**(17/3)*x**3*(a/(b*x**3) + 1)**(2/3)
*gamma(-8/3)/(27*a**5*b**4*x**6*gamma(1/3) + 54*a**4*b**5*x**9*ga
mma(1/3) + 27*a**3*b**6*x**12*gamma(1/3)) + 4*a**2*b**(20/3)*x**6
*(a/(b*x**3) + 1)**(2/3)*gamma(-8/3)/(27*a**5*b**4*x**6*gamma(1/3
) + 54*a**4*b**5*x**9*gamma(1/3) + 27*a**3*b**6*x**12*gamma(1/3))
 + 24*a*b**(23/3)*x**9*(a/(b*x**3) + 1)**(2/3)*gamma(-8/3)/(27*a*
*5*b**4*x**6*gamma(1/3) + 54*a**4*b**5*x**9*gamma(1/3) + 27*a**3*
b**6*x**12*gamma(1/3)) + 18*b**(26/3)*x**12*(a/(b*x**3) + 1)**(2/
3)*gamma(-8/3)/(27*a**5*b**4*x**6*gamma(1/3) + 54*a**4*b**5*x**9*
gamma(1/3) + 27*a**3*b**6*x**12*gamma(1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^3+a)^{\frac{1}{3}}x^9}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(1/3)*x^9),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^3 + a)^(1/3)*x^9), x)
```

3.559 $\int \frac{1}{x^{12}\sqrt[3]{a+bx^3}}\,dx$

Optimal. Leaf size=92

$$\frac{81b^3\left(a+bx^3\right)^{2/3}}{440a^4x^2}-\frac{27b^2\left(a+bx^3\right)^{2/3}}{220a^3x^5}+\frac{9b\left(a+bx^3\right)^{2/3}}{88a^2x^8}-\frac{\left(a+bx^3\right)^{2/3}}{11ax^{11}}$$

```
[Out] -(a + b*x^3)^(2/3)/(11*a*x^11) + (9*b*(a + b*x^3)^(2/3))/(88*a^2*
x^8) - (27*b^2*(a + b*x^3)^(2/3))/(220*a^3*x^5) + (81*b^3*(a + b*
x^3)^(2/3))/(440*a^4*x^2)
```

Rubi [A] time = 0.0927548, antiderivative size = 92, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{81b^3\left(a+bx^3\right)^{2/3}}{440a^4x^2}-\frac{27b^2\left(a+bx^3\right)^{2/3}}{220a^3x^5}+\frac{9b\left(a+bx^3\right)^{2/3}}{88a^2x^8}-\frac{\left(a+bx^3\right)^{2/3}}{11ax^{11}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^12*(a + b*x^3)^(1/3)),x]
```

```
[Out] -(a + b*x^3)^(2/3)/(11*a*x^11) + (9*b*(a + b*x^3)^(2/3))/(88*a^2*
x^8) - (27*b^2*(a + b*x^3)^(2/3))/(220*a^3*x^5) + (81*b^3*(a + b*
x^3)^(2/3))/(440*a^4*x^2)
```

Rubi in Sympy [A] time = 9.74709, size = 85, normalized size = 0.92

$$-\frac{\left(a+bx^3\right)^{\frac{2}{3}}}{11ax^{11}}+\frac{9b\left(a+bx^3\right)^{\frac{2}{3}}}{88a^2x^8}-\frac{27b^2\left(a+bx^3\right)^{\frac{2}{3}}}{220a^3x^5}+\frac{81b^3\left(a+bx^3\right)^{\frac{2}{3}}}{440a^4x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**12/(b*x**3+a)**(1/3),x)
```

```
[Out] -(a + b*x**3)**(2/3)/(11*a*x**11) + 9*b*(a + b*x**3)**(2/3)/(88*a
**2*x**8) - 27*b**2*(a + b*x**3)**(2/3)/(220*a**3*x**5) + 81*b**3
*(a + b*x**3)**(2/3)/(440*a**4*x**2)
```

Mathematica [A] time = 0.0391778, size = 53, normalized size = 0.58

$$\frac{\left(a+bx^3\right)^{2/3}\left(-40a^3+45a^2bx^3-54ab^2x^6+81b^3x^9\right)}{440a^4x^{11}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^12*(a + b*x^3)^(1/3)),x]
```

```
[Out] ((a + b*x^3)^(2/3)*(-40*a^3 + 45*a^2*b*x^3 - 54*a*b^2*x^6 + 81*b^
3*x^9))/(440*a^4*x^11)
```

Maple [A] time = 0.01, size = 50, normalized size = 0.5

$$-\frac{-81\,b^3x^9+54\,ab^2x^6-45\,a^2bx^3+40\,a^3}{440\,x^{11}a^4}\left(bx^3+a\right)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^12/(b*x^3+a)^(1/3),x)
```

```
[Out] -1/440*(b*x^3+a)^(2/3)*(-81*b^3*x^9+54*a*b^2*x^6-45*a^2*b*x^3+40*
a^3)/x^11/a^4
```

Maxima [A] time = 1.44616, size = 93, normalized size = 1.01

$$\frac{\frac{220\,(bx^3+a)^{\frac{2}{3}}b^3}{x^2} - \frac{264\,(bx^3+a)^{\frac{5}{3}}b^2}{x^5} + \frac{165\,(bx^3+a)^{\frac{8}{3}}b}{x^8} - \frac{40\,(bx^3+a)^{\frac{11}{3}}}{x^{11}}}{440\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(1/3)*x^12),x, algorithm="maxima")
```

```
[Out] 1/440*(220*(b*x^3 + a)^(2/3)*b^3/x^2 - 264*(b*x^3 + a)^(5/3)*b^2/
x^5 + 165*(b*x^3 + a)^(8/3)*b/x^8 - 40*(b*x^3 + a)^(11/3)/x^11)/a
^4
```

Fricas [A] time = 0.236288, size = 66, normalized size = 0.72

$$\frac{\left(81\,b^3x^9 - 54\,ab^2x^6 + 45\,a^2bx^3 - 40\,a^3\right)\left(bx^3+a\right)^{\frac{2}{3}}}{440\,a^4x^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(1/3)*x^12),x, algorithm="fricas")
```

```
[Out] 1/440*(81*b^3*x^9 - 54*a*b^2*x^6 + 45*a^2*b*x^3 - 40*a^3)*(b*x^3
+ a)^(2/3)/(a^4*x^11)
```

Sympy [A] time = 10.6426, size = 692, normalized size = 7.52

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**12/(b*x**3+a)**(1/3),x)
```

```
[Out] -80*a**6*b**(29/3)*(a/(b*x**3) + 1)**(2/3)*gamma(-11/3)/(81*a**7*
b**9*x**9*gamma(1/3) + 243*a**6*b**10*x**12*gamma(1/3) + 243*a**5
*b**11*x**15*gamma(1/3) + 81*a**4*b**12*x**18*gamma(1/3)) - 150*a
**5*b**(32/3)*x**3*(a/(b*x**3) + 1)**(2/3)*gamma(-11/3)/(81*a**7*
b**9*x**9*gamma(1/3) + 243*a**6*b**10*x**12*gamma(1/3) + 243*a**5
*b**11*x**15*gamma(1/3) + 81*a**4*b**12*x**18*gamma(1/3)) - 78*a*
*4*b**(35/3)*x**6*(a/(b*x**3) + 1)**(2/3)*gamma(-11/3)/(81*a**7*b
**9*x**9*gamma(1/3) + 243*a**6*b**10*x**12*gamma(1/3) + 243*a**5*
b**11*x**15*gamma(1/3) + 81*a**4*b**12*x**18*gamma(1/3)) + 28*a**
3*b**(38/3)*x**9*(a/(b*x**3) + 1)**(2/3)*gamma(-11/3)/(81*a**7*b*
*9*x**9*gamma(1/3) + 243*a**6*b**10*x**12*gamma(1/3) + 243*a**5*b
**11*x**15*gamma(1/3) + 81*a**4*b**12*x**18*gamma(1/3)) + 252*a**
2*b**(41/3)*x**12*(a/(b*x**3) + 1)**(2/3)*gamma(-11/3)/(81*a**7*b
**9*x**9*gamma(1/3) + 243*a**6*b**10*x**12*gamma(1/3) + 243*a**5*
b**11*x**15*gamma(1/3) + 81*a**4*b**12*x**18*gamma(1/3)) + 378*a*
b**(44/3)*x**15*(a/(b*x**3) + 1)**(2/3)*gamma(-11/3)/(81*a**7*b**
9*x**9*gamma(1/3) + 243*a**6*b**10*x**12*gamma(1/3) + 243*a**5*b*
*11*x**15*gamma(1/3) + 81*a**4*b**12*x**18*gamma(1/3)) + 162*b**(
```

```
47/3)*x**18*(a/(b*x**3) + 1)**(2/3)*gamma(-11/3)/(81*a**7*b**9*x*
*9*gamma(1/3) + 243*a**6*b**10*x**12*gamma(1/3) + 243*a**5*b**11*
x**15*gamma(1/3) + 81*a**4*b**12*x**18*gamma(1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^3+a)^{\frac{1}{3}}x^{12}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(1/3)*x^12),x, algorithm="giac")

[Out] integrate(1/((b*x^3 + a)^(1/3)*x^12), x)
```

3.560 $\int \frac{x^{11}}{(a+bx^3)^{2/3}}\,dx$

Optimal. Leaf size=78

$$-\frac{a^3\sqrt[3]{a+bx^3}}{b^4}+\frac{3a^2\left(a+bx^3\right)^{4/3}}{4b^4}+\frac{\left(a+bx^3\right)^{10/3}}{10b^4}-\frac{3a\left(a+bx^3\right)^{7/3}}{7b^4}$$

```
[Out] -((a^3*(a + b*x^3)^(1/3))/b^4) + (3*a^2*(a + b*x^3)^(4/3))/(4*b^4
) - (3*a*(a + b*x^3)^(7/3))/(7*b^4) + (a + b*x^3)^(10/3)/(10*b^4)
```

Rubi [A] time = 0.104177, antiderivative size = 78, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^3\sqrt[3]{a+bx^3}}{b^4}+\frac{3a^2\left(a+bx^3\right)^{4/3}}{4b^4}+\frac{\left(a+bx^3\right)^{10/3}}{10b^4}-\frac{3a\left(a+bx^3\right)^{7/3}}{7b^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11/(a + b*x^3)^(2/3),x]
```

```
[Out] -((a^3*(a + b*x^3)^(1/3))/b^4) + (3*a^2*(a + b*x^3)^(4/3))/(4*b^4
) - (3*a*(a + b*x^3)^(7/3))/(7*b^4) + (a + b*x^3)^(10/3)/(10*b^4)
```

Rubi in Sympy [A] time = 14.1711, size = 70, normalized size = 0.9

$$-\frac{a^3\sqrt[3]{a+bx^3}}{b^4}+\frac{3a^2\left(a+bx^3\right)^{\frac{4}{3}}}{4b^4}-\frac{3a\left(a+bx^3\right)^{\frac{7}{3}}}{7b^4}+\frac{\left(a+bx^3\right)^{\frac{10}{3}}}{10b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11/(b*x**3+a)**(2/3),x)
```

```
[Out] -a**3*(a + b*x**3)**(1/3)/b**4 + 3*a**2*(a + b*x**3)**(4/3)/(4*b*
*4) - 3*a*(a + b*x**3)**(7/3)/(7*b**4) + (a + b*x**3)**(10/3)/(10
*b**4)
```

Mathematica [A] time = 0.0289613, size = 50, normalized size = 0.64

$$\frac{\sqrt[3]{a+bx^3}\left(-81a^3+27a^2bx^3-18ab^2x^6+14b^3x^9\right)}{140b^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11/(a + b*x^3)^(2/3),x]
```

```
[Out] ((a + b*x^3)^(1/3)*(-81*a^3 + 27*a^2*b*x^3 - 18*a*b^2*x^6 + 14*b^
3*x^9))/(140*b^4)
```

Maple [A] time = 0.009, size = 47, normalized size = 0.6

$$-\frac{-14\,b^3x^9+18\,ab^2x^6-27\,a^2bx^3+81\,a^3}{140\,b^4}\sqrt[3]{bx^3+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11/(b*x^3+a)^(2/3),x)
```

```
[Out] -1/140*(b*x^3+a)^(1/3)*(-14*b^3*x^9+18*a*b^2*x^6-27*a^2*b*x^3+81*
a^3)/b^4
```

Maxima [A] time = 1.44297, size = 86, normalized size = 1.1

$$\frac{\left(bx^3+a\right)^{\frac{10}{3}}}{10\,b^4}-\frac{3\left(bx^3+a\right)^{\frac{7}{3}}a}{7\,b^4}+\frac{3\left(bx^3+a\right)^{\frac{4}{3}}a^2}{4\,b^4}-\frac{\left(bx^3+a\right)^{\frac{1}{3}}a^3}{b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(b*x^3 + a)^(2/3),x, algorithm="maxima")
```

```
[Out] 1/10*(b*x^3 + a)^(10/3)/b^4 - 3/7*(b*x^3 + a)^(7/3)*a/b^4 + 3/4*(
b*x^3 + a)^(4/3)*a^2/b^4 - (b*x^3 + a)^(1/3)*a^3/b^4
```

Fricas [A] time = 0.230627, size = 62, normalized size = 0.79

$$\frac{\left(14\,b^3x^9-18\,ab^2x^6+27\,a^2bx^3-81\,a^3\right)\left(bx^3+a\right)^{\frac{1}{3}}}{140\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(b*x^3 + a)^(2/3),x, algorithm="fricas")
```

```
[Out] 1/140*(14*b^3*x^9 - 18*a*b^2*x^6 + 27*a^2*b*x^3 - 81*a^3)*(b*x^3
+ a)^(1/3)/b^4
```

Sympy [A] time = 10.9806, size = 92, normalized size = 1.18

$$\begin{cases}-\frac{81a^3\sqrt[3]{a+bx^3}}{140b^4}+\frac{27a^2x^3\sqrt[3]{a+bx^3}}{140b^3}-\frac{9ax^6\sqrt[3]{a+bx^3}}{70b^2}+\frac{x^9\sqrt[3]{a+bx^3}}{10b} & \text{for } b\neq 0\\ \frac{x^{12}}{12a^{\frac{2}{3}}} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11/(b*x**3+a)**(2/3),x)
```

```
[Out] Piecewise((-81*a**3*(a + b*x**3)**(1/3)/(140*b**4) + 27*a**2*x**3
*(a + b*x**3)**(1/3)/(140*b**3) - 9*a*x**6*(a + b*x**3)**(1/3)/(7
0*b**2) + x**9*(a + b*x**3)**(1/3)/(10*b), Ne(b, 0)), (x**12/(12*
a**(2/3)), True))
```

GIAC/XCAS [A] time = 0.559299, size = 77, normalized size = 0.99

$$\frac{14\left(bx^3+a\right)^{\frac{10}{3}}-60\left(bx^3+a\right)^{\frac{7}{3}}a+105\left(bx^3+a\right)^{\frac{4}{3}}a^2-140\left(bx^3+a\right)^{\frac{1}{3}}a^3}{140\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(b*x^3 + a)^(2/3),x, algorithm="giac")
```

```
[Out] 1/140*(14*(b*x^3 + a)^(10/3) - 60*(b*x^3 + a)^(7/3)*a + 105*(b*x^
3 + a)^(4/3)*a^2 - 140*(b*x^3 + a)^(1/3)*a^3)/b^4
```

3.561 $\int \frac{x^8}{(a+bx^3)^{2/3}}\,dx$

Optimal. Leaf size=56

$$\frac{a^2\sqrt[3]{a+bx^3}}{b^3}+\frac{\left(a+bx^3\right)^{7/3}}{7b^3}-\frac{a\left(a+bx^3\right)^{4/3}}{2b^3}$$

```
[Out] (a^2*(a + b*x^3)^(1/3))/b^3 - (a*(a + b*x^3)^(4/3))/(2*b^3) + (a
+ b*x^3)^(7/3)/(7*b^3)
```

Rubi [A] time = 0.083769, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{a^2\sqrt[3]{a+bx^3}}{b^3}+\frac{\left(a+bx^3\right)^{7/3}}{7b^3}-\frac{a\left(a+bx^3\right)^{4/3}}{2b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8/(a + b*x^3)^(2/3),x]
```

```
[Out] (a^2*(a + b*x^3)^(1/3))/b^3 - (a*(a + b*x^3)^(4/3))/(2*b^3) + (a
+ b*x^3)^(7/3)/(7*b^3)
```

Rubi in Sympy [A] time = 10.5464, size = 48, normalized size = 0.86

$$\frac{a^2\sqrt[3]{a+bx^3}}{b^3}-\frac{a\left(a+bx^3\right)^{\frac{4}{3}}}{2b^3}+\frac{\left(a+bx^3\right)^{\frac{7}{3}}}{7b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8/(b*x**3+a)**(2/3),x)
```

```
[Out] a**2*(a + b*x**3)**(1/3)/b**3 - a*(a + b*x**3)**(4/3)/(2*b**3) +
(a + b*x**3)**(7/3)/(7*b**3)
```

Mathematica [A] time = 0.0267451, size = 39, normalized size = 0.7

$$\frac{\sqrt[3]{a+bx^3}\left(9a^2-3abx^3+2b^2x^6\right)}{14b^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8/(a + b*x^3)^(2/3),x]
```

```
[Out] ((a + b*x^3)^(1/3)*(9*a^2 - 3*a*b*x^3 + 2*b^2*x^6))/(14*b^3)
```

Maple [A] time = 0.006, size = 36, normalized size = 0.6

$$\frac{2\,b^2x^6-3\,abx^3+9\,a^2}{14\,b^3}\sqrt[3]{bx^3+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8/(b*x^3+a)^(2/3),x)
```

```
[Out] 1/14*(b*x^3+a)^(1/3)*(2*b^2*x^6-3*a*b*x^3+9*a^2)/b^3
```

Maxima [A] time = 1.4392, size = 62, normalized size = 1.11

$$\frac{\left(bx^3+a\right)^{\frac{7}{3}}}{7\,b^3}-\frac{\left(bx^3+a\right)^{\frac{4}{3}}a}{2\,b^3}+\frac{\left(bx^3+a\right)^{\frac{1}{3}}a^2}{b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^3 + a)^(2/3),x, algorithm="maxima")
```

```
[Out] 1/7*(b*x^3 + a)^(7/3)/b^3 - 1/2*(b*x^3 + a)^(4/3)*a/b^3 + (b*x^3
+ a)^(1/3)*a^2/b^3
```

Fricas [A] time = 0.22636, size = 47, normalized size = 0.84

$$\frac{\left(2\,b^2x^6-3\,abx^3+9\,a^2\right)\left(bx^3+a\right)^{\frac{1}{3}}}{14\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^3 + a)^(2/3),x, algorithm="fricas")
```

```
[Out] 1/14*(2*b^2*x^6 - 3*a*b*x^3 + 9*a^2)*(b*x^3 + a)^(1/3)/b^3
```

Sympy [A] time = 5.05947, size = 68, normalized size = 1.21

$$\begin{cases} \frac{9a^2\sqrt[3]{a+bx^3}}{14b^3}-\frac{3ax^3\sqrt[3]{a+bx^3}}{14b^2}+\frac{x^6\sqrt[3]{a+bx^3}}{7b} & \text{for } b\neq 0 \\ \frac{x^9}{9a^{\frac{2}{3}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8/(b*x**3+a)**(2/3),x)
```

```
[Out] Piecewise((9*a**2*(a + b*x**3)**(1/3)/(14*b**3) - 3*a*x**3*(a + b
*x**3)**(1/3)/(14*b**2) + x**6*(a + b*x**3)**(1/3)/(7*b), Ne(b, 0
)), (x**9/(9*a**(2/3)), True))
```

GIAC/XCAS [A] time = 0.295931, size = 58, normalized size = 1.04

$$\frac{2\left(bx^3+a\right)^{\frac{7}{3}}-7\left(bx^3+a\right)^{\frac{4}{3}}a+14\left(bx^3+a\right)^{\frac{1}{3}}a^2}{14\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^3 + a)^(2/3),x, algorithm="giac")
```

```
[Out] 1/14*(2*(b*x^3 + a)^(7/3) - 7*(b*x^3 + a)^(4/3)*a + 14*(b*x^3 + a
)^(1/3)*a^2)/b^3
```

3.562 $\int \frac{x^5}{(a+bx^3)^{2/3}} dx$

Optimal. Leaf size=36

$$\frac{(a+bx^3)^{4/3}}{4b^2} - \frac{a\sqrt[3]{a+bx^3}}{b^2}$$

```
[Out] -((a*(a + b*x^3)^(1/3))/b^2) + (a + b*x^3)^(4/3)/(4*b^2)
```

Rubi [A] time = 0.0595879, antiderivative size = 36, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{(a+bx^3)^{4/3}}{4b^2} - \frac{a\sqrt[3]{a+bx^3}}{b^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^5/(a + b*x^3)^(2/3),x]

[Out] -((a*(a + b*x^3)^(1/3))/b^2) + (a + b*x^3)^(4/3)/(4*b^2)
```

Rubi in Sympy [A] time = 7.06374, size = 29, normalized size = 0.81

$$-\frac{a\sqrt[3]{a+bx^3}}{b^2} + \frac{(a+bx^3)^{\frac{4}{3}}}{4b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**5/(b*x**3+a)**(2/3),x)

[Out] -a*(a + b*x**3)**(1/3)/b**2 + (a + b*x**3)**(4/3)/(4*b**2)
```

Mathematica [A] time = 0.0197119, size = 27, normalized size = 0.75

$$\frac{(bx^3-3a)\sqrt[3]{a+bx^3}}{4b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5/(a + b*x^3)^(2/3),x]

[Out] ((-3*a + b*x^3)*(a + b*x^3)^(1/3))/(4*b^2)
```

Maple [A] time = 0.007, size = 25, normalized size = 0.7

$$-\frac{-bx^3+3a}{4b^2}\sqrt[3]{bx^3+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5/(b*x^3+a)^(2/3),x)
```

```
[Out] -1/4*(b*x^3+a)^(1/3)*(-b*x^3+3*a)/b^2
```

Maxima [A] time = 1.42822, size = 41, normalized size = 1.14

$$\frac{\left(bx^3+a\right)^{\frac{4}{3}}}{4\,b^2}-\frac{\left(bx^3+a\right)^{\frac{1}{3}}a}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^3 + a)^(2/3),x, algorithm="maxima")
```

```
[Out] 1/4*(b*x^3 + a)^(4/3)/b^2 - (b*x^3 + a)^(1/3)*a/b^2
```

Fricas [A] time = 0.231915, size = 31, normalized size = 0.86

$$\frac{\left(bx^3+a\right)^{\frac{1}{3}}\left(bx^3-3\,a\right)}{4\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^3 + a)^(2/3),x, algorithm="fricas")
```

```
[Out] 1/4*(b*x^3 + a)^(1/3)*(b*x^3 - 3*a)/b^2
```

Sympy [A] time = 2.71002, size = 44, normalized size = 1.22

$$\begin{cases} -\frac{3a\sqrt[3]{a+bx^3}}{4b^2}+\frac{x^3\sqrt[3]{a+bx^3}}{4b} & \text{for } b \neq 0 \\ \frac{x^6}{6a^{\frac{2}{3}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(b*x**3+a)**(2/3),x)
```

```
[Out] Piecewise((-3*a*(a + b*x**3)**(1/3)/(4*b**2) + x**3*(a + b*x**3)*
*(1/3)/(4*b), Ne(b, 0)), (x**6/(6*a**(2/3)), True))
```

GIAC/XCAS [A] time = 0.336972, size = 36, normalized size = 1.

$$\frac{\left(bx^3+a\right)^{\frac{4}{3}}-4\left(bx^3+a\right)^{\frac{1}{3}}a}{4\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^3 + a)^(2/3),x, algorithm="giac")
```

```
[Out] 1/4*((b*x^3 + a)^(4/3) - 4*(b*x^3 + a)^(1/3)*a)/b^2
```

3.563 $\int \frac{x^2}{(a+bx^3)^{2/3}}\,dx$

Optimal. Leaf size=15

$$\frac{\sqrt[3]{a+bx^3}}{b}$$

```
[Out] (a + b*x^3)^(1/3)/b
```

Rubi [A] time = 0.0103252, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{\sqrt[3]{a+bx^3}}{b}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(a + b*x^3)^(2/3),x]

[Out] (a + b*x^3)^(1/3)/b
```

Rubi in Sympy [A] time = 2.15879, size = 10, normalized size = 0.67

$$\frac{\sqrt[3]{a+bx^3}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**2/(b*x**3+a)**(2/3),x)

[Out] (a + b*x**3)**(1/3)/b
```

Mathematica [A] time = 0.00839603, size = 15, normalized size = 1.

$$\frac{\sqrt[3]{a+bx^3}}{b}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(a + b*x^3)^(2/3),x]

[Out] (a + b*x^3)^(1/3)/b
```

Maple [A] time = 0.005, size = 14, normalized size = 0.9

$$\frac{1}{b}\sqrt[3]{bx^3+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(b*x^3+a)^(2/3),x)

[Out] (b*x^3+a)^(1/3)/b
```

Maxima [A] time = 1.43317, size = 18, normalized size = 1.2

$$\frac{\left(bx^3+a\right)^{\frac{1}{3}}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^3 + a)^(2/3),x, algorithm="maxima")
```

```
[Out] (b*x^3 + a)^(1/3)/b
```

Fricas [A] time = 0.227798, size = 18, normalized size = 1.2

$$\frac{\left(bx^3+a\right)^{\frac{1}{3}}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^3 + a)^(2/3),x, algorithm="fricas")
```

```
[Out] (b*x^3 + a)^(1/3)/b
```

Sympy [A] time = 1.60796, size = 20, normalized size = 1.33

$$\begin{cases} \frac{\sqrt[3]{a+bx^3}}{b} & \text{for } b \neq 0 \\ \frac{x^3}{3a^{\frac{2}{3}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(b*x**3+a)**(2/3),x)
```

```
[Out] Piecewise(((a + b*x**3)**(1/3)/b, Ne(b, 0)), (x**3/(3*a**(2/3)),
True))
```

GIAC/XCAS [A] time = 0.358414, size = 18, normalized size = 1.2

$$\frac{\left(bx^3+a\right)^{\frac{1}{3}}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^3 + a)^(2/3),x, algorithm="giac")
```

```
[Out] (b*x^3 + a)^(1/3)/b
```

3.564 $\int \frac{1}{x(a+bx^3)^{2/3}}\,dx$

Optimal. Leaf size=84

$$\frac{\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^3}\right)}{2a^{2/3}}-\frac{\tan^{-1}\left(\frac{2\sqrt[3]{a+bx^3}+\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}a^{2/3}}-\frac{\log(x)}{2a^{2/3}}$$

```
[Out] -(ArcTan[(a^(1/3) + 2*(a + b*x^3)^(1/3))/(Sqrt[3]*a^(1/3))]/(Sqrt
[3]*a^(2/3))) - Log[x]/(2*a^(2/3)) + Log[a^(1/3) - (a + b*x^3)^(1
/3)]/(2*a^(2/3))
```

Rubi [A] time = 0.115965, antiderivative size = 84, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^3}\right)}{2a^{2/3}}-\frac{\tan^{-1}\left(\frac{2\sqrt[3]{a+bx^3}+\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}a^{2/3}}-\frac{\log(x)}{2a^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a + b*x^3)^(2/3)),x]
```

```
[Out] -(ArcTan[(a^(1/3) + 2*(a + b*x^3)^(1/3))/(Sqrt[3]*a^(1/3))]/(Sqrt
[3]*a^(2/3))) - Log[x]/(2*a^(2/3)) + Log[a^(1/3) - (a + b*x^3)^(1
/3)]/(2*a^(2/3))
```

Rubi in Sympy [A] time = 7.38794, size = 78, normalized size = 0.93

$$-\frac{\log\left(x^3\right)}{6a^{\frac{2}{3}}}+\frac{\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^3}\right)}{2a^{\frac{2}{3}}}-\frac{\sqrt{3}\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\frac{2\sqrt[3]{a+bx^3}}{3}\right)}{\sqrt[3]{a}}\right)}{3a^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(b*x**3+a)**(2/3),x)
```

```
[Out] -log(x**3)/(6*a**(2/3)) + log(a**(1/3) - (a + b*x**3)**(1/3))/(2*
a**(2/3)) - sqrt(3)*atan(sqrt(3)*(a**(1/3)/3 + 2*(a + b*x**3)**(1
/3)/3)/a**(1/3))/(3*a**(2/3))
```

Mathematica [C] time = 0.0334808, size = 48, normalized size = 0.57

$$-\frac{\left(\frac{a}{bx^3}+1\right)^{2/3}{}_2F_1\left(\frac{2}{3},\frac{2}{3};\frac{5}{3};-\frac{a}{bx^3}\right)}{2\left(a+bx^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a + b*x^3)^(2/3)),x]
```

```
[Out] -((1 + a/(b*x^3))^(2/3)*Hypergeometric2F1[2/3, 2/3, 5/3, -(a/(b*x
^3))])/(2*(a + b*x^3)^(2/3))
```

Maple [F] time = 0.031, size = 0, normalized size = 0.

$$\int \frac{1}{x}\left(bx^3+a\right)^{-\frac{2}{3}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(b*x^3+a)^(2/3),x)
```

```
[Out] int(1/x/(b*x^3+a)^(2/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(2/3)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.251581, size = 147, normalized size = 1.75

$$-\frac{\sqrt{3}\left(\sqrt{3}\log\left(a^2+\left(bx^3+a\right)^{\frac{1}{3}}\left(a^2\right)^{\frac{1}{3}}a+\left(bx^3+a\right)^{\frac{2}{3}}\left(a^2\right)^{\frac{2}{3}}\right)-2\sqrt{3}\log\left(-a+\left(bx^3+a\right)^{\frac{1}{3}}\left(a^2\right)^{\frac{1}{3}}\right)+6\arctan\left(\frac{\sqrt{3}a+2\sqrt{3}\left(bx^3+a\right)^{\frac{1}{3}}}{3a}\right.\right.}{18\left(a^2\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(2/3)*x),x, algorithm="fricas")
```

```
[Out] -1/18*sqrt(3)*(sqrt(3)*log(a^2 + (b*x^3 + a)^(1/3)*(a^2)^(1/3)*a
+ (b*x^3 + a)^(2/3)*(a^2)^(2/3)) - 2*sqrt(3)*log(-a + (b*x^3 + a)
^(1/3)*(a^2)^(1/3)) + 6*arctan(1/3*(sqrt(3)*a + 2*sqrt(3)*(b*x^3
+ a)^(1/3)*(a^2)^(1/3))/a))/(a^2)^(1/3)
```

Sympy [A] time = 3.86497, size = 39, normalized size = 0.46

$$-\frac{\Gamma\left(\frac{2}{3}\right){}_2F_1\left(\begin{matrix}\frac{2}{3},\frac{2}{3}\\\frac{5}{3}\end{matrix}\middle|\frac{ae^{i\pi}}{bx^3}\right)}{3b^{\frac{2}{3}}x^2\Gamma\left(\frac{5}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(b*x**3+a)**(2/3),x)
```

```
[Out] -gamma(2/3)*hyper((2/3, 2/3), (5/3,), a*exp_polar(I*pi)/(b*x**3))
/(3*b**(2/3)*x**2*gamma(5/3))
```

GIAC/XCAS [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(2/3)*x),x, algorithm="giac")
```

```
[Out] Timed out
```

3.565 $\int \frac{1}{x^4(a+bx^3)^{2/3}}\,dx$

Optimal. Leaf size=110

$$-\frac{b\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^3}\right)}{3a^{5/3}}+\frac{2b\tan^{-1}\left(\frac{2\sqrt[3]{a+bx^3}+\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{5/3}}+\frac{b\log(x)}{3a^{5/3}}-\frac{\sqrt[3]{a+bx^3}}{3ax^3}$$

```
[Out] -(a + b*x^3)^(1/3)/(3*a*x^3) + (2*b*ArcTan[(a^(1/3) + 2*(a + b*x^
3)^(1/3))/(Sqrt[3]*a^(1/3))])/(3*Sqrt[3]*a^(5/3)) + (b*Log[x])/(3
*a^(5/3)) - (b*Log[a^(1/3) - (a + b*x^3)^(1/3)])/(3*a^(5/3))
```

Rubi [A] time = 0.153255, antiderivative size = 110, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$-\frac{b\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^3}\right)}{3a^{5/3}}+\frac{2b\tan^{-1}\left(\frac{2\sqrt[3]{a+bx^3}+\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{5/3}}+\frac{b\log(x)}{3a^{5/3}}-\frac{\sqrt[3]{a+bx^3}}{3ax^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*(a + b*x^3)^(2/3)),x]
```

```
[Out] -(a + b*x^3)^(1/3)/(3*a*x^3) + (2*b*ArcTan[(a^(1/3) + 2*(a + b*x^
3)^(1/3))/(Sqrt[3]*a^(1/3))])/(3*Sqrt[3]*a^(5/3)) + (b*Log[x])/(3
*a^(5/3)) - (b*Log[a^(1/3) - (a + b*x^3)^(1/3)])/(3*a^(5/3))
```

Rubi in Sympy [A] time = 10.4717, size = 102, normalized size = 0.93

$$-\frac{\sqrt[3]{a+bx^3}}{3ax^3}+\frac{b\log\left(x^3\right)}{9a^{\frac{5}{3}}}-\frac{b\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^3}\right)}{3a^{\frac{5}{3}}}+\frac{2\sqrt{3}b\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\frac{2\sqrt[3]{a+bx^3}}{3}\right)}{\sqrt[3]{a}}\right)}{9a^{\frac{5}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(b*x**3+a)**(2/3),x)
```

```
[Out] -(a + b*x**3)**(1/3)/(3*a*x**3) + b*log(x**3)/(9*a**(5/3)) - b*lo
g(a**(1/3) - (a + b*x**3)**(1/3))/(3*a**(5/3)) + 2*sqrt(3)*b*atan
(sqrt(3)*(a**(1/3)/3 + 2*(a + b*x**3)**(1/3)/3)/a**(1/3))/(9*a**(
5/3))
```

Mathematica [C] time = 0.0487433, size = 69, normalized size = 0.63

$$\frac{bx^3\left(\frac{a}{bx^3}+1\right)^{2/3}{}_2F_1\left(\frac{2}{3},\frac{2}{3};\frac{5}{3};-\frac{a}{bx^3}\right)-a-bx^3}{3ax^3\left(a+bx^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*(a + b*x^3)^(2/3)),x]
```

```
[Out] (-a - b*x^3 + b*(1 + a/(b*x^3))^(2/3)*x^3*Hypergeometric2F1[2/3,
2/3, 5/3, -(a/(b*x^3))])/(3*a*x^3*(a + b*x^3)^(2/3))
```

Maple [F] time = 0.044, size = 0, normalized size = 0.

$$\int \frac{1}{x^4} \left(bx^3 + a\right)^{-\frac{2}{3}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(b*x^3+a)^(2/3),x)
```

```
[Out] int(1/x^4/(b*x^3+a)^(2/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(2/3)*x^4),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.251071, size = 212, normalized size = 1.93

$$-\frac{\sqrt{3}\left(\sqrt{3}bx^3 \log\left(a^2 - \left(bx^3 + a\right)^{\frac{1}{3}} \left(-a^2\right)^{\frac{1}{3}} a + \left(bx^3 + a\right)^{\frac{2}{3}} \left(-a^2\right)^{\frac{2}{3}}\right) - 2\sqrt{3}bx^3 \log\left(a + \left(bx^3 + a\right)^{\frac{1}{3}} \left(-a^2\right)^{\frac{1}{3}}\right) - 6\, bx^3 \arctan\left(\right.}{27\left(-a^2\right)^{\frac{1}{3}} ax^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(2/3)*x^4),x, algorithm="fricas")
```

```
[Out] -1/27*sqrt(3)*(sqrt(3)*b*x^3*log(a^2 - (b*x^3 + a)^(1/3)*(-a^2)^(
1/3)*a + (b*x^3 + a)^(2/3)*(-a^2)^(2/3)) - 2*sqrt(3)*b*x^3*log(a
+ (b*x^3 + a)^(1/3)*(-a^2)^(1/3)) - 6*b*x^3*arctan(-1/3*(sqrt(3)*
a - 2*sqrt(3)*(b*x^3 + a)^(1/3)*(-a^2)^(1/3))/a) + 3*sqrt(3)*(b*x
^3 + a)^(1/3)*(-a^2)^(1/3))/((-a^2)^(1/3)*a*x^3)
```

Sympy [A] time = 5.08161, size = 39, normalized size = 0.35

$$-\frac{\Gamma\left(\frac{5}{3}\right) {}_{2}F_{1}\left(\begin{matrix} \frac{2}{3}, \frac{5}{3} \\ \frac{8}{3} \end{matrix}\middle| {\frac{ae^{i\pi}}{bx^3}} \right)}{3b^{\frac{2}{3}}x^5\,\Gamma\left(\frac{8}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(b*x**3+a)**(2/3),x)
```

```
[Out] -gamma(5/3)*hyper((2/3, 5/3), (8/3,), a*exp_polar(I*pi)/(b*x**3))
/(3*b**(2/3)*x**5*gamma(8/3))
```

GIAC/XCAS [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(2/3)*x^4),x, algorithm="giac")
```

```
[Out] Timed out
```

3.566 $\int \frac{x^4}{(a+bx^3)^{2/3}}\,dx$

Optimal. Leaf size=148

$$\frac{2a\log\left(1-\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}\right)}{9b^{5/3}}+\frac{2a\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1}{\sqrt{3}}\right)}{3\sqrt{3}b^{5/3}}-\frac{a\log\left(\frac{b^{2/3}x^2}{(a+bx^3)^{2/3}}+\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)}{9b^{5/3}}+\frac{x^2\sqrt[3]{a+bx^3}}{3b}$$

```
[Out] (x^2*(a + b*x^3)^(1/3))/(3*b) + (2*a*ArcTan[(1 + (2*b^(1/3)*x)/(a
 + b*x^3)^(1/3))/Sqrt[3]])/(3*Sqrt[3]*b^(5/3)) + (2*a*Log[1 - (b^
(1/3)*x)/(a + b*x^3)^(1/3)])/(9*b^(5/3)) - (a*Log[1 + (b^(2/3)*x^
2)/(a + b*x^3)^(2/3) + (b^(1/3)*x)/(a + b*x^3)^(1/3)])/(9*b^(5/3)
)
```

Rubi [A] time = 0.159726, antiderivative size = 148, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.533

$$\frac{2a\log\left(1-\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}\right)}{9b^{5/3}}+\frac{2a\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1}{\sqrt{3}}\right)}{3\sqrt{3}b^{5/3}}-\frac{a\log\left(\frac{b^{2/3}x^2}{(a+bx^3)^{2/3}}+\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)}{9b^{5/3}}+\frac{x^2\sqrt[3]{a+bx^3}}{3b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a + b*x^3)^(2/3),x]
```

```
[Out] (x^2*(a + b*x^3)^(1/3))/(3*b) + (2*a*ArcTan[(1 + (2*b^(1/3)*x)/(a
 + b*x^3)^(1/3))/Sqrt[3]])/(3*Sqrt[3]*b^(5/3)) + (2*a*Log[1 - (b^
(1/3)*x)/(a + b*x^3)^(1/3)])/(9*b^(5/3)) - (a*Log[1 + (b^(2/3)*x^
2)/(a + b*x^3)^(2/3) + (b^(1/3)*x)/(a + b*x^3)^(1/3)])/(9*b^(5/3)
)
```

Rubi in Sympy [A] time = 21.2135, size = 139, normalized size = 0.94

$$\frac{2a\log\left(-\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)}{9b^{\frac{5}{3}}}-\frac{a\log\left(\frac{b^{\frac{2}{3}}x^2}{(a+bx^3)^{\frac{2}{3}}}+\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)}{9b^{\frac{5}{3}}}+\frac{2\sqrt{3}a\,\mathrm{atan}\left(\sqrt{3}\left(\frac{2\sqrt[3]{b}x}{3\sqrt[3]{a+bx^3}}+\frac{1}{3}\right)\right)}{9b^{\frac{5}{3}}}+\frac{x^2\sqrt[3]{a+bx^3}}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(b*x**3+a)**(2/3),x)
```

```
[Out] 2*a*log(-b**(1/3)*x/(a + b*x**3)**(1/3) + 1)/(9*b**(5/3)) - a*log
(b**(2/3)*x**2/(a + b*x**3)**(2/3) + b**(1/3)*x/(a + b*x**3)**(1/
3) + 1)/(9*b**(5/3)) + 2*sqrt(3)*a*atan(sqrt(3)*(2*b**(1/3)*x/(3*
(a + b*x**3)**(1/3)) + 1/3))/(9*b**(5/3)) + x**2*(a + b*x**3)**(1
/3)/(3*b)
```

Mathematica [C] time = 0.0485299, size = 64, normalized size = 0.43

$$\frac{x^2\left(-a\left(\frac{bx^3}{a}+1\right)^{2/3}{}_2F_1\left(\frac{2}{3},\frac{2}{3};\frac{5}{3};-\frac{bx^3}{a}\right)+a+bx^3\right)}{3b\left(a+bx^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(a + b*x^3)^(2/3),x]
```

```
[Out] (x^2*(a + b*x^3 - a*(1 + (b*x^3)/a)^(2/3)*Hypergeometric2F1[2/3,
2/3, 5/3, -((b*x^3)/a)]))/(3*b*(a + b*x^3)^(2/3))
```

Maple [F] time = 0.036, size = 0, normalized size = 0.

$$\int x^4 \left(bx^3+a\right)^{-\frac{2}{3}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(b*x^3+a)^(2/3),x)
```

```
[Out] int(x^4/(b*x^3+a)^(2/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^3 + a)^(2/3),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.259649, size = 212, normalized size = 1.43

$$\frac{\sqrt{3}\left(3\sqrt{3}\left(bx^3+a\right)^{\frac{1}{3}}\left(b^2\right)^{\frac{1}{3}}x^2+2\sqrt{3}a\log\left(-\frac{bx-\left(bx^3+a\right)^{\frac{1}{3}}\left(b^2\right)^{\frac{1}{3}}}{x}\right)-\sqrt{3}a\log\left(\frac{b^2x^2+\left(bx^3+a\right)^{\frac{1}{3}}\left(b^2\right)^{\frac{1}{3}}bx+\left(bx^3+a\right)^{\frac{2}{3}}\left(b^2\right)^{\frac{2}{3}}}{x^2}\right)-6\,a\arctan}{27\left(b^2\right)^{\frac{1}{3}}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^3 + a)^(2/3),x, algorithm="fricas")
```

```
[Out] 1/27*sqrt(3)*(3*sqrt(3)*(b*x^3 + a)^(1/3)*(b^2)^(1/3)*x^2 + 2*sqr
t(3)*a*log(-(b*x - (b*x^3 + a)^(1/3)*(b^2)^(1/3))/x) - sqrt(3)*a*
log((b^2*x^2 + (b*x^3 + a)^(1/3)*(b^2)^(1/3)*b*x + (b*x^3 + a)^(2
/3)*(b^2)^(2/3))/x^2) - 6*a*arctan(1/3*(sqrt(3)*b*x + 2*sqrt(3)*(
b*x^3 + a)^(1/3)*(b^2)^(1/3))/(b*x)))/((b^2)^(1/3)*b)
```

Sympy [A] time = 4.33538, size = 37, normalized size = 0.25

$$\frac{x^5\,\Gamma\left(\frac{5}{3}\right)\,{}_2F_1\left(\begin{matrix}\frac{2}{3},\frac{5}{3}\\ \frac{8}{3}\end{matrix}\middle|\frac{bx^3e^{i\pi}}{a}\right)}{3a^{\frac{2}{3}}\,\Gamma\left(\frac{8}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(b*x**3+a)**(2/3),x)
```

```
[Out] x**5*gamma(5/3)*hyper((2/3, 5/3), (8/3,), b*x**3*exp_polar(I*pi)/
a)/(3*a**(2/3)*gamma(8/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{(bx^3 + a)^{\frac{2}{3}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^3 + a)^(2/3),x, algorithm="giac")
```

```
[Out] integrate(x^4/(b*x^3 + a)^(2/3), x)
```

3.567 $\int \frac{x}{(a+bx^3)^{2/3}} \, dx$

Optimal. Leaf size=72

$$-\frac{\log\left(\sqrt[3]{b}x-\sqrt[3]{a+bx^3}\right)}{2b^{2/3}}-\frac{\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1}{\sqrt{3}}\right)}{\sqrt{3}b^{2/3}}$$

```
[Out] -(ArcTan[(1 + (2*b^(1/3)*x)/(a + b*x^3)^(1/3))/Sqrt[3]]/(Sqrt[3]*
b^(2/3))) - Log[b^(1/3)*x - (a + b*x^3)^(1/3)]/(2*b^(2/3))
```

Rubi [A] time = 0.116012, antiderivative size = 122, normalized size of antiderivative = 1.69, number of steps used = 7, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.538$

$$-\frac{\log\left(1-\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}\right)}{3b^{2/3}}-\frac{\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1}{\sqrt{3}}\right)}{\sqrt{3}b^{2/3}}+\frac{\log\left(\frac{b^{2/3}x^2}{(a+bx^3)^{2/3}}+\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)}{6b^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b*x^3)^(2/3),x]
```

```
[Out] -(ArcTan[(1 + (2*b^(1/3)*x)/(a + b*x^3)^(1/3))/Sqrt[3]]/(Sqrt[3]*
b^(2/3))) - Log[1 - (b^(1/3)*x)/(a + b*x^3)^(1/3)]/(3*b^(2/3)) +
Log[1 + (b^(2/3)*x^2)/(a + b*x^3)^(2/3) + (b^(1/3)*x)/(a + b*x^3)
^(1/3)]/(6*b^(2/3))
```

Rubi in Sympy [A] time = 17.5484, size = 114, normalized size = 1.58

$$-\frac{\log\left(-\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)}{3b^{\frac{2}{3}}}+\frac{\log\left(\frac{b^{\frac{2}{3}}x^2}{(a+bx^3)^{\frac{2}{3}}}+\frac{\sqrt[3]{b}x}{\sqrt[3]{a+bx^3}}+1\right)}{6b^{\frac{2}{3}}}-\frac{\sqrt{3}\operatorname{atan}\left(\sqrt{3}\left(\frac{2\sqrt[3]{b}x}{3\sqrt[3]{a+bx^3}}+\frac{1}{3}\right)\right)}{3b^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(b*x**3+a)**(2/3),x)
```

```
[Out] -log(-b**(1/3)*x/(a + b*x**3)**(1/3) + 1)/(3*b**(2/3)) + log(b**(
2/3)*x**2/(a + b*x**3)**(2/3) + b**(1/3)*x/(a + b*x**3)**(1/3) +
1)/(6*b**(2/3)) - sqrt(3)*atan(sqrt(3)*(2*b**(1/3)*x/(3*(a + b*x*
*3)**(1/3)) + 1/3))/(3*b**(2/3))
```

Mathematica [C] time = 0.0262757, size = 52, normalized size = 0.72

$$\frac{x^2\left(\frac{a+bx^3}{a}\right)^{2/3}\,{}_2F_1\left(\frac{2}{3},\frac{2}{3};\frac{5}{3};-\frac{bx^3}{a}\right)}{2\left(a+bx^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b*x^3)^(2/3),x]
```

```
[Out] (x^2*((a + b*x^3)/a)^(2/3)*Hypergeometric2F1[2/3, 2/3, 5/3, -((b*
x^3)/a)])/(2*(a + b*x^3)^(2/3))
```

Maple [F] time = 0.027, size = 0, normalized size = 0.

$$\int x\left(bx^{3}+a\right)^{-\frac{2}{3}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(b*x^3+a)^(2/3),x)

[Out] int(x/(b*x^3+a)^(2/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^3 + a)^(2/3),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [A] time = 0.242715, size = 186, normalized size = 2.58

$$\frac{\sqrt{3}\left(2\sqrt{3}\log\left(\frac{bx+\left(bx^{3}+a\right)^{\frac{1}{3}}\left(-b^{2}\right)^{\frac{1}{3}}}{x}\right)-\sqrt{3}\log\left(\frac{b^{2}x^{2}-\left(bx^{3}+a\right)^{\frac{1}{3}}\left(-b^{2}\right)^{\frac{1}{3}}bx+\left(bx^{3}+a\right)^{\frac{2}{3}}\left(-b^{2}\right)^{\frac{2}{3}}}{x^{2}}\right)+6\arctan\left(-\frac{\sqrt{3}bx-2\sqrt{3}\left(bx^{3}+a\right)^{\frac{1}{3}}\left(-b^{2}\right)^{\frac{1}{3}}}{3bx}\right)\right)}{18\left(-b^{2}\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^3 + a)^(2/3),x, algorithm="fricas")

[Out] 1/18*sqrt(3)*(2*sqrt(3)*log((b*x + (b*x^3 + a)^(1/3)*(-b^2)^(1/3)
)/x) - sqrt(3)*log((b^2*x^2 - (b*x^3 + a)^(1/3)*(-b^2)^(1/3)*b*x
+ (b*x^3 + a)^(2/3)*(-b^2)^(2/3))/x^2) + 6*arctan(-1/3*(sqrt(3)*b
*x - 2*sqrt(3)*(b*x^3 + a)^(1/3)*(-b^2)^(1/3))/(b*x)))/(-b^2)^(1/
3)
```

Sympy [A] time = 3.65367, size = 37, normalized size = 0.51

$$\frac{x^{2}\Gamma\left(\frac{2}{3}\right){}_{2}F_{1}\left(\begin{matrix}\frac{2}{3},\frac{2}{3}\\\frac{5}{3}\end{matrix}\middle|\frac{bx^{3}e^{i\pi}}{a}\right)}{3a^{\frac{2}{3}}\Gamma\left(\frac{5}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x**3+a)**(2/3),x)

[Out] x**2*gamma(2/3)*hyper((2/3, 2/3), (5/3,), b*x**3*exp_polar(I*pi)/
a)/(3*a**(2/3)*gamma(5/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{(bx^3 + a)^{\frac{2}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^3 + a)^(2/3),x, algorithm="giac")
```

```
[Out] integrate(x/(b*x^3 + a)^(2/3), x)
```

3.568 $\int \frac{1}{x^2(a+bx^3)^{2/3}}\,dx$

Optimal. Leaf size=19

$$-\frac{\sqrt[3]{a+bx^3}}{ax}$$

```
[Out] -((a + b*x^3)^(1/3)/(a*x))
```

Rubi [A] time = 0.0200223, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$-\frac{\sqrt[3]{a+bx^3}}{ax}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(a + b*x^3)^(2/3)),x]

[Out] -((a + b*x^3)^(1/3)/(a*x))
```

Rubi in Sympy [A] time = 2.67965, size = 14, normalized size = 0.74

$$-\frac{\sqrt[3]{a+bx^3}}{ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(b*x**3+a)**(2/3),x)

[Out] -(a + b*x**3)**(1/3)/(a*x)
```

Mathematica [A] time = 0.0147874, size = 19, normalized size = 1.

$$-\frac{\sqrt[3]{a+bx^3}}{ax}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*(a + b*x^3)^(2/3)),x]

[Out] -((a + b*x^3)^(1/3)/(a*x))
```

Maple [A] time = 0.004, size = 18, normalized size = 1.

$$-\frac{1}{ax}\sqrt[3]{bx^3+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(b*x^3+a)^(2/3),x)

[Out] -(b*x^3+a)^(1/3)/a/x
```

Maxima [A] time = 1.44057, size = 23, normalized size = 1.21

$$-\frac{\left(bx^3+a\right)^{\frac{1}{3}}}{ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(2/3)*x^2),x, algorithm="maxima")

[Out] -(b*x^3 + a)^(1/3)/(a*x)
```

Fricas [A] time = 0.234428, size = 23, normalized size = 1.21

$$-\frac{\left(bx^3+a\right)^{\frac{1}{3}}}{ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(2/3)*x^2),x, algorithm="fricas")

[Out] -(b*x^3 + a)^(1/3)/(a*x)
```

Sympy [A] time = 2.21171, size = 31, normalized size = 1.63

$$\frac{\sqrt[3]{b}\sqrt[3]{\frac{a}{bx^3}+1}\,\Gamma\left(-\frac{1}{3}\right)}{3a\,\Gamma\left(\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(b*x**3+a)**(2/3),x)

[Out] b**(1/3)*(a/(b*x**3) + 1)**(1/3)*gamma(-1/3)/(3*a*gamma(2/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^3+a)^{\frac{2}{3}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(2/3)*x^2),x, algorithm="giac")

[Out] integrate(1/((b*x^3 + a)^(2/3)*x^2), x)
```

3.569 $\int \frac{1}{x^5(a+bx^3)^{2/3}} \, dx$

Optimal. Leaf size=44

$$\frac{3b\sqrt[3]{a+bx^3}}{4a^2x}-\frac{\sqrt[3]{a+bx^3}}{4ax^4}$$

```
[Out] -(a + b*x^3)^(1/3)/(4*a*x^4) + (3*b*(a + b*x^3)^(1/3))/(4*a^2*x)
```

Rubi [A] time = 0.0410695, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{3b\sqrt[3]{a+bx^3}}{4a^2x}-\frac{\sqrt[3]{a+bx^3}}{4ax^4}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^5*(a + b*x^3)^(2/3)),x]
```

```
[Out] -(a + b*x^3)^(1/3)/(4*a*x^4) + (3*b*(a + b*x^3)^(1/3))/(4*a^2*x)
```

Rubi in Sympy [A] time = 4.23445, size = 36, normalized size = 0.82

$$-\frac{\sqrt[3]{a+bx^3}}{4ax^4}+\frac{3b\sqrt[3]{a+bx^3}}{4a^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**5/(b*x**3+a)**(2/3),x)
```

```
[Out] -(a + b*x**3)**(1/3)/(4*a*x**4) + 3*b*(a + b*x**3)**(1/3)/(4*a**2
*x)
```

Mathematica [A] time = 0.0218465, size = 29, normalized size = 0.66

$$-\frac{\left(a-3bx^3\right)\sqrt[3]{a+bx^3}}{4a^2x^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^5*(a + b*x^3)^(2/3)),x]
```

```
[Out] -((a - 3*b*x^3)*(a + b*x^3)^(1/3))/(4*a^2*x^4)
```

Maple [A] time = 0.007, size = 26, normalized size = 0.6

$$-\frac{-3\,bx^3+a}{4\,x^4a^2}\sqrt[3]{bx^3+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^5/(b*x^3+a)^(2/3),x)
```

```
[Out] -1/4*(b*x^3+a)^(1/3)*(-3*b*x^3+a)/x^4/a^2
```

Maxima [A] time = 1.43592, size = 47, normalized size = 1.07

$$\frac{\frac{4\,(bx^3+a)^{\frac{1}{3}}b}{x} - \frac{(bx^3+a)^{\frac{4}{3}}}{x^4}}{4\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(2/3)*x^5),x, algorithm="maxima")
```

```
[Out] 1/4*(4*(b*x^3 + a)^(1/3)*b/x - (b*x^3 + a)^(4/3)/x^4)/a^2
```

Fricas [A] time = 0.244261, size = 36, normalized size = 0.82

$$\frac{\left(3\,bx^3 - a\right)\left(bx^3 + a\right)^{\frac{1}{3}}}{4\,a^2x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(2/3)*x^5),x, algorithm="fricas")
```

```
[Out] 1/4*(3*b*x^3 - a)*(b*x^3 + a)^(1/3)/(a^2*x^4)
```

Sympy [A] time = 3.37566, size = 68, normalized size = 1.55

$$-\frac{\sqrt[3]{b}\sqrt[3]{\frac{a}{bx^3}+1}\,\Gamma\left(-\frac{4}{3}\right)}{9ax^3\,\Gamma\left(\frac{2}{3}\right)} + \frac{b^{\frac{4}{3}}\sqrt[3]{\frac{a}{bx^3}+1}\,\Gamma\left(-\frac{4}{3}\right)}{3a^2\,\Gamma\left(\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**5/(b*x**3+a)**(2/3),x)
```

```
[Out] -b**(1/3)*(a/(b*x**3) + 1)**(1/3)*gamma(-4/3)/(9*a*x**3*gamma(2/3
)) + b**(4/3)*(a/(b*x**3) + 1)**(1/3)*gamma(-4/3)/(3*a**2*gamma(2
/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^3+a)^{\frac{2}{3}}x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(2/3)*x^5),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^3 + a)^(2/3)*x^5), x)
```

3.570 $\int \frac{1}{x^8(a+bx^3)^{2/3}} dx$

Optimal. Leaf size=68

$$-\frac{9b^2\sqrt[3]{a+bx^3}}{14a^3x}+\frac{3b\sqrt[3]{a+bx^3}}{14a^2x^4}-\frac{\sqrt[3]{a+bx^3}}{7ax^7}$$

```
[Out] -(a + b*x^3)^(1/3)/(7*a*x^7) + (3*b*(a + b*x^3)^(1/3))/(14*a^2*x^
4) - (9*b^2*(a + b*x^3)^(1/3))/(14*a^3*x)
```

Rubi [A] time = 0.0646689, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{9b^2\sqrt[3]{a+bx^3}}{14a^3x}+\frac{3b\sqrt[3]{a+bx^3}}{14a^2x^4}-\frac{\sqrt[3]{a+bx^3}}{7ax^7}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^8*(a + b*x^3)^(2/3)),x]
```

```
[Out] -(a + b*x^3)^(1/3)/(7*a*x^7) + (3*b*(a + b*x^3)^(1/3))/(14*a^2*x^
4) - (9*b^2*(a + b*x^3)^(1/3))/(14*a^3*x)
```

Rubi in Sympy [A] time = 6.63645, size = 60, normalized size = 0.88

$$-\frac{\sqrt[3]{a+bx^3}}{7ax^7}+\frac{3b\sqrt[3]{a+bx^3}}{14a^2x^4}-\frac{9b^2\sqrt[3]{a+bx^3}}{14a^3x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**8/(b*x**3+a)**(2/3),x)
```

```
[Out] -(a + b*x**3)**(1/3)/(7*a*x**7) + 3*b*(a + b*x**3)**(1/3)/(14*a**
2*x**4) - 9*b**2*(a + b*x**3)**(1/3)/(14*a**3*x)
```

Mathematica [A] time = 0.0302845, size = 42, normalized size = 0.62

$$-\frac{\sqrt[3]{a+bx^3}\left(2a^2-3abx^3+9b^2x^6\right)}{14a^3x^7}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^8*(a + b*x^3)^(2/3)),x]
```

```
[Out] -((a + b*x^3)^(1/3)*(2*a^2 - 3*a*b*x^3 + 9*b^2*x^6))/(14*a^3*x^7)
```

Maple [A] time = 0.007, size = 39, normalized size = 0.6

$$-\frac{9\,b^2x^6-3\,abx^3+2\,a^2}{14\,a^3x^7}\sqrt[3]{bx^3+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^8/(b*x^3+a)^(2/3),x)
```

```
[Out] -1/14*(b*x^3+a)^(1/3)*(9*b^2*x^6-3*a*b*x^3+2*a^2)/a^3/x^7
```

Maxima [A] time = 1.43645, size = 70, normalized size = 1.03

$$-\frac{\frac{14\,(bx^3+a)^{\frac{1}{3}}b^2}{x}-\frac{7\,(bx^3+a)^{\frac{4}{3}}b}{x^4}+\frac{2\,(bx^3+a)^{\frac{7}{3}}}{x^7}}{14\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(2/3)*x^8),x, algorithm="maxima")
```

```
[Out] -1/14*(14*(b*x^3 + a)^(1/3)*b^2/x - 7*(b*x^3 + a)^(4/3)*b/x^4 + 2
*(b*x^3 + a)^(7/3)/x^7)/a^3
```

Fricas [A] time = 0.24131, size = 51, normalized size = 0.75

$$-\frac{\left(9\,b^2x^6-3\,abx^3+2\,a^2\right)\left(bx^3+a\right)^{\frac{1}{3}}}{14\,a^3x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(2/3)*x^8),x, algorithm="fricas")
```

```
[Out] -1/14*(9*b^2*x^6 - 3*a*b*x^3 + 2*a^2)*(b*x^3 + a)^(1/3)/(a^3*x^7)
```

Sympy [A] time = 6.42866, size = 406, normalized size = 5.97

$$\frac{4a^4b^{\frac{13}{3}}\sqrt[3]{\frac{a}{bx^3}+1}\,\Gamma\left(-\frac{7}{3}\right)}{27a^5b^4x^6\,\Gamma\left(\frac{2}{3}\right)+54a^4b^5x^9\,\Gamma\left(\frac{2}{3}\right)+27a^3b^6x^{12}\,\Gamma\left(\frac{2}{3}\right)}+\frac{2a^3b^{\frac{16}{3}}x^3\sqrt[3]{\frac{a}{bx^3}+1}\,\Gamma\left(-\frac{7}{3}\right)}{27a^5b^4x^6\,\Gamma\left(\frac{2}{3}\right)+54a^4b^5x^9\,\Gamma\left(\frac{2}{3}\right)+27a^3b^6x^{12}\,\Gamma\left(\frac{2}{3}\right)}+\frac{10a^2b^{\frac{19}{3}}x^6\sqrt[3]{\frac{a}{bx^3}+1}\,\Gamma\left(-\frac{7}{3}\right)}{27a^5b^4x^6\,\Gamma\left(\frac{2}{3}\right)+54a^4b^5x^9\,\Gamma\left(\frac{2}{3}\right)+27a^3b^6x^{12}\,\Gamma\left(\frac{2}{3}\right)}+\frac{30ab^{\frac{22}{3}}x^9\sqrt[3]{\frac{a}{bx^3}+1}\,\Gamma\left(-\frac{7}{3}\right)}{27a^5b^4x^6\,\Gamma\left(\frac{2}{3}\right)+54a^4b^5x^9\,\Gamma\left(\frac{2}{3}\right)+27a^3b^6x^{12}\,\Gamma\left(\frac{2}{3}\right)}+\frac{18b^{\frac{25}{3}}x^{12}\sqrt[3]{\frac{a}{bx^3}+1}\,\Gamma\left(-\frac{7}{3}\right)}{27a^5b^4x^6\,\Gamma\left(\frac{2}{3}\right)+54a^4b^5x^9\,\Gamma\left(\frac{2}{3}\right)+27a^3b^6x^{12}\,\Gamma\left(\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**8/(b*x**3+a)**(2/3),x)
```

```
[Out] 4*a**4*b**(13/3)*(a/(b*x**3) + 1)**(1/3)*gamma(-7/3)/(27*a**5*b**
4*x**6*gamma(2/3) + 54*a**4*b**5*x**9*gamma(2/3) + 27*a**3*b**6*x
**12*gamma(2/3)) + 2*a**3*b**(16/3)*x**3*(a/(b*x**3) + 1)**(1/3)*
gamma(-7/3)/(27*a**5*b**4*x**6*gamma(2/3) + 54*a**4*b**5*x**9*gam
ma(2/3) + 27*a**3*b**6*x**12*gamma(2/3)) + 10*a**2*b**(19/3)*x**6
*(a/(b*x**3) + 1)**(1/3)*gamma(-7/3)/(27*a**5*b**4*x**6*gamma(2/3
) + 54*a**4*b**5*x**9*gamma(2/3) + 27*a**3*b**6*x**12*gamma(2/3))
 + 30*a*b**(22/3)*x**9*(a/(b*x**3) + 1)**(1/3)*gamma(-7/3)/(27*a*
*5*b**4*x**6*gamma(2/3) + 54*a**4*b**5*x**9*gamma(2/3) + 27*a**3*
b**6*x**12*gamma(2/3)) + 18*b**(25/3)*x**12*(a/(b*x**3) + 1)**(1/
3)*gamma(-7/3)/(27*a**5*b**4*x**6*gamma(2/3) + 54*a**4*b**5*x**9*
gamma(2/3) + 27*a**3*b**6*x**12*gamma(2/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^3 + a)^{\frac{2}{3}}x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(2/3)*x^8),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^3 + a)^(2/3)*x^8), x)
```

3.571 $\int \frac{1}{x^{11}(a+bx^3)^{2/3}}\,dx$

Optimal. Leaf size=92

$$\frac{81b^3\sqrt[3]{a+bx^3}}{140a^4x}-\frac{27b^2\sqrt[3]{a+bx^3}}{140a^3x^4}+\frac{9b\sqrt[3]{a+bx^3}}{70a^2x^7}-\frac{\sqrt[3]{a+bx^3}}{10ax^{10}}$$

```
[Out] -(a + b*x^3)^(1/3)/(10*a*x^10) + (9*b*(a + b*x^3)^(1/3))/(70*a^2*
x^7) - (27*b^2*(a + b*x^3)^(1/3))/(140*a^3*x^4) + (81*b^3*(a + b*
x^3)^(1/3))/(140*a^4*x)
```

Rubi [A] time = 0.0941144, antiderivative size = 92, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{81b^3\sqrt[3]{a+bx^3}}{140a^4x}-\frac{27b^2\sqrt[3]{a+bx^3}}{140a^3x^4}+\frac{9b\sqrt[3]{a+bx^3}}{70a^2x^7}-\frac{\sqrt[3]{a+bx^3}}{10ax^{10}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^11*(a + b*x^3)^(2/3)),x]
```

```
[Out] -(a + b*x^3)^(1/3)/(10*a*x^10) + (9*b*(a + b*x^3)^(1/3))/(70*a^2*
x^7) - (27*b^2*(a + b*x^3)^(1/3))/(140*a^3*x^4) + (81*b^3*(a + b*
x^3)^(1/3))/(140*a^4*x)
```

Rubi in Sympy [A] time = 9.74862, size = 83, normalized size = 0.9

$$-\frac{\sqrt[3]{a+bx^3}}{10ax^{10}}+\frac{9b\sqrt[3]{a+bx^3}}{70a^2x^7}-\frac{27b^2\sqrt[3]{a+bx^3}}{140a^3x^4}+\frac{81b^3\sqrt[3]{a+bx^3}}{140a^4x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**11/(b*x**3+a)**(2/3),x)
```

```
[Out] -(a + b*x**3)**(1/3)/(10*a*x**10) + 9*b*(a + b*x**3)**(1/3)/(70*a
**2*x**7) - 27*b**2*(a + b*x**3)**(1/3)/(140*a**3*x**4) + 81*b**3
*(a + b*x**3)**(1/3)/(140*a**4*x)
```

Mathematica [A] time = 0.0372198, size = 53, normalized size = 0.58

$$\frac{\sqrt[3]{a+bx^3}\left(-14a^3+18a^2bx^3-27ab^2x^6+81b^3x^9\right)}{140a^4x^{10}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^11*(a + b*x^3)^(2/3)),x]
```

```
[Out] ((a + b*x^3)^(1/3)*(-14*a^3 + 18*a^2*b*x^3 - 27*a*b^2*x^6 + 81*b^
3*x^9))/(140*a^4*x^10)
```

Maple [A] time = 0.008, size = 50, normalized size = 0.5

$$-\frac{-81\,b^3x^9+27\,ab^2x^6-18\,a^2bx^3+14\,a^3}{140\,x^{10}a^4}\sqrt[3]{bx^3+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^11/(b*x^3+a)^(2/3),x)
```

```
[Out] -1/140*(b*x^3+a)^(1/3)*(-81*b^3*x^9+27*a*b^2*x^6-18*a^2*b*x^3+14*
a^3)/x^10/a^4
```

Maxima [A] time = 1.43711, size = 93, normalized size = 1.01

$$\frac{\frac{140\left(bx^3+a\right)^{\frac{1}{3}}b^3}{x}-\frac{105\left(bx^3+a\right)^{\frac{4}{3}}b^2}{x^4}+\frac{60\left(bx^3+a\right)^{\frac{7}{3}}b}{x^7}-\frac{14\left(bx^3+a\right)^{\frac{10}{3}}}{x^{10}}}{140\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(2/3)*x^11),x, algorithm="maxima")
```

```
[Out] 1/140*(140*(b*x^3 + a)^(1/3)*b^3/x - 105*(b*x^3 + a)^(4/3)*b^2/x^
4 + 60*(b*x^3 + a)^(7/3)*b/x^7 - 14*(b*x^3 + a)^(10/3)/x^10)/a^4
```

Fricas [A] time = 0.237884, size = 66, normalized size = 0.72

$$\frac{\left(81\,b^3x^9-27\,ab^2x^6+18\,a^2bx^3-14\,a^3\right)\left(bx^3+a\right)^{\frac{1}{3}}}{140\,a^4x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(2/3)*x^11),x, algorithm="fricas")
```

```
[Out] 1/140*(81*b^3*x^9 - 27*a*b^2*x^6 + 18*a^2*b*x^3 - 14*a^3)*(b*x^3
+ a)^(1/3)/(a^4*x^10)
```

Sympy [A] time = 11.5598, size = 692, normalized size = 7.52

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**11/(b*x**3+a)**(2/3),x)
```

```
[Out] -28*a**6*b**(28/3)*(a/(b*x**3) + 1)**(1/3)*gamma(-10/3)/(81*a**7*
b**9*x**9*gamma(2/3) + 243*a**6*b**10*x**12*gamma(2/3) + 243*a**5
*b**11*x**15*gamma(2/3) + 81*a**4*b**12*x**18*gamma(2/3)) - 48*a*
*5*b**(31/3)*x**3*(a/(b*x**3) + 1)**(1/3)*gamma(-10/3)/(81*a**7*b
**9*x**9*gamma(2/3) + 243*a**6*b**10*x**12*gamma(2/3) + 243*a**5*
b**11*x**15*gamma(2/3) + 81*a**4*b**12*x**18*gamma(2/3)) - 30*a**
4*b**(34/3)*x**6*(a/(b*x**3) + 1)**(1/3)*gamma(-10/3)/(81*a**7*b*
*9*x**9*gamma(2/3) + 243*a**6*b**10*x**12*gamma(2/3) + 243*a**5*b
**11*x**15*gamma(2/3) + 81*a**4*b**12*x**18*gamma(2/3)) + 80*a**3
*b**(37/3)*x**9*(a/(b*x**3) + 1)**(1/3)*gamma(-10/3)/(81*a**7*b**
9*x**9*gamma(2/3) + 243*a**6*b**10*x**12*gamma(2/3) + 243*a**5*b*
*11*x**15*gamma(2/3) + 81*a**4*b**12*x**18*gamma(2/3)) + 360*a**2
*b**(40/3)*x**12*(a/(b*x**3) + 1)**(1/3)*gamma(-10/3)/(81*a**7*b*
*9*x**9*gamma(2/3) + 243*a**6*b**10*x**12*gamma(2/3) + 243*a**5*b
**11*x**15*gamma(2/3) + 81*a**4*b**12*x**18*gamma(2/3)) + 432*a*b
**(43/3)*x**15*(a/(b*x**3) + 1)**(1/3)*gamma(-10/3)/(81*a**7*b**9
*x**9*gamma(2/3) + 243*a**6*b**10*x**12*gamma(2/3) + 243*a**5*b**
11*x**15*gamma(2/3) + 81*a**4*b**12*x**18*gamma(2/3)) + 162*b**(4
6/3)*x**18*(a/(b*x**3) + 1)**(1/3)*gamma(-10/3)/(81*a**7*b**9*x**
```

```
9*gamma(2/3) + 243*a**6*b**10*x**12*gamma(2/3) + 243*a**5*b**11*x
**15*gamma(2/3) + 81*a**4*b**12*x**18*gamma(2/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^3+a)^{\frac{2}{3}}x^{11}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(2/3)*x^11),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^3 + a)^(2/3)*x^11), x)
```

3.572 $\int \frac{x^6}{(a+bx^3)^{2/3}}\,dx$

Optimal. Leaf size=38

$$\frac{x^7\sqrt[3]{a+bx^3}\,{}_2F_1\left(1,\frac{8}{3};\frac{10}{3};-\frac{bx^3}{a}\right)}{7a}$$

```
[Out] (x^7*(a + b*x^3)^(1/3)*Hypergeometric2F1[1, 8/3, 10/3, -((b*x^3)/
a)])/(7*a)
```

Rubi [A] time = 0.0575217, antiderivative size = 51, normalized size of antiderivative = 1.34, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{x^7\left(\frac{bx^3}{a}+1\right)^{2/3}\,{}_2F_1\left(\frac{2}{3},\frac{7}{3};\frac{10}{3};-\frac{bx^3}{a}\right)}{7\left(a+bx^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/(a + b*x^3)^(2/3),x]
```

```
[Out] (x^7*(1 + (b*x^3)/a)^(2/3)*Hypergeometric2F1[2/3, 7/3, 10/3, -((b
*x^3)/a)])/(7*(a + b*x^3)^(2/3))
```

Rubi in Sympy [A] time = 6.2921, size = 42, normalized size = 1.11

$$\frac{x^7\sqrt[3]{a+bx^3}\,{}_2F_1\left(\begin{matrix}\frac{2}{3},\frac{7}{3}\\\frac{10}{3}\end{matrix}\middle|-\frac{bx^3}{a}\right)}{7a\sqrt[3]{1+\frac{bx^3}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(b*x**3+a)**(2/3),x)
```

```
[Out] x**7*(a + b*x**3)**(1/3)*hyper((2/3, 7/3), (10/3,), -b*x**3/a)/(7
*a*(1 + b*x**3/a)**(1/3))
```

Mathematica [B] time = 0.054328, size = 78, normalized size = 2.05

$$\frac{2a^2x\left(\frac{bx^3}{a}+1\right)^{2/3}\,{}_2F_1\left(\frac{1}{3},\frac{2}{3};\frac{4}{3};-\frac{bx^3}{a}\right)-2a^2x-abx^4+b^2x^7}{5b^2\left(a+bx^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6/(a + b*x^3)^(2/3),x]
```

```
[Out] (-2*a^2*x - a*b*x^4 + b^2*x^7 + 2*a^2*x*(1 + (b*x^3)/a)^(2/3)*Hyp
ergeometric2F1[1/3, 2/3, 4/3, -((b*x^3)/a)])/(5*b^2*(a + b*x^3)^(
2/3))
```

Maple [F] time = 0.037, size = 0, normalized size = 0.

$$\int x^6\left(bx^3+a\right)^{-\frac{2}{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^6/(b*x^3+a)^(2/3),x)
```

```
[Out] int(x^6/(b*x^3+a)^(2/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{(bx^3+a)^{\frac{2}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^6/(b*x^3 + a)^(2/3),x, algorithm="maxima")
```

```
[Out] integrate(x^6/(b*x^3 + a)^(2/3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^6}{(bx^3+a)^{\frac{2}{3}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^6/(b*x^3 + a)^(2/3),x, algorithm="fricas")
```

```
[Out] integral(x^6/(b*x^3 + a)^(2/3), x)
```

Sympy [A] time = 2.91734, size = 37, normalized size = 0.97

$$\frac{x^7\,\Gamma\left(\frac{7}{3}\right)\,{}_2F_1\left(\begin{matrix}\frac{2}{3},\frac{7}{3}\\ \frac{10}{3}\end{matrix}\middle|\,\frac{bx^3e^{i\pi}}{a}\right)}{3a^{\frac{2}{3}}\,\Gamma\left(\frac{10}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**6/(b*x**3+a)**(2/3),x)
```

```
[Out] x**7*gamma(7/3)*hyper((2/3, 7/3), (10/3,), b*x**3*exp_polar(I*pi)
/a)/(3*a**(2/3)*gamma(10/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{(bx^3+a)^{\frac{2}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^6/(b*x^3 + a)^(2/3),x, algorithm="giac")
```

```
[Out] integrate(x^6/(b*x^3 + a)^(2/3), x)
```

3.573 $\int \frac{x^3}{(a+bx^3)^{2/3}}\,dx$

Optimal. Leaf size=38

$$\frac{x^4\sqrt[3]{a+bx^3}\,{}_2F_1\left(1,\frac{5}{3};\frac{7}{3};-\frac{bx^3}{a}\right)}{4a}$$

```
[Out] (x^4*(a + b*x^3)^(1/3)*Hypergeometric2F1[1, 5/3, 7/3, -((b*x^3)/a
)])/(4*a)
```

Rubi [A] time = 0.0554262, antiderivative size = 51, normalized size of antiderivative = 1.34, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{x^4\left(\frac{bx^3}{a}+1\right)^{2/3}{}_2F_1\left(\frac{2}{3},\frac{4}{3};\frac{7}{3};-\frac{bx^3}{a}\right)}{4\left(a+bx^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(a + b*x^3)^(2/3),x]
```

```
[Out] (x^4*(1 + (b*x^3)/a)^(2/3)*Hypergeometric2F1[2/3, 4/3, 7/3, -((b*
x^3)/a)])/(4*(a + b*x^3)^(2/3))
```

Rubi in Sympy [A] time = 6.5362, size = 42, normalized size = 1.11

$$\frac{x^4\sqrt[3]{a+bx^3}\,{}_2F_1\left(\begin{matrix}\frac{2}{3},\frac{4}{3}\\ \frac{7}{3}\end{matrix}\middle|-\frac{bx^3}{a}\right)}{4a\sqrt[3]{1+\frac{bx^3}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(b*x**3+a)**(2/3),x)
```

```
[Out] x**4*(a + b*x**3)**(1/3)*hyper((2/3, 4/3), (7/3,), -b*x**3/a)/(4*
a*(1 + b*x**3/a)**(1/3))
```

Mathematica [A] time = 0.0482733, size = 62, normalized size = 1.63

$$\frac{x\left(-a\left(\frac{bx^3}{a}+1\right)^{2/3}{}_2F_1\left(\frac{1}{3},\frac{2}{3};\frac{4}{3};-\frac{bx^3}{a}\right)+a+bx^3\right)}{2b\left(a+bx^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(a + b*x^3)^(2/3),x]
```

```
[Out] (x*(a + b*x^3 - a*(1 + (b*x^3)/a)^(2/3)*Hypergeometric2F1[1/3, 2/
3, 4/3, -((b*x^3)/a)]))/(2*b*(a + b*x^3)^(2/3))
```

Maple [F] time = 0.052, size = 0, normalized size = 0.

$$\int x^3\left(bx^3+a\right)^{-\frac{2}{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^3/(b*x^3+a)^(2/3),x)
```

```
[Out] int(x^3/(b*x^3+a)^(2/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{(bx^3+a)^{\frac{2}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^3/(b*x^3 + a)^(2/3),x, algorithm="maxima")
```

```
[Out] integrate(x^3/(b*x^3 + a)^(2/3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^3}{(bx^3+a)^{\frac{2}{3}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^3/(b*x^3 + a)^(2/3),x, algorithm="fricas")
```

```
[Out] integral(x^3/(b*x^3 + a)^(2/3), x)
```

Sympy [A] time = 2.35418, size = 37, normalized size = 0.97

$$\frac{x^4\,\Gamma\left(\frac{4}{3}\right)\,{}_2F_1\left(\begin{matrix}\frac{2}{3},\frac{4}{3}\\ \frac{7}{3}\end{matrix}\middle|\frac{bx^3e^{i\pi}}{a}\right)}{3a^{\frac{2}{3}}\,\Gamma\left(\frac{7}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**3/(b*x**3+a)**(2/3),x)
```

```
[Out] x**4*gamma(4/3)*hyper((2/3, 4/3), (7/3,), b*x**3*exp_polar(I*pi)/
a)/(3*a**(2/3)*gamma(7/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{(bx^3+a)^{\frac{2}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^3/(b*x^3 + a)^(2/3),x, algorithm="giac")
```

```
[Out] integrate(x^3/(b*x^3 + a)^(2/3), x)
```

3.574 $\int \frac{1}{(a+bx^3)^{2/3}}\,dx$

Optimal. Leaf size=33

$$\frac{x\sqrt[3]{a+bx^3}\,{}_2F_1\left(\frac{2}{3},1;\frac{4}{3};-\frac{bx^3}{a}\right)}{a}$$

```
[Out] (x*(a + b*x^3)^(1/3)*Hypergeometric2F1[2/3, 1, 4/3, -((b*x^3)/a)]
)/a
```

Rubi [A] time = 0.0249702, antiderivative size = 46, normalized size of antiderivative = 1.39, number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{x\left(\frac{bx^3}{a}+1\right)^{2/3}\,{}_2F_1\left(\frac{1}{3},\frac{2}{3};\frac{4}{3};-\frac{bx^3}{a}\right)}{(a+bx^3)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^3)^(-2/3),x]
```

```
[Out] (x*(1 + (b*x^3)/a)^(2/3)*Hypergeometric2F1[1/3, 2/3, 4/3, -((b*x^
3)/a)])/(a + b*x^3)^(2/3)
```

Rubi in Sympy [A] time = 3.65654, size = 39, normalized size = 1.18

$$\frac{x\sqrt[3]{a+bx^3}\,{}_2F_1\left(\begin{matrix}\frac{2}{3},\frac{1}{3}\\ \frac{4}{3}\end{matrix}\middle|-\frac{bx^3}{a}\right)}{a\sqrt[3]{1+\frac{bx^3}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(b*x**3+a)**(2/3),x)
```

```
[Out] x*(a + b*x**3)**(1/3)*hyper((2/3, 1/3), (4/3,), -b*x**3/a)/(a*(1
+ b*x**3/a)**(1/3))
```

Mathematica [C] time = 0.395106, size = 177, normalized size = 5.36

$$\frac{3\sqrt[3]{2}\left((-1)^{2/3}\sqrt[3]{a}+\sqrt[3]{b}x\right)\left(\frac{\sqrt[3]{a}+(-1)^{2/3}\sqrt[3]{b}x}{\left(1+\sqrt[3]{-1}\right)\sqrt[3]{a}}\right)^{2/3}\sqrt[3]{\frac{i\left(\frac{\sqrt[3]{b}x}{\sqrt[3]{a}}+1\right)}{\sqrt{3}+3i}}\,{}_2F_1\left(\frac{1}{3},\frac{2}{3};\frac{4}{3};\frac{\left(1-i\sqrt{3}\right)\sqrt[3]{b}x+\left(1+i\sqrt{3}\right)\sqrt[3]{a}}{2\left(\sqrt[3]{b}x+\sqrt[3]{a}\right)}\right)}{\sqrt[3]{b}\,(a+bx^3)^{2/3}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*x^3)^(-2/3),x]
```

```
[Out] (3*2^(1/3)*((-1)^(2/3)*a^(1/3) + b^(1/3)*x)*((a^(1/3) + (-1)^(2/3
)*b^(1/3)*x)/((1 + (-1)^(1/3))*a^(1/3)))^(2/3)*((I*(1 + (b^(1/3)*
x)/a^(1/3)))/(3*I + Sqrt[3]))^(1/3)*Hypergeometric2F1[1/3, 2/3, 4
/3, ((1 + I*Sqrt[3])*a^(1/3) + (1 - I*Sqrt[3])*b^(1/3)*x)/(2*(a^(
1/3) + b^(1/3)*x))])/(b^(1/3)*(a + b*x^3)^(2/3))
```

Maple [F] time = 0.039, size = 0, normalized size = 0.

$$\int \left(b x^3+a\right)^{-\frac{2}{3}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^3+a)^(2/3),x)
```

```
[Out] int(1/(b*x^3+a)^(2/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(b x^3+a\right)^{\frac{2}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(-2/3),x, algorithm="maxima")
```

```
[Out] integrate((b*x^3 + a)^(-2/3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{\left(b x^3+a\right)^{\frac{2}{3}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(-2/3),x, algorithm="fricas")
```

```
[Out] integral((b*x^3 + a)^(-2/3), x)
```

Sympy [A] time = 2.13136, size = 36, normalized size = 1.09

$$\frac{x\,\Gamma\left(\frac{1}{3}\right)\,{}_2F_1\left(\left.\begin{matrix}\frac{1}{3},\frac{2}{3}\\ \frac{4}{3}\end{matrix}\right|\frac{bx^3e^{i\pi}}{a}\right)}{3a^{\frac{2}{3}}\,\Gamma\left(\frac{4}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**3+a)**(2/3),x)
```

```
[Out] x*gamma(1/3)*hyper((1/3, 2/3), (4/3,), b*x**3*exp_polar(I*pi)/a)/
(3*a**(2/3)*gamma(4/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(b x^3+a\right)^{\frac{2}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(-2/3),x, algorithm="giac")
```

```
[Out] integrate((b*x^3 + a)^(-2/3), x)
```

3.575 $\int \frac{1}{x^3(a+bx^3)^{2/3}}\,dx$

Optimal. Leaf size=38

$$-\frac{\sqrt[3]{a+bx^3}\,{}_2F_1\left(-\frac{1}{3},1;\frac{1}{3};-\frac{bx^3}{a}\right)}{2ax^2}$$

```
[Out] -((a + b*x^3)^(1/3)*Hypergeometric2F1[-1/3, 1, 1/3, -((b*x^3)/a)]
)/(2*a*x^2)
```

Rubi [A] time = 0.052523, antiderivative size = 51, normalized size of antiderivative = 1.34, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{\left(\frac{bx^3}{a}+1\right)^{2/3}\,{}_2F_1\left(-\frac{2}{3},\frac{2}{3};\frac{1}{3};-\frac{bx^3}{a}\right)}{2x^2\left(a+bx^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(a + b*x^3)^(2/3)),x]
```

```
[Out] -((1 + (b*x^3)/a)^(2/3)*Hypergeometric2F1[-2/3, 2/3, 1/3, -((b*x^
3)/a)])/(2*x^2*(a + b*x^3)^(2/3))
```

Rubi in Sympy [A] time = 6.08879, size = 46, normalized size = 1.21

$$-\frac{\sqrt[3]{a+bx^3}\,{}_2F_1\left(\begin{matrix}\frac{2}{3},-\frac{2}{3}\\ \frac{1}{3}\end{matrix}\middle|-\frac{bx^3}{a}\right)}{2ax^2\sqrt[3]{1+\frac{bx^3}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(b*x**3+a)**(2/3),x)
```

```
[Out] -(a + b*x**3)**(1/3)*hyper((2/3, -2/3), (1/3,), -b*x**3/a)/(2*a*x
**2*(1 + b*x**3/a)**(1/3))
```

Mathematica [A] time = 0.0532493, size = 70, normalized size = 1.84

$$\frac{-bx^3\left(\frac{bx^3}{a}+1\right)^{2/3}\,{}_2F_1\left(\frac{1}{3},\frac{2}{3};\frac{4}{3};-\frac{bx^3}{a}\right)-a-bx^3}{2ax^2\left(a+bx^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*(a + b*x^3)^(2/3)),x]
```

```
[Out] (-a - b*x^3 - b*x^3*(1 + (b*x^3)/a)^(2/3)*Hypergeometric2F1[1/3,
2/3, 4/3, -((b*x^3)/a)])/(2*a*x^2*(a + b*x^3)^(2/3))
```

Maple [F] time = 0.039, size = 0, normalized size = 0.

$$\int \frac{1}{x^3}\left(bx^3+a\right)^{-\frac{2}{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(b*x^3+a)^(2/3),x)
```

```
[Out] int(1/x^3/(b*x^3+a)^(2/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bx^3+a\right)^{\frac{2}{3}}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(2/3)*x^3),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x^3 + a)^(2/3)*x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{\left(bx^3+a\right)^{\frac{2}{3}}x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(2/3)*x^3),x, algorithm="fricas")
```

```
[Out] integral(1/((b*x^3 + a)^(2/3)*x^3), x)
```

Sympy [A] time = 2.85403, size = 41, normalized size = 1.08

$$\frac{\Gamma\left(-\frac{2}{3}\right) {}_2F_1\left(\begin{matrix} -\frac{2}{3}, \frac{2}{3} \\ \frac{1}{3} \end{matrix}\middle| \frac{bx^3e^{i\pi}}{a}\right)}{3a^{\frac{2}{3}}x^2\,\Gamma\left(\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(b*x**3+a)**(2/3),x)
```

```
[Out] gamma(-2/3)*hyper((-2/3, 2/3), (1/3,), b*x**3*exp_polar(I*pi)/a)/
(3*a**(2/3)*x**2*gamma(1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bx^3+a\right)^{\frac{2}{3}}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(2/3)*x^3),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^3 + a)^(2/3)*x^3), x)
```

3.576 $\int \frac{1}{x^6(a+bx^3)^{2/3}}\,dx$

Optimal. Leaf size=38

$$-\frac{\sqrt[3]{a+bx^3}\,{}_2F_1\left(-\frac{4}{3},1;-\frac{2}{3};-\frac{bx^3}{a}\right)}{5ax^5}$$

```
[Out] -((a + b*x^3)^(1/3)*Hypergeometric2F1[-4/3, 1, -2/3, -((b*x^3)/a)
])/(5*a*x^5)
```

Rubi [A] time = 0.0528049, antiderivative size = 51, normalized size of antiderivative = 1.34, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{\left(\frac{bx^3}{a}+1\right)^{2/3}\,{}_2F_1\left(-\frac{5}{3},\frac{2}{3};-\frac{2}{3};-\frac{bx^3}{a}\right)}{5x^5\left(a+bx^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^6*(a + b*x^3)^(2/3)),x]
```

```
[Out] -((1 + (b*x^3)/a)^(2/3)*Hypergeometric2F1[-5/3, 2/3, -2/3, -((b*x
^3)/a)])/(5*x^5*(a + b*x^3)^(2/3))
```

Rubi in Sympy [A] time = 6.12112, size = 48, normalized size = 1.26

$$-\frac{\sqrt[3]{a+bx^3}\,{}_2F_1\left(\begin{matrix}\frac{2}{3},-\frac{5}{3}\\-\frac{2}{3}\end{matrix}\middle|-\frac{bx^3}{a}\right)}{5ax^5\sqrt[3]{1+\frac{bx^3}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**6/(b*x**3+a)**(2/3),x)
```

```
[Out] -(a + b*x**3)**(1/3)*hyper((2/3, -5/3), (-2/3,), -b*x**3/a)/(5*a*
x**5*(1 + b*x**3/a)**(1/3))
```

Mathematica [B] time = 0.0607139, size = 82, normalized size = 2.16

$$\frac{-a^2+2b^2x^6\left(\frac{bx^3}{a}+1\right)^{2/3}\,{}_2F_1\left(\frac{1}{3},\frac{2}{3};\frac{4}{3};-\frac{bx^3}{a}\right)+abx^3+2b^2x^6}{5a^2x^5\left(a+bx^3\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^6*(a + b*x^3)^(2/3)),x]
```

```
[Out] (-a^2 + a*b*x^3 + 2*b^2*x^6 + 2*b^2*x^6*(1 + (b*x^3)/a)^(2/3)*Hyp
ergeometric2F1[1/3, 2/3, 4/3, -((b*x^3)/a)])/(5*a^2*x^5*(a + b*x^
3)^(2/3))
```

Maple [F] time = 0.046, size = 0, normalized size = 0.

$$\int \frac{1}{x^6}\left(bx^3+a\right)^{-\frac{2}{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^6/(b*x^3+a)^(2/3),x)
```

```
[Out] int(1/x^6/(b*x^3+a)^(2/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^3+a)^{\frac{2}{3}}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(2/3)*x^6),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x^3 + a)^(2/3)*x^6), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(bx^3+a)^{\frac{2}{3}}x^6}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(2/3)*x^6),x, algorithm="fricas")
```

```
[Out] integral(1/((b*x^3 + a)^(2/3)*x^6), x)
```

Sympy [A] time = 4.01704, size = 44, normalized size = 1.16

$$\frac{\Gamma\left(-\frac{5}{3}\right) {}_2F_1\left(\begin{matrix} -\frac{5}{3}, \frac{2}{3} \\ -\frac{2}{3} \end{matrix}\middle| \frac{bx^3e^{i\pi}}{a}\right)}{3a^{\frac{2}{3}}x^5\,\Gamma\left(-\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**6/(b*x**3+a)**(2/3),x)
```

```
[Out] gamma(-5/3)*hyper((-5/3, 2/3), (-2/3,), b*x**3*exp_polar(I*pi)/a)
/(3*a**(2/3)*x**5*gamma(-2/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^3+a)^{\frac{2}{3}}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)^(2/3)*x^6),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^3 + a)^(2/3)*x^6), x)
```

3.577 $\int \frac{1}{\sqrt[3]{a-bx^3}}\,dx$

Optimal. Leaf size=72

$$\frac{\log\left(\sqrt[3]{a-bx^3}+\sqrt[3]{b}x\right)}{2\sqrt[3]{b}}-\frac{\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{b}x}{\sqrt[3]{a-bx^3}}}{\sqrt{3}}\right)}{\sqrt{3}\sqrt[3]{b}}$$

```
[Out] -(ArcTan[(1 - (2*b^(1/3)*x)/(a - b*x^3)^(1/3))/Sqrt[3]]/(Sqrt[3]*
b^(1/3))) + Log[b^(1/3)*x + (a - b*x^3)^(1/3)]/(2*b^(1/3))
```

Rubi [A] time = 0.0303382, antiderivative size = 72, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083

$$\frac{\log\left(\sqrt[3]{a-bx^3}+\sqrt[3]{b}x\right)}{2\sqrt[3]{b}}-\frac{\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{b}x}{\sqrt[3]{a-bx^3}}}{\sqrt{3}}\right)}{\sqrt{3}\sqrt[3]{b}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a - b*x^3)^(-1/3),x]
```

```
[Out] -(ArcTan[(1 - (2*b^(1/3)*x)/(a - b*x^3)^(1/3))/Sqrt[3]]/(Sqrt[3]*
b^(1/3))) + Log[b^(1/3)*x + (a - b*x^3)^(1/3)]/(2*b^(1/3))
```

Rubi in Sympy [A] time = 16.488, size = 114, normalized size = 1.58

$$\frac{\log\left(\frac{\sqrt[3]{b}x}{\sqrt[3]{a-bx^3}}+1\right)}{3\sqrt[3]{b}}-\frac{\log\left(\frac{b^{\frac{2}{3}}x^2}{(a-bx^3)^{\frac{2}{3}}}-\frac{\sqrt[3]{b}x}{\sqrt[3]{a-bx^3}}+1\right)}{6\sqrt[3]{b}}-\frac{\sqrt{3}\,\operatorname{atan}\left(\sqrt{3}\left(-\frac{2\sqrt[3]{b}x}{3\sqrt[3]{a-bx^3}}+\frac{1}{3}\right)\right)}{3\sqrt[3]{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(-b*x**3+a)**(1/3),x)
```

```
[Out] log(b**(1/3)*x/(a - b*x**3)**(1/3) + 1)/(3*b**(1/3)) - log(b**(2/
3)*x**2/(a - b*x**3)**(2/3) - b**(1/3)*x/(a - b*x**3)**(1/3) + 1)
/(6*b**(1/3)) - sqrt(3)*atan(sqrt(3)*(-2*b**(1/3)*x/(3*(a - b*x**
3)**(1/3)) + 1/3))/(3*b**(1/3))
```

Mathematica [A] time = 0.132911, size = 116, normalized size = 1.61

$$\frac{-\log\left(\frac{b^{2/3}x^2}{(a-bx^3)^{2/3}}-\frac{\sqrt[3]{b}x}{\sqrt[3]{a-bx^3}}+1\right)+2\log\left(\frac{\sqrt[3]{b}x}{\sqrt[3]{a-bx^3}}+1\right)+2\sqrt{3}\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x}{\sqrt[3]{a-bx^3}}-1}{\sqrt{3}}\right)}{6\sqrt[3]{b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a - b*x^3)^(-1/3),x]
```

```
[Out] (2*Sqrt[3]*ArcTan[(-1 + (2*b^(1/3)*x)/(a - b*x^3)^(1/3))/Sqrt[3]]
 - Log[1 + (b^(2/3)*x^2)/(a - b*x^3)^(2/3) - (b^(1/3)*x)/(a - b*x
^3)^(1/3)] + 2*Log[1 + (b^(1/3)*x)/(a - b*x^3)^(1/3)])/(6*b^(1/3)
)
```

Maple [F] time = 0.045, size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt[3]{-b x^3 + a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(-b*x^3+a)^(1/3),x)
```

```
[Out] int(1/(-b*x^3+a)^(1/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^3 + a)^(-1/3),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.242721, size = 161, normalized size = 2.24

$$\frac{\sqrt{3}\left(2\sqrt{3}\log\left(\frac{bx+(-bx^3+a)^{\frac{1}{3}}b^{\frac{2}{3}}}{x}\right) - \sqrt{3}\log\left(\frac{bx^2-(-bx^3+a)^{\frac{1}{3}}b^{\frac{2}{3}}x+(-bx^3+a)^{\frac{2}{3}}b^{\frac{1}{3}}}{x^2}\right) - 6\arctan\left(-\frac{\sqrt{3}bx-2\sqrt{3}(-bx^3+a)^{\frac{1}{3}}b^{\frac{2}{3}}}{3bx}\right)\right)}{18\, b^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^3 + a)^(-1/3),x, algorithm="fricas")
```

```
[Out] 1/18*sqrt(3)*(2*sqrt(3)*log((b*x + (-b*x^3 + a)^(1/3)*b^(2/3))/x)
 - sqrt(3)*log((b*x^2 - (-b*x^3 + a)^(1/3)*b^(2/3)*x + (-b*x^3 +
a)^(2/3)*b^(1/3))/x^2) - 6*arctan(-1/3*(sqrt(3)*b*x - 2*sqrt(3)*(
-b*x^3 + a)^(1/3)*b^(2/3))/(b*x)))/b^(1/3)
```

Sympy [A] time = 3.65963, size = 37, normalized size = 0.51

$$\frac{x\,\Gamma\left(\frac{1}{3}\right)\, {}_2F_1\left(\begin{matrix}\frac{1}{3}, \frac{1}{3} \\ \frac{4}{3}\end{matrix}\middle|\, \frac{bx^3 e^{2i\pi}}{a}\right)}{3\sqrt[3]{a}\,\Gamma\left(\frac{4}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(-b*x**3+a)**(1/3),x)
```

```
[Out] x*gamma(1/3)*hyper((1/3, 1/3), (4/3,), b*x**3*exp_polar(2*I*pi)/a
)/(3*a**(1/3)*gamma(4/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-bx^3 + a\right)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^3 + a)^(-1/3),x, algorithm="giac")
```

```
[Out] integrate((-b*x^3 + a)^(-1/3), x)
```

3.578 $\int \frac{1}{\sqrt[3]{2+x^3}}\,dx$

Optimal. Leaf size=46

$$\frac{\tan^{-1}\left(\frac{\frac{2x}{\sqrt[3]{x^3+2}}+1}{\sqrt{3}}\right)}{\sqrt{3}}-\frac{1}{2}\log\left(\sqrt[3]{x^3+2}-x\right)$$

```
[Out] ArcTan[(1 + (2*x)/(2 + x^3)^(1/3))/Sqrt[3]]/Sqrt[3] - Log[-x + (2
 + x^3)^(1/3)]/2
```

Rubi [A] time = 0.0168941, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111

$$\frac{\tan^{-1}\left(\frac{\frac{2x}{\sqrt[3]{x^3+2}}+1}{\sqrt{3}}\right)}{\sqrt{3}}-\frac{1}{2}\log\left(\sqrt[3]{x^3+2}-x\right)$$

Antiderivative was successfully verified.

```
[In]  Int[(2 + x^3)^(-1/3),x]
```

```
[Out] ArcTan[(1 + (2*x)/(2 + x^3)^(1/3))/Sqrt[3]]/Sqrt[3] - Log[-x + (2
 + x^3)^(1/3)]/2
```

Rubi in Sympy [A] time = 5.34997, size = 71, normalized size = 1.54

$$-\frac{\log\left(-\frac{x}{\sqrt[3]{x^3+2}}+1\right)}{3}+\frac{\log\left(\frac{x^2}{(x^3+2)^{\frac{2}{3}}}+\frac{x}{\sqrt[3]{x^3+2}}+1\right)}{6}+\frac{\sqrt{3}\,\mathrm{atan}\left(\sqrt{3}\left(\frac{2x}{3\sqrt[3]{x^3+2}}+\frac{1}{3}\right)\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(x**3+2)**(1/3),x)
```

```
[Out] -log(-x/(x**3 + 2)**(1/3) + 1)/3 + log(x**2/(x**3 + 2)**(2/3) + x
/(x**3 + 2)**(1/3) + 1)/6 + sqrt(3)*atan(sqrt(3)*(2*x/(3*(x**3 +
2)**(1/3)) + 1/3))/3
```

Mathematica [A] time = 0.0597671, size = 78, normalized size = 1.7

$$-\frac{1}{3}\log\left(1-\frac{x}{\sqrt[3]{x^3+2}}\right)+\frac{\tan^{-1}\left(\frac{\frac{2x}{\sqrt[3]{x^3+2}}+1}{\sqrt{3}}\right)}{\sqrt{3}}+\frac{1}{6}\log\left(\frac{x}{\sqrt[3]{x^3+2}}+\frac{x^2}{(x^3+2)^{2/3}}+1\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(2 + x^3)^(-1/3),x]
```

```
[Out] ArcTan[(1 + (2*x)/(2 + x^3)^(1/3))/Sqrt[3]]/Sqrt[3] - Log[1 - x/(
2 + x^3)^(1/3)]/3 + Log[1 + x^2/(2 + x^3)^(2/3) + x/(2 + x^3)^(1/
3)]/6
```

Maple [C] time = 0.041, size = 18, normalized size = 0.4

$$\frac{x2^{\frac{2}{3}}}{2}{}_2\mathrm{F}_1(\frac{1}{3},\frac{1}{3};\frac{4}{3};-\frac{x^3}{2})$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/(x^3+2)^(1/3),x)
```

```
[Out] 1/2*2^(2/3)*x*hypergeom([1/3,1/3],[4/3],-1/2*x^3)
```

Maxima [A] time = 1.58662, size = 93, normalized size = 2.02

$$-\frac{1}{3}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}\left(\frac{2\left(x^3+2\right)^{\frac{1}{3}}}{x}+1\right)\right)+\frac{1}{6}\log\left(\frac{\left(x^3+2\right)^{\frac{1}{3}}}{x}+\frac{\left(x^3+2\right)^{\frac{2}{3}}}{x^2}+1\right)-\frac{1}{3}\log\left(\frac{\left(x^3+2\right)^{\frac{1}{3}}}{x}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((x^3 + 2)^(-1/3),x, algorithm="maxima")
```

```
[Out] -1/3*sqrt(3)*arctan(1/3*sqrt(3)*(2*(x^3 + 2)^(1/3)/x + 1)) + 1/6*
log((x^3 + 2)^(1/3)/x + (x^3 + 2)^(2/3)/x^2 + 1) - 1/3*log((x^3 +
 2)^(1/3)/x - 1)
```

Fricas [A] time = 0.244586, size = 113, normalized size = 2.46

$$-\frac{1}{18}\sqrt{3}\left(2\sqrt{3}\log\left(-\frac{x-\left(x^3+2\right)^{\frac{1}{3}}}{x}\right)-\sqrt{3}\log\left(\frac{x^2+\left(x^3+2\right)^{\frac{1}{3}}x+\left(x^3+2\right)^{\frac{2}{3}}}{x^2}\right)+6\arctan\left(\frac{\sqrt{3}x+2\sqrt{3}\left(x^3+2\right)^{\frac{1}{3}}}{3x}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((x^3 + 2)^(-1/3),x, algorithm="fricas")
```

```
[Out] -1/18*sqrt(3)*(2*sqrt(3)*log(-(x - (x^3 + 2)^(1/3))/x) - sqrt(3)*
log((x^2 + (x^3 + 2)^(1/3)*x + (x^3 + 2)^(2/3))/x^2) + 6*arctan(1
/3*(sqrt(3)*x + 2*sqrt(3)*(x^3 + 2)^(1/3))/x))
```

Sympy [A] time = 3.22593, size = 34, normalized size = 0.74

$$\frac{2^{\frac{2}{3}}x\,\Gamma\left(\frac{1}{3}\right){}_2F_1\left(\begin{matrix}\frac{1}{3},\frac{1}{3}\\\frac{4}{3}\end{matrix}\middle|\frac{x^3e^{i\pi}}{2}\right)}{6\,\Gamma\left(\frac{4}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(x**3+2)**(1/3),x)
```

```
[Out] 2**(2/3)*x*gamma(1/3)*hyper((1/3, 1/3), (4/3,), x**3*exp_polar(I*
pi)/2)/(6*gamma(4/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\left(x^3+2\right)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x^3 + 2)^(-1/3),x, algorithm="giac")
```

```
[Out] integrate((x^3 + 2)^(-1/3), x)
```

3.579 $\int \frac{x}{(1-x^3)^{2/3}}\,dx$

Optimal. Leaf size=49

$$-\frac{1}{2}\log\left(\sqrt[3]{1-x^3}+x\right)-\frac{\tan^{-1}\left(\frac{1-\frac{2x}{\sqrt[3]{1-x^3}}}{\sqrt{3}}\right)}{\sqrt{3}}$$

```
[Out] -(ArcTan[(1 - (2*x)/(1 - x^3)^(1/3))/Sqrt[3]]/Sqrt[3]) - Log[x +
(1 - x^3)^(1/3)]/2
```

Rubi [A] time = 0.0908387, antiderivative size = 87, normalized size of antiderivative = 1.78, number of steps used = 7, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538

$$-\frac{1}{3}\log\left(\frac{x}{\sqrt[3]{1-x^3}}+1\right)-\frac{\tan^{-1}\left(\frac{1-\frac{2x}{\sqrt[3]{1-x^3}}}{\sqrt{3}}\right)}{\sqrt{3}}+\frac{1}{6}\log\left(-\frac{x}{\sqrt[3]{1-x^3}}+\frac{x^2}{(1-x^3)^{2/3}}+1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x/(1 - x^3)^(2/3),x]
```

```
[Out] -(ArcTan[(1 - (2*x)/(1 - x^3)^(1/3))/Sqrt[3]]/Sqrt[3]) + Log[1 +
x^2/(1 - x^3)^(2/3) - x/(1 - x^3)^(1/3)]/6 - Log[1 + x/(1 - x^3)^
(1/3)]/3
```

Rubi in Sympy [A] time = 8.29559, size = 71, normalized size = 1.45

$$-\frac{\log\left(\frac{x}{\sqrt[3]{-x^3+1}}+1\right)}{3}+\frac{\log\left(\frac{x^2}{(-x^3+1)^{\frac{2}{3}}}-\frac{x}{\sqrt[3]{-x^3+1}}+1\right)}{6}+\frac{\sqrt{3}\,\mathrm{atan}\left(\sqrt{3}\left(\frac{2x}{3\sqrt[3]{-x^3+1}}-\frac{1}{3}\right)\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(-x**3+1)**(2/3),x)
```

```
[Out] -log(x/(-x**3 + 1)**(1/3) + 1)/3 + log(x**2/(-x**3 + 1)**(2/3) -
x/(-x**3 + 1)**(1/3) + 1)/6 + sqrt(3)*atan(sqrt(3)*(2*x/(3*(-x**3
 + 1)**(1/3)) - 1/3))/3
```

Mathematica [C] time = 0.0126688, size = 20, normalized size = 0.41

$$\frac{1}{2}x^2\,{}_2F_1\left(\frac{2}{3},\frac{2}{3};\frac{5}{3};x^3\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(1 - x^3)^(2/3),x]
```

```
[Out] (x^2*Hypergeometric2F1[2/3, 2/3, 5/3, x^3])/2
```

Maple [C] time = 0.053, size = 15, normalized size = 0.3

$$\frac{x^2}{2}\,{}_2\mathrm{F}_1\left(\frac{2}{3},\frac{2}{3};\,\frac{5}{3};\,x^3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(-x^3+1)^(2/3),x)
```

```
[Out] 1/2*x^2*hypergeom([2/3,2/3],[5/3],x^3)
```

Maxima [A] time = 1.58136, size = 105, normalized size = 2.14

$$-\frac{1}{3}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}\left(\frac{2\left(-x^3+1\right)^{\frac{1}{3}}}{x}-1\right)\right)-\frac{1}{3}\log\left(\frac{\left(-x^3+1\right)^{\frac{1}{3}}}{x}+1\right)+\frac{1}{6}\log\left(-\frac{\left(-x^3+1\right)^{\frac{1}{3}}}{x}+\frac{\left(-x^3+1\right)^{\frac{2}{3}}}{x^2}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(-x^3 + 1)^(2/3),x, algorithm="maxima")
```

```
[Out] -1/3*sqrt(3)*arctan(1/3*sqrt(3)*(2*(-x^3 + 1)^(1/3)/x - 1)) - 1/3
*log((-x^3 + 1)^(1/3)/x + 1) + 1/6*log(-(-x^3 + 1)^(1/3)/x + (-x^
3 + 1)^(2/3)/x^2 + 1)
```

Fricas [A] time = 0.243673, size = 122, normalized size = 2.49

$$-\frac{1}{18}\sqrt{3}\left(2\sqrt{3}\log\left(\frac{x+\left(-x^3+1\right)^{\frac{1}{3}}}{x}\right)-\sqrt{3}\log\left(\frac{x^2-\left(-x^3+1\right)^{\frac{1}{3}}x+\left(-x^3+1\right)^{\frac{2}{3}}}{x^2}\right)+6\arctan\left(-\frac{\sqrt{3}x-2\sqrt{3}\left(-x^3+1\right)^{\frac{1}{3}}}{3x}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(-x^3 + 1)^(2/3),x, algorithm="fricas")
```

```
[Out] -1/18*sqrt(3)*(2*sqrt(3)*log((x + (-x^3 + 1)^(1/3))/x) - sqrt(3)*
log((x^2 - (-x^3 + 1)^(1/3)*x + (-x^3 + 1)^(2/3))/x^2) + 6*arctan
(-1/3*(sqrt(3)*x - 2*sqrt(3)*(-x^3 + 1)^(1/3))/x))
```

Sympy [A] time = 3.31958, size = 31, normalized size = 0.63

$$\frac{x^2\left(\frac{2}{3}\right){}_2F_1\left(\begin{matrix}\frac{2}{3},\frac{2}{3}\\\frac{5}{3}\end{matrix}\middle|x^3e^{2i\pi}\right)}{3\left(\frac{5}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(-x**3+1)**(2/3),x)
```

```
[Out] x**2*gamma(2/3)*hyper((2/3, 2/3), (5/3,), x**3*exp_polar(2*I*pi))
/(3*gamma(5/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\left(-x^3+1\right)^{\frac{2}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(-x^3 + 1)^(2/3),x, algorithm="giac")
```

```
[Out] integrate(x/(-x^3 + 1)^(2/3), x)
```

3.580 $\int \frac{x^2}{\sqrt[4]{2+x^3}}\,dx$

Optimal. Leaf size=13

$$\frac{4}{9}\left(x^3+2\right)^{3/4}$$

```
[Out] (4*(2 + x^3)^(3/4))/9
```

Rubi [A] time = 0.00718234, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$\frac{4}{9}\left(x^3+2\right)^{3/4}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(2 + x^3)^(1/4),x]

[Out] (4*(2 + x^3)^(3/4))/9
```

Rubi in Sympy [A] time = 1.62351, size = 10, normalized size = 0.77

$$\frac{4\left(x^3+2\right)^{\frac{3}{4}}}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**2/(x**3+2)**(1/4),x)

[Out] 4*(x**3 + 2)**(3/4)/9
```

Mathematica [A] time = 0.00564578, size = 13, normalized size = 1.

$$\frac{4}{9}\left(x^3+2\right)^{3/4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(2 + x^3)^(1/4),x]

[Out] (4*(2 + x^3)^(3/4))/9
```

Maple [A] time = 0.005, size = 10, normalized size = 0.8

$$\frac{4}{9}\left(x^3+2\right)^{\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(x^3+2)^(1/4),x)

[Out] 4/9*(x^3+2)^(3/4)
```

Maxima [A] time = 1.41482, size = 12, normalized size = 0.92

$$\frac{4}{9}\left(x^3+2\right)^{\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(x^3 + 2)^(1/4),x, algorithm="maxima")
```

```
[Out] 4/9*(x^3 + 2)^(3/4)
```

Fricas [A] time = 0.2317, size = 12, normalized size = 0.92

$$\frac{4}{9}\left(x^3+2\right)^{\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(x^3 + 2)^(1/4),x, algorithm="fricas")
```

```
[Out] 4/9*(x^3 + 2)^(3/4)
```

Sympy [A] time = 0.449387, size = 10, normalized size = 0.77

$$\frac{4\left(x^3+2\right)^{\frac{3}{4}}}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(x**3+2)**(1/4),x)
```

```
[Out] 4*(x**3 + 2)**(3/4)/9
```

GIAC/XCAS [A] time = 0.218038, size = 12, normalized size = 0.92

$$\frac{4}{9}\left(x^3+2\right)^{\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(x^3 + 2)^(1/4),x, algorithm="giac")
```

```
[Out] 4/9*(x^3 + 2)^(3/4)
```

3.581 $\int x^m \left(a+bx^3\right)^8\,dx$

Optimal. Leaf size=151

$$\frac{a^8x^{m+1}}{m+1}+\frac{8a^7bx^{m+4}}{m+4}+\frac{28a^6b^2x^{m+7}}{m+7}+\frac{56a^5b^3x^{m+10}}{m+10}+\frac{70a^4b^4x^{m+13}}{m+13}+\frac{56a^3b^5x^{m+16}}{m+16}+\frac{28a^2b^6x^{m+19}}{m+19}+\frac{8ab^7x^{m+22}}{m+22}+\frac{b^8x^{m+25}}{m+25}$$

```
[Out] (a^8*x^(1 + m))/(1 + m) + (8*a^7*b*x^(4 + m))/(4 + m) + (28*a^6*b
^2*x^(7 + m))/(7 + m) + (56*a^5*b^3*x^(10 + m))/(10 + m) + (70*a^
4*b^4*x^(13 + m))/(13 + m) + (56*a^3*b^5*x^(16 + m))/(16 + m) + (
28*a^2*b^6*x^(19 + m))/(19 + m) + (8*a*b^7*x^(22 + m))/(22 + m) +
 (b^8*x^(25 + m))/(25 + m)
```

Rubi [A] time = 0.171017, antiderivative size = 151, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{a^8x^{m+1}}{m+1}+\frac{8a^7bx^{m+4}}{m+4}+\frac{28a^6b^2x^{m+7}}{m+7}+\frac{56a^5b^3x^{m+10}}{m+10}+\frac{70a^4b^4x^{m+13}}{m+13}+\frac{56a^3b^5x^{m+16}}{m+16}+\frac{28a^2b^6x^{m+19}}{m+19}+\frac{8ab^7x^{m+22}}{m+22}+\frac{b^8x^{m+25}}{m+25}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m*(a + b*x^3)^8,x]
```

```
[Out] (a^8*x^(1 + m))/(1 + m) + (8*a^7*b*x^(4 + m))/(4 + m) + (28*a^6*b
^2*x^(7 + m))/(7 + m) + (56*a^5*b^3*x^(10 + m))/(10 + m) + (70*a^
4*b^4*x^(13 + m))/(13 + m) + (56*a^3*b^5*x^(16 + m))/(16 + m) + (
28*a^2*b^6*x^(19 + m))/(19 + m) + (8*a*b^7*x^(22 + m))/(22 + m) +
 (b^8*x^(25 + m))/(25 + m)
```

Rubi in Sympy [A] time = 25.4755, size = 138, normalized size = 0.91

$$\frac{a^8x^{m+1}}{m+1}+\frac{8a^7bx^{m+4}}{m+4}+\frac{28a^6b^2x^{m+7}}{m+7}+\frac{56a^5b^3x^{m+10}}{m+10}+\frac{70a^4b^4x^{m+13}}{m+13}+\frac{56a^3b^5x^{m+16}}{m+16}+\frac{28a^2b^6x^{m+19}}{m+19}+\frac{8ab^7x^{m+22}}{m+22}+\frac{b^8x^{m+25}}{m+25}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(b*x**3+a)**8,x)
```

```
[Out] a**8*x**(m + 1)/(m + 1) + 8*a**7*b*x**(m + 4)/(m + 4) + 28*a**6*b
**2*x**(m + 7)/(m + 7) + 56*a**5*b**3*x**(m + 10)/(m + 10) + 70*a
**4*b**4*x**(m + 13)/(m + 13) + 56*a**3*b**5*x**(m + 16)/(m + 16)
 + 28*a**2*b**6*x**(m + 19)/(m + 19) + 8*a*b**7*x**(m + 22)/(m +
22) + b**8*x**(m + 25)/(m + 25)
```

Mathematica [A] time = 0.0819064, size = 135, normalized size = 0.89

$$x^m\left(\frac{a^8x}{m+1}+\frac{8a^7bx^4}{m+4}+\frac{28a^6b^2x^7}{m+7}+\frac{56a^5b^3x^{10}}{m+10}+\frac{70a^4b^4x^{13}}{m+13}+\frac{56a^3b^5x^{16}}{m+16}+\frac{28a^2b^6x^{19}}{m+19}+\frac{8ab^7x^{22}}{m+22}+\frac{b^8x^{25}}{m+25}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m*(a + b*x^3)^8,x]
```

```
[Out] x^m*((a^8*x)/(1 + m) + (8*a^7*b*x^4)/(4 + m) + (28*a^6*b^2*x^7)/(
7 + m) + (56*a^5*b^3*x^10)/(10 + m) + (70*a^4*b^4*x^13)/(13 + m)
+ (56*a^3*b^5*x^16)/(16 + m) + (28*a^2*b^6*x^19)/(19 + m) + (8*a*
b^7*x^22)/(22 + m) + (b^8*x^25)/(25 + m))
```

Maple [B] time = 0.013, size = 1023, normalized size = 6.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(b*x^3+a)^8,x)
```

```
[Out] x^(1+m)*(b^8*m^8*x^24+92*b^8*m^7*x^24+3514*b^8*m^6*x^24+8*a*b^7*m
^8*x^21+72128*b^8*m^5*x^24+760*a*b^7*m^7*x^21+859369*b^8*m^4*x^24
+29792*a*b^7*m^6*x^21+5974388*b^8*m^3*x^24+28*a^2*b^6*m^8*x^18+62
4400*a*b^7*m^5*x^21+22963996*b^8*m^2*x^24+2744*a^2*b^6*m^7*x^18+7
563752*a*b^7*m^4*x^21+42124592*b^8*m*x^24+110656*a^2*b^6*m^6*x^18
+53266360*a*b^7*m^3*x^21+24344320*b^8*x^24+56*a^3*b^5*m^8*x^15+23
76920*a^2*b^6*m^5*x^18+206729648*a*b^7*m^2*x^21+5656*a^3*b^5*m^7*
x^15+29390452*a^2*b^6*m^4*x^18+381743680*a*b^7*m*x^21+235088*a^3*
b^5*m^6*x^15+210422576*a^2*b^6*m^3*x^18+221312000*a*b^7*x^21+70*a
^4*b^4*m^8*x^12+5197360*a^3*b^5*m^5*x^15+827034544*a^2*b^6*m^2*x^
18+7280*a^4*b^4*m^7*x^12+65946104*a^3*b^5*m^4*x^15+1540629440*a^2
*b^6*m*x^18+312340*a^4*b^4*m^6*x^12+482544664*a^3*b^5*m^3*x^15+89
6896000*a^2*b^6*x^18+56*a^5*b^3*m^8*x^9+7138040*a^4*b^4*m^5*x^12+
1929412352*a^3*b^5*m^2*x^15+5992*a^5*b^3*m^7*x^9+93585310*a^4*b^4
*m^4*x^12+3637973920*a^3*b^5*m*x^15+265664*a^5*b^3*m^6*x^9+705493
880*a^4*b^4*m^3*x^12+2130128000*a^3*b^5*x^15+28*a^6*b^2*m^8*x^6+6
302128*a^5*b^3*m^5*x^9+2891238280*a^4*b^4*m^2*x^12+3080*a^6*b^2*m
^7*x^6+86082584*a^5*b^3*m^4*x^9+5549616800*a^4*b^4*m*x^12+141232*
a^6*b^2*m^6*x^6+676856488*a^5*b^3*m^3*x^9+3277120000*a^4*b^4*x^12
+8*a^7*b*m^8*x^3+3490760*a^6*b^2*m^5*x^6+2881562096*a^5*b^3*m^2*x
^9+904*a^7*b*m^7*x^3+50116612*a^6*b^2*m^4*x^6+5692950592*a^5*b^3*
m*x^9+42896*a^7*b*m^6*x^3+418024880*a^6*b^2*m^3*x^6+3408204800*a^
5*b^3*x^9+a^8*m^8+1108240*a^7*b*m^5*x^3+1898889328*a^6*b^2*m^2*x^
6+116*a^8*m^7+16867592*a^7*b*m^4*x^3+3962060480*a^6*b^2*m*x^6+569
8*a^8*m^6+152198536*a^7*b*m^3*x^3+2434432000*a^6*b^2*x^6+154280*a
^8*m^5+769795424*a^7*b*m^2*x^3+2508289*a^8*m^4+1850614240*a^7*b*m
*x^3+24950324*a^8*m^3+1217216000*a^7*b*x^3+147373372*a^8*m^2+4688
51120*a^8*m+608608000*a^8)/(1+m)/(22+m)/(25+m)/(7+m)/(10+m)/(13+m
)/(16+m)/(19+m)/(4+m)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^3 + a)^8*x^m,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.25325, size = 1143, normalized size = 7.57

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^3 + a)^8*x^m,x, algorithm="fricas")
```

```
[Out] ((b^8*m^8 + 92*b^8*m^7 + 3514*b^8*m^6 + 72128*b^8*m^5 + 859369*b^
8*m^4 + 5974388*b^8*m^3 + 22963996*b^8*m^2 + 42124592*b^8*m + 243
44320*b^8)*x^25 + 8*(a*b^7*m^8 + 95*a*b^7*m^7 + 3724*a*b^7*m^6 +
78050*a*b^7*m^5 + 945469*a*b^7*m^4 + 6658295*a*b^7*m^3 + 25841206
*a*b^7*m^2 + 47717960*a*b^7*m + 27664000*a*b^7)*x^22 + 28*(a^2*b^
6*m^8 + 98*a^2*b^6*m^7 + 3952*a^2*b^6*m^6 + 84890*a^2*b^6*m^5 + 1
049659*a^2*b^6*m^4 + 7515092*a^2*b^6*m^3 + 29536948*a^2*b^6*m^2 +
 55022480*a^2*b^6*m + 32032000*a^2*b^6)*x^19 + 56*(a^3*b^5*m^8 +
101*a^3*b^5*m^7 + 4198*a^3*b^5*m^6 + 92810*a^3*b^5*m^5 + 1177609*
a^3*b^5*m^4 + 8616869*a^3*b^5*m^3 + 34453792*a^3*b^5*m^2 + 649638
20*a^3*b^5*m + 38038000*a^3*b^5)*x^16 + 70*(a^4*b^4*m^8 + 104*a^4
*b^4*m^7 + 4462*a^4*b^4*m^6 + 101972*a^4*b^4*m^5 + 1336933*a^4*b^
4*m^4 + 10078484*a^4*b^4*m^3 + 41303404*a^4*b^4*m^2 + 79280240*a^
4*b^4*m + 46816000*a^4*b^4)*x^13 + 56*(a^5*b^3*m^8 + 107*a^5*b^3*
m^7 + 4744*a^5*b^3*m^6 + 112538*a^5*b^3*m^5 + 1537189*a^5*b^3*m^4
 + 12086723*a^5*b^3*m^3 + 51456466*a^5*b^3*m^2 + 101659832*a^5*b^
3*m + 60860800*a^5*b^3)*x^10 + 28*(a^6*b^2*m^8 + 110*a^6*b^2*m^7
+ 5044*a^6*b^2*m^6 + 124670*a^6*b^2*m^5 + 1789879*a^6*b^2*m^4 + 1
4929460*a^6*b^2*m^3 + 67817476*a^6*b^2*m^2 + 141502160*a^6*b^2*m
+ 86944000*a^6*b^2)*x^7 + 8*(a^7*b*m^8 + 113*a^7*b*m^7 + 5362*a^7
*b*m^6 + 138530*a^7*b*m^5 + 2108449*a^7*b*m^4 + 19024817*a^7*b*m^
3 + 96224428*a^7*b*m^2 + 231326780*a^7*b*m + 152152000*a^7*b)*x^4
 + (a^8*m^8 + 116*a^8*m^7 + 5698*a^8*m^6 + 154280*a^8*m^5 + 25082
89*a^8*m^4 + 24950324*a^8*m^3 + 147373372*a^8*m^2 + 468851120*a^8
*m + 608608000*a^8)*x)*x^m/(m^9 + 117*m^8 + 5814*m^7 + 159978*m^6
 + 2662569*m^5 + 27458613*m^4 + 172323696*m^3 + 616224492*m^2 + 1
077459120*m + 608608000)
```

Sympy [A] time = 158.549, size = 5902, normalized size = 39.09

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(b*x**3+a)**8,x)
```

```
[Out] Piecewise((-a**8/(24*x**24) - 8*a**7*b/(21*x**21) - 14*a**6*b**2/
(9*x**18) - 56*a**5*b**3/(15*x**15) - 35*a**4*b**4/(6*x**12) - 56
*a**3*b**5/(9*x**9) - 14*a**2*b**6/(3*x**6) - 8*a*b**7/(3*x**3) +
 b**8*log(x), Eq(m, -25)), (-a**8/(21*x**21) - 4*a**7*b/(9*x**18)
 - 28*a**6*b**2/(15*x**15) - 14*a**5*b**3/(3*x**12) - 70*a**4*b**
4/(9*x**9) - 28*a**3*b**5/(3*x**6) - 28*a**2*b**6/(3*x**3) + 8*a*
b**7*log(x) + b**8*x**3/3, Eq(m, -22)), (-a**8/(18*x**18) - 8*a**
7*b/(15*x**15) - 7*a**6*b**2/(3*x**12) - 56*a**5*b**3/(9*x**9) -
35*a**4*b**4/(3*x**6) - 56*a**3*b**5/(3*x**3) + 28*a**2*b**6*log(
x) + 8*a*b**7*x**3/3 + b**8*x**6/6, Eq(m, -19)), (-a**8/(15*x**15
) - 2*a**7*b/(3*x**12) - 28*a**6*b**2/(9*x**9) - 28*a**5*b**3/(3*
x**6) - 70*a**4*b**4/(3*x**3) + 56*a**3*b**5*log(x) + 28*a**2*b**
6*x**3/3 + 4*a*b**7*x**6/3 + b**8*x**9/9, Eq(m, -16)), (-a**8/(12
*x**12) - 8*a**7*b/(9*x**9) - 14*a**6*b**2/(3*x**6) - 56*a**5*b**
3/(3*x**3) + 70*a**4*b**4*log(x) + 56*a**3*b**5*x**3/3 + 14*a**2*
b**6*x**6/3 + 8*a*b**7*x**9/9 + b**8*x**12/12, Eq(m, -13)), (-a**
8/(9*x**9) - 4*a**7*b/(3*x**6) - 28*a**6*b**2/(3*x**3) + 56*a**5*
b**3*log(x) + 70*a**4*b**4*x**3/3 + 28*a**3*b**5*x**6/3 + 28*a**2
*b**6*x**9/9 + 2*a*b**7*x**12/3 + b**8*x**15/15, Eq(m, -10)), (-a
**8/(6*x**6) - 8*a**7*b/(3*x**3) + 28*a**6*b**2*log(x) + 56*a**5*
b**3*x**3/3 + 35*a**4*b**4*x**6/3 + 56*a**3*b**5*x**9/9 + 7*a**2*
b**6*x**12/3 + 8*a*b**7*x**15/15 + b**8*x**18/18, Eq(m, -7)), (-a
**8/(3*x**3) + 8*a**7*b*log(x) + 28*a**6*b**2*x**3/3 + 28*a**5*b*
*3*x**6/3 + 70*a**4*b**4*x**9/9 + 14*a**3*b**5*x**12/3 + 28*a**2*
b**6*x**15/15 + 4*a*b**7*x**18/9 + b**8*x**21/21, Eq(m, -4)), (a*
*8*log(x) + 8*a**7*b*x**3/3 + 14*a**6*b**2*x**6/3 + 56*a**5*b**3*
x**9/9 + 35*a**4*b**4*x**12/6 + 56*a**3*b**5*x**15/15 + 14*a**2*b
**6*x**18/9 + 8*a*b**7*x**21/21 + b**8*x**24/24, Eq(m, -1)), (a**
8*m**8*x*x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978*m**6 + 266256
9*m**5 + 27458613*m**4 + 172323696*m**3 + 616224492*m**2 + 107745
9120*m + 608608000) + 116*a**8*m**7*x*x**m/(m**9 + 117*m**8 + 581
4*m**7 + 159978*m**6 + 2662569*m**5 + 27458613*m**4 + 172323696*m
**3 + 616224492*m**2 + 1077459120*m + 608608000) + 5698*a**8*m**6
*x*x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978*m**6 + 2662569*m**5
```

 + 27458613*m**4 + 172323696*m**3 + 616224492*m**2 + 1077459120*m
 + 608608000) + 154280*a**8*m**5*x*x**m/(m**9 + 117*m**8 + 5814*m
7 + 159978*m6 + 2662569*m**5 + 27458613*m**4 + 172323696*m**3
 + 616224492*m**2 + 1077459120*m + 608608000) + 2508289*a**8*m**4
*x*x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978*m**6 + 2662569*m**5
 + 27458613*m**4 + 172323696*m**3 + 616224492*m**2 + 1077459120*m
 + 608608000) + 24950324*a**8*m**3*x*x**m/(m**9 + 117*m**8 + 5814
*m**7 + 159978*m**6 + 2662569*m**5 + 27458613*m**4 + 172323696*m*
*3 + 616224492*m**2 + 1077459120*m + 608608000) + 147373372*a**8*
m**2*x*x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978*m**6 + 2662569*
m**5 + 27458613*m**4 + 172323696*m**3 + 616224492*m**2 + 10774591
20*m + 608608000) + 468851120*a**8*m*x*x**m/(m**9 + 117*m**8 + 58
14*m**7 + 159978*m**6 + 2662569*m**5 + 27458613*m**4 + 172323696*
m**3 + 616224492*m**2 + 1077459120*m + 608608000) + 608608000*a**
8*x*x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978*m**6 + 2662569*m**
5 + 27458613*m**4 + 172323696*m**3 + 616224492*m**2 + 1077459120*
m + 608608000) + 8*a**7*b*m**8*x**4*x**m/(m**9 + 117*m**8 + 5814*
m**7 + 159978*m**6 + 2662569*m**5 + 27458613*m**4 + 172323696*m**
3 + 616224492*m**2 + 1077459120*m + 608608000) + 904*a**7*b*m**7*
x**4*x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978*m**6 + 2662569*m*
*5 + 27458613*m**4 + 172323696*m**3 + 616224492*m**2 + 1077459120
*m + 608608000) + 42896*a**7*b*m**6*x**4*x**m/(m**9 + 117*m**8 +
5814*m**7 + 159978*m**6 + 2662569*m**5 + 27458613*m**4 + 17232369
6*m**3 + 616224492*m**2 + 1077459120*m + 608608000) + 1108240*a**
7*b*m**5*x**4*x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978*m**6 + 2
662569*m**5 + 27458613*m**4 + 172323696*m**3 + 616224492*m**2 + 1
077459120*m + 608608000) + 16867592*a**7*b*m**4*x**4*x**m/(m**9 +
 117*m**8 + 5814*m**7 + 159978*m**6 + 2662569*m**5 + 27458613*m**
4 + 172323696*m**3 + 616224492*m**2 + 1077459120*m + 608608000) +
 152198536*a**7*b*m**3*x**4*x**m/(m**9 + 117*m**8 + 5814*m**7 + 1
59978*m**6 + 2662569*m**5 + 27458613*m**4 + 172323696*m**3 + 6162
24492*m**2 + 1077459120*m + 608608000) + 769795424*a**7*b*m**2*x*
*4*x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978*m**6 + 2662569*m**5
 + 27458613*m**4 + 172323696*m**3 + 616224492*m**2 + 1077459120*m
 + 608608000) + 1850614240*a**7*b*m*x**4*x**m/(m**9 + 117*m**8 +
5814*m**7 + 159978*m**6 + 2662569*m**5 + 27458613*m**4 + 17232369
6*m**3 + 616224492*m**2 + 1077459120*m + 608608000) + 1217216000*
a**7*b*x**4*x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978*m**6 + 266
2569*m**5 + 27458613*m**4 + 172323696*m**3 + 616224492*m**2 + 107
7459120*m + 608608000) + 28*a**6*b**2*m**8*x**7*x**m/(m**9 + 117*
m**8 + 5814*m**7 + 159978*m**6 + 2662569*m**5 + 27458613*m**4 + 1
72323696*m**3 + 616224492*m**2 + 1077459120*m + 608608000) + 3080
*a**6*b**2*m**7*x**7*x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978*m
6 + 2662569*m5 + 27458613*m**4 + 172323696*m**3 + 616224492*m
2 + 1077459120*m + 608608000) + 141232*a6*b**2*m**6*x**7*x**m
/(m**9 + 117*m**8 + 5814*m**7 + 159978*m**6 + 2662569*m**5 + 2745
8613*m**4 + 172323696*m**3 + 616224492*m**2 + 1077459120*m + 6086
08000) + 3490760*a**6*b**2*m**5*x**7*x**m/(m**9 + 117*m**8 + 5814
*m**7 + 159978*m**6 + 2662569*m**5 + 27458613*m**4 + 172323696*m*
*3 + 616224492*m**2 + 1077459120*m + 608608000) + 50116612*a**6*b
2*m4*x**7*x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978*m**6 + 2
662569*m**5 + 27458613*m**4 + 172323696*m**3 + 616224492*m**2 + 1
077459120*m + 608608000) + 418024880*a**6*b**2*m**3*x**7*x**m/(m*
*9 + 117*m**8 + 5814*m**7 + 159978*m**6 + 2662569*m**5 + 27458613
*m**4 + 172323696*m**3 + 616224492*m**2 + 1077459120*m + 60860800
0) + 1898889328*a**6*b**2*m**2*x**7*x**m/(m**9 + 117*m**8 + 5814*
m**7 + 159978*m**6 + 2662569*m**5 + 27458613*m**4 + 172323696*m**
3 + 616224492*m**2 + 1077459120*m + 608608000) + 3962060480*a**6*
b**2*m*x**7*x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978*m**6 + 266
2569*m**5 + 27458613*m**4 + 172323696*m**3 + 616224492*m**2 + 107
7459120*m + 608608000) + 2434432000*a**6*b**2*x**7*x**m/(m**9 + 1
17*m**8 + 5814*m**7 + 159978*m**6 + 2662569*m**5 + 27458613*m**4
+ 172323696*m**3 + 616224492*m**2 + 1077459120*m + 608608000) + 5
6*a**5*b**3*m**8*x**10*x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978
*m**6 + 2662569*m**5 + 27458613*m**4 + 172323696*m**3 + 616224492
*m**2 + 1077459120*m + 608608000) + 5992*a**5*b**3*m**7*x**10*x**
m/(m**9 + 117*m**8 + 5814*m**7 + 159978*m**6 + 2662569*m**5 + 274
58613*m**4 + 172323696*m**3 + 616224492*m**2 + 1077459120*m + 608
608000) + 265664*a**5*b**3*m**6*x**10*x**m/(m**9 + 117*m**8 + 581
4*m**7 + 159978*m**6 + 2662569*m**5 + 27458613*m**4 + 172323696*m
3 + 616224492*m2 + 1077459120*m + 608608000) + 6302128*a**5*b
3*m5*x**10*x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978*m**6 +
2662569*m**5 + 27458613*m**4 + 172323696*m**3 + 616224492*m**2 +
1077459120*m + 608608000) + 86082584*a**5*b**3*m**4*x**10*x**m/(m

```
**9 + 117*m**8 + 5814*m**7 + 159978*m**6 + 2662569*m**5 + 2745861
3*m**4 + 172323696*m**3 + 616224492*m**2 + 1077459120*m + 6086080
00) + 676856488*a**5*b**3*m**3*x**10*x**m/(m**9 + 117*m**8 + 5814
*m**7 + 159978*m**6 + 2662569*m**5 + 27458613*m**4 + 172323696*m*
*3 + 616224492*m**2 + 1077459120*m + 608608000) + 2881562096*a**5
*b**3*m**2*x**10*x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978*m**6
+ 2662569*m**5 + 27458613*m**4 + 172323696*m**3 + 616224492*m**2
+ 1077459120*m + 608608000) + 5692950592*a**5*b**3*m*x**10*x**m/(
m**9 + 117*m**8 + 5814*m**7 + 159978*m**6 + 2662569*m**5 + 274586
13*m**4 + 172323696*m**3 + 616224492*m**2 + 1077459120*m + 608608
000) + 3408204800*a**5*b**3*x**10*x**m/(m**9 + 117*m**8 + 5814*m*
*7 + 159978*m**6 + 2662569*m**5 + 27458613*m**4 + 172323696*m**3
+ 616224492*m**2 + 1077459120*m + 608608000) + 70*a**4*b**4*m**8*
x**13*x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978*m**6 + 2662569*m
**5 + 27458613*m**4 + 172323696*m**3 + 616224492*m**2 + 107745912
0*m + 608608000) + 7280*a**4*b**4*m**7*x**13*x**m/(m**9 + 117*m**
8 + 5814*m**7 + 159978*m**6 + 2662569*m**5 + 27458613*m**4 + 1723
23696*m**3 + 616224492*m**2 + 1077459120*m + 608608000) + 312340*
a**4*b**4*m**6*x**13*x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978*m
**6 + 2662569*m**5 + 27458613*m**4 + 172323696*m**3 + 616224492*m
**2 + 1077459120*m + 608608000) + 7138040*a**4*b**4*m**5*x**13*x*
*m/(m**9 + 117*m**8 + 5814*m**7 + 159978*m**6 + 2662569*m**5 + 27
458613*m**4 + 172323696*m**3 + 616224492*m**2 + 1077459120*m + 60
8608000) + 93585310*a**4*b**4*m**4*x**13*x**m/(m**9 + 117*m**8 +
5814*m**7 + 159978*m**6 + 2662569*m**5 + 27458613*m**4 + 17232369
6*m**3 + 616224492*m**2 + 1077459120*m + 608608000) + 705493880*a
**4*b**4*m**3*x**13*x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978*m*
*6 + 2662569*m**5 + 27458613*m**4 + 172323696*m**3 + 616224492*m*
*2 + 1077459120*m + 608608000) + 2891238280*a**4*b**4*m**2*x**13*
x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978*m**6 + 2662569*m**5 +
27458613*m**4 + 172323696*m**3 + 616224492*m**2 + 1077459120*m +
608608000) + 5549616800*a**4*b**4*m*x**13*x**m/(m**9 + 117*m**8 +
 5814*m**7 + 159978*m**6 + 2662569*m**5 + 27458613*m**4 + 1723236
96*m**3 + 616224492*m**2 + 1077459120*m + 608608000) + 3277120000
*a**4*b**4*x**13*x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978*m**6
+ 2662569*m**5 + 27458613*m**4 + 172323696*m**3 + 616224492*m**2
+ 1077459120*m + 608608000) + 56*a**3*b**5*m**8*x**16*x**m/(m**9
+ 117*m**8 + 5814*m**7 + 159978*m**6 + 2662569*m**5 + 27458613*m*
*4 + 172323696*m**3 + 616224492*m**2 + 1077459120*m + 608608000)
+ 5656*a**3*b**5*m**7*x**16*x**m/(m**9 + 117*m**8 + 5814*m**7 + 1
59978*m**6 + 2662569*m**5 + 27458613*m**4 + 172323696*m**3 + 6162
24492*m**2 + 1077459120*m + 608608000) + 235088*a**3*b**5*m**6*x*
*16*x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978*m**6 + 2662569*m**
5 + 27458613*m**4 + 172323696*m**3 + 616224492*m**2 + 1077459120*
m + 608608000) + 5197360*a**3*b**5*m**5*x**16*x**m/(m**9 + 117*m*
*8 + 5814*m**7 + 159978*m**6 + 2662569*m**5 + 27458613*m**4 + 172
323696*m**3 + 616224492*m**2 + 1077459120*m + 608608000) + 659461
04*a**3*b**5*m**4*x**16*x**m/(m**9 + 117*m**8 + 5814*m**7 + 15997
8*m**6 + 2662569*m**5 + 27458613*m**4 + 172323696*m**3 + 61622449
2*m**2 + 1077459120*m + 608608000) + 482544664*a**3*b**5*m**3*x**
16*x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978*m**6 + 2662569*m**5
 + 27458613*m**4 + 172323696*m**3 + 616224492*m**2 + 1077459120*m
 + 608608000) + 1929412352*a**3*b**5*m**2*x**16*x**m/(m**9 + 117*
m**8 + 5814*m**7 + 159978*m**6 + 2662569*m**5 + 27458613*m**4 + 1
72323696*m**3 + 616224492*m**2 + 1077459120*m + 608608000) + 3637
973920*a**3*b**5*m*x**16*x**m/(m**9 + 117*m**8 + 5814*m**7 + 1599
78*m**6 + 2662569*m**5 + 27458613*m**4 + 172323696*m**3 + 6162244
92*m**2 + 1077459120*m + 608608000) + 2130128000*a**3*b**5*x**16*
x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978*m**6 + 2662569*m**5 +
27458613*m**4 + 172323696*m**3 + 616224492*m**2 + 1077459120*m +
608608000) + 28*a**2*b**6*m**8*x**19*x**m/(m**9 + 117*m**8 + 5814
*m**7 + 159978*m**6 + 2662569*m**5 + 27458613*m**4 + 172323696*m*
*3 + 616224492*m**2 + 1077459120*m + 608608000) + 2744*a**2*b**6*
m**7*x**19*x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978*m**6 + 2662
569*m**5 + 27458613*m**4 + 172323696*m**3 + 616224492*m**2 + 1077
459120*m + 608608000) + 110656*a**2*b**6*m**6*x**19*x**m/(m**9 +
117*m**8 + 5814*m**7 + 159978*m**6 + 2662569*m**5 + 27458613*m**4
 + 172323696*m**3 + 616224492*m**2 + 1077459120*m + 608608000) +
2376920*a**2*b**6*m**5*x**19*x**m/(m**9 + 117*m**8 + 5814*m**7 +
159978*m**6 + 2662569*m**5 + 27458613*m**4 + 172323696*m**3 + 616
224492*m**2 + 1077459120*m + 608608000) + 29390452*a**2*b**6*m**4
*x**19*x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978*m**6 + 2662569*
m**5 + 27458613*m**4 + 172323696*m**3 + 616224492*m**2 + 10774591
20*m + 608608000) + 210422576*a**2*b**6*m**3*x**19*x**m/(m**9 + 1
```

```
17*m**8 + 5814*m**7 + 159978*m**6 + 2662569*m**5 + 27458613*m**4
+ 172323696*m**3 + 616224492*m**2 + 1077459120*m + 608608000) + 8
27034544*a**2*b**6*m**2*x**19*x**m/(m**9 + 117*m**8 + 5814*m**7 +
 159978*m**6 + 2662569*m**5 + 27458613*m**4 + 172323696*m**3 + 61
6224492*m**2 + 1077459120*m + 608608000) + 1540629440*a**2*b**6*m
*x**19*x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978*m**6 + 2662569*
m**5 + 27458613*m**4 + 172323696*m**3 + 616224492*m**2 + 10774591
20*m + 608608000) + 896896000*a**2*b**6*x**19*x**m/(m**9 + 117*m*
*8 + 5814*m**7 + 159978*m**6 + 2662569*m**5 + 27458613*m**4 + 172
323696*m**3 + 616224492*m**2 + 1077459120*m + 608608000) + 8*a*b*
*7*m**8*x**22*x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978*m**6 + 2
662569*m**5 + 27458613*m**4 + 172323696*m**3 + 616224492*m**2 + 1
077459120*m + 608608000) + 760*a*b**7*m**7*x**22*x**m/(m**9 + 117
*m**8 + 5814*m**7 + 159978*m**6 + 2662569*m**5 + 27458613*m**4 +
172323696*m**3 + 616224492*m**2 + 1077459120*m + 608608000) + 297
92*a*b**7*m**6*x**22*x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978*m
**6 + 2662569*m**5 + 27458613*m**4 + 172323696*m**3 + 616224492*m
**2 + 1077459120*m + 608608000) + 624400*a*b**7*m**5*x**22*x**m/(
m**9 + 117*m**8 + 5814*m**7 + 159978*m**6 + 2662569*m**5 + 274586
13*m**4 + 172323696*m**3 + 616224492*m**2 + 1077459120*m + 608608
000) + 7563752*a*b**7*m**4*x**22*x**m/(m**9 + 117*m**8 + 5814*m**
7 + 159978*m**6 + 2662569*m**5 + 27458613*m**4 + 172323696*m**3 +
 616224492*m**2 + 1077459120*m + 608608000) + 53266360*a*b**7*m**
3*x**22*x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978*m**6 + 2662569
*m**5 + 27458613*m**4 + 172323696*m**3 + 616224492*m**2 + 1077459
120*m + 608608000) + 206729648*a*b**7*m**2*x**22*x**m/(m**9 + 117
*m**8 + 5814*m**7 + 159978*m**6 + 2662569*m**5 + 27458613*m**4 +
172323696*m**3 + 616224492*m**2 + 1077459120*m + 608608000) + 381
743680*a*b**7*m*x**22*x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978*
m**6 + 2662569*m**5 + 27458613*m**4 + 172323696*m**3 + 616224492*
m**2 + 1077459120*m + 608608000) + 221312000*a*b**7*x**22*x**m/(m
**9 + 117*m**8 + 5814*m**7 + 159978*m**6 + 2662569*m**5 + 2745861
3*m**4 + 172323696*m**3 + 616224492*m**2 + 1077459120*m + 6086080
00) + b**8*m**8*x**25*x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978*
m**6 + 2662569*m**5 + 27458613*m**4 + 172323696*m**3 + 616224492*
m**2 + 1077459120*m + 608608000) + 92*b**8*m**7*x**25*x**m/(m**9
+ 117*m**8 + 5814*m**7 + 159978*m**6 + 2662569*m**5 + 27458613*m*
*4 + 172323696*m**3 + 616224492*m**2 + 1077459120*m + 608608000)
+ 3514*b**8*m**6*x**25*x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978
*m**6 + 2662569*m**5 + 27458613*m**4 + 172323696*m**3 + 616224492
*m**2 + 1077459120*m + 608608000) + 72128*b**8*m**5*x**25*x**m/(m
**9 + 117*m**8 + 5814*m**7 + 159978*m**6 + 2662569*m**5 + 2745861
3*m**4 + 172323696*m**3 + 616224492*m**2 + 1077459120*m + 6086080
00) + 859369*b**8*m**4*x**25*x**m/(m**9 + 117*m**8 + 5814*m**7 +
159978*m**6 + 2662569*m**5 + 27458613*m**4 + 172323696*m**3 + 616
224492*m**2 + 1077459120*m + 608608000) + 5974388*b**8*m**3*x**25
*x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978*m**6 + 2662569*m**5 +
 27458613*m**4 + 172323696*m**3 + 616224492*m**2 + 1077459120*m +
 608608000) + 22963996*b**8*m**2*x**25*x**m/(m**9 + 117*m**8 + 58
14*m**7 + 159978*m**6 + 2662569*m**5 + 27458613*m**4 + 172323696*
m**3 + 616224492*m**2 + 1077459120*m + 608608000) + 42124592*b**8
*m*x**25*x**m/(m**9 + 117*m**8 + 5814*m**7 + 159978*m**6 + 266256
9*m**5 + 27458613*m**4 + 172323696*m**3 + 616224492*m**2 + 107745
9120*m + 608608000) + 24344320*b**8*x**25*x**m/(m**9 + 117*m**8 +
 5814*m**7 + 159978*m**6 + 2662569*m**5 + 27458613*m**4 + 1723236
96*m**3 + 616224492*m**2 + 1077459120*m + 608608000), True))
```

GIAC/XCAS [A] time = 0.255647, size = 1, normalized size = 0.01

Done

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8*x^m,x, algorithm="giac")
```

```
[Out] Done
```

3.582 $\int x^m (a+bx^3)^5 \, dx$

Optimal. Leaf size=97

$$\frac{a^5x^{m+1}}{m+1}+\frac{5a^4bx^{m+4}}{m+4}+\frac{10a^3b^2x^{m+7}}{m+7}+\frac{10a^2b^3x^{m+10}}{m+10}+\frac{5ab^4x^{m+13}}{m+13}+\frac{b^5x^{m+16}}{m+16}$$

```
[Out] (a^5*x^(1 + m))/(1 + m) + (5*a^4*b*x^(4 + m))/(4 + m) + (10*a^3*b
^2*x^(7 + m))/(7 + m) + (10*a^2*b^3*x^(10 + m))/(10 + m) + (5*a*b
^4*x^(13 + m))/(13 + m) + (b^5*x^(16 + m))/(16 + m)
```

Rubi [A] time = 0.0959203, antiderivative size = 97, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{a^5x^{m+1}}{m+1}+\frac{5a^4bx^{m+4}}{m+4}+\frac{10a^3b^2x^{m+7}}{m+7}+\frac{10a^2b^3x^{m+10}}{m+10}+\frac{5ab^4x^{m+13}}{m+13}+\frac{b^5x^{m+16}}{m+16}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m*(a + b*x^3)^5,x]
```

```
[Out] (a^5*x^(1 + m))/(1 + m) + (5*a^4*b*x^(4 + m))/(4 + m) + (10*a^3*b
^2*x^(7 + m))/(7 + m) + (10*a^2*b^3*x^(10 + m))/(10 + m) + (5*a*b
^4*x^(13 + m))/(13 + m) + (b^5*x^(16 + m))/(16 + m)
```

Rubi in Sympy [A] time = 16.1684, size = 87, normalized size = 0.9

$$\frac{a^5x^{m+1}}{m+1}+\frac{5a^4bx^{m+4}}{m+4}+\frac{10a^3b^2x^{m+7}}{m+7}+\frac{10a^2b^3x^{m+10}}{m+10}+\frac{5ab^4x^{m+13}}{m+13}+\frac{b^5x^{m+16}}{m+16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(b*x**3+a)**5,x)
```

```
[Out] a**5*x**(m + 1)/(m + 1) + 5*a**4*b*x**(m + 4)/(m + 4) + 10*a**3*b
**2*x**(m + 7)/(m + 7) + 10*a**2*b**3*x**(m + 10)/(m + 10) + 5*a*
b**4*x**(m + 13)/(m + 13) + b**5*x**(m + 16)/(m + 16)
```

Mathematica [A] time = 0.0554959, size = 87, normalized size = 0.9

$$x^m\left(\frac{a^5x}{m+1}+\frac{5a^4bx^4}{m+4}+\frac{10a^3b^2x^7}{m+7}+\frac{10a^2b^3x^{10}}{m+10}+\frac{5ab^4x^{13}}{m+13}+\frac{b^5x^{16}}{m+16}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m*(a + b*x^3)^5,x]
```

```
[Out] x^m*((a^5*x)/(1 + m) + (5*a^4*b*x^4)/(4 + m) + (10*a^3*b^2*x^7)/(
7 + m) + (10*a^2*b^3*x^10)/(10 + m) + (5*a*b^4*x^13)/(13 + m) + (
b^5*x^16)/(16 + m))
```

Maple [B] time = 0.01, size = 432, normalized size = 4.5

$$x^{1+m}\left(b^5m^5x^{15}+35\,b^5m^4x^{15}+445\,b^5m^3x^{15}+5\,ab^4m^5x^{12}+2485\,b^5m^2x^{15}+190\,ab^4m^4x^{12}+5714\,b^5mx^{15}+2555\,ab^4m^3x^{12}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(b*x^3+a)^5,x)
```

```
[Out] x^(1+m)*(b^5*m^5*x^15+35*b^5*m^4*x^15+445*b^5*m^3*x^15+5*a*b^4*m^
5*x^12+2485*b^5*m^2*x^15+190*a*b^4*m^4*x^12+5714*b^5*m*x^15+2555*
a*b^4*m^3*x^12+3640*b^5*x^15+10*a^2*b^3*m^5*x^9+14810*a*b^4*m^2*x
^12+410*a^2*b^3*m^4*x^9+34840*a*b^4*m*x^12+5950*a^2*b^3*m^3*x^9+2
2400*a*b^4*x^12+10*a^3*b^2*m^5*x^6+36550*a^2*b^3*m^2*x^9+440*a^3*
b^2*m^4*x^6+89240*a^2*b^3*m*x^9+6970*a^3*b^2*m^3*x^6+58240*a^2*b^
3*x^9+5*a^4*b*m^5*x^3+47260*a^3*b^2*m^2*x^6+235*a^4*b*m^4*x^3+123
920*a^3*b^2*m*x^6+4085*a^4*b*m^3*x^3+83200*a^3*b^2*x^6+a^5*m^5+31
685*a^4*b*m^2*x^3+50*a^5*m^4+100630*a^4*b*m*x^3+955*a^5*m^3+72800
*a^4*b*x^3+8650*a^5*m^2+36824*a^5*m+58240*a^5)/(1+m)/(4+m)/(7+m)/
(10+m)/(13+m)/(16+m)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5*x^m,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.245564, size = 495, normalized size = 5.1

$$\left(\left(b^5m^5 + 35\,b^5m^4 + 445\,b^5m^3 + 2485\,b^5m^2 + 5714\,b^5m + 3640\,b^5\right)x^{16} + 5\,\left(ab^4m^5 + 38\,ab^4m^4 + 511\,ab^4m^3 + 2962\,ab^4m^2 + 6\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5*x^m,x, algorithm="fricas")
```

```
[Out] ((b^5*m^5 + 35*b^5*m^4 + 445*b^5*m^3 + 2485*b^5*m^2 + 5714*b^5*m
+ 3640*b^5)*x^16 + 5*(a*b^4*m^5 + 38*a*b^4*m^4 + 511*a*b^4*m^3 +
2962*a*b^4*m^2 + 6968*a*b^4*m + 4480*a*b^4)*x^13 + 10*(a^2*b^3*m^
5 + 41*a^2*b^3*m^4 + 595*a^2*b^3*m^3 + 3655*a^2*b^3*m^2 + 8924*a^
2*b^3*m + 5824*a^2*b^3)*x^10 + 10*(a^3*b^2*m^5 + 44*a^3*b^2*m^4 +
 697*a^3*b^2*m^3 + 4726*a^3*b^2*m^2 + 12392*a^3*b^2*m + 8320*a^3*
b^2)*x^7 + 5*(a^4*b*m^5 + 47*a^4*b*m^4 + 817*a^4*b*m^3 + 6337*a^4
*b*m^2 + 20126*a^4*b*m + 14560*a^4*b)*x^4 + (a^5*m^5 + 50*a^5*m^4
 + 955*a^5*m^3 + 8650*a^5*m^2 + 36824*a^5*m + 58240*a^5)*x)*x^m/(
m^6 + 51*m^5 + 1005*m^4 + 9605*m^3 + 45474*m^2 + 95064*m + 58240)
```

Sympy [A] time = 41.5975, size = 2006, normalized size = 20.68

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(b*x**3+a)**5,x)
```

```
[Out] Piecewise((-a**5/(15*x**15) - 5*a**4*b/(12*x**12) - 10*a**3*b**2/
(9*x**9) - 5*a**2*b**3/(3*x**6) - 5*a*b**4/(3*x**3) + b**5*log(x)
, Eq(m, -16)), (-a**5/(12*x**12) - 5*a**4*b/(9*x**9) - 5*a**3*b**
2/(3*x**6) - 10*a**2*b**3/(3*x**3) + 5*a*b**4*log(x) + b**5*x**3/
3, Eq(m, -13)), (-a**5/(9*x**9) - 5*a**4*b/(6*x**6) - 10*a**3*b**
```

```
2/(3*x**3) + 10*a**2*b**3*log(x) + 5*a*b**4*x**3/3 + b**5*x**6/6,
 Eq(m, -10)), (-a**5/(6*x**6) - 5*a**4*b/(3*x**3) + 10*a**3*b**2*
log(x) + 10*a**2*b**3*x**3/3 + 5*a*b**4*x**6/6 + b**5*x**9/9, Eq(
m, -7)), (-a**5/(3*x**3) + 5*a**4*b*log(x) + 10*a**3*b**2*x**3/3
+ 5*a**2*b**3*x**6/3 + 5*a*b**4*x**9/9 + b**5*x**12/12, Eq(m, -4)
), (a**5*log(x) + 5*a**4*b*x**3/3 + 5*a**3*b**2*x**6/3 + 10*a**2*
b**3*x**9/9 + 5*a*b**4*x**12/12 + b**5*x**15/15, Eq(m, -1)), (a**
5*m**5*x*x**m/(m**6 + 51*m**5 + 1005*m**4 + 9605*m**3 + 45474*m**
2 + 95064*m + 58240) + 50*a**5*m**4*x*x**m/(m**6 + 51*m**5 + 1005
*m**4 + 9605*m**3 + 45474*m**2 + 95064*m + 58240) + 955*a**5*m**3
*x*x**m/(m**6 + 51*m**5 + 1005*m**4 + 9605*m**3 + 45474*m**2 + 95
064*m + 58240) + 8650*a**5*m**2*x*x**m/(m**6 + 51*m**5 + 1005*m**
4 + 9605*m**3 + 45474*m**2 + 95064*m + 58240) + 36824*a**5*m*x*x*
*m/(m**6 + 51*m**5 + 1005*m**4 + 9605*m**3 + 45474*m**2 + 95064*m
 + 58240) + 58240*a**5*x*x**m/(m**6 + 51*m**5 + 1005*m**4 + 9605*
m**3 + 45474*m**2 + 95064*m + 58240) + 5*a**4*b*m**5*x**4*x**m/(m
**6 + 51*m**5 + 1005*m**4 + 9605*m**3 + 45474*m**2 + 95064*m + 58
240) + 235*a**4*b*m**4*x**4*x**m/(m**6 + 51*m**5 + 1005*m**4 + 96
05*m**3 + 45474*m**2 + 95064*m + 58240) + 4085*a**4*b*m**3*x**4*x
**m/(m**6 + 51*m**5 + 1005*m**4 + 9605*m**3 + 45474*m**2 + 95064*
m + 58240) + 31685*a**4*b*m**2*x**4*x**m/(m**6 + 51*m**5 + 1005*m
**4 + 9605*m**3 + 45474*m**2 + 95064*m + 58240) + 100630*a**4*b*m
*x**4*x**m/(m**6 + 51*m**5 + 1005*m**4 + 9605*m**3 + 45474*m**2 +
 95064*m + 58240) + 72800*a**4*b*x**4*x**m/(m**6 + 51*m**5 + 1005
*m**4 + 9605*m**3 + 45474*m**2 + 95064*m + 58240) + 10*a**3*b**2*
m**5*x**7*x**m/(m**6 + 51*m**5 + 1005*m**4 + 9605*m**3 + 45474*m*
*2 + 95064*m + 58240) + 440*a**3*b**2*m**4*x**7*x**m/(m**6 + 51*m
**5 + 1005*m**4 + 9605*m**3 + 45474*m**2 + 95064*m + 58240) + 697
0*a**3*b**2*m**3*x**7*x**m/(m**6 + 51*m**5 + 1005*m**4 + 9605*m**
3 + 45474*m**2 + 95064*m + 58240) + 47260*a**3*b**2*m**2*x**7*x**
m/(m**6 + 51*m**5 + 1005*m**4 + 9605*m**3 + 45474*m**2 + 95064*m
+ 58240) + 123920*a**3*b**2*m*x**7*x**m/(m**6 + 51*m**5 + 1005*m*
*4 + 9605*m**3 + 45474*m**2 + 95064*m + 58240) + 83200*a**3*b**2*
x**7*x**m/(m**6 + 51*m**5 + 1005*m**4 + 9605*m**3 + 45474*m**2 +
95064*m + 58240) + 10*a**2*b**3*m**5*x**10*x**m/(m**6 + 51*m**5 +
 1005*m**4 + 9605*m**3 + 45474*m**2 + 95064*m + 58240) + 410*a**2
*b**3*m**4*x**10*x**m/(m**6 + 51*m**5 + 1005*m**4 + 9605*m**3 + 4
5474*m**2 + 95064*m + 58240) + 5950*a**2*b**3*m**3*x**10*x**m/(m*
*6 + 51*m**5 + 1005*m**4 + 9605*m**3 + 45474*m**2 + 95064*m + 582
40) + 36550*a**2*b**3*m**2*x**10*x**m/(m**6 + 51*m**5 + 1005*m**4
 + 9605*m**3 + 45474*m**2 + 95064*m + 58240) + 89240*a**2*b**3*m*
x**10*x**m/(m**6 + 51*m**5 + 1005*m**4 + 9605*m**3 + 45474*m**2 +
 95064*m + 58240) + 58240*a**2*b**3*x**10*x**m/(m**6 + 51*m**5 +
1005*m**4 + 9605*m**3 + 45474*m**2 + 95064*m + 58240) + 5*a*b**4*
m**5*x**13*x**m/(m**6 + 51*m**5 + 1005*m**4 + 9605*m**3 + 45474*m
**2 + 95064*m + 58240) + 190*a*b**4*m**4*x**13*x**m/(m**6 + 51*m*
*5 + 1005*m**4 + 9605*m**3 + 45474*m**2 + 95064*m + 58240) + 2555
*a*b**4*m**3*x**13*x**m/(m**6 + 51*m**5 + 1005*m**4 + 9605*m**3 +
 45474*m**2 + 95064*m + 58240) + 14810*a*b**4*m**2*x**13*x**m/(m*
*6 + 51*m**5 + 1005*m**4 + 9605*m**3 + 45474*m**2 + 95064*m + 582
40) + 34840*a*b**4*m*x**13*x**m/(m**6 + 51*m**5 + 1005*m**4 + 960
5*m**3 + 45474*m**2 + 95064*m + 58240) + 22400*a*b**4*x**13*x**m/
(m**6 + 51*m**5 + 1005*m**4 + 9605*m**3 + 45474*m**2 + 95064*m +
58240) + b**5*m**5*x**16*x**m/(m**6 + 51*m**5 + 1005*m**4 + 9605*
m**3 + 45474*m**2 + 95064*m + 58240) + 35*b**5*m**4*x**16*x**m/(m
**6 + 51*m**5 + 1005*m**4 + 9605*m**3 + 45474*m**2 + 95064*m + 58
240) + 445*b**5*m**3*x**16*x**m/(m**6 + 51*m**5 + 1005*m**4 + 960
5*m**3 + 45474*m**2 + 95064*m + 58240) + 2485*b**5*m**2*x**16*x**
m/(m**6 + 51*m**5 + 1005*m**4 + 9605*m**3 + 45474*m**2 + 95064*m
+ 58240) + 5714*b**5*m*x**16*x**m/(m**6 + 51*m**5 + 1005*m**4 + 9
605*m**3 + 45474*m**2 + 95064*m + 58240) + 3640*b**5*x**16*x**m/(
m**6 + 51*m**5 + 1005*m**4 + 9605*m**3 + 45474*m**2 + 95064*m + 5
8240), True))
```

GIAC/XCAS [A] time = 0.227736, size = 826, normalized size = 8.52

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^5*x^m,x, algorithm="giac")
```

```
[Out] (b^5*m^5*x^16*e^(m*ln(x)) + 35*b^5*m^4*x^16*e^(m*ln(x)) + 445*b^5
*m^3*x^16*e^(m*ln(x)) + 5*a*b^4*m^5*x^13*e^(m*ln(x)) + 2485*b^5*m
^2*x^16*e^(m*ln(x)) + 190*a*b^4*m^4*x^13*e^(m*ln(x)) + 5714*b^5*m
*x^16*e^(m*ln(x)) + 2555*a*b^4*m^3*x^13*e^(m*ln(x)) + 3640*b^5*x^
16*e^(m*ln(x)) + 10*a^2*b^3*m^5*x^10*e^(m*ln(x)) + 14810*a*b^4*m^
2*x^13*e^(m*ln(x)) + 410*a^2*b^3*m^4*x^10*e^(m*ln(x)) + 34840*a*b
^4*m*x^13*e^(m*ln(x)) + 5950*a^2*b^3*m^3*x^10*e^(m*ln(x)) + 22400
*a*b^4*x^13*e^(m*ln(x)) + 10*a^3*b^2*m^5*x^7*e^(m*ln(x)) + 36550*
a^2*b^3*m^2*x^10*e^(m*ln(x)) + 440*a^3*b^2*m^4*x^7*e^(m*ln(x)) +
89240*a^2*b^3*m*x^10*e^(m*ln(x)) + 6970*a^3*b^2*m^3*x^7*e^(m*ln(x
)) + 58240*a^2*b^3*x^10*e^(m*ln(x)) + 5*a^4*b*m^5*x^4*e^(m*ln(x))
 + 47260*a^3*b^2*m^2*x^7*e^(m*ln(x)) + 235*a^4*b*m^4*x^4*e^(m*ln(
x)) + 123920*a^3*b^2*m*x^7*e^(m*ln(x)) + 4085*a^4*b*m^3*x^4*e^(m*
ln(x)) + 83200*a^3*b^2*x^7*e^(m*ln(x)) + a^5*m^5*x*e^(m*ln(x)) +
31685*a^4*b*m^2*x^4*e^(m*ln(x)) + 50*a^5*m^4*x*e^(m*ln(x)) + 1006
30*a^4*b*m*x^4*e^(m*ln(x)) + 955*a^5*m^3*x*e^(m*ln(x)) + 72800*a^
4*b*x^4*e^(m*ln(x)) + 8650*a^5*m^2*x*e^(m*ln(x)) + 36824*a^5*m*x*
e^(m*ln(x)) + 58240*a^5*x*e^(m*ln(x)))/(m^6 + 51*m^5 + 1005*m^4 +
 9605*m^3 + 45474*m^2 + 95064*m + 58240)
```

3.583 $\int x^m (a+bx^3)^3 \, dx$

Optimal. Leaf size=61

$$\frac{a^3x^{m+1}}{m+1}+\frac{3a^2bx^{m+4}}{m+4}+\frac{3ab^2x^{m+7}}{m+7}+\frac{b^3x^{m+10}}{m+10}$$

```
[Out] (a^3*x^(1 + m))/(1 + m) + (3*a^2*b*x^(4 + m))/(4 + m) + (3*a*b^2*
x^(7 + m))/(7 + m) + (b^3*x^(10 + m))/(10 + m)
```

Rubi [A] time = 0.0586542, antiderivative size = 61, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{a^3x^{m+1}}{m+1}+\frac{3a^2bx^{m+4}}{m+4}+\frac{3ab^2x^{m+7}}{m+7}+\frac{b^3x^{m+10}}{m+10}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m*(a + b*x^3)^3,x]
```

```
[Out] (a^3*x^(1 + m))/(1 + m) + (3*a^2*b*x^(4 + m))/(4 + m) + (3*a*b^2*
x^(7 + m))/(7 + m) + (b^3*x^(10 + m))/(10 + m)
```

Rubi in Sympy [A] time = 9.97688, size = 53, normalized size = 0.87

$$\frac{a^3x^{m+1}}{m+1}+\frac{3a^2bx^{m+4}}{m+4}+\frac{3ab^2x^{m+7}}{m+7}+\frac{b^3x^{m+10}}{m+10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(b*x**3+a)**3,x)
```

```
[Out] a**3*x**(m + 1)/(m + 1) + 3*a**2*b*x**(m + 4)/(m + 4) + 3*a*b**2*
x**(m + 7)/(m + 7) + b**3*x**(m + 10)/(m + 10)
```

Mathematica [A] time = 0.0417095, size = 55, normalized size = 0.9

$$x^m\left(\frac{a^3x}{m+1}+\frac{3a^2bx^4}{m+4}+\frac{3ab^2x^7}{m+7}+\frac{b^3x^{10}}{m+10}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m*(a + b*x^3)^3,x]
```

```
[Out] x^m*((a^3*x)/(1 + m) + (3*a^2*b*x^4)/(4 + m) + (3*a*b^2*x^7)/(7 +
 m) + (b^3*x^10)/(10 + m))
```

Maple [B] time = 0.007, size = 178, normalized size = 2.9

$$\frac{x^{1+m}\left(b^3m^3x^9+12\,b^3m^2x^9+39\,b^3mx^9+3\,ab^2m^3x^6+28\,b^3x^9+45\,ab^2m^2x^6+162\,ab^2mx^6+3\,a^2bm^3x^3+120\,ab^2x^6+54\,a^2\ldots\right.}{(10+m)(7+m)(4+m)(1+m)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(b*x^3+a)^3,x)
```

```
[Out] x^(1+m)*(b^3*m^3*x^9+12*b^3*m^2*x^9+39*b^3*m*x^9+3*a*b^2*m^3*x^6+
28*b^3*x^9+45*a*b^2*m^2*x^6+162*a*b^2*m*x^6+3*a^2*b*m^3*x^3+120*a
*b^2*x^6+54*a^2*b*m^2*x^3+261*a^2*b*m*x^3+a^3*m^3+210*a^2*b*x^3+2
1*a^3*m^2+138*a^3*m+280*a^3)/(10+m)/(7+m)/(4+m)/(1+m)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3*x^m,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.246054, size = 212, normalized size = 3.48

$$\frac{\left(\left(b^3m^3 + 12\,b^3m^2 + 39\,b^3m + 28\,b^3\right)x^{10} + 3\,\left(ab^2m^3 + 15\,ab^2m^2 + 54\,ab^2m + 40\,ab^2\right)x^7 + 3\,\left(a^2bm^3 + 18\,a^2bm^2 + 87\,a^2bm + 7\right.}{m^4 + 22\,m^3 + 159\,m^2 + 418\,m + 280}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3*x^m,x, algorithm="fricas")
```

```
[Out] ((b^3*m^3 + 12*b^3*m^2 + 39*b^3*m + 28*b^3)*x^10 + 3*(a*b^2*m^3 +
 15*a*b^2*m^2 + 54*a*b^2*m + 40*a*b^2)*x^7 + 3*(a^2*b*m^3 + 18*a^
2*b*m^2 + 87*a^2*b*m + 70*a^2*b)*x^4 + (a^3*m^3 + 21*a^3*m^2 + 13
8*a^3*m + 280*a^3)*x)*x^m/(m^4 + 22*m^3 + 159*m^2 + 418*m + 280)
```

Sympy [A] time = 9.83612, size = 666, normalized size = 10.92

$$\begin{cases} -\frac{a^3}{9x^9} - \frac{a^2b}{2x^6} - \frac{ab^2}{x^3} + b^3\log(x) \\ -\frac{a^3}{6x^6} - \frac{a^2b}{x^3} + 3ab^2\log(x) + \frac{b^3x^3}{3} \\ -\frac{a^3}{3x^3} + 3a^2b\log(x) + ab^2x^3 + \frac{b^3x^6}{6} \\ a^3\log(x) + a^2bx^3 + \frac{ab^2x^6}{2} + \frac{b^3x^9}{9} \\ \frac{a^3m^3xx^m}{m^4+22m^3+159m^2+418m+280} + \frac{21a^3m^2xx^m}{m^4+22m^3+159m^2+418m+280} + \frac{138a^3mxx^m}{m^4+22m^3+159m^2+418m+280} + \frac{280a^3xx^m}{m^4+22m^3+159m^2+418m+280} + \frac{3a^2bm^3x^4x^m}{m^4+22m^3+159m^2+418m} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(b*x**3+a)**3,x)
```

```
[Out] Piecewise((-a**3/(9*x**9) - a**2*b/(2*x**6) - a*b**2/x**3 + b**3*
log(x), Eq(m, -10)), (-a**3/(6*x**6) - a**2*b/x**3 + 3*a*b**2*log
(x) + b**3*x**3/3, Eq(m, -7)), (-a**3/(3*x**3) + 3*a**2*b*log(x)
+ a*b**2*x**3 + b**3*x**6/6, Eq(m, -4)), (a**3*log(x) + a**2*b*x*
*3 + a*b**2*x**6/2 + b**3*x**9/9, Eq(m, -1)), (a**3*m**3*x*x**m/(
m**4 + 22*m**3 + 159*m**2 + 418*m + 280) + 21*a**3*m**2*x*x**m/(m
**4 + 22*m**3 + 159*m**2 + 418*m + 280) + 138*a**3*m*x*x**m/(m**4
 + 22*m**3 + 159*m**2 + 418*m + 280) + 280*a**3*x*x**m/(m**4 + 22
*m**3 + 159*m**2 + 418*m + 280) + 3*a**2*b*m**3*x**4*x**m/(m**4 +
 22*m**3 + 159*m**2 + 418*m + 280) + 54*a**2*b*m**2*x**4*x**m/(m*
*4 + 22*m**3 + 159*m**2 + 418*m + 280) + 261*a**2*b*m*x**4*x**m/(
m**4 + 22*m**3 + 159*m**2 + 418*m + 280) + 210*a**2*b*x**4*x**m/(
m**4 + 22*m**3 + 159*m**2 + 418*m + 280) + 3*a*b**2*m**3*x**7*x**
m/(m**4 + 22*m**3 + 159*m**2 + 418*m + 280) + 45*a*b**2*m**2*x**7
*x**m/(m**4 + 22*m**3 + 159*m**2 + 418*m + 280) + 162*a*b**2*m*x*
*7*x**m/(m**4 + 22*m**3 + 159*m**2 + 418*m + 280) + 120*a*b**2*x*
*7*x**m/(m**4 + 22*m**3 + 159*m**2 + 418*m + 280) + b**3*m**3*x**
10*x**m/(m**4 + 22*m**3 + 159*m**2 + 418*m + 280) + 12*b**3*m**2*
```

```
x**10*x**m/(m**4 + 22*m**3 + 159*m**2 + 418*m + 280) + 39*b**3*m*
x**10*x**m/(m**4 + 22*m**3 + 159*m**2 + 418*m + 280) + 28*b**3*x*
*10*x**m/(m**4 + 22*m**3 + 159*m**2 + 418*m + 280), True))
```

GIAC/XCAS [A] time = 0.236883, size = 346, normalized size = 5.67

$$\frac{b^3m^3x^{10}e^{(m\ln(x))} + 12\,b^3m^2x^{10}e^{(m\ln(x))} + 39\,b^3mx^{10}e^{(m\ln(x))} + 3\,ab^2m^3x^7e^{(m\ln(x))} + 28\,b^3x^{10}e^{(m\ln(x))} + 45\,ab^2m^2x^7e^{(m\ln(x))} + 1}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^3*x^m,x, algorithm="giac")
```

```
[Out] (b^3*m^3*x^10*e^(m*ln(x)) + 12*b^3*m^2*x^10*e^(m*ln(x)) + 39*b^3*
m*x^10*e^(m*ln(x)) + 3*a*b^2*m^3*x^7*e^(m*ln(x)) + 28*b^3*x^10*e^
(m*ln(x)) + 45*a*b^2*m^2*x^7*e^(m*ln(x)) + 162*a*b^2*m*x^7*e^(m*l
n(x)) + 3*a^2*b*m^3*x^4*e^(m*ln(x)) + 120*a*b^2*x^7*e^(m*ln(x)) +
 54*a^2*b*m^2*x^4*e^(m*ln(x)) + 261*a^2*b*m*x^4*e^(m*ln(x)) + a^3
*m^3*x*e^(m*ln(x)) + 210*a^2*b*x^4*e^(m*ln(x)) + 21*a^3*m^2*x*e^(
m*ln(x)) + 138*a^3*m*x*e^(m*ln(x)) + 280*a^3*x*e^(m*ln(x)))/(m^4
+ 22*m^3 + 159*m^2 + 418*m + 280)
```

3.584 $\int x^m \left(a+bx^3\right)^2 dx$

Optimal. Leaf size=43

$$\frac{a^2x^{m+1}}{m+1}+\frac{2abx^{m+4}}{m+4}+\frac{b^2x^{m+7}}{m+7}$$

```
[Out] (a^2*x^(1 + m))/(1 + m) + (2*a*b*x^(4 + m))/(4 + m) + (b^2*x^(7 +
 m))/(7 + m)
```

Rubi [A] time = 0.0411258, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{a^2x^{m+1}}{m+1}+\frac{2abx^{m+4}}{m+4}+\frac{b^2x^{m+7}}{m+7}$$

Antiderivative was successfully verified.

```
[In] Int[x^m*(a + b*x^3)^2,x]
```

```
[Out] (a^2*x^(1 + m))/(1 + m) + (2*a*b*x^(4 + m))/(4 + m) + (b^2*x^(7 +
 m))/(7 + m)
```

Rubi in Sympy [A] time = 7.23094, size = 36, normalized size = 0.84

$$\frac{a^2x^{m+1}}{m+1}+\frac{2abx^{m+4}}{m+4}+\frac{b^2x^{m+7}}{m+7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**m*(b*x**3+a)**2,x)
```

```
[Out] a**2*x**(m + 1)/(m + 1) + 2*a*b*x**(m + 4)/(m + 4) + b**2*x**(m +
 7)/(m + 7)
```

Mathematica [A] time = 0.0301088, size = 39, normalized size = 0.91

$$x^m\left(\frac{a^2x}{m+1}+\frac{2abx^4}{m+4}+\frac{b^2x^7}{m+7}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^m*(a + b*x^3)^2,x]
```

```
[Out] x^m*((a^2*x)/(1 + m) + (2*a*b*x^4)/(4 + m) + (b^2*x^7)/(7 + m))
```

Maple [B] time = 0.008, size = 93, normalized size = 2.2

$$\frac{x^{1+m}\left(b^2m^2x^6+5\,b^2mx^6+4\,b^2x^6+2\,abm^2x^3+16\,abmx^3+14\,abx^3+a^2m^2+11\,a^2m+28\,a^2\right)}{(7+m)\,(4+m)\,(1+m)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(b*x^3+a)^2,x)
```

```
[Out] x^(1+m)*(b^2*m^2*x^6+5*b^2*m*x^6+4*b^2*x^6+2*a*b*m^2*x^3+16*a*b*m
*x^3+14*a*b*x^3+a^2*m^2+11*a^2*m+28*a^2)/(7+m)/(4+m)/(1+m)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2*x^m,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.247911, size = 115, normalized size = 2.67

$$\frac{\left(\left(b^2m^2 + 5\,b^2m + 4\,b^2\right)x^7 + 2\left(abm^2 + 8\,abm + 7\,ab\right)x^4 + \left(a^2m^2 + 11\,a^2m + 28\,a^2\right)x\right)x^m}{m^3 + 12\,m^2 + 39\,m + 28}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2*x^m,x, algorithm="fricas")
```

```
[Out] ((b^2*m^2 + 5*b^2*m + 4*b^2)*x^7 + 2*(a*b*m^2 + 8*a*b*m + 7*a*b)*
x^4 + (a^2*m^2 + 11*a^2*m + 28*a^2)*x)*x^m/(m^3 + 12*m^2 + 39*m +
 28)
```

Sympy [A] time = 4.31148, size = 313, normalized size = 7.28

$$\begin{cases} -\frac{a^2}{6x^6} - \frac{2ab}{3x^3} + b^2\log\left(x\right) \\ -\frac{a^2}{3x^3} + 2ab\log\left(x\right) + \frac{b^2x^3}{3} \\ a^2\log\left(x\right) + \frac{2abx^3}{3} + \frac{b^2x^6}{6} \\ \frac{a^2m^2xx^m}{m^3+12m^2+39m+28} + \frac{11a^2mxx^m}{m^3+12m^2+39m+28} + \frac{28a^2xx^m}{m^3+12m^2+39m+28} + \frac{2abm^2x^4x^m}{m^3+12m^2+39m+28} + \frac{16abmx^4x^m}{m^3+12m^2+39m+28} + \frac{14abx^4x^m}{m^3+12m^2+39m+28} + \frac{b^2m^2x^7x^m}{m^3+12m^2+39m+2} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(b*x**3+a)**2,x)
```

```
[Out] Piecewise((-a**2/(6*x**6) - 2*a*b/(3*x**3) + b**2*log(x), Eq(m, -
7)), (-a**2/(3*x**3) + 2*a*b*log(x) + b**2*x**3/3, Eq(m, -4)), (a
**2*log(x) + 2*a*b*x**3/3 + b**2*x**6/6, Eq(m, -1)), (a**2*m**2*x
*x**m/(m**3 + 12*m**2 + 39*m + 28) + 11*a**2*m*x*x**m/(m**3 + 12*
m**2 + 39*m + 28) + 28*a**2*x*x**m/(m**3 + 12*m**2 + 39*m + 28) +
 2*a*b*m**2*x**4*x**m/(m**3 + 12*m**2 + 39*m + 28) + 16*a*b*m*x**
4*x**m/(m**3 + 12*m**2 + 39*m + 28) + 14*a*b*x**4*x**m/(m**3 + 12
*m**2 + 39*m + 28) + b**2*m**2*x**7*x**m/(m**3 + 12*m**2 + 39*m +
 28) + 5*b**2*m*x**7*x**m/(m**3 + 12*m**2 + 39*m + 28) + 4*b**2*x
**7*x**m/(m**3 + 12*m**2 + 39*m + 28), True))
```

GIAC/XCAS [A] time = 0.220314, size = 182, normalized size = 4.23

$$\frac{b^2m^2x^7e^{(m\ln(x))} + 5\,b^2mx^7e^{(m\ln(x))} + 4\,b^2x^7e^{(m\ln(x))} + 2\,abm^2x^4e^{(m\ln(x))} + 16\,abmx^4e^{(m\ln(x))} + 14\,abx^4e^{(m\ln(x))} + a^2m^2xe^{(m\ln(x}}{m^3 + 12\,m^2 + 39\,m + 28}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2*x^m,x, algorithm="giac")
```

```
[Out] (b^2*m^2*x^7*e^(m*ln(x)) + 5*b^2*m*x^7*e^(m*ln(x)) + 4*b^2*x^7*e^
(m*ln(x)) + 2*a*b*m^2*x^4*e^(m*ln(x)) + 16*a*b*m*x^4*e^(m*ln(x))
+ 14*a*b*x^4*e^(m*ln(x)) + a^2*m^2*x*e^(m*ln(x)) + 11*a^2*m*x*e^(
m*ln(x)) + 28*a^2*x*e^(m*ln(x)))/(m^3 + 12*m^2 + 39*m + 28)
```

3.585 $\int x^m (a + bx^3)\, dx$

Optimal. Leaf size=25

$$\frac{ax^{m+1}}{m+1} + \frac{bx^{m+4}}{m+4}$$

```
[Out] (a*x^(1 + m))/(1 + m) + (b*x^(4 + m))/(4 + m)
```

Rubi [A] time = 0.0200095, antiderivative size = 25, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$

$$\frac{ax^{m+1}}{m+1} + \frac{bx^{m+4}}{m+4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m*(a + b*x^3),x]

[Out] (a*x^(1 + m))/(1 + m) + (b*x^(4 + m))/(4 + m)
```

Rubi in Sympy [A] time = 3.84712, size = 19, normalized size = 0.76

$$\frac{ax^{m+1}}{m+1} + \frac{bx^{m+4}}{m+4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(b*x**3+a),x)

[Out] a*x**(m + 1)/(m + 1) + b*x**(m + 4)/(m + 4)
```

Mathematica [A] time = 0.0254124, size = 23, normalized size = 0.92

$$x^m \left(\frac{ax}{m+1} + \frac{bx^4}{m+4}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m*(a + b*x^3),x]

[Out] x^m*((a*x)/(1 + m) + (b*x^4)/(4 + m))
```

Maple [A] time = 0.003, size = 35, normalized size = 1.4

$$\frac{x^{1+m} \left(bmx^3 + bx^3 + am + 4\,a\right)}{(4+m)(1+m)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(b*x^3+a),x)

[Out] x^(1+m)*(b*m*x^3+b*x^3+a*m+4*a)/(4+m)/(1+m)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)*x^m,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.250649, size = 45, normalized size = 1.8

$$\frac{\left((bm + b)x^4 + (am + 4\,a)x\right)x^m}{m^2 + 5\,m + 4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)*x^m,x, algorithm="fricas")
```

```
[Out] ((b*m + b)*x^4 + (a*m + 4*a)*x)*x^m/(m^2 + 5*m + 4)
```

Sympy [A] time = 1.48818, size = 94, normalized size = 3.76

$$\begin{cases} -\frac{a}{3x^3} + b\log(x) & \text{for } m = -4 \\ a\log(x) + \frac{bx^3}{3} & \text{for } m = -1 \\ \frac{amxx^m}{m^2+5m+4} + \frac{4axx^m}{m^2+5m+4} + \frac{bmx^4x^m}{m^2+5m+4} + \frac{bx^4x^m}{m^2+5m+4} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(b*x**3+a),x)
```

```
[Out] Piecewise((-a/(3*x**3) + b*log(x), Eq(m, -4)), (a*log(x) + b*x**3
/3, Eq(m, -1)), (a*m*x*x**m/(m**2 + 5*m + 4) + 4*a*x*x**m/(m**2 +
 5*m + 4) + b*m*x**4*x**m/(m**2 + 5*m + 4) + b*x**4*x**m/(m**2 +
5*m + 4), True))
```

GIAC/XCAS [A] time = 0.241647, size = 69, normalized size = 2.76

$$\frac{bmx^4e^{(m\ln(x))} + bx^4e^{(m\ln(x))} + amxe^{(m\ln(x))} + 4\,axe^{(m\ln(x))}}{m^2 + 5\,m + 4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)*x^m,x, algorithm="giac")
```

```
[Out] (b*m*x^4*e^(m*ln(x)) + b*x^4*e^(m*ln(x)) + a*m*x*e^(m*ln(x)) + 4*
a*x*e^(m*ln(x)))/(m^2 + 5*m + 4)
```

3.586 $\int \frac{x^m}{a+bx^3}\,dx$

Optimal. Leaf size=39

$$\frac{x^{m+1}\,{}_2F_1\left(1,\frac{m+1}{3};\frac{m+4}{3};-\frac{bx^3}{a}\right)}{a(m+1)}$$

```
[Out] (x^(1 + m)*Hypergeometric2F1[1, (1 + m)/3, (4 + m)/3, -((b*x^3)/a
)])/(a*(1 + m))
```

Rubi [A] time = 0.0293812, antiderivative size = 39, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{x^{m+1}\,{}_2F_1\left(1,\frac{m+1}{3};\frac{m+4}{3};-\frac{bx^3}{a}\right)}{a(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m/(a + b*x^3),x]
```

```
[Out] (x^(1 + m)*Hypergeometric2F1[1, (1 + m)/3, (4 + m)/3, -((b*x^3)/a
)])/(a*(1 + m))
```

Rubi in Sympy [A] time = 4.28009, size = 29, normalized size = 0.74

$$\frac{x^{m+1}{}_2F_1\left(\begin{matrix}1,\frac{m}{3}+\frac{1}{3}\\ \frac{m}{3}+\frac{4}{3}\end{matrix}\middle|-\frac{bx^3}{a}\right)}{a\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m/(b*x**3+a),x)
```

```
[Out] x**(m + 1)*hyper((1, m/3 + 1/3), (m/3 + 4/3,), -b*x**3/a)/(a*(m +
 1))
```

Mathematica [A] time = 0.0290186, size = 41, normalized size = 1.05

$$\frac{x^{m+1}\,{}_2F_1\left(1,\frac{m+1}{3};\frac{m+1}{3}+1;-\frac{bx^3}{a}\right)}{a(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m/(a + b*x^3),x]
```

```
[Out] (x^(1 + m)*Hypergeometric2F1[1, (1 + m)/3, 1 + (1 + m)/3, -((b*x^
3)/a)])/(a*(1 + m))
```

Maple [F] time = 0.046, size = 0, normalized size = 0.

$$\int \frac{x^m}{bx^3+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m/(b*x^3+a),x)
```

```
[Out] int(x^m/(b*x^3+a),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{bx^3+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^3 + a),x, algorithm="maxima")
```

```
[Out] integrate(x^m/(b*x^3 + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^m}{bx^3+a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^3 + a),x, algorithm="fricas")
```

```
[Out] integral(x^m/(b*x^3 + a), x)
```

Sympy [A] time = 22.7738, size = 88, normalized size = 2.26

$$\frac{mxx^m \left(\frac{bx^3e^{i\pi}}{a}, 1, \frac{m}{3}+\frac{1}{3}\right) \left(\frac{m}{3}+\frac{1}{3}\right)}{9a\left(\frac{m}{3}+\frac{4}{3}\right)} + \frac{xx^m \left(\frac{bx^3e^{i\pi}}{a}, 1, \frac{m}{3}+\frac{1}{3}\right) \left(\frac{m}{3}+\frac{1}{3}\right)}{9a\left(\frac{m}{3}+\frac{4}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m/(b*x**3+a),x)
```

```
[Out] m*x*x**m*lerchphi(b*x**3*exp_polar(I*pi)/a, 1, m/3 + 1/3)*gamma(m
/3 + 1/3)/(9*a*gamma(m/3 + 4/3)) + x*x**m*lerchphi(b*x**3*exp_pol
ar(I*pi)/a, 1, m/3 + 1/3)*gamma(m/3 + 1/3)/(9*a*gamma(m/3 + 4/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{bx^3+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^3 + a),x, algorithm="giac")
```

```
[Out] integrate(x^m/(b*x^3 + a), x)
```

3.587 $\int \frac{x^m}{(a+bx^3)^2} dx$

Optimal. Leaf size=39

$$\frac{x^{m+1} {}_2F_1\left(2, \frac{m+1}{3}; \frac{m+4}{3}; -\frac{bx^3}{a}\right)}{a^2(m+1)}$$

```
[Out] (x^(1 + m)*Hypergeometric2F1[2, (1 + m)/3, (4 + m)/3, -((b*x^3)/a
)])/(a^2*(1 + m))
```

Rubi [A] time = 0.0283655, antiderivative size = 39, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$\frac{x^{m+1} {}_2F_1\left(2, \frac{m+1}{3}; \frac{m+4}{3}; -\frac{bx^3}{a}\right)}{a^2(m+1)}$$

Antiderivative was successfully verified.

```
[In] Int[x^m/(a + b*x^3)^2,x]
```

```
[Out] (x^(1 + m)*Hypergeometric2F1[2, (1 + m)/3, (4 + m)/3, -((b*x^3)/a
)])/(a^2*(1 + m))
```

Rubi in Sympy [A] time = 3.87933, size = 31, normalized size = 0.79

$$\frac{x^{m+1} {}_2F_1\left(\begin{matrix} 2, \frac{m}{3} + \frac{1}{3} \\ \frac{m}{3} + \frac{4}{3} \end{matrix}\middle| -\frac{bx^3}{a}\right)}{a^2 (m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**m/(b*x**3+a)**2,x)
```

```
[Out] x**(m + 1)*hyper((2, m/3 + 1/3), (m/3 + 4/3,), -b*x**3/a)/(a**2*(
m + 1))
```

Mathematica [A] time = 0.0302432, size = 41, normalized size = 1.05

$$\frac{x^{m+1} {}_2F_1\left(2, \frac{m+1}{3}; \frac{m+1}{3} + 1; -\frac{bx^3}{a}\right)}{a^2(m+1)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^m/(a + b*x^3)^2,x]
```

```
[Out] (x^(1 + m)*Hypergeometric2F1[2, (1 + m)/3, 1 + (1 + m)/3, -((b*x^
3)/a)])/(a^2*(1 + m))
```

Maple [F] time = 0.059, size = 0, normalized size = 0.

$$\int \frac{x^m}{(bx^3+a)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m/(b*x^3+a)^2,x)
```

```
[Out] int(x^m/(b*x^3+a)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{(bx^3 + a)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^3 + a)^2,x, algorithm="maxima")
```

```
[Out] integrate(x^m/(b*x^3 + a)^2, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^m}{b^2x^6 + 2\,abx^3 + a^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^3 + a)^2,x, algorithm="fricas")
```

```
[Out] integral(x^m/(b^2*x^6 + 2*a*b*x^3 + a^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m/(b*x**3+a)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{(bx^3 + a)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^3 + a)^2,x, algorithm="giac")
```

```
[Out] integrate(x^m/(b*x^3 + a)^2, x)
```

3.588 $\int \frac{x^m}{(a+bx^3)^3}\,dx$

Optimal. Leaf size=39

$$\frac{x^{m+1}\,{}_2F_1\left(3,\frac{m+1}{3};\frac{m+4}{3};-\frac{bx^3}{a}\right)}{a^3(m+1)}$$

```
[Out] (x^(1 + m)*Hypergeometric2F1[3, (1 + m)/3, (4 + m)/3, -((b*x^3)/a
)])/(a^3*(1 + m))
```

Rubi [A] time = 0.0277582, antiderivative size = 39, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{x^{m+1}\,{}_2F_1\left(3,\frac{m+1}{3};\frac{m+4}{3};-\frac{bx^3}{a}\right)}{a^3(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m/(a + b*x^3)^3,x]
```

```
[Out] (x^(1 + m)*Hypergeometric2F1[3, (1 + m)/3, (4 + m)/3, -((b*x^3)/a
)])/(a^3*(1 + m))
```

Rubi in Sympy [A] time = 3.89263, size = 31, normalized size = 0.79

$$\frac{x^{m+1}{}_2F_1\left(\begin{matrix}3,\frac{m}{3}+\frac{1}{3}\\\frac{m}{3}+\frac{4}{3}\end{matrix}\middle|-\frac{bx^3}{a}\right)}{a^3\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m/(b*x**3+a)**3,x)
```

```
[Out] x**(m + 1)*hyper((3, m/3 + 1/3), (m/3 + 4/3,), -b*x**3/a)/(a**3*(
m + 1))
```

Mathematica [A] time = 0.0322098, size = 41, normalized size = 1.05

$$\frac{x^{m+1}\,{}_2F_1\left(3,\frac{m+1}{3};\frac{m+1}{3}+1;-\frac{bx^3}{a}\right)}{a^3(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m/(a + b*x^3)^3,x]
```

```
[Out] (x^(1 + m)*Hypergeometric2F1[3, (1 + m)/3, 1 + (1 + m)/3, -((b*x^
3)/a)])/(a^3*(1 + m))
```

Maple [F] time = 0.047, size = 0, normalized size = 0.

$$\int \frac{x^m}{(bx^3+a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m/(b*x^3+a)^3,x)

[Out] int(x^m/(b*x^3+a)^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{(bx^3+a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^3 + a)^3,x, algorithm="maxima")

[Out] integrate(x^m/(b*x^3 + a)^3, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^m}{b^3x^9+3\,ab^2x^6+3\,a^2bx^3+a^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^3 + a)^3,x, algorithm="fricas")

[Out] integral(x^m/(b^3*x^9 + 3*a*b^2*x^6 + 3*a^2*b*x^3 + a^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m/(b*x**3+a)**3,x)

[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{(bx^3+a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^3 + a)^3,x, algorithm="giac")

[Out] integrate(x^m/(b*x^3 + a)^3, x)
```

3.589 $\int x^m \left(a+bx^3\right)^{3/2} dx$

Optimal. Leaf size=64

$$\frac{ax^{m+1}\sqrt{a+bx^3}\,{}_2F_1\left(-\frac{3}{2},\frac{m+1}{3};\frac{m+4}{3};-\frac{bx^3}{a}\right)}{(m+1)\sqrt{\frac{bx^3}{a}+1}}$$

```
[Out] (a*x^(1 + m)*Sqrt[a + b*x^3]*Hypergeometric2F1[-3/2, (1 + m)/3, (
4 + m)/3, -((b*x^3)/a)])/((1 + m)*Sqrt[1 + (b*x^3)/a])
```

Rubi [A] time = 0.0592202, antiderivative size = 64, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{ax^{m+1}\sqrt{a+bx^3}\,{}_2F_1\left(-\frac{3}{2},\frac{m+1}{3};\frac{m+4}{3};-\frac{bx^3}{a}\right)}{(m+1)\sqrt{\frac{bx^3}{a}+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m*(a + b*x^3)^(3/2),x]
```

```
[Out] (a*x^(1 + m)*Sqrt[a + b*x^3]*Hypergeometric2F1[-3/2, (1 + m)/3, (
4 + m)/3, -((b*x^3)/a)])/((1 + m)*Sqrt[1 + (b*x^3)/a])
```

Rubi in Sympy [A] time = 7.01364, size = 54, normalized size = 0.84

$$\frac{ax^{m+1}\sqrt{a+bx^3}\,{}_2F_1\left(\begin{matrix}-\frac{3}{2},\frac{m}{3}+\frac{1}{3}\\ \frac{m}{3}+\frac{4}{3}\end{matrix}\middle|-\frac{bx^3}{a}\right)}{\sqrt{1+\frac{bx^3}{a}}\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(b*x**3+a)**(3/2),x)
```

```
[Out] a*x**(m + 1)*sqrt(a + b*x**3)*hyper((-3/2, m/3 + 1/3), (m/3 + 4/3
,), -b*x**3/a)/(sqrt(1 + b*x**3/a)*(m + 1))
```

Mathematica [A] time = 0.122575, size = 109, normalized size = 1.7

$$\frac{x^{m+1}\sqrt{a+bx^3}\left(b(m+1)x^3\,{}_2F_1\left(-\frac{1}{2},\frac{m+4}{3};\frac{m+7}{3};-\frac{bx^3}{a}\right)+a(m+4)\,{}_2F_1\left(-\frac{1}{2},\frac{m+1}{3};\frac{m+4}{3};-\frac{bx^3}{a}\right)\right)}{(m+1)(m+4)\sqrt{\frac{bx^3}{a}+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m*(a + b*x^3)^(3/2),x]
```

```
[Out] (x^(1 + m)*Sqrt[a + b*x^3]*(a*(4 + m)*Hypergeometric2F1[-1/2, (1
+ m)/3, (4 + m)/3, -((b*x^3)/a)] + b*(1 + m)*x^3*Hypergeometric2F
1[-1/2, (4 + m)/3, (7 + m)/3, -((b*x^3)/a)]))/((1 + m)*(4 + m)*Sq
rt[1 + (b*x^3)/a])
```

Maple [F] time = 0.038, size = 0, normalized size = 0.

$$\int x^{m} \left(b x^{3}+a\right)^{\frac{3}{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(b*x^3+a)^(3/2),x)
```

```
[Out] int(x^m*(b*x^3+a)^(3/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b x^{3}+a\right)^{\frac{3}{2}} x^{m}\,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(3/2)*x^m,x, algorithm="maxima")
```

```
[Out] integrate((b*x^3 + a)^(3/2)*x^m, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(b x^{3}+a\right)^{\frac{3}{2}} x^{m}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(3/2)*x^m,x, algorithm="fricas")
```

```
[Out] integral((b*x^3 + a)^(3/2)*x^m, x)
```

Sympy [A] time = 21.2882, size = 54, normalized size = 0.84

$$\frac{a^{\frac{3}{2}} x x^{m} \left(\frac{m}{3}+\frac{1}{3}\right) {}_{2}F_{1}\left(\left.\begin{matrix} -\frac{3}{2}, \frac{m}{3}+\frac{1}{3} \\ \frac{m}{3}+\frac{4}{3} \end{matrix}\right| \frac{b x^{3} e^{i\pi}}{a}\right)}{3\left(\frac{m}{3}+\frac{4}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(b*x**3+a)**(3/2),x)
```

```
[Out] a**(3/2)*x*x**m*gamma(m/3 + 1/3)*hyper((-3/2, m/3 + 1/3), (m/3 +
4/3,), b*x**3*exp_polar(I*pi)/a)/(3*gamma(m/3 + 4/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b x^{3}+a\right)^{\frac{3}{2}} x^{m}\,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(3/2)*x^m,x, algorithm="giac")
```

```
[Out] integrate((b*x^3 + a)^(3/2)*x^m, x)
```

3.590 $\int x^m\sqrt{a+bx^3}\,dx$

Optimal. Leaf size=63

$$\frac{x^{m+1}\sqrt{a+bx^3}\,{}_2F_1\left(-\frac{1}{2},\frac{m+1}{3};\frac{m+4}{3};-\frac{bx^3}{a}\right)}{(m+1)\sqrt{\frac{bx^3}{a}+1}}$$

```
[Out] (x^(1 + m)*Sqrt[a + b*x^3]*Hypergeometric2F1[-1/2, (1 + m)/3, (4
+ m)/3, -((b*x^3)/a)])/((1 + m)*Sqrt[1 + (b*x^3)/a])
```

Rubi [A] time = 0.0560249, antiderivative size = 63, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{x^{m+1}\sqrt{a+bx^3}\,{}_2F_1\left(-\frac{1}{2},\frac{m+1}{3};\frac{m+4}{3};-\frac{bx^3}{a}\right)}{(m+1)\sqrt{\frac{bx^3}{a}+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m*Sqrt[a + b*x^3],x]
```

```
[Out] (x^(1 + m)*Sqrt[a + b*x^3]*Hypergeometric2F1[-1/2, (1 + m)/3, (4
+ m)/3, -((b*x^3)/a)])/((1 + m)*Sqrt[1 + (b*x^3)/a])
```

Rubi in Sympy [A] time = 6.91581, size = 53, normalized size = 0.84

$$\frac{x^{m+1}\sqrt{a+bx^3}\,{}_2F_1\left(\begin{matrix}-\frac{1}{2},\frac{m}{3}+\frac{1}{3}\\ \frac{m}{3}+\frac{4}{3}\end{matrix}\middle|-\frac{bx^3}{a}\right)}{\sqrt{1+\frac{bx^3}{a}}\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(b*x**3+a)**(1/2),x)
```

```
[Out] x**(m + 1)*sqrt(a + b*x**3)*hyper((-1/2, m/3 + 1/3), (m/3 + 4/3,)
, -b*x**3/a)/(sqrt(1 + b*x**3/a)*(m + 1))
```

Mathematica [A] time = 0.0301965, size = 63, normalized size = 1.

$$\frac{x^{m+1}\sqrt{a+bx^3}\,{}_2F_1\left(-\frac{1}{2},\frac{m+1}{3};\frac{m+4}{3};-\frac{bx^3}{a}\right)}{(m+1)\sqrt{\frac{bx^3}{a}+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m*Sqrt[a + b*x^3],x]
```

```
[Out] (x^(1 + m)*Sqrt[a + b*x^3]*Hypergeometric2F1[-1/2, (1 + m)/3, (4
+ m)/3, -((b*x^3)/a)])/((1 + m)*Sqrt[1 + (b*x^3)/a])
```

Maple [F] time = 0.029, size = 0, normalized size = 0.

$$\int x^m\sqrt{bx^3+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(b*x^3+a)^(1/2),x)

[Out] int(x^m*(b*x^3+a)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{bx^3 + a}x^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)*x^m,x, algorithm="maxima")

[Out] integrate(sqrt(b*x^3 + a)*x^m, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{bx^3 + a}x^m, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)*x^m,x, algorithm="fricas")

[Out] integral(sqrt(b*x^3 + a)*x^m, x)
```

Sympy [A] time = 3.70184, size = 54, normalized size = 0.86

$$\frac{\sqrt{a}xx^m\left(\frac{m}{3}+\frac{1}{3}\right){}_2F_1\left(\begin{matrix}-\frac{1}{2},\frac{m}{3}+\frac{1}{3}\\ \frac{m}{3}+\frac{4}{3}\end{matrix}\middle|\frac{bx^3e^{i\pi}}{a}\right)}{3\left(\frac{m}{3}+\frac{4}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(b*x**3+a)**(1/2),x)

[Out] sqrt(a)*x*x**m*gamma(m/3 + 1/3)*hyper((-1/2, m/3 + 1/3), (m/3 + 4
/3,), b*x**3*exp_polar(I*pi)/a)/(3*gamma(m/3 + 4/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{bx^3 + a}x^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^3 + a)*x^m,x, algorithm="giac")

[Out] integrate(sqrt(b*x^3 + a)*x^m, x)
```

3.591 $\int \frac{x^m}{\sqrt{a+bx^3}} \, dx$

Optimal. Leaf size=52

$$\frac{x^{m+1}\sqrt{a+bx^3}\,{}_2F_1\left(1,\frac{1}{6}(2m+5);\frac{m+4}{3};-\frac{bx^3}{a}\right)}{a(m+1)}$$

```
[Out] (x^(1 + m)*Sqrt[a + b*x^3]*Hypergeometric2F1[1, (5 + 2*m)/6, (4 +
 m)/3, -((b*x^3)/a)])/(a*(1 + m))
```

Rubi [A] time = 0.0571528, antiderivative size = 63, normalized size of antiderivative = 1.21, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{x^{m+1}\sqrt{\frac{bx^3}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{m+1}{3};\frac{m+4}{3};-\frac{bx^3}{a}\right)}{(m+1)\sqrt{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m/Sqrt[a + b*x^3],x]
```

```
[Out] (x^(1 + m)*Sqrt[1 + (b*x^3)/a]*Hypergeometric2F1[1/2, (1 + m)/3,
(4 + m)/3, -((b*x^3)/a)])/((1 + m)*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 7.44656, size = 53, normalized size = 1.02

$$\frac{x^{m+1}\sqrt{a+bx^3}\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{m}{3}+\frac{1}{3}\\ \frac{m}{3}+\frac{4}{3}\end{matrix}\middle|-\frac{bx^3}{a}\right)}{a\sqrt{1+\frac{bx^3}{a}}\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m/(b*x**3+a)**(1/2),x)
```

```
[Out] x**(m + 1)*sqrt(a + b*x**3)*hyper((1/2, m/3 + 1/3), (m/3 + 4/3,),
 -b*x**3/a)/(a*sqrt(1 + b*x**3/a)*(m + 1))
```

Mathematica [A] time = 0.0523796, size = 63, normalized size = 1.21

$$\frac{x^{m+1}\sqrt{\frac{bx^3}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{m+1}{3};\frac{m+4}{3};-\frac{bx^3}{a}\right)}{(m+1)\sqrt{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m/Sqrt[a + b*x^3],x]
```

```
[Out] (x^(1 + m)*Sqrt[1 + (b*x^3)/a]*Hypergeometric2F1[1/2, (1 + m)/3,
(4 + m)/3, -((b*x^3)/a)])/((1 + m)*Sqrt[a + b*x^3])
```

Maple [F] time = 0.031, size = 0, normalized size = 0.

$$\int x^m \frac{1}{\sqrt{bx^3+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m/(b*x^3+a)^(1/2),x)
```

```
[Out] int(x^m/(b*x^3+a)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{\sqrt{bx^3+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/sqrt(b*x^3 + a),x, algorithm="maxima")
```

```
[Out] integrate(x^m/sqrt(b*x^3 + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^m}{\sqrt{bx^3+a}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/sqrt(b*x^3 + a),x, algorithm="fricas")
```

```
[Out] integral(x^m/sqrt(b*x^3 + a), x)
```

Sympy [A] time = 3.01416, size = 53, normalized size = 1.02

$$\frac{xx^m\,\Gamma\left(\frac{m}{3}+\frac{1}{3}\right)\,{}_2F_1\left(\left.\begin{matrix}\frac{1}{2}, \frac{m}{3}+\frac{1}{3}\\ \frac{m}{3}+\frac{4}{3}\end{matrix}\right|\frac{bx^3e^{i\pi}}{a}\right)}{3\sqrt{a}\,\Gamma\left(\frac{m}{3}+\frac{4}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m/(b*x**3+a)**(1/2),x)
```

```
[Out] x*x**m*gamma(m/3 + 1/3)*hyper((1/2, m/3 + 1/3), (m/3 + 4/3,), b*x
**3*exp_polar(I*pi)/a)/(3*sqrt(a)*gamma(m/3 + 4/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{\sqrt{bx^3+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/sqrt(b*x^3 + a),x, algorithm="giac")
```

```
[Out] integrate(x^m/sqrt(b*x^3 + a), x)
```

3.592 $\int \frac{x^m}{(a+bx^3)^{3/2}}\,dx$

Optimal. Leaf size=66

$$\frac{x^{m+1}\sqrt{\frac{bx^3}{a}+1}\,{}_2F_1\left(\frac{3}{2},\frac{m+1}{3};\frac{m+4}{3};-\frac{bx^3}{a}\right)}{a(m+1)\sqrt{a+bx^3}}$$

```
[Out] (x^(1 + m)*Sqrt[1 + (b*x^3)/a]*Hypergeometric2F1[3/2, (1 + m)/3,
(4 + m)/3, -((b*x^3)/a)])/(a*(1 + m)*Sqrt[a + b*x^3])
```

Rubi [A] time = 0.059729, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{x^{m+1}\sqrt{\frac{bx^3}{a}+1}\,{}_2F_1\left(\frac{3}{2},\frac{m+1}{3};\frac{m+4}{3};-\frac{bx^3}{a}\right)}{a(m+1)\sqrt{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m/(a + b*x^3)^(3/2),x]
```

```
[Out] (x^(1 + m)*Sqrt[1 + (b*x^3)/a]*Hypergeometric2F1[3/2, (1 + m)/3,
(4 + m)/3, -((b*x^3)/a)])/(a*(1 + m)*Sqrt[a + b*x^3])
```

Rubi in Sympy [A] time = 7.32391, size = 54, normalized size = 0.82

$$\frac{x^{m+1}\sqrt{a+bx^3}\,{}_2F_1\left(\begin{matrix}\frac{3}{2},\frac{m}{3}+\frac{1}{3}\\ \frac{m}{3}+\frac{4}{3}\end{matrix}\middle|-\frac{bx^3}{a}\right)}{a^2\sqrt{1+\frac{bx^3}{a}}\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m/(b*x**3+a)**(3/2),x)
```

```
[Out] x**(m + 1)*sqrt(a + b*x**3)*hyper((3/2, m/3 + 1/3), (m/3 + 4/3,),
 -b*x**3/a)/(a**2*sqrt(1 + b*x**3/a)*(m + 1))
```

Mathematica [A] time = 0.0547945, size = 66, normalized size = 1.

$$\frac{x^{m+1}\sqrt{\frac{bx^3}{a}+1}\,{}_2F_1\left(\frac{3}{2},\frac{m+1}{3};\frac{m+4}{3};-\frac{bx^3}{a}\right)}{a(m+1)\sqrt{a+bx^3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m/(a + b*x^3)^(3/2),x]
```

```
[Out] (x^(1 + m)*Sqrt[1 + (b*x^3)/a]*Hypergeometric2F1[3/2, (1 + m)/3,
(4 + m)/3, -((b*x^3)/a)])/(a*(1 + m)*Sqrt[a + b*x^3])
```

Maple [F] time = 0.03, size = 0, normalized size = 0.

$$\int x^m\left(bx^3+a\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m/(b*x^3+a)^(3/2),x)
```

```
[Out] int(x^m/(b*x^3+a)^(3/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{(bx^3+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^3 + a)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^m/(b*x^3 + a)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^m}{(bx^3+a)^{\frac{3}{2}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^3 + a)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^m/(b*x^3 + a)^(3/2), x)
```

Sympy [A] time = 5.5495, size = 53, normalized size = 0.8

$$\frac{xx^m\,\Gamma\left(\frac{m}{3}+\frac{1}{3}\right){}_2F_1\left(\begin{matrix}\frac{3}{2},\frac{m}{3}+\frac{1}{3}\\ \frac{m}{3}+\frac{4}{3}\end{matrix}\middle|\frac{bx^3e^{i\pi}}{a}\right)}{3a^{\frac{3}{2}}\,\Gamma\left(\frac{m}{3}+\frac{4}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m/(b*x**3+a)**(3/2),x)
```

```
[Out] x*x**m*gamma(m/3 + 1/3)*hyper((3/2, m/3 + 1/3), (m/3 + 4/3,), b*x
**3*exp_polar(I*pi)/a)/(3*a**(3/2)*gamma(m/3 + 4/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{(bx^3+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^3 + a)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^m/(b*x^3 + a)^(3/2), x)
```

3.593 $\int (cx)^m \left(a+bx^3\right)^{4/3} dx$

Optimal. Leaf size=69

$$\frac{a\sqrt[3]{a+bx^3}(cx)^{m+1}\,{}_2F_1\left(-\frac{4}{3},\frac{m+1}{3};\frac{m+4}{3};-\frac{bx^3}{a}\right)}{c(m+1)\sqrt[3]{\frac{bx^3}{a}+1}}$$

```
[Out] (a*(c*x)^(1 + m)*(a + b*x^3)^(1/3)*Hypergeometric2F1[-4/3, (1 + m
)/3, (4 + m)/3, -((b*x^3)/a)])/(c*(1 + m)*(1 + (b*x^3)/a)^(1/3))
```

Rubi [A] time = 0.0673379, antiderivative size = 69, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{a\sqrt[3]{a+bx^3}(cx)^{m+1}\,{}_2F_1\left(-\frac{4}{3},\frac{m+1}{3};\frac{m+4}{3};-\frac{bx^3}{a}\right)}{c(m+1)\sqrt[3]{\frac{bx^3}{a}+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^m*(a + b*x^3)^(4/3),x]
```

```
[Out] (a*(c*x)^(1 + m)*(a + b*x^3)^(1/3)*Hypergeometric2F1[-4/3, (1 + m
)/3, (4 + m)/3, -((b*x^3)/a)])/(c*(1 + m)*(1 + (b*x^3)/a)^(1/3))
```

Rubi in Sympy [A] time = 7.79481, size = 58, normalized size = 0.84

$$\frac{a\,(cx)^{m+1}\sqrt[3]{a+bx^3}\,{}_2F_1\left(\begin{matrix}-\frac{4}{3},\frac{m}{3}+\frac{1}{3}\\ \frac{m}{3}+\frac{4}{3}\end{matrix}\middle|-\frac{bx^3}{a}\right)}{c\sqrt[3]{1+\frac{bx^3}{a}}\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**m*(b*x**3+a)**(4/3),x)
```

```
[Out] a*(c*x)**(m + 1)*(a + b*x**3)**(1/3)*hyper((-4/3, m/3 + 1/3), (m/
3 + 4/3,), -b*x**3/a)/(c*(1 + b*x**3/a)**(1/3)*(m + 1))
```

Mathematica [A] time = 0.12274, size = 110, normalized size = 1.59

$$\frac{x\sqrt[3]{a+bx^3}(cx)^m\left(b(m+1)x^3\,{}_2F_1\left(-\frac{1}{3},\frac{m+4}{3};\frac{m+7}{3};-\frac{bx^3}{a}\right)+a(m+4)\,{}_2F_1\left(-\frac{1}{3},\frac{m+1}{3};\frac{m+4}{3};-\frac{bx^3}{a}\right)\right)}{(m+1)(m+4)\sqrt[3]{\frac{bx^3}{a}+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^m*(a + b*x^3)^(4/3),x]
```

```
[Out] (x*(c*x)^m*(a + b*x^3)^(1/3)*(a*(4 + m)*Hypergeometric2F1[-1/3, (
1 + m)/3, (4 + m)/3, -((b*x^3)/a)] + b*(1 + m)*x^3*Hypergeometric
2F1[-1/3, (4 + m)/3, (7 + m)/3, -((b*x^3)/a)]))/((1 + m)*(4 + m)*
(1 + (b*x^3)/a)^(1/3))
```

Maple [F] time = 0.029, size = 0, normalized size = 0.

$$\int (cx)^m \left(bx^3+a\right)^{\frac{4}{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^m*(b*x^3+a)^(4/3),x)
```

```
[Out] int((c*x)^m*(b*x^3+a)^(4/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bx^3+a\right)^{\frac{4}{3}} (cx)^m\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(4/3)*(c*x)^m,x, algorithm="maxima")
```

```
[Out] integrate((b*x^3 + a)^(4/3)*(c*x)^m, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(bx^3+a\right)^{\frac{4}{3}} (cx)^m, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(4/3)*(c*x)^m,x, algorithm="fricas")
```

```
[Out] integral((b*x^3 + a)^(4/3)*(c*x)^m, x)
```

Sympy [A] time = 162.541, size = 58, normalized size = 0.84

$$\frac{a^{\frac{4}{3}} c^m x x^m \Gamma\left(\frac{m}{3}+\frac{1}{3}\right) {}_2F_1\left(\begin{matrix} -\frac{4}{3}, \frac{m}{3}+\frac{1}{3} \\ \frac{m}{3}+\frac{4}{3} \end{matrix}\middle| \frac{bx^3 e^{i\pi}}{a}\right)}{3\Gamma\left(\frac{m}{3}+\frac{4}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**m*(b*x**3+a)**(4/3),x)
```

```
[Out] a**(4/3)*c**m*x*x**m*gamma(m/3 + 1/3)*hyper((-4/3, m/3 + 1/3), (m
/3 + 4/3,), b*x**3*exp_polar(I*pi)/a)/(3*gamma(m/3 + 4/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bx^3+a\right)^{\frac{4}{3}} (cx)^m\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(4/3)*(c*x)^m,x, algorithm="giac")
```

```
[Out] integrate((b*x^3 + a)^(4/3)*(c*x)^m, x)
```

3.594 $\int (cx)^m \left(a+bx^3\right)^{2/3} dx$

Optimal. Leaf size=61

$$\frac{(cx)^{m+1} \left(a+bc^3x^3\right)^{5/3} {}_2F_1\left(1,\frac{m+6}{3};\frac{m+4}{3};-\frac{bc^3x^3}{a}\right)}{ac(m+1)}$$

```
[Out] ((c*x)^(1 + m)*(a + b*c^3*x^3)^(5/3)*Hypergeometric2F1[1, (6 + m)
/3, (4 + m)/3, -((b*c^3*x^3)/a)])/(a*c*(1 + m))
```

Rubi [A] time = 0.0632082, antiderivative size = 68, normalized size of antiderivative = 1.11, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{\left(a+bx^3\right)^{2/3} (cx)^{m+1} {}_2F_1\left(-\frac{2}{3},\frac{m+1}{3};\frac{m+4}{3};-\frac{bx^3}{a}\right)}{c(m+1)\left(\frac{bx^3}{a}+1\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Int[(c*x)^m*(a + b*x^3)^(2/3),x]
```

```
[Out] ((c*x)^(1 + m)*(a + b*x^3)^(2/3)*Hypergeometric2F1[-2/3, (1 + m)/
3, (4 + m)/3, -((b*x^3)/a)])/(c*(1 + m)*(1 + (b*x^3)/a)^(2/3))
```

Rubi in Sympy [A] time = 7.70243, size = 56, normalized size = 0.92

$$\frac{(cx)^{m+1} \left(a+bx^3\right)^{\frac{2}{3}} {}_2F_1\left(\begin{matrix} -\frac{2}{3}, \frac{m}{3}+\frac{1}{3} \\ \frac{m}{3}+\frac{4}{3} \end{matrix}\middle| -\frac{bx^3}{a}\right)}{c\left(1+\frac{bx^3}{a}\right)^{\frac{2}{3}}(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((c*x)**m*(b*x**3+a)**(2/3),x)
```

```
[Out] (c*x)**(m + 1)*(a + b*x**3)**(2/3)*hyper((-2/3, m/3 + 1/3), (m/3
+ 4/3,), -b*x**3/a)/(c*(1 + b*x**3/a)**(2/3)*(m + 1))
```

Mathematica [A] time = 0.0485709, size = 64, normalized size = 1.05

$$\frac{x\left(a+bx^3\right)^{2/3} (cx)^m {}_2F_1\left(-\frac{2}{3},\frac{m+1}{3};\frac{m+4}{3};-\frac{bx^3}{a}\right)}{(m+1)\left(\frac{bx^3}{a}+1\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*x)^m*(a + b*x^3)^(2/3),x]
```

```
[Out] (x*(c*x)^m*(a + b*x^3)^(2/3)*Hypergeometric2F1[-2/3, (1 + m)/3, (
4 + m)/3, -((b*x^3)/a)])/((1 + m)*(1 + (b*x^3)/a)^(2/3))
```

Maple [F] time = 0.028, size = 0, normalized size = 0.

$$\int (cx)^m \left(bx^3+a\right)^{\frac{2}{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^m*(b*x^3+a)^(2/3),x)

[Out] int((c*x)^m*(b*x^3+a)^(2/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bx^3+a\right)^{\frac{2}{3}} (cx)^m\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)*(c*x)^m,x, algorithm="maxima")

[Out] integrate((b*x^3 + a)^(2/3)*(c*x)^m, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(bx^3+a\right)^{\frac{2}{3}} (cx)^m, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)*(c*x)^m,x, algorithm="fricas")

[Out] integral((b*x^3 + a)^(2/3)*(c*x)^m, x)
```

Sympy [A] time = 12.5358, size = 58, normalized size = 0.95

$$\frac{a^{\frac{2}{3}} c^m x x^m \Gamma\left(\frac{m}{3}+\frac{1}{3}\right) {}_2F_1\left(\begin{matrix} -\frac{2}{3}, \frac{m}{3}+\frac{1}{3} \\ \frac{m}{3}+\frac{4}{3} \end{matrix}\middle| \frac{bx^3 e^{i\pi}}{a}\right)}{3\Gamma\left(\frac{m}{3}+\frac{4}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**m*(b*x**3+a)**(2/3),x)

[Out] a**(2/3)*c**m*x*x**m*gamma(m/3 + 1/3)*hyper((-2/3, m/3 + 1/3), (m
/3 + 4/3,), b*x**3*exp_polar(I*pi)/a)/(3*gamma(m/3 + 4/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bx^3+a\right)^{\frac{2}{3}} (cx)^m\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(2/3)*(c*x)^m,x, algorithm="giac")

[Out] integrate((b*x^3 + a)^(2/3)*(c*x)^m, x)
```

3.595 $\int (cx)^m \sqrt[3]{a+bx^3}\,dx$

Optimal. Leaf size=61

$$\frac{(cx)^{m+1}\left(a+bc^3x^3\right)^{4/3}\,{}_2F_1\left(1,\frac{m+5}{3};\frac{m+4}{3};-\frac{bc^3x^3}{a}\right)}{ac(m+1)}$$

```
[Out] ((c*x)^(1 + m)*(a + b*c^3*x^3)^(4/3)*Hypergeometric2F1[1, (5 + m)
/3, (4 + m)/3, -((b*c^3*x^3)/a)])/(a*c*(1 + m))
```

Rubi [A] time = 0.0633637, antiderivative size = 68, normalized size of antiderivative = 1.11, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$

$$\frac{\sqrt[3]{a+bx^3}(cx)^{m+1}\,{}_2F_1\left(-\frac{1}{3},\frac{m+1}{3};\frac{m+4}{3};-\frac{bx^3}{a}\right)}{c(m+1)\sqrt[3]{\frac{bx^3}{a}+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^m*(a + b*x^3)^(1/3),x]
```

```
[Out] ((c*x)^(1 + m)*(a + b*x^3)^(1/3)*Hypergeometric2F1[-1/3, (1 + m)/
3, (4 + m)/3, -((b*x^3)/a)])/(c*(1 + m)*(1 + (b*x^3)/a)^(1/3))
```

Rubi in Sympy [A] time = 7.66497, size = 56, normalized size = 0.92

$$\frac{(cx)^{m+1}\sqrt[3]{a+bx^3}\,{}_2F_1\left(\begin{matrix}-\frac{1}{3},\frac{m}{3}+\frac{1}{3}\\ \frac{m}{3}+\frac{4}{3}\end{matrix}\middle|-\frac{bx^3}{a}\right)}{c\sqrt[3]{1+\frac{bx^3}{a}}(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**m*(b*x**3+a)**(1/3),x)
```

```
[Out] (c*x)**(m + 1)*(a + b*x**3)**(1/3)*hyper((-1/3, m/3 + 1/3), (m/3
+ 4/3,), -b*x**3/a)/(c*(1 + b*x**3/a)**(1/3)*(m + 1))
```

Mathematica [A] time = 0.0295587, size = 64, normalized size = 1.05

$$\frac{x\sqrt[3]{a+bx^3}(cx)^m\,{}_2F_1\left(-\frac{1}{3},\frac{m+1}{3};\frac{m+4}{3};-\frac{bx^3}{a}\right)}{(m+1)\sqrt[3]{\frac{bx^3}{a}+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^m*(a + b*x^3)^(1/3),x]
```

```
[Out] (x*(c*x)^m*(a + b*x^3)^(1/3)*Hypergeometric2F1[-1/3, (1 + m)/3, (
4 + m)/3, -((b*x^3)/a)])/((1 + m)*(1 + (b*x^3)/a)^(1/3))
```

Maple [F] time = 0.029, size = 0, normalized size = 0.

$$\int (cx)^m \sqrt[3]{bx^3 + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^m*(b*x^3+a)^(1/3),x)
```

```
[Out] int((c*x)^m*(b*x^3+a)^(1/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bx^3 + a\right)^{\frac{1}{3}} (cx)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)*(c*x)^m,x, algorithm="maxima")
```

```
[Out] integrate((b*x^3 + a)^(1/3)*(c*x)^m, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(bx^3 + a\right)^{\frac{1}{3}} (cx)^m, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)*(c*x)^m,x, algorithm="fricas")
```

```
[Out] integral((b*x^3 + a)^(1/3)*(c*x)^m, x)
```

Sympy [A] time = 5.0469, size = 58, normalized size = 0.95

$$\frac{\sqrt[3]{a} c^m x x^m \Gamma\left(\frac{m}{3} + \frac{1}{3}\right) {}_2F_1\left(\begin{matrix} -\frac{1}{3}, \frac{m}{3} + \frac{1}{3} \\ \frac{m}{3} + \frac{4}{3} \end{matrix}\middle| \frac{bx^3 e^{i\pi}}{a}\right)}{3\Gamma\left(\frac{m}{3} + \frac{4}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**m*(b*x**3+a)**(1/3),x)
```

```
[Out] a**(1/3)*c**m*x*x**m*gamma(m/3 + 1/3)*hyper((-1/3, m/3 + 1/3), (m
/3 + 4/3,), b*x**3*exp_polar(I*pi)/a)/(3*gamma(m/3 + 4/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bx^3 + a\right)^{\frac{1}{3}} (cx)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^(1/3)*(c*x)^m,x, algorithm="giac")
```

```
[Out] integrate((b*x^3 + a)^(1/3)*(c*x)^m, x)
```

3.596 $\int (cx)^m \left(a+bx^3\right)^p \, dx$

Optimal. Leaf size=66

$$\frac{(cx)^{m+1}\left(a+bx^3\right)^p\left(\frac{bx^3}{a}+1\right)^{-p}{}_2F_1\left(\frac{m+1}{3},-p;\frac{m+4}{3};-\frac{bx^3}{a}\right)}{c(m+1)}$$

```
[Out] ((c*x)^(1 + m)*(a + b*x^3)^p*Hypergeometric2F1[(1 + m)/3, -p, (4
+ m)/3, -((b*x^3)/a)])/(c*(1 + m)*(1 + (b*x^3)/a)^p)
```

Rubi [A] time = 0.0511109, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{(cx)^{m+1}\left(a+bx^3\right)^p\left(\frac{bx^3}{a}+1\right)^{-p}{}_2F_1\left(\frac{m+1}{3},-p;\frac{m+4}{3};-\frac{bx^3}{a}\right)}{c(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^m*(a + b*x^3)^p,x]
```

```
[Out] ((c*x)^(1 + m)*(a + b*x^3)^p*Hypergeometric2F1[(1 + m)/3, -p, (4
+ m)/3, -((b*x^3)/a)])/(c*(1 + m)*(1 + (b*x^3)/a)^p)
```

Rubi in Sympy [A] time = 7.92868, size = 51, normalized size = 0.77

$$\frac{(cx)^{m+1}\left(1+\frac{bx^3}{a}\right)^{-p}\left(a+bx^3\right)^p{}_2F_1\left(\begin{matrix}-p,\frac{m}{3}+\frac{1}{3}\\ \frac{m}{3}+\frac{4}{3}\end{matrix}\middle|-\frac{bx^3}{a}\right)}{c\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**m*(b*x**3+a)**p,x)
```

```
[Out] (c*x)**(m + 1)*(1 + b*x**3/a)**(-p)*(a + b*x**3)**p*hyper((-p, m/
3 + 1/3), (m/3 + 4/3,), -b*x**3/a)/(c*(m + 1))
```

Mathematica [A] time = 0.0549968, size = 64, normalized size = 0.97

$$\frac{x(cx)^m\left(a+bx^3\right)^p\left(\frac{bx^3}{a}+1\right)^{-p}{}_2F_1\left(\frac{m+1}{3},-p;\frac{m+1}{3}+1;-\frac{bx^3}{a}\right)}{m+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^m*(a + b*x^3)^p,x]
```

```
[Out] (x*(c*x)^m*(a + b*x^3)^p*Hypergeometric2F1[(1 + m)/3, -p, 1 + (1
+ m)/3, -((b*x^3)/a)])/((1 + m)*(1 + (b*x^3)/a)^p)
```

Maple [F] time = 0.094, size = 0, normalized size = 0.

$$\int (cx)^m\left(bx^3+a\right)^p\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^m*(b*x^3+a)^p,x)
```

```
[Out] int((c*x)^m*(b*x^3+a)^p,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^3 + a)^p (cx)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^p*(c*x)^m,x, algorithm="maxima")
```

```
[Out] integrate((b*x^3 + a)^p*(c*x)^m, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left((bx^3 + a)^p (cx)^m, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^p*(c*x)^m,x, algorithm="fricas")
```

```
[Out] integral((b*x^3 + a)^p*(c*x)^m, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**m*(b*x**3+a)**p,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^3 + a)^p (cx)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^p*(c*x)^m,x, algorithm="giac")
```

```
[Out] integrate((b*x^3 + a)^p*(c*x)^m, x)
```

3.597 $\int x^2 (a + bx^3)^p \, dx$

Optimal. Leaf size=23

$$\frac{(a + bx^3)^{p+1}}{3b(p + 1)}$$

```
[Out] (a + b*x^3)^(1 + p)/(3*b*(1 + p))
```

Rubi [A] time = 0.0182122, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$\frac{(a + bx^3)^{p+1}}{3b(p + 1)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2*(a + b*x^3)^p,x]

[Out] (a + b*x^3)^(1 + p)/(3*b*(1 + p))
```

Rubi in Sympy [A] time = 2.59768, size = 15, normalized size = 0.65

$$\frac{(a + bx^3)^{p+1}}{3b\,(p + 1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(b*x**3+a)**p,x)

[Out] (a + b*x**3)**(p + 1)/(3*b*(p + 1))
```

Mathematica [A] time = 0.0178912, size = 22, normalized size = 0.96

$$\frac{(a + bx^3)^{p+1}}{3bp + 3b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2*(a + b*x^3)^p,x]

[Out] (a + b*x^3)^(1 + p)/(3*b + 3*b*p)
```

Maple [A] time = 0.006, size = 22, normalized size = 1.

$$\frac{(bx^3 + a)^{1+p}}{3\,b\,(1 + p)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(b*x^3+a)^p,x)
```

```
[Out] 1/3*(b*x^3+a)^(1+p)/b/(1+p)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^p*x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.24264, size = 34, normalized size = 1.48

$$\frac{\left(bx^3 + a\right)\left(bx^3 + a\right)^p}{3\left(bp + b\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^p*x^2,x, algorithm="fricas")
```

```
[Out] 1/3*(b*x^3 + a)*(b*x^3 + a)^p/(b*p + b)
```

Sympy [A] time = 5.87109, size = 134, normalized size = 5.83

$$\begin{cases} \frac{x^3}{3a} & \text{for } b = 0 \wedge p = -1 \\ \frac{a^p x^3}{3} & \text{for } b = 0 \\ \frac{\log\left(-\sqrt[3]{-1}\sqrt[3]{a}\sqrt[3]{\frac{1}{b}}+x\right)}{3b} + \frac{\log\left(4(-1)^{\frac{2}{3}}a^{\frac{2}{3}}\left(\frac{1}{b}\right)^{\frac{2}{3}}+4\sqrt[3]{-1}\sqrt[3]{a}x\sqrt[3]{\frac{1}{b}}+4x^2\right)}{3b} & \text{for } p = -1 \\ \frac{a\left(a+bx^3\right)^p}{3bp+3b} + \frac{bx^3\left(a+bx^3\right)^p}{3bp+3b} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(b*x**3+a)**p,x)
```

```
[Out] Piecewise((x**3/(3*a), Eq(b, 0) & Eq(p, -1)), (a**p*x**3/3, Eq(b,
 0)), (log(-(-1)**(1/3)*a**(1/3)*(1/b)**(1/3) + x)/(3*b) + log(4*
(-1)**(2/3)*a**(2/3)*(1/b)**(2/3) + 4*(-1)**(1/3)*a**(1/3)*x*(1/b
)**(1/3) + 4*x**2)/(3*b), Eq(p, -1)), (a*(a + b*x**3)**p/(3*b*p +
 3*b) + b*x**3*(a + b*x**3)**p/(3*b*p + 3*b), True))
```

GIAC/XCAS [A] time = 0.213426, size = 28, normalized size = 1.22

$$\frac{\left(bx^3 + a\right)^{p+1}}{3\,b(p + 1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^p*x^2,x, algorithm="giac")
```

```
[Out] 1/3*(b*x^3 + a)^(p + 1)/(b*(p + 1))
```

3.598 $\int x^5 \left(a+bx^3\right)^p\,dx$

Optimal. Leaf size=48

$$\frac{\left(a+bx^3\right)^{p+2}}{3b^2(p+2)}-\frac{a\left(a+bx^3\right)^{p+1}}{3b^2(p+1)}$$

```
[Out] -(a*(a + b*x^3)^(1 + p))/(3*b^2*(1 + p)) + (a + b*x^3)^(2 + p)/(3
*b^2*(2 + p))
```

Rubi [A] time = 0.0658253, antiderivative size = 48, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{\left(a+bx^3\right)^{p+2}}{3b^2(p+2)}-\frac{a\left(a+bx^3\right)^{p+1}}{3b^2(p+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5*(a + b*x^3)^p,x]
```

```
[Out] -(a*(a + b*x^3)^(1 + p))/(3*b^2*(1 + p)) + (a + b*x^3)^(2 + p)/(3
*b^2*(2 + p))
```

Rubi in Sympy [A] time = 10.1917, size = 37, normalized size = 0.77

$$-\frac{a\left(a+bx^3\right)^{p+1}}{3b^2\left(p+1\right)}+\frac{\left(a+bx^3\right)^{p+2}}{3b^2\left(p+2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5*(b*x**3+a)**p,x)
```

```
[Out] -a*(a + b*x**3)**(p + 1)/(3*b**2*(p + 1)) + (a + b*x**3)**(p + 2)
/(3*b**2*(p + 2))
```

Mathematica [A] time = 0.02909, size = 40, normalized size = 0.83

$$\frac{\left(a+bx^3\right)^{p+1}\left(b(p+1)x^3-a\right)}{3b^2(p+1)(p+2)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5*(a + b*x^3)^p,x]
```

```
[Out] ((a + b*x^3)^(1 + p)*(-a + b*(1 + p)*x^3))/(3*b^2*(1 + p)*(2 + p)
)
```

Maple [A] time = 0.007, size = 42, normalized size = 0.9

$$-\frac{\left(bx^3+a\right)^{1+p}\left(-x^3pb-bx^3+a\right)}{3\,b^2\left(p^2+3\,p+2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5*(b*x^3+a)^p,x)
```

```
[Out] -1/3*(b*x^3+a)^(1+p)*(-b*p*x^3-b*x^3+a)/b^2/(p^2+3*p+2)
```

Maxima [A] time = 1.45276, size = 63, normalized size = 1.31

$$\frac{\left(b^2(p+1)x^6+abpx^3-a^2\right)\left(bx^3+a\right)^p}{3\left(p^2+3p+2\right)b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^p*x^5,x, algorithm="maxima")
```

```
[Out] 1/3*(b^2*(p + 1)*x^6 + a*b*p*x^3 - a^2)*(b*x^3 + a)^p/((p^2 + 3*p
 + 2)*b^2)
```

Fricas [A] time = 0.246074, size = 78, normalized size = 1.62

$$\frac{\left(\left(b^2p+b^2\right)x^6+abpx^3-a^2\right)\left(bx^3+a\right)^p}{3\left(b^2p^2+3\,b^2p+2\,b^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^p*x^5,x, algorithm="fricas")
```

```
[Out] 1/3*((b^2*p + b^2)*x^6 + a*b*p*x^3 - a^2)*(b*x^3 + a)^p/(b^2*p^2
+ 3*b^2*p + 2*b^2)
```

Sympy [A] time = 21.3249, size = 524, normalized size = 10.92

$$\begin{cases} \frac{a^p x^6}{6} \\ \frac{a\log\left(-\sqrt[3]{-1}\sqrt[3]{a}\sqrt[3]{\frac{1}{b}}+x\right)}{3ab^2+3b^3x^3}+\frac{a\log\left(4(-1)^{\frac{2}{3}}a^{\frac{2}{3}}\left(\frac{1}{b}\right)^{\frac{2}{3}}+4\sqrt[3]{-1}\sqrt[3]{a}x\sqrt[3]{\frac{1}{b}}+4x^2\right)}{3ab^2+3b^3x^3}-\frac{2a\log(2)}{3ab^2+3b^3x^3}+\frac{a}{3ab^2+3b^3x^3}+\frac{bx^3\log\left(-\sqrt[3]{-1}\sqrt[3]{a}\sqrt[3]{\frac{1}{b}}+x\right)}{3ab^2+3b^3x^3}+\frac{bx^3\,\mathrm{lo}}{} \\ -\frac{a\log\left(-\sqrt[3]{-1}\sqrt[3]{a}\sqrt[3]{\frac{1}{b}}+x\right)}{3b^2}-\frac{a\log\left(4(-1)^{\frac{2}{3}}a^{\frac{2}{3}}\left(\frac{1}{b}\right)^{\frac{2}{3}}+4\sqrt[3]{-1}\sqrt[3]{a}x\sqrt[3]{\frac{1}{b}}+4x^2\right)}{3b^2}+\frac{x^3}{3b} \\ -\frac{a^2\left(a+bx^3\right)^p}{3b^2p^2+9b^2p+6b^2}+\frac{abpx^3\left(a+bx^3\right)^p}{3b^2p^2+9b^2p+6b^2}+\frac{b^2px^6\left(a+bx^3\right)^p}{3b^2p^2+9b^2p+6b^2}+\frac{b^2x^6\left(a+bx^3\right)^p}{3b^2p^2+9b^2p+6b^2} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5*(b*x**3+a)**p,x)
```

```
[Out] Piecewise((a**p*x**6/6, Eq(b, 0)), (a*log(-(-1)**(1/3)*a**(1/3)*(
1/b)**(1/3) + x)/(3*a*b**2 + 3*b**3*x**3) + a*log(4*(-1)**(2/3)*a
**(2/3)*(1/b)**(2/3) + 4*(-1)**(1/3)*a**(1/3)*x*(1/b)**(1/3) + 4*
x**2)/(3*a*b**2 + 3*b**3*x**3) - 2*a*log(2)/(3*a*b**2 + 3*b**3*x*
*3) + a/(3*a*b**2 + 3*b**3*x**3) + b*x**3*log(-(-1)**(1/3)*a**(1/
3)*(1/b)**(1/3) + x)/(3*a*b**2 + 3*b**3*x**3) + b*x**3*log(4*(-1)
**(2/3)*a**(2/3)*(1/b)**(2/3) + 4*(-1)**(1/3)*a**(1/3)*x*(1/b)**(
1/3) + 4*x**2)/(3*a*b**2 + 3*b**3*x**3) - 2*b*x**3*log(2)/(3*a*b*
*2 + 3*b**3*x**3), Eq(p, -2)), (-a*log(-(-1)**(1/3)*a**(1/3)*(1/b
)**(1/3) + x)/(3*b**2) - a*log(4*(-1)**(2/3)*a**(2/3)*(1/b)**(2/3
) + 4*(-1)**(1/3)*a**(1/3)*x*(1/b)**(1/3) + 4*x**2)/(3*b**2) + x*
*3/(3*b), Eq(p, -1)), (-a**2*(a + b*x**3)**p/(3*b**2*p**2 + 9*b**
2*p + 6*b**2) + a*b*p*x**3*(a + b*x**3)**p/(3*b**2*p**2 + 9*b**2*
p + 6*b**2) + b**2*p*x**6*(a + b*x**3)**p/(3*b**2*p**2 + 9*b**2*p
 + 6*b**2) + b**2*x**6*(a + b*x**3)**p/(3*b**2*p**2 + 9*b**2*p +
```

```
6*b**2), True))
```

GIAC/XCAS [A] time = 0.213444, size = 138, normalized size = 2.88

$$\frac{\left(bx^3+a\right)^2 pe^{\left(p\ln\left(bx^3+a\right)\right)} - \left(bx^3+a\right)ape^{\left(p\ln\left(bx^3+a\right)\right)} + \left(bx^3+a\right)^2 e^{\left(p\ln\left(bx^3+a\right)\right)} - 2\left(bx^3+a\right)ae^{\left(p\ln\left(bx^3+a\right)\right)}}{3\left(p^2+3p+2\right)b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^p*x^5,x, algorithm="giac")
```

```
[Out] 1/3*((b*x^3 + a)^2*p*e^(p*ln(b*x^3 + a)) - (b*x^3 + a)*a*p*e^(p*l
n(b*x^3 + a)) + (b*x^3 + a)^2*e^(p*ln(b*x^3 + a)) - 2*(b*x^3 + a)
*a*e^(p*ln(b*x^3 + a)))/((p^2 + 3*p + 2)*b^2)
```

3.599 $\int x^8 \left(a+bx^3\right)^p\,dx$

Optimal. Leaf size=74

$$\frac{a^2\left(a+bx^3\right)^{p+1}}{3b^3(p+1)}-\frac{2a\left(a+bx^3\right)^{p+2}}{3b^3(p+2)}+\frac{\left(a+bx^3\right)^{p+3}}{3b^3(p+3)}$$

```
[Out] (a^2*(a + b*x^3)^(1 + p))/(3*b^3*(1 + p)) - (2*a*(a + b*x^3)^(2 +
 p))/(3*b^3*(2 + p)) + (a + b*x^3)^(3 + p)/(3*b^3*(3 + p))
```

Rubi [A] time = 0.096864, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^2\left(a+bx^3\right)^{p+1}}{3b^3(p+1)}-\frac{2a\left(a+bx^3\right)^{p+2}}{3b^3(p+2)}+\frac{\left(a+bx^3\right)^{p+3}}{3b^3(p+3)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8*(a + b*x^3)^p,x]
```

```
[Out] (a^2*(a + b*x^3)^(1 + p))/(3*b^3*(1 + p)) - (2*a*(a + b*x^3)^(2 +
 p))/(3*b^3*(2 + p)) + (a + b*x^3)^(3 + p)/(3*b^3*(3 + p))
```

Rubi in Sympy [A] time = 16.566, size = 61, normalized size = 0.82

$$\frac{a^2\left(a+bx^3\right)^{p+1}}{3b^3\left(p+1\right)}-\frac{2a\left(a+bx^3\right)^{p+2}}{3b^3\left(p+2\right)}+\frac{\left(a+bx^3\right)^{p+3}}{3b^3\left(p+3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8*(b*x**3+a)**p,x)
```

```
[Out] a**2*(a + b*x**3)**(p + 1)/(3*b**3*(p + 1)) - 2*a*(a + b*x**3)**(
p + 2)/(3*b**3*(p + 2)) + (a + b*x**3)**(p + 3)/(3*b**3*(p + 3))
```

Mathematica [A] time = 0.0458337, size = 64, normalized size = 0.86

$$\frac{\left(a+bx^3\right)^{p+1}\left(2a^2-2ab(p+1)x^3+b^2\left(p^2+3p+2\right)x^6\right)}{3b^3(p+1)(p+2)(p+3)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8*(a + b*x^3)^p,x]
```

```
[Out] ((a + b*x^3)^(1 + p)*(2*a^2 - 2*a*b*(1 + p)*x^3 + b^2*(2 + 3*p +
p^2)*x^6))/(3*b^3*(1 + p)*(2 + p)*(3 + p))
```

Maple [A] time = 0.008, size = 80, normalized size = 1.1

$$\frac{\left(bx^3+a\right)^{1+p}\left(b^2p^2x^6+3\,b^2px^6+2\,b^2x^6-2\,abpx^3-2\,abx^3+2\,a^2\right)}{3\,b^3\left(p^3+6\,p^2+11\,p+6\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8*(b*x^3+a)^p,x)
```

```
[Out] 1/3*(b*x^3+a)^(1+p)*(b^2*p^2*x^6+3*b^2*p*x^6+2*b^2*x^6-2*a*b*p*x^
3-2*a*b*x^3+2*a^2)/b^3/(p^3+6*p^2+11*p+6)
```

Maxima [A] time = 1.44993, size = 99, normalized size = 1.34

$$\frac{\left(\left(p^2+3\,p+2\right)b^3x^9+\left(p^2+p\right)ab^2x^6-2\,a^2bpx^3+2\,a^3\right)\left(bx^3+a\right)^p}{3\,(p^3+6\,p^2+11\,p+6)b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^p*x^8,x, algorithm="maxima")
```

```
[Out] 1/3*((p^2 + 3*p + 2)*b^3*x^9 + (p^2 + p)*a*b^2*x^6 - 2*a^2*b*p*x^
3 + 2*a^3)*(b*x^3 + a)^p/((p^3 + 6*p^2 + 11*p + 6)*b^3)
```

Fricas [A] time = 0.243509, size = 132, normalized size = 1.78

$$\frac{\left(\left(b^3p^2+3\,b^3p+2\,b^3\right)x^9-2\,a^2bpx^3+\left(ab^2p^2+ab^2p\right)x^6+2\,a^3\right)\left(bx^3+a\right)^p}{3\,(b^3p^3+6\,b^3p^2+11\,b^3p+6\,b^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^p*x^8,x, algorithm="fricas")
```

```
[Out] 1/3*((b^3*p^2 + 3*b^3*p + 2*b^3)*x^9 - 2*a^2*b*p*x^3 + (a*b^2*p^2
 + a*b^2*p)*x^6 + 2*a^3)*(b*x^3 + a)^p/(b^3*p^3 + 6*b^3*p^2 + 11*
b^3*p + 6*b^3)
```

Sympy [A] time = 90.7707, size = 1368, normalized size = 18.49

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8*(b*x**3+a)**p,x)
```

```
[Out] Piecewise((a**p*x**9/9, Eq(b, 0)), (2*a**2*log(-(-1)**(1/3)*a**(1
/3)*(1/b)**(1/3) + x)/(6*a**2*b**3 + 12*a*b**4*x**3 + 6*b**5*x**6
) + 2*a**2*log(4*(-1)**(2/3)*a**(2/3)*(1/b)**(2/3) + 4*(-1)**(1/3
)*a**(1/3)*x*(1/b)**(1/3) + 4*x**2)/(6*a**2*b**3 + 12*a*b**4*x**3
 + 6*b**5*x**6) - 4*a**2*log(2)/(6*a**2*b**3 + 12*a*b**4*x**3 + 6
*b**5*x**6) + a**2/(6*a**2*b**3 + 12*a*b**4*x**3 + 6*b**5*x**6) +
 4*a*b*x**3*log(-(-1)**(1/3)*a**(1/3)*(1/b)**(1/3) + x)/(6*a**2*b
**3 + 12*a*b**4*x**3 + 6*b**5*x**6) + 4*a*b*x**3*log(4*(-1)**(2/3
)*a**(2/3)*(1/b)**(2/3) + 4*(-1)**(1/3)*a**(1/3)*x*(1/b)**(1/3) +
 4*x**2)/(6*a**2*b**3 + 12*a*b**4*x**3 + 6*b**5*x**6) - 8*a*b*x**
3*log(2)/(6*a**2*b**3 + 12*a*b**4*x**3 + 6*b**5*x**6) + 2*b**2*x*
*6*log(-(-1)**(1/3)*a**(1/3)*(1/b)**(1/3) + x)/(6*a**2*b**3 + 12*
a*b**4*x**3 + 6*b**5*x**6) + 2*b**2*x**6*log(4*(-1)**(2/3)*a**(2/
3)*(1/b)**(2/3) + 4*(-1)**(1/3)*a**(1/3)*x*(1/b)**(1/3) + 4*x**2)
/(6*a**2*b**3 + 12*a*b**4*x**3 + 6*b**5*x**6) - 4*b**2*x**6*log(2
)/(6*a**2*b**3 + 12*a*b**4*x**3 + 6*b**5*x**6) - 2*b**2*x**6/(6*a
**2*b**3 + 12*a*b**4*x**3 + 6*b**5*x**6), Eq(p, -3)), (-2*a**2*lo
g(-(-1)**(1/3)*a**(1/3)*(1/b)**(1/3) + x)/(3*a*b**3 + 3*b**4*x**3
) - 2*a**2*log(4*(-1)**(2/3)*a**(2/3)*(1/b)**(2/3) + 4*(-1)**(1/3
)*a**(1/3)*x*(1/b)**(1/3) + 4*x**2)/(3*a*b**3 + 3*b**4*x**3) - 2*
a**2/(3*a*b**3 + 3*b**4*x**3) + 4*a**2*log(2)/(3*a*b**3 + 3*b**4*
```

```
x**3) - 2*a*b*x**3*log(-(-1)**(1/3)*a**(1/3)*(1/b)**(1/3) + x)/(3
*a*b**3 + 3*b**4*x**3) - 2*a*b*x**3*log(4*(-1)**(2/3)*a**(2/3)*(1
/b)**(2/3) + 4*(-1)**(1/3)*a**(1/3)*x*(1/b)**(1/3) + 4*x**2)/(3*a
*b**3 + 3*b**4*x**3) + 4*a*b*x**3*log(2)/(3*a*b**3 + 3*b**4*x**3)
 + b**2*x**6/(3*a*b**3 + 3*b**4*x**3), Eq(p, -2)), (a**2*log(-(-1
)**(1/3)*a**(1/3)*(1/b)**(1/3) + x)/(3*b**3) + a**2*log(4*(-1)**(
2/3)*a**(2/3)*(1/b)**(2/3) + 4*(-1)**(1/3)*a**(1/3)*x*(1/b)**(1/3
) + 4*x**2)/(3*b**3) - a*x**3/(3*b**2) + x**6/(6*b), Eq(p, -1)),
(2*a**3*(a + b*x**3)**p/(3*b**3*p**3 + 18*b**3*p**2 + 33*b**3*p +
 18*b**3) - 2*a**2*b*p*x**3*(a + b*x**3)**p/(3*b**3*p**3 + 18*b**
3*p**2 + 33*b**3*p + 18*b**3) + a*b**2*p**2*x**6*(a + b*x**3)**p/
(3*b**3*p**3 + 18*b**3*p**2 + 33*b**3*p + 18*b**3) + a*b**2*p*x**
6*(a + b*x**3)**p/(3*b**3*p**3 + 18*b**3*p**2 + 33*b**3*p + 18*b*
*3) + b**3*p**2*x**9*(a + b*x**3)**p/(3*b**3*p**3 + 18*b**3*p**2
+ 33*b**3*p + 18*b**3) + 3*b**3*p*x**9*(a + b*x**3)**p/(3*b**3*p*
*3 + 18*b**3*p**2 + 33*b**3*p + 18*b**3) + 2*b**3*x**9*(a + b*x**
3)**p/(3*b**3*p**3 + 18*b**3*p**2 + 33*b**3*p + 18*b**3), True))
```

GIAC/XCAS [A] time = 0.219965, size = 336, normalized size = 4.54

$$\frac{\left(bx^3+a\right)^3p^2e^{\left(p\ln\left(bx^3+a\right)\right)}-2\left(bx^3+a\right)^2ap^2e^{\left(p\ln\left(bx^3+a\right)\right)}+\left(bx^3+a\right)a^2p^2e^{\left(p\ln\left(bx^3+a\right)\right)}+3\left(bx^3+a\right)^3pe^{\left(p\ln\left(bx^3+a\right)\right)}-8\left(bx^3\right.}{3\left(b^2p^3+6\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^p*x^8,x, algorithm="giac")
```

```
[Out] 1/3*((b*x^3 + a)^3*p^2*e^(p*ln(b*x^3 + a)) - 2*(b*x^3 + a)^2*a*p^
2*e^(p*ln(b*x^3 + a)) + (b*x^3 + a)*a^2*p^2*e^(p*ln(b*x^3 + a)) +
 3*(b*x^3 + a)^3*p*e^(p*ln(b*x^3 + a)) - 8*(b*x^3 + a)^2*a*p*e^(p
*ln(b*x^3 + a)) + 5*(b*x^3 + a)*a^2*p*e^(p*ln(b*x^3 + a)) + 2*(b*
x^3 + a)^3*e^(p*ln(b*x^3 + a)) - 6*(b*x^3 + a)^2*a*e^(p*ln(b*x^3
+ a)) + 6*(b*x^3 + a)*a^2*e^(p*ln(b*x^3 + a)))/((b^2*p^3 + 6*b^2*
p^2 + 11*b^2*p + 6*b^2)*b)
```

3.600 $\int x^{11} \left(a+bx^3\right)^p \, dx$

Optimal. Leaf size=95

$$-\frac{a^3\left(a+bx^3\right)^{p+1}}{3b^4(p+1)}+\frac{a^2\left(a+bx^3\right)^{p+2}}{b^4(p+2)}-\frac{a\left(a+bx^3\right)^{p+3}}{b^4(p+3)}+\frac{\left(a+bx^3\right)^{p+4}}{3b^4(p+4)}$$

```
[Out] -(a^3*(a + b*x^3)^(1 + p))/(3*b^4*(1 + p)) + (a^2*(a + b*x^3)^(2
+ p))/(b^4*(2 + p)) - (a*(a + b*x^3)^(3 + p))/(b^4*(3 + p)) + (a
+ b*x^3)^(4 + p)/(3*b^4*(4 + p))
```

Rubi [A] time = 0.127572, antiderivative size = 95, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^3\left(a+bx^3\right)^{p+1}}{3b^4(p+1)}+\frac{a^2\left(a+bx^3\right)^{p+2}}{b^4(p+2)}-\frac{a\left(a+bx^3\right)^{p+3}}{b^4(p+3)}+\frac{\left(a+bx^3\right)^{p+4}}{3b^4(p+4)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11*(a + b*x^3)^p,x]
```

```
[Out] -(a^3*(a + b*x^3)^(1 + p))/(3*b^4*(1 + p)) + (a^2*(a + b*x^3)^(2
+ p))/(b^4*(2 + p)) - (a*(a + b*x^3)^(3 + p))/(b^4*(3 + p)) + (a
+ b*x^3)^(4 + p)/(3*b^4*(4 + p))
```

Rubi in Sympy [A] time = 22.821, size = 78, normalized size = 0.82

$$-\frac{a^3\left(a+bx^3\right)^{p+1}}{3b^4\left(p+1\right)}+\frac{a^2\left(a+bx^3\right)^{p+2}}{b^4\left(p+2\right)}-\frac{a\left(a+bx^3\right)^{p+3}}{b^4\left(p+3\right)}+\frac{\left(a+bx^3\right)^{p+4}}{3b^4\left(p+4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11*(b*x**3+a)**p,x)
```

```
[Out] -a**3*(a + b*x**3)**(p + 1)/(3*b**4*(p + 1)) + a**2*(a + b*x**3)*
*(p + 2)/(b**4*(p + 2)) - a*(a + b*x**3)**(p + 3)/(b**4*(p + 3))
+ (a + b*x**3)**(p + 4)/(3*b**4*(p + 4))
```

Mathematica [A] time = 0.0634782, size = 93, normalized size = 0.98

$$\frac{\left(a+bx^3\right)^{p+1}\left(-6a^3+6a^2b(p+1)x^3-3ab^2\left(p^2+3p+2\right)x^6+b^3\left(p^3+6p^2+11p+6\right)x^9\right)}{3b^4(p+1)(p+2)(p+3)(p+4)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11*(a + b*x^3)^p,x]
```

```
[Out] ((a + b*x^3)^(1 + p)*(-6*a^3 + 6*a^2*b*(1 + p)*x^3 - 3*a*b^2*(2 +
 3*p + p^2)*x^6 + b^3*(6 + 11*p + 6*p^2 + p^3)*x^9))/(3*b^4*(1 +
p)*(2 + p)*(3 + p)*(4 + p))
```

Maple [A] time = 0.01, size = 132, normalized size = 1.4

$$-\frac{\left(bx^3+a\right)^{1+p}\left(-b^3p^3x^9-6\,b^3p^2x^9-11\,b^3px^9-6\,b^3x^9+3\,ab^2p^2x^6+9\,ab^2px^6+6\,ab^2x^6-6\,a^2bpx^3-6\,a^2bx^3+6\,a^3\right)}{3\,b^4\left(p^4+10\,p^3+35\,p^2+50\,p+24\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11*(b*x^3+a)^p,x)
```

```
[Out] -1/3*(b*x^3+a)^(1+p)*(-b^3*p^3*x^9-6*b^3*p^2*x^9-11*b^3*p*x^9-6*b
^3*x^9+3*a*b^2*p^2*x^6+9*a*b^2*p*x^6+6*a*b^2*x^6-6*a^2*b*p*x^3-6*
a^2*b*x^3+6*a^3)/b^4/(p^4+10*p^3+35*p^2+50*p+24)
```

Maxima [A] time = 1.46397, size = 143, normalized size = 1.51

$$\frac{\left(\left(p^3+6\,p^2+11\,p+6\right)b^4x^{12}+\left(p^3+3\,p^2+2\,p\right)ab^3x^9-3\,\left(p^2+p\right)a^2b^2x^6+6\,a^3bpx^3-6\,a^4\right)\left(bx^3+a\right)^p}{3\,(p^4+10\,p^3+35\,p^2+50\,p+24)b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^p*x^11,x, algorithm="maxima")
```

```
[Out] 1/3*((p^3 + 6*p^2 + 11*p + 6)*b^4*x^12 + (p^3 + 3*p^2 + 2*p)*a*b^
3*x^9 - 3*(p^2 + p)*a^2*b^2*x^6 + 6*a^3*b*p*x^3 - 6*a^4)*(b*x^3 +
 a)^p/((p^4 + 10*p^3 + 35*p^2 + 50*p + 24)*b^4)
```

Fricas [A] time = 0.245015, size = 200, normalized size = 2.11

$$\frac{\left(\left(b^4p^3+6\,b^4p^2+11\,b^4p+6\,b^4\right)x^{12}+\left(ab^3p^3+3\,ab^3p^2+2\,ab^3p\right)x^9+6\,a^3bpx^3-3\,\left(a^2b^2p^2+a^2b^2p\right)x^6-6\,a^4\right)\left(bx^3+a\right)^p}{3\,(b^4p^4+10\,b^4p^3+35\,b^4p^2+50\,b^4p+24\,b^4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^p*x^11,x, algorithm="fricas")
```

```
[Out] 1/3*((b^4*p^3 + 6*b^4*p^2 + 11*b^4*p + 6*b^4)*x^12 + (a*b^3*p^3 +
 3*a*b^3*p^2 + 2*a*b^3*p)*x^9 + 6*a^3*b*p*x^3 - 3*(a^2*b^2*p^2 +
a^2*b^2*p)*x^6 - 6*a^4)*(b*x^3 + a)^p/(b^4*p^4 + 10*b^4*p^3 + 35*
b^4*p^2 + 50*b^4*p + 24*b^4)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11*(b*x**3+a)**p,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.218402, size = 597, normalized size = 6.28

$$\frac{\left(bx^3+a\right)^4p^3e^{\left(p\ln\left(bx^3+a\right)\right)}-3\left(bx^3+a\right)^3ap^3e^{\left(p\ln\left(bx^3+a\right)\right)}+3\left(bx^3+a\right)^2a^2p^3e^{\left(p\ln\left(bx^3+a\right)\right)}-\left(bx^3+a\right)a^3p^3e^{\left(p\ln\left(bx^3+a\right)\right)}+6\,(b$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^p*x^11,x, algorithm="giac")
```

```
[Out] 1/3*((b*x^3 + a)^4*p^3*e^(p*ln(b*x^3 + a)) - 3*(b*x^3 + a)^3*a*p^
3*e^(p*ln(b*x^3 + a)) + 3*(b*x^3 + a)^2*a^2*p^3*e^(p*ln(b*x^3 + a
)) - (b*x^3 + a)*a^3*p^3*e^(p*ln(b*x^3 + a)) + 6*(b*x^3 + a)^4*p^
2*e^(p*ln(b*x^3 + a)) - 21*(b*x^3 + a)^3*a*p^2*e^(p*ln(b*x^3 + a)
) + 24*(b*x^3 + a)^2*a^2*p^2*e^(p*ln(b*x^3 + a)) - 9*(b*x^3 + a)*
a^3*p^2*e^(p*ln(b*x^3 + a)) + 11*(b*x^3 + a)^4*p*e^(p*ln(b*x^3 +
a)) - 42*(b*x^3 + a)^3*a*p*e^(p*ln(b*x^3 + a)) + 57*(b*x^3 + a)^2
*a^2*p*e^(p*ln(b*x^3 + a)) - 26*(b*x^3 + a)*a^3*p*e^(p*ln(b*x^3 +
 a)) + 6*(b*x^3 + a)^4*e^(p*ln(b*x^3 + a)) - 24*(b*x^3 + a)^3*a*e
^(p*ln(b*x^3 + a)) + 36*(b*x^3 + a)^2*a^2*e^(p*ln(b*x^3 + a)) - 2
4*(b*x^3 + a)*a^3*e^(p*ln(b*x^3 + a)))/((b^3*p^4 + 10*b^3*p^3 + 3
5*b^3*p^2 + 50*b^3*p + 24*b^3)*b)
```

3.601 $\int x^m (a + bx^4) \, dx$

Optimal. Leaf size=25

$$\frac{ax^{m+1}}{m+1} + \frac{bx^{m+5}}{m+5}$$

```
[Out] (a*x^(1 + m))/(1 + m) + (b*x^(5 + m))/(5 + m)
```

Rubi [A] time = 0.0217521, antiderivative size = 25, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{ax^{m+1}}{m+1} + \frac{bx^{m+5}}{m+5}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m*(a + b*x^4),x]

[Out] (a*x^(1 + m))/(1 + m) + (b*x^(5 + m))/(5 + m)
```

Rubi in Sympy [A] time = 3.83116, size = 19, normalized size = 0.76

$$\frac{ax^{m+1}}{m+1} + \frac{bx^{m+5}}{m+5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(b*x**4+a),x)

[Out] a*x**(m + 1)/(m + 1) + b*x**(m + 5)/(m + 5)
```

Mathematica [A] time = 0.0264495, size = 23, normalized size = 0.92

$$x^m \left(\frac{ax}{m+1} + \frac{bx^5}{m+5}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m*(a + b*x^4),x]

[Out] x^m*((a*x)/(1 + m) + (b*x^5)/(5 + m))
```

Maple [A] time = 0.005, size = 35, normalized size = 1.4

$$\frac{x^{1+m} \left(bmx^4 + bx^4 + am + 5\,a\right)}{(5+m)(1+m)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(b*x^4+a),x)

[Out] x^(1+m)*(b*m*x^4+b*x^4+a*m+5*a)/(5+m)/(1+m)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)*x^m,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.248959, size = 45, normalized size = 1.8

$$\frac{\left((bm+b)x^5+(am+5\,a)x\right)x^m}{m^2+6\,m+5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)*x^m,x, algorithm="fricas")
```

```
[Out] ((b*m + b)*x^5 + (a*m + 5*a)*x)*x^m/(m^2 + 6*m + 5)
```

Sympy [A] time = 1.98056, size = 94, normalized size = 3.76

$$\begin{cases} -\frac{a}{4x^4}+b\log(x) & \text{for}\ m=-5\\ a\log(x)+\frac{bx^4}{4} & \text{for}\ m=-1\\ \frac{amxx^m}{m^2+6m+5}+\frac{5axx^m}{m^2+6m+5}+\frac{bmx^5x^m}{m^2+6m+5}+\frac{bx^5x^m}{m^2+6m+5} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(b*x**4+a),x)
```

```
[Out] Piecewise((-a/(4*x**4) + b*log(x), Eq(m, -5)), (a*log(x) + b*x**4
/4, Eq(m, -1)), (a*m*x*x**m/(m**2 + 6*m + 5) + 5*a*x*x**m/(m**2 +
 6*m + 5) + b*m*x**5*x**m/(m**2 + 6*m + 5) + b*x**5*x**m/(m**2 +
6*m + 5), True))
```

GIAC/XCAS [A] time = 0.214973, size = 69, normalized size = 2.76

$$\frac{bmx^5e^{(m\ln(x))}+bx^5e^{(m\ln(x))}+amxe^{(m\ln(x))}+5\,axe^{(m\ln(x))}}{m^2+6\,m+5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)*x^m,x, algorithm="giac")
```

```
[Out] (b*m*x^5*e^(m*ln(x)) + b*x^5*e^(m*ln(x)) + a*m*x*e^(m*ln(x)) + 5*
a*x*e^(m*ln(x)))/(m^2 + 6*m + 5)
```

3.602 $\int x^5 (a + bx^4)\, dx$

Optimal. Leaf size=17

$$\frac{ax^6}{6} + \frac{bx^{10}}{10}$$

```
[Out] (a*x^6)/6 + (b*x^10)/10
```

Rubi [A] time = 0.0146299, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$

$$\frac{ax^6}{6} + \frac{bx^{10}}{10}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5*(a + b*x^4),x]

[Out] (a*x^6)/6 + (b*x^10)/10
```

Rubi in Sympy [A] time = 2.90939, size = 12, normalized size = 0.71

$$\frac{ax^6}{6} + \frac{bx^{10}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5*(b*x**4+a),x)

[Out] a*x**6/6 + b*x**10/10
```

Mathematica [A] time = 0.00174519, size = 17, normalized size = 1.

$$\frac{ax^6}{6} + \frac{bx^{10}}{10}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5*(a + b*x^4),x]

[Out] (a*x^6)/6 + (b*x^10)/10
```

Maple [A] time = 0.001, size = 14, normalized size = 0.8

$$\frac{x^6a}{6} + \frac{bx^{10}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5*(b*x^4+a),x)

[Out] 1/6*x^6*a+1/10*b*x^10
```

Maxima [A] time = 1.43958, size = 18, normalized size = 1.06

$$\frac{1}{10}\,bx^{10} + \frac{1}{6}\,ax^{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)*x^5,x, algorithm="maxima")
```

```
[Out] 1/10*b*x^10 + 1/6*a*x^6
```

Fricas [A] time = 0.200504, size = 1, normalized size = 0.06

$$\frac{1}{10}x^{10}b + \frac{1}{6}x^{6}a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)*x^5,x, algorithm="fricas")
```

```
[Out] 1/10*x^10*b + 1/6*x^6*a
```

Sympy [A] time = 0.069065, size = 12, normalized size = 0.71

$$\frac{ax^{6}}{6} + \frac{bx^{10}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5*(b*x**4+a),x)
```

```
[Out] a*x**6/6 + b*x**10/10
```

GIAC/XCAS [A] time = 0.218314, size = 18, normalized size = 1.06

$$\frac{1}{10}\,bx^{10} + \frac{1}{6}\,ax^{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)*x^5,x, algorithm="giac")
```

```
[Out] 1/10*b*x^10 + 1/6*a*x^6
```

3.603 $\int x^4 \left(a + bx^4\right) \, dx$

Optimal. Leaf size=17

$$\frac{ax^5}{5} + \frac{bx^9}{9}$$

```
[Out] (a*x^5)/5 + (b*x^9)/9
```

Rubi [A] time = 0.013735, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{ax^5}{5} + \frac{bx^9}{9}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(a + b*x^4),x]

[Out] (a*x^5)/5 + (b*x^9)/9
```

Rubi in Sympy [A] time = 3.07485, size = 12, normalized size = 0.71

$$\frac{ax^5}{5} + \frac{bx^9}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**4*(b*x**4+a),x)

[Out] a*x**5/5 + b*x**9/9
```

Mathematica [A] time = 0.00179126, size = 17, normalized size = 1.

$$\frac{ax^5}{5} + \frac{bx^9}{9}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(a + b*x^4),x]

[Out] (a*x^5)/5 + (b*x^9)/9
```

Maple [A] time = 0., size = 14, normalized size = 0.8

$$\frac{ax^5}{5} + \frac{bx^9}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(b*x^4+a),x)

[Out] 1/5*a*x^5+1/9*b*x^9
```

Maxima [A] time = 1.43455, size = 18, normalized size = 1.06

$$\frac{1}{9}\,bx^9 + \frac{1}{5}\,ax^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)*x^4,x, algorithm="maxima")
```

```
[Out] 1/9*b*x^9 + 1/5*a*x^5
```

Fricas [A] time = 0.20206, size = 1, normalized size = 0.06

$$\frac{1}{9}x^9b + \frac{1}{5}x^5a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)*x^4,x, algorithm="fricas")
```

```
[Out] 1/9*x^9*b + 1/5*x^5*a
```

Sympy [A] time = 0.063051, size = 12, normalized size = 0.71

$$\frac{ax^5}{5} + \frac{bx^9}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4*(b*x**4+a),x)
```

```
[Out] a*x**5/5 + b*x**9/9
```

GIAC/XCAS [A] time = 0.223233, size = 18, normalized size = 1.06

$$\frac{1}{9}\,bx^9 + \frac{1}{5}\,ax^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)*x^4,x, algorithm="giac")
```

```
[Out] 1/9*b*x^9 + 1/5*a*x^5
```

3.604 $\int x^3 (a + bx^4)\, dx$

Optimal. Leaf size=17

$$\frac{ax^4}{4} + \frac{bx^8}{8}$$

```
[Out] (a*x^4)/4 + (b*x^8)/8
```

Rubi [A] time = 0.0137743, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{ax^4}{4} + \frac{bx^8}{8}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3*(a + b*x^4),x]

[Out] (a*x^4)/4 + (b*x^8)/8
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{b \int^{x^4} x\, dx}{4} + \frac{\int^{x^4} a\, dx}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3*(b*x**4+a),x)

[Out] b*Integral(x, (x, x**4))/4 + Integral(a, (x, x**4))/4
```

Mathematica [A] time = 0.00176247, size = 17, normalized size = 1.

$$\frac{ax^4}{4} + \frac{bx^8}{8}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3*(a + b*x^4),x]

[Out] (a*x^4)/4 + (b*x^8)/8
```

Maple [A] time = 0.001, size = 14, normalized size = 0.8

$$\frac{ax^4}{4} + \frac{bx^8}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3*(b*x^4+a),x)

[Out] 1/4*a*x^4+1/8*b*x^8
```

Maxima [A] time = 1.43749, size = 19, normalized size = 1.12

$$\frac{\left(bx^4+a\right)^2}{8\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)*x^3,x, algorithm="maxima")
```

```
[Out] 1/8*(b*x^4 + a)^2/b
```

Fricas [A] time = 0.199839, size = 1, normalized size = 0.06

$$\frac{1}{8}x^8b+\frac{1}{4}x^4a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)*x^3,x, algorithm="fricas")
```

```
[Out] 1/8*x^8*b + 1/4*x^4*a
```

Sympy [A] time = 0.066283, size = 12, normalized size = 0.71

$$\frac{ax^4}{4}+\frac{bx^8}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(b*x**4+a),x)
```

```
[Out] a*x**4/4 + b*x**8/8
```

GIAC/XCAS [A] time = 0.215207, size = 18, normalized size = 1.06

$$\frac{1}{8}\,bx^8+\frac{1}{4}\,ax^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)*x^3,x, algorithm="giac")
```

```
[Out] 1/8*b*x^8 + 1/4*a*x^4
```

3.605 $\int x^2 (a + bx^4) \, dx$

Optimal. Leaf size=17

$$\frac{ax^3}{3} + \frac{bx^7}{7}$$

```
[Out] (a*x^3)/3 + (b*x^7)/7
```

Rubi [A] time = 0.0137615, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$

$$\frac{ax^3}{3} + \frac{bx^7}{7}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2*(a + b*x^4),x]

[Out] (a*x^3)/3 + (b*x^7)/7
```

Rubi in Sympy [A] time = 2.9478, size = 12, normalized size = 0.71

$$\frac{ax^3}{3} + \frac{bx^7}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(b*x**4+a),x)

[Out] a*x**3/3 + b*x**7/7
```

Mathematica [A] time = 0.00168727, size = 17, normalized size = 1.

$$\frac{ax^3}{3} + \frac{bx^7}{7}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2*(a + b*x^4),x]

[Out] (a*x^3)/3 + (b*x^7)/7
```

Maple [A] time = 0.002, size = 14, normalized size = 0.8

$$\frac{ax^3}{3} + \frac{bx^7}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(b*x^4+a),x)

[Out] 1/3*a*x^3+1/7*b*x^7
```

Maxima [A] time = 1.43105, size = 18, normalized size = 1.06

$$\frac{1}{7}\,bx^{7}+\frac{1}{3}\,ax^{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)*x^2,x, algorithm="maxima")
```

```
[Out] 1/7*b*x^7 + 1/3*a*x^3
```

Fricas [A] time = 0.200517, size = 1, normalized size = 0.06

$$\frac{1}{7}x^{7}b+\frac{1}{3}x^{3}a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)*x^2,x, algorithm="fricas")
```

```
[Out] 1/7*x^7*b + 1/3*x^3*a
```

Sympy [A] time = 0.067651, size = 12, normalized size = 0.71

$$\frac{ax^{3}}{3}+\frac{bx^{7}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(b*x**4+a),x)
```

```
[Out] a*x**3/3 + b*x**7/7
```

GIAC/XCAS [A] time = 0.215751, size = 18, normalized size = 1.06

$$\frac{1}{7}\,bx^{7}+\frac{1}{3}\,ax^{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)*x^2,x, algorithm="giac")
```

```
[Out] 1/7*b*x^7 + 1/3*a*x^3
```

3.606 $\int x\left(a+bx^4\right)\,dx$

Optimal. Leaf size=17

$$\frac{ax^2}{2}+\frac{bx^6}{6}$$

```
[Out] (a*x^2)/2 + (b*x^6)/6
```

Rubi [A] time = 0.0129817, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111

$$\frac{ax^2}{2}+\frac{bx^6}{6}$$

Antiderivative was successfully verified.

```
[In] Int[x*(a + b*x^4),x]

[Out] (a*x^2)/2 + (b*x^6)/6
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$a\int x\,dx+\frac{bx^6}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x*(b*x**4+a),x)

[Out] a*Integral(x, x) + b*x**6/6
```

Mathematica [A] time = 0.00156312, size = 17, normalized size = 1.

$$\frac{ax^2}{2}+\frac{bx^6}{6}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(a + b*x^4),x]

[Out] (a*x^2)/2 + (b*x^6)/6
```

Maple [A] time = 0.002, size = 14, normalized size = 0.8

$$\frac{ax^2}{2}+\frac{bx^6}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(b*x^4+a),x)

[Out] 1/2*a*x^2+1/6*b*x^6
```

Maxima [A] time = 1.43425, size = 18, normalized size = 1.06

$$\frac{1}{6}\,bx^6 + \frac{1}{2}\,ax^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)*x,x, algorithm="maxima")
```

```
[Out] 1/6*b*x^6 + 1/2*a*x^2
```

Fricas [A] time = 0.199385, size = 1, normalized size = 0.06

$$\frac{1}{6}x^6b + \frac{1}{2}x^2a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)*x,x, algorithm="fricas")
```

```
[Out] 1/6*x^6*b + 1/2*x^2*a
```

Sympy [A] time = 0.064121, size = 12, normalized size = 0.71

$$\frac{ax^2}{2} + \frac{bx^6}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(b*x**4+a),x)
```

```
[Out] a*x**2/2 + b*x**6/6
```

GIAC/XCAS [A] time = 0.222071, size = 18, normalized size = 1.06

$$\frac{1}{6}\,bx^6 + \frac{1}{2}\,ax^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)*x,x, algorithm="giac")
```

```
[Out] 1/6*b*x^6 + 1/2*a*x^2
```

3.607 $\int (a + bx^4) \, dx$

Optimal. Leaf size=12

$$ax + \frac{bx^5}{5}$$

```
[Out] a*x + (b*x^5)/5
```

Rubi [A] time = 0.00883185, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 0, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$

$$ax + \frac{bx^5}{5}$$

Antiderivative was successfully verified.

```
[In]  Int[a + b*x^4,x]

[Out] a*x + (b*x^5)/5
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{bx^5}{5} + \int a \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(b*x**4+a,x)

[Out] b*x**5/5 + Integral(a, x)
```

Mathematica [A] time = 0.0000825556, size = 12, normalized size = 1.

$$ax + \frac{bx^5}{5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[a + b*x^4,x]

[Out] a*x + (b*x^5)/5
```

Maple [A] time = 0.001, size = 11, normalized size = 0.9

$$ax + \frac{bx^5}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(b*x^4+a,x)

[Out] a*x+1/5*b*x^5
```

Maxima [A] time = 1.43827, size = 14, normalized size = 1.17

$$\frac{1}{5}bx^5 + ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(b*x^4 + a,x, algorithm="maxima")
```

```
[Out] 1/5*b*x^5 + a*x
```

Fricas [A] time = 0.199391, size = 1, normalized size = 0.08

$$\frac{1}{5}x^5b + xa$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(b*x^4 + a,x, algorithm="fricas")
```

```
[Out] 1/5*x^5*b + x*a
```

Sympy [A] time = 0.058885, size = 8, normalized size = 0.67

$$ax + \frac{bx^5}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(b*x**4+a,x)
```

```
[Out] a*x + b*x**5/5
```

GIAC/XCAS [A] time = 0.22042, size = 14, normalized size = 1.17

$$\frac{1}{5}bx^5 + ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(b*x^4 + a,x, algorithm="giac")
```

```
[Out] 1/5*b*x^5 + a*x
```

3.608 $\int \frac{a+bx^4}{x} \, dx$

Optimal. Leaf size=13

$$a\log(x) + \frac{bx^4}{4}$$

```
[Out] (b*x^4)/4 + a*Log[x]
```

Rubi [A] time = 0.011927, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$

$$a\log(x) + \frac{bx^4}{4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)/x,x]

[Out] (b*x^4)/4 + a*Log[x]
```

Rubi in Sympy [A] time = 2.7176, size = 10, normalized size = 0.77

$$a\log(x) + \frac{bx^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)/x,x)

[Out] a*log(x) + b*x**4/4
```

Mathematica [A] time = 0.00411498, size = 13, normalized size = 1.

$$a\log(x) + \frac{bx^4}{4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)/x,x]

[Out] (b*x^4)/4 + a*Log[x]
```

Maple [A] time = 0.003, size = 12, normalized size = 0.9

$$\frac{bx^4}{4} + a\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)/x,x)

[Out] 1/4*b*x^4+a*ln(x)
```

Maxima [A] time = 1.4371, size = 19, normalized size = 1.46

$$\frac{1}{4}\,bx^4 + \frac{1}{4}\,a\log\left(x^4\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)/x,x, algorithm="maxima")
```

```
[Out] 1/4*b*x^4 + 1/4*a*log(x^4)
```

Fricas [A] time = 0.225637, size = 15, normalized size = 1.15

$$\frac{1}{4}\,bx^4 + a\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)/x,x, algorithm="fricas")
```

```
[Out] 1/4*b*x^4 + a*log(x)
```

Sympy [A] time = 0.134662, size = 10, normalized size = 0.77

$$a\log\left(x\right) + \frac{bx^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)/x,x)
```

```
[Out] a*log(x) + b*x**4/4
```

GIAC/XCAS [A] time = 0.222394, size = 19, normalized size = 1.46

$$\frac{1}{4}\,bx^4 + \frac{1}{4}\,a\ln\left(x^4\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)/x,x, algorithm="giac")
```

```
[Out] 1/4*b*x^4 + 1/4*a*ln(x^4)
```

3.609 $\int \frac{a+bx^4}{x^2} dx$

Optimal. Leaf size=15

$$\frac{bx^3}{3} - \frac{a}{x}$$

```
[Out] -(a/x) + (b*x^3)/3
```

Rubi [A] time = 0.0131727, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{bx^3}{3} - \frac{a}{x}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)/x^2,x]

[Out] -(a/x) + (b*x^3)/3
```

Rubi in Sympy [A] time = 2.8234, size = 8, normalized size = 0.53

$$-\frac{a}{x} + \frac{bx^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)/x**2,x)

[Out] -a/x + b*x**3/3
```

Mathematica [A] time = 0.00351181, size = 15, normalized size = 1.

$$\frac{bx^3}{3} - \frac{a}{x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)/x^2,x]

[Out] -(a/x) + (b*x^3)/3
```

Maple [A] time = 0.004, size = 14, normalized size = 0.9

$$-\frac{a}{x} + \frac{bx^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)/x^2,x)

[Out] -a/x+1/3*b*x^3
```

Maxima [A] time = 1.43182, size = 18, normalized size = 1.2

$$\frac{1}{3}\,bx^3 - \frac{a}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)/x^2,x, algorithm="maxima")
```

```
[Out] 1/3*b*x^3 - a/x
```

Fricas [A] time = 0.215554, size = 19, normalized size = 1.27

$$\frac{bx^4 - 3\,a}{3\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)/x^2,x, algorithm="fricas")
```

```
[Out] 1/3*(b*x^4 - 3*a)/x
```

Sympy [A] time = 0.96271, size = 8, normalized size = 0.53

$$-\frac{a}{x} + \frac{bx^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)/x**2,x)
```

```
[Out] -a/x + b*x**3/3
```

GIAC/XCAS [A] time = 0.217517, size = 18, normalized size = 1.2

$$\frac{1}{3}\,bx^3 - \frac{a}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)/x^2,x, algorithm="giac")
```

```
[Out] 1/3*b*x^3 - a/x
```

3.610 $\int \frac{a+bx^4}{x^3} dx$

Optimal. Leaf size=17

$$\frac{bx^2}{2} - \frac{a}{2x^2}$$

```
[Out] -a/(2*x^2) + (b*x^2)/2
```

Rubi [A] time = 0.0140303, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{bx^2}{2} - \frac{a}{2x^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^4)/x^3,x]

[Out] -a/(2*x^2) + (b*x^2)/2
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a}{2x^2} + b \int x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**4+a)/x**3,x)

[Out] -a/(2*x**2) + b*Integral(x, x)
```

Mathematica [A] time = 0.00205973, size = 17, normalized size = 1.

$$\frac{bx^2}{2} - \frac{a}{2x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^4)/x^3,x]

[Out] -a/(2*x^2) + (b*x^2)/2
```

Maple [A] time = 0.005, size = 14, normalized size = 0.8

$$-\frac{a}{2\,x^2} + \frac{bx^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x^4+a)/x^3,x)

[Out] -1/2*a/x^2+1/2*b*x^2
```

Maxima [A] time = 1.43338, size = 18, normalized size = 1.06

$$\frac{1}{2}\,bx^2 - \frac{a}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)/x^3,x, algorithm="maxima")
```

```
[Out] 1/2*b*x^2 - 1/2*a/x^2
```

Fricas [A] time = 0.22449, size = 19, normalized size = 1.12

$$\frac{bx^4 - a}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)/x^3,x, algorithm="fricas")
```

```
[Out] 1/2*(b*x^4 - a)/x^2
```

Sympy [A] time = 0.977738, size = 12, normalized size = 0.71

$$-\frac{a}{2x^2} + \frac{bx^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)/x**3,x)
```

```
[Out] -a/(2*x**2) + b*x**2/2
```

GIAC/XCAS [A] time = 0.218288, size = 18, normalized size = 1.06

$$\frac{1}{2}\,bx^2 - \frac{a}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)/x^3,x, algorithm="giac")
```

```
[Out] 1/2*b*x^2 - 1/2*a/x^2
```

3.611 $\int \frac{a+bx^4}{x^4}\,dx$

Optimal. Leaf size=12

$$bx-\frac{a}{3x^3}$$

```
[Out] -a/(3*x^3) + b*x
```

Rubi [A] time = 0.012304, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$bx-\frac{a}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)/x^4,x]

[Out] -a/(3*x^3) + b*x
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a}{3x^3}+\int b\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)/x**4,x)

[Out] -a/(3*x**3) + Integral(b, x)
```

Mathematica [A] time = 0.00165271, size = 12, normalized size = 1.

$$bx-\frac{a}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)/x^4,x]

[Out] -a/(3*x^3) + b*x
```

Maple [A] time = 0.006, size = 11, normalized size = 0.9

$$-\frac{a}{3\,x^3}+bx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)/x^4,x)

[Out] -1/3*a/x^3+b*x
```

Maxima [A] time = 1.44679, size = 14, normalized size = 1.17

$$bx - \frac{a}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)/x^4,x, algorithm="maxima")
```

```
[Out] b*x - 1/3*a/x^3
```

Fricas [A] time = 0.226431, size = 20, normalized size = 1.67

$$\frac{3\,bx^4 - a}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)/x^4,x, algorithm="fricas")
```

```
[Out] 1/3*(3*b*x^4 - a)/x^3
```

Sympy [A] time = 1.01382, size = 8, normalized size = 0.67

$$-\frac{a}{3x^3} + bx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)/x**4,x)
```

```
[Out] -a/(3*x**3) + b*x
```

GIAC/XCAS [A] time = 0.222555, size = 14, normalized size = 1.17

$$bx - \frac{a}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)/x^4,x, algorithm="giac")
```

```
[Out] b*x - 1/3*a/x^3
```

3.612 $\int \frac{a+bx^4}{x^5}\,dx$

Optimal. Leaf size=13

$$b\log(x)-\frac{a}{4x^4}$$

```
[Out] -a/(4*x^4) + b*Log[x]
```

Rubi [A] time = 0.0137289, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$b\log(x)-\frac{a}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)/x^5,x]

[Out] -a/(4*x^4) + b*Log[x]
```

Rubi in Sympy [A] time = 2.77397, size = 10, normalized size = 0.77

$$-\frac{a}{4x^4}+b\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)/x**5,x)

[Out] -a/(4*x**4) + b*log(x)
```

Mathematica [A] time = 0.0041345, size = 13, normalized size = 1.

$$b\log(x)-\frac{a}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)/x^5,x]

[Out] -a/(4*x^4) + b*Log[x]
```

Maple [A] time = 0.007, size = 12, normalized size = 0.9

$$-\frac{a}{4\,x^4}+b\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)/x^5,x)

[Out] -1/4*a/x^4+b*ln(x)
```

Maxima [A] time = 1.44237, size = 19, normalized size = 1.46

$$\frac{1}{4}\,b\log\left(x^4\right)-\frac{a}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)/x^5,x, algorithm="maxima")
```

```
[Out] 1/4*b*log(x^4) - 1/4*a/x^4
```

Fricas [A] time = 0.227814, size = 23, normalized size = 1.77

$$\frac{4\,bx^4\log\left(x\right)-a}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)/x^5,x, algorithm="fricas")
```

```
[Out] 1/4*(4*b*x^4*log(x) - a)/x^4
```

Sympy [A] time = 1.09182, size = 10, normalized size = 0.77

$$-\frac{a}{4x^4}+b\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)/x**5,x)
```

```
[Out] -a/(4*x**4) + b*log(x)
```

GIAC/XCAS [A] time = 0.226415, size = 27, normalized size = 2.08

$$\frac{1}{4}\,b\ln\left(x^4\right)-\frac{bx^4+a}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)/x^5,x, algorithm="giac")
```

```
[Out] 1/4*b*ln(x^4) - 1/4*(b*x^4 + a)/x^4
```

3.613 $\int \frac{a+bx^4}{x^6} \, dx$

Optimal. Leaf size=15

$$-\frac{a}{5x^5}-\frac{b}{x}$$

```
[Out] -a/(5*x^5) - b/x
```

Rubi [A] time = 0.013574, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$-\frac{a}{5x^5}-\frac{b}{x}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)/x^6,x]

[Out] -a/(5*x^5) - b/x
```

Rubi in Sympy [A] time = 2.90562, size = 10, normalized size = 0.67

$$-\frac{a}{5x^5}-\frac{b}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)/x**6,x)

[Out] -a/(5*x**5) - b/x
```

Mathematica [A] time = 0.00366381, size = 15, normalized size = 1.

$$-\frac{a}{5x^5}-\frac{b}{x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)/x^6,x]

[Out] -a/(5*x^5) - b/x
```

Maple [A] time = 0.008, size = 14, normalized size = 0.9

$$-\frac{a}{5\,x^5}-\frac{b}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)/x^6,x)

[Out] -1/5*a/x^5-b/x
```

Maxima [A] time = 1.43862, size = 18, normalized size = 1.2

$$-\frac{5\,bx^4 + a}{5\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)/x^6,x, algorithm="maxima")
```

```
[Out] -1/5*(5*b*x^4 + a)/x^5
```

Fricas [A] time = 0.219469, size = 18, normalized size = 1.2

$$-\frac{5\,bx^4 + a}{5\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)/x^6,x, algorithm="fricas")
```

```
[Out] -1/5*(5*b*x^4 + a)/x^5
```

Sympy [A] time = 1.12274, size = 14, normalized size = 0.93

$$-\frac{a + 5bx^4}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)/x**6,x)
```

```
[Out] -(a + 5*b*x**4)/(5*x**5)
```

GIAC/XCAS [A] time = 0.217971, size = 18, normalized size = 1.2

$$-\frac{5\,bx^4 + a}{5\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)/x^6,x, algorithm="giac")
```

```
[Out] -1/5*(5*b*x^4 + a)/x^5
```

3.614 $\int \frac{a+bx^4}{x^7} \, dx$

Optimal. Leaf size=17

$$-\frac{a}{6x^6}-\frac{b}{2x^2}$$

```
[Out] -a/(6*x^6) - b/(2*x^2)
```

Rubi [A] time = 0.0132883, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$-\frac{a}{6x^6}-\frac{b}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)/x^7,x]

[Out] -a/(6*x^6) - b/(2*x^2)
```

Rubi in Sympy [A] time = 2.91241, size = 14, normalized size = 0.82

$$-\frac{a}{6x^6}-\frac{b}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)/x**7,x)

[Out] -a/(6*x**6) - b/(2*x**2)
```

Mathematica [A] time = 0.00347534, size = 17, normalized size = 1.

$$-\frac{a}{6x^6}-\frac{b}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)/x^7,x]

[Out] -a/(6*x^6) - b/(2*x^2)
```

Maple [A] time = 0.007, size = 14, normalized size = 0.8

$$-\frac{a}{6\,x^6}-\frac{b}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)/x^7,x)

[Out] -1/6*a/x^6-1/2*b/x^2
```

Maxima [A] time = 1.42916, size = 18, normalized size = 1.06

$$-\frac{3\,bx^4 + a}{6\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)/x^7,x, algorithm="maxima")
```

```
[Out] -1/6*(3*b*x^4 + a)/x^6
```

Fricas [A] time = 0.216459, size = 18, normalized size = 1.06

$$-\frac{3\,bx^4 + a}{6\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)/x^7,x, algorithm="fricas")
```

```
[Out] -1/6*(3*b*x^4 + a)/x^6
```

Sympy [A] time = 1.14796, size = 14, normalized size = 0.82

$$-\frac{a + 3bx^4}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)/x**7,x)
```

```
[Out] -(a + 3*b*x**4)/(6*x**6)
```

GIAC/XCAS [A] time = 0.24539, size = 18, normalized size = 1.06

$$-\frac{3\,bx^4 + a}{6\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)/x^7,x, algorithm="giac")
```

```
[Out] -1/6*(3*b*x^4 + a)/x^6
```

3.615 $\int \frac{a+bx^4}{x^8}\,dx$

Optimal. Leaf size=17

$$-\frac{a}{7x^7}-\frac{b}{3x^3}$$

```
[Out] -a/(7*x^7) - b/(3*x^3)
```

Rubi [A] time = 0.0136524, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$-\frac{a}{7x^7}-\frac{b}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)/x^8,x]

[Out] -a/(7*x^7) - b/(3*x^3)
```

Rubi in Sympy [A] time = 2.94884, size = 14, normalized size = 0.82

$$-\frac{a}{7x^7}-\frac{b}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)/x**8,x)

[Out] -a/(7*x**7) - b/(3*x**3)
```

Mathematica [A] time = 0.00350285, size = 17, normalized size = 1.

$$-\frac{a}{7x^7}-\frac{b}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)/x^8,x]

[Out] -a/(7*x^7) - b/(3*x^3)
```

Maple [A] time = 0.007, size = 14, normalized size = 0.8

$$-\frac{a}{7\,x^7}-\frac{b}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)/x^8,x)

[Out] -1/7*a/x^7-1/3*b/x^3
```

Maxima [A] time = 1.44075, size = 20, normalized size = 1.18

$$-\frac{7 \, b x^4 + 3 \, a}{21 \, x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)/x^8,x, algorithm="maxima")
```

```
[Out] -1/21*(7*b*x^4 + 3*a)/x^7
```

Fricas [A] time = 0.217145, size = 20, normalized size = 1.18

$$-\frac{7 \, b x^4 + 3 \, a}{21 \, x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)/x^8,x, algorithm="fricas")
```

```
[Out] -1/21*(7*b*x^4 + 3*a)/x^7
```

Sympy [A] time = 1.16746, size = 15, normalized size = 0.88

$$-\frac{3a + 7bx^4}{21x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)/x**8,x)
```

```
[Out] -(3*a + 7*b*x**4)/(21*x**7)
```

GIAC/XCAS [A] time = 0.233702, size = 20, normalized size = 1.18

$$-\frac{7 \, b x^4 + 3 \, a}{21 \, x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)/x^8,x, algorithm="giac")
```

```
[Out] -1/21*(7*b*x^4 + 3*a)/x^7
```

3.616 $\int \frac{a+bx^4}{x^9} dx$

Optimal. Leaf size=17

$$-\frac{a}{8x^8} - \frac{b}{4x^4}$$

```
[Out] -a/(8*x^8) - b/(4*x^4)
```

Rubi [A] time = 0.0128003, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$-\frac{a}{8x^8} - \frac{b}{4x^4}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^4)/x^9,x]

[Out] -a/(8*x^8) - b/(4*x^4)
```

Rubi in Sympy [A] time = 2.95685, size = 14, normalized size = 0.82

$$-\frac{a}{8x^8} - \frac{b}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**4+a)/x**9,x)

[Out] -a/(8*x**8) - b/(4*x**4)
```

Mathematica [A] time = 0.00360173, size = 17, normalized size = 1.

$$-\frac{a}{8x^8} - \frac{b}{4x^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^4)/x^9,x]

[Out] -a/(8*x^8) - b/(4*x^4)
```

Maple [A] time = 0.006, size = 14, normalized size = 0.8

$$-\frac{a}{8\,x^8} - \frac{b}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x^4+a)/x^9,x)

[Out] -1/8*a/x^8-1/4*b/x^4
```

Maxima [A] time = 1.44623, size = 18, normalized size = 1.06

$$-\frac{2\,bx^4 + a}{8\,x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)/x^9,x, algorithm="maxima")
```

```
[Out] -1/8*(2*b*x^4 + a)/x^8
```

Fricas [A] time = 0.219109, size = 18, normalized size = 1.06

$$-\frac{2\,bx^4 + a}{8\,x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)/x^9,x, algorithm="fricas")
```

```
[Out] -1/8*(2*b*x^4 + a)/x^8
```

Sympy [A] time = 1.19651, size = 14, normalized size = 0.82

$$-\frac{a + 2bx^4}{8x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)/x**9,x)
```

```
[Out] -(a + 2*b*x**4)/(8*x**8)
```

GIAC/XCAS [A] time = 0.219892, size = 18, normalized size = 1.06

$$-\frac{2\,bx^4 + a}{8\,x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)/x^9,x, algorithm="giac")
```

```
[Out] -1/8*(2*b*x^4 + a)/x^8
```

3.617 $\int \frac{a+bx^4}{x^{10}} \, dx$

Optimal. Leaf size=17

$$-\frac{a}{9x^9}-\frac{b}{5x^5}$$

```
[Out] -a/(9*x^9) - b/(5*x^5)
```

Rubi [A] time = 0.013565, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$-\frac{a}{9x^9}-\frac{b}{5x^5}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)/x^10,x]

[Out] -a/(9*x^9) - b/(5*x^5)
```

Rubi in Sympy [A] time = 2.97977, size = 14, normalized size = 0.82

$$-\frac{a}{9x^9}-\frac{b}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)/x**10,x)

[Out] -a/(9*x**9) - b/(5*x**5)
```

Mathematica [A] time = 0.00354381, size = 17, normalized size = 1.

$$-\frac{a}{9x^9}-\frac{b}{5x^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)/x^10,x]

[Out] -a/(9*x^9) - b/(5*x^5)
```

Maple [A] time = 0.008, size = 14, normalized size = 0.8

$$-\frac{a}{9\,x^9}-\frac{b}{5\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)/x^10,x)

[Out] -1/9*a/x^9-1/5*b/x^5
```

Maxima [A] time = 1.44104, size = 20, normalized size = 1.18

$$-\frac{9\,bx^4+5\,a}{45\,x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)/x^10,x, algorithm="maxima")
```

```
[Out] -1/45*(9*b*x^4 + 5*a)/x^9
```

Fricas [A] time = 0.219002, size = 20, normalized size = 1.18

$$-\frac{9\,bx^4+5\,a}{45\,x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)/x^10,x, algorithm="fricas")
```

```
[Out] -1/45*(9*b*x^4 + 5*a)/x^9
```

Sympy [A] time = 1.25559, size = 15, normalized size = 0.88

$$-\frac{5a+9bx^4}{45x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)/x**10,x)
```

```
[Out] -(5*a + 9*b*x**4)/(45*x**9)
```

GIAC/XCAS [A] time = 0.23623, size = 20, normalized size = 1.18

$$-\frac{9\,bx^4+5\,a}{45\,x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)/x^10,x, algorithm="giac")
```

```
[Out] -1/45*(9*b*x^4 + 5*a)/x^9
```

3.618 $\int x^m \left(a+bx^4\right)^2 \, dx$

Optimal. Leaf size=43

$$\frac{a^2x^{m+1}}{m+1}+\frac{2abx^{m+5}}{m+5}+\frac{b^2x^{m+9}}{m+9}$$

```
[Out] (a^2*x^(1 + m))/(1 + m) + (2*a*b*x^(5 + m))/(5 + m) + (b^2*x^(9 +
 m))/(9 + m)
```

Rubi [A] time = 0.0438201, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{a^2x^{m+1}}{m+1}+\frac{2abx^{m+5}}{m+5}+\frac{b^2x^{m+9}}{m+9}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m*(a + b*x^4)^2,x]
```

```
[Out] (a^2*x^(1 + m))/(1 + m) + (2*a*b*x^(5 + m))/(5 + m) + (b^2*x^(9 +
 m))/(9 + m)
```

Rubi in Sympy [A] time = 7.24812, size = 36, normalized size = 0.84

$$\frac{a^2x^{m+1}}{m+1}+\frac{2abx^{m+5}}{m+5}+\frac{b^2x^{m+9}}{m+9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(b*x**4+a)**2,x)
```

```
[Out] a**2*x**(m + 1)/(m + 1) + 2*a*b*x**(m + 5)/(m + 5) + b**2*x**(m +
 9)/(m + 9)
```

Mathematica [A] time = 0.0283918, size = 39, normalized size = 0.91

$$x^m\left(\frac{a^2x}{m+1}+\frac{2abx^5}{m+5}+\frac{b^2x^9}{m+9}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m*(a + b*x^4)^2,x]
```

```
[Out] x^m*((a^2*x)/(1 + m) + (2*a*b*x^5)/(5 + m) + (b^2*x^9)/(9 + m))
```

Maple [B] time = 0.008, size = 93, normalized size = 2.2

$$\frac{x^{1+m}\left(b^2m^2x^8+6\,b^2mx^8+5\,b^2x^8+2\,abm^2x^4+20\,abmx^4+18\,abx^4+a^2m^2+14\,a^2m+45\,a^2\right)}{(9+m)\,(5+m)\,(1+m)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(b*x^4+a)^2,x)
```

```
[Out] x^(1+m)*(b^2*m^2*x^8+6*b^2*m*x^8+5*b^2*x^8+2*a*b*m^2*x^4+20*a*b*m
*x^4+18*a*b*x^4+a^2*m^2+14*a^2*m+45*a^2)/(9+m)/(5+m)/(1+m)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2*x^m,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.246231, size = 115, normalized size = 2.67

$$\frac{\left(\left(b^{2} m^{2} + 6 \, b^{2} m + 5 \, b^{2}\right) x^{9} + 2 \, \left(a b m^{2} + 10 \, a b m + 9 \, a b\right) x^{5} + \left(a^{2} m^{2} + 14 \, a^{2} m + 45 \, a^{2}\right) x\right) x^{m}}{m^{3} + 15 \, m^{2} + 59 \, m + 45}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2*x^m,x, algorithm="fricas")
```

```
[Out] ((b^2*m^2 + 6*b^2*m + 5*b^2)*x^9 + 2*(a*b*m^2 + 10*a*b*m + 9*a*b)
*x^5 + (a^2*m^2 + 14*a^2*m + 45*a^2)*x)*x^m/(m^3 + 15*m^2 + 59*m
+ 45)
```

Sympy [A] time = 7.12518, size = 309, normalized size = 7.19

$$\begin{cases} - \frac{a^{2}}{8 x^{8}} - \frac{a b}{2 x^{4}} + b^{2} \log{\left(x \right)} \\ - \frac{a^{2}}{4 x^{4}} + 2 a b \log{\left(x \right)} + \frac{b^{2} x^{4}}{4} \\ a^{2} \log{\left(x \right)} + \frac{a b x^{4}}{2} + \frac{b^{2} x^{8}}{8} \\ \frac{a^{2} m^{2} x x^{m}}{m^{3} + 15 m^{2} + 59 m + 45} + \frac{14 a^{2} m x x^{m}}{m^{3} + 15 m^{2} + 59 m + 45} + \frac{45 a^{2} x x^{m}}{m^{3} + 15 m^{2} + 59 m + 45} + \frac{2 a b m^{2} x^{5} x^{m}}{m^{3} + 15 m^{2} + 59 m + 45} + \frac{20 a b m x^{5} x^{m}}{m^{3} + 15 m^{2} + 59 m + 45} + \frac{18 a b x^{5} x^{m}}{m^{3} + 15 m^{2} + 59 m + 45} + \frac{b^{2} m^{2} x^{9} x^{m}}{m^{3} + 15 m^{2} + 59 m + 4} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(b*x**4+a)**2,x)
```

```
[Out] Piecewise((-a**2/(8*x**8) - a*b/(2*x**4) + b**2*log(x), Eq(m, -9)
), (-a**2/(4*x**4) + 2*a*b*log(x) + b**2*x**4/4, Eq(m, -5)), (a**
2*log(x) + a*b*x**4/2 + b**2*x**8/8, Eq(m, -1)), (a**2*m**2*x*x**
m/(m**3 + 15*m**2 + 59*m + 45) + 14*a**2*m*x*x**m/(m**3 + 15*m**2
 + 59*m + 45) + 45*a**2*x*x**m/(m**3 + 15*m**2 + 59*m + 45) + 2*a
*b*m**2*x**5*x**m/(m**3 + 15*m**2 + 59*m + 45) + 20*a*b*m*x**5*x*
*m/(m**3 + 15*m**2 + 59*m + 45) + 18*a*b*x**5*x**m/(m**3 + 15*m**
2 + 59*m + 45) + b**2*m**2*x**9*x**m/(m**3 + 15*m**2 + 59*m + 45)
 + 6*b**2*m*x**9*x**m/(m**3 + 15*m**2 + 59*m + 45) + 5*b**2*x**9*
x**m/(m**3 + 15*m**2 + 59*m + 45), True))
```

GIAC/XCAS [A] time = 0.228233, size = 182, normalized size = 4.23

$$\frac{b^{2} m^{2} x^{9} e^{\left(m \ln\left(x\right)\right)} + 6 \, b^{2} m x^{9} e^{\left(m \ln\left(x\right)\right)} + 5 \, b^{2} x^{9} e^{\left(m \ln\left(x\right)\right)} + 2 \, a b m^{2} x^{5} e^{\left(m \ln\left(x\right)\right)} + 20 \, a b m x^{5} e^{\left(m \ln\left(x\right)\right)} + 18 \, a b x^{5} e^{\left(m \ln\left(x\right)\right)} + a^{2} m^{2} x e^{\left(m \ln\left(x\right.\right.}}{m^{3} + 15 \, m^{2} + 59 \, m + 45}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2*x^m,x, algorithm="giac")

[Out] (b^2*m^2*x^9*e^(m*ln(x)) + 6*b^2*m*x^9*e^(m*ln(x)) + 5*b^2*x^9*e^
(m*ln(x)) + 2*a*b*m^2*x^5*e^(m*ln(x)) + 20*a*b*m*x^5*e^(m*ln(x))
+ 18*a*b*x^5*e^(m*ln(x)) + a^2*m^2*x*e^(m*ln(x)) + 14*a^2*m*x*e^(
m*ln(x)) + 45*a^2*x*e^(m*ln(x)))/(m^3 + 15*m^2 + 59*m + 45)
```

3.619 $\int x^5 (a + bx^4)^2 \, dx$

Optimal. Leaf size=30

$$\frac{a^2x^6}{6} + \frac{1}{5}abx^{10} + \frac{b^2x^{14}}{14}$$

```
[Out] (a^2*x^6)/6 + (a*b*x^10)/5 + (b^2*x^14)/14
```

Rubi [A] time = 0.0335464, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$\frac{a^2x^6}{6} + \frac{1}{5}abx^{10} + \frac{b^2x^{14}}{14}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5*(a + b*x^4)^2,x]

[Out] (a^2*x^6)/6 + (a*b*x^10)/5 + (b^2*x^14)/14
```

Rubi in Sympy [A] time = 5.23841, size = 24, normalized size = 0.8

$$\frac{a^2x^6}{6} + \frac{abx^{10}}{5} + \frac{b^2x^{14}}{14}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5*(b*x**4+a)**2,x)

[Out] a**2*x**6/6 + a*b*x**10/5 + b**2*x**14/14
```

Mathematica [A] time = 0.00163031, size = 30, normalized size = 1.

$$\frac{a^2x^6}{6} + \frac{1}{5}abx^{10} + \frac{b^2x^{14}}{14}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5*(a + b*x^4)^2,x]

[Out] (a^2*x^6)/6 + (a*b*x^10)/5 + (b^2*x^14)/14
```

Maple [A] time = 0.001, size = 25, normalized size = 0.8

$$\frac{a^2x^6}{6} + \frac{abx^{10}}{5} + \frac{b^2x^{14}}{14}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5*(b*x^4+a)^2,x)

[Out] 1/6*a^2*x^6+1/5*a*b*x^10+1/14*b^2*x^14
```

Maxima [A] time = 1.41466, size = 32, normalized size = 1.07

$$\frac{1}{14}\,b^2x^{14} + \frac{1}{5}\,abx^{10} + \frac{1}{6}\,a^2x^6$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2*x^5,x, algorithm="maxima")

[Out] 1/14*b^2*x^14 + 1/5*a*b*x^10 + 1/6*a^2*x^6
```

Fricas [A] time = 0.199934, size = 1, normalized size = 0.03

$$\frac{1}{14}x^{14}b^2 + \frac{1}{5}x^{10}ba + \frac{1}{6}x^6a^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2*x^5,x, algorithm="fricas")

[Out] 1/14*x^14*b^2 + 1/5*x^10*b*a + 1/6*x^6*a^2
```

Sympy [A] time = 0.087693, size = 24, normalized size = 0.8

$$\frac{a^2x^6}{6} + \frac{abx^{10}}{5} + \frac{b^2x^{14}}{14}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5*(b*x**4+a)**2,x)

[Out] a**2*x**6/6 + a*b*x**10/5 + b**2*x**14/14
```

GIAC/XCAS [A] time = 0.221796, size = 32, normalized size = 1.07

$$\frac{1}{14}\,b^2x^{14} + \frac{1}{5}\,abx^{10} + \frac{1}{6}\,a^2x^6$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2*x^5,x, algorithm="giac")

[Out] 1/14*b^2*x^14 + 1/5*a*b*x^10 + 1/6*a^2*x^6
```

3.620 $\int x^4 \left(a+bx^4\right)^2 dx$

Optimal. Leaf size=30

$$\frac{a^2x^5}{5}+\frac{2}{9}abx^9+\frac{b^2x^{13}}{13}$$

```
[Out] (a^2*x^5)/5 + (2*a*b*x^9)/9 + (b^2*x^13)/13
```

Rubi [A] time = 0.0322847, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{a^2x^5}{5}+\frac{2}{9}abx^9+\frac{b^2x^{13}}{13}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4*(a + b*x^4)^2,x]

[Out] (a^2*x^5)/5 + (2*a*b*x^9)/9 + (b^2*x^13)/13
```

Rubi in Sympy [A] time = 5.32679, size = 26, normalized size = 0.87

$$\frac{a^2x^5}{5}+\frac{2abx^9}{9}+\frac{b^2x^{13}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4*(b*x**4+a)**2,x)

[Out] a**2*x**5/5 + 2*a*b*x**9/9 + b**2*x**13/13
```

Mathematica [A] time = 0.00139993, size = 30, normalized size = 1.

$$\frac{a^2x^5}{5}+\frac{2}{9}abx^9+\frac{b^2x^{13}}{13}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4*(a + b*x^4)^2,x]

[Out] (a^2*x^5)/5 + (2*a*b*x^9)/9 + (b^2*x^13)/13
```

Maple [A] time = 0.002, size = 25, normalized size = 0.8

$$\frac{x^5a^2}{5}+\frac{2\,abx^9}{9}+\frac{b^2x^{13}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4*(b*x^4+a)^2,x)

[Out] 1/5*x^5*a^2+2/9*a*b*x^9+1/13*b^2*x^13
```

Maxima [A] time = 1.43832, size = 32, normalized size = 1.07

$$\frac{1}{13}\,b^2x^{13}+\frac{2}{9}\,abx^9+\frac{1}{5}\,a^2x^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2*x^4,x, algorithm="maxima")
```

```
[Out] 1/13*b^2*x^13 + 2/9*a*b*x^9 + 1/5*a^2*x^5
```

Fricas [A] time = 0.198883, size = 1, normalized size = 0.03

$$\frac{1}{13}x^{13}b^2+\frac{2}{9}x^9ba+\frac{1}{5}x^5a^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2*x^4,x, algorithm="fricas")
```

```
[Out] 1/13*x^13*b^2 + 2/9*x^9*b*a + 1/5*x^5*a^2
```

Sympy [A] time = 0.081982, size = 26, normalized size = 0.87

$$\frac{a^2x^5}{5}+\frac{2abx^9}{9}+\frac{b^2x^{13}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4*(b*x**4+a)**2,x)
```

```
[Out] a**2*x**5/5 + 2*a*b*x**9/9 + b**2*x**13/13
```

GIAC/XCAS [A] time = 0.220052, size = 32, normalized size = 1.07

$$\frac{1}{13}\,b^2x^{13}+\frac{2}{9}\,abx^9+\frac{1}{5}\,a^2x^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2*x^4,x, algorithm="giac")
```

```
[Out] 1/13*b^2*x^13 + 2/9*a*b*x^9 + 1/5*a^2*x^5
```

3.621 $\int x^3 (a + bx^4)^2 \, dx$

Optimal. Leaf size=16

$$\frac{(a + bx^4)^3}{12b}$$

```
[Out] (a + b*x^4)^3/(12*b)
```

Rubi [A] time = 0.0110391, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$\frac{(a + bx^4)^3}{12b}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(a + b*x^4)^2,x]

[Out] (a + b*x^4)^3/(12*b)
```

Rubi in Sympy [A] time = 2.17803, size = 10, normalized size = 0.62

$$\frac{(a + bx^4)^3}{12b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**3*(b*x**4+a)**2,x)

[Out] (a + b*x**4)**3/(12*b)
```

Mathematica [A] time = 0.00148984, size = 30, normalized size = 1.88

$$\frac{a^2x^4}{4} + \frac{1}{4}abx^8 + \frac{b^2x^{12}}{12}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(a + b*x^4)^2,x]

[Out] (a^2*x^4)/4 + (a*b*x^8)/4 + (b^2*x^12)/12
```

Maple [A] time = 0.001, size = 25, normalized size = 1.6

$$\frac{b^2x^{12}}{12} + \frac{abx^8}{4} + \frac{x^4a^2}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(b*x^4+a)^2,x)

[Out] 1/12*b^2*x^12+1/4*a*b*x^8+1/4*x^4*a^2
```

Maxima [A] time = 1.42769, size = 19, normalized size = 1.19

$$\frac{\left(bx^4 + a\right)^3}{12\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2*x^3,x, algorithm="maxima")
```

```
[Out] 1/12*(b*x^4 + a)^3/b
```

Fricas [A] time = 0.201558, size = 1, normalized size = 0.06

$$\frac{1}{12}x^{12}b^2 + \frac{1}{4}x^8ba + \frac{1}{4}x^4a^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2*x^3,x, algorithm="fricas")
```

```
[Out] 1/12*x^12*b^2 + 1/4*x^8*b*a + 1/4*x^4*a^2
```

Sympy [A] time = 0.090557, size = 24, normalized size = 1.5

$$\frac{a^2x^4}{4} + \frac{abx^8}{4} + \frac{b^2x^{12}}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(b*x**4+a)**2,x)
```

```
[Out] a**2*x**4/4 + a*b*x**8/4 + b**2*x**12/12
```

GIAC/XCAS [A] time = 0.220883, size = 19, normalized size = 1.19

$$\frac{\left(bx^4 + a\right)^3}{12\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2*x^3,x, algorithm="giac")
```

```
[Out] 1/12*(b*x^4 + a)^3/b
```

3.622 $\int x^2 (a + bx^4)^2\, dx$

Optimal. Leaf size=30

$$\frac{a^2x^3}{3} + \frac{2}{7}abx^7 + \frac{b^2x^{11}}{11}$$

```
[Out] (a^2*x^3)/3 + (2*a*b*x^7)/7 + (b^2*x^11)/11
```

Rubi [A] time = 0.0322706, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{a^2x^3}{3} + \frac{2}{7}abx^7 + \frac{b^2x^{11}}{11}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2*(a + b*x^4)^2,x]

[Out] (a^2*x^3)/3 + (2*a*b*x^7)/7 + (b^2*x^11)/11
```

Rubi in Sympy [A] time = 5.20119, size = 26, normalized size = 0.87

$$\frac{a^2x^3}{3} + \frac{2abx^7}{7} + \frac{b^2x^{11}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(b*x**4+a)**2,x)

[Out] a**2*x**3/3 + 2*a*b*x**7/7 + b**2*x**11/11
```

Mathematica [A] time = 0.00155, size = 30, normalized size = 1.

$$\frac{a^2x^3}{3} + \frac{2}{7}abx^7 + \frac{b^2x^{11}}{11}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2*(a + b*x^4)^2,x]

[Out] (a^2*x^3)/3 + (2*a*b*x^7)/7 + (b^2*x^11)/11
```

Maple [A] time = 0.001, size = 25, normalized size = 0.8

$$\frac{x^3a^2}{3} + \frac{2\,abx^7}{7} + \frac{b^2x^{11}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(b*x^4+a)^2,x)

[Out] 1/3*x^3*a^2+2/7*a*b*x^7+1/11*b^2*x^11
```

Maxima [A] time = 1.42159, size = 32, normalized size = 1.07

$$\frac{1}{11}\,b^2x^{11} + \frac{2}{7}\,abx^7 + \frac{1}{3}\,a^2x^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2*x^2,x, algorithm="maxima")
```

```
[Out] 1/11*b^2*x^11 + 2/7*a*b*x^7 + 1/3*a^2*x^3
```

Fricas [A] time = 0.199596, size = 1, normalized size = 0.03

$$\frac{1}{11}x^{11}b^2 + \frac{2}{7}x^7ba + \frac{1}{3}x^3a^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2*x^2,x, algorithm="fricas")
```

```
[Out] 1/11*x^11*b^2 + 2/7*x^7*b*a + 1/3*x^3*a^2
```

Sympy [A] time = 0.084343, size = 26, normalized size = 0.87

$$\frac{a^2x^3}{3} + \frac{2abx^7}{7} + \frac{b^2x^{11}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(b*x**4+a)**2,x)
```

```
[Out] a**2*x**3/3 + 2*a*b*x**7/7 + b**2*x**11/11
```

GIAC/XCAS [A] time = 0.217998, size = 32, normalized size = 1.07

$$\frac{1}{11}\,b^2x^{11} + \frac{2}{7}\,abx^7 + \frac{1}{3}\,a^2x^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2*x^2,x, algorithm="giac")
```

```
[Out] 1/11*b^2*x^11 + 2/7*a*b*x^7 + 1/3*a^2*x^3
```

3.623 $\int x\left(a+bx^4\right)^2\,dx$

Optimal. Leaf size=30

$$\frac{a^2x^2}{2}+\frac{1}{3}abx^6+\frac{b^2x^{10}}{10}$$

```
[Out] (a^2*x^2)/2 + (a*b*x^6)/3 + (b^2*x^10)/10
```

Rubi [A] time = 0.0298851, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{a^2x^2}{2}+\frac{1}{3}abx^6+\frac{b^2x^{10}}{10}$$

Antiderivative was successfully verified.

```
[In] Int[x*(a + b*x^4)^2,x]

[Out] (a^2*x^2)/2 + (a*b*x^6)/3 + (b^2*x^10)/10
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$a^2\int x\,dx+\frac{abx^6}{3}+\frac{b^2x^{10}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x*(b*x**4+a)**2,x)

[Out] a**2*Integral(x, x) + a*b*x**6/3 + b**2*x**10/10
```

Mathematica [A] time = 0.00216724, size = 30, normalized size = 1.

$$\frac{a^2x^2}{2}+\frac{1}{3}abx^6+\frac{b^2x^{10}}{10}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(a + b*x^4)^2,x]

[Out] (a^2*x^2)/2 + (a*b*x^6)/3 + (b^2*x^10)/10
```

Maple [A] time = 0., size = 25, normalized size = 0.8

$$\frac{a^2x^2}{2}+\frac{abx^6}{3}+\frac{b^2x^{10}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(b*x^4+a)^2,x)

[Out] 1/2*a^2*x^2+1/3*a*b*x^6+1/10*b^2*x^10
```

Maxima [A] time = 1.42467, size = 32, normalized size = 1.07

$$\frac{1}{10}\,b^2x^{10}+\frac{1}{3}\,abx^6+\frac{1}{2}\,a^2x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2*x,x, algorithm="maxima")
```

```
[Out] 1/10*b^2*x^10 + 1/3*a*b*x^6 + 1/2*a^2*x^2
```

Fricas [A] time = 0.203778, size = 1, normalized size = 0.03

$$\frac{1}{10}x^{10}b^2+\frac{1}{3}x^6ba+\frac{1}{2}x^2a^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2*x,x, algorithm="fricas")
```

```
[Out] 1/10*x^10*b^2 + 1/3*x^6*b*a + 1/2*x^2*a^2
```

Sympy [A] time = 0.084656, size = 24, normalized size = 0.8

$$\frac{a^2x^2}{2}+\frac{abx^6}{3}+\frac{b^2x^{10}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(b*x**4+a)**2,x)
```

```
[Out] a**2*x**2/2 + a*b*x**6/3 + b**2*x**10/10
```

GIAC/XCAS [A] time = 0.219632, size = 32, normalized size = 1.07

$$\frac{1}{10}\,b^2x^{10}+\frac{1}{3}\,abx^6+\frac{1}{2}\,a^2x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2*x,x, algorithm="giac")
```

```
[Out] 1/10*b^2*x^10 + 1/3*a*b*x^6 + 1/2*a^2*x^2
```

3.624 $\int (a+bx^4)^2\,dx$

Optimal. Leaf size=25

$$a^2x+\frac{2}{5}abx^5+\frac{b^2x^9}{9}$$

```
[Out] a^2*x + (2*a*b*x^5)/5 + (b^2*x^9)/9
```

Rubi [A] time = 0.0196626, antiderivative size = 25, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111

$$a^2x+\frac{2}{5}abx^5+\frac{b^2x^9}{9}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^2,x]

[Out] a^2*x + (2*a*b*x^5)/5 + (b^2*x^9)/9
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{2abx^5}{5}+\frac{b^2x^9}{9}+\int a^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**2,x)

[Out] 2*a*b*x**5/5 + b**2*x**9/9 + Integral(a**2, x)
```

Mathematica [A] time = 0.00145464, size = 25, normalized size = 1.

$$a^2x+\frac{2}{5}abx^5+\frac{b^2x^9}{9}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^2,x]

[Out] a^2*x + (2*a*b*x^5)/5 + (b^2*x^9)/9
```

Maple [A] time = 0.001, size = 22, normalized size = 0.9

$$xa^2+\frac{2x^5ab}{5}+\frac{b^2x^9}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^2,x)

[Out] x*a^2+2/5*x^5*a*b+1/9*b^2*x^9
```

Maxima [A] time = 1.4217, size = 28, normalized size = 1.12

$$\frac{1}{9}b^2x^9 + \frac{2}{5}abx^5 + a^2x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2,x, algorithm="maxima")
```

```
[Out] 1/9*b^2*x^9 + 2/5*a*b*x^5 + a^2*x
```

Fricas [A] time = 0.205749, size = 1, normalized size = 0.04

$$\frac{1}{9}x^9b^2 + \frac{2}{5}x^5ba + xa^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2,x, algorithm="fricas")
```

```
[Out] 1/9*x^9*b^2 + 2/5*x^5*b*a + x*a^2
```

Sympy [A] time = 0.082973, size = 22, normalized size = 0.88

$$a^2x + \frac{2abx^5}{5} + \frac{b^2x^9}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**2,x)
```

```
[Out] a**2*x + 2*a*b*x**5/5 + b**2*x**9/9
```

GIAC/XCAS [A] time = 0.218151, size = 28, normalized size = 1.12

$$\frac{1}{9}b^2x^9 + \frac{2}{5}abx^5 + a^2x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2,x, algorithm="giac")
```

```
[Out] 1/9*b^2*x^9 + 2/5*a*b*x^5 + a^2*x
```

3.625 $\int \frac{(a+bx^4)^2}{x} \, dx$

Optimal. Leaf size=26

$$a^2 \log(x) + \frac{1}{2} abx^4 + \frac{b^2 x^8}{8}$$

```
[Out] (a*b*x^4)/2 + (b^2*x^8)/8 + a^2*Log[x]
```

Rubi [A] time = 0.0343828, antiderivative size = 26, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$a^2 \log(x) + \frac{1}{2} abx^4 + \frac{b^2 x^8}{8}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^2/x,x]

[Out] (a*b*x^4)/2 + (b^2*x^8)/8 + a^2*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^2 \log\left(x^4\right)}{4} + \frac{abx^4}{2} + \frac{b^2 \int^{x^4} x \, dx}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**2/x,x)

[Out] a**2*log(x**4)/4 + a*b*x**4/2 + b**2*Integral(x, (x, x**4))/4
```

Mathematica [A] time = 0.00134809, size = 26, normalized size = 1.

$$a^2 \log(x) + \frac{1}{2} abx^4 + \frac{b^2 x^8}{8}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^2/x,x]

[Out] (a*b*x^4)/2 + (b^2*x^8)/8 + a^2*Log[x]
```

Maple [A] time = 0.003, size = 23, normalized size = 0.9

$$\frac{abx^4}{2} + \frac{b^2 x^8}{8} + a^2 \ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^2/x,x)

[Out] 1/2*a*b*x^4+1/8*b^2*x^8+a^2*ln(x)
```

Maxima [A] time = 1.41446, size = 34, normalized size = 1.31

$$\frac{1}{8}\,b^2x^8+\frac{1}{2}\,abx^4+\frac{1}{4}\,a^2\log\left(x^4\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2/x,x, algorithm="maxima")
```

```
[Out] 1/8*b^2*x^8 + 1/2*a*b*x^4 + 1/4*a^2*log(x^4)
```

Fricas [A] time = 0.224095, size = 30, normalized size = 1.15

$$\frac{1}{8}\,b^2x^8+\frac{1}{2}\,abx^4+a^2\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2/x,x, algorithm="fricas")
```

```
[Out] 1/8*b^2*x^8 + 1/2*a*b*x^4 + a^2*log(x)
```

Sympy [A] time = 1.01544, size = 22, normalized size = 0.85

$$a^2\log\left(x\right)+\frac{abx^4}{2}+\frac{b^2x^8}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**2/x,x)
```

```
[Out] a**2*log(x) + a*b*x**4/2 + b**2*x**8/8
```

GIAC/XCAS [A] time = 0.221118, size = 34, normalized size = 1.31

$$\frac{1}{8}\,b^2x^8+\frac{1}{2}\,abx^4+\frac{1}{4}\,a^2\ln\left(x^4\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2/x,x, algorithm="giac")
```

```
[Out] 1/8*b^2*x^8 + 1/2*a*b*x^4 + 1/4*a^2*ln(x^4)
```

3.626 $\int \frac{(a+bx^4)^2}{x^2} dx$

Optimal. Leaf size=28

$$-\frac{a^2}{x}+\frac{2}{3}abx^3+\frac{b^2x^7}{7}$$

```
[Out] -(a^2/x) + (2*a*b*x^3)/3 + (b^2*x^7)/7
```

Rubi [A] time = 0.0292538, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a^2}{x}+\frac{2}{3}abx^3+\frac{b^2x^7}{7}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^2/x^2,x]

[Out] -(a^2/x) + (2*a*b*x^3)/3 + (b^2*x^7)/7
```

Rubi in Sympy [A] time = 5.01804, size = 22, normalized size = 0.79

$$-\frac{a^2}{x}+\frac{2abx^3}{3}+\frac{b^2x^7}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**2/x**2,x)

[Out] -a**2/x + 2*a*b*x**3/3 + b**2*x**7/7
```

Mathematica [A] time = 0.00154136, size = 28, normalized size = 1.

$$-\frac{a^2}{x}+\frac{2}{3}abx^3+\frac{b^2x^7}{7}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^2/x^2,x]

[Out] -(a^2/x) + (2*a*b*x^3)/3 + (b^2*x^7)/7
```

Maple [A] time = 0.004, size = 25, normalized size = 0.9

$$-\frac{a^2}{x}+\frac{2\,abx^3}{3}+\frac{b^2x^7}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^2/x^2,x)

[Out] -a^2/x+2/3*a*b*x^3+1/7*b^2*x^7
```

Maxima [A] time = 1.43873, size = 32, normalized size = 1.14

$$\frac{1}{7}\,b^{2}x^{7}+\frac{2}{3}\,abx^{3}-\frac{a^{2}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2/x^2,x, algorithm="maxima")
```

```
[Out] 1/7*b^2*x^7 + 2/3*a*b*x^3 - a^2/x
```

Fricas [A] time = 0.212032, size = 35, normalized size = 1.25

$$\frac{3\,b^{2}x^{8}+14\,abx^{4}-21\,a^{2}}{21\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2/x^2,x, algorithm="fricas")
```

```
[Out] 1/21*(3*b^2*x^8 + 14*a*b*x^4 - 21*a^2)/x
```

Sympy [A] time = 1.00383, size = 22, normalized size = 0.79

$$-\frac{a^{2}}{x}+\frac{2abx^{3}}{3}+\frac{b^{2}x^{7}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**2/x**2,x)
```

```
[Out] -a**2/x + 2*a*b*x**3/3 + b**2*x**7/7
```

GIAC/XCAS [A] time = 0.233662, size = 32, normalized size = 1.14

$$\frac{1}{7}\,b^{2}x^{7}+\frac{2}{3}\,abx^{3}-\frac{a^{2}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2/x^2,x, algorithm="giac")
```

```
[Out] 1/7*b^2*x^7 + 2/3*a*b*x^3 - a^2/x
```

3.627 $\int \frac{(a+bx^4)^2}{x^3}\,dx$

Optimal. Leaf size=27

$$-\frac{a^2}{2x^2}+abx^2+\frac{b^2x^6}{6}$$

```
[Out] -a^2/(2*x^2) + a*b*x^2 + (b^2*x^6)/6
```

Rubi [A] time = 0.0291175, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a^2}{2x^2}+abx^2+\frac{b^2x^6}{6}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^2/x^3,x]

[Out] -a^2/(2*x^2) + a*b*x^2 + (b^2*x^6)/6
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^2}{2x^2}+2ab\int x\,dx+\frac{b^2x^6}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**2/x**3,x)

[Out] -a**2/(2*x**2) + 2*a*b*Integral(x, x) + b**2*x**6/6
```

Mathematica [A] time = 0.00171799, size = 27, normalized size = 1.

$$-\frac{a^2}{2x^2}+abx^2+\frac{b^2x^6}{6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^2/x^3,x]

[Out] -a^2/(2*x^2) + a*b*x^2 + (b^2*x^6)/6
```

Maple [A] time = 0.004, size = 24, normalized size = 0.9

$$-\frac{a^2}{2\,x^2}+abx^2+\frac{b^2x^6}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^2/x^3,x)

[Out] -1/2*a^2/x^2+a*b*x^2+1/6*b^2*x^6
```

Maxima [A] time = 1.41868, size = 31, normalized size = 1.15

$$\frac{1}{6}\,b^2x^6 + abx^2 - \frac{a^2}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2/x^3,x, algorithm="maxima")
```

```
[Out] 1/6*b^2*x^6 + a*b*x^2 - 1/2*a^2/x^2
```

Fricas [A] time = 0.218637, size = 34, normalized size = 1.26

$$\frac{b^2x^8 + 6\,abx^4 - 3\,a^2}{6\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2/x^3,x, algorithm="fricas")
```

```
[Out] 1/6*(b^2*x^8 + 6*a*b*x^4 - 3*a^2)/x^2
```

Sympy [A] time = 1.02861, size = 22, normalized size = 0.81

$$-\frac{a^2}{2x^2} + abx^2 + \frac{b^2x^6}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**2/x**3,x)
```

```
[Out] -a**2/(2*x**2) + a*b*x**2 + b**2*x**6/6
```

GIAC/XCAS [A] time = 0.226255, size = 31, normalized size = 1.15

$$\frac{1}{6}\,b^2x^6 + abx^2 - \frac{a^2}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2/x^3,x, algorithm="giac")
```

```
[Out] 1/6*b^2*x^6 + a*b*x^2 - 1/2*a^2/x^2
```

3.628 $\int \frac{(a+bx^4)^2}{x^4} dx$

Optimal. Leaf size=26

$$-\frac{a^2}{3x^3} + 2abx + \frac{b^2x^5}{5}$$

```
[Out] -a^2/(3*x^3) + 2*a*b*x + (b^2*x^5)/5
```

Rubi [A] time = 0.0280088, antiderivative size = 26, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a^2}{3x^3} + 2abx + \frac{b^2x^5}{5}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^2/x^4,x]

[Out] -a^2/(3*x^3) + 2*a*b*x + (b^2*x^5)/5
```

Rubi in Sympy [A] time = 5.01069, size = 22, normalized size = 0.85

$$-\frac{a^2}{3x^3} + 2abx + \frac{b^2x^5}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**2/x**4,x)

[Out] -a**2/(3*x**3) + 2*a*b*x + b**2*x**5/5
```

Mathematica [A] time = 0.00121466, size = 26, normalized size = 1.

$$-\frac{a^2}{3x^3} + 2abx + \frac{b^2x^5}{5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^2/x^4,x]

[Out] -a^2/(3*x^3) + 2*a*b*x + (b^2*x^5)/5
```

Maple [A] time = 0.005, size = 23, normalized size = 0.9

$$-\frac{a^2}{3\,x^3} + 2\,abx + \frac{b^2x^5}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^2/x^4,x)

[Out] -1/3*a^2/x^3+2*a*b*x+1/5*b^2*x^5
```

Maxima [A] time = 1.49092, size = 30, normalized size = 1.15

$$\frac{1}{5}\,b^2x^5 + 2\,abx - \frac{a^2}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2/x^4,x, algorithm="maxima")
```

```
[Out] 1/5*b^2*x^5 + 2*a*b*x - 1/3*a^2/x^3
```

Fricas [A] time = 0.216637, size = 35, normalized size = 1.35

$$\frac{3\,b^2x^8 + 30\,abx^4 - 5\,a^2}{15\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2/x^4,x, algorithm="fricas")
```

```
[Out] 1/15*(3*b^2*x^8 + 30*a*b*x^4 - 5*a^2)/x^3
```

Sympy [A] time = 1.04259, size = 22, normalized size = 0.85

$$-\frac{a^2}{3x^3} + 2abx + \frac{b^2x^5}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**2/x**4,x)
```

```
[Out] -a**2/(3*x**3) + 2*a*b*x + b**2*x**5/5
```

GIAC/XCAS [A] time = 0.222841, size = 30, normalized size = 1.15

$$\frac{1}{5}\,b^2x^5 + 2\,abx - \frac{a^2}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2/x^4,x, algorithm="giac")
```

```
[Out] 1/5*b^2*x^5 + 2*a*b*x - 1/3*a^2/x^3
```

3.629 $\int \frac{(a+bx^4)^2}{x^5} \, dx$

Optimal. Leaf size=27

$$-\frac{a^2}{4x^4} + 2ab\log(x) + \frac{b^2x^4}{4}$$

```
[Out] -a^2/(4*x^4) + (b^2*x^4)/4 + 2*a*b*Log[x]
```

Rubi [A] time = 0.038412, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$-\frac{a^2}{4x^4} + 2ab\log(x) + \frac{b^2x^4}{4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^2/x^5,x]

[Out] -a^2/(4*x^4) + (b^2*x^4)/4 + 2*a*b*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^2}{4x^4} + \frac{ab\log(x^4)}{2} + \frac{\int^{x^4} b^2\,dx}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**2/x**5,x)

[Out] -a**2/(4*x**4) + a*b*log(x**4)/2 + Integral(b**2, (x, x**4))/4
```

Mathematica [A] time = 0.00136633, size = 27, normalized size = 1.

$$-\frac{a^2}{4x^4} + 2ab\log(x) + \frac{b^2x^4}{4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^2/x^5,x]

[Out] -a^2/(4*x^4) + (b^2*x^4)/4 + 2*a*b*Log[x]
```

Maple [A] time = 0.008, size = 24, normalized size = 0.9

$$-\frac{a^2}{4\,x^4} + \frac{b^2x^4}{4} + 2\,ab\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^2/x^5,x)

[Out] -1/4*a^2/x^4+1/4*b^2*x^4+2*a*b*ln(x)
```

Maxima [A] time = 1.41748, size = 34, normalized size = 1.26

$$\frac{1}{4}\,b^2x^4 + \frac{1}{2}\,ab\log\left(x^4\right) - \frac{a^2}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2/x^5,x, algorithm="maxima")
```

```
[Out] 1/4*b^2*x^4 + 1/2*a*b*log(x^4) - 1/4*a^2/x^4
```

Fricas [A] time = 0.224365, size = 36, normalized size = 1.33

$$\frac{b^2x^8 + 8\,abx^4\log\left(x\right) - a^2}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2/x^5,x, algorithm="fricas")
```

```
[Out] 1/4*(b^2*x^8 + 8*a*b*x^4*log(x) - a^2)/x^4
```

Sympy [A] time = 1.17824, size = 24, normalized size = 0.89

$$-\frac{a^2}{4x^4} + 2ab\log\left(x\right) + \frac{b^2x^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**2/x**5,x)
```

```
[Out] -a**2/(4*x**4) + 2*a*b*log(x) + b**2*x**4/4
```

GIAC/XCAS [A] time = 0.232262, size = 45, normalized size = 1.67

$$\frac{1}{4}\,b^2x^4 + \frac{1}{2}\,ab\ln\left(x^4\right) - \frac{2\,abx^4 + a^2}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^2/x^5,x, algorithm="giac")
```

```
[Out] 1/4*b^2*x^4 + 1/2*a*b*ln(x^4) - 1/4*(2*a*b*x^4 + a^2)/x^4
```

3.630 $\int x^m \left(a+bx^4\right)^3 \, dx$

Optimal. Leaf size=61

$$\frac{a^3x^{m+1}}{m+1}+\frac{3a^2bx^{m+5}}{m+5}+\frac{3ab^2x^{m+9}}{m+9}+\frac{b^3x^{m+13}}{m+13}$$

```
[Out] (a^3*x^(1 + m))/(1 + m) + (3*a^2*b*x^(5 + m))/(5 + m) + (3*a*b^2*
x^(9 + m))/(9 + m) + (b^3*x^(13 + m))/(13 + m)
```

Rubi [A] time = 0.0574369, antiderivative size = 61, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{a^3x^{m+1}}{m+1}+\frac{3a^2bx^{m+5}}{m+5}+\frac{3ab^2x^{m+9}}{m+9}+\frac{b^3x^{m+13}}{m+13}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m*(a + b*x^4)^3,x]
```

```
[Out] (a^3*x^(1 + m))/(1 + m) + (3*a^2*b*x^(5 + m))/(5 + m) + (3*a*b^2*
x^(9 + m))/(9 + m) + (b^3*x^(13 + m))/(13 + m)
```

Rubi in Sympy [A] time = 9.99585, size = 53, normalized size = 0.87

$$\frac{a^3x^{m+1}}{m+1}+\frac{3a^2bx^{m+5}}{m+5}+\frac{3ab^2x^{m+9}}{m+9}+\frac{b^3x^{m+13}}{m+13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(b*x**4+a)**3,x)
```

```
[Out] a**3*x**(m + 1)/(m + 1) + 3*a**2*b*x**(m + 5)/(m + 5) + 3*a*b**2*
x**(m + 9)/(m + 9) + b**3*x**(m + 13)/(m + 13)
```

Mathematica [A] time = 0.0419658, size = 55, normalized size = 0.9

$$x^m\left(\frac{a^3x}{m+1}+\frac{3a^2bx^5}{m+5}+\frac{3ab^2x^9}{m+9}+\frac{b^3x^{13}}{m+13}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m*(a + b*x^4)^3,x]
```

```
[Out] x^m*((a^3*x)/(1 + m) + (3*a^2*b*x^5)/(5 + m) + (3*a*b^2*x^9)/(9 +
 m) + (b^3*x^13)/(13 + m))
```

Maple [B] time = 0.008, size = 178, normalized size = 2.9

$$\frac{x^{1+m}\left(b^3m^3x^{12}+15\,b^3m^2x^{12}+59\,b^3mx^{12}+45\,b^3x^{12}+3\,ab^2m^3x^8+57\,ab^2m^2x^8+249\,ab^2mx^8+195\,ab^2x^8+3\,a^2bm^3x^4+69\right.}{(13+m)(9+m)(5+m)(1+m)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(b*x^4+a)^3,x)
```

```
[Out] x^(1+m)*(b^3*m^3*x^12+15*b^3*m^2*x^12+59*b^3*m*x^12+45*b^3*x^12+3
*a*b^2*m^3*x^8+57*a*b^2*m^2*x^8+249*a*b^2*m*x^8+195*a*b^2*x^8+3*a
^2*b*m^3*x^4+69*a^2*b*m^2*x^4+417*a^2*b*m*x^4+351*a^2*b*x^4+a^3*m
^3+27*a^3*m^2+227*a^3*m+585*a^3)/(13+m)/(9+m)/(5+m)/(1+m)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3*x^m,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.248285, size = 212, normalized size = 3.48

$$\frac{\left(\left(b^3m^3 + 15\,b^3m^2 + 59\,b^3m + 45\,b^3\right)x^{13} + 3\,\left(ab^2m^3 + 19\,ab^2m^2 + 83\,ab^2m + 65\,ab^2\right)x^9 + 3\,\left(a^2bm^3 + 23\,a^2bm^2 + 139\,a^2bm + \right.\right.}{m^4 + 28\,m^3 + 254\,m^2 + 812\,m + 585}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3*x^m,x, algorithm="fricas")
```

```
[Out] ((b^3*m^3 + 15*b^3*m^2 + 59*b^3*m + 45*b^3)*x^13 + 3*(a*b^2*m^3 +
 19*a*b^2*m^2 + 83*a*b^2*m + 65*a*b^2)*x^9 + 3*(a^2*b*m^3 + 23*a^
2*b*m^2 + 139*a^2*b*m + 117*a^2*b)*x^5 + (a^3*m^3 + 27*a^3*m^2 +
227*a^3*m + 585*a^3)*x)*x^m/(m^4 + 28*m^3 + 254*m^2 + 812*m + 585
)
```

Sympy [A] time = 18.2702, size = 683, normalized size = 11.2

$$\begin{cases} -\frac{a^3}{12x^{12}} - \frac{3a^2b}{8x^8} - \frac{3ab^2}{4x^4} + b^3\log(x) \\ -\frac{a^3}{8x^8} - \frac{3a^2b}{4x^4} + 3ab^2\log(x) + \frac{b^3x^4}{4} \\ -\frac{a^3}{4x^4} + 3a^2b\log(x) + \frac{3ab^2x^4}{4} + \frac{b^3x^8}{8} \\ a^3\log(x) + \frac{3a^2bx^4}{4} + \frac{3ab^2x^8}{8} + \frac{b^3x^{12}}{12} \\ \frac{a^3m^3xx^m}{m^4+28m^3+254m^2+812m+585} + \frac{27a^3m^2xx^m}{m^4+28m^3+254m^2+812m+585} + \frac{227a^3mxx^m}{m^4+28m^3+254m^2+812m+585} + \frac{585a^3xx^m}{m^4+28m^3+254m^2+812m+585} + \frac{3a^2bm^3x^5x^m}{m^4+28m^3+254m^2+812m} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(b*x**4+a)**3,x)
```

```
[Out] Piecewise((-a**3/(12*x**12) - 3*a**2*b/(8*x**8) - 3*a*b**2/(4*x**
4) + b**3*log(x), Eq(m, -13)), (-a**3/(8*x**8) - 3*a**2*b/(4*x**4
) + 3*a*b**2*log(x) + b**3*x**4/4, Eq(m, -9)), (-a**3/(4*x**4) +
3*a**2*b*log(x) + 3*a*b**2*x**4/4 + b**3*x**8/8, Eq(m, -5)), (a**
3*log(x) + 3*a**2*b*x**4/4 + 3*a*b**2*x**8/8 + b**3*x**12/12, Eq(
m, -1)), (a**3*m**3*x*x**m/(m**4 + 28*m**3 + 254*m**2 + 812*m + 5
85) + 27*a**3*m**2*x*x**m/(m**4 + 28*m**3 + 254*m**2 + 812*m + 58
5) + 227*a**3*m*x*x**m/(m**4 + 28*m**3 + 254*m**2 + 812*m + 585)
+ 585*a**3*x*x**m/(m**4 + 28*m**3 + 254*m**2 + 812*m + 585) + 3*a
**2*b*m**3*x**5*x**m/(m**4 + 28*m**3 + 254*m**2 + 812*m + 585) +
69*a**2*b*m**2*x**5*x**m/(m**4 + 28*m**3 + 254*m**2 + 812*m + 585
) + 417*a**2*b*m*x**5*x**m/(m**4 + 28*m**3 + 254*m**2 + 812*m + 5
85) + 351*a**2*b*x**5*x**m/(m**4 + 28*m**3 + 254*m**2 + 812*m + 5
85) + 3*a*b**2*m**3*x**9*x**m/(m**4 + 28*m**3 + 254*m**2 + 812*m
+ 585) + 57*a*b**2*m**2*x**9*x**m/(m**4 + 28*m**3 + 254*m**2 + 81
2*m + 585) + 249*a*b**2*m*x**9*x**m/(m**4 + 28*m**3 + 254*m**2 +
812*m + 585) + 195*a*b**2*x**9*x**m/(m**4 + 28*m**3 + 254*m**2 +
```

```
812*m + 585) + b**3*m**3*x**13*x**m/(m**4 + 28*m**3 + 254*m**2 +
812*m + 585) + 15*b**3*m**2*x**13*x**m/(m**4 + 28*m**3 + 254*m**2
 + 812*m + 585) + 59*b**3*m*x**13*x**m/(m**4 + 28*m**3 + 254*m**2
 + 812*m + 585) + 45*b**3*x**13*x**m/(m**4 + 28*m**3 + 254*m**2 +
 812*m + 585), True))
```

GIAC/XCAS [A] time = 0.231584, size = 346, normalized size = 5.67

$$b^3m^3x^{13}e^{(m\ln(x))} + 15\,b^3m^2x^{13}e^{(m\ln(x))} + 59\,b^3mx^{13}e^{(m\ln(x))} + 45\,b^3x^{13}e^{(m\ln(x))} + 3\,ab^2m^3x^9e^{(m\ln(x))} + 57\,ab^2m^2x^9e^{(m\ln(x))} + 2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3*x^m,x, algorithm="giac")
```

```
[Out] (b^3*m^3*x^13*e^(m*ln(x)) + 15*b^3*m^2*x^13*e^(m*ln(x)) + 59*b^3*
m*x^13*e^(m*ln(x)) + 45*b^3*x^13*e^(m*ln(x)) + 3*a*b^2*m^3*x^9*e^
(m*ln(x)) + 57*a*b^2*m^2*x^9*e^(m*ln(x)) + 249*a*b^2*m*x^9*e^(m*l
n(x)) + 195*a*b^2*x^9*e^(m*ln(x)) + 3*a^2*b*m^3*x^5*e^(m*ln(x)) +
 69*a^2*b*m^2*x^5*e^(m*ln(x)) + 417*a^2*b*m*x^5*e^(m*ln(x)) + 351
*a^2*b*x^5*e^(m*ln(x)) + a^3*m^3*x*e^(m*ln(x)) + 27*a^3*m^2*x*e^(
m*ln(x)) + 227*a^3*m*x*e^(m*ln(x)) + 585*a^3*x*e^(m*ln(x)))/(m^4
+ 28*m^3 + 254*m^2 + 812*m + 585)
```

3.631 $\int x^5 \left(a+bx^4\right)^3 \, dx$

Optimal. Leaf size=43

$$\frac{a^3x^6}{6}+\frac{3}{10}a^2bx^{10}+\frac{3}{14}ab^2x^{14}+\frac{b^3x^{18}}{18}$$

```
[Out] (a^3*x^6)/6 + (3*a^2*b*x^10)/10 + (3*a*b^2*x^14)/14 + (b^3*x^18)/
18
```

Rubi [A] time = 0.0439554, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{a^3x^6}{6}+\frac{3}{10}a^2bx^{10}+\frac{3}{14}ab^2x^{14}+\frac{b^3x^{18}}{18}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5*(a + b*x^4)^3,x]

[Out] (a^3*x^6)/6 + (3*a^2*b*x^10)/10 + (3*a*b^2*x^14)/14 + (b^3*x^18)/
18
```

Rubi in Sympy [A] time = 6.89522, size = 39, normalized size = 0.91

$$\frac{a^3x^6}{6}+\frac{3a^2bx^{10}}{10}+\frac{3ab^2x^{14}}{14}+\frac{b^3x^{18}}{18}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5*(b*x**4+a)**3,x)

[Out] a**3*x**6/6 + 3*a**2*b*x**10/10 + 3*a*b**2*x**14/14 + b**3*x**18/
18
```

Mathematica [A] time = 0.00389707, size = 43, normalized size = 1.

$$\frac{a^3x^6}{6}+\frac{3}{10}a^2bx^{10}+\frac{3}{14}ab^2x^{14}+\frac{b^3x^{18}}{18}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5*(a + b*x^4)^3,x]

[Out] (a^3*x^6)/6 + (3*a^2*b*x^10)/10 + (3*a*b^2*x^14)/14 + (b^3*x^18)/
18
```

Maple [A] time = 0.001, size = 36, normalized size = 0.8

$$\frac{a^3x^6}{6}+\frac{3\,a^2bx^{10}}{10}+\frac{3\,ab^2x^{14}}{14}+\frac{b^3x^{18}}{18}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5*(b*x^4+a)^3,x)
```

```
[Out] 1/6*a^3*x^6+3/10*a^2*b*x^10+3/14*a*b^2*x^14+1/18*b^3*x^18
```

Maxima [A] time = 1.42456, size = 47, normalized size = 1.09

$$\frac{1}{18}\,b^{3}x^{18}+\frac{3}{14}\,ab^{2}x^{14}+\frac{3}{10}\,a^{2}bx^{10}+\frac{1}{6}\,a^{3}x^{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3*x^5,x, algorithm="maxima")
```

```
[Out] 1/18*b^3*x^18 + 3/14*a*b^2*x^14 + 3/10*a^2*b*x^10 + 1/6*a^3*x^6
```

Fricas [A] time = 0.199748, size = 1, normalized size = 0.02

$$\frac{1}{18}x^{18}b^{3}+\frac{3}{14}x^{14}b^{2}a+\frac{3}{10}x^{10}ba^{2}+\frac{1}{6}x^{6}a^{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3*x^5,x, algorithm="fricas")
```

```
[Out] 1/18*x^18*b^3 + 3/14*x^14*b^2*a + 3/10*x^10*b*a^2 + 1/6*x^6*a^3
```

Sympy [A] time = 0.098465, size = 39, normalized size = 0.91

$$\frac{a^{3}x^{6}}{6}+\frac{3a^{2}bx^{10}}{10}+\frac{3ab^{2}x^{14}}{14}+\frac{b^{3}x^{18}}{18}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5*(b*x**4+a)**3,x)
```

```
[Out] a**3*x**6/6 + 3*a**2*b*x**10/10 + 3*a*b**2*x**14/14 + b**3*x**18/
18
```

GIAC/XCAS [A] time = 0.218582, size = 47, normalized size = 1.09

$$\frac{1}{18}\,b^{3}x^{18}+\frac{3}{14}\,ab^{2}x^{14}+\frac{3}{10}\,a^{2}bx^{10}+\frac{1}{6}\,a^{3}x^{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3*x^5,x, algorithm="giac")
```

```
[Out] 1/18*b^3*x^18 + 3/14*a*b^2*x^14 + 3/10*a^2*b*x^10 + 1/6*a^3*x^6
```

3.632 $\int x^4 \left(a+bx^4\right)^3 \, dx$

Optimal. Leaf size=43

$$\frac{a^3x^5}{5}+\frac{1}{3}a^2bx^9+\frac{3}{13}ab^2x^{13}+\frac{b^3x^{17}}{17}$$

```
[Out] (a^3*x^5)/5 + (a^2*b*x^9)/3 + (3*a*b^2*x^13)/13 + (b^3*x^17)/17
```

Rubi [A] time = 0.0420275, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{a^3x^5}{5}+\frac{1}{3}a^2bx^9+\frac{3}{13}ab^2x^{13}+\frac{b^3x^{17}}{17}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4*(a + b*x^4)^3,x]

[Out] (a^3*x^5)/5 + (a^2*b*x^9)/3 + (3*a*b^2*x^13)/13 + (b^3*x^17)/17
```

Rubi in Sympy [A] time = 7.0113, size = 37, normalized size = 0.86

$$\frac{a^3x^5}{5}+\frac{a^2bx^9}{3}+\frac{3ab^2x^{13}}{13}+\frac{b^3x^{17}}{17}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4*(b*x**4+a)**3,x)

[Out] a**3*x**5/5 + a**2*b*x**9/3 + 3*a*b**2*x**13/13 + b**3*x**17/17
```

Mathematica [A] time = 0.00315055, size = 43, normalized size = 1.

$$\frac{a^3x^5}{5}+\frac{1}{3}a^2bx^9+\frac{3}{13}ab^2x^{13}+\frac{b^3x^{17}}{17}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4*(a + b*x^4)^3,x]

[Out] (a^3*x^5)/5 + (a^2*b*x^9)/3 + (3*a*b^2*x^13)/13 + (b^3*x^17)/17
```

Maple [A] time = 0.001, size = 36, normalized size = 0.8

$$\frac{a^3x^5}{5}+\frac{a^2bx^9}{3}+\frac{3\,ab^2x^{13}}{13}+\frac{b^3x^{17}}{17}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4*(b*x^4+a)^3,x)

[Out] 1/5*a^3*x^5+1/3*a^2*b*x^9+3/13*a*b^2*x^13+1/17*b^3*x^17
```

Maxima [A] time = 1.42694, size = 47, normalized size = 1.09

$$\frac{1}{17}\,b^3x^{17} + \frac{3}{13}\,ab^2x^{13} + \frac{1}{3}\,a^2bx^9 + \frac{1}{5}\,a^3x^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3*x^4,x, algorithm="maxima")
```

```
[Out] 1/17*b^3*x^17 + 3/13*a*b^2*x^13 + 1/3*a^2*b*x^9 + 1/5*a^3*x^5
```

Fricas [A] time = 0.201435, size = 1, normalized size = 0.02

$$\frac{1}{17}x^{17}b^3 + \frac{3}{13}x^{13}b^2a + \frac{1}{3}x^9ba^2 + \frac{1}{5}x^5a^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3*x^4,x, algorithm="fricas")
```

```
[Out] 1/17*x^17*b^3 + 3/13*x^13*b^2*a + 1/3*x^9*b*a^2 + 1/5*x^5*a^3
```

Sympy [A] time = 0.098659, size = 37, normalized size = 0.86

$$\frac{a^3x^5}{5} + \frac{a^2bx^9}{3} + \frac{3ab^2x^{13}}{13} + \frac{b^3x^{17}}{17}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4*(b*x**4+a)**3,x)
```

```
[Out] a**3*x**5/5 + a**2*b*x**9/3 + 3*a*b**2*x**13/13 + b**3*x**17/17
```

GIAC/XCAS [A] time = 0.217194, size = 47, normalized size = 1.09

$$\frac{1}{17}\,b^3x^{17} + \frac{3}{13}\,ab^2x^{13} + \frac{1}{3}\,a^2bx^9 + \frac{1}{5}\,a^3x^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3*x^4,x, algorithm="giac")
```

```
[Out] 1/17*b^3*x^17 + 3/13*a*b^2*x^13 + 1/3*a^2*b*x^9 + 1/5*a^3*x^5
```

3.633 $\int x^3 \left(a + bx^4\right)^3 \, dx$

Optimal. Leaf size=16

$$\frac{\left(a + bx^4\right)^4}{16b}$$

```
[Out] (a + b*x^4)^4/(16*b)
```

Rubi [A] time = 0.0115565, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$\frac{\left(a + bx^4\right)^4}{16b}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(a + b*x^4)^3,x]

[Out] (a + b*x^4)^4/(16*b)
```

Rubi in Sympy [A] time = 2.13104, size = 10, normalized size = 0.62

$$\frac{\left(a + bx^4\right)^4}{16b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**3*(b*x**4+a)**3,x)

[Out] (a + b*x**4)**4/(16*b)
```

Mathematica [B] time = 0.0034043, size = 43, normalized size = 2.69

$$\frac{a^3x^4}{4} + \frac{3}{8}a^2bx^8 + \frac{1}{4}ab^2x^{12} + \frac{b^3x^{16}}{16}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(a + b*x^4)^3,x]

[Out] (a^3*x^4)/4 + (3*a^2*b*x^8)/8 + (a*b^2*x^12)/4 + (b^3*x^16)/16
```

Maple [B] time = 0.002, size = 36, normalized size = 2.3

$$\frac{b^3x^{16}}{16} + \frac{ab^2x^{12}}{4} + \frac{3\,a^2bx^8}{8} + \frac{a^3x^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(b*x^4+a)^3,x)

[Out] 1/16*b^3*x^16+1/4*a*b^2*x^12+3/8*a^2*b*x^8+1/4*a^3*x^4
```

Maxima [A] time = 1.4182, size = 19, normalized size = 1.19

$$\frac{\left(bx^4 + a\right)^4}{16\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3*x^3,x, algorithm="maxima")
```

```
[Out] 1/16*(b*x^4 + a)^4/b
```

Fricas [A] time = 0.20002, size = 1, normalized size = 0.06

$$\frac{1}{16}x^{16}b^3 + \frac{1}{4}x^{12}b^2a + \frac{3}{8}x^8ba^2 + \frac{1}{4}x^4a^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3*x^3,x, algorithm="fricas")
```

```
[Out] 1/16*x^16*b^3 + 1/4*x^12*b^2*a + 3/8*x^8*b*a^2 + 1/4*x^4*a^3
```

Sympy [A] time = 0.097599, size = 37, normalized size = 2.31

$$\frac{a^3x^4}{4} + \frac{3a^2bx^8}{8} + \frac{ab^2x^{12}}{4} + \frac{b^3x^{16}}{16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(b*x**4+a)**3,x)
```

```
[Out] a**3*x**4/4 + 3*a**2*b*x**8/8 + a*b**2*x**12/4 + b**3*x**16/16
```

GIAC/XCAS [A] time = 0.219991, size = 19, normalized size = 1.19

$$\frac{\left(bx^4 + a\right)^4}{16\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3*x^3,x, algorithm="giac")
```

```
[Out] 1/16*(b*x^4 + a)^4/b
```

3.634 $\int x^2 (a + bx^4)^3 \, dx$

Optimal. Leaf size=43

$$\frac{a^3x^3}{3} + \frac{3}{7}a^2bx^7 + \frac{3}{11}ab^2x^{11} + \frac{b^3x^{15}}{15}$$

```
[Out] (a^3*x^3)/3 + (3*a^2*b*x^7)/7 + (3*a*b^2*x^11)/11 + (b^3*x^15)/15
```

Rubi [A] time = 0.0416256, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$\frac{a^3x^3}{3} + \frac{3}{7}a^2bx^7 + \frac{3}{11}ab^2x^{11} + \frac{b^3x^{15}}{15}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(a + b*x^4)^3,x]
```

```
[Out] (a^3*x^3)/3 + (3*a^2*b*x^7)/7 + (3*a*b^2*x^11)/11 + (b^3*x^15)/15
```

Rubi in Sympy [A] time = 6.86267, size = 39, normalized size = 0.91

$$\frac{a^3x^3}{3} + \frac{3a^2bx^7}{7} + \frac{3ab^2x^{11}}{11} + \frac{b^3x^{15}}{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**2*(b*x**4+a)**3,x)
```

```
[Out] a**3*x**3/3 + 3*a**2*b*x**7/7 + 3*a*b**2*x**11/11 + b**3*x**15/15
```

Mathematica [A] time = 0.00304368, size = 43, normalized size = 1.

$$\frac{a^3x^3}{3} + \frac{3}{7}a^2bx^7 + \frac{3}{11}ab^2x^{11} + \frac{b^3x^{15}}{15}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(a + b*x^4)^3,x]
```

```
[Out] (a^3*x^3)/3 + (3*a^2*b*x^7)/7 + (3*a*b^2*x^11)/11 + (b^3*x^15)/15
```

Maple [A] time = 0.001, size = 36, normalized size = 0.8

$$\frac{a^3x^3}{3} + \frac{3\,a^2bx^7}{7} + \frac{3\,ab^2x^{11}}{11} + \frac{b^3x^{15}}{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(b*x^4+a)^3,x)
```

```
[Out] 1/3*a^3*x^3+3/7*a^2*b*x^7+3/11*a*b^2*x^11+1/15*b^3*x^15
```

Maxima [A] time = 1.43963, size = 47, normalized size = 1.09

$$\frac{1}{15}\,b^3x^{15} + \frac{3}{11}\,ab^2x^{11} + \frac{3}{7}\,a^2bx^7 + \frac{1}{3}\,a^3x^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3*x^2,x, algorithm="maxima")
```

```
[Out] 1/15*b^3*x^15 + 3/11*a*b^2*x^11 + 3/7*a^2*b*x^7 + 1/3*a^3*x^3
```

Fricas [A] time = 0.202276, size = 1, normalized size = 0.02

$$\frac{1}{15}x^{15}b^3 + \frac{3}{11}x^{11}b^2a + \frac{3}{7}x^7ba^2 + \frac{1}{3}x^3a^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3*x^2,x, algorithm="fricas")
```

```
[Out] 1/15*x^15*b^3 + 3/11*x^11*b^2*a + 3/7*x^7*b*a^2 + 1/3*x^3*a^3
```

Sympy [A] time = 0.10447, size = 39, normalized size = 0.91

$$\frac{a^3x^3}{3} + \frac{3a^2bx^7}{7} + \frac{3ab^2x^{11}}{11} + \frac{b^3x^{15}}{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(b*x**4+a)**3,x)
```

```
[Out] a**3*x**3/3 + 3*a**2*b*x**7/7 + 3*a*b**2*x**11/11 + b**3*x**15/15
```

GIAC/XCAS [A] time = 0.223095, size = 47, normalized size = 1.09

$$\frac{1}{15}\,b^3x^{15} + \frac{3}{11}\,ab^2x^{11} + \frac{3}{7}\,a^2bx^7 + \frac{1}{3}\,a^3x^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3*x^2,x, algorithm="giac")
```

```
[Out] 1/15*b^3*x^15 + 3/11*a*b^2*x^11 + 3/7*a^2*b*x^7 + 1/3*a^3*x^3
```

3.635 $\int x\left(a+bx^4\right)^3\,dx$

Optimal. Leaf size=43

$$\frac{a^3x^2}{2}+\frac{1}{2}a^2bx^6+\frac{3}{10}ab^2x^{10}+\frac{b^3x^{14}}{14}$$

```
[Out] (a^3*x^2)/2 + (a^2*b*x^6)/2 + (3*a*b^2*x^10)/10 + (b^3*x^14)/14
```

Rubi [A] time = 0.0397048, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{a^3x^2}{2}+\frac{1}{2}a^2bx^6+\frac{3}{10}ab^2x^{10}+\frac{b^3x^{14}}{14}$$

Antiderivative was successfully verified.

```
[In]  Int[x*(a + b*x^4)^3,x]

[Out] (a^3*x^2)/2 + (a^2*b*x^6)/2 + (3*a*b^2*x^10)/10 + (b^3*x^14)/14
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$a^3\int x\,dx+\frac{a^2bx^6}{2}+\frac{3ab^2x^{10}}{10}+\frac{b^3x^{14}}{14}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(b*x**4+a)**3,x)

[Out] a**3*Integral(x, x) + a**2*b*x**6/2 + 3*a*b**2*x**10/10 + b**3*x*
*14/14
```

Mathematica [A] time = 0.0026405, size = 43, normalized size = 1.

$$\frac{a^3x^2}{2}+\frac{1}{2}a^2bx^6+\frac{3}{10}ab^2x^{10}+\frac{b^3x^{14}}{14}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x*(a + b*x^4)^3,x]

[Out] (a^3*x^2)/2 + (a^2*b*x^6)/2 + (3*a*b^2*x^10)/10 + (b^3*x^14)/14
```

Maple [A] time = 0.002, size = 36, normalized size = 0.8

$$\frac{x^2a^3}{2}+\frac{a^2bx^6}{2}+\frac{3\,ab^2x^{10}}{10}+\frac{b^3x^{14}}{14}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(b*x^4+a)^3,x)

[Out] 1/2*x^2*a^3+1/2*a^2*b*x^6+3/10*a*b^2*x^10+1/14*b^3*x^14
```

Maxima [A] time = 1.43569, size = 47, normalized size = 1.09

$$\frac{1}{14}\,b^{3}x^{14} + \frac{3}{10}\,ab^{2}x^{10} + \frac{1}{2}\,a^{2}bx^{6} + \frac{1}{2}\,a^{3}x^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3*x,x, algorithm="maxima")
```

```
[Out] 1/14*b^3*x^14 + 3/10*a*b^2*x^10 + 1/2*a^2*b*x^6 + 1/2*a^3*x^2
```

Fricas [A] time = 0.201343, size = 1, normalized size = 0.02

$$\frac{1}{14}x^{14}b^{3} + \frac{3}{10}x^{10}b^{2}a + \frac{1}{2}x^{6}ba^{2} + \frac{1}{2}x^{2}a^{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3*x,x, algorithm="fricas")
```

```
[Out] 1/14*x^14*b^3 + 3/10*x^10*b^2*a + 1/2*x^6*b*a^2 + 1/2*x^2*a^3
```

Sympy [A] time = 0.094599, size = 37, normalized size = 0.86

$$\frac{a^{3}x^{2}}{2} + \frac{a^{2}bx^{6}}{2} + \frac{3ab^{2}x^{10}}{10} + \frac{b^{3}x^{14}}{14}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(b*x**4+a)**3,x)
```

```
[Out] a**3*x**2/2 + a**2*b*x**6/2 + 3*a*b**2*x**10/10 + b**3*x**14/14
```

GIAC/XCAS [A] time = 0.217169, size = 47, normalized size = 1.09

$$\frac{1}{14}\,b^{3}x^{14} + \frac{3}{10}\,ab^{2}x^{10} + \frac{1}{2}\,a^{2}bx^{6} + \frac{1}{2}\,a^{3}x^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3*x,x, algorithm="giac")
```

```
[Out] 1/14*b^3*x^14 + 3/10*a*b^2*x^10 + 1/2*a^2*b*x^6 + 1/2*a^3*x^2
```

3.636 $\int (a + bx^4)^3 \, dx$

Optimal. Leaf size=38

$$a^3x + \frac{3}{5}a^2bx^5 + \frac{1}{3}ab^2x^9 + \frac{b^3x^{13}}{13}$$

```
[Out] a^3*x + (3*a^2*b*x^5)/5 + (a*b^2*x^9)/3 + (b^3*x^13)/13
```

Rubi [A] time = 0.0276609, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111

$$a^3x + \frac{3}{5}a^2bx^5 + \frac{1}{3}ab^2x^9 + \frac{b^3x^{13}}{13}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^3,x]

[Out] a^3*x + (3*a^2*b*x^5)/5 + (a*b^2*x^9)/3 + (b^3*x^13)/13
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{3a^2bx^5}{5} + \frac{ab^2x^9}{3} + \frac{b^3x^{13}}{13} + \int a^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**3,x)

[Out] 3*a**2*b*x**5/5 + a*b**2*x**9/3 + b**3*x**13/13 + Integral(a**3,
x)
```

Mathematica [A] time = 0.0015676, size = 38, normalized size = 1.

$$a^3x + \frac{3}{5}a^2bx^5 + \frac{1}{3}ab^2x^9 + \frac{b^3x^{13}}{13}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^3,x]

[Out] a^3*x + (3*a^2*b*x^5)/5 + (a*b^2*x^9)/3 + (b^3*x^13)/13
```

Maple [A] time = 0.001, size = 33, normalized size = 0.9

$$a^3x + \frac{3\,a^2bx^5}{5} + \frac{ab^2x^9}{3} + \frac{b^3x^{13}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^3,x)

[Out] a^3*x+3/5*a^2*b*x^5+1/3*a*b^2*x^9+1/13*b^3*x^13
```

Maxima [A] time = 1.441, size = 43, normalized size = 1.13

$$\frac{1}{13}\,b^3x^{13}+\frac{1}{3}\,ab^2x^9+\frac{3}{5}\,a^2bx^5+a^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3,x, algorithm="maxima")
```

```
[Out] 1/13*b^3*x^13 + 1/3*a*b^2*x^9 + 3/5*a^2*b*x^5 + a^3*x
```

Fricas [A] time = 0.218377, size = 1, normalized size = 0.03

$$\frac{1}{13}x^{13}b^3+\frac{1}{3}x^9b^2a+\frac{3}{5}x^5ba^2+xa^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3,x, algorithm="fricas")
```

```
[Out] 1/13*x^13*b^3 + 1/3*x^9*b^2*a + 3/5*x^5*b*a^2 + x*a^3
```

Sympy [A] time = 0.091466, size = 34, normalized size = 0.89

$$a^3x+\frac{3a^2bx^5}{5}+\frac{ab^2x^9}{3}+\frac{b^3x^{13}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**3,x)
```

```
[Out] a**3*x + 3*a**2*b*x**5/5 + a*b**2*x**9/3 + b**3*x**13/13
```

GIAC/XCAS [A] time = 0.216401, size = 43, normalized size = 1.13

$$\frac{1}{13}\,b^3x^{13}+\frac{1}{3}\,ab^2x^9+\frac{3}{5}\,a^2bx^5+a^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3,x, algorithm="giac")
```

```
[Out] 1/13*b^3*x^13 + 1/3*a*b^2*x^9 + 3/5*a^2*b*x^5 + a^3*x
```

3.637 $\int \frac{(a+bx^4)^3}{x} dx$

Optimal. Leaf size=39

$$a^3 \log(x) + \frac{3}{4}a^2bx^4 + \frac{3}{8}ab^2x^8 + \frac{b^3x^{12}}{12}$$

```
[Out] (3*a^2*b*x^4)/4 + (3*a*b^2*x^8)/8 + (b^3*x^12)/12 + a^3*Log[x]
```

Rubi [A] time = 0.0468644, antiderivative size = 39, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$a^3 \log(x) + \frac{3}{4}a^2bx^4 + \frac{3}{8}ab^2x^8 + \frac{b^3x^{12}}{12}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^3/x,x]
```

```
[Out] (3*a^2*b*x^4)/4 + (3*a*b^2*x^8)/8 + (b^3*x^12)/12 + a^3*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^3 \log(x^4)}{4} + \frac{3a^2bx^4}{4} + \frac{3ab^2 \int^{x^4} x\, dx}{4} + \frac{b^3x^{12}}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**3/x,x)
```

```
[Out] a**3*log(x**4)/4 + 3*a**2*b*x**4/4 + 3*a*b**2*Integral(x, (x, x**
4))/4 + b**3*x**12/12
```

Mathematica [A] time = 0.00707066, size = 39, normalized size = 1.

$$a^3 \log(x) + \frac{3}{4}a^2bx^4 + \frac{3}{8}ab^2x^8 + \frac{b^3x^{12}}{12}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^3/x,x]
```

```
[Out] (3*a^2*b*x^4)/4 + (3*a*b^2*x^8)/8 + (b^3*x^12)/12 + a^3*Log[x]
```

Maple [A] time = 0.003, size = 34, normalized size = 0.9

$$\frac{3\,a^2bx^4}{4} + \frac{3\,ab^2x^8}{8} + \frac{b^3x^{12}}{12} + a^3\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^3/x,x)
```

```
[Out] 3/4*a^2*b*x^4+3/8*a*b^2*x^8+1/12*b^3*x^12+a^3*ln(x)
```

Maxima [A] time = 1.43534, size = 49, normalized size = 1.26

$$\frac{1}{12}\,b^3x^{12} + \frac{3}{8}\,ab^2x^8 + \frac{3}{4}\,a^2bx^4 + \frac{1}{4}\,a^3\log\left(x^4\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3/x,x, algorithm="maxima")

[Out] 1/12*b^3*x^12 + 3/8*a*b^2*x^8 + 3/4*a^2*b*x^4 + 1/4*a^3*log(x^4)
```

Fricas [A] time = 0.226609, size = 45, normalized size = 1.15

$$\frac{1}{12}\,b^3x^{12} + \frac{3}{8}\,ab^2x^8 + \frac{3}{4}\,a^2bx^4 + a^3\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3/x,x, algorithm="fricas")

[Out] 1/12*b^3*x^12 + 3/8*a*b^2*x^8 + 3/4*a^2*b*x^4 + a^3*log(x)
```

Sympy [A] time = 1.07238, size = 37, normalized size = 0.95

$$a^3\log\left(x\right) + \frac{3a^2bx^4}{4} + \frac{3ab^2x^8}{8} + \frac{b^3x^{12}}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**3/x,x)

[Out] a**3*log(x) + 3*a**2*b*x**4/4 + 3*a*b**2*x**8/8 + b**3*x**12/12
```

GIAC/XCAS [A] time = 0.228728, size = 49, normalized size = 1.26

$$\frac{1}{12}\,b^3x^{12} + \frac{3}{8}\,ab^2x^8 + \frac{3}{4}\,a^2bx^4 + \frac{1}{4}\,a^3\ln\left(x^4\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3/x,x, algorithm="giac")

[Out] 1/12*b^3*x^12 + 3/8*a*b^2*x^8 + 3/4*a^2*b*x^4 + 1/4*a^3*ln(x^4)
```

3.638 $\int \frac{(a+bx^4)^3}{x^2} dx$

Optimal. Leaf size=38

$$-\frac{a^3}{x} + a^2bx^3 + \frac{3}{7}ab^2x^7 + \frac{b^3x^{11}}{11}$$

```
[Out] -(a^3/x) + a^2*b*x^3 + (3*a*b^2*x^7)/7 + (b^3*x^11)/11
```

Rubi [A] time = 0.0359539, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a^3}{x} + a^2bx^3 + \frac{3}{7}ab^2x^7 + \frac{b^3x^{11}}{11}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^3/x^2,x]

[Out] -(a^3/x) + a^2*b*x^3 + (3*a*b^2*x^7)/7 + (b^3*x^11)/11
```

Rubi in Sympy [A] time = 6.7243, size = 32, normalized size = 0.84

$$-\frac{a^3}{x} + a^2bx^3 + \frac{3ab^2x^7}{7} + \frac{b^3x^{11}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**3/x**2,x)

[Out] -a**3/x + a**2*b*x**3 + 3*a*b**2*x**7/7 + b**3*x**11/11
```

Mathematica [A] time = 0.00699419, size = 38, normalized size = 1.

$$-\frac{a^3}{x} + a^2bx^3 + \frac{3}{7}ab^2x^7 + \frac{b^3x^{11}}{11}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^3/x^2,x]

[Out] -(a^3/x) + a^2*b*x^3 + (3*a*b^2*x^7)/7 + (b^3*x^11)/11
```

Maple [A] time = 0.005, size = 35, normalized size = 0.9

$$-\frac{a^3}{x} + a^2bx^3 + \frac{3\,ab^2x^7}{7} + \frac{b^3x^{11}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^3/x^2,x)

[Out] -a^3/x+a^2*b*x^3+3/7*a*b^2*x^7+1/11*b^3*x^11
```

Maxima [A] time = 1.43845, size = 46, normalized size = 1.21

$$\frac{1}{11}\,b^3x^{11} + \frac{3}{7}\,ab^2x^7 + a^2bx^3 - \frac{a^3}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3/x^2,x, algorithm="maxima")
```

```
[Out] 1/11*b^3*x^11 + 3/7*a*b^2*x^7 + a^2*b*x^3 - a^3/x
```

Fricas [A] time = 0.219918, size = 50, normalized size = 1.32

$$\frac{7\,b^3x^{12} + 33\,ab^2x^8 + 77\,a^2bx^4 - 77\,a^3}{77\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3/x^2,x, algorithm="fricas")
```

```
[Out] 1/77*(7*b^3*x^12 + 33*a*b^2*x^8 + 77*a^2*b*x^4 - 77*a^3)/x
```

Sympy [A] time = 1.03662, size = 32, normalized size = 0.84

$$-\frac{a^3}{x} + a^2bx^3 + \frac{3ab^2x^7}{7} + \frac{b^3x^{11}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**3/x**2,x)
```

```
[Out] -a**3/x + a**2*b*x**3 + 3*a*b**2*x**7/7 + b**3*x**11/11
```

GIAC/XCAS [A] time = 0.233754, size = 46, normalized size = 1.21

$$\frac{1}{11}\,b^3x^{11} + \frac{3}{7}\,ab^2x^7 + a^2bx^3 - \frac{a^3}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3/x^2,x, algorithm="giac")
```

```
[Out] 1/11*b^3*x^11 + 3/7*a*b^2*x^7 + a^2*b*x^3 - a^3/x
```

3.639 $\int \frac{(a+bx^4)^3}{x^3} dx$

Optimal. Leaf size=43

$$-\frac{a^3}{2x^2}+\frac{3}{2}a^2bx^2+\frac{1}{2}ab^2x^6+\frac{b^3x^{10}}{10}$$

```
[Out] -a^3/(2*x^2) + (3*a^2*b*x^2)/2 + (a*b^2*x^6)/2 + (b^3*x^10)/10
```

Rubi [A] time = 0.037318, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a^3}{2x^2}+\frac{3}{2}a^2bx^2+\frac{1}{2}ab^2x^6+\frac{b^3x^{10}}{10}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^4)^3/x^3,x]

[Out] -a^3/(2*x^2) + (3*a^2*b*x^2)/2 + (a*b^2*x^6)/2 + (b^3*x^10)/10
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^3}{2x^2}+3a^2b\int x\,dx+\frac{ab^2x^6}{2}+\frac{b^3x^{10}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**4+a)**3/x**3,x)

[Out] -a**3/(2*x**2) + 3*a**2*b*Integral(x, x) + a*b**2*x**6/2 + b**3*x
**10/10
```

Mathematica [A] time = 0.01141, size = 43, normalized size = 1.

$$-\frac{a^3}{2x^2}+\frac{3}{2}a^2bx^2+\frac{1}{2}ab^2x^6+\frac{b^3x^{10}}{10}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^4)^3/x^3,x]

[Out] -a^3/(2*x^2) + (3*a^2*b*x^2)/2 + (a*b^2*x^6)/2 + (b^3*x^10)/10
```

Maple [A] time = 0.004, size = 36, normalized size = 0.8

$$-\frac{a^3}{2\,x^2}+\frac{3\,a^2bx^2}{2}+\frac{ab^2x^6}{2}+\frac{b^3x^{10}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x^4+a)^3/x^3,x)
```

```
[Out] -1/2*a^3/x^2+3/2*a^2*b*x^2+1/2*a*b^2*x^6+1/10*b^3*x^10
```

Maxima [A] time = 1.44137, size = 47, normalized size = 1.09

$$\frac{1}{10}\,b^3x^{10}+\frac{1}{2}\,ab^2x^6+\frac{3}{2}\,a^2bx^2-\frac{a^3}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3/x^3,x, algorithm="maxima")
```

```
[Out] 1/10*b^3*x^10 + 1/2*a*b^2*x^6 + 3/2*a^2*b*x^2 - 1/2*a^3/x^2
```

Fricas [A] time = 0.216383, size = 49, normalized size = 1.14

$$\frac{b^3x^{12}+5\,ab^2x^8+15\,a^2bx^4-5\,a^3}{10\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3/x^3,x, algorithm="fricas")
```

```
[Out] 1/10*(b^3*x^12 + 5*a*b^2*x^8 + 15*a^2*b*x^4 - 5*a^3)/x^2
```

Sympy [A] time = 1.07261, size = 37, normalized size = 0.86

$$-\frac{a^3}{2x^2}+\frac{3a^2bx^2}{2}+\frac{ab^2x^6}{2}+\frac{b^3x^{10}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**3/x**3,x)
```

```
[Out] -a**3/(2*x**2) + 3*a**2*b*x**2/2 + a*b**2*x**6/2 + b**3*x**10/10
```

GIAC/XCAS [A] time = 0.21524, size = 47, normalized size = 1.09

$$\frac{1}{10}\,b^3x^{10}+\frac{1}{2}\,ab^2x^6+\frac{3}{2}\,a^2bx^2-\frac{a^3}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3/x^3,x, algorithm="giac")
```

```
[Out] 1/10*b^3*x^10 + 1/2*a*b^2*x^6 + 3/2*a^2*b*x^2 - 1/2*a^3/x^2
```

3.640 $\int \frac{(a+bx^4)^3}{x^4} dx$

Optimal. Leaf size=39

$$-\frac{a^3}{3x^3} + 3a^2bx + \frac{3}{5}ab^2x^5 + \frac{b^3x^9}{9}$$

```
[Out] -a^3/(3*x^3) + 3*a^2*b*x + (3*a*b^2*x^5)/5 + (b^3*x^9)/9
```

Rubi [A] time = 0.0363632, antiderivative size = 39, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$-\frac{a^3}{3x^3} + 3a^2bx + \frac{3}{5}ab^2x^5 + \frac{b^3x^9}{9}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^4)^3/x^4,x]

[Out] -a^3/(3*x^3) + 3*a^2*b*x + (3*a*b^2*x^5)/5 + (b^3*x^9)/9
```

Rubi in Sympy [A] time = 6.51733, size = 36, normalized size = 0.92

$$-\frac{a^3}{3x^3} + 3a^2bx + \frac{3ab^2x^5}{5} + \frac{b^3x^9}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**4+a)**3/x**4,x)

[Out] -a**3/(3*x**3) + 3*a**2*b*x + 3*a*b**2*x**5/5 + b**3*x**9/9
```

Mathematica [A] time = 0.00672156, size = 39, normalized size = 1.

$$-\frac{a^3}{3x^3} + 3a^2bx + \frac{3}{5}ab^2x^5 + \frac{b^3x^9}{9}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^4)^3/x^4,x]

[Out] -a^3/(3*x^3) + 3*a^2*b*x + (3*a*b^2*x^5)/5 + (b^3*x^9)/9
```

Maple [A] time = 0.006, size = 34, normalized size = 0.9

$$-\frac{a^3}{3\,x^3} + 3\,a^2bx + \frac{3\,ab^2x^5}{5} + \frac{b^3x^9}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x^4+a)^3/x^4,x)

[Out] -1/3*a^3/x^3+3*a^2*b*x+3/5*a*b^2*x^5+1/9*b^3*x^9
```

Maxima [A] time = 1.4398, size = 45, normalized size = 1.15

$$\frac{1}{9}\,b^{3}x^{9}+\frac{3}{5}\,ab^{2}x^{5}+3\,a^{2}bx-\frac{a^{3}}{3\,x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3/x^4,x, algorithm="maxima")
```

```
[Out] 1/9*b^3*x^9 + 3/5*a*b^2*x^5 + 3*a^2*b*x - 1/3*a^3/x^3
```

Fricas [A] time = 0.215726, size = 50, normalized size = 1.28

$$\frac{5\,b^{3}x^{12}+27\,ab^{2}x^{8}+135\,a^{2}bx^{4}-15\,a^{3}}{45\,x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3/x^4,x, algorithm="fricas")
```

```
[Out] 1/45*(5*b^3*x^12 + 27*a*b^2*x^8 + 135*a^2*b*x^4 - 15*a^3)/x^3
```

Sympy [A] time = 1.08477, size = 36, normalized size = 0.92

$$-\frac{a^{3}}{3x^{3}}+3a^{2}bx+\frac{3ab^{2}x^{5}}{5}+\frac{b^{3}x^{9}}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**3/x**4,x)
```

```
[Out] -a**3/(3*x**3) + 3*a**2*b*x + 3*a*b**2*x**5/5 + b**3*x**9/9
```

GIAC/XCAS [A] time = 0.216426, size = 45, normalized size = 1.15

$$\frac{1}{9}\,b^{3}x^{9}+\frac{3}{5}\,ab^{2}x^{5}+3\,a^{2}bx-\frac{a^{3}}{3\,x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3/x^4,x, algorithm="giac")
```

```
[Out] 1/9*b^3*x^9 + 3/5*a*b^2*x^5 + 3*a^2*b*x - 1/3*a^3/x^3
```

3.641 $\int \frac{(a+bx^4)^3}{x^5}\,dx$

Optimal. Leaf size=40

$$-\frac{a^3}{4x^4}+3a^2b\log(x)+\frac{3}{4}ab^2x^4+\frac{b^3x^8}{8}$$

```
[Out] -a^3/(4*x^4) + (3*a*b^2*x^4)/4 + (b^3*x^8)/8 + 3*a^2*b*Log[x]
```

Rubi [A] time = 0.0533335, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^3}{4x^4}+3a^2b\log(x)+\frac{3}{4}ab^2x^4+\frac{b^3x^8}{8}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^4)^3/x^5,x]
```

```
[Out] -a^3/(4*x^4) + (3*a*b^2*x^4)/4 + (b^3*x^8)/8 + 3*a^2*b*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^3}{4x^4}+\frac{3a^2b\log\left(x^4\right)}{4}+\frac{3ab^2x^4}{4}+\frac{b^3\int^{x^4}x\,dx}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**4+a)**3/x**5,x)
```

```
[Out] -a**3/(4*x**4) + 3*a**2*b*log(x**4)/4 + 3*a*b**2*x**4/4 + b**3*In
tegral(x, (x, x**4))/4
```

Mathematica [A] time = 0.00794614, size = 40, normalized size = 1.

$$-\frac{a^3}{4x^4}+3a^2b\log(x)+\frac{3}{4}ab^2x^4+\frac{b^3x^8}{8}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^4)^3/x^5,x]
```

```
[Out] -a^3/(4*x^4) + (3*a*b^2*x^4)/4 + (b^3*x^8)/8 + 3*a^2*b*Log[x]
```

Maple [A] time = 0.007, size = 35, normalized size = 0.9

$$-\frac{a^3}{4\,x^4}+\frac{3\,ab^2x^4}{4}+\frac{b^3x^8}{8}+3\,a^2b\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x^4+a)^3/x^5,x)
```

```
[Out] -1/4*a^3/x^4+3/4*a*b^2*x^4+1/8*b^3*x^8+3*a^2*b*ln(x)
```

Maxima [A] time = 1.43044, size = 49, normalized size = 1.22

$$\frac{1}{8}\,b^3x^8+\frac{3}{4}\,ab^2x^4+\frac{3}{4}\,a^2b\log\left(x^4\right)-\frac{a^3}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3/x^5,x, algorithm="maxima")
```

```
[Out] 1/8*b^3*x^8 + 3/4*a*b^2*x^4 + 3/4*a^2*b*log(x^4) - 1/4*a^3/x^4
```

Fricas [A] time = 0.223746, size = 51, normalized size = 1.27

$$\frac{b^3x^{12}+6\,ab^2x^8+24\,a^2bx^4\log\left(x\right)-2\,a^3}{8\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3/x^5,x, algorithm="fricas")
```

```
[Out] 1/8*(b^3*x^12 + 6*a*b^2*x^8 + 24*a^2*b*x^4*log(x) - 2*a^3)/x^4
```

Sympy [A] time = 1.25327, size = 37, normalized size = 0.92

$$-\frac{a^3}{4x^4}+3a^2b\log\left(x\right)+\frac{3ab^2x^4}{4}+\frac{b^3x^8}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**3/x**5,x)
```

```
[Out] -a**3/(4*x**4) + 3*a**2*b*log(x) + 3*a*b**2*x**4/4 + b**3*x**8/8
```

GIAC/XCAS [A] time = 0.218691, size = 62, normalized size = 1.55

$$\frac{1}{8}\,b^3x^8+\frac{3}{4}\,ab^2x^4+\frac{3}{4}\,a^2b\ln\left(x^4\right)-\frac{3\,a^2bx^4+a^3}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^3/x^5,x, algorithm="giac")
```

```
[Out] 1/8*b^3*x^8 + 3/4*a*b^2*x^4 + 3/4*a^2*b*ln(x^4) - 1/4*(3*a^2*b*x^
4 + a^3)/x^4
```

3.642 $\int \frac{x^9}{a+cx^4}\,dx$

Optimal. Leaf size=51

$$\frac{a^{3/2}\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{2c^{5/2}}-\frac{ax^2}{2c^2}+\frac{x^6}{6c}$$

```
[Out] -(a*x^2)/(2*c^2) + x^6/(6*c) + (a^(3/2)*ArcTan[(Sqrt[c]*x^2)/Sqrt
[a]])/(2*c^(5/2))
```

Rubi [A] time = 0.0767684, antiderivative size = 51, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{a^{3/2}\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{2c^{5/2}}-\frac{ax^2}{2c^2}+\frac{x^6}{6c}$$

Antiderivative was successfully verified.

```
[In]  Int[x^9/(a + c*x^4),x]
```

```
[Out] -(a*x^2)/(2*c^2) + x^6/(6*c) + (a^(3/2)*ArcTan[(Sqrt[c]*x^2)/Sqrt
[a]])/(2*c^(5/2))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^{\frac{3}{2}}\operatorname{atan}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{2c^{\frac{5}{2}}}+\frac{x^6}{6c}-\frac{\int^{x^2} a\,dx}{2c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**9/(c*x**4+a),x)
```

```
[Out] a**(3/2)*atan(sqrt(c)*x**2/sqrt(a))/(2*c**(5/2)) + x**6/(6*c) - I
ntegral(a, (x, x**2))/(2*c**2)
```

Mathematica [A] time = 0.0559989, size = 48, normalized size = 0.94

$$\frac{1}{6}\left(\frac{3a^{3/2}\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{c^{5/2}}+\frac{cx^6-3ax^2}{c^2}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^9/(a + c*x^4),x]
```

```
[Out] ((-3*a*x^2 + c*x^6)/c^2 + (3*a^(3/2)*ArcTan[(Sqrt[c]*x^2)/Sqrt[a]
])/c^(5/2))/6
```

Maple [A] time = 0.008, size = 43, normalized size = 0.8

$$\frac{x^6}{6\,c}-\frac{ax^2}{2\,c^2}+\frac{a^2}{2\,c^2}\arctan\left(cx^2\frac{1}{\sqrt{ac}}\right)\frac{1}{\sqrt{ac}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^9/(c*x^4+a),x)
```

```
[Out] 1/6*x^6/c-1/2*a*x^2/c^2+1/2*a^2/c^2/(a*c)^(1/2)*arctan(c*x^2/(a*c
)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(c*x^4 + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.237071, size = 1, normalized size = 0.02

$$\left[\frac{2\,cx^{6}-6\,ax^{2}+3\,a\sqrt{-\frac{a}{c}}\log\left(\frac{cx^{4}+2\,cx^{2}\sqrt{-\frac{a}{c}}-a}{cx^{4}+a}\right)}{12\,c^{2}},\ \frac{cx^{6}-3\,ax^{2}+3\,a\sqrt{\frac{a}{c}}\arctan\left(\frac{x^{2}}{\sqrt{\frac{a}{c}}}\right)}{6\,c^{2}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(c*x^4 + a),x, algorithm="fricas")
```

```
[Out] [1/12*(2*c*x^6 - 6*a*x^2 + 3*a*sqrt(-a/c)*log((c*x^4 + 2*c*x^2*sq
rt(-a/c) - a)/(c*x^4 + a)))/c^2, 1/6*(c*x^6 - 3*a*x^2 + 3*a*sqrt(
a/c)*arctan(x^2/sqrt(a/c)))/c^2]
```

Sympy [A] time = 1.39009, size = 87, normalized size = 1.71

$$-\frac{ax^{2}}{2c^{2}}-\frac{\sqrt{-\frac{a^{3}}{c^{5}}}\log\left(x^{2}-\frac{c^{2}\sqrt{-\frac{a^{3}}{c^{5}}}}{a}\right)}{4}+\frac{\sqrt{-\frac{a^{3}}{c^{5}}}\log\left(x^{2}+\frac{c^{2}\sqrt{-\frac{a^{3}}{c^{5}}}}{a}\right)}{4}+\frac{x^{6}}{6c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**9/(c*x**4+a),x)
```

```
[Out] -a*x**2/(2*c**2) - sqrt(-a**3/c**5)*log(x**2 - c**2*sqrt(-a**3/c*
*5)/a)/4 + sqrt(-a**3/c**5)*log(x**2 + c**2*sqrt(-a**3/c**5)/a)/4
 + x**6/(6*c)
```

GIAC/XCAS [A] time = 0.223756, size = 61, normalized size = 1.2

$$\frac{a^{2}\arctan\left(\frac{cx^{2}}{\sqrt{ac}}\right)}{2\,\sqrt{ac}c^{2}}+\frac{c^{2}x^{6}-3\,acx^{2}}{6\,c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(c*x^4 + a),x, algorithm="giac")
```

```
[Out] 1/2*a^2*arctan(c*x^2/sqrt(a*c))/(sqrt(a*c)*c^2) + 1/6*(c^2*x^6 -
3*a*c*x^2)/c^3
```

3.643 $\int \frac{x^7}{a+cx^4}\,dx$

Optimal. Leaf size=27

$$\frac{x^4}{4c}-\frac{a\log\left(a+cx^4\right)}{4c^2}$$

```
[Out] x^4/(4*c) - (a*Log[a + c*x^4])/(4*c^2)
```

Rubi [A] time = 0.0465332, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{x^4}{4c}-\frac{a\log\left(a+cx^4\right)}{4c^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7/(a + c*x^4),x]

[Out] x^4/(4*c) - (a*Log[a + c*x^4])/(4*c^2)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a\log\left(a+cx^4\right)}{4c^2}+\frac{\int^{x^4}\frac{1}{c}\,dx}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7/(c*x**4+a),x)

[Out] -a*log(a + c*x**4)/(4*c**2) + Integral(1/c, (x, x**4))/4
```

Mathematica [A] time = 0.0104449, size = 27, normalized size = 1.

$$\frac{x^4}{4c}-\frac{a\log\left(a+cx^4\right)}{4c^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^7/(a + c*x^4),x]

[Out] x^4/(4*c) - (a*Log[a + c*x^4])/(4*c^2)
```

Maple [A] time = 0.004, size = 24, normalized size = 0.9

$$\frac{x^4}{4\,c}-\frac{a\ln\left(cx^4+a\right)}{4\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7/(c*x^4+a),x)

[Out] 1/4*x^4/c-1/4*a*ln(c*x^4+a)/c^2
```

Maxima [A] time = 1.43794, size = 31, normalized size = 1.15

$$\frac{x^4}{4\,c} - \frac{a\log\left(cx^4 + a\right)}{4\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(c*x^4 + a),x, algorithm="maxima")
```

```
[Out] 1/4*x^4/c - 1/4*a*log(c*x^4 + a)/c^2
```

Fricas [A] time = 0.22011, size = 30, normalized size = 1.11

$$\frac{cx^4 - a\log\left(cx^4 + a\right)}{4\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(c*x^4 + a),x, algorithm="fricas")
```

```
[Out] 1/4*(c*x^4 - a*log(c*x^4 + a))/c^2
```

Sympy [A] time = 1.33632, size = 20, normalized size = 0.74

$$-\frac{a\log\left(a + cx^4\right)}{4c^2} + \frac{x^4}{4c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(c*x**4+a),x)
```

```
[Out] -a*log(a + c*x**4)/(4*c**2) + x**4/(4*c)
```

GIAC/XCAS [A] time = 0.221271, size = 32, normalized size = 1.19

$$\frac{x^4}{4\,c} - \frac{a\ln\left(\left|cx^4 + a\right|\right)}{4\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(c*x^4 + a),x, algorithm="giac")
```

```
[Out] 1/4*x^4/c - 1/4*a*ln(abs(c*x^4 + a))/c^2
```

3.644 $\int \frac{x^5}{a+cx^4} dx$

Optimal. Leaf size=40

$$\frac{x^2}{2c} - \frac{\sqrt{a}\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{2c^{3/2}}$$

```
[Out] x^2/(2*c) - (Sqrt[a]*ArcTan[(Sqrt[c]*x^2)/Sqrt[a]])/(2*c^(3/2))
```

Rubi [A] time = 0.0548419, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$

$$\frac{x^2}{2c} - \frac{\sqrt{a}\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{2c^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/(a + c*x^4),x]
```

```
[Out] x^2/(2*c) - (Sqrt[a]*ArcTan[(Sqrt[c]*x^2)/Sqrt[a]])/(2*c^(3/2))
```

Rubi in Sympy [A] time = 9.08327, size = 32, normalized size = 0.8

$$-\frac{\sqrt{a}\,\mathrm{atan}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{2c^{\frac{3}{2}}} + \frac{x^2}{2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(c*x**4+a),x)
```

```
[Out] -sqrt(a)*atan(sqrt(c)*x**2/sqrt(a))/(2*c**(3/2)) + x**2/(2*c)
```

Mathematica [A] time = 0.0216222, size = 40, normalized size = 1.

$$\frac{x^2}{2c} - \frac{\sqrt{a}\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{2c^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/(a + c*x^4),x]
```

```
[Out] x^2/(2*c) - (Sqrt[a]*ArcTan[(Sqrt[c]*x^2)/Sqrt[a]])/(2*c^(3/2))
```

Maple [A] time = 0.004, size = 32, normalized size = 0.8

$$\frac{x^2}{2\,c} - \frac{a}{2\,c}\arctan\left(cx^2\frac{1}{\sqrt{ac}}\right)\frac{1}{\sqrt{ac}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(c*x^4+a),x)
```

```
[Out] 1/2*x^2/c-1/2*a/c/(a*c)^(1/2)*arctan(c*x^2/(a*c)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(c*x^4 + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.231979, size = 1, normalized size = 0.02

$$\left[\frac{2\,x^2+\sqrt{-\frac{a}{c}}\log\left(\frac{cx^4-2\,cx^2\sqrt{-\frac{a}{c}}-a}{cx^4+a}\right)}{4\,c}, \frac{x^2-\sqrt{\frac{a}{c}}\arctan\left(\frac{x^2}{\sqrt{\frac{a}{c}}}\right)}{2\,c}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(c*x^4 + a),x, algorithm="fricas")
```

```
[Out] [1/4*(2*x^2 + sqrt(-a/c)*log((c*x^4 - 2*c*x^2*sqrt(-a/c) - a)/(c*
x^4 + a)))/c, 1/2*(x^2 - sqrt(a/c)*arctan(x^2/sqrt(a/c)))/c]
```

Sympy [A] time = 1.35723, size = 63, normalized size = 1.58

$$\frac{\sqrt{-\frac{a}{c^3}}\log\left(-c\sqrt{-\frac{a}{c^3}}+x^2\right)}{4}-\frac{\sqrt{-\frac{a}{c^3}}\log\left(c\sqrt{-\frac{a}{c^3}}+x^2\right)}{4}+\frac{x^2}{2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(c*x**4+a),x)
```

```
[Out] sqrt(-a/c**3)*log(-c*sqrt(-a/c**3) + x**2)/4 - sqrt(-a/c**3)*log(
c*sqrt(-a/c**3) + x**2)/4 + x**2/(2*c)
```

GIAC/XCAS [A] time = 0.221138, size = 42, normalized size = 1.05

$$\frac{x^2}{2\,c}-\frac{a\arctan\left(\frac{cx^2}{\sqrt{ac}}\right)}{2\,\sqrt{ac}c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(c*x^4 + a),x, algorithm="giac")
```

```
[Out] 1/2*x^2/c - 1/2*a*arctan(c*x^2/sqrt(a*c))/(sqrt(a*c)*c)
```

3.645 $\int \frac{x^3}{a+cx^4} dx$

Optimal. Leaf size=15

$$\frac{\log(a+cx^4)}{4c}$$

```
[Out] Log[a + c*x^4]/(4*c)
```

Rubi [A] time = 0.00909488, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{\log(a+cx^4)}{4c}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(a + c*x^4),x]

[Out] Log[a + c*x^4]/(4*c)
```

Rubi in Sympy [A] time = 2.16837, size = 10, normalized size = 0.67

$$\frac{\log(a+cx^4)}{4c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(c*x**4+a),x)

[Out] log(a + c*x**4)/(4*c)
```

Mathematica [A] time = 0.00617343, size = 15, normalized size = 1.

$$\frac{\log(a+cx^4)}{4c}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(a + c*x^4),x]

[Out] Log[a + c*x^4]/(4*c)
```

Maple [A] time = 0.002, size = 14, normalized size = 0.9

$$\frac{\ln(cx^4+a)}{4\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(c*x^4+a),x)

[Out] 1/4*ln(c*x^4+a)/c
```

Maxima [A] time = 1.44464, size = 18, normalized size = 1.2

$$\frac{\log\left(cx^4 + a\right)}{4\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(c*x^4 + a),x, algorithm="maxima")
```

```
[Out] 1/4*log(c*x^4 + a)/c
```

Fricas [A] time = 0.219767, size = 18, normalized size = 1.2

$$\frac{\log\left(cx^4 + a\right)}{4\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(c*x^4 + a),x, algorithm="fricas")
```

```
[Out] 1/4*log(c*x^4 + a)/c
```

Sympy [A] time = 0.363051, size = 10, normalized size = 0.67

$$\frac{\log\left(a + cx^4\right)}{4c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(c*x**4+a),x)
```

```
[Out] log(a + c*x**4)/(4*c)
```

GIAC/XCAS [A] time = 0.221671, size = 19, normalized size = 1.27

$$\frac{\ln\left(\left|cx^4 + a\right|\right)}{4\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(c*x^4 + a),x, algorithm="giac")
```

```
[Out] 1/4*ln(abs(c*x^4 + a))/c
```

3.646 $\int \frac{x}{a+cx^4} \, dx$

Optimal. Leaf size=29

$$\frac{\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{2\sqrt{a}\sqrt{c}}$$

```
[Out] ArcTan[(Sqrt[c]*x^2)/Sqrt[a]]/(2*Sqrt[a]*Sqrt[c])
```

Rubi [A] time = 0.03091, antiderivative size = 29, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$

$$\frac{\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{2\sqrt{a}\sqrt{c}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + c*x^4),x]
```

```
[Out] ArcTan[(Sqrt[c]*x^2)/Sqrt[a]]/(2*Sqrt[a]*Sqrt[c])
```

Rubi in Sympy [A] time = 4.70512, size = 26, normalized size = 0.9

$$\frac{\operatorname{atan}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{2\sqrt{a}\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(c*x**4+a),x)
```

```
[Out] atan(sqrt(c)*x**2/sqrt(a))/(2*sqrt(a)*sqrt(c))
```

Mathematica [A] time = 0.00939374, size = 29, normalized size = 1.

$$\frac{\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{2\sqrt{a}\sqrt{c}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + c*x^4),x]
```

```
[Out] ArcTan[(Sqrt[c]*x^2)/Sqrt[a]]/(2*Sqrt[a]*Sqrt[c])
```

Maple [A] time = 0.002, size = 19, normalized size = 0.7

$$\frac{1}{2}\arctan\left(cx^2\frac{1}{\sqrt{ac}}\right)\frac{1}{\sqrt{ac}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(c*x^4+a),x)
```

```
[Out] 1/2/(a*c)^(1/2)*arctan(c*x^2/(a*c)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(c*x^4 + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.241088, size = 1, normalized size = 0.03

$$\left[\frac{\log\left(\frac{2\,acx^2+\left(cx^4-a\right)\sqrt{-ac}}{cx^4+a}\right)}{4\,\sqrt{-ac}}, -\frac{\arctan\left(\frac{a}{\sqrt{ac}x^2}\right)}{2\,\sqrt{ac}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(c*x^4 + a),x, algorithm="fricas")
```

```
[Out] [1/4*log((2*a*c*x^2 + (c*x^4 - a)*sqrt(-a*c))/(c*x^4 + a))/sqrt(-
a*c), -1/2*arctan(a/(sqrt(a*c)*x^2))/sqrt(a*c)]
```

Sympy [A] time = 0.406543, size = 56, normalized size = 1.93

$$-\frac{\sqrt{-\frac{1}{ac}}\log\left(-a\sqrt{-\frac{1}{ac}}+x^2\right)}{4}+\frac{\sqrt{-\frac{1}{ac}}\log\left(a\sqrt{-\frac{1}{ac}}+x^2\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(c*x**4+a),x)
```

```
[Out] -sqrt(-1/(a*c))*log(-a*sqrt(-1/(a*c)) + x**2)/4 + sqrt(-1/(a*c))*
log(a*sqrt(-1/(a*c)) + x**2)/4
```

GIAC/XCAS [A] time = 0.223509, size = 24, normalized size = 0.83

$$\frac{\arctan\left(\frac{cx^2}{\sqrt{ac}}\right)}{2\,\sqrt{ac}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(c*x^4 + a),x, algorithm="giac")
```

```
[Out] 1/2*arctan(c*x^2/sqrt(a*c))/sqrt(a*c)
```

3.647 $\int \frac{1}{x(a+cx^4)} dx$

Optimal. Leaf size=22

$$\frac{\log(x)}{a} - \frac{\log(a+cx^4)}{4a}$$

```
[Out] Log[x]/a - Log[a + c*x^4]/(4*a)
```

Rubi [A] time = 0.0331179, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$

$$\frac{\log(x)}{a} - \frac{\log(a+cx^4)}{4a}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a + c*x^4)),x]

[Out] Log[x]/a - Log[a + c*x^4]/(4*a)
```

Rubi in Sympy [A] time = 5.44952, size = 19, normalized size = 0.86

$$\frac{\log(x^4)}{4a} - \frac{\log(a+cx^4)}{4a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(c*x**4+a),x)

[Out] log(x**4)/(4*a) - log(a + c*x**4)/(4*a)
```

Mathematica [A] time = 0.0107981, size = 22, normalized size = 1.

$$\frac{\log(x)}{a} - \frac{\log(a+cx^4)}{4a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a + c*x^4)),x]

[Out] Log[x]/a - Log[a + c*x^4]/(4*a)
```

Maple [A] time = 0.007, size = 21, normalized size = 1.

$$\frac{\ln(x)}{a} - \frac{\ln(cx^4+a)}{4a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(c*x^4+a),x)

[Out] ln(x)/a-1/4*ln(c*x^4+a)/a
```

Maxima [A] time = 1.43191, size = 31, normalized size = 1.41

$$-\frac{\log\left(cx^4+a\right)}{4\,a}+\frac{\log\left(x^4\right)}{4\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)*x),x, algorithm="maxima")
```

```
[Out] -1/4*log(c*x^4 + a)/a + 1/4*log(x^4)/a
```

Fricas [A] time = 0.226576, size = 24, normalized size = 1.09

$$-\frac{\log\left(cx^4+a\right)-4\,\log\left(x\right)}{4\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)*x),x, algorithm="fricas")
```

```
[Out] -1/4*(log(c*x^4 + a) - 4*log(x))/a
```

Sympy [A] time = 0.665316, size = 15, normalized size = 0.68

$$\frac{\log\left(x\right)}{a}-\frac{\log\left(\frac{a}{c}+x^4\right)}{4a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(c*x**4+a),x)
```

```
[Out] log(x)/a - log(a/c + x**4)/(4*a)
```

GIAC/XCAS [A] time = 0.222681, size = 32, normalized size = 1.45

$$\frac{\ln\left(x^4\right)}{4\,a}-\frac{\ln\left(\left|cx^4+a\right|\right)}{4\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)*x),x, algorithm="giac")
```

```
[Out] 1/4*ln(x^4)/a - 1/4*ln(abs(c*x^4 + a))/a
```

3.648 $\int \frac{1}{x^3(a+cx^4)}\,dx$

Optimal. Leaf size=40

$$-\frac{\sqrt{c}\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{2a^{3/2}}-\frac{1}{2ax^2}$$

```
[Out] -1/(2*a*x^2) - (Sqrt[c]*ArcTan[(Sqrt[c]*x^2)/Sqrt[a]])/(2*a^(3/2)
)
```

Rubi [A] time = 0.0499701, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{\sqrt{c}\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{2a^{3/2}}-\frac{1}{2ax^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(a + c*x^4)),x]
```

```
[Out] -1/(2*a*x^2) - (Sqrt[c]*ArcTan[(Sqrt[c]*x^2)/Sqrt[a]])/(2*a^(3/2)
)
```

Rubi in Sympy [A] time = 8.76636, size = 36, normalized size = 0.9

$$-\frac{1}{2ax^2}-\frac{\sqrt{c}\,\mathrm{atan}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{2a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(c*x**4+a),x)
```

```
[Out] -1/(2*a*x**2) - sqrt(c)*atan(sqrt(c)*x**2/sqrt(a))/(2*a**(3/2))
```

Mathematica [A] time = 0.0602915, size = 79, normalized size = 1.98

$$\frac{\sqrt{c}x^2\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)+\sqrt{c}x^2\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)-\sqrt{a}}{2a^{3/2}x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*(a + c*x^4)),x]
```

```
[Out] (-Sqrt[a] + Sqrt[c]*x^2*ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)] +
 Sqrt[c]*x^2*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(2*a^(3/2)*
x^2)
```

Maple [A] time = 0.005, size = 32, normalized size = 0.8

$$-\frac{c}{2\,a}\arctan\left(cx^2\frac{1}{\sqrt{ac}}\right)\frac{1}{\sqrt{ac}}-\frac{1}{2\,ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(c*x^4+a),x)
```

```
[Out] -1/2/a*c/(a*c)^(1/2)*arctan(c*x^2/(a*c)^(1/2))-1/2/a/x^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)*x^3),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.23313, size = 1, normalized size = 0.02

$$\left[\frac{x^2\sqrt{-\frac{c}{a}}\log\left(\frac{cx^4-2\,ax^2\sqrt{-\frac{c}{a}}-a}{cx^4+a}\right)-2}{4\,ax^2},\ \frac{x^2\sqrt{\frac{c}{a}}\arctan\left(\frac{a\sqrt{\frac{c}{a}}}{cx^2}\right)-1}{2\,ax^2}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)*x^3),x, algorithm="fricas")
```

```
[Out] [1/4*(x^2*sqrt(-c/a)*log((c*x^4 - 2*a*x^2*sqrt(-c/a) - a)/(c*x^4
+ a)) - 2)/(a*x^2), 1/2*(x^2*sqrt(c/a)*arctan(a*sqrt(c/a)/(c*x^2)
) - 1)/(a*x^2)]
```

Sympy [A] time = 1.51676, size = 71, normalized size = 1.78

$$\frac{\sqrt{-\frac{c}{a^3}}\log\left(-\frac{a^2\sqrt{-\frac{c}{a^3}}}{c}+x^2\right)}{4}-\frac{\sqrt{-\frac{c}{a^3}}\log\left(\frac{a^2\sqrt{-\frac{c}{a^3}}}{c}+x^2\right)}{4}-\frac{1}{2ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(c*x**4+a),x)
```

```
[Out] sqrt(-c/a**3)*log(-a**2*sqrt(-c/a**3)/c + x**2)/4 - sqrt(-c/a**3)
*log(a**2*sqrt(-c/a**3)/c + x**2)/4 - 1/(2*a*x**2)
```

GIAC/XCAS [A] time = 0.224536, size = 42, normalized size = 1.05

$$-\frac{c\arctan\left(\frac{cx^2}{\sqrt{ac}}\right)}{2\sqrt{ac}a}-\frac{1}{2\,ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)*x^3),x, algorithm="giac")
```

```
[Out] -1/2*c*arctan(c*x^2/sqrt(a*c))/(sqrt(a*c)*a) - 1/2/(a*x^2)
```

3.649 $\int \frac{1}{x^5(a+cx^4)}\,dx$

Optimal. Leaf size=35

$$\frac{c\log\left(a+cx^4\right)}{4a^2}-\frac{c\log(x)}{a^2}-\frac{1}{4ax^4}$$

```
[Out] -1/(4*a*x^4) - (c*Log[x])/a^2 + (c*Log[a + c*x^4])/(4*a^2)
```

Rubi [A] time = 0.0546377, antiderivative size = 35, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{c\log\left(a+cx^4\right)}{4a^2}-\frac{c\log(x)}{a^2}-\frac{1}{4ax^4}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^5*(a + c*x^4)),x]

[Out] -1/(4*a*x^4) - (c*Log[x])/a^2 + (c*Log[a + c*x^4])/(4*a^2)
```

Rubi in Sympy [A] time = 8.11624, size = 34, normalized size = 0.97

$$-\frac{1}{4ax^4}-\frac{c\log\left(x^4\right)}{4a^2}+\frac{c\log\left(a+cx^4\right)}{4a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**5/(c*x**4+a),x)

[Out] -1/(4*a*x**4) - c*log(x**4)/(4*a**2) + c*log(a + c*x**4)/(4*a**2)
```

Mathematica [A] time = 0.0128486, size = 35, normalized size = 1.

$$\frac{c\log\left(a+cx^4\right)}{4a^2}-\frac{c\log(x)}{a^2}-\frac{1}{4ax^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^5*(a + c*x^4)),x]

[Out] -1/(4*a*x^4) - (c*Log[x])/a^2 + (c*Log[a + c*x^4])/(4*a^2)
```

Maple [A] time = 0.009, size = 32, normalized size = 0.9

$$-\frac{1}{4\,ax^4}-\frac{c\ln(x)}{a^2}+\frac{c\ln\left(cx^4+a\right)}{4\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^5/(c*x^4+a),x)

[Out] -1/4/a/x^4-c*ln(x)/a^2+1/4*c*ln(c*x^4+a)/a^2
```

Maxima [A] time = 1.4341, size = 45, normalized size = 1.29

$$\frac{c\log\left(cx^4+a\right)}{4\,a^2}-\frac{c\log\left(x^4\right)}{4\,a^2}-\frac{1}{4\,ax^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)*x^5),x, algorithm="maxima")
```

```
[Out] 1/4*c*log(c*x^4 + a)/a^2 - 1/4*c*log(x^4)/a^2 - 1/4/(a*x^4)
```

Fricas [A] time = 0.227005, size = 45, normalized size = 1.29

$$\frac{cx^4\log\left(cx^4+a\right)-4\,cx^4\log\left(x\right)-a}{4\,a^2x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)*x^5),x, algorithm="fricas")
```

```
[Out] 1/4*(c*x^4*log(c*x^4 + a) - 4*c*x^4*log(x) - a)/(a^2*x^4)
```

Sympy [A] time = 2.1587, size = 31, normalized size = 0.89

$$-\frac{1}{4ax^4}-\frac{c\log\left(x\right)}{a^2}+\frac{c\log\left(\frac{a}{c}+x^4\right)}{4a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**5/(c*x**4+a),x)
```

```
[Out] -1/(4*a*x**4) - c*log(x)/a**2 + c*log(a/c + x**4)/(4*a**2)
```

GIAC/XCAS [A] time = 0.222669, size = 58, normalized size = 1.66

$$-\frac{c\ln\left(x^4\right)}{4\,a^2}+\frac{c\ln\left(\left|cx^4+a\right|\right)}{4\,a^2}+\frac{cx^4-a}{4\,a^2x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)*x^5),x, algorithm="giac")
```

```
[Out] -1/4*c*ln(x^4)/a^2 + 1/4*c*ln(abs(c*x^4 + a))/a^2 + 1/4*(c*x^4 -
a)/(a^2*x^4)
```

3.650 $\int \frac{1}{x^7(a+cx^4)}\,dx$

Optimal. Leaf size=51

$$\frac{c^{3/2}\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{2a^{5/2}}+\frac{c}{2a^2x^2}-\frac{1}{6ax^6}$$

```
[Out] -1/(6*a*x^6) + c/(2*a^2*x^2) + (c^(3/2)*ArcTan[(Sqrt[c]*x^2)/Sqrt
[a]])/(2*a^(5/2))
```

Rubi [A] time = 0.0680764, antiderivative size = 51, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{c^{3/2}\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{2a^{5/2}}+\frac{c}{2a^2x^2}-\frac{1}{6ax^6}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^7*(a + c*x^4)),x]
```

```
[Out] -1/(6*a*x^6) + c/(2*a^2*x^2) + (c^(3/2)*ArcTan[(Sqrt[c]*x^2)/Sqrt
[a]])/(2*a^(5/2))
```

Rubi in Sympy [A] time = 12.6732, size = 44, normalized size = 0.86

$$-\frac{1}{6ax^6}+\frac{c}{2a^2x^2}+\frac{c^{\frac{3}{2}}\operatorname{atan}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{2a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**7/(c*x**4+a),x)
```

```
[Out] -1/(6*a*x**6) + c/(2*a**2*x**2) + c**(3/2)*atan(sqrt(c)*x**2/sqrt
(a))/(2*a**(5/2))
```

Mathematica [A] time = 0.0774301, size = 88, normalized size = 1.73

$$-\frac{3c^{3/2}x^6\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)+3c^{3/2}x^6\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)+\sqrt{a}\left(a-3cx^4\right)}{6a^{5/2}x^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^7*(a + c*x^4)),x]
```

```
[Out] -(Sqrt[a]*(a - 3*c*x^4) + 3*c^(3/2)*x^6*ArcTan[1 - (Sqrt[2]*c^(1/
4)*x)/a^(1/4)] + 3*c^(3/2)*x^6*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(
1/4)])/(6*a^(5/2)*x^6)
```

Maple [A] time = 0.008, size = 43, normalized size = 0.8

$$-\frac{1}{6\,x^6a}+\frac{c}{2\,a^2x^2}+\frac{c^2}{2\,a^2}\arctan\left(cx^2\frac{1}{\sqrt{ac}}\right)\frac{1}{\sqrt{ac}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^7/(c*x^4+a),x)
```

```
[Out] -1/6/x^6/a+1/2*c/a^2/x^2+1/2*c^2/a^2/(a*c)^(1/2)*arctan(c*x^2/(a*
c)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)*x^7),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.228595, size = 1, normalized size = 0.02

$$\left[\frac{3\,cx^6\sqrt{-\frac{c}{a}}\log\left(\frac{cx^4+2\,ax^2\sqrt{-\frac{c}{a}}-a}{cx^4+a}\right)+6\,cx^4-2\,a}{12\,a^2x^6},\,-\frac{3\,cx^6\sqrt{\frac{c}{a}}\arctan\left(\frac{a\sqrt{\frac{c}{a}}}{cx^2}\right)-3\,cx^4+a}{6\,a^2x^6}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)*x^7),x, algorithm="fricas")
```

```
[Out] [1/12*(3*c*x^6*sqrt(-c/a)*log((c*x^4 + 2*a*x^2*sqrt(-c/a) - a)/(c
*x^4 + a)) + 6*c*x^4 - 2*a)/(a^2*x^6), -1/6*(3*c*x^6*sqrt(c/a)*ar
ctan(a*sqrt(c/a)/(c*x^2)) - 3*c*x^4 + a)/(a^2*x^6)]
```

Sympy [A] time = 2.7149, size = 90, normalized size = 1.76

$$-\frac{\sqrt{-\frac{c^3}{a^5}}\log\left(-\frac{a^3\sqrt{-\frac{c^3}{a^5}}}{c^2}+x^2\right)}{4}+\frac{\sqrt{-\frac{c^3}{a^5}}\log\left(\frac{a^3\sqrt{-\frac{c^3}{a^5}}}{c^2}+x^2\right)}{4}+\frac{-a+3cx^4}{6a^2x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**7/(c*x**4+a),x)
```

```
[Out] -sqrt(-c**3/a**5)*log(-a**3*sqrt(-c**3/a**5)/c**2 + x**2)/4 + sqr
t(-c**3/a**5)*log(a**3*sqrt(-c**3/a**5)/c**2 + x**2)/4 + (-a + 3*
c*x**4)/(6*a**2*x**6)
```

GIAC/XCAS [A] time = 0.224902, size = 58, normalized size = 1.14

$$\frac{c^2\arctan\left(\frac{cx^2}{\sqrt{ac}}\right)}{2\sqrt{ac}a^2}+\frac{3\,cx^4-a}{6\,a^2x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)*x^7),x, algorithm="giac")
```

```
[Out] 1/2*c^2*arctan(c*x^2/sqrt(a*c))/(sqrt(a*c)*a^2) + 1/6*(3*c*x^4 -
a)/(a^2*x^6)
```

3.651 $\int \frac{x^4}{a+cx^4}\,dx$

Optimal. Leaf size=190

$$\frac{\sqrt[4]{a}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{4\sqrt{2}c^{5/4}}-\frac{\sqrt[4]{a}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{4\sqrt{2}c^{5/4}}+\frac{\sqrt[4]{a}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{2\sqrt{2}c^{5/4}}-\frac{\sqrt[4]{a}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{2\sqrt{2}c^{5/4}}+\frac{x}{c}$$

```
[Out] x/c + (a^(1/4)*ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(2*Sqrt[2
]*c^(5/4)) - (a^(1/4)*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(2
*Sqrt[2]*c^(5/4)) + (a^(1/4)*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4
)*x + Sqrt[c]*x^2])/(4*Sqrt[2]*c^(5/4)) - (a^(1/4)*Log[Sqrt[a] +
Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(4*Sqrt[2]*c^(5/4))
```

Rubi [A] time = 0.279137, antiderivative size = 190, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538

$$\frac{\sqrt[4]{a}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{4\sqrt{2}c^{5/4}}-\frac{\sqrt[4]{a}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{4\sqrt{2}c^{5/4}}+\frac{\sqrt[4]{a}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{2\sqrt{2}c^{5/4}}-\frac{\sqrt[4]{a}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{2\sqrt{2}c^{5/4}}+\frac{x}{c}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a + c*x^4),x]
```

```
[Out] x/c + (a^(1/4)*ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(2*Sqrt[2
]*c^(5/4)) - (a^(1/4)*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(2
*Sqrt[2]*c^(5/4)) + (a^(1/4)*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4
)*x + Sqrt[c]*x^2])/(4*Sqrt[2]*c^(5/4)) - (a^(1/4)*Log[Sqrt[a] +
Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(4*Sqrt[2]*c^(5/4))
```

Rubi in Sympy [A] time = 53.0266, size = 175, normalized size = 0.92

$$\frac{\sqrt{2}\sqrt[4]{a}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{8c^{\frac{5}{4}}}-\frac{\sqrt{2}\sqrt[4]{a}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{8c^{\frac{5}{4}}}+\frac{\sqrt{2}\sqrt[4]{a}\,\mathrm{atan}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{4c^{\frac{5}{4}}}-\frac{\sqrt{2}\sqrt[4]{a}\,\mathrm{atan}\left(1+\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{4c^{\frac{5}{4}}}+\frac{x}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(c*x**4+a),x)
```

```
[Out] sqrt(2)*a**(1/4)*log(-sqrt(2)*a**(1/4)*c**(1/4)*x + sqrt(a) + sqr
t(c)*x**2)/(8*c**(5/4)) - sqrt(2)*a**(1/4)*log(sqrt(2)*a**(1/4)*c
**(1/4)*x + sqrt(a) + sqrt(c)*x**2)/(8*c**(5/4)) + sqrt(2)*a**(1/
4)*atan(1 - sqrt(2)*c**(1/4)*x/a**(1/4))/(4*c**(5/4)) - sqrt(2)*a
**(1/4)*atan(1 + sqrt(2)*c**(1/4)*x/a**(1/4))/(4*c**(5/4)) + x/c
```

Mathematica [A] time = 0.0620553, size = 173, normalized size = 0.91

$$\frac{\sqrt{2}\sqrt[4]{a}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)-\sqrt{2}\sqrt[4]{a}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)+2\sqrt{2}\sqrt[4]{a}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)-2\sqrt{2}\sqrt[4]{a}\tan^{-1}}{8c^{5/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(a + c*x^4),x]
```

```
[Out] (8*c^(1/4)*x + 2*Sqrt[2]*a^(1/4)*ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a
^(1/4)] - 2*Sqrt[2]*a^(1/4)*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4
)] + Sqrt[2]*a^(1/4)*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4)*x + Sq
rt[c]*x^2] - Sqrt[2]*a^(1/4)*Log[Sqrt[a] + Sqrt[2]*a^(1/4)*c^(1/4
)*x + Sqrt[c]*x^2])/(8*c^(5/4))
```

Maple [A] time = 0.013, size = 133, normalized size = 0.7

$$\frac{x}{c}-\frac{\sqrt{2}}{8\,c}\sqrt[4]{\frac{a}{c}}\ln\left(1\left(x^2+\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)\left(x^2-\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)^{-1}\right)$$
$$-\frac{\sqrt{2}}{4\,c}\sqrt[4]{\frac{a}{c}}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}+1\right)-\frac{\sqrt{2}}{4\,c}\sqrt[4]{\frac{a}{c}}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(c*x^4+a),x)
```

```
[Out] x/c-1/8/c*(a/c)^(1/4)*2^(1/2)*ln((x^2+(a/c)^(1/4)*x*2^(1/2)+(a/c)
^(1/2))/(x^2-(a/c)^(1/4)*x*2^(1/2)+(a/c)^(1/2)))-1/4/c*(a/c)^(1/4
)*2^(1/2)*arctan(2^(1/2)/(a/c)^(1/4)*x+1)-1/4/c*(a/c)^(1/4)*2^(1/
2)*arctan(2^(1/2)/(a/c)^(1/4)*x-1)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(c*x^4 + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.253049, size = 136, normalized size = 0.72

$$\frac{4\,c\left(-\frac{a}{c^5}\right)^{\frac{1}{4}}\arctan\left(\frac{c\left(-\frac{a}{c^5}\right)^{\frac{1}{4}}}{x+\sqrt{c^2\sqrt{-\frac{a}{c^5}}+x^2}}\right)-c\left(-\frac{a}{c^5}\right)^{\frac{1}{4}}\log\left(c\left(-\frac{a}{c^5}\right)^{\frac{1}{4}}+x\right)+c\left(-\frac{a}{c^5}\right)^{\frac{1}{4}}\log\left(-c\left(-\frac{a}{c^5}\right)^{\frac{1}{4}}+x\right)+4\,x}{4\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(c*x^4 + a),x, algorithm="fricas")
```

```
[Out] 1/4*(4*c*(-a/c^5)^(1/4)*arctan(c*(-a/c^5)^(1/4)/(x + sqrt(c^2*sqr
t(-a/c^5) + x^2))) - c*(-a/c^5)^(1/4)*log(c*(-a/c^5)^(1/4) + x) +
```

```
c*(-a/c^5)^(1/4)*log(-c*(-a/c^5)^(1/4) + x) + 4*x)/c
```

Sympy [A] time = 1.25531, size = 22, normalized size = 0.12

$$\mathrm{RootSum}\left(256t^4c^5 + a, \left(t \mapsto t\log\left(-4tc + x\right)\right)\right) + \frac{x}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(c*x**4+a),x)
```

```
[Out] RootSum(256*_t**4*c**5 + a, Lambda(_t, _t*log(-4*_t*c + x))) + x/
c
```

GIAC/XCAS [A] time = 0.222944, size = 232, normalized size = 1.22

$$\frac{x}{c} - \frac{\sqrt{2}\left(ac^3\right)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(2x+\sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{4c^2} - \frac{\sqrt{2}\left(ac^3\right)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(2x-\sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{4c^2} - \frac{\sqrt{2}\left(ac^3\right)^{\frac{1}{4}}\ln\left(x^2+\sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{c}}\right)}{8c^2} + \frac{\sqrt{2}\left(ac^3\right)^{\frac{1}{4}}\ln\left(x^2-\sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{c}}\right)}{8c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(c*x^4 + a),x, algorithm="giac")
```

```
[Out] x/c - 1/4*sqrt(2)*(a*c^3)^(1/4)*arctan(1/2*sqrt(2)*(2*x + sqrt(2)
*(a/c)^(1/4))/(a/c)^(1/4))/c^2 - 1/4*sqrt(2)*(a*c^3)^(1/4)*arctan
(1/2*sqrt(2)*(2*x - sqrt(2)*(a/c)^(1/4))/(a/c)^(1/4))/c^2 - 1/8*s
qrt(2)*(a*c^3)^(1/4)*ln(x^2 + sqrt(2)*x*(a/c)^(1/4) + sqrt(a/c))/
c^2 + 1/8*sqrt(2)*(a*c^3)^(1/4)*ln(x^2 - sqrt(2)*x*(a/c)^(1/4) +
sqrt(a/c))/c^2
```

3.652 $\int \frac{x^2}{a+cx^4}\,dx$

Optimal. Leaf size=185

$$\frac{\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{4\sqrt{2}\sqrt[4]{a}c^{3/4}}-\frac{\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{4\sqrt{2}\sqrt[4]{a}c^{3/4}}-\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{2\sqrt{2}\sqrt[4]{a}c^{3/4}}+\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{2\sqrt{2}\sqrt[4]{a}c^{3/4}}$$

```
[Out] -ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)]/(2*Sqrt[2]*a^(1/4)*c^(3/
4)) + ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4)]/(2*Sqrt[2]*a^(1/4)*
c^(3/4)) + Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2]
/(4*Sqrt[2]*a^(1/4)*c^(3/4)) - Log[Sqrt[a] + Sqrt[2]*a^(1/4)*c^(1
/4)*x + Sqrt[c]*x^2]/(4*Sqrt[2]*a^(1/4)*c^(3/4))
```

Rubi [A] time = 0.210221, antiderivative size = 185, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 6, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.462

$$\frac{\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{4\sqrt{2}\sqrt[4]{a}c^{3/4}}-\frac{\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{4\sqrt{2}\sqrt[4]{a}c^{3/4}}-\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{2\sqrt{2}\sqrt[4]{a}c^{3/4}}+\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{2\sqrt{2}\sqrt[4]{a}c^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + c*x^4),x]
```

```
[Out] -ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)]/(2*Sqrt[2]*a^(1/4)*c^(3/
4)) + ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4)]/(2*Sqrt[2]*a^(1/4)*
c^(3/4)) + Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2]
/(4*Sqrt[2]*a^(1/4)*c^(3/4)) - Log[Sqrt[a] + Sqrt[2]*a^(1/4)*c^(1
/4)*x + Sqrt[c]*x^2]/(4*Sqrt[2]*a^(1/4)*c^(3/4))
```

Rubi in Sympy [A] time = 47.7867, size = 172, normalized size = 0.93

$$\frac{\sqrt{2}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{8\sqrt[4]{a}c^{\frac{3}{4}}}-\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{8\sqrt[4]{a}c^{\frac{3}{4}}}-\frac{\sqrt{2}\,\mathrm{atan}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{4\sqrt[4]{a}c^{\frac{3}{4}}}+\frac{\sqrt{2}\,\mathrm{atan}\left(1+\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{4\sqrt[4]{a}c^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(c*x**4+a),x)
```

```
[Out] sqrt(2)*log(-sqrt(2)*a**(1/4)*c**(1/4)*x + sqrt(a) + sqrt(c)*x**2
)/(8*a**(1/4)*c**(3/4)) - sqrt(2)*log(sqrt(2)*a**(1/4)*c**(1/4)*x
 + sqrt(a) + sqrt(c)*x**2)/(8*a**(1/4)*c**(3/4)) - sqrt(2)*atan(1
 - sqrt(2)*c**(1/4)*x/a**(1/4))/(4*a**(1/4)*c**(3/4)) + sqrt(2)*a
tan(1 + sqrt(2)*c**(1/4)*x/a**(1/4))/(4*a**(1/4)*c**(3/4))
```

Mathematica [A] time = 0.0507221, size = 134, normalized size = 0.72

$$\frac{\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)-\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)-2\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)+2\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{4\sqrt{2}\sqrt[4]{a}c^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a + c*x^4),x]
```

```
[Out] (-2*ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)] + 2*ArcTan[1 + (Sqrt[
2]*c^(1/4)*x)/a^(1/4)] + Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4)*x
+ Sqrt[c]*x^2] - Log[Sqrt[a] + Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c
]*x^2])/(4*Sqrt[2]*a^(1/4)*c^(3/4))
```

Maple [A] time = 0.004, size = 128, normalized size = 0.7

$$\frac{\sqrt{2}}{8\,c}\ln\left(1\left(x^2-\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)\left(x^2+\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)^{-1}\right)\frac{1}{\sqrt[4]{\frac{a}{c}}}+\frac{\sqrt{2}}{4\,c}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}+1\right)\frac{1}{\sqrt[4]{\frac{a}{c}}}+\frac{\sqrt{2}}{4\,c}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}-1\right)\frac{1}{\sqrt[4]{\frac{a}{c}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(c*x^4+a),x)
```

```
[Out] 1/8/c/(a/c)^(1/4)*2^(1/2)*ln((x^2-(a/c)^(1/4)*x*2^(1/2)+(a/c)^(1/
2))/(x^2+(a/c)^(1/4)*x*2^(1/2)+(a/c)^(1/2)))+1/4/c/(a/c)^(1/4)*2^
(1/2)*arctan(2^(1/2)/(a/c)^(1/4)*x+1)+1/4/c/(a/c)^(1/4)*2^(1/2)*a
rctan(2^(1/2)/(a/c)^(1/4)*x-1)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(c*x^4 + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.238958, size = 153, normalized size = 0.83

$$\left(-\frac{1}{ac^3}\right)^{\frac{1}{4}}\arctan\left(\frac{ac^2\left(-\frac{1}{ac^3}\right)^{\frac{3}{4}}}{x+\sqrt{-ac\sqrt{-\frac{1}{ac^3}}+x^2}}\right)+\frac{1}{4}\left(-\frac{1}{ac^3}\right)^{\frac{1}{4}}\log\left(ac^2\left(-\frac{1}{ac^3}\right)^{\frac{3}{4}}+x\right)-\frac{1}{4}\left(-\frac{1}{ac^3}\right)^{\frac{1}{4}}\log\left(-ac^2\left(-\frac{1}{ac^3}\right)^{\frac{3}{4}}+x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(c*x^4 + a),x, algorithm="fricas")
```

```
[Out] (-1/(a*c^3))^(1/4)*arctan(a*c^2*(-1/(a*c^3))^(3/4)/(x + sqrt(-a*c
*sqrt(-1/(a*c^3)) + x^2))) + 1/4*(-1/(a*c^3))^(1/4)*log(a*c^2*(-1
/(a*c^3))^(3/4) + x) - 1/4*(-1/(a*c^3))^(1/4)*log(-a*c^2*(-1/(a*c
^3))^(3/4) + x)
```

Sympy [A] time = 0.374871, size = 26, normalized size = 0.14

$$\operatorname{RootSum}\left(256t^4ac^3+1,\left(t\mapsto t\log\left(64t^3ac^2+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(c*x**4+a),x)
```

```
[Out] RootSum(256*_t**4*a*c**3 + 1, Lambda(_t, _t*log(64*_t**3*a*c**2 +
 x)))
```

GIAC/XCAS [A] time = 0.225741, size = 242, normalized size = 1.31

$$\frac{\sqrt{2}\left(ac^3\right)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(2x+\sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{4\,ac^3}+\frac{\sqrt{2}\left(ac^3\right)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(2x-\sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{4\,ac^3}-\frac{\sqrt{2}\left(ac^3\right)^{\frac{3}{4}}\ln\left(x^2+\sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{c}}\right)}{8\,ac^3}+\frac{\sqrt{2}\left(ac^3\right)^{\frac{3}{4}}\ln\left(x^2-\sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{c}}\right)}{8\,ac^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(c*x^4 + a),x, algorithm="giac")
```

```
[Out] 1/4*sqrt(2)*(a*c^3)^(3/4)*arctan(1/2*sqrt(2)*(2*x + sqrt(2)*(a/c)
^(1/4))/(a/c)^(1/4))/(a*c^3) + 1/4*sqrt(2)*(a*c^3)^(3/4)*arctan(1
/2*sqrt(2)*(2*x - sqrt(2)*(a/c)^(1/4))/(a/c)^(1/4))/(a*c^3) - 1/8
*sqrt(2)*(a*c^3)^(3/4)*ln(x^2 + sqrt(2)*x*(a/c)^(1/4) + sqrt(a/c)
)/(a*c^3) + 1/8*sqrt(2)*(a*c^3)^(3/4)*ln(x^2 - sqrt(2)*x*(a/c)^(1
/4) + sqrt(a/c))/(a*c^3)
```

3.653 $\int \frac{1}{a+cx^4}\,dx$

Optimal. Leaf size=185

$$-\frac{\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{4\sqrt{2}a^{3/4}\sqrt[4]{c}}+\frac{\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{4\sqrt{2}a^{3/4}\sqrt[4]{c}}-\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{2\sqrt{2}a^{3/4}\sqrt[4]{c}}+\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{2\sqrt{2}a^{3/4}\sqrt[4]{c}}$$

```
[Out] -ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)]/(2*Sqrt[2]*a^(3/4)*c^(1/
4)) + ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4)]/(2*Sqrt[2]*a^(3/4)*
c^(1/4)) - Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2]
/(4*Sqrt[2]*a^(3/4)*c^(1/4)) + Log[Sqrt[a] + Sqrt[2]*a^(1/4)*c^(1
/4)*x + Sqrt[c]*x^2]/(4*Sqrt[2]*a^(3/4)*c^(1/4))
```

Rubi [A] time = 0.197241, antiderivative size = 185, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 6, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667

$$-\frac{\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{4\sqrt{2}a^{3/4}\sqrt[4]{c}}+\frac{\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{4\sqrt{2}a^{3/4}\sqrt[4]{c}}-\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{2\sqrt{2}a^{3/4}\sqrt[4]{c}}+\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{2\sqrt{2}a^{3/4}\sqrt[4]{c}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + c*x^4)^(-1),x]
```

```
[Out] -ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)]/(2*Sqrt[2]*a^(3/4)*c^(1/
4)) + ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4)]/(2*Sqrt[2]*a^(3/4)*
c^(1/4)) - Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2]
/(4*Sqrt[2]*a^(3/4)*c^(1/4)) + Log[Sqrt[a] + Sqrt[2]*a^(1/4)*c^(1
/4)*x + Sqrt[c]*x^2]/(4*Sqrt[2]*a^(3/4)*c^(1/4))
```

Rubi in Sympy [A] time = 46.1712, size = 172, normalized size = 0.93

$$-\frac{\sqrt{2}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{8a^{\frac{3}{4}}\sqrt[4]{c}}+\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{8a^{\frac{3}{4}}\sqrt[4]{c}}-\frac{\sqrt{2}\operatorname{atan}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{4a^{\frac{3}{4}}\sqrt[4]{c}}+\frac{\sqrt{2}\operatorname{atan}\left(1+\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{4a^{\frac{3}{4}}\sqrt[4]{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(c*x**4+a),x)
```

```
[Out] -sqrt(2)*log(-sqrt(2)*a**(1/4)*c**(1/4)*x + sqrt(a) + sqrt(c)*x**
2)/(8*a**(3/4)*c**(1/4)) + sqrt(2)*log(sqrt(2)*a**(1/4)*c**(1/4)*
x + sqrt(a) + sqrt(c)*x**2)/(8*a**(3/4)*c**(1/4)) - sqrt(2)*atan(
1 - sqrt(2)*c**(1/4)*x/a**(1/4))/(4*a**(3/4)*c**(1/4)) + sqrt(2)*
atan(1 + sqrt(2)*c**(1/4)*x/a**(1/4))/(4*a**(3/4)*c**(1/4))
```

Mathematica [A] time = 0.0325176, size = 134, normalized size = 0.72

$$\frac{-\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)+\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)-2\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)+2\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{4\sqrt{2}a^{3/4}\sqrt[4]{c}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + c*x^4)^(-1),x]
```

```
[Out] (-2*ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)] + 2*ArcTan[1 + (Sqrt[
2]*c^(1/4)*x)/a^(1/4)] - Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4)*x
+ Sqrt[c]*x^2] + Log[Sqrt[a] + Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c
]*x^2])/(4*Sqrt[2]*a^(3/4)*c^(1/4))
```

Maple [A] time = 0.004, size = 128, normalized size = 0.7

$$\frac{\sqrt{2}}{8\,a}\sqrt[4]{\frac{a}{c}}\ln\left(1\left(x^2+\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)\left(x^2-\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)^{-1}\right)+\frac{\sqrt{2}}{4\,a}\sqrt[4]{\frac{a}{c}}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}+1\right)+\frac{\sqrt{2}}{4\,a}\sqrt[4]{\frac{a}{c}}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(c*x^4+a),x)
```

```
[Out] 1/8*(a/c)^(1/4)/a*2^(1/2)*ln((x^2+(a/c)^(1/4)*x*2^(1/2)+(a/c)^(1/
2))/(x^2-(a/c)^(1/4)*x*2^(1/2)+(a/c)^(1/2)))+1/4*(a/c)^(1/4)/a*2^
(1/2)*arctan(2^(1/2)/(a/c)^(1/4)*x+1)+1/4*(a/c)^(1/4)/a*2^(1/2)*a
rctan(2^(1/2)/(a/c)^(1/4)*x-1)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(c*x^4 + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.23706, size = 142, normalized size = 0.77

$$-\left(-\frac{1}{a^3c}\right)^{\frac{1}{4}}\arctan\left(\frac{a\left(-\frac{1}{a^3c}\right)^{\frac{1}{4}}}{x+\sqrt{a^2\sqrt{-\frac{1}{a^3c}}+x^2}}\right)+\frac{1}{4}\left(-\frac{1}{a^3c}\right)^{\frac{1}{4}}\log\left(a\left(-\frac{1}{a^3c}\right)^{\frac{1}{4}}+x\right)-\frac{1}{4}\left(-\frac{1}{a^3c}\right)^{\frac{1}{4}}\log\left(-a\left(-\frac{1}{a^3c}\right)^{\frac{1}{4}}+x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(c*x^4 + a),x, algorithm="fricas")
```

```
[Out] -(-1/(a^3*c))^(1/4)*arctan(a*(-1/(a^3*c))^(1/4)/(x + sqrt(a^2*sqr
t(-1/(a^3*c)) + x^2))) + 1/4*(-1/(a^3*c))^(1/4)*log(a*(-1/(a^3*c)
)^(1/4) + x) - 1/4*(-1/(a^3*c))^(1/4)*log(-a*(-1/(a^3*c))^(1/4) +
 x)
```

Sympy [A] time = 0.373336, size = 20, normalized size = 0.11

$$\operatorname{RootSum}\left(256t^4a^3c+1,\left(t\mapsto t\log\left(4ta+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(c*x**4+a),x)
```

```
[Out] RootSum(256*_t**4*a**3*c + 1, Lambda(_t, _t*log(4*_t*a + x)))
```

GIAC/XCAS [A] time = 0.219271, size = 242, normalized size = 1.31

$$\frac{\sqrt{2}\left(ac^3\right)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(2x+\sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{4ac}+\frac{\sqrt{2}\left(ac^3\right)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(2x-\sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{4ac}+\frac{\sqrt{2}\left(ac^3\right)^{\frac{1}{4}}\ln\left(x^2+\sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{c}}\right)}{8ac}-\frac{\sqrt{2}\left(ac^3\right)^{\frac{1}{4}}\ln\left(x^2-\sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{c}}\right)}{8ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(c*x^4 + a),x, algorithm="giac")
```

```
[Out] 1/4*sqrt(2)*(a*c^3)^(1/4)*arctan(1/2*sqrt(2)*(2*x + sqrt(2)*(a/c)
^(1/4))/(a/c)^(1/4))/(a*c) + 1/4*sqrt(2)*(a*c^3)^(1/4)*arctan(1/2
*sqrt(2)*(2*x - sqrt(2)*(a/c)^(1/4))/(a/c)^(1/4))/(a*c) + 1/8*sqr
t(2)*(a*c^3)^(1/4)*ln(x^2 + sqrt(2)*x*(a/c)^(1/4) + sqrt(a/c))/(a
*c) - 1/8*sqrt(2)*(a*c^3)^(1/4)*ln(x^2 - sqrt(2)*x*(a/c)^(1/4) +
sqrt(a/c))/(a*c)
```

3.654 $\int \frac{1}{x^2(a+cx^4)}\,dx$

Optimal. Leaf size=193

$$-\frac{\sqrt[4]{c}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{4\sqrt{2}a^{5/4}}+\frac{\sqrt[4]{c}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{4\sqrt{2}a^{5/4}}+\frac{\sqrt[4]{c}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{2\sqrt{2}a^{5/4}}-\frac{\sqrt[4]{c}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{2\sqrt{2}a^{5/4}}-\frac{1}{ax}$$

```
[Out] -(1/(a*x)) + (c^(1/4)*ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(2
*Sqrt[2]*a^(5/4)) - (c^(1/4)*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/
4)])/(2*Sqrt[2]*a^(5/4)) - (c^(1/4)*Log[Sqrt[a] - Sqrt[2]*a^(1/4)
*c^(1/4)*x + Sqrt[c]*x^2])/(4*Sqrt[2]*a^(5/4)) + (c^(1/4)*Log[Sqr
t[a] + Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(4*Sqrt[2]*a^(5/
4))
```

Rubi [A] time = 0.243608, antiderivative size = 193, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538

$$-\frac{\sqrt[4]{c}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{4\sqrt{2}a^{5/4}}+\frac{\sqrt[4]{c}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{4\sqrt{2}a^{5/4}}+\frac{\sqrt[4]{c}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{2\sqrt{2}a^{5/4}}-\frac{\sqrt[4]{c}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{2\sqrt{2}a^{5/4}}-\frac{1}{ax}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(a + c*x^4)),x]
```


```
[Out] -(1/(a*x)) + (c^(1/4)*ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(2
*Sqrt[2]*a^(5/4)) - (c^(1/4)*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/
4)])/(2*Sqrt[2]*a^(5/4)) - (c^(1/4)*Log[Sqrt[a] - Sqrt[2]*a^(1/4)
*c^(1/4)*x + Sqrt[c]*x^2])/(4*Sqrt[2]*a^(5/4)) + (c^(1/4)*Log[Sqr
t[a] + Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(4*Sqrt[2]*a^(5/
4))
```

Rubi in Sympy [A] time = 54.7804, size = 177, normalized size = 0.92

$$-\frac{1}{ax}-\frac{\sqrt{2}\sqrt[4]{c}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{8a^{\frac{5}{4}}}+\frac{\sqrt{2}\sqrt[4]{c}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{8a^{\frac{5}{4}}}+\frac{\sqrt{2}\sqrt[4]{c}\,\mathrm{atan}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{4a^{\frac{5}{4}}}-\frac{\sqrt{2}\sqrt[4]{c}\,\mathrm{atan}\left(1+\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{4a^{\frac{5}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(c*x**4+a),x)
```

```
[Out] -1/(a*x) - sqrt(2)*c**(1/4)*log(-sqrt(2)*a**(1/4)*c**(1/4)*x + sq
rt(a) + sqrt(c)*x**2)/(8*a**(5/4)) + sqrt(2)*c**(1/4)*log(sqrt(2)
*a**(1/4)*c**(1/4)*x + sqrt(a) + sqrt(c)*x**2)/(8*a**(5/4)) + sqr
t(2)*c**(1/4)*atan(1 - sqrt(2)*c**(1/4)*x/a**(1/4))/(4*a**(5/4))
- sqrt(2)*c**(1/4)*atan(1 + sqrt(2)*c**(1/4)*x/a**(1/4))/(4*a**(5
/4))
```

Mathematica [A] time = 0.0583748, size = 179, normalized size = 0.93

$$\frac{-\sqrt{2}\sqrt[4]{c}x\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)+\sqrt{2}\sqrt[4]{c}x\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)+2\sqrt{2}\sqrt[4]{c}x\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)-2\sqrt{2}\sqrt[4]{c}x}{8a^{5/4}x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*(a + c*x^4)),x]
```

```
[Out] (-8*a^(1/4) + 2*Sqrt[2]*c^(1/4)*x*ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/
a^(1/4)] - 2*Sqrt[2]*c^(1/4)*x*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(
1/4)] - Sqrt[2]*c^(1/4)*x*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4)*x
 + Sqrt[c]*x^2] + Sqrt[2]*c^(1/4)*x*Log[Sqrt[a] + Sqrt[2]*a^(1/4)
*c^(1/4)*x + Sqrt[c]*x^2])/(8*a^(5/4)*x)
```

Maple [A] time = 0.006, size = 136, normalized size = 0.7

$$-\frac{\sqrt{2}}{8\,a}\ln\left(1\left(x^2-\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)\left(x^2+\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)^{-1}\right)\frac{1}{\sqrt[4]{\frac{a}{c}}}-\frac{\sqrt{2}}{4\,a}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}+1\right)\frac{1}{\sqrt[4]{\frac{a}{c}}}-\frac{\sqrt{2}}{4\,a}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}-1\right)\frac{1}{\sqrt[4]{\frac{a}{c}}}-\frac{1}{ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(c*x^4+a),x)
```

```
[Out] -1/8/a/(a/c)^(1/4)*2^(1/2)*ln((x^2-(a/c)^(1/4)*x*2^(1/2)+(a/c)^(1
/2))/(x^2+(a/c)^(1/4)*x*2^(1/2)+(a/c)^(1/2)))-1/4/a/(a/c)^(1/4)*2
^(1/2)*arctan(2^(1/2)/(a/c)^(1/4)*x+1)-1/4/a/(a/c)^(1/4)*2^(1/2)*
arctan(2^(1/2)/(a/c)^(1/4)*x-1)-1/a/x
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)*x^2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.256528, size = 171, normalized size = 0.89

$$-\frac{4\,ax\left(-\frac{c}{a^5}\right)^{\frac{1}{4}}\arctan\left(\frac{a^4\left(-\frac{c}{a^5}\right)^{\frac{3}{4}}}{cx+c\sqrt{-\frac{a^3\sqrt{-\frac{c}{a^5}}-cx^2}{c}}}\right)+ax\left(-\frac{c}{a^5}\right)^{\frac{1}{4}}\log\left(a^4\left(-\frac{c}{a^5}\right)^{\frac{3}{4}}+cx\right)-ax\left(-\frac{c}{a^5}\right)^{\frac{1}{4}}\log\left(-a^4\left(-\frac{c}{a^5}\right)^{\frac{3}{4}}+cx\right)+4}{4\,ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)*x^2),x, algorithm="fricas")
```

```
[Out] -1/4*(4*a*x*(-c/a^5)^(1/4)*arctan(a^4*(-c/a^5)^(3/4)/(c*x + c*sqr
t(-(a^3*sqrt(-c/a^5) - c*x^2)/c))) + a*x*(-c/a^5)^(1/4)*log(a^4*(
-c/a^5)^(3/4) + c*x) - a*x*(-c/a^5)^(1/4)*log(-a^4*(-c/a^5)^(3/4)
 + c*x) + 4)/(a*x)
```

Sympy [A] time = 1.37081, size = 29, normalized size = 0.15

$$\operatorname{RootSum}\left(256t^4a^5 + c, \left(t \mapsto t\log\left(-\frac{64t^3a^4}{c} + x\right)\right)\right) - \frac{1}{ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(c*x**4+a),x)
```

```
[Out] RootSum(256*_t**4*a**5 + c, Lambda(_t, _t*log(-64*_t**3*a**4/c +
x))) - 1/(a*x)
```

GIAC/XCAS [A] time = 0.224642, size = 252, normalized size = 1.31

$$-\frac{\sqrt{2}\left(ac^3\right)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x+\sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{4\,a^2c^2} - \frac{\sqrt{2}\left(ac^3\right)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x-\sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{4\,a^2c^2} + \frac{\sqrt{2}\left(ac^3\right)^{\frac{3}{4}}\ln\left(x^2 + \sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}} + \sqrt{\frac{a}{c}}\right)}{8\,a^2c^2} - \frac{\sqrt{2}\left(ac^3\right)^{\frac{3}{4}}\ln\left(x^2 - \sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}} + \sqrt{\frac{a}{c}}\right)}{8\,a^2c^2} - \frac{1}{ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)*x^2),x, algorithm="giac")
```

```
[Out] -1/4*sqrt(2)*(a*c^3)^(3/4)*arctan(1/2*sqrt(2)*(2*x + sqrt(2)*(a/c
)^(1/4))/(a/c)^(1/4))/(a^2*c^2) - 1/4*sqrt(2)*(a*c^3)^(3/4)*arcta
n(1/2*sqrt(2)*(2*x - sqrt(2)*(a/c)^(1/4))/(a/c)^(1/4))/(a^2*c^2)
+ 1/8*sqrt(2)*(a*c^3)^(3/4)*ln(x^2 + sqrt(2)*x*(a/c)^(1/4) + sqrt
(a/c))/(a^2*c^2) - 1/8*sqrt(2)*(a*c^3)^(3/4)*ln(x^2 - sqrt(2)*x*(
a/c)^(1/4) + sqrt(a/c))/(a^2*c^2) - 1/(a*x)
```

3.655 $\int \frac{1}{x^4(a+cx^4)}\,dx$

Optimal. Leaf size=195

$$\frac{c^{3/4}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{4\sqrt{2}a^{7/4}}-\frac{c^{3/4}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{4\sqrt{2}a^{7/4}}+\frac{c^{3/4}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{2\sqrt{2}a^{7/4}}-\frac{c^{3/4}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{2\sqrt{2}a^{7/4}}-\frac{1}{3ax^3}$$

```
[Out] -1/(3*a*x^3) + (c^(3/4)*ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/
(2*Sqrt[2]*a^(7/4)) - (c^(3/4)*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(
1/4)])/(2*Sqrt[2]*a^(7/4)) + (c^(3/4)*Log[Sqrt[a] - Sqrt[2]*a^(1/
4)*c^(1/4)*x + Sqrt[c]*x^2])/(4*Sqrt[2]*a^(7/4)) - (c^(3/4)*Log[S
qrt[a] + Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(4*Sqrt[2]*a^(
7/4))
```

Rubi [A] time = 0.239959, antiderivative size = 195, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538

$$\frac{c^{3/4}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{4\sqrt{2}a^{7/4}}-\frac{c^{3/4}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{4\sqrt{2}a^{7/4}}+\frac{c^{3/4}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{2\sqrt{2}a^{7/4}}-\frac{c^{3/4}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{2\sqrt{2}a^{7/4}}-\frac{1}{3ax^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*(a + c*x^4)),x]
```

```
[Out] -1/(3*a*x^3) + (c^(3/4)*ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/
(2*Sqrt[2]*a^(7/4)) - (c^(3/4)*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(
1/4)])/(2*Sqrt[2]*a^(7/4)) + (c^(3/4)*Log[Sqrt[a] - Sqrt[2]*a^(1/
4)*c^(1/4)*x + Sqrt[c]*x^2])/(4*Sqrt[2]*a^(7/4)) - (c^(3/4)*Log[S
qrt[a] + Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(4*Sqrt[2]*a^(
7/4))
```

Rubi in Sympy [A] time = 52.7651, size = 180, normalized size = 0.92

$$-\frac{1}{3ax^3}+\frac{\sqrt{2}c^{\frac{3}{4}}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{8a^{\frac{7}{4}}}-\frac{\sqrt{2}c^{\frac{3}{4}}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{8a^{\frac{7}{4}}}+\frac{\sqrt{2}c^{\frac{3}{4}}\operatorname{atan}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{4a^{\frac{7}{4}}}-\frac{\sqrt{2}c^{\frac{3}{4}}\operatorname{atan}\left(1+\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{4a^{\frac{7}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(c*x**4+a),x)
```

```
[Out] -1/(3*a*x**3) + sqrt(2)*c**(3/4)*log(-sqrt(2)*a**(1/4)*c**(1/4)*x
 + sqrt(a) + sqrt(c)*x**2)/(8*a**(7/4)) - sqrt(2)*c**(3/4)*log(sq
rt(2)*a**(1/4)*c**(1/4)*x + sqrt(a) + sqrt(c)*x**2)/(8*a**(7/4))
 + sqrt(2)*c**(3/4)*atan(1 - sqrt(2)*c**(1/4)*x/a**(1/4))/(4*a**(7
/4)) - sqrt(2)*c**(3/4)*atan(1 + sqrt(2)*c**(1/4)*x/a**(1/4))/(4*
a**(7/4))
```

Mathematica [A] time = 0.0664477, size = 188, normalized size = 0.96

$$\frac{-8a^{3/4} + 6\sqrt{2}c^{3/4}x^3\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right) - 6\sqrt{2}c^{3/4}x^3\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right) + 3\sqrt{2}c^{3/4}x^3\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right) - 3\sqrt{}}{24a^{7/4}x^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*(a + c*x^4)),x]
```

```
[Out] (-8*a^(3/4) + 6*Sqrt[2]*c^(3/4)*x^3*ArcTan[1 - (Sqrt[2]*c^(1/4)*x
)/a^(1/4)] - 6*Sqrt[2]*c^(3/4)*x^3*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)
/a^(1/4)] + 3*Sqrt[2]*c^(3/4)*x^3*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c
^(1/4)*x + Sqrt[c]*x^2] - 3*Sqrt[2]*c^(3/4)*x^3*Log[Sqrt[a] + Sqr
t[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(24*a^(7/4)*x^3)
```

Maple [A] time = 0.006, size = 139, normalized size = 0.7

$$-\frac{c\sqrt{2}}{8\,a^2}\sqrt[4]{\frac{a}{c}}\ln\left(1\left(x^2+\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)\left(x^2-\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)^{-1}\right)$$
$$-\frac{c\sqrt{2}}{4\,a^2}\sqrt[4]{\frac{a}{c}}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}+1\right)-\frac{c\sqrt{2}}{4\,a^2}\sqrt[4]{\frac{a}{c}}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}-1\right)-\frac{1}{3\,ax^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(c*x^4+a),x)
```

```
[Out] -1/8/a^2*c*(a/c)^(1/4)*2^(1/2)*ln((x^2+(a/c)^(1/4)*x*2^(1/2)+(a/c
)^(1/2))/(x^2-(a/c)^(1/4)*x*2^(1/2)+(a/c)^(1/2)))-1/4/a^2*c*(a/c)
^(1/4)*2^(1/2)*arctan(2^(1/2)/(a/c)^(1/4)*x+1)-1/4/a^2*c*(a/c)^(1
/4)*2^(1/2)*arctan(2^(1/2)/(a/c)^(1/4)*x-1)-1/3/a/x^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)*x^4),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.249701, size = 200, normalized size = 1.03

$$\frac{12\,ax^3\left(-\frac{c^3}{a^7}\right)^{\frac{1}{4}}\arctan\left(\frac{a^2\left(-\frac{c^3}{a^7}\right)^{\frac{1}{4}}}{cx+c\sqrt{\frac{a^4\sqrt{-\frac{c^3}{a^7}}+c^2x^2}{c^2}}}\right)-3\,ax^3\left(-\frac{c^3}{a^7}\right)^{\frac{1}{4}}\log\left(a^2\left(-\frac{c^3}{a^7}\right)^{\frac{1}{4}}+cx\right)+3\,ax^3\left(-\frac{c^3}{a^7}\right)^{\frac{1}{4}}\log\left(-a^2\left(-\frac{c^3}{a^7}\right)^{\frac{1}{4}}+cx\right)-}{12\,ax^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)*x^4),x, algorithm="fricas")
```

```
[Out] 1/12*(12*a*x^3*(-c^3/a^7)^(1/4)*arctan(a^2*(-c^3/a^7)^(1/4)/(c*x
+ c*sqrt((a^4*sqrt(-c^3/a^7) + c^2*x^2)/c^2))) - 3*a*x^3*(-c^3/a^
7)^(1/4)*log(a^2*(-c^3/a^7)^(1/4) + c*x) + 3*a*x^3*(-c^3/a^7)^(1/
4)*log(-a^2*(-c^3/a^7)^(1/4) + c*x) - 4)/(a*x^3)
```

Sympy [A] time = 1.58711, size = 32, normalized size = 0.16

$$\operatorname{RootSum}\left(256t^4a^7+c^3,\left(t\mapsto t\log\left(-\frac{4ta^2}{c}+x\right)\right)\right)-\frac{1}{3ax^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(c*x**4+a),x)
```

```
[Out] RootSum(256*_t**4*a**7 + c**3, Lambda(_t, _t*log(-4*_t*a**2/c + x
))) - 1/(3*a*x**3)
```

GIAC/XCAS [A] time = 0.22824, size = 236, normalized size = 1.21

$$-\frac{\sqrt{2}\left(ac^3\right)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x+\sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{4\,a^2}-\frac{\sqrt{2}\left(ac^3\right)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x-\sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{4\,a^2}-\frac{\sqrt{2}\left(ac^3\right)^{\frac{1}{4}}\ln\left(x^2+\sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{c}}\right)}{8\,a^2}+\frac{\sqrt{2}\left(ac^3\right)^{\frac{1}{4}}\ln\left(x^2-\sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{c}}\right)}{8\,a^2}-\frac{1}{3\,ax^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)*x^4),x, algorithm="giac")
```

```
[Out] -1/4*sqrt(2)*(a*c^3)^(1/4)*arctan(1/2*sqrt(2)*(2*x + sqrt(2)*(a/c
)^(1/4))/(a/c)^(1/4))/a^2 - 1/4*sqrt(2)*(a*c^3)^(1/4)*arctan(1/2*
sqrt(2)*(2*x - sqrt(2)*(a/c)^(1/4))/(a/c)^(1/4))/a^2 - 1/8*sqrt(2
)*(a*c^3)^(1/4)*ln(x^2 + sqrt(2)*x*(a/c)^(1/4) + sqrt(a/c))/a^2 +
 1/8*sqrt(2)*(a*c^3)^(1/4)*ln(x^2 - sqrt(2)*x*(a/c)^(1/4) + sqrt(
a/c))/a^2 - 1/3/(a*x^3)
```

3.656 $\int \frac{x^{11}}{(a+cx^4)^2} dx$

Optimal. Leaf size=46

$$-\frac{a^2}{4c^3(a+cx^4)}-\frac{a\log(a+cx^4)}{2c^3}+\frac{x^4}{4c^2}$$

```
[Out] x^4/(4*c^2) - a^2/(4*c^3*(a + c*x^4)) - (a*Log[a + c*x^4])/(2*c^3
)
```

Rubi [A] time = 0.0758085, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^2}{4c^3(a+cx^4)}-\frac{a\log(a+cx^4)}{2c^3}+\frac{x^4}{4c^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11/(a + c*x^4)^2,x]
```

```
[Out] x^4/(4*c^2) - a^2/(4*c^3*(a + c*x^4)) - (a*Log[a + c*x^4])/(2*c^3
)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^2}{4c^3(a+cx^4)}-\frac{a\log(a+cx^4)}{2c^3}+\frac{\int^{x^4}\frac{1}{c^2}\,dx}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11/(c*x**4+a)**2,x)
```

```
[Out] -a**2/(4*c**3*(a + c*x**4)) - a*log(a + c*x**4)/(2*c**3) + Integr
al(c**(-2), (x, x**4))/4
```

Mathematica [A] time = 0.0344519, size = 38, normalized size = 0.83

$$\frac{-\frac{a^2}{a+cx^4}-2a\log(a+cx^4)+cx^4}{4c^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11/(a + c*x^4)^2,x]
```

```
[Out] (c*x^4 - a^2/(a + c*x^4) - 2*a*Log[a + c*x^4])/(4*c^3)
```

Maple [A] time = 0.019, size = 41, normalized size = 0.9

$$\frac{x^4}{4\,c^2}-\frac{a^2}{4\,c^3(cx^4+a)}-\frac{a\ln(cx^4+a)}{2\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11/(c*x^4+a)^2,x)

[Out] 1/4*x^4/c^2-1/4*a^2/c^3/(c*x^4+a)-1/2*a*ln(c*x^4+a)/c^3
```

Maxima [A] time = 1.43671, size = 58, normalized size = 1.26

$$\frac{x^4}{4\,c^2} - \frac{a^2}{4\,(c^4x^4 + ac^3)} - \frac{a\log\left(cx^4 + a\right)}{2\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(c*x^4 + a)^2,x, algorithm="maxima")

[Out] 1/4*x^4/c^2 - 1/4*a^2/(c^4*x^4 + a*c^3) - 1/2*a*log(c*x^4 + a)/c^
3
```

Fricas [A] time = 0.224977, size = 76, normalized size = 1.65

$$\frac{c^2x^8 + acx^4 - a^2 - 2\left(acx^4 + a^2\right)\log\left(cx^4 + a\right)}{4\,(c^4x^4 + ac^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(c*x^4 + a)^2,x, algorithm="fricas")

[Out] 1/4*(c^2*x^8 + a*c*x^4 - a^2 - 2*(a*c*x^4 + a^2)*log(c*x^4 + a))/
(c^4*x^4 + a*c^3)
```

Sympy [A] time = 2.04735, size = 41, normalized size = 0.89

$$-\frac{a^2}{4ac^3 + 4c^4x^4} - \frac{a\log\left(a + cx^4\right)}{2c^3} + \frac{x^4}{4c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11/(c*x**4+a)**2,x)

[Out] -a**2/(4*a*c**3 + 4*c**4*x**4) - a*log(a + c*x**4)/(2*c**3) + x**
4/(4*c**2)
```

GIAC/XCAS [A] time = 0.22016, size = 66, normalized size = 1.43

$$\frac{x^4}{4\,c^2} - \frac{a\ln\left(\left|cx^4 + a\right|\right)}{2\,c^3} + \frac{2\,acx^4 + a^2}{4\,(cx^4 + a)c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(c*x^4 + a)^2,x, algorithm="giac")

[Out] 1/4*x^4/c^2 - 1/2*a*ln(abs(c*x^4 + a))/c^3 + 1/4*(2*a*c*x^4 + a^2
)/((c*x^4 + a)*c^3)
```

3.657 $\int \frac{x^9}{(a+cx^4)^2} dx$

Optimal. Leaf size=59

$$-\frac{3\sqrt{a}\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{4c^{5/2}}-\frac{x^6}{4c\left(a+cx^4\right)}+\frac{3x^2}{4c^2}$$

```
[Out] (3*x^2)/(4*c^2) - x^6/(4*c*(a + c*x^4)) - (3*Sqrt[a]*ArcTan[(Sqrt
[c]*x^2)/Sqrt[a]])/(4*c^(5/2))
```

Rubi [A] time = 0.0777882, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$-\frac{3\sqrt{a}\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{4c^{5/2}}-\frac{x^6}{4c\left(a+cx^4\right)}+\frac{3x^2}{4c^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^9/(a + c*x^4)^2,x]
```

```
[Out] (3*x^2)/(4*c^2) - x^6/(4*c*(a + c*x^4)) - (3*Sqrt[a]*ArcTan[(Sqrt
[c]*x^2)/Sqrt[a]])/(4*c^(5/2))
```

Rubi in Sympy [A] time = 13.1356, size = 51, normalized size = 0.86

$$-\frac{3\sqrt{a}\,\mathrm{atan}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{4c^{\frac{5}{2}}}-\frac{x^6}{4c\left(a+cx^4\right)}+\frac{3x^2}{4c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**9/(c*x**4+a)**2,x)
```

```
[Out] -3*sqrt(a)*atan(sqrt(c)*x**2/sqrt(a))/(4*c**(5/2)) - x**6/(4*c*(a
 + c*x**4)) + 3*x**2/(4*c**2)
```

Mathematica [A] time = 0.0822974, size = 60, normalized size = 1.02

$$-\frac{3\sqrt{a}\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{4c^{5/2}}+\frac{ax^2}{4c^2\left(a+cx^4\right)}+\frac{x^2}{2c^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^9/(a + c*x^4)^2,x]
```

```
[Out] x^2/(2*c^2) + (a*x^2)/(4*c^2*(a + c*x^4)) - (3*Sqrt[a]*ArcTan[(Sq
rt[c]*x^2)/Sqrt[a]])/(4*c^(5/2))
```

Maple [A] time = 0.014, size = 50, normalized size = 0.9

$$\frac{x^2}{2\,c^2}+\frac{ax^2}{4\,c^2\left(cx^4+a\right)}-\frac{3\,a}{4\,c^2}\arctan\left(cx^2\frac{1}{\sqrt{ac}}\right)\frac{1}{\sqrt{ac}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^9/(c*x^4+a)^2,x)
```

```
[Out] 1/2*x^2/c^2+1/4*a/c^2*x^2/(c*x^4+a)-3/4*a/c^2/(a*c)^(1/2)*arctan(
c*x^2/(a*c)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(c*x^4 + a)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.24373, size = 1, normalized size = 0.02

$$\left[\frac{4\,cx^6+6\,ax^2+3\,(cx^4+a)\,\sqrt{-\frac{a}{c}}\log\left(\frac{cx^4-2\,cx^2\sqrt{-\frac{a}{c}}-a}{cx^4+a}\right)}{8\,(c^3x^4+ac^2)},\ \frac{2\,cx^6+3\,ax^2-3\,(cx^4+a)\,\sqrt{\frac{a}{c}}\arctan\left(\frac{x^2}{\sqrt{\frac{a}{c}}}\right)}{4\,(c^3x^4+ac^2)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(c*x^4 + a)^2,x, algorithm="fricas")
```

```
[Out] [1/8*(4*c*x^6 + 6*a*x^2 + 3*(c*x^4 + a)*sqrt(-a/c)*log((c*x^4 - 2
*c*x^2*sqrt(-a/c) - a)/(c*x^4 + a)))/(c^3*x^4 + a*c^2), 1/4*(2*c*
x^6 + 3*a*x^2 - 3*(c*x^4 + a)*sqrt(a/c)*arctan(x^2/sqrt(a/c)))/(c
^3*x^4 + a*c^2)]
```

Sympy [A] time = 2.13898, size = 92, normalized size = 1.56

$$\frac{ax^2}{4ac^2+4c^3x^4}+\frac{3\sqrt{-\frac{a}{c^5}}\log\left(-c^2\sqrt{-\frac{a}{c^5}}+x^2\right)}{8}-\frac{3\sqrt{-\frac{a}{c^5}}\log\left(c^2\sqrt{-\frac{a}{c^5}}+x^2\right)}{8}+\frac{x^2}{2c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**9/(c*x**4+a)**2,x)
```

```
[Out] a*x**2/(4*a*c**2 + 4*c**3*x**4) + 3*sqrt(-a/c**5)*log(-c**2*sqrt(
-a/c**5) + x**2)/8 - 3*sqrt(-a/c**5)*log(c**2*sqrt(-a/c**5) + x**
2)/8 + x**2/(2*c**2)
```

GIAC/XCAS [A] time = 0.221287, size = 66, normalized size = 1.12

$$\frac{ax^2}{4\,(cx^4+a)c^2}+\frac{x^2}{2\,c^2}-\frac{3\,a\arctan\left(\frac{cx^2}{\sqrt{ac}}\right)}{4\,\sqrt{ac}c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(c*x^4 + a)^2,x, algorithm="giac")
```

```
[Out] 1/4*a*x^2/((c*x^4 + a)*c^2) + 1/2*x^2/c^2 - 3/4*a*arctan(c*x^2/sq
rt(a*c))/(sqrt(a*c)*c^2)
```

3.658 $\int \frac{x^7}{(a+cx^4)^2}\,dx$

Optimal. Leaf size=33

$$\frac{a}{4c^2(a+cx^4)}+\frac{\log(a+cx^4)}{4c^2}$$

```
[Out] a/(4*c^2*(a + c*x^4)) + Log[a + c*x^4]/(4*c^2)
```

Rubi [A] time = 0.0556498, antiderivative size = 33, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a}{4c^2(a+cx^4)}+\frac{\log(a+cx^4)}{4c^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7/(a + c*x^4)^2,x]

[Out] a/(4*c^2*(a + c*x^4)) + Log[a + c*x^4]/(4*c^2)
```

Rubi in Sympy [A] time = 7.45886, size = 26, normalized size = 0.79

$$\frac{a}{4c^2(a+cx^4)}+\frac{\log(a+cx^4)}{4c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7/(c*x**4+a)**2,x)

[Out] a/(4*c**2*(a + c*x**4)) + log(a + c*x**4)/(4*c**2)
```

Mathematica [A] time = 0.0185315, size = 27, normalized size = 0.82

$$\frac{\frac{a}{a+cx^4}+\log(a+cx^4)}{4c^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^7/(a + c*x^4)^2,x]

[Out] (a/(a + c*x^4) + Log[a + c*x^4])/(4*c^2)
```

Maple [A] time = 0.014, size = 30, normalized size = 0.9

$$\frac{a}{4\,c^2(cx^4+a)}+\frac{\ln(cx^4+a)}{4\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7/(c*x^4+a)^2,x)
```

```
[Out] 1/4*a/c^2/(c*x^4+a)+1/4*ln(c*x^4+a)/c^2
```

Maxima [A] time = 1.44569, size = 43, normalized size = 1.3

$$\frac{a}{4\,(c^3x^4+ac^2)}+\frac{\log\left(cx^4+a\right)}{4\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(c*x^4 + a)^2,x, algorithm="maxima")
```

```
[Out] 1/4*a/(c^3*x^4 + a*c^2) + 1/4*log(c*x^4 + a)/c^2
```

Fricas [A] time = 0.243661, size = 47, normalized size = 1.42

$$\frac{\left(cx^4+a\right)\log\left(cx^4+a\right)+a}{4\,(c^3x^4+ac^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(c*x^4 + a)^2,x, algorithm="fricas")
```

```
[Out] 1/4*((c*x^4 + a)*log(c*x^4 + a) + a)/(c^3*x^4 + a*c^2)
```

Sympy [A] time = 1.8564, size = 29, normalized size = 0.88

$$\frac{a}{4ac^2+4c^3x^4}+\frac{\log\left(a+cx^4\right)}{4c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(c*x**4+a)**2,x)
```

```
[Out] a/(4*a*c**2 + 4*c**3*x**4) + log(a + c*x**4)/(4*c**2)
```

GIAC/XCAS [A] time = 0.221555, size = 65, normalized size = 1.97

$$-\frac{\frac{\ln\left(\frac{|cx^4+a|}{\left(cx^4+a\right)^2|c|}\right)}{c}-\frac{a}{(cx^4+a)c}}{4\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(c*x^4 + a)^2,x, algorithm="giac")
```

```
[Out] -1/4*(ln(abs(c*x^4 + a)/((c*x^4 + a)^2*abs(c)))/c - a/((c*x^4 + a
)*c))/c
```

3.659 $\int \frac{x^5}{(a+cx^4)^2}\,dx$

Optimal. Leaf size=49

$$\frac{\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{4\sqrt{a}c^{3/2}}-\frac{x^2}{4c\,(a+cx^4)}$$

```
[Out] -x^2/(4*c*(a + c*x^4)) + ArcTan[(Sqrt[c]*x^2)/Sqrt[a]]/(4*Sqrt[a]
*c^(3/2))
```

Rubi [A] time = 0.0589047, antiderivative size = 49, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{4\sqrt{a}c^{3/2}}-\frac{x^2}{4c\,(a+cx^4)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/(a + c*x^4)^2,x]
```

```
[Out] -x^2/(4*c*(a + c*x^4)) + ArcTan[(Sqrt[c]*x^2)/Sqrt[a]]/(4*Sqrt[a]
*c^(3/2))
```

Rubi in Sympy [A] time = 8.7489, size = 39, normalized size = 0.8

$$-\frac{x^2}{4c\,(a+cx^4)}+\frac{\operatorname{atan}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{4\sqrt{a}c^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(c*x**4+a)**2,x)
```

```
[Out] -x**2/(4*c*(a + c*x**4)) + atan(sqrt(c)*x**2/sqrt(a))/(4*sqrt(a)*
c**(3/2))
```

Mathematica [A] time = 0.0410628, size = 49, normalized size = 1.

$$\frac{\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{4\sqrt{a}c^{3/2}}-\frac{x^2}{4c\,(a+cx^4)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/(a + c*x^4)^2,x]
```

```
[Out] -x^2/(4*c*(a + c*x^4)) + ArcTan[(Sqrt[c]*x^2)/Sqrt[a]]/(4*Sqrt[a]
*c^(3/2))
```

Maple [A] time = 0.013, size = 40, normalized size = 0.8

$$-\frac{x^2}{4\,c\,(cx^4+a)}+\frac{1}{4\,c}\arctan\left(cx^2\frac{1}{\sqrt{ac}}\right)\frac{1}{\sqrt{ac}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(c*x^4+a)^2,x)
```

```
[Out] -1/4*x^2/c/(c*x^4+a)+1/4/c/(a*c)^(1/2)*arctan(c*x^2/(a*c)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(c*x^4 + a)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.228168, size = 1, normalized size = 0.02

$$\left[-\frac{2\sqrt{-ac}x^2 - (cx^4 + a)\log\left(\frac{2\,acx^2 + (cx^4 - a)\sqrt{-ac}}{cx^4 + a}\right)}{8\,(c^2x^4 + ac)\sqrt{-ac}}, -\frac{\sqrt{ac}x^2 + (cx^4 + a)\arctan\left(\frac{a}{\sqrt{ac}x^2}\right)}{4\,(c^2x^4 + ac)\sqrt{ac}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(c*x^4 + a)^2,x, algorithm="fricas")
```

```
[Out] [-1/8*(2*sqrt(-a*c)*x^2 - (c*x^4 + a)*log((2*a*c*x^2 + (c*x^4 - a
)*sqrt(-a*c))/(c*x^4 + a)))/((c^2*x^4 + a*c)*sqrt(-a*c)), -1/4*(s
qrt(a*c)*x^2 + (c*x^4 + a)*arctan(a/(sqrt(a*c)*x^2)))/((c^2*x^4 +
 a*c)*sqrt(a*c))]
```

Sympy [A] time = 1.88744, size = 83, normalized size = 1.69

$$-\frac{x^2}{4ac + 4c^2x^4} - \frac{\sqrt{-\frac{1}{ac^3}}\log\left(-ac\sqrt{-\frac{1}{ac^3}} + x^2\right)}{8} + \frac{\sqrt{-\frac{1}{ac^3}}\log\left(ac\sqrt{-\frac{1}{ac^3}} + x^2\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(c*x**4+a)**2,x)
```

```
[Out] -x**2/(4*a*c + 4*c**2*x**4) - sqrt(-1/(a*c**3))*log(-a*c*sqrt(-1/
(a*c**3)) + x**2)/8 + sqrt(-1/(a*c**3))*log(a*c*sqrt(-1/(a*c**3))
 + x**2)/8
```

GIAC/XCAS [A] time = 0.223306, size = 53, normalized size = 1.08

$$-\frac{x^2}{4\,(cx^4 + a)c} + \frac{\arctan\left(\frac{cx^2}{\sqrt{ac}}\right)}{4\,\sqrt{ac}c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(c*x^4 + a)^2,x, algorithm="giac")
```

```
[Out] -1/4*x^2/((c*x^4 + a)*c) + 1/4*arctan(c*x^2/sqrt(a*c))/(sqrt(a*c)
*c)
```

3.660 $\int \frac{x^3}{(a+cx^4)^2}\,dx$

Optimal. Leaf size=16

$$-\frac{1}{4c\,(a+cx^4)}$$

```
[Out] -1/(4*c*(a + c*x^4))
```

Rubi [A] time = 0.00971756, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{1}{4c\,(a+cx^4)}$$

Antiderivative was successfully verified.

```
[In] Int[x^3/(a + c*x^4)^2,x]

[Out] -1/(4*c*(a + c*x^4))
```

Rubi in Sympy [A] time = 2.13711, size = 12, normalized size = 0.75

$$-\frac{1}{4c\,(a+cx^4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**3/(c*x**4+a)**2,x)

[Out] -1/(4*c*(a + c*x**4))
```

Mathematica [A] time = 0.00764503, size = 16, normalized size = 1.

$$-\frac{1}{4c\,(a+cx^4)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3/(a + c*x^4)^2,x]

[Out] -1/(4*c*(a + c*x^4))
```

Maple [A] time = 0.001, size = 15, normalized size = 0.9

$$-\frac{1}{4\,c\,(cx^4+a)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(c*x^4+a)^2,x)

[Out] -1/4/c/(c*x^4+a)
```

Maxima [A] time = 1.4462, size = 19, normalized size = 1.19

$$-\frac{1}{4\,(cx^4+a)c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(c*x^4 + a)^2,x, algorithm="maxima")

[Out] -1/4/((c*x^4 + a)*c)
```

Fricas [A] time = 0.220257, size = 20, normalized size = 1.25

$$-\frac{1}{4\,(c^2x^4+ac)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(c*x^4 + a)^2,x, algorithm="fricas")

[Out] -1/4/(c^2*x^4 + a*c)
```

Sympy [A] time = 1.61802, size = 15, normalized size = 0.94

$$-\frac{1}{4ac+4c^2x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(c*x**4+a)**2,x)

[Out] -1/(4*a*c + 4*c**2*x**4)
```

GIAC/XCAS [A] time = 0.217045, size = 19, normalized size = 1.19

$$-\frac{1}{4\,(cx^4+a)c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(c*x^4 + a)^2,x, algorithm="giac")

[Out] -1/4/((c*x^4 + a)*c)
```

3.661 $\int \frac{x}{(a+cx^4)^2}\,dx$

Optimal. Leaf size=49

$$\frac{\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{4a^{3/2}\sqrt{c}}+\frac{x^2}{4a\left(a+cx^4\right)}$$

```
[Out] x^2/(4*a*(a + c*x^4)) + ArcTan[(Sqrt[c]*x^2)/Sqrt[a]]/(4*a^(3/2)*
Sqrt[c])
```

Rubi [A] time = 0.050205, antiderivative size = 49, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273

$$\frac{\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{4a^{3/2}\sqrt{c}}+\frac{x^2}{4a\left(a+cx^4\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + c*x^4)^2,x]
```

```
[Out] x^2/(4*a*(a + c*x^4)) + ArcTan[(Sqrt[c]*x^2)/Sqrt[a]]/(4*a^(3/2)*
Sqrt[c])
```

Rubi in Sympy [A] time = 6.21374, size = 39, normalized size = 0.8

$$\frac{x^2}{4a\left(a+cx^4\right)}+\frac{\operatorname{atan}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{4a^{\frac{3}{2}}\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(c*x**4+a)**2,x)
```

```
[Out] x**2/(4*a*(a + c*x**4)) + atan(sqrt(c)*x**2/sqrt(a))/(4*a**(3/2)*
sqrt(c))
```

Mathematica [A] time = 0.0511806, size = 49, normalized size = 1.

$$\frac{\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{4a^{3/2}\sqrt{c}}+\frac{x^2}{4a\left(a+cx^4\right)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + c*x^4)^2,x]
```

```
[Out] x^2/(4*a*(a + c*x^4)) + ArcTan[(Sqrt[c]*x^2)/Sqrt[a]]/(4*a^(3/2)*
Sqrt[c])
```

Maple [A] time = 0.008, size = 40, normalized size = 0.8

$$\frac{x^2}{4\,a\left(cx^4+a\right)}+\frac{1}{4\,a}\arctan\left(cx^2\frac{1}{\sqrt{ac}}\right)\frac{1}{\sqrt{ac}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(c*x^4+a)^2,x)
```

```
[Out] 1/4*x^2/a/(c*x^4+a)+1/4/a/(a*c)^(1/2)*arctan(c*x^2/(a*c)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(c*x^4 + a)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.247717, size = 1, normalized size = 0.02

$$\left[\frac{2\sqrt{-ac}x^2 + (cx^4+a)\log\left(\frac{2acx^2+(cx^4-a)\sqrt{-ac}}{cx^4+a}\right)}{8(acx^4+a^2)\sqrt{-ac}}, \frac{\sqrt{ac}x^2 - (cx^4+a)\arctan\left(\frac{a}{\sqrt{ac}x^2}\right)}{4(acx^4+a^2)\sqrt{ac}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(c*x^4 + a)^2,x, algorithm="fricas")
```

```
[Out] [1/8*(2*sqrt(-a*c)*x^2 + (c*x^4 + a)*log((2*a*c*x^2 + (c*x^4 - a)
*sqrt(-a*c))/(c*x^4 + a)))/((a*c*x^4 + a^2)*sqrt(-a*c)), 1/4*(sqr
t(a*c)*x^2 - (c*x^4 + a)*arctan(a/(sqrt(a*c)*x^2)))/((a*c*x^4 + a
^2)*sqrt(a*c))]
```

Sympy [A] time = 1.85093, size = 83, normalized size = 1.69

$$\frac{x^2}{4a^2+4acx^4} - \frac{\sqrt{-\frac{1}{a^3c}}\log\left(-a^2\sqrt{-\frac{1}{a^3c}}+x^2\right)}{8} + \frac{\sqrt{-\frac{1}{a^3c}}\log\left(a^2\sqrt{-\frac{1}{a^3c}}+x^2\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(c*x**4+a)**2,x)
```

```
[Out] x**2/(4*a**2 + 4*a*c*x**4) - sqrt(-1/(a**3*c))*log(-a**2*sqrt(-1/
(a**3*c)) + x**2)/8 + sqrt(-1/(a**3*c))*log(a**2*sqrt(-1/(a**3*c)
) + x**2)/8
```

GIAC/XCAS [A] time = 0.218429, size = 53, normalized size = 1.08

$$\frac{x^2}{4(cx^4+a)a} + \frac{\arctan\left(\frac{cx^2}{\sqrt{ac}}\right)}{4\sqrt{ac}a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(c*x^4 + a)^2,x, algorithm="giac")
```

```
[Out] 1/4*x^2/((c*x^4 + a)*a) + 1/4*arctan(c*x^2/sqrt(a*c))/(sqrt(a*c)*
a)
```

3.662 $\int \frac{1}{x(a+cx^4)^2}\,dx$

Optimal. Leaf size=38

$$-\frac{\log\left(a+cx^4\right)}{4a^2}+\frac{\log(x)}{a^2}+\frac{1}{4a\left(a+cx^4\right)}$$

```
[Out] 1/(4*a*(a + c*x^4)) + Log[x]/a^2 - Log[a + c*x^4]/(4*a^2)
```

Rubi [A] time = 0.0586852, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{\log\left(a+cx^4\right)}{4a^2}+\frac{\log(x)}{a^2}+\frac{1}{4a\left(a+cx^4\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a + c*x^4)^2),x]
```

```
[Out] 1/(4*a*(a + c*x^4)) + Log[x]/a^2 - Log[a + c*x^4]/(4*a^2)
```

Rubi in Sympy [A] time = 8.2986, size = 34, normalized size = 0.89

$$\frac{1}{4a\left(a+cx^4\right)}+\frac{\log\left(x^4\right)}{4a^2}-\frac{\log\left(a+cx^4\right)}{4a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(c*x**4+a)**2,x)
```

```
[Out] 1/(4*a*(a + c*x**4)) + log(x**4)/(4*a**2) - log(a + c*x**4)/(4*a*
*2)
```

Mathematica [A] time = 0.0236803, size = 33, normalized size = 0.87

$$\frac{\frac{a}{a+cx^4}-\log\left(a+cx^4\right)+4\log(x)}{4a^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a + c*x^4)^2),x]
```

```
[Out] (a/(a + c*x^4) + 4*Log[x] - Log[a + c*x^4])/(4*a^2)
```

Maple [A] time = 0.02, size = 35, normalized size = 0.9

$$\frac{1}{4\,a\left(cx^4+a\right)}+\frac{\ln(x)}{a^2}-\frac{\ln\left(cx^4+a\right)}{4\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(c*x^4+a)^2,x)
```

```
[Out] 1/4/a/(c*x^4+a)+ln(x)/a^2-1/4*ln(c*x^4+a)/a^2
```

Maxima [A] time = 1.42478, size = 50, normalized size = 1.32

$$\frac{1}{4\left(acx^4+a^2\right)}-\frac{\log\left(cx^4+a\right)}{4\,a^2}+\frac{\log\left(x^4\right)}{4\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)^2*x),x, algorithm="maxima")
```

```
[Out] 1/4/(a*c*x^4 + a^2) - 1/4*log(c*x^4 + a)/a^2 + 1/4*log(x^4)/a^2
```

Fricas [A] time = 0.233987, size = 63, normalized size = 1.66

$$-\frac{\left(cx^4+a\right)\log\left(cx^4+a\right)-4\left(cx^4+a\right)\log\left(x\right)-a}{4\left(a^2cx^4+a^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)^2*x),x, algorithm="fricas")
```

```
[Out] -1/4*((c*x^4 + a)*log(c*x^4 + a) - 4*(c*x^4 + a)*log(x) - a)/(a^2
*c*x^4 + a^3)
```

Sympy [A] time = 2.35357, size = 34, normalized size = 0.89

$$\frac{1}{4a^2+4acx^4}+\frac{\log\left(x\right)}{a^2}-\frac{\log\left(\frac{a}{c}+x^4\right)}{4a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(c*x**4+a)**2,x)
```

```
[Out] 1/(4*a**2 + 4*a*c*x**4) + log(x)/a**2 - log(a/c + x**4)/(4*a**2)
```

GIAC/XCAS [A] time = 0.223932, size = 63, normalized size = 1.66

$$\frac{\ln\left(x^4\right)}{4\,a^2}-\frac{\ln\left(\left|cx^4+a\right|\right)}{4\,a^2}+\frac{cx^4+2\,a}{4\left(cx^4+a\right)a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)^2*x),x, algorithm="giac")
```

```
[Out] 1/4*ln(x^4)/a^2 - 1/4*ln(abs(c*x^4 + a))/a^2 + 1/4*(c*x^4 + 2*a)/
((c*x^4 + a)*a^2)
```

3.663 $\int \frac{1}{x^3(a+cx^4)^2}\,dx$

Optimal. Leaf size=59

$$-\frac{3\sqrt{c}\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{4a^{5/2}}-\frac{3}{4a^2x^2}+\frac{1}{4ax^2(a+cx^4)}$$

```
[Out] -3/(4*a^2*x^2) + 1/(4*a*x^2*(a + c*x^4)) - (3*Sqrt[c]*ArcTan[(Sqr
t[c]*x^2)/Sqrt[a]])/(4*a^(5/2))
```

Rubi [A] time = 0.0726742, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$-\frac{3\sqrt{c}\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{4a^{5/2}}-\frac{3}{4a^2x^2}+\frac{1}{4ax^2(a+cx^4)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(a + c*x^4)^2),x]
```

```
[Out] -3/(4*a^2*x^2) + 1/(4*a*x^2*(a + c*x^4)) - (3*Sqrt[c]*ArcTan[(Sqr
t[c]*x^2)/Sqrt[a]])/(4*a^(5/2))
```

Rubi in Sympy [A] time = 12.3762, size = 53, normalized size = 0.9

$$\frac{1}{4ax^2(a+cx^4)}-\frac{3}{4a^2x^2}-\frac{3\sqrt{c}\operatorname{atan}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{4a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(c*x**4+a)**2,x)
```

```
[Out] 1/(4*a*x**2*(a + c*x**4)) - 3/(4*a**2*x**2) - 3*sqrt(c)*atan(sqrt
(c)*x**2/sqrt(a))/(4*a**(5/2))
```

Mathematica [A] time = 0.121747, size = 94, normalized size = 1.59

$$\frac{-\frac{\sqrt{a}(2a+3cx^4)}{x^2(a+cx^4)}+3\sqrt{c}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)+3\sqrt{c}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{4a^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*(a + c*x^4)^2),x]
```

```
[Out] (-((Sqrt[a]*(2*a + 3*c*x^4))/(x^2*(a + c*x^4))) + 3*Sqrt[c]*ArcTa
n[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)] + 3*Sqrt[c]*ArcTan[1 + (Sqrt[2
]*c^(1/4)*x)/a^(1/4)])/(4*a^(5/2))
```

Maple [A] time = 0.017, size = 50, normalized size = 0.9

$$-\frac{1}{2\,a^2x^2}-\frac{cx^2}{4\,a^2\,(cx^4+a)}-\frac{3\,c}{4\,a^2}\arctan\left(cx^2\frac{1}{\sqrt{ac}}\right)\frac{1}{\sqrt{ac}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^3/(c*x^4+a)^2,x)
```

```
[Out] -1/2/a^2/x^2-1/4/a^2*c*x^2/(c*x^4+a)-3/4/a^2*c/(a*c)^(1/2)*arctan
(c*x^2/(a*c)^(1/2))
```

Maxima [F]   time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((c*x^4 + a)^2*x^3),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A]   time = 0.239564, size = 1, normalized size = 0.02

$$\left[-\frac{6\,cx^4 - 3\,(cx^6 + ax^2)\sqrt{-\frac{c}{a}}\log\left(\frac{cx^4 - 2\,ax^2\sqrt{-\frac{c}{a}} - a}{cx^4 + a}\right) + 4\,a}{8\,(a^2cx^6 + a^3x^2)}, -\frac{3\,cx^4 - 3\,(cx^6 + ax^2)\sqrt{\frac{c}{a}}\arctan\left(\frac{a\sqrt{\frac{c}{a}}}{cx^2}\right) + 2\,a}{4\,(a^2cx^6 + a^3x^2)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((c*x^4 + a)^2*x^3),x, algorithm="fricas")
```

```
[Out] [-1/8*(6*c*x^4 - 3*(c*x^6 + a*x^2)*sqrt(-c/a)*log((c*x^4 - 2*a*x^
2*sqrt(-c/a) - a)/(c*x^4 + a)) + 4*a)/(a^2*c*x^6 + a^3*x^2), -1/4
*(3*c*x^4 - 3*(c*x^6 + a*x^2)*sqrt(c/a)*arctan(a*sqrt(c/a)/(c*x^2
)) + 2*a)/(a^2*c*x^6 + a^3*x^2)]
```

Sympy [A]   time = 3.7234, size = 95, normalized size = 1.61

$$\frac{3\sqrt{-\frac{c}{a^5}}\log\left(-\frac{a^3\sqrt{-\frac{c}{a^5}}}{c} + x^2\right)}{8} - \frac{3\sqrt{-\frac{c}{a^5}}\log\left(\frac{a^3\sqrt{-\frac{c}{a^5}}}{c} + x^2\right)}{8} - \frac{2a + 3cx^4}{4a^3x^2 + 4a^2cx^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/x**3/(c*x**4+a)**2,x)
```

```
[Out] 3*sqrt(-c/a**5)*log(-a**3*sqrt(-c/a**5)/c + x**2)/8 - 3*sqrt(-c/a
**5)*log(a**3*sqrt(-c/a**5)/c + x**2)/8 - (2*a + 3*c*x**4)/(4*a**
3*x**2 + 4*a**2*c*x**6)
```

GIAC/XCAS [A]   time = 0.217758, size = 69, normalized size = 1.17

$$-\frac{3\,c\arctan\left(\frac{cx^2}{\sqrt{ac}}\right)}{4\,\sqrt{ac}a^2} - \frac{3\,cx^4 + 2\,a}{4\,(cx^6 + ax^2)a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)^2*x^3),x, algorithm="giac")
```

```
[Out] -3/4*c*arctan(c*x^2/sqrt(a*c))/(sqrt(a*c)*a^2) - 1/4*(3*c*x^4 + 2
*a)/((c*x^6 + a*x^2)*a^2)
```

3.664 $\int \frac{x^6}{(a+cx^4)^2}\,dx$

Optimal. Leaf size=204

$$\frac{3\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{16\sqrt{2}\sqrt[4]{a}c^{7/4}}-\frac{3\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{16\sqrt{2}\sqrt[4]{a}c^{7/4}}-\frac{3\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{8\sqrt{2}\sqrt[4]{a}c^{7/4}}+\frac{3\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{8\sqrt{2}\sqrt[4]{a}c^{7/4}}-\frac{x^3}{4c\left(a+cx^4\right)}$$

```
[Out] -x^3/(4*c*(a + c*x^4)) - (3*ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4
)])/(8*Sqrt[2]*a^(1/4)*c^(7/4)) + (3*ArcTan[1 + (Sqrt[2]*c^(1/4)*
x)/a^(1/4)])/(8*Sqrt[2]*a^(1/4)*c^(7/4)) + (3*Log[Sqrt[a] - Sqrt[
2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(16*Sqrt[2]*a^(1/4)*c^(7/4))
 - (3*Log[Sqrt[a] + Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(16
*Sqrt[2]*a^(1/4)*c^(7/4))
```

Rubi [A] time = 0.263406, antiderivative size = 204, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538

$$\frac{3\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{16\sqrt{2}\sqrt[4]{a}c^{7/4}}-\frac{3\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{16\sqrt{2}\sqrt[4]{a}c^{7/4}}-\frac{3\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{8\sqrt{2}\sqrt[4]{a}c^{7/4}}+\frac{3\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{8\sqrt{2}\sqrt[4]{a}c^{7/4}}-\frac{x^3}{4c\left(a+cx^4\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/(a + c*x^4)^2,x]
```

```
[Out] -x^3/(4*c*(a + c*x^4)) - (3*ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4
)])/(8*Sqrt[2]*a^(1/4)*c^(7/4)) + (3*ArcTan[1 + (Sqrt[2]*c^(1/4)*
x)/a^(1/4)])/(8*Sqrt[2]*a^(1/4)*c^(7/4)) + (3*Log[Sqrt[a] - Sqrt[
2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(16*Sqrt[2]*a^(1/4)*c^(7/4))
 - (3*Log[Sqrt[a] + Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(16
*Sqrt[2]*a^(1/4)*c^(7/4))
```

Rubi in Sympy [A] time = 53.8217, size = 192, normalized size = 0.94

$$-\frac{x^3}{4c\left(a+cx^4\right)}+\frac{3\sqrt{2}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{32\sqrt[4]{a}c^{\frac{7}{4}}}-\frac{3\sqrt{2}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{32\sqrt[4]{a}c^{\frac{7}{4}}}-\frac{3\sqrt{2}\,\mathrm{atan}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{16\sqrt[4]{a}c^{\frac{7}{4}}}+\frac{3\sqrt{2}\,\mathrm{atan}\left(1+\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{16\sqrt[4]{a}c^{\frac{7}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(c*x**4+a)**2,x)
```

```
[Out] -x**3/(4*c*(a + c*x**4)) + 3*sqrt(2)*log(-sqrt(2)*a**(1/4)*c**(1/
4)*x + sqrt(a) + sqrt(c)*x**2)/(32*a**(1/4)*c**(7/4)) - 3*sqrt(2)
*log(sqrt(2)*a**(1/4)*c**(1/4)*x + sqrt(a) + sqrt(c)*x**2)/(32*a*
*(1/4)*c**(7/4)) - 3*sqrt(2)*atan(1 - sqrt(2)*c**(1/4)*x/a**(1/4)
)/(16*a**(1/4)*c**(7/4)) + 3*sqrt(2)*atan(1 + sqrt(2)*c**(1/4)*x/
a**(1/4))/(16*a**(1/4)*c**(7/4))
```

Mathematica [A] time = 0.300103, size = 185, normalized size = 0.91

$$\frac{-\frac{8c^{3/4}x^3}{a+cx^4}+\frac{3\sqrt{2}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{\sqrt[4]{a}}-\frac{3\sqrt{2}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{\sqrt[4]{a}}-\frac{6\sqrt{2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{\sqrt[4]{a}}+\frac{6\sqrt{2}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{\sqrt[4]{a}}}{32c^{7/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6/(a + c*x^4)^2,x]
```

```
[Out] ((-8*c^(3/4)*x^3)/(a + c*x^4) - (6*Sqrt[2]*ArcTan[1 - (Sqrt[2]*c^
(1/4)*x)/a^(1/4)])/a^(1/4) + (6*Sqrt[2]*ArcTan[1 + (Sqrt[2]*c^(1/
4)*x)/a^(1/4)])/a^(1/4) + (3*Sqrt[2]*Log[Sqrt[a] - Sqrt[2]*a^(1/4
)*c^(1/4)*x + Sqrt[c]*x^2])/a^(1/4) - (3*Sqrt[2]*Log[Sqrt[a] + Sq
rt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/a^(1/4))/(32*c^(7/4))
```

Maple [A] time = 0.011, size = 145, normalized size = 0.7

$$-\frac{x^3}{4\,c\,(cx^4+a)}+\frac{3\,\sqrt{2}}{32\,c^2}\ln\left(1\left(x^2-\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)\left(x^2+\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)^{-1}\right)\frac{1}{\sqrt[4]{\frac{a}{c}}}+\frac{3\,\sqrt{2}}{16\,c^2}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}+1\right)\frac{1}{\sqrt[4]{\frac{a}{c}}}+\frac{3\,\sqrt{2}}{16\,c^2}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}-1\right)\frac{1}{\sqrt[4]{\frac{a}{c}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(c*x^4+a)^2,x)
```

```
[Out] -1/4*x^3/c/(c*x^4+a)+3/32/c^2/(a/c)^(1/4)*2^(1/2)*ln((x^2-(a/c)^(
1/4)*x*2^(1/2)+(a/c)^(1/2))/(x^2+(a/c)^(1/4)*x*2^(1/2)+(a/c)^(1/2
)))+3/16/c^2/(a/c)^(1/4)*2^(1/2)*arctan(2^(1/2)/(a/c)^(1/4)*x+1)+
3/16/c^2/(a/c)^(1/4)*2^(1/2)*arctan(2^(1/2)/(a/c)^(1/4)*x-1)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(c*x^4 + a)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.247078, size = 228, normalized size = 1.12

$$-\frac{4\,x^3-12\,(c^2x^4+ac)\left(-\frac{1}{ac^7}\right)^{\frac{1}{4}}\arctan\left(\frac{ac^5\left(-\frac{1}{ac^7}\right)^{\frac{3}{4}}}{x+\sqrt{-ac^3\sqrt{-\frac{1}{ac^7}}+x^2}}\right)-3\,(c^2x^4+ac)\left(-\frac{1}{ac^7}\right)^{\frac{1}{4}}\log\left(ac^5\left(-\frac{1}{ac^7}\right)^{\frac{3}{4}}+x\right)+3\,(c^2x^4+ac)}{16\,(c^2x^4+ac)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(c*x^4 + a)^2,x, algorithm="fricas")
```

```
[Out] -1/16*(4*x^3 - 12*(c^2*x^4 + a*c)*(-1/(a*c^7))^(1/4)*arctan(a*c^5
*(-1/(a*c^7))^(3/4)/(x + sqrt(-a*c^3*sqrt(-1/(a*c^7)) + x^2))) -
3*(c^2*x^4 + a*c)*(-1/(a*c^7))^(1/4)*log(a*c^5*(-1/(a*c^7))^(3/4)
 + x) + 3*(c^2*x^4 + a*c)*(-1/(a*c^7))^(1/4)*log(-a*c^5*(-1/(a*c^
7))^(3/4) + x))/(c^2*x^4 + a*c)
```

Sympy [A] time = 1.88773, size = 44, normalized size = 0.22

$$-\frac{x^3}{4ac+4c^2x^4}+\operatorname{RootSum}\left(65536t^4ac^7+81,\left(t\mapsto t\log\left(\frac{4096t^3ac^5}{27}+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(c*x**4+a)**2,x)
```

```
[Out] -x**3/(4*a*c + 4*c**2*x**4) + RootSum(65536*_t**4*a*c**7 + 81, La
mbda(_t, _t*log(4096*_t**3*a*c**5/27 + x)))
```

GIAC/XCAS [A] time = 0.22572, size = 265, normalized size = 1.3

$$-\frac{x^3}{4\,(cx^4+a)c}+\frac{3\,\sqrt{2}\,(ac^3)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x+\sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{16\,ac^4}+\frac{3\,\sqrt{2}\,(ac^3)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x-\sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{16\,ac^4}-\frac{3\,\sqrt{2}\,(ac^3)^{\frac{3}{4}}\ln\left(x^2+\sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{c}}\right)}{32\,ac^4}+\frac{3\,\sqrt{2}\,(ac^3)^{\frac{3}{4}}\ln\left(x^2-\sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{c}}\right)}{32\,ac^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(c*x^4 + a)^2,x, algorithm="giac")
```

```
[Out] -1/4*x^3/((c*x^4 + a)*c) + 3/16*sqrt(2)*(a*c^3)^(3/4)*arctan(1/2*
sqrt(2)*(2*x + sqrt(2)*(a/c)^(1/4))/(a/c)^(1/4))/(a*c^4) + 3/16*s
qrt(2)*(a*c^3)^(3/4)*arctan(1/2*sqrt(2)*(2*x - sqrt(2)*(a/c)^(1/4
))/(a/c)^(1/4))/(a*c^4) - 3/32*sqrt(2)*(a*c^3)^(3/4)*ln(x^2 + sqr
t(2)*x*(a/c)^(1/4) + sqrt(a/c))/(a*c^4) + 3/32*sqrt(2)*(a*c^3)^(3
/4)*ln(x^2 - sqrt(2)*x*(a/c)^(1/4) + sqrt(a/c))/(a*c^4)
```

3.665 $\int \frac{x^4}{(a+cx^4)^2}\,dx$

Optimal. Leaf size=202

$$-\frac{\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{16\sqrt{2}a^{3/4}c^{5/4}}+\frac{\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{16\sqrt{2}a^{3/4}c^{5/4}}-\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{8\sqrt{2}a^{3/4}c^{5/4}}+\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{8\sqrt{2}a^{3/4}c^{5/4}}-\frac{x}{4c\left(a+cx^4\right)}$$

```
[Out] -x/(4*c*(a + c*x^4)) - ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)]/(8
*Sqrt[2]*a^(3/4)*c^(5/4)) + ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4
)]/(8*Sqrt[2]*a^(3/4)*c^(5/4)) - Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^
(1/4)*x + Sqrt[c]*x^2]/(16*Sqrt[2]*a^(3/4)*c^(5/4)) + Log[Sqrt[a]
 + Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2]/(16*Sqrt[2]*a^(3/4)*c
^(5/4))
```

Rubi [A] time = 0.241701, antiderivative size = 202, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538

$$-\frac{\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{16\sqrt{2}a^{3/4}c^{5/4}}+\frac{\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{16\sqrt{2}a^{3/4}c^{5/4}}-\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{8\sqrt{2}a^{3/4}c^{5/4}}+\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{8\sqrt{2}a^{3/4}c^{5/4}}-\frac{x}{4c\left(a+cx^4\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a + c*x^4)^2,x]
```

```
[Out] -x/(4*c*(a + c*x^4)) - ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)]/(8
*Sqrt[2]*a^(3/4)*c^(5/4)) + ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4
)]/(8*Sqrt[2]*a^(3/4)*c^(5/4)) - Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^
(1/4)*x + Sqrt[c]*x^2]/(16*Sqrt[2]*a^(3/4)*c^(5/4)) + Log[Sqrt[a]
 + Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2]/(16*Sqrt[2]*a^(3/4)*c
^(5/4))
```

Rubi in Sympy [A] time = 52.8674, size = 184, normalized size = 0.91

$$-\frac{x}{4c\left(a+cx^4\right)}-\frac{\sqrt{2}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{32a^{\frac{3}{4}}c^{\frac{5}{4}}}+\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{32a^{\frac{3}{4}}c^{\frac{5}{4}}}-\frac{\sqrt{2}\,\mathrm{atan}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{16a^{\frac{3}{4}}c^{\frac{5}{4}}}+\frac{\sqrt{2}\,\mathrm{atan}\left(1+\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{16a^{\frac{3}{4}}c^{\frac{5}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(c*x**4+a)**2,x)
```

```
[Out] -x/(4*c*(a + c*x**4)) - sqrt(2)*log(-sqrt(2)*a**(1/4)*c**(1/4)*x
+ sqrt(a) + sqrt(c)*x**2)/(32*a**(3/4)*c**(5/4)) + sqrt(2)*log(sq
rt(2)*a**(1/4)*c**(1/4)*x + sqrt(a) + sqrt(c)*x**2)/(32*a**(3/4)*
c**(5/4)) - sqrt(2)*atan(1 - sqrt(2)*c**(1/4)*x/a**(1/4))/(16*a**
(3/4)*c**(5/4)) + sqrt(2)*atan(1 + sqrt(2)*c**(1/4)*x/a**(1/4))/(
16*a**(3/4)*c**(5/4))
```

Mathematica [A] time = 0.311557, size = 182, normalized size = 0.9

$$\frac{-\frac{\sqrt{2}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{a^{3/4}}+\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{a^{3/4}}-\frac{2\sqrt{2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{a^{3/4}}+\frac{2\sqrt{2}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{a^{3/4}}-\frac{8\sqrt[4]{c}x}{a+cx^4}}{32c^{5/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(a + c*x^4)^2,x]
```

```
[Out] ((-8*c^(1/4)*x)/(a + c*x^4) - (2*Sqrt[2]*ArcTan[1 - (Sqrt[2]*c^(1
/4)*x)/a^(1/4)])/a^(3/4) + (2*Sqrt[2]*ArcTan[1 + (Sqrt[2]*c^(1/4)
*x)/a^(1/4)])/a^(3/4) - (Sqrt[2]*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^
(1/4)*x + Sqrt[c]*x^2])/a^(3/4) + (Sqrt[2]*Log[Sqrt[a] + Sqrt[2]*
a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/a^(3/4))/(32*c^(5/4))
```

Maple [A] time = 0.011, size = 152, normalized size = 0.8

$$-\frac{x}{4c(cx^4+a)}+\frac{\sqrt{2}}{32ac}\sqrt[4]{\frac{a}{c}}\ln\left(1\left(x^2+\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)\left(x^2-\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)^{-1}\right)$$
$$+\frac{\sqrt{2}}{16ac}\sqrt[4]{\frac{a}{c}}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}+1\right)+\frac{\sqrt{2}}{16ac}\sqrt[4]{\frac{a}{c}}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(c*x^4+a)^2,x)
```

```
[Out] -1/4*x/c/(c*x^4+a)+1/32/c*(a/c)^(1/4)/a*2^(1/2)*ln((x^2+(a/c)^(1/
4)*x*2^(1/2)+(a/c)^(1/2))/(x^2-(a/c)^(1/4)*x*2^(1/2)+(a/c)^(1/2))
)+1/16/c*(a/c)^(1/4)/a*2^(1/2)*arctan(2^(1/2)/(a/c)^(1/4)*x+1)+1/
16/c*(a/c)^(1/4)/a*2^(1/2)*arctan(2^(1/2)/(a/c)^(1/4)*x-1)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(c*x^4 + a)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.249044, size = 217, normalized size = 1.07

$$-\frac{4\left(c^2x^4+ac\right)\left(-\frac{1}{a^3c^5}\right)^{\frac{1}{4}}\arctan\left(\frac{ac\left(-\frac{1}{a^3c^5}\right)^{\frac{1}{4}}}{x+\sqrt{a^2c^2\sqrt{-\frac{1}{a^3c^5}}+x^2}}\right)-\left(c^2x^4+ac\right)\left(-\frac{1}{a^3c^5}\right)^{\frac{1}{4}}\log\left(ac\left(-\frac{1}{a^3c^5}\right)^{\frac{1}{4}}+x\right)+\left(c^2x^4+ac\right)\left(-\frac{1}{a^3c^5}\right)}{16\left(c^2x^4+ac\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(c*x^4 + a)^2,x, algorithm="fricas")
```

```
[Out] -1/16*(4*(c^2*x^4 + a*c)*(-1/(a^3*c^5))^(1/4)*arctan(a*c*(-1/(a^3
*c^5))^(1/4)/(x + sqrt(a^2*c^2*sqrt(-1/(a^3*c^5)) + x^2))) - (c^2
*x^4 + a*c)*(-1/(a^3*c^5))^(1/4)*log(a*c*(-1/(a^3*c^5))^(1/4) + x
) + (c^2*x^4 + a*c)*(-1/(a^3*c^5))^(1/4)*log(-a*c*(-1/(a^3*c^5))^
(1/4) + x) + 4*x)/(c^2*x^4 + a*c)
```

Sympy [A] time = 1.79667, size = 39, normalized size = 0.19

$$-\frac{x}{4ac+4c^2x^4}+\operatorname{RootSum}\left(65536t^4a^3c^5+1,\left(t\mapsto t\log\left(16tac+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(c*x**4+a)**2,x)
```

```
[Out] -x/(4*a*c + 4*c**2*x**4) + RootSum(65536*_t**4*a**3*c**5 + 1, Lam
bda(_t, _t*log(16*_t*a*c + x)))
```

GIAC/XCAS [A] time = 0.224315, size = 262, normalized size = 1.3

$$-\frac{x}{4\,(cx^4+a)c}+\frac{\sqrt{2}\left(ac^3\right)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x+\sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{16\,ac^2}+\frac{\sqrt{2}\left(ac^3\right)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x-\sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{16\,ac^2}+\frac{\sqrt{2}\left(ac^3\right)^{\frac{1}{4}}\ln\left(x^2+\sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{c}}\right)}{32\,ac^2}-\frac{\sqrt{2}\left(ac^3\right)^{\frac{1}{4}}\ln\left(x^2-\sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{c}}\right)}{32\,ac^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(c*x^4 + a)^2,x, algorithm="giac")
```

```
[Out] -1/4*x/((c*x^4 + a)*c) + 1/16*sqrt(2)*(a*c^3)^(1/4)*arctan(1/2*sq
rt(2)*(2*x + sqrt(2)*(a/c)^(1/4))/(a/c)^(1/4))/(a*c^2) + 1/16*sqr
t(2)*(a*c^3)^(1/4)*arctan(1/2*sqrt(2)*(2*x - sqrt(2)*(a/c)^(1/4))
/(a/c)^(1/4))/(a*c^2) + 1/32*sqrt(2)*(a*c^3)^(1/4)*ln(x^2 + sqrt(
2)*x*(a/c)^(1/4) + sqrt(a/c))/(a*c^2) - 1/32*sqrt(2)*(a*c^3)^(1/4
)*ln(x^2 - sqrt(2)*x*(a/c)^(1/4) + sqrt(a/c))/(a*c^2)
```

3.666 $\int \frac{x^2}{(a+cx^4)^2}\,dx$

Optimal. Leaf size=204

$$\frac{\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{16\sqrt{2}a^{5/4}c^{3/4}}-\frac{\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{16\sqrt{2}a^{5/4}c^{3/4}}-\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{8\sqrt{2}a^{5/4}c^{3/4}}+\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{8\sqrt{2}a^{5/4}c^{3/4}}+\frac{x^3}{4a(a+cx^4)}$$

```
[Out] x^3/(4*a*(a + c*x^4)) - ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)]/(
8*Sqrt[2]*a^(5/4)*c^(3/4)) + ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/
4)]/(8*Sqrt[2]*a^(5/4)*c^(3/4)) + Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c
^(1/4)*x + Sqrt[c]*x^2]/(16*Sqrt[2]*a^(5/4)*c^(3/4)) - Log[Sqrt[a
] + Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2]/(16*Sqrt[2]*a^(5/4)*
c^(3/4))
```

Rubi [A] time = 0.242339, antiderivative size = 204, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538

$$\frac{\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{16\sqrt{2}a^{5/4}c^{3/4}}-\frac{\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{16\sqrt{2}a^{5/4}c^{3/4}}-\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{8\sqrt{2}a^{5/4}c^{3/4}}+\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{8\sqrt{2}a^{5/4}c^{3/4}}+\frac{x^3}{4a(a+cx^4)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + c*x^4)^2,x]
```

```
[Out] x^3/(4*a*(a + c*x^4)) - ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)]/(
8*Sqrt[2]*a^(5/4)*c^(3/4)) + ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/
4)]/(8*Sqrt[2]*a^(5/4)*c^(3/4)) + Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c
^(1/4)*x + Sqrt[c]*x^2]/(16*Sqrt[2]*a^(5/4)*c^(3/4)) - Log[Sqrt[a
] + Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2]/(16*Sqrt[2]*a^(5/4)*
c^(3/4))
```

Rubi in Sympy [A] time = 53.3747, size = 185, normalized size = 0.91

$$\frac{x^3}{4a(a+cx^4)}+\frac{\sqrt{2}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{32a^{\frac{5}{4}}c^{\frac{3}{4}}}-\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{32a^{\frac{5}{4}}c^{\frac{3}{4}}}-\frac{\sqrt{2}\,\mathrm{atan}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{16a^{\frac{5}{4}}c^{\frac{3}{4}}}+\frac{\sqrt{2}\,\mathrm{atan}\left(1+\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{16a^{\frac{5}{4}}c^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(c*x**4+a)**2,x)
```

```
[Out] x**3/(4*a*(a + c*x**4)) + sqrt(2)*log(-sqrt(2)*a**(1/4)*c**(1/4)*
x + sqrt(a) + sqrt(c)*x**2)/(32*a**(5/4)*c**(3/4)) - sqrt(2)*log(
sqrt(2)*a**(1/4)*c**(1/4)*x + sqrt(a) + sqrt(c)*x**2)/(32*a**(5/4
)*c**(3/4)) - sqrt(2)*atan(1 - sqrt(2)*c**(1/4)*x/a**(1/4))/(16*a
**(5/4)*c**(3/4)) + sqrt(2)*atan(1 + sqrt(2)*c**(1/4)*x/a**(1/4))
/(16*a**(5/4)*c**(3/4))
```

Mathematica [A] time = 0.272686, size = 184, normalized size = 0.9

$$\frac{\frac{\sqrt{2}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{c^{3/4}}-\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{c^{3/4}}-\frac{2\sqrt{2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{c^{3/4}}+\frac{2\sqrt{2}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{c^{3/4}}+\frac{8\sqrt[4]{a}x^3}{a+cx^4}}{32a^{5/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a + c*x^4)^2,x]
```

```
[Out] ((8*a^(1/4)*x^3)/(a + c*x^4) - (2*Sqrt[2]*ArcTan[1 - (Sqrt[2]*c^(
1/4)*x)/a^(1/4)])/c^(3/4) + (2*Sqrt[2]*ArcTan[1 + (Sqrt[2]*c^(1/4
)*x)/a^(1/4)])/c^(3/4) + (Sqrt[2]*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c
^(1/4)*x + Sqrt[c]*x^2])/c^(3/4) - (Sqrt[2]*Log[Sqrt[a] + Sqrt[2]
*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/c^(3/4))/(32*a^(5/4))
```

Maple [A] time = 0.009, size = 154, normalized size = 0.8

$$\frac{x^3}{4\,a\,(cx^4+a)}+\frac{\sqrt{2}}{32\,ac}\ln\left(1\left(x^2-\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)\left(x^2+\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)^{-1}\right)\frac{1}{\sqrt[4]{\frac{a}{c}}}$$
$$+\frac{\sqrt{2}}{16\,ac}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}+1\right)\frac{1}{\sqrt[4]{\frac{a}{c}}}+\frac{\sqrt{2}}{16\,ac}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}-1\right)\frac{1}{\sqrt[4]{\frac{a}{c}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(c*x^4+a)^2,x)
```

```
[Out] 1/4*x^3/a/(c*x^4+a)+1/32/a/c/(a/c)^(1/4)*2^(1/2)*ln((x^2-(a/c)^(1
/4)*x*2^(1/2)+(a/c)^(1/2))/(x^2+(a/c)^(1/4)*x*2^(1/2)+(a/c)^(1/2)
))+1/16/a/c/(a/c)^(1/4)*2^(1/2)*arctan(2^(1/2)/(a/c)^(1/4)*x+1)+1
/16/a/c/(a/c)^(1/4)*2^(1/2)*arctan(2^(1/2)/(a/c)^(1/4)*x-1)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(c*x^4 + a)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.245625, size = 230, normalized size = 1.13

$$\frac{4\,x^3+4\left(acx^4+a^2\right)\left(-\frac{1}{a^5c^3}\right)^{\frac{1}{4}}\arctan\left(\frac{a^4c^2\left(-\frac{1}{a^5c^3}\right)^{\frac{3}{4}}}{x+\sqrt{-a^3c\sqrt{-\frac{1}{a^5c^3}}+x^2}}\right)+\left(acx^4+a^2\right)\left(-\frac{1}{a^5c^3}\right)^{\frac{1}{4}}\log\left(a^4c^2\left(-\frac{1}{a^5c^3}\right)^{\frac{3}{4}}+x\right)-\left(acx^4+a^2\right)\left(\right.}{16\left(acx^4+a^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(c*x^4 + a)^2,x, algorithm="fricas")
```

```
[Out] 1/16*(4*x^3 + 4*(a*c*x^4 + a^2)*(-1/(a^5*c^3))^(1/4)*arctan(a^4*c
^2*(-1/(a^5*c^3))^(3/4)/(x + sqrt(-a^3*c*sqrt(-1/(a^5*c^3)) + x^2
))) + (a*c*x^4 + a^2)*(-1/(a^5*c^3))^(1/4)*log(a^4*c^2*(-1/(a^5*c
^3))^(3/4) + x) - (a*c*x^4 + a^2)*(-1/(a^5*c^3))^(1/4)*log(-a^4*c
^2*(-1/(a^5*c^3))^(3/4) + x))/(a*c*x^4 + a^2)
```

Sympy [A] time = 1.84723, size = 46, normalized size = 0.23

$$\frac{x^3}{4a^2 + 4acx^4} + \text{RootSum}\left(65536t^4a^5c^3 + 1, \left(t \mapsto t\log\left(4096t^3a^4c^2 + x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(c*x**4+a)**2,x)
```

```
[Out] x**3/(4*a**2 + 4*a*c*x**4) + RootSum(65536*_t**4*a**5*c**3 + 1, L
ambda(_t, _t*log(4096*_t**3*a**4*c**2 + x)))
```

GIAC/XCAS [A] time = 0.22397, size = 265, normalized size = 1.3

$$\frac{x^3}{4\,(cx^4 + a)a} + \frac{\sqrt{2}\left(ac^3\right)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x + \sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{16\,a^2c^3} + \frac{\sqrt{2}\left(ac^3\right)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x - \sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{16\,a^2c^3} - \frac{\sqrt{2}\left(ac^3\right)^{\frac{3}{4}}\ln\left(x^2 + \sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}} + \sqrt{\frac{a}{c}}\right)}{32\,a^2c^3} + \frac{\sqrt{2}\left(ac^3\right)^{\frac{3}{4}}\ln\left(x^2 - \sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}} + \sqrt{\frac{a}{c}}\right)}{32\,a^2c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(c*x^4 + a)^2,x, algorithm="giac")
```

```
[Out] 1/4*x^3/((c*x^4 + a)*a) + 1/16*sqrt(2)*(a*c^3)^(3/4)*arctan(1/2*s
qrt(2)*(2*x + sqrt(2)*(a/c)^(1/4))/(a/c)^(1/4))/(a^2*c^3) + 1/16*
sqrt(2)*(a*c^3)^(3/4)*arctan(1/2*sqrt(2)*(2*x - sqrt(2)*(a/c)^(1/
4))/(a/c)^(1/4))/(a^2*c^3) - 1/32*sqrt(2)*(a*c^3)^(3/4)*ln(x^2 +
sqrt(2)*x*(a/c)^(1/4) + sqrt(a/c))/(a^2*c^3) + 1/32*sqrt(2)*(a*c^
3)^(3/4)*ln(x^2 - sqrt(2)*x*(a/c)^(1/4) + sqrt(a/c))/(a^2*c^3)
```

3.667 $\int \frac{1}{(a+cx^4)^2} dx$

Optimal. Leaf size=202

$$-\frac{3\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{16\sqrt{2}a^{7/4}\sqrt[4]{c}}+\frac{3\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{16\sqrt{2}a^{7/4}\sqrt[4]{c}}-\frac{3\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{8\sqrt{2}a^{7/4}\sqrt[4]{c}}+\frac{3\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{8\sqrt{2}a^{7/4}\sqrt[4]{c}}+\frac{x}{4a\left(a+cx^4\right)}$$

```
[Out] x/(4*a*(a + c*x^4)) - (3*ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)])
/(8*Sqrt[2]*a^(7/4)*c^(1/4)) + (3*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/
a^(1/4)])/(8*Sqrt[2]*a^(7/4)*c^(1/4)) - (3*Log[Sqrt[a] - Sqrt[2]*
a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(16*Sqrt[2]*a^(7/4)*c^(1/4)) +
(3*Log[Sqrt[a] + Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(16*Sq
rt[2]*a^(7/4)*c^(1/4))
```

Rubi [A] time = 0.233327, antiderivative size = 202, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 7, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.778

$$-\frac{3\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{16\sqrt{2}a^{7/4}\sqrt[4]{c}}+\frac{3\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{16\sqrt{2}a^{7/4}\sqrt[4]{c}}-\frac{3\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{8\sqrt{2}a^{7/4}\sqrt[4]{c}}+\frac{3\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{8\sqrt{2}a^{7/4}\sqrt[4]{c}}+\frac{x}{4a\left(a+cx^4\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + c*x^4)^(-2),x]
```

```
[Out] x/(4*a*(a + c*x^4)) - (3*ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)])
/(8*Sqrt[2]*a^(7/4)*c^(1/4)) + (3*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/
a^(1/4)])/(8*Sqrt[2]*a^(7/4)*c^(1/4)) - (3*Log[Sqrt[a] - Sqrt[2]*
a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(16*Sqrt[2]*a^(7/4)*c^(1/4)) +
(3*Log[Sqrt[a] + Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(16*Sq
rt[2]*a^(7/4)*c^(1/4))
```

Rubi in Sympy [A] time = 51.025, size = 190, normalized size = 0.94

$$\frac{x}{4a\left(a+cx^4\right)}-\frac{3\sqrt{2}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{32a^{\frac{7}{4}}\sqrt[4]{c}}+\frac{3\sqrt{2}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{32a^{\frac{7}{4}}\sqrt[4]{c}}-\frac{3\sqrt{2}\,\mathrm{atan}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{16a^{\frac{7}{4}}\sqrt[4]{c}}+\frac{3\sqrt{2}\,\mathrm{atan}\left(1+\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{16a^{\frac{7}{4}}\sqrt[4]{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(c*x**4+a)**2,x)
```

```
[Out] x/(4*a*(a + c*x**4)) - 3*sqrt(2)*log(-sqrt(2)*a**(1/4)*c**(1/4)*x
 + sqrt(a) + sqrt(c)*x**2)/(32*a**(7/4)*c**(1/4)) + 3*sqrt(2)*log
(sqrt(2)*a**(1/4)*c**(1/4)*x + sqrt(a) + sqrt(c)*x**2)/(32*a**(7/
4)*c**(1/4)) - 3*sqrt(2)*atan(1 - sqrt(2)*c**(1/4)*x/a**(1/4))/(1
6*a**(7/4)*c**(1/4)) + 3*sqrt(2)*atan(1 + sqrt(2)*c**(1/4)*x/a**(
1/4))/(16*a**(7/4)*c**(1/4))
```

Mathematica [A] time = 0.253026, size = 183, normalized size = 0.91

$$\frac{\frac{8a^{3/4}x}{a+cx^4}-\frac{3\sqrt{2}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{\sqrt[4]{c}}+\frac{3\sqrt{2}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{\sqrt[4]{c}}-\frac{6\sqrt{2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{\sqrt[4]{c}}+\frac{6\sqrt{2}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{\sqrt[4]{c}}}{32a^{7/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + c*x^4)^(-2),x]
```

```
[Out] ((8*a^(3/4)*x)/(a + c*x^4) - (6*Sqrt[2]*ArcTan[1 - (Sqrt[2]*c^(1/
4)*x)/a^(1/4)])/c^(1/4) + (6*Sqrt[2]*ArcTan[1 + (Sqrt[2]*c^(1/4)*
x)/a^(1/4)])/c^(1/4) - (3*Sqrt[2]*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c
^(1/4)*x + Sqrt[c]*x^2])/c^(1/4) + (3*Sqrt[2]*Log[Sqrt[a] + Sqrt[
2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/c^(1/4))/(32*a^(7/4))
```

Maple [A] time = 0.006, size = 143, normalized size = 0.7

$$\frac{x}{4\,a\,(cx^4+a)}+\frac{3\,\sqrt{2}}{32\,a^2}\sqrt[4]{\frac{a}{c}}\ln\left(1\left(x^2+\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)\left(x^2-\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)^{-1}\right)+\frac{3\,\sqrt{2}}{16\,a^2}\sqrt[4]{\frac{a}{c}}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}+1\right)+\frac{3\,\sqrt{2}}{16\,a^2}\sqrt[4]{\frac{a}{c}}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(c*x^4+a)^2,x)
```

```
[Out] 1/4*x/a/(c*x^4+a)+3/32/a^2*(a/c)^(1/4)*2^(1/2)*ln((x^2+(a/c)^(1/4
)*x*2^(1/2)+(a/c)^(1/2))/(x^2-(a/c)^(1/4)*x*2^(1/2)+(a/c)^(1/2)))
+3/16/a^2*(a/c)^(1/4)*2^(1/2)*arctan(2^(1/2)/(a/c)^(1/4)*x+1)+3/1
6/a^2*(a/c)^(1/4)*2^(1/2)*arctan(2^(1/2)/(a/c)^(1/4)*x-1)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(-2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.24122, size = 213, normalized size = 1.05

$$-\frac{12\left(acx^4+a^2\right)\left(-\frac{1}{a^7c}\right)^{\frac{1}{4}}\arctan\left(\frac{a^2\left(-\frac{1}{a^7c}\right)^{\frac{1}{4}}}{x+\sqrt{a^4\sqrt{-\frac{1}{a^7c}}+x^2}}\right)-3\left(acx^4+a^2\right)\left(-\frac{1}{a^7c}\right)^{\frac{1}{4}}\log\left(a^2\left(-\frac{1}{a^7c}\right)^{\frac{1}{4}}+x\right)+3\left(acx^4+a^2\right)\left(-\frac{1}{a^7c}\right)^{\frac{1}{4}}}{16\left(acx^4+a^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(-2),x, algorithm="fricas")
```

```
[Out] -1/16*(12*(a*c*x^4 + a^2)*(-1/(a^7*c))^(1/4)*arctan(a^2*(-1/(a^7*
c))^(1/4)/(x + sqrt(a^4*sqrt(-1/(a^7*c)) + x^2))) - 3*(a*c*x^4 +
a^2)*(-1/(a^7*c))^(1/4)*log(a^2*(-1/(a^7*c))^(1/4) + x) + 3*(a*c*
x^4 + a^2)*(-1/(a^7*c))^(1/4)*log(-a^2*(-1/(a^7*c))^(1/4) + x) -
4*x)/(a*c*x^4 + a^2)
```

Sympy [A] time = 1.86836, size = 39, normalized size = 0.19

$$\frac{x}{4a^2 + 4acx^4} + \mathrm{RootSum}\left(65536t^4a^7c + 81, \left(t \mapsto t\log\left(\frac{16ta^2}{3} + x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(c*x**4+a)**2,x)
```

```
[Out] x/(4*a**2 + 4*a*c*x**4) + RootSum(65536*_t**4*a**7*c + 81, Lambda
(_t, _t*log(16*_t*a**2/3 + x)))
```

GIAC/XCAS [A] time = 0.219011, size = 262, normalized size = 1.3

$$\frac{x}{4\,(cx^4 + a)a} + \frac{3\,\sqrt{2}\,(ac^3)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x + \sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{16\,a^2c} + \frac{3\,\sqrt{2}\,(ac^3)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x - \sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{16\,a^2c} + \frac{3\,\sqrt{2}\,(ac^3)^{\frac{1}{4}}\ln\left(x^2 + \sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}} + \sqrt{\frac{a}{c}}\right)}{32\,a^2c} - \frac{3\,\sqrt{2}\,(ac^3)^{\frac{1}{4}}\ln\left(x^2 - \sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}} + \sqrt{\frac{a}{c}}\right)}{32\,a^2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(-2),x, algorithm="giac")
```

```
[Out] 1/4*x/((c*x^4 + a)*a) + 3/16*sqrt(2)*(a*c^3)^(1/4)*arctan(1/2*sqr
t(2)*(2*x + sqrt(2)*(a/c)^(1/4))/(a/c)^(1/4))/(a^2*c) + 3/16*sqrt
(2)*(a*c^3)^(1/4)*arctan(1/2*sqrt(2)*(2*x - sqrt(2)*(a/c)^(1/4))/
(a/c)^(1/4))/(a^2*c) + 3/32*sqrt(2)*(a*c^3)^(1/4)*ln(x^2 + sqrt(2
)*x*(a/c)^(1/4) + sqrt(a/c))/(a^2*c) - 3/32*sqrt(2)*(a*c^3)^(1/4)
*ln(x^2 - sqrt(2)*x*(a/c)^(1/4) + sqrt(a/c))/(a^2*c)
```

3.668 $\int \frac{1}{x^2(a+cx^4)^2} \, dx$

Optimal. Leaf size=214

$$-\frac{5\sqrt[4]{c}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{16\sqrt{2}a^{9/4}}+\frac{5\sqrt[4]{c}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{16\sqrt{2}a^{9/4}}+\frac{5\sqrt[4]{c}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{8\sqrt{2}a^{9/4}}-\frac{5\sqrt[4]{c}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{8\sqrt{2}a^{9/4}}-\frac{5}{4a^2x}+\frac{1}{4ax\left(a+cx^4\right)}$$

```
[Out] -5/(4*a^2*x) + 1/(4*a*x*(a + c*x^4)) + (5*c^(1/4)*ArcTan[1 - (Sqr
t[2]*c^(1/4)*x)/a^(1/4)])/(8*Sqrt[2]*a^(9/4)) - (5*c^(1/4)*ArcTan
[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(8*Sqrt[2]*a^(9/4)) - (5*c^(1/
4)*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(16*Sq
rt[2]*a^(9/4)) + (5*c^(1/4)*Log[Sqrt[a] + Sqrt[2]*a^(1/4)*c^(1/4)
*x + Sqrt[c]*x^2])/(16*Sqrt[2]*a^(9/4))
```

Rubi [A] time = 0.283516, antiderivative size = 214, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615

$$-\frac{5\sqrt[4]{c}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{16\sqrt{2}a^{9/4}}+\frac{5\sqrt[4]{c}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{16\sqrt{2}a^{9/4}}+\frac{5\sqrt[4]{c}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{8\sqrt{2}a^{9/4}}-\frac{5\sqrt[4]{c}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{8\sqrt{2}a^{9/4}}-\frac{5}{4a^2x}+\frac{1}{4ax\left(a+cx^4\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(a + c*x^4)^2),x]
```

```
[Out] -5/(4*a^2*x) + 1/(4*a*x*(a + c*x^4)) + (5*c^(1/4)*ArcTan[1 - (Sqr
t[2]*c^(1/4)*x)/a^(1/4)])/(8*Sqrt[2]*a^(9/4)) - (5*c^(1/4)*ArcTan
[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(8*Sqrt[2]*a^(9/4)) - (5*c^(1/
4)*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(16*Sq
rt[2]*a^(9/4)) + (5*c^(1/4)*Log[Sqrt[a] + Sqrt[2]*a^(1/4)*c^(1/4)
*x + Sqrt[c]*x^2])/(16*Sqrt[2]*a^(9/4))
```

Rubi in Sympy [A] time = 59.8355, size = 201, normalized size = 0.94

$$\frac{1}{4ax\left(a+cx^4\right)}-\frac{5}{4a^2x}-\frac{5\sqrt{2}\sqrt[4]{c}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{32a^{\frac{9}{4}}}+\frac{5\sqrt{2}\sqrt[4]{c}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{32a^{\frac{9}{4}}}+\frac{5\sqrt{2}\sqrt[4]{c}\,\mathrm{atan}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{16a^{\frac{9}{4}}}-\frac{5\sqrt{2}\sqrt[4]{c}\,\mathrm{atan}\left(1+\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{16a^{\frac{9}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(c*x**4+a)**2,x)
```

```
[Out] 1/(4*a*x*(a + c*x**4)) - 5/(4*a**2*x) - 5*sqrt(2)*c**(1/4)*log(-s
qrt(2)*a**(1/4)*c**(1/4)*x + sqrt(a) + sqrt(c)*x**2)/(32*a**(9/4)
) + 5*sqrt(2)*c**(1/4)*log(sqrt(2)*a**(1/4)*c**(1/4)*x + sqrt(a)
+ sqrt(c)*x**2)/(32*a**(9/4)) + 5*sqrt(2)*c**(1/4)*atan(1 - sqrt(
2)*c**(1/4)*x/a**(1/4))/(16*a**(9/4)) - 5*sqrt(2)*c**(1/4)*atan(1
 + sqrt(2)*c**(1/4)*x/a**(1/4))/(16*a**(9/4))
```

Mathematica [A] time = 0.321301, size = 196, normalized size = 0.92

$$\frac{-5\sqrt{2}\sqrt[4]{c}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)+5\sqrt{2}\sqrt[4]{c}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)-\frac{8\sqrt[4]{a}cx^3}{a+cx^4}+10\sqrt{2}\sqrt[4]{c}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)-}{32a^{9/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*(a + c*x^4)^2),x]
```

```
[Out] ((-32*a^(1/4))/x - (8*a^(1/4)*c*x^3)/(a + c*x^4) + 10*Sqrt[2]*c^(
1/4)*ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)] - 10*Sqrt[2]*c^(1/4)
*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4)] - 5*Sqrt[2]*c^(1/4)*Log[
Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2] + 5*Sqrt[2]*c^
(1/4)*Log[Sqrt[a] + Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(32
*a^(9/4))
```

Maple [A] time = 0.015, size = 154, normalized size = 0.7

$$-\frac{1}{xa^2}-\frac{cx^3}{4\,a^2\,(cx^4+a)}-\frac{5\,\sqrt{2}}{32\,a^2}\ln\left(1\left(x^2-\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)\left(x^2+\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)^{-1}\right)\frac{1}{\sqrt[4]{\frac{a}{c}}}$$
$$-\frac{5\,\sqrt{2}}{16\,a^2}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}+1\right)\frac{1}{\sqrt[4]{\frac{a}{c}}}-\frac{5\,\sqrt{2}}{16\,a^2}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}-1\right)\frac{1}{\sqrt[4]{\frac{a}{c}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(c*x^4+a)^2,x)
```

```
[Out] -1/a^2/x-1/4/a^2*c*x^3/(c*x^4+a)-5/32/a^2/(a/c)^(1/4)*2^(1/2)*ln(
(x^2-(a/c)^(1/4)*x*2^(1/2)+(a/c)^(1/2))/(x^2+(a/c)^(1/4)*x*2^(1/2
)+(a/c)^(1/2)))-5/16/a^2/(a/c)^(1/4)*2^(1/2)*arctan(2^(1/2)/(a/c)
^(1/4)*x+1)-5/16/a^2/(a/c)^(1/4)*2^(1/2)*arctan(2^(1/2)/(a/c)^(1/
4)*x-1)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)^2*x^2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.261435, size = 250, normalized size = 1.17

$$-\frac{20\,cx^4+20\left(a^2cx^5+a^3x\right)\left(-\frac{c}{a^9}\right)^{\frac{1}{4}}\arctan\left(\frac{a^7\left(-\frac{c}{a^9}\right)^{\frac{3}{4}}}{cx+c\sqrt{-\frac{a^5\sqrt{-\frac{c}{a^9}}-cx^2}{c}}}\right)+5\left(a^2cx^5+a^3x\right)\left(-\frac{c}{a^9}\right)^{\frac{1}{4}}\log\left(125\,a^7\left(-\frac{c}{a^9}\right)^{\frac{3}{4}}+125\,cx\right)-}{16\left(a^2cx^5+a^3x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)^2*x^2),x, algorithm="fricas")
```

```
[Out] -1/16*(20*c*x^4 + 20*(a^2*c*x^5 + a^3*x)*(-c/a^9)^(1/4)*arctan(a^
7*(-c/a^9)^(3/4)/(c*x + c*sqrt(-(a^5*sqrt(-c/a^9) - c*x^2)/c))) +
 5*(a^2*c*x^5 + a^3*x)*(-c/a^9)^(1/4)*log(125*a^7*(-c/a^9)^(3/4)
+ 125*c*x) - 5*(a^2*c*x^5 + a^3*x)*(-c/a^9)^(1/4)*log(-125*a^7*(-
c/a^9)^(3/4) + 125*c*x) + 16*a)/(a^2*c*x^5 + a^3*x)
```

Sympy [A] time = 2.73878, size = 54, normalized size = 0.25

$$-\frac{4a+5cx^4}{4a^3x+4a^2cx^5}+\operatorname{RootSum}\left(65536t^4a^9+625c,\left(t\mapsto t\log\left(-\frac{4096t^3a^7}{125c}+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(c*x**4+a)**2,x)
```

```
[Out] -(4*a + 5*c*x**4)/(4*a**3*x + 4*a**2*c*x**5) + RootSum(65536*_t**
4*a**9 + 625*c, Lambda(_t, _t*log(-4096*_t**3*a**7/(125*c) + x)))
```

GIAC/XCAS [A] time = 0.240104, size = 277, normalized size = 1.29

$$-\frac{5\,cx^4+4\,a}{4\,(cx^5+ax)a^2}-\frac{5\,\sqrt{2}\,(ac^3)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x+\sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{16\,a^3c^2}-\frac{5\,\sqrt{2}\,(ac^3)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x-\sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{16\,a^3c^2}+\frac{5\,\sqrt{2}\,(ac^3)^{\frac{3}{4}}\ln\left(x^2+\sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{c}}\right)}{32\,a^3c^2}-\frac{5\,\sqrt{2}\,(ac^3)^{\frac{3}{4}}\ln\left(x^2-\sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{c}}\right)}{32\,a^3c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)^2*x^2),x, algorithm="giac")
```

```
[Out] -1/4*(5*c*x^4 + 4*a)/((c*x^5 + a*x)*a^2) - 5/16*sqrt(2)*(a*c^3)^(
3/4)*arctan(1/2*sqrt(2)*(2*x + sqrt(2)*(a/c)^(1/4))/(a/c)^(1/4))/
(a^3*c^2) - 5/16*sqrt(2)*(a*c^3)^(3/4)*arctan(1/2*sqrt(2)*(2*x -
sqrt(2)*(a/c)^(1/4))/(a/c)^(1/4))/(a^3*c^2) + 5/32*sqrt(2)*(a*c^3
)^(3/4)*ln(x^2 + sqrt(2)*x*(a/c)^(1/4) + sqrt(a/c))/(a^3*c^2) - 5
/32*sqrt(2)*(a*c^3)^(3/4)*ln(x^2 - sqrt(2)*x*(a/c)^(1/4) + sqrt(a
/c))/(a^3*c^2)
```

3.669 $\int \frac{1}{x^4(a+cx^4)^2}\,dx$

Optimal. Leaf size=214

$$\frac{7c^{3/4}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{16\sqrt{2}a^{11/4}}-\frac{7c^{3/4}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{16\sqrt{2}a^{11/4}}+\frac{7c^{3/4}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{8\sqrt{2}a^{11/4}}-\frac{7c^{3/4}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{8\sqrt{2}a^{11/4}}-\frac{7}{12a^2x^3}+\frac{1}{4ax^3\left(a+cx^4\right)}$$

```
[Out] -7/(12*a^2*x^3) + 1/(4*a*x^3*(a + c*x^4)) + (7*c^(3/4)*ArcTan[1 -
 (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(8*Sqrt[2]*a^(11/4)) - (7*c^(3/4)*
ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(8*Sqrt[2]*a^(11/4)) + (
7*c^(3/4)*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])
/(16*Sqrt[2]*a^(11/4)) - (7*c^(3/4)*Log[Sqrt[a] + Sqrt[2]*a^(1/4)
*c^(1/4)*x + Sqrt[c]*x^2])/(16*Sqrt[2]*a^(11/4))
```

Rubi [A] time = 0.280431, antiderivative size = 214, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615

$$\frac{7c^{3/4}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{16\sqrt{2}a^{11/4}}-\frac{7c^{3/4}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{16\sqrt{2}a^{11/4}}+\frac{7c^{3/4}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{8\sqrt{2}a^{11/4}}-\frac{7c^{3/4}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{8\sqrt{2}a^{11/4}}-\frac{7}{12a^2x^3}+\frac{1}{4ax^3\left(a+cx^4\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*(a + c*x^4)^2),x]
```

```
[Out] -7/(12*a^2*x^3) + 1/(4*a*x^3*(a + c*x^4)) + (7*c^(3/4)*ArcTan[1 -
 (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(8*Sqrt[2]*a^(11/4)) - (7*c^(3/4)*
ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(8*Sqrt[2]*a^(11/4)) + (
7*c^(3/4)*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])
/(16*Sqrt[2]*a^(11/4)) - (7*c^(3/4)*Log[Sqrt[a] + Sqrt[2]*a^(1/4)
*c^(1/4)*x + Sqrt[c]*x^2])/(16*Sqrt[2]*a^(11/4))
```

Rubi in Sympy [A] time = 58.7664, size = 204, normalized size = 0.95

$$\frac{1}{4ax^3\left(a+cx^4\right)}-\frac{7}{12a^2x^3}+\frac{7\sqrt{2}c^{\frac{3}{4}}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{32a^{\frac{11}{4}}}-\frac{7\sqrt{2}c^{\frac{3}{4}}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{32a^{\frac{11}{4}}}+\frac{7\sqrt{2}c^{\frac{3}{4}}\operatorname{atan}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{16a^{\frac{11}{4}}}-\frac{7\sqrt{2}c^{\frac{3}{4}}\operatorname{atan}\left(1+\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{16a^{\frac{11}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(c*x**4+a)**2,x)
```

```
[Out] 1/(4*a*x**3*(a + c*x**4)) - 7/(12*a**2*x**3) + 7*sqrt(2)*c**(3/4)
*log(-sqrt(2)*a**(1/4)*c**(1/4)*x + sqrt(a) + sqrt(c)*x**2)/(32*a
**(11/4)) - 7*sqrt(2)*c**(3/4)*log(sqrt(2)*a**(1/4)*c**(1/4)*x +
sqrt(a) + sqrt(c)*x**2)/(32*a**(11/4)) + 7*sqrt(2)*c**(3/4)*atan(
1 - sqrt(2)*c**(1/4)*x/a**(1/4))/(16*a**(11/4)) - 7*sqrt(2)*c**(3
/4)*atan(1 + sqrt(2)*c**(1/4)*x/a**(1/4))/(16*a**(11/4))
```

Mathematica [A] time = 0.32208, size = 194, normalized size = 0.91

$$-\frac{-\frac{24a^{3/4}cx}{a+cx^4}-\frac{32a^{3/4}}{x^3}+21\sqrt{2}c^{3/4}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)-21\sqrt{2}c^{3/4}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)+42\sqrt{2}c^{3/4}\tan^{-1}\left(\right.}{96a^{11/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*(a + c*x^4)^2),x]
```

```
[Out] ((-32*a^(3/4))/x^3 - (24*a^(3/4)*c*x)/(a + c*x^4) + 42*Sqrt[2]*c^
(3/4)*ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)] - 42*Sqrt[2]*c^(3/4
)*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4)] + 21*Sqrt[2]*c^(3/4)*Lo
g[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2] - 21*Sqrt[2]
*c^(3/4)*Log[Sqrt[a] + Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/
(96*a^(11/4))
```

Maple [A] time = 0.015, size = 155, normalized size = 0.7

$$-\frac{1}{3\,x^3a^2}-\frac{cx}{4\,a^2\,(cx^4+a)}-\frac{7\,c\sqrt{2}}{32\,a^3}\sqrt[4]{\frac{a}{c}}\ln\left(1\left(x^2+\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)\left(x^2-\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)^{-1}\right)$$
$$-\frac{7\,c\sqrt{2}}{16\,a^3}\sqrt[4]{\frac{a}{c}}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}+1\right)-\frac{7\,c\sqrt{2}}{16\,a^3}\sqrt[4]{\frac{a}{c}}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(c*x^4+a)^2,x)
```

```
[Out] -1/3/x^3/a^2-1/4/a^2*c*x/(c*x^4+a)-7/32/a^3*c*(a/c)^(1/4)*2^(1/2)
*ln((x^2+(a/c)^(1/4)*x*2^(1/2)+(a/c)^(1/2))/(x^2-(a/c)^(1/4)*x*2^
(1/2)+(a/c)^(1/2)))-7/16/a^3*c*(a/c)^(1/4)*2^(1/2)*arctan(2^(1/2)
/(a/c)^(1/4)*x+1)-7/16/a^3*c*(a/c)^(1/4)*2^(1/2)*arctan(2^(1/2)/(
a/c)^(1/4)*x-1)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)^2*x^4),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.251383, size = 279, normalized size = 1.3

$$-\frac{28\,cx^4-84\left(a^2cx^7+a^3x^3\right)\left(-\frac{c^3}{a^{11}}\right)^{\frac{1}{4}}\arctan\left(\frac{a^3\left(-\frac{c^3}{a^{11}}\right)^{\frac{1}{4}}}{cx+c\sqrt{\frac{a^6\sqrt{-\frac{c^3}{a^{11}}}+c^2x^2}{c^2}}}\right)+21\left(a^2cx^7+a^3x^3\right)\left(-\frac{c^3}{a^{11}}\right)^{\frac{1}{4}}\log\left(7\,a^3\left(-\frac{c^3}{a^{11}}\right)^{\frac{1}{4}}+7\,cx\right)-}{48\left(a^2cx^7+a^3x^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)^2*x^4),x, algorithm="fricas")
```

```
[Out] -1/48*(28*c*x^4 - 84*(a^2*c*x^7 + a^3*x^3)*(-c^3/a^11)^(1/4)*arct
an(a^3*(-c^3/a^11)^(1/4)/(c*x + c*sqrt((a^6*sqrt(-c^3/a^11) + c^2
*x^2)/c^2))) + 21*(a^2*c*x^7 + a^3*x^3)*(-c^3/a^11)^(1/4)*log(7*a
^3*(-c^3/a^11)^(1/4) + 7*c*x) - 21*(a^2*c*x^7 + a^3*x^3)*(-c^3/a^
11)^(1/4)*log(-7*a^3*(-c^3/a^11)^(1/4) + 7*c*x) + 16*a)/(a^2*c*x^
7 + a^3*x^3)
```

Sympy [A] time = 5.22274, size = 56, normalized size = 0.26

$$-\frac{4a+7cx^4}{12a^3x^3+12a^2cx^7}+\operatorname{RootSum}\left(65536t^4a^{11}+2401c^3,\left(t\mapsto t\log\left(-\frac{16ta^3}{7c}+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(c*x**4+a)**2,x)
```

```
[Out] -(4*a + 7*c*x**4)/(12*a**3*x**3 + 12*a**2*c*x**7) + RootSum(65536
*_t**4*a**11 + 2401*c**3, Lambda(_t, _t*log(-16*_t*a**3/(7*c) + x
)))
```

GIAC/XCAS [A] time = 0.234782, size = 258, normalized size = 1.21

$$-\frac{cx}{4\,(cx^4+a)a^2}-\frac{7\,\sqrt{2}\,\left(ac^3\right)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x+\sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{16\,a^3}-\frac{7\,\sqrt{2}\,\left(ac^3\right)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x-\sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{16\,a^3}-\frac{7\,\sqrt{2}\,\left(ac^3\right)^{\frac{1}{4}}\ln\left(x^2+\sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{c}}\right)}{32\,a^3}+\frac{7\,\sqrt{2}\,\left(ac^3\right)^{\frac{1}{4}}\ln\left(x^2-\sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{c}}\right)}{32\,a^3}-\frac{1}{3\,a^2x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)^2*x^4),x, algorithm="giac")
```

```
[Out] -1/4*c*x/((c*x^4 + a)*a^2) - 7/16*sqrt(2)*(a*c^3)^(1/4)*arctan(1/
2*sqrt(2)*(2*x + sqrt(2)*(a/c)^(1/4))/(a/c)^(1/4))/a^3 - 7/16*sqr
t(2)*(a*c^3)^(1/4)*arctan(1/2*sqrt(2)*(2*x - sqrt(2)*(a/c)^(1/4))
/(a/c)^(1/4))/a^3 - 7/32*sqrt(2)*(a*c^3)^(1/4)*ln(x^2 + sqrt(2)*x
*(a/c)^(1/4) + sqrt(a/c))/a^3 + 7/32*sqrt(2)*(a*c^3)^(1/4)*ln(x^2
 - sqrt(2)*x*(a/c)^(1/4) + sqrt(a/c))/a^3 - 1/3/(a^2*x^3)
```

3.670 $\int \frac{x^{11}}{(a+cx^4)^3} dx$

Optimal. Leaf size=52

$$-\frac{a^2}{8c^3(a+cx^4)^2}+\frac{a}{2c^3(a+cx^4)}+\frac{\log(a+cx^4)}{4c^3}$$

```
[Out] -a^2/(8*c^3*(a + c*x^4)^2) + a/(2*c^3*(a + c*x^4)) + Log[a + c*x^
4]/(4*c^3)
```

Rubi [A] time = 0.0832737, antiderivative size = 52, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^2}{8c^3(a+cx^4)^2}+\frac{a}{2c^3(a+cx^4)}+\frac{\log(a+cx^4)}{4c^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11/(a + c*x^4)^3,x]
```

```
[Out] -a^2/(8*c^3*(a + c*x^4)^2) + a/(2*c^3*(a + c*x^4)) + Log[a + c*x^
4]/(4*c^3)
```

Rubi in Sympy [A] time = 11.6202, size = 42, normalized size = 0.81

$$-\frac{a^2}{8c^3(a+cx^4)^2}+\frac{a}{2c^3(a+cx^4)}+\frac{\log(a+cx^4)}{4c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11/(c*x**4+a)**3,x)
```

```
[Out] -a**2/(8*c**3*(a + c*x**4)**2) + a/(2*c**3*(a + c*x**4)) + log(a
+ c*x**4)/(4*c**3)
```

Mathematica [A] time = 0.0324476, size = 39, normalized size = 0.75

$$\frac{\frac{a(3a+4cx^4)}{(a+cx^4)^2}+2\log(a+cx^4)}{8c^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11/(a + c*x^4)^3,x]
```

```
[Out] ((a*(3*a + 4*c*x^4))/(a + c*x^4)^2 + 2*Log[a + c*x^4])/(8*c^3)
```

Maple [A] time = 0.016, size = 47, normalized size = 0.9

$$-\frac{a^2}{8\,c^3(cx^4+a)^2}+\frac{a}{2\,c^3(cx^4+a)}+\frac{\ln(cx^4+a)}{4\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11/(c*x^4+a)^3,x)
```

```
[Out] -1/8*a^2/c^3/(c*x^4+a)^2+1/2*a/c^3/(c*x^4+a)+1/4*ln(c*x^4+a)/c^3
```

Maxima [A] time = 1.45577, size = 74, normalized size = 1.42

$$\frac{4\,acx^{4} + 3\,a^{2}}{8\,(c^{5}x^{8} + 2\,ac^{4}x^{4} + a^{2}c^{3})} + \frac{\log\left(cx^{4} + a\right)}{4\,c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(c*x^4 + a)^3,x, algorithm="maxima")
```

```
[Out] 1/8*(4*a*c*x^4 + 3*a^2)/(c^5*x^8 + 2*a*c^4*x^4 + a^2*c^3) + 1/4*l
og(c*x^4 + a)/c^3
```

Fricas [A] time = 0.218644, size = 93, normalized size = 1.79

$$\frac{4\,acx^{4} + 3\,a^{2} + 2\,\left(c^{2}x^{8} + 2\,acx^{4} + a^{2}\right)\log\left(cx^{4} + a\right)}{8\,(c^{5}x^{8} + 2\,ac^{4}x^{4} + a^{2}c^{3})}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(c*x^4 + a)^3,x, algorithm="fricas")
```

```
[Out] 1/8*(4*a*c*x^4 + 3*a^2 + 2*(c^2*x^8 + 2*a*c*x^4 + a^2)*log(c*x^4
+ a))/(c^5*x^8 + 2*a*c^4*x^4 + a^2*c^3)
```

Sympy [A] time = 5.03825, size = 53, normalized size = 1.02

$$\frac{3a^{2} + 4acx^{4}}{8a^{2}c^{3} + 16ac^{4}x^{4} + 8c^{5}x^{8}} + \frac{\log\left(a + cx^{4}\right)}{4c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11/(c*x**4+a)**3,x)
```

```
[Out] (3*a**2 + 4*a*c*x**4)/(8*a**2*c**3 + 16*a*c**4*x**4 + 8*c**5*x**8
) + log(a + c*x**4)/(4*c**3)
```

GIAC/XCAS [A] time = 0.226214, size = 57, normalized size = 1.1

$$\frac{\ln\left(\left|cx^{4} + a\right|\right)}{4\,c^{3}} - \frac{3\,cx^{8} + 2\,ax^{4}}{8\,(cx^{4} + a)^{2}c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(c*x^4 + a)^3,x, algorithm="giac")
```

```
[Out] 1/4*ln(abs(c*x^4 + a))/c^3 - 1/8*(3*c*x^8 + 2*a*x^4)/((c*x^4 + a)
^2*c^2)
```

3.671 $\int \frac{x^9}{(a+cx^4)^3} dx$

Optimal. Leaf size=68

$$\frac{3\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{16\sqrt{a}c^{5/2}}-\frac{3x^2}{16c^2(a+cx^4)}-\frac{x^6}{8c(a+cx^4)^2}$$

```
[Out] -x^6/(8*c*(a + c*x^4)^2) - (3*x^2)/(16*c^2*(a + c*x^4)) + (3*ArcT
an[(Sqrt[c]*x^2)/Sqrt[a]])/(16*Sqrt[a]*c^(5/2))
```

Rubi [A] time = 0.0882107, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{3\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{16\sqrt{a}c^{5/2}}-\frac{3x^2}{16c^2(a+cx^4)}-\frac{x^6}{8c(a+cx^4)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^9/(a + c*x^4)^3,x]
```

```
[Out] -x^6/(8*c*(a + c*x^4)^2) - (3*x^2)/(16*c^2*(a + c*x^4)) + (3*ArcT
an[(Sqrt[c]*x^2)/Sqrt[a]])/(16*Sqrt[a]*c^(5/2))
```

Rubi in Sympy [A] time = 12.8702, size = 60, normalized size = 0.88

$$-\frac{x^6}{8c(a+cx^4)^2}-\frac{3x^2}{16c^2(a+cx^4)}+\frac{3\,\text{atan}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{16\sqrt{a}c^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**9/(c*x**4+a)**3,x)
```

```
[Out] -x**6/(8*c*(a + c*x**4)**2) - 3*x**2/(16*c**2*(a + c*x**4)) + 3*a
tan(sqrt(c)*x**2/sqrt(a))/(16*sqrt(a)*c**(5/2))
```

Mathematica [A] time = 0.0923042, size = 58, normalized size = 0.85

$$\frac{1}{16}\left(\frac{3\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{\sqrt{a}c^{5/2}}+\frac{-3ax^2-5cx^6}{c^2(a+cx^4)^2}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^9/(a + c*x^4)^3,x]
```

```
[Out] ((-3*a*x^2 - 5*c*x^6)/(c^2*(a + c*x^4)^2) + (3*ArcTan[(Sqrt[c]*x^
2)/Sqrt[a]])/(Sqrt[a]*c^(5/2)))/16
```

Maple [A] time = 0.015, size = 52, normalized size = 0.8

$$\frac{1}{2\,(cx^4+a)^2}\left(-\frac{5\,x^6}{8\,c}-\frac{3\,ax^2}{8\,c^2}\right)+\frac{3}{16\,c^2}\arctan\left(cx^2\frac{1}{\sqrt{ac}}\right)\frac{1}{\sqrt{ac}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^9/(c*x^4+a)^3,x)
```

```
[Out] 1/2*(-5/8*x^6/c-3/8*a*x^2/c^2)/(c*x^4+a)^2+3/16/c^2/(a*c)^(1/2)*a
rctan(c*x^2/(a*c)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(c*x^4 + a)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.232998, size = 1, normalized size = 0.01

$$\left[\frac{3\left(c^{2}x^{8}+2\,acx^{4}+a^{2}\right)\log\left(\frac{2\,acx^{2}+\left(cx^{4}-a\right)\sqrt{-ac}}{cx^{4}+a}\right)-2\left(5\,cx^{6}+3\,ax^{2}\right)\sqrt{-ac}}{32\left(c^{4}x^{8}+2\,ac^{3}x^{4}+a^{2}c^{2}\right)\sqrt{-ac}},\ -\frac{3\left(c^{2}x^{8}+2\,acx^{4}+a^{2}\right)\arctan\left(\frac{a}{\sqrt{ac}x^{2}}\right)+\left(5\,cx^{6}+3\,ax^{2}\right)\sqrt{ac}}{16\left(c^{4}x^{8}+2\,ac^{3}x^{4}+a^{2}c^{2}\right)\sqrt{ac}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(c*x^4 + a)^3,x, algorithm="fricas")
```

```
[Out] [1/32*(3*(c^2*x^8 + 2*a*c*x^4 + a^2)*log((2*a*c*x^2 + (c*x^4 - a)
*sqrt(-a*c))/(c*x^4 + a)) - 2*(5*c*x^6 + 3*a*x^2)*sqrt(-a*c))/((c
^4*x^8 + 2*a*c^3*x^4 + a^2*c^2)*sqrt(-a*c)), -1/16*(3*(c^2*x^8 +
2*a*c*x^4 + a^2)*arctan(a/(sqrt(a*c)*x^2)) + (5*c*x^6 + 3*a*x^2)*
sqrt(a*c))/((c^4*x^8 + 2*a*c^3*x^4 + a^2*c^2)*sqrt(a*c))]
```

Sympy [A] time = 5.10263, size = 114, normalized size = 1.68

$$-\frac{3\sqrt{-\frac{1}{ac^{5}}}\log\left(-ac^{2}\sqrt{-\frac{1}{ac^{5}}}+x^{2}\right)}{32}+\frac{3\sqrt{-\frac{1}{ac^{5}}}\log\left(ac^{2}\sqrt{-\frac{1}{ac^{5}}}+x^{2}\right)}{32}-\frac{3ax^{2}+5cx^{6}}{16a^{2}c^{2}+32ac^{3}x^{4}+16c^{4}x^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**9/(c*x**4+a)**3,x)
```

```
[Out] -3*sqrt(-1/(a*c**5))*log(-a*c**2*sqrt(-1/(a*c**5)) + x**2)/32 + 3
*sqrt(-1/(a*c**5))*log(a*c**2*sqrt(-1/(a*c**5)) + x**2)/32 - (3*a
*x**2 + 5*c*x**6)/(16*a**2*c**2 + 32*a*c**3*x**4 + 16*c**4*x**8)
```

GIAC/XCAS [A] time = 0.222273, size = 66, normalized size = 0.97

$$\frac{3\arctan\left(\frac{cx^{2}}{\sqrt{ac}}\right)}{16\sqrt{ac}c^{2}}-\frac{5\,cx^{6}+3\,ax^{2}}{16\left(cx^{4}+a\right)^{2}c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(c*x^4 + a)^3,x, algorithm="giac")
```

```
[Out] 3/16*arctan(c*x^2/sqrt(a*c))/(sqrt(a*c)*c^2) - 1/16*(5*c*x^6 + 3*
a*x^2)/((c*x^4 + a)^2*c^2)
```

3.672 $\int \frac{x^7}{(a+cx^4)^3} \, dx$

Optimal. Leaf size=19

$$\frac{x^8}{8a\left(a+cx^4\right)^2}$$

[Out] x^8/(8*a*(a + c*x^4)^2)

Rubi [A] time = 0.0164148, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{x^8}{8a\left(a+cx^4\right)^2}$$

Antiderivative was successfully verified.

[In] Int[x^7/(a + c*x^4)^3,x]

[Out] x^8/(8*a*(a + c*x^4)^2)

Rubi in Sympy [A] time = 2.84427, size = 14, normalized size = 0.74

$$\frac{x^8}{8a\left(a+cx^4\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(x**7/(c*x**4+a)**3,x)

[Out] x**8/(8*a*(a + c*x**4)**2)

Mathematica [A] time = 0.0164769, size = 24, normalized size = 1.26

$$-\frac{a+2cx^4}{8c^2\left(a+cx^4\right)^2}$$

Antiderivative was successfully verified.

[In] Integrate[x^7/(a + c*x^4)^3,x]

[Out] -(a + 2*c*x^4)/(8*c^2*(a + c*x^4)^2)

Maple [A] time = 0.013, size = 31, normalized size = 1.6

$$-\frac{1}{(4\,cx^4+4\,a)\,c^2}+\frac{a}{8\,c^2\,(cx^4+a)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^7/(c*x^4+a)^3,x)

```
[Out] -1/4/(c*x^4+a)/c^2+1/8*a/c^2/(c*x^4+a)^2
```

Maxima [A] time = 1.43852, size = 49, normalized size = 2.58

$$-\frac{2\,cx^4 + a}{8\,(c^4x^8 + 2\,ac^3x^4 + a^2c^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(c*x^4 + a)^3,x, algorithm="maxima")
```

```
[Out] -1/8*(2*c*x^4 + a)/(c^4*x^8 + 2*a*c^3*x^4 + a^2*c^2)
```

Fricas [A] time = 0.217046, size = 49, normalized size = 2.58

$$-\frac{2\,cx^4 + a}{8\,(c^4x^8 + 2\,ac^3x^4 + a^2c^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(c*x^4 + a)^3,x, algorithm="fricas")
```

```
[Out] -1/8*(2*c*x^4 + a)/(c^4*x^8 + 2*a*c^3*x^4 + a^2*c^2)
```

Sympy [A] time = 4.81274, size = 36, normalized size = 1.89

$$-\frac{a + 2cx^4}{8a^2c^2 + 16ac^3x^4 + 8c^4x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(c*x**4+a)**3,x)
```

```
[Out] -(a + 2*c*x**4)/(8*a**2*c**2 + 16*a*c**3*x**4 + 8*c**4*x**8)
```

GIAC/XCAS [A] time = 0.220026, size = 30, normalized size = 1.58

$$-\frac{2\,cx^4 + a}{8\,(cx^4 + a)^2c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(c*x^4 + a)^3,x, algorithm="giac")
```

```
[Out] -1/8*(2*c*x^4 + a)/((c*x^4 + a)^2*c^2)
```

3.673 $\int \frac{x^5}{(a+cx^4)^3} dx$

Optimal. Leaf size=71

$$\frac{\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{16a^{3/2}c^{3/2}}+\frac{x^2}{16ac\left(a+cx^4\right)}-\frac{x^2}{8c\left(a+cx^4\right)^2}$$

```
[Out] -x^2/(8*c*(a + c*x^4)^2) + x^2/(16*a*c*(a + c*x^4)) + ArcTan[(Sqr
t[c]*x^2)/Sqrt[a]]/(16*a^(3/2)*c^(3/2))
```

Rubi [A] time = 0.0833789, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{16a^{3/2}c^{3/2}}+\frac{x^2}{16ac\left(a+cx^4\right)}-\frac{x^2}{8c\left(a+cx^4\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/(a + c*x^4)^3,x]
```

```
[Out] -x^2/(8*c*(a + c*x^4)^2) + x^2/(16*a*c*(a + c*x^4)) + ArcTan[(Sqr
t[c]*x^2)/Sqrt[a]]/(16*a^(3/2)*c^(3/2))
```

Rubi in Sympy [A] time = 11.3689, size = 56, normalized size = 0.79

$$-\frac{x^2}{8c\left(a+cx^4\right)^2}+\frac{x^2}{16ac\left(a+cx^4\right)}+\frac{\operatorname{atan}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{16a^{\frac{3}{2}}c^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(c*x**4+a)**3,x)
```

```
[Out] -x**2/(8*c*(a + c*x**4)**2) + x**2/(16*a*c*(a + c*x**4)) + atan(s
qrt(c)*x**2/sqrt(a))/(16*a**(3/2)*c**(3/2))
```

Mathematica [A] time = 0.0559769, size = 62, normalized size = 0.87

$$\frac{\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)+\frac{\sqrt{a}\sqrt{c}x^2\left(cx^4-a\right)}{\left(a+cx^4\right)^2}}{16a^{3/2}c^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/(a + c*x^4)^3,x]
```

```
[Out] ((Sqrt[a]*Sqrt[c]*x^2*(-a + c*x^4))/(a + c*x^4)^2 + ArcTan[(Sqrt[
c]*x^2)/Sqrt[a]])/(16*a^(3/2)*c^(3/2))
```

Maple [A] time = 0.014, size = 54, normalized size = 0.8

$$\frac{1}{2\left(cx^4+a\right)^2}\left(\frac{x^6}{8\,a}-\frac{x^2}{8\,c}\right)+\frac{1}{16\,ac}\arctan\left(cx^2\frac{1}{\sqrt{ac}}\right)\frac{1}{\sqrt{ac}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(c*x^4+a)^3,x)
```

```
[Out] 1/2*(1/8*x^6/a-1/8*x^2/c)/(c*x^4+a)^2+1/16/c/a/(a*c)^(1/2)*arctan
(c*x^2/(a*c)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(c*x^4 + a)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.234141, size = 1, normalized size = 0.01

$$\left[\frac{\left(c^{2} x^{8} + 2 \, a c x^{4} + a^{2}\right) \log\left(\frac{2 \, a c x^{2} + \left(c x^{4} - a\right) \sqrt{-a c}}{c x^{4} + a}\right) + 2 \, \left(c x^{6} - a x^{2}\right) \sqrt{-a c}}{32 \, {\left(a c^{3} x^{8} + 2 \, a^{2} c^{2} x^{4} + a^{3} c\right)} \sqrt{-a c}}, -\frac{\left(c^{2} x^{8} + 2 \, a c x^{4} + a^{2}\right) \arctan\left(\frac{a}{\sqrt{a c} x^{2}}\right) - \left(c x^{6} - a x^{2}\right) \sqrt{a c}}{16 \, {\left(a c^{3} x^{8} + 2 \, a^{2} c^{2} x^{4} + a^{3} c\right)} \sqrt{a c}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(c*x^4 + a)^3,x, algorithm="fricas")
```

```
[Out] [1/32*((c^2*x^8 + 2*a*c*x^4 + a^2)*log((2*a*c*x^2 + (c*x^4 - a)*s
qrt(-a*c))/(c*x^4 + a)) + 2*(c*x^6 - a*x^2)*sqrt(-a*c))/((a*c^3*x
^8 + 2*a^2*c^2*x^4 + a^3*c)*sqrt(-a*c)), -1/16*((c^2*x^8 + 2*a*c*
x^4 + a^2)*arctan(a/(sqrt(a*c)*x^2)) - (c*x^6 - a*x^2)*sqrt(a*c))
/((a*c^3*x^8 + 2*a^2*c^2*x^4 + a^3*c)*sqrt(a*c))]
```

Sympy [A] time = 4.98255, size = 116, normalized size = 1.63

$$-\frac{\sqrt{-\frac{1}{a^{3} c^{3}}} \log\left(-a^{2} c \sqrt{-\frac{1}{a^{3} c^{3}}} + x^{2}\right)}{32} + \frac{\sqrt{-\frac{1}{a^{3} c^{3}}} \log\left(a^{2} c \sqrt{-\frac{1}{a^{3} c^{3}}} + x^{2}\right)}{32} + \frac{-a x^{2} + c x^{6}}{16 a^{3} c + 32 a^{2} c^{2} x^{4} + 16 a c^{3} x^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(c*x**4+a)**3,x)
```

```
[Out] -sqrt(-1/(a**3*c**3))*log(-a**2*c*sqrt(-1/(a**3*c**3)) + x**2)/32
 + sqrt(-1/(a**3*c**3))*log(a**2*c*sqrt(-1/(a**3*c**3)) + x**2)/3
2 + (-a*x**2 + c*x**6)/(16*a**3*c + 32*a**2*c**2*x**4 + 16*a*c**3
*x**8)
```

GIAC/XCAS [A] time = 0.226203, size = 73, normalized size = 1.03

$$\frac{\arctan\left(\frac{c x^{2}}{\sqrt{a c}}\right)}{16 \, \sqrt{a c} a c} + \frac{c x^{6} - a x^{2}}{16 \, {\left(c x^{4} + a\right)}^{2} a c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(c*x^4 + a)^3,x, algorithm="giac")
```

```
[Out] 1/16*arctan(c*x^2/sqrt(a*c))/(sqrt(a*c)*a*c) + 1/16*(c*x^6 - a*x^
2)/((c*x^4 + a)^2*a*c)
```

3.674 $\int \frac{x^3}{(a+cx^4)^3} \, dx$

Optimal. Leaf size=16

$$-\frac{1}{8c(a+cx^4)^2}$$

[Out] -1/(8*c*(a + c*x^4)^2)

Rubi [A] time = 0.00996235, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{1}{8c(a+cx^4)^2}$$

Antiderivative was successfully verified.

[In] Int[x^3/(a + c*x^4)^3,x]

[Out] -1/(8*c*(a + c*x^4)^2)

Rubi in Sympy [A] time = 2.12789, size = 14, normalized size = 0.88

$$-\frac{1}{8c(a+cx^4)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(x**3/(c*x**4+a)**3,x)

[Out] -1/(8*c*(a + c*x**4)**2)

Mathematica [A] time = 0.00736345, size = 16, normalized size = 1.

$$-\frac{1}{8c(a+cx^4)^2}$$

Antiderivative was successfully verified.

[In] Integrate[x^3/(a + c*x^4)^3,x]

[Out] -1/(8*c*(a + c*x^4)^2)

Maple [A] time = 0.001, size = 15, normalized size = 0.9

$$-\frac{1}{8\,c\,(cx^4+a)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^3/(c*x^4+a)^3,x)

[Out] -1/8/c/(c*x^4+a)^2

Maxima [A] time = 1.43196, size = 19, normalized size = 1.19

$$-\frac{1}{8\,(cx^4+a)^2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(c*x^4 + a)^3,x, algorithm="maxima")
```

```
[Out] -1/8/((c*x^4 + a)^2*c)
```

Fricas [A] time = 0.214808, size = 35, normalized size = 2.19

$$-\frac{1}{8\,(c^3x^8+2\,ac^2x^4+a^2c)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(c*x^4 + a)^3,x, algorithm="fricas")
```

```
[Out] -1/8/(c^3*x^8 + 2*a*c^2*x^4 + a^2*c)
```

Sympy [A] time = 4.59924, size = 27, normalized size = 1.69

$$-\frac{1}{8a^2c+16ac^2x^4+8c^3x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(c*x**4+a)**3,x)
```

```
[Out] -1/(8*a**2*c + 16*a*c**2*x**4 + 8*c**3*x**8)
```

GIAC/XCAS [A] time = 0.221449, size = 19, normalized size = 1.19

$$-\frac{1}{8\,(cx^4+a)^2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(c*x^4 + a)^3,x, algorithm="giac")
```

```
[Out] -1/8/((c*x^4 + a)^2*c)
```

3.675 $\int \frac{x}{(a+cx^4)^3}\,dx$

Optimal. Leaf size=68

$$\frac{3\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{16a^{5/2}\sqrt{c}}+\frac{3x^2}{16a^2\left(a+cx^4\right)}+\frac{x^2}{8a\left(a+cx^4\right)^2}$$

```
[Out] x^2/(8*a*(a + c*x^4)^2) + (3*x^2)/(16*a^2*(a + c*x^4)) + (3*ArcTa
n[(Sqrt[c]*x^2)/Sqrt[a]])/(16*a^(5/2)*Sqrt[c])
```

Rubi [A] time = 0.0705767, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273

$$\frac{3\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{16a^{5/2}\sqrt{c}}+\frac{3x^2}{16a^2\left(a+cx^4\right)}+\frac{x^2}{8a\left(a+cx^4\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + c*x^4)^3,x]
```

```
[Out] x^2/(8*a*(a + c*x^4)^2) + (3*x^2)/(16*a^2*(a + c*x^4)) + (3*ArcTa
n[(Sqrt[c]*x^2)/Sqrt[a]])/(16*a^(5/2)*Sqrt[c])
```

Rubi in Sympy [A] time = 8.34, size = 60, normalized size = 0.88

$$\frac{x^2}{8a\left(a+cx^4\right)^2}+\frac{3x^2}{16a^2\left(a+cx^4\right)}+\frac{3\,\mathrm{atan}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{16a^{\frac{5}{2}}\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(c*x**4+a)**3,x)
```

```
[Out] x**2/(8*a*(a + c*x**4)**2) + 3*x**2/(16*a**2*(a + c*x**4)) + 3*at
an(sqrt(c)*x**2/sqrt(a))/(16*a**(5/2)*sqrt(c))
```

Mathematica [A] time = 0.0785993, size = 58, normalized size = 0.85

$$\frac{1}{16}\left(\frac{3\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{a^{5/2}\sqrt{c}}+\frac{5ax^2+3cx^6}{a^2\left(a+cx^4\right)^2}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + c*x^4)^3,x]
```

```
[Out] ((5*a*x^2 + 3*c*x^6)/(a^2*(a + c*x^4)^2) + (3*ArcTan[(Sqrt[c]*x^2
)/Sqrt[a]])/(a^(5/2)*Sqrt[c]))/16
```

Maple [A] time = 0.009, size = 57, normalized size = 0.8

$$\frac{x^2}{8\,a\left(cx^4+a\right)^2}+\frac{3\,x^2}{16\,a^2\left(cx^4+a\right)}+\frac{3}{16\,a^2}\arctan\left(cx^2\frac{1}{\sqrt{ac}}\right)\frac{1}{\sqrt{ac}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(c*x^4+a)^3,x)
```

```
[Out] 1/8*x^2/a/(c*x^4+a)^2+3/16*x^2/a^2/(c*x^4+a)+3/16/a^2/(a*c)^(1/2)
*arctan(c*x^2/(a*c)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(c*x^4 + a)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.23838, size = 1, normalized size = 0.01

$$\left[\frac{3\left(c^2x^8 + 2\,acx^4 + a^2\right)\log\left(\frac{2\,acx^2 + (cx^4 - a)\sqrt{-ac}}{cx^4 + a}\right) + 2\left(3\,cx^6 + 5\,ax^2\right)\sqrt{-ac}}{32\,(a^2c^2x^8 + 2\,a^3cx^4 + a^4)\sqrt{-ac}},\right.$$
$$\left.-\frac{3\left(c^2x^8 + 2\,acx^4 + a^2\right)\arctan\left(\frac{a}{\sqrt{ac}x^2}\right) - \left(3\,cx^6 + 5\,ax^2\right)\sqrt{ac}}{16\,(a^2c^2x^8 + 2\,a^3cx^4 + a^4)\sqrt{ac}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(c*x^4 + a)^3,x, algorithm="fricas")
```

```
[Out] [1/32*(3*(c^2*x^8 + 2*a*c*x^4 + a^2)*log((2*a*c*x^2 + (c*x^4 - a)
*sqrt(-a*c))/(c*x^4 + a)) + 2*(3*c*x^6 + 5*a*x^2)*sqrt(-a*c))/((a
^2*c^2*x^8 + 2*a^3*c*x^4 + a^4)*sqrt(-a*c)), -1/16*(3*(c^2*x^8 +
2*a*c*x^4 + a^2)*arctan(a/(sqrt(a*c)*x^2)) - (3*c*x^6 + 5*a*x^2)*
sqrt(a*c))/((a^2*c^2*x^8 + 2*a^3*c*x^4 + a^4)*sqrt(a*c))]
```

Sympy [A] time = 4.94295, size = 110, normalized size = 1.62

$$-\frac{3\sqrt{-\frac{1}{a^5c}}\log\left(-a^3\sqrt{-\frac{1}{a^5c}} + x^2\right)}{32} + \frac{3\sqrt{-\frac{1}{a^5c}}\log\left(a^3\sqrt{-\frac{1}{a^5c}} + x^2\right)}{32} + \frac{5ax^2 + 3cx^6}{16a^4 + 32a^3cx^4 + 16a^2c^2x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(c*x**4+a)**3,x)
```

```
[Out] -3*sqrt(-1/(a**5*c))*log(-a**3*sqrt(-1/(a**5*c)) + x**2)/32 + 3*s
qrt(-1/(a**5*c))*log(a**3*sqrt(-1/(a**5*c)) + x**2)/32 + (5*a*x**
2 + 3*c*x**6)/(16*a**4 + 32*a**3*c*x**4 + 16*a**2*c**2*x**8)
```

GIAC/XCAS [A] time = 0.221665, size = 66, normalized size = 0.97

$$\frac{3\arctan\left(\frac{cx^2}{\sqrt{ac}}\right)}{16\sqrt{ac}a^2} + \frac{3\,cx^6 + 5\,ax^2}{16\,(cx^4 + a)^2a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(c*x^4 + a)^3,x, algorithm="giac")
```

```
[Out] 3/16*arctan(c*x^2/sqrt(a*c))/(sqrt(a*c)*a^2) + 1/16*(3*c*x^6 + 5*
a*x^2)/((c*x^4 + a)^2*a^2)
```

3.676 $\int \frac{1}{x(a+cx^4)^3}\,dx$

Optimal. Leaf size=54

$$-\frac{\log\left(a+cx^4\right)}{4a^3}+\frac{\log(x)}{a^3}+\frac{1}{4a^2\left(a+cx^4\right)}+\frac{1}{8a\left(a+cx^4\right)^2}$$

```
[Out] 1/(8*a*(a + c*x^4)^2) + 1/(4*a^2*(a + c*x^4)) + Log[x]/a^3 - Log[
a + c*x^4]/(4*a^3)
```

Rubi [A] time = 0.079981, antiderivative size = 54, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{\log\left(a+cx^4\right)}{4a^3}+\frac{\log(x)}{a^3}+\frac{1}{4a^2\left(a+cx^4\right)}+\frac{1}{8a\left(a+cx^4\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a + c*x^4)^3),x]
```

```
[Out] 1/(8*a*(a + c*x^4)^2) + 1/(4*a^2*(a + c*x^4)) + Log[x]/a^3 - Log[
a + c*x^4]/(4*a^3)
```

Rubi in Sympy [A] time = 10.8501, size = 49, normalized size = 0.91

$$\frac{1}{8a\left(a+cx^4\right)^2}+\frac{1}{4a^2\left(a+cx^4\right)}+\frac{\log\left(x^4\right)}{4a^3}-\frac{\log\left(a+cx^4\right)}{4a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(c*x**4+a)**3,x)
```

```
[Out] 1/(8*a*(a + c*x**4)**2) + 1/(4*a**2*(a + c*x**4)) + log(x**4)/(4*
a**3) - log(a + c*x**4)/(4*a**3)
```

Mathematica [A] time = 0.0624152, size = 43, normalized size = 0.8

$$\frac{\frac{a\left(3a+2cx^4\right)}{\left(a+cx^4\right)^2}-2\log\left(a+cx^4\right)+8\log(x)}{8a^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a + c*x^4)^3),x]
```

```
[Out] ((a*(3*a + 2*c*x^4))/(a + c*x^4)^2 + 8*Log[x] - 2*Log[a + c*x^4])
/(8*a^3)
```

Maple [A] time = 0.022, size = 49, normalized size = 0.9

$$\frac{1}{8\,a\left(cx^4+a\right)^2}+\frac{1}{4\,a^2\left(cx^4+a\right)}+\frac{\ln(x)}{a^3}-\frac{\ln\left(cx^4+a\right)}{4\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(c*x^4+a)^3,x)
```

```
[Out] 1/8/a/(c*x^4+a)^2+1/4/a^2/(c*x^4+a)+ln(x)/a^3-1/4*ln(c*x^4+a)/a^3
```

Maxima [A] time = 1.42709, size = 81, normalized size = 1.5

$$\frac{2\,cx^{4}+3\,a}{8\,\left(a^{2}c^{2}x^{8}+2\,a^{3}cx^{4}+a^{4}\right)}-\frac{\log\left(cx^{4}+a\right)}{4\,a^{3}}+\frac{\log\left(x^{4}\right)}{4\,a^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)^3*x),x, algorithm="maxima")
```

```
[Out] 1/8*(2*c*x^4 + 3*a)/(a^2*c^2*x^8 + 2*a^3*c*x^4 + a^4) - 1/4*log(c
*x^4 + a)/a^3 + 1/4*log(x^4)/a^3
```

Fricas [A] time = 0.231196, size = 122, normalized size = 2.26

$$\frac{2\,acx^{4}+3\,a^{2}-2\,\left(c^{2}x^{8}+2\,acx^{4}+a^{2}\right)\log\left(cx^{4}+a\right)+8\,\left(c^{2}x^{8}+2\,acx^{4}+a^{2}\right)\log\left(x\right)}{8\,\left(a^{3}c^{2}x^{8}+2\,a^{4}cx^{4}+a^{5}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)^3*x),x, algorithm="fricas")
```

```
[Out] 1/8*(2*a*c*x^4 + 3*a^2 - 2*(c^2*x^8 + 2*a*c*x^4 + a^2)*log(c*x^4
+ a) + 8*(c^2*x^8 + 2*a*c*x^4 + a^2)*log(x))/(a^3*c^2*x^8 + 2*a^4
*c*x^4 + a^5)
```

Sympy [A] time = 10.5943, size = 56, normalized size = 1.04

$$\frac{3a+2cx^{4}}{8a^{4}+16a^{3}cx^{4}+8a^{2}c^{2}x^{8}}+\frac{\log\left(x\right)}{a^{3}}-\frac{\log\left(\frac{a}{c}+x^{4}\right)}{4a^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(c*x**4+a)**3,x)
```

```
[Out] (3*a + 2*c*x**4)/(8*a**4 + 16*a**3*c*x**4 + 8*a**2*c**2*x**8) + l
og(x)/a**3 - log(a/c + x**4)/(4*a**3)
```

GIAC/XCAS [A] time = 0.223924, size = 80, normalized size = 1.48

$$\frac{\ln\left(x^{4}\right)}{4\,a^{3}}-\frac{\ln\left(\left|cx^{4}+a\right|\right)}{4\,a^{3}}+\frac{3\,c^{2}x^{8}+8\,acx^{4}+6\,a^{2}}{8\,\left(cx^{4}+a\right)^{2}a^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)^3*x),x, algorithm="giac")
```

```
[Out] 1/4*ln(x^4)/a^3 - 1/4*ln(abs(c*x^4 + a))/a^3 + 1/8*(3*c^2*x^8 + 8
*a*c*x^4 + 6*a^2)/((c*x^4 + a)^2*a^3)
```

3.677 $\int \frac{1}{x^3(a+cx^4)^3}\,dx$

Optimal. Leaf size=78

$$-\frac{15\sqrt{c}\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{16a^{7/2}}-\frac{15}{16a^3x^2}+\frac{5}{16a^2x^2\left(a+cx^4\right)}+\frac{1}{8ax^2\left(a+cx^4\right)^2}$$

```
[Out] -15/(16*a^3*x^2) + 1/(8*a*x^2*(a + c*x^4)^2) + 5/(16*a^2*x^2*(a +
 c*x^4)) - (15*Sqrt[c]*ArcTan[(Sqrt[c]*x^2)/Sqrt[a]])/(16*a^(7/2)
)
```

Rubi [A] time = 0.102196, antiderivative size = 78, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$-\frac{15\sqrt{c}\tan^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{16a^{7/2}}-\frac{15}{16a^3x^2}+\frac{5}{16a^2x^2\left(a+cx^4\right)}+\frac{1}{8ax^2\left(a+cx^4\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(a + c*x^4)^3),x]
```

```
[Out] -15/(16*a^3*x^2) + 1/(8*a*x^2*(a + c*x^4)^2) + 5/(16*a^2*x^2*(a +
 c*x^4)) - (15*Sqrt[c]*ArcTan[(Sqrt[c]*x^2)/Sqrt[a]])/(16*a^(7/2)
)
```

Rubi in Sympy [A] time = 16.3619, size = 71, normalized size = 0.91

$$\frac{1}{8ax^2\left(a+cx^4\right)^2}+\frac{5}{16a^2x^2\left(a+cx^4\right)}-\frac{15}{16a^3x^2}-\frac{15\sqrt{c}\,\mathrm{atan}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{16a^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(c*x**4+a)**3,x)
```

```
[Out] 1/(8*a*x**2*(a + c*x**4)**2) + 5/(16*a**2*x**2*(a + c*x**4)) - 15
/(16*a**3*x**2) - 15*sqrt(c)*atan(sqrt(c)*x**2/sqrt(a))/(16*a**(7
/2))
```

Mathematica [A] time = 0.177981, size = 105, normalized size = 1.35

$$\frac{-\frac{\sqrt{a}\left(8a^2+25acx^4+15c^2x^8\right)}{x^2\left(a+cx^4\right)^2}+15\sqrt{c}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)+15\sqrt{c}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{16a^{7/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*(a + c*x^4)^3),x]
```

```
[Out] (-((Sqrt[a]*(8*a^2 + 25*a*c*x^4 + 15*c^2*x^8))/(x^2*(a + c*x^4)^2
)) + 15*Sqrt[c]*ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)] + 15*Sqrt
[c]*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(16*a^(7/2))
```

Maple [A] time = 0.02, size = 70, normalized size = 0.9

$$-\frac{1}{2x^{2}a^{3}}-\frac{7c^{2}x^{6}}{16a^{3}\left(cx^{4}+a\right)^{2}}-\frac{9cx^{2}}{16a^{2}\left(cx^{4}+a\right)^{2}}-\frac{15c}{16a^{3}}\arctan\left(cx^{2}\frac{1}{\sqrt{ac}}\right)\frac{1}{\sqrt{ac}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(c*x^4+a)^3,x)
```

```
[Out] -1/2/x^2/a^3-7/16*c^2/a^3/(c*x^4+a)^2*x^6-9/16*c/a^2/(c*x^4+a)^2*
x^2-15/16*c/a^3/(a*c)^(1/2)*arctan(c*x^2/(a*c)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)^3*x^3),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.24088, size = 1, normalized size = 0.01

$$\left[-\frac{30c^{2}x^{8}+50acx^{4}-15\left(c^{2}x^{10}+2acx^{6}+a^{2}x^{2}\right)\sqrt{-\frac{c}{a}}\log\left(\frac{cx^{4}-2ax^{2}\sqrt{-\frac{c}{a}}-a}{cx^{4}+a}\right)+16a^{2}}{32\left(a^{3}c^{2}x^{10}+2a^{4}cx^{6}+a^{5}x^{2}\right)},\ -\frac{15c^{2}x^{8}+25acx^{4}-15\left(c^{2}x^{10}+2acx^{6}+a^{2}x^{2}\right)\sqrt{\frac{c}{a}}\arctan\left(\frac{a\sqrt{\frac{c}{a}}}{cx^{2}}\right)+8a^{2}}{16\left(a^{3}c^{2}x^{10}+2a^{4}cx^{6}+a^{5}x^{2}\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)^3*x^3),x, algorithm="fricas")
```

```
[Out] [-1/32*(30*c^2*x^8 + 50*a*c*x^4 - 15*(c^2*x^10 + 2*a*c*x^6 + a^2*
x^2)*sqrt(-c/a)*log((c*x^4 - 2*a*x^2*sqrt(-c/a) - a)/(c*x^4 + a))
 + 16*a^2)/(a^3*c^2*x^10 + 2*a^4*c*x^6 + a^5*x^2), -1/16*(15*c^2*
x^8 + 25*a*c*x^4 - 15*(c^2*x^10 + 2*a*c*x^6 + a^2*x^2)*sqrt(c/a)*
arctan(a*sqrt(c/a)/(c*x^2)) + 8*a^2)/(a^3*c^2*x^10 + 2*a^4*c*x^6
+ a^5*x^2)]
```

Sympy [A] time = 34.2568, size = 119, normalized size = 1.53

$$\frac{15\sqrt{-\frac{c}{a^{7}}}\log\left(-\frac{a^{4}\sqrt{-\frac{c}{a^{7}}}}{c}+x^{2}\right)}{32}-\frac{15\sqrt{-\frac{c}{a^{7}}}\log\left(\frac{a^{4}\sqrt{-\frac{c}{a^{7}}}}{c}+x^{2}\right)}{32}-\frac{8a^{2}+25acx^{4}+15c^{2}x^{8}}{16a^{5}x^{2}+32a^{4}cx^{6}+16a^{3}c^{2}x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(c*x**4+a)**3,x)
```

```
[Out] 15*sqrt(-c/a**7)*log(-a**4*sqrt(-c/a**7)/c + x**2)/32 - 15*sqrt(-
c/a**7)*log(a**4*sqrt(-c/a**7)/c + x**2)/32 - (8*a**2 + 25*a*c*x*
```

```
*4 + 15*c**2*x**8)/(16*a**5*x**2 + 32*a**4*c*x**6 + 16*a**3*c**2*
x**10)
```

GIAC/XCAS [A] time = 0.21984, size = 82, normalized size = 1.05

$$-\frac{15\,c\arctan\left(\frac{cx^2}{\sqrt{ac}}\right)}{16\,\sqrt{ac}a^3}-\frac{7\,c^2x^6+9\,acx^2}{16\,(cx^4+a)^2a^3}-\frac{1}{2\,a^3x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)^3*x^3),x, algorithm="giac")
```

```
[Out] -15/16*c*arctan(c*x^2/sqrt(a*c))/(sqrt(a*c)*a^3) - 1/16*(7*c^2*x^
6 + 9*a*c*x^2)/((c*x^4 + a)^2*a^3) - 1/2/(a^3*x^2)
```

3.678 $\int \frac{x^{10}}{(a+cx^4)^3} dx$

Optimal. Leaf size=223

$$\frac{21\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{128\sqrt{2}\sqrt[4]{a}c^{11/4}}-\frac{21\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{128\sqrt{2}\sqrt[4]{a}c^{11/4}}-\frac{21\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{64\sqrt{2}\sqrt[4]{a}c^{11/4}}+\frac{21\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{64\sqrt{2}\sqrt[4]{a}c^{11/4}}-\frac{7x^3}{32c^2(a+cx^4)}-\frac{x^7}{8c(a+cx^4)^2}$$

```
[Out] -x^7/(8*c*(a + c*x^4)^2) - (7*x^3)/(32*c^2*(a + c*x^4)) - (21*Arc
Tan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(64*Sqrt[2]*a^(1/4)*c^(11/4
)) + (21*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(64*Sqrt[2]*a^(
1/4)*c^(11/4)) + (21*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4)*x + Sq
rt[c]*x^2])/(128*Sqrt[2]*a^(1/4)*c^(11/4)) - (21*Log[Sqrt[a] + Sq
rt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(128*Sqrt[2]*a^(1/4)*c^(1
1/4))
```

Rubi [A] time = 0.303145, antiderivative size = 223, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538

$$\frac{21\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{128\sqrt{2}\sqrt[4]{a}c^{11/4}}-\frac{21\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{128\sqrt{2}\sqrt[4]{a}c^{11/4}}-\frac{21\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{64\sqrt{2}\sqrt[4]{a}c^{11/4}}+\frac{21\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{64\sqrt{2}\sqrt[4]{a}c^{11/4}}-\frac{7x^3}{32c^2(a+cx^4)}-\frac{x^7}{8c(a+cx^4)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^10/(a + c*x^4)^3,x]
```

```
[Out] -x^7/(8*c*(a + c*x^4)^2) - (7*x^3)/(32*c^2*(a + c*x^4)) - (21*Arc
Tan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(64*Sqrt[2]*a^(1/4)*c^(11/4
)) + (21*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(64*Sqrt[2]*a^(
1/4)*c^(11/4)) + (21*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4)*x + Sq
rt[c]*x^2])/(128*Sqrt[2]*a^(1/4)*c^(11/4)) - (21*Log[Sqrt[a] + Sq
rt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(128*Sqrt[2]*a^(1/4)*c^(1
1/4))
```

Rubi in Sympy [A] time = 60.6886, size = 211, normalized size = 0.95

$$-\frac{x^7}{8c(a+cx^4)^2}-\frac{7x^3}{32c^2(a+cx^4)}+\frac{21\sqrt{2}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{256\sqrt[4]{a}c^{\frac{11}{4}}}-\frac{21\sqrt{2}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{256\sqrt[4]{a}c^{\frac{11}{4}}}-\frac{21\sqrt{2}\,\text{atan}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{128\sqrt[4]{a}c^{\frac{11}{4}}}+\frac{21\sqrt{2}\,\text{atan}\left(1+\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{128\sqrt[4]{a}c^{\frac{11}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**10/(c*x**4+a)**3,x)
```

```
[Out] -x**7/(8*c*(a + c*x**4)**2) - 7*x**3/(32*c**2*(a + c*x**4)) + 21*
sqrt(2)*log(-sqrt(2)*a**(1/4)*c**(1/4)*x + sqrt(a) + sqrt(c)*x**2
)/(256*a**(1/4)*c**(11/4)) - 21*sqrt(2)*log(sqrt(2)*a**(1/4)*c**(
1/4)*x + sqrt(a) + sqrt(c)*x**2)/(256*a**(1/4)*c**(11/4)) - 21*sq
rt(2)*atan(1 - sqrt(2)*c**(1/4)*x/a**(1/4))/(128*a**(1/4)*c**(11/
4)) + 21*sqrt(2)*atan(1 + sqrt(2)*c**(1/4)*x/a**(1/4))/(128*a**(1
```

```
/4)*c**(11/4))
```

Mathematica [A] time = 0.201928, size = 205, normalized size = 0.92

$$-\frac{\frac{88c^{3/4}x^3}{a+cx^4}+\frac{32ac^{3/4}x^3}{(a+cx^4)^2}+\frac{21\sqrt{2}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{\sqrt[4]{a}}-\frac{21\sqrt{2}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{\sqrt[4]{a}}-\frac{42\sqrt{2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{\sqrt[4]{a}}+\frac{42\sqrt{2}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+\right.}{\sqrt[4]{a}}}{256c^{11/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^10/(a + c*x^4)^3,x]
```

```
[Out] ((32*a*c^(3/4)*x^3)/(a + c*x^4)^2 - (88*c^(3/4)*x^3)/(a + c*x^4)
- (42*Sqrt[2]*ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/a^(1/4) +
(42*Sqrt[2]*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/a^(1/4) + (2
1*Sqrt[2]*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])
/a^(1/4) - (21*Sqrt[2]*Log[Sqrt[a] + Sqrt[2]*a^(1/4)*c^(1/4)*x +
Sqrt[c]*x^2])/a^(1/4))/(256*c^(11/4))
```

Maple [A] time = 0.017, size = 156, normalized size = 0.7

$$\frac{1}{(cx^4+a)^2}\left(-\frac{11\,x^7}{32\,c}-\frac{7\,ax^3}{32\,c^2}\right)+\frac{21\,\sqrt{2}}{256\,c^3}\ln\left(1\left(x^2-\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)\left(x^2+\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)^{-1}\right)\frac{1}{\sqrt[4]{\frac{a}{c}}}+\frac{21\,\sqrt{2}}{128\,c^3}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}+1\right)\frac{1}{\sqrt[4]{\frac{a}{c}}}+\frac{21\,\sqrt{2}}{128\,c^3}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}-1\right)\frac{1}{\sqrt[4]{\frac{a}{c}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^10/(c*x^4+a)^3,x)
```

```
[Out] (-11/32/c*x^7-7/32*a/c^2*x^3)/(c*x^4+a)^2+21/256/c^3/(a/c)^(1/4)*
2^(1/2)*ln((x^2-(a/c)^(1/4)*x*2^(1/2)+(a/c)^(1/2))/(x^2+(a/c)^(1/
4)*x*2^(1/2)+(a/c)^(1/2)))+21/128/c^3/(a/c)^(1/4)*2^(1/2)*arctan(
2^(1/2)/(a/c)^(1/4)*x+1)+21/128/c^3/(a/c)^(1/4)*2^(1/2)*arctan(2^
(1/2)/(a/c)^(1/4)*x-1)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/(c*x^4 + a)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.240513, size = 308, normalized size = 1.38

$$-\frac{44\,cx^7+28\,ax^3-84\left(c^4x^8+2\,ac^3x^4+a^2c^2\right)\left(-\frac{1}{ac^{11}}\right)^{\frac{1}{4}}\arctan\left(\frac{ac^8\left(-\frac{1}{ac^{11}}\right)^{\frac{3}{4}}}{x+\sqrt{-ac^5\sqrt{-\frac{1}{ac^{11}}}+x^2}}\right)-21\left(c^4x^8+2\,ac^3x^4+a^2c^2\right)\left(-\frac{1}{ac^{11}}\right)^{\frac{1}{4}}}{128\left(c^4x^8+2\,ac^3x^4+a^2c^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/(c*x^4 + a)^3,x, algorithm="fricas")
```

```
[Out] -1/128*(44*c*x^7 + 28*a*x^3 - 84*(c^4*x^8 + 2*a*c^3*x^4 + a^2*c^2
)*(-1/(a*c^11))^(1/4)*arctan(a*c^8*(-1/(a*c^11))^(3/4)/(x + sqrt(
-a*c^5*sqrt(-1/(a*c^11)) + x^2))) - 21*(c^4*x^8 + 2*a*c^3*x^4 + a
^2*c^2)*(-1/(a*c^11))^(1/4)*log(a*c^8*(-1/(a*c^11))^(3/4) + x) +
21*(c^4*x^8 + 2*a*c^3*x^4 + a^2*c^2)*(-1/(a*c^11))^(1/4)*log(-a*c
^8*(-1/(a*c^11))^(3/4) + x))/(c^4*x^8 + 2*a*c^3*x^4 + a^2*c^2)
```

Sympy [A] time = 5.14377, size = 68, normalized size = 0.3

$$-\frac{7ax^3+11cx^7}{32a^2c^2+64ac^3x^4+32c^4x^8}+\operatorname{RootSum}\left(268435456t^4ac^{11}+194481,\left(t\mapsto t\log\left(\frac{2097152t^3ac^8}{9261}+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**10/(c*x**4+a)**3,x)
```

```
[Out] -(7*a*x**3 + 11*c*x**7)/(32*a**2*c**2 + 64*a*c**3*x**4 + 32*c**4*
x**8) + RootSum(268435456*_t**4*a*c**11 + 194481, Lambda(_t, _t*l
og(2097152*_t**3*a*c**8/9261 + x)))
```

GIAC/XCAS [A] time = 0.226937, size = 278, normalized size = 1.25

$$-\frac{11\,cx^7+7\,ax^3}{32\,(cx^4+a)^2c^2}+\frac{21\,\sqrt{2}\,(ac^3)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x+\sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{128\,ac^5}+\frac{21\,\sqrt{2}\,(ac^3)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x-\sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{128\,ac^5}-\frac{21\,\sqrt{2}\,(ac^3)^{\frac{3}{4}}\ln\left(x^2+\sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{c}}\right)}{256\,ac^5}+\frac{21\,\sqrt{2}\,(ac^3)^{\frac{3}{4}}\ln\left(x^2-\sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{c}}\right)}{256\,ac^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/(c*x^4 + a)^3,x, algorithm="giac")
```

```
[Out] -1/32*(11*c*x^7 + 7*a*x^3)/((c*x^4 + a)^2*c^2) + 21/128*sqrt(2)*(
a*c^3)^(3/4)*arctan(1/2*sqrt(2)*(2*x + sqrt(2)*(a/c)^(1/4))/(a/c)
^(1/4))/(a*c^5) + 21/128*sqrt(2)*(a*c^3)^(3/4)*arctan(1/2*sqrt(2)
*(2*x - sqrt(2)*(a/c)^(1/4))/(a/c)^(1/4))/(a*c^5) - 21/256*sqrt(2
)*(a*c^3)^(3/4)*ln(x^2 + sqrt(2)*x*(a/c)^(1/4) + sqrt(a/c))/(a*c^
5) + 21/256*sqrt(2)*(a*c^3)^(3/4)*ln(x^2 - sqrt(2)*x*(a/c)^(1/4)
+ sqrt(a/c))/(a*c^5)
```

3.679 $\int \frac{x^8}{(a+cx^4)^3}\,dx$

Optimal. Leaf size=221

$$-\frac{5\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{128\sqrt{2}a^{3/4}c^{9/4}}+\frac{5\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{128\sqrt{2}a^{3/4}c^{9/4}}-\frac{5\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{64\sqrt{2}a^{3/4}c^{9/4}}+\frac{5\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{64\sqrt{2}a^{3/4}c^{9/4}}-\frac{5x}{32c^2\left(a+cx^4\right)}-\frac{x^5}{8c\left(a+cx^4\right)^2}$$

```
[Out] -x^5/(8*c*(a + c*x^4)^2) - (5*x)/(32*c^2*(a + c*x^4)) - (5*ArcTan
[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(64*Sqrt[2]*a^(3/4)*c^(9/4)) +
 (5*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(64*Sqrt[2]*a^(3/4)*
c^(9/4)) - (5*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x
^2])/(128*Sqrt[2]*a^(3/4)*c^(9/4)) + (5*Log[Sqrt[a] + Sqrt[2]*a^(
1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(128*Sqrt[2]*a^(3/4)*c^(9/4))
```

Rubi [A] time = 0.287622, antiderivative size = 221, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538

$$-\frac{5\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{128\sqrt{2}a^{3/4}c^{9/4}}+\frac{5\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{128\sqrt{2}a^{3/4}c^{9/4}}-\frac{5\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{64\sqrt{2}a^{3/4}c^{9/4}}+\frac{5\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{64\sqrt{2}a^{3/4}c^{9/4}}-\frac{5x}{32c^2\left(a+cx^4\right)}-\frac{x^5}{8c\left(a+cx^4\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8/(a + c*x^4)^3,x]
```

```
[Out] -x^5/(8*c*(a + c*x^4)^2) - (5*x)/(32*c^2*(a + c*x^4)) - (5*ArcTan
[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(64*Sqrt[2]*a^(3/4)*c^(9/4)) +
 (5*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(64*Sqrt[2]*a^(3/4)*
c^(9/4)) - (5*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x
^2])/(128*Sqrt[2]*a^(3/4)*c^(9/4)) + (5*Log[Sqrt[a] + Sqrt[2]*a^(
1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(128*Sqrt[2]*a^(3/4)*c^(9/4))
```

Rubi in Sympy [A] time = 59.6547, size = 209, normalized size = 0.95

$$-\frac{x^5}{8c\left(a+cx^4\right)^2}-\frac{5x}{32c^2\left(a+cx^4\right)}-\frac{5\sqrt{2}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{256a^{\frac{3}{4}}c^{\frac{9}{4}}}+\frac{5\sqrt{2}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{256a^{\frac{3}{4}}c^{\frac{9}{4}}}-\frac{5\sqrt{2}\,\mathrm{atan}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{128a^{\frac{3}{4}}c^{\frac{9}{4}}}+\frac{5\sqrt{2}\,\mathrm{atan}\left(1+\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{128a^{\frac{3}{4}}c^{\frac{9}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8/(c*x**4+a)**3,x)
```

```
[Out] -x**5/(8*c*(a + c*x**4)**2) - 5*x/(32*c**2*(a + c*x**4)) - 5*sqrt
(2)*log(-sqrt(2)*a**(1/4)*c**(1/4)*x + sqrt(a) + sqrt(c)*x**2)/(2
56*a**(3/4)*c**(9/4)) + 5*sqrt(2)*log(sqrt(2)*a**(1/4)*c**(1/4)*x
 + sqrt(a) + sqrt(c)*x**2)/(256*a**(3/4)*c**(9/4)) - 5*sqrt(2)*at
an(1 - sqrt(2)*c**(1/4)*x/a**(1/4))/(128*a**(3/4)*c**(9/4)) + 5*s
qrt(2)*atan(1 + sqrt(2)*c**(1/4)*x/a**(1/4))/(128*a**(3/4)*c**(9/
4))
```

Mathematica [A] time = 0.183343, size = 201, normalized size = 0.91

$$-\frac{-\frac{5\sqrt{2}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{a^{3/4}}+\frac{5\sqrt{2}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{a^{3/4}}-\frac{10\sqrt{2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{a^{3/4}}+\frac{10\sqrt{2}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{a^{3/4}}-\frac{72\sqrt[4]{c}x}{a+cx^4}+\frac{32a\sqrt[4]{c}x}{(a+cx^4)^2}}{256c^{9/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8/(a + c*x^4)^3,x]
```

```
[Out] ((32*a*c^(1/4)*x)/(a + c*x^4)^2 - (72*c^(1/4)*x)/(a + c*x^4) - (1
0*Sqrt[2]*ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/a^(3/4) + (10*
Sqrt[2]*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/a^(3/4) - (5*Sqr
t[2]*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/a^(3
/4) + (5*Sqrt[2]*Log[Sqrt[a] + Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c
]*x^2])/a^(3/4))/(256*c^(9/4))
```

Maple [A] time = 0.015, size = 163, normalized size = 0.7

$$\frac{1}{(cx^4+a)^2}\left(-\frac{9x^5}{32c}-\frac{5ax}{32c^2}\right)+\frac{5\sqrt{2}}{256c^2a}\sqrt[4]{\frac{a}{c}}\ln\left(1\left(x^2+\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)\left(x^2-\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)^{-1}\right)$$
$$+\frac{5\sqrt{2}}{128c^2a}\sqrt[4]{\frac{a}{c}}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}+1\right)+\frac{5\sqrt{2}}{128c^2a}\sqrt[4]{\frac{a}{c}}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8/(c*x^4+a)^3,x)
```

```
[Out] (-9/32/c*x^5-5/32*a/c^2*x)/(c*x^4+a)^2+5/256/c^2*(a/c)^(1/4)/a*2^
(1/2)*ln((x^2+(a/c)^(1/4)*x*2^(1/2)+(a/c)^(1/2))/(x^2-(a/c)^(1/4)
*x*2^(1/2)+(a/c)^(1/2)))+5/128/c^2*(a/c)^(1/4)/a*2^(1/2)*arctan(2
^(1/2)/(a/c)^(1/4)*x+1)+5/128/c^2*(a/c)^(1/4)/a*2^(1/2)*arctan(2^
(1/2)/(a/c)^(1/4)*x-1)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(c*x^4 + a)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.247375, size = 306, normalized size = 1.38

$$-\frac{36cx^5+20\left(c^4x^8+2ac^3x^4+a^2c^2\right)\left(-\frac{1}{a^3c^9}\right)^{\frac{1}{4}}\arctan\left(\frac{ac^2\left(-\frac{1}{a^3c^9}\right)^{\frac{1}{4}}}{x+\sqrt{a^2c^4\sqrt{-\frac{1}{a^3c^9}}+x^2}}\right)-5\left(c^4x^8+2ac^3x^4+a^2c^2\right)\left(-\frac{1}{a^3c^9}\right)^{\frac{1}{4}}\log\left(ac^2\left(-\right.\right.}{128\left(c^4x^8+2ac^3x^4+a^2c^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(c*x^4 + a)^3,x, algorithm="fricas")
```

```
[Out] -1/128*(36*c*x^5 + 20*(c^4*x^8 + 2*a*c^3*x^4 + a^2*c^2)*(-1/(a^3*
c^9))^(1/4)*arctan(a*c^2*(-1/(a^3*c^9))^(1/4)/(x + sqrt(a^2*c^4*s
qrt(-1/(a^3*c^9)) + x^2))) - 5*(c^4*x^8 + 2*a*c^3*x^4 + a^2*c^2)*
(-1/(a^3*c^9))^(1/4)*log(a*c^2*(-1/(a^3*c^9))^(1/4) + x) + 5*(c^4
*x^8 + 2*a*c^3*x^4 + a^2*c^2)*(-1/(a^3*c^9))^(1/4)*log(-a*c^2*(-1
/(a^3*c^9))^(1/4) + x) + 20*a*x)/(c^4*x^8 + 2*a*c^3*x^4 + a^2*c^2
)
```

Sympy [A] time = 4.97007, size = 66, normalized size = 0.3

$$-\frac{5ax+9cx^5}{32a^2c^2+64ac^3x^4+32c^4x^8}+\operatorname{RootSum}\left(268435456t^4a^3c^9+625,\left(t\mapsto t\log\left(\frac{128tac^2}{5}+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8/(c*x**4+a)**3,x)
```

```
[Out] -(5*a*x + 9*c*x**5)/(32*a**2*c**2 + 64*a*c**3*x**4 + 32*c**4*x**8
) + RootSum(268435456*_t**4*a**3*c**9 + 625, Lambda(_t, _t*log(12
8*_t*a*c**2/5 + x)))
```

GIAC/XCAS [A] time = 0.224414, size = 275, normalized size = 1.24

$$\frac{5\sqrt{2}\left(ac^3\right)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(2x+\sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{128\,ac^3}+\frac{5\sqrt{2}\left(ac^3\right)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(2x-\sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{128\,ac^3}+\frac{5\sqrt{2}\left(ac^3\right)^{\frac{1}{4}}\ln\left(x^2+\sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{c}}\right)}{256\,ac^3}-\frac{5\sqrt{2}\left(ac^3\right)^{\frac{1}{4}}\ln\left(x^2-\sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{c}}\right)}{256\,ac^3}-\frac{9\,cx^5+5\,ax}{32\left(cx^4+a\right)^2c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(c*x^4 + a)^3,x, algorithm="giac")
```

```
[Out] 5/128*sqrt(2)*(a*c^3)^(1/4)*arctan(1/2*sqrt(2)*(2*x + sqrt(2)*(a/
c)^(1/4))/(a/c)^(1/4))/(a*c^3) + 5/128*sqrt(2)*(a*c^3)^(1/4)*arct
an(1/2*sqrt(2)*(2*x - sqrt(2)*(a/c)^(1/4))/(a/c)^(1/4))/(a*c^3) +
 5/256*sqrt(2)*(a*c^3)^(1/4)*ln(x^2 + sqrt(2)*x*(a/c)^(1/4) + sqr
t(a/c))/(a*c^3) - 5/256*sqrt(2)*(a*c^3)^(1/4)*ln(x^2 - sqrt(2)*x*
(a/c)^(1/4) + sqrt(a/c))/(a*c^3) - 1/32*(9*c*x^5 + 5*a*x)/((c*x^4
 + a)^2*c^2)
```

3.680 $\int \frac{x^6}{(a+cx^4)^3} dx$

Optimal. Leaf size=226

$$\frac{3\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{128\sqrt{2}a^{5/4}c^{7/4}}-\frac{3\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{128\sqrt{2}a^{5/4}c^{7/4}}-\frac{3\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{64\sqrt{2}a^{5/4}c^{7/4}}+\frac{3\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{64\sqrt{2}a^{5/4}c^{7/4}}+\frac{3x^3}{32ac\left(a+cx^4\right)}-\frac{x^3}{8c\left(a+cx^4\right)^2}$$

```
[Out] -x^3/(8*c*(a + c*x^4)^2) + (3*x^3)/(32*a*c*(a + c*x^4)) - (3*ArcT
an[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(64*Sqrt[2]*a^(5/4)*c^(7/4))
 + (3*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(64*Sqrt[2]*a^(5/4
)*c^(7/4)) + (3*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]
*x^2])/(128*Sqrt[2]*a^(5/4)*c^(7/4)) - (3*Log[Sqrt[a] + Sqrt[2]*a
^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(128*Sqrt[2]*a^(5/4)*c^(7/4))
```

Rubi [A] time = 0.289421, antiderivative size = 226, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615

$$\frac{3\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{128\sqrt{2}a^{5/4}c^{7/4}}-\frac{3\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{128\sqrt{2}a^{5/4}c^{7/4}}-\frac{3\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{64\sqrt{2}a^{5/4}c^{7/4}}+\frac{3\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{64\sqrt{2}a^{5/4}c^{7/4}}+\frac{3x^3}{32ac\left(a+cx^4\right)}-\frac{x^3}{8c\left(a+cx^4\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/(a + c*x^4)^3,x]
```

```
[Out] -x^3/(8*c*(a + c*x^4)^2) + (3*x^3)/(32*a*c*(a + c*x^4)) - (3*ArcT
an[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(64*Sqrt[2]*a^(5/4)*c^(7/4))
 + (3*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(64*Sqrt[2]*a^(5/4
)*c^(7/4)) + (3*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]
*x^2])/(128*Sqrt[2]*a^(5/4)*c^(7/4)) - (3*Log[Sqrt[a] + Sqrt[2]*a
^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(128*Sqrt[2]*a^(5/4)*c^(7/4))
```

Rubi in Sympy [A] time = 60.376, size = 211, normalized size = 0.93

$$-\frac{x^3}{8c\left(a+cx^4\right)^2}+\frac{3x^3}{32ac\left(a+cx^4\right)}+\frac{3\sqrt{2}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{256a^{\frac{5}{4}}c^{\frac{7}{4}}}-\frac{3\sqrt{2}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{256a^{\frac{5}{4}}c^{\frac{7}{4}}}-\frac{3\sqrt{2}\,\mathrm{atan}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{128a^{\frac{5}{4}}c^{\frac{7}{4}}}+\frac{3\sqrt{2}\,\mathrm{atan}\left(1+\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{128a^{\frac{5}{4}}c^{\frac{7}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(c*x**4+a)**3,x)
```

```
[Out] -x**3/(8*c*(a + c*x**4)**2) + 3*x**3/(32*a*c*(a + c*x**4)) + 3*sq
rt(2)*log(-sqrt(2)*a**(1/4)*c**(1/4)*x + sqrt(a) + sqrt(c)*x**2)/
(256*a**(5/4)*c**(7/4)) - 3*sqrt(2)*log(sqrt(2)*a**(1/4)*c**(1/4)
*x + sqrt(a) + sqrt(c)*x**2)/(256*a**(5/4)*c**(7/4)) - 3*sqrt(2)*
atan(1 - sqrt(2)*c**(1/4)*x/a**(1/4))/(128*a**(5/4)*c**(7/4)) + 3
*sqrt(2)*atan(1 + sqrt(2)*c**(1/4)*x/a**(1/4))/(128*a**(5/4)*c**(
7/4))
```

Mathematica [A] time = 0.2015, size = 207, normalized size = 0.92

$$\frac{\frac{3\sqrt{2}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{a^{5/4}}-\frac{3\sqrt{2}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{a^{5/4}}-\frac{6\sqrt{2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{a^{5/4}}+\frac{6\sqrt{2}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{a^{5/4}}+\frac{24c^{3/4}x^3}{a^2+acx^4}-\frac{32c^{3/4}x^3}{(a+cx^4)^2}}{256c^{7/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6/(a + c*x^4)^3,x]
```

```
[Out] ((-32*c^(3/4)*x^3)/(a + c*x^4)^2 + (24*c^(3/4)*x^3)/(a^2 + a*c*x^
4) - (6*Sqrt[2]*ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/a^(5/4)
+ (6*Sqrt[2]*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/a^(5/4) + (
3*Sqrt[2]*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])
/a^(5/4) - (3*Sqrt[2]*Log[Sqrt[a] + Sqrt[2]*a^(1/4)*c^(1/4)*x + S
qrt[c]*x^2])/a^(5/4))/(256*c^(7/4))
```

Maple [A] time = 0.015, size = 164, normalized size = 0.7

$$\frac{1}{(cx^4+a)^2}\left(\frac{3\,x^7}{32\,a}-\frac{x^3}{32\,c}\right)+\frac{3\sqrt{2}}{256\,c^2a}\ln\left(1\left(x^2-\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)\left(x^2+\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)^{-1}\right)\frac{1}{\sqrt[4]{\frac{a}{c}}}+\frac{3\sqrt{2}}{128\,c^2a}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}+1\right)\frac{1}{\sqrt[4]{\frac{a}{c}}}+\frac{3\sqrt{2}}{128\,c^2a}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}-1\right)\frac{1}{\sqrt[4]{\frac{a}{c}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(c*x^4+a)^3,x)
```

```
[Out] (3/32*x^7/a-1/32/c*x^3)/(c*x^4+a)^2+3/256/c^2/a/(a/c)^(1/4)*2^(1/
2)*ln((x^2-(a/c)^(1/4)*x*2^(1/2)+(a/c)^(1/2))/(x^2+(a/c)^(1/4)*x*
2^(1/2)+(a/c)^(1/2)))+3/128/c^2/a/(a/c)^(1/4)*2^(1/2)*arctan(2^(1
/2)/(a/c)^(1/4)*x+1)+3/128/c^2/a/(a/c)^(1/4)*2^(1/2)*arctan(2^(1/
2)/(a/c)^(1/4)*x-1)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(c*x^4 + a)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.246098, size = 324, normalized size = 1.43

$$\frac{12\,cx^7-4\,ax^3+12\left(ac^3x^8+2\,a^2c^2x^4+a^3c\right)\left(-\frac{1}{a^5c^7}\right)^{\frac{1}{4}}\arctan\left(\frac{a^4c^5\left(-\frac{1}{a^5c^7}\right)^{\frac{3}{4}}}{x+\sqrt{-a^3c^3\sqrt{-\frac{1}{a^5c^7}}+x^2}}\right)+3\left(ac^3x^8+2\,a^2c^2x^4+a^3c\right)\left(-\frac{1}{a^5c^7}\right)^{\frac{1}{4}}1}{128\left(ac^3x^8+2\,a^2c^2x^4+a^3c\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(c*x^4 + a)^3,x, algorithm="fricas")
```

```
[Out] 1/128*(12*c*x^7 - 4*a*x^3 + 12*(a*c^3*x^8 + 2*a^2*c^2*x^4 + a^3*c
)*(-1/(a^5*c^7))^(1/4)*arctan(a^4*c^5*(-1/(a^5*c^7))^(3/4)/(x + s
qrt(-a^3*c^3*sqrt(-1/(a^5*c^7)) + x^2))) + 3*(a*c^3*x^8 + 2*a^2*c
^2*x^4 + a^3*c)*(-1/(a^5*c^7))^(1/4)*log(a^4*c^5*(-1/(a^5*c^7))^(
3/4) + x) - 3*(a*c^3*x^8 + 2*a^2*c^2*x^4 + a^3*c)*(-1/(a^5*c^7))^
(1/4)*log(-a^4*c^5*(-1/(a^5*c^7))^(3/4) + x))/(a*c^3*x^8 + 2*a^2*
c^2*x^4 + a^3*c)
```

Sympy [A] time = 5.0495, size = 71, normalized size = 0.31

$$\frac{-ax^3+3cx^7}{32a^3c+64a^2c^2x^4+32ac^3x^8}+\operatorname{RootSum}\left(268435456t^4a^5c^7+81,\left(t\mapsto t\log\left(\frac{2097152t^3a^4c^5}{27}+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(c*x**4+a)**3,x)
```

```
[Out] (-a*x**3 + 3*c*x**7)/(32*a**3*c + 64*a**2*c**2*x**4 + 32*a*c**3*x
**8) + RootSum(268435456*_t**4*a**5*c**7 + 81, Lambda(_t, _t*log(
2097152*_t**3*a**4*c**5/27 + x)))
```

GIAC/XCAS [A] time = 0.224173, size = 282, normalized size = 1.25

$$\frac{3\,cx^7-ax^3}{32\,(cx^4+a)^2ac}+\frac{3\sqrt{2}\,(ac^3)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x+\sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{128\,a^2c^4}+\frac{3\sqrt{2}\,(ac^3)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x-\sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{128\,a^2c^4}-\frac{3\sqrt{2}\,(ac^3)^{\frac{3}{4}}\ln\left(x^2+\sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{c}}\right)}{256\,a^2c^4}+\frac{3\sqrt{2}\,(ac^3)^{\frac{3}{4}}\ln\left(x^2-\sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{c}}\right)}{256\,a^2c^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(c*x^4 + a)^3,x, algorithm="giac")
```

```
[Out] 1/32*(3*c*x^7 - a*x^3)/((c*x^4 + a)^2*a*c) + 3/128*sqrt(2)*(a*c^3
)^(3/4)*arctan(1/2*sqrt(2)*(2*x + sqrt(2)*(a/c)^(1/4))/(a/c)^(1/4
))/(a^2*c^4) + 3/128*sqrt(2)*(a*c^3)^(3/4)*arctan(1/2*sqrt(2)*(2*
x - sqrt(2)*(a/c)^(1/4))/(a/c)^(1/4))/(a^2*c^4) - 3/256*sqrt(2)*(
a*c^3)^(3/4)*ln(x^2 + sqrt(2)*x*(a/c)^(1/4) + sqrt(a/c))/(a^2*c^4
) + 3/256*sqrt(2)*(a*c^3)^(3/4)*ln(x^2 - sqrt(2)*x*(a/c)^(1/4) +
sqrt(a/c))/(a^2*c^4)
```

3.681 $\int \frac{x^4}{(a+cx^4)^3}\,dx$

Optimal. Leaf size=222

$$-\frac{3\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{128\sqrt{2}a^{7/4}c^{5/4}}+\frac{3\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{128\sqrt{2}a^{7/4}c^{5/4}}-\frac{3\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{64\sqrt{2}a^{7/4}c^{5/4}}+\frac{3\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{64\sqrt{2}a^{7/4}c^{5/4}}+\frac{x}{32ac\left(a+cx^4\right)}-\frac{x}{8c\left(a+cx^4\right)^2}$$

```
[Out] -x/(8*c*(a + c*x^4)^2) + x/(32*a*c*(a + c*x^4)) - (3*ArcTan[1 - (
Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(64*Sqrt[2]*a^(7/4)*c^(5/4)) + (3*Ar
cTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(64*Sqrt[2]*a^(7/4)*c^(5/4
)) - (3*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(
128*Sqrt[2]*a^(7/4)*c^(5/4)) + (3*Log[Sqrt[a] + Sqrt[2]*a^(1/4)*c
^(1/4)*x + Sqrt[c]*x^2])/(128*Sqrt[2]*a^(7/4)*c^(5/4))
```

Rubi [A] time = 0.277425, antiderivative size = 222, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615

$$-\frac{3\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{128\sqrt{2}a^{7/4}c^{5/4}}+\frac{3\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{128\sqrt{2}a^{7/4}c^{5/4}}-\frac{3\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{64\sqrt{2}a^{7/4}c^{5/4}}+\frac{3\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{64\sqrt{2}a^{7/4}c^{5/4}}+\frac{x}{32ac\left(a+cx^4\right)}-\frac{x}{8c\left(a+cx^4\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a + c*x^4)^3,x]
```

```
[Out] -x/(8*c*(a + c*x^4)^2) + x/(32*a*c*(a + c*x^4)) - (3*ArcTan[1 - (
Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(64*Sqrt[2]*a^(7/4)*c^(5/4)) + (3*Ar
cTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(64*Sqrt[2]*a^(7/4)*c^(5/4
)) - (3*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(
128*Sqrt[2]*a^(7/4)*c^(5/4)) + (3*Log[Sqrt[a] + Sqrt[2]*a^(1/4)*c
^(1/4)*x + Sqrt[c]*x^2])/(128*Sqrt[2]*a^(7/4)*c^(5/4))
```

Rubi in Sympy [A] time = 58.266, size = 206, normalized size = 0.93

$$-\frac{x}{8c\left(a+cx^4\right)^2}+\frac{x}{32ac\left(a+cx^4\right)}-\frac{3\sqrt{2}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{256a^{\frac{7}{4}}c^{\frac{5}{4}}}+\frac{3\sqrt{2}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{256a^{\frac{7}{4}}c^{\frac{5}{4}}}-\frac{3\sqrt{2}\,\mathrm{atan}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{128a^{\frac{7}{4}}c^{\frac{5}{4}}}+\frac{3\sqrt{2}\,\mathrm{atan}\left(1+\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{128a^{\frac{7}{4}}c^{\frac{5}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(c*x**4+a)**3,x)
```

```
[Out] -x/(8*c*(a + c*x**4)**2) + x/(32*a*c*(a + c*x**4)) - 3*sqrt(2)*lo
g(-sqrt(2)*a**(1/4)*c**(1/4)*x + sqrt(a) + sqrt(c)*x**2)/(256*a**
(7/4)*c**(5/4)) + 3*sqrt(2)*log(sqrt(2)*a**(1/4)*c**(1/4)*x + sqr
t(a) + sqrt(c)*x**2)/(256*a**(7/4)*c**(5/4)) - 3*sqrt(2)*atan(1 -
 sqrt(2)*c**(1/4)*x/a**(1/4))/(128*a**(7/4)*c**(5/4)) + 3*sqrt(2)
*atan(1 + sqrt(2)*c**(1/4)*x/a**(1/4))/(128*a**(7/4)*c**(5/4))
```

Mathematica [A] time = 0.187814, size = 203, normalized size = 0.91

$$-\frac{\frac{3\sqrt{2}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{a^{7/4}}+\frac{3\sqrt{2}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{a^{7/4}}-\frac{6\sqrt{2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{a^{7/4}}+\frac{6\sqrt{2}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{a^{7/4}}+\frac{8\sqrt[4]{c}x}{a^2+acx^4}-\frac{32\sqrt[4]{c}x}{(a+cx^4)^2}}{256c^{5/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(a + c*x^4)^3,x]
```

```
[Out] ((-32*c^(1/4)*x)/(a + c*x^4)^2 + (8*c^(1/4)*x)/(a^2 + a*c*x^4) -
(6*Sqrt[2]*ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/a^(7/4) + (6*
Sqrt[2]*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/a^(7/4) - (3*Sqr
t[2]*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/a^(7
/4) + (3*Sqrt[2]*Log[Sqrt[a] + Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c
]*x^2])/a^(7/4))/(256*c^(5/4))
```

Maple [A] time = 0.017, size = 162, normalized size = 0.7

$$\frac{1}{(cx^4+a)^2}\left(\frac{x^5}{32\,a}-\frac{3\,x}{32\,c}\right)+\frac{3\,\sqrt{2}}{256\,a^2c}\sqrt[4]{\frac{a}{c}}\ln\left(1\left(x^2+\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)\left(x^2-\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)^{-1}\right)$$
$$+\frac{3\,\sqrt{2}}{128\,a^2c}\sqrt[4]{\frac{a}{c}}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}+1\right)+\frac{3\,\sqrt{2}}{128\,a^2c}\sqrt[4]{\frac{a}{c}}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(c*x^4+a)^3,x)
```

```
[Out] (1/32*x^5/a-3/32*x/c)/(c*x^4+a)^2+3/256/c/a^2*(a/c)^(1/4)*2^(1/2)
*ln((x^2+(a/c)^(1/4)*x*2^(1/2)+(a/c)^(1/2))/(x^2-(a/c)^(1/4)*x*2^
(1/2)+(a/c)^(1/2)))+3/128/c/a^2*(a/c)^(1/4)*2^(1/2)*arctan(2^(1/2
)/(a/c)^(1/4)*x+1)+3/128/c/a^2*(a/c)^(1/4)*2^(1/2)*arctan(2^(1/2)
/(a/c)^(1/4)*x-1)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(c*x^4 + a)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.25148, size = 312, normalized size = 1.41

$$\frac{4\,cx^5-12\left(ac^3x^8+2\,a^2c^2x^4+a^3c\right)\left(-\frac{1}{a^7c^5}\right)^{\frac{1}{4}}\arctan\left(\frac{a^2c\left(-\frac{1}{a^7c^5}\right)^{\frac{1}{4}}}{x+\sqrt{a^4c^2\sqrt{-\frac{1}{a^7c^5}}+x^2}}\right)+3\left(ac^3x^8+2\,a^2c^2x^4+a^3c\right)\left(-\frac{1}{a^7c^5}\right)^{\frac{1}{4}}\log\left(a^2c\left(-\right.\right.}{128\left(ac^3x^8+2\,a^2c^2x^4+a^3c\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(c*x^4 + a)^3,x, algorithm="fricas")
```

```
[Out] 1/128*(4*c*x^5 - 12*(a*c^3*x^8 + 2*a^2*c^2*x^4 + a^3*c)*(-1/(a^7*
c^5))^(1/4)*arctan(a^2*c*(-1/(a^7*c^5))^(1/4)/(x + sqrt(a^4*c^2*s
qrt(-1/(a^7*c^5)) + x^2))) + 3*(a*c^3*x^8 + 2*a^2*c^2*x^4 + a^3*c
)*(-1/(a^7*c^5))^(1/4)*log(a^2*c*(-1/(a^7*c^5))^(1/4) + x) - 3*(a
*c^3*x^8 + 2*a^2*c^2*x^4 + a^3*c)*(-1/(a^7*c^5))^(1/4)*log(-a^2*c
*(-1/(a^7*c^5))^(1/4) + x) - 12*a*x)/(a*c^3*x^8 + 2*a^2*c^2*x^4 +
 a^3*c)
```

Sympy [A] time = 4.87081, size = 66, normalized size = 0.3

$$\frac{-3ax+cx^5}{32a^3c+64a^2c^2x^4+32ac^3x^8}+\operatorname{RootSum}\left(268435456t^4a^7c^5+81,\left(t\mapsto t\log\left(\frac{128ta^2c}{3}+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(c*x**4+a)**3,x)
```

```
[Out] (-3*a*x + c*x**5)/(32*a**3*c + 64*a**2*c**2*x**4 + 32*a*c**3*x**8
) + RootSum(268435456*_t**4*a**7*c**5 + 81, Lambda(_t, _t*log(128
*_t*a**2*c/3 + x)))
```

GIAC/XCAS [A] time = 0.234133, size = 278, normalized size = 1.25

$$\frac{3\sqrt{2}\left(ac^3\right)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(2x+\sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{128a^2c^2}+\frac{3\sqrt{2}\left(ac^3\right)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(2x-\sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{128a^2c^2}+\frac{3\sqrt{2}\left(ac^3\right)^{\frac{1}{4}}\ln\left(x^2+\sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{c}}\right)}{256a^2c^2}-\frac{3\sqrt{2}\left(ac^3\right)^{\frac{1}{4}}\ln\left(x^2-\sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{c}}\right)}{256a^2c^2}+\frac{cx^5-3ax}{32\left(cx^4+a\right)^2ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(c*x^4 + a)^3,x, algorithm="giac")
```

```
[Out] 3/128*sqrt(2)*(a*c^3)^(1/4)*arctan(1/2*sqrt(2)*(2*x + sqrt(2)*(a/
c)^(1/4))/(a/c)^(1/4))/(a^2*c^2) + 3/128*sqrt(2)*(a*c^3)^(1/4)*ar
ctan(1/2*sqrt(2)*(2*x - sqrt(2)*(a/c)^(1/4))/(a/c)^(1/4))/(a^2*c^
2) + 3/256*sqrt(2)*(a*c^3)^(1/4)*ln(x^2 + sqrt(2)*x*(a/c)^(1/4) +
 sqrt(a/c))/(a^2*c^2) - 3/256*sqrt(2)*(a*c^3)^(1/4)*ln(x^2 - sqrt
(2)*x*(a/c)^(1/4) + sqrt(a/c))/(a^2*c^2) + 1/32*(c*x^5 - 3*a*x)/(
(c*x^4 + a)^2*a*c)
```

3.682 $\int \frac{x^2}{(a+cx^4)^3}\,dx$

Optimal. Leaf size=223

$$\frac{5\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{128\sqrt{2}a^{9/4}c^{3/4}}-\frac{5\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{128\sqrt{2}a^{9/4}c^{3/4}}-\frac{5\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{64\sqrt{2}a^{9/4}c^{3/4}}+\frac{5\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{64\sqrt{2}a^{9/4}c^{3/4}}+\frac{5x^3}{32a^2\left(a+cx^4\right)}+\frac{x^3}{8a\left(a+cx^4\right)^2}$$

```
[Out] x^3/(8*a*(a + c*x^4)^2) + (5*x^3)/(32*a^2*(a + c*x^4)) - (5*ArcTa
n[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(64*Sqrt[2]*a^(9/4)*c^(3/4))
+ (5*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(64*Sqrt[2]*a^(9/4)
*c^(3/4)) + (5*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*
x^2])/(128*Sqrt[2]*a^(9/4)*c^(3/4)) - (5*Log[Sqrt[a] + Sqrt[2]*a^
(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(128*Sqrt[2]*a^(9/4)*c^(3/4))
```

Rubi [A] time = 0.286353, antiderivative size = 223, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538

$$\frac{5\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{128\sqrt{2}a^{9/4}c^{3/4}}-\frac{5\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{128\sqrt{2}a^{9/4}c^{3/4}}-\frac{5\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{64\sqrt{2}a^{9/4}c^{3/4}}+\frac{5\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{64\sqrt{2}a^{9/4}c^{3/4}}+\frac{5x^3}{32a^2\left(a+cx^4\right)}+\frac{x^3}{8a\left(a+cx^4\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + c*x^4)^3,x]
```

```
[Out] x^3/(8*a*(a + c*x^4)^2) + (5*x^3)/(32*a^2*(a + c*x^4)) - (5*ArcTa
n[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(64*Sqrt[2]*a^(9/4)*c^(3/4))
+ (5*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(64*Sqrt[2]*a^(9/4)
*c^(3/4)) + (5*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*
x^2])/(128*Sqrt[2]*a^(9/4)*c^(3/4)) - (5*Log[Sqrt[a] + Sqrt[2]*a^
(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(128*Sqrt[2]*a^(9/4)*c^(3/4))
```

Rubi in Sympy [A] time = 60.191, size = 211, normalized size = 0.95

$$\frac{x^3}{8a\left(a+cx^4\right)^2}+\frac{5x^3}{32a^2\left(a+cx^4\right)}+\frac{5\sqrt{2}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{256a^{\frac{9}{4}}c^{\frac{3}{4}}}-\frac{5\sqrt{2}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{256a^{\frac{9}{4}}c^{\frac{3}{4}}}-\frac{5\sqrt{2}\,\mathrm{atan}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{128a^{\frac{9}{4}}c^{\frac{3}{4}}}+\frac{5\sqrt{2}\,\mathrm{atan}\left(1+\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{128a^{\frac{9}{4}}c^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(c*x**4+a)**3,x)
```

```
[Out] x**3/(8*a*(a + c*x**4)**2) + 5*x**3/(32*a**2*(a + c*x**4)) + 5*sq
rt(2)*log(-sqrt(2)*a**(1/4)*c**(1/4)*x + sqrt(a) + sqrt(c)*x**2)/
(256*a**(9/4)*c**(3/4)) - 5*sqrt(2)*log(sqrt(2)*a**(1/4)*c**(1/4)
*x + sqrt(a) + sqrt(c)*x**2)/(256*a**(9/4)*c**(3/4)) - 5*sqrt(2)*
atan(1 - sqrt(2)*c**(1/4)*x/a**(1/4))/(128*a**(9/4)*c**(3/4)) + 5
*sqrt(2)*atan(1 + sqrt(2)*c**(1/4)*x/a**(1/4))/(128*a**(9/4)*c**(
3/4))
```

Mathematica [A] time = 0.183884, size = 204, normalized size = 0.91

$$\frac{\frac{32a^{5/4}x^3}{(a+cx^4)^2}+\frac{5\sqrt{2}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{c^{3/4}}-\frac{5\sqrt{2}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{c^{3/4}}-\frac{10\sqrt{2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{c^{3/4}}+\frac{10\sqrt{2}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{c^{3/4}}+\frac{40\sqrt[4]{a}x^3}{a+cx^4}}{256a^{9/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a + c*x^4)^3,x]
```

```
[Out] ((32*a^(5/4)*x^3)/(a + c*x^4)^2 + (40*a^(1/4)*x^3)/(a + c*x^4) -
(10*Sqrt[2]*ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/c^(3/4) + (1
0*Sqrt[2]*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/c^(3/4) + (5*S
qrt[2]*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/c^
(3/4) - (5*Sqrt[2]*Log[Sqrt[a] + Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt
[c]*x^2])/c^(3/4))/(256*a^(9/4))
```

Maple [A] time = 0.007, size = 171, normalized size = 0.8

$$\frac{x^3}{8\,a\,(cx^4+a)^2}+\frac{5\,x^3}{32\,a^2\,(cx^4+a)}+\frac{5\,\sqrt{2}}{256\,a^2c}\ln\left(1\left(x^2-\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)\left(x^2+\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)^{-1}\right)\frac{1}{\sqrt[4]{\frac{a}{c}}}$$
$$+\frac{5\,\sqrt{2}}{128\,a^2c}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}+1\right)\frac{1}{\sqrt[4]{\frac{a}{c}}}+\frac{5\,\sqrt{2}}{128\,a^2c}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}-1\right)\frac{1}{\sqrt[4]{\frac{a}{c}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(c*x^4+a)^3,x)
```

```
[Out] 1/8*x^3/a/(c*x^4+a)^2+5/32*x^3/a^2/(c*x^4+a)+5/256/a^2/c/(a/c)^(1
/4)*2^(1/2)*ln((x^2-(a/c)^(1/4)*x*2^(1/2)+(a/c)^(1/2))/(x^2+(a/c)
^(1/4)*x*2^(1/2)+(a/c)^(1/2)))+5/128/a^2/c/(a/c)^(1/4)*2^(1/2)*ar
ctan(2^(1/2)/(a/c)^(1/4)*x+1)+5/128/a^2/c/(a/c)^(1/4)*2^(1/2)*arc
tan(2^(1/2)/(a/c)^(1/4)*x-1)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(c*x^4 + a)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.250395, size = 311, normalized size = 1.39

$$\frac{20\,cx^7+36\,ax^3+20\left(a^2c^2x^8+2\,a^3cx^4+a^4\right)\left(-\frac{1}{a^9c^3}\right)^{\frac{1}{4}}\arctan\left(\frac{a^7c^2\left(-\frac{1}{a^9c^3}\right)^{\frac{3}{4}}}{x+\sqrt{-a^5c\sqrt{-\frac{1}{a^9c^3}}+x^2}}\right)+5\left(a^2c^2x^8+2\,a^3cx^4+a^4\right)\left(-\frac{1}{a^9c^3}\right)^{\frac{1}{4}}\log}{128\left(a^2c^2x^8+2\,a^3cx^4+a^4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(c*x^4 + a)^3,x, algorithm="fricas")
```

```
[Out] 1/128*(20*c*x^7 + 36*a*x^3 + 20*(a^2*c^2*x^8 + 2*a^3*c*x^4 + a^4)
*(-1/(a^9*c^3))^(1/4)*arctan(a^7*c^2*(-1/(a^9*c^3))^(3/4)/(x + sq
rt(-a^5*c*sqrt(-1/(a^9*c^3)) + x^2))) + 5*(a^2*c^2*x^8 + 2*a^3*c*
x^4 + a^4)*(-1/(a^9*c^3))^(1/4)*log(a^7*c^2*(-1/(a^9*c^3))^(3/4)
+ x) - 5*(a^2*c^2*x^8 + 2*a^3*c*x^4 + a^4)*(-1/(a^9*c^3))^(1/4)*l
og(-a^7*c^2*(-1/(a^9*c^3))^(3/4) + x))/(a^2*c^2*x^8 + 2*a^3*c*x^4
 + a^4)
```

Sympy [A] time = 4.92303, size = 71, normalized size = 0.32

$$\frac{9ax^3 + 5cx^7}{32a^4 + 64a^3cx^4 + 32a^2c^2x^8} + \operatorname{RootSum}\left(268435456t^4a^9c^3 + 625, \left(t \mapsto t\log\left(\frac{2097152t^3a^7c^2}{125} + x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(c*x**4+a)**3,x)
```

```
[Out] (9*a*x**3 + 5*c*x**7)/(32*a**4 + 64*a**3*c*x**4 + 32*a**2*c**2*x*
*8) + RootSum(268435456*_t**4*a**9*c**3 + 625, Lambda(_t, _t*log(
2097152*_t**3*a**7*c**2/125 + x)))
```

GIAC/XCAS [A] time = 0.226927, size = 278, normalized size = 1.25

$$\frac{5\,cx^7 + 9\,ax^3}{32\,(cx^4+a)^2a^2} + \frac{5\,\sqrt{2}\,(ac^3)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x+\sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{128\,a^3c^3} + \frac{5\,\sqrt{2}\,(ac^3)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x-\sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{128\,a^3c^3} - \frac{5\,\sqrt{2}\,(ac^3)^{\frac{3}{4}}\ln\left(x^2+\sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{c}}\right)}{256\,a^3c^3} + \frac{5\,\sqrt{2}\,(ac^3)^{\frac{3}{4}}\ln\left(x^2-\sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{c}}\right)}{256\,a^3c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(c*x^4 + a)^3,x, algorithm="giac")
```

```
[Out] 1/32*(5*c*x^7 + 9*a*x^3)/((c*x^4 + a)^2*a^2) + 5/128*sqrt(2)*(a*c
^3)^(3/4)*arctan(1/2*sqrt(2)*(2*x + sqrt(2)*(a/c)^(1/4))/(a/c)^(1
/4))/(a^3*c^3) + 5/128*sqrt(2)*(a*c^3)^(3/4)*arctan(1/2*sqrt(2)*(
2*x - sqrt(2)*(a/c)^(1/4))/(a/c)^(1/4))/(a^3*c^3) - 5/256*sqrt(2)
*(a*c^3)^(3/4)*ln(x^2 + sqrt(2)*x*(a/c)^(1/4) + sqrt(a/c))/(a^3*c
^3) + 5/256*sqrt(2)*(a*c^3)^(3/4)*ln(x^2 - sqrt(2)*x*(a/c)^(1/4)
+ sqrt(a/c))/(a^3*c^3)
```

3.683 $\int \frac{1}{(a+cx^4)^3}\,dx$

Optimal. Leaf size=219

$$-\frac{21\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{128\sqrt{2}a^{11/4}\sqrt[4]{c}}+\frac{21\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{128\sqrt{2}a^{11/4}\sqrt[4]{c}}-\frac{21\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{64\sqrt{2}a^{11/4}\sqrt[4]{c}}+\frac{21\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{64\sqrt{2}a^{11/4}\sqrt[4]{c}}+\frac{7x}{32a^2(a+cx^4)}+\frac{x}{8a(a+cx^4)^2}$$

```
[Out] x/(8*a*(a + c*x^4)^2) + (7*x)/(32*a^2*(a + c*x^4)) - (21*ArcTan[1
 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(64*Sqrt[2]*a^(11/4)*c^(1/4)) +
(21*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(64*Sqrt[2]*a^(11/4)
*c^(1/4)) - (21*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]
*x^2])/(128*Sqrt[2]*a^(11/4)*c^(1/4)) + (21*Log[Sqrt[a] + Sqrt[2]
*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(128*Sqrt[2]*a^(11/4)*c^(1/4))
```

Rubi [A] time = 0.269436, antiderivative size = 219, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 7, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.778

$$-\frac{21\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{128\sqrt{2}a^{11/4}\sqrt[4]{c}}+\frac{21\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{128\sqrt{2}a^{11/4}\sqrt[4]{c}}-\frac{21\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{64\sqrt{2}a^{11/4}\sqrt[4]{c}}+\frac{21\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{64\sqrt{2}a^{11/4}\sqrt[4]{c}}+\frac{7x}{32a^2(a+cx^4)}+\frac{x}{8a(a+cx^4)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + c*x^4)^(-3),x]
```

```
[Out] x/(8*a*(a + c*x^4)^2) + (7*x)/(32*a^2*(a + c*x^4)) - (21*ArcTan[1
 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(64*Sqrt[2]*a^(11/4)*c^(1/4)) +
(21*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(64*Sqrt[2]*a^(11/4)
*c^(1/4)) - (21*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]
*x^2])/(128*Sqrt[2]*a^(11/4)*c^(1/4)) + (21*Log[Sqrt[a] + Sqrt[2]
*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(128*Sqrt[2]*a^(11/4)*c^(1/4))
```

Rubi in Sympy [A] time = 56.3521, size = 207, normalized size = 0.95

$$\frac{x}{8a(a+cx^4)^2}+\frac{7x}{32a^2(a+cx^4)}-\frac{21\sqrt{2}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{256a^{\frac{11}{4}}\sqrt[4]{c}}+\frac{21\sqrt{2}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{256a^{\frac{11}{4}}\sqrt[4]{c}}-\frac{21\sqrt{2}\,\mathrm{atan}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{128a^{\frac{11}{4}}\sqrt[4]{c}}+\frac{21\sqrt{2}\,\mathrm{atan}\left(1+\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{128a^{\frac{11}{4}}\sqrt[4]{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(c*x**4+a)**3,x)
```

```
[Out] x/(8*a*(a + c*x**4)**2) + 7*x/(32*a**2*(a + c*x**4)) - 21*sqrt(2)
*log(-sqrt(2)*a**(1/4)*c**(1/4)*x + sqrt(a) + sqrt(c)*x**2)/(256*
a**(11/4)*c**(1/4)) + 21*sqrt(2)*log(sqrt(2)*a**(1/4)*c**(1/4)*x
+ sqrt(a) + sqrt(c)*x**2)/(256*a**(11/4)*c**(1/4)) - 21*sqrt(2)*a
tan(1 - sqrt(2)*c**(1/4)*x/a**(1/4))/(128*a**(11/4)*c**(1/4)) + 2
1*sqrt(2)*atan(1 + sqrt(2)*c**(1/4)*x/a**(1/4))/(128*a**(11/4)*c*
*(1/4))
```

Mathematica [A] time = 0.190809, size = 200, normalized size = 0.91

$$\frac{\frac{32a^{7/4}x}{(a+cx^4)^2}+\frac{56a^{3/4}x}{a+cx^4}-\frac{21\sqrt{2}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{\sqrt[4]{c}}+\frac{21\sqrt{2}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{\sqrt[4]{c}}-\frac{42\sqrt{2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{\sqrt[4]{c}}+\frac{42\sqrt{2}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{\sqrt[4]{c}}}{256a^{11/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + c*x^4)^(-3),x]
```

```
[Out] ((32*a^(7/4)*x)/(a + c*x^4)^2 + (56*a^(3/4)*x)/(a + c*x^4) - (42*
Sqrt[2]*ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/c^(1/4) + (42*Sq
rt[2]*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/c^(1/4) - (21*Sqrt
[2]*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/c^(1/
4) + (21*Sqrt[2]*Log[Sqrt[a] + Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c
]*x^2])/c^(1/4))/(256*a^(11/4))
```

Maple [A] time = 0.007, size = 158, normalized size = 0.7

$$\frac{x}{8\,a\,(cx^4+a)^2}+\frac{7\,x}{32\,a^2\,(cx^4+a)}+\frac{21\,\sqrt{2}}{256\,a^3}\sqrt[4]{\frac{a}{c}}\ln\left(1\left(x^2+\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)\left(x^2-\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)^{-1}\right)+\frac{21\,\sqrt{2}}{128\,a^3}\sqrt[4]{\frac{a}{c}}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}+1\right)+\frac{21\,\sqrt{2}}{128\,a^3}\sqrt[4]{\frac{a}{c}}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(c*x^4+a)^3,x)
```

```
[Out] 1/8*x/a/(c*x^4+a)^2+7/32*x/a^2/(c*x^4+a)+21/256/a^3*(a/c)^(1/4)*2
^(1/2)*ln((x^2+(a/c)^(1/4)*x*2^(1/2)+(a/c)^(1/2))/(x^2-(a/c)^(1/4
)*x*2^(1/2)+(a/c)^(1/2)))+21/128/a^3*(a/c)^(1/4)*2^(1/2)*arctan(2
^(1/2)/(a/c)^(1/4)*x+1)+21/128/a^3*(a/c)^(1/4)*2^(1/2)*arctan(2^(
1/2)/(a/c)^(1/4)*x-1)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(-3),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.246418, size = 293, normalized size = 1.34

$$\frac{28\,cx^5-84\left(a^2c^2x^8+2\,a^3cx^4+a^4\right)\left(-\frac{1}{a^{11}c}\right)^{\frac{1}{4}}\arctan\left(\frac{a^3\left(-\frac{1}{a^{11}c}\right)^{\frac{1}{4}}}{x+\sqrt{a^6\sqrt{-\frac{1}{a^{11}c}}+x^2}}\right)+21\left(a^2c^2x^8+2\,a^3cx^4+a^4\right)\left(-\frac{1}{a^{11}c}\right)^{\frac{1}{4}}\log\left(a^3\left(-\frac{1}{a^{1}}\right.\right.}{128\left(a^2c^2x^8+2\,a^3cx^4+a^4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(-3),x, algorithm="fricas")
```

```
[Out] 1/128*(28*c*x^5 - 84*(a^2*c^2*x^8 + 2*a^3*c*x^4 + a^4)*(-1/(a^11*
c))^(1/4)*arctan(a^3*(-1/(a^11*c))^(1/4)/(x + sqrt(a^6*sqrt(-1/(a
^11*c)) + x^2))) + 21*(a^2*c^2*x^8 + 2*a^3*c*x^4 + a^4)*(-1/(a^11
*c))^(1/4)*log(a^3*(-1/(a^11*c))^(1/4) + x) - 21*(a^2*c^2*x^8 + 2
*a^3*c*x^4 + a^4)*(-1/(a^11*c))^(1/4)*log(-a^3*(-1/(a^11*c))^(1/4
) + x) + 44*a*x)/(a^2*c^2*x^8 + 2*a^3*c*x^4 + a^4)
```

Sympy [A] time = 4.88075, size = 63, normalized size = 0.29

$$\frac{11ax + 7cx^5}{32a^4 + 64a^3cx^4 + 32a^2c^2x^8} + \operatorname{RootSum}\left(268435456t^4a^{11}c + 194481, \left(t \mapsto t\log\left(\frac{128ta^3}{21} + x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(c*x**4+a)**3,x)
```

```
[Out] (11*a*x + 7*c*x**5)/(32*a**4 + 64*a**3*c*x**4 + 32*a**2*c**2*x**8
) + RootSum(268435456*_t**4*a**11*c + 194481, Lambda(_t, _t*log(1
28*_t*a**3/21 + x)))
```

GIAC/XCAS [A] time = 0.218096, size = 275, normalized size = 1.26

$$\frac{21\sqrt{2}\left(ac^3\right)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(2x+\sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{128\,a^3c} + \frac{21\sqrt{2}\left(ac^3\right)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(2x-\sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{128\,a^3c} + \frac{21\sqrt{2}\left(ac^3\right)^{\frac{1}{4}}\ln\left(x^2+\sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{c}}\right)}{256\,a^3c} - \frac{21\sqrt{2}\left(ac^3\right)^{\frac{1}{4}}\ln\left(x^2-\sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{c}}\right)}{256\,a^3c} + \frac{7\,cx^5+11\,ax}{32\left(cx^4+a\right)^2a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(-3),x, algorithm="giac")
```

```
[Out] 21/128*sqrt(2)*(a*c^3)^(1/4)*arctan(1/2*sqrt(2)*(2*x + sqrt(2)*(a
/c)^(1/4))/(a/c)^(1/4))/(a^3*c) + 21/128*sqrt(2)*(a*c^3)^(1/4)*ar
ctan(1/2*sqrt(2)*(2*x - sqrt(2)*(a/c)^(1/4))/(a/c)^(1/4))/(a^3*c)
 + 21/256*sqrt(2)*(a*c^3)^(1/4)*ln(x^2 + sqrt(2)*x*(a/c)^(1/4) +
sqrt(a/c))/(a^3*c) - 21/256*sqrt(2)*(a*c^3)^(1/4)*ln(x^2 - sqrt(2
)*x*(a/c)^(1/4) + sqrt(a/c))/(a^3*c) + 1/32*(7*c*x^5 + 11*a*x)/((
c*x^4 + a)^2*a^2)
```

3.684 $\int \frac{1}{x^2(a+cx^4)^3} dx$

Optimal. Leaf size=233

$$-\frac{45\sqrt[4]{c}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{128\sqrt{2}a^{13/4}}+\frac{45\sqrt[4]{c}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{128\sqrt{2}a^{13/4}}+\frac{45\sqrt[4]{c}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{64\sqrt{2}a^{13/4}}-\frac{45\sqrt[4]{c}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{64\sqrt{2}a^{13/4}}-\frac{45}{32a^3x}+\frac{9}{32a^2x\left(a+cx^4\right)}+\frac{1}{8ax\left(a+cx^4\right)^2}$$

```
[Out] -45/(32*a^3*x) + 1/(8*a*x*(a + c*x^4)^2) + 9/(32*a^2*x*(a + c*x^4
)) + (45*c^(1/4)*ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(64*Sqr
t[2]*a^(13/4)) - (45*c^(1/4)*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/
4)])/(64*Sqrt[2]*a^(13/4)) - (45*c^(1/4)*Log[Sqrt[a] - Sqrt[2]*a^
(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(128*Sqrt[2]*a^(13/4)) + (45*c^(1
/4)*Log[Sqrt[a] + Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(128*
Sqrt[2]*a^(13/4))
```

Rubi [A] time = 0.327615, antiderivative size = 233, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615

$$-\frac{45\sqrt[4]{c}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{128\sqrt{2}a^{13/4}}+\frac{45\sqrt[4]{c}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{128\sqrt{2}a^{13/4}}+\frac{45\sqrt[4]{c}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{64\sqrt{2}a^{13/4}}-\frac{45\sqrt[4]{c}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}+1\right)}{64\sqrt{2}a^{13/4}}-\frac{45}{32a^3x}+\frac{9}{32a^2x\left(a+cx^4\right)}+\frac{1}{8ax\left(a+cx^4\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(a + c*x^4)^3),x]
```

```
[Out] -45/(32*a^3*x) + 1/(8*a*x*(a + c*x^4)^2) + 9/(32*a^2*x*(a + c*x^4
)) + (45*c^(1/4)*ArcTan[1 - (Sqrt[2]*c^(1/4)*x)/a^(1/4)])/(64*Sqr
t[2]*a^(13/4)) - (45*c^(1/4)*ArcTan[1 + (Sqrt[2]*c^(1/4)*x)/a^(1/
4)])/(64*Sqrt[2]*a^(13/4)) - (45*c^(1/4)*Log[Sqrt[a] - Sqrt[2]*a^
(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(128*Sqrt[2]*a^(13/4)) + (45*c^(1
/4)*Log[Sqrt[a] + Sqrt[2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(128*
Sqrt[2]*a^(13/4))
```

Rubi in Sympy [A] time = 66.7529, size = 218, normalized size = 0.94

$$\frac{1}{8ax\left(a+cx^4\right)^2}+\frac{9}{32a^2x\left(a+cx^4\right)}-\frac{45}{32a^3x}-\frac{45\sqrt{2}\sqrt[4]{c}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{256a^{\frac{13}{4}}}+\frac{45\sqrt{2}\sqrt[4]{c}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)}{256a^{\frac{13}{4}}}+\frac{45\sqrt{2}\sqrt[4]{c}\,\text{atan}\left(1-\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{128a^{\frac{13}{4}}}-\frac{45\sqrt{2}\sqrt[4]{c}\,\text{atan}\left(1+\frac{\sqrt{2}\sqrt[4]{c}x}{\sqrt[4]{a}}\right)}{128a^{\frac{13}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(c*x**4+a)**3,x)
```

```
[Out] 1/(8*a*x*(a + c*x**4)**2) + 9/(32*a**2*x*(a + c*x**4)) - 45/(32*a
**3*x) - 45*sqrt(2)*c**(1/4)*log(-sqrt(2)*a**(1/4)*c**(1/4)*x + s
qrt(a) + sqrt(c)*x**2)/(256*a**(13/4)) + 45*sqrt(2)*c**(1/4)*log(
sqrt(2)*a**(1/4)*c**(1/4)*x + sqrt(a) + sqrt(c)*x**2)/(256*a**(13
/4)) + 45*sqrt(2)*c**(1/4)*atan(1 - sqrt(2)*c**(1/4)*x/a**(1/4))/
(128*a**(13/4)) - 45*sqrt(2)*c**(1/4)*atan(1 + sqrt(2)*c**(1/4)*x
```

```
/a**(1/4))/(128*a**(13/4))
```

Mathematica [A] time = 0.194921, size = 216, normalized size = 0.93

$$\frac{-\frac{32a^{5/4}cx^3}{(a+cx^4)^2}-45\sqrt{2}\sqrt[4]{c}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)+45\sqrt{2}\sqrt[4]{c}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{c}x+\sqrt{a}+\sqrt{c}x^2\right)-\frac{104\sqrt[4]{a}cx^3}{a+cx^4}+90\sqrt{2}\sqrt[4]{c}\tan^{-1}}{256a^{13/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*(a + c*x^4)^3),x]
```

```
[Out] ((-256*a^(1/4))/x - (32*a^(5/4)*c*x^3)/(a + c*x^4)^2 - (104*a^(1/
4)*c*x^3)/(a + c*x^4) + 90*Sqrt[2]*c^(1/4)*ArcTan[1 - (Sqrt[2]*c^
(1/4)*x)/a^(1/4)] - 90*Sqrt[2]*c^(1/4)*ArcTan[1 + (Sqrt[2]*c^(1/4
)*x)/a^(1/4)] - 45*Sqrt[2]*c^(1/4)*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*
c^(1/4)*x + Sqrt[c]*x^2] + 45*Sqrt[2]*c^(1/4)*Log[Sqrt[a] + Sqrt[
2]*a^(1/4)*c^(1/4)*x + Sqrt[c]*x^2])/(256*a^(13/4))
```

Maple [A] time = 0.02, size = 174, normalized size = 0.8

$$-\frac{1}{a^3x}-\frac{13\,c^2x^7}{32\,a^3\,(cx^4+a)^2}-\frac{17\,cx^3}{32\,a^2\,(cx^4+a)^2}-\frac{45\,\sqrt{2}}{256\,a^3}\ln\left(1\left(x^2-\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)\left(x^2+\sqrt[4]{\frac{a}{c}}x\sqrt{2}+\sqrt{\frac{a}{c}}\right)^{-1}\right)\frac{1}{\sqrt[4]{\frac{a}{c}}}-\frac{45\,\sqrt{2}}{128\,a^3}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}+1\right)\frac{1}{\sqrt[4]{\frac{a}{c}}}-\frac{45\,\sqrt{2}}{128\,a^3}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{c}}}-1\right)\frac{1}{\sqrt[4]{\frac{a}{c}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(c*x^4+a)^3,x)
```

```
[Out] -1/a^3/x-13/32*c^2/a^3/(c*x^4+a)^2*x^7-17/32*c/a^2/(c*x^4+a)^2*x^
3-45/256/a^3/(a/c)^(1/4)*2^(1/2)*ln((x^2-(a/c)^(1/4)*x*2^(1/2)+(a
/c)^(1/2))/(x^2+(a/c)^(1/4)*x*2^(1/2)+(a/c)^(1/2)))-45/128/a^3/(a
/c)^(1/4)*2^(1/2)*arctan(2^(1/2)/(a/c)^(1/4)*x+1)-45/128/a^3/(a/c
)^(1/4)*2^(1/2)*arctan(2^(1/2)/(a/c)^(1/4)*x-1)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)^3*x^2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.251099, size = 324, normalized size = 1.39

$$-\frac{180\,c^2x^8+324\,acx^4+180\left(a^3c^2x^9+2\,a^4cx^5+a^5x\right)\left(-\frac{c}{a^{13}}\right)^{\frac{1}{4}}\arctan\left(\frac{a^{10}\left(-\frac{c}{a^{13}}\right)^{\frac{3}{4}}}{cx+c\sqrt{-\frac{a^7\sqrt{-\frac{c}{a^{13}}}-cx^2}{c}}}\right)+45\left(a^3c^2x^9+2\,a^4cx^5+a^5x\right)\left(-\right.}{128\left(a^3c^2x\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)^3*x^2),x, algorithm="fricas")
```

```
[Out] -1/128*(180*c^2*x^8 + 324*a*c*x^4 + 180*(a^3*c^2*x^9 + 2*a^4*c*x^
5 + a^5*x)*(-c/a^13)^(1/4)*arctan(a^10*(-c/a^13)^(3/4)/(c*x + c*s
qrt(-(a^7*sqrt(-c/a^13) - c*x^2)/c))) + 45*(a^3*c^2*x^9 + 2*a^4*c
*x^5 + a^5*x)*(-c/a^13)^(1/4)*log(91125*a^10*(-c/a^13)^(3/4) + 91
125*c*x) - 45*(a^3*c^2*x^9 + 2*a^4*c*x^5 + a^5*x)*(-c/a^13)^(1/4)
*log(-91125*a^10*(-c/a^13)^(3/4) + 91125*c*x) + 128*a^2)/(a^3*c^2
*x^9 + 2*a^4*c*x^5 + a^5*x)
```

Sympy [A] time = 18.6368, size = 78, normalized size = 0.33

$$-\frac{32a^2 + 81acx^4 + 45c^2x^8}{32a^5x + 64a^4cx^5 + 32a^3c^2x^9} + \operatorname{RootSum}\left(268435456t^4a^{13} + 4100625c, \left(t \mapsto t\log\left(-\frac{2097152t^3a^{10}}{91125c} + x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(c*x**4+a)**3,x)
```

```
[Out] -(32*a**2 + 81*a*c*x**4 + 45*c**2*x**8)/(32*a**5*x + 64*a**4*c*x*
*5 + 32*a**3*c**2*x**9) + RootSum(268435456*_t**4*a**13 + 4100625
*c, Lambda(_t, _t*log(-2097152*_t**3*a**10/(91125*c) + x)))
```

GIAC/XCAS [A] time = 0.223603, size = 293, normalized size = 1.26

$$-\frac{45\sqrt{2}\left(ac^3\right)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(2x+\sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{128\,a^4c^2} - \frac{45\sqrt{2}\left(ac^3\right)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(2x-\sqrt{2}\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{c}\right)^{\frac{1}{4}}}\right)}{128\,a^4c^2} + \frac{45\sqrt{2}\left(ac^3\right)^{\frac{3}{4}}\ln\left(x^2+\sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{c}}\right)}{256\,a^4c^2} - \frac{45\sqrt{2}\left(ac^3\right)^{\frac{3}{4}}\ln\left(x^2-\sqrt{2}x\left(\frac{a}{c}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{c}}\right)}{256\,a^4c^2} - \frac{13\,c^2x^7+17\,acx^3}{32\left(cx^4+a\right)^2a^3} - \frac{1}{a^3x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)^3*x^2),x, algorithm="giac")
```

```
[Out] -45/128*sqrt(2)*(a*c^3)^(3/4)*arctan(1/2*sqrt(2)*(2*x + sqrt(2)*(
a/c)^(1/4))/(a/c)^(1/4))/(a^4*c^2) - 45/128*sqrt(2)*(a*c^3)^(3/4)
*arctan(1/2*sqrt(2)*(2*x - sqrt(2)*(a/c)^(1/4))/(a/c)^(1/4))/(a^4
*c^2) + 45/256*sqrt(2)*(a*c^3)^(3/4)*ln(x^2 + sqrt(2)*x*(a/c)^(1/
4) + sqrt(a/c))/(a^4*c^2) - 45/256*sqrt(2)*(a*c^3)^(3/4)*ln(x^2 -
 sqrt(2)*x*(a/c)^(1/4) + sqrt(a/c))/(a^4*c^2) - 1/32*(13*c^2*x^7
+ 17*a*c*x^3)/((c*x^4 + a)^2*a^3) - 1/(a^3*x)
```

3.685 $\int \frac{x^9}{2+3x^4} \, dx$

Optimal. Leaf size=38

$$\frac{x^6}{18}-\frac{x^2}{9}+\frac{1}{9}\sqrt{\frac{2}{3}}\tan^{-1}\left(\sqrt{\frac{3}{2}}x^2\right)$$

```
[Out] -x^2/9 + x^6/18 + (Sqrt[2/3]*ArcTan[Sqrt[3/2]*x^2])/9
```

Rubi [A] time = 0.0513045, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{x^6}{18}-\frac{x^2}{9}+\frac{1}{9}\sqrt{\frac{2}{3}}\tan^{-1}\left(\sqrt{\frac{3}{2}}x^2\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^9/(2 + 3*x^4),x]
```

```
[Out] -x^2/9 + x^6/18 + (Sqrt[2/3]*ArcTan[Sqrt[3/2]*x^2])/9
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{x^6}{18}+\frac{\sqrt{6}\operatorname{atan}\left(\frac{\sqrt{6}x^2}{2}\right)}{27}+\frac{\int^{x^2}\left(-\frac{2}{9}\right)\,dx}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**9/(3*x**4+2),x)
```

```
[Out] x**6/18 + sqrt(6)*atan(sqrt(6)*x**2/2)/27 + Integral(-2/9, (x, x*
*2))/2
```

Mathematica [A] time = 0.0285102, size = 34, normalized size = 0.89

$$\frac{1}{54}\left(3x^6-6x^2+2\sqrt{6}\tan^{-1}\left(\sqrt{\frac{3}{2}}x^2\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^9/(2 + 3*x^4),x]
```

```
[Out] (-6*x^2 + 3*x^6 + 2*Sqrt[6]*ArcTan[Sqrt[3/2]*x^2])/54
```

Maple [A] time = 0.005, size = 26, normalized size = 0.7

$$-\frac{x^2}{9}+\frac{x^6}{18}+\frac{\sqrt{6}}{27}\arctan\left(\frac{x^2\sqrt{6}}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^9/(3*x^4+2),x)
```

```
[Out] -1/9*x^2+1/18*x^6+1/27*arctan(1/2*x^2*6^(1/2))*6^(1/2)
```

Maxima [A] time = 1.58673, size = 34, normalized size = 0.89

$$\frac{1}{18}x^6 - \frac{1}{9}x^2 + \frac{1}{27}\sqrt{6}\arctan\left(\frac{1}{2}\sqrt{6}x^2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(3*x^4 + 2),x, algorithm="maxima")
```

```
[Out] 1/18*x^6 - 1/9*x^2 + 1/27*sqrt(6)*arctan(1/2*sqrt(6)*x^2)
```

Fricas [A] time = 0.223301, size = 49, normalized size = 1.29

$$\frac{1}{54}\sqrt{3}\left(\sqrt{3}\left(x^6 - 2x^2\right) + 2\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{3}\sqrt{2}x^2\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(3*x^4 + 2),x, algorithm="fricas")
```

```
[Out] 1/54*sqrt(3)*(sqrt(3)*(x^6 - 2*x^2) + 2*sqrt(2)*arctan(1/2*sqrt(3
)*sqrt(2)*x^2))
```

Sympy [A] time = 0.202807, size = 27, normalized size = 0.71

$$\frac{x^6}{18} - \frac{x^2}{9} + \frac{\sqrt{6}\operatorname{atan}\left(\frac{\sqrt{6}x^2}{2}\right)}{27}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**9/(3*x**4+2),x)
```

```
[Out] x**6/18 - x**2/9 + sqrt(6)*atan(sqrt(6)*x**2/2)/27
```

GIAC/XCAS [A] time = 0.219429, size = 34, normalized size = 0.89

$$\frac{1}{18}x^6 - \frac{1}{9}x^2 + \frac{1}{27}\sqrt{6}\arctan\left(\frac{1}{2}\sqrt{6}x^2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(3*x^4 + 2),x, algorithm="giac")
```

```
[Out] 1/18*x^6 - 1/9*x^2 + 1/27*sqrt(6)*arctan(1/2*sqrt(6)*x^2)
```

3.686 $\int \frac{x^7}{2+3x^4} dx$

Optimal. Leaf size=20

$$\frac{x^4}{12} - \frac{1}{18}\log\left(3x^4+2\right)$$

```
[Out] x^4/12 - Log[2 + 3*x^4]/18
```

Rubi [A] time = 0.0325867, antiderivative size = 20, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{x^4}{12} - \frac{1}{18}\log\left(3x^4+2\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^7/(2 + 3*x^4),x]

[Out] x^4/12 - Log[2 + 3*x^4]/18
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\log\left(3x^4+2\right)}{18} + \frac{\int^{x^4} \frac{1}{3}\, dx}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7/(3*x**4+2),x)

[Out] -log(3*x**4 + 2)/18 + Integral(1/3, (x, x**4))/4
```

Mathematica [A] time = 0.00897264, size = 21, normalized size = 1.05

$$\frac{1}{36}\left(3x^4 - 2\log\left(3x^4+2\right) + 2\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^7/(2 + 3*x^4),x]

[Out] (2 + 3*x^4 - 2*Log[2 + 3*x^4])/36
```

Maple [A] time = 0.004, size = 17, normalized size = 0.9

$$\frac{x^4}{12} - \frac{\ln\left(3\,x^4+2\right)}{18}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7/(3*x^4+2),x)

[Out] 1/12*x^4-1/18*ln(3*x^4+2)
```

Maxima [A] time = 1.44082, size = 22, normalized size = 1.1

$$\frac{1}{12}\,x^4 - \frac{1}{18}\,\log\left(3\,x^4 + 2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(3*x^4 + 2),x, algorithm="maxima")

[Out] 1/12*x^4 - 1/18*log(3*x^4 + 2)
```

Fricas [A] time = 0.223798, size = 22, normalized size = 1.1

$$\frac{1}{12}\,x^4 - \frac{1}{18}\,\log\left(3\,x^4 + 2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(3*x^4 + 2),x, algorithm="fricas")

[Out] 1/12*x^4 - 1/18*log(3*x^4 + 2)
```

Sympy [A] time = 0.154494, size = 14, normalized size = 0.7

$$\frac{x^4}{12} - \frac{\log\left(3x^4 + 2\right)}{18}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(3*x**4+2),x)

[Out] x**4/12 - log(3*x**4 + 2)/18
```

GIAC/XCAS [A] time = 0.220127, size = 22, normalized size = 1.1

$$\frac{1}{12}\,x^4 - \frac{1}{18}\,\ln\left(3\,x^4 + 2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(3*x^4 + 2),x, algorithm="giac")

[Out] 1/12*x^4 - 1/18*ln(3*x^4 + 2)
```

3.687 $\int \frac{x^5}{2+3x^4}\,dx$

Optimal. Leaf size=29

$$\frac{x^2}{6}-\frac{\tan^{-1}\left(\sqrt{\frac{3}{2}}x^2\right)}{3\sqrt{6}}$$

```
[Out] x^2/6 - ArcTan[Sqrt[3/2]*x^2]/(3*Sqrt[6])
```

Rubi [A] time = 0.0376713, antiderivative size = 29, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{x^2}{6}-\frac{\tan^{-1}\left(\sqrt{\frac{3}{2}}x^2\right)}{3\sqrt{6}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/(2 + 3*x^4),x]

[Out] x^2/6 - ArcTan[Sqrt[3/2]*x^2]/(3*Sqrt[6])
```

Rubi in Sympy [A] time = 5.47535, size = 22, normalized size = 0.76

$$\frac{x^2}{6}-\frac{\sqrt{6}\,\mathrm{atan}\left(\frac{\sqrt{6}x^2}{2}\right)}{18}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(3*x**4+2),x)

[Out] x**2/6 - sqrt(6)*atan(sqrt(6)*x**2/2)/18
```

Mathematica [A] time = 0.0186189, size = 29, normalized size = 1.

$$\frac{x^2}{6}-\frac{\tan^{-1}\left(\sqrt{\frac{3}{2}}x^2\right)}{3\sqrt{6}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/(2 + 3*x^4),x]

[Out] x^2/6 - ArcTan[Sqrt[3/2]*x^2]/(3*Sqrt[6])
```

Maple [A] time = 0.003, size = 21, normalized size = 0.7

$$\frac{x^2}{6}-\frac{\sqrt{6}}{18}\arctan\left(\frac{x^2\sqrt{6}}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(3*x^4+2),x)

[Out] 1/6*x^2-1/18*arctan(1/2*x^2*6^(1/2))*6^(1/2)
```

Maxima [A] time = 1.5861, size = 27, normalized size = 0.93

$$\frac{1}{6}x^2 - \frac{1}{18}\sqrt{6}\arctan\left(\frac{1}{2}\sqrt{6}x^2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(3*x^4 + 2),x, algorithm="maxima")

[Out] 1/6*x^2 - 1/18*sqrt(6)*arctan(1/2*sqrt(6)*x^2)
```

Fricas [A] time = 0.22674, size = 32, normalized size = 1.1

$$\frac{1}{36}\sqrt{6}\left(\sqrt{6}x^2 - 2\arctan\left(\frac{1}{2}\sqrt{6}x^2\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(3*x^4 + 2),x, algorithm="fricas")

[Out] 1/36*sqrt(6)*(sqrt(6)*x^2 - 2*arctan(1/2*sqrt(6)*x^2))
```

Sympy [A] time = 0.200022, size = 22, normalized size = 0.76

$$\frac{x^2}{6} - \frac{\sqrt{6}\operatorname{atan}\left(\frac{\sqrt{6}x^2}{2}\right)}{18}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(3*x**4+2),x)

[Out] x**2/6 - sqrt(6)*atan(sqrt(6)*x**2/2)/18
```

GIAC/XCAS [A] time = 0.219578, size = 27, normalized size = 0.93

$$\frac{1}{6}x^2 - \frac{1}{18}\sqrt{6}\arctan\left(\frac{1}{2}\sqrt{6}x^2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(3*x^4 + 2),x, algorithm="giac")

[Out] 1/6*x^2 - 1/18*sqrt(6)*arctan(1/2*sqrt(6)*x^2)
```

3.688 $\int \frac{x^3}{2+3x^4} \, dx$

Optimal. Leaf size=12

$$\frac{1}{12}\log\left(3x^4+2\right)$$

```
[Out] Log[2 + 3*x^4]/12
```

Rubi [A] time = 0.00670748, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{1}{12}\log\left(3x^4+2\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(2 + 3*x^4),x]

[Out] Log[2 + 3*x^4]/12
```

Rubi in Sympy [A] time = 1.9416, size = 8, normalized size = 0.67

$$\frac{\log\left(3x^4+2\right)}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(3*x**4+2),x)

[Out] log(3*x**4 + 2)/12
```

Mathematica [A] time = 0.0045764, size = 12, normalized size = 1.

$$\frac{1}{12}\log\left(3x^4+2\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(2 + 3*x^4),x]

[Out] Log[2 + 3*x^4]/12
```

Maple [A] time = 0.001, size = 11, normalized size = 0.9

$$\frac{\ln\left(3\,x^4+2\right)}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(3*x^4+2),x)

[Out] 1/12*ln(3*x^4+2)
```

Maxima [A] time = 1.4283, size = 14, normalized size = 1.17

$$\frac{1}{12} \log\left(3 x^4 + 2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(3*x^4 + 2),x, algorithm="maxima")

[Out] 1/12*log(3*x^4 + 2)
```

Fricas [A] time = 0.2226, size = 14, normalized size = 1.17

$$\frac{1}{12} \log\left(3 x^4 + 2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(3*x^4 + 2),x, algorithm="fricas")

[Out] 1/12*log(3*x^4 + 2)
```

Sympy [A] time = 0.144578, size = 8, normalized size = 0.67

$$\frac{\log\left(3x^4 + 2\right)}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(3*x**4+2),x)

[Out] log(3*x**4 + 2)/12
```

GIAC/XCAS [A] time = 0.220499, size = 14, normalized size = 1.17

$$\frac{1}{12} \ln\left(3 x^4 + 2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(3*x^4 + 2),x, algorithm="giac")

[Out] 1/12*ln(3*x^4 + 2)
```

3.689 $\int \frac{x}{2+3x^4}\,dx$

Optimal. Leaf size=21

$$\frac{\tan^{-1}\left(\sqrt{\frac{3}{2}}x^2\right)}{2\sqrt{6}}$$

```
[Out] ArcTan[Sqrt[3/2]*x^2]/(2*Sqrt[6])
```

Rubi [A] time = 0.0201487, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$

$$\frac{\tan^{-1}\left(\sqrt{\frac{3}{2}}x^2\right)}{2\sqrt{6}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(2 + 3*x^4),x]

[Out] ArcTan[Sqrt[3/2]*x^2]/(2*Sqrt[6])
```

Rubi in Sympy [A] time = 2.6205, size = 17, normalized size = 0.81

$$\frac{\sqrt{6}\,\operatorname{atan}\left(\frac{\sqrt{6}x^2}{2}\right)}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(3*x**4+2),x)

[Out] sqrt(6)*atan(sqrt(6)*x**2/2)/12
```

Mathematica [A] time = 0.0129919, size = 21, normalized size = 1.

$$\frac{\tan^{-1}\left(\sqrt{\frac{3}{2}}x^2\right)}{2\sqrt{6}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(2 + 3*x^4),x]

[Out] ArcTan[Sqrt[3/2]*x^2]/(2*Sqrt[6])
```

Maple [A] time = 0.002, size = 15, normalized size = 0.7

$$\frac{\sqrt{6}}{12}\arctan\left(\frac{x^2\sqrt{6}}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(3*x^4+2),x)
```

```
[Out] 1/12*arctan(1/2*x^2*6^(1/2))*6^(1/2)
```

Maxima [A] time = 1.59247, size = 19, normalized size = 0.9

$$\frac{1}{12}\sqrt{6}\arctan\left(\frac{1}{2}\sqrt{6}x^2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(3*x^4 + 2),x, algorithm="maxima")
```

```
[Out] 1/12*sqrt(6)*arctan(1/2*sqrt(6)*x^2)
```

Fricas [A] time = 0.222981, size = 19, normalized size = 0.9

$$\frac{1}{12}\sqrt{6}\arctan\left(\frac{1}{2}\sqrt{6}x^2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(3*x^4 + 2),x, algorithm="fricas")
```

```
[Out] 1/12*sqrt(6)*arctan(1/2*sqrt(6)*x^2)
```

Sympy [A] time = 0.189759, size = 17, normalized size = 0.81

$$\frac{\sqrt{6}\operatorname{atan}\left(\frac{\sqrt{6}x^2}{2}\right)}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(3*x**4+2),x)
```

```
[Out] sqrt(6)*atan(sqrt(6)*x**2/2)/12
```

GIAC/XCAS [A] time = 0.224629, size = 19, normalized size = 0.9

$$\frac{1}{12}\sqrt{6}\arctan\left(\frac{1}{2}\sqrt{6}x^2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(3*x^4 + 2),x, algorithm="giac")
```

```
[Out] 1/12*sqrt(6)*arctan(1/2*sqrt(6)*x^2)
```

3.690 $\int \frac{1}{x(2+3x^4)} \, dx$

Optimal. Leaf size=19

$$\frac{\log(x)}{2} - \frac{1}{8}\log\left(3x^4+2\right)$$

```
[Out] Log[x]/2 - Log[2 + 3*x^4]/8
```

Rubi [A] time = 0.0250931, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{\log(x)}{2} - \frac{1}{8}\log\left(3x^4+2\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(2 + 3*x^4)),x]

[Out] Log[x]/2 - Log[2 + 3*x^4]/8
```

Rubi in Sympy [A] time = 3.90463, size = 15, normalized size = 0.79

$$\frac{\log\left(x^4\right)}{8} - \frac{\log\left(3x^4+2\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(3*x**4+2),x)

[Out] log(x**4)/8 - log(3*x**4 + 2)/8
```

Mathematica [A] time = 0.00625727, size = 19, normalized size = 1.

$$\frac{\log(x)}{2} - \frac{1}{8}\log\left(3x^4+2\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(2 + 3*x^4)),x]

[Out] Log[x]/2 - Log[2 + 3*x^4]/8
```

Maple [A] time = 0.006, size = 16, normalized size = 0.8

$$\frac{\ln(x)}{2} - \frac{\ln\left(3x^4+2\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(3*x^4+2),x)

[Out] 1/2*ln(x)-1/8*ln(3*x^4+2)
```

Maxima [A] time = 1.41793, size = 23, normalized size = 1.21

$$-\frac{1}{8}\log\left(3x^4+2\right)+\frac{1}{8}\log\left(x^4\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((3*x^4 + 2)*x),x, algorithm="maxima")
```

```
[Out] -1/8*log(3*x^4 + 2) + 1/8*log(x^4)
```

Fricas [A] time = 0.223185, size = 20, normalized size = 1.05

$$-\frac{1}{8}\log\left(3x^4+2\right)+\frac{1}{2}\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((3*x^4 + 2)*x),x, algorithm="fricas")
```

```
[Out] -1/8*log(3*x^4 + 2) + 1/2*log(x)
```

Sympy [A] time = 0.195491, size = 14, normalized size = 0.74

$$\frac{\log(x)}{2}-\frac{\log\left(3x^4+2\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(3*x**4+2),x)
```

```
[Out] log(x)/2 - log(3*x**4 + 2)/8
```

GIAC/XCAS [A] time = 0.220728, size = 23, normalized size = 1.21

$$-\frac{1}{8}\ln\left(3x^4+2\right)+\frac{1}{8}\ln\left(x^4\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((3*x^4 + 2)*x),x, algorithm="giac")
```

```
[Out] -1/8*ln(3*x^4 + 2) + 1/8*ln(x^4)
```

3.691 $\int \frac{1}{x^3(2+3x^4)}\,dx$

Optimal. Leaf size=31

$$-\frac{1}{4x^2}-\frac{1}{4}\sqrt{\frac{3}{2}}\tan^{-1}\left(\sqrt{\frac{3}{2}}x^2\right)$$

```
[Out] -1/(4*x^2) - (Sqrt[3/2]*ArcTan[Sqrt[3/2]*x^2])/4
```

Rubi [A] time = 0.0347719, antiderivative size = 31, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{1}{4x^2}-\frac{1}{4}\sqrt{\frac{3}{2}}\tan^{-1}\left(\sqrt{\frac{3}{2}}x^2\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(2 + 3*x^4)),x]

[Out] -1/(4*x^2) - (Sqrt[3/2]*ArcTan[Sqrt[3/2]*x^2])/4
```

Rubi in Sympy [A] time = 5.17499, size = 26, normalized size = 0.84

$$-\frac{\sqrt{6}\,\text{atan}\left(\frac{\sqrt{6}x^2}{2}\right)}{8}-\frac{1}{4x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(3*x**4+2),x)

[Out] -sqrt(6)*atan(sqrt(6)*x**2/2)/8 - 1/(4*x**2)
```

Mathematica [A] time = 0.0357927, size = 48, normalized size = 1.55

$$\frac{\sqrt{6}x^2\tan^{-1}\left(1-\sqrt[4]{6}x\right)+\sqrt{6}x^2\tan^{-1}\left(\sqrt[4]{6}x+1\right)-2}{8x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*(2 + 3*x^4)),x]

[Out] (-2 + Sqrt[6]*x^2*ArcTan[1 - 6^(1/4)*x] + Sqrt[6]*x^2*ArcTan[1 +
6^(1/4)*x])/(8*x^2)
```

Maple [A] time = 0.006, size = 21, normalized size = 0.7

$$-\frac{1}{4\,x^2}-\frac{\sqrt{6}}{8}\arctan\left(\frac{x^2\sqrt{6}}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(3*x^4+2),x)
```

```
[Out] -1/4/x^2-1/8*arctan(1/2*x^2*6^(1/2))*6^(1/2)
```

Maxima [A] time = 1.59174, size = 27, normalized size = 0.87

$$-\frac{1}{8}\sqrt{6}\arctan\left(\frac{1}{2}\sqrt{6}x^2\right) - \frac{1}{4x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((3*x^4 + 2)*x^3),x, algorithm="maxima")
```

```
[Out] -1/8*sqrt(6)*arctan(1/2*sqrt(6)*x^2) - 1/4/x^2
```

Fricas [A] time = 0.221196, size = 42, normalized size = 1.35

$$-\frac{\sqrt{2}\left(\sqrt{3}x^2\arctan\left(\frac{1}{2}\sqrt{3}\sqrt{2}x^2\right) + \sqrt{2}\right)}{8x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((3*x^4 + 2)*x^3),x, algorithm="fricas")
```

```
[Out] -1/8*sqrt(2)*(sqrt(3)*x^2*arctan(1/2*sqrt(3)*sqrt(2)*x^2) + sqrt(
2))/x^2
```

Sympy [A] time = 0.279784, size = 26, normalized size = 0.84

$$-\frac{\sqrt{6}\,\mathrm{atan}\left(\frac{\sqrt{6}x^2}{2}\right)}{8} - \frac{1}{4x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(3*x**4+2),x)
```

```
[Out] -sqrt(6)*atan(sqrt(6)*x**2/2)/8 - 1/(4*x**2)
```

GIAC/XCAS [A] time = 0.219831, size = 27, normalized size = 0.87

$$-\frac{1}{8}\sqrt{6}\arctan\left(\frac{1}{2}\sqrt{6}x^2\right) - \frac{1}{4x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((3*x^4 + 2)*x^3),x, algorithm="giac")
```

```
[Out] -1/8*sqrt(6)*arctan(1/2*sqrt(6)*x^2) - 1/4/x^2
```

3.692 $\int \frac{x^6}{2+3x^4}\,dx$

Optimal. Leaf size=122

$$\frac{x^3}{9}-\frac{\log\left(\sqrt{3}x^2-2^{3/4}\sqrt[4]{3}x+\sqrt{2}\right)}{6\ 6^{3/4}}+\frac{\log\left(\sqrt{3}x^2+2^{3/4}\sqrt[4]{3}x+\sqrt{2}\right)}{6\ 6^{3/4}}+\frac{\tan^{-1}\left(1-\sqrt[4]{6}x\right)}{3\ 6^{3/4}}-\frac{\tan^{-1}\left(\sqrt[4]{6}x+1\right)}{3\ 6^{3/4}}$$

```
[Out] x^3/9 + ArcTan[1 - 6^(1/4)*x]/(3*6^(3/4)) - ArcTan[1 + 6^(1/4)*x]
/(3*6^(3/4)) - Log[Sqrt[2] - 2^(3/4)*3^(1/4)*x + Sqrt[3]*x^2]/(6*
6^(3/4)) + Log[Sqrt[2] + 2^(3/4)*3^(1/4)*x + Sqrt[3]*x^2]/(6*6^(3
/4))
```

Rubi [A] time = 0.195524, antiderivative size = 104, normalized size of antiderivative = 0.85, number of steps used = 10, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538

$$\frac{x^3}{9}-\frac{\log\left(3x^2-6^{3/4}x+\sqrt{6}\right)}{6\ 6^{3/4}}+\frac{\log\left(3x^2+6^{3/4}x+\sqrt{6}\right)}{6\ 6^{3/4}}+\frac{\tan^{-1}\left(1-\sqrt[4]{6}x\right)}{3\ 6^{3/4}}-\frac{\tan^{-1}\left(\sqrt[4]{6}x+1\right)}{3\ 6^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/(2 + 3*x^4),x]
```

```
[Out] x^3/9 + ArcTan[1 - 6^(1/4)*x]/(3*6^(3/4)) - ArcTan[1 + 6^(1/4)*x]
/(3*6^(3/4)) - Log[Sqrt[6] - 6^(3/4)*x + 3*x^2]/(6*6^(3/4)) + Log
[Sqrt[6] + 6^(3/4)*x + 3*x^2]/(6*6^(3/4))
```

Rubi in Sympy [A] time = 20.2006, size = 88, normalized size = 0.72

$$\frac{x^3}{9}-\frac{\sqrt[4]{6}\log\left(3x^2-6^{\frac{3}{4}}x+\sqrt{6}\right)}{36}+\frac{\sqrt[4]{6}\log\left(3x^2+6^{\frac{3}{4}}x+\sqrt{6}\right)}{36}-\frac{\sqrt[4]{6}\,\mathrm{atan}\left(\sqrt[4]{6}x-1\right)}{18}-\frac{\sqrt[4]{6}\,\mathrm{atan}\left(\sqrt[4]{6}x+1\right)}{18}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(3*x**4+2),x)
```

```
[Out] x**3/9 - 6**(1/4)*log(3*x**2 - 6**(3/4)*x + sqrt(6))/36 + 6**(1/4
)*log(3*x**2 + 6**(3/4)*x + sqrt(6))/36 - 6**(1/4)*atan(6**(1/4)*
x - 1)/18 - 6**(1/4)*atan(6**(1/4)*x + 1)/18
```

Mathematica [A] time = 0.0533002, size = 98, normalized size = 0.8

$$\frac{1}{36}\left(4x^3-\sqrt[4]{6}\log\left(\sqrt{6}x^2-2\sqrt[4]{6}x+2\right)+\sqrt[4]{6}\log\left(\sqrt{6}x^2+2\sqrt[4]{6}x+2\right)\right.$$
$$\left.+2\sqrt[4]{6}\tan^{-1}\left(1-\sqrt[4]{6}x\right)-2\sqrt[4]{6}\tan^{-1}\left(\sqrt[4]{6}x+1\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6/(2 + 3*x^4),x]
```

```
[Out] (4*x^3 + 2*6^(1/4)*ArcTan[1 - 6^(1/4)*x] - 2*6^(1/4)*ArcTan[1 + 6
^(1/4)*x] - 6^(1/4)*Log[2 - 2*6^(1/4)*x + Sqrt[6]*x^2] + 6^(1/4)*
Log[2 + 2*6^(1/4)*x + Sqrt[6]*x^2])/36
```

Maple [A] time = 0.008, size = 116, normalized size = 1.

$$\frac{x^3}{9} - \frac{\sqrt{2}\sqrt{3}6^{\frac{3}{4}}}{108}\arctan\left(\frac{\sqrt{2}\sqrt{3}6^{\frac{3}{4}}x}{6}+1\right) - \frac{\sqrt{2}\sqrt{3}6^{\frac{3}{4}}}{108}\arctan\left(\frac{\sqrt{2}\sqrt{3}6^{\frac{3}{4}}x}{6}-1\right) - \frac{\sqrt{2}\sqrt{3}6^{\frac{3}{4}}}{216}\ln\left(1\left(x^2-\frac{\sqrt{3}\sqrt[4]{6}x\sqrt{2}}{3}+\frac{\sqrt{6}}{3}\right)\left(x^2+\frac{\sqrt{3}\sqrt[4]{6}x\sqrt{2}}{3}+\frac{\sqrt{6}}{3}\right)^{-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(3*x^4+2),x)
```

```
[Out] 1/9*x^3-1/108*6^(3/4)*3^(1/2)*2^(1/2)*arctan(1/6*2^(1/2)*3^(1/2)*
6^(3/4)*x+1)-1/108*6^(3/4)*3^(1/2)*2^(1/2)*arctan(1/6*2^(1/2)*3^(
1/2)*6^(3/4)*x-1)-1/216*6^(3/4)*3^(1/2)*2^(1/2)*ln((x^2-1/3*3^(1/
2)*6^(1/4)*x*2^(1/2)+1/3*6^(1/2))/(x^2+1/3*3^(1/2)*6^(1/4)*x*2^(1
/2)+1/3*6^(1/2)))
```

Maxima [A] time = 1.60352, size = 170, normalized size = 1.39

$$\frac{1}{9}x^3 - \frac{1}{18}\cdot 3^{\frac{1}{4}}2^{\frac{1}{4}}\arctan\left(\frac{1}{6}\cdot 3^{\frac{3}{4}}2^{\frac{1}{4}}\left(2\sqrt{3}x+3^{\frac{1}{4}}2^{\frac{3}{4}}\right)\right) - \frac{1}{18}\cdot 3^{\frac{1}{4}}2^{\frac{1}{4}}\arctan\left(\frac{1}{6}\cdot 3^{\frac{3}{4}}2^{\frac{1}{4}}\left(2\sqrt{3}x-3^{\frac{1}{4}}2^{\frac{3}{4}}\right)\right) + \frac{1}{36}\cdot 3^{\frac{1}{4}}2^{\frac{1}{4}}\log\left(\sqrt{3}x^2+3^{\frac{1}{4}}2^{\frac{3}{4}}x+\sqrt{2}\right) - \frac{1}{36}\cdot 3^{\frac{1}{4}}2^{\frac{1}{4}}\log\left(\sqrt{3}x^2-3^{\frac{1}{4}}2^{\frac{3}{4}}x+\sqrt{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(3*x^4 + 2),x, algorithm="maxima")
```

```
[Out] 1/9*x^3 - 1/18*3^(1/4)*2^(1/4)*arctan(1/6*3^(3/4)*2^(1/4)*(2*sqrt
(3)*x + 3^(1/4)*2^(3/4))) - 1/18*3^(1/4)*2^(1/4)*arctan(1/6*3^(3/
4)*2^(1/4)*(2*sqrt(3)*x - 3^(1/4)*2^(3/4))) + 1/36*3^(1/4)*2^(1/4
)*log(sqrt(3)*x^2 + 3^(1/4)*2^(3/4)*x + sqrt(2)) - 1/36*3^(1/4)*2
^(1/4)*log(sqrt(3)*x^2 - 3^(1/4)*2^(3/4)*x + sqrt(2))
```

Fricas [A] time = 0.240086, size = 235, normalized size = 1.93

$$\frac{1}{1944}\cdot 54^{\frac{3}{4}}\left(4\cdot 54^{\frac{1}{4}}x^3 + 12\sqrt{2}\arctan\left(\frac{54}{54^{\frac{3}{4}}\sqrt{2}\sqrt{\frac{1}{6}}\sqrt{\sqrt{6}\left(9\sqrt{6}x^2+54^{\frac{3}{4}}\sqrt{2}x+18\right)}+3\cdot 54^{\frac{3}{4}}\sqrt{2}x+54}\right) + 12\sqrt{2}\arctan\left(\frac{}{54^{\frac{3}{4}}\sqrt{2}\sqrt{\frac{1}{6}}\sqrt{}}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(3*x^4 + 2),x, algorithm="fricas")
```

```
[Out] 1/1944*54^(3/4)*(4*54^(1/4)*x^3 + 12*sqrt(2)*arctan(54/(54^(3/4)*
sqrt(2)*sqrt(1/6)*sqrt(sqrt(6)*(9*sqrt(6)*x^2 + 54^(3/4)*sqrt(2)*
x + 18)) + 3*54^(3/4)*sqrt(2)*x + 54)) + 12*sqrt(2)*arctan(54/(54
^(3/4)*sqrt(2)*sqrt(1/6)*sqrt(sqrt(6)*(9*sqrt(6)*x^2 - 54^(3/4)*s
qrt(2)*x + 18)) + 3*54^(3/4)*sqrt(2)*x - 54)) + 3*sqrt(2)*log(9*s
qrt(6)*x^2 + 54^(3/4)*sqrt(2)*x + 18) - 3*sqrt(2)*log(9*sqrt(6)*x
^2 - 54^(3/4)*sqrt(2)*x + 18))
```

Sympy [A] time = 1.51627, size = 92, normalized size = 0.75

$$\frac{x^3}{9} - \frac{\sqrt[4]{6}\log\left(x^2 - \frac{6^{\frac{3}{4}}x}{3} + \frac{\sqrt{6}}{3}\right)}{36} + \frac{\sqrt[4]{6}\log\left(x^2 + \frac{6^{\frac{3}{4}}x}{3} + \frac{\sqrt{6}}{3}\right)}{36} - \frac{\sqrt[4]{6}\operatorname{atan}\left(\sqrt[4]{6}x - 1\right)}{18} - \frac{\sqrt[4]{6}\operatorname{atan}\left(\sqrt[4]{6}x + 1\right)}{18}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(3*x**4+2),x)
```

```
[Out] x**3/9 - 6**(1/4)*log(x**2 - 6**(3/4)*x/3 + sqrt(6)/3)/36 + 6**(1
/4)*log(x**2 + 6**(3/4)*x/3 + sqrt(6)/3)/36 - 6**(1/4)*atan(6**(1
/4)*x - 1)/18 - 6**(1/4)*atan(6**(1/4)*x + 1)/18
```

GIAC/XCAS [A] time = 0.226364, size = 135, normalized size = 1.11

$$\frac{1}{9}x^3 - \frac{1}{18}\cdot 6^{\frac{1}{4}}\arctan\left(\frac{3}{4}\sqrt{2}\left(\frac{2}{3}\right)^{\frac{3}{4}}\left(2x + \sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}\right)\right) - \frac{1}{18}\cdot 6^{\frac{1}{4}}\arctan\left(\frac{3}{4}\sqrt{2}\left(\frac{2}{3}\right)^{\frac{3}{4}}\left(2x - \sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}\right)\right) + \frac{1}{36}\cdot 6^{\frac{1}{4}}\ln\left(x^2 + \sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}x + \sqrt{\frac{2}{3}}\right) - \frac{1}{36}\cdot 6^{\frac{1}{4}}\ln\left(x^2 - \sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}x + \sqrt{\frac{2}{3}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(3*x^4 + 2),x, algorithm="giac")
```

```
[Out] 1/9*x^3 - 1/18*6^(1/4)*arctan(3/4*sqrt(2)*(2/3)^(3/4)*(2*x + sqrt
(2)*(2/3)^(1/4))) - 1/18*6^(1/4)*arctan(3/4*sqrt(2)*(2/3)^(3/4)*(
2*x - sqrt(2)*(2/3)^(1/4))) + 1/36*6^(1/4)*ln(x^2 + sqrt(2)*(2/3)
^(1/4)*x + sqrt(2/3)) - 1/36*6^(1/4)*ln(x^2 - sqrt(2)*(2/3)^(1/4)
*x + sqrt(2/3))
```

3.693 $\int \frac{x^4}{2+3x^4}\,dx$

Optimal. Leaf size=120

$$\frac{\log\left(\sqrt{3}x^2-2^{3/4}\sqrt[4]{3}x+\sqrt{2}\right)}{12\sqrt[4]{6}}-\frac{\log\left(\sqrt{3}x^2+2^{3/4}\sqrt[4]{3}x+\sqrt{2}\right)}{12\sqrt[4]{6}}+\frac{x}{3}+\frac{\tan^{-1}\left(1-\sqrt[4]{6}x\right)}{6\sqrt[4]{6}}-\frac{\tan^{-1}\left(\sqrt[4]{6}x+1\right)}{6\sqrt[4]{6}}$$

```
[Out] x/3 + ArcTan[1 - 6^(1/4)*x]/(6*6^(1/4)) - ArcTan[1 + 6^(1/4)*x]/(
6*6^(1/4)) + Log[Sqrt[2] - 2^(3/4)*3^(1/4)*x + Sqrt[3]*x^2]/(12*6
^(1/4)) - Log[Sqrt[2] + 2^(3/4)*3^(1/4)*x + Sqrt[3]*x^2]/(12*6^(1
/4))
```

Rubi [A] time = 0.149742, antiderivative size = 102, normalized size of antiderivative = 0.85, number of steps used = 10, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.538$

$$\frac{\log\left(3x^2-6^{3/4}x+\sqrt{6}\right)}{12\sqrt[4]{6}}-\frac{\log\left(3x^2+6^{3/4}x+\sqrt{6}\right)}{12\sqrt[4]{6}}+\frac{x}{3}+\frac{\tan^{-1}\left(1-\sqrt[4]{6}x\right)}{6\sqrt[4]{6}}-\frac{\tan^{-1}\left(\sqrt[4]{6}x+1\right)}{6\sqrt[4]{6}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(2 + 3*x^4),x]
```

```
[Out] x/3 + ArcTan[1 - 6^(1/4)*x]/(6*6^(1/4)) - ArcTan[1 + 6^(1/4)*x]/(
6*6^(1/4)) + Log[Sqrt[6] - 6^(3/4)*x + 3*x^2]/(12*6^(1/4)) - Log[
Sqrt[6] + 6^(3/4)*x + 3*x^2]/(12*6^(1/4))
```

Rubi in Sympy [A] time = 19.2207, size = 87, normalized size = 0.72

$$\frac{x}{3}+\frac{6^{\frac{3}{4}}\log\left(3x^2-6^{\frac{3}{4}}x+\sqrt{6}\right)}{72}-\frac{6^{\frac{3}{4}}\log\left(3x^2+6^{\frac{3}{4}}x+\sqrt{6}\right)}{72}-\frac{6^{\frac{3}{4}}\operatorname{atan}\left(\sqrt[4]{6}x-1\right)}{36}-\frac{6^{\frac{3}{4}}\operatorname{atan}\left(\sqrt[4]{6}x+1\right)}{36}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(3*x**4+2),x)
```

```
[Out] x/3 + 6**(3/4)*log(3*x**2 - 6**(3/4)*x + sqrt(6))/72 - 6**(3/4)*l
og(3*x**2 + 6**(3/4)*x + sqrt(6))/72 - 6**(3/4)*atan(6**(1/4)*x -
 1)/36 - 6**(3/4)*atan(6**(1/4)*x + 1)/36
```

Mathematica [A] time = 0.0430889, size = 96, normalized size = 0.8

$$\frac{1}{72}\left(6^{3/4}\log\left(\sqrt{6}x^2-2\sqrt[4]{6}x+2\right)-6^{3/4}\log\left(\sqrt{6}x^2+2\sqrt[4]{6}x+2\right)+24x+2\,6^{3/4}\tan^{-1}\left(1-\sqrt[4]{6}x\right)-2\,6^{3/4}\tan^{-1}\left(\sqrt[4]{6}x+1\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(2 + 3*x^4),x]
```

```
[Out] (24*x + 2*6^(3/4)*ArcTan[1 - 6^(1/4)*x] - 2*6^(3/4)*ArcTan[1 + 6^
(1/4)*x] + 6^(3/4)*Log[2 - 2*6^(1/4)*x + Sqrt[6]*x^2] - 6^(3/4)*L
og[2 + 2*6^(1/4)*x + Sqrt[6]*x^2])/72
```

Maple [A] time = 0.006, size = 114, normalized size = 1.

$$\frac{x}{3}-\frac{\sqrt{3}\,6^{\frac{1}{4}}\sqrt{2}}{36}\arctan\left(\frac{\sqrt{2}\sqrt{3}\,6^{\frac{3}{4}}x}{6}+1\right)-\frac{\sqrt{3}\,6^{\frac{1}{4}}\sqrt{2}}{36}\arctan\left(\frac{\sqrt{2}\sqrt{3}\,6^{\frac{3}{4}}x}{6}-1\right)-\frac{\sqrt{3}\,6^{\frac{1}{4}}\sqrt{2}}{72}\ln\left(1\left(x^{2}+\frac{\sqrt{3}\,6^{\frac{1}{4}}x\sqrt{2}}{3}+\frac{\sqrt{6}}{3}\right)\left(x^{2}-\frac{\sqrt{3}\,6^{\frac{1}{4}}x\sqrt{2}}{3}+\frac{\sqrt{6}}{3}\right)^{-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(3*x^4+2),x)
```

```
[Out] 1/3*x-1/36*3^(1/2)*6^(1/4)*2^(1/2)*arctan(1/6*2^(1/2)*3^(1/2)*6^(
3/4)*x+1)-1/36*3^(1/2)*6^(1/4)*2^(1/2)*arctan(1/6*2^(1/2)*3^(1/2)
*6^(3/4)*x-1)-1/72*3^(1/2)*6^(1/4)*2^(1/2)*ln((x^2+1/3*3^(1/2)*6^
(1/4)*x*2^(1/2)+1/3*6^(1/2))/(x^2-1/3*3^(1/2)*6^(1/4)*x*2^(1/2)+1
/3*6^(1/2)))
```

Maxima [A] time = 1.59697, size = 167, normalized size = 1.39

$$-\frac{1}{36}\cdot 3^{\frac{3}{4}}2^{\frac{3}{4}}\arctan\left(\frac{1}{6}\cdot 3^{\frac{3}{4}}2^{\frac{1}{4}}\left(2\sqrt{3}x+3^{\frac{1}{4}}2^{\frac{3}{4}}\right)\right)-\frac{1}{36}\cdot 3^{\frac{3}{4}}2^{\frac{3}{4}}\arctan\left(\frac{1}{6}\cdot 3^{\frac{3}{4}}2^{\frac{1}{4}}\left(2\sqrt{3}x-3^{\frac{1}{4}}2^{\frac{3}{4}}\right)\right)-\frac{1}{72}\cdot 3^{\frac{3}{4}}2^{\frac{3}{4}}\log\left(\sqrt{3}x^{2}+3^{\frac{1}{4}}2^{\frac{3}{4}}x+\sqrt{2}\right)+\frac{1}{72}\cdot 3^{\frac{3}{4}}2^{\frac{3}{4}}\log\left(\sqrt{3}x^{2}-3^{\frac{1}{4}}2^{\frac{3}{4}}x+\sqrt{2}\right)+\frac{1}{3}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(3*x^4 + 2),x, algorithm="maxima")
```

```
[Out] -1/36*3^(3/4)*2^(3/4)*arctan(1/6*3^(3/4)*2^(1/4)*(2*sqrt(3)*x + 3
^(1/4)*2^(3/4))) - 1/36*3^(3/4)*2^(3/4)*arctan(1/6*3^(3/4)*2^(1/4
)*(2*sqrt(3)*x - 3^(1/4)*2^(3/4))) - 1/72*3^(3/4)*2^(3/4)*log(sqr
t(3)*x^2 + 3^(1/4)*2^(3/4)*x + sqrt(2)) + 1/72*3^(3/4)*2^(3/4)*lo
g(sqrt(3)*x^2 - 3^(1/4)*2^(3/4)*x + sqrt(2)) + 1/3*x
```

Fricas [A] time = 0.249149, size = 227, normalized size = 1.89

$$\frac{1}{288}\cdot 24^{\frac{3}{4}}\left(4\sqrt{2}\arctan\left(\frac{2}{24^{\frac{1}{4}}\sqrt{2}\sqrt{\frac{1}{6}}\sqrt{\sqrt{6}\left(\sqrt{6}x^{2}+24^{\frac{1}{4}}\sqrt{2}x+2\right)}+24^{\frac{1}{4}}\sqrt{2}x+2}\right)+4\sqrt{2}\arctan\left(\frac{2}{24^{\frac{1}{4}}\sqrt{2}\sqrt{\frac{1}{6}}\sqrt{\sqrt{6}\left(\sqrt{6}x^{2}-24^{\frac{1}{4}}\sqrt{2}x+\right.}}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(3*x^4 + 2),x, algorithm="fricas")
```

```
[Out] 1/288*24^(3/4)*(4*sqrt(2)*arctan(2/(24^(1/4)*sqrt(2)*sqrt(1/6)*sq
rt(sqrt(6)*(sqrt(6)*x^2 + 24^(1/4)*sqrt(2)*x + 2)) + 24^(1/4)*sqr
t(2)*x + 2)) + 4*sqrt(2)*arctan(2/(24^(1/4)*sqrt(2)*sqrt(1/6)*sqr
t(sqrt(6)*(sqrt(6)*x^2 - 24^(1/4)*sqrt(2)*x + 2)) + 24^(1/4)*sqrt
(2)*x - 2)) - sqrt(2)*log(2*sqrt(6)*x^2 + 2*24^(1/4)*sqrt(2)*x +
4) + sqrt(2)*log(2*sqrt(6)*x^2 - 2*24^(1/4)*sqrt(2)*x + 4) + 4*24
^(1/4)*x)
```

Sympy [A] time = 1.57958, size = 90, normalized size = 0.75

$$\frac{x}{3}+\frac{6^{\frac{3}{4}}\log\left(x^{2}-\frac{6^{\frac{3}{4}}x}{3}+\frac{\sqrt{6}}{3}\right)}{36}-\frac{6^{\frac{3}{4}}\log\left(x^{2}+\frac{6^{\frac{3}{4}}x}{3}+\frac{\sqrt{6}}{3}\right)}{36}-\frac{6^{\frac{3}{4}}\operatorname{atan}\left(\sqrt[4]{6}x-1\right)}{18}-\frac{6^{\frac{3}{4}}\operatorname{atan}\left(\sqrt[4]{6}x+1\right)}{18}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(3*x**4+2),x)
```

```
[Out] x/3 + 6**(3/4)*log(x**2 - 6**(3/4)*x/3 + sqrt(6)/3)/36 - 6**(3/4)
*log(x**2 + 6**(3/4)*x/3 + sqrt(6)/3)/36 - 6**(3/4)*atan(6**(1/4)
*x - 1)/18 - 6**(3/4)*atan(6**(1/4)*x + 1)/18
```

GIAC/XCAS [A] time = 0.226606, size = 132, normalized size = 1.1

$$-\frac{1}{36}\cdot 6^{\frac{3}{4}}\arctan\left(\frac{3}{4}\sqrt{2}\left(\frac{2}{3}\right)^{\frac{3}{4}}\left(2\,x+\sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}\right)\right)-\frac{1}{36}\cdot 6^{\frac{3}{4}}\arctan\left(\frac{3}{4}\sqrt{2}\left(\frac{2}{3}\right)^{\frac{3}{4}}\left(2\,x-\sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}\right)\right)$$
$$-\frac{1}{72}\cdot 6^{\frac{3}{4}}\ln\left(x^{2}+\sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}x+\sqrt{\frac{2}{3}}\right)+\frac{1}{72}\cdot 6^{\frac{3}{4}}\ln\left(x^{2}-\sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}x+\sqrt{\frac{2}{3}}\right)+\frac{1}{3}\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(3*x^4 + 2),x, algorithm="giac")
```

```
[Out] -1/36*6^(3/4)*arctan(3/4*sqrt(2)*(2/3)^(3/4)*(2*x + sqrt(2)*(2/3)
^(1/4))) - 1/36*6^(3/4)*arctan(3/4*sqrt(2)*(2/3)^(3/4)*(2*x - sqr
t(2)*(2/3)^(1/4))) - 1/72*6^(3/4)*ln(x^2 + sqrt(2)*(2/3)^(1/4)*x
+ sqrt(2/3)) + 1/72*6^(3/4)*ln(x^2 - sqrt(2)*(2/3)^(1/4)*x + sqrt
(2/3)) + 1/3*x
```

3.694 $\int \frac{x^2}{2+3x^4}\,dx$

Optimal. Leaf size=115

$$\frac{\log\left(\sqrt{3}x^2-2^{3/4}\sqrt[4]{3}x+\sqrt{2}\right)}{4\ 6^{3/4}}-\frac{\log\left(\sqrt{3}x^2+2^{3/4}\sqrt[4]{3}x+\sqrt{2}\right)}{4\ 6^{3/4}}-\frac{\tan^{-1}\left(1-\sqrt[4]{6}x\right)}{2\ 6^{3/4}}+\frac{\tan^{-1}\left(\sqrt[4]{6}x+1\right)}{2\ 6^{3/4}}$$

```
[Out] -ArcTan[1 - 6^(1/4)*x]/(2*6^(3/4)) + ArcTan[1 + 6^(1/4)*x]/(2*6^(
3/4)) + Log[Sqrt[2] - 2^(3/4)*3^(1/4)*x + Sqrt[3]*x^2]/(4*6^(3/4)
) - Log[Sqrt[2] + 2^(3/4)*3^(1/4)*x + Sqrt[3]*x^2]/(4*6^(3/4))
```

Rubi [A] time = 0.134494, antiderivative size = 97, normalized size of antiderivative = 0.84, number of steps used = 9, number of rules used = 6, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.462$

$$\frac{\log\left(3x^2-6^{3/4}x+\sqrt{6}\right)}{4\ 6^{3/4}}-\frac{\log\left(3x^2+6^{3/4}x+\sqrt{6}\right)}{4\ 6^{3/4}}-\frac{\tan^{-1}\left(1-\sqrt[4]{6}x\right)}{2\ 6^{3/4}}+\frac{\tan^{-1}\left(\sqrt[4]{6}x+1\right)}{2\ 6^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(2 + 3*x^4),x]
```

```
[Out] -ArcTan[1 - 6^(1/4)*x]/(2*6^(3/4)) + ArcTan[1 + 6^(1/4)*x]/(2*6^(
3/4)) + Log[Sqrt[6] - 6^(3/4)*x + 3*x^2]/(4*6^(3/4)) - Log[Sqrt[6
] + 6^(3/4)*x + 3*x^2]/(4*6^(3/4))
```

Rubi in Sympy [A] time = 18.4263, size = 83, normalized size = 0.72

$$\frac{\sqrt[4]{6}\log\left(3x^2-6^{\frac{3}{4}}x+\sqrt{6}\right)}{24}-\frac{\sqrt[4]{6}\log\left(3x^2+6^{\frac{3}{4}}x+\sqrt{6}\right)}{24}+\frac{\sqrt[4]{6}\,\mathrm{atan}\left(\sqrt[4]{6}x-1\right)}{12}+\frac{\sqrt[4]{6}\,\mathrm{atan}\left(\sqrt[4]{6}x+1\right)}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(3*x**4+2),x)
```

```
[Out] 6**(1/4)*log(3*x**2 - 6**(3/4)*x + sqrt(6))/24 - 6**(1/4)*log(3*x
**2 + 6**(3/4)*x + sqrt(6))/24 + 6**(1/4)*atan(6**(1/4)*x - 1)/12
 + 6**(1/4)*atan(6**(1/4)*x + 1)/12
```

Mathematica [A] time = 0.0306633, size = 77, normalized size = 0.67

$$\frac{\log\left(\sqrt{6}x^2-2\sqrt[4]{6}x+2\right)-\log\left(\sqrt{6}x^2+2\sqrt[4]{6}x+2\right)-2\tan^{-1}\left(1-\sqrt[4]{6}x\right)+2\tan^{-1}\left(\sqrt[4]{6}x+1\right)}{4\ 6^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(2 + 3*x^4),x]
```

```
[Out] (-2*ArcTan[1 - 6^(1/4)*x] + 2*ArcTan[1 + 6^(1/4)*x] + Log[2 - 2*6
^(1/4)*x + Sqrt[6]*x^2] - Log[2 + 2*6^(1/4)*x + Sqrt[6]*x^2])/(4*
6^(3/4))
```

Maple [A] time = 0.004, size = 111, normalized size = 1.

$$\frac{\sqrt{2}\sqrt{3}6^{\frac{3}{4}}}{72}\arctan\left(\frac{\sqrt{2}\sqrt{3}6^{\frac{3}{4}}x}{6}+1\right)+\frac{\sqrt{2}\sqrt{3}6^{\frac{3}{4}}}{72}\arctan\left(\frac{\sqrt{2}\sqrt{3}6^{\frac{3}{4}}x}{6}-1\right)+\frac{\sqrt{2}\sqrt{3}6^{\frac{3}{4}}}{144}\ln\left(1\left(x^2-\frac{\sqrt{3}\sqrt[4]{6}x\sqrt{2}}{3}+\frac{\sqrt{6}}{3}\right)\left(x^2+\frac{\sqrt{3}\sqrt[4]{6}x\sqrt{2}}{3}+\frac{\sqrt{6}}{3}\right)^{-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(3*x^4+2),x)
```

```
[Out] 1/72*6^(3/4)*3^(1/2)*2^(1/2)*arctan(1/6*2^(1/2)*3^(1/2)*6^(3/4)*x
+1)+1/72*6^(3/4)*3^(1/2)*2^(1/2)*arctan(1/6*2^(1/2)*3^(1/2)*6^(3/
4)*x-1)+1/144*6^(3/4)*3^(1/2)*2^(1/2)*ln((x^2-1/3*3^(1/2)*6^(1/4)
*x*2^(1/2)+1/3*6^(1/2))/(x^2+1/3*3^(1/2)*6^(1/4)*x*2^(1/2)+1/3*6^
(1/2)))
```

Maxima [A] time = 1.60043, size = 163, normalized size = 1.42

$$\frac{1}{12}\cdot 3^{\frac{1}{4}}2^{\frac{1}{4}}\arctan\left(\frac{1}{6}\cdot 3^{\frac{3}{4}}2^{\frac{1}{4}}\left(2\sqrt{3}x+3^{\frac{1}{4}}2^{\frac{3}{4}}\right)\right)+\frac{1}{12}\cdot 3^{\frac{1}{4}}2^{\frac{1}{4}}\arctan\left(\frac{1}{6}\cdot 3^{\frac{3}{4}}2^{\frac{1}{4}}\left(2\sqrt{3}x-3^{\frac{1}{4}}2^{\frac{3}{4}}\right)\right)-\frac{1}{24}\cdot 3^{\frac{1}{4}}2^{\frac{1}{4}}\log\left(\sqrt{3}x^2+3^{\frac{1}{4}}2^{\frac{3}{4}}x+\sqrt{2}\right)+\frac{1}{24}\cdot 3^{\frac{1}{4}}2^{\frac{1}{4}}\log\left(\sqrt{3}x^2-3^{\frac{1}{4}}2^{\frac{3}{4}}x+\sqrt{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(3*x^4 + 2),x, algorithm="maxima")
```

```
[Out] 1/12*3^(1/4)*2^(1/4)*arctan(1/6*3^(3/4)*2^(1/4)*(2*sqrt(3)*x + 3^
(1/4)*2^(3/4))) + 1/12*3^(1/4)*2^(1/4)*arctan(1/6*3^(3/4)*2^(1/4)
*(2*sqrt(3)*x - 3^(1/4)*2^(3/4))) - 1/24*3^(1/4)*2^(1/4)*log(sqrt
(3)*x^2 + 3^(1/4)*2^(3/4)*x + sqrt(2)) + 1/24*3^(1/4)*2^(1/4)*log
(sqrt(3)*x^2 - 3^(1/4)*2^(3/4)*x + sqrt(2))
```

Fricas [A] time = 0.239131, size = 223, normalized size = 1.94

$$-\frac{1}{432}\cdot 54^{\frac{3}{4}}\left(4\sqrt{2}\arctan\left(\frac{54}{54^{\frac{3}{4}}\sqrt{2}\sqrt{\frac{1}{6}}\sqrt{\sqrt{6}\left(9\sqrt{6}x^2+54^{\frac{3}{4}}\sqrt{2}x+18\right)}+3\cdot 54^{\frac{3}{4}}\sqrt{2}x+54}\right)+4\sqrt{2}\arctan\left(\frac{}{54^{\frac{3}{4}}\sqrt{2}\sqrt{\frac{1}{6}}\sqrt{\sqrt{6}\left(9\sqrt{6}x^2-5\right.}}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(3*x^4 + 2),x, algorithm="fricas")
```

```
[Out] -1/432*54^(3/4)*(4*sqrt(2)*arctan(54/(54^(3/4)*sqrt(2)*sqrt(1/6)*
sqrt(sqrt(6)*(9*sqrt(6)*x^2 + 54^(3/4)*sqrt(2)*x + 18)) + 3*54^(3
/4)*sqrt(2)*x + 54)) + 4*sqrt(2)*arctan(54/(54^(3/4)*sqrt(2)*sqrt
(1/6)*sqrt(sqrt(6)*(9*sqrt(6)*x^2 - 54^(3/4)*sqrt(2)*x + 18)) + 3
*54^(3/4)*sqrt(2)*x - 54)) + sqrt(2)*log(9*sqrt(6)*x^2 + 54^(3/4)
*sqrt(2)*x + 18) - sqrt(2)*log(9*sqrt(6)*x^2 - 54^(3/4)*sqrt(2)*x
 + 18))
```

Sympy [A] time = 1.54761, size = 87, normalized size = 0.76

$$\frac{\sqrt[4]{6}\log\left(x^2-\frac{6^{\frac{3}{4}}x}{3}+\frac{\sqrt{6}}{3}\right)}{24}-\frac{\sqrt[4]{6}\log\left(x^2+\frac{6^{\frac{3}{4}}x}{3}+\frac{\sqrt{6}}{3}\right)}{24}+\frac{\sqrt[4]{6}\operatorname{atan}\left(\sqrt[4]{6}x-1\right)}{12}+\frac{\sqrt[4]{6}\operatorname{atan}\left(\sqrt[4]{6}x+1\right)}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(3*x**4+2),x)
```

```
[Out] 6**(1/4)*log(x**2 - 6**(3/4)*x/3 + sqrt(6)/3)/24 - 6**(1/4)*log(x
**2 + 6**(3/4)*x/3 + sqrt(6)/3)/24 + 6**(1/4)*atan(6**(1/4)*x - 1
)/12 + 6**(1/4)*atan(6**(1/4)*x + 1)/12
```

GIAC/XCAS [A] time = 0.229129, size = 128, normalized size = 1.11

$$\frac{1}{12}\cdot 6^{\frac{1}{4}}\arctan\left(\frac{3}{4}\sqrt{2}\left(\frac{2}{3}\right)^{\frac{3}{4}}\left(2\,x+\sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}\right)\right)+\frac{1}{12}\cdot 6^{\frac{1}{4}}\arctan\left(\frac{3}{4}\sqrt{2}\left(\frac{2}{3}\right)^{\frac{3}{4}}\left(2\,x-\sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}\right)\right)-\frac{1}{24}\cdot 6^{\frac{1}{4}}\ln\left(x^2+\sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}x+\sqrt{\frac{2}{3}}\right)+\frac{1}{24}\cdot 6^{\frac{1}{4}}\ln\left(x^2-\sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}x+\sqrt{\frac{2}{3}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(3*x^4 + 2),x, algorithm="giac")
```

```
[Out] 1/12*6^(1/4)*arctan(3/4*sqrt(2)*(2/3)^(3/4)*(2*x + sqrt(2)*(2/3)^
(1/4))) + 1/12*6^(1/4)*arctan(3/4*sqrt(2)*(2/3)^(3/4)*(2*x - sqrt
(2)*(2/3)^(1/4))) - 1/24*6^(1/4)*ln(x^2 + sqrt(2)*(2/3)^(1/4)*x +
 sqrt(2/3)) + 1/24*6^(1/4)*ln(x^2 - sqrt(2)*(2/3)^(1/4)*x + sqrt(
2/3))
```

3.695 $\int \frac{1}{2+3x^4}\,dx$

Optimal. Leaf size=115

$$-\frac{\log\left(\sqrt{3}x^2-2^{3/4}\sqrt[4]{3}x+\sqrt{2}\right)}{8\sqrt[4]{6}}+\frac{\log\left(\sqrt{3}x^2+2^{3/4}\sqrt[4]{3}x+\sqrt{2}\right)}{8\sqrt[4]{6}}-\frac{\tan^{-1}\left(1-\sqrt[4]{6}x\right)}{4\sqrt[4]{6}}+\frac{\tan^{-1}\left(\sqrt[4]{6}x+1\right)}{4\sqrt[4]{6}}$$

```
[Out] -ArcTan[1 - 6^(1/4)*x]/(4*6^(1/4)) + ArcTan[1 + 6^(1/4)*x]/(4*6^(
1/4)) - Log[Sqrt[2] - 2^(3/4)*3^(1/4)*x + Sqrt[3]*x^2]/(8*6^(1/4)
) + Log[Sqrt[2] + 2^(3/4)*3^(1/4)*x + Sqrt[3]*x^2]/(8*6^(1/4))
```

Rubi [A] time = 0.127433, antiderivative size = 97, normalized size of antiderivative = 0.84, number of steps used = 9, number of rules used = 6, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667

$$-\frac{\log\left(3x^2-6^{3/4}x+\sqrt{6}\right)}{8\sqrt[4]{6}}+\frac{\log\left(3x^2+6^{3/4}x+\sqrt{6}\right)}{8\sqrt[4]{6}}-\frac{\tan^{-1}\left(1-\sqrt[4]{6}x\right)}{4\sqrt[4]{6}}+\frac{\tan^{-1}\left(\sqrt[4]{6}x+1\right)}{4\sqrt[4]{6}}$$

Antiderivative was successfully verified.

```
[In]  Int[(2 + 3*x^4)^(-1),x]
```

```
[Out] -ArcTan[1 - 6^(1/4)*x]/(4*6^(1/4)) + ArcTan[1 + 6^(1/4)*x]/(4*6^(
1/4)) - Log[Sqrt[6] - 6^(3/4)*x + 3*x^2]/(8*6^(1/4)) + Log[Sqrt[6
] + 6^(3/4)*x + 3*x^2]/(8*6^(1/4))
```

Rubi in Sympy [A] time = 17.3884, size = 83, normalized size = 0.72

$$-\frac{6^{\frac{3}{4}}\log\left(3x^2-6^{\frac{3}{4}}x+\sqrt{6}\right)}{48}+\frac{6^{\frac{3}{4}}\log\left(3x^2+6^{\frac{3}{4}}x+\sqrt{6}\right)}{48}+\frac{6^{\frac{3}{4}}\operatorname{atan}\left(\sqrt[4]{6}x-1\right)}{24}+\frac{6^{\frac{3}{4}}\operatorname{atan}\left(\sqrt[4]{6}x+1\right)}{24}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(3*x**4+2),x)
```

```
[Out] -6**(3/4)*log(3*x**2 - 6**(3/4)*x + sqrt(6))/48 + 6**(3/4)*log(3*
x**2 + 6**(3/4)*x + sqrt(6))/48 + 6**(3/4)*atan(6**(1/4)*x - 1)/2
4 + 6**(3/4)*atan(6**(1/4)*x + 1)/24
```

Mathematica [A] time = 0.0265599, size = 77, normalized size = 0.67

$$\frac{-\log\left(\sqrt{6}x^2-2\sqrt[4]{6}x+2\right)+\log\left(\sqrt{6}x^2+2\sqrt[4]{6}x+2\right)-2\tan^{-1}\left(1-\sqrt[4]{6}x\right)+2\tan^{-1}\left(\sqrt[4]{6}x+1\right)}{8\sqrt[4]{6}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(2 + 3*x^4)^(-1),x]
```

```
[Out] (-2*ArcTan[1 - 6^(1/4)*x] + 2*ArcTan[1 + 6^(1/4)*x] - Log[2 - 2*6
^(1/4)*x + Sqrt[6]*x^2] + Log[2 + 2*6^(1/4)*x + Sqrt[6]*x^2])/(8*
6^(1/4))
```

Maple [A] time = 0.003, size = 111, normalized size = 1.

$$\frac{\sqrt{3}\,\sqrt[4]{6}\,\sqrt{2}}{24}\arctan\left(\frac{\sqrt{2}\,\sqrt{3}\,6^{\frac{3}{4}}x}{6}+1\right)+\frac{\sqrt{3}\,\sqrt[4]{6}\,\sqrt{2}}{24}\arctan\left(\frac{\sqrt{2}\,\sqrt{3}\,6^{\frac{3}{4}}x}{6}-1\right)+\frac{\sqrt{3}\,\sqrt[4]{6}\,\sqrt{2}}{48}\ln\left(1\left(x^2+\frac{\sqrt{3}\,\sqrt[4]{6}x\sqrt{2}}{3}+\frac{\sqrt{6}}{3}\right)\left(x^2-\frac{\sqrt{3}\,\sqrt[4]{6}x\sqrt{2}}{3}+\frac{\sqrt{6}}{3}\right)^{-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(3*x^4+2),x)
```

```
[Out] 1/24*3^(1/2)*6^(1/4)*2^(1/2)*arctan(1/6*2^(1/2)*3^(1/2)*6^(3/4)*x
+1)+1/24*3^(1/2)*6^(1/4)*2^(1/2)*arctan(1/6*2^(1/2)*3^(1/2)*6^(3/
4)*x-1)+1/48*3^(1/2)*6^(1/4)*2^(1/2)*ln((x^2+1/3*3^(1/2)*6^(1/4)*
x*2^(1/2)+1/3*6^(1/2))/(x^2-1/3*3^(1/2)*6^(1/4)*x*2^(1/2)+1/3*6^(
1/2)))
```

Maxima [A] time = 1.60736, size = 163, normalized size = 1.42

$$\frac{1}{24}\cdot 3^{\frac{3}{4}}2^{\frac{3}{4}}\arctan\left(\frac{1}{6}\cdot 3^{\frac{3}{4}}2^{\frac{1}{4}}\left(2\sqrt{3}x+3^{\frac{1}{4}}2^{\frac{3}{4}}\right)\right)+\frac{1}{24}\cdot 3^{\frac{3}{4}}2^{\frac{3}{4}}\arctan\left(\frac{1}{6}\cdot 3^{\frac{3}{4}}2^{\frac{1}{4}}\left(2\sqrt{3}x-3^{\frac{1}{4}}2^{\frac{3}{4}}\right)\right)+\frac{1}{48}\cdot 3^{\frac{3}{4}}2^{\frac{3}{4}}\log\left(\sqrt{3}x^2+3^{\frac{1}{4}}2^{\frac{3}{4}}x+\sqrt{2}\right)-\frac{1}{48}\cdot 3^{\frac{3}{4}}2^{\frac{3}{4}}\log\left(\sqrt{3}x^2-3^{\frac{1}{4}}2^{\frac{3}{4}}x+\sqrt{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(3*x^4 + 2),x, algorithm="maxima")
```

```
[Out] 1/24*3^(3/4)*2^(3/4)*arctan(1/6*3^(3/4)*2^(1/4)*(2*sqrt(3)*x + 3^
(1/4)*2^(3/4))) + 1/24*3^(3/4)*2^(3/4)*arctan(1/6*3^(3/4)*2^(1/4)
*(2*sqrt(3)*x - 3^(1/4)*2^(3/4))) + 1/48*3^(3/4)*2^(3/4)*log(sqrt
(3)*x^2 + 3^(1/4)*2^(3/4)*x + sqrt(2)) - 1/48*3^(3/4)*2^(3/4)*log
(sqrt(3)*x^2 - 3^(1/4)*2^(3/4)*x + sqrt(2))
```

Fricas [A] time = 0.241417, size = 219, normalized size = 1.9

$$-\frac{1}{192}\cdot 24^{\frac{3}{4}}\left(4\sqrt{2}\arctan\left(\frac{2}{24^{\frac{1}{4}}\sqrt{2}\sqrt{\frac{1}{6}}\sqrt{\sqrt{6}\left(\sqrt{6}x^2+24^{\frac{1}{4}}\sqrt{2}x+2\right)}+24^{\frac{1}{4}}\sqrt{2}x+2}\right)+4\sqrt{2}\arctan\left(\frac{2}{24^{\frac{1}{4}}\sqrt{2}\sqrt{\frac{1}{6}}\sqrt{\sqrt{6}\left(\sqrt{6}x^2-24^{\frac{1}{4}}\sqrt{2}x+\right.}}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(3*x^4 + 2),x, algorithm="fricas")
```

```
[Out] -1/192*24^(3/4)*(4*sqrt(2)*arctan(2/(24^(1/4)*sqrt(2)*sqrt(1/6)*s
qrt(sqrt(6)*(sqrt(6)*x^2 + 24^(1/4)*sqrt(2)*x + 2)) + 24^(1/4)*sq
rt(2)*x + 2)) + 4*sqrt(2)*arctan(2/(24^(1/4)*sqrt(2)*sqrt(1/6)*sq
rt(sqrt(6)*(sqrt(6)*x^2 - 24^(1/4)*sqrt(2)*x + 2)) + 24^(1/4)*sqr
t(2)*x - 2)) - sqrt(2)*log(2*sqrt(6)*x^2 + 2*24^(1/4)*sqrt(2)*x +
 4) + sqrt(2)*log(2*sqrt(6)*x^2 - 2*24^(1/4)*sqrt(2)*x + 4))
```

Sympy [A] time = 1.57107, size = 87, normalized size = 0.76

$$-\frac{6^{\frac{3}{4}}\log\left(x^2-\frac{6^{\frac{3}{4}}x}{3}+\frac{\sqrt{6}}{3}\right)}{24}+\frac{6^{\frac{3}{4}}\log\left(x^2+\frac{6^{\frac{3}{4}}x}{3}+\frac{\sqrt{6}}{3}\right)}{24}+\frac{6^{\frac{3}{4}}\operatorname{atan}\left(\sqrt[4]{6}x-1\right)}{12}+\frac{6^{\frac{3}{4}}\operatorname{atan}\left(\sqrt[4]{6}x+1\right)}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(3*x**4+2),x)
```

```
[Out] -6**(3/4)*log(x**2 - 6**(3/4)*x/3 + sqrt(6)/3)/24 + 6**(3/4)*log(
x**2 + 6**(3/4)*x/3 + sqrt(6)/3)/24 + 6**(3/4)*atan(6**(1/4)*x -
1)/12 + 6**(3/4)*atan(6**(1/4)*x + 1)/12
```

GIAC/XCAS [A]   time = 0.23348, size = 128, normalized size = 1.11

$$\frac{1}{24}\cdot 6^{\frac{3}{4}}\arctan\left(\frac{3}{4}\sqrt{2}\left(\frac{2}{3}\right)^{\frac{3}{4}}\left(2x+\sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}\right)\right)+\frac{1}{24}\cdot 6^{\frac{3}{4}}\arctan\left(\frac{3}{4}\sqrt{2}\left(\frac{2}{3}\right)^{\frac{3}{4}}\left(2x-\sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}\right)\right)+\frac{1}{48}\cdot 6^{\frac{3}{4}}\ln\left(x^2+\sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}x+\sqrt{\frac{2}{3}}\right)-\frac{1}{48}\cdot 6^{\frac{3}{4}}\ln\left(x^2-\sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}x+\sqrt{\frac{2}{3}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(3*x^4 + 2),x, algorithm="giac")
```

```
[Out] 1/24*6^(3/4)*arctan(3/4*sqrt(2)*(2/3)^(3/4)*(2*x + sqrt(2)*(2/3)^
(1/4))) + 1/24*6^(3/4)*arctan(3/4*sqrt(2)*(2/3)^(3/4)*(2*x - sqrt
(2)*(2/3)^(1/4))) + 1/48*6^(3/4)*ln(x^2 + sqrt(2)*(2/3)^(1/4)*x +
 sqrt(2/3)) - 1/48*6^(3/4)*ln(x^2 - sqrt(2)*(2/3)^(1/4)*x + sqrt(
2/3))
```

3.696 $\int \frac{1}{x^2(2+3x^4)}\,dx$

Optimal. Leaf size=142

$$-\frac{\sqrt[4]{3}\log\left(\sqrt{3}x^2-2^{3/4}\sqrt[4]{3}x+\sqrt{2}\right)}{8\ 2^{3/4}}+\frac{\sqrt[4]{3}\log\left(\sqrt{3}x^2+2^{3/4}\sqrt[4]{3}x+\sqrt{2}\right)}{8\ 2^{3/4}}-\frac{1}{2x}+\frac{\sqrt[4]{3}\tan^{-1}\left(1-\sqrt[4]{6}x\right)}{4\ 2^{3/4}}-\frac{\sqrt[4]{3}\tan^{-1}\left(\sqrt[4]{6}x+1\right)}{4\ 2^{3/4}}$$

```
[Out] -1/(2*x) + (3^(1/4)*ArcTan[1 - 6^(1/4)*x])/(4*2^(3/4)) - (3^(1/4)
*ArcTan[1 + 6^(1/4)*x])/(4*2^(3/4)) - (3^(1/4)*Log[Sqrt[2] - 2^(3
/4)*3^(1/4)*x + Sqrt[3]*x^2])/(8*2^(3/4)) + (3^(1/4)*Log[Sqrt[2]
+ 2^(3/4)*3^(1/4)*x + Sqrt[3]*x^2])/(8*2^(3/4))
```

Rubi [A] time = 0.153464, antiderivative size = 124, normalized size of antiderivative = 0.87, number of steps used = 10, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538

$$-\frac{\sqrt[4]{3}\log\left(3x^2-6^{3/4}x+\sqrt{6}\right)}{8\ 2^{3/4}}+\frac{\sqrt[4]{3}\log\left(3x^2+6^{3/4}x+\sqrt{6}\right)}{8\ 2^{3/4}}-\frac{1}{2x}+\frac{\sqrt[4]{3}\tan^{-1}\left(1-\sqrt[4]{6}x\right)}{4\ 2^{3/4}}-\frac{\sqrt[4]{3}\tan^{-1}\left(\sqrt[4]{6}x+1\right)}{4\ 2^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(2 + 3*x^4)),x]
```

```
[Out] -1/(2*x) + (3^(1/4)*ArcTan[1 - 6^(1/4)*x])/(4*2^(3/4)) - (3^(1/4)
*ArcTan[1 + 6^(1/4)*x])/(4*2^(3/4)) - (3^(1/4)*Log[Sqrt[6] - 6^(3
/4)*x + 3*x^2])/(8*2^(3/4)) + (3^(1/4)*Log[Sqrt[6] + 6^(3/4)*x +
3*x^2])/(8*2^(3/4))
```

Rubi in Sympy [A] time = 20.1535, size = 88, normalized size = 0.62

$$-\frac{\sqrt[4]{6}\log\left(3x^2-6^{\frac{3}{4}}x+\sqrt{6}\right)}{16}+\frac{\sqrt[4]{6}\log\left(3x^2+6^{\frac{3}{4}}x+\sqrt{6}\right)}{16}-\frac{\sqrt[4]{6}\,\text{atan}\left(\sqrt[4]{6}x-1\right)}{8}-\frac{\sqrt[4]{6}\,\text{atan}\left(\sqrt[4]{6}x+1\right)}{8}-\frac{1}{2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(3*x**4+2),x)
```

```
[Out] -6**(1/4)*log(3*x**2 - 6**(3/4)*x + sqrt(6))/16 + 6**(1/4)*log(3*
x**2 + 6**(3/4)*x + sqrt(6))/16 - 6**(1/4)*atan(6**(1/4)*x - 1)/8
 - 6**(1/4)*atan(6**(1/4)*x + 1)/8 - 1/(2*x)
```

Mathematica [A] time = 0.0416749, size = 101, normalized size = 0.71

$$-\frac{\sqrt[4]{6}x\log\left(\sqrt{6}x^2-2\sqrt[4]{6}x+2\right)-\sqrt[4]{6}x\log\left(\sqrt{6}x^2+2\sqrt[4]{6}x+2\right)-2\sqrt[4]{6}x\tan^{-1}\left(1-\sqrt[4]{6}x\right)+2\sqrt[4]{6}x\tan^{-1}\left(\sqrt[4]{6}x+1\right)+8}{16x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*(2 + 3*x^4)),x]
```

```
[Out] -(8 - 2*6^(1/4)*x*ArcTan[1 - 6^(1/4)*x] + 2*6^(1/4)*x*ArcTan[1 +
6^(1/4)*x] + 6^(1/4)*x*Log[2 - 2*6^(1/4)*x + Sqrt[6]*x^2] - 6^(1/
4)*x*Log[2 + 2*6^(1/4)*x + Sqrt[6]*x^2])/(16*x)
```

Maple [A] time = 0.007, size = 116, normalized size = 0.8

$$-\frac{\sqrt{3}6^{\frac{3}{4}}\sqrt{2}}{48}\arctan\left(\frac{\sqrt{2}\sqrt{3}6^{\frac{3}{4}}x}{6}-1\right)-\frac{\sqrt{3}6^{\frac{3}{4}}\sqrt{2}}{96}\ln\left(1\left(x^{2}-\frac{\sqrt{3}\sqrt[4]{6}x\sqrt{2}}{3}+\frac{\sqrt{6}}{3}\right)\left(x^{2}+\frac{\sqrt{3}\sqrt[4]{6}x\sqrt{2}}{3}+\frac{\sqrt{6}}{3}\right)^{-1}\right)-\frac{\sqrt{3}6^{\frac{3}{4}}\sqrt{2}}{48}\arctan\left(\frac{\sqrt{2}\sqrt{3}6^{\frac{3}{4}}x}{6}+1\right)-\frac{1}{2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^2/(3*x^4+2),x)
```

```
[Out] -1/48*6^(3/4)*3^(1/2)*2^(1/2)*arctan(1/6*2^(1/2)*3^(1/2)*6^(3/4)*
x-1)-1/96*6^(3/4)*3^(1/2)*2^(1/2)*ln((x^2-1/3*3^(1/2)*6^(1/4)*x*2
^(1/2)+1/3*6^(1/2))/(x^2+1/3*3^(1/2)*6^(1/4)*x*2^(1/2)+1/3*6^(1/2
)))-1/48*6^(3/4)*3^(1/2)*2^(1/2)*arctan(1/6*2^(1/2)*3^(1/2)*6^(3/
4)*x+1)-1/2/x
```

Maxima [A] time = 1.59754, size = 170, normalized size = 1.2

$$-\frac{1}{8}\cdot 3^{\frac{1}{4}}2^{\frac{1}{4}}\arctan\left(\frac{1}{6}\cdot 3^{\frac{3}{4}}2^{\frac{1}{4}}\left(2\sqrt{3}x+3^{\frac{1}{4}}2^{\frac{3}{4}}\right)\right)-\frac{1}{8}\cdot 3^{\frac{1}{4}}2^{\frac{1}{4}}\arctan\left(\frac{1}{6}\cdot 3^{\frac{3}{4}}2^{\frac{1}{4}}\left(2\sqrt{3}x-3^{\frac{1}{4}}2^{\frac{3}{4}}\right)\right)+\frac{1}{16}\cdot 3^{\frac{1}{4}}2^{\frac{1}{4}}\log\left(\sqrt{3}x^{2}+3^{\frac{1}{4}}2^{\frac{3}{4}}x+\sqrt{2}\right)-\frac{1}{16}\cdot 3^{\frac{1}{4}}2^{\frac{1}{4}}\log\left(\sqrt{3}x^{2}-3^{\frac{1}{4}}2^{\frac{3}{4}}x+\sqrt{2}\right)-\frac{1}{2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((3*x^4 + 2)*x^2),x, algorithm="maxima")
```

```
[Out] -1/8*3^(1/4)*2^(1/4)*arctan(1/6*3^(3/4)*2^(1/4)*(2*sqrt(3)*x + 3^
(1/4)*2^(3/4))) - 1/8*3^(1/4)*2^(1/4)*arctan(1/6*3^(3/4)*2^(1/4)*
(2*sqrt(3)*x - 3^(1/4)*2^(3/4))) + 1/16*3^(1/4)*2^(1/4)*log(sqrt(
3)*x^2 + 3^(1/4)*2^(3/4)*x + sqrt(2)) - 1/16*3^(1/4)*2^(1/4)*log(
sqrt(3)*x^2 - 3^(1/4)*2^(3/4)*x + sqrt(2)) - 1/2/x
```

Fricas [A] time = 0.245427, size = 297, normalized size = 2.09

$$\frac{2^{\frac{3}{4}}\left(4\cdot 3^{\frac{1}{4}}\sqrt{2}x\arctan\left(\frac{3^{\frac{3}{4}}\sqrt{2}}{3\cdot 2^{\frac{3}{4}}\sqrt{\frac{1}{6}}\sqrt{\sqrt{2}\left(3\sqrt{2}x^{2}+2\cdot 3^{\frac{3}{4}}2^{\frac{1}{4}}x+2\sqrt{3}\right)}+3\cdot 2^{\frac{3}{4}}x+3^{\frac{3}{4}}\sqrt{2}}\right)+4\cdot 3^{\frac{1}{4}}\sqrt{2}x\arctan\left(\frac{3^{\frac{3}{4}}\sqrt{2}}{3\cdot 2^{\frac{3}{4}}\sqrt{\frac{1}{6}}\sqrt{\sqrt{2}\left(3\sqrt{2}x^{2}-2\cdot 3^{\frac{3}{4}}2^{\frac{1}{4}}x+2\sqrt{3}\right)}+3\cdot 2^{\frac{3}{4}}x\cdots}\right.\cdots\right.}{32x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((3*x^4 + 2)*x^2),x, algorithm="fricas")
```

```
[Out] 1/32*2^(3/4)*(4*3^(1/4)*sqrt(2)*x*arctan(3^(3/4)*sqrt(2)/(3*2^(3/
4)*sqrt(1/6)*sqrt(sqrt(2)*(3*sqrt(2)*x^2 + 2*3^(3/4)*2^(1/4)*x +
2*sqrt(3))) + 3*2^(3/4)*x + 3^(3/4)*sqrt(2))) + 4*3^(1/4)*sqrt(2)
*x*arctan(3^(3/4)*sqrt(2)/(3*2^(3/4)*sqrt(1/6)*sqrt(sqrt(2)*(3*sq
rt(2)*x^2 - 2*3^(3/4)*2^(1/4)*x + 2*sqrt(3))) + 3*2^(3/4)*x - 3^(
3/4)*sqrt(2))) + 3^(1/4)*sqrt(2)*x*log(3*sqrt(2)*x^2 + 2*3^(3/4)*
2^(1/4)*x + 2*sqrt(3)) - 3^(1/4)*sqrt(2)*x*log(3*sqrt(2)*x^2 - 2*
3^(3/4)*2^(1/4)*x + 2*sqrt(3)) - 8*2^(1/4))/x
```

Sympy [A] time = 1.60636, size = 92, normalized size = 0.65

$$-\frac{\sqrt[4]{6}\log\left(x^2-\frac{6^{\frac{3}{4}}x}{3}+\frac{\sqrt{6}}{3}\right)}{16}+\frac{\sqrt[4]{6}\log\left(x^2+\frac{6^{\frac{3}{4}}x}{3}+\frac{\sqrt{6}}{3}\right)}{16}-\frac{\sqrt[4]{6}\operatorname{atan}\left(\sqrt[4]{6}x-1\right)}{8}-\frac{\sqrt[4]{6}\operatorname{atan}\left(\sqrt[4]{6}x+1\right)}{8}-\frac{1}{2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(3*x**4+2),x)
```

```
[Out] -6**(1/4)*log(x**2 - 6**(3/4)*x/3 + sqrt(6)/3)/16 + 6**(1/4)*log(
x**2 + 6**(3/4)*x/3 + sqrt(6)/3)/16 - 6**(1/4)*atan(6**(1/4)*x -
1)/8 - 6**(1/4)*atan(6**(1/4)*x + 1)/8 - 1/(2*x)
```

GIAC/XCAS [A] time = 0.235565, size = 135, normalized size = 0.95

$$-\frac{1}{8}\cdot 6^{\frac{1}{4}}\arctan\left(\frac{3}{4}\sqrt{2}\left(\frac{2}{3}\right)^{\frac{3}{4}}\left(2x+\sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}\right)\right)-\frac{1}{8}\cdot 6^{\frac{1}{4}}\arctan\left(\frac{3}{4}\sqrt{2}\left(\frac{2}{3}\right)^{\frac{3}{4}}\left(2x-\sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}\right)\right)+\frac{1}{16}\cdot 6^{\frac{1}{4}}\ln\left(x^2+\sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}x+\sqrt{\frac{2}{3}}\right)-\frac{1}{16}\cdot 6^{\frac{1}{4}}\ln\left(x^2-\sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}x+\sqrt{\frac{2}{3}}\right)-\frac{1}{2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((3*x^4 + 2)*x^2),x, algorithm="giac")
```

```
[Out] -1/8*6^(1/4)*arctan(3/4*sqrt(2)*(2/3)^(3/4)*(2*x + sqrt(2)*(2/3)^
(1/4))) - 1/8*6^(1/4)*arctan(3/4*sqrt(2)*(2/3)^(3/4)*(2*x - sqrt(
2)*(2/3)^(1/4))) + 1/16*6^(1/4)*ln(x^2 + sqrt(2)*(2/3)^(1/4)*x +
sqrt(2/3)) - 1/16*6^(1/4)*ln(x^2 - sqrt(2)*(2/3)^(1/4)*x + sqrt(2
/3)) - 1/2/x
```

3.697 $\int \frac{x^3}{(2+3x^4)^2}\,dx$

Optimal. Leaf size=13

$$-\frac{1}{12\,(3x^4+2)}$$

```
[Out] -1/(12*(2 + 3*x^4))
```

Rubi [A] time = 0.00775095, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$-\frac{1}{12\,(3x^4+2)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(2 + 3*x^4)^2,x]

[Out] -1/(12*(2 + 3*x^4))
```

Rubi in Sympy [A] time = 1.92482, size = 8, normalized size = 0.62

$$-\frac{1}{12\,(3x^4+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(3*x**4+2)**2,x)

[Out] -1/(12*(3*x**4 + 2))
```

Mathematica [A] time = 0.00601536, size = 13, normalized size = 1.

$$-\frac{1}{12\,(3x^4+2)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(2 + 3*x^4)^2,x]

[Out] -1/(12*(2 + 3*x^4))
```

Maple [A] time = 0.001, size = 12, normalized size = 0.9

$$-\frac{1}{36\,x^4+24}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(3*x^4+2)^2,x)

[Out] -1/12/(3*x^4+2)
```

Maxima [A] time = 1.43838, size = 15, normalized size = 1.15

$$-\frac{1}{12\,(3\,x^4+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(3*x^4 + 2)^2,x, algorithm="maxima")

[Out] -1/12/(3*x^4 + 2)
```

Fricas [A] time = 0.217176, size = 15, normalized size = 1.15

$$-\frac{1}{12\,(3\,x^4+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(3*x^4 + 2)^2,x, algorithm="fricas")

[Out] -1/12/(3*x^4 + 2)
```

Sympy [A] time = 0.24916, size = 8, normalized size = 0.62

$$-\frac{1}{36x^4+24}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(3*x**4+2)**2,x)

[Out] -1/(36*x**4 + 24)
```

GIAC/XCAS [A] time = 0.224295, size = 15, normalized size = 1.15

$$-\frac{1}{12\,(3\,x^4+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(3*x^4 + 2)^2,x, algorithm="giac")

[Out] -1/12/(3*x^4 + 2)
```

3.698 $\int \frac{x}{(2+3x^4)^2}\,dx$

Optimal. Leaf size=38

$$\frac{\tan^{-1}\left(\sqrt{\frac{3}{2}}x^2\right)}{8\sqrt{6}}+\frac{x^2}{8\left(3x^4+2\right)}$$

```
[Out] x^2/(8*(2 + 3*x^4)) + ArcTan[Sqrt[3/2]*x^2]/(8*Sqrt[6])
```

Rubi [A] time = 0.0352096, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273

$$\frac{\tan^{-1}\left(\sqrt{\frac{3}{2}}x^2\right)}{8\sqrt{6}}+\frac{x^2}{8\left(3x^4+2\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(2 + 3*x^4)^2,x]
```

```
[Out] x^2/(8*(2 + 3*x^4)) + ArcTan[Sqrt[3/2]*x^2]/(8*Sqrt[6])
```

Rubi in Sympy [A] time = 2.8662, size = 27, normalized size = 0.71

$$\frac{x^2}{8\left(3x^4+2\right)}+\frac{\sqrt{6}\,\mathrm{atan}\left(\frac{\sqrt{6}x^2}{2}\right)}{48}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(3*x**4+2)**2,x)
```

```
[Out] x**2/(8*(3*x**4 + 2)) + sqrt(6)*atan(sqrt(6)*x**2/2)/48
```

Mathematica [A] time = 0.030039, size = 38, normalized size = 1.

$$\frac{\tan^{-1}\left(\sqrt{\frac{3}{2}}x^2\right)}{8\sqrt{6}}+\frac{x^2}{8\left(3x^4+2\right)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(2 + 3*x^4)^2,x]
```

```
[Out] x^2/(8*(2 + 3*x^4)) + ArcTan[Sqrt[3/2]*x^2]/(8*Sqrt[6])
```

Maple [A] time = 0.01, size = 30, normalized size = 0.8

$$\frac{x^2}{24\,x^4+16}+\frac{\sqrt{6}}{48}\arctan\left(\frac{x^2\sqrt{6}}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(3*x^4+2)^2,x)

[Out] 1/8*x^2/(3*x^4+2)+1/48*arctan(1/2*x^2*6^(1/2))*6^(1/2)
```

Maxima [A] time = 1.57935, size = 39, normalized size = 1.03

$$\frac{1}{48}\sqrt{6}\arctan\left(\frac{1}{2}\sqrt{6}x^2\right)+\frac{x^2}{8\,(3\,x^4+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(3*x^4 + 2)^2,x, algorithm="maxima")

[Out] 1/48*sqrt(6)*arctan(1/2*sqrt(6)*x^2) + 1/8*x^2/(3*x^4 + 2)
```

Fricas [A] time = 0.229895, size = 53, normalized size = 1.39

$$\frac{\sqrt{6}\left(\sqrt{6}x^2+\left(3\,x^4+2\right)\arctan\left(\frac{1}{2}\sqrt{6}x^2\right)\right)}{48\,(3\,x^4+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(3*x^4 + 2)^2,x, algorithm="fricas")

[Out] 1/48*sqrt(6)*(sqrt(6)*x^2 + (3*x^4 + 2)*arctan(1/2*sqrt(6)*x^2))/
(3*x^4 + 2)
```

Sympy [A] time = 0.323769, size = 27, normalized size = 0.71

$$\frac{x^2}{24x^4+16}+\frac{\sqrt{6}\,\mathrm{atan}\left(\frac{\sqrt{6}x^2}{2}\right)}{48}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(3*x**4+2)**2,x)

[Out] x**2/(24*x**4 + 16) + sqrt(6)*atan(sqrt(6)*x**2/2)/48
```

GIAC/XCAS [A] time = 0.224473, size = 39, normalized size = 1.03

$$\frac{1}{48}\sqrt{6}\arctan\left(\frac{1}{2}\sqrt{6}x^2\right)+\frac{x^2}{8\,(3\,x^4+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(3*x^4 + 2)^2,x, algorithm="giac")

[Out] 1/48*sqrt(6)*arctan(1/2*sqrt(6)*x^2) + 1/8*x^2/(3*x^4 + 2)
```

3.699 $\int \frac{1}{x(2+3x^4)^2} \, dx$

Optimal. Leaf size=32

$$\frac{1}{8(3x^4+2)} - \frac{1}{16}\log\left(3x^4+2\right) + \frac{\log(x)}{4}$$

```
[Out] 1/(8*(2 + 3*x^4)) + Log[x]/4 - Log[2 + 3*x^4]/16
```

Rubi [A] time = 0.0453793, antiderivative size = 32, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{1}{8(3x^4+2)} - \frac{1}{16}\log\left(3x^4+2\right) + \frac{\log(x)}{4}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(2 + 3*x^4)^2),x]

[Out] 1/(8*(2 + 3*x^4)) + Log[x]/4 - Log[2 + 3*x^4]/16
```

Rubi in Sympy [A] time = 5.38617, size = 24, normalized size = 0.75

$$\frac{\log\left(x^4\right)}{16} - \frac{\log\left(3x^4+2\right)}{16} + \frac{1}{8(3x^4+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(3*x**4+2)**2,x)

[Out] log(x**4)/16 - log(3*x**4 + 2)/16 + 1/(8*(3*x**4 + 2))
```

Mathematica [A] time = 0.015962, size = 32, normalized size = 1.

$$\frac{1}{8(3x^4+2)} - \frac{1}{16}\log\left(3x^4+2\right) + \frac{\log(x)}{4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(2 + 3*x^4)^2),x]

[Out] 1/(8*(2 + 3*x^4)) + Log[x]/4 - Log[2 + 3*x^4]/16
```

Maple [A] time = 0.019, size = 27, normalized size = 0.8

$$\frac{1}{24\,x^4+16} + \frac{\ln(x)}{4} - \frac{\ln\left(3\,x^4+2\right)}{16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(3*x^4+2)^2,x)

[Out] 1/8/(3*x^4+2)+1/4*ln(x)-1/16*ln(3*x^4+2)
```

Maxima [A] time = 1.42523, size = 38, normalized size = 1.19

$$\frac{1}{8\,(3\,x^4+2)} - \frac{1}{16}\,\log\left(3\,x^4+2\right) + \frac{1}{16}\,\log\left(x^4\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((3*x^4 + 2)^2*x),x, algorithm="maxima")
```

```
[Out] 1/8/(3*x^4 + 2) - 1/16*log(3*x^4 + 2) + 1/16*log(x^4)
```

Fricas [A] time = 0.229597, size = 54, normalized size = 1.69

$$-\frac{\left(3\,x^4+2\right)\log\left(3\,x^4+2\right) - 4\left(3\,x^4+2\right)\log\left(x\right) - 2}{16\,(3\,x^4+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((3*x^4 + 2)^2*x),x, algorithm="fricas")
```

```
[Out] -1/16*((3*x^4 + 2)*log(3*x^4 + 2) - 4*(3*x^4 + 2)*log(x) - 2)/(3*
x^4 + 2)
```

Sympy [A] time = 0.335434, size = 22, normalized size = 0.69

$$\frac{\log\left(x\right)}{4} - \frac{\log\left(3x^4+2\right)}{16} + \frac{1}{24x^4+16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(3*x**4+2)**2,x)
```

```
[Out] log(x)/4 - log(3*x**4 + 2)/16 + 1/(24*x**4 + 16)
```

GIAC/XCAS [A] time = 0.226198, size = 47, normalized size = 1.47

$$\frac{3\,x^4+4}{16\,(3\,x^4+2)} - \frac{1}{16}\ln\left(3\,x^4+2\right) + \frac{1}{16}\ln\left(x^4\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((3*x^4 + 2)^2*x),x, algorithm="giac")
```

```
[Out] 1/16*(3*x^4 + 4)/(3*x^4 + 2) - 1/16*ln(3*x^4 + 2) + 1/16*ln(x^4)
```

3.700 $\int \frac{1}{x^3(2+3x^4)^2} dx$

Optimal. Leaf size=47

$$-\frac{3}{16x^2}-\frac{3}{16}\sqrt{\frac{3}{2}}\tan^{-1}\left(\sqrt{\frac{3}{2}}x^2\right)+\frac{1}{8x^2(3x^4+2)}$$

```
[Out] -3/(16*x^2) + 1/(8*x^2*(2 + 3*x^4)) - (3*Sqrt[3/2]*ArcTan[Sqrt[3/
2]*x^2])/16
```

Rubi [A] time = 0.0534458, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$-\frac{3}{16x^2}-\frac{3}{16}\sqrt{\frac{3}{2}}\tan^{-1}\left(\sqrt{\frac{3}{2}}x^2\right)+\frac{1}{8x^2(3x^4+2)}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^3*(2 + 3*x^4)^2),x]
```

```
[Out] -3/(16*x^2) + 1/(8*x^2*(2 + 3*x^4)) - (3*Sqrt[3/2]*ArcTan[Sqrt[3/
2]*x^2])/16
```

Rubi in Sympy [A] time = 7.19162, size = 39, normalized size = 0.83

$$-\frac{3\sqrt{6}\,\text{atan}\left(\frac{\sqrt{6}x^2}{2}\right)}{32}-\frac{3}{16x^2}+\frac{1}{8x^2(3x^4+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**3/(3*x**4+2)**2,x)
```

```
[Out] -3*sqrt(6)*atan(sqrt(6)*x**2/2)/32 - 3/(16*x**2) + 1/(8*x**2*(3*x
**4 + 2))
```

Mathematica [A] time = 0.0739957, size = 59, normalized size = 1.26

$$\frac{1}{32}\left(-\frac{4}{x^2}-\frac{6x^2}{3x^4+2}+3\sqrt{6}\tan^{-1}\left(1-\sqrt[4]{6}x\right)+3\sqrt{6}\tan^{-1}\left(\sqrt[4]{6}x+1\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^3*(2 + 3*x^4)^2),x]
```

```
[Out] (-4/x^2 - (6*x^2)/(2 + 3*x^4) + 3*Sqrt[6]*ArcTan[1 - 6^(1/4)*x] +
 3*Sqrt[6]*ArcTan[1 + 6^(1/4)*x])/32
```

Maple [A] time = 0.016, size = 33, normalized size = 0.7

$$-\frac{1}{8x^2}-\frac{x^2}{16}\left(x^4+\frac{2}{3}\right)^{-1}-\frac{3\sqrt{6}}{32}\arctan\left(\frac{x^2\sqrt{6}}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^3/(3*x^4+2)^2,x)

[Out] -1/8/x^2-1/16*x^2/(x^4+2/3)-3/32*arctan(1/2*x^2*6^(1/2))*6^(1/2)
```

Maxima [A] time = 1.64916, size = 50, normalized size = 1.06

$$-\frac{3}{32}\sqrt{6}\arctan\left(\frac{1}{2}\sqrt{6}x^2\right)-\frac{9x^4+4}{16(3x^6+2x^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((3*x^4 + 2)^2*x^3),x, algorithm="maxima")

[Out] -3/32*sqrt(6)*arctan(1/2*sqrt(6)*x^2) - 1/16*(9*x^4 + 4)/(3*x^6 +
 2*x^2)
```

Fricas [A] time = 0.226613, size = 78, normalized size = 1.66

$$-\frac{\sqrt{2}\left(3\sqrt{3}(3x^6+2x^2)\arctan\left(\frac{1}{2}\sqrt{3}\sqrt{2}x^2\right)+\sqrt{2}(9x^4+4)\right)}{32(3x^6+2x^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((3*x^4 + 2)^2*x^3),x, algorithm="fricas")

[Out] -1/32*sqrt(2)*(3*sqrt(3)*(3*x^6 + 2*x^2)*arctan(1/2*sqrt(3)*sqrt(
2)*x^2) + sqrt(2)*(9*x^4 + 4))/(3*x^6 + 2*x^2)
```

Sympy [A] time = 0.440606, size = 37, normalized size = 0.79

$$-\frac{9x^4+4}{48x^6+32x^2}-\frac{3\sqrt{6}\operatorname{atan}\left(\frac{\sqrt{6}x^2}{2}\right)}{32}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/x**3/(3*x**4+2)**2,x)

[Out] -(9*x**4 + 4)/(48*x**6 + 32*x**2) - 3*sqrt(6)*atan(sqrt(6)*x**2/2
)/32
```

GIAC/XCAS [A] time = 0.220241, size = 50, normalized size = 1.06

$$-\frac{3}{32}\sqrt{6}\arctan\left(\frac{1}{2}\sqrt{6}x^2\right)-\frac{9x^4+4}{16(3x^6+2x^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((3*x^4 + 2)^2*x^3),x, algorithm="giac")

[Out] -3/32*sqrt(6)*arctan(1/2*sqrt(6)*x^2) - 1/16*(9*x^4 + 4)/(3*x^6 +
 2*x^2)
```

3.701 $\int \frac{x^4}{(2+3x^4)^2} \, dx$

Optimal. Leaf size=129

$$-\frac{x}{12(3x^4+2)}-\frac{\log\left(\sqrt{3}x^2-2^{3/4}\sqrt[4]{3}x+\sqrt{2}\right)}{96\sqrt[4]{6}}+\frac{\log\left(\sqrt{3}x^2+2^{3/4}\sqrt[4]{3}x+\sqrt{2}\right)}{96\sqrt[4]{6}}-\frac{\tan^{-1}\left(1-\sqrt[4]{6}x\right)}{48\sqrt[4]{6}}+\frac{\tan^{-1}\left(\sqrt[4]{6}x+1\right)}{48\sqrt[4]{6}}$$

```
[Out] -x/(12*(2 + 3*x^4)) - ArcTan[1 - 6^(1/4)*x]/(48*6^(1/4)) + ArcTan
[1 + 6^(1/4)*x]/(48*6^(1/4)) - Log[Sqrt[2] - 2^(3/4)*3^(1/4)*x +
Sqrt[3]*x^2]/(96*6^(1/4)) + Log[Sqrt[2] + 2^(3/4)*3^(1/4)*x + Sqr
t[3]*x^2]/(96*6^(1/4))
```

Rubi [A] time = 0.146405, antiderivative size = 111, normalized size of antiderivative = 0.86, number of steps used = 10, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.538$

$$-\frac{x}{12(3x^4+2)}-\frac{\log\left(3x^2-6^{3/4}x+\sqrt{6}\right)}{96\sqrt[4]{6}}+\frac{\log\left(3x^2+6^{3/4}x+\sqrt{6}\right)}{96\sqrt[4]{6}}-\frac{\tan^{-1}\left(1-\sqrt[4]{6}x\right)}{48\sqrt[4]{6}}+\frac{\tan^{-1}\left(\sqrt[4]{6}x+1\right)}{48\sqrt[4]{6}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(2 + 3*x^4)^2,x]
```

```
[Out] -x/(12*(2 + 3*x^4)) - ArcTan[1 - 6^(1/4)*x]/(48*6^(1/4)) + ArcTan
[1 + 6^(1/4)*x]/(48*6^(1/4)) - Log[Sqrt[6] - 6^(3/4)*x + 3*x^2]/(
96*6^(1/4)) + Log[Sqrt[6] + 6^(3/4)*x + 3*x^2]/(96*6^(1/4))
```

Rubi in Sympy [A] time = 19.6939, size = 92, normalized size = 0.71

$$-\frac{x}{12(3x^4+2)}-\frac{6^{\frac{3}{4}}\log\left(3x^2-6^{\frac{3}{4}}x+\sqrt{6}\right)}{576}+\frac{6^{\frac{3}{4}}\log\left(3x^2+6^{\frac{3}{4}}x+\sqrt{6}\right)}{576}+\frac{6^{\frac{3}{4}}\operatorname{atan}\left(\sqrt[4]{6}x-1\right)}{288}+\frac{6^{\frac{3}{4}}\operatorname{atan}\left(\sqrt[4]{6}x+1\right)}{288}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(3*x**4+2)**2,x)
```

```
[Out] -x/(12*(3*x**4 + 2)) - 6**(3/4)*log(3*x**2 - 6**(3/4)*x + sqrt(6)
)/576 + 6**(3/4)*log(3*x**2 + 6**(3/4)*x + sqrt(6))/576 + 6**(3/4
)*atan(6**(1/4)*x - 1)/288 + 6**(3/4)*atan(6**(1/4)*x + 1)/288
```

Mathematica [A] time = 0.166623, size = 105, normalized size = 0.81

$$\frac{1}{576}\left(-\frac{48x}{3x^4+2}-6^{3/4}\log\left(\sqrt{6}x^2-2\sqrt[4]{6}x+2\right)+6^{3/4}\log\left(\sqrt{6}x^2+2\sqrt[4]{6}x+2\right)-2\,6^{3/4}\tan^{-1}\left(1-\sqrt[4]{6}x\right)+2\,6^{3/4}\tan^{-1}\left(\sqrt[4]{6}x+1\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(2 + 3*x^4)^2,x]
```

```
[Out] ((-48*x)/(2 + 3*x^4) - 2*6^(3/4)*ArcTan[1 - 6^(1/4)*x] + 2*6^(3/4
)*ArcTan[1 + 6^(1/4)*x] - 6^(3/4)*Log[2 - 2*6^(1/4)*x + Sqrt[6]*x
^2] + 6^(3/4)*Log[2 + 2*6^(1/4)*x + Sqrt[6]*x^2])/576
```

Maple [A] time = 0.011, size = 121, normalized size = 0.9

$$-\frac{x}{36}\left(x^{4}+\frac{2}{3}\right)^{-1}+\frac{\sqrt{3}\sqrt[4]{6}\sqrt{2}}{288}\arctan\left(\frac{\sqrt{2}\sqrt{3}6^{\frac{3}{4}}x}{6}-1\right)+\frac{\sqrt{3}\sqrt[4]{6}\sqrt{2}}{576}\ln\left(1\left(x^{2}+\frac{\sqrt{3}\sqrt[4]{6}x\sqrt{2}}{3}+\frac{\sqrt{6}}{3}\right)\left(x^{2}-\frac{\sqrt{3}\sqrt[4]{6}x\sqrt{2}}{3}+\frac{\sqrt{6}}{3}\right)^{-1}\right)+\frac{\sqrt{3}\sqrt[4]{6}\sqrt{2}}{288}\arctan\left(\frac{\sqrt{2}\sqrt{3}6^{\frac{3}{4}}x}{6}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(3*x^4+2)^2,x)
```

```
[Out] -1/36*x/(x^4+2/3)+1/288*3^(1/2)*6^(1/4)*2^(1/2)*arctan(1/6*2^(1/2
)*3^(1/2)*6^(3/4)*x-1)+1/576*3^(1/2)*6^(1/4)*2^(1/2)*ln((x^2+1/3*
3^(1/2)*6^(1/4)*x*2^(1/2)+1/3*6^(1/2))/(x^2-1/3*3^(1/2)*6^(1/4)*x
*2^(1/2)+1/3*6^(1/2)))+1/288*3^(1/2)*6^(1/4)*2^(1/2)*arctan(1/6*2
^(1/2)*3^(1/2)*6^(3/4)*x+1)
```

Maxima [A] time = 1.58328, size = 180, normalized size = 1.4

$$\frac{1}{288}\cdot 3^{\frac{3}{4}}2^{\frac{3}{4}}\arctan\left(\frac{1}{6}\cdot 3^{\frac{3}{4}}2^{\frac{1}{4}}\left(2\sqrt{3}x+3^{\frac{1}{4}}2^{\frac{3}{4}}\right)\right)+\frac{1}{288}\cdot 3^{\frac{3}{4}}2^{\frac{3}{4}}\arctan\left(\frac{1}{6}\cdot 3^{\frac{3}{4}}2^{\frac{1}{4}}\left(2\sqrt{3}x-3^{\frac{1}{4}}2^{\frac{3}{4}}\right)\right)+\frac{1}{576}\cdot 3^{\frac{3}{4}}2^{\frac{3}{4}}\log\left(\sqrt{3}x^{2}+3^{\frac{1}{4}}2^{\frac{3}{4}}x+\sqrt{2}\right)-\frac{1}{576}\cdot 3^{\frac{3}{4}}2^{\frac{3}{4}}\log\left(\sqrt{3}x^{2}-3^{\frac{1}{4}}2^{\frac{3}{4}}x+\sqrt{2}\right)-\frac{x}{12\,(3\,x^{4}+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(3*x^4 + 2)^2,x, algorithm="maxima")
```

```
[Out] 1/288*3^(3/4)*2^(3/4)*arctan(1/6*3^(3/4)*2^(1/4)*(2*sqrt(3)*x + 3
^(1/4)*2^(3/4))) + 1/288*3^(3/4)*2^(3/4)*arctan(1/6*3^(3/4)*2^(1/
4)*(2*sqrt(3)*x - 3^(1/4)*2^(3/4))) + 1/576*3^(3/4)*2^(3/4)*log(s
qrt(3)*x^2 + 3^(1/4)*2^(3/4)*x + sqrt(2)) - 1/576*3^(3/4)*2^(3/4)
*log(sqrt(3)*x^2 - 3^(1/4)*2^(3/4)*x + sqrt(2)) - 1/12*x/(3*x^4 +
 2)
```

Fricas [A] time = 0.240542, size = 277, normalized size = 2.15

$$-\frac{24^{\frac{3}{4}}\left(4\sqrt{2}(3\,x^{4}+2)\arctan\left(\frac{2}{24^{\frac{1}{4}}\sqrt{2}\sqrt{\frac{1}{6}}\sqrt{\sqrt{6}\left(\sqrt{6}x^{2}+24^{\frac{1}{4}}\sqrt{2}x+2\right)}+24^{\frac{1}{4}}\sqrt{2}x+2}\right)+4\sqrt{2}(3\,x^{4}+2)\arctan\left(\frac{2}{24^{\frac{1}{4}}\sqrt{2}\sqrt{\frac{1}{6}}\sqrt{\sqrt{6}\left(\sqrt{6}x^{2}-24^{\frac{1}{4}}\sqrt{2}x+2\right)}+\cdots}\right)\cdots\right.}{2304\,(3\,x^{4}\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(3*x^4 + 2)^2,x, algorithm="fricas")
```

```
[Out] -1/2304*24^(3/4)*(4*sqrt(2)*(3*x^4 + 2)*arctan(2/(24^(1/4)*sqrt(2
)*sqrt(1/6)*sqrt(sqrt(6)*(sqrt(6)*x^2 + 24^(1/4)*sqrt(2)*x + 2))
+ 24^(1/4)*sqrt(2)*x + 2)) + 4*sqrt(2)*(3*x^4 + 2)*arctan(2/(24^(
1/4)*sqrt(2)*sqrt(1/6)*sqrt(sqrt(6)*(sqrt(6)*x^2 - 24^(1/4)*sqrt(
```

```
2)*x + 2)) + 24^(1/4)*sqrt(2)*x - 2)) - sqrt(2)*(3*x^4 + 2)*log(2
*sqrt(6)*x^2 + 2*24^(1/4)*sqrt(2)*x + 4) + sqrt(2)*(3*x^4 + 2)*lo
g(2*sqrt(6)*x^2 - 2*24^(1/4)*sqrt(2)*x + 4) + 8*24^(1/4)*x)/(3*x^
4 + 2)
```

Sympy [A] time = 1.70627, size = 95, normalized size = 0.74

$$-\frac{x}{36x^4+24}-\frac{6^{\frac{3}{4}}\log\left(x^2-\frac{6^{\frac{3}{4}}x}{3}+\frac{\sqrt{6}}{3}\right)}{288}+\frac{6^{\frac{3}{4}}\log\left(x^2+\frac{6^{\frac{3}{4}}x}{3}+\frac{\sqrt{6}}{3}\right)}{288}+\frac{6^{\frac{3}{4}}\operatorname{atan}\left(\sqrt[4]{6}x-1\right)}{144}+\frac{6^{\frac{3}{4}}\operatorname{atan}\left(\sqrt[4]{6}x+1\right)}{144}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(3*x**4+2)**2,x)
```

```
[Out] -x/(36*x**4 + 24) - 6**(3/4)*log(x**2 - 6**(3/4)*x/3 + sqrt(6)/3)
/288 + 6**(3/4)*log(x**2 + 6**(3/4)*x/3 + sqrt(6)/3)/288 + 6**(3/
4)*atan(6**(1/4)*x - 1)/144 + 6**(3/4)*atan(6**(1/4)*x + 1)/144
```

GIAC/XCAS [A] time = 0.228689, size = 144, normalized size = 1.12

$$\frac{1}{288}\cdot 6^{\frac{3}{4}}\arctan\left(\frac{3}{4}\sqrt{2}\left(\frac{2}{3}\right)^{\frac{3}{4}}\left(2x+\sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}\right)\right)+\frac{1}{288}\cdot 6^{\frac{3}{4}}\arctan\left(\frac{3}{4}\sqrt{2}\left(\frac{2}{3}\right)^{\frac{3}{4}}\left(2x-\sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}\right)\right)+\frac{1}{576}\cdot 6^{\frac{3}{4}}\ln\left(x^2+\sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}x+\sqrt{\frac{2}{3}}\right)-\frac{1}{576}\cdot 6^{\frac{3}{4}}\ln\left(x^2-\sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}x+\sqrt{\frac{2}{3}}\right)-\frac{x}{12\,(3\,x^4+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(3*x^4 + 2)^2,x, algorithm="giac")
```

```
[Out] 1/288*6^(3/4)*arctan(3/4*sqrt(2)*(2/3)^(3/4)*(2*x + sqrt(2)*(2/3)
^(1/4))) + 1/288*6^(3/4)*arctan(3/4*sqrt(2)*(2/3)^(3/4)*(2*x - sq
rt(2)*(2/3)^(1/4))) + 1/576*6^(3/4)*ln(x^2 + sqrt(2)*(2/3)^(1/4)*
x + sqrt(2/3)) - 1/576*6^(3/4)*ln(x^2 - sqrt(2)*(2/3)^(1/4)*x + s
qrt(2/3)) - 1/12*x/(3*x^4 + 2)
```

3.702 $\int \frac{x^2}{(2+3x^4)^2}\,dx$

Optimal. Leaf size=131

$$\frac{\log\left(\sqrt{3}x^2-2^{3/4}\sqrt[4]{3}x+\sqrt{2}\right)}{32\ 6^{3/4}}-\frac{\log\left(\sqrt{3}x^2+2^{3/4}\sqrt[4]{3}x+\sqrt{2}\right)}{32\ 6^{3/4}}+\frac{x^3}{8(3x^4+2)}-\frac{\tan^{-1}\left(1-\sqrt[4]{6}x\right)}{16\ 6^{3/4}}+\frac{\tan^{-1}\left(\sqrt[4]{6}x+1\right)}{16\ 6^{3/4}}$$

```
[Out] x^3/(8*(2 + 3*x^4)) - ArcTan[1 - 6^(1/4)*x]/(16*6^(3/4)) + ArcTan
[1 + 6^(1/4)*x]/(16*6^(3/4)) + Log[Sqrt[2] - 2^(3/4)*3^(1/4)*x +
Sqrt[3]*x^2]/(32*6^(3/4)) - Log[Sqrt[2] + 2^(3/4)*3^(1/4)*x + Sqr
t[3]*x^2]/(32*6^(3/4))
```

Rubi [A] time = 0.150667, antiderivative size = 113, normalized size of antiderivative = 0.86, number of steps used = 10, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538

$$\frac{\log\left(3x^2-6^{3/4}x+\sqrt{6}\right)}{32\ 6^{3/4}}-\frac{\log\left(3x^2+6^{3/4}x+\sqrt{6}\right)}{32\ 6^{3/4}}+\frac{x^3}{8(3x^4+2)}-\frac{\tan^{-1}\left(1-\sqrt[4]{6}x\right)}{16\ 6^{3/4}}+\frac{\tan^{-1}\left(\sqrt[4]{6}x+1\right)}{16\ 6^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(2 + 3*x^4)^2,x]
```

```
[Out] x^3/(8*(2 + 3*x^4)) - ArcTan[1 - 6^(1/4)*x]/(16*6^(3/4)) + ArcTan
[1 + 6^(1/4)*x]/(16*6^(3/4)) + Log[Sqrt[6] - 6^(3/4)*x + 3*x^2]/(
32*6^(3/4)) - Log[Sqrt[6] + 6^(3/4)*x + 3*x^2]/(32*6^(3/4))
```

Rubi in Sympy [A] time = 20.6163, size = 94, normalized size = 0.72

$$\frac{x^3}{8(3x^4+2)}+\frac{\sqrt[4]{6}\log\left(3x^2-6^{\frac{3}{4}}x+\sqrt{6}\right)}{192}-\frac{\sqrt[4]{6}\log\left(3x^2+6^{\frac{3}{4}}x+\sqrt{6}\right)}{192}+\frac{\sqrt[4]{6}\,\mathrm{atan}\left(\sqrt[4]{6}x-1\right)}{96}+\frac{\sqrt[4]{6}\,\mathrm{atan}\left(\sqrt[4]{6}x+1\right)}{96}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(3*x**4+2)**2,x)
```

```
[Out] x**3/(8*(3*x**4 + 2)) + 6**(1/4)*log(3*x**2 - 6**(3/4)*x + sqrt(6
))/192 - 6**(1/4)*log(3*x**2 + 6**(3/4)*x + sqrt(6))/192 + 6**(1/
4)*atan(6**(1/4)*x - 1)/96 + 6**(1/4)*atan(6**(1/4)*x + 1)/96
```

Mathematica [A] time = 0.148017, size = 107, normalized size = 0.82

$$\frac{1}{192}\left(\sqrt[4]{6}\log\left(\sqrt{6}x^2-2\sqrt[4]{6}x+2\right)-\sqrt[4]{6}\log\left(\sqrt{6}x^2+2\sqrt[4]{6}x+2\right)+\frac{24x^3}{3x^4+2}-2\sqrt[4]{6}\tan^{-1}\left(1-\sqrt[4]{6}x\right)+2\sqrt[4]{6}\tan^{-1}\left(\sqrt[4]{6}x+1\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(2 + 3*x^4)^2,x]
```

```
[Out] ((24*x^3)/(2 + 3*x^4) - 2*6^(1/4)*ArcTan[1 - 6^(1/4)*x] + 2*6^(1/
4)*ArcTan[1 + 6^(1/4)*x] + 6^(1/4)*Log[2 - 2*6^(1/4)*x + Sqrt[6]*
x^2] - 6^(1/4)*Log[2 + 2*6^(1/4)*x + Sqrt[6]*x^2])/192
```

Maple [A] time = 0.006, size = 125, normalized size = 1.

$$\frac{x^3}{24x^4+16}+\frac{\sqrt{3}6^{\frac{3}{4}}\sqrt{2}}{576}\arctan\left(\frac{\sqrt{2}\sqrt{3}6^{\frac{3}{4}}x}{6}-1\right)+\frac{\sqrt{3}6^{\frac{3}{4}}\sqrt{2}}{1152}\ln\left(1\left(x^2-\frac{\sqrt{3}\sqrt[4]{6}x\sqrt{2}}{3}+\frac{\sqrt{6}}{3}\right)\left(x^2+\frac{\sqrt{3}\sqrt[4]{6}x\sqrt{2}}{3}+\frac{\sqrt{6}}{3}\right)^{-1}\right)+\frac{\sqrt{3}6^{\frac{3}{4}}\sqrt{2}}{576}\arctan\left(\frac{\sqrt{2}\sqrt{3}6^{\frac{3}{4}}x}{6}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(3*x^4+2)^2,x)
```

```
[Out] 1/8*x^3/(3*x^4+2)+1/576*6^(3/4)*3^(1/2)*2^(1/2)*arctan(1/6*2^(1/2
)*3^(1/2)*6^(3/4)*x-1)+1/1152*6^(3/4)*3^(1/2)*2^(1/2)*ln((x^2-1/3
*3^(1/2)*6^(1/4)*x*2^(1/2)+1/3*6^(1/2))/(x^2+1/3*3^(1/2)*6^(1/4)*
x*2^(1/2)+1/3*6^(1/2)))+1/576*6^(3/4)*3^(1/2)*2^(1/2)*arctan(1/6*
2^(1/2)*3^(1/2)*6^(3/4)*x+1)
```

Maxima [A] time = 1.61455, size = 182, normalized size = 1.39

$$\frac{x^3}{8(3x^4+2)}+\frac{1}{96}\cdot 3^{\frac{1}{4}}2^{\frac{1}{4}}\arctan\left(\frac{1}{6}\cdot 3^{\frac{3}{4}}2^{\frac{1}{4}}\left(2\sqrt{3}x+3^{\frac{1}{4}}2^{\frac{3}{4}}\right)\right)+\frac{1}{96}\cdot 3^{\frac{1}{4}}2^{\frac{1}{4}}\arctan\left(\frac{1}{6}\cdot 3^{\frac{3}{4}}2^{\frac{1}{4}}\left(2\sqrt{3}x-3^{\frac{1}{4}}2^{\frac{3}{4}}\right)\right)-\frac{1}{192}\cdot 3^{\frac{1}{4}}2^{\frac{1}{4}}\log\left(\sqrt{3}x^2+3^{\frac{1}{4}}2^{\frac{3}{4}}x+\sqrt{2}\right)+\frac{1}{192}\cdot 3^{\frac{1}{4}}2^{\frac{1}{4}}\log\left(\sqrt{3}x^2-3^{\frac{1}{4}}2^{\frac{3}{4}}x+\sqrt{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(3*x^4 + 2)^2,x, algorithm="maxima")
```

```
[Out] 1/8*x^3/(3*x^4 + 2) + 1/96*3^(1/4)*2^(1/4)*arctan(1/6*3^(3/4)*2^(
1/4)*(2*sqrt(3)*x + 3^(1/4)*2^(3/4))) + 1/96*3^(1/4)*2^(1/4)*arct
an(1/6*3^(3/4)*2^(1/4)*(2*sqrt(3)*x - 3^(1/4)*2^(3/4))) - 1/192*3
^(1/4)*2^(1/4)*log(sqrt(3)*x^2 + 3^(1/4)*2^(3/4)*x + sqrt(2)) + 1
/192*3^(1/4)*2^(1/4)*log(sqrt(3)*x^2 - 3^(1/4)*2^(3/4)*x + sqrt(2
))
```

Fricas [A] time = 0.241979, size = 284, normalized size = 2.17

$$\frac{54^{\frac{3}{4}}\left(8\cdot 54^{\frac{1}{4}}x^3-4\sqrt{2}(3x^4+2)\arctan\left(\frac{54}{54^{\frac{3}{4}}\sqrt{2}\sqrt{\frac{1}{6}}\sqrt{\sqrt{6}\left(9\sqrt{6}x^2+54^{\frac{3}{4}}\sqrt{2}x+18\right)}+3\cdot 54^{\frac{3}{4}}\sqrt{2}x+54}\right)-4\sqrt{2}(3x^4+2)\arctan\left(\frac{}{54^{\frac{3}{4}}\sqrt{2}\sqrt{\frac{1}{6}}\sqrt{\sqrt{6}(9}}\right.\right.}{3456(3x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(3*x^4 + 2)^2,x, algorithm="fricas")
```

```
[Out] 1/3456*54^(3/4)*(8*54^(1/4)*x^3 - 4*sqrt(2)*(3*x^4 + 2)*arctan(54
/(54^(3/4)*sqrt(2)*sqrt(1/6)*sqrt(sqrt(6)*(9*sqrt(6)*x^2 + 54^(3/
```

```
4)*sqrt(2)*x + 18)) + 3*54^(3/4)*sqrt(2)*x + 54)) - 4*sqrt(2)*(3*
x^4 + 2)*arctan(54/(54^(3/4)*sqrt(2)*sqrt(1/6)*sqrt(sqrt(6)*(9*sq
rt(6)*x^2 - 54^(3/4)*sqrt(2)*x + 18)) + 3*54^(3/4)*sqrt(2)*x - 54
)) - sqrt(2)*(3*x^4 + 2)*log(9*sqrt(6)*x^2 + 54^(3/4)*sqrt(2)*x +
 18) + sqrt(2)*(3*x^4 + 2)*log(9*sqrt(6)*x^2 - 54^(3/4)*sqrt(2)*x
 + 18))/(3*x^4 + 2)
```

Sympy [A] time = 1.69839, size = 97, normalized size = 0.74

$$\frac{x^3}{24x^4+16}+\frac{\sqrt[4]{6}\log\left(x^2-\frac{6^{\frac{3}{4}}x}{3}+\frac{\sqrt{6}}{3}\right)}{192}-\frac{\sqrt[4]{6}\log\left(x^2+\frac{6^{\frac{3}{4}}x}{3}+\frac{\sqrt{6}}{3}\right)}{192}+\frac{\sqrt[4]{6}\operatorname{atan}\left(\sqrt[4]{6}x-1\right)}{96}+\frac{\sqrt[4]{6}\operatorname{atan}\left(\sqrt[4]{6}x+1\right)}{96}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(3*x**4+2)**2,x)
```

```
[Out] x**3/(24*x**4 + 16) + 6**(1/4)*log(x**2 - 6**(3/4)*x/3 + sqrt(6)/
3)/192 - 6**(1/4)*log(x**2 + 6**(3/4)*x/3 + sqrt(6)/3)/192 + 6**(
1/4)*atan(6**(1/4)*x - 1)/96 + 6**(1/4)*atan(6**(1/4)*x + 1)/96
```

GIAC/XCAS [A] time = 0.224579, size = 147, normalized size = 1.12

$$\frac{x^3}{8\,(3\,x^4+2)}+\frac{1}{96}\cdot 6^{\frac{1}{4}}\arctan\left(\frac{3}{4}\sqrt{2}\left(\frac{2}{3}\right)^{\frac{3}{4}}\left(2\,x+\sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}\right)\right)+\frac{1}{96}\cdot 6^{\frac{1}{4}}\arctan\left(\frac{3}{4}\sqrt{2}\left(\frac{2}{3}\right)^{\frac{3}{4}}\left(2\,x-\sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}\right)\right)-\frac{1}{192}\cdot 6^{\frac{1}{4}}\ln\left(x^2+\sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}x+\sqrt{\frac{2}{3}}\right)+\frac{1}{192}\cdot 6^{\frac{1}{4}}\ln\left(x^2-\sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}x+\sqrt{\frac{2}{3}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(3*x^4 + 2)^2,x, algorithm="giac")
```

```
[Out] 1/8*x^3/(3*x^4 + 2) + 1/96*6^(1/4)*arctan(3/4*sqrt(2)*(2/3)^(3/4)
*(2*x + sqrt(2)*(2/3)^(1/4))) + 1/96*6^(1/4)*arctan(3/4*sqrt(2)*(
2/3)^(3/4)*(2*x - sqrt(2)*(2/3)^(1/4))) - 1/192*6^(1/4)*ln(x^2 +
sqrt(2)*(2/3)^(1/4)*x + sqrt(2/3)) + 1/192*6^(1/4)*ln(x^2 - sqrt(
2)*(2/3)^(1/4)*x + sqrt(2/3))
```

3.703 $\int \frac{1}{(2+3x^4)^2}\,dx$

Optimal. Leaf size=149

$$\frac{x}{8(3x^4+2)}-\frac{3^{3/4}\log\left(\sqrt{3}x^2-2^{3/4}\sqrt[4]{3}x+\sqrt{2}\right)}{64\sqrt[4]{2}}+\frac{3^{3/4}\log\left(\sqrt{3}x^2+2^{3/4}\sqrt[4]{3}x+\sqrt{2}\right)}{64\sqrt[4]{2}}-\frac{3^{3/4}\tan^{-1}\left(1-\sqrt[4]{6}x\right)}{32\sqrt[4]{2}}+\frac{3^{3/4}\tan^{-1}\left(\sqrt[4]{6}x+1\right)}{32\sqrt[4]{2}}$$

```
[Out] x/(8*(2 + 3*x^4)) - (3^(3/4)*ArcTan[1 - 6^(1/4)*x])/(32*2^(1/4))
+ (3^(3/4)*ArcTan[1 + 6^(1/4)*x])/(32*2^(1/4)) - (3^(3/4)*Log[Sqr
t[2] - 2^(3/4)*3^(1/4)*x + Sqrt[3]*x^2])/(64*2^(1/4)) + (3^(3/4)*
Log[Sqrt[2] + 2^(3/4)*3^(1/4)*x + Sqrt[3]*x^2])/(64*2^(1/4))
```

Rubi [A] time = 0.141159, antiderivative size = 131, normalized size of antiderivative = 0.88, number of steps used = 10, number of rules used = 7, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.778

$$\frac{x}{8(3x^4+2)}-\frac{3^{3/4}\log\left(3x^2-6^{3/4}x+\sqrt{6}\right)}{64\sqrt[4]{2}}+\frac{3^{3/4}\log\left(3x^2+6^{3/4}x+\sqrt{6}\right)}{64\sqrt[4]{2}}-\frac{3^{3/4}\tan^{-1}\left(1-\sqrt[4]{6}x\right)}{32\sqrt[4]{2}}+\frac{3^{3/4}\tan^{-1}\left(\sqrt[4]{6}x+1\right)}{32\sqrt[4]{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(2 + 3*x^4)^(-2),x]
```

```
[Out] x/(8*(2 + 3*x^4)) - (3^(3/4)*ArcTan[1 - 6^(1/4)*x])/(32*2^(1/4))
+ (3^(3/4)*ArcTan[1 + 6^(1/4)*x])/(32*2^(1/4)) - (3^(3/4)*Log[Sqr
t[6] - 6^(3/4)*x + 3*x^2])/(64*2^(1/4)) + (3^(3/4)*Log[Sqrt[6] +
6^(3/4)*x + 3*x^2])/(64*2^(1/4))
```

Rubi in Sympy [A] time = 18.0352, size = 92, normalized size = 0.62

$$\frac{x}{8(3x^4+2)}-\frac{6^{\frac{3}{4}}\log\left(3x^2-6^{\frac{3}{4}}x+\sqrt{6}\right)}{128}+\frac{6^{\frac{3}{4}}\log\left(3x^2+6^{\frac{3}{4}}x+\sqrt{6}\right)}{128}+\frac{6^{\frac{3}{4}}\operatorname{atan}\left(\sqrt[4]{6}x-1\right)}{64}+\frac{6^{\frac{3}{4}}\operatorname{atan}\left(\sqrt[4]{6}x+1\right)}{64}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(3*x**4+2)**2,x)
```

```
[Out] x/(8*(3*x**4 + 2)) - 6**(3/4)*log(3*x**2 - 6**(3/4)*x + sqrt(6))/
128 + 6**(3/4)*log(3*x**2 + 6**(3/4)*x + sqrt(6))/128 + 6**(3/4)*
atan(6**(1/4)*x - 1)/64 + 6**(3/4)*atan(6**(1/4)*x + 1)/64
```

Mathematica [A] time = 0.137772, size = 105, normalized size = 0.7

$$\frac{1}{128}\left(\frac{16x}{3x^4+2}-6^{3/4}\log\left(\sqrt{6}x^2-2\sqrt[4]{6}x+2\right)+6^{3/4}\log\left(\sqrt{6}x^2+2\sqrt[4]{6}x+2\right)-2\,6^{3/4}\tan^{-1}\left(1-\sqrt[4]{6}x\right)+2\,6^{3/4}\tan^{-1}\left(\sqrt[4]{6}x+1\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(2 + 3*x^4)^(-2),x]
```

```
[Out] ((16*x)/(2 + 3*x^4) - 2*6^(3/4)*ArcTan[1 - 6^(1/4)*x] + 2*6^(3/4)
*ArcTan[1 + 6^(1/4)*x] - 6^(3/4)*Log[2 - 2*6^(1/4)*x + Sqrt[6]*x^
2] + 6^(3/4)*Log[2 + 2*6^(1/4)*x + Sqrt[6]*x^2])/128
```

Maple [A] time = 0.007, size = 123, normalized size = 0.8

$$\frac{x}{24\,x^{4}+16}+\frac{\sqrt{3}\sqrt[4]{6}\sqrt{2}}{64}\arctan\left(\frac{\sqrt{2}\sqrt{3}6^{\frac{3}{4}}x}{6}+1\right)+\frac{\sqrt{3}\sqrt[4]{6}\sqrt{2}}{64}\arctan\left(\frac{\sqrt{2}\sqrt{3}6^{\frac{3}{4}}x}{6}-1\right)+\frac{\sqrt{3}\sqrt[4]{6}\sqrt{2}}{128}\ln\left(1\left(x^{2}+\frac{\sqrt{3}\sqrt[4]{6}x\sqrt{2}}{3}+\frac{\sqrt{6}}{3}\right)\left(x^{2}-\frac{\sqrt{3}\sqrt[4]{6}x\sqrt{2}}{3}+\frac{\sqrt{6}}{3}\right)^{-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(3*x^4+2)^2,x)
```

```
[Out] 1/8*x/(3*x^4+2)+1/64*3^(1/2)*6^(1/4)*2^(1/2)*arctan(1/6*2^(1/2)*3
^(1/2)*6^(3/4)*x+1)+1/64*3^(1/2)*6^(1/4)*2^(1/2)*arctan(1/6*2^(1/
2)*3^(1/2)*6^(3/4)*x-1)+1/128*3^(1/2)*6^(1/4)*2^(1/2)*ln((x^2+1/3
*3^(1/2)*6^(1/4)*x*2^(1/2)+1/3*6^(1/2))/(x^2-1/3*3^(1/2)*6^(1/4)*
x*2^(1/2)+1/3*6^(1/2)))
```

Maxima [A] time = 1.59282, size = 180, normalized size = 1.21

$$\frac{1}{64}\cdot 3^{\frac{3}{4}}2^{\frac{3}{4}}\arctan\left(\frac{1}{6}\cdot 3^{\frac{3}{4}}2^{\frac{1}{4}}\left(2\sqrt{3}x+3^{\frac{1}{4}}2^{\frac{3}{4}}\right)\right)+\frac{1}{64}\cdot 3^{\frac{3}{4}}2^{\frac{3}{4}}\arctan\left(\frac{1}{6}\cdot 3^{\frac{3}{4}}2^{\frac{1}{4}}\left(2\sqrt{3}x-3^{\frac{1}{4}}2^{\frac{3}{4}}\right)\right)+\frac{1}{128}\cdot 3^{\frac{3}{4}}2^{\frac{3}{4}}\log\left(\sqrt{3}x^{2}+3^{\frac{1}{4}}2^{\frac{3}{4}}x+\sqrt{2}\right)-\frac{1}{128}\cdot 3^{\frac{3}{4}}2^{\frac{3}{4}}\log\left(\sqrt{3}x^{2}-3^{\frac{1}{4}}2^{\frac{3}{4}}x+\sqrt{2}\right)+\frac{x}{8\,(3\,x^{4}+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((3*x^4 + 2)^(-2),x, algorithm="maxima")
```

```
[Out] 1/64*3^(3/4)*2^(3/4)*arctan(1/6*3^(3/4)*2^(1/4)*(2*sqrt(3)*x + 3^
(1/4)*2^(3/4))) + 1/64*3^(3/4)*2^(3/4)*arctan(1/6*3^(3/4)*2^(1/4)
*(2*sqrt(3)*x - 3^(1/4)*2^(3/4))) + 1/128*3^(3/4)*2^(3/4)*log(sqr
t(3)*x^2 + 3^(1/4)*2^(3/4)*x + sqrt(2)) - 1/128*3^(3/4)*2^(3/4)*l
og(sqrt(3)*x^2 - 3^(1/4)*2^(3/4)*x + sqrt(2)) + 1/8*x/(3*x^4 + 2)
```

Fricas [A] time = 0.244845, size = 354, normalized size = 2.38

$$-\frac{8^{\frac{3}{4}}\left(4\cdot 27^{\frac{1}{4}}\sqrt{2}(3\,x^{4}+2)\arctan\left(\frac{27^{\frac{1}{4}}\sqrt{2}}{3\cdot 8^{\frac{1}{4}}\sqrt{\frac{1}{6}}\sqrt{\sqrt{2}\left(3\sqrt{2}x^{2}+27^{\frac{1}{4}}8^{\frac{1}{4}}\sqrt{2}x+2\sqrt{3}\right)}+3\cdot 8^{\frac{1}{4}}x+27^{\frac{1}{4}}\sqrt{2}}\right)+4\cdot 27^{\frac{1}{4}}\sqrt{2}(3\,x^{4}+2)\arctan\left(\frac{}{3\cdot 8^{\frac{1}{4}}\sqrt{\frac{1}{6}}\sqrt{\sqrt{2}(3\cdots}}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((3*x^4 + 2)^(-2),x, algorithm="fricas")
```

```
[Out] -1/512*8^(3/4)*(4*27^(1/4)*sqrt(2)*(3*x^4 + 2)*arctan(27^(1/4)*sq
rt(2)/(3*8^(1/4)*sqrt(1/6)*sqrt(sqrt(2)*(3*sqrt(2)*x^2 + 27^(1/4)
*8^(1/4)*sqrt(2)*x + 2*sqrt(3))) + 3*8^(1/4)*x + 27^(1/4)*sqrt(2)
)) + 4*27^(1/4)*sqrt(2)*(3*x^4 + 2)*arctan(27^(1/4)*sqrt(2)/(3*8^
(1/4)*sqrt(1/6)*sqrt(sqrt(2)*(3*sqrt(2)*x^2 - 27^(1/4)*8^(1/4)*sq
rt(2)*x + 2*sqrt(3))) + 3*8^(1/4)*x - 27^(1/4)*sqrt(2))) - 27^(1/
```

```
4)*sqrt(2)*(3*x^4 + 2)*log(18*sqrt(2)*x^2 + 6*27^(1/4)*8^(1/4)*sq
rt(2)*x + 12*sqrt(3)) + 27^(1/4)*sqrt(2)*(3*x^4 + 2)*log(18*sqrt(
2)*x^2 - 6*27^(1/4)*8^(1/4)*sqrt(2)*x + 12*sqrt(3)) - 8*8^(1/4)*x
)/(3*x^4 + 2)
```

Sympy [A] time = 1.72346, size = 95, normalized size = 0.64

$$\frac{x}{24x^4+16}-\frac{6^{\frac{3}{4}}\log\left(x^2-\frac{6^{\frac{3}{4}}x}{3}+\frac{\sqrt{6}}{3}\right)}{64}+\frac{6^{\frac{3}{4}}\log\left(x^2+\frac{6^{\frac{3}{4}}x}{3}+\frac{\sqrt{6}}{3}\right)}{64}+\frac{6^{\frac{3}{4}}\operatorname{atan}\left(\sqrt[4]{6}x-1\right)}{32}+\frac{6^{\frac{3}{4}}\operatorname{atan}\left(\sqrt[4]{6}x+1\right)}{32}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(3*x**4+2)**2,x)
```

```
[Out] x/(24*x**4 + 16) - 6**(3/4)*log(x**2 - 6**(3/4)*x/3 + sqrt(6)/3)/
64 + 6**(3/4)*log(x**2 + 6**(3/4)*x/3 + sqrt(6)/3)/64 + 6**(3/4)*
atan(6**(1/4)*x - 1)/32 + 6**(3/4)*atan(6**(1/4)*x + 1)/32
```

GIAC/XCAS [A] time = 0.226837, size = 144, normalized size = 0.97

$$\frac{1}{64}\cdot 6^{\frac{3}{4}}\arctan\left(\frac{3}{4}\sqrt{2}\left(\frac{2}{3}\right)^{\frac{3}{4}}\left(2x+\sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}\right)\right)+\frac{1}{64}\cdot 6^{\frac{3}{4}}\arctan\left(\frac{3}{4}\sqrt{2}\left(\frac{2}{3}\right)^{\frac{3}{4}}\left(2x-\sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}\right)\right)+\frac{1}{128}\cdot 6^{\frac{3}{4}}\ln\left(x^2+\sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}x+\sqrt{\frac{2}{3}}\right)-\frac{1}{128}\cdot 6^{\frac{3}{4}}\ln\left(x^2-\sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}x+\sqrt{\frac{2}{3}}\right)+\frac{x}{8\,(3\,x^4+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((3*x^4 + 2)^(-2),x, algorithm="giac")
```

```
[Out] 1/64*6^(3/4)*arctan(3/4*sqrt(2)*(2/3)^(3/4)*(2*x + sqrt(2)*(2/3)^
(1/4))) + 1/64*6^(3/4)*arctan(3/4*sqrt(2)*(2/3)^(3/4)*(2*x - sqrt
(2)*(2/3)^(1/4))) + 1/128*6^(3/4)*ln(x^2 + sqrt(2)*(2/3)^(1/4)*x
+ sqrt(2/3)) - 1/128*6^(3/4)*ln(x^2 - sqrt(2)*(2/3)^(1/4)*x + sqr
t(2/3)) + 1/8*x/(3*x^4 + 2)
```

3.704 $\int \frac{1}{x^2(2+3x^4)^2} dx$

Optimal. Leaf size=158

$$\frac{1}{8x(3x^4+2)}-\frac{5\sqrt[4]{3}\log\left(\sqrt{3}x^2-2^{3/4}\sqrt[4]{3}x+\sqrt{2}\right)}{64\ 2^{3/4}}+\frac{5\sqrt[4]{3}\log\left(\sqrt{3}x^2+2^{3/4}\sqrt[4]{3}x+\sqrt{2}\right)}{64\ 2^{3/4}}-\frac{5}{16x}+\frac{5\sqrt[4]{3}\tan^{-1}\left(1-\sqrt[4]{6}x\right)}{32\ 2^{3/4}}-\frac{5\sqrt[4]{3}\tan^{-1}\left(\sqrt[4]{6}x+1\right)}{32\ 2^{3/4}}$$

```
[Out] -5/(16*x) + 1/(8*x*(2 + 3*x^4)) + (5*3^(1/4)*ArcTan[1 - 6^(1/4)*x
])/(32*2^(3/4)) - (5*3^(1/4)*ArcTan[1 + 6^(1/4)*x])/(32*2^(3/4))
- (5*3^(1/4)*Log[Sqrt[2] - 2^(3/4)*3^(1/4)*x + Sqrt[3]*x^2])/(64*
2^(3/4)) + (5*3^(1/4)*Log[Sqrt[2] + 2^(3/4)*3^(1/4)*x + Sqrt[3]*x
^2])/(64*2^(3/4))
```

Rubi [A] time = 0.17455, antiderivative size = 140, normalized size of antiderivative = 0.89, number of steps used = 11, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615

$$\frac{1}{8x(3x^4+2)}-\frac{5\sqrt[4]{3}\log\left(3x^2-6^{3/4}x+\sqrt{6}\right)}{64\ 2^{3/4}}+\frac{5\sqrt[4]{3}\log\left(3x^2+6^{3/4}x+\sqrt{6}\right)}{64\ 2^{3/4}}-\frac{5}{16x}+\frac{5\sqrt[4]{3}\tan^{-1}\left(1-\sqrt[4]{6}x\right)}{32\ 2^{3/4}}-\frac{5\sqrt[4]{3}\tan^{-1}\left(\sqrt[4]{6}x+1\right)}{32\ 2^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(2 + 3*x^4)^2),x]
```

```
[Out] -5/(16*x) + 1/(8*x*(2 + 3*x^4)) + (5*3^(1/4)*ArcTan[1 - 6^(1/4)*x
])/(32*2^(3/4)) - (5*3^(1/4)*ArcTan[1 + 6^(1/4)*x])/(32*2^(3/4))
- (5*3^(1/4)*Log[Sqrt[6] - 6^(3/4)*x + 3*x^2])/(64*2^(3/4)) + (5*
3^(1/4)*Log[Sqrt[6] + 6^(3/4)*x + 3*x^2])/(64*2^(3/4))
```

Rubi in Sympy [A] time = 22.0413, size = 107, normalized size = 0.68

$$-\frac{5\sqrt[4]{6}\log\left(3x^2-6^{\frac{3}{4}}x+\sqrt{6}\right)}{128}+\frac{5\sqrt[4]{6}\log\left(3x^2+6^{\frac{3}{4}}x+\sqrt{6}\right)}{128}-\frac{5\sqrt[4]{6}\,\mathrm{atan}\left(\sqrt[4]{6}x-1\right)}{64}-\frac{5\sqrt[4]{6}\,\mathrm{atan}\left(\sqrt[4]{6}x+1\right)}{64}-\frac{5}{16x}+\frac{1}{8x(3x^4+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(3*x**4+2)**2,x)
```

```
[Out] -5*6**(1/4)*log(3*x**2 - 6**(3/4)*x + sqrt(6))/128 + 5*6**(1/4)*l
og(3*x**2 + 6**(3/4)*x + sqrt(6))/128 - 5*6**(1/4)*atan(6**(1/4)*
x - 1)/64 - 5*6**(1/4)*atan(6**(1/4)*x + 1)/64 - 5/(16*x) + 1/(8*
x*(3*x**4 + 2))
```

Mathematica [A] time = 0.163608, size = 113, normalized size = 0.72

$$\frac{1}{128}\left(-5\sqrt[4]{6}\log\left(\sqrt{6}x^2-2\sqrt[4]{6}x+2\right)+5\sqrt[4]{6}\log\left(\sqrt{6}x^2+2\sqrt[4]{6}x+2\right)-\frac{24x^3}{3x^4+2}-\frac{32}{x}+10\sqrt[4]{6}\tan^{-1}\left(1-\sqrt[4]{6}x\right)-10\sqrt[4]{6}\tan^{-1}\left(\sqrt[4]{6}x+1\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*(2 + 3*x^4)^2),x]
```

```
[Out] (-32/x - (24*x^3)/(2 + 3*x^4) + 10*6^(1/4)*ArcTan[1 - 6^(1/4)*x]
- 10*6^(1/4)*ArcTan[1 + 6^(1/4)*x] - 5*6^(1/4)*Log[2 - 2*6^(1/4)*
x + Sqrt[6]*x^2] + 5*6^(1/4)*Log[2 + 2*6^(1/4)*x + Sqrt[6]*x^2])/
128
```

Maple [A] time = 0.016, size = 128, normalized size = 0.8

$$-\frac{1}{4x}-\frac{x^3}{16}\left(x^4+\frac{2}{3}\right)^{-1}-\frac{5\sqrt{2}\sqrt{3}6^{3/4}}{384}\arctan\left(\frac{\sqrt{2}\sqrt{3}6^{\frac{3}{4}}x}{6}+1\right)-\frac{5\sqrt{2}\sqrt{3}6^{3/4}}{384}\arctan\left(\frac{\sqrt{2}\sqrt{3}6^{\frac{3}{4}}x}{6}-1\right)-\frac{5\sqrt{2}\sqrt{3}6^{3/4}}{768}\ln\left(1\left(x^2-\frac{\sqrt{3}\sqrt[4]{6}x\sqrt{2}}{3}+\frac{\sqrt{6}}{3}\right)\left(x^2+\frac{\sqrt{3}\sqrt[4]{6}x\sqrt{2}}{3}+\frac{\sqrt{6}}{3}\right)^{-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(3*x^4+2)^2,x)
```

```
[Out] -1/4/x-1/16*x^3/(x^4+2/3)-5/384*6^(3/4)*3^(1/2)*2^(1/2)*arctan(1/
6*2^(1/2)*3^(1/2)*6^(3/4)*x+1)-5/384*6^(3/4)*3^(1/2)*2^(1/2)*arct
an(1/6*2^(1/2)*3^(1/2)*6^(3/4)*x-1)-5/768*6^(3/4)*3^(1/2)*2^(1/2)
*ln((x^2-1/3*3^(1/2)*6^(1/4)*x*2^(1/2)+1/3*6^(1/2))/(x^2+1/3*3^(1
/2)*6^(1/4)*x*2^(1/2)+1/3*6^(1/2)))
```

Maxima [A] time = 1.61655, size = 190, normalized size = 1.2

$$-\frac{5}{64}\cdot 3^{\frac{1}{4}}2^{\frac{1}{4}}\arctan\left(\frac{1}{6}\cdot 3^{\frac{3}{4}}2^{\frac{1}{4}}\left(2\sqrt{3}x+3^{\frac{1}{4}}2^{\frac{3}{4}}\right)\right)-\frac{5}{64}\cdot 3^{\frac{1}{4}}2^{\frac{1}{4}}\arctan\left(\frac{1}{6}\cdot 3^{\frac{3}{4}}2^{\frac{1}{4}}\left(2\sqrt{3}x-3^{\frac{1}{4}}2^{\frac{3}{4}}\right)\right)+\frac{5}{128}\cdot 3^{\frac{1}{4}}2^{\frac{1}{4}}\log\left(\sqrt{3}x^2+3^{\frac{1}{4}}2^{\frac{3}{4}}x+\sqrt{2}\right)-\frac{5}{128}\cdot 3^{\frac{1}{4}}2^{\frac{1}{4}}\log\left(\sqrt{3}x^2-3^{\frac{1}{4}}2^{\frac{3}{4}}x+\sqrt{2}\right)-\frac{15x^4+8}{16(3x^5+2x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((3*x^4 + 2)^2*x^2),x, algorithm="maxima")
```

```
[Out] -5/64*3^(1/4)*2^(1/4)*arctan(1/6*3^(3/4)*2^(1/4)*(2*sqrt(3)*x + 3
^(1/4)*2^(3/4))) - 5/64*3^(1/4)*2^(1/4)*arctan(1/6*3^(3/4)*2^(1/4
)*(2*sqrt(3)*x - 3^(1/4)*2^(3/4))) + 5/128*3^(1/4)*2^(1/4)*log(sq
rt(3)*x^2 + 3^(1/4)*2^(3/4)*x + sqrt(2)) - 5/128*3^(1/4)*2^(1/4)*
log(sqrt(3)*x^2 - 3^(1/4)*2^(3/4)*x + sqrt(2)) - 1/16*(15*x^4 + 8
)/(3*x^5 + 2*x)
```

Fricas [A] time = 0.247202, size = 362, normalized size = 2.29

$$2^{\frac{3}{4}}\left(20\cdot 3^{\frac{1}{4}}\sqrt{2}(3x^5+2x)\arctan\left(\frac{3^{\frac{3}{4}}\sqrt{2}}{3\cdot 2^{\frac{3}{4}}\sqrt{\frac{1}{6}}\sqrt{\sqrt{2}\left(3\sqrt{2}x^2+2\cdot 3^{\frac{3}{4}}2^{\frac{1}{4}}x+2\sqrt{3}\right)}+3\cdot 2^{\frac{3}{4}}x+3^{\frac{3}{4}}\sqrt{2}}\right)+20\cdot 3^{\frac{1}{4}}\sqrt{2}(3x^5+2x)\arctan\left(\frac{}{3\cdot 2^{\frac{3}{4}}\sqrt{\frac{1}{6}}\sqrt{\sqrt{2}(3}}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((3*x^4 + 2)^2*x^2),x, algorithm="fricas")
```

```
[Out] 1/256*2^(3/4)*(20*3^(1/4)*sqrt(2)*(3*x^5 + 2*x)*arctan(3^(3/4)*sq
rt(2)/(3*2^(3/4)*sqrt(1/6)*sqrt(sqrt(2)*(3*sqrt(2)*x^2 + 2*3^(3/4
```

```
)*2^(1/4)*x + 2*sqrt(3))) + 3*2^(3/4)*x + 3^(3/4)*sqrt(2))) + 20*
3^(1/4)*sqrt(2)*(3*x^5 + 2*x)*arctan(3^(3/4)*sqrt(2)/(3*2^(3/4)*s
qrt(1/6)*sqrt(sqrt(2)*(3*sqrt(2)*x^2 - 2*3^(3/4)*2^(1/4)*x + 2*sq
rt(3))) + 3*2^(3/4)*x - 3^(3/4)*sqrt(2))) + 5*3^(1/4)*sqrt(2)*(3*
x^5 + 2*x)*log(3*sqrt(2)*x^2 + 2*3^(3/4)*2^(1/4)*x + 2*sqrt(3)) -
 5*3^(1/4)*sqrt(2)*(3*x^5 + 2*x)*log(3*sqrt(2)*x^2 - 2*3^(3/4)*2^
(1/4)*x + 2*sqrt(3)) - 8*2^(1/4)*(15*x^4 + 8))/(3*x^5 + 2*x)
```

Sympy [A] time = 1.75922, size = 109, normalized size = 0.69

$$-\frac{15x^4+8}{48x^5+32x}-\frac{5\sqrt[4]{6}\log\left(x^2-\frac{6^{\frac{3}{4}}x}{3}+\frac{\sqrt{6}}{3}\right)}{128}+\frac{5\sqrt[4]{6}\log\left(x^2+\frac{6^{\frac{3}{4}}x}{3}+\frac{\sqrt{6}}{3}\right)}{128}-\frac{5\sqrt[4]{6}\operatorname{atan}\left(\sqrt[4]{6}x-1\right)}{64}-\frac{5\sqrt[4]{6}\operatorname{atan}\left(\sqrt[4]{6}x+1\right)}{64}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/x**2/(3*x**4+2)**2,x)
```

```
[Out] -(15*x**4 + 8)/(48*x**5 + 32*x) - 5*6**(1/4)*log(x**2 - 6**(3/4)*
x/3 + sqrt(6)/3)/128 + 5*6**(1/4)*log(x**2 + 6**(3/4)*x/3 + sqrt(
6)/3)/128 - 5*6**(1/4)*atan(6**(1/4)*x - 1)/64 - 5*6**(1/4)*atan(
6**(1/4)*x + 1)/64
```

GIAC/XCAS [A] time = 0.228674, size = 155, normalized size = 0.98

$$-\frac{5}{64}\cdot 6^{\frac{1}{4}}\arctan\left(\frac{3}{4}\sqrt{2}\left(\frac{2}{3}\right)^{\frac{3}{4}}\left(2\,x+\sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}\right)\right)-\frac{5}{64}\cdot 6^{\frac{1}{4}}\arctan\left(\frac{3}{4}\sqrt{2}\left(\frac{2}{3}\right)^{\frac{3}{4}}\left(2\,x-\sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}\right)\right)+\frac{5}{128}\cdot 6^{\frac{1}{4}}\ln\left(x^2+\sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}x+\sqrt{\frac{2}{3}}\right)-\frac{5}{128}\cdot 6^{\frac{1}{4}}\ln\left(x^2-\sqrt{2}\left(\frac{2}{3}\right)^{\frac{1}{4}}x+\sqrt{\frac{2}{3}}\right)-\frac{15\,x^4+8}{16\,(3\,x^5+2\,x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((3*x^4 + 2)^2*x^2),x, algorithm="giac")
```

```
[Out] -5/64*6^(1/4)*arctan(3/4*sqrt(2)*(2/3)^(3/4)*(2*x + sqrt(2)*(2/3)
^(1/4))) - 5/64*6^(1/4)*arctan(3/4*sqrt(2)*(2/3)^(3/4)*(2*x - sqr
t(2)*(2/3)^(1/4))) + 5/128*6^(1/4)*ln(x^2 + sqrt(2)*(2/3)^(1/4)*x
 + sqrt(2/3)) - 5/128*6^(1/4)*ln(x^2 - sqrt(2)*(2/3)^(1/4)*x + sq
rt(2/3)) - 1/16*(15*x^4 + 8)/(3*x^5 + 2*x)
```

3.705 $\int \frac{x^2}{3+x^4} dx$

Optimal. Leaf size=133

$$\frac{\log \left(x^2-\sqrt{2}\sqrt[4]{3}x+\sqrt{3}\right)}{4\sqrt{2}\sqrt[4]{3}}-\frac{\log \left(x^2+\sqrt{2}\sqrt[4]{3}x+\sqrt{3}\right)}{4\sqrt{2}\sqrt[4]{3}}-\frac{\tan^{-1}\left(1-\frac{\sqrt{2}x}{\sqrt[4]{3}}\right)}{2\sqrt{2}\sqrt[4]{3}}+\frac{\tan^{-1}\left(\frac{\sqrt{2}x}{\sqrt[4]{3}}+1\right)}{2\sqrt{2}\sqrt[4]{3}}$$

```
[Out] -ArcTan[1 - (Sqrt[2]*x)/3^(1/4)]/(2*Sqrt[2]*3^(1/4)) + ArcTan[1 +
 (Sqrt[2]*x)/3^(1/4)]/(2*Sqrt[2]*3^(1/4)) + Log[Sqrt[3] - Sqrt[2]
*3^(1/4)*x + x^2]/(4*Sqrt[2]*3^(1/4)) - Log[Sqrt[3] + Sqrt[2]*3^(
1/4)*x + x^2]/(4*Sqrt[2]*3^(1/4))
```

Rubi [A] time = 0.153967, antiderivative size = 133, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 6, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.546

$$\frac{\log \left(x^2-\sqrt{2}\sqrt[4]{3}x+\sqrt{3}\right)}{4\sqrt{2}\sqrt[4]{3}}-\frac{\log \left(x^2+\sqrt{2}\sqrt[4]{3}x+\sqrt{3}\right)}{4\sqrt{2}\sqrt[4]{3}}-\frac{\tan^{-1}\left(1-\frac{\sqrt{2}x}{\sqrt[4]{3}}\right)}{2\sqrt{2}\sqrt[4]{3}}+\frac{\tan^{-1}\left(\frac{\sqrt{2}x}{\sqrt[4]{3}}+1\right)}{2\sqrt{2}\sqrt[4]{3}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(3 + x^4),x]
```

```
[Out] -ArcTan[1 - (Sqrt[2]*x)/3^(1/4)]/(2*Sqrt[2]*3^(1/4)) + ArcTan[1 +
 (Sqrt[2]*x)/3^(1/4)]/(2*Sqrt[2]*3^(1/4)) + Log[Sqrt[3] - Sqrt[2]
*3^(1/4)*x + x^2]/(4*Sqrt[2]*3^(1/4)) - Log[Sqrt[3] + Sqrt[2]*3^(
1/4)*x + x^2]/(4*Sqrt[2]*3^(1/4))
```

Rubi in Sympy [A] time = 19.8402, size = 124, normalized size = 0.93

$$\frac{\sqrt{2}\cdot 3^{\frac{3}{4}}\log \left(x^2-\sqrt{2}\sqrt[4]{3}x+\sqrt{3}\right)}{24}-\frac{\sqrt{2}\cdot 3^{\frac{3}{4}}\log \left(x^2+\sqrt{2}\sqrt[4]{3}x+\sqrt{3}\right)}{24}+\frac{\sqrt{2}\cdot 3^{\frac{3}{4}}\operatorname{atan}\left(\frac{\sqrt{2}\cdot 3^{\frac{3}{4}}x}{3}-1\right)}{12}+\frac{\sqrt{2}\cdot 3^{\frac{3}{4}}\operatorname{atan}\left(\frac{\sqrt{2}\cdot 3^{\frac{3}{4}}x}{3}+1\right)}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(x**4+3),x)
```

```
[Out] sqrt(2)*3**(3/4)*log(x**2 - sqrt(2)*3**(1/4)*x + sqrt(3))/24 - sq
rt(2)*3**(3/4)*log(x**2 + sqrt(2)*3**(1/4)*x + sqrt(3))/24 + sqrt
(2)*3**(3/4)*atan(sqrt(2)*3**(3/4)*x/3 - 1)/12 + sqrt(2)*3**(3/4)
*atan(sqrt(2)*3**(3/4)*x/3 + 1)/12
```

Mathematica [A] time = 0.0765979, size = 101, normalized size = 0.76

$$\frac{\log \left(\sqrt{3}x^2-\sqrt{2}3^{3/4}x+3\right)-\log \left(\sqrt{3}x^2+\sqrt{2}3^{3/4}x+3\right)-2\tan^{-1}\left(1-\frac{\sqrt{2}x}{\sqrt[4]{3}}\right)+2\tan^{-1}\left(\frac{\sqrt{2}x}{\sqrt[4]{3}}+1\right)}{4\sqrt{2}\sqrt[4]{3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(3 + x^4),x]
```

```
[Out] (-2*ArcTan[1 - (Sqrt[2]*x)/3^(1/4)] + 2*ArcTan[1 + (Sqrt[2]*x)/3^
(1/4)] + Log[3 - Sqrt[2]*3^(3/4)*x + Sqrt[3]*x^2] - Log[3 + Sqrt[
2]*3^(3/4)*x + Sqrt[3]*x^2])/(4*Sqrt[2]*3^(1/4))
```

Maple [A] time = 0.006, size = 85, normalized size = 0.6

$$\frac{\sqrt{2}\,3^{\frac{3}{4}}}{12}\arctan\left(-1+\frac{x\sqrt{2}\,3^{\frac{3}{4}}}{3}\right)+\frac{\sqrt{2}\,3^{\frac{3}{4}}}{24}\ln\left(\frac{x^{2}-\sqrt[4]{3}x\sqrt{2}+\sqrt{3}}{x^{2}+\sqrt[4]{3}x\sqrt{2}+\sqrt{3}}\right)+\frac{\sqrt{2}\,3^{\frac{3}{4}}}{12}\arctan\left(1+\frac{x\sqrt{2}\,3^{\frac{3}{4}}}{3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(x^4+3),x)
```

```
[Out] 1/12*arctan(-1+1/3*x*2^(1/2)*3^(3/4))*3^(3/4)*2^(1/2)+1/24*3^(3/4
)*2^(1/2)*ln((x^2-3^(1/4)*x*2^(1/2)+3^(1/2))/(x^2+3^(1/4)*x*2^(1/
2)+3^(1/2)))+1/12*arctan(1+1/3*x*2^(1/2)*3^(3/4))*3^(3/4)*2^(1/2)
```

Maxima [A] time = 1.59072, size = 144, normalized size = 1.08

$$\frac{1}{12}\cdot 3^{\frac{3}{4}}\sqrt{2}\arctan\left(\frac{1}{6}\cdot 3^{\frac{3}{4}}\sqrt{2}\left(2\,x+3^{\frac{1}{4}}\sqrt{2}\right)\right)+\frac{1}{12}\cdot 3^{\frac{3}{4}}\sqrt{2}\arctan\left(\frac{1}{6}\cdot 3^{\frac{3}{4}}\sqrt{2}\left(2\,x-3^{\frac{1}{4}}\sqrt{2}\right)\right)$$
$$-\frac{1}{24}\cdot 3^{\frac{3}{4}}\sqrt{2}\log\left(x^{2}+3^{\frac{1}{4}}\sqrt{2}x+\sqrt{3}\right)+\frac{1}{24}\cdot 3^{\frac{3}{4}}\sqrt{2}\log\left(x^{2}-3^{\frac{1}{4}}\sqrt{2}x+\sqrt{3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(x^4 + 3),x, algorithm="maxima")
```

```
[Out] 1/12*3^(3/4)*sqrt(2)*arctan(1/6*3^(3/4)*sqrt(2)*(2*x + 3^(1/4)*sq
rt(2))) + 1/12*3^(3/4)*sqrt(2)*arctan(1/6*3^(3/4)*sqrt(2)*(2*x -
3^(1/4)*sqrt(2))) - 1/24*3^(3/4)*sqrt(2)*log(x^2 + 3^(1/4)*sqrt(2
)*x + sqrt(3)) + 1/24*3^(3/4)*sqrt(2)*log(x^2 - 3^(1/4)*sqrt(2)*x
 + sqrt(3))
```

Fricas [A] time = 0.236352, size = 215, normalized size = 1.62

$$-\frac{1}{24}\cdot 3^{\frac{3}{4}}\left(4\sqrt{2}\arctan\left(\frac{3}{3^{\frac{3}{4}}\sqrt{2}\sqrt{\frac{1}{3}}\sqrt{\sqrt{3}\left(\sqrt{3}x^{2}+3^{\frac{3}{4}}\sqrt{2}x+3\right)}+3^{\frac{3}{4}}\sqrt{2}x+3}\right)+4\sqrt{2}\arctan\left(\frac{3}{3^{\frac{3}{4}}\sqrt{2}\sqrt{\frac{1}{3}}\sqrt{\sqrt{3}\left(\sqrt{3}x^{2}-3^{\frac{3}{4}}\sqrt{2}x+3\right)}+3\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(x^4 + 3),x, algorithm="fricas")
```

```
[Out] -1/24*3^(3/4)*(4*sqrt(2)*arctan(3/(3^(3/4)*sqrt(2)*sqrt(1/3)*sqrt
(sqrt(3)*(sqrt(3)*x^2 + 3^(3/4)*sqrt(2)*x + 3)) + 3^(3/4)*sqrt(2)
*x + 3)) + 4*sqrt(2)*arctan(3/(3^(3/4)*sqrt(2)*sqrt(1/3)*sqrt(sqr
t(3)*(sqrt(3)*x^2 - 3^(3/4)*sqrt(2)*x + 3)) + 3^(3/4)*sqrt(2)*x -
 3)) + sqrt(2)*log(sqrt(3)*x^2 + 3^(3/4)*sqrt(2)*x + 3) - sqrt(2)
*log(sqrt(3)*x^2 - 3^(3/4)*sqrt(2)*x + 3))
```

Sympy [A] time = 1.59997, size = 124, normalized size = 0.93

$$\frac{\sqrt{2}\cdot 3^{\frac{3}{4}}\log\left(x^2-\sqrt{2}\sqrt[4]{3}x+\sqrt{3}\right)}{12}-\frac{\sqrt{2}\cdot 3^{\frac{3}{4}}\log\left(x^2+\sqrt{2}\sqrt[4]{3}x+\sqrt{3}\right)}{12}+\frac{\sqrt{2}\cdot 3^{\frac{3}{4}}\operatorname{atan}\left(\frac{\sqrt{2}\cdot 3^{\frac{3}{4}}x}{3}-1\right)}{6}+\frac{\sqrt{2}\cdot 3^{\frac{3}{4}}\operatorname{atan}\left(\frac{\sqrt{2}\cdot 3^{\frac{3}{4}}x}{3}+1\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(x**4+3),x)
```

```
[Out] sqrt(2)*3**(3/4)*log(x**2 - sqrt(2)*3**(1/4)*x + sqrt(3))/12 - sq
rt(2)*3**(3/4)*log(x**2 + sqrt(2)*3**(1/4)*x + sqrt(3))/12 + sqrt
(2)*3**(3/4)*atan(sqrt(2)*3**(3/4)*x/3 - 1)/6 + sqrt(2)*3**(3/4)*
atan(sqrt(2)*3**(3/4)*x/3 + 1)/6
```

GIAC/XCAS [A] time = 0.225416, size = 128, normalized size = 0.96

$$\frac{1}{12}\cdot 108^{\frac{1}{4}}\arctan\left(\frac{1}{6}\cdot 3^{\frac{3}{4}}\sqrt{2}\left(2x+3^{\frac{1}{4}}\sqrt{2}\right)\right)+\frac{1}{12}\cdot 108^{\frac{1}{4}}\arctan\left(\frac{1}{6}\cdot 3^{\frac{3}{4}}\sqrt{2}\left(2x-3^{\frac{1}{4}}\sqrt{2}\right)\right)-\frac{1}{24}\cdot 108^{\frac{1}{4}}\ln\left(x^2+3^{\frac{1}{4}}\sqrt{2}x+\sqrt{3}\right)+\frac{1}{24}\cdot 108^{\frac{1}{4}}\ln\left(x^2-3^{\frac{1}{4}}\sqrt{2}x+\sqrt{3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(x^4 + 3),x, algorithm="giac")
```

```
[Out] 1/12*108^(1/4)*arctan(1/6*3^(3/4)*sqrt(2)*(2*x + 3^(1/4)*sqrt(2))
) + 1/12*108^(1/4)*arctan(1/6*3^(3/4)*sqrt(2)*(2*x - 3^(1/4)*sqrt
(2))) - 1/24*108^(1/4)*ln(x^2 + 3^(1/4)*sqrt(2)*x + sqrt(3)) + 1/
24*108^(1/4)*ln(x^2 - 3^(1/4)*sqrt(2)*x + sqrt(3))
```

3.706 $\int \frac{1}{1+a+(-1+a)x^4}\,dx$

Optimal. Leaf size=83

$$\frac{\tan^{-1}\left(\frac{\sqrt[4]{1-a}x}{\sqrt[4]{a+1}}\right)}{2\sqrt{a+1}\sqrt[4]{1-a^2}}+\frac{\tanh^{-1}\left(\frac{\sqrt[4]{1-a}x}{\sqrt[4]{a+1}}\right)}{2\sqrt{a+1}\sqrt[4]{1-a^2}}$$

```
[Out] ArcTan[((1 - a)^(1/4)*x)/(1 + a)^(1/4)]/(2*Sqrt[1 + a]*(1 - a^2)^
(1/4)) + ArcTanh[((1 - a)^(1/4)*x)/(1 + a)^(1/4)]/(2*Sqrt[1 + a]*
(1 - a^2)^(1/4))
```

Rubi [A] time = 0.141138, antiderivative size = 83, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25

$$\frac{\tan^{-1}\left(\frac{\sqrt[4]{1-a}x}{\sqrt[4]{a+1}}\right)}{2\sqrt{a+1}\sqrt[4]{1-a^2}}+\frac{\tanh^{-1}\left(\frac{\sqrt[4]{1-a}x}{\sqrt[4]{a+1}}\right)}{2\sqrt{a+1}\sqrt[4]{1-a^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(1 + a + (-1 + a)*x^4)^(-1),x]
```

```
[Out] ArcTan[((1 - a)^(1/4)*x)/(1 + a)^(1/4)]/(2*Sqrt[1 + a]*(1 - a^2)^
(1/4)) + ArcTanh[((1 - a)^(1/4)*x)/(1 + a)^(1/4)]/(2*Sqrt[1 + a]*
(1 - a^2)^(1/4))
```

Rubi in Sympy [A] time = 16.7366, size = 63, normalized size = 0.76

$$\frac{\operatorname{atan}\left(\frac{x\sqrt[4]{-a+1}}{\sqrt[4]{a+1}}\right)}{2\sqrt[4]{-a+1}\,(a+1)^{\frac{3}{4}}}+\frac{\operatorname{atanh}\left(\frac{x\sqrt[4]{-a+1}}{\sqrt[4]{a+1}}\right)}{2\sqrt[4]{-a+1}\,(a+1)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(1+a+(-1+a)*x**4),x)
```

```
[Out] atan(x*(-a + 1)**(1/4)/(a + 1)**(1/4))/(2*(-a + 1)**(1/4)*(a + 1)
**(3/4)) + atanh(x*(-a + 1)**(1/4)/(a + 1)**(1/4))/(2*(-a + 1)**(
1/4)*(a + 1)**(3/4))
```

Mathematica [A] time = 0.118108, size = 160, normalized size = 1.93

$$\frac{-\log\left(\sqrt{a-1}x^2-\sqrt{2}\sqrt[4]{a-1}\sqrt[4]{a+1}x+\sqrt{a+1}\right)+\log\left(\sqrt{a-1}x^2+\sqrt{2}\sqrt[4]{a-1}\sqrt[4]{a+1}x+\sqrt{a+1}\right)-2\tan^{-1}\left(1-\sqrt{2}\sqrt[4]{\frac{a-1}{a+1}}\right.}{4\sqrt{2}\sqrt[4]{a-1}(a+1)^{3/4}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[(1 + a + (-1 + a)*x^4)^(-1),x]
```

```
[Out] (-2*ArcTan[1 - Sqrt[2]*((-1 + a)/(1 + a))^(1/4)*x] + 2*ArcTan[1 +
 Sqrt[2]*((-1 + a)/(1 + a))^(1/4)*x] - Log[Sqrt[1 + a] - Sqrt[2]*
(-1 + a)^(1/4)*(1 + a)^(1/4)*x + Sqrt[-1 + a]*x^2] + Log[Sqrt[1 +
 a] + Sqrt[2]*(-1 + a)^(1/4)*(1 + a)^(1/4)*x + Sqrt[-1 + a]*x^2])
```

```
/(4*Sqrt[2]*(-1 + a)^(1/4)*(1 + a)^(3/4))
```

Maple [B] time = 0.014, size = 170, normalized size = 2.1

$$\frac{\sqrt{2}}{8+8a}\sqrt[4]{\frac{1+a}{-1+a}}\ln\left(1\left(x^2+\sqrt[4]{\frac{1+a}{-1+a}}x\sqrt{2}+\sqrt{\frac{1+a}{-1+a}}\right)\left(x^2-\sqrt[4]{\frac{1+a}{-1+a}}x\sqrt{2}+\sqrt{\frac{1+a}{-1+a}}\right)^{-1}\right)+\frac{\sqrt{2}}{4+4a}\sqrt[4]{\frac{1+a}{-1+a}}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{1+a}{-1+a}}}+1\right)+\frac{\sqrt{2}}{4+4a}\sqrt[4]{\frac{1+a}{-1+a}}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{1+a}{-1+a}}}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(1+a+(-1+a)*x^4),x)
```

```
[Out] 1/8*((1+a)/(-1+a))^(1/4)/(1+a)*2^(1/2)*ln((x^2+((1+a)/(-1+a))^(1/
4)*x*2^(1/2)+((1+a)/(-1+a))^(1/2))/(x^2-((1+a)/(-1+a))^(1/4)*x*2^
(1/2)+((1+a)/(-1+a))^(1/2)))+1/4*((1+a)/(-1+a))^(1/4)/(1+a)*2^(1/
2)*arctan(2^(1/2)/((1+a)/(-1+a))^(1/4)*x+1)+1/4*((1+a)/(-1+a))^(1
/4)/(1+a)*2^(1/2)*arctan(2^(1/2)/((1+a)/(-1+a))^(1/4)*x-1)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a - 1)*x^4 + a + 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.241454, size = 242, normalized size = 2.92

$$-\left(-\frac{1}{a^4+2a^3-2a-1}\right)^{\frac{1}{4}}\arctan\left(\frac{(a+1)\left(-\frac{1}{a^4+2a^3-2a-1}\right)^{\frac{1}{4}}}{x+\sqrt{x^2+(a^2+2a+1)\sqrt{-\frac{1}{a^4+2a^3-2a-1}}}}\right)+\frac{1}{4}\left(-\frac{1}{a^4+2a^3-2a-1}\right)^{\frac{1}{4}}\log\left((a+1)\left(-\frac{1}{a^4+2a^3-2a-1}\right)^{\frac{1}{4}}+x\right)-\frac{1}{4}\left(-\frac{1}{a^4+2a^3-2a-1}\right)^{\frac{1}{4}}\log\left(-(a+1)\left(-\frac{1}{a^4+2a^3-2a-1}\right)^{\frac{1}{4}}+x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a - 1)*x^4 + a + 1),x, algorithm="fricas")
```

```
[Out] -(-1/(a^4 + 2*a^3 - 2*a - 1))^(1/4)*arctan((a + 1)*(-1/(a^4 + 2*a
^3 - 2*a - 1))^(1/4)/(x + sqrt(x^2 + (a^2 + 2*a + 1)*sqrt(-1/(a^4
 + 2*a^3 - 2*a - 1))))) + 1/4*(-1/(a^4 + 2*a^3 - 2*a - 1))^(1/4)*
log((a + 1)*(-1/(a^4 + 2*a^3 - 2*a - 1))^(1/4) + x) - 1/4*(-1/(a^
4 + 2*a^3 - 2*a - 1))^(1/4)*log(-(a + 1)*(-1/(a^4 + 2*a^3 - 2*a -
 1))^(1/4) + x)
```

Sympy [A] time = 0.816406, size = 32, normalized size = 0.39

$$\operatorname{RootSum}\left(t^{4}\left(256a^{4}+512a^{3}-512a-256\right)+1,\left(t\mapsto t\log\left(4ta+4t+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(1+a+(-1+a)*x**4),x)
```

```
[Out] RootSum(_t**4*(256*a**4 + 512*a**3 - 512*a - 256) + 1, Lambda(_t,
 _t*log(4*_t*a + 4*_t + x)))
```

GIAC/XCAS [A] time = 0.217449, size = 360, normalized size = 4.34

$$\frac{\left(a^{4}-2\,a^{3}+2\,a-1\right)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x+\sqrt{2}\left(\frac{a+1}{a-1}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a+1}{a-1}\right)^{\frac{1}{4}}}\right)}{2\left(\sqrt{2}a^{2}-\sqrt{2}\right)}+\frac{\left(a^{4}-2\,a^{3}+2\,a-1\right)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x-\sqrt{2}\left(\frac{a+1}{a-1}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a+1}{a-1}\right)^{\frac{1}{4}}}\right)}{2\left(\sqrt{2}a^{2}-\sqrt{2}\right)}+\frac{\left(a^{4}-2\,a^{3}+2\,a-1\right)^{\frac{1}{4}}\ln\left(x^{2}+\sqrt{2}x\left(\frac{a+1}{a-1}\right)^{\frac{1}{4}}+\sqrt{\frac{a+1}{a-1}}\right)}{4\left(\sqrt{2}a^{2}-\sqrt{2}\right)}-\frac{\left(a^{4}-2\,a^{3}+2\,a-1\right)^{\frac{1}{4}}\ln\left(x^{2}-\sqrt{2}x\left(\frac{a+1}{a-1}\right)^{\frac{1}{4}}+\sqrt{\frac{a+1}{a-1}}\right)}{4\left(\sqrt{2}a^{2}-\sqrt{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a - 1)*x^4 + a + 1),x, algorithm="giac")
```

```
[Out] 1/2*(a^4 - 2*a^3 + 2*a - 1)^(1/4)*arctan(1/2*sqrt(2)*(2*x + sqrt(
2)*((a + 1)/(a - 1))^(1/4))/((a + 1)/(a - 1))^(1/4))/(sqrt(2)*a^2
 - sqrt(2)) + 1/2*(a^4 - 2*a^3 + 2*a - 1)^(1/4)*arctan(1/2*sqrt(2
)*(2*x - sqrt(2)*((a + 1)/(a - 1))^(1/4))/((a + 1)/(a - 1))^(1/4)
)/(sqrt(2)*a^2 - sqrt(2)) + 1/4*(a^4 - 2*a^3 + 2*a - 1)^(1/4)*ln(
x^2 + sqrt(2)*x*((a + 1)/(a - 1))^(1/4) + sqrt((a + 1)/(a - 1)))/
(sqrt(2)*a^2 - sqrt(2)) - 1/4*(a^4 - 2*a^3 + 2*a - 1)^(1/4)*ln(x^
2 - sqrt(2)*x*((a + 1)/(a - 1))^(1/4) + sqrt((a + 1)/(a - 1)))/(s
qrt(2)*a^2 - sqrt(2))
```

3.707 $\int \frac{1}{2a+2b+x^4}\,dx$

Optimal. Leaf size=79

$$-\frac{\tan^{-1}\left(\frac{x}{\sqrt[4]{2}\sqrt[4]{-a-b}}\right)}{2\ 2^{3/4}(-a-b)^{3/4}}-\frac{\tanh^{-1}\left(\frac{x}{\sqrt[4]{2}\sqrt[4]{-a-b}}\right)}{2\ 2^{3/4}(-a-b)^{3/4}}$$

```
[Out] -ArcTan[x/(2^(1/4)*(-a - b)^(1/4))]/(2*2^(3/4)*(-a - b)^(3/4)) -
ArcTanh[x/(2^(1/4)*(-a - b)^(1/4))]/(2*2^(3/4)*(-a - b)^(3/4))
```

Rubi [A] time = 0.11562, antiderivative size = 79, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25

$$-\frac{\tan^{-1}\left(\frac{x}{\sqrt[4]{2}\sqrt[4]{-a-b}}\right)}{2\ 2^{3/4}(-a-b)^{3/4}}-\frac{\tanh^{-1}\left(\frac{x}{\sqrt[4]{2}\sqrt[4]{-a-b}}\right)}{2\ 2^{3/4}(-a-b)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Int[(2*a + 2*b + x^4)^(-1),x]
```

```
[Out] -ArcTan[x/(2^(1/4)*(-a - b)^(1/4))]/(2*2^(3/4)*(-a - b)^(3/4)) -
ArcTanh[x/(2^(1/4)*(-a - b)^(1/4))]/(2*2^(3/4)*(-a - b)^(3/4))
```

Rubi in Sympy [A] time = 10.1799, size = 68, normalized size = 0.86

$$-\frac{\sqrt[4]{2}\operatorname{atan}\left(\frac{2^{\frac{3}{4}}x}{2\sqrt[4]{-a-b}}\right)}{4(-a-b)^{\frac{3}{4}}}-\frac{\sqrt[4]{2}\operatorname{atanh}\left(\frac{2^{\frac{3}{4}}x}{2\sqrt[4]{-a-b}}\right)}{4(-a-b)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(x**4+2*a+2*b),x)
```

```
[Out] -2**(1/4)*atan(2**(3/4)*x/(2*(-a - b)**(1/4)))/(4*(-a - b)**(3/4)
) - 2**(1/4)*atanh(2**(3/4)*x/(2*(-a - b)**(1/4)))/(4*(-a - b)**(
3/4))
```

Mathematica [A] time = 0.11977, size = 128, normalized size = 1.62

$$\frac{-\log\left(-2\sqrt[4]{2}x\sqrt[4]{a+b}+2\sqrt{a+b}+\sqrt{2}x^2\right)+\log\left(2\sqrt[4]{2}x\sqrt[4]{a+b}+2\sqrt{a+b}+\sqrt{2}x^2\right)-2\tan^{-1}\left(1-\frac{\sqrt[4]{2}x}{\sqrt[4]{a+b}}\right)+2\tan^{-1}\left(\frac{\sqrt[4]{2}x}{\sqrt[4]{a+b}}\right.}{8\sqrt[4]{2}(a+b)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(2*a + 2*b + x^4)^(-1),x]
```

```
[Out] (-2*ArcTan[1 - (2^(1/4)*x)/(a + b)^(1/4)] + 2*ArcTan[1 + (2^(1/4)
*x)/(a + b)^(1/4)] - Log[2*Sqrt[a + b] - 2*2^(1/4)*(a + b)^(1/4)*
x + Sqrt[2]*x^2] + Log[2*Sqrt[a + b] + 2*2^(1/4)*(a + b)^(1/4)*x
+ Sqrt[2]*x^2])/(8*2^(1/4)*(a + b)^(3/4))
```

Maple [B] time = 0.01, size = 137, normalized size = 1.7

$$\frac{\sqrt{2}}{8}\ln\left(1\left(x^{2}+\sqrt[4]{2a+2b}\,x\sqrt{2}+\sqrt{2a+2b}\right)\left(x^{2}-\sqrt[4]{2a+2b}\,x\sqrt{2}+\sqrt{2a+2b}\right)^{-1}\right)(2a+2b)^{-\frac{3}{4}}+\frac{\sqrt{2}}{4}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{2a+2b}}+1\right)(2a+2b)^{-\frac{3}{4}}+\frac{\sqrt{2}}{4}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{2a+2b}}-1\right)(2a+2b)^{-\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(x^4+2*a+2*b),x)
```

```
[Out] 1/8/(2*a+2*b)^(3/4)*2^(1/2)*ln((x^2+(2*a+2*b)^(1/4)*x*2^(1/2)+(2*
a+2*b)^(1/2))/(x^2-(2*a+2*b)^(1/4)*x*2^(1/2)+(2*a+2*b)^(1/2)))+1/
4/(2*a+2*b)^(3/4)*2^(1/2)*arctan(2^(1/2)/(2*a+2*b)^(1/4)*x+1)+1/4
/(2*a+2*b)^(3/4)*2^(1/2)*arctan(2^(1/2)/(2*a+2*b)^(1/4)*x-1)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^4 + 2*a + 2*b),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.249172, size = 335, normalized size = 4.24

$$-\left(\frac{1}{8}\right)^{\frac{1}{4}}\left(-\frac{1}{a^{3}+3a^{2}b+3ab^{2}+b^{3}}\right)^{\frac{1}{4}}\arctan\left(\frac{2\left(\frac{1}{8}\right)^{\frac{1}{4}}(a+b)\left(-\frac{1}{a^{3}+3a^{2}b+3ab^{2}+b^{3}}\right)^{\frac{1}{4}}}{x+\sqrt{x^{2}+2\sqrt{\frac{1}{2}}(a^{2}+2ab+b^{2})\sqrt{-\frac{1}{a^{3}+3a^{2}b+3ab^{2}+b^{3}}}}}\right)+\frac{1}{4}\left(\frac{1}{8}\right)^{\frac{1}{4}}\left(-\frac{1}{a^{3}+3a^{2}b+3ab^{2}+b^{3}}\right)^{\frac{1}{4}}\log\left(2\left(\frac{1}{8}\right)^{\frac{1}{4}}(a+b)\left(-\frac{1}{a^{3}+3a^{2}b+3ab^{2}+b^{3}}\right)^{\frac{1}{4}}+x\right)-\frac{1}{4}\left(\frac{1}{8}\right)^{\frac{1}{4}}\left(-\frac{1}{a^{3}+3a^{2}b+3ab^{2}+b^{3}}\right)^{\frac{1}{4}}\log\left(-2\left(\frac{1}{8}\right)^{\frac{1}{4}}(a+b)\left(-\frac{1}{a^{3}+3a^{2}b+3ab^{2}+b^{3}}\right)^{\frac{1}{4}}+x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^4 + 2*a + 2*b),x, algorithm="fricas")
```

```
[Out] -(1/8)^(1/4)*(-1/(a^3 + 3*a^2*b + 3*a*b^2 + b^3))^(1/4)*arctan(2*
(1/8)^(1/4)*(a + b)*(-1/(a^3 + 3*a^2*b + 3*a*b^2 + b^3))^(1/4)/(x
 + sqrt(x^2 + 2*sqrt(1/2)*(a^2 + 2*a*b + b^2)*sqrt(-1/(a^3 + 3*a^
2*b + 3*a*b^2 + b^3))))) + 1/4*(1/8)^(1/4)*(-1/(a^3 + 3*a^2*b + 3
*a*b^2 + b^3))^(1/4)*log(2*(1/8)^(1/4)*(a + b)*(-1/(a^3 + 3*a^2*b
 + 3*a*b^2 + b^3))^(1/4) + x) - 1/4*(1/8)^(1/4)*(-1/(a^3 + 3*a^2*
b + 3*a*b^2 + b^3))^(1/4)*log(-2*(1/8)^(1/4)*(a + b)*(-1/(a^3 + 3
*a^2*b + 3*a*b^2 + b^3))^(1/4) + x)
```

Sympy [A] time = 0.616146, size = 42, normalized size = 0.53

$$\operatorname{RootSum}\left(t^{4}\left(2048a^{3}+6144a^{2}b+6144ab^{2}+2048b^{3}\right)+1,\left(t\mapsto t\log\left(8ta+8tb+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x**4+2*a+2*b),x)
```

```
[Out] RootSum(_t**4*(2048*a**3 + 6144*a**2*b + 6144*a*b**2 + 2048*b**3)
 + 1, Lambda(_t, _t*log(8*_t*a + 8*_t*b + x)))
```

GIAC/XCAS [A] time = 0.220201, size = 296, normalized size = 3.75

$$\frac{(2a+2b)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(2x+\sqrt{2}(2a+2b)^{\frac{1}{4}}\right)}{2(2a+2b)^{\frac{1}{4}}}\right)}{4\left(\sqrt{2}a+\sqrt{2}b\right)}+\frac{(2a+2b)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(2x-\sqrt{2}(2a+2b)^{\frac{1}{4}}\right)}{2(2a+2b)^{\frac{1}{4}}}\right)}{4\left(\sqrt{2}a+\sqrt{2}b\right)}+\frac{(2a+2b)^{\frac{1}{4}}\ln\left(x^2+\sqrt{2}(2a+2b)^{\frac{1}{4}}x+\sqrt{2a+2b}\right)}{8\left(\sqrt{2}a+\sqrt{2}b\right)}-\frac{(2a+2b)^{\frac{1}{4}}\ln\left(x^2-\sqrt{2}(2a+2b)^{\frac{1}{4}}x+\sqrt{2a+2b}\right)}{8\left(\sqrt{2}a+\sqrt{2}b\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^4 + 2*a + 2*b),x, algorithm="giac")
```

```
[Out] 1/4*(2*a + 2*b)^(1/4)*arctan(1/2*sqrt(2)*(2*x + sqrt(2)*(2*a + 2*
b)^(1/4))/(2*a + 2*b)^(1/4))/(sqrt(2)*a + sqrt(2)*b) + 1/4*(2*a +
 2*b)^(1/4)*arctan(1/2*sqrt(2)*(2*x - sqrt(2)*(2*a + 2*b)^(1/4))/
(2*a + 2*b)^(1/4))/(sqrt(2)*a + sqrt(2)*b) + 1/8*(2*a + 2*b)^(1/4
)*ln(x^2 + sqrt(2)*(2*a + 2*b)^(1/4)*x + sqrt(2*a + 2*b))/(sqrt(2
)*a + sqrt(2)*b) - 1/8*(2*a + 2*b)^(1/4)*ln(x^2 - sqrt(2)*(2*a +
2*b)^(1/4)*x + sqrt(2*a + 2*b))/(sqrt(2)*a + sqrt(2)*b)
```

3.708 $\int \frac{1}{2(a+b)+x^4}\,dx$

Optimal. Leaf size=79

$$-\frac{\tan^{-1}\left(\frac{x}{\sqrt[4]{2}\sqrt[4]{-a-b}}\right)}{2\,2^{3/4}(-a-b)^{3/4}}-\frac{\tanh^{-1}\left(\frac{x}{\sqrt[4]{2}\sqrt[4]{-a-b}}\right)}{2\,2^{3/4}(-a-b)^{3/4}}$$

```
[Out] -ArcTan[x/(2^(1/4)*(-a - b)^(1/4))]/(2*2^(3/4)*(-a - b)^(3/4)) -
ArcTanh[x/(2^(1/4)*(-a - b)^(1/4))]/(2*2^(3/4)*(-a - b)^(3/4))
```

Rubi [A] time = 0.0726998, antiderivative size = 79, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273

$$-\frac{\tan^{-1}\left(\frac{x}{\sqrt[4]{2}\sqrt[4]{-a-b}}\right)}{2\,2^{3/4}(-a-b)^{3/4}}-\frac{\tanh^{-1}\left(\frac{x}{\sqrt[4]{2}\sqrt[4]{-a-b}}\right)}{2\,2^{3/4}(-a-b)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Int[(2*(a + b) + x^4)^(-1),x]
```

```
[Out] -ArcTan[x/(2^(1/4)*(-a - b)^(1/4))]/(2*2^(3/4)*(-a - b)^(3/4)) -
ArcTanh[x/(2^(1/4)*(-a - b)^(1/4))]/(2*2^(3/4)*(-a - b)^(3/4))
```

Rubi in Sympy [A] time = 10.1798, size = 68, normalized size = 0.86

$$-\frac{\sqrt[4]{2}\,\mathrm{atan}\left(\frac{2^{\frac{3}{4}}x}{2\sqrt[4]{-a-b}}\right)}{4\left(-a-b\right)^{\frac{3}{4}}}-\frac{\sqrt[4]{2}\,\mathrm{atanh}\left(\frac{2^{\frac{3}{4}}x}{2\sqrt[4]{-a-b}}\right)}{4\left(-a-b\right)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(x**4+2*a+2*b),x)
```

```
[Out] -2**(1/4)*atan(2**(3/4)*x/(2*(-a - b)**(1/4)))/(4*(-a - b)**(3/4)
) - 2**(1/4)*atanh(2**(3/4)*x/(2*(-a - b)**(1/4)))/(4*(-a - b)**(
3/4))
```

Mathematica [A] time = 0.0213, size = 128, normalized size = 1.62

$$\frac{-\log\left(-2\sqrt[4]{2}x\sqrt[4]{a+b}+2\sqrt{a+b}+\sqrt{2}x^2\right)+\log\left(2\sqrt[4]{2}x\sqrt[4]{a+b}+2\sqrt{a+b}+\sqrt{2}x^2\right)-2\tan^{-1}\left(1-\frac{\sqrt[4]{2}x}{\sqrt[4]{a+b}}\right)+2\tan^{-1}\left(\frac{\sqrt[4]{2}x}{\sqrt[4]{a+b}}\right.}{8\sqrt[4]{2}(a+b)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(2*(a + b) + x^4)^(-1),x]
```

```
[Out] (-2*ArcTan[1 - (2^(1/4)*x)/(a + b)^(1/4)] + 2*ArcTan[1 + (2^(1/4)
*x)/(a + b)^(1/4)] - Log[2*Sqrt[a + b] - 2*2^(1/4)*(a + b)^(1/4)*
x + Sqrt[2]*x^2] + Log[2*Sqrt[a + b] + 2*2^(1/4)*(a + b)^(1/4)*x
+ Sqrt[2]*x^2])/(8*2^(1/4)*(a + b)^(3/4))
```

Maple [B] time = 0.001, size = 137, normalized size = 1.7

$$\frac{\sqrt{2}}{8}\ln\left(1\left(x^{2}+\sqrt[4]{2a+2b}\,x\sqrt{2}+\sqrt{2a+2b}\right)\left(x^{2}-\sqrt[4]{2a+2b}\,x\sqrt{2}+\sqrt{2a+2b}\right)^{-1}\right)(2a+2b)^{-\frac{3}{4}} + \frac{\sqrt{2}}{4}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{2a+2b}}+1\right)(2a+2b)^{-\frac{3}{4}} + \frac{\sqrt{2}}{4}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{2a+2b}}-1\right)(2a+2b)^{-\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(x^4+2*a+2*b),x)
```

```
[Out] 1/8/(2*a+2*b)^(3/4)*2^(1/2)*ln((x^2+(2*a+2*b)^(1/4)*x*2^(1/2)+(2*
a+2*b)^(1/2))/(x^2-(2*a+2*b)^(1/4)*x*2^(1/2)+(2*a+2*b)^(1/2)))+1/
4/(2*a+2*b)^(3/4)*2^(1/2)*arctan(2^(1/2)/(2*a+2*b)^(1/4)*x+1)+1/4
/(2*a+2*b)^(3/4)*2^(1/2)*arctan(2^(1/2)/(2*a+2*b)^(1/4)*x-1)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^4 + 2*a + 2*b),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.24146, size = 335, normalized size = 4.24

$$-\left(\frac{1}{8}\right)^{\frac{1}{4}}\left(-\frac{1}{a^{3}+3a^{2}b+3ab^{2}+b^{3}}\right)^{\frac{1}{4}}\arctan\left(\frac{2\left(\frac{1}{8}\right)^{\frac{1}{4}}(a+b)\left(-\frac{1}{a^{3}+3a^{2}b+3ab^{2}+b^{3}}\right)^{\frac{1}{4}}}{x+\sqrt{x^{2}+2\sqrt{\frac{1}{2}}(a^{2}+2ab+b^{2})\sqrt{-\frac{1}{a^{3}+3a^{2}b+3ab^{2}+b^{3}}}}}\right) + \frac{1}{4}\left(\frac{1}{8}\right)^{\frac{1}{4}}\left(-\frac{1}{a^{3}+3a^{2}b+3ab^{2}+b^{3}}\right)^{\frac{1}{4}}\log\left(2\left(\frac{1}{8}\right)^{\frac{1}{4}}(a+b)\left(-\frac{1}{a^{3}+3a^{2}b+3ab^{2}+b^{3}}\right)^{\frac{1}{4}}+x\right) - \frac{1}{4}\left(\frac{1}{8}\right)^{\frac{1}{4}}\left(-\frac{1}{a^{3}+3a^{2}b+3ab^{2}+b^{3}}\right)^{\frac{1}{4}}\log\left(-2\left(\frac{1}{8}\right)^{\frac{1}{4}}(a+b)\left(-\frac{1}{a^{3}+3a^{2}b+3ab^{2}+b^{3}}\right)^{\frac{1}{4}}+x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^4 + 2*a + 2*b),x, algorithm="fricas")
```

```
[Out] -(1/8)^(1/4)*(-1/(a^3 + 3*a^2*b + 3*a*b^2 + b^3))^(1/4)*arctan(2*
(1/8)^(1/4)*(a + b)*(-1/(a^3 + 3*a^2*b + 3*a*b^2 + b^3))^(1/4)/(x
 + sqrt(x^2 + 2*sqrt(1/2)*(a^2 + 2*a*b + b^2)*sqrt(-1/(a^3 + 3*a^
2*b + 3*a*b^2 + b^3))))) + 1/4*(1/8)^(1/4)*(-1/(a^3 + 3*a^2*b + 3
*a*b^2 + b^3))^(1/4)*log(2*(1/8)^(1/4)*(a + b)*(-1/(a^3 + 3*a^2*b
 + 3*a*b^2 + b^3))^(1/4) + x) - 1/4*(1/8)^(1/4)*(-1/(a^3 + 3*a^2*
b + 3*a*b^2 + b^3))^(1/4)*log(-2*(1/8)^(1/4)*(a + b)*(-1/(a^3 + 3
*a^2*b + 3*a*b^2 + b^3))^(1/4) + x)
```

Sympy [A] time = 0.620501, size = 42, normalized size = 0.53

$$\operatorname{RootSum}\left(t^{4}\left(2048a^{3}+6144a^{2}b+6144ab^{2}+2048b^{3}\right)+1,\left(t\mapsto t\log\left(8ta+8tb+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x**4+2*a+2*b),x)
```

```
[Out] RootSum(_t**4*(2048*a**3 + 6144*a**2*b + 6144*a*b**2 + 2048*b**3)
 + 1, Lambda(_t, _t*log(8*_t*a + 8*_t*b + x)))
```

GIAC/XCAS [A] time = 0.218594, size = 296, normalized size = 3.75

$$\frac{(2\,a+2\,b)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x+\sqrt{2}(2\,a+2\,b)^{\frac{1}{4}}\right)}{2\,(2\,a+2\,b)^{\frac{1}{4}}}\right)}{4\left(\sqrt{2}a+\sqrt{2}b\right)}+\frac{(2\,a+2\,b)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x-\sqrt{2}(2\,a+2\,b)^{\frac{1}{4}}\right)}{2\,(2\,a+2\,b)^{\frac{1}{4}}}\right)}{4\left(\sqrt{2}a+\sqrt{2}b\right)}+\frac{(2\,a+2\,b)^{\frac{1}{4}}\ln\left(x^2+\sqrt{2}(2\,a+2\,b)^{\frac{1}{4}}x+\sqrt{2\,a+2\,b}\right)}{8\left(\sqrt{2}a+\sqrt{2}b\right)}-\frac{(2\,a+2\,b)^{\frac{1}{4}}\ln\left(x^2-\sqrt{2}(2\,a+2\,b)^{\frac{1}{4}}x+\sqrt{2\,a+2\,b}\right)}{8\left(\sqrt{2}a+\sqrt{2}b\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^4 + 2*a + 2*b),x, algorithm="giac")
```

```
[Out] 1/4*(2*a + 2*b)^(1/4)*arctan(1/2*sqrt(2)*(2*x + sqrt(2)*(2*a + 2*
b)^(1/4))/(2*a + 2*b)^(1/4))/(sqrt(2)*a + sqrt(2)*b) + 1/4*(2*a +
 2*b)^(1/4)*arctan(1/2*sqrt(2)*(2*x - sqrt(2)*(2*a + 2*b)^(1/4))/
(2*a + 2*b)^(1/4))/(sqrt(2)*a + sqrt(2)*b) + 1/8*(2*a + 2*b)^(1/4
)*ln(x^2 + sqrt(2)*(2*a + 2*b)^(1/4)*x + sqrt(2*a + 2*b))/(sqrt(2
)*a + sqrt(2)*b) - 1/8*(2*a + 2*b)^(1/4)*ln(x^2 - sqrt(2)*(2*a +
2*b)^(1/4)*x + sqrt(2*a + 2*b))/(sqrt(2)*a + sqrt(2)*b)
```

3.709 $\int \frac{x}{2a+2b+x^4}\,dx$

Optimal. Leaf size=33

$$\frac{\tan^{-1}\left(\frac{x^2}{\sqrt{2}\sqrt{a+b}}\right)}{2\sqrt{2}\sqrt{a+b}}$$

```
[Out] ArcTan[x^2/(Sqrt[2]*Sqrt[a + b])]/(2*Sqrt[2]*Sqrt[a + b])
```

Rubi [A] time = 0.0524299, antiderivative size = 33, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$\frac{\tan^{-1}\left(\frac{x^2}{\sqrt{2}\sqrt{a+b}}\right)}{2\sqrt{2}\sqrt{a+b}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(2*a + 2*b + x^4),x]
```

```
[Out] ArcTan[x^2/(Sqrt[2]*Sqrt[a + b])]/(2*Sqrt[2]*Sqrt[a + b])
```

Rubi in Sympy [A] time = 4.72483, size = 31, normalized size = 0.94

$$\frac{\sqrt{2}\,\mathrm{atan}\left(\frac{\sqrt{2}x^2}{2\sqrt{a+b}}\right)}{4\sqrt{a+b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(x**4+2*a+2*b),x)
```

```
[Out] sqrt(2)*atan(sqrt(2)*x**2/(2*sqrt(a + b)))/(4*sqrt(a + b))
```

Mathematica [A] time = 0.0149954, size = 33, normalized size = 1.

$$\frac{\tan^{-1}\left(\frac{x^2}{\sqrt{2}\sqrt{a+b}}\right)}{2\sqrt{2}\sqrt{a+b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(2*a + 2*b + x^4),x]
```

```
[Out] ArcTan[x^2/(Sqrt[2]*Sqrt[a + b])]/(2*Sqrt[2]*Sqrt[a + b])
```

Maple [A] time = 0.005, size = 26, normalized size = 0.8

$$\frac{1}{2}\arctan\left(x^2\frac{1}{\sqrt{2\,a+2\,b}}\right)\frac{1}{\sqrt{2\,a+2\,b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(x^4+2*a+2*b),x)
```

```
[Out] 1/2/(2*a+2*b)^(1/2)*arctan(x^2/(2*a+2*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(x^4 + 2*a + 2*b),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.228364, size = 1, normalized size = 0.03

$$\left[\frac{\log\left(\frac{4\,(a+b)x^2+\left(x^4-2\,a-2\,b\right)\sqrt{-2\,a-2\,b}}{x^4+2\,a+2\,b}\right)}{4\,\sqrt{-2\,a-2\,b}}, -\frac{\arctan\left(\frac{\sqrt{2\,a+2\,b}}{x^2}\right)}{2\,\sqrt{2\,a+2\,b}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(x^4 + 2*a + 2*b),x, algorithm="fricas")
```

```
[Out] [1/4*log((4*(a + b)*x^2 + (x^4 - 2*a - 2*b)*sqrt(-2*a - 2*b))/(x^
4 + 2*a + 2*b))/sqrt(-2*a - 2*b), -1/2*arctan(sqrt(2*a + 2*b)/x^2
)/sqrt(2*a + 2*b)]
```

Sympy [A] time = 0.591826, size = 110, normalized size = 3.33

$$-\frac{\sqrt{2}\sqrt{-\frac{1}{a+b}}\log\left(-\sqrt{2}a\sqrt{-\frac{1}{a+b}}-\sqrt{2}b\sqrt{-\frac{1}{a+b}}+x^2\right)}{8}+\frac{\sqrt{2}\sqrt{-\frac{1}{a+b}}\log\left(\sqrt{2}a\sqrt{-\frac{1}{a+b}}+\sqrt{2}b\sqrt{-\frac{1}{a+b}}+x^2\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(x**4+2*a+2*b),x)
```

```
[Out] -sqrt(2)*sqrt(-1/(a + b))*log(-sqrt(2)*a*sqrt(-1/(a + b)) - sqrt(
2)*b*sqrt(-1/(a + b)) + x**2)/8 + sqrt(2)*sqrt(-1/(a + b))*log(sq
rt(2)*a*sqrt(-1/(a + b)) + sqrt(2)*b*sqrt(-1/(a + b)) + x**2)/8
```

GIAC/XCAS [A] time = 0.218041, size = 32, normalized size = 0.97

$$\frac{\sqrt{2}\arctan\left(\frac{\sqrt{2}x^2}{2\sqrt{a+b}}\right)}{4\sqrt{a+b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(x^4 + 2*a + 2*b),x, algorithm="giac")
```

```
[Out] 1/4*sqrt(2)*arctan(1/2*sqrt(2)*x^2/sqrt(a + b))/sqrt(a + b)
```

3.710 $\int \frac{x}{2(a+b)+x^4} \, dx$

Optimal. Leaf size=33

$$\frac{\tan^{-1}\left(\frac{x^2}{\sqrt{2}\sqrt{a+b}}\right)}{2\sqrt{2}\sqrt{a+b}}$$

```
[Out] ArcTan[x^2/(Sqrt[2]*Sqrt[a + b])]/(2*Sqrt[2]*Sqrt[a + b])
```

Rubi [A] time = 0.0336936, antiderivative size = 33, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{\tan^{-1}\left(\frac{x^2}{\sqrt{2}\sqrt{a+b}}\right)}{2\sqrt{2}\sqrt{a+b}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(2*(a + b) + x^4),x]

[Out] ArcTan[x^2/(Sqrt[2]*Sqrt[a + b])]/(2*Sqrt[2]*Sqrt[a + b])
```

Rubi in Sympy [A] time = 4.70543, size = 31, normalized size = 0.94

$$\frac{\sqrt{2}\,\operatorname{atan}\left(\frac{\sqrt{2}x^2}{2\sqrt{a+b}}\right)}{4\sqrt{a+b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(x**4+2*a+2*b),x)

[Out] sqrt(2)*atan(sqrt(2)*x**2/(2*sqrt(a + b)))/(4*sqrt(a + b))
```

Mathematica [A] time = 0.00854451, size = 33, normalized size = 1.

$$\frac{\tan^{-1}\left(\frac{x^2}{\sqrt{2}\sqrt{a+b}}\right)}{2\sqrt{2}\sqrt{a+b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(2*(a + b) + x^4),x]

[Out] ArcTan[x^2/(Sqrt[2]*Sqrt[a + b])]/(2*Sqrt[2]*Sqrt[a + b])
```

Maple [A] time = 0., size = 26, normalized size = 0.8

$$\frac{1}{2}\arctan\left(x^2\frac{1}{\sqrt{2\,a+2\,b}}\right)\frac{1}{\sqrt{2\,a+2\,b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(x^4+2*a+2*b),x)
```

```
[Out] 1/2/(2*a+2*b)^(1/2)*arctan(x^2/(2*a+2*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(x^4 + 2*a + 2*b),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.233484, size = 1, normalized size = 0.03

$$\left[\frac{\log\left(\frac{4\,(a+b)x^2+\left(x^4-2\,a-2\,b\right)\sqrt{-2\,a-2\,b}}{x^4+2\,a+2\,b}\right)}{4\,\sqrt{-2\,a-2\,b}}, -\frac{\arctan\left(\frac{\sqrt{2\,a+2\,b}}{x^2}\right)}{2\,\sqrt{2\,a+2\,b}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(x^4 + 2*a + 2*b),x, algorithm="fricas")
```

```
[Out] [1/4*log((4*(a + b)*x^2 + (x^4 - 2*a - 2*b)*sqrt(-2*a - 2*b))/(x^
4 + 2*a + 2*b))/sqrt(-2*a - 2*b), -1/2*arctan(sqrt(2*a + 2*b)/x^2
)/sqrt(2*a + 2*b)]
```

Sympy [A] time = 0.599132, size = 110, normalized size = 3.33

$$-\frac{\sqrt{2}\sqrt{-\frac{1}{a+b}}\log\left(-\sqrt{2}a\sqrt{-\frac{1}{a+b}}-\sqrt{2}b\sqrt{-\frac{1}{a+b}}+x^2\right)}{8}+\frac{\sqrt{2}\sqrt{-\frac{1}{a+b}}\log\left(\sqrt{2}a\sqrt{-\frac{1}{a+b}}+\sqrt{2}b\sqrt{-\frac{1}{a+b}}+x^2\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(x**4+2*a+2*b),x)
```

```
[Out] -sqrt(2)*sqrt(-1/(a + b))*log(-sqrt(2)*a*sqrt(-1/(a + b)) - sqrt(
2)*b*sqrt(-1/(a + b)) + x**2)/8 + sqrt(2)*sqrt(-1/(a + b))*log(sq
rt(2)*a*sqrt(-1/(a + b)) + sqrt(2)*b*sqrt(-1/(a + b)) + x**2)/8
```

GIAC/XCAS [A] time = 0.215663, size = 32, normalized size = 0.97

$$\frac{\sqrt{2}\arctan\left(\frac{\sqrt{2}x^2}{2\,\sqrt{a+b}}\right)}{4\,\sqrt{a+b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(x^4 + 2*a + 2*b),x, algorithm="giac")
```

```
[Out] 1/4*sqrt(2)*arctan(1/2*sqrt(2)*x^2/sqrt(a + b))/sqrt(a + b)
```

3.711 $\int \frac{x^2}{2a+2b+x^4}\,dx$

Optimal. Leaf size=79

$$\frac{\tan^{-1}\left(\frac{x}{\sqrt[4]{2}\sqrt[4]{-a-b}}\right)}{2\sqrt[4]{2}\sqrt[4]{-a-b}}-\frac{\tanh^{-1}\left(\frac{x}{\sqrt[4]{2}\sqrt[4]{-a-b}}\right)}{2\sqrt[4]{2}\sqrt[4]{-a-b}}$$

```
[Out] ArcTan[x/(2^(1/4)*(-a - b)^(1/4))]/(2*2^(1/4)*(-a - b)^(1/4)) - A
rcTanh[x/(2^(1/4)*(-a - b)^(1/4))]/(2*2^(1/4)*(-a - b)^(1/4))
```

Rubi [A] time = 0.0636917, antiderivative size = 79, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.188

$$\frac{\tan^{-1}\left(\frac{x}{\sqrt[4]{2}\sqrt[4]{-a-b}}\right)}{2\sqrt[4]{2}\sqrt[4]{-a-b}}-\frac{\tanh^{-1}\left(\frac{x}{\sqrt[4]{2}\sqrt[4]{-a-b}}\right)}{2\sqrt[4]{2}\sqrt[4]{-a-b}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(2*a + 2*b + x^4),x]
```

```
[Out] ArcTan[x/(2^(1/4)*(-a - b)^(1/4))]/(2*2^(1/4)*(-a - b)^(1/4)) - A
rcTanh[x/(2^(1/4)*(-a - b)^(1/4))]/(2*2^(1/4)*(-a - b)^(1/4))
```

Rubi in Sympy [A] time = 11.0372, size = 66, normalized size = 0.84

$$\frac{2^{\frac{3}{4}}\operatorname{atan}\left(\frac{2^{\frac{3}{4}}x}{2\sqrt[4]{-a-b}}\right)}{4\sqrt[4]{-a-b}}-\frac{2^{\frac{3}{4}}\operatorname{atanh}\left(\frac{2^{\frac{3}{4}}x}{2\sqrt[4]{-a-b}}\right)}{4\sqrt[4]{-a-b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(x**4+2*a+2*b),x)
```

```
[Out] 2**(3/4)*atan(2**(3/4)*x/(2*(-a - b)**(1/4)))/(4*(-a - b)**(1/4))
 - 2**(3/4)*atanh(2**(3/4)*x/(2*(-a - b)**(1/4)))/(4*(-a - b)**(1
/4))
```

Mathematica [A] time = 0.0524769, size = 128, normalized size = 1.62

$$\frac{\log\left(-2\sqrt[4]{2}x\sqrt[4]{a+b}+2\sqrt{a+b}+\sqrt{2}x^2\right)-\log\left(2\sqrt[4]{2}x\sqrt[4]{a+b}+2\sqrt{a+b}+\sqrt{2}x^2\right)-2\tan^{-1}\left(1-\frac{\sqrt[4]{2}x}{\sqrt[4]{a+b}}\right)+2\tan^{-1}\left(\frac{\sqrt[4]{2}x}{\sqrt[4]{a+b}}\right.}{4\,2^{3/4}\sqrt[4]{a+b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(2*a + 2*b + x^4),x]
```

```
[Out] (-2*ArcTan[1 - (2^(1/4)*x)/(a + b)^(1/4)] + 2*ArcTan[1 + (2^(1/4)
*x)/(a + b)^(1/4)] + Log[2*Sqrt[a + b] - 2*2^(1/4)*(a + b)^(1/4)*
x + Sqrt[2]*x^2] - Log[2*Sqrt[a + b] + 2*2^(1/4)*(a + b)^(1/4)*x
+ Sqrt[2]*x^2])/(4*2^(3/4)*(a + b)^(1/4))
```

Maple [B] time = 0.005, size = 137, normalized size = 1.7

$$\frac{\sqrt{2}}{8}\ln\left(1\left(x^2-\sqrt[4]{2a+2b}\,x\sqrt{2}+\sqrt{2a+2b}\right)\left(x^2+\sqrt[4]{2a+2b}\,x\sqrt{2}+\sqrt{2a+2b}\right)^{-1}\right)\frac{1}{\sqrt[4]{2a+2b}}+\frac{\sqrt{2}}{4}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{2a+2b}}+1\right)\frac{1}{\sqrt[4]{2a+2b}}+\frac{\sqrt{2}}{4}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{2a+2b}}-1\right)\frac{1}{\sqrt[4]{2a+2b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(x^4+2*a+2*b),x)
```

```
[Out] 1/8/(2*a+2*b)^(1/4)*2^(1/2)*ln((x^2-(2*a+2*b)^(1/4)*x*2^(1/2)+(2*
a+2*b)^(1/2))/(x^2+(2*a+2*b)^(1/4)*x*2^(1/2)+(2*a+2*b)^(1/2)))+1/
4/(2*a+2*b)^(1/4)*2^(1/2)*arctan(2^(1/2)/(2*a+2*b)^(1/4)*x+1)+1/4
/(2*a+2*b)^(1/4)*2^(1/2)*arctan(2^(1/2)/(2*a+2*b)^(1/4)*x-1)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(x^4 + 2*a + 2*b),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.241995, size = 171, normalized size = 2.16

$$\left(\frac{1}{2}\right)^{\frac{1}{4}}\left(-\frac{1}{a+b}\right)^{\frac{1}{4}}\arctan\left(\frac{2\left(\frac{1}{2}\right)^{\frac{3}{4}}(a+b)\left(-\frac{1}{a+b}\right)^{\frac{3}{4}}}{x+\sqrt{x^2-2\sqrt{\frac{1}{2}}(a+b)\sqrt{-\frac{1}{a+b}}}}\right)+\frac{1}{4}\left(\frac{1}{2}\right)^{\frac{1}{4}}\left(-\frac{1}{a+b}\right)^{\frac{1}{4}}\log\left(2\left(\frac{1}{2}\right)^{\frac{3}{4}}(a+b)\left(-\frac{1}{a+b}\right)^{\frac{3}{4}}+x\right)-\frac{1}{4}\left(\frac{1}{2}\right)^{\frac{1}{4}}\left(-\frac{1}{a+b}\right)^{\frac{1}{4}}\log\left(-2\left(\frac{1}{2}\right)^{\frac{3}{4}}(a+b)\left(-\frac{1}{a+b}\right)^{\frac{3}{4}}+x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(x^4 + 2*a + 2*b),x, algorithm="fricas")
```

```
[Out] (1/2)^(1/4)*(-1/(a + b))^(1/4)*arctan(2*(1/2)^(3/4)*(a + b)*(-1/(
a + b))^(3/4)/(x + sqrt(x^2 - 2*sqrt(1/2)*(a + b)*sqrt(-1/(a + b)
)))) + 1/4*(1/2)^(1/4)*(-1/(a + b))^(1/4)*log(2*(1/2)^(3/4)*(a +
b)*(-1/(a + b))^(3/4) + x) - 1/4*(1/2)^(1/4)*(-1/(a + b))^(1/4)*l
og(-2*(1/2)^(3/4)*(a + b)*(-1/(a + b))^(3/4) + x)
```

Sympy [A] time = 0.506423, size = 29, normalized size = 0.37

$$\operatorname{RootSum}\left(t^4(512a+512b)+1,\left(t\mapsto t\log\left(128t^3a+128t^3b+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(x**4+2*a+2*b),x)
```

```
[Out] RootSum(_t**4*(512*a + 512*b) + 1, Lambda(_t, _t*log(128*_t**3*a
+ 128*_t**3*b + x)))
```

GIAC/XCAS [A] time = 0.224454, size = 296, normalized size = 3.75

$$\frac{(2\,a+2\,b)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x+\sqrt{2}(2\,a+2\,b)^{\frac{1}{4}}\right)}{2\,(2\,a+2\,b)^{\frac{1}{4}}}\right)}{4\left(\sqrt{2}a+\sqrt{2}b\right)}+\frac{(2\,a+2\,b)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x-\sqrt{2}(2\,a+2\,b)^{\frac{1}{4}}\right)}{2\,(2\,a+2\,b)^{\frac{1}{4}}}\right)}{4\left(\sqrt{2}a+\sqrt{2}b\right)}-\frac{(2\,a+2\,b)^{\frac{3}{4}}\ln\left(x^2+\sqrt{2}(2\,a+2\,b)^{\frac{1}{4}}x+\sqrt{2\,a+2\,b}\right)}{8\left(\sqrt{2}a+\sqrt{2}b\right)}+\frac{(2\,a+2\,b)^{\frac{3}{4}}\ln\left(x^2-\sqrt{2}(2\,a+2\,b)^{\frac{1}{4}}x+\sqrt{2\,a+2\,b}\right)}{8\left(\sqrt{2}a+\sqrt{2}b\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(x^4 + 2*a + 2*b),x, algorithm="giac")
```

```
[Out] 1/4*(2*a + 2*b)^(3/4)*arctan(1/2*sqrt(2)*(2*x + sqrt(2)*(2*a + 2*
b)^(1/4))/(2*a + 2*b)^(1/4))/(sqrt(2)*a + sqrt(2)*b) + 1/4*(2*a +
 2*b)^(3/4)*arctan(1/2*sqrt(2)*(2*x - sqrt(2)*(2*a + 2*b)^(1/4))/
(2*a + 2*b)^(1/4))/(sqrt(2)*a + sqrt(2)*b) - 1/8*(2*a + 2*b)^(3/4
)*ln(x^2 + sqrt(2)*(2*a + 2*b)^(1/4)*x + sqrt(2*a + 2*b))/(sqrt(2
)*a + sqrt(2)*b) + 1/8*(2*a + 2*b)^(3/4)*ln(x^2 - sqrt(2)*(2*a +
2*b)^(1/4)*x + sqrt(2*a + 2*b))/(sqrt(2)*a + sqrt(2)*b)
```

3.712 $\int \frac{x^2}{2(a+b)+x^4} \, dx$

Optimal. Leaf size=79

$$\frac{\tan^{-1}\left(\frac{x}{\sqrt[4]{2}\sqrt[4]{-a-b}}\right)}{2\sqrt[4]{2}\sqrt[4]{-a-b}}-\frac{\tanh^{-1}\left(\frac{x}{\sqrt[4]{2}\sqrt[4]{-a-b}}\right)}{2\sqrt[4]{2}\sqrt[4]{-a-b}}$$

```
[Out] ArcTan[x/(2^(1/4)*(-a - b)^(1/4))]/(2*2^(1/4)*(-a - b)^(1/4)) - A
rcTanh[x/(2^(1/4)*(-a - b)^(1/4))]/(2*2^(1/4)*(-a - b)^(1/4))
```

Rubi [A] time = 0.062781, antiderivative size = 79, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{\tan^{-1}\left(\frac{x}{\sqrt[4]{2}\sqrt[4]{-a-b}}\right)}{2\sqrt[4]{2}\sqrt[4]{-a-b}}-\frac{\tanh^{-1}\left(\frac{x}{\sqrt[4]{2}\sqrt[4]{-a-b}}\right)}{2\sqrt[4]{2}\sqrt[4]{-a-b}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(2*(a + b) + x^4),x]
```

```
[Out] ArcTan[x/(2^(1/4)*(-a - b)^(1/4))]/(2*2^(1/4)*(-a - b)^(1/4)) - A
rcTanh[x/(2^(1/4)*(-a - b)^(1/4))]/(2*2^(1/4)*(-a - b)^(1/4))
```

Rubi in Sympy [A] time = 11.1388, size = 66, normalized size = 0.84

$$\frac{2^{\frac{3}{4}}\operatorname{atan}\left(\frac{2^{\frac{3}{4}}x}{2\sqrt[4]{-a-b}}\right)}{4\sqrt[4]{-a-b}}-\frac{2^{\frac{3}{4}}\operatorname{atanh}\left(\frac{2^{\frac{3}{4}}x}{2\sqrt[4]{-a-b}}\right)}{4\sqrt[4]{-a-b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(x**4+2*a+2*b),x)
```

```
[Out] 2**(3/4)*atan(2**(3/4)*x/(2*(-a - b)**(1/4)))/(4*(-a - b)**(1/4))
 - 2**(3/4)*atanh(2**(3/4)*x/(2*(-a - b)**(1/4)))/(4*(-a - b)**(1
/4))
```

Mathematica [A] time = 0.0205576, size = 128, normalized size = 1.62

$$\frac{\log\left(-2\sqrt[4]{2}x\sqrt[4]{a+b}+2\sqrt{a+b}+\sqrt{2}x^2\right)-\log\left(2\sqrt[4]{2}x\sqrt[4]{a+b}+2\sqrt{a+b}+\sqrt{2}x^2\right)-2\tan^{-1}\left(1-\frac{\sqrt[4]{2}x}{\sqrt[4]{a+b}}\right)+2\tan^{-1}\left(\frac{\sqrt[4]{2}x}{\sqrt[4]{a+b}}\right.}{4\,2^{3/4}\sqrt[4]{a+b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(2*(a + b) + x^4),x]
```

```
[Out] (-2*ArcTan[1 - (2^(1/4)*x)/(a + b)^(1/4)] + 2*ArcTan[1 + (2^(1/4)
*x)/(a + b)^(1/4)] + Log[2*Sqrt[a + b] - 2*2^(1/4)*(a + b)^(1/4)*
x + Sqrt[2]*x^2] - Log[2*Sqrt[a + b] + 2*2^(1/4)*(a + b)^(1/4)*x
+ Sqrt[2]*x^2])/(4*2^(3/4)*(a + b)^(1/4))
```

Maple [B] time = 0., size = 137, normalized size = 1.7

$$\frac{\sqrt{2}}{8}\ln\left(1\left(x^{2}-\sqrt[4]{2a+2b}\,x\sqrt{2}+\sqrt{2a+2b}\right)\left(x^{2}+\sqrt[4]{2a+2b}\,x\sqrt{2}+\sqrt{2a+2b}\right)^{-1}\right)\frac{1}{\sqrt[4]{2a+2b}}+\frac{\sqrt{2}}{4}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{2a+2b}}+1\right)\frac{1}{\sqrt[4]{2a+2b}}+\frac{\sqrt{2}}{4}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{2a+2b}}-1\right)\frac{1}{\sqrt[4]{2a+2b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(x^4+2*a+2*b),x)
```

```
[Out] 1/8/(2*a+2*b)^(1/4)*2^(1/2)*ln((x^2-(2*a+2*b)^(1/4)*x*2^(1/2)+(2*
a+2*b)^(1/2))/(x^2+(2*a+2*b)^(1/4)*x*2^(1/2)+(2*a+2*b)^(1/2)))+1/
4/(2*a+2*b)^(1/4)*2^(1/2)*arctan(2^(1/2)/(2*a+2*b)^(1/4)*x+1)+1/4
/(2*a+2*b)^(1/4)*2^(1/2)*arctan(2^(1/2)/(2*a+2*b)^(1/4)*x-1)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(x^4 + 2*a + 2*b),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.234493, size = 171, normalized size = 2.16

$$\left(\frac{1}{2}\right)^{\frac{1}{4}}\left(-\frac{1}{a+b}\right)^{\frac{1}{4}}\arctan\left(\frac{2\left(\frac{1}{2}\right)^{\frac{3}{4}}(a+b)\left(-\frac{1}{a+b}\right)^{\frac{3}{4}}}{x+\sqrt{x^{2}-2\sqrt{\frac{1}{2}}(a+b)\sqrt{-\frac{1}{a+b}}}}\right)+\frac{1}{4}\left(\frac{1}{2}\right)^{\frac{1}{4}}\left(-\frac{1}{a+b}\right)^{\frac{1}{4}}\log\left(2\left(\frac{1}{2}\right)^{\frac{3}{4}}(a+b)\left(-\frac{1}{a+b}\right)^{\frac{3}{4}}+x\right)-\frac{1}{4}\left(\frac{1}{2}\right)^{\frac{1}{4}}\left(-\frac{1}{a+b}\right)^{\frac{1}{4}}\log\left(-2\left(\frac{1}{2}\right)^{\frac{3}{4}}(a+b)\left(-\frac{1}{a+b}\right)^{\frac{3}{4}}+x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(x^4 + 2*a + 2*b),x, algorithm="fricas")
```

```
[Out] (1/2)^(1/4)*(-1/(a + b))^(1/4)*arctan(2*(1/2)^(3/4)*(a + b)*(-1/(
a + b))^(3/4)/(x + sqrt(x^2 - 2*sqrt(1/2)*(a + b)*sqrt(-1/(a + b)
)))) + 1/4*(1/2)^(1/4)*(-1/(a + b))^(1/4)*log(2*(1/2)^(3/4)*(a +
b)*(-1/(a + b))^(3/4) + x) - 1/4*(1/2)^(1/4)*(-1/(a + b))^(1/4)*l
og(-2*(1/2)^(3/4)*(a + b)*(-1/(a + b))^(3/4) + x)
```

Sympy [A] time = 0.500326, size = 29, normalized size = 0.37

$$\operatorname{RootSum}\left(t^{4}(512a+512b)+1,\left(t\mapsto t\log\left(128t^{3}a+128t^{3}b+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(x**4+2*a+2*b),x)
```

```
[Out] RootSum(_t**4*(512*a + 512*b) + 1, Lambda(_t, _t*log(128*_t**3*a
+ 128*_t**3*b + x)))
```

GIAC/XCAS [A] time = 0.22104, size = 296, normalized size = 3.75

$$\frac{(2\,a+2\,b)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x+\sqrt{2}(2\,a+2\,b)^{\frac{1}{4}}\right)}{2\,(2\,a+2\,b)^{\frac{1}{4}}}\right)}{4\left(\sqrt{2}a+\sqrt{2}b\right)}+\frac{(2\,a+2\,b)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x-\sqrt{2}(2\,a+2\,b)^{\frac{1}{4}}\right)}{2\,(2\,a+2\,b)^{\frac{1}{4}}}\right)}{4\left(\sqrt{2}a+\sqrt{2}b\right)}-\frac{(2\,a+2\,b)^{\frac{3}{4}}\ln\left(x^2+\sqrt{2}(2\,a+2\,b)^{\frac{1}{4}}x+\sqrt{2\,a+2\,b}\right)}{8\left(\sqrt{2}a+\sqrt{2}b\right)}+\frac{(2\,a+2\,b)^{\frac{3}{4}}\ln\left(x^2-\sqrt{2}(2\,a+2\,b)^{\frac{1}{4}}x+\sqrt{2\,a+2\,b}\right)}{8\left(\sqrt{2}a+\sqrt{2}b\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(x^4 + 2*a + 2*b),x, algorithm="giac")
```

```
[Out] 1/4*(2*a + 2*b)^(3/4)*arctan(1/2*sqrt(2)*(2*x + sqrt(2)*(2*a + 2*
b)^(1/4))/(2*a + 2*b)^(1/4))/(sqrt(2)*a + sqrt(2)*b) + 1/4*(2*a +
 2*b)^(3/4)*arctan(1/2*sqrt(2)*(2*x - sqrt(2)*(2*a + 2*b)^(1/4))/
(2*a + 2*b)^(1/4))/(sqrt(2)*a + sqrt(2)*b) - 1/8*(2*a + 2*b)^(3/4
)*ln(x^2 + sqrt(2)*(2*a + 2*b)^(1/4)*x + sqrt(2*a + 2*b))/(sqrt(2
)*a + sqrt(2)*b) + 1/8*(2*a + 2*b)^(3/4)*ln(x^2 - sqrt(2)*(2*a +
2*b)^(1/4)*x + sqrt(2*a + 2*b))/(sqrt(2)*a + sqrt(2)*b)
```

3.713 $\int \frac{x^3}{2a+2b+x^4} \, dx$

Optimal. Leaf size=14

$$\frac{1}{4}\log\left(2(a+b)+x^4\right)$$

```
[Out] Log[2*(a + b) + x^4]/4
```

Rubi [A] time = 0.00731769, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062

$$\frac{1}{4}\log\left(2(a+b)+x^4\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(2*a + 2*b + x^4),x]

[Out] Log[2*(a + b) + x^4]/4
```

Rubi in Sympy [A] time = 2.51146, size = 12, normalized size = 0.86

$$\frac{\log\left(2a+2b+x^4\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(x**4+2*a+2*b),x)

[Out] log(2*a + 2*b + x**4)/4
```

Mathematica [A] time = 0.00609792, size = 15, normalized size = 1.07

$$\frac{1}{4}\log\left(2a+2b+x^4\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(2*a + 2*b + x^4),x]

[Out] Log[2*a + 2*b + x^4]/4
```

Maple [A] time = 0.002, size = 14, normalized size = 1.

$$\frac{\ln\left(x^4+2\,a+2\,b\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(x^4+2*a+2*b),x)

[Out] 1/4*ln(x^4+2*a+2*b)
```

MaximA [A] time = 1.44358, size = 18, normalized size = 1.29

$$\frac{1}{4}\,\log\left(x^4+2\,a+2\,b\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(x^4 + 2*a + 2*b),x, algorithm="maxima")

[Out] 1/4*log(x^4 + 2*a + 2*b)
```

Fricas [A] time = 0.21954, size = 18, normalized size = 1.29

$$\frac{1}{4}\,\log\left(x^4+2\,a+2\,b\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(x^4 + 2*a + 2*b),x, algorithm="fricas")

[Out] 1/4*log(x^4 + 2*a + 2*b)
```

Sympy [A] time = 0.355697, size = 12, normalized size = 0.86

$$\frac{\log\left(2a+2b+x^4\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(x**4+2*a+2*b),x)

[Out] log(2*a + 2*b + x**4)/4
```

GIAC/XCAS [A] time = 0.223345, size = 19, normalized size = 1.36

$$\frac{1}{4}\ln\left(\left|x^4+2\,a+2\,b\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(x^4 + 2*a + 2*b),x, algorithm="giac")

[Out] 1/4*ln(abs(x^4 + 2*a + 2*b))
```

3.714 $\int \frac{x^3}{2(a+b)+x^4} dx$

Optimal. Leaf size=14

$$\frac{1}{4}\log\left(2(a+b)+x^4\right)$$

```
[Out] Log[2*(a + b) + x^4]/4
```

Rubi [A] time = 0.00716794, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{1}{4}\log\left(2(a+b)+x^4\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(2*(a + b) + x^4),x]

[Out] Log[2*(a + b) + x^4]/4
```

Rubi in Sympy [A] time = 2.52253, size = 12, normalized size = 0.86

$$\frac{\log\left(2a+2b+x^4\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(x**4+2*a+2*b),x)

[Out] log(2*a + 2*b + x**4)/4
```

Mathematica [A] time = 0.00625663, size = 15, normalized size = 1.07

$$\frac{1}{4}\log\left(2a+2b+x^4\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(2*(a + b) + x^4),x]

[Out] Log[2*a + 2*b + x^4]/4
```

Maple [A] time = 0., size = 14, normalized size = 1.

$$\frac{\ln\left(x^4+2a+2b\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(x^4+2*a+2*b),x)

[Out] 1/4*ln(x^4+2*a+2*b)
```

Maxima [A] time = 1.47282, size = 18, normalized size = 1.29

$$\frac{1}{4}\,\log\left(x^{4}+2\,a+2\,b\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(x^4 + 2*a + 2*b),x, algorithm="maxima")
```

```
[Out] 1/4*log(x^4 + 2*a + 2*b)
```

Fricas [A] time = 0.220404, size = 18, normalized size = 1.29

$$\frac{1}{4}\,\log\left(x^{4}+2\,a+2\,b\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(x^4 + 2*a + 2*b),x, algorithm="fricas")
```

```
[Out] 1/4*log(x^4 + 2*a + 2*b)
```

Sympy [A] time = 0.349603, size = 12, normalized size = 0.86

$$\frac{\log\left(2a+2b+x^{4}\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(x**4+2*a+2*b),x)
```

```
[Out] log(2*a + 2*b + x**4)/4
```

GIAC/XCAS [A] time = 0.225268, size = 19, normalized size = 1.36

$$\frac{1}{4}\,\ln\left(\left|x^{4}+2\,a+2\,b\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(x^4 + 2*a + 2*b),x, algorithm="giac")
```

```
[Out] 1/4*ln(abs(x^4 + 2*a + 2*b))
```

3.715 $\int x^{5/2}\left(a+cx^4\right)\,dx$

Optimal. Leaf size=21

$$\frac{2}{7}ax^{7/2}+\frac{2}{15}cx^{15/2}$$

```
[Out] (2*a*x^(7/2))/7 + (2*c*x^(15/2))/15
```

Rubi [A] time = 0.0119542, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{2}{7}ax^{7/2}+\frac{2}{15}cx^{15/2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(5/2)*(a + c*x^4),x]

[Out] (2*a*x^(7/2))/7 + (2*c*x^(15/2))/15
```

Rubi in Sympy [A] time = 2.61917, size = 19, normalized size = 0.9

$$\frac{2ax^{\frac{7}{2}}}{7}+\frac{2cx^{\frac{15}{2}}}{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(5/2)*(c*x**4+a),x)

[Out] 2*a*x**(7/2)/7 + 2*c*x**(15/2)/15
```

Mathematica [A] time = 0.00762455, size = 21, normalized size = 1.

$$\frac{2}{7}ax^{7/2}+\frac{2}{15}cx^{15/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(5/2)*(a + c*x^4),x]

[Out] (2*a*x^(7/2))/7 + (2*c*x^(15/2))/15
```

Maple [A] time = 0.006, size = 16, normalized size = 0.8

$$\frac{14\,cx^4+30\,a}{105}x^{\frac{7}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(5/2)*(c*x^4+a),x)

[Out] 2/105*x^(7/2)*(7*c*x^4+15*a)
```

Maxima [A] time = 1.44899, size = 18, normalized size = 0.86

$$\frac{2}{15}\,cx^{\frac{15}{2}} + \frac{2}{7}\,ax^{\frac{7}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)*x^(5/2),x, algorithm="maxima")
```

```
[Out] 2/15*c*x^(15/2) + 2/7*a*x^(7/2)
```

Fricas [A] time = 0.227247, size = 24, normalized size = 1.14

$$\frac{2}{105}\left(7\,cx^7 + 15\,ax^3\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)*x^(5/2),x, algorithm="fricas")
```

```
[Out] 2/105*(7*c*x^7 + 15*a*x^3)*sqrt(x)
```

Sympy [A] time = 18.9275, size = 19, normalized size = 0.9

$$\frac{2ax^{\frac{7}{2}}}{7} + \frac{2cx^{\frac{15}{2}}}{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(5/2)*(c*x**4+a),x)
```

```
[Out] 2*a*x**(7/2)/7 + 2*c*x**(15/2)/15
```

GIAC/XCAS [A] time = 0.215617, size = 18, normalized size = 0.86

$$\frac{2}{15}\,cx^{\frac{15}{2}} + \frac{2}{7}\,ax^{\frac{7}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)*x^(5/2),x, algorithm="giac")
```

```
[Out] 2/15*c*x^(15/2) + 2/7*a*x^(7/2)
```

3.716 $\int x^{3/2}(a+cx^4)\,dx$

Optimal. Leaf size=21

$$\frac{2}{5}ax^{5/2}+\frac{2}{13}cx^{13/2}$$

```
[Out] (2*a*x^(5/2))/5 + (2*c*x^(13/2))/13
```

Rubi [A] time = 0.0162308, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{2}{5}ax^{5/2}+\frac{2}{13}cx^{13/2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(3/2)*(a + c*x^4),x]

[Out] (2*a*x^(5/2))/5 + (2*c*x^(13/2))/13
```

Rubi in Sympy [A] time = 2.60835, size = 19, normalized size = 0.9

$$\frac{2ax^{\frac{5}{2}}}{5}+\frac{2cx^{\frac{13}{2}}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(3/2)*(c*x**4+a),x)

[Out] 2*a*x**(5/2)/5 + 2*c*x**(13/2)/13
```

Mathematica [A] time = 0.00728537, size = 21, normalized size = 1.

$$\frac{2}{5}ax^{5/2}+\frac{2}{13}cx^{13/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(3/2)*(a + c*x^4),x]

[Out] (2*a*x^(5/2))/5 + (2*c*x^(13/2))/13
```

Maple [A] time = 0.004, size = 16, normalized size = 0.8

$$\frac{10\,cx^4+26\,a}{65}x^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(3/2)*(c*x^4+a),x)

[Out] 2/65*x^(5/2)*(5*c*x^4+13*a)
```

Maxima [A] time = 1.45482, size = 18, normalized size = 0.86

$$\frac{2}{13}\,cx^{\frac{13}{2}} + \frac{2}{5}\,ax^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)*x^(3/2),x, algorithm="maxima")
```

```
[Out] 2/13*c*x^(13/2) + 2/5*a*x^(5/2)
```

Fricas [A] time = 0.224731, size = 24, normalized size = 1.14

$$\frac{2}{65}\left(5\,cx^{6} + 13\,ax^{2}\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)*x^(3/2),x, algorithm="fricas")
```

```
[Out] 2/65*(5*c*x^6 + 13*a*x^2)*sqrt(x)
```

Sympy [A] time = 7.82112, size = 19, normalized size = 0.9

$$\frac{2ax^{\frac{5}{2}}}{5} + \frac{2cx^{\frac{13}{2}}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(3/2)*(c*x**4+a),x)
```

```
[Out] 2*a*x**(5/2)/5 + 2*c*x**(13/2)/13
```

GIAC/XCAS [A] time = 0.210789, size = 18, normalized size = 0.86

$$\frac{2}{13}\,cx^{\frac{13}{2}} + \frac{2}{5}\,ax^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)*x^(3/2),x, algorithm="giac")
```

```
[Out] 2/13*c*x^(13/2) + 2/5*a*x^(5/2)
```

3.717 $\int \sqrt{x} \left(a+cx^4\right) \, dx$

Optimal. Leaf size=21

$$\frac{2}{3}ax^{3/2}+\frac{2}{11}cx^{11/2}$$

```
[Out] (2*a*x^(3/2))/3 + (2*c*x^(11/2))/11
```

Rubi [A] time = 0.0162625, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{2}{3}ax^{3/2}+\frac{2}{11}cx^{11/2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[x]*(a + c*x^4),x]

[Out] (2*a*x^(3/2))/3 + (2*c*x^(11/2))/11
```

Rubi in Sympy [A] time = 2.65604, size = 19, normalized size = 0.9

$$\frac{2ax^{\frac{3}{2}}}{3}+\frac{2cx^{\frac{11}{2}}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)*x**(1/2),x)

[Out] 2*a*x**(3/2)/3 + 2*c*x**(11/2)/11
```

Mathematica [A] time = 0.0071129, size = 21, normalized size = 1.

$$\frac{2}{3}ax^{3/2}+\frac{2}{11}cx^{11/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[x]*(a + c*x^4),x]

[Out] (2*a*x^(3/2))/3 + (2*c*x^(11/2))/11
```

Maple [A] time = 0.005, size = 16, normalized size = 0.8

$$\frac{6\,cx^4+22\,a}{33}x^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)*x^(1/2),x)

[Out] 2/33*x^(3/2)*(3*c*x^4+11*a)
```

Maxima [A] time = 1.50853, size = 18, normalized size = 0.86

$$\frac{2}{11}\,cx^{\frac{11}{2}} + \frac{2}{3}\,ax^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)*sqrt(x),x, algorithm="maxima")

[Out] 2/11*c*x^(11/2) + 2/3*a*x^(3/2)
```

Fricas [A] time = 0.224774, size = 22, normalized size = 1.05

$$\frac{2}{33}\left(3\,cx^{5} + 11\,ax\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)*sqrt(x),x, algorithm="fricas")

[Out] 2/33*(3*c*x^5 + 11*a*x)*sqrt(x)
```

Sympy [A] time = 2.30966, size = 19, normalized size = 0.9

$$\frac{2ax^{\frac{3}{2}}}{3} + \frac{2cx^{\frac{11}{2}}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)*x**(1/2),x)

[Out] 2*a*x**(3/2)/3 + 2*c*x**(11/2)/11
```

GIAC/XCAS [A] time = 0.213894, size = 18, normalized size = 0.86

$$\frac{2}{11}\,cx^{\frac{11}{2}} + \frac{2}{3}\,ax^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)*sqrt(x),x, algorithm="giac")

[Out] 2/11*c*x^(11/2) + 2/3*a*x^(3/2)
```

3.718 $\int \frac{a+cx^4}{\sqrt{x}}\,dx$

Optimal. Leaf size=19

$$2a\sqrt{x} + \frac{2}{9}cx^{9/2}$$

```
[Out] 2*a*Sqrt[x] + (2*c*x^(9/2))/9
```

Rubi [A] time = 0.0137599, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$2a\sqrt{x} + \frac{2}{9}cx^{9/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + c*x^4)/Sqrt[x],x]

[Out] 2*a*Sqrt[x] + (2*c*x^(9/2))/9
```

Rubi in Sympy [A] time = 2.63539, size = 17, normalized size = 0.89

$$2a\sqrt{x} + \frac{2cx^{\frac{9}{2}}}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)/x**(1/2),x)

[Out] 2*a*sqrt(x) + 2*c*x**(9/2)/9
```

Mathematica [A] time = 0.00657469, size = 19, normalized size = 1.

$$2a\sqrt{x} + \frac{2}{9}cx^{9/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + c*x^4)/Sqrt[x],x]

[Out] 2*a*Sqrt[x] + (2*c*x^(9/2))/9
```

Maple [A] time = 0.003, size = 15, normalized size = 0.8

$$\frac{2\,cx^4 + 18\,a}{9}\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)/x^(1/2),x)

[Out] 2/9*x^(1/2)*(c*x^4+9*a)
```

Maxima [A] time = 1.43583, size = 18, normalized size = 0.95

$$\frac{2}{9}\,cx^{\frac{9}{2}} + 2\,a\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)/sqrt(x),x, algorithm="maxima")
```

```
[Out] 2/9*c*x^(9/2) + 2*a*sqrt(x)
```

Fricas [A] time = 0.239344, size = 19, normalized size = 1.

$$\frac{2}{9}\,\left(cx^{4} + 9\,a\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)/sqrt(x),x, algorithm="fricas")
```

```
[Out] 2/9*(c*x^4 + 9*a)*sqrt(x)
```

Sympy [A] time = 1.95418, size = 17, normalized size = 0.89

$$2a\sqrt{x} + \frac{2cx^{\frac{9}{2}}}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)/x**(1/2),x)
```

```
[Out] 2*a*sqrt(x) + 2*c*x**(9/2)/9
```

GIAC/XCAS [A] time = 0.211987, size = 18, normalized size = 0.95

$$\frac{2}{9}\,cx^{\frac{9}{2}} + 2\,a\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)/sqrt(x),x, algorithm="giac")
```

```
[Out] 2/9*c*x^(9/2) + 2*a*sqrt(x)
```

3.719 $\int \frac{a+cx^4}{x^{3/2}} dx$

Optimal. Leaf size=19

$$\frac{2}{7}cx^{7/2} - \frac{2a}{\sqrt{x}}$$

```
[Out] (-2*a)/Sqrt[x] + (2*c*x^(7/2))/7
```

Rubi [A] time = 0.0117597, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{2}{7}cx^{7/2} - \frac{2a}{\sqrt{x}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + c*x^4)/x^(3/2),x]

[Out] (-2*a)/Sqrt[x] + (2*c*x^(7/2))/7
```

Rubi in Sympy [A] time = 2.62062, size = 17, normalized size = 0.89

$$-\frac{2a}{\sqrt{x}} + \frac{2cx^{\frac{7}{2}}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)/x**(3/2),x)

[Out] -2*a/sqrt(x) + 2*c*x**(7/2)/7
```

Mathematica [A] time = 0.00802901, size = 19, normalized size = 1.

$$\frac{2}{7}cx^{7/2} - \frac{2a}{\sqrt{x}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + c*x^4)/x^(3/2),x]

[Out] (-2*a)/Sqrt[x] + (2*c*x^(7/2))/7
```

Maple [A] time = 0.004, size = 16, normalized size = 0.8

$$-\frac{-2\,cx^4 + 14\,a}{7}\frac{1}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)/x^(3/2),x)

[Out] -2/7*(-c*x^4+7*a)/x^(1/2)
```

Maxima [A] time = 1.43631, size = 18, normalized size = 0.95

$$\frac{2}{7}\,cx^{\frac{7}{2}}-\frac{2\,a}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)/x^(3/2),x, algorithm="maxima")

[Out] 2/7*c*x^(7/2) - 2*a/sqrt(x)
```

Fricas [A] time = 0.236784, size = 19, normalized size = 1.

$$\frac{2\left(cx^{4}-7\,a\right)}{7\,\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)/x^(3/2),x, algorithm="fricas")

[Out] 2/7*(c*x^4 - 7*a)/sqrt(x)
```

Sympy [A] time = 3.12702, size = 17, normalized size = 0.89

$$-\frac{2a}{\sqrt{x}}+\frac{2cx^{\frac{7}{2}}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)/x**(3/2),x)

[Out] -2*a/sqrt(x) + 2*c*x**(7/2)/7
```

GIAC/XCAS [A] time = 0.212452, size = 18, normalized size = 0.95

$$\frac{2}{7}\,cx^{\frac{7}{2}}-\frac{2\,a}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)/x^(3/2),x, algorithm="giac")

[Out] 2/7*c*x^(7/2) - 2*a/sqrt(x)
```

3.720 $\int \frac{a+cx^4}{x^{5/2}}\,dx$

Optimal. Leaf size=21

$$\frac{2}{5}cx^{5/2}-\frac{2a}{3x^{3/2}}$$

```
[Out] (-2*a)/(3*x^(3/2)) + (2*c*x^(5/2))/5
```

Rubi [A] time = 0.0118211, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{2}{5}cx^{5/2}-\frac{2a}{3x^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + c*x^4)/x^(5/2),x]
```

```
[Out] (-2*a)/(3*x^(3/2)) + (2*c*x^(5/2))/5
```

Rubi in Sympy [A] time = 2.62246, size = 19, normalized size = 0.9

$$-\frac{2a}{3x^{\frac{3}{2}}}+\frac{2cx^{\frac{5}{2}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)/x**(5/2),x)
```

```
[Out] -2*a/(3*x**(3/2)) + 2*c*x**(5/2)/5
```

Mathematica [A] time = 0.00883601, size = 21, normalized size = 1.

$$\frac{2}{5}cx^{5/2}-\frac{2a}{3x^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + c*x^4)/x^(5/2),x]
```

```
[Out] (-2*a)/(3*x^(3/2)) + (2*c*x^(5/2))/5
```

Maple [A] time = 0.005, size = 16, normalized size = 0.8

$$-\frac{-6\,cx^4+10\,a}{15}x^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)/x^(5/2),x)
```

```
[Out] -2/15*(-3*c*x^4+5*a)/x^(3/2)
```

Maxima [A] time = 1.43783, size = 18, normalized size = 0.86

$$\frac{2}{5}\,cx^{\frac{5}{2}} - \frac{2\,a}{3\,x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)/x^(5/2),x, algorithm="maxima")
```

```
[Out] 2/5*c*x^(5/2) - 2/3*a/x^(3/2)
```

Fricas [A] time = 0.22424, size = 20, normalized size = 0.95

$$\frac{2\,\left(3\,cx^{4} - 5\,a\right)}{15\,x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)/x^(5/2),x, algorithm="fricas")
```

```
[Out] 2/15*(3*c*x^4 - 5*a)/x^(3/2)
```

Sympy [A] time = 4.01375, size = 19, normalized size = 0.9

$$-\frac{2a}{3x^{\frac{3}{2}}} + \frac{2cx^{\frac{5}{2}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)/x**(5/2),x)
```

```
[Out] -2*a/(3*x**(3/2)) + 2*c*x**(5/2)/5
```

GIAC/XCAS [A] time = 0.215932, size = 18, normalized size = 0.86

$$\frac{2}{5}\,cx^{\frac{5}{2}} - \frac{2\,a}{3\,x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)/x^(5/2),x, algorithm="giac")
```

```
[Out] 2/5*c*x^(5/2) - 2/3*a/x^(3/2)
```

3.721 $\int \frac{a+cx^4}{x^{7/2}}\,dx$

Optimal. Leaf size=21

$$\frac{2}{3}cx^{3/2}-\frac{2a}{5x^{5/2}}$$

```
[Out] (-2*a)/(5*x^(5/2)) + (2*c*x^(3/2))/3
```

Rubi [A] time = 0.0126499, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{2}{3}cx^{3/2}-\frac{2a}{5x^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + c*x^4)/x^(7/2),x]
```

```
[Out] (-2*a)/(5*x^(5/2)) + (2*c*x^(3/2))/3
```

Rubi in Sympy [A] time = 2.62152, size = 19, normalized size = 0.9

$$-\frac{2a}{5x^{\frac{5}{2}}}+\frac{2cx^{\frac{3}{2}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((c*x**4+a)/x**(7/2),x)
```

```
[Out] -2*a/(5*x**(5/2)) + 2*c*x**(3/2)/3
```

Mathematica [A] time = 0.00904272, size = 21, normalized size = 1.

$$\frac{2}{3}cx^{3/2}-\frac{2a}{5x^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + c*x^4)/x^(7/2),x]
```

```
[Out] (-2*a)/(5*x^(5/2)) + (2*c*x^(3/2))/3
```

Maple [A] time = 0.005, size = 16, normalized size = 0.8

$$-\frac{-10\,cx^4+6\,a}{15}x^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*x^4+a)/x^(7/2),x)
```

```
[Out] -2/15*(-5*c*x^4+3*a)/x^(5/2)
```

Maxima [A] time = 1.4447, size = 18, normalized size = 0.86

$$\frac{2}{3}\,cx^{\frac{3}{2}} - \frac{2\,a}{5\,x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)/x^(7/2),x, algorithm="maxima")
```

```
[Out] 2/3*c*x^(3/2) - 2/5*a/x^(5/2)
```

Fricas [A] time = 0.224025, size = 20, normalized size = 0.95

$$\frac{2\,\left(5\,cx^{4} - 3\,a\right)}{15\,x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)/x^(7/2),x, algorithm="fricas")
```

```
[Out] 2/15*(5*c*x^4 - 3*a)/x^(5/2)
```

Sympy [A] time = 6.05808, size = 19, normalized size = 0.9

$$-\frac{2a}{5x^{\frac{5}{2}}} + \frac{2cx^{\frac{3}{2}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)/x**(7/2),x)
```

```
[Out] -2*a/(5*x**(5/2)) + 2*c*x**(3/2)/3
```

GIAC/XCAS [A] time = 0.21814, size = 18, normalized size = 0.86

$$\frac{2}{3}\,cx^{\frac{3}{2}} - \frac{2\,a}{5\,x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)/x^(7/2),x, algorithm="giac")
```

```
[Out] 2/3*c*x^(3/2) - 2/5*a/x^(5/2)
```

3.722 $\int x^{5/2} \left(a + cx^4\right)^2 \, dx$

Optimal. Leaf size=36

$$\frac{2}{7}a^2x^{7/2} + \frac{4}{15}acx^{15/2} + \frac{2}{23}c^2x^{23/2}$$

```
[Out] (2*a^2*x^(7/2))/7 + (4*a*c*x^(15/2))/15 + (2*c^2*x^(23/2))/23
```

Rubi [A] time = 0.0264287, antiderivative size = 36, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{2}{7}a^2x^{7/2} + \frac{4}{15}acx^{15/2} + \frac{2}{23}c^2x^{23/2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(5/2)*(a + c*x^4)^2,x]

[Out] (2*a^2*x^(7/2))/7 + (4*a*c*x^(15/2))/15 + (2*c^2*x^(23/2))/23
```

Rubi in Sympy [A] time = 4.51766, size = 34, normalized size = 0.94

$$\frac{2a^2x^{\frac{7}{2}}}{7} + \frac{4acx^{\frac{15}{2}}}{15} + \frac{2c^2x^{\frac{23}{2}}}{23}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(5/2)*(c*x**4+a)**2,x)

[Out] 2*a**2*x**(7/2)/7 + 4*a*c*x**(15/2)/15 + 2*c**2*x**(23/2)/23
```

Mathematica [A] time = 0.012895, size = 30, normalized size = 0.83

$$\frac{2x^{7/2}\left(345a^2 + 322acx^4 + 105c^2x^8\right)}{2415}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(5/2)*(a + c*x^4)^2,x]

[Out] (2*x^(7/2)*(345*a^2 + 322*a*c*x^4 + 105*c^2*x^8))/2415
```

Maple [A] time = 0.006, size = 27, normalized size = 0.8

$$\frac{210\,c^2x^8 + 644\,acx^4 + 690\,a^2}{2415}x^{\frac{7}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(5/2)*(c*x^4+a)^2,x)

[Out] 2/2415*x^(7/2)*(105*c^2*x^8+322*a*c*x^4+345*a^2)
```

Maxima [A] time = 1.43973, size = 32, normalized size = 0.89

$$\frac{2}{23}\,c^2x^{\frac{23}{2}} + \frac{4}{15}\,acx^{\frac{15}{2}} + \frac{2}{7}\,a^2x^{\frac{7}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^2*x^(5/2),x, algorithm="maxima")
```

```
[Out] 2/23*c^2*x^(23/2) + 4/15*a*c*x^(15/2) + 2/7*a^2*x^(7/2)
```

Fricas [A] time = 0.226314, size = 39, normalized size = 1.08

$$\frac{2}{2415}\,\left(105\,c^2x^{11} + 322\,acx^7 + 345\,a^2x^3\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^2*x^(5/2),x, algorithm="fricas")
```

```
[Out] 2/2415*(105*c^2*x^11 + 322*a*c*x^7 + 345*a^2*x^3)*sqrt(x)
```

Sympy [A] time = 70.4942, size = 34, normalized size = 0.94

$$\frac{2a^2x^{\frac{7}{2}}}{7} + \frac{4acx^{\frac{15}{2}}}{15} + \frac{2c^2x^{\frac{23}{2}}}{23}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(5/2)*(c*x**4+a)**2,x)
```

```
[Out] 2*a**2*x**(7/2)/7 + 4*a*c*x**(15/2)/15 + 2*c**2*x**(23/2)/23
```

GIAC/XCAS [A] time = 0.217067, size = 32, normalized size = 0.89

$$\frac{2}{23}\,c^2x^{\frac{23}{2}} + \frac{4}{15}\,acx^{\frac{15}{2}} + \frac{2}{7}\,a^2x^{\frac{7}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^2*x^(5/2),x, algorithm="giac")
```

```
[Out] 2/23*c^2*x^(23/2) + 4/15*a*c*x^(15/2) + 2/7*a^2*x^(7/2)
```

3.723 $\int x^{3/2} \left(a+cx^4\right)^2 \, dx$

Optimal. Leaf size=36

$$\frac{2}{5}a^2x^{5/2}+\frac{4}{13}acx^{13/2}+\frac{2}{21}c^2x^{21/2}$$

```
[Out] (2*a^2*x^(5/2))/5 + (4*a*c*x^(13/2))/13 + (2*c^2*x^(21/2))/21
```

Rubi [A] time = 0.0291444, antiderivative size = 36, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{2}{5}a^2x^{5/2}+\frac{4}{13}acx^{13/2}+\frac{2}{21}c^2x^{21/2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(3/2)*(a + c*x^4)^2,x]

[Out] (2*a^2*x^(5/2))/5 + (4*a*c*x^(13/2))/13 + (2*c^2*x^(21/2))/21
```

Rubi in Sympy [A] time = 4.50819, size = 34, normalized size = 0.94

$$\frac{2a^2x^{\frac{5}{2}}}{5}+\frac{4acx^{\frac{13}{2}}}{13}+\frac{2c^2x^{\frac{21}{2}}}{21}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(3/2)*(c*x**4+a)**2,x)

[Out] 2*a**2*x**(5/2)/5 + 4*a*c*x**(13/2)/13 + 2*c**2*x**(21/2)/21
```

Mathematica [A] time = 0.012375, size = 30, normalized size = 0.83

$$\frac{2x^{5/2}\left(273a^2+210acx^4+65c^2x^8\right)}{1365}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(3/2)*(a + c*x^4)^2,x]

[Out] (2*x^(5/2)*(273*a^2 + 210*a*c*x^4 + 65*c^2*x^8))/1365
```

Maple [A] time = 0.008, size = 27, normalized size = 0.8

$$\frac{130\,c^2x^8+420\,acx^4+546\,a^2}{1365}x^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(3/2)*(c*x^4+a)^2,x)

[Out] 2/1365*x^(5/2)*(65*c^2*x^8+210*a*c*x^4+273*a^2)
```

Maxima [A] time = 1.42541, size = 32, normalized size = 0.89

$$\frac{2}{21}\,c^2x^{\frac{21}{2}}+\frac{4}{13}\,acx^{\frac{13}{2}}+\frac{2}{5}\,a^2x^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^2*x^(3/2),x, algorithm="maxima")

[Out] 2/21*c^2*x^(21/2) + 4/13*a*c*x^(13/2) + 2/5*a^2*x^(5/2)
```

Fricas [A] time = 0.239145, size = 39, normalized size = 1.08

$$\frac{2}{1365}\,\left(65\,c^2x^{10}+210\,acx^6+273\,a^2x^2\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^2*x^(3/2),x, algorithm="fricas")

[Out] 2/1365*(65*c^2*x^10 + 210*a*c*x^6 + 273*a^2*x^2)*sqrt(x)
```

Sympy [A] time = 37.8736, size = 34, normalized size = 0.94

$$\frac{2a^2x^{\frac{5}{2}}}{5}+\frac{4acx^{\frac{13}{2}}}{13}+\frac{2c^2x^{\frac{21}{2}}}{21}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(3/2)*(c*x**4+a)**2,x)

[Out] 2*a**2*x**(5/2)/5 + 4*a*c*x**(13/2)/13 + 2*c**2*x**(21/2)/21
```

GIAC/XCAS [A] time = 0.216725, size = 32, normalized size = 0.89

$$\frac{2}{21}\,c^2x^{\frac{21}{2}}+\frac{4}{13}\,acx^{\frac{13}{2}}+\frac{2}{5}\,a^2x^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^2*x^(3/2),x, algorithm="giac")

[Out] 2/21*c^2*x^(21/2) + 4/13*a*c*x^(13/2) + 2/5*a^2*x^(5/2)
```

3.724 $\int \sqrt{x} \left(a + cx^4\right)^2 dx$

Optimal. Leaf size=36

$$\frac{2}{3}a^2x^{3/2} + \frac{4}{11}acx^{11/2} + \frac{2}{19}c^2x^{19/2}$$

```
[Out] (2*a^2*x^(3/2))/3 + (4*a*c*x^(11/2))/11 + (2*c^2*x^(19/2))/19
```

Rubi [A] time = 0.027979, antiderivative size = 36, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$\frac{2}{3}a^2x^{3/2} + \frac{4}{11}acx^{11/2} + \frac{2}{19}c^2x^{19/2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[x]*(a + c*x^4)^2,x]

[Out] (2*a^2*x^(3/2))/3 + (4*a*c*x^(11/2))/11 + (2*c^2*x^(19/2))/19
```

Rubi in Sympy [A] time = 4.48704, size = 34, normalized size = 0.94

$$\frac{2a^2x^{\frac{3}{2}}}{3} + \frac{4acx^{\frac{11}{2}}}{11} + \frac{2c^2x^{\frac{19}{2}}}{19}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**2*x**(1/2),x)

[Out] 2*a**2*x**(3/2)/3 + 4*a*c*x**(11/2)/11 + 2*c**2*x**(19/2)/19
```

Mathematica [A] time = 0.0111882, size = 30, normalized size = 0.83

$$\frac{2}{627}x^{3/2}\left(209a^2 + 114acx^4 + 33c^2x^8\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[x]*(a + c*x^4)^2,x]

[Out] (2*x^(3/2)*(209*a^2 + 114*a*c*x^4 + 33*c^2*x^8))/627
```

Maple [A] time = 0.008, size = 27, normalized size = 0.8

$$\frac{66\,c^2x^8 + 228\,acx^4 + 418\,a^2}{627}x^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)^2*x^(1/2),x)

[Out] 2/627*x^(3/2)*(33*c^2*x^8+114*a*c*x^4+209*a^2)
```

Maxima [A] time = 1.43969, size = 32, normalized size = 0.89

$$\frac{2}{19}\,c^2x^{\frac{19}{2}}+\frac{4}{11}\,acx^{\frac{11}{2}}+\frac{2}{3}\,a^2x^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^2*sqrt(x),x, algorithm="maxima")
```

```
[Out] 2/19*c^2*x^(19/2) + 4/11*a*c*x^(11/2) + 2/3*a^2*x^(3/2)
```

Fricas [A] time = 0.229349, size = 36, normalized size = 1.

$$\frac{2}{627}\,\left(33\,c^2x^9+114\,acx^5+209\,a^2x\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^2*sqrt(x),x, algorithm="fricas")
```

```
[Out] 2/627*(33*c^2*x^9 + 114*a*c*x^5 + 209*a^2*x)*sqrt(x)
```

Sympy [A] time = 9.64151, size = 34, normalized size = 0.94

$$\frac{2a^2x^{\frac{3}{2}}}{3}+\frac{4acx^{\frac{11}{2}}}{11}+\frac{2c^2x^{\frac{19}{2}}}{19}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**2*x**(1/2),x)
```

```
[Out] 2*a**2*x**(3/2)/3 + 4*a*c*x**(11/2)/11 + 2*c**2*x**(19/2)/19
```

GIAC/XCAS [A] time = 0.214722, size = 32, normalized size = 0.89

$$\frac{2}{19}\,c^2x^{\frac{19}{2}}+\frac{4}{11}\,acx^{\frac{11}{2}}+\frac{2}{3}\,a^2x^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^2*sqrt(x),x, algorithm="giac")
```

```
[Out] 2/19*c^2*x^(19/2) + 4/11*a*c*x^(11/2) + 2/3*a^2*x^(3/2)
```

3.725 $\int \frac{(a+cx^4)^2}{\sqrt{x}}\,dx$

Optimal. Leaf size=34

$$2a^2\sqrt{x}+\frac{4}{9}acx^{9/2}+\frac{2}{17}c^2x^{17/2}$$

```
[Out] 2*a^2*Sqrt[x] + (4*a*c*x^(9/2))/9 + (2*c^2*x^(17/2))/17
```

Rubi [A] time = 0.0262335, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$2a^2\sqrt{x}+\frac{4}{9}acx^{9/2}+\frac{2}{17}c^2x^{17/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + c*x^4)^2/Sqrt[x],x]
```

```
[Out] 2*a^2*Sqrt[x] + (4*a*c*x^(9/2))/9 + (2*c^2*x^(17/2))/17
```

Rubi in Sympy [A] time = 4.572, size = 32, normalized size = 0.94

$$2a^2\sqrt{x}+\frac{4acx^{\frac{9}{2}}}{9}+\frac{2c^2x^{\frac{17}{2}}}{17}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**2/x**(1/2),x)
```

```
[Out] 2*a**2*sqrt(x) + 4*a*c*x**(9/2)/9 + 2*c**2*x**(17/2)/17
```

Mathematica [A] time = 0.0115658, size = 30, normalized size = 0.88

$$\frac{2}{153}\sqrt{x}\left(153a^2+34acx^4+9c^2x^8\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + c*x^4)^2/Sqrt[x],x]
```

```
[Out] (2*Sqrt[x]*(153*a^2 + 34*a*c*x^4 + 9*c^2*x^8))/153
```

Maple [A] time = 0.006, size = 27, normalized size = 0.8

$$\frac{18\,c^2x^8+68\,acx^4+306\,a^2}{153}\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)^2/x^(1/2),x)
```

```
[Out] 2/153*x^(1/2)*(9*c^2*x^8+34*a*c*x^4+153*a^2)
```

Maxima [A] time = 1.43623, size = 32, normalized size = 0.94

$$\frac{2}{17}\,c^2x^{\frac{17}{2}}+\frac{4}{9}\,acx^{\frac{9}{2}}+2\,a^2\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^2/sqrt(x),x, algorithm="maxima")
```

```
[Out] 2/17*c^2*x^(17/2) + 4/9*a*c*x^(9/2) + 2*a^2*sqrt(x)
```

Fricas [A] time = 0.22316, size = 35, normalized size = 1.03

$$\frac{2}{153}\left(9\,c^2x^8+34\,acx^4+153\,a^2\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^2/sqrt(x),x, algorithm="fricas")
```

```
[Out] 2/153*(9*c^2*x^8 + 34*a*c*x^4 + 153*a^2)*sqrt(x)
```

Sympy [A] time = 15.4393, size = 32, normalized size = 0.94

$$2a^2\sqrt{x}+\frac{4acx^{\frac{9}{2}}}{9}+\frac{2c^2x^{\frac{17}{2}}}{17}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**2/x**(1/2),x)
```

```
[Out] 2*a**2*sqrt(x) + 4*a*c*x**(9/2)/9 + 2*c**2*x**(17/2)/17
```

GIAC/XCAS [A] time = 0.2112, size = 32, normalized size = 0.94

$$\frac{2}{17}\,c^2x^{\frac{17}{2}}+\frac{4}{9}\,acx^{\frac{9}{2}}+2\,a^2\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^2/sqrt(x),x, algorithm="giac")
```

```
[Out] 2/17*c^2*x^(17/2) + 4/9*a*c*x^(9/2) + 2*a^2*sqrt(x)
```

3.726 $\int \frac{(a+cx^4)^2}{x^{3/2}}\,dx$

Optimal. Leaf size=34

$$-\frac{2a^2}{\sqrt{x}}+\frac{4}{7}acx^{7/2}+\frac{2}{15}c^2x^{15/2}$$

```
[Out] (-2*a^2)/Sqrt[x] + (4*a*c*x^(7/2))/7 + (2*c^2*x^(15/2))/15
```

Rubi [A] time = 0.0299939, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{2a^2}{\sqrt{x}}+\frac{4}{7}acx^{7/2}+\frac{2}{15}c^2x^{15/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + c*x^4)^2/x^(3/2),x]

[Out] (-2*a^2)/Sqrt[x] + (4*a*c*x^(7/2))/7 + (2*c^2*x^(15/2))/15
```

Rubi in Sympy [A] time = 4.49889, size = 32, normalized size = 0.94

$$-\frac{2a^2}{\sqrt{x}}+\frac{4acx^{\frac{7}{2}}}{7}+\frac{2c^2x^{\frac{15}{2}}}{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**2/x**(3/2),x)

[Out] -2*a**2/sqrt(x) + 4*a*c*x**(7/2)/7 + 2*c**2*x**(15/2)/15
```

Mathematica [A] time = 0.0127433, size = 30, normalized size = 0.88

$$\frac{2\left(-105a^2+30acx^4+7c^2x^8\right)}{105\sqrt{x}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + c*x^4)^2/x^(3/2),x]

[Out] (2*(-105*a^2 + 30*a*c*x^4 + 7*c^2*x^8))/(105*Sqrt[x])
```

Maple [A] time = 0.008, size = 27, normalized size = 0.8

$$-\frac{-14\,c^2x^8-60\,acx^4+210\,a^2}{105}\frac{1}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)^2/x^(3/2),x)
```

```
[Out] -2/105*(-7*c^2*x^8-30*a*c*x^4+105*a^2)/x^(1/2)
```

Maxima [A] time = 1.43739, size = 32, normalized size = 0.94

$$\frac{2}{15}\,c^2x^{\frac{15}{2}} + \frac{4}{7}\,acx^{\frac{7}{2}} - \frac{2\,a^2}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^2/x^(3/2),x, algorithm="maxima")
```

```
[Out] 2/15*c^2*x^(15/2) + 4/7*a*c*x^(7/2) - 2*a^2/sqrt(x)
```

Fricas [A] time = 0.226507, size = 35, normalized size = 1.03

$$\frac{2\left(7\,c^2x^8 + 30\,acx^4 - 105\,a^2\right)}{105\,\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^2/x^(3/2),x, algorithm="fricas")
```

```
[Out] 2/105*(7*c^2*x^8 + 30*a*c*x^4 - 105*a^2)/sqrt(x)
```

Sympy [A] time = 18.7052, size = 32, normalized size = 0.94

$$-\frac{2a^2}{\sqrt{x}} + \frac{4acx^{\frac{7}{2}}}{7} + \frac{2c^2x^{\frac{15}{2}}}{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**2/x**(3/2),x)
```

```
[Out] -2*a**2/sqrt(x) + 4*a*c*x**(7/2)/7 + 2*c**2*x**(15/2)/15
```

GIAC/XCAS [A] time = 0.214569, size = 32, normalized size = 0.94

$$\frac{2}{15}\,c^2x^{\frac{15}{2}} + \frac{4}{7}\,acx^{\frac{7}{2}} - \frac{2\,a^2}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^2/x^(3/2),x, algorithm="giac")
```

```
[Out] 2/15*c^2*x^(15/2) + 4/7*a*c*x^(7/2) - 2*a^2/sqrt(x)
```

3.727 $\int \frac{(a+cx^4)^2}{x^{5/2}} \, dx$

Optimal. Leaf size=36

$$-\frac{2a^2}{3x^{3/2}}+\frac{4}{5}acx^{5/2}+\frac{2}{13}c^2x^{13/2}$$

[Out] (-2*a^2)/(3*x^(3/2)) + (4*a*c*x^(5/2))/5 + (2*c^2*x^(13/2))/13

Rubi [A] time = 0.02622, antiderivative size = 36, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{2a^2}{3x^{3/2}}+\frac{4}{5}acx^{5/2}+\frac{2}{13}c^2x^{13/2}$$

Antiderivative was successfully verified.

[In] Int[(a + c*x^4)^2/x^(5/2),x]

[Out] (-2*a^2)/(3*x^(3/2)) + (4*a*c*x^(5/2))/5 + (2*c^2*x^(13/2))/13

Rubi in Sympy [A] time = 4.53123, size = 34, normalized size = 0.94

$$-\frac{2a^2}{3x^{\frac{3}{2}}}+\frac{4acx^{\frac{5}{2}}}{5}+\frac{2c^2x^{\frac{13}{2}}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((c*x**4+a)**2/x**(5/2),x)

[Out] -2*a**2/(3*x**(3/2)) + 4*a*c*x**(5/2)/5 + 2*c**2*x**(13/2)/13

Mathematica [A] time = 0.0135442, size = 30, normalized size = 0.83

$$\frac{2\left(-65a^2+78acx^4+15c^2x^8\right)}{195x^{3/2}}$$

Antiderivative was successfully verified.

[In] Integrate[(a + c*x^4)^2/x^(5/2),x]

[Out] (2*(-65*a^2 + 78*a*c*x^4 + 15*c^2*x^8))/(195*x^(3/2))

Maple [A] time = 0.009, size = 27, normalized size = 0.8

$$-\frac{-30\,c^2x^8-156\,acx^4+130\,a^2}{195}x^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((c*x^4+a)^2/x^(5/2),x)

[Out] -2/195*(-15*c^2*x^8-78*a*c*x^4+65*a^2)/x^(3/2)

Maxima [A] time = 1.4393, size = 32, normalized size = 0.89

$$\frac{2}{13}\,c^2x^{\frac{13}{2}} + \frac{4}{5}\,acx^{\frac{5}{2}} - \frac{2\,a^2}{3\,x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^2/x^(5/2),x, algorithm="maxima")

[Out] 2/13*c^2*x^(13/2) + 4/5*a*c*x^(5/2) - 2/3*a^2/x^(3/2)
```

Fricas [A] time = 0.227724, size = 35, normalized size = 0.97

$$\frac{2\left(15\,c^2x^8 + 78\,acx^4 - 65\,a^2\right)}{195\,x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^2/x^(5/2),x, algorithm="fricas")

[Out] 2/195*(15*c^2*x^8 + 78*a*c*x^4 - 65*a^2)/x^(3/2)
```

Sympy [A] time = 22.5508, size = 34, normalized size = 0.94

$$-\frac{2a^2}{3x^{\frac{3}{2}}} + \frac{4acx^{\frac{5}{2}}}{5} + \frac{2c^2x^{\frac{13}{2}}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**2/x**(5/2),x)

[Out] -2*a**2/(3*x**(3/2)) + 4*a*c*x**(5/2)/5 + 2*c**2*x**(13/2)/13
```

GIAC/XCAS [A] time = 0.212642, size = 32, normalized size = 0.89

$$\frac{2}{13}\,c^2x^{\frac{13}{2}} + \frac{4}{5}\,acx^{\frac{5}{2}} - \frac{2\,a^2}{3\,x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^2/x^(5/2),x, algorithm="giac")

[Out] 2/13*c^2*x^(13/2) + 4/5*a*c*x^(5/2) - 2/3*a^2/x^(3/2)
```

3.728 $\int \frac{(a+cx^4)^2}{x^{7/2}} \, dx$

Optimal. Leaf size=36

$$-\frac{2a^2}{5x^{5/2}}+\frac{4}{3}acx^{3/2}+\frac{2}{11}c^2x^{11/2}$$

```
[Out] (-2*a^2)/(5*x^(5/2)) + (4*a*c*x^(3/2))/3 + (2*c^2*x^(11/2))/11
```

Rubi [A] time = 0.0263919, antiderivative size = 36, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{2a^2}{5x^{5/2}}+\frac{4}{3}acx^{3/2}+\frac{2}{11}c^2x^{11/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + c*x^4)^2/x^(7/2),x]

[Out] (-2*a^2)/(5*x^(5/2)) + (4*a*c*x^(3/2))/3 + (2*c^2*x^(11/2))/11
```

Rubi in Sympy [A] time = 4.50867, size = 34, normalized size = 0.94

$$-\frac{2a^2}{5x^{\frac{5}{2}}}+\frac{4acx^{\frac{3}{2}}}{3}+\frac{2c^2x^{\frac{11}{2}}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**2/x**(7/2),x)

[Out] -2*a**2/(5*x**(5/2)) + 4*a*c*x**(3/2)/3 + 2*c**2*x**(11/2)/11
```

Mathematica [A] time = 0.0141404, size = 30, normalized size = 0.83

$$\frac{2\left(-33a^2+110acx^4+15c^2x^8\right)}{165x^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + c*x^4)^2/x^(7/2),x]

[Out] (2*(-33*a^2 + 110*a*c*x^4 + 15*c^2*x^8))/(165*x^(5/2))
```

Maple [A] time = 0.007, size = 27, normalized size = 0.8

$$-\frac{-30\,c^2x^8-220\,acx^4+66\,a^2}{165}x^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)^2/x^(7/2),x)

[Out] -2/165*(-15*c^2*x^8-110*a*c*x^4+33*a^2)/x^(5/2)
```

Maxima [A] time = 1.44146, size = 32, normalized size = 0.89

$$\frac{2}{11}\,c^2x^{\frac{11}{2}} + \frac{4}{3}\,acx^{\frac{3}{2}} - \frac{2\,a^2}{5\,x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^2/x^(7/2),x, algorithm="maxima")
```

```
[Out] 2/11*c^2*x^(11/2) + 4/3*a*c*x^(3/2) - 2/5*a^2/x^(5/2)
```

Fricas [A] time = 0.232838, size = 35, normalized size = 0.97

$$\frac{2\left(15\,c^2x^8 + 110\,acx^4 - 33\,a^2\right)}{165\,x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^2/x^(7/2),x, algorithm="fricas")
```

```
[Out] 2/165*(15*c^2*x^8 + 110*a*c*x^4 - 33*a^2)/x^(5/2)
```

Sympy [A] time = 31.7333, size = 34, normalized size = 0.94

$$-\frac{2a^2}{5x^{\frac{5}{2}}} + \frac{4acx^{\frac{3}{2}}}{3} + \frac{2c^2x^{\frac{11}{2}}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**2/x**(7/2),x)
```

```
[Out] -2*a**2/(5*x**(5/2)) + 4*a*c*x**(3/2)/3 + 2*c**2*x**(11/2)/11
```

GIAC/XCAS [A] time = 0.216221, size = 32, normalized size = 0.89

$$\frac{2}{11}\,c^2x^{\frac{11}{2}} + \frac{4}{3}\,acx^{\frac{3}{2}} - \frac{2\,a^2}{5\,x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^2/x^(7/2),x, algorithm="giac")
```

```
[Out] 2/11*c^2*x^(11/2) + 4/3*a*c*x^(3/2) - 2/5*a^2/x^(5/2)
```

3.729 $\int x^{5/2} \left(a + cx^4\right)^3 \, dx$

Optimal. Leaf size=51

$$\frac{2}{7}a^3x^{7/2} + \frac{2}{5}a^2cx^{15/2} + \frac{6}{23}ac^2x^{23/2} + \frac{2}{31}c^3x^{31/2}$$

```
[Out] (2*a^3*x^(7/2))/7 + (2*a^2*c*x^(15/2))/5 + (6*a*c^2*x^(23/2))/23
+ (2*c^3*x^(31/2))/31
```

Rubi [A] time = 0.0374547, antiderivative size = 51, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$\frac{2}{7}a^3x^{7/2} + \frac{2}{5}a^2cx^{15/2} + \frac{6}{23}ac^2x^{23/2} + \frac{2}{31}c^3x^{31/2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(5/2)*(a + c*x^4)^3,x]
```

```
[Out] (2*a^3*x^(7/2))/7 + (2*a^2*c*x^(15/2))/5 + (6*a*c^2*x^(23/2))/23
+ (2*c^3*x^(31/2))/31
```

Rubi in Sympy [A] time = 5.75007, size = 49, normalized size = 0.96

$$\frac{2a^3x^{\frac{7}{2}}}{7} + \frac{2a^2cx^{\frac{15}{2}}}{5} + \frac{6ac^2x^{\frac{23}{2}}}{23} + \frac{2c^3x^{\frac{31}{2}}}{31}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(5/2)*(c*x**4+a)**3,x)
```

```
[Out] 2*a**3*x**(7/2)/7 + 2*a**2*c*x**(15/2)/5 + 6*a*c**2*x**(23/2)/23
+ 2*c**3*x**(31/2)/31
```

Mathematica [A] time = 0.0169959, size = 51, normalized size = 1.

$$\frac{2}{7}a^3x^{7/2} + \frac{2}{5}a^2cx^{15/2} + \frac{6}{23}ac^2x^{23/2} + \frac{2}{31}c^3x^{31/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(5/2)*(a + c*x^4)^3,x]
```

```
[Out] (2*a^3*x^(7/2))/7 + (2*a^2*c*x^(15/2))/5 + (6*a*c^2*x^(23/2))/23
+ (2*c^3*x^(31/2))/31
```

Maple [A] time = 0.009, size = 38, normalized size = 0.8

$$\frac{1610\,c^3x^{12} + 6510\,ac^2x^8 + 9982\,a^2cx^4 + 7130\,a^3}{24955}x^{\frac{7}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(5/2)*(c*x^4+a)^3,x)
```

```
[Out] 2/24955*x^(7/2)*(805*c^3*x^12+3255*a*c^2*x^8+4991*a^2*c*x^4+3565*
a^3)
```

Maxima [A] time = 1.41485, size = 47, normalized size = 0.92

$$\frac{2}{31}\,c^3x^{\frac{31}{2}} + \frac{6}{23}\,ac^2x^{\frac{23}{2}} + \frac{2}{5}\,a^2cx^{\frac{15}{2}} + \frac{2}{7}\,a^3x^{\frac{7}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^3*x^(5/2),x, algorithm="maxima")
```

```
[Out] 2/31*c^3*x^(31/2) + 6/23*a*c^2*x^(23/2) + 2/5*a^2*c*x^(15/2) + 2/
7*a^3*x^(7/2)
```

Fricas [A] time = 0.223929, size = 54, normalized size = 1.06

$$\frac{2}{24955}\left(805\,c^3x^{15} + 3255\,ac^2x^{11} + 4991\,a^2cx^7 + 3565\,a^3x^3\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^3*x^(5/2),x, algorithm="fricas")
```

```
[Out] 2/24955*(805*c^3*x^15 + 3255*a*c^2*x^11 + 4991*a^2*c*x^7 + 3565*a
^3*x^3)*sqrt(x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(5/2)*(c*x**4+a)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.21395, size = 47, normalized size = 0.92

$$\frac{2}{31}\,c^3x^{\frac{31}{2}} + \frac{6}{23}\,ac^2x^{\frac{23}{2}} + \frac{2}{5}\,a^2cx^{\frac{15}{2}} + \frac{2}{7}\,a^3x^{\frac{7}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^3*x^(5/2),x, algorithm="giac")
```

```
[Out] 2/31*c^3*x^(31/2) + 6/23*a*c^2*x^(23/2) + 2/5*a^2*c*x^(15/2) + 2/
7*a^3*x^(7/2)
```

3.730 $\int x^{3/2} \left(a+cx^4\right)^3 \, dx$

Optimal. Leaf size=51

$$\frac{2}{5}a^3x^{5/2}+\frac{6}{13}a^2cx^{13/2}+\frac{2}{7}ac^2x^{21/2}+\frac{2}{29}c^3x^{29/2}$$

```
[Out] (2*a^3*x^(5/2))/5 + (6*a^2*c*x^(13/2))/13 + (2*a*c^2*x^(21/2))/7
+ (2*c^3*x^(29/2))/29
```

Rubi [A] time = 0.0358835, antiderivative size = 51, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{2}{5}a^3x^{5/2}+\frac{6}{13}a^2cx^{13/2}+\frac{2}{7}ac^2x^{21/2}+\frac{2}{29}c^3x^{29/2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(3/2)*(a + c*x^4)^3,x]
```

```
[Out] (2*a^3*x^(5/2))/5 + (6*a^2*c*x^(13/2))/13 + (2*a*c^2*x^(21/2))/7
+ (2*c^3*x^(29/2))/29
```

Rubi in Sympy [A] time = 5.80707, size = 49, normalized size = 0.96

$$\frac{2a^3x^{\frac{5}{2}}}{5}+\frac{6a^2cx^{\frac{13}{2}}}{13}+\frac{2ac^2x^{\frac{21}{2}}}{7}+\frac{2c^3x^{\frac{29}{2}}}{29}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(3/2)*(c*x**4+a)**3,x)
```

```
[Out] 2*a**3*x**(5/2)/5 + 6*a**2*c*x**(13/2)/13 + 2*a*c**2*x**(21/2)/7
+ 2*c**3*x**(29/2)/29
```

Mathematica [A] time = 0.0163873, size = 51, normalized size = 1.

$$\frac{2}{5}a^3x^{5/2}+\frac{6}{13}a^2cx^{13/2}+\frac{2}{7}ac^2x^{21/2}+\frac{2}{29}c^3x^{29/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(3/2)*(a + c*x^4)^3,x]
```

```
[Out] (2*a^3*x^(5/2))/5 + (6*a^2*c*x^(13/2))/13 + (2*a*c^2*x^(21/2))/7
+ (2*c^3*x^(29/2))/29
```

Maple [A] time = 0.009, size = 38, normalized size = 0.8

$$\frac{910\,c^3x^{12}+3770\,ac^2x^8+6090\,a^2cx^4+5278\,a^3}{13195}x^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(3/2)*(c*x^4+a)^3,x)
```

```
[Out] 2/13195*x^(5/2)*(455*c^3*x^12+1885*a*c^2*x^8+3045*a^2*c*x^4+2639*
a^3)
```

Maxima [A] time = 1.43787, size = 47, normalized size = 0.92

$$\frac{2}{29}\,c^{3}x^{\frac{29}{2}} + \frac{2}{7}\,ac^{2}x^{\frac{21}{2}} + \frac{6}{13}\,a^{2}cx^{\frac{13}{2}} + \frac{2}{5}\,a^{3}x^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^3*x^(3/2),x, algorithm="maxima")
```

```
[Out] 2/29*c^3*x^(29/2) + 2/7*a*c^2*x^(21/2) + 6/13*a^2*c*x^(13/2) + 2/
5*a^3*x^(5/2)
```

Fricas [A] time = 0.224134, size = 54, normalized size = 1.06

$$\frac{2}{13195}\left(455\,c^{3}x^{14} + 1885\,ac^{2}x^{10} + 3045\,a^{2}cx^{6} + 2639\,a^{3}x^{2}\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^3*x^(3/2),x, algorithm="fricas")
```

```
[Out] 2/13195*(455*c^3*x^14 + 1885*a*c^2*x^10 + 3045*a^2*c*x^6 + 2639*a
^3*x^2)*sqrt(x)
```

Sympy [A] time = 122.576, size = 49, normalized size = 0.96

$$\frac{2a^{3}x^{\frac{5}{2}}}{5} + \frac{6a^{2}cx^{\frac{13}{2}}}{13} + \frac{2ac^{2}x^{\frac{21}{2}}}{7} + \frac{2c^{3}x^{\frac{29}{2}}}{29}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(3/2)*(c*x**4+a)**3,x)
```

```
[Out] 2*a**3*x**(5/2)/5 + 6*a**2*c*x**(13/2)/13 + 2*a*c**2*x**(21/2)/7
+ 2*c**3*x**(29/2)/29
```

GIAC/XCAS [A] time = 0.214426, size = 47, normalized size = 0.92

$$\frac{2}{29}\,c^{3}x^{\frac{29}{2}} + \frac{2}{7}\,ac^{2}x^{\frac{21}{2}} + \frac{6}{13}\,a^{2}cx^{\frac{13}{2}} + \frac{2}{5}\,a^{3}x^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^3*x^(3/2),x, algorithm="giac")
```

```
[Out] 2/29*c^3*x^(29/2) + 2/7*a*c^2*x^(21/2) + 6/13*a^2*c*x^(13/2) + 2/
5*a^3*x^(5/2)
```

3.731 $\int \sqrt{x}\left(a+cx^4\right)^3\,dx$

Optimal. Leaf size=51

$$\frac{2}{3}a^3x^{3/2}+\frac{6}{11}a^2cx^{11/2}+\frac{6}{19}ac^2x^{19/2}+\frac{2}{27}c^3x^{27/2}$$

```
[Out] (2*a^3*x^(3/2))/3 + (6*a^2*c*x^(11/2))/11 + (6*a*c^2*x^(19/2))/19
 + (2*c^3*x^(27/2))/27
```

Rubi [A] time = 0.0349735, antiderivative size = 51, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{2}{3}a^3x^{3/2}+\frac{6}{11}a^2cx^{11/2}+\frac{6}{19}ac^2x^{19/2}+\frac{2}{27}c^3x^{27/2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[x]*(a + c*x^4)^3,x]
```

```
[Out] (2*a^3*x^(3/2))/3 + (6*a^2*c*x^(11/2))/11 + (6*a*c^2*x^(19/2))/19
 + (2*c^3*x^(27/2))/27
```

Rubi in Sympy [A] time = 5.79958, size = 49, normalized size = 0.96

$$\frac{2a^3x^{\frac{3}{2}}}{3}+\frac{6a^2cx^{\frac{11}{2}}}{11}+\frac{6ac^2x^{\frac{19}{2}}}{19}+\frac{2c^3x^{\frac{27}{2}}}{27}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**3*x**(1/2),x)
```

```
[Out] 2*a**3*x**(3/2)/3 + 6*a**2*c*x**(11/2)/11 + 6*a*c**2*x**(19/2)/19
 + 2*c**3*x**(27/2)/27
```

Mathematica [A] time = 0.0137471, size = 41, normalized size = 0.8

$$\frac{2x^{3/2}\left(1881a^3+1539a^2cx^4+891ac^2x^8+209c^3x^{12}\right)}{5643}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[x]*(a + c*x^4)^3,x]
```

```
[Out] (2*x^(3/2)*(1881*a^3 + 1539*a^2*c*x^4 + 891*a*c^2*x^8 + 209*c^3*x
^12))/5643
```

Maple [A] time = 0.009, size = 38, normalized size = 0.8

$$\frac{418\,c^3x^{12}+1782\,ac^2x^8+3078\,a^2cx^4+3762\,a^3}{5643}x^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)^3*x^(1/2),x)
```

```
[Out] 2/5643*x^(3/2)*(209*c^3*x^12+891*a*c^2*x^8+1539*a^2*c*x^4+1881*a^
3)
```

Maxima [A] time = 1.42841, size = 47, normalized size = 0.92

$$\frac{2}{27}\,c^3x^{\frac{27}{2}}+\frac{6}{19}\,ac^2x^{\frac{19}{2}}+\frac{6}{11}\,a^2cx^{\frac{11}{2}}+\frac{2}{3}\,a^3x^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^3*sqrt(x),x, algorithm="maxima")
```

```
[Out] 2/27*c^3*x^(27/2) + 6/19*a*c^2*x^(19/2) + 6/11*a^2*c*x^(11/2) + 2
/3*a^3*x^(3/2)
```

Fricas [A] time = 0.227585, size = 51, normalized size = 1.

$$\frac{2}{5643}\,\left(209\,c^3x^{13}+891\,ac^2x^9+1539\,a^2cx^5+1881\,a^3x\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^3*sqrt(x),x, algorithm="fricas")
```

```
[Out] 2/5643*(209*c^3*x^13 + 891*a*c^2*x^9 + 1539*a^2*c*x^5 + 1881*a^3*
x)*sqrt(x)
```

Sympy [A] time = 29.1991, size = 49, normalized size = 0.96

$$\frac{2a^3x^{\frac{3}{2}}}{3}+\frac{6a^2cx^{\frac{11}{2}}}{11}+\frac{6ac^2x^{\frac{19}{2}}}{19}+\frac{2c^3x^{\frac{27}{2}}}{27}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**3*x**(1/2),x)
```

```
[Out] 2*a**3*x**(3/2)/3 + 6*a**2*c*x**(11/2)/11 + 6*a*c**2*x**(19/2)/19
 + 2*c**3*x**(27/2)/27
```

GIAC/XCAS [A] time = 0.212428, size = 47, normalized size = 0.92

$$\frac{2}{27}\,c^3x^{\frac{27}{2}}+\frac{6}{19}\,ac^2x^{\frac{19}{2}}+\frac{6}{11}\,a^2cx^{\frac{11}{2}}+\frac{2}{3}\,a^3x^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^3*sqrt(x),x, algorithm="giac")
```

```
[Out] 2/27*c^3*x^(27/2) + 6/19*a*c^2*x^(19/2) + 6/11*a^2*c*x^(11/2) + 2
/3*a^3*x^(3/2)
```

3.732 $\int \frac{(a+cx^4)^3}{\sqrt{x}}\,dx$

Optimal. Leaf size=49

$$2a^3\sqrt{x} + \frac{2}{3}a^2cx^{9/2} + \frac{6}{17}ac^2x^{17/2} + \frac{2}{25}c^3x^{25/2}$$

```
[Out] 2*a^3*Sqrt[x] + (2*a^2*c*x^(9/2))/3 + (6*a*c^2*x^(17/2))/17 + (2*
c^3*x^(25/2))/25
```

Rubi [A] time = 0.0347239, antiderivative size = 49, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$2a^3\sqrt{x} + \frac{2}{3}a^2cx^{9/2} + \frac{6}{17}ac^2x^{17/2} + \frac{2}{25}c^3x^{25/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + c*x^4)^3/Sqrt[x],x]
```

```
[Out] 2*a^3*Sqrt[x] + (2*a^2*c*x^(9/2))/3 + (6*a*c^2*x^(17/2))/17 + (2*
c^3*x^(25/2))/25
```

Rubi in Sympy [A] time = 5.7909, size = 48, normalized size = 0.98

$$2a^3\sqrt{x} + \frac{2a^2cx^{\frac{9}{2}}}{3} + \frac{6ac^2x^{\frac{17}{2}}}{17} + \frac{2c^3x^{\frac{25}{2}}}{25}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**3/x**(1/2),x)
```

```
[Out] 2*a**3*sqrt(x) + 2*a**2*c*x**(9/2)/3 + 6*a*c**2*x**(17/2)/17 + 2*
c**3*x**(25/2)/25
```

Mathematica [A] time = 0.0138767, size = 41, normalized size = 0.84

$$\frac{2\sqrt{x}\left(1275a^3 + 425a^2cx^4 + 225ac^2x^8 + 51c^3x^{12}\right)}{1275}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + c*x^4)^3/Sqrt[x],x]
```

```
[Out] (2*Sqrt[x]*(1275*a^3 + 425*a^2*c*x^4 + 225*a*c^2*x^8 + 51*c^3*x^1
2))/1275
```

Maple [A] time = 0.008, size = 38, normalized size = 0.8

$$\frac{102\,c^3x^{12} + 450\,ac^2x^8 + 850\,a^2cx^4 + 2550\,a^3}{1275}\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)^3/x^(1/2),x)
```

```
[Out] 2/1275*x^(1/2)*(51*c^3*x^12+225*a*c^2*x^8+425*a^2*c*x^4+1275*a^3)
```

Maxima [A] time = 1.43547, size = 47, normalized size = 0.96

$$\frac{2}{25}\,c^3x^{\frac{25}{2}} + \frac{6}{17}\,ac^2x^{\frac{17}{2}} + \frac{2}{3}\,a^2cx^{\frac{9}{2}} + 2\,a^3\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^3/sqrt(x),x, algorithm="maxima")
```

```
[Out] 2/25*c^3*x^(25/2) + 6/17*a*c^2*x^(17/2) + 2/3*a^2*c*x^(9/2) + 2*a
^3*sqrt(x)
```

Fricas [A] time = 0.227382, size = 50, normalized size = 1.02

$$\frac{2}{1275}\left(51\,c^3x^{12} + 225\,ac^2x^8 + 425\,a^2cx^4 + 1275\,a^3\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^3/sqrt(x),x, algorithm="fricas")
```

```
[Out] 2/1275*(51*c^3*x^12 + 225*a*c^2*x^8 + 425*a^2*c*x^4 + 1275*a^3)*s
qrt(x)
```

Sympy [A] time = 60.6146, size = 48, normalized size = 0.98

$$2a^3\sqrt{x} + \frac{2a^2cx^{\frac{9}{2}}}{3} + \frac{6ac^2x^{\frac{17}{2}}}{17} + \frac{2c^3x^{\frac{25}{2}}}{25}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**3/x**(1/2),x)
```

```
[Out] 2*a**3*sqrt(x) + 2*a**2*c*x**(9/2)/3 + 6*a*c**2*x**(17/2)/17 + 2*
c**3*x**(25/2)/25
```

GIAC/XCAS [A] time = 0.215798, size = 47, normalized size = 0.96

$$\frac{2}{25}\,c^3x^{\frac{25}{2}} + \frac{6}{17}\,ac^2x^{\frac{17}{2}} + \frac{2}{3}\,a^2cx^{\frac{9}{2}} + 2\,a^3\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^3/sqrt(x),x, algorithm="giac")
```

```
[Out] 2/25*c^3*x^(25/2) + 6/17*a*c^2*x^(17/2) + 2/3*a^2*c*x^(9/2) + 2*a
^3*sqrt(x)
```

3.733 $\int \frac{(a+cx^4)^3}{x^{3/2}}\,dx$

Optimal. Leaf size=49

$$-\frac{2a^3}{\sqrt{x}}+\frac{6}{7}a^2cx^{7/2}+\frac{2}{5}ac^2x^{15/2}+\frac{2}{23}c^3x^{23/2}$$

```
[Out] (-2*a^3)/Sqrt[x] + (6*a^2*c*x^(7/2))/7 + (2*a*c^2*x^(15/2))/5 + (
2*c^3*x^(23/2))/23
```

Rubi [A] time = 0.0354327, antiderivative size = 49, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{2a^3}{\sqrt{x}}+\frac{6}{7}a^2cx^{7/2}+\frac{2}{5}ac^2x^{15/2}+\frac{2}{23}c^3x^{23/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + c*x^4)^3/x^(3/2),x]
```

```
[Out] (-2*a^3)/Sqrt[x] + (6*a^2*c*x^(7/2))/7 + (2*a*c^2*x^(15/2))/5 + (
2*c^3*x^(23/2))/23
```

Rubi in Sympy [A] time = 5.78201, size = 48, normalized size = 0.98

$$-\frac{2a^3}{\sqrt{x}}+\frac{6a^2cx^{\frac{7}{2}}}{7}+\frac{2ac^2x^{\frac{15}{2}}}{5}+\frac{2c^3x^{\frac{23}{2}}}{23}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**3/x**(3/2),x)
```

```
[Out] -2*a**3/sqrt(x) + 6*a**2*c*x**(7/2)/7 + 2*a*c**2*x**(15/2)/5 + 2*
c**3*x**(23/2)/23
```

Mathematica [A] time = 0.0162779, size = 41, normalized size = 0.84

$$\frac{2\left(-805a^3+345a^2cx^4+161ac^2x^8+35c^3x^{12}\right)}{805\sqrt{x}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + c*x^4)^3/x^(3/2),x]
```

```
[Out] (2*(-805*a^3 + 345*a^2*c*x^4 + 161*a*c^2*x^8 + 35*c^3*x^12))/(805
*Sqrt[x])
```

Maple [A] time = 0.009, size = 38, normalized size = 0.8

$$-\frac{-70\,c^3x^{12}-322\,ac^2x^8-690\,a^2cx^4+1610\,a^3}{805}\frac{1}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)^3/x^(3/2),x)

[Out] -2/805*(-35*c^3*x^12-161*a*c^2*x^8-345*a^2*c*x^4+805*a^3)/x^(1/2)
```

Maxima [A] time = 1.43543, size = 47, normalized size = 0.96

$$\frac{2}{23}\,c^3x^{\frac{23}{2}} + \frac{2}{5}\,ac^2x^{\frac{15}{2}} + \frac{6}{7}\,a^2cx^{\frac{7}{2}} - \frac{2\,a^3}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^3/x^(3/2),x, algorithm="maxima")

[Out] 2/23*c^3*x^(23/2) + 2/5*a*c^2*x^(15/2) + 6/7*a^2*c*x^(7/2) - 2*a^
3/sqrt(x)
```

Fricas [A] time = 0.225161, size = 50, normalized size = 1.02

$$\frac{2\left(35\,c^3x^{12} + 161\,ac^2x^8 + 345\,a^2cx^4 - 805\,a^3\right)}{805\,\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^3/x^(3/2),x, algorithm="fricas")

[Out] 2/805*(35*c^3*x^12 + 161*a*c^2*x^8 + 345*a^2*c*x^4 - 805*a^3)/sqr
t(x)
```

Sympy [A] time = 69.2825, size = 48, normalized size = 0.98

$$-\frac{2a^3}{\sqrt{x}} + \frac{6a^2cx^{\frac{7}{2}}}{7} + \frac{2ac^2x^{\frac{15}{2}}}{5} + \frac{2c^3x^{\frac{23}{2}}}{23}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**3/x**(3/2),x)

[Out] -2*a**3/sqrt(x) + 6*a**2*c*x**(7/2)/7 + 2*a*c**2*x**(15/2)/5 + 2*
c**3*x**(23/2)/23
```

GIAC/XCAS [A] time = 0.211472, size = 47, normalized size = 0.96

$$\frac{2}{23}\,c^3x^{\frac{23}{2}} + \frac{2}{5}\,ac^2x^{\frac{15}{2}} + \frac{6}{7}\,a^2cx^{\frac{7}{2}} - \frac{2\,a^3}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^3/x^(3/2),x, algorithm="giac")

[Out] 2/23*c^3*x^(23/2) + 2/5*a*c^2*x^(15/2) + 6/7*a^2*c*x^(7/2) - 2*a^
3/sqrt(x)
```

3.734 $\int \frac{(a+cx^4)^3}{x^{5/2}} \, dx$

Optimal. Leaf size=51

$$-\frac{2a^3}{3x^{3/2}}+\frac{6}{5}a^2cx^{5/2}+\frac{6}{13}ac^2x^{13/2}+\frac{2}{21}c^3x^{21/2}$$

```
[Out] (-2*a^3)/(3*x^(3/2)) + (6*a^2*c*x^(5/2))/5 + (6*a*c^2*x^(13/2))/1
3 + (2*c^3*x^(21/2))/21
```

Rubi [A] time = 0.0364448, antiderivative size = 51, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{2a^3}{3x^{3/2}}+\frac{6}{5}a^2cx^{5/2}+\frac{6}{13}ac^2x^{13/2}+\frac{2}{21}c^3x^{21/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + c*x^4)^3/x^(5/2),x]
```

```
[Out] (-2*a^3)/(3*x^(3/2)) + (6*a^2*c*x^(5/2))/5 + (6*a*c^2*x^(13/2))/1
3 + (2*c^3*x^(21/2))/21
```

Rubi in Sympy [A] time = 5.76896, size = 49, normalized size = 0.96

$$-\frac{2a^3}{3x^{\frac{3}{2}}}+\frac{6a^2cx^{\frac{5}{2}}}{5}+\frac{6ac^2x^{\frac{13}{2}}}{13}+\frac{2c^3x^{\frac{21}{2}}}{21}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**3/x**(5/2),x)
```

```
[Out] -2*a**3/(3*x**(3/2)) + 6*a**2*c*x**(5/2)/5 + 6*a*c**2*x**(13/2)/1
3 + 2*c**3*x**(21/2)/21
```

Mathematica [A] time = 0.0159259, size = 41, normalized size = 0.8

$$\frac{2\left(-455a^3+819a^2cx^4+315ac^2x^8+65c^3x^{12}\right)}{1365x^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + c*x^4)^3/x^(5/2),x]
```

```
[Out] (2*(-455*a^3 + 819*a^2*c*x^4 + 315*a*c^2*x^8 + 65*c^3*x^12))/(136
5*x^(3/2))
```

Maple [A] time = 0.008, size = 38, normalized size = 0.8

$$-\frac{-130\,c^3x^{12}-630\,ac^2x^8-1638\,a^2cx^4+910\,a^3}{1365}x^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)^3/x^(5/2),x)
```

```
[Out] -2/1365*(-65*c^3*x^12-315*a*c^2*x^8-819*a^2*c*x^4+455*a^3)/x^(3/2
)
```

Maxima [A] time = 1.44151, size = 47, normalized size = 0.92

$$\frac{2}{21}\,c^{3}x^{\frac{21}{2}}+\frac{6}{13}\,ac^{2}x^{\frac{13}{2}}+\frac{6}{5}\,a^{2}cx^{\frac{5}{2}}-\frac{2\,a^{3}}{3\,x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^3/x^(5/2),x, algorithm="maxima")
```

```
[Out] 2/21*c^3*x^(21/2) + 6/13*a*c^2*x^(13/2) + 6/5*a^2*c*x^(5/2) - 2/3
*a^3/x^(3/2)
```

Fricas [A] time = 0.228134, size = 50, normalized size = 0.98

$$\frac{2\left(65\,c^{3}x^{12}+315\,ac^{2}x^{8}+819\,a^{2}cx^{4}-455\,a^{3}\right)}{1365\,x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^3/x^(5/2),x, algorithm="fricas")
```

```
[Out] 2/1365*(65*c^3*x^12 + 315*a*c^2*x^8 + 819*a^2*c*x^4 - 455*a^3)/x^
(3/2)
```

Sympy [A] time = 78.7912, size = 49, normalized size = 0.96

$$-\frac{2a^{3}}{3x^{\frac{3}{2}}}+\frac{6a^{2}cx^{\frac{5}{2}}}{5}+\frac{6ac^{2}x^{\frac{13}{2}}}{13}+\frac{2c^{3}x^{\frac{21}{2}}}{21}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**3/x**(5/2),x)
```

```
[Out] -2*a**3/(3*x**(3/2)) + 6*a**2*c*x**(5/2)/5 + 6*a*c**2*x**(13/2)/1
3 + 2*c**3*x**(21/2)/21
```

GIAC/XCAS [A] time = 0.216936, size = 47, normalized size = 0.92

$$\frac{2}{21}\,c^{3}x^{\frac{21}{2}}+\frac{6}{13}\,ac^{2}x^{\frac{13}{2}}+\frac{6}{5}\,a^{2}cx^{\frac{5}{2}}-\frac{2\,a^{3}}{3\,x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^3/x^(5/2),x, algorithm="giac")
```

```
[Out] 2/21*c^3*x^(21/2) + 6/13*a*c^2*x^(13/2) + 6/5*a^2*c*x^(5/2) - 2/3
*a^3/x^(3/2)
```

3.735 $\int \frac{(a+cx^4)^3}{x^{7/2}}\,dx$

Optimal. Leaf size=49

$$-\frac{2a^3}{5x^{5/2}}+2a^2cx^{3/2}+\frac{6}{11}ac^2x^{11/2}+\frac{2}{19}c^3x^{19/2}$$

```
[Out] (-2*a^3)/(5*x^(5/2)) + 2*a^2*c*x^(3/2) + (6*a*c^2*x^(11/2))/11 +
(2*c^3*x^(19/2))/19
```

Rubi [A] time = 0.039299, antiderivative size = 49, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$-\frac{2a^3}{5x^{5/2}}+2a^2cx^{3/2}+\frac{6}{11}ac^2x^{11/2}+\frac{2}{19}c^3x^{19/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + c*x^4)^3/x^(7/2),x]
```

```
[Out] (-2*a^3)/(5*x^(5/2)) + 2*a^2*c*x^(3/2) + (6*a*c^2*x^(11/2))/11 +
(2*c^3*x^(19/2))/19
```

Rubi in Sympy [A] time = 5.75682, size = 48, normalized size = 0.98

$$-\frac{2a^3}{5x^{\frac{5}{2}}}+2a^2cx^{\frac{3}{2}}+\frac{6ac^2x^{\frac{11}{2}}}{11}+\frac{2c^3x^{\frac{19}{2}}}{19}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**3/x**(7/2),x)
```

```
[Out] -2*a**3/(5*x**(5/2)) + 2*a**2*c*x**(3/2) + 6*a*c**2*x**(11/2)/11
+ 2*c**3*x**(19/2)/19
```

Mathematica [A] time = 0.0192028, size = 41, normalized size = 0.84

$$\frac{2\left(-209a^3+1045a^2cx^4+285ac^2x^8+55c^3x^{12}\right)}{1045x^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + c*x^4)^3/x^(7/2),x]
```

```
[Out] (2*(-209*a^3 + 1045*a^2*c*x^4 + 285*a*c^2*x^8 + 55*c^3*x^12))/(10
45*x^(5/2))
```

Maple [A] time = 0.007, size = 38, normalized size = 0.8

$$-\frac{-110\,c^3x^{12}-570\,ac^2x^8-2090\,a^2cx^4+418\,a^3}{1045}x^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)^3/x^(7/2),x)
```

```
[Out] -2/1045*(-55*c^3*x^12-285*a*c^2*x^8-1045*a^2*c*x^4+209*a^3)/x^(5/
2)
```

Maxima [A] time = 1.44282, size = 47, normalized size = 0.96

$$\frac{2}{19}\,c^3x^{\frac{19}{2}} + \frac{6}{11}\,ac^2x^{\frac{11}{2}} + 2\,a^2cx^{\frac{3}{2}} - \frac{2\,a^3}{5\,x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^3/x^(7/2),x, algorithm="maxima")
```

```
[Out] 2/19*c^3*x^(19/2) + 6/11*a*c^2*x^(11/2) + 2*a^2*c*x^(3/2) - 2/5*a
^3/x^(5/2)
```

Fricas [A] time = 0.23287, size = 50, normalized size = 1.02

$$\frac{2\left(55\,c^3x^{12} + 285\,ac^2x^8 + 1045\,a^2cx^4 - 209\,a^3\right)}{1045\,x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^3/x^(7/2),x, algorithm="fricas")
```

```
[Out] 2/1045*(55*c^3*x^12 + 285*a*c^2*x^8 + 1045*a^2*c*x^4 - 209*a^3)/x
^(5/2)
```

Sympy [A] time = 101.494, size = 48, normalized size = 0.98

$$-\frac{2a^3}{5x^{\frac{5}{2}}} + 2a^2cx^{\frac{3}{2}} + \frac{6ac^2x^{\frac{11}{2}}}{11} + \frac{2c^3x^{\frac{19}{2}}}{19}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**3/x**(7/2),x)
```

```
[Out] -2*a**3/(5*x**(5/2)) + 2*a**2*c*x**(3/2) + 6*a*c**2*x**(11/2)/11
+ 2*c**3*x**(19/2)/19
```

GIAC/XCAS [A] time = 0.215157, size = 47, normalized size = 0.96

$$\frac{2}{19}\,c^3x^{\frac{19}{2}} + \frac{6}{11}\,ac^2x^{\frac{11}{2}} + 2\,a^2cx^{\frac{3}{2}} - \frac{2\,a^3}{5\,x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^3/x^(7/2),x, algorithm="giac")
```

```
[Out] 2/19*c^3*x^(19/2) + 6/11*a*c^2*x^(11/2) + 2*a^2*c*x^(3/2) - 2/5*a
^3/x^(5/2)
```

3.736 $\int \frac{x^{9/2}}{a+cx^4} \, dx$

Optimal. Leaf size=299

$$-\frac{(-a)^{3/8} \log \left(-\sqrt{2} \sqrt[8]{-a} \sqrt[8]{c} \sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c} x\right)}{4 \sqrt{2} c^{11/8}}+\frac{(-a)^{3/8} \log \left(\sqrt{2} \sqrt[8]{-a} \sqrt[8]{c} \sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c} x\right)}{4 \sqrt{2} c^{11/8}}+\frac{(-a)^{3/8} \tan ^{-1}\left(1-\frac{\sqrt{2} \sqrt[8]{c} \sqrt{x}}{\sqrt[8]{-a}}\right)}{2 \sqrt{2} c^{11/8}}-\frac{(-a)^{3/8} \tan ^{-1}\left(\frac{\sqrt{2} \sqrt[8]{c} \sqrt{x}}{\sqrt[8]{-a}}+1\right)}{2 \sqrt{2} c^{11/8}}+\frac{(-a)^{3/8} \tan ^{-1}\left(\frac{\sqrt[8]{c} \sqrt{x}}{\sqrt[8]{-a}}\right)}{2 c^{11/8}}-\frac{(-a)^{3/8} \tanh ^{-1}\left(\frac{\sqrt[8]{c} \sqrt{x}}{\sqrt[8]{-a}}\right)}{2 c^{11/8}}+\frac{2 x^{3/2}}{3 c}$$

```
[Out] (2*x^(3/2))/(3*c) + ((-a)^(3/8)*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[
x])/(-a)^(1/8)])/(2*Sqrt[2]*c^(11/8)) - ((-a)^(3/8)*ArcTan[1 + (S
qrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(2*Sqrt[2]*c^(11/8)) + ((-a)
^(3/8)*ArcTan[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(2*c^(11/8)) - ((-a)
^(3/8)*ArcTanh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(2*c^(11/8)) - ((-a
)^(3/8)*Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(
1/4)*x])/(4*Sqrt[2]*c^(11/8)) + ((-a)^(3/8)*Log[(-a)^(1/4) + Sqrt
[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(4*Sqrt[2]*c^(11/8))
```

Rubi [A] time = 0.714572, antiderivative size = 299, normalized size of antiderivative = 1., number of steps used = 15, number of rules used = 12, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.8

$$-\frac{(-a)^{3/8} \log \left(-\sqrt{2} \sqrt[8]{-a} \sqrt[8]{c} \sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c} x\right)}{4 \sqrt{2} c^{11/8}}+\frac{(-a)^{3/8} \log \left(\sqrt{2} \sqrt[8]{-a} \sqrt[8]{c} \sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c} x\right)}{4 \sqrt{2} c^{11/8}}+\frac{(-a)^{3/8} \tan ^{-1}\left(1-\frac{\sqrt{2} \sqrt[8]{c} \sqrt{x}}{\sqrt[8]{-a}}\right)}{2 \sqrt{2} c^{11/8}}-\frac{(-a)^{3/8} \tan ^{-1}\left(\frac{\sqrt{2} \sqrt[8]{c} \sqrt{x}}{\sqrt[8]{-a}}+1\right)}{2 \sqrt{2} c^{11/8}}+\frac{(-a)^{3/8} \tan ^{-1}\left(\frac{\sqrt[8]{c} \sqrt{x}}{\sqrt[8]{-a}}\right)}{2 c^{11/8}}-\frac{(-a)^{3/8} \tanh ^{-1}\left(\frac{\sqrt[8]{c} \sqrt{x}}{\sqrt[8]{-a}}\right)}{2 c^{11/8}}+\frac{2 x^{3/2}}{3 c}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(9/2)/(a + c*x^4),x]
```


```
[Out] (2*x^(3/2))/(3*c) + ((-a)^(3/8)*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[
x])/(-a)^(1/8)])/(2*Sqrt[2]*c^(11/8)) - ((-a)^(3/8)*ArcTan[1 + (S
qrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(2*Sqrt[2]*c^(11/8)) + ((-a)
^(3/8)*ArcTan[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(2*c^(11/8)) - ((-a)
^(3/8)*ArcTanh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(2*c^(11/8)) - ((-a
)^(3/8)*Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(
1/4)*x])/(4*Sqrt[2]*c^(11/8)) + ((-a)^(3/8)*Log[(-a)^(1/4) + Sqrt
[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(4*Sqrt[2]*c^(11/8))
```

Rubi in Sympy [A] time = 120.22, size = 274, normalized size = 0.92

$$\frac{2 x^{\frac{3}{2}}}{3 c}-\frac{\sqrt{2} (-a)^{\frac{3}{8}} \log \left(-\sqrt{2} \sqrt[8]{c} \sqrt{x} \sqrt[8]{-a}+\sqrt[4]{c} x+\sqrt[4]{-a}\right)}{8 c^{\frac{11}{8}}}+\frac{\sqrt{2} (-a)^{\frac{3}{8}} \log \left(\sqrt{2} \sqrt[8]{c} \sqrt{x} \sqrt[8]{-a}+\sqrt[4]{c} x+\sqrt[4]{-a}\right)}{8 c^{\frac{11}{8}}}+\frac{(-a)^{\frac{3}{8}} \operatorname{atan}\left(\frac{\sqrt[8]{c} \sqrt{x}}{\sqrt[8]{-a}}\right)}{2 c^{\frac{11}{8}}}-\frac{\sqrt{2} (-a)^{\frac{3}{8}} \operatorname{atan}\left(\frac{\sqrt{2} \sqrt[8]{c} \sqrt{x}}{\sqrt[8]{-a}}-1\right)}{4 c^{\frac{11}{8}}}-\frac{\sqrt{2} (-a)^{\frac{3}{8}} \operatorname{atan}\left(\frac{\sqrt{2} \sqrt[8]{c} \sqrt{x}}{\sqrt[8]{-a}}+1\right)}{4 c^{\frac{11}{8}}}-\frac{(-a)^{\frac{3}{8}} \operatorname{atanh}\left(\frac{\sqrt[8]{c} \sqrt{x}}{\sqrt[8]{-a}}\right)}{2 c^{\frac{11}{8}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate(x**(9/2)/(c*x**4+a),x)
```

```
[Out] 2*x**(3/2)/(3*c) - sqrt(2)*(-a)**(3/8)*log(-sqrt(2)*c**(1/8)*sqrt
(x)*(-a)**(1/8) + c**(1/4)*x + (-a)**(1/4))/(8*c**(11/8)) + sqrt(
2)*(-a)**(3/8)*log(sqrt(2)*c**(1/8)*sqrt(x)*(-a)**(1/8) + c**(1/4
)*x + (-a)**(1/4))/(8*c**(11/8)) + (-a)**(3/8)*atan(c**(1/8)*sqrt
(x)/(-a)**(1/8))/(2*c**(11/8)) - sqrt(2)*(-a)**(3/8)*atan(sqrt(2)
*c**(1/8)*sqrt(x)/(-a)**(1/8) - 1)/(4*c**(11/8)) - sqrt(2)*(-a)**
(3/8)*atan(sqrt(2)*c**(1/8)*sqrt(x)/(-a)**(1/8) + 1)/(4*c**(11/8)
) - (-a)**(3/8)*atanh(c**(1/8)*sqrt(x)/(-a)**(1/8))/(2*c**(11/8))
```

Mathematica [A] time = 0.501914, size = 397, normalized size = 1.33

$$-3a^{3/8}\cos\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)+3a^{3/8}\cos\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)+3a^{3/8}\sin\left(\frac{\pi}{8}\right)$$

Antiderivative was successfully verified.

```
[In]   Integrate[x^(9/2)/(a + c*x^4),x]
```

```
[Out] (8*c^(3/8)*x^(3/2) + 6*a^(3/8)*ArcTan[Cot[Pi/8] - (c^(1/8)*Sqrt[x
]*Csc[Pi/8])/a^(1/8)]*Cos[Pi/8] - 6*a^(3/8)*ArcTan[Cot[Pi/8] + (c
^(1/8)*Sqrt[x]*Csc[Pi/8])/a^(1/8)]*Cos[Pi/8] - 3*a^(3/8)*Cos[Pi/8
]*Log[a^(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[x]*Sin[Pi/8]]
+ 3*a^(3/8)*Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x + 2*a^(1/8)*c^(1/8)
*Sqrt[x]*Sin[Pi/8]] + 6*a^(3/8)*ArcTan[(c^(1/8)*Sqrt[x]*Sec[Pi/8]
)/a^(1/8) - Tan[Pi/8]]*Sin[Pi/8] + 6*a^(3/8)*ArcTan[(c^(1/8)*Sqrt
[x]*Sec[Pi/8])/a^(1/8) + Tan[Pi/8]]*Sin[Pi/8] + 3*a^(3/8)*Log[a^(
1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[x]*Cos[Pi/8]]*Sin[Pi/8]
 - 3*a^(3/8)*Log[a^(1/4) + c^(1/4)*x + 2*a^(1/8)*c^(1/8)*Sqrt[x]*
Cos[Pi/8]]*Sin[Pi/8])/(12*c^(11/8))
```

Maple [C] time = 0.107, size = 39, normalized size = 0.1

$$\frac{2}{3\,c}x^{\frac{3}{2}}-\frac{a}{4\,c^2}\sum_{\_R=RootOf\left(c\_Z^8+a\right)}\frac{1}{\_R^5}\ln\left(\sqrt{x}-\_R\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^(9/2)/(c*x^4+a),x)
```

```
[Out] 2/3*x^(3/2)/c-1/4*a/c^2*sum(1/_R^5*ln(x^(1/2)-_R),_R=RootOf(_Z^8*
c+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-a\int\frac{\sqrt{x}}{c^2x^4+ac}\,dx+\frac{2\,x^{\frac{3}{2}}}{3\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^(9/2)/(c*x^4 + a),x, algorithm="maxima")
```

```
[Out] -a*integrate(sqrt(x)/(c^2*x^4 + a*c), x) + 2/3*x^(3/2)/c
```

Fricas [A] time = 0.259194, size = 636, normalized size = 2.13

$$\sqrt{2}\left(12\sqrt{2}c\left(-\frac{a^3}{c^{11}}\right)^{\frac{1}{8}}\arctan\left(\frac{c^4\left(-\frac{a^3}{c^{11}}\right)^{\frac{3}{8}}}{a\sqrt{x}+\sqrt{c^8\left(-\frac{a^3}{c^{11}}\right)^{\frac{3}{4}}+a^2x}}\right)+3\sqrt{2}c\left(-\frac{a^3}{c^{11}}\right)^{\frac{1}{8}}\log\left(c^4\left(-\frac{a^3}{c^{11}}\right)^{\frac{3}{8}}+a\sqrt{x}\right)-3\sqrt{2}c\left(-\frac{a^3}{c^{11}}\right)^{\frac{1}{8}}\log\left(-c^4\left(-\frac{a}{c^1}\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(9/2)/(c*x^4 + a),x, algorithm="fricas")
```

```
[Out] 1/24*sqrt(2)*(12*sqrt(2)*c*(-a^3/c^11)^(1/8)*arctan(c^4*(-a^3/c^1
1)^(3/8)/(a*sqrt(x) + sqrt(c^8*(-a^3/c^11)^(3/4) + a^2*x))) + 3*s
qrt(2)*c*(-a^3/c^11)^(1/8)*log(c^4*(-a^3/c^11)^(3/8) + a*sqrt(x))
 - 3*sqrt(2)*c*(-a^3/c^11)^(1/8)*log(-c^4*(-a^3/c^11)^(3/8) + a*s
qrt(x)) - 12*c*(-a^3/c^11)^(1/8)*arctan(c^4*(-a^3/c^11)^(3/8)/(c^
4*(-a^3/c^11)^(3/8) + sqrt(2)*a*sqrt(x) + sqrt(2*c^8*(-a^3/c^11)^
(3/4) + 2*sqrt(2)*a*c^4*sqrt(x)*(-a^3/c^11)^(3/8) + 2*a^2*x))) -
12*c*(-a^3/c^11)^(1/8)*arctan(-c^4*(-a^3/c^11)^(3/8)/(c^4*(-a^3/c
^11)^(3/8) - sqrt(2)*a*sqrt(x) - sqrt(2*c^8*(-a^3/c^11)^(3/4) - 2
*sqrt(2)*a*c^4*sqrt(x)*(-a^3/c^11)^(3/8) + 2*a^2*x))) - 3*c*(-a^3
/c^11)^(1/8)*log(2*c^8*(-a^3/c^11)^(3/4) + 2*sqrt(2)*a*c^4*sqrt(x
)*(-a^3/c^11)^(3/8) + 2*a^2*x) + 3*c*(-a^3/c^11)^(1/8)*log(2*c^8*
(-a^3/c^11)^(3/4) - 2*sqrt(2)*a*c^4*sqrt(x)*(-a^3/c^11)^(3/8) + 2
*a^2*x) + 8*sqrt(2)*x^(3/2))/c
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(9/2)/(c*x**4+a),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.305306, size = 601, normalized size = 2.01

$$\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{3}{8}}\arctan\left(\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{4c}+\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{3}{8}}\arctan\left(-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{4c}$$
$$-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{3}{8}}\arctan\left(\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{4c}-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{3}{8}}\arctan\left(-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{4c}$$
$$-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{3}{8}}\ln\left(\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{8c}$$
$$+\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{3}{8}}\ln\left(-\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{8c}$$
$$+\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{3}{8}}\ln\left(\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{8c}$$
$$-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{3}{8}}\ln\left(-\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{8c}+\frac{2x^{\frac{3}{2}}}{3c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(9/2)/(c*x^4 + a),x, algorithm="giac")
```

```
[Out] 1/4*sqrt(-sqrt(2) + 2)*(a/c)^(3/8)*arctan((sqrt(-sqrt(2) + 2)*(a/
c)^(1/8) + 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/c + 1/4*sq
rt(-sqrt(2) + 2)*(a/c)^(3/8)*arctan(-(sqrt(-sqrt(2) + 2)*(a/c)^(1
/8) - 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/c - 1/4*sqrt(sq
rt(2) + 2)*(a/c)^(3/8)*arctan((sqrt(sqrt(2) + 2)*(a/c)^(1/8) + 2*
sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/c - 1/4*sqrt(sqrt(2) +
 2)*(a/c)^(3/8)*arctan(-(sqrt(sqrt(2) + 2)*(a/c)^(1/8) - 2*sqrt(x
))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/c - 1/8*sqrt(-sqrt(2) + 2)*(
a/c)^(3/8)*ln(sqrt(x)*sqrt(sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(
1/4))/c + 1/8*sqrt(-sqrt(2) + 2)*(a/c)^(3/8)*ln(-sqrt(x)*sqrt(sqr
t(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/c + 1/8*sqrt(sqrt(2) + 2
)*(a/c)^(3/8)*ln(sqrt(x)*sqrt(-sqrt(2) + 2)*(a/c)^(1/8) + x + (a/
c)^(1/4))/c - 1/8*sqrt(sqrt(2) + 2)*(a/c)^(3/8)*ln(-sqrt(x)*sqrt(
-sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/c + 2/3*x^(3/2)/c
```

3.737 $\int \frac{x^{7/2}}{a+cx^4}\,dx$

Optimal. Leaf size=297

$$\frac{\sqrt[8]{-a}\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{4\sqrt{2}c^{9/8}}-\frac{\sqrt[8]{-a}\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{4\sqrt{2}c^{9/8}}+\frac{\sqrt[8]{-a}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2\sqrt{2}c^{9/8}}-\frac{\sqrt[8]{-a}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{2\sqrt{2}c^{9/8}}-\frac{\sqrt[8]{-a}\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2c^{9/8}}-\frac{\sqrt[8]{-a}\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2c^{9/8}}+\frac{2\sqrt{x}}{c}$$

```
[Out] (2*Sqrt[x])/c + ((-a)^(1/8)*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/
(-a)^(1/8)])/(2*Sqrt[2]*c^(9/8)) - ((-a)^(1/8)*ArcTan[1 + (Sqrt[2
]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(2*Sqrt[2]*c^(9/8)) - ((-a)^(1/8)
*ArcTan[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(2*c^(9/8)) - ((-a)^(1/8)*
ArcTanh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(2*c^(9/8)) + ((-a)^(1/8)*
Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])
/(4*Sqrt[2]*c^(9/8)) - ((-a)^(1/8)*Log[(-a)^(1/4) + Sqrt[2]*(-a)^
(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(4*Sqrt[2]*c^(9/8))
```

Rubi [A] time = 0.574625, antiderivative size = 297, normalized size of antiderivative = 1., number of steps used = 15, number of rules used = 12, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.8

$$\frac{\sqrt[8]{-a}\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{4\sqrt{2}c^{9/8}}-\frac{\sqrt[8]{-a}\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{4\sqrt{2}c^{9/8}}+\frac{\sqrt[8]{-a}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2\sqrt{2}c^{9/8}}-\frac{\sqrt[8]{-a}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{2\sqrt{2}c^{9/8}}-\frac{\sqrt[8]{-a}\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2c^{9/8}}-\frac{\sqrt[8]{-a}\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2c^{9/8}}+\frac{2\sqrt{x}}{c}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(7/2)/(a + c*x^4),x]
```

```
[Out] (2*Sqrt[x])/c + ((-a)^(1/8)*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/
(-a)^(1/8)])/(2*Sqrt[2]*c^(9/8)) - ((-a)^(1/8)*ArcTan[1 + (Sqrt[2
]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(2*Sqrt[2]*c^(9/8)) - ((-a)^(1/8)
*ArcTan[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(2*c^(9/8)) - ((-a)^(1/8)*
ArcTanh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(2*c^(9/8)) + ((-a)^(1/8)*
Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])
/(4*Sqrt[2]*c^(9/8)) - ((-a)^(1/8)*Log[(-a)^(1/4) + Sqrt[2]*(-a)^
(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(4*Sqrt[2]*c^(9/8))
```

Rubi in Sympy [A] time = 118.395, size = 272, normalized size = 0.92

$$\frac{2\sqrt{x}}{c}+\frac{\sqrt{2}\sqrt[8]{-a}\log\left(-\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{8c^{\frac{9}{8}}}-\frac{\sqrt{2}\sqrt[8]{-a}\log\left(\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{8c^{\frac{9}{8}}}-\frac{\sqrt[8]{-a}\operatorname{atan}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2c^{\frac{9}{8}}}-\frac{\sqrt{2}\sqrt[8]{-a}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}-1\right)}{4c^{\frac{9}{8}}}-\frac{\sqrt{2}\sqrt[8]{-a}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{4c^{\frac{9}{8}}}-\frac{\sqrt[8]{-a}\operatorname{atanh}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2c^{\frac{9}{8}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(7/2)/(c*x**4+a),x)
```

```
[Out] 2*sqrt(x)/c + sqrt(2)*(-a)**(1/8)*log(-sqrt(2)*c**(1/8)*sqrt(x)*(
-a)**(1/8) + c**(1/4)*x + (-a)**(1/4))/(8*c**(9/8)) - sqrt(2)*(-a
)**(1/8)*log(sqrt(2)*c**(1/8)*sqrt(x)*(-a)**(1/8) + c**(1/4)*x +
(-a)**(1/4))/(8*c**(9/8)) - (-a)**(1/8)*atan(c**(1/8)*sqrt(x)/(-a
)**(1/8))/(2*c**(9/8)) - sqrt(2)*(-a)**(1/8)*atan(sqrt(2)*c**(1/8
)*sqrt(x)/(-a)**(1/8) - 1)/(4*c**(9/8)) - sqrt(2)*(-a)**(1/8)*ata
n(sqrt(2)*c**(1/8)*sqrt(x)/(-a)**(1/8) + 1)/(4*c**(9/8)) - (-a)**
(1/8)*atanh(c**(1/8)*sqrt(x)/(-a)**(1/8))/(2*c**(9/8))
```

Mathematica [A] time = 0.368669, size = 395, normalized size = 1.33

$$\sqrt[8]{a}\sin\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)-\sqrt[8]{a}\sin\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)+\sqrt[8]{a}\cos\left(\frac{\pi}{8}\right)\log\left(-2\right.$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(7/2)/(a + c*x^4),x]
```

```
[Out] (8*c^(1/8)*Sqrt[x] - 2*a^(1/8)*ArcTan[(c^(1/8)*Sqrt[x]*Sec[Pi/8])
/a^(1/8) - Tan[Pi/8]]*Cos[Pi/8] - 2*a^(1/8)*ArcTan[(c^(1/8)*Sqrt[
x]*Sec[Pi/8])/a^(1/8) + Tan[Pi/8]]*Cos[Pi/8] + a^(1/8)*Cos[Pi/8]*
Log[a^(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[x]*Cos[Pi/8]] -
a^(1/8)*Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x + 2*a^(1/8)*c^(1/8)*Sqr
t[x]*Cos[Pi/8]] + 2*a^(1/8)*ArcTan[Cot[Pi/8] - (c^(1/8)*Sqrt[x]*C
sc[Pi/8])/a^(1/8)]*Sin[Pi/8] - 2*a^(1/8)*ArcTan[Cot[Pi/8] + (c^(1
/8)*Sqrt[x]*Csc[Pi/8])/a^(1/8)]*Sin[Pi/8] + a^(1/8)*Log[a^(1/4) +
 c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[x]*Sin[Pi/8]]*Sin[Pi/8] - a^(
1/8)*Log[a^(1/4) + c^(1/4)*x + 2*a^(1/8)*c^(1/8)*Sqrt[x]*Sin[Pi/8
]]*Sin[Pi/8])/(4*c^(9/8))
```

Maple [C] time = 0.023, size = 39, normalized size = 0.1

$$2\,\frac{\sqrt{x}}{c}-\frac{a}{4\,c^{2}}\sum_{\_R=RootOf(\_Z^{8}c+a)}\frac{1}{\_R^{7}}\ln\left(\sqrt{x}-\_R\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(7/2)/(c*x^4+a),x)
```

```
[Out] 2*x^(1/2)/c-1/4*a/c^2*sum(1/_R^7*ln(x^(1/2)-_R),_R=RootOf(_Z^8*c+
a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^{\frac{7}{2}}}{cx^{4}+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(7/2)/(c*x^4 + a),x, algorithm="maxima")
```

```
[Out] integrate(x^(7/2)/(c*x^4 + a), x)
```

Fricas [A] time = 0.262596, size = 504, normalized size = 1.7

$$\frac{\sqrt{2}\left(4\sqrt{2}c\left(-\frac{a}{c^9}\right)^{\frac{1}{8}}\arctan\left(\frac{c\left(-\frac{a}{c^9}\right)^{\frac{1}{8}}}{\sqrt{c^2\left(-\frac{a}{c^9}\right)^{\frac{1}{4}}+x}+\sqrt{x}}\right)-\sqrt{2}c\left(-\frac{a}{c^9}\right)^{\frac{1}{8}}\log\left(c\left(-\frac{a}{c^9}\right)^{\frac{1}{8}}+\sqrt{x}\right)+\sqrt{2}c\left(-\frac{a}{c^9}\right)^{\frac{1}{8}}\log\left(-c\left(-\frac{a}{c^9}\right)^{\frac{1}{8}}+\sqrt{x}\right)+4\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(7/2)/(c*x^4 + a),x, algorithm="fricas")
```

```
[Out] 1/8*sqrt(2)*(4*sqrt(2)*c*(-a/c^9)^(1/8)*arctan(c*(-a/c^9)^(1/8)/(
sqrt(c^2*(-a/c^9)^(1/4) + x) + sqrt(x))) - sqrt(2)*c*(-a/c^9)^(1/
8)*log(c*(-a/c^9)^(1/8) + sqrt(x)) + sqrt(2)*c*(-a/c^9)^(1/8)*log
(-c*(-a/c^9)^(1/8) + sqrt(x)) + 4*c*(-a/c^9)^(1/8)*arctan(c*(-a/c
^9)^(1/8)/(c*(-a/c^9)^(1/8) + sqrt(2)*sqrt(x) + sqrt(2*c^2*(-a/c^
9)^(1/4) + 2*sqrt(2)*c*sqrt(x)*(-a/c^9)^(1/8) + 2*x))) + 4*c*(-a/
c^9)^(1/8)*arctan(-c*(-a/c^9)^(1/8)/(c*(-a/c^9)^(1/8) - sqrt(2)*s
qrt(x) - sqrt(2*c^2*(-a/c^9)^(1/4) - 2*sqrt(2)*c*sqrt(x)*(-a/c^9)
^(1/8) + 2*x))) - c*(-a/c^9)^(1/8)*log(2*c^2*(-a/c^9)^(1/4) + 2*s
qrt(2)*c*sqrt(x)*(-a/c^9)^(1/8) + 2*x) + c*(-a/c^9)^(1/8)*log(2*c
^2*(-a/c^9)^(1/4) - 2*sqrt(2)*c*sqrt(x)*(-a/c^9)^(1/8) + 2*x) + 8
*sqrt(2)*sqrt(x))/c
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(7/2)/(c*x**4+a),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.281345, size = 601, normalized size = 2.02

$$-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\arctan\left(\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{4c}-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\arctan\left(-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{4c}-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\arctan\left(\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{4c}-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\arctan\left(-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{4c}-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\ln\left(\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{8c}+\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\ln\left(-\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{8c}-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\ln\left(\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{8c}+\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\ln\left(-\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{8c}+\frac{2\sqrt{x}}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(7/2)/(c*x^4 + a),x, algorithm="giac")
```

```
[Out] -1/4*sqrt(sqrt(2) + 2)*(a/c)^(1/8)*arctan((sqrt(-sqrt(2) + 2)*(a/
c)^(1/8) + 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/c - 1/4*sq
```

```
rt(sqrt(2) + 2)*(a/c)^(1/8)*arctan(-(sqrt(-sqrt(2) + 2)*(a/c)^(1/
8) - 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/c - 1/4*sqrt(-sq
rt(2) + 2)*(a/c)^(1/8)*arctan((sqrt(sqrt(2) + 2)*(a/c)^(1/8) + 2*
sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/c - 1/4*sqrt(-sqrt(2)
+ 2)*(a/c)^(1/8)*arctan(-(sqrt(sqrt(2) + 2)*(a/c)^(1/8) - 2*sqrt(
x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/c - 1/8*sqrt(sqrt(2) + 2)*(
a/c)^(1/8)*ln(sqrt(x)*sqrt(sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(
1/4))/c + 1/8*sqrt(sqrt(2) + 2)*(a/c)^(1/8)*ln(-sqrt(x)*sqrt(sqrt
(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/c - 1/8*sqrt(-sqrt(2) + 2
)*(a/c)^(1/8)*ln(sqrt(x)*sqrt(-sqrt(2) + 2)*(a/c)^(1/8) + x + (a/
c)^(1/4))/c + 1/8*sqrt(-sqrt(2) + 2)*(a/c)^(1/8)*ln(-sqrt(x)*sqrt
(-sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/c + 2*sqrt(x)/c
```

3.738 $\int \frac{x^{5/2}}{a+cx^4}\,dx$

Optimal. Leaf size=287

$$\frac{\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{4\sqrt{2}\sqrt[8]{-a}c^{7/8}}-\frac{\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{4\sqrt{2}\sqrt[8]{-a}c^{7/8}}-\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2\sqrt{2}\sqrt[8]{-a}c^{7/8}}+\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{2\sqrt{2}\sqrt[8]{-a}c^{7/8}}+\frac{\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2\sqrt[8]{-a}c^{7/8}}-\frac{\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2\sqrt[8]{-a}c^{7/8}}$$

```
[Out] -ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)]/(2*Sqrt[2]*(-a)
^(1/8)*c^(7/8)) + ArcTan[1 + (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)
]/(2*Sqrt[2]*(-a)^(1/8)*c^(7/8)) + ArcTan[(c^(1/8)*Sqrt[x])/(-a)^
(1/8)]/(2*(-a)^(1/8)*c^(7/8)) - ArcTanh[(c^(1/8)*Sqrt[x])/(-a)^(1
/8)]/(2*(-a)^(1/8)*c^(7/8)) + Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)
*c^(1/8)*Sqrt[x] + c^(1/4)*x]/(4*Sqrt[2]*(-a)^(1/8)*c^(7/8)) - Lo
g[(-a)^(1/4) + Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x]/(4
*Sqrt[2]*(-a)^(1/8)*c^(7/8))
```

Rubi [A] time = 0.508049, antiderivative size = 287, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 11, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.733

$$\frac{\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{4\sqrt{2}\sqrt[8]{-a}c^{7/8}}-\frac{\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{4\sqrt{2}\sqrt[8]{-a}c^{7/8}}-\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2\sqrt{2}\sqrt[8]{-a}c^{7/8}}+\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{2\sqrt{2}\sqrt[8]{-a}c^{7/8}}+\frac{\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2\sqrt[8]{-a}c^{7/8}}-\frac{\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2\sqrt[8]{-a}c^{7/8}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(5/2)/(a + c*x^4),x]
```

```
[Out] -ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)]/(2*Sqrt[2]*(-a)
^(1/8)*c^(7/8)) + ArcTan[1 + (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)
]/(2*Sqrt[2]*(-a)^(1/8)*c^(7/8)) + ArcTan[(c^(1/8)*Sqrt[x])/(-a)^
(1/8)]/(2*(-a)^(1/8)*c^(7/8)) - ArcTanh[(c^(1/8)*Sqrt[x])/(-a)^(1
/8)]/(2*(-a)^(1/8)*c^(7/8)) + Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)
*c^(1/8)*Sqrt[x] + c^(1/4)*x]/(4*Sqrt[2]*(-a)^(1/8)*c^(7/8)) - Lo
g[(-a)^(1/4) + Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x]/(4
*Sqrt[2]*(-a)^(1/8)*c^(7/8))
```

Rubi in Sympy [A] time = 99.3218, size = 264, normalized size = 0.92

$$\frac{\sqrt{2}\log\left(-\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{8c^{\frac{7}{8}}\sqrt[8]{-a}}-\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{8c^{\frac{7}{8}}\sqrt[8]{-a}}+\frac{\operatorname{atan}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2c^{\frac{7}{8}}\sqrt[8]{-a}}+\frac{\sqrt{2}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}-1\right)}{4c^{\frac{7}{8}}\sqrt[8]{-a}}+\frac{\sqrt{2}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{4c^{\frac{7}{8}}\sqrt[8]{-a}}-\frac{\operatorname{atanh}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2c^{\frac{7}{8}}\sqrt[8]{-a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(5/2)/(c*x**4+a),x)
```

```
[Out] sqrt(2)*log(-sqrt(2)*c**(1/8)*sqrt(x)*(-a)**(1/8) + c**(1/4)*x +
(-a)**(1/4))/(8*c**(7/8)*(-a)**(1/8)) - sqrt(2)*log(sqrt(2)*c**(1
/8)*sqrt(x)*(-a)**(1/8) + c**(1/4)*x + (-a)**(1/4))/(8*c**(7/8)*(
-a)**(1/8)) + atan(c**(1/8)*sqrt(x)/(-a)**(1/8))/(2*c**(7/8)*(-a)
```

```
**(1/8)) + sqrt(2)*atan(sqrt(2)*c**(1/8)*sqrt(x)/(-a)**(1/8) - 1)
/(4*c**(7/8)*(-a)**(1/8)) + sqrt(2)*atan(sqrt(2)*c**(1/8)*sqrt(x)
/(-a)**(1/8) + 1)/(4*c**(7/8)*(-a)**(1/8)) - atanh(c**(1/8)*sqrt(
x)/(-a)**(1/8))/(2*c**(7/8)*(-a)**(1/8))
```

Mathematica [A] time = 0.254485, size = 348, normalized size = 1.21

$$\frac{\sin\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)-\sin\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)+\cos\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\cos \cdots\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(5/2)/(a + c*x^4),x]
```

```
[Out] (2*ArcTan[(c^(1/8)*Sqrt[x]*Sec[Pi/8])/a^(1/8) - Tan[Pi/8]]*Cos[Pi
/8] + 2*ArcTan[(c^(1/8)*Sqrt[x]*Sec[Pi/8])/a^(1/8) + Tan[Pi/8]]*C
os[Pi/8] + Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*
Sqrt[x]*Cos[Pi/8]] - Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x + 2*a^(1/8
)*c^(1/8)*Sqrt[x]*Cos[Pi/8]] - 2*ArcTan[Cot[Pi/8] - (c^(1/8)*Sqrt
[x]*Csc[Pi/8])/a^(1/8)]*Sin[Pi/8] + 2*ArcTan[Cot[Pi/8] + (c^(1/8)
*Sqrt[x]*Csc[Pi/8])/a^(1/8)]*Sin[Pi/8] + Log[a^(1/4) + c^(1/4)*x
- 2*a^(1/8)*c^(1/8)*Sqrt[x]*Sin[Pi/8]]*Sin[Pi/8] - Log[a^(1/4) +
c^(1/4)*x + 2*a^(1/8)*c^(1/8)*Sqrt[x]*Sin[Pi/8]]*Sin[Pi/8])/(4*a^
(1/8)*c^(7/8))
```

Maple [C] time = 0.023, size = 29, normalized size = 0.1

$$\frac{1}{4\,c}\sum_{\_R=RootOf(\_Z^8c+a)}\frac{1}{\_R}\ln\left(\sqrt{x}-\_R\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(5/2)/(c*x^4+a),x)
```

```
[Out] 1/4/c*sum(1/_R*ln(x^(1/2)-_R),_R=RootOf(_Z^8*c+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{\frac{5}{2}}}{cx^4+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5/2)/(c*x^4 + a),x, algorithm="maxima")
```

```
[Out] integrate(x^(5/2)/(c*x^4 + a), x)
```

Fricas [A] time = 0.253334, size = 594, normalized size = 2.07

$$\frac{1}{8}\sqrt{2}\left(4\sqrt{2}\left(-\frac{1}{ac^7}\right)^{\frac{1}{8}}\arctan\left(\frac{ac^6\left(-\frac{1}{ac^7}\right)^{\frac{7}{8}}}{\sqrt{-ac^5\left(-\frac{1}{ac^7}\right)^{\frac{3}{4}}+x}+\sqrt{x}}\right)+\sqrt{2}\left(-\frac{1}{ac^7}\right)^{\frac{1}{8}}\log\left(ac^6\left(-\frac{1}{ac^7}\right)^{\frac{7}{8}}+\sqrt{x}\right)-\sqrt{2}\left(-\frac{1}{ac^7}\right)^{\frac{1}{8}}\log\left(-ac \cdots\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5/2)/(c*x^4 + a),x, algorithm="fricas")
```

```
[Out] 1/8*sqrt(2)*(4*sqrt(2)*(-1/(a*c^7))^(1/8)*arctan(a*c^6*(-1/(a*c^7
))^(7/8)/(sqrt(-a*c^5*(-1/(a*c^7))^(3/4) + x) + sqrt(x))) + sqrt(
2)*(-1/(a*c^7))^(1/8)*log(a*c^6*(-1/(a*c^7))^(7/8) + sqrt(x)) - s
qrt(2)*(-1/(a*c^7))^(1/8)*log(-a*c^6*(-1/(a*c^7))^(7/8) + sqrt(x)
) + 4*(-1/(a*c^7))^(1/8)*arctan(a*c^6*(-1/(a*c^7))^(7/8)/(a*c^6*(
-1/(a*c^7))^(7/8) + sqrt(2)*sqrt(x) + sqrt(2*sqrt(2)*a*c^6*sqrt(x
)*(-1/(a*c^7))^(7/8) - 2*a*c^5*(-1/(a*c^7))^(3/4) + 2*x))) + 4*(-
1/(a*c^7))^(1/8)*arctan(-a*c^6*(-1/(a*c^7))^(7/8)/(a*c^6*(-1/(a*c
^7))^(7/8) - sqrt(2)*sqrt(x) - sqrt(-2*sqrt(2)*a*c^6*sqrt(x)*(-1/
(a*c^7))^(7/8) - 2*a*c^5*(-1/(a*c^7))^(3/4) + 2*x))) + (-1/(a*c^7
))^(1/8)*log(2*sqrt(2)*a*c^6*sqrt(x)*(-1/(a*c^7))^(7/8) - 2*a*c^5
*(-1/(a*c^7))^(3/4) + 2*x) - (-1/(a*c^7))^(1/8)*log(-2*sqrt(2)*a*
c^6*sqrt(x)*(-1/(a*c^7))^(7/8) - 2*a*c^5*(-1/(a*c^7))^(3/4) + 2*x
))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(5/2)/(c*x**4+a),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.296237, size = 590, normalized size = 2.06

$$\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\arctan\left(\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{4a}+\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\arctan\left(-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{4a}+\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\arctan\left(\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{4a}+\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\arctan\left(-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{4a}-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\ln\left(\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{8a}+\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\ln\left(-\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{8a}-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\ln\left(\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{8a}+\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\ln\left(-\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{8a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5/2)/(c*x^4 + a),x, algorithm="giac")
```

```
[Out] 1/4*sqrt(sqrt(2) + 2)*(a/c)^(7/8)*arctan((sqrt(-sqrt(2) + 2)*(a/c
)^(1/8) + 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/a + 1/4*sqr
t(sqrt(2) + 2)*(a/c)^(7/8)*arctan(-(sqrt(-sqrt(2) + 2)*(a/c)^(1/8
) - 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/a + 1/4*sqrt(-sqr
t(2) + 2)*(a/c)^(7/8)*arctan((sqrt(sqrt(2) + 2)*(a/c)^(1/8) + 2*s
qrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/a + 1/4*sqrt(-sqrt(2) +
 2)*(a/c)^(7/8)*arctan(-(sqrt(sqrt(2) + 2)*(a/c)^(1/8) - 2*sqrt(x
))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/a - 1/8*sqrt(sqrt(2) + 2)*(a
/c)^(7/8)*ln(sqrt(x)*sqrt(sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1
/4))/a + 1/8*sqrt(sqrt(2) + 2)*(a/c)^(7/8)*ln(-sqrt(x)*sqrt(sqrt(
2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/a - 1/8*sqrt(-sqrt(2) + 2)
```

```
*(a/c)^(7/8)*ln(sqrt(x)*sqrt(-sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c
)^(1/4))/a + 1/8*sqrt(-sqrt(2) + 2)*(a/c)^(7/8)*ln(-sqrt(x)*sqrt(
-sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/a
```

3.739 $\int \frac{x^{3/2}}{a+cx^4} dx$

Optimal. Leaf size=287

$$-\frac{\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{4\sqrt{2}(-a)^{3/8}c^{5/8}}+\frac{\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{4\sqrt{2}(-a)^{3/8}c^{5/8}}-\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2\sqrt{2}(-a)^{3/8}c^{5/8}}+\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{2\sqrt{2}(-a)^{3/8}c^{5/8}}-\frac{\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2(-a)^{3/8}c^{5/8}}-\frac{\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2(-a)^{3/8}c^{5/8}}$$

```
[Out] -ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)]/(2*Sqrt[2]*(-a)
^(3/8)*c^(5/8)) + ArcTan[1 + (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)
]/(2*Sqrt[2]*(-a)^(3/8)*c^(5/8)) - ArcTan[(c^(1/8)*Sqrt[x])/(-a)^
(1/8)]/(2*(-a)^(3/8)*c^(5/8)) - ArcTanh[(c^(1/8)*Sqrt[x])/(-a)^(1
/8)]/(2*(-a)^(3/8)*c^(5/8)) - Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)
*c^(1/8)*Sqrt[x] + c^(1/4)*x]/(4*Sqrt[2]*(-a)^(3/8)*c^(5/8)) + Lo
g[(-a)^(1/4) + Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x]/(4
*Sqrt[2]*(-a)^(3/8)*c^(5/8))
```

Rubi [A] time = 0.480318, antiderivative size = 287, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 11, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.733

$$-\frac{\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{4\sqrt{2}(-a)^{3/8}c^{5/8}}+\frac{\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{4\sqrt{2}(-a)^{3/8}c^{5/8}}-\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2\sqrt{2}(-a)^{3/8}c^{5/8}}+\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{2\sqrt{2}(-a)^{3/8}c^{5/8}}-\frac{\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2(-a)^{3/8}c^{5/8}}-\frac{\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2(-a)^{3/8}c^{5/8}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(3/2)/(a + c*x^4),x]
```

```
[Out] -ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)]/(2*Sqrt[2]*(-a)
^(3/8)*c^(5/8)) + ArcTan[1 + (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)
]/(2*Sqrt[2]*(-a)^(3/8)*c^(5/8)) - ArcTan[(c^(1/8)*Sqrt[x])/(-a)^
(1/8)]/(2*(-a)^(3/8)*c^(5/8)) - ArcTanh[(c^(1/8)*Sqrt[x])/(-a)^(1
/8)]/(2*(-a)^(3/8)*c^(5/8)) - Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)
*c^(1/8)*Sqrt[x] + c^(1/4)*x]/(4*Sqrt[2]*(-a)^(3/8)*c^(5/8)) + Lo
g[(-a)^(1/4) + Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x]/(4
*Sqrt[2]*(-a)^(3/8)*c^(5/8))
```

Rubi in Sympy [A] time = 99.5278, size = 264, normalized size = 0.92

$$-\frac{\sqrt{2}\log\left(-\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{8c^{\frac{5}{8}}\left(-a\right)^{\frac{3}{8}}}+\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{8c^{\frac{5}{8}}\left(-a\right)^{\frac{3}{8}}}-\frac{\operatorname{atan}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2c^{\frac{5}{8}}\left(-a\right)^{\frac{3}{8}}}+\frac{\sqrt{2}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}-1\right)}{4c^{\frac{5}{8}}\left(-a\right)^{\frac{3}{8}}}+\frac{\sqrt{2}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{4c^{\frac{5}{8}}\left(-a\right)^{\frac{3}{8}}}-\frac{\operatorname{atanh}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2c^{\frac{5}{8}}\left(-a\right)^{\frac{3}{8}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(3/2)/(c*x**4+a),x)
```

```
[Out] -sqrt(2)*log(-sqrt(2)*c**(1/8)*sqrt(x)*(-a)**(1/8) + c**(1/4)*x +
 (-a)**(1/4))/(8*c**(5/8)*(-a)**(3/8)) + sqrt(2)*log(sqrt(2)*c**(
1/8)*sqrt(x)*(-a)**(1/8) + c**(1/4)*x + (-a)**(1/4))/(8*c**(5/8)*
(-a)**(3/8)) - atan(c**(1/8)*sqrt(x)/(-a)**(1/8))/(2*c**(5/8)*(-a
```

```
)**(3/8)) + sqrt(2)*atan(sqrt(2)*c**(1/8)*sqrt(x)/(-a)**(1/8) - 1
)/(4*c**(5/8)*(-a)**(3/8)) + sqrt(2)*atan(sqrt(2)*c**(1/8)*sqrt(x
)/(-a)**(1/8) + 1)/(4*c**(5/8)*(-a)**(3/8)) - atanh(c**(1/8)*sqrt
(x)/(-a)**(1/8))/(2*c**(5/8)*(-a)**(3/8))
```

Mathematica [A] time = 0.410355, size = 348, normalized size = 1.21

$$-\frac{\cos\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{cx}\right)-\cos\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{cx}\right)-\sin\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\right.}{}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(3/2)/(a + c*x^4),x]
```

```
[Out] -(2*ArcTan[Cot[Pi/8] - (c^(1/8)*Sqrt[x]*Csc[Pi/8])/a^(1/8)]*Cos[P
i/8] - 2*ArcTan[Cot[Pi/8] + (c^(1/8)*Sqrt[x]*Csc[Pi/8])/a^(1/8)]*
Cos[Pi/8] + Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)
*Sqrt[x]*Sin[Pi/8]] - Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x + 2*a^(1/
8)*c^(1/8)*Sqrt[x]*Sin[Pi/8]] + 2*ArcTan[(c^(1/8)*Sqrt[x]*Sec[Pi/
8])/a^(1/8) - Tan[Pi/8]]*Sin[Pi/8] + 2*ArcTan[(c^(1/8)*Sqrt[x]*Se
c[Pi/8])/a^(1/8) + Tan[Pi/8]]*Sin[Pi/8] - Log[a^(1/4) + c^(1/4)*x
 - 2*a^(1/8)*c^(1/8)*Sqrt[x]*Cos[Pi/8]]*Sin[Pi/8] + Log[a^(1/4) +
 c^(1/4)*x + 2*a^(1/8)*c^(1/8)*Sqrt[x]*Cos[Pi/8]]*Sin[Pi/8])/(4*a
^(3/8)*c^(5/8))
```

Maple [C] time = 0.023, size = 29, normalized size = 0.1

$$\frac{1}{4c}\sum_{\_R=RootOf(\_Z^8c+a)}\frac{1}{\_R^3}\ln\left(\sqrt{x}-\_R\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(3/2)/(c*x^4+a),x)
```

```
[Out] 1/4/c*sum(1/_R^3*ln(x^(1/2)-_R),_R=RootOf(_Z^8*c+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^{\frac{3}{2}}}{cx^4+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2)/(c*x^4 + a),x, algorithm="maxima")
```

```
[Out] integrate(x^(3/2)/(c*x^4 + a), x)
```

Fricas [A] time = 0.265412, size = 610, normalized size = 2.13

$$\frac{1}{8}\sqrt{2}\left(4\sqrt{2}\left(-\frac{1}{a^3c^5}\right)^{\frac{1}{8}}\arctan\left(\frac{a^2c^3\left(-\frac{1}{a^3c^5}\right)^{\frac{5}{8}}}{\sqrt{-ac\left(-\frac{1}{a^3c^5}\right)^{\frac{1}{4}}+x+\sqrt{x}}}\right)-\sqrt{2}\left(-\frac{1}{a^3c^5}\right)^{\frac{1}{8}}\log\left(a^2c^3\left(-\frac{1}{a^3c^5}\right)^{\frac{5}{8}}+\sqrt{x}\right)+\sqrt{2}\left(-\frac{1}{a^3c^5}\right)^{\frac{1}{8}}\log\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2)/(c*x^4 + a),x, algorithm="fricas")
```

```
[Out] 1/8*sqrt(2)*(4*sqrt(2)*(-1/(a^3*c^5))^(1/8)*arctan(a^2*c^3*(-1/(a
^3*c^5))^(5/8)/(sqrt(-a*c*(-1/(a^3*c^5))^(1/4) + x) + sqrt(x))) -
 sqrt(2)*(-1/(a^3*c^5))^(1/8)*log(a^2*c^3*(-1/(a^3*c^5))^(5/8) +
sqrt(x)) + sqrt(2)*(-1/(a^3*c^5))^(1/8)*log(-a^2*c^3*(-1/(a^3*c^5
))^(5/8) + sqrt(x)) - 4*(-1/(a^3*c^5))^(1/8)*arctan(a^2*c^3*(-1/(
a^3*c^5))^(5/8)/(a^2*c^3*(-1/(a^3*c^5))^(5/8) + sqrt(2)*sqrt(x) +
 sqrt(2*sqrt(2)*a^2*c^3*sqrt(x)*(-1/(a^3*c^5))^(5/8) - 2*a*c*(-1/
(a^3*c^5))^(1/4) + 2*x))) - 4*(-1/(a^3*c^5))^(1/8)*arctan(-a^2*c^
3*(-1/(a^3*c^5))^(5/8)/(a^2*c^3*(-1/(a^3*c^5))^(5/8) - sqrt(2)*sq
rt(x) - sqrt(-2*sqrt(2)*a^2*c^3*sqrt(x)*(-1/(a^3*c^5))^(5/8) - 2*
a*c*(-1/(a^3*c^5))^(1/4) + 2*x))) + (-1/(a^3*c^5))^(1/8)*log(2*sq
rt(2)*a^2*c^3*sqrt(x)*(-1/(a^3*c^5))^(5/8) - 2*a*c*(-1/(a^3*c^5))
^(1/4) + 2*x) - (-1/(a^3*c^5))^(1/8)*log(-2*sqrt(2)*a^2*c^3*sqrt(
x)*(-1/(a^3*c^5))^(5/8) - 2*a*c*(-1/(a^3*c^5))^(1/4) + 2*x))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(3/2)/(c*x**4+a),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.294627, size = 590, normalized size = 2.06

$$-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{5}{8}}\arctan\left(\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{4a}-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{5}{8}}\arctan\left(-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{4a}+\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{5}{8}}\arctan\left(\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{4a}+\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{5}{8}}\arctan\left(-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{4a}-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{5}{8}}\ln\left(\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{8a}+\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{5}{8}}\ln\left(-\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{8a}+\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{5}{8}}\ln\left(\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{8a}-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{5}{8}}\ln\left(-\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{8a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2)/(c*x^4 + a),x, algorithm="giac")
```

```
[Out] -1/4*sqrt(-sqrt(2) + 2)*(a/c)^(5/8)*arctan((sqrt(-sqrt(2) + 2)*(a
/c)^(1/8) + 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/a - 1/4*s
qrt(-sqrt(2) + 2)*(a/c)^(5/8)*arctan(-(sqrt(-sqrt(2) + 2)*(a/c)^(
1/8) - 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/a + 1/4*sqrt(s
qrt(2) + 2)*(a/c)^(5/8)*arctan((sqrt(sqrt(2) + 2)*(a/c)^(1/8) + 2
*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/a + 1/4*sqrt(sqrt(2)
+ 2)*(a/c)^(5/8)*arctan(-(sqrt(sqrt(2) + 2)*(a/c)^(1/8) - 2*sqrt(
x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/a - 1/8*sqrt(-sqrt(2) + 2)*
(a/c)^(5/8)*ln(sqrt(x)*sqrt(sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^
(1/4))/a + 1/8*sqrt(-sqrt(2) + 2)*(a/c)^(5/8)*ln(-sqrt(x)*sqrt(sq
rt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/a + 1/8*sqrt(sqrt(2) +
```

```
2)*(a/c)^(5/8)*ln(sqrt(x)*sqrt(-sqrt(2) + 2)*(a/c)^(1/8) + x + (a
/c)^(1/4))/a - 1/8*sqrt(sqrt(2) + 2)*(a/c)^(5/8)*ln(-sqrt(x)*sqrt
(-sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/a
```

3.740 $\int \frac{\sqrt{x}}{a+cx^4}\,dx$

Optimal. Leaf size=287

$$-\frac{\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{4\sqrt{2}(-a)^{5/8}c^{3/8}}+\frac{\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{4\sqrt{2}(-a)^{5/8}c^{3/8}}+\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2\sqrt{2}(-a)^{5/8}c^{3/8}}-\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{2\sqrt{2}(-a)^{5/8}c^{3/8}}+\frac{\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2(-a)^{5/8}c^{3/8}}-\frac{\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2(-a)^{5/8}c^{3/8}}$$

```
[Out] ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)]/(2*Sqrt[2]*(-a)^
(5/8)*c^(3/8)) - ArcTan[1 + (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)]
/(2*Sqrt[2]*(-a)^(5/8)*c^(3/8)) + ArcTan[(c^(1/8)*Sqrt[x])/(-a)^(
1/8)]/(2*(-a)^(5/8)*c^(3/8)) - ArcTanh[(c^(1/8)*Sqrt[x])/(-a)^(1/
8)]/(2*(-a)^(5/8)*c^(3/8)) - Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*
c^(1/8)*Sqrt[x] + c^(1/4)*x]/(4*Sqrt[2]*(-a)^(5/8)*c^(3/8)) + Log
[(-a)^(1/4) + Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x]/(4*
Sqrt[2]*(-a)^(5/8)*c^(3/8))
```

Rubi [A] time = 0.493543, antiderivative size = 287, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 11, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.733

$$-\frac{\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{4\sqrt{2}(-a)^{5/8}c^{3/8}}+\frac{\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{4\sqrt{2}(-a)^{5/8}c^{3/8}}+\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2\sqrt{2}(-a)^{5/8}c^{3/8}}-\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{2\sqrt{2}(-a)^{5/8}c^{3/8}}+\frac{\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2(-a)^{5/8}c^{3/8}}-\frac{\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2(-a)^{5/8}c^{3/8}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[x]/(a + c*x^4),x]
```

```
[Out] ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)]/(2*Sqrt[2]*(-a)^
(5/8)*c^(3/8)) - ArcTan[1 + (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)]
/(2*Sqrt[2]*(-a)^(5/8)*c^(3/8)) + ArcTan[(c^(1/8)*Sqrt[x])/(-a)^(
1/8)]/(2*(-a)^(5/8)*c^(3/8)) - ArcTanh[(c^(1/8)*Sqrt[x])/(-a)^(1/
8)]/(2*(-a)^(5/8)*c^(3/8)) - Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*
c^(1/8)*Sqrt[x] + c^(1/4)*x]/(4*Sqrt[2]*(-a)^(5/8)*c^(3/8)) + Log
[(-a)^(1/4) + Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x]/(4*
Sqrt[2]*(-a)^(5/8)*c^(3/8))
```

Rubi in Sympy [A] time = 108.745, size = 264, normalized size = 0.92

$$-\frac{\sqrt{2}\log\left(-\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{8c^{\frac{3}{8}}\left(-a\right)^{\frac{5}{8}}}+\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{8c^{\frac{3}{8}}\left(-a\right)^{\frac{5}{8}}}+\frac{\operatorname{atan}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2c^{\frac{3}{8}}\left(-a\right)^{\frac{5}{8}}}-\frac{\sqrt{2}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}-1\right)}{4c^{\frac{3}{8}}\left(-a\right)^{\frac{5}{8}}}-\frac{\sqrt{2}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{4c^{\frac{3}{8}}\left(-a\right)^{\frac{5}{8}}}-\frac{\operatorname{atanh}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2c^{\frac{3}{8}}\left(-a\right)^{\frac{5}{8}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(1/2)/(c*x**4+a),x)
```

```
[Out] -sqrt(2)*log(-sqrt(2)*c**(1/8)*sqrt(x)*(-a)**(1/8) + c**(1/4)*x +
 (-a)**(1/4))/(8*c**(3/8)*(-a)**(5/8)) + sqrt(2)*log(sqrt(2)*c**(
1/8)*sqrt(x)*(-a)**(1/8) + c**(1/4)*x + (-a)**(1/4))/(8*c**(3/8)*
(-a)**(5/8)) + atan(c**(1/8)*sqrt(x)/(-a)**(1/8))/(2*c**(3/8)*(-a
```

```
)**(5/8)) - sqrt(2)*atan(sqrt(2)*c**(1/8)*sqrt(x)/(-a)**(1/8) - 1
)/(4*c**(3/8)*(-a)**(5/8)) - sqrt(2)*atan(sqrt(2)*c**(1/8)*sqrt(x
)/(-a)**(1/8) + 1)/(4*c**(3/8)*(-a)**(5/8)) - atanh(c**(1/8)*sqrt
(x)/(-a)**(1/8))/(2*c**(3/8)*(-a)**(5/8))
```

Mathematica [A] time = 0.302655, size = 348, normalized size = 1.21

$$-\frac{-\cos\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{cx}\right)+\cos\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{cx}\right)+\sin\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{\cdots}\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[x]/(a + c*x^4),x]
```

```
[Out] -(2*ArcTan[Cot[Pi/8] - (c^(1/8)*Sqrt[x]*Csc[Pi/8])/a^(1/8)]*Cos[P
i/8] - 2*ArcTan[Cot[Pi/8] + (c^(1/8)*Sqrt[x]*Csc[Pi/8])/a^(1/8)]*
Cos[Pi/8] - Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)
*Sqrt[x]*Sin[Pi/8]] + Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x + 2*a^(1/
8)*c^(1/8)*Sqrt[x]*Sin[Pi/8]] + 2*ArcTan[(c^(1/8)*Sqrt[x]*Sec[Pi/
8])/a^(1/8) - Tan[Pi/8]]*Sin[Pi/8] + 2*ArcTan[(c^(1/8)*Sqrt[x]*Se
c[Pi/8])/a^(1/8) + Tan[Pi/8]]*Sin[Pi/8] + Log[a^(1/4) + c^(1/4)*x
 - 2*a^(1/8)*c^(1/8)*Sqrt[x]*Cos[Pi/8]]*Sin[Pi/8] - Log[a^(1/4) +
 c^(1/4)*x + 2*a^(1/8)*c^(1/8)*Sqrt[x]*Cos[Pi/8]]*Sin[Pi/8])/(4*a
^(5/8)*c^(3/8))
```

Maple [C] time = 0.009, size = 29, normalized size = 0.1

$$\frac{1}{4\,c}\sum_{\_R={\it RootOf}\left(\_Z^{8}c+a\right)}\frac{1}{\_R^{5}}\ln\left(\sqrt{x}-\_R\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(1/2)/(c*x^4+a),x)
```

```
[Out] 1/4/c*sum(1/_R^5*ln(x^(1/2)-_R),_R=RootOf(_Z^8*c+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{x}}{cx^4+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(c*x^4 + a),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(x)/(c*x^4 + a), x)
```

Fricas [A] time = 0.25896, size = 606, normalized size = 2.11

$$-\frac{1}{8}\sqrt{2}\left(4\sqrt{2}\left(-\frac{1}{a^5c^3}\right)^{\frac{1}{8}}\arctan\left(\frac{a^2c\left(-\frac{1}{a^5c^3}\right)^{\frac{3}{8}}}{\sqrt{a^4c^2\left(-\frac{1}{a^5c^3}\right)^{\frac{3}{4}}+x}+\sqrt{x}}\right)+\sqrt{2}\left(-\frac{1}{a^5c^3}\right)^{\frac{1}{8}}\log\left(a^2c\left(-\frac{1}{a^5c^3}\right)^{\frac{3}{8}}+\sqrt{x}\right)-\sqrt{2}\left(-\frac{1}{a^5c^3}\right)^{\frac{1}{8}}\log\cdots\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(c*x^4 + a),x, algorithm="fricas")
```

```
[Out] -1/8*sqrt(2)*(4*sqrt(2)*(-1/(a^5*c^3))^(1/8)*arctan(a^2*c*(-1/(a^
5*c^3))^(3/8)/(sqrt(a^4*c^2*(-1/(a^5*c^3))^(3/4) + x) + sqrt(x)))
 + sqrt(2)*(-1/(a^5*c^3))^(1/8)*log(a^2*c*(-1/(a^5*c^3))^(3/8) +
sqrt(x)) - sqrt(2)*(-1/(a^5*c^3))^(1/8)*log(-a^2*c*(-1/(a^5*c^3))
^(3/8) + sqrt(x)) - 4*(-1/(a^5*c^3))^(1/8)*arctan(a^2*c*(-1/(a^5*
c^3))^(3/8)/(a^2*c*(-1/(a^5*c^3))^(3/8) + sqrt(2)*sqrt(x) + sqrt(
2*a^4*c^2*(-1/(a^5*c^3))^(3/4) + 2*sqrt(2)*a^2*c*sqrt(x)*(-1/(a^5
*c^3))^(3/8) + 2*x))) - 4*(-1/(a^5*c^3))^(1/8)*arctan(-a^2*c*(-1/
(a^5*c^3))^(3/8)/(a^2*c*(-1/(a^5*c^3))^(3/8) - sqrt(2)*sqrt(x) -
sqrt(2*a^4*c^2*(-1/(a^5*c^3))^(3/4) - 2*sqrt(2)*a^2*c*sqrt(x)*(-1
/(a^5*c^3))^(3/8) + 2*x))) - (-1/(a^5*c^3))^(1/8)*log(2*a^4*c^2*(
-1/(a^5*c^3))^(3/4) + 2*sqrt(2)*a^2*c*sqrt(x)*(-1/(a^5*c^3))^(3/8
) + 2*x) + (-1/(a^5*c^3))^(1/8)*log(2*a^4*c^2*(-1/(a^5*c^3))^(3/4
) - 2*sqrt(2)*a^2*c*sqrt(x)*(-1/(a^5*c^3))^(3/8) + 2*x))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(1/2)/(c*x**4+a),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.300316, size = 590, normalized size = 2.06

$$-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{3}{8}}\arctan\left(\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{4a}-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{3}{8}}\arctan\left(-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{4a}+\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{3}{8}}\arctan\left(\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{4a}+\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{3}{8}}\arctan\left(-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{4a}+\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{3}{8}}\ln\left(\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{8a}-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{3}{8}}\ln\left(-\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{8a}-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{3}{8}}\ln\left(\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{8a}+\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{3}{8}}\ln\left(-\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{8a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(c*x^4 + a),x, algorithm="giac")
```

```
[Out] -1/4*sqrt(-sqrt(2) + 2)*(a/c)^(3/8)*arctan((sqrt(-sqrt(2) + 2)*(a
/c)^(1/8) + 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/a - 1/4*s
qrt(-sqrt(2) + 2)*(a/c)^(3/8)*arctan(-(sqrt(-sqrt(2) + 2)*(a/c)^(
1/8) - 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/a + 1/4*sqrt(s
qrt(2) + 2)*(a/c)^(3/8)*arctan((sqrt(sqrt(2) + 2)*(a/c)^(1/8) + 2
*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/a + 1/4*sqrt(sqrt(2)
+ 2)*(a/c)^(3/8)*arctan(-(sqrt(sqrt(2) + 2)*(a/c)^(1/8) - 2*sqrt(
x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/a + 1/8*sqrt(-sqrt(2) + 2)*
(a/c)^(3/8)*ln(sqrt(x)*sqrt(sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^
(1/4))/a - 1/8*sqrt(-sqrt(2) + 2)*(a/c)^(3/8)*ln(-sqrt(x)*sqrt(sq
rt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/a - 1/8*sqrt(sqrt(2) +
```

```
2)*(a/c)^(3/8)*ln(sqrt(x)*sqrt(-sqrt(2) + 2)*(a/c)^(1/8) + x + (a
/c)^(1/4))/a + 1/8*sqrt(sqrt(2) + 2)*(a/c)^(3/8)*ln(-sqrt(x)*sqrt
(-sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/a
```

3.741 $\int \frac{1}{\sqrt{x}(a+cx^4)}\,dx$

Optimal. Leaf size=287

$$\frac{\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{4\sqrt{2}(-a)^{7/8}\sqrt[8]{c}}-\frac{\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{4\sqrt{2}(-a)^{7/8}\sqrt[8]{c}}+\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2\sqrt{2}(-a)^{7/8}\sqrt[8]{c}}-\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{2\sqrt{2}(-a)^{7/8}\sqrt[8]{c}}-\frac{\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2(-a)^{7/8}\sqrt[8]{c}}-\frac{\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2(-a)^{7/8}\sqrt[8]{c}}$$

```
[Out] ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)]/(2*Sqrt[2]*(-a)^
(7/8)*c^(1/8)) - ArcTan[1 + (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)]
/(2*Sqrt[2]*(-a)^(7/8)*c^(1/8)) - ArcTan[(c^(1/8)*Sqrt[x])/(-a)^(
1/8)]/(2*(-a)^(7/8)*c^(1/8)) - ArcTanh[(c^(1/8)*Sqrt[x])/(-a)^(1/
8)]/(2*(-a)^(7/8)*c^(1/8)) + Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*
c^(1/8)*Sqrt[x] + c^(1/4)*x]/(4*Sqrt[2]*(-a)^(7/8)*c^(1/8)) - Log
[(-a)^(1/4) + Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x]/(4*
Sqrt[2]*(-a)^(7/8)*c^(1/8))
```

Rubi [A] time = 0.465634, antiderivative size = 287, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 11, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.733

$$\frac{\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{4\sqrt{2}(-a)^{7/8}\sqrt[8]{c}}-\frac{\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{4\sqrt{2}(-a)^{7/8}\sqrt[8]{c}}+\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2\sqrt{2}(-a)^{7/8}\sqrt[8]{c}}-\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{2\sqrt{2}(-a)^{7/8}\sqrt[8]{c}}-\frac{\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2(-a)^{7/8}\sqrt[8]{c}}-\frac{\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2(-a)^{7/8}\sqrt[8]{c}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[x]*(a + c*x^4)),x]
```

```
[Out] ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)]/(2*Sqrt[2]*(-a)^
(7/8)*c^(1/8)) - ArcTan[1 + (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)]
/(2*Sqrt[2]*(-a)^(7/8)*c^(1/8)) - ArcTan[(c^(1/8)*Sqrt[x])/(-a)^(
1/8)]/(2*(-a)^(7/8)*c^(1/8)) - ArcTanh[(c^(1/8)*Sqrt[x])/(-a)^(1/
8)]/(2*(-a)^(7/8)*c^(1/8)) + Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*
c^(1/8)*Sqrt[x] + c^(1/4)*x]/(4*Sqrt[2]*(-a)^(7/8)*c^(1/8)) - Log
[(-a)^(1/4) + Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x]/(4*
Sqrt[2]*(-a)^(7/8)*c^(1/8))
```

Rubi in Sympy [A] time = 104.998, size = 264, normalized size = 0.92

$$\frac{\sqrt{2}\log\left(-\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{8\sqrt[8]{c}\,(-a)^{\frac{7}{8}}}-\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{8\sqrt[8]{c}\,(-a)^{\frac{7}{8}}}-\frac{\operatorname{atan}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2\sqrt[8]{c}\,(-a)^{\frac{7}{8}}}-\frac{\sqrt{2}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}-1\right)}{4\sqrt[8]{c}\,(-a)^{\frac{7}{8}}}-\frac{\sqrt{2}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{4\sqrt[8]{c}\,(-a)^{\frac{7}{8}}}-\frac{\operatorname{atanh}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2\sqrt[8]{c}\,(-a)^{\frac{7}{8}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(c*x**4+a)/x**(1/2),x)
```

```
[Out] sqrt(2)*log(-sqrt(2)*c**(1/8)*sqrt(x)*(-a)**(1/8) + c**(1/4)*x +
(-a)**(1/4))/(8*c**(1/8)*(-a)**(7/8)) - sqrt(2)*log(sqrt(2)*c**(1
/8)*sqrt(x)*(-a)**(1/8) + c**(1/4)*x + (-a)**(1/4))/(8*c**(1/8)*(
-a)**(7/8)) - atan(c**(1/8)*sqrt(x)/(-a)**(1/8))/(2*c**(1/8)*(-a)
```

```
**(7/8)) - sqrt(2)*atan(sqrt(2)*c**(1/8)*sqrt(x)/(-a)**(1/8) - 1)
/(4*c**(1/8)*(-a)**(7/8)) - sqrt(2)*atan(sqrt(2)*c**(1/8)*sqrt(x)
/(-a)**(1/8) + 1)/(4*c**(1/8)*(-a)**(7/8)) - atanh(c**(1/8)*sqrt(
x)/(-a)**(1/8))/(2*c**(1/8)*(-a)**(7/8))
```

Mathematica [A] time = 0.289531, size = 348, normalized size = 1.21

$$-\sin\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)+\sin\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)-\cos\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\right.$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[x]*(a + c*x^4)),x]
```

```
[Out] (2*ArcTan[(c^(1/8)*Sqrt[x]*Sec[Pi/8])/a^(1/8) - Tan[Pi/8]]*Cos[Pi
/8] + 2*ArcTan[(c^(1/8)*Sqrt[x]*Sec[Pi/8])/a^(1/8) + Tan[Pi/8]]*C
os[Pi/8] - Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*
Sqrt[x]*Cos[Pi/8]] + Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x + 2*a^(1/8
)*c^(1/8)*Sqrt[x]*Cos[Pi/8]] - 2*ArcTan[Cot[Pi/8] - (c^(1/8)*Sqrt
[x]*Csc[Pi/8])/a^(1/8)]*Sin[Pi/8] + 2*ArcTan[Cot[Pi/8] + (c^(1/8)
*Sqrt[x]*Csc[Pi/8])/a^(1/8)]*Sin[Pi/8] - Log[a^(1/4) + c^(1/4)*x
- 2*a^(1/8)*c^(1/8)*Sqrt[x]*Sin[Pi/8]]*Sin[Pi/8] + Log[a^(1/4) +
c^(1/4)*x + 2*a^(1/8)*c^(1/8)*Sqrt[x]*Sin[Pi/8]]*Sin[Pi/8])/(4*a^
(7/8)*c^(1/8))
```

Maple [C] time = 0.008, size = 29, normalized size = 0.1

$$\frac{1}{4\,c}\sum_{\_R=RootOf(\_Z^8c+a)}\frac{1}{\_R^7}\ln\left(\sqrt{x}-\_R\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(c*x^4+a)/x^(1/2),x)
```

```
[Out] 1/4/c*sum(1/_R^7*ln(x^(1/2)-_R),_R=RootOf(_Z^8*c+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-c\int\frac{x^{\frac{7}{2}}}{acx^4+a^2}\,dx+\frac{2\sqrt{x}}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)*sqrt(x)),x, algorithm="maxima")
```

```
[Out] -c*integrate(x^(7/2)/(a*c*x^4 + a^2), x) + 2*sqrt(x)/a
```

Fricas [A] time = 0.259465, size = 541, normalized size = 1.89

$$-\frac{1}{8}\sqrt{2}\left(4\sqrt{2}\left(-\frac{1}{a^7c}\right)^{\frac{1}{8}}\arctan\left(\frac{a\left(-\frac{1}{a^7c}\right)^{\frac{1}{8}}}{\sqrt{a^2\left(-\frac{1}{a^7c}\right)^{\frac{1}{4}}+x+\sqrt{x}}}\right)-\sqrt{2}\left(-\frac{1}{a^7c}\right)^{\frac{1}{8}}\log\left(a\left(-\frac{1}{a^7c}\right)^{\frac{1}{8}}+\sqrt{x}\right)+\sqrt{2}\left(-\frac{1}{a^7c}\right)^{\frac{1}{8}}\log\left(-a\left(-\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)*sqrt(x)),x, algorithm="fricas")
```

```
[Out] -1/8*sqrt(2)*(4*sqrt(2)*(-1/(a^7*c))^(1/8)*arctan(a*(-1/(a^7*c))^
(1/8)/(sqrt(a^2*(-1/(a^7*c))^(1/4) + x) + sqrt(x))) - sqrt(2)*(-1
/(a^7*c))^(1/8)*log(a*(-1/(a^7*c))^(1/8) + sqrt(x)) + sqrt(2)*(-1
/(a^7*c))^(1/8)*log(-a*(-1/(a^7*c))^(1/8) + sqrt(x)) + 4*(-1/(a^7
*c))^(1/8)*arctan(a*(-1/(a^7*c))^(1/8)/(a*(-1/(a^7*c))^(1/8) + sq
rt(2)*sqrt(x) + sqrt(2*a^2*(-1/(a^7*c))^(1/4) + 2*sqrt(2)*a*sqrt(
x)*(-1/(a^7*c))^(1/8) + 2*x))) + 4*(-1/(a^7*c))^(1/8)*arctan(-a*(
-1/(a^7*c))^(1/8)/(a*(-1/(a^7*c))^(1/8) - sqrt(2)*sqrt(x) - sqrt(
2*a^2*(-1/(a^7*c))^(1/4) - 2*sqrt(2)*a*sqrt(x)*(-1/(a^7*c))^(1/8)
 + 2*x))) - (-1/(a^7*c))^(1/8)*log(2*a^2*(-1/(a^7*c))^(1/4) + 2*s
qrt(2)*a*sqrt(x)*(-1/(a^7*c))^(1/8) + 2*x) + (-1/(a^7*c))^(1/8)*l
og(2*a^2*(-1/(a^7*c))^(1/4) - 2*sqrt(2)*a*sqrt(x)*(-1/(a^7*c))^(1
/8) + 2*x))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(c*x**4+a)/x**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.271278, size = 590, normalized size = 2.06

$$\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\arctan\left(\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{4a}+\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\arctan\left(-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{4a}+\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\arctan\left(\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{4a}+\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\arctan\left(-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{4a}+\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\ln\left(\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{8a}-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\ln\left(-\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{8a}+\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\ln\left(\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{8a}-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\ln\left(-\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{8a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)*sqrt(x)),x, algorithm="giac")
```

```
[Out] 1/4*sqrt(sqrt(2) + 2)*(a/c)^(1/8)*arctan((sqrt(-sqrt(2) + 2)*(a/c
)^(1/8) + 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/a + 1/4*sqr
t(sqrt(2) + 2)*(a/c)^(1/8)*arctan(-(sqrt(-sqrt(2) + 2)*(a/c)^(1/8
) - 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/a + 1/4*sqrt(-sqr
t(2) + 2)*(a/c)^(1/8)*arctan((sqrt(sqrt(2) + 2)*(a/c)^(1/8) + 2*s
qrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/a + 1/4*sqrt(-sqrt(2) +
 2)*(a/c)^(1/8)*arctan(-(sqrt(sqrt(2) + 2)*(a/c)^(1/8) - 2*sqrt(x
))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/a + 1/8*sqrt(sqrt(2) + 2)*(a
/c)^(1/8)*ln(sqrt(x)*sqrt(sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1
/4))/a - 1/8*sqrt(sqrt(2) + 2)*(a/c)^(1/8)*ln(-sqrt(x)*sqrt(sqrt(
2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/a + 1/8*sqrt(-sqrt(2) + 2)
*(a/c)^(1/8)*ln(sqrt(x)*sqrt(-sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c
```

```
)^(1/4))/a - 1/8*sqrt(-sqrt(2) + 2)*(a/c)^(1/8)*ln(-sqrt(x)*sqrt(
-sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/a
```

3.742 $\int \frac{1}{x^{3/2}(a+cx^4)}\,dx$

Optimal. Leaf size=297

$$\frac{\sqrt[8]{c}\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{4\sqrt{2}(-a)^{9/8}}-\frac{\sqrt[8]{c}\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{4\sqrt{2}(-a)^{9/8}}-\frac{\sqrt[8]{c}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2\sqrt{2}(-a)^{9/8}}+\frac{\sqrt[8]{c}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{2\sqrt{2}(-a)^{9/8}}+\frac{\sqrt[8]{c}\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2(-a)^{9/8}}-\frac{\sqrt[8]{c}\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2(-a)^{9/8}}-\frac{2}{a\sqrt{x}}$$

```
[Out] -2/(a*Sqrt[x]) - (c^(1/8)*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/(-
a)^(1/8)])/(2*Sqrt[2]*(-a)^(9/8)) + (c^(1/8)*ArcTan[1 + (Sqrt[2]*
c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(2*Sqrt[2]*(-a)^(9/8)) + (c^(1/8)*A
rcTan[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(2*(-a)^(9/8)) - (c^(1/8)*Ar
cTanh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(2*(-a)^(9/8)) + (c^(1/8)*Lo
g[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(
4*Sqrt[2]*(-a)^(9/8)) - (c^(1/8)*Log[(-a)^(1/4) + Sqrt[2]*(-a)^(1
/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(4*Sqrt[2]*(-a)^(9/8))
```

Rubi [A] time = 0.619237, antiderivative size = 297, normalized size of antiderivative = 1., number of steps used = 15, number of rules used = 12, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.8$

$$\frac{\sqrt[8]{c}\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{4\sqrt{2}(-a)^{9/8}}-\frac{\sqrt[8]{c}\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{4\sqrt{2}(-a)^{9/8}}-\frac{\sqrt[8]{c}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2\sqrt{2}(-a)^{9/8}}+\frac{\sqrt[8]{c}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{2\sqrt{2}(-a)^{9/8}}+\frac{\sqrt[8]{c}\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2(-a)^{9/8}}-\frac{\sqrt[8]{c}\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2(-a)^{9/8}}-\frac{2}{a\sqrt{x}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^(3/2)*(a + c*x^4)),x]
```


```
[Out] -2/(a*Sqrt[x]) - (c^(1/8)*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/(-
a)^(1/8)])/(2*Sqrt[2]*(-a)^(9/8)) + (c^(1/8)*ArcTan[1 + (Sqrt[2]*
c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(2*Sqrt[2]*(-a)^(9/8)) + (c^(1/8)*A
rcTan[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(2*(-a)^(9/8)) - (c^(1/8)*Ar
cTanh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(2*(-a)^(9/8)) + (c^(1/8)*Lo
g[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(
4*Sqrt[2]*(-a)^(9/8)) - (c^(1/8)*Log[(-a)^(1/4) + Sqrt[2]*(-a)^(1
/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(4*Sqrt[2]*(-a)^(9/8))
```

Rubi in Sympy [A] time = 113.016, size = 272, normalized size = 0.92

$$\frac{\sqrt{2}\sqrt[8]{c}\log\left(-\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{8\left(-a\right)^{\frac{9}{8}}}-\frac{\sqrt{2}\sqrt[8]{c}\log\left(\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{8\left(-a\right)^{\frac{9}{8}}}+\frac{\sqrt[8]{c}\operatorname{atan}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2\left(-a\right)^{\frac{9}{8}}}+\frac{\sqrt{2}\sqrt[8]{c}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}-1\right)}{4\left(-a\right)^{\frac{9}{8}}}+\frac{\sqrt{2}\sqrt[8]{c}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{4\left(-a\right)^{\frac{9}{8}}}-\frac{\sqrt[8]{c}\operatorname{atanh}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2\left(-a\right)^{\frac{9}{8}}}-\frac{2}{a\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate(1/x**(3/2)/(c*x**4+a),x)
```

```
[Out] sqrt(2)*c**(1/8)*log(-sqrt(2)*c**(1/8)*sqrt(x)*(-a)**(1/8) + c**(
1/4)*x + (-a)**(1/4))/(8*(-a)**(9/8)) - sqrt(2)*c**(1/8)*log(sqrt
(2)*c**(1/8)*sqrt(x)*(-a)**(1/8) + c**(1/4)*x + (-a)**(1/4))/(8*(
-a)**(9/8)) + c**(1/8)*atan(c**(1/8)*sqrt(x)/(-a)**(1/8))/(2*(-a)
**(9/8)) + sqrt(2)*c**(1/8)*atan(sqrt(2)*c**(1/8)*sqrt(x)/(-a)**(
1/8) - 1)/(4*(-a)**(9/8)) + sqrt(2)*c**(1/8)*atan(sqrt(2)*c**(1/8
)*sqrt(x)/(-a)**(1/8) + 1)/(4*(-a)**(9/8)) - c**(1/8)*atanh(c**(1
/8)*sqrt(x)/(-a)**(1/8))/(2*(-a)**(9/8)) - 2/(a*sqrt(x))
```

Mathematica [A] time = 0.444393, size = 435, normalized size = 1.46

$$-\frac{\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{cx}\right)-\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{cx}\right)+\sqrt[8]{c}\sqrt{x}\cos\left(\frac{\pi}{8}\right)\cdots}{\cdots}$$

Antiderivative was successfully verified.

```
[In]   Integrate[1/(x^(3/2)*(a + c*x^4)),x]
```

```
[Out] -(8*a^(1/8) + 2*c^(1/8)*Sqrt[x]*ArcTan[(c^(1/8)*Sqrt[x]*Sec[Pi/8]
)/a^(1/8) - Tan[Pi/8]]*Cos[Pi/8] + 2*c^(1/8)*Sqrt[x]*ArcTan[(c^(1
/8)*Sqrt[x]*Sec[Pi/8])/a^(1/8) + Tan[Pi/8]]*Cos[Pi/8] + c^(1/8)*S
qrt[x]*Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt
[x]*Cos[Pi/8]] - c^(1/8)*Sqrt[x]*Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*
x + 2*a^(1/8)*c^(1/8)*Sqrt[x]*Cos[Pi/8]] - 2*c^(1/8)*Sqrt[x]*ArcT
an[Cot[Pi/8] - (c^(1/8)*Sqrt[x]*Csc[Pi/8])/a^(1/8)]*Sin[Pi/8] + 2
*c^(1/8)*Sqrt[x]*ArcTan[Cot[Pi/8] + (c^(1/8)*Sqrt[x]*Csc[Pi/8])/a
^(1/8)]*Sin[Pi/8] + c^(1/8)*Sqrt[x]*Log[a^(1/4) + c^(1/4)*x - 2*a
^(1/8)*c^(1/8)*Sqrt[x]*Sin[Pi/8]]*Sin[Pi/8] - c^(1/8)*Sqrt[x]*Log
[a^(1/4) + c^(1/4)*x + 2*a^(1/8)*c^(1/8)*Sqrt[x]*Sin[Pi/8]]*Sin[P
i/8])/(4*a^(9/8)*Sqrt[x])
```

Maple [C] time = 0.013, size = 38, normalized size = 0.1

$$-\frac{1}{4\,a}\sum_{\_R=RootOf\left(\_Z^{8}c+a\right)}\frac{1}{\_R}\ln\left(\sqrt{x}-\_R\right)-2\,\frac{1}{a\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^(3/2)/(c*x^4+a),x)
```

```
[Out] -1/4/a*sum(1/_R*ln(x^(1/2)-_R),_R=RootOf(_Z^8*c+a))-2/a/x^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-c\int\frac{x^{\frac{5}{2}}}{acx^{4}+a^{2}}\,dx-\frac{2}{a\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((c*x^4 + a)*x^(3/2)),x, algorithm="maxima")
```

```
[Out] -c*integrate(x^(5/2)/(a*c*x^4 + a^2), x) - 2/(a*sqrt(x))
```

Fricas [A] time = 0.260167, size = 608, normalized size = 2.05

$$-\frac{\sqrt{2}\left(4\sqrt{2}a\sqrt{x}\left(-\frac{c}{a^9}\right)^{\frac{1}{8}}\arctan\left(\frac{a^8\left(-\frac{c}{a^9}\right)^{\frac{7}{8}}}{c\sqrt{x}+\sqrt{-a^7c\left(-\frac{c}{a^9}\right)^{\frac{3}{4}}+c^2x}}\right)+\sqrt{2}a\sqrt{x}\left(-\frac{c}{a^9}\right)^{\frac{1}{8}}\log\left(a^8\left(-\frac{c}{a^9}\right)^{\frac{7}{8}}+c\sqrt{x}\right)-\sqrt{2}a\sqrt{x}\left(-\frac{c}{a^9}\right)^{\frac{1}{8}}\log\left(-c\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)*x^(3/2)),x, algorithm="fricas")
```

```
[Out] -1/8*sqrt(2)*(4*sqrt(2)*a*sqrt(x)*(-c/a^9)^(1/8)*arctan(a^8*(-c/a
^9)^(7/8)/(c*sqrt(x) + sqrt(-a^7*c*(-c/a^9)^(3/4) + c^2*x))) + sq
rt(2)*a*sqrt(x)*(-c/a^9)^(1/8)*log(a^8*(-c/a^9)^(7/8) + c*sqrt(x)
) - sqrt(2)*a*sqrt(x)*(-c/a^9)^(1/8)*log(-a^8*(-c/a^9)^(7/8) + c*
sqrt(x)) + 4*a*sqrt(x)*(-c/a^9)^(1/8)*arctan(a^8*(-c/a^9)^(7/8)/(
a^8*(-c/a^9)^(7/8) + sqrt(2)*c*sqrt(x) + sqrt(2*sqrt(2)*a^8*c*sqr
t(x)*(-c/a^9)^(7/8) - 2*a^7*c*(-c/a^9)^(3/4) + 2*c^2*x))) + 4*a*s
qrt(x)*(-c/a^9)^(1/8)*arctan(-a^8*(-c/a^9)^(7/8)/(a^8*(-c/a^9)^(7
/8) - sqrt(2)*c*sqrt(x) - sqrt(-2*sqrt(2)*a^8*c*sqrt(x)*(-c/a^9)^
(7/8) - 2*a^7*c*(-c/a^9)^(3/4) + 2*c^2*x))) + a*sqrt(x)*(-c/a^9)^
(1/8)*log(2*sqrt(2)*a^8*c*sqrt(x)*(-c/a^9)^(7/8) - 2*a^7*c*(-c/a^
9)^(3/4) + 2*c^2*x) - a*sqrt(x)*(-c/a^9)^(1/8)*log(-2*sqrt(2)*a^8
*c*sqrt(x)*(-c/a^9)^(7/8) - 2*a^7*c*(-c/a^9)^(3/4) + 2*c^2*x) + 8
*sqrt(2))/(a*sqrt(x))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**(3/2)/(c*x**4+a),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.29686, size = 612, normalized size = 2.06

$$-\frac{c\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\arctan\left(\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{4a^2}-\frac{c\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\arctan\left(-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{4a^2}$$
$$-\frac{c\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\arctan\left(\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{4a^2}-\frac{c\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\arctan\left(-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{4a^2}$$
$$+\frac{c\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\ln\left(\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{8a^2}$$
$$-\frac{c\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\ln\left(-\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{8a^2}$$
$$+\frac{c\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\ln\left(\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{8a^2}$$
$$-\frac{c\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\ln\left(-\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{8a^2}-\frac{2}{a\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)*x^(3/2)),x, algorithm="giac")
```

```
[Out] -1/4*c*sqrt(sqrt(2) + 2)*(a/c)^(7/8)*arctan((sqrt(-sqrt(2) + 2)*(
a/c)^(1/8) + 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/a^2 - 1/
4*c*sqrt(sqrt(2) + 2)*(a/c)^(7/8)*arctan(-(sqrt(-sqrt(2) + 2)*(a/
c)^(1/8) - 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/a^2 - 1/4*
c*sqrt(-sqrt(2) + 2)*(a/c)^(7/8)*arctan((sqrt(sqrt(2) + 2)*(a/c)^
(1/8) + 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/a^2 - 1/4*c*
sqrt(-sqrt(2) + 2)*(a/c)^(7/8)*arctan(-(sqrt(sqrt(2) + 2)*(a/c)^(
1/8) - 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/a^2 + 1/8*c*s
qrt(sqrt(2) + 2)*(a/c)^(7/8)*ln(sqrt(x)*sqrt(sqrt(2) + 2)*(a/c)^(
1/8) + x + (a/c)^(1/4))/a^2 - 1/8*c*sqrt(sqrt(2) + 2)*(a/c)^(7/8)
*ln(-sqrt(x)*sqrt(sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/a^2
 + 1/8*c*sqrt(-sqrt(2) + 2)*(a/c)^(7/8)*ln(sqrt(x)*sqrt(-sqrt(2)
+ 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/a^2 - 1/8*c*sqrt(-sqrt(2) + 2
)*(a/c)^(7/8)*ln(-sqrt(x)*sqrt(-sqrt(2) + 2)*(a/c)^(1/8) + x + (a
/c)^(1/4))/a^2 - 2/(a*sqrt(x))
```

3.743 $\int \frac{1}{x^{5/2}(a+cx^4)}\,dx$

Optimal. Leaf size=299

$$-\frac{c^{3/8}\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{4\sqrt{2}(-a)^{11/8}}+\frac{c^{3/8}\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{4\sqrt{2}(-a)^{11/8}}-\frac{c^{3/8}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2\sqrt{2}(-a)^{11/8}}+\frac{c^{3/8}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{2\sqrt{2}(-a)^{11/8}}-\frac{c^{3/8}\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2(-a)^{11/8}}-\frac{c^{3/8}\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2(-a)^{11/8}}-\frac{2}{3ax^{3/2}}$$

```
[Out] -2/(3*a*x^(3/2)) - (c^(3/8)*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/
(-a)^(1/8)])/(2*Sqrt[2]*(-a)^(11/8)) + (c^(3/8)*ArcTan[1 + (Sqrt[
2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(2*Sqrt[2]*(-a)^(11/8)) - (c^(3/
8)*ArcTan[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(2*(-a)^(11/8)) - (c^(3/
8)*ArcTanh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(2*(-a)^(11/8)) - (c^(3
/8)*Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)
*x])/(4*Sqrt[2]*(-a)^(11/8)) + (c^(3/8)*Log[(-a)^(1/4) + Sqrt[2]*
(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(4*Sqrt[2]*(-a)^(11/8))
```

Rubi [A] time = 0.599176, antiderivative size = 299, normalized size of antiderivative = 1., number of steps used = 15, number of rules used = 12, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.8$

$$-\frac{c^{3/8}\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{4\sqrt{2}(-a)^{11/8}}+\frac{c^{3/8}\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{4\sqrt{2}(-a)^{11/8}}-\frac{c^{3/8}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2\sqrt{2}(-a)^{11/8}}+\frac{c^{3/8}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{2\sqrt{2}(-a)^{11/8}}-\frac{c^{3/8}\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2(-a)^{11/8}}-\frac{c^{3/8}\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2(-a)^{11/8}}-\frac{2}{3ax^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^(5/2)*(a + c*x^4)),x]
```

```
[Out] -2/(3*a*x^(3/2)) - (c^(3/8)*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/
(-a)^(1/8)])/(2*Sqrt[2]*(-a)^(11/8)) + (c^(3/8)*ArcTan[1 + (Sqrt[
2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(2*Sqrt[2]*(-a)^(11/8)) - (c^(3/
8)*ArcTan[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(2*(-a)^(11/8)) - (c^(3/
8)*ArcTanh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(2*(-a)^(11/8)) - (c^(3
/8)*Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)
*x])/(4*Sqrt[2]*(-a)^(11/8)) + (c^(3/8)*Log[(-a)^(1/4) + Sqrt[2]*
(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(4*Sqrt[2]*(-a)^(11/8))
```

Rubi in Sympy [A] time = 114.322, size = 274, normalized size = 0.92

$$-\frac{\sqrt{2}c^{\frac{3}{8}}\log\left(-\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{8\left(-a\right)^{\frac{11}{8}}}+\frac{\sqrt{2}c^{\frac{3}{8}}\log\left(\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{8\left(-a\right)^{\frac{11}{8}}}-\frac{c^{\frac{3}{8}}\operatorname{atan}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2\left(-a\right)^{\frac{11}{8}}}+\frac{\sqrt{2}c^{\frac{3}{8}}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}-1\right)}{4\left(-a\right)^{\frac{11}{8}}}+\frac{\sqrt{2}c^{\frac{3}{8}}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{4\left(-a\right)^{\frac{11}{8}}}-\frac{c^{\frac{3}{8}}\operatorname{atanh}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{2\left(-a\right)^{\frac{11}{8}}}-\frac{2}{3ax^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**(5/2)/(c*x**4+a),x)
```

```
[Out] -sqrt(2)*c**(3/8)*log(-sqrt(2)*c**(1/8)*sqrt(x)*(-a)**(1/8) + c**
(1/4)*x + (-a)**(1/4))/(8*(-a)**(11/8)) + sqrt(2)*c**(3/8)*log(sq
rt(2)*c**(1/8)*sqrt(x)*(-a)**(1/8) + c**(1/4)*x + (-a)**(1/4))/(8
*(-a)**(11/8)) - c**(3/8)*atan(c**(1/8)*sqrt(x)/(-a)**(1/8))/(2*(
-a)**(11/8)) + sqrt(2)*c**(3/8)*atan(sqrt(2)*c**(1/8)*sqrt(x)/(-a
)**(1/8) - 1)/(4*(-a)**(11/8)) + sqrt(2)*c**(3/8)*atan(sqrt(2)*c*
*(1/8)*sqrt(x)/(-a)**(1/8) + 1)/(4*(-a)**(11/8)) - c**(3/8)*atanh
(c**(1/8)*sqrt(x)/(-a)**(1/8))/(2*(-a)**(11/8)) - 2/(3*a*x**(3/2)
)
```

Mathematica [A] time = 0.349181, size = 437, normalized size = 1.46

$$-8a^{3/8} + 3c^{3/8}x^{3/2}\cos\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right) + \sqrt[4]{a} + \sqrt[4]{c}x\right) - 3c^{3/8}x^{3/2}\cos\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right) + \sqrt[4]{a} + \sqrt[4]{c}x\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^(5/2)*(a + c*x^4)),x]
```

```
[Out] (-8*a^(3/8) + 6*c^(3/8)*x^(3/2)*ArcTan[Cot[Pi/8] - (c^(1/8)*Sqrt[
x]*Csc[Pi/8])/a^(1/8)]*Cos[Pi/8] - 6*c^(3/8)*x^(3/2)*ArcTan[Cot[P
i/8] + (c^(1/8)*Sqrt[x]*Csc[Pi/8])/a^(1/8)]*Cos[Pi/8] + 3*c^(3/8)
*x^(3/2)*Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sq
rt[x]*Sin[Pi/8]] - 3*c^(3/8)*x^(3/2)*Cos[Pi/8]*Log[a^(1/4) + c^(1
/4)*x + 2*a^(1/8)*c^(1/8)*Sqrt[x]*Sin[Pi/8]] + 6*c^(3/8)*x^(3/2)*
ArcTan[(c^(1/8)*Sqrt[x]*Sec[Pi/8])/a^(1/8) - Tan[Pi/8]]*Sin[Pi/8]
 + 6*c^(3/8)*x^(3/2)*ArcTan[(c^(1/8)*Sqrt[x]*Sec[Pi/8])/a^(1/8) +
 Tan[Pi/8]]*Sin[Pi/8] - 3*c^(3/8)*x^(3/2)*Log[a^(1/4) + c^(1/4)*x
 - 2*a^(1/8)*c^(1/8)*Sqrt[x]*Cos[Pi/8]]*Sin[Pi/8] + 3*c^(3/8)*x^(
3/2)*Log[a^(1/4) + c^(1/4)*x + 2*a^(1/8)*c^(1/8)*Sqrt[x]*Cos[Pi/8
]]*Sin[Pi/8])/(12*a^(11/8)*x^(3/2))
```

Maple [C] time = 0.012, size = 38, normalized size = 0.1

$$-\frac{1}{4a}\sum_{\_R=RootOf(\_Z^8c+a)}\frac{1}{\_R^3}\ln\left(\sqrt{x}-\_R\right)-\frac{2}{3a}x^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^(5/2)/(c*x^4+a),x)
```

```
[Out] -1/4/a*sum(1/_R^3*ln(x^(1/2)-_R),_R=RootOf(_Z^8*c+a))-2/3/a/x^(3/
2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-c\int\frac{x^{\frac{3}{2}}}{acx^4+a^2}\,dx-\frac{2}{3\,ax^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)*x^(5/2)),x, algorithm="maxima")
```

```
[Out] -c*integrate(x^(3/2)/(a*c*x^4 + a^2), x) - 2/3/(a*x^(3/2))
```

Fricas [A]   time = 0.261191, size = 710, normalized size = 2.37

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)*x^(5/2)),x, algorithm="fricas")
```

```
[Out] -1/24*sqrt(2)*(12*sqrt(2)*a*x^(3/2)*(-c^3/a^11)^(1/8)*arctan(a^7*
(-c^3/a^11)^(5/8)/(c^2*sqrt(x) + sqrt(-a^3*c^3*(-c^3/a^11)^(1/4)
+ c^4*x))) - 3*sqrt(2)*a*x^(3/2)*(-c^3/a^11)^(1/8)*log(a^7*(-c^3/
a^11)^(5/8) + c^2*sqrt(x)) + 3*sqrt(2)*a*x^(3/2)*(-c^3/a^11)^(1/8
)*log(-a^7*(-c^3/a^11)^(5/8) + c^2*sqrt(x)) - 12*a*x^(3/2)*(-c^3/
a^11)^(1/8)*arctan(a^7*(-c^3/a^11)^(5/8)/(a^7*(-c^3/a^11)^(5/8) +
 sqrt(2)*c^2*sqrt(x) + sqrt(2*sqrt(2)*a^7*c^2*sqrt(x)*(-c^3/a^11)
^(5/8) - 2*a^3*c^3*(-c^3/a^11)^(1/4) + 2*c^4*x))) - 12*a*x^(3/2)*
(-c^3/a^11)^(1/8)*arctan(-a^7*(-c^3/a^11)^(5/8)/(a^7*(-c^3/a^11)^
(5/8) - sqrt(2)*c^2*sqrt(x) - sqrt(-2*sqrt(2)*a^7*c^2*sqrt(x)*(-c
^3/a^11)^(5/8) - 2*a^3*c^3*(-c^3/a^11)^(1/4) + 2*c^4*x))) + 3*a*x
^(3/2)*(-c^3/a^11)^(1/8)*log(2*sqrt(2)*a^7*c^2*sqrt(x)*(-c^3/a^11
)^(5/8) - 2*a^3*c^3*(-c^3/a^11)^(1/4) + 2*c^4*x) - 3*a*x^(3/2)*(-
c^3/a^11)^(1/8)*log(-2*sqrt(2)*a^7*c^2*sqrt(x)*(-c^3/a^11)^(5/8)
- 2*a^3*c^3*(-c^3/a^11)^(1/4) + 2*c^4*x) + 8*sqrt(2))/(a*x^(3/2))
```

Sympy [F(-1)]   time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**(5/2)/(c*x**4+a),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A]   time = 0.293143, size = 612, normalized size = 2.05

$$\frac{c\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{5}{8}}\arctan\left(\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{4a^2}+\frac{c\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{5}{8}}\arctan\left(-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{4a^2}-\frac{c\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{5}{8}}\arctan\left(\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{4a^2}-\frac{c\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{5}{8}}\arctan\left(-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{4a^2}+\frac{c\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{5}{8}}\ln\left(\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{8a^2}-\frac{c\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{5}{8}}\ln\left(-\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{8a^2}-\frac{c\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{5}{8}}\ln\left(\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{8a^2}+\frac{c\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{5}{8}}\ln\left(-\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{8a^2}-\frac{2}{3ax^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)*x^(5/2)),x, algorithm="giac")
```

```
[Out] 1/4*c*sqrt(-sqrt(2) + 2)*(a/c)^(5/8)*arctan((sqrt(-sqrt(2) + 2)*(
a/c)^(1/8) + 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/a^2 + 1/
4*c*sqrt(-sqrt(2) + 2)*(a/c)^(5/8)*arctan(-(sqrt(-sqrt(2) + 2)*(a
/c)^(1/8) - 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/a^2 - 1/4
*c*sqrt(sqrt(2) + 2)*(a/c)^(5/8)*arctan((sqrt(sqrt(2) + 2)*(a/c)^
(1/8) + 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/a^2 - 1/4*c*
sqrt(sqrt(2) + 2)*(a/c)^(5/8)*arctan(-(sqrt(sqrt(2) + 2)*(a/c)^(1
/8) - 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/a^2 + 1/8*c*sq
rt(-sqrt(2) + 2)*(a/c)^(5/8)*ln(sqrt(x)*sqrt(sqrt(2) + 2)*(a/c)^(
1/8) + x + (a/c)^(1/4))/a^2 - 1/8*c*sqrt(-sqrt(2) + 2)*(a/c)^(5/8
)*ln(-sqrt(x)*sqrt(sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/a^
2 - 1/8*c*sqrt(sqrt(2) + 2)*(a/c)^(5/8)*ln(sqrt(x)*sqrt(-sqrt(2)
+ 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/a^2 + 1/8*c*sqrt(sqrt(2) + 2)
*(a/c)^(5/8)*ln(-sqrt(x)*sqrt(-sqrt(2) + 2)*(a/c)^(1/8) + x + (a/
c)^(1/4))/a^2 - 2/3/(a*x^(3/2))
```

3.744 $\int \frac{x^{13/2}}{(a+cx^4)^2}\,dx$

Optimal. Leaf size=308

$$\frac{7\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}\sqrt[8]{-a}c^{15/8}}-\frac{7\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}\sqrt[8]{-a}c^{15/8}}-\frac{7\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16\sqrt{2}\sqrt[8]{-a}c^{15/8}}+\frac{7\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{16\sqrt{2}\sqrt[8]{-a}c^{15/8}}+\frac{7\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16\sqrt[8]{-a}c^{15/8}}-\frac{7\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16\sqrt[8]{-a}c^{15/8}}-\frac{x^{7/2}}{4c\left(a+cx^4\right)}$$

```
[Out] -x^(7/2)/(4*c*(a + c*x^4)) - (7*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[
x])/(-a)^(1/8)])/(16*Sqrt[2]*(-a)^(1/8)*c^(15/8)) + (7*ArcTan[1 +
 (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*Sqrt[2]*(-a)^(1/8)*c^
(15/8)) + (7*ArcTan[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*(-a)^(1/8)
*c^(15/8)) - (7*ArcTanh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*(-a)^(
1/8)*c^(15/8)) + (7*Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*S
qrt[x] + c^(1/4)*x])/(32*Sqrt[2]*(-a)^(1/8)*c^(15/8)) - (7*Log[(-
a)^(1/4) + Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(32*S
qrt[2]*(-a)^(1/8)*c^(15/8))
```

Rubi [A] time = 0.56899, antiderivative size = 308, normalized size of antiderivative = 1., number of steps used = 15, number of rules used = 12, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.8

$$\frac{7\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}\sqrt[8]{-a}c^{15/8}}-\frac{7\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}\sqrt[8]{-a}c^{15/8}}-\frac{7\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16\sqrt{2}\sqrt[8]{-a}c^{15/8}}+\frac{7\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{16\sqrt{2}\sqrt[8]{-a}c^{15/8}}+\frac{7\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16\sqrt[8]{-a}c^{15/8}}-\frac{7\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16\sqrt[8]{-a}c^{15/8}}-\frac{x^{7/2}}{4c\left(a+cx^4\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(13/2)/(a + c*x^4)^2,x]
```


```
[Out] -x^(7/2)/(4*c*(a + c*x^4)) - (7*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[
x])/(-a)^(1/8)])/(16*Sqrt[2]*(-a)^(1/8)*c^(15/8)) + (7*ArcTan[1 +
 (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*Sqrt[2]*(-a)^(1/8)*c^
(15/8)) + (7*ArcTan[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*(-a)^(1/8)
*c^(15/8)) - (7*ArcTanh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*(-a)^(
1/8)*c^(15/8)) + (7*Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*S
qrt[x] + c^(1/4)*x])/(32*Sqrt[2]*(-a)^(1/8)*c^(15/8)) - (7*Log[(-
a)^(1/4) + Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(32*S
qrt[2]*(-a)^(1/8)*c^(15/8))
```

Rubi in Sympy [A] time = 109.696, size = 289, normalized size = 0.94

$$-\frac{x^{\frac{7}{2}}}{4c\left(a+cx^4\right)}+\frac{7\sqrt{2}\log\left(-\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{64c^{\frac{15}{8}}\sqrt[8]{-a}}-\frac{7\sqrt{2}\log\left(\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{64c^{\frac{15}{8}}\sqrt[8]{-a}}+\frac{7\,\mathrm{atan}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16c^{\frac{15}{8}}\sqrt[8]{-a}}+\frac{7\sqrt{2}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}-1\right)}{32c^{\frac{15}{8}}\sqrt[8]{-a}}+\frac{7\sqrt{2}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{32c^{\frac{15}{8}}\sqrt[8]{-a}}-\frac{7\,\mathrm{atanh}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16c^{\frac{15}{8}}\sqrt[8]{-a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(13/2)/(c*x**4+a)**2,x)
```

```
[Out] -x**(7/2)/(4*c*(a + c*x**4)) + 7*sqrt(2)*log(-sqrt(2)*c**(1/8)*sq
rt(x)*(-a)**(1/8) + c**(1/4)*x + (-a)**(1/4))/(64*c**(15/8)*(-a)*
*(1/8)) - 7*sqrt(2)*log(sqrt(2)*c**(1/8)*sqrt(x)*(-a)**(1/8) + c*
*(1/4)*x + (-a)**(1/4))/(64*c**(15/8)*(-a)**(1/8)) + 7*atan(c**(1
/8)*sqrt(x)/(-a)**(1/8))/(16*c**(15/8)*(-a)**(1/8)) + 7*sqrt(2)*a
tan(sqrt(2)*c**(1/8)*sqrt(x)/(-a)**(1/8) - 1)/(32*c**(15/8)*(-a)*
*(1/8)) + 7*sqrt(2)*atan(sqrt(2)*c**(1/8)*sqrt(x)/(-a)**(1/8) + 1
)/(32*c**(15/8)*(-a)**(1/8)) - 7*atanh(c**(1/8)*sqrt(x)/(-a)**(1/
8))/(16*c**(15/8)*(-a)**(1/8))
```

Mathematica [A] time = 1.72581, size = 406, normalized size = 1.32

$$-\frac{8c^{7/8}x^{7/2}}{a+cx^4}+\frac{7\sin\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{\sqrt[8]{a}}-\frac{7\sin\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{\sqrt[8]{a}}+\frac{7\cos\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\cos\left(\frac{\pi}{8}\right)+\sqrt[4]{\ldots}\right.}{\sqrt[8]{a}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(13/2)/(a + c*x^4)^2,x]
```

```
[Out] ((-8*c^(7/8)*x^(7/2))/(a + c*x^4) + (14*ArcTan[(c^(1/8)*Sqrt[x]*S
ec[Pi/8])/a^(1/8) - Tan[Pi/8]]*Cos[Pi/8])/a^(1/8) + (14*ArcTan[(c
^(1/8)*Sqrt[x]*Sec[Pi/8])/a^(1/8) + Tan[Pi/8]]*Cos[Pi/8])/a^(1/8)
 + (7*Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[
x]*Cos[Pi/8]])/a^(1/8) - (7*Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x + 2
*a^(1/8)*c^(1/8)*Sqrt[x]*Cos[Pi/8]])/a^(1/8) - (14*ArcTan[Cot[Pi/
8] - (c^(1/8)*Sqrt[x]*Csc[Pi/8])/a^(1/8)]*Sin[Pi/8])/a^(1/8) + (1
4*ArcTan[Cot[Pi/8] + (c^(1/8)*Sqrt[x]*Csc[Pi/8])/a^(1/8)]*Sin[Pi/
8])/a^(1/8) + (7*Log[a^(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt
[x]*Sin[Pi/8]]*Sin[Pi/8])/a^(1/8) - (7*Log[a^(1/4) + c^(1/4)*x +
2*a^(1/8)*c^(1/8)*Sqrt[x]*Sin[Pi/8]]*Sin[Pi/8])/a^(1/8))/(32*c^(1
5/8))
```

Maple [C] time = 0.02, size = 47, normalized size = 0.2

$$-\frac{1}{4c(cx^4+a)}x^{\frac{7}{2}}+\frac{7}{32c^2}\sum_{\_R=RootOf(\_Z^8c+a)}\frac{1}{\_R}\ln\left(\sqrt{x}-\_R\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(13/2)/(c*x^4+a)^2,x)
```

```
[Out] -1/4*x^(7/2)/c/(c*x^4+a)+7/32/c^2*sum(1/_R*ln(x^(1/2)-_R),_R=Root
Of(_Z^8*c+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{x^{\frac{7}{2}}}{4(c^2x^4+ac)}+7\int\frac{x^{\frac{5}{2}}}{8(c^2x^4+ac)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(13/2)/(c*x^4 + a)^2,x, algorithm="maxima")
```

```
[Out] -1/4*x^(7/2)/(c^2*x^4 + a*c) + 7*integrate(1/8*x^(5/2)/(c^2*x^4 +
 a*c), x)
```

Fricas [A] time = 0.263735, size = 729, normalized size = 2.37

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(13/2)/(c*x^4 + a)^2,x, algorithm="fricas")
```

```
[Out] -1/64*sqrt(2)*(8*sqrt(2)*x^(7/2) - 28*sqrt(2)*(c^2*x^4 + a*c)*(-1
/(a*c^15))^(1/8)*arctan(a*c^13*(-1/(a*c^15))^(7/8)/(sqrt(-a*c^11*
(-1/(a*c^15))^(3/4) + x) + sqrt(x))) - 7*sqrt(2)*(c^2*x^4 + a*c)*
(-1/(a*c^15))^(1/8)*log(a*c^13*(-1/(a*c^15))^(7/8) + sqrt(x)) + 7
*sqrt(2)*(c^2*x^4 + a*c)*(-1/(a*c^15))^(1/8)*log(-a*c^13*(-1/(a*c
^15))^(7/8) + sqrt(x)) - 28*(c^2*x^4 + a*c)*(-1/(a*c^15))^(1/8)*a
rctan(a*c^13*(-1/(a*c^15))^(7/8)/(a*c^13*(-1/(a*c^15))^(7/8) + sq
rt(2)*sqrt(x) + sqrt(2*sqrt(2)*a*c^13*sqrt(x)*(-1/(a*c^15))^(7/8)
 - 2*a*c^11*(-1/(a*c^15))^(3/4) + 2*x))) - 28*(c^2*x^4 + a*c)*(-1
/(a*c^15))^(1/8)*arctan(-a*c^13*(-1/(a*c^15))^(7/8)/(a*c^13*(-1/(
a*c^15))^(7/8) - sqrt(2)*sqrt(x) - sqrt(-2*sqrt(2)*a*c^13*sqrt(x)
*(-1/(a*c^15))^(7/8) - 2*a*c^11*(-1/(a*c^15))^(3/4) + 2*x))) - 7*
(c^2*x^4 + a*c)*(-1/(a*c^15))^(1/8)*log(2*sqrt(2)*a*c^13*sqrt(x)*
(-1/(a*c^15))^(7/8) - 2*a*c^11*(-1/(a*c^15))^(3/4) + 2*x) + 7*(c^
2*x^4 + a*c)*(-1/(a*c^15))^(1/8)*log(-2*sqrt(2)*a*c^13*sqrt(x)*(-
1/(a*c^15))^(7/8) - 2*a*c^11*(-1/(a*c^15))^(3/4) + 2*x))/(c^2*x^4
 + a*c)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(13/2)/(c*x**4+a)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.330762, size = 645, normalized size = 2.09

$$-\frac{x^{\frac{7}{2}}}{4\,(cx^4+a)c}+\frac{7\,\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\arctan\left(\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\,\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32\,ac}+\frac{7\,\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\arctan\left(-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\,\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32\,ac}+\frac{7\,\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\arctan\left(\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\,\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32\,ac}+\frac{7\,\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\arctan\left(-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\,\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32\,ac}-\frac{7\,\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\ln\left(\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64\,ac}+\frac{7\,\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\ln\left(-\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64\,ac}-\frac{7\,\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\ln\left(\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64\,ac}+\frac{7\,\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\ln\left(-\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64\,ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(13/2)/(c*x^4 + a)^2,x, algorithm="giac")
```

```
[Out] -1/4*x^(7/2)/((c*x^4 + a)*c) + 7/32*sqrt(sqrt(2) + 2)*(a/c)^(7/8)
*arctan((sqrt(-sqrt(2) + 2)*(a/c)^(1/8) + 2*sqrt(x))/(sqrt(sqrt(2
) + 2)*(a/c)^(1/8)))/(a*c) + 7/32*sqrt(sqrt(2) + 2)*(a/c)^(7/8)*a
rctan(-(sqrt(-sqrt(2) + 2)*(a/c)^(1/8) - 2*sqrt(x))/(sqrt(sqrt(2)
 + 2)*(a/c)^(1/8)))/(a*c) + 7/32*sqrt(-sqrt(2) + 2)*(a/c)^(7/8)*a
rctan((sqrt(sqrt(2) + 2)*(a/c)^(1/8) + 2*sqrt(x))/(sqrt(-sqrt(2)
+ 2)*(a/c)^(1/8)))/(a*c) + 7/32*sqrt(-sqrt(2) + 2)*(a/c)^(7/8)*ar
ctan(-(sqrt(sqrt(2) + 2)*(a/c)^(1/8) - 2*sqrt(x))/(sqrt(-sqrt(2)
+ 2)*(a/c)^(1/8)))/(a*c) - 7/64*sqrt(sqrt(2) + 2)*(a/c)^(7/8)*ln(
sqrt(x)*sqrt(sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/(a*c) +
7/64*sqrt(sqrt(2) + 2)*(a/c)^(7/8)*ln(-sqrt(x)*sqrt(sqrt(2) + 2)*
(a/c)^(1/8) + x + (a/c)^(1/4))/(a*c) - 7/64*sqrt(-sqrt(2) + 2)*(a
/c)^(7/8)*ln(sqrt(x)*sqrt(-sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(
1/4))/(a*c) + 7/64*sqrt(-sqrt(2) + 2)*(a/c)^(7/8)*ln(-sqrt(x)*sqr
t(-sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/(a*c)
```

3.745 $\int \frac{x^{11/2}}{(a+cx^4)^2}\,dx$

Optimal. Leaf size=308

$$-\frac{5\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}(-a)^{3/8}c^{13/8}}+\frac{5\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}(-a)^{3/8}c^{13/8}}-\frac{5\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16\sqrt{2}(-a)^{3/8}c^{13/8}}+\frac{5\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{16\sqrt{2}(-a)^{3/8}c^{13/8}}-\frac{5\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{3/8}c^{13/8}}-\frac{5\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{3/8}c^{13/8}}-\frac{x^{5/2}}{4c\,(a+cx^4)}$$

```
[Out] -x^(5/2)/(4*c*(a + c*x^4)) - (5*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[
x])/(-a)^(1/8)])/(16*Sqrt[2]*(-a)^(3/8)*c^(13/8)) + (5*ArcTan[1 +
 (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*Sqrt[2]*(-a)^(3/8)*c^
(13/8)) - (5*ArcTan[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*(-a)^(3/8)
*c^(13/8)) - (5*ArcTanh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*(-a)^(
3/8)*c^(13/8)) - (5*Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*S
qrt[x] + c^(1/4)*x])/(32*Sqrt[2]*(-a)^(3/8)*c^(13/8)) + (5*Log[(-
a)^(1/4) + Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(32*S
qrt[2]*(-a)^(3/8)*c^(13/8))
```

Rubi [A] time = 0.523117, antiderivative size = 308, normalized size of antiderivative = 1., number of steps used = 15, number of rules used = 12, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.8$

$$-\frac{5\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}(-a)^{3/8}c^{13/8}}+\frac{5\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}(-a)^{3/8}c^{13/8}}-\frac{5\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16\sqrt{2}(-a)^{3/8}c^{13/8}}+\frac{5\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{16\sqrt{2}(-a)^{3/8}c^{13/8}}-\frac{5\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{3/8}c^{13/8}}-\frac{5\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{3/8}c^{13/8}}-\frac{x^{5/2}}{4c\,(a+cx^4)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(11/2)/(a + c*x^4)^2,x]
```



```
[Out] -x^(5/2)/(4*c*(a + c*x^4)) - (5*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[
x])/(-a)^(1/8)])/(16*Sqrt[2]*(-a)^(3/8)*c^(13/8)) + (5*ArcTan[1 +
 (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*Sqrt[2]*(-a)^(3/8)*c^
(13/8)) - (5*ArcTan[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*(-a)^(3/8)
*c^(13/8)) - (5*ArcTanh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*(-a)^(
3/8)*c^(13/8)) - (5*Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*S
qrt[x] + c^(1/4)*x])/(32*Sqrt[2]*(-a)^(3/8)*c^(13/8)) + (5*Log[(-
a)^(1/4) + Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(32*S
qrt[2]*(-a)^(3/8)*c^(13/8))
```

Rubi in Sympy [A] time = 110.127, size = 289, normalized size = 0.94

$$-\frac{x^{\frac{5}{2}}}{4c\,(a+cx^4)}-\frac{5\sqrt{2}\log\left(-\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{64c^{\frac{13}{8}}\,(-a)^{\frac{3}{8}}}+\frac{5\sqrt{2}\log\left(\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{64c^{\frac{13}{8}}\,(-a)^{\frac{3}{8}}}-\frac{5\,\mathrm{atan}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16c^{\frac{13}{8}}\,(-a)^{\frac{3}{8}}}+\frac{5\sqrt{2}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}-1\right)}{32c^{\frac{13}{8}}\,(-a)^{\frac{3}{8}}}+\frac{5\sqrt{2}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{32c^{\frac{13}{8}}\,(-a)^{\frac{3}{8}}}-\frac{5\,\mathrm{atanh}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16c^{\frac{13}{8}}\,(-a)^{\frac{3}{8}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(11/2)/(c*x**4+a)**2,x)
```

```
[Out] -x**(5/2)/(4*c*(a + c*x**4)) - 5*sqrt(2)*log(-sqrt(2)*c**(1/8)*sq
rt(x)*(-a)**(1/8) + c**(1/4)*x + (-a)**(1/4))/(64*c**(13/8)*(-a)*
*(3/8)) + 5*sqrt(2)*log(sqrt(2)*c**(1/8)*sqrt(x)*(-a)**(1/8) + c*
*(1/4)*x + (-a)**(1/4))/(64*c**(13/8)*(-a)**(3/8)) - 5*atan(c**(1
/8)*sqrt(x)/(-a)**(1/8))/(16*c**(13/8)*(-a)**(3/8)) + 5*sqrt(2)*a
tan(sqrt(2)*c**(1/8)*sqrt(x)/(-a)**(1/8) - 1)/(32*c**(13/8)*(-a)*
*(3/8)) + 5*sqrt(2)*atan(sqrt(2)*c**(1/8)*sqrt(x)/(-a)**(1/8) + 1
)/(32*c**(13/8)*(-a)**(3/8)) - 5*atanh(c**(1/8)*sqrt(x)/(-a)**(1/
8))/(16*c**(13/8)*(-a)**(3/8))
```

Mathematica [A] time = 1.58524, size = 406, normalized size = 1.32

$$-\frac{\frac{5\cos\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{a^{3/8}}+\frac{5\cos\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{a^{3/8}}+\frac{5\sin\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\cos\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{a^{3/8}}-\cdots}{\cdots}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(11/2)/(a + c*x^4)^2,x]
```

```
[Out] ((-8*c^(5/8)*x^(5/2))/(a + c*x^4) - (10*ArcTan[Cot[Pi/8] - (c^(1/
8)*Sqrt[x]*Csc[Pi/8])/a^(1/8)]*Cos[Pi/8])/a^(3/8) + (10*ArcTan[Co
t[Pi/8] + (c^(1/8)*Sqrt[x]*Csc[Pi/8])/a^(1/8)]*Cos[Pi/8])/a^(3/8)
 - (5*Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[
x]*Sin[Pi/8]])/a^(3/8) + (5*Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x + 2
*a^(1/8)*c^(1/8)*Sqrt[x]*Sin[Pi/8]])/a^(3/8) - (10*ArcTan[(c^(1/8
)*Sqrt[x]*Sec[Pi/8])/a^(1/8) - Tan[Pi/8]]*Sin[Pi/8])/a^(3/8) - (1
0*ArcTan[(c^(1/8)*Sqrt[x]*Sec[Pi/8])/a^(1/8) + Tan[Pi/8]]*Sin[Pi/
8])/a^(3/8) + (5*Log[a^(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt
[x]*Cos[Pi/8]]*Sin[Pi/8])/a^(3/8) - (5*Log[a^(1/4) + c^(1/4)*x +
2*a^(1/8)*c^(1/8)*Sqrt[x]*Cos[Pi/8]]*Sin[Pi/8])/a^(3/8))/(32*c^(1
3/8))
```

Maple [C] time = 0.019, size = 47, normalized size = 0.2

$$-\frac{1}{4\,c\left(cx^{4}+a\right)}x^{\frac{5}{2}}+\frac{5}{32\,c^{2}}\sum_{\_R=RootOf\left(\_Z^{8}c+a\right)}\frac{1}{\_R^{3}}\ln\left(\sqrt{x}-\_R\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(11/2)/(c*x^4+a)^2,x)
```

```
[Out] -1/4*x^(5/2)/c/(c*x^4+a)+5/32/c^2*sum(1/_R^3*ln(x^(1/2)-_R),_R=Ro
otOf(_Z^8*c+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{x^{\frac{5}{2}}}{4\left(c^{2}x^{4}+ac\right)}+5\int\frac{x^{\frac{3}{2}}}{8\left(c^{2}x^{4}+ac\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(11/2)/(c*x^4 + a)^2,x, algorithm="maxima")
```

```
[Out] -1/4*x^(5/2)/(c^2*x^4 + a*c) + 5*integrate(1/8*x^(3/2)/(c^2*x^4 +
 a*c), x)
```

Fricas [A] time = 0.260771, size = 759, normalized size = 2.46

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(11/2)/(c*x^4 + a)^2,x, algorithm="fricas")
```

```
[Out] -1/64*sqrt(2)*(8*sqrt(2)*x^(5/2) - 20*sqrt(2)*(c^2*x^4 + a*c)*(-1
/(a^3*c^13))^(1/8)*arctan(a^2*c^8*(-1/(a^3*c^13))^(5/8)/(sqrt(-a*
c^3*(-1/(a^3*c^13))^(1/4) + x) + sqrt(x))) + 5*sqrt(2)*(c^2*x^4 +
 a*c)*(-1/(a^3*c^13))^(1/8)*log(a^2*c^8*(-1/(a^3*c^13))^(5/8) + s
qrt(x)) - 5*sqrt(2)*(c^2*x^4 + a*c)*(-1/(a^3*c^13))^(1/8)*log(-a^
2*c^8*(-1/(a^3*c^13))^(5/8) + sqrt(x)) + 20*(c^2*x^4 + a*c)*(-1/(
a^3*c^13))^(1/8)*arctan(a^2*c^8*(-1/(a^3*c^13))^(5/8)/(a^2*c^8*(-
1/(a^3*c^13))^(5/8) + sqrt(2)*sqrt(x) + sqrt(2*sqrt(2)*a^2*c^8*sq
rt(x)*(-1/(a^3*c^13))^(5/8) - 2*a*c^3*(-1/(a^3*c^13))^(1/4) + 2*x
))) + 20*(c^2*x^4 + a*c)*(-1/(a^3*c^13))^(1/8)*arctan(-a^2*c^8*(-
1/(a^3*c^13))^(5/8)/(a^2*c^8*(-1/(a^3*c^13))^(5/8) - sqrt(2)*sqrt
(x) - sqrt(-2*sqrt(2)*a^2*c^8*sqrt(x)*(-1/(a^3*c^13))^(5/8) - 2*a
*c^3*(-1/(a^3*c^13))^(1/4) + 2*x))) - 5*(c^2*x^4 + a*c)*(-1/(a^3*
c^13))^(1/8)*log(2*sqrt(2)*a^2*c^8*sqrt(x)*(-1/(a^3*c^13))^(5/8)
 - 2*a*c^3*(-1/(a^3*c^13))^(1/4) + 2*x) + 5*(c^2*x^4 + a*c)*(-1/(a
^3*c^13))^(1/8)*log(-2*sqrt(2)*a^2*c^8*sqrt(x)*(-1/(a^3*c^13))^(5
/8) - 2*a*c^3*(-1/(a^3*c^13))^(1/4) + 2*x))/(c^2*x^4 + a*c)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(11/2)/(c*x**4+a)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.339623, size = 645, normalized size = 2.09

$$-\frac{x^{\frac{5}{2}}}{4\,(cx^4+a)c}-\frac{5\,\sqrt{-\sqrt{2}+2}\,\left(\frac{a}{c}\right)^{\frac{5}{8}}\arctan\left(\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\,\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32\,ac}-\frac{5\,\sqrt{-\sqrt{2}+2}\,\left(\frac{a}{c}\right)^{\frac{5}{8}}\arctan\left(-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\,\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32\,ac}+\frac{5\,\sqrt{\sqrt{2}+2}\,\left(\frac{a}{c}\right)^{\frac{5}{8}}\arctan\left(\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\,\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32\,ac}+\frac{5\,\sqrt{\sqrt{2}+2}\,\left(\frac{a}{c}\right)^{\frac{5}{8}}\arctan\left(-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\,\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32\,ac}-\frac{5\,\sqrt{-\sqrt{2}+2}\,\left(\frac{a}{c}\right)^{\frac{5}{8}}\ln\left(\sqrt{x}\sqrt{\sqrt{2}+2}\,\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64\,ac}+\frac{5\,\sqrt{-\sqrt{2}+2}\,\left(\frac{a}{c}\right)^{\frac{5}{8}}\ln\left(-\sqrt{x}\sqrt{\sqrt{2}+2}\,\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64\,ac}+\frac{5\,\sqrt{\sqrt{2}+2}\,\left(\frac{a}{c}\right)^{\frac{5}{8}}\ln\left(\sqrt{x}\sqrt{-\sqrt{2}+2}\,\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64\,ac}-\frac{5\,\sqrt{\sqrt{2}+2}\,\left(\frac{a}{c}\right)^{\frac{5}{8}}\ln\left(-\sqrt{x}\sqrt{-\sqrt{2}+2}\,\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64\,ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(11/2)/(c*x^4 + a)^2,x, algorithm="giac")
```

```
[Out] -1/4*x^(5/2)/((c*x^4 + a)*c) - 5/32*sqrt(-sqrt(2) + 2)*(a/c)^(5/8
)*arctan((sqrt(-sqrt(2) + 2)*(a/c)^(1/8) + 2*sqrt(x))/(sqrt(sqrt(
2) + 2)*(a/c)^(1/8)))/(a*c) - 5/32*sqrt(-sqrt(2) + 2)*(a/c)^(5/8)
*arctan(-(sqrt(-sqrt(2) + 2)*(a/c)^(1/8) - 2*sqrt(x))/(sqrt(sqrt(
2) + 2)*(a/c)^(1/8)))/(a*c) + 5/32*sqrt(sqrt(2) + 2)*(a/c)^(5/8)*
arctan((sqrt(sqrt(2) + 2)*(a/c)^(1/8) + 2*sqrt(x))/(sqrt(-sqrt(2)
 + 2)*(a/c)^(1/8)))/(a*c) + 5/32*sqrt(sqrt(2) + 2)*(a/c)^(5/8)*ar
ctan(-(sqrt(sqrt(2) + 2)*(a/c)^(1/8) - 2*sqrt(x))/(sqrt(-sqrt(2)
+ 2)*(a/c)^(1/8)))/(a*c) - 5/64*sqrt(-sqrt(2) + 2)*(a/c)^(5/8)*ln
(sqrt(x)*sqrt(sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/(a*c) +
 5/64*sqrt(-sqrt(2) + 2)*(a/c)^(5/8)*ln(-sqrt(x)*sqrt(sqrt(2) + 2
)*(a/c)^(1/8) + x + (a/c)^(1/4))/(a*c) + 5/64*sqrt(sqrt(2) + 2)*(
a/c)^(5/8)*ln(sqrt(x)*sqrt(-sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^
(1/4))/(a*c) - 5/64*sqrt(sqrt(2) + 2)*(a/c)^(5/8)*ln(-sqrt(x)*sqr
t(-sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/(a*c)
```

3.746 $\int \frac{x^{9/2}}{(a+cx^4)^2}\,dx$

Optimal. Leaf size=308

$$-\frac{3\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}(-a)^{5/8}c^{11/8}}+\frac{3\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}(-a)^{5/8}c^{11/8}}+\frac{3\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16\sqrt{2}(-a)^{5/8}c^{11/8}}-\frac{3\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{16\sqrt{2}(-a)^{5/8}c^{11/8}}+\frac{3\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{5/8}c^{11/8}}-\frac{3\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{5/8}c^{11/8}}-\frac{x^{3/2}}{4c\left(a+cx^4\right)}$$

```
[Out] -x^(3/2)/(4*c*(a + c*x^4)) + (3*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[
x])/(-a)^(1/8)])/(16*Sqrt[2]*(-a)^(5/8)*c^(11/8)) - (3*ArcTan[1 +
 (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*Sqrt[2]*(-a)^(5/8)*c^
(11/8)) + (3*ArcTan[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*(-a)^(5/8)
*c^(11/8)) - (3*ArcTanh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*(-a)^(
5/8)*c^(11/8)) - (3*Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*S
qrt[x] + c^(1/4)*x])/(32*Sqrt[2]*(-a)^(5/8)*c^(11/8)) + (3*Log[(-
a)^(1/4) + Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(32*S
qrt[2]*(-a)^(5/8)*c^(11/8))
```

Rubi [A] time = 0.544083, antiderivative size = 308, normalized size of antiderivative = 1., number of steps used = 15, number of rules used = 12, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.8$

$$-\frac{3\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}(-a)^{5/8}c^{11/8}}+\frac{3\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}(-a)^{5/8}c^{11/8}}+\frac{3\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16\sqrt{2}(-a)^{5/8}c^{11/8}}-\frac{3\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{16\sqrt{2}(-a)^{5/8}c^{11/8}}+\frac{3\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{5/8}c^{11/8}}-\frac{3\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{5/8}c^{11/8}}-\frac{x^{3/2}}{4c\left(a+cx^4\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(9/2)/(a + c*x^4)^2,x]
```



```
[Out] -x^(3/2)/(4*c*(a + c*x^4)) + (3*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[
x])/(-a)^(1/8)])/(16*Sqrt[2]*(-a)^(5/8)*c^(11/8)) - (3*ArcTan[1 +
 (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*Sqrt[2]*(-a)^(5/8)*c^
(11/8)) + (3*ArcTan[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*(-a)^(5/8)
*c^(11/8)) - (3*ArcTanh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*(-a)^(
5/8)*c^(11/8)) - (3*Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*S
qrt[x] + c^(1/4)*x])/(32*Sqrt[2]*(-a)^(5/8)*c^(11/8)) + (3*Log[(-
a)^(1/4) + Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(32*S
qrt[2]*(-a)^(5/8)*c^(11/8))
```

Rubi in Sympy [A] time = 117.273, size = 289, normalized size = 0.94

$$-\frac{x^{\frac{3}{2}}}{4c\left(a+cx^4\right)}-\frac{3\sqrt{2}\log\left(-\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{64c^{\frac{11}{8}}\left(-a\right)^{\frac{5}{8}}}+\frac{3\sqrt{2}\log\left(\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{64c^{\frac{11}{8}}\left(-a\right)^{\frac{5}{8}}}+\frac{3\,\mathrm{atan}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16c^{\frac{11}{8}}\left(-a\right)^{\frac{5}{8}}}-\frac{3\sqrt{2}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}-1\right)}{32c^{\frac{11}{8}}\left(-a\right)^{\frac{5}{8}}}-\frac{3\sqrt{2}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{32c^{\frac{11}{8}}\left(-a\right)^{\frac{5}{8}}}-\frac{3\,\mathrm{atanh}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16c^{\frac{11}{8}}\left(-a\right)^{\frac{5}{8}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(9/2)/(c*x**4+a)**2,x)
```

```
[Out] -x**(3/2)/(4*c*(a + c*x**4)) - 3*sqrt(2)*log(-sqrt(2)*c**(1/8)*sq
rt(x)*(-a)**(1/8) + c**(1/4)*x + (-a)**(1/4))/(64*c**(11/8)*(-a)*
*(5/8)) + 3*sqrt(2)*log(sqrt(2)*c**(1/8)*sqrt(x)*(-a)**(1/8) + c*
*(1/4)*x + (-a)**(1/4))/(64*c**(11/8)*(-a)**(5/8)) + 3*atan(c**(1
/8)*sqrt(x)/(-a)**(1/8))/(16*c**(11/8)*(-a)**(5/8)) - 3*sqrt(2)*a
tan(sqrt(2)*c**(1/8)*sqrt(x)/(-a)**(1/8) - 1)/(32*c**(11/8)*(-a)*
*(5/8)) - 3*sqrt(2)*atan(sqrt(2)*c**(1/8)*sqrt(x)/(-a)**(1/8) + 1
)/(32*c**(11/8)*(-a)**(5/8)) - 3*atanh(c**(1/8)*sqrt(x)/(-a)**(1/
8))/(16*c**(11/8)*(-a)**(5/8))
```

Mathematica [A] time = 1.94538, size = 406, normalized size = 1.32

$$\frac{3\cos\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{a^{5/8}}-\frac{3\cos\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{a^{5/8}}-\frac{3\sin\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\cos\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{a^{5/8}}+\cdots$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(9/2)/(a + c*x^4)^2,x]
```

```
[Out] ((-8*c^(3/8)*x^(3/2))/(a + c*x^4) - (6*ArcTan[Cot[Pi/8] - (c^(1/8
)*Sqrt[x]*Csc[Pi/8])/a^(1/8)]*Cos[Pi/8])/a^(5/8) + (6*ArcTan[Cot[
Pi/8] + (c^(1/8)*Sqrt[x]*Csc[Pi/8])/a^(1/8)]*Cos[Pi/8])/a^(5/8) +
 (3*Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[x]
*Sin[Pi/8]])/a^(5/8) - (3*Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x + 2*a
^(1/8)*c^(1/8)*Sqrt[x]*Sin[Pi/8]])/a^(5/8) - (6*ArcTan[(c^(1/8)*S
qrt[x]*Sec[Pi/8])/a^(1/8) - Tan[Pi/8]]*Sin[Pi/8])/a^(5/8) - (6*Ar
cTan[(c^(1/8)*Sqrt[x]*Sec[Pi/8])/a^(1/8) + Tan[Pi/8]]*Sin[Pi/8])/
a^(5/8) - (3*Log[a^(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[x]*
Cos[Pi/8]]*Sin[Pi/8])/a^(5/8) + (3*Log[a^(1/4) + c^(1/4)*x + 2*a^
(1/8)*c^(1/8)*Sqrt[x]*Cos[Pi/8]]*Sin[Pi/8])/a^(5/8))/(32*c^(11/8)
)
```

Maple [C] time = 0.02, size = 47, normalized size = 0.2

$$-\frac{1}{4\,c\,(cx^4+a)}x^{\frac{3}{2}}+\frac{3}{32\,c^2}\sum_{\_R=RootOf(\_Z^8c+a)}\frac{1}{\_R^5}\ln\left(\sqrt{x}-\_R\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(9/2)/(c*x^4+a)^2,x)
```

```
[Out] -1/4*x^(3/2)/c/(c*x^4+a)+3/32/c^2*sum(1/_R^5*ln(x^(1/2)-_R),_R=Ro
otOf(_Z^8*c+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{x^{\frac{3}{2}}}{4\,(c^2x^4+ac)}+3\int\frac{\sqrt{x}}{8\,(c^2x^4+ac)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(9/2)/(c*x^4 + a)^2,x, algorithm="maxima")
```

```
[Out] -1/4*x^(3/2)/(c^2*x^4 + a*c) + 3*integrate(1/8*sqrt(x)/(c^2*x^4 +
 a*c), x)
```

Fricas [A] time = 0.277675, size = 771, normalized size = 2.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(9/2)/(c*x^4 + a)^2,x, algorithm="fricas")
```

```
[Out] -1/64*sqrt(2)*(12*sqrt(2)*(c^2*x^4 + a*c)*(-1/(a^5*c^11))^(1/8)*a
rctan(a^2*c^4*(-1/(a^5*c^11))^(3/8)/(sqrt(a^4*c^8*(-1/(a^5*c^11))
^(3/4) + x) + sqrt(x))) + 3*sqrt(2)*(c^2*x^4 + a*c)*(-1/(a^5*c^11
))^(1/8)*log(a^2*c^4*(-1/(a^5*c^11))^(3/8) + sqrt(x)) - 3*sqrt(2)
*(c^2*x^4 + a*c)*(-1/(a^5*c^11))^(1/8)*log(-a^2*c^4*(-1/(a^5*c^11
))^(3/8) + sqrt(x)) - 12*(c^2*x^4 + a*c)*(-1/(a^5*c^11))^(1/8)*ar
ctan(a^2*c^4*(-1/(a^5*c^11))^(3/8)/(a^2*c^4*(-1/(a^5*c^11))^(3/8)
 + sqrt(2)*sqrt(x) + sqrt(2*a^4*c^8*(-1/(a^5*c^11))^(3/4) + 2*sqr
t(2)*a^2*c^4*sqrt(x)*(-1/(a^5*c^11))^(3/8) + 2*x))) - 12*(c^2*x^4
 + a*c)*(-1/(a^5*c^11))^(1/8)*arctan(-a^2*c^4*(-1/(a^5*c^11))^(3/
8)/(a^2*c^4*(-1/(a^5*c^11))^(3/8) - sqrt(2)*sqrt(x) - sqrt(2*a^4*
c^8*(-1/(a^5*c^11))^(3/4) - 2*sqrt(2)*a^2*c^4*sqrt(x)*(-1/(a^5*c^
11))^(3/8) + 2*x))) - 3*(c^2*x^4 + a*c)*(-1/(a^5*c^11))^(1/8)*log
(2*a^4*c^8*(-1/(a^5*c^11))^(3/4) + 2*sqrt(2)*a^2*c^4*sqrt(x)*(-1/
(a^5*c^11))^(3/8) + 2*x) + 3*(c^2*x^4 + a*c)*(-1/(a^5*c^11))^(1/8
)*log(2*a^4*c^8*(-1/(a^5*c^11))^(3/4) - 2*sqrt(2)*a^2*c^4*sqrt(x)
*(-1/(a^5*c^11))^(3/8) + 2*x) + 8*sqrt(2)*x^(3/2))/(c^2*x^4 + a*c
)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(9/2)/(c*x**4+a)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.333066, size = 645, normalized size = 2.09

$$-\frac{3\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{3}{8}}\arctan\left(\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32\,ac}-\frac{3\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{3}{8}}\arctan\left(-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32\,ac}+\frac{3\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{3}{8}}\arctan\left(\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32\,ac}+\frac{3\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{3}{8}}\arctan\left(-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32\,ac}+\frac{3\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{3}{8}}\ln\left(\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64\,ac}-\frac{3\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{3}{8}}\ln\left(-\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64\,ac}-\frac{3\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{3}{8}}\ln\left(\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64\,ac}+\frac{3\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{3}{8}}\ln\left(-\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64\,ac}-\frac{x^{\frac{3}{2}}}{4\,(cx^4+a)c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(9/2)/(c*x^4 + a)^2,x, algorithm="giac")
```

```
[Out] -3/32*sqrt(-sqrt(2) + 2)*(a/c)^(3/8)*arctan((sqrt(-sqrt(2) + 2)*(
a/c)^(1/8) + 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/(a*c) -
3/32*sqrt(-sqrt(2) + 2)*(a/c)^(3/8)*arctan(-(sqrt(-sqrt(2) + 2)*(
a/c)^(1/8) - 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/(a*c) +
3/32*sqrt(sqrt(2) + 2)*(a/c)^(3/8)*arctan((sqrt(sqrt(2) + 2)*(a/c
)^(1/8) + 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/(a*c) + 3/
32*sqrt(sqrt(2) + 2)*(a/c)^(3/8)*arctan(-(sqrt(sqrt(2) + 2)*(a/c)
^(1/8) - 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/(a*c) + 3/6
4*sqrt(-sqrt(2) + 2)*(a/c)^(3/8)*ln(sqrt(x)*sqrt(sqrt(2) + 2)*(a/
c)^(1/8) + x + (a/c)^(1/4))/(a*c) - 3/64*sqrt(-sqrt(2) + 2)*(a/c)
^(3/8)*ln(-sqrt(x)*sqrt(sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4
))/(a*c) - 3/64*sqrt(sqrt(2) + 2)*(a/c)^(3/8)*ln(sqrt(x)*sqrt(-sq
rt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/(a*c) + 3/64*sqrt(sqrt(
2) + 2)*(a/c)^(3/8)*ln(-sqrt(x)*sqrt(-sqrt(2) + 2)*(a/c)^(1/8) +
x + (a/c)^(1/4))/(a*c) - 1/4*x^(3/2)/((c*x^4 + a)*c)
```

3.747 $\int \frac{x^{7/2}}{(a+cx^4)^2} \, dx$

Optimal. Leaf size=308

$$\frac{\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}(-a)^{7/8}c^{9/8}}-\frac{\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}(-a)^{7/8}c^{9/8}}+\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16\sqrt{2}(-a)^{7/8}c^{9/8}}-\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{16\sqrt{2}(-a)^{7/8}c^{9/8}}-\frac{\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{7/8}c^{9/8}}-\frac{\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{7/8}c^{9/8}}-\frac{\sqrt{x}}{4c\left(a+cx^4\right)}$$

```
[Out] -Sqrt[x]/(4*c*(a + c*x^4)) + ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])
/(-a)^(1/8)]/(16*Sqrt[2]*(-a)^(7/8)*c^(9/8)) - ArcTan[1 + (Sqrt[2
]*c^(1/8)*Sqrt[x])/(-a)^(1/8)]/(16*Sqrt[2]*(-a)^(7/8)*c^(9/8)) -
ArcTan[(c^(1/8)*Sqrt[x])/(-a)^(1/8)]/(16*(-a)^(7/8)*c^(9/8)) - Ar
cTanh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)]/(16*(-a)^(7/8)*c^(9/8)) + Log
[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x]/(32
*Sqrt[2]*(-a)^(7/8)*c^(9/8)) - Log[(-a)^(1/4) + Sqrt[2]*(-a)^(1/8
)*c^(1/8)*Sqrt[x] + c^(1/4)*x]/(32*Sqrt[2]*(-a)^(7/8)*c^(9/8))
```

Rubi [A] time = 0.528013, antiderivative size = 308, normalized size of antiderivative = 1., number of steps used = 15, number of rules used = 12, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.8

$$\frac{\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}(-a)^{7/8}c^{9/8}}-\frac{\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}(-a)^{7/8}c^{9/8}}+\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16\sqrt{2}(-a)^{7/8}c^{9/8}}-\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{16\sqrt{2}(-a)^{7/8}c^{9/8}}-\frac{\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{7/8}c^{9/8}}-\frac{\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{7/8}c^{9/8}}-\frac{\sqrt{x}}{4c\left(a+cx^4\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(7/2)/(a + c*x^4)^2,x]
```


```
[Out] -Sqrt[x]/(4*c*(a + c*x^4)) + ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])
/(-a)^(1/8)]/(16*Sqrt[2]*(-a)^(7/8)*c^(9/8)) - ArcTan[1 + (Sqrt[2
]*c^(1/8)*Sqrt[x])/(-a)^(1/8)]/(16*Sqrt[2]*(-a)^(7/8)*c^(9/8)) -
ArcTan[(c^(1/8)*Sqrt[x])/(-a)^(1/8)]/(16*(-a)^(7/8)*c^(9/8)) - Ar
cTanh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)]/(16*(-a)^(7/8)*c^(9/8)) + Log
[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x]/(32
*Sqrt[2]*(-a)^(7/8)*c^(9/8)) - Log[(-a)^(1/4) + Sqrt[2]*(-a)^(1/8
)*c^(1/8)*Sqrt[x] + c^(1/4)*x]/(32*Sqrt[2]*(-a)^(7/8)*c^(9/8))
```

Rubi in Sympy [A] time = 114.957, size = 279, normalized size = 0.91

$$-\frac{\sqrt{x}}{4c\left(a+cx^4\right)}+\frac{\sqrt{2}\log\left(-\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{64c^{\frac{9}{8}}\left(-a\right)^{\frac{7}{8}}}-\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{64c^{\frac{9}{8}}\left(-a\right)^{\frac{7}{8}}}-\frac{\operatorname{atan}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16c^{\frac{9}{8}}\left(-a\right)^{\frac{7}{8}}}-\frac{\sqrt{2}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}-1\right)}{32c^{\frac{9}{8}}\left(-a\right)^{\frac{7}{8}}}-\frac{\sqrt{2}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{32c^{\frac{9}{8}}\left(-a\right)^{\frac{7}{8}}}-\frac{\operatorname{atanh}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16c^{\frac{9}{8}}\left(-a\right)^{\frac{7}{8}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(7/2)/(c*x**4+a)**2,x)
```

```
[Out] -sqrt(x)/(4*c*(a + c*x**4)) + sqrt(2)*log(-sqrt(2)*c**(1/8)*sqrt(
x)*(-a)**(1/8) + c**(1/4)*x + (-a)**(1/4))/(64*c**(9/8)*(-a)**(7/
```

```
8)) - sqrt(2)*log(sqrt(2)*c**(1/8)*sqrt(x)*(-a)**(1/8) + c**(1/4)
*x + (-a)**(1/4))/(64*c**(9/8)*(-a)**(7/8)) - atan(c**(1/8)*sqrt(
x)/(-a)**(1/8))/(16*c**(9/8)*(-a)**(7/8)) - sqrt(2)*atan(sqrt(2)*
c**(1/8)*sqrt(x)/(-a)**(1/8) - 1)/(32*c**(9/8)*(-a)**(7/8)) - sqr
t(2)*atan(sqrt(2)*c**(1/8)*sqrt(x)/(-a)**(1/8) + 1)/(32*c**(9/8)*
(-a)**(7/8)) - atanh(c**(1/8)*sqrt(x)/(-a)**(1/8))/(16*c**(9/8)*(
-a)**(7/8))
```

Mathematica [A] time = 1.55356, size = 404, normalized size = 1.31

$$-\frac{\sin\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{a^{7/8}}+\frac{\sin\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{a^{7/8}}-\frac{\cos\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\cos\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{a^{7/8}}+\cos($$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(7/2)/(a + c*x^4)^2,x]
```

```
[Out] ((-8*c^(1/8)*Sqrt[x])/(a + c*x^4) + (2*ArcTan[(c^(1/8)*Sqrt[x]*Se
c[Pi/8])/a^(1/8) - Tan[Pi/8]]*Cos[Pi/8])/a^(7/8) + (2*ArcTan[(c^(
1/8)*Sqrt[x]*Sec[Pi/8])/a^(1/8) + Tan[Pi/8]]*Cos[Pi/8])/a^(7/8) -
 (Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[x]*C
os[Pi/8]])/a^(7/8) + (Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x + 2*a^(1/
8)*c^(1/8)*Sqrt[x]*Cos[Pi/8]])/a^(7/8) - (2*ArcTan[Cot[Pi/8] - (c
^(1/8)*Sqrt[x]*Csc[Pi/8])/a^(1/8)]*Sin[Pi/8])/a^(7/8) + (2*ArcTan
[Cot[Pi/8] + (c^(1/8)*Sqrt[x]*Csc[Pi/8])/a^(1/8)]*Sin[Pi/8])/a^(7
/8) - (Log[a^(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[x]*Sin[Pi
/8]]*Sin[Pi/8])/a^(7/8) + (Log[a^(1/4) + c^(1/4)*x + 2*a^(1/8)*c^
(1/8)*Sqrt[x]*Sin[Pi/8]]*Sin[Pi/8])/a^(7/8))/(32*c^(9/8))
```

Maple [C] time = 0.018, size = 47, normalized size = 0.2

$$-\frac{1}{4\,c\left(cx^{4}+a\right)}\sqrt{x}+\frac{1}{32\,c^{2}}\sum_{\_R=RootOf\left(\_Z^{8}c+a\right)}\frac{1}{\_R^{7}}\ln\left(\sqrt{x}-\_R\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(7/2)/(c*x^4+a)^2,x)
```

```
[Out] -1/4*x^(1/2)/c/(c*x^4+a)+1/32/c^2*sum(1/_R^7*ln(x^(1/2)-_R),_R=Ro
otOf(_Z^8*c+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{x^{\frac{9}{2}}}{4\left(acx^{4}+a^{2}\right)}-\int\frac{x^{\frac{7}{2}}}{8\left(acx^{4}+a^{2}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(7/2)/(c*x^4 + a)^2,x, algorithm="maxima")
```

```
[Out] 1/4*x^(9/2)/(a*c*x^4 + a^2) - integrate(1/8*x^(7/2)/(a*c*x^4 + a^
2), x)
```

Fricas [A] time = 0.261808, size = 709, normalized size = 2.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(7/2)/(c*x^4 + a)^2,x, algorithm="fricas")
```

```
[Out] -1/64*sqrt(2)*(4*sqrt(2)*(c^2*x^4 + a*c)*(-1/(a^7*c^9))^(1/8)*arc
tan(a*c*(-1/(a^7*c^9))^(1/8)/(sqrt(a^2*c^2*(-1/(a^7*c^9))^(1/4) +
 x) + sqrt(x))) - sqrt(2)*(c^2*x^4 + a*c)*(-1/(a^7*c^9))^(1/8)*lo
g(a*c*(-1/(a^7*c^9))^(1/8) + sqrt(x)) + sqrt(2)*(c^2*x^4 + a*c)*(
-1/(a^7*c^9))^(1/8)*log(-a*c*(-1/(a^7*c^9))^(1/8) + sqrt(x)) + 4*
(c^2*x^4 + a*c)*(-1/(a^7*c^9))^(1/8)*arctan(a*c*(-1/(a^7*c^9))^(1
/8)/(a*c*(-1/(a^7*c^9))^(1/8) + sqrt(2)*sqrt(x) + sqrt(2*a^2*c^2*
(-1/(a^7*c^9))^(1/4) + 2*sqrt(2)*a*c*sqrt(x)*(-1/(a^7*c^9))^(1/8)
 + 2*x))) + 4*(c^2*x^4 + a*c)*(-1/(a^7*c^9))^(1/8)*arctan(-a*c*(-
1/(a^7*c^9))^(1/8)/(a*c*(-1/(a^7*c^9))^(1/8) - sqrt(2)*sqrt(x) -
sqrt(2*a^2*c^2*(-1/(a^7*c^9))^(1/4) - 2*sqrt(2)*a*c*sqrt(x)*(-1/(
a^7*c^9))^(1/8) + 2*x))) - (c^2*x^4 + a*c)*(-1/(a^7*c^9))^(1/8)*l
og(2*a^2*c^2*(-1/(a^7*c^9))^(1/4) + 2*sqrt(2)*a*c*sqrt(x)*(-1/(a^
7*c^9))^(1/8) + 2*x) + (c^2*x^4 + a*c)*(-1/(a^7*c^9))^(1/8)*log(2
*a^2*c^2*(-1/(a^7*c^9))^(1/4) - 2*sqrt(2)*a*c*sqrt(x)*(-1/(a^7*c^
9))^(1/8) + 2*x) + 8*sqrt(2)*sqrt(x))/(c^2*x^4 + a*c)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(7/2)/(c*x**4+a)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.30362, size = 645, normalized size = 2.09

$$\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\arctan\left(\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32\,ac}+\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\arctan\left(-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32\,ac}$$
$$+\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\arctan\left(\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32\,ac}+\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\arctan\left(-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32\,ac}$$
$$+\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\ln\left(\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64\,ac}$$
$$-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\ln\left(-\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64\,ac}$$
$$+\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\ln\left(\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64\,ac}$$
$$-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\ln\left(-\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64\,ac}-\frac{\sqrt{x}}{4\,(cx^4+a)c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(7/2)/(c*x^4 + a)^2,x, algorithm="giac")
```

```
[Out] 1/32*sqrt(sqrt(2) + 2)*(a/c)^(1/8)*arctan((sqrt(-sqrt(2) + 2)*(a/
c)^(1/8) + 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/(a*c) + 1/
32*sqrt(sqrt(2) + 2)*(a/c)^(1/8)*arctan(-(sqrt(-sqrt(2) + 2)*(a/c
)^(1/8) - 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/(a*c) + 1/3
2*sqrt(-sqrt(2) + 2)*(a/c)^(1/8)*arctan((sqrt(sqrt(2) + 2)*(a/c)^
(1/8) + 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/(a*c) + 1/32
*sqrt(-sqrt(2) + 2)*(a/c)^(1/8)*arctan(-(sqrt(sqrt(2) + 2)*(a/c)^
```

```
(1/8) - 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/(a*c) + 1/64
*sqrt(sqrt(2) + 2)*(a/c)^(1/8)*ln(sqrt(x)*sqrt(sqrt(2) + 2)*(a/c)
^(1/8) + x + (a/c)^(1/4))/(a*c) - 1/64*sqrt(sqrt(2) + 2)*(a/c)^(1
/8)*ln(-sqrt(x)*sqrt(sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/
(a*c) + 1/64*sqrt(-sqrt(2) + 2)*(a/c)^(1/8)*ln(sqrt(x)*sqrt(-sqrt
(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/(a*c) - 1/64*sqrt(-sqrt(2
) + 2)*(a/c)^(1/8)*ln(-sqrt(x)*sqrt(-sqrt(2) + 2)*(a/c)^(1/8) + x
 + (a/c)^(1/4))/(a*c) - 1/4*sqrt(x)/((c*x^4 + a)*c)
```

3.748 $\int \frac{x^{5/2}}{(a+cx^4)^2}\,dx$

Optimal. Leaf size=308

$$-\frac{\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}(-a)^{9/8}c^{7/8}}+\frac{\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}(-a)^{9/8}c^{7/8}}+\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16\sqrt{2}(-a)^{9/8}c^{7/8}}-\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{16\sqrt{2}(-a)^{9/8}c^{7/8}}-\frac{\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{9/8}c^{7/8}}+\frac{\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{9/8}c^{7/8}}+\frac{x^{7/2}}{4a(a+cx^4)}$$

```
[Out] x^(7/2)/(4*a*(a + c*x^4)) + ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/
(-a)^(1/8)]/(16*Sqrt[2]*(-a)^(9/8)*c^(7/8)) - ArcTan[1 + (Sqrt[2]
*c^(1/8)*Sqrt[x])/(-a)^(1/8)]/(16*Sqrt[2]*(-a)^(9/8)*c^(7/8)) - A
rcTan[(c^(1/8)*Sqrt[x])/(-a)^(1/8)]/(16*(-a)^(9/8)*c^(7/8)) + Arc
Tanh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)]/(16*(-a)^(9/8)*c^(7/8)) - Log[
(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x]/(32*
Sqrt[2]*(-a)^(9/8)*c^(7/8)) + Log[(-a)^(1/4) + Sqrt[2]*(-a)^(1/8)
*c^(1/8)*Sqrt[x] + c^(1/4)*x]/(32*Sqrt[2]*(-a)^(9/8)*c^(7/8))
```

Rubi [A] time = 0.530903, antiderivative size = 308, normalized size of antiderivative = 1., number of steps used = 15, number of rules used = 12, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.8

$$-\frac{\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}(-a)^{9/8}c^{7/8}}+\frac{\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}(-a)^{9/8}c^{7/8}}+\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16\sqrt{2}(-a)^{9/8}c^{7/8}}-\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{16\sqrt{2}(-a)^{9/8}c^{7/8}}-\frac{\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{9/8}c^{7/8}}+\frac{\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{9/8}c^{7/8}}+\frac{x^{7/2}}{4a(a+cx^4)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(5/2)/(a + c*x^4)^2,x]
```

```
[Out] x^(7/2)/(4*a*(a + c*x^4)) + ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/
(-a)^(1/8)]/(16*Sqrt[2]*(-a)^(9/8)*c^(7/8)) - ArcTan[1 + (Sqrt[2]
*c^(1/8)*Sqrt[x])/(-a)^(1/8)]/(16*Sqrt[2]*(-a)^(9/8)*c^(7/8)) - A
rcTan[(c^(1/8)*Sqrt[x])/(-a)^(1/8)]/(16*(-a)^(9/8)*c^(7/8)) + Arc
Tanh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)]/(16*(-a)^(9/8)*c^(7/8)) - Log[
(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x]/(32*
Sqrt[2]*(-a)^(9/8)*c^(7/8)) + Log[(-a)^(1/4) + Sqrt[2]*(-a)^(1/8)
*c^(1/8)*Sqrt[x] + c^(1/4)*x]/(32*Sqrt[2]*(-a)^(9/8)*c^(7/8))
```

Rubi in Sympy [A] time = 113.475, size = 279, normalized size = 0.91

$$-\frac{\sqrt{2}\log\left(-\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{64c^{\frac{7}{8}}\left(-a\right)^{\frac{9}{8}}}+\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{64c^{\frac{7}{8}}\left(-a\right)^{\frac{9}{8}}}-\frac{\operatorname{atan}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16c^{\frac{7}{8}}\left(-a\right)^{\frac{9}{8}}}-\frac{\sqrt{2}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}-1\right)}{32c^{\frac{7}{8}}\left(-a\right)^{\frac{9}{8}}}-\frac{\sqrt{2}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{32c^{\frac{7}{8}}\left(-a\right)^{\frac{9}{8}}}+\frac{\operatorname{atanh}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16c^{\frac{7}{8}}\left(-a\right)^{\frac{9}{8}}}+\frac{x^{\frac{7}{2}}}{4a\left(a+cx^4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(5/2)/(c*x**4+a)**2,x)
```

```
[Out] -sqrt(2)*log(-sqrt(2)*c**(1/8)*sqrt(x)*(-a)**(1/8) + c**(1/4)*x +
 (-a)**(1/4))/(64*c**(7/8)*(-a)**(9/8)) + sqrt(2)*log(sqrt(2)*c**
```

```
(1/8)*sqrt(x)*(-a)**(1/8) + c**(1/4)*x + (-a)**(1/4))/(64*c**(7/8
)*(-a)**(9/8)) - atan(c**(1/8)*sqrt(x)/(-a)**(1/8))/(16*c**(7/8)*
(-a)**(9/8)) - sqrt(2)*atan(sqrt(2)*c**(1/8)*sqrt(x)/(-a)**(1/8)
- 1)/(32*c**(7/8)*(-a)**(9/8)) - sqrt(2)*atan(sqrt(2)*c**(1/8)*sq
rt(x)/(-a)**(1/8) + 1)/(32*c**(7/8)*(-a)**(9/8)) + atanh(c**(1/8)
*sqrt(x)/(-a)**(1/8))/(16*c**(7/8)*(-a)**(9/8)) + x**(7/2)/(4*a*(
a + c*x**4))
```

Mathematica [A] time = 1.69989, size = 404, normalized size = 1.31

$$\frac{\frac{\sin\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{c^{7/8}}-\frac{\sin\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{c^{7/8}}+\frac{\cos\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\cos\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{c^{7/8}}-\cos\left(\frac{\pi}{8}\right.\cdots}{\cdots}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(5/2)/(a + c*x^4)^2,x]
```

```
[Out] ((8*a^(1/8)*x^(7/2))/(a + c*x^4) + (2*ArcTan[(c^(1/8)*Sqrt[x]*Sec
[Pi/8])/a^(1/8) - Tan[Pi/8]]*Cos[Pi/8])/c^(7/8) + (2*ArcTan[(c^(1
/8)*Sqrt[x]*Sec[Pi/8])/a^(1/8) + Tan[Pi/8]]*Cos[Pi/8])/c^(7/8) +
(Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[x]*Co
s[Pi/8]])/c^(7/8) - (Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x + 2*a^(1/8
)*c^(1/8)*Sqrt[x]*Cos[Pi/8]])/c^(7/8) - (2*ArcTan[Cot[Pi/8] - (c^
(1/8)*Sqrt[x]*Csc[Pi/8])/a^(1/8)]*Sin[Pi/8])/c^(7/8) + (2*ArcTan[
Cot[Pi/8] + (c^(1/8)*Sqrt[x]*Csc[Pi/8])/a^(1/8)]*Sin[Pi/8])/c^(7/
8) + (Log[a^(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[x]*Sin[Pi/
8]]*Sin[Pi/8])/c^(7/8) - (Log[a^(1/4) + c^(1/4)*x + 2*a^(1/8)*c^(
1/8)*Sqrt[x]*Sin[Pi/8]]*Sin[Pi/8])/c^(7/8))/(32*a^(9/8))
```

Maple [C] time = 0.018, size = 50, normalized size = 0.2

$$\frac{1}{4\,a\left(cx^{4}+a\right)}x^{\frac{7}{2}}+\frac{1}{32\,ac}\sum_{\_R=RootOf\left(\_Z^{8}c+a\right)}\frac{1}{\_R}\ln\left(\sqrt{x}-\_R\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(5/2)/(c*x^4+a)^2,x)
```

```
[Out] 1/4*x^(7/2)/a/(c*x^4+a)+1/32/a/c*sum(1/_R*ln(x^(1/2)-_R),_R=RootO
f(_Z^8*c+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{x^{\frac{7}{2}}}{4\left(acx^{4}+a^{2}\right)}+\int\frac{x^{\frac{5}{2}}}{8\left(acx^{4}+a^{2}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5/2)/(c*x^4 + a)^2,x, algorithm="maxima")
```

```
[Out] 1/4*x^(7/2)/(a*c*x^4 + a^2) + integrate(1/8*x^(5/2)/(a*c*x^4 + a^
2), x)
```

Fricas [A] time = 0.267931, size = 759, normalized size = 2.46

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5/2)/(c*x^4 + a)^2,x, algorithm="fricas")
```

```
[Out] 1/64*sqrt(2)*(8*sqrt(2)*x^(7/2) + 4*sqrt(2)*(a*c*x^4 + a^2)*(-1/(
a^9*c^7))^(1/8)*arctan(a^8*c^6*(-1/(a^9*c^7))^(7/8)/(sqrt(-a^7*c^
5*(-1/(a^9*c^7))^(3/4) + x) + sqrt(x))) + sqrt(2)*(a*c*x^4 + a^2)
*(-1/(a^9*c^7))^(1/8)*log(a^8*c^6*(-1/(a^9*c^7))^(7/8) + sqrt(x))
 - sqrt(2)*(a*c*x^4 + a^2)*(-1/(a^9*c^7))^(1/8)*log(-a^8*c^6*(-1/
(a^9*c^7))^(7/8) + sqrt(x)) + 4*(a*c*x^4 + a^2)*(-1/(a^9*c^7))^(1
/8)*arctan(a^8*c^6*(-1/(a^9*c^7))^(7/8)/(a^8*c^6*(-1/(a^9*c^7))^(
7/8) + sqrt(2)*sqrt(x) + sqrt(2*sqrt(2)*a^8*c^6*sqrt(x)*(-1/(a^9*
c^7))^(7/8) - 2*a^7*c^5*(-1/(a^9*c^7))^(3/4) + 2*x))) + 4*(a*c*x^
4 + a^2)*(-1/(a^9*c^7))^(1/8)*arctan(-a^8*c^6*(-1/(a^9*c^7))^(7/8
)/(a^8*c^6*(-1/(a^9*c^7))^(7/8) - sqrt(2)*sqrt(x) - sqrt(-2*sqrt(
2)*a^8*c^6*sqrt(x)*(-1/(a^9*c^7))^(7/8) - 2*a^7*c^5*(-1/(a^9*c^7)
)^(3/4) + 2*x))) + (a*c*x^4 + a^2)*(-1/(a^9*c^7))^(1/8)*log(2*sqr
t(2)*a^8*c^6*sqrt(x)*(-1/(a^9*c^7))^(7/8) - 2*a^7*c^5*(-1/(a^9*c^
7))^(3/4) + 2*x) - (a*c*x^4 + a^2)*(-1/(a^9*c^7))^(1/8)*log(-2*sq
rt(2)*a^8*c^6*sqrt(x)*(-1/(a^9*c^7))^(7/8) - 2*a^7*c^5*(-1/(a^9*c
^7))^(3/4) + 2*x))/(a*c*x^4 + a^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(5/2)/(c*x**4+a)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.332132, size = 613, normalized size = 1.99

$$\frac{x^{\frac{7}{2}}}{4\,(cx^4+a)a}+\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\arctan\left(\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32\,a^2}+\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\arctan\left(-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32\,a^2}+\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\arctan\left(\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32\,a^2}+\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\arctan\left(-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32\,a^2}-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\ln\left(\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64\,a^2}+\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\ln\left(-\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64\,a^2}-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\ln\left(\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64\,a^2}+\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\ln\left(-\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5/2)/(c*x^4 + a)^2,x, algorithm="giac")
```

```
[Out] 1/4*x^(7/2)/((c*x^4 + a)*a) + 1/32*sqrt(sqrt(2) + 2)*(a/c)^(7/8)*
arctan((sqrt(-sqrt(2) + 2)*(a/c)^(1/8) + 2*sqrt(x))/(sqrt(sqrt(2)
```

```
 + 2)*(a/c)^(1/8)))/a^2 + 1/32*sqrt(sqrt(2) + 2)*(a/c)^(7/8)*arct
an(-(sqrt(-sqrt(2) + 2)*(a/c)^(1/8) - 2*sqrt(x))/(sqrt(sqrt(2) +
2)*(a/c)^(1/8)))/a^2 + 1/32*sqrt(-sqrt(2) + 2)*(a/c)^(7/8)*arctan
((sqrt(sqrt(2) + 2)*(a/c)^(1/8) + 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*
(a/c)^(1/8)))/a^2 + 1/32*sqrt(-sqrt(2) + 2)*(a/c)^(7/8)*arctan(-(
sqrt(sqrt(2) + 2)*(a/c)^(1/8) - 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a
/c)^(1/8)))/a^2 - 1/64*sqrt(sqrt(2) + 2)*(a/c)^(7/8)*ln(sqrt(x)*s
qrt(sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/a^2 + 1/64*sqrt(s
qrt(2) + 2)*(a/c)^(7/8)*ln(-sqrt(x)*sqrt(sqrt(2) + 2)*(a/c)^(1/8)
 + x + (a/c)^(1/4))/a^2 - 1/64*sqrt(-sqrt(2) + 2)*(a/c)^(7/8)*ln(
sqrt(x)*sqrt(-sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/a^2 + 1
/64*sqrt(-sqrt(2) + 2)*(a/c)^(7/8)*ln(-sqrt(x)*sqrt(-sqrt(2) + 2)
*(a/c)^(1/8) + x + (a/c)^(1/4))/a^2
```

3.749 $\int \frac{x^{3/2}}{(a+cx^4)^2}\,dx$

Optimal. Leaf size=308

$$\frac{3\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}(-a)^{11/8}c^{5/8}}-\frac{3\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}(-a)^{11/8}c^{5/8}}+\frac{3\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16\sqrt{2}(-a)^{11/8}c^{5/8}}-\frac{3\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{16\sqrt{2}(-a)^{11/8}c^{5/8}}+\frac{3\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{11/8}c^{5/8}}+\frac{3\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{11/8}c^{5/8}}+\frac{x^{5/2}}{4a\left(a+cx^4\right)}$$

```
[Out] x^(5/2)/(4*a*(a + c*x^4)) + (3*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x
])/(-a)^(1/8)])/(16*Sqrt[2]*(-a)^(11/8)*c^(5/8)) - (3*ArcTan[1 +
(Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*Sqrt[2]*(-a)^(11/8)*c^
(5/8)) + (3*ArcTan[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*(-a)^(11/8)
*c^(5/8)) + (3*ArcTanh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*(-a)^(1
1/8)*c^(5/8)) + (3*Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sq
rt[x] + c^(1/4)*x])/(32*Sqrt[2]*(-a)^(11/8)*c^(5/8)) - (3*Log[(-a
)^(1/4) + Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(32*Sq
rt[2]*(-a)^(11/8)*c^(5/8))
```

Rubi [A] time = 0.531817, antiderivative size = 308, normalized size of antiderivative = 1., number of steps used = 15, number of rules used = 12, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.8

$$\frac{3\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}(-a)^{11/8}c^{5/8}}-\frac{3\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}(-a)^{11/8}c^{5/8}}+\frac{3\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16\sqrt{2}(-a)^{11/8}c^{5/8}}-\frac{3\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{16\sqrt{2}(-a)^{11/8}c^{5/8}}+\frac{3\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{11/8}c^{5/8}}+\frac{3\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{11/8}c^{5/8}}+\frac{x^{5/2}}{4a\left(a+cx^4\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(3/2)/(a + c*x^4)^2,x]
```


```
[Out] x^(5/2)/(4*a*(a + c*x^4)) + (3*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x
])/(-a)^(1/8)])/(16*Sqrt[2]*(-a)^(11/8)*c^(5/8)) - (3*ArcTan[1 +
(Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*Sqrt[2]*(-a)^(11/8)*c^
(5/8)) + (3*ArcTan[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*(-a)^(11/8)
*c^(5/8)) + (3*ArcTanh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*(-a)^(1
1/8)*c^(5/8)) + (3*Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sq
rt[x] + c^(1/4)*x])/(32*Sqrt[2]*(-a)^(11/8)*c^(5/8)) - (3*Log[(-a
)^(1/4) + Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(32*Sq
rt[2]*(-a)^(11/8)*c^(5/8))
```

Rubi in Sympy [A] time = 113.347, size = 289, normalized size = 0.94

$$\frac{3\sqrt{2}\log\left(-\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{64c^{\frac{5}{8}}\left(-a\right)^{\frac{11}{8}}}-\frac{3\sqrt{2}\log\left(\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{64c^{\frac{5}{8}}\left(-a\right)^{\frac{11}{8}}}+\frac{3\operatorname{atan}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16c^{\frac{5}{8}}\left(-a\right)^{\frac{11}{8}}}-\frac{3\sqrt{2}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}-1\right)}{32c^{\frac{5}{8}}\left(-a\right)^{\frac{11}{8}}}-\frac{3\sqrt{2}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{32c^{\frac{5}{8}}\left(-a\right)^{\frac{11}{8}}}+\frac{3\operatorname{atanh}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16c^{\frac{5}{8}}\left(-a\right)^{\frac{11}{8}}}+\frac{x^{\frac{5}{2}}}{4a\left(a+cx^4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(3/2)/(c*x**4+a)**2,x)
```

```
[Out] 3*sqrt(2)*log(-sqrt(2)*c**(1/8)*sqrt(x)*(-a)**(1/8) + c**(1/4)*x
+ (-a)**(1/4))/(64*c**(5/8)*(-a)**(11/8)) - 3*sqrt(2)*log(sqrt(2)
*c**(1/8)*sqrt(x)*(-a)**(1/8) + c**(1/4)*x + (-a)**(1/4))/(64*c**
(5/8)*(-a)**(11/8)) + 3*atan(c**(1/8)*sqrt(x)/(-a)**(1/8))/(16*c*
*(5/8)*(-a)**(11/8)) - 3*sqrt(2)*atan(sqrt(2)*c**(1/8)*sqrt(x)/(-
a)**(1/8) - 1)/(32*c**(5/8)*(-a)**(11/8)) - 3*sqrt(2)*atan(sqrt(2
)*c**(1/8)*sqrt(x)/(-a)**(1/8) + 1)/(32*c**(5/8)*(-a)**(11/8)) +
3*atanh(c**(1/8)*sqrt(x)/(-a)**(1/8))/(16*c**(5/8)*(-a)**(11/8))
+ x**(5/2)/(4*a*(a + c*x**4))
```

Mathematica [A] time = 1.95493, size = 406, normalized size = 1.32

$$\frac{\frac{8a^{3/8}x^{5/2}}{a+cx^4}-\frac{3\cos\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{c^{5/8}}+\frac{3\cos\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{c^{5/8}}+\frac{3\sin\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\cos\left(\frac{\pi}{8}\right)+\sqrt[4]{a}\cdots\right.}{c^{5/8}}}{}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(3/2)/(a + c*x^4)^2,x]
```

```
[Out] ((8*a^(3/8)*x^(5/2))/(a + c*x^4) - (6*ArcTan[Cot[Pi/8] - (c^(1/8)
*Sqrt[x]*Csc[Pi/8])/a^(1/8)]*Cos[Pi/8])/c^(5/8) + (6*ArcTan[Cot[P
i/8] + (c^(1/8)*Sqrt[x]*Csc[Pi/8])/a^(1/8)]*Cos[Pi/8])/c^(5/8) -
(3*Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[x]*
Sin[Pi/8]])/c^(5/8) + (3*Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x + 2*a^
(1/8)*c^(1/8)*Sqrt[x]*Sin[Pi/8]])/c^(5/8) - (6*ArcTan[(c^(1/8)*Sq
rt[x]*Sec[Pi/8])/a^(1/8) - Tan[Pi/8]]*Sin[Pi/8])/c^(5/8) - (6*Arc
Tan[(c^(1/8)*Sqrt[x]*Sec[Pi/8])/a^(1/8) + Tan[Pi/8]]*Sin[Pi/8])/c
^(5/8) + (3*Log[a^(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[x]*C
os[Pi/8]]*Sin[Pi/8])/c^(5/8) - (3*Log[a^(1/4) + c^(1/4)*x + 2*a^(
1/8)*c^(1/8)*Sqrt[x]*Cos[Pi/8]]*Sin[Pi/8])/c^(5/8))/(32*a^(11/8))
```

Maple [C] time = 0.018, size = 50, normalized size = 0.2

$$\frac{1}{4\,a\left(cx^{4}+a\right)}x^{\frac{5}{2}}+\frac{3}{32\,ac}\sum_{\_R=RootOf\left(\_Z^{8}c+a\right)}\frac{1}{\_R^{3}}\ln\left(\sqrt{x}-\_R\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(3/2)/(c*x^4+a)^2,x)
```

```
[Out] 1/4*x^(5/2)/a/(c*x^4+a)+3/32/a/c*sum(1/_R^3*ln(x^(1/2)-_R),_R=Roo
tOf(_Z^8*c+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{x^{\frac{5}{2}}}{4\left(acx^{4}+a^{2}\right)}+3\int\frac{x^{\frac{3}{2}}}{8\left(acx^{4}+a^{2}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2)/(c*x^4 + a)^2,x, algorithm="maxima")
```

```
[Out] 1/4*x^(5/2)/(a*c*x^4 + a^2) + 3*integrate(1/8*x^(3/2)/(a*c*x^4 +
a^2), x)
```

Fricas [A] time = 0.270533, size = 748, normalized size = 2.43

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2)/(c*x^4 + a)^2,x, algorithm="fricas")
```

```
[Out] 1/64*sqrt(2)*(8*sqrt(2)*x^(5/2) + 12*sqrt(2)*(a*c*x^4 + a^2)*(-1/
(a^11*c^5))^(1/8)*arctan(a^7*c^3*(-1/(a^11*c^5))^(5/8)/(sqrt(-a^3
*c*(-1/(a^11*c^5))^(1/4) + x) + sqrt(x))) - 3*sqrt(2)*(a*c*x^4 +
a^2)*(-1/(a^11*c^5))^(1/8)*log(a^7*c^3*(-1/(a^11*c^5))^(5/8) + sq
rt(x)) + 3*sqrt(2)*(a*c*x^4 + a^2)*(-1/(a^11*c^5))^(1/8)*log(-a^7
*c^3*(-1/(a^11*c^5))^(5/8) + sqrt(x)) - 12*(a*c*x^4 + a^2)*(-1/(a
^11*c^5))^(1/8)*arctan(a^7*c^3*(-1/(a^11*c^5))^(5/8)/(a^7*c^3*(-1
/(a^11*c^5))^(5/8) + sqrt(2)*sqrt(x) + sqrt(2*sqrt(2)*a^7*c^3*sqr
t(x)*(-1/(a^11*c^5))^(5/8) - 2*a^3*c*(-1/(a^11*c^5))^(1/4) + 2*x)
)) - 12*(a*c*x^4 + a^2)*(-1/(a^11*c^5))^(1/8)*arctan(-a^7*c^3*(-1
/(a^11*c^5))^(5/8)/(a^7*c^3*(-1/(a^11*c^5))^(5/8) - sqrt(2)*sqrt(
x) - sqrt(-2*sqrt(2)*a^7*c^3*sqrt(x)*(-1/(a^11*c^5))^(5/8) - 2*a^
3*c*(-1/(a^11*c^5))^(1/4) + 2*x))) + 3*(a*c*x^4 + a^2)*(-1/(a^11*
c^5))^(1/8)*log(2*sqrt(2)*a^7*c^3*sqrt(x)*(-1/(a^11*c^5))^(5/8) -
 2*a^3*c*(-1/(a^11*c^5))^(1/4) + 2*x) - 3*(a*c*x^4 + a^2)*(-1/(a^
11*c^5))^(1/8)*log(-2*sqrt(2)*a^7*c^3*sqrt(x)*(-1/(a^11*c^5))^(5/
8) - 2*a^3*c*(-1/(a^11*c^5))^(1/4) + 2*x))/(a*c*x^4 + a^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(3/2)/(c*x**4+a)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.335713, size = 613, normalized size = 1.99

$$\frac{x^{\frac{5}{2}}}{4\,(cx^4+a)a} - \frac{3\,\sqrt{-\sqrt{2}+2}\,\left(\frac{a}{c}\right)^{\frac{5}{8}}\arctan\left(\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\,\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32\,a^2} - \frac{3\,\sqrt{-\sqrt{2}+2}\,\left(\frac{a}{c}\right)^{\frac{5}{8}}\arctan\left(-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\,\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32\,a^2} + \frac{3\,\sqrt{\sqrt{2}+2}\,\left(\frac{a}{c}\right)^{\frac{5}{8}}\arctan\left(\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\,\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32\,a^2} + \frac{3\,\sqrt{\sqrt{2}+2}\,\left(\frac{a}{c}\right)^{\frac{5}{8}}\arctan\left(-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\,\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32\,a^2} - \frac{3\,\sqrt{-\sqrt{2}+2}\,\left(\frac{a}{c}\right)^{\frac{5}{8}}\ln\left(\sqrt{x}\sqrt{\sqrt{2}+2}\,\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64\,a^2} + \frac{3\,\sqrt{-\sqrt{2}+2}\,\left(\frac{a}{c}\right)^{\frac{5}{8}}\ln\left(-\sqrt{x}\sqrt{\sqrt{2}+2}\,\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64\,a^2} + \frac{3\,\sqrt{\sqrt{2}+2}\,\left(\frac{a}{c}\right)^{\frac{5}{8}}\ln\left(\sqrt{x}\sqrt{-\sqrt{2}+2}\,\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64\,a^2} - \frac{3\,\sqrt{\sqrt{2}+2}\,\left(\frac{a}{c}\right)^{\frac{5}{8}}\ln\left(-\sqrt{x}\sqrt{-\sqrt{2}+2}\,\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2)/(c*x^4 + a)^2,x, algorithm="giac")
```

```
[Out] 1/4*x^(5/2)/((c*x^4 + a)*a) - 3/32*sqrt(-sqrt(2) + 2)*(a/c)^(5/8)
*arctan((sqrt(-sqrt(2) + 2)*(a/c)^(1/8) + 2*sqrt(x))/(sqrt(sqrt(2
) + 2)*(a/c)^(1/8)))/a^2 - 3/32*sqrt(-sqrt(2) + 2)*(a/c)^(5/8)*ar
ctan(-(sqrt(-sqrt(2) + 2)*(a/c)^(1/8) - 2*sqrt(x))/(sqrt(sqrt(2)
+ 2)*(a/c)^(1/8)))/a^2 + 3/32*sqrt(sqrt(2) + 2)*(a/c)^(5/8)*arcta
n((sqrt(sqrt(2) + 2)*(a/c)^(1/8) + 2*sqrt(x))/(sqrt(-sqrt(2) + 2)
*(a/c)^(1/8)))/a^2 + 3/32*sqrt(sqrt(2) + 2)*(a/c)^(5/8)*arctan(-(
sqrt(sqrt(2) + 2)*(a/c)^(1/8) - 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a
/c)^(1/8)))/a^2 - 3/64*sqrt(-sqrt(2) + 2)*(a/c)^(5/8)*ln(sqrt(x)*
sqrt(sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/a^2 + 3/64*sqrt(
-sqrt(2) + 2)*(a/c)^(5/8)*ln(-sqrt(x)*sqrt(sqrt(2) + 2)*(a/c)^(1/
8) + x + (a/c)^(1/4))/a^2 + 3/64*sqrt(sqrt(2) + 2)*(a/c)^(5/8)*ln
(sqrt(x)*sqrt(-sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/a^2 -
3/64*sqrt(sqrt(2) + 2)*(a/c)^(5/8)*ln(-sqrt(x)*sqrt(-sqrt(2) + 2)
*(a/c)^(1/8) + x + (a/c)^(1/4))/a^2
```

3.750 $\int \frac{\sqrt{x}}{(a+cx^4)^2} dx$

Optimal. Leaf size=308

$$\frac{5\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}(-a)^{13/8}c^{3/8}}-\frac{5\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}(-a)^{13/8}c^{3/8}}-\frac{5\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16\sqrt{2}(-a)^{13/8}c^{3/8}}+\frac{5\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{16\sqrt{2}(-a)^{13/8}c^{3/8}}-\frac{5\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{13/8}c^{3/8}}+\frac{5\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{13/8}c^{3/8}}+\frac{x^{3/2}}{4a(a+cx^4)}$$

```
[Out] x^(3/2)/(4*a*(a + c*x^4)) - (5*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x
])/(-a)^(1/8)])/(16*Sqrt[2]*(-a)^(13/8)*c^(3/8)) + (5*ArcTan[1 +
(Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*Sqrt[2]*(-a)^(13/8)*c^
(3/8)) - (5*ArcTan[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*(-a)^(13/8)
*c^(3/8)) + (5*ArcTanh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*(-a)^(1
3/8)*c^(3/8)) + (5*Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sq
rt[x] + c^(1/4)*x])/(32*Sqrt[2]*(-a)^(13/8)*c^(3/8)) - (5*Log[(-a
)^(1/4) + Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(32*Sq
rt[2]*(-a)^(13/8)*c^(3/8))
```

Rubi [A] time = 0.563296, antiderivative size = 308, normalized size of antiderivative = 1., number of steps used = 15, number of rules used = 12, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.8

$$\frac{5\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}(-a)^{13/8}c^{3/8}}-\frac{5\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}(-a)^{13/8}c^{3/8}}-\frac{5\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16\sqrt{2}(-a)^{13/8}c^{3/8}}+\frac{5\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{16\sqrt{2}(-a)^{13/8}c^{3/8}}-\frac{5\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{13/8}c^{3/8}}+\frac{5\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{13/8}c^{3/8}}+\frac{x^{3/2}}{4a(a+cx^4)}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[x]/(a + c*x^4)^2,x]
```


```
[Out] x^(3/2)/(4*a*(a + c*x^4)) - (5*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x
])/(-a)^(1/8)])/(16*Sqrt[2]*(-a)^(13/8)*c^(3/8)) + (5*ArcTan[1 +
(Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*Sqrt[2]*(-a)^(13/8)*c^
(3/8)) - (5*ArcTan[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*(-a)^(13/8)
*c^(3/8)) + (5*ArcTanh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*(-a)^(1
3/8)*c^(3/8)) + (5*Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sq
rt[x] + c^(1/4)*x])/(32*Sqrt[2]*(-a)^(13/8)*c^(3/8)) - (5*Log[(-a
)^(1/4) + Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(32*Sq
rt[2]*(-a)^(13/8)*c^(3/8))
```

Rubi in Sympy [A] time = 120.903, size = 289, normalized size = 0.94

$$\frac{5\sqrt{2}\log\left(-\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{64c^{\frac{3}{8}}\left(-a\right)^{\frac{13}{8}}}-\frac{5\sqrt{2}\log\left(\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{64c^{\frac{3}{8}}\left(-a\right)^{\frac{13}{8}}}-\frac{5\,\mathrm{atan}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16c^{\frac{3}{8}}\left(-a\right)^{\frac{13}{8}}}+\frac{5\sqrt{2}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}-1\right)}{32c^{\frac{3}{8}}\left(-a\right)^{\frac{13}{8}}}+\frac{5\sqrt{2}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{32c^{\frac{3}{8}}\left(-a\right)^{\frac{13}{8}}}+\frac{5\,\mathrm{atanh}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16c^{\frac{3}{8}}\left(-a\right)^{\frac{13}{8}}}+\frac{x^{\frac{3}{2}}}{4a\left(a+cx^4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(1/2)/(c*x**4+a)**2,x)
```

```
[Out] 5*sqrt(2)*log(-sqrt(2)*c**(1/8)*sqrt(x)*(-a)**(1/8) + c**(1/4)*x
+ (-a)**(1/4))/(64*c**(3/8)*(-a)**(13/8)) - 5*sqrt(2)*log(sqrt(2)
*c**(1/8)*sqrt(x)*(-a)**(1/8) + c**(1/4)*x + (-a)**(1/4))/(64*c**
(3/8)*(-a)**(13/8)) - 5*atan(c**(1/8)*sqrt(x)/(-a)**(1/8))/(16*c*
*(3/8)*(-a)**(13/8)) + 5*sqrt(2)*atan(sqrt(2)*c**(1/8)*sqrt(x)/(-
a)**(1/8) - 1)/(32*c**(3/8)*(-a)**(13/8)) + 5*sqrt(2)*atan(sqrt(2
)*c**(1/8)*sqrt(x)/(-a)**(1/8) + 1)/(32*c**(3/8)*(-a)**(13/8)) +
5*atanh(c**(1/8)*sqrt(x)/(-a)**(1/8))/(16*c**(3/8)*(-a)**(13/8))
+ x**(3/2)/(4*a*(a + c*x**4))
```

Mathematica [A] time = 2.03238, size = 406, normalized size = 1.32

$$\frac{\frac{8a^{5/8}x^{3/2}}{a+cx^4}+\frac{5\cos\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{c^{3/8}}-\frac{5\cos\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{c^{3/8}}-\frac{5\sin\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\cos\left(\frac{\pi}{8}\right)+\sqrt[4]{a}\right.}{c^{3/8}}}{}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[x]/(a + c*x^4)^2,x]
```

```
[Out] ((8*a^(5/8)*x^(3/2))/(a + c*x^4) - (10*ArcTan[Cot[Pi/8] - (c^(1/8
)*Sqrt[x]*Csc[Pi/8])/a^(1/8)]*Cos[Pi/8])/c^(3/8) + (10*ArcTan[Cot
[Pi/8] + (c^(1/8)*Sqrt[x]*Csc[Pi/8])/a^(1/8)]*Cos[Pi/8])/c^(3/8)
+ (5*Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[x
]*Sin[Pi/8]])/c^(3/8) - (5*Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x + 2*
a^(1/8)*c^(1/8)*Sqrt[x]*Sin[Pi/8]])/c^(3/8) - (10*ArcTan[(c^(1/8)
*Sqrt[x]*Sec[Pi/8])/a^(1/8) - Tan[Pi/8]]*Sin[Pi/8])/c^(3/8) - (10
*ArcTan[(c^(1/8)*Sqrt[x]*Sec[Pi/8])/a^(1/8) + Tan[Pi/8]]*Sin[Pi/8
])/c^(3/8) - (5*Log[a^(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[
x]*Cos[Pi/8]]*Sin[Pi/8])/c^(3/8) + (5*Log[a^(1/4) + c^(1/4)*x + 2
*a^(1/8)*c^(1/8)*Sqrt[x]*Cos[Pi/8]]*Sin[Pi/8])/c^(3/8))/(32*a^(13
/8))
```

Maple [C] time = 0.019, size = 50, normalized size = 0.2

$$\frac{1}{4\,a\,(cx^4+a)}x^{\frac{3}{2}}+\frac{5}{32\,ac}\sum_{\_R=RootOf(\_Z^8c+a)}\frac{1}{\_R^5}\ln\left(\sqrt{x}-\_R\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(1/2)/(c*x^4+a)^2,x)
```

```
[Out] 1/4*x^(3/2)/a/(c*x^4+a)+5/32/a/c*sum(1/_R^5*ln(x^(1/2)-_R),_R=Roo
tOf(_Z^8*c+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{x^{\frac{3}{2}}}{4\,(acx^4+a^2)}+5\int\frac{\sqrt{x}}{8\,(acx^4+a^2)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(c*x^4 + a)^2,x, algorithm="maxima")
```

```
[Out] 1/4*x^(3/2)/(a*c*x^4 + a^2) + 5*integrate(1/8*sqrt(x)/(a*c*x^4 +
a^2), x)
```

Fricas [A] time = 0.261596, size = 730, normalized size = 2.37

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(c*x^4 + a)^2,x, algorithm="fricas")
```

```
[Out] -1/64*sqrt(2)*(20*sqrt(2)*(a*c*x^4 + a^2)*(-1/(a^13*c^3))^(1/8)*a
rctan(a^5*c*(-1/(a^13*c^3))^(3/8)/(sqrt(a^10*c^2*(-1/(a^13*c^3))^
(3/4) + x) + sqrt(x))) + 5*sqrt(2)*(a*c*x^4 + a^2)*(-1/(a^13*c^3)
)^(1/8)*log(a^5*c*(-1/(a^13*c^3))^(3/8) + sqrt(x)) - 5*sqrt(2)*(a
*c*x^4 + a^2)*(-1/(a^13*c^3))^(1/8)*log(-a^5*c*(-1/(a^13*c^3))^(3
/8) + sqrt(x)) - 20*(a*c*x^4 + a^2)*(-1/(a^13*c^3))^(1/8)*arctan(
a^5*c*(-1/(a^13*c^3))^(3/8)/(a^5*c*(-1/(a^13*c^3))^(3/8) + sqrt(2
)*sqrt(x) + sqrt(2*a^10*c^2*(-1/(a^13*c^3))^(3/4) + 2*sqrt(2)*a^5
*c*sqrt(x)*(-1/(a^13*c^3))^(3/8) + 2*x))) - 20*(a*c*x^4 + a^2)*(-
1/(a^13*c^3))^(1/8)*arctan(-a^5*c*(-1/(a^13*c^3))^(3/8)/(a^5*c*(-
1/(a^13*c^3))^(3/8) - sqrt(2)*sqrt(x) - sqrt(2*a^10*c^2*(-1/(a^13
*c^3))^(3/4) - 2*sqrt(2)*a^5*c*sqrt(x)*(-1/(a^13*c^3))^(3/8) + 2*
x))) - 5*(a*c*x^4 + a^2)*(-1/(a^13*c^3))^(1/8)*log(2*a^10*c^2*(-1
/(a^13*c^3))^(3/4) + 2*sqrt(2)*a^5*c*sqrt(x)*(-1/(a^13*c^3))^(3/8
) + 2*x) + 5*(a*c*x^4 + a^2)*(-1/(a^13*c^3))^(1/8)*log(2*a^10*c^2
*(-1/(a^13*c^3))^(3/4) - 2*sqrt(2)*a^5*c*sqrt(x)*(-1/(a^13*c^3))^
(3/8) + 2*x) - 8*sqrt(2)*x^(3/2))/(a*c*x^4 + a^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(1/2)/(c*x**4+a)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.327839, size = 613, normalized size = 1.99

$$-\frac{5\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{3}{8}}\arctan\left(\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32\,a^{2}}-\frac{5\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{3}{8}}\arctan\left(-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32\,a^{2}}+\frac{5\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{3}{8}}\arctan\left(\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32\,a^{2}}+\frac{5\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{3}{8}}\arctan\left(-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32\,a^{2}}+\frac{5\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{3}{8}}\ln\left(\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64\,a^{2}}-\frac{5\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{3}{8}}\ln\left(-\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64\,a^{2}}-\frac{5\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{3}{8}}\ln\left(\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64\,a^{2}}+\frac{5\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{3}{8}}\ln\left(-\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64\,a^{2}}+\frac{x^{\frac{3}{2}}}{4\,(cx^{4}+a)a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(c*x^4 + a)^2,x, algorithm="giac")
```

```
[Out] -5/32*sqrt(-sqrt(2) + 2)*(a/c)^(3/8)*arctan((sqrt(-sqrt(2) + 2)*(
a/c)^(1/8) + 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/a^2 - 5/
```

```
32*sqrt(-sqrt(2) + 2)*(a/c)^(3/8)*arctan(-(sqrt(-sqrt(2) + 2)*(a/
c)^(1/8) - 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/a^2 + 5/32
*sqrt(sqrt(2) + 2)*(a/c)^(3/8)*arctan((sqrt(sqrt(2) + 2)*(a/c)^(1
/8) + 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/a^2 + 5/32*sqr
t(sqrt(2) + 2)*(a/c)^(3/8)*arctan(-(sqrt(sqrt(2) + 2)*(a/c)^(1/8)
 - 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/a^2 + 5/64*sqrt(-
sqrt(2) + 2)*(a/c)^(3/8)*ln(sqrt(x)*sqrt(sqrt(2) + 2)*(a/c)^(1/8)
 + x + (a/c)^(1/4))/a^2 - 5/64*sqrt(-sqrt(2) + 2)*(a/c)^(3/8)*ln(
-sqrt(x)*sqrt(sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/a^2 - 5
/64*sqrt(sqrt(2) + 2)*(a/c)^(3/8)*ln(sqrt(x)*sqrt(-sqrt(2) + 2)*(
a/c)^(1/8) + x + (a/c)^(1/4))/a^2 + 5/64*sqrt(sqrt(2) + 2)*(a/c)^
(3/8)*ln(-sqrt(x)*sqrt(-sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4
))/a^2 + 1/4*x^(3/2)/((c*x^4 + a)*a)
```

3.751 $\int \frac{1}{\sqrt{x}(a+cx^4)^2}\,dx$

Optimal. Leaf size=308

$$\frac{\sqrt{x}}{4a\,(a+cx^4)}-\frac{7\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}(-a)^{15/8}\sqrt[8]{c}}+\frac{7\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}(-a)^{15/8}\sqrt[8]{c}}-\frac{7\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16\sqrt{2}(-a)^{15/8}\sqrt[8]{c}}+\frac{7\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{16\sqrt{2}(-a)^{15/8}\sqrt[8]{c}}+\frac{7\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{15/8}\sqrt[8]{c}}+\frac{7\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{15/8}\sqrt[8]{c}}$$

```
[Out] Sqrt[x]/(4*a*(a + c*x^4)) - (7*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x
])/(-a)^(1/8)])/(16*Sqrt[2]*(-a)^(15/8)*c^(1/8)) + (7*ArcTan[1 +
(Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*Sqrt[2]*(-a)^(15/8)*c^
(1/8)) + (7*ArcTan[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*(-a)^(15/8)
*c^(1/8)) + (7*ArcTanh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*(-a)^(1
5/8)*c^(1/8)) - (7*Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sq
rt[x] + c^(1/4)*x])/(32*Sqrt[2]*(-a)^(15/8)*c^(1/8)) + (7*Log[(-a
)^(1/4) + Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(32*Sq
rt[2]*(-a)^(15/8)*c^(1/8))
```

Rubi [A] time = 0.577137, antiderivative size = 308, normalized size of antiderivative = 1., number of steps used = 15, number of rules used = 12, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.8

$$\frac{\sqrt{x}}{4a\,(a+cx^4)}-\frac{7\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}(-a)^{15/8}\sqrt[8]{c}}+\frac{7\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}(-a)^{15/8}\sqrt[8]{c}}-\frac{7\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16\sqrt{2}(-a)^{15/8}\sqrt[8]{c}}+\frac{7\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{16\sqrt{2}(-a)^{15/8}\sqrt[8]{c}}+\frac{7\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{15/8}\sqrt[8]{c}}+\frac{7\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{15/8}\sqrt[8]{c}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[x]*(a + c*x^4)^2),x]
```


```
[Out] Sqrt[x]/(4*a*(a + c*x^4)) - (7*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x
])/(-a)^(1/8)])/(16*Sqrt[2]*(-a)^(15/8)*c^(1/8)) + (7*ArcTan[1 +
(Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*Sqrt[2]*(-a)^(15/8)*c^
(1/8)) + (7*ArcTan[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*(-a)^(15/8)
*c^(1/8)) + (7*ArcTanh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*(-a)^(1
5/8)*c^(1/8)) - (7*Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sq
rt[x] + c^(1/4)*x])/(32*Sqrt[2]*(-a)^(15/8)*c^(1/8)) + (7*Log[(-a
)^(1/4) + Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(32*Sq
rt[2]*(-a)^(15/8)*c^(1/8))
```

Rubi in Sympy [A] time = 119.262, size = 289, normalized size = 0.94

$$-\frac{7\sqrt{2}\log\left(-\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{64\sqrt[8]{c}\,(-a)^{\frac{15}{8}}}+\frac{7\sqrt{2}\log\left(\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{64\sqrt[8]{c}\,(-a)^{\frac{15}{8}}}+\frac{7\,\mathrm{atan}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16\sqrt[8]{c}\,(-a)^{\frac{15}{8}}}+\frac{7\sqrt{2}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}-1\right)}{32\sqrt[8]{c}\,(-a)^{\frac{15}{8}}}+\frac{7\sqrt{2}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{32\sqrt[8]{c}\,(-a)^{\frac{15}{8}}}+\frac{7\,\mathrm{atanh}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16\sqrt[8]{c}\,(-a)^{\frac{15}{8}}}+\frac{\sqrt{x}}{4a\,(a+cx^4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(c*x**4+a)**2/x**(1/2),x)
```

```
[Out] -7*sqrt(2)*log(-sqrt(2)*c**(1/8)*sqrt(x)*(-a)**(1/8) + c**(1/4)*x
 + (-a)**(1/4))/(64*c**(1/8)*(-a)**(15/8)) + 7*sqrt(2)*log(sqrt(2
```

```
)*c**(1/8)*sqrt(x)*(-a)**(1/8) + c**(1/4)*x + (-a)**(1/4))/(64*c*
*(1/8)*(-a)**(15/8)) + 7*atan(c**(1/8)*sqrt(x)/(-a)**(1/8))/(16*c
**(1/8)*(-a)**(15/8)) + 7*sqrt(2)*atan(sqrt(2)*c**(1/8)*sqrt(x)/(
-a)**(1/8) - 1)/(32*c**(1/8)*(-a)**(15/8)) + 7*sqrt(2)*atan(sqrt(
2)*c**(1/8)*sqrt(x)/(-a)**(1/8) + 1)/(32*c**(1/8)*(-a)**(15/8)) +
 7*atanh(c**(1/8)*sqrt(x)/(-a)**(1/8))/(16*c**(1/8)*(-a)**(15/8))
 + sqrt(x)/(4*a*(a + c*x**4))
```

Mathematica [A] time = 2.07623, size = 406, normalized size = 1.32

$$\frac{8a^{7/8}\sqrt{x}}{a+cx^4} - \frac{7\sin\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{\sqrt[8]{c}} + \frac{7\sin\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{\sqrt[8]{c}} - \frac{7\cos\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\cos\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\cdots\right.}{\sqrt[8]{c}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[x]*(a + c*x^4)^2),x]
```

```
[Out] ((8*a^(7/8)*Sqrt[x])/(a + c*x^4) + (14*ArcTan[(c^(1/8)*Sqrt[x]*Se
c[Pi/8])/a^(1/8) - Tan[Pi/8]]*Cos[Pi/8])/c^(1/8) + (14*ArcTan[(c^
(1/8)*Sqrt[x]*Sec[Pi/8])/a^(1/8) + Tan[Pi/8]]*Cos[Pi/8])/c^(1/8)
- (7*Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[x
]*Cos[Pi/8]])/c^(1/8) + (7*Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x + 2*
a^(1/8)*c^(1/8)*Sqrt[x]*Cos[Pi/8]])/c^(1/8) - (14*ArcTan[Cot[Pi/8
] - (c^(1/8)*Sqrt[x]*Csc[Pi/8])/a^(1/8)]*Sin[Pi/8])/c^(1/8) + (14
*ArcTan[Cot[Pi/8] + (c^(1/8)*Sqrt[x]*Csc[Pi/8])/a^(1/8)]*Sin[Pi/8
])/c^(1/8) - (7*Log[a^(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[
x]*Sin[Pi/8]]*Sin[Pi/8])/c^(1/8) + (7*Log[a^(1/4) + c^(1/4)*x + 2
*a^(1/8)*c^(1/8)*Sqrt[x]*Sin[Pi/8]]*Sin[Pi/8])/c^(1/8))/(32*a^(15
/8))
```

Maple [C] time = 0.019, size = 50, normalized size = 0.2

$$\frac{1}{4\,a\left(cx^4+a\right)}\sqrt{x}+\frac{7}{32\,ac}\sum_{\_R=RootOf\left(\_Z^8c+a\right)}\frac{1}{\_R^7}\ln\left(\sqrt{x}-\_R\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(c*x^4+a)^2/x^(1/2),x)
```

```
[Out] 1/4*x^(1/2)/a/(c*x^4+a)+7/32/a/c*sum(1/_R^7*ln(x^(1/2)-_R),_R=Roo
tOf(_Z^8*c+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-7\,c\int\frac{x^{\frac{7}{2}}}{8\left(a^2cx^4+a^3\right)}\,dx+\frac{7\,cx^{\frac{9}{2}}+8\,a\sqrt{x}}{4\left(a^2cx^4+a^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)^2*sqrt(x)),x, algorithm="maxima")
```

```
[Out] -7*c*integrate(1/8*x^(7/2)/(a^2*c*x^4 + a^3), x) + 1/4*(7*c*x^(9/
2) + 8*a*sqrt(x))/(a^2*c*x^4 + a^3)
```

Fricas [A] time = 0.26749, size = 695, normalized size = 2.26

$$-\frac{\sqrt{2}\left(28\sqrt{2}\left(acx^4+a^2\right)\left(-\frac{1}{a^{15}c}\right)^{\frac{1}{8}}\arctan\left(\frac{a^2\left(-\frac{1}{a^{15}c}\right)^{\frac{1}{8}}}{\sqrt{a^4\left(-\frac{1}{a^{15}c}\right)^{\frac{1}{4}}+x}+\sqrt{x}}\right)-7\sqrt{2}\left(acx^4+a^2\right)\left(-\frac{1}{a^{15}c}\right)^{\frac{1}{8}}\log\left(a^2\left(-\frac{1}{a^{15}c}\right)^{\frac{1}{8}}+\sqrt{x}\right)+7\sqrt{2}(\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)^2*sqrt(x)),x, algorithm="fricas")
```

```
[Out] -1/64*sqrt(2)*(28*sqrt(2)*(a*c*x^4 + a^2)*(-1/(a^15*c))^(1/8)*arc
tan(a^2*(-1/(a^15*c))^(1/8)/(sqrt(a^4*(-1/(a^15*c))^(1/4) + x) +
sqrt(x))) - 7*sqrt(2)*(a*c*x^4 + a^2)*(-1/(a^15*c))^(1/8)*log(a^2
*(-1/(a^15*c))^(1/8) + sqrt(x)) + 7*sqrt(2)*(a*c*x^4 + a^2)*(-1/(
a^15*c))^(1/8)*log(-a^2*(-1/(a^15*c))^(1/8) + sqrt(x)) + 28*(a*c*
x^4 + a^2)*(-1/(a^15*c))^(1/8)*arctan(a^2*(-1/(a^15*c))^(1/8)/(a^
2*(-1/(a^15*c))^(1/8) + sqrt(2)*sqrt(x) + sqrt(2*a^4*(-1/(a^15*c)
)^(1/4) + 2*sqrt(2)*a^2*sqrt(x)*(-1/(a^15*c))^(1/8) + 2*x))) + 28
*(a*c*x^4 + a^2)*(-1/(a^15*c))^(1/8)*arctan(-a^2*(-1/(a^15*c))^(1
/8)/(a^2*(-1/(a^15*c))^(1/8) - sqrt(2)*sqrt(x) - sqrt(2*a^4*(-1/(
a^15*c))^(1/4) - 2*sqrt(2)*a^2*sqrt(x)*(-1/(a^15*c))^(1/8) + 2*x)
)) - 7*(a*c*x^4 + a^2)*(-1/(a^15*c))^(1/8)*log(2*a^4*(-1/(a^15*c)
)^(1/4) + 2*sqrt(2)*a^2*sqrt(x)*(-1/(a^15*c))^(1/8) + 2*x) + 7*(a
*c*x^4 + a^2)*(-1/(a^15*c))^(1/8)*log(2*a^4*(-1/(a^15*c))^(1/4) -
 2*sqrt(2)*a^2*sqrt(x)*(-1/(a^15*c))^(1/8) + 2*x) - 8*sqrt(2)*sqr
t(x))/(a*c*x^4 + a^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(c*x**4+a)**2/x**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.296256, size = 613, normalized size = 1.99

$$\frac{7\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\arctan\left(\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32a^2}+\frac{7\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\arctan\left(-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32a^2}+\frac{7\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\arctan\left(\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32a^2}+\frac{7\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\arctan\left(-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32a^2}+\frac{7\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\ln\left(\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64a^2}-\frac{7\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\ln\left(-\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64a^2}+\frac{7\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\ln\left(\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64a^2}-\frac{7\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\ln\left(-\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64a^2}+\frac{\sqrt{x}}{4\left(cx^4+a\right)a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)^2*sqrt(x)),x, algorithm="giac")
```

```
[Out] 7/32*sqrt(sqrt(2) + 2)*(a/c)^(1/8)*arctan((sqrt(-sqrt(2) + 2)*(a/
c)^(1/8) + 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/a^2 + 7/32
*sqrt(sqrt(2) + 2)*(a/c)^(1/8)*arctan(-(sqrt(-sqrt(2) + 2)*(a/c)^
(1/8) - 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/a^2 + 7/32*sq
rt(-sqrt(2) + 2)*(a/c)^(1/8)*arctan((sqrt(sqrt(2) + 2)*(a/c)^(1/8
) + 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/a^2 + 7/32*sqrt(
-sqrt(2) + 2)*(a/c)^(1/8)*arctan(-(sqrt(sqrt(2) + 2)*(a/c)^(1/8)
- 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/a^2 + 7/64*sqrt(sq
rt(2) + 2)*(a/c)^(1/8)*ln(sqrt(x)*sqrt(sqrt(2) + 2)*(a/c)^(1/8) +
 x + (a/c)^(1/4))/a^2 - 7/64*sqrt(sqrt(2) + 2)*(a/c)^(1/8)*ln(-sq
rt(x)*sqrt(sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/a^2 + 7/64
*sqrt(-sqrt(2) + 2)*(a/c)^(1/8)*ln(sqrt(x)*sqrt(-sqrt(2) + 2)*(a/
c)^(1/8) + x + (a/c)^(1/4))/a^2 - 7/64*sqrt(-sqrt(2) + 2)*(a/c)^(
1/8)*ln(-sqrt(x)*sqrt(-sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4)
)/a^2 + 1/4*sqrt(x)/((c*x^4 + a)*a)
```

3.752 $\int \frac{1}{x^{3/2}(a+cx^4)^2} dx$

Optimal. Leaf size=320

$$-\frac{9}{4a^2\sqrt{x}}+\frac{1}{4a\sqrt{x}(a+cx^4)}-\frac{9\sqrt[8]{c}\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}(-a)^{17/8}}+\frac{9\sqrt[8]{c}\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}(-a)^{17/8}}+\frac{9\sqrt[8]{c}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16\sqrt{2}(-a)^{17/8}}-\frac{9\sqrt[8]{c}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{16\sqrt{2}(-a)^{17/8}}-\frac{9\sqrt[8]{c}\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{17/8}}+\frac{9\sqrt[8]{c}\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{17/8}}$$

```
[Out] -9/(4*a^2*Sqrt[x]) + 1/(4*a*Sqrt[x]*(a + c*x^4)) + (9*c^(1/8)*Arc
Tan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*Sqrt[2]*(-a)^(
17/8)) - (9*c^(1/8)*ArcTan[1 + (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/
8)])/(16*Sqrt[2]*(-a)^(17/8)) - (9*c^(1/8)*ArcTan[(c^(1/8)*Sqrt[x
])/(-a)^(1/8)])/(16*(-a)^(17/8)) + (9*c^(1/8)*ArcTanh[(c^(1/8)*Sq
rt[x])/(-a)^(1/8)])/(16*(-a)^(17/8)) - (9*c^(1/8)*Log[(-a)^(1/4)
- Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(32*Sqrt[2]*(-
a)^(17/8)) + (9*c^(1/8)*Log[(-a)^(1/4) + Sqrt[2]*(-a)^(1/8)*c^(1/
8)*Sqrt[x] + c^(1/4)*x])/(32*Sqrt[2]*(-a)^(17/8))
```

Rubi [A] time = 0.614727, antiderivative size = 320, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 13, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.867

$$-\frac{9}{4a^2\sqrt{x}}+\frac{1}{4a\sqrt{x}(a+cx^4)}-\frac{9\sqrt[8]{c}\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}(-a)^{17/8}}+\frac{9\sqrt[8]{c}\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{32\sqrt{2}(-a)^{17/8}}+\frac{9\sqrt[8]{c}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16\sqrt{2}(-a)^{17/8}}-\frac{9\sqrt[8]{c}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{16\sqrt{2}(-a)^{17/8}}-\frac{9\sqrt[8]{c}\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{17/8}}+\frac{9\sqrt[8]{c}\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{17/8}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^(3/2)*(a + c*x^4)^2),x]
```


```
[Out] -9/(4*a^2*Sqrt[x]) + 1/(4*a*Sqrt[x]*(a + c*x^4)) + (9*c^(1/8)*Arc
Tan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(16*Sqrt[2]*(-a)^(
17/8)) - (9*c^(1/8)*ArcTan[1 + (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/
8)])/(16*Sqrt[2]*(-a)^(17/8)) - (9*c^(1/8)*ArcTan[(c^(1/8)*Sqrt[x
])/(-a)^(1/8)])/(16*(-a)^(17/8)) + (9*c^(1/8)*ArcTanh[(c^(1/8)*Sq
rt[x])/(-a)^(1/8)])/(16*(-a)^(17/8)) - (9*c^(1/8)*Log[(-a)^(1/4)
- Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(32*Sqrt[2]*(-
a)^(17/8)) + (9*c^(1/8)*Log[(-a)^(1/4) + Sqrt[2]*(-a)^(1/8)*c^(1/
8)*Sqrt[x] + c^(1/4)*x])/(32*Sqrt[2]*(-a)^(17/8))
```

Rubi in Sympy [A] time = 127.681, size = 303, normalized size = 0.95

$$-\frac{9\sqrt{2}\sqrt[8]{c}\log\left(-\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{64(-a)^{\frac{17}{8}}}+\frac{9\sqrt{2}\sqrt[8]{c}\log\left(\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{64(-a)^{\frac{17}{8}}} - \frac{9\sqrt[8]{c}\,\mathrm{atan}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{\frac{17}{8}}} - \frac{9\sqrt{2}\sqrt[8]{c}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}-1\right)}{32(-a)^{\frac{17}{8}}} - \frac{9\sqrt{2}\sqrt[8]{c}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{32(-a)^{\frac{17}{8}}} + \frac{9\sqrt[8]{c}\,\mathrm{atanh}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{16(-a)^{\frac{17}{8}}} + \frac{1}{4a\sqrt{x}(a+cx^4)} - \frac{9}{4a^2\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**(3/2)/(c*x**4+a)**2,x)
```

```
[Out] -9*sqrt(2)*c**(1/8)*log(-sqrt(2)*c**(1/8)*sqrt(x)*(-a)**(1/8) + c
**(1/4)*x + (-a)**(1/4))/(64*(-a)**(17/8)) + 9*sqrt(2)*c**(1/8)*l
og(sqrt(2)*c**(1/8)*sqrt(x)*(-a)**(1/8) + c**(1/4)*x + (-a)**(1/4
))/(64*(-a)**(17/8)) - 9*c**(1/8)*atan(c**(1/8)*sqrt(x)/(-a)**(1/
8))/(16*(-a)**(17/8)) - 9*sqrt(2)*c**(1/8)*atan(sqrt(2)*c**(1/8)*
sqrt(x)/(-a)**(1/8) - 1)/(32*(-a)**(17/8)) - 9*sqrt(2)*c**(1/8)*a
tan(sqrt(2)*c**(1/8)*sqrt(x)/(-a)**(1/8) + 1)/(32*(-a)**(17/8)) +
 9*c**(1/8)*atanh(c**(1/8)*sqrt(x)/(-a)**(1/8))/(16*(-a)**(17/8))
 + 1/(4*a*sqrt(x)*(a + c*x**4)) - 9/(4*a**2*sqrt(x))
```

Mathematica [A] time = 1.3212, size = 419, normalized size = 1.31

$$-\frac{8\sqrt[8]{a}cx^{7/2}}{a+cx^4} - 9\sqrt[8]{c}\sin\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)+9\sqrt[8]{c}\sin\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)-9\sqrt[8]{c}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^(3/2)*(a + c*x^4)^2),x]
```

```
[Out] ((-64*a^(1/8))/Sqrt[x] - (8*a^(1/8)*c*x^(7/2))/(a + c*x^4) - 18*c
^(1/8)*ArcTan[(c^(1/8)*Sqrt[x]*Sec[Pi/8])/a^(1/8) - Tan[Pi/8]]*Co
s[Pi/8] - 18*c^(1/8)*ArcTan[(c^(1/8)*Sqrt[x]*Sec[Pi/8])/a^(1/8) +
 Tan[Pi/8]]*Cos[Pi/8] - 9*c^(1/8)*Cos[Pi/8]*Log[a^(1/4) + c^(1/4)
*x - 2*a^(1/8)*c^(1/8)*Sqrt[x]*Cos[Pi/8]] + 9*c^(1/8)*Cos[Pi/8]*L
og[a^(1/4) + c^(1/4)*x + 2*a^(1/8)*c^(1/8)*Sqrt[x]*Cos[Pi/8]] + 1
8*c^(1/8)*ArcTan[Cot[Pi/8] - (c^(1/8)*Sqrt[x]*Csc[Pi/8])/a^(1/8)]
*Sin[Pi/8] - 18*c^(1/8)*ArcTan[Cot[Pi/8] + (c^(1/8)*Sqrt[x]*Csc[P
i/8])/a^(1/8)]*Sin[Pi/8] - 9*c^(1/8)*Log[a^(1/4) + c^(1/4)*x - 2*
a^(1/8)*c^(1/8)*Sqrt[x]*Sin[Pi/8]]*Sin[Pi/8] + 9*c^(1/8)*Log[a^(1
/4) + c^(1/4)*x + 2*a^(1/8)*c^(1/8)*Sqrt[x]*Sin[Pi/8]]*Sin[Pi/8])
/(32*a^(17/8))
```

Maple [C] time = 0.023, size = 56, normalized size = 0.2

$$-2\,\frac{1}{a^2\sqrt{x}} - \frac{c}{4\,a^2\,(cx^4+a)}x^{\frac{7}{2}} - \frac{9}{32\,a^2}\sum_{\_R=RootOf(\_Z^8c+a)}\frac{1}{\_R}\ln\left(\sqrt{x}-\_R\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^(3/2)/(c*x^4+a)^2,x)
```

```
[Out] -2/a^2/x^(1/2)-1/4/a^2*c*x^(7/2)/(c*x^4+a)-9/32/a^2*sum(1/_R*ln(x
^(1/2)-_R),_R=RootOf(_Z^8*c+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-9\,c\int \frac{x^{\frac{5}{2}}}{8\,(a^2cx^4+a^3)}\,dx - \frac{9\,cx^{\frac{7}{2}}+\frac{8\,a}{\sqrt{x}}}{4\,(a^2cx^4+a^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)^2*x^(3/2)),x, algorithm="maxima")
```

```
[Out] -9*c*integrate(1/8*x^(5/2)/(a^2*c*x^4 + a^3), x) - 1/4*(9*c*x^(7/
2) + 8*a/sqrt(x))/(a^2*c*x^4 + a^3)
```

Fricas [A] time = 0.279851, size = 755, normalized size = 2.36

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)^2*x^(3/2)),x, algorithm="fricas")
```

```
[Out] -1/64*sqrt(2)*(36*sqrt(2)*(a^2*c*x^4 + a^3)*sqrt(x)*(-c/a^17)^(1/
8)*arctan(4782969*a^15*(-c/a^17)^(7/8)/(4782969*c*sqrt(x) + sqrt(
-22876792454961*a^13*c*(-c/a^17)^(3/4) + 22876792454961*c^2*x)))
+ 9*sqrt(2)*(a^2*c*x^4 + a^3)*sqrt(x)*(-c/a^17)^(1/8)*log(4782969
*a^15*(-c/a^17)^(7/8) + 4782969*c*sqrt(x)) - 9*sqrt(2)*(a^2*c*x^4
 + a^3)*sqrt(x)*(-c/a^17)^(1/8)*log(-4782969*a^15*(-c/a^17)^(7/8)
 + 4782969*c*sqrt(x)) + 36*(a^2*c*x^4 + a^3)*sqrt(x)*(-c/a^17)^(1
/8)*arctan(-4782969*a^15*(-c/a^17)^(7/8)/(4782969*a^15*(-c/a^17)^
(7/8) - 4782969*sqrt(2)*c*sqrt(x) - sqrt(-45753584909922*sqrt(2)*
a^15*c*sqrt(x)*(-c/a^17)^(7/8) - 45753584909922*a^13*c*(-c/a^17)^
(3/4) + 45753584909922*c^2*x))) + 36*(a^2*c*x^4 + a^3)*sqrt(x)*(-
c/a^17)^(1/8)*arctan(a^15*(-c/a^17)^(7/8)/(a^15*(-c/a^17)^(7/8) +
 sqrt(2)*c*sqrt(x) + sqrt(2)*sqrt(sqrt(2)*a^15*c*sqrt(x)*(-c/a^17
)^(7/8) - a^13*c*(-c/a^17)^(3/4) + c^2*x))) + 9*(a^2*c*x^4 + a^3)
*sqrt(x)*(-c/a^17)^(1/8)*log(45753584909922*sqrt(2)*a^15*c*sqrt(x
)*(-c/a^17)^(7/8) - 45753584909922*a^13*c*(-c/a^17)^(3/4) + 45753
584909922*c^2*x) - 9*(a^2*c*x^4 + a^3)*sqrt(x)*(-c/a^17)^(1/8)*lo
g(-45753584909922*sqrt(2)*a^15*c*sqrt(x)*(-c/a^17)^(7/8) - 457535
84909922*a^13*c*(-c/a^17)^(3/4) + 45753584909922*c^2*x) + 8*sqrt(
2)*(9*c*x^4 + 8*a))/((a^2*c*x^4 + a^3)*sqrt(x))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**(3/2)/(c*x**4+a)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.323047, size = 639, normalized size = 2.

$$-\frac{9\,c\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\arctan\left(\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\,\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32\,a^{3}}-\frac{9\,c\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\arctan\left(-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\,\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32\,a^{3}}-\frac{9\,c\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\arctan\left(\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\,\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32\,a^{3}}-\frac{9\,c\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\arctan\left(-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\,\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{32\,a^{3}}+\frac{9\,c\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\ln\left(\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64\,a^{3}}-\frac{9\,c\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\ln\left(-\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64\,a^{3}}+\frac{9\,c\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\ln\left(\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64\,a^{3}}-\frac{9\,c\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\ln\left(-\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{64\,a^{3}}-\frac{9\,cx^{4}+8\,a}{4\left(cx^{\frac{9}{2}}+a\sqrt{x}\right)a^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)^2*x^(3/2)),x, algorithm="giac")
```

```
[Out] -9/32*c*sqrt(sqrt(2) + 2)*(a/c)^(7/8)*arctan((sqrt(-sqrt(2) + 2)*
(a/c)^(1/8) + 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/a^3 - 9
/32*c*sqrt(sqrt(2) + 2)*(a/c)^(7/8)*arctan(-(sqrt(-sqrt(2) + 2)*(
a/c)^(1/8) - 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/a^3 - 9/
32*c*sqrt(-sqrt(2) + 2)*(a/c)^(7/8)*arctan((sqrt(sqrt(2) + 2)*(a/
c)^(1/8) + 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/a^3 - 9/3
2*c*sqrt(-sqrt(2) + 2)*(a/c)^(7/8)*arctan(-(sqrt(sqrt(2) + 2)*(a/
c)^(1/8) - 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/a^3 + 9/6
4*c*sqrt(sqrt(2) + 2)*(a/c)^(7/8)*ln(sqrt(x)*sqrt(sqrt(2) + 2)*(a
/c)^(1/8) + x + (a/c)^(1/4))/a^3 - 9/64*c*sqrt(sqrt(2) + 2)*(a/c)
^(7/8)*ln(-sqrt(x)*sqrt(sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4
))/a^3 + 9/64*c*sqrt(-sqrt(2) + 2)*(a/c)^(7/8)*ln(sqrt(x)*sqrt(-s
qrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/a^3 - 9/64*c*sqrt(-sqr
t(2) + 2)*(a/c)^(7/8)*ln(-sqrt(x)*sqrt(-sqrt(2) + 2)*(a/c)^(1/8)
+ x + (a/c)^(1/4))/a^3 - 1/4*(9*c*x^4 + 8*a)/((c*x^(9/2) + a*sqrt
(x))*a^2)
```

3.753 $\int \frac{x^{15/2}}{(a+cx^4)^3}\,dx$

Optimal. Leaf size=329

$$\frac{9\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{7/8}c^{17/8}}-\frac{9\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{7/8}c^{17/8}}+\frac{9\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256\sqrt{2}(-a)^{7/8}c^{17/8}}-\frac{9\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{256\sqrt{2}(-a)^{7/8}c^{17/8}}-\frac{9\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{7/8}c^{17/8}}-\frac{9\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{7/8}c^{17/8}}-\frac{9\sqrt{x}}{64c^2\left(a+cx^4\right)}-\frac{x^{9/2}}{8c\left(a+cx^4\right)^2}$$

```
[Out] -x^(9/2)/(8*c*(a + c*x^4)^2) - (9*Sqrt[x])/(64*c^2*(a + c*x^4)) +
 (9*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*Sqrt[2
]*(-a)^(7/8)*c^(17/8)) - (9*ArcTan[1 + (Sqrt[2]*c^(1/8)*Sqrt[x])/
(-a)^(1/8)])/(256*Sqrt[2]*(-a)^(7/8)*c^(17/8)) - (9*ArcTan[(c^(1/
8)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(7/8)*c^(17/8)) - (9*ArcTanh[(
c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(7/8)*c^(17/8)) + (9*Log[
(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(51
2*Sqrt[2]*(-a)^(7/8)*c^(17/8)) - (9*Log[(-a)^(1/4) + Sqrt[2]*(-a)
^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(512*Sqrt[2]*(-a)^(7/8)*c^(1
7/8))
```

Rubi [A] time = 0.596897, antiderivative size = 329, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 12, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.8

$$\frac{9\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{7/8}c^{17/8}}-\frac{9\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{7/8}c^{17/8}}+\frac{9\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256\sqrt{2}(-a)^{7/8}c^{17/8}}-\frac{9\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{256\sqrt{2}(-a)^{7/8}c^{17/8}}-\frac{9\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{7/8}c^{17/8}}-\frac{9\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{7/8}c^{17/8}}-\frac{9\sqrt{x}}{64c^2\left(a+cx^4\right)}-\frac{x^{9/2}}{8c\left(a+cx^4\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(15/2)/(a + c*x^4)^3,x]
```

```
[Out] -x^(9/2)/(8*c*(a + c*x^4)^2) - (9*Sqrt[x])/(64*c^2*(a + c*x^4)) +
 (9*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*Sqrt[2
]*(-a)^(7/8)*c^(17/8)) - (9*ArcTan[1 + (Sqrt[2]*c^(1/8)*Sqrt[x])/
(-a)^(1/8)])/(256*Sqrt[2]*(-a)^(7/8)*c^(17/8)) - (9*ArcTan[(c^(1/
8)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(7/8)*c^(17/8)) - (9*ArcTanh[(
c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(7/8)*c^(17/8)) + (9*Log[
(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(51
2*Sqrt[2]*(-a)^(7/8)*c^(17/8)) - (9*Log[(-a)^(1/4) + Sqrt[2]*(-a)
^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(512*Sqrt[2]*(-a)^(7/8)*c^(1
7/8))
```

Rubi in Sympy [A] time = 127.005, size = 309, normalized size = 0.94

$$-\frac{x^{\frac{9}{2}}}{8c\left(a+cx^4\right)^2}-\frac{9\sqrt{x}}{64c^2\left(a+cx^4\right)}+\frac{9\sqrt{2}\log\left(-\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{1024c^{\frac{17}{8}}\left(-a\right)^{\frac{7}{8}}}-\frac{9\sqrt{2}\log\left(\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{1024c^{\frac{17}{8}}\left(-a\right)^{\frac{7}{8}}}-\frac{9\operatorname{atan}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256c^{\frac{17}{8}}\left(-a\right)^{\frac{7}{8}}}-\frac{9\sqrt{2}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}-1\right)}{512c^{\frac{17}{8}}\left(-a\right)^{\frac{7}{8}}}-\frac{9\sqrt{2}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{512c^{\frac{17}{8}}\left(-a\right)^{\frac{7}{8}}}-\frac{9\operatorname{atanh}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256c^{\frac{17}{8}}\left(-a\right)^{\frac{7}{8}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(15/2)/(c*x**4+a)**3,x)
```

```
[Out] -x**(9/2)/(8*c*(a + c*x**4)**2) - 9*sqrt(x)/(64*c**2*(a + c*x**4)
) + 9*sqrt(2)*log(-sqrt(2)*c**(1/8)*sqrt(x)*(-a)**(1/8) + c**(1/4
)*x + (-a)**(1/4))/(1024*c**(17/8)*(-a)**(7/8)) - 9*sqrt(2)*log(s
qrt(2)*c**(1/8)*sqrt(x)*(-a)**(1/8) + c**(1/4)*x + (-a)**(1/4))/(
1024*c**(17/8)*(-a)**(7/8)) - 9*atan(c**(1/8)*sqrt(x)/(-a)**(1/8)
)/(256*c**(17/8)*(-a)**(7/8)) - 9*sqrt(2)*atan(sqrt(2)*c**(1/8)*s
qrt(x)/(-a)**(1/8) - 1)/(512*c**(17/8)*(-a)**(7/8)) - 9*sqrt(2)*a
tan(sqrt(2)*c**(1/8)*sqrt(x)/(-a)**(1/8) + 1)/(512*c**(17/8)*(-a)
**(7/8)) - 9*atanh(c**(1/8)*sqrt(x)/(-a)**(1/8))/(256*c**(17/8)*(
-a)**(7/8))
```

Mathematica [A] time = 0.838436, size = 428, normalized size = 1.3

$$-\frac{9\sin\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{a^{7/8}}+\frac{9\sin\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{a^{7/8}}-\frac{9\cos\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\cos\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{a^{7/8}}+$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(15/2)/(a + c*x^4)^3,x]
```

```
[Out] ((64*a*c^(1/8)*Sqrt[x])/(a + c*x^4)^2 - (136*c^(1/8)*Sqrt[x])/(a
+ c*x^4) + (18*ArcTan[(c^(1/8)*Sqrt[x]*Sec[Pi/8])/a^(1/8) - Tan[P
i/8]]*Cos[Pi/8])/a^(7/8) + (18*ArcTan[(c^(1/8)*Sqrt[x]*Sec[Pi/8])
/a^(1/8) + Tan[Pi/8]]*Cos[Pi/8])/a^(7/8) - (9*Cos[Pi/8]*Log[a^(1/
4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[x]*Cos[Pi/8]])/a^(7/8) +
(9*Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x + 2*a^(1/8)*c^(1/8)*Sqrt[x]*
Cos[Pi/8]])/a^(7/8) - (18*ArcTan[Cot[Pi/8] - (c^(1/8)*Sqrt[x]*Csc
[Pi/8])/a^(1/8)]*Sin[Pi/8])/a^(7/8) + (18*ArcTan[Cot[Pi/8] + (c^(
1/8)*Sqrt[x]*Csc[Pi/8])/a^(1/8)]*Sin[Pi/8])/a^(7/8) - (9*Log[a^(1
/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[x]*Sin[Pi/8]]*Sin[Pi/8])
/a^(7/8) + (9*Log[a^(1/4) + c^(1/4)*x + 2*a^(1/8)*c^(1/8)*Sqrt[x]
*Sin[Pi/8]]*Sin[Pi/8])/a^(7/8))/(512*c^(17/8))
```

Maple [C] time = 0.028, size = 59, normalized size = 0.2

$$2\,\frac{1}{(cx^4+a)^2}\left(-\frac{9\,a\sqrt{x}}{128\,c^2}-\frac{17\,x^{9/2}}{128\,c}\right)+\frac{9}{512\,c^3}\sum_{\_R=RootOf(\_Z^8c+a)}\frac{1}{\_R^7}\ln\left(\sqrt{x}-\_R\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(15/2)/(c*x^4+a)^3,x)
```

```
[Out] 2*(-9/128*a/c^2*x^(1/2)-17/128/c*x^(9/2))/(c*x^4+a)^2+9/512/c^3*s
um(1/_R^7*ln(x^(1/2)-_R),_R=RootOf(_Z^8*c+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{9\,cx^{\frac{17}{2}}+ax^{\frac{9}{2}}}{64\,(ac^3x^8+2\,a^2c^2x^4+a^3c)}-9\int\frac{x^{\frac{7}{2}}}{128\,(ac^2x^4+a^2c)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(15/2)/(c*x^4 + a)^3,x, algorithm="maxima")
```

```
[Out] 1/64*(9*c*x^(17/2) + a*x^(9/2))/(a*c^3*x^8 + 2*a^2*c^2*x^4 + a^3*
c) - 9*integrate(1/128*x^(7/2)/(a*c^2*x^4 + a^2*c), x)
```

Fricas [A] time = 0.266906, size = 895, normalized size = 2.72

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(15/2)/(c*x^4 + a)^3,x, algorithm="fricas")
```

```
[Out] -1/1024*sqrt(2)*(36*sqrt(2)*(c^4*x^8 + 2*a*c^3*x^4 + a^2*c^2)*(-1
/(a^7*c^17))^(1/8)*arctan(a*c^2*(-1/(a^7*c^17))^(1/8)/(sqrt(a^2*c
^4*(-1/(a^7*c^17))^(1/4) + x) + sqrt(x))) - 9*sqrt(2)*(c^4*x^8 +
2*a*c^3*x^4 + a^2*c^2)*(-1/(a^7*c^17))^(1/8)*log(a*c^2*(-1/(a^7*c
^17))^(1/8) + sqrt(x)) + 9*sqrt(2)*(c^4*x^8 + 2*a*c^3*x^4 + a^2*c
^2)*(-1/(a^7*c^17))^(1/8)*log(-a*c^2*(-1/(a^7*c^17))^(1/8) + sqrt
(x)) + 36*(c^4*x^8 + 2*a*c^3*x^4 + a^2*c^2)*(-1/(a^7*c^17))^(1/8)
*arctan(a*c^2*(-1/(a^7*c^17))^(1/8)/(a*c^2*(-1/(a^7*c^17))^(1/8)
+ sqrt(2)*sqrt(x) + sqrt(2*a^2*c^4*(-1/(a^7*c^17))^(1/4) + 2*sqrt
(2)*a*c^2*sqrt(x)*(-1/(a^7*c^17))^(1/8) + 2*x))) + 36*(c^4*x^8 +
2*a*c^3*x^4 + a^2*c^2)*(-1/(a^7*c^17))^(1/8)*arctan(-a*c^2*(-1/(a
^7*c^17))^(1/8)/(a*c^2*(-1/(a^7*c^17))^(1/8) - sqrt(2)*sqrt(x) -
sqrt(2*a^2*c^4*(-1/(a^7*c^17))^(1/4) - 2*sqrt(2)*a*c^2*sqrt(x)*(-
1/(a^7*c^17))^(1/8) + 2*x))) - 9*(c^4*x^8 + 2*a*c^3*x^4 + a^2*c^2
)*(-1/(a^7*c^17))^(1/8)*log(2*a^2*c^4*(-1/(a^7*c^17))^(1/4) + 2*s
qrt(2)*a*c^2*sqrt(x)*(-1/(a^7*c^17))^(1/8) + 2*x) + 9*(c^4*x^8 +
2*a*c^3*x^4 + a^2*c^2)*(-1/(a^7*c^17))^(1/8)*log(2*a^2*c^4*(-1/(a
^7*c^17))^(1/4) - 2*sqrt(2)*a*c^2*sqrt(x)*(-1/(a^7*c^17))^(1/8) +
 2*x) + 8*sqrt(2)*(17*c*x^4 + 9*a)*sqrt(x))/(c^4*x^8 + 2*a*c^3*x^
4 + a^2*c^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(15/2)/(c*x**4+a)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.330876, size = 659, normalized size = 2.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(15/2)/(c*x^4 + a)^3,x, algorithm="giac")
```

```
[Out] 9/512*sqrt(sqrt(2) + 2)*(a/c)^(1/8)*arctan((sqrt(-sqrt(2) + 2)*(a
/c)^(1/8) + 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/(a*c^2) +
 9/512*sqrt(sqrt(2) + 2)*(a/c)^(1/8)*arctan(-(sqrt(-sqrt(2) + 2)*
(a/c)^(1/8) - 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/(a*c^2)
 + 9/512*sqrt(-sqrt(2) + 2)*(a/c)^(1/8)*arctan((sqrt(sqrt(2) + 2)
*(a/c)^(1/8) + 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/(a*c^
2) + 9/512*sqrt(-sqrt(2) + 2)*(a/c)^(1/8)*arctan(-(sqrt(sqrt(2) +
 2)*(a/c)^(1/8) - 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/(a
*c^2) + 9/1024*sqrt(sqrt(2) + 2)*(a/c)^(1/8)*ln(sqrt(x)*sqrt(sqrt
(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/(a*c^2) - 9/1024*sqrt(sqr
```

```
t(2) + 2)*(a/c)^(1/8)*ln(-sqrt(x)*sqrt(sqrt(2) + 2)*(a/c)^(1/8) +
 x + (a/c)^(1/4))/(a*c^2) + 9/1024*sqrt(-sqrt(2) + 2)*(a/c)^(1/8)
*ln(sqrt(x)*sqrt(-sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/(a*
c^2) - 9/1024*sqrt(-sqrt(2) + 2)*(a/c)^(1/8)*ln(-sqrt(x)*sqrt(-sq
rt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/(a*c^2) - 1/64*(17*c*x^
(9/2) + 9*a*sqrt(x))/((c*x^4 + a)^2*c^2)
```

3.754 $\int \frac{x^{13/2}}{(a+cx^4)^3}\,dx$

Optimal. Leaf size=332

$$-\frac{7\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{9/8}c^{15/8}}+\frac{7\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{9/8}c^{15/8}}+\frac{7\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256\sqrt{2}(-a)^{9/8}c^{15/8}}-\frac{7\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{256\sqrt{2}(-a)^{9/8}c^{15/8}}-\frac{7\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{9/8}c^{15/8}}+\frac{7\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{9/8}c^{15/8}}+\frac{7x^{7/2}}{64ac\left(a+cx^4\right)}-\frac{x^{7/2}}{8c\left(a+cx^4\right)^2}$$

```
[Out] -x^(7/2)/(8*c*(a + c*x^4)^2) + (7*x^(7/2))/(64*a*c*(a + c*x^4)) +
 (7*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*Sqrt[2
]*(-a)^(9/8)*c^(15/8)) - (7*ArcTan[1 + (Sqrt[2]*c^(1/8)*Sqrt[x])/
(-a)^(1/8)])/(256*Sqrt[2]*(-a)^(9/8)*c^(15/8)) - (7*ArcTan[(c^(1/
8)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(9/8)*c^(15/8)) + (7*ArcTanh[(
c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(9/8)*c^(15/8)) - (7*Log[
(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(51
2*Sqrt[2]*(-a)^(9/8)*c^(15/8)) + (7*Log[(-a)^(1/4) + Sqrt[2]*(-a)
^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(512*Sqrt[2]*(-a)^(9/8)*c^(1
5/8))
```

Rubi [A] time = 0.609615, antiderivative size = 332, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 13, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.867

$$-\frac{7\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{9/8}c^{15/8}}+\frac{7\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{9/8}c^{15/8}}+\frac{7\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256\sqrt{2}(-a)^{9/8}c^{15/8}}-\frac{7\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{256\sqrt{2}(-a)^{9/8}c^{15/8}}-\frac{7\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{9/8}c^{15/8}}+\frac{7\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{9/8}c^{15/8}}+\frac{7x^{7/2}}{64ac\left(a+cx^4\right)}-\frac{x^{7/2}}{8c\left(a+cx^4\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(13/2)/(a + c*x^4)^3,x]
```


```
[Out] -x^(7/2)/(8*c*(a + c*x^4)^2) + (7*x^(7/2))/(64*a*c*(a + c*x^4)) +
 (7*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*Sqrt[2
]*(-a)^(9/8)*c^(15/8)) - (7*ArcTan[1 + (Sqrt[2]*c^(1/8)*Sqrt[x])/
(-a)^(1/8)])/(256*Sqrt[2]*(-a)^(9/8)*c^(15/8)) - (7*ArcTan[(c^(1/
8)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(9/8)*c^(15/8)) + (7*ArcTanh[(
c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(9/8)*c^(15/8)) - (7*Log[
(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(51
2*Sqrt[2]*(-a)^(9/8)*c^(15/8)) + (7*Log[(-a)^(1/4) + Sqrt[2]*(-a)
^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(512*Sqrt[2]*(-a)^(9/8)*c^(1
5/8))
```

Rubi in Sympy [A] time = 124.404, size = 309, normalized size = 0.93

$$-\frac{x^{\frac{7}{2}}}{8c\left(a+cx^{4}\right)^{2}}-\frac{7\sqrt{2}\log\left(-\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{1024c^{\frac{15}{8}}\left(-a\right)^{\frac{9}{8}}}+\frac{7\sqrt{2}\log\left(\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{1024c^{\frac{15}{8}}\left(-a\right)^{\frac{9}{8}}}-\frac{7\operatorname{atan}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256c^{\frac{15}{8}}\left(-a\right)^{\frac{9}{8}}}-\frac{7\sqrt{2}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}-1\right)}{512c^{\frac{15}{8}}\left(-a\right)^{\frac{9}{8}}}-\frac{7\sqrt{2}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{512c^{\frac{15}{8}}\left(-a\right)^{\frac{9}{8}}}+\frac{7\operatorname{atanh}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256c^{\frac{15}{8}}\left(-a\right)^{\frac{9}{8}}}+\frac{7x^{\frac{7}{2}}}{64ac\left(a+cx^{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate(x**(13/2)/(c*x**4+a)**3,x)
```

```
[Out] -x**(7/2)/(8*c*(a + c*x**4)**2) - 7*sqrt(2)*log(-sqrt(2)*c**(1/8)
*sqrt(x)*(-a)**(1/8) + c**(1/4)*x + (-a)**(1/4))/(1024*c**(15/8)*
(-a)**(9/8)) + 7*sqrt(2)*log(sqrt(2)*c**(1/8)*sqrt(x)*(-a)**(1/8)
 + c**(1/4)*x + (-a)**(1/4))/(1024*c**(15/8)*(-a)**(9/8)) - 7*ata
n(c**(1/8)*sqrt(x)/(-a)**(1/8))/(256*c**(15/8)*(-a)**(9/8)) - 7*s
qrt(2)*atan(sqrt(2)*c**(1/8)*sqrt(x)/(-a)**(1/8) - 1)/(512*c**(15
/8)*(-a)**(9/8)) - 7*sqrt(2)*atan(sqrt(2)*c**(1/8)*sqrt(x)/(-a)**
(1/8) + 1)/(512*c**(15/8)*(-a)**(9/8)) + 7*atanh(c**(1/8)*sqrt(x)
/(-a)**(1/8))/(256*c**(15/8)*(-a)**(9/8)) + 7*x**(7/2)/(64*a*c*(a
 + c*x**4))
```

Mathematica [A] time = 0.978842, size = 430, normalized size = 1.3

$$\frac{7\sin\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{a^{9/8}}-\frac{7\sin\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{a^{9/8}}+\frac{7\cos\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\cos\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{a^{9/8}}-7\ldots$$

Antiderivative was successfully verified.

```
[In]   Integrate[x^(13/2)/(a + c*x^4)^3,x]
```

```
[Out] ((-64*c^(7/8)*x^(7/2))/(a + c*x^4)^2 + (56*c^(7/8)*x^(7/2))/(a^2
+ a*c*x^4) + (14*ArcTan[(c^(1/8)*Sqrt[x]*Sec[Pi/8])/a^(1/8) - Tan
[Pi/8]]*Cos[Pi/8])/a^(9/8) + (14*ArcTan[(c^(1/8)*Sqrt[x]*Sec[Pi/8
])/a^(1/8) + Tan[Pi/8]]*Cos[Pi/8])/a^(9/8) + (7*Cos[Pi/8]*Log[a^(
1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[x]*Cos[Pi/8]])/a^(9/8)
- (7*Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x + 2*a^(1/8)*c^(1/8)*Sqrt[x
]*Cos[Pi/8]])/a^(9/8) - (14*ArcTan[Cot[Pi/8] - (c^(1/8)*Sqrt[x]*C
sc[Pi/8])/a^(1/8)]*Sin[Pi/8])/a^(9/8) + (14*ArcTan[Cot[Pi/8] + (c
^(1/8)*Sqrt[x]*Csc[Pi/8])/a^(1/8)]*Sin[Pi/8])/a^(9/8) + (7*Log[a^
(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[x]*Sin[Pi/8]]*Sin[Pi/8
])/a^(9/8) - (7*Log[a^(1/4) + c^(1/4)*x + 2*a^(1/8)*c^(1/8)*Sqrt[
x]*Sin[Pi/8]]*Sin[Pi/8])/a^(9/8))/(512*c^(15/8))
```

Maple [C] time = 0.029, size = 61, normalized size = 0.2

$$2\,\frac{1}{\left(cx^{4}+a\right)^{2}}\left(-\frac{x^{7/2}}{128\,c}+\frac{7\,x^{15/2}}{128\,a}\right)+\frac{7}{512\,c^{2}a}\sum_{\_R=RootOf\left(\_Z^{8}c+a\right)}\frac{1}{\_R}\ln\left(\sqrt{x}-\_R\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^(13/2)/(c*x^4+a)^3,x)
```

```
[Out] 2*(-1/128/c*x^(7/2)+7/128/a*x^(15/2))/(c*x^4+a)^2+7/512/c^2/a*sum
(1/_R*ln(x^(1/2)-_R),_R=RootOf(_Z^8*c+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{7\,cx^{\frac{15}{2}} - ax^{\frac{7}{2}}}{64\,(ac^3x^8 + 2\,a^2c^2x^4 + a^3c)} + 7\int \frac{x^{\frac{5}{2}}}{128\,(ac^2x^4 + a^2c)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(13/2)/(c*x^4 + a)^3,x, algorithm="maxima")
```

```
[Out] 1/64*(7*c*x^(15/2) - a*x^(7/2))/(a*c^3*x^8 + 2*a^2*c^2*x^4 + a^3*
c) + 7*integrate(1/128*x^(5/2)/(a*c^2*x^4 + a^2*c), x)
```

Fricas [A] time = 0.271978, size = 941, normalized size = 2.83

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(13/2)/(c*x^4 + a)^3,x, algorithm="fricas")
```

```
[Out] 1/1024*sqrt(2)*(28*sqrt(2)*(a*c^3*x^8 + 2*a^2*c^2*x^4 + a^3*c)*(-
1/(a^9*c^15))^(1/8)*arctan(a^8*c^13*(-1/(a^9*c^15))^(7/8)/(sqrt(-
a^7*c^11*(-1/(a^9*c^15))^(3/4) + x) + sqrt(x))) + 7*sqrt(2)*(a*c^
3*x^8 + 2*a^2*c^2*x^4 + a^3*c)*(-1/(a^9*c^15))^(1/8)*log(a^8*c^13
*(-1/(a^9*c^15))^(7/8) + sqrt(x)) - 7*sqrt(2)*(a*c^3*x^8 + 2*a^2*
c^2*x^4 + a^3*c)*(-1/(a^9*c^15))^(1/8)*log(-a^8*c^13*(-1/(a^9*c^1
5))^(7/8) + sqrt(x)) + 28*(a*c^3*x^8 + 2*a^2*c^2*x^4 + a^3*c)*(-1
/(a^9*c^15))^(1/8)*arctan(a^8*c^13*(-1/(a^9*c^15))^(7/8)/(a^8*c^1
3*(-1/(a^9*c^15))^(7/8) + sqrt(2)*sqrt(x) + sqrt(2*sqrt(2)*a^8*c^
13*sqrt(x)*(-1/(a^9*c^15))^(7/8) - 2*a^7*c^11*(-1/(a^9*c^15))^(3/
4) + 2*x))) + 28*(a*c^3*x^8 + 2*a^2*c^2*x^4 + a^3*c)*(-1/(a^9*c^1
5))^(1/8)*arctan(-a^8*c^13*(-1/(a^9*c^15))^(7/8)/(a^8*c^13*(-1/(a
^9*c^15))^(7/8) - sqrt(2)*sqrt(x) - sqrt(-2*sqrt(2)*a^8*c^13*sqrt
(x)*(-1/(a^9*c^15))^(7/8) - 2*a^7*c^11*(-1/(a^9*c^15))^(3/4) + 2*
x))) + 7*(a*c^3*x^8 + 2*a^2*c^2*x^4 + a^3*c)*(-1/(a^9*c^15))^(1/8
)*log(2*sqrt(2)*a^8*c^13*sqrt(x)*(-1/(a^9*c^15))^(7/8) - 2*a^7*c^
11*(-1/(a^9*c^15))^(3/4) + 2*x) - 7*(a*c^3*x^8 + 2*a^2*c^2*x^4 +
a^3*c)*(-1/(a^9*c^15))^(1/8)*log(-2*sqrt(2)*a^8*c^13*sqrt(x)*(-1/
(a^9*c^15))^(7/8) - 2*a^7*c^11*(-1/(a^9*c^15))^(3/4) + 2*x) + 8*s
qrt(2)*(7*c*x^7 - a*x^3)*sqrt(x))/(a*c^3*x^8 + 2*a^2*c^2*x^4 + a^
3*c)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(13/2)/(c*x**4+a)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.353355, size = 663, normalized size = 2.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(13/2)/(c*x^4 + a)^3,x, algorithm="giac")
```

```
[Out] 7/512*sqrt(sqrt(2) + 2)*(a/c)^(7/8)*arctan((sqrt(-sqrt(2) + 2)*(a
/c)^(1/8) + 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/(a^2*c) +
 7/512*sqrt(sqrt(2) + 2)*(a/c)^(7/8)*arctan(-(sqrt(-sqrt(2) + 2)*
(a/c)^(1/8) - 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/(a^2*c)
 + 7/512*sqrt(-sqrt(2) + 2)*(a/c)^(7/8)*arctan((sqrt(sqrt(2) + 2)
*(a/c)^(1/8) + 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/(a^2*
c) + 7/512*sqrt(-sqrt(2) + 2)*(a/c)^(7/8)*arctan(-(sqrt(sqrt(2) +
 2)*(a/c)^(1/8) - 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/(a
^2*c) - 7/1024*sqrt(sqrt(2) + 2)*(a/c)^(7/8)*ln(sqrt(x)*sqrt(sqrt
(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/(a^2*c) + 7/1024*sqrt(sqr
t(2) + 2)*(a/c)^(7/8)*ln(-sqrt(x)*sqrt(sqrt(2) + 2)*(a/c)^(1/8) +
 x + (a/c)^(1/4))/(a^2*c) - 7/1024*sqrt(-sqrt(2) + 2)*(a/c)^(7/8)
*ln(sqrt(x)*sqrt(-sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/(a^
2*c) + 7/1024*sqrt(-sqrt(2) + 2)*(a/c)^(7/8)*ln(-sqrt(x)*sqrt(-sq
rt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/(a^2*c) + 1/64*(7*c*x^(
15/2) - a*x^(7/2))/((c*x^4 + a)^2*a*c)
```

3.755 $\int \frac{x^{11/2}}{(a+cx^4)^3}\,dx$

Optimal. Leaf size=332

$$\frac{15\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{11/8}c^{13/8}}-\frac{15\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{11/8}c^{13/8}}+\frac{15\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256\sqrt{2}(-a)^{11/8}c^{13/8}}-\frac{15\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{256\sqrt{2}(-a)^{11/8}c^{13/8}}+\frac{15\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{11/8}c^{13/8}}+\frac{15\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{11/8}c^{13/8}}+\frac{5x^{5/2}}{64ac\,(a+cx^4)}-\frac{x^{5/2}}{8c\,(a+cx^4)^2}$$

```
[Out] -x^(5/2)/(8*c*(a + c*x^4)^2) + (5*x^(5/2))/(64*a*c*(a + c*x^4)) +
 (15*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*Sqrt[
2]*(-a)^(11/8)*c^(13/8)) - (15*ArcTan[1 + (Sqrt[2]*c^(1/8)*Sqrt[x
])/(-a)^(1/8)])/(256*Sqrt[2]*(-a)^(11/8)*c^(13/8)) + (15*ArcTan[(
c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(11/8)*c^(13/8)) + (15*Ar
cTanh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(11/8)*c^(13/8)) +
 (15*Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4
)*x])/(512*Sqrt[2]*(-a)^(11/8)*c^(13/8)) - (15*Log[(-a)^(1/4) + S
qrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(512*Sqrt[2]*(-a)
^(11/8)*c^(13/8))
```

Rubi [A] time = 0.592031, antiderivative size = 332, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 13, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.867

$$\frac{15\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{11/8}c^{13/8}}-\frac{15\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{11/8}c^{13/8}}+\frac{15\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256\sqrt{2}(-a)^{11/8}c^{13/8}}-\frac{15\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{256\sqrt{2}(-a)^{11/8}c^{13/8}}+\frac{15\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{11/8}c^{13/8}}+\frac{15\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{11/8}c^{13/8}}+\frac{5x^{5/2}}{64ac\,(a+cx^4)}-\frac{x^{5/2}}{8c\,(a+cx^4)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(11/2)/(a + c*x^4)^3,x]
```


```
[Out] -x^(5/2)/(8*c*(a + c*x^4)^2) + (5*x^(5/2))/(64*a*c*(a + c*x^4)) +
 (15*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*Sqrt[
2]*(-a)^(11/8)*c^(13/8)) - (15*ArcTan[1 + (Sqrt[2]*c^(1/8)*Sqrt[x
])/(-a)^(1/8)])/(256*Sqrt[2]*(-a)^(11/8)*c^(13/8)) + (15*ArcTan[(
c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(11/8)*c^(13/8)) + (15*Ar
cTanh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(11/8)*c^(13/8)) +
 (15*Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4
)*x])/(512*Sqrt[2]*(-a)^(11/8)*c^(13/8)) - (15*Log[(-a)^(1/4) + S
qrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(512*Sqrt[2]*(-a)
^(11/8)*c^(13/8))
```

Rubi in Sympy [A] time = 124.944, size = 309, normalized size = 0.93

$$-\frac{x^{\frac{5}{2}}}{8c\left(a+cx^{4}\right)^{2}}+\frac{15\sqrt{2}\log\left(-\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{1024c^{\frac{13}{8}}\left(-a\right)^{\frac{11}{8}}}-\frac{15\sqrt{2}\log\left(\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{1024c^{\frac{13}{8}}\left(-a\right)^{\frac{11}{8}}}+\frac{15\operatorname{atan}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256c^{\frac{13}{8}}\left(-a\right)^{\frac{11}{8}}}-\frac{15\sqrt{2}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}-1\right)}{512c^{\frac{13}{8}}\left(-a\right)^{\frac{11}{8}}}-\frac{15\sqrt{2}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{512c^{\frac{13}{8}}\left(-a\right)^{\frac{11}{8}}}+\frac{15\operatorname{atanh}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256c^{\frac{13}{8}}\left(-a\right)^{\frac{11}{8}}}+\frac{5x^{\frac{5}{2}}}{64ac\left(a+cx^{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(11/2)/(c*x**4+a)**3,x)
```

```
[Out] -x**(5/2)/(8*c*(a + c*x**4)**2) + 15*sqrt(2)*log(-sqrt(2)*c**(1/8
)*sqrt(x)*(-a)**(1/8) + c**(1/4)*x + (-a)**(1/4))/(1024*c**(13/8)
*(-a)**(11/8)) - 15*sqrt(2)*log(sqrt(2)*c**(1/8)*sqrt(x)*(-a)**(1
/8) + c**(1/4)*x + (-a)**(1/4))/(1024*c**(13/8)*(-a)**(11/8)) + 1
5*atan(c**(1/8)*sqrt(x)/(-a)**(1/8))/(256*c**(13/8)*(-a)**(11/8))
 - 15*sqrt(2)*atan(sqrt(2)*c**(1/8)*sqrt(x)/(-a)**(1/8) - 1)/(512
*c**(13/8)*(-a)**(11/8)) - 15*sqrt(2)*atan(sqrt(2)*c**(1/8)*sqrt(
x)/(-a)**(1/8) + 1)/(512*c**(13/8)*(-a)**(11/8)) + 15*atanh(c**(1
/8)*sqrt(x)/(-a)**(1/8))/(256*c**(13/8)*(-a)**(11/8)) + 5*x**(5/2
)/(64*a*c*(a + c*x**4))
```

Mathematica [A] time = 0.972584, size = 430, normalized size = 1.3

$$-\frac{15\cos\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{a^{11/8}}+\frac{15\cos\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{a^{11/8}}+\frac{15\sin\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\cos\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{a^{11/8}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(11/2)/(a + c*x^4)^3,x]
```

```
[Out] ((-64*c^(5/8)*x^(5/2))/(a + c*x^4)^2 + (40*c^(5/8)*x^(5/2))/(a^2
+ a*c*x^4) - (30*ArcTan[Cot[Pi/8] - (c^(1/8)*Sqrt[x]*Csc[Pi/8])/a
^(1/8)]*Cos[Pi/8])/a^(11/8) + (30*ArcTan[Cot[Pi/8] + (c^(1/8)*Sqr
t[x]*Csc[Pi/8])/a^(1/8)]*Cos[Pi/8])/a^(11/8) - (15*Cos[Pi/8]*Log[
a^(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[x]*Sin[Pi/8]])/a^(11
/8) + (15*Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x + 2*a^(1/8)*c^(1/8)*S
qrt[x]*Sin[Pi/8]])/a^(11/8) - (30*ArcTan[(c^(1/8)*Sqrt[x]*Sec[Pi/
8])/a^(1/8) - Tan[Pi/8]]*Sin[Pi/8])/a^(11/8) - (30*ArcTan[(c^(1/8
)*Sqrt[x]*Sec[Pi/8])/a^(1/8) + Tan[Pi/8]]*Sin[Pi/8])/a^(11/8) + (
15*Log[a^(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[x]*Cos[Pi/8]]
*Sin[Pi/8])/a^(11/8) - (15*Log[a^(1/4) + c^(1/4)*x + 2*a^(1/8)*c^
(1/8)*Sqrt[x]*Cos[Pi/8]]*Sin[Pi/8])/a^(11/8))/(512*c^(13/8))
```

Maple [C] time = 0.027, size = 61, normalized size = 0.2

$$2\,\frac{1}{\left(cx^{4}+a\right)^{2}}\left(-\frac{3\,x^{5/2}}{128\,c}+\frac{5\,x^{13/2}}{128\,a}\right)+\frac{15}{512\,c^{2}a}\sum_{\_R=RootOf\left(\_Z^{8}c+a\right)}\frac{1}{\_R^{3}}\ln\left(\sqrt{x}-\_R\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(11/2)/(c*x^4+a)^3,x)
```

```
[Out] 2*(-3/128/c*x^(5/2)+5/128/a*x^(13/2))/(c*x^4+a)^2+15/512/c^2/a*su
m(1/_R^3*ln(x^(1/2)-_R),_R=RootOf(_Z^8*c+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{5\,cx^{\frac{13}{2}} - 3\,ax^{\frac{5}{2}}}{64\,(ac^3x^8 + 2\,a^2c^2x^4 + a^3c)} + 15\int \frac{x^{\frac{3}{2}}}{128\,(ac^2x^4 + a^2c)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(11/2)/(c*x^4 + a)^3,x, algorithm="maxima")
```

```
[Out] 1/64*(5*c*x^(13/2) - 3*a*x^(5/2))/(a*c^3*x^8 + 2*a^2*c^2*x^4 + a^
3*c) + 15*integrate(1/128*x^(3/2)/(a*c^2*x^4 + a^2*c), x)
```

Fricas [A] time = 0.268926, size = 941, normalized size = 2.83

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(11/2)/(c*x^4 + a)^3,x, algorithm="fricas")
```

```
[Out] 1/1024*sqrt(2)*(60*sqrt(2)*(a*c^3*x^8 + 2*a^2*c^2*x^4 + a^3*c)*(-
1/(a^11*c^13))^(1/8)*arctan(a^7*c^8*(-1/(a^11*c^13))^(5/8)/(sqrt(
-a^3*c^3*(-1/(a^11*c^13))^(1/4) + x) + sqrt(x))) - 15*sqrt(2)*(a*
c^3*x^8 + 2*a^2*c^2*x^4 + a^3*c)*(-1/(a^11*c^13))^(1/8)*log(a^7*c
^8*(-1/(a^11*c^13))^(5/8) + sqrt(x)) + 15*sqrt(2)*(a*c^3*x^8 + 2*
a^2*c^2*x^4 + a^3*c)*(-1/(a^11*c^13))^(1/8)*log(-a^7*c^8*(-1/(a^1
1*c^13))^(5/8) + sqrt(x)) - 60*(a*c^3*x^8 + 2*a^2*c^2*x^4 + a^3*c
)*(-1/(a^11*c^13))^(1/8)*arctan(a^7*c^8*(-1/(a^11*c^13))^(5/8)/(a
^7*c^8*(-1/(a^11*c^13))^(5/8) + sqrt(2)*sqrt(x) + sqrt(2*sqrt(2)*
a^7*c^8*sqrt(x)*(-1/(a^11*c^13))^(5/8) - 2*a^3*c^3*(-1/(a^11*c^13
))^(1/4) + 2*x))) - 60*(a*c^3*x^8 + 2*a^2*c^2*x^4 + a^3*c)*(-1/(a
^11*c^13))^(1/8)*arctan(-a^7*c^8*(-1/(a^11*c^13))^(5/8)/(a^7*c^8*
(-1/(a^11*c^13))^(5/8) - sqrt(2)*sqrt(x) - sqrt(-2*sqrt(2)*a^7*c^
8*sqrt(x)*(-1/(a^11*c^13))^(5/8) - 2*a^3*c^3*(-1/(a^11*c^13))^(1/
4) + 2*x))) + 15*(a*c^3*x^8 + 2*a^2*c^2*x^4 + a^3*c)*(-1/(a^11*c^
13))^(1/8)*log(2*sqrt(2)*a^7*c^8*sqrt(x)*(-1/(a^11*c^13))^(5/8) -
 2*a^3*c^3*(-1/(a^11*c^13))^(1/4) + 2*x) - 15*(a*c^3*x^8 + 2*a^2*
c^2*x^4 + a^3*c)*(-1/(a^11*c^13))^(1/8)*log(-2*sqrt(2)*a^7*c^8*sq
rt(x)*(-1/(a^11*c^13))^(5/8) - 2*a^3*c^3*(-1/(a^11*c^13))^(1/4) +
 2*x) + 8*sqrt(2)*(5*c*x^6 - 3*a*x^2)*sqrt(x))/(a*c^3*x^8 + 2*a^2
*c^2*x^4 + a^3*c)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**(11/2)/(c*x**4+a)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.356975, size = 663, normalized size = 2.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(11/2)/(c*x^4 + a)^3,x, algorithm="giac")
```

```
[Out] -15/512*sqrt(-sqrt(2) + 2)*(a/c)^(5/8)*arctan((sqrt(-sqrt(2) + 2)
*(a/c)^(1/8) + 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/(a^2*c
) - 15/512*sqrt(-sqrt(2) + 2)*(a/c)^(5/8)*arctan(-(sqrt(-sqrt(2)
+ 2)*(a/c)^(1/8) - 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/(a
^2*c) + 15/512*sqrt(sqrt(2) + 2)*(a/c)^(5/8)*arctan((sqrt(sqrt(2)
 + 2)*(a/c)^(1/8) + 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/
(a^2*c) + 15/512*sqrt(sqrt(2) + 2)*(a/c)^(5/8)*arctan(-(sqrt(sqrt
(2) + 2)*(a/c)^(1/8) - 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)
))/(a^2*c) - 15/1024*sqrt(-sqrt(2) + 2)*(a/c)^(5/8)*ln(sqrt(x)*sq
rt(sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/(a^2*c) + 15/1024*
sqrt(-sqrt(2) + 2)*(a/c)^(5/8)*ln(-sqrt(x)*sqrt(sqrt(2) + 2)*(a/c
)^(1/8) + x + (a/c)^(1/4))/(a^2*c) + 15/1024*sqrt(sqrt(2) + 2)*(a
/c)^(5/8)*ln(sqrt(x)*sqrt(-sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(
1/4))/(a^2*c) - 15/1024*sqrt(sqrt(2) + 2)*(a/c)^(5/8)*ln(-sqrt(x)
*sqrt(-sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/(a^2*c) + 1/64
*(5*c*x^(13/2) - 3*a*x^(5/2))/((c*x^4 + a)^2*a^2*c)
```

3.756 $\int \frac{x^{9/2}}{(a+cx^4)^3}\,dx$

Optimal. Leaf size=332

$$\frac{15\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{13/8}c^{11/8}}-\frac{15\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{13/8}c^{11/8}}-\frac{15\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256\sqrt{2}(-a)^{13/8}c^{11/8}}+\frac{15\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{256\sqrt{2}(-a)^{13/8}c^{11/8}}-\frac{15\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{13/8}c^{11/8}}+\frac{15\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{13/8}c^{11/8}}+\frac{3x^{3/2}}{64ac\,(a+cx^4)}-\frac{x^{3/2}}{8c\,(a+cx^4)^2}$$

```
[Out] -x^(3/2)/(8*c*(a + c*x^4)^2) + (3*x^(3/2))/(64*a*c*(a + c*x^4)) -
 (15*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*Sqrt[
2]*(-a)^(13/8)*c^(11/8)) + (15*ArcTan[1 + (Sqrt[2]*c^(1/8)*Sqrt[x
])/(-a)^(1/8)])/(256*Sqrt[2]*(-a)^(13/8)*c^(11/8)) - (15*ArcTan[(
c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(13/8)*c^(11/8)) + (15*Ar
cTanh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(13/8)*c^(11/8)) +
 (15*Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4
)*x])/(512*Sqrt[2]*(-a)^(13/8)*c^(11/8)) - (15*Log[(-a)^(1/4) + S
qrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(512*Sqrt[2]*(-a)
^(13/8)*c^(11/8))
```

Rubi [A] time = 0.611523, antiderivative size = 332, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 13, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.867

$$\frac{15\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{13/8}c^{11/8}}-\frac{15\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{13/8}c^{11/8}}-\frac{15\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256\sqrt{2}(-a)^{13/8}c^{11/8}}+\frac{15\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{256\sqrt{2}(-a)^{13/8}c^{11/8}}-\frac{15\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{13/8}c^{11/8}}+\frac{15\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{13/8}c^{11/8}}+\frac{3x^{3/2}}{64ac\,(a+cx^4)}-\frac{x^{3/2}}{8c\,(a+cx^4)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(9/2)/(a + c*x^4)^3,x]
```

```
[Out] -x^(3/2)/(8*c*(a + c*x^4)^2) + (3*x^(3/2))/(64*a*c*(a + c*x^4)) -
 (15*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*Sqrt[
2]*(-a)^(13/8)*c^(11/8)) + (15*ArcTan[1 + (Sqrt[2]*c^(1/8)*Sqrt[x
])/(-a)^(1/8)])/(256*Sqrt[2]*(-a)^(13/8)*c^(11/8)) - (15*ArcTan[(
c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(13/8)*c^(11/8)) + (15*Ar
cTanh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(13/8)*c^(11/8)) +
 (15*Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4
)*x])/(512*Sqrt[2]*(-a)^(13/8)*c^(11/8)) - (15*Log[(-a)^(1/4) + S
qrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(512*Sqrt[2]*(-a)
^(13/8)*c^(11/8))
```

Rubi in Sympy [A] time = 132.536, size = 309, normalized size = 0.93

$$-\frac{x^{\frac{3}{2}}}{8c(a+cx^4)^2}+\frac{15\sqrt{2}\log\left(-\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{1024c^{\frac{11}{8}}(-a)^{\frac{13}{8}}}-\frac{15\sqrt{2}\log\left(\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{1024c^{\frac{11}{8}}(-a)^{\frac{13}{8}}}-\frac{15\,\mathrm{atan}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256c^{\frac{11}{8}}(-a)^{\frac{13}{8}}}+\frac{15\sqrt{2}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}-1\right)}{512c^{\frac{11}{8}}(-a)^{\frac{13}{8}}}+\frac{15\sqrt{2}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{512c^{\frac{11}{8}}(-a)^{\frac{13}{8}}}+\frac{15\,\mathrm{atanh}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256c^{\frac{11}{8}}(-a)^{\frac{13}{8}}}+\frac{3x^{\frac{3}{2}}}{64ac(a+cx^4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(9/2)/(c*x**4+a)**3,x)
```

```
[Out] -x**(3/2)/(8*c*(a + c*x**4)**2) + 15*sqrt(2)*log(-sqrt(2)*c**(1/8
)*sqrt(x)*(-a)**(1/8) + c**(1/4)*x + (-a)**(1/4))/(1024*c**(11/8)
*(-a)**(13/8)) - 15*sqrt(2)*log(sqrt(2)*c**(1/8)*sqrt(x)*(-a)**(1
/8) + c**(1/4)*x + (-a)**(1/4))/(1024*c**(11/8)*(-a)**(13/8)) - 1
5*atan(c**(1/8)*sqrt(x)/(-a)**(1/8))/(256*c**(11/8)*(-a)**(13/8))
 + 15*sqrt(2)*atan(sqrt(2)*c**(1/8)*sqrt(x)/(-a)**(1/8) - 1)/(512
*c**(11/8)*(-a)**(13/8)) + 15*sqrt(2)*atan(sqrt(2)*c**(1/8)*sqrt(
x)/(-a)**(1/8) + 1)/(512*c**(11/8)*(-a)**(13/8)) + 15*atanh(c**(1
/8)*sqrt(x)/(-a)**(1/8))/(256*c**(11/8)*(-a)**(13/8)) + 3*x**(3/2
)/(64*a*c*(a + c*x**4))
```

Mathematica [A] time = 1.12073, size = 430, normalized size = 1.3

$$\frac{\frac{15\cos\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{a^{13/8}}-\frac{15\cos\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{a^{13/8}}-\frac{15\sin\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\cos\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{a^{13/8}}-}{}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(9/2)/(a + c*x^4)^3,x]
```

```
[Out] ((-64*c^(3/8)*x^(3/2))/(a + c*x^4)^2 + (24*c^(3/8)*x^(3/2))/(a^2
+ a*c*x^4) - (30*ArcTan[Cot[Pi/8] - (c^(1/8)*Sqrt[x]*Csc[Pi/8])/a
^(1/8)]*Cos[Pi/8])/a^(13/8) + (30*ArcTan[Cot[Pi/8] + (c^(1/8)*Sqr
t[x]*Csc[Pi/8])/a^(1/8)]*Cos[Pi/8])/a^(13/8) + (15*Cos[Pi/8]*Log[
a^(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[x]*Sin[Pi/8]])/a^(13
/8) - (15*Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x + 2*a^(1/8)*c^(1/8)*S
qrt[x]*Sin[Pi/8]])/a^(13/8) - (30*ArcTan[(c^(1/8)*Sqrt[x]*Sec[Pi/
8])/a^(1/8) - Tan[Pi/8]]*Sin[Pi/8])/a^(13/8) - (30*ArcTan[(c^(1/8
)*Sqrt[x]*Sec[Pi/8])/a^(1/8) + Tan[Pi/8]]*Sin[Pi/8])/a^(13/8) - (
15*Log[a^(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[x]*Cos[Pi/8]]
*Sin[Pi/8])/a^(13/8) + (15*Log[a^(1/4) + c^(1/4)*x + 2*a^(1/8)*c^
(1/8)*Sqrt[x]*Cos[Pi/8]]*Sin[Pi/8])/a^(13/8))/(512*c^(11/8))
```

Maple [C] time = 0.028, size = 61, normalized size = 0.2

$$2\,\frac{1}{(cx^4+a)^2}\left(-\frac{5\,x^{3/2}}{128\,c}+\frac{3\,x^{11/2}}{128\,a}\right)+\frac{15}{512\,c^2a}\sum_{\_R=RootOf(\_Z^8c+a)}\frac{1}{\_R^5}\ln\left(\sqrt{x}-\_R\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(9/2)/(c*x^4+a)^3,x)
```

```
[Out] 2*(-5/128*x^(3/2)/c+3/128/a*x^(11/2))/(c*x^4+a)^2+15/512/c^2/a*su
m(1/_R^5*ln(x^(1/2)-_R),_R=RootOf(_Z^8*c+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{3\,cx^{\frac{11}{2}} - 5\,ax^{\frac{3}{2}}}{64\,(ac^3x^8 + 2\,a^2c^2x^4 + a^3c)} + 15\int \frac{\sqrt{x}}{128\,(ac^2x^4 + a^2c)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(9/2)/(c*x^4 + a)^3,x, algorithm="maxima")
```

```
[Out] 1/64*(3*c*x^(11/2) - 5*a*x^(3/2))/(a*c^3*x^8 + 2*a^2*c^2*x^4 + a^
3*c) + 15*integrate(1/128*sqrt(x)/(a*c^2*x^4 + a^2*c), x)
```

Fricas [A] time = 0.264346, size = 937, normalized size = 2.82

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(9/2)/(c*x^4 + a)^3,x, algorithm="fricas")
```

```
[Out] -1/1024*sqrt(2)*(60*sqrt(2)*(a*c^3*x^8 + 2*a^2*c^2*x^4 + a^3*c)*(
-1/(a^13*c^11))^(1/8)*arctan(a^5*c^4*(-1/(a^13*c^11))^(3/8)/(sqrt
(a^10*c^8*(-1/(a^13*c^11))^(3/4) + x) + sqrt(x))) + 15*sqrt(2)*(a
*c^3*x^8 + 2*a^2*c^2*x^4 + a^3*c)*(-1/(a^13*c^11))^(1/8)*log(a^5*
c^4*(-1/(a^13*c^11))^(3/8) + sqrt(x)) - 15*sqrt(2)*(a*c^3*x^8 + 2
*a^2*c^2*x^4 + a^3*c)*(-1/(a^13*c^11))^(1/8)*log(-a^5*c^4*(-1/(a^
13*c^11))^(3/8) + sqrt(x)) - 60*(a*c^3*x^8 + 2*a^2*c^2*x^4 + a^3*
c)*(-1/(a^13*c^11))^(1/8)*arctan(a^5*c^4*(-1/(a^13*c^11))^(3/8)/(
a^5*c^4*(-1/(a^13*c^11))^(3/8) + sqrt(2)*sqrt(x) + sqrt(2*a^10*c^
8*(-1/(a^13*c^11))^(3/4) + 2*sqrt(2)*a^5*c^4*sqrt(x)*(-1/(a^13*c^
11))^(3/8) + 2*x))) - 60*(a*c^3*x^8 + 2*a^2*c^2*x^4 + a^3*c)*(-1/
(a^13*c^11))^(1/8)*arctan(-a^5*c^4*(-1/(a^13*c^11))^(3/8)/(a^5*c^
4*(-1/(a^13*c^11))^(3/8) - sqrt(2)*sqrt(x) - sqrt(2*a^10*c^8*(-1/
(a^13*c^11))^(3/4) - 2*sqrt(2)*a^5*c^4*sqrt(x)*(-1/(a^13*c^11))^(
3/8) + 2*x))) - 15*(a*c^3*x^8 + 2*a^2*c^2*x^4 + a^3*c)*(-1/(a^13*
c^11))^(1/8)*log(2*a^10*c^8*(-1/(a^13*c^11))^(3/4) + 2*sqrt(2)*a^
5*c^4*sqrt(x)*(-1/(a^13*c^11))^(3/8) + 2*x) + 15*(a*c^3*x^8 + 2*a
^2*c^2*x^4 + a^3*c)*(-1/(a^13*c^11))^(1/8)*log(2*a^10*c^8*(-1/(a^
13*c^11))^(3/4) - 2*sqrt(2)*a^5*c^4*sqrt(x)*(-1/(a^13*c^11))^(3/8
) + 2*x) - 8*sqrt(2)*(3*c*x^5 - 5*a*x)*sqrt(x))/(a*c^3*x^8 + 2*a^
2*c^2*x^4 + a^3*c)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(9/2)/(c*x**4+a)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.354538, size = 663, normalized size = 2.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(9/2)/(c*x^4 + a)^3,x, algorithm="giac")
```

```
[Out] -15/512*sqrt(-sqrt(2) + 2)*(a/c)^(3/8)*arctan((sqrt(-sqrt(2) + 2)
*(a/c)^(1/8) + 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/(a^2*c
) - 15/512*sqrt(-sqrt(2) + 2)*(a/c)^(3/8)*arctan(-(sqrt(-sqrt(2)
+ 2)*(a/c)^(1/8) - 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/(a
^2*c) + 15/512*sqrt(sqrt(2) + 2)*(a/c)^(3/8)*arctan((sqrt(sqrt(2)
 + 2)*(a/c)^(1/8) + 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/
(a^2*c) + 15/512*sqrt(sqrt(2) + 2)*(a/c)^(3/8)*arctan(-(sqrt(sqrt
(2) + 2)*(a/c)^(1/8) - 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)
))/(a^2*c) + 15/1024*sqrt(-sqrt(2) + 2)*(a/c)^(3/8)*ln(sqrt(x)*sq
rt(sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/(a^2*c) - 15/1024*
sqrt(-sqrt(2) + 2)*(a/c)^(3/8)*ln(-sqrt(x)*sqrt(sqrt(2) + 2)*(a/c
)^(1/8) + x + (a/c)^(1/4))/(a^2*c) - 15/1024*sqrt(sqrt(2) + 2)*(a
/c)^(3/8)*ln(sqrt(x)*sqrt(-sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(
1/4))/(a^2*c) + 15/1024*sqrt(sqrt(2) + 2)*(a/c)^(3/8)*ln(-sqrt(x)
*sqrt(-sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/(a^2*c) + 1/64
*(3*c*x^(11/2) - 5*a*x^(3/2))/((c*x^4 + a)^2*a*c)
```

3.757 $\int \frac{x^{7/2}}{(a+cx^4)^3}\,dx$

Optimal. Leaf size=332

$$-\frac{7\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{15/8}c^{9/8}}+\frac{7\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{15/8}c^{9/8}}-\frac{7\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256\sqrt{2}(-a)^{15/8}c^{9/8}}+\frac{7\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{256\sqrt{2}(-a)^{15/8}c^{9/8}}+\frac{7\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{15/8}c^{9/8}}+\frac{7\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{15/8}c^{9/8}}+\frac{\sqrt{x}}{64ac\left(a+cx^4\right)}-\frac{\sqrt{x}}{8c\left(a+cx^4\right)^2}$$

```
[Out] -Sqrt[x]/(8*c*(a + c*x^4)^2) + Sqrt[x]/(64*a*c*(a + c*x^4)) - (7*
ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*Sqrt[2]*(-
a)^(15/8)*c^(9/8)) + (7*ArcTan[1 + (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)
^(1/8)])/(256*Sqrt[2]*(-a)^(15/8)*c^(9/8)) + (7*ArcTan[(c^(1/8)*S
qrt[x])/(-a)^(1/8)])/(256*(-a)^(15/8)*c^(9/8)) + (7*ArcTanh[(c^(1
/8)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(15/8)*c^(9/8)) - (7*Log[(-a)
^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(512*Sq
rt[2]*(-a)^(15/8)*c^(9/8)) + (7*Log[(-a)^(1/4) + Sqrt[2]*(-a)^(1/
8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(512*Sqrt[2]*(-a)^(15/8)*c^(9/8)
)
```

Rubi [A] time = 0.612799, antiderivative size = 332, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 13, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.867

$$-\frac{7\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{15/8}c^{9/8}}+\frac{7\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{15/8}c^{9/8}}-\frac{7\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256\sqrt{2}(-a)^{15/8}c^{9/8}}+\frac{7\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{256\sqrt{2}(-a)^{15/8}c^{9/8}}+\frac{7\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{15/8}c^{9/8}}+\frac{7\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{15/8}c^{9/8}}+\frac{\sqrt{x}}{64ac\left(a+cx^4\right)}-\frac{\sqrt{x}}{8c\left(a+cx^4\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(7/2)/(a + c*x^4)^3,x]
```



```
[Out] -Sqrt[x]/(8*c*(a + c*x^4)^2) + Sqrt[x]/(64*a*c*(a + c*x^4)) - (7*
ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*Sqrt[2]*(-
a)^(15/8)*c^(9/8)) + (7*ArcTan[1 + (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)
^(1/8)])/(256*Sqrt[2]*(-a)^(15/8)*c^(9/8)) + (7*ArcTan[(c^(1/8)*S
qrt[x])/(-a)^(1/8)])/(256*(-a)^(15/8)*c^(9/8)) + (7*ArcTanh[(c^(1
/8)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(15/8)*c^(9/8)) - (7*Log[(-a)
^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(512*Sq
rt[2]*(-a)^(15/8)*c^(9/8)) + (7*Log[(-a)^(1/4) + Sqrt[2]*(-a)^(1/
8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(512*Sqrt[2]*(-a)^(15/8)*c^(9/8)
)
```

Rubi in Sympy [A] time = 130.399, size = 308, normalized size = 0.93

$$-\frac{\sqrt{x}}{8c(a+cx^4)^2}-\frac{7\sqrt{2}\log\left(-\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{1024c^{\frac{9}{8}}(-a)^{\frac{15}{8}}}+\frac{7\sqrt{2}\log\left(\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{1024c^{\frac{9}{8}}(-a)^{\frac{15}{8}}}+\frac{7\,\mathrm{atan}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256c^{\frac{9}{8}}(-a)^{\frac{15}{8}}}+\frac{7\sqrt{2}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}-1\right)}{512c^{\frac{9}{8}}(-a)^{\frac{15}{8}}}+\frac{7\sqrt{2}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{512c^{\frac{9}{8}}(-a)^{\frac{15}{8}}}+\frac{7\,\mathrm{atanh}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256c^{\frac{9}{8}}(-a)^{\frac{15}{8}}}+\frac{\sqrt{x}}{64ac(a+cx^4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(7/2)/(c*x**4+a)**3,x)
```

```
[Out] -sqrt(x)/(8*c*(a + c*x**4)**2) - 7*sqrt(2)*log(-sqrt(2)*c**(1/8)*
sqrt(x)*(-a)**(1/8) + c**(1/4)*x + (-a)**(1/4))/(1024*c**(9/8)*(-
a)**(15/8)) + 7*sqrt(2)*log(sqrt(2)*c**(1/8)*sqrt(x)*(-a)**(1/8)
+ c**(1/4)*x + (-a)**(1/4))/(1024*c**(9/8)*(-a)**(15/8)) + 7*atan
(c**(1/8)*sqrt(x)/(-a)**(1/8))/(256*c**(9/8)*(-a)**(15/8)) + 7*sq
rt(2)*atan(sqrt(2)*c**(1/8)*sqrt(x)/(-a)**(1/8) - 1)/(512*c**(9/8
)*(-a)**(15/8)) + 7*sqrt(2)*atan(sqrt(2)*c**(1/8)*sqrt(x)/(-a)**(
1/8) + 1)/(512*c**(9/8)*(-a)**(15/8)) + 7*atanh(c**(1/8)*sqrt(x)/
(-a)**(1/8))/(256*c**(9/8)*(-a)**(15/8)) + sqrt(x)/(64*a*c*(a + c
*x**4))
```

Mathematica [A] time = 0.916491, size = 430, normalized size = 1.3

$$\frac{-\frac{7\sin\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{a^{15/8}}+\frac{7\sin\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{a^{15/8}}-\frac{7\cos\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\cos\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{a^{15/8}}+}{}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(7/2)/(a + c*x^4)^3,x]
```

```
[Out] ((-64*c^(1/8)*Sqrt[x])/(a + c*x^4)^2 + (8*c^(1/8)*Sqrt[x])/(a^2 +
 a*c*x^4) + (14*ArcTan[(c^(1/8)*Sqrt[x]*Sec[Pi/8])/a^(1/8) - Tan[
Pi/8]]*Cos[Pi/8])/a^(15/8) + (14*ArcTan[(c^(1/8)*Sqrt[x]*Sec[Pi/8
])/a^(1/8) + Tan[Pi/8]]*Cos[Pi/8])/a^(15/8) - (7*Cos[Pi/8]*Log[a^
(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[x]*Cos[Pi/8]])/a^(15/8
) + (7*Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x + 2*a^(1/8)*c^(1/8)*Sqrt
[x]*Cos[Pi/8]])/a^(15/8) - (14*ArcTan[Cot[Pi/8] - (c^(1/8)*Sqrt[x
]*Csc[Pi/8])/a^(1/8)]*Sin[Pi/8])/a^(15/8) + (14*ArcTan[Cot[Pi/8]
+ (c^(1/8)*Sqrt[x]*Csc[Pi/8])/a^(1/8)]*Sin[Pi/8])/a^(15/8) - (7*L
og[a^(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[x]*Sin[Pi/8]]*Sin
[Pi/8])/a^(15/8) + (7*Log[a^(1/4) + c^(1/4)*x + 2*a^(1/8)*c^(1/8)
*Sqrt[x]*Sin[Pi/8]]*Sin[Pi/8])/a^(15/8))/(512*c^(9/8))
```

Maple [C] time = 0.03, size = 61, normalized size = 0.2

$$2\,\frac{1}{(cx^4+a)^2}\left(-\frac{7\,\sqrt{x}}{128\,c}+\frac{x^{9/2}}{128\,a}\right)+\frac{7}{512\,c^2a}\sum_{\_R=RootOf(\_Z^8c+a)}\frac{1}{\_R^7}\ln\left(\sqrt{x}-\_R\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(7/2)/(c*x^4+a)^3,x)
```

```
[Out] 2*(-7/128*x^(1/2)/c+1/128/a*x^(9/2))/(c*x^4+a)^2+7/512/c^2/a*sum(
1/_R^7*ln(x^(1/2)-_R),_R=RootOf(_Z^8*c+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{7\,cx^{\frac{17}{2}} + 15\,ax^{\frac{9}{2}}}{64\,(a^2c^2x^8 + 2\,a^3cx^4 + a^4)} - 7\int \frac{x^{\frac{7}{2}}}{128\,(a^2cx^4 + a^3)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(7/2)/(c*x^4 + a)^3,x, algorithm="maxima")
```

```
[Out] 1/64*(7*c*x^(17/2) + 15*a*x^(9/2))/(a^2*c^2*x^8 + 2*a^3*c*x^4 + a
^4) - 7*integrate(1/128*x^(7/2)/(a^2*c*x^4 + a^3), x)
```

Fricas [A] time = 0.274784, size = 905, normalized size = 2.73

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(7/2)/(c*x^4 + a)^3,x, algorithm="fricas")
```

```
[Out] -1/1024*sqrt(2)*(28*sqrt(2)*(a*c^3*x^8 + 2*a^2*c^2*x^4 + a^3*c)*(
-1/(a^15*c^9))^(1/8)*arctan(a^2*c*(-1/(a^15*c^9))^(1/8)/(sqrt(a^4
*c^2*(-1/(a^15*c^9))^(1/4) + x) + sqrt(x))) - 7*sqrt(2)*(a*c^3*x^
8 + 2*a^2*c^2*x^4 + a^3*c)*(-1/(a^15*c^9))^(1/8)*log(a^2*c*(-1/(a
^15*c^9))^(1/8) + sqrt(x)) + 7*sqrt(2)*(a*c^3*x^8 + 2*a^2*c^2*x^4
 + a^3*c)*(-1/(a^15*c^9))^(1/8)*log(-a^2*c*(-1/(a^15*c^9))^(1/8)
+ sqrt(x)) + 28*(a*c^3*x^8 + 2*a^2*c^2*x^4 + a^3*c)*(-1/(a^15*c^9
))^(1/8)*arctan(a^2*c*(-1/(a^15*c^9))^(1/8)/(a^2*c*(-1/(a^15*c^9)
)^(1/8) + sqrt(2)*sqrt(x) + sqrt(2*a^4*c^2*(-1/(a^15*c^9))^(1/4)
+ 2*sqrt(2)*a^2*c*sqrt(x)*(-1/(a^15*c^9))^(1/8) + 2*x))) + 28*(a*
c^3*x^8 + 2*a^2*c^2*x^4 + a^3*c)*(-1/(a^15*c^9))^(1/8)*arctan(-a^
2*c*(-1/(a^15*c^9))^(1/8)/(a^2*c*(-1/(a^15*c^9))^(1/8) - sqrt(2)*
sqrt(x) - sqrt(2*a^4*c^2*(-1/(a^15*c^9))^(1/4) - 2*sqrt(2)*a^2*c*
sqrt(x)*(-1/(a^15*c^9))^(1/8) + 2*x))) - 7*(a*c^3*x^8 + 2*a^2*c^2
*x^4 + a^3*c)*(-1/(a^15*c^9))^(1/8)*log(2*a^4*c^2*(-1/(a^15*c^9))
^(1/4) + 2*sqrt(2)*a^2*c*sqrt(x)*(-1/(a^15*c^9))^(1/8) + 2*x) + 7
*(a*c^3*x^8 + 2*a^2*c^2*x^4 + a^3*c)*(-1/(a^15*c^9))^(1/8)*log(2*
a^4*c^2*(-1/(a^15*c^9))^(1/4) - 2*sqrt(2)*a^2*c*sqrt(x)*(-1/(a^15
*c^9))^(1/8) + 2*x) - 8*sqrt(2)*(c*x^4 - 7*a)*sqrt(x))/(a*c^3*x^8
 + 2*a^2*c^2*x^4 + a^3*c)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(7/2)/(c*x**4+a)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.335732, size = 662, normalized size = 1.99

$$\frac{7\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\arctan\left(\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{512\,a^2c}+\frac{7\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\arctan\left(-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{512\,a^2c}$$
$$+\frac{7\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\arctan\left(\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{512\,a^2c}+\frac{7\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\arctan\left(-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{512\,a^2c}$$
$$+\frac{7\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\ln\left(\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{1024\,a^2c}$$
$$-\frac{7\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\ln\left(-\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{1024\,a^2c}$$
$$+\frac{7\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\ln\left(\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{1024\,a^2c}$$
$$-\frac{7\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}\ln\left(-\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{1024\,a^2c}+\frac{cx^{\frac{9}{2}}-7\,a\sqrt{x}}{64\,(cx^4+a)^2ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(7/2)/(c*x^4 + a)^3,x, algorithm="giac")
```

```
[Out] 7/512*sqrt(sqrt(2) + 2)*(a/c)^(1/8)*arctan((sqrt(-sqrt(2) + 2)*(a
/c)^(1/8) + 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/(a^2*c) +
 7/512*sqrt(sqrt(2) + 2)*(a/c)^(1/8)*arctan(-(sqrt(-sqrt(2) + 2)*
(a/c)^(1/8) - 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/(a^2*c)
 + 7/512*sqrt(-sqrt(2) + 2)*(a/c)^(1/8)*arctan((sqrt(sqrt(2) + 2)
*(a/c)^(1/8) + 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/(a^2*
c) + 7/512*sqrt(-sqrt(2) + 2)*(a/c)^(1/8)*arctan(-(sqrt(sqrt(2) +
 2)*(a/c)^(1/8) - 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/(a
^2*c) + 7/1024*sqrt(sqrt(2) + 2)*(a/c)^(1/8)*ln(sqrt(x)*sqrt(sqrt
(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/(a^2*c) - 7/1024*sqrt(sqr
t(2) + 2)*(a/c)^(1/8)*ln(-sqrt(x)*sqrt(sqrt(2) + 2)*(a/c)^(1/8) +
 x + (a/c)^(1/4))/(a^2*c) + 7/1024*sqrt(-sqrt(2) + 2)*(a/c)^(1/8)
*ln(sqrt(x)*sqrt(-sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/(a^
2*c) - 7/1024*sqrt(-sqrt(2) + 2)*(a/c)^(1/8)*ln(-sqrt(x)*sqrt(-sq
rt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/(a^2*c) + 1/64*(c*x^(9/
2) - 7*a*sqrt(x))/((c*x^4 + a)^2*a*c)
```

3.758 $\int \frac{x^{5/2}}{(a+cx^4)^3}\,dx$

Optimal. Leaf size=329

$$\frac{9x^{7/2}}{64a^2(a+cx^4)}+\frac{9\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{17/8}c^{7/8}}-\frac{9\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{17/8}c^{7/8}}-\frac{9\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256\sqrt{2}(-a)^{17/8}c^{7/8}}+\frac{9\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{256\sqrt{2}(-a)^{17/8}c^{7/8}}+\frac{9\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{17/8}c^{7/8}}-\frac{9\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{17/8}c^{7/8}}+\frac{x^{7/2}}{8a(a+cx^4)^2}$$

```
[Out] x^(7/2)/(8*a*(a + c*x^4)^2) + (9*x^(7/2))/(64*a^2*(a + c*x^4)) -
(9*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*Sqrt[2]
*(-a)^(17/8)*c^(7/8)) + (9*ArcTan[1 + (Sqrt[2]*c^(1/8)*Sqrt[x])/(
-a)^(1/8)])/(256*Sqrt[2]*(-a)^(17/8)*c^(7/8)) + (9*ArcTan[(c^(1/8
)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(17/8)*c^(7/8)) - (9*ArcTanh[(c
^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(17/8)*c^(7/8)) + (9*Log[(
-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(512
*Sqrt[2]*(-a)^(17/8)*c^(7/8)) - (9*Log[(-a)^(1/4) + Sqrt[2]*(-a)^
(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(512*Sqrt[2]*(-a)^(17/8)*c^(7
/8))
```

Rubi [A] time = 0.62463, antiderivative size = 329, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 12, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.8

$$\frac{9x^{7/2}}{64a^2(a+cx^4)}+\frac{9\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{17/8}c^{7/8}}-\frac{9\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{17/8}c^{7/8}}-\frac{9\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256\sqrt{2}(-a)^{17/8}c^{7/8}}+\frac{9\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{256\sqrt{2}(-a)^{17/8}c^{7/8}}+\frac{9\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{17/8}c^{7/8}}-\frac{9\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{17/8}c^{7/8}}+\frac{x^{7/2}}{8a(a+cx^4)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(5/2)/(a + c*x^4)^3,x]
```


```
[Out] x^(7/2)/(8*a*(a + c*x^4)^2) + (9*x^(7/2))/(64*a^2*(a + c*x^4)) -
(9*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*Sqrt[2]
*(-a)^(17/8)*c^(7/8)) + (9*ArcTan[1 + (Sqrt[2]*c^(1/8)*Sqrt[x])/(
-a)^(1/8)])/(256*Sqrt[2]*(-a)^(17/8)*c^(7/8)) + (9*ArcTan[(c^(1/8
)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(17/8)*c^(7/8)) - (9*ArcTanh[(c
^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(17/8)*c^(7/8)) + (9*Log[(
-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(512
*Sqrt[2]*(-a)^(17/8)*c^(7/8)) - (9*Log[(-a)^(1/4) + Sqrt[2]*(-a)^
(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(512*Sqrt[2]*(-a)^(17/8)*c^(7
/8))
```

Rubi in Sympy [A] time = 128.337, size = 309, normalized size = 0.94

$$\frac{9\sqrt{2}\log\left(-\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{1024c^{\frac{7}{8}}(-a)^{\frac{17}{8}}}-\frac{9\sqrt{2}\log\left(\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{1024c^{\frac{7}{8}}(-a)^{\frac{17}{8}}}+\frac{9\,\mathrm{atan}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256c^{\frac{7}{8}}(-a)^{\frac{17}{8}}}+\frac{9\sqrt{2}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}-1\right)}{512c^{\frac{7}{8}}(-a)^{\frac{17}{8}}}+\frac{9\sqrt{2}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{512c^{\frac{7}{8}}(-a)^{\frac{17}{8}}}-\frac{9\,\mathrm{atanh}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256c^{\frac{7}{8}}(-a)^{\frac{17}{8}}}+\frac{x^{\frac{7}{2}}}{8a(a+cx^4)^2}+\frac{9x^{\frac{7}{2}}}{64a^2(a+cx^4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(5/2)/(c*x**4+a)**3,x)
```

```
[Out] 9*sqrt(2)*log(-sqrt(2)*c**(1/8)*sqrt(x)*(-a)**(1/8) + c**(1/4)*x
+ (-a)**(1/4))/(1024*c**(7/8)*(-a)**(17/8)) - 9*sqrt(2)*log(sqrt(
2)*c**(1/8)*sqrt(x)*(-a)**(1/8) + c**(1/4)*x + (-a)**(1/4))/(1024
*c**(7/8)*(-a)**(17/8)) + 9*atan(c**(1/8)*sqrt(x)/(-a)**(1/8))/(2
56*c**(7/8)*(-a)**(17/8)) + 9*sqrt(2)*atan(sqrt(2)*c**(1/8)*sqrt(
x)/(-a)**(1/8) - 1)/(512*c**(7/8)*(-a)**(17/8)) + 9*sqrt(2)*atan(
sqrt(2)*c**(1/8)*sqrt(x)/(-a)**(1/8) + 1)/(512*c**(7/8)*(-a)**(17
/8)) - 9*atanh(c**(1/8)*sqrt(x)/(-a)**(1/8))/(256*c**(7/8)*(-a)**
(17/8)) + x**(7/2)/(8*a*(a + c*x**4)**2) + 9*x**(7/2)/(64*a**2*(a
 + c*x**4))
```

Mathematica [A] time = 0.984868, size = 427, normalized size = 1.3

$$\frac{64a^{9/8}x^{7/2}}{(a+cx^4)^2}+\frac{9\sin\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{c^{7/8}}-\frac{9\sin\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{c^{7/8}}+\frac{9\cos\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\cos\left(\frac{\pi}{8}\right)+\cdots\right.}{c^{7/8}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(5/2)/(a + c*x^4)^3,x]
```

```
[Out] ((64*a^(9/8)*x^(7/2))/(a + c*x^4)^2 + (72*a^(1/8)*x^(7/2))/(a + c
*x^4) + (18*ArcTan[(c^(1/8)*Sqrt[x]*Sec[Pi/8])/a^(1/8) - Tan[Pi/8
]]*Cos[Pi/8])/c^(7/8) + (18*ArcTan[(c^(1/8)*Sqrt[x]*Sec[Pi/8])/a^
(1/8) + Tan[Pi/8]]*Cos[Pi/8])/c^(7/8) + (9*Cos[Pi/8]*Log[a^(1/4)
+ c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[x]*Cos[Pi/8]])/c^(7/8) - (9*
Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x + 2*a^(1/8)*c^(1/8)*Sqrt[x]*Cos
[Pi/8]])/c^(7/8) - (18*ArcTan[Cot[Pi/8] - (c^(1/8)*Sqrt[x]*Csc[Pi
/8])/a^(1/8)]*Sin[Pi/8])/c^(7/8) + (18*ArcTan[Cot[Pi/8] + (c^(1/8
)*Sqrt[x]*Csc[Pi/8])/a^(1/8)]*Sin[Pi/8])/c^(7/8) + (9*Log[a^(1/4)
 + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[x]*Sin[Pi/8]]*Sin[Pi/8])/c^
(7/8) - (9*Log[a^(1/4) + c^(1/4)*x + 2*a^(1/8)*c^(1/8)*Sqrt[x]*Si
n[Pi/8]]*Sin[Pi/8])/c^(7/8))/(512*a^(17/8))
```

Maple [C] time = 0.026, size = 62, normalized size = 0.2

$$2\,\frac{1}{(cx^4+a)^2}\left(\frac{17\,x^{7/2}}{128\,a}+\frac{9\,cx^{15/2}}{128\,a^2}\right)+\frac{9}{512\,a^2c}\sum_{\_R=RootOf(\_Z^8c+a)}\frac{1}{\_R}\ln\left(\sqrt{x}-\_R\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(5/2)/(c*x^4+a)^3,x)
```

```
[Out] 2*(17/128*x^(7/2)/a+9/128/a^2*c*x^(15/2))/(c*x^4+a)^2+9/512/a^2/c
*sum(1/_R*ln(x^(1/2)-_R),_R=RootOf(_Z^8*c+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{9\,cx^{\frac{15}{2}} + 17\,ax^{\frac{7}{2}}}{64\,(a^2c^2x^8 + 2\,a^3cx^4 + a^4)} + 9\int \frac{x^{\frac{5}{2}}}{128\,(a^2cx^4 + a^3)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5/2)/(c*x^4 + a)^3,x, algorithm="maxima")
```

```
[Out] 1/64*(9*c*x^(15/2) + 17*a*x^(7/2))/(a^2*c^2*x^8 + 2*a^3*c*x^4 + a
^4) + 9*integrate(1/128*x^(5/2)/(a^2*c*x^4 + a^3), x)
```

Fricas [A] time = 0.263203, size = 919, normalized size = 2.79

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5/2)/(c*x^4 + a)^3,x, algorithm="fricas")
```

```
[Out] 1/1024*sqrt(2)*(36*sqrt(2)*(a^2*c^2*x^8 + 2*a^3*c*x^4 + a^4)*(-1/
(a^17*c^7))^(1/8)*arctan(a^15*c^6*(-1/(a^17*c^7))^(7/8)/(sqrt(-a^
13*c^5*(-1/(a^17*c^7))^(3/4) + x) + sqrt(x))) + 9*sqrt(2)*(a^2*c^
2*x^8 + 2*a^3*c*x^4 + a^4)*(-1/(a^17*c^7))^(1/8)*log(a^15*c^6*(-1
/(a^17*c^7))^(7/8) + sqrt(x)) - 9*sqrt(2)*(a^2*c^2*x^8 + 2*a^3*c*
x^4 + a^4)*(-1/(a^17*c^7))^(1/8)*log(-a^15*c^6*(-1/(a^17*c^7))^(7
/8) + sqrt(x)) + 36*(a^2*c^2*x^8 + 2*a^3*c*x^4 + a^4)*(-1/(a^17*c
^7))^(1/8)*arctan(a^15*c^6*(-1/(a^17*c^7))^(7/8)/(a^15*c^6*(-1/(a
^17*c^7))^(7/8) + sqrt(2)*sqrt(x) + sqrt(2*sqrt(2)*a^15*c^6*sqrt(
x)*(-1/(a^17*c^7))^(7/8) - 2*a^13*c^5*(-1/(a^17*c^7))^(3/4) + 2*x
))) + 36*(a^2*c^2*x^8 + 2*a^3*c*x^4 + a^4)*(-1/(a^17*c^7))^(1/8)*
arctan(-a^15*c^6*(-1/(a^17*c^7))^(7/8)/(a^15*c^6*(-1/(a^17*c^7))^
(7/8) - sqrt(2)*sqrt(x) - sqrt(-2*sqrt(2)*a^15*c^6*sqrt(x)*(-1/(a
^17*c^7))^(7/8) - 2*a^13*c^5*(-1/(a^17*c^7))^(3/4) + 2*x))) + 9*(
a^2*c^2*x^8 + 2*a^3*c*x^4 + a^4)*(-1/(a^17*c^7))^(1/8)*log(2*sqrt
(2)*a^15*c^6*sqrt(x)*(-1/(a^17*c^7))^(7/8) - 2*a^13*c^5*(-1/(a^17
*c^7))^(3/4) + 2*x) - 9*(a^2*c^2*x^8 + 2*a^3*c*x^4 + a^4)*(-1/(a^
17*c^7))^(1/8)*log(-2*sqrt(2)*a^15*c^6*sqrt(x)*(-1/(a^17*c^7))^(7
/8) - 2*a^13*c^5*(-1/(a^17*c^7))^(3/4) + 2*x) + 8*sqrt(2)*(9*c*x^
7 + 17*a*x^3)*sqrt(x))/(a^2*c^2*x^8 + 2*a^3*c*x^4 + a^4)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(5/2)/(c*x**4+a)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.355832, size = 626, normalized size = 1.9

$$\frac{9\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\arctan\left(\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{512\,a^3}+\frac{9\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\arctan\left(-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\sqrt{x}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{512\,a^3}$$
$$+\frac{9\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\arctan\left(\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+2\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{512\,a^3}+\frac{9\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\arctan\left(-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}-2\sqrt{x}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}}\right)}{512\,a^3}$$
$$-\frac{9\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\ln\left(\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{1024\,a^3}$$
$$+\frac{9\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\ln\left(-\sqrt{x}\sqrt{\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{1024\,a^3}$$
$$-\frac{9\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\ln\left(\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{1024\,a^3}$$
$$+\frac{9\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{7}{8}}\ln\left(-\sqrt{x}\sqrt{-\sqrt{2}+2}\left(\frac{a}{c}\right)^{\frac{1}{8}}+x+\left(\frac{a}{c}\right)^{\frac{1}{4}}\right)}{1024\,a^3}+\frac{9\,cx^{\frac{15}{2}}+17\,ax^{\frac{7}{2}}}{64\,(cx^4+a)^2a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5/2)/(c*x^4 + a)^3,x, algorithm="giac")
```

```
[Out] 9/512*sqrt(sqrt(2) + 2)*(a/c)^(7/8)*arctan((sqrt(-sqrt(2) + 2)*(a
/c)^(1/8) + 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/a^3 + 9/5
12*sqrt(sqrt(2) + 2)*(a/c)^(7/8)*arctan(-(sqrt(-sqrt(2) + 2)*(a/c
)^(1/8) - 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/a^3 + 9/512
*sqrt(-sqrt(2) + 2)*(a/c)^(7/8)*arctan((sqrt(sqrt(2) + 2)*(a/c)^(
1/8) + 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/a^3 + 9/512*s
qrt(-sqrt(2) + 2)*(a/c)^(7/8)*arctan(-(sqrt(sqrt(2) + 2)*(a/c)^(1
/8) - 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/a^3 - 9/1024*s
qrt(sqrt(2) + 2)*(a/c)^(7/8)*ln(sqrt(x)*sqrt(sqrt(2) + 2)*(a/c)^(
1/8) + x + (a/c)^(1/4))/a^3 + 9/1024*sqrt(sqrt(2) + 2)*(a/c)^(7/8
)*ln(-sqrt(x)*sqrt(sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/a^
3 - 9/1024*sqrt(-sqrt(2) + 2)*(a/c)^(7/8)*ln(sqrt(x)*sqrt(-sqrt(2
) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/a^3 + 9/1024*sqrt(-sqrt(2)
+ 2)*(a/c)^(7/8)*ln(-sqrt(x)*sqrt(-sqrt(2) + 2)*(a/c)^(1/8) + x +
 (a/c)^(1/4))/a^3 + 1/64*(9*c*x^(15/2) + 17*a*x^(7/2))/((c*x^4 +
a)^2*a^2)
```

3.759 $\int \frac{x^{3/2}}{(a+cx^4)^3}\,dx$

Optimal. Leaf size=329

$$\frac{11x^{5/2}}{64a^2\left(a+cx^4\right)}-\frac{33\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{19/8}c^{5/8}}+\frac{33\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{19/8}c^{5/8}}-\frac{33\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256\sqrt{2}(-a)^{19/8}c^{5/8}}+\frac{33\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{256\sqrt{2}(-a)^{19/8}c^{5/8}}-\frac{33\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{19/8}c^{5/8}}-\frac{33\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{19/8}c^{5/8}}+\frac{x^{5/2}}{8a\left(a+cx^4\right)^2}$$

```
[Out] x^(5/2)/(8*a*(a + c*x^4)^2) + (11*x^(5/2))/(64*a^2*(a + c*x^4)) -
 (33*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*Sqrt[
2]*(-a)^(19/8)*c^(5/8)) + (33*ArcTan[1 + (Sqrt[2]*c^(1/8)*Sqrt[x]
)/(-a)^(1/8)])/(256*Sqrt[2]*(-a)^(19/8)*c^(5/8)) - (33*ArcTan[(c^
(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(19/8)*c^(5/8)) - (33*ArcTa
nh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(19/8)*c^(5/8)) - (33
*Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x]
)/(512*Sqrt[2]*(-a)^(19/8)*c^(5/8)) + (33*Log[(-a)^(1/4) + Sqrt[2
]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(512*Sqrt[2]*(-a)^(19/
8)*c^(5/8))
```

Rubi [A] time = 0.625741, antiderivative size = 329, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 12, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.8

$$\frac{11x^{5/2}}{64a^2\left(a+cx^4\right)}-\frac{33\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{19/8}c^{5/8}}+\frac{33\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{19/8}c^{5/8}}-\frac{33\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256\sqrt{2}(-a)^{19/8}c^{5/8}}+\frac{33\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{256\sqrt{2}(-a)^{19/8}c^{5/8}}-\frac{33\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{19/8}c^{5/8}}-\frac{33\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{19/8}c^{5/8}}+\frac{x^{5/2}}{8a\left(a+cx^4\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(3/2)/(a + c*x^4)^3,x]
```



```
[Out] x^(5/2)/(8*a*(a + c*x^4)^2) + (11*x^(5/2))/(64*a^2*(a + c*x^4)) -
 (33*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*Sqrt[
2]*(-a)^(19/8)*c^(5/8)) + (33*ArcTan[1 + (Sqrt[2]*c^(1/8)*Sqrt[x]
)/(-a)^(1/8)])/(256*Sqrt[2]*(-a)^(19/8)*c^(5/8)) - (33*ArcTan[(c^
(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(19/8)*c^(5/8)) - (33*ArcTa
nh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(19/8)*c^(5/8)) - (33
*Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x]
)/(512*Sqrt[2]*(-a)^(19/8)*c^(5/8)) + (33*Log[(-a)^(1/4) + Sqrt[2
]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(512*Sqrt[2]*(-a)^(19/
8)*c^(5/8))
```

Rubi in Sympy [A] time = 127.908, size = 309, normalized size = 0.94

$$-\frac{33\sqrt{2}\log\left(-\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{1024c^{\frac{5}{8}}\left(-a\right)^{\frac{19}{8}}}+\frac{33\sqrt{2}\log\left(\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{1024c^{\frac{5}{8}}\left(-a\right)^{\frac{19}{8}}} - \frac{33\,\mathrm{atan}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256c^{\frac{5}{8}}\left(-a\right)^{\frac{19}{8}}}+\frac{33\sqrt{2}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}-1\right)}{512c^{\frac{5}{8}}\left(-a\right)^{\frac{19}{8}}}+\frac{33\sqrt{2}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{512c^{\frac{5}{8}}\left(-a\right)^{\frac{19}{8}}} - \frac{33\,\mathrm{atanh}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256c^{\frac{5}{8}}\left(-a\right)^{\frac{19}{8}}}+\frac{x^{\frac{5}{2}}}{8a\left(a+cx^4\right)^2}+\frac{11x^{\frac{5}{2}}}{64a^2\left(a+cx^4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(3/2)/(c*x**4+a)**3,x)
```

```
[Out] -33*sqrt(2)*log(-sqrt(2)*c**(1/8)*sqrt(x)*(-a)**(1/8) + c**(1/4)*
x + (-a)**(1/4))/(1024*c**(5/8)*(-a)**(19/8)) + 33*sqrt(2)*log(sq
rt(2)*c**(1/8)*sqrt(x)*(-a)**(1/8) + c**(1/4)*x + (-a)**(1/4))/(1
024*c**(5/8)*(-a)**(19/8)) - 33*atan(c**(1/8)*sqrt(x)/(-a)**(1/8)
)/(256*c**(5/8)*(-a)**(19/8)) + 33*sqrt(2)*atan(sqrt(2)*c**(1/8)*
sqrt(x)/(-a)**(1/8) - 1)/(512*c**(5/8)*(-a)**(19/8)) + 33*sqrt(2)
*atan(sqrt(2)*c**(1/8)*sqrt(x)/(-a)**(1/8) + 1)/(512*c**(5/8)*(-a
)**(19/8)) - 33*atanh(c**(1/8)*sqrt(x)/(-a)**(1/8))/(256*c**(5/8)
*(-a)**(19/8)) + x**(5/2)/(8*a*(a + c*x**4)**2) + 11*x**(5/2)/(64
*a**2*(a + c*x**4))
```

Mathematica [A] time = 1.02643, size = 427, normalized size = 1.3

$$\frac{\frac{88a^{3/8}x^{5/2}}{a+cx^4}+\frac{64a^{11/8}x^{5/2}}{(a+cx^4)^2}-\frac{33\cos\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{c^{5/8}}+\frac{33\cos\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{c^{5/8}}+\frac{33\sin\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\right.}{}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(3/2)/(a + c*x^4)^3,x]
```

```
[Out] ((64*a^(11/8)*x^(5/2))/(a + c*x^4)^2 + (88*a^(3/8)*x^(5/2))/(a +
c*x^4) - (66*ArcTan[Cot[Pi/8] - (c^(1/8)*Sqrt[x]*Csc[Pi/8])/a^(1/
8)]*Cos[Pi/8])/c^(5/8) + (66*ArcTan[Cot[Pi/8] + (c^(1/8)*Sqrt[x]*
Csc[Pi/8])/a^(1/8)]*Cos[Pi/8])/c^(5/8) - (33*Cos[Pi/8]*Log[a^(1/4
) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[x]*Sin[Pi/8]])/c^(5/8) + (
33*Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x + 2*a^(1/8)*c^(1/8)*Sqrt[x]*
Sin[Pi/8]])/c^(5/8) - (66*ArcTan[(c^(1/8)*Sqrt[x]*Sec[Pi/8])/a^(1
/8) - Tan[Pi/8]]*Sin[Pi/8])/c^(5/8) - (66*ArcTan[(c^(1/8)*Sqrt[x]
*Sec[Pi/8])/a^(1/8) + Tan[Pi/8]]*Sin[Pi/8])/c^(5/8) + (33*Log[a^(
1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[x]*Cos[Pi/8]]*Sin[Pi/8]
)/c^(5/8) - (33*Log[a^(1/4) + c^(1/4)*x + 2*a^(1/8)*c^(1/8)*Sqrt[
x]*Cos[Pi/8]]*Sin[Pi/8])/c^(5/8))/(512*a^(19/8))
```

Maple [C] time = 0.027, size = 62, normalized size = 0.2

$$2\,\frac{1}{\left(cx^4+a\right)^2}\left(\frac{19\,x^{5/2}}{128\,a}+\frac{11\,cx^{13/2}}{128\,a^2}\right)+\frac{33}{512\,a^2c}\sum_{\_R=RootOf(\_Z^8c+a)}\frac{1}{\_R^3}\ln\left(\sqrt{x}-\_R\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(3/2)/(c*x^4+a)^3,x)
```

```
[Out] 2*(19/128/a*x^(5/2)+11/128/a^2*c*x^(13/2))/(c*x^4+a)^2+33/512/a^2
/c*sum(1/_R^3*ln(x^(1/2)-_R),_R=RootOf(_Z^8*c+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{11\,cx^{\frac{13}{2}} + 19\,ax^{\frac{5}{2}}}{64\,(a^2c^2x^8 + 2\,a^3cx^4 + a^4)} + 33\int \frac{x^{\frac{3}{2}}}{128\,(a^2cx^4 + a^3)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2)/(c*x^4 + a)^3,x, algorithm="maxima")
```

```
[Out] 1/64*(11*c*x^(13/2) + 19*a*x^(5/2))/(a^2*c^2*x^8 + 2*a^3*c*x^4 +
a^4) + 33*integrate(1/128*x^(3/2)/(a^2*c*x^4 + a^3), x)
```

Fricas [A] time = 0.264942, size = 906, normalized size = 2.75

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2)/(c*x^4 + a)^3,x, algorithm="fricas")
```

```
[Out] 1/1024*sqrt(2)*(132*sqrt(2)*(a^2*c^2*x^8 + 2*a^3*c*x^4 + a^4)*(-1
/(a^19*c^5))^(1/8)*arctan(a^12*c^3*(-1/(a^19*c^5))^(5/8)/(sqrt(-a
^5*c*(-1/(a^19*c^5))^(1/4) + x) + sqrt(x))) - 33*sqrt(2)*(a^2*c^2
*x^8 + 2*a^3*c*x^4 + a^4)*(-1/(a^19*c^5))^(1/8)*log(a^12*c^3*(-1/
(a^19*c^5))^(5/8) + sqrt(x)) + 33*sqrt(2)*(a^2*c^2*x^8 + 2*a^3*c*
x^4 + a^4)*(-1/(a^19*c^5))^(1/8)*log(-a^12*c^3*(-1/(a^19*c^5))^(5
/8) + sqrt(x)) - 132*(a^2*c^2*x^8 + 2*a^3*c*x^4 + a^4)*(-1/(a^19*
c^5))^(1/8)*arctan(a^12*c^3*(-1/(a^19*c^5))^(5/8)/(a^12*c^3*(-1/(
a^19*c^5))^(5/8) + sqrt(2)*sqrt(x) + sqrt(2*sqrt(2)*a^12*c^3*sqrt
(x)*(-1/(a^19*c^5))^(5/8) - 2*a^5*c*(-1/(a^19*c^5))^(1/4) + 2*x))
) - 132*(a^2*c^2*x^8 + 2*a^3*c*x^4 + a^4)*(-1/(a^19*c^5))^(1/8)*a
rctan(-a^12*c^3*(-1/(a^19*c^5))^(5/8)/(a^12*c^3*(-1/(a^19*c^5))^(
5/8) - sqrt(2)*sqrt(x) - sqrt(-2*sqrt(2)*a^12*c^3*sqrt(x)*(-1/(a^
19*c^5))^(5/8) - 2*a^5*c*(-1/(a^19*c^5))^(1/4) + 2*x))) + 33*(a^2
*c^2*x^8 + 2*a^3*c*x^4 + a^4)*(-1/(a^19*c^5))^(1/8)*log(2*sqrt(2)
*a^12*c^3*sqrt(x)*(-1/(a^19*c^5))^(5/8) - 2*a^5*c*(-1/(a^19*c^5))
^(1/4) + 2*x) - 33*(a^2*c^2*x^8 + 2*a^3*c*x^4 + a^4)*(-1/(a^19*c^
5))^(1/8)*log(-2*sqrt(2)*a^12*c^3*sqrt(x)*(-1/(a^19*c^5))^(5/8) -
 2*a^5*c*(-1/(a^19*c^5))^(1/4) + 2*x) + 8*sqrt(2)*(11*c*x^6 + 19*
a*x^2)*sqrt(x))/(a^2*c^2*x^8 + 2*a^3*c*x^4 + a^4)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(3/2)/(c*x**4+a)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.355334, size = 626, normalized size = 1.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2)/(c*x^4 + a)^3,x, algorithm="giac")
```

```
[Out] -33/512*sqrt(-sqrt(2) + 2)*(a/c)^(5/8)*arctan((sqrt(-sqrt(2) + 2)
*(a/c)^(1/8) + 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/a^3 -
33/512*sqrt(-sqrt(2) + 2)*(a/c)^(5/8)*arctan(-(sqrt(-sqrt(2) + 2)
*(a/c)^(1/8) - 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/a^3 +
33/512*sqrt(sqrt(2) + 2)*(a/c)^(5/8)*arctan((sqrt(sqrt(2) + 2)*(a
/c)^(1/8) + 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/a^3 + 33
/512*sqrt(sqrt(2) + 2)*(a/c)^(5/8)*arctan(-(sqrt(sqrt(2) + 2)*(a/
c)^(1/8) - 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/a^3 - 33/
1024*sqrt(-sqrt(2) + 2)*(a/c)^(5/8)*ln(sqrt(x)*sqrt(sqrt(2) + 2)*
(a/c)^(1/8) + x + (a/c)^(1/4))/a^3 + 33/1024*sqrt(-sqrt(2) + 2)*(
a/c)^(5/8)*ln(-sqrt(x)*sqrt(sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^
(1/4))/a^3 + 33/1024*sqrt(sqrt(2) + 2)*(a/c)^(5/8)*ln(sqrt(x)*sqr
t(-sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/a^3 - 33/1024*sqrt
(sqrt(2) + 2)*(a/c)^(5/8)*ln(-sqrt(x)*sqrt(-sqrt(2) + 2)*(a/c)^(1
/8) + x + (a/c)^(1/4))/a^3 + 1/64*(11*c*x^(13/2) + 19*a*x^(5/2))/
((c*x^4 + a)^2*a^2)
```

3.760 $\int \frac{\sqrt{x}}{(a+cx^4)^3}\,dx$

Optimal. Leaf size=329

$$\frac{13x^{3/2}}{64a^2(a+cx^4)}-\frac{65\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{21/8}c^{3/8}}+\frac{65\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{21/8}c^{3/8}}+\frac{65\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256\sqrt{2}(-a)^{21/8}c^{3/8}}-\frac{65\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{256\sqrt{2}(-a)^{21/8}c^{3/8}}+\frac{65\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{21/8}c^{3/8}}-\frac{65\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{21/8}c^{3/8}}+\frac{x^{3/2}}{8a(a+cx^4)^2}$$

```
[Out] x^(3/2)/(8*a*(a + c*x^4)^2) + (13*x^(3/2))/(64*a^2*(a + c*x^4)) +
 (65*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*Sqrt[
2]*(-a)^(21/8)*c^(3/8)) - (65*ArcTan[1 + (Sqrt[2]*c^(1/8)*Sqrt[x]
)/(-a)^(1/8)])/(256*Sqrt[2]*(-a)^(21/8)*c^(3/8)) + (65*ArcTan[(c^
(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(21/8)*c^(3/8)) - (65*ArcTa
nh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(21/8)*c^(3/8)) - (65
*Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x]
)/(512*Sqrt[2]*(-a)^(21/8)*c^(3/8)) + (65*Log[(-a)^(1/4) + Sqrt[2
]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(512*Sqrt[2]*(-a)^(21/
8)*c^(3/8))
```

Rubi [A] time = 0.651351, antiderivative size = 329, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 12, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.8$

$$\frac{13x^{3/2}}{64a^2(a+cx^4)}-\frac{65\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{21/8}c^{3/8}}+\frac{65\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{21/8}c^{3/8}}+\frac{65\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256\sqrt{2}(-a)^{21/8}c^{3/8}}-\frac{65\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{256\sqrt{2}(-a)^{21/8}c^{3/8}}+\frac{65\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{21/8}c^{3/8}}-\frac{65\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{21/8}c^{3/8}}+\frac{x^{3/2}}{8a(a+cx^4)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[x]/(a + c*x^4)^3,x]
```

```
[Out] x^(3/2)/(8*a*(a + c*x^4)^2) + (13*x^(3/2))/(64*a^2*(a + c*x^4)) +
 (65*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*Sqrt[
2]*(-a)^(21/8)*c^(3/8)) - (65*ArcTan[1 + (Sqrt[2]*c^(1/8)*Sqrt[x]
)/(-a)^(1/8)])/(256*Sqrt[2]*(-a)^(21/8)*c^(3/8)) + (65*ArcTan[(c^
(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(21/8)*c^(3/8)) - (65*ArcTa
nh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(21/8)*c^(3/8)) - (65
*Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x]
)/(512*Sqrt[2]*(-a)^(21/8)*c^(3/8)) + (65*Log[(-a)^(1/4) + Sqrt[2
]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(512*Sqrt[2]*(-a)^(21/
8)*c^(3/8))
```

Rubi in Sympy [A] time = 135.674, size = 309, normalized size = 0.94

$$-\frac{65\sqrt{2}\log\left(-\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{1024c^{\frac{3}{8}}(-a)^{\frac{21}{8}}}+\frac{65\sqrt{2}\log\left(\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{1024c^{\frac{3}{8}}(-a)^{\frac{21}{8}}}+\frac{65\,\mathrm{atan}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256c^{\frac{3}{8}}(-a)^{\frac{21}{8}}}-\frac{65\sqrt{2}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}-1\right)}{512c^{\frac{3}{8}}(-a)^{\frac{21}{8}}}-\frac{65\sqrt{2}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{512c^{\frac{3}{8}}(-a)^{\frac{21}{8}}}-\frac{65\,\mathrm{atanh}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256c^{\frac{3}{8}}(-a)^{\frac{21}{8}}}+\frac{x^{\frac{3}{2}}}{8a(a+cx^4)^2}+\frac{13x^{\frac{3}{2}}}{64a^2(a+cx^4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(1/2)/(c*x**4+a)**3,x)
```

```
[Out] -65*sqrt(2)*log(-sqrt(2)*c**(1/8)*sqrt(x)*(-a)**(1/8) + c**(1/4)*
x + (-a)**(1/4))/(1024*c**(3/8)*(-a)**(21/8)) + 65*sqrt(2)*log(sq
rt(2)*c**(1/8)*sqrt(x)*(-a)**(1/8) + c**(1/4)*x + (-a)**(1/4))/(1
024*c**(3/8)*(-a)**(21/8)) + 65*atan(c**(1/8)*sqrt(x)/(-a)**(1/8)
)/(256*c**(3/8)*(-a)**(21/8)) - 65*sqrt(2)*atan(sqrt(2)*c**(1/8)*
sqrt(x)/(-a)**(1/8) - 1)/(512*c**(3/8)*(-a)**(21/8)) - 65*sqrt(2)
*atan(sqrt(2)*c**(1/8)*sqrt(x)/(-a)**(1/8) + 1)/(512*c**(3/8)*(-a
)**(21/8)) - 65*atanh(c**(1/8)*sqrt(x)/(-a)**(1/8))/(256*c**(3/8)
*(-a)**(21/8)) + x**(3/2)/(8*a*(a + c*x**4)**2) + 13*x**(3/2)/(64
*a**2*(a + c*x**4))
```

Mathematica [A] time = 1.08447, size = 427, normalized size = 1.3

$$\frac{\frac{64a^{13/8}x^{3/2}}{(a+cx^4)^2}+\frac{104a^{5/8}x^{3/2}}{a+cx^4}+\frac{65\cos\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{c^{3/8}}-\frac{65\cos\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{c^{3/8}}-\frac{65\sin\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{\ldots}\right.}{\ldots}}{\ldots}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[x]/(a + c*x^4)^3,x]
```

```
[Out] ((64*a^(13/8)*x^(3/2))/(a + c*x^4)^2 + (104*a^(5/8)*x^(3/2))/(a +
 c*x^4) - (130*ArcTan[Cot[Pi/8] - (c^(1/8)*Sqrt[x]*Csc[Pi/8])/a^(
1/8)]*Cos[Pi/8])/c^(3/8) + (130*ArcTan[Cot[Pi/8] + (c^(1/8)*Sqrt[
x]*Csc[Pi/8])/a^(1/8)]*Cos[Pi/8])/c^(3/8) + (65*Cos[Pi/8]*Log[a^(
1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[x]*Sin[Pi/8]])/c^(3/8)
- (65*Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x + 2*a^(1/8)*c^(1/8)*Sqrt[
x]*Sin[Pi/8]])/c^(3/8) - (130*ArcTan[(c^(1/8)*Sqrt[x]*Sec[Pi/8])/
a^(1/8) - Tan[Pi/8]]*Sin[Pi/8])/c^(3/8) - (130*ArcTan[(c^(1/8)*Sq
rt[x]*Sec[Pi/8])/a^(1/8) + Tan[Pi/8]]*Sin[Pi/8])/c^(3/8) - (65*Lo
g[a^(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[x]*Cos[Pi/8]]*Sin[
Pi/8])/c^(3/8) + (65*Log[a^(1/4) + c^(1/4)*x + 2*a^(1/8)*c^(1/8)*
Sqrt[x]*Cos[Pi/8]]*Sin[Pi/8])/c^(3/8))/(512*a^(21/8))
```

Maple [C] time = 0.027, size = 62, normalized size = 0.2

$$2\,\frac{1}{(cx^4+a)^2}\left(\frac{21\,x^{3/2}}{128\,a}+\frac{13\,cx^{11/2}}{128\,a^2}\right)+\frac{65}{512\,a^2c}\sum_{\_R=RootOf(\_Z^8c+a)}\frac{1}{\_R^5}\ln\left(\sqrt{x}-\_R\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(1/2)/(c*x^4+a)^3,x)
```

```
[Out] 2*(21/128*x^(3/2)/a+13/128/a^2*c*x^(11/2))/(c*x^4+a)^2+65/512/a^2
/c*sum(1/_R^5*ln(x^(1/2)-_R),_R=RootOf(_Z^8*c+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{13\,cx^{\frac{11}{2}} + 21\,ax^{\frac{3}{2}}}{64\,(a^2c^2x^8 + 2\,a^3cx^4 + a^4)} + 65\int \frac{\sqrt{x}}{128\,(a^2cx^4 + a^3)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(c*x^4 + a)^3,x, algorithm="maxima")
```

```
[Out] 1/64*(13*c*x^(11/2) + 21*a*x^(3/2))/(a^2*c^2*x^8 + 2*a^3*c*x^4 +
a^4) + 65*integrate(1/128*sqrt(x)/(a^2*c*x^4 + a^3), x)
```

Fricas [A] time = 0.270768, size = 886, normalized size = 2.69

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(c*x^4 + a)^3,x, algorithm="fricas")
```

```
[Out] -1/1024*sqrt(2)*(260*sqrt(2)*(a^2*c^2*x^8 + 2*a^3*c*x^4 + a^4)*(-
1/(a^21*c^3))^(1/8)*arctan(a^8*c*(-1/(a^21*c^3))^(3/8)/(sqrt(a^16
*c^2*(-1/(a^21*c^3))^(3/4) + x) + sqrt(x))) + 65*sqrt(2)*(a^2*c^2
*x^8 + 2*a^3*c*x^4 + a^4)*(-1/(a^21*c^3))^(1/8)*log(a^8*c*(-1/(a^
21*c^3))^(3/8) + sqrt(x)) - 65*sqrt(2)*(a^2*c^2*x^8 + 2*a^3*c*x^4
 + a^4)*(-1/(a^21*c^3))^(1/8)*log(-a^8*c*(-1/(a^21*c^3))^(3/8) +
sqrt(x)) - 260*(a^2*c^2*x^8 + 2*a^3*c*x^4 + a^4)*(-1/(a^21*c^3))^
(1/8)*arctan(a^8*c*(-1/(a^21*c^3))^(3/8)/(a^8*c*(-1/(a^21*c^3))^(
3/8) + sqrt(2)*sqrt(x) + sqrt(2*a^16*c^2*(-1/(a^21*c^3))^(3/4) +
2*sqrt(2)*a^8*c*sqrt(x)*(-1/(a^21*c^3))^(3/8) + 2*x))) - 260*(a^2
*c^2*x^8 + 2*a^3*c*x^4 + a^4)*(-1/(a^21*c^3))^(1/8)*arctan(-a^8*c
*(-1/(a^21*c^3))^(3/8)/(a^8*c*(-1/(a^21*c^3))^(3/8) - sqrt(2)*sqr
t(x) - sqrt(2*a^16*c^2*(-1/(a^21*c^3))^(3/4) - 2*sqrt(2)*a^8*c*sq
rt(x)*(-1/(a^21*c^3))^(3/8) + 2*x))) - 65*(a^2*c^2*x^8 + 2*a^3*c*
x^4 + a^4)*(-1/(a^21*c^3))^(1/8)*log(2*a^16*c^2*(-1/(a^21*c^3))^(
3/4) + 2*sqrt(2)*a^8*c*sqrt(x)*(-1/(a^21*c^3))^(3/8) + 2*x) + 65*
(a^2*c^2*x^8 + 2*a^3*c*x^4 + a^4)*(-1/(a^21*c^3))^(1/8)*log(2*a^1
6*c^2*(-1/(a^21*c^3))^(3/4) - 2*sqrt(2)*a^8*c*sqrt(x)*(-1/(a^21*c
^3))^(3/8) + 2*x) - 8*sqrt(2)*(13*c*x^5 + 21*a*x)*sqrt(x))/(a^2*c
^2*x^8 + 2*a^3*c*x^4 + a^4)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(1/2)/(c*x**4+a)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.351052, size = 626, normalized size = 1.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(c*x^4 + a)^3,x, algorithm="giac")
```

```
[Out] -65/512*sqrt(-sqrt(2) + 2)*(a/c)^(3/8)*arctan((sqrt(-sqrt(2) + 2)
*(a/c)^(1/8) + 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/a^3 -
65/512*sqrt(-sqrt(2) + 2)*(a/c)^(3/8)*arctan(-(sqrt(-sqrt(2) + 2)
*(a/c)^(1/8) - 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/a^3 +
65/512*sqrt(sqrt(2) + 2)*(a/c)^(3/8)*arctan((sqrt(sqrt(2) + 2)*(a
/c)^(1/8) + 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/a^3 + 65
/512*sqrt(sqrt(2) + 2)*(a/c)^(3/8)*arctan(-(sqrt(sqrt(2) + 2)*(a/
c)^(1/8) - 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/a^3 + 65/
1024*sqrt(-sqrt(2) + 2)*(a/c)^(3/8)*ln(sqrt(x)*sqrt(sqrt(2) + 2)*
(a/c)^(1/8) + x + (a/c)^(1/4))/a^3 - 65/1024*sqrt(-sqrt(2) + 2)*(
a/c)^(3/8)*ln(-sqrt(x)*sqrt(sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^
(1/4))/a^3 - 65/1024*sqrt(sqrt(2) + 2)*(a/c)^(3/8)*ln(sqrt(x)*sqr
t(-sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/a^3 + 65/1024*sqrt
(sqrt(2) + 2)*(a/c)^(3/8)*ln(-sqrt(x)*sqrt(-sqrt(2) + 2)*(a/c)^(1
/8) + x + (a/c)^(1/4))/a^3 + 1/64*(13*c*x^(11/2) + 21*a*x^(3/2))/
((c*x^4 + a)^2*a^2)
```

3.761 $\int \frac{1}{\sqrt{x}(a+cx^4)^3}\,dx$

Optimal. Leaf size=329

$$\frac{15\sqrt{x}}{64a^2(a+cx^4)}+\frac{\sqrt{x}}{8a(a+cx^4)^2}+\frac{105\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{23/8}\sqrt[8]{c}}-\frac{105\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{23/8}\sqrt[8]{c}}+\frac{105\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256\sqrt{2}(-a)^{23/8}\sqrt[8]{c}}-\frac{105\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{256\sqrt{2}(-a)^{23/8}\sqrt[8]{c}}-\frac{105\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{23/8}\sqrt[8]{c}}-\frac{105\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{23/8}\sqrt[8]{c}}$$

```
[Out] Sqrt[x]/(8*a*(a + c*x^4)^2) + (15*Sqrt[x])/(64*a^2*(a + c*x^4)) +
 (105*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*Sqrt
[2]*(-a)^(23/8)*c^(1/8)) - (105*ArcTan[1 + (Sqrt[2]*c^(1/8)*Sqrt[
x])/(-a)^(1/8)])/(256*Sqrt[2]*(-a)^(23/8)*c^(1/8)) - (105*ArcTan[
(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(23/8)*c^(1/8)) - (105*A
rcTanh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(23/8)*c^(1/8)) +
 (105*Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/
4)*x])/(512*Sqrt[2]*(-a)^(23/8)*c^(1/8)) - (105*Log[(-a)^(1/4) +
Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(512*Sqrt[2]*(-a
)^(23/8)*c^(1/8))
```

Rubi [A] time = 0.626389, antiderivative size = 329, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 12, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.8

$$\frac{15\sqrt{x}}{64a^2(a+cx^4)}+\frac{\sqrt{x}}{8a(a+cx^4)^2}+\frac{105\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{23/8}\sqrt[8]{c}}-\frac{105\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{c}\sqrt{x}+\sqrt[4]{-a}+\sqrt[4]{c}x\right)}{512\sqrt{2}(-a)^{23/8}\sqrt[8]{c}}+\frac{105\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256\sqrt{2}(-a)^{23/8}\sqrt[8]{c}}-\frac{105\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{256\sqrt{2}(-a)^{23/8}\sqrt[8]{c}}-\frac{105\tan^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{23/8}\sqrt[8]{c}}-\frac{105\tanh^{-1}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256(-a)^{23/8}\sqrt[8]{c}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[x]*(a + c*x^4)^3),x]
```


```
[Out] Sqrt[x]/(8*a*(a + c*x^4)^2) + (15*Sqrt[x])/(64*a^2*(a + c*x^4)) +
 (105*ArcTan[1 - (Sqrt[2]*c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*Sqrt
[2]*(-a)^(23/8)*c^(1/8)) - (105*ArcTan[1 + (Sqrt[2]*c^(1/8)*Sqrt[
x])/(-a)^(1/8)])/(256*Sqrt[2]*(-a)^(23/8)*c^(1/8)) - (105*ArcTan[
(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(23/8)*c^(1/8)) - (105*A
rcTanh[(c^(1/8)*Sqrt[x])/(-a)^(1/8)])/(256*(-a)^(23/8)*c^(1/8)) +
 (105*Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/
4)*x])/(512*Sqrt[2]*(-a)^(23/8)*c^(1/8)) - (105*Log[(-a)^(1/4) +
Sqrt[2]*(-a)^(1/8)*c^(1/8)*Sqrt[x] + c^(1/4)*x])/(512*Sqrt[2]*(-a
)^(23/8)*c^(1/8))
```

Rubi in Sympy [A] time = 133.098, size = 309, normalized size = 0.94

$$\frac{105\sqrt{2}\log\left(-\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{1024\sqrt[8]{c}\left(-a\right)^{\frac{23}{8}}}-\frac{105\sqrt{2}\log\left(\sqrt{2}\sqrt[8]{c}\sqrt{x}\sqrt[8]{-a}+\sqrt[4]{c}x+\sqrt[4]{-a}\right)}{1024\sqrt[8]{c}\left(-a\right)^{\frac{23}{8}}}-\frac{105\,\mathrm{atan}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256\sqrt[8]{c}\left(-a\right)^{\frac{23}{8}}}-\frac{105\sqrt{2}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}-1\right)}{512\sqrt[8]{c}\left(-a\right)^{\frac{23}{8}}}-\frac{105\sqrt{2}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}+1\right)}{512\sqrt[8]{c}\left(-a\right)^{\frac{23}{8}}}-\frac{105\,\mathrm{atanh}\left(\frac{\sqrt[8]{c}\sqrt{x}}{\sqrt[8]{-a}}\right)}{256\sqrt[8]{c}\left(-a\right)^{\frac{23}{8}}}+\frac{\sqrt{x}}{8a\left(a+cx^{4}\right)^{2}}+\frac{15\sqrt{x}}{64a^{2}\left(a+cx^{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(c*x**4+a)**3/x**(1/2),x)
```

```
[Out] 105*sqrt(2)*log(-sqrt(2)*c**(1/8)*sqrt(x)*(-a)**(1/8) + c**(1/4)*
x + (-a)**(1/4))/(1024*c**(1/8)*(-a)**(23/8)) - 105*sqrt(2)*log(s
qrt(2)*c**(1/8)*sqrt(x)*(-a)**(1/8) + c**(1/4)*x + (-a)**(1/4))/(
1024*c**(1/8)*(-a)**(23/8)) - 105*atan(c**(1/8)*sqrt(x)/(-a)**(1/
8))/(256*c**(1/8)*(-a)**(23/8)) - 105*sqrt(2)*atan(sqrt(2)*c**(1/
8)*sqrt(x)/(-a)**(1/8) - 1)/(512*c**(1/8)*(-a)**(23/8)) - 105*sqr
t(2)*atan(sqrt(2)*c**(1/8)*sqrt(x)/(-a)**(1/8) + 1)/(512*c**(1/8)
*(-a)**(23/8)) - 105*atanh(c**(1/8)*sqrt(x)/(-a)**(1/8))/(256*c**
(1/8)*(-a)**(23/8)) + sqrt(x)/(8*a*(a + c*x**4)**2) + 15*sqrt(x)/
(64*a**2*(a + c*x**4))
```

Mathematica [A] time = 0.874826, size = 427, normalized size = 1.3

$$\frac{64a^{15/8}\sqrt{x}}{\left(a+cx^{4}\right)^{2}}+\frac{120a^{7/8}\sqrt{x}}{a+cx^{4}}-\frac{105\sin\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{\sqrt[8]{c}}+\frac{105\sin\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{c}\sqrt{x}\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{c}x\right)}{\sqrt[8]{c}}-105\cos\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{\ldots}\right.$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[x]*(a + c*x^4)^3),x]
```

```
[Out] ((64*a^(15/8)*Sqrt[x])/(a + c*x^4)^2 + (120*a^(7/8)*Sqrt[x])/(a +
 c*x^4) + (210*ArcTan[(c^(1/8)*Sqrt[x]*Sec[Pi/8])/a^(1/8) - Tan[P
i/8]]*Cos[Pi/8])/c^(1/8) + (210*ArcTan[(c^(1/8)*Sqrt[x]*Sec[Pi/8]
)/a^(1/8) + Tan[Pi/8]]*Cos[Pi/8])/c^(1/8) - (105*Cos[Pi/8]*Log[a^
(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[x]*Cos[Pi/8]])/c^(1/8)
 + (105*Cos[Pi/8]*Log[a^(1/4) + c^(1/4)*x + 2*a^(1/8)*c^(1/8)*Sqr
t[x]*Cos[Pi/8]])/c^(1/8) - (210*ArcTan[Cot[Pi/8] - (c^(1/8)*Sqrt[
x]*Csc[Pi/8])/a^(1/8)]*Sin[Pi/8])/c^(1/8) + (210*ArcTan[Cot[Pi/8]
 + (c^(1/8)*Sqrt[x]*Csc[Pi/8])/a^(1/8)]*Sin[Pi/8])/c^(1/8) - (105
*Log[a^(1/4) + c^(1/4)*x - 2*a^(1/8)*c^(1/8)*Sqrt[x]*Sin[Pi/8]]*S
in[Pi/8])/c^(1/8) + (105*Log[a^(1/4) + c^(1/4)*x + 2*a^(1/8)*c^(1
/8)*Sqrt[x]*Sin[Pi/8]]*Sin[Pi/8])/c^(1/8))/(512*a^(23/8))
```

Maple [C] time = 0.026, size = 62, normalized size = 0.2

$$2\,\frac{1}{\left(cx^{4}+a\right)^{2}}\left(\frac{23\sqrt{x}}{128\,a}+\frac{15\,cx^{9/2}}{128\,a^{2}}\right)+\frac{105}{512\,a^{2}c}\sum_{\_R=RootOf\left(\_Z^{8}c+a\right)}\frac{1}{\_R^{7}}\ln\left(\sqrt{x}-\_R\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(c*x^4+a)^3/x^(1/2),x)
```

```
[Out] 2*(23/128*x^(1/2)/a+15/128/a^2*c*x^(9/2))/(c*x^4+a)^2+105/512/a^2
/c*sum(1/_R^7*ln(x^(1/2)-_R),_R=RootOf(_Z^8*c+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-105\,c\int \frac{x^{\frac{7}{2}}}{128\,(a^3cx^4+a^4)}\,dx+\frac{105\,c^2x^{\frac{17}{2}}+225\,acx^{\frac{9}{2}}+128\,a^2\sqrt{x}}{64\,(a^3c^2x^8+2\,a^4cx^4+a^5)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)^3*sqrt(x)),x, algorithm="maxima")
```

```
[Out] -105*c*integrate(1/128*x^(7/2)/(a^3*c*x^4 + a^4), x) + 1/64*(105*
c^2*x^(17/2) + 225*a*c*x^(9/2) + 128*a^2*sqrt(x))/(a^3*c^2*x^8 +
2*a^4*c*x^4 + a^5)
```

Fricas [A] time = 0.258798, size = 849, normalized size = 2.58

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)^3*sqrt(x)),x, algorithm="fricas")
```

```
[Out] -1/1024*sqrt(2)*(420*sqrt(2)*(a^2*c^2*x^8 + 2*a^3*c*x^4 + a^4)*(-
1/(a^23*c))^(1/8)*arctan(a^3*(-1/(a^23*c))^(1/8)/(sqrt(a^6*(-1/(a
^23*c))^(1/4) + x) + sqrt(x))) - 105*sqrt(2)*(a^2*c^2*x^8 + 2*a^3
*c*x^4 + a^4)*(-1/(a^23*c))^(1/8)*log(a^3*(-1/(a^23*c))^(1/8) + s
qrt(x)) + 105*sqrt(2)*(a^2*c^2*x^8 + 2*a^3*c*x^4 + a^4)*(-1/(a^23
*c))^(1/8)*log(-a^3*(-1/(a^23*c))^(1/8) + sqrt(x)) + 420*(a^2*c^2
*x^8 + 2*a^3*c*x^4 + a^4)*(-1/(a^23*c))^(1/8)*arctan(a^3*(-1/(a^2
3*c))^(1/8)/(a^3*(-1/(a^23*c))^(1/8) + sqrt(2)*sqrt(x) + sqrt(2*a
^6*(-1/(a^23*c))^(1/4) + 2*sqrt(2)*a^3*sqrt(x)*(-1/(a^23*c))^(1/8
) + 2*x))) + 420*(a^2*c^2*x^8 + 2*a^3*c*x^4 + a^4)*(-1/(a^23*c))^
(1/8)*arctan(-a^3*(-1/(a^23*c))^(1/8)/(a^3*(-1/(a^23*c))^(1/8) -
sqrt(2)*sqrt(x) - sqrt(2*a^6*(-1/(a^23*c))^(1/4) - 2*sqrt(2)*a^3*
sqrt(x)*(-1/(a^23*c))^(1/8) + 2*x))) - 105*(a^2*c^2*x^8 + 2*a^3*c
*x^4 + a^4)*(-1/(a^23*c))^(1/8)*log(2*a^6*(-1/(a^23*c))^(1/4) + 2
*sqrt(2)*a^3*sqrt(x)*(-1/(a^23*c))^(1/8) + 2*x) + 105*(a^2*c^2*x^
8 + 2*a^3*c*x^4 + a^4)*(-1/(a^23*c))^(1/8)*log(2*a^6*(-1/(a^23*c)
)^(1/4) - 2*sqrt(2)*a^3*sqrt(x)*(-1/(a^23*c))^(1/8) + 2*x) - 8*sq
rt(2)*(15*c*x^4 + 23*a)*sqrt(x))/(a^2*c^2*x^8 + 2*a^3*c*x^4 + a^4
)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(c*x**4+a)**3/x**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.335583, size = 626, normalized size = 1.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^4 + a)^3*sqrt(x)),x, algorithm="giac")
```

```
[Out] 105/512*sqrt(sqrt(2) + 2)*(a/c)^(1/8)*arctan((sqrt(-sqrt(2) + 2)*
(a/c)^(1/8) + 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/a^3 + 1
05/512*sqrt(sqrt(2) + 2)*(a/c)^(1/8)*arctan(-(sqrt(-sqrt(2) + 2)*
(a/c)^(1/8) - 2*sqrt(x))/(sqrt(sqrt(2) + 2)*(a/c)^(1/8)))/a^3 + 1
05/512*sqrt(-sqrt(2) + 2)*(a/c)^(1/8)*arctan((sqrt(sqrt(2) + 2)*(
a/c)^(1/8) + 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/a^3 + 1
05/512*sqrt(-sqrt(2) + 2)*(a/c)^(1/8)*arctan(-(sqrt(sqrt(2) + 2)*
(a/c)^(1/8) - 2*sqrt(x))/(sqrt(-sqrt(2) + 2)*(a/c)^(1/8)))/a^3 +
105/1024*sqrt(sqrt(2) + 2)*(a/c)^(1/8)*ln(sqrt(x)*sqrt(sqrt(2) +
2)*(a/c)^(1/8) + x + (a/c)^(1/4))/a^3 - 105/1024*sqrt(sqrt(2) + 2
)*(a/c)^(1/8)*ln(-sqrt(x)*sqrt(sqrt(2) + 2)*(a/c)^(1/8) + x + (a/
c)^(1/4))/a^3 + 105/1024*sqrt(-sqrt(2) + 2)*(a/c)^(1/8)*ln(sqrt(x
)*sqrt(-sqrt(2) + 2)*(a/c)^(1/8) + x + (a/c)^(1/4))/a^3 - 105/102
4*sqrt(-sqrt(2) + 2)*(a/c)^(1/8)*ln(-sqrt(x)*sqrt(-sqrt(2) + 2)*(
a/c)^(1/8) + x + (a/c)^(1/4))/a^3 + 1/64*(15*c*x^(9/2) + 23*a*sqr
t(x))/((c*x^4 + a)^2*a^2)
```

3.762 $\int x^{11}\sqrt{a+cx^4}\,dx$

Optimal. Leaf size=59

$$\frac{a^2\left(a+cx^4\right)^{3/2}}{6c^3}+\frac{\left(a+cx^4\right)^{7/2}}{14c^3}-\frac{a\left(a+cx^4\right)^{5/2}}{5c^3}$$

```
[Out] (a^2*(a + c*x^4)^(3/2))/(6*c^3) - (a*(a + c*x^4)^(5/2))/(5*c^3) +
 (a + c*x^4)^(7/2)/(14*c^3)
```

Rubi [A] time = 0.0815291, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^2\left(a+cx^4\right)^{3/2}}{6c^3}+\frac{\left(a+cx^4\right)^{7/2}}{14c^3}-\frac{a\left(a+cx^4\right)^{5/2}}{5c^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11*Sqrt[a + c*x^4],x]
```

```
[Out] (a^2*(a + c*x^4)^(3/2))/(6*c^3) - (a*(a + c*x^4)^(5/2))/(5*c^3) +
 (a + c*x^4)^(7/2)/(14*c^3)
```

Rubi in Sympy [A] time = 10.5893, size = 49, normalized size = 0.83

$$\frac{a^2\left(a+cx^4\right)^{\frac{3}{2}}}{6c^3}-\frac{a\left(a+cx^4\right)^{\frac{5}{2}}}{5c^3}+\frac{\left(a+cx^4\right)^{\frac{7}{2}}}{14c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11*(c*x**4+a)**(1/2),x)
```

```
[Out] a**2*(a + c*x**4)**(3/2)/(6*c**3) - a*(a + c*x**4)**(5/2)/(5*c**3
) + (a + c*x**4)**(7/2)/(14*c**3)
```

Mathematica [A] time = 0.0280059, size = 50, normalized size = 0.85

$$\frac{\sqrt{a+cx^4}\left(8a^3-4a^2cx^4+3ac^2x^8+15c^3x^{12}\right)}{210c^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11*Sqrt[a + c*x^4],x]
```

```
[Out] (Sqrt[a + c*x^4]*(8*a^3 - 4*a^2*c*x^4 + 3*a*c^2*x^8 + 15*c^3*x^12
))/(210*c^3)
```

Maple [A] time = 0.008, size = 36, normalized size = 0.6

$$\frac{15\,x^8c^2-12\,ax^4c+8\,a^2}{210\,c^3}\left(cx^4+a\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11*(c*x^4+a)^(1/2),x)
```

```
[Out] 1/210*(c*x^4+a)^(3/2)*(15*c^2*x^8-12*a*c*x^4+8*a^2)/c^3
```

Maxima [A] time = 1.4301, size = 63, normalized size = 1.07

$$\frac{\left(cx^4+a\right)^{\frac{7}{2}}}{14\,c^3}-\frac{\left(cx^4+a\right)^{\frac{5}{2}}a}{5\,c^3}+\frac{\left(cx^4+a\right)^{\frac{3}{2}}a^2}{6\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)*x^11,x, algorithm="maxima")
```

```
[Out] 1/14*(c*x^4 + a)^(7/2)/c^3 - 1/5*(c*x^4 + a)^(5/2)*a/c^3 + 1/6*(c
*x^4 + a)^(3/2)*a^2/c^3
```

Fricas [A] time = 0.225684, size = 62, normalized size = 1.05

$$\frac{\left(15\,c^3x^{12}+3\,ac^2x^8-4\,a^2cx^4+8\,a^3\right)\sqrt{cx^4+a}}{210\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)*x^11,x, algorithm="fricas")
```

```
[Out] 1/210*(15*c^3*x^12 + 3*a*c^2*x^8 - 4*a^2*c*x^4 + 8*a^3)*sqrt(c*x^
4 + a)/c^3
```

Sympy [A] time = 9.76098, size = 87, normalized size = 1.47

$$\begin{cases} \frac{4a^3\sqrt{a+cx^4}}{105c^3}-\frac{2a^2x^4\sqrt{a+cx^4}}{105c^2}+\frac{ax^8\sqrt{a+cx^4}}{70c}+\frac{x^{12}\sqrt{a+cx^4}}{14} & \text{for}\ c\neq 0\\ \frac{\sqrt{a}x^{12}}{12} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11*(c*x**4+a)**(1/2),x)
```

```
[Out] Piecewise((4*a**3*sqrt(a + c*x**4)/(105*c**3) - 2*a**2*x**4*sqrt(
a + c*x**4)/(105*c**2) + a*x**8*sqrt(a + c*x**4)/(70*c) + x**12*s
qrt(a + c*x**4)/14, Ne(c, 0)), (sqrt(a)*x**12/12, True))
```

GIAC/XCAS [A] time = 0.21862, size = 58, normalized size = 0.98

$$\frac{15\left(cx^4+a\right)^{\frac{7}{2}}-42\left(cx^4+a\right)^{\frac{5}{2}}a+35\left(cx^4+a\right)^{\frac{3}{2}}a^2}{210\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)*x^11,x, algorithm="giac")
```

```
[Out] 1/210*(15*(c*x^4 + a)^(7/2) - 42*(c*x^4 + a)^(5/2)*a + 35*(c*x^4
+ a)^(3/2)*a^2)/c^3
```

3.763 $\int x^7\sqrt{a+cx^4}\,dx$

Optimal. Leaf size=38

$$\frac{\left(a+cx^4\right)^{5/2}}{10c^2}-\frac{a\left(a+cx^4\right)^{3/2}}{6c^2}$$

```
[Out] -(a*(a + c*x^4)^(3/2))/(6*c^2) + (a + c*x^4)^(5/2)/(10*c^2)
```

Rubi [A] time = 0.05825, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{\left(a+cx^4\right)^{5/2}}{10c^2}-\frac{a\left(a+cx^4\right)^{3/2}}{6c^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7*Sqrt[a + c*x^4],x]

[Out] -(a*(a + c*x^4)^(3/2))/(6*c^2) + (a + c*x^4)^(5/2)/(10*c^2)
```

Rubi in Sympy [A] time = 7.08941, size = 31, normalized size = 0.82

$$-\frac{a\left(a+cx^4\right)^{\frac{3}{2}}}{6c^2}+\frac{\left(a+cx^4\right)^{\frac{5}{2}}}{10c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7*(c*x**4+a)**(1/2),x)

[Out] -a*(a + c*x**4)**(3/2)/(6*c**2) + (a + c*x**4)**(5/2)/(10*c**2)
```

Mathematica [A] time = 0.0221895, size = 38, normalized size = 1.

$$\frac{\sqrt{a+cx^4}\left(-2a^2+acx^4+3c^2x^8\right)}{30c^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^7*Sqrt[a + c*x^4],x]

[Out] (Sqrt[a + c*x^4]*(-2*a^2 + a*c*x^4 + 3*c^2*x^8))/(30*c^2)
```

Maple [A] time = 0.008, size = 25, normalized size = 0.7

$$-\frac{-3\,cx^4+2\,a}{30\,c^2}\left(cx^4+a\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7*(c*x^4+a)^(1/2),x)

[Out] -1/30*(c*x^4+a)^(3/2)*(-3*c*x^4+2*a)/c^2
```

Maxima [A] time = 1.44381, size = 41, normalized size = 1.08

$$\frac{\left(cx^4+a\right)^{\frac{5}{2}}}{10\,c^2}-\frac{\left(cx^4+a\right)^{\frac{3}{2}}a}{6\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)*x^7,x, algorithm="maxima")
```

```
[Out] 1/10*(c*x^4 + a)^(5/2)/c^2 - 1/6*(c*x^4 + a)^(3/2)*a/c^2
```

Fricas [A] time = 0.230666, size = 46, normalized size = 1.21

$$\frac{\left(3\,c^2x^8+acx^4-2\,a^2\right)\sqrt{cx^4+a}}{30\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)*x^7,x, algorithm="fricas")
```

```
[Out] 1/30*(3*c^2*x^8 + a*c*x^4 - 2*a^2)*sqrt(c*x^4 + a)/c^2
```

Sympy [A] time = 2.93014, size = 61, normalized size = 1.61

$$\begin{cases} -\frac{a^2\sqrt{a+cx^4}}{15c^2}+\frac{ax^4\sqrt{a+cx^4}}{30c}+\frac{x^8\sqrt{a+cx^4}}{10} & \text{for } c\neq 0 \\ \frac{\sqrt{a}x^8}{8} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7*(c*x**4+a)**(1/2),x)
```

```
[Out] Piecewise((-a**2*sqrt(a + c*x**4)/(15*c**2) + a*x**4*sqrt(a + c*x
**4)/(30*c) + x**8*sqrt(a + c*x**4)/10, Ne(c, 0)), (sqrt(a)*x**8/
8, True))
```

GIAC/XCAS [A] time = 0.2133, size = 39, normalized size = 1.03

$$\frac{3\left(cx^4+a\right)^{\frac{5}{2}}-5\left(cx^4+a\right)^{\frac{3}{2}}a}{30\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)*x^7,x, algorithm="giac")
```

```
[Out] 1/30*(3*(c*x^4 + a)^(5/2) - 5*(c*x^4 + a)^(3/2)*a)/c^2
```

3.764 $\int x^3\sqrt{a+cx^4}\,dx$

Optimal. Leaf size=18

$$\frac{\left(a+cx^4\right)^{3/2}}{6c}$$

```
[Out] (a + c*x^4)^(3/2)/(6*c)
```

Rubi [A] time = 0.0100257, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{\left(a+cx^4\right)^{3/2}}{6c}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3*Sqrt[a + c*x^4],x]

[Out] (a + c*x^4)^(3/2)/(6*c)
```

Rubi in Sympy [A] time = 2.12814, size = 12, normalized size = 0.67

$$\frac{\left(a+cx^4\right)^{\frac{3}{2}}}{6c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3*(c*x**4+a)**(1/2),x)

[Out] (a + c*x**4)**(3/2)/(6*c)
```

Mathematica [A] time = 0.00862258, size = 18, normalized size = 1.

$$\frac{\left(a+cx^4\right)^{3/2}}{6c}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3*Sqrt[a + c*x^4],x]

[Out] (a + c*x^4)^(3/2)/(6*c)
```

Maple [A] time = 0.007, size = 15, normalized size = 0.8

$$\frac{1}{6\,c}\left(cx^4+a\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3*(c*x^4+a)^(1/2),x)

[Out] 1/6*(c*x^4+a)^(3/2)/c
```

Maxima [A] time = 1.43666, size = 19, normalized size = 1.06

$$\frac{\left(cx^4+a\right)^{\frac{3}{2}}}{6\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)*x^3,x, algorithm="maxima")
```

```
[Out] 1/6*(c*x^4 + a)^(3/2)/c
```

Fricas [A] time = 0.244807, size = 19, normalized size = 1.06

$$\frac{\left(cx^4+a\right)^{\frac{3}{2}}}{6\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)*x^3,x, algorithm="fricas")
```

```
[Out] 1/6*(c*x^4 + a)^(3/2)/c
```

Sympy [A] time = 0.659839, size = 39, normalized size = 2.17

$$\begin{cases} \frac{a\sqrt{a+cx^4}}{6c} + \frac{x^4\sqrt{a+cx^4}}{6} & \text{for } c \neq 0 \\ \frac{\sqrt{a}x^4}{4} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(c*x**4+a)**(1/2),x)
```

```
[Out] Piecewise((a*sqrt(a + c*x**4)/(6*c) + x**4*sqrt(a + c*x**4)/6, Ne
(c, 0)), (sqrt(a)*x**4/4, True))
```

GIAC/XCAS [A] time = 0.214001, size = 19, normalized size = 1.06

$$\frac{\left(cx^4+a\right)^{\frac{3}{2}}}{6\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)*x^3,x, algorithm="giac")
```

```
[Out] 1/6*(c*x^4 + a)^(3/2)/c
```

3.765 $\int \frac{\sqrt{a+cx^4}}{x}\,dx$

Optimal. Leaf size=43

$$\frac{1}{2}\sqrt{a+cx^4}-\frac{1}{2}\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+cx^4}}{\sqrt{a}}\right)$$

```
[Out] Sqrt[a + c*x^4]/2 - (Sqrt[a]*ArcTanh[Sqrt[a + c*x^4]/Sqrt[a]])/2
```

Rubi [A] time = 0.0673404, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{1}{2}\sqrt{a+cx^4}-\frac{1}{2}\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+cx^4}}{\sqrt{a}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + c*x^4]/x,x]
```

```
[Out] Sqrt[a + c*x^4]/2 - (Sqrt[a]*ArcTanh[Sqrt[a + c*x^4]/Sqrt[a]])/2
```

Rubi in Sympy [A] time = 6.69605, size = 34, normalized size = 0.79

$$-\frac{\sqrt{a}\operatorname{atanh}\left(\frac{\sqrt{a+cx^4}}{\sqrt{a}}\right)}{2}+\frac{\sqrt{a+cx^4}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**(1/2)/x,x)
```

```
[Out] -sqrt(a)*atanh(sqrt(a + c*x**4)/sqrt(a))/2 + sqrt(a + c*x**4)/2
```

Mathematica [A] time = 0.0699035, size = 43, normalized size = 1.

$$\frac{1}{2}\sqrt{a+cx^4}-\frac{1}{2}\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+cx^4}}{\sqrt{a}}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + c*x^4]/x,x]
```

```
[Out] Sqrt[a + c*x^4]/2 - (Sqrt[a]*ArcTanh[Sqrt[a + c*x^4]/Sqrt[a]])/2
```

Maple [A] time = 0.017, size = 41, normalized size = 1.

$$\frac{1}{2}\sqrt{cx^4+a}-\frac{1}{2}\sqrt{a}\ln\left(\frac{1}{x^2}\left(2\,a+2\,\sqrt{a}\sqrt{cx^4+a}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)^(1/2)/x,x)
```

```
[Out] 1/2*(c*x^4+a)^(1/2)-1/2*a^(1/2)*ln((2*a+2*a^(1/2)*(c*x^4+a)^(1/2)
)/x^2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.277143, size = 1, normalized size = 0.02

$$\left[\frac{1}{4}\sqrt{a}\log\left(\frac{cx^4 - 2\sqrt{cx^4 + a}\sqrt{a} + 2a}{x^4}\right) + \frac{1}{2}\sqrt{cx^4 + a}, -\frac{1}{2}\sqrt{-a}\arctan\left(\frac{\sqrt{cx^4 + a}}{\sqrt{-a}}\right) + \frac{1}{2}\sqrt{cx^4 + a}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x,x, algorithm="fricas")
```

```
[Out] [1/4*sqrt(a)*log((c*x^4 - 2*sqrt(c*x^4 + a)*sqrt(a) + 2*a)/x^4) +
 1/2*sqrt(c*x^4 + a), -1/2*sqrt(-a)*arctan(sqrt(c*x^4 + a)/sqrt(-
a)) + 1/2*sqrt(c*x^4 + a)]
```

Sympy [A] time = 4.81135, size = 66, normalized size = 1.53

$$-\frac{\sqrt{a}\operatorname{asinh}\left(\frac{\sqrt{a}}{\sqrt{c}x^2}\right)}{2} + \frac{a}{2\sqrt{c}x^2\sqrt{\frac{a}{cx^4} + 1}} + \frac{\sqrt{c}x^2}{2\sqrt{\frac{a}{cx^4} + 1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**(1/2)/x,x)
```

```
[Out] -sqrt(a)*asinh(sqrt(a)/(sqrt(c)*x**2))/2 + a/(2*sqrt(c)*x**2*sqrt
(a/(c*x**4) + 1)) + sqrt(c)*x**2/(2*sqrt(a/(c*x**4) + 1))
```

GIAC/XCAS [A] time = 0.217072, size = 49, normalized size = 1.14

$$\frac{a\arctan\left(\frac{\sqrt{cx^4+a}}{\sqrt{-a}}\right)}{2\sqrt{-a}} + \frac{1}{2}\sqrt{cx^4 + a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x,x, algorithm="giac")
```

```
[Out] 1/2*a*arctan(sqrt(c*x^4 + a)/sqrt(-a))/sqrt(-a) + 1/2*sqrt(c*x^4
+ a)
```

3.766 $\int \frac{\sqrt{a+cx^4}}{x^5} dx$

Optimal. Leaf size=47

$$-\frac{\sqrt{a+cx^4}}{4x^4}-\frac{c\tanh^{-1}\left(\frac{\sqrt{a+cx^4}}{\sqrt{a}}\right)}{4\sqrt{a}}$$

```
[Out] -Sqrt[a + c*x^4]/(4*x^4) - (c*ArcTanh[Sqrt[a + c*x^4]/Sqrt[a]])/(
4*Sqrt[a])
```

Rubi [A] time = 0.0683244, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{\sqrt{a+cx^4}}{4x^4}-\frac{c\tanh^{-1}\left(\frac{\sqrt{a+cx^4}}{\sqrt{a}}\right)}{4\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + c*x^4]/x^5,x]
```

```
[Out] -Sqrt[a + c*x^4]/(4*x^4) - (c*ArcTanh[Sqrt[a + c*x^4]/Sqrt[a]])/(
4*Sqrt[a])
```

Rubi in Sympy [A] time = 6.93961, size = 41, normalized size = 0.87

$$-\frac{\sqrt{a+cx^4}}{4x^4}-\frac{c\,\text{atanh}\left(\frac{\sqrt{a+cx^4}}{\sqrt{a}}\right)}{4\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**(1/2)/x**5,x)
```

```
[Out] -sqrt(a + c*x**4)/(4*x**4) - c*atanh(sqrt(a + c*x**4)/sqrt(a))/(4
*sqrt(a))
```

Mathematica [A] time = 0.0769847, size = 47, normalized size = 1.

$$-\frac{\sqrt{a+cx^4}}{4x^4}-\frac{c\tanh^{-1}\left(\frac{\sqrt{a+cx^4}}{\sqrt{a}}\right)}{4\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + c*x^4]/x^5,x]
```

```
[Out] -Sqrt[a + c*x^4]/(4*x^4) - (c*ArcTanh[Sqrt[a + c*x^4]/Sqrt[a]])/(
4*Sqrt[a])
```

Maple [A] time = 0.014, size = 63, normalized size = 1.3

$$-\frac{1}{4\,a{x}^{4}}\left(c{x}^{4}+a\right)^{\frac{3}{2}}-\frac{c}{4}\ln\left(\frac{1}{{x}^{2}}\left(2\,a+2\,\sqrt{a}\sqrt{c{x}^{4}+a}\right)\right)\frac{1}{\sqrt{a}}+\frac{c}{4\,a}\sqrt{c{x}^{4}+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)^(1/2)/x^5,x)
```

```
[Out] -1/4/a/x^4*(c*x^4+a)^(3/2)-1/4/a^(1/2)*c*ln((2*a+2*a^(1/2)*(c*x^4
+a)^(1/2))/x^2)+1/4/a*c*(c*x^4+a)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x^5,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.266395, size = 1, normalized size = 0.02

$$\left[\frac{cx^4\log\left(\frac{(cx^4+2\,a)\,\sqrt{a}-2\,\sqrt{cx^4+a}a}{x^4}\right)-2\,\sqrt{cx^4+a}\sqrt{a}}{8\,\sqrt{a}x^4},\ \frac{cx^4\arctan\left(\frac{a}{\sqrt{cx^4+a}\sqrt{-a}}\right)-\sqrt{cx^4+a}\sqrt{-a}}{4\,\sqrt{-a}x^4}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x^5,x, algorithm="fricas")
```

```
[Out] [1/8*(c*x^4*log(((c*x^4 + 2*a)*sqrt(a) - 2*sqrt(c*x^4 + a)*a)/x^4
) - 2*sqrt(c*x^4 + a)*sqrt(a))/(sqrt(a)*x^4), 1/4*(c*x^4*arctan(a
/(sqrt(c*x^4 + a)*sqrt(-a))) - sqrt(c*x^4 + a)*sqrt(-a))/(sqrt(-a
)*x^4)]
```

Sympy [A] time = 6.79009, size = 46, normalized size = 0.98

$$-\frac{\sqrt{c}\sqrt{\frac{a}{cx^4}+1}}{4x^2}-\frac{c\,\mathrm{asinh}\left(\frac{\sqrt{a}}{\sqrt{c}x^2}\right)}{4\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**(1/2)/x**5,x)
```

```
[Out] -sqrt(c)*sqrt(a/(c*x**4) + 1)/(4*x**2) - c*asinh(sqrt(a)/(sqrt(c)
*x**2))/(4*sqrt(a))
```

GIAC/XCAS [A] time = 0.216746, size = 58, normalized size = 1.23

$$\frac{1}{4}\,c\left(\frac{\arctan\left(\frac{\sqrt{cx^4+a}}{\sqrt{-a}}\right)}{\sqrt{-a}}-\frac{\sqrt{cx^4+a}}{cx^4}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x^5,x, algorithm="giac")
```

```
[Out] 1/4*c*(arctan(sqrt(c*x^4 + a)/sqrt(-a))/sqrt(-a) - sqrt(c*x^4 + a
)/(c*x^4))
```

3.767 $\int \frac{\sqrt{a+cx^4}}{x^9}\,dx$

Optimal. Leaf size=71

$$\frac{c^2\tanh^{-1}\left(\frac{\sqrt{a+cx^4}}{\sqrt{a}}\right)}{16a^{3/2}}-\frac{c\sqrt{a+cx^4}}{16ax^4}-\frac{\sqrt{a+cx^4}}{8x^8}$$

```
[Out] -Sqrt[a + c*x^4]/(8*x^8) - (c*Sqrt[a + c*x^4])/(16*a*x^4) + (c^2*
ArcTanh[Sqrt[a + c*x^4]/Sqrt[a]])/(16*a^(3/2))
```

Rubi [A] time = 0.0978562, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{c^2\tanh^{-1}\left(\frac{\sqrt{a+cx^4}}{\sqrt{a}}\right)}{16a^{3/2}}-\frac{c\sqrt{a+cx^4}}{16ax^4}-\frac{\sqrt{a+cx^4}}{8x^8}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + c*x^4]/x^9,x]
```

```
[Out] -Sqrt[a + c*x^4]/(8*x^8) - (c*Sqrt[a + c*x^4])/(16*a*x^4) + (c^2*
ArcTanh[Sqrt[a + c*x^4]/Sqrt[a]])/(16*a^(3/2))
```

Rubi in Sympy [A] time = 9.70185, size = 60, normalized size = 0.85

$$-\frac{\sqrt{a+cx^4}}{8x^8}-\frac{c\sqrt{a+cx^4}}{16ax^4}+\frac{c^2\operatorname{atanh}\left(\frac{\sqrt{a+cx^4}}{\sqrt{a}}\right)}{16a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**(1/2)/x**9,x)
```

```
[Out] -sqrt(a + c*x**4)/(8*x**8) - c*sqrt(a + c*x**4)/(16*a*x**4) + c**
2*atanh(sqrt(a + c*x**4)/sqrt(a))/(16*a**(3/2))
```

Mathematica [A] time = 0.0971865, size = 62, normalized size = 0.87

$$\frac{c^2\tanh^{-1}\left(\frac{\sqrt{a+cx^4}}{\sqrt{a}}\right)}{16a^{3/2}}+\left(-\frac{c}{16ax^4}-\frac{1}{8x^8}\right)\sqrt{a+cx^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + c*x^4]/x^9,x]
```

```
[Out] (-1/(8*x^8) - c/(16*a*x^4))*Sqrt[a + c*x^4] + (c^2*ArcTanh[Sqrt[a
 + c*x^4]/Sqrt[a]])/(16*a^(3/2))
```

Maple [A] time = 0.018, size = 85, normalized size = 1.2

$$-\frac{1}{8\,ax^8}\left(cx^4+a\right)^{\frac{3}{2}}+\frac{c}{16\,x^4a^2}\left(cx^4+a\right)^{\frac{3}{2}}+\frac{c^2}{16}\ln\left(\frac{1}{x^2}\left(2\,a+2\,\sqrt{a}\sqrt{cx^4+a}\right)\right)a^{-\frac{3}{2}}-\frac{c^2}{16\,a^2}\sqrt{cx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)^(1/2)/x^9,x)
```

```
[Out] -1/8/a/x^8*(c*x^4+a)^(3/2)+1/16/a^2*c/x^4*(c*x^4+a)^(3/2)+1/16/a^
(3/2)*c^2*ln((2*a+2*a^(1/2)*(c*x^4+a)^(1/2))/x^2)-1/16/a^2*c^2*(c
*x^4+a)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x^9,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.274445, size = 1, normalized size = 0.01

$$\left[\frac{c^2x^8\log\left(\frac{(cx^4+2\,a)\,\sqrt{a}+2\,\sqrt{cx^4+a}a}{x^4}\right)-2\,(cx^4+2\,a)\,\sqrt{cx^4+a}\sqrt{a}}{32\,a^{\frac{3}{2}}x^8},\right.$$
$$\left.-\frac{c^2x^8\arctan\left(\frac{a}{\sqrt{cx^4+a}\sqrt{-a}}\right)+(cx^4+2\,a)\,\sqrt{cx^4+a}\sqrt{-a}}{16\,\sqrt{-a}ax^8}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x^9,x, algorithm="fricas")
```

```
[Out] [1/32*(c^2*x^8*log(((c*x^4 + 2*a)*sqrt(a) + 2*sqrt(c*x^4 + a)*a)/
x^4) - 2*(c*x^4 + 2*a)*sqrt(c*x^4 + a)*sqrt(a))/(a^(3/2)*x^8), -1
/16*(c^2*x^8*arctan(a/(sqrt(c*x^4 + a)*sqrt(-a))) + (c*x^4 + 2*a)
*sqrt(c*x^4 + a)*sqrt(-a))/(sqrt(-a)*a*x^8)]
```

Sympy [A] time = 13.7271, size = 95, normalized size = 1.34

$$-\frac{a}{8\sqrt{c}x^{10}\sqrt{\frac{a}{cx^4}+1}}-\frac{3\sqrt{c}}{16x^6\sqrt{\frac{a}{cx^4}+1}}-\frac{c^{\frac{3}{2}}}{16ax^2\sqrt{\frac{a}{cx^4}+1}}+\frac{c^2\operatorname{asinh}\left(\frac{\sqrt{a}}{\sqrt{c}x^2}\right)}{16a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**(1/2)/x**9,x)
```

```
[Out] -a/(8*sqrt(c)*x**10*sqrt(a/(c*x**4) + 1)) - 3*sqrt(c)/(16*x**6*sq
rt(a/(c*x**4) + 1)) - c**(3/2)/(16*a*x**2*sqrt(a/(c*x**4) + 1)) +
 c**2*asinh(sqrt(a)/(sqrt(c)*x**2))/(16*a**(3/2))
```

GIAC/XCAS [A] time = 0.219816, size = 84, normalized size = 1.18

$$-\frac{1}{16}\,c^2\left(\frac{\arctan\left(\frac{\sqrt{cx^4+a}}{\sqrt{-a}}\right)}{\sqrt{-a}a}+\frac{(cx^4+a)^{\frac{3}{2}}+\sqrt{cx^4+a}a}{ac^2x^8}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x^9,x, algorithm="giac")
```

```
[Out] -1/16*c^2*(arctan(sqrt(c*x^4 + a)/sqrt(-a))/(sqrt(-a)*a) + ((c*x^
4 + a)^(3/2) + sqrt(c*x^4 + a)*a)/(a*c^2*x^8))
```

3.768 $\int x^5\sqrt{a+cx^4}\,dx$

Optimal. Leaf size=74

$$-\frac{a^2\tanh^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a+cx^4}}\right)}{16c^{3/2}}+\frac{1}{8}x^6\sqrt{a+cx^4}+\frac{ax^2\sqrt{a+cx^4}}{16c}$$

```
[Out] (a*x^2*Sqrt[a + c*x^4])/(16*c) + (x^6*Sqrt[a + c*x^4])/8 - (a^2*A
rcTanh[(Sqrt[c]*x^2)/Sqrt[a + c*x^4]])/(16*c^(3/2))
```

Rubi [A] time = 0.108596, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{a^2\tanh^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a+cx^4}}\right)}{16c^{3/2}}+\frac{1}{8}x^6\sqrt{a+cx^4}+\frac{ax^2\sqrt{a+cx^4}}{16c}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5*Sqrt[a + c*x^4],x]
```

```
[Out] (a*x^2*Sqrt[a + c*x^4])/(16*c) + (x^6*Sqrt[a + c*x^4])/8 - (a^2*A
rcTanh[(Sqrt[c]*x^2)/Sqrt[a + c*x^4]])/(16*c^(3/2))
```

Rubi in Sympy [A] time = 11.5531, size = 63, normalized size = 0.85

$$-\frac{a^2\operatorname{atanh}\left(\frac{\sqrt{c}x^2}{\sqrt{a+cx^4}}\right)}{16c^{\frac{3}{2}}}+\frac{ax^2\sqrt{a+cx^4}}{16c}+\frac{x^6\sqrt{a+cx^4}}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5*(c*x**4+a)**(1/2),x)
```

```
[Out] -a**2*atanh(sqrt(c)*x**2/sqrt(a + c*x**4))/(16*c**(3/2)) + a*x**2
*sqrt(a + c*x**4)/(16*c) + x**6*sqrt(a + c*x**4)/8
```

Mathematica [A] time = 0.052737, size = 67, normalized size = 0.91

$$\frac{\sqrt{c}x^2\sqrt{a+cx^4}\left(a+2cx^4\right)-a^2\log\left(\sqrt{c}\sqrt{a+cx^4}+cx^2\right)}{16c^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5*Sqrt[a + c*x^4],x]
```

```
[Out] (Sqrt[c]*x^2*Sqrt[a + c*x^4]*(a + 2*c*x^4) - a^2*Log[c*x^2 + Sqrt
[c]*Sqrt[a + c*x^4]])/(16*c^(3/2))
```

Maple [A] time = 0.019, size = 63, normalized size = 0.9

$$\frac{x^2}{8\,c}\left(cx^4+a\right)^{\frac{3}{2}}-\frac{ax^2}{16\,c}\sqrt{cx^4+a}-\frac{a^2}{16}\ln\left(x^2\sqrt{c}+\sqrt{cx^4+a}\right)c^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5*(c*x^4+a)^(1/2),x)
```

```
[Out] 1/8*x^2*(c*x^4+a)^(3/2)/c-1/16*a*x^2*(c*x^4+a)^(1/2)/c-1/16*a^2/c
^(3/2)*ln(x^2*c^(1/2)+(c*x^4+a)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)*x^5,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.253611, size = 1, normalized size = 0.01

$$\left[\frac{a^2 \log\left(2\sqrt{cx^4+a}cx^2 - \left(2\,cx^4+a\right)\sqrt{c}\right) + 2\left(2\,cx^6+ax^2\right)\sqrt{cx^4+a}\sqrt{c}}{32\,c^{\frac{3}{2}}},\right.$$
$$\left.-\frac{a^2 \arctan\left(\frac{\sqrt{-c}x^2}{\sqrt{cx^4+a}}\right) - \left(2\,cx^6+ax^2\right)\sqrt{cx^4+a}\sqrt{-c}}{16\sqrt{-c}c}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)*x^5,x, algorithm="fricas")
```

```
[Out] [1/32*(a^2*log(2*sqrt(c*x^4 + a)*c*x^2 - (2*c*x^4 + a)*sqrt(c)) +
 2*(2*c*x^6 + a*x^2)*sqrt(c*x^4 + a)*sqrt(c))/c^(3/2), -1/16*(a^2
*arctan(sqrt(-c)*x^2/sqrt(c*x^4 + a)) - (2*c*x^6 + a*x^2)*sqrt(c*
x^4 + a)*sqrt(-c))/(sqrt(-c)*c)]
```

Sympy [A] time = 11.9362, size = 95, normalized size = 1.28

$$\frac{a^{\frac{3}{2}}x^2}{16c\sqrt{1+\frac{cx^4}{a}}} + \frac{3\sqrt{a}x^6}{16\sqrt{1+\frac{cx^4}{a}}} - \frac{a^2 \operatorname{asinh}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{16c^{\frac{3}{2}}} + \frac{cx^{10}}{8\sqrt{a}\sqrt{1+\frac{cx^4}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5*(c*x**4+a)**(1/2),x)
```

```
[Out] a**(3/2)*x**2/(16*c*sqrt(1 + c*x**4/a)) + 3*sqrt(a)*x**6/(16*sqrt
(1 + c*x**4/a)) - a**2*asinh(sqrt(c)*x**2/sqrt(a))/(16*c**(3/2))
+ c*x**10/(8*sqrt(a)*sqrt(1 + c*x**4/a))
```

GIAC/XCAS [A] time = 0.230994, size = 73, normalized size = 0.99

$$\frac{1}{16}\sqrt{cx^4+a}\left(2\,x^4+\frac{a}{c}\right)x^2 + \frac{a^2 \ln\left(\left|-\sqrt{c}x^2+\sqrt{cx^4+a}\right|\right)}{16\,c^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)*x^5,x, algorithm="giac")
```

```
[Out] 1/16*sqrt(c*x^4 + a)*(2*x^4 + a/c)*x^2 + 1/16*a^2*ln(abs(-sqrt(c)
*x^2 + sqrt(c*x^4 + a)))/c^(3/2)
```

3.769 $\int x\sqrt{a+cx^4}\,dx$

Optimal. Leaf size=50

$$\frac{1}{4}x^2\sqrt{a+cx^4}+\frac{a\tanh^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a+cx^4}}\right)}{4\sqrt{c}}$$

```
[Out] (x^2*Sqrt[a + c*x^4])/4 + (a*ArcTanh[(Sqrt[c]*x^2)/Sqrt[a + c*x^4
]])/(4*Sqrt[c])
```

Rubi [A] time = 0.0561052, antiderivative size = 50, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{1}{4}x^2\sqrt{a+cx^4}+\frac{a\tanh^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a+cx^4}}\right)}{4\sqrt{c}}$$

Antiderivative was successfully verified.

```
[In] Int[x*Sqrt[a + c*x^4],x]
```

```
[Out] (x^2*Sqrt[a + c*x^4])/4 + (a*ArcTanh[(Sqrt[c]*x^2)/Sqrt[a + c*x^4
]])/(4*Sqrt[c])
```

Rubi in Sympy [A] time = 5.11774, size = 42, normalized size = 0.84

$$\frac{a\operatorname{atanh}\left(\frac{\sqrt{c}x^2}{\sqrt{a+cx^4}}\right)}{4\sqrt{c}}+\frac{x^2\sqrt{a+cx^4}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x*(c*x**4+a)**(1/2),x)
```

```
[Out] a*atanh(sqrt(c)*x**2/sqrt(a + c*x**4))/(4*sqrt(c)) + x**2*sqrt(a
+ c*x**4)/4
```

Mathematica [A] time = 0.0293181, size = 53, normalized size = 1.06

$$\frac{1}{4}x^2\sqrt{a+cx^4}+\frac{a\log\left(\sqrt{c}\sqrt{a+cx^4}+cx^2\right)}{4\sqrt{c}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*Sqrt[a + c*x^4],x]
```

```
[Out] (x^2*Sqrt[a + c*x^4])/4 + (a*Log[c*x^2 + Sqrt[c]*Sqrt[a + c*x^4]]
)/(4*Sqrt[c])
```

Maple [A] time = 0.009, size = 40, normalized size = 0.8

$$\frac{x^2}{4}\sqrt{cx^4+a}+\frac{a}{4}\ln\left(x^2\sqrt{c}+\sqrt{cx^4+a}\right)\frac{1}{\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x*(c*x^4+a)^(1/2),x)
```

```
[Out] 1/4*x^2*(c*x^4+a)^(1/2)+1/4*a/c^(1/2)*ln(x^2*c^(1/2)+(c*x^4+a)^(1
/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(c*x^4 + a)*x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.29485, size = 1, normalized size = 0.02

$$\left[\frac{2\sqrt{cx^4+a}\sqrt{c}x^2 + a\log\left(-2\sqrt{cx^4+a}cx^2 - \left(2cx^4+a\right)\sqrt{c}\right)}{8\sqrt{c}}, \frac{\sqrt{cx^4+a}\sqrt{-c}x^2 + a\arctan\left(\frac{\sqrt{-c}x^2}{\sqrt{cx^4+a}}\right)}{4\sqrt{-c}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(c*x^4 + a)*x,x, algorithm="fricas")
```

```
[Out] [1/8*(2*sqrt(c*x^4 + a)*sqrt(c)*x^2 + a*log(-2*sqrt(c*x^4 + a)*c*
x^2 - (2*c*x^4 + a)*sqrt(c)))/sqrt(c), 1/4*(sqrt(c*x^4 + a)*sqrt(
-c)*x^2 + a*arctan(sqrt(-c)*x^2/sqrt(c*x^4 + a)))/sqrt(-c)]
```

Sympy [A] time = 6.24094, size = 44, normalized size = 0.88

$$\frac{\sqrt{a}x^2\sqrt{1+\frac{cx^4}{a}}}{4} + \frac{a\operatorname{asinh}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{4\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x*(c*x**4+a)**(1/2),x)
```

```
[Out] sqrt(a)*x**2*sqrt(1 + c*x**4/a)/4 + a*asinh(sqrt(c)*x**2/sqrt(a))
/(4*sqrt(c))
```

GIAC/XCAS [A] time = 0.217435, size = 55, normalized size = 1.1

$$\frac{1}{4}\sqrt{cx^4+a}x^2 - \frac{a\ln\left(\left|-\sqrt{c}x^2 + \sqrt{cx^4+a}\right|\right)}{4\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(c*x^4 + a)*x,x, algorithm="giac")
```

```
[Out] 1/4*sqrt(c*x^4 + a)*x^2 - 1/4*a*ln(abs(-sqrt(c)*x^2 + sqrt(c*x^4
+ a)))/sqrt(c)
```

3.770 $\int \frac{\sqrt{a+cx^4}}{x^3} dx$

Optimal. Leaf size=49

$$\frac{1}{2}\sqrt{c}\tanh^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a+cx^4}}\right)-\frac{\sqrt{a+cx^4}}{2x^2}$$

```
[Out] -Sqrt[a + c*x^4]/(2*x^2) + (Sqrt[c]*ArcTanh[(Sqrt[c]*x^2)/Sqrt[a
+ c*x^4]])/2
```

Rubi [A] time = 0.0665315, antiderivative size = 49, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{1}{2}\sqrt{c}\tanh^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a+cx^4}}\right)-\frac{\sqrt{a+cx^4}}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + c*x^4]/x^3,x]
```

```
[Out] -Sqrt[a + c*x^4]/(2*x^2) + (Sqrt[c]*ArcTanh[(Sqrt[c]*x^2)/Sqrt[a
+ c*x^4]])/2
```

Rubi in Sympy [A] time = 7.07481, size = 41, normalized size = 0.84

$$\frac{\sqrt{c}\,\text{atanh}\left(\frac{\sqrt{c}x^2}{\sqrt{a+cx^4}}\right)}{2}-\frac{\sqrt{a+cx^4}}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**(1/2)/x**3,x)
```

```
[Out] sqrt(c)*atanh(sqrt(c)*x**2/sqrt(a + c*x**4))/2 - sqrt(a + c*x**4)
/(2*x**2)
```

Mathematica [A] time = 0.0607901, size = 49, normalized size = 1.

$$\frac{1}{2}\sqrt{c}\tanh^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a+cx^4}}\right)-\frac{\sqrt{a+cx^4}}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + c*x^4]/x^3,x]
```

```
[Out] -Sqrt[a + c*x^4]/(2*x^2) + (Sqrt[c]*ArcTanh[(Sqrt[c]*x^2)/Sqrt[a
+ c*x^4]])/2
```

Maple [A] time = 0.015, size = 60, normalized size = 1.2

$$-\frac{1}{2\,ax^2}\left(cx^4+a\right)^{\frac{3}{2}}+\frac{cx^2}{2\,a}\sqrt{cx^4+a}+\frac{1}{2}\sqrt{c}\ln\left(x^2\sqrt{c}+\sqrt{cx^4+a}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)^(1/2)/x^3,x)
```

```
[Out] -1/2/a/x^2*(c*x^4+a)^(3/2)+1/2/a*c*x^2*(c*x^4+a)^(1/2)+1/2*c^(1/2
)*ln(x^2*c^(1/2)+(c*x^4+a)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.267745, size = 1, normalized size = 0.02

$$\left[\frac{\sqrt{c}x^2\log\left(-2\,cx^4-2\,\sqrt{cx^4+a}\sqrt{c}x^2-a\right)-2\,\sqrt{cx^4+a}}{4\,x^2},\ \frac{\sqrt{-c}x^2\arctan\left(\frac{cx^2}{\sqrt{cx^4+a}\sqrt{-c}}\right)-\sqrt{cx^4+a}}{2\,x^2}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x^3,x, algorithm="fricas")
```

```
[Out] [1/4*(sqrt(c)*x^2*log(-2*c*x^4 - 2*sqrt(c*x^4 + a)*sqrt(c)*x^2 -
a) - 2*sqrt(c*x^4 + a))/x^2, 1/2*(sqrt(-c)*x^2*arctan(c*x^2/(sqrt
(c*x^4 + a)*sqrt(-c))) - sqrt(c*x^4 + a))/x^2]
```

Sympy [A] time = 4.94525, size = 66, normalized size = 1.35

$$-\frac{\sqrt{a}}{2x^2\sqrt{1+\frac{cx^4}{a}}}+\frac{\sqrt{c}\operatorname{asinh}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{2}-\frac{cx^2}{2\sqrt{a}\sqrt{1+\frac{cx^4}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**(1/2)/x**3,x)
```

```
[Out] -sqrt(a)/(2*x**2*sqrt(1 + c*x**4/a)) + sqrt(c)*asinh(sqrt(c)*x**2
/sqrt(a))/2 - c*x**2/(2*sqrt(a)*sqrt(1 + c*x**4/a))
```

GIAC/XCAS [A] time = 0.219232, size = 49, normalized size = 1.

$$-\frac{c\arctan\left(\frac{\sqrt{c+\frac{a}{x^4}}}{\sqrt{-c}}\right)}{2\,\sqrt{-c}}-\frac{1}{2}\,\sqrt{c+\frac{a}{x^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x^3,x, algorithm="giac")
```

```
[Out] -1/2*c*arctan(sqrt(c + a/x^4)/sqrt(-c))/sqrt(-c) - 1/2*sqrt(c + a
/x^4)
```

3.771 $\int \frac{\sqrt{a+cx^4}}{x^7}\,dx$

Optimal. Leaf size=21

$$-\frac{\left(a+cx^4\right)^{3/2}}{6ax^6}$$

```
[Out] -(a + c*x^4)^(3/2)/(6*a*x^6)
```

Rubi [A] time = 0.0191497, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{\left(a+cx^4\right)^{3/2}}{6ax^6}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[a + c*x^4]/x^7,x]
```

```
[Out] -(a + c*x^4)^(3/2)/(6*a*x^6)
```

Rubi in Sympy [A] time = 2.72137, size = 17, normalized size = 0.81

$$-\frac{\left(a+cx^4\right)^{\frac{3}{2}}}{6ax^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((c*x**4+a)**(1/2)/x**7,x)
```

```
[Out] -(a + c*x**4)**(3/2)/(6*a*x**6)
```

Mathematica [A] time = 0.0172468, size = 21, normalized size = 1.

$$-\frac{\left(a+cx^4\right)^{3/2}}{6ax^6}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[a + c*x^4]/x^7,x]
```

```
[Out] -(a + c*x^4)^(3/2)/(6*a*x^6)
```

Maple [A] time = 0.006, size = 18, normalized size = 0.9

$$-\frac{1}{6\,x^6a}\left(cx^4+a\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*x^4+a)^(1/2)/x^7,x)
```

```
[Out] -1/6*(c*x^4+a)^(3/2)/x^6/a
```

Maxima [A] time = 1.44224, size = 23, normalized size = 1.1

$$-\frac{\left(cx^4+a\right)^{\frac{3}{2}}}{6\,ax^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x^7,x, algorithm="maxima")
```

```
[Out] -1/6*(c*x^4 + a)^(3/2)/(a*x^6)
```

Fricas [A] time = 0.245211, size = 23, normalized size = 1.1

$$-\frac{\left(cx^4+a\right)^{\frac{3}{2}}}{6\,ax^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x^7,x, algorithm="fricas")
```

```
[Out] -1/6*(c*x^4 + a)^(3/2)/(a*x^6)
```

Sympy [A] time = 2.83673, size = 42, normalized size = 2.

$$-\frac{\sqrt{c}\sqrt{\frac{a}{cx^4}+1}}{6x^4}-\frac{c^{\frac{3}{2}}\sqrt{\frac{a}{cx^4}+1}}{6a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**(1/2)/x**7,x)
```

```
[Out] -sqrt(c)*sqrt(a/(c*x**4) + 1)/(6*x**4) - c**(3/2)*sqrt(a/(c*x**4)
 + 1)/(6*a)
```

GIAC/XCAS [A] time = 0.214957, size = 19, normalized size = 0.9

$$-\frac{\left(c+\frac{a}{x^4}\right)^{\frac{3}{2}}}{6\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x^7,x, algorithm="giac")
```

```
[Out] -1/6*(c + a/x^4)^(3/2)/a
```

3.772 $\int \frac{\sqrt{a+cx^4}}{x^{11}} \, dx$

Optimal. Leaf size=44

$$\frac{c\left(a+cx^4\right)^{3/2}}{15a^2x^6}-\frac{\left(a+cx^4\right)^{3/2}}{10ax^{10}}$$

```
[Out] -(a + c*x^4)^(3/2)/(10*a*x^10) + (c*(a + c*x^4)^(3/2))/(15*a^2*x^
6)
```

Rubi [A] time = 0.039715, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{c\left(a+cx^4\right)^{3/2}}{15a^2x^6}-\frac{\left(a+cx^4\right)^{3/2}}{10ax^{10}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + c*x^4]/x^11,x]
```

```
[Out] -(a + c*x^4)^(3/2)/(10*a*x^10) + (c*(a + c*x^4)^(3/2))/(15*a^2*x^
6)
```

Rubi in Sympy [A] time = 4.28462, size = 36, normalized size = 0.82

$$-\frac{\left(a+cx^4\right)^{\frac{3}{2}}}{10ax^{10}}+\frac{c\left(a+cx^4\right)^{\frac{3}{2}}}{15a^2x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**(1/2)/x**11,x)
```

```
[Out] -(a + c*x**4)**(3/2)/(10*a*x**10) + c*(a + c*x**4)**(3/2)/(15*a**
2*x**6)
```

Mathematica [A] time = 0.0236378, size = 41, normalized size = 0.93

$$-\frac{\sqrt{a+cx^4}\left(3a^2+acx^4-2c^2x^8\right)}{30a^2x^{10}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + c*x^4]/x^11,x]
```

```
[Out] -(Sqrt[a + c*x^4]*(3*a^2 + a*c*x^4 - 2*c^2*x^8))/(30*a^2*x^10)
```

Maple [A] time = 0.007, size = 28, normalized size = 0.6

$$-\frac{-2\,cx^4+3\,a}{30\,x^{10}a^2}\left(cx^4+a\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)^(1/2)/x^11,x)
```

```
[Out] -1/30*(c*x^4+a)^(3/2)*(-2*c*x^4+3*a)/x^10/a^2
```

Maxima [A] time = 1.44049, size = 47, normalized size = 1.07

$$\frac{\frac{5\,(cx^4+a)^{\frac{3}{2}}c}{x^6} - \frac{3\,(cx^4+a)^{\frac{5}{2}}}{x^{10}}}{30\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x^11,x, algorithm="maxima")

[Out] 1/30*(5*(c*x^4 + a)^(3/2)*c/x^6 - 3*(c*x^4 + a)^(5/2)/x^10)/a^2
```

Fricas [A] time = 0.278824, size = 51, normalized size = 1.16

$$\frac{\left(2\,c^2x^8 - acx^4 - 3\,a^2\right)\sqrt{cx^4 + a}}{30\,a^2x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x^11,x, algorithm="fricas")

[Out] 1/30*(2*c^2*x^8 - a*c*x^4 - 3*a^2)*sqrt(c*x^4 + a)/(a^2*x^10)
```

Sympy [A] time = 6.08287, size = 66, normalized size = 1.5

$$-\frac{\sqrt{c}\sqrt{\frac{a}{cx^4} + 1}}{10x^8} - \frac{c^{\frac{3}{2}}\sqrt{\frac{a}{cx^4} + 1}}{30ax^4} + \frac{c^{\frac{5}{2}}\sqrt{\frac{a}{cx^4} + 1}}{15a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**(1/2)/x**11,x)

[Out] -sqrt(c)*sqrt(a/(c*x**4) + 1)/(10*x**8) - c**(3/2)*sqrt(a/(c*x**4
) + 1)/(30*a*x**4) + c**(5/2)*sqrt(a/(c*x**4) + 1)/(15*a**2)
```

GIAC/XCAS [A] time = 0.216665, size = 39, normalized size = 0.89

$$-\frac{3\left(c + \frac{a}{x^4}\right)^{\frac{5}{2}} - 5\left(c + \frac{a}{x^4}\right)^{\frac{3}{2}}c}{30\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x^11,x, algorithm="giac")

[Out] -1/30*(3*(c + a/x^4)^(5/2) - 5*(c + a/x^4)^(3/2)*c)/a^2
```

3.773 $\int \frac{\sqrt{a+cx^4}}{x^{15}}\,dx$

Optimal. Leaf size=68

$$-\frac{4c^2\left(a+cx^4\right)^{3/2}}{105a^3x^6}+\frac{2c\left(a+cx^4\right)^{3/2}}{35a^2x^{10}}-\frac{\left(a+cx^4\right)^{3/2}}{14ax^{14}}$$

```
[Out] -(a + c*x^4)^(3/2)/(14*a*x^14) + (2*c*(a + c*x^4)^(3/2))/(35*a^2*
x^10) - (4*c^2*(a + c*x^4)^(3/2))/(105*a^3*x^6)
```

Rubi [A] time = 0.0614255, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{4c^2\left(a+cx^4\right)^{3/2}}{105a^3x^6}+\frac{2c\left(a+cx^4\right)^{3/2}}{35a^2x^{10}}-\frac{\left(a+cx^4\right)^{3/2}}{14ax^{14}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + c*x^4]/x^15,x]
```

```
[Out] -(a + c*x^4)^(3/2)/(14*a*x^14) + (2*c*(a + c*x^4)^(3/2))/(35*a^2*
x^10) - (4*c^2*(a + c*x^4)^(3/2))/(105*a^3*x^6)
```

Rubi in Sympy [A] time = 6.74217, size = 61, normalized size = 0.9

$$-\frac{\left(a+cx^4\right)^{\frac{3}{2}}}{14ax^{14}}+\frac{2c\left(a+cx^4\right)^{\frac{3}{2}}}{35a^2x^{10}}-\frac{4c^2\left(a+cx^4\right)^{\frac{3}{2}}}{105a^3x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**(1/2)/x**15,x)
```

```
[Out] -(a + c*x**4)**(3/2)/(14*a*x**14) + 2*c*(a + c*x**4)**(3/2)/(35*a
**2*x**10) - 4*c**2*(a + c*x**4)**(3/2)/(105*a**3*x**6)
```

Mathematica [A] time = 0.029864, size = 53, normalized size = 0.78

$$-\frac{\sqrt{a+cx^4}\left(15a^3+3a^2cx^4-4ac^2x^8+8c^3x^{12}\right)}{210a^3x^{14}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + c*x^4]/x^15,x]
```

```
[Out] -(Sqrt[a + c*x^4]*(15*a^3 + 3*a^2*c*x^4 - 4*a*c^2*x^8 + 8*c^3*x^1
2))/(210*a^3*x^14)
```

Maple [A] time = 0.009, size = 39, normalized size = 0.6

$$-\frac{8\,c^2x^8-12\,cx^4a+15\,a^2}{210\,x^{14}a^3}\left(cx^4+a\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)^(1/2)/x^15,x)
```

```
[Out] -1/210*(c*x^4+a)^(3/2)*(8*c^2*x^8-12*a*c*x^4+15*a^2)/x^14/a^3
```

Maxima [A] time = 1.45509, size = 70, normalized size = 1.03

$$-\frac{\frac{35\,(cx^4+a)^{\frac{3}{2}}c^2}{x^6}-\frac{42\,(cx^4+a)^{\frac{5}{2}}c}{x^{10}}+\frac{15\,(cx^4+a)^{\frac{7}{2}}}{x^{14}}}{210\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x^15,x, algorithm="maxima")
```

```
[Out] -1/210*(35*(c*x^4 + a)^(3/2)*c^2/x^6 - 42*(c*x^4 + a)^(5/2)*c/x^1
0 + 15*(c*x^4 + a)^(7/2)/x^14)/a^3
```

Fricas [A] time = 0.296953, size = 66, normalized size = 0.97

$$-\frac{\left(8\,c^3x^{12}-4\,ac^2x^8+3\,a^2cx^4+15\,a^3\right)\sqrt{cx^4+a}}{210\,a^3x^{14}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x^15,x, algorithm="fricas")
```

```
[Out] -1/210*(8*c^3*x^12 - 4*a*c^2*x^8 + 3*a^2*c*x^4 + 15*a^3)*sqrt(c*x
^4 + a)/(a^3*x^14)
```

Sympy [A] time = 13.4143, size = 359, normalized size = 5.28

$$-\frac{15a^5c^{\frac{9}{2}}\sqrt{\frac{a}{cx^4}+1}}{210a^5c^4x^{12}+420a^4c^5x^{16}+210a^3c^6x^{20}}-\frac{33a^4c^{\frac{11}{2}}x^4\sqrt{\frac{a}{cx^4}+1}}{210a^5c^4x^{12}+420a^4c^5x^{16}+210a^3c^6x^{20}}-\frac{17a^3c^{\frac{13}{2}}x^8\sqrt{\frac{a}{cx^4}+1}}{210a^5c^4x^{12}+420a^4c^5x^{16}+210a^3c^6x^{20}}-\frac{3a^2c^{\frac{15}{2}}x^{12}\sqrt{\frac{a}{cx^4}+1}}{210a^5c^4x^{12}+420a^4c^5x^{16}+210a^3c^6x^{20}}-\frac{12ac^{\frac{17}{2}}x^{16}\sqrt{\frac{a}{cx^4}+1}}{210a^5c^4x^{12}+420a^4c^5x^{16}+210a^3c^6x^{20}}-\frac{8c^{\frac{19}{2}}x^{20}\sqrt{\frac{a}{cx^4}+1}}{210a^5c^4x^{12}+420a^4c^5x^{16}+210a^3c^6x^{20}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**(1/2)/x**15,x)
```

```
[Out] -15*a**5*c**(9/2)*sqrt(a/(c*x**4) + 1)/(210*a**5*c**4*x**12 + 420
*a**4*c**5*x**16 + 210*a**3*c**6*x**20) - 33*a**4*c**(11/2)*x**4*
sqrt(a/(c*x**4) + 1)/(210*a**5*c**4*x**12 + 420*a**4*c**5*x**16 +
 210*a**3*c**6*x**20) - 17*a**3*c**(13/2)*x**8*sqrt(a/(c*x**4) +
1)/(210*a**5*c**4*x**12 + 420*a**4*c**5*x**16 + 210*a**3*c**6*x**
20) - 3*a**2*c**(15/2)*x**12*sqrt(a/(c*x**4) + 1)/(210*a**5*c**4*
x**12 + 420*a**4*c**5*x**16 + 210*a**3*c**6*x**20) - 12*a*c**(17/
2)*x**16*sqrt(a/(c*x**4) + 1)/(210*a**5*c**4*x**12 + 420*a**4*c**
5*x**16 + 210*a**3*c**6*x**20) - 8*c**(19/2)*x**20*sqrt(a/(c*x**4
) + 1)/(210*a**5*c**4*x**12 + 420*a**4*c**5*x**16 + 210*a**3*c**6
*x**20)
```

GIAC/XCAS [A] time = 0.218101, size = 58, normalized size = 0.85

$$-\frac{15\left(c+\frac{a}{x^4}\right)^{\frac{7}{2}}-42\left(c+\frac{a}{x^4}\right)^{\frac{5}{2}}c+35\left(c+\frac{a}{x^4}\right)^{\frac{3}{2}}c^2}{210\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x^15,x, algorithm="giac")
```

```
[Out] -1/210*(15*(c + a/x^4)^(7/2) - 42*(c + a/x^4)^(5/2)*c + 35*(c + a
/x^4)^(3/2)*c^2)/a^3
```

3.774 $\int x^4\sqrt{a+cx^4}\,dx$

Optimal. Leaf size=127

$$-\frac{a^{7/4}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{21c^{5/4}\sqrt{a+cx^4}}+\frac{2ax\sqrt{a+cx^4}}{21c}+\frac{1}{7}x^5\sqrt{a+cx^4}$$

```
[Out] (2*a*x*Sqrt[a + c*x^4])/(21*c) + (x^5*Sqrt[a + c*x^4])/7 - (a^(7/
4)*(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[(a + c*x^4)/(Sqrt[a] + Sqrt[c]*x^
2)^2]*EllipticF[2*ArcTan[(c^(1/4)*x)/a^(1/4)], 1/2])/(21*c^(5/4)*
Sqrt[a + c*x^4])
```

Rubi [A] time = 0.10449, antiderivative size = 127, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{a^{7/4}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{21c^{5/4}\sqrt{a+cx^4}}+\frac{2ax\sqrt{a+cx^4}}{21c}+\frac{1}{7}x^5\sqrt{a+cx^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4*Sqrt[a + c*x^4],x]
```

```
[Out] (2*a*x*Sqrt[a + c*x^4])/(21*c) + (x^5*Sqrt[a + c*x^4])/7 - (a^(7/
4)*(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[(a + c*x^4)/(Sqrt[a] + Sqrt[c]*x^
2)^2]*EllipticF[2*ArcTan[(c^(1/4)*x)/a^(1/4)], 1/2])/(21*c^(5/4)*
Sqrt[a + c*x^4])
```

Rubi in Sympy [A] time = 11.1112, size = 112, normalized size = 0.88

$$-\frac{a^{\frac{7}{4}}\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}\left(\sqrt{a}+\sqrt{c}x^2\right)F\left(2\,\text{atan}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{21c^{\frac{5}{4}}\sqrt{a+cx^4}}+\frac{2ax\sqrt{a+cx^4}}{21c}+\frac{x^5\sqrt{a+cx^4}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4*(c*x**4+a)**(1/2),x)
```

```
[Out] -a**(7/4)*sqrt((a + c*x**4)/(sqrt(a) + sqrt(c)*x**2)**2)*(sqrt(a)
 + sqrt(c)*x**2)*elliptic_f(2*atan(c**(1/4)*x/a**(1/4)), 1/2)/(21
*c**(5/4)*sqrt(a + c*x**4)) + 2*a*x*sqrt(a + c*x**4)/(21*c) + x**
5*sqrt(a + c*x**4)/7
```

Mathematica [C] time = 0.281049, size = 106, normalized size = 0.83

$$\frac{\frac{2ia^2\sqrt{\frac{cx^4}{a}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}x\right)\middle|-1\right)}{\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}}+2a^2x+5acx^5+3c^2x^9}{21c\sqrt{a+cx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4*Sqrt[a + c*x^4],x]
```

```
[Out] (2*a^2*x + 5*a*c*x^5 + 3*c^2*x^9 + ((2*I)*a^2*Sqrt[1 + (c*x^4)/a]
*EllipticF[I*ArcSinh[Sqrt[(I*Sqrt[c])/Sqrt[a]]*x], -1])/Sqrt[(I*S
qrt[c])/Sqrt[a]])/(21*c*Sqrt[a + c*x^4])
```

Maple [C] time = 0.05, size = 108, normalized size = 0.9

$$\frac{x^5}{7}\sqrt{cx^4+a}+\frac{2\,ax}{21\,c}\sqrt{cx^4+a}-\frac{2\,a^2}{21\,c}\sqrt{1-ix^2\sqrt{c}\frac{1}{\sqrt{a}}}\sqrt{1+ix^2\sqrt{c}\frac{1}{\sqrt{a}}}EllipticF\left(x\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}},i\right)\frac{1}{\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{cx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4*(c*x^4+a)^(1/2),x)
```

```
[Out] 1/7*x^5*(c*x^4+a)^(1/2)+2/21*a*x*(c*x^4+a)^(1/2)/c-2/21*a^2/c/(I/
a^(1/2)*c^(1/2))^(1/2)*(1-I/a^(1/2)*c^(1/2)*x^2)^(1/2)*(1+I/a^(1/
2)*c^(1/2)*x^2)^(1/2)/(c*x^4+a)^(1/2)*EllipticF(x*(I/a^(1/2)*c^(1
/2))^(1/2),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{cx^4+a}x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)*x^4,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(c*x^4 + a)*x^4, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\sqrt{cx^4+a}x^4,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)*x^4,x, algorithm="fricas")
```

```
[Out] integral(sqrt(c*x^4 + a)*x^4, x)
```

Sympy [A] time = 2.46479, size = 39, normalized size = 0.31

$$\frac{\sqrt{a}x^5\,\Gamma\left(\frac{5}{4}\right)\,{}_2F_1\left(\begin{matrix}-\frac{1}{2},\frac{5}{4}\\\frac{9}{4}\end{matrix}\middle|\frac{cx^4e^{i\pi}}{a}\right)}{4\,\Gamma\left(\frac{9}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4*(c*x**4+a)**(1/2),x)
```

```
[Out] sqrt(a)*x**5*gamma(5/4)*hyper((-1/2, 5/4), (9/4,), c*x**4*exp_pol
ar(I*pi)/a)/(4*gamma(9/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{cx^4 + a}x^4 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)*x^4,x, algorithm="giac")
```

```
[Out] integrate(sqrt(c*x^4 + a)*x^4, x)
```

3.775 $\int \sqrt{a+cx^4}\,dx$

Optimal. Leaf size=105

$$\frac{a^{3/4}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{3\sqrt[4]{c}\sqrt{a+cx^4}}+\frac{1}{3}x\sqrt{a+cx^4}$$

```
[Out] (x*Sqrt[a + c*x^4])/3 + (a^(3/4)*(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[(a
+ c*x^4)/(Sqrt[a] + Sqrt[c]*x^2)^2]*EllipticF[2*ArcTan[(c^(1/4)*x
)/a^(1/4)], 1/2])/(3*c^(1/4)*Sqrt[a + c*x^4])
```

Rubi [A] time = 0.0557103, antiderivative size = 105, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{a^{3/4}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{3\sqrt[4]{c}\sqrt{a+cx^4}}+\frac{1}{3}x\sqrt{a+cx^4}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + c*x^4],x]
```

```
[Out] (x*Sqrt[a + c*x^4])/3 + (a^(3/4)*(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[(a
+ c*x^4)/(Sqrt[a] + Sqrt[c]*x^2)^2]*EllipticF[2*ArcTan[(c^(1/4)*x
)/a^(1/4)], 1/2])/(3*c^(1/4)*Sqrt[a + c*x^4])
```

Rubi in Sympy [A] time = 5.39637, size = 92, normalized size = 0.88

$$\frac{a^{\frac{3}{4}}\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}\left(\sqrt{a}+\sqrt{c}x^2\right)F\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{3\sqrt[4]{c}\sqrt{a+cx^4}}+\frac{x\sqrt{a+cx^4}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**(1/2),x)
```

```
[Out] a**(3/4)*sqrt((a + c*x**4)/(sqrt(a) + sqrt(c)*x**2)**2)*(sqrt(a)
+ sqrt(c)*x**2)*elliptic_f(2*atan(c**(1/4)*x/a**(1/4)), 1/2)/(3*c
**(1/4)*sqrt(a + c*x**4)) + x*sqrt(a + c*x**4)/3
```

Mathematica [C] time = 0.199562, size = 89, normalized size = 0.85

$$\frac{x\left(a+cx^4\right)-\frac{2ia\sqrt{\frac{cx^4}{a}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}x\right)\middle|-1\right)}{\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}}}{3\sqrt{a+cx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + c*x^4],x]
```

```
[Out] (x*(a + c*x^4) - ((2*I)*a*Sqrt[1 + (c*x^4)/a]*EllipticF[I*ArcSinh
[Sqrt[(I*Sqrt[c])/Sqrt[a]]*x], -1])/Sqrt[(I*Sqrt[c])/Sqrt[a]])/(3
*Sqrt[a + c*x^4])
```

Maple [C] time = 0.008, size = 85, normalized size = 0.8

$$\frac{x}{3}\sqrt{cx^4+a}+\frac{2a}{3}\sqrt{1-ix^2\sqrt{c}\frac{1}{\sqrt{a}}}\sqrt{1+ix^2\sqrt{c}\frac{1}{\sqrt{a}}}EllipticF\left(x\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}},i\right)\frac{1}{\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{cx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)^(1/2),x)
```

```
[Out] 1/3*x*(c*x^4+a)^(1/2)+2/3*a/(I/a^(1/2)*c^(1/2))^(1/2)*(1-I/a^(1/2
)*c^(1/2)*x^2)^(1/2)*(1+I/a^(1/2)*c^(1/2)*x^2)^(1/2)/(c*x^4+a)^(1
/2)*EllipticF(x*(I/a^(1/2)*c^(1/2))^(1/2),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\sqrt{cx^4+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(c*x^4 + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\sqrt{cx^4+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a),x, algorithm="fricas")
```

```
[Out] integral(sqrt(c*x^4 + a), x)
```

Sympy [A] time = 2.09821, size = 37, normalized size = 0.35

$$\frac{\sqrt{a}x\Gamma\left(\frac{1}{4}\right){}_2F_1\left(\begin{matrix}-\frac{1}{2},\frac{1}{4}\\\frac{5}{4}\end{matrix}\middle|\frac{cx^4e^{i\pi}}{a}\right)}{4\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**(1/2),x)
```

```
[Out] sqrt(a)*x*gamma(1/4)*hyper((-1/2, 1/4), (5/4,), c*x**4*exp_polar(
I*pi)/a)/(4*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\sqrt{cx^4+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a),x, algorithm="giac")
```

```
[Out] integrate(sqrt(c*x^4 + a), x)
```

3.776 $\int \frac{\sqrt{a+cx^4}}{x^4}\,dx$

Optimal. Leaf size=107

$$\frac{c^{3/4}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{3\sqrt[4]{a}\sqrt{a+cx^4}}-\frac{\sqrt{a+cx^4}}{3x^3}$$

```
[Out] -Sqrt[a + c*x^4]/(3*x^3) + (c^(3/4)*(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[
(a + c*x^4)/(Sqrt[a] + Sqrt[c]*x^2)^2]*EllipticF[2*ArcTan[(c^(1/4
)*x)/a^(1/4)], 1/2])/(3*a^(1/4)*Sqrt[a + c*x^4])
```

Rubi [A] time = 0.0684904, antiderivative size = 107, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{c^{3/4}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{3\sqrt[4]{a}\sqrt{a+cx^4}}-\frac{\sqrt{a+cx^4}}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + c*x^4]/x^4,x]
```

```
[Out] -Sqrt[a + c*x^4]/(3*x^3) + (c^(3/4)*(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[
(a + c*x^4)/(Sqrt[a] + Sqrt[c]*x^2)^2]*EllipticF[2*ArcTan[(c^(1/4
)*x)/a^(1/4)], 1/2])/(3*a^(1/4)*Sqrt[a + c*x^4])
```

Rubi in Sympy [A] time = 7.02261, size = 94, normalized size = 0.88

$$-\frac{\sqrt{a+cx^4}}{3x^3}+\frac{c^{\frac{3}{4}}\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}\left(\sqrt{a}+\sqrt{c}x^2\right)F\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{3\sqrt[4]{a}\sqrt{a+cx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**(1/2)/x**4,x)
```

```
[Out] -sqrt(a + c*x**4)/(3*x**3) + c**(3/4)*sqrt((a + c*x**4)/(sqrt(a)
+ sqrt(c)*x**2)**2)*(sqrt(a) + sqrt(c)*x**2)*elliptic_f(2*atan(c*
*(1/4)*x/a**(1/4)), 1/2)/(3*a**(1/4)*sqrt(a + c*x**4))
```

Mathematica [C] time = 0.209058, size = 92, normalized size = 0.86

$$\frac{-\frac{a+cx^4}{x^3}-\frac{2ic\sqrt{\frac{cx^4}{a}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}x\right)\middle|-1\right)}{\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}}}{3\sqrt{a+cx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + c*x^4]/x^4,x]
```

```
[Out] (-((a + c*x^4)/x^3) - ((2*I)*c*Sqrt[1 + (c*x^4)/a]*EllipticF[I*Ar
cSinh[Sqrt[(I*Sqrt[c])/Sqrt[a]]*x], -1])/Sqrt[(I*Sqrt[c])/Sqrt[a]
```

```
])/(3*Sqrt[a + c*x^4])
```

Maple [C] time = 0.015, size = 87, normalized size = 0.8

$$-\frac{1}{3\,x^{3}}\sqrt{c x^{4}+a}+\frac{2\,c}{3}\sqrt{1-i x^{2}\sqrt{c}\frac{1}{\sqrt{a}}}\sqrt{1+i x^{2}\sqrt{c}\frac{1}{\sqrt{a}}}\mathit{EllipticF}\left(x\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}},i\right)\frac{1}{\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{c x^{4}+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)^(1/2)/x^4,x)
```

```
[Out] -1/3*(c*x^4+a)^(1/2)/x^3+2/3*c/(I/a^(1/2)*c^(1/2))^(1/2)*(1-I/a^(
1/2)*c^(1/2)*x^2)^(1/2)*(1+I/a^(1/2)*c^(1/2)*x^2)^(1/2)/(c*x^4+a)
^(1/2)*EllipticF(x*(I/a^(1/2)*c^(1/2))^(1/2),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{c x^{4}+a}}{x^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x^4,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(c*x^4 + a)/x^4, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\sqrt{c x^{4}+a}}{x^{4}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x^4,x, algorithm="fricas")
```

```
[Out] integral(sqrt(c*x^4 + a)/x^4, x)
```

Sympy [A] time = 2.48414, size = 42, normalized size = 0.39

$$\frac{\sqrt{a}\,\Gamma\left(-\frac{3}{4}\right){}_{2}F_{1}\left(\begin{matrix}-\frac{3}{4},-\frac{1}{2}\\ \frac{1}{4}\end{matrix}\middle|\frac{c x^{4} e^{i\pi}}{a}\right)}{4x^{3}\,\Gamma\left(\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**(1/2)/x**4,x)
```

```
[Out] sqrt(a)*gamma(-3/4)*hyper((-3/4, -1/2), (1/4,), c*x**4*exp_polar(
I*pi)/a)/(4*x**3*gamma(1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{cx^4 + a}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x^4,x, algorithm="giac")
```

```
[Out] integrate(sqrt(c*x^4 + a)/x^4, x)
```

3.777 $\int \frac{\sqrt{a+cx^4}}{x^8} dx$

Optimal. Leaf size=129

$$-\frac{c^{7/4}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{21a^{5/4}\sqrt{a+cx^4}}-\frac{\sqrt{a+cx^4}}{7x^7}-\frac{2c\sqrt{a+cx^4}}{21ax^3}$$

```
[Out] -Sqrt[a + c*x^4]/(7*x^7) - (2*c*Sqrt[a + c*x^4])/(21*a*x^3) - (c^
(7/4)*(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[(a + c*x^4)/(Sqrt[a] + Sqrt[c]
*x^2)^2]*EllipticF[2*ArcTan[(c^(1/4)*x)/a^(1/4)], 1/2])/(21*a^(5/
4)*Sqrt[a + c*x^4])
```

Rubi [A] time = 0.100734, antiderivative size = 129, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{c^{7/4}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{21a^{5/4}\sqrt{a+cx^4}}-\frac{\sqrt{a+cx^4}}{7x^7}-\frac{2c\sqrt{a+cx^4}}{21ax^3}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + c*x^4]/x^8,x]
```

```
[Out] -Sqrt[a + c*x^4]/(7*x^7) - (2*c*Sqrt[a + c*x^4])/(21*a*x^3) - (c^
(7/4)*(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[(a + c*x^4)/(Sqrt[a] + Sqrt[c]
*x^2)^2]*EllipticF[2*ArcTan[(c^(1/4)*x)/a^(1/4)], 1/2])/(21*a^(5/
4)*Sqrt[a + c*x^4])
```

Rubi in Sympy [A] time = 10.8297, size = 116, normalized size = 0.9

$$-\frac{\sqrt{a+cx^4}}{7x^7}-\frac{2c\sqrt{a+cx^4}}{21ax^3}-\frac{c^{\frac{7}{4}}\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}\left(\sqrt{a}+\sqrt{c}x^2\right)F\left(2\operatorname{atan}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{21a^{\frac{5}{4}}\sqrt{a+cx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**(1/2)/x**8,x)
```

```
[Out] -sqrt(a + c*x**4)/(7*x**7) - 2*c*sqrt(a + c*x**4)/(21*a*x**3) - c
**(7/4)*sqrt((a + c*x**4)/(sqrt(a) + sqrt(c)*x**2)**2)*(sqrt(a) +
 sqrt(c)*x**2)*elliptic_f(2*atan(c**(1/4)*x/a**(1/4)), 1/2)/(21*a
**(5/4)*sqrt(a + c*x**4))
```

Mathematica [C] time = 0.347415, size = 106, normalized size = 0.82

$$\frac{-\frac{3a^2}{x^7}+\frac{2ic^2\sqrt{\frac{cx^4}{a}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}x\right)\middle|-1\right)}{\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}}-\frac{5ac}{x^3}-2c^2x}{21a\sqrt{a+cx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + c*x^4]/x^8,x]
```

```
[Out] ((-3*a^2)/x^7 - (5*a*c)/x^3 - 2*c^2*x + ((2*I)*c^2*Sqrt[1 + (c*x^
4)/a]*EllipticF[I*ArcSinh[Sqrt[(I*Sqrt[c])/Sqrt[a]]*x], -1])/Sqrt
[(I*Sqrt[c])/Sqrt[a]])/(21*a*Sqrt[a + c*x^4])
```

Maple [C] time = 0.02, size = 110, normalized size = 0.9

$$-\frac{1}{7\,x^{7}}\sqrt{cx^{4}+a}-\frac{2\,c}{21\,ax^{3}}\sqrt{cx^{4}+a}-\frac{2\,c^{2}}{21\,a}\sqrt{1-ix^{2}\sqrt{c}\frac{1}{\sqrt{a}}}\sqrt{1+ix^{2}\sqrt{c}\frac{1}{\sqrt{a}}}\mathit{EllipticF}\left(x\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}},i\right)\frac{1}{\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{cx^{4}+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)^(1/2)/x^8,x)
```

```
[Out] -1/7*(c*x^4+a)^(1/2)/x^7-2/21*c*(c*x^4+a)^(1/2)/a/x^3-2/21*c^2/a/
(I/a^(1/2)*c^(1/2))^(1/2)*(1-I/a^(1/2)*c^(1/2)*x^2)^(1/2)*(1+I/a^
(1/2)*c^(1/2)*x^2)^(1/2)/(c*x^4+a)^(1/2)*EllipticF(x*(I/a^(1/2)*c
^(1/2))^(1/2),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{cx^{4}+a}}{x^{8}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x^8,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(c*x^4 + a)/x^8, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\sqrt{cx^{4}+a}}{x^{8}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x^8,x, algorithm="fricas")
```

```
[Out] integral(sqrt(c*x^4 + a)/x^8, x)
```

Sympy [A] time = 3.70851, size = 46, normalized size = 0.36

$$\frac{\sqrt{a}\,\Gamma\left(-\frac{7}{4}\right){}_{2}F_{1}\left(\begin{matrix}-\frac{7}{4},-\frac{1}{2}\\-\frac{3}{4}\end{matrix}\middle|\frac{cx^{4}e^{i\pi}}{a}\right)}{4x^{7}\,\Gamma\left(-\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**(1/2)/x**8,x)
```

```
[Out] sqrt(a)*gamma(-7/4)*hyper((-7/4, -1/2), (-3/4,), c*x**4*exp_polar
(I*pi)/a)/(4*x**7*gamma(-3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{cx^4 + a}}{x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x^8,x, algorithm="giac")
```

```
[Out] integrate(sqrt(c*x^4 + a)/x^8, x)
```

3.778 $\int x^2\sqrt{a+cx^4}\,dx$

Optimal. Leaf size=234

$$\frac{a^{5/4}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{5c^{3/4}\sqrt{a+cx^4}} - \frac{2a^{5/4}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{5c^{3/4}\sqrt{a+cx^4}} + \frac{1}{5}x^3\sqrt{a+cx^4} + \frac{2ax\sqrt{a+cx^4}}{5\sqrt{c}\left(\sqrt{a}+\sqrt{c}x^2\right)}$$

```
[Out] (x^3*Sqrt[a + c*x^4])/5 + (2*a*x*Sqrt[a + c*x^4])/(5*Sqrt[c]*(Sqr
t[a] + Sqrt[c]*x^2)) - (2*a^(5/4)*(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[(a
 + c*x^4)/(Sqrt[a] + Sqrt[c]*x^2)^2]*EllipticE[2*ArcTan[(c^(1/4)*
x)/a^(1/4)], 1/2])/(5*c^(3/4)*Sqrt[a + c*x^4]) + (a^(5/4)*(Sqrt[a
] + Sqrt[c]*x^2)*Sqrt[(a + c*x^4)/(Sqrt[a] + Sqrt[c]*x^2)^2]*Elli
pticF[2*ArcTan[(c^(1/4)*x)/a^(1/4)], 1/2])/(5*c^(3/4)*Sqrt[a + c*
x^4])
```

Rubi [A] time = 0.189373, antiderivative size = 234, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{a^{5/4}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{5c^{3/4}\sqrt{a+cx^4}} - \frac{2a^{5/4}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{5c^{3/4}\sqrt{a+cx^4}} + \frac{1}{5}x^3\sqrt{a+cx^4} + \frac{2ax\sqrt{a+cx^4}}{5\sqrt{c}\left(\sqrt{a}+\sqrt{c}x^2\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2*Sqrt[a + c*x^4],x]
```

```
[Out] (x^3*Sqrt[a + c*x^4])/5 + (2*a*x*Sqrt[a + c*x^4])/(5*Sqrt[c]*(Sqr
t[a] + Sqrt[c]*x^2)) - (2*a^(5/4)*(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[(a
 + c*x^4)/(Sqrt[a] + Sqrt[c]*x^2)^2]*EllipticE[2*ArcTan[(c^(1/4)*
x)/a^(1/4)], 1/2])/(5*c^(3/4)*Sqrt[a + c*x^4]) + (a^(5/4)*(Sqrt[a
] + Sqrt[c]*x^2)*Sqrt[(a + c*x^4)/(Sqrt[a] + Sqrt[c]*x^2)^2]*Elli
pticF[2*ArcTan[(c^(1/4)*x)/a^(1/4)], 1/2])/(5*c^(3/4)*Sqrt[a + c*
x^4])
```

Rubi in Sympy [A] time = 22.3875, size = 211, normalized size = 0.9

$$-\frac{2a^{\frac{5}{4}}\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}\left(\sqrt{a}+\sqrt{c}x^2\right)E\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{5c^{\frac{3}{4}}\sqrt{a+cx^4}} + \frac{a^{\frac{5}{4}}\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}\left(\sqrt{a}+\sqrt{c}x^2\right)F\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{5c^{\frac{3}{4}}\sqrt{a+cx^4}} + \frac{2ax\sqrt{a+cx^4}}{5\sqrt{c}\left(\sqrt{a}+\sqrt{c}x^2\right)} + \frac{x^3\sqrt{a+cx^4}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(c*x**4+a)**(1/2),x)
```

```
[Out] -2*a**(5/4)*sqrt((a + c*x**4)/(sqrt(a) + sqrt(c)*x**2)**2)*(sqrt(
a) + sqrt(c)*x**2)*elliptic_e(2*atan(c**(1/4)*x/a**(1/4)), 1/2)/(
5*c**(3/4)*sqrt(a + c*x**4)) + a**(5/4)*sqrt((a + c*x**4)/(sqrt(a
) + sqrt(c)*x**2)**2)*(sqrt(a) + sqrt(c)*x**2)*elliptic_f(2*atan(
```

```
c**(1/4)*x/a**(1/4)), 1/2)/(5*c**(3/4)*sqrt(a + c*x**4)) + 2*a*x*
sqrt(a + c*x**4)/(5*sqrt(c)*(sqrt(a) + sqrt(c)*x**2)) + x**3*sqrt
(a + c*x**4)/5
```

Mathematica [C] time = 0.546719, size = 121, normalized size = 0.52

$$\frac{x^3\left(a+cx^4\right)+\frac{2ia\sqrt{\frac{cx^4}{a}+1}\left(E\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}x\right)\middle|-1\right)-F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}x\right)\middle|-1\right)\right)}{\left(\frac{i\sqrt{c}}{\sqrt{a}}\right)^{3/2}}}{5\sqrt{a+cx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2*Sqrt[a + c*x^4],x]
```

```
[Out] (x^3*(a + c*x^4) + ((2*I)*a*Sqrt[1 + (c*x^4)/a]*(EllipticE[I*ArcS
inh[Sqrt[(I*Sqrt[c])/Sqrt[a]]*x], -1] - EllipticF[I*ArcSinh[Sqrt[
(I*Sqrt[c])/Sqrt[a]]*x], -1]))/((I*Sqrt[c])/Sqrt[a])^(3/2))/(5*Sq
rt[a + c*x^4])
```

Maple [C] time = 0.012, size = 112, normalized size = 0.5

$$\frac{x^3}{5}\sqrt{cx^4+a}$$
$$+\frac{2i}{5}a^{\frac{3}{2}}\sqrt{1-ix^2\sqrt{c}\frac{1}{\sqrt{a}}}\sqrt{1+ix^2\sqrt{c}\frac{1}{\sqrt{a}}}\left(EllipticF\left(x\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}},i\right)-EllipticE\left(x\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}},i\right)\right)\frac{1}{\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{cx^4+a}}\frac{1}{\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(c*x^4+a)^(1/2),x)
```

```
[Out] 1/5*x^3*(c*x^4+a)^(1/2)+2/5*I*a^(3/2)/(I/a^(1/2)*c^(1/2))^(1/2)*(
1-I/a^(1/2)*c^(1/2)*x^2)^(1/2)*(1+I/a^(1/2)*c^(1/2)*x^2)^(1/2)/(c
*x^4+a)^(1/2)/c^(1/2)*(EllipticF(x*(I/a^(1/2)*c^(1/2))^(1/2),I)-E
llipticE(x*(I/a^(1/2)*c^(1/2))^(1/2),I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\sqrt{cx^4+a}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)*x^2,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(c*x^4 + a)*x^2, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{cx^4+a}x^2,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)*x^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(c*x^4 + a)*x^2, x)
```

Sympy [A] time = 2.24364, size = 39, normalized size = 0.17

$$\frac{\sqrt{a}x^3\,\Gamma\left(\frac{3}{4}\right)\,{}_2F_1\left(\begin{matrix}-\frac{1}{2},\frac{3}{4}\\ \frac{7}{4}\end{matrix}\middle|\frac{cx^4e^{i\pi}}{a}\right)}{4\,\Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(c*x**4+a)**(1/2),x)
```

```
[Out] sqrt(a)*x**3*gamma(3/4)*hyper((-1/2, 3/4), (7/4,), c*x**4*exp_pol
ar(I*pi)/a)/(4*gamma(7/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{cx^4 + a}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)*x^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(c*x^4 + a)*x^2, x)
```

3.779 $\int \frac{\sqrt{a+cx^4}}{x^2}\,dx$

Optimal. Leaf size=224

$$-\frac{\sqrt{a+cx^4}}{x}+\frac{2\sqrt{c}x\sqrt{a+cx^4}}{\sqrt{a}+\sqrt{c}x^2}+\frac{\sqrt[4]{a}\sqrt[4]{c}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{\sqrt{a+cx^4}}-\frac{2\sqrt[4]{a}\sqrt[4]{c}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{\sqrt{a+cx^4}}$$

```
[Out] -(Sqrt[a + c*x^4]/x) + (2*Sqrt[c]*x*Sqrt[a + c*x^4])/(Sqrt[a] + S
qrt[c]*x^2) - (2*a^(1/4)*c^(1/4)*(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[(a
+ c*x^4)/(Sqrt[a] + Sqrt[c]*x^2)^2]*EllipticE[2*ArcTan[(c^(1/4)*x
)/a^(1/4)], 1/2])/Sqrt[a + c*x^4] + (a^(1/4)*c^(1/4)*(Sqrt[a] + S
qrt[c]*x^2)*Sqrt[(a + c*x^4)/(Sqrt[a] + Sqrt[c]*x^2)^2]*EllipticF
[2*ArcTan[(c^(1/4)*x)/a^(1/4)], 1/2])/Sqrt[a + c*x^4]
```

Rubi [A] time = 0.186762, antiderivative size = 224, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{\sqrt{a+cx^4}}{x}+\frac{2\sqrt{c}x\sqrt{a+cx^4}}{\sqrt{a}+\sqrt{c}x^2}+\frac{\sqrt[4]{a}\sqrt[4]{c}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{\sqrt{a+cx^4}}-\frac{2\sqrt[4]{a}\sqrt[4]{c}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{\sqrt{a+cx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + c*x^4]/x^2,x]
```


```
[Out] -(Sqrt[a + c*x^4]/x) + (2*Sqrt[c]*x*Sqrt[a + c*x^4])/(Sqrt[a] + S
qrt[c]*x^2) - (2*a^(1/4)*c^(1/4)*(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[(a
+ c*x^4)/(Sqrt[a] + Sqrt[c]*x^2)^2]*EllipticE[2*ArcTan[(c^(1/4)*x
)/a^(1/4)], 1/2])/Sqrt[a + c*x^4] + (a^(1/4)*c^(1/4)*(Sqrt[a] + S
qrt[c]*x^2)*Sqrt[(a + c*x^4)/(Sqrt[a] + Sqrt[c]*x^2)^2]*EllipticF
[2*ArcTan[(c^(1/4)*x)/a^(1/4)], 1/2])/Sqrt[a + c*x^4]
```

Rubi in Sympy [A] time = 22.5369, size = 201, normalized size = 0.9

$$-\frac{2\sqrt[4]{a}\sqrt[4]{c}\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}\left(\sqrt{a}+\sqrt{c}x^2\right)E\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{\sqrt{a+cx^4}}+\frac{\sqrt[4]{a}\sqrt[4]{c}\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}\left(\sqrt{a}+\sqrt{c}x^2\right)F\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{\sqrt{a+cx^4}}+\frac{2\sqrt{c}x\sqrt{a+cx^4}}{\sqrt{a}+\sqrt{c}x^2}-\frac{\sqrt{a+cx^4}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**(1/2)/x**2,x)
```

```
[Out] -2*a**(1/4)*c**(1/4)*sqrt((a + c*x**4)/(sqrt(a) + sqrt(c)*x**2)**
2)*(sqrt(a) + sqrt(c)*x**2)*elliptic_e(2*atan(c**(1/4)*x/a**(1/4)
), 1/2)/sqrt(a + c*x**4) + a**(1/4)*c**(1/4)*sqrt((a + c*x**4)/(s
qrt(a) + sqrt(c)*x**2)**2)*(sqrt(a) + sqrt(c)*x**2)*elliptic_f(2*
atan(c**(1/4)*x/a**(1/4)), 1/2)/sqrt(a + c*x**4) + 2*sqrt(c)*x*sq
rt(a + c*x**4)/(sqrt(a) + sqrt(c)*x**2) - sqrt(a + c*x**4)/x
```

Mathematica [C] time = 0.448157, size = 119, normalized size = 0.53

$$\frac{-\frac{a+cx^4}{x}+\frac{2ic\sqrt{\frac{cx^4}{a}+1}\left(E\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}x\right)\middle|-1\right)-F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}x\right)\middle|-1\right)\right)}{\left(\frac{i\sqrt{c}}{\sqrt{a}}\right)^{3/2}}}{\sqrt{a+cx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + c*x^4]/x^2,x]
```

```
[Out] (-((a + c*x^4)/x) + ((2*I)*c*Sqrt[1 + (c*x^4)/a]*(EllipticE[I*Arc
Sinh[Sqrt[(I*Sqrt[c])/Sqrt[a]]*x], -1] - EllipticF[I*ArcSinh[Sqrt
[(I*Sqrt[c])/Sqrt[a]]*x], -1]))/((I*Sqrt[c])/Sqrt[a])^(3/2))/Sqrt
[a + c*x^4]
```

Maple [C] time = 0.014, size = 112, normalized size = 0.5

$$-\frac{1}{x}\sqrt{cx^4+a}$$
$$+2\,i\sqrt{a}\sqrt{c}\sqrt{1-ix^2\sqrt{c}\frac{1}{\sqrt{a}}}\sqrt{1+ix^2\sqrt{c}\frac{1}{\sqrt{a}}}\left(\mathit{EllipticF}\left(x\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}},i\right)-\mathit{EllipticE}\left(x\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}},i\right)\right)\frac{1}{\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{cx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)^(1/2)/x^2,x)
```

```
[Out] -(c*x^4+a)^(1/2)/x+2*I*c^(1/2)*a^(1/2)/(I/a^(1/2)*c^(1/2))^(1/2)*
(1-I/a^(1/2)*c^(1/2)*x^2)^(1/2)*(1+I/a^(1/2)*c^(1/2)*x^2)^(1/2)/(
c*x^4+a)^(1/2)*(EllipticF(x*(I/a^(1/2)*c^(1/2))^(1/2),I)-Elliptic
E(x*(I/a^(1/2)*c^(1/2))^(1/2),I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{cx^4+a}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x^2,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(c*x^4 + a)/x^2, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\sqrt{cx^4+a}}{x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(c*x^4 + a)/x^2, x)
```

Sympy [A] time = 2.26068, size = 41, normalized size = 0.18

$$\frac{\sqrt{a}\,\Gamma\left(-\frac{1}{4}\right)\,{}_2F_1\left(\begin{matrix}-\frac{1}{2}, -\frac{1}{4}\\ \frac{3}{4}\end{matrix}\middle|\frac{cx^4e^{i\pi}}{a}\right)}{4x\,\Gamma\left(\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**(1/2)/x**2,x)
```

```
[Out] sqrt(a)*gamma(-1/4)*hyper((-1/2, -1/4), (3/4,), c*x**4*exp_polar(
I*pi)/a)/(4*x*gamma(3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{cx^4 + a}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(c*x^4 + a)/x^2, x)
```

3.780 $\int \frac{\sqrt{a+cx^4}}{x^6} \, dx$

Optimal. Leaf size=258

$$\frac{c^{5/4}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{5a^{3/4}\sqrt{a+cx^4}} - \frac{2c^{5/4}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{5a^{3/4}\sqrt{a+cx^4}} + \frac{2c^{3/2}x\sqrt{a+cx^4}}{5a\left(\sqrt{a}+\sqrt{c}x^2\right)} - \frac{2c\sqrt{a+cx^4}}{5ax} - \frac{\sqrt{a+cx^4}}{5x^5}$$

```
[Out] -Sqrt[a + c*x^4]/(5*x^5) - (2*c*Sqrt[a + c*x^4])/(5*a*x) + (2*c^(
3/2)*x*Sqrt[a + c*x^4])/(5*a*(Sqrt[a] + Sqrt[c]*x^2)) - (2*c^(5/4
)*(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[(a + c*x^4)/(Sqrt[a] + Sqrt[c]*x^2
)^2]*EllipticE[2*ArcTan[(c^(1/4)*x)/a^(1/4)], 1/2])/(5*a^(3/4)*Sq
rt[a + c*x^4]) + (c^(5/4)*(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[(a + c*x^4
)/(Sqrt[a] + Sqrt[c]*x^2)^2]*EllipticF[2*ArcTan[(c^(1/4)*x)/a^(1/
4)], 1/2])/(5*a^(3/4)*Sqrt[a + c*x^4])
```

Rubi [A] time = 0.239579, antiderivative size = 258, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{c^{5/4}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{5a^{3/4}\sqrt{a+cx^4}} - \frac{2c^{5/4}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{5a^{3/4}\sqrt{a+cx^4}} + \frac{2c^{3/2}x\sqrt{a+cx^4}}{5a\left(\sqrt{a}+\sqrt{c}x^2\right)} - \frac{2c\sqrt{a+cx^4}}{5ax} - \frac{\sqrt{a+cx^4}}{5x^5}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + c*x^4]/x^6,x]
```

```
[Out] -Sqrt[a + c*x^4]/(5*x^5) - (2*c*Sqrt[a + c*x^4])/(5*a*x) + (2*c^(
3/2)*x*Sqrt[a + c*x^4])/(5*a*(Sqrt[a] + Sqrt[c]*x^2)) - (2*c^(5/4
)*(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[(a + c*x^4)/(Sqrt[a] + Sqrt[c]*x^2
)^2]*EllipticE[2*ArcTan[(c^(1/4)*x)/a^(1/4)], 1/2])/(5*a^(3/4)*Sq
rt[a + c*x^4]) + (c^(5/4)*(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[(a + c*x^4
)/(Sqrt[a] + Sqrt[c]*x^2)^2]*EllipticF[2*ArcTan[(c^(1/4)*x)/a^(1/
4)], 1/2])/(5*a^(3/4)*Sqrt[a + c*x^4])
```

Rubi in Sympy [A] time = 28.8004, size = 230, normalized size = 0.89

$$-\frac{\sqrt{a+cx^4}}{5x^5} + \frac{2c^{\frac{3}{2}}x\sqrt{a+cx^4}}{5a\left(\sqrt{a}+\sqrt{c}x^2\right)} - \frac{2c\sqrt{a+cx^4}}{5ax} - \frac{2c^{\frac{5}{4}}\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}\left(\sqrt{a}+\sqrt{c}x^2\right)E\left(2\operatorname{atan}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{5a^{\frac{3}{4}}\sqrt{a+cx^4}} + \frac{c^{\frac{5}{4}}\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}\left(\sqrt{a}+\sqrt{c}x^2\right)F\left(2\operatorname{atan}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{5a^{\frac{3}{4}}\sqrt{a+cx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**(1/2)/x**6,x)
```

```
[Out] -sqrt(a + c*x**4)/(5*x**5) + 2*c**(3/2)*x*sqrt(a + c*x**4)/(5*a*(
sqrt(a) + sqrt(c)*x**2)) - 2*c*sqrt(a + c*x**4)/(5*a*x) - 2*c**(5
/4)*sqrt((a + c*x**4)/(sqrt(a) + sqrt(c)*x**2)**2)*(sqrt(a) + sqr
t(c)*x**2)*elliptic_e(2*atan(c**(1/4)*x/a**(1/4)), 1/2)/(5*a**(3/
```

```
4)*sqrt(a + c*x**4)) + c**(5/4)*sqrt((a + c*x**4)/(sqrt(a) + sqrt
(c)*x**2)**2)*(sqrt(a) + sqrt(c)*x**2)*elliptic_f(2*atan(c**(1/4)
*x/a**(1/4)), 1/2)/(5*a**(3/4)*sqrt(a + c*x**4))
```

Mathematica [C] time = 0.47627, size = 133, normalized size = 0.52

$$\frac{-\frac{(a+cx^4)(a+2cx^4)}{ax^5}-2ic\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\sqrt{\frac{cx^4}{a}+1}\left(E\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}x\right)\middle|-1\right)-F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}x\right)\middle|-1\right)\right)}{5\sqrt{a+cx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + c*x^4]/x^6,x]
```

```
[Out] (-(((a + c*x^4)*(a + 2*c*x^4))/(a*x^5)) - (2*I)*Sqrt[(I*Sqrt[c])/
Sqrt[a]]*c*Sqrt[1 + (c*x^4)/a]*(EllipticE[I*ArcSinh[Sqrt[(I*Sqrt[
c])/Sqrt[a]]*x], -1] - EllipticF[I*ArcSinh[Sqrt[(I*Sqrt[c])/Sqrt[
a]]*x], -1]))/(5*Sqrt[a + c*x^4])
```

Maple [C] time = 0.019, size = 130, normalized size = 0.5

$$-\frac{1}{5\,x^5}\sqrt{cx^4+a}-\frac{2\,c}{5\,ax}\sqrt{cx^4+a}$$
$$+\frac{2\,i}{5}c^{\frac{3}{2}}\sqrt{1-ix^2\sqrt{c}\frac{1}{\sqrt{a}}}\sqrt{1+ix^2\sqrt{c}\frac{1}{\sqrt{a}}}\left(\mathit{EllipticF}\left(x\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}},i\right)-\mathit{EllipticE}\left(x\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}},i\right)\right)\frac{1}{\sqrt{a}}\frac{1}{\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{cx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)^(1/2)/x^6,x)
```

```
[Out] -1/5*(c*x^4+a)^(1/2)/x^5-2/5*c*(c*x^4+a)^(1/2)/a/x+2/5*I*c^(3/2)/
a^(1/2)/(I/a^(1/2)*c^(1/2))^(1/2)*(1-I/a^(1/2)*c^(1/2)*x^2)^(1/2)
*(1+I/a^(1/2)*c^(1/2)*x^2)^(1/2)/(c*x^4+a)^(1/2)*(EllipticF(x*(I/
a^(1/2)*c^(1/2))^(1/2),I)-EllipticE(x*(I/a^(1/2)*c^(1/2))^(1/2),I
))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{cx^4+a}}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x^6,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(c*x^4 + a)/x^6, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\sqrt{cx^4+a}}{x^6},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x^6,x, algorithm="fricas")
```

```
[Out] integral(sqrt(c*x^4 + a)/x^6, x)
```

Sympy [A] time = 2.97086, size = 46, normalized size = 0.18

$$\frac{\sqrt{a}\,\Gamma\left(-\frac{5}{4}\right){}_{2}F_{1}\left(\begin{matrix}-\frac{5}{4},-\frac{1}{2}\\ -\frac{1}{4}\end{matrix}\middle|\frac{cx^{4}e^{i\pi}}{a}\right)}{4x^{5}\,\Gamma\left(-\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**(1/2)/x**6,x)
```

```
[Out] sqrt(a)*gamma(-5/4)*hyper((-5/4, -1/2), (-1/4,), c*x**4*exp_polar
(I*pi)/a)/(4*x**5*gamma(-1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{cx^{4}+a}}{x^{6}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c*x^4 + a)/x^6,x, algorithm="giac")
```

```
[Out] integrate(sqrt(c*x^4 + a)/x^6, x)
```

3.781 $\int x^{11} \left(a + cx^4\right)^{3/2} \, dx$

Optimal. Leaf size=59

$$\frac{a^2 \left(a + cx^4\right)^{5/2}}{10c^3} + \frac{\left(a + cx^4\right)^{9/2}}{18c^3} - \frac{a \left(a + cx^4\right)^{7/2}}{7c^3}$$

```
[Out] (a^2*(a + c*x^4)^(5/2))/(10*c^3) - (a*(a + c*x^4)^(7/2))/(7*c^3)
+ (a + c*x^4)^(9/2)/(18*c^3)
```

Rubi [A] time = 0.0849369, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{a^2 \left(a + cx^4\right)^{5/2}}{10c^3} + \frac{\left(a + cx^4\right)^{9/2}}{18c^3} - \frac{a \left(a + cx^4\right)^{7/2}}{7c^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11*(a + c*x^4)^(3/2),x]
```

```
[Out] (a^2*(a + c*x^4)^(5/2))/(10*c^3) - (a*(a + c*x^4)^(7/2))/(7*c^3)
+ (a + c*x^4)^(9/2)/(18*c^3)
```

Rubi in Sympy [A] time = 10.6932, size = 49, normalized size = 0.83

$$\frac{a^2 \left(a + cx^4\right)^{\frac{5}{2}}}{10c^3} - \frac{a \left(a + cx^4\right)^{\frac{7}{2}}}{7c^3} + \frac{\left(a + cx^4\right)^{\frac{9}{2}}}{18c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11*(c*x**4+a)**(3/2),x)
```

```
[Out] a**2*(a + c*x**4)**(5/2)/(10*c**3) - a*(a + c*x**4)**(7/2)/(7*c**
3) + (a + c*x**4)**(9/2)/(18*c**3)
```

Mathematica [A] time = 0.041456, size = 39, normalized size = 0.66

$$\frac{\left(a + cx^4\right)^{5/2} \left(8a^2 - 20acx^4 + 35c^2x^8\right)}{630c^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11*(a + c*x^4)^(3/2),x]
```

```
[Out] ((a + c*x^4)^(5/2)*(8*a^2 - 20*a*c*x^4 + 35*c^2*x^8))/(630*c^3)
```

Maple [A] time = 0.008, size = 36, normalized size = 0.6

$$\frac{35\,x^8c^2 - 20\,ax^4c + 8\,a^2}{630\,c^3} \left(cx^4 + a\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11*(c*x^4+a)^(3/2),x)
```

```
[Out] 1/630*(c*x^4+a)^(5/2)*(35*c^2*x^8-20*a*c*x^4+8*a^2)/c^3
```

Maxima [A] time = 1.44727, size = 63, normalized size = 1.07

$$\frac{\left(cx^4+a\right)^{\frac{9}{2}}}{18\,c^3}-\frac{\left(cx^4+a\right)^{\frac{7}{2}}a}{7\,c^3}+\frac{\left(cx^4+a\right)^{\frac{5}{2}}a^2}{10\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)*x^11,x, algorithm="maxima")
```

```
[Out] 1/18*(c*x^4 + a)^(9/2)/c^3 - 1/7*(c*x^4 + a)^(7/2)*a/c^3 + 1/10*(
c*x^4 + a)^(5/2)*a^2/c^3
```

Fricas [A] time = 0.233321, size = 77, normalized size = 1.31

$$\frac{\left(35\,c^4x^{16}+50\,ac^3x^{12}+3\,a^2c^2x^8-4\,a^3cx^4+8\,a^4\right)\sqrt{cx^4+a}}{630\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)*x^11,x, algorithm="fricas")
```

```
[Out] 1/630*(35*c^4*x^16 + 50*a*c^3*x^12 + 3*a^2*c^2*x^8 - 4*a^3*c*x^4
+ 8*a^4)*sqrt(c*x^4 + a)/c^3
```

Sympy [A] time = 23.8364, size = 109, normalized size = 1.85

$$\begin{cases} \frac{4a^4\sqrt{a+cx^4}}{315c^3}-\frac{2a^3x^4\sqrt{a+cx^4}}{315c^2}+\frac{a^2x^8\sqrt{a+cx^4}}{210c}+\frac{5ax^{12}\sqrt{a+cx^4}}{63}+\frac{cx^{16}\sqrt{a+cx^4}}{18} & \text{for } c\neq 0 \\ \frac{a^{\frac{3}{2}}x^{12}}{12} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11*(c*x**4+a)**(3/2),x)
```

```
[Out] Piecewise((4*a**4*sqrt(a + c*x**4)/(315*c**3) - 2*a**3*x**4*sqrt(
a + c*x**4)/(315*c**2) + a**2*x**8*sqrt(a + c*x**4)/(210*c) + 5*a
*x**12*sqrt(a + c*x**4)/63 + c*x**16*sqrt(a + c*x**4)/18, Ne(c, 0
)), (a**(3/2)*x**12/12, True))
```

GIAC/XCAS [A] time = 0.219136, size = 143, normalized size = 2.42

$$\frac{\frac{3\left(15\left(cx^4+a\right)^{\frac{7}{2}}-42\left(cx^4+a\right)^{\frac{5}{2}}a+35\left(cx^4+a\right)^{\frac{3}{2}}a^2\right)a}{c^2}+\frac{35\left(cx^4+a\right)^{\frac{9}{2}}-135\left(cx^4+a\right)^{\frac{7}{2}}a+189\left(cx^4+a\right)^{\frac{5}{2}}a^2-105\left(cx^4+a\right)^{\frac{3}{2}}a^3}{c^2}}{630\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)*x^11,x, algorithm="giac")
```

```
[Out] 1/630*(3*(15*(c*x^4 + a)^(7/2) - 42*(c*x^4 + a)^(5/2)*a + 35*(c*x
^4 + a)^(3/2)*a^2)*a/c^2 + (35*(c*x^4 + a)^(9/2) - 135*(c*x^4 + a
)^(7/2)*a + 189*(c*x^4 + a)^(5/2)*a^2 - 105*(c*x^4 + a)^(3/2)*a^3
)/c^2)/c
```

3.782 $\int x^7 \left(a+cx^4\right)^{3/2} dx$

Optimal. Leaf size=38

$$\frac{\left(a+cx^4\right)^{7/2}}{14c^2}-\frac{a\left(a+cx^4\right)^{5/2}}{10c^2}$$

```
[Out] -(a*(a + c*x^4)^(5/2))/(10*c^2) + (a + c*x^4)^(7/2)/(14*c^2)
```

Rubi [A] time = 0.0599741, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{\left(a+cx^4\right)^{7/2}}{14c^2}-\frac{a\left(a+cx^4\right)^{5/2}}{10c^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7*(a + c*x^4)^(3/2),x]

[Out] -(a*(a + c*x^4)^(5/2))/(10*c^2) + (a + c*x^4)^(7/2)/(14*c^2)
```

Rubi in Sympy [A] time = 7.1595, size = 31, normalized size = 0.82

$$-\frac{a\left(a+cx^4\right)^{\frac{5}{2}}}{10c^2}+\frac{\left(a+cx^4\right)^{\frac{7}{2}}}{14c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7*(c*x**4+a)**(3/2),x)

[Out] -a*(a + c*x**4)**(5/2)/(10*c**2) + (a + c*x**4)**(7/2)/(14*c**2)
```

Mathematica [A] time = 0.0338798, size = 28, normalized size = 0.74

$$\frac{\left(a+cx^4\right)^{5/2}\left(5cx^4-2a\right)}{70c^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^7*(a + c*x^4)^(3/2),x]

[Out] ((a + c*x^4)^(5/2)*(-2*a + 5*c*x^4))/(70*c^2)
```

Maple [A] time = 0.007, size = 25, normalized size = 0.7

$$-\frac{-5\,cx^4+2\,a}{70\,c^2}\left(cx^4+a\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7*(c*x^4+a)^(3/2),x)

[Out] -1/70*(c*x^4+a)^(5/2)*(-5*c*x^4+2*a)/c^2
```

Maxima [A] time = 1.4254, size = 41, normalized size = 1.08

$$\frac{\left(cx^4+a\right)^{\frac{7}{2}}}{14\,c^2}-\frac{\left(cx^4+a\right)^{\frac{5}{2}}a}{10\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)*x^7,x, algorithm="maxima")
```

```
[Out] 1/14*(c*x^4 + a)^(7/2)/c^2 - 1/10*(c*x^4 + a)^(5/2)*a/c^2
```

Fricas [A] time = 0.254951, size = 61, normalized size = 1.61

$$\frac{\left(5\,c^3x^{12}+8\,ac^2x^8+a^2cx^4-2\,a^3\right)\sqrt{cx^4+a}}{70\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)*x^7,x, algorithm="fricas")
```

```
[Out] 1/70*(5*c^3*x^12 + 8*a*c^2*x^8 + a^2*c*x^4 - 2*a^3)*sqrt(c*x^4 +
a)/c^2
```

Sympy [A] time = 9.4906, size = 83, normalized size = 2.18

$$\begin{cases} -\frac{a^3\sqrt{a+cx^4}}{35c^2}+\frac{a^2x^4\sqrt{a+cx^4}}{70c}+\frac{4ax^8\sqrt{a+cx^4}}{35}+\frac{cx^{12}\sqrt{a+cx^4}}{14} & \text{for } c\neq 0\\ \frac{a^{\frac{3}{2}}x^8}{8} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7*(c*x**4+a)**(3/2),x)
```

```
[Out] Piecewise((-a**3*sqrt(a + c*x**4)/(35*c**2) + a**2*x**4*sqrt(a +
c*x**4)/(70*c) + 4*a*x**8*sqrt(a + c*x**4)/35 + c*x**12*sqrt(a +
c*x**4)/14, Ne(c, 0)), (a**(3/2)*x**8/8, True))
```

GIAC/XCAS [A] time = 0.214462, size = 105, normalized size = 2.76

$$\frac{\frac{7\left(3\left(cx^4+a\right)^{\frac{5}{2}}-5\left(cx^4+a\right)^{\frac{3}{2}}a\right)a}{c}+\frac{15\left(cx^4+a\right)^{\frac{7}{2}}-42\left(cx^4+a\right)^{\frac{5}{2}}a+35\left(cx^4+a\right)^{\frac{3}{2}}a^2}{c}}{210\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)*x^7,x, algorithm="giac")
```

```
[Out] 1/210*(7*(3*(c*x^4 + a)^(5/2) - 5*(c*x^4 + a)^(3/2)*a)*a/c + (15*
(c*x^4 + a)^(7/2) - 42*(c*x^4 + a)^(5/2)*a + 35*(c*x^4 + a)^(3/2)
*a^2)/c)/c
```

3.783 $\int x^3 \left(a+cx^4\right)^{3/2} dx$

Optimal. Leaf size=18

$$\frac{\left(a+cx^4\right)^{5/2}}{10c}$$

```
[Out] (a + c*x^4)^(5/2)/(10*c)
```

Rubi [A] time = 0.0108471, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{\left(a+cx^4\right)^{5/2}}{10c}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(a + c*x^4)^(3/2),x]

[Out] (a + c*x^4)^(5/2)/(10*c)
```

Rubi in Sympy [A] time = 2.16209, size = 12, normalized size = 0.67

$$\frac{\left(a+cx^4\right)^{\frac{5}{2}}}{10c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**3*(c*x**4+a)**(3/2),x)

[Out] (a + c*x**4)**(5/2)/(10*c)
```

Mathematica [A] time = 0.00892337, size = 18, normalized size = 1.

$$\frac{\left(a+cx^4\right)^{5/2}}{10c}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(a + c*x^4)^(3/2),x]

[Out] (a + c*x^4)^(5/2)/(10*c)
```

Maple [A] time = 0.005, size = 15, normalized size = 0.8

$$\frac{1}{10\,c}\left(cx^4+a\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(c*x^4+a)^(3/2),x)

[Out] 1/10*(c*x^4+a)^(5/2)/c
```

Maxima [A] time = 1.44181, size = 19, normalized size = 1.06

$$\frac{\left(cx^4+a\right)^{\frac{5}{2}}}{10\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)*x^3,x, algorithm="maxima")
```

```
[Out] 1/10*(c*x^4 + a)^(5/2)/c
```

Fricas [A] time = 0.253964, size = 43, normalized size = 2.39

$$\frac{\left(c^2x^8+2\,acx^4+a^2\right)\sqrt{cx^4+a}}{10\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)*x^3,x, algorithm="fricas")
```

```
[Out] 1/10*(c^2*x^8 + 2*a*c*x^4 + a^2)*sqrt(c*x^4 + a)/c
```

Sympy [A] time = 2.78516, size = 60, normalized size = 3.33

$$\begin{cases} \frac{a^2\sqrt{a+cx^4}}{10c}+\frac{ax^4\sqrt{a+cx^4}}{5}+\frac{cx^8\sqrt{a+cx^4}}{10} & \text{for } c\neq 0 \\ \frac{a^{\frac{3}{2}}x^4}{4} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(c*x**4+a)**(3/2),x)
```

```
[Out] Piecewise((a**2*sqrt(a + c*x**4)/(10*c) + a*x**4*sqrt(a + c*x**4)
/5 + c*x**8*sqrt(a + c*x**4)/10, Ne(c, 0)), (a**(3/2)*x**4/4, Tru
e))
```

GIAC/XCAS [A] time = 0.216249, size = 19, normalized size = 1.06

$$\frac{\left(cx^4+a\right)^{\frac{5}{2}}}{10\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)*x^3,x, algorithm="giac")
```

```
[Out] 1/10*(c*x^4 + a)^(5/2)/c
```

3.784 $\int \frac{(a+cx^4)^{3/2}}{x}\,dx$

Optimal. Leaf size=59

$$-\frac{1}{2}a^{3/2}\tanh^{-1}\left(\frac{\sqrt{a+cx^4}}{\sqrt{a}}\right)+\frac{1}{2}a\sqrt{a+cx^4}+\frac{1}{6}\left(a+cx^4\right)^{3/2}$$

```
[Out] (a*Sqrt[a + c*x^4])/2 + (a + c*x^4)^(3/2)/6 - (a^(3/2)*ArcTanh[Sq
rt[a + c*x^4]/Sqrt[a]])/2
```

Rubi [A] time = 0.0910448, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{1}{2}a^{3/2}\tanh^{-1}\left(\frac{\sqrt{a+cx^4}}{\sqrt{a}}\right)+\frac{1}{2}a\sqrt{a+cx^4}+\frac{1}{6}\left(a+cx^4\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + c*x^4)^(3/2)/x,x]
```

```
[Out] (a*Sqrt[a + c*x^4])/2 + (a + c*x^4)^(3/2)/6 - (a^(3/2)*ArcTanh[Sq
rt[a + c*x^4]/Sqrt[a]])/2
```

Rubi in Sympy [A] time = 8.63257, size = 48, normalized size = 0.81

$$-\frac{a^{\frac{3}{2}}\operatorname{atanh}\left(\frac{\sqrt{a+cx^4}}{\sqrt{a}}\right)}{2}+\frac{a\sqrt{a+cx^4}}{2}+\frac{\left(a+cx^4\right)^{\frac{3}{2}}}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**(3/2)/x,x)
```

```
[Out] -a**(3/2)*atanh(sqrt(a + c*x**4)/sqrt(a))/2 + a*sqrt(a + c*x**4)/
2 + (a + c*x**4)**(3/2)/6
```

Mathematica [A] time = 0.0957863, size = 51, normalized size = 0.86

$$\frac{1}{6}\left(\sqrt{a+cx^4}\left(4a+cx^4\right)-3a^{3/2}\tanh^{-1}\left(\frac{\sqrt{a+cx^4}}{\sqrt{a}}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + c*x^4)^(3/2)/x,x]
```

```
[Out] (Sqrt[a + c*x^4]*(4*a + c*x^4) - 3*a^(3/2)*ArcTanh[Sqrt[a + c*x^4
]/Sqrt[a]])/6
```

Maple [A] time = 0.023, size = 57, normalized size = 1.

$$-\frac{1}{2}a^{\frac{3}{2}}\ln\left(\frac{1}{x^2}\left(2a+2\sqrt{a}\sqrt{cx^4+a}\right)\right)+\frac{cx^4}{6}\sqrt{cx^4+a}+\frac{2a}{3}\sqrt{cx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)^(3/2)/x,x)
```

```
[Out] -1/2*a^(3/2)*ln((2*a+2*a^(1/2)*(c*x^4+a)^(1/2))/x^2)+1/6*c*x^4*(c
*x^4+a)^(1/2)+2/3*a*(c*x^4+a)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.261046, size = 1, normalized size = 0.02

$$\left[\frac{1}{4}\,a^{\frac{3}{2}}\log\left(\frac{cx^4 - 2\,\sqrt{cx^4 + a}\sqrt{a} + 2\,a}{x^4}\right) + \frac{1}{6}\,\left(cx^4 + 4\,a\right)\sqrt{cx^4 + a},\right.$$
$$\left.-\frac{1}{2}\,\sqrt{-a}a\arctan\left(\frac{\sqrt{cx^4 + a}}{\sqrt{-a}}\right) + \frac{1}{6}\,\left(cx^4 + 4\,a\right)\sqrt{cx^4 + a}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)/x,x, algorithm="fricas")
```

```
[Out] [1/4*a^(3/2)*log((c*x^4 - 2*sqrt(c*x^4 + a)*sqrt(a) + 2*a)/x^4) +
 1/6*(c*x^4 + 4*a)*sqrt(c*x^4 + a), -1/2*sqrt(-a)*a*arctan(sqrt(c
*x^4 + a)/sqrt(-a)) + 1/6*(c*x^4 + 4*a)*sqrt(c*x^4 + a)]
```

Sympy [A] time = 6.84488, size = 80, normalized size = 1.36

$$\frac{2a^{\frac{3}{2}}\sqrt{1 + \frac{cx^4}{a}}}{3} + \frac{a^{\frac{3}{2}}\log\left(\frac{cx^4}{a}\right)}{4} - \frac{a^{\frac{3}{2}}\log\left(\sqrt{1 + \frac{cx^4}{a}} + 1\right)}{2} + \frac{\sqrt{a}cx^4\sqrt{1 + \frac{cx^4}{a}}}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**(3/2)/x,x)
```

```
[Out] 2*a**(3/2)*sqrt(1 + c*x**4/a)/3 + a**(3/2)*log(c*x**4/a)/4 - a**(
3/2)*log(sqrt(1 + c*x**4/a) + 1)/2 + sqrt(a)*c*x**4*sqrt(1 + c*x*
*4/a)/6
```

GIAC/XCAS [A] time = 0.218739, size = 68, normalized size = 1.15

$$\frac{a^2\arctan\left(\frac{\sqrt{cx^4+a}}{\sqrt{-a}}\right)}{2\,\sqrt{-a}} + \frac{1}{6}\,\left(cx^4 + a\right)^{\frac{3}{2}} + \frac{1}{2}\,\sqrt{cx^4 + a}a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)/x,x, algorithm="giac")
```

```
[Out] 1/2*a^2*arctan(sqrt(c*x^4 + a)/sqrt(-a))/sqrt(-a) + 1/6*(c*x^4 +
a)^(3/2) + 1/2*sqrt(c*x^4 + a)*a
```

3.785 $\int \frac{(a+cx^4)^{3/2}}{x^5}\,dx$

Optimal. Leaf size=63

$$-\frac{(a+cx^4)^{3/2}}{4x^4}+\frac{3}{4}c\sqrt{a+cx^4}-\frac{3}{4}\sqrt{a}c\tanh^{-1}\left(\frac{\sqrt{a+cx^4}}{\sqrt{a}}\right)$$

```
[Out] (3*c*Sqrt[a + c*x^4])/4 - (a + c*x^4)^(3/2)/(4*x^4) - (3*Sqrt[a]*
c*ArcTanh[Sqrt[a + c*x^4]/Sqrt[a]])/4
```

Rubi [A] time = 0.0938859, antiderivative size = 63, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{(a+cx^4)^{3/2}}{4x^4}+\frac{3}{4}c\sqrt{a+cx^4}-\frac{3}{4}\sqrt{a}c\tanh^{-1}\left(\frac{\sqrt{a+cx^4}}{\sqrt{a}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + c*x^4)^(3/2)/x^5,x]
```

```
[Out] (3*c*Sqrt[a + c*x^4])/4 - (a + c*x^4)^(3/2)/(4*x^4) - (3*Sqrt[a]*
c*ArcTanh[Sqrt[a + c*x^4]/Sqrt[a]])/4
```

Rubi in Sympy [A] time = 8.95702, size = 56, normalized size = 0.89

$$-\frac{3\sqrt{a}c\,\text{atanh}\left(\frac{\sqrt{a+cx^4}}{\sqrt{a}}\right)}{4}+\frac{3c\sqrt{a+cx^4}}{4}-\frac{(a+cx^4)^{\frac{3}{2}}}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**(3/2)/x**5,x)
```

```
[Out] -3*sqrt(a)*c*atanh(sqrt(a + c*x**4)/sqrt(a))/4 + 3*c*sqrt(a + c*x
**4)/4 - (a + c*x**4)**(3/2)/(4*x**4)
```

Mathematica [A] time = 0.0819188, size = 55, normalized size = 0.87

$$\left(\frac{c}{2}-\frac{a}{4x^4}\right)\sqrt{a+cx^4}-\frac{3}{4}\sqrt{a}c\tanh^{-1}\left(\frac{\sqrt{a+cx^4}}{\sqrt{a}}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + c*x^4)^(3/2)/x^5,x]
```

```
[Out] (c/2 - a/(4*x^4))*Sqrt[a + c*x^4] - (3*Sqrt[a]*c*ArcTanh[Sqrt[a +
 c*x^4]/Sqrt[a]])/4
```

Maple [A] time = 0.021, size = 58, normalized size = 0.9

$$\frac{c}{2}\sqrt{cx^4+a}-\frac{a}{4x^4}\sqrt{cx^4+a}-\frac{3c}{4}\sqrt{a}\ln\left(\frac{1}{x^2}\left(2a+2\sqrt{a}\sqrt{cx^4+a}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)^(3/2)/x^5,x)
```

```
[Out] 1/2*c*(c*x^4+a)^(1/2)-1/4*a/x^4*(c*x^4+a)^(1/2)-3/4*a^(1/2)*c*ln(
(2*a+2*a^(1/2)*(c*x^4+a)^(1/2))/x^2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)/x^5,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.246822, size = 1, normalized size = 0.02

$$\left[\frac{3\,\sqrt{a}cx^4\log\left(\frac{cx^4-2\,\sqrt{cx^4+a}\sqrt{a}+2\,a}{x^4}\right)+2\left(2\,cx^4-a\right)\sqrt{cx^4+a}}{8\,x^4},\ -\frac{3\,\sqrt{-a}cx^4\arctan\left(\frac{\sqrt{cx^4+a}}{\sqrt{-a}}\right)-\left(2\,cx^4-a\right)\sqrt{cx^4+a}}{4\,x^4}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)/x^5,x, algorithm="fricas")
```

```
[Out] [1/8*(3*sqrt(a)*c*x^4*log((c*x^4 - 2*sqrt(c*x^4 + a)*sqrt(a) + 2*
a)/x^4) + 2*(2*c*x^4 - a)*sqrt(c*x^4 + a))/x^4, -1/4*(3*sqrt(-a)*
c*x^4*arctan(sqrt(c*x^4 + a)/sqrt(-a)) - (2*c*x^4 - a)*sqrt(c*x^4
 + a))/x^4]
```

Sympy [A] time = 8.94732, size = 95, normalized size = 1.51

$$-\frac{3\sqrt{a}c\operatorname{asinh}\left(\frac{\sqrt{a}}{\sqrt{c}x^2}\right)}{4}-\frac{a^2}{4\sqrt{c}x^6\sqrt{\frac{a}{cx^4}+1}}+\frac{a\sqrt{c}}{4x^2\sqrt{\frac{a}{cx^4}+1}}+\frac{c^{\frac{3}{2}}x^2}{2\sqrt{\frac{a}{cx^4}+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**(3/2)/x**5,x)
```

```
[Out] -3*sqrt(a)*c*asinh(sqrt(a)/(sqrt(c)*x**2))/4 - a**2/(4*sqrt(c)*x*
*6*sqrt(a/(c*x**4) + 1)) + a*sqrt(c)/(4*x**2*sqrt(a/(c*x**4) + 1)
) + c**(3/2)*x**2/(2*sqrt(a/(c*x**4) + 1))
```

GIAC/XCAS [A] time = 0.214447, size = 77, normalized size = 1.22

$$\frac{1}{4}\left(\frac{3\,a\arctan\left(\frac{\sqrt{cx^4+a}}{\sqrt{-a}}\right)}{\sqrt{-a}}+2\,\sqrt{cx^4+a}-\frac{\sqrt{cx^4+a}a}{cx^4}\right)c$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)/x^5,x, algorithm="giac")
```

```
[Out] 1/4*(3*a*arctan(sqrt(c*x^4 + a)/sqrt(-a))/sqrt(-a) + 2*sqrt(c*x^4
 + a) - sqrt(c*x^4 + a)*a/(c*x^4))*c
```

3.786 $\int \frac{(a+cx^4)^{3/2}}{x^9}\,dx$

Optimal. Leaf size=68

$$-\frac{3c^2\tanh^{-1}\left(\frac{\sqrt{a+cx^4}}{\sqrt{a}}\right)}{16\sqrt{a}}-\frac{3c\sqrt{a+cx^4}}{16x^4}-\frac{(a+cx^4)^{3/2}}{8x^8}$$

```
[Out] (-3*c*Sqrt[a + c*x^4])/(16*x^4) - (a + c*x^4)^(3/2)/(8*x^8) - (3*
c^2*ArcTanh[Sqrt[a + c*x^4]/Sqrt[a]])/(16*Sqrt[a])
```

Rubi [A] time = 0.0969037, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{3c^2\tanh^{-1}\left(\frac{\sqrt{a+cx^4}}{\sqrt{a}}\right)}{16\sqrt{a}}-\frac{3c\sqrt{a+cx^4}}{16x^4}-\frac{(a+cx^4)^{3/2}}{8x^8}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + c*x^4)^(3/2)/x^9,x]
```

```
[Out] (-3*c*Sqrt[a + c*x^4])/(16*x^4) - (a + c*x^4)^(3/2)/(8*x^8) - (3*
c^2*ArcTanh[Sqrt[a + c*x^4]/Sqrt[a]])/(16*Sqrt[a])
```

Rubi in Sympy [A] time = 9.59444, size = 63, normalized size = 0.93

$$-\frac{3c\sqrt{a+cx^4}}{16x^4}-\frac{(a+cx^4)^{\frac{3}{2}}}{8x^8}-\frac{3c^2\operatorname{atanh}\left(\frac{\sqrt{a+cx^4}}{\sqrt{a}}\right)}{16\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**(3/2)/x**9,x)
```

```
[Out] -3*c*sqrt(a + c*x**4)/(16*x**4) - (a + c*x**4)**(3/2)/(8*x**8) -
3*c**2*atanh(sqrt(a + c*x**4)/sqrt(a))/(16*sqrt(a))
```

Mathematica [A] time = 0.104716, size = 60, normalized size = 0.88

$$\left(-\frac{a}{8x^8}-\frac{5c}{16x^4}\right)\sqrt{a+cx^4}-\frac{3c^2\tanh^{-1}\left(\frac{\sqrt{a+cx^4}}{\sqrt{a}}\right)}{16\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + c*x^4)^(3/2)/x^9,x]
```

```
[Out] (-a/(8*x^8) - (5*c)/(16*x^4))*Sqrt[a + c*x^4] - (3*c^2*ArcTanh[Sq
rt[a + c*x^4]/Sqrt[a]])/(16*Sqrt[a])
```

Maple [A] time = 0.023, size = 63, normalized size = 0.9

$$-\frac{a}{8x^8}\sqrt{cx^4+a}-\frac{5c}{16x^4}\sqrt{cx^4+a}-\frac{3c^2}{16}\ln\left(\frac{1}{x^2}\left(2a+2\sqrt{a}\sqrt{cx^4+a}\right)\right)\frac{1}{\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)^(3/2)/x^9,x)
```

```
[Out] -1/8*a/x^8*(c*x^4+a)^(1/2)-5/16*c*(c*x^4+a)^(1/2)/x^4-3/16/a^(1/2
)*c^2*ln((2*a+2*a^(1/2)*(c*x^4+a)^(1/2))/x^2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)/x^9,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.266838, size = 1, normalized size = 0.01

$$\left[\frac{3\,c^2x^8\log\left(\frac{(cx^4+2\,a)\sqrt{a}-2\,\sqrt{cx^4+a}a}{x^4}\right)-2\left(5\,cx^4+2\,a\right)\sqrt{cx^4+a}\sqrt{a}}{32\,\sqrt{a}x^8},\ \frac{3\,c^2x^8\arctan\left(\frac{a}{\sqrt{cx^4+a}\sqrt{-a}}\right)-\left(5\,cx^4+2\,a\right)\sqrt{cx^4+a}\sqrt{-a}}{16\,\sqrt{-a}x^8}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)/x^9,x, algorithm="fricas")
```

```
[Out] [1/32*(3*c^2*x^8*log(((c*x^4 + 2*a)*sqrt(a) - 2*sqrt(c*x^4 + a)*a
)/x^4) - 2*(5*c*x^4 + 2*a)*sqrt(c*x^4 + a)*sqrt(a))/(sqrt(a)*x^8)
, 1/16*(3*c^2*x^8*arctan(a/(sqrt(c*x^4 + a)*sqrt(-a))) - (5*c*x^4
 + 2*a)*sqrt(c*x^4 + a)*sqrt(-a))/(sqrt(-a)*x^8)]
```

Sympy [A] time = 13.572, size = 75, normalized size = 1.1

$$-\frac{a\sqrt{c}\sqrt{\frac{a}{cx^4}+1}}{8x^6}-\frac{5c^{\frac{3}{2}}\sqrt{\frac{a}{cx^4}+1}}{16x^2}-\frac{3c^2\operatorname{asinh}\left(\frac{\sqrt{a}}{\sqrt{c}x^2}\right)}{16\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**(3/2)/x**9,x)
```

```
[Out] -a*sqrt(c)*sqrt(a/(c*x**4) + 1)/(8*x**6) - 5*c**(3/2)*sqrt(a/(c*x
**4) + 1)/(16*x**2) - 3*c**2*asinh(sqrt(a)/(sqrt(c)*x**2))/(16*sq
rt(a))
```

GIAC/XCAS [A] time = 0.21564, size = 82, normalized size = 1.21

$$\frac{1}{16}\,c^2\left(\frac{3\,\arctan\left(\frac{\sqrt{cx^4+a}}{\sqrt{-a}}\right)}{\sqrt{-a}}-\frac{5\,\left(cx^4+a\right)^{\frac{3}{2}}-3\,\sqrt{cx^4+a}a}{c^2x^8}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)/x^9,x, algorithm="giac")

[Out] 1/16*c^2*(3*arctan(sqrt(c*x^4 + a)/sqrt(-a))/sqrt(-a) - (5*(c*x^4
 + a)^(3/2) - 3*sqrt(c*x^4 + a)*a)/(c^2*x^8))
```

3.787 $\int x^5 \left(a+cx^4\right)^{3/2} dx$

Optimal. Leaf size=95

$$-\frac{a^3 \tanh^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a+cx^4}}\right)}{32c^{3/2}}+\frac{a^2x^2\sqrt{a+cx^4}}{32c}+\frac{1}{12}x^6\left(a+cx^4\right)^{3/2}+\frac{1}{16}ax^6\sqrt{a+cx^4}$$

```
[Out] (a^2*x^2*Sqrt[a + c*x^4])/(32*c) + (a*x^6*Sqrt[a + c*x^4])/16 + (
x^6*(a + c*x^4)^(3/2))/12 - (a^3*ArcTanh[(Sqrt[c]*x^2)/Sqrt[a + c
*x^4]])/(32*c^(3/2))
```

Rubi [A] time = 0.14832, antiderivative size = 95, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{a^3 \tanh^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a+cx^4}}\right)}{32c^{3/2}}+\frac{a^2x^2\sqrt{a+cx^4}}{32c}+\frac{1}{12}x^6\left(a+cx^4\right)^{3/2}+\frac{1}{16}ax^6\sqrt{a+cx^4}$$

Antiderivative was successfully verified.

```
[In] Int[x^5*(a + c*x^4)^(3/2),x]
```

```
[Out] (a^2*x^2*Sqrt[a + c*x^4])/(32*c) + (a*x^6*Sqrt[a + c*x^4])/16 + (
x^6*(a + c*x^4)^(3/2))/12 - (a^3*ArcTanh[(Sqrt[c]*x^2)/Sqrt[a + c
*x^4]])/(32*c^(3/2))
```

Rubi in Sympy [A] time = 15.3602, size = 82, normalized size = 0.86

$$-\frac{a^3 \operatorname{atanh}\left(\frac{\sqrt{c}x^2}{\sqrt{a+cx^4}}\right)}{32c^{\frac{3}{2}}}+\frac{a^2x^2\sqrt{a+cx^4}}{32c}+\frac{ax^6\sqrt{a+cx^4}}{16}+\frac{x^6\left(a+cx^4\right)^{\frac{3}{2}}}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**5*(c*x**4+a)**(3/2),x)
```

```
[Out] -a**3*atanh(sqrt(c)*x**2/sqrt(a + c*x**4))/(32*c**(3/2)) + a**2*x
**2*sqrt(a + c*x**4)/(32*c) + a*x**6*sqrt(a + c*x**4)/16 + x**6*(
a + c*x**4)**(3/2)/12
```

Mathematica [A] time = 0.0670835, size = 82, normalized size = 0.86

$$\frac{1}{2}\sqrt{a+cx^4}\left(\frac{a^2x^2}{16c}+\frac{7ax^6}{24}+\frac{cx^{10}}{6}\right)-\frac{a^3\log\left(\sqrt{c}\sqrt{a+cx^4}+cx^2\right)}{32c^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5*(a + c*x^4)^(3/2),x]
```

```
[Out] (Sqrt[a + c*x^4]*((a^2*x^2)/(16*c) + (7*a*x^6)/24 + (c*x^10)/6))/
2 - (a^3*Log[c*x^2 + Sqrt[c]*Sqrt[a + c*x^4]])/(32*c^(3/2))
```

Maple [A] time = 0.025, size = 78, normalized size = 0.8

$$\frac{a^2x^2}{32\,c}\sqrt{cx^4+a}-\frac{a^3}{32}\ln\left(x^2\sqrt{c}+\sqrt{cx^4+a}\right)c^{-\frac{3}{2}}+\frac{cx^{10}}{12}\sqrt{cx^4+a}+\frac{7\,x^6a}{48}\sqrt{cx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^5*(c*x^4+a)^(3/2),x)
```

```
[Out] 1/32*a^2*x^2*(c*x^4+a)^(1/2)/c-1/32*a^3/c^(3/2)*ln(x^2*c^(1/2)+(c
*x^4+a)^(1/2))+1/12*c*x^10*(c*x^4+a)^(1/2)+7/48*a*x^6*(c*x^4+a)^(
1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((c*x^4 + a)^(3/2)*x^5,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.29038, size = 1, normalized size = 0.01

$$\left[\frac{3\,a^3\log\left(2\,\sqrt{cx^4+a}cx^2-\left(2\,cx^4+a\right)\sqrt{c}\right)+2\left(8\,c^2x^{10}+14\,acx^6+3\,a^2x^2\right)\sqrt{cx^4+a}\sqrt{c}}{192\,c^{\frac{3}{2}}},\ -\frac{3\,a^3\arctan\left(\frac{\sqrt{-c}x^2}{\sqrt{cx^4+a}}\right)-\left(8\,c^2x^{10}+14\,acx^6+3\,a^2x^2\right)\sqrt{cx^4+a}\sqrt{-c}}{96\,\sqrt{-c}c}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((c*x^4 + a)^(3/2)*x^5,x, algorithm="fricas")
```

```
[Out] [1/192*(3*a^3*log(2*sqrt(c*x^4 + a)*c*x^2 - (2*c*x^4 + a)*sqrt(c)
) + 2*(8*c^2*x^10 + 14*a*c*x^6 + 3*a^2*x^2)*sqrt(c*x^4 + a)*sqrt(
c))/c^(3/2), -1/96*(3*a^3*arctan(sqrt(-c)*x^2/sqrt(c*x^4 + a)) -
(8*c^2*x^10 + 14*a*c*x^6 + 3*a^2*x^2)*sqrt(c*x^4 + a)*sqrt(-c))/(
sqrt(-c)*c)]
```

Sympy [A] time = 18.403, size = 122, normalized size = 1.28

$$\frac{a^{\frac{5}{2}}x^2}{32c\sqrt{1+\frac{cx^4}{a}}}+\frac{17a^{\frac{3}{2}}x^6}{96\sqrt{1+\frac{cx^4}{a}}}+\frac{11\sqrt{a}cx^{10}}{48\sqrt{1+\frac{cx^4}{a}}}-\frac{a^3\operatorname{asinh}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{32c^{\frac{3}{2}}}+\frac{c^2x^{14}}{12\sqrt{a}\sqrt{1+\frac{cx^4}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**5*(c*x**4+a)**(3/2),x)
```

```
[Out] a**(5/2)*x**2/(32*c*sqrt(1 + c*x**4/a)) + 17*a**(3/2)*x**6/(96*sq
rt(1 + c*x**4/a)) + 11*sqrt(a)*c*x**10/(48*sqrt(1 + c*x**4/a)) -
a**3*asinh(sqrt(c)*x**2/sqrt(a))/(32*c**(3/2)) + c**2*x**14/(12*s
qrt(a)*sqrt(1 + c*x**4/a))
```

GIAC/XCAS [A] time = 0.228599, size = 90, normalized size = 0.95

$$\frac{1}{96}\left(2\left(4\,cx^4+7\,a\right)x^4+\frac{3\,a^2}{c}\right)\sqrt{cx^4+a}x^2+\frac{a^3\ln\left(\left|-\sqrt{c}x^2+\sqrt{cx^4+a}\right|\right)}{32\,c^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)*x^5,x, algorithm="giac")
```

```
[Out] 1/96*(2*(4*c*x^4 + 7*a)*x^4 + 3*a^2/c)*sqrt(c*x^4 + a)*x^2 + 1/32
*a^3*ln(abs(-sqrt(c)*x^2 + sqrt(c*x^4 + a)))/c^(3/2)
```

3.788 $\int x\left(a+cx^4\right)^{3/2}\,dx$

Optimal. Leaf size=71

$$\frac{3a^2\tanh^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a+cx^4}}\right)}{16\sqrt{c}}+\frac{3}{16}ax^2\sqrt{a+cx^4}+\frac{1}{8}x^2\left(a+cx^4\right)^{3/2}$$

```
[Out] (3*a*x^2*Sqrt[a + c*x^4])/16 + (x^2*(a + c*x^4)^(3/2))/8 + (3*a^2
*ArcTanh[(Sqrt[c]*x^2)/Sqrt[a + c*x^4]])/(16*Sqrt[c])
```

Rubi [A] time = 0.0791766, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{3a^2\tanh^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a+cx^4}}\right)}{16\sqrt{c}}+\frac{3}{16}ax^2\sqrt{a+cx^4}+\frac{1}{8}x^2\left(a+cx^4\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In] Int[x*(a + c*x^4)^(3/2),x]
```

```
[Out] (3*a*x^2*Sqrt[a + c*x^4])/16 + (x^2*(a + c*x^4)^(3/2))/8 + (3*a^2
*ArcTanh[(Sqrt[c]*x^2)/Sqrt[a + c*x^4]])/(16*Sqrt[c])
```

Rubi in Sympy [A] time = 6.5933, size = 65, normalized size = 0.92

$$\frac{3a^2\operatorname{atanh}\left(\frac{\sqrt{c}x^2}{\sqrt{a+cx^4}}\right)}{16\sqrt{c}}+\frac{3ax^2\sqrt{a+cx^4}}{16}+\frac{x^2\left(a+cx^4\right)^{\frac{3}{2}}}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x*(c*x**4+a)**(3/2),x)
```

```
[Out] 3*a**2*atanh(sqrt(c)*x**2/sqrt(a + c*x**4))/(16*sqrt(c)) + 3*a*x*
*2*sqrt(a + c*x**4)/16 + x**2*(a + c*x**4)**(3/2)/8
```

Mathematica [A] time = 0.0656864, size = 64, normalized size = 0.9

$$\frac{1}{16}\left(\frac{3a^2\log\left(\sqrt{c}\sqrt{a+cx^4}+cx^2\right)}{\sqrt{c}}+x^2\sqrt{a+cx^4}\left(5a+2cx^4\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(a + c*x^4)^(3/2),x]
```

```
[Out] (x^2*Sqrt[a + c*x^4]*(5*a + 2*c*x^4) + (3*a^2*Log[c*x^2 + Sqrt[c]
*Sqrt[a + c*x^4]])/Sqrt[c])/16
```

Maple [A] time = 0.014, size = 58, normalized size = 0.8

$$\frac{3\,a^2}{16}\ln\left(x^2\sqrt{c}+\sqrt{cx^4+a}\right)\frac{1}{\sqrt{c}}+\frac{cx^6}{8}\sqrt{cx^4+a}+\frac{5\,ax^2}{16}\sqrt{cx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(c*x^4+a)^(3/2),x)
```

```
[Out] 3/16*a^2*ln(x^2*c^(1/2)+(c*x^4+a)^(1/2))/c^(1/2)+1/8*c*x^6*(c*x^4
+a)^(1/2)+5/16*a*x^2*(c*x^4+a)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)*x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.263374, size = 1, normalized size = 0.01

$$\left[\frac{3\,a^2\log\left(-2\,\sqrt{cx^4+a}cx^2-\left(2\,cx^4+a\right)\sqrt{c}\right)+2\left(2\,cx^6+5\,ax^2\right)\sqrt{cx^4+a}\sqrt{c}}{32\,\sqrt{c}}, \frac{3\,a^2\arctan\left(\frac{\sqrt{-c}x^2}{\sqrt{cx^4+a}}\right)+\left(2\,cx^6+5\,ax^2\right)\sqrt{cx^4+\right.}{16\,\sqrt{-c}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)*x,x, algorithm="fricas")
```

```
[Out] [1/32*(3*a^2*log(-2*sqrt(c*x^4 + a)*c*x^2 - (2*c*x^4 + a)*sqrt(c)
) + 2*(2*c*x^6 + 5*a*x^2)*sqrt(c*x^4 + a)*sqrt(c))/sqrt(c), 1/16*
(3*a^2*arctan(sqrt(-c)*x^2/sqrt(c*x^4 + a)) + (2*c*x^6 + 5*a*x^2)
*sqrt(c*x^4 + a)*sqrt(-c))/sqrt(-c)]
```

Sympy [A] time = 10.0555, size = 73, normalized size = 1.03

$$\frac{5a^{\frac{3}{2}}x^2\sqrt{1+\frac{cx^4}{a}}}{16}+\frac{\sqrt{a}cx^6\sqrt{1+\frac{cx^4}{a}}}{8}+\frac{3a^2\operatorname{asinh}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{16\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(c*x**4+a)**(3/2),x)
```

```
[Out] 5*a**(3/2)*x**2*sqrt(1 + c*x**4/a)/16 + sqrt(a)*c*x**6*sqrt(1 + c
*x**4/a)/8 + 3*a**2*asinh(sqrt(c)*x**2/sqrt(a))/(16*sqrt(c))
```

GIAC/XCAS [A] time = 0.224441, size = 72, normalized size = 1.01

$$\frac{1}{16}\left(2\,cx^4+5\,a\right)\sqrt{cx^4+a}x^2-\frac{3\,a^2\ln\left(\left|-\sqrt{c}x^2+\sqrt{cx^4+a}\right|\right)}{16\,\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)*x,x, algorithm="giac")
```

```
[Out] 1/16*(2*c*x^4 + 5*a)*sqrt(c*x^4 + a)*x^2 - 3/16*a^2*ln(abs(-sqrt(
c)*x^2 + sqrt(c*x^4 + a)))/sqrt(c)
```

3.789 $\int \frac{(a+cx^4)^{3/2}}{x^3} dx$

Optimal. Leaf size=69

$$\frac{3}{4}cx^2\sqrt{a+cx^4} - \frac{(a+cx^4)^{3/2}}{2x^2} + \frac{3}{4}a\sqrt{c}\tanh^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a+cx^4}}\right)$$

```
[Out] (3*c*x^2*Sqrt[a + c*x^4])/4 - (a + c*x^4)^(3/2)/(2*x^2) + (3*a*Sq
rt[c]*ArcTanh[(Sqrt[c]*x^2)/Sqrt[a + c*x^4]])/4
```

Rubi [A] time = 0.0926946, antiderivative size = 69, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{3}{4}cx^2\sqrt{a+cx^4} - \frac{(a+cx^4)^{3/2}}{2x^2} + \frac{3}{4}a\sqrt{c}\tanh^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a+cx^4}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + c*x^4)^(3/2)/x^3,x]
```

```
[Out] (3*c*x^2*Sqrt[a + c*x^4])/4 - (a + c*x^4)^(3/2)/(2*x^2) + (3*a*Sq
rt[c]*ArcTanh[(Sqrt[c]*x^2)/Sqrt[a + c*x^4]])/4
```

Rubi in Sympy [A] time = 8.17768, size = 63, normalized size = 0.91

$$\frac{3a\sqrt{c}\operatorname{atanh}\left(\frac{\sqrt{c}x^2}{\sqrt{a+cx^4}}\right)}{4} + \frac{3cx^2\sqrt{a+cx^4}}{4} - \frac{(a+cx^4)^{\frac{3}{2}}}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**(3/2)/x**3,x)
```

```
[Out] 3*a*sqrt(c)*atanh(sqrt(c)*x**2/sqrt(a + c*x**4))/4 + 3*c*x**2*sqr
t(a + c*x**4)/4 - (a + c*x**4)**(3/2)/(2*x**2)
```

Mathematica [A] time = 0.0922338, size = 58, normalized size = 0.84

$$\frac{1}{4}\left(\frac{\sqrt{a+cx^4}(cx^4-2a)}{x^2} + 3a\sqrt{c}\tanh^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a+cx^4}}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + c*x^4)^(3/2)/x^3,x]
```

```
[Out] (((-2*a + c*x^4)*Sqrt[a + c*x^4])/x^2 + 3*a*Sqrt[c]*ArcTanh[(Sqrt
[c]*x^2)/Sqrt[a + c*x^4]])/4
```

Maple [A] time = 0.023, size = 56, normalized size = 0.8

$$-\frac{a}{2x^2}\sqrt{cx^4+a} + \frac{cx^2}{4}\sqrt{cx^4+a} + \frac{3a}{4}\sqrt{c}\ln\left(x^2\sqrt{c} + \sqrt{cx^4+a}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)^(3/2)/x^3,x)
```

```
[Out] -1/2*a/x^2*(c*x^4+a)^(1/2)+1/4*c*x^2*(c*x^4+a)^(1/2)+3/4*c^(1/2)*
a*ln(x^2*c^(1/2)+(c*x^4+a)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)/x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.267508, size = 1, normalized size = 0.01

$$\left[\frac{3\,a\sqrt{c}x^2\log\left(-2\,cx^4-2\,\sqrt{cx^4+a}\sqrt{c}x^2-a\right)+2\,\sqrt{cx^4+a}\left(cx^4-2\,a\right)}{8\,x^2},\frac{3\,a\sqrt{-c}x^2\arctan\left(\frac{cx^2}{\sqrt{cx^4+a}\sqrt{-c}}\right)+\sqrt{cx^4+a}\left(cx^4-2\,a\right)}{4\,x^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)/x^3,x, algorithm="fricas")
```

```
[Out] [1/8*(3*a*sqrt(c)*x^2*log(-2*c*x^4 - 2*sqrt(c*x^4 + a)*sqrt(c)*x^
2 - a) + 2*sqrt(c*x^4 + a)*(c*x^4 - 2*a))/x^2, 1/4*(3*a*sqrt(-c)*
x^2*arctan(c*x^2/(sqrt(c*x^4 + a)*sqrt(-c))) + sqrt(c*x^4 + a)*(c
*x^4 - 2*a))/x^2]
```

Sympy [A] time = 8.37831, size = 95, normalized size = 1.38

$$-\frac{a^{\frac{3}{2}}}{2x^2\sqrt{1+\frac{cx^4}{a}}}-\frac{\sqrt{a}cx^2}{4\sqrt{1+\frac{cx^4}{a}}}+\frac{3a\sqrt{c}\operatorname{asinh}\left(\frac{\sqrt{c}x^2}{\sqrt{a}}\right)}{4}+\frac{c^2x^6}{4\sqrt{a}\sqrt{1+\frac{cx^4}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**(3/2)/x**3,x)
```

```
[Out] -a**(3/2)/(2*x**2*sqrt(1 + c*x**4/a)) - sqrt(a)*c*x**2/(4*sqrt(1
+ c*x**4/a)) + 3*a*sqrt(c)*asinh(sqrt(c)*x**2/sqrt(a))/4 + c**2*x
**6/(4*sqrt(a)*sqrt(1 + c*x**4/a))
```

GIAC/XCAS [A] time = 0.243277, size = 72, normalized size = 1.04

$$\frac{1}{4}\sqrt{cx^4+a}cx^2-\frac{3\,ac\arctan\left(\frac{\sqrt{c+\frac{a}{x^4}}}{\sqrt{-c}}\right)}{4\,\sqrt{-c}}-\frac{1}{2}\,a\sqrt{c+\frac{a}{x^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)/x^3,x, algorithm="giac")
```

```
[Out] 1/4*sqrt(c*x^4 + a)*c*x^2 - 3/4*a*c*arctan(sqrt(c + a/x^4)/sqrt(-
c))/sqrt(-c) - 1/2*a*sqrt(c + a/x^4)
```

3.790 $\int \frac{(a+cx^4)^{3/2}}{x^7} dx$

Optimal. Leaf size=68

$$\frac{1}{2}c^{3/2}\tanh^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a+cx^4}}\right)-\frac{(a+cx^4)^{3/2}}{6x^6}-\frac{c\sqrt{a+cx^4}}{2x^2}$$

```
[Out] -(c*Sqrt[a + c*x^4])/(2*x^2) - (a + c*x^4)^(3/2)/(6*x^6) + (c^(3/
2)*ArcTanh[(Sqrt[c]*x^2)/Sqrt[a + c*x^4]])/2
```

Rubi [A] time = 0.100201, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{1}{2}c^{3/2}\tanh^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a+cx^4}}\right)-\frac{(a+cx^4)^{3/2}}{6x^6}-\frac{c\sqrt{a+cx^4}}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + c*x^4)^(3/2)/x^7,x]
```

```
[Out] -(c*Sqrt[a + c*x^4])/(2*x^2) - (a + c*x^4)^(3/2)/(6*x^6) + (c^(3/
2)*ArcTanh[(Sqrt[c]*x^2)/Sqrt[a + c*x^4]])/2
```

Rubi in Sympy [A] time = 9.87035, size = 58, normalized size = 0.85

$$\frac{c^{\frac{3}{2}}\operatorname{atanh}\left(\frac{\sqrt{c}x^2}{\sqrt{a+cx^4}}\right)}{2}-\frac{c\sqrt{a+cx^4}}{2x^2}-\frac{(a+cx^4)^{\frac{3}{2}}}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**(3/2)/x**7,x)
```

```
[Out] c**(3/2)*atanh(sqrt(c)*x**2/sqrt(a + c*x**4))/2 - c*sqrt(a + c*x*
*4)/(2*x**2) - (a + c*x**4)**(3/2)/(6*x**6)
```

Mathematica [A] time = 0.0707399, size = 57, normalized size = 0.84

$$\frac{1}{2}c^{3/2}\tanh^{-1}\left(\frac{\sqrt{c}x^2}{\sqrt{a+cx^4}}\right)-\frac{\sqrt{a+cx^4}\,(a+4cx^4)}{6x^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + c*x^4)^(3/2)/x^7,x]
```

```
[Out] -(Sqrt[a + c*x^4]*(a + 4*c*x^4))/(6*x^6) + (c^(3/2)*ArcTanh[(Sqrt
[c]*x^2)/Sqrt[a + c*x^4]])/2
```

Maple [A] time = 0.022, size = 55, normalized size = 0.8

$$\frac{1}{2}c^{\frac{3}{2}}\ln\left(x^2\sqrt{c}+\sqrt{cx^4+a}\right)-\frac{a}{6\,x^6}\sqrt{cx^4+a}-\frac{2\,c}{3\,x^2}\sqrt{cx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)^(3/2)/x^7,x)
```

```
[Out] 1/2*c^(3/2)*ln(x^2*c^(1/2)+(c*x^4+a)^(1/2))-1/6*a/x^6*(c*x^4+a)^(
1/2)-2/3*c*(c*x^4+a)^(1/2)/x^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)/x^7,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.276377, size = 1, normalized size = 0.01

$$\left[\frac{3\,c^{\frac{3}{2}}x^6\log\left(-2\,cx^4-2\,\sqrt{cx^4+a}\sqrt{c}x^2-a\right)-2\left(4\,cx^4+a\right)\sqrt{cx^4+a}}{12\,x^6},\ \frac{3\,\sqrt{-c}cx^6\arctan\left(\frac{cx^2}{\sqrt{cx^4+a}\sqrt{-c}}\right)-\left(4\,cx^4+a\right)\sqrt{cx^4+a}}{6\,x^6}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)/x^7,x, algorithm="fricas")
```

```
[Out] [1/12*(3*c^(3/2)*x^6*log(-2*c*x^4 - 2*sqrt(c*x^4 + a)*sqrt(c)*x^2
 - a) - 2*(4*c*x^4 + a)*sqrt(c*x^4 + a))/x^6, 1/6*(3*sqrt(-c)*c*x
^6*arctan(c*x^2/(sqrt(c*x^4 + a)*sqrt(-c))) - (4*c*x^4 + a)*sqrt(
c*x^4 + a))/x^6]
```

Sympy [A] time = 8.7653, size = 80, normalized size = 1.18

$$-\frac{a\sqrt{c}\sqrt{\frac{a}{cx^4}+1}}{6x^4}-\frac{2c^{\frac{3}{2}}\sqrt{\frac{a}{cx^4}+1}}{3}-\frac{c^{\frac{3}{2}}\log\left(\frac{a}{cx^4}\right)}{4}+\frac{c^{\frac{3}{2}}\log\left(\sqrt{\frac{a}{cx^4}+1}+1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**(3/2)/x**7,x)
```

```
[Out] -a*sqrt(c)*sqrt(a/(c*x**4) + 1)/(6*x**4) - 2*c**(3/2)*sqrt(a/(c*x
**4) + 1)/3 - c**(3/2)*log(a/(c*x**4))/4 + c**(3/2)*log(sqrt(a/(c
*x**4) + 1) + 1)/2
```

GIAC/XCAS [A] time = 0.219101, size = 68, normalized size = 1.

$$-\frac{c^2\arctan\left(\frac{\sqrt{c+\frac{a}{x^4}}}{\sqrt{-c}}\right)}{2\sqrt{-c}}-\frac{1}{6}\left(c+\frac{a}{x^4}\right)^{\frac{3}{2}}-\frac{1}{2}\sqrt{c+\frac{a}{x^4}}c$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)/x^7,x, algorithm="giac")
```

```
[Out] -1/2*c^2*arctan(sqrt(c + a/x^4)/sqrt(-c))/sqrt(-c) - 1/6*(c + a/x
^4)^(3/2) - 1/2*sqrt(c + a/x^4)*c
```

3.791 $\int \frac{(a+cx^4)^{3/2}}{x^{11}}\,dx$

Optimal. Leaf size=21

$$-\frac{(a+cx^4)^{5/2}}{10ax^{10}}$$

```
[Out] -(a + c*x^4)^(5/2)/(10*a*x^10)
```

Rubi [A] time = 0.0204386, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{(a+cx^4)^{5/2}}{10ax^{10}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + c*x^4)^(3/2)/x^11,x]
```

```
[Out] -(a + c*x^4)^(5/2)/(10*a*x^10)
```

Rubi in Sympy [A] time = 2.70352, size = 17, normalized size = 0.81

$$-\frac{(a+cx^4)^{\frac{5}{2}}}{10ax^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**(3/2)/x**11,x)
```

```
[Out] -(a + c*x**4)**(5/2)/(10*a*x**10)
```

Mathematica [A] time = 0.0274053, size = 21, normalized size = 1.

$$-\frac{(a+cx^4)^{5/2}}{10ax^{10}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + c*x^4)^(3/2)/x^11,x]
```

```
[Out] -(a + c*x^4)^(5/2)/(10*a*x^10)
```

Maple [A] time = 0.007, size = 18, normalized size = 0.9

$$-\frac{1}{10\,ax^{10}}\left(cx^4+a\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)^(3/2)/x^11,x)
```

```
[Out] -1/10*(c*x^4+a)^(5/2)/a/x^10
```

Maxima [A] time = 1.42637, size = 23, normalized size = 1.1

$$-\frac{\left(cx^4+a\right)^{\frac{5}{2}}}{10\,ax^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*x^4 + a)^(3/2)/x^11,x, algorithm="maxima")
```

```
[Out] -1/10*(c*x^4 + a)^(5/2)/(a*x^10)
```

Fricas [A] time = 0.260878, size = 47, normalized size = 2.24

$$-\frac{\left(c^2x^8+2\,acx^4+a^2\right)\sqrt{cx^4+a}}{10\,ax^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*x^4 + a)^(3/2)/x^11,x, algorithm="fricas")
```

```
[Out] -1/10*(c^2*x^8 + 2*a*c*x^4 + a^2)*sqrt(c*x^4 + a)/(a*x^10)
```

Sympy [A] time = 8.54613, size = 66, normalized size = 3.14

$$-\frac{a\sqrt{c}\sqrt{\frac{a}{cx^4}+1}}{10x^8}-\frac{c^{\frac{3}{2}}\sqrt{\frac{a}{cx^4}+1}}{5x^4}-\frac{c^{\frac{5}{2}}\sqrt{\frac{a}{cx^4}+1}}{10a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*x**4+a)**(3/2)/x**11,x)
```

```
[Out] -a*sqrt(c)*sqrt(a/(c*x**4) + 1)/(10*x**8) - c**(3/2)*sqrt(a/(c*x*
*4) + 1)/(5*x**4) - c**(5/2)*sqrt(a/(c*x**4) + 1)/(10*a)
```

GIAC/XCAS [A] time = 0.216995, size = 19, normalized size = 0.9

$$-\frac{\left(c+\frac{a}{x^4}\right)^{\frac{5}{2}}}{10\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*x^4 + a)^(3/2)/x^11,x, algorithm="giac")
```

```
[Out] -1/10*(c + a/x^4)^(5/2)/a
```

3.792 $\int \frac{(a+cx^4)^{3/2}}{x^{15}}\,dx$

Optimal. Leaf size=44

$$\frac{c\left(a+cx^4\right)^{5/2}}{35a^2x^{10}}-\frac{\left(a+cx^4\right)^{5/2}}{14ax^{14}}$$

```
[Out] -(a + c*x^4)^(5/2)/(14*a*x^14) + (c*(a + c*x^4)^(5/2))/(35*a^2*x^
10)
```

Rubi [A] time = 0.0404651, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{c\left(a+cx^4\right)^{5/2}}{35a^2x^{10}}-\frac{\left(a+cx^4\right)^{5/2}}{14ax^{14}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + c*x^4)^(3/2)/x^15,x]
```

```
[Out] -(a + c*x^4)^(5/2)/(14*a*x^14) + (c*(a + c*x^4)^(5/2))/(35*a^2*x^
10)
```

Rubi in Sympy [A] time = 4.27583, size = 36, normalized size = 0.82

$$-\frac{\left(a+cx^4\right)^{\frac{5}{2}}}{14ax^{14}}+\frac{c\left(a+cx^4\right)^{\frac{5}{2}}}{35a^2x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**(3/2)/x**15,x)
```

```
[Out] -(a + c*x**4)**(5/2)/(14*a*x**14) + c*(a + c*x**4)**(5/2)/(35*a**
2*x**10)
```

Mathematica [A] time = 0.0400296, size = 31, normalized size = 0.7

$$\frac{\left(a+cx^4\right)^{5/2}\left(2cx^4-5a\right)}{70a^2x^{14}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + c*x^4)^(3/2)/x^15,x]
```

```
[Out] ((a + c*x^4)^(5/2)*(-5*a + 2*c*x^4))/(70*a^2*x^14)
```

Maple [A] time = 0.007, size = 28, normalized size = 0.6

$$-\frac{-2\,cx^4+5\,a}{70\,x^{14}a^2}\left(cx^4+a\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)^(3/2)/x^15,x)

[Out] -1/70*(c*x^4+a)^(5/2)*(-2*c*x^4+5*a)/x^14/a^2
```

Maxima [A] time = 1.42321, size = 47, normalized size = 1.07

$$\frac{\frac{7\,(cx^4+a)^{\frac{5}{2}}c}{x^{10}} - \frac{5\,(cx^4+a)^{\frac{7}{2}}}{x^{14}}}{70\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)/x^15,x, algorithm="maxima")

[Out] 1/70*(7*(c*x^4 + a)^(5/2)*c/x^10 - 5*(c*x^4 + a)^(7/2)/x^14)/a^2
```

Fricas [A] time = 0.290969, size = 66, normalized size = 1.5

$$\frac{\left(2\,c^3x^{12} - ac^2x^8 - 8\,a^2cx^4 - 5\,a^3\right)\sqrt{cx^4 + a}}{70\,a^2x^{14}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)/x^15,x, algorithm="fricas")

[Out] 1/70*(2*c^3*x^12 - a*c^2*x^8 - 8*a^2*c*x^4 - 5*a^3)*sqrt(c*x^4 +
a)/(a^2*x^14)
```

Sympy [A] time = 18.5229, size = 92, normalized size = 2.09

$$-\frac{a\sqrt{c}\sqrt{\frac{a}{cx^4}+1}}{14x^{12}} - \frac{4c^{\frac{3}{2}}\sqrt{\frac{a}{cx^4}+1}}{35x^8} - \frac{c^{\frac{5}{2}}\sqrt{\frac{a}{cx^4}+1}}{70ax^4} + \frac{c^{\frac{7}{2}}\sqrt{\frac{a}{cx^4}+1}}{35a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**(3/2)/x**15,x)

[Out] -a*sqrt(c)*sqrt(a/(c*x**4) + 1)/(14*x**12) - 4*c**(3/2)*sqrt(a/(c
*x**4) + 1)/(35*x**8) - c**(5/2)*sqrt(a/(c*x**4) + 1)/(70*a*x**4)
 + c**(7/2)*sqrt(a/(c*x**4) + 1)/(35*a**2)
```

GIAC/XCAS [A] time = 0.218721, size = 105, normalized size = 2.39

$$-\frac{\frac{7\left(3\left(c+\frac{a}{x^4}\right)^{\frac{5}{2}}-5\left(c+\frac{a}{x^4}\right)^{\frac{3}{2}}c\right)c}{a} + \frac{15\left(c+\frac{a}{x^4}\right)^{\frac{7}{2}}-42\left(c+\frac{a}{x^4}\right)^{\frac{5}{2}}c+35\left(c+\frac{a}{x^4}\right)^{\frac{3}{2}}c^2}{a}}{210\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)/x^15,x, algorithm="giac")

[Out] -1/210*(7*(3*(c + a/x^4)^(5/2) - 5*(c + a/x^4)^(3/2)*c)*c/a + (15
*(c + a/x^4)^(7/2) - 42*(c + a/x^4)^(5/2)*c + 35*(c + a/x^4)^(3/2
)*c^2)/a)/a
```

3.793 $\int \frac{(a+cx^4)^{3/2}}{x^{19}} dx$

Optimal. Leaf size=68

$$-\frac{4c^2 (a + cx^4)^{5/2}}{315a^3x^{10}} + \frac{2c (a + cx^4)^{5/2}}{63a^2x^{14}} - \frac{(a + cx^4)^{5/2}}{18ax^{18}}$$

```
[Out] -(a + c*x^4)^(5/2)/(18*a*x^18) + (2*c*(a + c*x^4)^(5/2))/(63*a^2*
x^14) - (4*c^2*(a + c*x^4)^(5/2))/(315*a^3*x^10)
```

Rubi [A] time = 0.0638984, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{4c^2 (a + cx^4)^{5/2}}{315a^3x^{10}} + \frac{2c (a + cx^4)^{5/2}}{63a^2x^{14}} - \frac{(a + cx^4)^{5/2}}{18ax^{18}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + c*x^4)^(3/2)/x^19,x]
```

```
[Out] -(a + c*x^4)^(5/2)/(18*a*x^18) + (2*c*(a + c*x^4)^(5/2))/(63*a^2*
x^14) - (4*c^2*(a + c*x^4)^(5/2))/(315*a^3*x^10)
```

Rubi in Sympy [A] time = 6.68596, size = 61, normalized size = 0.9

$$-\frac{(a + cx^4)^{\frac{5}{2}}}{18ax^{18}} + \frac{2c (a + cx^4)^{\frac{5}{2}}}{63a^2x^{14}} - \frac{4c^2 (a + cx^4)^{\frac{5}{2}}}{315a^3x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**(3/2)/x**19,x)
```

```
[Out] -(a + c*x**4)**(5/2)/(18*a*x**18) + 2*c*(a + c*x**4)**(5/2)/(63*a
**2*x**14) - 4*c**2*(a + c*x**4)**(5/2)/(315*a**3*x**10)
```

Mathematica [A] time = 0.0539661, size = 42, normalized size = 0.62

$$-\frac{(a + cx^4)^{5/2} (35a^2 - 20acx^4 + 8c^2x^8)}{630a^3x^{18}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + c*x^4)^(3/2)/x^19,x]
```

```
[Out] -((a + c*x^4)^(5/2)*(35*a^2 - 20*a*c*x^4 + 8*c^2*x^8))/(630*a^3*x
^18)
```

Maple [A] time = 0.008, size = 39, normalized size = 0.6

$$-\frac{8\,c^2x^8 - 20\,cx^4a + 35\,a^2}{630\,x^{18}a^3} (cx^4 + a)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)^(3/2)/x^19,x)
```

```
[Out] -1/630*(c*x^4+a)^(5/2)*(8*c^2*x^8-20*a*c*x^4+35*a^2)/x^18/a^3
```

Maxima [A] time = 1.43231, size = 70, normalized size = 1.03

$$-\frac{\frac{63\,(cx^4+a)^{\frac{5}{2}}c^2}{x^{10}}-\frac{90\,(cx^4+a)^{\frac{7}{2}}c}{x^{14}}+\frac{35\,(cx^4+a)^{\frac{9}{2}}}{x^{18}}}{630\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)/x^19,x, algorithm="maxima")
```

```
[Out] -1/630*(63*(c*x^4 + a)^(5/2)*c^2/x^10 - 90*(c*x^4 + a)^(7/2)*c/x^
14 + 35*(c*x^4 + a)^(9/2)/x^18)/a^3
```

Fricas [A] time = 0.318325, size = 81, normalized size = 1.19

$$-\frac{\left(8\,c^4x^{16}-4\,ac^3x^{12}+3\,a^2c^2x^8+50\,a^3cx^4+35\,a^4\right)\sqrt{cx^4+a}}{630\,a^3x^{18}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)/x^19,x, algorithm="fricas")
```

```
[Out] -1/630*(8*c^4*x^16 - 4*a*c^3*x^12 + 3*a^2*c^2*x^8 + 50*a^3*c*x^4
+ 35*a^4)*sqrt(c*x^4 + a)/(a^3*x^18)
```

Sympy [A] time = 32.2862, size = 420, normalized size = 6.18

$$-\frac{35a^6c^{\frac{9}{2}}\sqrt{\frac{a}{cx^4}+1}}{630a^5c^4x^{16}+1260a^4c^5x^{20}+630a^3c^6x^{24}}-\frac{120a^5c^{\frac{11}{2}}x^4\sqrt{\frac{a}{cx^4}+1}}{630a^5c^4x^{16}+1260a^4c^5x^{20}+630a^3c^6x^{24}}-\frac{138a^4c^{\frac{13}{2}}x^8\sqrt{\frac{a}{cx^4}+1}}{630a^5c^4x^{16}+1260a^4c^5x^{20}+630a^3c^6x^{24}}-\frac{52a^3c^{\frac{15}{2}}x^{12}\sqrt{\frac{a}{cx^4}+1}}{630a^5c^4x^{16}+1260a^4c^5x^{20}+630a^3c^6x^{24}}-\frac{3a^2c^{\frac{17}{2}}x^{16}\sqrt{\frac{a}{cx^4}+1}}{630a^5c^4x^{16}+1260a^4c^5x^{20}+630a^3c^6x^{24}}-\frac{12ac^{\frac{19}{2}}x^{20}\sqrt{\frac{a}{cx^4}+1}}{630a^5c^4x^{16}+1260a^4c^5x^{20}+630a^3c^6x^{24}}-\frac{8c^{\frac{21}{2}}x^{24}\sqrt{\frac{a}{cx^4}+1}}{630a^5c^4x^{16}+1260a^4c^5x^{20}+630a^3c^6x^{24}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**(3/2)/x**19,x)
```

```
[Out] -35*a**6*c**(9/2)*sqrt(a/(c*x**4) + 1)/(630*a**5*c**4*x**16 + 126
0*a**4*c**5*x**20 + 630*a**3*c**6*x**24) - 120*a**5*c**(11/2)*x**
4*sqrt(a/(c*x**4) + 1)/(630*a**5*c**4*x**16 + 1260*a**4*c**5*x**2
0 + 630*a**3*c**6*x**24) - 138*a**4*c**(13/2)*x**8*sqrt(a/(c*x**4
) + 1)/(630*a**5*c**4*x**16 + 1260*a**4*c**5*x**20 + 630*a**3*c**
6*x**24) - 52*a**3*c**(15/2)*x**12*sqrt(a/(c*x**4) + 1)/(630*a**5
*c**4*x**16 + 1260*a**4*c**5*x**20 + 630*a**3*c**6*x**24) - 3*a**
2*c**(17/2)*x**16*sqrt(a/(c*x**4) + 1)/(630*a**5*c**4*x**16 + 126
0*a**4*c**5*x**20 + 630*a**3*c**6*x**24) - 12*a*c**(19/2)*x**20*s
qrt(a/(c*x**4) + 1)/(630*a**5*c**4*x**16 + 1260*a**4*c**5*x**20 +
 630*a**3*c**6*x**24) - 8*c**(21/2)*x**24*sqrt(a/(c*x**4) + 1)/(6
```

```
30*a**5*c**4*x**16 + 1260*a**4*c**5*x**20 + 630*a**3*c**6*x**24)
```

GIAC/XCAS [A] time = 0.217465, size = 143, normalized size = 2.1

$$-\frac{\frac{3\left(15\left(c+\frac{a}{x^4}\right)^{\frac{7}{2}}-42\left(c+\frac{a}{x^4}\right)^{\frac{5}{2}}c+35\left(c+\frac{a}{x^4}\right)^{\frac{3}{2}}c^2\right)c}{a^2}+\frac{35\left(c+\frac{a}{x^4}\right)^{\frac{9}{2}}-135\left(c+\frac{a}{x^4}\right)^{\frac{7}{2}}c+189\left(c+\frac{a}{x^4}\right)^{\frac{5}{2}}c^2-105\left(c+\frac{a}{x^4}\right)^{\frac{3}{2}}c^3}{a^2}}{630\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)/x^19,x, algorithm="giac")
```

```
[Out] -1/630*(3*(15*(c + a/x^4)^(7/2) - 42*(c + a/x^4)^(5/2)*c + 35*(c
+ a/x^4)^(3/2)*c^2)*c/a^2 + (35*(c + a/x^4)^(9/2) - 135*(c + a/x^
4)^(7/2)*c + 189*(c + a/x^4)^(5/2)*c^2 - 105*(c + a/x^4)^(3/2)*c^
3)/a^2)/a
```

3.794 $\int x^4 \left(a+cx^4\right)^{3/2} dx$

Optimal. Leaf size=148

$$-\frac{2a^{11/4}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{77c^{5/4}\sqrt{a+cx^4}}+\frac{4a^2x\sqrt{a+cx^4}}{77c}+\frac{1}{11}x^5\left(a+cx^4\right)^{3/2}+\frac{6}{77}ax^5\sqrt{a+cx^4}$$

```
[Out] (4*a^2*x*Sqrt[a + c*x^4])/(77*c) + (6*a*x^5*Sqrt[a + c*x^4])/77 +
 (x^5*(a + c*x^4)^(3/2))/11 - (2*a^(11/4)*(Sqrt[a] + Sqrt[c]*x^2)
*Sqrt[(a + c*x^4)/(Sqrt[a] + Sqrt[c]*x^2)^2]*EllipticF[2*ArcTan[(
c^(1/4)*x)/a^(1/4)], 1/2])/(77*c^(5/4)*Sqrt[a + c*x^4])
```

Rubi [A] time = 0.135681, antiderivative size = 148, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$-\frac{2a^{11/4}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{77c^{5/4}\sqrt{a+cx^4}}+\frac{4a^2x\sqrt{a+cx^4}}{77c}+\frac{1}{11}x^5\left(a+cx^4\right)^{3/2}+\frac{6}{77}ax^5\sqrt{a+cx^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4*(a + c*x^4)^(3/2),x]
```

```
[Out] (4*a^2*x*Sqrt[a + c*x^4])/(77*c) + (6*a*x^5*Sqrt[a + c*x^4])/77 +
 (x^5*(a + c*x^4)^(3/2))/11 - (2*a^(11/4)*(Sqrt[a] + Sqrt[c]*x^2)
*Sqrt[(a + c*x^4)/(Sqrt[a] + Sqrt[c]*x^2)^2]*EllipticF[2*ArcTan[(
c^(1/4)*x)/a^(1/4)], 1/2])/(77*c^(5/4)*Sqrt[a + c*x^4])
```

Rubi in Sympy [A] time = 15.0443, size = 134, normalized size = 0.91

$$-\frac{2a^{\frac{11}{4}}\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}\left(\sqrt{a}+\sqrt{c}x^2\right)F\left(2\operatorname{atan}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{77c^{\frac{5}{4}}\sqrt{a+cx^4}}+\frac{4a^2x\sqrt{a+cx^4}}{77c}+\frac{6ax^5\sqrt{a+cx^4}}{77}+\frac{x^5\left(a+cx^4\right)^{\frac{3}{2}}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4*(c*x**4+a)**(3/2),x)
```

```
[Out] -2*a**(11/4)*sqrt((a + c*x**4)/(sqrt(a) + sqrt(c)*x**2)**2)*(sqrt
(a) + sqrt(c)*x**2)*elliptic_f(2*atan(c**(1/4)*x/a**(1/4)), 1/2)/
(77*c**(5/4)*sqrt(a + c*x**4)) + 4*a**2*x*sqrt(a + c*x**4)/(77*c)
 + 6*a*x**5*sqrt(a + c*x**4)/77 + x**5*(a + c*x**4)**(3/2)/11
```

Mathematica [C] time = 0.332878, size = 117, normalized size = 0.79

$$\frac{\frac{4ia^3\sqrt{\frac{cx^4}{a}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}x\right)\middle|-1\right)}{\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}}+4a^3x+17a^2cx^5+20ac^2x^9+7c^3x^{13}}{77c\sqrt{a+cx^4}}$$

Antiderivative was successfully verified.

```
[In]   Integrate[x^4*(a + c*x^4)^(3/2),x]
```

```
[Out] (4*a^3*x + 17*a^2*c*x^5 + 20*a*c^2*x^9 + 7*c^3*x^13 + ((4*I)*a^3*
Sqrt[1 + (c*x^4)/a]*EllipticF[I*ArcSinh[Sqrt[(I*Sqrt[c])/Sqrt[a]]
*x], -1])/Sqrt[(I*Sqrt[c])/Sqrt[a]])/(77*c*Sqrt[a + c*x^4])
```

Maple [C] time = 0.012, size = 126, normalized size = 0.9

$$\frac{cx^9}{11}\sqrt{cx^4+a}+\frac{13\,ax^5}{77}\sqrt{cx^4+a}+\frac{4\,xa^2}{77\,c}\sqrt{cx^4+a}
-\frac{4\,a^3}{77\,c}\sqrt{1-ix^2\sqrt{c}\frac{1}{\sqrt{a}}}\sqrt{1+ix^2\sqrt{c}\frac{1}{\sqrt{a}}}\mathit{EllipticF}\left(x\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}},i\right)\frac{1}{\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{cx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^4*(c*x^4+a)^(3/2),x)
```

```
[Out] 1/11*c*x^9*(c*x^4+a)^(1/2)+13/77*a*x^5*(c*x^4+a)^(1/2)+4/77*a^2*x
*(c*x^4+a)^(1/2)/c-4/77*a^3/c/(I/a^(1/2)*c^(1/2))^(1/2)*(1-I/a^(1
/2)*c^(1/2)*x^2)^(1/2)*(1+I/a^(1/2)*c^(1/2)*x^2)^(1/2)/(c*x^4+a)^
(1/2)*EllipticF(x*(I/a^(1/2)*c^(1/2))^(1/2),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(cx^4+a\right)^{\frac{3}{2}}x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((c*x^4 + a)^(3/2)*x^4,x, algorithm="maxima")
```

```
[Out] integrate((c*x^4 + a)^(3/2)*x^4, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\left(cx^8+ax^4\right)\sqrt{cx^4+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((c*x^4 + a)^(3/2)*x^4,x, algorithm="fricas")
```

```
[Out] integral((c*x^8 + a*x^4)*sqrt(c*x^4 + a), x)
```

Sympy [A] time = 3.98772, size = 39, normalized size = 0.26

$$\frac{a^{\frac{3}{2}}x^5\,\Gamma\left(\frac{5}{4}\right)\,{}_2F_1\left(\left.\begin{matrix}-\frac{3}{2},\frac{5}{4}\\ \frac{9}{4}\end{matrix}\right|\frac{cx^4e^{i\pi}}{a}\right)}{4\,\Gamma\left(\frac{9}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**4*(c*x**4+a)**(3/2),x)
```

```
[Out] a**(3/2)*x**5*gamma(5/4)*hyper((-3/2, 5/4), (9/4,), c*x**4*exp_po
lar(I*pi)/a)/(4*gamma(9/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(cx^4 + a\right)^{\frac{3}{2}} x^4 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)*x^4,x, algorithm="giac")
```

```
[Out] integrate((c*x^4 + a)^(3/2)*x^4, x)
```

3.795 $\int \left(a+cx^4\right)^{3/2}\,dx$

Optimal. Leaf size=122

$$\frac{2a^{7/4}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{7\sqrt[4]{c}\sqrt{a+cx^4}}+\frac{2}{7}ax\sqrt{a+cx^4}+\frac{1}{7}x\left(a+cx^4\right)^{3/2}$$

```
[Out] (2*a*x*Sqrt[a + c*x^4])/7 + (x*(a + c*x^4)^(3/2))/7 + (2*a^(7/4)*
(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[(a + c*x^4)/(Sqrt[a] + Sqrt[c]*x^2)^
2]*EllipticF[2*ArcTan[(c^(1/4)*x)/a^(1/4)], 1/2])/(7*c^(1/4)*Sqrt
[a + c*x^4])
```

Rubi [A] time = 0.0779991, antiderivative size = 122, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{2a^{7/4}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{7\sqrt[4]{c}\sqrt{a+cx^4}}+\frac{2}{7}ax\sqrt{a+cx^4}+\frac{1}{7}x\left(a+cx^4\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + c*x^4)^(3/2),x]
```

```
[Out] (2*a*x*Sqrt[a + c*x^4])/7 + (x*(a + c*x^4)^(3/2))/7 + (2*a^(7/4)*
(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[(a + c*x^4)/(Sqrt[a] + Sqrt[c]*x^2)^
2]*EllipticF[2*ArcTan[(c^(1/4)*x)/a^(1/4)], 1/2])/(7*c^(1/4)*Sqrt
[a + c*x^4])
```

Rubi in Sympy [A] time = 7.26833, size = 110, normalized size = 0.9

$$\frac{2a^{\frac{7}{4}}\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}\left(\sqrt{a}+\sqrt{c}x^2\right)F\left(2\operatorname{atan}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{7\sqrt[4]{c}\sqrt{a+cx^4}}+\frac{2ax\sqrt{a+cx^4}}{7}+\frac{x\left(a+cx^4\right)^{\frac{3}{2}}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**(3/2),x)
```

```
[Out] 2*a**(7/4)*sqrt((a + c*x**4)/(sqrt(a) + sqrt(c)*x**2)**2)*(sqrt(a
) + sqrt(c)*x**2)*elliptic_f(2*atan(c**(1/4)*x/a**(1/4)), 1/2)/(7
*c**(1/4)*sqrt(a + c*x**4)) + 2*a*x*sqrt(a + c*x**4)/7 + x*(a + c
*x**4)**(3/2)/7
```

Mathematica [C] time = 0.246741, size = 102, normalized size = 0.84

$$\frac{-\frac{4ia^2\sqrt{\frac{cx^4}{a}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}x\right)\middle|-1\right)}{\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}}+3a^2x+4acx^5+c^2x^9}{7\sqrt{a+cx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + c*x^4)^(3/2),x]
```

```
[Out] (3*a^2*x + 4*a*c*x^5 + c^2*x^9 - ((4*I)*a^2*Sqrt[1 + (c*x^4)/a]*E
llipticF[I*ArcSinh[Sqrt[(I*Sqrt[c])/Sqrt[a]]*x], -1])/Sqrt[(I*Sqr
t[c])/Sqrt[a]])/(7*Sqrt[a + c*x^4])
```

Maple [C] time = 0.008, size = 103, normalized size = 0.8

$$\frac{cx^5}{7}\sqrt{cx^4+a}+\frac{3\,ax}{7}\sqrt{cx^4+a}+\frac{4\,a^2}{7}\sqrt{1-ix^2\sqrt{c}\frac{1}{\sqrt{a}}}\sqrt{1+ix^2\sqrt{c}\frac{1}{\sqrt{a}}}\mathit{EllipticF}\left(x\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}},i\right)\frac{1}{\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{cx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)^(3/2),x)
```

```
[Out] 1/7*c*x^5*(c*x^4+a)^(1/2)+3/7*a*x*(c*x^4+a)^(1/2)+4/7*a^2/(I/a^(1
/2)*c^(1/2))^(1/2)*(1-I/a^(1/2)*c^(1/2)*x^2)^(1/2)*(1+I/a^(1/2)*c
^(1/2)*x^2)^(1/2)/(c*x^4+a)^(1/2)*EllipticF(x*(I/a^(1/2)*c^(1/2))
^(1/2),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\left(cx^4+a\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((c*x^4 + a)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(cx^4+a\right)^{\frac{3}{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2),x, algorithm="fricas")
```

```
[Out] integral((c*x^4 + a)^(3/2), x)
```

Sympy [A] time = 2.77626, size = 37, normalized size = 0.3

$$\frac{a^{\frac{3}{2}}x\left(\frac{1}{4}\right)\,{}_{2}F_{1}\left(\left.\begin{matrix}-\frac{3}{2},\frac{1}{4}\\\frac{5}{4}\end{matrix}\right|\frac{cx^4e^{i\pi}}{a}\right)}{4\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**(3/2),x)
```

```
[Out] a**(3/2)*x*gamma(1/4)*hyper((-3/2, 1/4), (5/4,), c*x**4*exp_polar
(I*pi)/a)/(4*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(cx^4 + a\right)^{\frac{3}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((c*x^4 + a)^(3/2), x)
```

3.796 $\int \frac{(a+cx^4)^{3/2}}{x^4}\,dx$

Optimal. Leaf size=124

$$\frac{2a^{3/4}c^{3/4}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{3\sqrt{a+cx^4}}+\frac{2}{3}cx\sqrt{a+cx^4}-\frac{\left(a+cx^4\right)^{3/2}}{3x^3}$$

```
[Out] (2*c*x*Sqrt[a + c*x^4])/3 - (a + c*x^4)^(3/2)/(3*x^3) + (2*a^(3/4
)*c^(3/4)*(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[(a + c*x^4)/(Sqrt[a] + Sqr
t[c]*x^2)^2]*EllipticF[2*ArcTan[(c^(1/4)*x)/a^(1/4)], 1/2])/(3*Sq
rt[a + c*x^4])
```

Rubi [A] time = 0.0849027, antiderivative size = 124, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{2a^{3/4}c^{3/4}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{3\sqrt{a+cx^4}}+\frac{2}{3}cx\sqrt{a+cx^4}-\frac{\left(a+cx^4\right)^{3/2}}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + c*x^4)^(3/2)/x^4,x]
```

```
[Out] (2*c*x*Sqrt[a + c*x^4])/3 - (a + c*x^4)^(3/2)/(3*x^3) + (2*a^(3/4
)*c^(3/4)*(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[(a + c*x^4)/(Sqrt[a] + Sqr
t[c]*x^2)^2]*EllipticF[2*ArcTan[(c^(1/4)*x)/a^(1/4)], 1/2])/(3*Sq
rt[a + c*x^4])
```

Rubi in Sympy [A] time = 8.85012, size = 112, normalized size = 0.9

$$\frac{2a^{\frac{3}{4}}c^{\frac{3}{4}}\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}\left(\sqrt{a}+\sqrt{c}x^2\right)F\left(2\operatorname{atan}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{3\sqrt{a+cx^4}}+\frac{2cx\sqrt{a+cx^4}}{3}-\frac{\left(a+cx^4\right)^{\frac{3}{2}}}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**(3/2)/x**4,x)
```

```
[Out] 2*a**(3/4)*c**(3/4)*sqrt((a + c*x**4)/(sqrt(a) + sqrt(c)*x**2)**2
)*(sqrt(a) + sqrt(c)*x**2)*elliptic_f(2*atan(c**(1/4)*x/a**(1/4))
, 1/2)/(3*sqrt(a + c*x**4)) + 2*c*x*sqrt(a + c*x**4)/3 - (a + c*x
**4)**(3/2)/(3*x**3)
```

Mathematica [C] time = 0.210883, size = 96, normalized size = 0.77

$$\frac{-\frac{a^2}{x^3}-\frac{4iac\sqrt{\frac{cx^4}{a}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}x\right)\middle|-1\right)}{\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}}+c^2x^5}{3\sqrt{a+cx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + c*x^4)^(3/2)/x^4,x]
```

```
[Out] (-(a^2/x^3) + c^2*x^5 - ((4*I)*a*c*Sqrt[1 + (c*x^4)/a]*EllipticF[
I*ArcSinh[Sqrt[(I*Sqrt[c])/Sqrt[a]]*x], -1])/Sqrt[(I*Sqrt[c])/Sqr
t[a]])/(3*Sqrt[a + c*x^4])
```

Maple [C] time = 0.017, size = 102, normalized size = 0.8

$$-\frac{a}{3x^3}\sqrt{cx^4+a}+\frac{cx}{3}\sqrt{cx^4+a} + \frac{4ac}{3}\sqrt{1-ix^2\sqrt{c}\frac{1}{\sqrt{a}}}\sqrt{1+ix^2\sqrt{c}\frac{1}{\sqrt{a}}}EllipticF\left(x\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}},i\right)\frac{1}{\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{cx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)^(3/2)/x^4,x)
```

```
[Out] -1/3*a*(c*x^4+a)^(1/2)/x^3+1/3*c*x*(c*x^4+a)^(1/2)+4/3*a*c/(I/a^(
1/2)*c^(1/2))^(1/2)*(1-I/a^(1/2)*c^(1/2)*x^2)^(1/2)*(1+I/a^(1/2)*
c^(1/2)*x^2)^(1/2)/(c*x^4+a)^(1/2)*EllipticF(x*(I/a^(1/2)*c^(1/2)
)^(1/2),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx^4+a)^{\frac{3}{2}}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)/x^4,x, algorithm="maxima")
```

```
[Out] integrate((c*x^4 + a)^(3/2)/x^4, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(cx^4+a)^{\frac{3}{2}}}{x^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)/x^4,x, algorithm="fricas")
```

```
[Out] integral((c*x^4 + a)^(3/2)/x^4, x)
```

Sympy [A] time = 3.15984, size = 42, normalized size = 0.34

$$\frac{a^{\frac{3}{2}}\Gamma\left(-\frac{3}{4}\right){}_2F_1\left(\begin{matrix}-\frac{3}{2},-\frac{3}{4}\\ \frac{1}{4}\end{matrix}\middle|\frac{cx^4e^{i\pi}}{a}\right)}{4x^3\Gamma\left(\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**(3/2)/x**4,x)
```

```
[Out] a**(3/2)*gamma(-3/4)*hyper((-3/2, -3/4), (1/4,), c*x**4*exp_polar
(I*pi)/a)/(4*x**3*gamma(1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(cx^4+a\right)^{\frac{3}{2}}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*x^4 + a)^(3/2)/x^4,x, algorithm="giac")
```

```
[Out] integrate((c*x^4 + a)^(3/2)/x^4, x)
```

3.797 $\int \frac{(a+cx^4)^{3/2}}{x^8}\,dx$

Optimal. Leaf size=126

$$\frac{2c^{7/4}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{7\sqrt[4]{a}\sqrt{a+cx^4}}-\frac{\left(a+cx^4\right)^{3/2}}{7x^7}-\frac{2c\sqrt{a+cx^4}}{7x^3}$$

```
[Out] (-2*c*Sqrt[a + c*x^4])/(7*x^3) - (a + c*x^4)^(3/2)/(7*x^7) + (2*c
^(7/4)*(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[(a + c*x^4)/(Sqrt[a] + Sqrt[c
]*x^2)^2]*EllipticF[2*ArcTan[(c^(1/4)*x)/a^(1/4)], 1/2])/(7*a^(1/
4)*Sqrt[a + c*x^4])
```

Rubi [A] time = 0.0967737, antiderivative size = 126, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2c^{7/4}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{7\sqrt[4]{a}\sqrt{a+cx^4}}-\frac{\left(a+cx^4\right)^{3/2}}{7x^7}-\frac{2c\sqrt{a+cx^4}}{7x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + c*x^4)^(3/2)/x^8,x]
```

```
[Out] (-2*c*Sqrt[a + c*x^4])/(7*x^3) - (a + c*x^4)^(3/2)/(7*x^7) + (2*c
^(7/4)*(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[(a + c*x^4)/(Sqrt[a] + Sqrt[c
]*x^2)^2]*EllipticF[2*ArcTan[(c^(1/4)*x)/a^(1/4)], 1/2])/(7*a^(1/
4)*Sqrt[a + c*x^4])
```

Rubi in Sympy [A] time = 10.2677, size = 114, normalized size = 0.9

$$-\frac{2c\sqrt{a+cx^4}}{7x^3}-\frac{\left(a+cx^4\right)^{\frac{3}{2}}}{7x^7}+\frac{2c^{\frac{7}{4}}\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}\left(\sqrt{a}+\sqrt{c}x^2\right)F\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{7\sqrt[4]{a}\sqrt{a+cx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**(3/2)/x**8,x)
```

```
[Out] -2*c*sqrt(a + c*x**4)/(7*x**3) - (a + c*x**4)**(3/2)/(7*x**7) + 2
*c**(7/4)*sqrt((a + c*x**4)/(sqrt(a) + sqrt(c)*x**2)**2)*(sqrt(a)
 + sqrt(c)*x**2)*elliptic_f(2*atan(c**(1/4)*x/a**(1/4)), 1/2)/(7*
a**(1/4)*sqrt(a + c*x**4))
```

Mathematica [C] time = 0.246471, size = 106, normalized size = 0.84

$$\frac{-\frac{a^2+4acx^4+3c^2x^8}{x^7}-\frac{4ic^2\sqrt{\frac{cx^4}{a}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}x\right)\middle|-1\right)}{\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}}}{7\sqrt{a+cx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + c*x^4)^(3/2)/x^8,x]
```

```
[Out] (-((a^2 + 4*a*c*x^4 + 3*c^2*x^8)/x^7) - ((4*I)*c^2*Sqrt[1 + (c*x^
4)/a]*EllipticF[I*ArcSinh[Sqrt[(I*Sqrt[c])/Sqrt[a]]*x], -1])/Sqrt
[(I*Sqrt[c])/Sqrt[a]])/(7*Sqrt[a + c*x^4])
```

Maple [C] time = 0.02, size = 105, normalized size = 0.8

$$-\frac{a}{7\,x^{7}}\sqrt{cx^{4}+a}-\frac{3\,c}{7\,x^{3}}\sqrt{cx^{4}+a}+\frac{4\,c^{2}}{7}\sqrt{1-ix^{2}\sqrt{c}\frac{1}{\sqrt{a}}}\sqrt{1+ix^{2}\sqrt{c}\frac{1}{\sqrt{a}}}\mathit{EllipticF}\left(x\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}},i\right)\frac{1}{\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{cx^{4}+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*x^4+a)^(3/2)/x^8,x)
```

```
[Out] -1/7*a*(c*x^4+a)^(1/2)/x^7-3/7*c*(c*x^4+a)^(1/2)/x^3+4/7*c^2/(I/a
^(1/2)*c^(1/2))^(1/2)*(1-I/a^(1/2)*c^(1/2)*x^2)^(1/2)*(1+I/a^(1/2
)*c^(1/2)*x^2)^(1/2)/(c*x^4+a)^(1/2)*EllipticF(x*(I/a^(1/2)*c^(1/
2))^(1/2),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(cx^{4}+a\right)^{\frac{3}{2}}}{x^{8}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*x^4 + a)^(3/2)/x^8,x, algorithm="maxima")
```

```
[Out] integrate((c*x^4 + a)^(3/2)/x^8, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\left(cx^{4}+a\right)^{\frac{3}{2}}}{x^{8}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*x^4 + a)^(3/2)/x^8,x, algorithm="fricas")
```

```
[Out] integral((c*x^4 + a)^(3/2)/x^8, x)
```

Sympy [A] time = 5.50176, size = 46, normalized size = 0.37

$$\frac{a^{\frac{3}{2}}\,\Gamma\left(-\frac{7}{4}\right)\,{}_{2}F_{1}\left(\begin{matrix}-\frac{7}{4},-\frac{3}{2}\\-\frac{3}{4}\end{matrix}\middle|\frac{cx^{4}e^{i\pi}}{a}\right)}{4x^{7}\,\Gamma\left(-\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*x**4+a)**(3/2)/x**8,x)
```

```
[Out] a**(3/2)*gamma(-7/4)*hyper((-7/4, -3/2), (-3/4,), c*x**4*exp_pola
r(I*pi)/a)/(4*x**7*gamma(-3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(cx^4 + a\right)^{\frac{3}{2}}}{x^8}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*x^4 + a)^(3/2)/x^8,x, algorithm="giac")
```

```
[Out] integrate((c*x^4 + a)^(3/2)/x^8, x)
```

3.798 $\int x^2 \left(a+cx^4\right)^{3/2} dx$

Optimal. Leaf size=255

$$\frac{2a^{9/4}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{15c^{3/4}\sqrt{a+cx^4}} - \frac{4a^{9/4}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{15c^{3/4}\sqrt{a+cx^4}} + \frac{4a^2x\sqrt{a+cx^4}}{15\sqrt{c}\left(\sqrt{a}+\sqrt{c}x^2\right)} + \frac{1}{9}x^3\left(a+cx^4\right)^{3/2} + \frac{2}{15}ax^3\sqrt{a+cx^4}$$

```
[Out] (2*a*x^3*Sqrt[a + c*x^4])/15 + (4*a^2*x*Sqrt[a + c*x^4])/(15*Sqrt
[c]*(Sqrt[a] + Sqrt[c]*x^2)) + (x^3*(a + c*x^4)^(3/2))/9 - (4*a^(
9/4)*(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[(a + c*x^4)/(Sqrt[a] + Sqrt[c]*
x^2)^2]*EllipticE[2*ArcTan[(c^(1/4)*x)/a^(1/4)], 1/2])/(15*c^(3/4
)*Sqrt[a + c*x^4]) + (2*a^(9/4)*(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[(a +
 c*x^4)/(Sqrt[a] + Sqrt[c]*x^2)^2]*EllipticF[2*ArcTan[(c^(1/4)*x)
/a^(1/4)], 1/2])/(15*c^(3/4)*Sqrt[a + c*x^4])
```

Rubi [A] time = 0.236141, antiderivative size = 255, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{2a^{9/4}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{15c^{3/4}\sqrt{a+cx^4}} - \frac{4a^{9/4}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{15c^{3/4}\sqrt{a+cx^4}} + \frac{4a^2x\sqrt{a+cx^4}}{15\sqrt{c}\left(\sqrt{a}+\sqrt{c}x^2\right)} + \frac{1}{9}x^3\left(a+cx^4\right)^{3/2} + \frac{2}{15}ax^3\sqrt{a+cx^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2*(a + c*x^4)^(3/2),x]
```

```
[Out] (2*a*x^3*Sqrt[a + c*x^4])/15 + (4*a^2*x*Sqrt[a + c*x^4])/(15*Sqrt
[c]*(Sqrt[a] + Sqrt[c]*x^2)) + (x^3*(a + c*x^4)^(3/2))/9 - (4*a^(
9/4)*(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[(a + c*x^4)/(Sqrt[a] + Sqrt[c]*
x^2)^2]*EllipticE[2*ArcTan[(c^(1/4)*x)/a^(1/4)], 1/2])/(15*c^(3/4
)*Sqrt[a + c*x^4]) + (2*a^(9/4)*(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[(a +
 c*x^4)/(Sqrt[a] + Sqrt[c]*x^2)^2]*EllipticF[2*ArcTan[(c^(1/4)*x)
/a^(1/4)], 1/2])/(15*c^(3/4)*Sqrt[a + c*x^4])
```

Rubi in Sympy [A] time = 28.0885, size = 233, normalized size = 0.91

$$-\frac{4a^{\frac{9}{4}}\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}\left(\sqrt{a}+\sqrt{c}x^2\right)E\left(2\operatorname{atan}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{15c^{\frac{3}{4}}\sqrt{a+cx^4}} + \frac{2a^{\frac{9}{4}}\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}\left(\sqrt{a}+\sqrt{c}x^2\right)F\left(2\operatorname{atan}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{15c^{\frac{3}{4}}\sqrt{a+cx^4}} + \frac{4a^2x\sqrt{a+cx^4}}{15\sqrt{c}\left(\sqrt{a}+\sqrt{c}x^2\right)} + \frac{2ax^3\sqrt{a+cx^4}}{15} + \frac{x^3\left(a+cx^4\right)^{\frac{3}{2}}}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(c*x**4+a)**(3/2),x)
```

```
[Out] -4*a**(9/4)*sqrt((a + c*x**4)/(sqrt(a) + sqrt(c)*x**2)**2)*(sqrt(
a) + sqrt(c)*x**2)*elliptic_e(2*atan(c**(1/4)*x/a**(1/4)), 1/2)/(
15*c**(3/4)*sqrt(a + c*x**4)) + 2*a**(9/4)*sqrt((a + c*x**4)/(sqr
t(a) + sqrt(c)*x**2)**2)*(sqrt(a) + sqrt(c)*x**2)*elliptic_f(2*at
an(c**(1/4)*x/a**(1/4)), 1/2)/(15*c**(3/4)*sqrt(a + c*x**4)) + 4*
a**2*x*sqrt(a + c*x**4)/(15*sqrt(c)*(sqrt(a) + sqrt(c)*x**2)) + 2
*a*x**3*sqrt(a + c*x**4)/15 + x**3*(a + c*x**4)**(3/2)/9
```

Mathematica [C] time = 0.538826, size = 133, normalized size = 0.52

$$\frac{(a+cx^4)\left(11ax^3+5cx^7\right)+\frac{12ia^2\sqrt{\frac{cx^4}{a}+1}\left(E\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}x\right)\middle|-1\right)-F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}x\right)\middle|-1\right)\right)}{\left(\frac{i\sqrt{c}}{\sqrt{a}}\right)^{3/2}}}{45\sqrt{a+cx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2*(a + c*x^4)^(3/2),x]
```

```
[Out] ((a + c*x^4)*(11*a*x^3 + 5*c*x^7) + ((12*I)*a^2*Sqrt[1 + (c*x^4)/
a]*(EllipticE[I*ArcSinh[Sqrt[(I*Sqrt[c])/Sqrt[a]]*x], -1] - Ellip
ticF[I*ArcSinh[Sqrt[(I*Sqrt[c])/Sqrt[a]]*x], -1]))/((I*Sqrt[c])/S
qrt[a])^(3/2))/(45*Sqrt[a + c*x^4])
```

Maple [C] time = 0.013, size = 128, normalized size = 0.5

$$\frac{cx^7}{9}\sqrt{cx^4+a}+\frac{11\,ax^3}{45}\sqrt{cx^4+a}$$
$$+\frac{4\,i}{15}a^{\frac{5}{2}}\sqrt{1-ix^2\sqrt{c}\frac{1}{\sqrt{a}}}\sqrt{1+ix^2\sqrt{c}\frac{1}{\sqrt{a}}}\left(EllipticF\left(x\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}},i\right)-EllipticE\left(x\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}},i\right)\right)\frac{1}{\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{cx^4+a}}\frac{1}{\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(c*x^4+a)^(3/2),x)
```

```
[Out] 1/9*c*x^7*(c*x^4+a)^(1/2)+11/45*a*x^3*(c*x^4+a)^(1/2)+4/15*I*a^(5
/2)/(I/a^(1/2)*c^(1/2))^(1/2)*(1-I/a^(1/2)*c^(1/2)*x^2)^(1/2)*(1+
I/a^(1/2)*c^(1/2)*x^2)^(1/2)/(c*x^4+a)^(1/2)/c^(1/2)*(EllipticF(x
*(I/a^(1/2)*c^(1/2))^(1/2),I)-EllipticE(x*(I/a^(1/2)*c^(1/2))^(1/
2),I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(cx^4+a\right)^{\frac{3}{2}}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)*x^2,x, algorithm="maxima")
```

```
[Out] integrate((c*x^4 + a)^(3/2)*x^2, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(cx^6+ax^2\right)\sqrt{cx^4+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)*x^2,x, algorithm="fricas")
```

```
[Out] integral((c*x^6 + a*x^2)*sqrt(c*x^4 + a), x)
```

Sympy [A] time = 3.17425, size = 39, normalized size = 0.15

$$\frac{a^{\frac{3}{2}}x^3\,\Gamma\left(\frac{3}{4}\right)\,{}_2F_1\left(\begin{matrix} -\frac{3}{2}, \frac{3}{4} \\ \frac{7}{4} \end{matrix}\middle| \frac{cx^4e^{i\pi}}{a}\right)}{4\,\Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(c*x**4+a)**(3/2),x)
```

```
[Out] a**(3/2)*x**3*gamma(3/4)*hyper((-3/2, 3/4), (7/4,), c*x**4*exp_po
lar(I*pi)/a)/(4*gamma(7/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(cx^4 + a\right)^{\frac{3}{2}} x^2\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)*x^2,x, algorithm="giac")
```

```
[Out] integrate((c*x^4 + a)^(3/2)*x^2, x)
```

3.799 $\int \frac{(a+cx^4)^{3/2}}{x^2}\,dx$

Optimal. Leaf size=251

$$\frac{6a^{5/4}\sqrt[4]{c}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{5\sqrt{a+cx^4}} - \frac{12a^{5/4}\sqrt[4]{c}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{5\sqrt{a+cx^4}} - \frac{\left(a+cx^4\right)^{3/2}}{x} + \frac{6}{5}cx^3\sqrt{a+cx^4} + \frac{12a\sqrt{c}x\sqrt{a+cx^4}}{5\left(\sqrt{a}+\sqrt{c}x^2\right)}$$

```
[Out] (6*c*x^3*Sqrt[a + c*x^4])/5 + (12*a*Sqrt[c]*x*Sqrt[a + c*x^4])/(5
*(Sqrt[a] + Sqrt[c]*x^2)) - (a + c*x^4)^(3/2)/x - (12*a^(5/4)*c^(
1/4)*(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[(a + c*x^4)/(Sqrt[a] + Sqrt[c]*
x^2)^2]*EllipticE[2*ArcTan[(c^(1/4)*x)/a^(1/4)], 1/2])/(5*Sqrt[a
+ c*x^4]) + (6*a^(5/4)*c^(1/4)*(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[(a +
c*x^4)/(Sqrt[a] + Sqrt[c]*x^2)^2]*EllipticF[2*ArcTan[(c^(1/4)*x)/
a^(1/4)], 1/2])/(5*Sqrt[a + c*x^4])
```

Rubi [A] time = 0.237627, antiderivative size = 251, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{6a^{5/4}\sqrt[4]{c}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{5\sqrt{a+cx^4}} - \frac{12a^{5/4}\sqrt[4]{c}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{5\sqrt{a+cx^4}} - \frac{\left(a+cx^4\right)^{3/2}}{x} + \frac{6}{5}cx^3\sqrt{a+cx^4} + \frac{12a\sqrt{c}x\sqrt{a+cx^4}}{5\left(\sqrt{a}+\sqrt{c}x^2\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + c*x^4)^(3/2)/x^2,x]
```

```
[Out] (6*c*x^3*Sqrt[a + c*x^4])/5 + (12*a*Sqrt[c]*x*Sqrt[a + c*x^4])/(5
*(Sqrt[a] + Sqrt[c]*x^2)) - (a + c*x^4)^(3/2)/x - (12*a^(5/4)*c^(
1/4)*(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[(a + c*x^4)/(Sqrt[a] + Sqrt[c]*
x^2)^2]*EllipticE[2*ArcTan[(c^(1/4)*x)/a^(1/4)], 1/2])/(5*Sqrt[a
+ c*x^4]) + (6*a^(5/4)*c^(1/4)*(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[(a +
c*x^4)/(Sqrt[a] + Sqrt[c]*x^2)^2]*EllipticF[2*ArcTan[(c^(1/4)*x)/
a^(1/4)], 1/2])/(5*Sqrt[a + c*x^4])
```

Rubi in Sympy [A] time = 27.5867, size = 230, normalized size = 0.92

$$-\frac{12a^{\frac{5}{4}}\sqrt[4]{c}\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}\left(\sqrt{a}+\sqrt{c}x^2\right)E\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{5\sqrt{a+cx^4}} + \frac{6a^{\frac{5}{4}}\sqrt[4]{c}\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}\left(\sqrt{a}+\sqrt{c}x^2\right)F\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{5\sqrt{a+cx^4}} + \frac{12a\sqrt{c}x\sqrt{a+cx^4}}{5\left(\sqrt{a}+\sqrt{c}x^2\right)} + \frac{6cx^3\sqrt{a+cx^4}}{5} - \frac{\left(a+cx^4\right)^{\frac{3}{2}}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**(3/2)/x**2,x)
```

```
[Out] -12*a**(5/4)*c**(1/4)*sqrt((a + c*x**4)/(sqrt(a) + sqrt(c)*x**2)*
*2)*(sqrt(a) + sqrt(c)*x**2)*elliptic_e(2*atan(c**(1/4)*x/a**(1/4
)), 1/2)/(5*sqrt(a + c*x**4)) + 6*a**(5/4)*c**(1/4)*sqrt((a + c*x
**4)/(sqrt(a) + sqrt(c)*x**2)**2)*(sqrt(a) + sqrt(c)*x**2)*ellipt
ic_f(2*atan(c**(1/4)*x/a**(1/4)), 1/2)/(5*sqrt(a + c*x**4)) + 12*
a*sqrt(c)*x*sqrt(a + c*x**4)/(5*(sqrt(a) + sqrt(c)*x**2)) + 6*c*x
**3*sqrt(a + c*x**4)/5 - (a + c*x**4)**(3/2)/x
```

Mathematica [C] time = 0.397798, size = 136, normalized size = 0.54

$$\sqrt{a+cx^4}\left(\frac{cx^3}{5}-\frac{a}{x}\right)+\frac{12iac\sqrt{\frac{cx^4}{a}+1}\left(E\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}x\right)\middle|-1\right)-F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}x\right)\middle|-1\right)\right)}{5\left(\frac{i\sqrt{c}}{\sqrt{a}}\right)^{3/2}\sqrt{a+cx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + c*x^4)^(3/2)/x^2,x]
```

```
[Out] (-(a/x) + (c*x^3)/5)*Sqrt[a + c*x^4] + (((12*I)/5)*a*c*Sqrt[1 + (
c*x^4)/a]*(EllipticE[I*ArcSinh[Sqrt[(I*Sqrt[c])/Sqrt[a]]*x], -1]
- EllipticF[I*ArcSinh[Sqrt[(I*Sqrt[c])/Sqrt[a]]*x], -1]))/(((I*Sq
rt[c])/Sqrt[a])^(3/2)*Sqrt[a + c*x^4])
```

Maple [C] time = 0.016, size = 128, normalized size = 0.5

$$-\frac{a}{x}\sqrt{cx^4+a}+\frac{cx^3}{5}\sqrt{cx^4+a}$$
$$+\frac{12\,i}{5}a^{\frac{3}{2}}\sqrt{c}\sqrt{1-ix^2\sqrt{c}\frac{1}{\sqrt{a}}}\sqrt{1+ix^2\sqrt{c}\frac{1}{\sqrt{a}}}\left(EllipticF\left(x\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}},i\right)-EllipticE\left(x\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}},i\right)\right)\frac{1}{\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{cx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)^(3/2)/x^2,x)
```

```
[Out] -a*(c*x^4+a)^(1/2)/x+1/5*c*x^3*(c*x^4+a)^(1/2)+12/5*I*a^(3/2)*c^(
1/2)/(I/a^(1/2)*c^(1/2))^(1/2)*(1-I/a^(1/2)*c^(1/2)*x^2)^(1/2)*(1
+I/a^(1/2)*c^(1/2)*x^2)^(1/2)/(c*x^4+a)^(1/2)*(EllipticF(x*(I/a^(
1/2)*c^(1/2))^(1/2),I)-EllipticE(x*(I/a^(1/2)*c^(1/2))^(1/2),I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(cx^4+a\right)^{\frac{3}{2}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)/x^2,x, algorithm="maxima")
```

```
[Out] integrate((c*x^4 + a)^(3/2)/x^2, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(cx^4+a\right)^{\frac{3}{2}}}{x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)/x^2,x, algorithm="fricas")
```

```
[Out] integral((c*x^4 + a)^(3/2)/x^2, x)
```

Sympy [A] time = 3.10132, size = 41, normalized size = 0.16

$$\frac{a^{\frac{3}{2}}\Gamma\left(-\frac{1}{4}\right){}_2F_1\left(\begin{matrix}-\frac{3}{2},-\frac{1}{4}\\ \frac{3}{4}\end{matrix}\middle|\frac{cx^4e^{i\pi}}{a}\right)}{4x\Gamma\left(\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**(3/2)/x**2,x)
```

```
[Out] a**(3/2)*gamma(-1/4)*hyper((-3/2, -1/4), (3/4,), c*x**4*exp_polar
(I*pi)/a)/(4*x*gamma(3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(cx^4+a\right)^{\frac{3}{2}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)/x^2,x, algorithm="giac")
```

```
[Out] integrate((c*x^4 + a)^(3/2)/x^2, x)
```

3.800 $\int \frac{(a+cx^4)^{3/2}}{x^6}\,dx$

Optimal. Leaf size=252

$$\frac{12c^{3/2}x\sqrt{a+cx^4}}{5\left(\sqrt{a}+\sqrt{c}x^2\right)}+\frac{6\sqrt[4]{a}c^{5/4}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{5\sqrt{a+cx^4}}-\frac{12\sqrt[4]{a}c^{5/4}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{5\sqrt{a+cx^4}}-\frac{6c\sqrt{a+cx^4}}{5x}-\frac{\left(a+cx^4\right)^{3/2}}{5x^5}$$

```
[Out] (-6*c*Sqrt[a + c*x^4])/(5*x) + (12*c^(3/2)*x*Sqrt[a + c*x^4])/(5*
(Sqrt[a] + Sqrt[c]*x^2)) - (a + c*x^4)^(3/2)/(5*x^5) - (12*a^(1/4
)*c^(5/4)*(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[(a + c*x^4)/(Sqrt[a] + Sqr
t[c]*x^2)^2]*EllipticE[2*ArcTan[(c^(1/4)*x)/a^(1/4)], 1/2])/(5*Sq
rt[a + c*x^4]) + (6*a^(1/4)*c^(5/4)*(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[
(a + c*x^4)/(Sqrt[a] + Sqrt[c]*x^2)^2]*EllipticF[2*ArcTan[(c^(1/4
)*x)/a^(1/4)], 1/2])/(5*Sqrt[a + c*x^4])
```

Rubi [A] time = 0.230841, antiderivative size = 252, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{12c^{3/2}x\sqrt{a+cx^4}}{5\left(\sqrt{a}+\sqrt{c}x^2\right)}+\frac{6\sqrt[4]{a}c^{5/4}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{5\sqrt{a+cx^4}}-\frac{12\sqrt[4]{a}c^{5/4}\left(\sqrt{a}+\sqrt{c}x^2\right)\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{5\sqrt{a+cx^4}}-\frac{6c\sqrt{a+cx^4}}{5x}-\frac{\left(a+cx^4\right)^{3/2}}{5x^5}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + c*x^4)^(3/2)/x^6,x]
```

```
[Out] (-6*c*Sqrt[a + c*x^4])/(5*x) + (12*c^(3/2)*x*Sqrt[a + c*x^4])/(5*
(Sqrt[a] + Sqrt[c]*x^2)) - (a + c*x^4)^(3/2)/(5*x^5) - (12*a^(1/4
)*c^(5/4)*(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[(a + c*x^4)/(Sqrt[a] + Sqr
t[c]*x^2)^2]*EllipticE[2*ArcTan[(c^(1/4)*x)/a^(1/4)], 1/2])/(5*Sq
rt[a + c*x^4]) + (6*a^(1/4)*c^(5/4)*(Sqrt[a] + Sqrt[c]*x^2)*Sqrt[
(a + c*x^4)/(Sqrt[a] + Sqrt[c]*x^2)^2]*EllipticF[2*ArcTan[(c^(1/4
)*x)/a^(1/4)], 1/2])/(5*Sqrt[a + c*x^4])
```

Rubi in Sympy [A] time = 27.5589, size = 230, normalized size = 0.91

$$-\frac{12\sqrt[4]{a}c^{\frac{5}{4}}\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}\left(\sqrt{a}+\sqrt{c}x^2\right)E\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{5\sqrt{a+cx^4}}+\frac{6\sqrt[4]{a}c^{\frac{5}{4}}\sqrt{\frac{a+cx^4}{\left(\sqrt{a}+\sqrt{c}x^2\right)^2}}\left(\sqrt{a}+\sqrt{c}x^2\right)F\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{c}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{5\sqrt{a+cx^4}}+\frac{12c^{\frac{3}{2}}x\sqrt{a+cx^4}}{5\left(\sqrt{a}+\sqrt{c}x^2\right)}-\frac{6c\sqrt{a+cx^4}}{5x}-\frac{\left(a+cx^4\right)^{\frac{3}{2}}}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**4+a)**(3/2)/x**6,x)
```

```
[Out] -12*a**(1/4)*c**(5/4)*sqrt((a + c*x**4)/(sqrt(a) + sqrt(c)*x**2)*
*2)*(sqrt(a) + sqrt(c)*x**2)*elliptic_e(2*atan(c**(1/4)*x/a**(1/4
)), 1/2)/(5*sqrt(a + c*x**4)) + 6*a**(1/4)*c**(5/4)*sqrt((a + c*x
```

```
**4)/(sqrt(a) + sqrt(c)*x**2)**2)*(sqrt(a) + sqrt(c)*x**2)*ellipt
ic_f(2*atan(c**(1/4)*x/a**(1/4)), 1/2)/(5*sqrt(a + c*x**4)) + 12*
c**(3/2)*x*sqrt(a + c*x**4)/(5*(sqrt(a) + sqrt(c)*x**2)) - 6*c*sq
rt(a + c*x**4)/(5*x) - (a + c*x**4)**(3/2)/(5*x**5)
```

Mathematica [C] time = 0.47982, size = 132, normalized size = 0.52

$$\frac{-\frac{(a+cx^4)(a+7cx^4)}{x^5}+\frac{12ic^2\sqrt{\frac{cx^4}{a}+1}\left(E\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}x\right)\middle|-1\right)-F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}x\right)\middle|-1\right)\right)}{\left(\frac{i\sqrt{c}}{\sqrt{a}}\right)^{3/2}}}{5\sqrt{a+cx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + c*x^4)^(3/2)/x^6,x]
```

```
[Out] (-(((a + c*x^4)*(a + 7*c*x^4))/x^5) + ((12*I)*c^2*Sqrt[1 + (c*x^4
)/a]*(EllipticE[I*ArcSinh[Sqrt[(I*Sqrt[c])/Sqrt[a]]*x], -1] - Ell
ipticF[I*ArcSinh[Sqrt[(I*Sqrt[c])/Sqrt[a]]*x], -1]))/((I*Sqrt[c])
/Sqrt[a])^(3/2))/(5*Sqrt[a + c*x^4])
```

Maple [C] time = 0.019, size = 128, normalized size = 0.5

$$-\frac{a}{5x^5}\sqrt{cx^4+a}-\frac{7c}{5x}\sqrt{cx^4+a}$$
$$+\frac{12i}{5}c^{\frac{3}{2}}\sqrt{a}\sqrt{1-ix^2\sqrt{c}\frac{1}{\sqrt{a}}}\sqrt{1+ix^2\sqrt{c}\frac{1}{\sqrt{a}}}\left(EllipticF\left(x\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}},i\right)-EllipticE\left(x\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}},i\right)\right)\frac{1}{\sqrt{i\sqrt{c}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{cx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^4+a)^(3/2)/x^6,x)
```

```
[Out] -1/5*a*(c*x^4+a)^(1/2)/x^5-7/5*c*(c*x^4+a)^(1/2)/x+12/5*I*c^(3/2)
*a^(1/2)/(I/a^(1/2)*c^(1/2))^(1/2)*(1-I/a^(1/2)*c^(1/2)*x^2)^(1/2
)*(1+I/a^(1/2)*c^(1/2)*x^2)^(1/2)/(c*x^4+a)^(1/2)*(EllipticF(x*(I
/a^(1/2)*c^(1/2))^(1/2),I)-EllipticE(x*(I/a^(1/2)*c^(1/2))^(1/2),
I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx^4+a)^{\frac{3}{2}}}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)/x^6,x, algorithm="maxima")
```

```
[Out] integrate((c*x^4 + a)^(3/2)/x^6, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(cx^4+a)^{\frac{3}{2}}}{x^6},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)/x^6,x, algorithm="fricas")
```

```
[Out] integral((c*x^4 + a)^(3/2)/x^6, x)
```

Sympy [A] time = 4.02594, size = 46, normalized size = 0.18

$$\frac{a^{\frac{3}{2}}\Gamma\left(-\frac{5}{4}\right){}_2F_1\left(\begin{matrix}-\frac{3}{2},-\frac{5}{4}\\-\frac{1}{4}\end{matrix}\middle|\frac{cx^4e^{i\pi}}{a}\right)}{4x^5\Gamma\left(-\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**4+a)**(3/2)/x**6,x)
```

```
[Out] a**(3/2)*gamma(-5/4)*hyper((-3/2, -5/4), (-1/4,), c*x**4*exp_pola
r(I*pi)/a)/(4*x**5*gamma(-1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(cx^4+a\right)^{\frac{3}{2}}}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^4 + a)^(3/2)/x^6,x, algorithm="giac")
```

```
[Out] integrate((c*x^4 + a)^(3/2)/x^6, x)
```

3.801 $\int \left(1+x^4\right)^{3/2} dx$

Optimal. Leaf size=72

$$\frac{1}{7}x\left(x^4+1\right)^{3/2}+\frac{2}{7}x\sqrt{x^4+1}+\frac{2\left(x^2+1\right)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{7\sqrt{x^4+1}}$$

```
[Out] (2*x*Sqrt[1 + x^4])/7 + (x*(1 + x^4)^(3/2))/7 + (2*(1 + x^2)*Sqrt
[(1 + x^4)/(1 + x^2)^2]*EllipticF[2*ArcTan[x], 1/2])/(7*Sqrt[1 +
x^4])
```

Rubi [A] time = 0.0327541, antiderivative size = 72, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{1}{7}x\left(x^4+1\right)^{3/2}+\frac{2}{7}x\sqrt{x^4+1}+\frac{2\left(x^2+1\right)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{7\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[(1 + x^4)^(3/2),x]
```

```
[Out] (2*x*Sqrt[1 + x^4])/7 + (x*(1 + x^4)^(3/2))/7 + (2*(1 + x^2)*Sqrt
[(1 + x^4)/(1 + x^2)^2]*EllipticF[2*ArcTan[x], 1/2])/(7*Sqrt[1 +
x^4])
```

Rubi in Sympy [A] time = 1.68956, size = 65, normalized size = 0.9

$$\frac{x\left(x^4+1\right)^{\frac{3}{2}}}{7}+\frac{2x\sqrt{x^4+1}}{7}+\frac{2\sqrt{\frac{x^4+1}{(x^2+1)^2}}\left(x^2+1\right)F\left(2\operatorname{atan}(x)\middle|\frac{1}{2}\right)}{7\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((x**4+1)**(3/2),x)
```

```
[Out] x*(x**4 + 1)**(3/2)/7 + 2*x*sqrt(x**4 + 1)/7 + 2*sqrt((x**4 + 1)/
(x**2 + 1)**2)*(x**2 + 1)*elliptic_f(2*atan(x), 1/2)/(7*sqrt(x**4
 + 1))
```

Mathematica [C] time = 0.0403646, size = 55, normalized size = 0.76

$$\frac{x^9+4x^5-4\sqrt[4]{-1}\sqrt{x^4+1}F\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)+3x}{7\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(1 + x^4)^(3/2),x]
```

```
[Out] (3*x + 4*x^5 + x^9 - 4*(-1)^(1/4)*Sqrt[1 + x^4]*EllipticF[I*ArcSi
nh[(-1)^(1/4)*x], -1])/(7*Sqrt[1 + x^4])
```

Maple [C] time = 0.128, size = 84, normalized size = 1.2

$$\frac{x^5}{7}\sqrt{x^4+1}+\frac{3x}{7}\sqrt{x^4+1}+\frac{4\,EllipticF\left(x\left(1/2\sqrt{2}+i/2\sqrt{2}\right),i\right)}{\frac{7\sqrt{2}}{2}+\frac{7i}{2}\sqrt{2}}\sqrt{1-ix^2}\sqrt{1+ix^2}\frac{1}{\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((x^4+1)^(3/2),x)
```

```
[Out] 1/7*x^5*(x^4+1)^(1/2)+3/7*x*(x^4+1)^(1/2)+4/7/(1/2*2^(1/2)+1/2*I*
2^(1/2))*(1-I*x^2)^(1/2)*(1+I*x^2)^(1/2)/(x^4+1)^(1/2)*EllipticF(
x*(1/2*2^(1/2)+1/2*I*2^(1/2)),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(x^4+1\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x^4 + 1)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((x^4 + 1)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\left(x^4+1\right)^{\frac{3}{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x^4 + 1)^(3/2),x, algorithm="fricas")
```

```
[Out] integral((x^4 + 1)^(3/2), x)
```

Sympy [A] time = 2.298, size = 29, normalized size = 0.4

$$\frac{x\,\Gamma\left(\frac{1}{4}\right)\,{}_2F_1\left(\begin{matrix}-\frac{3}{2},\frac{1}{4}\\ \frac{5}{4}\end{matrix}\middle|x^4e^{i\pi}\right)}{4\,\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x**4+1)**(3/2),x)
```

```
[Out] x*gamma(1/4)*hyper((-3/2, 1/4), (5/4,), x**4*exp_polar(I*pi))/(4*
gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(x^4+1\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x^4 + 1)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((x^4 + 1)^(3/2), x)
```

3.802 $\int \left(1-x^4\right)^{3/2} dx$

Optimal. Leaf size=41

$$\frac{1}{7}x\left(1-x^4\right)^{3/2}+\frac{2}{7}x\sqrt{1-x^4}+\frac{4}{7}F\left(\sin^{-1}(x)\middle|-1\right)$$

```
[Out] (2*x*Sqrt[1 - x^4])/7 + (x*(1 - x^4)^(3/2))/7 + (4*EllipticF[ArcS
in[x], -1])/7
```

Rubi [A] time = 0.0182557, antiderivative size = 41, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{1}{7}x\left(1-x^4\right)^{3/2}+\frac{2}{7}x\sqrt{1-x^4}+\frac{4}{7}F\left(\sin^{-1}(x)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[(1 - x^4)^(3/2),x]
```

```
[Out] (2*x*Sqrt[1 - x^4])/7 + (x*(1 - x^4)^(3/2))/7 + (4*EllipticF[ArcS
in[x], -1])/7
```

Rubi in Sympy [A] time = 1.42777, size = 34, normalized size = 0.83

$$\frac{x\left(-x^4+1\right)^{\frac{3}{2}}}{7}+\frac{2x\sqrt{-x^4+1}}{7}+\frac{4F\left(\operatorname{asin}(x)\middle|-1\right)}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((-x**4+1)**(3/2),x)
```

```
[Out] x*(-x**4 + 1)**(3/2)/7 + 2*x*sqrt(-x**4 + 1)/7 + 4*elliptic_f(asi
n(x), -1)/7
```

Mathematica [A] time = 0.0356835, size = 44, normalized size = 1.07

$$\frac{x^9-4x^5+4\sqrt{1-x^4}F\left(\sin^{-1}(x)\middle|-1\right)+3x}{7\sqrt{1-x^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(1 - x^4)^(3/2),x]
```

```
[Out] (3*x - 4*x^5 + x^9 + 4*Sqrt[1 - x^4]*EllipticF[ArcSin[x], -1])/(7
*Sqrt[1 - x^4])
```

Maple [A] time = 0.009, size = 59, normalized size = 1.4

$$-\frac{x^5}{7}\sqrt{-x^4+1}+\frac{3\,x}{7}\sqrt{-x^4+1}+\frac{4\,EllipticF\left(x,i\right)}{7}\sqrt{-x^2+1}\sqrt{x^2+1}\frac{1}{\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((-x^4+1)^(3/2),x)
```

```
[Out] -1/7*x^5*(-x^4+1)^(1/2)+3/7*x*(-x^4+1)^(1/2)+4/7*(-x^2+1)^(1/2)*(
x^2+1)^(1/2)/(-x^4+1)^(1/2)*EllipticF(x,I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-x^4+1\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-x^4 + 1)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((-x^4 + 1)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(-x^4+1\right)^{\frac{3}{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-x^4 + 1)^(3/2),x, algorithm="fricas")
```

```
[Out] integral((-x^4 + 1)^(3/2), x)
```

Sympy [A] time = 2.37815, size = 31, normalized size = 0.76

$$\frac{x\,\Gamma\left(\frac{1}{4}\right)\,{}_2F_1\left(\begin{matrix}-\frac{3}{2},\frac{1}{4}\\ \frac{5}{4}\end{matrix}\middle|x^4e^{2i\pi}\right)}{4\,\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-x**4+1)**(3/2),x)
```

```
[Out] x*gamma(1/4)*hyper((-3/2, 1/4), (5/4,), x**4*exp_polar(2*I*pi))/(
4*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-x^4+1\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-x^4 + 1)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((-x^4 + 1)^(3/2), x)
```

3.803 $\int x^7 \sqrt{5+3x^4}\,dx$

Optimal. Leaf size=31

$$\frac{1}{90}\left(3x^4+5\right)^{5/2}-\frac{5}{54}\left(3x^4+5\right)^{3/2}$$

```
[Out] (-5*(5 + 3*x^4)^(3/2))/54 + (5 + 3*x^4)^(5/2)/90
```

Rubi [A] time = 0.0394817, antiderivative size = 31, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{1}{90}\left(3x^4+5\right)^{5/2}-\frac{5}{54}\left(3x^4+5\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7*Sqrt[5 + 3*x^4],x]

[Out] (-5*(5 + 3*x^4)^(3/2))/54 + (5 + 3*x^4)^(5/2)/90
```

Rubi in Sympy [A] time = 4.84401, size = 24, normalized size = 0.77

$$\frac{\left(3x^4+5\right)^{\frac{5}{2}}}{90}-\frac{5\left(3x^4+5\right)^{\frac{3}{2}}}{54}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7*(3*x**4+5)**(1/2),x)

[Out] (3*x**4 + 5)**(5/2)/90 - 5*(3*x**4 + 5)**(3/2)/54
```

Mathematica [A] time = 0.0133727, size = 22, normalized size = 0.71

$$\frac{1}{270}\left(3x^4+5\right)^{3/2}\left(9x^4-10\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^7*Sqrt[5 + 3*x^4],x]

[Out] ((5 + 3*x^4)^(3/2)*(-10 + 9*x^4))/270
```

Maple [A] time = 0.006, size = 19, normalized size = 0.6

$$\frac{9\,x^4-10}{270}\left(3\,x^4+5\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7*(3*x^4+5)^(1/2),x)

[Out] 1/270*(3*x^4+5)^(3/2)*(9*x^4-10)
```

Maxima [A] time = 1.4372, size = 31, normalized size = 1.

$$\frac{1}{90}\left(3\,x^4+5\right)^{\frac{5}{2}}-\frac{5}{54}\left(3\,x^4+5\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(3*x^4 + 5)*x^7,x, algorithm="maxima")
```

```
[Out] 1/90*(3*x^4 + 5)^(5/2) - 5/54*(3*x^4 + 5)^(3/2)
```

Fricas [A] time = 0.23149, size = 31, normalized size = 1.

$$\frac{1}{270}\left(27\,x^8+15\,x^4-50\right)\sqrt{3\,x^4+5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(3*x^4 + 5)*x^7,x, algorithm="fricas")
```

```
[Out] 1/270*(27*x^8 + 15*x^4 - 50)*sqrt(3*x^4 + 5)
```

Sympy [A] time = 1.66159, size = 42, normalized size = 1.35

$$\frac{x^8\sqrt{3x^4+5}}{10}+\frac{x^4\sqrt{3x^4+5}}{18}-\frac{5\sqrt{3x^4+5}}{27}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7*(3*x**4+5)**(1/2),x)
```

```
[Out] x**8*sqrt(3*x**4 + 5)/10 + x**4*sqrt(3*x**4 + 5)/18 - 5*sqrt(3*x*
*4 + 5)/27
```

GIAC/XCAS [A] time = 0.215625, size = 31, normalized size = 1.

$$\frac{1}{90}\left(3\,x^4+5\right)^{\frac{5}{2}}-\frac{5}{54}\left(3\,x^4+5\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(3*x^4 + 5)*x^7,x, algorithm="giac")
```

```
[Out] 1/90*(3*x^4 + 5)^(5/2) - 5/54*(3*x^4 + 5)^(3/2)
```

3.804 $\int x^3\sqrt{5+x^4}\,dx$

Optimal. Leaf size=13

$$\frac{1}{6}\left(x^4+5\right)^{3/2}$$

```
[Out] (5 + x^4)^(3/2)/6
```

Rubi [A] time = 0.00685628, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{1}{6}\left(x^4+5\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3*Sqrt[5 + x^4],x]

[Out] (5 + x^4)^(3/2)/6
```

Rubi in Sympy [A] time = 1.62052, size = 8, normalized size = 0.62

$$\frac{\left(x^4+5\right)^{\frac{3}{2}}}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3*(x**4+5)**(1/2),x)

[Out] (x**4 + 5)**(3/2)/6
```

Mathematica [A] time = 0.00618847, size = 13, normalized size = 1.

$$\frac{1}{6}\left(x^4+5\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3*Sqrt[5 + x^4],x]

[Out] (5 + x^4)^(3/2)/6
```

Maple [A] time = 0.006, size = 10, normalized size = 0.8

$$\frac{1}{6}\left(x^4+5\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3*(x^4+5)^(1/2),x)

[Out] 1/6*(x^4+5)^(3/2)
```

Maxima [A] time = 1.43292, size = 12, normalized size = 0.92

$$\frac{1}{6}\left(x^4+5\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^4 + 5)*x^3,x, algorithm="maxima")

[Out] 1/6*(x^4 + 5)^(3/2)
```

Fricas [A] time = 0.228481, size = 12, normalized size = 0.92

$$\frac{1}{6}\left(x^4+5\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^4 + 5)*x^3,x, algorithm="fricas")

[Out] 1/6*(x^4 + 5)^(3/2)
```

Sympy [A] time = 0.474179, size = 24, normalized size = 1.85

$$\frac{x^4\sqrt{x^4+5}}{6}+\frac{5\sqrt{x^4+5}}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(x**4+5)**(1/2),x)

[Out] x**4*sqrt(x**4 + 5)/6 + 5*sqrt(x**4 + 5)/6
```

GIAC/XCAS [A] time = 0.213963, size = 12, normalized size = 0.92

$$\frac{1}{6}\left(x^4+5\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^4 + 5)*x^3,x, algorithm="giac")

[Out] 1/6*(x^4 + 5)^(3/2)
```

3.805 $\int x\sqrt{3+2x^4}\,dx$

Optimal. Leaf size=40

$$\frac{3\sinh^{-1}\left(\sqrt{\frac{2}{3}}x^2\right)}{4\sqrt{2}}+\frac{1}{4}\sqrt{2x^4+3}x^2$$

```
[Out] (x^2*Sqrt[3 + 2*x^4])/4 + (3*ArcSinh[Sqrt[2/3]*x^2])/(4*Sqrt[2])
```

Rubi [A] time = 0.0399934, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{3\sinh^{-1}\left(\sqrt{\frac{2}{3}}x^2\right)}{4\sqrt{2}}+\frac{1}{4}\sqrt{2x^4+3}x^2$$

Antiderivative was successfully verified.

```
[In] Int[x*Sqrt[3 + 2*x^4],x]

[Out] (x^2*Sqrt[3 + 2*x^4])/4 + (3*ArcSinh[Sqrt[2/3]*x^2])/(4*Sqrt[2])
```

Rubi in Sympy [A] time = 2.87534, size = 34, normalized size = 0.85

$$\frac{x^2\sqrt{2x^4+3}}{4}+\frac{3\sqrt{2}\,\mathrm{asinh}\left(\frac{\sqrt{6}x^2}{3}\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x*(2*x**4+3)**(1/2),x)

[Out] x**2*sqrt(2*x**4 + 3)/4 + 3*sqrt(2)*asinh(sqrt(6)*x**2/3)/8
```

Mathematica [A] time = 0.0227729, size = 40, normalized size = 1.

$$\frac{3\sinh^{-1}\left(\sqrt{\frac{2}{3}}x^2\right)}{4\sqrt{2}}+\frac{1}{4}\sqrt{2x^4+3}x^2$$

Antiderivative was successfully verified.

```
[In] Integrate[x*Sqrt[3 + 2*x^4],x]

[Out] (x^2*Sqrt[3 + 2*x^4])/4 + (3*ArcSinh[Sqrt[2/3]*x^2])/(4*Sqrt[2])
```

Maple [A] time = 0.011, size = 30, normalized size = 0.8

$$\frac{3\sqrt{2}}{8}Arcsinh\left(\frac{x^2\sqrt{6}}{3}\right)+\frac{x^2}{4}\sqrt{2x^4+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(2*x^4+3)^(1/2),x)
```

```
[Out] 3/8*arcsinh(1/3*x^2*6^(1/2))*2^(1/2)+1/4*x^2*(2*x^4+3)^(1/2)
```

Maxima [A] time = 1.58951, size = 103, normalized size = 2.58

$$-\frac{3}{16}\sqrt{2}\log\left(-\frac{2\left(\sqrt{2}-\frac{\sqrt{2\,x^4+3}}{x^2}\right)}{2\,\sqrt{2}+\frac{2\,\sqrt{2\,x^4+3}}{x^2}}\right)+\frac{3\,\sqrt{2\,x^4+3}}{4\,x^2\left(\frac{2\,x^4+3}{x^4}-2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(2*x^4 + 3)*x,x, algorithm="maxima")
```

```
[Out] -3/16*sqrt(2)*log(-2*(sqrt(2) - sqrt(2*x^4 + 3)/x^2)/((2*sqrt(2))
 + 2*sqrt(2*x^4 + 3)/x^2)) + 3/4*sqrt(2*x^4 + 3)/(x^2*((2*x^4 + 3
)/x^4 - 2))
```

Fricas [A] time = 0.250966, size = 72, normalized size = 1.8

$$\frac{1}{16}\sqrt{2}\left(2\,\sqrt{2}\sqrt{2\,x^4+3}x^2+3\,\log\left(-4\,\sqrt{2\,x^4+3}x^2-\sqrt{2}\left(4\,x^4+3\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(2*x^4 + 3)*x,x, algorithm="fricas")
```

```
[Out] 1/16*sqrt(2)*(2*sqrt(2)*sqrt(2*x^4 + 3)*x^2 + 3*log(-4*sqrt(2*x^4
 + 3)*x^2 - sqrt(2)*(4*x^4 + 3)))
```

Sympy [A] time = 4.95882, size = 51, normalized size = 1.27

$$\frac{x^6}{2\sqrt{2x^4+3}}+\frac{3x^2}{4\sqrt{2x^4+3}}+\frac{3\sqrt{2}\operatorname{asinh}\left(\frac{\sqrt{6}x^2}{3}\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(2*x**4+3)**(1/2),x)
```

```
[Out] x**6/(2*sqrt(2*x**4 + 3)) + 3*x**2/(4*sqrt(2*x**4 + 3)) + 3*sqrt(
2)*asinh(sqrt(6)*x**2/3)/8
```

GIAC/XCAS [A] time = 0.215324, size = 53, normalized size = 1.32

$$\frac{1}{4}\sqrt{2\,x^4+3}x^2-\frac{3}{8}\sqrt{2}\ln\left(-\sqrt{2}x^2+\sqrt{2\,x^4+3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(2*x^4 + 3)*x,x, algorithm="giac")
```

```
[Out] 1/4*sqrt(2*x^4 + 3)*x^2 - 3/8*sqrt(2)*ln(-sqrt(2)*x^2 + sqrt(2*x^
4 + 3))
```

3.806 $\int x\sqrt{-2+x^4}\,dx$

Optimal. Leaf size=35

$$\frac{1}{4}x^2\sqrt{x^4-2}-\frac{1}{2}\tanh^{-1}\left(\frac{x^2}{\sqrt{x^4-2}}\right)$$

```
[Out] (x^2*Sqrt[-2 + x^4])/4 - ArcTanh[x^2/Sqrt[-2 + x^4]]/2
```

Rubi [A] time = 0.0290756, antiderivative size = 35, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364

$$\frac{1}{4}x^2\sqrt{x^4-2}-\frac{1}{2}\tanh^{-1}\left(\frac{x^2}{\sqrt{x^4-2}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x*Sqrt[-2 + x^4],x]

[Out] (x^2*Sqrt[-2 + x^4])/4 - ArcTanh[x^2/Sqrt[-2 + x^4]]/2
```

Rubi in Sympy [A] time = 2.52855, size = 27, normalized size = 0.77

$$\frac{x^2\sqrt{x^4-2}}{4}-\frac{\operatorname{atanh}\left(\frac{x^2}{\sqrt{x^4-2}}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(x**4-2)**(1/2),x)

[Out] x**2*sqrt(x**4 - 2)/4 - atanh(x**2/sqrt(x**4 - 2))/2
```

Mathematica [A] time = 0.0148069, size = 35, normalized size = 1.

$$\frac{1}{4}x^2\sqrt{x^4-2}-\frac{1}{2}\log\left(\sqrt{x^4-2}+x^2\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x*Sqrt[-2 + x^4],x]

[Out] (x^2*Sqrt[-2 + x^4])/4 - Log[x^2 + Sqrt[-2 + x^4]]/2
```

Maple [A] time = 0.012, size = 28, normalized size = 0.8

$$\frac{x^2}{4}\sqrt{x^4-2}-\frac{1}{2}\ln\left(x^2+\sqrt{x^4-2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(x^4-2)^(1/2),x)

[Out] 1/4*x^2*(x^4-2)^(1/2)-1/2*ln(x^2+(x^4-2)^(1/2))
```

Maxima [A] time = 1.44101, size = 78, normalized size = 2.23

$$-\frac{\sqrt{x^4-2}}{2\,x^2\left(\frac{x^4-2}{x^4}-1\right)}-\frac{1}{4}\,\log\left(\frac{\sqrt{x^4-2}}{x^2}+1\right)+\frac{1}{4}\,\log\left(\frac{\sqrt{x^4-2}}{x^2}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^4 - 2)*x,x, algorithm="maxima")
```

```
[Out] -1/2*sqrt(x^4 - 2)/(x^2*((x^4 - 2)/x^4 - 1)) - 1/4*log(sqrt(x^4 -
 2)/x^2 + 1) + 1/4*log(sqrt(x^4 - 2)/x^2 - 1)
```

Fricas [A] time = 0.273931, size = 109, normalized size = 3.11

$$-\frac{x^8-2\,x^4-2\left(x^4-\sqrt{x^4-2}x^2-1\right)\log\left(-x^2+\sqrt{x^4-2}\right)-\left(x^6-x^2\right)\sqrt{x^4-2}}{4\left(x^4-\sqrt{x^4-2}x^2-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^4 - 2)*x,x, algorithm="fricas")
```

```
[Out] -1/4*(x^8 - 2*x^4 - 2*(x^4 - sqrt(x^4 - 2)*x^2 - 1)*log(-x^2 + sq
rt(x^4 - 2)) - (x^6 - x^2)*sqrt(x^4 - 2))/(x^4 - sqrt(x^4 - 2)*x^
2 - 1)
```

Sympy [A] time = 5.27351, size = 90, normalized size = 2.57

$$\begin{cases} \frac{x^6}{4\sqrt{x^4-2}}-\frac{x^2}{2\sqrt{x^4-2}}-\frac{\operatorname{acosh}\left(\frac{\sqrt{2}x^2}{2}\right)}{2} & \text{for}\ \frac{\left|x^4\right|}{2}>1 \\ -\frac{ix^6}{4\sqrt{-x^4+2}}+\frac{ix^2}{2\sqrt{-x^4+2}}+\frac{i\operatorname{asin}\left(\frac{\sqrt{2}x^2}{2}\right)}{2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(x**4-2)**(1/2),x)
```

```
[Out] Piecewise((x**6/(4*sqrt(x**4 - 2)) - x**2/(2*sqrt(x**4 - 2)) - ac
osh(sqrt(2)*x**2/2)/2, Abs(x**4)/2 > 1), (-I*x**6/(4*sqrt(-x**4 +
 2)) + I*x**2/(2*sqrt(-x**4 + 2)) + I*asin(sqrt(2)*x**2/2)/2, Tru
e))
```

GIAC/XCAS [A] time = 0.219372, size = 39, normalized size = 1.11

$$\frac{1}{4}\,\sqrt{x^4-2}x^2+\frac{1}{2}\,\ln\left(x^2-\sqrt{x^4-2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^4 - 2)*x,x, algorithm="giac")
```

```
[Out] 1/4*sqrt(x^4 - 2)*x^2 + 1/2*ln(x^2 - sqrt(x^4 - 2))
```

3.807 $\int \sqrt{1+x^4}\,dx$

Optimal. Leaf size=58

$$\frac{1}{3}\sqrt{x^4+1}x+\frac{\left(x^2+1\right)\sqrt{\frac{x^4+1}{\left(x^2+1\right)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{3\sqrt{x^4+1}}$$

```
[Out] (x*Sqrt[1 + x^4])/3 + ((1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*Elli
pticF[2*ArcTan[x], 1/2])/(3*Sqrt[1 + x^4])
```

Rubi [A] time = 0.0224954, antiderivative size = 58, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{1}{3}\sqrt{x^4+1}x+\frac{\left(x^2+1\right)\sqrt{\frac{x^4+1}{\left(x^2+1\right)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{3\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[1 + x^4],x]
```

```
[Out] (x*Sqrt[1 + x^4])/3 + ((1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*Elli
pticF[2*ArcTan[x], 1/2])/(3*Sqrt[1 + x^4])
```

Rubi in Sympy [A] time = 1.42838, size = 49, normalized size = 0.84

$$\frac{x\sqrt{x^4+1}}{3}+\frac{\sqrt{\frac{x^4+1}{\left(x^2+1\right)^2}}\left(x^2+1\right)F\left(2\operatorname{atan}(x)\middle|\frac{1}{2}\right)}{3\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((x**4+1)**(1/2),x)
```

```
[Out] x*sqrt(x**4 + 1)/3 + sqrt((x**4 + 1)/(x**2 + 1)**2)*(x**2 + 1)*el
liptic_f(2*atan(x), 1/2)/(3*sqrt(x**4 + 1))
```

Mathematica [C] time = 0.0329822, size = 48, normalized size = 0.83

$$\frac{x^5-2\sqrt[4]{-1}\sqrt{x^4+1}F\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)+x}{3\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[1 + x^4],x]
```

```
[Out] (x + x^5 - 2*(-1)^(1/4)*Sqrt[1 + x^4]*EllipticF[I*ArcSinh[(-1)^(1
/4)*x], -1])/(3*Sqrt[1 + x^4])
```

Maple [C] time = 0.006, size = 72, normalized size = 1.2

$$\frac{x}{3}\sqrt{x^4+1}+\frac{2\,\mathit{EllipticF}\left(x\left(1/2\sqrt{2}+i/2\sqrt{2}\right),i\right)}{\frac{3\sqrt{2}}{2}+\frac{3i}{2}\sqrt{2}}\sqrt{1-ix^2}\sqrt{1+ix^2}\frac{1}{\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((x^4+1)^(1/2),x)
```

```
[Out] 1/3*x*(x^4+1)^(1/2)+2/3/(1/2*2^(1/2)+1/2*I*2^(1/2))*(1-I*x^2)^(1/
2)*(1+I*x^2)^(1/2)/(x^4+1)^(1/2)*EllipticF(x*(1/2*2^(1/2)+1/2*I*2
^(1/2)),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{x^4 + 1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^4 + 1),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(x^4 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{x^4 + 1}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^4 + 1),x, algorithm="fricas")
```

```
[Out] integral(sqrt(x^4 + 1), x)
```

Sympy [A] time = 1.69543, size = 29, normalized size = 0.5

$$\frac{x\,\Gamma\left(\frac{1}{4}\right)\,{}_2F_1\left(\begin{matrix}-\frac{1}{2},\frac{1}{4}\\ \frac{5}{4}\end{matrix}\middle|\,x^4e^{i\pi}\right)}{4\,\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x**4+1)**(1/2),x)
```

```
[Out] x*gamma(1/4)*hyper((-1/2, 1/4), (5/4,), x**4*exp_polar(I*pi))/(4*
gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{x^4 + 1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^4 + 1),x, algorithm="giac")
```

```
[Out] integrate(sqrt(x^4 + 1), x)
```

3.808 $\int \sqrt{1-x^4}\,dx$

Optimal. Leaf size=25

$$\frac{1}{3}\sqrt{1-x^4}x+\frac{2}{3}F\left(\sin^{-1}(x)\middle|-1\right)$$

```
[Out] (x*Sqrt[1 - x^4])/3 + (2*EllipticF[ArcSin[x], -1])/3
```

Rubi [A] time = 0.0113578, antiderivative size = 25, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{1}{3}\sqrt{1-x^4}x+\frac{2}{3}F\left(\sin^{-1}(x)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[1 - x^4],x]

[Out] (x*Sqrt[1 - x^4])/3 + (2*EllipticF[ArcSin[x], -1])/3
```

Rubi in Sympy [A] time = 1.18436, size = 20, normalized size = 0.8

$$\frac{x\sqrt{-x^4+1}}{3}+\frac{2F\left(\operatorname{asin}(x)\middle|-1\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((-x**4+1)**(1/2),x)

[Out] x*sqrt(-x**4 + 1)/3 + 2*elliptic_f(asin(x), -1)/3
```

Mathematica [A] time = 0.0306921, size = 39, normalized size = 1.56

$$\frac{-x^5+2\sqrt{1-x^4}F\left(\sin^{-1}(x)\middle|-1\right)+x}{3\sqrt{1-x^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[1 - x^4],x]

[Out] (x - x^5 + 2*Sqrt[1 - x^4]*EllipticF[ArcSin[x], -1])/(3*Sqrt[1 -
x^4])
```

Maple [B] time = 0.008, size = 45, normalized size = 1.8

$$\frac{x}{3}\sqrt{-x^4+1}+\frac{2\,EllipticF(x,i)}{3}\sqrt{-x^2+1}\sqrt{x^2+1}\frac{1}{\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((-x^4+1)^(1/2),x)
```

```
[Out] 1/3*x*(-x^4+1)^(1/2)+2/3*(-x^2+1)^(1/2)*(x^2+1)^(1/2)/(-x^4+1)^(1
/2)*EllipticF(x,I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{-x^4+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(-x^4 + 1),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(-x^4 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{-x^4+1},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(-x^4 + 1),x, algorithm="fricas")
```

```
[Out] integral(sqrt(-x^4 + 1), x)
```

Sympy [A] time = 1.76051, size = 31, normalized size = 1.24

$$\frac{x\,\Gamma\left(\frac{1}{4}\right)\,{}_2F_1\left(\begin{matrix}-\frac{1}{2},\frac{1}{4}\\\frac{5}{4}\end{matrix}\middle|x^4e^{2i\pi}\right)}{4\,\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-x**4+1)**(1/2),x)
```

```
[Out] x*gamma(1/4)*hyper((-1/2, 1/4), (5/4,), x**4*exp_polar(2*I*pi))/(
4*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{-x^4+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(-x^4 + 1),x, algorithm="giac")
```

```
[Out] integrate(sqrt(-x^4 + 1), x)
```

3.809 $\int \frac{x^{11}}{\sqrt{a+bx^4}}\,dx$

Optimal. Leaf size=59

$$\frac{a^2\sqrt{a+bx^4}}{2b^3}+\frac{\left(a+bx^4\right)^{5/2}}{10b^3}-\frac{a\left(a+bx^4\right)^{3/2}}{3b^3}$$

```
[Out] (a^2*Sqrt[a + b*x^4])/(2*b^3) - (a*(a + b*x^4)^(3/2))/(3*b^3) + (
a + b*x^4)^(5/2)/(10*b^3)
```

Rubi [A] time = 0.0889194, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^2\sqrt{a+bx^4}}{2b^3}+\frac{\left(a+bx^4\right)^{5/2}}{10b^3}-\frac{a\left(a+bx^4\right)^{3/2}}{3b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11/Sqrt[a + b*x^4],x]
```

```
[Out] (a^2*Sqrt[a + b*x^4])/(2*b^3) - (a*(a + b*x^4)^(3/2))/(3*b^3) + (
a + b*x^4)^(5/2)/(10*b^3)
```

Rubi in Sympy [A] time = 10.6649, size = 49, normalized size = 0.83

$$\frac{a^2\sqrt{a+bx^4}}{2b^3}-\frac{a\left(a+bx^4\right)^{\frac{3}{2}}}{3b^3}+\frac{\left(a+bx^4\right)^{\frac{5}{2}}}{10b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11/(b*x**4+a)**(1/2),x)
```

```
[Out] a**2*sqrt(a + b*x**4)/(2*b**3) - a*(a + b*x**4)**(3/2)/(3*b**3) +
 (a + b*x**4)**(5/2)/(10*b**3)
```

Mathematica [A] time = 0.0288769, size = 39, normalized size = 0.66

$$\frac{\sqrt{a+bx^4}\left(8a^2-4abx^4+3b^2x^8\right)}{30b^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11/Sqrt[a + b*x^4],x]
```

```
[Out] (Sqrt[a + b*x^4]*(8*a^2 - 4*a*b*x^4 + 3*b^2*x^8))/(30*b^3)
```

Maple [A] time = 0.009, size = 36, normalized size = 0.6

$$\frac{3\,b^2x^8-4\,abx^4+8\,a^2}{30\,b^3}\sqrt{bx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11/(b*x^4+a)^(1/2),x)
```

```
[Out] 1/30*(b*x^4+a)^(1/2)*(3*b^2*x^8-4*a*b*x^4+8*a^2)/b^3
```

Maxima [A] time = 1.4227, size = 63, normalized size = 1.07

$$\frac{(bx^4+a)^{\frac{5}{2}}}{10\,b^3} - \frac{(bx^4+a)^{\frac{3}{2}}a}{3\,b^3} + \frac{\sqrt{bx^4+a}a^2}{2\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/sqrt(b*x^4 + a),x, algorithm="maxima")
```

```
[Out] 1/10*(b*x^4 + a)^(5/2)/b^3 - 1/3*(b*x^4 + a)^(3/2)*a/b^3 + 1/2*sq
rt(b*x^4 + a)*a^2/b^3
```

Fricas [A] time = 0.247733, size = 47, normalized size = 0.8

$$\frac{\left(3\,b^2x^8 - 4\,abx^4 + 8\,a^2\right)\sqrt{bx^4+a}}{30\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/sqrt(b*x^4 + a),x, algorithm="fricas")
```

```
[Out] 1/30*(3*b^2*x^8 - 4*a*b*x^4 + 8*a^2)*sqrt(b*x^4 + a)/b^3
```

Sympy [A] time = 8.9373, size = 68, normalized size = 1.15

$$\begin{cases} \frac{4a^2\sqrt{a+bx^4}}{15b^3} - \frac{2ax^4\sqrt{a+bx^4}}{15b^2} + \frac{x^8\sqrt{a+bx^4}}{10b} & \text{for}\ b \neq 0 \\ \frac{x^{12}}{12\sqrt{a}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11/(b*x**4+a)**(1/2),x)
```

```
[Out] Piecewise((4*a**2*sqrt(a + b*x**4)/(15*b**3) - 2*a*x**4*sqrt(a +
b*x**4)/(15*b**2) + x**8*sqrt(a + b*x**4)/(10*b), Ne(b, 0)), (x**
12/(12*sqrt(a)), True))
```

GIAC/XCAS [A] time = 0.215425, size = 58, normalized size = 0.98

$$\frac{3\left(bx^4+a\right)^{\frac{5}{2}} - 10\left(bx^4+a\right)^{\frac{3}{2}}a + 15\sqrt{bx^4+a}a^2}{30\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/sqrt(b*x^4 + a),x, algorithm="giac")
```

```
[Out] 1/30*(3*(b*x^4 + a)^(5/2) - 10*(b*x^4 + a)^(3/2)*a + 15*sqrt(b*x^
4 + a)*a^2)/b^3
```

3.810 $\int \frac{x^7}{\sqrt{a+bx^4}}\,dx$

Optimal. Leaf size=38

$$\frac{(a+bx^4)^{3/2}}{6b^2}-\frac{a\sqrt{a+bx^4}}{2b^2}$$

```
[Out] -(a*Sqrt[a + b*x^4])/(2*b^2) + (a + b*x^4)^(3/2)/(6*b^2)
```

Rubi [A] time = 0.0629535, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{(a+bx^4)^{3/2}}{6b^2}-\frac{a\sqrt{a+bx^4}}{2b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7/Sqrt[a + b*x^4],x]

[Out] -(a*Sqrt[a + b*x^4])/(2*b^2) + (a + b*x^4)^(3/2)/(6*b^2)
```

Rubi in Sympy [A] time = 7.13061, size = 31, normalized size = 0.82

$$-\frac{a\sqrt{a+bx^4}}{2b^2}+\frac{(a+bx^4)^{\frac{3}{2}}}{6b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7/(b*x**4+a)**(1/2),x)

[Out] -a*sqrt(a + b*x**4)/(2*b**2) + (a + b*x**4)**(3/2)/(6*b**2)
```

Mathematica [A] time = 0.0221623, size = 27, normalized size = 0.71

$$\frac{(bx^4-2a)\sqrt{a+bx^4}}{6b^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^7/Sqrt[a + b*x^4],x]

[Out] ((-2*a + b*x^4)*Sqrt[a + b*x^4])/(6*b^2)
```

Maple [A] time = 0.007, size = 25, normalized size = 0.7

$$-\frac{-bx^4+2\,a}{6\,b^2}\sqrt{bx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7/(b*x^4+a)^(1/2),x)
```

```
[Out] -1/6*(b*x^4+a)^(1/2)*(-b*x^4+2*a)/b^2
```

Maxima [A] time = 1.43814, size = 41, normalized size = 1.08

$$\frac{\left(bx^4+a\right)^{\frac{3}{2}}}{6\,b^2}-\frac{\sqrt{bx^4+a}a}{2\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(b*x^4 + a),x, algorithm="maxima")
```

```
[Out] 1/6*(b*x^4 + a)^(3/2)/b^2 - 1/2*sqrt(b*x^4 + a)*a/b^2
```

Fricas [A] time = 0.235908, size = 31, normalized size = 0.82

$$\frac{\sqrt{bx^4+a}\left(bx^4-2\,a\right)}{6\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(b*x^4 + a),x, algorithm="fricas")
```

```
[Out] 1/6*sqrt(b*x^4 + a)*(b*x^4 - 2*a)/b^2
```

Sympy [A] time = 3.58189, size = 42, normalized size = 1.11

$$\begin{cases} -\frac{a\sqrt{a+bx^4}}{3b^2}+\frac{x^4\sqrt{a+bx^4}}{6b} & \text{for}\: b \neq 0 \\ \frac{x^8}{8\sqrt{a}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(b*x**4+a)**(1/2),x)
```

```
[Out] Piecewise((-a*sqrt(a + b*x**4)/(3*b**2) + x**4*sqrt(a + b*x**4)/(
6*b), Ne(b, 0)), (x**8/(8*sqrt(a)), True))
```

GIAC/XCAS [A] time = 0.214511, size = 36, normalized size = 0.95

$$\frac{\left(bx^4+a\right)^{\frac{3}{2}}-3\,\sqrt{bx^4+a}a}{6\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(b*x^4 + a),x, algorithm="giac")
```

```
[Out] 1/6*((b*x^4 + a)^(3/2) - 3*sqrt(b*x^4 + a)*a)/b^2
```

3.811 $\int \frac{x^3}{\sqrt{a+bx^4}}\,dx$

Optimal. Leaf size=18

$$\frac{\sqrt{a+bx^4}}{2b}$$

[Out] Sqrt[a + b*x^4]/(2*b)

Rubi [A] time = 0.0107421, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$\frac{\sqrt{a+bx^4}}{2b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/Sqrt[a + b*x^4],x]

[Out] Sqrt[a + b*x^4]/(2*b)
```

Rubi in Sympy [A] time = 2.12308, size = 12, normalized size = 0.67

$$\frac{\sqrt{a+bx^4}}{2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(b*x**4+a)**(1/2),x)

[Out] sqrt(a + b*x**4)/(2*b)
```

Mathematica [A] time = 0.00628767, size = 18, normalized size = 1.

$$\frac{\sqrt{a+bx^4}}{2b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/Sqrt[a + b*x^4],x]

[Out] Sqrt[a + b*x^4]/(2*b)
```

Maple [A] time = 0.008, size = 15, normalized size = 0.8

$$\frac{1}{2\,b}\sqrt{bx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(b*x^4+a)^(1/2),x)

[Out] 1/2*(b*x^4+a)^(1/2)/b
```

Maxima [A] time = 1.43403, size = 19, normalized size = 1.06

$$\frac{\sqrt{bx^4+a}}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(b*x^4 + a),x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(b*x^4 + a)/b
```

Fricas [A] time = 0.266061, size = 19, normalized size = 1.06

$$\frac{\sqrt{bx^4+a}}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(b*x^4 + a),x, algorithm="fricas")
```

```
[Out] 1/2*sqrt(b*x^4 + a)/b
```

Sympy [A] time = 1.66771, size = 22, normalized size = 1.22

$$\begin{cases} \frac{\sqrt{a+bx^4}}{2b} & \text{for } b \neq 0 \\ \frac{x^4}{4\sqrt{a}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(b*x**4+a)**(1/2),x)
```

```
[Out] Piecewise((sqrt(a + b*x**4)/(2*b), Ne(b, 0)), (x**4/(4*sqrt(a)),
True))
```

GIAC/XCAS [A] time = 0.213307, size = 19, normalized size = 1.06

$$\frac{\sqrt{bx^4+a}}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(b*x^4 + a),x, algorithm="giac")
```

```
[Out] 1/2*sqrt(b*x^4 + a)/b
```

3.812 $\int \frac{1}{x\sqrt{a+bx^4}}\,dx$

Optimal. Leaf size=27

$$-\frac{\tanh^{-1}\left(\frac{\sqrt{a+bx^4}}{\sqrt{a}}\right)}{2\sqrt{a}}$$

```
[Out] -ArcTanh[Sqrt[a + b*x^4]/Sqrt[a]]/(2*Sqrt[a])
```

Rubi [A] time = 0.0480342, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{\tanh^{-1}\left(\frac{\sqrt{a+bx^4}}{\sqrt{a}}\right)}{2\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*Sqrt[a + b*x^4]),x]

[Out] -ArcTanh[Sqrt[a + b*x^4]/Sqrt[a]]/(2*Sqrt[a])
```

Rubi in Sympy [A] time = 5.19078, size = 24, normalized size = 0.89

$$-\frac{\operatorname{atanh}\left(\frac{\sqrt{a+bx^4}}{\sqrt{a}}\right)}{2\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(b*x**4+a)**(1/2),x)

[Out] -atanh(sqrt(a + b*x**4)/sqrt(a))/(2*sqrt(a))
```

Mathematica [A] time = 0.0642398, size = 27, normalized size = 1.

$$-\frac{\tanh^{-1}\left(\frac{\sqrt{a+bx^4}}{\sqrt{a}}\right)}{2\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*Sqrt[a + b*x^4]),x]

[Out] -ArcTanh[Sqrt[a + b*x^4]/Sqrt[a]]/(2*Sqrt[a])
```

Maple [A] time = 0.03, size = 29, normalized size = 1.1

$$-\frac{1}{2}\ln\left(\frac{1}{x^2}\left(2\,a+2\,\sqrt{a}\sqrt{bx^4+a}\right)\right)\frac{1}{\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(b*x^4+a)^(1/2),x)
```

```
[Out] -1/2/a^(1/2)*ln((2*a+2*a^(1/2)*(b*x^4+a)^(1/2))/x^2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^4 + a)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.276053, size = 1, normalized size = 0.04

$$\left[\frac{\log\left(\frac{(bx^4+2a)\sqrt{a}-2\sqrt{bx^4+a}a}{x^4}\right)}{4\sqrt{a}}, \frac{\arctan\left(\frac{a}{\sqrt{bx^4+a}\sqrt{-a}}\right)}{2\sqrt{-a}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^4 + a)*x),x, algorithm="fricas")
```

```
[Out] [1/4*log(((b*x^4 + 2*a)*sqrt(a) - 2*sqrt(b*x^4 + a)*a)/x^4)/sqrt(
a), 1/2*arctan(a/(sqrt(b*x^4 + a)*sqrt(-a)))/sqrt(-a)]
```

Sympy [A] time = 3.6979, size = 22, normalized size = 0.81

$$-\frac{\operatorname{asinh}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(b*x**4+a)**(1/2),x)
```

```
[Out] -asinh(sqrt(a)/(sqrt(b)*x**2))/(2*sqrt(a))
```

GIAC/XCAS [A] time = 0.214674, size = 31, normalized size = 1.15

$$\frac{\arctan\left(\frac{\sqrt{bx^4+a}}{\sqrt{-a}}\right)}{2\sqrt{-a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^4 + a)*x),x, algorithm="giac")
```

```
[Out] 1/2*arctan(sqrt(b*x^4 + a)/sqrt(-a))/sqrt(-a)
```

3.813 $\int \frac{1}{x^5\sqrt{a+bx^4}}\,dx$

Optimal. Leaf size=50

$$\frac{b\tanh^{-1}\left(\frac{\sqrt{a+bx^4}}{\sqrt{a}}\right)}{4a^{3/2}}-\frac{\sqrt{a+bx^4}}{4ax^4}$$

```
[Out] -Sqrt[a + b*x^4]/(4*a*x^4) + (b*ArcTanh[Sqrt[a + b*x^4]/Sqrt[a]])
/(4*a^(3/2))
```

Rubi [A] time = 0.0722205, antiderivative size = 50, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{b\tanh^{-1}\left(\frac{\sqrt{a+bx^4}}{\sqrt{a}}\right)}{4a^{3/2}}-\frac{\sqrt{a+bx^4}}{4ax^4}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^5*Sqrt[a + b*x^4]),x]
```

```
[Out] -Sqrt[a + b*x^4]/(4*a*x^4) + (b*ArcTanh[Sqrt[a + b*x^4]/Sqrt[a]])
/(4*a^(3/2))
```

Rubi in Sympy [A] time = 7.03555, size = 41, normalized size = 0.82

$$-\frac{\sqrt{a+bx^4}}{4ax^4}+\frac{b\,\mathrm{atanh}\left(\frac{\sqrt{a+bx^4}}{\sqrt{a}}\right)}{4a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**5/(b*x**4+a)**(1/2),x)
```

```
[Out] -sqrt(a + b*x**4)/(4*a*x**4) + b*atanh(sqrt(a + b*x**4)/sqrt(a))/
(4*a**(3/2))
```

Mathematica [A] time = 0.0753576, size = 50, normalized size = 1.

$$\frac{b\tanh^{-1}\left(\frac{\sqrt{a+bx^4}}{\sqrt{a}}\right)}{4a^{3/2}}-\frac{\sqrt{a+bx^4}}{4ax^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^5*Sqrt[a + b*x^4]),x]
```

```
[Out] -Sqrt[a + b*x^4]/(4*a*x^4) + (b*ArcTanh[Sqrt[a + b*x^4]/Sqrt[a]])
/(4*a^(3/2))
```

Maple [A] time = 0.014, size = 48, normalized size = 1.

$$-\frac{1}{4\,a{x}^{4}}\sqrt{b{x}^{4}+a}+\frac{b}{4}\ln\left(\frac{1}{{x}^{2}}\left(2\,a+2\,\sqrt{a}\sqrt{b{x}^{4}+a}\right)\right){a}^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^5/(b*x^4+a)^(1/2),x)
```

```
[Out] -1/4*(b*x^4+a)^(1/2)/a/x^4+1/4*b/a^(3/2)*ln((2*a+2*a^(1/2)*(b*x^4
+a)^(1/2))/x^2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^4 + a)*x^5),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.251624, size = 1, normalized size = 0.02

$$\left[\frac{bx^4\log\left(\frac{(bx^4+2\,a)\sqrt{a}+2\,\sqrt{bx^4+a}a}{x^4}\right)-2\,\sqrt{bx^4+a}\sqrt{a}}{8\,a^{\frac{3}{2}}x^4},-\frac{bx^4\arctan\left(\frac{a}{\sqrt{bx^4+a}\sqrt{-a}}\right)+\sqrt{bx^4+a}\sqrt{-a}}{4\,\sqrt{-a}ax^4}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^4 + a)*x^5),x, algorithm="fricas")
```

```
[Out] [1/8*(b*x^4*log(((b*x^4 + 2*a)*sqrt(a) + 2*sqrt(b*x^4 + a)*a)/x^4
) - 2*sqrt(b*x^4 + a)*sqrt(a))/(a^(3/2)*x^4), -1/4*(b*x^4*arctan(
a/(sqrt(b*x^4 + a)*sqrt(-a))) + sqrt(b*x^4 + a)*sqrt(-a))/(sqrt(-
a)*a*x^4)]
```

Sympy [A] time = 8.10246, size = 46, normalized size = 0.92

$$-\frac{\sqrt{b}\sqrt{\frac{a}{bx^4}+1}}{4ax^2}+\frac{b\operatorname{asinh}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{4a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**5/(b*x**4+a)**(1/2),x)
```

```
[Out] -sqrt(b)*sqrt(a/(b*x**4) + 1)/(4*a*x**2) + b*asinh(sqrt(a)/(sqrt(
b)*x**2))/(4*a**(3/2))
```

GIAC/XCAS [A] time = 0.21636, size = 65, normalized size = 1.3

$$-\frac{1}{4}\,b\left(\frac{\arctan\left(\frac{\sqrt{bx^4+a}}{\sqrt{-a}}\right)}{\sqrt{-a}a}+\frac{\sqrt{bx^4+a}}{abx^4}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^4 + a)*x^5),x, algorithm="giac")
```

```
[Out] -1/4*b*(arctan(sqrt(b*x^4 + a)/sqrt(-a))/(sqrt(-a)*a) + sqrt(b*x^
4 + a)/(a*b*x^4))
```

3.814 $\int \frac{x^5}{\sqrt{a+bx^4}}\,dx$

Optimal. Leaf size=53

$$\frac{x^2\sqrt{a+bx^4}}{4b}-\frac{a\tanh^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a+bx^4}}\right)}{4b^{3/2}}$$

```
[Out] (x^2*Sqrt[a + b*x^4])/(4*b) - (a*ArcTanh[(Sqrt[b]*x^2)/Sqrt[a + b
*x^4]])/(4*b^(3/2))
```

Rubi [A] time = 0.0764817, antiderivative size = 53, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{x^2\sqrt{a+bx^4}}{4b}-\frac{a\tanh^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a+bx^4}}\right)}{4b^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^5/Sqrt[a + b*x^4],x]
```

```
[Out] (x^2*Sqrt[a + b*x^4])/(4*b) - (a*ArcTanh[(Sqrt[b]*x^2)/Sqrt[a + b
*x^4]])/(4*b^(3/2))
```

Rubi in Sympy [A] time = 8.04486, size = 44, normalized size = 0.83

$$-\frac{a\,\text{atanh}\left(\frac{\sqrt{b}x^2}{\sqrt{a+bx^4}}\right)}{4b^{\frac{3}{2}}}+\frac{x^2\sqrt{a+bx^4}}{4b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**5/(b*x**4+a)**(1/2),x)
```

```
[Out] -a*atanh(sqrt(b)*x**2/sqrt(a + b*x**4))/(4*b**(3/2)) + x**2*sqrt(
a + b*x**4)/(4*b)
```

Mathematica [A] time = 0.0428265, size = 56, normalized size = 1.06

$$\frac{x^2\sqrt{a+bx^4}}{4b}-\frac{a\log\left(\sqrt{b}\sqrt{a+bx^4}+bx^2\right)}{4b^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5/Sqrt[a + b*x^4],x]
```

```
[Out] (x^2*Sqrt[a + b*x^4])/(4*b) - (a*Log[b*x^2 + Sqrt[b]*Sqrt[a + b*x
^4]])/(4*b^(3/2))
```

Maple [A] time = 0.016, size = 43, normalized size = 0.8

$$\frac{x^2}{4\,b}\sqrt{bx^4+a}-\frac{a}{4}\ln\left(\sqrt{b}x^2+\sqrt{bx^4+a}\right)b^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(b*x^4+a)^(1/2),x)
```

```
[Out] 1/4*x^2*(b*x^4+a)^(1/2)/b-1/4*a/b^(3/2)*ln(b^(1/2)*x^2+(b*x^4+a)^
(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(b*x^4 + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.262007, size = 1, normalized size = 0.02

$$\left[\frac{2\,\sqrt{bx^4+a}\sqrt{b}x^2+a\log\left(2\,\sqrt{bx^4+a}bx^2-\left(2\,bx^4+a\right)\sqrt{b}\right)}{8\,b^{\frac{3}{2}}},\frac{\sqrt{bx^4+a}\sqrt{-b}x^2-a\arctan\left(\frac{\sqrt{-b}x^2}{\sqrt{bx^4+a}}\right)}{4\,\sqrt{-b}b}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(b*x^4 + a),x, algorithm="fricas")
```

```
[Out] [1/8*(2*sqrt(b*x^4 + a)*sqrt(b)*x^2 + a*log(2*sqrt(b*x^4 + a)*b*x
^2 - (2*b*x^4 + a)*sqrt(b)))/b^(3/2), 1/4*(sqrt(b*x^4 + a)*sqrt(-
b)*x^2 - a*arctan(sqrt(-b)*x^2/sqrt(b*x^4 + a)))/(sqrt(-b)*b)]
```

Sympy [A] time = 7.68053, size = 46, normalized size = 0.87

$$\frac{\sqrt{a}x^2\sqrt{1+\frac{bx^4}{a}}}{4b}-\frac{a\operatorname{asinh}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{4b^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(b*x**4+a)**(1/2),x)
```

```
[Out] sqrt(a)*x**2*sqrt(1 + b*x**4/a)/(4*b) - a*asinh(sqrt(b)*x**2/sqrt
(a))/(4*b**(3/2))
```

GIAC/XCAS [A] time = 0.231578, size = 59, normalized size = 1.11

$$\frac{\sqrt{bx^4+a}x^2}{4\,b}+\frac{a\ln\left(\left|-\sqrt{b}x^2+\sqrt{bx^4+a}\right|\right)}{4\,b^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(b*x^4 + a),x, algorithm="giac")
```

```
[Out] 1/4*sqrt(b*x^4 + a)*x^2/b + 1/4*a*ln(abs(-sqrt(b)*x^2 + sqrt(b*x^
4 + a)))/b^(3/2)
```

3.815 $\int \frac{x}{\sqrt{a+bx^4}}\,dx$

Optimal. Leaf size=30

$$\frac{\tanh^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a+bx^4}}\right)}{2\sqrt{b}}$$

```
[Out] ArcTanh[(Sqrt[b]*x^2)/Sqrt[a + b*x^4]]/(2*Sqrt[b])
```

Rubi [A] time = 0.0375919, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{\tanh^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a+bx^4}}\right)}{2\sqrt{b}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/Sqrt[a + b*x^4],x]

[Out] ArcTanh[(Sqrt[b]*x^2)/Sqrt[a + b*x^4]]/(2*Sqrt[b])
```

Rubi in Sympy [A] time = 4.28193, size = 26, normalized size = 0.87

$$\frac{\operatorname{atanh}\left(\frac{\sqrt{b}x^2}{\sqrt{a+bx^4}}\right)}{2\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(b*x**4+a)**(1/2),x)

[Out] atanh(sqrt(b)*x**2/sqrt(a + b*x**4))/(2*sqrt(b))
```

Mathematica [A] time = 0.0153819, size = 30, normalized size = 1.

$$\frac{\tanh^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a+bx^4}}\right)}{2\sqrt{b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/Sqrt[a + b*x^4],x]

[Out] ArcTanh[(Sqrt[b]*x^2)/Sqrt[a + b*x^4]]/(2*Sqrt[b])
```

Maple [A] time = 0.008, size = 24, normalized size = 0.8

$$\frac{1}{2}\ln\left(\sqrt{b}x^2+\sqrt{bx^4+a}\right)\frac{1}{\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(b*x^4+a)^(1/2),x)
```

```
[Out] 1/2*ln(b^(1/2)*x^2+(b*x^4+a)^(1/2))/b^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(b*x^4 + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.246733, size = 1, normalized size = 0.03

$$\left[\frac{\log\left(-2\sqrt{bx^4+a}bx^2-\left(2bx^4+a\right)\sqrt{b}\right)}{4\sqrt{b}}, \frac{\arctan\left(\frac{\sqrt{-b}x^2}{\sqrt{bx^4+a}}\right)}{2\sqrt{-b}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(b*x^4 + a),x, algorithm="fricas")
```

```
[Out] [1/4*log(-2*sqrt(b*x^4 + a)*b*x^2 - (2*b*x^4 + a)*sqrt(b))/sqrt(b
), 1/2*arctan(sqrt(-b)*x^2/sqrt(b*x^4 + a))/sqrt(-b)]
```

Sympy [A] time = 3.55987, size = 20, normalized size = 0.67

$$\frac{\operatorname{asinh}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x**4+a)**(1/2),x)
```

```
[Out] asinh(sqrt(b)*x**2/sqrt(a))/(2*sqrt(b))
```

GIAC/XCAS [A] time = 0.223648, size = 34, normalized size = 1.13

$$-\frac{\ln\left(\left|-\sqrt{b}x^2+\sqrt{bx^4+a}\right|\right)}{2\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(b*x^4 + a),x, algorithm="giac")
```

```
[Out] -1/2*ln(abs(-sqrt(b)*x^2 + sqrt(b*x^4 + a)))/sqrt(b)
```

3.816 $\int \frac{1}{x^3\sqrt{a+bx^4}}\,dx$

Optimal. Leaf size=21

$$-\frac{\sqrt{a+bx^4}}{2ax^2}$$

```
[Out] -Sqrt[a + b*x^4]/(2*a*x^2)
```

Rubi [A] time = 0.0199967, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{\sqrt{a+bx^4}}{2ax^2}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^3*Sqrt[a + b*x^4]),x]

[Out] -Sqrt[a + b*x^4]/(2*a*x^2)
```

Rubi in Sympy [A] time = 2.78694, size = 17, normalized size = 0.81

$$-\frac{\sqrt{a+bx^4}}{2ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**3/(b*x**4+a)**(1/2),x)

[Out] -sqrt(a + b*x**4)/(2*a*x**2)
```

Mathematica [A] time = 0.0146616, size = 21, normalized size = 1.

$$-\frac{\sqrt{a+bx^4}}{2ax^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^3*Sqrt[a + b*x^4]),x]

[Out] -Sqrt[a + b*x^4]/(2*a*x^2)
```

Maple [A] time = 0.006, size = 18, normalized size = 0.9

$$-\frac{1}{2\,ax^2}\sqrt{bx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^3/(b*x^4+a)^(1/2),x)

[Out] -1/2*(b*x^4+a)^(1/2)/a/x^2
```

Maxima [A] time = 1.43725, size = 23, normalized size = 1.1

$$-\frac{\sqrt{bx^4 + a}}{2\,ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^4 + a)*x^3),x, algorithm="maxima")
```

```
[Out] -1/2*sqrt(b*x^4 + a)/(a*x^2)
```

Fricas [A] time = 0.23168, size = 23, normalized size = 1.1

$$-\frac{\sqrt{bx^4 + a}}{2\,ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^4 + a)*x^3),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(b*x^4 + a)/(a*x^2)
```

Sympy [A] time = 2.03931, size = 20, normalized size = 0.95

$$-\frac{\sqrt{b}\sqrt{\frac{a}{bx^4} + 1}}{2a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(b*x**4+a)**(1/2),x)
```

```
[Out] -sqrt(b)*sqrt(a/(b*x**4) + 1)/(2*a)
```

GIAC/XCAS [A] time = 0.223031, size = 19, normalized size = 0.9

$$-\frac{\sqrt{b + \frac{a}{x^4}}}{2\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^4 + a)*x^3),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(b + a/x^4)/a
```

3.817 $\int \frac{1}{x^7\sqrt{a+bx^4}}\,dx$

Optimal. Leaf size=44

$$\frac{b\sqrt{a+bx^4}}{3a^2x^2}-\frac{\sqrt{a+bx^4}}{6ax^6}$$

```
[Out] -Sqrt[a + b*x^4]/(6*a*x^6) + (b*Sqrt[a + b*x^4])/(3*a^2*x^2)
```

Rubi [A] time = 0.0406231, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{b\sqrt{a+bx^4}}{3a^2x^2}-\frac{\sqrt{a+bx^4}}{6ax^6}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^7*Sqrt[a + b*x^4]),x]

[Out] -Sqrt[a + b*x^4]/(6*a*x^6) + (b*Sqrt[a + b*x^4])/(3*a^2*x^2)
```

Rubi in Sympy [A] time = 4.34652, size = 36, normalized size = 0.82

$$-\frac{\sqrt{a+bx^4}}{6ax^6}+\frac{b\sqrt{a+bx^4}}{3a^2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**7/(b*x**4+a)**(1/2),x)

[Out] -sqrt(a + b*x**4)/(6*a*x**6) + b*sqrt(a + b*x**4)/(3*a**2*x**2)
```

Mathematica [A] time = 0.023233, size = 29, normalized size = 0.66

$$-\frac{\left(a-2bx^4\right)\sqrt{a+bx^4}}{6a^2x^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^7*Sqrt[a + b*x^4]),x]

[Out] -((a - 2*b*x^4)*Sqrt[a + b*x^4])/(6*a^2*x^6)
```

Maple [A] time = 0.007, size = 26, normalized size = 0.6

$$-\frac{-2\,bx^4+a}{6\,a^2x^6}\sqrt{bx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^7/(b*x^4+a)^(1/2),x)

[Out] -1/6*(b*x^4+a)^(1/2)*(-2*b*x^4+a)/a^2/x^6
```

Maxima [A] time = 1.43673, size = 47, normalized size = 1.07

$$\frac{\frac{3\sqrt{bx^4+a}b}{x^2} - \frac{(bx^4+a)^{\frac{3}{2}}}{x^6}}{6a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^4 + a)*x^7),x, algorithm="maxima")
```

```
[Out] 1/6*(3*sqrt(b*x^4 + a)*b/x^2 - (b*x^4 + a)^(3/2)/x^6)/a^2
```

Fricas [A] time = 0.233565, size = 36, normalized size = 0.82

$$\frac{(2bx^4 - a)\sqrt{bx^4 + a}}{6a^2x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^4 + a)*x^7),x, algorithm="fricas")
```

```
[Out] 1/6*(2*b*x^4 - a)*sqrt(b*x^4 + a)/(a^2*x^6)
```

Sympy [A] time = 3.59953, size = 44, normalized size = 1.

$$-\frac{\sqrt{b}\sqrt{\frac{a}{bx^4}+1}}{6ax^4} + \frac{b^{\frac{3}{2}}\sqrt{\frac{a}{bx^4}+1}}{3a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**7/(b*x**4+a)**(1/2),x)
```

```
[Out] -sqrt(b)*sqrt(a/(b*x**4) + 1)/(6*a*x**4) + b**(3/2)*sqrt(a/(b*x**
4) + 1)/(3*a**2)
```

GIAC/XCAS [A] time = 0.220643, size = 36, normalized size = 0.82

$$-\frac{\left(b + \frac{a}{x^4}\right)^{\frac{3}{2}} - 3\sqrt{b + \frac{a}{x^4}}b}{6a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^4 + a)*x^7),x, algorithm="giac")
```

```
[Out] -1/6*((b + a/x^4)^(3/2) - 3*sqrt(b + a/x^4)*b)/a^2
```

3.818 $\int \frac{1}{x^{11}\sqrt{a+bx^4}}\,dx$

Optimal. Leaf size=68

$$-\frac{4b^2\sqrt{a+bx^4}}{15a^3x^2}+\frac{2b\sqrt{a+bx^4}}{15a^2x^6}-\frac{\sqrt{a+bx^4}}{10ax^{10}}$$

```
[Out] -Sqrt[a + b*x^4]/(10*a*x^10) + (2*b*Sqrt[a + b*x^4])/(15*a^2*x^6)
 - (4*b^2*Sqrt[a + b*x^4])/(15*a^3*x^2)
```

Rubi [A] time = 0.0658592, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{4b^2\sqrt{a+bx^4}}{15a^3x^2}+\frac{2b\sqrt{a+bx^4}}{15a^2x^6}-\frac{\sqrt{a+bx^4}}{10ax^{10}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^11*Sqrt[a + b*x^4]),x]
```

```
[Out] -Sqrt[a + b*x^4]/(10*a*x^10) + (2*b*Sqrt[a + b*x^4])/(15*a^2*x^6)
 - (4*b^2*Sqrt[a + b*x^4])/(15*a^3*x^2)
```

Rubi in Sympy [A] time = 6.8055, size = 61, normalized size = 0.9

$$-\frac{\sqrt{a+bx^4}}{10ax^{10}}+\frac{2b\sqrt{a+bx^4}}{15a^2x^6}-\frac{4b^2\sqrt{a+bx^4}}{15a^3x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**11/(b*x**4+a)**(1/2),x)
```

```
[Out] -sqrt(a + b*x**4)/(10*a*x**10) + 2*b*sqrt(a + b*x**4)/(15*a**2*x*
*6) - 4*b**2*sqrt(a + b*x**4)/(15*a**3*x**2)
```

Mathematica [A] time = 0.0340686, size = 42, normalized size = 0.62

$$-\frac{\sqrt{a+bx^4}\left(3a^2-4abx^4+8b^2x^8\right)}{30a^3x^{10}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^11*Sqrt[a + b*x^4]),x]
```

```
[Out] -(Sqrt[a + b*x^4]*(3*a^2 - 4*a*b*x^4 + 8*b^2*x^8))/(30*a^3*x^10)
```

Maple [A] time = 0.007, size = 39, normalized size = 0.6

$$-\frac{8\,b^2x^8-4\,abx^4+3\,a^2}{30\,x^{10}a^3}\sqrt{bx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^11/(b*x^4+a)^(1/2),x)
```

```
[Out] -1/30*(b*x^4+a)^(1/2)*(8*b^2*x^8-4*a*b*x^4+3*a^2)/x^10/a^3
```

Maxima [A] time = 1.43589, size = 70, normalized size = 1.03

$$-\frac{\frac{15\sqrt{bx^4+a}b^2}{x^2}-\frac{10\left(bx^4+a\right)^{\frac{3}{2}}b}{x^6}+\frac{3\left(bx^4+a\right)^{\frac{5}{2}}}{x^{10}}}{30\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(b*x^4 + a)*x^11),x, algorithm="maxima")
```

```
[Out] -1/30*(15*sqrt(b*x^4 + a)*b^2/x^2 - 10*(b*x^4 + a)^(3/2)*b/x^6 +
3*(b*x^4 + a)^(5/2)/x^10)/a^3
```

Fricas [A] time = 0.267401, size = 51, normalized size = 0.75

$$-\frac{\left(8\,b^2x^8-4\,abx^4+3\,a^2\right)\sqrt{bx^4+a}}{30\,a^3x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(b*x^4 + a)*x^11),x, algorithm="fricas")
```

```
[Out] -1/30*(8*b^2*x^8 - 4*a*b*x^4 + 3*a^2)*sqrt(b*x^4 + a)/(a^3*x^10)
```

Sympy [A] time = 8.00128, size = 298, normalized size = 4.38

$$-\frac{3a^4b^{\frac{9}{2}}\sqrt{\frac{a}{bx^4}+1}}{30a^5b^4x^8+60a^4b^5x^{12}+30a^3b^6x^{16}}-\frac{2a^3b^{\frac{11}{2}}x^4\sqrt{\frac{a}{bx^4}+1}}{30a^5b^4x^8+60a^4b^5x^{12}+30a^3b^6x^{16}}-\frac{3a^2b^{\frac{13}{2}}x^8\sqrt{\frac{a}{bx^4}+1}}{30a^5b^4x^8+60a^4b^5x^{12}+30a^3b^6x^{16}}-\frac{12ab^{\frac{15}{2}}x^{12}\sqrt{\frac{a}{bx^4}+1}}{30a^5b^4x^8+60a^4b^5x^{12}+30a^3b^6x^{16}}-\frac{8b^{\frac{17}{2}}x^{16}\sqrt{\frac{a}{bx^4}+1}}{30a^5b^4x^8+60a^4b^5x^{12}+30a^3b^6x^{16}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**11/(b*x**4+a)**(1/2),x)
```

```
[Out] -3*a**4*b**(9/2)*sqrt(a/(b*x**4) + 1)/(30*a**5*b**4*x**8 + 60*a**
4*b**5*x**12 + 30*a**3*b**6*x**16) - 2*a**3*b**(11/2)*x**4*sqrt(a
/(b*x**4) + 1)/(30*a**5*b**4*x**8 + 60*a**4*b**5*x**12 + 30*a**3*
b**6*x**16) - 3*a**2*b**(13/2)*x**8*sqrt(a/(b*x**4) + 1)/(30*a**5
*b**4*x**8 + 60*a**4*b**5*x**12 + 30*a**3*b**6*x**16) - 12*a*b**(
15/2)*x**12*sqrt(a/(b*x**4) + 1)/(30*a**5*b**4*x**8 + 60*a**4*b**
5*x**12 + 30*a**3*b**6*x**16) - 8*b**(17/2)*x**16*sqrt(a/(b*x**4)
 + 1)/(30*a**5*b**4*x**8 + 60*a**4*b**5*x**12 + 30*a**3*b**6*x**1
6)
```

GIAC/XCAS [A] time = 0.217594, size = 58, normalized size = 0.85

$$-\frac{3\left(b+\frac{a}{x^4}\right)^{\frac{5}{2}}-10\left(b+\frac{a}{x^4}\right)^{\frac{3}{2}}b+15\sqrt{b+\frac{a}{x^4}}b^2}{30\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^4 + a)*x^11),x, algorithm="giac")
```

```
[Out] -1/30*(3*(b + a/x^4)^(5/2) - 10*(b + a/x^4)^(3/2)*b + 15*sqrt(b +
 a/x^4)*b^2)/a^3
```

3.819 $\int \frac{x^8}{\sqrt{a+bx^4}}\,dx$

Optimal. Leaf size=130

$$\frac{5a^{7/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{42b^{9/4}\sqrt{a+bx^4}}-\frac{5ax\sqrt{a+bx^4}}{21b^2}+\frac{x^5\sqrt{a+bx^4}}{7b}$$

```
[Out] (-5*a*x*Sqrt[a + b*x^4])/(21*b^2) + (x^5*Sqrt[a + b*x^4])/(7*b) +
 (5*a^(7/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + S
qrt[b]*x^2)^2]*EllipticF[2*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(42
*b^(9/4)*Sqrt[a + b*x^4])
```

Rubi [A] time = 0.110391, antiderivative size = 130, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{5a^{7/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{42b^{9/4}\sqrt{a+bx^4}}-\frac{5ax\sqrt{a+bx^4}}{21b^2}+\frac{x^5\sqrt{a+bx^4}}{7b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8/Sqrt[a + b*x^4],x]
```

```
[Out] (-5*a*x*Sqrt[a + b*x^4])/(21*b^2) + (x^5*Sqrt[a + b*x^4])/(7*b) +
 (5*a^(7/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + S
qrt[b]*x^2)^2]*EllipticF[2*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(42
*b^(9/4)*Sqrt[a + b*x^4])
```

Rubi in Sympy [A] time = 11.0792, size = 117, normalized size = 0.9

$$\frac{5a^{\frac{7}{4}}\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)F\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{42b^{\frac{9}{4}}\sqrt{a+bx^4}}-\frac{5ax\sqrt{a+bx^4}}{21b^2}+\frac{x^5\sqrt{a+bx^4}}{7b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8/(b*x**4+a)**(1/2),x)
```

```
[Out] 5*a**(7/4)*sqrt((a + b*x**4)/(sqrt(a) + sqrt(b)*x**2)**2)*(sqrt(a
) + sqrt(b)*x**2)*elliptic_f(2*atan(b**(1/4)*x/a**(1/4)), 1/2)/(4
2*b**(9/4)*sqrt(a + b*x**4)) - 5*a*x*sqrt(a + b*x**4)/(21*b**2) +
 x**5*sqrt(a + b*x**4)/(7*b)
```

Mathematica [C] time = 0.280929, size = 106, normalized size = 0.82

$$\frac{-\frac{5ia^2\sqrt{\frac{bx^4}{a}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)}{\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}}-5a^2x-2abx^5+3b^2x^9}{21b^2\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8/Sqrt[a + b*x^4],x]
```

```
[Out] (-5*a^2*x - 2*a*b*x^5 + 3*b^2*x^9 - ((5*I)*a^2*Sqrt[1 + (b*x^4)/a
]*EllipticF[I*ArcSinh[Sqrt[(I*Sqrt[b])/Sqrt[a]]*x], -1])/Sqrt[(I*
Sqrt[b])/Sqrt[a]])/(21*b^2*Sqrt[a + b*x^4])
```

Maple [C] time = 0.051, size = 111, normalized size = 0.9

$$\frac{x^5}{7b}\sqrt{bx^4+a}-\frac{5\,ax}{21\,b^2}\sqrt{bx^4+a} + \frac{5\,a^2}{21\,b^2}\sqrt{1-ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\sqrt{1+ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\mathit{EllipticF}\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)\frac{1}{\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8/(b*x^4+a)^(1/2),x)
```

```
[Out] 1/7*x^5*(b*x^4+a)^(1/2)/b-5/21*a*x*(b*x^4+a)^(1/2)/b^2+5/21*a^2/b
^2/(I/a^(1/2)*b^(1/2))^(1/2)*(1-I/a^(1/2)*b^(1/2)*x^2)^(1/2)*(1+I
/a^(1/2)*b^(1/2)*x^2)^(1/2)/(b*x^4+a)^(1/2)*EllipticF(x*(I/a^(1/2
)*b^(1/2))^(1/2),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^8}{\sqrt{bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/sqrt(b*x^4 + a),x, algorithm="maxima")
```

```
[Out] integrate(x^8/sqrt(b*x^4 + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x^8}{\sqrt{bx^4+a}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/sqrt(b*x^4 + a),x, algorithm="fricas")
```

```
[Out] integral(x^8/sqrt(b*x^4 + a), x)
```

Sympy [A] time = 3.18558, size = 37, normalized size = 0.28

$$\frac{x^9\,\Gamma\left(\frac{9}{4}\right)\,{}_2F_1\left(\left.\begin{matrix}\frac{1}{2},\frac{9}{4}\\ \frac{13}{4}\end{matrix}\right|\frac{bx^4e^{i\pi}}{a}\right)}{4\sqrt{a}\,\Gamma\left(\frac{13}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8/(b*x**4+a)**(1/2),x)
```

```
[Out] x**9*gamma(9/4)*hyper((1/2, 9/4), (13/4,), b*x**4*exp_polar(I*pi)
/a)/(4*sqrt(a)*gamma(13/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^8}{\sqrt{bx^4 + a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/sqrt(b*x^4 + a),x, algorithm="giac")
```

```
[Out] integrate(x^8/sqrt(b*x^4 + a), x)
```

3.820 $\int \frac{x^4}{\sqrt{a+bx^4}} \, dx$

Optimal. Leaf size=108

$$\frac{x\sqrt{a+bx^4}}{3b}-\frac{a^{3/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{6b^{5/4}\sqrt{a+bx^4}}$$

```
[Out] (x*Sqrt[a + b*x^4])/(3*b) - (a^(3/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqrt
[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticF[2*ArcTan[(b^(1/
4)*x)/a^(1/4)], 1/2])/(6*b^(5/4)*Sqrt[a + b*x^4])
```

Rubi [A] time = 0.0681394, antiderivative size = 108, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{x\sqrt{a+bx^4}}{3b}-\frac{a^{3/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{6b^{5/4}\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/Sqrt[a + b*x^4],x]
```

```
[Out] (x*Sqrt[a + b*x^4])/(3*b) - (a^(3/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqrt
[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticF[2*ArcTan[(b^(1/
4)*x)/a^(1/4)], 1/2])/(6*b^(5/4)*Sqrt[a + b*x^4])
```

Rubi in Sympy [A] time = 7.60295, size = 94, normalized size = 0.87

$$-\frac{a^{\frac{3}{4}}\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)F\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{6b^{\frac{5}{4}}\sqrt{a+bx^4}}+\frac{x\sqrt{a+bx^4}}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(b*x**4+a)**(1/2),x)
```

```
[Out] -a**(3/4)*sqrt((a + b*x**4)/(sqrt(a) + sqrt(b)*x**2)**2)*(sqrt(a)
 + sqrt(b)*x**2)*elliptic_f(2*atan(b**(1/4)*x/a**(1/4)), 1/2)/(6*
b**(5/4)*sqrt(a + b*x**4)) + x*sqrt(a + b*x**4)/(3*b)
```

Mathematica [C] time = 0.217241, size = 92, normalized size = 0.85

$$\frac{x\left(a+bx^4\right)+\frac{ia\sqrt{\frac{bx^4}{a}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)}{\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}}}{3b\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/Sqrt[a + b*x^4],x]
```

```
[Out] (x*(a + b*x^4) + (I*a*Sqrt[1 + (b*x^4)/a]*EllipticF[I*ArcSinh[Sqr
t[(I*Sqrt[b])/Sqrt[a]]*x], -1])/Sqrt[(I*Sqrt[b])/Sqrt[a]])/(3*b*S
```

```
qrt[a + b*x^4])
```

Maple [C] time = 0.012, size = 91, normalized size = 0.8

$$\frac{x}{3b}\sqrt{bx^4+a}-\frac{a}{3b}\sqrt{1-ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\sqrt{1+ix^2\sqrt{b}\frac{1}{\sqrt{a}}}EllipticF\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)\frac{1}{\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(b*x^4+a)^(1/2),x)
```

```
[Out] 1/3*x*(b*x^4+a)^(1/2)/b-1/3*a/b/(I/a^(1/2)*b^(1/2))^(1/2)*(1-I/a^
(1/2)*b^(1/2)*x^2)^(1/2)*(1+I/a^(1/2)*b^(1/2)*x^2)^(1/2)/(b*x^4+a
)^(1/2)*EllipticF(x*(I/a^(1/2)*b^(1/2))^(1/2),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\sqrt{bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(b*x^4 + a),x, algorithm="maxima")
```

```
[Out] integrate(x^4/sqrt(b*x^4 + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^4}{\sqrt{bx^4+a}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(b*x^4 + a),x, algorithm="fricas")
```

```
[Out] integral(x^4/sqrt(b*x^4 + a), x)
```

Sympy [A] time = 2.26844, size = 37, normalized size = 0.34

$$\frac{x^5\,\Gamma\left(\frac{5}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{5}{4}\\\frac{9}{4}\end{matrix}\middle|\frac{bx^4e^{i\pi}}{a}\right)}{4\sqrt{a}\,\Gamma\left(\frac{9}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(b*x**4+a)**(1/2),x)
```

```
[Out] x**5*gamma(5/4)*hyper((1/2, 5/4), (9/4,), b*x**4*exp_polar(I*pi)/
a)/(4*sqrt(a)*gamma(9/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\sqrt{bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(b*x^4 + a),x, algorithm="giac")
```

```
[Out] integrate(x^4/sqrt(b*x^4 + a), x)
```

3.821 $\int \frac{1}{\sqrt{a+bx^4}} dx$

Optimal. Leaf size=88

$$\frac{\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{2\sqrt[4]{a}\sqrt[4]{b}\sqrt{a+bx^4}}$$

```
[Out] ((Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)
^2]*EllipticF[2*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(2*a^(1/4)*b^(
1/4)*Sqrt[a + b*x^4])
```

Rubi [A] time = 0.0360726, antiderivative size = 88, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$

$$\frac{\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{2\sqrt[4]{a}\sqrt[4]{b}\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[a + b*x^4],x]
```

```
[Out] ((Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)
^2]*EllipticF[2*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(2*a^(1/4)*b^(
1/4)*Sqrt[a + b*x^4])
```

Rubi in Sympy [A] time = 3.73728, size = 78, normalized size = 0.89

$$\frac{\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)F\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{2\sqrt[4]{a}\sqrt[4]{b}\sqrt{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**4+a)**(1/2),x)
```

```
[Out] sqrt((a + b*x**4)/(sqrt(a) + sqrt(b)*x**2)**2)*(sqrt(a) + sqrt(b)
*x**2)*elliptic_f(2*atan(b**(1/4)*x/a**(1/4)), 1/2)/(2*a**(1/4)*b
**(1/4)*sqrt(a + b*x**4))
```

Mathematica [C] time = 0.0526814, size = 74, normalized size = 0.84

$$-\frac{i\sqrt{\frac{bx^4}{a}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)}{\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/Sqrt[a + b*x^4],x]
```

```
[Out] ((-I)*Sqrt[1 + (b*x^4)/a]*EllipticF[I*ArcSinh[Sqrt[(I*Sqrt[b])/Sq
rt[a]]*x], -1])/(Sqrt[(I*Sqrt[b])/Sqrt[a]]*Sqrt[a + b*x^4])
```

Maple [C] time = 0.005, size = 70, normalized size = 0.8

$$1\sqrt{1-ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\sqrt{1+ix^2\sqrt{b}\frac{1}{\sqrt{a}}}EllipticF\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)\frac{1}{\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^4+a)^(1/2),x)
```

```
[Out] 1/(I/a^(1/2)*b^(1/2))^(1/2)*(1-I/a^(1/2)*b^(1/2)*x^2)^(1/2)*(1+I/
a^(1/2)*b^(1/2)*x^2)^(1/2)/(b*x^4+a)^(1/2)*EllipticF(x*(I/a^(1/2)
*b^(1/2))^(1/2),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*x^4 + a),x, algorithm="maxima")
```

```
[Out] integrate(1/sqrt(b*x^4 + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{\sqrt{bx^4+a}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*x^4 + a),x, algorithm="fricas")
```

```
[Out] integral(1/sqrt(b*x^4 + a), x)
```

Sympy [A] time = 1.99004, size = 36, normalized size = 0.41

$$\frac{x\Gamma\left(\frac{1}{4}\right){}_2F_1\left(\begin{matrix}\frac{1}{4},\frac{1}{2}\\ \frac{5}{4}\end{matrix}\middle|\frac{bx^4e^{i\pi}}{a}\right)}{4\sqrt{a}\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**4+a)**(1/2),x)
```

```
[Out] x*gamma(1/4)*hyper((1/4, 1/2), (5/4,), b*x**4*exp_polar(I*pi)/a)/
(4*sqrt(a)*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*x^4 + a),x, algorithm="giac")
```

```
[Out] integrate(1/sqrt(b*x^4 + a), x)
```

3.822 $\int \frac{1}{x^4\sqrt{a+bx^4}}\,dx$

Optimal. Leaf size=110

$$-\frac{b^{3/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{6a^{5/4}\sqrt{a+bx^4}}-\frac{\sqrt{a+bx^4}}{3ax^3}$$

```
[Out] -Sqrt[a + b*x^4]/(3*a*x^3) - (b^(3/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqr
t[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticF[2*ArcTan[(b^(1
/4)*x)/a^(1/4)], 1/2])/(6*a^(5/4)*Sqrt[a + b*x^4])
```

Rubi [A] time = 0.0692434, antiderivative size = 110, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{b^{3/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{6a^{5/4}\sqrt{a+bx^4}}-\frac{\sqrt{a+bx^4}}{3ax^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*Sqrt[a + b*x^4]),x]
```

```
[Out] -Sqrt[a + b*x^4]/(3*a*x^3) - (b^(3/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqr
t[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticF[2*ArcTan[(b^(1
/4)*x)/a^(1/4)], 1/2])/(6*a^(5/4)*Sqrt[a + b*x^4])
```

Rubi in Sympy [A] time = 7.43004, size = 97, normalized size = 0.88

$$-\frac{\sqrt{a+bx^4}}{3ax^3}-\frac{b^{\frac{3}{4}}\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)F\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{6a^{\frac{5}{4}}\sqrt{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(b*x**4+a)**(1/2),x)
```

```
[Out] -sqrt(a + b*x**4)/(3*a*x**3) - b**(3/4)*sqrt((a + b*x**4)/(sqrt(a
) + sqrt(b)*x**2)**2)*(sqrt(a) + sqrt(b)*x**2)*elliptic_f(2*atan(
b**(1/4)*x/a**(1/4)), 1/2)/(6*a**(5/4)*sqrt(a + b*x**4))
```

Mathematica [C] time = 0.202588, size = 95, normalized size = 0.86

$$\frac{-\frac{a+bx^4}{x^3}+\frac{ib\sqrt{\frac{bx^4}{a}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)}{\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}}}{3a\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*Sqrt[a + b*x^4]),x]
```

```
[Out] (-((a + b*x^4)/x^3) + (I*b*Sqrt[1 + (b*x^4)/a]*EllipticF[I*ArcSin
h[Sqrt[(I*Sqrt[b])/Sqrt[a]]*x], -1])/Sqrt[(I*Sqrt[b])/Sqrt[a]])/(
```

```
3*a*Sqrt[a + b*x^4])
```

Maple [C] time = 0.017, size = 93, normalized size = 0.9

$$-\frac{1}{3\,a x^3}\sqrt{b x^4+a}-\frac{b}{3\,a}\sqrt{1-i x^2\sqrt{b}\frac{1}{\sqrt{a}}}\sqrt{1+i x^2\sqrt{b}\frac{1}{\sqrt{a}}}\,EllipticF\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)\frac{1}{\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{b x^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(b*x^4+a)^(1/2),x)
```

```
[Out] -1/3*(b*x^4+a)^(1/2)/a/x^3-1/3*b/a/(I/a^(1/2)*b^(1/2))^(1/2)*(1-I
/a^(1/2)*b^(1/2)*x^2)^(1/2)*(1+I/a^(1/2)*b^(1/2)*x^2)^(1/2)/(b*x^
4+a)^(1/2)*EllipticF(x*(I/a^(1/2)*b^(1/2))^(1/2),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{b x^4+a}\,x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^4 + a)*x^4),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(b*x^4 + a)*x^4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{b x^4+a}\,x^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^4 + a)*x^4),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(b*x^4 + a)*x^4), x)
```

Sympy [A] time = 2.70023, size = 41, normalized size = 0.37

$$\frac{\Gamma\left(-\frac{3}{4}\right)\,{}_2F_1\left(\begin{matrix}-\frac{3}{4},\frac{1}{2}\\ \frac{1}{4}\end{matrix}\middle|\frac{b x^4 e^{i\pi}}{a}\right)}{4\sqrt{a}x^3\,\Gamma\left(\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(b*x**4+a)**(1/2),x)
```

```
[Out] gamma(-3/4)*hyper((-3/4, 1/2), (1/4,), b*x**4*exp_polar(I*pi)/a)/
(4*sqrt(a)*x**3*gamma(1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{bx^4 + a}x^4} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^4 + a)*x^4),x, algorithm="giac")

[Out] integrate(1/(sqrt(b*x^4 + a)*x^4), x)
```

3.823 $\int \frac{1}{x^8\sqrt{a+bx^4}}\,dx$

Optimal. Leaf size=132

$$\frac{5b^{7/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{42a^{9/4}\sqrt{a+bx^4}}+\frac{5b\sqrt{a+bx^4}}{21a^2x^3}-\frac{\sqrt{a+bx^4}}{7ax^7}$$

```
[Out] -Sqrt[a + b*x^4]/(7*a*x^7) + (5*b*Sqrt[a + b*x^4])/(21*a^2*x^3) +
 (5*b^(7/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + S
qrt[b]*x^2)^2]*EllipticF[2*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(42
*a^(9/4)*Sqrt[a + b*x^4])
```

Rubi [A] time = 0.106155, antiderivative size = 132, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{5b^{7/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{42a^{9/4}\sqrt{a+bx^4}}+\frac{5b\sqrt{a+bx^4}}{21a^2x^3}-\frac{\sqrt{a+bx^4}}{7ax^7}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^8*Sqrt[a + b*x^4]),x]
```

```
[Out] -Sqrt[a + b*x^4]/(7*a*x^7) + (5*b*Sqrt[a + b*x^4])/(21*a^2*x^3) +
 (5*b^(7/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + S
qrt[b]*x^2)^2]*EllipticF[2*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(42
*a^(9/4)*Sqrt[a + b*x^4])
```

Rubi in Sympy [A] time = 10.9396, size = 119, normalized size = 0.9

$$-\frac{\sqrt{a+bx^4}}{7ax^7}+\frac{5b\sqrt{a+bx^4}}{21a^2x^3}+\frac{5b^{\frac{7}{4}}\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)F\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{42a^{\frac{9}{4}}\sqrt{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**8/(b*x**4+a)**(1/2),x)
```

```
[Out] -sqrt(a + b*x**4)/(7*a*x**7) + 5*b*sqrt(a + b*x**4)/(21*a**2*x**3
) + 5*b**(7/4)*sqrt((a + b*x**4)/(sqrt(a) + sqrt(b)*x**2)**2)*(sq
rt(a) + sqrt(b)*x**2)*elliptic_f(2*atan(b**(1/4)*x/a**(1/4)), 1/2
)/(42*a**(9/4)*sqrt(a + b*x**4))
```

Mathematica [C] time = 0.244999, size = 106, normalized size = 0.8

$$\frac{-\frac{3a^2}{x^7}-\frac{5ib^2\sqrt{\frac{bx^4}{a}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)}{\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}}+\frac{2ab}{x^3}+5b^2x}{21a^2\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^8*Sqrt[a + b*x^4]),x]
```

```
[Out] ((-3*a^2)/x^7 + (2*a*b)/x^3 + 5*b^2*x - ((5*I)*b^2*Sqrt[1 + (b*x^
4)/a]*EllipticF[I*ArcSinh[Sqrt[(I*Sqrt[b])/Sqrt[a]]*x], -1])/Sqrt
[(I*Sqrt[b])/Sqrt[a]])/(21*a^2*Sqrt[a + b*x^4])
```

Maple [C] time = 0.021, size = 113, normalized size = 0.9

$$-\frac{1}{7\,ax^{7}}\sqrt{bx^{4}+a}+\frac{5\,b}{21\,x^{3}a^{2}}\sqrt{bx^{4}+a} \\ +\frac{5\,b^{2}}{21\,a^{2}}\sqrt{1-ix^{2}\sqrt{b}\frac{1}{\sqrt{a}}}\sqrt{1+ix^{2}\sqrt{b}\frac{1}{\sqrt{a}}}\mathit{EllipticF}\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)\frac{1}{\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{bx^{4}+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^8/(b*x^4+a)^(1/2),x)
```

```
[Out] -1/7*(b*x^4+a)^(1/2)/a/x^7+5/21*b*(b*x^4+a)^(1/2)/x^3/a^2+5/21/a^
2*b^2/(I/a^(1/2)*b^(1/2))^(1/2)*(1-I/a^(1/2)*b^(1/2)*x^2)^(1/2)*(
1+I/a^(1/2)*b^(1/2)*x^2)^(1/2)/(b*x^4+a)^(1/2)*EllipticF(x*(I/a^(
1/2)*b^(1/2))^(1/2),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{bx^{4}+ax^{8}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^4 + a)*x^8),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(b*x^4 + a)*x^8), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{\sqrt{bx^{4}+ax^{8}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^4 + a)*x^8),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(b*x^4 + a)*x^8), x)
```

Sympy [A] time = 4.44487, size = 44, normalized size = 0.33

$$\frac{\left(-\frac{7}{4}\right)\,{}_{2}F_{1}\left(\begin{matrix}-\frac{7}{4},\frac{1}{2}\\-\frac{3}{4}\end{matrix}\middle|\frac{bx^{4}e^{i\pi}}{a}\right)}{4\sqrt{a}x^{7}\left(-\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**8/(b*x**4+a)**(1/2),x)
```

```
[Out] gamma(-7/4)*hyper((-7/4, 1/2), (-3/4,), b*x**4*exp_polar(I*pi)/a)
/(4*sqrt(a)*x**7*gamma(-3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{bx^4 + ax^8}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^4 + a)*x^8),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(b*x^4 + a)*x^8), x)
```

3.824 $\int \frac{x^{10}}{\sqrt{a+bx^4}}\,dx$

Optimal. Leaf size=261

$$\frac{7a^{9/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{30b^{11/4}\sqrt{a+bx^4}}-\frac{7a^{9/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{15b^{11/4}\sqrt{a+bx^4}}+\frac{7a^2x\sqrt{a+bx^4}}{15b^{5/2}\left(\sqrt{a}+\sqrt{b}x^2\right)}-\frac{7ax^3\sqrt{a+bx^4}}{45b^2}+\frac{x^7\sqrt{a+bx^4}}{9b}$$

```
[Out] (-7*a*x^3*Sqrt[a + b*x^4])/(45*b^2) + (x^7*Sqrt[a + b*x^4])/(9*b)
 + (7*a^2*x*Sqrt[a + b*x^4])/(15*b^(5/2)*(Sqrt[a] + Sqrt[b]*x^2))
 - (7*a^(9/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] +
 Sqrt[b]*x^2)^2]*EllipticE[2*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(
15*b^(11/4)*Sqrt[a + b*x^4]) + (7*a^(9/4)*(Sqrt[a] + Sqrt[b]*x^2)
*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticF[2*ArcTan[(
b^(1/4)*x)/a^(1/4)], 1/2])/(30*b^(11/4)*Sqrt[a + b*x^4])
```

Rubi [A] time = 0.251432, antiderivative size = 261, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{7a^{9/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{30b^{11/4}\sqrt{a+bx^4}}-\frac{7a^{9/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{15b^{11/4}\sqrt{a+bx^4}}+\frac{7a^2x\sqrt{a+bx^4}}{15b^{5/2}\left(\sqrt{a}+\sqrt{b}x^2\right)}-\frac{7ax^3\sqrt{a+bx^4}}{45b^2}+\frac{x^7\sqrt{a+bx^4}}{9b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^10/Sqrt[a + b*x^4],x]
```

```
[Out] (-7*a*x^3*Sqrt[a + b*x^4])/(45*b^2) + (x^7*Sqrt[a + b*x^4])/(9*b)
 + (7*a^2*x*Sqrt[a + b*x^4])/(15*b^(5/2)*(Sqrt[a] + Sqrt[b]*x^2))
 - (7*a^(9/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] +
 Sqrt[b]*x^2)^2]*EllipticE[2*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(
15*b^(11/4)*Sqrt[a + b*x^4]) + (7*a^(9/4)*(Sqrt[a] + Sqrt[b]*x^2)
*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticF[2*ArcTan[(
b^(1/4)*x)/a^(1/4)], 1/2])/(30*b^(11/4)*Sqrt[a + b*x^4])
```

Rubi in Sympy [A] time = 28.8388, size = 238, normalized size = 0.91

$$-\frac{7a^{\frac{9}{4}}\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)E\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{15b^{\frac{11}{4}}\sqrt{a+bx^4}}+\frac{7a^{\frac{9}{4}}\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)F\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{30b^{\frac{11}{4}}\sqrt{a+bx^4}}+\frac{7a^2x\sqrt{a+bx^4}}{15b^{\frac{5}{2}}\left(\sqrt{a}+\sqrt{b}x^2\right)}-\frac{7ax^3\sqrt{a+bx^4}}{45b^2}+\frac{x^7\sqrt{a+bx^4}}{9b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate(x**10/(b*x**4+a)**(1/2),x)
```

```
[Out] -7*a**(9/4)*sqrt((a + b*x**4)/(sqrt(a) + sqrt(b)*x**2)**2)*(sqrt(
a) + sqrt(b)*x**2)*elliptic_e(2*atan(b**(1/4)*x/a**(1/4)), 1/2)/(
15*b**(11/4)*sqrt(a + b*x**4)) + 7*a**(9/4)*sqrt((a + b*x**4)/(sq
rt(a) + sqrt(b)*x**2)**2)*(sqrt(a) + sqrt(b)*x**2)*elliptic_f(2*a
tan(b**(1/4)*x/a**(1/4)), 1/2)/(30*b**(11/4)*sqrt(a + b*x**4)) +
7*a**2*x*sqrt(a + b*x**4)/(15*b**(5/2)*(sqrt(a) + sqrt(b)*x**2))
- 7*a*x**3*sqrt(a + b*x**4)/(45*b**2) + x**7*sqrt(a + b*x**4)/(9*
b)
```

Mathematica [C] time = 0.758686, size = 136, normalized size = 0.52

$$\frac{(a+bx^4)(5bx^7-7ax^3)+\frac{21ia^2\sqrt{\frac{bx^4}{a}+1}\left(E\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)-F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)\right)}{\left(\frac{i\sqrt{b}}{\sqrt{a}}\right)^{3/2}}}{45b^2\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]   Integrate[x^10/Sqrt[a + b*x^4],x]
```

```
[Out] ((a + b*x^4)*(-7*a*x^3 + 5*b*x^7) + ((21*I)*a^2*Sqrt[1 + (b*x^4)/
a]*(EllipticE[I*ArcSinh[Sqrt[(I*Sqrt[b])/Sqrt[a]]*x], -1] - Ellip
ticF[I*ArcSinh[Sqrt[(I*Sqrt[b])/Sqrt[a]]*x], -1]))/((I*Sqrt[b])/S
qrt[a])^(3/2))/(45*b^2*Sqrt[a + b*x^4])
```

Maple [C] time = 0.012, size = 133, normalized size = 0.5

$$\frac{x^7}{9b}\sqrt{bx^4+a}-\frac{7ax^3}{45b^2}\sqrt{bx^4+a}$$
$$+\frac{7i}{15}a^{\frac{5}{2}}\sqrt{1-ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\sqrt{1+ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\left(EllipticF\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)-EllipticE\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)\right)b^{-\frac{5}{2}}\frac{1}{\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^10/(b*x^4+a)^(1/2),x)
```

```
[Out] 1/9*x^7*(b*x^4+a)^(1/2)/b-7/45*a*x^3*(b*x^4+a)^(1/2)/b^2+7/15*I*a
^(5/2)/b^(5/2)/(I/a^(1/2)*b^(1/2))^(1/2)*(1-I/a^(1/2)*b^(1/2)*x^2
)^(1/2)*(1+I/a^(1/2)*b^(1/2)*x^2)^(1/2)/(b*x^4+a)^(1/2)*(Elliptic
F(x*(I/a^(1/2)*b^(1/2))^(1/2),I)-EllipticE(x*(I/a^(1/2)*b^(1/2))^
(1/2),I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^{10}}{\sqrt{bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^10/sqrt(b*x^4 + a),x, algorithm="maxima")
```

```
[Out] integrate(x^10/sqrt(b*x^4 + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{10}}{\sqrt{bx^4+a}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/sqrt(b*x^4 + a),x, algorithm="fricas")
```

```
[Out] integral(x^10/sqrt(b*x^4 + a), x)
```

Sympy [A] time = 4.42504, size = 37, normalized size = 0.14

$$\frac{x^{11}\Gamma\left(\frac{11}{4}\right){}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{11}{4}\\ \frac{15}{4}\end{matrix}\middle|\frac{bx^4e^{i\pi}}{a}\right)}{4\sqrt{a}\,\Gamma\left(\frac{15}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**10/(b*x**4+a)**(1/2),x)
```

```
[Out] x**11*gamma(11/4)*hyper((1/2, 11/4), (15/4,), b*x**4*exp_polar(I*
pi)/a)/(4*sqrt(a)*gamma(15/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{10}}{\sqrt{bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/sqrt(b*x^4 + a),x, algorithm="giac")
```

```
[Out] integrate(x^10/sqrt(b*x^4 + a), x)
```

3.825 $\int \frac{x^6}{\sqrt{a+bx^4}}\,dx$

Optimal. Leaf size=237

$$-\frac{3a^{5/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{10b^{7/4}\sqrt{a+bx^4}}+\frac{3a^{5/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{5b^{7/4}\sqrt{a+bx^4}}-\frac{3ax\sqrt{a+bx^4}}{5b^{3/2}\left(\sqrt{a}+\sqrt{b}x^2\right)}+\frac{x^3\sqrt{a+bx^4}}{5b}$$

```
[Out] (x^3*Sqrt[a + b*x^4])/(5*b) - (3*a*x*Sqrt[a + b*x^4])/(5*b^(3/2)*
(Sqrt[a] + Sqrt[b]*x^2)) + (3*a^(5/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqr
t[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticE[2*ArcTan[(b^(1
/4)*x)/a^(1/4)], 1/2])/(5*b^(7/4)*Sqrt[a + b*x^4]) - (3*a^(5/4)*(
Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2
]*EllipticF[2*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(10*b^(7/4)*Sqrt
[a + b*x^4])
```

Rubi [A] time = 0.192352, antiderivative size = 237, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{3a^{5/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{10b^{7/4}\sqrt{a+bx^4}}+\frac{3a^{5/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{5b^{7/4}\sqrt{a+bx^4}}-\frac{3ax\sqrt{a+bx^4}}{5b^{3/2}\left(\sqrt{a}+\sqrt{b}x^2\right)}+\frac{x^3\sqrt{a+bx^4}}{5b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/Sqrt[a + b*x^4],x]
```

```
[Out] (x^3*Sqrt[a + b*x^4])/(5*b) - (3*a*x*Sqrt[a + b*x^4])/(5*b^(3/2)*
(Sqrt[a] + Sqrt[b]*x^2)) + (3*a^(5/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqr
t[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticE[2*ArcTan[(b^(1
/4)*x)/a^(1/4)], 1/2])/(5*b^(7/4)*Sqrt[a + b*x^4]) - (3*a^(5/4)*(
Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2
]*EllipticF[2*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(10*b^(7/4)*Sqrt
[a + b*x^4])
```

Rubi in Sympy [A] time = 22.8382, size = 214, normalized size = 0.9

$$\frac{3a^{\frac{5}{4}}\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)E\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{5b^{\frac{7}{4}}\sqrt{a+bx^4}}-\frac{3a^{\frac{5}{4}}\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)F\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{10b^{\frac{7}{4}}\sqrt{a+bx^4}}-\frac{3ax\sqrt{a+bx^4}}{5b^{\frac{3}{2}}\left(\sqrt{a}+\sqrt{b}x^2\right)}+\frac{x^3\sqrt{a+bx^4}}{5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(b*x**4+a)**(1/2),x)
```

```
[Out] 3*a**(5/4)*sqrt((a + b*x**4)/(sqrt(a) + sqrt(b)*x**2)**2)*(sqrt(a
) + sqrt(b)*x**2)*elliptic_e(2*atan(b**(1/4)*x/a**(1/4)), 1/2)/(5
*b**(7/4)*sqrt(a + b*x**4)) - 3*a**(5/4)*sqrt((a + b*x**4)/(sqrt(
a) + sqrt(b)*x**2)**2)*(sqrt(a) + sqrt(b)*x**2)*elliptic_f(2*atan
(b**(1/4)*x/a**(1/4)), 1/2)/(10*b**(7/4)*sqrt(a + b*x**4)) - 3*a*
x*sqrt(a + b*x**4)/(5*b**(3/2)*(sqrt(a) + sqrt(b)*x**2)) + x**3*s
qrt(a + b*x**4)/(5*b)
```

Mathematica [C] time = 0.225525, size = 168, normalized size = 0.71

$$\frac{x^3\sqrt{a+bx^4}}{5b}-\frac{3a^{3/2}\sqrt{1-\frac{i\sqrt{b}x^2}{\sqrt{a}}}\sqrt{1+\frac{i\sqrt{b}x^2}{\sqrt{a}}}\left(E\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)-F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)\right)}{5b^{3/2}\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6/Sqrt[a + b*x^4],x]
```

```
[Out] (x^3*Sqrt[a + b*x^4])/(5*b) - (3*a^(3/2)*Sqrt[1 - (I*Sqrt[b]*x^2)
/Sqrt[a]]*Sqrt[1 + (I*Sqrt[b]*x^2)/Sqrt[a]]*(EllipticE[I*ArcSinh[
Sqrt[(I*Sqrt[b])/Sqrt[a]]*x], -1] - EllipticF[I*ArcSinh[Sqrt[(I*S
qrt[b])/Sqrt[a]]*x], -1]))/(5*Sqrt[(I*Sqrt[b])/Sqrt[a]]*b^(3/2)*S
qrt[a + b*x^4])
```

Maple [C] time = 0.011, size = 115, normalized size = 0.5

$$\frac{x^3}{5\,b}\sqrt{bx^4+a}-\frac{3\,i}{5}a^{\frac{3}{2}}\sqrt{1-ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\sqrt{1+ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\left(\mathit{EllipticF}\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)-\mathit{EllipticE}\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)\right)b^{-\frac{3}{2}}\frac{1}{\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(b*x^4+a)^(1/2),x)
```

```
[Out] 1/5*x^3*(b*x^4+a)^(1/2)/b-3/5*I*a^(3/2)/b^(3/2)/(I/a^(1/2)*b^(1/2
))^(1/2)*(1-I/a^(1/2)*b^(1/2)*x^2)^(1/2)*(1+I/a^(1/2)*b^(1/2)*x^2
)^(1/2)/(b*x^4+a)^(1/2)*(EllipticF(x*(I/a^(1/2)*b^(1/2))^(1/2),I)
-EllipticE(x*(I/a^(1/2)*b^(1/2))^(1/2),I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{\sqrt{bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(b*x^4 + a),x, algorithm="maxima")
```

```
[Out] integrate(x^6/sqrt(b*x^4 + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^6}{\sqrt{bx^4+a}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(b*x^4 + a),x, algorithm="fricas")
```

```
[Out] integral(x^6/sqrt(b*x^4 + a), x)
```

Sympy [A] time = 2.64426, size = 37, normalized size = 0.16

$$\frac{x^7\,\Gamma\left(\frac{7}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{7}{4}\\ \frac{11}{4}\end{matrix}\middle|\frac{bx^4e^{i\pi}}{a}\right)}{4\sqrt{a}\,\Gamma\left(\frac{11}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(b*x**4+a)**(1/2),x)
```

```
[Out] x**7*gamma(7/4)*hyper((1/2, 7/4), (11/4,), b*x**4*exp_polar(I*pi)
/a)/(4*sqrt(a)*gamma(11/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{\sqrt{bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(b*x^4 + a),x, algorithm="giac")
```

```
[Out] integrate(x^6/sqrt(b*x^4 + a), x)
```

3.826 $\int \frac{x^2}{\sqrt{a+bx^4}}\,dx$

Optimal. Leaf size=210

$$\frac{\sqrt[4]{a}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{2b^{3/4}\sqrt{a+bx^4}}-\frac{\sqrt[4]{a}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{b^{3/4}\sqrt{a+bx^4}}+\frac{x\sqrt{a+bx^4}}{\sqrt{b}\left(\sqrt{a}+\sqrt{b}x^2\right)}$$

```
[Out] (x*Sqrt[a + b*x^4])/(Sqrt[b]*(Sqrt[a] + Sqrt[b]*x^2)) - (a^(1/4)*
(Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^
2]*EllipticE[2*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(b^(3/4)*Sqrt[a
 + b*x^4]) + (a^(1/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/(S
qrt[a] + Sqrt[b]*x^2)^2]*EllipticF[2*ArcTan[(b^(1/4)*x)/a^(1/4)],
 1/2])/(2*b^(3/4)*Sqrt[a + b*x^4])
```

Rubi [A] time = 0.140904, antiderivative size = 210, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{\sqrt[4]{a}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{2b^{3/4}\sqrt{a+bx^4}}-\frac{\sqrt[4]{a}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{b^{3/4}\sqrt{a+bx^4}}+\frac{x\sqrt{a+bx^4}}{\sqrt{b}\left(\sqrt{a}+\sqrt{b}x^2\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/Sqrt[a + b*x^4],x]
```

```
[Out] (x*Sqrt[a + b*x^4])/(Sqrt[b]*(Sqrt[a] + Sqrt[b]*x^2)) - (a^(1/4)*
(Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^
2]*EllipticE[2*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(b^(3/4)*Sqrt[a
 + b*x^4]) + (a^(1/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/(S
qrt[a] + Sqrt[b]*x^2)^2]*EllipticF[2*ArcTan[(b^(1/4)*x)/a^(1/4)],
 1/2])/(2*b^(3/4)*Sqrt[a + b*x^4])
```

Rubi in Sympy [A] time = 17.3039, size = 187, normalized size = 0.89

$$-\frac{\sqrt[4]{a}\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)E\left(2\,\text{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{b^{\frac{3}{4}}\sqrt{a+bx^4}}+\frac{\sqrt[4]{a}\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)F\left(2\,\text{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{2b^{\frac{3}{4}}\sqrt{a+bx^4}}+\frac{x\sqrt{a+bx^4}}{\sqrt{b}\left(\sqrt{a}+\sqrt{b}x^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(b*x**4+a)**(1/2),x)
```

```
[Out] -a**(1/4)*sqrt((a + b*x**4)/(sqrt(a) + sqrt(b)*x**2)**2)*(sqrt(a)
 + sqrt(b)*x**2)*elliptic_e(2*atan(b**(1/4)*x/a**(1/4)), 1/2)/(b*
```

```
*(3/4)*sqrt(a + b*x**4)) + a**(1/4)*sqrt((a + b*x**4)/(sqrt(a) +
sqrt(b)*x**2)**2)*(sqrt(a) + sqrt(b)*x**2)*elliptic_f(2*atan(b**(
1/4)*x/a**(1/4)), 1/2)/(2*b**(3/4)*sqrt(a + b*x**4)) + x*sqrt(a +
 b*x**4)/(sqrt(b)*(sqrt(a) + sqrt(b)*x**2))
```

Mathematica [C] time = 0.0854787, size = 104, normalized size = 0.5

$$\frac{i\sqrt{\frac{bx^4}{a}+1}\left(E\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)-F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)\right)}{\left(\frac{i\sqrt{b}}{\sqrt{a}}\right)^{3/2}\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]   Integrate[x^2/Sqrt[a + b*x^4],x]
```

```
[Out] (I*Sqrt[1 + (b*x^4)/a]*(EllipticE[I*ArcSinh[Sqrt[(I*Sqrt[b])/Sqrt
[a]]*x], -1] - EllipticF[I*ArcSinh[Sqrt[(I*Sqrt[b])/Sqrt[a]]*x],
-1]))/(((I*Sqrt[b])/Sqrt[a])^(3/2)*Sqrt[a + b*x^4])
```

Maple [C] time = 0.009, size = 97, normalized size = 0.5

$$i\sqrt{a}\sqrt{1-ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\sqrt{1+ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\left(EllipticF\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)-EllipticE\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)\right)\frac{1}{\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{bx^4+a}}\frac{1}{\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^2/(b*x^4+a)^(1/2),x)
```

```
[Out] I*a^(1/2)/(I/a^(1/2)*b^(1/2))^(1/2)*(1-I/a^(1/2)*b^(1/2)*x^2)^(1/
2)*(1+I/a^(1/2)*b^(1/2)*x^2)^(1/2)/(b*x^4+a)^(1/2)/b^(1/2)*(Ellip
ticF(x*(I/a^(1/2)*b^(1/2))^(1/2),I)-EllipticE(x*(I/a^(1/2)*b^(1/2
))^(1/2),I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\sqrt{bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^2/sqrt(b*x^4 + a),x, algorithm="maxima")
```

```
[Out] integrate(x^2/sqrt(b*x^4 + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^2}{\sqrt{bx^4+a}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^2/sqrt(b*x^4 + a),x, algorithm="fricas")
```

```
[Out] integral(x^2/sqrt(b*x^4 + a), x)
```

Sympy [A] time = 2.12199, size = 37, normalized size = 0.18

$$\frac{x^3\,\Gamma\left(\frac{3}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{3}{4}\\ \frac{7}{4}\end{matrix}\middle|\frac{bx^4e^{i\pi}}{a}\right)}{4\sqrt{a}\,\Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(b*x**4+a)**(1/2),x)
```

```
[Out] x**3*gamma(3/4)*hyper((1/2, 3/4), (7/4,), b*x**4*exp_polar(I*pi)/
a)/(4*sqrt(a)*gamma(7/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\sqrt{bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(b*x^4 + a),x, algorithm="giac")
```

```
[Out] integrate(x^2/sqrt(b*x^4 + a), x)
```

3.827 $\int \frac{1}{x^2\sqrt{a+bx^4}}\,dx$

Optimal. Leaf size=232

$$\frac{\sqrt[4]{b}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{2a^{3/4}\sqrt{a+bx^4}}-\frac{\sqrt[4]{b}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{a^{3/4}\sqrt{a+bx^4}}-\frac{\sqrt{a+bx^4}}{ax}+\frac{\sqrt{b}x\sqrt{a+bx^4}}{a\left(\sqrt{a}+\sqrt{b}x^2\right)}$$

```
[Out] -(Sqrt[a + b*x^4]/(a*x)) + (Sqrt[b]*x*Sqrt[a + b*x^4])/(a*(Sqrt[a
] + Sqrt[b]*x^2)) - (b^(1/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*
x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticE[2*ArcTan[(b^(1/4)*x)/a^
(1/4)], 1/2])/(a^(3/4)*Sqrt[a + b*x^4]) + (b^(1/4)*(Sqrt[a] + Sqr
t[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticF[2
*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(2*a^(3/4)*Sqrt[a + b*x^4])
```

Rubi [A] time = 0.194308, antiderivative size = 232, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{\sqrt[4]{b}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{2a^{3/4}\sqrt{a+bx^4}}-\frac{\sqrt[4]{b}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{a^{3/4}\sqrt{a+bx^4}}-\frac{\sqrt{a+bx^4}}{ax}+\frac{\sqrt{b}x\sqrt{a+bx^4}}{a\left(\sqrt{a}+\sqrt{b}x^2\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*Sqrt[a + b*x^4]),x]
```

```
[Out] -(Sqrt[a + b*x^4]/(a*x)) + (Sqrt[b]*x*Sqrt[a + b*x^4])/(a*(Sqrt[a
] + Sqrt[b]*x^2)) - (b^(1/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*
x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticE[2*ArcTan[(b^(1/4)*x)/a^
(1/4)], 1/2])/(a^(3/4)*Sqrt[a + b*x^4]) + (b^(1/4)*(Sqrt[a] + Sqr
t[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticF[2
*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(2*a^(3/4)*Sqrt[a + b*x^4])
```

Rubi in Sympy [A] time = 22.8872, size = 202, normalized size = 0.87

$$\frac{\sqrt{b}x\sqrt{a+bx^4}}{a\left(\sqrt{a}+\sqrt{b}x^2\right)}-\frac{\sqrt{a+bx^4}}{ax}-\frac{\sqrt[4]{b}\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)E\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{a^{\frac{3}{4}}\sqrt{a+bx^4}}+\frac{\sqrt[4]{b}\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)F\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{2a^{\frac{3}{4}}\sqrt{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(b*x**4+a)**(1/2),x)
```

```
[Out] sqrt(b)*x*sqrt(a + b*x**4)/(a*(sqrt(a) + sqrt(b)*x**2)) - sqrt(a
+ b*x**4)/(a*x) - b**(1/4)*sqrt((a + b*x**4)/(sqrt(a) + sqrt(b)*x
**2)**2)*(sqrt(a) + sqrt(b)*x**2)*elliptic_e(2*atan(b**(1/4)*x/a*
```

```
*(1/4)), 1/2)/(a**(3/4)*sqrt(a + b*x**4)) + b**(1/4)*sqrt((a + b*
x**4)/(sqrt(a) + sqrt(b)*x**2)**2)*(sqrt(a) + sqrt(b)*x**2)*ellip
tic_f(2*atan(b**(1/4)*x/a**(1/4)), 1/2)/(2*a**(3/4)*sqrt(a + b*x*
*4))
```

Mathematica [C] time = 0.470396, size = 121, normalized size = 0.52

$$\frac{-\frac{a+bx^4}{ax}-i\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\sqrt{\frac{bx^4}{a}+1}\left(E\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)-F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)\right)}{\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*Sqrt[a + b*x^4]),x]
```

```
[Out] (-((a + b*x^4)/(a*x)) - I*Sqrt[(I*Sqrt[b])/Sqrt[a]]*Sqrt[1 + (b*x
^4)/a]*(EllipticE[I*ArcSinh[Sqrt[(I*Sqrt[b])/Sqrt[a]]*x], -1] - E
llipticF[I*ArcSinh[Sqrt[(I*Sqrt[b])/Sqrt[a]]*x], -1]))/Sqrt[a + b
*x^4]
```

Maple [C] time = 0.014, size = 115, normalized size = 0.5

$$-\frac{1}{ax}\sqrt{bx^4+a}$$
$$+i\sqrt{b}\sqrt{1-ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\sqrt{1+ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\left(\mathit{EllipticF}\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)-\mathit{EllipticE}\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)\right)\frac{1}{\sqrt{a}}\frac{1}{\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(b*x^4+a)^(1/2),x)
```

```
[Out] -(b*x^4+a)^(1/2)/a/x+I*b^(1/2)/a^(1/2)/(I/a^(1/2)*b^(1/2))^(1/2)*
(1-I/a^(1/2)*b^(1/2)*x^2)^(1/2)*(1+I/a^(1/2)*b^(1/2)*x^2)^(1/2)/(
b*x^4+a)^(1/2)*(EllipticF(x*(I/a^(1/2)*b^(1/2))^(1/2),I)-Elliptic
E(x*(I/a^(1/2)*b^(1/2))^(1/2),I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{bx^4+ax^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^4 + a)*x^2),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(b*x^4 + a)*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{bx^4+ax^2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^4 + a)*x^2),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(b*x^4 + a)*x^2), x)
```

Sympy [A] time = 2.38786, size = 39, normalized size = 0.17

$$\frac{\Gamma\left(-\frac{1}{4}\right) {}_2F_1\left(\begin{matrix} -\frac{1}{4}, \frac{1}{2} \\ \frac{3}{4} \end{matrix}\middle| \frac{bx^4e^{i\pi}}{a}\right)}{4\sqrt{a}x\,\Gamma\left(\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(b*x**4+a)**(1/2),x)
```

```
[Out] gamma(-1/4)*hyper((-1/4, 1/2), (3/4,), b*x**4*exp_polar(I*pi)/a)/
(4*sqrt(a)*x*gamma(3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{bx^4 + ax^2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^4 + a)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(b*x^4 + a)*x^2), x)
```

3.828 $\int \frac{1}{x^6\sqrt{a+bx^4}}\,dx$

Optimal. Leaf size=261

$$-\frac{3b^{5/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{10a^{7/4}\sqrt{a+bx^4}}+\frac{3b^{5/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{5a^{7/4}\sqrt{a+bx^4}}-\frac{3b^{3/2}x\sqrt{a+bx^4}}{5a^2\left(\sqrt{a}+\sqrt{b}x^2\right)}+\frac{3b\sqrt{a+bx^4}}{5a^2x}-\frac{\sqrt{a+bx^4}}{5ax^5}$$

```
[Out] -Sqrt[a + b*x^4]/(5*a*x^5) + (3*b*Sqrt[a + b*x^4])/(5*a^2*x) - (3
*b^(3/2)*x*Sqrt[a + b*x^4])/(5*a^2*(Sqrt[a] + Sqrt[b]*x^2)) + (3*
b^(5/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqrt[
b]*x^2)^2]*EllipticE[2*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(5*a^(7
/4)*Sqrt[a + b*x^4]) - (3*b^(5/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a
 + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticF[2*ArcTan[(b^(1/4)*
x)/a^(1/4)], 1/2])/(10*a^(7/4)*Sqrt[a + b*x^4])
```

Rubi [A] time = 0.243216, antiderivative size = 261, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$

$$-\frac{3b^{5/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{10a^{7/4}\sqrt{a+bx^4}}+\frac{3b^{5/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{5a^{7/4}\sqrt{a+bx^4}}-\frac{3b^{3/2}x\sqrt{a+bx^4}}{5a^2\left(\sqrt{a}+\sqrt{b}x^2\right)}+\frac{3b\sqrt{a+bx^4}}{5a^2x}-\frac{\sqrt{a+bx^4}}{5ax^5}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^6*Sqrt[a + b*x^4]),x]
```

```
[Out] -Sqrt[a + b*x^4]/(5*a*x^5) + (3*b*Sqrt[a + b*x^4])/(5*a^2*x) - (3
*b^(3/2)*x*Sqrt[a + b*x^4])/(5*a^2*(Sqrt[a] + Sqrt[b]*x^2)) + (3*
b^(5/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqrt[
b]*x^2)^2]*EllipticE[2*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(5*a^(7
/4)*Sqrt[a + b*x^4]) - (3*b^(5/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a
 + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticF[2*ArcTan[(b^(1/4)*
x)/a^(1/4)], 1/2])/(10*a^(7/4)*Sqrt[a + b*x^4])
```

Rubi in Sympy [A] time = 29.256, size = 236, normalized size = 0.9

$$-\frac{\sqrt{a+bx^4}}{5ax^5}-\frac{3b^{\frac{3}{2}}x\sqrt{a+bx^4}}{5a^2\left(\sqrt{a}+\sqrt{b}x^2\right)}+\frac{3b\sqrt{a+bx^4}}{5a^2x}+\frac{3b^{\frac{5}{4}}\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)E\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{5a^{\frac{7}{4}}\sqrt{a+bx^4}}-\frac{3b^{\frac{5}{4}}\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)F\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{10a^{\frac{7}{4}}\sqrt{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**6/(b*x**4+a)**(1/2),x)
```

```
[Out] -sqrt(a + b*x**4)/(5*a*x**5) - 3*b**(3/2)*x*sqrt(a + b*x**4)/(5*a
**2*(sqrt(a) + sqrt(b)*x**2)) + 3*b*sqrt(a + b*x**4)/(5*a**2*x) +
 3*b**(5/4)*sqrt((a + b*x**4)/(sqrt(a) + sqrt(b)*x**2)**2)*(sqrt(
a) + sqrt(b)*x**2)*elliptic_e(2*atan(b**(1/4)*x/a**(1/4)), 1/2)/(
5*a**(7/4)*sqrt(a + b*x**4)) - 3*b**(5/4)*sqrt((a + b*x**4)/(sqrt
(a) + sqrt(b)*x**2)**2)*(sqrt(a) + sqrt(b)*x**2)*elliptic_f(2*ata
n(b**(1/4)*x/a**(1/4)), 1/2)/(10*a**(7/4)*sqrt(a + b*x**4))
```

Mathematica [C] time = 0.493914, size = 135, normalized size = 0.52

$$\frac{\frac{(a+bx^4)(3bx^4-a)}{x^5}+3iab\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\sqrt{\frac{bx^4}{a}+1}\left(E\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)-F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)\right)}{5a^2\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^6*Sqrt[a + b*x^4]),x]
```

```
[Out] (((a + b*x^4)*(-a + 3*b*x^4))/x^5 + (3*I)*a*Sqrt[(I*Sqrt[b])/Sqrt
[a]]*b*Sqrt[1 + (b*x^4)/a]*(EllipticE[I*ArcSinh[Sqrt[(I*Sqrt[b])/
Sqrt[a]]*x], -1] - EllipticF[I*ArcSinh[Sqrt[(I*Sqrt[b])/Sqrt[a]]*
x], -1]))/(5*a^2*Sqrt[a + b*x^4])
```

Maple [C] time = 0.02, size = 133, normalized size = 0.5

$$-\frac{1}{5\,ax^5}\sqrt{bx^4+a}+\frac{3\,b}{5\,xa^2}\sqrt{bx^4+a}$$
$$-\frac{3\,i}{5}b^{\frac{3}{2}}\sqrt{1-ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\sqrt{1+ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\left(EllipticF\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)-EllipticE\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)\right)a^{-\frac{3}{2}}\frac{1}{\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^6/(b*x^4+a)^(1/2),x)
```

```
[Out] -1/5*(b*x^4+a)^(1/2)/a/x^5+3/5*b*(b*x^4+a)^(1/2)/x/a^2-3/5*I/a^(3
/2)*b^(3/2)/(I/a^(1/2)*b^(1/2))^(1/2)*(1-I/a^(1/2)*b^(1/2)*x^2)^(
1/2)*(1+I/a^(1/2)*b^(1/2)*x^2)^(1/2)/(b*x^4+a)^(1/2)*(EllipticF(x
*(I/a^(1/2)*b^(1/2))^(1/2),I)-EllipticE(x*(I/a^(1/2)*b^(1/2))^(1/
2),I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{bx^4+ax^6}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^4 + a)*x^6),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(b*x^4 + a)*x^6), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{bx^4+ax^6}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(b*x^4 + a)*x^6),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(b*x^4 + a)*x^6), x)
```

Sympy [A] time = 3.33616, size = 44, normalized size = 0.17

$$\frac{\Gamma\left(-\frac{5}{4}\right) {}_2F_1\left(\begin{matrix} -\frac{5}{4}, \frac{1}{2} \\ -\frac{1}{4} \end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{4\sqrt{a}x^5\,\Gamma\left(-\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/x**6/(b*x**4+a)**(1/2),x)
```

```
[Out] gamma(-5/4)*hyper((-5/4, 1/2), (-1/4,), b*x**4*exp_polar(I*pi)/a)
/(4*sqrt(a)*x**5*gamma(-1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{bx^4 + a}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(b*x^4 + a)*x^6),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(b*x^4 + a)*x^6), x)
```

3.829 $\int \frac{x^{11}}{\sqrt{a-bx^4}}\,dx$

Optimal. Leaf size=62

$$-\frac{a^2\sqrt{a-bx^4}}{2b^3}-\frac{\left(a-bx^4\right)^{5/2}}{10b^3}+\frac{a\left(a-bx^4\right)^{3/2}}{3b^3}$$

```
[Out] -(a^2*Sqrt[a - b*x^4])/(2*b^3) + (a*(a - b*x^4)^(3/2))/(3*b^3) -
(a - b*x^4)^(5/2)/(10*b^3)
```

Rubi [A] time = 0.0922607, antiderivative size = 62, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125

$$-\frac{a^2\sqrt{a-bx^4}}{2b^3}-\frac{\left(a-bx^4\right)^{5/2}}{10b^3}+\frac{a\left(a-bx^4\right)^{3/2}}{3b^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^11/Sqrt[a - b*x^4],x]
```

```
[Out] -(a^2*Sqrt[a - b*x^4])/(2*b^3) + (a*(a - b*x^4)^(3/2))/(3*b^3) -
(a - b*x^4)^(5/2)/(10*b^3)
```

Rubi in Sympy [A] time = 11.7182, size = 49, normalized size = 0.79

$$-\frac{a^2\sqrt{a-bx^4}}{2b^3}+\frac{a\left(a-bx^4\right)^{\frac{3}{2}}}{3b^3}-\frac{\left(a-bx^4\right)^{\frac{5}{2}}}{10b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**11/(-b*x**4+a)**(1/2),x)
```

```
[Out] -a**2*sqrt(a - b*x**4)/(2*b**3) + a*(a - b*x**4)**(3/2)/(3*b**3)
- (a - b*x**4)**(5/2)/(10*b**3)
```

Mathematica [A] time = 0.0312255, size = 40, normalized size = 0.65

$$-\frac{\sqrt{a-bx^4}\left(8a^2+4abx^4+3b^2x^8\right)}{30b^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^11/Sqrt[a - b*x^4],x]
```

```
[Out] -(Sqrt[a - b*x^4]*(8*a^2 + 4*a*b*x^4 + 3*b^2*x^8))/(30*b^3)
```

Maple [A] time = 0.01, size = 37, normalized size = 0.6

$$-\frac{3\,b^2x^8+4\,abx^4+8\,a^2}{30\,b^3}\sqrt{-bx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^11/(-b*x^4+a)^(1/2),x)
```

```
[Out] -1/30*(-b*x^4+a)^(1/2)*(3*b^2*x^8+4*a*b*x^4+8*a^2)/b^3
```

Maxima [A] time = 1.44017, size = 68, normalized size = 1.1

$$-\frac{\left(-bx^4+a\right)^{\frac{5}{2}}}{10\,b^3}+\frac{\left(-bx^4+a\right)^{\frac{3}{2}}a}{3\,b^3}-\frac{\sqrt{-bx^4+a}a^2}{2\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/sqrt(-b*x^4 + a),x, algorithm="maxima")
```

```
[Out] -1/10*(-b*x^4 + a)^(5/2)/b^3 + 1/3*(-b*x^4 + a)^(3/2)*a/b^3 - 1/2
*sqrt(-b*x^4 + a)*a^2/b^3
```

Fricas [A] time = 0.255351, size = 49, normalized size = 0.79

$$-\frac{\left(3\,b^2x^8+4\,abx^4+8\,a^2\right)\sqrt{-bx^4+a}}{30\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/sqrt(-b*x^4 + a),x, algorithm="fricas")
```

```
[Out] -1/30*(3*b^2*x^8 + 4*a*b*x^4 + 8*a^2)*sqrt(-b*x^4 + a)/b^3
```

Sympy [A] time = 8.98152, size = 70, normalized size = 1.13

$$\begin{cases} -\frac{4a^2\sqrt{a-bx^4}}{15b^3}-\frac{2ax^4\sqrt{a-bx^4}}{15b^2}-\frac{x^8\sqrt{a-bx^4}}{10b} & \text{for } b\neq 0 \\ \frac{x^{12}}{12\sqrt{a}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11/(-b*x**4+a)**(1/2),x)
```

```
[Out] Piecewise((-4*a**2*sqrt(a - b*x**4)/(15*b**3) - 2*a*x**4*sqrt(a -
 b*x**4)/(15*b**2) - x**8*sqrt(a - b*x**4)/(10*b), Ne(b, 0)), (x*
*12/(12*sqrt(a)), True))
```

GIAC/XCAS [A] time = 0.218517, size = 77, normalized size = 1.24

$$-\frac{3\left(bx^4-a\right)^2\sqrt{-bx^4+a}-10\left(-bx^4+a\right)^{\frac{3}{2}}a+15\sqrt{-bx^4+a}a^2}{30\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/sqrt(-b*x^4 + a),x, algorithm="giac")
```

```
[Out] -1/30*(3*(b*x^4 - a)^2*sqrt(-b*x^4 + a) - 10*(-b*x^4 + a)^(3/2)*a
 + 15*sqrt(-b*x^4 + a)*a^2)/b^3
```

3.830 $\int \frac{x^7}{\sqrt{a-bx^4}}\,dx$

Optimal. Leaf size=40

$$\frac{(a-bx^4)^{3/2}}{6b^2}-\frac{a\sqrt{a-bx^4}}{2b^2}$$

```
[Out] -(a*Sqrt[a - b*x^4])/(2*b^2) + (a - b*x^4)^(3/2)/(6*b^2)
```

Rubi [A] time = 0.064627, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125

$$\frac{(a-bx^4)^{3/2}}{6b^2}-\frac{a\sqrt{a-bx^4}}{2b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7/Sqrt[a - b*x^4],x]

[Out] -(a*Sqrt[a - b*x^4])/(2*b^2) + (a - b*x^4)^(3/2)/(6*b^2)
```

Rubi in Sympy [A] time = 7.90742, size = 31, normalized size = 0.78

$$-\frac{a\sqrt{a-bx^4}}{2b^2}+\frac{(a-bx^4)^{\frac{3}{2}}}{6b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7/(-b*x**4+a)**(1/2),x)

[Out] -a*sqrt(a - b*x**4)/(2*b**2) + (a - b*x**4)**(3/2)/(6*b**2)
```

Mathematica [A] time = 0.0235731, size = 28, normalized size = 0.7

$$-\frac{\sqrt{a-bx^4}\,(2a+bx^4)}{6b^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^7/Sqrt[a - b*x^4],x]

[Out] -(Sqrt[a - b*x^4]*(2*a + b*x^4))/(6*b^2)
```

Maple [A] time = 0.007, size = 25, normalized size = 0.6

$$-\frac{bx^4+2\,a}{6\,b^2}\sqrt{-bx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7/(-b*x^4+a)^(1/2),x)
```

```
[Out] -1/6*(-b*x^4+a)^(1/2)*(b*x^4+2*a)/b^2
```

Maxima [A] time = 1.42636, size = 43, normalized size = 1.08

$$\frac{\left(-bx^4+a\right)^{\frac{3}{2}}}{6\,b^2}-\frac{\sqrt{-bx^4+a}a}{2\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(-b*x^4 + a),x, algorithm="maxima")
```

```
[Out] 1/6*(-b*x^4 + a)^(3/2)/b^2 - 1/2*sqrt(-b*x^4 + a)*a/b^2
```

Fricas [A] time = 0.270373, size = 32, normalized size = 0.8

$$-\frac{\left(bx^4+2\,a\right)\sqrt{-bx^4+a}}{6\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(-b*x^4 + a),x, algorithm="fricas")
```

```
[Out] -1/6*(b*x^4 + 2*a)*sqrt(-b*x^4 + a)/b^2
```

Sympy [A] time = 3.58123, size = 44, normalized size = 1.1

$$\begin{cases} -\frac{a\sqrt{a-bx^4}}{3b^2}-\frac{x^4\sqrt{a-bx^4}}{6b} & \text{for } b\neq 0 \\ \frac{x^8}{8\sqrt{a}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(-b*x**4+a)**(1/2),x)
```

```
[Out] Piecewise((-a*sqrt(a - b*x**4)/(3*b**2) - x**4*sqrt(a - b*x**4)/(
6*b), Ne(b, 0)), (x**8/(8*sqrt(a)), True))
```

GIAC/XCAS [A] time = 0.218204, size = 39, normalized size = 0.98

$$\frac{\left(-bx^4+a\right)^{\frac{3}{2}}-3\sqrt{-bx^4+a}a}{6\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(-b*x^4 + a),x, algorithm="giac")
```

```
[Out] 1/6*((-b*x^4 + a)^(3/2) - 3*sqrt(-b*x^4 + a)*a)/b^2
```

3.831 $\int \frac{x^3}{\sqrt{a-bx^4}} \, dx$

Optimal. Leaf size=19

$$-\frac{\sqrt{a-bx^4}}{2b}$$

```
[Out] -Sqrt[a - b*x^4]/(2*b)
```

Rubi [A] time = 0.0112074, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.062$

$$-\frac{\sqrt{a-bx^4}}{2b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/Sqrt[a - b*x^4],x]

[Out] -Sqrt[a - b*x^4]/(2*b)
```

Rubi in Sympy [A] time = 2.38299, size = 14, normalized size = 0.74

$$-\frac{\sqrt{a-bx^4}}{2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(-b*x**4+a)**(1/2),x)

[Out] -sqrt(a - b*x**4)/(2*b)
```

Mathematica [A] time = 0.00816565, size = 19, normalized size = 1.

$$-\frac{\sqrt{a-bx^4}}{2b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/Sqrt[a - b*x^4],x]

[Out] -Sqrt[a - b*x^4]/(2*b)
```

Maple [A] time = 0.005, size = 16, normalized size = 0.8

$$-\frac{1}{2\,b}\sqrt{-bx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(-b*x^4+a)^(1/2),x)

[Out] -1/2*(-b*x^4+a)^(1/2)/b
```

Maxima [A] time = 1.43872, size = 20, normalized size = 1.05

$$-\frac{\sqrt{-bx^4+a}}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(-b*x^4 + a),x, algorithm="maxima")
```

```
[Out] -1/2*sqrt(-b*x^4 + a)/b
```

Fricas [A] time = 0.225568, size = 20, normalized size = 1.05

$$-\frac{\sqrt{-bx^4+a}}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(-b*x^4 + a),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(-b*x^4 + a)/b
```

Sympy [A] time = 1.68569, size = 24, normalized size = 1.26

$$\begin{cases} -\frac{\sqrt{a-bx^4}}{2b} & \text{for}\ b \neq 0 \\ \frac{x^4}{4\sqrt{a}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(-b*x**4+a)**(1/2),x)
```

```
[Out] Piecewise((-sqrt(a - b*x**4)/(2*b), Ne(b, 0)), (x**4/(4*sqrt(a)),
 True))
```

GIAC/XCAS [A] time = 0.215174, size = 20, normalized size = 1.05

$$-\frac{\sqrt{-bx^4+a}}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(-b*x^4 + a),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(-b*x^4 + a)/b
```

3.832 $\int \frac{1}{x\sqrt{a-bx^4}}\,dx$

Optimal. Leaf size=28

$$-\frac{\tanh^{-1}\left(\frac{\sqrt{a-bx^4}}{\sqrt{a}}\right)}{2\sqrt{a}}$$

```
[Out] -ArcTanh[Sqrt[a - b*x^4]/Sqrt[a]]/(2*Sqrt[a])
```

Rubi [A] time = 0.0505528, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.188

$$-\frac{\tanh^{-1}\left(\frac{\sqrt{a-bx^4}}{\sqrt{a}}\right)}{2\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*Sqrt[a - b*x^4]),x]

[Out] -ArcTanh[Sqrt[a - b*x^4]/Sqrt[a]]/(2*Sqrt[a])
```

Rubi in Sympy [A] time = 5.64752, size = 24, normalized size = 0.86

$$-\frac{\operatorname{atanh}\left(\frac{\sqrt{a-bx^4}}{\sqrt{a}}\right)}{2\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(-b*x**4+a)**(1/2),x)

[Out] -atanh(sqrt(a - b*x**4)/sqrt(a))/(2*sqrt(a))
```

Mathematica [A] time = 0.0758824, size = 28, normalized size = 1.

$$-\frac{\tanh^{-1}\left(\frac{\sqrt{a-bx^4}}{\sqrt{a}}\right)}{2\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*Sqrt[a - b*x^4]),x]

[Out] -ArcTanh[Sqrt[a - b*x^4]/Sqrt[a]]/(2*Sqrt[a])
```

Maple [A] time = 0.016, size = 30, normalized size = 1.1

$$-\frac{1}{2}\ln\left(\frac{1}{x^2}\left(2a+2\sqrt{a}\sqrt{-bx^4+a}\right)\right)\frac{1}{\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(-b*x^4+a)^(1/2),x)
```

```
[Out] -1/2/a^(1/2)*ln((2*a+2*a^(1/2)*(-b*x^4+a)^(1/2))/x^2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-b*x^4 + a)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.26438, size = 1, normalized size = 0.04

$$\left[\frac{\log\left(\frac{(bx^4-2a)\sqrt{a}+2\sqrt{-bx^4+a}a}{x^4}\right)}{4\sqrt{a}}, \frac{\arctan\left(\frac{a}{\sqrt{-bx^4+a}\sqrt{-a}}\right)}{2\sqrt{-a}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-b*x^4 + a)*x),x, algorithm="fricas")
```

```
[Out] [1/4*log(((b*x^4 - 2*a)*sqrt(a) + 2*sqrt(-b*x^4 + a)*a)/x^4)/sqrt
(a), 1/2*arctan(a/(sqrt(-b*x^4 + a)*sqrt(-a)))/sqrt(-a)]
```

Sympy [A] time = 3.89452, size = 53, normalized size = 1.89

$$\begin{cases} -\frac{\operatorname{acosh}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2\sqrt{a}} & \text{for } \left|\frac{a}{bx^4}\right| > 1 \\ \frac{i\operatorname{asin}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2\sqrt{a}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(-b*x**4+a)**(1/2),x)
```

```
[Out] Piecewise((-acosh(sqrt(a)/(sqrt(b)*x**2))/(2*sqrt(a)), Abs(a/(b*x
**4)) > 1), (I*asin(sqrt(a)/(sqrt(b)*x**2))/(2*sqrt(a)), True))
```

GIAC/XCAS [A] time = 0.223323, size = 32, normalized size = 1.14

$$\frac{\arctan\left(\frac{\sqrt{-bx^4+a}}{\sqrt{-a}}\right)}{2\sqrt{-a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-b*x^4 + a)*x),x, algorithm="giac")
```

```
[Out] 1/2*arctan(sqrt(-b*x^4 + a)/sqrt(-a))/sqrt(-a)
```

3.833 $\int \frac{1}{x^5\sqrt{a-bx^4}}\,dx$

Optimal. Leaf size=52

$$-\frac{b\tanh^{-1}\left(\frac{\sqrt{a-bx^4}}{\sqrt{a}}\right)}{4a^{3/2}}-\frac{\sqrt{a-bx^4}}{4ax^4}$$

```
[Out] -Sqrt[a - b*x^4]/(4*a*x^4) - (b*ArcTanh[Sqrt[a - b*x^4]/Sqrt[a]])
/(4*a^(3/2))
```

Rubi [A] time = 0.0787222, antiderivative size = 52, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25

$$-\frac{b\tanh^{-1}\left(\frac{\sqrt{a-bx^4}}{\sqrt{a}}\right)}{4a^{3/2}}-\frac{\sqrt{a-bx^4}}{4ax^4}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^5*Sqrt[a - b*x^4]),x]
```

```
[Out] -Sqrt[a - b*x^4]/(4*a*x^4) - (b*ArcTanh[Sqrt[a - b*x^4]/Sqrt[a]])
/(4*a^(3/2))
```

Rubi in Sympy [A] time = 7.78037, size = 42, normalized size = 0.81

$$-\frac{\sqrt{a-bx^4}}{4ax^4}-\frac{b\,\mathrm{atanh}\left(\frac{\sqrt{a-bx^4}}{\sqrt{a}}\right)}{4a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**5/(-b*x**4+a)**(1/2),x)
```

```
[Out] -sqrt(a - b*x**4)/(4*a*x**4) - b*atanh(sqrt(a - b*x**4)/sqrt(a))/
(4*a**(3/2))
```

Mathematica [A] time = 0.0984556, size = 52, normalized size = 1.

$$-\frac{b\tanh^{-1}\left(\frac{\sqrt{a-bx^4}}{\sqrt{a}}\right)}{4a^{3/2}}-\frac{\sqrt{a-bx^4}}{4ax^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^5*Sqrt[a - b*x^4]),x]
```

```
[Out] -Sqrt[a - b*x^4]/(4*a*x^4) - (b*ArcTanh[Sqrt[a - b*x^4]/Sqrt[a]])
/(4*a^(3/2))
```

Maple [A] time = 0.018, size = 50, normalized size = 1.

$$-\frac{1}{4\,a{x}^{4}}\sqrt{-b{x}^{4}+a}-\frac{b}{4}\ln\left(\frac{1}{{x}^{2}}\left(2\,a+2\,\sqrt{a}\sqrt{-b{x}^{4}+a}\right)\right){a}^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^5/(-b*x^4+a)^(1/2),x)
```

```
[Out] -1/4*(-b*x^4+a)^(1/2)/a/x^4-1/4*b/a^(3/2)*ln((2*a+2*a^(1/2)*(-b*x
^4+a)^(1/2))/x^2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-b*x^4 + a)*x^5),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.287458, size = 1, normalized size = 0.02

$$\left[\frac{bx^4 \log\left(\frac{(bx^4-2\,a)\,\sqrt{a}+2\,\sqrt{-bx^4+a}a}{x^4}\right) - 2\,\sqrt{-bx^4+a}\sqrt{a}}{8\,a^{\frac{3}{2}}x^4}, \frac{bx^4 \arctan\left(\frac{a}{\sqrt{-bx^4+a}\sqrt{-a}}\right) - \sqrt{-bx^4+a}\sqrt{-a}}{4\,\sqrt{-a}ax^4}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-b*x^4 + a)*x^5),x, algorithm="fricas")
```

```
[Out] [1/8*(b*x^4*log(((b*x^4 - 2*a)*sqrt(a) + 2*sqrt(-b*x^4 + a)*a)/x^
4) - 2*sqrt(-b*x^4 + a)*sqrt(a))/(a^(3/2)*x^4), 1/4*(b*x^4*arctan
(a/(sqrt(-b*x^4 + a)*sqrt(-a))) - sqrt(-b*x^4 + a)*sqrt(-a))/(sqr
t(-a)*a*x^4)]
```

Sympy [A] time = 8.47815, size = 129, normalized size = 2.48

$$\begin{cases} -\frac{\sqrt{b}\sqrt{\frac{a}{bx^4}-1}}{4ax^2} - \frac{b\,\mathrm{acosh}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{4a^{\frac{3}{2}}} & \text{for } \left|\frac{a}{bx^4}\right| > 1 \\ \frac{i}{4\sqrt{b}x^6\sqrt{-\frac{a}{bx^4}+1}} - \frac{i\sqrt{b}}{4ax^2\sqrt{-\frac{a}{bx^4}+1}} + \frac{ib\,\mathrm{asin}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{4a^{\frac{3}{2}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**5/(-b*x**4+a)**(1/2),x)
```

```
[Out] Piecewise((-sqrt(b)*sqrt(a/(b*x**4) - 1)/(4*a*x**2) - b*acosh(sqr
t(a)/(sqrt(b)*x**2))/(4*a**(3/2)), Abs(a/(b*x**4)) > 1), (I/(4*sq
rt(b)*x**6*sqrt(-a/(b*x**4) + 1)) - I*sqrt(b)/(4*a*x**2*sqrt(-a/(
b*x**4) + 1)) + I*b*asin(sqrt(a)/(sqrt(b)*x**2))/(4*a**(3/2)), Tr
ue))
```

GIAC/XCAS [A] time = 0.214263, size = 69, normalized size = 1.33

$$\frac{1}{4}\,b\left(\frac{\arctan\left(\frac{\sqrt{-bx^4+a}}{\sqrt{-a}}\right)}{\sqrt{-a}a} - \frac{\sqrt{-bx^4+a}}{abx^4}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-b*x^4 + a)*x^5),x, algorithm="giac")
```

```
[Out] 1/4*b*(arctan(sqrt(-b*x^4 + a)/sqrt(-a))/(sqrt(-a)*a) - sqrt(-b*x
^4 + a)/(a*b*x^4))
```

3.834 $\int \frac{x^5}{\sqrt{a-bx^4}}\,dx$

Optimal. Leaf size=55

$$\frac{a\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}\right)}{4b^{3/2}}-\frac{x^2\sqrt{a-bx^4}}{4b}$$

```
[Out] -(x^2*Sqrt[a - b*x^4])/(4*b) + (a*ArcTan[(Sqrt[b]*x^2)/Sqrt[a - b
*x^4]])/(4*b^(3/2))
```

Rubi [A] time = 0.0814901, antiderivative size = 55, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25

$$\frac{a\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}\right)}{4b^{3/2}}-\frac{x^2\sqrt{a-bx^4}}{4b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/Sqrt[a - b*x^4],x]
```

```
[Out] -(x^2*Sqrt[a - b*x^4])/(4*b) + (a*ArcTan[(Sqrt[b]*x^2)/Sqrt[a - b
*x^4]])/(4*b^(3/2))
```

Rubi in Sympy [A] time = 8.75837, size = 44, normalized size = 0.8

$$\frac{a\,\mathrm{atan}\left(\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}\right)}{4b^{\frac{3}{2}}}-\frac{x^2\sqrt{a-bx^4}}{4b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(-b*x**4+a)**(1/2),x)
```

```
[Out] a*atan(sqrt(b)*x**2/sqrt(a - b*x**4))/(4*b**(3/2)) - x**2*sqrt(a
- b*x**4)/(4*b)
```

Mathematica [A] time = 0.0556924, size = 55, normalized size = 1.

$$\frac{a\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}\right)}{4b^{3/2}}-\frac{x^2\sqrt{a-bx^4}}{4b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/Sqrt[a - b*x^4],x]
```

```
[Out] -(x^2*Sqrt[a - b*x^4])/(4*b) + (a*ArcTan[(Sqrt[b]*x^2)/Sqrt[a - b
*x^4]])/(4*b^(3/2))
```

Maple [A] time = 0.019, size = 44, normalized size = 0.8

$$\frac{a}{4}\arctan\left(x^2\sqrt{b}\frac{1}{\sqrt{-bx^4+a}}\right)b^{-\frac{3}{2}}-\frac{x^2}{4\,b}\sqrt{-bx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(-b*x^4+a)^(1/2),x)
```

```
[Out] 1/4*a*arctan(x^2*b^(1/2)/(-b*x^4+a)^(1/2))/b^(3/2)-1/4*x^2*(-b*x^
4+a)^(1/2)/b
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(-b*x^4 + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.260498, size = 1, normalized size = 0.02

$$\left[-\frac{2\sqrt{-bx^4+a}\sqrt{-b}x^2 - a\log\left(2\sqrt{-bx^4+a}bx^2 + \left(2bx^4-a\right)\sqrt{-b}\right)}{8\sqrt{-b}b}, -\frac{\sqrt{-bx^4+a}\sqrt{b}x^2 - a\arctan\left(\frac{\sqrt{b}x^2}{\sqrt{-bx^4+a}}\right)}{4b^{\frac{3}{2}}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(-b*x^4 + a),x, algorithm="fricas")
```

```
[Out] [-1/8*(2*sqrt(-b*x^4 + a)*sqrt(-b)*x^2 - a*log(2*sqrt(-b*x^4 + a)
*b*x^2 + (2*b*x^4 - a)*sqrt(-b)))/(sqrt(-b)*b), -1/4*(sqrt(-b*x^4
 + a)*sqrt(b)*x^2 - a*arctan(sqrt(b)*x^2/sqrt(-b*x^4 + a)))/b^(3/
2)]
```

Sympy [A] time = 7.83894, size = 128, normalized size = 2.33

$$\begin{cases} -\frac{i\sqrt{a}x^2\sqrt{-1+\frac{bx^4}{a}}}{4b} - \frac{ia\operatorname{acosh}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{4b^{\frac{3}{2}}} & \text{for } \left|\frac{bx^4}{a}\right| > 1 \\ -\frac{\sqrt{a}x^2}{4b\sqrt{1-\frac{bx^4}{a}}} + \frac{a\operatorname{asin}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{4b^{\frac{3}{2}}} + \frac{x^6}{4\sqrt{a}\sqrt{1-\frac{bx^4}{a}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(-b*x**4+a)**(1/2),x)
```

```
[Out] Piecewise((-I*sqrt(a)*x**2*sqrt(-1 + b*x**4/a)/(4*b) - I*a*acosh(
sqrt(b)*x**2/sqrt(a))/(4*b**(3/2)), Abs(b*x**4/a) > 1), (-sqrt(a)
*x**2/(4*b*sqrt(1 - b*x**4/a)) + a*asin(sqrt(b)*x**2/sqrt(a))/(4*
b**(3/2)) + x**6/(4*sqrt(a)*sqrt(1 - b*x**4/a)), True))
```

GIAC/XCAS [A] time = 0.235467, size = 72, normalized size = 1.31

$$-\frac{\sqrt{-bx^4+a}x^2}{4b} - \frac{a\ln\left(\left|-\sqrt{-b}x^2+\sqrt{-bx^4+a}\right|\right)}{4\sqrt{-b}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(-b*x^4 + a),x, algorithm="giac")
```

```
[Out] -1/4*sqrt(-b*x^4 + a)*x^2/b - 1/4*a*ln(abs(-sqrt(-b)*x^2 + sqrt(-
b*x^4 + a)))/(sqrt(-b)*b)
```

3.835 $\int \frac{x}{\sqrt{a-bx^4}}\,dx$

Optimal. Leaf size=31

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}\right)}{2\sqrt{b}}$$

```
[Out] ArcTan[(Sqrt[b]*x^2)/Sqrt[a - b*x^4]]/(2*Sqrt[b])
```

Rubi [A] time = 0.039516, antiderivative size = 31, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}\right)}{2\sqrt{b}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/Sqrt[a - b*x^4],x]

[Out] ArcTan[(Sqrt[b]*x^2)/Sqrt[a - b*x^4]]/(2*Sqrt[b])
```

Rubi in Sympy [A] time = 4.47612, size = 26, normalized size = 0.84

$$\frac{\operatorname{atan}\left(\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}\right)}{2\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(-b*x**4+a)**(1/2),x)

[Out] atan(sqrt(b)*x**2/sqrt(a - b*x**4))/(2*sqrt(b))
```

Mathematica [A] time = 0.0121114, size = 31, normalized size = 1.

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}\right)}{2\sqrt{b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/Sqrt[a - b*x^4],x]

[Out] ArcTan[(Sqrt[b]*x^2)/Sqrt[a - b*x^4]]/(2*Sqrt[b])
```

Maple [A] time = 0.008, size = 24, normalized size = 0.8

$$\frac{1}{2}\arctan\left(x^2\sqrt{b}\frac{1}{\sqrt{-bx^4+a}}\right)\frac{1}{\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(-b*x^4+a)^(1/2),x)
```

```
[Out] 1/2*arctan(x^2*b^(1/2)/(-b*x^4+a)^(1/2))/b^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(-b*x^4 + a),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [A] time = 0.247086, size = 1, normalized size = 0.03

$$\left[\frac{\log\left(2\sqrt{-bx^4+a}bx^2+\left(2bx^4-a\right)\sqrt{-b}\right)}{4\sqrt{-b}}, \frac{\arctan\left(\frac{\sqrt{b}x^2}{\sqrt{-bx^4+a}}\right)}{2\sqrt{b}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(-b*x^4 + a),x, algorithm="fricas")

[Out] [1/4*log(2*sqrt(-b*x^4 + a)*b*x^2 + (2*b*x^4 - a)*sqrt(-b))/sqrt(
-b), 1/2*arctan(sqrt(b)*x^2/sqrt(-b*x^4 + a))/sqrt(b)]
```

Sympy [A] time = 3.75775, size = 53, normalized size = 1.71

$$\begin{cases} -\frac{i \operatorname{acosh}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2\sqrt{b}} & \text{for}\ \left|\frac{bx^4}{a}\right| > 1 \\ \frac{\operatorname{asin}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2\sqrt{b}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(-b*x**4+a)**(1/2),x)

[Out] Piecewise((-I*acosh(sqrt(b)*x**2/sqrt(a))/(2*sqrt(b)), Abs(b*x**4
/a) > 1), (asin(sqrt(b)*x**2/sqrt(a))/(2*sqrt(b)), True))
```

GIAC/XCAS [A] time = 0.223236, size = 41, normalized size = 1.32

$$-\frac{\ln\left(\left|-\sqrt{-b}x^2+\sqrt{-bx^4+a}\right|\right)}{2\sqrt{-b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(-b*x^4 + a),x, algorithm="giac")

[Out] -1/2*ln(abs(-sqrt(-b)*x^2 + sqrt(-b*x^4 + a)))/sqrt(-b)
```

3.836 $\int \frac{1}{x^3\sqrt{a-bx^4}}\,dx$

Optimal. Leaf size=22

$$-\frac{\sqrt{a-bx^4}}{2ax^2}$$

```
[Out] -Sqrt[a - b*x^4]/(2*a*x^2)
```

Rubi [A] time = 0.0209266, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062

$$-\frac{\sqrt{a-bx^4}}{2ax^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*Sqrt[a - b*x^4]),x]

[Out] -Sqrt[a - b*x^4]/(2*a*x^2)
```

Rubi in Sympy [A] time = 3.0411, size = 17, normalized size = 0.77

$$-\frac{\sqrt{a-bx^4}}{2ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(-b*x**4+a)**(1/2),x)

[Out] -sqrt(a - b*x**4)/(2*a*x**2)
```

Mathematica [A] time = 0.0173172, size = 22, normalized size = 1.

$$-\frac{\sqrt{a-bx^4}}{2ax^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*Sqrt[a - b*x^4]),x]

[Out] -Sqrt[a - b*x^4]/(2*a*x^2)
```

Maple [A] time = 0.006, size = 19, normalized size = 0.9

$$-\frac{1}{2\,ax^2}\sqrt{-bx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(-b*x^4+a)^(1/2),x)

[Out] -1/2*(-b*x^4+a)^(1/2)/a/x^2
```

Maxima [A] time = 1.43681, size = 24, normalized size = 1.09

$$-\frac{\sqrt{-bx^4 + a}}{2\,ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-b*x^4 + a)*x^3),x, algorithm="maxima")
```

```
[Out] -1/2*sqrt(-b*x^4 + a)/(a*x^2)
```

Fricas [A] time = 0.272873, size = 24, normalized size = 1.09

$$-\frac{\sqrt{-bx^4 + a}}{2\,ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-b*x^4 + a)*x^3),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(-b*x^4 + a)/(a*x^2)
```

Sympy [A] time = 2.21865, size = 51, normalized size = 2.32

$$\begin{cases} -\frac{\sqrt{b}\sqrt{\frac{a}{bx^4}-1}}{2a} & \text{for } \left|\frac{a}{bx^4}\right| > 1 \\ -\frac{i\sqrt{b}\sqrt{-\frac{a}{bx^4}+1}}{2a} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(-b*x**4+a)**(1/2),x)
```

```
[Out] Piecewise((-sqrt(b)*sqrt(a/(b*x**4) - 1)/(2*a), Abs(a/(b*x**4)) >
 1), (-I*sqrt(b)*sqrt(-a/(b*x**4) + 1)/(2*a), True))
```

GIAC/XCAS [A] time = 0.222101, size = 22, normalized size = 1.

$$-\frac{\sqrt{-b + \frac{a}{x^4}}}{2\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-b*x^4 + a)*x^3),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(-b + a/x^4)/a
```

3.837 $\int \frac{1}{x^7\sqrt{a-bx^4}}\,dx$

Optimal. Leaf size=46

$$-\frac{b\sqrt{a-bx^4}}{3a^2x^2}-\frac{\sqrt{a-bx^4}}{6ax^6}$$

```
[Out] -Sqrt[a - b*x^4]/(6*a*x^6) - (b*Sqrt[a - b*x^4])/(3*a^2*x^2)
```

Rubi [A] time = 0.0442738, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125

$$-\frac{b\sqrt{a-bx^4}}{3a^2x^2}-\frac{\sqrt{a-bx^4}}{6ax^6}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^7*Sqrt[a - b*x^4]),x]

[Out] -Sqrt[a - b*x^4]/(6*a*x^6) - (b*Sqrt[a - b*x^4])/(3*a^2*x^2)
```

Rubi in Sympy [A] time = 4.89733, size = 37, normalized size = 0.8

$$-\frac{\sqrt{a-bx^4}}{6ax^6}-\frac{b\sqrt{a-bx^4}}{3a^2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**7/(-b*x**4+a)**(1/2),x)

[Out] -sqrt(a - b*x**4)/(6*a*x**6) - b*sqrt(a - b*x**4)/(3*a**2*x**2)
```

Mathematica [A] time = 0.026636, size = 30, normalized size = 0.65

$$-\frac{\sqrt{a-bx^4}\left(a+2bx^4\right)}{6a^2x^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^7*Sqrt[a - b*x^4]),x]

[Out] -(Sqrt[a - b*x^4]*(a + 2*b*x^4))/(6*a^2*x^6)
```

Maple [A] time = 0.007, size = 27, normalized size = 0.6

$$-\frac{2\,bx^4+a}{6\,a^2x^6}\sqrt{-bx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^7/(-b*x^4+a)^(1/2),x)

[Out] -1/6*(-b*x^4+a)^(1/2)*(2*b*x^4+a)/a^2/x^6
```

Maxima [A] time = 1.4143, size = 49, normalized size = 1.07

$$-\frac{\frac{3\sqrt{-bx^4+a}b}{x^2}+\frac{(-bx^4+a)^{\frac{3}{2}}}{x^6}}{6a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-b*x^4 + a)*x^7),x, algorithm="maxima")
```

```
[Out] -1/6*(3*sqrt(-b*x^4 + a)*b/x^2 + (-b*x^4 + a)^(3/2)/x^6)/a^2
```

Fricas [A] time = 0.251375, size = 35, normalized size = 0.76

$$-\frac{(2bx^4+a)\sqrt{-bx^4+a}}{6a^2x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-b*x^4 + a)*x^7),x, algorithm="fricas")
```

```
[Out] -1/6*(2*b*x^4 + a)*sqrt(-b*x^4 + a)/(a^2*x^6)
```

Sympy [A] time = 3.81942, size = 189, normalized size = 4.11

$$\begin{cases} -\frac{\sqrt{b}\sqrt{\frac{a}{bx^4}-1}}{6ax^4}-\frac{b^{\frac{3}{2}}\sqrt{\frac{a}{bx^4}-1}}{3a^2} & \text{for } \left|\frac{a}{bx^4}\right|>1 \\ \frac{ia^2b^{\frac{3}{2}}\sqrt{-\frac{a}{bx^4}+1}}{-6a^3bx^4+6a^2b^2x^8}+\frac{iab^{\frac{5}{2}}x^4\sqrt{-\frac{a}{bx^4}+1}}{-6a^3bx^4+6a^2b^2x^8}-\frac{2ib^{\frac{7}{2}}x^8\sqrt{-\frac{a}{bx^4}+1}}{-6a^3bx^4+6a^2b^2x^8} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**7/(-b*x**4+a)**(1/2),x)
```

```
[Out] Piecewise((-sqrt(b)*sqrt(a/(b*x**4) - 1)/(6*a*x**4) - b**(3/2)*sq
rt(a/(b*x**4) - 1)/(3*a**2), Abs(a/(b*x**4)) > 1), (I*a**2*b**(3/
2)*sqrt(-a/(b*x**4) + 1)/(-6*a**3*b*x**4 + 6*a**2*b**2*x**8) + I*
a*b**(5/2)*x**4*sqrt(-a/(b*x**4) + 1)/(-6*a**3*b*x**4 + 6*a**2*b*
*2*x**8) - 2*I*b**(7/2)*x**8*sqrt(-a/(b*x**4) + 1)/(-6*a**3*b*x**
4 + 6*a**2*b**2*x**8), True))
```

GIAC/XCAS [A] time = 0.2161, size = 42, normalized size = 0.91

$$-\frac{3b\sqrt{-b+\frac{a}{x^4}}+\left(-b+\frac{a}{x^4}\right)^{\frac{3}{2}}}{6a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-b*x^4 + a)*x^7),x, algorithm="giac")
```

```
[Out] -1/6*(3*b*sqrt(-b + a/x^4) + (-b + a/x^4)^(3/2))/a^2
```

3.838 $\int \frac{1}{x^{11}\sqrt{a-bx^4}}\,dx$

Optimal. Leaf size=71

$$-\frac{4b^2\sqrt{a-bx^4}}{15a^3x^2}-\frac{2b\sqrt{a-bx^4}}{15a^2x^6}-\frac{\sqrt{a-bx^4}}{10ax^{10}}$$

```
[Out] -Sqrt[a - b*x^4]/(10*a*x^10) - (2*b*Sqrt[a - b*x^4])/(15*a^2*x^6)
 - (4*b^2*Sqrt[a - b*x^4])/(15*a^3*x^2)
```

Rubi [A] time = 0.0700337, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125

$$-\frac{4b^2\sqrt{a-bx^4}}{15a^3x^2}-\frac{2b\sqrt{a-bx^4}}{15a^2x^6}-\frac{\sqrt{a-bx^4}}{10ax^{10}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^11*Sqrt[a - b*x^4]),x]
```

```
[Out] -Sqrt[a - b*x^4]/(10*a*x^10) - (2*b*Sqrt[a - b*x^4])/(15*a^2*x^6)
 - (4*b^2*Sqrt[a - b*x^4])/(15*a^3*x^2)
```

Rubi in Sympy [A] time = 7.63583, size = 63, normalized size = 0.89

$$-\frac{\sqrt{a-bx^4}}{10ax^{10}}-\frac{2b\sqrt{a-bx^4}}{15a^2x^6}-\frac{4b^2\sqrt{a-bx^4}}{15a^3x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**11/(-b*x**4+a)**(1/2),x)
```

```
[Out] -sqrt(a - b*x**4)/(10*a*x**10) - 2*b*sqrt(a - b*x**4)/(15*a**2*x*
*6) - 4*b**2*sqrt(a - b*x**4)/(15*a**3*x**2)
```

Mathematica [A] time = 0.0332488, size = 43, normalized size = 0.61

$$-\frac{\sqrt{a-bx^4}\left(3a^2+4abx^4+8b^2x^8\right)}{30a^3x^{10}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^11*Sqrt[a - b*x^4]),x]
```

```
[Out] -(Sqrt[a - b*x^4]*(3*a^2 + 4*a*b*x^4 + 8*b^2*x^8))/(30*a^3*x^10)
```

Maple [A] time = 0.008, size = 40, normalized size = 0.6

$$-\frac{8\,b^2x^8+4\,abx^4+3\,a^2}{30\,x^{10}a^3}\sqrt{-bx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^11/(-b*x^4+a)^(1/2),x)
```

```
[Out] -1/30*(-b*x^4+a)^(1/2)*(8*b^2*x^8+4*a*b*x^4+3*a^2)/x^10/a^3
```

Maxima [A] time = 1.5259, size = 74, normalized size = 1.04

$$-\frac{\frac{15\sqrt{-bx^4+a}b^2}{x^2} + \frac{10\left(-bx^4+a\right)^{\frac{3}{2}}b}{x^6} + \frac{3\left(-bx^4+a\right)^{\frac{5}{2}}}{x^{10}}}{30\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-b*x^4 + a)*x^11),x, algorithm="maxima")
```

```
[Out] -1/30*(15*sqrt(-b*x^4 + a)*b^2/x^2 + 10*(-b*x^4 + a)^(3/2)*b/x^6
+ 3*(-b*x^4 + a)^(5/2)/x^10)/a^3
```

Fricas [A] time = 0.273372, size = 53, normalized size = 0.75

$$-\frac{\left(8\,b^2x^8 + 4\,abx^4 + 3\,a^2\right)\sqrt{-bx^4 + a}}{30\,a^3x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-b*x^4 + a)*x^11),x, algorithm="fricas")
```

```
[Out] -1/30*(8*b^2*x^8 + 4*a*b*x^4 + 3*a^2)*sqrt(-b*x^4 + a)/(a^3*x^10)
```

Sympy [A] time = 8.24177, size = 609, normalized size = 8.58

$$\begin{cases} -\frac{3a^4b^{\frac{9}{2}}\sqrt{\frac{a}{bx^4}-1}}{30a^5b^4x^8-60a^4b^5x^{12}+30a^3b^6x^{16}} + \frac{2a^3b^{\frac{11}{2}}x^4\sqrt{\frac{a}{bx^4}-1}}{30a^5b^4x^8-60a^4b^5x^{12}+30a^3b^6x^{16}} - \frac{3a^2b^{\frac{13}{2}}x^8\sqrt{\frac{a}{bx^4}-1}}{30a^5b^4x^8-60a^4b^5x^{12}+30a^3b^6x^{16}} + \frac{12ab^{\frac{15}{2}}x^{12}\sqrt{\frac{a}{bx^4}-1}}{30a^5b^4x^8-60a^4b^5x^{12}+30a^3b^6x^{16}} - \frac{\quad}{30a^5 \ldots} \\ -\frac{3ia^4b^{\frac{9}{2}}\sqrt{-\frac{a}{bx^4}+1}}{30a^5b^4x^8-60a^4b^5x^{12}+30a^3b^6x^{16}} + \frac{2ia^3b^{\frac{11}{2}}x^4\sqrt{-\frac{a}{bx^4}+1}}{30a^5b^4x^8-60a^4b^5x^{12}+30a^3b^6x^{16}} - \frac{3ia^2b^{\frac{13}{2}}x^8\sqrt{-\frac{a}{bx^4}+1}}{30a^5b^4x^8-60a^4b^5x^{12}+30a^3b^6x^{16}} + \frac{12iab^{\frac{15}{2}}x^{12}\sqrt{-\frac{a}{bx^4}+1}}{30a^5b^4x^8-60a^4b^5x^{12}+30a^3b^6x^{16}} - \frac{\quad}{30a^5 \ldots} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**11/(-b*x**4+a)**(1/2),x)
```

```
[Out] Piecewise((-3*a**4*b**(9/2)*sqrt(a/(b*x**4) - 1)/(30*a**5*b**4*x*
*8 - 60*a**4*b**5*x**12 + 30*a**3*b**6*x**16) + 2*a**3*b**(11/2)*
x**4*sqrt(a/(b*x**4) - 1)/(30*a**5*b**4*x**8 - 60*a**4*b**5*x**12
 + 30*a**3*b**6*x**16) - 3*a**2*b**(13/2)*x**8*sqrt(a/(b*x**4) -
1)/(30*a**5*b**4*x**8 - 60*a**4*b**5*x**12 + 30*a**3*b**6*x**16)
+ 12*a*b**(15/2)*x**12*sqrt(a/(b*x**4) - 1)/(30*a**5*b**4*x**8 -
60*a**4*b**5*x**12 + 30*a**3*b**6*x**16) - 8*b**(17/2)*x**16*sqrt
(a/(b*x**4) - 1)/(30*a**5*b**4*x**8 - 60*a**4*b**5*x**12 + 30*a**
3*b**6*x**16), Abs(a/(b*x**4)) > 1), (-3*I*a**4*b**(9/2)*sqrt(-a/
(b*x**4) + 1)/(30*a**5*b**4*x**8 - 60*a**4*b**5*x**12 + 30*a**3*b
**6*x**16) + 2*I*a**3*b**(11/2)*x**4*sqrt(-a/(b*x**4) + 1)/(30*a*
*5*b**4*x**8 - 60*a**4*b**5*x**12 + 30*a**3*b**6*x**16) - 3*I*a**
2*b**(13/2)*x**8*sqrt(-a/(b*x**4) + 1)/(30*a**5*b**4*x**8 - 60*a*
*4*b**5*x**12 + 30*a**3*b**6*x**16) + 12*I*a*b**(15/2)*x**12*sqrt
(-a/(b*x**4) + 1)/(30*a**5*b**4*x**8 - 60*a**4*b**5*x**12 + 30*a*
*3*b**6*x**16) - 8*I*b**(17/2)*x**16*sqrt(-a/(b*x**4) + 1)/(30*a*
*5*b**4*x**8 - 60*a**4*b**5*x**12 + 30*a**3*b**6*x**16), True))
```

GIAC/XCAS [A] time = 0.219657, size = 80, normalized size = 1.13

$$-\frac{3\left(b - \frac{a}{x^4}\right)^2\sqrt{-b + \frac{a}{x^4}} + 15\,b^2\sqrt{-b + \frac{a}{x^4}} + 10\,b\left(-b + \frac{a}{x^4}\right)^{\frac{3}{2}}}{30\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-b*x^4 + a)*x^11),x, algorithm="giac")
```

```
[Out] -1/30*(3*(b - a/x^4)^2*sqrt(-b + a/x^4) + 15*b^2*sqrt(-b + a/x^4)
 + 10*b*(-b + a/x^4)^(3/2))/a^3
```

3.839 $\int \frac{x^8}{\sqrt{a-bx^4}} \, dx$

Optimal. Leaf size=100

$$\frac{5a^{9/4}\sqrt{1-\frac{bx^4}{a}}F\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{21b^{9/4}\sqrt{a-bx^4}}-\frac{5ax\sqrt{a-bx^4}}{21b^2}-\frac{x^5\sqrt{a-bx^4}}{7b}$$

```
[Out] (-5*a*x*Sqrt[a - b*x^4])/(21*b^2) - (x^5*Sqrt[a - b*x^4])/(7*b) +
 (5*a^(9/4)*Sqrt[1 - (b*x^4)/a]*EllipticF[ArcSin[(b^(1/4)*x)/a^(1
/4)], -1])/(21*b^(9/4)*Sqrt[a - b*x^4])
```

Rubi [A] time = 0.100349, antiderivative size = 100, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.188

$$\frac{5a^{9/4}\sqrt{1-\frac{bx^4}{a}}F\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{21b^{9/4}\sqrt{a-bx^4}}-\frac{5ax\sqrt{a-bx^4}}{21b^2}-\frac{x^5\sqrt{a-bx^4}}{7b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8/Sqrt[a - b*x^4],x]
```

```
[Out] (-5*a*x*Sqrt[a - b*x^4])/(21*b^2) - (x^5*Sqrt[a - b*x^4])/(7*b) +
 (5*a^(9/4)*Sqrt[1 - (b*x^4)/a]*EllipticF[ArcSin[(b^(1/4)*x)/a^(1
/4)], -1])/(21*b^(9/4)*Sqrt[a - b*x^4])
```

Rubi in Sympy [A] time = 12.8651, size = 88, normalized size = 0.88

$$\frac{5a^{\frac{9}{4}}\sqrt{1-\frac{bx^4}{a}}F\left(\operatorname{asin}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{21b^{\frac{9}{4}}\sqrt{a-bx^4}}-\frac{5ax\sqrt{a-bx^4}}{21b^2}-\frac{x^5\sqrt{a-bx^4}}{7b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8/(-b*x**4+a)**(1/2),x)
```

```
[Out] 5*a**(9/4)*sqrt(1 - b*x**4/a)*elliptic_f(asin(b**(1/4)*x/a**(1/4)
), -1)/(21*b**(9/4)*sqrt(a - b*x**4)) - 5*a*x*sqrt(a - b*x**4)/(2
1*b**2) - x**5*sqrt(a - b*x**4)/(7*b)
```

Mathematica [C] time = 0.160883, size = 122, normalized size = 1.22

$$\frac{x\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}\left(-5a^2+2abx^4+3b^2x^8\right)-5ia^2\sqrt{1-\frac{bx^4}{a}}F\left(i\sinh^{-1}\left(\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)}{21b^2\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}\sqrt{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8/Sqrt[a - b*x^4],x]
```

```
[Out] (Sqrt[-(Sqrt[b]/Sqrt[a])]*x*(-5*a^2 + 2*a*b*x^4 + 3*b^2*x^8) - (5
*I)*a^2*Sqrt[1 - (b*x^4)/a]*EllipticF[I*ArcSinh[Sqrt[-(Sqrt[b]/Sq
rt[a])]*x], -1])/(21*Sqrt[-(Sqrt[b]/Sqrt[a])]*b^2*Sqrt[a - b*x^4]
```

)

Maple [A] time = 0.027, size = 107, normalized size = 1.1

$$-\frac{x^5}{7b}\sqrt{-bx^4+a}-\frac{5ax}{21b^2}\sqrt{-bx^4+a}+\frac{5a^2}{21b^2}\sqrt{1-x^2\sqrt{b}\frac{1}{\sqrt{a}}}\sqrt{1+x^2\sqrt{b}\frac{1}{\sqrt{a}}}\mathit{EllipticF}\left(x\sqrt{1\sqrt{b}\frac{1}{\sqrt{a}}},i\right)\frac{1}{\sqrt{1\sqrt{b}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{-bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8/(-b*x^4+a)^(1/2),x)
```

```
[Out] -1/7*x^5*(-b*x^4+a)^(1/2)/b-5/21*a*x*(-b*x^4+a)^(1/2)/b^2+5/21*a^
2/b^2/(1/a^(1/2)*b^(1/2))^(1/2)*(1-b^(1/2)*x^2/a^(1/2))^(1/2)*(1+
b^(1/2)*x^2/a^(1/2))^(1/2)/(-b*x^4+a)^(1/2)*EllipticF(x*(1/a^(1/2
)*b^(1/2))^(1/2),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^8}{\sqrt{-bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/sqrt(-b*x^4 + a),x, algorithm="maxima")
```

```
[Out] integrate(x^8/sqrt(-b*x^4 + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x^8}{\sqrt{-bx^4+a}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/sqrt(-b*x^4 + a),x, algorithm="fricas")
```

```
[Out] integral(x^8/sqrt(-b*x^4 + a), x)
```

Sympy [A] time = 3.27009, size = 39, normalized size = 0.39

$$\frac{x^9\,\Gamma\left(\frac{9}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{9}{4}\\ \frac{13}{4}\end{matrix}\middle|\frac{bx^4e^{2i\pi}}{a}\right)}{4\sqrt{a}\,\Gamma\left(\frac{13}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8/(-b*x**4+a)**(1/2),x)
```

```
[Out] x**9*gamma(9/4)*hyper((1/2, 9/4), (13/4,), b*x**4*exp_polar(2*I*p
i)/a)/(4*sqrt(a)*gamma(13/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^8}{\sqrt{-bx^4 + a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/sqrt(-b*x^4 + a),x, algorithm="giac")

[Out] integrate(x^8/sqrt(-b*x^4 + a), x)
```

3.840 $\int \frac{x^4}{\sqrt{a-bx^4}}\,dx$

Optimal. Leaf size=77

$$\frac{a^{5/4}\sqrt{1-\frac{bx^4}{a}}\,F\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{3b^{5/4}\sqrt{a-bx^4}}-\frac{x\sqrt{a-bx^4}}{3b}$$

```
[Out] -(x*Sqrt[a - b*x^4])/(3*b) + (a^(5/4)*Sqrt[1 - (b*x^4)/a]*Ellipti
cF[ArcSin[(b^(1/4)*x)/a^(1/4)], -1])/(3*b^(5/4)*Sqrt[a - b*x^4])
```

Rubi [A] time = 0.0631304, antiderivative size = 77, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.188

$$\frac{a^{5/4}\sqrt{1-\frac{bx^4}{a}}\,F\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{3b^{5/4}\sqrt{a-bx^4}}-\frac{x\sqrt{a-bx^4}}{3b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/Sqrt[a - b*x^4],x]
```

```
[Out] -(x*Sqrt[a - b*x^4])/(3*b) + (a^(5/4)*Sqrt[1 - (b*x^4)/a]*Ellipti
cF[ArcSin[(b^(1/4)*x)/a^(1/4)], -1])/(3*b^(5/4)*Sqrt[a - b*x^4])
```

Rubi in Sympy [A] time = 9.27301, size = 65, normalized size = 0.84

$$\frac{a^{\frac{5}{4}}\sqrt{1-\frac{bx^4}{a}}\,F\left(\operatorname{asin}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{3b^{\frac{5}{4}}\sqrt{a-bx^4}}-\frac{x\sqrt{a-bx^4}}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(-b*x**4+a)**(1/2),x)
```

```
[Out] a**(5/4)*sqrt(1 - b*x**4/a)*elliptic_f(asin(b**(1/4)*x/a**(1/4)),
 -1)/(3*b**(5/4)*sqrt(a - b*x**4)) - x*sqrt(a - b*x**4)/(3*b)
```

Mathematica [C] time = 0.133509, size = 108, normalized size = 1.4

$$\frac{x\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}\left(bx^4-a\right)-ia\sqrt{1-\frac{bx^4}{a}}\,F\left(i\sinh^{-1}\left(\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)}{3b\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}\sqrt{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/Sqrt[a - b*x^4],x]
```

```
[Out] (Sqrt[-(Sqrt[b]/Sqrt[a])]*x*(-a + b*x^4) - I*a*Sqrt[1 - (b*x^4)/a
]*EllipticF[I*ArcSinh[Sqrt[-(Sqrt[b]/Sqrt[a])]*x], -1])/(3*Sqrt[-
(Sqrt[b]/Sqrt[a])]*b*Sqrt[a - b*x^4])
```

Maple [A] time = 0.013, size = 86, normalized size = 1.1

$$-\frac{x}{3\,b}\sqrt{-bx^{4}+a}+\frac{a}{3\,b}\sqrt{1-x^{2}\sqrt{b}\frac{1}{\sqrt{a}}}\sqrt{1+x^{2}\sqrt{b}\frac{1}{\sqrt{a}}}EllipticF\left(x\sqrt{1\sqrt{b}\frac{1}{\sqrt{a}}},i\right)\frac{1}{\sqrt{1\sqrt{b}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{-bx^{4}+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(-b*x^4+a)^(1/2),x)
```

```
[Out] -1/3*x*(-b*x^4+a)^(1/2)/b+1/3*a/b/(1/a^(1/2)*b^(1/2))^(1/2)*(1-b^
(1/2)*x^2/a^(1/2))^(1/2)*(1+b^(1/2)*x^2/a^(1/2))^(1/2)/(-b*x^4+a)
^(1/2)*EllipticF(x*(1/a^(1/2)*b^(1/2))^(1/2),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{4}}{\sqrt{-bx^{4}+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(-b*x^4 + a),x, algorithm="maxima")
```

```
[Out] integrate(x^4/sqrt(-b*x^4 + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x^{4}}{\sqrt{-bx^{4}+a}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(-b*x^4 + a),x, algorithm="fricas")
```

```
[Out] integral(x^4/sqrt(-b*x^4 + a), x)
```

Sympy [A] time = 2.3729, size = 39, normalized size = 0.51

$$\frac{x^{5}\,\Gamma\left(\frac{5}{4}\right)\,{}_{2}F_{1}\left(\left.\begin{matrix}\frac{1}{2},\frac{5}{4}\\\frac{9}{4}\end{matrix}\right|\frac{bx^{4}e^{2i\pi}}{a}\right)}{4\sqrt{a}\,\Gamma\left(\frac{9}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(-b*x**4+a)**(1/2),x)
```

```
[Out] x**5*gamma(5/4)*hyper((1/2, 5/4), (9/4,), b*x**4*exp_polar(2*I*pi
)/a)/(4*sqrt(a)*gamma(9/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{4}}{\sqrt{-bx^{4}+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(-b*x^4 + a),x, algorithm="giac")

[Out] integrate(x^4/sqrt(-b*x^4 + a), x)
```

3.841 $\int \frac{1}{\sqrt{a-bx^4}} dx$

Optimal. Leaf size=53

$$\frac{\sqrt[4]{a}\sqrt{1-\frac{bx^4}{a}}F\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{\sqrt[4]{b}\sqrt{a-bx^4}}$$

```
[Out] (a^(1/4)*Sqrt[1 - (b*x^4)/a]*EllipticF[ArcSin[(b^(1/4)*x)/a^(1/4)
], -1])/(b^(1/4)*Sqrt[a - b*x^4])
```

Rubi [A] time = 0.0325707, antiderivative size = 53, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167

$$\frac{\sqrt[4]{a}\sqrt{1-\frac{bx^4}{a}}F\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{\sqrt[4]{b}\sqrt{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[a - b*x^4],x]
```

```
[Out] (a^(1/4)*Sqrt[1 - (b*x^4)/a]*EllipticF[ArcSin[(b^(1/4)*x)/a^(1/4)
], -1])/(b^(1/4)*Sqrt[a - b*x^4])
```

Rubi in Sympy [A] time = 5.3708, size = 48, normalized size = 0.91

$$\frac{\sqrt[4]{a}\sqrt{1-\frac{bx^4}{a}}F\left(\operatorname{asin}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{\sqrt[4]{b}\sqrt{a-bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(-b*x**4+a)**(1/2),x)
```

```
[Out] a**(1/4)*sqrt(1 - b*x**4/a)*elliptic_f(asin(b**(1/4)*x/a**(1/4)),
 -1)/(b**(1/4)*sqrt(a - b*x**4))
```

Mathematica [C] time = 0.053904, size = 72, normalized size = 1.36

$$-\frac{i\sqrt{1-\frac{bx^4}{a}}F\left(i\sinh^{-1}\left(\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)}{\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}\sqrt{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/Sqrt[a - b*x^4],x]
```

```
[Out] ((-I)*Sqrt[1 - (b*x^4)/a]*EllipticF[I*ArcSinh[Sqrt[-(Sqrt[b]/Sqrt
[a])]*x], -1])/(Sqrt[-(Sqrt[b]/Sqrt[a])]*Sqrt[a - b*x^4])
```

Maple [A] time = 0.008, size = 64, normalized size = 1.2

$$1\sqrt{1-x^2\sqrt{b}\,\frac{1}{\sqrt{a}}}\sqrt{1+x^2\sqrt{b}\,\frac{1}{\sqrt{a}}}\,EllipticF\left(x\sqrt{1\sqrt{b}\,\frac{1}{\sqrt{a}}},i\right)\frac{1}{\sqrt{1\sqrt{b}\,\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{-bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(-b*x^4+a)^(1/2),x)
```

```
[Out] 1/(1/a^(1/2)*b^(1/2))^(1/2)*(1-b^(1/2)*x^2/a^(1/2))^(1/2)*(1+b^(1
/2)*x^2/a^(1/2))^(1/2)/(-b*x^4+a)^(1/2)*EllipticF(x*(1/a^(1/2)*b^
(1/2))^(1/2),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(-b*x^4 + a),x, algorithm="maxima")
```

```
[Out] integrate(1/sqrt(-b*x^4 + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{-bx^4+a}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(-b*x^4 + a),x, algorithm="fricas")
```

```
[Out] integral(1/sqrt(-b*x^4 + a), x)
```

Sympy [A] time = 2.08008, size = 37, normalized size = 0.7

$$\frac{x\,\Gamma\left(\frac{1}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{4},\frac{1}{2}\\ \frac{5}{4}\end{matrix}\middle|\frac{bx^4e^{2i\pi}}{a}\right)}{4\sqrt{a}\,\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(-b*x**4+a)**(1/2),x)
```

```
[Out] x*gamma(1/4)*hyper((1/4, 1/2), (5/4,), b*x**4*exp_polar(2*I*pi)/a
)/(4*sqrt(a)*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(-b*x^4 + a),x, algorithm="giac")
```

```
[Out] integrate(1/sqrt(-b*x^4 + a), x)
```

3.842 $\int \frac{1}{x^4\sqrt{a-bx^4}}\,dx$

Optimal. Leaf size=79

$$\frac{b^{3/4}\sqrt{1-\frac{bx^4}{a}}\,F\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{3a^{3/4}\sqrt{a-bx^4}}-\frac{\sqrt{a-bx^4}}{3ax^3}$$

```
[Out] -Sqrt[a - b*x^4]/(3*a*x^3) + (b^(3/4)*Sqrt[1 - (b*x^4)/a]*Ellipti
cF[ArcSin[(b^(1/4)*x)/a^(1/4)], -1])/(3*a^(3/4)*Sqrt[a - b*x^4])
```

Rubi [A] time = 0.0627656, antiderivative size = 79, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.188$

$$\frac{b^{3/4}\sqrt{1-\frac{bx^4}{a}}\,F\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{3a^{3/4}\sqrt{a-bx^4}}-\frac{\sqrt{a-bx^4}}{3ax^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*Sqrt[a - b*x^4]),x]
```

```
[Out] -Sqrt[a - b*x^4]/(3*a*x^3) + (b^(3/4)*Sqrt[1 - (b*x^4)/a]*Ellipti
cF[ArcSin[(b^(1/4)*x)/a^(1/4)], -1])/(3*a^(3/4)*Sqrt[a - b*x^4])
```

Rubi in Sympy [A] time = 9.0855, size = 66, normalized size = 0.84

$$-\frac{\sqrt{a-bx^4}}{3ax^3}+\frac{b^{\frac{3}{4}}\sqrt{1-\frac{bx^4}{a}}\,F\left(\operatorname{asin}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{3a^{\frac{3}{4}}\sqrt{a-bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(-b*x**4+a)**(1/2),x)
```

```
[Out] -sqrt(a - b*x**4)/(3*a*x**3) + b**(3/4)*sqrt(1 - b*x**4/a)*ellipt
ic_f(asin(b**(1/4)*x/a**(1/4)), -1)/(3*a**(3/4)*sqrt(a - b*x**4))
```

Mathematica [C] time = 0.256946, size = 90, normalized size = 1.14

$$\frac{-\frac{ib\sqrt{1-\frac{bx^4}{a}}\,F\left(i\sinh^{-1}\left(\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)}{\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}}-\frac{a}{x^3}+bx}{3a\sqrt{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*Sqrt[a - b*x^4]),x]
```

```
[Out] (-(a/x^3) + b*x - (I*b*Sqrt[1 - (b*x^4)/a]*EllipticF[I*ArcSinh[Sq
rt[-(Sqrt[b]/Sqrt[a])]*x], -1])/Sqrt[-(Sqrt[b]/Sqrt[a])])/(3*a*Sq
rt[a - b*x^4])
```

Maple [A] time = 0.018, size = 88, normalized size = 1.1

$$-\frac{1}{3\,a{x}^{3}}\sqrt{-b{x}^{4}+a}+\frac{b}{3\,a}\sqrt{1-{x}^{2}\sqrt{b}\frac{1}{\sqrt{a}}}\sqrt{1+{x}^{2}\sqrt{b}\frac{1}{\sqrt{a}}}{\it EllipticF} \left(x\sqrt{1\sqrt{b}\frac{1}{\sqrt{a}}},i \right) \frac{1}{\sqrt{1\sqrt{b}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{-b{x}^{4}+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(-b*x^4+a)^(1/2),x)
```

```
[Out] -1/3*(-b*x^4+a)^(1/2)/a/x^3+1/3*b/a/(1/a^(1/2)*b^(1/2))^(1/2)*(1-
b^(1/2)*x^2/a^(1/2))^(1/2)*(1+b^(1/2)*x^2/a^(1/2))^(1/2)/(-b*x^4+
a)^(1/2)*EllipticF(x*(1/a^(1/2)*b^(1/2))^(1/2),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-bx^4 + a}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-b*x^4 + a)*x^4),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(-b*x^4 + a)*x^4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{\sqrt{-bx^4 + a}x^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-b*x^4 + a)*x^4),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(-b*x^4 + a)*x^4), x)
```

Sympy [A] time = 2.8603, size = 42, normalized size = 0.53

$$\frac{\Gamma\left(-\frac{3}{4}\right) {}_{2}F_{1}\left(\begin{matrix} -\frac{3}{4}, \frac{1}{2} \\ \frac{1}{4} \end{matrix}\middle| {\frac{bx^{4} e^{2 i \pi}}{a}} \right)}{4 \sqrt{a} x^{3} \Gamma\left(\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(-b*x**4+a)**(1/2),x)
```

```
[Out] gamma(-3/4)*hyper((-3/4, 1/2), (1/4,), b*x**4*exp_polar(2*I*pi)/a
)/(4*sqrt(a)*x**3*gamma(1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-bx^4 + a}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-b*x^4 + a)*x^4),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(-b*x^4 + a)*x^4), x)
```

3.843 $\int \frac{1}{x^8\sqrt{a-bx^4}}\,dx$

Optimal. Leaf size=102

$$\frac{5b^{7/4}\sqrt{1-\frac{bx^4}{a}}F\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{21a^{7/4}\sqrt{a-bx^4}}-\frac{5b\sqrt{a-bx^4}}{21a^2x^3}-\frac{\sqrt{a-bx^4}}{7ax^7}$$

```
[Out] -Sqrt[a - b*x^4]/(7*a*x^7) - (5*b*Sqrt[a - b*x^4])/(21*a^2*x^3) +
 (5*b^(7/4)*Sqrt[1 - (b*x^4)/a]*EllipticF[ArcSin[(b^(1/4)*x)/a^(1
/4)], -1])/(21*a^(7/4)*Sqrt[a - b*x^4])
```

Rubi [A] time = 0.0914435, antiderivative size = 102, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.188

$$\frac{5b^{7/4}\sqrt{1-\frac{bx^4}{a}}F\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{21a^{7/4}\sqrt{a-bx^4}}-\frac{5b\sqrt{a-bx^4}}{21a^2x^3}-\frac{\sqrt{a-bx^4}}{7ax^7}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^8*Sqrt[a - b*x^4]),x]
```

```
[Out] -Sqrt[a - b*x^4]/(7*a*x^7) - (5*b*Sqrt[a - b*x^4])/(21*a^2*x^3) +
 (5*b^(7/4)*Sqrt[1 - (b*x^4)/a]*EllipticF[ArcSin[(b^(1/4)*x)/a^(1
/4)], -1])/(21*a^(7/4)*Sqrt[a - b*x^4])
```

Rubi in Sympy [A] time = 12.5357, size = 90, normalized size = 0.88

$$-\frac{\sqrt{a-bx^4}}{7ax^7}-\frac{5b\sqrt{a-bx^4}}{21a^2x^3}+\frac{5b^{\frac{7}{4}}\sqrt{1-\frac{bx^4}{a}}F\left(\operatorname{asin}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{21a^{\frac{7}{4}}\sqrt{a-bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**8/(-b*x**4+a)**(1/2),x)
```

```
[Out] -sqrt(a - b*x**4)/(7*a*x**7) - 5*b*sqrt(a - b*x**4)/(21*a**2*x**3
) + 5*b**(7/4)*sqrt(1 - b*x**4/a)*elliptic_f(asin(b**(1/4)*x/a**(
1/4)), -1)/(21*a**(7/4)*sqrt(a - b*x**4))
```

Mathematica [C] time = 0.248317, size = 104, normalized size = 1.02

$$\frac{-\frac{3a^2}{x^7}-\frac{5ib^2\sqrt{1-\frac{bx^4}{a}}F\left(i\sinh^{-1}\left(\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)}{\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}}-\frac{2ab}{x^3}+5b^2x}{21a^2\sqrt{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^8*Sqrt[a - b*x^4]),x]
```

```
[Out] ((-3*a^2)/x^7 - (2*a*b)/x^3 + 5*b^2*x - ((5*I)*b^2*Sqrt[1 - (b*x^
4)/a]*EllipticF[I*ArcSinh[Sqrt[-(Sqrt[b]/Sqrt[a])]*x], -1])/Sqrt[
-(Sqrt[b]/Sqrt[a])])/(21*a^2*Sqrt[a - b*x^4])
```

Maple [A] time = 0.022, size = 109, normalized size = 1.1

$$-\frac{1}{7\,a x^7}\sqrt{-b x^4+a}-\frac{5\,b}{21\,x^3 a^2}\sqrt{-b x^4+a}+\frac{5\,b^2}{21\,a^2}\sqrt{1-x^2\sqrt{b}\frac{1}{\sqrt{a}}}\sqrt{1+x^2\sqrt{b}\frac{1}{\sqrt{a}}}\,EllipticF\left(x\sqrt{1\sqrt{b}\frac{1}{\sqrt{a}}},i\right)\frac{1}{\sqrt{1\sqrt{b}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{-b x^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^8/(-b*x^4+a)^(1/2),x)
```

```
[Out] -1/7*(-b*x^4+a)^(1/2)/a/x^7-5/21*b*(-b*x^4+a)^(1/2)/x^3/a^2+5/21/
a^2*b^2/(1/a^(1/2)*b^(1/2))^(1/2)*(1-b^(1/2)*x^2/a^(1/2))^(1/2)*(
1+b^(1/2)*x^2/a^(1/2))^(1/2)/(-b*x^4+a)^(1/2)*EllipticF(x*(1/a^(1
/2)*b^(1/2))^(1/2),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-b x^4 + a x^8}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(-b*x^4 + a)*x^8),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(-b*x^4 + a)*x^8), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{-b x^4 + a x^8}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(-b*x^4 + a)*x^8),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(-b*x^4 + a)*x^8), x)
```

Sympy [A] time = 4.57097, size = 46, normalized size = 0.45

$$\frac{\Gamma\left(-\frac{7}{4}\right){}_{2}F_{1}\left(\begin{matrix}-\frac{7}{4},\frac{1}{2}\\-\frac{3}{4}\end{matrix}\middle|\frac{b x^4 e^{2i\pi}}{a}\right)}{4\sqrt{a}x^7\,\Gamma\left(-\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/x**8/(-b*x**4+a)**(1/2),x)
```

```
[Out] gamma(-7/4)*hyper((-7/4, 1/2), (-3/4,), b*x**4*exp_polar(2*I*pi)/
a)/(4*sqrt(a)*x**7*gamma(-3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-bx^4 + a}x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-b*x^4 + a)*x^8),x, algorithm="giac")

[Out] integrate(1/(sqrt(-b*x^4 + a)*x^8), x)
```

3.844 $\int \frac{x^{10}}{\sqrt{a-bx^4}}\,dx$

Optimal. Leaf size=158

$$-\frac{7a^{11/4}\sqrt{1-\frac{bx^4}{a}}F\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{15b^{11/4}\sqrt{a-bx^4}}+\frac{7a^{11/4}\sqrt{1-\frac{bx^4}{a}}E\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{15b^{11/4}\sqrt{a-bx^4}}-\frac{7ax^3\sqrt{a-bx^4}}{45b^2}-\frac{x^7\sqrt{a-bx^4}}{9b}$$

```
[Out] (-7*a*x^3*Sqrt[a - b*x^4])/(45*b^2) - (x^7*Sqrt[a - b*x^4])/(9*b)
 + (7*a^(11/4)*Sqrt[1 - (b*x^4)/a]*EllipticE[ArcSin[(b^(1/4)*x)/a
^(1/4)], -1])/(15*b^(11/4)*Sqrt[a - b*x^4]) - (7*a^(11/4)*Sqrt[1
- (b*x^4)/a]*EllipticF[ArcSin[(b^(1/4)*x)/a^(1/4)], -1])/(15*b^(1
1/4)*Sqrt[a - b*x^4])
```

Rubi [A] time = 0.282767, antiderivative size = 158, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.438

$$-\frac{7a^{11/4}\sqrt{1-\frac{bx^4}{a}}F\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{15b^{11/4}\sqrt{a-bx^4}}+\frac{7a^{11/4}\sqrt{1-\frac{bx^4}{a}}E\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{15b^{11/4}\sqrt{a-bx^4}}-\frac{7ax^3\sqrt{a-bx^4}}{45b^2}-\frac{x^7\sqrt{a-bx^4}}{9b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^10/Sqrt[a - b*x^4],x]
```

```
[Out] (-7*a*x^3*Sqrt[a - b*x^4])/(45*b^2) - (x^7*Sqrt[a - b*x^4])/(9*b)
 + (7*a^(11/4)*Sqrt[1 - (b*x^4)/a]*EllipticE[ArcSin[(b^(1/4)*x)/a
^(1/4)], -1])/(15*b^(11/4)*Sqrt[a - b*x^4]) - (7*a^(11/4)*Sqrt[1
- (b*x^4)/a]*EllipticF[ArcSin[(b^(1/4)*x)/a^(1/4)], -1])/(15*b^(1
1/4)*Sqrt[a - b*x^4])
```

Rubi in Sympy [A] time = 45.3341, size = 143, normalized size = 0.91

$$\frac{7a^{\frac{11}{4}}\sqrt{1-\frac{bx^4}{a}}E\left(\operatorname{asin}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{15b^{\frac{11}{4}}\sqrt{a-bx^4}}-\frac{7a^{\frac{11}{4}}\sqrt{1-\frac{bx^4}{a}}F\left(\operatorname{asin}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{15b^{\frac{11}{4}}\sqrt{a-bx^4}}-\frac{7ax^3\sqrt{a-bx^4}}{45b^2}-\frac{x^7\sqrt{a-bx^4}}{9b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**10/(-b*x**4+a)**(1/2),x)
```

```
[Out] 7*a**(11/4)*sqrt(1 - b*x**4/a)*elliptic_e(asin(b**(1/4)*x/a**(1/4
)), -1)/(15*b**(11/4)*sqrt(a - b*x**4)) - 7*a**(11/4)*sqrt(1 - b*
x**4/a)*elliptic_f(asin(b**(1/4)*x/a**(1/4)), -1)/(15*b**(11/4)*s
qrt(a - b*x**4)) - 7*a*x**3*sqrt(a - b*x**4)/(45*b**2) - x**7*sqr
t(a - b*x**4)/(9*b)
```

Mathematica [C] time = 1.37931, size = 134, normalized size = 0.85

$$\frac{(bx^4-a)\left(7ax^3+5bx^7\right)+\frac{21ia^2\sqrt{1-\frac{bx^4}{a}}\left(E\left(i\sinh^{-1}\left(\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)-F\left(i\sinh^{-1}\left(\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)\right)}{\left(-\frac{\sqrt{b}}{\sqrt{a}}\right)^{3/2}}}{45b^2\sqrt{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]   Integrate[x^10/Sqrt[a - b*x^4],x]
```

```
[Out] ((-a + b*x^4)*(7*a*x^3 + 5*b*x^7) + ((21*I)*a^2*Sqrt[1 - (b*x^4)/
a]*(EllipticE[I*ArcSinh[Sqrt[-(Sqrt[b]/Sqrt[a])]*x], -1] - Ellipt
icF[I*ArcSinh[Sqrt[-(Sqrt[b]/Sqrt[a])]*x], -1]))/(-(Sqrt[b]/Sqrt[
a]))^(3/2))/(45*b^2*Sqrt[a - b*x^4])
```

Maple [A] time = 0.014, size = 126, normalized size = 0.8

$$-\frac{x^7}{9b}\sqrt{-bx^4+a}-\frac{7\,ax^3}{45\,b^2}\sqrt{-bx^4+a}$$
$$-\frac{7}{15}a^{\frac{5}{2}}\sqrt{1-x^2\sqrt{b}\frac{1}{\sqrt{a}}}\sqrt{1+x^2\sqrt{b}\frac{1}{\sqrt{a}}}\left(EllipticF\left(x\sqrt{1\sqrt{b}\frac{1}{\sqrt{a}}},i\right)-EllipticE\left(x\sqrt{1\sqrt{b}\frac{1}{\sqrt{a}}},i\right)\right)b^{-\frac{5}{2}}\frac{1}{\sqrt{1\sqrt{b}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{-bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^10/(-b*x^4+a)^(1/2),x)
```

```
[Out] -1/9*x^7*(-b*x^4+a)^(1/2)/b-7/45*a*x^3*(-b*x^4+a)^(1/2)/b^2-7/15*
a^(5/2)/b^(5/2)/(1/a^(1/2)*b^(1/2))^(1/2)*(1-b^(1/2)*x^2/a^(1/2))
^(1/2)*(1+b^(1/2)*x^2/a^(1/2))^(1/2)/(-b*x^4+a)^(1/2)*(EllipticF(
x*(1/a^(1/2)*b^(1/2))^(1/2),I)-EllipticE(x*(1/a^(1/2)*b^(1/2))^(1
/2),I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^{10}}{\sqrt{-bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^10/sqrt(-b*x^4 + a),x, algorithm="maxima")
```

```
[Out] integrate(x^10/sqrt(-b*x^4 + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{10}}{\sqrt{-bx^4+a}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^10/sqrt(-b*x^4 + a),x, algorithm="fricas")
```

```
[Out] integral(x^10/sqrt(-b*x^4 + a), x)
```

Sympy [A] time = 4.53067, size = 39, normalized size = 0.25

$$\frac{x^{11}\left(\frac{11}{4}\right){}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{11}{4}\\\frac{15}{4}\end{matrix}\middle|\frac{bx^4e^{2i\pi}}{a}\right)}{4\sqrt{a}\left(\frac{15}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**10/(-b*x**4+a)**(1/2),x)
```

```
[Out] x**11*gamma(11/4)*hyper((1/2, 11/4), (15/4,), b*x**4*exp_polar(2*
I*pi)/a)/(4*sqrt(a)*gamma(15/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{10}}{\sqrt{-bx^4 + a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/sqrt(-b*x^4 + a),x, algorithm="giac")
```

```
[Out] integrate(x^10/sqrt(-b*x^4 + a), x)
```

3.845 $\int \frac{x^6}{\sqrt{a-bx^4}}\,dx$

Optimal. Leaf size=135

$$-\frac{3a^{7/4}\sqrt{1-\frac{bx^4}{a}}F\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{5b^{7/4}\sqrt{a-bx^4}}+\frac{3a^{7/4}\sqrt{1-\frac{bx^4}{a}}E\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{5b^{7/4}\sqrt{a-bx^4}}-\frac{x^3\sqrt{a-bx^4}}{5b}$$

```
[Out] -(x^3*Sqrt[a - b*x^4])/(5*b) + (3*a^(7/4)*Sqrt[1 - (b*x^4)/a]*Ell
ipticE[ArcSin[(b^(1/4)*x)/a^(1/4)], -1])/(5*b^(7/4)*Sqrt[a - b*x^
4]) - (3*a^(7/4)*Sqrt[1 - (b*x^4)/a]*EllipticF[ArcSin[(b^(1/4)*x)
/a^(1/4)], -1])/(5*b^(7/4)*Sqrt[a - b*x^4])
```

Rubi [A] time = 0.229456, antiderivative size = 135, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.438

$$-\frac{3a^{7/4}\sqrt{1-\frac{bx^4}{a}}F\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{5b^{7/4}\sqrt{a-bx^4}}+\frac{3a^{7/4}\sqrt{1-\frac{bx^4}{a}}E\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{5b^{7/4}\sqrt{a-bx^4}}-\frac{x^3\sqrt{a-bx^4}}{5b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/Sqrt[a - b*x^4],x]
```

```
[Out] -(x^3*Sqrt[a - b*x^4])/(5*b) + (3*a^(7/4)*Sqrt[1 - (b*x^4)/a]*Ell
ipticE[ArcSin[(b^(1/4)*x)/a^(1/4)], -1])/(5*b^(7/4)*Sqrt[a - b*x^
4]) - (3*a^(7/4)*Sqrt[1 - (b*x^4)/a]*EllipticF[ArcSin[(b^(1/4)*x)
/a^(1/4)], -1])/(5*b^(7/4)*Sqrt[a - b*x^4])
```

Rubi in Sympy [A] time = 40.3, size = 121, normalized size = 0.9

$$\frac{3a^{\frac{7}{4}}\sqrt{1-\frac{bx^4}{a}}E\left(\operatorname{asin}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{5b^{\frac{7}{4}}\sqrt{a-bx^4}}-\frac{3a^{\frac{7}{4}}\sqrt{1-\frac{bx^4}{a}}F\left(\operatorname{asin}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{5b^{\frac{7}{4}}\sqrt{a-bx^4}}-\frac{x^3\sqrt{a-bx^4}}{5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(-b*x**4+a)**(1/2),x)
```

```
[Out] 3*a**(7/4)*sqrt(1 - b*x**4/a)*elliptic_e(asin(b**(1/4)*x/a**(1/4)
), -1)/(5*b**(7/4)*sqrt(a - b*x**4)) - 3*a**(7/4)*sqrt(1 - b*x**4
/a)*elliptic_f(asin(b**(1/4)*x/a**(1/4)), -1)/(5*b**(7/4)*sqrt(a
- b*x**4)) - x**3*sqrt(a - b*x**4)/(5*b)
```

Mathematica [C] time = 0.693132, size = 120, normalized size = 0.89

$$\frac{\frac{3ia\sqrt{1-\frac{bx^4}{a}}\left(E\left(i\sinh^{-1}\left(\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)-F\left(i\sinh^{-1}\left(\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)\right)}{\left(-\frac{\sqrt{b}}{\sqrt{a}}\right)^{3/2}}-ax^3+bx^7}{5b\sqrt{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6/Sqrt[a - b*x^4],x]
```

```
[Out] (-(a*x^3) + b*x^7 + ((3*I)*a*Sqrt[1 - (b*x^4)/a]*(EllipticE[I*Arc
Sinh[Sqrt[-(Sqrt[b]/Sqrt[a])]*x], -1] - EllipticF[I*ArcSinh[Sqrt[
```

```
-(Sqrt[b]/Sqrt[a])]*x], -1]))/(-(Sqrt[b]/Sqrt[a]))^(3/2))/(5*b*Sq
rt[a - b*x^4])
```

Maple [A] time = 0.013, size = 107, normalized size = 0.8

$$-\frac{x^{3}}{5\,b}\sqrt{-b x^{4}+a}$$
$$-\frac{3}{5}a^{\frac{3}{2}}\sqrt{1-x^{2}\sqrt{b}\frac{1}{\sqrt{a}}}\sqrt{1+x^{2}\sqrt{b}\frac{1}{\sqrt{a}}}\left(\mathit{EllipticF}\left(x\sqrt{1\sqrt{b}\frac{1}{\sqrt{a}}},i\right)-\mathit{EllipticE}\left(x\sqrt{1\sqrt{b}\frac{1}{\sqrt{a}}},i\right)\right)b^{-\frac{3}{2}}\frac{1}{\sqrt{1\sqrt{b}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{-b x^{4}+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(-b*x^4+a)^(1/2),x)
```

```
[Out] -1/5*x^3*(-b*x^4+a)^(1/2)/b-3/5*a^(3/2)/b^(3/2)/(1/a^(1/2)*b^(1/2
))^(1/2)*(1-b^(1/2)*x^2/a^(1/2))^(1/2)*(1+b^(1/2)*x^2/a^(1/2))^(1
/2)/(-b*x^4+a)^(1/2)*(EllipticF(x*(1/a^(1/2)*b^(1/2))^(1/2),I)-El
lipticE(x*(1/a^(1/2)*b^(1/2))^(1/2),I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{6}}{\sqrt{-b x^{4}+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(-b*x^4 + a),x, algorithm="maxima")
```

```
[Out] integrate(x^6/sqrt(-b*x^4 + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x^{6}}{\sqrt{-b x^{4}+a}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(-b*x^4 + a),x, algorithm="fricas")
```

```
[Out] integral(x^6/sqrt(-b*x^4 + a), x)
```

Sympy [A] time = 2.74817, size = 39, normalized size = 0.29

$$\frac{x^{7}\,\Gamma\left(\frac{7}{4}\right)\,{}_{2}F_{1}\left(\begin{matrix}\frac{1}{2},\frac{7}{4}\\\frac{11}{4}\end{matrix}\middle|\frac{b x^{4} e^{2 i \pi}}{a}\right)}{4\sqrt{a}\,\Gamma\left(\frac{11}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(-b*x**4+a)**(1/2),x)
```

```
[Out] x**7*gamma(7/4)*hyper((1/2, 7/4), (11/4,), b*x**4*exp_polar(2*I*p
i)/a)/(4*sqrt(a)*gamma(11/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{\sqrt{-bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(-b*x^4 + a),x, algorithm="giac")
```

```
[Out] integrate(x^6/sqrt(-b*x^4 + a), x)
```

3.846 $\int \frac{x^2}{\sqrt{a-bx^4}}\,dx$

Optimal. Leaf size=108

$$\frac{a^{3/4}\sqrt{1-\frac{bx^4}{a}}\,E\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{b^{3/4}\sqrt{a-bx^4}}-\frac{a^{3/4}\sqrt{1-\frac{bx^4}{a}}\,F\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{b^{3/4}\sqrt{a-bx^4}}$$

```
[Out] (a^(3/4)*Sqrt[1 - (b*x^4)/a]*EllipticE[ArcSin[(b^(1/4)*x)/a^(1/4)
], -1])/(b^(3/4)*Sqrt[a - b*x^4]) - (a^(3/4)*Sqrt[1 - (b*x^4)/a]*
EllipticF[ArcSin[(b^(1/4)*x)/a^(1/4)], -1])/(b^(3/4)*Sqrt[a - b*x
^4])
```

Rubi [A] time = 0.196045, antiderivative size = 108, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375

$$\frac{a^{3/4}\sqrt{1-\frac{bx^4}{a}}\,E\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{b^{3/4}\sqrt{a-bx^4}}-\frac{a^{3/4}\sqrt{1-\frac{bx^4}{a}}\,F\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{b^{3/4}\sqrt{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/Sqrt[a - b*x^4],x]
```

```
[Out] (a^(3/4)*Sqrt[1 - (b*x^4)/a]*EllipticE[ArcSin[(b^(1/4)*x)/a^(1/4)
], -1])/(b^(3/4)*Sqrt[a - b*x^4]) - (a^(3/4)*Sqrt[1 - (b*x^4)/a]*
EllipticF[ArcSin[(b^(1/4)*x)/a^(1/4)], -1])/(b^(3/4)*Sqrt[a - b*x
^4])
```

Rubi in Sympy [A] time = 36.291, size = 97, normalized size = 0.9

$$\frac{a^{\frac{3}{4}}\sqrt{1-\frac{bx^4}{a}}\,E\left(\operatorname{asin}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{b^{\frac{3}{4}}\sqrt{a-bx^4}}-\frac{a^{\frac{3}{4}}\sqrt{1-\frac{bx^4}{a}}\,F\left(\operatorname{asin}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{b^{\frac{3}{4}}\sqrt{a-bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(-b*x**4+a)**(1/2),x)
```

```
[Out] a**(3/4)*sqrt(1 - b*x**4/a)*elliptic_e(asin(b**(1/4)*x/a**(1/4)),
 -1)/(b**(3/4)*sqrt(a - b*x**4)) - a**(3/4)*sqrt(1 - b*x**4/a)*el
liptic_f(asin(b**(1/4)*x/a**(1/4)), -1)/(b**(3/4)*sqrt(a - b*x**4
))
```

Mathematica [C] time = 0.104973, size = 100, normalized size = 0.93

$$\frac{i\sqrt{1-\frac{bx^4}{a}}\left(E\left(i\sinh^{-1}\left(\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)-F\left(i\sinh^{-1}\left(\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)\right)}{\left(-\frac{\sqrt{b}}{\sqrt{a}}\right)^{3/2}\sqrt{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/Sqrt[a - b*x^4],x]
```

```
[Out] (I*Sqrt[1 - (b*x^4)/a]*(EllipticE[I*ArcSinh[Sqrt[-(Sqrt[b]/Sqrt[a
])]*x], -1] - EllipticF[I*ArcSinh[Sqrt[-(Sqrt[b]/Sqrt[a])]*x], -1
```

```
]))/((-(Sqrt[b]/Sqrt[a]))^(3/2)*Sqrt[a - b*x^4])
```

Maple [A] time = 0.01, size = 88, normalized size = 0.8

$$-1\sqrt{a}\sqrt{1-x^2\sqrt{b}\frac{1}{\sqrt{a}}}\sqrt{1+x^2\sqrt{b}\frac{1}{\sqrt{a}}}\left(EllipticF\left(x\sqrt{1\sqrt{b}\frac{1}{\sqrt{a}}},i\right)-EllipticE\left(x\sqrt{1\sqrt{b}\frac{1}{\sqrt{a}}},i\right)\right)\frac{1}{\sqrt{1\sqrt{b}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{-bx^4+a}}\frac{1}{\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(-b*x^4+a)^(1/2),x)
```

```
[Out] -a^(1/2)/(1/a^(1/2)*b^(1/2))^(1/2)*(1-b^(1/2)*x^2/a^(1/2))^(1/2)*
(1+b^(1/2)*x^2/a^(1/2))^(1/2)/(-b*x^4+a)^(1/2)/b^(1/2)*(EllipticF
(x*(1/a^(1/2)*b^(1/2))^(1/2),I)-EllipticE(x*(1/a^(1/2)*b^(1/2))^(
1/2),I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\sqrt{-bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(-b*x^4 + a),x, algorithm="maxima")
```

```
[Out] integrate(x^2/sqrt(-b*x^4 + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^2}{\sqrt{-bx^4+a}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(-b*x^4 + a),x, algorithm="fricas")
```

```
[Out] integral(x^2/sqrt(-b*x^4 + a), x)
```

Sympy [A] time = 2.21856, size = 39, normalized size = 0.36

$$\frac{x^3\left(\frac{3}{4}\right){}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{3}{4}\\ \frac{7}{4}\end{matrix}\middle|\frac{bx^4e^{2i\pi}}{a}\right)}{4\sqrt{a}\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(-b*x**4+a)**(1/2),x)
```

```
[Out] x**3*gamma(3/4)*hyper((1/2, 3/4), (7/4,), b*x**4*exp_polar(2*I*pi
)/a)/(4*sqrt(a)*gamma(7/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\sqrt{-bx^4 + a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(-b*x^4 + a),x, algorithm="giac")
```

```
[Out] integrate(x^2/sqrt(-b*x^4 + a), x)
```

3.847 $\int \frac{1}{x^2\sqrt{a-bx^4}}\,dx$

Optimal. Leaf size=128

$$-\frac{\sqrt{a-bx^4}}{ax}+\frac{\sqrt[4]{b}\sqrt{1-\frac{bx^4}{a}}F\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{\sqrt[4]{a}\sqrt{a-bx^4}}-\frac{\sqrt[4]{b}\sqrt{1-\frac{bx^4}{a}}E\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{\sqrt[4]{a}\sqrt{a-bx^4}}$$

```
[Out] -(Sqrt[a - b*x^4]/(a*x)) - (b^(1/4)*Sqrt[1 - (b*x^4)/a]*EllipticE
[ArcSin[(b^(1/4)*x)/a^(1/4)], -1])/(a^(1/4)*Sqrt[a - b*x^4]) + (b
^(1/4)*Sqrt[1 - (b*x^4)/a]*EllipticF[ArcSin[(b^(1/4)*x)/a^(1/4)],
 -1])/(a^(1/4)*Sqrt[a - b*x^4])
```

Rubi [A] time = 0.233451, antiderivative size = 128, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.438

$$-\frac{\sqrt{a-bx^4}}{ax}+\frac{\sqrt[4]{b}\sqrt{1-\frac{bx^4}{a}}F\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{\sqrt[4]{a}\sqrt{a-bx^4}}-\frac{\sqrt[4]{b}\sqrt{1-\frac{bx^4}{a}}E\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{\sqrt[4]{a}\sqrt{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*Sqrt[a - b*x^4]),x]
```

```
[Out] -(Sqrt[a - b*x^4]/(a*x)) - (b^(1/4)*Sqrt[1 - (b*x^4)/a]*EllipticE
[ArcSin[(b^(1/4)*x)/a^(1/4)], -1])/(a^(1/4)*Sqrt[a - b*x^4]) + (b
^(1/4)*Sqrt[1 - (b*x^4)/a]*EllipticF[ArcSin[(b^(1/4)*x)/a^(1/4)],
 -1])/(a^(1/4)*Sqrt[a - b*x^4])
```

Rubi in Sympy [A] time = 39.9791, size = 110, normalized size = 0.86

$$-\frac{\sqrt{a-bx^4}}{ax}-\frac{\sqrt[4]{b}\sqrt{1-\frac{bx^4}{a}}E\left(\operatorname{asin}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{\sqrt[4]{a}\sqrt{a-bx^4}}+\frac{\sqrt[4]{b}\sqrt{1-\frac{bx^4}{a}}F\left(\operatorname{asin}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{\sqrt[4]{a}\sqrt{a-bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(-b*x**4+a)**(1/2),x)
```

```
[Out] -sqrt(a - b*x**4)/(a*x) - b**(1/4)*sqrt(1 - b*x**4/a)*elliptic_e(
asin(b**(1/4)*x/a**(1/4)), -1)/(a**(1/4)*sqrt(a - b*x**4)) + b**(
1/4)*sqrt(1 - b*x**4/a)*elliptic_f(asin(b**(1/4)*x/a**(1/4)), -1)
/(a**(1/4)*sqrt(a - b*x**4))
```

Mathematica [C] time = 0.490198, size = 115, normalized size = 0.9

$$\frac{-i\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}\sqrt{1-\frac{bx^4}{a}}\left(E\left(i\sinh^{-1}\left(\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)-F\left(i\sinh^{-1}\left(\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)\right)+\frac{bx^3}{a}-\frac{1}{x}}{\sqrt{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*Sqrt[a - b*x^4]),x]
```

```
[Out] (-x^(-1) + (b*x^3)/a - I*Sqrt[-(Sqrt[b]/Sqrt[a])]*Sqrt[1 - (b*x^4
)/a]*(EllipticE[I*ArcSinh[Sqrt[-(Sqrt[b]/Sqrt[a])]*x], -1] - Elli
```

```
pticF[I*ArcSinh[Sqrt[-(Sqrt[b]/Sqrt[a])]*x], -1]))/Sqrt[a - b*x^4
]
```

Maple [A] time = 0.015, size = 106, normalized size = 0.8

$$-\frac{1}{ax}\sqrt{-bx^4+a} +1\sqrt{b}\sqrt{1-x^2\sqrt{b}\frac{1}{\sqrt{a}}}\sqrt{1+x^2\sqrt{b}\frac{1}{\sqrt{a}}}\left(EllipticF\left(x\sqrt{1\sqrt{b}\frac{1}{\sqrt{a}}},i\right)-EllipticE\left(x\sqrt{1\sqrt{b}\frac{1}{\sqrt{a}}},i\right)\right)\frac{1}{\sqrt{a}}\frac{1}{\sqrt{1\sqrt{b}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{-bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(-b*x^4+a)^(1/2),x)
```

```
[Out] -(-b*x^4+a)^(1/2)/a/x+b^(1/2)/a^(1/2)/(1/a^(1/2)*b^(1/2))^(1/2)*(
1-b^(1/2)*x^2/a^(1/2))^(1/2)*(1+b^(1/2)*x^2/a^(1/2))^(1/2)/(-b*x^
4+a)^(1/2)*(EllipticF(x*(1/a^(1/2)*b^(1/2))^(1/2),I)-EllipticE(x*
(1/a^(1/2)*b^(1/2))^(1/2),I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-bx^4+a}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-b*x^4 + a)*x^2),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(-b*x^4 + a)*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{\sqrt{-bx^4+a}x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-b*x^4 + a)*x^2),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(-b*x^4 + a)*x^2), x)
```

Sympy [A] time = 2.46498, size = 41, normalized size = 0.32

$$\frac{\left(-\frac{1}{4}\right) {}_2F_1\left(\begin{matrix} -\frac{1}{4}, \frac{1}{2} \\ \frac{3}{4} \end{matrix}\middle| \frac{bx^4e^{2i\pi}}{a}\right)}{4\sqrt{a}x\left(\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(-b*x**4+a)**(1/2),x)
```

```
[Out] gamma(-1/4)*hyper((-1/4, 1/2), (3/4,), b*x**4*exp_polar(2*I*pi)/a
)/(4*sqrt(a)*x*gamma(3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-bx^4 + ax^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-b*x^4 + a)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(-b*x^4 + a)*x^2), x)
```

3.848 $\int \frac{1}{x^6\sqrt{a-bx^4}}\,dx$

Optimal. Leaf size=158

$$\frac{3b^{5/4}\sqrt{1-\frac{bx^4}{a}}F\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{5a^{5/4}\sqrt{a-bx^4}}-\frac{3b^{5/4}\sqrt{1-\frac{bx^4}{a}}E\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{5a^{5/4}\sqrt{a-bx^4}}-\frac{3b\sqrt{a-bx^4}}{5a^2x}-\frac{\sqrt{a-bx^4}}{5ax^5}$$

```
[Out] -Sqrt[a - b*x^4]/(5*a*x^5) - (3*b*Sqrt[a - b*x^4])/(5*a^2*x) - (3
*b^(5/4)*Sqrt[1 - (b*x^4)/a]*EllipticE[ArcSin[(b^(1/4)*x)/a^(1/4)
], -1])/(5*a^(5/4)*Sqrt[a - b*x^4]) + (3*b^(5/4)*Sqrt[1 - (b*x^4)
/a]*EllipticF[ArcSin[(b^(1/4)*x)/a^(1/4)], -1])/(5*a^(5/4)*Sqrt[a
 - b*x^4])
```

Rubi [A] time = 0.265528, antiderivative size = 158, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.438

$$\frac{3b^{5/4}\sqrt{1-\frac{bx^4}{a}}F\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{5a^{5/4}\sqrt{a-bx^4}}-\frac{3b^{5/4}\sqrt{1-\frac{bx^4}{a}}E\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{5a^{5/4}\sqrt{a-bx^4}}-\frac{3b\sqrt{a-bx^4}}{5a^2x}-\frac{\sqrt{a-bx^4}}{5ax^5}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^6*Sqrt[a - b*x^4]),x]
```

```
[Out] -Sqrt[a - b*x^4]/(5*a*x^5) - (3*b*Sqrt[a - b*x^4])/(5*a^2*x) - (3
*b^(5/4)*Sqrt[1 - (b*x^4)/a]*EllipticE[ArcSin[(b^(1/4)*x)/a^(1/4)
], -1])/(5*a^(5/4)*Sqrt[a - b*x^4]) + (3*b^(5/4)*Sqrt[1 - (b*x^4)
/a]*EllipticF[ArcSin[(b^(1/4)*x)/a^(1/4)], -1])/(5*a^(5/4)*Sqrt[a
 - b*x^4])
```

Rubi in Sympy [A] time = 44.818, size = 141, normalized size = 0.89

$$-\frac{\sqrt{a-bx^4}}{5ax^5}-\frac{3b\sqrt{a-bx^4}}{5a^2x}-\frac{3b^{\frac{5}{4}}\sqrt{1-\frac{bx^4}{a}}E\left(\operatorname{asin}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{5a^{\frac{5}{4}}\sqrt{a-bx^4}}+\frac{3b^{\frac{5}{4}}\sqrt{1-\frac{bx^4}{a}}F\left(\operatorname{asin}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|-1\right)}{5a^{\frac{5}{4}}\sqrt{a-bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**6/(-b*x**4+a)**(1/2),x)
```

```
[Out] -sqrt(a - b*x**4)/(5*a*x**5) - 3*b*sqrt(a - b*x**4)/(5*a**2*x) -
3*b**(5/4)*sqrt(1 - b*x**4/a)*elliptic_e(asin(b**(1/4)*x/a**(1/4)
), -1)/(5*a**(5/4)*sqrt(a - b*x**4)) + 3*b**(5/4)*sqrt(1 - b*x**4
/a)*elliptic_f(asin(b**(1/4)*x/a**(1/4)), -1)/(5*a**(5/4)*sqrt(a
- b*x**4))
```

Mathematica [C] time = 0.558353, size = 131, normalized size = 0.83

$$\frac{\frac{(bx^4-a)(a+3bx^4)}{x^5}-3iab\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}\sqrt{1-\frac{bx^4}{a}}\left(E\left(i\sinh^{-1}\left(\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)-F\left(i\sinh^{-1}\left(\sqrt{-\frac{\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)\right)}{5a^2\sqrt{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^6*Sqrt[a - b*x^4]),x]
```

```
[Out] (((-a + b*x^4)*(a + 3*b*x^4))/x^5 - (3*I)*a*Sqrt[-(Sqrt[b]/Sqrt[a
])]*b*Sqrt[1 - (b*x^4)/a]*(EllipticE[I*ArcSinh[Sqrt[-(Sqrt[b]/Sqr
t[a])]*x], -1] - EllipticF[I*ArcSinh[Sqrt[-(Sqrt[b]/Sqrt[a])]*x],
 -1]))/(5*a^2*Sqrt[a - b*x^4])
```

Maple [A] time = 0.02, size = 126, normalized size = 0.8

$$-\frac{1}{5\,ax^{5}}\sqrt{-bx^{4}+a}-\frac{3\,b}{5\,xa^{2}}\sqrt{-bx^{4}+a}+\frac{3}{5}b^{\frac{3}{2}}\sqrt{1-x^{2}\sqrt{b}\frac{1}{\sqrt{a}}}\sqrt{1+x^{2}\sqrt{b}\frac{1}{\sqrt{a}}}\left(EllipticF\left(x\sqrt{1\sqrt{b}\frac{1}{\sqrt{a}}},i\right)-EllipticE\left(x\sqrt{1\sqrt{b}\frac{1}{\sqrt{a}}},i\right)\right)a^{-\frac{3}{2}}\frac{1}{\sqrt{1\sqrt{b}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{-bx^{4}+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^6/(-b*x^4+a)^(1/2),x)
```

```
[Out] -1/5*(-b*x^4+a)^(1/2)/a/x^5-3/5*b*(-b*x^4+a)^(1/2)/x/a^2+3/5/a^(3
/2)*b^(3/2)/(1/a^(1/2)*b^(1/2))^(1/2)*(1-b^(1/2)*x^2/a^(1/2))^(1/
2)*(1+b^(1/2)*x^2/a^(1/2))^(1/2)/(-b*x^4+a)^(1/2)*(EllipticF(x*(1
/a^(1/2)*b^(1/2))^(1/2),I)-EllipticE(x*(1/a^(1/2)*b^(1/2))^(1/2),
I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-bx^{4}+ax^{6}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(-b*x^4 + a)*x^6),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(-b*x^4 + a)*x^6), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{-bx^{4}+ax^{6}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(-b*x^4 + a)*x^6),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(-b*x^4 + a)*x^6), x)
```

Sympy [A] time = 3.43552, size = 46, normalized size = 0.29

$$\frac{\left(-\frac{5}{4}\right)\,{}_2F_1\left(\begin{matrix}-\frac{5}{4},\frac{1}{2}\\-\frac{1}{4}\end{matrix}\middle|\frac{bx^{4}e^{2i\pi}}{a}\right)}{4\sqrt{a}x^{5}\left(-\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**6/(-b*x**4+a)**(1/2),x)
```

```
[Out] gamma(-5/4)*hyper((-5/4, 1/2), (-1/4,), b*x**4*exp_polar(2*I*pi)/
a)/(4*sqrt(a)*x**5*gamma(-1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-bx^4 + ax^6}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-b*x^4 + a)*x^6),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(-b*x^4 + a)*x^6), x)
```

3.849 $\int \frac{x^{11}}{(a+bx^4)^{3/2}}\,dx$

Optimal. Leaf size=57

$$-\frac{a^2}{2b^3\sqrt{a+bx^4}}-\frac{a\sqrt{a+bx^4}}{b^3}+\frac{(a+bx^4)^{3/2}}{6b^3}$$

```
[Out] -a^2/(2*b^3*Sqrt[a + b*x^4]) - (a*Sqrt[a + b*x^4])/b^3 + (a + b*x
^4)^(3/2)/(6*b^3)
```

Rubi [A] time = 0.0846349, antiderivative size = 57, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^2}{2b^3\sqrt{a+bx^4}}-\frac{a\sqrt{a+bx^4}}{b^3}+\frac{(a+bx^4)^{3/2}}{6b^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^11/(a + b*x^4)^(3/2),x]
```

```
[Out] -a^2/(2*b^3*Sqrt[a + b*x^4]) - (a*Sqrt[a + b*x^4])/b^3 + (a + b*x
^4)^(3/2)/(6*b^3)
```

Rubi in Sympy [A] time = 10.5486, size = 48, normalized size = 0.84

$$-\frac{a^2}{2b^3\sqrt{a+bx^4}}-\frac{a\sqrt{a+bx^4}}{b^3}+\frac{(a+bx^4)^{\frac{3}{2}}}{6b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**11/(b*x**4+a)**(3/2),x)
```

```
[Out] -a**2/(2*b**3*sqrt(a + b*x**4)) - a*sqrt(a + b*x**4)/b**3 + (a +
b*x**4)**(3/2)/(6*b**3)
```

Mathematica [A] time = 0.0342107, size = 38, normalized size = 0.67

$$\frac{-8a^2-4abx^4+b^2x^8}{6b^3\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^11/(a + b*x^4)^(3/2),x]
```

```
[Out] (-8*a^2 - 4*a*b*x^4 + b^2*x^8)/(6*b^3*Sqrt[a + b*x^4])
```

Maple [A] time = 0.008, size = 36, normalized size = 0.6

$$-\frac{-b^2x^8+4\,abx^4+8\,a^2}{6\,b^3}\frac{1}{\sqrt{bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11/(b*x^4+a)^(3/2),x)
```

```
[Out] -1/6*(-b^2*x^8+4*a*b*x^4+8*a^2)/(b*x^4+a)^(1/2)/b^3
```

Maxima [A] time = 1.4311, size = 63, normalized size = 1.11

$$\frac{\left(bx^4+a\right)^{\frac{3}{2}}}{6\,b^3}-\frac{\sqrt{bx^4+a}a}{b^3}-\frac{a^2}{2\,\sqrt{bx^4+a}b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(b*x^4 + a)^(3/2),x, algorithm="maxima")
```

```
[Out] 1/6*(b*x^4 + a)^(3/2)/b^3 - sqrt(b*x^4 + a)*a/b^3 - 1/2*a^2/(sqrt
(b*x^4 + a)*b^3)
```

Fricas [A] time = 0.265801, size = 46, normalized size = 0.81

$$\frac{b^2x^8-4\,abx^4-8\,a^2}{6\,\sqrt{bx^4+a}b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(b*x^4 + a)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/6*(b^2*x^8 - 4*a*b*x^4 - 8*a^2)/(sqrt(b*x^4 + a)*b^3)
```

Sympy [A] time = 10.1977, size = 68, normalized size = 1.19

$$\begin{cases} -\frac{4a^2}{3b^3\sqrt{a+bx^4}}-\frac{2ax^4}{3b^2\sqrt{a+bx^4}}+\frac{x^8}{6b\sqrt{a+bx^4}} & \text{for } b\neq 0\\ \frac{x^{12}}{12a^{\frac{3}{2}}} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11/(b*x**4+a)**(3/2),x)
```

```
[Out] Piecewise((-4*a**2/(3*b**3*sqrt(a + b*x**4)) - 2*a*x**4/(3*b**2*s
qrt(a + b*x**4)) + x**8/(6*b*sqrt(a + b*x**4)), Ne(b, 0)), (x**12
/(12*a**(3/2)), True))
```

GIAC/XCAS [A] time = 0.222902, size = 55, normalized size = 0.96

$$\frac{\left(bx^4+a\right)^{\frac{3}{2}}-6\,\sqrt{bx^4+a}a-\frac{3\,a^2}{\sqrt{bx^4+a}}}{6\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(b*x^4 + a)^(3/2),x, algorithm="giac")
```

```
[Out] 1/6*((b*x^4 + a)^(3/2) - 6*sqrt(b*x^4 + a)*a - 3*a^2/sqrt(b*x^4 +
 a))/b^3
```

3.850 $\int \frac{x^7}{(a+bx^4)^{3/2}}\,dx$

Optimal. Leaf size=38

$$\frac{a}{2b^2\sqrt{a+bx^4}}+\frac{\sqrt{a+bx^4}}{2b^2}$$

```
[Out] a/(2*b^2*Sqrt[a + b*x^4]) + Sqrt[a + b*x^4]/(2*b^2)
```

Rubi [A] time = 0.0582628, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a}{2b^2\sqrt{a+bx^4}}+\frac{\sqrt{a+bx^4}}{2b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7/(a + b*x^4)^(3/2),x]

[Out] a/(2*b^2*Sqrt[a + b*x^4]) + Sqrt[a + b*x^4]/(2*b^2)
```

Rubi in Sympy [A] time = 7.10198, size = 31, normalized size = 0.82

$$\frac{a}{2b^2\sqrt{a+bx^4}}+\frac{\sqrt{a+bx^4}}{2b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7/(b*x**4+a)**(3/2),x)

[Out] a/(2*b**2*sqrt(a + b*x**4)) + sqrt(a + b*x**4)/(2*b**2)
```

Mathematica [A] time = 0.0253046, size = 27, normalized size = 0.71

$$\frac{2a+bx^4}{2b^2\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^7/(a + b*x^4)^(3/2),x]

[Out] (2*a + b*x^4)/(2*b^2*Sqrt[a + b*x^4])
```

Maple [A] time = 0.007, size = 24, normalized size = 0.6

$${\frac{bx^4+2\,a}{2\,b^2}}{\frac{1}{\sqrt{bx^4+a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7/(b*x^4+a)^(3/2),x)
```

```
[Out] 1/2*(b*x^4+2*a)/(b*x^4+a)^(1/2)/b^2
```

Maxima [A] time = 1.44289, size = 41, normalized size = 1.08

$$\frac{\sqrt{bx^4 + a}}{2\,b^2} + \frac{a}{2\,\sqrt{bx^4 + a}b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(b*x^4 + a)^(3/2),x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(b*x^4 + a)/b^2 + 1/2*a/(sqrt(b*x^4 + a)*b^2)
```

Fricas [A] time = 0.253775, size = 31, normalized size = 0.82

$$\frac{bx^4 + 2\,a}{2\,\sqrt{bx^4 + a}b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(b*x^4 + a)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/2*(b*x^4 + 2*a)/(sqrt(b*x^4 + a)*b^2)
```

Sympy [A] time = 4.00967, size = 41, normalized size = 1.08

$$\begin{cases} \frac{a}{b^2\sqrt{a+bx^4}} + \frac{x^4}{2b\sqrt{a+bx^4}} & \text{for } b \neq 0 \\ \frac{x^8}{8a^{\frac{3}{2}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(b*x**4+a)**(3/2),x)
```

```
[Out] Piecewise((a/(b**2*sqrt(a + b*x**4)) + x**4/(2*b*sqrt(a + b*x**4)
), Ne(b, 0)), (x**8/(8*a**(3/2)), True))
```

GIAC/XCAS [A] time = 0.216919, size = 35, normalized size = 0.92

$$\frac{\sqrt{bx^4 + a} + \frac{a}{\sqrt{bx^4+a}}}{2\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(b*x^4 + a)^(3/2),x, algorithm="giac")
```

```
[Out] 1/2*(sqrt(b*x^4 + a) + a/sqrt(b*x^4 + a))/b^2
```

3.851 $\int \frac{x^3}{(a+bx^4)^{3/2}} \, dx$

Optimal. Leaf size=18

$$-\frac{1}{2b\sqrt{a+bx^4}}$$

[Out] -1/(2*b*Sqrt[a + b*x^4])

Rubi [A] time = 0.0104478, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{1}{2b\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

[In] Int[x^3/(a + b*x^4)^(3/2),x]

[Out] -1/(2*b*Sqrt[a + b*x^4])

Rubi in Sympy [A] time = 2.13264, size = 15, normalized size = 0.83

$$-\frac{1}{2b\sqrt{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(x**3/(b*x**4+a)**(3/2),x)

[Out] -1/(2*b*sqrt(a + b*x**4))

Mathematica [A] time = 0.00953613, size = 18, normalized size = 1.

$$-\frac{1}{2b\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

[In] Integrate[x^3/(a + b*x^4)^(3/2),x]

[Out] -1/(2*b*Sqrt[a + b*x^4])

Maple [A] time = 0.007, size = 15, normalized size = 0.8

$$-\frac{1}{2\,b}\frac{1}{\sqrt{b{x}^{4}+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^3/(b*x^4+a)^(3/2),x)

[Out] -1/2/b/(b*x^4+a)^(1/2)

Maxima [A] time = 1.44309, size = 19, normalized size = 1.06

$$-\frac{1}{2\sqrt{bx^4+a}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^4 + a)^(3/2),x, algorithm="maxima")
```

```
[Out] -1/2/(sqrt(b*x^4 + a)*b)
```

Fricas [A] time = 0.264633, size = 19, normalized size = 1.06

$$-\frac{1}{2\sqrt{bx^4+a}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^4 + a)^(3/2),x, algorithm="fricas")
```

```
[Out] -1/2/(sqrt(b*x^4 + a)*b)
```

Sympy [A] time = 1.90867, size = 26, normalized size = 1.44

$$\begin{cases} -\frac{1}{2b\sqrt{a+bx^4}} & \text{for}\: b \neq 0 \\ \frac{x^4}{4a^{\frac{3}{2}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(b*x**4+a)**(3/2),x)
```

```
[Out] Piecewise((-1/(2*b*sqrt(a + b*x**4)), Ne(b, 0)), (x**4/(4*a**(3/2
)), True))
```

GIAC/XCAS [A] time = 0.217604, size = 19, normalized size = 1.06

$$-\frac{1}{2\sqrt{bx^4+a}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^4 + a)^(3/2),x, algorithm="giac")
```

```
[Out] -1/2/(sqrt(b*x^4 + a)*b)
```

3.852 $\int \frac{1}{x(a+bx^4)^{3/2}}\,dx$

Optimal. Leaf size=46

$$\frac{1}{2a\sqrt{a+bx^4}}-\frac{\tanh^{-1}\left(\frac{\sqrt{a+bx^4}}{\sqrt{a}}\right)}{2a^{3/2}}$$

```
[Out] 1/(2*a*Sqrt[a + b*x^4]) - ArcTanh[Sqrt[a + b*x^4]/Sqrt[a]]/(2*a^(
3/2))
```

Rubi [A] time = 0.0715207, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{1}{2a\sqrt{a+bx^4}}-\frac{\tanh^{-1}\left(\frac{\sqrt{a+bx^4}}{\sqrt{a}}\right)}{2a^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a + b*x^4)^(3/2)),x]
```

```
[Out] 1/(2*a*Sqrt[a + b*x^4]) - ArcTanh[Sqrt[a + b*x^4]/Sqrt[a]]/(2*a^(
3/2))
```

Rubi in Sympy [A] time = 7.19185, size = 37, normalized size = 0.8

$$\frac{1}{2a\sqrt{a+bx^4}}-\frac{\operatorname{atanh}\left(\frac{\sqrt{a+bx^4}}{\sqrt{a}}\right)}{2a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(b*x**4+a)**(3/2),x)
```

```
[Out] 1/(2*a*sqrt(a + b*x**4)) - atanh(sqrt(a + b*x**4)/sqrt(a))/(2*a**
(3/2))
```

Mathematica [A] time = 0.101797, size = 46, normalized size = 1.

$$\frac{1}{2a\sqrt{a+bx^4}}-\frac{\tanh^{-1}\left(\frac{\sqrt{a+bx^4}}{\sqrt{a}}\right)}{2a^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a + b*x^4)^(3/2)),x]
```

```
[Out] 1/(2*a*Sqrt[a + b*x^4]) - ArcTanh[Sqrt[a + b*x^4]/Sqrt[a]]/(2*a^(
3/2))
```

Maple [A] time = 0.019, size = 44, normalized size = 1.

$$\frac{1}{2\,a}\frac{1}{\sqrt{bx^4+a}}-\frac{1}{2}\ln\left(\frac{1}{x^2}\left(2\,a+2\,\sqrt{a}\sqrt{bx^4+a}\right)\right)a^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x/(b*x^4+a)^(3/2),x)
```

```
[Out] 1/2/a/(b*x^4+a)^(1/2)-1/2/a^(3/2)*ln((2*a+2*a^(1/2)*(b*x^4+a)^(1/
2))/x^2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((b*x^4 + a)^(3/2)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.292922, size = 1, normalized size = 0.02

$$\left[\frac{\sqrt{bx^4+a}\log\left(\frac{(bx^4+2\,a)\sqrt{a}-2\,\sqrt{bx^4+a}a}{x^4}\right)+2\,\sqrt{a}}{4\,\sqrt{bx^4+a}a^{\frac{3}{2}}},\ \frac{\sqrt{bx^4+a}\arctan\left(\frac{a}{\sqrt{bx^4+a}\sqrt{-a}}\right)+\sqrt{-a}}{2\,\sqrt{bx^4+a}\sqrt{-a}a}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((b*x^4 + a)^(3/2)*x),x, algorithm="fricas")
```

```
[Out] [1/4*(sqrt(b*x^4 + a)*log(((b*x^4 + 2*a)*sqrt(a) - 2*sqrt(b*x^4 +
 a)*a)/x^4) + 2*sqrt(a))/(sqrt(b*x^4 + a)*a^(3/2)), 1/2*(sqrt(b*x
^4 + a)*arctan(a/(sqrt(b*x^4 + a)*sqrt(-a))) + sqrt(-a))/(sqrt(b*
x^4 + a)*sqrt(-a)*a)]
```

Sympy [A] time = 5.84632, size = 184, normalized size = 4.

$$\frac{2a^3\sqrt{1+\frac{bx^4}{a}}}{4a^{\frac{9}{2}}+4a^{\frac{7}{2}}bx^4}+\frac{a^3\log\left(\frac{bx^4}{a}\right)}{4a^{\frac{9}{2}}+4a^{\frac{7}{2}}bx^4}-\frac{2a^3\log\left(\sqrt{1+\frac{bx^4}{a}}+1\right)}{4a^{\frac{9}{2}}+4a^{\frac{7}{2}}bx^4}+\frac{a^2bx^4\log\left(\frac{bx^4}{a}\right)}{4a^{\frac{9}{2}}+4a^{\frac{7}{2}}bx^4}-\frac{2a^2bx^4\log\left(\sqrt{1+\frac{bx^4}{a}}+1\right)}{4a^{\frac{9}{2}}+4a^{\frac{7}{2}}bx^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/x/(b*x**4+a)**(3/2),x)
```

```
[Out] 2*a**3*sqrt(1 + b*x**4/a)/(4*a**(9/2) + 4*a**(7/2)*b*x**4) + a**3
*log(b*x**4/a)/(4*a**(9/2) + 4*a**(7/2)*b*x**4) - 2*a**3*log(sqrt
(1 + b*x**4/a) + 1)/(4*a**(9/2) + 4*a**(7/2)*b*x**4) + a**2*b*x**
4*log(b*x**4/a)/(4*a**(9/2) + 4*a**(7/2)*b*x**4) - 2*a**2*b*x**4*
log(sqrt(1 + b*x**4/a) + 1)/(4*a**(9/2) + 4*a**(7/2)*b*x**4)
```

GIAC/XCAS [A] time = 0.215509, size = 55, normalized size = 1.2

$$\frac{\arctan\left(\frac{\sqrt{bx^4+a}}{\sqrt{-a}}\right)}{2\,\sqrt{-a}a}+\frac{1}{2\,\sqrt{bx^4+a}a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/2)*x),x, algorithm="giac")
```

```
[Out] 1/2*arctan(sqrt(b*x^4 + a)/sqrt(-a))/(sqrt(-a)*a) + 1/2/(sqrt(b*x
^4 + a)*a)
```

3.853 $\int \frac{1}{x^5(a+bx^4)^{3/2}}\,dx$

Optimal. Leaf size=71

$$\frac{3b\tanh^{-1}\left(\frac{\sqrt{a+bx^4}}{\sqrt{a}}\right)}{4a^{5/2}}-\frac{3\sqrt{a+bx^4}}{4a^2x^4}+\frac{1}{2ax^4\sqrt{a+bx^4}}$$

```
[Out] 1/(2*a*x^4*Sqrt[a + b*x^4]) - (3*Sqrt[a + b*x^4])/(4*a^2*x^4) + (
3*b*ArcTanh[Sqrt[a + b*x^4]/Sqrt[a]])/(4*a^(5/2))
```

Rubi [A] time = 0.099341, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{3b\tanh^{-1}\left(\frac{\sqrt{a+bx^4}}{\sqrt{a}}\right)}{4a^{5/2}}-\frac{3\sqrt{a+bx^4}}{4a^2x^4}+\frac{1}{2ax^4\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^5*(a + b*x^4)^(3/2)),x]
```

```
[Out] 1/(2*a*x^4*Sqrt[a + b*x^4]) - (3*Sqrt[a + b*x^4])/(4*a^2*x^4) + (
3*b*ArcTanh[Sqrt[a + b*x^4]/Sqrt[a]])/(4*a^(5/2))
```

Rubi in Sympy [A] time = 9.88013, size = 65, normalized size = 0.92

$$\frac{1}{2ax^4\sqrt{a+bx^4}}-\frac{3\sqrt{a+bx^4}}{4a^2x^4}+\frac{3b\,\mathrm{atanh}\left(\frac{\sqrt{a+bx^4}}{\sqrt{a}}\right)}{4a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**5/(b*x**4+a)**(3/2),x)
```

```
[Out] 1/(2*a*x**4*sqrt(a + b*x**4)) - 3*sqrt(a + b*x**4)/(4*a**2*x**4)
+ 3*b*atanh(sqrt(a + b*x**4)/sqrt(a))/(4*a**(5/2))
```

Mathematica [A] time = 0.130668, size = 58, normalized size = 0.82

$$\frac{3b\tanh^{-1}\left(\frac{\sqrt{a+bx^4}}{\sqrt{a}}\right)}{4a^{5/2}}-\frac{a+3bx^4}{4a^2x^4\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^5*(a + b*x^4)^(3/2)),x]
```

```
[Out] -(a + 3*b*x^4)/(4*a^2*x^4*Sqrt[a + b*x^4]) + (3*b*ArcTanh[Sqrt[a
+ b*x^4]/Sqrt[a]])/(4*a^(5/2))
```

Maple [A] time = 0.018, size = 63, normalized size = 0.9

$$-\frac{1}{4\,ax^4}\frac{1}{\sqrt{bx^4+a}}-\frac{3\,b}{4\,a^2}\frac{1}{\sqrt{bx^4+a}}+\frac{3\,b}{4}\ln\left(\frac{1}{x^2}\left(2\,a+2\,\sqrt{a}\sqrt{bx^4+a}\right)\right)a^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^5/(b*x^4+a)^(3/2),x)
```

```
[Out] -1/4/a/x^4/(b*x^4+a)^(1/2)-3/4*b/a^2/(b*x^4+a)^(1/2)+3/4*b/a^(5/2
)*ln((2*a+2*a^(1/2)*(b*x^4+a)^(1/2))/x^2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/2)*x^5),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.384068, size = 1, normalized size = 0.01

$$\left[\frac{3\sqrt{bx^4+a}bx^4\log\left(\frac{(bx^4+2\,a)\sqrt{a}+2\,\sqrt{bx^4+a}a}{x^4}\right)-2\left(3\,bx^4+a\right)\sqrt{a}}{8\,\sqrt{bx^4+a}a^{\frac{5}{2}}x^4},\right.$$
$$\left.-\frac{3\sqrt{bx^4+a}bx^4\arctan\left(\frac{a}{\sqrt{bx^4+a}\sqrt{-a}}\right)+\left(3\,bx^4+a\right)\sqrt{-a}}{4\,\sqrt{bx^4+a}\sqrt{-a}a^2x^4}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/2)*x^5),x, algorithm="fricas")
```

```
[Out] [1/8*(3*sqrt(b*x^4 + a)*b*x^4*log(((b*x^4 + 2*a)*sqrt(a) + 2*sqrt
(b*x^4 + a)*a)/x^4) - 2*(3*b*x^4 + a)*sqrt(a))/(sqrt(b*x^4 + a)*a
^(5/2)*x^4), -1/4*(3*sqrt(b*x^4 + a)*b*x^4*arctan(a/(sqrt(b*x^4 +
 a)*sqrt(-a))) + (3*b*x^4 + a)*sqrt(-a))/(sqrt(b*x^4 + a)*sqrt(-a
)*a^2*x^4)]
```

Sympy [A] time = 12.1225, size = 76, normalized size = 1.07

$$-\frac{1}{4a\sqrt{b}x^6\sqrt{\frac{a}{bx^4}+1}}-\frac{3\sqrt{b}}{4a^2x^2\sqrt{\frac{a}{bx^4}+1}}+\frac{3b\operatorname{asinh}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{4a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**5/(b*x**4+a)**(3/2),x)
```

```
[Out] -1/(4*a*sqrt(b)*x**6*sqrt(a/(b*x**4) + 1)) - 3*sqrt(b)/(4*a**2*x*
*2*sqrt(a/(b*x**4) + 1)) + 3*b*asinh(sqrt(a)/(sqrt(b)*x**2))/(4*a
**(5/2))
```

GIAC/XCAS [A] time = 0.2153, size = 89, normalized size = 1.25

$$-\frac{1}{4}b\left(\frac{3\arctan\left(\frac{\sqrt{bx^4+a}}{\sqrt{-a}}\right)}{\sqrt{-a}a^2}+\frac{3\,bx^4+a}{\left((bx^4+a)^{\frac{3}{2}}-\sqrt{bx^4+a}a\right)a^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/2)*x^5),x, algorithm="giac")
```

```
[Out] -1/4*b*(3*arctan(sqrt(b*x^4 + a)/sqrt(-a))/(sqrt(-a)*a^2) + (3*b*
x^4 + a)/(((b*x^4 + a)^(3/2) - sqrt(b*x^4 + a)*a)*a^2))
```

3.854 $\int \frac{x^9}{(a+bx^4)^{3/2}}\,dx$

Optimal. Leaf size=74

$$-\frac{3a\tanh^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a+bx^4}}\right)}{4b^{5/2}}+\frac{3x^2\sqrt{a+bx^4}}{4b^2}-\frac{x^6}{2b\sqrt{a+bx^4}}$$

```
[Out] -x^6/(2*b*Sqrt[a + b*x^4]) + (3*x^2*Sqrt[a + b*x^4])/(4*b^2) - (3
*a*ArcTanh[(Sqrt[b]*x^2)/Sqrt[a + b*x^4]])/(4*b^(5/2))
```

Rubi [A] time = 0.110273, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{3a\tanh^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a+bx^4}}\right)}{4b^{5/2}}+\frac{3x^2\sqrt{a+bx^4}}{4b^2}-\frac{x^6}{2b\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^9/(a + b*x^4)^(3/2),x]
```

```
[Out] -x^6/(2*b*Sqrt[a + b*x^4]) + (3*x^2*Sqrt[a + b*x^4])/(4*b^2) - (3
*a*ArcTanh[(Sqrt[b]*x^2)/Sqrt[a + b*x^4]])/(4*b^(5/2))
```

Rubi in Sympy [A] time = 11.7722, size = 66, normalized size = 0.89

$$-\frac{3a\operatorname{atanh}\left(\frac{\sqrt{b}x^2}{\sqrt{a+bx^4}}\right)}{4b^{\frac{5}{2}}}-\frac{x^6}{2b\sqrt{a+bx^4}}+\frac{3x^2\sqrt{a+bx^4}}{4b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**9/(b*x**4+a)**(3/2),x)
```

```
[Out] -3*a*atanh(sqrt(b)*x**2/sqrt(a + b*x**4))/(4*b**(5/2)) - x**6/(2*
b*sqrt(a + b*x**4)) + 3*x**2*sqrt(a + b*x**4)/(4*b**2)
```

Mathematica [A] time = 0.108848, size = 65, normalized size = 0.88

$$\frac{3ax^2+bx^6}{4b^2\sqrt{a+bx^4}}-\frac{3a\log\left(\sqrt{b}\sqrt{a+bx^4}+bx^2\right)}{4b^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^9/(a + b*x^4)^(3/2),x]
```

```
[Out] (3*a*x^2 + b*x^6)/(4*b^2*Sqrt[a + b*x^4]) - (3*a*Log[b*x^2 + Sqrt
[b]*Sqrt[a + b*x^4]])/(4*b^(5/2))
```

Maple [A] time = 0.017, size = 61, normalized size = 0.8

$$\frac{x^6}{4\,b}\frac{1}{\sqrt{bx^4+a}}+\frac{3\,ax^2}{4\,b^2}\frac{1}{\sqrt{bx^4+a}}-\frac{3\,a}{4}\ln\left(\sqrt{b}x^2+\sqrt{bx^4+a}\right)b^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^9/(b*x^4+a)^(3/2),x)
```

```
[Out] 1/4*x^6/b/(b*x^4+a)^(1/2)+3/4*a/b^2*x^2/(b*x^4+a)^(1/2)-3/4*a/b^(
5/2)*ln(b^(1/2)*x^2+(b*x^4+a)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(b*x^4 + a)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.327221, size = 1, normalized size = 0.01

$$\left[\frac{2\left(bx^{6}+3\,ax^{2}\right)\sqrt{bx^{4}+a}\sqrt{b}+3\left(abx^{4}+a^{2}\right)\log\left(2\sqrt{bx^{4}+a}bx^{2}-\left(2\,bx^{4}+a\right)\sqrt{b}\right)}{8\left(b^{3}x^{4}+ab^{2}\right)\sqrt{b}}, \frac{\left(bx^{6}+3\,ax^{2}\right)\sqrt{bx^{4}+a}\sqrt{-b}-3\left(abx^{4}\right.}{4\left(b^{3}x^{4}+ab^{2}\right)\sqrt{-}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(b*x^4 + a)^(3/2),x, algorithm="fricas")
```

```
[Out] [1/8*(2*(b*x^6 + 3*a*x^2)*sqrt(b*x^4 + a)*sqrt(b) + 3*(a*b*x^4 +
a^2)*log(2*sqrt(b*x^4 + a)*b*x^2 - (2*b*x^4 + a)*sqrt(b)))/((b^3*
x^4 + a*b^2)*sqrt(b)), 1/4*((b*x^6 + 3*a*x^2)*sqrt(b*x^4 + a)*sqr
t(-b) - 3*(a*b*x^4 + a^2)*arctan(sqrt(-b)*x^2/sqrt(b*x^4 + a)))/(
(b^3*x^4 + a*b^2)*sqrt(-b))]
```

Sympy [A] time = 12.393, size = 75, normalized size = 1.01

$$\frac{3\sqrt{a}x^{2}}{4b^{2}\sqrt{1+\frac{bx^{4}}{a}}}-\frac{3a\operatorname{asinh}\left(\frac{\sqrt{b}x^{2}}{\sqrt{a}}\right)}{4b^{\frac{5}{2}}}+\frac{x^{6}}{4\sqrt{a}b\sqrt{1+\frac{bx^{4}}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**9/(b*x**4+a)**(3/2),x)
```

```
[Out] 3*sqrt(a)*x**2/(4*b**2*sqrt(1 + b*x**4/a)) - 3*a*asinh(sqrt(b)*x*
*2/sqrt(a))/(4*b**(5/2)) + x**6/(4*sqrt(a)*b*sqrt(1 + b*x**4/a))
```

GIAC/XCAS [A] time = 0.233652, size = 74, normalized size = 1.

$$\frac{\left(\frac{x^{4}}{b}+\frac{3\,a}{b^{2}}\right)x^{2}}{4\sqrt{bx^{4}+a}}+\frac{3\,a\ln\left(\left|-\sqrt{b}x^{2}+\sqrt{bx^{4}+a}\right|\right)}{4\,b^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(b*x^4 + a)^(3/2),x, algorithm="giac")
```

```
[Out] 1/4*(x^4/b + 3*a/b^2)*x^2/sqrt(b*x^4 + a) + 3/4*a*ln(abs(-sqrt(b)
*x^2 + sqrt(b*x^4 + a)))/b^(5/2)
```

3.855 $\int \frac{x^5}{(a+bx^4)^{3/2}}\,dx$

Optimal. Leaf size=52

$$\frac{\tanh^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a+bx^4}}\right)}{2b^{3/2}}-\frac{x^2}{2b\sqrt{a+bx^4}}$$

```
[Out] -x^2/(2*b*Sqrt[a + b*x^4]) + ArcTanh[(Sqrt[b]*x^2)/Sqrt[a + b*x^4
]]/(2*b^(3/2))
```

Rubi [A] time = 0.0744296, antiderivative size = 52, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{\tanh^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a+bx^4}}\right)}{2b^{3/2}}-\frac{x^2}{2b\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/(a + b*x^4)^(3/2),x]
```

```
[Out] -x^2/(2*b*Sqrt[a + b*x^4]) + ArcTanh[(Sqrt[b]*x^2)/Sqrt[a + b*x^4
]]/(2*b^(3/2))
```

Rubi in Sympy [A] time = 7.89916, size = 42, normalized size = 0.81

$$-\frac{x^2}{2b\sqrt{a+bx^4}}+\frac{\operatorname{atanh}\left(\frac{\sqrt{b}x^2}{\sqrt{a+bx^4}}\right)}{2b^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(b*x**4+a)**(3/2),x)
```

```
[Out] -x**2/(2*b*sqrt(a + b*x**4)) + atanh(sqrt(b)*x**2/sqrt(a + b*x**4
))/(2*b**(3/2))
```

Mathematica [A] time = 0.0421878, size = 55, normalized size = 1.06

$$\frac{\log\left(\sqrt{b}\sqrt{a+bx^4}+bx^2\right)}{2b^{3/2}}-\frac{x^2}{2b\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/(a + b*x^4)^(3/2),x]
```

```
[Out] -x^2/(2*b*Sqrt[a + b*x^4]) + Log[b*x^2 + Sqrt[b]*Sqrt[a + b*x^4]]
/(2*b^(3/2))
```

Maple [A] time = 0.016, size = 42, normalized size = 0.8

$$-\frac{x^2}{2\,b}\frac{1}{\sqrt{bx^4+a}}+\frac{1}{2}\ln\left(\sqrt{b}x^2+\sqrt{bx^4+a}\right)b^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(b*x^4+a)^(3/2),x)
```

```
[Out] -1/2*x^2/b/(b*x^4+a)^(1/2)+1/2/b^(3/2)*ln(b^(1/2)*x^2+(b*x^4+a)^(
1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^4 + a)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.327374, size = 1, normalized size = 0.02

$$\left[-\frac{2\sqrt{bx^4+a}\sqrt{b}x^2-\left(bx^4+a\right)\log\left(-2\sqrt{bx^4+a}bx^2-\left(2\,bx^4+a\right)\sqrt{b}\right)}{4\left(b^2x^4+ab\right)\sqrt{b}},\right.$$
$$\left.-\frac{\sqrt{bx^4+a}\sqrt{-b}x^2-\left(bx^4+a\right)\arctan\left(\frac{\sqrt{-b}x^2}{\sqrt{bx^4+a}}\right)}{2\left(b^2x^4+ab\right)\sqrt{-b}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^4 + a)^(3/2),x, algorithm="fricas")
```

```
[Out] [-1/4*(2*sqrt(b*x^4 + a)*sqrt(b)*x^2 - (b*x^4 + a)*log(-2*sqrt(b*
x^4 + a)*b*x^2 - (2*b*x^4 + a)*sqrt(b)))/((b^2*x^4 + a*b)*sqrt(b)
), -1/2*(sqrt(b*x^4 + a)*sqrt(-b)*x^2 - (b*x^4 + a)*arctan(sqrt(-
b)*x^2/sqrt(b*x^4 + a)))/((b^2*x^4 + a*b)*sqrt(-b))]
```

Sympy [A] time = 5.97639, size = 44, normalized size = 0.85

$$\frac{\operatorname{asinh}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2b^{\frac{3}{2}}}-\frac{x^2}{2\sqrt{a}b\sqrt{1+\frac{bx^4}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(b*x**4+a)**(3/2),x)
```

```
[Out] asinh(sqrt(b)*x**2/sqrt(a))/(2*b**(3/2)) - x**2/(2*sqrt(a)*b*sqrt
(1 + b*x**4/a))
```

GIAC/XCAS [A] time = 0.239285, size = 58, normalized size = 1.12

$$-\frac{x^2}{2\sqrt{bx^4+a}b}-\frac{\ln\left(\left|-\sqrt{b}x^2+\sqrt{bx^4+a}\right|\right)}{2\,b^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^4 + a)^(3/2),x, algorithm="giac")
```

```
[Out] -1/2*x^2/(sqrt(b*x^4 + a)*b) - 1/2*ln(abs(-sqrt(b)*x^2 + sqrt(b*x
^4 + a)))/b^(3/2)
```

3.856 $\int \frac{x}{(a+bx^4)^{3/2}}\,dx$

Optimal. Leaf size=21

$$\frac{x^2}{2a\sqrt{a+bx^4}}$$

```
[Out] x^2/(2*a*Sqrt[a + b*x^4])
```

Rubi [A] time = 0.0170324, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{x^2}{2a\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b*x^4)^(3/2),x]

[Out] x^2/(2*a*Sqrt[a + b*x^4])
```

Rubi in Sympy [A] time = 2.50186, size = 15, normalized size = 0.71

$$\frac{x^2}{2a\sqrt{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(b*x**4+a)**(3/2),x)

[Out] x**2/(2*a*sqrt(a + b*x**4))
```

Mathematica [A] time = 0.0171319, size = 21, normalized size = 1.

$$\frac{x^2}{2a\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b*x^4)^(3/2),x]

[Out] x^2/(2*a*Sqrt[a + b*x^4])
```

Maple [A] time = 0.006, size = 18, normalized size = 0.9

$$\frac{x^2}{2\,a}\frac{1}{\sqrt{bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(b*x^4+a)^(3/2),x)
```

```
[Out] 1/2*x^2/a/(b*x^4+a)^(1/2)
```

Maxima [A] time = 1.43703, size = 23, normalized size = 1.1

$$\frac{x^2}{2\sqrt{bx^4+a}a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^4 + a)^(3/2),x, algorithm="maxima")
```

```
[Out] 1/2*x^2/(sqrt(b*x^4 + a)*a)
```

Fricas [A] time = 0.272596, size = 35, normalized size = 1.67

$$\frac{\sqrt{bx^4+a}x^2}{2(abx^4+a^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^4 + a)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/2*sqrt(b*x^4 + a)*x^2/(a*b*x^4 + a^2)
```

Sympy [A] time = 1.80735, size = 20, normalized size = 0.95

$$\frac{x^2}{2a^{\frac{3}{2}}\sqrt{1+\frac{bx^4}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x**4+a)**(3/2),x)
```

```
[Out] x**2/(2*a**(3/2)*sqrt(1 + b*x**4/a))
```

GIAC/XCAS [A] time = 0.230945, size = 23, normalized size = 1.1

$$\frac{x^2}{2\sqrt{bx^4+a}a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^4 + a)^(3/2),x, algorithm="giac")
```

```
[Out] 1/2*x^2/(sqrt(b*x^4 + a)*a)
```

3.857 $\int \frac{1}{x^3(a+bx^4)^{3/2}}\,dx$

Optimal. Leaf size=42

$$-\frac{bx^2}{a^2\sqrt{a+bx^4}}-\frac{1}{2ax^2\sqrt{a+bx^4}}$$

```
[Out] -1/(2*a*x^2*Sqrt[a + b*x^4]) - (b*x^2)/(a^2*Sqrt[a + b*x^4])
```

Rubi [A] time = 0.0384338, antiderivative size = 42, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{bx^2}{a^2\sqrt{a+bx^4}}-\frac{1}{2ax^2\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(a + b*x^4)^(3/2)),x]

[Out] -1/(2*a*x^2*Sqrt[a + b*x^4]) - (b*x^2)/(a^2*Sqrt[a + b*x^4])
```

Rubi in Sympy [A] time = 4.06167, size = 37, normalized size = 0.88

$$-\frac{1}{2ax^2\sqrt{a+bx^4}}-\frac{bx^2}{a^2\sqrt{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(b*x**4+a)**(3/2),x)

[Out] -1/(2*a*x**2*sqrt(a + b*x**4)) - b*x**2/(a**2*sqrt(a + b*x**4))
```

Mathematica [A] time = 0.0245545, size = 29, normalized size = 0.69

$$-\frac{a+2bx^4}{2a^2x^2\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*(a + b*x^4)^(3/2)),x]

[Out] -(a + 2*b*x^4)/(2*a^2*x^2*Sqrt[a + b*x^4])
```

Maple [A] time = 0.007, size = 26, normalized size = 0.6

$$-\frac{2\,bx^4+a}{2\,a^2x^2}\frac{1}{\sqrt{bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(b*x^4+a)^(3/2),x)
```

```
[Out] -1/2*(2*b*x^4+a)/x^2/(b*x^4+a)^(1/2)/a^2
```

Maxima [A] time = 1.44188, size = 49, normalized size = 1.17

$$-\frac{bx^2}{2\sqrt{bx^4+a}a^2}-\frac{\sqrt{bx^4+a}}{2\,a^2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/2)*x^3),x, algorithm="maxima")
```

```
[Out] -1/2*b*x^2/(sqrt(b*x^4 + a)*a^2) - 1/2*sqrt(b*x^4 + a)/(a^2*x^2)
```

Fricas [A] time = 0.253297, size = 50, normalized size = 1.19

$$-\frac{\left(2\,bx^4+a\right)\sqrt{bx^4+a}}{2\,(a^2bx^6+a^3x^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/2)*x^3),x, algorithm="fricas")
```

```
[Out] -1/2*(2*b*x^4 + a)*sqrt(b*x^4 + a)/(a^2*b*x^6 + a^3*x^2)
```

Sympy [A] time = 2.85669, size = 46, normalized size = 1.1

$$-\frac{1}{2a\sqrt{b}x^4\sqrt{\frac{a}{bx^4}+1}}-\frac{\sqrt{b}}{a^2\sqrt{\frac{a}{bx^4}+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(b*x**4+a)**(3/2),x)
```

```
[Out] -1/(2*a*sqrt(b)*x**4*sqrt(a/(b*x**4) + 1)) - sqrt(b)/(a**2*sqrt(a
/(b*x**4) + 1))
```

GIAC/XCAS [A] time = 0.24261, size = 47, normalized size = 1.12

$$-\frac{\sqrt{b+\frac{a}{x^4}}}{2\,a^2}+\frac{x^2}{256\sqrt{bx^4+a}a^3b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/2)*x^3),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(b + a/x^4)/a^2 + 1/256*x^2/(sqrt(b*x^4 + a)*a^3*b^3)
```

3.858 $\int \frac{1}{x^7(a+bx^4)^{3/2}}\,dx$

Optimal. Leaf size=68

$$\frac{4b^2x^2}{3a^3\sqrt{a+bx^4}}+\frac{2b}{3a^2x^2\sqrt{a+bx^4}}-\frac{1}{6ax^6\sqrt{a+bx^4}}$$

```
[Out] -1/(6*a*x^6*Sqrt[a + b*x^4]) + (2*b)/(3*a^2*x^2*Sqrt[a + b*x^4])
+ (4*b^2*x^2)/(3*a^3*Sqrt[a + b*x^4])
```

Rubi [A] time = 0.0608464, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{4b^2x^2}{3a^3\sqrt{a+bx^4}}+\frac{2b}{3a^2x^2\sqrt{a+bx^4}}-\frac{1}{6ax^6\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^7*(a + b*x^4)^(3/2)),x]
```

```
[Out] -1/(6*a*x^6*Sqrt[a + b*x^4]) + (2*b)/(3*a^2*x^2*Sqrt[a + b*x^4])
+ (4*b^2*x^2)/(3*a^3*Sqrt[a + b*x^4])
```

Rubi in Sympy [A] time = 6.48862, size = 63, normalized size = 0.93

$$-\frac{1}{6ax^6\sqrt{a+bx^4}}+\frac{2b}{3a^2x^2\sqrt{a+bx^4}}+\frac{4b^2x^2}{3a^3\sqrt{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**7/(b*x**4+a)**(3/2),x)
```

```
[Out] -1/(6*a*x**6*sqrt(a + b*x**4)) + 2*b/(3*a**2*x**2*sqrt(a + b*x**4
)) + 4*b**2*x**2/(3*a**3*sqrt(a + b*x**4))
```

Mathematica [A] time = 0.0382332, size = 42, normalized size = 0.62

$$\frac{-a^2+4abx^4+8b^2x^8}{6a^3x^6\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^7*(a + b*x^4)^(3/2)),x]
```

```
[Out] (-a^2 + 4*a*b*x^4 + 8*b^2*x^8)/(6*a^3*x^6*Sqrt[a + b*x^4])
```

Maple [A] time = 0.007, size = 37, normalized size = 0.5

$$-\frac{-8\,b^2x^8-4\,abx^4+a^2}{6\,a^3x^6}\frac{1}{\sqrt{bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^7/(b*x^4+a)^(3/2),x)
```

```
[Out] -1/6*(-8*b^2*x^8-4*a*b*x^4+a^2)/x^6/(b*x^4+a)^(1/2)/a^3
```

Maxima [A] time = 1.43974, size = 76, normalized size = 1.12

$$\frac{b^2x^2}{2\sqrt{bx^4+a}a^3}+\frac{\frac{6\sqrt{bx^4+a}b}{x^2}-\frac{(bx^4+a)^{\frac{3}{2}}}{x^6}}{6a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/2)*x^7),x, algorithm="maxima")
```

```
[Out] 1/2*b^2*x^2/(sqrt(b*x^4 + a)*a^3) + 1/6*(6*sqrt(b*x^4 + a)*b/x^2
- (b*x^4 + a)^(3/2)/x^6)/a^3
```

Fricas [A] time = 0.280812, size = 68, normalized size = 1.

$$\frac{\left(8b^2x^8+4abx^4-a^2\right)\sqrt{bx^4+a}}{6\left(a^3bx^{10}+a^4x^6\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/2)*x^7),x, algorithm="fricas")
```

```
[Out] 1/6*(8*b^2*x^8 + 4*a*b*x^4 - a^2)*sqrt(b*x^4 + a)/(a^3*b*x^10 + a
^4*x^6)
```

Sympy [A] time = 6.35944, size = 233, normalized size = 3.43

$$-\frac{a^3b^{\frac{9}{2}}\sqrt{\frac{a}{bx^4}+1}}{6a^5b^4x^4+12a^4b^5x^8+6a^3b^6x^{12}}+\frac{3a^2b^{\frac{11}{2}}x^4\sqrt{\frac{a}{bx^4}+1}}{6a^5b^4x^4+12a^4b^5x^8+6a^3b^6x^{12}}+\frac{12ab^{\frac{13}{2}}x^8\sqrt{\frac{a}{bx^4}+1}}{6a^5b^4x^4+12a^4b^5x^8+6a^3b^6x^{12}}+\frac{8b^{\frac{15}{2}}x^{12}\sqrt{\frac{a}{bx^4}+1}}{6a^5b^4x^4+12a^4b^5x^8+6a^3b^6x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**7/(b*x**4+a)**(3/2),x)
```

```
[Out] -a**3*b**(9/2)*sqrt(a/(b*x**4) + 1)/(6*a**5*b**4*x**4 + 12*a**4*b
**5*x**8 + 6*a**3*b**6*x**12) + 3*a**2*b**(11/2)*x**4*sqrt(a/(b*x
**4) + 1)/(6*a**5*b**4*x**4 + 12*a**4*b**5*x**8 + 6*a**3*b**6*x**
12) + 12*a*b**(13/2)*x**8*sqrt(a/(b*x**4) + 1)/(6*a**5*b**4*x**4
+ 12*a**4*b**5*x**8 + 6*a**3*b**6*x**12) + 8*b**(15/2)*x**12*sqrt
(a/(b*x**4) + 1)/(6*a**5*b**4*x**4 + 12*a**4*b**5*x**8 + 6*a**3*b
**6*x**12)
```

GIAC/XCAS [A] time = 0.239089, size = 65, normalized size = 0.96

$$-\frac{\left(b+\frac{a}{x^4}\right)^{\frac{3}{2}}-6\sqrt{b+\frac{a}{x^4}}b}{6a^3}-\frac{x^2}{256\sqrt{bx^4+a}a^3b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/2)*x^7),x, algorithm="giac")
```

```
[Out] -1/6*((b + a/x^4)^(3/2) - 6*sqrt(b + a/x^4)*b)/a^3 - 1/256*x^2/(s
qrt(b*x^4 + a)*a^3*b^2)
```

3.859 $\int \frac{x^{12}}{(a+bx^4)^{3/2}}\,dx$

Optimal. Leaf size=151

$$\frac{15a^{7/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{28b^{13/4}\sqrt{a+bx^4}}-\frac{15ax\sqrt{a+bx^4}}{14b^3}+\frac{9x^5\sqrt{a+bx^4}}{14b^2}-\frac{x^9}{2b\sqrt{a+bx^4}}$$

```
[Out] -x^9/(2*b*Sqrt[a + b*x^4]) - (15*a*x*Sqrt[a + b*x^4])/(14*b^3) +
(9*x^5*Sqrt[a + b*x^4])/(14*b^2) + (15*a^(7/4)*(Sqrt[a] + Sqrt[b]
*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticF[2*Arc
Tan[(b^(1/4)*x)/a^(1/4)], 1/2])/(28*b^(13/4)*Sqrt[a + b*x^4])
```

Rubi [A] time = 0.140961, antiderivative size = 151, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$\frac{15a^{7/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{28b^{13/4}\sqrt{a+bx^4}}-\frac{15ax\sqrt{a+bx^4}}{14b^3}+\frac{9x^5\sqrt{a+bx^4}}{14b^2}-\frac{x^9}{2b\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^12/(a + b*x^4)^(3/2),x]
```


```
[Out] -x^9/(2*b*Sqrt[a + b*x^4]) - (15*a*x*Sqrt[a + b*x^4])/(14*b^3) +
(9*x^5*Sqrt[a + b*x^4])/(14*b^2) + (15*a^(7/4)*(Sqrt[a] + Sqrt[b]
*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticF[2*Arc
Tan[(b^(1/4)*x)/a^(1/4)], 1/2])/(28*b^(13/4)*Sqrt[a + b*x^4])
```

Rubi in Sympy [A] time = 15.7999, size = 138, normalized size = 0.91

$$\frac{15a^{\frac{7}{4}}\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)F\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{28b^{\frac{13}{4}}\sqrt{a+bx^4}}-\frac{15ax\sqrt{a+bx^4}}{14b^3}-\frac{x^9}{2b\sqrt{a+bx^4}}+\frac{9x^5\sqrt{a+bx^4}}{14b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**12/(b*x**4+a)**(3/2),x)
```

```
[Out] 15*a**(7/4)*sqrt((a + b*x**4)/(sqrt(a) + sqrt(b)*x**2)**2)*(sqrt(
a) + sqrt(b)*x**2)*elliptic_f(2*atan(b**(1/4)*x/a**(1/4)), 1/2)/(
28*b**(13/4)*sqrt(a + b*x**4)) - 15*a*x*sqrt(a + b*x**4)/(14*b**3
) - x**9/(2*b*sqrt(a + b*x**4)) + 9*x**5*sqrt(a + b*x**4)/(14*b**
2)
```

Mathematica [C] time = 0.263205, size = 106, normalized size = 0.7

$$\frac{-\frac{15ia^2\sqrt{\frac{bx^4}{a}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)}{\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}}-15a^2x-6abx^5+2b^2x^9}{14b^3\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^12/(a + b*x^4)^(3/2),x]
```

```
[Out] (-15*a^2*x - 6*a*b*x^5 + 2*b^2*x^9 - ((15*I)*a^2*Sqrt[1 + (b*x^4)
/a]*EllipticF[I*ArcSinh[Sqrt[(I*Sqrt[b])/Sqrt[a]]*x], -1])/Sqrt[(
I*Sqrt[b])/Sqrt[a]])/(14*b^3*Sqrt[a + b*x^4])
```

Maple [C] time = 0.024, size = 133, normalized size = 0.9

$$-\frac{xa^2}{2\,b^3}\frac{1}{\sqrt{\left(x^4+\frac{a}{b}\right)b}}+\frac{x^5}{7\,b^2}\sqrt{bx^4+a}-\frac{4\,ax}{7\,b^3}\sqrt{bx^4+a}$$
$$+\frac{15\,a^2}{14\,b^3}\sqrt{1-ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\sqrt{1+ix^2\sqrt{b}\frac{1}{\sqrt{a}}}EllipticF\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)\frac{1}{\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^12/(b*x^4+a)^(3/2),x)
```

```
[Out] -1/2/b^3*a^2*x/((x^4+a/b)*b)^(1/2)+1/7*x^5*(b*x^4+a)^(1/2)/b^2-4/
7*a*x*(b*x^4+a)^(1/2)/b^3+15/14*a^2/b^3/(I/a^(1/2)*b^(1/2))^(1/2)
*(1-I/a^(1/2)*b^(1/2)*x^2)^(1/2)*(1+I/a^(1/2)*b^(1/2)*x^2)^(1/2)/
(b*x^4+a)^(1/2)*EllipticF(x*(I/a^(1/2)*b^(1/2))^(1/2),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^{12}}{(bx^4+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^12/(b*x^4 + a)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^12/(b*x^4 + a)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{12}}{(bx^4+a)^{\frac{3}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^12/(b*x^4 + a)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^12/(b*x^4 + a)^(3/2), x)
```

Sympy [A] time = 6.99806, size = 37, normalized size = 0.25

$$\frac{x^{13}\,\Gamma\left(\frac{13}{4}\right)\,{}_2F_1\left(\left.\begin{matrix}\frac{3}{2},\frac{13}{4}\\\frac{17}{4}\end{matrix}\right|\frac{bx^4e^{i\pi}}{a}\right)}{4a^{\frac{3}{2}}\,\Gamma\left(\frac{17}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**12/(b*x**4+a)**(3/2),x)
```

```
[Out] x**13*gamma(13/4)*hyper((3/2, 13/4), (17/4,), b*x**4*exp_polar(I*
pi)/a)/(4*a**(3/2)*gamma(17/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{12}}{(bx^4 + a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^12/(b*x^4 + a)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^12/(b*x^4 + a)^(3/2), x)
```

3.860 $\int \frac{x^8}{(a+bx^4)^{3/2}}\,dx$

Optimal. Leaf size=129

$$-\frac{5a^{3/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{12b^{9/4}\sqrt{a+bx^4}}+\frac{5x\sqrt{a+bx^4}}{6b^2}-\frac{x^5}{2b\sqrt{a+bx^4}}$$

```
[Out] -x^5/(2*b*Sqrt[a + b*x^4]) + (5*x*Sqrt[a + b*x^4])/(6*b^2) - (5*a
^(3/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqrt[b
]*x^2)^2]*EllipticF[2*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(12*b^(9
/4)*Sqrt[a + b*x^4])
```

Rubi [A] time = 0.107616, antiderivative size = 129, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{5a^{3/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{12b^{9/4}\sqrt{a+bx^4}}+\frac{5x\sqrt{a+bx^4}}{6b^2}-\frac{x^5}{2b\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8/(a + b*x^4)^(3/2),x]
```

```
[Out] -x^5/(2*b*Sqrt[a + b*x^4]) + (5*x*Sqrt[a + b*x^4])/(6*b^2) - (5*a
^(3/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqrt[b
]*x^2)^2]*EllipticF[2*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(12*b^(9
/4)*Sqrt[a + b*x^4])
```

Rubi in Sympy [A] time = 11.6803, size = 116, normalized size = 0.9

$$-\frac{5a^{\frac{3}{4}}\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)F\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{12b^{\frac{9}{4}}\sqrt{a+bx^4}}-\frac{x^5}{2b\sqrt{a+bx^4}}+\frac{5x\sqrt{a+bx^4}}{6b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8/(b*x**4+a)**(3/2),x)
```

```
[Out] -5*a**(3/4)*sqrt((a + b*x**4)/(sqrt(a) + sqrt(b)*x**2)**2)*(sqrt(
a) + sqrt(b)*x**2)*elliptic_f(2*atan(b**(1/4)*x/a**(1/4)), 1/2)/(
12*b**(9/4)*sqrt(a + b*x**4)) - x**5/(2*b*sqrt(a + b*x**4)) + 5*x
*sqrt(a + b*x**4)/(6*b**2)
```

Mathematica [C] time = 0.217556, size = 93, normalized size = 0.72

$$\frac{\frac{5ia\sqrt{\frac{bx^4}{a}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)}{\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}}+5ax+2bx^5}{6b^2\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8/(a + b*x^4)^(3/2),x]
```

```
[Out] (5*a*x + 2*b*x^5 + ((5*I)*a*Sqrt[1 + (b*x^4)/a]*EllipticF[I*ArcSi
nh[Sqrt[(I*Sqrt[b])/Sqrt[a]]*x], -1])/Sqrt[(I*Sqrt[b])/Sqrt[a]])/
(6*b^2*Sqrt[a + b*x^4])
```

Maple [C] time = 0.018, size = 111, normalized size = 0.9

$$\frac{ax}{2\,b^2}\frac{1}{\sqrt{\left(x^4+\frac{a}{b}\right)b}}+\frac{x}{3\,b^2}\sqrt{bx^4+a} \\ -\frac{5\,a}{6\,b^2}\sqrt{1-ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\sqrt{1+ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\mathit{EllipticF}\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)\frac{1}{\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8/(b*x^4+a)^(3/2),x)
```

```
[Out] 1/2/b^2*a*x/((x^4+a/b)*b)^(1/2)+1/3*x*(b*x^4+a)^(1/2)/b^2-5/6*a/b
^2/(I/a^(1/2)*b^(1/2))^(1/2)*(1-I/a^(1/2)*b^(1/2)*x^2)^(1/2)*(1+I
/a^(1/2)*b^(1/2)*x^2)^(1/2)/(b*x^4+a)^(1/2)*EllipticF(x*(I/a^(1/2
)*b^(1/2))^(1/2),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^8}{(bx^4+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^4 + a)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^8/(b*x^4 + a)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x^8}{(bx^4+a)^{\frac{3}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^4 + a)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^8/(b*x^4 + a)^(3/2), x)
```

Sympy [A] time = 3.51584, size = 37, normalized size = 0.29

$$\frac{x^9\,\Gamma\left(\frac{9}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{3}{2},\frac{9}{4}\\\frac{13}{4}\end{matrix}\middle|\frac{bx^4e^{i\pi}}{a}\right)}{4a^{\frac{3}{2}}\,\Gamma\left(\frac{13}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8/(b*x**4+a)**(3/2),x)
```

```
[Out] x**9*gamma(9/4)*hyper((3/2, 9/4), (13/4,), b*x**4*exp_polar(I*pi)
/a)/(4*a**(3/2)*gamma(13/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^8}{(bx^4+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^4 + a)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^8/(b*x^4 + a)^(3/2), x)
```

3.861 $\int \frac{x^4}{(a+bx^4)^{3/2}}\,dx$

Optimal. Leaf size=108

$$\frac{\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{4\sqrt[4]{a}b^{5/4}\sqrt{a+bx^4}}-\frac{x}{2b\sqrt{a+bx^4}}$$

```
[Out] -x/(2*b*Sqrt[a + b*x^4]) + ((Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x
^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticF[2*ArcTan[(b^(1/4)*x)/a^(
1/4)], 1/2])/(4*a^(1/4)*b^(5/4)*Sqrt[a + b*x^4])
```

Rubi [A] time = 0.0736015, antiderivative size = 108, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{4\sqrt[4]{a}b^{5/4}\sqrt{a+bx^4}}-\frac{x}{2b\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a + b*x^4)^(3/2),x]
```

```
[Out] -x/(2*b*Sqrt[a + b*x^4]) + ((Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x
^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticF[2*ArcTan[(b^(1/4)*x)/a^(
1/4)], 1/2])/(4*a^(1/4)*b^(5/4)*Sqrt[a + b*x^4])
```

Rubi in Sympy [A] time = 7.60235, size = 94, normalized size = 0.87

$$-\frac{x}{2b\sqrt{a+bx^4}}+\frac{\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)F\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{4\sqrt[4]{a}b^{\frac{5}{4}}\sqrt{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(b*x**4+a)**(3/2),x)
```

```
[Out] -x/(2*b*sqrt(a + b*x**4)) + sqrt((a + b*x**4)/(sqrt(a) + sqrt(b)*
x**2)**2)*(sqrt(a) + sqrt(b)*x**2)*elliptic_f(2*atan(b**(1/4)*x/a
**(1/4)), 1/2)/(4*a**(1/4)*b**(5/4)*sqrt(a + b*x**4))
```

Mathematica [C] time = 0.124246, size = 102, normalized size = 0.94

$$-\frac{i\sqrt{\frac{bx^4}{a}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)+x\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}}{2b\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(a + b*x^4)^(3/2),x]
```

```
[Out] -(Sqrt[(I*Sqrt[b])/Sqrt[a]]*x + I*Sqrt[1 + (b*x^4)/a]*EllipticF[I
*ArcSinh[Sqrt[(I*Sqrt[b])/Sqrt[a]]*x], -1])/(2*Sqrt[(I*Sqrt[b])/S
```

```
qrt[a]]*b*Sqrt[a + b*x^4])
```

Maple [C] time = 0.018, size = 94, normalized size = 0.9

$$-\frac{x}{2b}\frac{1}{\sqrt{\left(x^4+\frac{a}{b}\right)b}}+\frac{1}{2b}\sqrt{1-ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\sqrt{1+ix^2\sqrt{b}\frac{1}{\sqrt{a}}}EllipticF\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)\frac{1}{\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(b*x^4+a)^(3/2),x)
```

```
[Out] -1/2/b*x/((x^4+a/b)*b)^(1/2)+1/2/b/(I/a^(1/2)*b^(1/2))^(1/2)*(1-I
/a^(1/2)*b^(1/2)*x^2)^(1/2)*(1+I/a^(1/2)*b^(1/2)*x^2)^(1/2)/(b*x^
4+a)^(1/2)*EllipticF(x*(I/a^(1/2)*b^(1/2))^(1/2),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{(bx^4+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^4 + a)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^4/(b*x^4 + a)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^4}{(bx^4+a)^{\frac{3}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^4 + a)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^4/(b*x^4 + a)^(3/2), x)
```

Sympy [A] time = 2.39853, size = 37, normalized size = 0.34

$$\frac{x^5\,\Gamma\left(\frac{5}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{5}{4},\frac{3}{2}\\ \frac{9}{4}\end{matrix}\middle|\frac{bx^4e^{i\pi}}{a}\right)}{4a^{\frac{3}{2}}\,\Gamma\left(\frac{9}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(b*x**4+a)**(3/2),x)
```

```
[Out] x**5*gamma(5/4)*hyper((5/4, 3/2), (9/4,), b*x**4*exp_polar(I*pi)/
a)/(4*a**(3/2)*gamma(9/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{(bx^4 + a)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^4 + a)^(3/2),x, algorithm="giac")

[Out] integrate(x^4/(b*x^4 + a)^(3/2), x)
```

3.862 $\int \frac{1}{(a+bx^4)^{3/2}}\,dx$

Optimal. Leaf size=108

$$\frac{\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{4a^{5/4}\sqrt[4]{b}\sqrt{a+bx^4}}+\frac{x}{2a\sqrt{a+bx^4}}$$

```
[Out] x/(2*a*Sqrt[a + b*x^4]) + ((Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^
4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticF[2*ArcTan[(b^(1/4)*x)/a^(1
/4)], 1/2])/(4*a^(5/4)*b^(1/4)*Sqrt[a + b*x^4])
```

Rubi [A] time = 0.0593581, antiderivative size = 108, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$

$$\frac{\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{4a^{5/4}\sqrt[4]{b}\sqrt{a+bx^4}}+\frac{x}{2a\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(-3/2),x]
```

```
[Out] x/(2*a*Sqrt[a + b*x^4]) + ((Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^
4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticF[2*ArcTan[(b^(1/4)*x)/a^(1
/4)], 1/2])/(4*a^(5/4)*b^(1/4)*Sqrt[a + b*x^4])
```

Rubi in Sympy [A] time = 5.6406, size = 94, normalized size = 0.87

$$\frac{x}{2a\sqrt{a+bx^4}}+\frac{\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)F\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{4a^{\frac{5}{4}}\sqrt[4]{b}\sqrt{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**4+a)**(3/2),x)
```

```
[Out] x/(2*a*sqrt(a + b*x**4)) + sqrt((a + b*x**4)/(sqrt(a) + sqrt(b)*x
**2)**2)*(sqrt(a) + sqrt(b)*x**2)*elliptic_f(2*atan(b**(1/4)*x/a*
*(1/4)), 1/2)/(4*a**(5/4)*b**(1/4)*sqrt(a + b*x**4))
```

Mathematica [C] time = 0.0718528, size = 102, normalized size = 0.94

$$\frac{x\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}-i\sqrt{\frac{bx^4}{a}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)}{2a\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(-3/2),x]
```

```
[Out] (Sqrt[(I*Sqrt[b])/Sqrt[a]]*x - I*Sqrt[1 + (b*x^4)/a]*EllipticF[I*
ArcSinh[Sqrt[(I*Sqrt[b])/Sqrt[a]]*x], -1])/(2*a*Sqrt[(I*Sqrt[b])/
```

```
Sqrt[a]]*Sqrt[a + b*x^4])
```

Maple [C] time = 0.012, size = 94, normalized size = 0.9

$$\frac{x}{2a}\frac{1}{\sqrt{\left(x^4+\frac{a}{b}\right)b}}+\frac{1}{2a}\sqrt{1-ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\sqrt{1+ix^2\sqrt{b}\frac{1}{\sqrt{a}}}EllipticF\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)\frac{1}{\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^4+a)^(3/2),x)
```

```
[Out] 1/2/a*x/((x^4+a/b)*b)^(1/2)+1/2/a/(I/a^(1/2)*b^(1/2))^(1/2)*(1-I/
a^(1/2)*b^(1/2)*x^2)^(1/2)*(1+I/a^(1/2)*b^(1/2)*x^2)^(1/2)/(b*x^4
+a)^(1/2)*EllipticF(x*(I/a^(1/2)*b^(1/2))^(1/2),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(-3/2),x, algorithm="maxima")
```

```
[Out] integrate((b*x^4 + a)^(-3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(bx^4+a)^{\frac{3}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(-3/2),x, algorithm="fricas")
```

```
[Out] integral((b*x^4 + a)^(-3/2), x)
```

Sympy [A] time = 2.24253, size = 36, normalized size = 0.33

$$\frac{x\,\Gamma\left(\frac{1}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{4},\frac{3}{2}\\\frac{5}{4}\end{matrix}\middle|\frac{bx^4e^{i\pi}}{a}\right)}{4a^{\frac{3}{2}}\,\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**4+a)**(3/2),x)
```

```
[Out] x*gamma(1/4)*hyper((1/4, 3/2), (5/4,), b*x**4*exp_polar(I*pi)/a)/
(4*a**(3/2)*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bx^4 + a\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(-3/2),x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(-3/2), x)
```

3.863 $\int \frac{1}{x^4(a+bx^4)^{3/2}}\,dx$

Optimal. Leaf size=131

$$-\frac{5b^{3/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{12a^{9/4}\sqrt{a+bx^4}}-\frac{5\sqrt{a+bx^4}}{6a^2x^3}+\frac{1}{2ax^3\sqrt{a+bx^4}}$$

```
[Out] 1/(2*a*x^3*Sqrt[a + b*x^4]) - (5*Sqrt[a + b*x^4])/(6*a^2*x^3) - (
5*b^(3/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqr
t[b]*x^2)^2]*EllipticF[2*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(12*a
^(9/4)*Sqrt[a + b*x^4])
```

Rubi [A] time = 0.103376, antiderivative size = 131, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$-\frac{5b^{3/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{12a^{9/4}\sqrt{a+bx^4}}-\frac{5\sqrt{a+bx^4}}{6a^2x^3}+\frac{1}{2ax^3\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*(a + b*x^4)^(3/2)),x]
```

```
[Out] 1/(2*a*x^3*Sqrt[a + b*x^4]) - (5*Sqrt[a + b*x^4])/(6*a^2*x^3) - (
5*b^(3/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqr
t[b]*x^2)^2]*EllipticF[2*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(12*a
^(9/4)*Sqrt[a + b*x^4])
```

Rubi in Sympy [A] time = 11.1125, size = 119, normalized size = 0.91

$$\frac{1}{2ax^3\sqrt{a+bx^4}}-\frac{5\sqrt{a+bx^4}}{6a^2x^3}-\frac{5b^{\frac{3}{4}}\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)F\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{12a^{\frac{9}{4}}\sqrt{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(b*x**4+a)**(3/2),x)
```

```
[Out] 1/(2*a*x**3*sqrt(a + b*x**4)) - 5*sqrt(a + b*x**4)/(6*a**2*x**3)
- 5*b**(3/4)*sqrt((a + b*x**4)/(sqrt(a) + sqrt(b)*x**2)**2)*(sqrt
(a) + sqrt(b)*x**2)*elliptic_f(2*atan(b**(1/4)*x/a**(1/4)), 1/2)/
(12*a**(9/4)*sqrt(a + b*x**4))
```

Mathematica [C] time = 0.217908, size = 93, normalized size = 0.71

$$\frac{\frac{5ib\sqrt{\frac{bx^4}{a}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)}{\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}}-\frac{2a}{x^3}-5bx}{6a^2\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*(a + b*x^4)^(3/2)),x]
```

```
[Out] ((-2*a)/x^3 - 5*b*x + ((5*I)*b*Sqrt[1 + (b*x^4)/a]*EllipticF[I*Ar
cSinh[Sqrt[(I*Sqrt[b])/Sqrt[a]]*x], -1])/Sqrt[(I*Sqrt[b])/Sqrt[a]
])/(6*a^2*Sqrt[a + b*x^4])
```

Maple [C] time = 0.025, size = 113, normalized size = 0.9

$$-\frac{bx}{2\,a^{2}}\frac{1}{\sqrt{\left(x^{4}+\frac{a}{b}\right)b}}-\frac{1}{3\,x^{3}a^{2}}\sqrt{bx^{4}+a}$$
$$-\frac{5\,b}{6\,a^{2}}\sqrt{1-ix^{2}\sqrt{b}\frac{1}{\sqrt{a}}}\sqrt{1+ix^{2}\sqrt{b}\frac{1}{\sqrt{a}}}\mathit{EllipticF}\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)\frac{1}{\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{bx^{4}+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(b*x^4+a)^(3/2),x)
```

```
[Out] -1/2*b/a^2*x/((x^4+a/b)*b)^(1/2)-1/3*(b*x^4+a)^(1/2)/x^3/a^2-5/6*
b/a^2/(I/a^(1/2)*b^(1/2))^(1/2)*(1-I/a^(1/2)*b^(1/2)*x^2)^(1/2)*(
1+I/a^(1/2)*b^(1/2)*x^2)^(1/2)/(b*x^4+a)^(1/2)*EllipticF(x*(I/a^(
1/2)*b^(1/2))^(1/2),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^{4}+a)^{\frac{3}{2}}x^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/2)*x^4),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x^4 + a)^(3/2)*x^4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(bx^{8}+ax^{4})\sqrt{bx^{4}+a}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/2)*x^4),x, algorithm="fricas")
```

```
[Out] integral(1/((b*x^8 + a*x^4)*sqrt(b*x^4 + a)), x)
```

Sympy [A] time = 3.46837, size = 41, normalized size = 0.31

$$\frac{\left(-\frac{3}{4}\right)\,{}_{2}F_{1}\left(\begin{matrix}-\frac{3}{4},\frac{3}{2}\\ \frac{1}{4}\end{matrix}\middle|\frac{bx^{4}e^{i\pi}}{a}\right)}{4a^{\frac{3}{2}}x^{3}\left(\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(b*x**4+a)**(3/2),x)
```

```
[Out] gamma(-3/4)*hyper((-3/4, 3/2), (1/4,), b*x**4*exp_polar(I*pi)/a)/
(4*a**(3/2)*x**3*gamma(1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4 + a)^{\frac{3}{2}}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((b*x^4 + a)^(3/2)*x^4),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^4 + a)^(3/2)*x^4), x)
```

3.864 $\int \frac{1}{x^8(a+bx^4)^{3/2}}\,dx$

Optimal. Leaf size=153

$$\frac{15b^{7/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{28a^{13/4}\sqrt{a+bx^4}}+\frac{15b\sqrt{a+bx^4}}{14a^3x^3}-\frac{9\sqrt{a+bx^4}}{14a^2x^7}+\frac{1}{2ax^7\sqrt{a+bx^4}}$$

```
[Out] 1/(2*a*x^7*Sqrt[a + b*x^4]) - (9*Sqrt[a + b*x^4])/(14*a^2*x^7) +
(15*b*Sqrt[a + b*x^4])/(14*a^3*x^3) + (15*b^(7/4)*(Sqrt[a] + Sqrt
[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticF[2*
ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(28*a^(13/4)*Sqrt[a + b*x^4])
```

Rubi [A] time = 0.13909, antiderivative size = 153, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{15b^{7/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{28a^{13/4}\sqrt{a+bx^4}}+\frac{15b\sqrt{a+bx^4}}{14a^3x^3}-\frac{9\sqrt{a+bx^4}}{14a^2x^7}+\frac{1}{2ax^7\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^8*(a + b*x^4)^(3/2)),x]
```

```
[Out] 1/(2*a*x^7*Sqrt[a + b*x^4]) - (9*Sqrt[a + b*x^4])/(14*a^2*x^7) +
(15*b*Sqrt[a + b*x^4])/(14*a^3*x^3) + (15*b^(7/4)*(Sqrt[a] + Sqrt
[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticF[2*
ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(28*a^(13/4)*Sqrt[a + b*x^4])
```

Rubi in Sympy [A] time = 15.0845, size = 141, normalized size = 0.92

$$\frac{1}{2ax^7\sqrt{a+bx^4}}-\frac{9\sqrt{a+bx^4}}{14a^2x^7}+\frac{15b\sqrt{a+bx^4}}{14a^3x^3}+\frac{15b^{\frac{7}{4}}\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)F\left(2\,\text{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{28a^{\frac{13}{4}}\sqrt{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**8/(b*x**4+a)**(3/2),x)
```

```
[Out] 1/(2*a*x**7*sqrt(a + b*x**4)) - 9*sqrt(a + b*x**4)/(14*a**2*x**7)
 + 15*b*sqrt(a + b*x**4)/(14*a**3*x**3) + 15*b**(7/4)*sqrt((a + b
*x**4)/(sqrt(a) + sqrt(b)*x**2)**2)*(sqrt(a) + sqrt(b)*x**2)*elli
ptic_f(2*atan(b**(1/4)*x/a**(1/4)), 1/2)/(28*a**(13/4)*sqrt(a + b
*x**4))
```

Mathematica [C] time = 0.301633, size = 106, normalized size = 0.69

$$\frac{-\frac{2a^2}{x^7}-\frac{15ib^2\sqrt{\frac{bx^4}{a}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)}{\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}}+\frac{6ab}{x^3}+15b^2x}{14a^3\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^8*(a + b*x^4)^(3/2)),x]
```

```
[Out] ((-2*a^2)/x^7 + (6*a*b)/x^3 + 15*b^2*x - ((15*I)*b^2*Sqrt[1 + (b*
x^4)/a]*EllipticF[I*ArcSinh[Sqrt[(I*Sqrt[b])/Sqrt[a]]*x], -1])/Sq
rt[(I*Sqrt[b])/Sqrt[a]])/(14*a^3*Sqrt[a + b*x^4])
```

Maple [C] time = 0.032, size = 135, normalized size = 0.9

$$\frac{b^2x}{2\,a^3}\frac{1}{\sqrt{\left(x^4+\frac{a}{b}\right)b}}-\frac{1}{7\,a^2x^7}\sqrt{bx^4+a}+\frac{4\,b}{7\,a^3x^3}\sqrt{bx^4+a}+\frac{15\,b^2}{14\,a^3}\sqrt{1-ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\sqrt{1+ix^2\sqrt{b}\frac{1}{\sqrt{a}}}EllipticF\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)\frac{1}{\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^8/(b*x^4+a)^(3/2),x)
```

```
[Out] 1/2*b^2/a^3*x/((x^4+a/b)*b)^(1/2)-1/7*(b*x^4+a)^(1/2)/a^2/x^7+4/7
*b*(b*x^4+a)^(1/2)/a^3/x^3+15/14/a^3*b^2/(I/a^(1/2)*b^(1/2))^(1/2
)*(1-I/a^(1/2)*b^(1/2)*x^2)^(1/2)*(1+I/a^(1/2)*b^(1/2)*x^2)^(1/2)
/(b*x^4+a)^(1/2)*EllipticF(x*(I/a^(1/2)*b^(1/2))^(1/2),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bx^4+a\right)^{\frac{3}{2}}x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/2)*x^8),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x^4 + a)^(3/2)*x^8), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\left(bx^{12}+ax^8\right)\sqrt{bx^4+a}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/2)*x^8),x, algorithm="fricas")
```

```
[Out] integral(1/((b*x^12 + a*x^8)*sqrt(b*x^4 + a)), x)
```

Sympy [A] time = 7.0108, size = 44, normalized size = 0.29

$$\frac{\Gamma\left(-\frac{7}{4}\right){}_2F_1\left(\begin{matrix}-\frac{7}{4},\frac{3}{2}\\-\frac{3}{4}\end{matrix}\middle|\frac{bx^4e^{i\pi}}{a}\right)}{4a^{\frac{3}{2}}x^7\,\Gamma\left(-\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**8/(b*x**4+a)**(3/2),x)
```

```
[Out] gamma(-7/4)*hyper((-7/4, 3/2), (-3/4,), b*x**4*exp_polar(I*pi)/a)
/(4*a**(3/2)*x**7*gamma(-3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4 + a)^{\frac{3}{2}} x^8} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/2)*x^8),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^4 + a)^(3/2)*x^8), x)
```

3.865 $\int \frac{x^{14}}{(a+bx^4)^{3/2}}\, dx$

Optimal. Leaf size=282

$$\frac{77a^{9/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{60b^{15/4}\sqrt{a+bx^4}} - \frac{77a^{9/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{30b^{15/4}\sqrt{a+bx^4}} + \frac{77a^2x\sqrt{a+bx^4}}{30b^{7/2}\left(\sqrt{a}+\sqrt{b}x^2\right)} - \frac{77ax^3\sqrt{a+bx^4}}{90b^3} + \frac{11x^7\sqrt{a+bx^4}}{18b^2} - \frac{x^{11}}{2b\sqrt{a+bx^4}}$$

```
[Out] -x^11/(2*b*Sqrt[a + b*x^4]) - (77*a*x^3*Sqrt[a + b*x^4])/(90*b^3)
 + (11*x^7*Sqrt[a + b*x^4])/(18*b^2) + (77*a^2*x*Sqrt[a + b*x^4])
/(30*b^(7/2)*(Sqrt[a] + Sqrt[b]*x^2)) - (77*a^(9/4)*(Sqrt[a] + Sq
rt[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticE[
2*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(30*b^(15/4)*Sqrt[a + b*x^4]
) + (77*a^(9/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a]
 + Sqrt[b]*x^2)^2]*EllipticF[2*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])
/(60*b^(15/4)*Sqrt[a + b*x^4])
```

Rubi [A] time = 0.303914, antiderivative size = 282, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$

$$\frac{77a^{9/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{60b^{15/4}\sqrt{a+bx^4}} - \frac{77a^{9/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{30b^{15/4}\sqrt{a+bx^4}} + \frac{77a^2x\sqrt{a+bx^4}}{30b^{7/2}\left(\sqrt{a}+\sqrt{b}x^2\right)} - \frac{77ax^3\sqrt{a+bx^4}}{90b^3} + \frac{11x^7\sqrt{a+bx^4}}{18b^2} - \frac{x^{11}}{2b\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^14/(a + b*x^4)^(3/2),x]
```

```
[Out] -x^11/(2*b*Sqrt[a + b*x^4]) - (77*a*x^3*Sqrt[a + b*x^4])/(90*b^3)
 + (11*x^7*Sqrt[a + b*x^4])/(18*b^2) + (77*a^2*x*Sqrt[a + b*x^4])
/(30*b^(7/2)*(Sqrt[a] + Sqrt[b]*x^2)) - (77*a^(9/4)*(Sqrt[a] + Sq
rt[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticE[
2*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(30*b^(15/4)*Sqrt[a + b*x^4]
) + (77*a^(9/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a]
 + Sqrt[b]*x^2)^2]*EllipticF[2*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])
/(60*b^(15/4)*Sqrt[a + b*x^4])
```

Rubi in Sympy [A] time = 35.9243, size = 258, normalized size = 0.91

$$-\frac{77a^{\frac{9}{4}}\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)E\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{30b^{\frac{15}{4}}\sqrt{a+bx^4}}+\frac{77a^{\frac{9}{4}}\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)F\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{60b^{\frac{15}{4}}\sqrt{a+bx^4}}+\frac{77a^2x\sqrt{a+bx^4}}{30b^{\frac{7}{2}}\left(\sqrt{a}+\sqrt{b}x^2\right)}-\frac{77ax^3\sqrt{a+bx^4}}{90b^3}-\frac{x^{11}}{2b\sqrt{a+bx^4}}+\frac{11x^7\sqrt{a+bx^4}}{18b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**14/(b*x**4+a)**(3/2),x)
```

```
[Out] -77*a**(9/4)*sqrt((a + b*x**4)/(sqrt(a) + sqrt(b)*x**2)**2)*(sqrt
(a) + sqrt(b)*x**2)*elliptic_e(2*atan(b**(1/4)*x/a**(1/4)), 1/2)/
(30*b**(15/4)*sqrt(a + b*x**4)) + 77*a**(9/4)*sqrt((a + b*x**4)/(
sqrt(a) + sqrt(b)*x**2)**2)*(sqrt(a) + sqrt(b)*x**2)*elliptic_f(2
*atan(b**(1/4)*x/a**(1/4)), 1/2)/(60*b**(15/4)*sqrt(a + b*x**4))
+ 77*a**2*x*sqrt(a + b*x**4)/(30*b**(7/2)*(sqrt(a) + sqrt(b)*x**2
)) - 77*a*x**3*sqrt(a + b*x**4)/(90*b**3) - x**11/(2*b*sqrt(a + b
*x**4)) + 11*x**7*sqrt(a + b*x**4)/(18*b**2)
```

Mathematica [C] time = 0.344506, size = 183, normalized size = 0.65

$$\frac{-231a^{5/2}\sqrt{\frac{bx^4}{a}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)+231a^{5/2}\sqrt{\frac{bx^4}{a}+1}E\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)+\sqrt{b}x^3\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\left(-77a^2-22ab\right.}{90b^{7/2}\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^14/(a + b*x^4)^(3/2),x]
```

```
[Out] (Sqrt[(I*Sqrt[b])/Sqrt[a]]*Sqrt[b]*x^3*(-77*a^2 - 22*a*b*x^4 + 10
*b^2*x^8) + 231*a^(5/2)*Sqrt[1 + (b*x^4)/a]*EllipticE[I*ArcSinh[S
qrt[(I*Sqrt[b])/Sqrt[a]]*x], -1] - 231*a^(5/2)*Sqrt[1 + (b*x^4)/a
]*EllipticF[I*ArcSinh[Sqrt[(I*Sqrt[b])/Sqrt[a]]*x], -1])/(90*Sqrt
[(I*Sqrt[b])/Sqrt[a]]*b^(7/2)*Sqrt[a + b*x^4])
```

Maple [C] time = 0.018, size = 157, normalized size = 0.6

$$-\frac{x^3a^2}{2\,b^3}\frac{1}{\sqrt{\left(x^4+\frac{a}{b}\right)b}}+\frac{x^7}{9\,b^2}\sqrt{bx^4+a}-\frac{16\,ax^3}{45\,b^3}\sqrt{bx^4+a}+\frac{77\,i}{30}a^{\frac{5}{2}}\sqrt{1-ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\sqrt{1+ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\left(EllipticF\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)-EllipticE\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)\right)b^{-\frac{7}{2}}\frac{1}{\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^14/(b*x^4+a)^(3/2),x)
```

```
[Out] -1/2/b^3*a^2*x^3/((x^4+a/b)*b)^(1/2)+1/9*x^7*(b*x^4+a)^(1/2)/b^2-
16/45*a*x^3*(b*x^4+a)^(1/2)/b^3+77/30*I*a^(5/2)/b^(7/2)/(I/a^(1/2
)*b^(1/2))^(1/2)*(1-I/a^(1/2)*b^(1/2)*x^2)^(1/2)*(1+I/a^(1/2)*b^(
1/2)*x^2)^(1/2)/(b*x^4+a)^(1/2)*(EllipticF(x*(I/a^(1/2)*b^(1/2))^
```

```
(1/2),I)-EllipticE(x*(I/a^(1/2)*b^(1/2))^(1/2),I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{14}}{(bx^4+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^14/(b*x^4 + a)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^14/(b*x^4 + a)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{14}}{(bx^4+a)^{\frac{3}{2}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^14/(b*x^4 + a)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^14/(b*x^4 + a)^(3/2), x)
```

Sympy [A] time = 10.2945, size = 37, normalized size = 0.13

$$\frac{x^{15}\,\Gamma\left(\frac{15}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{3}{2},\frac{15}{4}\\ \frac{19}{4}\end{matrix}\middle|\frac{bx^4e^{i\pi}}{a}\right)}{4a^{\frac{3}{2}}\,\Gamma\left(\frac{19}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**14/(b*x**4+a)**(3/2),x)
```

```
[Out] x**15*gamma(15/4)*hyper((3/2, 15/4), (19/4,), b*x**4*exp_polar(I*
pi)/a)/(4*a**(3/2)*gamma(19/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{14}}{(bx^4+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^14/(b*x^4 + a)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^14/(b*x^4 + a)^(3/2), x)
```

3.866 $\int \frac{x^{10}}{(a+bx^4)^{3/2}}\,dx$

Optimal. Leaf size=258

$$-\frac{21a^{5/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{20b^{11/4}\sqrt{a+bx^4}}+\frac{21a^{5/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{10b^{11/4}\sqrt{a+bx^4}}-\frac{21ax\sqrt{a+bx^4}}{10b^{5/2}\left(\sqrt{a}+\sqrt{b}x^2\right)}+\frac{7x^3\sqrt{a+bx^4}}{10b^2}-\frac{x^7}{2b\sqrt{a+bx^4}}$$

```
[Out] -x^7/(2*b*Sqrt[a + b*x^4]) + (7*x^3*Sqrt[a + b*x^4])/(10*b^2) - (
21*a*x*Sqrt[a + b*x^4])/(10*b^(5/2)*(Sqrt[a] + Sqrt[b]*x^2)) + (2
1*a^(5/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqr
t[b]*x^2)^2]*EllipticE[2*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(10*b
^(11/4)*Sqrt[a + b*x^4]) - (21*a^(5/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sq
rt[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticF[2*ArcTan[(b^(
1/4)*x)/a^(1/4)], 1/2])/(20*b^(11/4)*Sqrt[a + b*x^4])
```

Rubi [A] time = 0.247386, antiderivative size = 258, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{21a^{5/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{20b^{11/4}\sqrt{a+bx^4}}+\frac{21a^{5/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{10b^{11/4}\sqrt{a+bx^4}}-\frac{21ax\sqrt{a+bx^4}}{10b^{5/2}\left(\sqrt{a}+\sqrt{b}x^2\right)}+\frac{7x^3\sqrt{a+bx^4}}{10b^2}-\frac{x^7}{2b\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^10/(a + b*x^4)^(3/2),x]
```

```
[Out] -x^7/(2*b*Sqrt[a + b*x^4]) + (7*x^3*Sqrt[a + b*x^4])/(10*b^2) - (
21*a*x*Sqrt[a + b*x^4])/(10*b^(5/2)*(Sqrt[a] + Sqrt[b]*x^2)) + (2
1*a^(5/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqr
t[b]*x^2)^2]*EllipticE[2*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(10*b
^(11/4)*Sqrt[a + b*x^4]) - (21*a^(5/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sq
rt[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticF[2*ArcTan[(b^(
1/4)*x)/a^(1/4)], 1/2])/(20*b^(11/4)*Sqrt[a + b*x^4])
```

Rubi in Sympy [A] time = 29.2571, size = 235, normalized size = 0.91

$$\frac{21a^{\frac{5}{4}}\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)E\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{10b^{\frac{11}{4}}\sqrt{a+bx^4}}-\frac{21a^{\frac{5}{4}}\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)F\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{20b^{\frac{11}{4}}\sqrt{a+bx^4}}-\frac{21ax\sqrt{a+bx^4}}{10b^{\frac{5}{2}}\left(\sqrt{a}+\sqrt{b}x^2\right)}-\frac{x^7}{2b\sqrt{a+bx^4}}+\frac{7x^3\sqrt{a+bx^4}}{10b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate(x**10/(b*x**4+a)**(3/2),x)
```

```
[Out] 21*a**(5/4)*sqrt((a + b*x**4)/(sqrt(a) + sqrt(b)*x**2)**2)*(sqrt(
a) + sqrt(b)*x**2)*elliptic_e(2*atan(b**(1/4)*x/a**(1/4)), 1/2)/(
10*b**(11/4)*sqrt(a + b*x**4)) - 21*a**(5/4)*sqrt((a + b*x**4)/(s
qrt(a) + sqrt(b)*x**2)**2)*(sqrt(a) + sqrt(b)*x**2)*elliptic_f(2*
atan(b**(1/4)*x/a**(1/4)), 1/2)/(20*b**(11/4)*sqrt(a + b*x**4)) -
 21*a*x*sqrt(a + b*x**4)/(10*b**(5/2)*(sqrt(a) + sqrt(b)*x**2)) -
 x**7/(2*b*sqrt(a + b*x**4)) + 7*x**3*sqrt(a + b*x**4)/(10*b**2)
```

Mathematica [C] time = 0.229341, size = 172, normalized size = 0.67

$$\frac{21a^{3/2}\sqrt{\frac{bx^4}{a}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)-21a^{3/2}\sqrt{\frac{bx^4}{a}+1}E\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)+\sqrt{b}x^3\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\left(7a+2bx^4\right)}{10b^{5/2}\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]   Integrate[x^10/(a + b*x^4)^(3/2),x]
```

```
[Out] (Sqrt[(I*Sqrt[b])/Sqrt[a]]*Sqrt[b]*x^3*(7*a + 2*b*x^4) - 21*a^(3/
2)*Sqrt[1 + (b*x^4)/a]*EllipticE[I*ArcSinh[Sqrt[(I*Sqrt[b])/Sqrt[
a]]*x], -1] + 21*a^(3/2)*Sqrt[1 + (b*x^4)/a]*EllipticF[I*ArcSinh[
Sqrt[(I*Sqrt[b])/Sqrt[a]]*x], -1])/(10*Sqrt[(I*Sqrt[b])/Sqrt[a]]*
b^(5/2)*Sqrt[a + b*x^4])
```

Maple [C] time = 0.018, size = 137, normalized size = 0.5

$$\frac{ax^3}{2\,b^2}\frac{1}{\sqrt{\left(x^4+\frac{a}{b}\right)b}}+\frac{x^3}{5\,b^2}\sqrt{bx^4+a}-\frac{21\,i}{10}a^{\frac{3}{2}}\sqrt{1-ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\sqrt{1+ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\left(EllipticF\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)-EllipticE\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)\right)b^{-\frac{5}{2}}\frac{1}{\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^10/(b*x^4+a)^(3/2),x)
```

```
[Out] 1/2/b^2*a*x^3/((x^4+a/b)*b)^(1/2)+1/5*x^3*(b*x^4+a)^(1/2)/b^2-21/
10*I*a^(3/2)/b^(5/2)/(I/a^(1/2)*b^(1/2))^(1/2)*(1-I/a^(1/2)*b^(1/
2)*x^2)^(1/2)*(1+I/a^(1/2)*b^(1/2)*x^2)^(1/2)/(b*x^4+a)^(1/2)*(El
lipticF(x*(I/a^(1/2)*b^(1/2))^(1/2),I)-EllipticE(x*(I/a^(1/2)*b^(
1/2))^(1/2),I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{10}}{(bx^4+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^10/(b*x^4 + a)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^10/(b*x^4 + a)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{10}}{(bx^4+a)^{\frac{3}{2}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^10/(b*x^4 + a)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^10/(b*x^4 + a)^(3/2), x)
```

Sympy [A] time = 5.10265, size = 37, normalized size = 0.14

$$\frac{x^{11}\Gamma\left(\frac{11}{4}\right){}_2F_1\left(\begin{matrix}\frac{3}{2},\frac{11}{4}\\ \frac{15}{4}\end{matrix}\middle|\frac{bx^4e^{i\pi}}{a}\right)}{4a^{\frac{3}{2}}\Gamma\left(\frac{15}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**10/(b*x**4+a)**(3/2),x)
```

```
[Out] x**11*gamma(11/4)*hyper((3/2, 11/4), (15/4,), b*x**4*exp_polar(I*
pi)/a)/(4*a**(3/2)*gamma(15/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{10}}{(bx^4+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^10/(b*x^4 + a)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^10/(b*x^4 + a)^(3/2), x)
```

3.867 $\int \frac{x^6}{(a+bx^4)^{3/2}}\,dx$

Optimal. Leaf size=236

$$\frac{3x\sqrt{a+bx^4}}{2b^{3/2}\left(\sqrt{a}+\sqrt{b}x^2\right)}+\frac{3\sqrt[4]{a}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{4b^{7/4}\sqrt{a+bx^4}}-\frac{3\sqrt[4]{a}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{2b^{7/4}\sqrt{a+bx^4}}-\frac{x^3}{2b\sqrt{a+bx^4}}$$

```
[Out] -x^3/(2*b*Sqrt[a + b*x^4]) + (3*x*Sqrt[a + b*x^4])/(2*b^(3/2)*(Sq
rt[a] + Sqrt[b]*x^2)) - (3*a^(1/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(
a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticE[2*ArcTan[(b^(1/4)
*x)/a^(1/4)], 1/2])/(2*b^(7/4)*Sqrt[a + b*x^4]) + (3*a^(1/4)*(Sqr
t[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*E
llipticF[2*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(4*b^(7/4)*Sqrt[a +
 b*x^4])
```

Rubi [A] time = 0.19101, antiderivative size = 236, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{3x\sqrt{a+bx^4}}{2b^{3/2}\left(\sqrt{a}+\sqrt{b}x^2\right)}+\frac{3\sqrt[4]{a}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{4b^{7/4}\sqrt{a+bx^4}}-\frac{3\sqrt[4]{a}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{2b^{7/4}\sqrt{a+bx^4}}-\frac{x^3}{2b\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/(a + b*x^4)^(3/2),x]
```

```
[Out] -x^3/(2*b*Sqrt[a + b*x^4]) + (3*x*Sqrt[a + b*x^4])/(2*b^(3/2)*(Sq
rt[a] + Sqrt[b]*x^2)) - (3*a^(1/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(
a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticE[2*ArcTan[(b^(1/4)
*x)/a^(1/4)], 1/2])/(2*b^(7/4)*Sqrt[a + b*x^4]) + (3*a^(1/4)*(Sqr
t[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*E
llipticF[2*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(4*b^(7/4)*Sqrt[a +
 b*x^4])
```

Rubi in Sympy [A] time = 23.4443, size = 212, normalized size = 0.9

$$-\frac{3\sqrt[4]{a}\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)E\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{2b^{\frac{7}{4}}\sqrt{a+bx^4}}+\frac{3\sqrt[4]{a}\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)F\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{4b^{\frac{7}{4}}\sqrt{a+bx^4}}-\frac{x^3}{2b\sqrt{a+bx^4}}+\frac{3x\sqrt{a+bx^4}}{2b^{\frac{3}{2}}\left(\sqrt{a}+\sqrt{b}x^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(b*x**4+a)**(3/2),x)
```

```
[Out] -3*a**(1/4)*sqrt((a + b*x**4)/(sqrt(a) + sqrt(b)*x**2)**2)*(sqrt(
a) + sqrt(b)*x**2)*elliptic_e(2*atan(b**(1/4)*x/a**(1/4)), 1/2)/(
2*b**(7/4)*sqrt(a + b*x**4)) + 3*a**(1/4)*sqrt((a + b*x**4)/(sqrt
(a) + sqrt(b)*x**2)**2)*(sqrt(a) + sqrt(b)*x**2)*elliptic_f(2*ata
n(b**(1/4)*x/a**(1/4)), 1/2)/(4*b**(7/4)*sqrt(a + b*x**4)) - x**3
/(2*b*sqrt(a + b*x**4)) + 3*x*sqrt(a + b*x**4)/(2*b**(3/2)*(sqrt(
a) + sqrt(b)*x**2))
```

Mathematica [C] time = 0.168475, size = 163, normalized size = 0.69

$$\frac{-3\sqrt{a}\sqrt{\frac{bx^4}{a}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)+3\sqrt{a}\sqrt{\frac{bx^4}{a}+1}E\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)+\sqrt{b}x^3\left(-\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\right)}{2b^{3/2}\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6/(a + b*x^4)^(3/2),x]
```

```
[Out] (-(Sqrt[(I*Sqrt[b])/Sqrt[a]]*Sqrt[b]*x^3) + 3*Sqrt[a]*Sqrt[1 + (b
*x^4)/a]*EllipticE[I*ArcSinh[Sqrt[(I*Sqrt[b])/Sqrt[a]]*x], -1] -
3*Sqrt[a]*Sqrt[1 + (b*x^4)/a]*EllipticF[I*ArcSinh[Sqrt[(I*Sqrt[b]
)/Sqrt[a]]*x], -1])/(2*Sqrt[(I*Sqrt[b])/Sqrt[a]]*b^(3/2)*Sqrt[a +
 b*x^4])
```

Maple [C] time = 0.016, size = 119, normalized size = 0.5

$$-\frac{x^3}{2\,b}\frac{1}{\sqrt{\left(x^4+\frac{a}{b}\right)b}}+\frac{3\,i}{2}\sqrt{a}\sqrt{1-ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\sqrt{1+ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\left(EllipticF\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)-EllipticE\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)\right)b^{-\frac{3}{2}}\frac{1}{\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(b*x^4+a)^(3/2),x)
```

```
[Out] -1/2/b*x^3/((x^4+a/b)*b)^(1/2)+3/2*I/b^(3/2)*a^(1/2)/(I/a^(1/2)*b
^(1/2))^(1/2)*(1-I/a^(1/2)*b^(1/2)*x^2)^(1/2)*(1+I/a^(1/2)*b^(1/2
)*x^2)^(1/2)/(b*x^4+a)^(1/2)*(EllipticF(x*(I/a^(1/2)*b^(1/2))^(1/
2),I)-EllipticE(x*(I/a^(1/2)*b^(1/2))^(1/2),I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{(bx^4+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(b*x^4 + a)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^6/(b*x^4 + a)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^6}{(bx^4+a)^{\frac{3}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(b*x^4 + a)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^6/(b*x^4 + a)^(3/2), x)
```

Sympy [A] time = 2.8202, size = 37, normalized size = 0.16

$$\frac{x^7\,\Gamma\left(\frac{7}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{3}{2},\frac{7}{4}\\\frac{11}{4}\end{matrix}\middle|\frac{bx^4e^{i\pi}}{a}\right)}{4a^{\frac{3}{2}}\,\Gamma\left(\frac{11}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(b*x**4+a)**(3/2),x)
```

```
[Out] x**7*gamma(7/4)*hyper((3/2, 7/4), (11/4,), b*x**4*exp_polar(I*pi)
/a)/(4*a**(3/2)*gamma(11/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{(bx^4+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(b*x^4 + a)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^6/(b*x^4 + a)^(3/2), x)
```

3.868 $\int \frac{x^2}{(a+bx^4)^{3/2}}\,dx$

Optimal. Leaf size=239

$$-\frac{\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{4a^{3/4}b^{3/4}\sqrt{a+bx^4}}+\frac{\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{2a^{3/4}b^{3/4}\sqrt{a+bx^4}}+\frac{x^3}{2a\sqrt{a+bx^4}}-\frac{x\sqrt{a+bx^4}}{2a\sqrt{b}\left(\sqrt{a}+\sqrt{b}x^2\right)}$$

```
[Out] x^3/(2*a*Sqrt[a + b*x^4]) - (x*Sqrt[a + b*x^4])/(2*a*Sqrt[b]*(Sqr
t[a] + Sqrt[b]*x^2)) + ((Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/
(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticE[2*ArcTan[(b^(1/4)*x)/a^(1/4)
], 1/2])/(2*a^(3/4)*b^(3/4)*Sqrt[a + b*x^4]) - ((Sqrt[a] + Sqrt[b
]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticF[2*Ar
cTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(4*a^(3/4)*b^(3/4)*Sqrt[a + b*x^
4])
```

Rubi [A] time = 0.193722, antiderivative size = 239, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{4a^{3/4}b^{3/4}\sqrt{a+bx^4}}+\frac{\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{2a^{3/4}b^{3/4}\sqrt{a+bx^4}}+\frac{x^3}{2a\sqrt{a+bx^4}}-\frac{x\sqrt{a+bx^4}}{2a\sqrt{b}\left(\sqrt{a}+\sqrt{b}x^2\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b*x^4)^(3/2),x]
```

```
[Out] x^3/(2*a*Sqrt[a + b*x^4]) - (x*Sqrt[a + b*x^4])/(2*a*Sqrt[b]*(Sqr
t[a] + Sqrt[b]*x^2)) + ((Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/
(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticE[2*ArcTan[(b^(1/4)*x)/a^(1/4)
], 1/2])/(2*a^(3/4)*b^(3/4)*Sqrt[a + b*x^4]) - ((Sqrt[a] + Sqrt[b
]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticF[2*Ar
cTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(4*a^(3/4)*b^(3/4)*Sqrt[a + b*x^
4])
```

Rubi in Sympy [A] time = 23.3418, size = 209, normalized size = 0.87

$$\frac{x^3}{2a\sqrt{a+bx^4}}-\frac{x\sqrt{a+bx^4}}{2a\sqrt{b}\left(\sqrt{a}+\sqrt{b}x^2\right)}+\frac{\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)E\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{2a^{\frac{3}{4}}b^{\frac{3}{4}}\sqrt{a+bx^4}}-\frac{\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)F\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{4a^{\frac{3}{4}}b^{\frac{3}{4}}\sqrt{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(b*x**4+a)**(3/2),x)
```

```
[Out] x**3/(2*a*sqrt(a + b*x**4)) - x*sqrt(a + b*x**4)/(2*a*sqrt(b)*(sq
rt(a) + sqrt(b)*x**2)) + sqrt((a + b*x**4)/(sqrt(a) + sqrt(b)*x**
2)**2)*(sqrt(a) + sqrt(b)*x**2)*elliptic_e(2*atan(b**(1/4)*x/a**(
1/4)), 1/2)/(2*a**(3/4)*b**(3/4)*sqrt(a + b*x**4)) - sqrt((a + b*
x**4)/(sqrt(a) + sqrt(b)*x**2)**2)*(sqrt(a) + sqrt(b)*x**2)*ellip
tic_f(2*atan(b**(1/4)*x/a**(1/4)), 1/2)/(4*a**(3/4)*b**(3/4)*sqrt
(a + b*x**4))
```

Mathematica [C] time = 0.203382, size = 163, normalized size = 0.68

$$\frac{i\left(\sqrt{a}\sqrt{\frac{bx^4}{a}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)-\sqrt{a}\sqrt{\frac{bx^4}{a}+1}E\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)+\sqrt{b}x^3\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\right)}{2a^{3/2}\left(\frac{i\sqrt{b}}{\sqrt{a}}\right)^{3/2}\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a + b*x^4)^(3/2),x]
```

```
[Out] ((I/2)*(Sqrt[(I*Sqrt[b])/Sqrt[a]]*Sqrt[b]*x^3 - Sqrt[a]*Sqrt[1 +
(b*x^4)/a]*EllipticE[I*ArcSinh[Sqrt[(I*Sqrt[b])/Sqrt[a]]*x], -1]
+ Sqrt[a]*Sqrt[1 + (b*x^4)/a]*EllipticF[I*ArcSinh[Sqrt[(I*Sqrt[b]
)/Sqrt[a]]*x], -1]))/(a^(3/2)*((I*Sqrt[b])/Sqrt[a])^(3/2)*Sqrt[a
+ b*x^4])
```

Maple [C] time = 0.016, size = 119, normalized size = 0.5

$$\frac{x^3}{2\,a}\frac{1}{\sqrt{\left(x^4+\frac{a}{b}\right)b}}$$
$$-\frac{i}{2}\sqrt{1-ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\sqrt{1+ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\left(EllipticF\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)-EllipticE\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)\right)\frac{1}{\sqrt{a}}\frac{1}{\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{bx^4+a}}\frac{1}{\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(b*x^4+a)^(3/2),x)
```

```
[Out] 1/2/a*x^3/((x^4+a/b)*b)^(1/2)-1/2*I/a^(1/2)/(I/a^(1/2)*b^(1/2))^(
1/2)*(1-I/a^(1/2)*b^(1/2)*x^2)^(1/2)*(1+I/a^(1/2)*b^(1/2)*x^2)^(1
/2)/(b*x^4+a)^(1/2)/b^(1/2)*(EllipticF(x*(I/a^(1/2)*b^(1/2))^(1/2
),I)-EllipticE(x*(I/a^(1/2)*b^(1/2))^(1/2),I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{(bx^4+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^4 + a)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^2/(b*x^4 + a)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^2}{(bx^4+a)^{\frac{3}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^4 + a)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^2/(b*x^4 + a)^(3/2), x)
```

Sympy [A] time = 2.26656, size = 37, normalized size = 0.15

$$\frac{x^3 \Gamma\left(\frac{3}{4}\right) {}_2F_1\left(\begin{matrix} \frac{3}{4}, \frac{3}{2} \\ \frac{7}{4} \end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{4a^{\frac{3}{2}} \Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(b*x**4+a)**(3/2),x)
```

```
[Out] x**3*gamma(3/4)*hyper((3/4, 3/2), (7/4,), b*x**4*exp_polar(I*pi)/
a)/(4*a**(3/2)*gamma(7/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{(bx^4 + a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^4 + a)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^2/(b*x^4 + a)^(3/2), x)
```

3.869 $\int \frac{1}{x^2(a+bx^4)^{3/2}}\,dx$

Optimal. Leaf size=260

$$\frac{3\sqrt[4]{b}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{4a^{7/4}\sqrt{a+bx^4}}-\frac{3\sqrt[4]{b}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{2a^{7/4}\sqrt{a+bx^4}}-\frac{3\sqrt{a+bx^4}}{2a^2x}+\frac{3\sqrt{b}x\sqrt{a+bx^4}}{2a^2\left(\sqrt{a}+\sqrt{b}x^2\right)}+\frac{1}{2ax\sqrt{a+bx^4}}$$

```
[Out] 1/(2*a*x*Sqrt[a + b*x^4]) - (3*Sqrt[a + b*x^4])/(2*a^2*x) + (3*Sq
rt[b]*x*Sqrt[a + b*x^4])/(2*a^2*(Sqrt[a] + Sqrt[b]*x^2)) - (3*b^(
1/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*
x^2)^2]*EllipticE[2*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(2*a^(7/4)
*Sqrt[a + b*x^4]) + (3*b^(1/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a +
b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticF[2*ArcTan[(b^(1/4)*x)/
a^(1/4)], 1/2])/(4*a^(7/4)*Sqrt[a + b*x^4])
```

Rubi [A] time = 0.240115, antiderivative size = 260, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$

$$\frac{3\sqrt[4]{b}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{4a^{7/4}\sqrt{a+bx^4}}-\frac{3\sqrt[4]{b}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{2a^{7/4}\sqrt{a+bx^4}}-\frac{3\sqrt{a+bx^4}}{2a^2x}+\frac{3\sqrt{b}x\sqrt{a+bx^4}}{2a^2\left(\sqrt{a}+\sqrt{b}x^2\right)}+\frac{1}{2ax\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(a + b*x^4)^(3/2)),x]
```

```
[Out] 1/(2*a*x*Sqrt[a + b*x^4]) - (3*Sqrt[a + b*x^4])/(2*a^2*x) + (3*Sq
rt[b]*x*Sqrt[a + b*x^4])/(2*a^2*(Sqrt[a] + Sqrt[b]*x^2)) - (3*b^(
1/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*
x^2)^2]*EllipticE[2*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(2*a^(7/4)
*Sqrt[a + b*x^4]) + (3*b^(1/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a +
b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticF[2*ArcTan[(b^(1/4)*x)/
a^(1/4)], 1/2])/(4*a^(7/4)*Sqrt[a + b*x^4])
```

Rubi in Sympy [A] time = 29.3822, size = 235, normalized size = 0.9

$$\frac{1}{2ax\sqrt{a+bx^4}}+\frac{3\sqrt{b}x\sqrt{a+bx^4}}{2a^2\left(\sqrt{a}+\sqrt{b}x^2\right)}-\frac{3\sqrt{a+bx^4}}{2a^2x}-\frac{3\sqrt[4]{b}\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)E\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{2a^{\frac{7}{4}}\sqrt{a+bx^4}}+\frac{3\sqrt[4]{b}\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)F\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{4a^{\frac{7}{4}}\sqrt{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate(1/x**2/(b*x**4+a)**(3/2),x)
```

```
[Out] 1/(2*a*x*sqrt(a + b*x**4)) + 3*sqrt(b)*x*sqrt(a + b*x**4)/(2*a**2
*(sqrt(a) + sqrt(b)*x**2)) - 3*sqrt(a + b*x**4)/(2*a**2*x) - 3*b*
*(1/4)*sqrt((a + b*x**4)/(sqrt(a) + sqrt(b)*x**2)**2)*(sqrt(a) +
sqrt(b)*x**2)*elliptic_e(2*atan(b**(1/4)*x/a**(1/4)), 1/2)/(2*a**
(7/4)*sqrt(a + b*x**4)) + 3*b**(1/4)*sqrt((a + b*x**4)/(sqrt(a) +
 sqrt(b)*x**2)**2)*(sqrt(a) + sqrt(b)*x**2)*elliptic_f(2*atan(b**
(1/4)*x/a**(1/4)), 1/2)/(4*a**(7/4)*sqrt(a + b*x**4))
```

Mathematica [C] time = 0.227274, size = 178, normalized size = 0.68

$$\frac{-\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\left(2a+3bx^4\right)-3\sqrt{a}\sqrt{b}x\sqrt{\frac{bx^4}{a}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)+3\sqrt{a}\sqrt{b}x\sqrt{\frac{bx^4}{a}+1}E\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)}{2a^2x\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]   Integrate[1/(x^2*(a + b*x^4)^(3/2)),x]
```

```
[Out] (-(Sqrt[(I*Sqrt[b])/Sqrt[a]]*(2*a + 3*b*x^4)) + 3*Sqrt[a]*Sqrt[b]
*x*Sqrt[1 + (b*x^4)/a]*EllipticE[I*ArcSinh[Sqrt[(I*Sqrt[b])/Sqrt[
a]]*x], -1] - 3*Sqrt[a]*Sqrt[b]*x*Sqrt[1 + (b*x^4)/a]*EllipticF[I
*ArcSinh[Sqrt[(I*Sqrt[b])/Sqrt[a]]*x], -1])/(2*a^2*Sqrt[(I*Sqrt[b
])/Sqrt[a]]*x*Sqrt[a + b*x^4])
```

Maple [C] time = 0.022, size = 137, normalized size = 0.5

$$-\frac{bx^3}{2\,a^2}\frac{1}{\sqrt{\left(x^4+\frac{a}{b}\right)b}}-\frac{1}{xa^2}\sqrt{bx^4+a}$$
$$+\frac{3\,i}{2}\sqrt{b}\sqrt{1-ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\sqrt{1+ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\left(EllipticF\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)-EllipticE\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)\right)a^{-\frac{3}{2}}\frac{1}{\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^2/(b*x^4+a)^(3/2),x)
```

```
[Out] -1/2*b/a^2*x^3/((x^4+a/b)*b)^(1/2)-(b*x^4+a)^(1/2)/x/a^2+3/2*I*b^
(1/2)/a^(3/2)/(I/a^(1/2)*b^(1/2))^(1/2)*(1-I/a^(1/2)*b^(1/2)*x^2)
^(1/2)*(1+I/a^(1/2)*b^(1/2)*x^2)^(1/2)/(b*x^4+a)^(1/2)*(EllipticF
(x*(I/a^(1/2)*b^(1/2))^(1/2),I)-EllipticE(x*(I/a^(1/2)*b^(1/2))^(
1/2),I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\left(bx^4+a\right)^{\frac{3}{2}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((b*x^4 + a)^(3/2)*x^2),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x^4 + a)^(3/2)*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(bx^6 + ax^2)\sqrt{bx^4 + a}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/2)*x^2),x, algorithm="fricas")
```

```
[Out] integral(1/((b*x^6 + a*x^2)*sqrt(b*x^4 + a)), x)
```

Sympy [A] time = 2.89187, size = 39, normalized size = 0.15

$$\frac{\left(-\frac{1}{4}\right)\, {}_2F_1\left(\begin{matrix} -\frac{1}{4}, \frac{3}{2} \\ \frac{3}{4} \end{matrix}\middle| \frac{bx^4e^{i\pi}}{a}\right)}{4a^{\frac{3}{2}}x\left(\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(b*x**4+a)**(3/2),x)
```

```
[Out] gamma(-1/4)*hyper((-1/4, 3/2), (3/4,), b*x**4*exp_polar(I*pi)/a)/
(4*a**(3/2)*x*gamma(3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4 + a)^{\frac{3}{2}}x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/2)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^4 + a)^(3/2)*x^2), x)
```

3.870 $\int \frac{1}{x^6(a+bx^4)^{3/2}}\,dx$

Optimal. Leaf size=282

$$-\frac{21b^{5/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{20a^{11/4}\sqrt{a+bx^4}}+\frac{21b^{5/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{10a^{11/4}\sqrt{a+bx^4}}-\frac{21b^{3/2}x\sqrt{a+bx^4}}{10a^3\left(\sqrt{a}+\sqrt{b}x^2\right)}+\frac{21b\sqrt{a+bx^4}}{10a^3x}-\frac{7\sqrt{a+bx^4}}{10a^2x^5}+\frac{1}{2ax^5\sqrt{a+bx^4}}$$

```
[Out] 1/(2*a*x^5*Sqrt[a + b*x^4]) - (7*Sqrt[a + b*x^4])/(10*a^2*x^5) +
(21*b*Sqrt[a + b*x^4])/(10*a^3*x) - (21*b^(3/2)*x*Sqrt[a + b*x^4]
)/(10*a^3*(Sqrt[a] + Sqrt[b]*x^2)) + (21*b^(5/4)*(Sqrt[a] + Sqrt[
b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticE[2*A
rcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(10*a^(11/4)*Sqrt[a + b*x^4]) -
 (21*b^(5/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] +
Sqrt[b]*x^2)^2]*EllipticF[2*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(2
0*a^(11/4)*Sqrt[a + b*x^4])
```

Rubi [A] time = 0.298554, antiderivative size = 282, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{21b^{5/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{20a^{11/4}\sqrt{a+bx^4}}+\frac{21b^{5/4}\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}E\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{10a^{11/4}\sqrt{a+bx^4}}-\frac{21b^{3/2}x\sqrt{a+bx^4}}{10a^3\left(\sqrt{a}+\sqrt{b}x^2\right)}+\frac{21b\sqrt{a+bx^4}}{10a^3x}-\frac{7\sqrt{a+bx^4}}{10a^2x^5}+\frac{1}{2ax^5\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^6*(a + b*x^4)^(3/2)),x]
```


```
[Out] 1/(2*a*x^5*Sqrt[a + b*x^4]) - (7*Sqrt[a + b*x^4])/(10*a^2*x^5) +
(21*b*Sqrt[a + b*x^4])/(10*a^3*x) - (21*b^(3/2)*x*Sqrt[a + b*x^4]
)/(10*a^3*(Sqrt[a] + Sqrt[b]*x^2)) + (21*b^(5/4)*(Sqrt[a] + Sqrt[
b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2]*EllipticE[2*A
rcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(10*a^(11/4)*Sqrt[a + b*x^4]) -
 (21*b^(5/4)*(Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] +
Sqrt[b]*x^2)^2]*EllipticF[2*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(2
0*a^(11/4)*Sqrt[a + b*x^4])
```

Rubi in Sympy [A] time = 35.6554, size = 258, normalized size = 0.91

$$\frac{1}{2ax^5\sqrt{a+bx^4}}-\frac{7\sqrt{a+bx^4}}{10a^2x^5}-\frac{21b^{\frac{3}{2}}x\sqrt{a+bx^4}}{10a^3\left(\sqrt{a}+\sqrt{b}x^2\right)}+\frac{21b\sqrt{a+bx^4}}{10a^3x}+\frac{21b^{\frac{5}{4}}\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)E\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{10a^{\frac{11}{4}}\sqrt{a+bx^4}}-\frac{21b^{\frac{5}{4}}\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)F\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{20a^{\frac{11}{4}}\sqrt{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**6/(b*x**4+a)**(3/2),x)
```

```
[Out] 1/(2*a*x**5*sqrt(a + b*x**4)) - 7*sqrt(a + b*x**4)/(10*a**2*x**5)
 - 21*b**(3/2)*x*sqrt(a + b*x**4)/(10*a**3*(sqrt(a) + sqrt(b)*x**
2)) + 21*b*sqrt(a + b*x**4)/(10*a**3*x) + 21*b**(5/4)*sqrt((a + b
*x**4)/(sqrt(a) + sqrt(b)*x**2)**2)*(sqrt(a) + sqrt(b)*x**2)*elli
ptic_e(2*atan(b**(1/4)*x/a**(1/4)), 1/2)/(10*a**(11/4)*sqrt(a + b
*x**4)) - 21*b**(5/4)*sqrt((a + b*x**4)/(sqrt(a) + sqrt(b)*x**2)*
*2)*(sqrt(a) + sqrt(b)*x**2)*elliptic_f(2*atan(b**(1/4)*x/a**(1/4
)), 1/2)/(20*a**(11/4)*sqrt(a + b*x**4))
```

Mathematica [C] time = 0.269439, size = 192, normalized size = 0.68

$$\frac{\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\left(-2a^2+14abx^4+21b^2x^8\right)+21\sqrt{a}b^{3/2}x^5\sqrt{\frac{bx^4}{a}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)-21\sqrt{a}b^{3/2}x^5\sqrt{\frac{bx^4}{a}+1}E\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)}{10a^3x^5\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\sqrt{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^6*(a + b*x^4)^(3/2)),x]
```

```
[Out] (Sqrt[(I*Sqrt[b])/Sqrt[a]]*(-2*a^2 + 14*a*b*x^4 + 21*b^2*x^8) - 2
1*Sqrt[a]*b^(3/2)*x^5*Sqrt[1 + (b*x^4)/a]*EllipticE[I*ArcSinh[Sqr
t[(I*Sqrt[b])/Sqrt[a]]*x], -1] + 21*Sqrt[a]*b^(3/2)*x^5*Sqrt[1 +
(b*x^4)/a]*EllipticF[I*ArcSinh[Sqrt[(I*Sqrt[b])/Sqrt[a]]*x], -1])
/(10*a^3*Sqrt[(I*Sqrt[b])/Sqrt[a]]*x^5*Sqrt[a + b*x^4])
```

Maple [C] time = 0.027, size = 157, normalized size = 0.6

$$\frac{b^2x^3}{2\,a^3}\frac{1}{\sqrt{\left(x^4+\frac{a}{b}\right)b}}-\frac{1}{5\,x^5a^2}\sqrt{bx^4+a}+\frac{8\,b}{5\,a^3x}\sqrt{bx^4+a}-\frac{21\,i}{10}b^{\frac{3}{2}}\sqrt{1-ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\sqrt{1+ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\left(EllipticF\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)-EllipticE\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)\right)a^{-\frac{5}{2}}\frac{1}{\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^6/(b*x^4+a)^(3/2),x)
```

```
[Out] 1/2*b^2/a^3*x^3/((x^4+a/b)*b)^(1/2)-1/5*(b*x^4+a)^(1/2)/x^5/a^2+8
/5*b*(b*x^4+a)^(1/2)/a^3/x-21/10*I/a^(5/2)*b^(3/2)/(I/a^(1/2)*b^(
1/2))^(1/2)*(1-I/a^(1/2)*b^(1/2)*x^2)^(1/2)*(1+I/a^(1/2)*b^(1/2)*
x^2)^(1/2)/(b*x^4+a)^(1/2)*(EllipticF(x*(I/a^(1/2)*b^(1/2))^(1/2)
```

```
,I)-EllipticE(x*(I/a^(1/2)*b^(1/2))^(1/2),I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4+a)^{\frac{3}{2}}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/2)*x^6),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x^4 + a)^(3/2)*x^6), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(bx^{10}+ax^6)\sqrt{bx^4+a}},\,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/2)*x^6),x, algorithm="fricas")
```

```
[Out] integral(1/((b*x^10 + a*x^6)*sqrt(b*x^4 + a)), x)
```

Sympy [A] time = 4.90366, size = 44, normalized size = 0.16

$$\frac{\left(-\frac{5}{4}\right)\,{}_2F_1\left(\begin{matrix} -\frac{5}{4},\frac{3}{2} \\ -\frac{1}{4} \end{matrix}\middle|\,\frac{bx^4e^{i\pi}}{a}\right)}{4a^{\frac{3}{2}}x^5\left(-\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**6/(b*x**4+a)**(3/2),x)
```

```
[Out] gamma(-5/4)*hyper((-5/4, 3/2), (-1/4,), b*x**4*exp_polar(I*pi)/a)
/(4*a**(3/2)*x**5*gamma(-1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4+a)^{\frac{3}{2}}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/2)*x^6),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^4 + a)^(3/2)*x^6), x)
```

3.871 $\int \frac{1}{(a+bx^4)^{5/2}}\,dx$

Optimal. Leaf size=127

$$\frac{5\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{24a^{9/4}\sqrt[4]{b}\sqrt{a+bx^4}}+\frac{5x}{12a^2\sqrt{a+bx^4}}+\frac{x}{6a\left(a+bx^4\right)^{3/2}}$$

```
[Out] x/(6*a*(a + b*x^4)^(3/2)) + (5*x)/(12*a^2*Sqrt[a + b*x^4]) + (5*(
Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2
]*EllipticF[2*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(24*a^(9/4)*b^(1
/4)*Sqrt[a + b*x^4])
```

Rubi [A] time = 0.0812811, antiderivative size = 127, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{5\left(\sqrt{a}+\sqrt{b}x^2\right)\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{24a^{9/4}\sqrt[4]{b}\sqrt{a+bx^4}}+\frac{5x}{12a^2\sqrt{a+bx^4}}+\frac{x}{6a\left(a+bx^4\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(-5/2),x]
```

```
[Out] x/(6*a*(a + b*x^4)^(3/2)) + (5*x)/(12*a^2*Sqrt[a + b*x^4]) + (5*(
Sqrt[a] + Sqrt[b]*x^2)*Sqrt[(a + b*x^4)/(Sqrt[a] + Sqrt[b]*x^2)^2
]*EllipticF[2*ArcTan[(b^(1/4)*x)/a^(1/4)], 1/2])/(24*a^(9/4)*b^(1
/4)*Sqrt[a + b*x^4])
```

Rubi in Sympy [A] time = 8.11033, size = 114, normalized size = 0.9

$$\frac{x}{6a\left(a+bx^4\right)^{\frac{3}{2}}}+\frac{5x}{12a^2\sqrt{a+bx^4}}+\frac{5\sqrt{\frac{a+bx^4}{\left(\sqrt{a}+\sqrt{b}x^2\right)^2}}\left(\sqrt{a}+\sqrt{b}x^2\right)F\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{24a^{\frac{9}{4}}\sqrt[4]{b}\sqrt{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**4+a)**(5/2),x)
```

```
[Out] x/(6*a*(a + b*x**4)**(3/2)) + 5*x/(12*a**2*sqrt(a + b*x**4)) + 5*
sqrt((a + b*x**4)/(sqrt(a) + sqrt(b)*x**2)**2)*(sqrt(a) + sqrt(b)
*x**2)*elliptic_f(2*atan(b**(1/4)*x/a**(1/4)), 1/2)/(24*a**(9/4)*
b**(1/4)*sqrt(a + b*x**4))
```

Mathematica [C] time = 0.336925, size = 99, normalized size = 0.78

$$\frac{-\frac{5i\left(a+bx^4\right)\sqrt{\frac{bx^4}{a}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}x\right)\middle|-1\right)}{\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}}+7ax+5bx^5}{12a^2\left(a+bx^4\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(-5/2),x]
```

```
[Out] (7*a*x + 5*b*x^5 - ((5*I)*(a + b*x^4)*Sqrt[1 + (b*x^4)/a]*Ellipti
cF[I*ArcSinh[Sqrt[(I*Sqrt[b])/Sqrt[a]]*x], -1])/Sqrt[(I*Sqrt[b])/
Sqrt[a]])/(12*a^2*(a + b*x^4)^(3/2))
```

Maple [C] time = 0.019, size = 123, normalized size = 1.

$$\frac{x}{6\,ab^2}\sqrt{bx^4+a}\left(x^4+\frac{a}{b}\right)^{-2}+\frac{5\,x}{12\,a^2}\frac{1}{\sqrt{\left(x^4+\frac{a}{b}\right)b}}+\frac{5}{12\,a^2}\sqrt{1-ix^2\sqrt{b}\frac{1}{\sqrt{a}}}\sqrt{1+ix^2\sqrt{b}\frac{1}{\sqrt{a}}}EllipticF\left(x\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}},i\right)\frac{1}{\sqrt{i\sqrt{b}\frac{1}{\sqrt{a}}}}\frac{1}{\sqrt{bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^4+a)^(5/2),x)
```

```
[Out] 1/6/a*x/b^2*(b*x^4+a)^(1/2)/(x^4+a/b)^2+5/12/a^2*x/((x^4+a/b)*b)^
(1/2)+5/12/a^2/(I/a^(1/2)*b^(1/2))^(1/2)*(1-I/a^(1/2)*b^(1/2)*x^2
)^(1/2)*(1+I/a^(1/2)*b^(1/2)*x^2)^(1/2)/(b*x^4+a)^(1/2)*EllipticF
(x*(I/a^(1/2)*b^(1/2))^(1/2),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{(bx^4+a)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(-5/2),x, algorithm="maxima")
```

```
[Out] integrate((b*x^4 + a)^(-5/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{(b^2x^8+2\,abx^4+a^2)\sqrt{bx^4+a}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(-5/2),x, algorithm="fricas")
```

```
[Out] integral(1/((b^2*x^8 + 2*a*b*x^4 + a^2)*sqrt(b*x^4 + a)), x)
```

Sympy [A] time = 2.80247, size = 36, normalized size = 0.28

$$\frac{x\,\Gamma\left(\frac{1}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{4},\frac{5}{2}\\\frac{5}{4}\end{matrix}\middle|\frac{bx^4e^{i\pi}}{a}\right)}{4a^{\frac{5}{2}}\,\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**4+a)**(5/2),x)
```

```
[Out] x*gamma(1/4)*hyper((1/4, 5/2), (5/4,), b*x**4*exp_polar(I*pi)/a)/
(4*a**(5/2)*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4+a)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(-5/2),x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(-5/2), x)
```

3.872 $\int \frac{x^{11}}{\sqrt{1-x^4}}\,dx$

Optimal. Leaf size=46

$$-\frac{1}{10}\left(1-x^4\right)^{5/2}+\frac{1}{3}\left(1-x^4\right)^{3/2}-\frac{\sqrt{1-x^4}}{2}$$

```
[Out] -Sqrt[1 - x^4]/2 + (1 - x^4)^(3/2)/3 - (1 - x^4)^(5/2)/10
```

Rubi [A] time = 0.0531364, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$-\frac{1}{10}\left(1-x^4\right)^{5/2}+\frac{1}{3}\left(1-x^4\right)^{3/2}-\frac{\sqrt{1-x^4}}{2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11/Sqrt[1 - x^4],x]

[Out] -Sqrt[1 - x^4]/2 + (1 - x^4)^(3/2)/3 - (1 - x^4)^(5/2)/10
```

Rubi in Sympy [A] time = 5.08847, size = 29, normalized size = 0.63

$$-\frac{\left(-x^4+1\right)^{\frac{5}{2}}}{10}+\frac{\left(-x^4+1\right)^{\frac{3}{2}}}{3}-\frac{\sqrt{-x^4+1}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11/(-x**4+1)**(1/2),x)

[Out] -(-x**4 + 1)**(5/2)/10 + (-x**4 + 1)**(3/2)/3 - sqrt(-x**4 + 1)/2
```

Mathematica [A] time = 0.0161124, size = 27, normalized size = 0.59

$$-\frac{1}{30}\sqrt{1-x^4}\left(3x^8+4x^4+8\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11/Sqrt[1 - x^4],x]

[Out] -(Sqrt[1 - x^4]*(8 + 4*x^4 + 3*x^8))/30
```

Maple [A] time = 0.007, size = 35, normalized size = 0.8

$$\frac{(-1+x)(1+x)\left(x^2+1\right)\left(3x^8+4x^4+8\right)}{30}\frac{1}{\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11/(-x^4+1)^(1/2),x)

[Out] 1/30*(-1+x)*(1+x)*(x^2+1)*(3*x^8+4*x^4+8)/(-x^4+1)^(1/2)
```

Maxima [A] time = 1.44005, size = 46, normalized size = 1.

$$-\frac{1}{10}\left(-x^4+1\right)^{\frac{5}{2}}+\frac{1}{3}\left(-x^4+1\right)^{\frac{3}{2}}-\frac{1}{2}\sqrt{-x^4+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/sqrt(-x^4 + 1),x, algorithm="maxima")
```

```
[Out] -1/10*(-x^4 + 1)^(5/2) + 1/3*(-x^4 + 1)^(3/2) - 1/2*sqrt(-x^4 + 1
)
```

Fricas [A] time = 0.26617, size = 31, normalized size = 0.67

$$-\frac{1}{30}\left(3x^8+4x^4+8\right)\sqrt{-x^4+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/sqrt(-x^4 + 1),x, algorithm="fricas")
```

```
[Out] -1/30*(3*x^8 + 4*x^4 + 8)*sqrt(-x^4 + 1)
```

Sympy [A] time = 4.08342, size = 41, normalized size = 0.89

$$-\frac{x^8\sqrt{-x^4+1}}{10}-\frac{2x^4\sqrt{-x^4+1}}{15}-\frac{4\sqrt{-x^4+1}}{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11/(-x**4+1)**(1/2),x)
```

```
[Out] -x**8*sqrt(-x**4 + 1)/10 - 2*x**4*sqrt(-x**4 + 1)/15 - 4*sqrt(-x*
*4 + 1)/15
```

GIAC/XCAS [A] time = 0.21244, size = 55, normalized size = 1.2

$$-\frac{1}{10}\left(x^4-1\right)^2\sqrt{-x^4+1}+\frac{1}{3}\left(-x^4+1\right)^{\frac{3}{2}}-\frac{1}{2}\sqrt{-x^4+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/sqrt(-x^4 + 1),x, algorithm="giac")
```

```
[Out] -1/10*(x^4 - 1)^2*sqrt(-x^4 + 1) + 1/3*(-x^4 + 1)^(3/2) - 1/2*sqr
t(-x^4 + 1)
```

3.873 $\int \frac{x^7}{\sqrt{1-x^4}} \, dx$

Optimal. Leaf size=31

$$\frac{1}{6}\left(1-x^4\right)^{3/2}-\frac{\sqrt{1-x^4}}{2}$$

```
[Out] -Sqrt[1 - x^4]/2 + (1 - x^4)^(3/2)/6
```

Rubi [A] time = 0.0403579, antiderivative size = 31, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{1}{6}\left(1-x^4\right)^{3/2}-\frac{\sqrt{1-x^4}}{2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7/Sqrt[1 - x^4],x]

[Out] -Sqrt[1 - x^4]/2 + (1 - x^4)^(3/2)/6
```

Rubi in Sympy [A] time = 4.56117, size = 19, normalized size = 0.61

$$\frac{\left(-x^4+1\right)^{\frac{3}{2}}}{6}-\frac{\sqrt{-x^4+1}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7/(-x**4+1)**(1/2),x)

[Out] (-x**4 + 1)**(3/2)/6 - sqrt(-x**4 + 1)/2
```

Mathematica [A] time = 0.0098814, size = 20, normalized size = 0.65

$$-\frac{1}{6}\sqrt{1-x^4}\left(x^4+2\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^7/Sqrt[1 - x^4],x]

[Out] -(Sqrt[1 - x^4]*(2 + x^4))/6
```

Maple [A] time = 0.006, size = 28, normalized size = 0.9

$$\frac{(-1+x)(1+x)\left(x^2+1\right)\left(x^4+2\right)}{6}\frac{1}{\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7/(-x^4+1)^(1/2),x)

[Out] 1/6*(-1+x)*(1+x)*(x^2+1)*(x^4+2)/(-x^4+1)^(1/2)
```

Maxima [A] time = 1.43179, size = 31, normalized size = 1.

$$\frac{1}{6}\left(-x^4+1\right)^{\frac{3}{2}}-\frac{1}{2}\sqrt{-x^4+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(-x^4 + 1),x, algorithm="maxima")
```

```
[Out] 1/6*(-x^4 + 1)^(3/2) - 1/2*sqrt(-x^4 + 1)
```

Fricas [A] time = 0.248508, size = 22, normalized size = 0.71

$$-\frac{1}{6}\left(x^4+2\right)\sqrt{-x^4+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(-x^4 + 1),x, algorithm="fricas")
```

```
[Out] -1/6*(x^4 + 2)*sqrt(-x^4 + 1)
```

Sympy [A] time = 1.31124, size = 24, normalized size = 0.77

$$-\frac{x^4\sqrt{-x^4+1}}{6}-\frac{\sqrt{-x^4+1}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(-x**4+1)**(1/2),x)
```

```
[Out] -x**4*sqrt(-x**4 + 1)/6 - sqrt(-x**4 + 1)/3
```

GIAC/XCAS [A] time = 0.210485, size = 31, normalized size = 1.

$$\frac{1}{6}\left(-x^4+1\right)^{\frac{3}{2}}-\frac{1}{2}\sqrt{-x^4+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(-x^4 + 1),x, algorithm="giac")
```

```
[Out] 1/6*(-x^4 + 1)^(3/2) - 1/2*sqrt(-x^4 + 1)
```

3.874 $\int \frac{x^3}{\sqrt{1-x^4}}\,dx$

Optimal. Leaf size=15

$$-\frac{1}{2}\sqrt{1-x^4}$$

```
[Out] -Sqrt[1 - x^4]/2
```

Rubi [A] time = 0.00806581, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$-\frac{1}{2}\sqrt{1-x^4}$$

Antiderivative was successfully verified.

```
[In] Int[x^3/Sqrt[1 - x^4],x]

[Out] -Sqrt[1 - x^4]/2
```

Rubi in Sympy [A] time = 1.93221, size = 10, normalized size = 0.67

$$-\frac{\sqrt{-x^4+1}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**3/(-x**4+1)**(1/2),x)

[Out] -sqrt(-x**4 + 1)/2
```

Mathematica [A] time = 0.0052842, size = 15, normalized size = 1.

$$-\frac{1}{2}\sqrt{1-x^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3/Sqrt[1 - x^4],x]

[Out] -Sqrt[1 - x^4]/2
```

Maple [A] time = 0.007, size = 23, normalized size = 1.5

$$\frac{(-1+x)(1+x)\left(x^2+1\right)}{2}\frac{1}{\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(-x^4+1)^(1/2),x)

[Out] 1/2*(-1+x)*(1+x)*(x^2+1)/(-x^4+1)^(1/2)
```

Maxima [A] time = 1.44102, size = 15, normalized size = 1.

$$-\frac{1}{2}\sqrt{-x^4+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(-x^4 + 1),x, algorithm="maxima")
```

```
[Out] -1/2*sqrt(-x^4 + 1)
```

Fricas [A] time = 0.273306, size = 15, normalized size = 1.

$$-\frac{1}{2}\sqrt{-x^4+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(-x^4 + 1),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(-x^4 + 1)
```

Sympy [A] time = 0.388837, size = 10, normalized size = 0.67

$$-\frac{\sqrt{-x^4+1}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(-x**4+1)**(1/2),x)
```

```
[Out] -sqrt(-x**4 + 1)/2
```

GIAC/XCAS [A] time = 0.210913, size = 15, normalized size = 1.

$$-\frac{1}{2}\sqrt{-x^4+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(-x^4 + 1),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(-x^4 + 1)
```

3.875 $\int \frac{1}{x\sqrt{1-x^4}}\,dx$

Optimal. Leaf size=16

$$-\frac{1}{2}\tanh^{-1}\left(\sqrt{1-x^4}\right)$$

```
[Out] -ArcTanh[Sqrt[1 - x^4]]/2
```

Rubi [A] time = 0.0277166, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$-\frac{1}{2}\tanh^{-1}\left(\sqrt{1-x^4}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*Sqrt[1 - x^4]),x]

[Out] -ArcTanh[Sqrt[1 - x^4]]/2
```

Rubi in Sympy [A] time = 3.80427, size = 12, normalized size = 0.75

$$-\frac{\operatorname{atanh}\left(\sqrt{-x^4+1}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(-x**4+1)**(1/2),x)

[Out] -atanh(sqrt(-x**4 + 1))/2
```

Mathematica [A] time = 0.035617, size = 16, normalized size = 1.

$$-\frac{1}{2}\tanh^{-1}\left(\sqrt{1-x^4}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*Sqrt[1 - x^4]),x]

[Out] -ArcTanh[Sqrt[1 - x^4]]/2
```

Maple [A] time = 0.014, size = 13, normalized size = 0.8

$$-\frac{1}{2}\mathit{Artanh}\left(\frac{1}{\sqrt{-x^4+1}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(-x^4+1)^(1/2),x)

[Out] -1/2*arctanh(1/(-x^4+1)^(1/2))
```

Maxima [A] time = 1.43414, size = 39, normalized size = 2.44

$$-\frac{1}{4}\log\left(\sqrt{-x^4+1}+1\right)+\frac{1}{4}\log\left(\sqrt{-x^4+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 1)*x),x, algorithm="maxima")
```

```
[Out] -1/4*log(sqrt(-x^4 + 1) + 1) + 1/4*log(sqrt(-x^4 + 1) - 1)
```

Fricas [A] time = 0.288008, size = 39, normalized size = 2.44

$$-\frac{1}{4}\log\left(\sqrt{-x^4+1}+1\right)+\frac{1}{4}\log\left(\sqrt{-x^4+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 1)*x),x, algorithm="fricas")
```

```
[Out] -1/4*log(sqrt(-x^4 + 1) + 1) + 1/4*log(sqrt(-x^4 + 1) - 1)
```

Sympy [A] time = 3.36679, size = 24, normalized size = 1.5

$$\begin{cases} -\frac{\operatorname{acosh}\left(\frac{1}{x^2}\right)}{2} & \text{for } \left|\frac{1}{x^4}\right| > 1 \\ \frac{i\operatorname{asin}\left(\frac{1}{x^2}\right)}{2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(-x**4+1)**(1/2),x)
```

```
[Out] Piecewise((-acosh(x**(-2))/2, Abs(x**(-4)) > 1), (I*asin(x**(-2))
/2, True))
```

GIAC/XCAS [A] time = 0.216125, size = 42, normalized size = 2.62

$$-\frac{1}{4}\ln\left(\sqrt{-x^4+1}+1\right)+\frac{1}{4}\ln\left(-\sqrt{-x^4+1}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 1)*x),x, algorithm="giac")
```

```
[Out] -1/4*ln(sqrt(-x^4 + 1) + 1) + 1/4*ln(-sqrt(-x^4 + 1) + 1)
```

3.876 $\int \frac{1}{x^5\sqrt{1-x^4}}\,dx$

Optimal. Leaf size=35

$$-\frac{\sqrt{1-x^4}}{4x^4}-\frac{1}{4}\tanh^{-1}\left(\sqrt{1-x^4}\right)$$

```
[Out] -Sqrt[1 - x^4]/(4*x^4) - ArcTanh[Sqrt[1 - x^4]]/4
```

Rubi [A] time = 0.0456465, antiderivative size = 35, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{\sqrt{1-x^4}}{4x^4}-\frac{1}{4}\tanh^{-1}\left(\sqrt{1-x^4}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^5*Sqrt[1 - x^4]),x]

[Out] -Sqrt[1 - x^4]/(4*x^4) - ArcTanh[Sqrt[1 - x^4]]/4
```

Rubi in Sympy [A] time = 4.69523, size = 26, normalized size = 0.74

$$-\frac{\operatorname{atanh}\left(\sqrt{-x^4+1}\right)}{4}-\frac{\sqrt{-x^4+1}}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**5/(-x**4+1)**(1/2),x)

[Out] -atanh(sqrt(-x**4 + 1))/4 - sqrt(-x**4 + 1)/(4*x**4)
```

Mathematica [A] time = 0.0417946, size = 35, normalized size = 1.

$$-\frac{\sqrt{1-x^4}}{4x^4}-\frac{1}{4}\tanh^{-1}\left(\sqrt{1-x^4}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^5*Sqrt[1 - x^4]),x]

[Out] -Sqrt[1 - x^4]/(4*x^4) - ArcTanh[Sqrt[1 - x^4]]/4
```

Maple [A] time = 0.015, size = 28, normalized size = 0.8

$$-\frac{1}{4\,x^4}\sqrt{-x^4+1}-\frac{1}{4}\mathit{Artanh}\left(\frac{1}{\sqrt{-x^4+1}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^5/(-x^4+1)^(1/2),x)
```

```
[Out] -1/4*(-x^4+1)^(1/2)/x^4-1/4*arctanh(1/(-x^4+1)^(1/2))
```

Maxima [A] time = 1.53975, size = 58, normalized size = 1.66

$$-\frac{\sqrt{-x^4+1}}{4\,x^4}-\frac{1}{8}\,\log\left(\sqrt{-x^4+1}+1\right)+\frac{1}{8}\,\log\left(\sqrt{-x^4+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 1)*x^5),x, algorithm="maxima")
```

```
[Out] -1/4*sqrt(-x^4 + 1)/x^4 - 1/8*log(sqrt(-x^4 + 1) + 1) + 1/8*log(s
qrt(-x^4 + 1) - 1)
```

Fricas [A] time = 0.239126, size = 68, normalized size = 1.94

$$-\frac{x^4\log\left(\sqrt{-x^4+1}+1\right)-x^4\log\left(\sqrt{-x^4+1}-1\right)+2\sqrt{-x^4+1}}{8\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 1)*x^5),x, algorithm="fricas")
```

```
[Out] -1/8*(x^4*log(sqrt(-x^4 + 1) + 1) - x^4*log(sqrt(-x^4 + 1) - 1) +
 2*sqrt(-x^4 + 1))/x^4
```

Sympy [A] time = 6.43017, size = 73, normalized size = 2.09

$$\begin{cases}-\frac{\operatorname{acosh}\left(\frac{1}{x^2}\right)}{4}-\frac{\sqrt{-1+\frac{1}{x^4}}}{4x^2} & \text{for } \left|\frac{1}{x^4}\right|>1\\ \frac{i\operatorname{asin}\left(\frac{1}{x^2}\right)}{4}-\frac{i}{4x^2\sqrt{1-\frac{1}{x^4}}}+\frac{i}{4x^6\sqrt{1-\frac{1}{x^4}}} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**5/(-x**4+1)**(1/2),x)
```

```
[Out] Piecewise((-acosh(x**(-2))/4 - sqrt(-1 + x**(-4))/(4*x**2), Abs(x
**(-4)) > 1), (I*asin(x**(-2))/4 - I/(4*x**2*sqrt(1 - 1/x**4)) +
I/(4*x**6*sqrt(1 - 1/x**4)), True))
```

GIAC/XCAS [A] time = 0.215293, size = 61, normalized size = 1.74

$$-\frac{\sqrt{-x^4+1}}{4\,x^4}-\frac{1}{8}\ln\left(\sqrt{-x^4+1}+1\right)+\frac{1}{8}\ln\left(-\sqrt{-x^4+1}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 1)*x^5),x, algorithm="giac")
```

```
[Out] -1/4*sqrt(-x^4 + 1)/x^4 - 1/8*ln(sqrt(-x^4 + 1) + 1) + 1/8*ln(-sq
rt(-x^4 + 1) + 1)
```

3.877 $\int \frac{x^5}{\sqrt{1-x^4}}\,dx$

Optimal. Leaf size=27

$$\frac{1}{4}\sin^{-1}\left(x^2\right)-\frac{1}{4}x^2\sqrt{1-x^4}$$

```
[Out] -(x^2*Sqrt[1 - x^4])/4 + ArcSin[x^2]/4
```

Rubi [A] time = 0.0377561, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{1}{4}\sin^{-1}\left(x^2\right)-\frac{1}{4}x^2\sqrt{1-x^4}$$

Antiderivative was successfully verified.

```
[In] Int[x^5/Sqrt[1 - x^4],x]

[Out] -(x^2*Sqrt[1 - x^4])/4 + ArcSin[x^2]/4
```

Rubi in Sympy [A] time = 5.17066, size = 19, normalized size = 0.7

$$-\frac{x^2\sqrt{-x^4+1}}{4}+\frac{\operatorname{asin}\left(x^2\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**5/(-x**4+1)**(1/2),x)

[Out] -x**2*sqrt(-x**4 + 1)/4 + asin(x**2)/4
```

Mathematica [A] time = 0.016131, size = 27, normalized size = 1.

$$\frac{1}{4}\sin^{-1}\left(x^2\right)-\frac{1}{4}x^2\sqrt{1-x^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5/Sqrt[1 - x^4],x]

[Out] -(x^2*Sqrt[1 - x^4])/4 + ArcSin[x^2]/4
```

Maple [A] time = 0.015, size = 22, normalized size = 0.8

$$\frac{\arcsin\left(x^2\right)}{4}-\frac{x^2}{4}\sqrt{-x^4+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5/(-x^4+1)^(1/2),x)

[Out] 1/4*arcsin(x^2)-1/4*x^2*(-x^4+1)^(1/2)
```

Maxima [A] time = 1.58951, size = 59, normalized size = 2.19

$$\frac{\sqrt{-x^4+1}}{4\,x^2\left(\frac{x^4-1}{x^4}-1\right)}-\frac{1}{4}\,\arctan\left(\frac{\sqrt{-x^4+1}}{x^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(-x^4 + 1),x, algorithm="maxima")
```

```
[Out] 1/4*sqrt(-x^4 + 1)/(x^2*((x^4 - 1)/x^4 - 1)) - 1/4*arctan(sqrt(-x
^4 + 1)/x^2)
```

Fricas [A] time = 0.246919, size = 115, normalized size = 4.26

$$\frac{2\,x^6-2\,x^2-2\left(x^4+2\,\sqrt{-x^4+1}-2\right)\arctan\left(\frac{\sqrt{-x^4+1}-1}{x^2}\right)-\left(x^6-2\,x^2\right)\sqrt{-x^4+1}}{4\left(x^4+2\,\sqrt{-x^4+1}-2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(-x^4 + 1),x, algorithm="fricas")
```

```
[Out] 1/4*(2*x^6 - 2*x^2 - 2*(x^4 + 2*sqrt(-x^4 + 1) - 2)*arctan((sqrt(
-x^4 + 1) - 1)/x^2) - (x^6 - 2*x^2)*sqrt(-x^4 + 1))/(x^4 + 2*sqrt
(-x^4 + 1) - 2)
```

Sympy [A] time = 5.91816, size = 61, normalized size = 2.26

$$\begin{cases} -\frac{ix^2\sqrt{x^4-1}}{4}-\frac{i\operatorname{acosh}\left(x^2\right)}{4} & \text{for}\ \left|x^4\right|>1\\ \frac{x^6}{4\sqrt{-x^4+1}}-\frac{x^2}{4\sqrt{-x^4+1}}+\frac{\operatorname{asin}\left(x^2\right)}{4} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(-x**4+1)**(1/2),x)
```

```
[Out] Piecewise((-I*x**2*sqrt(x**4 - 1)/4 - I*acosh(x**2)/4, Abs(x**4)
> 1), (x**6/(4*sqrt(-x**4 + 1)) - x**2/(4*sqrt(-x**4 + 1)) + asin
(x**2)/4, True))
```

GIAC/XCAS [A] time = 0.218245, size = 28, normalized size = 1.04

$$-\frac{1}{4}\,\sqrt{-x^4+1}x^2+\frac{1}{4}\,\arcsin\left(x^2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(-x^4 + 1),x, algorithm="giac")
```

```
[Out] -1/4*sqrt(-x^4 + 1)*x^2 + 1/4*arcsin(x^2)
```

3.878 $\int \frac{x}{\sqrt{1-x^4}} \, dx$

Optimal. Leaf size=8

$$\frac{1}{2}\sin^{-1}\left(x^2\right)$$

```
[Out] ArcSin[x^2]/2
```

Rubi [A] time = 0.0126796, antiderivative size = 8, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$\frac{1}{2}\sin^{-1}\left(x^2\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x/Sqrt[1 - x^4],x]

[Out] ArcSin[x^2]/2
```

Rubi in Sympy [A] time = 2.49598, size = 5, normalized size = 0.62

$$\frac{\operatorname{asin}\left(x^2\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(-x**4+1)**(1/2),x)

[Out] asin(x**2)/2
```

Mathematica [A] time = 0.00867826, size = 8, normalized size = 1.

$$\frac{1}{2}\sin^{-1}\left(x^2\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/Sqrt[1 - x^4],x]

[Out] ArcSin[x^2]/2
```

Maple [A] time = 0.01, size = 7, normalized size = 0.9

$$\frac{\arcsin\left(x^2\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(-x^4+1)^(1/2),x)

[Out] 1/2*arcsin(x^2)
```

Maxima [A] time = 1.58955, size = 22, normalized size = 2.75

$$-\frac{1}{2}\arctan\left(\frac{\sqrt{-x^4+1}}{x^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(-x^4 + 1),x, algorithm="maxima")
```

```
[Out] -1/2*arctan(sqrt(-x^4 + 1)/x^2)
```

Fricas [A] time = 0.245405, size = 24, normalized size = 3.

$$-\arctan\left(\frac{\sqrt{-x^4+1}-1}{x^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(-x^4 + 1),x, algorithm="fricas")
```

```
[Out] -arctan((sqrt(-x^4 + 1) - 1)/x^2)
```

Sympy [A] time = 3.23801, size = 19, normalized size = 2.38

$$\begin{cases} -\frac{i\operatorname{acosh}\left(x^2\right)}{2} & \text{for } \left|x^4\right| > 1 \\ \frac{\operatorname{asin}\left(x^2\right)}{2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(-x**4+1)**(1/2),x)
```

```
[Out] Piecewise((-I*acosh(x**2)/2, Abs(x**4) > 1), (asin(x**2)/2, True)
)
```

GIAC/XCAS [A] time = 0.218459, size = 8, normalized size = 1.

$$\frac{1}{2}\arcsin\left(x^2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(-x^4 + 1),x, algorithm="giac")
```

```
[Out] 1/2*arcsin(x^2)
```

3.879 $\int \frac{1}{x^3\sqrt{1-x^4}}\,dx$

Optimal. Leaf size=18

$$-\frac{\sqrt{1-x^4}}{2x^2}$$

```
[Out] -Sqrt[1 - x^4]/(2*x^2)
```

Rubi [A] time = 0.0151032, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$-\frac{\sqrt{1-x^4}}{2x^2}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^3*Sqrt[1 - x^4]),x]

[Out] -Sqrt[1 - x^4]/(2*x^2)
```

Rubi in Sympy [A] time = 2.53008, size = 14, normalized size = 0.78

$$-\frac{\sqrt{-x^4+1}}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**3/(-x**4+1)**(1/2),x)

[Out] -sqrt(-x**4 + 1)/(2*x**2)
```

Mathematica [A] time = 0.0104622, size = 18, normalized size = 1.

$$-\frac{\sqrt{1-x^4}}{2x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^3*Sqrt[1 - x^4]),x]

[Out] -Sqrt[1 - x^4]/(2*x^2)
```

Maple [A] time = 0.007, size = 26, normalized size = 1.4

$$\frac{(-1+x)(1+x)\left(x^2+1\right)}{2\,x^2}\frac{1}{\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^3/(-x^4+1)^(1/2),x)

[Out] 1/2/x^2*(-1+x)*(1+x)*(x^2+1)/(-x^4+1)^(1/2)
```

Maxima [A] time = 1.42646, size = 19, normalized size = 1.06

$$-\frac{\sqrt{-x^4+1}}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 1)*x^3),x, algorithm="maxima")
```

```
[Out] -1/2*sqrt(-x^4 + 1)/x^2
```

Fricas [A] time = 0.237728, size = 50, normalized size = 2.78

$$\frac{x^4+\sqrt{-x^4+1}-1}{2\left(\sqrt{-x^4+1}x^2-x^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 1)*x^3),x, algorithm="fricas")
```

```
[Out] 1/2*(x^4 + sqrt(-x^4 + 1) - 1)/(sqrt(-x^4 + 1)*x^2 - x^2)
```

Sympy [A] time = 1.87038, size = 34, normalized size = 1.89

$$\begin{cases} -\frac{i\sqrt{x^4-1}}{2x^2} & \text{for } \left|x^4\right| > 1 \\ -\frac{\sqrt{-x^4+1}}{2x^2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(-x**4+1)**(1/2),x)
```

```
[Out] Piecewise((-I*sqrt(x**4 - 1)/(2*x**2), Abs(x**4) > 1), (-sqrt(-x*
*4 + 1)/(2*x**2), True))
```

GIAC/XCAS [A] time = 0.213929, size = 12, normalized size = 0.67

$$-\frac{1}{2}\sqrt{\frac{1}{x^4}-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 1)*x^3),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(1/x^4 - 1)
```

3.880 $\int \frac{1}{x^7\sqrt{1-x^4}}\,dx$

Optimal. Leaf size=37

$$-\frac{\sqrt{1-x^4}}{6x^6}-\frac{\sqrt{1-x^4}}{3x^2}$$

```
[Out] -Sqrt[1 - x^4]/(6*x^6) - Sqrt[1 - x^4]/(3*x^2)
```

Rubi [A] time = 0.0297258, antiderivative size = 37, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{\sqrt{1-x^4}}{6x^6}-\frac{\sqrt{1-x^4}}{3x^2}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^7*Sqrt[1 - x^4]),x]

[Out] -Sqrt[1 - x^4]/(6*x^6) - Sqrt[1 - x^4]/(3*x^2)
```

Rubi in Sympy [A] time = 3.53772, size = 27, normalized size = 0.73

$$-\frac{\sqrt{-x^4+1}}{3x^2}-\frac{\sqrt{-x^4+1}}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**7/(-x**4+1)**(1/2),x)

[Out] -sqrt(-x**4 + 1)/(3*x**2) - sqrt(-x**4 + 1)/(6*x**6)
```

Mathematica [A] time = 0.0141308, size = 27, normalized size = 0.73

$$\left(-\frac{1}{6x^6}-\frac{1}{3x^2}\right)\sqrt{1-x^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^7*Sqrt[1 - x^4]),x]

[Out] (-1/(6*x^6) - 1/(3*x^2))*Sqrt[1 - x^4]
```

Maple [A] time = 0.007, size = 33, normalized size = 0.9

$$\frac{(-1+x)(1+x)\left(x^2+1\right)\left(2x^4+1\right)}{6x^6}\frac{1}{\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^7/(-x^4+1)^(1/2),x)

[Out] 1/6*(-1+x)*(1+x)*(x^2+1)*(2*x^4+1)/x^6/(-x^4+1)^(1/2)
```

Maxima [A] time = 1.43055, size = 39, normalized size = 1.05

$$-\frac{\sqrt{-x^4+1}}{2\,x^2}-\frac{\left(-x^4+1\right)^{\frac{3}{2}}}{6\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 1)*x^7),x, algorithm="maxima")
```

```
[Out] -1/2*sqrt(-x^4 + 1)/x^2 - 1/6*(-x^4 + 1)^(3/2)/x^6
```

Fricas [A] time = 0.246029, size = 100, normalized size = 2.7

$$-\frac{2\,x^{12}-9\,x^8+3\,x^4+\left(6\,x^8-5\,x^4-4\right)\sqrt{-x^4+1}+4}{6\left(3\,x^{10}-4\,x^6-(x^{10}-4\,x^6)\sqrt{-x^4+1}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 1)*x^7),x, algorithm="fricas")
```

```
[Out] -1/6*(2*x^12 - 9*x^8 + 3*x^4 + (6*x^8 - 5*x^4 - 4)*sqrt(-x^4 + 1)
 + 4)/(3*x^10 - 4*x^6 - (x^10 - 4*x^6)*sqrt(-x^4 + 1))
```

Sympy [A] time = 3.04937, size = 63, normalized size = 1.7

$$\begin{cases} -\frac{i\sqrt{x^4-1}}{3x^2}-\frac{i\sqrt{x^4-1}}{6x^6} & \text{for } \left|x^4\right|>1 \\ -\frac{\sqrt{-x^4+1}}{3x^2}-\frac{\sqrt{-x^4+1}}{6x^6} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**7/(-x**4+1)**(1/2),x)
```

```
[Out] Piecewise((-I*sqrt(x**4 - 1)/(3*x**2) - I*sqrt(x**4 - 1)/(6*x**6)
, Abs(x**4) > 1), (-sqrt(-x**4 + 1)/(3*x**2) - sqrt(-x**4 + 1)/(6
*x**6), True))
```

GIAC/XCAS [A] time = 0.211441, size = 26, normalized size = 0.7

$$-\frac{1}{6}\left(\frac{1}{x^4}-1\right)^{\frac{3}{2}}-\frac{1}{2}\sqrt{\frac{1}{x^4}-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 1)*x^7),x, algorithm="giac")
```

```
[Out] -1/6*(1/x^4 - 1)^(3/2) - 1/2*sqrt(1/x^4 - 1)
```

3.881 $\int \frac{1}{x^{11}\sqrt{1-x^4}}\,dx$

Optimal. Leaf size=55

$$-\frac{\sqrt{1-x^4}}{10x^{10}}-\frac{2\sqrt{1-x^4}}{15x^6}-\frac{4\sqrt{1-x^4}}{15x^2}$$

```
[Out] -Sqrt[1 - x^4]/(10*x^10) - (2*Sqrt[1 - x^4])/(15*x^6) - (4*Sqrt[1
 - x^4])/(15*x^2)
```

Rubi [A] time = 0.0459716, antiderivative size = 55, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{\sqrt{1-x^4}}{10x^{10}}-\frac{2\sqrt{1-x^4}}{15x^6}-\frac{4\sqrt{1-x^4}}{15x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^11*Sqrt[1 - x^4]),x]
```

```
[Out] -Sqrt[1 - x^4]/(10*x^10) - (2*Sqrt[1 - x^4])/(15*x^6) - (4*Sqrt[1
 - x^4])/(15*x^2)
```

Rubi in Sympy [A] time = 4.6859, size = 44, normalized size = 0.8

$$-\frac{4\sqrt{-x^4+1}}{15x^2}-\frac{2\sqrt{-x^4+1}}{15x^6}-\frac{\sqrt{-x^4+1}}{10x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**11/(-x**4+1)**(1/2),x)
```

```
[Out] -4*sqrt(-x**4 + 1)/(15*x**2) - 2*sqrt(-x**4 + 1)/(15*x**6) - sqrt
(-x**4 + 1)/(10*x**10)
```

Mathematica [A] time = 0.0152123, size = 30, normalized size = 0.55

$$-\frac{\sqrt{1-x^4}\left(8x^8+4x^4+3\right)}{30x^{10}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^11*Sqrt[1 - x^4]),x]
```

```
[Out] -(Sqrt[1 - x^4]*(3 + 4*x^4 + 8*x^8))/(30*x^10)
```

Maple [A] time = 0.007, size = 38, normalized size = 0.7

$$\frac{(-1+x)(1+x)\left(x^2+1\right)\left(8\,x^8+4\,x^4+3\right)}{30\,x^{10}}\frac{1}{\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^11/(-x^4+1)^(1/2),x)
```

```
[Out] 1/30*(-1+x)*(1+x)*(x^2+1)*(8*x^8+4*x^4+3)/x^10/(-x^4+1)^(1/2)
```

Maxima [A] time = 1.43514, size = 58, normalized size = 1.05

$$-\frac{\sqrt{-x^4+1}}{2\,x^2}-\frac{\left(-x^4+1\right)^{\frac{3}{2}}}{3\,x^6}-\frac{\left(-x^4+1\right)^{\frac{5}{2}}}{10\,x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 1)*x^11),x, algorithm="maxima")
```

```
[Out] -1/2*sqrt(-x^4 + 1)/x^2 - 1/3*(-x^4 + 1)^(3/2)/x^6 - 1/10*(-x^4 +
 1)^(5/2)/x^10
```

Fricas [A] time = 0.252112, size = 140, normalized size = 2.55

$$-\frac{8\,x^{20}-100\,x^{16}+175\,x^{12}-55\,x^8+20\,x^4+\left(40\,x^{16}-140\,x^{12}+63\,x^8+4\,x^4+48\right)\sqrt{-x^4+1}-48}{30\left(5\,x^{18}-20\,x^{14}+16\,x^{10}-\left(x^{18}-12\,x^{14}+16\,x^{10}\right)\sqrt{-x^4+1}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 1)*x^11),x, algorithm="fricas")
```

```
[Out] -1/30*(8*x^20 - 100*x^16 + 175*x^12 - 55*x^8 + 20*x^4 + (40*x^16
- 140*x^12 + 63*x^8 + 4*x^4 + 48)*sqrt(-x^4 + 1) - 48)/(5*x^18 -
20*x^14 + 16*x^10 - (x^18 - 12*x^14 + 16*x^10)*sqrt(-x^4 + 1))
```

Sympy [A] time = 6.4398, size = 104, normalized size = 1.89

$$\begin{cases} -\frac{4\sqrt{-1+\frac{1}{x^4}}}{15}-\frac{2\sqrt{-1+\frac{1}{x^4}}}{15x^4}-\frac{\sqrt{-1+\frac{1}{x^4}}}{10x^8} & \text{for}\ \left|\frac{1}{x^4}\right|>1 \\ -\frac{4i\sqrt{1-\frac{1}{x^4}}}{15}-\frac{2i\sqrt{1-\frac{1}{x^4}}}{15x^4}-\frac{i\sqrt{1-\frac{1}{x^4}}}{10x^8} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**11/(-x**4+1)**(1/2),x)
```

```
[Out] Piecewise((-4*sqrt(-1 + x**(-4))/15 - 2*sqrt(-1 + x**(-4))/(15*x*
*4) - sqrt(-1 + x**(-4))/(10*x**8), Abs(x**(-4)) > 1), (-4*I*sqrt
(1 - 1/x**4)/15 - 2*I*sqrt(1 - 1/x**4)/(15*x**4) - I*sqrt(1 - 1/x
**4)/(10*x**8), True))
```

GIAC/XCAS [A] time = 0.21538, size = 38, normalized size = 0.69

$$-\frac{1}{10}\left(\frac{1}{x^4}-1\right)^{\frac{5}{2}}-\frac{1}{3}\left(\frac{1}{x^4}-1\right)^{\frac{3}{2}}-\frac{1}{2}\sqrt{\frac{1}{x^4}-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 1)*x^11),x, algorithm="giac")
```

```
[Out] -1/10*(1/x^4 - 1)^(5/2) - 1/3*(1/x^4 - 1)^(3/2) - 1/2*sqrt(1/x^4
- 1)
```

3.882 $\int \frac{x^8}{\sqrt{1-x^4}} dx$

Optimal. Leaf size=43

$$-\frac{5}{21}\sqrt{1-x^4}x-\frac{1}{7}\sqrt{1-x^4}x^5+\frac{5}{21}F\left(\sin^{-1}(x)\middle|-1\right)$$

```
[Out] (-5*x*Sqrt[1 - x^4])/21 - (x^5*Sqrt[1 - x^4])/7 + (5*EllipticF[Ar
cSin[x], -1])/21
```

Rubi [A] time = 0.0354781, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{5}{21}\sqrt{1-x^4}x-\frac{1}{7}\sqrt{1-x^4}x^5+\frac{5}{21}F\left(\sin^{-1}(x)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^8/Sqrt[1 - x^4],x]
```

```
[Out] (-5*x*Sqrt[1 - x^4])/21 - (x^5*Sqrt[1 - x^4])/7 + (5*EllipticF[Ar
cSin[x], -1])/21
```

Rubi in Sympy [A] time = 4.19139, size = 36, normalized size = 0.84

$$-\frac{x^5\sqrt{-x^4+1}}{7}-\frac{5x\sqrt{-x^4+1}}{21}+\frac{5F\left(\operatorname{asin}(x)\middle|-1\right)}{21}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8/(-x**4+1)**(1/2),x)
```

```
[Out] -x**5*sqrt(-x**4 + 1)/7 - 5*x*sqrt(-x**4 + 1)/21 + 5*elliptic_f(a
sin(x), -1)/21
```

Mathematica [A] time = 0.0358736, size = 46, normalized size = 1.07

$$\frac{3x^9+2x^5+5\sqrt{1-x^4}F\left(\sin^{-1}(x)\middle|-1\right)-5x}{21\sqrt{1-x^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8/Sqrt[1 - x^4],x]
```

```
[Out] (-5*x + 2*x^5 + 3*x^9 + 5*Sqrt[1 - x^4]*EllipticF[ArcSin[x], -1])
/(21*Sqrt[1 - x^4])
```

Maple [A] time = 0.012, size = 59, normalized size = 1.4

$$-\frac{x^5}{7}\sqrt{-x^4+1}-\frac{5\,x}{21}\sqrt{-x^4+1}+\frac{5\,EllipticF\,(x,i)}{21}\sqrt{-x^2+1}\sqrt{x^2+1}\frac{1}{\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^8/(-x^4+1)^(1/2),x)
```

```
[Out] -1/7*x^5*(-x^4+1)^(1/2)-5/21*x*(-x^4+1)^(1/2)+5/21*(-x^2+1)^(1/2)
*(x^2+1)^(1/2)/(-x^4+1)^(1/2)*EllipticF(x,I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^8}{\sqrt{-x^4+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^8/sqrt(-x^4 + 1),x, algorithm="maxima")
```

```
[Out] integrate(x^8/sqrt(-x^4 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{x^8}{\sqrt{-x^4+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^8/sqrt(-x^4 + 1),x, algorithm="fricas")
```

```
[Out] integral(x^8/sqrt(-x^4 + 1), x)
```

Sympy [A] time = 2.65064, size = 31, normalized size = 0.72

$$\frac{x^9\,\Gamma\left(\frac{9}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{9}{4}\\\frac{13}{4}\end{matrix}\middle|x^4e^{2i\pi}\right)}{4\,\Gamma\left(\frac{13}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**8/(-x**4+1)**(1/2),x)
```

```
[Out] x**9*gamma(9/4)*hyper((1/2, 9/4), (13/4,), x**4*exp_polar(2*I*pi)
)/(4*gamma(13/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^8}{\sqrt{-x^4+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^8/sqrt(-x^4 + 1),x, algorithm="giac")
```

```
[Out] integrate(x^8/sqrt(-x^4 + 1), x)
```

3.883 $\int \frac{x^4}{\sqrt{1-x^4}} \, dx$

Optimal. Leaf size=25

$$\frac{1}{3}F\left(\sin^{-1}(x)\middle|-1\right)-\frac{1}{3}x\sqrt{1-x^4}$$

```
[Out] -(x*Sqrt[1 - x^4])/3 + EllipticF[ArcSin[x], -1]/3
```

Rubi [A] time = 0.021627, antiderivative size = 25, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{1}{3}F\left(\sin^{-1}(x)\middle|-1\right)-\frac{1}{3}x\sqrt{1-x^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/Sqrt[1 - x^4],x]

[Out] -(x*Sqrt[1 - x^4])/3 + EllipticF[ArcSin[x], -1]/3
```

Rubi in Sympy [A] time = 2.97352, size = 19, normalized size = 0.76

$$-\frac{x\sqrt{-x^4+1}}{3}+\frac{F\left(\operatorname{asin}(x)\middle|-1\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(-x**4+1)**(1/2),x)

[Out] -x*sqrt(-x**4 + 1)/3 + elliptic_f(asin(x), -1)/3
```

Mathematica [A] time = 0.0327071, size = 38, normalized size = 1.52

$$\frac{x^5+\sqrt{1-x^4}F\left(\sin^{-1}(x)\middle|-1\right)-x}{3\sqrt{1-x^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/Sqrt[1 - x^4],x]

[Out] (-x + x^5 + Sqrt[1 - x^4]*EllipticF[ArcSin[x], -1])/(3*Sqrt[1 - x
^4])
```

Maple [B] time = 0.011, size = 45, normalized size = 1.8

$$-\frac{x}{3}\sqrt{-x^4+1}+\frac{EllipticF(x,i)}{3}\sqrt{-x^2+1}\sqrt{x^2+1}\frac{1}{\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(-x^4+1)^(1/2),x)
```

```
[Out] -1/3*x*(-x^4+1)^(1/2)+1/3*(-x^2+1)^(1/2)*(x^2+1)^(1/2)/(-x^4+1)^(
1/2)*EllipticF(x,I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\sqrt{-x^4+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(-x^4 + 1),x, algorithm="maxima")
```

```
[Out] integrate(x^4/sqrt(-x^4 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^4}{\sqrt{-x^4+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(-x^4 + 1),x, algorithm="fricas")
```

```
[Out] integral(x^4/sqrt(-x^4 + 1), x)
```

Sympy [A] time = 1.91818, size = 31, normalized size = 1.24

$$\frac{x^5\left(\frac{5}{4}\right) {}_2F_1\left(\begin{matrix}\frac{1}{2}, \frac{5}{4}\\ \frac{9}{4}\end{matrix}\middle| x^4 e^{2i\pi}\right)}{4\left(\frac{9}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(-x**4+1)**(1/2),x)
```

```
[Out] x**5*gamma(5/4)*hyper((1/2, 5/4), (9/4,), x**4*exp_polar(2*I*pi))
/(4*gamma(9/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\sqrt{-x^4+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(-x^4 + 1),x, algorithm="giac")
```

```
[Out] integrate(x^4/sqrt(-x^4 + 1), x)
```

3.884 $\int \frac{1}{\sqrt{1-x^4}}\,dx$

Optimal. Leaf size=4

$$F\left(\sin^{-1}(x)\middle|-1\right)$$

```
[Out] EllipticF[ArcSin[x], -1]
```

Rubi [A] time = 0.00514693, antiderivative size = 4, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$F\left(\sin^{-1}(x)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[1 - x^4],x]
```

```
[Out] EllipticF[ArcSin[x], -1]
```

Rubi in Sympy [A] time = 0.171468, size = 5, normalized size = 1.25

$$F\left(\operatorname{asin}(x)\middle|-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(-x**4+1)**(1/2),x)
```

```
[Out] elliptic_f(asin(x), -1)
```

Mathematica [A] time = 0.0170205, size = 4, normalized size = 1.

$$F\left(\sin^{-1}(x)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/Sqrt[1 - x^4],x]
```

```
[Out] EllipticF[ArcSin[x], -1]
```

Maple [B] time = 0.007, size = 31, normalized size = 7.8

$$\mathit{EllipticF}(x, i)\sqrt{-x^2+1}\sqrt{x^2+1}\frac{1}{\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(-x^4+1)^(1/2),x)
```

```
[Out] (-x^2+1)^(1/2)*(x^2+1)^(1/2)/(-x^4+1)^(1/2)*EllipticF(x,I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^4+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(-x^4 + 1),x, algorithm="maxima")
```

```
[Out] integrate(1/sqrt(-x^4 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{-x^4+1}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(-x^4 + 1),x, algorithm="fricas")
```

```
[Out] integral(1/sqrt(-x^4 + 1), x)
```

Sympy [A] time = 1.71671, size = 29, normalized size = 7.25

$$\frac{x\,\Gamma\left(\frac{1}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{4},\frac{1}{2}\\ \frac{5}{4}\end{matrix}\middle|x^4e^{2i\pi}\right)}{4\,\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(-x**4+1)**(1/2),x)
```

```
[Out] x*gamma(1/4)*hyper((1/4, 1/2), (5/4,), x**4*exp_polar(2*I*pi))/(4
*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^4+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(-x^4 + 1),x, algorithm="giac")
```

```
[Out] integrate(1/sqrt(-x^4 + 1), x)
```

3.885 $\int \frac{1}{x^4\sqrt{1-x^4}}\,dx$

Optimal. Leaf size=27

$$\frac{1}{3}F\left(\sin^{-1}(x)\middle|-1\right)-\frac{\sqrt{1-x^4}}{3x^3}$$

```
[Out] -Sqrt[1 - x^4]/(3*x^3) + EllipticF[ArcSin[x], -1]/3
```

Rubi [A] time = 0.0210414, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{1}{3}F\left(\sin^{-1}(x)\middle|-1\right)-\frac{\sqrt{1-x^4}}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*Sqrt[1 - x^4]),x]

[Out] -Sqrt[1 - x^4]/(3*x^3) + EllipticF[ArcSin[x], -1]/3
```

Rubi in Sympy [A] time = 2.89664, size = 20, normalized size = 0.74

$$\frac{F\left(\operatorname{asin}(x)\middle|-1\right)}{3}-\frac{\sqrt{-x^4+1}}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(-x**4+1)**(1/2),x)

[Out] elliptic_f(asin(x), -1)/3 - sqrt(-x**4 + 1)/(3*x**3)
```

Mathematica [A] time = 0.0321807, size = 42, normalized size = 1.56

$$\frac{x^4+\sqrt{1-x^4}x^3F\left(\sin^{-1}(x)\middle|-1\right)-1}{3x^3\sqrt{1-x^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*Sqrt[1 - x^4]),x]

[Out] (-1 + x^4 + x^3*Sqrt[1 - x^4]*EllipticF[ArcSin[x], -1])/(3*x^3*Sq
rt[1 - x^4])
```

Maple [B] time = 0.015, size = 47, normalized size = 1.7

$$-\frac{1}{3\,x^3}\sqrt{-x^4+1}+\frac{EllipticF(x,i)}{3}\sqrt{-x^2+1}\sqrt{x^2+1}\frac{1}{\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(-x^4+1)^(1/2),x)
```

```
[Out] -1/3*(-x^4+1)^(1/2)/x^3+1/3*(-x^2+1)^(1/2)*(x^2+1)^(1/2)/(-x^4+1)
^(1/2)*EllipticF(x,I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^4+1}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 1)*x^4),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(-x^4 + 1)*x^4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{-x^4+1}x^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 1)*x^4),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(-x^4 + 1)*x^4), x)
```

Sympy [A] time = 2.27922, size = 34, normalized size = 1.26

$$\frac{\Gamma\left(-\frac{3}{4}\right) {}_2F_1\left(\left.\begin{matrix} -\frac{3}{4}, \frac{1}{2} \\ \frac{1}{4} \end{matrix}\right| x^4 e^{2i\pi}\right)}{4x^3\,\Gamma\left(\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(-x**4+1)**(1/2),x)
```

```
[Out] gamma(-3/4)*hyper((-3/4, 1/2), (1/4,), x**4*exp_polar(2*I*pi))/(4
*x**3*gamma(1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^4+1}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 1)*x^4),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(-x^4 + 1)*x^4), x)
```

3.886 $\int \frac{1}{x^8\sqrt{1-x^4}}\,dx$

Optimal. Leaf size=45

$$-\frac{\sqrt{1-x^4}}{7x^7}-\frac{5\sqrt{1-x^4}}{21x^3}+\frac{5}{21}F\left(\sin^{-1}(x)\middle|-1\right)$$

```
[Out] -Sqrt[1 - x^4]/(7*x^7) - (5*Sqrt[1 - x^4])/(21*x^3) + (5*Elliptic
F[ArcSin[x], -1])/21
```

Rubi [A] time = 0.0358512, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{\sqrt{1-x^4}}{7x^7}-\frac{5\sqrt{1-x^4}}{21x^3}+\frac{5}{21}F\left(\sin^{-1}(x)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^8*Sqrt[1 - x^4]),x]
```

```
[Out] -Sqrt[1 - x^4]/(7*x^7) - (5*Sqrt[1 - x^4])/(21*x^3) + (5*Elliptic
F[ArcSin[x], -1])/21
```

Rubi in Sympy [A] time = 4.06708, size = 37, normalized size = 0.82

$$\frac{5F\left(\operatorname{asin}(x)\middle|-1\right)}{21}-\frac{5\sqrt{-x^4+1}}{21x^3}-\frac{\sqrt{-x^4+1}}{7x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**8/(-x**4+1)**(1/2),x)
```

```
[Out] 5*elliptic_f(asin(x), -1)/21 - 5*sqrt(-x**4 + 1)/(21*x**3) - sqrt
(-x**4 + 1)/(7*x**7)
```

Mathematica [A] time = 0.0359872, size = 50, normalized size = 1.11

$$\frac{5x^8-2x^4+5\sqrt{1-x^4}x^7F\left(\sin^{-1}(x)\middle|-1\right)-3}{21x^7\sqrt{1-x^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^8*Sqrt[1 - x^4]),x]
```

```
[Out] (-3 - 2*x^4 + 5*x^8 + 5*x^7*Sqrt[1 - x^4]*EllipticF[ArcSin[x], -1
])/(21*x^7*Sqrt[1 - x^4])
```

Maple [A] time = 0.018, size = 61, normalized size = 1.4

$$-\frac{1}{7x^7}\sqrt{-x^4+1}-\frac{5}{21x^3}\sqrt{-x^4+1}+\frac{5\,EllipticF(x,i)}{21}\sqrt{-x^2+1}\sqrt{x^2+1}\frac{1}{\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^8/(-x^4+1)^(1/2),x)
```

```
[Out] -1/7*(-x^4+1)^(1/2)/x^7-5/21*(-x^4+1)^(1/2)/x^3+5/21*(-x^2+1)^(1/
2)*(x^2+1)^(1/2)/(-x^4+1)^(1/2)*EllipticF(x,I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^4+1}x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 1)*x^8),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(-x^4 + 1)*x^8), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{-x^4+1}x^8}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 1)*x^8),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(-x^4 + 1)*x^8), x)
```

Sympy [A] time = 3.72186, size = 37, normalized size = 0.82

$$\frac{\Gamma\left(-\frac{7}{4}\right) {}_2F_1\left(\begin{matrix} -\frac{7}{4}, \frac{1}{2} \\ -\frac{3}{4} \end{matrix}\middle| x^4 e^{2i\pi}\right)}{4x^7\,\Gamma\left(-\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**8/(-x**4+1)**(1/2),x)
```

```
[Out] gamma(-7/4)*hyper((-7/4, 1/2), (-3/4,), x**4*exp_polar(2*I*pi))/(
4*x**7*gamma(-3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^4+1}x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 1)*x^8),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(-x^4 + 1)*x^8), x)
```

3.887 $\int \frac{x^{10}}{\sqrt{1-x^4}} dx$

Optimal. Leaf size=53

$$-\frac{1}{9}\sqrt{1-x^4}x^7-\frac{7}{45}\sqrt{1-x^4}x^3-\frac{7}{15}F\left(\sin^{-1}(x)\middle|-1\right)+\frac{7}{15}E\left(\sin^{-1}(x)\middle|-1\right)$$

```
[Out] (-7*x^3*Sqrt[1 - x^4])/45 - (x^7*Sqrt[1 - x^4])/9 + (7*EllipticE[
ArcSin[x], -1])/15 - (7*EllipticF[ArcSin[x], -1])/15
```

Rubi [A] time = 0.0776288, antiderivative size = 53, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{1}{9}\sqrt{1-x^4}x^7-\frac{7}{45}\sqrt{1-x^4}x^3-\frac{7}{15}F\left(\sin^{-1}(x)\middle|-1\right)+\frac{7}{15}E\left(\sin^{-1}(x)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^10/Sqrt[1 - x^4],x]
```

```
[Out] (-7*x^3*Sqrt[1 - x^4])/45 - (x^7*Sqrt[1 - x^4])/9 + (7*EllipticE[
ArcSin[x], -1])/15 - (7*EllipticF[ArcSin[x], -1])/15
```

Rubi in Sympy [A] time = 11.8215, size = 48, normalized size = 0.91

$$-\frac{x^7\sqrt{-x^4+1}}{9}-\frac{7x^3\sqrt{-x^4+1}}{45}+\frac{7E\left(\operatorname{asin}(x)|-1\right)}{15}-\frac{7F\left(\operatorname{asin}(x)|-1\right)}{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**10/(-x**4+1)**(1/2),x)
```

```
[Out] -x**7*sqrt(-x**4 + 1)/9 - 7*x**3*sqrt(-x**4 + 1)/45 + 7*elliptic_
e(asin(x), -1)/15 - 7*elliptic_f(asin(x), -1)/15
```

Mathematica [A] time = 0.0812226, size = 44, normalized size = 0.83

$$\frac{1}{45}\left(\frac{\left(5x^8+2x^4-7\right)x^3}{\sqrt{1-x^4}}-21F\left(\sin^{-1}(x)\middle|-1\right)+21E\left(\sin^{-1}(x)\middle|-1\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^10/Sqrt[1 - x^4],x]
```

```
[Out] ((x^3*(-7 + 2*x^4 + 5*x^8))/Sqrt[1 - x^4] + 21*EllipticE[ArcSin[x
], -1] - 21*EllipticF[ArcSin[x], -1])/45
```

Maple [A] time = 0.012, size = 68, normalized size = 1.3

$$-\frac{x^7}{9}\sqrt{-x^4+1}-\frac{7x^3}{45}\sqrt{-x^4+1}-\frac{7\,\mathit{EllipticF}(x,i)-7\,\mathit{EllipticE}(x,i)}{15}\sqrt{-x^2+1}\sqrt{x^2+1}\frac{1}{\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^10/(-x^4+1)^(1/2),x)
```

```
[Out] -1/9*x^7*(-x^4+1)^(1/2)-7/45*x^3*(-x^4+1)^(1/2)-7/15*(-x^2+1)^(1/
2)*(x^2+1)^(1/2)/(-x^4+1)^(1/2)*(EllipticF(x,I)-EllipticE(x,I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{10}}{\sqrt{-x^4+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/sqrt(-x^4 + 1),x, algorithm="maxima")
```

```
[Out] integrate(x^10/sqrt(-x^4 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{10}}{\sqrt{-x^4+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/sqrt(-x^4 + 1),x, algorithm="fricas")
```

```
[Out] integral(x^10/sqrt(-x^4 + 1), x)
```

Sympy [A] time = 3.62997, size = 31, normalized size = 0.58

$$\frac{x^{11}\Gamma\left(\frac{11}{4}\right){}_{2}F_{1}\left(\begin{matrix}\frac{1}{2},\frac{11}{4}\\\frac{15}{4}\end{matrix}\middle|x^4e^{2i\pi}\right)}{4\Gamma\left(\frac{15}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**10/(-x**4+1)**(1/2),x)
```

```
[Out] x**11*gamma(11/4)*hyper((1/2, 11/4), (15/4,), x**4*exp_polar(2*I*
pi))/(4*gamma(15/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{10}}{\sqrt{-x^4+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/sqrt(-x^4 + 1),x, algorithm="giac")
```

```
[Out] integrate(x^10/sqrt(-x^4 + 1), x)
```

3.888 $\int \frac{x^6}{\sqrt{1-x^4}} \, dx$

Optimal. Leaf size=35

$$-\frac{1}{5}\sqrt{1-x^4}x^3-\frac{3}{5}F\left(\sin^{-1}(x)\middle|-1\right)+\frac{3}{5}E\left(\sin^{-1}(x)\middle|-1\right)$$

```
[Out] -(x^3*Sqrt[1 - x^4])/5 + (3*EllipticE[ArcSin[x], -1])/5 - (3*Elli
pticF[ArcSin[x], -1])/5
```

Rubi [A] time = 0.0634609, antiderivative size = 35, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{1}{5}\sqrt{1-x^4}x^3-\frac{3}{5}F\left(\sin^{-1}(x)\middle|-1\right)+\frac{3}{5}E\left(\sin^{-1}(x)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In] Int[x^6/Sqrt[1 - x^4],x]
```

```
[Out] -(x^3*Sqrt[1 - x^4])/5 + (3*EllipticE[ArcSin[x], -1])/5 - (3*Elli
pticF[ArcSin[x], -1])/5
```

Rubi in Sympy [A] time = 10.6163, size = 32, normalized size = 0.91

$$-\frac{x^3\sqrt{-x^4+1}}{5}+\frac{3E\left(\operatorname{asin}(x)\middle|-1\right)}{5}-\frac{3F\left(\operatorname{asin}(x)\middle|-1\right)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**6/(-x**4+1)**(1/2),x)
```

```
[Out] -x**3*sqrt(-x**4 + 1)/5 + 3*elliptic_e(asin(x), -1)/5 - 3*ellipti
c_f(asin(x), -1)/5
```

Mathematica [A] time = 0.0691163, size = 48, normalized size = 1.37

$$\frac{1}{5}\left(\frac{x^7}{\sqrt{1-x^4}}-\frac{x^3}{\sqrt{1-x^4}}-3F\left(\sin^{-1}(x)\middle|-1\right)+3E\left(\sin^{-1}(x)\middle|-1\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^6/Sqrt[1 - x^4],x]
```

```
[Out] (-(x^3/Sqrt[1 - x^4]) + x^7/Sqrt[1 - x^4] + 3*EllipticE[ArcSin[x]
, -1] - 3*EllipticF[ArcSin[x], -1])/5
```

Maple [A] time = 0.013, size = 54, normalized size = 1.5

$$-\frac{x^3}{5}\sqrt{-x^4+1}-\frac{3\,EllipticF(x,i)-3\,EllipticE(x,i)}{5}\sqrt{-x^2+1}\sqrt{x^2+1}\frac{1}{\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(-x^4+1)^(1/2),x)
```

```
[Out] -1/5*x^3*(-x^4+1)^(1/2)-3/5*(-x^2+1)^(1/2)*(x^2+1)^(1/2)/(-x^4+1)
^(1/2)*(EllipticF(x,I)-EllipticE(x,I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{\sqrt{-x^4+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(-x^4 + 1),x, algorithm="maxima")
```

```
[Out] integrate(x^6/sqrt(-x^4 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^6}{\sqrt{-x^4+1}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(-x^4 + 1),x, algorithm="fricas")
```

```
[Out] integral(x^6/sqrt(-x^4 + 1), x)
```

Sympy [A] time = 2.23125, size = 31, normalized size = 0.89

$$\frac{x^7\,\Gamma\left(\frac{7}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{7}{4}\\\frac{11}{4}\end{matrix}\middle|x^4e^{2i\pi}\right)}{4\,\Gamma\left(\frac{11}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(-x**4+1)**(1/2),x)
```

```
[Out] x**7*gamma(7/4)*hyper((1/2, 7/4), (11/4,), x**4*exp_polar(2*I*pi)
)/(4*gamma(11/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{\sqrt{-x^4+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(-x^4 + 1),x, algorithm="giac")
```

```
[Out] integrate(x^6/sqrt(-x^4 + 1), x)
```

3.889 $\int \frac{x^2}{\sqrt{1-x^4}}\,dx$

Optimal. Leaf size=11

$$E\left(\sin^{-1}(x)\middle|-1\right)-F\left(\sin^{-1}(x)\middle|-1\right)$$

```
[Out] EllipticE[ArcSin[x], -1] - EllipticF[ArcSin[x], -1]
```

Rubi [A] time = 0.0480243, antiderivative size = 11, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$E\left(\sin^{-1}(x)\middle|-1\right)-F\left(\sin^{-1}(x)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/Sqrt[1 - x^4],x]

[Out] EllipticE[ArcSin[x], -1] - EllipticF[ArcSin[x], -1]
```

Rubi in Sympy [A] time = 9.35612, size = 12, normalized size = 1.09

$$E(\operatorname{asin}(x)|-1)-F(\operatorname{asin}(x)|-1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(-x**4+1)**(1/2),x)

[Out] elliptic_e(asin(x), -1) - elliptic_f(asin(x), -1)
```

Mathematica [A] time = 0.0280366, size = 11, normalized size = 1.

$$E\left(\sin^{-1}(x)\middle|-1\right)-F\left(\sin^{-1}(x)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/Sqrt[1 - x^4],x]

[Out] EllipticE[ArcSin[x], -1] - EllipticF[ArcSin[x], -1]
```

Maple [B] time = 0.01, size = 39, normalized size = 3.6

$$-(EllipticF(x,i)-EllipticE(x,i))\sqrt{-x^2+1}\sqrt{x^2+1}\frac{1}{\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(-x^4+1)^(1/2),x)

[Out] -(-x^2+1)^(1/2)*(x^2+1)^(1/2)/(-x^4+1)^(1/2)*(EllipticF(x,I)-Elli
pticE(x,I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\sqrt{-x^4+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(-x^4 + 1),x, algorithm="maxima")
```

```
[Out] integrate(x^2/sqrt(-x^4 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^2}{\sqrt{-x^4+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(-x^4 + 1),x, algorithm="fricas")
```

```
[Out] integral(x^2/sqrt(-x^4 + 1), x)
```

Sympy [A] time = 1.77979, size = 31, normalized size = 2.82

$$\frac{x^3\,\Gamma\left(\frac{3}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{3}{4}\\\frac{7}{4}\end{matrix}\middle|x^4e^{2i\pi}\right)}{4\,\Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(-x**4+1)**(1/2),x)
```

```
[Out] x**3*gamma(3/4)*hyper((1/2, 3/4), (7/4,), x**4*exp_polar(2*I*pi))
/(4*gamma(7/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\sqrt{-x^4+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(-x^4 + 1),x, algorithm="giac")
```

```
[Out] integrate(x^2/sqrt(-x^4 + 1), x)
```

3.890 $\int \frac{1}{x^2\sqrt{1-x^4}}\,dx$

Optimal. Leaf size=27

$$-\frac{\sqrt{1-x^4}}{x}+F\left(\sin^{-1}(x)\middle|-1\right)-E\left(\sin^{-1}(x)\middle|-1\right)$$

```
[Out] -(Sqrt[1 - x^4]/x) - EllipticE[ArcSin[x], -1] + EllipticF[ArcSin[
x], -1]
```

Rubi [A] time = 0.059944, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{\sqrt{1-x^4}}{x}+F\left(\sin^{-1}(x)\middle|-1\right)-E\left(\sin^{-1}(x)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*Sqrt[1 - x^4]),x]

[Out] -(Sqrt[1 - x^4]/x) - EllipticE[ArcSin[x], -1] + EllipticF[ArcSin[
x], -1]
```

Rubi in Sympy [A] time = 10.4525, size = 22, normalized size = 0.81

$$-E\left(\operatorname{asin}(x)\middle|-1\right)+F\left(\operatorname{asin}(x)\middle|-1\right)-\frac{\sqrt{-x^4+1}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(-x**4+1)**(1/2),x)

[Out] -elliptic_e(asin(x), -1) + elliptic_f(asin(x), -1) - sqrt(-x**4 +
 1)/x
```

Mathematica [A] time = 0.0548265, size = 42, normalized size = 1.56

$$-\frac{1}{\sqrt{1-x^4}x}+\frac{x^3}{\sqrt{1-x^4}}+F\left(\sin^{-1}(x)\middle|-1\right)-E\left(\sin^{-1}(x)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*Sqrt[1 - x^4]),x]

[Out] -(1/(x*Sqrt[1 - x^4])) + x^3/Sqrt[1 - x^4] - EllipticE[ArcSin[x],
 -1] + EllipticF[ArcSin[x], -1]
```

Maple [B] time = 0.014, size = 53, normalized size = 2.

$$-\frac{1}{x}\sqrt{-x^4+1}+\left(\mathit{EllipticF}(x,i)-\mathit{EllipticE}(x,i)\right)\sqrt{-x^2+1}\sqrt{x^2+1}\frac{1}{\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^2/(-x^4+1)^(1/2),x)
```

```
[Out] -(-x^4+1)^(1/2)/x+(-x^2+1)^(1/2)*(x^2+1)^(1/2)/(-x^4+1)^(1/2)*(El
lipticF(x,I)-EllipticE(x,I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^4+1}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(-x^4 + 1)*x^2),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(-x^4 + 1)*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{-x^4+1}x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(-x^4 + 1)*x^2),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(-x^4 + 1)*x^2), x)
```

Sympy [A] time = 2.01959, size = 32, normalized size = 1.19

$$\frac{\left(-\frac{1}{4}\right)\,{}_2F_1\left(\begin{matrix}-\frac{1}{4},\frac{1}{2}\\ \frac{3}{4}\end{matrix}\middle|x^4e^{2i\pi}\right)}{4x\left(\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/x**2/(-x**4+1)**(1/2),x)
```

```
[Out] gamma(-1/4)*hyper((-1/4, 1/2), (3/4,), x**4*exp_polar(2*I*pi))/(4
*x*gamma(3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^4+1}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(-x^4 + 1)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(-x^4 + 1)*x^2), x)
```

3.891 $\int \frac{1}{x^6\sqrt{1-x^4}}\,dx$

Optimal. Leaf size=53

$$-\frac{3\sqrt{1-x^4}}{5x}-\frac{\sqrt{1-x^4}}{5x^5}+\frac{3}{5}F\left(\sin^{-1}(x)\middle|-1\right)-\frac{3}{5}E\left(\sin^{-1}(x)\middle|-1\right)$$

```
[Out] -Sqrt[1 - x^4]/(5*x^5) - (3*Sqrt[1 - x^4])/(5*x) - (3*EllipticE[A
rcSin[x], -1])/5 + (3*EllipticF[ArcSin[x], -1])/5
```

Rubi [A] time = 0.0758939, antiderivative size = 53, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{3\sqrt{1-x^4}}{5x}-\frac{\sqrt{1-x^4}}{5x^5}+\frac{3}{5}F\left(\sin^{-1}(x)\middle|-1\right)-\frac{3}{5}E\left(\sin^{-1}(x)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^6*Sqrt[1 - x^4]),x]
```

```
[Out] -Sqrt[1 - x^4]/(5*x^5) - (3*Sqrt[1 - x^4])/(5*x) - (3*EllipticE[A
rcSin[x], -1])/5 + (3*EllipticF[ArcSin[x], -1])/5
```

Rubi in Sympy [A] time = 11.6885, size = 46, normalized size = 0.87

$$-\frac{3E\left(\operatorname{asin}(x)\middle|-1\right)}{5}+\frac{3F\left(\operatorname{asin}(x)\middle|-1\right)}{5}-\frac{3\sqrt{-x^4+1}}{5x}-\frac{\sqrt{-x^4+1}}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**6/(-x**4+1)**(1/2),x)
```

```
[Out] -3*elliptic_e(asin(x), -1)/5 + 3*elliptic_f(asin(x), -1)/5 - 3*sq
rt(-x**4 + 1)/(5*x) - sqrt(-x**4 + 1)/(5*x**5)
```

Mathematica [A] time = 0.0676831, size = 70, normalized size = 1.32

$$-\frac{-3x^8+2x^4-3\sqrt{1-x^4}x^5F\left(\sin^{-1}(x)\middle|-1\right)+3\sqrt{1-x^4}x^5E\left(\sin^{-1}(x)\middle|-1\right)+1}{5x^5\sqrt{1-x^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^6*Sqrt[1 - x^4]),x]
```

```
[Out] -(1 + 2*x^4 - 3*x^8 + 3*x^5*Sqrt[1 - x^4]*EllipticE[ArcSin[x], -1
] - 3*x^5*Sqrt[1 - x^4]*EllipticF[ArcSin[x], -1])/(5*x^5*Sqrt[1 -
 x^4])
```

Maple [A] time = 0.017, size = 68, normalized size = 1.3

$$-\frac{1}{5\,x^5}\sqrt{-x^4+1}-\frac{3}{5\,x}\sqrt{-x^4+1}+\frac{3\,EllipticF\left(x,i\right)-3\,EllipticE\left(x,i\right)}{5}\sqrt{-x^2+1}\sqrt{x^2+1}\frac{1}{\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^6/(-x^4+1)^(1/2),x)
```

```
[Out] -1/5*(-x^4+1)^(1/2)/x^5-3/5*(-x^4+1)^(1/2)/x+3/5*(-x^2+1)^(1/2)*(
x^2+1)^(1/2)/(-x^4+1)^(1/2)*(EllipticF(x,I)-EllipticE(x,I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^4+1}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 1)*x^6),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(-x^4 + 1)*x^6), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{-x^4+1}x^6}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 1)*x^6),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(-x^4 + 1)*x^6), x)
```

Sympy [A] time = 2.82634, size = 37, normalized size = 0.7

$$\frac{\Gamma\left(-\frac{5}{4}\right) {}_2F_1\left(\begin{matrix} -\frac{5}{4}, \frac{1}{2} \\ -\frac{1}{4} \end{matrix}\middle| x^4 e^{2i\pi}\right)}{4x^5\,\Gamma\left(-\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**6/(-x**4+1)**(1/2),x)
```

```
[Out] gamma(-5/4)*hyper((-5/4, 1/2), (-1/4,), x**4*exp_polar(2*I*pi))/(
4*x**5*gamma(-1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^4+1}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 1)*x^6),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(-x^4 + 1)*x^6), x)
```

3.892 $\int \frac{x^{11}}{(1-x^4)^{3/2}}\,dx$

Optimal. Leaf size=42

$$-\frac{1}{6}\left(1-x^4\right)^{3/2}+\sqrt{1-x^4}+\frac{1}{2\sqrt{1-x^4}}$$

```
[Out] 1/(2*Sqrt[1 - x^4]) + Sqrt[1 - x^4] - (1 - x^4)^(3/2)/6
```

Rubi [A] time = 0.0528638, antiderivative size = 42, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{1}{6}\left(1-x^4\right)^{3/2}+\sqrt{1-x^4}+\frac{1}{2\sqrt{1-x^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11/(1 - x^4)^(3/2),x]
```

```
[Out] 1/(2*Sqrt[1 - x^4]) + Sqrt[1 - x^4] - (1 - x^4)^(3/2)/6
```

Rubi in Sympy [A] time = 4.99895, size = 29, normalized size = 0.69

$$-\frac{\left(-x^4+1\right)^{\frac{3}{2}}}{6}+\sqrt{-x^4+1}+\frac{1}{2\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11/(-x**4+1)**(3/2),x)
```

```
[Out] -(-x**4 + 1)**(3/2)/6 + sqrt(-x**4 + 1) + 1/(2*sqrt(-x**4 + 1))
```

Mathematica [A] time = 0.016683, size = 27, normalized size = 0.64

$$\frac{-x^8-4x^4+8}{6\sqrt{1-x^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11/(1 - x^4)^(3/2),x]
```

```
[Out] (8 - 4*x^4 - x^8)/(6*Sqrt[1 - x^4])
```

Maple [A] time = 0.008, size = 33, normalized size = 0.8

$$\frac{(-1+x)(1+x)\left(x^2+1\right)\left(x^8+4x^4-8\right)}{6}\left(-x^4+1\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11/(-x^4+1)^(3/2),x)
```

```
[Out] 1/6*(-1+x)*(1+x)*(x^2+1)*(x^8+4*x^4-8)/(-x^4+1)^(3/2)
```

Maxima [A] time = 1.43641, size = 43, normalized size = 1.02

$$-\frac{1}{6}\left(-x^4+1\right)^{\frac{3}{2}}+\sqrt{-x^4+1}+\frac{1}{2\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^11/(-x^4 + 1)^(3/2),x, algorithm="maxima")
```

```
[Out] -1/6*(-x^4 + 1)^(3/2) + sqrt(-x^4 + 1) + 1/2/sqrt(-x^4 + 1)
```

Fricas [A] time = 0.282666, size = 28, normalized size = 0.67

$$-\frac{x^8+4\,x^4-8}{6\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^11/(-x^4 + 1)^(3/2),x, algorithm="fricas")
```

```
[Out] -1/6*(x^8 + 4*x^4 - 8)/sqrt(-x^4 + 1)
```

Sympy [A] time = 5.64192, size = 39, normalized size = 0.93

$$-\frac{x^8}{6\sqrt{-x^4+1}}-\frac{2x^4}{3\sqrt{-x^4+1}}+\frac{4}{3\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**11/(-x**4+1)**(3/2),x)
```

```
[Out] -x**8/(6*sqrt(-x**4 + 1)) - 2*x**4/(3*sqrt(-x**4 + 1)) + 4/(3*sqr
t(-x**4 + 1))
```

GIAC/XCAS [A] time = 0.213292, size = 43, normalized size = 1.02

$$-\frac{1}{6}\left(-x^4+1\right)^{\frac{3}{2}}+\sqrt{-x^4+1}+\frac{1}{2\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^11/(-x^4 + 1)^(3/2),x, algorithm="giac")
```

```
[Out] -1/6*(-x^4 + 1)^(3/2) + sqrt(-x^4 + 1) + 1/2/sqrt(-x^4 + 1)
```

3.893 $\int \frac{x^7}{(1-x^4)^{3/2}} dx$

Optimal. Leaf size=31

$$\frac{\sqrt{1-x^4}}{2}+\frac{1}{2\sqrt{1-x^4}}$$

```
[Out] 1/(2*Sqrt[1 - x^4]) + Sqrt[1 - x^4]/2
```

Rubi [A] time = 0.0393266, antiderivative size = 31, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{\sqrt{1-x^4}}{2}+\frac{1}{2\sqrt{1-x^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7/(1 - x^4)^(3/2),x]

[Out] 1/(2*Sqrt[1 - x^4]) + Sqrt[1 - x^4]/2
```

Rubi in Sympy [A] time = 4.54226, size = 20, normalized size = 0.65

$$\frac{\sqrt{-x^4+1}}{2}+\frac{1}{2\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7/(-x**4+1)**(3/2),x)

[Out] sqrt(-x**4 + 1)/2 + 1/(2*sqrt(-x**4 + 1))
```

Mathematica [A] time = 0.0110737, size = 22, normalized size = 0.71

$$\frac{2-x^4}{2\sqrt{1-x^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^7/(1 - x^4)^(3/2),x]

[Out] (2 - x^4)/(2*Sqrt[1 - x^4])
```

Maple [A] time = 0.006, size = 28, normalized size = 0.9

$$\frac{(-1+x)(1+x)\left(x^2+1\right)\left(x^4-2\right)}{2}\left(-x^4+1\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7/(-x^4+1)^(3/2),x)
```

```
[Out] 1/2*(-1+x)*(1+x)*(x^2+1)*(x^4-2)/(-x^4+1)^(3/2)
```

Maxima [A] time = 1.4395, size = 31, normalized size = 1.

$$\frac{1}{2}\sqrt{-x^4+1}+\frac{1}{2\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(-x^4 + 1)^(3/2),x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(-x^4 + 1) + 1/2/sqrt(-x^4 + 1)
```

Fricas [A] time = 0.284799, size = 22, normalized size = 0.71

$$-\frac{x^4-2}{2\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(-x^4 + 1)^(3/2),x, algorithm="fricas")
```

```
[Out] -1/2*(x^4 - 2)/sqrt(-x^4 + 1)
```

Sympy [A] time = 2.3447, size = 22, normalized size = 0.71

$$-\frac{x^4}{2\sqrt{-x^4+1}}+\frac{1}{\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(-x**4+1)**(3/2),x)
```

```
[Out] -x**4/(2*sqrt(-x**4 + 1)) + 1/sqrt(-x**4 + 1)
```

GIAC/XCAS [A] time = 0.211369, size = 31, normalized size = 1.

$$\frac{1}{2}\sqrt{-x^4+1}+\frac{1}{2\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(-x^4 + 1)^(3/2),x, algorithm="giac")
```

```
[Out] 1/2*sqrt(-x^4 + 1) + 1/2/sqrt(-x^4 + 1)
```

3.894 $\int \frac{x^3}{(1-x^4)^{3/2}}\,dx$

Optimal. Leaf size=15

$$\frac{1}{2\sqrt{1-x^4}}$$

```
[Out] 1/(2*Sqrt[1 - x^4])
```

Rubi [A] time = 0.00808117, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{1}{2\sqrt{1-x^4}}$$

Antiderivative was successfully verified.

```
[In] Int[x^3/(1 - x^4)^(3/2),x]
```

```
[Out] 1/(2*Sqrt[1 - x^4])
```

Rubi in Sympy [A] time = 1.92273, size = 10, normalized size = 0.67

$$\frac{1}{2\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**3/(-x**4+1)**(3/2),x)
```

```
[Out] 1/(2*sqrt(-x**4 + 1))
```

Mathematica [A] time = 0.00484006, size = 15, normalized size = 1.

$$\frac{1}{2\sqrt{1-x^4}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3/(1 - x^4)^(3/2),x]
```

```
[Out] 1/(2*Sqrt[1 - x^4])
```

Maple [A] time = 0.006, size = 23, normalized size = 1.5

$$-\frac{(-1+x)(1+x)\left(x^2+1\right)}{2}\left(-x^4+1\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(-x^4+1)^(3/2),x)
```

```
[Out] -1/2*(-1+x)*(1+x)*(x^2+1)/(-x^4+1)^(3/2)
```

Maxima [A] time = 1.43415, size = 15, normalized size = 1.

$$\frac{1}{2\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(-x^4 + 1)^(3/2),x, algorithm="maxima")
```

```
[Out] 1/2/sqrt(-x^4 + 1)
```

Fricas [A] time = 0.279419, size = 15, normalized size = 1.

$$\frac{1}{2\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(-x^4 + 1)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/2/sqrt(-x^4 + 1)
```

Sympy [A] time = 1.36861, size = 10, normalized size = 0.67

$$\frac{1}{2\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(-x**4+1)**(3/2),x)
```

```
[Out] 1/(2*sqrt(-x**4 + 1))
```

GIAC/XCAS [A] time = 0.213182, size = 15, normalized size = 1.

$$\frac{1}{2\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(-x^4 + 1)^(3/2),x, algorithm="giac")
```

```
[Out] 1/2/sqrt(-x^4 + 1)
```

3.895 $\int \frac{1}{x(1-x^4)^{3/2}} dx$

Optimal. Leaf size=32

$$\frac{1}{2\sqrt{1-x^4}} - \frac{1}{2}\tanh^{-1}\left(\sqrt{1-x^4}\right)$$

```
[Out] 1/(2*Sqrt[1 - x^4]) - ArcTanh[Sqrt[1 - x^4]]/2
```

Rubi [A] time = 0.0423776, antiderivative size = 32, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{1}{2\sqrt{1-x^4}} - \frac{1}{2}\tanh^{-1}\left(\sqrt{1-x^4}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(1 - x^4)^(3/2)),x]

[Out] 1/(2*Sqrt[1 - x^4]) - ArcTanh[Sqrt[1 - x^4]]/2
```

Rubi in Sympy [A] time = 4.7933, size = 22, normalized size = 0.69

$$-\frac{\operatorname{atanh}\left(\sqrt{-x^4+1}\right)}{2} + \frac{1}{2\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(-x**4+1)**(3/2),x)

[Out] -atanh(sqrt(-x**4 + 1))/2 + 1/(2*sqrt(-x**4 + 1))
```

Mathematica [A] time = 0.0512818, size = 30, normalized size = 0.94

$$\frac{1}{2}\left(\frac{1}{\sqrt{1-x^4}} - \tanh^{-1}\left(\sqrt{1-x^4}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(1 - x^4)^(3/2)),x]

[Out] (1/Sqrt[1 - x^4] - ArcTanh[Sqrt[1 - x^4]])/2
```

Maple [B] time = 0.024, size = 68, normalized size = 2.1

$$-\frac{1}{2}\mathit{Artanh}\left(\frac{1}{\sqrt{-x^4+1}}\right) + \frac{1}{4x^2+4}\sqrt{-(x^2+1)^2+2+2x^2} - \frac{1}{4x^2-4}\sqrt{-(x^2-1)^2-2x^2+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(-x^4+1)^(3/2),x)
```

```
[Out] -1/2*arctanh(1/(-x^4+1)^(1/2))+1/4/(x^2+1)*(-(x^2+1)^2+2+2*x^2)^(
1/2)-1/4/(x^2-1)*(-(x^2-1)^2-2*x^2+2)^(1/2)
```

Maxima [A] time = 1.40954, size = 54, normalized size = 1.69

$$\frac{1}{2\sqrt{-x^4+1}} - \frac{1}{4}\log\left(\sqrt{-x^4+1}+1\right) + \frac{1}{4}\log\left(\sqrt{-x^4+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-x^4 + 1)^(3/2)*x),x, algorithm="maxima")
```

```
[Out] 1/2/sqrt(-x^4 + 1) - 1/4*log(sqrt(-x^4 + 1) + 1) + 1/4*log(sqrt(-
x^4 + 1) - 1)
```

Fricas [A] time = 0.3062, size = 78, normalized size = 2.44

$$-\frac{\sqrt{-x^4+1}\log\left(\sqrt{-x^4+1}+1\right) - \sqrt{-x^4+1}\log\left(\sqrt{-x^4+1}-1\right) - 2}{4\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-x^4 + 1)^(3/2)*x),x, algorithm="fricas")
```

```
[Out] -1/4*(sqrt(-x^4 + 1)*log(sqrt(-x^4 + 1) + 1) - sqrt(-x^4 + 1)*log
(sqrt(-x^4 + 1) - 1) - 2)/sqrt(-x^4 + 1)
```

Sympy [A] time = 4.8843, size = 228, normalized size = 7.12

$$\begin{cases} -\frac{2x^4\log(x^2)}{4x^4-4} + \frac{x^4\log(x^4)}{4x^4-4} + \frac{2ix^4\operatorname{asin}\left(\frac{1}{x^2}\right)}{4x^4-4} - \frac{2i\sqrt{x^4-1}}{4x^4-4} + \frac{2\log(x^2)}{4x^4-4} - \frac{\log(x^4)}{4x^4-4} - \frac{2i\operatorname{asin}\left(\frac{1}{x^2}\right)}{4x^4-4} & \text{for } |x^4| > 1 \\ \frac{x^4\log(x^4)}{4x^4-4} - \frac{2x^4\log\left(\sqrt{-x^4+1}+1\right)}{4x^4-4} + \frac{i\pi x^4}{4x^4-4} - \frac{2\sqrt{-x^4+1}}{4x^4-4} - \frac{\log(x^4)}{4x^4-4} + \frac{2\log\left(\sqrt{-x^4+1}+1\right)}{4x^4-4} - \frac{i\pi}{4x^4-4} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(-x**4+1)**(3/2),x)
```

```
[Out] Piecewise((-2*x**4*log(x**2)/(4*x**4 - 4) + x**4*log(x**4)/(4*x**
4 - 4) + 2*I*x**4*asin(x**(-2))/(4*x**4 - 4) - 2*I*sqrt(x**4 - 1)
/(4*x**4 - 4) + 2*log(x**2)/(4*x**4 - 4) - log(x**4)/(4*x**4 - 4)
 - 2*I*asin(x**(-2))/(4*x**4 - 4), Abs(x**4) > 1), (x**4*log(x**4
)/(4*x**4 - 4) - 2*x**4*log(sqrt(-x**4 + 1) + 1)/(4*x**4 - 4) + I
*pi*x**4/(4*x**4 - 4) - 2*sqrt(-x**4 + 1)/(4*x**4 - 4) - log(x**4
)/(4*x**4 - 4) + 2*log(sqrt(-x**4 + 1) + 1)/(4*x**4 - 4) - I*pi/(
4*x**4 - 4), True))
```

GIAC/XCAS [A] time = 0.213032, size = 57, normalized size = 1.78

$$\frac{1}{2\sqrt{-x^4+1}} - \frac{1}{4}\ln\left(\sqrt{-x^4+1}+1\right) + \frac{1}{4}\ln\left(-\sqrt{-x^4+1}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-x^4 + 1)^(3/2)*x),x, algorithm="giac")
```

```
[Out] 1/2/sqrt(-x^4 + 1) - 1/4*ln(sqrt(-x^4 + 1) + 1) + 1/4*ln(-sqrt(-x
^4 + 1) + 1)
```

3.896 $\int \frac{1}{x^5(1-x^4)^{3/2}}\,dx$

Optimal. Leaf size=53

$$-\frac{3\sqrt{1-x^4}}{4x^4}+\frac{1}{2x^4\sqrt{1-x^4}}-\frac{3}{4}\tanh^{-1}\left(\sqrt{1-x^4}\right)$$

```
[Out] 1/(2*x^4*Sqrt[1 - x^4]) - (3*Sqrt[1 - x^4])/(4*x^4) - (3*ArcTanh[
Sqrt[1 - x^4]])/4
```

Rubi [A] time = 0.0607043, antiderivative size = 53, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{3\sqrt{1-x^4}}{4x^4}+\frac{1}{2x^4\sqrt{1-x^4}}-\frac{3}{4}\tanh^{-1}\left(\sqrt{1-x^4}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^5*(1 - x^4)^(3/2)),x]
```

```
[Out] 1/(2*x^4*Sqrt[1 - x^4]) - (3*Sqrt[1 - x^4])/(4*x^4) - (3*ArcTanh[
Sqrt[1 - x^4]])/4
```

Rubi in Sympy [A] time = 5.87212, size = 42, normalized size = 0.79

$$-\frac{3\,\text{atanh}\left(\sqrt{-x^4+1}\right)}{4}-\frac{3\sqrt{-x^4+1}}{4x^4}+\frac{1}{2x^4\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**5/(-x**4+1)**(3/2),x)
```

```
[Out] -3*atanh(sqrt(-x**4 + 1))/4 - 3*sqrt(-x**4 + 1)/(4*x**4) + 1/(2*x
**4*sqrt(-x**4 + 1))
```

Mathematica [A] time = 0.0909456, size = 41, normalized size = 0.77

$$\frac{1}{4}\left(\frac{3x^4-1}{x^4\sqrt{1-x^4}}-3\tanh^{-1}\left(\sqrt{1-x^4}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^5*(1 - x^4)^(3/2)),x]
```

```
[Out] ((-1 + 3*x^4)/(x^4*Sqrt[1 - x^4]) - 3*ArcTanh[Sqrt[1 - x^4]])/4
```

Maple [A] time = 0.024, size = 82, normalized size = 1.6

$$-\frac{1}{4\,x^4}\sqrt{-x^4+1}-\frac{3}{4}Artanh\left(\frac{1}{\sqrt{-x^4+1}}\right)+\frac{1}{4\,x^2+4}\sqrt{-\left(x^2+1\right)^2+2+2\,x^2}-\frac{1}{4\,x^2-4}\sqrt{-\left(x^2-1\right)^2-2\,x^2+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^5/(-x^4+1)^(3/2),x)
```

```
[Out] -1/4*(-x^4+1)^(1/2)/x^4-3/4*arctanh(1/(-x^4+1)^(1/2))+1/4/(x^2+1)
*(-(x^2+1)^2+2+2*x^2)^(1/2)-1/4/(x^2-1)*(-(x^2-1)^2-2*x^2+2)^(1/2
)
```

Maxima [A] time = 1.4393, size = 82, normalized size = 1.55

$$-\frac{3\,x^4-1}{4\left(\left(-x^4+1\right)^{\frac{3}{2}}-\sqrt{-x^4+1}\right)}-\frac{3}{8}\,\log\left(\sqrt{-x^4+1}+1\right)+\frac{3}{8}\,\log\left(\sqrt{-x^4+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-x^4 + 1)^(3/2)*x^5),x, algorithm="maxima")
```

```
[Out] -1/4*(3*x^4 - 1)/((-x^4 + 1)^(3/2) - sqrt(-x^4 + 1)) - 3/8*log(sq
rt(-x^4 + 1) + 1) + 3/8*log(sqrt(-x^4 + 1) - 1)
```

Fricas [A] time = 0.283338, size = 99, normalized size = 1.87

$$-\frac{3\,\sqrt{-x^4+1}x^4\log\left(\sqrt{-x^4+1}+1\right)-3\,\sqrt{-x^4+1}x^4\log\left(\sqrt{-x^4+1}-1\right)-6\,x^4+2}{8\,\sqrt{-x^4+1}x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-x^4 + 1)^(3/2)*x^5),x, algorithm="fricas")
```

```
[Out] -1/8*(3*sqrt(-x^4 + 1)*x^4*log(sqrt(-x^4 + 1) + 1) - 3*sqrt(-x^4
+ 1)*x^4*log(sqrt(-x^4 + 1) - 1) - 6*x^4 + 2)/(sqrt(-x^4 + 1)*x^4
)
```

Sympy [A] time = 8.95723, size = 95, normalized size = 1.79

$$\begin{cases} -\frac{3\operatorname{acosh}\left(\frac{1}{x^2}\right)}{4}+\frac{3}{4x^2\sqrt{-1+\frac{1}{x^4}}}-\frac{1}{4x^6\sqrt{-1+\frac{1}{x^4}}} & \text{for}\ \left|\frac{1}{x^4}\right|>1 \\ \frac{3i\operatorname{asin}\left(\frac{1}{x^2}\right)}{4}-\frac{3i}{4x^2\sqrt{1-\frac{1}{x^4}}}+\frac{i}{4x^6\sqrt{1-\frac{1}{x^4}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**5/(-x**4+1)**(3/2),x)
```

```
[Out] Piecewise((-3*acosh(x**(-2))/4 + 3/(4*x**2*sqrt(-1 + x**(-4))) -
1/(4*x**6*sqrt(-1 + x**(-4))), Abs(x**(-4)) > 1), (3*I*asin(x**(-
2))/4 - 3*I/(4*x**2*sqrt(1 - 1/x**4)) + I/(4*x**6*sqrt(1 - 1/x**4
)), True))
```

GIAC/XCAS [A] time = 0.216231, size = 85, normalized size = 1.6

$$-\frac{3\,x^4-1}{4\left(\left(-x^4+1\right)^{\frac{3}{2}}-\sqrt{-x^4+1}\right)}-\frac{3}{8}\,\ln\left(\sqrt{-x^4+1}+1\right)+\frac{3}{8}\,\ln\left(-\sqrt{-x^4+1}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-x^4 + 1)^(3/2)*x^5),x, algorithm="giac")
```

```
[Out] -1/4*(3*x^4 - 1)/((-x^4 + 1)^(3/2) - sqrt(-x^4 + 1)) - 3/8*ln(sqr
t(-x^4 + 1) + 1) + 3/8*ln(-sqrt(-x^4 + 1) + 1)
```

3.897 $\int \frac{x^9}{(1-x^4)^{3/2}} \, dx$

Optimal. Leaf size=45

$$-\frac{3}{4}\sin^{-1}\left(x^2\right)+\frac{x^6}{2\sqrt{1-x^4}}+\frac{3}{4}\sqrt{1-x^4}x^2$$

```
[Out] x^6/(2*Sqrt[1 - x^4]) + (3*x^2*Sqrt[1 - x^4])/4 - (3*ArcSin[x^2])
/4
```

Rubi [A] time = 0.0593844, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$

$$-\frac{3}{4}\sin^{-1}\left(x^2\right)+\frac{x^6}{2\sqrt{1-x^4}}+\frac{3}{4}\sqrt{1-x^4}x^2$$

Antiderivative was successfully verified.

```
[In] Int[x^9/(1 - x^4)^(3/2),x]
```

```
[Out] x^6/(2*Sqrt[1 - x^4]) + (3*x^2*Sqrt[1 - x^4])/4 - (3*ArcSin[x^2])
/4
```

Rubi in Sympy [A] time = 7.22949, size = 36, normalized size = 0.8

$$\frac{x^6}{2\sqrt{-x^4+1}}+\frac{3x^2\sqrt{-x^4+1}}{4}-\frac{3\,\mathrm{asin}\left(x^2\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**9/(-x**4+1)**(3/2),x)
```

```
[Out] x**6/(2*sqrt(-x**4 + 1)) + 3*x**2*sqrt(-x**4 + 1)/4 - 3*asin(x**2
)/4
```

Mathematica [A] time = 0.0463003, size = 32, normalized size = 0.71

$$-\frac{3}{4}\sin^{-1}\left(x^2\right)-\frac{\left(x^4-3\right)x^2}{4\sqrt{1-x^4}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^9/(1 - x^4)^(3/2),x]
```

```
[Out] -(x^2*(-3 + x^4))/(4*Sqrt[1 - x^4]) - (3*ArcSin[x^2])/4
```

Maple [B] time = 0.023, size = 76, normalized size = 1.7

$$-\frac{3\arcsin\left(x^2\right)}{4}+\frac{x^2}{4}\sqrt{-x^4+1}-\frac{1}{4x^2+4}\sqrt{-\left(x^2+1\right)^2+2+2x^2}-\frac{1}{4x^2-4}\sqrt{-\left(x^2-1\right)^2-2x^2+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^9/(-x^4+1)^(3/2),x)
```

```
[Out] -3/4*arcsin(x^2)+1/4*x^2*(-x^4+1)^(1/2)-1/4/(x^2+1)*(-(x^2+1)^2+2
+2*x^2)^(1/2)-1/4/(x^2-1)*(-(x^2-1)^2-2*x^2+2)^(1/2)
```

Maxima [A] time = 1.59205, size = 81, normalized size = 1.8

$$-\frac{\frac{3\,(x^4-1)}{x^4}-2}{4\left(\frac{\sqrt{-x^4+1}}{x^2}+\frac{(-x^4+1)^{\frac{3}{2}}}{x^6}\right)}+\frac{3}{4}\,\arctan\left(\frac{\sqrt{-x^4+1}}{x^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(-x^4 + 1)^(3/2),x, algorithm="maxima")
```

```
[Out] -1/4*(3*(x^4 - 1)/x^4 - 2)/(sqrt(-x^4 + 1)/x^2 + (-x^4 + 1)^(3/2)
/x^6) + 3/4*arctan(sqrt(-x^4 + 1)/x^2)
```

Fricas [A] time = 0.261884, size = 158, normalized size = 3.51

$$-\frac{3\,x^{10}-13\,x^6+12\,x^2-6\left(x^8-5\,x^4+\left(3\,x^4-4\right)\sqrt{-x^4+1}+4\right)\arctan\left(\frac{\sqrt{-x^4+1}-1}{x^2}\right)-\left(x^{10}-7\,x^6+12\,x^2\right)\sqrt{-x^4+1}}{4\left(x^8-5\,x^4+(3\,x^4-4)\sqrt{-x^4+1}+4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(-x^4 + 1)^(3/2),x, algorithm="fricas")
```

```
[Out] -1/4*(3*x^10 - 13*x^6 + 12*x^2 - 6*(x^8 - 5*x^4 + (3*x^4 - 4)*sqr
t(-x^4 + 1) + 4)*arctan((sqrt(-x^4 + 1) - 1)/x^2) - (x^10 - 7*x^6
 + 12*x^2)*sqrt(-x^4 + 1))/(x^8 - 5*x^4 + (3*x^4 - 4)*sqrt(-x^4 +
 1) + 4)
```

Sympy [A] time = 9.27667, size = 82, normalized size = 1.82

$$\begin{cases} \frac{ix^6}{4\sqrt{x^4-1}}-\frac{3ix^2}{4\sqrt{x^4-1}}+\frac{3i\operatorname{acosh}\left(x^2\right)}{4} & \text{for}\ \left|x^4\right|>1 \\ -\frac{x^6}{4\sqrt{-x^4+1}}+\frac{3x^2}{4\sqrt{-x^4+1}}-\frac{3\operatorname{asin}\left(x^2\right)}{4} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**9/(-x**4+1)**(3/2),x)
```

```
[Out] Piecewise((I*x**6/(4*sqrt(x**4 - 1)) - 3*I*x**2/(4*sqrt(x**4 - 1)
) + 3*I*acosh(x**2)/4, Abs(x**4) > 1), (-x**6/(4*sqrt(-x**4 + 1))
 + 3*x**2/(4*sqrt(-x**4 + 1)) - 3*asin(x**2)/4, True))
```

GIAC/XCAS [A] time = 0.2178, size = 45, normalized size = 1.

$$\frac{\left(x^4-3\right)\sqrt{-x^4+1}x^2}{4\,(x^4-1)}-\frac{3}{4}\,\arcsin\left(x^2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(-x^4 + 1)^(3/2),x, algorithm="giac")

[Out] 1/4*(x^4 - 3)*sqrt(-x^4 + 1)*x^2/(x^4 - 1) - 3/4*arcsin(x^2)
```

3.898 $\int \frac{x^5}{(1-x^4)^{3/2}}\,dx$

Optimal. Leaf size=27

$$\frac{x^2}{2\sqrt{1-x^4}}-\frac{1}{2}\sin^{-1}\left(x^2\right)$$

```
[Out] x^2/(2*Sqrt[1 - x^4]) - ArcSin[x^2]/2
```

Rubi [A] time = 0.0363181, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{x^2}{2\sqrt{1-x^4}}-\frac{1}{2}\sin^{-1}\left(x^2\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/(1 - x^4)^(3/2),x]

[Out] x^2/(2*Sqrt[1 - x^4]) - ArcSin[x^2]/2
```

Rubi in Sympy [A] time = 4.93694, size = 19, normalized size = 0.7

$$\frac{x^2}{2\sqrt{-x^4+1}}-\frac{\operatorname{asin}\left(x^2\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(-x**4+1)**(3/2),x)

[Out] x**2/(2*sqrt(-x**4 + 1)) - asin(x**2)/2
```

Mathematica [A] time = 0.0374265, size = 26, normalized size = 0.96

$$\frac{1}{2}\left(\frac{x^2}{\sqrt{1-x^4}}-\sin^{-1}\left(x^2\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/(1 - x^4)^(3/2),x]

[Out] (x^2/Sqrt[1 - x^4] - ArcSin[x^2])/2
```

Maple [B] time = 0.021, size = 62, normalized size = 2.3

$$-\frac{\arcsin\left(x^2\right)}{2}-\frac{1}{4x^2+4}\sqrt{-\left(x^2+1\right)^2+2+2x^2}-\frac{1}{4x^2-4}\sqrt{-\left(x^2-1\right)^2-2x^2+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(-x^4+1)^(3/2),x)
```

```
[Out] -1/2*arcsin(x^2)-1/4/(x^2+1)*(-(x^2+1)^2+2+2*x^2)^(1/2)-1/4/(x^2-
1)*(-(x^2-1)^2-2*x^2+2)^(1/2)
```

Maxima [A] time = 1.63352, size = 42, normalized size = 1.56

$$\frac{x^2}{2\sqrt{-x^4+1}} + \frac{1}{2}\arctan\left(\frac{\sqrt{-x^4+1}}{x^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(-x^4 + 1)^(3/2),x, algorithm="maxima")
```

```
[Out] 1/2*x^2/sqrt(-x^4 + 1) + 1/2*arctan(sqrt(-x^4 + 1)/x^2)
```

Fricas [A] time = 0.289074, size = 93, normalized size = 3.44

$$-\frac{\sqrt{-x^4+1}x^2 - x^2 - 2\left(x^4 + \sqrt{-x^4+1} - 1\right)\arctan\left(\frac{\sqrt{-x^4+1}-1}{x^2}\right)}{2\left(x^4 + \sqrt{-x^4+1} - 1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(-x^4 + 1)^(3/2),x, algorithm="fricas")
```

```
[Out] -1/2*(sqrt(-x^4 + 1)*x^2 - x^2 - 2*(x^4 + sqrt(-x^4 + 1) - 1)*arc
tan((sqrt(-x^4 + 1) - 1)/x^2))/(x^4 + sqrt(-x^4 + 1) - 1)
```

Sympy [A] time = 4.86511, size = 46, normalized size = 1.7

$$\begin{cases} -\frac{ix^2}{2\sqrt{x^4-1}} + \frac{i\,\operatorname{acosh}\left(x^2\right)}{2} & \text{for}\: \left|x^4\right| > 1 \\ \frac{x^2}{2\sqrt{-x^4+1}} - \frac{\operatorname{asin}\left(x^2\right)}{2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(-x**4+1)**(3/2),x)
```

```
[Out] Piecewise((-I*x**2/(2*sqrt(x**4 - 1)) + I*acosh(x**2)/2, Abs(x**4
) > 1), (x**2/(2*sqrt(-x**4 + 1)) - asin(x**2)/2, True))
```

GIAC/XCAS [A] time = 0.219655, size = 38, normalized size = 1.41

$$-\frac{\sqrt{-x^4+1}x^2}{2\left(x^4-1\right)} - \frac{1}{2}\arcsin\left(x^2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(-x^4 + 1)^(3/2),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(-x^4 + 1)*x^2/(x^4 - 1) - 1/2*arcsin(x^2)
```

3.899 $\int \frac{x}{(1-x^4)^{3/2}} \, dx$

Optimal. Leaf size=18

$$\frac{x^2}{2\sqrt{1-x^4}}$$

```
[Out] x^2/(2*Sqrt[1 - x^4])
```

Rubi [A] time = 0.0127446, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{x^2}{2\sqrt{1-x^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(1 - x^4)^(3/2),x]

[Out] x^2/(2*Sqrt[1 - x^4])
```

Rubi in Sympy [A] time = 2.26679, size = 12, normalized size = 0.67

$$\frac{x^2}{2\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(-x**4+1)**(3/2),x)

[Out] x**2/(2*sqrt(-x**4 + 1))
```

Mathematica [A] time = 0.0112336, size = 18, normalized size = 1.

$$\frac{x^2}{2\sqrt{1-x^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(1 - x^4)^(3/2),x]

[Out] x^2/(2*Sqrt[1 - x^4])
```

Maple [A] time = 0.005, size = 26, normalized size = 1.4

$$-\frac{(-1+x)(1+x)\left(x^2+1\right)x^2}{2}\left(-x^4+1\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(-x^4+1)^(3/2),x)

[Out] -1/2*(-1+x)*(1+x)*(x^2+1)*x^2/(-x^4+1)^(3/2)
```

Maxima [A] time = 1.43034, size = 19, normalized size = 1.06

$$\frac{x^2}{2\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(-x^4 + 1)^(3/2),x, algorithm="maxima")
```

```
[Out] 1/2*x^2/sqrt(-x^4 + 1)
```

Fricas [A] time = 0.26828, size = 50, normalized size = 2.78

$$-\frac{\sqrt{-x^4+1}x^2-x^2}{2\left(x^4+\sqrt{-x^4+1}-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(-x^4 + 1)^(3/2),x, algorithm="fricas")
```

```
[Out] -1/2*(sqrt(-x^4 + 1)*x^2 - x^2)/(x^4 + sqrt(-x^4 + 1) - 1)
```

Sympy [A] time = 1.66813, size = 32, normalized size = 1.78

$$\begin{cases} -\frac{ix^2}{2\sqrt{x^4-1}} & \text{for } |x^4| > 1 \\ \frac{x^2}{2\sqrt{-x^4+1}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(-x**4+1)**(3/2),x)
```

```
[Out] Piecewise((-I*x**2/(2*sqrt(x**4 - 1)), Abs(x**4) > 1), (x**2/(2*s
qrt(-x**4 + 1)), True))
```

GIAC/XCAS [A] time = 0.218817, size = 28, normalized size = 1.56

$$-\frac{\sqrt{-x^4+1}x^2}{2(x^4-1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(-x^4 + 1)^(3/2),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(-x^4 + 1)*x^2/(x^4 - 1)
```

3.900 $\int \frac{1}{x^3(1-x^4)^{3/2}}\,dx$

Optimal. Leaf size=34

$$\frac{x^2}{\sqrt{1-x^4}}-\frac{1}{2x^2\sqrt{1-x^4}}$$

```
[Out] -1/(2*x^2*Sqrt[1 - x^4]) + x^2/Sqrt[1 - x^4]
```

Rubi [A] time = 0.0276021, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{x^2}{\sqrt{1-x^4}}-\frac{1}{2x^2\sqrt{1-x^4}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^3*(1 - x^4)^(3/2)),x]

[Out] -1/(2*x^2*Sqrt[1 - x^4]) + x^2/Sqrt[1 - x^4]
```

Rubi in Sympy [A] time = 3.23965, size = 26, normalized size = 0.76

$$\frac{x^2}{\sqrt{-x^4+1}}-\frac{1}{2x^2\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**3/(-x**4+1)**(3/2),x)

[Out] x**2/sqrt(-x**4 + 1) - 1/(2*x**2*sqrt(-x**4 + 1))
```

Mathematica [A] time = 0.0168733, size = 25, normalized size = 0.74

$$\frac{2x^4-1}{2x^2\sqrt{1-x^4}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^3*(1 - x^4)^(3/2)),x]

[Out] (-1 + 2*x^4)/(2*x^2*Sqrt[1 - x^4])
```

Maple [A] time = 0.007, size = 33, normalized size = 1.

$$-\frac{(-1+x)(1+x)\left(x^2+1\right)\left(2\,x^4-1\right)}{2\,x^2}\left(-x^4+1\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^3/(-x^4+1)^(3/2),x)

[Out] -1/2*(-1+x)*(1+x)*(x^2+1)*(2*x^4-1)/x^2/(-x^4+1)^(3/2)
```

Maxima [A] time = 1.43341, size = 39, normalized size = 1.15

$$\frac{x^2}{2\sqrt{-x^4+1}} - \frac{\sqrt{-x^4+1}}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-x^4 + 1)^(3/2)*x^3),x, algorithm="maxima")
```

```
[Out] 1/2*x^2/sqrt(-x^4 + 1) - 1/2*sqrt(-x^4 + 1)/x^2
```

Fricas [A] time = 0.29657, size = 88, normalized size = 2.59

$$-\frac{2x^8 - 5x^4 + 2(2x^4 - 1)\sqrt{-x^4+1} + 2}{2\left(2x^6 - 2x^2 - (x^6 - 2x^2)\sqrt{-x^4+1}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-x^4 + 1)^(3/2)*x^3),x, algorithm="fricas")
```

```
[Out] -1/2*(2*x^8 - 5*x^4 + 2*(2*x^4 - 1)*sqrt(-x^4 + 1) + 2)/(2*x^6 -
2*x^2 - (x^6 - 2*x^2)*sqrt(-x^4 + 1))
```

Sympy [A] time = 2.43996, size = 90, normalized size = 2.65

$$\begin{cases} -\frac{2ix^4\sqrt{x^4-1}}{2x^6-2x^2} + \frac{i\sqrt{x^4-1}}{2x^6-2x^2} & \text{for } \left|x^4\right| > 1 \\ -\frac{2x^4\sqrt{-x^4+1}}{2x^6-2x^2} + \frac{\sqrt{-x^4+1}}{2x^6-2x^2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(-x**4+1)**(3/2),x)
```

```
[Out] Piecewise((-2*I*x**4*sqrt(x**4 - 1)/(2*x**6 - 2*x**2) + I*sqrt(x*
*4 - 1)/(2*x**6 - 2*x**2), Abs(x**4) > 1), (-2*x**4*sqrt(-x**4 +
1)/(2*x**6 - 2*x**2) + sqrt(-x**4 + 1)/(2*x**6 - 2*x**2), True))
```

GIAC/XCAS [A] time = 0.222744, size = 42, normalized size = 1.24

$$-\frac{\sqrt{-x^4+1}x^2}{2(x^4-1)} - \frac{1}{2}\sqrt{\frac{1}{x^4} - 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-x^4 + 1)^(3/2)*x^3),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(-x^4 + 1)*x^2/(x^4 - 1) - 1/2*sqrt(1/x^4 - 1)
```

3.901 $\int \frac{1}{x^7(1-x^4)^{3/2}} dx$

Optimal. Leaf size=55

$$-\frac{1}{6\sqrt{1-x^4}x^6}+\frac{4x^2}{3\sqrt{1-x^4}}-\frac{2}{3\sqrt{1-x^4}x^2}$$

```
[Out] -1/(6*x^6*Sqrt[1 - x^4]) - 2/(3*x^2*Sqrt[1 - x^4]) + (4*x^2)/(3*S
qrt[1 - x^4])
```

Rubi [A] time = 0.0420547, antiderivative size = 55, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{1}{6\sqrt{1-x^4}x^6}+\frac{4x^2}{3\sqrt{1-x^4}}-\frac{2}{3\sqrt{1-x^4}x^2}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^7*(1 - x^4)^(3/2)),x]
```

```
[Out] -1/(6*x^6*Sqrt[1 - x^4]) - 2/(3*x^2*Sqrt[1 - x^4]) + (4*x^2)/(3*S
qrt[1 - x^4])
```

Rubi in Sympy [A] time = 4.29678, size = 44, normalized size = 0.8

$$\frac{4x^2}{3\sqrt{-x^4+1}}-\frac{2}{3x^2\sqrt{-x^4+1}}-\frac{1}{6x^6\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**7/(-x**4+1)**(3/2),x)
```

```
[Out] 4*x**2/(3*sqrt(-x**4 + 1)) - 2/(3*x**2*sqrt(-x**4 + 1)) - 1/(6*x*
*6*sqrt(-x**4 + 1))
```

Mathematica [A] time = 0.0223115, size = 30, normalized size = 0.55

$$\frac{8x^8-4x^4-1}{6x^6\sqrt{1-x^4}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^7*(1 - x^4)^(3/2)),x]
```

```
[Out] (-1 - 4*x^4 + 8*x^8)/(6*x^6*Sqrt[1 - x^4])
```

Maple [A] time = 0.007, size = 38, normalized size = 0.7

$$-\frac{(-1+x)(1+x)\left(x^2+1\right)\left(8x^8-4x^4-1\right)}{6x^6}\left(-x^4+1\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^7/(-x^4+1)^(3/2),x)
```

```
[Out] -1/6*(-1+x)*(1+x)*(x^2+1)*(8*x^8-4*x^4-1)/x^6/(-x^4+1)^(3/2)
```

Maxima [A] time = 1.44294, size = 58, normalized size = 1.05

$$\frac{x^2}{2\sqrt{-x^4+1}} - \frac{\sqrt{-x^4+1}}{x^2} - \frac{\left(-x^4+1\right)^{\frac{3}{2}}}{6\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-x^4 + 1)^(3/2)*x^7),x, algorithm="maxima")
```

```
[Out] 1/2*x^2/sqrt(-x^4 + 1) - sqrt(-x^4 + 1)/x^2 - 1/6*(-x^4 + 1)^(3/2
)/x^6
```

Fricas [A] time = 0.288825, size = 128, normalized size = 2.33

$$-\frac{8\,x^{16} - 68\,x^{12} + 95\,x^8 - 24\,x^4 + 4\left(8\,x^{12} - 20\,x^8 + 7\,x^4 + 2\right)\sqrt{-x^4+1} - 8}{6\left(4\,x^{14} - 12\,x^{10} + 8\,x^6 - \left(x^{14} - 8\,x^{10} + 8\,x^6\right)\sqrt{-x^4+1}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-x^4 + 1)^(3/2)*x^7),x, algorithm="fricas")
```

```
[Out] -1/6*(8*x^16 - 68*x^12 + 95*x^8 - 24*x^4 + 4*(8*x^12 - 20*x^8 + 7
*x^4 + 2)*sqrt(-x^4 + 1) - 8)/(4*x^14 - 12*x^10 + 8*x^6 - (x^14 -
 8*x^10 + 8*x^6)*sqrt(-x^4 + 1))
```

Sympy [A] time = 5.1927, size = 151, normalized size = 2.75

$$\begin{cases} -\frac{8x^8\sqrt{-1+\frac{1}{x^4}}}{6x^8-6x^4} + \frac{4x^4\sqrt{-1+\frac{1}{x^4}}}{6x^8-6x^4} + \frac{\sqrt{-1+\frac{1}{x^4}}}{6x^8-6x^4} & \text{for}\ \left|\frac{1}{x^4}\right| > 1 \\ -\frac{8ix^8\sqrt{1-\frac{1}{x^4}}}{6x^8-6x^4} + \frac{4ix^4\sqrt{1-\frac{1}{x^4}}}{6x^8-6x^4} + \frac{i\sqrt{1-\frac{1}{x^4}}}{6x^8-6x^4} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**7/(-x**4+1)**(3/2),x)
```

```
[Out] Piecewise((-8*x**8*sqrt(-1 + x**(-4))/(6*x**8 - 6*x**4) + 4*x**4*
sqrt(-1 + x**(-4))/(6*x**8 - 6*x**4) + sqrt(-1 + x**(-4))/(6*x**8
 - 6*x**4), Abs(x**(-4)) > 1), (-8*I*x**8*sqrt(1 - 1/x**4)/(6*x**
8 - 6*x**4) + 4*I*x**4*sqrt(1 - 1/x**4)/(6*x**8 - 6*x**4) + I*sqr
t(1 - 1/x**4)/(6*x**8 - 6*x**4), True))
```

GIAC/XCAS [A] time = 0.225852, size = 54, normalized size = 0.98

$$-\frac{\sqrt{-x^4+1}x^2}{2\left(x^4-1\right)} - \frac{1}{6}\left(\frac{1}{x^4}-1\right)^{\frac{3}{2}} - \sqrt{\frac{1}{x^4}-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-x^4 + 1)^(3/2)*x^7),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(-x^4 + 1)*x^2/(x^4 - 1) - 1/6*(1/x^4 - 1)^(3/2) - sqrt(
1/x^4 - 1)
```

3.902 $\int \frac{x^{12}}{(1-x^4)^{3/2}}\,dx$

Optimal. Leaf size=61

$$\frac{15}{14}\sqrt{1-x^4}x+\frac{x^9}{2\sqrt{1-x^4}}+\frac{9}{14}\sqrt{1-x^4}x^5-\frac{15}{14}F\left(\sin^{-1}(x)\middle|-1\right)$$

```
[Out] x^9/(2*Sqrt[1 - x^4]) + (15*x*Sqrt[1 - x^4])/14 + (9*x^5*Sqrt[1 -
 x^4])/14 - (15*EllipticF[ArcSin[x], -1])/14
```

Rubi [A] time = 0.0523767, antiderivative size = 61, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{15}{14}\sqrt{1-x^4}x+\frac{x^9}{2\sqrt{1-x^4}}+\frac{9}{14}\sqrt{1-x^4}x^5-\frac{15}{14}F\left(\sin^{-1}(x)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^12/(1 - x^4)^(3/2),x]
```

```
[Out] x^9/(2*Sqrt[1 - x^4]) + (15*x*Sqrt[1 - x^4])/14 + (9*x^5*Sqrt[1 -
 x^4])/14 - (15*EllipticF[ArcSin[x], -1])/14
```

Rubi in Sympy [A] time = 5.97614, size = 51, normalized size = 0.84

$$\frac{x^9}{2\sqrt{-x^4+1}}+\frac{9x^5\sqrt{-x^4+1}}{14}+\frac{15x\sqrt{-x^4+1}}{14}-\frac{15F(\operatorname{asin}(x)|-1)}{14}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**12/(-x**4+1)**(3/2),x)
```

```
[Out] x**9/(2*sqrt(-x**4 + 1)) + 9*x**5*sqrt(-x**4 + 1)/14 + 15*x*sqrt(
-x**4 + 1)/14 - 15*elliptic_f(asin(x), -1)/14
```

Mathematica [A] time = 0.0501682, size = 46, normalized size = 0.75

$$-\frac{2x^9+6x^5+15\sqrt{1-x^4}F\left(\sin^{-1}(x)\middle|-1\right)-15x}{14\sqrt{1-x^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^12/(1 - x^4)^(3/2),x]
```

```
[Out] -(-15*x + 6*x^5 + 2*x^9 + 15*Sqrt[1 - x^4]*EllipticF[ArcSin[x], -
1])/(14*Sqrt[1 - x^4])
```

Maple [A] time = 0.014, size = 71, normalized size = 1.2

$$\frac{x}{2}\frac{1}{\sqrt{-x^4+1}}+\frac{x^5}{7}\sqrt{-x^4+1}+\frac{4x}{7}\sqrt{-x^4+1}-\frac{15\,\mathit{EllipticF}(x,i)}{14}\sqrt{-x^2+1}\sqrt{x^2+1}\frac{1}{\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^12/(-x^4+1)^(3/2),x)
```

```
[Out] 1/2*x/(-x^4+1)^(1/2)+1/7*x^5*(-x^4+1)^(1/2)+4/7*x*(-x^4+1)^(1/2)-
15/14*(-x^2+1)^(1/2)*(x^2+1)^(1/2)/(-x^4+1)^(1/2)*EllipticF(x,I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{12}}{(-x^4+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^12/(-x^4 + 1)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^12/(-x^4 + 1)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{x^{12}}{(x^4-1)\sqrt{-x^4+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^12/(-x^4 + 1)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(-x^12/((x^4 - 1)*sqrt(-x^4 + 1)), x)
```

Sympy [A] time = 5.85672, size = 31, normalized size = 0.51

$$\frac{x^{13}\,\Gamma\left(\frac{13}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{3}{2},\frac{13}{4}\\\frac{17}{4}\end{matrix}\middle|x^4e^{2i\pi}\right)}{4\,\Gamma\left(\frac{17}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**12/(-x**4+1)**(3/2),x)
```

```
[Out] x**13*gamma(13/4)*hyper((3/2, 13/4), (17/4,), x**4*exp_polar(2*I*
pi))/(4*gamma(17/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{12}}{(-x^4+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^12/(-x^4 + 1)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^12/(-x^4 + 1)^(3/2), x)
```

3.903 $\int \frac{x^8}{(1-x^4)^{3/2}}\,dx$

Optimal. Leaf size=43

$$\frac{5}{6}\sqrt{1-x^4}x+\frac{x^5}{2\sqrt{1-x^4}}-\frac{5}{6}F\left(\sin^{-1}(x)\middle|-1\right)$$

```
[Out] x^5/(2*Sqrt[1 - x^4]) + (5*x*Sqrt[1 - x^4])/6 - (5*EllipticF[ArcS
in[x], -1])/6
```

Rubi [A] time = 0.0360646, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{5}{6}\sqrt{1-x^4}x+\frac{x^5}{2\sqrt{1-x^4}}-\frac{5}{6}F\left(\sin^{-1}(x)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^8/(1 - x^4)^(3/2),x]
```

```
[Out] x^5/(2*Sqrt[1 - x^4]) + (5*x*Sqrt[1 - x^4])/6 - (5*EllipticF[ArcS
in[x], -1])/6
```

Rubi in Sympy [A] time = 4.63866, size = 36, normalized size = 0.84

$$\frac{x^5}{2\sqrt{-x^4+1}}+\frac{5x\sqrt{-x^4+1}}{6}-\frac{5F\left(\operatorname{asin}(x)\middle|-1\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8/(-x**4+1)**(3/2),x)
```

```
[Out] x**5/(2*sqrt(-x**4 + 1)) + 5*x*sqrt(-x**4 + 1)/6 - 5*elliptic_f(a
sin(x), -1)/6
```

Mathematica [A] time = 0.0447375, size = 41, normalized size = 0.95

$$-\frac{2x^5+5\sqrt{1-x^4}F\left(\sin^{-1}(x)\middle|-1\right)-5x}{6\sqrt{1-x^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8/(1 - x^4)^(3/2),x]
```

```
[Out] -(-5*x + 2*x^5 + 5*Sqrt[1 - x^4]*EllipticF[ArcSin[x], -1])/(6*Sqr
t[1 - x^4])
```

Maple [A] time = 0.015, size = 57, normalized size = 1.3

$$\frac{x}{2}\frac{1}{\sqrt{-x^4+1}}+\frac{x}{3}\sqrt{-x^4+1}-\frac{5\,EllipticF(x,i)}{6}\sqrt{-x^2+1}\sqrt{x^2+1}\frac{1}{\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8/(-x^4+1)^(3/2),x)
```

```
[Out] 1/2*x/(-x^4+1)^(1/2)+1/3*x*(-x^4+1)^(1/2)-5/6*(-x^2+1)^(1/2)*(x^2
+1)^(1/2)/(-x^4+1)^(1/2)*EllipticF(x,I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^8}{(-x^4+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(-x^4 + 1)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^8/(-x^4 + 1)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{x^8}{(x^4-1)\sqrt{-x^4+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(-x^4 + 1)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(-x^8/((x^4 - 1)*sqrt(-x^4 + 1)), x)
```

Sympy [A] time = 2.94299, size = 31, normalized size = 0.72

$$\frac{x^9\,\Gamma\left(\frac{9}{4}\right)\,{}_2F_1\left(\left.\begin{matrix}\frac{3}{2},\frac{9}{4}\\\frac{13}{4}\end{matrix}\right|x^4e^{2i\pi}\right)}{4\,\Gamma\left(\frac{13}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8/(-x**4+1)**(3/2),x)
```

```
[Out] x**9*gamma(9/4)*hyper((3/2, 9/4), (13/4,), x**4*exp_polar(2*I*pi)
)/(4*gamma(13/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^8}{(-x^4+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(-x^4 + 1)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^8/(-x^4 + 1)^(3/2), x)
```

3.904 $\int \frac{x^4}{(1-x^4)^{3/2}}\,dx$

Optimal. Leaf size=25

$$\frac{x}{2\sqrt{1-x^4}}-\frac{1}{2}F\left(\sin^{-1}(x)\middle|-1\right)$$

```
[Out] x/(2*Sqrt[1 - x^4]) - EllipticF[ArcSin[x], -1]/2
```

Rubi [A] time = 0.0207963, antiderivative size = 25, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{x}{2\sqrt{1-x^4}}-\frac{1}{2}F\left(\sin^{-1}(x)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(1 - x^4)^(3/2),x]

[Out] x/(2*Sqrt[1 - x^4]) - EllipticF[ArcSin[x], -1]/2
```

Rubi in Sympy [A] time = 2.86768, size = 19, normalized size = 0.76

$$\frac{x}{2\sqrt{-x^4+1}}-\frac{F\left(\operatorname{asin}(x)\middle|-1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(-x**4+1)**(3/2),x)

[Out] x/(2*sqrt(-x**4 + 1)) - elliptic_f(asin(x), -1)/2
```

Mathematica [A] time = 0.0393378, size = 24, normalized size = 0.96

$$\frac{1}{2}\left(\frac{x}{\sqrt{1-x^4}}-F\left(\sin^{-1}(x)\middle|-1\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(1 - x^4)^(3/2),x]

[Out] (x/Sqrt[1 - x^4] - EllipticF[ArcSin[x], -1])/2
```

Maple [B] time = 0.013, size = 45, normalized size = 1.8

$$\frac{x}{2}\frac{1}{\sqrt{-x^4+1}}-\frac{EllipticF(x,i)}{2}\sqrt{-x^2+1}\sqrt{x^2+1}\frac{1}{\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(-x^4+1)^(3/2),x)
```

```
[Out] 1/2*x/(-x^4+1)^(1/2)-1/2*(-x^2+1)^(1/2)*(x^2+1)^(1/2)/(-x^4+1)^(1
/2)*EllipticF(x,I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{(-x^4+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(-x^4 + 1)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^4/(-x^4 + 1)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{x^4}{(x^4-1)\sqrt{-x^4+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(-x^4 + 1)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(-x^4/((x^4 - 1)*sqrt(-x^4 + 1)), x)
```

Sympy [A] time = 2.00247, size = 31, normalized size = 1.24

$$\frac{x^5\,\Gamma\left(\frac{5}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{5}{4},\frac{3}{2}\\ \frac{9}{4}\end{matrix}\middle|x^4e^{2i\pi}\right)}{4\,\Gamma\left(\frac{9}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4/(-x**4+1)**(3/2),x)
```

```
[Out] x**5*gamma(5/4)*hyper((5/4, 3/2), (9/4,), x**4*exp_polar(2*I*pi))
/(4*gamma(9/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{(-x^4+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(-x^4 + 1)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^4/(-x^4 + 1)^(3/2), x)
```

3.905 $\int \frac{1}{(1-x^4)^{3/2}}\,dx$

Optimal. Leaf size=25

$$\frac{x}{2\sqrt{1-x^4}}+\frac{1}{2}F\left(\sin^{-1}(x)\middle|-1\right)$$

```
[Out] x/(2*Sqrt[1 - x^4]) + EllipticF[ArcSin[x], -1]/2
```

Rubi [A] time = 0.0113872, antiderivative size = 25, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{x}{2\sqrt{1-x^4}}+\frac{1}{2}F\left(\sin^{-1}(x)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[(1 - x^4)^(-3/2),x]

[Out] x/(2*Sqrt[1 - x^4]) + EllipticF[ArcSin[x], -1]/2
```

Rubi in Sympy [A] time = 1.17715, size = 19, normalized size = 0.76

$$\frac{x}{2\sqrt{-x^4+1}}+\frac{F\left(\operatorname{asin}(x)\middle|-1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(-x**4+1)**(3/2),x)

[Out] x/(2*sqrt(-x**4 + 1)) + elliptic_f(asin(x), -1)/2
```

Mathematica [A] time = 0.0316185, size = 22, normalized size = 0.88

$$\frac{1}{2}\left(\frac{x}{\sqrt{1-x^4}}+F\left(\sin^{-1}(x)\middle|-1\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(1 - x^4)^(-3/2),x]

[Out] (x/Sqrt[1 - x^4] + EllipticF[ArcSin[x], -1])/2
```

Maple [B] time = 0.012, size = 45, normalized size = 1.8

$$\frac{x}{2}\frac{1}{\sqrt{-x^4+1}}+\frac{\mathit{EllipticF}(x,i)}{2}\sqrt{-x^2+1}\sqrt{x^2+1}\frac{1}{\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(-x^4+1)^(3/2),x)
```

```
[Out] 1/2*x/(-x^4+1)^(1/2)+1/2*(-x^2+1)^(1/2)*(x^2+1)^(1/2)/(-x^4+1)^(1
/2)*EllipticF(x,I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(-x^4+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-x^4 + 1)^(-3/2),x, algorithm="maxima")
```

```
[Out] integrate((-x^4 + 1)^(-3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{1}{(x^4-1)\sqrt{-x^4+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-x^4 + 1)^(-3/2),x, algorithm="fricas")
```

```
[Out] integral(-1/((x^4 - 1)*sqrt(-x^4 + 1)), x)
```

Sympy [A] time = 1.90273, size = 29, normalized size = 1.16

$$\frac{x\Gamma\left(\frac{1}{4}\right) {}_2F_1\left(\begin{matrix}\frac{1}{4},\frac{3}{2}\\\frac{5}{4}\end{matrix}\middle| x^4e^{2i\pi}\right)}{4\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(-x**4+1)**(3/2),x)
```

```
[Out] x*gamma(1/4)*hyper((1/4, 3/2), (5/4,), x**4*exp_polar(2*I*pi))/(4
*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(-x^4+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-x^4 + 1)^(-3/2),x, algorithm="giac")
```

```
[Out] integrate((-x^4 + 1)^(-3/2), x)
```

3.906 $\int \frac{1}{x^4(1-x^4)^{3/2}}\,dx$

Optimal. Leaf size=45

$$-\frac{5\sqrt{1-x^4}}{6x^3}+\frac{1}{2x^3\sqrt{1-x^4}}+\frac{5}{6}F\left(\sin^{-1}(x)\middle|-1\right)$$

```
[Out] 1/(2*x^3*Sqrt[1 - x^4]) - (5*Sqrt[1 - x^4])/(6*x^3) + (5*Elliptic
F[ArcSin[x], -1])/6
```

Rubi [A] time = 0.034282, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{5\sqrt{1-x^4}}{6x^3}+\frac{1}{2x^3\sqrt{1-x^4}}+\frac{5}{6}F\left(\sin^{-1}(x)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*(1 - x^4)^(3/2)),x]
```

```
[Out] 1/(2*x^3*Sqrt[1 - x^4]) - (5*Sqrt[1 - x^4])/(6*x^3) + (5*Elliptic
F[ArcSin[x], -1])/6
```

Rubi in Sympy [A] time = 4.41573, size = 39, normalized size = 0.87

$$\frac{5F\left(\operatorname{asin}(x)\middle|-1\right)}{6}-\frac{5\sqrt{-x^4+1}}{6x^3}+\frac{1}{2x^3\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(-x**4+1)**(3/2),x)
```

```
[Out] 5*elliptic_f(asin(x), -1)/6 - 5*sqrt(-x**4 + 1)/(6*x**3) + 1/(2*x
**3*sqrt(-x**4 + 1))
```

Mathematica [A] time = 0.0607152, size = 33, normalized size = 0.73

$$\frac{1}{6}\left(\frac{5x^4-2}{x^3\sqrt{1-x^4}}+5F\left(\sin^{-1}(x)\middle|-1\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*(1 - x^4)^(3/2)),x]
```

```
[Out] ((-2 + 5*x^4)/(x^3*Sqrt[1 - x^4]) + 5*EllipticF[ArcSin[x], -1])/6
```

Maple [A] time = 0.02, size = 59, normalized size = 1.3

$$\frac{x}{2}\frac{1}{\sqrt{-x^4+1}}-\frac{1}{3\,x^3}\sqrt{-x^4+1}+\frac{5\,\mathit{EllipticF}\left(x,i\right)}{6}\sqrt{-x^2+1}\sqrt{x^2+1}\frac{1}{\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(-x^4+1)^(3/2),x)
```

```
[Out] 1/2*x/(-x^4+1)^(1/2)-1/3*(-x^4+1)^(1/2)/x^3+5/6*(-x^2+1)^(1/2)*(x
^2+1)^(1/2)/(-x^4+1)^(1/2)*EllipticF(x,I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(-x^4+1)^{\frac{3}{2}}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-x^4 + 1)^(3/2)*x^4),x, algorithm="maxima")
```

```
[Out] integrate(1/((-x^4 + 1)^(3/2)*x^4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{1}{(x^8-x^4)\sqrt{-x^4+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-x^4 + 1)^(3/2)*x^4),x, algorithm="fricas")
```

```
[Out] integral(-1/((x^8 - x^4)*sqrt(-x^4 + 1)), x)
```

Sympy [A] time = 2.93578, size = 34, normalized size = 0.76

$$\frac{\Gamma\left(-\frac{3}{4}\right) {}_2F_1\left(\begin{matrix} -\frac{3}{4}, \frac{3}{2} \\ \frac{1}{4} \end{matrix}\middle| x^4 e^{2i\pi}\right)}{4x^3\,\Gamma\left(\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(-x**4+1)**(3/2),x)
```

```
[Out] gamma(-3/4)*hyper((-3/4, 3/2), (1/4,), x**4*exp_polar(2*I*pi))/(4
*x**3*gamma(1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(-x^4+1)^{\frac{3}{2}}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-x^4 + 1)^(3/2)*x^4),x, algorithm="giac")
```

```
[Out] integrate(1/((-x^4 + 1)^(3/2)*x^4), x)
```

3.907 $\int \frac{1}{x^8(1-x^4)^{3/2}}\,dx$

Optimal. Leaf size=63

$$-\frac{9\sqrt{1-x^4}}{14x^7}+\frac{1}{2x^7\sqrt{1-x^4}}-\frac{15\sqrt{1-x^4}}{14x^3}+\frac{15}{14}F\left(\sin^{-1}(x)\middle|-1\right)$$

```
[Out] 1/(2*x^7*Sqrt[1 - x^4]) - (9*Sqrt[1 - x^4])/(14*x^7) - (15*Sqrt[1
 - x^4])/(14*x^3) + (15*EllipticF[ArcSin[x], -1])/14
```

Rubi [A] time = 0.0517454, antiderivative size = 63, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{9\sqrt{1-x^4}}{14x^7}+\frac{1}{2x^7\sqrt{1-x^4}}-\frac{15\sqrt{1-x^4}}{14x^3}+\frac{15}{14}F\left(\sin^{-1}(x)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^8*(1 - x^4)^(3/2)),x]
```

```
[Out] 1/(2*x^7*Sqrt[1 - x^4]) - (9*Sqrt[1 - x^4])/(14*x^7) - (15*Sqrt[1
 - x^4])/(14*x^3) + (15*EllipticF[ArcSin[x], -1])/14
```

Rubi in Sympy [A] time = 5.65612, size = 54, normalized size = 0.86

$$\frac{15F\left(\operatorname{asin}(x)\middle|-1\right)}{14}-\frac{15\sqrt{-x^4+1}}{14x^3}-\frac{9\sqrt{-x^4+1}}{14x^7}+\frac{1}{2x^7\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**8/(-x**4+1)**(3/2),x)
```

```
[Out] 15*elliptic_f(asin(x), -1)/14 - 15*sqrt(-x**4 + 1)/(14*x**3) - 9*
sqrt(-x**4 + 1)/(14*x**7) + 1/(2*x**7*sqrt(-x**4 + 1))
```

Mathematica [A] time = 0.045149, size = 50, normalized size = 0.79

$$\frac{15x^8-6x^4+15\sqrt{1-x^4}x^7F\left(\sin^{-1}(x)\middle|-1\right)-2}{14x^7\sqrt{1-x^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^8*(1 - x^4)^(3/2)),x]
```

```
[Out] (-2 - 6*x^4 + 15*x^8 + 15*x^7*Sqrt[1 - x^4]*EllipticF[ArcSin[x],
-1])/(14*x^7*Sqrt[1 - x^4])
```

Maple [A] time = 0.023, size = 73, normalized size = 1.2

$$\frac{x}{2}\frac{1}{\sqrt{-x^4+1}}-\frac{1}{7x^7}\sqrt{-x^4+1}-\frac{4}{7x^3}\sqrt{-x^4+1}+\frac{15\,EllipticF(x,i)}{14}\sqrt{-x^2+1}\sqrt{x^2+1}\frac{1}{\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^8/(-x^4+1)^(3/2),x)
```

```
[Out] 1/2*x/(-x^4+1)^(1/2)-1/7*(-x^4+1)^(1/2)/x^7-4/7*(-x^4+1)^(1/2)/x^
3+15/14*(-x^2+1)^(1/2)*(x^2+1)^(1/2)/(-x^4+1)^(1/2)*EllipticF(x,I
)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(-x^4+1)^{\frac{3}{2}}x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-x^4 + 1)^(3/2)*x^8),x, algorithm="maxima")
```

```
[Out] integrate(1/((-x^4 + 1)^(3/2)*x^8), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{1}{(x^{12}-x^8)\sqrt{-x^4+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-x^4 + 1)^(3/2)*x^8),x, algorithm="fricas")
```

```
[Out] integral(-1/((x^12 - x^8)*sqrt(-x^4 + 1)), x)
```

Sympy [A] time = 5.94527, size = 37, normalized size = 0.59

$$\frac{\Gamma\left(-\frac{7}{4}\right) {}_2F_1\left(\begin{matrix} -\frac{7}{4}, \frac{3}{2} \\ -\frac{3}{4} \end{matrix}\middle| x^4 e^{2i\pi}\right)}{4x^7\,\Gamma\left(-\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**8/(-x**4+1)**(3/2),x)
```

```
[Out] gamma(-7/4)*hyper((-7/4, 3/2), (-3/4,), x**4*exp_polar(2*I*pi))/(
4*x**7*gamma(-3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(-x^4+1)^{\frac{3}{2}}x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-x^4 + 1)^(3/2)*x^8),x, algorithm="giac")
```

```
[Out] integrate(1/((-x^4 + 1)^(3/2)*x^8), x)
```

3.908 $\int \frac{x^{14}}{(1-x^4)^{3/2}}\,dx$

Optimal. Leaf size=71

$$\frac{x^{11}}{2\sqrt{1-x^4}}+\frac{11}{18}\sqrt{1-x^4}x^7+\frac{77}{90}\sqrt{1-x^4}x^3+\frac{77}{30}F\left(\sin^{-1}(x)\middle|-1\right)-\frac{77}{30}E\left(\sin^{-1}(x)\middle|-1\right)$$

```
[Out] x^11/(2*Sqrt[1 - x^4]) + (77*x^3*Sqrt[1 - x^4])/90 + (11*x^7*Sqrt
[1 - x^4])/18 - (77*EllipticE[ArcSin[x], -1])/30 + (77*EllipticF[
ArcSin[x], -1])/30
```

Rubi [A] time = 0.0916057, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$\frac{x^{11}}{2\sqrt{1-x^4}}+\frac{11}{18}\sqrt{1-x^4}x^7+\frac{77}{90}\sqrt{1-x^4}x^3+\frac{77}{30}F\left(\sin^{-1}(x)\middle|-1\right)-\frac{77}{30}E\left(\sin^{-1}(x)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^14/(1 - x^4)^(3/2),x]
```

```
[Out] x^11/(2*Sqrt[1 - x^4]) + (77*x^3*Sqrt[1 - x^4])/90 + (11*x^7*Sqrt
[1 - x^4])/18 - (77*EllipticE[ArcSin[x], -1])/30 + (77*EllipticF[
ArcSin[x], -1])/30
```

Rubi in Sympy [A] time = 13.4833, size = 63, normalized size = 0.89

$$\frac{x^{11}}{2\sqrt{-x^4+1}}+\frac{11x^7\sqrt{-x^4+1}}{18}+\frac{77x^3\sqrt{-x^4+1}}{90}-\frac{77E\left(\operatorname{asin}(x)\middle|-1\right)}{30}+\frac{77F\left(\operatorname{asin}(x)\middle|-1\right)}{30}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**14/(-x**4+1)**(3/2),x)
```

```
[Out] x**11/(2*sqrt(-x**4 + 1)) + 11*x**7*sqrt(-x**4 + 1)/18 + 77*x**3*
sqrt(-x**4 + 1)/90 - 77*elliptic_e(asin(x), -1)/30 + 77*elliptic_
f(asin(x), -1)/30
```

Mathematica [A] time = 0.0844563, size = 44, normalized size = 0.62

$$\frac{1}{90}\left(\frac{\left(-10x^8-22x^4+77\right)x^3}{\sqrt{1-x^4}}+231F\left(\sin^{-1}(x)\middle|-1\right)-231E\left(\sin^{-1}(x)\middle|-1\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^14/(1 - x^4)^(3/2),x]
```

```
[Out] ((x^3*(77 - 22*x^4 - 10*x^8))/Sqrt[1 - x^4] - 231*EllipticE[ArcSi
n[x], -1] + 231*EllipticF[ArcSin[x], -1])/90
```

Maple [A] time = 0.016, size = 82, normalized size = 1.2

$$\frac{x^3}{2}\frac{1}{\sqrt{-x^4+1}}+\frac{x^7}{9}\sqrt{-x^4+1}+\frac{16\,x^3}{45}\sqrt{-x^4+1}+\frac{77\,EllipticF\,(x,i)-77\,EllipticE\,(x,i)}{30}\sqrt{-x^2+1}\sqrt{x^2+1}\frac{1}{\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^14/(-x^4+1)^(3/2),x)
```

```
[Out] 1/2*x^3/(-x^4+1)^(1/2)+1/9*x^7*(-x^4+1)^(1/2)+16/45*x^3*(-x^4+1)^
(1/2)+77/30*(-x^2+1)^(1/2)*(x^2+1)^(1/2)/(-x^4+1)^(1/2)*(Elliptic
F(x,I)-EllipticE(x,I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{14}}{(-x^4+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^14/(-x^4 + 1)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^14/(-x^4 + 1)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{x^{14}}{(x^4-1)\sqrt{-x^4+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^14/(-x^4 + 1)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(-x^14/((x^4 - 1)*sqrt(-x^4 + 1)), x)
```

Sympy [A] time = 8.63156, size = 31, normalized size = 0.44

$$\frac{x^{15}\,\Gamma\left(\frac{15}{4}\right)\,{}_2F_1\left(\left.\begin{matrix}\frac{3}{2}, \frac{15}{4}\\ \frac{19}{4}\end{matrix}\right| x^4 e^{2i\pi}\right)}{4\,\Gamma\left(\frac{19}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**14/(-x**4+1)**(3/2),x)
```

```
[Out] x**15*gamma(15/4)*hyper((3/2, 15/4), (19/4,), x**4*exp_polar(2*I*
pi))/(4*gamma(19/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{14}}{(-x^4+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^14/(-x^4 + 1)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^14/(-x^4 + 1)^(3/2), x)
```

3.909 $\int \frac{x^{10}}{(1-x^4)^{3/2}}\,dx$

Optimal. Leaf size=53

$$\frac{x^7}{2\sqrt{1-x^4}}+\frac{7}{10}\sqrt{1-x^4}x^3+\frac{21}{10}F\left(\sin^{-1}(x)\middle|-1\right)-\frac{21}{10}E\left(\sin^{-1}(x)\middle|-1\right)$$

```
[Out] x^7/(2*Sqrt[1 - x^4]) + (7*x^3*Sqrt[1 - x^4])/10 - (21*EllipticE[
ArcSin[x], -1])/10 + (21*EllipticF[ArcSin[x], -1])/10
```

Rubi [A] time = 0.0760235, antiderivative size = 53, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$\frac{x^7}{2\sqrt{1-x^4}}+\frac{7}{10}\sqrt{1-x^4}x^3+\frac{21}{10}F\left(\sin^{-1}(x)\middle|-1\right)-\frac{21}{10}E\left(\sin^{-1}(x)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^10/(1 - x^4)^(3/2),x]
```

```
[Out] x^7/(2*Sqrt[1 - x^4]) + (7*x^3*Sqrt[1 - x^4])/10 - (21*EllipticE[
ArcSin[x], -1])/10 + (21*EllipticF[ArcSin[x], -1])/10
```

Rubi in Sympy [A] time = 12.3158, size = 48, normalized size = 0.91

$$\frac{x^7}{2\sqrt{-x^4+1}}+\frac{7x^3\sqrt{-x^4+1}}{10}-\frac{21E\left(\operatorname{asin}(x)|-1\right)}{10}+\frac{21F\left(\operatorname{asin}(x)|-1\right)}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**10/(-x**4+1)**(3/2),x)
```

```
[Out] x**7/(2*sqrt(-x**4 + 1)) + 7*x**3*sqrt(-x**4 + 1)/10 - 21*ellipti
c_e(asin(x), -1)/10 + 21*elliptic_f(asin(x), -1)/10
```

Mathematica [A] time = 0.0639899, size = 49, normalized size = 0.92

$$\frac{1}{10}\left(-\frac{2x^7}{\sqrt{1-x^4}}+\frac{7x^3}{\sqrt{1-x^4}}+21F\left(\sin^{-1}(x)\middle|-1\right)-21E\left(\sin^{-1}(x)\middle|-1\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^10/(1 - x^4)^(3/2),x]
```

```
[Out] ((7*x^3)/Sqrt[1 - x^4] - (2*x^7)/Sqrt[1 - x^4] - 21*EllipticE[Arc
Sin[x], -1] + 21*EllipticF[ArcSin[x], -1])/10
```

Maple [A] time = 0.016, size = 68, normalized size = 1.3

$$\frac{x^3}{2}\frac{1}{\sqrt{-x^4+1}}+\frac{x^3}{5}\sqrt{-x^4+1}+\frac{21\,\mathit{EllipticF}\left(x,i\right)-21\,\mathit{EllipticE}\left(x,i\right)}{10}\sqrt{-x^2+1}\sqrt{x^2+1}\frac{1}{\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^10/(-x^4+1)^(3/2),x)
```

```
[Out] 1/2*x^3/(-x^4+1)^(1/2)+1/5*x^3*(-x^4+1)^(1/2)+21/10*(-x^2+1)^(1/2
)*(x^2+1)^(1/2)/(-x^4+1)^(1/2)*(EllipticF(x,I)-EllipticE(x,I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{10}}{(-x^4+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/(-x^4 + 1)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^10/(-x^4 + 1)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{x^{10}}{(x^4-1)\sqrt{-x^4+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/(-x^4 + 1)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(-x^10/((x^4 - 1)*sqrt(-x^4 + 1)), x)
```

Sympy [A] time = 4.22732, size = 31, normalized size = 0.58

$$\frac{x^{11}\left(\frac{11}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{3}{2},\frac{11}{4}\\ \frac{15}{4}\end{matrix}\middle| x^4e^{2i\pi}\right)}{4\left(\frac{15}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**10/(-x**4+1)**(3/2),x)
```

```
[Out] x**11*gamma(11/4)*hyper((3/2, 11/4), (15/4,), x**4*exp_polar(2*I*
pi))/(4*gamma(15/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{10}}{(-x^4+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/(-x^4 + 1)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^10/(-x^4 + 1)^(3/2), x)
```

3.910 $\int \frac{x^6}{(1-x^4)^{3/2}}\,dx$

Optimal. Leaf size=35

$$\frac{x^3}{2\sqrt{1-x^4}}+\frac{3}{2}F\left(\sin^{-1}(x)\middle|-1\right)-\frac{3}{2}E\left(\sin^{-1}(x)\middle|-1\right)$$

```
[Out] x^3/(2*Sqrt[1 - x^4]) - (3*EllipticE[ArcSin[x], -1])/2 + (3*Ellip
ticF[ArcSin[x], -1])/2
```

Rubi [A] time = 0.0606169, antiderivative size = 35, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{x^3}{2\sqrt{1-x^4}}+\frac{3}{2}F\left(\sin^{-1}(x)\middle|-1\right)-\frac{3}{2}E\left(\sin^{-1}(x)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/(1 - x^4)^(3/2),x]
```

```
[Out] x^3/(2*Sqrt[1 - x^4]) - (3*EllipticE[ArcSin[x], -1])/2 + (3*Ellip
ticF[ArcSin[x], -1])/2
```

Rubi in Sympy [A] time = 11.0147, size = 32, normalized size = 0.91

$$\frac{x^3}{2\sqrt{-x^4+1}}-\frac{3E\left(\operatorname{asin}(x)\middle|-1\right)}{2}+\frac{3F\left(\operatorname{asin}(x)\middle|-1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(-x**4+1)**(3/2),x)
```

```
[Out] x**3/(2*sqrt(-x**4 + 1)) - 3*elliptic_e(asin(x), -1)/2 + 3*ellipt
ic_f(asin(x), -1)/2
```

Mathematica [A] time = 0.0572107, size = 32, normalized size = 0.91

$$\frac{1}{2}\left(\frac{x^3}{\sqrt{1-x^4}}+3F\left(\sin^{-1}(x)\middle|-1\right)-3E\left(\sin^{-1}(x)\middle|-1\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6/(1 - x^4)^(3/2),x]
```

```
[Out] (x^3/Sqrt[1 - x^4] - 3*EllipticE[ArcSin[x], -1] + 3*EllipticF[Arc
Sin[x], -1])/2
```

Maple [A] time = 0.014, size = 54, normalized size = 1.5

$$\frac{x^3}{2}\frac{1}{\sqrt{-x^4+1}}+\frac{3\,EllipticF(x,i)-3\,EllipticE(x,i)}{2}\sqrt{-x^2+1}\sqrt{x^2+1}\frac{1}{\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^6/(-x^4+1)^(3/2),x)
```

```
[Out] 1/2*x^3/(-x^4+1)^(1/2)+3/2*(-x^2+1)^(1/2)*(x^2+1)^(1/2)/(-x^4+1)^
(1/2)*(EllipticF(x,I)-EllipticE(x,I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{(-x^4+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^6/(-x^4 + 1)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^6/(-x^4 + 1)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{x^6}{(x^4-1)\sqrt{-x^4+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^6/(-x^4 + 1)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(-x^6/((x^4 - 1)*sqrt(-x^4 + 1)), x)
```

Sympy [A] time = 2.38722, size = 31, normalized size = 0.89

$$\frac{x^7 \Gamma\left(\frac{7}{4}\right) {}_2F_1\left(\begin{matrix} \frac{3}{2}, \frac{7}{4} \\ \frac{11}{4} \end{matrix}\middle| x^4 e^{2i\pi}\right)}{4\Gamma\left(\frac{11}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**6/(-x**4+1)**(3/2),x)
```

```
[Out] x**7*gamma(7/4)*hyper((3/2, 7/4), (11/4,), x**4*exp_polar(2*I*pi)
)/(4*gamma(11/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{(-x^4+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^6/(-x^4 + 1)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^6/(-x^4 + 1)^(3/2), x)
```

3.911 $\int \frac{x^2}{(1-x^4)^{3/2}}\,dx$

Optimal. Leaf size=35

$$\frac{x^3}{2\sqrt{1-x^4}}+\frac{1}{2}F\left(\sin^{-1}(x)\middle|-1\right)-\frac{1}{2}E\left(\sin^{-1}(x)\middle|-1\right)$$

```
[Out] x^3/(2*Sqrt[1 - x^4]) - EllipticE[ArcSin[x], -1]/2 + EllipticF[Ar
cSin[x], -1]/2
```

Rubi [A] time = 0.0600672, antiderivative size = 35, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{x^3}{2\sqrt{1-x^4}}+\frac{1}{2}F\left(\sin^{-1}(x)\middle|-1\right)-\frac{1}{2}E\left(\sin^{-1}(x)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(1 - x^4)^(3/2),x]
```

```
[Out] x^3/(2*Sqrt[1 - x^4]) - EllipticE[ArcSin[x], -1]/2 + EllipticF[Ar
cSin[x], -1]/2
```

Rubi in Sympy [A] time = 10.9784, size = 29, normalized size = 0.83

$$\frac{x^3}{2\sqrt{-x^4+1}}-\frac{E\left(\operatorname{asin}(x)\middle|-1\right)}{2}+\frac{F\left(\operatorname{asin}(x)\middle|-1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(-x**4+1)**(3/2),x)
```

```
[Out] x**3/(2*sqrt(-x**4 + 1)) - elliptic_e(asin(x), -1)/2 + elliptic_f
(asin(x), -1)/2
```

Mathematica [A] time = 0.0506911, size = 30, normalized size = 0.86

$$\frac{1}{2}\left(\frac{x^3}{\sqrt{1-x^4}}+F\left(\sin^{-1}(x)\middle|-1\right)-E\left(\sin^{-1}(x)\middle|-1\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(1 - x^4)^(3/2),x]
```

```
[Out] (x^3/Sqrt[1 - x^4] - EllipticE[ArcSin[x], -1] + EllipticF[ArcSin[
x], -1])/2
```

Maple [A] time = 0.014, size = 54, normalized size = 1.5

$$\frac{x^3}{2}\frac{1}{\sqrt{-x^4+1}}+\frac{\mathit{EllipticF}(x,i)-\mathit{EllipticE}(x,i)}{2}\sqrt{-x^2+1}\sqrt{x^2+1}\frac{1}{\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(-x^4+1)^(3/2),x)
```

```
[Out] 1/2*x^3/(-x^4+1)^(1/2)+1/2*(-x^2+1)^(1/2)*(x^2+1)^(1/2)/(-x^4+1)^
(1/2)*(EllipticF(x,I)-EllipticE(x,I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{(-x^4+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(-x^4 + 1)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^2/(-x^4 + 1)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{x^2}{(x^4-1)\sqrt{-x^4+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(-x^4 + 1)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(-x^2/((x^4 - 1)*sqrt(-x^4 + 1)), x)
```

Sympy [A] time = 1.93959, size = 31, normalized size = 0.89

$$\frac{x^3\left(\frac{3}{4}\right)\,{}_2F_1\left(\left.\begin{matrix}\frac{3}{4},\frac{3}{2}\\ \frac{7}{4}\end{matrix}\right| x^4e^{2i\pi}\right)}{4\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(-x**4+1)**(3/2),x)
```

```
[Out] x**3*gamma(3/4)*hyper((3/4, 3/2), (7/4,), x**4*exp_polar(2*I*pi))
/(4*gamma(7/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{(-x^4+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(-x^4 + 1)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^2/(-x^4 + 1)^(3/2), x)
```

3.912 $\int \frac{1}{x^2(1-x^4)^{3/2}}\,dx$

Optimal. Leaf size=53

$$-\frac{3\sqrt{1-x^4}}{2x}+\frac{1}{2x\sqrt{1-x^4}}+\frac{3}{2}F\left(\sin^{-1}(x)\middle|-1\right)-\frac{3}{2}E\left(\sin^{-1}(x)\middle|-1\right)$$

```
[Out] 1/(2*x*Sqrt[1 - x^4]) - (3*Sqrt[1 - x^4])/(2*x) - (3*EllipticE[Ar
cSin[x], -1])/2 + (3*EllipticF[ArcSin[x], -1])/2
```

Rubi [A] time = 0.0712506, antiderivative size = 53, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$-\frac{3\sqrt{1-x^4}}{2x}+\frac{1}{2x\sqrt{1-x^4}}+\frac{3}{2}F\left(\sin^{-1}(x)\middle|-1\right)-\frac{3}{2}E\left(\sin^{-1}(x)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(1 - x^4)^(3/2)),x]
```

```
[Out] 1/(2*x*Sqrt[1 - x^4]) - (3*Sqrt[1 - x^4])/(2*x) - (3*EllipticE[Ar
cSin[x], -1])/2 + (3*EllipticF[ArcSin[x], -1])/2
```

Rubi in Sympy [A] time = 12.1127, size = 46, normalized size = 0.87

$$-\frac{3E\left(\operatorname{asin}(x)\middle|-1\right)}{2}+\frac{3F\left(\operatorname{asin}(x)\middle|-1\right)}{2}-\frac{3\sqrt{-x^4+1}}{2x}+\frac{1}{2x\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(-x**4+1)**(3/2),x)
```

```
[Out] -3*elliptic_e(asin(x), -1)/2 + 3*elliptic_f(asin(x), -1)/2 - 3*sq
rt(-x**4 + 1)/(2*x) + 1/(2*x*sqrt(-x**4 + 1))
```

Mathematica [A] time = 0.0641217, size = 49, normalized size = 0.92

$$\frac{1}{2}\left(-\frac{2}{\sqrt{1-x^4}x}+\frac{3x^3}{\sqrt{1-x^4}}+3F\left(\sin^{-1}(x)\middle|-1\right)-3E\left(\sin^{-1}(x)\middle|-1\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*(1 - x^4)^(3/2)),x]
```

```
[Out] (-2/(x*Sqrt[1 - x^4]) + (3*x^3)/Sqrt[1 - x^4] - 3*EllipticE[ArcSi
n[x], -1] + 3*EllipticF[ArcSin[x], -1])/2
```

Maple [A] time = 0.019, size = 68, normalized size = 1.3

$$\frac{x^3}{2}\frac{1}{\sqrt{-x^4+1}}-\frac{1}{x}\sqrt{-x^4+1}+\frac{3\,EllipticF(x,i)-3\,EllipticE(x,i)}{2}\sqrt{-x^2+1}\sqrt{x^2+1}\frac{1}{\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(-x^4+1)^(3/2),x)
```

```
[Out] 1/2*x^3/(-x^4+1)^(1/2)-(-x^4+1)^(1/2)/x+3/2*(-x^2+1)^(1/2)*(x^2+1
)^(1/2)/(-x^4+1)^(1/2)*(EllipticF(x,I)-EllipticE(x,I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(-x^4+1)^{\frac{3}{2}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-x^4 + 1)^(3/2)*x^2),x, algorithm="maxima")
```

```
[Out] integrate(1/((-x^4 + 1)^(3/2)*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{1}{(x^6-x^2)\sqrt{-x^4+1}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-x^4 + 1)^(3/2)*x^2),x, algorithm="fricas")
```

```
[Out] integral(-1/((x^6 - x^2)*sqrt(-x^4 + 1)), x)
```

Sympy [A] time = 2.45739, size = 32, normalized size = 0.6

$$\frac{\Gamma\left(-\frac{1}{4}\right) {}_2F_1\left(\begin{matrix}-\frac{1}{4},\frac{3}{2}\\ \frac{3}{4}\end{matrix}\middle| x^4e^{2i\pi}\right)}{4x\Gamma\left(\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(-x**4+1)**(3/2),x)
```

```
[Out] gamma(-1/4)*hyper((-1/4, 3/2), (3/4,), x**4*exp_polar(2*I*pi))/(4
*x*gamma(3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(-x^4+1)^{\frac{3}{2}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-x^4 + 1)^(3/2)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/((-x^4 + 1)^(3/2)*x^2), x)
```

3.913 $\int \frac{1}{x^6(1-x^4)^{3/2}} dx$

Optimal. Leaf size=71

$$-\frac{21\sqrt{1-x^4}}{10x}-\frac{7\sqrt{1-x^4}}{10x^5}+\frac{1}{2x^5\sqrt{1-x^4}}+\frac{21}{10}F\left(\sin^{-1}(x)\middle|-1\right)-\frac{21}{10}E\left(\sin^{-1}(x)\middle|-1\right)$$

```
[Out] 1/(2*x^5*Sqrt[1 - x^4]) - (7*Sqrt[1 - x^4])/(10*x^5) - (21*Sqrt[1
 - x^4])/(10*x) - (21*EllipticE[ArcSin[x], -1])/10 + (21*Elliptic
F[ArcSin[x], -1])/10
```

Rubi [A] time = 0.0884827, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$-\frac{21\sqrt{1-x^4}}{10x}-\frac{7\sqrt{1-x^4}}{10x^5}+\frac{1}{2x^5\sqrt{1-x^4}}+\frac{21}{10}F\left(\sin^{-1}(x)\middle|-1\right)-\frac{21}{10}E\left(\sin^{-1}(x)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^6*(1 - x^4)^(3/2)),x]
```


```
[Out] 1/(2*x^5*Sqrt[1 - x^4]) - (7*Sqrt[1 - x^4])/(10*x^5) - (21*Sqrt[1
 - x^4])/(10*x) - (21*EllipticE[ArcSin[x], -1])/10 + (21*Elliptic
F[ArcSin[x], -1])/10
```

Rubi in Sympy [A] time = 13.3491, size = 63, normalized size = 0.89

$$-\frac{21E\left(\operatorname{asin}(x)\middle|-1\right)}{10}+\frac{21F\left(\operatorname{asin}(x)\middle|-1\right)}{10}-\frac{21\sqrt{-x^4+1}}{10x}-\frac{7\sqrt{-x^4+1}}{10x^5}+\frac{1}{2x^5\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**6/(-x**4+1)**(3/2),x)
```

```
[Out] -21*elliptic_e(asin(x), -1)/10 + 21*elliptic_f(asin(x), -1)/10 -
21*sqrt(-x**4 + 1)/(10*x) - 7*sqrt(-x**4 + 1)/(10*x**5) + 1/(2*x*
*5*sqrt(-x**4 + 1))
```

Mathematica [A] time = 0.0677026, size = 70, normalized size = 0.99

$$-\frac{-21x^8+14x^4-21\sqrt{1-x^4}x^5F\left(\sin^{-1}(x)\middle|-1\right)+21\sqrt{1-x^4}x^5E\left(\sin^{-1}(x)\middle|-1\right)+2}{10x^5\sqrt{1-x^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^6*(1 - x^4)^(3/2)),x]
```

```
[Out] -(2 + 14*x^4 - 21*x^8 + 21*x^5*Sqrt[1 - x^4]*EllipticE[ArcSin[x],
 -1] - 21*x^5*Sqrt[1 - x^4]*EllipticF[ArcSin[x], -1])/(10*x^5*Sqr
t[1 - x^4])
```

Maple [A] time = 0.023, size = 82, normalized size = 1.2

$$\frac{x^3}{2}\frac{1}{\sqrt{-x^4+1}}-\frac{1}{5x^5}\sqrt{-x^4+1}-\frac{8}{5x}\sqrt{-x^4+1}+\frac{21\,EllipticF(x,i)-21\,EllipticE(x,i)}{10}\sqrt{-x^2+1}\sqrt{x^2+1}\frac{1}{\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^6/(-x^4+1)^(3/2),x)
```

```
[Out] 1/2*x^3/(-x^4+1)^(1/2)-1/5*(-x^4+1)^(1/2)/x^5-8/5*(-x^4+1)^(1/2)/
x+21/10*(-x^2+1)^(1/2)*(x^2+1)^(1/2)/(-x^4+1)^(1/2)*(EllipticF(x,
I)-EllipticE(x,I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{(-x^4+1)^{\frac{3}{2}}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-x^4 + 1)^(3/2)*x^6),x, algorithm="maxima")
```

```
[Out] integrate(1/((-x^4 + 1)^(3/2)*x^6), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{1}{(x^{10}-x^6)\sqrt{-x^4+1}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-x^4 + 1)^(3/2)*x^6),x, algorithm="fricas")
```

```
[Out] integral(-1/((x^10 - x^6)*sqrt(-x^4 + 1)), x)
```

Sympy [A] time = 4.12242, size = 37, normalized size = 0.52

$$\frac{\Gamma\left(-\frac{5}{4}\right){}_2F_1\left(\begin{matrix}-\frac{5}{4},\frac{3}{2}\\-\frac{1}{4}\end{matrix}\middle|x^4e^{2i\pi}\right)}{4x^5\,\Gamma\left(-\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**6/(-x**4+1)**(3/2),x)
```

```
[Out] gamma(-5/4)*hyper((-5/4, 3/2), (-1/4,), x**4*exp_polar(2*I*pi))/(
4*x**5*gamma(-1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{(-x^4+1)^{\frac{3}{2}}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-x^4 + 1)^(3/2)*x^6),x, algorithm="giac")
```

```
[Out] integrate(1/((-x^4 + 1)^(3/2)*x^6), x)
```

3.914 $\int \frac{1}{(1-x^4)^{5/2}}\,dx$

Optimal. Leaf size=41

$$\frac{5x}{12\sqrt{1-x^4}}+\frac{x}{6(1-x^4)^{3/2}}+\frac{5}{12}F\left(\sin^{-1}(x)\middle|-1\right)$$

```
[Out] x/(6*(1 - x^4)^(3/2)) + (5*x)/(12*Sqrt[1 - x^4]) + (5*EllipticF[A
rcSin[x], -1])/12
```

Rubi [A] time = 0.0185232, antiderivative size = 41, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{5x}{12\sqrt{1-x^4}}+\frac{x}{6(1-x^4)^{3/2}}+\frac{5}{12}F\left(\sin^{-1}(x)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In] Int[(1 - x^4)^(-5/2),x]
```

```
[Out] x/(6*(1 - x^4)^(3/2)) + (5*x)/(12*Sqrt[1 - x^4]) + (5*EllipticF[A
rcSin[x], -1])/12
```

Rubi in Sympy [A] time = 1.42995, size = 34, normalized size = 0.83

$$\frac{5x}{12\sqrt{-x^4+1}}+\frac{x}{6\left(-x^4+1\right)^{\frac{3}{2}}}+\frac{5F\left(\operatorname{asin}(x)\middle|-1\right)}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(-x**4+1)**(5/2),x)
```

```
[Out] 5*x/(12*sqrt(-x**4 + 1)) + x/(6*(-x**4 + 1)**(3/2)) + 5*elliptic_
f(asin(x), -1)/12
```

Mathematica [A] time = 0.0666771, size = 41, normalized size = 1.

$$\frac{-5x^5+5\left(1-x^4\right)^{3/2}F\left(\sin^{-1}(x)\middle|-1\right)+7x}{12(1-x^4)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(1 - x^4)^(-5/2),x]
```

```
[Out] (7*x - 5*x^5 + 5*(1 - x^4)^(3/2)*EllipticF[ArcSin[x], -1])/(12*(1
 - x^4)^(3/2))
```

Maple [B] time = 0.013, size = 64, normalized size = 1.6

$$\frac{x}{6\left(x^4-1\right)^2}\sqrt{-x^4+1}+\frac{5x}{12}\frac{1}{\sqrt{-x^4+1}}+\frac{5\,EllipticF(x,i)}{12}\sqrt{-x^2+1}\sqrt{x^2+1}\frac{1}{\sqrt{-x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(-x^4+1)^(5/2),x)
```

```
[Out] 1/6*x*(-x^4+1)^(1/2)/(x^4-1)^2+5/12*x/(-x^4+1)^(1/2)+5/12*(-x^2+1
)^(1/2)*(x^2+1)^(1/2)/(-x^4+1)^(1/2)*EllipticF(x,I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(-x^4+1)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-x^4 + 1)^(-5/2),x, algorithm="maxima")
```

```
[Out] integrate((-x^4 + 1)^(-5/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(x^8-2\,x^4+1)\sqrt{-x^4+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-x^4 + 1)^(-5/2),x, algorithm="fricas")
```

```
[Out] integral(1/((x^8 - 2*x^4 + 1)*sqrt(-x^4 + 1)), x)
```

Sympy [A] time = 2.38035, size = 29, normalized size = 0.71

$$\frac{x\,\Gamma\left(\frac{1}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{4},\frac{5}{2}\\ \frac{5}{4}\end{matrix}\middle|\,x^4e^{2i\pi}\right)}{4\,\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(-x**4+1)**(5/2),x)
```

```
[Out] x*gamma(1/4)*hyper((1/4, 5/2), (5/4,), x**4*exp_polar(2*I*pi))/(4
*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(-x^4+1)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-x^4 + 1)^(-5/2),x, algorithm="giac")
```

```
[Out] integrate((-x^4 + 1)^(-5/2), x)
```

3.915 $\int \frac{x^{11}}{\sqrt{1+x^4}}\,dx$

Optimal. Leaf size=40

$$\frac{1}{10}\left(x^4+1\right)^{5/2}-\frac{1}{3}\left(x^4+1\right)^{3/2}+\frac{\sqrt{x^4+1}}{2}$$

```
[Out] Sqrt[1 + x^4]/2 - (1 + x^4)^(3/2)/3 + (1 + x^4)^(5/2)/10
```

Rubi [A] time = 0.0412065, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{1}{10}\left(x^4+1\right)^{5/2}-\frac{1}{3}\left(x^4+1\right)^{3/2}+\frac{\sqrt{x^4+1}}{2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11/Sqrt[1 + x^4],x]

[Out] Sqrt[1 + x^4]/2 - (1 + x^4)^(3/2)/3 + (1 + x^4)^(5/2)/10
```

Rubi in Sympy [A] time = 4.11713, size = 29, normalized size = 0.72

$$\frac{\left(x^4+1\right)^{\frac{5}{2}}}{10}-\frac{\left(x^4+1\right)^{\frac{3}{2}}}{3}+\frac{\sqrt{x^4+1}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11/(x**4+1)**(1/2),x)

[Out] (x**4 + 1)**(5/2)/10 - (x**4 + 1)**(3/2)/3 + sqrt(x**4 + 1)/2
```

Mathematica [A] time = 0.0147247, size = 25, normalized size = 0.62

$$\frac{1}{30}\sqrt{x^4+1}\left(3x^8-4x^4+8\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11/Sqrt[1 + x^4],x]

[Out] (Sqrt[1 + x^4]*(8 - 4*x^4 + 3*x^8))/30
```

Maple [A] time = 0.006, size = 22, normalized size = 0.6

$$\frac{3\,x^8-4\,x^4+8}{30}\sqrt{x^4+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11/(x^4+1)^(1/2),x)

[Out] 1/30*(x^4+1)^(1/2)*(3*x^8-4*x^4+8)
```

Maxima [A] time = 1.43604, size = 38, normalized size = 0.95

$$\frac{1}{10}\left(x^4+1\right)^{\frac{5}{2}}-\frac{1}{3}\left(x^4+1\right)^{\frac{3}{2}}+\frac{1}{2}\sqrt{x^4+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/sqrt(x^4 + 1),x, algorithm="maxima")
```

```
[Out] 1/10*(x^4 + 1)^(5/2) - 1/3*(x^4 + 1)^(3/2) + 1/2*sqrt(x^4 + 1)
```

Fricas [A] time = 0.265958, size = 28, normalized size = 0.7

$$\frac{1}{30}\left(3x^8-4x^4+8\right)\sqrt{x^4+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/sqrt(x^4 + 1),x, algorithm="fricas")
```

```
[Out] 1/30*(3*x^8 - 4*x^4 + 8)*sqrt(x^4 + 1)
```

Sympy [A] time = 4.08776, size = 39, normalized size = 0.98

$$\frac{x^8\sqrt{x^4+1}}{10}-\frac{2x^4\sqrt{x^4+1}}{15}+\frac{4\sqrt{x^4+1}}{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11/(x**4+1)**(1/2),x)
```

```
[Out] x**8*sqrt(x**4 + 1)/10 - 2*x**4*sqrt(x**4 + 1)/15 + 4*sqrt(x**4 +
 1)/15
```

GIAC/XCAS [A] time = 0.213109, size = 38, normalized size = 0.95

$$\frac{1}{10}\left(x^4+1\right)^{\frac{5}{2}}-\frac{1}{3}\left(x^4+1\right)^{\frac{3}{2}}+\frac{1}{2}\sqrt{x^4+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/sqrt(x^4 + 1),x, algorithm="giac")
```

```
[Out] 1/10*(x^4 + 1)^(5/2) - 1/3*(x^4 + 1)^(3/2) + 1/2*sqrt(x^4 + 1)
```

3.916 $\int \frac{x^7}{\sqrt{1+x^4}}\,dx$

Optimal. Leaf size=27

$$\frac{1}{6}\left(x^4+1\right)^{3/2}-\frac{\sqrt{x^4+1}}{2}$$

```
[Out] -Sqrt[1 + x^4]/2 + (1 + x^4)^(3/2)/6
```

Rubi [A] time = 0.0316514, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{1}{6}\left(x^4+1\right)^{3/2}-\frac{\sqrt{x^4+1}}{2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7/Sqrt[1 + x^4],x]

[Out] -Sqrt[1 + x^4]/2 + (1 + x^4)^(3/2)/6
```

Rubi in Sympy [A] time = 3.41998, size = 19, normalized size = 0.7

$$\frac{\left(x^4+1\right)^{\frac{3}{2}}}{6}-\frac{\sqrt{x^4+1}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7/(x**4+1)**(1/2),x)

[Out] (x**4 + 1)**(3/2)/6 - sqrt(x**4 + 1)/2
```

Mathematica [A] time = 0.00923823, size = 18, normalized size = 0.67

$$\frac{1}{6}\left(x^4-2\right)\sqrt{x^4+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^7/Sqrt[1 + x^4],x]

[Out] ((-2 + x^4)*Sqrt[1 + x^4])/6
```

Maple [A] time = 0.007, size = 15, normalized size = 0.6

$$\frac{x^4-2}{6}\sqrt{x^4+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7/(x^4+1)^(1/2),x)

[Out] 1/6*(x^4+1)^(1/2)*(x^4-2)
```

Maxima [A] time = 1.43838, size = 26, normalized size = 0.96

$$\frac{1}{6}\left(x^4+1\right)^{\frac{3}{2}}-\frac{1}{2}\sqrt{x^4+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(x^4 + 1),x, algorithm="maxima")
```

```
[Out] 1/6*(x^4 + 1)^(3/2) - 1/2*sqrt(x^4 + 1)
```

Fricas [A] time = 0.261307, size = 19, normalized size = 0.7

$$\frac{1}{6}\sqrt{x^4+1}\left(x^4-2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(x^4 + 1),x, algorithm="fricas")
```

```
[Out] 1/6*sqrt(x^4 + 1)*(x^4 - 2)
```

Sympy [A] time = 1.27964, size = 22, normalized size = 0.81

$$\frac{x^4\sqrt{x^4+1}}{6}-\frac{\sqrt{x^4+1}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(x**4+1)**(1/2),x)
```

```
[Out] x**4*sqrt(x**4 + 1)/6 - sqrt(x**4 + 1)/3
```

GIAC/XCAS [A] time = 0.210199, size = 26, normalized size = 0.96

$$\frac{1}{6}\left(x^4+1\right)^{\frac{3}{2}}-\frac{1}{2}\sqrt{x^4+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(x^4 + 1),x, algorithm="giac")
```

```
[Out] 1/6*(x^4 + 1)^(3/2) - 1/2*sqrt(x^4 + 1)
```

3.917 $\int \frac{x^3}{\sqrt{1+x^4}}\,dx$

Optimal. Leaf size=13

$$\frac{\sqrt{x^4+1}}{2}$$

```
[Out] Sqrt[1 + x^4]/2
```

Rubi [A] time = 0.00693403, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$\frac{\sqrt{x^4+1}}{2}$$

Antiderivative was successfully verified.

```
[In] Int[x^3/Sqrt[1 + x^4],x]

[Out] Sqrt[1 + x^4]/2
```

Rubi in Sympy [A] time = 1.62751, size = 8, normalized size = 0.62

$$\frac{\sqrt{x^4+1}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**3/(x**4+1)**(1/2),x)

[Out] sqrt(x**4 + 1)/2
```

Mathematica [A] time = 0.00453576, size = 13, normalized size = 1.

$$\frac{\sqrt{x^4+1}}{2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3/Sqrt[1 + x^4],x]

[Out] Sqrt[1 + x^4]/2
```

Maple [A] time = 0.006, size = 10, normalized size = 0.8

$$\frac{1}{2}\sqrt{x^4+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(x^4+1)^(1/2),x)

[Out] 1/2*(x^4+1)^(1/2)
```

Maxima [A] time = 1.43518, size = 12, normalized size = 0.92

$$\frac{1}{2}\sqrt{x^4+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(x^4 + 1),x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(x^4 + 1)
```

Fricas [A] time = 0.261994, size = 12, normalized size = 0.92

$$\frac{1}{2}\sqrt{x^4+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(x^4 + 1),x, algorithm="fricas")
```

```
[Out] 1/2*sqrt(x^4 + 1)
```

Sympy [A] time = 0.378164, size = 8, normalized size = 0.62

$$\frac{\sqrt{x^4+1}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(x**4+1)**(1/2),x)
```

```
[Out] sqrt(x**4 + 1)/2
```

GIAC/XCAS [A] time = 0.210733, size = 12, normalized size = 0.92

$$\frac{1}{2}\sqrt{x^4+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(x^4 + 1),x, algorithm="giac")
```

```
[Out] 1/2*sqrt(x^4 + 1)
```

3.918 $\int \frac{1}{x\sqrt{1+x^4}}\,dx$

Optimal. Leaf size=14

$$-\frac{1}{2}\tanh^{-1}\left(\sqrt{x^4+1}\right)$$

```
[Out] -ArcTanh[Sqrt[1 + x^4]]/2
```

Rubi [A] time = 0.0232999, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{1}{2}\tanh^{-1}\left(\sqrt{x^4+1}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*Sqrt[1 + x^4]),x]

[Out] -ArcTanh[Sqrt[1 + x^4]]/2
```

Rubi in Sympy [A] time = 3.21453, size = 12, normalized size = 0.86

$$-\frac{\operatorname{atanh}\left(\sqrt{x^4+1}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(x**4+1)**(1/2),x)

[Out] -atanh(sqrt(x**4 + 1))/2
```

Mathematica [A] time = 0.0303389, size = 14, normalized size = 1.

$$-\frac{1}{2}\tanh^{-1}\left(\sqrt{x^4+1}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*Sqrt[1 + x^4]),x]

[Out] -ArcTanh[Sqrt[1 + x^4]]/2
```

Maple [A] time = 0.012, size = 11, normalized size = 0.8

$$-\frac{1}{2}Artanh\left(\frac{1}{\sqrt{x^4+1}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(x^4+1)^(1/2),x)

[Out] -1/2*arctanh(1/(x^4+1)^(1/2))
```

Maxima [A] time = 1.43781, size = 34, normalized size = 2.43

$$-\frac{1}{4}\,\log\left(\sqrt{x^4+1}+1\right)+\frac{1}{4}\,\log\left(\sqrt{x^4+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 + 1)*x),x, algorithm="maxima")
```

```
[Out] -1/4*log(sqrt(x^4 + 1) + 1) + 1/4*log(sqrt(x^4 + 1) - 1)
```

Fricas [A] time = 0.271323, size = 34, normalized size = 2.43

$$-\frac{1}{4}\,\log\left(\sqrt{x^4+1}+1\right)+\frac{1}{4}\,\log\left(\sqrt{x^4+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 + 1)*x),x, algorithm="fricas")
```

```
[Out] -1/4*log(sqrt(x^4 + 1) + 1) + 1/4*log(sqrt(x^4 + 1) - 1)
```

Sympy [A] time = 3.25413, size = 8, normalized size = 0.57

$$-\frac{\operatorname{asinh}\left(\frac{1}{x^2}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(x**4+1)**(1/2),x)
```

```
[Out] -asinh(x**(-2))/2
```

GIAC/XCAS [A] time = 0.215251, size = 34, normalized size = 2.43

$$-\frac{1}{4}\ln\left(\sqrt{x^4+1}+1\right)+\frac{1}{4}\ln\left(\sqrt{x^4+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 + 1)*x),x, algorithm="giac")
```

```
[Out] -1/4*ln(sqrt(x^4 + 1) + 1) + 1/4*ln(sqrt(x^4 + 1) - 1)
```

3.919 $\int \frac{1}{x^5\sqrt{1+x^4}}\,dx$

Optimal. Leaf size=31

$$\frac{1}{4}\tanh^{-1}\left(\sqrt{x^4+1}\right)-\frac{\sqrt{x^4+1}}{4x^4}$$

```
[Out] -Sqrt[1 + x^4]/(4*x^4) + ArcTanh[Sqrt[1 + x^4]]/4
```

Rubi [A] time = 0.0358663, antiderivative size = 31, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{1}{4}\tanh^{-1}\left(\sqrt{x^4+1}\right)-\frac{\sqrt{x^4+1}}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^5*Sqrt[1 + x^4]),x]

[Out] -Sqrt[1 + x^4]/(4*x^4) + ArcTanh[Sqrt[1 + x^4]]/4
```

Rubi in Sympy [A] time = 3.95533, size = 24, normalized size = 0.77

$$\frac{\operatorname{atanh}\left(\sqrt{x^4+1}\right)}{4}-\frac{\sqrt{x^4+1}}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**5/(x**4+1)**(1/2),x)

[Out] atanh(sqrt(x**4 + 1))/4 - sqrt(x**4 + 1)/(4*x**4)
```

Mathematica [A] time = 0.0384936, size = 31, normalized size = 1.

$$\frac{1}{4}\tanh^{-1}\left(\sqrt{x^4+1}\right)-\frac{\sqrt{x^4+1}}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^5*Sqrt[1 + x^4]),x]

[Out] -Sqrt[1 + x^4]/(4*x^4) + ArcTanh[Sqrt[1 + x^4]]/4
```

Maple [A] time = 0.013, size = 24, normalized size = 0.8

$$-\frac{1}{4\,x^4}\sqrt{x^4+1}+\frac{1}{4}\mathit{Artanh}\left(\frac{1}{\sqrt{x^4+1}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^5/(x^4+1)^(1/2),x)
```

```
[Out] -1/4*(x^4+1)^(1/2)/x^4+1/4*arctanh(1/(x^4+1)^(1/2))
```

Maxima [A] time = 1.43835, size = 50, normalized size = 1.61

$$-\frac{\sqrt{x^4+1}}{4\,x^4}+\frac{1}{8}\,\log\left(\sqrt{x^4+1}+1\right)-\frac{1}{8}\,\log\left(\sqrt{x^4+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 + 1)*x^5),x, algorithm="maxima")
```

```
[Out] -1/4*sqrt(x^4 + 1)/x^4 + 1/8*log(sqrt(x^4 + 1) + 1) - 1/8*log(sqr
t(x^4 + 1) - 1)
```

Fricas [A] time = 0.260686, size = 59, normalized size = 1.9

$$\frac{x^4\log\left(\sqrt{x^4+1}+1\right)-x^4\log\left(\sqrt{x^4+1}-1\right)-2\,\sqrt{x^4+1}}{8\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 + 1)*x^5),x, algorithm="fricas")
```

```
[Out] 1/8*(x^4*log(sqrt(x^4 + 1) + 1) - x^4*log(sqrt(x^4 + 1) - 1) - 2*
sqrt(x^4 + 1))/x^4
```

Sympy [A] time = 6.29972, size = 22, normalized size = 0.71

$$\frac{\operatorname{asinh}\left(\frac{1}{x^2}\right)}{4}-\frac{\sqrt{1+\frac{1}{x^4}}}{4x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**5/(x**4+1)**(1/2),x)
```

```
[Out] asinh(x**(-2))/4 - sqrt(1 + x**(-4))/(4*x**2)
```

GIAC/XCAS [A] time = 0.227321, size = 50, normalized size = 1.61

$$-\frac{\sqrt{x^4+1}}{4\,x^4}+\frac{1}{8}\ln\left(\sqrt{x^4+1}+1\right)-\frac{1}{8}\ln\left(\sqrt{x^4+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 + 1)*x^5),x, algorithm="giac")
```

```
[Out] -1/4*sqrt(x^4 + 1)/x^4 + 1/8*ln(sqrt(x^4 + 1) + 1) - 1/8*ln(sqrt(
x^4 + 1) - 1)
```

3.920 $\int \frac{x^5}{\sqrt{1+x^4}} \, dx$

Optimal. Leaf size=25

$$\frac{1}{4}x^2\sqrt{x^4+1}-\frac{1}{4}\sinh^{-1}\left(x^2\right)$$

```
[Out] (x^2*Sqrt[1 + x^4])/4 - ArcSinh[x^2]/4
```

Rubi [A] time = 0.0317372, antiderivative size = 25, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{1}{4}x^2\sqrt{x^4+1}-\frac{1}{4}\sinh^{-1}\left(x^2\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/Sqrt[1 + x^4],x]

[Out] (x^2*Sqrt[1 + x^4])/4 - ArcSinh[x^2]/4
```

Rubi in Sympy [A] time = 4.45925, size = 19, normalized size = 0.76

$$\frac{x^2\sqrt{x^4+1}}{4}-\frac{\operatorname{asinh}\left(x^2\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(x**4+1)**(1/2),x)

[Out] x**2*sqrt(x**4 + 1)/4 - asinh(x**2)/4
```

Mathematica [A] time = 0.0141762, size = 25, normalized size = 1.

$$\frac{1}{4}x^2\sqrt{x^4+1}-\frac{1}{4}\sinh^{-1}\left(x^2\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/Sqrt[1 + x^4],x]

[Out] (x^2*Sqrt[1 + x^4])/4 - ArcSinh[x^2]/4
```

Maple [A] time = 0.014, size = 20, normalized size = 0.8

$$-\frac{Arcsinh\left(x^2\right)}{4}+\frac{x^2}{4}\sqrt{x^4+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(x^4+1)^(1/2),x)

[Out] -1/4*arcsinh(x^2)+1/4*x^2*(x^4+1)^(1/2)
```

Maxima [A] time = 1.44208, size = 78, normalized size = 3.12

$$\frac{\sqrt{x^4+1}}{4\,x^2\left(\frac{x^4+1}{x^4}-1\right)}-\frac{1}{8}\,\log\left(\frac{\sqrt{x^4+1}}{x^2}+1\right)+\frac{1}{8}\,\log\left(\frac{\sqrt{x^4+1}}{x^2}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(x^4 + 1),x, algorithm="maxima")
```

```
[Out] 1/4*sqrt(x^4 + 1)/(x^2*((x^4 + 1)/x^4 - 1)) - 1/8*log(sqrt(x^4 +
1)/x^2 + 1) + 1/8*log(sqrt(x^4 + 1)/x^2 - 1)
```

Fricas [A] time = 0.258263, size = 117, normalized size = 4.68

$$-\frac{2\,x^8+2\,x^4-\left(2\,x^4-2\,\sqrt{x^4+1}x^2+1\right)\log\left(-x^2+\sqrt{x^4+1}\right)-\left(2\,x^6+x^2\right)\sqrt{x^4+1}}{4\left(2\,x^4-2\,\sqrt{x^4+1}x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(x^4 + 1),x, algorithm="fricas")
```

```
[Out] -1/4*(2*x^8 + 2*x^4 - (2*x^4 - 2*sqrt(x^4 + 1)*x^2 + 1)*log(-x^2
+ sqrt(x^4 + 1)) - (2*x^6 + x^2)*sqrt(x^4 + 1))/(2*x^4 - 2*sqrt(x
^4 + 1)*x^2 + 1)
```

Sympy [A] time = 5.86892, size = 19, normalized size = 0.76

$$\frac{x^2\sqrt{x^4+1}}{4}-\frac{\operatorname{asinh}\left(x^2\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(x**4+1)**(1/2),x)
```

```
[Out] x**2*sqrt(x**4 + 1)/4 - asinh(x**2)/4
```

GIAC/XCAS [A] time = 0.222529, size = 39, normalized size = 1.56

$$\frac{1}{4}\,\sqrt{x^4+1}x^2+\frac{1}{4}\,\ln\left(-x^2+\sqrt{x^4+1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(x^4 + 1),x, algorithm="giac")
```

```
[Out] 1/4*sqrt(x^4 + 1)*x^2 + 1/4*ln(-x^2 + sqrt(x^4 + 1))
```

3.921 $\int \frac{x}{\sqrt{1+x^4}} \, dx$

Optimal. Leaf size=8

$$\frac{1}{2} \sinh^{-1}\left(x^2\right)$$

```
[Out] ArcSinh[x^2]/2
```

Rubi [A] time = 0.0113079, antiderivative size = 8, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{1}{2} \sinh^{-1}\left(x^2\right)$$

Antiderivative was successfully verified.

```
[In] Int[x/Sqrt[1 + x^4],x]
```

```
[Out] ArcSinh[x^2]/2
```

Rubi in Sympy [A] time = 2.17973, size = 5, normalized size = 0.62

$$\frac{\operatorname{asinh}\left(x^2\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x/(x**4+1)**(1/2),x)
```

```
[Out] asinh(x**2)/2
```

Mathematica [A] time = 0.00731417, size = 8, normalized size = 1.

$$\frac{1}{2} \sinh^{-1}\left(x^2\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x/Sqrt[1 + x^4],x]
```

```
[Out] ArcSinh[x^2]/2
```

Maple [A] time = 0.008, size = 7, normalized size = 0.9

$$\frac{\mathit{Arcsinh}\left(x^2\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(x^4+1)^(1/2),x)
```

```
[Out] 1/2*arcsinh(x^2)
```

Maxima [A] time = 1.44278, size = 45, normalized size = 5.62

$$\frac{1}{4}\log\left(\frac{\sqrt{x^4+1}}{x^2}+1\right)-\frac{1}{4}\log\left(\frac{\sqrt{x^4+1}}{x^2}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(x^4 + 1),x, algorithm="maxima")
```

```
[Out] 1/4*log(sqrt(x^4 + 1)/x^2 + 1) - 1/4*log(sqrt(x^4 + 1)/x^2 - 1)
```

Fricas [A] time = 0.261559, size = 22, normalized size = 2.75

$$-\frac{1}{2}\log\left(-x^2+\sqrt{x^4+1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(x^4 + 1),x, algorithm="fricas")
```

```
[Out] -1/2*log(-x^2 + sqrt(x^4 + 1))
```

Sympy [A] time = 3.12677, size = 5, normalized size = 0.62

$$\frac{\operatorname{asinh}\left(x^2\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(x**4+1)**(1/2),x)
```

```
[Out] asinh(x**2)/2
```

GIAC/XCAS [A] time = 0.225817, size = 22, normalized size = 2.75

$$-\frac{1}{2}\ln\left(-x^2+\sqrt{x^4+1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(x^4 + 1),x, algorithm="giac")
```

```
[Out] -1/2*ln(-x^2 + sqrt(x^4 + 1))
```

3.922 $\int \frac{1}{x^3\sqrt{1+x^4}}\,dx$

Optimal. Leaf size=16

$$-\frac{\sqrt{x^4+1}}{2x^2}$$

```
[Out] -Sqrt[1 + x^4]/(2*x^2)
```

Rubi [A] time = 0.0135103, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{\sqrt{x^4+1}}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*Sqrt[1 + x^4]),x]

[Out] -Sqrt[1 + x^4]/(2*x^2)
```

Rubi in Sympy [A] time = 2.21692, size = 14, normalized size = 0.88

$$-\frac{\sqrt{x^4+1}}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(x**4+1)**(1/2),x)

[Out] -sqrt(x**4 + 1)/(2*x**2)
```

Mathematica [A] time = 0.00840659, size = 16, normalized size = 1.

$$-\frac{\sqrt{x^4+1}}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*Sqrt[1 + x^4]),x]

[Out] -Sqrt[1 + x^4]/(2*x^2)
```

Maple [A] time = 0.004, size = 13, normalized size = 0.8

$$-\frac{1}{2\,x^2}\sqrt{x^4+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(x^4+1)^(1/2),x)

[Out] -1/2*(x^4+1)^(1/2)/x^2
```

Maxima [A] time = 1.43921, size = 16, normalized size = 1.

$$-\frac{\sqrt{x^4+1}}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 + 1)*x^3),x, algorithm="maxima")
```

```
[Out] -1/2*sqrt(x^4 + 1)/x^2
```

Fricas [A] time = 0.25324, size = 27, normalized size = 1.69

$$\frac{1}{2\left(x^4-\sqrt{x^4+1}x^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 + 1)*x^3),x, algorithm="fricas")
```

```
[Out] 1/2/(x^4 - sqrt(x^4 + 1)*x^2)
```

Sympy [A] time = 1.75109, size = 12, normalized size = 0.75

$$-\frac{\sqrt{1+\frac{1}{x^4}}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(x**4+1)**(1/2),x)
```

```
[Out] -sqrt(1 + x**(-4))/2
```

GIAC/XCAS [A] time = 0.233927, size = 12, normalized size = 0.75

$$-\frac{1}{2}\sqrt{\frac{1}{x^4}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 + 1)*x^3),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(1/x^4 + 1)
```

3.923 $\int \frac{1}{x^7\sqrt{1+x^4}}\,dx$

Optimal. Leaf size=33

$$\frac{\sqrt{x^4+1}}{3x^2}-\frac{\sqrt{x^4+1}}{6x^6}$$

```
[Out] -Sqrt[1 + x^4]/(6*x^6) + Sqrt[1 + x^4]/(3*x^2)
```

Rubi [A] time = 0.0256047, antiderivative size = 33, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{\sqrt{x^4+1}}{3x^2}-\frac{\sqrt{x^4+1}}{6x^6}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^7*Sqrt[1 + x^4]),x]

[Out] -Sqrt[1 + x^4]/(6*x^6) + Sqrt[1 + x^4]/(3*x^2)
```

Rubi in Sympy [A] time = 3.13653, size = 26, normalized size = 0.79

$$\frac{\sqrt{x^4+1}}{3x^2}-\frac{\sqrt{x^4+1}}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**7/(x**4+1)**(1/2),x)

[Out] sqrt(x**4 + 1)/(3*x**2) - sqrt(x**4 + 1)/(6*x**6)
```

Mathematica [A] time = 0.0116528, size = 25, normalized size = 0.76

$$\left(\frac{1}{3x^2}-\frac{1}{6x^6}\right)\sqrt{x^4+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^7*Sqrt[1 + x^4]),x]

[Out] (-1/(6*x^6) + 1/(3*x^2))*Sqrt[1 + x^4]
```

Maple [A] time = 0.005, size = 20, normalized size = 0.6

$$\frac{2\,x^4-1}{6\,x^6}\sqrt{x^4+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^7/(x^4+1)^(1/2),x)

[Out] 1/6*(x^4+1)^(1/2)*(2*x^4-1)/x^6
```

Maxima [A] time = 1.44203, size = 34, normalized size = 1.03

$$\frac{\sqrt{x^4+1}}{2\,x^2}-\frac{\left(x^4+1\right)^{\frac{3}{2}}}{6\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 + 1)*x^7),x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(x^4 + 1)/x^2 - 1/6*(x^4 + 1)^(3/2)/x^6
```

Fricas [A] time = 0.250516, size = 70, normalized size = 2.12

$$\frac{3\,x^4-3\,\sqrt{x^4+1}x^2+1}{6\left(4\,x^{12}+3\,x^8-\left(4\,x^{10}+x^6\right)\sqrt{x^4+1}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 + 1)*x^7),x, algorithm="fricas")
```

```
[Out] 1/6*(3*x^4 - 3*sqrt(x^4 + 1)*x^2 + 1)/(4*x^12 + 3*x^8 - (4*x^10 +
 x^6)*sqrt(x^4 + 1))
```

Sympy [A] time = 2.92878, size = 26, normalized size = 0.79

$$\frac{\sqrt{1+\frac{1}{x^4}}}{3}-\frac{\sqrt{1+\frac{1}{x^4}}}{6x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**7/(x**4+1)**(1/2),x)
```

```
[Out] sqrt(1 + x**(-4))/3 - sqrt(1 + x**(-4))/(6*x**4)
```

GIAC/XCAS [A] time = 0.221168, size = 26, normalized size = 0.79

$$-\frac{1}{6}\left(\frac{1}{x^4}+1\right)^{\frac{3}{2}}+\frac{1}{2}\sqrt{\frac{1}{x^4}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 + 1)*x^7),x, algorithm="giac")
```

```
[Out] -1/6*(1/x^4 + 1)^(3/2) + 1/2*sqrt(1/x^4 + 1)
```

3.924 $\int \frac{1}{x^{11}\sqrt{1+x^4}}\,dx$

Optimal. Leaf size=49

$$-\frac{\sqrt{x^4+1}}{10x^{10}}+\frac{2\sqrt{x^4+1}}{15x^6}-\frac{4\sqrt{x^4+1}}{15x^2}$$

```
[Out] -Sqrt[1 + x^4]/(10*x^10) + (2*Sqrt[1 + x^4])/(15*x^6) - (4*Sqrt[1
 + x^4])/(15*x^2)
```

Rubi [A] time = 0.0386037, antiderivative size = 49, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{\sqrt{x^4+1}}{10x^{10}}+\frac{2\sqrt{x^4+1}}{15x^6}-\frac{4\sqrt{x^4+1}}{15x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^11*Sqrt[1 + x^4]),x]
```

```
[Out] -Sqrt[1 + x^4]/(10*x^10) + (2*Sqrt[1 + x^4])/(15*x^6) - (4*Sqrt[1
 + x^4])/(15*x^2)
```

Rubi in Sympy [A] time = 4.16691, size = 42, normalized size = 0.86

$$-\frac{4\sqrt{x^4+1}}{15x^2}+\frac{2\sqrt{x^4+1}}{15x^6}-\frac{\sqrt{x^4+1}}{10x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**11/(x**4+1)**(1/2),x)
```

```
[Out] -4*sqrt(x**4 + 1)/(15*x**2) + 2*sqrt(x**4 + 1)/(15*x**6) - sqrt(x
**4 + 1)/(10*x**10)
```

Mathematica [A] time = 0.0147026, size = 28, normalized size = 0.57

$$-\frac{\sqrt{x^4+1}\left(8x^8-4x^4+3\right)}{30x^{10}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^11*Sqrt[1 + x^4]),x]
```

```
[Out] -(Sqrt[1 + x^4]*(3 - 4*x^4 + 8*x^8))/(30*x^10)
```

Maple [A] time = 0.006, size = 25, normalized size = 0.5

$$-\frac{8\,x^8-4\,x^4+3}{30\,x^{10}}\sqrt{x^4+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^11/(x^4+1)^(1/2),x)
```

```
[Out] -1/30*(x^4+1)^(1/2)*(8*x^8-4*x^4+3)/x^10
```

Maxima [A] time = 1.43605, size = 50, normalized size = 1.02

$$-\frac{\sqrt{x^4+1}}{2\,x^2}+\frac{\left(x^4+1\right)^{\frac{3}{2}}}{3\,x^6}-\frac{\left(x^4+1\right)^{\frac{5}{2}}}{10\,x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 + 1)*x^11),x, algorithm="maxima")
```

```
[Out] -1/2*sqrt(x^4 + 1)/x^2 + 1/3*(x^4 + 1)^(3/2)/x^6 - 1/10*(x^4 + 1)
^(5/2)/x^10
```

Fricas [A] time = 0.255531, size = 101, normalized size = 2.06

$$\frac{40\,x^8+35\,x^4-5\left(8\,x^6+3\,x^2\right)\sqrt{x^4+1}+3}{30\left(16\,x^{20}+20\,x^{16}+5\,x^{12}-\left(16\,x^{18}+12\,x^{14}+x^{10}\right)\sqrt{x^4+1}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 + 1)*x^11),x, algorithm="fricas")
```

```
[Out] 1/30*(40*x^8 + 35*x^4 - 5*(8*x^6 + 3*x^2)*sqrt(x^4 + 1) + 3)/(16*
x^20 + 20*x^16 + 5*x^12 - (16*x^18 + 12*x^14 + x^10)*sqrt(x^4 + 1
))
```

Sympy [A] time = 6.35461, size = 44, normalized size = 0.9

$$-\frac{4\sqrt{1+\frac{1}{x^4}}}{15}+\frac{2\sqrt{1+\frac{1}{x^4}}}{15x^4}-\frac{\sqrt{1+\frac{1}{x^4}}}{10x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**11/(x**4+1)**(1/2),x)
```

```
[Out] -4*sqrt(1 + x**(-4))/15 + 2*sqrt(1 + x**(-4))/(15*x**4) - sqrt(1
+ x**(-4))/(10*x**8)
```

GIAC/XCAS [A] time = 0.231434, size = 38, normalized size = 0.78

$$-\frac{1}{10}\left(\frac{1}{x^4}+1\right)^{\frac{5}{2}}+\frac{1}{3}\left(\frac{1}{x^4}+1\right)^{\frac{3}{2}}-\frac{1}{2}\sqrt{\frac{1}{x^4}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 + 1)*x^11),x, algorithm="giac")
```

```
[Out] -1/10*(1/x^4 + 1)^(5/2) + 1/3*(1/x^4 + 1)^(3/2) - 1/2*sqrt(1/x^4
+ 1)
```

3.925 $\int \frac{x^8}{\sqrt{1+x^4}} dx$

Optimal. Leaf size=74

$$-\frac{5}{21}\sqrt{x^4+1}x+\frac{1}{7}\sqrt{x^4+1}x^5+\frac{5\left(x^2+1\right)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)\middle|\frac{1}{2}\right)}{42\sqrt{x^4+1}}$$

```
[Out] (-5*x*Sqrt[1 + x^4])/21 + (x^5*Sqrt[1 + x^4])/7 + (5*(1 + x^2)*Sq
rt[(1 + x^4)/(1 + x^2)^2]*EllipticF[2*ArcTan[x], 1/2])/(42*Sqrt[1
 + x^4])
```

Rubi [A] time = 0.0456225, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$-\frac{5}{21}\sqrt{x^4+1}x+\frac{1}{7}\sqrt{x^4+1}x^5+\frac{5\left(x^2+1\right)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)\middle|\frac{1}{2}\right)}{42\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8/Sqrt[1 + x^4],x]
```

```
[Out] (-5*x*Sqrt[1 + x^4])/21 + (x^5*Sqrt[1 + x^4])/7 + (5*(1 + x^2)*Sq
rt[(1 + x^4)/(1 + x^2)^2]*EllipticF[2*ArcTan[x], 1/2])/(42*Sqrt[1
 + x^4])
```

Rubi in Sympy [A] time = 4.08809, size = 66, normalized size = 0.89

$$\frac{x^5\sqrt{x^4+1}}{7}-\frac{5x\sqrt{x^4+1}}{21}+\frac{5\sqrt{\frac{x^4+1}{(x^2+1)^2}}\left(x^2+1\right)F\left(2\operatorname{atan}(x)\middle|\frac{1}{2}\right)}{42\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8/(x**4+1)**(1/2),x)
```

```
[Out] x**5*sqrt(x**4 + 1)/7 - 5*x*sqrt(x**4 + 1)/21 + 5*sqrt((x**4 + 1)
/(x**2 + 1)**2)*(x**2 + 1)*elliptic_f(2*atan(x), 1/2)/(42*sqrt(x*
*4 + 1))
```

Mathematica [C] time = 0.0501285, size = 57, normalized size = 0.77

$$-\frac{-3x^9+2x^5+5\sqrt[4]{-1}\sqrt{x^4+1}F\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)+5x}{21\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8/Sqrt[1 + x^4],x]
```

```
[Out] -(5*x + 2*x^5 - 3*x^9 + 5*(-1)^(1/4)*Sqrt[1 + x^4]*EllipticF[I*Ar
cSinh[(-1)^(1/4)*x], -1])/(21*Sqrt[1 + x^4])
```

Maple [C] time = 0.008, size = 84, normalized size = 1.1

$$\frac{x^5}{7}\sqrt{x^4+1}-\frac{5x}{21}\sqrt{x^4+1}+\frac{5\,EllipticF\left(x\left(1/2\sqrt{2}+i/2\sqrt{2}\right),i\right)}{\frac{21\sqrt{2}}{2}+\frac{21\,i}{2}\sqrt{2}}\sqrt{1-ix^2}\sqrt{1+ix^2}\frac{1}{\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8/(x^4+1)^(1/2),x)
```

```
[Out] 1/7*x^5*(x^4+1)^(1/2)-5/21*x*(x^4+1)^(1/2)+5/21/(1/2*2^(1/2)+1/2*
I*2^(1/2))*(1-I*x^2)^(1/2)*(1+I*x^2)^(1/2)/(x^4+1)^(1/2)*Elliptic
F(x*(1/2*2^(1/2)+1/2*I*2^(1/2)),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^8}{\sqrt{x^4+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/sqrt(x^4 + 1),x, algorithm="maxima")
```

```
[Out] integrate(x^8/sqrt(x^4 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x^8}{\sqrt{x^4+1}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/sqrt(x^4 + 1),x, algorithm="fricas")
```

```
[Out] integral(x^8/sqrt(x^4 + 1), x)
```

Sympy [A] time = 2.5589, size = 29, normalized size = 0.39

$$\frac{x^9\,\Gamma\left(\frac{9}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{9}{4}\\ \frac{13}{4}\end{matrix}\middle|x^4e^{i\pi}\right)}{4\,\Gamma\left(\frac{13}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8/(x**4+1)**(1/2),x)
```

```
[Out] x**9*gamma(9/4)*hyper((1/2, 9/4), (13/4,), x**4*exp_polar(I*pi))/
(4*gamma(13/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^8}{\sqrt{x^4+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/sqrt(x^4 + 1),x, algorithm="giac")
```

```
[Out] integrate(x^8/sqrt(x^4 + 1), x)
```

3.926 $\int \frac{x^4}{\sqrt{1+x^4}}\,dx$

Optimal. Leaf size=58

$$\frac{1}{3}x\sqrt{x^4+1}-\frac{(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)\middle|\frac{1}{2}\right)}{6\sqrt{x^4+1}}$$

```
[Out] (x*Sqrt[1 + x^4])/3 - ((1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*Elli
pticF[2*ArcTan[x], 1/2])/(6*Sqrt[1 + x^4])
```

Rubi [A] time = 0.0306694, antiderivative size = 58, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{1}{3}x\sqrt{x^4+1}-\frac{(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)\middle|\frac{1}{2}\right)}{6\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/Sqrt[1 + x^4],x]
```

```
[Out] (x*Sqrt[1 + x^4])/3 - ((1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*Elli
pticF[2*ArcTan[x], 1/2])/(6*Sqrt[1 + x^4])
```

Rubi in Sympy [A] time = 2.91752, size = 49, normalized size = 0.84

$$\frac{x\sqrt{x^4+1}}{3}-\frac{\sqrt{\frac{x^4+1}{(x^2+1)^2}}\,(x^2+1)\,F\left(2\,\mathrm{atan}\,(x)\middle|\frac{1}{2}\right)}{6\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(x**4+1)**(1/2),x)
```

```
[Out] x*sqrt(x**4 + 1)/3 - sqrt((x**4 + 1)/(x**2 + 1)**2)*(x**2 + 1)*el
liptic_f(2*atan(x), 1/2)/(6*sqrt(x**4 + 1))
```

Mathematica [C] time = 0.0336936, size = 47, normalized size = 0.81

$$\frac{x^5+\sqrt[4]{-1}\sqrt{x^4+1}F\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)+x}{3\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/Sqrt[1 + x^4],x]
```

```
[Out] (x + x^5 + (-1)^(1/4)*Sqrt[1 + x^4]*EllipticF[I*ArcSinh[(-1)^(1/4
)*x], -1])/(3*Sqrt[1 + x^4])
```

Maple [C] time = 0.009, size = 72, normalized size = 1.2

$$\frac{x}{3}\sqrt{x^4+1}-\frac{\mathit{EllipticF}\left(x\left(\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}\right),i\right)}{\frac{3\sqrt{2}}{2}+\frac{3i}{2}\sqrt{2}}\sqrt{1-ix^2}\sqrt{1+ix^2}\frac{1}{\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(x^4+1)^(1/2),x)
```

```
[Out] 1/3*x*(x^4+1)^(1/2)-1/3/(1/2*2^(1/2)+1/2*I*2^(1/2))*(1-I*x^2)^(1/
2)*(1+I*x^2)^(1/2)/(x^4+1)^(1/2)*EllipticF(x*(1/2*2^(1/2)+1/2*I*2
^(1/2)),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\sqrt{x^4+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(x^4 + 1),x, algorithm="maxima")
```

```
[Out] integrate(x^4/sqrt(x^4 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x^4}{\sqrt{x^4+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(x^4 + 1),x, algorithm="fricas")
```

```
[Out] integral(x^4/sqrt(x^4 + 1), x)
```

Sympy [A] time = 1.83505, size = 29, normalized size = 0.5

$$\frac{x^5\left(\frac{5}{4}\right)\,{}_2F_1\left(\left.\begin{matrix}\frac{1}{2},\frac{5}{4}\\ \frac{9}{4}\end{matrix}\right| x^4e^{i\pi}\right)}{4\left(\frac{9}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(x**4+1)**(1/2),x)
```

```
[Out] x**5*gamma(5/4)*hyper((1/2, 5/4), (9/4,), x**4*exp_polar(I*pi))/(
4*gamma(9/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\sqrt{x^4+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(x^4 + 1),x, algorithm="giac")
```

```
[Out] integrate(x^4/sqrt(x^4 + 1), x)
```

3.927 $\int \frac{1}{\sqrt{1+x^4}}\,dx$

Optimal. Leaf size=43

$$\frac{(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)\middle|\frac{1}{2}\right)}{2\sqrt{x^4+1}}$$

```
[Out] ((1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*EllipticF[2*ArcTan[x], 1/2
])/(2*Sqrt[1 + x^4])
```

Rubi [A] time = 0.012928, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111

$$\frac{(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)\middle|\frac{1}{2}\right)}{2\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In] Int[1/Sqrt[1 + x^4],x]
```

```
[Out] ((1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*EllipticF[2*ArcTan[x], 1/2
])/(2*Sqrt[1 + x^4])
```

Rubi in Sympy [A] time = 1.15466, size = 37, normalized size = 0.86

$$\frac{\sqrt{\frac{x^4+1}{(x^2+1)^2}}(x^2+1)F\left(2\operatorname{atan}(x)\middle|\frac{1}{2}\right)}{2\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(x**4+1)**(1/2),x)
```

```
[Out] sqrt((x**4 + 1)/(x**2 + 1)**2)*(x**2 + 1)*elliptic_f(2*atan(x), 1
/2)/(2*sqrt(x**4 + 1))
```

Mathematica [C] time = 0.0190761, size = 21, normalized size = 0.49

$$-\sqrt[4]{-1}F\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[1/Sqrt[1 + x^4],x]
```

```
[Out] -((-1)^(1/4)*EllipticF[I*ArcSinh[(-1)^(1/4)*x], -1])
```

Maple [C] time = 0.006, size = 60, normalized size = 1.4

$$\frac{\mathit{EllipticF}\left(x\left(\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}\right),i\right)}{\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}}\sqrt{1-ix^2}\sqrt{1+ix^2}\frac{1}{\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(x^4+1)^(1/2),x)
```

```
[Out] 1/(1/2*2^(1/2)+1/2*I*2^(1/2))*(1-I*x^2)^(1/2)*(1+I*x^2)^(1/2)/(x^
4+1)^(1/2)*EllipticF(x*(1/2*2^(1/2)+1/2*I*2^(1/2)),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^4+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(x^4 + 1),x, algorithm="maxima")
```

```
[Out] integrate(1/sqrt(x^4 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{1}{\sqrt{x^4+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(x^4 + 1),x, algorithm="fricas")
```

```
[Out] integral(1/sqrt(x^4 + 1), x)
```

Sympy [A] time = 1.60933, size = 27, normalized size = 0.63

$$\frac{x\Gamma\left(\frac{1}{4}\right){}_2F_1\left(\begin{matrix}\frac{1}{4},\frac{1}{2}\\ \frac{5}{4}\end{matrix}\middle| x^4e^{i\pi}\right)}{4\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x**4+1)**(1/2),x)
```

```
[Out] x*gamma(1/4)*hyper((1/4, 1/2), (5/4,), x**4*exp_polar(I*pi))/(4*g
amma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^4+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(x^4 + 1),x, algorithm="giac")
```

```
[Out] integrate(1/sqrt(x^4 + 1), x)
```

3.928 $\int \frac{1}{x^4\sqrt{1+x^4}}\,dx$

Optimal. Leaf size=60

$$-\frac{\sqrt{x^4+1}}{3x^3}-\frac{\left(x^2+1\right)\sqrt{\frac{x^4+1}{\left(x^2+1\right)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{6\sqrt{x^4+1}}$$

```
[Out] -Sqrt[1 + x^4]/(3*x^3) - ((1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*E
llipticF[2*ArcTan[x], 1/2])/(6*Sqrt[1 + x^4])
```

Rubi [A] time = 0.0295383, antiderivative size = 60, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$-\frac{\sqrt{x^4+1}}{3x^3}-\frac{\left(x^2+1\right)\sqrt{\frac{x^4+1}{\left(x^2+1\right)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{6\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*Sqrt[1 + x^4]),x]
```

```
[Out] -Sqrt[1 + x^4]/(3*x^3) - ((1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*E
llipticF[2*ArcTan[x], 1/2])/(6*Sqrt[1 + x^4])
```

Rubi in Sympy [A] time = 2.76526, size = 53, normalized size = 0.88

$$-\frac{\sqrt{\frac{x^4+1}{\left(x^2+1\right)^2}}\left(x^2+1\right)F\left(2\operatorname{atan}(x)\middle|\frac{1}{2}\right)}{6\sqrt{x^4+1}}-\frac{\sqrt{x^4+1}}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(x**4+1)**(1/2),x)
```

```
[Out] -sqrt((x**4 + 1)/(x**2 + 1)**2)*(x**2 + 1)*elliptic_f(2*atan(x),
1/2)/(6*sqrt(x**4 + 1)) - sqrt(x**4 + 1)/(3*x**3)
```

Mathematica [C] time = 0.0339854, size = 55, normalized size = 0.92

$$\frac{-x^4+\sqrt[4]{-1}\sqrt{x^4+1}x^3F\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)-1}{3x^3\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*Sqrt[1 + x^4]),x]
```

```
[Out] (-1 - x^4 + (-1)^(1/4)*x^3*Sqrt[1 + x^4]*EllipticF[I*ArcSinh[(-1)
^(1/4)*x], -1])/(3*x^3*Sqrt[1 + x^4])
```

Maple [C] time = 0.013, size = 74, normalized size = 1.2

$$-\frac{1}{3\,x^3}\sqrt{x^4+1}-\frac{\mathit{EllipticF}\left(x\left(\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}\right),i\right)}{\frac{3\sqrt{2}}{2}+\frac{3\,i}{2}\sqrt{2}}\sqrt{1-ix^2}\sqrt{1+ix^2}\frac{1}{\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(x^4+1)^(1/2),x)
```

```
[Out] -1/3*(x^4+1)^(1/2)/x^3-1/3/(1/2*2^(1/2)+1/2*I*2^(1/2))*(1-I*x^2)^
(1/2)*(1+I*x^2)^(1/2)/(x^4+1)^(1/2)*EllipticF(x*(1/2*2^(1/2)+1/2*
I*2^(1/2)),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^4+1}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 + 1)*x^4),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(x^4 + 1)*x^4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{x^4+1}x^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 + 1)*x^4),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(x^4 + 1)*x^4), x)
```

Sympy [A] time = 2.21277, size = 32, normalized size = 0.53

$$\frac{\Gamma\left(-\frac{3}{4}\right) {}_{2}F_{1}\left(\begin{matrix} -\frac{3}{4}, \frac{1}{2} \\ \frac{1}{4} \end{matrix}\middle| {x^{4} e^{i\pi}} \right)}{4x^{3}\Gamma\left(\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(x**4+1)**(1/2),x)
```

```
[Out] gamma(-3/4)*hyper((-3/4, 1/2), (1/4,), x**4*exp_polar(I*pi))/(4*x
**3*gamma(1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^4+1}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 + 1)*x^4),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(x^4 + 1)*x^4), x)
```

3.929 $\int \frac{1}{x^8\sqrt{1+x^4}}\,dx$

Optimal. Leaf size=76

$$-\frac{\sqrt{x^4+1}}{7x^7}+\frac{5\sqrt{x^4+1}}{21x^3}+\frac{5\left(x^2+1\right)\sqrt{\frac{x^4+1}{\left(x^2+1\right)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{42\sqrt{x^4+1}}$$

```
[Out] -Sqrt[1 + x^4]/(7*x^7) + (5*Sqrt[1 + x^4])/(21*x^3) + (5*(1 + x^2
)*Sqrt[(1 + x^4)/(1 + x^2)^2]*EllipticF[2*ArcTan[x], 1/2])/(42*Sq
rt[1 + x^4])
```

Rubi [A] time = 0.0463073, antiderivative size = 76, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{\sqrt{x^4+1}}{7x^7}+\frac{5\sqrt{x^4+1}}{21x^3}+\frac{5\left(x^2+1\right)\sqrt{\frac{x^4+1}{\left(x^2+1\right)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{42\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^8*Sqrt[1 + x^4]),x]
```

```
[Out] -Sqrt[1 + x^4]/(7*x^7) + (5*Sqrt[1 + x^4])/(21*x^3) + (5*(1 + x^2
)*Sqrt[(1 + x^4)/(1 + x^2)^2]*EllipticF[2*ArcTan[x], 1/2])/(42*Sq
rt[1 + x^4])
```

Rubi in Sympy [A] time = 3.99967, size = 68, normalized size = 0.89

$$\frac{5\sqrt{\frac{x^4+1}{\left(x^2+1\right)^2}}\left(x^2+1\right)F\left(2\operatorname{atan}(x)\middle|\frac{1}{2}\right)}{42\sqrt{x^4+1}}+\frac{5\sqrt{x^4+1}}{21x^3}-\frac{\sqrt{x^4+1}}{7x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**8/(x**4+1)**(1/2),x)
```

```
[Out] 5*sqrt((x**4 + 1)/(x**2 + 1)**2)*(x**2 + 1)*elliptic_f(2*atan(x),
 1/2)/(42*sqrt(x**4 + 1)) + 5*sqrt(x**4 + 1)/(21*x**3) - sqrt(x**
4 + 1)/(7*x**7)
```

Mathematica [C] time = 0.0396248, size = 61, normalized size = 0.8

$$\frac{5x^8+2x^4-5\sqrt[4]{-1}\sqrt{x^4+1}x^7F\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)-3}{21x^7\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^8*Sqrt[1 + x^4]),x]
```

```
[Out] (-3 + 2*x^4 + 5*x^8 - 5*(-1)^(1/4)*x^7*Sqrt[1 + x^4]*EllipticF[I*
ArcSinh[(-1)^(1/4)*x], -1])/(21*x^7*Sqrt[1 + x^4])
```

Maple [C] time = 0.017, size = 86, normalized size = 1.1

$$-\frac{1}{7\,x^{7}}\sqrt{x^{4}+1}+\frac{5}{21\,x^{3}}\sqrt{x^{4}+1}+\frac{5\,EllipticF\left(x\left(1/2\,\sqrt{2}+i/2\sqrt{2}\right),i\right)}{\frac{21\,\sqrt{2}}{2}+\frac{21\,i}{2}\sqrt{2}}\sqrt{1-ix^{2}}\sqrt{1+ix^{2}}\frac{1}{\sqrt{x^{4}+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^8/(x^4+1)^(1/2),x)
```

```
[Out] -1/7*(x^4+1)^(1/2)/x^7+5/21*(x^4+1)^(1/2)/x^3+5/21/(1/2*2^(1/2)+1
/2*I*2^(1/2))*(1-I*x^2)^(1/2)*(1+I*x^2)^(1/2)/(x^4+1)^(1/2)*Ellip
ticF(x*(1/2*2^(1/2)+1/2*I*2^(1/2)),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^{4}+1}x^{8}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 + 1)*x^8),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(x^4 + 1)*x^8), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{x^{4}+1}x^{8}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 + 1)*x^8),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(x^4 + 1)*x^8), x)
```

Sympy [A] time = 3.59373, size = 36, normalized size = 0.47

$$\frac{\Gamma\left(-\frac{7}{4}\right)\,{}_{2}F_{1}\left(\begin{matrix}-\frac{7}{4},\frac{1}{2}\\-\frac{3}{4}\end{matrix}\middle|x^{4}e^{i\pi}\right)}{4x^{7}\,\Gamma\left(-\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**8/(x**4+1)**(1/2),x)
```

```
[Out] gamma(-7/4)*hyper((-7/4, 1/2), (-3/4,), x**4*exp_polar(I*pi))/(4*
x**7*gamma(-3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^{4}+1}x^{8}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 + 1)*x^8),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(x^4 + 1)*x^8), x)
```

3.930 $\int \frac{x^{10}}{\sqrt{1+x^4}}\,dx$

Optimal. Leaf size=140

$$\frac{1}{9}\sqrt{x^4+1}x^7-\frac{7}{45}\sqrt{x^4+1}x^3+\frac{7\sqrt{x^4+1}x}{15\,(x^2+1)}+\frac{7\,(x^2+1)\,\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{30\sqrt{x^4+1}}-\frac{7\,(x^2+1)\,\sqrt{\frac{x^4+1}{(x^2+1)^2}}E\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{15\sqrt{x^4+1}}$$

```
[Out] (-7*x^3*Sqrt[1 + x^4])/45 + (x^7*Sqrt[1 + x^4])/9 + (7*x*Sqrt[1 +
 x^4])/(15*(1 + x^2)) - (7*(1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*
EllipticE[2*ArcTan[x], 1/2])/(15*Sqrt[1 + x^4]) + (7*(1 + x^2)*Sq
rt[(1 + x^4)/(1 + x^2)^2]*EllipticF[2*ArcTan[x], 1/2])/(30*Sqrt[1
 + x^4])
```

Rubi [A] time = 0.091335, antiderivative size = 140, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{1}{9}\sqrt{x^4+1}x^7-\frac{7}{45}\sqrt{x^4+1}x^3+\frac{7\sqrt{x^4+1}x}{15\,(x^2+1)}+\frac{7\,(x^2+1)\,\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{30\sqrt{x^4+1}}-\frac{7\,(x^2+1)\,\sqrt{\frac{x^4+1}{(x^2+1)^2}}E\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{15\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^10/Sqrt[1 + x^4],x]
```

```
[Out] (-7*x^3*Sqrt[1 + x^4])/45 + (x^7*Sqrt[1 + x^4])/9 + (7*x*Sqrt[1 +
 x^4])/(15*(1 + x^2)) - (7*(1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*
EllipticE[2*ArcTan[x], 1/2])/(15*Sqrt[1 + x^4]) + (7*(1 + x^2)*Sq
rt[(1 + x^4)/(1 + x^2)^2]*EllipticF[2*ArcTan[x], 1/2])/(30*Sqrt[1
 + x^4])
```

Rubi in Sympy [A] time = 8.42862, size = 128, normalized size = 0.91

$$\frac{x^7\sqrt{x^4+1}}{9}-\frac{7x^3\sqrt{x^4+1}}{45}+\frac{7x\sqrt{x^4+1}}{15\,(x^2+1)}-\frac{7\sqrt{\frac{x^4+1}{(x^2+1)^2}}\,(x^2+1)\,E\left(2\,\mathrm{atan}\,(x)\middle|\frac{1}{2}\right)}{15\sqrt{x^4+1}}+\frac{7\sqrt{\frac{x^4+1}{(x^2+1)^2}}\,(x^2+1)\,F\left(2\,\mathrm{atan}\,(x)\middle|\frac{1}{2}\right)}{30\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**10/(x**4+1)**(1/2),x)
```

```
[Out] x**7*sqrt(x**4 + 1)/9 - 7*x**3*sqrt(x**4 + 1)/45 + 7*x*sqrt(x**4
+ 1)/(15*(x**2 + 1)) - 7*sqrt((x**4 + 1)/(x**2 + 1)**2)*(x**2 + 1
)*elliptic_e(2*atan(x), 1/2)/(15*sqrt(x**4 + 1)) + 7*sqrt((x**4 +
 1)/(x**2 + 1)**2)*(x**2 + 1)*elliptic_f(2*atan(x), 1/2)/(30*sqrt
(x**4 + 1))
```

Mathematica [C] time = 0.0918306, size = 72, normalized size = 0.51

$$\frac{1}{45}\left(\frac{(5x^8-2x^4-7)\,x^3}{\sqrt{x^4+1}}+21(-1)^{3/4}F\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)-21(-1)^{3/4}E\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)\right)$$

Antiderivative was successfully verified.

```
[In]   Integrate[x^10/Sqrt[1 + x^4],x]
```

```
[Out] ((x^3*(-7 - 2*x^4 + 5*x^8))/Sqrt[1 + x^4] - 21*(-1)^(3/4)*Ellipti
cE[I*ArcSinh[(-1)^(1/4)*x], -1] + 21*(-1)^(3/4)*EllipticF[I*ArcSi
nh[(-1)^(1/4)*x], -1])/45
```

Maple [C] time = 0.01, size = 107, normalized size = 0.8

$$\frac{x^7}{9}\sqrt{x^4+1}-\frac{7\,x^3}{45}\sqrt{x^4+1} + \frac{\frac{7\,i}{15}\left(EllipticF\left(x\left(\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}\right),i\right)-EllipticE\left(x\left(\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}\right),i\right)\right)}{\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}}\sqrt{1-ix^2}\sqrt{1+ix^2}\frac{1}{\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^10/(x^4+1)^(1/2),x)
```

```
[Out] 1/9*x^7*(x^4+1)^(1/2)-7/45*x^3*(x^4+1)^(1/2)+7/15*I/(1/2*2^(1/2)+
1/2*I*2^(1/2))*(1-I*x^2)^(1/2)*(1+I*x^2)^(1/2)/(x^4+1)^(1/2)*(Ell
ipticF(x*(1/2*2^(1/2)+1/2*I*2^(1/2)),I)-EllipticE(x*(1/2*2^(1/2)+
1/2*I*2^(1/2)),I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{10}}{\sqrt{x^4+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^10/sqrt(x^4 + 1),x, algorithm="maxima")
```

```
[Out] integrate(x^10/sqrt(x^4 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{10}}{\sqrt{x^4+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^10/sqrt(x^4 + 1),x, algorithm="fricas")
```

```
[Out] integral(x^10/sqrt(x^4 + 1), x)
```

Sympy [A] time = 3.52164, size = 29, normalized size = 0.21

$$\frac{x^{11}\,\Gamma\left(\frac{11}{4}\right)\,{}_2F_1\left(\left.\begin{matrix}\frac{1}{2},\frac{11}{4}\\\frac{15}{4}\end{matrix}\right|x^4e^{i\pi}\right)}{4\,\Gamma\left(\frac{15}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**10/(x**4+1)**(1/2),x)
```

```
[Out] x**11*gamma(11/4)*hyper((1/2, 11/4), (15/4,), x**4*exp_polar(I*pi
))/(4*gamma(15/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{10}}{\sqrt{x^4+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/sqrt(x^4 + 1),x, algorithm="giac")
```

```
[Out] integrate(x^10/sqrt(x^4 + 1), x)
```

3.931 $\int \frac{x^6}{\sqrt{1+x^4}}\,dx$

Optimal. Leaf size=124

$$\frac{1}{5}\sqrt{x^4+1}x^3-\frac{3\sqrt{x^4+1}x}{5(x^2+1)}-\frac{3(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{10\sqrt{x^4+1}}+\frac{3(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}E\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{5\sqrt{x^4+1}}$$

```
[Out] (x^3*Sqrt[1 + x^4])/5 - (3*x*Sqrt[1 + x^4])/(5*(1 + x^2)) + (3*(1
 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*EllipticE[2*ArcTan[x], 1/2])/
(5*Sqrt[1 + x^4]) - (3*(1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*Elli
pticF[2*ArcTan[x], 1/2])/(10*Sqrt[1 + x^4])
```

Rubi [A] time = 0.069317, antiderivative size = 124, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{1}{5}\sqrt{x^4+1}x^3-\frac{3\sqrt{x^4+1}x}{5(x^2+1)}-\frac{3(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{10\sqrt{x^4+1}}+\frac{3(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}E\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{5\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/Sqrt[1 + x^4],x]
```

```
[Out] (x^3*Sqrt[1 + x^4])/5 - (3*x*Sqrt[1 + x^4])/(5*(1 + x^2)) + (3*(1
 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*EllipticE[2*ArcTan[x], 1/2])/
(5*Sqrt[1 + x^4]) - (3*(1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*Elli
pticF[2*ArcTan[x], 1/2])/(10*Sqrt[1 + x^4])
```

Rubi in Sympy [A] time = 6.93296, size = 112, normalized size = 0.9

$$\frac{x^3\sqrt{x^4+1}}{5}-\frac{3x\sqrt{x^4+1}}{5(x^2+1)}+\frac{3\sqrt{\frac{x^4+1}{(x^2+1)^2}}(x^2+1)E\left(2\operatorname{atan}(x)|\frac{1}{2}\right)}{5\sqrt{x^4+1}}-\frac{3\sqrt{\frac{x^4+1}{(x^2+1)^2}}(x^2+1)F\left(2\operatorname{atan}(x)|\frac{1}{2}\right)}{10\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(x**4+1)**(1/2),x)
```

```
[Out] x**3*sqrt(x**4 + 1)/5 - 3*x*sqrt(x**4 + 1)/(5*(x**2 + 1)) + 3*sqr
t((x**4 + 1)/(x**2 + 1)**2)*(x**2 + 1)*elliptic_e(2*atan(x), 1/2)
/(5*sqrt(x**4 + 1)) - 3*sqrt((x**4 + 1)/(x**2 + 1)**2)*(x**2 + 1)
*elliptic_f(2*atan(x), 1/2)/(10*sqrt(x**4 + 1))
```

Mathematica [C] time = 0.0869151, size = 73, normalized size = 0.59

$$\frac{1}{5}\left(\frac{x^7-3(-1)^{3/4}\sqrt{x^4+1}F\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)+x^3}{\sqrt{x^4+1}}+3(-1)^{3/4}E\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6/Sqrt[1 + x^4],x]
```

```
[Out] (3*(-1)^(3/4)*EllipticE[I*ArcSinh[(-1)^(1/4)*x], -1] + (x^3 + x^7
 - 3*(-1)^(3/4)*Sqrt[1 + x^4]*EllipticF[I*ArcSinh[(-1)^(1/4)*x],
-1])/Sqrt[1 + x^4])/5
```

Maple [C] time = 0.01, size = 95, normalized size = 0.8

$$\frac{x^3}{5}\sqrt{x^4+1}-\frac{\frac{3i}{5}\left(\mathit{EllipticF}\left(x\left(\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}\right),i\right)-\mathit{EllipticE}\left(x\left(\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}\right),i\right)\right)}{\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}}\sqrt{1-ix^2}\sqrt{1+ix^2}\frac{1}{\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^6/(x^4+1)^(1/2),x)
```

```
[Out] 1/5*x^3*(x^4+1)^(1/2)-3/5*I/(1/2*2^(1/2)+1/2*I*2^(1/2))*(1-I*x^2)
^(1/2)*(1+I*x^2)^(1/2)/(x^4+1)^(1/2)*(EllipticF(x*(1/2*2^(1/2)+1/
2*I*2^(1/2)),I)-EllipticE(x*(1/2*2^(1/2)+1/2*I*2^(1/2)),I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{\sqrt{x^4+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^6/sqrt(x^4 + 1),x, algorithm="maxima")
```

```
[Out] integrate(x^6/sqrt(x^4 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x^6}{\sqrt{x^4+1}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^6/sqrt(x^4 + 1),x, algorithm="fricas")
```

```
[Out] integral(x^6/sqrt(x^4 + 1), x)
```

Sympy [A] time = 2.13629, size = 29, normalized size = 0.23

$$\frac{x^7\,\Gamma\left(\frac{7}{4}\right)\,{}_2F_1\left(\left.\begin{matrix}\frac{1}{2},\frac{7}{4}\\ \frac{11}{4}\end{matrix}\right|x^4e^{i\pi}\right)}{4\,\Gamma\left(\frac{11}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**6/(x**4+1)**(1/2),x)
```

```
[Out] x**7*gamma(7/4)*hyper((1/2, 7/4), (11/4,), x**4*exp_polar(I*pi))/
(4*gamma(11/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{\sqrt{x^4+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(x^4 + 1),x, algorithm="giac")
```

```
[Out] integrate(x^6/sqrt(x^4 + 1), x)
```

3.932 $\int \frac{x^2}{\sqrt{1+x^4}}\,dx$

Optimal. Leaf size=103

$$\frac{\sqrt{x^4+1}x}{x^2+1}+\frac{(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{2\sqrt{x^4+1}}-\frac{(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}E\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{\sqrt{x^4+1}}$$

```
[Out] (x*Sqrt[1 + x^4])/(1 + x^2) - ((1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)
^2]*EllipticE[2*ArcTan[x], 1/2])/Sqrt[1 + x^4] + ((1 + x^2)*Sqrt[
(1 + x^4)/(1 + x^2)^2]*EllipticF[2*ArcTan[x], 1/2])/(2*Sqrt[1 + x
^4])
```

Rubi [A] time = 0.048616, antiderivative size = 103, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{\sqrt{x^4+1}x}{x^2+1}+\frac{(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{2\sqrt{x^4+1}}-\frac{(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}E\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/Sqrt[1 + x^4],x]
```

```
[Out] (x*Sqrt[1 + x^4])/(1 + x^2) - ((1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)
^2]*EllipticE[2*ArcTan[x], 1/2])/Sqrt[1 + x^4] + ((1 + x^2)*Sqrt[
(1 + x^4)/(1 + x^2)^2]*EllipticF[2*ArcTan[x], 1/2])/(2*Sqrt[1 + x
^4])
```

Rubi in Sympy [A] time = 5.588, size = 90, normalized size = 0.87

$$\frac{x\sqrt{x^4+1}}{x^2+1}-\frac{\sqrt{\frac{x^4+1}{(x^2+1)^2}}(x^2+1)E\left(2\,\text{atan}(x)|\frac{1}{2}\right)}{\sqrt{x^4+1}}+\frac{\sqrt{\frac{x^4+1}{(x^2+1)^2}}(x^2+1)F\left(2\,\text{atan}(x)|\frac{1}{2}\right)}{2\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(x**4+1)**(1/2),x)
```

```
[Out] x*sqrt(x**4 + 1)/(x**2 + 1) - sqrt((x**4 + 1)/(x**2 + 1)**2)*(x**
2 + 1)*elliptic_e(2*atan(x), 1/2)/sqrt(x**4 + 1) + sqrt((x**4 + 1
)/(x**2 + 1)**2)*(x**2 + 1)*elliptic_f(2*atan(x), 1/2)/(2*sqrt(x*
*4 + 1))
```

Mathematica [C] time = 0.0309104, size = 37, normalized size = 0.36

$$(-1)^{3/4}\left(F\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)-E\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/Sqrt[1 + x^4],x]
```

```
[Out] (-1)^(3/4)*(-EllipticE[I*ArcSinh[(-1)^(1/4)*x], -1] + EllipticF[I
*ArcSinh[(-1)^(1/4)*x], -1])
```

Maple [C] time = 0.008, size = 82, normalized size = 0.8

$$\frac{i\left(\mathit{EllipticF}\left(x\left(\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}\right),i\right)-\mathit{EllipticE}\left(x\left(\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}\right),i\right)\right)}{\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}}\sqrt{1-ix^2}\sqrt{1+ix^2}\frac{1}{\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(x^4+1)^(1/2),x)
```

```
[Out] I/(1/2*2^(1/2)+1/2*I*2^(1/2))*(1-I*x^2)^(1/2)*(1+I*x^2)^(1/2)/(x^
4+1)^(1/2)*(EllipticF(x*(1/2*2^(1/2)+1/2*I*2^(1/2)),I)-EllipticE(
x*(1/2*2^(1/2)+1/2*I*2^(1/2)),I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\sqrt{x^4+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(x^4 + 1),x, algorithm="maxima")
```

```
[Out] integrate(x^2/sqrt(x^4 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^2}{\sqrt{x^4+1}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(x^4 + 1),x, algorithm="fricas")
```

```
[Out] integral(x^2/sqrt(x^4 + 1), x)
```

Sympy [A] time = 1.70592, size = 29, normalized size = 0.28

$$\frac{x^3\Gamma\left(\frac{3}{4}\right){}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{3}{4}\\\frac{7}{4}\end{matrix}\middle|x^4e^{i\pi}\right)}{4\Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(x**4+1)**(1/2),x)
```

```
[Out] x**3*gamma(3/4)*hyper((1/2, 3/4), (7/4,), x**4*exp_polar(I*pi))/(
4*gamma(7/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\sqrt{x^4+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(x^4 + 1),x, algorithm="giac")
```

```
[Out] integrate(x^2/sqrt(x^4 + 1), x)
```

3.933 $\int \frac{1}{x^2\sqrt{1+x^4}}\,dx$

Optimal. Leaf size=117

$$-\frac{\sqrt{x^4+1}}{x}+\frac{\sqrt{x^4+1}x}{x^2+1}+\frac{(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{2\sqrt{x^4+1}}-\frac{(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}E\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{\sqrt{x^4+1}}$$

```
[Out] -(Sqrt[1 + x^4]/x) + (x*Sqrt[1 + x^4])/(1 + x^2) - ((1 + x^2)*Sqr
t[(1 + x^4)/(1 + x^2)^2]*EllipticE[2*ArcTan[x], 1/2])/Sqrt[1 + x^
4] + ((1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*EllipticF[2*ArcTan[x]
, 1/2])/(2*Sqrt[1 + x^4])
```

Rubi [A] time = 0.0596317, antiderivative size = 117, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$

$$-\frac{\sqrt{x^4+1}}{x}+\frac{\sqrt{x^4+1}x}{x^2+1}+\frac{(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{2\sqrt{x^4+1}}-\frac{(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}E\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*Sqrt[1 + x^4]),x]
```

```
[Out] -(Sqrt[1 + x^4]/x) + (x*Sqrt[1 + x^4])/(1 + x^2) - ((1 + x^2)*Sqr
t[(1 + x^4)/(1 + x^2)^2]*EllipticE[2*ArcTan[x], 1/2])/Sqrt[1 + x^
4] + ((1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*EllipticF[2*ArcTan[x]
, 1/2])/(2*Sqrt[1 + x^4])
```

Rubi in Sympy [A] time = 6.71618, size = 100, normalized size = 0.85

$$\frac{x\sqrt{x^4+1}}{x^2+1}-\frac{\sqrt{\frac{x^4+1}{(x^2+1)^2}}(x^2+1)E\left(2\operatorname{atan}(x)|\frac{1}{2}\right)}{\sqrt{x^4+1}}+\frac{\sqrt{\frac{x^4+1}{(x^2+1)^2}}(x^2+1)F\left(2\operatorname{atan}(x)|\frac{1}{2}\right)}{2\sqrt{x^4+1}}-\frac{\sqrt{x^4+1}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(x**4+1)**(1/2),x)
```

```
[Out] x*sqrt(x**4 + 1)/(x**2 + 1) - sqrt((x**4 + 1)/(x**2 + 1)**2)*(x**
2 + 1)*elliptic_e(2*atan(x), 1/2)/sqrt(x**4 + 1) + sqrt((x**4 + 1
)/(x**2 + 1)**2)*(x**2 + 1)*elliptic_f(2*atan(x), 1/2)/(2*sqrt(x*
*4 + 1)) - sqrt(x**4 + 1)/x
```

Mathematica [C] time = 0.064619, size = 70, normalized size = 0.6

$$-\frac{1}{\sqrt{x^4+1}x}-\frac{x^3}{\sqrt{x^4+1}}+(-1)^{3/4}F\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)-(-1)^{3/4}E\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*Sqrt[1 + x^4]),x]
```

```
[Out] -(1/(x*Sqrt[1 + x^4])) - x^3/Sqrt[1 + x^4] - (-1)^(3/4)*EllipticE
[I*ArcSinh[(-1)^(1/4)*x], -1] + (-1)^(3/4)*EllipticF[I*ArcSinh[(-
1)^(1/4)*x], -1]
```

Maple [C] time = 0.012, size = 95, normalized size = 0.8

$$-\frac{1}{x}\sqrt{x^4+1}+\frac{i\left(EllipticF\left(x\left(\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}\right),i\right)-EllipticE\left(x\left(\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}\right),i\right)\right)}{\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}}\sqrt{1-ix^2}\sqrt{1+ix^2}\frac{1}{\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(x^4+1)^(1/2),x)
```

```
[Out] -(x^4+1)^(1/2)/x+I/(1/2*2^(1/2)+1/2*I*2^(1/2))*(1-I*x^2)^(1/2)*(1
+I*x^2)^(1/2)/(x^4+1)^(1/2)*(EllipticF(x*(1/2*2^(1/2)+1/2*I*2^(1/
2)),I)-EllipticE(x*(1/2*2^(1/2)+1/2*I*2^(1/2)),I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^4+1}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 + 1)*x^2),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(x^4 + 1)*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{\sqrt{x^4+1}x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 + 1)*x^2),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(x^4 + 1)*x^2), x)
```

Sympy [A] time = 1.9442, size = 31, normalized size = 0.26

$$\frac{\left(-\frac{1}{4}\right)\,{}_2F_1\left(\begin{matrix}-\frac{1}{4},\frac{1}{2}\\\frac{3}{4}\end{matrix}\middle|x^4e^{i\pi}\right)}{4x\left(\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(x**4+1)**(1/2),x)
```

```
[Out] gamma(-1/4)*hyper((-1/4, 1/2), (3/4,), x**4*exp_polar(I*pi))/(4*x
*gamma(3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^4+1}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 + 1)*x^2),x, algorithm="giac")

[Out] integrate(1/(sqrt(x^4 + 1)*x^2), x)
```

3.934 $\int \frac{1}{x^6\sqrt{1+x^4}}\,dx$

Optimal. Leaf size=140

$$\frac{3\sqrt{x^4+1}}{5x}-\frac{\sqrt{x^4+1}}{5x^5}-\frac{3\sqrt{x^4+1}\,x}{5\left(x^2+1\right)}-\frac{3\left(x^2+1\right)\sqrt{\frac{x^4+1}{\left(x^2+1\right)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{10\sqrt{x^4+1}}+\frac{3\left(x^2+1\right)\sqrt{\frac{x^4+1}{\left(x^2+1\right)^2}}E\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{5\sqrt{x^4+1}}$$

```
[Out] -Sqrt[1 + x^4]/(5*x^5) + (3*Sqrt[1 + x^4])/(5*x) - (3*x*Sqrt[1 +
x^4])/(5*(1 + x^2)) + (3*(1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*El
lipticE[2*ArcTan[x], 1/2])/(5*Sqrt[1 + x^4]) - (3*(1 + x^2)*Sqrt[
(1 + x^4)/(1 + x^2)^2]*EllipticF[2*ArcTan[x], 1/2])/(10*Sqrt[1 +
x^4])
```

Rubi [A] time = 0.0809755, antiderivative size = 140, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{3\sqrt{x^4+1}}{5x}-\frac{\sqrt{x^4+1}}{5x^5}-\frac{3\sqrt{x^4+1}\,x}{5\left(x^2+1\right)}-\frac{3\left(x^2+1\right)\sqrt{\frac{x^4+1}{\left(x^2+1\right)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{10\sqrt{x^4+1}}+\frac{3\left(x^2+1\right)\sqrt{\frac{x^4+1}{\left(x^2+1\right)^2}}E\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{5\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^6*Sqrt[1 + x^4]),x]
```

```
[Out] -Sqrt[1 + x^4]/(5*x^5) + (3*Sqrt[1 + x^4])/(5*x) - (3*x*Sqrt[1 +
x^4])/(5*(1 + x^2)) + (3*(1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*El
lipticE[2*ArcTan[x], 1/2])/(5*Sqrt[1 + x^4]) - (3*(1 + x^2)*Sqrt[
(1 + x^4)/(1 + x^2)^2]*EllipticF[2*ArcTan[x], 1/2])/(10*Sqrt[1 +
x^4])
```

Rubi in Sympy [A] time = 8.14026, size = 126, normalized size = 0.9

$$-\frac{3x\sqrt{x^4+1}}{5\left(x^2+1\right)}+\frac{3\sqrt{\frac{x^4+1}{\left(x^2+1\right)^2}}\left(x^2+1\right)E\left(2\operatorname{atan}(x)\middle|\frac{1}{2}\right)}{5\sqrt{x^4+1}}-\frac{3\sqrt{\frac{x^4+1}{\left(x^2+1\right)^2}}\left(x^2+1\right)F\left(2\operatorname{atan}(x)\middle|\frac{1}{2}\right)}{10\sqrt{x^4+1}}+\frac{3\sqrt{x^4+1}}{5x}-\frac{\sqrt{x^4+1}}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**6/(x**4+1)**(1/2),x)
```

```
[Out] -3*x*sqrt(x**4 + 1)/(5*(x**2 + 1)) + 3*sqrt((x**4 + 1)/(x**2 + 1)
**2)*(x**2 + 1)*elliptic_e(2*atan(x), 1/2)/(5*sqrt(x**4 + 1)) - 3
*sqrt((x**4 + 1)/(x**2 + 1)**2)*(x**2 + 1)*elliptic_f(2*atan(x),
1/2)/(10*sqrt(x**4 + 1)) + 3*sqrt(x**4 + 1)/(5*x) - sqrt(x**4 + 1
)/(5*x**5)
```

Mathematica [C] time = 0.0530177, size = 94, normalized size = 0.67

$$\frac{3x^8+2x^4-3(-1)^{3/4}\sqrt{x^4+1}x^5F\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)+3(-1)^{3/4}\sqrt{x^4+1}x^5E\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)-1}{5x^5\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^6*Sqrt[1 + x^4]),x]
```

```
[Out] (-1 + 2*x^4 + 3*x^8 + 3*(-1)^(3/4)*x^5*Sqrt[1 + x^4]*EllipticE[I*
ArcSinh[(-1)^(1/4)*x], -1] - 3*(-1)^(3/4)*x^5*Sqrt[1 + x^4]*Ellip
```

```
ticF[I*ArcSinh[(-1)^(1/4)*x], -1])/(5*x^5*Sqrt[1 + x^4])
```

Maple [C] time = 0.015, size = 107, normalized size = 0.8

$$-\frac{1}{5x^5}\sqrt{x^4+1}+\frac{3}{5x}\sqrt{x^4+1} - \frac{\frac{3i}{5}\left(EllipticF\left(x\left(\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}\right),i\right)-EllipticE\left(x\left(\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}\right),i\right)\right)}{\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}}\sqrt{1-ix^2}\sqrt{1+ix^2}\frac{1}{\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^6/(x^4+1)^(1/2),x)
```

```
[Out] -1/5*(x^4+1)^(1/2)/x^5+3/5*(x^4+1)^(1/2)/x-3/5*I/(1/2*2^(1/2)+1/2
*I*2^(1/2))*(1-I*x^2)^(1/2)*(1+I*x^2)^(1/2)/(x^4+1)^(1/2)*(Ellipt
icF(x*(1/2*2^(1/2)+1/2*I*2^(1/2)),I)-EllipticE(x*(1/2*2^(1/2)+1/2
*I*2^(1/2)),I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^4+1}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 + 1)*x^6),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(x^4 + 1)*x^6), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{x^4+1}x^6},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 + 1)*x^6),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(x^4 + 1)*x^6), x)
```

Sympy [A] time = 2.71082, size = 36, normalized size = 0.26

$$\frac{\Gamma\left(-\frac{5}{4}\right) {}_2F_1\left(\begin{matrix} -\frac{5}{4}, \frac{1}{2} \\ -\frac{1}{4} \end{matrix}\middle| x^4 e^{i\pi}\right)}{4x^5\,\Gamma\left(-\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**6/(x**4+1)**(1/2),x)
```

```
[Out] gamma(-5/4)*hyper((-5/4, 1/2), (-1/4,), x**4*exp_polar(I*pi))/(4*
x**5*gamma(-1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^4+1}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 + 1)*x^6),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(x^4 + 1)*x^6), x)
```

3.935 $\int \frac{x^{11}}{(1+x^4)^{3/2}}\,dx$

Optimal. Leaf size=38

$$\frac{1}{6}\left(x^4+1\right)^{3/2}-\sqrt{x^4+1}-\frac{1}{2\sqrt{x^4+1}}$$

```
[Out] -1/(2*Sqrt[1 + x^4]) - Sqrt[1 + x^4] + (1 + x^4)^(3/2)/6
```

Rubi [A] time = 0.0408458, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{1}{6}\left(x^4+1\right)^{3/2}-\sqrt{x^4+1}-\frac{1}{2\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11/(1 + x^4)^(3/2),x]
```

```
[Out] -1/(2*Sqrt[1 + x^4]) - Sqrt[1 + x^4] + (1 + x^4)^(3/2)/6
```

Rubi in Sympy [A] time = 4.04554, size = 29, normalized size = 0.76

$$\frac{\left(x^4+1\right)^{\frac{3}{2}}}{6}-\sqrt{x^4+1}-\frac{1}{2\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11/(x**4+1)**(3/2),x)
```

```
[Out] (x**4 + 1)**(3/2)/6 - sqrt(x**4 + 1) - 1/(2*sqrt(x**4 + 1))
```

Mathematica [A] time = 0.0157931, size = 23, normalized size = 0.61

$$\frac{x^8-4x^4-8}{6\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11/(1 + x^4)^(3/2),x]
```

```
[Out] (-8 - 4*x^4 + x^8)/(6*Sqrt[1 + x^4])
```

Maple [A] time = 0.006, size = 20, normalized size = 0.5

$$\frac{x^8-4\,x^4-8}{6}\frac{1}{\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11/(x^4+1)^(3/2),x)
```

```
[Out] 1/6*(x^8-4*x^4-8)/(x^4+1)^(1/2)
```

Maxima [A] time = 1.43238, size = 38, normalized size = 1.

$$\frac{1}{6}\left(x^4+1\right)^{\frac{3}{2}}-\sqrt{x^4+1}-\frac{1}{2\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(x^4 + 1)^(3/2),x, algorithm="maxima")
```

```
[Out] 1/6*(x^4 + 1)^(3/2) - sqrt(x^4 + 1) - 1/2/sqrt(x^4 + 1)
```

Fricas [A] time = 0.263039, size = 26, normalized size = 0.68

$$\frac{x^8-4\,x^4-8}{6\,\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(x^4 + 1)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/6*(x^8 - 4*x^4 - 8)/sqrt(x^4 + 1)
```

Sympy [A] time = 5.66389, size = 39, normalized size = 1.03

$$\frac{x^8}{6\sqrt{x^4+1}}-\frac{2x^4}{3\sqrt{x^4+1}}-\frac{4}{3\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11/(x**4+1)**(3/2),x)
```

```
[Out] x**8/(6*sqrt(x**4 + 1)) - 2*x**4/(3*sqrt(x**4 + 1)) - 4/(3*sqrt(x
**4 + 1))
```

GIAC/XCAS [A] time = 0.227877, size = 38, normalized size = 1.

$$\frac{1}{6}\left(x^4+1\right)^{\frac{3}{2}}-\sqrt{x^4+1}-\frac{1}{2\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(x^4 + 1)^(3/2),x, algorithm="giac")
```

```
[Out] 1/6*(x^4 + 1)^(3/2) - sqrt(x^4 + 1) - 1/2/sqrt(x^4 + 1)
```

3.936 $\int \frac{x^7}{(1+x^4)^{3/2}}\, dx$

Optimal. Leaf size=27

$$\frac{\sqrt{x^4+1}}{2}+\frac{1}{2\sqrt{x^4+1}}$$

```
[Out] 1/(2*Sqrt[1 + x^4]) + Sqrt[1 + x^4]/2
```

Rubi [A] time = 0.0318335, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{\sqrt{x^4+1}}{2}+\frac{1}{2\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7/(1 + x^4)^(3/2),x]

[Out] 1/(2*Sqrt[1 + x^4]) + Sqrt[1 + x^4]/2
```

Rubi in Sympy [A] time = 3.32849, size = 20, normalized size = 0.74

$$\frac{\sqrt{x^4+1}}{2}+\frac{1}{2\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7/(x**4+1)**(3/2),x)

[Out] sqrt(x**4 + 1)/2 + 1/(2*sqrt(x**4 + 1))
```

Mathematica [A] time = 0.00999915, size = 18, normalized size = 0.67

$$\frac{x^4+2}{2\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^7/(1 + x^4)^(3/2),x]

[Out] (2 + x^4)/(2*Sqrt[1 + x^4])
```

Maple [A] time = 0.006, size = 15, normalized size = 0.6

$$\frac{x^4+2}{2}\frac{1}{\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7/(x^4+1)^(3/2),x)
```

```
[Out] 1/2*(x^4+2)/(x^4+1)^(1/2)
```

Maxima [A] time = 1.44417, size = 26, normalized size = 0.96

$$\frac{1}{2}\sqrt{x^4+1}+\frac{1}{2\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^7/(x^4 + 1)^(3/2),x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(x^4 + 1) + 1/2/sqrt(x^4 + 1)
```

Fricas [A] time = 0.248308, size = 19, normalized size = 0.7

$$\frac{x^4+2}{2\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^7/(x^4 + 1)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/2*(x^4 + 2)/sqrt(x^4 + 1)
```

Sympy [A] time = 2.33139, size = 22, normalized size = 0.81

$$\frac{x^4}{2\sqrt{x^4+1}}+\frac{1}{\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**7/(x**4+1)**(3/2),x)
```

```
[Out] x**4/(2*sqrt(x**4 + 1)) + 1/sqrt(x**4 + 1)
```

GIAC/XCAS [A] time = 0.220836, size = 26, normalized size = 0.96

$$\frac{1}{2}\sqrt{x^4+1}+\frac{1}{2\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^7/(x^4 + 1)^(3/2),x, algorithm="giac")
```

```
[Out] 1/2*sqrt(x^4 + 1) + 1/2/sqrt(x^4 + 1)
```

3.937 $\int \frac{x^3}{(1+x^4)^{3/2}}\,dx$

Optimal. Leaf size=13

$$-\frac{1}{2\sqrt{x^4+1}}$$

```
[Out] -1/(2*Sqrt[1 + x^4])
```

Rubi [A] time = 0.00698683, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{1}{2\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In] Int[x^3/(1 + x^4)^(3/2),x]

[Out] -1/(2*Sqrt[1 + x^4])
```

Rubi in Sympy [A] time = 1.61938, size = 12, normalized size = 0.92

$$-\frac{1}{2\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**3/(x**4+1)**(3/2),x)

[Out] -1/(2*sqrt(x**4 + 1))
```

Mathematica [A] time = 0.00428745, size = 13, normalized size = 1.

$$-\frac{1}{2\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3/(1 + x^4)^(3/2),x]

[Out] -1/(2*Sqrt[1 + x^4])
```

Maple [A] time = 0.007, size = 10, normalized size = 0.8

$$-\frac{1}{2}\frac{1}{\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(x^4+1)^(3/2),x)

[Out] -1/2/(x^4+1)^(1/2)
```

Maxima [A] time = 1.45428, size = 12, normalized size = 0.92

$$-\frac{1}{2\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(x^4 + 1)^(3/2),x, algorithm="maxima")
```

```
[Out] -1/2/sqrt(x^4 + 1)
```

Fricas [A] time = 0.258313, size = 12, normalized size = 0.92

$$-\frac{1}{2\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(x^4 + 1)^(3/2),x, algorithm="fricas")
```

```
[Out] -1/2/sqrt(x^4 + 1)
```

Sympy [A] time = 1.34648, size = 12, normalized size = 0.92

$$-\frac{1}{2\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(x**4+1)**(3/2),x)
```

```
[Out] -1/(2*sqrt(x**4 + 1))
```

GIAC/XCAS [A] time = 0.227554, size = 12, normalized size = 0.92

$$-\frac{1}{2\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(x^4 + 1)^(3/2),x, algorithm="giac")
```

```
[Out] -1/2/sqrt(x^4 + 1)
```

3.938 $\int \frac{1}{x(1+x^4)^{3/2}} dx$

Optimal. Leaf size=28

$$\frac{1}{2\sqrt{x^4+1}} - \frac{1}{2}\tanh^{-1}\left(\sqrt{x^4+1}\right)$$

```
[Out] 1/(2*Sqrt[1 + x^4]) - ArcTanh[Sqrt[1 + x^4]]/2
```

Rubi [A] time = 0.033269, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$

$$\frac{1}{2\sqrt{x^4+1}} - \frac{1}{2}\tanh^{-1}\left(\sqrt{x^4+1}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(1 + x^4)^(3/2)),x]

[Out] 1/(2*Sqrt[1 + x^4]) - ArcTanh[Sqrt[1 + x^4]]/2
```

Rubi in Sympy [A] time = 3.94977, size = 22, normalized size = 0.79

$$-\frac{\operatorname{atanh}\left(\sqrt{x^4+1}\right)}{2} + \frac{1}{2\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(x**4+1)**(3/2),x)

[Out] -atanh(sqrt(x**4 + 1))/2 + 1/(2*sqrt(x**4 + 1))
```

Mathematica [A] time = 0.0361846, size = 28, normalized size = 1.

$$\frac{1}{2\sqrt{x^4+1}} - \frac{1}{2}\tanh^{-1}\left(\sqrt{x^4+1}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(1 + x^4)^(3/2)),x]

[Out] 1/(2*Sqrt[1 + x^4]) - ArcTanh[Sqrt[1 + x^4]]/2
```

Maple [A] time = 0.016, size = 21, normalized size = 0.8

$$\frac{1}{2}\frac{1}{\sqrt{x^4+1}} - \frac{1}{2}\mathit{Artanh}\left(\frac{1}{\sqrt{x^4+1}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(x^4+1)^(3/2),x)
```

```
[Out] 1/2/(x^4+1)^(1/2)-1/2*arctanh(1/(x^4+1)^(1/2))
```

Maxima [A] time = 1.41593, size = 46, normalized size = 1.64

$$\frac{1}{2\sqrt{x^4+1}} - \frac{1}{4}\log\left(\sqrt{x^4+1}+1\right) + \frac{1}{4}\log\left(\sqrt{x^4+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^4 + 1)^(3/2)*x),x, algorithm="maxima")
```

```
[Out] 1/2/sqrt(x^4 + 1) - 1/4*log(sqrt(x^4 + 1) + 1) + 1/4*log(sqrt(x^4
 + 1) - 1)
```

Fricas [A] time = 0.267229, size = 65, normalized size = 2.32

$$-\frac{\sqrt{x^4+1}\log\left(\sqrt{x^4+1}+1\right) - \sqrt{x^4+1}\log\left(\sqrt{x^4+1}-1\right) - 2}{4\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^4 + 1)^(3/2)*x),x, algorithm="fricas")
```

```
[Out] -1/4*(sqrt(x^4 + 1)*log(sqrt(x^4 + 1) + 1) - sqrt(x^4 + 1)*log(sq
rt(x^4 + 1) - 1) - 2)/sqrt(x^4 + 1)
```

Sympy [A] time = 4.70878, size = 87, normalized size = 3.11

$$\frac{x^4\log\left(x^4\right)}{4x^4+4} - \frac{2x^4\log\left(\sqrt{x^4+1}+1\right)}{4x^4+4} + \frac{2\sqrt{x^4+1}}{4x^4+4} + \frac{\log\left(x^4\right)}{4x^4+4} - \frac{2\log\left(\sqrt{x^4+1}+1\right)}{4x^4+4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(x**4+1)**(3/2),x)
```

```
[Out] x**4*log(x**4)/(4*x**4 + 4) - 2*x**4*log(sqrt(x**4 + 1) + 1)/(4*x
**4 + 4) + 2*sqrt(x**4 + 1)/(4*x**4 + 4) + log(x**4)/(4*x**4 + 4)
 - 2*log(sqrt(x**4 + 1) + 1)/(4*x**4 + 4)
```

GIAC/XCAS [A] time = 0.221631, size = 46, normalized size = 1.64

$$\frac{1}{2\sqrt{x^4+1}} - \frac{1}{4}\ln\left(\sqrt{x^4+1}+1\right) + \frac{1}{4}\ln\left(\sqrt{x^4+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^4 + 1)^(3/2)*x),x, algorithm="giac")
```

```
[Out] 1/2/sqrt(x^4 + 1) - 1/4*ln(sqrt(x^4 + 1) + 1) + 1/4*ln(sqrt(x^4 +
 1) - 1)
```

3.939 $\int \frac{1}{x^5(1+x^4)^{3/2}}\,dx$

Optimal. Leaf size=47

$$-\frac{3\sqrt{x^4+1}}{4x^4}+\frac{1}{2x^4\sqrt{x^4+1}}+\frac{3}{4}\tanh^{-1}\left(\sqrt{x^4+1}\right)$$

```
[Out] 1/(2*x^4*Sqrt[1 + x^4]) - (3*Sqrt[1 + x^4])/(4*x^4) + (3*ArcTanh[
Sqrt[1 + x^4]])/4
```

Rubi [A] time = 0.0467639, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$-\frac{3\sqrt{x^4+1}}{4x^4}+\frac{1}{2x^4\sqrt{x^4+1}}+\frac{3}{4}\tanh^{-1}\left(\sqrt{x^4+1}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^5*(1 + x^4)^(3/2)),x]
```

```
[Out] 1/(2*x^4*Sqrt[1 + x^4]) - (3*Sqrt[1 + x^4])/(4*x^4) + (3*ArcTanh[
Sqrt[1 + x^4]])/4
```

Rubi in Sympy [A] time = 4.8724, size = 42, normalized size = 0.89

$$\frac{3\,\operatorname{atanh}\left(\sqrt{x^4+1}\right)}{4}-\frac{3\sqrt{x^4+1}}{4x^4}+\frac{1}{2x^4\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**5/(x**4+1)**(3/2),x)
```

```
[Out] 3*atanh(sqrt(x**4 + 1))/4 - 3*sqrt(x**4 + 1)/(4*x**4) + 1/(2*x**4
*sqrt(x**4 + 1))
```

Mathematica [A] time = 0.061527, size = 38, normalized size = 0.81

$$\frac{3}{4}\tanh^{-1}\left(\sqrt{x^4+1}\right)-\frac{3x^4+1}{4x^4\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^5*(1 + x^4)^(3/2)),x]
```

```
[Out] -(1 + 3*x^4)/(4*x^4*Sqrt[1 + x^4]) + (3*ArcTanh[Sqrt[1 + x^4]])/4
```

Maple [A] time = 0.016, size = 33, normalized size = 0.7

$$-\frac{1}{4\,x^4}\frac{1}{\sqrt{x^4+1}}-\frac{3}{4}\frac{1}{\sqrt{x^4+1}}+\frac{3}{4}\mathit{Artanh}\left(\frac{1}{\sqrt{x^4+1}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^5/(x^4+1)^(3/2),x)
```

```
[Out] -1/4/x^4/(x^4+1)^(1/2)-3/4/(x^4+1)^(1/2)+3/4*arctanh(1/(x^4+1)^(1
/2))
```

Maxima [A] time = 1.44056, size = 72, normalized size = 1.53

$$-\frac{3\,x^4+1}{4\left((x^4+1)^{\frac{3}{2}}-\sqrt{x^4+1}\right)}+\frac{3}{8}\,\log\left(\sqrt{x^4+1}+1\right)-\frac{3}{8}\,\log\left(\sqrt{x^4+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^4 + 1)^(3/2)*x^5),x, algorithm="maxima")
```

```
[Out] -1/4*(3*x^4 + 1)/((x^4 + 1)^(3/2) - sqrt(x^4 + 1)) + 3/8*log(sqrt
(x^4 + 1) + 1) - 3/8*log(sqrt(x^4 + 1) - 1)
```

Fricas [A] time = 0.261162, size = 85, normalized size = 1.81

$$\frac{3\,\sqrt{x^4+1}x^4\log\left(\sqrt{x^4+1}+1\right)-3\,\sqrt{x^4+1}x^4\log\left(\sqrt{x^4+1}-1\right)-6\,x^4-2}{8\,\sqrt{x^4+1}x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^4 + 1)^(3/2)*x^5),x, algorithm="fricas")
```

```
[Out] 1/8*(3*sqrt(x^4 + 1)*x^4*log(sqrt(x^4 + 1) + 1) - 3*sqrt(x^4 + 1)
*x^4*log(sqrt(x^4 + 1) - 1) - 6*x^4 - 2)/(sqrt(x^4 + 1)*x^4)
```

Sympy [A] time = 8.98049, size = 42, normalized size = 0.89

$$\frac{3\operatorname{asinh}\left(\frac{1}{x^2}\right)}{4}-\frac{3}{4x^2\sqrt{1+\frac{1}{x^4}}}-\frac{1}{4x^6\sqrt{1+\frac{1}{x^4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**5/(x**4+1)**(3/2),x)
```

```
[Out] 3*asinh(x**(-2))/4 - 3/(4*x**2*sqrt(1 + x**(-4))) - 1/(4*x**6*sqr
t(1 + x**(-4)))
```

GIAC/XCAS [A] time = 0.23299, size = 72, normalized size = 1.53

$$-\frac{3\,x^4+1}{4\left((x^4+1)^{\frac{3}{2}}-\sqrt{x^4+1}\right)}+\frac{3}{8}\ln\left(\sqrt{x^4+1}+1\right)-\frac{3}{8}\ln\left(\sqrt{x^4+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^4 + 1)^(3/2)*x^5),x, algorithm="giac")
```

```
[Out] -1/4*(3*x^4 + 1)/((x^4 + 1)^(3/2) - sqrt(x^4 + 1)) + 3/8*ln(sqrt(
x^4 + 1) + 1) - 3/8*ln(sqrt(x^4 + 1) - 1)
```

3.940 $\int \frac{x^9}{(1+x^4)^{3/2}}\,dx$

Optimal. Leaf size=41

$$-\frac{3}{4}\sinh^{-1}\left(x^2\right)-\frac{x^6}{2\sqrt{x^4+1}}+\frac{3}{4}\sqrt{x^4+1}x^2$$

```
[Out] -x^6/(2*Sqrt[1 + x^4]) + (3*x^2*Sqrt[1 + x^4])/4 - (3*ArcSinh[x^2
])/4
```

Rubi [A] time = 0.0475946, antiderivative size = 41, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$-\frac{3}{4}\sinh^{-1}\left(x^2\right)-\frac{x^6}{2\sqrt{x^4+1}}+\frac{3}{4}\sqrt{x^4+1}x^2$$

Antiderivative was successfully verified.

```
[In]  Int[x^9/(1 + x^4)^(3/2),x]
```

```
[Out] -x^6/(2*Sqrt[1 + x^4]) + (3*x^2*Sqrt[1 + x^4])/4 - (3*ArcSinh[x^2
])/4
```

Rubi in Sympy [A] time = 6.23299, size = 36, normalized size = 0.88

$$-\frac{x^6}{2\sqrt{x^4+1}}+\frac{3x^2\sqrt{x^4+1}}{4}-\frac{3\,\text{asinh}\left(x^2\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**9/(x**4+1)**(3/2),x)
```

```
[Out] -x**6/(2*sqrt(x**4 + 1)) + 3*x**2*sqrt(x**4 + 1)/4 - 3*asinh(x**2
)/4
```

Mathematica [A] time = 0.0310787, size = 37, normalized size = 0.9

$$\frac{x^6+3x^2-3\sqrt{x^4+1}\sinh^{-1}\left(x^2\right)}{4\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^9/(1 + x^4)^(3/2),x]
```

```
[Out] (3*x^2 + x^6 - 3*Sqrt[1 + x^4]*ArcSinh[x^2])/(4*Sqrt[1 + x^4])
```

Maple [A] time = 0.015, size = 32, normalized size = 0.8

$$\frac{x^6}{4}\frac{1}{\sqrt{x^4+1}}+\frac{3\,x^2}{4}\frac{1}{\sqrt{x^4+1}}-\frac{3\,Arcsinh\left(x^2\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^9/(x^4+1)^(3/2),x)
```

```
[Out] 1/4*x^6/(x^4+1)^(1/2)+3/4*x^2/(x^4+1)^(1/2)-3/4*arcsinh(x^2)
```

Maxima [A] time = 1.42306, size = 99, normalized size = 2.41

$$-\frac{\frac{3\,(x^4+1)}{x^4}-2}{4\left(\frac{\sqrt{x^4+1}}{x^2}-\frac{(x^4+1)^{\frac{3}{2}}}{x^6}\right)}-\frac{3}{8}\,\log\left(\frac{\sqrt{x^4+1}}{x^2}+1\right)+\frac{3}{8}\,\log\left(\frac{\sqrt{x^4+1}}{x^2}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(x^4 + 1)^(3/2),x, algorithm="maxima")
```

```
[Out] -1/4*(3*(x^4 + 1)/x^4 - 2)/(sqrt(x^4 + 1)/x^2 - (x^4 + 1)^(3/2)/x
^6) - 3/8*log(sqrt(x^4 + 1)/x^2 + 1) + 3/8*log(sqrt(x^4 + 1)/x^2
- 1)
```

Fricas [A] time = 0.252759, size = 170, normalized size = 4.15

$$-\frac{4\,x^{12}+7\,x^8-x^4-3\left(4\,x^8+5\,x^4-\left(4\,x^6+3\,x^2\right)\sqrt{x^4+1}+1\right)\log\left(-x^2+\sqrt{x^4+1}\right)-\left(4\,x^{10}+5\,x^6-3\,x^2\right)\sqrt{x^4+1}-2}{4\left(4\,x^8+5\,x^4-(4\,x^6+3\,x^2)\sqrt{x^4+1}+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(x^4 + 1)^(3/2),x, algorithm="fricas")
```

```
[Out] -1/4*(4*x^12 + 7*x^8 - x^4 - 3*(4*x^8 + 5*x^4 - (4*x^6 + 3*x^2)*s
qrt(x^4 + 1) + 1)*log(-x^2 + sqrt(x^4 + 1)) - (4*x^10 + 5*x^6 - 3
*x^2)*sqrt(x^4 + 1) - 2)/(4*x^8 + 5*x^4 - (4*x^6 + 3*x^2)*sqrt(x^
4 + 1) + 1)
```

Sympy [A] time = 9.2043, size = 36, normalized size = 0.88

$$\frac{x^6}{4\sqrt{x^4+1}}+\frac{3x^2}{4\sqrt{x^4+1}}-\frac{3\,\mathrm{asinh}\left(x^2\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**9/(x**4+1)**(3/2),x)
```

```
[Out] x**6/(4*sqrt(x**4 + 1)) + 3*x**2/(4*sqrt(x**4 + 1)) - 3*asinh(x**
2)/4
```

GIAC/XCAS [A] time = 0.226761, size = 46, normalized size = 1.12

$$\frac{\left(x^4+3\right)x^2}{4\,\sqrt{x^4+1}}+\frac{3}{4}\,\ln\left(-x^2+\sqrt{x^4+1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(x^4 + 1)^(3/2),x, algorithm="giac")
```

```
[Out] 1/4*(x^4 + 3)*x^2/sqrt(x^4 + 1) + 3/4*ln(-x^2 + sqrt(x^4 + 1))
```

3.941 $\int \frac{x^5}{(1+x^4)^{3/2}} dx$

Optimal. Leaf size=25

$$\frac{1}{2}\sinh^{-1}\left(x^2\right)-\frac{x^2}{2\sqrt{x^4+1}}$$

```
[Out] -x^2/(2*Sqrt[1 + x^4]) + ArcSinh[x^2]/2
```

Rubi [A] time = 0.0300038, antiderivative size = 25, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{1}{2}\sinh^{-1}\left(x^2\right)-\frac{x^2}{2\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In] Int[x^5/(1 + x^4)^(3/2),x]

[Out] -x^2/(2*Sqrt[1 + x^4]) + ArcSinh[x^2]/2
```

Rubi in Sympy [A] time = 4.26764, size = 19, normalized size = 0.76

$$-\frac{x^2}{2\sqrt{x^4+1}}+\frac{\operatorname{asinh}\left(x^2\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**5/(x**4+1)**(3/2),x)

[Out] -x**2/(2*sqrt(x**4 + 1)) + asinh(x**2)/2
```

Mathematica [A] time = 0.0218577, size = 25, normalized size = 1.

$$\frac{1}{2}\sinh^{-1}\left(x^2\right)-\frac{x^2}{2\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5/(1 + x^4)^(3/2),x]

[Out] -x^2/(2*Sqrt[1 + x^4]) + ArcSinh[x^2]/2
```

Maple [A] time = 0.013, size = 20, normalized size = 0.8

$$\frac{Arcsinh\left(x^2\right)}{2}-\frac{x^2}{2}\frac{1}{\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5/(x^4+1)^(3/2),x)
```

```
[Out] 1/2*arcsinh(x^2)-1/2*x^2/(x^4+1)^(1/2)
```

Maxima [A] time = 1.44653, size = 61, normalized size = 2.44

$$-\frac{x^2}{2\sqrt{x^4+1}}+\frac{1}{4}\log\left(\frac{\sqrt{x^4+1}}{x^2}+1\right)-\frac{1}{4}\log\left(\frac{\sqrt{x^4+1}}{x^2}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(x^4 + 1)^(3/2),x, algorithm="maxima")
```

```
[Out] -1/2*x^2/sqrt(x^4 + 1) + 1/4*log(sqrt(x^4 + 1)/x^2 + 1) - 1/4*log
(sqrt(x^4 + 1)/x^2 - 1)
```

Fricas [A] time = 0.264491, size = 74, normalized size = 2.96

$$-\frac{\left(x^4-\sqrt{x^4+1}x^2+1\right)\log\left(-x^2+\sqrt{x^4+1}\right)+1}{2\left(x^4-\sqrt{x^4+1}x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(x^4 + 1)^(3/2),x, algorithm="fricas")
```

```
[Out] -1/2*((x^4 - sqrt(x^4 + 1)*x^2 + 1)*log(-x^2 + sqrt(x^4 + 1)) + 1
)/(x^4 - sqrt(x^4 + 1)*x^2 + 1)
```

Sympy [A] time = 4.81203, size = 19, normalized size = 0.76

$$-\frac{x^2}{2\sqrt{x^4+1}}+\frac{\operatorname{asinh}\left(x^2\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(x**4+1)**(3/2),x)
```

```
[Out] -x**2/(2*sqrt(x**4 + 1)) + asinh(x**2)/2
```

GIAC/XCAS [A] time = 0.229368, size = 39, normalized size = 1.56

$$-\frac{x^2}{2\sqrt{x^4+1}}-\frac{1}{2}\ln\left(-x^2+\sqrt{x^4+1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(x^4 + 1)^(3/2),x, algorithm="giac")
```

```
[Out] -1/2*x^2/sqrt(x^4 + 1) - 1/2*ln(-x^2 + sqrt(x^4 + 1))
```

3.942 $\int \frac{x}{(1+x^4)^{3/2}} \, dx$

Optimal. Leaf size=16

$$\frac{x^2}{2\sqrt{x^4+1}}$$

```
[Out] x^2/(2*Sqrt[1 + x^4])
```

Rubi [A] time = 0.0110394, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{x^2}{2\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(1 + x^4)^(3/2),x]

[Out] x^2/(2*Sqrt[1 + x^4])
```

Rubi in Sympy [A] time = 1.97324, size = 12, normalized size = 0.75

$$\frac{x^2}{2\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(x**4+1)**(3/2),x)

[Out] x**2/(2*sqrt(x**4 + 1))
```

Mathematica [A] time = 0.0086853, size = 16, normalized size = 1.

$$\frac{x^2}{2\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(1 + x^4)^(3/2),x]

[Out] x^2/(2*Sqrt[1 + x^4])
```

Maple [A] time = 0.003, size = 13, normalized size = 0.8

$$\frac{x^2}{2}\frac{1}{\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(x^4+1)^(3/2),x)
```

```
[Out] 1/2*x^2/(x^4+1)^(1/2)
```

Maxima [A] time = 1.41794, size = 16, normalized size = 1.

$$\frac{x^2}{2\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(x^4 + 1)^(3/2),x, algorithm="maxima")
```

```
[Out] 1/2*x^2/sqrt(x^4 + 1)
```

Fricas [A] time = 0.262134, size = 28, normalized size = 1.75

$$\frac{1}{2\left(x^4-\sqrt{x^4+1}x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(x^4 + 1)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/2/(x^4 - sqrt(x^4 + 1)*x^2 + 1)
```

Sympy [A] time = 1.57566, size = 12, normalized size = 0.75

$$\frac{x^2}{2\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(x**4+1)**(3/2),x)
```

```
[Out] x**2/(2*sqrt(x**4 + 1))
```

GIAC/XCAS [A] time = 0.228867, size = 16, normalized size = 1.

$$\frac{x^2}{2\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(x^4 + 1)^(3/2),x, algorithm="giac")
```

```
[Out] 1/2*x^2/sqrt(x^4 + 1)
```

3.943 $\int \frac{1}{x^3(1+x^4)^{3/2}}\,dx$

Optimal. Leaf size=31

$$-\frac{x^2}{\sqrt{x^4+1}}-\frac{1}{2\sqrt{x^4+1}x^2}$$

```
[Out] -1/(2*x^2*Sqrt[1 + x^4]) - x^2/Sqrt[1 + x^4]
```

Rubi [A] time = 0.0223854, antiderivative size = 31, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{x^2}{\sqrt{x^4+1}}-\frac{1}{2\sqrt{x^4+1}x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(1 + x^4)^(3/2)),x]

[Out] -1/(2*x^2*Sqrt[1 + x^4]) - x^2/Sqrt[1 + x^4]
```

Rubi in Sympy [A] time = 2.85681, size = 27, normalized size = 0.87

$$-\frac{x^2}{\sqrt{x^4+1}}-\frac{1}{2x^2\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(x**4+1)**(3/2),x)

[Out] -x**2/sqrt(x**4 + 1) - 1/(2*x**2*sqrt(x**4 + 1))
```

Mathematica [A] time = 0.0130547, size = 23, normalized size = 0.74

$$-\frac{2x^4+1}{2x^2\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*(1 + x^4)^(3/2)),x]

[Out] -(1 + 2*x^4)/(2*x^2*Sqrt[1 + x^4])
```

Maple [A] time = 0.005, size = 20, normalized size = 0.7

$$-\frac{2\,x^4+1}{2\,x^2}\frac{1}{\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(x^4+1)^(3/2),x)
```

```
[Out] -1/2*(2*x^4+1)/x^2/(x^4+1)^(1/2)
```

Maxima [A] time = 1.46181, size = 34, normalized size = 1.1

$$-\frac{x^2}{2\sqrt{x^4+1}}-\frac{\sqrt{x^4+1}}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^4 + 1)^(3/2)*x^3),x, algorithm="maxima")
```

```
[Out] -1/2*x^2/sqrt(x^4 + 1) - 1/2*sqrt(x^4 + 1)/x^2
```

Fricas [A] time = 0.265342, size = 45, normalized size = 1.45

$$\frac{1}{2\left(2x^8+2x^4-(2x^6+x^2)\sqrt{x^4+1}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^4 + 1)^(3/2)*x^3),x, algorithm="fricas")
```

```
[Out] 1/2/(2*x^8 + 2*x^4 - (2*x^6 + x^2)*sqrt(x^4 + 1))
```

Sympy [A] time = 2.3531, size = 42, normalized size = 1.35

$$-\frac{2x^4\sqrt{x^4+1}}{2x^6+2x^2}-\frac{\sqrt{x^4+1}}{2x^6+2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(x**4+1)**(3/2),x)
```

```
[Out] -2*x**4*sqrt(x**4 + 1)/(2*x**6 + 2*x**2) - sqrt(x**4 + 1)/(2*x**6
 + 2*x**2)
```

GIAC/XCAS [A] time = 0.233895, size = 30, normalized size = 0.97

$$-\frac{x^2}{2\sqrt{x^4+1}}-\frac{1}{2}\sqrt{\frac{1}{x^4}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^4 + 1)^(3/2)*x^3),x, algorithm="giac")
```

```
[Out] -1/2*x^2/sqrt(x^4 + 1) - 1/2*sqrt(1/x^4 + 1)
```

3.944 $\int \frac{1}{x^7(1+x^4)^{3/2}}\,dx$

Optimal. Leaf size=49

$$-\frac{1}{6\sqrt{x^4+1}x^6}+\frac{4x^2}{3\sqrt{x^4+1}}+\frac{2}{3\sqrt{x^4+1}x^2}$$

```
[Out] -1/(6*x^6*Sqrt[1 + x^4]) + 2/(3*x^2*Sqrt[1 + x^4]) + (4*x^2)/(3*S
qrt[1 + x^4])
```

Rubi [A] time = 0.03545, antiderivative size = 49, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{1}{6\sqrt{x^4+1}x^6}+\frac{4x^2}{3\sqrt{x^4+1}}+\frac{2}{3\sqrt{x^4+1}x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^7*(1 + x^4)^(3/2)),x]
```

```
[Out] -1/(6*x^6*Sqrt[1 + x^4]) + 2/(3*x^2*Sqrt[1 + x^4]) + (4*x^2)/(3*S
qrt[1 + x^4])
```

Rubi in Sympy [A] time = 3.7896, size = 44, normalized size = 0.9

$$\frac{4x^2}{3\sqrt{x^4+1}}+\frac{2}{3x^2\sqrt{x^4+1}}-\frac{1}{6x^6\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**7/(x**4+1)**(3/2),x)
```

```
[Out] 4*x**2/(3*sqrt(x**4 + 1)) + 2/(3*x**2*sqrt(x**4 + 1)) - 1/(6*x**6
*sqrt(x**4 + 1))
```

Mathematica [A] time = 0.0155781, size = 28, normalized size = 0.57

$$\frac{8x^8+4x^4-1}{6x^6\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^7*(1 + x^4)^(3/2)),x]
```

```
[Out] (-1 + 4*x^4 + 8*x^8)/(6*x^6*Sqrt[1 + x^4])
```

Maple [A] time = 0.006, size = 25, normalized size = 0.5

$$\frac{8\,x^8+4\,x^4-1}{6\,x^6}\frac{1}{\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^7/(x^4+1)^(3/2),x)
```

```
[Out] 1/6*(8*x^8+4*x^4-1)/x^6/(x^4+1)^(1/2)
```

Maxima [A] time = 1.48871, size = 49, normalized size = 1.

$$\frac{x^2}{2\sqrt{x^4+1}} + \frac{\sqrt{x^4+1}}{x^2} - \frac{\left(x^4+1\right)^{\frac{3}{2}}}{6\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^4 + 1)^(3/2)*x^7),x, algorithm="maxima")
```

```
[Out] 1/2*x^2/sqrt(x^4 + 1) + sqrt(x^4 + 1)/x^2 - 1/6*(x^4 + 1)^(3/2)/x
^6
```

Fricas [A] time = 0.264475, size = 84, normalized size = 1.71

$$\frac{4\,x^4 - 4\,\sqrt{x^4+1}x^2 + 1}{6\left(8\,x^{16} + 12\,x^{12} + 4\,x^8 - \left(8\,x^{14} + 8\,x^{10} + x^6\right)\sqrt{x^4+1}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^4 + 1)^(3/2)*x^7),x, algorithm="fricas")
```

```
[Out] 1/6*(4*x^4 - 4*sqrt(x^4 + 1)*x^2 + 1)/(8*x^16 + 12*x^12 + 4*x^8 -
 (8*x^14 + 8*x^10 + x^6)*sqrt(x^4 + 1))
```

Sympy [A] time = 5.06567, size = 70, normalized size = 1.43

$$\frac{8x^8\sqrt{1+\frac{1}{x^4}}}{6x^8+6x^4} + \frac{4x^4\sqrt{1+\frac{1}{x^4}}}{6x^8+6x^4} - \frac{\sqrt{1+\frac{1}{x^4}}}{6x^8+6x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**7/(x**4+1)**(3/2),x)
```

```
[Out] 8*x**8*sqrt(1 + x**(-4))/(6*x**8 + 6*x**4) + 4*x**4*sqrt(1 + x**(
-4))/(6*x**8 + 6*x**4) - sqrt(1 + x**(-4))/(6*x**8 + 6*x**4)
```

GIAC/XCAS [A] time = 0.233008, size = 39, normalized size = 0.8

$$\frac{x^2}{2\sqrt{x^4+1}} - \frac{1}{6}\left(\frac{1}{x^4}+1\right)^{\frac{3}{2}} + \sqrt{\frac{1}{x^4}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^4 + 1)^(3/2)*x^7),x, algorithm="giac")
```

```
[Out] 1/2*x^2/sqrt(x^4 + 1) - 1/6*(1/x^4 + 1)^(3/2) + sqrt(1/x^4 + 1)
```

3.945 $\int \frac{x^{12}}{(1+x^4)^{3/2}} dx$

Optimal. Leaf size=90

$$-\frac{15}{14}\sqrt{x^4+1}x-\frac{x^9}{2\sqrt{x^4+1}}+\frac{9}{14}\sqrt{x^4+1}x^5+\frac{15\left(x^2+1\right)\sqrt{\frac{x^4+1}{\left(x^2+1\right)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{28\sqrt{x^4+1}}$$

```
[Out] -x^9/(2*Sqrt[1 + x^4]) - (15*x*Sqrt[1 + x^4])/14 + (9*x^5*Sqrt[1
+ x^4])/14 + (15*(1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*EllipticF[
2*ArcTan[x], 1/2])/(28*Sqrt[1 + x^4])
```

Rubi [A] time = 0.0619925, antiderivative size = 90, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{15}{14}\sqrt{x^4+1}x-\frac{x^9}{2\sqrt{x^4+1}}+\frac{9}{14}\sqrt{x^4+1}x^5+\frac{15\left(x^2+1\right)\sqrt{\frac{x^4+1}{\left(x^2+1\right)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{28\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^12/(1 + x^4)^(3/2),x]
```

```
[Out] -x^9/(2*Sqrt[1 + x^4]) - (15*x*Sqrt[1 + x^4])/14 + (9*x^5*Sqrt[1
+ x^4])/14 + (15*(1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*EllipticF[
2*ArcTan[x], 1/2])/(28*Sqrt[1 + x^4])
```

Rubi in Sympy [A] time = 5.68319, size = 82, normalized size = 0.91

$$-\frac{x^9}{2\sqrt{x^4+1}}+\frac{9x^5\sqrt{x^4+1}}{14}-\frac{15x\sqrt{x^4+1}}{14}+\frac{15\sqrt{\frac{x^4+1}{\left(x^2+1\right)^2}}\left(x^2+1\right)F\left(2\,\mathrm{atan}\,(x)\middle|\frac{1}{2}\right)}{28\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**12/(x**4+1)**(3/2),x)
```

```
[Out] -x**9/(2*sqrt(x**4 + 1)) + 9*x**5*sqrt(x**4 + 1)/14 - 15*x*sqrt(x
**4 + 1)/14 + 15*sqrt((x**4 + 1)/(x**2 + 1)**2)*(x**2 + 1)*ellipt
ic_f(2*atan(x), 1/2)/(28*sqrt(x**4 + 1))
```

Mathematica [C] time = 0.0507083, size = 57, normalized size = 0.63

$$-\frac{-2x^9+6x^5+15\sqrt[4]{-1}\sqrt{x^4+1}F\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)+15x}{14\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^12/(1 + x^4)^(3/2),x]
```

```
[Out] -(15*x + 6*x^5 - 2*x^9 + 15*(-1)^(1/4)*Sqrt[1 + x^4]*EllipticF[I*
ArcSinh[(-1)^(1/4)*x], -1])/(14*Sqrt[1 + x^4])
```

Maple [C] time = 0.013, size = 94, normalized size = 1.

$$-\frac{x}{2}\frac{1}{\sqrt{x^4+1}}+\frac{x^5}{7}\sqrt{x^4+1}-\frac{4x}{7}\sqrt{x^4+1}+\frac{15\,EllipticF\left(x\left(1/2\sqrt{2}+i/2\sqrt{2}\right),i\right)}{7\sqrt{2}+7\,i\sqrt{2}}\sqrt{1-ix^2}\sqrt{1+ix^2}\frac{1}{\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^12/(x^4+1)^(3/2),x)
```

```
[Out] -1/2*x/(x^4+1)^(1/2)+1/7*x^5*(x^4+1)^(1/2)-4/7*x*(x^4+1)^(1/2)+15
/14/(1/2*2^(1/2)+1/2*I*2^(1/2))*(1-I*x^2)^(1/2)*(1+I*x^2)^(1/2)/(
x^4+1)^(1/2)*EllipticF(x*(1/2*2^(1/2)+1/2*I*2^(1/2)),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{12}}{(x^4+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^12/(x^4 + 1)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^12/(x^4 + 1)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{12}}{(x^4+1)^{\frac{3}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^12/(x^4 + 1)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^12/(x^4 + 1)^(3/2), x)
```

Sympy [A] time = 5.7449, size = 29, normalized size = 0.32

$$\frac{x^{13}\,\Gamma\left(\frac{13}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{3}{2},\frac{13}{4}\\\frac{17}{4}\end{matrix}\middle|x^4e^{i\pi}\right)}{4\,\Gamma\left(\frac{17}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**12/(x**4+1)**(3/2),x)
```

```
[Out] x**13*gamma(13/4)*hyper((3/2, 13/4), (17/4,), x**4*exp_polar(I*pi
))/(4*gamma(17/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{12}}{(x^4+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^12/(x^4 + 1)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^12/(x^4 + 1)^(3/2), x)
```

3.946 $\int \frac{x^8}{(1+x^4)^{3/2}}\,dx$

Optimal. Leaf size=74

$$\frac{5}{6}\sqrt{x^4+1}x-\frac{x^5}{2\sqrt{x^4+1}}-\frac{5\left(x^2+1\right)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{12\sqrt{x^4+1}}$$

```
[Out] -x^5/(2*Sqrt[1 + x^4]) + (5*x*Sqrt[1 + x^4])/6 - (5*(1 + x^2)*Sqr
t[(1 + x^4)/(1 + x^2)^2]*EllipticF[2*ArcTan[x], 1/2])/(12*Sqrt[1
+ x^4])
```

Rubi [A] time = 0.0469885, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{5}{6}\sqrt{x^4+1}x-\frac{x^5}{2\sqrt{x^4+1}}-\frac{5\left(x^2+1\right)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{12\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In] Int[x^8/(1 + x^4)^(3/2),x]
```

```
[Out] -x^5/(2*Sqrt[1 + x^4]) + (5*x*Sqrt[1 + x^4])/6 - (5*(1 + x^2)*Sqr
t[(1 + x^4)/(1 + x^2)^2]*EllipticF[2*ArcTan[x], 1/2])/(12*Sqrt[1
+ x^4])
```

Rubi in Sympy [A] time = 4.44207, size = 66, normalized size = 0.89

$$-\frac{x^5}{2\sqrt{x^4+1}}+\frac{5x\sqrt{x^4+1}}{6}-\frac{5\sqrt{\frac{x^4+1}{(x^2+1)^2}}\left(x^2+1\right)F\left(2\,\mathrm{atan}\,(x)\middle|\frac{1}{2}\right)}{12\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**8/(x**4+1)**(3/2),x)
```

```
[Out] -x**5/(2*sqrt(x**4 + 1)) + 5*x*sqrt(x**4 + 1)/6 - 5*sqrt((x**4 +
1)/(x**2 + 1)**2)*(x**2 + 1)*elliptic_f(2*atan(x), 1/2)/(12*sqrt(
x**4 + 1))
```

Mathematica [C] time = 0.040052, size = 52, normalized size = 0.7

$$\frac{2x^5+5\sqrt[4]{-1}\sqrt{x^4+1}F\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)+5x}{6\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^8/(1 + x^4)^(3/2),x]
```

```
[Out] (5*x + 2*x^5 + 5*(-1)^(1/4)*Sqrt[1 + x^4]*EllipticF[I*ArcSinh[(-1
)^(1/4)*x], -1])/(6*Sqrt[1 + x^4])
```

Maple [C] time = 0.012, size = 82, normalized size = 1.1

$$\frac{x}{2}\frac{1}{\sqrt{x^4+1}}+\frac{x}{3}\sqrt{x^4+1}-\frac{5\,EllipticF\left(x\left(1/2\sqrt{2}+i/2\sqrt{2}\right),i\right)}{3\sqrt{2}+3\,i\sqrt{2}}\sqrt{1-ix^2}\sqrt{1+ix^2}\frac{1}{\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^8/(x^4+1)^(3/2),x)
```

```
[Out] 1/2*x/(x^4+1)^(1/2)+1/3*x*(x^4+1)^(1/2)-5/6/(1/2*2^(1/2)+1/2*I*2^
(1/2))*(1-I*x^2)^(1/2)*(1+I*x^2)^(1/2)/(x^4+1)^(1/2)*EllipticF(x*
(1/2*2^(1/2)+1/2*I*2^(1/2)),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^8}{(x^4+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^8/(x^4 + 1)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^8/(x^4 + 1)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x^8}{(x^4+1)^{\frac{3}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^8/(x^4 + 1)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^8/(x^4 + 1)^(3/2), x)
```

Sympy [A] time = 2.84276, size = 29, normalized size = 0.39

$$\frac{x^9\,\Gamma\left(\frac{9}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{3}{2},\frac{9}{4}\\ \frac{13}{4}\end{matrix}\middle|\,x^4e^{i\pi}\right)}{4\,\Gamma\left(\frac{13}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**8/(x**4+1)**(3/2),x)
```

```
[Out] x**9*gamma(9/4)*hyper((3/2, 9/4), (13/4,), x**4*exp_polar(I*pi))/
(4*gamma(13/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^8}{(x^4+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(x^4 + 1)^(3/2),x, algorithm="giac")

[Out] integrate(x^8/(x^4 + 1)^(3/2), x)
```

3.947 $\int \frac{x^4}{(1+x^4)^{3/2}}\,dx$

Optimal. Leaf size=58

$$\frac{(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)\middle|\frac{1}{2}\right)}{4\sqrt{x^4+1}}-\frac{x}{2\sqrt{x^4+1}}$$

```
[Out] -x/(2*Sqrt[1 + x^4]) + ((1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*Ell
ipticF[2*ArcTan[x], 1/2])/(4*Sqrt[1 + x^4])
```

Rubi [A] time = 0.0300925, antiderivative size = 58, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)\middle|\frac{1}{2}\right)}{4\sqrt{x^4+1}}-\frac{x}{2\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(1 + x^4)^(3/2),x]
```

```
[Out] -x/(2*Sqrt[1 + x^4]) + ((1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*Ell
ipticF[2*ArcTan[x], 1/2])/(4*Sqrt[1 + x^4])
```

Rubi in Sympy [A] time = 2.82101, size = 49, normalized size = 0.84

$$-\frac{x}{2\sqrt{x^4+1}}+\frac{\sqrt{\frac{x^4+1}{(x^2+1)^2}}\,(x^2+1)\,F\left(2\operatorname{atan}(x)\middle|\frac{1}{2}\right)}{4\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(x**4+1)**(3/2),x)
```

```
[Out] -x/(2*sqrt(x**4 + 1)) + sqrt((x**4 + 1)/(x**2 + 1)**2)*(x**2 + 1)
*elliptic_f(2*atan(x), 1/2)/(4*sqrt(x**4 + 1))
```

Mathematica [C] time = 0.037637, size = 38, normalized size = 0.66

$$-\frac{x}{2\sqrt{x^4+1}}-\frac{1}{2}\sqrt[4]{-1}F\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(1 + x^4)^(3/2),x]
```

```
[Out] -x/(2*Sqrt[1 + x^4]) - ((-1)^(1/4)*EllipticF[I*ArcSinh[(-1)^(1/4)
*x], -1])/2
```

Maple [C] time = 0.011, size = 72, normalized size = 1.2

$$-\frac{x}{2}\frac{1}{\sqrt{x^4+1}}+\frac{\mathit{EllipticF}\left(x\left(\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}\right),i\right)}{\sqrt{2}+i\sqrt{2}}\sqrt{1-ix^2}\sqrt{1+ix^2}\frac{1}{\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^4/(x^4+1)^(3/2),x)
```

```
[Out] -1/2*x/(x^4+1)^(1/2)+1/2/(1/2*2^(1/2)+1/2*I*2^(1/2))*(1-I*x^2)^(1
/2)*(1+I*x^2)^(1/2)/(x^4+1)^(1/2)*EllipticF(x*(1/2*2^(1/2)+1/2*I*
2^(1/2)),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{(x^4+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^4/(x^4 + 1)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^4/(x^4 + 1)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^4}{(x^4+1)^{\frac{3}{2}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^4/(x^4 + 1)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^4/(x^4 + 1)^(3/2), x)
```

Sympy [A] time = 1.92442, size = 29, normalized size = 0.5

$$\frac{x^5\left(\frac{5}{4}\right) {}_2F_1\left(\begin{matrix}\frac{5}{4}, \frac{3}{2}\\ \frac{9}{4}\end{matrix}\middle| x^4e^{i\pi}\right)}{4\left(\frac{9}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**4/(x**4+1)**(3/2),x)
```

```
[Out] x**5*gamma(5/4)*hyper((5/4, 3/2), (9/4,), x**4*exp_polar(I*pi))/(
4*gamma(9/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{(x^4+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^4/(x^4 + 1)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^4/(x^4 + 1)^(3/2), x)
```

3.948 $\int \frac{1}{(1+x^4)^{3/2}}\,dx$

Optimal. Leaf size=58

$$\frac{x}{2\sqrt{x^4+1}}+\frac{(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{4\sqrt{x^4+1}}$$

```
[Out] x/(2*Sqrt[1 + x^4]) + ((1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*Elli
pticF[2*ArcTan[x], 1/2])/(4*Sqrt[1 + x^4])
```

Rubi [A] time = 0.0221527, antiderivative size = 58, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{x}{2\sqrt{x^4+1}}+\frac{(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{4\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[(1 + x^4)^(-3/2),x]
```

```
[Out] x/(2*Sqrt[1 + x^4]) + ((1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*Elli
pticF[2*ArcTan[x], 1/2])/(4*Sqrt[1 + x^4])
```

Rubi in Sympy [A] time = 1.37587, size = 49, normalized size = 0.84

$$\frac{x}{2\sqrt{x^4+1}}+\frac{\sqrt{\frac{x^4+1}{(x^2+1)^2}}\,(x^2+1)\,F\left(2\,\mathrm{atan}\,(x)|\frac{1}{2}\right)}{4\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(x**4+1)**(3/2),x)
```

```
[Out] x/(2*sqrt(x**4 + 1)) + sqrt((x**4 + 1)/(x**2 + 1)**2)*(x**2 + 1)*
elliptic_f(2*atan(x), 1/2)/(4*sqrt(x**4 + 1))
```

Mathematica [C] time = 0.0318901, size = 37, normalized size = 0.64

$$\frac{1}{2}\left(\frac{x}{\sqrt{x^4+1}}-\sqrt[4]{-1}F\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(1 + x^4)^(-3/2),x]
```

```
[Out] (x/Sqrt[1 + x^4] - (-1)^(1/4)*EllipticF[I*ArcSinh[(-1)^(1/4)*x],
-1])/2
```

Maple [C] time = 0.008, size = 72, normalized size = 1.2

$$\frac{x}{2}\frac{1}{\sqrt{x^4+1}}+\frac{EllipticF\left(x\left(\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}\right),i\right)}{\sqrt{2}+i\sqrt{2}}\sqrt{1-ix^2}\sqrt{1+ix^2}\frac{1}{\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(x^4+1)^(3/2),x)
```

```
[Out] 1/2*x/(x^4+1)^(1/2)+1/2/(1/2*2^(1/2)+1/2*I*2^(1/2))*(1-I*x^2)^(1/
2)*(1+I*x^2)^(1/2)/(x^4+1)^(1/2)*EllipticF(x*(1/2*2^(1/2)+1/2*I*2
^(1/2)),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(x^4+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x^4 + 1)^(-3/2),x, algorithm="maxima")
```

```
[Out] integrate((x^4 + 1)^(-3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(x^4+1)^{\frac{3}{2}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x^4 + 1)^(-3/2),x, algorithm="fricas")
```

```
[Out] integral((x^4 + 1)^(-3/2), x)
```

Sympy [A] time = 1.80607, size = 27, normalized size = 0.47

$$\frac{x\left(\frac{1}{4}\right) {}_2F_1\left(\begin{matrix} \frac{1}{4}, \frac{3}{2} \\ \frac{5}{4} \end{matrix}\middle| x^4 e^{i\pi}\right)}{4\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x**4+1)**(3/2),x)
```

```
[Out] x*gamma(1/4)*hyper((1/4, 3/2), (5/4,), x**4*exp_polar(I*pi))/(4*g
amma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(x^4+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x^4 + 1)^(-3/2),x, algorithm="giac")
```

```
[Out] integrate((x^4 + 1)^(-3/2), x)
```

3.949 $\int \frac{1}{x^4(1+x^4)^{3/2}}\,dx$

Optimal. Leaf size=76

$$-\frac{5\sqrt{x^4+1}}{6x^3}+\frac{1}{2x^3\sqrt{x^4+1}}-\frac{5\left(x^2+1\right)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{12\sqrt{x^4+1}}$$

```
[Out] 1/(2*x^3*Sqrt[1 + x^4]) - (5*Sqrt[1 + x^4])/(6*x^3) - (5*(1 + x^2
)*Sqrt[(1 + x^4)/(1 + x^2)^2]*EllipticF[2*ArcTan[x], 1/2])/(12*Sq
rt[1 + x^4])
```

Rubi [A] time = 0.0448991, antiderivative size = 76, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{5\sqrt{x^4+1}}{6x^3}+\frac{1}{2x^3\sqrt{x^4+1}}-\frac{5\left(x^2+1\right)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{12\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*(1 + x^4)^(3/2)),x]
```

```
[Out] 1/(2*x^3*Sqrt[1 + x^4]) - (5*Sqrt[1 + x^4])/(6*x^3) - (5*(1 + x^2
)*Sqrt[(1 + x^4)/(1 + x^2)^2]*EllipticF[2*ArcTan[x], 1/2])/(12*Sq
rt[1 + x^4])
```

Rubi in Sympy [A] time = 4.18499, size = 70, normalized size = 0.92

$$-\frac{5\sqrt{\frac{x^4+1}{(x^2+1)^2}}\left(x^2+1\right)F\left(2\operatorname{atan}(x)|\frac{1}{2}\right)}{12\sqrt{x^4+1}}-\frac{5\sqrt{x^4+1}}{6x^3}+\frac{1}{2x^3\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(x**4+1)**(3/2),x)
```

```
[Out] -5*sqrt((x**4 + 1)/(x**2 + 1)**2)*(x**2 + 1)*elliptic_f(2*atan(x)
, 1/2)/(12*sqrt(x**4 + 1)) - 5*sqrt(x**4 + 1)/(6*x**3) + 1/(2*x**
3*sqrt(x**4 + 1))
```

Mathematica [C] time = 0.0664525, size = 46, normalized size = 0.61

$$\frac{1}{6}\left(\frac{-5x^4-2}{x^3\sqrt{x^4+1}}+5\sqrt[4]{-1}F\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*(1 + x^4)^(3/2)),x]
```

```
[Out] ((-2 - 5*x^4)/(x^3*Sqrt[1 + x^4]) + 5*(-1)^(1/4)*EllipticF[I*ArcS
inh[(-1)^(1/4)*x], -1])/6
```

Maple [C] time = 0.017, size = 84, normalized size = 1.1

$$-\frac{x}{2}\frac{1}{\sqrt{x^4+1}}-\frac{1}{3\,x^3}\sqrt{x^4+1}-\frac{5\,EllipticF\left(x\left(1/2\,\sqrt{2}+i/2\sqrt{2}\right),i\right)}{3\,\sqrt{2}+3\,i\sqrt{2}}\sqrt{1-ix^2}\sqrt{1+ix^2}\frac{1}{\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(x^4+1)^(3/2),x)
```

```
[Out] -1/2*x/(x^4+1)^(1/2)-1/3*(x^4+1)^(1/2)/x^3-5/6/(1/2*2^(1/2)+1/2*I
*2^(1/2))*(1-I*x^2)^(1/2)*(1+I*x^2)^(1/2)/(x^4+1)^(1/2)*EllipticF
(x*(1/2*2^(1/2)+1/2*I*2^(1/2)),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(x^4+1)^{\frac{3}{2}}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^4 + 1)^(3/2)*x^4),x, algorithm="maxima")
```

```
[Out] integrate(1/((x^4 + 1)^(3/2)*x^4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(x^8+x^4)\sqrt{x^4+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^4 + 1)^(3/2)*x^4),x, algorithm="fricas")
```

```
[Out] integral(1/((x^8 + x^4)*sqrt(x^4 + 1)), x)
```

Sympy [A] time = 2.83842, size = 32, normalized size = 0.42

$$\frac{\Gamma\left(-\frac{3}{4}\right) {}_2F_1\left(\begin{matrix} -\frac{3}{4}, \frac{3}{2} \\ \frac{1}{4} \end{matrix}\middle| x^4 e^{i\pi}\right)}{4x^3\,\Gamma\left(\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(x**4+1)**(3/2),x)
```

```
[Out] gamma(-3/4)*hyper((-3/4, 3/2), (1/4,), x**4*exp_polar(I*pi))/(4*x
**3*gamma(1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(x^4+1)^{\frac{3}{2}}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^4 + 1)^(3/2)*x^4),x, algorithm="giac")
```

```
[Out] integrate(1/((x^4 + 1)^(3/2)*x^4), x)
```

3.950 $\int \frac{1}{x^8(1+x^4)^{3/2}}\,dx$

Optimal. Leaf size=92

$$-\frac{9\sqrt{x^4+1}}{14x^7}+\frac{1}{2x^7\sqrt{x^4+1}}+\frac{15\sqrt{x^4+1}}{14x^3}+\frac{15\left(x^2+1\right)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)\middle|\frac{1}{2}\right)}{28\sqrt{x^4+1}}$$

```
[Out] 1/(2*x^7*Sqrt[1 + x^4]) - (9*Sqrt[1 + x^4])/(14*x^7) + (15*Sqrt[1
 + x^4])/(14*x^3) + (15*(1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*Ell
ipticF[2*ArcTan[x], 1/2])/(28*Sqrt[1 + x^4])
```

Rubi [A] time = 0.0611315, antiderivative size = 92, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$

$$-\frac{9\sqrt{x^4+1}}{14x^7}+\frac{1}{2x^7\sqrt{x^4+1}}+\frac{15\sqrt{x^4+1}}{14x^3}+\frac{15\left(x^2+1\right)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)\middle|\frac{1}{2}\right)}{28\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^8*(1 + x^4)^(3/2)),x]
```

```
[Out] 1/(2*x^7*Sqrt[1 + x^4]) - (9*Sqrt[1 + x^4])/(14*x^7) + (15*Sqrt[1
 + x^4])/(14*x^3) + (15*(1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*Ell
ipticF[2*ArcTan[x], 1/2])/(28*Sqrt[1 + x^4])
```

Rubi in Sympy [A] time = 5.49764, size = 85, normalized size = 0.92

$$\frac{15\sqrt{\frac{x^4+1}{(x^2+1)^2}}\left(x^2+1\right)F\left(2\operatorname{atan}(x)\middle|\frac{1}{2}\right)}{28\sqrt{x^4+1}}+\frac{15\sqrt{x^4+1}}{14x^3}-\frac{9\sqrt{x^4+1}}{14x^7}+\frac{1}{2x^7\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**8/(x**4+1)**(3/2),x)
```

```
[Out] 15*sqrt((x**4 + 1)/(x**2 + 1)**2)*(x**2 + 1)*elliptic_f(2*atan(x)
, 1/2)/(28*sqrt(x**4 + 1)) + 15*sqrt(x**4 + 1)/(14*x**3) - 9*sqrt
(x**4 + 1)/(14*x**7) + 1/(2*x**7*sqrt(x**4 + 1))
```

Mathematica [C] time = 0.042455, size = 61, normalized size = 0.66

$$\frac{15x^8+6x^4-15\sqrt[4]{-1}\sqrt{x^4+1}x^7F\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)-2}{14x^7\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^8*(1 + x^4)^(3/2)),x]
```

```
[Out] (-2 + 6*x^4 + 15*x^8 - 15*(-1)^(1/4)*x^7*Sqrt[1 + x^4]*EllipticF[
I*ArcSinh[(-1)^(1/4)*x], -1])/(14*x^7*Sqrt[1 + x^4])
```

Maple [C] time = 0.02, size = 96, normalized size = 1.

$$\frac{x}{2}\frac{1}{\sqrt{x^4+1}}-\frac{1}{7x^7}\sqrt{x^4+1}+\frac{4}{7x^3}\sqrt{x^4+1}+\frac{15\,\mathit{EllipticF}\left(x\left(1/2\sqrt{2}+i/2\sqrt{2}\right),i\right)}{7\sqrt{2}+7i\sqrt{2}}\sqrt{1-ix^2}\sqrt{1+ix^2}\frac{1}{\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^8/(x^4+1)^(3/2),x)
```

```
[Out] 1/2*x/(x^4+1)^(1/2)-1/7*(x^4+1)^(1/2)/x^7+4/7*(x^4+1)^(1/2)/x^3+1
5/14/(1/2*2^(1/2)+1/2*I*2^(1/2))*(1-I*x^2)^(1/2)*(1+I*x^2)^(1/2)/
(x^4+1)^(1/2)*EllipticF(x*(1/2*2^(1/2)+1/2*I*2^(1/2)),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(x^4+1\right)^{\frac{3}{2}}x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^4 + 1)^(3/2)*x^8),x, algorithm="maxima")
```

```
[Out] integrate(1/((x^4 + 1)^(3/2)*x^8), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\left(x^{12}+x^8\right)\sqrt{x^4+1}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^4 + 1)^(3/2)*x^8),x, algorithm="fricas")
```

```
[Out] integral(1/((x^12 + x^8)*sqrt(x^4 + 1)), x)
```

Sympy [A] time = 5.82385, size = 36, normalized size = 0.39

$$\frac{\Gamma\left(-\frac{7}{4}\right){}_2F_1\left(\begin{matrix}-\frac{7}{4},\frac{3}{2}\\-\frac{3}{4}\end{matrix}\middle|x^4e^{i\pi}\right)}{4x^7\,\Gamma\left(-\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**8/(x**4+1)**(3/2),x)
```

```
[Out] gamma(-7/4)*hyper((-7/4, 3/2), (-3/4,), x**4*exp_polar(I*pi))/(4*
x**7*gamma(-3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(x^4+1\right)^{\frac{3}{2}}x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^4 + 1)^(3/2)*x^8),x, algorithm="giac")
```

```
[Out] integrate(1/((x^4 + 1)^(3/2)*x^8), x)
```

3.951 $\int \frac{x^{14}}{(1+x^4)^{3/2}} \, dx$

Optimal. Leaf size=156

$$-\frac{x^{11}}{2\sqrt{x^4+1}}+\frac{11}{18}\sqrt{x^4+1}x^7-\frac{77}{90}\sqrt{x^4+1}x^3+\frac{77\sqrt{x^4+1}x}{30(x^2+1)}+\frac{77(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{60\sqrt{x^4+1}}-\frac{77(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}E\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{30\sqrt{x^4+1}}$$

```
[Out] -x^11/(2*Sqrt[1 + x^4]) - (77*x^3*Sqrt[1 + x^4])/90 + (11*x^7*Sqr
t[1 + x^4])/18 + (77*x*Sqrt[1 + x^4])/(30*(1 + x^2)) - (77*(1 + x
^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*EllipticE[2*ArcTan[x], 1/2])/(30*
Sqrt[1 + x^4]) + (77*(1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*Ellipt
icF[2*ArcTan[x], 1/2])/(60*Sqrt[1 + x^4])
```

Rubi [A] time = 0.112814, antiderivative size = 156, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.385$

$$-\frac{x^{11}}{2\sqrt{x^4+1}}+\frac{11}{18}\sqrt{x^4+1}x^7-\frac{77}{90}\sqrt{x^4+1}x^3+\frac{77\sqrt{x^4+1}x}{30(x^2+1)}+\frac{77(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{60\sqrt{x^4+1}}-\frac{77(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}E\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{30\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^14/(1 + x^4)^(3/2),x]
```

```
[Out] -x^11/(2*Sqrt[1 + x^4]) - (77*x^3*Sqrt[1 + x^4])/90 + (11*x^7*Sqr
t[1 + x^4])/18 + (77*x*Sqrt[1 + x^4])/(30*(1 + x^2)) - (77*(1 + x
^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*EllipticE[2*ArcTan[x], 1/2])/(30*
Sqrt[1 + x^4]) + (77*(1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*Ellipt
icF[2*ArcTan[x], 1/2])/(60*Sqrt[1 + x^4])
```

Rubi in Sympy [A] time = 10.2372, size = 143, normalized size = 0.92

$$-\frac{x^{11}}{2\sqrt{x^4+1}}+\frac{11x^7\sqrt{x^4+1}}{18}-\frac{77x^3\sqrt{x^4+1}}{90}+\frac{77x\sqrt{x^4+1}}{30(x^2+1)}-\frac{77\sqrt{\frac{x^4+1}{(x^2+1)^2}}(x^2+1)E\left(2\operatorname{atan}(x)|\frac{1}{2}\right)}{30\sqrt{x^4+1}}+\frac{77\sqrt{\frac{x^4+1}{(x^2+1)^2}}(x^2+1)F\left(2\operatorname{atan}(x)|\frac{1}{2}\right)}{60\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**14/(x**4+1)**(3/2),x)
```

```
[Out] -x**11/(2*sqrt(x**4 + 1)) + 11*x**7*sqrt(x**4 + 1)/18 - 77*x**3*s
qrt(x**4 + 1)/90 + 77*x*sqrt(x**4 + 1)/(30*(x**2 + 1)) - 77*sqrt(
(x**4 + 1)/(x**2 + 1)**2)*(x**2 + 1)*elliptic_e(2*atan(x), 1/2)/(
30*sqrt(x**4 + 1)) + 77*sqrt((x**4 + 1)/(x**2 + 1)**2)*(x**2 + 1)
*elliptic_f(2*atan(x), 1/2)/(60*sqrt(x**4 + 1))
```

Mathematica [C] time = 0.0957604, size = 72, normalized size = 0.46

$$\frac{1}{90}\left(\frac{(10x^8-22x^4-77)x^3}{\sqrt{x^4+1}}+231(-1)^{3/4}F\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)-231(-1)^{3/4}E\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)\right)$$

Antiderivative was successfully verified.

```
[In]   Integrate[x^14/(1 + x^4)^(3/2),x]
```

```
[Out] ((x^3*(-77 - 22*x^4 + 10*x^8))/Sqrt[1 + x^4] - 231*(-1)^(3/4)*Ell
ipticE[I*ArcSinh[(-1)^(1/4)*x], -1] + 231*(-1)^(3/4)*EllipticF[I*
ArcSinh[(-1)^(1/4)*x], -1])/90
```

Maple [C]   time = 0.012, size = 119, normalized size = 0.8

$$-\frac{x^3}{2}\frac{1}{\sqrt{x^4+1}}+\frac{x^7}{9}\sqrt{x^4+1}-\frac{16\,x^3}{45}\sqrt{x^4+1}+\frac{\frac{77\,i}{30}\left(\mathit{EllipticF}\left(x\left(\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}\right),i\right)-\mathit{EllipticE}\left(x\left(\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}\right),i\right)\right)}{\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}}\sqrt{1-ix^2}\sqrt{1+ix^2}\frac{1}{\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^14/(x^4+1)^(3/2),x)
```

```
[Out] -1/2*x^3/(x^4+1)^(1/2)+1/9*x^7*(x^4+1)^(1/2)-16/45*x^3*(x^4+1)^(1
/2)+77/30*I/(1/2*2^(1/2)+1/2*I*2^(1/2))*(1-I*x^2)^(1/2)*(1+I*x^2)
^(1/2)/(x^4+1)^(1/2)*(EllipticF(x*(1/2*2^(1/2)+1/2*I*2^(1/2)),I)-
EllipticE(x*(1/2*2^(1/2)+1/2*I*2^(1/2)),I))
```

Maxima [F]   time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{14}}{(x^4+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^14/(x^4 + 1)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^14/(x^4 + 1)^(3/2), x)
```

Fricas [F]   time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x^{14}}{(x^4+1)^{\frac{3}{2}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^14/(x^4 + 1)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^14/(x^4 + 1)^(3/2), x)
```

Sympy [A]   time = 8.61967, size = 29, normalized size = 0.19

$$\frac{x^{15}\,\Gamma\left(\frac{15}{4}\right)\,{}_2F_1\left(\left.\begin{matrix}\frac{3}{2},\frac{15}{4}\\\frac{19}{4}\end{matrix}\right|x^4e^{i\pi}\right)}{4\,\Gamma\left(\frac{19}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**14/(x**4+1)**(3/2),x)
```

```
[Out] x**15*gamma(15/4)*hyper((3/2, 15/4), (19/4,), x**4*exp_polar(I*pi
))/(4*gamma(19/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{14}}{(x^4+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^14/(x^4 + 1)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^14/(x^4 + 1)^(3/2), x)
```

3.952 $\int \frac{x^{10}}{(1+x^4)^{3/2}}\, dx$

Optimal. Leaf size=140

$$-\frac{x^7}{2\sqrt{x^4+1}}+\frac{7}{10}\sqrt{x^4+1}x^3-\frac{21\sqrt{x^4+1}x}{10(x^2+1)}-\frac{21(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)\middle|\frac{1}{2}\right)}{20\sqrt{x^4+1}}+\frac{21(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}E\left(2\tan^{-1}(x)\middle|\frac{1}{2}\right)}{10\sqrt{x^4+1}}$$

```
[Out] -x^7/(2*Sqrt[1 + x^4]) + (7*x^3*Sqrt[1 + x^4])/10 - (21*x*Sqrt[1
+ x^4])/(10*(1 + x^2)) + (21*(1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2
]*EllipticE[2*ArcTan[x], 1/2])/(10*Sqrt[1 + x^4]) - (21*(1 + x^2)
*Sqrt[(1 + x^4)/(1 + x^2)^2]*EllipticF[2*ArcTan[x], 1/2])/(20*Sqr
t[1 + x^4])
```

Rubi [A] time = 0.0904643, antiderivative size = 140, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385

$$-\frac{x^7}{2\sqrt{x^4+1}}+\frac{7}{10}\sqrt{x^4+1}x^3-\frac{21\sqrt{x^4+1}x}{10(x^2+1)}-\frac{21(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)\middle|\frac{1}{2}\right)}{20\sqrt{x^4+1}}+\frac{21(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}E\left(2\tan^{-1}(x)\middle|\frac{1}{2}\right)}{10\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^10/(1 + x^4)^(3/2),x]
```

```
[Out] -x^7/(2*Sqrt[1 + x^4]) + (7*x^3*Sqrt[1 + x^4])/10 - (21*x*Sqrt[1
+ x^4])/(10*(1 + x^2)) + (21*(1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2
]*EllipticE[2*ArcTan[x], 1/2])/(10*Sqrt[1 + x^4]) - (21*(1 + x^2)
*Sqrt[(1 + x^4)/(1 + x^2)^2]*EllipticF[2*ArcTan[x], 1/2])/(20*Sqr
t[1 + x^4])
```

Rubi in Sympy [A] time = 8.76336, size = 128, normalized size = 0.91

$$-\frac{x^7}{2\sqrt{x^4+1}}+\frac{7x^3\sqrt{x^4+1}}{10}-\frac{21x\sqrt{x^4+1}}{10(x^2+1)}+\frac{21\sqrt{\frac{x^4+1}{(x^2+1)^2}}(x^2+1)E\left(2\operatorname{atan}(x)\middle|\frac{1}{2}\right)}{10\sqrt{x^4+1}}-\frac{21\sqrt{\frac{x^4+1}{(x^2+1)^2}}(x^2+1)F\left(2\operatorname{atan}(x)\middle|\frac{1}{2}\right)}{20\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**10/(x**4+1)**(3/2),x)
```

```
[Out] -x**7/(2*sqrt(x**4 + 1)) + 7*x**3*sqrt(x**4 + 1)/10 - 21*x*sqrt(x
**4 + 1)/(10*(x**2 + 1)) + 21*sqrt((x**4 + 1)/(x**2 + 1)**2)*(x**
2 + 1)*elliptic_e(2*atan(x), 1/2)/(10*sqrt(x**4 + 1)) - 21*sqrt((
x**4 + 1)/(x**2 + 1)**2)*(x**2 + 1)*elliptic_f(2*atan(x), 1/2)/(2
0*sqrt(x**4 + 1))
```

Mathematica [C] time = 0.0724765, size = 75, normalized size = 0.54

$$\frac{1}{10}\left(\frac{2x^7}{\sqrt{x^4+1}}+\frac{7x^3}{\sqrt{x^4+1}}-21(-1)^{3/4}F\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)+21(-1)^{3/4}E\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^10/(1 + x^4)^(3/2),x]
```

```
[Out] ((7*x^3)/Sqrt[1 + x^4] + (2*x^7)/Sqrt[1 + x^4] + 21*(-1)^(3/4)*El
lipticE[I*ArcSinh[(-1)^(1/4)*x], -1] - 21*(-1)^(3/4)*EllipticF[I*
ArcSinh[(-1)^(1/4)*x], -1])/10
```

Maple [C] time = 0.012, size = 107, normalized size = 0.8

$$\frac{x^3}{2}\frac{1}{\sqrt{x^4+1}}+\frac{x^3}{5}\sqrt{x^4+1}-\frac{\frac{21\,i}{10}\left(\mathit{EllipticF}\left(x\left(\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}\right),i\right)-\mathit{EllipticE}\left(x\left(\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}\right),i\right)\right)}{\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}}\sqrt{1-ix^2}\sqrt{1+ix^2}\frac{1}{\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^10/(x^4+1)^(3/2),x)
```

```
[Out] 1/2*x^3/(x^4+1)^(1/2)+1/5*x^3*(x^4+1)^(1/2)-21/10*I/(1/2*2^(1/2)+
1/2*I*2^(1/2))*(1-I*x^2)^(1/2)*(1+I*x^2)^(1/2)/(x^4+1)^(1/2)*(Ell
ipticF(x*(1/2*2^(1/2)+1/2*I*2^(1/2)),I)-EllipticE(x*(1/2*2^(1/2)+
1/2*I*2^(1/2)),I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{10}}{(x^4+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/(x^4 + 1)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^10/(x^4 + 1)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{10}}{(x^4+1)^{\frac{3}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/(x^4 + 1)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^10/(x^4 + 1)^(3/2), x)
```

Sympy [A] time = 4.10445, size = 29, normalized size = 0.21

$$\frac{x^{11}\,\Gamma\left(\frac{11}{4}\right)\,{}_2F_1\left(\left.\begin{matrix}\frac{3}{2},\frac{11}{4}\\ \frac{15}{4}\end{matrix}\right|x^4e^{i\pi}\right)}{4\,\Gamma\left(\frac{15}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**10/(x**4+1)**(3/2),x)
```

```
[Out] x**11*gamma(11/4)*hyper((3/2, 11/4), (15/4,), x**4*exp_polar(I*pi
))/(4*gamma(15/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{10}}{(x^4+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/(x^4 + 1)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^10/(x^4 + 1)^(3/2), x)
```

3.953 $\int \frac{x^6}{(1+x^4)^{3/2}}\,dx$

Optimal. Leaf size=124

$$-\frac{x^3}{2\sqrt{x^4+1}}+\frac{3\sqrt{x^4+1}x}{2(x^2+1)}+\frac{3(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)\middle|\frac{1}{2}\right)}{4\sqrt{x^4+1}}-\frac{3(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}E\left(2\tan^{-1}(x)\middle|\frac{1}{2}\right)}{2\sqrt{x^4+1}}$$

```
[Out] -x^3/(2*Sqrt[1 + x^4]) + (3*x*Sqrt[1 + x^4])/(2*(1 + x^2)) - (3*(
1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*EllipticE[2*ArcTan[x], 1/2])
/(2*Sqrt[1 + x^4]) + (3*(1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*Ell
ipticF[2*ArcTan[x], 1/2])/(4*Sqrt[1 + x^4])
```

Rubi [A] time = 0.0691605, antiderivative size = 124, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$

$$-\frac{x^3}{2\sqrt{x^4+1}}+\frac{3\sqrt{x^4+1}x}{2(x^2+1)}+\frac{3(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)\middle|\frac{1}{2}\right)}{4\sqrt{x^4+1}}-\frac{3(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}E\left(2\tan^{-1}(x)\middle|\frac{1}{2}\right)}{2\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/(1 + x^4)^(3/2),x]
```

```
[Out] -x^3/(2*Sqrt[1 + x^4]) + (3*x*Sqrt[1 + x^4])/(2*(1 + x^2)) - (3*(
1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*EllipticE[2*ArcTan[x], 1/2])
/(2*Sqrt[1 + x^4]) + (3*(1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*Ell
ipticF[2*ArcTan[x], 1/2])/(4*Sqrt[1 + x^4])
```

Rubi in Sympy [A] time = 7.36903, size = 112, normalized size = 0.9

$$-\frac{x^3}{2\sqrt{x^4+1}}+\frac{3x\sqrt{x^4+1}}{2(x^2+1)}-\frac{3\sqrt{\frac{x^4+1}{(x^2+1)^2}}(x^2+1)E\left(2\,\mathrm{atan}(x)\middle|\frac{1}{2}\right)}{2\sqrt{x^4+1}}+\frac{3\sqrt{\frac{x^4+1}{(x^2+1)^2}}(x^2+1)F\left(2\,\mathrm{atan}(x)\middle|\frac{1}{2}\right)}{4\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(x**4+1)**(3/2),x)
```

```
[Out] -x**3/(2*sqrt(x**4 + 1)) + 3*x*sqrt(x**4 + 1)/(2*(x**2 + 1)) - 3*
sqrt((x**4 + 1)/(x**2 + 1)**2)*(x**2 + 1)*elliptic_e(2*atan(x), 1
/2)/(2*sqrt(x**4 + 1)) + 3*sqrt((x**4 + 1)/(x**2 + 1)**2)*(x**2 +
 1)*elliptic_f(2*atan(x), 1/2)/(4*sqrt(x**4 + 1))
```

Mathematica [C] time = 0.067231, size = 61, normalized size = 0.49

$$\frac{1}{2}\left(-\frac{x^3}{\sqrt{x^4+1}}+3(-1)^{3/4}F\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)-3(-1)^{3/4}E\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6/(1 + x^4)^(3/2),x]
```

```
[Out] (-(x^3/Sqrt[1 + x^4]) - 3*(-1)^(3/4)*EllipticE[I*ArcSinh[(-1)^(1/
4)*x], -1] + 3*(-1)^(3/4)*EllipticF[I*ArcSinh[(-1)^(1/4)*x], -1])
/2
```

Maple [C] time = 0.012, size = 95, normalized size = 0.8

$$-\frac{x^3}{2}\frac{1}{\sqrt{x^4+1}}+\frac{\frac{3i}{2}\left(\mathit{EllipticF}\left(x\left(\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}\right),i\right)-\mathit{EllipticE}\left(x\left(\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}\right),i\right)\right)}{\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}}\sqrt{1-ix^2}\sqrt{1+ix^2}\frac{1}{\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^6/(x^4+1)^(3/2),x)
```

```
[Out] -1/2*x^3/(x^4+1)^(1/2)+3/2*I/(1/2*2^(1/2)+1/2*I*2^(1/2))*(1-I*x^2
)^(1/2)*(1+I*x^2)^(1/2)/(x^4+1)^(1/2)*(EllipticF(x*(1/2*2^(1/2)+1
/2*I*2^(1/2)),I)-EllipticE(x*(1/2*2^(1/2)+1/2*I*2^(1/2)),I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{(x^4+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^6/(x^4 + 1)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^6/(x^4 + 1)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^6}{(x^4+1)^{\frac{3}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^6/(x^4 + 1)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^6/(x^4 + 1)^(3/2), x)
```

Sympy [A] time = 2.29822, size = 29, normalized size = 0.23

$$\frac{x^7\,\Gamma\left(\frac{7}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{3}{2},\frac{7}{4}\\ \frac{11}{4}\end{matrix}\middle|x^4e^{i\pi}\right)}{4\,\Gamma\left(\frac{11}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**6/(x**4+1)**(3/2),x)
```

```
[Out] x**7*gamma(7/4)*hyper((3/2, 7/4), (11/4,), x**4*exp_polar(I*pi))/
(4*gamma(11/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{(x^4+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(x^4 + 1)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^6/(x^4 + 1)^(3/2), x)
```

3.954 $\int \frac{x^2}{(1+x^4)^{3/2}}\,dx$

Optimal. Leaf size=124

$$\frac{x^3}{2\sqrt{x^4+1}}-\frac{\sqrt{x^4+1}x}{2(x^2+1)}-\frac{(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)\middle|\frac{1}{2}\right)}{4\sqrt{x^4+1}}+\frac{(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}E\left(2\tan^{-1}(x)\middle|\frac{1}{2}\right)}{2\sqrt{x^4+1}}$$

```
[Out] x^3/(2*Sqrt[1 + x^4]) - (x*Sqrt[1 + x^4])/(2*(1 + x^2)) + ((1 + x
^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*EllipticE[2*ArcTan[x], 1/2])/(2*S
qrt[1 + x^4]) - ((1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*EllipticF[
2*ArcTan[x], 1/2])/(4*Sqrt[1 + x^4])
```

Rubi [A] time = 0.0726176, antiderivative size = 124, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{x^3}{2\sqrt{x^4+1}}-\frac{\sqrt{x^4+1}x}{2(x^2+1)}-\frac{(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)\middle|\frac{1}{2}\right)}{4\sqrt{x^4+1}}+\frac{(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}E\left(2\tan^{-1}(x)\middle|\frac{1}{2}\right)}{2\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(1 + x^4)^(3/2),x]
```

```
[Out] x^3/(2*Sqrt[1 + x^4]) - (x*Sqrt[1 + x^4])/(2*(1 + x^2)) + ((1 + x
^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*EllipticE[2*ArcTan[x], 1/2])/(2*S
qrt[1 + x^4]) - ((1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*EllipticF[
2*ArcTan[x], 1/2])/(4*Sqrt[1 + x^4])
```

Rubi in Sympy [A] time = 7.19606, size = 107, normalized size = 0.86

$$\frac{x^3}{2\sqrt{x^4+1}}-\frac{x\sqrt{x^4+1}}{2(x^2+1)}+\frac{\sqrt{\frac{x^4+1}{(x^2+1)^2}}(x^2+1)E\left(2\operatorname{atan}(x)\middle|\frac{1}{2}\right)}{2\sqrt{x^4+1}}-\frac{\sqrt{\frac{x^4+1}{(x^2+1)^2}}(x^2+1)F\left(2\operatorname{atan}(x)\middle|\frac{1}{2}\right)}{4\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(x**4+1)**(3/2),x)
```

```
[Out] x**3/(2*sqrt(x**4 + 1)) - x*sqrt(x**4 + 1)/(2*(x**2 + 1)) + sqrt(
(x**4 + 1)/(x**2 + 1)**2)*(x**2 + 1)*elliptic_e(2*atan(x), 1/2)/(
2*sqrt(x**4 + 1)) - sqrt((x**4 + 1)/(x**2 + 1)**2)*(x**2 + 1)*ell
iptic_f(2*atan(x), 1/2)/(4*sqrt(x**4 + 1))
```

Mathematica [C] time = 0.063085, size = 59, normalized size = 0.48

$$\frac{1}{2}\left(\frac{x^3}{\sqrt{x^4+1}}-(-1)^{3/4}F\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)+(-1)^{3/4}E\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(1 + x^4)^(3/2),x]
```

```
[Out] (x^3/Sqrt[1 + x^4] + (-1)^(3/4)*EllipticE[I*ArcSinh[(-1)^(1/4)*x]
, -1] - (-1)^(3/4)*EllipticF[I*ArcSinh[(-1)^(1/4)*x], -1])/2
```

Maple [C] time = 0.01, size = 95, normalized size = 0.8

$$\frac{x^3}{2}\frac{1}{\sqrt{x^4+1}} - \frac{\frac{i}{2}\left(\mathit{EllipticF}\left(x\left(\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}\right),i\right)-\mathit{EllipticE}\left(x\left(\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}\right),i\right)\right)}{\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}}\sqrt{1-ix^2}\sqrt{1+ix^2}\frac{1}{\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(x^4+1)^(3/2),x)
```

```
[Out] 1/2*x^3/(x^4+1)^(1/2)-1/2*I/(1/2*2^(1/2)+1/2*I*2^(1/2))*(1-I*x^2)
^(1/2)*(1+I*x^2)^(1/2)/(x^4+1)^(1/2)*(EllipticF(x*(1/2*2^(1/2)+1/
2*I*2^(1/2)),I)-EllipticE(x*(1/2*2^(1/2)+1/2*I*2^(1/2)),I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{(x^4+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(x^4 + 1)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^2/(x^4 + 1)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x^2}{(x^4+1)^{\frac{3}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(x^4 + 1)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^2/(x^4 + 1)^(3/2), x)
```

Sympy [A] time = 1.87581, size = 29, normalized size = 0.23

$$\frac{x^3\,\Gamma\left(\frac{3}{4}\right)\,{}_2F_1\left(\left.\begin{matrix}\frac{3}{4},\frac{3}{2}\\ \frac{7}{4}\end{matrix}\right| x^4e^{i\pi}\right)}{4\,\Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(x**4+1)**(3/2),x)
```

```
[Out] x**3*gamma(3/4)*hyper((3/4, 3/2), (7/4,), x**4*exp_polar(I*pi))/(
4*gamma(7/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{(x^4+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(x^4 + 1)^(3/2),x, algorithm="giac")

[Out] integrate(x^2/(x^4 + 1)^(3/2), x)
```

3.955 $\int \frac{1}{x^2(1+x^4)^{3/2}}\,dx$

Optimal. Leaf size=140

$$-\frac{3\sqrt{x^4+1}}{2x}+\frac{1}{2\sqrt{x^4+1}x}+\frac{3\sqrt{x^4+1}x}{2(x^2+1)}+\frac{3(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{4\sqrt{x^4+1}}-\frac{3(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}E\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{2\sqrt{x^4+1}}$$

```
[Out] 1/(2*x*Sqrt[1 + x^4]) - (3*Sqrt[1 + x^4])/(2*x) + (3*x*Sqrt[1 + x
^4])/(2*(1 + x^2)) - (3*(1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*Ell
ipticE[2*ArcTan[x], 1/2])/(2*Sqrt[1 + x^4]) + (3*(1 + x^2)*Sqrt[(
1 + x^4)/(1 + x^2)^2]*EllipticF[2*ArcTan[x], 1/2])/(4*Sqrt[1 + x^
4])
```

Rubi [A] time = 0.0810831, antiderivative size = 140, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385

$$-\frac{3\sqrt{x^4+1}}{2x}+\frac{1}{2\sqrt{x^4+1}x}+\frac{3\sqrt{x^4+1}x}{2(x^2+1)}+\frac{3(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{4\sqrt{x^4+1}}-\frac{3(x^2+1)\sqrt{\frac{x^4+1}{(x^2+1)^2}}E\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{2\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(1 + x^4)^(3/2)),x]
```

```
[Out] 1/(2*x*Sqrt[1 + x^4]) - (3*Sqrt[1 + x^4])/(2*x) + (3*x*Sqrt[1 + x
^4])/(2*(1 + x^2)) - (3*(1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*Ell
ipticE[2*ArcTan[x], 1/2])/(2*Sqrt[1 + x^4]) + (3*(1 + x^2)*Sqrt[(
1 + x^4)/(1 + x^2)^2]*EllipticF[2*ArcTan[x], 1/2])/(4*Sqrt[1 + x^
4])
```

Rubi in Sympy [A] time = 8.41106, size = 126, normalized size = 0.9

$$\frac{3x\sqrt{x^4+1}}{2(x^2+1)}-\frac{3\sqrt{\frac{x^4+1}{(x^2+1)^2}}(x^2+1)E\left(2\operatorname{atan}(x)|\frac{1}{2}\right)}{2\sqrt{x^4+1}}+\frac{3\sqrt{\frac{x^4+1}{(x^2+1)^2}}(x^2+1)F\left(2\operatorname{atan}(x)|\frac{1}{2}\right)}{4\sqrt{x^4+1}}-\frac{3\sqrt{x^4+1}}{2x}+\frac{1}{2x\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(x**4+1)**(3/2),x)
```

```
[Out] 3*x*sqrt(x**4 + 1)/(2*(x**2 + 1)) - 3*sqrt((x**4 + 1)/(x**2 + 1)*
*2)*(x**2 + 1)*elliptic_e(2*atan(x), 1/2)/(2*sqrt(x**4 + 1)) + 3*
sqrt((x**4 + 1)/(x**2 + 1)**2)*(x**2 + 1)*elliptic_f(2*atan(x), 1
/2)/(4*sqrt(x**4 + 1)) - 3*sqrt(x**4 + 1)/(2*x) + 1/(2*x*sqrt(x**
4 + 1))
```

Mathematica [C] time = 0.0742425, size = 75, normalized size = 0.54

$$\frac{1}{2}\left(-\frac{2}{\sqrt{x^4+1}x}-\frac{3x^3}{\sqrt{x^4+1}}+3(-1)^{3/4}F\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)|-1\right)-3(-1)^{3/4}E\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)|-1\right)\right)$$

Antiderivative was successfully verified.

```
[In]   Integrate[1/(x^2*(1 + x^4)^(3/2)),x]
```

```
[Out] (-2/(x*Sqrt[1 + x^4]) - (3*x^3)/Sqrt[1 + x^4] - 3*(-1)^(3/4)*Elli
pticE[I*ArcSinh[(-1)^(1/4)*x], -1] + 3*(-1)^(3/4)*EllipticF[I*Arc
Sinh[(-1)^(1/4)*x], -1])/2
```

Maple [C] time = 0.016, size = 107, normalized size = 0.8

$$-\frac{x^3}{2}\frac{1}{\sqrt{x^4+1}}-\frac{1}{x}\sqrt{x^4+1}+\frac{\frac{3i}{2}\left(EllipticF\left(x\left(\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}\right),i\right)-EllipticE\left(x\left(\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}\right),i\right)\right)}{\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}}\sqrt{1-ix^2}\sqrt{1+ix^2}\frac{1}{\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^2/(x^4+1)^(3/2),x)
```

```
[Out] -1/2*x^3/(x^4+1)^(1/2)-(x^4+1)^(1/2)/x+3/2*I/(1/2*2^(1/2)+1/2*I*2
^(1/2))*(1-I*x^2)^(1/2)*(1+I*x^2)^(1/2)/(x^4+1)^(1/2)*(EllipticF(
x*(1/2*2^(1/2)+1/2*I*2^(1/2)),I)-EllipticE(x*(1/2*2^(1/2)+1/2*I*2
^(1/2)),I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(x^4+1)^{\frac{3}{2}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((x^4 + 1)^(3/2)*x^2),x, algorithm="maxima")
```

```
[Out] integrate(1/((x^4 + 1)^(3/2)*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{(x^6+x^2)\sqrt{x^4+1}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((x^4 + 1)^(3/2)*x^2),x, algorithm="fricas")
```

```
[Out] integral(1/((x^6 + x^2)*sqrt(x^4 + 1)), x)
```

Sympy [A] time = 2.38554, size = 31, normalized size = 0.22

$$\frac{\Gamma\left(-\frac{1}{4}\right){}_2F_1\left(\begin{matrix}-\frac{1}{4},\frac{3}{2}\\ \frac{3}{4}\end{matrix}\middle| x^4e^{i\pi}\right)}{4x\Gamma\left(\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(x**4+1)**(3/2),x)
```

```
[Out] gamma(-1/4)*hyper((-1/4, 3/2), (3/4,), x**4*exp_polar(I*pi))/(4*x
*gamma(3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(x^4+1)^{\frac{3}{2}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^4 + 1)^(3/2)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/((x^4 + 1)^(3/2)*x^2), x)
```

3.956 $\int \frac{1}{x^6(1+x^4)^{3/2}}\,dx$

Optimal. Leaf size=156

$$\frac{21\sqrt{x^4+1}}{10x}-\frac{7\sqrt{x^4+1}}{10x^5}+\frac{1}{2\sqrt{x^4+1}x^5}-\frac{21\sqrt{x^4+1}x}{10\left(x^2+1\right)}-\frac{21\left(x^2+1\right)\sqrt{\frac{x^4+1}{\left(x^2+1\right)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{20\sqrt{x^4+1}}+\frac{21\left(x^2+1\right)\sqrt{\frac{x^4+1}{\left(x^2+1\right)^2}}E\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{10\sqrt{x^4+1}}$$

```
[Out] 1/(2*x^5*Sqrt[1 + x^4]) - (7*Sqrt[1 + x^4])/(10*x^5) + (21*Sqrt[1
 + x^4])/(10*x) - (21*x*Sqrt[1 + x^4])/(10*(1 + x^2)) + (21*(1 +
x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*EllipticE[2*ArcTan[x], 1/2])/(10
*Sqrt[1 + x^4]) - (21*(1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*Ellip
ticF[2*ArcTan[x], 1/2])/(20*Sqrt[1 + x^4])
```

Rubi [A] time = 0.104759, antiderivative size = 156, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.385$

$$\frac{21\sqrt{x^4+1}}{10x}-\frac{7\sqrt{x^4+1}}{10x^5}+\frac{1}{2\sqrt{x^4+1}x^5}-\frac{21\sqrt{x^4+1}x}{10\left(x^2+1\right)}-\frac{21\left(x^2+1\right)\sqrt{\frac{x^4+1}{\left(x^2+1\right)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{20\sqrt{x^4+1}}+\frac{21\left(x^2+1\right)\sqrt{\frac{x^4+1}{\left(x^2+1\right)^2}}E\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{10\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^6*(1 + x^4)^(3/2)),x]
```

```
[Out] 1/(2*x^5*Sqrt[1 + x^4]) - (7*Sqrt[1 + x^4])/(10*x^5) + (21*Sqrt[1
 + x^4])/(10*x) - (21*x*Sqrt[1 + x^4])/(10*(1 + x^2)) + (21*(1 +
x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*EllipticE[2*ArcTan[x], 1/2])/(10
*Sqrt[1 + x^4]) - (21*(1 + x^2)*Sqrt[(1 + x^4)/(1 + x^2)^2]*Ellip
ticF[2*ArcTan[x], 1/2])/(20*Sqrt[1 + x^4])
```

Rubi in Sympy [A] time = 9.79945, size = 143, normalized size = 0.92

$$-\frac{21x\sqrt{x^4+1}}{10\left(x^2+1\right)}+\frac{21\sqrt{\frac{x^4+1}{\left(x^2+1\right)^2}}\left(x^2+1\right)E\left(2\operatorname{atan}(x)|\frac{1}{2}\right)}{10\sqrt{x^4+1}}-\frac{21\sqrt{\frac{x^4+1}{\left(x^2+1\right)^2}}\left(x^2+1\right)F\left(2\operatorname{atan}(x)|\frac{1}{2}\right)}{20\sqrt{x^4+1}}+\frac{21\sqrt{x^4+1}}{10x}-\frac{7\sqrt{x^4+1}}{10x^5}+\frac{1}{2x^5\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**6/(x**4+1)**(3/2),x)
```

```
[Out] -21*x*sqrt(x**4 + 1)/(10*(x**2 + 1)) + 21*sqrt((x**4 + 1)/(x**2 +
 1)**2)*(x**2 + 1)*elliptic_e(2*atan(x), 1/2)/(10*sqrt(x**4 + 1))
 - 21*sqrt((x**4 + 1)/(x**2 + 1)**2)*(x**2 + 1)*elliptic_f(2*atan
(x), 1/2)/(20*sqrt(x**4 + 1)) + 21*sqrt(x**4 + 1)/(10*x) - 7*sqrt
(x**4 + 1)/(10*x**5) + 1/(2*x**5*sqrt(x**4 + 1))
```

Mathematica [C] time = 0.0586494, size = 94, normalized size = 0.6

$$\frac{21x^8+14x^4-21(-1)^{3/4}\sqrt{x^4+1}x^5F\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)+21(-1)^{3/4}\sqrt{x^4+1}x^5E\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)-2}{10x^5\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^6*(1 + x^4)^(3/2)),x]
```

```
[Out] (-2 + 14*x^4 + 21*x^8 + 21*(-1)^(3/4)*x^5*Sqrt[1 + x^4]*EllipticE
[I*ArcSinh[(-1)^(1/4)*x], -1] - 21*(-1)^(3/4)*x^5*Sqrt[1 + x^4]*E
llipticF[I*ArcSinh[(-1)^(1/4)*x], -1])/(10*x^5*Sqrt[1 + x^4])
```

Maple [C] time = 0.02, size = 119, normalized size = 0.8

$$\frac{x^3}{2}\frac{1}{\sqrt{x^4+1}}-\frac{1}{5\,x^5}\sqrt{x^4+1}+\frac{8}{5\,x}\sqrt{x^4+1} \\ -\frac{\frac{21\,i}{10}\left(\mathit{EllipticF}\left(x\left(\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}\right),i\right)-\mathit{EllipticE}\left(x\left(\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}\right),i\right)\right)}{\frac{\sqrt{2}}{2}+\frac{i}{2}\sqrt{2}}\sqrt{1-ix^2}\sqrt{1+ix^2}\frac{1}{\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^6/(x^4+1)^(3/2),x)
```

```
[Out] 1/2*x^3/(x^4+1)^(1/2)-1/5*(x^4+1)^(1/2)/x^5+8/5*(x^4+1)^(1/2)/x-2
1/10*I/(1/2*2^(1/2)+1/2*I*2^(1/2))*(1-I*x^2)^(1/2)*(1+I*x^2)^(1/2
)/(x^4+1)^(1/2)*(EllipticF(x*(1/2*2^(1/2)+1/2*I*2^(1/2)),I)-Ellip
ticE(x*(1/2*2^(1/2)+1/2*I*2^(1/2)),I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(x^4+1)^{\frac{3}{2}}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^4 + 1)^(3/2)*x^6),x, algorithm="maxima")
```

```
[Out] integrate(1/((x^4 + 1)^(3/2)*x^6), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{(x^{10}+x^6)\sqrt{x^4+1}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^4 + 1)^(3/2)*x^6),x, algorithm="fricas")
```

```
[Out] integral(1/((x^10 + x^6)*sqrt(x^4 + 1)), x)
```

Sympy [A] time = 4.03422, size = 36, normalized size = 0.23

$$\frac{\left(-\frac{5}{4}\right)\,{}_2F_1\left(\begin{matrix}-\frac{5}{4},\frac{3}{2}\\-\frac{1}{4}\end{matrix}\middle|x^4e^{i\pi}\right)}{4x^5\left(-\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**6/(x**4+1)**(3/2),x)
```

```
[Out] gamma(-5/4)*hyper((-5/4, 3/2), (-1/4,), x**4*exp_polar(I*pi))/(4*
x**5*gamma(-1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(x^4+1)^{\frac{3}{2}}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^4 + 1)^(3/2)*x^6),x, algorithm="giac")
```

```
[Out] integrate(1/((x^4 + 1)^(3/2)*x^6), x)
```

3.957 $\int \frac{1}{(1+x^4)^{5/2}}\,dx$

Optimal. Leaf size=72

$$\frac{5x}{12\sqrt{x^4+1}}+\frac{x}{6\left(x^4+1\right)^{3/2}}+\frac{5\left(x^2+1\right)\sqrt{\frac{x^4+1}{\left(x^2+1\right)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{24\sqrt{x^4+1}}$$

```
[Out] x/(6*(1 + x^4)^(3/2)) + (5*x)/(12*Sqrt[1 + x^4]) + (5*(1 + x^2)*S
qrt[(1 + x^4)/(1 + x^2)^2]*EllipticF[2*ArcTan[x], 1/2])/(24*Sqrt[
1 + x^4])
```

Rubi [A] time = 0.0312607, antiderivative size = 72, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{5x}{12\sqrt{x^4+1}}+\frac{x}{6\left(x^4+1\right)^{3/2}}+\frac{5\left(x^2+1\right)\sqrt{\frac{x^4+1}{\left(x^2+1\right)^2}}F\left(2\tan^{-1}(x)|\frac{1}{2}\right)}{24\sqrt{x^4+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[(1 + x^4)^(-5/2),x]
```

```
[Out] x/(6*(1 + x^4)^(3/2)) + (5*x)/(12*Sqrt[1 + x^4]) + (5*(1 + x^2)*S
qrt[(1 + x^4)/(1 + x^2)^2]*EllipticF[2*ArcTan[x], 1/2])/(24*Sqrt[
1 + x^4])
```

Rubi in Sympy [A] time = 1.69381, size = 65, normalized size = 0.9

$$\frac{5x}{12\sqrt{x^4+1}}+\frac{x}{6\left(x^4+1\right)^{\frac{3}{2}}}+\frac{5\sqrt{\frac{x^4+1}{\left(x^2+1\right)^2}}\left(x^2+1\right)F\left(2\operatorname{atan}(x)|\frac{1}{2}\right)}{24\sqrt{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(x**4+1)**(5/2),x)
```

```
[Out] 5*x/(12*sqrt(x**4 + 1)) + x/(6*(x**4 + 1)**(3/2)) + 5*sqrt((x**4
+ 1)/(x**2 + 1)**2)*(x**2 + 1)*elliptic_f(2*atan(x), 1/2)/(24*sqr
t(x**4 + 1))
```

Mathematica [C] time = 0.0614723, size = 52, normalized size = 0.72

$$\frac{5x^5-5\sqrt[4]{-1}\left(x^4+1\right)^{3/2}F\left(i\sinh^{-1}\left(\sqrt[4]{-1}x\right)\middle|-1\right)+7x}{12\left(x^4+1\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(1 + x^4)^(-5/2),x]
```

```
[Out] (7*x + 5*x^5 - 5*(-1)^(1/4)*(1 + x^4)^(3/2)*EllipticF[I*ArcSinh[(
-1)^(1/4)*x], -1])/(12*(1 + x^4)^(3/2))
```

Maple [C] time = 0.013, size = 82, normalized size = 1.1

$$\frac{x}{6}\left(x^{4}+1\right)^{-\frac{3}{2}}+\frac{5x}{12}\frac{1}{\sqrt{x^{4}+1}}+\frac{5\,EllipticF\left(x\left(1/2\sqrt{2}+i/2\sqrt{2}\right),i\right)}{6\sqrt{2}+6\,i\sqrt{2}}\sqrt{1-ix^{2}}\sqrt{1+ix^{2}}\frac{1}{\sqrt{x^{4}+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(x^4+1)^(5/2),x)
```

```
[Out] 1/6*x/(x^4+1)^(3/2)+5/12*x/(x^4+1)^(1/2)+5/12/(1/2*2^(1/2)+1/2*I*
2^(1/2))*(1-I*x^2)^(1/2)*(1+I*x^2)^(1/2)/(x^4+1)^(1/2)*EllipticF(
x*(1/2*2^(1/2)+1/2*I*2^(1/2)),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\left(x^{4}+1\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x^4 + 1)^(-5/2),x, algorithm="maxima")
```

```
[Out] integrate((x^4 + 1)^(-5/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{\left(x^{8}+2\,x^{4}+1\right)\sqrt{x^{4}+1}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x^4 + 1)^(-5/2),x, algorithm="fricas")
```

```
[Out] integral(1/((x^8 + 2*x^4 + 1)*sqrt(x^4 + 1)), x)
```

Sympy [A] time = 2.25683, size = 27, normalized size = 0.38

$$\frac{x\,\Gamma\left(\frac{1}{4}\right)\,{}_{2}F_{1}\left(\begin{matrix}\frac{1}{4},\frac{5}{2}\\\frac{5}{4}\end{matrix}\middle|x^{4}e^{i\pi}\right)}{4\,\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x**4+1)**(5/2),x)
```

```
[Out] x*gamma(1/4)*hyper((1/4, 5/2), (5/4,), x**4*exp_polar(I*pi))/(4*g
amma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\left(x^{4}+1\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x^4 + 1)^(-5/2),x, algorithm="giac")
```

```
[Out] integrate((x^4 + 1)^(-5/2), x)
```

3.958 $\int \frac{x^7}{\sqrt{16-x^4}} \, dx$

Optimal. Leaf size=29

$$\frac{1}{6}\left(16-x^4\right)^{3/2}-8\sqrt{16-x^4}$$

```
[Out] -8*Sqrt[16 - x^4] + (16 - x^4)^(3/2)/6
```

Rubi [A] time = 0.0404775, antiderivative size = 29, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{1}{6}\left(16-x^4\right)^{3/2}-8\sqrt{16-x^4}$$

Antiderivative was successfully verified.

```
[In] Int[x^7/Sqrt[16 - x^4],x]

[Out] -8*Sqrt[16 - x^4] + (16 - x^4)^(3/2)/6
```

Rubi in Sympy [A] time = 4.79858, size = 19, normalized size = 0.66

$$\frac{\left(-x^4+16\right)^{\frac{3}{2}}}{6}-8\sqrt{-x^4+16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**7/(-x**4+16)**(1/2),x)

[Out] (-x**4 + 16)**(3/2)/6 - 8*sqrt(-x**4 + 16)
```

Mathematica [A] time = 0.0128521, size = 20, normalized size = 0.69

$$-\frac{1}{6}\sqrt{16-x^4}\left(x^4+32\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^7/Sqrt[16 - x^4],x]

[Out] -(Sqrt[16 - x^4]*(32 + x^4))/6
```

Maple [A] time = 0.007, size = 28, normalized size = 1.

$$\frac{(-2+x)(2+x)\left(x^2+4\right)\left(x^4+32\right)}{6}\frac{1}{\sqrt{-x^4+16}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^7/(-x^4+16)^(1/2),x)

[Out] 1/6*(-2+x)*(2+x)*(x^2+4)*(x^4+32)/(-x^4+16)^(1/2)
```

Maxima [A] time = 1.43153, size = 31, normalized size = 1.07

$$\frac{1}{6}\left(-x^4+16\right)^{\frac{3}{2}}-8\sqrt{-x^4+16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(-x^4 + 16),x, algorithm="maxima")
```

```
[Out] 1/6*(-x^4 + 16)^(3/2) - 8*sqrt(-x^4 + 16)
```

Fricas [A] time = 0.262264, size = 22, normalized size = 0.76

$$-\frac{1}{6}\left(x^4+32\right)\sqrt{-x^4+16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(-x^4 + 16),x, algorithm="fricas")
```

```
[Out] -1/6*(x^4 + 32)*sqrt(-x^4 + 16)
```

Sympy [A] time = 1.28591, size = 26, normalized size = 0.9

$$-\frac{x^4\sqrt{-x^4+16}}{6}-\frac{16\sqrt{-x^4+16}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(-x**4+16)**(1/2),x)
```

```
[Out] -x**4*sqrt(-x**4 + 16)/6 - 16*sqrt(-x**4 + 16)/3
```

GIAC/XCAS [A] time = 0.21355, size = 31, normalized size = 1.07

$$\frac{1}{6}\left(-x^4+16\right)^{\frac{3}{2}}-8\sqrt{-x^4+16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(-x^4 + 16),x, algorithm="giac")
```

```
[Out] 1/6*(-x^4 + 16)^(3/2) - 8*sqrt(-x^4 + 16)
```

3.959 $\int \frac{x^5}{\sqrt{16-x^4}}\,dx$

Optimal. Leaf size=29

$$4\sin^{-1}\left(\frac{x^2}{4}\right)-\frac{1}{4}x^2\sqrt{16-x^4}$$

```
[Out] -(x^2*Sqrt[16 - x^4])/4 + 4*ArcSin[x^2/4]
```

Rubi [A] time = 0.0420893, antiderivative size = 29, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$4\sin^{-1}\left(\frac{x^2}{4}\right)-\frac{1}{4}x^2\sqrt{16-x^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/Sqrt[16 - x^4],x]

[Out] -(x^2*Sqrt[16 - x^4])/4 + 4*ArcSin[x^2/4]
```

Rubi in Sympy [A] time = 5.26836, size = 20, normalized size = 0.69

$$-\frac{x^2\sqrt{-x^4+16}}{4}+4\,\mathrm{asin}\left(\frac{x^2}{4}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(-x**4+16)**(1/2),x)

[Out] -x**2*sqrt(-x**4 + 16)/4 + 4*asin(x**2/4)
```

Mathematica [A] time = 0.0163204, size = 29, normalized size = 1.

$$4\sin^{-1}\left(\frac{x^2}{4}\right)-\frac{1}{4}x^2\sqrt{16-x^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/Sqrt[16 - x^4],x]

[Out] -(x^2*Sqrt[16 - x^4])/4 + 4*ArcSin[x^2/4]
```

Maple [A] time = 0.018, size = 24, normalized size = 0.8

$$4\ \arcsin\left(1/4\,x^2\right)-\frac{x^2}{4}\sqrt{-x^4+16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(-x^4+16)^(1/2),x)

[Out] 4*arcsin(1/4*x^2)-1/4*x^2*(-x^4+16)^(1/2)
```

Maxima [A] time = 1.58885, size = 59, normalized size = 2.03

$$\frac{4\sqrt{-x^4+16}}{x^2\left(\frac{x^4-16}{x^4}-1\right)} - 4\arctan\left(\frac{\sqrt{-x^4+16}}{x^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(-x^4 + 16),x, algorithm="maxima")
```

```
[Out] 4*sqrt(-x^4 + 16)/(x^2*((x^4 - 16)/x^4 - 1)) - 4*arctan(sqrt(-x^4
 + 16)/x^2)
```

Fricas [A] time = 0.267674, size = 115, normalized size = 3.97

$$\frac{8x^6 - 128x^2 - 32\left(x^4 + 8\sqrt{-x^4+16} - 32\right)\arctan\left(\frac{\sqrt{-x^4+16}-4}{x^2}\right) - \left(x^6 - 32x^2\right)\sqrt{-x^4+16}}{4\left(x^4 + 8\sqrt{-x^4+16} - 32\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(-x^4 + 16),x, algorithm="fricas")
```

```
[Out] 1/4*(8*x^6 - 128*x^2 - 32*(x^4 + 8*sqrt(-x^4 + 16) - 32)*arctan((
sqrt(-x^4 + 16) - 4)/x^2) - (x^6 - 32*x^2)*sqrt(-x^4 + 16))/(x^4
+ 8*sqrt(-x^4 + 16) - 32)
```

Sympy [A] time = 6.10564, size = 80, normalized size = 2.76

$$\begin{cases} -\frac{ix^6}{4\sqrt{x^4-16}} + \frac{4ix^2}{\sqrt{x^4-16}} - 4i\operatorname{acosh}\left(\frac{x^2}{4}\right) & \text{for}\ \frac{|x^4|}{16} > 1 \\ \frac{x^6}{4\sqrt{-x^4+16}} - \frac{4x^2}{\sqrt{-x^4+16}} + 4\operatorname{asin}\left(\frac{x^2}{4}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(-x**4+16)**(1/2),x)
```

```
[Out] Piecewise((-I*x**6/(4*sqrt(x**4 - 16)) + 4*I*x**2/sqrt(x**4 - 16)
 - 4*I*acosh(x**2/4), Abs(x**4)/16 > 1), (x**6/(4*sqrt(-x**4 + 16
)) - 4*x**2/sqrt(-x**4 + 16) + 4*asin(x**2/4), True))
```

GIAC/XCAS [A] time = 0.220729, size = 31, normalized size = 1.07

$$-\frac{1}{4}\sqrt{-x^4+16}x^2 + 4\arcsin\left(\frac{1}{4}x^2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(-x^4 + 16),x, algorithm="giac")
```

```
[Out] -1/4*sqrt(-x^4 + 16)*x^2 + 4*arcsin(1/4*x^2)
```

3.960 $\int \frac{x^3}{\sqrt{16-x^4}}\,dx$

Optimal. Leaf size=15

$$-\frac{1}{2}\sqrt{16-x^4}$$

```
[Out] -Sqrt[16 - x^4]/2
```

Rubi [A] time = 0.00842355, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{1}{2}\sqrt{16-x^4}$$

Antiderivative was successfully verified.

```
[In] Int[x^3/Sqrt[16 - x^4],x]

[Out] -Sqrt[16 - x^4]/2
```

Rubi in Sympy [A] time = 1.91237, size = 10, normalized size = 0.67

$$-\frac{\sqrt{-x^4+16}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**3/(-x**4+16)**(1/2),x)

[Out] -sqrt(-x**4 + 16)/2
```

Mathematica [A] time = 0.00499109, size = 15, normalized size = 1.

$$-\frac{1}{2}\sqrt{16-x^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3/Sqrt[16 - x^4],x]

[Out] -Sqrt[16 - x^4]/2
```

Maple [A] time = 0.007, size = 23, normalized size = 1.5

$$\frac{(-2+x)(2+x)\left(x^2+4\right)}{2}\frac{1}{\sqrt{-x^4+16}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(-x^4+16)^(1/2),x)

[Out] 1/2*(-2+x)*(2+x)*(x^2+4)/(-x^4+16)^(1/2)
```

Maxima [A] time = 1.43801, size = 15, normalized size = 1.

$$-\frac{1}{2}\sqrt{-x^4+16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(-x^4 + 16),x, algorithm="maxima")

[Out] -1/2*sqrt(-x^4 + 16)
```

Fricas [A] time = 0.246205, size = 15, normalized size = 1.

$$-\frac{1}{2}\sqrt{-x^4+16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(-x^4 + 16),x, algorithm="fricas")

[Out] -1/2*sqrt(-x^4 + 16)
```

Sympy [A] time = 0.390717, size = 10, normalized size = 0.67

$$-\frac{\sqrt{-x^4+16}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(-x**4+16)**(1/2),x)

[Out] -sqrt(-x**4 + 16)/2
```

GIAC/XCAS [A] time = 0.214138, size = 15, normalized size = 1.

$$-\frac{1}{2}\sqrt{-x^4+16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(-x^4 + 16),x, algorithm="giac")

[Out] -1/2*sqrt(-x^4 + 16)
```

3.961 $\int \frac{x}{\sqrt{16-x^4}} \, dx$

Optimal. Leaf size=12

$$\frac{1}{2}\sin^{-1}\left(\frac{x^2}{4}\right)$$

```
[Out] ArcSin[x^2/4]/2
```

Rubi [A] time = 0.014869, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{1}{2}\sin^{-1}\left(\frac{x^2}{4}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x/Sqrt[16 - x^4],x]

[Out] ArcSin[x^2/4]/2
```

Rubi in Sympy [A] time = 2.54564, size = 7, normalized size = 0.58

$$\frac{\operatorname{asin}\left(\frac{x^2}{4}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(-x**4+16)**(1/2),x)

[Out] asin(x**2/4)/2
```

Mathematica [A] time = 0.00853491, size = 12, normalized size = 1.

$$\frac{1}{2}\sin^{-1}\left(\frac{x^2}{4}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/Sqrt[16 - x^4],x]

[Out] ArcSin[x^2/4]/2
```

Maple [A] time = 0.01, size = 9, normalized size = 0.8

$$\frac{1}{2}\arcsin\left(\frac{x^2}{4}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(-x^4+16)^(1/2),x)
```

```
[Out] 1/2*arcsin(1/4*x^2)
```

Maxima [A] time = 1.60151, size = 22, normalized size = 1.83

$$-\frac{1}{2}\arctan\left(\frac{\sqrt{-x^4+16}}{x^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(-x^4 + 16),x, algorithm="maxima")
```

```
[Out] -1/2*arctan(sqrt(-x^4 + 16)/x^2)
```

Fricas [A] time = 0.254795, size = 24, normalized size = 2.

$$-\arctan\left(\frac{\sqrt{-x^4+16}-4}{x^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(-x^4 + 16),x, algorithm="fricas")
```

```
[Out] -arctan((sqrt(-x^4 + 16) - 4)/x^2)
```

Sympy [A] time = 3.3181, size = 24, normalized size = 2.

$$\begin{cases} -\frac{i\operatorname{acosh}\left(\frac{x^2}{4}\right)}{2} & \text{for}\ \frac{|x^4|}{16} > 1 \\ \frac{\operatorname{asin}\left(\frac{x^2}{4}\right)}{2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(-x**4+16)**(1/2),x)
```

```
[Out] Piecewise((-I*acosh(x**2/4)/2, Abs(x**4)/16 > 1), (asin(x**2/4)/2
, True))
```

GIAC/XCAS [A] time = 0.221435, size = 11, normalized size = 0.92

$$\frac{1}{2}\arcsin\left(\frac{1}{4}x^2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(-x^4 + 16),x, algorithm="giac")
```

```
[Out] 1/2*arcsin(1/4*x^2)
```

3.962 $\int \frac{1}{x\sqrt{16-x^4}}\,dx$

Optimal. Leaf size=20

$$-\frac{1}{8}\tanh^{-1}\left(\frac{\sqrt{16-x^4}}{4}\right)$$

```
[Out] -ArcTanh[Sqrt[16 - x^4]/4]/8
```

Rubi [A] time = 0.0312655, antiderivative size = 20, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$-\frac{1}{8}\tanh^{-1}\left(\frac{\sqrt{16-x^4}}{4}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*Sqrt[16 - x^4]),x]

[Out] -ArcTanh[Sqrt[16 - x^4]/4]/8
```

Rubi in Sympy [A] time = 3.9284, size = 14, normalized size = 0.7

$$-\frac{\operatorname{atanh}\left(\frac{\sqrt{-x^4+16}}{4}\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(-x**4+16)**(1/2),x)

[Out] -atanh(sqrt(-x**4 + 16)/4)/8
```

Mathematica [A] time = 0.0365142, size = 20, normalized size = 1.

$$-\frac{1}{8}\tanh^{-1}\left(\frac{\sqrt{16-x^4}}{4}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*Sqrt[16 - x^4]),x]

[Out] -ArcTanh[Sqrt[16 - x^4]/4]/8
```

Maple [A] time = 0.013, size = 15, normalized size = 0.8

$$-\frac{1}{8}Artanh\left(4\frac{1}{\sqrt{-x^4+16}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(-x^4+16)^(1/2),x)
```

```
[Out] -1/8*arctanh(4/(-x^4+16)^(1/2))
```

Maxima [A] time = 1.41982, size = 39, normalized size = 1.95

$$-\frac{1}{16}\log\left(\sqrt{-x^4+16}+4\right)+\frac{1}{16}\log\left(\sqrt{-x^4+16}-4\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 16)*x),x, algorithm="maxima")
```

```
[Out] -1/16*log(sqrt(-x^4 + 16) + 4) + 1/16*log(sqrt(-x^4 + 16) - 4)
```

Fricas [A] time = 0.281048, size = 39, normalized size = 1.95

$$-\frac{1}{16}\log\left(\sqrt{-x^4+16}+4\right)+\frac{1}{16}\log\left(\sqrt{-x^4+16}-4\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 16)*x),x, algorithm="fricas")
```

```
[Out] -1/16*log(sqrt(-x^4 + 16) + 4) + 1/16*log(sqrt(-x^4 + 16) - 4)
```

Sympy [A] time = 3.41409, size = 26, normalized size = 1.3

$$\begin{cases} -\frac{\operatorname{acosh}\left(\frac{4}{x^2}\right)}{8} & \text{for } 16\left|\frac{1}{x^4}\right|>1 \\ \frac{i\operatorname{asin}\left(\frac{4}{x^2}\right)}{8} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(-x**4+16)**(1/2),x)
```

```
[Out] Piecewise((-acosh(4/x**2)/8, 16*Abs(x**(-4)) > 1), (I*asin(4/x**2
)/8, True))
```

GIAC/XCAS [A] time = 0.213667, size = 42, normalized size = 2.1

$$-\frac{1}{16}\ln\left(\sqrt{-x^4+16}+4\right)+\frac{1}{16}\ln\left(-\sqrt{-x^4+16}+4\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 16)*x),x, algorithm="giac")
```

```
[Out] -1/16*ln(sqrt(-x^4 + 16) + 4) + 1/16*ln(-sqrt(-x^4 + 16) + 4)
```

3.963 $\int \frac{1}{x^3\sqrt{16-x^4}}\,dx$

Optimal. Leaf size=18

$$-\frac{\sqrt{16-x^4}}{32x^2}$$

```
[Out] -Sqrt[16 - x^4]/(32*x^2)
```

Rubi [A] time = 0.0158401, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{\sqrt{16-x^4}}{32x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*Sqrt[16 - x^4]),x]

[Out] -Sqrt[16 - x^4]/(32*x^2)
```

Rubi in Sympy [A] time = 2.54028, size = 14, normalized size = 0.78

$$-\frac{\sqrt{-x^4+16}}{32x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(-x**4+16)**(1/2),x)

[Out] -sqrt(-x**4 + 16)/(32*x**2)
```

Mathematica [A] time = 0.0104609, size = 18, normalized size = 1.

$$-\frac{\sqrt{16-x^4}}{32x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*Sqrt[16 - x^4]),x]

[Out] -Sqrt[16 - x^4]/(32*x^2)
```

Maple [A] time = 0.006, size = 26, normalized size = 1.4

$$\frac{(-2+x)(2+x)\left(x^2+4\right)}{32\,x^2}\frac{1}{\sqrt{-x^4+16}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(-x^4+16)^(1/2),x)

[Out] 1/32/x^2*(-2+x)*(2+x)*(x^2+4)/(-x^4+16)^(1/2)
```

Maxima [A] time = 1.43896, size = 19, normalized size = 1.06

$$-\frac{\sqrt{-x^4+16}}{32\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 16)*x^3),x, algorithm="maxima")
```

```
[Out] -1/32*sqrt(-x^4 + 16)/x^2
```

Fricas [A] time = 0.272571, size = 53, normalized size = 2.94

$$\frac{x^4+4\sqrt{-x^4+16}-16}{32\left(\sqrt{-x^4+16}x^2-4\,x^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 16)*x^3),x, algorithm="fricas")
```

```
[Out] 1/32*(x^4 + 4*sqrt(-x^4 + 16) - 16)/(sqrt(-x^4 + 16)*x^2 - 4*x^2)
```

Sympy [A] time = 1.89374, size = 34, normalized size = 1.89

$$\begin{cases} -\frac{\sqrt{-1+\frac{16}{x^4}}}{32} & \text{for } 16\left|\frac{1}{x^4}\right|>1 \\ -\frac{i\sqrt{1-\frac{16}{x^4}}}{32} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(-x**4+16)**(1/2),x)
```

```
[Out] Piecewise((-sqrt(-1 + 16/x**4)/32, 16*Abs(x**(-4)) > 1), (-I*sqrt
(1 - 16/x**4)/32, True))
```

GIAC/XCAS [A] time = 0.214497, size = 15, normalized size = 0.83

$$-\frac{1}{32}\sqrt{\frac{16}{x^4}-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 16)*x^3),x, algorithm="giac")
```

```
[Out] -1/32*sqrt(16/x^4 - 1)
```

3.964 $\int \frac{1}{x^5\sqrt{16-x^4}}\,dx$

Optimal. Leaf size=39

$$-\frac{\sqrt{16-x^4}}{64x^4}-\frac{1}{256}\tanh^{-1}\left(\frac{\sqrt{16-x^4}}{4}\right)$$

```
[Out] -Sqrt[16 - x^4]/(64*x^4) - ArcTanh[Sqrt[16 - x^4]/4]/256
```

Rubi [A] time = 0.0538851, antiderivative size = 39, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{\sqrt{16-x^4}}{64x^4}-\frac{1}{256}\tanh^{-1}\left(\frac{\sqrt{16-x^4}}{4}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^5*Sqrt[16 - x^4]),x]
```

```
[Out] -Sqrt[16 - x^4]/(64*x^4) - ArcTanh[Sqrt[16 - x^4]/4]/256
```

Rubi in Sympy [A] time = 4.76968, size = 27, normalized size = 0.69

$$-\frac{\operatorname{atanh}\left(\frac{\sqrt{-x^4+16}}{4}\right)}{256}-\frac{\sqrt{-x^4+16}}{64x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**5/(-x**4+16)**(1/2),x)
```

```
[Out] -atanh(sqrt(-x**4 + 16)/4)/256 - sqrt(-x**4 + 16)/(64*x**4)
```

Mathematica [A] time = 0.0450386, size = 39, normalized size = 1.

$$-\frac{\sqrt{16-x^4}}{64x^4}-\frac{1}{256}\tanh^{-1}\left(\frac{\sqrt{16-x^4}}{4}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^5*Sqrt[16 - x^4]),x]
```

```
[Out] -Sqrt[16 - x^4]/(64*x^4) - ArcTanh[Sqrt[16 - x^4]/4]/256
```

Maple [A] time = 0.016, size = 30, normalized size = 0.8

$$-\frac{1}{64\,x^4}\sqrt{-x^4+16}-\frac{1}{256}\mathit{Artanh}\left(4\,\frac{1}{\sqrt{-x^4+16}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^5/(-x^4+16)^(1/2),x)
```

```
[Out] -1/64*(-x^4+16)^(1/2)/x^4-1/256*arctanh(4/(-x^4+16)^(1/2))
```

Maxima [A] time = 1.43463, size = 58, normalized size = 1.49

$$-\frac{\sqrt{-x^4+16}}{64\,x^4}-\frac{1}{512}\,\log\left(\sqrt{-x^4+16}+4\right)+\frac{1}{512}\,\log\left(\sqrt{-x^4+16}-4\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 16)*x^5),x, algorithm="maxima")
```

```
[Out] -1/64*sqrt(-x^4 + 16)/x^4 - 1/512*log(sqrt(-x^4 + 16) + 4) + 1/51
2*log(sqrt(-x^4 + 16) - 4)
```

Fricas [A] time = 0.280225, size = 68, normalized size = 1.74

$$-\frac{x^4\log\left(\sqrt{-x^4+16}+4\right)-x^4\log\left(\sqrt{-x^4+16}-4\right)+8\sqrt{-x^4+16}}{512\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 16)*x^5),x, algorithm="fricas")
```

```
[Out] -1/512*(x^4*log(sqrt(-x^4 + 16) + 4) - x^4*log(sqrt(-x^4 + 16) -
4) + 8*sqrt(-x^4 + 16))/x^4
```

Sympy [A] time = 6.69003, size = 75, normalized size = 1.92

$$\begin{cases} -\frac{\operatorname{acosh}\left(\frac{4}{x^2}\right)}{256}-\frac{\sqrt{-1+\frac{16}{x^4}}}{64x^2} & \text{for } 16\left|\frac{1}{x^4}\right|>1 \\ \frac{i\operatorname{asin}\left(\frac{4}{x^2}\right)}{256}-\frac{i}{64x^2\sqrt{1-\frac{16}{x^4}}}+\frac{i}{4x^6\sqrt{1-\frac{16}{x^4}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**5/(-x**4+16)**(1/2),x)
```

```
[Out] Piecewise((-acosh(4/x**2)/256 - sqrt(-1 + 16/x**4)/(64*x**2), 16*
Abs(x**(-4)) > 1), (I*asin(4/x**2)/256 - I/(64*x**2*sqrt(1 - 16/x
**4)) + I/(4*x**6*sqrt(1 - 16/x**4)), True))
```

GIAC/XCAS [A] time = 0.215477, size = 61, normalized size = 1.56

$$-\frac{\sqrt{-x^4+16}}{64\,x^4}-\frac{1}{512}\ln\left(\sqrt{-x^4+16}+4\right)+\frac{1}{512}\ln\left(-\sqrt{-x^4+16}+4\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 16)*x^5),x, algorithm="giac")
```

```
[Out] -1/64*sqrt(-x^4 + 16)/x^4 - 1/512*ln(sqrt(-x^4 + 16) + 4) + 1/512
*ln(-sqrt(-x^4 + 16) + 4)
```

3.965 $\int \frac{1}{x^7\sqrt{16-x^4}}\,dx$

Optimal. Leaf size=37

$$-\frac{\sqrt{16-x^4}}{96x^6}-\frac{\sqrt{16-x^4}}{768x^2}$$

```
[Out] -Sqrt[16 - x^4]/(96*x^6) - Sqrt[16 - x^4]/(768*x^2)
```

Rubi [A] time = 0.0289965, antiderivative size = 37, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{\sqrt{16-x^4}}{96x^6}-\frac{\sqrt{16-x^4}}{768x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^7*Sqrt[16 - x^4]),x]

[Out] -Sqrt[16 - x^4]/(96*x^6) - Sqrt[16 - x^4]/(768*x^2)
```

Rubi in Sympy [A] time = 3.54588, size = 27, normalized size = 0.73

$$-\frac{\sqrt{-x^4+16}}{768x^2}-\frac{\sqrt{-x^4+16}}{96x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**7/(-x**4+16)**(1/2),x)

[Out] -sqrt(-x**4 + 16)/(768*x**2) - sqrt(-x**4 + 16)/(96*x**6)
```

Mathematica [A] time = 0.0130572, size = 23, normalized size = 0.62

$$-\frac{\sqrt{16-x^4}\left(x^4+8\right)}{768x^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^7*Sqrt[16 - x^4]),x]

[Out] -(Sqrt[16 - x^4]*(8 + x^4))/(768*x^6)
```

Maple [A] time = 0.007, size = 31, normalized size = 0.8

$$\frac{(-2+x)(2+x)\left(x^2+4\right)\left(x^4+8\right)}{768\,x^6}\frac{1}{\sqrt{-x^4+16}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^7/(-x^4+16)^(1/2),x)

[Out] 1/768*(-2+x)*(2+x)*(x^2+4)*(x^4+8)/x^6/(-x^4+16)^(1/2)
```

Maxima [A] time = 1.43925, size = 39, normalized size = 1.05

$$-\frac{\sqrt{-x^4+16}}{512\,x^2}-\frac{\left(-x^4+16\right)^{\frac{3}{2}}}{1536\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 16)*x^7),x, algorithm="maxima")
```

```
[Out] -1/512*sqrt(-x^4 + 16)/x^2 - 1/1536*(-x^4 + 16)^(3/2)/x^6
```

Fricas [A] time = 0.26191, size = 99, normalized size = 2.68

$$-\frac{x^{12}-72\,x^8+384\,x^4+4\left(3\,x^8-40\,x^4-512\right)\sqrt{-x^4+16}+8192}{768\left(12\,x^{10}-256\,x^6-\left(x^{10}-64\,x^6\right)\sqrt{-x^4+16}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 16)*x^7),x, algorithm="fricas")
```

```
[Out] -1/768*(x^12 - 72*x^8 + 384*x^4 + 4*(3*x^8 - 40*x^4 - 512)*sqrt(-
x^4 + 16) + 8192)/(12*x^10 - 256*x^6 - (x^10 - 64*x^6)*sqrt(-x^4
+ 16))
```

Sympy [A] time = 3.10299, size = 66, normalized size = 1.78

$$\begin{cases} -\frac{\sqrt{-1+\frac{16}{x^4}}}{768}-\frac{\sqrt{-1+\frac{16}{x^4}}}{96x^4} & \text{for}\ 16\left|\frac{1}{x^4}\right|>1 \\ -\frac{i\sqrt{1-\frac{16}{x^4}}}{768}-\frac{i\sqrt{1-\frac{16}{x^4}}}{96x^4} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**7/(-x**4+16)**(1/2),x)
```

```
[Out] Piecewise((-sqrt(-1 + 16/x**4)/768 - sqrt(-1 + 16/x**4)/(96*x**4)
, 16*Abs(x**(-4)) > 1), (-I*sqrt(1 - 16/x**4)/768 - I*sqrt(1 - 16
/x**4)/(96*x**4), True))
```

GIAC/XCAS [A] time = 0.214914, size = 31, normalized size = 0.84

$$-\frac{1}{1536}\left(\frac{16}{x^4}-1\right)^{\frac{3}{2}}-\frac{1}{512}\sqrt{\frac{16}{x^4}-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 16)*x^7),x, algorithm="giac")
```

```
[Out] -1/1536*(16/x^4 - 1)^(3/2) - 1/512*sqrt(16/x^4 - 1)
```

3.966 $\int \frac{x^6}{\sqrt{16-x^4}}\,dx$

Optimal. Leaf size=43

$$-\frac{1}{5}\sqrt{16-x^4}x^3-\frac{96}{5}F\left(\sin^{-1}\left(\frac{x}{2}\right)\middle|-1\right)+\frac{96}{5}E\left(\sin^{-1}\left(\frac{x}{2}\right)\middle|-1\right)$$

```
[Out] -(x^3*Sqrt[16 - x^4])/5 + (96*EllipticE[ArcSin[x/2], -1])/5 - (96
*EllipticF[ArcSin[x/2], -1])/5
```

Rubi [A] time = 0.0674675, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$-\frac{1}{5}\sqrt{16-x^4}x^3-\frac{96}{5}F\left(\sin^{-1}\left(\frac{x}{2}\right)\middle|-1\right)+\frac{96}{5}E\left(\sin^{-1}\left(\frac{x}{2}\right)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/Sqrt[16 - x^4],x]
```

```
[Out] -(x^3*Sqrt[16 - x^4])/5 + (96*EllipticE[ArcSin[x/2], -1])/5 - (96
*EllipticF[ArcSin[x/2], -1])/5
```

Rubi in Sympy [A] time = 11.5037, size = 36, normalized size = 0.84

$$-\frac{x^3\sqrt{-x^4+16}}{5}+\frac{96E\left(\operatorname{asin}\left(\frac{x}{2}\right)\middle|-1\right)}{5}-\frac{96F\left(\operatorname{asin}\left(\frac{x}{2}\right)\middle|-1\right)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(-x**4+16)**(1/2),x)
```

```
[Out] -x**3*sqrt(-x**4 + 16)/5 + 96*elliptic_e(asin(x/2), -1)/5 - 96*el
liptic_f(asin(x/2), -1)/5
```

Mathematica [A] time = 0.0712276, size = 56, normalized size = 1.3

$$\frac{1}{5}\left(\frac{x^7}{\sqrt{16-x^4}}-\frac{16x^3}{\sqrt{16-x^4}}-96F\left(\sin^{-1}\left(\frac{x}{2}\right)\middle|-1\right)+96E\left(\sin^{-1}\left(\frac{x}{2}\right)\middle|-1\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6/Sqrt[16 - x^4],x]
```

```
[Out] ((-16*x^3)/Sqrt[16 - x^4] + x^7/Sqrt[16 - x^4] + 96*EllipticE[Arc
Sin[x/2], -1] - 96*EllipticF[ArcSin[x/2], -1])/5
```

Maple [A] time = 0.012, size = 58, normalized size = 1.4

$$-\frac{x^3}{5}\sqrt{-x^4+16}-\frac{96}{5}\sqrt{-x^2+4}\sqrt{x^2+4}\left(\mathit{EllipticF}\left(\frac{x}{2},i\right)-\mathit{EllipticE}\left(\frac{x}{2},i\right)\right)\frac{1}{\sqrt{-x^4+16}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(-x^4+16)^(1/2),x)
```

```
[Out] -1/5*x^3*(-x^4+16)^(1/2)-96/5*(-x^2+4)^(1/2)*(x^2+4)^(1/2)/(-x^4+
16)^(1/2)*(EllipticF(1/2*x,I)-EllipticE(1/2*x,I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{\sqrt{-x^4+16}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(-x^4 + 16),x, algorithm="maxima")
```

```
[Out] integrate(x^6/sqrt(-x^4 + 16), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^6}{\sqrt{-x^4+16}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(-x^4 + 16),x, algorithm="fricas")
```

```
[Out] integral(x^6/sqrt(-x^4 + 16), x)
```

Sympy [A] time = 2.30131, size = 32, normalized size = 0.74

$$\frac{x^7\,\Gamma\left(\frac{7}{4}\right)\,{}_2F_1\left(\left.\begin{matrix}\frac{1}{2},\frac{7}{4}\\\frac{11}{4}\end{matrix}\right|\frac{x^4e^{2i\pi}}{16}\right)}{16\,\Gamma\left(\frac{11}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(-x**4+16)**(1/2),x)
```

```
[Out] x**7*gamma(7/4)*hyper((1/2, 7/4), (11/4,), x**4*exp_polar(2*I*pi)
/16)/(16*gamma(11/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{\sqrt{-x^4+16}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(-x^4 + 16),x, algorithm="giac")
```

```
[Out] integrate(x^6/sqrt(-x^4 + 16), x)
```

3.967 $\int \frac{x^4}{\sqrt{16-x^4}}\,dx$

Optimal. Leaf size=29

$$\frac{8}{3}F\left(\sin^{-1}\left(\frac{x}{2}\right)\middle|-1\right)-\frac{1}{3}x\sqrt{16-x^4}$$

```
[Out] -(x*Sqrt[16 - x^4])/3 + (8*EllipticF[ArcSin[x/2], -1])/3
```

Rubi [A] time = 0.0217364, antiderivative size = 29, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{8}{3}F\left(\sin^{-1}\left(\frac{x}{2}\right)\middle|-1\right)-\frac{1}{3}x\sqrt{16-x^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/Sqrt[16 - x^4],x]

[Out] -(x*Sqrt[16 - x^4])/3 + (8*EllipticF[ArcSin[x/2], -1])/3
```

Rubi in Sympy [A] time = 3.0727, size = 22, normalized size = 0.76

$$-\frac{x\sqrt{-x^4+16}}{3}+\frac{8F\left(\operatorname{asin}\left(\frac{x}{2}\right)\middle|-1\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(-x**4+16)**(1/2),x)

[Out] -x*sqrt(-x**4 + 16)/3 + 8*elliptic_f(asin(x/2), -1)/3
```

Mathematica [A] time = 0.0335157, size = 43, normalized size = 1.48

$$\frac{x^5+8\sqrt{16-x^4}F\left(\sin^{-1}\left(\frac{x}{2}\right)\middle|-1\right)-16x}{3\sqrt{16-x^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/Sqrt[16 - x^4],x]

[Out] (-16*x + x^5 + 8*Sqrt[16 - x^4]*EllipticF[ArcSin[x/2], -1])/(3*Sq
rt[16 - x^4])
```

Maple [B] time = 0.01, size = 47, normalized size = 1.6

$$-\frac{x}{3}\sqrt{-x^4+16}+\frac{8}{3}\sqrt{-x^2+4}\sqrt{x^2+4}EllipticF\left(\frac{x}{2},i\right)\frac{1}{\sqrt{-x^4+16}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(-x^4+16)^(1/2),x)
```

```
[Out] -1/3*x*(-x^4+16)^(1/2)+8/3*(-x^2+4)^(1/2)*(x^2+4)^(1/2)/(-x^4+16)
^(1/2)*EllipticF(1/2*x,I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\sqrt{-x^4+16}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/sqrt(-x^4 + 16),x, algorithm="maxima")
```

```
[Out] integrate(x^4/sqrt(-x^4 + 16), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^4}{\sqrt{-x^4+16}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/sqrt(-x^4 + 16),x, algorithm="fricas")
```

```
[Out] integral(x^4/sqrt(-x^4 + 16), x)
```

Sympy [A] time = 1.99242, size = 32, normalized size = 1.1

$$\frac{x^5\,\Gamma\left(\frac{5}{4}\right)\,{}_2F_1\left(\left.\begin{matrix}\frac{1}{2},\frac{5}{4}\\ \frac{9}{4}\end{matrix}\right|\frac{x^4e^{2i\pi}}{16}\right)}{16\,\Gamma\left(\frac{9}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4/(-x**4+16)**(1/2),x)
```

```
[Out] x**5*gamma(5/4)*hyper((1/2, 5/4), (9/4,), x**4*exp_polar(2*I*pi)/
16)/(16*gamma(9/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\sqrt{-x^4+16}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/sqrt(-x^4 + 16),x, algorithm="giac")
```

```
[Out] integrate(x^4/sqrt(-x^4 + 16), x)
```

3.968 $\int \frac{x^2}{\sqrt{16-x^4}}\,dx$

Optimal. Leaf size=21

$$2E\left(\sin^{-1}\left(\frac{x}{2}\right)\middle|-1\right)-2F\left(\sin^{-1}\left(\frac{x}{2}\right)\middle|-1\right)$$

```
[Out] 2*EllipticE[ArcSin[x/2], -1] - 2*EllipticF[ArcSin[x/2], -1]
```

Rubi [A] time = 0.0518187, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$2E\left(\sin^{-1}\left(\frac{x}{2}\right)\middle|-1\right)-2F\left(\sin^{-1}\left(\frac{x}{2}\right)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/Sqrt[16 - x^4],x]
```

```
[Out] 2*EllipticE[ArcSin[x/2], -1] - 2*EllipticF[ArcSin[x/2], -1]
```

Rubi in Sympy [A] time = 10.2646, size = 19, normalized size = 0.9

$$2E\left(\operatorname{asin}\left(\frac{x}{2}\right)\middle|-1\right)-2F\left(\operatorname{asin}\left(\frac{x}{2}\right)\middle|-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(-x**4+16)**(1/2),x)
```

```
[Out] 2*elliptic_e(asin(x/2), -1) - 2*elliptic_f(asin(x/2), -1)
```

Mathematica [A] time = 0.0295316, size = 21, normalized size = 1.

$$2\left(E\left(\sin^{-1}\left(\frac{x}{2}\right)\middle|-1\right)-F\left(\sin^{-1}\left(\frac{x}{2}\right)\middle|-1\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/Sqrt[16 - x^4],x]
```

```
[Out] 2*(EllipticE[ArcSin[x/2], -1] - EllipticF[ArcSin[x/2], -1])
```

Maple [B] time = 0.01, size = 43, normalized size = 2.1

$$-2\,\frac{\sqrt{-x^2+4}\sqrt{x^2+4}\,(\mathit{EllipticF}\,(x/2,i)-\mathit{EllipticE}\,(x/2,i))}{\sqrt{-x^4+16}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(-x^4+16)^(1/2),x)
```

```
[Out] -2*(-x^2+4)^(1/2)*(x^2+4)^(1/2)/(-x^4+16)^(1/2)*(EllipticF(1/2*x,
I)-EllipticE(1/2*x,I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\sqrt{-x^4+16}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(-x^4 + 16),x, algorithm="maxima")
```

```
[Out] integrate(x^2/sqrt(-x^4 + 16), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^2}{\sqrt{-x^4+16}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(-x^4 + 16),x, algorithm="fricas")
```

```
[Out] integral(x^2/sqrt(-x^4 + 16), x)
```

Sympy [A] time = 1.84712, size = 32, normalized size = 1.52

$$\frac{x^3\,\Gamma\left(\frac{3}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{3}{4}\\ \frac{7}{4}\end{matrix}\middle|\frac{x^4e^{2i\pi}}{16}\right)}{16\,\Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(-x**4+16)**(1/2),x)
```

```
[Out] x**3*gamma(3/4)*hyper((1/2, 3/4), (7/4,), x**4*exp_polar(2*I*pi)/
16)/(16*gamma(7/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\sqrt{-x^4+16}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(-x^4 + 16),x, algorithm="giac")
```

```
[Out] integrate(x^2/sqrt(-x^4 + 16), x)
```

3.969 $\int \frac{1}{\sqrt{16-x^4}}\,dx$

Optimal. Leaf size=12

$$\frac{1}{2}F\left(\sin^{-1}\left(\frac{x}{2}\right)\middle|-1\right)$$

```
[Out] EllipticF[ArcSin[x/2], -1]/2
```

Rubi [A] time = 0.00638878, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$

$$\frac{1}{2}F\left(\sin^{-1}\left(\frac{x}{2}\right)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[16 - x^4],x]

[Out] EllipticF[ArcSin[x/2], -1]/2
```

Rubi in Sympy [A] time = 1.03983, size = 8, normalized size = 0.67

$$\frac{F\left(\operatorname{asin}\left(\frac{x}{2}\right)\middle|-1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(-x**4+16)**(1/2),x)

[Out] elliptic_f(asin(x/2), -1)/2
```

Mathematica [A] time = 0.0209384, size = 12, normalized size = 1.

$$\frac{1}{2}F\left(\sin^{-1}\left(\frac{x}{2}\right)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/Sqrt[16 - x^4],x]

[Out] EllipticF[ArcSin[x/2], -1]/2
```

Maple [B] time = 0.007, size = 34, normalized size = 2.8

$$\frac{1}{2}\sqrt{-x^2+4}\sqrt{x^2+4}\,EllipticF\left(\frac{x}{2},i\right)\frac{1}{\sqrt{-x^4+16}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(-x^4+16)^(1/2),x)

[Out] 1/2*(-x^2+4)^(1/2)*(x^2+4)^(1/2)/(-x^4+16)^(1/2)*EllipticF(1/2*x,
I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^4 + 16}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(-x^4 + 16),x, algorithm="maxima")
```

```
[Out] integrate(1/sqrt(-x^4 + 16), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{-x^4 + 16}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(-x^4 + 16),x, algorithm="fricas")
```

```
[Out] integral(1/sqrt(-x^4 + 16), x)
```

Sympy [A] time = 1.73025, size = 31, normalized size = 2.58

$$\frac{x\Gamma\left(\frac{1}{4}\right) {}_{2}F_{1}\left(\begin{matrix} \frac{1}{4}, \frac{1}{2} \\ \frac{5}{4} \end{matrix}\middle| \frac{x^4 e^{2i\pi}}{16}\right)}{16\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(-x**4+16)**(1/2),x)
```

```
[Out] x*gamma(1/4)*hyper((1/4, 1/2), (5/4,), x**4*exp_polar(2*I*pi)/16)
/(16*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^4 + 16}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(-x^4 + 16),x, algorithm="giac")
```

```
[Out] integrate(1/sqrt(-x^4 + 16), x)
```

3.970 $\int \frac{1}{x^2\sqrt{16-x^4}}\,dx$

Optimal. Leaf size=43

$$-\frac{\sqrt{16-x^4}}{16x}+\frac{1}{8}F\left(\sin^{-1}\left(\frac{x}{2}\right)\middle|-1\right)-\frac{1}{8}E\left(\sin^{-1}\left(\frac{x}{2}\right)\middle|-1\right)$$

```
[Out] -Sqrt[16 - x^4]/(16*x) - EllipticE[ArcSin[x/2], -1]/8 + EllipticF
[ArcSin[x/2], -1]/8
```

Rubi [A] time = 0.0664928, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$-\frac{\sqrt{16-x^4}}{16x}+\frac{1}{8}F\left(\sin^{-1}\left(\frac{x}{2}\right)\middle|-1\right)-\frac{1}{8}E\left(\sin^{-1}\left(\frac{x}{2}\right)\middle|-1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*Sqrt[16 - x^4]),x]
```

```
[Out] -Sqrt[16 - x^4]/(16*x) - EllipticE[ArcSin[x/2], -1]/8 + EllipticF
[ArcSin[x/2], -1]/8
```

Rubi in Sympy [A] time = 11.4579, size = 31, normalized size = 0.72

$$-\frac{E\left(\operatorname{asin}\left(\frac{x}{2}\right)\middle|-1\right)}{8}+\frac{F\left(\operatorname{asin}\left(\frac{x}{2}\right)\middle|-1\right)}{8}-\frac{\sqrt{-x^4+16}}{16x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(-x**4+16)**(1/2),x)
```

```
[Out] -elliptic_e(asin(x/2), -1)/8 + elliptic_f(asin(x/2), -1)/8 - sqrt
(-x**4 + 16)/(16*x)
```

Mathematica [A] time = 0.0749275, size = 57, normalized size = 1.33

$$\frac{1}{16}\left(\frac{x^4+2\sqrt{16-x^4}xF\left(\sin^{-1}\left(\frac{x}{2}\right)\middle|-1\right)-16}{x\sqrt{16-x^4}}-2E\left(\sin^{-1}\left(\frac{x}{2}\right)\middle|-1\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*Sqrt[16 - x^4]),x]
```

```
[Out] (-2*EllipticE[ArcSin[x/2], -1] + (-16 + x^4 + 2*x*Sqrt[16 - x^4]*
EllipticF[ArcSin[x/2], -1])/(x*Sqrt[16 - x^4]))/16
```

Maple [A] time = 0.014, size = 58, normalized size = 1.4

$$-\frac{1}{16\,x}\sqrt{-x^4+16}+\frac{1}{8}\sqrt{-x^2+4}\sqrt{x^2+4}\left(\mathit{EllipticF}\left(\frac{x}{2},i\right)-\mathit{EllipticE}\left(\frac{x}{2},i\right)\right)\frac{1}{\sqrt{-x^4+16}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(-x^4+16)^(1/2),x)

[Out] -1/16*(-x^4+16)^(1/2)/x+1/8*(-x^2+4)^(1/2)*(x^2+4)^(1/2)/(-x^4+16
)^(1/2)*(EllipticF(1/2*x,I)-EllipticE(1/2*x,I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^4+16x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 16)*x^2),x, algorithm="maxima")

[Out] integrate(1/(sqrt(-x^4 + 16)*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{-x^4+16x^2}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 16)*x^2),x, algorithm="fricas")

[Out] integral(1/(sqrt(-x^4 + 16)*x^2), x)
```

Sympy [A] time = 2.06529, size = 34, normalized size = 0.79

$$\frac{\left(-\frac{1}{4}\right)\, {}_2F_1\left(\begin{matrix} -\frac{1}{4}, \frac{1}{2} \\ \frac{3}{4} \end{matrix}\middle| \frac{x^4 e^{2i\pi}}{16}\right)}{16x\left(\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(-x**4+16)**(1/2),x)

[Out] gamma(-1/4)*hyper((-1/4, 1/2), (3/4,), x**4*exp_polar(2*I*pi)/16)
/(16*x*gamma(3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^4+16x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 16)*x^2),x, algorithm="giac")

[Out] integrate(1/(sqrt(-x^4 + 16)*x^2), x)
```

3.971 $\int \frac{1}{x^4\sqrt{16-x^4}}\,dx$

Optimal. Leaf size=31

$$\frac{1}{96}F\left(\sin^{-1}\left(\frac{x}{2}\right)\middle|-1\right)-\frac{\sqrt{16-x^4}}{48x^3}$$

```
[Out] -Sqrt[16 - x^4]/(48*x^3) + EllipticF[ArcSin[x/2], -1]/96
```

Rubi [A] time = 0.0217035, antiderivative size = 31, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{1}{96}F\left(\sin^{-1}\left(\frac{x}{2}\right)\middle|-1\right)-\frac{\sqrt{16-x^4}}{48x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*Sqrt[16 - x^4]),x]
```

```
[Out] -Sqrt[16 - x^4]/(48*x^3) + EllipticF[ArcSin[x/2], -1]/96
```

Rubi in Sympy [A] time = 2.94358, size = 22, normalized size = 0.71

$$\frac{F\left(\operatorname{asin}\left(\frac{x}{2}\right)\middle|-1\right)}{96}-\frac{\sqrt{-x^4+16}}{48x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(-x**4+16)**(1/2),x)
```

```
[Out] elliptic_f(asin(x/2), -1)/96 - sqrt(-x**4 + 16)/(48*x**3)
```

Mathematica [A] time = 0.0363894, size = 48, normalized size = 1.55

$$\frac{2x^4+\sqrt{16-x^4}x^3F\left(\sin^{-1}\left(\frac{x}{2}\right)\middle|-1\right)-32}{96x^3\sqrt{16-x^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*Sqrt[16 - x^4]),x]
```

```
[Out] (-32 + 2*x^4 + x^3*Sqrt[16 - x^4]*EllipticF[ArcSin[x/2], -1])/(96
*x^3*Sqrt[16 - x^4])
```

Maple [B] time = 0.016, size = 49, normalized size = 1.6

$$-\frac{1}{48\,x^3}\sqrt{-x^4+16}+\frac{1}{96}\sqrt{-x^2+4}\sqrt{x^2+4}EllipticF\left(\frac{x}{2},i\right)\frac{1}{\sqrt{-x^4+16}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(-x^4+16)^(1/2),x)
```

```
[Out] -1/48*(-x^4+16)^(1/2)/x^3+1/96*(-x^2+4)^(1/2)*(x^2+4)^(1/2)/(-x^4
+16)^(1/2)*EllipticF(1/2*x,I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^4+16}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 16)*x^4),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(-x^4 + 16)*x^4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{-x^4+16}x^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 16)*x^4),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(-x^4 + 16)*x^4), x)
```

Sympy [A] time = 2.36044, size = 36, normalized size = 1.16

$$\frac{\Gamma\left(-\frac{3}{4}\right) {}_2F_1\left(\begin{matrix} -\frac{3}{4}, \frac{1}{2} \\ \frac{1}{4} \end{matrix}\middle| \frac{x^4 e^{2i\pi}}{16}\right)}{16x^3\Gamma\left(\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(-x**4+16)**(1/2),x)
```

```
[Out] gamma(-3/4)*hyper((-3/4, 1/2), (1/4,), x**4*exp_polar(2*I*pi)/16)
/(16*x**3*gamma(1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-x^4+16}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-x^4 + 16)*x^4),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(-x^4 + 16)*x^4), x)
```

3.972 $\int \frac{x}{\sqrt{-4+x^4}} dx$

Optimal. Leaf size=18

$$\frac{1}{2}\tanh^{-1}\left(\frac{x^2}{\sqrt{x^4-4}}\right)$$

```
[Out] ArcTanh[x^2/Sqrt[-4 + x^4]]/2
```

Rubi [A] time = 0.0204476, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273

$$\frac{1}{2}\tanh^{-1}\left(\frac{x^2}{\sqrt{x^4-4}}\right)$$

Antiderivative was successfully verified.

```
[In] Int[x/Sqrt[-4 + x^4],x]
```

```
[Out] ArcTanh[x^2/Sqrt[-4 + x^4]]/2
```

Rubi in Sympy [A] time = 2.35574, size = 14, normalized size = 0.78

$$\frac{\operatorname{atanh}\left(\frac{x^2}{\sqrt{x^4-4}}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x/(x**4-4)**(1/2),x)
```

```
[Out] atanh(x**2/sqrt(x**4 - 4))/2
```

Mathematica [B] time = 0.00776279, size = 42, normalized size = 2.33

$$\frac{1}{4}\log\left(\frac{x^2}{\sqrt{x^4-4}}+1\right)-\frac{1}{4}\log\left(1-\frac{x^2}{\sqrt{x^4-4}}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x/Sqrt[-4 + x^4],x]
```

```
[Out] -Log[1 - x^2/Sqrt[-4 + x^4]]/4 + Log[1 + x^2/Sqrt[-4 + x^4]]/4
```

Maple [A] time = 0.011, size = 15, normalized size = 0.8

$$\frac{1}{2}\ln\left(x^2+\sqrt{x^4-4}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(x^4-4)^(1/2),x)
```

```
[Out] 1/2*ln(x^2+(x^4-4)^(1/2))
```

Maxima [A] time = 1.42865, size = 45, normalized size = 2.5

$$\frac{1}{4}\,\log\left(\frac{\sqrt{x^4-4}}{x^2}+1\right)-\frac{1}{4}\,\log\left(\frac{\sqrt{x^4-4}}{x^2}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(x^4 - 4),x, algorithm="maxima")
```

```
[Out] 1/4*log(sqrt(x^4 - 4)/x^2 + 1) - 1/4*log(sqrt(x^4 - 4)/x^2 - 1)
```

Fricas [A] time = 0.263172, size = 22, normalized size = 1.22

$$-\frac{1}{2}\,\log\left(-x^2+\sqrt{x^4-4}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(x^4 - 4),x, algorithm="fricas")
```

```
[Out] -1/2*log(-x^2 + sqrt(x^4 - 4))
```

Sympy [A] time = 3.33074, size = 24, normalized size = 1.33

$$\begin{cases} \frac{\operatorname{acosh}\left(\frac{x^2}{2}\right)}{2} & \text{for}\ \frac{|x^4|}{4}>1 \\ -\frac{i\operatorname{asin}\left(\frac{x^2}{2}\right)}{2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(x**4-4)**(1/2),x)
```

```
[Out] Piecewise((acosh(x**2/2)/2, Abs(x**4)/4 > 1), (-I*asin(x**2/2)/2,
 True))
```

GIAC/XCAS [A] time = 0.220194, size = 22, normalized size = 1.22

$$-\frac{1}{2}\ln\left(x^2-\sqrt{x^4-4}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(x^4 - 4),x, algorithm="giac")
```

```
[Out] -1/2*ln(x^2 - sqrt(x^4 - 4))
```

3.973 $\int \frac{x}{\sqrt{4+x^4}} \, dx$

Optimal. Leaf size=12

$$\frac{1}{2}\sinh^{-1}\left(\frac{x^2}{2}\right)$$

```
[Out] ArcSinh[x^2/2]/2
```

Rubi [A] time = 0.0142085, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{1}{2}\sinh^{-1}\left(\frac{x^2}{2}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x/Sqrt[4 + x^4],x]

[Out] ArcSinh[x^2/2]/2
```

Rubi in Sympy [A] time = 2.20789, size = 7, normalized size = 0.58

$$\frac{\operatorname{asinh}\left(\frac{x^2}{2}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(x**4+4)**(1/2),x)

[Out] asinh(x**2/2)/2
```

Mathematica [A] time = 0.00880593, size = 12, normalized size = 1.

$$\frac{1}{2}\sinh^{-1}\left(\frac{x^2}{2}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/Sqrt[4 + x^4],x]

[Out] ArcSinh[x^2/2]/2
```

Maple [A] time = 0.011, size = 9, normalized size = 0.8

$$\frac{1}{2}Arcsinh\left(\frac{x^2}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(x^4+4)^(1/2),x)
```

```
[Out] 1/2*arcsinh(1/2*x^2)
```

Maxima [A] time = 1.44044, size = 45, normalized size = 3.75

$$\frac{1}{4}\log\left(\frac{\sqrt{x^4+4}}{x^2}+1\right)-\frac{1}{4}\log\left(\frac{\sqrt{x^4+4}}{x^2}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(x^4 + 4),x, algorithm="maxima")
```

```
[Out] 1/4*log(sqrt(x^4 + 4)/x^2 + 1) - 1/4*log(sqrt(x^4 + 4)/x^2 - 1)
```

Fricas [A] time = 0.260655, size = 22, normalized size = 1.83

$$-\frac{1}{2}\log\left(-x^2+\sqrt{x^4+4}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(x^4 + 4),x, algorithm="fricas")
```

```
[Out] -1/2*log(-x^2 + sqrt(x^4 + 4))
```

Sympy [A] time = 3.1612, size = 7, normalized size = 0.58

$$\frac{\operatorname{asinh}\left(\frac{x^2}{2}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(x**4+4)**(1/2),x)
```

```
[Out] asinh(x**2/2)/2
```

GIAC/XCAS [A] time = 0.22002, size = 22, normalized size = 1.83

$$-\frac{1}{2}\ln\left(-x^2+\sqrt{x^4+4}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(x^4 + 4),x, algorithm="giac")
```

```
[Out] -1/2*ln(-x^2 + sqrt(x^4 + 4))
```

3.974 $\int \frac{1}{x\sqrt{-1+x^4}}\,dx$

Optimal. Leaf size=14

$$\frac{1}{2}\tan^{-1}\left(\sqrt{x^4-1}\right)$$

```
[Out] ArcTan[Sqrt[-1 + x^4]]/2
```

Rubi [A] time = 0.0236733, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{1}{2}\tan^{-1}\left(\sqrt{x^4-1}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*Sqrt[-1 + x^4]),x]

[Out] ArcTan[Sqrt[-1 + x^4]]/2
```

Rubi in Sympy [A] time = 3.20581, size = 10, normalized size = 0.71

$$\frac{\operatorname{atan}\left(\sqrt{x^4-1}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(x**4-1)**(1/2),x)

[Out] atan(sqrt(x**4 - 1))/2
```

Mathematica [A] time = 0.0320399, size = 14, normalized size = 1.

$$\frac{1}{2}\tan^{-1}\left(\sqrt{x^4-1}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*Sqrt[-1 + x^4]),x]

[Out] ArcTan[Sqrt[-1 + x^4]]/2
```

Maple [A] time = 0.016, size = 11, normalized size = 0.8

$$-\frac{1}{2}\arctan\left(\frac{1}{\sqrt{x^4-1}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(x^4-1)^(1/2),x)

[Out] -1/2*arctan(1/(x^4-1)^(1/2))
```

Maxima [A] time = 1.61973, size = 14, normalized size = 1.

$$\frac{1}{2}\arctan\left(\sqrt{x^4-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 - 1)*x),x, algorithm="maxima")
```

```
[Out] 1/2*arctan(sqrt(x^4 - 1))
```

Fricas [A] time = 0.275404, size = 14, normalized size = 1.

$$\frac{1}{2}\arctan\left(\sqrt{x^4-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 - 1)*x),x, algorithm="fricas")
```

```
[Out] 1/2*arctan(sqrt(x^4 - 1))
```

Sympy [A] time = 3.33344, size = 24, normalized size = 1.71

$$\begin{cases} \frac{i\operatorname{acosh}\left(\frac{1}{x^2}\right)}{2} & \text{for } \left|\frac{1}{x^4}\right| > 1 \\ -\frac{\operatorname{asin}\left(\frac{1}{x^2}\right)}{2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(x**4-1)**(1/2),x)
```

```
[Out] Piecewise((I*acosh(x**(-2))/2, Abs(x**(-4)) > 1), (-asin(x**(-2))
/2, True))
```

GIAC/XCAS [A] time = 0.213125, size = 14, normalized size = 1.

$$\frac{1}{2}\arctan\left(\sqrt{x^4-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 - 1)*x),x, algorithm="giac")
```

```
[Out] 1/2*arctan(sqrt(x^4 - 1))
```

3.975 $\int \frac{x^4}{\sqrt{-1+x^4}} \, dx$

Optimal. Leaf size=72

$$\frac{1}{3}\sqrt{x^4-1}x+\frac{\sqrt{x^2-1}\sqrt{x^2+1}F\left(\sin^{-1}\left(\frac{\sqrt{2}x}{\sqrt{x^2-1}}\right)|\frac{1}{2}\right)}{3\sqrt{2}\sqrt{x^4-1}}$$

```
[Out] (x*Sqrt[-1 + x^4])/3 + (Sqrt[-1 + x^2]*Sqrt[1 + x^2]*EllipticF[Ar
cSin[(Sqrt[2]*x)/Sqrt[-1 + x^2]], 1/2])/(3*Sqrt[2]*Sqrt[-1 + x^4]
)
```

Rubi [A] time = 0.0328226, antiderivative size = 72, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{1}{3}\sqrt{x^4-1}x+\frac{\sqrt{x^2-1}\sqrt{x^2+1}F\left(\sin^{-1}\left(\frac{\sqrt{2}x}{\sqrt{x^2-1}}\right)|\frac{1}{2}\right)}{3\sqrt{2}\sqrt{x^4-1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/Sqrt[-1 + x^4],x]
```

```
[Out] (x*Sqrt[-1 + x^4])/3 + (Sqrt[-1 + x^2]*Sqrt[1 + x^2]*EllipticF[Ar
cSin[(Sqrt[2]*x)/Sqrt[-1 + x^2]], 1/2])/(3*Sqrt[2]*Sqrt[-1 + x^4]
)
```

Rubi in Sympy [A] time = 2.94839, size = 36, normalized size = 0.5

$$\frac{x\sqrt{x^4-1}}{3}+\frac{\sqrt{-x^4+1}F(\text{asin}(x)|-1)}{3\sqrt{x^4-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(x**4-1)**(1/2),x)
```

```
[Out] x*sqrt(x**4 - 1)/3 + sqrt(-x**4 + 1)*elliptic_f(asin(x), -1)/(3*s
qrt(x**4 - 1))
```

Mathematica [A] time = 0.033852, size = 36, normalized size = 0.5

$$\frac{x^5+\sqrt{1-x^4}F\left(\sin^{-1}(x)\middle|-1\right)-x}{3\sqrt{x^4-1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/Sqrt[-1 + x^4],x]
```

```
[Out] (-x + x^5 + Sqrt[1 - x^4]*EllipticF[ArcSin[x], -1])/(3*Sqrt[-1 +
x^4])
```

Maple [C] time = 0.012, size = 45, normalized size = 0.6

$$\frac{x}{3}\sqrt{x^4-1}-\frac{i}{3}EllipticF(ix,i)\sqrt{x^2+1}\sqrt{-x^2+1}\frac{1}{\sqrt{x^4-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(x^4-1)^(1/2),x)
```

```
[Out] 1/3*x*(x^4-1)^(1/2)-1/3*I*(x^2+1)^(1/2)*(-x^2+1)^(1/2)/(x^4-1)^(1
/2)*EllipticF(I*x,I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\sqrt{x^4-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(x^4 - 1),x, algorithm="maxima")
```

```
[Out] integrate(x^4/sqrt(x^4 - 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^4}{\sqrt{x^4-1}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(x^4 - 1),x, algorithm="fricas")
```

```
[Out] integral(x^4/sqrt(x^4 - 1), x)
```

Sympy [A] time = 1.91683, size = 27, normalized size = 0.38

$$-\frac{ix^5\,\Gamma\left(\frac{5}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{5}{4}\\ \frac{9}{4}\end{matrix}\middle|x^4\right)}{4\,\Gamma\left(\frac{9}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(x**4-1)**(1/2),x)
```

```
[Out] -I*x**5*gamma(5/4)*hyper((1/2, 5/4), (9/4,), x**4)/(4*gamma(9/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\sqrt{x^4-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(x^4 - 1),x, algorithm="giac")
```

```
[Out] integrate(x^4/sqrt(x^4 - 1), x)
```

3.976 $\int \frac{1}{\sqrt{-1+x^4}} \, dx$

Optimal. Leaf size=54

$$\frac{\sqrt{x^2-1}\sqrt{x^2+1}F\left(\sin^{-1}\left(\frac{\sqrt{2}x}{\sqrt{x^2-1}}\right)|\frac{1}{2}\right)}{\sqrt{2}\sqrt{x^4-1}}$$

```
[Out] (Sqrt[-1 + x^2]*Sqrt[1 + x^2]*EllipticF[ArcSin[(Sqrt[2]*x)/Sqrt[-
1 + x^2]], 1/2])/(Sqrt[2]*Sqrt[-1 + x^4])
```

Rubi [A] time = 0.0146213, antiderivative size = 54, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$

$$\frac{\sqrt{x^2-1}\sqrt{x^2+1}F\left(\sin^{-1}\left(\frac{\sqrt{2}x}{\sqrt{x^2-1}}\right)|\frac{1}{2}\right)}{\sqrt{2}\sqrt{x^4-1}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[-1 + x^4],x]
```

```
[Out] (Sqrt[-1 + x^2]*Sqrt[1 + x^2]*EllipticF[ArcSin[(Sqrt[2]*x)/Sqrt[-
1 + x^2]], 1/2])/(Sqrt[2]*Sqrt[-1 + x^4])
```

Rubi in Sympy [A] time = 1.2738, size = 22, normalized size = 0.41

$$\frac{\sqrt{-x^4+1}F\left(\operatorname{asin}(x)|-1\right)}{\sqrt{x^4-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(x**4-1)**(1/2),x)
```

```
[Out] sqrt(-x**4 + 1)*elliptic_f(asin(x), -1)/sqrt(x**4 - 1)
```

Mathematica [A] time = 0.0178122, size = 25, normalized size = 0.46

$$\frac{\sqrt{1-x^4}F\left(\sin^{-1}(x)\middle|-1\right)}{\sqrt{x^4-1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/Sqrt[-1 + x^4],x]
```

```
[Out] (Sqrt[1 - x^4]*EllipticF[ArcSin[x], -1])/Sqrt[-1 + x^4]
```

Maple [C] time = 0.007, size = 34, normalized size = 0.6

$$-i\mathit{EllipticF}\left(ix,i\right)\sqrt{x^2+1}\sqrt{-x^2+1}\frac{1}{\sqrt{x^4-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(x^4-1)^(1/2),x)

[Out] -I*(x^2+1)^(1/2)*(-x^2+1)^(1/2)/(x^4-1)^(1/2)*EllipticF(I*x,I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^4-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(x^4 - 1),x, algorithm="maxima")

[Out] integrate(1/sqrt(x^4 - 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{x^4-1}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(x^4 - 1),x, algorithm="fricas")

[Out] integral(1/sqrt(x^4 - 1), x)
```

Sympy [A] time = 1.66939, size = 26, normalized size = 0.48

$$-\frac{ix\,\Gamma\left(\frac{1}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{4},\frac{1}{2}\\ \frac{5}{4}\end{matrix}\middle|x^4\right)}{4\,\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x**4-1)**(1/2),x)

[Out] -I*x*gamma(1/4)*hyper((1/4, 1/2), (5/4,), x**4)/(4*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^4-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(x^4 - 1),x, algorithm="giac")

[Out] integrate(1/sqrt(x^4 - 1), x)
```

3.977 $\int \frac{1}{x^4\sqrt{-1+x^4}}\,dx$

Optimal. Leaf size=74

$$\frac{\sqrt{x^4-1}}{3x^3}+\frac{\sqrt{x^2-1}\sqrt{x^2+1}F\left(\sin^{-1}\left(\frac{\sqrt{2}x}{\sqrt{x^2-1}}\right)|\frac{1}{2}\right)}{3\sqrt{2}\sqrt{x^4-1}}$$

```
[Out] Sqrt[-1 + x^4]/(3*x^3) + (Sqrt[-1 + x^2]*Sqrt[1 + x^2]*EllipticF[
ArcSin[(Sqrt[2]*x)/Sqrt[-1 + x^2]], 1/2])/(3*Sqrt[2]*Sqrt[-1 + x^
4])
```

Rubi [A] time = 0.032677, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{\sqrt{x^4-1}}{3x^3}+\frac{\sqrt{x^2-1}\sqrt{x^2+1}F\left(\sin^{-1}\left(\frac{\sqrt{2}x}{\sqrt{x^2-1}}\right)|\frac{1}{2}\right)}{3\sqrt{2}\sqrt{x^4-1}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*Sqrt[-1 + x^4]),x]
```

```
[Out] Sqrt[-1 + x^4]/(3*x^3) + (Sqrt[-1 + x^2]*Sqrt[1 + x^2]*EllipticF[
ArcSin[(Sqrt[2]*x)/Sqrt[-1 + x^2]], 1/2])/(3*Sqrt[2]*Sqrt[-1 + x^
4])
```

Rubi in Sympy [A] time = 2.84377, size = 37, normalized size = 0.5

$$\frac{\sqrt{-x^4+1}F(\operatorname{asin}(x)|-1)}{3\sqrt{x^4-1}}+\frac{\sqrt{x^4-1}}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(x**4-1)**(1/2),x)
```

```
[Out] sqrt(-x**4 + 1)*elliptic_f(asin(x), -1)/(3*sqrt(x**4 - 1)) + sqrt
(x**4 - 1)/(3*x**3)
```

Mathematica [A] time = 0.0311596, size = 40, normalized size = 0.54

$$\frac{x^4+\sqrt{1-x^4}x^3F\left(\sin^{-1}(x)\middle|-1\right)-1}{3x^3\sqrt{x^4-1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*Sqrt[-1 + x^4]),x]
```

```
[Out] (-1 + x^4 + x^3*Sqrt[1 - x^4]*EllipticF[ArcSin[x], -1])/(3*x^3*Sq
rt[-1 + x^4])
```

Maple [C] time = 0.014, size = 47, normalized size = 0.6

$$\frac{1}{3x^3}\sqrt{x^4-1}-\frac{i}{3}EllipticF(ix,i)\sqrt{x^2+1}\sqrt{-x^2+1}\frac{1}{\sqrt{x^4-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(x^4-1)^(1/2),x)
```

```
[Out] 1/3*(x^4-1)^(1/2)/x^3-1/3*I*(x^2+1)^(1/2)*(-x^2+1)^(1/2)/(x^4-1)^
(1/2)*EllipticF(I*x,I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^4-1}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 - 1)*x^4),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(x^4 - 1)*x^4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{x^4-1}x^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 - 1)*x^4),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(x^4 - 1)*x^4), x)
```

Sympy [A] time = 2.28507, size = 31, normalized size = 0.42

$$-\frac{i\Gamma\left(-\frac{3}{4}\right){}_2F_1\left(\begin{matrix}-\frac{3}{4},\frac{1}{2}\\ \frac{1}{4}\end{matrix}\middle| x^4\right)}{4x^3\Gamma\left(\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(x**4-1)**(1/2),x)
```

```
[Out] -I*gamma(-3/4)*hyper((-3/4, 1/2), (1/4,), x**4)/(4*x**3*gamma(1/4
))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^4-1}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 - 1)*x^4),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(x^4 - 1)*x^4), x)
```

3.978 $\int \frac{x^6}{\sqrt{-1+x^4}}\,dx$

Optimal. Leaf size=150

$$\frac{1}{5}\sqrt{x^4-1}x^3+\frac{3\left(x^2+1\right)x}{5\sqrt{x^4-1}}+\frac{3\sqrt{x^2-1}\sqrt{x^2+1}F\left(\sin^{-1}\left(\frac{\sqrt{2}x}{\sqrt{x^2-1}}\right)|\frac{1}{2}\right)}{5\sqrt{2}\sqrt{x^4-1}}-\frac{3\sqrt{2}\sqrt{x^2-1}\sqrt{x^2+1}E\left(\sin^{-1}\left(\frac{\sqrt{2}x}{\sqrt{x^2-1}}\right)|\frac{1}{2}\right)}{5\sqrt{x^4-1}}$$

```
[Out] (3*x*(1 + x^2))/(5*Sqrt[-1 + x^4]) + (x^3*Sqrt[-1 + x^4])/5 - (3*
Sqrt[2]*Sqrt[-1 + x^2]*Sqrt[1 + x^2]*EllipticE[ArcSin[(Sqrt[2]*x)
/Sqrt[-1 + x^2]], 1/2])/(5*Sqrt[-1 + x^4]) + (3*Sqrt[-1 + x^2]*Sq
rt[1 + x^2]*EllipticF[ArcSin[(Sqrt[2]*x)/Sqrt[-1 + x^2]], 1/2])/(
5*Sqrt[2]*Sqrt[-1 + x^4])
```

Rubi [A] time = 0.0739881, antiderivative size = 150, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{1}{5}\sqrt{x^4-1}x^3+\frac{3\left(x^2+1\right)x}{5\sqrt{x^4-1}}+\frac{3\sqrt{x^2-1}\sqrt{x^2+1}F\left(\sin^{-1}\left(\frac{\sqrt{2}x}{\sqrt{x^2-1}}\right)|\frac{1}{2}\right)}{5\sqrt{2}\sqrt{x^4-1}}-\frac{3\sqrt{2}\sqrt{x^2-1}\sqrt{x^2+1}E\left(\sin^{-1}\left(\frac{\sqrt{2}x}{\sqrt{x^2-1}}\right)|\frac{1}{2}\right)}{5\sqrt{x^4-1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/Sqrt[-1 + x^4],x]
```

```
[Out] (3*x*(1 + x^2))/(5*Sqrt[-1 + x^4]) + (x^3*Sqrt[-1 + x^4])/5 - (3*
Sqrt[2]*Sqrt[-1 + x^2]*Sqrt[1 + x^2]*EllipticE[ArcSin[(Sqrt[2]*x)
/Sqrt[-1 + x^2]], 1/2])/(5*Sqrt[-1 + x^4]) + (3*Sqrt[-1 + x^2]*Sq
rt[1 + x^2]*EllipticF[ArcSin[(Sqrt[2]*x)/Sqrt[-1 + x^2]], 1/2])/(
5*Sqrt[2]*Sqrt[-1 + x^4])
```

Rubi in Sympy [A] time = 7.12724, size = 112, normalized size = 0.75

$$\frac{x^3\sqrt{x^4-1}}{5}+\frac{3x\left(x^2+1\right)}{5\sqrt{x^4-1}}-\frac{3\sqrt{2}\sqrt{x^2-1}\sqrt{x^2+1}E\left(\operatorname{asin}\left(\frac{\sqrt{2}x}{\sqrt{x^2-1}}\right)\middle|\frac{1}{2}\right)}{5\sqrt{x^4-1}}+\frac{3\sqrt{-x^4+1}F\left(\operatorname{asin}\left(x\right)\middle|-1\right)}{5\sqrt{x^4-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(x**4-1)**(1/2),x)
```

```
[Out] x**3*sqrt(x**4 - 1)/5 + 3*x*(x**2 + 1)/(5*sqrt(x**4 - 1)) - 3*sqr
t(2)*sqrt(x**2 - 1)*sqrt(x**2 + 1)*elliptic_e(asin(sqrt(2)*x/sqrt
(x**2 - 1)), 1/2)/(5*sqrt(x**4 - 1)) + 3*sqrt(-x**4 + 1)*elliptic
_f(asin(x), -1)/(5*sqrt(x**4 - 1))
```

Mathematica [A] time = 0.0455134, size = 56, normalized size = 0.37

$$\frac{x^7-3\sqrt{1-x^4}F\left(\sin^{-1}(x)\middle|-1\right)+3\sqrt{1-x^4}E\left(\sin^{-1}(x)\middle|-1\right)-x^3}{5\sqrt{x^4-1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6/Sqrt[-1 + x^4],x]
```

```
[Out] (-x^3 + x^7 + 3*Sqrt[1 - x^4]*EllipticE[ArcSin[x], -1] - 3*Sqrt[1
 - x^4]*EllipticF[ArcSin[x], -1])/(5*Sqrt[-1 + x^4])
```

Maple [C] time = 0.011, size = 57, normalized size = 0.4

$$\frac{x^3}{5}\sqrt{x^4-1}-\frac{3\,i}{5}\left(EllipticF\left(ix,i\right)-EllipticE\left(ix,i\right)\right)\sqrt{x^2+1}\sqrt{-x^2+1}\frac{1}{\sqrt{x^4-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(x^4-1)^(1/2),x)
```

```
[Out] 1/5*x^3*(x^4-1)^(1/2)-3/5*I*(x^2+1)^(1/2)*(-x^2+1)^(1/2)/(x^4-1)^
(1/2)*(EllipticF(I*x,I)-EllipticE(I*x,I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{\sqrt{x^4-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(x^4 - 1),x, algorithm="maxima")
```

```
[Out] integrate(x^6/sqrt(x^4 - 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^6}{\sqrt{x^4-1}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(x^4 - 1),x, algorithm="fricas")
```

```
[Out] integral(x^6/sqrt(x^4 - 1), x)
```

Sympy [A] time = 2.22213, size = 27, normalized size = 0.18

$$-\frac{ix^7\,\Gamma\left(\frac{7}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{7}{4}\\ \frac{11}{4}\end{matrix}\middle|x^4\right)}{4\,\Gamma\left(\frac{11}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(x**4-1)**(1/2),x)
```

```
[Out] -I*x**7*gamma(7/4)*hyper((1/2, 7/4), (11/4,), x**4)/(4*gamma(11/4
))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{\sqrt{x^4-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(x^4 - 1),x, algorithm="giac")

[Out] integrate(x^6/sqrt(x^4 - 1), x)
```

3.979 $\int \frac{x^2}{\sqrt{-1+x^4}} \, dx$

Optimal. Leaf size=126

$$\frac{x(x^2+1)}{\sqrt{x^4-1}}+\frac{\sqrt{x^2-1}\sqrt{x^2+1}F\left(\sin^{-1}\left(\frac{\sqrt{2}x}{\sqrt{x^2-1}}\right)|\frac{1}{2}\right)}{\sqrt{2}\sqrt{x^4-1}}-\frac{\sqrt{2}\sqrt{x^2-1}\sqrt{x^2+1}E\left(\sin^{-1}\left(\frac{\sqrt{2}x}{\sqrt{x^2-1}}\right)|\frac{1}{2}\right)}{\sqrt{x^4-1}}$$

```
[Out] (x*(1 + x^2))/Sqrt[-1 + x^4] - (Sqrt[2]*Sqrt[-1 + x^2]*Sqrt[1 + x
^2]*EllipticE[ArcSin[(Sqrt[2]*x)/Sqrt[-1 + x^2]], 1/2])/Sqrt[-1 +
 x^4] + (Sqrt[-1 + x^2]*Sqrt[1 + x^2]*EllipticF[ArcSin[(Sqrt[2]*x
)/Sqrt[-1 + x^2]], 1/2])/(Sqrt[2]*Sqrt[-1 + x^4])
```

Rubi [A] time = 0.0501161, antiderivative size = 126, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{x(x^2+1)}{\sqrt{x^4-1}}+\frac{\sqrt{x^2-1}\sqrt{x^2+1}F\left(\sin^{-1}\left(\frac{\sqrt{2}x}{\sqrt{x^2-1}}\right)|\frac{1}{2}\right)}{\sqrt{2}\sqrt{x^4-1}}-\frac{\sqrt{2}\sqrt{x^2-1}\sqrt{x^2+1}E\left(\sin^{-1}\left(\frac{\sqrt{2}x}{\sqrt{x^2-1}}\right)|\frac{1}{2}\right)}{\sqrt{x^4-1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/Sqrt[-1 + x^4],x]
```

```
[Out] (x*(1 + x^2))/Sqrt[-1 + x^4] - (Sqrt[2]*Sqrt[-1 + x^2]*Sqrt[1 + x
^2]*EllipticE[ArcSin[(Sqrt[2]*x)/Sqrt[-1 + x^2]], 1/2])/Sqrt[-1 +
 x^4] + (Sqrt[-1 + x^2]*Sqrt[1 + x^2]*EllipticF[ArcSin[(Sqrt[2]*x
)/Sqrt[-1 + x^2]], 1/2])/(Sqrt[2]*Sqrt[-1 + x^4])
```

Rubi in Sympy [A] time = 5.77124, size = 88, normalized size = 0.7

$$\frac{x(x^2+1)}{\sqrt{x^4-1}}-\frac{\sqrt{2}\sqrt{x^2-1}\sqrt{x^2+1}E\left(\operatorname{asin}\left(\frac{\sqrt{2}x}{\sqrt{x^2-1}}\right)\middle|\frac{1}{2}\right)}{\sqrt{x^4-1}}+\frac{\sqrt{-x^4+1}F(\operatorname{asin}(x)|-1)}{\sqrt{x^4-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(x**4-1)**(1/2),x)
```

```
[Out] x*(x**2 + 1)/sqrt(x**4 - 1) - sqrt(2)*sqrt(x**2 - 1)*sqrt(x**2 +
1)*elliptic_e(asin(sqrt(2)*x/sqrt(x**2 - 1)), 1/2)/sqrt(x**4 - 1)
 + sqrt(-x**4 + 1)*elliptic_f(asin(x), -1)/sqrt(x**4 - 1)
```

Mathematica [A] time = 0.0307353, size = 32, normalized size = 0.25

$$\frac{\sqrt{1-x^4}\left(E\left(\sin^{-1}(x)\middle|-1\right)-F\left(\sin^{-1}(x)\middle|-1\right)\right)}{\sqrt{x^4-1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/Sqrt[-1 + x^4],x]
```

```
[Out] (Sqrt[1 - x^4]*(EllipticE[ArcSin[x], -1] - EllipticF[ArcSin[x], -
1]))/Sqrt[-1 + x^4]
```

Maple [C] time = 0.009, size = 44, normalized size = 0.4

$$-i\left(EllipticF\left(ix,i\right)-EllipticE\left(ix,i\right)\right)\sqrt{x^{2}+1}\,\sqrt{-x^{2}+1}\,\frac{1}{\sqrt{x^{4}-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(x^4-1)^(1/2),x)
```

```
[Out] -I*(x^2+1)^(1/2)*(-x^2+1)^(1/2)/(x^4-1)^(1/2)*(EllipticF(I*x,I)-E
llipticE(I*x,I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{2}}{\sqrt{x^{4}-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(x^4 - 1),x, algorithm="maxima")
```

```
[Out] integrate(x^2/sqrt(x^4 - 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{2}}{\sqrt{x^{4}-1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(x^4 - 1),x, algorithm="fricas")
```

```
[Out] integral(x^2/sqrt(x^4 - 1), x)
```

Sympy [A] time = 1.8077, size = 27, normalized size = 0.21

$$-\frac{ix^{3}\,\Gamma\left(\frac{3}{4}\right)\,{}_{2}F_{1}\left(\begin{matrix}\frac{1}{2},\frac{3}{4}\\ \frac{7}{4}\end{matrix}\middle|\,x^{4}\right)}{4\,\Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(x**4-1)**(1/2),x)
```

```
[Out] -I*x**3*gamma(3/4)*hyper((1/2, 3/4), (7/4,), x**4)/(4*gamma(7/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{2}}{\sqrt{x^{4}-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(x^4 - 1),x, algorithm="giac")

[Out] integrate(x^2/sqrt(x^4 - 1), x)
```

3.980 $\int \frac{1}{x^2\sqrt{-1+x^4}}\,dx$

Optimal. Leaf size=140

$$\frac{\sqrt{x^4-1}}{x}-\frac{x\left(x^2+1\right)}{\sqrt{x^4-1}}-\frac{\sqrt{x^2-1}\sqrt{x^2+1}F\left(\sin^{-1}\left(\frac{\sqrt{2}x}{\sqrt{x^2-1}}\right)|\frac{1}{2}\right)}{\sqrt{2}\sqrt{x^4-1}}+\frac{\sqrt{2}\sqrt{x^2-1}\sqrt{x^2+1}E\left(\sin^{-1}\left(\frac{\sqrt{2}x}{\sqrt{x^2-1}}\right)|\frac{1}{2}\right)}{\sqrt{x^4-1}}$$

```
[Out] -((x*(1 + x^2))/Sqrt[-1 + x^4]) + Sqrt[-1 + x^4]/x + (Sqrt[2]*Sqr
t[-1 + x^2]*Sqrt[1 + x^2]*EllipticE[ArcSin[(Sqrt[2]*x)/Sqrt[-1 +
x^2]], 1/2])/Sqrt[-1 + x^4] - (Sqrt[-1 + x^2]*Sqrt[1 + x^2]*Ellip
ticF[ArcSin[(Sqrt[2]*x)/Sqrt[-1 + x^2]], 1/2])/(Sqrt[2]*Sqrt[-1 +
 x^4])
```

Rubi [A] time = 0.0613276, antiderivative size = 140, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$

$$\frac{\sqrt{x^4-1}}{x}-\frac{x\left(x^2+1\right)}{\sqrt{x^4-1}}-\frac{\sqrt{x^2-1}\sqrt{x^2+1}F\left(\sin^{-1}\left(\frac{\sqrt{2}x}{\sqrt{x^2-1}}\right)|\frac{1}{2}\right)}{\sqrt{2}\sqrt{x^4-1}}+\frac{\sqrt{2}\sqrt{x^2-1}\sqrt{x^2+1}E\left(\sin^{-1}\left(\frac{\sqrt{2}x}{\sqrt{x^2-1}}\right)|\frac{1}{2}\right)}{\sqrt{x^4-1}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*Sqrt[-1 + x^4]),x]
```


```
[Out] -((x*(1 + x^2))/Sqrt[-1 + x^4]) + Sqrt[-1 + x^4]/x + (Sqrt[2]*Sqr
t[-1 + x^2]*Sqrt[1 + x^2]*EllipticE[ArcSin[(Sqrt[2]*x)/Sqrt[-1 +
x^2]], 1/2])/Sqrt[-1 + x^4] - (Sqrt[-1 + x^2]*Sqrt[1 + x^2]*Ellip
ticF[ArcSin[(Sqrt[2]*x)/Sqrt[-1 + x^2]], 1/2])/(Sqrt[2]*Sqrt[-1 +
 x^4])
```

Rubi in Sympy [A] time = 6.84739, size = 99, normalized size = 0.71

$$-\frac{x\left(x^2+1\right)}{\sqrt{x^4-1}}+\frac{\sqrt{2}\sqrt{x^2-1}\sqrt{x^2+1}E\left(\operatorname{asin}\left(\frac{\sqrt{2}x}{\sqrt{x^2-1}}\right)\middle|\frac{1}{2}\right)}{\sqrt{x^4-1}}-\frac{\sqrt{-x^4+1}F\left(\operatorname{asin}(x)|-1\right)}{\sqrt{x^4-1}}+\frac{\sqrt{x^4-1}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(x**4-1)**(1/2),x)
```

```
[Out] -x*(x**2 + 1)/sqrt(x**4 - 1) + sqrt(2)*sqrt(x**2 - 1)*sqrt(x**2 +
 1)*elliptic_e(asin(sqrt(2)*x/sqrt(x**2 - 1)), 1/2)/sqrt(x**4 - 1
) - sqrt(-x**4 + 1)*elliptic_f(asin(x), -1)/sqrt(x**4 - 1) + sqrt
(x**4 - 1)/x
```

Mathematica [A] time = 0.0460273, size = 55, normalized size = 0.39

$$\frac{\sqrt{x^4-1}}{x}+\frac{\sqrt{1-x^2}\sqrt{x^2+1}\left(F\left(\sin^{-1}(x)\middle|-1\right)-E\left(\sin^{-1}(x)\middle|-1\right)\right)}{\sqrt{x^4-1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*Sqrt[-1 + x^4]),x]
```

```
[Out] Sqrt[-1 + x^4]/x + (Sqrt[1 - x^2]*Sqrt[1 + x^2]*(-EllipticE[ArcSi
n[x], -1] + EllipticF[ArcSin[x], -1]))/Sqrt[-1 + x^4]
```

Maple [C] time = 0.013, size = 56, normalized size = 0.4

$$\frac{1}{x}\sqrt{x^4-1}+i\left(\mathit{EllipticF}\left(ix,i\right)-\mathit{EllipticE}\left(ix,i\right)\right)\sqrt{x^2+1}\sqrt{-x^2+1}\frac{1}{\sqrt{x^4-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^2/(x^4-1)^(1/2),x)
```

```
[Out] (x^4-1)^(1/2)/x+I*(x^2+1)^(1/2)*(-x^2+1)^(1/2)/(x^4-1)^(1/2)*(Ell
ipticF(I*x,I)-EllipticE(I*x,I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^4-1}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(x^4 - 1)*x^2),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(x^4 - 1)*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{1}{\sqrt{x^4-1}x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(x^4 - 1)*x^2),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(x^4 - 1)*x^2), x)
```

Sympy [A] time = 2.00875, size = 29, normalized size = 0.21

$$-\frac{i\left(-\frac{1}{4}\right)\,{}_{2}F_{1}\left(\begin{matrix}-\frac{1}{4},\frac{1}{2}\\ \frac{3}{4}\end{matrix}\middle|x^4\right)}{4x\left(\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/x**2/(x**4-1)**(1/2),x)
```

```
[Out] -I*gamma(-1/4)*hyper((-1/4, 1/2), (3/4,), x**4)/(4*x*gamma(3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^4-1}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^4 - 1)*x^2),x, algorithm="giac")

[Out] integrate(1/(sqrt(x^4 - 1)*x^2), x)
```

3.981 $\int \frac{x^2}{\sqrt{3-2x^4}}\,dx$

Optimal. Leaf size=48

$$\frac{\sqrt[4]{3}E\left(\sin^{-1}\left(\sqrt[4]{\frac{2}{3}}x\right)\middle|-1\right)}{2^{3/4}}-\frac{\sqrt[4]{3}F\left(\sin^{-1}\left(\sqrt[4]{\frac{2}{3}}x\right)\middle|-1\right)}{2^{3/4}}$$

```
[Out] (3^(1/4)*EllipticE[ArcSin[(2/3)^(1/4)*x], -1])/2^(3/4) - (3^(1/4)
*EllipticF[ArcSin[(2/3)^(1/4)*x], -1])/2^(3/4)
```

Rubi [A] time = 0.124061, antiderivative size = 48, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{\sqrt[4]{3}E\left(\sin^{-1}\left(\sqrt[4]{\frac{2}{3}}x\right)\middle|-1\right)}{2^{3/4}}-\frac{\sqrt[4]{3}F\left(\sin^{-1}\left(\sqrt[4]{\frac{2}{3}}x\right)\middle|-1\right)}{2^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/Sqrt[3 - 2*x^4],x]
```

```
[Out] (3^(1/4)*EllipticE[ArcSin[(2/3)^(1/4)*x], -1])/2^(3/4) - (3^(1/4)
*EllipticF[ArcSin[(2/3)^(1/4)*x], -1])/2^(3/4)
```

Rubi in Sympy [A] time = 13.7575, size = 49, normalized size = 1.02

$$\frac{\sqrt[4]{6}E\left(\operatorname{asin}\left(\frac{\sqrt[4]{2}\cdot 3^{\frac{3}{4}}x}{3}\right)\middle|-1\right)}{2}-\frac{\sqrt[4]{6}F\left(\operatorname{asin}\left(\frac{\sqrt[4]{2}\cdot 3^{\frac{3}{4}}x}{3}\right)\middle|-1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(-2*x**4+3)**(1/2),x)
```

```
[Out] 6**(1/4)*elliptic_e(asin(2**(1/4)*3**(3/4)*x/3), -1)/2 - 6**(1/4)
*elliptic_f(asin(2**(1/4)*3**(3/4)*x/3), -1)/2
```

Mathematica [A] time = 0.0521902, size = 38, normalized size = 0.79

$$\frac{\sqrt[4]{3}\left(E\left(\sin^{-1}\left(\sqrt[4]{\frac{2}{3}}x\right)\middle|-1\right)-F\left(\sin^{-1}\left(\sqrt[4]{\frac{2}{3}}x\right)\middle|-1\right)\right)}{2^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/Sqrt[3 - 2*x^4],x]
```

```
[Out] (3^(1/4)*(EllipticE[ArcSin[(2/3)^(1/4)*x], -1] - EllipticF[ArcSin
[(2/3)^(1/4)*x], -1]))/2^(3/4)
```

Maple [A] time = 0.082, size = 69, normalized size = 1.4

$$-\frac{\sqrt{3}\sqrt[4]{6}}{18}\sqrt{9-3\,x^2\sqrt{6}}\sqrt{9+3\,x^2\sqrt{6}}\left(\mathit{EllipticF}\left(\frac{x\sqrt{3}\sqrt[4]{6}}{3},i\right)-\mathit{EllipticE}\left(\frac{x\sqrt{3}\sqrt[4]{6}}{3},i\right)\right)\frac{1}{\sqrt{-2\,x^4+3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^2/(-2*x^4+3)^(1/2),x)
```

```
[Out] -1/18*3^(1/2)*6^(1/4)*(9-3*x^2*6^(1/2))^(1/2)*(9+3*x^2*6^(1/2))^(
1/2)/(-2*x^4+3)^(1/2)*(EllipticF(1/3*x*3^(1/2)*6^(1/4),I)-Ellipti
cE(1/3*x*3^(1/2)*6^(1/4),I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\sqrt{-2\,x^4+3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^2/sqrt(-2*x^4 + 3),x, algorithm="maxima")
```

```
[Out] integrate(x^2/sqrt(-2*x^4 + 3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x^2}{\sqrt{-2\,x^4+3}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^2/sqrt(-2*x^4 + 3),x, algorithm="fricas")
```

```
[Out] integral(x^2/sqrt(-2*x^4 + 3), x)
```

Sympy [A] time = 1.92152, size = 39, normalized size = 0.81

$$\frac{\sqrt{3}x^3\,\Gamma\left(\frac{3}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{3}{4}\\\frac{7}{4}\end{matrix}\middle|\frac{2x^4e^{2i\pi}}{3}\right)}{12\,\Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**2/(-2*x**4+3)**(1/2),x)
```

```
[Out] sqrt(3)*x**3*gamma(3/4)*hyper((1/2, 3/4), (7/4,), 2*x**4*exp_pola
r(2*I*pi)/3)/(12*gamma(7/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\sqrt{-2\,x^4+3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^2/sqrt(-2*x^4 + 3),x, algorithm="giac")
```

```
[Out] integrate(x^2/sqrt(-2*x^4 + 3), x)
```

3.982 $\int \frac{x^2}{\sqrt{3-bx^4}}\,dx$

Optimal. Leaf size=54

$$\frac{\sqrt[4]{3}E\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{3}}\right)\middle|-1\right)}{b^{3/4}}-\frac{\sqrt[4]{3}F\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{3}}\right)\middle|-1\right)}{b^{3/4}}$$

```
[Out] (3^(1/4)*EllipticE[ArcSin[(b^(1/4)*x)/3^(1/4)], -1])/b^(3/4) - (3
^(1/4)*EllipticF[ArcSin[(b^(1/4)*x)/3^(1/4)], -1])/b^(3/4)
```

Rubi [A] time = 0.145094, antiderivative size = 54, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.25$

$$\frac{\sqrt[4]{3}E\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{3}}\right)\middle|-1\right)}{b^{3/4}}-\frac{\sqrt[4]{3}F\left(\sin^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{3}}\right)\middle|-1\right)}{b^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/Sqrt[3 - b*x^4],x]
```

```
[Out] (3^(1/4)*EllipticE[ArcSin[(b^(1/4)*x)/3^(1/4)], -1])/b^(3/4) - (3
^(1/4)*EllipticF[ArcSin[(b^(1/4)*x)/3^(1/4)], -1])/b^(3/4)
```

Rubi in Sympy [A] time = 23.8078, size = 56, normalized size = 1.04

$$\frac{\sqrt[4]{3}E\left(\operatorname{asin}\left(\frac{3^{\frac{3}{4}}\sqrt[4]{b}x}{3}\right)\middle|-1\right)}{b^{\frac{3}{4}}}-\frac{\sqrt[4]{3}F\left(\operatorname{asin}\left(\frac{3^{\frac{3}{4}}\sqrt[4]{b}x}{3}\right)\middle|-1\right)}{b^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(-b*x**4+3)**(1/2),x)
```

```
[Out] 3**(1/4)*elliptic_e(asin(3**(3/4)*b**(1/4)*x/3), -1)/b**(3/4) - 3
**(1/4)*elliptic_f(asin(3**(3/4)*b**(1/4)*x/3), -1)/b**(3/4)
```

Mathematica [C] time = 0.0705489, size = 76, normalized size = 1.41

$$\frac{i\sqrt[4]{3}\sqrt{-\sqrt{b}}\left(E\left(i\sinh^{-1}\left(\frac{\sqrt{-\sqrt{b}}x}{\sqrt[4]{3}}\right)\middle|-1\right)-F\left(i\sinh^{-1}\left(\frac{\sqrt{-\sqrt{b}}x}{\sqrt[4]{3}}\right)\middle|-1\right)\right)}{b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/Sqrt[3 - b*x^4],x]
```

```
[Out] (I*3^(1/4)*Sqrt[-Sqrt[b]]*(EllipticE[I*ArcSinh[(Sqrt[-Sqrt[b]]*x)
/3^(1/4)], -1] - EllipticF[I*ArcSinh[(Sqrt[-Sqrt[b]]*x)/3^(1/4)],
 -1]))/b
```

Maple [B] time = 0.02, size = 94, normalized size = 1.7

$$-\frac{1}{3}\sqrt{9-3\sqrt{3}\sqrt{b}x^2}\sqrt{9+3\sqrt{3}\sqrt{b}x^2}\left(EllipticF\left(\frac{x\sqrt{3}}{3}\sqrt{\sqrt{3}\sqrt{b}},i\right)-EllipticE\left(\frac{x\sqrt{3}}{3}\sqrt{\sqrt{3}\sqrt{b}},i\right)\right)\frac{1}{\sqrt{\sqrt{3}\sqrt{b}}}\frac{1}{\sqrt{-bx^4+3}}\frac{1}{\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^2/(-b*x^4+3)^(1/2),x)
```

```
[Out] -1/3/(3^(1/2)*b^(1/2))^(1/2)*(9-3*3^(1/2)*b^(1/2)*x^2)^(1/2)*(9+3
*3^(1/2)*b^(1/2)*x^2)^(1/2)/(-b*x^4+3)^(1/2)/b^(1/2)*(EllipticF(1
/3*x*3^(1/2)*(3^(1/2)*b^(1/2))^(1/2),I)-EllipticE(1/3*x*3^(1/2)*(
3^(1/2)*b^(1/2))^(1/2),I))
```

Maxima [F]   time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\sqrt{-bx^4+3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^2/sqrt(-b*x^4 + 3),x, algorithm="maxima")
```

```
[Out] integrate(x^2/sqrt(-b*x^4 + 3), x)
```

Fricas [F]   time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^2}{\sqrt{-bx^4+3}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^2/sqrt(-b*x^4 + 3),x, algorithm="fricas")
```

```
[Out] integral(x^2/sqrt(-b*x^4 + 3), x)
```

Sympy [A]   time = 2.1119, size = 39, normalized size = 0.72

$$\frac{\sqrt{3}x^3\,\Gamma\left(\frac{3}{4}\right)\,{}_2F_1\left(\left.\begin{matrix}\frac{1}{2},\frac{3}{4}\\\frac{7}{4}\end{matrix}\right|\frac{bx^4e^{2i\pi}}{3}\right)}{12\,\Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**2/(-b*x**4+3)**(1/2),x)
```

```
[Out] sqrt(3)*x**3*gamma(3/4)*hyper((1/2, 3/4), (7/4,), b*x**4*exp_pola
r(2*I*pi)/3)/(12*gamma(7/4))
```

GIAC/XCAS [F]   time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\sqrt{-bx^4+3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^2/sqrt(-b*x^4 + 3),x, algorithm="giac")
```

```
[Out] integrate(x^2/sqrt(-b*x^4 + 3), x)
```

3.983 $\int x^7 \sqrt[3]{1+x^4} \, dx$

Optimal. Leaf size=27

$$\frac{3}{28}\left(x^4+1\right)^{7/3}-\frac{3}{16}\left(x^4+1\right)^{4/3}$$

```
[Out] (-3*(1 + x^4)^(4/3))/16 + (3*(1 + x^4)^(7/3))/28
```

Rubi [A] time = 0.0313519, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{3}{28}\left(x^4+1\right)^{7/3}-\frac{3}{16}\left(x^4+1\right)^{4/3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7*(1 + x^4)^(1/3),x]

[Out] (-3*(1 + x^4)^(4/3))/16 + (3*(1 + x^4)^(7/3))/28
```

Rubi in Sympy [A] time = 3.30984, size = 22, normalized size = 0.81

$$\frac{3\left(x^4+1\right)^{\frac{7}{3}}}{28}-\frac{3\left(x^4+1\right)^{\frac{4}{3}}}{16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7*(x**4+1)**(1/3),x)

[Out] 3*(x**4 + 1)**(7/3)/28 - 3*(x**4 + 1)**(4/3)/16
```

Mathematica [A] time = 0.0116579, size = 20, normalized size = 0.74

$$\frac{3}{112}\left(x^4+1\right)^{4/3}\left(4x^4-3\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^7*(1 + x^4)^(1/3),x]

[Out] (3*(1 + x^4)^(4/3)*(-3 + 4*x^4))/112
```

Maple [A] time = 0.006, size = 17, normalized size = 0.6

$$\frac{12\,x^4-9}{112}\left(x^4+1\right)^{\frac{4}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7*(x^4+1)^(1/3),x)

[Out] 3/112*(x^4+1)^(4/3)*(4*x^4-3)
```

Maxima [A] time = 1.43776, size = 26, normalized size = 0.96

$$\frac{3}{28}\left(x^4+1\right)^{\frac{7}{3}}-\frac{3}{16}\left(x^4+1\right)^{\frac{4}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x^4 + 1)^(1/3)*x^7,x, algorithm="maxima")
```

```
[Out] 3/28*(x^4 + 1)^(7/3) - 3/16*(x^4 + 1)^(4/3)
```

Fricas [A] time = 0.251414, size = 26, normalized size = 0.96

$$\frac{3}{112}\left(4\,x^8+x^4-3\right)\left(x^4+1\right)^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x^4 + 1)^(1/3)*x^7,x, algorithm="fricas")
```

```
[Out] 3/112*(4*x^8 + x^4 - 3)*(x^4 + 1)^(1/3)
```

Sympy [A] time = 2.18884, size = 41, normalized size = 1.52

$$\frac{3x^8\sqrt[3]{x^4+1}}{28}+\frac{3x^4\sqrt[3]{x^4+1}}{112}-\frac{9\sqrt[3]{x^4+1}}{112}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7*(x**4+1)**(1/3),x)
```

```
[Out] 3*x**8*(x**4 + 1)**(1/3)/28 + 3*x**4*(x**4 + 1)**(1/3)/112 - 9*(x
**4 + 1)**(1/3)/112
```

GIAC/XCAS [A] time = 0.213136, size = 26, normalized size = 0.96

$$\frac{3}{28}\left(x^4+1\right)^{\frac{7}{3}}-\frac{3}{16}\left(x^4+1\right)^{\frac{4}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x^4 + 1)^(1/3)*x^7,x, algorithm="giac")
```

```
[Out] 3/28*(x^4 + 1)^(7/3) - 3/16*(x^4 + 1)^(4/3)
```

3.984 $\int \frac{x^3}{(1+x^4)^{4/3}} \, dx$

Optimal. Leaf size=13

$$-\frac{3}{4\sqrt[3]{x^4+1}}$$

[Out] -3/(4*(1 + x^4)^(1/3))

Rubi [A] time = 0.00689211, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{3}{4\sqrt[3]{x^4+1}}$$

Antiderivative was successfully verified.

[In] Int[x^3/(1 + x^4)^(4/3),x]

[Out] -3/(4*(1 + x^4)^(1/3))

Rubi in Sympy [A] time = 1.6376, size = 12, normalized size = 0.92

$$-\frac{3}{4\sqrt[3]{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(x**3/(x**4+1)**(4/3),x)

[Out] -3/(4*(x**4 + 1)**(1/3))

Mathematica [A] time = 0.00550883, size = 13, normalized size = 1.

$$-\frac{3}{4\sqrt[3]{x^4+1}}$$

Antiderivative was successfully verified.

[In] Integrate[x^3/(1 + x^4)^(4/3),x]

[Out] -3/(4*(1 + x^4)^(1/3))

Maple [A] time = 0.005, size = 10, normalized size = 0.8

$$-\frac{3}{4}\frac{1}{\sqrt[3]{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^3/(x^4+1)^(4/3),x)

[Out] -3/4/(x^4+1)^(1/3)

Maxima [A] time = 1.41986, size = 12, normalized size = 0.92

$$-\frac{3}{4\left(x^4+1\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(x^4 + 1)^(4/3),x, algorithm="maxima")
```

```
[Out] -3/4/(x^4 + 1)^(1/3)
```

Fricas [A] time = 0.251176, size = 12, normalized size = 0.92

$$-\frac{3}{4\left(x^4+1\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(x^4 + 1)^(4/3),x, algorithm="fricas")
```

```
[Out] -3/4/(x^4 + 1)^(1/3)
```

Sympy [A] time = 1.54353, size = 12, normalized size = 0.92

$$-\frac{3}{4\sqrt[3]{x^4+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(x**4+1)**(4/3),x)
```

```
[Out] -3/(4*(x**4 + 1)**(1/3))
```

GIAC/XCAS [A] time = 0.214483, size = 12, normalized size = 0.92

$$-\frac{3}{4\left(x^4+1\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(x^4 + 1)^(4/3),x, algorithm="giac")
```

```
[Out] -3/4/(x^4 + 1)^(1/3)
```

3.985 $\int \frac{x^3}{\sqrt[3]{1+x^4}}\,dx$

Optimal. Leaf size=13

$$\frac{3}{8}\left(x^4+1\right)^{2/3}$$

```
[Out] (3*(1 + x^4)^(2/3))/8
```

Rubi [A] time = 0.0070857, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{3}{8}\left(x^4+1\right)^{2/3}$$

Antiderivative was successfully verified.

```
[In] Int[x^3/(1 + x^4)^(1/3),x]

[Out] (3*(1 + x^4)^(2/3))/8
```

Rubi in Sympy [A] time = 1.64394, size = 10, normalized size = 0.77

$$\frac{3\left(x^4+1\right)^{\frac{2}{3}}}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**3/(x**4+1)**(1/3),x)

[Out] 3*(x**4 + 1)**(2/3)/8
```

Mathematica [A] time = 0.00505253, size = 13, normalized size = 1.

$$\frac{3}{8}\left(x^4+1\right)^{2/3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3/(1 + x^4)^(1/3),x]

[Out] (3*(1 + x^4)^(2/3))/8
```

Maple [A] time = 0.006, size = 10, normalized size = 0.8

$$\frac{3}{8}\left(x^4+1\right)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(x^4+1)^(1/3),x)

[Out] 3/8*(x^4+1)^(2/3)
```

Maxima [A] time = 1.4418, size = 12, normalized size = 0.92

$$\frac{3}{8}\left(x^{4}+1\right)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(x^4 + 1)^(1/3),x, algorithm="maxima")
```

```
[Out] 3/8*(x^4 + 1)^(2/3)
```

Fricas [A] time = 0.269216, size = 12, normalized size = 0.92

$$\frac{3}{8}\left(x^{4}+1\right)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(x^4 + 1)^(1/3),x, algorithm="fricas")
```

```
[Out] 3/8*(x^4 + 1)^(2/3)
```

Sympy [A] time = 0.404428, size = 10, normalized size = 0.77

$$\frac{3\left(x^{4}+1\right)^{\frac{2}{3}}}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(x**4+1)**(1/3),x)
```

```
[Out] 3*(x**4 + 1)**(2/3)/8
```

GIAC/XCAS [A] time = 0.213232, size = 12, normalized size = 0.92

$$\frac{3}{8}\left(x^{4}+1\right)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(x^4 + 1)^(1/3),x, algorithm="giac")
```

```
[Out] 3/8*(x^4 + 1)^(2/3)
```

3.986 $\int x^{19}\sqrt[4]{a+bx^4}\,dx$

Optimal. Leaf size=101

$$\frac{a^4\left(a+bx^4\right)^{5/4}}{5b^5}-\frac{4a^3\left(a+bx^4\right)^{9/4}}{9b^5}+\frac{6a^2\left(a+bx^4\right)^{13/4}}{13b^5}+\frac{\left(a+bx^4\right)^{21/4}}{21b^5}-\frac{4a\left(a+bx^4\right)^{17/4}}{17b^5}$$

```
[Out] (a^4*(a + b*x^4)^(5/4))/(5*b^5) - (4*a^3*(a + b*x^4)^(9/4))/(9*b^
5) + (6*a^2*(a + b*x^4)^(13/4))/(13*b^5) - (4*a*(a + b*x^4)^(17/4
))/(17*b^5) + (a + b*x^4)^(21/4)/(21*b^5)
```

Rubi [A] time = 0.133534, antiderivative size = 101, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^4\left(a+bx^4\right)^{5/4}}{5b^5}-\frac{4a^3\left(a+bx^4\right)^{9/4}}{9b^5}+\frac{6a^2\left(a+bx^4\right)^{13/4}}{13b^5}+\frac{\left(a+bx^4\right)^{21/4}}{21b^5}-\frac{4a\left(a+bx^4\right)^{17/4}}{17b^5}$$

Antiderivative was successfully verified.

```
[In] Int[x^19*(a + b*x^4)^(1/4),x]
```

```
[Out] (a^4*(a + b*x^4)^(5/4))/(5*b^5) - (4*a^3*(a + b*x^4)^(9/4))/(9*b^
5) + (6*a^2*(a + b*x^4)^(13/4))/(13*b^5) - (4*a*(a + b*x^4)^(17/4
))/(17*b^5) + (a + b*x^4)^(21/4)/(21*b^5)
```

Rubi in Sympy [A] time = 17.4974, size = 92, normalized size = 0.91

$$\frac{a^4\left(a+bx^4\right)^{\frac{5}{4}}}{5b^5}-\frac{4a^3\left(a+bx^4\right)^{\frac{9}{4}}}{9b^5}+\frac{6a^2\left(a+bx^4\right)^{\frac{13}{4}}}{13b^5}-\frac{4a\left(a+bx^4\right)^{\frac{17}{4}}}{17b^5}+\frac{\left(a+bx^4\right)^{\frac{21}{4}}}{21b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**19*(b*x**4+a)**(1/4),x)
```

```
[Out] a**4*(a + b*x**4)**(5/4)/(5*b**5) - 4*a**3*(a + b*x**4)**(9/4)/(9
*b**5) + 6*a**2*(a + b*x**4)**(13/4)/(13*b**5) - 4*a*(a + b*x**4)
**(17/4)/(17*b**5) + (a + b*x**4)**(21/4)/(21*b**5)
```

Mathematica [A] time = 0.0335333, size = 72, normalized size = 0.71

$$\frac{\sqrt[4]{a+bx^4}\left(2048a^5-512a^4bx^4+320a^3b^2x^8-240a^2b^3x^{12}+195ab^4x^{16}+3315b^5x^{20}\right)}{69615b^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^19*(a + b*x^4)^(1/4),x]
```

```
[Out] ((a + b*x^4)^(1/4)*(2048*a^5 - 512*a^4*b*x^4 + 320*a^3*b^2*x^8 -
240*a^2*b^3*x^12 + 195*a*b^4*x^16 + 3315*b^5*x^20))/(69615*b^5)
```

Maple [A] time = 0.01, size = 58, normalized size = 0.6

$$\frac{3315\,x^{16}b^4-3120\,ax^{12}b^3+2880\,a^2x^8b^2-2560\,a^3x^4b+2048\,a^4}{69615\,b^5}\left(bx^4+a\right)^{\frac{5}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^19*(b*x^4+a)^(1/4),x)
```

```
[Out] 1/69615*(b*x^4+a)^(5/4)*(3315*b^4*x^16-3120*a*b^3*x^12+2880*a^2*b
^2*x^8-2560*a^3*b*x^4+2048*a^4)/b^5
```

Maxima [A] time = 1.42774, size = 109, normalized size = 1.08

$$\frac{\left(bx^4+a\right)^{\frac{21}{4}}}{21\,b^5}-\frac{4\left(bx^4+a\right)^{\frac{17}{4}}a}{17\,b^5}+\frac{6\left(bx^4+a\right)^{\frac{13}{4}}a^2}{13\,b^5}-\frac{4\left(bx^4+a\right)^{\frac{9}{4}}a^3}{9\,b^5}+\frac{\left(bx^4+a\right)^{\frac{5}{4}}a^4}{5\,b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^19,x, algorithm="maxima")
```

```
[Out] 1/21*(b*x^4 + a)^(21/4)/b^5 - 4/17*(b*x^4 + a)^(17/4)*a/b^5 + 6/1
3*(b*x^4 + a)^(13/4)*a^2/b^5 - 4/9*(b*x^4 + a)^(9/4)*a^3/b^5 + 1/
5*(b*x^4 + a)^(5/4)*a^4/b^5
```

Fricas [A] time = 0.242951, size = 92, normalized size = 0.91

$$\frac{\left(3315\,b^5x^{20}+195\,ab^4x^{16}-240\,a^2b^3x^{12}+320\,a^3b^2x^8-512\,a^4bx^4+2048\,a^5\right)\left(bx^4+a\right)^{\frac{1}{4}}}{69615\,b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^19,x, algorithm="fricas")
```

```
[Out] 1/69615*(3315*b^5*x^20 + 195*a*b^4*x^16 - 240*a^2*b^3*x^12 + 320*
a^3*b^2*x^8 - 512*a^4*b*x^4 + 2048*a^5)*(b*x^4 + a)^(1/4)/b^5
```

Sympy [A] time = 67.0538, size = 134, normalized size = 1.33

$$\begin{cases} \frac{2048a^5\sqrt[4]{a+bx^4}}{69615b^5}-\frac{512a^4x^4\sqrt[4]{a+bx^4}}{69615b^4}+\frac{64a^3x^8\sqrt[4]{a+bx^4}}{13923b^3}-\frac{16a^2x^{12}\sqrt[4]{a+bx^4}}{4641b^2}+\frac{ax^{16}\sqrt[4]{a+bx^4}}{357b}+\frac{x^{20}\sqrt[4]{a+bx^4}}{21} & \text{for } b\neq 0 \\ \frac{\sqrt[4]{a}x^{20}}{20} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**19*(b*x**4+a)**(1/4),x)
```

```
[Out] Piecewise((2048*a**5*(a + b*x**4)**(1/4)/(69615*b**5) - 512*a**4*
x**4*(a + b*x**4)**(1/4)/(69615*b**4) + 64*a**3*x**8*(a + b*x**4)
**(1/4)/(13923*b**3) - 16*a**2*x**12*(a + b*x**4)**(1/4)/(4641*b*
*2) + a*x**16*(a + b*x**4)**(1/4)/(357*b) + x**20*(a + b*x**4)**(
1/4)/21, Ne(b, 0)), (a**(1/4)*x**20/20, True))
```

GIAC/XCAS [A] time = 0.215951, size = 96, normalized size = 0.95

$$\frac{3315\left(bx^4+a\right)^{\frac{21}{4}}-16380\left(bx^4+a\right)^{\frac{17}{4}}a+32130\left(bx^4+a\right)^{\frac{13}{4}}a^2-30940\left(bx^4+a\right)^{\frac{9}{4}}a^3+13923\left(bx^4+a\right)^{\frac{5}{4}}a^4}{69615\,b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^19,x, algorithm="giac")
```

```
[Out] 1/69615*(3315*(b*x^4 + a)^(21/4) - 16380*(b*x^4 + a)^(17/4)*a + 3
2130*(b*x^4 + a)^(13/4)*a^2 - 30940*(b*x^4 + a)^(9/4)*a^3 + 13923
*(b*x^4 + a)^(5/4)*a^4)/b^5
```

3.987 $\int x^{15}\sqrt[4]{a+bx^4}\,dx$

Optimal. Leaf size=80

$$-\frac{a^3\left(a+bx^4\right)^{5/4}}{5b^4}+\frac{a^2\left(a+bx^4\right)^{9/4}}{3b^4}+\frac{\left(a+bx^4\right)^{17/4}}{17b^4}-\frac{3a\left(a+bx^4\right)^{13/4}}{13b^4}$$

```
[Out] -(a^3*(a + b*x^4)^(5/4))/(5*b^4) + (a^2*(a + b*x^4)^(9/4))/(3*b^4
) - (3*a*(a + b*x^4)^(13/4))/(13*b^4) + (a + b*x^4)^(17/4)/(17*b^
4)
```

Rubi [A] time = 0.107116, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^3\left(a+bx^4\right)^{5/4}}{5b^4}+\frac{a^2\left(a+bx^4\right)^{9/4}}{3b^4}+\frac{\left(a+bx^4\right)^{17/4}}{17b^4}-\frac{3a\left(a+bx^4\right)^{13/4}}{13b^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^15*(a + b*x^4)^(1/4),x]
```

```
[Out] -(a^3*(a + b*x^4)^(5/4))/(5*b^4) + (a^2*(a + b*x^4)^(9/4))/(3*b^4
) - (3*a*(a + b*x^4)^(13/4))/(13*b^4) + (a + b*x^4)^(17/4)/(17*b^
4)
```

Rubi in Sympy [A] time = 14.2401, size = 70, normalized size = 0.88

$$-\frac{a^3\left(a+bx^4\right)^{\frac{5}{4}}}{5b^4}+\frac{a^2\left(a+bx^4\right)^{\frac{9}{4}}}{3b^4}-\frac{3a\left(a+bx^4\right)^{\frac{13}{4}}}{13b^4}+\frac{\left(a+bx^4\right)^{\frac{17}{4}}}{17b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**15*(b*x**4+a)**(1/4),x)
```

```
[Out] -a**3*(a + b*x**4)**(5/4)/(5*b**4) + a**2*(a + b*x**4)**(9/4)/(3*
b**4) - 3*a*(a + b*x**4)**(13/4)/(13*b**4) + (a + b*x**4)**(17/4)
/(17*b**4)
```

Mathematica [A] time = 0.0295268, size = 61, normalized size = 0.76

$$\frac{\sqrt[4]{a+bx^4}\left(-128a^4+32a^3bx^4-20a^2b^2x^8+15ab^3x^{12}+195b^4x^{16}\right)}{3315b^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^15*(a + b*x^4)^(1/4),x]
```

```
[Out] ((a + b*x^4)^(1/4)*(-128*a^4 + 32*a^3*b*x^4 - 20*a^2*b^2*x^8 + 15
*a*b^3*x^12 + 195*b^4*x^16))/(3315*b^4)
```

Maple [A] time = 0.009, size = 47, normalized size = 0.6

$$-\frac{-195\,b^3x^{12}+180\,ab^2x^8-160\,a^2bx^4+128\,a^3}{3315\,b^4}\left(bx^4+a\right)^{\frac{5}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^15*(b*x^4+a)^(1/4),x)
```

```
[Out] -1/3315*(b*x^4+a)^(5/4)*(-195*b^3*x^12+180*a*b^2*x^8-160*a^2*b*x^
4+128*a^3)/b^4
```

Maxima [A] time = 1.43967, size = 86, normalized size = 1.08

$$\frac{\left(bx^4+a\right)^{\frac{17}{4}}}{17\,b^4}-\frac{3\left(bx^4+a\right)^{\frac{13}{4}}a}{13\,b^4}+\frac{\left(bx^4+a\right)^{\frac{9}{4}}a^2}{3\,b^4}-\frac{\left(bx^4+a\right)^{\frac{5}{4}}a^3}{5\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^15,x, algorithm="maxima")
```

```
[Out] 1/17*(b*x^4 + a)^(17/4)/b^4 - 3/13*(b*x^4 + a)^(13/4)*a/b^4 + 1/3
*(b*x^4 + a)^(9/4)*a^2/b^4 - 1/5*(b*x^4 + a)^(5/4)*a^3/b^4
```

Fricas [A] time = 0.265648, size = 77, normalized size = 0.96

$$\frac{\left(195\,b^4x^{16}+15\,ab^3x^{12}-20\,a^2b^2x^8+32\,a^3bx^4-128\,a^4\right)\left(bx^4+a\right)^{\frac{1}{4}}}{3315\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^15,x, algorithm="fricas")
```

```
[Out] 1/3315*(195*b^4*x^16 + 15*a*b^3*x^12 - 20*a^2*b^2*x^8 + 32*a^3*b*
x^4 - 128*a^4)*(b*x^4 + a)^(1/4)/b^4
```

Sympy [A] time = 34.8031, size = 110, normalized size = 1.38

$$\begin{cases} -\frac{128a^4\sqrt[4]{a+bx^4}}{3315b^4}+\frac{32a^3x^4\sqrt[4]{a+bx^4}}{3315b^3}-\frac{4a^2x^8\sqrt[4]{a+bx^4}}{663b^2}+\frac{ax^{12}\sqrt[4]{a+bx^4}}{221b}+\frac{x^{16}\sqrt[4]{a+bx^4}}{17} & \text{for}\ b\neq 0 \\ \frac{\sqrt[4]{a}x^{16}}{16} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**15*(b*x**4+a)**(1/4),x)
```

```
[Out] Piecewise((-128*a**4*(a + b*x**4)**(1/4)/(3315*b**4) + 32*a**3*x*
*4*(a + b*x**4)**(1/4)/(3315*b**3) - 4*a**2*x**8*(a + b*x**4)**(1
/4)/(663*b**2) + a*x**12*(a + b*x**4)**(1/4)/(221*b) + x**16*(a +
 b*x**4)**(1/4)/17, Ne(b, 0)), (a**(1/4)*x**16/16, True))
```

GIAC/XCAS [A] time = 0.215606, size = 77, normalized size = 0.96

$$\frac{195\left(bx^4+a\right)^{\frac{17}{4}}-765\left(bx^4+a\right)^{\frac{13}{4}}a+1105\left(bx^4+a\right)^{\frac{9}{4}}a^2-663\left(bx^4+a\right)^{\frac{5}{4}}a^3}{3315\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^15,x, algorithm="giac")
```

```
[Out] 1/3315*(195*(b*x^4 + a)^(17/4) - 765*(b*x^4 + a)^(13/4)*a + 1105*
(b*x^4 + a)^(9/4)*a^2 - 663*(b*x^4 + a)^(5/4)*a^3)/b^4
```

3.988 $\int x^{11}\sqrt[4]{a+bx^4}\,dx$

Optimal. Leaf size=59

$$\frac{a^2\left(a+bx^4\right)^{5/4}}{5b^3}+\frac{\left(a+bx^4\right)^{13/4}}{13b^3}-\frac{2a\left(a+bx^4\right)^{9/4}}{9b^3}$$

```
[Out] (a^2*(a + b*x^4)^(5/4))/(5*b^3) - (2*a*(a + b*x^4)^(9/4))/(9*b^3)
 + (a + b*x^4)^(13/4)/(13*b^3)
```

Rubi [A] time = 0.0831764, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^2\left(a+bx^4\right)^{5/4}}{5b^3}+\frac{\left(a+bx^4\right)^{13/4}}{13b^3}-\frac{2a\left(a+bx^4\right)^{9/4}}{9b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11*(a + b*x^4)^(1/4),x]
```

```
[Out] (a^2*(a + b*x^4)^(5/4))/(5*b^3) - (2*a*(a + b*x^4)^(9/4))/(9*b^3)
 + (a + b*x^4)^(13/4)/(13*b^3)
```

Rubi in Sympy [A] time = 10.5631, size = 51, normalized size = 0.86

$$\frac{a^2\left(a+bx^4\right)^{\frac{5}{4}}}{5b^3}-\frac{2a\left(a+bx^4\right)^{\frac{9}{4}}}{9b^3}+\frac{\left(a+bx^4\right)^{\frac{13}{4}}}{13b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11*(b*x**4+a)**(1/4),x)
```

```
[Out] a**2*(a + b*x**4)**(5/4)/(5*b**3) - 2*a*(a + b*x**4)**(9/4)/(9*b*
*3) + (a + b*x**4)**(13/4)/(13*b**3)
```

Mathematica [A] time = 0.0249289, size = 50, normalized size = 0.85

$$\frac{\sqrt[4]{a+bx^4}\left(32a^3-8a^2bx^4+5ab^2x^8+45b^3x^{12}\right)}{585b^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11*(a + b*x^4)^(1/4),x]
```

```
[Out] ((a + b*x^4)^(1/4)*(32*a^3 - 8*a^2*b*x^4 + 5*a*b^2*x^8 + 45*b^3*x
^12))/(585*b^3)
```

Maple [A] time = 0.008, size = 36, normalized size = 0.6

$$\frac{45\,b^2x^8-40\,abx^4+32\,a^2}{585\,b^3}\left(bx^4+a\right)^{\frac{5}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11*(b*x^4+a)^(1/4),x)
```

```
[Out] 1/585*(b*x^4+a)^(5/4)*(45*b^2*x^8-40*a*b*x^4+32*a^2)/b^3
```

Maxima [A] time = 1.44974, size = 63, normalized size = 1.07

$$\frac{\left(bx^4+a\right)^{\frac{13}{4}}}{13\,b^3}-\frac{2\left(bx^4+a\right)^{\frac{9}{4}}a}{9\,b^3}+\frac{\left(bx^4+a\right)^{\frac{5}{4}}a^2}{5\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^11,x, algorithm="maxima")
```

```
[Out] 1/13*(b*x^4 + a)^(13/4)/b^3 - 2/9*(b*x^4 + a)^(9/4)*a/b^3 + 1/5*(
b*x^4 + a)^(5/4)*a^2/b^3
```

Fricas [A] time = 0.265969, size = 62, normalized size = 1.05

$$\frac{\left(45\,b^3x^{12}+5\,ab^2x^8-8\,a^2bx^4+32\,a^3\right)\left(bx^4+a\right)^{\frac{1}{4}}}{585\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^11,x, algorithm="fricas")
```

```
[Out] 1/585*(45*b^3*x^12 + 5*a*b^2*x^8 - 8*a^2*b*x^4 + 32*a^3)*(b*x^4 +
 a)^(1/4)/b^3
```

Sympy [A] time = 14.904, size = 87, normalized size = 1.47

$$\begin{cases}\frac{32a^3\sqrt[4]{a+bx^4}}{585b^3}-\frac{8a^2x^4\sqrt[4]{a+bx^4}}{585b^2}+\frac{ax^8\sqrt[4]{a+bx^4}}{117b}+\frac{x^{12}\sqrt[4]{a+bx^4}}{13} & \text{for } b\neq 0\\ \frac{\sqrt[4]{a}x^{12}}{12} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11*(b*x**4+a)**(1/4),x)
```

```
[Out] Piecewise((32*a**3*(a + b*x**4)**(1/4)/(585*b**3) - 8*a**2*x**4*(
a + b*x**4)**(1/4)/(585*b**2) + a*x**8*(a + b*x**4)**(1/4)/(117*b
) + x**12*(a + b*x**4)**(1/4)/13, Ne(b, 0)), (a**(1/4)*x**12/12,
True))
```

GIAC/XCAS [A] time = 0.215709, size = 58, normalized size = 0.98

$$\frac{45\left(bx^4+a\right)^{\frac{13}{4}}-130\left(bx^4+a\right)^{\frac{9}{4}}a+117\left(bx^4+a\right)^{\frac{5}{4}}a^2}{585\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^11,x, algorithm="giac")
```

```
[Out] 1/585*(45*(b*x^4 + a)^(13/4) - 130*(b*x^4 + a)^(9/4)*a + 117*(b*x
^4 + a)^(5/4)*a^2)/b^3
```

3.989 $\int x^7 \sqrt[4]{a+bx^4}\,dx$

Optimal. Leaf size=38

$$\frac{(a+bx^4)^{9/4}}{9b^2}-\frac{a(a+bx^4)^{5/4}}{5b^2}$$

```
[Out] -(a*(a + b*x^4)^(5/4))/(5*b^2) + (a + b*x^4)^(9/4)/(9*b^2)
```

Rubi [A] time = 0.0590743, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{(a+bx^4)^{9/4}}{9b^2}-\frac{a(a+bx^4)^{5/4}}{5b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7*(a + b*x^4)^(1/4),x]

[Out] -(a*(a + b*x^4)^(5/4))/(5*b^2) + (a + b*x^4)^(9/4)/(9*b^2)
```

Rubi in Sympy [A] time = 7.05372, size = 31, normalized size = 0.82

$$-\frac{a(a+bx^4)^{\frac{5}{4}}}{5b^2}+\frac{(a+bx^4)^{\frac{9}{4}}}{9b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7*(b*x**4+a)**(1/4),x)

[Out] -a*(a + b*x**4)**(5/4)/(5*b**2) + (a + b*x**4)**(9/4)/(9*b**2)
```

Mathematica [A] time = 0.0214011, size = 38, normalized size = 1.

$$\frac{\sqrt[4]{a+bx^4}\left(-4a^2+abx^4+5b^2x^8\right)}{45b^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^7*(a + b*x^4)^(1/4),x]

[Out] ((a + b*x^4)^(1/4)*(-4*a^2 + a*b*x^4 + 5*b^2*x^8))/(45*b^2)
```

Maple [A] time = 0.008, size = 25, normalized size = 0.7

$$-\frac{-5\,bx^4+4\,a}{45\,b^2}\left(bx^4+a\right)^{\frac{5}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7*(b*x^4+a)^(1/4),x)

[Out] -1/45*(b*x^4+a)^(5/4)*(-5*b*x^4+4*a)/b^2
```

Maxima [A] time = 1.58795, size = 41, normalized size = 1.08

$$\frac{\left(bx^4+a\right)^{\frac{9}{4}}}{9\,b^2}-\frac{\left(bx^4+a\right)^{\frac{5}{4}}a}{5\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^7,x, algorithm="maxima")
```

```
[Out] 1/9*(b*x^4 + a)^(9/4)/b^2 - 1/5*(b*x^4 + a)^(5/4)*a/b^2
```

Fricas [A] time = 0.254994, size = 46, normalized size = 1.21

$$\frac{\left(5\,b^2x^8+abx^4-4\,a^2\right)\left(bx^4+a\right)^{\frac{1}{4}}}{45\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^7,x, algorithm="fricas")
```

```
[Out] 1/45*(5*b^2*x^8 + a*b*x^4 - 4*a^2)*(b*x^4 + a)^(1/4)/b^2
```

Sympy [A] time = 5.22519, size = 63, normalized size = 1.66

$$\begin{cases} -\frac{4a^2\sqrt[4]{a+bx^4}}{45b^2}+\frac{ax^4\sqrt[4]{a+bx^4}}{45b}+\frac{x^8\sqrt[4]{a+bx^4}}{9} & \text{for } b\neq 0 \\ \frac{\sqrt[4]{a}x^8}{8} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7*(b*x**4+a)**(1/4),x)
```

```
[Out] Piecewise((-4*a**2*(a + b*x**4)**(1/4)/(45*b**2) + a*x**4*(a + b*
x**4)**(1/4)/(45*b) + x**8*(a + b*x**4)**(1/4)/9, Ne(b, 0)), (a**
(1/4)*x**8/8, True))
```

GIAC/XCAS [A] time = 0.21503, size = 39, normalized size = 1.03

$$\frac{5\left(bx^4+a\right)^{\frac{9}{4}}-9\left(bx^4+a\right)^{\frac{5}{4}}a}{45\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^7,x, algorithm="giac")
```

```
[Out] 1/45*(5*(b*x^4 + a)^(9/4) - 9*(b*x^4 + a)^(5/4)*a)/b^2
```

3.990 $\int x^3 \sqrt[4]{a+bx^4}\,dx$

Optimal. Leaf size=18

$$\frac{\left(a+bx^4\right)^{5/4}}{5b}$$

```
[Out] (a + b*x^4)^(5/4)/(5*b)
```

Rubi [A] time = 0.010355, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{\left(a+bx^4\right)^{5/4}}{5b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3*(a + b*x^4)^(1/4),x]

[Out] (a + b*x^4)^(5/4)/(5*b)
```

Rubi in Sympy [A] time = 2.11942, size = 12, normalized size = 0.67

$$\frac{\left(a+bx^4\right)^{\frac{5}{4}}}{5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3*(b*x**4+a)**(1/4),x)

[Out] (a + b*x**4)**(5/4)/(5*b)
```

Mathematica [A] time = 0.0085893, size = 18, normalized size = 1.

$$\frac{\left(a+bx^4\right)^{5/4}}{5b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3*(a + b*x^4)^(1/4),x]

[Out] (a + b*x^4)^(5/4)/(5*b)
```

Maple [A] time = 0.007, size = 15, normalized size = 0.8

$$\frac{1}{5\,b}\left(bx^4+a\right)^{\frac{5}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3*(b*x^4+a)^(1/4),x)

[Out] 1/5*(b*x^4+a)^(5/4)/b
```

Maxima [A] time = 1.43418, size = 19, normalized size = 1.06

$$\frac{\left(bx^4 + a\right)^{\frac{5}{4}}}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^3,x, algorithm="maxima")
```

```
[Out] 1/5*(b*x^4 + a)^(5/4)/b
```

Fricas [A] time = 0.269688, size = 19, normalized size = 1.06

$$\frac{\left(bx^4 + a\right)^{\frac{5}{4}}}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^3,x, algorithm="fricas")
```

```
[Out] 1/5*(b*x^4 + a)^(5/4)/b
```

Sympy [A] time = 1.34232, size = 39, normalized size = 2.17

$$\begin{cases} \frac{a\sqrt[4]{a + bx^4}}{5b} + \frac{x^4\sqrt[4]{a + bx^4}}{5} & \text{for } b \neq 0 \\ \frac{\sqrt[4]{a}x^4}{4} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(b*x**4+a)**(1/4),x)
```

```
[Out] Piecewise((a*(a + b*x**4)**(1/4)/(5*b) + x**4*(a + b*x**4)**(1/4)
/5, Ne(b, 0)), (a**(1/4)*x**4/4, True))
```

GIAC/XCAS [A] time = 0.211964, size = 19, normalized size = 1.06

$$\frac{\left(bx^4 + a\right)^{\frac{5}{4}}}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^3,x, algorithm="giac")
```

```
[Out] 1/5*(b*x^4 + a)^(5/4)/b
```

3.991 $\int \frac{\sqrt[4]{a+bx^4}}{x}\,dx$

Optimal. Leaf size=66

$$\sqrt[4]{a+bx^4}-\frac{1}{2}\sqrt[4]{a}\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)-\frac{1}{2}\sqrt[4]{a}\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)$$

```
[Out] (a + b*x^4)^(1/4) - (a^(1/4)*ArcTan[(a + b*x^4)^(1/4)/a^(1/4)])/2
 - (a^(1/4)*ArcTanh[(a + b*x^4)^(1/4)/a^(1/4)])/2
```

Rubi [A] time = 0.100755, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$\sqrt[4]{a+bx^4}-\frac{1}{2}\sqrt[4]{a}\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)-\frac{1}{2}\sqrt[4]{a}\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(1/4)/x,x]
```

```
[Out] (a + b*x^4)^(1/4) - (a^(1/4)*ArcTan[(a + b*x^4)^(1/4)/a^(1/4)])/2
 - (a^(1/4)*ArcTanh[(a + b*x^4)^(1/4)/a^(1/4)])/2
```

Rubi in Sympy [A] time = 10.5008, size = 56, normalized size = 0.85

$$-\frac{\sqrt[4]{a}\operatorname{atan}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{2}-\frac{\sqrt[4]{a}\operatorname{atanh}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{2}+\sqrt[4]{a+bx^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(1/4)/x,x)
```

```
[Out] -a**(1/4)*atan((a + b*x**4)**(1/4)/a**(1/4))/2 - a**(1/4)*atanh((
a + b*x**4)**(1/4)/a**(1/4))/2 + (a + b*x**4)**(1/4)
```

Mathematica [C] time = 0.0426291, size = 61, normalized size = 0.92

$$\frac{3\left(a+bx^4\right)-a\left(\frac{a}{bx^4}+1\right)^{3/4}{}_2F_1\left(\frac{3}{4},\frac{3}{4};\frac{7}{4};-\frac{a}{bx^4}\right)}{3\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(1/4)/x,x]
```

```
[Out] (3*(a + b*x^4) - a*(1 + a/(b*x^4))^(3/4)*Hypergeometric2F1[3/4, 3
/4, 7/4, -(a/(b*x^4))])/(3*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.045, size = 0, normalized size = 0.

$$\int \frac{1}{x}\sqrt[4]{bx^4+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(1/4)/x,x)
```

```
[Out] int((b*x^4+a)^(1/4)/x,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.29539, size = 116, normalized size = 1.76

$$a^{\frac{1}{4}} \arctan\left(\frac{a^{\frac{1}{4}}}{\sqrt{\sqrt{bx^4+a}+\sqrt{a}}+(bx^4+a)^{\frac{1}{4}}}\right) - \frac{1}{4}\,a^{\frac{1}{4}}\log\left((bx^4+a)^{\frac{1}{4}}+a^{\frac{1}{4}}\right) + \frac{1}{4}\,a^{\frac{1}{4}}\log\left((bx^4+a)^{\frac{1}{4}}-a^{\frac{1}{4}}\right) + (bx^4+a)^{\frac{1}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x,x, algorithm="fricas")
```

```
[Out] a^(1/4)*arctan(a^(1/4)/(sqrt(sqrt(b*x^4 + a) + sqrt(a)) + (b*x^4
+ a)^(1/4))) - 1/4*a^(1/4)*log((b*x^4 + a)^(1/4) + a^(1/4)) + 1/4
*a^(1/4)*log((b*x^4 + a)^(1/4) - a^(1/4)) + (b*x^4 + a)^(1/4)
```

Sympy [A] time = 3.7672, size = 42, normalized size = 0.64

$$-\frac{\sqrt[4]{b}x\,\Gamma\left(-\frac{1}{4}\right)\,{}_{2}F_{1}\left(\begin{matrix}-\frac{1}{4},-\frac{1}{4}\\ \frac{3}{4}\end{matrix}\middle|\frac{ae^{i\pi}}{bx^4}\right)}{4\,\Gamma\left(\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(1/4)/x,x)
```

```
[Out] -b**(1/4)*x*gamma(-1/4)*hyper((-1/4, -1/4), (3/4,), a*exp_polar(I
*pi)/(b*x**4))/(4*gamma(3/4))
```

GIAC/XCAS [A] time = 0.22896, size = 247, normalized size = 3.74

$$-\frac{1}{4}\sqrt{2}(-a)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}+2\left(bx^4+a\right)^{\frac{1}{4}}\right)}{2(-a)^{\frac{1}{4}}}\right) - \frac{1}{4}\sqrt{2}(-a)^{\frac{1}{4}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}-2\left(bx^4+a\right)^{\frac{1}{4}}\right)}{2(-a)^{\frac{1}{4}}}\right) - \frac{1}{8}\sqrt{2}(-a)^{\frac{1}{4}}\ln\left(\sqrt{2}\left(bx^4+a\right)^{\frac{1}{4}}(-a)^{\frac{1}{4}}+\sqrt{bx^4+a}+\sqrt{-a}\right) + \frac{1}{8}\sqrt{2}(-a)^{\frac{1}{4}}\ln\left(-\sqrt{2}\left(bx^4+a\right)^{\frac{1}{4}}(-a)^{\frac{1}{4}}+\sqrt{bx^4+a}+\sqrt{-a}\right) + \left(bx^4+a\right)^{\frac{1}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x,x, algorithm="giac")
```

```
[Out] -1/4*sqrt(2)*(-a)^(1/4)*arctan(1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) +
2*(b*x^4 + a)^(1/4))/(-a)^(1/4)) - 1/4*sqrt(2)*(-a)^(1/4)*arctan(
-1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) - 2*(b*x^4 + a)^(1/4))/(-a)^(1/4
)) - 1/8*sqrt(2)*(-a)^(1/4)*ln(sqrt(2)*(b*x^4 + a)^(1/4)*(-a)^(1/
4) + sqrt(b*x^4 + a) + sqrt(-a)) + 1/8*sqrt(2)*(-a)^(1/4)*ln(-sqr
t(2)*(b*x^4 + a)^(1/4)*(-a)^(1/4) + sqrt(b*x^4 + a) + sqrt(-a)) +
 (b*x^4 + a)^(1/4)
```

3.992 $\int \frac{\sqrt[4]{a+bx^4}}{x^5}\,dx$

Optimal. Leaf size=75

$$-\frac{b\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{8a^{3/4}}-\frac{b\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{8a^{3/4}}-\frac{\sqrt[4]{a+bx^4}}{4x^4}$$

```
[Out] -(a + b*x^4)^(1/4)/(4*x^4) - (b*ArcTan[(a + b*x^4)^(1/4)/a^(1/4)]
)/(8*a^(3/4)) - (b*ArcTanh[(a + b*x^4)^(1/4)/a^(1/4)])/(8*a^(3/4)
)
```

Rubi [A] time = 0.102864, antiderivative size = 75, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$-\frac{b\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{8a^{3/4}}-\frac{b\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{8a^{3/4}}-\frac{\sqrt[4]{a+bx^4}}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(1/4)/x^5,x]
```

```
[Out] -(a + b*x^4)^(1/4)/(4*x^4) - (b*ArcTan[(a + b*x^4)^(1/4)/a^(1/4)]
)/(8*a^(3/4)) - (b*ArcTanh[(a + b*x^4)^(1/4)/a^(1/4)])/(8*a^(3/4)
)
```

Rubi in Sympy [A] time = 10.8681, size = 66, normalized size = 0.88

$$-\frac{\sqrt[4]{a+bx^4}}{4x^4}-\frac{b\,\mathrm{atan}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{8a^{\frac{3}{4}}}-\frac{b\,\mathrm{atanh}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{8a^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(1/4)/x**5,x)
```

```
[Out] -(a + b*x**4)**(1/4)/(4*x**4) - b*atan((a + b*x**4)**(1/4)/a**(1/
4))/(8*a**(3/4)) - b*atanh((a + b*x**4)**(1/4)/a**(1/4))/(8*a**(3
/4))
```

Mathematica [C] time = 0.0424096, size = 67, normalized size = 0.89

$$\frac{-bx^4\left(\frac{a}{bx^4}+1\right)^{3/4}\,{}_2F_1\left(\frac{3}{4},\frac{3}{4};\frac{7}{4};-\frac{a}{bx^4}\right)-3\left(a+bx^4\right)}{12x^4\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(1/4)/x^5,x]
```

```
[Out] (-3*(a + b*x^4) - b*(1 + a/(b*x^4))^(3/4)*x^4*Hypergeometric2F1[3
/4, 3/4, 7/4, -(a/(b*x^4))])/(12*x^4*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.05, size = 0, normalized size = 0.

$$\int \frac{1}{x^5}\sqrt[4]{bx^4+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(1/4)/x^5,x)
```

```
[Out] int((b*x^4+a)^(1/4)/x^5,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^5,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.274834, size = 219, normalized size = 2.92

$$\frac{4\left(\frac{b^4}{a^3}\right)^{\frac{1}{4}}x^4\arctan\left(\frac{a\left(\frac{b^4}{a^3}\right)^{\frac{1}{4}}}{(bx^4+a)^{\frac{1}{4}}b+\sqrt{\sqrt{bx^4+a}b^2+a^2\sqrt{\frac{b^4}{a^3}}}}\right)-\left(\frac{b^4}{a^3}\right)^{\frac{1}{4}}x^4\log\left((bx^4+a)^{\frac{1}{4}}b+a\left(\frac{b^4}{a^3}\right)^{\frac{1}{4}}\right)+\left(\frac{b^4}{a^3}\right)^{\frac{1}{4}}x^4\log\left((bx^4+a)^{\frac{1}{4}}b-a\right.}{16\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^5,x, algorithm="fricas")
```

```
[Out] 1/16*(4*(b^4/a^3)^(1/4)*x^4*arctan(a*(b^4/a^3)^(1/4)/((b*x^4 + a)
^(1/4)*b + sqrt(sqrt(b*x^4 + a)*b^2 + a^2*sqrt(b^4/a^3)))) - (b^4
/a^3)^(1/4)*x^4*log((b*x^4 + a)^(1/4)*b + a*(b^4/a^3)^(1/4)) + (b
^4/a^3)^(1/4)*x^4*log((b*x^4 + a)^(1/4)*b - a*(b^4/a^3)^(1/4)) -
4*(b*x^4 + a)^(1/4))/x^4
```

Sympy [A] time = 5.04281, size = 41, normalized size = 0.55

$$-\frac{\sqrt[4]{b}\,\Gamma\left(\frac{3}{4}\right)\,{}_2F_1\left(\begin{matrix}-\frac{1}{4},\frac{3}{4}\\ \frac{7}{4}\end{matrix}\middle|\frac{ae^{i\pi}}{bx^4}\right)}{4x^3\,\Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(1/4)/x**5,x)
```

```
[Out] -b**(1/4)*gamma(3/4)*hyper((-1/4, 3/4), (7/4,), a*exp_polar(I*pi)
/(b*x**4))/(4*x**3*gamma(7/4))
```

GIAC/XCAS [A] time = 0.230956, size = 277, normalized size = 3.69

$$-\frac{1}{32}\,b\left(\frac{2\sqrt{2}\,(-a)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}+2\,(bx^{4}+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{a}+\frac{2\sqrt{2}\,(-a)^{\frac{1}{4}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}-2\,(bx^{4}+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{a}+\frac{\sqrt{2}\,(-a)^{\frac{1}{4}}\ln\left(\sqrt{2}\left(bx^{4}+\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^5,x, algorithm="giac")
```

```
[Out] -1/32*b*(2*sqrt(2)*(-a)^(1/4)*arctan(1/2*sqrt(2)*(sqrt(2)*(-a)^(1
/4) + 2*(b*x^4 + a)^(1/4))/(-a)^(1/4))/a + 2*sqrt(2)*(-a)^(1/4)*a
rctan(-1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) - 2*(b*x^4 + a)^(1/4))/(-a
)^(1/4))/a + sqrt(2)*(-a)^(1/4)*ln(sqrt(2)*(b*x^4 + a)^(1/4)*(-a)
^(1/4) + sqrt(b*x^4 + a) + sqrt(-a))/a - sqrt(2)*(-a)^(1/4)*ln(-s
qrt(2)*(b*x^4 + a)^(1/4)*(-a)^(1/4) + sqrt(b*x^4 + a) + sqrt(-a))
/a + 8*(b*x^4 + a)^(1/4)/(b*x^4))
```

3.993 $\int \frac{\sqrt[4]{a+bx^4}}{x^9}\,dx$

Optimal. Leaf size=101

$$\frac{3b^2\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{7/4}}+\frac{3b^2\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{7/4}}-\frac{b\sqrt[4]{a+bx^4}}{32ax^4}-\frac{\sqrt[4]{a+bx^4}}{8x^8}$$

```
[Out] -(a + b*x^4)^(1/4)/(8*x^8) - (b*(a + b*x^4)^(1/4))/(32*a*x^4) + (
3*b^2*ArcTan[(a + b*x^4)^(1/4)/a^(1/4)])/(64*a^(7/4)) + (3*b^2*Ar
cTanh[(a + b*x^4)^(1/4)/a^(1/4)])/(64*a^(7/4))
```

Rubi [A] time = 0.138102, antiderivative size = 101, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.467

$$\frac{3b^2\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{7/4}}+\frac{3b^2\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{7/4}}-\frac{b\sqrt[4]{a+bx^4}}{32ax^4}-\frac{\sqrt[4]{a+bx^4}}{8x^8}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(1/4)/x^9,x]
```

```
[Out] -(a + b*x^4)^(1/4)/(8*x^8) - (b*(a + b*x^4)^(1/4))/(32*a*x^4) + (
3*b^2*ArcTan[(a + b*x^4)^(1/4)/a^(1/4)])/(64*a^(7/4)) + (3*b^2*Ar
cTanh[(a + b*x^4)^(1/4)/a^(1/4)])/(64*a^(7/4))
```

Rubi in Sympy [A] time = 14.6797, size = 90, normalized size = 0.89

$$-\frac{\sqrt[4]{a+bx^4}}{8x^8}-\frac{b\sqrt[4]{a+bx^4}}{32ax^4}+\frac{3b^2\operatorname{atan}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{\frac{7}{4}}}+\frac{3b^2\operatorname{atanh}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{\frac{7}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(1/4)/x**9,x)
```

```
[Out] -(a + b*x**4)**(1/4)/(8*x**8) - b*(a + b*x**4)**(1/4)/(32*a*x**4)
 + 3*b**2*atan((a + b*x**4)**(1/4)/a**(1/4))/(64*a**(7/4)) + 3*b*
*2*atanh((a + b*x**4)**(1/4)/a**(1/4))/(64*a**(7/4))
```

Mathematica [C] time = 0.0522116, size = 82, normalized size = 0.81

$$\frac{-4a^2+b^2x^8\left(\frac{a}{bx^4}+1\right)^{3/4}{}_2F_1\left(\frac{3}{4},\frac{3}{4};\frac{7}{4};-\frac{a}{bx^4}\right)-5abx^4-b^2x^8}{32ax^8\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(1/4)/x^9,x]
```

```
[Out] (-4*a^2 - 5*a*b*x^4 - b^2*x^8 + b^2*(1 + a/(b*x^4))^(3/4)*x^8*Hyp
ergeometric2F1[3/4, 3/4, 7/4, -(a/(b*x^4))])/(32*a*x^8*(a + b*x^4
)^(3/4))
```

Maple [F] time = 0.052, size = 0, normalized size = 0.

$$\int \frac{1}{x^9}\sqrt[4]{bx^4+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(1/4)/x^9,x)
```

```
[Out] int((b*x^4+a)^(1/4)/x^9,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^9,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.290427, size = 261, normalized size = 2.58

$$-\frac{12\,a\left(\frac{b^8}{a^7}\right)^{\frac{1}{4}}x^8\arctan\left(\frac{a^2\left(\frac{b^8}{a^7}\right)^{\frac{1}{4}}}{(bx^4+a)^{\frac{1}{4}}b^2+\sqrt{\sqrt{bx^4+a}b^4+a^4\sqrt{\frac{b^8}{a^7}}}}\right)-3\,a\left(\frac{b^8}{a^7}\right)^{\frac{1}{4}}x^8\log\left(3\left(bx^4+a\right)^{\frac{1}{4}}b^2+3\,a^2\left(\frac{b^8}{a^7}\right)^{\frac{1}{4}}\right)+3\,a\left(\frac{b^8}{a^7}\right)^{\frac{1}{4}}x^8\log\left(\right.}{128\,ax^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^9,x, algorithm="fricas")
```

```
[Out] -1/128*(12*a*(b^8/a^7)^(1/4)*x^8*arctan(a^2*(b^8/a^7)^(1/4)/((b*x
^4 + a)^(1/4)*b^2 + sqrt(sqrt(b*x^4 + a)*b^4 + a^4*sqrt(b^8/a^7))
)) - 3*a*(b^8/a^7)^(1/4)*x^8*log(3*(b*x^4 + a)^(1/4)*b^2 + 3*a^2*
(b^8/a^7)^(1/4)) + 3*a*(b^8/a^7)^(1/4)*x^8*log(3*(b*x^4 + a)^(1/4
)*b^2 - 3*a^2*(b^8/a^7)^(1/4)) + 4*(b*x^4 + 4*a)*(b*x^4 + a)^(1/4
))/(a*x^8)
```

Sympy [A] time = 8.3833, size = 41, normalized size = 0.41

$$-\frac{\sqrt[4]{b}\,\Gamma\left(\frac{7}{4}\right)\,{}_2F_1\left(\begin{matrix}-\frac{1}{4},\frac{7}{4}\\ \frac{11}{4}\end{matrix}\middle|\frac{ae^{i\pi}}{bx^4}\right)}{4x^7\,\Gamma\left(\frac{11}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(1/4)/x**9,x)
```

```
[Out] -b**(1/4)*gamma(7/4)*hyper((-1/4, 7/4), (11/4,), a*exp_polar(I*pi
)/(b*x**4))/(4*x**7*gamma(11/4))
```

GIAC/XCAS [A] time = 0.232057, size = 302, normalized size = 2.99

$$\frac{1}{256}\,b^2\left(\frac{6\,\sqrt{2}\,(-a)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}+2\,(bx^4+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{a^2}+\frac{6\,\sqrt{2}\,(-a)^{\frac{1}{4}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}-2\,(bx^4+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{a^2}+\frac{3\,\sqrt{2}\,(-a)^{\frac{1}{4}}\ln\left(\sqrt{2}(bx^4\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^9,x, algorithm="giac")
```

```
[Out] 1/256*b^2*(6*sqrt(2)*(-a)^(1/4)*arctan(1/2*sqrt(2)*(sqrt(2)*(-a)^
(1/4) + 2*(b*x^4 + a)^(1/4))/(-a)^(1/4))/a^2 + 6*sqrt(2)*(-a)^(1/
4)*arctan(-1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) - 2*(b*x^4 + a)^(1/4))
/(-a)^(1/4))/a^2 + 3*sqrt(2)*(-a)^(1/4)*ln(sqrt(2)*(b*x^4 + a)^(1
/4)*(-a)^(1/4) + sqrt(b*x^4 + a) + sqrt(-a))/a^2 - 3*sqrt(2)*(-a)
^(1/4)*ln(-sqrt(2)*(b*x^4 + a)^(1/4)*(-a)^(1/4) + sqrt(b*x^4 + a)
 + sqrt(-a))/a^2 - 8*((b*x^4 + a)^(5/4) + 3*(b*x^4 + a)^(1/4)*a)/
(a*b^2*x^8))
```

3.994 $\int x^9\sqrt[4]{a+bx^4}\,dx$

Optimal. Leaf size=125

$$\frac{4a^{7/2}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{77b^{5/2}\left(a+bx^4\right)^{3/4}}-\frac{2a^2x^2\sqrt[4]{a+bx^4}}{77b^2}+\frac{1}{11}x^{10}\sqrt[4]{a+bx^4}+\frac{ax^6\sqrt[4]{a+bx^4}}{77b}$$

```
[Out] (-2*a^2*x^2*(a + b*x^4)^(1/4))/(77*b^2) + (a*x^6*(a + b*x^4)^(1/4
))/(77*b) + (x^10*(a + b*x^4)^(1/4))/11 + (4*a^(7/2)*(1 + (b*x^4)
/a)^(3/4)*EllipticF[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(77*b^(5
/2)*(a + b*x^4)^(3/4))
```

Rubi [A] time = 0.200105, antiderivative size = 125, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{4a^{7/2}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{77b^{5/2}\left(a+bx^4\right)^{3/4}}-\frac{2a^2x^2\sqrt[4]{a+bx^4}}{77b^2}+\frac{1}{11}x^{10}\sqrt[4]{a+bx^4}+\frac{ax^6\sqrt[4]{a+bx^4}}{77b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^9*(a + b*x^4)^(1/4),x]
```

```
[Out] (-2*a^2*x^2*(a + b*x^4)^(1/4))/(77*b^2) + (a*x^6*(a + b*x^4)^(1/4
))/(77*b) + (x^10*(a + b*x^4)^(1/4))/11 + (4*a^(7/2)*(1 + (b*x^4)
/a)^(3/4)*EllipticF[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(77*b^(5
/2)*(a + b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 19.3451, size = 110, normalized size = 0.88

$$\frac{4a^{\frac{7}{2}}\left(1+\frac{bx^4}{a}\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{77b^{\frac{5}{2}}\left(a+bx^4\right)^{\frac{3}{4}}}-\frac{2a^2x^2\sqrt[4]{a+bx^4}}{77b^2}+\frac{ax^6\sqrt[4]{a+bx^4}}{77b}+\frac{x^{10}\sqrt[4]{a+bx^4}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**9*(b*x**4+a)**(1/4),x)
```

```
[Out] 4*a**(7/2)*(1 + b*x**4/a)**(3/4)*elliptic_f(atan(sqrt(b)*x**2/sqr
t(a))/2, 2)/(77*b**(5/2)*(a + b*x**4)**(3/4)) - 2*a**2*x**2*(a +
b*x**4)**(1/4)/(77*b**2) + a*x**6*(a + b*x**4)**(1/4)/(77*b) + x*
*10*(a + b*x**4)**(1/4)/11
```

Mathematica [C] time = 0.0680639, size = 91, normalized size = 0.73

$$\frac{x^2\left(2a^3\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};-\frac{bx^4}{a}\right)-2a^3-a^2bx^4+8ab^2x^8+7b^3x^{12}\right)}{77b^2\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^9*(a + b*x^4)^(1/4),x]
```

```
[Out] (x^2*(-2*a^3 - a^2*b*x^4 + 8*a*b^2*x^8 + 7*b^3*x^12 + 2*a^3*(1 +
(b*x^4)/a)^(3/4)*Hypergeometric2F1[1/2, 3/4, 3/2, -((b*x^4)/a)]))
```

```
/(77*b^2*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.043, size = 0, normalized size = 0.

$$\int x^9 \sqrt[4]{bx^4 + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^9*(b*x^4+a)^(1/4),x)

[Out] int(x^9*(b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bx^4 + a\right)^{\frac{1}{4}} x^9\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^9,x, algorithm="maxima")

[Out] integrate((b*x^4 + a)^(1/4)*x^9, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\left(bx^4 + a\right)^{\frac{1}{4}} x^9, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^9,x, algorithm="fricas")

[Out] integral((b*x^4 + a)^(1/4)*x^9, x)
```

Sympy [A] time = 5.82783, size = 29, normalized size = 0.23

$$\frac{\sqrt[4]{a} x^{10} {}_{2}F_{1}\left(\begin{matrix} -\frac{1}{4}, \frac{5}{2} \\ \frac{7}{2} \end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**9*(b*x**4+a)**(1/4),x)

[Out] a**(1/4)*x**10*hyper((-1/4, 5/2), (7/2,), b*x**4*exp_polar(I*pi)/
a)/10
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bx^4 + a\right)^{\frac{1}{4}} x^9\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^9,x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(1/4)*x^9, x)
```

3.995 $\int x^5\sqrt[4]{a+bx^4}\,dx$

Optimal. Leaf size=101

$$-\frac{2a^{5/2}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{21b^{3/2}\left(a+bx^4\right)^{3/4}}+\frac{1}{7}x^6\sqrt[4]{a+bx^4}+\frac{ax^2\sqrt[4]{a+bx^4}}{21b}$$

```
[Out] (a*x^2*(a + b*x^4)^(1/4))/(21*b) + (x^6*(a + b*x^4)^(1/4))/7 - (2
*a^(5/2)*(1 + (b*x^4)/a)^(3/4)*EllipticF[ArcTan[(Sqrt[b]*x^2)/Sqr
t[a]]/2, 2])/(21*b^(3/2)*(a + b*x^4)^(3/4))
```

Rubi [A] time = 0.147767, antiderivative size = 101, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{2a^{5/2}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{21b^{3/2}\left(a+bx^4\right)^{3/4}}+\frac{1}{7}x^6\sqrt[4]{a+bx^4}+\frac{ax^2\sqrt[4]{a+bx^4}}{21b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5*(a + b*x^4)^(1/4),x]
```

```
[Out] (a*x^2*(a + b*x^4)^(1/4))/(21*b) + (x^6*(a + b*x^4)^(1/4))/7 - (2
*a^(5/2)*(1 + (b*x^4)/a)^(3/4)*EllipticF[ArcTan[(Sqrt[b]*x^2)/Sqr
t[a]]/2, 2])/(21*b^(3/2)*(a + b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 14.7811, size = 87, normalized size = 0.86

$$-\frac{2a^{\frac{5}{2}}\left(1+\frac{bx^4}{a}\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{21b^{\frac{3}{2}}\left(a+bx^4\right)^{\frac{3}{4}}}+\frac{ax^2\sqrt[4]{a+bx^4}}{21b}+\frac{x^6\sqrt[4]{a+bx^4}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5*(b*x**4+a)**(1/4),x)
```

```
[Out] -2*a**(5/2)*(1 + b*x**4/a)**(3/4)*elliptic_f(atan(sqrt(b)*x**2/sq
rt(a))/2, 2)/(21*b**(3/2)*(a + b*x**4)**(3/4)) + a*x**2*(a + b*x*
*4)**(1/4)/(21*b) + x**6*(a + b*x**4)**(1/4)/7
```

Mathematica [C] time = 0.0576033, size = 78, normalized size = 0.77

$$\frac{x^2\left(-a^2\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};-\frac{bx^4}{a}\right)+a^2+4abx^4+3b^2x^8\right)}{21b\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5*(a + b*x^4)^(1/4),x]
```

```
[Out] (x^2*(a^2 + 4*a*b*x^4 + 3*b^2*x^8 - a^2*(1 + (b*x^4)/a)^(3/4)*Hyp
ergeometric2F1[1/2, 3/4, 3/2, -((b*x^4)/a)]))/(21*b*(a + b*x^4)^(
3/4))
```

Maple [F] time = 0.038, size = 0, normalized size = 0.

$$\int x^{5} \sqrt[4]{b x^{4}+a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5*(b*x^4+a)^(1/4),x)

[Out] int(x^5*(b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b x^{4}+a\right)^{\frac{1}{4}} x^{5}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^5,x, algorithm="maxima")

[Out] integrate((b*x^4 + a)^(1/4)*x^5, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(b x^{4}+a\right)^{\frac{1}{4}} x^{5}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^5,x, algorithm="fricas")

[Out] integral((b*x^4 + a)^(1/4)*x^5, x)
```

Sympy [A] time = 3.18603, size = 29, normalized size = 0.29

$$\frac{\sqrt[4]{a} x^{6} {}_{2}F_{1}\left(\begin{matrix} -\frac{1}{4}, \frac{3}{2} \\ \frac{5}{2} \end{matrix}\middle| {\frac{b x^{4} e^{i \pi}}{a}} \right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5*(b*x**4+a)**(1/4),x)

[Out] a**(1/4)*x**6*hyper((-1/4, 3/2), (5/2,), b*x**4*exp_polar(I*pi)/a
)/6
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b x^{4}+a\right)^{\frac{1}{4}} x^{5}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^5,x, algorithm="giac")

[Out] integrate((b*x^4 + a)^(1/4)*x^5, x)
```

3.996 $\int x\sqrt[4]{a+bx^4}\,dx$

Optimal. Leaf size=79

$$\frac{a^{3/2}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{3\sqrt{b}\left(a+bx^4\right)^{3/4}}+\frac{1}{3}x^2\sqrt[4]{a+bx^4}$$

```
[Out] (x^2*(a + b*x^4)^(1/4))/3 + (a^(3/2)*(1 + (b*x^4)/a)^(3/4)*Ellipt
icF[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(3*Sqrt[b]*(a + b*x^4)^(
3/4))
```

Rubi [A] time = 0.091143, antiderivative size = 79, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{a^{3/2}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{3\sqrt{b}\left(a+bx^4\right)^{3/4}}+\frac{1}{3}x^2\sqrt[4]{a+bx^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x*(a + b*x^4)^(1/4),x]
```

```
[Out] (x^2*(a + b*x^4)^(1/4))/3 + (a^(3/2)*(1 + (b*x^4)/a)^(3/4)*Ellipt
icF[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(3*Sqrt[b]*(a + b*x^4)^(
3/4))
```

Rubi in Sympy [A] time = 8.27723, size = 66, normalized size = 0.84

$$\frac{a^{\frac{3}{2}}\left(1+\frac{bx^4}{a}\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{3\sqrt{b}\left(a+bx^4\right)^{\frac{3}{4}}}+\frac{x^2\sqrt[4]{a+bx^4}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(b*x**4+a)**(1/4),x)
```

```
[Out] a**(3/2)*(1 + b*x**4/a)**(3/4)*elliptic_f(atan(sqrt(b)*x**2/sqrt(
a))/2, 2)/(3*sqrt(b)*(a + b*x**4)**(3/4)) + x**2*(a + b*x**4)**(1
/4)/3
```

Mathematica [C] time = 0.0383573, size = 63, normalized size = 0.8

$$\frac{x^2\left(a\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};-\frac{bx^4}{a}\right)+2\left(a+bx^4\right)\right)}{6\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x*(a + b*x^4)^(1/4),x]
```

```
[Out] (x^2*(2*(a + b*x^4) + a*(1 + (b*x^4)/a)^(3/4)*Hypergeometric2F1[1
/2, 3/4, 3/2, -((b*x^4)/a)]))/(6*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.034, size = 0, normalized size = 0.

$$\int x\sqrt[4]{bx^4+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(b*x^4+a)^(1/4),x)

[Out] int(x*(b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bx^4+a\right)^{\frac{1}{4}} x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x,x, algorithm="maxima")

[Out] integrate((b*x^4 + a)^(1/4)*x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(bx^4+a\right)^{\frac{1}{4}}x, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x,x, algorithm="fricas")

[Out] integral((b*x^4 + a)^(1/4)*x, x)
```

Sympy [A] time = 2.33196, size = 29, normalized size = 0.37

$$\frac{\sqrt[4]{a}x^2{}_2F_1\left(\begin{matrix} -\frac{1}{4}, \frac{1}{2} \\ \frac{3}{2} \end{matrix}\middle| \frac{bx^4e^{i\pi}}{a}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(b*x**4+a)**(1/4),x)

[Out] a**(1/4)*x**2*hyper((-1/4, 1/2), (3/2,), b*x**4*exp_polar(I*pi)/a
)/2
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bx^4+a\right)^{\frac{1}{4}} x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x,x, algorithm="giac")

[Out] integrate((b*x^4 + a)^(1/4)*x, x)
```

3.997 $\int \frac{\sqrt[4]{a+bx^4}}{x^3}\,dx$

Optimal. Leaf size=79

$$\frac{\sqrt{a}\sqrt{b}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{2\left(a+bx^4\right)^{3/4}}-\frac{\sqrt[4]{a+bx^4}}{2x^2}$$

```
[Out] -(a + b*x^4)^(1/4)/(2*x^2) + (Sqrt[a]*Sqrt[b]*(1 + (b*x^4)/a)^(3/
4)*EllipticF[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(2*(a + b*x^4)^
(3/4))
```

Rubi [A] time = 0.100554, antiderivative size = 79, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{\sqrt{a}\sqrt{b}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{2\left(a+bx^4\right)^{3/4}}-\frac{\sqrt[4]{a+bx^4}}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(1/4)/x^3,x]
```

```
[Out] -(a + b*x^4)^(1/4)/(2*x^2) + (Sqrt[a]*Sqrt[b]*(1 + (b*x^4)/a)^(3/
4)*EllipticF[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(2*(a + b*x^4)^
(3/4))
```

Rubi in Sympy [A] time = 10.2915, size = 66, normalized size = 0.84

$$\frac{\sqrt{a}\sqrt{b}\left(1+\frac{bx^4}{a}\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{2\left(a+bx^4\right)^{\frac{3}{4}}}-\frac{\sqrt[4]{a+bx^4}}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(1/4)/x**3,x)
```

```
[Out] sqrt(a)*sqrt(b)*(1 + b*x**4/a)**(3/4)*elliptic_f(atan(sqrt(b)*x**
2/sqrt(a))/2, 2)/(2*(a + b*x**4)**(3/4)) - (a + b*x**4)**(1/4)/(2
*x**2)
```

Mathematica [C] time = 0.0416064, size = 66, normalized size = 0.84

$$\frac{bx^4\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};-\frac{bx^4}{a}\right)-2\left(a+bx^4\right)}{4x^2\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(1/4)/x^3,x]
```

```
[Out] (-2*(a + b*x^4) + b*x^4*(1 + (b*x^4)/a)^(3/4)*Hypergeometric2F1[1
/2, 3/4, 3/2, -((b*x^4)/a)])/(4*x^2*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.041, size = 0, normalized size = 0.

$$\int \frac{1}{x^{3}} \sqrt[4]{b x^{4}+a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(1/4)/x^3,x)
```

```
[Out] int((b*x^4+a)^(1/4)/x^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b x^{4}+a\right)^{\frac{1}{4}}}{x^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^3,x, algorithm="maxima")
```

```
[Out] integrate((b*x^4 + a)^(1/4)/x^3, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(b x^{4}+a\right)^{\frac{1}{4}}}{x^{3}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^3,x, algorithm="fricas")
```

```
[Out] integral((b*x^4 + a)^(1/4)/x^3, x)
```

Sympy [A] time = 2.66805, size = 32, normalized size = 0.41

$$-\frac{\sqrt[4]{a}\,{}_{2}F_{1}\left(\begin{matrix} -\frac{1}{2}, -\frac{1}{4} \\ \frac{1}{2} \end{matrix}\middle| {\frac{b x^{4} e^{i \pi}}{a}} \right)}{2 x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(1/4)/x**3,x)
```

```
[Out] -a**(1/4)*hyper((-1/2, -1/4), (1/2,), b*x**4*exp_polar(I*pi)/a)/(
2*x**2)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b x^{4}+a\right)^{\frac{1}{4}}}{x^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^3,x, algorithm="giac")

[Out] integrate((b*x^4 + a)^(1/4)/x^3, x)
```

3.998 $\int \frac{\sqrt[4]{a+bx^4}}{x^7}\,dx$

Optimal. Leaf size=101

$$-\frac{b^{3/2}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{12\sqrt{a}\left(a+bx^4\right)^{3/4}}-\frac{\sqrt[4]{a+bx^4}}{6x^6}-\frac{b\sqrt[4]{a+bx^4}}{12ax^2}$$

```
[Out] -(a + b*x^4)^(1/4)/(6*x^6) - (b*(a + b*x^4)^(1/4))/(12*a*x^2) - (
b^(3/2)*(1 + (b*x^4)/a)^(3/4)*EllipticF[ArcTan[(Sqrt[b]*x^2)/Sqrt
[a]]/2, 2])/(12*Sqrt[a]*(a + b*x^4)^(3/4))
```

Rubi [A] time = 0.141399, antiderivative size = 101, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{b^{3/2}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{12\sqrt{a}\left(a+bx^4\right)^{3/4}}-\frac{\sqrt[4]{a+bx^4}}{6x^6}-\frac{b\sqrt[4]{a+bx^4}}{12ax^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(1/4)/x^7,x]
```

```
[Out] -(a + b*x^4)^(1/4)/(6*x^6) - (b*(a + b*x^4)^(1/4))/(12*a*x^2) - (
b^(3/2)*(1 + (b*x^4)/a)^(3/4)*EllipticF[ArcTan[(Sqrt[b]*x^2)/Sqrt
[a]]/2, 2])/(12*Sqrt[a]*(a + b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 14.3684, size = 87, normalized size = 0.86

$$-\frac{\sqrt[4]{a+bx^4}}{6x^6}-\frac{b\sqrt[4]{a+bx^4}}{12ax^2}-\frac{b^{\frac{3}{2}}\left(1+\frac{bx^4}{a}\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{12\sqrt{a}\left(a+bx^4\right)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(1/4)/x**7,x)
```

```
[Out] -(a + b*x**4)**(1/4)/(6*x**6) - b*(a + b*x**4)**(1/4)/(12*a*x**2)
 - b**(3/2)*(1 + b*x**4/a)**(3/4)*elliptic_f(atan(sqrt(b)*x**2/sq
rt(a))/2, 2)/(12*sqrt(a)*(a + b*x**4)**(3/4))
```

Mathematica [C] time = 0.055854, size = 85, normalized size = 0.84

$$\frac{-2\left(2a^2+3abx^4+b^2x^8\right)-b^2x^8\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};-\frac{bx^4}{a}\right)}{24ax^6\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(1/4)/x^7,x]
```

```
[Out] (-2*(2*a^2 + 3*a*b*x^4 + b^2*x^8) - b^2*x^8*(1 + (b*x^4)/a)^(3/4)
*Hypergeometric2F1[1/2, 3/4, 3/2, -((b*x^4)/a)])/(24*a*x^6*(a + b
*x^4)^(3/4))
```

Maple [F] time = 0.046, size = 0, normalized size = 0.

$$\int \frac{1}{x^7}\sqrt[4]{b x^4+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(1/4)/x^7,x)

[Out] int((b*x^4+a)^(1/4)/x^7,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b x^4+a)^{\frac{1}{4}}}{x^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^7,x, algorithm="maxima")

[Out] integrate((b*x^4 + a)^(1/4)/x^7, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(b x^4+a)^{\frac{1}{4}}}{x^7},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^7,x, algorithm="fricas")

[Out] integral((b*x^4 + a)^(1/4)/x^7, x)
```

Sympy [A] time = 4.42386, size = 34, normalized size = 0.34

$$-\frac{\sqrt[4]{a}\,{}_2F_1\left(\begin{matrix} -\frac{3}{2},-\frac{1}{4} \\ -\frac{1}{2} \end{matrix}\middle| \frac{b x^4 e^{i\pi}}{a}\right)}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(1/4)/x**7,x)

[Out] -a**(1/4)*hyper((-3/2, -1/4), (-1/2,), b*x**4*exp_polar(I*pi)/a)/
(6*x**6)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b x^4+a)^{\frac{1}{4}}}{x^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^7,x, algorithm="giac")

[Out] integrate((b*x^4 + a)^(1/4)/x^7, x)
```

3.999 $\int \frac{\sqrt[4]{a+bx^4}}{x^{11}}\,dx$

Optimal. Leaf size=125

$$\frac{b^{5/2}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{24a^{3/2}\left(a+bx^4\right)^{3/4}}+\frac{b^2\sqrt[4]{a+bx^4}}{24a^2x^2}-\frac{\sqrt[4]{a+bx^4}}{10x^{10}}-\frac{b\sqrt[4]{a+bx^4}}{60ax^6}$$

```
[Out] -(a + b*x^4)^(1/4)/(10*x^10) - (b*(a + b*x^4)^(1/4))/(60*a*x^6) +
 (b^2*(a + b*x^4)^(1/4))/(24*a^2*x^2) + (b^(5/2)*(1 + (b*x^4)/a)^
(3/4)*EllipticF[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(24*a^(3/2)*
(a + b*x^4)^(3/4))
```

Rubi [A] time = 0.18376, antiderivative size = 125, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{b^{5/2}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{24a^{3/2}\left(a+bx^4\right)^{3/4}}+\frac{b^2\sqrt[4]{a+bx^4}}{24a^2x^2}-\frac{\sqrt[4]{a+bx^4}}{10x^{10}}-\frac{b\sqrt[4]{a+bx^4}}{60ax^6}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(1/4)/x^11,x]
```

```
[Out] -(a + b*x^4)^(1/4)/(10*x^10) - (b*(a + b*x^4)^(1/4))/(60*a*x^6) +
 (b^2*(a + b*x^4)^(1/4))/(24*a^2*x^2) + (b^(5/2)*(1 + (b*x^4)/a)^
(3/4)*EllipticF[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(24*a^(3/2)*
(a + b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 18.991, size = 107, normalized size = 0.86

$$-\frac{\sqrt[4]{a+bx^4}}{10x^{10}}-\frac{b\sqrt[4]{a+bx^4}}{60ax^6}+\frac{b^2\sqrt[4]{a+bx^4}}{24a^2x^2}+\frac{b^{\frac{5}{2}}\left(1+\frac{bx^4}{a}\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{24a^{\frac{3}{2}}\left(a+bx^4\right)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(1/4)/x**11,x)
```

```
[Out] -(a + b*x**4)**(1/4)/(10*x**10) - b*(a + b*x**4)**(1/4)/(60*a*x**
6) + b**2*(a + b*x**4)**(1/4)/(24*a**2*x**2) + b**(5/2)*(1 + b*x*
*4/a)**(3/4)*elliptic_f(atan(sqrt(b)*x**2/sqrt(a))/2, 2)/(24*a**(
3/2)*(a + b*x**4)**(3/4))
```

Mathematica [C] time = 0.0536903, size = 94, normalized size = 0.75

$$\frac{-24a^3-28a^2bx^4+5b^3x^{12}\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};-\frac{bx^4}{a}\right)+6ab^2x^8+10b^3x^{12}}{240a^2x^{10}\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(1/4)/x^11,x]
```

```
[Out] (-24*a^3 - 28*a^2*b*x^4 + 6*a*b^2*x^8 + 10*b^3*x^12 + 5*b^3*x^12*
(1 + (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/2, 3/4, 3/2, -((b*x^4)/
```

```
a)])/(240*a^2*x^10*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.051, size = 0, normalized size = 0.

$$\int \frac{1}{x^{11}}\sqrt[4]{bx^4+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(1/4)/x^11,x)
```

```
[Out] int((b*x^4+a)^(1/4)/x^11,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bx^4+a\right)^{\frac{1}{4}}}{x^{11}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^11,x, algorithm="maxima")
```

```
[Out] integrate((b*x^4 + a)^(1/4)/x^11, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(bx^4+a\right)^{\frac{1}{4}}}{x^{11}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^11,x, algorithm="fricas")
```

```
[Out] integral((b*x^4 + a)^(1/4)/x^11, x)
```

Sympy [A] time = 8.72474, size = 34, normalized size = 0.27

$$-\frac{\sqrt[4]{a}\,{}_2F_1\left(\begin{matrix} -\frac{5}{2}, -\frac{1}{4} \\ -\frac{3}{2} \end{matrix}\middle|\, \frac{bx^4e^{i\pi}}{a}\right)}{10x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(1/4)/x**11,x)
```

```
[Out] -a**(1/4)*hyper((-5/2, -1/4), (-3/2,), b*x**4*exp_polar(I*pi)/a)/
(10*x**10)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bx^4+a\right)^{\frac{1}{4}}}{x^{11}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^11,x, algorithm="giac")

[Out] integrate((b*x^4 + a)^(1/4)/x^11, x)
```

3.1000 $\int x^6 \sqrt[4]{a+bx^4}\,dx$

Optimal. Leaf size=103

$$\frac{3a^2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{7/4}}-\frac{3a^2\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{7/4}}+\frac{1}{8}x^7\sqrt[4]{a+bx^4}+\frac{ax^3\sqrt[4]{a+bx^4}}{32b}$$

```
[Out] (a*x^3*(a + b*x^4)^(1/4))/(32*b) + (x^7*(a + b*x^4)^(1/4))/8 + (3
*a^2*ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(64*b^(7/4)) - (3*a^2
*ArcTanh[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(64*b^(7/4))
```

Rubi [A] time = 0.112435, antiderivative size = 103, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.4$

$$\frac{3a^2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{7/4}}-\frac{3a^2\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{7/4}}+\frac{1}{8}x^7\sqrt[4]{a+bx^4}+\frac{ax^3\sqrt[4]{a+bx^4}}{32b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6*(a + b*x^4)^(1/4),x]
```

```
[Out] (a*x^3*(a + b*x^4)^(1/4))/(32*b) + (x^7*(a + b*x^4)^(1/4))/8 + (3
*a^2*ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(64*b^(7/4)) - (3*a^2
*ArcTanh[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(64*b^(7/4))
```

Rubi in Sympy [A] time = 13.9107, size = 94, normalized size = 0.91

$$\frac{3a^2\,\text{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{\frac{7}{4}}}-\frac{3a^2\,\text{atanh}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{\frac{7}{4}}}+\frac{ax^3\sqrt[4]{a+bx^4}}{32b}+\frac{x^7\sqrt[4]{a+bx^4}}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6*(b*x**4+a)**(1/4),x)
```

```
[Out] 3*a**2*atan(b**(1/4)*x/(a + b*x**4)**(1/4))/(64*b**(7/4)) - 3*a**
2*atanh(b**(1/4)*x/(a + b*x**4)**(1/4))/(64*b**(7/4)) + a*x**3*(a
 + b*x**4)**(1/4)/(32*b) + x**7*(a + b*x**4)**(1/4)/8
```

Mathematica [C] time = 0.0525284, size = 78, normalized size = 0.76

$$\frac{x^3\left(-a^2\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{3}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)+a^2+5abx^4+4b^2x^8\right)}{32b\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6*(a + b*x^4)^(1/4),x]
```

```
[Out] (x^3*(a^2 + 5*a*b*x^4 + 4*b^2*x^8 - a^2*(1 + (b*x^4)/a)^(3/4)*Hyp
ergeometric2F1[3/4, 3/4, 7/4, -((b*x^4)/a)]))/(32*b*(a + b*x^4)^(
3/4))
```

Maple [F] time = 0.046, size = 0, normalized size = 0.

$$\int x^{6} \sqrt[4]{b x^{4}+a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6*(b*x^4+a)^(1/4),x)
```

```
[Out] int(x^6*(b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^6,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.28558, size = 274, normalized size = 2.66

$$\frac{12 \left(\frac{a^8}{b^7}\right)^{\frac{1}{4}} b \arctan\left(\frac{\left(\frac{a^8}{b^7}\right)^{\frac{1}{4}} b^2 x}{(bx^4+a)^{\frac{1}{4}} a^2 + x\sqrt{\frac{\sqrt{\frac{a^8}{b^7}} b^4 x^2 + \sqrt{bx^4+a}\, a^4}{x^2}}}\right) - 3 \left(\frac{a^8}{b^7}\right)^{\frac{1}{4}} b \log\left(\frac{3\left(\left(\frac{a^8}{b^7}\right)^{\frac{1}{4}} b^2 x + (bx^4+a)^{\frac{1}{4}} a^2\right)}{x}\right) + 3 \left(\frac{a^8}{b^7}\right)^{\frac{1}{4}} b \log\left(-\frac{3\left(\left(\frac{a^8}{b^7}\right)^{\frac{1}{4}} b^2 \cdots\right.}{\cdots}\right.}{128\, b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^6,x, algorithm="fricas")
```

```
[Out] 1/128*(12*(a^8/b^7)^(1/4)*b*arctan((a^8/b^7)^(1/4)*b^2*x/((b*x^4
+ a)^(1/4)*a^2 + x*sqrt((sqrt(a^8/b^7)*b^4*x^2 + sqrt(b*x^4 + a)*
a^4)/x^2))) - 3*(a^8/b^7)^(1/4)*b*log(3*((a^8/b^7)^(1/4)*b^2*x +
(b*x^4 + a)^(1/4)*a^2)/x) + 3*(a^8/b^7)^(1/4)*b*log(-3*((a^8/b^7)
^(1/4)*b^2*x - (b*x^4 + a)^(1/4)*a^2)/x) + 4*(4*b*x^7 + a*x^3)*(b
*x^4 + a)^(1/4))/b
```

Sympy [A] time = 5.88931, size = 39, normalized size = 0.38

$$\frac{\sqrt[4]{a} x^{7} \Gamma\left(\frac{7}{4}\right) {}_{2}F_{1}\left(\begin{matrix} -\frac{1}{4}, \frac{7}{4} \\ \frac{11}{4} \end{matrix}\middle| {\frac{b x^{4} e^{i \pi}}{a}} \right)}{4 \Gamma\left(\frac{11}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6*(b*x**4+a)**(1/4),x)
```

```
[Out] a**(1/4)*x**7*gamma(7/4)*hyper((-1/4, 7/4), (11/4,), b*x**4*exp_p
olar(I*pi)/a)/(4*gamma(11/4))
```

GIAC/XCAS [A] time = 0.237515, size = 348, normalized size = 3.38

$$\frac{1}{256}\left(\frac{8\,x^8\left(\frac{\left(bx^4+a\right)^{\frac{1}{4}}\left(b+\frac{a}{x^4}\right)}{x}+\frac{3\left(bx^4+a\right)^{\frac{1}{4}}b}{x}\right)}{a^2b}-\frac{6\sqrt{2}\,(-b)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-b)^{\frac{1}{4}}+\frac{2\left(bx^4+a\right)^{\frac{1}{4}}}{x}\right)}{2\,(-b)^{\frac{1}{4}}}\right)}{b^2}-\frac{6\sqrt{2}\,(-b)^{\frac{1}{4}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-b)^{\frac{1}{4}}-\frac{2\cdots}{\cdots}\right)}{2\,(-b)^{\cdots}}\right)}{b^2}\cdots\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^6,x, algorithm="giac")
```

```
[Out] 1/256*(8*x^8*((b*x^4 + a)^(1/4)*(b + a/x^4)/x + 3*(b*x^4 + a)^(1/
4)*b/x)/(a^2*b) - 6*sqrt(2)*(-b)^(1/4)*arctan(1/2*sqrt(2)*(sqrt(2
)*(-b)^(1/4) + 2*(b*x^4 + a)^(1/4)/x)/(-b)^(1/4))/b^2 - 6*sqrt(2)
*(-b)^(1/4)*arctan(-1/2*sqrt(2)*(sqrt(2)*(-b)^(1/4) - 2*(b*x^4 +
a)^(1/4)/x)/(-b)^(1/4))/b^2 - 3*sqrt(2)*(-b)^(1/4)*ln(sqrt(-b) +
sqrt(2)*(b*x^4 + a)^(1/4)*(-b)^(1/4)/x + sqrt(b*x^4 + a)/x^2)/b^2
 + 3*sqrt(2)*(-b)^(1/4)*ln(sqrt(-b) - sqrt(2)*(b*x^4 + a)^(1/4)*(
-b)^(1/4)/x + sqrt(b*x^4 + a)/x^2)/b^2)*a^2
```

3.1001 $\int x^2 \sqrt[4]{a+bx^4}\,dx$

Optimal. Leaf size=77

$$-\frac{a\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{8b^{3/4}}+\frac{a\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{8b^{3/4}}+\frac{1}{4}x^3\sqrt[4]{a+bx^4}$$

```
[Out] (x^3*(a + b*x^4)^(1/4))/4 - (a*ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/
4)])/(8*b^(3/4)) + (a*ArcTanh[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(8*
b^(3/4))
```

Rubi [A] time = 0.0759054, antiderivative size = 77, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{a\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{8b^{3/4}}+\frac{a\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{8b^{3/4}}+\frac{1}{4}x^3\sqrt[4]{a+bx^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2*(a + b*x^4)^(1/4),x]
```

```
[Out] (x^3*(a + b*x^4)^(1/4))/4 - (a*ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/
4)])/(8*b^(3/4)) + (a*ArcTanh[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(8*
b^(3/4))
```

Rubi in Sympy [A] time = 10.5406, size = 68, normalized size = 0.88

$$-\frac{a\,\mathrm{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{8b^{\frac{3}{4}}}+\frac{a\,\mathrm{atanh}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{8b^{\frac{3}{4}}}+\frac{x^3\sqrt[4]{a+bx^4}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(b*x**4+a)**(1/4),x)
```

```
[Out] -a*atan(b**(1/4)*x/(a + b*x**4)**(1/4))/(8*b**(3/4)) + a*atanh(b*
*(1/4)*x/(a + b*x**4)**(1/4))/(8*b**(3/4)) + x**3*(a + b*x**4)**(
1/4)/4
```

Mathematica [C] time = 0.0434783, size = 63, normalized size = 0.82

$$\frac{x^3\left(a\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{3}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)+3\left(a+bx^4\right)\right)}{12\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2*(a + b*x^4)^(1/4),x]
```

```
[Out] (x^3*(3*(a + b*x^4) + a*(1 + (b*x^4)/a)^(3/4)*Hypergeometric2F1[3
/4, 3/4, 7/4, -((b*x^4)/a)]))/(12*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.039, size = 0, normalized size = 0.

$$\int x^{2} \sqrt[4]{b x^{4}+a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(b*x^4+a)^(1/4),x)

[Out] int(x^2*(b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^2,x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [A] time = 0.283194, size = 234, normalized size = 3.04

$$\frac{1}{4}\left(bx^{4}+a\right)^{\frac{1}{4}}x^{3}-\frac{1}{4}\left(\frac{a^{4}}{b^{3}}\right)^{\frac{1}{4}}\arctan\left(\frac{\left(\frac{a^{4}}{b^{3}}\right)^{\frac{1}{4}}bx}{x\sqrt{\frac{\sqrt{\frac{a^{4}}{b^{3}}}b^{2}x^{2}+\sqrt{bx^{4}+a}a^{2}}{x^{2}}}+\left(bx^{4}+a\right)^{\frac{1}{4}}a}\right)+\frac{1}{16}\left(\frac{a^{4}}{b^{3}}\right)^{\frac{1}{4}}\log\left(\frac{\left(\frac{a^{4}}{b^{3}}\right)^{\frac{1}{4}}bx+\left(bx^{4}+a\right)^{\frac{1}{4}}a}{x}\right)-\frac{1}{16}\left(\frac{a^{4}}{b^{3}}\right)^{\frac{1}{4}}\log\left(-\frac{\left(\frac{a^{4}}{b^{3}}\right)^{\frac{1}{4}}bx-\left(bx^{4}+a\right)^{\frac{1}{4}}a}{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^2,x, algorithm="fricas")

[Out] 1/4*(b*x^4 + a)^(1/4)*x^3 - 1/4*(a^4/b^3)^(1/4)*arctan((a^4/b^3)^
(1/4)*b*x/(x*sqrt((sqrt(a^4/b^3)*b^2*x^2 + sqrt(b*x^4 + a)*a^2)/x
^2) + (b*x^4 + a)^(1/4)*a)) + 1/16*(a^4/b^3)^(1/4)*log(((a^4/b^3)
^(1/4)*b*x + (b*x^4 + a)^(1/4)*a)/x) - 1/16*(a^4/b^3)^(1/4)*log(-
((a^4/b^3)^(1/4)*b*x - (b*x^4 + a)^(1/4)*a)/x)
```

Sympy [A] time = 4.18308, size = 39, normalized size = 0.51

$$\frac{\sqrt[4]{a}x^{3}\Gamma\left(\frac{3}{4}\right){}_{2}F_{1}\left(\begin{matrix}-\frac{1}{4},\frac{3}{4}\\\frac{7}{4}\end{matrix}\middle|\frac{bx^{4}e^{i\pi}}{a}\right)}{4\Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(b*x**4+a)**(1/4),x)

[Out] a**(1/4)*x**3*gamma(3/4)*hyper((-1/4, 3/4), (7/4,), b*x**4*exp_po
lar(I*pi)/a)/(4*gamma(7/4))
```

GIAC/XCAS [A] time = 0.235306, size = 304, normalized size = 3.95

$$\frac{1}{32}\left(\frac{8\,{\left(bx^{4}+a\right)}^{\frac{1}{4}}x^{3}}{a}+\frac{2\,\sqrt{2}\,(-b)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-b)^{\frac{1}{4}}+\frac{2\,{\left(bx^{4}+a\right)}^{\frac{1}{4}}}{x}\right)}{2\,(-b)^{\frac{1}{4}}}\right)}{b}+\frac{2\,\sqrt{2}\,(-b)^{\frac{1}{4}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-b)^{\frac{1}{4}}-\frac{2\,{\left(bx^{4}+a\right)}^{\frac{1}{4}}}{x}\right)}{2\,(-b)^{\frac{1}{4}}}\right)}{b}+\frac{\sqrt{2}\,(-b)^{\frac{1}{4}}}{\ldots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^2,x, algorithm="giac")
```

```
[Out] 1/32*(8*(b*x^4 + a)^(1/4)*x^3/a + 2*sqrt(2)*(-b)^(1/4)*arctan(1/2
*sqrt(2)*(sqrt(2)*(-b)^(1/4) + 2*(b*x^4 + a)^(1/4)/x)/(-b)^(1/4))
/b + 2*sqrt(2)*(-b)^(1/4)*arctan(-1/2*sqrt(2)*(sqrt(2)*(-b)^(1/4)
 - 2*(b*x^4 + a)^(1/4)/x)/(-b)^(1/4))/b + sqrt(2)*(-b)^(1/4)*ln(s
qrt(-b) + sqrt(2)*(b*x^4 + a)^(1/4)*(-b)^(1/4)/x + sqrt(b*x^4 + a
)/x^2)/b - sqrt(2)*(-b)^(1/4)*ln(sqrt(-b) - sqrt(2)*(b*x^4 + a)^(
1/4)*(-b)^(1/4)/x + sqrt(b*x^4 + a)/x^2)/b)*a
```

3.1002 $\int \frac{\sqrt[4]{a+bx^4}}{x^2}\,dx$

Optimal. Leaf size=73

$$-\frac{\sqrt[4]{a+bx^4}}{x}-\frac{1}{2}\sqrt[4]{b}\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)+\frac{1}{2}\sqrt[4]{b}\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)$$

```
[Out] -((a + b*x^4)^(1/4)/x) - (b^(1/4)*ArcTan[(b^(1/4)*x)/(a + b*x^4)^
(1/4)])/2 + (b^(1/4)*ArcTanh[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/2
```

Rubi [A] time = 0.0725216, antiderivative size = 73, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{\sqrt[4]{a+bx^4}}{x}-\frac{1}{2}\sqrt[4]{b}\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)+\frac{1}{2}\sqrt[4]{b}\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(1/4)/x^2,x]
```

```
[Out] -((a + b*x^4)^(1/4)/x) - (b^(1/4)*ArcTan[(b^(1/4)*x)/(a + b*x^4)^
(1/4)])/2 + (b^(1/4)*ArcTanh[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/2
```

Rubi in Sympy [A] time = 10.4698, size = 61, normalized size = 0.84

$$-\frac{\sqrt[4]{b}\,\mathrm{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{2}+\frac{\sqrt[4]{b}\,\mathrm{atanh}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{2}-\frac{\sqrt[4]{a+bx^4}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(1/4)/x**2,x)
```

```
[Out] -b**(1/4)*atan(b**(1/4)*x/(a + b*x**4)**(1/4))/2 + b**(1/4)*atanh
(b**(1/4)*x/(a + b*x**4)**(1/4))/2 - (a + b*x**4)**(1/4)/x
```

Mathematica [C] time = 0.0401937, size = 66, normalized size = 0.9

$$\frac{bx^4\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{3}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)-3\left(a+bx^4\right)}{3x\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(1/4)/x^2,x]
```

```
[Out] (-3*(a + b*x^4) + b*x^4*(1 + (b*x^4)/a)^(3/4)*Hypergeometric2F1[3
/4, 3/4, 7/4, -((b*x^4)/a)])/(3*x*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.042, size = 0, normalized size = 0.

$$\int \frac{1}{x^2}\sqrt[4]{bx^4+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(1/4)/x^2,x)
```

```
[Out] int((b*x^4+a)^(1/4)/x^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^2,x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [A] time = 3.84295, size = 41, normalized size = 0.56

$$\frac{\sqrt[4]{a}\,\Gamma\left(-\frac{1}{4}\right)\,{}_2F_1\left(\begin{matrix}-\frac{1}{4},-\frac{1}{4}\\ \frac{3}{4}\end{matrix}\middle|\frac{bx^4e^{i\pi}}{a}\right)}{4x\,\Gamma\left(\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(1/4)/x**2,x)
```

```
[Out] a**(1/4)*gamma(-1/4)*hyper((-1/4, -1/4), (3/4,), b*x**4*exp_polar
(I*pi)/a)/(4*x*gamma(3/4))
```

GIAC/XCAS [A] time = 0.232325, size = 281, normalized size = 3.85

$$\frac{1}{4}\sqrt{2}(-b)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-b)^{\frac{1}{4}}+\frac{2(bx^4+a)^{\frac{1}{4}}}{x}\right)}{2(-b)^{\frac{1}{4}}}\right) + \frac{1}{4}\sqrt{2}(-b)^{\frac{1}{4}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-b)^{\frac{1}{4}}-\frac{2(bx^4+a)^{\frac{1}{4}}}{x}\right)}{2(-b)^{\frac{1}{4}}}\right) + \frac{1}{8}\sqrt{2}(-b)^{\frac{1}{4}}\ln\left(\sqrt{-b}+\frac{\sqrt{2}(bx^4+a)^{\frac{1}{4}}(-b)^{\frac{1}{4}}}{x}+\frac{\sqrt{bx^4+a}}{x^2}\right) - \frac{1}{8}\sqrt{2}(-b)^{\frac{1}{4}}\ln\left(\sqrt{-b}-\frac{\sqrt{2}(bx^4+a)^{\frac{1}{4}}(-b)^{\frac{1}{4}}}{x}+\frac{\sqrt{bx^4+a}}{x^2}\right) - \frac{(bx^4+a)^{\frac{1}{4}}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^2,x, algorithm="giac")
```

```
[Out] 1/4*sqrt(2)*(-b)^(1/4)*arctan(1/2*sqrt(2)*(sqrt(2)*(-b)^(1/4) + 2
*(b*x^4 + a)^(1/4)/x)/(-b)^(1/4)) + 1/4*sqrt(2)*(-b)^(1/4)*arctan
(-1/2*sqrt(2)*(sqrt(2)*(-b)^(1/4) - 2*(b*x^4 + a)^(1/4)/x)/(-b)^(
1/4)) + 1/8*sqrt(2)*(-b)^(1/4)*ln(sqrt(-b) + sqrt(2)*(b*x^4 + a)^
(1/4)*(-b)^(1/4)/x + sqrt(b*x^4 + a)/x^2) - 1/8*sqrt(2)*(-b)^(1/4
)*ln(sqrt(-b) - sqrt(2)*(b*x^4 + a)^(1/4)*(-b)^(1/4)/x + sqrt(b*x
^4 + a)/x^2) - (b*x^4 + a)^(1/4)/x
```

3.1003 $\int \frac{\sqrt[4]{a+bx^4}}{x^6}\,dx$

Optimal. Leaf size=21

$$-\frac{\left(a+bx^4\right)^{5/4}}{5ax^5}$$

```
[Out] -(a + b*x^4)^(5/4)/(5*a*x^5)
```

Rubi [A] time = 0.0191385, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{\left(a+bx^4\right)^{5/4}}{5ax^5}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^4)^(1/4)/x^6,x]
```

```
[Out] -(a + b*x^4)^(5/4)/(5*a*x^5)
```

Rubi in Sympy [A] time = 2.77387, size = 17, normalized size = 0.81

$$-\frac{\left(a+bx^4\right)^{\frac{5}{4}}}{5ax^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**4+a)**(1/4)/x**6,x)
```

```
[Out] -(a + b*x**4)**(5/4)/(5*a*x**5)
```

Mathematica [A] time = 0.0157086, size = 21, normalized size = 1.

$$-\frac{\left(a+bx^4\right)^{5/4}}{5ax^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^4)^(1/4)/x^6,x]
```

```
[Out] -(a + b*x^4)^(5/4)/(5*a*x^5)
```

Maple [A] time = 0.006, size = 18, normalized size = 0.9

$$-\frac{1}{5\,ax^5}\left(bx^4+a\right)^{\frac{5}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x^4+a)^(1/4)/x^6,x)
```

```
[Out] -1/5*(b*x^4+a)^(5/4)/a/x^5
```

Maxima [A] time = 1.43883, size = 23, normalized size = 1.1

$$-\frac{\left(bx^4+a\right)^{\frac{5}{4}}}{5\,ax^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^4 + a)^(1/4)/x^6,x, algorithm="maxima")
```

```
[Out] -1/5*(b*x^4 + a)^(5/4)/(a*x^5)
```

Fricas [A] time = 0.321182, size = 23, normalized size = 1.1

$$-\frac{\left(bx^4+a\right)^{\frac{5}{4}}}{5\,ax^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^4 + a)^(1/4)/x^6,x, algorithm="fricas")
```

```
[Out] -1/5*(b*x^4 + a)^(5/4)/(a*x^5)
```

Sympy [A] time = 3.20061, size = 68, normalized size = 3.24

$$\frac{\sqrt[4]{b}\sqrt[4]{\frac{a}{bx^4}+1}\,\Gamma\left(-\frac{5}{4}\right)}{4x^4\,\Gamma\left(-\frac{1}{4}\right)}+\frac{b^{\frac{5}{4}}\sqrt[4]{\frac{a}{bx^4}+1}\,\Gamma\left(-\frac{5}{4}\right)}{4a\,\Gamma\left(-\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x**4+a)**(1/4)/x**6,x)
```

```
[Out] b**(1/4)*(a/(b*x**4) + 1)**(1/4)*gamma(-5/4)/(4*x**4*gamma(-1/4))
 + b**(5/4)*(a/(b*x**4) + 1)**(1/4)*gamma(-5/4)/(4*a*gamma(-1/4))
```

GIAC/XCAS [A] time = 0.223637, size = 32, normalized size = 1.52

$$-\frac{\left(bx^4+a\right)^{\frac{1}{4}}\left(b+\frac{a}{x^4}\right)}{5\,ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^4 + a)^(1/4)/x^6,x, algorithm="giac")
```

```
[Out] -1/5*(b*x^4 + a)^(1/4)*(b + a/x^4)/(a*x)
```

3.1004 $\int \frac{\sqrt[4]{a+bx^4}}{x^{10}}\,dx$

Optimal. Leaf size=44

$$\frac{4b\left(a+bx^4\right)^{5/4}}{45a^2x^5}-\frac{\left(a+bx^4\right)^{5/4}}{9ax^9}$$

```
[Out] -(a + b*x^4)^(5/4)/(9*a*x^9) + (4*b*(a + b*x^4)^(5/4))/(45*a^2*x^
5)
```

Rubi [A] time = 0.0395528, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{4b\left(a+bx^4\right)^{5/4}}{45a^2x^5}-\frac{\left(a+bx^4\right)^{5/4}}{9ax^9}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(1/4)/x^10,x]
```

```
[Out] -(a + b*x^4)^(5/4)/(9*a*x^9) + (4*b*(a + b*x^4)^(5/4))/(45*a^2*x^
5)
```

Rubi in Sympy [A] time = 4.27945, size = 37, normalized size = 0.84

$$-\frac{\left(a+bx^4\right)^{\frac{5}{4}}}{9ax^9}+\frac{4b\left(a+bx^4\right)^{\frac{5}{4}}}{45a^2x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(1/4)/x**10,x)
```

```
[Out] -(a + b*x**4)**(5/4)/(9*a*x**9) + 4*b*(a + b*x**4)**(5/4)/(45*a**
2*x**5)
```

Mathematica [A] time = 0.0227585, size = 41, normalized size = 0.93

$$-\frac{\sqrt[4]{a+bx^4}\left(5a^2+abx^4-4b^2x^8\right)}{45a^2x^9}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(1/4)/x^10,x]
```

```
[Out] -((a + b*x^4)^(1/4)*(5*a^2 + a*b*x^4 - 4*b^2*x^8))/(45*a^2*x^9)
```

Maple [A] time = 0.008, size = 28, normalized size = 0.6

$$-\frac{-4\,bx^4+5\,a}{45\,a^2x^9}\left(bx^4+a\right)^{\frac{5}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(1/4)/x^10,x)

[Out] -1/45*(b*x^4+a)^(5/4)*(-4*b*x^4+5*a)/a^2/x^9
```

Maxima [A] time = 1.44511, size = 47, normalized size = 1.07

$$\frac{\frac{9\,(bx^4+a)^{\frac{5}{4}}b}{x^5} - \frac{5\,(bx^4+a)^{\frac{9}{4}}}{x^9}}{45\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^10,x, algorithm="maxima")

[Out] 1/45*(9*(b*x^4 + a)^(5/4)*b/x^5 - 5*(b*x^4 + a)^(9/4)/x^9)/a^2
```

Fricas [A] time = 0.396605, size = 51, normalized size = 1.16

$$\frac{\left(4\,b^2x^8 - abx^4 - 5\,a^2\right)\left(bx^4 + a\right)^{\frac{1}{4}}}{45\,a^2x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^10,x, algorithm="fricas")

[Out] 1/45*(4*b^2*x^8 - a*b*x^4 - 5*a^2)*(b*x^4 + a)^(1/4)/(a^2*x^9)
```

Sympy [A] time = 7.10385, size = 109, normalized size = 2.48

$$-\frac{5\sqrt[4]{b}\sqrt[4]{\frac{a}{bx^4}+1}\,\Gamma\left(-\frac{9}{4}\right)}{16x^8\,\Gamma\left(-\frac{1}{4}\right)} - \frac{b^{\frac{5}{4}}\sqrt[4]{\frac{a}{bx^4}+1}\,\Gamma\left(-\frac{9}{4}\right)}{16ax^4\,\Gamma\left(-\frac{1}{4}\right)} + \frac{b^{\frac{9}{4}}\sqrt[4]{\frac{a}{bx^4}+1}\,\Gamma\left(-\frac{9}{4}\right)}{4a^2\,\Gamma\left(-\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(1/4)/x**10,x)

[Out] -5*b**(1/4)*(a/(b*x**4) + 1)**(1/4)*gamma(-9/4)/(16*x**8*gamma(-1
/4)) - b**(5/4)*(a/(b*x**4) + 1)**(1/4)*gamma(-9/4)/(16*a*x**4*ga
mma(-1/4)) + b**(9/4)*(a/(b*x**4) + 1)**(1/4)*gamma(-9/4)/(4*a**2
*gamma(-1/4))
```

GIAC/XCAS [A] time = 0.222465, size = 81, normalized size = 1.84

$$\frac{\frac{9\,(bx^4+a)^{\frac{1}{4}}\left(b+\frac{a}{x^4}\right)b}{x} - \frac{5\,\left(b^2x^8+2\,abx^4+a^2\right)\left(bx^4+a\right)^{\frac{1}{4}}}{x^9}}{45\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^10,x, algorithm="giac")

[Out] 1/45*(9*(b*x^4 + a)^(1/4)*(b + a/x^4)*b/x - 5*(b^2*x^8 + 2*a*b*x^
4 + a^2)*(b*x^4 + a)^(1/4)/x^9)/a^2
```

3.1005 $\int \frac{\sqrt[4]{a+bx^4}}{x^{14}} \, dx$

Optimal. Leaf size=68

$$-\frac{32b^2\left(a+bx^4\right)^{5/4}}{585a^3x^5}+\frac{8b\left(a+bx^4\right)^{5/4}}{117a^2x^9}-\frac{\left(a+bx^4\right)^{5/4}}{13ax^{13}}$$

```
[Out] -(a + b*x^4)^(5/4)/(13*a*x^13) + (8*b*(a + b*x^4)^(5/4))/(117*a^2
*x^9) - (32*b^2*(a + b*x^4)^(5/4))/(585*a^3*x^5)
```

Rubi [A] time = 0.0629874, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{32b^2\left(a+bx^4\right)^{5/4}}{585a^3x^5}+\frac{8b\left(a+bx^4\right)^{5/4}}{117a^2x^9}-\frac{\left(a+bx^4\right)^{5/4}}{13ax^{13}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(1/4)/x^14,x]
```

```
[Out] -(a + b*x^4)^(5/4)/(13*a*x^13) + (8*b*(a + b*x^4)^(5/4))/(117*a^2
*x^9) - (32*b^2*(a + b*x^4)^(5/4))/(585*a^3*x^5)
```

Rubi in Sympy [A] time = 6.66644, size = 61, normalized size = 0.9

$$-\frac{\left(a+bx^4\right)^{\frac{5}{4}}}{13ax^{13}}+\frac{8b\left(a+bx^4\right)^{\frac{5}{4}}}{117a^2x^9}-\frac{32b^2\left(a+bx^4\right)^{\frac{5}{4}}}{585a^3x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(1/4)/x**14,x)
```

```
[Out] -(a + b*x**4)**(5/4)/(13*a*x**13) + 8*b*(a + b*x**4)**(5/4)/(117*
a**2*x**9) - 32*b**2*(a + b*x**4)**(5/4)/(585*a**3*x**5)
```

Mathematica [A] time = 0.0296195, size = 53, normalized size = 0.78

$$-\frac{\sqrt[4]{a+bx^4}\left(45a^3+5a^2bx^4-8ab^2x^8+32b^3x^{12}\right)}{585a^3x^{13}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(1/4)/x^14,x]
```

```
[Out] -((a + b*x^4)^(1/4)*(45*a^3 + 5*a^2*b*x^4 - 8*a*b^2*x^8 + 32*b^3*
x^12))/(585*a^3*x^13)
```

Maple [A] time = 0.009, size = 39, normalized size = 0.6

$$-\frac{32\,b^2x^8-40\,abx^4+45\,a^2}{585\,x^{13}a^3}\left(bx^4+a\right)^{\frac{5}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(1/4)/x^14,x)
```

```
[Out] -1/585*(b*x^4+a)^(5/4)*(32*b^2*x^8-40*a*b*x^4+45*a^2)/x^13/a^3
```

Maxima [A] time = 1.43925, size = 70, normalized size = 1.03

$$-\frac{\frac{117\,(bx^4+a)^{\frac{5}{4}}b^2}{x^5}-\frac{130\,(bx^4+a)^{\frac{9}{4}}b}{x^9}+\frac{45\,(bx^4+a)^{\frac{13}{4}}}{x^{13}}}{585\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^14,x, algorithm="maxima")
```

```
[Out] -1/585*(117*(b*x^4 + a)^(5/4)*b^2/x^5 - 130*(b*x^4 + a)^(9/4)*b/x
^9 + 45*(b*x^4 + a)^(13/4)/x^13)/a^3
```

Fricas [A] time = 0.323688, size = 66, normalized size = 0.97

$$-\frac{\left(32\,b^3x^{12}-8\,ab^2x^8+5\,a^2bx^4+45\,a^3\right)\left(bx^4+a\right)^{\frac{1}{4}}}{585\,a^3x^{13}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^14,x, algorithm="fricas")
```

```
[Out] -1/585*(32*b^3*x^12 - 8*a*b^2*x^8 + 5*a^2*b*x^4 + 45*a^3)*(b*x^4
+ a)^(1/4)/(a^3*x^13)
```

Sympy [A] time = 15.7905, size = 520, normalized size = 7.65

$$\frac{45a^5b^{\frac{17}{4}}\sqrt[4]{\frac{a}{bx^4}+1}\,\Gamma\left(-\frac{13}{4}\right)}{64a^5b^4x^{12}\Gamma\left(-\frac{1}{4}\right)+128a^4b^5x^{16}\Gamma\left(-\frac{1}{4}\right)+64a^3b^6x^{20}\Gamma\left(-\frac{1}{4}\right)}+\frac{95a^4b^{\frac{21}{4}}x^4\sqrt[4]{\frac{a}{bx^4}+1}\,\Gamma\left(-\frac{13}{4}\right)}{64a^5b^4x^{12}\Gamma\left(-\frac{1}{4}\right)+128a^4b^5x^{16}\Gamma\left(-\frac{1}{4}\right)+64a^3b^6x^{20}\Gamma\left(-\frac{1}{4}\right)}+\frac{47a^3b^{\frac{25}{4}}x^8\sqrt[4]{\frac{a}{bx^4}+1}\,\Gamma\left(-\frac{13}{4}\right)}{64a^5b^4x^{12}\Gamma\left(-\frac{1}{4}\right)+128a^4b^5x^{16}\Gamma\left(-\frac{1}{4}\right)+64a^3b^6x^{20}\Gamma\left(-\frac{1}{4}\right)}+\frac{21a^2b^{\frac{29}{4}}x^{12}\sqrt[4]{\frac{a}{bx^4}+1}\,\Gamma\left(-\frac{13}{4}\right)}{64a^5b^4x^{12}\Gamma\left(-\frac{1}{4}\right)+128a^4b^5x^{16}\Gamma\left(-\frac{1}{4}\right)+64a^3b^6x^{20}\Gamma\left(-\frac{1}{4}\right)}+\frac{56ab^{\frac{33}{4}}x^{16}\sqrt[4]{\frac{a}{bx^4}+1}\,\Gamma\left(-\frac{13}{4}\right)}{64a^5b^4x^{12}\Gamma\left(-\frac{1}{4}\right)+128a^4b^5x^{16}\Gamma\left(-\frac{1}{4}\right)+64a^3b^6x^{20}\Gamma\left(-\frac{1}{4}\right)}+\frac{32b^{\frac{37}{4}}x^{20}\sqrt[4]{\frac{a}{bx^4}+1}\,\Gamma\left(-\frac{13}{4}\right)}{64a^5b^4x^{12}\Gamma\left(-\frac{1}{4}\right)+128a^4b^5x^{16}\Gamma\left(-\frac{1}{4}\right)+64a^3b^6x^{20}\Gamma\left(-\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(1/4)/x**14,x)
```

```
[Out] 45*a**5*b**(17/4)*(a/(b*x**4) + 1)**(1/4)*gamma(-13/4)/(64*a**5*b
**4*x**12*gamma(-1/4) + 128*a**4*b**5*x**16*gamma(-1/4) + 64*a**3
*b**6*x**20*gamma(-1/4)) + 95*a**4*b**(21/4)*x**4*(a/(b*x**4) + 1
)**(1/4)*gamma(-13/4)/(64*a**5*b**4*x**12*gamma(-1/4) + 128*a**4*
b**5*x**16*gamma(-1/4) + 64*a**3*b**6*x**20*gamma(-1/4)) + 47*a**
3*b**(25/4)*x**8*(a/(b*x**4) + 1)**(1/4)*gamma(-13/4)/(64*a**5*b*
*4*x**12*gamma(-1/4) + 128*a**4*b**5*x**16*gamma(-1/4) + 64*a**3*
b**6*x**20*gamma(-1/4)) + 21*a**2*b**(29/4)*x**12*(a/(b*x**4) + 1
)**(1/4)*gamma(-13/4)/(64*a**5*b**4*x**12*gamma(-1/4) + 128*a**4*
b**5*x**16*gamma(-1/4) + 64*a**3*b**6*x**20*gamma(-1/4)) + 56*a*b
**(33/4)*x**16*(a/(b*x**4) + 1)**(1/4)*gamma(-13/4)/(64*a**5*b**4
*x**12*gamma(-1/4) + 128*a**4*b**5*x**16*gamma(-1/4) + 64*a**3*b*
*6*x**20*gamma(-1/4)) + 32*b**(37/4)*x**20*(a/(b*x**4) + 1)**(1/4
)*gamma(-13/4)/(64*a**5*b**4*x**12*gamma(-1/4) + 128*a**4*b**5*x*
*16*gamma(-1/4) + 64*a**3*b**6*x**20*gamma(-1/4))
```

GIAC/XCAS [A] time = 0.222613, size = 143, normalized size = 2.1

$$-\frac{\frac{117\,(bx^4+a)^{\frac{1}{4}}\left(b+\frac{a}{x^4}\right)b^2}{x}-\frac{130\,(b^2x^8+2\,abx^4+a^2)\,(bx^4+a)^{\frac{1}{4}}\,b}{x^9}+\frac{45\,(b^3x^{12}+3\,ab^2x^8+3\,a^2bx^4+a^3)\,(bx^4+a)^{\frac{1}{4}}}{x^{13}}}{585\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^14,x, algorithm="giac")
```

```
[Out] -1/585*(117*(b*x^4 + a)^(1/4)*(b + a/x^4)*b^2/x - 130*(b^2*x^8 +
2*a*b*x^4 + a^2)*(b*x^4 + a)^(1/4)*b/x^9 + 45*(b^3*x^12 + 3*a*b^2
*x^8 + 3*a^2*b*x^4 + a^3)*(b*x^4 + a)^(1/4)/x^13)/a^3
```

3.1006 $\int \frac{\sqrt[4]{a+bx^4}}{x^{18}} \, dx$

Optimal. Leaf size=92

$$\frac{128b^3\left(a+bx^4\right)^{5/4}}{3315a^4x^5}-\frac{32b^2\left(a+bx^4\right)^{5/4}}{663a^3x^9}+\frac{12b\left(a+bx^4\right)^{5/4}}{221a^2x^{13}}-\frac{\left(a+bx^4\right)^{5/4}}{17ax^{17}}$$

```
[Out] -(a + b*x^4)^(5/4)/(17*a*x^17) + (12*b*(a + b*x^4)^(5/4))/(221*a^
2*x^13) - (32*b^2*(a + b*x^4)^(5/4))/(663*a^3*x^9) + (128*b^3*(a
+ b*x^4)^(5/4))/(3315*a^4*x^5)
```

Rubi [A] time = 0.089465, antiderivative size = 92, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{128b^3\left(a+bx^4\right)^{5/4}}{3315a^4x^5}-\frac{32b^2\left(a+bx^4\right)^{5/4}}{663a^3x^9}+\frac{12b\left(a+bx^4\right)^{5/4}}{221a^2x^{13}}-\frac{\left(a+bx^4\right)^{5/4}}{17ax^{17}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(1/4)/x^18,x]
```

```
[Out] -(a + b*x^4)^(5/4)/(17*a*x^17) + (12*b*(a + b*x^4)^(5/4))/(221*a^
2*x^13) - (32*b^2*(a + b*x^4)^(5/4))/(663*a^3*x^9) + (128*b^3*(a
+ b*x^4)^(5/4))/(3315*a^4*x^5)
```

Rubi in Sympy [A] time = 9.77249, size = 85, normalized size = 0.92

$$-\frac{\left(a+bx^4\right)^{\frac{5}{4}}}{17ax^{17}}+\frac{12b\left(a+bx^4\right)^{\frac{5}{4}}}{221a^2x^{13}}-\frac{32b^2\left(a+bx^4\right)^{\frac{5}{4}}}{663a^3x^9}+\frac{128b^3\left(a+bx^4\right)^{\frac{5}{4}}}{3315a^4x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(1/4)/x**18,x)
```

```
[Out] -(a + b*x**4)**(5/4)/(17*a*x**17) + 12*b*(a + b*x**4)**(5/4)/(221
*a**2*x**13) - 32*b**2*(a + b*x**4)**(5/4)/(663*a**3*x**9) + 128*
b**3*(a + b*x**4)**(5/4)/(3315*a**4*x**5)
```

Mathematica [A] time = 0.0407918, size = 64, normalized size = 0.7

$$-\frac{\sqrt[4]{a+bx^4}\left(195a^4+15a^3bx^4-20a^2b^2x^8+32ab^3x^{12}-128b^4x^{16}\right)}{3315a^4x^{17}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(1/4)/x^18,x]
```

```
[Out] -((a + b*x^4)^(1/4)*(195*a^4 + 15*a^3*b*x^4 - 20*a^2*b^2*x^8 + 32
*a*b^3*x^12 - 128*b^4*x^16))/(3315*a^4*x^17)
```

Maple [A] time = 0.01, size = 50, normalized size = 0.5

$$-\frac{-128\,b^3x^{12}+160\,ab^2x^8-180\,a^2bx^4+195\,a^3}{3315\,x^{17}a^4}\left(bx^4+a\right)^{\frac{5}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(1/4)/x^18,x)
```

```
[Out] -1/3315*(b*x^4+a)^(5/4)*(-128*b^3*x^12+160*a*b^2*x^8-180*a^2*b*x^
4+195*a^3)/x^17/a^4
```

Maxima [A] time = 1.43837, size = 93, normalized size = 1.01

$$\frac{\frac{663\,(bx^4+a)^{\frac{5}{4}}b^3}{x^5} - \frac{1105\,(bx^4+a)^{\frac{9}{4}}b^2}{x^9} + \frac{765\,(bx^4+a)^{\frac{13}{4}}b}{x^{13}} - \frac{195\,(bx^4+a)^{\frac{17}{4}}}{x^{17}}}{3315\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^18,x, algorithm="maxima")
```

```
[Out] 1/3315*(663*(b*x^4 + a)^(5/4)*b^3/x^5 - 1105*(b*x^4 + a)^(9/4)*b^
2/x^9 + 765*(b*x^4 + a)^(13/4)*b/x^13 - 195*(b*x^4 + a)^(17/4)/x^
17)/a^4
```

Fricas [A] time = 0.342867, size = 81, normalized size = 0.88

$$\frac{\left(128\,b^4x^{16} - 32\,ab^3x^{12} + 20\,a^2b^2x^8 - 15\,a^3bx^4 - 195\,a^4\right)\left(bx^4 + a\right)^{\frac{1}{4}}}{3315\,a^4x^{17}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^18,x, algorithm="fricas")
```

```
[Out] 1/3315*(128*b^4*x^16 - 32*a*b^3*x^12 + 20*a^2*b^2*x^8 - 15*a^3*b*
x^4 - 195*a^4)*(b*x^4 + a)^(1/4)/(a^4*x^17)
```

Sympy [A] time = 31.6228, size = 847, normalized size = 9.21

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(1/4)/x**18,x)
```

```
[Out] -585*a**7*b**(37/4)*(a/(b*x**4) + 1)**(1/4)*gamma(-17/4)/(256*a**
7*b**9*x**16*gamma(-1/4) + 768*a**6*b**10*x**20*gamma(-1/4) + 768
*a**5*b**11*x**24*gamma(-1/4) + 256*a**4*b**12*x**28*gamma(-1/4))
 - 1800*a**6*b**(41/4)*x**4*(a/(b*x**4) + 1)**(1/4)*gamma(-17/4)/
(256*a**7*b**9*x**16*gamma(-1/4) + 768*a**6*b**10*x**20*gamma(-1/
4) + 768*a**5*b**11*x**24*gamma(-1/4) + 256*a**4*b**12*x**28*gamm
a(-1/4)) - 1830*a**5*b**(45/4)*x**8*(a/(b*x**4) + 1)**(1/4)*gamma
(-17/4)/(256*a**7*b**9*x**16*gamma(-1/4) + 768*a**6*b**10*x**20*g
amma(-1/4) + 768*a**5*b**11*x**24*gamma(-1/4) + 256*a**4*b**12*x*
*28*gamma(-1/4)) - 636*a**4*b**(49/4)*x**12*(a/(b*x**4) + 1)**(1/
4)*gamma(-17/4)/(256*a**7*b**9*x**16*gamma(-1/4) + 768*a**6*b**10
*x**20*gamma(-1/4) + 768*a**5*b**11*x**24*gamma(-1/4) + 256*a**4*
b**12*x**28*gamma(-1/4)) + 231*a**3*b**(53/4)*x**16*(a/(b*x**4) +
 1)**(1/4)*gamma(-17/4)/(256*a**7*b**9*x**16*gamma(-1/4) + 768*a*
*6*b**10*x**20*gamma(-1/4) + 768*a**5*b**11*x**24*gamma(-1/4) + 2
56*a**4*b**12*x**28*gamma(-1/4)) + 924*a**2*b**(57/4)*x**20*(a/(b
*x**4) + 1)**(1/4)*gamma(-17/4)/(256*a**7*b**9*x**16*gamma(-1/4)
+ 768*a**6*b**10*x**20*gamma(-1/4) + 768*a**5*b**11*x**24*gamma(-
```

```
1/4) + 256*a**4*b**12*x**28*gamma(-1/4)) + 1056*a*b**(61/4)*x**24
*(a/(b*x**4) + 1)**(1/4)*gamma(-17/4)/(256*a**7*b**9*x**16*gamma(
-1/4) + 768*a**6*b**10*x**20*gamma(-1/4) + 768*a**5*b**11*x**24*g
amma(-1/4) + 256*a**4*b**12*x**28*gamma(-1/4)) + 384*b**(65/4)*x*
*28*(a/(b*x**4) + 1)**(1/4)*gamma(-17/4)/(256*a**7*b**9*x**16*gam
ma(-1/4) + 768*a**6*b**10*x**20*gamma(-1/4) + 768*a**5*b**11*x**2
4*gamma(-1/4) + 256*a**4*b**12*x**28*gamma(-1/4))
```

GIAC/XCAS [A] time = 0.223274, size = 220, normalized size = 2.39

$$\frac{\frac{663\,(bx^4+a)^{\frac{1}{4}}\left(b+\frac{a}{x^4}\right)b^3}{x}-\frac{1105\,(b^2x^8+2\,abx^4+a^2)\,(bx^4+a)^{\frac{1}{4}}\,b^2}{x^9}+\frac{765\,(b^3x^{12}+3\,ab^2x^8+3\,a^2bx^4+a^3)\,(bx^4+a)^{\frac{1}{4}}\,b}{x^{13}}-\frac{195\,(b^4x^{16}+4\,ab^3x^{12}+6\,a^2b^2x^8+4\,a^3bx^4+a^4)\,(bx^4+a)^{\frac{1}{4}}}{x^{17}}}{3315\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^18,x, algorithm="giac")
```

```
[Out] 1/3315*(663*(b*x^4 + a)^(1/4)*(b + a/x^4)*b^3/x - 1105*(b^2*x^8 +
 2*a*b*x^4 + a^2)*(b*x^4 + a)^(1/4)*b^2/x^9 + 765*(b^3*x^12 + 3*a
*b^2*x^8 + 3*a^2*b*x^4 + a^3)*(b*x^4 + a)^(1/4)*b/x^13 - 195*(b^4
*x^16 + 4*a*b^3*x^12 + 6*a^2*b^2*x^8 + 4*a^3*b*x^4 + a^4)*(b*x^4
+ a)^(1/4)/x^17)/a^4
```

3.1007 $\int x^{12}\sqrt[4]{a+bx^4}\,dx$

Optimal. Leaf size=150

$$\frac{3a^{7/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{112b^{5/2}\left(a+bx^4\right)^{3/4}}+\frac{3a^3x\sqrt[4]{a+bx^4}}{112b^3}-\frac{3a^2x^5\sqrt[4]{a+bx^4}}{280b^2}+\frac{1}{14}x^{13}\sqrt[4]{a+bx^4}+\frac{ax^9\sqrt[4]{a+bx^4}}{140b}$$

```
[Out] (3*a^3*x*(a + b*x^4)^(1/4))/(112*b^3) - (3*a^2*x^5*(a + b*x^4)^(1
/4))/(280*b^2) + (a*x^9*(a + b*x^4)^(1/4))/(140*b) + (x^13*(a + b
*x^4)^(1/4))/14 + (3*a^(7/2)*(1 + a/(b*x^4))^(3/4)*x^3*EllipticF[
ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(112*b^(5/2)*(a + b*x^4)^(3/
4))
```

Rubi [A] time = 0.21413, antiderivative size = 150, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$\frac{3a^{7/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{112b^{5/2}\left(a+bx^4\right)^{3/4}}+\frac{3a^3x\sqrt[4]{a+bx^4}}{112b^3}-\frac{3a^2x^5\sqrt[4]{a+bx^4}}{280b^2}+\frac{1}{14}x^{13}\sqrt[4]{a+bx^4}+\frac{ax^9\sqrt[4]{a+bx^4}}{140b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^12*(a + b*x^4)^(1/4),x]
```

```
[Out] (3*a^3*x*(a + b*x^4)^(1/4))/(112*b^3) - (3*a^2*x^5*(a + b*x^4)^(1
/4))/(280*b^2) + (a*x^9*(a + b*x^4)^(1/4))/(140*b) + (x^13*(a + b
*x^4)^(1/4))/14 + (3*a^(7/2)*(1 + a/(b*x^4))^(3/4)*x^3*EllipticF[
ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(112*b^(5/2)*(a + b*x^4)^(3/
4))
```

Rubi in Sympy [A] time = 23.3381, size = 136, normalized size = 0.91

$$\frac{3a^{\frac{7}{2}}x^3\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{112b^{\frac{5}{2}}\left(a+bx^4\right)^{\frac{3}{4}}}+\frac{3a^3x\sqrt[4]{a+bx^4}}{112b^3}-\frac{3a^2x^5\sqrt[4]{a+bx^4}}{280b^2}+\frac{ax^9\sqrt[4]{a+bx^4}}{140b}+\frac{x^{13}\sqrt[4]{a+bx^4}}{14}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**12*(b*x**4+a)**(1/4),x)
```

```
[Out] 3*a**(7/2)*x**3*(a/(b*x**4) + 1)**(3/4)*elliptic_f(atan(sqrt(a)/(
sqrt(b)*x**2))/2, 2)/(112*b**(5/2)*(a + b*x**4)**(3/4)) + 3*a**3*
x*(a + b*x**4)**(1/4)/(112*b**3) - 3*a**2*x**5*(a + b*x**4)**(1/4
)/(280*b**2) + a*x**9*(a + b*x**4)**(1/4)/(140*b) + x**13*(a + b*
x**4)**(1/4)/14
```

Mathematica [C] time = 0.0591345, size = 101, normalized size = 0.67

$$\frac{-15a^4x\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};-\frac{bx^4}{a}\right)+15a^4x+9a^3bx^5-2a^2b^2x^9+44ab^3x^{13}+40b^4x^{17}}{560b^3\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^12*(a + b*x^4)^(1/4),x]
```

```
[Out] (15*a^4*x + 9*a^3*b*x^5 - 2*a^2*b^2*x^9 + 44*a*b^3*x^13 + 40*b^4*
x^17 - 15*a^4*x*(1 + (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/4, 3/4,
 5/4, -((b*x^4)/a)])/(560*b^3*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.043, size = 0, normalized size = 0.

$$\int x^{12} \sqrt[4]{b x^4 + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^12*(b*x^4+a)^(1/4),x)
```

```
[Out] int(x^12*(b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b x^4 + a\right)^{\frac{1}{4}} x^{12}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^12,x, algorithm="maxima")
```

```
[Out] integrate((b*x^4 + a)^(1/4)*x^12, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\left(b x^4 + a\right)^{\frac{1}{4}} x^{12}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^12,x, algorithm="fricas")
```

```
[Out] integral((b*x^4 + a)^(1/4)*x^12, x)
```

Sympy [A] time = 9.95379, size = 39, normalized size = 0.26

$$\frac{\sqrt[4]{a} x^{13} \Gamma\left(\frac{13}{4}\right) {}_{2}F_{1}\left(\begin{matrix} -\frac{1}{4}, \frac{13}{4} \\ \frac{17}{4} \end{matrix}\middle| \frac{b x^4 e^{i\pi}}{a}\right)}{4 \Gamma\left(\frac{17}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**12*(b*x**4+a)**(1/4),x)
```

```
[Out] a**(1/4)*x**13*gamma(13/4)*hyper((-1/4, 13/4), (17/4,), b*x**4*ex
p_polar(I*pi)/a)/(4*gamma(17/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bx^4+a\right)^{\frac{1}{4}}x^{12}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^12,x, algorithm="giac")

[Out] integrate((b*x^4 + a)^(1/4)*x^12, x)
```

3.1008 $\int x^8 \sqrt[4]{a+bx^4}\,dx$

Optimal. Leaf size=126

$$-\frac{a^{5/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{24b^{3/2}\left(a+bx^4\right)^{3/4}}-\frac{a^2x\sqrt[4]{a+bx^4}}{24b^2}+\frac{1}{10}x^9\sqrt[4]{a+bx^4}+\frac{ax^5\sqrt[4]{a+bx^4}}{60b}$$

```
[Out] -(a^2*x*(a + b*x^4)^(1/4))/(24*b^2) + (a*x^5*(a + b*x^4)^(1/4))/(
60*b) + (x^9*(a + b*x^4)^(1/4))/10 - (a^(5/2)*(1 + a/(b*x^4))^(3/
4)*x^3*EllipticF[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(24*b^(3/2)
*(a + b*x^4)^(3/4))
```

Rubi [A] time = 0.157981, antiderivative size = 126, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$-\frac{a^{5/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{24b^{3/2}\left(a+bx^4\right)^{3/4}}-\frac{a^2x\sqrt[4]{a+bx^4}}{24b^2}+\frac{1}{10}x^9\sqrt[4]{a+bx^4}+\frac{ax^5\sqrt[4]{a+bx^4}}{60b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8*(a + b*x^4)^(1/4),x]
```

```
[Out] -(a^2*x*(a + b*x^4)^(1/4))/(24*b^2) + (a*x^5*(a + b*x^4)^(1/4))/(
60*b) + (x^9*(a + b*x^4)^(1/4))/10 - (a^(5/2)*(1 + a/(b*x^4))^(3/
4)*x^3*EllipticF[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(24*b^(3/2)
*(a + b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 18.7508, size = 109, normalized size = 0.87

$$-\frac{a^{\frac{5}{2}}x^3\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{24b^{\frac{3}{2}}\left(a+bx^4\right)^{\frac{3}{4}}}-\frac{a^2x\sqrt[4]{a+bx^4}}{24b^2}+\frac{ax^5\sqrt[4]{a+bx^4}}{60b}+\frac{x^9\sqrt[4]{a+bx^4}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8*(b*x**4+a)**(1/4),x)
```

```
[Out] -a**(5/2)*x**3*(a/(b*x**4) + 1)**(3/4)*elliptic_f(atan(sqrt(a)/(s
qrt(b)*x**2))/2, 2)/(24*b**(3/2)*(a + b*x**4)**(3/4)) - a**2*x*(a
 + b*x**4)**(1/4)/(24*b**2) + a*x**5*(a + b*x**4)**(1/4)/(60*b) +
 x**9*(a + b*x**4)**(1/4)/10
```

Mathematica [C] time = 0.0466148, size = 90, normalized size = 0.71

$$\frac{5a^3x\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};-\frac{bx^4}{a}\right)-5a^3x-3a^2bx^5+14ab^2x^9+12b^3x^{13}}{120b^2\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8*(a + b*x^4)^(1/4),x]
```

```
[Out] (-5*a^3*x - 3*a^2*b*x^5 + 14*a*b^2*x^9 + 12*b^3*x^13 + 5*a^3*x*(1
 + (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/4, 3/4, 5/4, -((b*x^4)/a)
```

```
])/(120*b^2*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.037, size = 0, normalized size = 0.

$$\int x^8 \sqrt[4]{b x^4 + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8*(b*x^4+a)^(1/4),x)
```

```
[Out] int(x^8*(b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b x^4 + a\right)^{\frac{1}{4}} x^8\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^8,x, algorithm="maxima")
```

```
[Out] integrate((b*x^4 + a)^(1/4)*x^8, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(b x^4 + a\right)^{\frac{1}{4}} x^8, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^8,x, algorithm="fricas")
```

```
[Out] integral((b*x^4 + a)^(1/4)*x^8, x)
```

Sympy [A] time = 5.04039, size = 39, normalized size = 0.31

$$\frac{\sqrt[4]{a} x^9 \Gamma\left(\frac{9}{4}\right) {}_2F_1\left(\left.\begin{matrix} -\frac{1}{4}, \frac{9}{4} \\ \frac{13}{4} \end{matrix}\right| \frac{b x^4 e^{i\pi}}{a}\right)}{4 \Gamma\left(\frac{13}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8*(b*x**4+a)**(1/4),x)
```

```
[Out] a**(1/4)*x**9*gamma(9/4)*hyper((-1/4, 9/4), (13/4,), b*x**4*exp_p
olar(I*pi)/a)/(4*gamma(13/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b x^4 + a\right)^{\frac{1}{4}} x^8\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^8,x, algorithm="giac")

[Out] integrate((b*x^4 + a)^(1/4)*x^8, x)
```

3.1009 $\int x^4\sqrt[4]{a+bx^4}\,dx$

Optimal. Leaf size=102

$$\frac{a^{3/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{12\sqrt{b}\left(a+bx^4\right)^{3/4}}+\frac{ax\sqrt[4]{a+bx^4}}{12b}+\frac{1}{6}x^5\sqrt[4]{a+bx^4}$$

```
[Out] (a*x*(a + b*x^4)^(1/4))/(12*b) + (x^5*(a + b*x^4)^(1/4))/6 + (a^(
3/2)*(1 + a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCot[(Sqrt[b]*x^2)/Sqr
t[a]]/2, 2])/(12*Sqrt[b]*(a + b*x^4)^(3/4))
```

Rubi [A] time = 0.127131, antiderivative size = 102, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$\frac{a^{3/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{12\sqrt{b}\left(a+bx^4\right)^{3/4}}+\frac{ax\sqrt[4]{a+bx^4}}{12b}+\frac{1}{6}x^5\sqrt[4]{a+bx^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4*(a + b*x^4)^(1/4),x]
```

```
[Out] (a*x*(a + b*x^4)^(1/4))/(12*b) + (x^5*(a + b*x^4)^(1/4))/6 + (a^(
3/2)*(1 + a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCot[(Sqrt[b]*x^2)/Sqr
t[a]]/2, 2])/(12*Sqrt[b]*(a + b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 15.1155, size = 87, normalized size = 0.85

$$\frac{a^{\frac{3}{2}}x^3\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{12\sqrt{b}\left(a+bx^4\right)^{\frac{3}{4}}}+\frac{ax\sqrt[4]{a+bx^4}}{12b}+\frac{x^5\sqrt[4]{a+bx^4}}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4*(b*x**4+a)**(1/4),x)
```

```
[Out] a**(3/2)*x**3*(a/(b*x**4) + 1)**(3/4)*elliptic_f(atan(sqrt(a)/(sq
rt(b)*x**2))/2, 2)/(12*sqrt(b)*(a + b*x**4)**(3/4)) + a*x*(a + b*
x**4)**(1/4)/(12*b) + x**5*(a + b*x**4)**(1/4)/6
```

Mathematica [C] time = 0.0496351, size = 76, normalized size = 0.75

$$\frac{x\left(-a^2\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};-\frac{bx^4}{a}\right)+a^2+3abx^4+2b^2x^8\right)}{12b\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4*(a + b*x^4)^(1/4),x]
```

```
[Out] (x*(a^2 + 3*a*b*x^4 + 2*b^2*x^8 - a^2*(1 + (b*x^4)/a)^(3/4)*Hyper
geometric2F1[1/4, 3/4, 5/4, -((b*x^4)/a)]))/(12*b*(a + b*x^4)^(3/
4))
```

Maple [F] time = 0.036, size = 0, normalized size = 0.

$$\int x^{4} \sqrt[4]{b x^{4}+a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4*(b*x^4+a)^(1/4),x)

[Out] int(x^4*(b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int {\left(b x^{4} + a\right)}^{\frac{1}{4}} x^{4}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^4,x, algorithm="maxima")

[Out] integrate((b*x^4 + a)^(1/4)*x^4, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$${\rm integral}\left({\left(b x^{4} + a\right)}^{\frac{1}{4}} x^{4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^4,x, algorithm="fricas")

[Out] integral((b*x^4 + a)^(1/4)*x^4, x)
```

Sympy [A] time = 2.91306, size = 39, normalized size = 0.38

$$\frac{\sqrt[4]{a} x^{5} \Gamma\left(\frac{5}{4}\right) {{}_{2}F_{1}\left(\begin{matrix} - \frac{1}{4}, \frac{5}{4} \\ \frac{9}{4} \end{matrix}\middle| {\frac{b x^{4} e^{i \pi}}{a}} \right)}}{4 \Gamma\left(\frac{9}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4*(b*x**4+a)**(1/4),x)

[Out] a**(1/4)*x**5*gamma(5/4)*hyper((-1/4, 5/4), (9/4,), b*x**4*exp_po
lar(I*pi)/a)/(4*gamma(9/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int {\left(b x^{4} + a\right)}^{\frac{1}{4}} x^{4}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)*x^4,x, algorithm="giac")

[Out] integrate((b*x^4 + a)^(1/4)*x^4, x)
```

3.1010 $\int \sqrt[4]{a+bx^4}\,dx$

Optimal. Leaf size=80

$$\frac{1}{2}x\sqrt[4]{a+bx^4}-\frac{\sqrt{a}\sqrt{b}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{2\left(a+bx^4\right)^{3/4}}$$

```
[Out] (x*(a + b*x^4)^(1/4))/2 - (Sqrt[a]*Sqrt[b]*(1 + a/(b*x^4))^(3/4)*
x^3*EllipticF[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(2*(a + b*x^4)
^(3/4))
```

Rubi [A] time = 0.0894522, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.454

$$\frac{1}{2}x\sqrt[4]{a+bx^4}-\frac{\sqrt{a}\sqrt{b}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{2\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(1/4),x]
```

```
[Out] (x*(a + b*x^4)^(1/4))/2 - (Sqrt[a]*Sqrt[b]*(1 + a/(b*x^4))^(3/4)*
x^3*EllipticF[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(2*(a + b*x^4)
^(3/4))
```

Rubi in Sympy [A] time = 9.97951, size = 68, normalized size = 0.85

$$-\frac{\sqrt{a}\sqrt{b}x^3\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{2\left(a+bx^4\right)^{\frac{3}{4}}}+\frac{x\sqrt[4]{a+bx^4}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(1/4),x)
```

```
[Out] -sqrt(a)*sqrt(b)*x**3*(a/(b*x**4) + 1)**(3/4)*elliptic_f(atan(sqr
t(a)/(sqrt(b)*x**2))/2, 2)/(2*(a + b*x**4)**(3/4)) + x*(a + b*x**
4)**(1/4)/2
```

Mathematica [C] time = 0.038468, size = 58, normalized size = 0.72

$$\frac{x\left(a\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};-\frac{bx^4}{a}\right)+a+bx^4\right)}{2\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(1/4),x]
```

```
[Out] (x*(a + b*x^4 + a*(1 + (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/4, 3/
4, 5/4, -((b*x^4)/a)]))/(2*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.045, size = 0, normalized size = 0.

$$\int \sqrt[4]{bx^4 + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(1/4),x)

[Out] int((b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^4 + a)^{\frac{1}{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4),x, algorithm="maxima")

[Out] integrate((b*x^4 + a)^(1/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left((bx^4 + a)^{\frac{1}{4}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4),x, algorithm="fricas")

[Out] integral((b*x^4 + a)^(1/4), x)
```

Sympy [A] time = 2.29438, size = 37, normalized size = 0.46

$$\frac{\sqrt[4]{a}x\,\Gamma\left(\frac{1}{4}\right){}_2F_1\left(\begin{matrix}-\frac{1}{4},\frac{1}{4}\\ \frac{5}{4}\end{matrix}\middle|\frac{bx^4e^{i\pi}}{a}\right)}{4\,\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(1/4),x)

[Out] a**(1/4)*x*gamma(1/4)*hyper((-1/4, 1/4), (5/4,), b*x**4*exp_polar
(I*pi)/a)/(4*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^4 + a)^{\frac{1}{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4),x, algorithm="giac")

[Out] integrate((b*x^4 + a)^(1/4), x)
```

3.1011 $\int \frac{\sqrt[4]{a+bx^4}}{x^4}\,dx$

Optimal. Leaf size=82

$$-\frac{b^{3/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{3\sqrt{a}\,(a+bx^4)^{3/4}}-\frac{\sqrt[4]{a+bx^4}}{3x^3}$$

```
[Out] -(a + b*x^4)^(1/4)/(3*x^3) - (b^(3/2)*(1 + a/(b*x^4))^(3/4)*x^3*E
llipticF[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(3*Sqrt[a]*(a + b*x
^4)^(3/4))
```

Rubi [A] time = 0.0993653, antiderivative size = 82, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{b^{3/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{3\sqrt{a}\,(a+bx^4)^{3/4}}-\frac{\sqrt[4]{a+bx^4}}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(1/4)/x^4,x]
```

```
[Out] -(a + b*x^4)^(1/4)/(3*x^3) - (b^(3/2)*(1 + a/(b*x^4))^(3/4)*x^3*E
llipticF[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(3*Sqrt[a]*(a + b*x
^4)^(3/4))
```

Rubi in Sympy [A] time = 11.4854, size = 71, normalized size = 0.87

$$-\frac{\sqrt[4]{a+bx^4}}{3x^3}-\frac{b^{\frac{3}{2}}x^3\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{3\sqrt{a}\,(a+bx^4)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(1/4)/x**4,x)
```

```
[Out] -(a + b*x**4)**(1/4)/(3*x**3) - b**(3/2)*x**3*(a/(b*x**4) + 1)**(
3/4)*elliptic_f(atan(sqrt(a)/(sqrt(b)*x**2))/2, 2)/(3*sqrt(a)*(a
+ b*x**4)**(3/4))
```

Mathematica [C] time = 0.0396075, size = 66, normalized size = 0.8

$$\frac{bx^4\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};-\frac{bx^4}{a}\right)-a-bx^4}{3x^3\,(a+bx^4)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(1/4)/x^4,x]
```

```
[Out] (-a - b*x^4 + b*x^4*(1 + (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/4,
3/4, 5/4, -((b*x^4)/a)])/(3*x^3*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.041, size = 0, normalized size = 0.

$$\int \frac{1}{x^4}\sqrt[4]{bx^4+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(1/4)/x^4,x)

[Out] int((b*x^4+a)^(1/4)/x^4,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^4+a)^{\frac{1}{4}}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^4,x, algorithm="maxima")

[Out] integrate((b*x^4 + a)^(1/4)/x^4, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(bx^4+a)^{\frac{1}{4}}}{x^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^4,x, algorithm="fricas")

[Out] integral((b*x^4 + a)^(1/4)/x^4, x)
```

Sympy [A] time = 3.01266, size = 31, normalized size = 0.38

$$-\frac{\sqrt[4]{b}\,{}_2F_1\left(\begin{matrix}-\frac{1}{4},\frac{1}{2}\\ \frac{3}{2}\end{matrix}\middle|\frac{ae^{i\pi}}{bx^4}\right)}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(1/4)/x**4,x)

[Out] -b**(1/4)*hyper((-1/4, 1/2), (3/2,), a*exp_polar(I*pi)/(b*x**4))/
(2*x**2)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^4+a)^{\frac{1}{4}}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^4,x, algorithm="giac")

[Out] integrate((b*x^4 + a)^(1/4)/x^4, x)
```

3.1012 $\int \frac{\sqrt[4]{a+bx^4}}{x^8}\,dx$

Optimal. Leaf size=104

$$\frac{2b^{5/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{21a^{3/2}\left(a+bx^4\right)^{3/4}}-\frac{\sqrt[4]{a+bx^4}}{7x^7}-\frac{b\sqrt[4]{a+bx^4}}{21ax^3}$$

```
[Out] -(a + b*x^4)^(1/4)/(7*x^7) - (b*(a + b*x^4)^(1/4))/(21*a*x^3) + (
2*b^(5/2)*(1 + a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCot[(Sqrt[b]*x^2
)/Sqrt[a]]/2, 2])/(21*a^(3/2)*(a + b*x^4)^(3/4))
```

Rubi [A] time = 0.128622, antiderivative size = 104, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$\frac{2b^{5/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{21a^{3/2}\left(a+bx^4\right)^{3/4}}-\frac{\sqrt[4]{a+bx^4}}{7x^7}-\frac{b\sqrt[4]{a+bx^4}}{21ax^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^4)^(1/4)/x^8,x]
```

```
[Out] -(a + b*x^4)^(1/4)/(7*x^7) - (b*(a + b*x^4)^(1/4))/(21*a*x^3) + (
2*b^(5/2)*(1 + a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCot[(Sqrt[b]*x^2
)/Sqrt[a]]/2, 2])/(21*a^(3/2)*(a + b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 14.9674, size = 90, normalized size = 0.87

$$-\frac{\sqrt[4]{a+bx^4}}{7x^7}-\frac{b\sqrt[4]{a+bx^4}}{21ax^3}+\frac{2b^{\frac{5}{2}}x^3\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{21a^{\frac{3}{2}}\left(a+bx^4\right)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**4+a)**(1/4)/x**8,x)
```

```
[Out] -(a + b*x**4)**(1/4)/(7*x**7) - b*(a + b*x**4)**(1/4)/(21*a*x**3)
 + 2*b**(5/2)*x**3*(a/(b*x**4) + 1)**(3/4)*elliptic_f(atan(sqrt(a
)/(sqrt(b)*x**2))/2, 2)/(21*a**(3/2)*(a + b*x**4)**(3/4))
```

Mathematica [C] time = 0.0446194, size = 83, normalized size = 0.8

$$\frac{-3a^2-2b^2x^8\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};-\frac{bx^4}{a}\right)-4abx^4-b^2x^8}{21ax^7\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^4)^(1/4)/x^8,x]
```

```
[Out] (-3*a^2 - 4*a*b*x^4 - b^2*x^8 - 2*b^2*x^8*(1 + (b*x^4)/a)^(3/4)*H
ypergeometric2F1[1/4, 3/4, 5/4, -((b*x^4)/a)])/(21*a*x^7*(a + b*x
^4)^(3/4))
```

Maple [F] time = 0.046, size = 0, normalized size = 0.

$$\int \frac{1}{x^8}\sqrt[4]{bx^4+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x^4+a)^(1/4)/x^8,x)

[Out] int((b*x^4+a)^(1/4)/x^8,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^4+a)^{\frac{1}{4}}}{x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^4 + a)^(1/4)/x^8,x, algorithm="maxima")

[Out] integrate((b*x^4 + a)^(1/4)/x^8, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(bx^4+a)^{\frac{1}{4}}}{x^8}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^4 + a)^(1/4)/x^8,x, algorithm="fricas")

[Out] integral((b*x^4 + a)^(1/4)/x^8, x)
```

Sympy [A] time = 5.30616, size = 31, normalized size = 0.3

$$-\frac{\sqrt[4]{b}\,{}_2F_1\left(\begin{matrix} -\frac{1}{4}, \frac{3}{2} \\ \frac{5}{2} \end{matrix}\middle| \frac{ae^{i\pi}}{bx^4}\right)}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x**4+a)**(1/4)/x**8,x)

[Out] -b**(1/4)*hyper((-1/4, 3/2), (5/2,), a*exp_polar(I*pi)/(b*x**4))/
(6*x**6)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^4+a)^{\frac{1}{4}}}{x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^8,x, algorithm="giac")

[Out] integrate((b*x^4 + a)^(1/4)/x^8, x)
```

3.1013 $\int \frac{\sqrt[4]{a+bx^4}}{x^{12}}\,dx$

Optimal. Leaf size=128

$$-\frac{4b^{7/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{77a^{5/2}\left(a+bx^4\right)^{3/4}}+\frac{2b^2\sqrt[4]{a+bx^4}}{77a^2x^3}-\frac{\sqrt[4]{a+bx^4}}{11x^{11}}-\frac{b\sqrt[4]{a+bx^4}}{77ax^7}$$

```
[Out] -(a + b*x^4)^(1/4)/(11*x^11) - (b*(a + b*x^4)^(1/4))/(77*a*x^7) +
 (2*b^2*(a + b*x^4)^(1/4))/(77*a^2*x^3) - (4*b^(7/2)*(1 + a/(b*x^
4))^(3/4)*x^3*EllipticF[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(77*
a^(5/2)*(a + b*x^4)^(3/4))
```

Rubi [A] time = 0.159284, antiderivative size = 128, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.4$

$$-\frac{4b^{7/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{77a^{5/2}\left(a+bx^4\right)^{3/4}}+\frac{2b^2\sqrt[4]{a+bx^4}}{77a^2x^3}-\frac{\sqrt[4]{a+bx^4}}{11x^{11}}-\frac{b\sqrt[4]{a+bx^4}}{77ax^7}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(1/4)/x^12,x]
```

```
[Out] -(a + b*x^4)^(1/4)/(11*x^11) - (b*(a + b*x^4)^(1/4))/(77*a*x^7) +
 (2*b^2*(a + b*x^4)^(1/4))/(77*a^2*x^3) - (4*b^(7/2)*(1 + a/(b*x^
4))^(3/4)*x^3*EllipticF[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(77*
a^(5/2)*(a + b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 18.7729, size = 114, normalized size = 0.89

$$-\frac{\sqrt[4]{a+bx^4}}{11x^{11}}-\frac{b\sqrt[4]{a+bx^4}}{77ax^7}+\frac{2b^2\sqrt[4]{a+bx^4}}{77a^2x^3}-\frac{4b^{\frac{7}{2}}x^3\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{77a^{\frac{5}{2}}\left(a+bx^4\right)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(1/4)/x**12,x)
```

```
[Out] -(a + b*x**4)**(1/4)/(11*x**11) - b*(a + b*x**4)**(1/4)/(77*a*x**
7) + 2*b**2*(a + b*x**4)**(1/4)/(77*a**2*x**3) - 4*b**(7/2)*x**3*
(a/(b*x**4) + 1)**(3/4)*elliptic_f(atan(sqrt(a)/(sqrt(b)*x**2))/2
, 2)/(77*a**(5/2)*(a + b*x**4)**(3/4))
```

Mathematica [C] time = 0.0543245, size = 93, normalized size = 0.73

$$\frac{-7a^3-8a^2bx^4+4b^3x^{12}\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};-\frac{bx^4}{a}\right)+ab^2x^8+2b^3x^{12}}{77a^2x^{11}\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(1/4)/x^12,x]
```

```
[Out] (-7*a^3 - 8*a^2*b*x^4 + a*b^2*x^8 + 2*b^3*x^12 + 4*b^3*x^12*(1 +
(b*x^4)/a)^(3/4)*Hypergeometric2F1[1/4, 3/4, 5/4, -((b*x^4)/a)])/
```

```
(77*a^2*x^11*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.052, size = 0, normalized size = 0.

$$\int \frac{1}{x^{12}}\sqrt[4]{bx^4+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(1/4)/x^12,x)

[Out] int((b*x^4+a)^(1/4)/x^12,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^4+a)^{\frac{1}{4}}}{x^{12}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^12,x, algorithm="maxima")

[Out] integrate((b*x^4 + a)^(1/4)/x^12, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(bx^4+a)^{\frac{1}{4}}}{x^{12}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^12,x, algorithm="fricas")

[Out] integral((b*x^4 + a)^(1/4)/x^12, x)
```

Sympy [A] time = 10.5732, size = 46, normalized size = 0.36

$$\frac{\sqrt[4]{a}\,\Gamma\left(-\frac{11}{4}\right) {}_2F_1\left(\begin{matrix} -\frac{11}{4}, -\frac{1}{4} \\ -\frac{7}{4} \end{matrix}\middle| \frac{bx^4e^{i\pi}}{a}\right)}{4x^{11}\,\Gamma\left(-\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(1/4)/x**12,x)

[Out] a**(1/4)*gamma(-11/4)*hyper((-11/4, -1/4), (-7/4,), b*x**4*exp_po
lar(I*pi)/a)/(4*x**11*gamma(-7/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^4+a)^{\frac{1}{4}}}{x^{12}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^12,x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(1/4)/x^12, x)
```

3.1014 $\int \frac{\sqrt[4]{a+bx^4}}{x^{16}}\,dx$

Optimal. Leaf size=152

$$\frac{8b^{9/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{231a^{7/2}\left(a+bx^4\right)^{3/4}}-\frac{4b^3\sqrt[4]{a+bx^4}}{231a^3x^3}+\frac{2b^2\sqrt[4]{a+bx^4}}{231a^2x^7}-\frac{\sqrt[4]{a+bx^4}}{15x^{15}}-\frac{b\sqrt[4]{a+bx^4}}{165ax^{11}}$$

```
[Out] -(a + b*x^4)^(1/4)/(15*x^15) - (b*(a + b*x^4)^(1/4))/(165*a*x^11)
 + (2*b^2*(a + b*x^4)^(1/4))/(231*a^2*x^7) - (4*b^3*(a + b*x^4)^(
1/4))/(231*a^3*x^3) + (8*b^(9/2)*(1 + a/(b*x^4))^(3/4)*x^3*Ellipt
icF[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(231*a^(7/2)*(a + b*x^4)
^(3/4))
```

Rubi [A] time = 0.201295, antiderivative size = 152, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.4$

$$\frac{8b^{9/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{231a^{7/2}\left(a+bx^4\right)^{3/4}}-\frac{4b^3\sqrt[4]{a+bx^4}}{231a^3x^3}+\frac{2b^2\sqrt[4]{a+bx^4}}{231a^2x^7}-\frac{\sqrt[4]{a+bx^4}}{15x^{15}}-\frac{b\sqrt[4]{a+bx^4}}{165ax^{11}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(1/4)/x^16,x]
```

```
[Out] -(a + b*x^4)^(1/4)/(15*x^15) - (b*(a + b*x^4)^(1/4))/(165*a*x^11)
 + (2*b^2*(a + b*x^4)^(1/4))/(231*a^2*x^7) - (4*b^3*(a + b*x^4)^(
1/4))/(231*a^3*x^3) + (8*b^(9/2)*(1 + a/(b*x^4))^(3/4)*x^3*Ellipt
icF[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(231*a^(7/2)*(a + b*x^4)
^(3/4))
```

Rubi in Sympy [A] time = 23.3178, size = 138, normalized size = 0.91

$$-\frac{\sqrt[4]{a+bx^4}}{15x^{15}}-\frac{b\sqrt[4]{a+bx^4}}{165ax^{11}}+\frac{2b^2\sqrt[4]{a+bx^4}}{231a^2x^7}-\frac{4b^3\sqrt[4]{a+bx^4}}{231a^3x^3}+\frac{8b^{\frac{9}{2}}x^3\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{231a^{\frac{7}{2}}\left(a+bx^4\right)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(1/4)/x**16,x)
```

```
[Out] -(a + b*x**4)**(1/4)/(15*x**15) - b*(a + b*x**4)**(1/4)/(165*a*x*
*11) + 2*b**2*(a + b*x**4)**(1/4)/(231*a**2*x**7) - 4*b**3*(a + b
*x**4)**(1/4)/(231*a**3*x**3) + 8*b**(9/2)*x**3*(a/(b*x**4) + 1)*
*(3/4)*elliptic_f(atan(sqrt(a)/(sqrt(b)*x**2))/2, 2)/(231*a**(7/2
)*(a + b*x**4)**(3/4))
```

Mathematica [C] time = 0.0616777, size = 105, normalized size = 0.69

$$\frac{-77a^4-84a^3bx^4+3a^2b^2x^8-40b^4x^{16}\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};-\frac{bx^4}{a}\right)-10ab^3x^{12}-20b^4x^{16}}{1155a^3x^{15}\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(1/4)/x^16,x]
```

```
[Out] (-77*a^4 - 84*a^3*b*x^4 + 3*a^2*b^2*x^8 - 10*a*b^3*x^12 - 20*b^4*
x^16 - 40*b^4*x^16*(1 + (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/4, 3
/4, 5/4, -((b*x^4)/a)])/(1155*a^3*x^15*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.058, size = 0, normalized size = 0.

$$\int \frac{1}{x^{16}}\sqrt[4]{bx^4+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x^4+a)^(1/4)/x^16,x)
```

```
[Out] int((b*x^4+a)^(1/4)/x^16,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^4+a)^{\frac{1}{4}}}{x^{16}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^4 + a)^(1/4)/x^16,x, algorithm="maxima")
```

```
[Out] integrate((b*x^4 + a)^(1/4)/x^16, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(bx^4+a)^{\frac{1}{4}}}{x^{16}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^4 + a)^(1/4)/x^16,x, algorithm="fricas")
```

```
[Out] integral((b*x^4 + a)^(1/4)/x^16, x)
```

Sympy [A] time = 21.7158, size = 46, normalized size = 0.3

$$\frac{\sqrt[4]{a}\,\Gamma\left(-\frac{15}{4}\right){}_2F_1\left(\begin{matrix}-\frac{15}{4},-\frac{1}{4}\\-\frac{11}{4}\end{matrix}\middle|\frac{bx^4e^{i\pi}}{a}\right)}{4x^{15}\,\Gamma\left(-\frac{11}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x**4+a)**(1/4)/x**16,x)
```

```
[Out] a**(1/4)*gamma(-15/4)*hyper((-15/4, -1/4), (-11/4,), b*x**4*exp_p
olar(I*pi)/a)/(4*x**15*gamma(-11/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bx^4 + a\right)^{\frac{1}{4}}}{x^{16}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(1/4)/x^16,x, algorithm="giac")

[Out] integrate((b*x^4 + a)^(1/4)/x^16, x)
```

3.1015 $\int x^{19} \left(a+bx^4\right)^{3/4} dx$

Optimal. Leaf size=101

$$\frac{a^4 \left(a+bx^4\right)^{7/4}}{7b^5}-\frac{4a^3 \left(a+bx^4\right)^{11/4}}{11b^5}+\frac{2a^2 \left(a+bx^4\right)^{15/4}}{5b^5}+\frac{\left(a+bx^4\right)^{23/4}}{23b^5}-\frac{4a \left(a+bx^4\right)^{19/4}}{19b^5}$$

```
[Out] (a^4*(a + b*x^4)^(7/4))/(7*b^5) - (4*a^3*(a + b*x^4)^(11/4))/(11*
b^5) + (2*a^2*(a + b*x^4)^(15/4))/(5*b^5) - (4*a*(a + b*x^4)^(19/
4))/(19*b^5) + (a + b*x^4)^(23/4)/(23*b^5)
```

Rubi [A] time = 0.125421, antiderivative size = 101, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^4 \left(a+bx^4\right)^{7/4}}{7b^5}-\frac{4a^3 \left(a+bx^4\right)^{11/4}}{11b^5}+\frac{2a^2 \left(a+bx^4\right)^{15/4}}{5b^5}+\frac{\left(a+bx^4\right)^{23/4}}{23b^5}-\frac{4a \left(a+bx^4\right)^{19/4}}{19b^5}$$

Antiderivative was successfully verified.

```
[In] Int[x^19*(a + b*x^4)^(3/4),x]
```

```
[Out] (a^4*(a + b*x^4)^(7/4))/(7*b^5) - (4*a^3*(a + b*x^4)^(11/4))/(11*
b^5) + (2*a^2*(a + b*x^4)^(15/4))/(5*b^5) - (4*a*(a + b*x^4)^(19/
4))/(19*b^5) + (a + b*x^4)^(23/4)/(23*b^5)
```

Rubi in Sympy [A] time = 17.5448, size = 92, normalized size = 0.91

$$\frac{a^4 \left(a+bx^4\right)^{\frac{7}{4}}}{7b^5}-\frac{4a^3 \left(a+bx^4\right)^{\frac{11}{4}}}{11b^5}+\frac{2a^2 \left(a+bx^4\right)^{\frac{15}{4}}}{5b^5}-\frac{4a \left(a+bx^4\right)^{\frac{19}{4}}}{19b^5}+\frac{\left(a+bx^4\right)^{\frac{23}{4}}}{23b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**19*(b*x**4+a)**(3/4),x)
```

```
[Out] a**4*(a + b*x**4)**(7/4)/(7*b**5) - 4*a**3*(a + b*x**4)**(11/4)/(
11*b**5) + 2*a**2*(a + b*x**4)**(15/4)/(5*b**5) - 4*a*(a + b*x**4
)**(19/4)/(19*b**5) + (a + b*x**4)**(23/4)/(23*b**5)
```

Mathematica [A] time = 0.0362253, size = 72, normalized size = 0.71

$$\frac{\left(a+bx^4\right)^{3/4} \left(2048a^5-1536a^4bx^4+1344a^3b^2x^8-1232a^2b^3x^{12}+1155ab^4x^{16}+7315b^5x^{20}\right)}{168245b^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^19*(a + b*x^4)^(3/4),x]
```

```
[Out] ((a + b*x^4)^(3/4)*(2048*a^5 - 1536*a^4*b*x^4 + 1344*a^3*b^2*x^8
- 1232*a^2*b^3*x^12 + 1155*a*b^4*x^16 + 7315*b^5*x^20))/(168245*b
^5)
```

Maple [A] time = 0.01, size = 58, normalized size = 0.6

$$\frac{7315\,x^{16}b^4-6160\,ax^{12}b^3+4928\,a^2x^8b^2-3584\,a^3x^4b+2048\,a^4}{168245\,b^5}\left(bx^4+a\right)^{\frac{7}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^19*(b*x^4+a)^(3/4),x)
```

```
[Out] 1/168245*(b*x^4+a)^(7/4)*(7315*b^4*x^16-6160*a*b^3*x^12+4928*a^2*
b^2*x^8-3584*a^3*b*x^4+2048*a^4)/b^5
```

Maxima [A]   time = 1.4328, size = 109, normalized size = 1.08

$$\frac{(bx^4+a)^{\frac{23}{4}}}{23\,b^5} - \frac{4\,(bx^4+a)^{\frac{19}{4}}a}{19\,b^5} + \frac{2\,(bx^4+a)^{\frac{15}{4}}a^2}{5\,b^5} - \frac{4\,(bx^4+a)^{\frac{11}{4}}a^3}{11\,b^5} + \frac{(bx^4+a)^{\frac{7}{4}}a^4}{7\,b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^4 + a)^(3/4)*x^19,x, algorithm="maxima")
```

```
[Out] 1/23*(b*x^4 + a)^(23/4)/b^5 - 4/19*(b*x^4 + a)^(19/4)*a/b^5 + 2/5
*(b*x^4 + a)^(15/4)*a^2/b^5 - 4/11*(b*x^4 + a)^(11/4)*a^3/b^5 + 1
/7*(b*x^4 + a)^(7/4)*a^4/b^5
```

Fricas [A]   time = 0.362319, size = 92, normalized size = 0.91

$$\frac{\left(7315\,b^5x^{20} + 1155\,ab^4x^{16} - 1232\,a^2b^3x^{12} + 1344\,a^3b^2x^8 - 1536\,a^4bx^4 + 2048\,a^5\right)(bx^4+a)^{\frac{3}{4}}}{168245\,b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^4 + a)^(3/4)*x^19,x, algorithm="fricas")
```

```
[Out] 1/168245*(7315*b^5*x^20 + 1155*a*b^4*x^16 - 1232*a^2*b^3*x^12 + 1
344*a^3*b^2*x^8 - 1536*a^4*b*x^4 + 2048*a^5)*(b*x^4 + a)^(3/4)/b^
5
```

Sympy [A]   time = 122.811, size = 136, normalized size = 1.35

$$\begin{cases} \frac{2048a^5(a+bx^4)^{\frac{3}{4}}}{168245b^5} - \frac{1536a^4x^4(a+bx^4)^{\frac{3}{4}}}{168245b^4} + \frac{192a^3x^8(a+bx^4)^{\frac{3}{4}}}{24035b^3} - \frac{16a^2x^{12}(a+bx^4)^{\frac{3}{4}}}{2185b^2} + \frac{3ax^{16}(a+bx^4)^{\frac{3}{4}}}{437b} + \frac{x^{20}(a+bx^4)^{\frac{3}{4}}}{23} & \text{for } b \neq 0 \\ \frac{a^{\frac{3}{4}}x^{20}}{20} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**19*(b*x**4+a)**(3/4),x)
```

```
[Out] Piecewise((2048*a**5*(a + b*x**4)**(3/4)/(168245*b**5) - 1536*a**
4*x**4*(a + b*x**4)**(3/4)/(168245*b**4) + 192*a**3*x**8*(a + b*x
**4)**(3/4)/(24035*b**3) - 16*a**2*x**12*(a + b*x**4)**(3/4)/(218
5*b**2) + 3*a*x**16*(a + b*x**4)**(3/4)/(437*b) + x**20*(a + b*x*
*4)**(3/4)/23, Ne(b, 0)), (a**(3/4)*x**20/20, True))
```

GIAC/XCAS [A]   time = 0.218377, size = 96, normalized size = 0.95

$$\frac{7315\,(bx^4+a)^{\frac{23}{4}} - 35420\,(bx^4+a)^{\frac{19}{4}}a + 67298\,(bx^4+a)^{\frac{15}{4}}a^2 - 61180\,(bx^4+a)^{\frac{11}{4}}a^3 + 24035\,(bx^4+a)^{\frac{7}{4}}a^4}{168245\,b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^19,x, algorithm="giac")
```

```
[Out] 1/168245*(7315*(b*x^4 + a)^(23/4) - 35420*(b*x^4 + a)^(19/4)*a +
67298*(b*x^4 + a)^(15/4)*a^2 - 61180*(b*x^4 + a)^(11/4)*a^3 + 240
35*(b*x^4 + a)^(7/4)*a^4)/b^5
```

3.1016 $\int x^{15} \left(a+bx^4\right)^{3/4} dx$

Optimal. Leaf size=80

$$-\frac{a^3 \left(a+bx^4\right)^{7/4}}{7b^4}+\frac{3a^2 \left(a+bx^4\right)^{11/4}}{11b^4}+\frac{\left(a+bx^4\right)^{19/4}}{19b^4}-\frac{a \left(a+bx^4\right)^{15/4}}{5b^4}$$

```
[Out] -(a^3*(a + b*x^4)^(7/4))/(7*b^4) + (3*a^2*(a + b*x^4)^(11/4))/(11
*b^4) - (a*(a + b*x^4)^(15/4))/(5*b^4) + (a + b*x^4)^(19/4)/(19*b
^4)
```

Rubi [A] time = 0.106935, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^3 \left(a+bx^4\right)^{7/4}}{7b^4}+\frac{3a^2 \left(a+bx^4\right)^{11/4}}{11b^4}+\frac{\left(a+bx^4\right)^{19/4}}{19b^4}-\frac{a \left(a+bx^4\right)^{15/4}}{5b^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^15*(a + b*x^4)^(3/4),x]
```

```
[Out] -(a^3*(a + b*x^4)^(7/4))/(7*b^4) + (3*a^2*(a + b*x^4)^(11/4))/(11
*b^4) - (a*(a + b*x^4)^(15/4))/(5*b^4) + (a + b*x^4)^(19/4)/(19*b
^4)
```

Rubi in Sympy [A] time = 14.2948, size = 70, normalized size = 0.88

$$-\frac{a^3 \left(a+bx^4\right)^{\frac{7}{4}}}{7b^4}+\frac{3a^2 \left(a+bx^4\right)^{\frac{11}{4}}}{11b^4}-\frac{a \left(a+bx^4\right)^{\frac{15}{4}}}{5b^4}+\frac{\left(a+bx^4\right)^{\frac{19}{4}}}{19b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**15*(b*x**4+a)**(3/4),x)
```

```
[Out] -a**3*(a + b*x**4)**(7/4)/(7*b**4) + 3*a**2*(a + b*x**4)**(11/4)/
(11*b**4) - a*(a + b*x**4)**(15/4)/(5*b**4) + (a + b*x**4)**(19/4
)/(19*b**4)
```

Mathematica [A] time = 0.0340574, size = 61, normalized size = 0.76

$$\frac{\left(a+bx^4\right)^{3/4} \left(-128a^4+96a^3bx^4-84a^2b^2x^8+77ab^3x^{12}+385b^4x^{16}\right)}{7315b^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^15*(a + b*x^4)^(3/4),x]
```

```
[Out] ((a + b*x^4)^(3/4)*(-128*a^4 + 96*a^3*b*x^4 - 84*a^2*b^2*x^8 + 77
*a*b^3*x^12 + 385*b^4*x^16))/(7315*b^4)
```

Maple [A] time = 0.008, size = 47, normalized size = 0.6

$$-\frac{-385\,b^3x^{12}+308\,ab^2x^8-224\,a^2bx^4+128\,a^3}{7315\,b^4}\left(bx^4+a\right)^{\frac{7}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^15*(b*x^4+a)^(3/4),x)
```

```
[Out] -1/7315*(b*x^4+a)^(7/4)*(-385*b^3*x^12+308*a*b^2*x^8-224*a^2*b*x^
4+128*a^3)/b^4
```

Maxima [A] time = 1.42589, size = 86, normalized size = 1.08

$$\frac{(bx^4+a)^{\frac{19}{4}}}{19\,b^4} - \frac{(bx^4+a)^{\frac{15}{4}}a}{5\,b^4} + \frac{3\,(bx^4+a)^{\frac{11}{4}}a^2}{11\,b^4} - \frac{(bx^4+a)^{\frac{7}{4}}a^3}{7\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^15,x, algorithm="maxima")
```

```
[Out] 1/19*(b*x^4 + a)^(19/4)/b^4 - 1/5*(b*x^4 + a)^(15/4)*a/b^4 + 3/11
*(b*x^4 + a)^(11/4)*a^2/b^4 - 1/7*(b*x^4 + a)^(7/4)*a^3/b^4
```

Fricas [A] time = 0.369758, size = 77, normalized size = 0.96

$$\frac{(385\,b^4x^{16} + 77\,ab^3x^{12} - 84\,a^2b^2x^8 + 96\,a^3bx^4 - 128\,a^4)\,(bx^4+a)^{\frac{3}{4}}}{7315\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^15,x, algorithm="fricas")
```

```
[Out] 1/7315*(385*b^4*x^16 + 77*a*b^3*x^12 - 84*a^2*b^2*x^8 + 96*a^3*b*
x^4 - 128*a^4)*(b*x^4 + a)^(3/4)/b^4
```

Sympy [A] time = 66.5883, size = 110, normalized size = 1.38

$$\begin{cases} -\frac{128a^4(a+bx^4)^{\frac{3}{4}}}{7315b^4} + \frac{96a^3x^4(a+bx^4)^{\frac{3}{4}}}{7315b^3} - \frac{12a^2x^8(a+bx^4)^{\frac{3}{4}}}{1045b^2} + \frac{ax^{12}(a+bx^4)^{\frac{3}{4}}}{95b} + \frac{x^{16}(a+bx^4)^{\frac{3}{4}}}{19} & \text{for } b \neq 0 \\ \frac{a^{\frac{3}{4}}x^{16}}{16} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**15*(b*x**4+a)**(3/4),x)
```

```
[Out] Piecewise((-128*a**4*(a + b*x**4)**(3/4)/(7315*b**4) + 96*a**3*x*
*4*(a + b*x**4)**(3/4)/(7315*b**3) - 12*a**2*x**8*(a + b*x**4)**(
3/4)/(1045*b**2) + a*x**12*(a + b*x**4)**(3/4)/(95*b) + x**16*(a
+ b*x**4)**(3/4)/19, Ne(b, 0)), (a**(3/4)*x**16/16, True))
```

GIAC/XCAS [A] time = 0.216494, size = 77, normalized size = 0.96

$$\frac{385\,(bx^4+a)^{\frac{19}{4}} - 1463\,(bx^4+a)^{\frac{15}{4}}a + 1995\,(bx^4+a)^{\frac{11}{4}}a^2 - 1045\,(bx^4+a)^{\frac{7}{4}}a^3}{7315\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^15,x, algorithm="giac")
```

```
[Out] 1/7315*(385*(b*x^4 + a)^(19/4) - 1463*(b*x^4 + a)^(15/4)*a + 1995
*(b*x^4 + a)^(11/4)*a^2 - 1045*(b*x^4 + a)^(7/4)*a^3)/b^4
```

3.1017 $\int x^{11} \left(a+bx^4\right)^{3/4} dx$

Optimal. Leaf size=59

$$\frac{a^2 \left(a+bx^4\right)^{7/4}}{7b^3}+\frac{\left(a+bx^4\right)^{15/4}}{15b^3}-\frac{2a \left(a+bx^4\right)^{11/4}}{11b^3}$$

```
[Out] (a^2*(a + b*x^4)^(7/4))/(7*b^3) - (2*a*(a + b*x^4)^(11/4))/(11*b^
3) + (a + b*x^4)^(15/4)/(15*b^3)
```

Rubi [A] time = 0.0823975, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^2 \left(a+bx^4\right)^{7/4}}{7b^3}+\frac{\left(a+bx^4\right)^{15/4}}{15b^3}-\frac{2a \left(a+bx^4\right)^{11/4}}{11b^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^11*(a + b*x^4)^(3/4),x]
```

```
[Out] (a^2*(a + b*x^4)^(7/4))/(7*b^3) - (2*a*(a + b*x^4)^(11/4))/(11*b^
3) + (a + b*x^4)^(15/4)/(15*b^3)
```

Rubi in Sympy [A] time = 10.601, size = 51, normalized size = 0.86

$$\frac{a^2 \left(a+bx^4\right)^{\frac{7}{4}}}{7b^3}-\frac{2a \left(a+bx^4\right)^{\frac{11}{4}}}{11b^3}+\frac{\left(a+bx^4\right)^{\frac{15}{4}}}{15b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**11*(b*x**4+a)**(3/4),x)
```

```
[Out] a**2*(a + b*x**4)**(7/4)/(7*b**3) - 2*a*(a + b*x**4)**(11/4)/(11*
b**3) + (a + b*x**4)**(15/4)/(15*b**3)
```

Mathematica [A] time = 0.0274331, size = 50, normalized size = 0.85

$$\frac{\left(a+bx^4\right)^{3/4} \left(32a^3-24a^2bx^4+21ab^2x^8+77b^3x^{12}\right)}{1155b^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^11*(a + b*x^4)^(3/4),x]
```

```
[Out] ((a + b*x^4)^(3/4)*(32*a^3 - 24*a^2*b*x^4 + 21*a*b^2*x^8 + 77*b^3
*x^12))/(1155*b^3)
```

Maple [A] time = 0.008, size = 36, normalized size = 0.6

$$\frac{77\,b^2x^8-56\,abx^4+32\,a^2}{1155\,b^3} \left(bx^4+a\right)^{\frac{7}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11*(b*x^4+a)^(3/4),x)
```

```
[Out] 1/1155*(b*x^4+a)^(7/4)*(77*b^2*x^8-56*a*b*x^4+32*a^2)/b^3
```

Maxima [A] time = 1.42403, size = 63, normalized size = 1.07

$$\frac{\left(bx^4+a\right)^{\frac{15}{4}}}{15\,b^3}-\frac{2\,\left(bx^4+a\right)^{\frac{11}{4}}a}{11\,b^3}+\frac{\left(bx^4+a\right)^{\frac{7}{4}}a^2}{7\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^11,x, algorithm="maxima")
```

```
[Out] 1/15*(b*x^4 + a)^(15/4)/b^3 - 2/11*(b*x^4 + a)^(11/4)*a/b^3 + 1/7
*(b*x^4 + a)^(7/4)*a^2/b^3
```

Fricas [A] time = 0.316823, size = 62, normalized size = 1.05

$$\frac{\left(77\,b^3x^{12}+21\,ab^2x^8-24\,a^2bx^4+32\,a^3\right)\left(bx^4+a\right)^{\frac{3}{4}}}{1155\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^11,x, algorithm="fricas")
```

```
[Out] 1/1155*(77*b^3*x^12 + 21*a*b^2*x^8 - 24*a^2*b*x^4 + 32*a^3)*(b*x^
4 + a)^(3/4)/b^3
```

Sympy [A] time = 34.1866, size = 87, normalized size = 1.47

$$\begin{cases} \frac{32a^3(a+bx^4)^{\frac{3}{4}}}{1155b^3}-\frac{8a^2x^4(a+bx^4)^{\frac{3}{4}}}{385b^2}+\frac{ax^8(a+bx^4)^{\frac{3}{4}}}{55b}+\frac{x^{12}(a+bx^4)^{\frac{3}{4}}}{15} & \text{for}\; b\neq 0 \\ \frac{a^{\frac{3}{4}}x^{12}}{12} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11*(b*x**4+a)**(3/4),x)
```

```
[Out] Piecewise((32*a**3*(a + b*x**4)**(3/4)/(1155*b**3) - 8*a**2*x**4*
(a + b*x**4)**(3/4)/(385*b**2) + a*x**8*(a + b*x**4)**(3/4)/(55*b
) + x**12*(a + b*x**4)**(3/4)/15, Ne(b, 0)), (a**(3/4)*x**12/12,
True))
```

GIAC/XCAS [A] time = 0.217737, size = 58, normalized size = 0.98

$$\frac{77\left(bx^4+a\right)^{\frac{15}{4}}-210\left(bx^4+a\right)^{\frac{11}{4}}a+165\left(bx^4+a\right)^{\frac{7}{4}}a^2}{1155\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^11,x, algorithm="giac")
```

```
[Out] 1/1155*(77*(b*x^4 + a)^(15/4) - 210*(b*x^4 + a)^(11/4)*a + 165*(b
*x^4 + a)^(7/4)*a^2)/b^3
```

3.1018 $\int x^7 \left(a+bx^4\right)^{3/4} dx$

Optimal. Leaf size=38

$$\frac{\left(a+bx^4\right)^{11/4}}{11b^2}-\frac{a\left(a+bx^4\right)^{7/4}}{7b^2}$$

```
[Out] -(a*(a + b*x^4)^(7/4))/(7*b^2) + (a + b*x^4)^(11/4)/(11*b^2)
```

Rubi [A] time = 0.0575112, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{\left(a+bx^4\right)^{11/4}}{11b^2}-\frac{a\left(a+bx^4\right)^{7/4}}{7b^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^7*(a + b*x^4)^(3/4),x]

[Out] -(a*(a + b*x^4)^(7/4))/(7*b^2) + (a + b*x^4)^(11/4)/(11*b^2)
```

Rubi in Sympy [A] time = 7.035, size = 31, normalized size = 0.82

$$-\frac{a\left(a+bx^4\right)^{\frac{7}{4}}}{7b^2}+\frac{\left(a+bx^4\right)^{\frac{11}{4}}}{11b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**7*(b*x**4+a)**(3/4),x)

[Out] -a*(a + b*x**4)**(7/4)/(7*b**2) + (a + b*x**4)**(11/4)/(11*b**2)
```

Mathematica [A] time = 0.0236039, size = 39, normalized size = 1.03

$$\frac{\left(a+bx^4\right)^{3/4}\left(-4a^2+3abx^4+7b^2x^8\right)}{77b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^7*(a + b*x^4)^(3/4),x]

[Out] ((a + b*x^4)^(3/4)*(-4*a^2 + 3*a*b*x^4 + 7*b^2*x^8))/(77*b^2)
```

Maple [A] time = 0.007, size = 25, normalized size = 0.7

$$-\frac{-7\,bx^4+4\,a}{77\,b^2}\left(bx^4+a\right)^{\frac{7}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^7*(b*x^4+a)^(3/4),x)

[Out] -1/77*(b*x^4+a)^(7/4)*(-7*b*x^4+4*a)/b^2
```

Maxima [A] time = 1.4398, size = 41, normalized size = 1.08

$$\frac{\left(bx^4+a\right)^{\frac{11}{4}}}{11\,b^2}-\frac{\left(bx^4+a\right)^{\frac{7}{4}}a}{7\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^7,x, algorithm="maxima")
```

```
[Out] 1/11*(b*x^4 + a)^(11/4)/b^2 - 1/7*(b*x^4 + a)^(7/4)*a/b^2
```

Fricas [A] time = 0.367529, size = 47, normalized size = 1.24

$$\frac{\left(7\,b^2x^8+3\,abx^4-4\,a^2\right)\left(bx^4+a\right)^{\frac{3}{4}}}{77\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^7,x, algorithm="fricas")
```

```
[Out] 1/77*(7*b^2*x^8 + 3*a*b*x^4 - 4*a^2)*(b*x^4 + a)^(3/4)/b^2
```

Sympy [A] time = 14.5384, size = 65, normalized size = 1.71

$$\begin{cases} -\frac{4a^2\left(a+bx^4\right)^{\frac{3}{4}}}{77b^2}+\frac{3ax^4\left(a+bx^4\right)^{\frac{3}{4}}}{77b}+\frac{x^8\left(a+bx^4\right)^{\frac{3}{4}}}{11} & \text{for } b\neq 0\\ \frac{a^{\frac{3}{4}}x^8}{8} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7*(b*x**4+a)**(3/4),x)
```

```
[Out] Piecewise((-4*a**2*(a + b*x**4)**(3/4)/(77*b**2) + 3*a*x**4*(a +
b*x**4)**(3/4)/(77*b) + x**8*(a + b*x**4)**(3/4)/11, Ne(b, 0)), (
a**(3/4)*x**8/8, True))
```

GIAC/XCAS [A] time = 0.218457, size = 39, normalized size = 1.03

$$\frac{7\left(bx^4+a\right)^{\frac{11}{4}}-11\left(bx^4+a\right)^{\frac{7}{4}}a}{77\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^7,x, algorithm="giac")
```

```
[Out] 1/77*(7*(b*x^4 + a)^(11/4) - 11*(b*x^4 + a)^(7/4)*a)/b^2
```

3.1019 $\int x^3 (a + bx^4)^{3/4} \, dx$

Optimal. Leaf size=18

$$\frac{(a + bx^4)^{7/4}}{7b}$$

```
[Out] (a + b*x^4)^(7/4)/(7*b)
```

Rubi [A] time = 0.0102302, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{(a + bx^4)^{7/4}}{7b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3*(a + b*x^4)^(3/4),x]

[Out] (a + b*x^4)^(7/4)/(7*b)
```

Rubi in Sympy [A] time = 2.1277, size = 12, normalized size = 0.67

$$\frac{(a + bx^4)^{\frac{7}{4}}}{7b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3*(b*x**4+a)**(3/4),x)

[Out] (a + b*x**4)**(7/4)/(7*b)
```

Mathematica [A] time = 0.00852947, size = 18, normalized size = 1.

$$\frac{(a + bx^4)^{7/4}}{7b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3*(a + b*x^4)^(3/4),x]

[Out] (a + b*x^4)^(7/4)/(7*b)
```

Maple [A] time = 0.006, size = 15, normalized size = 0.8

$$\frac{1}{7\,b} (bx^4 + a)^{\frac{7}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3*(b*x^4+a)^(3/4),x)

[Out] 1/7*(b*x^4+a)^(7/4)/b
```

Maxima [A] time = 1.41847, size = 19, normalized size = 1.06

$$\frac{\left(bx^4+a\right)^{\frac{7}{4}}}{7\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^3,x, algorithm="maxima")
```

```
[Out] 1/7*(b*x^4 + a)^(7/4)/b
```

Fricas [A] time = 0.324294, size = 19, normalized size = 1.06

$$\frac{\left(bx^4+a\right)^{\frac{7}{4}}}{7\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^3,x, algorithm="fricas")
```

```
[Out] 1/7*(b*x^4 + a)^(7/4)/b
```

Sympy [A] time = 4.86567, size = 39, normalized size = 2.17

$$\begin{cases} \frac{a\left(a+bx^4\right)^{\frac{3}{4}}}{7b} + \frac{x^4\left(a+bx^4\right)^{\frac{3}{4}}}{7} & \text{for}\ b \neq 0 \\ \frac{a^{\frac{3}{4}}x^4}{4} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(b*x**4+a)**(3/4),x)
```

```
[Out] Piecewise((a*(a + b*x**4)**(3/4)/(7*b) + x**4*(a + b*x**4)**(3/4)
/7, Ne(b, 0)), (a**(3/4)*x**4/4, True))
```

GIAC/XCAS [A] time = 0.215634, size = 19, normalized size = 1.06

$$\frac{\left(bx^4+a\right)^{\frac{7}{4}}}{7\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^3,x, algorithm="giac")
```

```
[Out] 1/7*(b*x^4 + a)^(7/4)/b
```

3.1020 $\int \frac{(a+bx^4)^{3/4}}{x}\,dx$

Optimal. Leaf size=70

$$\frac{1}{2}a^{3/4}\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)-\frac{1}{2}a^{3/4}\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)+\frac{1}{3}\left(a+bx^4\right)^{3/4}$$

```
[Out] (a + b*x^4)^(3/4)/3 + (a^(3/4)*ArcTan[(a + b*x^4)^(1/4)/a^(1/4)])
/2 - (a^(3/4)*ArcTanh[(a + b*x^4)^(1/4)/a^(1/4)])/2
```

Rubi [A] time = 0.105679, antiderivative size = 70, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$\frac{1}{2}a^{3/4}\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)-\frac{1}{2}a^{3/4}\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)+\frac{1}{3}\left(a+bx^4\right)^{3/4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(3/4)/x,x]
```

```
[Out] (a + b*x^4)^(3/4)/3 + (a^(3/4)*ArcTan[(a + b*x^4)^(1/4)/a^(1/4)])
/2 - (a^(3/4)*ArcTanh[(a + b*x^4)^(1/4)/a^(1/4)])/2
```

Rubi in Sympy [A] time = 11.4827, size = 58, normalized size = 0.83

$$\frac{a^{\frac{3}{4}}\operatorname{atan}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{2}-\frac{a^{\frac{3}{4}}\operatorname{atanh}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{2}+\frac{\left(a+bx^4\right)^{\frac{3}{4}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(3/4)/x,x)
```

```
[Out] a**(3/4)*atan((a + b*x**4)**(1/4)/a**(1/4))/2 - a**(3/4)*atanh((a
 + b*x**4)**(1/4)/a**(1/4))/2 + (a + b*x**4)**(3/4)/3
```

Mathematica [C] time = 0.0459377, size = 58, normalized size = 0.83

$$\frac{-3a\sqrt[4]{\frac{a}{bx^4}+1}\,{}_2F_1\left(\frac{1}{4},\frac{1}{4};\frac{5}{4};-\frac{a}{bx^4}\right)+a+bx^4}{3\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(3/4)/x,x]
```

```
[Out] (a + b*x^4 - 3*a*(1 + a/(b*x^4))^(1/4)*Hypergeometric2F1[1/4, 1/4
, 5/4, -(a/(b*x^4))])/(3*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.034, size = 0, normalized size = 0.

$$\int \frac{1}{x}\left(bx^4+a\right)^{\frac{3}{4}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((b*x^4+a)^(3/4)/x,x)
```

```
[Out] int((b*x^4+a)^(3/4)/x,x)
```

Maxima [F]   time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^4 + a)^(3/4)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A]   time = 0.270956, size = 166, normalized size = 2.37

$$-\left(a^{3}\right)^{\frac{1}{4}} \arctan\left(\frac{\left(a^{3}\right)^{\frac{3}{4}}}{\left(bx^{4}+a\right)^{\frac{1}{4}} a^{2}+\sqrt{\sqrt{bx^{4}+a}a^{4}+\sqrt{a^{3}}a^{3}}}\right)-\frac{1}{4}\left(a^{3}\right)^{\frac{1}{4}} \log\left(\left(bx^{4}+a\right)^{\frac{1}{4}} a^{2}+\left(a^{3}\right)^{\frac{3}{4}}\right)+\frac{1}{4}\left(a^{3}\right)^{\frac{1}{4}} \log\left(\left(bx^{4}+a\right)^{\frac{1}{4}} a^{2}-\left(a^{3}\right)^{\frac{3}{4}}\right)+\frac{1}{3}\left(bx^{4}+a\right)^{\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^4 + a)^(3/4)/x,x, algorithm="fricas")
```

```
[Out] -(a^3)^(1/4)*arctan((a^3)^(3/4)/((b*x^4 + a)^(1/4)*a^2 + sqrt(sqr
t(b*x^4 + a)*a^4 + sqrt(a^3)*a^3))) - 1/4*(a^3)^(1/4)*log((b*x^4
+ a)^(1/4)*a^2 + (a^3)^(3/4)) + 1/4*(a^3)^(1/4)*log((b*x^4 + a)^(
1/4)*a^2 - (a^3)^(3/4)) + 1/3*(b*x^4 + a)^(3/4)
```

Sympy [A]   time = 4.39877, size = 44, normalized size = 0.63

$$-\frac{b^{\frac{3}{4}} x^{3} \Gamma\left(-\frac{3}{4}\right) {}_{2}F_{1}\left(\begin{matrix} -\frac{3}{4}, -\frac{3}{4} \\ \frac{1}{4} \end{matrix}\middle| \frac{a e^{i\pi}}{bx^{4}}\right)}{4 \Gamma\left(\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x**4+a)**(3/4)/x,x)
```

```
[Out] -b**(3/4)*x**3*gamma(-3/4)*hyper((-3/4, -3/4), (1/4,), a*exp_pola
r(I*pi)/(b*x**4))/(4*gamma(1/4))
```

GIAC/XCAS [A] time = 0.224656, size = 250, normalized size = 3.57

$$-\frac{1}{4}\sqrt{2}(-a)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}+2\left(bx^4+a\right)^{\frac{1}{4}}\right)}{2(-a)^{\frac{1}{4}}}\right)-\frac{1}{4}\sqrt{2}(-a)^{\frac{3}{4}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}-2\left(bx^4+a\right)^{\frac{1}{4}}\right)}{2(-a)^{\frac{1}{4}}}\right)+\frac{1}{8}\sqrt{2}(-a)^{\frac{3}{4}}\ln\left(\sqrt{2}\left(bx^4+a\right)^{\frac{1}{4}}(-a)^{\frac{1}{4}}+\sqrt{bx^4+a}+\sqrt{-a}\right)-\frac{1}{8}\sqrt{2}(-a)^{\frac{3}{4}}\ln\left(-\sqrt{2}\left(bx^4+a\right)^{\frac{1}{4}}(-a)^{\frac{1}{4}}+\sqrt{bx^4+a}+\sqrt{-a}\right)+\frac{1}{3}\left(bx^4+a\right)^{\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x,x, algorithm="giac")
```

```
[Out] -1/4*sqrt(2)*(-a)^(3/4)*arctan(1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) +
2*(b*x^4 + a)^(1/4))/(-a)^(1/4)) - 1/4*sqrt(2)*(-a)^(3/4)*arctan(
-1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) - 2*(b*x^4 + a)^(1/4))/(-a)^(1/4
)) + 1/8*sqrt(2)*(-a)^(3/4)*ln(sqrt(2)*(b*x^4 + a)^(1/4)*(-a)^(1/
4) + sqrt(b*x^4 + a) + sqrt(-a)) - 1/8*sqrt(2)*(-a)^(3/4)*ln(-sqr
t(2)*(b*x^4 + a)^(1/4)*(-a)^(1/4) + sqrt(b*x^4 + a) + sqrt(-a)) +
 1/3*(b*x^4 + a)^(3/4)
```

3.1021 $\int \frac{(a+bx^4)^{3/4}}{x^5}\,dx$

Optimal. Leaf size=75

$$-\frac{(a+bx^4)^{3/4}}{4x^4}+\frac{3b\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{8\sqrt[4]{a}}-\frac{3b\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{8\sqrt[4]{a}}$$

```
[Out] -(a + b*x^4)^(3/4)/(4*x^4) + (3*b*ArcTan[(a + b*x^4)^(1/4)/a^(1/4
)])/(8*a^(1/4)) - (3*b*ArcTanh[(a + b*x^4)^(1/4)/a^(1/4)])/(8*a^(
1/4))
```

Rubi [A] time = 0.10817, antiderivative size = 75, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$-\frac{(a+bx^4)^{3/4}}{4x^4}+\frac{3b\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{8\sqrt[4]{a}}-\frac{3b\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{8\sqrt[4]{a}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(3/4)/x^5,x]
```

```
[Out] -(a + b*x^4)^(3/4)/(4*x^4) + (3*b*ArcTan[(a + b*x^4)^(1/4)/a^(1/4
)])/(8*a^(1/4)) - (3*b*ArcTanh[(a + b*x^4)^(1/4)/a^(1/4)])/(8*a^(
1/4))
```

Rubi in Sympy [A] time = 11.9555, size = 68, normalized size = 0.91

$$-\frac{(a+bx^4)^{\frac{3}{4}}}{4x^4}+\frac{3b\,\text{atan}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{8\sqrt[4]{a}}-\frac{3b\,\text{atanh}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{8\sqrt[4]{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(3/4)/x**5,x)
```

```
[Out] -(a + b*x**4)**(3/4)/(4*x**4) + 3*b*atan((a + b*x**4)**(1/4)/a**(
1/4))/(8*a**(1/4)) - 3*b*atanh((a + b*x**4)**(1/4)/a**(1/4))/(8*a
**(1/4))
```

Mathematica [C] time = 0.0490131, size = 67, normalized size = 0.89

$$\frac{-3bx^4\sqrt[4]{\frac{a}{bx^4}+1}\,{}_2F_1\left(\frac{1}{4},\frac{1}{4};\frac{5}{4};-\frac{a}{bx^4}\right)-a-bx^4}{4x^4\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(3/4)/x^5,x]
```

```
[Out] (-a - b*x^4 - 3*b*(1 + a/(b*x^4))^(1/4)*x^4*Hypergeometric2F1[1/4
, 1/4, 5/4, -(a/(b*x^4))])/(4*x^4*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.047, size = 0, normalized size = 0.

$$\int \frac{1}{x^5}\left(bx^4+a\right)^{\frac{3}{4}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(3/4)/x^5,x)

[Out] int((b*x^4+a)^(3/4)/x^5,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^5,x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [A] time = 0.461705, size = 234, normalized size = 3.12

$$-\frac{12\left(\frac{b^4}{a}\right)^{\frac{1}{4}}x^4\arctan\left(\frac{\left(\frac{b^4}{a}\right)^{\frac{3}{4}}a}{\left(bx^4+a\right)^{\frac{1}{4}}b^3+\sqrt{\sqrt{bx^4+a}b^6+\sqrt{\frac{b^4}{a}}ab^4}}\right)+3\left(\frac{b^4}{a}\right)^{\frac{1}{4}}x^4\log\left(27\left(bx^4+a\right)^{\frac{1}{4}}b^3+27\left(\frac{b^4}{a}\right)^{\frac{3}{4}}a\right)-3\left(\frac{b^4}{a}\right)^{\frac{1}{4}}x^4\log\left(2\right.}{16\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^5,x, algorithm="fricas")

[Out] -1/16*(12*(b^4/a)^(1/4)*x^4*arctan((b^4/a)^(3/4)*a/((b*x^4 + a)^(
1/4)*b^3 + sqrt(sqrt(b*x^4 + a)*b^6 + sqrt(b^4/a)*a*b^4))) + 3*(b
^4/a)^(1/4)*x^4*log(27*(b*x^4 + a)^(1/4)*b^3 + 27*(b^4/a)^(3/4)*a
) - 3*(b^4/a)^(1/4)*x^4*log(27*(b*x^4 + a)^(1/4)*b^3 - 27*(b^4/a)
^(3/4)*a) + 4*(b*x^4 + a)^(3/4))/x^4
```

Sympy [A] time = 6.1321, size = 39, normalized size = 0.52

$$-\frac{b^{\frac{3}{4}}\Gamma\left(\frac{1}{4}\right){}_2F_1\left(\begin{matrix}-\frac{3}{4},\frac{1}{4}\\ \frac{5}{4}\end{matrix}\middle|\frac{ae^{i\pi}}{bx^4}\right)}{4x\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(3/4)/x**5,x)

[Out] -b**(3/4)*gamma(1/4)*hyper((-3/4, 1/4), (5/4,), a*exp_polar(I*pi)
/(b*x**4))/(4*x*gamma(5/4))
```

GIAC/XCAS [A] time = 0.228602, size = 278, normalized size = 3.71

$$-\frac{1}{32}\left(\frac{6\sqrt{2}(-a)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}+2\left(bx^{4}+a\right)^{\frac{1}{4}}\right)}{2(-a)^{\frac{1}{4}}}\right)}{a}+\frac{6\sqrt{2}(-a)^{\frac{3}{4}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}-2\left(bx^{4}+a\right)^{\frac{1}{4}}\right)}{2(-a)^{\frac{1}{4}}}\right)}{a}-\frac{3\sqrt{2}(-a)^{\frac{3}{4}}\ln\left(\sqrt{2}\left(bx^{4}\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^5,x, algorithm="giac")
```

```
[Out] -1/32*(6*sqrt(2)*(-a)^(3/4)*arctan(1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4
) + 2*(b*x^4 + a)^(1/4))/(-a)^(1/4))/a + 6*sqrt(2)*(-a)^(3/4)*arc
tan(-1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) - 2*(b*x^4 + a)^(1/4))/(-a)^
(1/4))/a - 3*sqrt(2)*(-a)^(3/4)*ln(sqrt(2)*(b*x^4 + a)^(1/4)*(-a)
^(1/4) + sqrt(b*x^4 + a) + sqrt(-a))/a + 3*sqrt(2)*(-a)^(3/4)*ln(
-sqrt(2)*(b*x^4 + a)^(1/4)*(-a)^(1/4) + sqrt(b*x^4 + a) + sqrt(-a
))/a + 8*(b*x^4 + a)^(3/4)/(b*x^4))*b
```

3.1022 $\int \frac{(a+bx^4)^{3/4}}{x^9} dx$

Optimal. Leaf size=101

$$-\frac{3b^2\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{5/4}}+\frac{3b^2\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{5/4}}-\frac{3b\left(a+bx^4\right)^{3/4}}{32ax^4}-\frac{\left(a+bx^4\right)^{3/4}}{8x^8}$$

```
[Out] -(a + b*x^4)^(3/4)/(8*x^8) - (3*b*(a + b*x^4)^(3/4))/(32*a*x^4) -
 (3*b^2*ArcTan[(a + b*x^4)^(1/4)/a^(1/4)])/(64*a^(5/4)) + (3*b^2*
ArcTanh[(a + b*x^4)^(1/4)/a^(1/4)])/(64*a^(5/4))
```

Rubi [A] time = 0.147771, antiderivative size = 101, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.467

$$-\frac{3b^2\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{5/4}}+\frac{3b^2\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{5/4}}-\frac{3b\left(a+bx^4\right)^{3/4}}{32ax^4}-\frac{\left(a+bx^4\right)^{3/4}}{8x^8}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(3/4)/x^9,x]
```

```
[Out] -(a + b*x^4)^(3/4)/(8*x^8) - (3*b*(a + b*x^4)^(3/4))/(32*a*x^4) -
 (3*b^2*ArcTan[(a + b*x^4)^(1/4)/a^(1/4)])/(64*a^(5/4)) + (3*b^2*
ArcTanh[(a + b*x^4)^(1/4)/a^(1/4)])/(64*a^(5/4))
```

Rubi in Sympy [A] time = 15.6954, size = 92, normalized size = 0.91

$$-\frac{\left(a+bx^4\right)^{\frac{3}{4}}}{8x^8}-\frac{3b\left(a+bx^4\right)^{\frac{3}{4}}}{32ax^4}-\frac{3b^2\operatorname{atan}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{\frac{5}{4}}}+\frac{3b^2\operatorname{atanh}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{\frac{5}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(3/4)/x**9,x)
```

```
[Out] -(a + b*x**4)**(3/4)/(8*x**8) - 3*b*(a + b*x**4)**(3/4)/(32*a*x**
4) - 3*b**2*atan((a + b*x**4)**(1/4)/a**(1/4))/(64*a**(5/4)) + 3*
b**2*atanh((a + b*x**4)**(1/4)/a**(1/4))/(64*a**(5/4))
```

Mathematica [C] time = 0.0561714, size = 83, normalized size = 0.82

$$\frac{-4a^2+3b^2x^8\sqrt[4]{\frac{a}{bx^4}+1}\,{}_2F_1\left(\frac{1}{4},\frac{1}{4};\frac{5}{4};-\frac{a}{bx^4}\right)-7abx^4-3b^2x^8}{32ax^8\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(3/4)/x^9,x]
```

```
[Out] (-4*a^2 - 7*a*b*x^4 - 3*b^2*x^8 + 3*b^2*(1 + a/(b*x^4))^(1/4)*x^8
*Hypergeometric2F1[1/4, 1/4, 5/4, -(a/(b*x^4))])/(32*a*x^8*(a + b
*x^4)^(1/4))
```

Maple [F] time = 0.052, size = 0, normalized size = 0.

$$\int \frac{1}{x^9} \left(bx^4 + a\right)^{\frac{3}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(3/4)/x^9,x)
```

```
[Out] int((b*x^4+a)^(3/4)/x^9,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^9,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.421864, size = 266, normalized size = 2.63

$$\frac{12 \left(\frac{b^8}{a^5}\right)^{\frac{1}{4}} ax^8 \arctan\left(\frac{\left(\frac{b^8}{a^5}\right)^{\frac{3}{4}} a^4}{(bx^4+a)^{\frac{1}{4}} b^6 + \sqrt{\sqrt{bx^4+a}b^{12} + \sqrt{\frac{b^8}{a^5}}a^3 b^8}}\right) + 3 \left(\frac{b^8}{a^5}\right)^{\frac{1}{4}} ax^8 \log\left(27 \left(bx^4 + a\right)^{\frac{1}{4}} b^6 + 27 \left(\frac{b^8}{a^5}\right)^{\frac{3}{4}} a^4\right) - 3 \left(\frac{b^8}{a^5}\right)^{\frac{1}{4}} ax^8 \mathrm{l}}{128\, ax^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^9,x, algorithm="fricas")
```

```
[Out] 1/128*(12*(b^8/a^5)^(1/4)*a*x^8*arctan((b^8/a^5)^(3/4)*a^4/((b*x^
4 + a)^(1/4)*b^6 + sqrt(sqrt(b*x^4 + a)*b^12 + sqrt(b^8/a^5)*a^3*
b^8))) + 3*(b^8/a^5)^(1/4)*a*x^8*log(27*(b*x^4 + a)^(1/4)*b^6 + 2
7*(b^8/a^5)^(3/4)*a^4) - 3*(b^8/a^5)^(1/4)*a*x^8*log(27*(b*x^4 +
a)^(1/4)*b^6 - 27*(b^8/a^5)^(3/4)*a^4) - 4*(3*b*x^4 + 4*a)*(b*x^4
 + a)^(3/4))/(a*x^8)
```

Sympy [A] time = 10.8896, size = 41, normalized size = 0.41

$$-\frac{b^{\frac{3}{4}} \Gamma\left(\frac{5}{4}\right) {}_{2}F_{1}\left(\begin{matrix} -\frac{3}{4}, \frac{5}{4} \\ \frac{9}{4} \end{matrix}\middle| \frac{ae^{i\pi}}{bx^4}\right)}{4x^5 \Gamma\left(\frac{9}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(3/4)/x**9,x)
```

```
[Out] -b**(3/4)*gamma(5/4)*hyper((-3/4, 5/4), (9/4,), a*exp_polar(I*pi)
/(b*x**4))/(4*x**5*gamma(9/4))
```

GIAC/XCAS [A] time = 0.228808, size = 304, normalized size = 3.01

$$\frac{1}{256}\,b^2\left(\frac{6\,\sqrt{2}\,(-a)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}+2\,(bx^4+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{a^2}+\frac{6\,\sqrt{2}\,(-a)^{\frac{3}{4}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}-2\,(bx^4+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{a^2}-\frac{3\,\sqrt{2}\,(-a)^{\frac{3}{4}}\ln\left(\sqrt{2}(bx^4\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^9,x, algorithm="giac")
```

```
[Out] 1/256*b^2*(6*sqrt(2)*(-a)^(3/4)*arctan(1/2*sqrt(2)*(sqrt(2)*(-a)^
(1/4) + 2*(b*x^4 + a)^(1/4))/(-a)^(1/4))/a^2 + 6*sqrt(2)*(-a)^(3/
4)*arctan(-1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) - 2*(b*x^4 + a)^(1/4))
/(-a)^(1/4))/a^2 - 3*sqrt(2)*(-a)^(3/4)*ln(sqrt(2)*(b*x^4 + a)^(1
/4)*(-a)^(1/4) + sqrt(b*x^4 + a) + sqrt(-a))/a^2 + 3*sqrt(2)*(-a)
^(3/4)*ln(-sqrt(2)*(b*x^4 + a)^(1/4)*(-a)^(1/4) + sqrt(b*x^4 + a)
 + sqrt(-a))/a^2 - 8*(3*(b*x^4 + a)^(7/4) + (b*x^4 + a)^(3/4)*a)/
(a*b^2*x^8))
```

3.1023 $\int x^9 \left(a + bx^4\right)^{3/4} \, dx$

Optimal. Leaf size=149

$$-\frac{4a^{7/2}\sqrt[4]{\frac{bx^4}{a}+1}\,E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{65b^{5/2}\sqrt[4]{a+bx^4}}+\frac{4a^3x^2}{65b^2\sqrt[4]{a+bx^4}}-\frac{2a^2x^2\left(a+bx^4\right)^{3/4}}{65b^2}+\frac{1}{13}x^{10}\left(a+bx^4\right)^{3/4}+\frac{ax^6\left(a+bx^4\right)^{3/4}}{39b}$$

```
[Out] (4*a^3*x^2)/(65*b^2*(a + b*x^4)^(1/4)) - (2*a^2*x^2*(a + b*x^4)^(
3/4))/(65*b^2) + (a*x^6*(a + b*x^4)^(3/4))/(39*b) + (x^10*(a + b*
x^4)^(3/4))/13 - (4*a^(7/2)*(1 + (b*x^4)/a)^(1/4)*EllipticE[ArcTa
n[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(65*b^(5/2)*(a + b*x^4)^(1/4))
```

Rubi [A] time = 0.220688, antiderivative size = 149, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.4$

$$-\frac{4a^{7/2}\sqrt[4]{\frac{bx^4}{a}+1}\,E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{65b^{5/2}\sqrt[4]{a+bx^4}}+\frac{4a^3x^2}{65b^2\sqrt[4]{a+bx^4}}-\frac{2a^2x^2\left(a+bx^4\right)^{3/4}}{65b^2}+\frac{1}{13}x^{10}\left(a+bx^4\right)^{3/4}+\frac{ax^6\left(a+bx^4\right)^{3/4}}{39b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^9*(a + b*x^4)^(3/4),x]
```

```
[Out] (4*a^3*x^2)/(65*b^2*(a + b*x^4)^(1/4)) - (2*a^2*x^2*(a + b*x^4)^(
3/4))/(65*b^2) + (a*x^6*(a + b*x^4)^(3/4))/(39*b) + (x^10*(a + b*
x^4)^(3/4))/13 - (4*a^(7/2)*(1 + (b*x^4)/a)^(1/4)*EllipticE[ArcTa
n[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(65*b^(5/2)*(a + b*x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{2a^4\int^{x^2}\frac{1}{(a+bx^2)^{\frac{5}{4}}}\,dx}{65b^2}+\frac{4a^3x^2}{65b^2\sqrt[4]{a+bx^4}}-\frac{2a^2x^2\left(a+bx^4\right)^{\frac{3}{4}}}{65b^2}+\frac{ax^6\left(a+bx^4\right)^{\frac{3}{4}}}{39b}+\frac{x^{10}\left(a+bx^4\right)^{\frac{3}{4}}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**9*(b*x**4+a)**(3/4),x)
```

```
[Out] -2*a**4*Integral((a + b*x**2)**(-5/4), (x, x**2))/(65*b**2) + 4*a
**3*x**2/(65*b**2*(a + b*x**4)**(1/4)) - 2*a**2*x**2*(a + b*x**4)
**(3/4)/(65*b**2) + a*x**6*(a + b*x**4)**(3/4)/(39*b) + x**10*(a
+ b*x**4)**(3/4)/13
```

Mathematica [C] time = 0.0650817, size = 91, normalized size = 0.61

$$\frac{x^2\left(6a^3\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{3}{2};-\frac{bx^4}{a}\right)-6a^3-a^2bx^4+20ab^2x^8+15b^3x^{12}\right)}{195b^2\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^9*(a + b*x^4)^(3/4),x]
```

```
[Out] (x^2*(-6*a^3 - a^2*b*x^4 + 20*a*b^2*x^8 + 15*b^3*x^12 + 6*a^3*(1
+ (b*x^4)/a)^(1/4)*Hypergeometric2F1[1/4, 1/2, 3/2, -((b*x^4)/a)]
))/(195*b^2*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.041, size = 0, normalized size = 0.

$$\int x^{9} \left(b x^{4}+a\right)^{\frac{3}{4}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^9*(b*x^4+a)^(3/4),x)
```

```
[Out] int(x^9*(b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b x^{4}+a\right)^{\frac{3}{4}} x^{9}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^9,x, algorithm="maxima")
```

```
[Out] integrate((b*x^4 + a)^(3/4)*x^9, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\left(b x^{4}+a\right)^{\frac{3}{4}} x^{9}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^9,x, algorithm="fricas")
```

```
[Out] integral((b*x^4 + a)^(3/4)*x^9, x)
```

Sympy [A] time = 11.822, size = 29, normalized size = 0.19

$$\frac{a^{\frac{3}{4}} x^{10} {{}_{2}F_{1}\left(\begin{matrix} -\frac{3}{4}, \frac{5}{2} \\ \frac{7}{2} \end{matrix}\middle| {\frac{b x^{4} e^{i \pi}}{a}} \right)}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**9*(b*x**4+a)**(3/4),x)
```

```
[Out] a**(3/4)*x**10*hyper((-3/4, 5/2), (7/2,), b*x**4*exp_polar(I*pi)/
a)/10
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bx^4+a\right)^{\frac{3}{4}} x^9\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^9,x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(3/4)*x^9, x)
```

3.1024 $\int x^5 \left(a+bx^4\right)^{3/4} dx$

Optimal. Leaf size=125

$$\frac{2a^{5/2}\sqrt[4]{\frac{bx^4}{a}+1}\,E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{15b^{3/2}\sqrt[4]{a+bx^4}}-\frac{2a^2x^2}{15b\sqrt[4]{a+bx^4}}+\frac{1}{9}x^6\left(a+bx^4\right)^{3/4}+\frac{ax^2\left(a+bx^4\right)^{3/4}}{15b}$$

```
[Out] (-2*a^2*x^2)/(15*b*(a + b*x^4)^(1/4)) + (a*x^2*(a + b*x^4)^(3/4))
/(15*b) + (x^6*(a + b*x^4)^(3/4))/9 + (2*a^(5/2)*(1 + (b*x^4)/a)^
(1/4)*EllipticE[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(15*b^(3/2)*
(a + b*x^4)^(1/4))
```

Rubi [A] time = 0.171353, antiderivative size = 125, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$\frac{2a^{5/2}\sqrt[4]{\frac{bx^4}{a}+1}\,E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{15b^{3/2}\sqrt[4]{a+bx^4}}-\frac{2a^2x^2}{15b\sqrt[4]{a+bx^4}}+\frac{1}{9}x^6\left(a+bx^4\right)^{3/4}+\frac{ax^2\left(a+bx^4\right)^{3/4}}{15b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5*(a + b*x^4)^(3/4),x]
```

```
[Out] (-2*a^2*x^2)/(15*b*(a + b*x^4)^(1/4)) + (a*x^2*(a + b*x^4)^(3/4))
/(15*b) + (x^6*(a + b*x^4)^(3/4))/9 + (2*a^(5/2)*(1 + (b*x^4)/a)^
(1/4)*EllipticE[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(15*b^(3/2)*
(a + b*x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^2\int^{x^2}\frac{1}{\sqrt[4]{a+bx^2}}\,dx}{15b}+\frac{ax^2\left(a+bx^4\right)^{\frac{3}{4}}}{15b}+\frac{x^6\left(a+bx^4\right)^{\frac{3}{4}}}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5*(b*x**4+a)**(3/4),x)
```

```
[Out] -a**2*Integral((a + b*x**2)**(-1/4), (x, x**2))/(15*b) + a*x**2*(
a + b*x**4)**(3/4)/(15*b) + x**6*(a + b*x**4)**(3/4)/9
```

Mathematica [C] time = 0.0612009, size = 80, normalized size = 0.64

$$\frac{x^2\left(-3a^2\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{3}{2};-\frac{bx^4}{a}\right)+3a^2+8abx^4+5b^2x^8\right)}{45b\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5*(a + b*x^4)^(3/4),x]
```

```
[Out] (x^2*(3*a^2 + 8*a*b*x^4 + 5*b^2*x^8 - 3*a^2*(1 + (b*x^4)/a)^(1/4)
*Hypergeometric2F1[1/4, 1/2, 3/2, -((b*x^4)/a)]))/(45*b*(a + b*x^
4)^(1/4))
```

Maple [F] time = 0.038, size = 0, normalized size = 0.

$$\int x^{5} \left(b x^{4}+a \right)^{\frac{3}{4}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5*(b*x^4+a)^(3/4),x)
```

```
[Out] int(x^5*(b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bx^4+a\right)^{\frac{3}{4}}x^5\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^5,x, algorithm="maxima")
```

```
[Out] integrate((b*x^4 + a)^(3/4)*x^5, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(bx^4+a\right)^{\frac{3}{4}}x^5, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^5,x, algorithm="fricas")
```

```
[Out] integral((b*x^4 + a)^(3/4)*x^5, x)
```

Sympy [A] time = 5.80497, size = 29, normalized size = 0.23

$$\frac{a^{\frac{3}{4}}x^6\,{}_2F_1\left(\begin{matrix} -\frac{3}{4}, \frac{3}{2} \\ \frac{5}{2} \end{matrix}\middle| \frac{bx^4e^{i\pi}}{a}\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5*(b*x**4+a)**(3/4),x)
```

```
[Out] a**(3/4)*x**6*hyper((-3/4, 3/2), (5/2,), b*x**4*exp_polar(I*pi)/a
)/6
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bx^4+a\right)^{\frac{3}{4}}x^5\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^5,x, algorithm="giac")

[Out] integrate((b*x^4 + a)^(3/4)*x^5, x)
```

3.1025 $\int x\left(a+bx^4\right)^{3/4}\,dx$

Optimal. Leaf size=98

$$-\frac{3a^{3/2}\sqrt[4]{\frac{bx^4}{a}+1}\,E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{5\sqrt{b}\sqrt[4]{a+bx^4}}+\frac{1}{5}x^2\left(a+bx^4\right)^{3/4}+\frac{3ax^2}{5\sqrt[4]{a+bx^4}}$$

```
[Out] (3*a*x^2)/(5*(a + b*x^4)^(1/4)) + (x^2*(a + b*x^4)^(3/4))/5 - (3*
a^(3/2)*(1 + (b*x^4)/a)^(1/4)*EllipticE[ArcTan[(Sqrt[b]*x^2)/Sqrt
[a]]/2, 2])/(5*Sqrt[b]*(a + b*x^4)^(1/4))
```

Rubi [A] time = 0.122223, antiderivative size = 98, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385

$$-\frac{3a^{3/2}\sqrt[4]{\frac{bx^4}{a}+1}\,E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{5\sqrt{b}\sqrt[4]{a+bx^4}}+\frac{1}{5}x^2\left(a+bx^4\right)^{3/4}+\frac{3ax^2}{5\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x*(a + b*x^4)^(3/4),x]
```

```
[Out] (3*a*x^2)/(5*(a + b*x^4)^(1/4)) + (x^2*(a + b*x^4)^(3/4))/5 - (3*
a^(3/2)*(1 + (b*x^4)/a)^(1/4)*EllipticE[ArcTan[(Sqrt[b]*x^2)/Sqrt
[a]]/2, 2])/(5*Sqrt[b]*(a + b*x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{3a^2\int^{x^2}\frac{1}{(a+bx^2)^{\frac{5}{4}}}\,dx}{10}+\frac{3ax^2}{5\sqrt[4]{a+bx^4}}+\frac{x^2\left(a+bx^4\right)^{\frac{3}{4}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(b*x**4+a)**(3/4),x)
```

```
[Out] -3*a**2*Integral((a + b*x**2)**(-5/4), (x, x**2))/10 + 3*a*x**2/(
5*(a + b*x**4)**(1/4)) + x**2*(a + b*x**4)**(3/4)/5
```

Mathematica [C] time = 0.0571778, size = 64, normalized size = 0.65

$$\frac{x^2\left(3a\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{3}{2};-\frac{bx^4}{a}\right)+2\left(a+bx^4\right)\right)}{10\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x*(a + b*x^4)^(3/4),x]
```

```
[Out] (x^2*(2*(a + b*x^4) + 3*a*(1 + (b*x^4)/a)^(1/4)*Hypergeometric2F1
[1/4, 1/2, 3/2, -((b*x^4)/a)]))/(10*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.033, size = 0, normalized size = 0.

$$\int x\left(b x^4+a\right)^{\frac{3}{4}} d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(b*x^4+a)^(3/4),x)

[Out] int(x*(b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\left(b x^4+a\right)^{\frac{3}{4}} x\, d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x,x, algorithm="maxima")

[Out] integrate((b*x^4 + a)^(3/4)*x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\left(b x^4+a\right)^{\frac{3}{4}} x, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x,x, algorithm="fricas")

[Out] integral((b*x^4 + a)^(3/4)*x, x)
```

Sympy [A] time = 3.14084, size = 29, normalized size = 0.3

$$\frac{a^{\frac{3}{4}} x^2 {}_2F_1\left(\begin{matrix} -\frac{3}{4}, \frac{1}{2} \\ \frac{3}{2} \end{matrix}\middle| \frac{b x^4 e^{i\pi}}{a}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(b*x**4+a)**(3/4),x)

[Out] a**(3/4)*x**2*hyper((-3/4, 1/2), (3/2,), b*x**4*exp_polar(I*pi)/a
)/2
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x,x, algorithm="giac")

[Out] Exception raised: TypeError
```

3.1026 $\int \frac{\left(a+bx^4\right)^{3/4}}{x^3}\,dx$

Optimal. Leaf size=98

$$\frac{3bx^2}{2\sqrt[4]{a+bx^4}}-\frac{\left(a+bx^4\right)^{3/4}}{2x^2}-\frac{3\sqrt{a}\sqrt{b}\sqrt[4]{\frac{bx^4}{a}+1}E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{2\sqrt[4]{a+bx^4}}$$

```
[Out] (3*b*x^2)/(2*(a + b*x^4)^(1/4)) - (a + b*x^4)^(3/4)/(2*x^2) - (3*
Sqrt[a]*Sqrt[b]*(1 + (b*x^4)/a)^(1/4)*EllipticE[ArcTan[(Sqrt[b]*x
^2)/Sqrt[a]]/2, 2])/(2*(a + b*x^4)^(1/4))
```

Rubi [A] time = 0.134753, antiderivative size = 98, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{3bx^2}{2\sqrt[4]{a+bx^4}}-\frac{\left(a+bx^4\right)^{3/4}}{2x^2}-\frac{3\sqrt{a}\sqrt{b}\sqrt[4]{\frac{bx^4}{a}+1}E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{2\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(3/4)/x^3,x]
```

```
[Out] (3*b*x^2)/(2*(a + b*x^4)^(1/4)) - (a + b*x^4)^(3/4)/(2*x^2) - (3*
Sqrt[a]*Sqrt[b]*(1 + (b*x^4)/a)^(1/4)*EllipticE[ArcTan[(Sqrt[b]*x
^2)/Sqrt[a]]/2, 2])/(2*(a + b*x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{3ab\int^{x^2}\frac{1}{(a+bx^2)^{\frac{5}{4}}}\,dx}{4}+\frac{3bx^2}{2\sqrt[4]{a+bx^4}}-\frac{\left(a+bx^4\right)^{\frac{3}{4}}}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(3/4)/x**3,x)
```

```
[Out] -3*a*b*Integral((a + b*x**2)**(-5/4), (x, x**2))/4 + 3*b*x**2/(2*
(a + b*x**4)**(1/4)) - (a + b*x**4)**(3/4)/(2*x**2)
```

Mathematica [C] time = 0.0410525, size = 67, normalized size = 0.68

$$\frac{3bx^4\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{3}{2};-\frac{bx^4}{a}\right)-2\left(a+bx^4\right)}{4x^2\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(3/4)/x^3,x]
```

```
[Out] (-2*(a + b*x^4) + 3*b*x^4*(1 + (b*x^4)/a)^(1/4)*Hypergeometric2F1
[1/4, 1/2, 3/2, -((b*x^4)/a)])/(4*x^2*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.04, size = 0, normalized size = 0.

$$\int \frac{1}{x^3}\left(b x^4+a\right)^{\frac{3}{4}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(3/4)/x^3,x)

[Out] int((b*x^4+a)^(3/4)/x^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b x^4+a\right)^{\frac{3}{4}}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^3,x, algorithm="maxima")

[Out] integrate((b*x^4 + a)^(3/4)/x^3, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(b x^4+a\right)^{\frac{3}{4}}}{x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^3,x, algorithm="fricas")

[Out] integral((b*x^4 + a)^(3/4)/x^3, x)
```

Sympy [A] time = 3.15916, size = 32, normalized size = 0.33

$$-\frac{a^{\frac{3}{4}}\,{}_2F_1\left(\begin{matrix} -\frac{3}{4}, -\frac{1}{2} \\ \frac{1}{2} \end{matrix}\middle| \frac{b x^4 e^{i\pi}}{a}\right)}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(3/4)/x**3,x)

[Out] -a**(3/4)*hyper((-3/4, -1/2), (1/2,), b*x**4*exp_polar(I*pi)/a)/(
2*x**2)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b x^4+a\right)^{\frac{3}{4}}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^3,x, algorithm="giac")

[Out] integrate((b*x^4 + a)^(3/4)/x^3, x)
```

3.1027 $\int \frac{(a+bx^4)^{3/4}}{x^7} dx$

Optimal. Leaf size=125

$$-\frac{b^{3/2}\sqrt[4]{\frac{bx^4}{a}+1}E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{4\sqrt{a}\sqrt[4]{a+bx^4}}+\frac{b^2x^2}{4a\sqrt[4]{a+bx^4}}-\frac{(a+bx^4)^{3/4}}{6x^6}-\frac{b(a+bx^4)^{3/4}}{4ax^2}$$

```
[Out] (b^2*x^2)/(4*a*(a + b*x^4)^(1/4)) - (a + b*x^4)^(3/4)/(6*x^6) - (
b*(a + b*x^4)^(3/4))/(4*a*x^2) - (b^(3/2)*(1 + (b*x^4)/a)^(1/4)*E
llipticE[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(4*Sqrt[a]*(a + b*x
^4)^(1/4))
```

Rubi [A] time = 0.16385, antiderivative size = 125, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$-\frac{b^{3/2}\sqrt[4]{\frac{bx^4}{a}+1}E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{4\sqrt{a}\sqrt[4]{a+bx^4}}+\frac{b^2x^2}{4a\sqrt[4]{a+bx^4}}-\frac{(a+bx^4)^{3/4}}{6x^6}-\frac{b(a+bx^4)^{3/4}}{4ax^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(3/4)/x^7,x]
```

```
[Out] (b^2*x^2)/(4*a*(a + b*x^4)^(1/4)) - (a + b*x^4)^(3/4)/(6*x^6) - (
b*(a + b*x^4)^(3/4))/(4*a*x^2) - (b^(3/2)*(1 + (b*x^4)/a)^(1/4)*E
llipticE[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(4*Sqrt[a]*(a + b*x
^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{(a+bx^4)^{\frac{3}{4}}}{6x^6}+\frac{b^2\int^{x^2}\frac{1}{\sqrt[4]{a+bx^2}}\,dx}{8a}-\frac{b(a+bx^4)^{\frac{3}{4}}}{4ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(3/4)/x**7,x)
```

```
[Out] -(a + b*x**4)**(3/4)/(6*x**6) + b**2*Integral((a + b*x**2)**(-1/4
), (x, x**2))/(8*a) - b*(a + b*x**4)**(3/4)/(4*a*x**2)
```

Mathematica [C] time = 0.0518424, size = 86, normalized size = 0.69

$$\frac{3b^2x^8\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{3}{2};-\frac{bx^4}{a}\right)-2\left(2a^2+5abx^4+3b^2x^8\right)}{24ax^6\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(3/4)/x^7,x]
```

```
[Out] (-2*(2*a^2 + 5*a*b*x^4 + 3*b^2*x^8) + 3*b^2*x^8*(1 + (b*x^4)/a)^(
1/4)*Hypergeometric2F1[1/4, 1/2, 3/2, -((b*x^4)/a)])/(24*a*x^6*(a
 + b*x^4)^(1/4))
```

Maple [F] time = 0.044, size = 0, normalized size = 0.

$$\int \frac{1}{x^7} \left(b x^4 + a\right)^{\frac{3}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(3/4)/x^7,x)

[Out] int((b*x^4+a)^(3/4)/x^7,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b x^4 + a\right)^{\frac{3}{4}}}{x^7} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^7,x, algorithm="maxima")

[Out] integrate((b*x^4 + a)^(3/4)/x^7, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(b x^4 + a\right)^{\frac{3}{4}}}{x^7}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^7,x, algorithm="fricas")

[Out] integral((b*x^4 + a)^(3/4)/x^7, x)
```

Sympy [A] time = 6.16067, size = 34, normalized size = 0.27

$$-\frac{a^{\frac{3}{4}} {}_{2}F_{1}\left(\begin{matrix} -\frac{3}{2}, -\frac{3}{4} \\ -\frac{1}{2} \end{matrix}\middle| {\frac{b x^4 e^{i\pi}}{a}} \right)}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(3/4)/x**7,x)

[Out] -a**(3/4)*hyper((-3/2, -3/4), (-1/2,), b*x**4*exp_polar(I*pi)/a)/
(6*x**6)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b x^4 + a\right)^{\frac{3}{4}}}{x^7} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^7,x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(3/4)/x^7, x)
```

3.1028 $\int \frac{(a+bx^4)^{3/4}}{x^{11}}\,dx$

Optimal. Leaf size=149

$$\frac{3b^{5/2}\sqrt[4]{\frac{bx^4}{a}+1}E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{40a^{3/2}\sqrt[4]{a+bx^4}}-\frac{3b^3x^2}{40a^2\sqrt[4]{a+bx^4}}+\frac{3b^2\left(a+bx^4\right)^{3/4}}{40a^2x^2}-\frac{\left(a+bx^4\right)^{3/4}}{10x^{10}}-\frac{b\left(a+bx^4\right)^{3/4}}{20ax^6}$$

```
[Out] (-3*b^3*x^2)/(40*a^2*(a + b*x^4)^(1/4)) - (a + b*x^4)^(3/4)/(10*x
^10) - (b*(a + b*x^4)^(3/4))/(20*a*x^6) + (3*b^2*(a + b*x^4)^(3/4
))/(40*a^2*x^2) + (3*b^(5/2)*(1 + (b*x^4)/a)^(1/4)*EllipticE[ArcT
an[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(40*a^(3/2)*(a + b*x^4)^(1/4))
```

Rubi [A] time = 0.216134, antiderivative size = 149, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$\frac{3b^{5/2}\sqrt[4]{\frac{bx^4}{a}+1}E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{40a^{3/2}\sqrt[4]{a+bx^4}}-\frac{3b^3x^2}{40a^2\sqrt[4]{a+bx^4}}+\frac{3b^2\left(a+bx^4\right)^{3/4}}{40a^2x^2}-\frac{\left(a+bx^4\right)^{3/4}}{10x^{10}}-\frac{b\left(a+bx^4\right)^{3/4}}{20ax^6}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(3/4)/x^11,x]
```

```
[Out] (-3*b^3*x^2)/(40*a^2*(a + b*x^4)^(1/4)) - (a + b*x^4)^(3/4)/(10*x
^10) - (b*(a + b*x^4)^(3/4))/(20*a*x^6) + (3*b^2*(a + b*x^4)^(3/4
))/(40*a^2*x^2) + (3*b^(5/2)*(1 + (b*x^4)/a)^(1/4)*EllipticE[ArcT
an[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(40*a^(3/2)*(a + b*x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\left(a+bx^4\right)^{\frac{3}{4}}}{10x^{10}}+\frac{3b^3\int^{x^2}\frac{1}{(a+bx^2)^{\frac{5}{4}}}\,dx}{80a}-\frac{b\left(a+bx^4\right)^{\frac{3}{4}}}{20ax^6}-\frac{3b^3x^2}{40a^2\sqrt[4]{a+bx^4}}+\frac{3b^2\left(a+bx^4\right)^{\frac{3}{4}}}{40a^2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(3/4)/x**11,x)
```

```
[Out] -(a + b*x**4)**(3/4)/(10*x**10) + 3*b**3*Integral((a + b*x**2)**(
-5/4), (x, x**2))/(80*a) - b*(a + b*x**4)**(3/4)/(20*a*x**6) - 3*
b**3*x**2/(40*a**2*(a + b*x**4)**(1/4)) + 3*b**2*(a + b*x**4)**(3
/4)/(40*a**2*x**2)
```

Mathematica [C] time = 0.0559941, size = 94, normalized size = 0.63

$$\frac{-8a^3-12a^2bx^4-3b^3x^{12}\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{3}{2};-\frac{bx^4}{a}\right)+2ab^2x^8+6b^3x^{12}}{80a^2x^{10}\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(3/4)/x^11,x]
```

```
[Out] (-8*a^3 - 12*a^2*b*x^4 + 2*a*b^2*x^8 + 6*b^3*x^12 - 3*b^3*x^12*(1
 + (b*x^4)/a)^(1/4)*Hypergeometric2F1[1/4, 1/2, 3/2, -((b*x^4)/a)
```

```
])/(80*a^2*x^10*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.05, size = 0, normalized size = 0.

$$\int \frac{1}{x^{11}} \left(b x^4 + a\right)^{\frac{3}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(3/4)/x^11,x)

[Out] int((b*x^4+a)^(3/4)/x^11,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b x^4 + a\right)^{\frac{3}{4}}}{x^{11}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^11,x, algorithm="maxima")

[Out] integrate((b*x^4 + a)^(3/4)/x^11, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(b x^4 + a\right)^{\frac{3}{4}}}{x^{11}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^11,x, algorithm="fricas")

[Out] integral((b*x^4 + a)^(3/4)/x^11, x)
```

Sympy [A] time = 12.7167, size = 34, normalized size = 0.23

$$-\frac{a^{\frac{3}{4}} {}_{2}F_{1}\left(\begin{matrix} -\frac{5}{2}, -\frac{3}{4} \\ -\frac{3}{2} \end{matrix}\middle| \frac{b x^4 e^{i\pi}}{a}\right)}{10 x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(3/4)/x**11,x)

[Out] -a**(3/4)*hyper((-5/2, -3/4), (-3/2,), b*x**4*exp_polar(I*pi)/a)/
(10*x**10)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b x^4 + a\right)^{\frac{3}{4}}}{x^{11}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^11,x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(3/4)/x^11, x)
```

3.1029 $\int x^{12} \left(a+bx^4\right)^{3/4} dx$

Optimal. Leaf size=149

$$-\frac{45a^4\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{4096b^{13/4}}-\frac{45a^4\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{4096b^{13/4}}+\frac{45a^3x\left(a+bx^4\right)^{3/4}}{2048b^3}-\frac{9a^2x^5\left(a+bx^4\right)^{3/4}}{512b^2}+\frac{1}{16}x^{13}\left(a+bx^4\right)^{3/4}+\frac{ax^9\left(a+bx^4\right)^{3/4}}{64b}$$

```
[Out] (45*a^3*x*(a + b*x^4)^(3/4))/(2048*b^3) - (9*a^2*x^5*(a + b*x^4)^
(3/4))/(512*b^2) + (a*x^9*(a + b*x^4)^(3/4))/(64*b) + (x^13*(a +
b*x^4)^(3/4))/16 - (45*a^4*ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/4)])
/(4096*b^(13/4)) - (45*a^4*ArcTanh[(b^(1/4)*x)/(a + b*x^4)^(1/4)]
)/(4096*b^(13/4))
```

Rubi [A] time = 0.162419, antiderivative size = 149, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$-\frac{45a^4\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{4096b^{13/4}}-\frac{45a^4\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{4096b^{13/4}}+\frac{45a^3x\left(a+bx^4\right)^{3/4}}{2048b^3}-\frac{9a^2x^5\left(a+bx^4\right)^{3/4}}{512b^2}+\frac{1}{16}x^{13}\left(a+bx^4\right)^{3/4}+\frac{ax^9\left(a+bx^4\right)^{3/4}}{64b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^12*(a + b*x^4)^(3/4),x]
```

```
[Out] (45*a^3*x*(a + b*x^4)^(3/4))/(2048*b^3) - (9*a^2*x^5*(a + b*x^4)^
(3/4))/(512*b^2) + (a*x^9*(a + b*x^4)^(3/4))/(64*b) + (x^13*(a +
b*x^4)^(3/4))/16 - (45*a^4*ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/4)])
/(4096*b^(13/4)) - (45*a^4*ArcTanh[(b^(1/4)*x)/(a + b*x^4)^(1/4)]
)/(4096*b^(13/4))
```

Rubi in Sympy [A] time = 19.8731, size = 139, normalized size = 0.93

$$-\frac{45a^4\operatorname{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{4096b^{\frac{13}{4}}}-\frac{45a^4\operatorname{atanh}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{4096b^{\frac{13}{4}}}+\frac{45a^3x\left(a+bx^4\right)^{\frac{3}{4}}}{2048b^3}-\frac{9a^2x^5\left(a+bx^4\right)^{\frac{3}{4}}}{512b^2}+\frac{ax^9\left(a+bx^4\right)^{\frac{3}{4}}}{64b}+\frac{x^{13}\left(a+bx^4\right)^{\frac{3}{4}}}{16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**12*(b*x**4+a)**(3/4),x)
```

```
[Out] -45*a**4*atan(b**(1/4)*x/(a + b*x**4)**(1/4))/(4096*b**(13/4)) -
45*a**4*atanh(b**(1/4)*x/(a + b*x**4)**(1/4))/(4096*b**(13/4)) +
45*a**3*x*(a + b*x**4)**(3/4)/(2048*b**3) - 9*a**2*x**5*(a + b*x*
*4)**(3/4)/(512*b**2) + a*x**9*(a + b*x**4)**(3/4)/(64*b) + x**13
*(a + b*x**4)**(3/4)/16
```

Mathematica [A] time = 0.16511, size = 135, normalized size = 0.91

$$(a+bx^4)^{3/4}\left(\frac{45a^3x}{2048b^3}-\frac{9a^2x^5}{512b^2}+\frac{ax^9}{64b}+\frac{x^{13}}{16}\right)-\frac{45a^4\left(-\log\left(1-\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)+\log\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}+1\right)+2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)\right)}{8192b^{13/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^12*(a + b*x^4)^(3/4),x]
```

```
[Out] (a + b*x^4)^(3/4)*((45*a^3*x)/(2048*b^3) - (9*a^2*x^5)/(512*b^2)
+ (a*x^9)/(64*b) + x^13/16) - (45*a^4*(2*ArcTan[(b^(1/4)*x)/(a +
b*x^4)^(1/4)] - Log[1 - (b^(1/4)*x)/(a + b*x^4)^(1/4)] + Log[1 +
(b^(1/4)*x)/(a + b*x^4)^(1/4)]))/(8192*b^(13/4))
```

Maple [F] time = 0.042, size = 0, normalized size = 0.

$$\int x^{12}\left(bx^4+a\right)^{\frac{3}{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^12*(b*x^4+a)^(3/4),x)
```

```
[Out] int(x^12*(b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^12,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.297731, size = 315, normalized size = 2.11

$$-\frac{180\left(\frac{a^{16}}{b^{13}}\right)^{\frac{1}{4}}b^3\arctan\left(\frac{\left(\frac{a^{16}}{b^{13}}\right)^{\frac{3}{4}}b^{10}x}{(bx^4+a)^{\frac{1}{4}}a^{12}+x\sqrt{\frac{\sqrt{\frac{a^{16}}{b^{13}}}a^{16}b^7x^2+\sqrt{bx^4+a}a^{24}}{x^2}}}\right)+45\left(\frac{a^{16}}{b^{13}}\right)^{\frac{1}{4}}b^3\log\left(\frac{91125\left((bx^4+a)^{\frac{1}{4}}a^{12}+\left(\frac{a^{16}}{b^{13}}\right)^{\frac{3}{4}}b^{10}x\right)}{x}\right)-45\left(\frac{a^{16}}{b^{13}}\right)^{\frac{1}{4}}}{8192\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^12,x, algorithm="fricas")
```

```
[Out] -1/8192*(180*(a^16/b^13)^(1/4)*b^3*arctan((a^16/b^13)^(3/4)*b^10*
x/((b*x^4 + a)^(1/4)*a^12 + x*sqrt((sqrt(a^16/b^13)*a^16*b^7*x^2
+ sqrt(b*x^4 + a)*a^24)/x^2))) + 45*(a^16/b^13)^(1/4)*b^3*log(911
25*((b*x^4 + a)^(1/4)*a^12 + (a^16/b^13)^(3/4)*b^10*x)/x) - 45*(a
^16/b^13)^(1/4)*b^3*log(91125*((b*x^4 + a)^(1/4)*a^12 - (a^16/b^1
3)^(3/4)*b^10*x)/x) - 4*(128*b^3*x^13 + 32*a*b^2*x^9 - 36*a^2*b*x
^5 + 45*a^3*x)*(b*x^4 + a)^(3/4))/b^3
```

Sympy [A] time = 23.4742, size = 39, normalized size = 0.26

$$\frac{a^{\frac{3}{4}}x^{13}\Gamma\left(\frac{13}{4}\right){}_{2}F_{1}\left(\begin{matrix}-\frac{3}{4},\frac{13}{4}\\ \frac{17}{4}\end{matrix}\middle|\frac{bx^4e^{i\pi}}{a}\right)}{4\Gamma\left(\frac{17}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**12*(b*x**4+a)**(3/4),x)
```

```
[Out] a**(3/4)*x**13*gamma(13/4)*hyper((-3/4, 13/4), (17/4,), b*x**4*ex
p_polar(I*pi)/a)/(4*gamma(17/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bx^4+a\right)^{\frac{3}{4}}x^{12}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^12,x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(3/4)*x^12, x)
```

3.1030 $\int x^8 \left(a+bx^4\right)^{3/4} dx$

Optimal. Leaf size=125

$$\frac{5a^3\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{256b^{9/4}}+\frac{5a^3\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{256b^{9/4}}-\frac{5a^2x\left(a+bx^4\right)^{3/4}}{128b^2}+\frac{1}{12}x^9\left(a+bx^4\right)^{3/4}+\frac{ax^5\left(a+bx^4\right)^{3/4}}{32b}$$

```
[Out] (-5*a^2*x*(a + b*x^4)^(3/4))/(128*b^2) + (a*x^5*(a + b*x^4)^(3/4)
)/(32*b) + (x^9*(a + b*x^4)^(3/4))/12 + (5*a^3*ArcTan[(b^(1/4)*x)
/(a + b*x^4)^(1/4)])/(256*b^(9/4)) + (5*a^3*ArcTanh[(b^(1/4)*x)/(
a + b*x^4)^(1/4)])/(256*b^(9/4))
```

Rubi [A] time = 0.123861, antiderivative size = 125, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$\frac{5a^3\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{256b^{9/4}}+\frac{5a^3\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{256b^{9/4}}-\frac{5a^2x\left(a+bx^4\right)^{3/4}}{128b^2}+\frac{1}{12}x^9\left(a+bx^4\right)^{3/4}+\frac{ax^5\left(a+bx^4\right)^{3/4}}{32b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8*(a + b*x^4)^(3/4),x]
```

```
[Out] (-5*a^2*x*(a + b*x^4)^(3/4))/(128*b^2) + (a*x^5*(a + b*x^4)^(3/4)
)/(32*b) + (x^9*(a + b*x^4)^(3/4))/12 + (5*a^3*ArcTan[(b^(1/4)*x)
/(a + b*x^4)^(1/4)])/(256*b^(9/4)) + (5*a^3*ArcTanh[(b^(1/4)*x)/(
a + b*x^4)^(1/4)])/(256*b^(9/4))
```

Rubi in Sympy [A] time = 15.0444, size = 116, normalized size = 0.93

$$\frac{5a^3\operatorname{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{256b^{\frac{9}{4}}}+\frac{5a^3\operatorname{atanh}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{256b^{\frac{9}{4}}}-\frac{5a^2x\left(a+bx^4\right)^{\frac{3}{4}}}{128b^2}+\frac{ax^5\left(a+bx^4\right)^{\frac{3}{4}}}{32b}+\frac{x^9\left(a+bx^4\right)^{\frac{3}{4}}}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8*(b*x**4+a)**(3/4),x)
```

```
[Out] 5*a**3*atan(b**(1/4)*x/(a + b*x**4)**(1/4))/(256*b**(9/4)) + 5*a*
*3*atanh(b**(1/4)*x/(a + b*x**4)**(1/4))/(256*b**(9/4)) - 5*a**2*
x*(a + b*x**4)**(3/4)/(128*b**2) + a*x**5*(a + b*x**4)**(3/4)/(32
*b) + x**9*(a + b*x**4)**(3/4)/12
```

Mathematica [A] time = 0.121862, size = 122, normalized size = 0.98

$$\frac{5a^3\left(-\log\left(1-\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)+\log\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}+1\right)+2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)\right)}{512b^{9/4}}+\left(a+bx^4\right)^{3/4}\left(-\frac{5a^2x}{128b^2}+\frac{ax^5}{32b}+\frac{x^9}{12}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8*(a + b*x^4)^(3/4),x]
```

```
[Out] (a + b*x^4)^(3/4)*((-5*a^2*x)/(128*b^2) + (a*x^5)/(32*b) + x^9/12
) + (5*a^3*(2*ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/4)] - Log[1 - (b^
(1/4)*x)/(a + b*x^4)^(1/4)] + Log[1 + (b^(1/4)*x)/(a + b*x^4)^(1/
4)]))/(512*b^(9/4))
```

Maple [F] time = 0.038, size = 0, normalized size = 0.

$$\int x^{8} \left(b x^{4}+a\right)^{\frac{3}{4}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8*(b*x^4+a)^(3/4),x)
```

```
[Out] int(x^8*(b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^8,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.271732, size = 300, normalized size = 2.4

$$\frac{60 \left(\frac{a^{12}}{b^{9}}\right)^{\frac{1}{4}} b^{2} \arctan\left(\frac{\left(\frac{a^{12}}{b^{9}}\right)^{\frac{3}{4}} b^{7} x}{\left(b x^{4}+a\right)^{\frac{1}{4}} a^{9}+x \sqrt{\frac{\sqrt{\frac{a^{12}}{b^{9}}}\, a^{12} b^{5} x^{2}+\sqrt{b x^{4}+a}\, a^{18}}{x^{2}}}}\right)+15 \left(\frac{a^{12}}{b^{9}}\right)^{\frac{1}{4}} b^{2} \log\left(\frac{125 \left(\left(b x^{4}+a\right)^{\frac{1}{4}} a^{9}+\left(\frac{a^{12}}{b^{9}}\right)^{\frac{3}{4}} b^{7} x\right)}{x}\right)-15 \left(\frac{a^{12}}{b^{9}}\right)^{\frac{1}{4}} b^{2} \log}{1536\, b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^8,x, algorithm="fricas")
```

```
[Out] 1/1536*(60*(a^12/b^9)^(1/4)*b^2*arctan((a^12/b^9)^(3/4)*b^7*x/((b
*x^4 + a)^(1/4)*a^9 + x*sqrt((sqrt(a^12/b^9)*a^12*b^5*x^2 + sqrt(
b*x^4 + a)*a^18)/x^2))) + 15*(a^12/b^9)^(1/4)*b^2*log(125*((b*x^4
 + a)^(1/4)*a^9 + (a^12/b^9)^(3/4)*b^7*x)/x) - 15*(a^12/b^9)^(1/4
)*b^2*log(125*((b*x^4 + a)^(1/4)*a^9 - (a^12/b^9)^(3/4)*b^7*x)/x)
 + 4*(32*b^2*x^9 + 12*a*b*x^5 - 15*a^2*x)*(b*x^4 + a)^(3/4))/b^2
```

Sympy [A] time = 12.6381, size = 39, normalized size = 0.31

$$\frac{a^{\frac{3}{4}} x^{9} \left(\frac{9}{4}\right) {}_{2}F_{1}\left(\begin{matrix} -\frac{3}{4}, \frac{9}{4} \\ \frac{13}{4} \end{matrix}\middle| {\frac{b x^{4} e^{i \pi}}{a}} \right)}{4 \left(\frac{13}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8*(b*x**4+a)**(3/4),x)
```

```
[Out] a**(3/4)*x**9*gamma(9/4)*hyper((-3/4, 9/4), (13/4,), b*x**4*exp_p
olar(I*pi)/a)/(4*gamma(13/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bx^4 + a\right)^{\frac{3}{4}} x^8 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^8,x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(3/4)*x^8, x)
```

3.1031 $\int x^4 \left(a+bx^4\right)^{3/4} dx$

Optimal. Leaf size=101

$$-\frac{3a^2 \tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{5/4}}-\frac{3a^2 \tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{5/4}}+\frac{3ax\left(a+bx^4\right)^{3/4}}{32b}+\frac{1}{8}x^5\left(a+bx^4\right)^{3/4}$$

```
[Out] (3*a*x*(a + b*x^4)^(3/4))/(32*b) + (x^5*(a + b*x^4)^(3/4))/8 - (3
*a^2*ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(64*b^(5/4)) - (3*a^2
*ArcTanh[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(64*b^(5/4))
```

Rubi [A] time = 0.0882331, antiderivative size = 101, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$-\frac{3a^2 \tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{5/4}}-\frac{3a^2 \tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{5/4}}+\frac{3ax\left(a+bx^4\right)^{3/4}}{32b}+\frac{1}{8}x^5\left(a+bx^4\right)^{3/4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4*(a + b*x^4)^(3/4),x]
```

```
[Out] (3*a*x*(a + b*x^4)^(3/4))/(32*b) + (x^5*(a + b*x^4)^(3/4))/8 - (3
*a^2*ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(64*b^(5/4)) - (3*a^2
*ArcTanh[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(64*b^(5/4))
```

Rubi in Sympy [A] time = 11.0421, size = 94, normalized size = 0.93

$$-\frac{3a^2 \operatorname{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{\frac{5}{4}}}-\frac{3a^2 \operatorname{atanh}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{\frac{5}{4}}}+\frac{3ax\left(a+bx^4\right)^{\frac{3}{4}}}{32b}+\frac{x^5\left(a+bx^4\right)^{\frac{3}{4}}}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4*(b*x**4+a)**(3/4),x)
```

```
[Out] -3*a**2*atan(b**(1/4)*x/(a + b*x**4)**(1/4))/(64*b**(5/4)) - 3*a*
*2*atanh(b**(1/4)*x/(a + b*x**4)**(1/4))/(64*b**(5/4)) + 3*a*x*(a
 + b*x**4)**(3/4)/(32*b) + x**5*(a + b*x**4)**(3/4)/8
```

Mathematica [A] time = 0.105817, size = 109, normalized size = 1.08

$$\left(a+bx^4\right)^{3/4}\left(\frac{3ax}{32b}+\frac{x^5}{8}\right)-\frac{3a^2\left(-\log\left(1-\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)+\log\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}+1\right)+2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)\right)}{128b^{5/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4*(a + b*x^4)^(3/4),x]
```

```
[Out] (a + b*x^4)^(3/4)*((3*a*x)/(32*b) + x^5/8) - (3*a^2*(2*ArcTan[(b^
(1/4)*x)/(a + b*x^4)^(1/4)] - Log[1 - (b^(1/4)*x)/(a + b*x^4)^(1/
4)] + Log[1 + (b^(1/4)*x)/(a + b*x^4)^(1/4)]))/(128*b^(5/4))
```

Maple [F] time = 0.037, size = 0, normalized size = 0.

$$\int x^4 (bx^4+a)^{\frac{3}{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4*(b*x^4+a)^(3/4),x)
```

```
[Out] int(x^4*(b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.279809, size = 277, normalized size = 2.74

$$-\frac{12 \left(\frac{a^8}{b^5}\right)^{\frac{1}{4}} b \arctan\left(\frac{\left(\frac{a^8}{b^5}\right)^{\frac{3}{4}} b^4 x}{(bx^4+a)^{\frac{1}{4}} a^6 + x\sqrt{\frac{\sqrt{\frac{a^8}{b^5}} a^8 b^3 x^2 + \sqrt{bx^4+a}\, a^{12}}{x^2}}}\right) + 3 \left(\frac{a^8}{b^5}\right)^{\frac{1}{4}} b \log\left(\frac{27\left((bx^4+a)^{\frac{1}{4}} a^6 + \left(\frac{a^8}{b^5}\right)^{\frac{3}{4}} b^4 x\right)}{x}\right) - 3 \left(\frac{a^8}{b^5}\right)^{\frac{1}{4}} b \log\left(\frac{27\left((bx^4\right.}{}\right.}{128\, b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^4,x, algorithm="fricas")
```

```
[Out] -1/128*(12*(a^8/b^5)^(1/4)*b*arctan((a^8/b^5)^(3/4)*b^4*x/((b*x^4
 + a)^(1/4)*a^6 + x*sqrt((sqrt(a^8/b^5)*a^8*b^3*x^2 + sqrt(b*x^4
+ a)*a^12)/x^2))) + 3*(a^8/b^5)^(1/4)*b*log(27*((b*x^4 + a)^(1/4)
*a^6 + (a^8/b^5)^(3/4)*b^4*x)/x) - 3*(a^8/b^5)^(1/4)*b*log(27*((b
*x^4 + a)^(1/4)*a^6 - (a^8/b^5)^(3/4)*b^4*x)/x) - 4*(4*b*x^5 + 3*
a*x)*(b*x^4 + a)^(3/4))/b
```

Sympy [A] time = 7.18052, size = 39, normalized size = 0.39

$$\frac{a^{\frac{3}{4}} x^5 \Gamma\left(\frac{5}{4}\right) {}_2F_1\left(\begin{matrix} -\frac{3}{4}, \frac{5}{4} \\ \frac{9}{4} \end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{4\Gamma\left(\frac{9}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4*(b*x**4+a)**(3/4),x)
```

```
[Out] a**(3/4)*x**5*gamma(5/4)*hyper((-3/4, 5/4), (9/4,), b*x**4*exp_po
lar(I*pi)/a)/(4*gamma(9/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bx^4 + a\right)^{\frac{3}{4}} x^4 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^4,x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(3/4)*x^4, x)
```

3.1032 $\int \left(a+bx^4\right)^{3/4}\,dx$

Optimal. Leaf size=75

$$\frac{1}{4}x\left(a+bx^4\right)^{3/4}+\frac{3a\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{8\sqrt[4]{b}}+\frac{3a\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{8\sqrt[4]{b}}$$

```
[Out] (x*(a + b*x^4)^(3/4))/4 + (3*a*ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/
4)])/(8*b^(1/4)) + (3*a*ArcTanh[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(
8*b^(1/4))
```

Rubi [A] time = 0.0456584, antiderivative size = 75, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.454

$$\frac{1}{4}x\left(a+bx^4\right)^{3/4}+\frac{3a\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{8\sqrt[4]{b}}+\frac{3a\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{8\sqrt[4]{b}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(3/4),x]
```

```
[Out] (x*(a + b*x^4)^(3/4))/4 + (3*a*ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/
4)])/(8*b^(1/4)) + (3*a*ArcTanh[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(
8*b^(1/4))
```

Rubi in Sympy [A] time = 5.31439, size = 70, normalized size = 0.93

$$\frac{3a\,\mathrm{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{8\sqrt[4]{b}}+\frac{3a\,\mathrm{atanh}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{8\sqrt[4]{b}}+\frac{x\left(a+bx^4\right)^{\frac{3}{4}}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(3/4),x)
```

```
[Out] 3*a*atan(b**(1/4)*x/(a + b*x**4)**(1/4))/(8*b**(1/4)) + 3*a*atanh
(b**(1/4)*x/(a + b*x**4)**(1/4))/(8*b**(1/4)) + x*(a + b*x**4)**(
3/4)/4
```

Mathematica [A] time = 0.0608566, size = 94, normalized size = 1.25

$$\frac{1}{4}x\left(a+bx^4\right)^{3/4}+\frac{3a\left(-\log\left(1-\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)+\log\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}+1\right)+2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)\right)}{16\sqrt[4]{b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(3/4),x]
```

```
[Out] (x*(a + b*x^4)^(3/4))/4 + (3*a*(2*ArcTan[(b^(1/4)*x)/(a + b*x^4)^
(1/4)] - Log[1 - (b^(1/4)*x)/(a + b*x^4)^(1/4)] + Log[1 + (b^(1/4
)*x)/(a + b*x^4)^(1/4)]))/(16*b^(1/4))
```

Maple [F] time = 0.044, size = 0, normalized size = 0.

$$\int \left(b x^4 + a\right)^{\frac{3}{4}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(3/4),x)

[Out] int((b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [A] time = 0.272914, size = 242, normalized size = 3.23

$$\frac{1}{4}\left(b x^4 + a\right)^{\frac{3}{4}} x + \frac{3}{4}\left(\frac{a^4}{b}\right)^{\frac{1}{4}} \arctan\left(\frac{\left(\frac{a^4}{b}\right)^{\frac{3}{4}} b x}{\left(b x^4 + a\right)^{\frac{1}{4}} a^3 + x\sqrt{\frac{\sqrt{\frac{a^4}{b}}\, a^4 b x^2 + \sqrt{b x^4 + a}\, a a^6}{x^2}}}\right) + \frac{3}{16}\left(\frac{a^4}{b}\right)^{\frac{1}{4}} \log\left(\frac{27\left(\left(b x^4 + a\right)^{\frac{1}{4}} a^3 + \left(\frac{a^4}{b}\right)^{\frac{3}{4}} b x\right)}{x}\right) - \frac{3}{16}\left(\frac{a^4}{b}\right)^{\frac{1}{4}} \log\left(\frac{27\left(\left(b x^4 + a\right)^{\frac{1}{4}} a^3 - \left(\frac{a^4}{b}\right)^{\frac{3}{4}} b x\right)}{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4),x, algorithm="fricas")

[Out] 1/4*(b*x^4 + a)^(3/4)*x + 3/4*(a^4/b)^(1/4)*arctan((a^4/b)^(3/4)*
b*x/((b*x^4 + a)^(1/4)*a^3 + x*sqrt((sqrt(a^4/b)*a^4*b*x^2 + sqrt
(b*x^4 + a)*a^6)/x^2))) + 3/16*(a^4/b)^(1/4)*log(27*((b*x^4 + a)^
(1/4)*a^3 + (a^4/b)^(3/4)*b*x)/x) - 3/16*(a^4/b)^(1/4)*log(27*((b
*x^4 + a)^(1/4)*a^3 - (a^4/b)^(3/4)*b*x)/x)
```

Sympy [A] time = 4.58564, size = 37, normalized size = 0.49

$$\frac{a^{\frac{3}{4}} x \Gamma\left(\frac{1}{4}\right) {}_{2}F_{1}\left(\begin{matrix} -\frac{3}{4}, \frac{1}{4} \\ \frac{5}{4} \end{matrix}\middle| {\frac{b x^4 e^{i\pi}}{a}}\right)}{4 \Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(3/4),x)

[Out] a**(3/4)*x*gamma(1/4)*hyper((-3/4, 1/4), (5/4,), b*x**4*exp_polar
(I*pi)/a)/(4*gamma(5/4))
```

GIAC/XCAS [A] time = 0.235747, size = 302, normalized size = 4.03

$$\frac{1}{32}\left(\frac{6\sqrt{2}(-b)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-b)^{\frac{1}{4}}+\frac{2\left(bx^4+a\right)^{\frac{1}{4}}}{x}\right)}{2(-b)^{\frac{1}{4}}}\right)}{b}+\frac{6\sqrt{2}(-b)^{\frac{3}{4}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-b)^{\frac{1}{4}}-\frac{2\left(bx^4+a\right)^{\frac{1}{4}}}{x}\right)}{2(-b)^{\frac{1}{4}}}\right)}{b}-\frac{3\sqrt{2}(-b)^{\frac{3}{4}}\ln\left(\sqrt{-b}+\frac{\sqrt{2}(b\cdots}{\cdots}\right.}{b}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4),x, algorithm="giac")
```

```
[Out] 1/32*(6*sqrt(2)*(-b)^(3/4)*arctan(1/2*sqrt(2)*(sqrt(2)*(-b)^(1/4)
 + 2*(b*x^4 + a)^(1/4)/x)/(-b)^(1/4))/b + 6*sqrt(2)*(-b)^(3/4)*ar
ctan(-1/2*sqrt(2)*(sqrt(2)*(-b)^(1/4) - 2*(b*x^4 + a)^(1/4)/x)/(-
b)^(1/4))/b - 3*sqrt(2)*(-b)^(3/4)*ln(sqrt(-b) + sqrt(2)*(b*x^4 +
 a)^(1/4)*(-b)^(1/4)/x + sqrt(b*x^4 + a)/x^2)/b + 3*sqrt(2)*(-b)^
(3/4)*ln(sqrt(-b) - sqrt(2)*(b*x^4 + a)^(1/4)*(-b)^(1/4)/x + sqrt
(b*x^4 + a)/x^2)/b + 8*(b*x^4 + a)^(3/4)*x/a)*a
```

3.1033 $\int \frac{(a+bx^4)^{3/4}}{x^4} dx$

Optimal. Leaf size=75

$$\frac{1}{2}b^{3/4}\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)+\frac{1}{2}b^{3/4}\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)-\frac{(a+bx^4)^{3/4}}{3x^3}$$

```
[Out] -(a + b*x^4)^(3/4)/(3*x^3) + (b^(3/4)*ArcTan[(b^(1/4)*x)/(a + b*x
^4)^(1/4)])/2 + (b^(3/4)*ArcTanh[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/
2
```

Rubi [A] time = 0.0571237, antiderivative size = 75, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{1}{2}b^{3/4}\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)+\frac{1}{2}b^{3/4}\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)-\frac{(a+bx^4)^{3/4}}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(3/4)/x^4,x]
```

```
[Out] -(a + b*x^4)^(3/4)/(3*x^3) + (b^(3/4)*ArcTan[(b^(1/4)*x)/(a + b*x
^4)^(1/4)])/2 + (b^(3/4)*ArcTanh[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/
2
```

Rubi in Sympy [A] time = 6.81954, size = 65, normalized size = 0.87

$$\frac{b^{\frac{3}{4}}\operatorname{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{2}+\frac{b^{\frac{3}{4}}\operatorname{atanh}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{2}-\frac{(a+bx^4)^{\frac{3}{4}}}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(3/4)/x**4,x)
```

```
[Out] b**(3/4)*atan(b**(1/4)*x/(a + b*x**4)**(1/4))/2 + b**(3/4)*atanh(
b**(1/4)*x/(a + b*x**4)**(1/4))/2 - (a + b*x**4)**(3/4)/(3*x**3)
```

Mathematica [A] time = 0.0855721, size = 95, normalized size = 1.27

$$\frac{1}{4}b^{3/4}\left(-\log\left(1-\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)+\log\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}+1\right)+2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)\right)-\frac{(a+bx^4)^{3/4}}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(3/4)/x^4,x]
```

```
[Out] -(a + b*x^4)^(3/4)/(3*x^3) + (b^(3/4)*(2*ArcTan[(b^(1/4)*x)/(a +
b*x^4)^(1/4)] - Log[1 - (b^(1/4)*x)/(a + b*x^4)^(1/4)] + Log[1 +
(b^(1/4)*x)/(a + b*x^4)^(1/4)]))/4
```

Maple [F] time = 0.037, size = 0, normalized size = 0.

$$\int \frac{1}{x^4}(bx^4+a)^{\frac{3}{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(3/4)/x^4,x)
```

```
[Out] int((b*x^4+a)^(3/4)/x^4,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^4,x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [A] time = 5.03848, size = 42, normalized size = 0.56

$$\frac{a^{\frac{3}{4}}\Gamma\left(-\frac{3}{4}\right){}_{2}F_{1}\left(\begin{matrix}-\frac{3}{4},-\frac{3}{4}\\ \frac{1}{4}\end{matrix}\middle|\frac{bx^{4}e^{i\pi}}{a}\right)}{4x^{3}\Gamma\left(\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(3/4)/x**4,x)
```

```
[Out] a**(3/4)*gamma(-3/4)*hyper((-3/4, -3/4), (1/4,), b*x**4*exp_polar
(I*pi)/a)/(4*x**3*gamma(1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^4+a)^{\frac{3}{4}}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^4,x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(3/4)/x^4, x)
```

3.1034 $\int \frac{(a+bx^4)^{3/4}}{x^8} \, dx$

Optimal. Leaf size=21

$$-\frac{(a+bx^4)^{7/4}}{7ax^7}$$

```
[Out] -(a + b*x^4)^(7/4)/(7*a*x^7)
```

Rubi [A] time = 0.0197478, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$-\frac{(a+bx^4)^{7/4}}{7ax^7}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^4)^(3/4)/x^8,x]
```

```
[Out] -(a + b*x^4)^(7/4)/(7*a*x^7)
```

Rubi in Sympy [A] time = 2.67817, size = 17, normalized size = 0.81

$$-\frac{(a+bx^4)^{\frac{7}{4}}}{7ax^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**4+a)**(3/4)/x**8,x)
```

```
[Out] -(a + b*x**4)**(7/4)/(7*a*x**7)
```

Mathematica [A] time = 0.0177987, size = 21, normalized size = 1.

$$-\frac{(a+bx^4)^{7/4}}{7ax^7}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^4)^(3/4)/x^8,x]
```

```
[Out] -(a + b*x^4)^(7/4)/(7*a*x^7)
```

Maple [A] time = 0.006, size = 18, normalized size = 0.9

$$-\frac{1}{7\,ax^7}\left(bx^4+a\right)^{\frac{7}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x^4+a)^(3/4)/x^8,x)
```

```
[Out] -1/7*(b*x^4+a)^(7/4)/a/x^7
```

Maxima [A] time = 1.44183, size = 23, normalized size = 1.1

$$-\frac{\left(bx^4+a\right)^{\frac{7}{4}}}{7\,ax^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^8,x, algorithm="maxima")
```

```
[Out] -1/7*(b*x^4 + a)^(7/4)/(a*x^7)
```

Fricas [A] time = 0.341981, size = 23, normalized size = 1.1

$$-\frac{\left(bx^4+a\right)^{\frac{7}{4}}}{7\,ax^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^8,x, algorithm="fricas")
```

```
[Out] -1/7*(b*x^4 + a)^(7/4)/(a*x^7)
```

Sympy [A] time = 6.71518, size = 68, normalized size = 3.24

$$\frac{b^{\frac{3}{4}}\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}\Gamma\left(-\frac{7}{4}\right)}{4x^4\Gamma\left(-\frac{3}{4}\right)}+\frac{b^{\frac{7}{4}}\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}\Gamma\left(-\frac{7}{4}\right)}{4a\Gamma\left(-\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(3/4)/x**8,x)
```

```
[Out] b**(3/4)*(a/(b*x**4) + 1)**(3/4)*gamma(-7/4)/(4*x**4*gamma(-3/4))
 + b**(7/4)*(a/(b*x**4) + 1)**(3/4)*gamma(-7/4)/(4*a*gamma(-3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bx^4+a\right)^{\frac{3}{4}}}{x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^8,x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(3/4)/x^8, x)
```

3.1035 $\int \frac{(a+bx^4)^{3/4}}{x^{12}}\,dx$

Optimal. Leaf size=44

$$\frac{4b(a+bx^4)^{7/4}}{77a^2x^7}-\frac{(a+bx^4)^{7/4}}{11ax^{11}}$$

```
[Out] -(a + b*x^4)^(7/4)/(11*a*x^11) + (4*b*(a + b*x^4)^(7/4))/(77*a^2*
x^7)
```

Rubi [A] time = 0.0415044, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{4b(a+bx^4)^{7/4}}{77a^2x^7}-\frac{(a+bx^4)^{7/4}}{11ax^{11}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(3/4)/x^12,x]

[Out] -(a + b*x^4)^(7/4)/(11*a*x^11) + (4*b*(a + b*x^4)^(7/4))/(77*a^2*
x^7)
```

Rubi in Sympy [A] time = 4.24587, size = 37, normalized size = 0.84

$$-\frac{(a+bx^4)^{\frac{7}{4}}}{11ax^{11}}+\frac{4b(a+bx^4)^{\frac{7}{4}}}{77a^2x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(3/4)/x**12,x)

[Out] -(a + b*x**4)**(7/4)/(11*a*x**11) + 4*b*(a + b*x**4)**(7/4)/(77*a
**2*x**7)
```

Mathematica [A] time = 0.0258143, size = 44, normalized size = 1.

$$\left(\frac{4b^2}{77a^2x^3}-\frac{3b}{77ax^7}-\frac{1}{11x^{11}}\right)(a+bx^4)^{3/4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(3/4)/x^12,x]

[Out] (-1/(11*x^11) - (3*b)/(77*a*x^7) + (4*b^2)/(77*a^2*x^3))*(a + b*x
^4)^(3/4)
```

Maple [A] time = 0.007, size = 28, normalized size = 0.6

$$-\frac{-4\,bx^4+7\,a}{77\,x^{11}a^2}\left(bx^4+a\right)^{\frac{7}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(3/4)/x^12,x)

[Out] -1/77*(b*x^4+a)^(7/4)*(-4*b*x^4+7*a)/x^11/a^2
```

Maxima [A] time = 1.43879, size = 47, normalized size = 1.07

$$\frac{\frac{11\,(bx^4+a)^{\frac{7}{4}}b}{x^7}-\frac{7\,(bx^4+a)^{\frac{11}{4}}}{x^{11}}}{77\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^12,x, algorithm="maxima")

[Out] 1/77*(11*(b*x^4 + a)^(7/4)*b/x^7 - 7*(b*x^4 + a)^(11/4)/x^11)/a^2
```

Fricas [A] time = 0.284959, size = 51, normalized size = 1.16

$$\frac{\left(4\,b^2x^8-3\,abx^4-7\,a^2\right)\left(bx^4+a\right)^{\frac{3}{4}}}{77\,a^2x^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^12,x, algorithm="fricas")

[Out] 1/77*(4*b^2*x^8 - 3*a*b*x^4 - 7*a^2)*(b*x^4 + a)^(3/4)/(a^2*x^11)
```

Sympy [A] time = 14.8968, size = 110, normalized size = 2.5

$$-\frac{7b^{\frac{3}{4}}\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}\Gamma\left(-\frac{11}{4}\right)}{16x^8\,\Gamma\left(-\frac{3}{4}\right)}-\frac{3b^{\frac{7}{4}}\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}\Gamma\left(-\frac{11}{4}\right)}{16ax^4\,\Gamma\left(-\frac{3}{4}\right)}+\frac{b^{\frac{11}{4}}\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}\Gamma\left(-\frac{11}{4}\right)}{4a^2\,\Gamma\left(-\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(3/4)/x**12,x)

[Out] -7*b**(3/4)*(a/(b*x**4) + 1)**(3/4)*gamma(-11/4)/(16*x**8*gamma(-
3/4)) - 3*b**(7/4)*(a/(b*x**4) + 1)**(3/4)*gamma(-11/4)/(16*a*x**
4*gamma(-3/4)) + b**(11/4)*(a/(b*x**4) + 1)**(3/4)*gamma(-11/4)/(
4*a**2*gamma(-3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bx^4+a\right)^{\frac{3}{4}}}{x^{12}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^12,x, algorithm="giac")

[Out] integrate((b*x^4 + a)^(3/4)/x^12, x)
```

3.1036 $\int \frac{(a+bx^4)^{3/4}}{x^{16}}\,dx$

Optimal. Leaf size=68

$$-\frac{32b^2(a+bx^4)^{7/4}}{1155a^3x^7}+\frac{8b(a+bx^4)^{7/4}}{165a^2x^{11}}-\frac{(a+bx^4)^{7/4}}{15ax^{15}}$$

```
[Out] -(a + b*x^4)^(7/4)/(15*a*x^15) + (8*b*(a + b*x^4)^(7/4))/(165*a^2
*x^11) - (32*b^2*(a + b*x^4)^(7/4))/(1155*a^3*x^7)
```

Rubi [A] time = 0.0636267, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{32b^2(a+bx^4)^{7/4}}{1155a^3x^7}+\frac{8b(a+bx^4)^{7/4}}{165a^2x^{11}}-\frac{(a+bx^4)^{7/4}}{15ax^{15}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(3/4)/x^16,x]
```

```
[Out] -(a + b*x^4)^(7/4)/(15*a*x^15) + (8*b*(a + b*x^4)^(7/4))/(165*a^2
*x^11) - (32*b^2*(a + b*x^4)^(7/4))/(1155*a^3*x^7)
```

Rubi in Sympy [A] time = 6.68978, size = 61, normalized size = 0.9

$$-\frac{(a+bx^4)^{\frac{7}{4}}}{15ax^{15}}+\frac{8b(a+bx^4)^{\frac{7}{4}}}{165a^2x^{11}}-\frac{32b^2(a+bx^4)^{\frac{7}{4}}}{1155a^3x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(3/4)/x**16,x)
```

```
[Out] -(a + b*x**4)**(7/4)/(15*a*x**15) + 8*b*(a + b*x**4)**(7/4)/(165*
a**2*x**11) - 32*b**2*(a + b*x**4)**(7/4)/(1155*a**3*x**7)
```

Mathematica [A] time = 0.0297267, size = 53, normalized size = 0.78

$$-\frac{(a+bx^4)^{3/4}(77a^3+21a^2bx^4-24ab^2x^8+32b^3x^{12})}{1155a^3x^{15}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(3/4)/x^16,x]
```

```
[Out] -((a + b*x^4)^(3/4)*(77*a^3 + 21*a^2*b*x^4 - 24*a*b^2*x^8 + 32*b^
3*x^12))/(1155*a^3*x^15)
```

Maple [A] time = 0.008, size = 39, normalized size = 0.6

$$-\frac{32\,b^2x^8-56\,abx^4+77\,a^2}{1155\,a^3x^{15}}(bx^4+a)^{\frac{7}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(3/4)/x^16,x)

[Out] -1/1155*(b*x^4+a)^(7/4)*(32*b^2*x^8-56*a*b*x^4+77*a^2)/a^3/x^15
```

Maxima [A] time = 1.4344, size = 70, normalized size = 1.03

$$-\frac{\frac{165\,{\left(b x^{4}+a\right)}^{\frac{7}{4}} b^{2}}{x^{7}}-\frac{210\,{\left(b x^{4}+a\right)}^{\frac{11}{4}} b}{x^{11}}+\frac{77\,{\left(b x^{4}+a\right)}^{\frac{15}{4}}}{x^{15}}}{1155\,a^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^16,x, algorithm="maxima")

[Out] -1/1155*(165*(b*x^4 + a)^(7/4)*b^2/x^7 - 210*(b*x^4 + a)^(11/4)*b
/x^11 + 77*(b*x^4 + a)^(15/4)/x^15)/a^3
```

Fricas [A] time = 0.355242, size = 66, normalized size = 0.97

$$-\frac{{\left(32\,b^{3} x^{12}-24\,a b^{2} x^{8}+21\,a^{2} b x^{4}+77\,a^{3}\right)} {\left(b x^{4}+a\right)}^{\frac{3}{4}}}{1155\,a^{3} x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^16,x, algorithm="fricas")

[Out] -1/1155*(32*b^3*x^12 - 24*a*b^2*x^8 + 21*a^2*b*x^4 + 77*a^3)*(b*x
^4 + a)^(3/4)/(a^3*x^15)
```

Sympy [A] time = 30.467, size = 520, normalized size = 7.65

$$\frac{77a^{5}b^{\frac{19}{4}}\left(\frac{a}{bx^{4}}+1\right)^{\frac{3}{4}}\Gamma\left(-\frac{15}{4}\right)}{64a^{5}b^{4}x^{12}\Gamma\left(-\frac{3}{4}\right)+128a^{4}b^{5}x^{16}\Gamma\left(-\frac{3}{4}\right)+64a^{3}b^{6}x^{20}\Gamma\left(-\frac{3}{4}\right)}+\frac{175a^{4}b^{\frac{23}{4}}x^{4}\left(\frac{a}{bx^{4}}+1\right)^{\frac{3}{4}}\Gamma\left(-\frac{15}{4}\right)}{64a^{5}b^{4}x^{12}\Gamma\left(-\frac{3}{4}\right)+128a^{4}b^{5}x^{16}\Gamma\left(-\frac{3}{4}\right)+64a^{3}b^{6}x^{20}\Gamma\left(-\frac{3}{4}\right)}+\frac{95a^{3}b^{\frac{27}{4}}x^{8}\left(\frac{a}{bx^{4}}+1\right)^{\frac{3}{4}}\Gamma\left(-\frac{15}{4}\right)}{64a^{5}b^{4}x^{12}\Gamma\left(-\frac{3}{4}\right)+128a^{4}b^{5}x^{16}\Gamma\left(-\frac{3}{4}\right)+64a^{3}b^{6}x^{20}\Gamma\left(-\frac{3}{4}\right)}+\frac{5a^{2}b^{\frac{31}{4}}x^{12}\left(\frac{a}{bx^{4}}+1\right)^{\frac{3}{4}}\Gamma\left(-\frac{15}{4}\right)}{64a^{5}b^{4}x^{12}\Gamma\left(-\frac{3}{4}\right)+128a^{4}b^{5}x^{16}\Gamma\left(-\frac{3}{4}\right)+64a^{3}b^{6}x^{20}\Gamma\left(-\frac{3}{4}\right)}+\frac{40ab^{\frac{35}{4}}x^{16}\left(\frac{a}{bx^{4}}+1\right)^{\frac{3}{4}}\Gamma\left(-\frac{15}{4}\right)}{64a^{5}b^{4}x^{12}\Gamma\left(-\frac{3}{4}\right)+128a^{4}b^{5}x^{16}\Gamma\left(-\frac{3}{4}\right)+64a^{3}b^{6}x^{20}\Gamma\left(-\frac{3}{4}\right)}+\frac{32b^{\frac{39}{4}}x^{20}\left(\frac{a}{bx^{4}}+1\right)^{\frac{3}{4}}\Gamma\left(-\frac{15}{4}\right)}{64a^{5}b^{4}x^{12}\Gamma\left(-\frac{3}{4}\right)+128a^{4}b^{5}x^{16}\Gamma\left(-\frac{3}{4}\right)+64a^{3}b^{6}x^{20}\Gamma\left(-\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(3/4)/x**16,x)

[Out] 77*a**5*b**(19/4)*(a/(b*x**4) + 1)**(3/4)*gamma(-15/4)/(64*a**5*b
**4*x**12*gamma(-3/4) + 128*a**4*b**5*x**16*gamma(-3/4) + 64*a**3
```

```
*b**6*x**20*gamma(-3/4)) + 175*a**4*b**(23/4)*x**4*(a/(b*x**4) +
1)**(3/4)*gamma(-15/4)/(64*a**5*b**4*x**12*gamma(-3/4) + 128*a**4
*b**5*x**16*gamma(-3/4) + 64*a**3*b**6*x**20*gamma(-3/4)) + 95*a*
*3*b**(27/4)*x**8*(a/(b*x**4) + 1)**(3/4)*gamma(-15/4)/(64*a**5*b
**4*x**12*gamma(-3/4) + 128*a**4*b**5*x**16*gamma(-3/4) + 64*a**3
*b**6*x**20*gamma(-3/4)) + 5*a**2*b**(31/4)*x**12*(a/(b*x**4) + 1
)**(3/4)*gamma(-15/4)/(64*a**5*b**4*x**12*gamma(-3/4) + 128*a**4*
b**5*x**16*gamma(-3/4) + 64*a**3*b**6*x**20*gamma(-3/4)) + 40*a*b
**(35/4)*x**16*(a/(b*x**4) + 1)**(3/4)*gamma(-15/4)/(64*a**5*b**4
*x**12*gamma(-3/4) + 128*a**4*b**5*x**16*gamma(-3/4) + 64*a**3*b*
*6*x**20*gamma(-3/4)) + 32*b**(39/4)*x**20*(a/(b*x**4) + 1)**(3/4
)*gamma(-15/4)/(64*a**5*b**4*x**12*gamma(-3/4) + 128*a**4*b**5*x*
*16*gamma(-3/4) + 64*a**3*b**6*x**20*gamma(-3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bx^4+a\right)^{\frac{3}{4}}}{x^{16}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^16,x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(3/4)/x^16, x)
```

3.1037 $\int \frac{(a+bx^4)^{3/4}}{x^{20}} dx$

Optimal. Leaf size=92

$$\frac{128b^3(a+bx^4)^{7/4}}{7315a^4x^7}-\frac{32b^2(a+bx^4)^{7/4}}{1045a^3x^{11}}+\frac{4b(a+bx^4)^{7/4}}{95a^2x^{15}}-\frac{(a+bx^4)^{7/4}}{19ax^{19}}$$

```
[Out] -(a + b*x^4)^(7/4)/(19*a*x^19) + (4*b*(a + b*x^4)^(7/4))/(95*a^2*
x^15) - (32*b^2*(a + b*x^4)^(7/4))/(1045*a^3*x^11) + (128*b^3*(a
+ b*x^4)^(7/4))/(7315*a^4*x^7)
```

Rubi [A] time = 0.0904368, antiderivative size = 92, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{128b^3(a+bx^4)^{7/4}}{7315a^4x^7}-\frac{32b^2(a+bx^4)^{7/4}}{1045a^3x^{11}}+\frac{4b(a+bx^4)^{7/4}}{95a^2x^{15}}-\frac{(a+bx^4)^{7/4}}{19ax^{19}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(3/4)/x^20,x]
```

```
[Out] -(a + b*x^4)^(7/4)/(19*a*x^19) + (4*b*(a + b*x^4)^(7/4))/(95*a^2*
x^15) - (32*b^2*(a + b*x^4)^(7/4))/(1045*a^3*x^11) + (128*b^3*(a
+ b*x^4)^(7/4))/(7315*a^4*x^7)
```

Rubi in Sympy [A] time = 9.77648, size = 85, normalized size = 0.92

$$-\frac{(a+bx^4)^{\frac{7}{4}}}{19ax^{19}}+\frac{4b(a+bx^4)^{\frac{7}{4}}}{95a^2x^{15}}-\frac{32b^2(a+bx^4)^{\frac{7}{4}}}{1045a^3x^{11}}+\frac{128b^3(a+bx^4)^{\frac{7}{4}}}{7315a^4x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(3/4)/x**20,x)
```

```
[Out] -(a + b*x**4)**(7/4)/(19*a*x**19) + 4*b*(a + b*x**4)**(7/4)/(95*a
**2*x**15) - 32*b**2*(a + b*x**4)**(7/4)/(1045*a**3*x**11) + 128*
b**3*(a + b*x**4)**(7/4)/(7315*a**4*x**7)
```

Mathematica [A] time = 0.0401515, size = 64, normalized size = 0.7

$$-\frac{(a+bx^4)^{3/4}(385a^4+77a^3bx^4-84a^2b^2x^8+96ab^3x^{12}-128b^4x^{16})}{7315a^4x^{19}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(3/4)/x^20,x]
```

```
[Out] -((a + b*x^4)^(3/4)*(385*a^4 + 77*a^3*b*x^4 - 84*a^2*b^2*x^8 + 96
*a*b^3*x^12 - 128*b^4*x^16))/(7315*a^4*x^19)
```

Maple [A] time = 0.01, size = 50, normalized size = 0.5

$$-\frac{-128\,b^3x^{12}+224\,ab^2x^8-308\,a^2bx^4+385\,a^3}{7315\,x^{19}a^4}(bx^4+a)^{\frac{7}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(3/4)/x^20,x)
```

```
[Out] -1/7315*(b*x^4+a)^(7/4)*(-128*b^3*x^12+224*a*b^2*x^8-308*a^2*b*x^
4+385*a^3)/x^19/a^4
```

Maxima [A] time = 1.43583, size = 93, normalized size = 1.01

$$\frac{\frac{1045\,{\left(b x^{4}+a\right)}^{\frac{7}{4}} b^{3}}{x^{7}} - \frac{1995\,{\left(b x^{4}+a\right)}^{\frac{11}{4}} b^{2}}{x^{11}} + \frac{1463\,{\left(b x^{4}+a\right)}^{\frac{15}{4}} b}{x^{15}} - \frac{385\,{\left(b x^{4}+a\right)}^{\frac{19}{4}}}{x^{19}}}{7315\,a^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^20,x, algorithm="maxima")
```

```
[Out] 1/7315*(1045*(b*x^4 + a)^(7/4)*b^3/x^7 - 1995*(b*x^4 + a)^(11/4)*
b^2/x^11 + 1463*(b*x^4 + a)^(15/4)*b/x^15 - 385*(b*x^4 + a)^(19/4
)/x^19)/a^4
```

Fricas [A] time = 0.32024, size = 81, normalized size = 0.88

$$\frac{{\left(128\,b^{4} x^{16} - 96\,a b^{3} x^{12} + 84\,a^{2} b^{2} x^{8} - 77\,a^{3} b x^{4} - 385\,a^{4}\right)} {\left(b x^{4} + a\right)}^{\frac{3}{4}}}{7315\,a^{4} x^{19}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^20,x, algorithm="fricas")
```

```
[Out] 1/7315*(128*b^4*x^16 - 96*a*b^3*x^12 + 84*a^2*b^2*x^8 - 77*a^3*b*
x^4 - 385*a^4)*(b*x^4 + a)^(3/4)/(a^4*x^19)
```

Sympy [A] time = 65.7367, size = 847, normalized size = 9.21

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(3/4)/x**20,x)
```

```
[Out] -1155*a**7*b**(39/4)*(a/(b*x**4) + 1)**(3/4)*gamma(-19/4)/(256*a*
*7*b**9*x**16*gamma(-3/4) + 768*a**6*b**10*x**20*gamma(-3/4) + 76
8*a**5*b**11*x**24*gamma(-3/4) + 256*a**4*b**12*x**28*gamma(-3/4)
) - 3696*a**6*b**(43/4)*x**4*(a/(b*x**4) + 1)**(3/4)*gamma(-19/4)
/(256*a**7*b**9*x**16*gamma(-3/4) + 768*a**6*b**10*x**20*gamma(-3
/4) + 768*a**5*b**11*x**24*gamma(-3/4) + 256*a**4*b**12*x**28*gam
ma(-3/4)) - 3906*a**5*b**(47/4)*x**8*(a/(b*x**4) + 1)**(3/4)*gamm
a(-19/4)/(256*a**7*b**9*x**16*gamma(-3/4) + 768*a**6*b**10*x**20*
gamma(-3/4) + 768*a**5*b**11*x**24*gamma(-3/4) + 256*a**4*b**12*x
**28*gamma(-3/4)) - 1380*a**4*b**(51/4)*x**12*(a/(b*x**4) + 1)**(
3/4)*gamma(-19/4)/(256*a**7*b**9*x**16*gamma(-3/4) + 768*a**6*b**
10*x**20*gamma(-3/4) + 768*a**5*b**11*x**24*gamma(-3/4) + 256*a**
4*b**12*x**28*gamma(-3/4)) + 45*a**3*b**(55/4)*x**16*(a/(b*x**4)
+ 1)**(3/4)*gamma(-19/4)/(256*a**7*b**9*x**16*gamma(-3/4) + 768*a
**6*b**10*x**20*gamma(-3/4) + 768*a**5*b**11*x**24*gamma(-3/4) +
256*a**4*b**12*x**28*gamma(-3/4)) + 540*a**2*b**(59/4)*x**20*(a/(
b*x**4) + 1)**(3/4)*gamma(-19/4)/(256*a**7*b**9*x**16*gamma(-3/4)
 + 768*a**6*b**10*x**20*gamma(-3/4) + 768*a**5*b**11*x**24*gamma(
```

```
-3/4) + 256*a**4*b**12*x**28*gamma(-3/4)) + 864*a*b**(63/4)*x**24
*(a/(b*x**4) + 1)**(3/4)*gamma(-19/4)/(256*a**7*b**9*x**16*gamma(
-3/4) + 768*a**6*b**10*x**20*gamma(-3/4) + 768*a**5*b**11*x**24*g
amma(-3/4) + 256*a**4*b**12*x**28*gamma(-3/4)) + 384*b**(67/4)*x*
*28*(a/(b*x**4) + 1)**(3/4)*gamma(-19/4)/(256*a**7*b**9*x**16*gam
ma(-3/4) + 768*a**6*b**10*x**20*gamma(-3/4) + 768*a**5*b**11*x**2
4*gamma(-3/4) + 256*a**4*b**12*x**28*gamma(-3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^4 + a)^{\frac{3}{4}}}{x^{20}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^20,x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(3/4)/x^20, x)
```

3.1038 $\int x^{10}\left(a+bx^4\right)^{3/4}\,dx$

Optimal. Leaf size=150

$$\frac{3a^{7/2}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{80b^{5/2}\sqrt[4]{a+bx^4}}+\frac{3a^3x^3}{80b^2\sqrt[4]{a+bx^4}}-\frac{a^2x^3\left(a+bx^4\right)^{3/4}}{40b^2}+\frac{1}{14}x^{11}\left(a+bx^4\right)^{3/4}+\frac{3ax^7\left(a+bx^4\right)^{3/4}}{140b}$$

```
[Out] (3*a^3*x^3)/(80*b^2*(a + b*x^4)^(1/4)) - (a^2*x^3*(a + b*x^4)^(3/
4))/(40*b^2) + (3*a*x^7*(a + b*x^4)^(3/4))/(140*b) + (x^11*(a + b
*x^4)^(3/4))/14 + (3*a^(7/2)*(1 + a/(b*x^4))^(1/4)*x*EllipticE[Ar
cCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(80*b^(5/2)*(a + b*x^4)^(1/4))
```

Rubi [A] time = 0.21566, antiderivative size = 150, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.467

$$\frac{3a^{7/2}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{80b^{5/2}\sqrt[4]{a+bx^4}}+\frac{3a^3x^3}{80b^2\sqrt[4]{a+bx^4}}-\frac{a^2x^3\left(a+bx^4\right)^{3/4}}{40b^2}+\frac{1}{14}x^{11}\left(a+bx^4\right)^{3/4}+\frac{3ax^7\left(a+bx^4\right)^{3/4}}{140b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^10*(a + b*x^4)^(3/4),x]
```

```
[Out] (3*a^3*x^3)/(80*b^2*(a + b*x^4)^(1/4)) - (a^2*x^3*(a + b*x^4)^(3/
4))/(40*b^2) + (3*a*x^7*(a + b*x^4)^(3/4))/(140*b) + (x^11*(a + b
*x^4)^(3/4))/14 + (3*a^(7/2)*(1 + a/(b*x^4))^(1/4)*x*EllipticE[Ar
cCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(80*b^(5/2)*(a + b*x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{3a^4x\sqrt[4]{\frac{a}{bx^4}+1}\int^{\frac{1}{x^2}}\frac{1}{\left(\frac{ax^2}{b}+1\right)^{\frac{5}{4}}}\,dx}{160b^3\sqrt[4]{a+bx^4}}+\frac{3a^3x^3}{80b^2\sqrt[4]{a+bx^4}}-\frac{a^2x^3\left(a+bx^4\right)^{\frac{3}{4}}}{40b^2}+\frac{3ax^7\left(a+bx^4\right)^{\frac{3}{4}}}{140b}+\frac{x^{11}\left(a+bx^4\right)^{\frac{3}{4}}}{14}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**10*(b*x**4+a)**(3/4),x)
```

```
[Out] 3*a**4*x*(a/(b*x**4) + 1)**(1/4)*Integral((a*x**2/b + 1)**(-5/4),
 (x, x**(-2)))/(160*b**3*(a + b*x**4)**(1/4)) + 3*a**3*x**3/(80*b
**2*(a + b*x**4)**(1/4)) - a**2*x**3*(a + b*x**4)**(3/4)/(40*b**2
) + 3*a*x**7*(a + b*x**4)**(3/4)/(140*b) + x**11*(a + b*x**4)**(3
/4)/14
```

Mathematica [C] time = 0.0688725, size = 91, normalized size = 0.61

$$\frac{x^3\left(7a^3\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)-7a^3-a^2bx^4+26ab^2x^8+20b^3x^{12}\right)}{280b^2\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]   Integrate[x^10*(a + b*x^4)^(3/4),x]
```

```
[Out] (x^3*(-7*a^3 - a^2*b*x^4 + 26*a*b^2*x^8 + 20*b^3*x^12 + 7*a^3*(1
+ (b*x^4)/a)^(1/4)*Hypergeometric2F1[1/4, 3/4, 7/4, -((b*x^4)/a)]
))/(280*b^2*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.043, size = 0, normalized size = 0.

$$\int x^{10} \left(b x^4 + a\right)^{\frac{3}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^10*(b*x^4+a)^(3/4),x)
```

```
[Out] int(x^10*(b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b x^4 + a\right)^{\frac{3}{4}} x^{10} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^4 + a)^(3/4)*x^10,x, algorithm="maxima")
```

```
[Out] integrate((b*x^4 + a)^(3/4)*x^10, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(b x^4 + a\right)^{\frac{3}{4}} x^{10}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^4 + a)^(3/4)*x^10,x, algorithm="fricas")
```

```
[Out] integral((b*x^4 + a)^(3/4)*x^10, x)
```

Sympy [A] time = 14.1734, size = 39, normalized size = 0.26

$$\frac{a^{\frac{3}{4}} x^{11} \Gamma\left(\frac{11}{4}\right) {}_{2}F_{1}\left(\begin{matrix} -\frac{3}{4}, \frac{11}{4} \\ \frac{15}{4} \end{matrix}\middle| {\frac{b x^4 e^{i\pi}}{a}} \right)}{4 \Gamma\left(\frac{15}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**10*(b*x**4+a)**(3/4),x)
```

```
[Out] a**(3/4)*x**11*gamma(11/4)*hyper((-3/4, 11/4), (15/4,), b*x**4*ex
p_polar(I*pi)/a)/(4*gamma(15/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bx^4 + a\right)^{\frac{3}{4}} x^{10}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^10,x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(3/4)*x^10, x)
```

3.1039 $\int x^6 \left(a+bx^4\right)^{3/4} dx$

Optimal. Leaf size=126

$$-\frac{3a^{5/2}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\Big|2\right)}{40b^{3/2}\sqrt[4]{a+bx^4}}-\frac{3a^2x^3}{40b\sqrt[4]{a+bx^4}}+\frac{1}{10}x^7\left(a+bx^4\right)^{3/4}+\frac{ax^3\left(a+bx^4\right)^{3/4}}{20b}$$

```
[Out] (-3*a^2*x^3)/(40*b*(a + b*x^4)^(1/4)) + (a*x^3*(a + b*x^4)^(3/4))
/(20*b) + (x^7*(a + b*x^4)^(3/4))/10 - (3*a^(5/2)*(1 + a/(b*x^4))
^(1/4)*x*EllipticE[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(40*b^(3/
2)*(a + b*x^4)^(1/4))
```

Rubi [A] time = 0.194994, antiderivative size = 126, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.467

$$-\frac{3a^{5/2}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\Big|2\right)}{40b^{3/2}\sqrt[4]{a+bx^4}}-\frac{3a^2x^3}{40b\sqrt[4]{a+bx^4}}+\frac{1}{10}x^7\left(a+bx^4\right)^{3/4}+\frac{ax^3\left(a+bx^4\right)^{3/4}}{20b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6*(a + b*x^4)^(3/4),x]
```

```
[Out] (-3*a^2*x^3)/(40*b*(a + b*x^4)^(1/4)) + (a*x^3*(a + b*x^4)^(3/4))
/(20*b) + (x^7*(a + b*x^4)^(3/4))/10 - (3*a^(5/2)*(1 + a/(b*x^4))
^(1/4)*x*EllipticE[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(40*b^(3/
2)*(a + b*x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{3a^3x\sqrt[4]{\frac{a}{bx^4}+1}\int^{\frac{1}{x^2}}\frac{1}{\sqrt[4]{\frac{ax^2}{b}+1}}\,dx}{80b^2\sqrt[4]{a+bx^4}}-\frac{3a^3}{40b^2x\sqrt[4]{a+bx^4}}-\frac{3a^2x^3}{40b\sqrt[4]{a+bx^4}}+\frac{ax^3\left(a+bx^4\right)^{\frac{3}{4}}}{20b}+\frac{x^7\left(a+bx^4\right)^{\frac{3}{4}}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6*(b*x**4+a)**(3/4),x)
```

```
[Out] 3*a**3*x*(a/(b*x**4) + 1)**(1/4)*Integral((a*x**2/b + 1)**(-1/4),
 (x, x**(-2)))/(80*b**2*(a + b*x**4)**(1/4)) - 3*a**3/(40*b**2*x*
(a + b*x**4)**(1/4)) - 3*a**2*x**3/(40*b*(a + b*x**4)**(1/4)) + a
*x**3*(a + b*x**4)**(3/4)/(20*b) + x**7*(a + b*x**4)**(3/4)/10
```

Mathematica [C] time = 0.0529185, size = 78, normalized size = 0.62

$$\frac{x^3\left(-a^2\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)+a^2+3abx^4+2b^2x^8\right)}{20b\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6*(a + b*x^4)^(3/4),x]
```

```
[Out] (x^3*(a^2 + 3*a*b*x^4 + 2*b^2*x^8 - a^2*(1 + (b*x^4)/a)^(1/4)*Hyp
ergeometric2F1[1/4, 3/4, 7/4, -((b*x^4)/a)]))/(20*b*(a + b*x^4)^(
1/4))
```

Maple [F] time = 0.04, size = 0, normalized size = 0.

$$\int x^6 \left(b x^4 + a\right)^{\frac{3}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^6*(b*x^4+a)^(3/4),x)
```

```
[Out] int(x^6*(b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b x^4 + a\right)^{\frac{3}{4}} x^6 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^4 + a)^(3/4)*x^6,x, algorithm="maxima")
```

```
[Out] integrate((b*x^4 + a)^(3/4)*x^6, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(b x^4 + a\right)^{\frac{3}{4}} x^6, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^4 + a)^(3/4)*x^6,x, algorithm="fricas")
```

```
[Out] integral((b*x^4 + a)^(3/4)*x^6, x)
```

Sympy [A] time = 6.92388, size = 39, normalized size = 0.31

$$\frac{a^{\frac{3}{4}} x^7 \Gamma\left(\frac{7}{4}\right) {}_2F_1\left(\begin{matrix} -\frac{3}{4}, \frac{7}{4} \\ \frac{11}{4} \end{matrix}\middle| \frac{b x^4 e^{i\pi}}{a}\right)}{4 \Gamma\left(\frac{11}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**6*(b*x**4+a)**(3/4),x)
```

```
[Out] a**(3/4)*x**7*gamma(7/4)*hyper((-3/4, 7/4), (11/4,), b*x**4*exp_p
olar(I*pi)/a)/(4*gamma(11/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b x^4 + a\right)^{\frac{3}{4}} x^6 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^6,x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(3/4)*x^6, x)
```

3.1040 $\int x^2 \left(a+bx^4\right)^{3/4} dx$

Optimal. Leaf size=99

$$\frac{a^{3/2}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{4\sqrt{b}\sqrt[4]{a+bx^4}}+\frac{1}{6}x^3\left(a+bx^4\right)^{3/4}+\frac{ax^3}{4\sqrt[4]{a+bx^4}}$$

```
[Out] (a*x^3)/(4*(a + b*x^4)^(1/4)) + (x^3*(a + b*x^4)^(3/4))/6 + (a^(3
/2)*(1 + a/(b*x^4))^(1/4)*x*EllipticE[ArcCot[(Sqrt[b]*x^2)/Sqrt[a
]]/2, 2])/(4*Sqrt[b]*(a + b*x^4)^(1/4))
```

Rubi [A] time = 0.14688, antiderivative size = 99, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.4$

$$\frac{a^{3/2}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{4\sqrt{b}\sqrt[4]{a+bx^4}}+\frac{1}{6}x^3\left(a+bx^4\right)^{3/4}+\frac{ax^3}{4\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2*(a + b*x^4)^(3/4),x]
```

```
[Out] (a*x^3)/(4*(a + b*x^4)^(1/4)) + (x^3*(a + b*x^4)^(3/4))/6 + (a^(3
/2)*(1 + a/(b*x^4))^(1/4)*x*EllipticE[ArcCot[(Sqrt[b]*x^2)/Sqrt[a
]]/2, 2])/(4*Sqrt[b]*(a + b*x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^2x\sqrt[4]{\frac{a}{bx^4}+1}\int^{\frac{1}{x^2}}\frac{1}{\left(\frac{ax^2}{b}+1\right)^{\frac{5}{4}}}\,dx}{8b\sqrt[4]{a+bx^4}}+\frac{ax^3}{4\sqrt[4]{a+bx^4}}+\frac{x^3\left(a+bx^4\right)^{\frac{3}{4}}}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(b*x**4+a)**(3/4),x)
```

```
[Out] a**2*x*(a/(b*x**4) + 1)**(1/4)*Integral((a*x**2/b + 1)**(-5/4), (
x, x**(-2)))/(8*b*(a + b*x**4)**(1/4)) + a*x**3/(4*(a + b*x**4)**
(1/4)) + x**3*(a + b*x**4)**(3/4)/6
```

Mathematica [C] time = 0.0438901, size = 60, normalized size = 0.61

$$\frac{x^3\left(a\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)+a+bx^4\right)}{6\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2*(a + b*x^4)^(3/4),x]
```

```
[Out] (x^3*(a + b*x^4 + a*(1 + (b*x^4)/a)^(1/4)*Hypergeometric2F1[1/4,
3/4, 7/4, -((b*x^4)/a)]))/(6*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.036, size = 0, normalized size = 0.

$$\int x^{2} \left(b x^{4}+a\right)^{\frac{3}{4}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(b*x^4+a)^(3/4),x)

[Out] int(x^2*(b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b x^{4}+a\right)^{\frac{3}{4}} x^{2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^2,x, algorithm="maxima")

[Out] integrate((b*x^4 + a)^(3/4)*x^2, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\left(b x^{4}+a\right)^{\frac{3}{4}} x^{2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^2,x, algorithm="fricas")

[Out] integral((b*x^4 + a)^(3/4)*x^2, x)
```

Sympy [A] time = 3.67509, size = 39, normalized size = 0.39

$$\frac{a^{\frac{3}{4}} x^{3} \Gamma\left(\frac{3}{4}\right) {}_{2}F_{1}\left(\begin{matrix} -\frac{3}{4}, \frac{3}{4} \\ \frac{7}{4} \end{matrix}\middle| {\frac{b x^{4} e^{i \pi}}{a}} \right)}{4 \Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(b*x**4+a)**(3/4),x)

[Out] a**(3/4)*x**3*gamma(3/4)*hyper((-3/4, 3/4), (7/4,), b*x**4*exp_po
lar(I*pi)/a)/(4*gamma(7/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b x^{4}+a\right)^{\frac{3}{4}} x^{2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)*x^2,x, algorithm="giac")

[Out] integrate((b*x^4 + a)^(3/4)*x^2, x)
```

3.1041 $\int \frac{(a+bx^4)^{3/4}}{x^2} dx$

Optimal. Leaf size=97

$$-\frac{(a+bx^4)^{3/4}}{x}+\frac{3bx^3}{2\sqrt[4]{a+bx^4}}+\frac{3\sqrt{a}\sqrt{b}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{2\sqrt[4]{a+bx^4}}$$

```
[Out] (3*b*x^3)/(2*(a + b*x^4)^(1/4)) - (a + b*x^4)^(3/4)/x + (3*Sqrt[a
]*Sqrt[b]*(1 + a/(b*x^4))^(1/4)*x*EllipticE[ArcCot[(Sqrt[b]*x^2)/
Sqrt[a]]/2, 2])/(2*(a + b*x^4)^(1/4))
```

Rubi [A] time = 0.152491, antiderivative size = 97, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.4$

$$-\frac{(a+bx^4)^{3/4}}{x}+\frac{3bx^3}{2\sqrt[4]{a+bx^4}}+\frac{3\sqrt{a}\sqrt{b}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{2\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(3/4)/x^2,x]
```

```
[Out] (3*b*x^3)/(2*(a + b*x^4)^(1/4)) - (a + b*x^4)^(3/4)/x + (3*Sqrt[a
]*Sqrt[b]*(1 + a/(b*x^4))^(1/4)*x*EllipticE[ArcCot[(Sqrt[b]*x^2)/
Sqrt[a]]/2, 2])/(2*(a + b*x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{3ax\sqrt[4]{\frac{a}{bx^4}+1}\int^{\frac{1}{x^2}}\frac{1}{\left(\frac{ax^2}{b}+1\right)^{\frac{5}{4}}}\,dx}{4\sqrt[4]{a+bx^4}}+\frac{3bx^3}{2\sqrt[4]{a+bx^4}}-\frac{(a+bx^4)^{\frac{3}{4}}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(3/4)/x**2,x)
```

```
[Out] 3*a*x*(a/(b*x**4) + 1)**(1/4)*Integral((a*x**2/b + 1)**(-5/4), (x
, x**(-2)))/(4*(a + b*x**4)**(1/4)) + 3*b*x**3/(2*(a + b*x**4)**(
1/4)) - (a + b*x**4)**(3/4)/x
```

Mathematica [C] time = 0.0380396, size = 63, normalized size = 0.65

$$\frac{bx^4\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)-a-bx^4}{x\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(3/4)/x^2,x]
```

```
[Out] (-a - b*x^4 + b*x^4*(1 + (b*x^4)/a)^(1/4)*Hypergeometric2F1[1/4,
3/4, 7/4, -((b*x^4)/a)])/(x*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.043, size = 0, normalized size = 0.

$$\int \frac{1}{x^2} \left(bx^4 + a\right)^{\frac{3}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(3/4)/x^2,x)
```

```
[Out] int((b*x^4+a)^(3/4)/x^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bx^4 + a\right)^{\frac{3}{4}}}{x^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^2,x, algorithm="maxima")
```

```
[Out] integrate((b*x^4 + a)^(3/4)/x^2, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(bx^4 + a\right)^{\frac{3}{4}}}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^2,x, algorithm="fricas")
```

```
[Out] integral((b*x^4 + a)^(3/4)/x^2, x)
```

Sympy [A] time = 3.20371, size = 41, normalized size = 0.42

$$\frac{a^{\frac{3}{4}} \Gamma\left(-\frac{1}{4}\right) {}_2F_1\left(\begin{matrix} -\frac{3}{4}, -\frac{1}{4} \\ \frac{3}{4} \end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{4x \Gamma\left(\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(3/4)/x**2,x)
```

```
[Out] a**(3/4)*gamma(-1/4)*hyper((-3/4, -1/4), (3/4,), b*x**4*exp_polar
(I*pi)/a)/(4*x*gamma(3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bx^4 + a\right)^{\frac{3}{4}}}{x^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^2,x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(3/4)/x^2, x)
```

3.1042 $\int \frac{(a+bx^4)^{3/4}}{x^6}\,dx$

Optimal. Leaf size=99

$$\frac{3b^{3/2}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{5\sqrt{a}\sqrt[4]{a+bx^4}}-\frac{3b}{5x\sqrt[4]{a+bx^4}}-\frac{(a+bx^4)^{3/4}}{5x^5}$$

```
[Out] (-3*b)/(5*x*(a + b*x^4)^(1/4)) - (a + b*x^4)^(3/4)/(5*x^5) + (3*b
^(3/2)*(1 + a/(b*x^4))^(1/4)*x*EllipticE[ArcCot[(Sqrt[b]*x^2)/Sqr
t[a]]/2, 2])/(5*Sqrt[a]*(a + b*x^4)^(1/4))
```

Rubi [A] time = 0.159725, antiderivative size = 99, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$\frac{3b^{3/2}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{5\sqrt{a}\sqrt[4]{a+bx^4}}-\frac{3b}{5x\sqrt[4]{a+bx^4}}-\frac{(a+bx^4)^{3/4}}{5x^5}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(3/4)/x^6,x]
```

```
[Out] (-3*b)/(5*x*(a + b*x^4)^(1/4)) - (a + b*x^4)^(3/4)/(5*x^5) + (3*b
^(3/2)*(1 + a/(b*x^4))^(1/4)*x*EllipticE[ArcCot[(Sqrt[b]*x^2)/Sqr
t[a]]/2, 2])/(5*Sqrt[a]*(a + b*x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{3bx\sqrt[4]{\frac{a}{bx^4}+1}\int^{\frac{1}{x^2}}\frac{1}{\left(\frac{ax^2}{b}+1\right)^{\frac{5}{4}}}\,dx}{10\sqrt[4]{a+bx^4}}-\frac{3b}{5x\sqrt[4]{a+bx^4}}-\frac{(a+bx^4)^{\frac{3}{4}}}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(3/4)/x**6,x)
```

```
[Out] 3*b*x*(a/(b*x**4) + 1)**(1/4)*Integral((a*x**2/b + 1)**(-5/4), (x
, x**(-2)))/(10*(a + b*x**4)**(1/4)) - 3*b/(5*x*(a + b*x**4)**(1/
4)) - (a + b*x**4)**(3/4)/(5*x**5)
```

Mathematica [C] time = 0.0480042, size = 83, normalized size = 0.84

$$\frac{-a^2+2b^2x^8\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)-4abx^4-3b^2x^8}{5ax^5\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(3/4)/x^6,x]
```

```
[Out] (-a^2 - 4*a*b*x^4 - 3*b^2*x^8 + 2*b^2*x^8*(1 + (b*x^4)/a)^(1/4)*H
ypergeometric2F1[1/4, 3/4, 7/4, -((b*x^4)/a)])/(5*a*x^5*(a + b*x^
4)^(1/4))
```

Maple [F] time = 0.046, size = 0, normalized size = 0.

$$\int \frac{1}{x^6} \left(bx^4 + a\right)^{\frac{3}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(3/4)/x^6,x)

[Out] int((b*x^4+a)^(3/4)/x^6,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bx^4 + a\right)^{\frac{3}{4}}}{x^6}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^6,x, algorithm="maxima")

[Out] integrate((b*x^4 + a)^(3/4)/x^6, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(bx^4 + a\right)^{\frac{3}{4}}}{x^6}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^6,x, algorithm="fricas")

[Out] integral((b*x^4 + a)^(3/4)/x^6, x)
```

Sympy [A] time = 5.28071, size = 31, normalized size = 0.31

$$-\frac{b^{\frac{3}{4}}\,{}_2F_1\left(\begin{matrix} -\frac{3}{4}, \frac{1}{2} \\ \frac{3}{2} \end{matrix}\middle| \frac{ae^{i\pi}}{bx^4}\right)}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(3/4)/x**6,x)

[Out] -b**(3/4)*hyper((-3/4, 1/2), (3/2,), a*exp_polar(I*pi)/(b*x**4))/
(2*x**2)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bx^4 + a\right)^{\frac{3}{4}}}{x^6}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^6,x, algorithm="giac")

[Out] integrate((b*x^4 + a)^(3/4)/x^6, x)
```

3.1043 $\int \frac{(a+bx^4)^{3/4}}{x^{10}}\,dx$

Optimal. Leaf size=126

$$-\frac{2b^{5/2}x\sqrt[4]{\frac{a}{bx^4}+1}\,E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{15a^{3/2}\sqrt[4]{a+bx^4}}+\frac{2b^2}{15ax\sqrt[4]{a+bx^4}}-\frac{(a+bx^4)^{3/4}}{9x^9}-\frac{b\,(a+bx^4)^{3/4}}{15ax^5}$$

```
[Out] (2*b^2)/(15*a*x*(a + b*x^4)^(1/4)) - (a + b*x^4)^(3/4)/(9*x^9) -
(b*(a + b*x^4)^(3/4))/(15*a*x^5) - (2*b^(5/2)*(1 + a/(b*x^4))^(1/
4)*x*EllipticE[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(15*a^(3/2)*(
a + b*x^4)^(1/4))
```

Rubi [A] time = 0.174998, antiderivative size = 126, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.467

$$-\frac{2b^{5/2}x\sqrt[4]{\frac{a}{bx^4}+1}\,E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{15a^{3/2}\sqrt[4]{a+bx^4}}+\frac{2b^2}{15ax\sqrt[4]{a+bx^4}}-\frac{(a+bx^4)^{3/4}}{9x^9}-\frac{b\,(a+bx^4)^{3/4}}{15ax^5}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(3/4)/x^10,x]
```

```
[Out] (2*b^2)/(15*a*x*(a + b*x^4)^(1/4)) - (a + b*x^4)^(3/4)/(9*x^9) -
(b*(a + b*x^4)^(3/4))/(15*a*x^5) - (2*b^(5/2)*(1 + a/(b*x^4))^(1/
4)*x*EllipticE[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(15*a^(3/2)*(
a + b*x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{(a+bx^4)^{\frac{3}{4}}}{9x^9}+\frac{b^2x\sqrt[4]{\frac{a}{bx^4}+1}\int^{\frac{1}{x^2}}\frac{1}{\sqrt[4]{\frac{ax^2}{b}+1}}\,dx}{15a\sqrt[4]{a+bx^4}}-\frac{b\,(a+bx^4)^{\frac{3}{4}}}{15ax^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(3/4)/x**10,x)
```

```
[Out] -(a + b*x**4)**(3/4)/(9*x**9) + b**2*x*(a/(b*x**4) + 1)**(1/4)*In
tegral((a*x**2/b + 1)**(-1/4), (x, x**(-2)))/(15*a*(a + b*x**4)**
(1/4)) - b*(a + b*x**4)**(3/4)/(15*a*x**5)
```

Mathematica [C] time = 0.0546576, size = 94, normalized size = 0.75

$$\frac{-5a^3-8a^2bx^4-4b^3x^{12}\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)+3ab^2x^8+6b^3x^{12}}{45a^2x^9\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(3/4)/x^10,x]
```

```
[Out] (-5*a^3 - 8*a^2*b*x^4 + 3*a*b^2*x^8 + 6*b^3*x^12 - 4*b^3*x^12*(1
+ (b*x^4)/a)^(1/4)*Hypergeometric2F1[1/4, 3/4, 7/4, -((b*x^4)/a)]
```

```
)/(45*a^2*x^9*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.053, size = 0, normalized size = 0.

$$\int \frac{1}{x^{10}} \left(bx^4 + a\right)^{\frac{3}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(3/4)/x^10,x)
```

```
[Out] int((b*x^4+a)^(3/4)/x^10,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bx^4 + a\right)^{\frac{3}{4}}}{x^{10}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^10,x, algorithm="maxima")
```

```
[Out] integrate((b*x^4 + a)^(3/4)/x^10, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(bx^4 + a\right)^{\frac{3}{4}}}{x^{10}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^10,x, algorithm="fricas")
```

```
[Out] integral((b*x^4 + a)^(3/4)/x^10, x)
```

Sympy [A] time = 10.5797, size = 31, normalized size = 0.25

$$-\frac{b^{\frac{3}{4}} {}_2F_1\left(\begin{matrix} -\frac{3}{4}, \frac{3}{2} \\ \frac{5}{2} \end{matrix}\middle| \frac{ae^{i\pi}}{bx^4}\right)}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(3/4)/x**10,x)
```

```
[Out] -b**(3/4)*hyper((-3/4, 3/2), (5/2,), a*exp_polar(I*pi)/(b*x**4))/
(6*x**6)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bx^4 + a\right)^{\frac{3}{4}}}{x^{10}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^10,x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(3/4)/x^10, x)
```

3.1044 $\int \frac{(a+bx^4)^{3/4}}{x^{14}}\,dx$

Optimal. Leaf size=150

$$\frac{4b^{7/2}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{65a^{5/2}\sqrt[4]{a+bx^4}}-\frac{4b^3}{65a^2x\sqrt[4]{a+bx^4}}+\frac{2b^2\left(a+bx^4\right)^{3/4}}{65a^2x^5}-\frac{\left(a+bx^4\right)^{3/4}}{13x^{13}}-\frac{b\left(a+bx^4\right)^{3/4}}{39ax^9}$$

```
[Out] (-4*b^3)/(65*a^2*x*(a + b*x^4)^(1/4)) - (a + b*x^4)^(3/4)/(13*x^1
3) - (b*(a + b*x^4)^(3/4))/(39*a*x^9) + (2*b^2*(a + b*x^4)^(3/4))
/(65*a^2*x^5) + (4*b^(7/2)*(1 + a/(b*x^4))^(1/4)*x*EllipticE[ArcC
ot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(65*a^(5/2)*(a + b*x^4)^(1/4))
```

Rubi [A] time = 0.214469, antiderivative size = 150, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.467

$$\frac{4b^{7/2}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{65a^{5/2}\sqrt[4]{a+bx^4}}-\frac{4b^3}{65a^2x\sqrt[4]{a+bx^4}}+\frac{2b^2\left(a+bx^4\right)^{3/4}}{65a^2x^5}-\frac{\left(a+bx^4\right)^{3/4}}{13x^{13}}-\frac{b\left(a+bx^4\right)^{3/4}}{39ax^9}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(3/4)/x^14,x]
```

```
[Out] (-4*b^3)/(65*a^2*x*(a + b*x^4)^(1/4)) - (a + b*x^4)^(3/4)/(13*x^1
3) - (b*(a + b*x^4)^(3/4))/(39*a*x^9) + (2*b^2*(a + b*x^4)^(3/4))
/(65*a^2*x^5) + (4*b^(7/2)*(1 + a/(b*x^4))^(1/4)*x*EllipticE[ArcC
ot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(65*a^(5/2)*(a + b*x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\left(a+bx^4\right)^{\frac{3}{4}}}{13x^{13}}-\frac{b\left(a+bx^4\right)^{\frac{3}{4}}}{39ax^9}+\frac{2b^3x\sqrt[4]{\frac{a}{bx^4}+1}\int^{\frac{1}{x^2}}\frac{1}{\left(\frac{ax^2}{b}+1\right)^{\frac{5}{4}}}\,dx}{65a^2\sqrt[4]{a+bx^4}}-\frac{4b^3}{65a^2x\sqrt[4]{a+bx^4}}+\frac{2b^2\left(a+bx^4\right)^{\frac{3}{4}}}{65a^2x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(3/4)/x**14,x)
```

```
[Out] -(a + b*x**4)**(3/4)/(13*x**13) - b*(a + b*x**4)**(3/4)/(39*a*x**
9) + 2*b**3*x*(a/(b*x**4) + 1)**(1/4)*Integral((a*x**2/b + 1)**(-
5/4), (x, x**(-2)))/(65*a**2*(a + b*x**4)**(1/4)) - 4*b**3/(65*a*
*2*x*(a + b*x**4)**(1/4)) + 2*b**2*(a + b*x**4)**(3/4)/(65*a**2*x
**5)
```

Mathematica [C] time = 0.0641991, size = 104, normalized size = 0.69

$$\frac{-15a^4-20a^3bx^4+a^2b^2x^8+8b^4x^{16}\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)-6ab^3x^{12}-12b^4x^{16}}{195a^3x^{13}\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(3/4)/x^14,x]
```

```
[Out] (-15*a^4 - 20*a^3*b*x^4 + a^2*b^2*x^8 - 6*a*b^3*x^12 - 12*b^4*x^1
6 + 8*b^4*x^16*(1 + (b*x^4)/a)^(1/4)*Hypergeometric2F1[1/4, 3/4,
7/4, -((b*x^4)/a)])/(195*a^3*x^13*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.056, size = 0, normalized size = 0.

$$\int \frac{1}{x^{14}} \left(bx^4 + a\right)^{\frac{3}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x^4+a)^(3/4)/x^14,x)
```

```
[Out] int((b*x^4+a)^(3/4)/x^14,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bx^4 + a\right)^{\frac{3}{4}}}{x^{14}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^4 + a)^(3/4)/x^14,x, algorithm="maxima")
```

```
[Out] integrate((b*x^4 + a)^(3/4)/x^14, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(bx^4 + a\right)^{\frac{3}{4}}}{x^{14}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^4 + a)^(3/4)/x^14,x, algorithm="fricas")
```

```
[Out] integral((b*x^4 + a)^(3/4)/x^14, x)
```

Sympy [A] time = 21.6565, size = 46, normalized size = 0.31

$$\frac{a^{\frac{3}{4}} \Gamma\left(-\frac{13}{4}\right) {}_2F_1\left(\begin{matrix} -\frac{13}{4}, -\frac{3}{4} \\ -\frac{9}{4} \end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{4x^{13} \Gamma\left(-\frac{9}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x**4+a)**(3/4)/x**14,x)
```

```
[Out] a**(3/4)*gamma(-13/4)*hyper((-13/4, -3/4), (-9/4,), b*x**4*exp_po
lar(I*pi)/a)/(4*x**13*gamma(-9/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^4 + a)^{\frac{3}{4}}}{x^{14}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(3/4)/x^14,x, algorithm="giac")

[Out] integrate((b*x^4 + a)^(3/4)/x^14, x)
```

3.1045 $\int x^{19} \left(a + bx^4\right)^{5/4} \, dx$

Optimal. Leaf size=101

$$\frac{a^4 \left(a + bx^4\right)^{9/4}}{9b^5} - \frac{4a^3 \left(a + bx^4\right)^{13/4}}{13b^5} + \frac{6a^2 \left(a + bx^4\right)^{17/4}}{17b^5} + \frac{\left(a + bx^4\right)^{25/4}}{25b^5} - \frac{4a \left(a + bx^4\right)^{21/4}}{21b^5}$$

```
[Out] (a^4*(a + b*x^4)^(9/4))/(9*b^5) - (4*a^3*(a + b*x^4)^(13/4))/(13*
b^5) + (6*a^2*(a + b*x^4)^(17/4))/(17*b^5) - (4*a*(a + b*x^4)^(21
/4))/(21*b^5) + (a + b*x^4)^(25/4)/(25*b^5)
```

Rubi [A] time = 0.130615, antiderivative size = 101, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{a^4 \left(a + bx^4\right)^{9/4}}{9b^5} - \frac{4a^3 \left(a + bx^4\right)^{13/4}}{13b^5} + \frac{6a^2 \left(a + bx^4\right)^{17/4}}{17b^5} + \frac{\left(a + bx^4\right)^{25/4}}{25b^5} - \frac{4a \left(a + bx^4\right)^{21/4}}{21b^5}$$

Antiderivative was successfully verified.

```
[In]  Int[x^19*(a + b*x^4)^(5/4),x]
```

```
[Out] (a^4*(a + b*x^4)^(9/4))/(9*b^5) - (4*a^3*(a + b*x^4)^(13/4))/(13*
b^5) + (6*a^2*(a + b*x^4)^(17/4))/(17*b^5) - (4*a*(a + b*x^4)^(21
/4))/(21*b^5) + (a + b*x^4)^(25/4)/(25*b^5)
```

Rubi in Sympy [A] time = 17.647, size = 92, normalized size = 0.91

$$\frac{a^4 \left(a + bx^4\right)^{\frac{9}{4}}}{9b^5} - \frac{4a^3 \left(a + bx^4\right)^{\frac{13}{4}}}{13b^5} + \frac{6a^2 \left(a + bx^4\right)^{\frac{17}{4}}}{17b^5} - \frac{4a \left(a + bx^4\right)^{\frac{21}{4}}}{21b^5} + \frac{\left(a + bx^4\right)^{\frac{25}{4}}}{25b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**19*(b*x**4+a)**(5/4),x)
```

```
[Out] a**4*(a + b*x**4)**(9/4)/(9*b**5) - 4*a**3*(a + b*x**4)**(13/4)/(
13*b**5) + 6*a**2*(a + b*x**4)**(17/4)/(17*b**5) - 4*a*(a + b*x**
4)**(21/4)/(21*b**5) + (a + b*x**4)**(25/4)/(25*b**5)
```

Mathematica [A] time = 0.0470077, size = 61, normalized size = 0.6

$$\frac{\left(a + bx^4\right)^{9/4} \left(2048a^4 - 4608a^3bx^4 + 7488a^2b^2x^8 - 10608ab^3x^{12} + 13923b^4x^{16}\right)}{348075b^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^19*(a + b*x^4)^(5/4),x]
```

```
[Out] ((a + b*x^4)^(9/4)*(2048*a^4 - 4608*a^3*b*x^4 + 7488*a^2*b^2*x^8
- 10608*a*b^3*x^12 + 13923*b^4*x^16))/(348075*b^5)
```

Maple [A] time = 0.011, size = 58, normalized size = 0.6

$$\frac{13923\,x^{16}b^4 - 10608\,ax^{12}b^3 + 7488\,a^2x^8b^2 - 4608\,a^3x^4b + 2048\,a^4}{348075\,b^5} \left(bx^4 + a\right)^{\frac{9}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^19*(b*x^4+a)^(5/4),x)
```

```
[Out] 1/348075*(b*x^4+a)^(9/4)*(13923*b^4*x^16-10608*a*b^3*x^12+7488*a^
2*b^2*x^8-4608*a^3*b*x^4+2048*a^4)/b^5
```

Maxima [A] time = 1.42591, size = 109, normalized size = 1.08

$$\frac{\left(bx^4+a\right)^{\frac{25}{4}}}{25\,b^5}-\frac{4\left(bx^4+a\right)^{\frac{21}{4}}a}{21\,b^5}+\frac{6\left(bx^4+a\right)^{\frac{17}{4}}a^2}{17\,b^5}-\frac{4\left(bx^4+a\right)^{\frac{13}{4}}a^3}{13\,b^5}+\frac{\left(bx^4+a\right)^{\frac{9}{4}}a^4}{9\,b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^19,x, algorithm="maxima")
```

```
[Out] 1/25*(b*x^4 + a)^(25/4)/b^5 - 4/21*(b*x^4 + a)^(21/4)*a/b^5 + 6/1
7*(b*x^4 + a)^(17/4)*a^2/b^5 - 4/13*(b*x^4 + a)^(13/4)*a^3/b^5 +
1/9*(b*x^4 + a)^(9/4)*a^4/b^5
```

Fricas [A] time = 0.300135, size = 107, normalized size = 1.06

$$\frac{\left(13923\,b^6x^{24}+17238\,ab^5x^{20}+195\,a^2b^4x^{16}-240\,a^3b^3x^{12}+320\,a^4b^2x^8-512\,a^5bx^4+2048\,a^6\right)\left(bx^4+a\right)^{\frac{1}{4}}}{348075\,b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^19,x, algorithm="fricas")
```

```
[Out] 1/348075*(13923*b^6*x^24 + 17238*a*b^5*x^20 + 195*a^2*b^4*x^16 -
240*a^3*b^3*x^12 + 320*a^4*b^2*x^8 - 512*a^5*b*x^4 + 2048*a^6)*(b
*x^4 + a)^(1/4)/b^5
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**19*(b*x**4+a)**(5/4),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.220839, size = 219, normalized size = 2.17

$$\frac{\frac{5\left(3315\left(bx^4+a\right)^{\frac{21}{4}}-16380\left(bx^4+a\right)^{\frac{17}{4}}a+32130\left(bx^4+a\right)^{\frac{13}{4}}a^2-30940\left(bx^4+a\right)^{\frac{9}{4}}a^3+13923\left(bx^4+a\right)^{\frac{5}{4}}a^4\right)a}{b^4}+\frac{13923\left(bx^4+a\right)^{\frac{25}{4}}-82875\left(bx^4+a\right)^{\frac{21}{4}}a+204750\left(bx\right.}{}}{348075\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^19,x, algorithm="giac")
```

```
[Out] 1/348075*(5*(3315*(b*x^4 + a)^(21/4) - 16380*(b*x^4 + a)^(17/4)*a
 + 32130*(b*x^4 + a)^(13/4)*a^2 - 30940*(b*x^4 + a)^(9/4)*a^3 + 1
3923*(b*x^4 + a)^(5/4)*a^4)*a/b^4 + (13923*(b*x^4 + a)^(25/4) - 8
2875*(b*x^4 + a)^(21/4)*a + 204750*(b*x^4 + a)^(17/4)*a^2 - 26775
0*(b*x^4 + a)^(13/4)*a^3 + 193375*(b*x^4 + a)^(9/4)*a^4 - 69615*(
b*x^4 + a)^(5/4)*a^5)/b^4)/b
```

3.1046 $\int x^{15} \left(a+bx^4\right)^{5/4} dx$

Optimal. Leaf size=80

$$-\frac{a^3 \left(a+bx^4\right)^{9/4}}{9b^4}+\frac{3a^2 \left(a+bx^4\right)^{13/4}}{13b^4}+\frac{\left(a+bx^4\right)^{21/4}}{21b^4}-\frac{3a \left(a+bx^4\right)^{17/4}}{17b^4}$$

```
[Out] -(a^3*(a + b*x^4)^(9/4))/(9*b^4) + (3*a^2*(a + b*x^4)^(13/4))/(13
*b^4) - (3*a*(a + b*x^4)^(17/4))/(17*b^4) + (a + b*x^4)^(21/4)/(2
1*b^4)
```

Rubi [A] time = 0.107598, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^3 \left(a+bx^4\right)^{9/4}}{9b^4}+\frac{3a^2 \left(a+bx^4\right)^{13/4}}{13b^4}+\frac{\left(a+bx^4\right)^{21/4}}{21b^4}-\frac{3a \left(a+bx^4\right)^{17/4}}{17b^4}$$

Antiderivative was successfully verified.

```
[In] Int[x^15*(a + b*x^4)^(5/4),x]
```

```
[Out] -(a^3*(a + b*x^4)^(9/4))/(9*b^4) + (3*a^2*(a + b*x^4)^(13/4))/(13
*b^4) - (3*a*(a + b*x^4)^(17/4))/(17*b^4) + (a + b*x^4)^(21/4)/(2
1*b^4)
```

Rubi in Sympy [A] time = 14.2803, size = 71, normalized size = 0.89

$$-\frac{a^3 \left(a+bx^4\right)^{\frac{9}{4}}}{9b^4}+\frac{3a^2 \left(a+bx^4\right)^{\frac{13}{4}}}{13b^4}-\frac{3a \left(a+bx^4\right)^{\frac{17}{4}}}{17b^4}+\frac{\left(a+bx^4\right)^{\frac{21}{4}}}{21b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**15*(b*x**4+a)**(5/4),x)
```

```
[Out] -a**3*(a + b*x**4)**(9/4)/(9*b**4) + 3*a**2*(a + b*x**4)**(13/4)/
(13*b**4) - 3*a*(a + b*x**4)**(17/4)/(17*b**4) + (a + b*x**4)**(2
1/4)/(21*b**4)
```

Mathematica [A] time = 0.0498684, size = 50, normalized size = 0.62

$$\frac{\left(a+bx^4\right)^{9/4} \left(-128a^3+288a^2bx^4-468ab^2x^8+663b^3x^{12}\right)}{13923b^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^15*(a + b*x^4)^(5/4),x]
```

```
[Out] ((a + b*x^4)^(9/4)*(-128*a^3 + 288*a^2*b*x^4 - 468*a*b^2*x^8 + 66
3*b^3*x^12))/(13923*b^4)
```

Maple [A] time = 0.009, size = 47, normalized size = 0.6

$$-\frac{-663\,b^3x^{12}+468\,ab^2x^8-288\,a^2bx^4+128\,a^3}{13923\,b^4} \left(bx^4+a\right)^{\frac{9}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^15*(b*x^4+a)^(5/4),x)
```

```
[Out] -1/13923*(b*x^4+a)^(9/4)*(-663*b^3*x^12+468*a*b^2*x^8-288*a^2*b*x
^4+128*a^3)/b^4
```

Maxima [A] time = 1.44508, size = 86, normalized size = 1.08

$$\frac{(bx^4+a)^{\frac{21}{4}}}{21\,b^4} - \frac{3\,(bx^4+a)^{\frac{17}{4}}a}{17\,b^4} + \frac{3\,(bx^4+a)^{\frac{13}{4}}a^2}{13\,b^4} - \frac{(bx^4+a)^{\frac{9}{4}}a^3}{9\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^4 + a)^(5/4)*x^15,x, algorithm="maxima")
```

```
[Out] 1/21*(b*x^4 + a)^(21/4)/b^4 - 3/17*(b*x^4 + a)^(17/4)*a/b^4 + 3/1
3*(b*x^4 + a)^(13/4)*a^2/b^4 - 1/9*(b*x^4 + a)^(9/4)*a^3/b^4
```

Fricas [A] time = 0.288325, size = 92, normalized size = 1.15

$$\frac{\left(663\,b^5x^{20} + 858\,ab^4x^{16} + 15\,a^2b^3x^{12} - 20\,a^3b^2x^8 + 32\,a^4bx^4 - 128\,a^5\right)(bx^4+a)^{\frac{1}{4}}}{13923\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^4 + a)^(5/4)*x^15,x, algorithm="fricas")
```

```
[Out] 1/13923*(663*b^5*x^20 + 858*a*b^4*x^16 + 15*a^2*b^3*x^12 - 20*a^3
*b^2*x^8 + 32*a^4*b*x^4 - 128*a^5)*(b*x^4 + a)^(1/4)/b^4
```

Sympy [A] time = 121.707, size = 134, normalized size = 1.68

$$\begin{cases} -\frac{128a^5\sqrt[4]{a+bx^4}}{13923b^4} + \frac{32a^4x^4\sqrt[4]{a+bx^4}}{13923b^3} - \frac{20a^3x^8\sqrt[4]{a+bx^4}}{13923b^2} + \frac{5a^2x^{12}\sqrt[4]{a+bx^4}}{4641b} + \frac{22ax^{16}\sqrt[4]{a+bx^4}}{357} + \frac{bx^{20}\sqrt[4]{a+bx^4}}{21} & \text{for } b \neq 0 \\ \frac{a^{\frac{5}{4}}x^{16}}{16} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**15*(b*x**4+a)**(5/4),x)
```

```
[Out] Piecewise((-128*a**5*(a + b*x**4)**(1/4)/(13923*b**4) + 32*a**4*x
**4*(a + b*x**4)**(1/4)/(13923*b**3) - 20*a**3*x**8*(a + b*x**4)*
*(1/4)/(13923*b**2) + 5*a**2*x**12*(a + b*x**4)**(1/4)/(4641*b) +
 22*a*x**16*(a + b*x**4)**(1/4)/357 + b*x**20*(a + b*x**4)**(1/4)
/21, Ne(b, 0)), (a**(5/4)*x**16/16, True))
```

GIAC/XCAS [A] time = 0.215834, size = 181, normalized size = 2.26

$$\frac{\frac{21\left(195\,(bx^4+a)^{\frac{17}{4}} - 765\,(bx^4+a)^{\frac{13}{4}}a + 1105\,(bx^4+a)^{\frac{9}{4}}a^2 - 663\,(bx^4+a)^{\frac{5}{4}}a^3\right)a}{b^3} + \frac{3315\,(bx^4+a)^{\frac{21}{4}} - 16380\,(bx^4+a)^{\frac{17}{4}}a + 32130\,(bx^4+a)^{\frac{13}{4}}a^2 - 30940\,(bx^4+a)^{\frac{9}{4}}a}{b^3}}{69615\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^15,x, algorithm="giac")
```

```
[Out] 1/69615*(21*(195*(b*x^4 + a)^(17/4) - 765*(b*x^4 + a)^(13/4)*a +
1105*(b*x^4 + a)^(9/4)*a^2 - 663*(b*x^4 + a)^(5/4)*a^3)*a/b^3 + (
3315*(b*x^4 + a)^(21/4) - 16380*(b*x^4 + a)^(17/4)*a + 32130*(b*x
^4 + a)^(13/4)*a^2 - 30940*(b*x^4 + a)^(9/4)*a^3 + 13923*(b*x^4 +
 a)^(5/4)*a^4)/b^3)/b
```

3.1047 $\int x^{11} \left(a+bx^4\right)^{5/4} dx$

Optimal. Leaf size=59

$$\frac{a^2 \left(a+bx^4\right)^{9/4}}{9b^3}+\frac{\left(a+bx^4\right)^{17/4}}{17b^3}-\frac{2a \left(a+bx^4\right)^{13/4}}{13b^3}$$

```
[Out] (a^2*(a + b*x^4)^(9/4))/(9*b^3) - (2*a*(a + b*x^4)^(13/4))/(13*b^
3) + (a + b*x^4)^(17/4)/(17*b^3)
```

Rubi [A] time = 0.0858777, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^2 \left(a+bx^4\right)^{9/4}}{9b^3}+\frac{\left(a+bx^4\right)^{17/4}}{17b^3}-\frac{2a \left(a+bx^4\right)^{13/4}}{13b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11*(a + b*x^4)^(5/4),x]
```

```
[Out] (a^2*(a + b*x^4)^(9/4))/(9*b^3) - (2*a*(a + b*x^4)^(13/4))/(13*b^
3) + (a + b*x^4)^(17/4)/(17*b^3)
```

Rubi in Sympy [A] time = 10.718, size = 51, normalized size = 0.86

$$\frac{a^2 \left(a+bx^4\right)^{\frac{9}{4}}}{9b^3}-\frac{2a \left(a+bx^4\right)^{\frac{13}{4}}}{13b^3}+\frac{\left(a+bx^4\right)^{\frac{17}{4}}}{17b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11*(b*x**4+a)**(5/4),x)
```

```
[Out] a**2*(a + b*x**4)**(9/4)/(9*b**3) - 2*a*(a + b*x**4)**(13/4)/(13*
b**3) + (a + b*x**4)**(17/4)/(17*b**3)
```

Mathematica [A] time = 0.0378009, size = 39, normalized size = 0.66

$$\frac{\left(a+bx^4\right)^{9/4} \left(32a^2-72abx^4+117b^2x^8\right)}{1989b^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11*(a + b*x^4)^(5/4),x]
```

```
[Out] ((a + b*x^4)^(9/4)*(32*a^2 - 72*a*b*x^4 + 117*b^2*x^8))/(1989*b^3
)
```

Maple [A] time = 0.008, size = 36, normalized size = 0.6

$$\frac{117\,b^2x^8-72\,abx^4+32\,a^2}{1989\,b^3} \left(bx^4+a\right)^{\frac{9}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11*(b*x^4+a)^(5/4),x)
```

```
[Out] 1/1989*(b*x^4+a)^(9/4)*(117*b^2*x^8-72*a*b*x^4+32*a^2)/b^3
```

Maxima [A] time = 1.43575, size = 63, normalized size = 1.07

$$\frac{\left(bx^4+a\right)^{\frac{17}{4}}}{17\,b^3}-\frac{2\left(bx^4+a\right)^{\frac{13}{4}}a}{13\,b^3}+\frac{\left(bx^4+a\right)^{\frac{9}{4}}a^2}{9\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^11,x, algorithm="maxima")
```

```
[Out] 1/17*(b*x^4 + a)^(17/4)/b^3 - 2/13*(b*x^4 + a)^(13/4)*a/b^3 + 1/9
*(b*x^4 + a)^(9/4)*a^2/b^3
```

Fricas [A] time = 0.248509, size = 77, normalized size = 1.31

$$\frac{\left(117\,b^4x^{16}+162\,ab^3x^{12}+5\,a^2b^2x^8-8\,a^3bx^4+32\,a^4\right)\left(bx^4+a\right)^{\frac{1}{4}}}{1989\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^11,x, algorithm="fricas")
```

```
[Out] 1/1989*(117*b^4*x^16 + 162*a*b^3*x^12 + 5*a^2*b^2*x^8 - 8*a^3*b*x
^4 + 32*a^4)*(b*x^4 + a)^(1/4)/b^3
```

Sympy [A] time = 65.8022, size = 110, normalized size = 1.86

$$\begin{cases} \frac{32a^4\sqrt[4]{a+bx^4}}{1989b^3}-\frac{8a^3x^4\sqrt[4]{a+bx^4}}{1989b^2}+\frac{5a^2x^8\sqrt[4]{a+bx^4}}{1989b}+\frac{18ax^{12}\sqrt[4]{a+bx^4}}{221}+\frac{bx^{16}\sqrt[4]{a+bx^4}}{17} & \text{for } b \neq 0 \\ \frac{a^{\frac{5}{4}}x^{12}}{12} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11*(b*x**4+a)**(5/4),x)
```

```
[Out] Piecewise((32*a**4*(a + b*x**4)**(1/4)/(1989*b**3) - 8*a**3*x**4*
(a + b*x**4)**(1/4)/(1989*b**2) + 5*a**2*x**8*(a + b*x**4)**(1/4)
/(1989*b) + 18*a*x**12*(a + b*x**4)**(1/4)/221 + b*x**16*(a + b*x
**4)**(1/4)/17, Ne(b, 0)), (a**(5/4)*x**12/12, True))
```

GIAC/XCAS [A] time = 0.219937, size = 144, normalized size = 2.44

$$\frac{\frac{17\left(45\left(bx^4+a\right)^{\frac{13}{4}}-130\left(bx^4+a\right)^{\frac{9}{4}}a+117\left(bx^4+a\right)^{\frac{5}{4}}a^2\right)a}{b^2}+\frac{3\left(195\left(bx^4+a\right)^{\frac{17}{4}}-765\left(bx^4+a\right)^{\frac{13}{4}}a+1105\left(bx^4+a\right)^{\frac{9}{4}}a^2-663\left(bx^4+a\right)^{\frac{5}{4}}a^3\right)}{b^2}}{9945\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^11,x, algorithm="giac")
```

```
[Out] 1/9945*(17*(45*(b*x^4 + a)^(13/4) - 130*(b*x^4 + a)^(9/4)*a + 117
*(b*x^4 + a)^(5/4)*a^2)*a/b^2 + 3*(195*(b*x^4 + a)^(17/4) - 765*(
```

```
b*x^4 + a)^(13/4)*a + 1105*(b*x^4 + a)^(9/4)*a^2 - 663*(b*x^4 + a
)^(5/4)*a^3)/b^2)/b
```

3.1048 $\int x^7 \left(a+bx^4\right)^{5/4} dx$

Optimal. Leaf size=38

$$\frac{\left(a+bx^4\right)^{13/4}}{13b^2}-\frac{a\left(a+bx^4\right)^{9/4}}{9b^2}$$

```
[Out] -(a*(a + b*x^4)^(9/4))/(9*b^2) + (a + b*x^4)^(13/4)/(13*b^2)
```

Rubi [A] time = 0.0579508, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{\left(a+bx^4\right)^{13/4}}{13b^2}-\frac{a\left(a+bx^4\right)^{9/4}}{9b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7*(a + b*x^4)^(5/4),x]
```

```
[Out] -(a*(a + b*x^4)^(9/4))/(9*b^2) + (a + b*x^4)^(13/4)/(13*b^2)
```

Rubi in Sympy [A] time = 7.13808, size = 31, normalized size = 0.82

$$-\frac{a\left(a+bx^4\right)^{\frac{9}{4}}}{9b^2}+\frac{\left(a+bx^4\right)^{\frac{13}{4}}}{13b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7*(b*x**4+a)**(5/4),x)
```

```
[Out] -a*(a + b*x**4)**(9/4)/(9*b**2) + (a + b*x**4)**(13/4)/(13*b**2)
```

Mathematica [A] time = 0.0333896, size = 28, normalized size = 0.74

$$\frac{\left(a+bx^4\right)^{9/4}\left(9bx^4-4a\right)}{117b^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^7*(a + b*x^4)^(5/4),x]
```

```
[Out] ((a + b*x^4)^(9/4)*(-4*a + 9*b*x^4))/(117*b^2)
```

Maple [A] time = 0.008, size = 25, normalized size = 0.7

$$-\frac{-9\,bx^4+4\,a}{117\,b^2}\left(bx^4+a\right)^{\frac{9}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7*(b*x^4+a)^(5/4),x)
```

```
[Out] -1/117*(b*x^4+a)^(9/4)*(-9*b*x^4+4*a)/b^2
```

Maxima [A] time = 1.42939, size = 41, normalized size = 1.08

$$\frac{\left(bx^4+a\right)^{\frac{13}{4}}}{13\,b^2}-\frac{\left(bx^4+a\right)^{\frac{9}{4}}a}{9\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^7,x, algorithm="maxima")
```

```
[Out] 1/13*(b*x^4 + a)^(13/4)/b^2 - 1/9*(b*x^4 + a)^(9/4)*a/b^2
```

Fricas [A] time = 0.292398, size = 61, normalized size = 1.61

$$\frac{\left(9\,b^3x^{12}+14\,ab^2x^8+a^2bx^4-4\,a^3\right)\left(bx^4+a\right)^{\frac{1}{4}}}{117\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^7,x, algorithm="fricas")
```

```
[Out] 1/117*(9*b^3*x^12 + 14*a*b^2*x^8 + a^2*b*x^4 - 4*a^3)*(b*x^4 + a)
^(1/4)/b^2
```

Sympy [A] time = 33.706, size = 85, normalized size = 2.24

$$\begin{cases} -\frac{4a^3\sqrt[4]{a+bx^4}}{117b^2}+\frac{a^2x^4\sqrt[4]{a+bx^4}}{117b}+\frac{14ax^8\sqrt[4]{a+bx^4}}{117}+\frac{bx^{12}\sqrt[4]{a+bx^4}}{13} & \text{for } b\neq 0 \\ \frac{a^{\frac{5}{4}}x^8}{8} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7*(b*x**4+a)**(5/4),x)
```

```
[Out] Piecewise((-4*a**3*(a + b*x**4)**(1/4)/(117*b**2) + a**2*x**4*(a
+ b*x**4)**(1/4)/(117*b) + 14*a*x**8*(a + b*x**4)**(1/4)/117 + b*
x**12*(a + b*x**4)**(1/4)/13, Ne(b, 0)), (a**(5/4)*x**8/8, True))
```

GIAC/XCAS [A] time = 0.21488, size = 105, normalized size = 2.76

$$\frac{\frac{13\left(5\left(bx^4+a\right)^{\frac{9}{4}}-9\left(bx^4+a\right)^{\frac{5}{4}}a\right)a}{b}+\frac{45\left(bx^4+a\right)^{\frac{13}{4}}-130\left(bx^4+a\right)^{\frac{9}{4}}a+117\left(bx^4+a\right)^{\frac{5}{4}}a^2}{b}}{585\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^7,x, algorithm="giac")
```

```
[Out] 1/585*(13*(5*(b*x^4 + a)^(9/4) - 9*(b*x^4 + a)^(5/4)*a)*a/b + (45
*(b*x^4 + a)^(13/4) - 130*(b*x^4 + a)^(9/4)*a + 117*(b*x^4 + a)^(
5/4)*a^2)/b)/b
```

3.1049 $\int x^3 \left(a+bx^4\right)^{5/4} dx$

Optimal. Leaf size=18

$$\frac{\left(a+bx^4\right)^{9/4}}{9b}$$

```
[Out] (a + b*x^4)^(9/4)/(9*b)
```

Rubi [A] time = 0.0108455, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$\frac{\left(a+bx^4\right)^{9/4}}{9b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3*(a + b*x^4)^(5/4),x]

[Out] (a + b*x^4)^(9/4)/(9*b)
```

Rubi in Sympy [A] time = 2.12816, size = 12, normalized size = 0.67

$$\frac{\left(a+bx^4\right)^{\frac{9}{4}}}{9b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3*(b*x**4+a)**(5/4),x)

[Out] (a + b*x**4)**(9/4)/(9*b)
```

Mathematica [A] time = 0.00843763, size = 18, normalized size = 1.

$$\frac{\left(a+bx^4\right)^{9/4}}{9b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3*(a + b*x^4)^(5/4),x]

[Out] (a + b*x^4)^(9/4)/(9*b)
```

Maple [A] time = 0.007, size = 15, normalized size = 0.8

$$\frac{1}{9\,b}\left(bx^4+a\right)^{\frac{9}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3*(b*x^4+a)^(5/4),x)

[Out] 1/9*(b*x^4+a)^(9/4)/b
```

Maxima [A] time = 1.43556, size = 19, normalized size = 1.06

$$\frac{\left(bx^4+a\right)^{\frac{9}{4}}}{9\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^3,x, algorithm="maxima")
```

```
[Out] 1/9*(b*x^4 + a)^(9/4)/b
```

Fricas [A] time = 0.282678, size = 43, normalized size = 2.39

$$\frac{\left(b^2x^8+2\,abx^4+a^2\right)\left(bx^4+a\right)^{\frac{1}{4}}}{9\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^3,x, algorithm="fricas")
```

```
[Out] 1/9*(b^2*x^8 + 2*a*b*x^4 + a^2)*(b*x^4 + a)^(1/4)/b
```

Sympy [A] time = 14.3177, size = 61, normalized size = 3.39

$$\begin{cases} \frac{a^2\sqrt[4]{a+bx^4}}{9b}+\frac{2ax^4\sqrt[4]{a+bx^4}}{9}+\frac{bx^8\sqrt[4]{a+bx^4}}{9} & \text{for } b\neq 0 \\ \frac{a^{\frac{5}{4}}x^4}{4} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(b*x**4+a)**(5/4),x)
```

```
[Out] Piecewise((a**2*(a + b*x**4)**(1/4)/(9*b) + 2*a*x**4*(a + b*x**4)
**(1/4)/9 + b*x**8*(a + b*x**4)**(1/4)/9, Ne(b, 0)), (a**(5/4)*x*
*4/4, True))
```

GIAC/XCAS [A] time = 0.215666, size = 19, normalized size = 1.06

$$\frac{\left(bx^4+a\right)^{\frac{9}{4}}}{9\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^3,x, algorithm="giac")
```

```
[Out] 1/9*(b*x^4 + a)^(9/4)/b
```

3.1050 $\int \frac{(a+bx^4)^{5/4}}{x}\,dx$

Optimal. Leaf size=83

$$-\frac{1}{2}a^{5/4}\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)-\frac{1}{2}a^{5/4}\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)+a\sqrt[4]{a+bx^4}+\frac{1}{5}\left(a+bx^4\right)^{5/4}$$

```
[Out] a*(a + b*x^4)^(1/4) + (a + b*x^4)^(5/4)/5 - (a^(5/4)*ArcTan[(a +
b*x^4)^(1/4)/a^(1/4)])/2 - (a^(5/4)*ArcTanh[(a + b*x^4)^(1/4)/a^(
1/4)])/2
```

Rubi [A] time = 0.13528, antiderivative size = 83, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$-\frac{1}{2}a^{5/4}\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)-\frac{1}{2}a^{5/4}\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)+a\sqrt[4]{a+bx^4}+\frac{1}{5}\left(a+bx^4\right)^{5/4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(5/4)/x,x]
```

```
[Out] a*(a + b*x^4)^(1/4) + (a + b*x^4)^(5/4)/5 - (a^(5/4)*ArcTan[(a +
b*x^4)^(1/4)/a^(1/4)])/2 - (a^(5/4)*ArcTanh[(a + b*x^4)^(1/4)/a^(
1/4)])/2
```

Rubi in Sympy [A] time = 12.868, size = 70, normalized size = 0.84

$$-\frac{a^{\frac{5}{4}}\operatorname{atan}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{2}-\frac{a^{\frac{5}{4}}\operatorname{atanh}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{2}+a\sqrt[4]{a+bx^4}+\frac{\left(a+bx^4\right)^{\frac{5}{4}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(5/4)/x,x)
```

```
[Out] -a**(5/4)*atan((a + b*x**4)**(1/4)/a**(1/4))/2 - a**(5/4)*atanh((
a + b*x**4)**(1/4)/a**(1/4))/2 + a*(a + b*x**4)**(1/4) + (a + b*x
**4)**(5/4)/5
```

Mathematica [C] time = 0.0546093, size = 76, normalized size = 0.92

$$\frac{3\left(6a^2+7abx^4+b^2x^8\right)-5a^2\left(\frac{a}{bx^4}+1\right)^{3/4}\,{}_2F_1\left(\frac{3}{4},\frac{3}{4};\frac{7}{4};-\frac{a}{bx^4}\right)}{15\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(5/4)/x,x]
```

```
[Out] (3*(6*a^2 + 7*a*b*x^4 + b^2*x^8) - 5*a^2*(1 + a/(b*x^4))^(3/4)*Hy
pergeometric2F1[3/4, 3/4, 7/4, -(a/(b*x^4))])/(15*(a + b*x^4)^(3/
4))
```

Maple [F] time = 0.035, size = 0, normalized size = 0.

$$\int \frac{1}{x} \left(bx^4 + a\right)^{\frac{5}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(5/4)/x,x)
```

```
[Out] int((b*x^4+a)^(5/4)/x,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.281554, size = 163, normalized size = 1.96

$$\frac{1}{5} \left(bx^4 + 6\,a\right) \left(bx^4 + a\right)^{\frac{1}{4}} + \left(a^5\right)^{\frac{1}{4}} \arctan\left(\frac{\left(a^5\right)^{\frac{1}{4}}}{(bx^4 + a)^{\frac{1}{4}} a + \sqrt{\sqrt{bx^4 + a}a^2 + \sqrt{a^5}}}\right) - \frac{1}{4} \left(a^5\right)^{\frac{1}{4}} \log\left(\left(bx^4 + a\right)^{\frac{1}{4}} a + \left(a^5\right)^{\frac{1}{4}}\right) + \frac{1}{4} \left(a^5\right)^{\frac{1}{4}} \log\left(\left(bx^4 + a\right)^{\frac{1}{4}} a - \left(a^5\right)^{\frac{1}{4}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x,x, algorithm="fricas")
```

```
[Out] 1/5*(b*x^4 + 6*a)*(b*x^4 + a)^(1/4) + (a^5)^(1/4)*arctan((a^5)^(1
/4)/((b*x^4 + a)^(1/4)*a + sqrt(sqrt(b*x^4 + a)*a^2 + sqrt(a^5)))
) - 1/4*(a^5)^(1/4)*log((b*x^4 + a)^(1/4)*a + (a^5)^(1/4)) + 1/4*
(a^5)^(1/4)*log((b*x^4 + a)^(1/4)*a - (a^5)^(1/4))
```

Sympy [A] time = 7.07708, size = 48, normalized size = 0.58

$$-\frac{b^{\frac{5}{4}} x^5 \Gamma\left(-\frac{5}{4}\right) {}_2F_1\left(\begin{matrix} -\frac{5}{4}, -\frac{5}{4} \\ -\frac{1}{4} \end{matrix} \middle| \frac{ae^{i\pi}}{bx^4}\right)}{4\Gamma\left(-\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(5/4)/x,x)
```

```
[Out] -b**(5/4)*x**5*gamma(-5/4)*hyper((-5/4, -5/4), (-1/4,), a*exp_pol
ar(I*pi)/(b*x**4))/(4*gamma(-1/4))
```

<u>**GIAC/XCAS**</u> **[A]** time = 0.223816, size = 270, normalized size = 3.25

$$-\frac{1}{4}\sqrt{2}(-a)^{\frac{1}{4}}a\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}+2\left(bx^4+a\right)^{\frac{1}{4}}\right)}{2(-a)^{\frac{1}{4}}}\right)-\frac{1}{4}\sqrt{2}(-a)^{\frac{1}{4}}a\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}-2\left(bx^4+a\right)^{\frac{1}{4}}\right)}{2(-a)^{\frac{1}{4}}}\right)-\frac{1}{8}\sqrt{2}(-a)^{\frac{1}{4}}a\ln\left(\sqrt{2}\left(bx^4+a\right)^{\frac{1}{4}}(-a)^{\frac{1}{4}}+\sqrt{bx^4+a}+\sqrt{-a}\right)+\frac{1}{8}\sqrt{2}(-a)^{\frac{1}{4}}a\ln\left(-\sqrt{2}\left(bx^4+a\right)^{\frac{1}{4}}(-a)^{\frac{1}{4}}+\sqrt{bx^4+a}+\sqrt{-a}\right)+\frac{1}{5}\left(bx^4+a\right)^{\frac{5}{4}}+\left(bx^4+a\right)^{\frac{1}{4}}a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x,x, algorithm="giac")
```

```
[Out] -1/4*sqrt(2)*(-a)^(1/4)*a*arctan(1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4)
+ 2*(b*x^4 + a)^(1/4))/(-a)^(1/4)) - 1/4*sqrt(2)*(-a)^(1/4)*a*arc
tan(-1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) - 2*(b*x^4 + a)^(1/4))/(-a)^
(1/4)) - 1/8*sqrt(2)*(-a)^(1/4)*a*ln(sqrt(2)*(b*x^4 + a)^(1/4)*(-
a)^(1/4) + sqrt(b*x^4 + a) + sqrt(-a)) + 1/8*sqrt(2)*(-a)^(1/4)*a
*ln(-sqrt(2)*(b*x^4 + a)^(1/4)*(-a)^(1/4) + sqrt(b*x^4 + a) + sqr
t(-a)) + 1/5*(b*x^4 + a)^(5/4) + (b*x^4 + a)^(1/4)*a
```

3.1051 $\int \frac{(a+bx^4)^{5/4}}{x^5} dx$

Optimal. Leaf size=91

$$-\frac{(a+bx^4)^{5/4}}{4x^4}+\frac{5}{4}b\sqrt[4]{a+bx^4}-\frac{5}{8}\sqrt[4]{a}b\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)-\frac{5}{8}\sqrt[4]{a}b\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)$$

```
[Out] (5*b*(a + b*x^4)^(1/4))/4 - (a + b*x^4)^(5/4)/(4*x^4) - (5*a^(1/4
)*b*ArcTan[(a + b*x^4)^(1/4)/a^(1/4)])/8 - (5*a^(1/4)*b*ArcTanh[(
a + b*x^4)^(1/4)/a^(1/4)])/8
```

Rubi [A] time = 0.137889, antiderivative size = 91, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.467$

$$-\frac{(a+bx^4)^{5/4}}{4x^4}+\frac{5}{4}b\sqrt[4]{a+bx^4}-\frac{5}{8}\sqrt[4]{a}b\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)-\frac{5}{8}\sqrt[4]{a}b\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(5/4)/x^5,x]
```

```
[Out] (5*b*(a + b*x^4)^(1/4))/4 - (a + b*x^4)^(5/4)/(4*x^4) - (5*a^(1/4
)*b*ArcTan[(a + b*x^4)^(1/4)/a^(1/4)])/8 - (5*a^(1/4)*b*ArcTanh[(
a + b*x^4)^(1/4)/a^(1/4)])/8
```

Rubi in Sympy [A] time = 13.2157, size = 83, normalized size = 0.91

$$-\frac{5\sqrt[4]{a}b\operatorname{atan}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{8}-\frac{5\sqrt[4]{a}b\operatorname{atanh}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{8}+\frac{5b\sqrt[4]{a+bx^4}}{4}-\frac{(a+bx^4)^{\frac{5}{4}}}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(5/4)/x**5,x)
```

```
[Out] -5*a**(1/4)*b*atan((a + b*x**4)**(1/4)/a**(1/4))/8 - 5*a**(1/4)*b
*atanh((a + b*x**4)**(1/4)/a**(1/4))/8 + 5*b*(a + b*x**4)**(1/4)/
4 - (a + b*x**4)**(5/4)/(4*x**4)
```

Mathematica [C] time = 0.0980166, size = 73, normalized size = 0.8

$$\left(b-\frac{a}{4x^4}\right)\sqrt[4]{a+bx^4}-\frac{5ab\left(\frac{a}{bx^4}+1\right)^{3/4}{}_2F_1\left(\frac{3}{4},\frac{3}{4};\frac{7}{4};-\frac{a}{bx^4}\right)}{12(a+bx^4)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(5/4)/x^5,x]
```

```
[Out] (b - a/(4*x^4))*(a + b*x^4)^(1/4) - (5*a*b*(1 + a/(b*x^4))^(3/4)*
Hypergeometric2F1[3/4, 3/4, 7/4, -(a/(b*x^4))])/(12*(a + b*x^4)^(
3/4))
```

Maple [F] time = 0.053, size = 0, normalized size = 0.

$$\int \frac{1}{x^5} \left(b x^4 + a\right)^{\frac{5}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(5/4)/x^5,x)
```

```
[Out] int((b*x^4+a)^(5/4)/x^5,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^5,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.298826, size = 209, normalized size = 2.3

$$\frac{20 \left(a b^4\right)^{\frac{1}{4}} x^4 \arctan\left(\frac{\left(a b^4\right)^{\frac{1}{4}}}{\left(b x^4+a\right)^{\frac{1}{4}} b+\sqrt{\sqrt{b x^4+a} b^2+\sqrt{a b^4}}}\right) - 5 \left(a b^4\right)^{\frac{1}{4}} x^4 \log\left(5 \left(b x^4+a\right)^{\frac{1}{4}} b + 5 \left(a b^4\right)^{\frac{1}{4}}\right) + 5 \left(a b^4\right)^{\frac{1}{4}} x^4 \log\left(5 \left(b x^4 + \right.\right.}{16 x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^5,x, algorithm="fricas")
```

```
[Out] 1/16*(20*(a*b^4)^(1/4)*x^4*arctan((a*b^4)^(1/4)/((b*x^4 + a)^(1/4
)*b + sqrt(sqrt(b*x^4 + a)*b^2 + sqrt(a*b^4)))) - 5*(a*b^4)^(1/4)
*x^4*log(5*(b*x^4 + a)^(1/4)*b + 5*(a*b^4)^(1/4)) + 5*(a*b^4)^(1/
4)*x^4*log(5*(b*x^4 + a)^(1/4)*b - 5*(a*b^4)^(1/4)) + 4*(4*b*x^4
- a)*(b*x^4 + a)^(1/4))/x^4
```

Sympy [A] time = 8.26234, size = 42, normalized size = 0.46

$$-\frac{b^{\frac{5}{4}} x \Gamma\left(-\frac{1}{4}\right) {}_{2}F_{1}\left(\begin{matrix} -\frac{5}{4}, -\frac{1}{4} \\ \frac{3}{4} \end{matrix}\middle| \frac{a e^{i\pi}}{b x^4}\right)}{4 \Gamma\left(\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(5/4)/x**5,x)
```

```
[Out] -b**(5/4)*x*gamma(-1/4)*hyper((-5/4, -1/4), (3/4,), a*exp_polar(I
*pi)/(b*x**4))/(4*gamma(3/4))
```

GIAC/XCAS [A] time = 0.22545, size = 278, normalized size = 3.05

$$-\frac{1}{32}\left(10 \sqrt{2} (-a)^{\frac{1}{4}} \arctan\left(\frac{\sqrt{2}\left(\sqrt{2} (-a)^{\frac{1}{4}} + 2 \left(b x^4 + a\right)^{\frac{1}{4}}\right)}{2 (-a)^{\frac{1}{4}}}\right) + 10 \sqrt{2} (-a)^{\frac{1}{4}} \arctan\left(-\frac{\sqrt{2}\left(\sqrt{2} (-a)^{\frac{1}{4}} - 2 \left(b x^4 + a\right)^{\frac{1}{4}}\right)}{2 (-a)^{\frac{1}{4}}}\right) + 5 \sqrt{2} (\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^5,x, algorithm="giac")
```

```
[Out] -1/32*(10*sqrt(2)*(-a)^(1/4)*arctan(1/2*sqrt(2)*(sqrt(2)*(-a)^(1/
4) + 2*(b*x^4 + a)^(1/4))/(-a)^(1/4)) + 10*sqrt(2)*(-a)^(1/4)*arc
tan(-1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) - 2*(b*x^4 + a)^(1/4))/(-a)^
(1/4)) + 5*sqrt(2)*(-a)^(1/4)*ln(sqrt(2)*(b*x^4 + a)^(1/4)*(-a)^(
1/4) + sqrt(b*x^4 + a) + sqrt(-a)) - 5*sqrt(2)*(-a)^(1/4)*ln(-sqr
t(2)*(b*x^4 + a)^(1/4)*(-a)^(1/4) + sqrt(b*x^4 + a) + sqrt(-a)) -
 32*(b*x^4 + a)^(1/4) + 8*(b*x^4 + a)^(1/4)*a/(b*x^4))*b
```

3.1052 $\int \frac{(a+bx^4)^{5/4}}{x^9} dx$

Optimal. Leaf size=98

$$-\frac{5b^2\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{3/4}}-\frac{5b^2\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{3/4}}-\frac{5b\sqrt[4]{a+bx^4}}{32x^4}-\frac{(a+bx^4)^{5/4}}{8x^8}$$

```
[Out] (-5*b*(a + b*x^4)^(1/4))/(32*x^4) - (a + b*x^4)^(5/4)/(8*x^8) - (
5*b^2*ArcTan[(a + b*x^4)^(1/4)/a^(1/4)])/(64*a^(3/4)) - (5*b^2*Ar
cTanh[(a + b*x^4)^(1/4)/a^(1/4)])/(64*a^(3/4))
```

Rubi [A] time = 0.138282, antiderivative size = 98, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$-\frac{5b^2\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{3/4}}-\frac{5b^2\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{3/4}}-\frac{5b\sqrt[4]{a+bx^4}}{32x^4}-\frac{(a+bx^4)^{5/4}}{8x^8}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(5/4)/x^9,x]
```

```
[Out] (-5*b*(a + b*x^4)^(1/4))/(32*x^4) - (a + b*x^4)^(5/4)/(8*x^8) - (
5*b^2*ArcTan[(a + b*x^4)^(1/4)/a^(1/4)])/(64*a^(3/4)) - (5*b^2*Ar
cTanh[(a + b*x^4)^(1/4)/a^(1/4)])/(64*a^(3/4))
```

Rubi in Sympy [A] time = 14.3535, size = 92, normalized size = 0.94

$$-\frac{5b\sqrt[4]{a+bx^4}}{32x^4}-\frac{(a+bx^4)^{\frac{5}{4}}}{8x^8}-\frac{5b^2\operatorname{atan}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{\frac{3}{4}}}-\frac{5b^2\operatorname{atanh}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(5/4)/x**9,x)
```

```
[Out] -5*b*(a + b*x**4)**(1/4)/(32*x**4) - (a + b*x**4)**(5/4)/(8*x**8)
 - 5*b**2*atan((a + b*x**4)**(1/4)/a**(1/4))/(64*a**(3/4)) - 5*b*
*2*atanh((a + b*x**4)**(1/4)/a**(1/4))/(64*a**(3/4))
```

Mathematica [C] time = 0.0617321, size = 85, normalized size = 0.87

$$\left(-\frac{a}{8x^8}-\frac{9b}{32x^4}\right)\sqrt[4]{a+bx^4}-\frac{5b^2\left(\frac{a+bx^4}{bx^4}\right)^{3/4}{}_2F_1\left(\frac{3}{4},\frac{3}{4};\frac{7}{4};-\frac{a}{bx^4}\right)}{96\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(5/4)/x^9,x]
```

```
[Out] (-a/(8*x^8) - (9*b)/(32*x^4))*(a + b*x^4)^(1/4) - (5*b^2*((a + b*
x^4)/(b*x^4))^(3/4)*Hypergeometric2F1[3/4, 3/4, 7/4, -(a/(b*x^4))
])/(96*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.05, size = 0, normalized size = 0.

$$\int \frac{1}{x^9}\left(bx^4+a\right)^{\frac{5}{4}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(5/4)/x^9,x)
```

```
[Out] int((b*x^4+a)^(5/4)/x^9,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^9,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.30805, size = 246, normalized size = 2.51

$$\frac{20\left(\frac{b^8}{a^3}\right)^{\frac{1}{4}}x^8\arctan\left(\frac{\left(\frac{b^8}{a^3}\right)^{\frac{1}{4}}a}{(bx^4+a)^{\frac{1}{4}}b^2+\sqrt{\sqrt{bx^4+a}b^4+\sqrt{\frac{b^8}{a^3}}a^2}}\right)-5\left(\frac{b^8}{a^3}\right)^{\frac{1}{4}}x^8\log\left(5\left(bx^4+a\right)^{\frac{1}{4}}b^2+5\left(\frac{b^8}{a^3}\right)^{\frac{1}{4}}a\right)+5\left(\frac{b^8}{a^3}\right)^{\frac{1}{4}}x^8\log\left(5\left(bx^4\right.\right.}{128\,x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^9,x, algorithm="fricas")
```

```
[Out] 1/128*(20*(b^8/a^3)^(1/4)*x^8*arctan((b^8/a^3)^(1/4)*a/((b*x^4 +
a)^(1/4)*b^2 + sqrt(sqrt(b*x^4 + a)*b^4 + sqrt(b^8/a^3)*a^2))) -
5*(b^8/a^3)^(1/4)*x^8*log(5*(b*x^4 + a)^(1/4)*b^2 + 5*(b^8/a^3)^(
1/4)*a) + 5*(b^8/a^3)^(1/4)*x^8*log(5*(b*x^4 + a)^(1/4)*b^2 - 5*(
b^8/a^3)^(1/4)*a) - 4*(9*b*x^4 + 4*a)*(b*x^4 + a)^(1/4))/x^8
```

Sympy [A] time = 15.1545, size = 41, normalized size = 0.42

$$-\frac{b^{\frac{5}{4}}\Gamma\left(\frac{3}{4}\right){}_{2}F_{1}\left(\begin{matrix}-\frac{5}{4},\frac{3}{4}\\ \frac{7}{4}\end{matrix}\middle|\frac{ae^{i\pi}}{bx^4}\right)}{4x^3\Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(5/4)/x**9,x)
```

```
[Out] -b**(5/4)*gamma(3/4)*hyper((-5/4, 3/4), (7/4,), a*exp_polar(I*pi)
/(b*x**4))/(4*x**3*gamma(7/4))
```

GIAC/XCAS [A] time = 0.227978, size = 301, normalized size = 3.07

$$-\frac{1}{256}\,b^{2}\left(\frac{10\,\sqrt{2}\,(-a)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}+2\,(bx^{4}+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{a}+\frac{10\,\sqrt{2}\,(-a)^{\frac{1}{4}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}-2\,(bx^{4}+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{a}+\frac{5\,\sqrt{2}\,(-a)^{\frac{1}{4}}\ln\left(\sqrt{2}\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^9,x, algorithm="giac")
```

```
[Out] -1/256*b^2*(10*sqrt(2)*(-a)^(1/4)*arctan(1/2*sqrt(2)*(sqrt(2)*(-a
)^(1/4) + 2*(b*x^4 + a)^(1/4))/(-a)^(1/4))/a + 10*sqrt(2)*(-a)^(1
/4)*arctan(-1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) - 2*(b*x^4 + a)^(1/4)
)/(-a)^(1/4))/a + 5*sqrt(2)*(-a)^(1/4)*ln(sqrt(2)*(b*x^4 + a)^(1/
4)*(-a)^(1/4) + sqrt(b*x^4 + a) + sqrt(-a))/a - 5*sqrt(2)*(-a)^(1
/4)*ln(-sqrt(2)*(b*x^4 + a)^(1/4)*(-a)^(1/4) + sqrt(b*x^4 + a) +
sqrt(-a))/a + 8*(9*(b*x^4 + a)^(5/4) - 5*(b*x^4 + a)^(1/4)*a)/(b^
2*x^8))
```

3.1053 $\int x^9 \left(a+bx^4\right)^{5/4} \, dx$

Optimal. Leaf size=146

$$\frac{4a^{9/2}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{231b^{5/2}\left(a+bx^4\right)^{3/4}}-\frac{2a^3x^2\sqrt[4]{a+bx^4}}{231b^2}+\frac{a^2x^6\sqrt[4]{a+bx^4}}{231b}+\frac{1}{15}x^{10}\left(a+bx^4\right)^{5/4}+\frac{1}{33}ax^{10}\sqrt[4]{a+bx^4}$$

```
[Out] (-2*a^3*x^2*(a + b*x^4)^(1/4))/(231*b^2) + (a^2*x^6*(a + b*x^4)^(
1/4))/(231*b) + (a*x^10*(a + b*x^4)^(1/4))/33 + (x^10*(a + b*x^4)
^(5/4))/15 + (4*a^(9/2)*(1 + (b*x^4)/a)^(3/4)*EllipticF[ArcTan[(S
qrt[b]*x^2)/Sqrt[a]]/2, 2])/(231*b^(5/2)*(a + b*x^4)^(3/4))
```

Rubi [A] time = 0.235929, antiderivative size = 146, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{4a^{9/2}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{231b^{5/2}\left(a+bx^4\right)^{3/4}}-\frac{2a^3x^2\sqrt[4]{a+bx^4}}{231b^2}+\frac{a^2x^6\sqrt[4]{a+bx^4}}{231b}+\frac{1}{15}x^{10}\left(a+bx^4\right)^{5/4}+\frac{1}{33}ax^{10}\sqrt[4]{a+bx^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^9*(a + b*x^4)^(5/4),x]
```


```
[Out] (-2*a^3*x^2*(a + b*x^4)^(1/4))/(231*b^2) + (a^2*x^6*(a + b*x^4)^(
1/4))/(231*b) + (a*x^10*(a + b*x^4)^(1/4))/33 + (x^10*(a + b*x^4)
^(5/4))/15 + (4*a^(9/2)*(1 + (b*x^4)/a)^(3/4)*EllipticF[ArcTan[(S
qrt[b]*x^2)/Sqrt[a]]/2, 2])/(231*b^(5/2)*(a + b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 24.2114, size = 129, normalized size = 0.88

$$\frac{4a^{\frac{9}{2}}\left(1+\frac{bx^4}{a}\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{231b^{\frac{5}{2}}\left(a+bx^4\right)^{\frac{3}{4}}}-\frac{2a^3x^2\sqrt[4]{a+bx^4}}{231b^2}+\frac{a^2x^6\sqrt[4]{a+bx^4}}{231b}+\frac{ax^{10}\sqrt[4]{a+bx^4}}{33}+\frac{x^{10}\left(a+bx^4\right)^{\frac{5}{4}}}{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**9*(b*x**4+a)**(5/4),x)
```

```
[Out] 4*a**(9/2)*(1 + b*x**4/a)**(3/4)*elliptic_f(atan(sqrt(b)*x**2/sqr
t(a))/2, 2)/(231*b**(5/2)*(a + b*x**4)**(3/4)) - 2*a**3*x**2*(a +
 b*x**4)**(1/4)/(231*b**2) + a**2*x**6*(a + b*x**4)**(1/4)/(231*b
) + a*x**10*(a + b*x**4)**(1/4)/33 + x**10*(a + b*x**4)**(5/4)/15
```

Mathematica [C] time = 0.0762219, size = 102, normalized size = 0.7

$$\frac{x^2\left(10a^4\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};-\frac{bx^4}{a}\right)-10a^4-5a^3bx^4+117a^2b^2x^8+189ab^3x^{12}+77b^4x^{16}\right)}{1155b^2\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^9*(a + b*x^4)^(5/4),x]
```

```
[Out] (x^2*(-10*a^4 - 5*a^3*b*x^4 + 117*a^2*b^2*x^8 + 189*a*b^3*x^12 +
77*b^4*x^16 + 10*a^4*(1 + (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/2,
 3/4, 3/2, -((b*x^4)/a)]))/(1155*b^2*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.039, size = 0, normalized size = 0.

$$\int x^{9} \left(b x^{4}+a\right)^{\frac{5}{4}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^9*(b*x^4+a)^(5/4),x)
```

```
[Out] int(x^9*(b*x^4+a)^(5/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b x^{4}+a\right)^{\frac{5}{4}} x^{9}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^9,x, algorithm="maxima")
```

```
[Out] integrate((b*x^4 + a)^(5/4)*x^9, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(b x^{13}+a x^{9}\right) \left(b x^{4}+a\right)^{\frac{1}{4}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^9,x, algorithm="fricas")
```

```
[Out] integral((b*x^13 + a*x^9)*(b*x^4 + a)^(1/4), x)
```

Sympy [A] time = 23.5186, size = 29, normalized size = 0.2

$$\frac{a^{\frac{5}{4}} x^{10} {}_{2}F_{1}\left(\begin{matrix} -\frac{5}{4}, \frac{5}{2} \\ \frac{7}{2} \end{matrix}\middle| {\frac{b x^{4} e^{i \pi}}{a}} \right)}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**9*(b*x**4+a)**(5/4),x)
```

```
[Out] a**(5/4)*x**10*hyper((-5/4, 5/2), (7/2,), b*x**4*exp_polar(I*pi)/
a)/10
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bx^4+a\right)^{\frac{5}{4}} x^9\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^9,x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(5/4)*x^9, x)
```

3.1054 $\int x^5 \left(a+bx^4\right)^{5/4} dx$

Optimal. Leaf size=122

$$-\frac{10a^{7/2}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{231b^{3/2}\left(a+bx^4\right)^{3/4}}+\frac{5a^2x^2\sqrt[4]{a+bx^4}}{231b}+\frac{1}{11}x^6\left(a+bx^4\right)^{5/4}+\frac{5}{77}ax^6\sqrt[4]{a+bx^4}$$

```
[Out] (5*a^2*x^2*(a + b*x^4)^(1/4))/(231*b) + (5*a*x^6*(a + b*x^4)^(1/4
))/77 + (x^6*(a + b*x^4)^(5/4))/11 - (10*a^(7/2)*(1 + (b*x^4)/a)^
(3/4)*EllipticF[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(231*b^(3/2)
*(a + b*x^4)^(3/4))
```

Rubi [A] time = 0.185824, antiderivative size = 122, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{10a^{7/2}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{231b^{3/2}\left(a+bx^4\right)^{3/4}}+\frac{5a^2x^2\sqrt[4]{a+bx^4}}{231b}+\frac{1}{11}x^6\left(a+bx^4\right)^{5/4}+\frac{5}{77}ax^6\sqrt[4]{a+bx^4}$$

Antiderivative was successfully verified.

```
[In] Int[x^5*(a + b*x^4)^(5/4),x]
```

```
[Out] (5*a^2*x^2*(a + b*x^4)^(1/4))/(231*b) + (5*a*x^6*(a + b*x^4)^(1/4
))/77 + (x^6*(a + b*x^4)^(5/4))/11 - (10*a^(7/2)*(1 + (b*x^4)/a)^
(3/4)*EllipticF[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(231*b^(3/2)
*(a + b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 19.1123, size = 109, normalized size = 0.89

$$-\frac{10a^{\frac{7}{2}}\left(1+\frac{bx^4}{a}\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{231b^{\frac{3}{2}}\left(a+bx^4\right)^{\frac{3}{4}}}+\frac{5a^2x^2\sqrt[4]{a+bx^4}}{231b}+\frac{5ax^6\sqrt[4]{a+bx^4}}{77}+\frac{x^6\left(a+bx^4\right)^{\frac{5}{4}}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**5*(b*x**4+a)**(5/4),x)
```

```
[Out] -10*a**(7/2)*(1 + b*x**4/a)**(3/4)*elliptic_f(atan(sqrt(b)*x**2/s
qrt(a))/2, 2)/(231*b**(3/2)*(a + b*x**4)**(3/4)) + 5*a**2*x**2*(a
 + b*x**4)**(1/4)/(231*b) + 5*a*x**6*(a + b*x**4)**(1/4)/77 + x**
6*(a + b*x**4)**(5/4)/11
```

Mathematica [C] time = 0.0722902, size = 91, normalized size = 0.75

$$\frac{x^2\left(-5a^3\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};-\frac{bx^4}{a}\right)+5a^3+41a^2bx^4+57ab^2x^8+21b^3x^{12}\right)}{231b\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5*(a + b*x^4)^(5/4),x]
```

```
[Out] (x^2*(5*a^3 + 41*a^2*b*x^4 + 57*a*b^2*x^8 + 21*b^3*x^12 - 5*a^3*(
1 + (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/2, 3/4, 3/2, -((b*x^4)/a
```

```
)]))/(231*b*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.039, size = 0, normalized size = 0.

$$\int x^{5} \left(b x^{4}+a\right)^{\frac{5}{4}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5*(b*x^4+a)^(5/4),x)

[Out] int(x^5*(b*x^4+a)^(5/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b x^{4}+a\right)^{\frac{5}{4}} x^{5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^5,x, algorithm="maxima")

[Out] integrate((b*x^4 + a)^(5/4)*x^5, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\left(b x^{9}+a x^{5}\right) \left(b x^{4}+a\right)^{\frac{1}{4}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^5,x, algorithm="fricas")

[Out] integral((b*x^9 + a*x^5)*(b*x^4 + a)^(1/4), x)
```

Sympy [A] time = 12.2386, size = 29, normalized size = 0.24

$$\frac{a^{\frac{5}{4}} x^{6} {}_{2}F_{1}\left(\begin{matrix} -\frac{5}{4}, \frac{3}{2} \\ \frac{5}{2} \end{matrix}\middle| {\frac{b x^{4} e^{i \pi}}{a}} \right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5*(b*x**4+a)**(5/4),x)

[Out] a**(5/4)*x**6*hyper((-5/4, 3/2), (5/2,), b*x**4*exp_polar(I*pi)/a
)/6
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b x^{4}+a\right)^{\frac{5}{4}} x^{5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^5,x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(5/4)*x^5, x)
```

3.1055 $\int x \left(a + bx^4\right)^{5/4} \, dx$

Optimal. Leaf size=98

$$\frac{5a^{5/2}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{21\sqrt{b}\left(a+bx^4\right)^{3/4}}+\frac{5}{21}ax^2\sqrt[4]{a+bx^4}+\frac{1}{7}x^2\left(a+bx^4\right)^{5/4}$$

```
[Out] (5*a*x^2*(a + b*x^4)^(1/4))/21 + (x^2*(a + b*x^4)^(5/4))/7 + (5*a
^(5/2)*(1 + (b*x^4)/a)^(3/4)*EllipticF[ArcTan[(Sqrt[b]*x^2)/Sqrt[
a]]/2, 2])/(21*Sqrt[b]*(a + b*x^4)^(3/4))
```

Rubi [A] time = 0.116676, antiderivative size = 98, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{5a^{5/2}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{21\sqrt{b}\left(a+bx^4\right)^{3/4}}+\frac{5}{21}ax^2\sqrt[4]{a+bx^4}+\frac{1}{7}x^2\left(a+bx^4\right)^{5/4}$$

Antiderivative was successfully verified.

```
[In]  Int[x*(a + b*x^4)^(5/4),x]
```

```
[Out] (5*a*x^2*(a + b*x^4)^(1/4))/21 + (x^2*(a + b*x^4)^(5/4))/7 + (5*a
^(5/2)*(1 + (b*x^4)/a)^(3/4)*EllipticF[ArcTan[(Sqrt[b]*x^2)/Sqrt[
a]]/2, 2])/(21*Sqrt[b]*(a + b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 9.97542, size = 87, normalized size = 0.89

$$\frac{5a^{\frac{5}{2}}\left(1+\frac{bx^4}{a}\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{21\sqrt{b}\left(a+bx^4\right)^{\frac{3}{4}}}+\frac{5ax^2\sqrt[4]{a+bx^4}}{21}+\frac{x^2\left(a+bx^4\right)^{\frac{5}{4}}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(b*x**4+a)**(5/4),x)
```

```
[Out] 5*a**(5/2)*(1 + b*x**4/a)**(3/4)*elliptic_f(atan(sqrt(b)*x**2/sqr
t(a))/2, 2)/(21*sqrt(b)*(a + b*x**4)**(3/4)) + 5*a*x**2*(a + b*x*
*4)**(1/4)/21 + x**2*(a + b*x**4)**(5/4)/7
```

Mathematica [C] time = 0.0579835, size = 77, normalized size = 0.79

$$\frac{x^2\left(5a^2\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};-\frac{bx^4}{a}\right)+16a^2+22abx^4+6b^2x^8\right)}{42\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x*(a + b*x^4)^(5/4),x]
```

```
[Out] (x^2*(16*a^2 + 22*a*b*x^4 + 6*b^2*x^8 + 5*a^2*(1 + (b*x^4)/a)^(3/
4)*Hypergeometric2F1[1/2, 3/4, 3/2, -((b*x^4)/a)]))/(42*(a + b*x^
4)^(3/4))
```

Maple [F] time = 0.035, size = 0, normalized size = 0.

$$\int x \left(b x^4 + a\right)^{\frac{5}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(b*x^4+a)^(5/4),x)
```

```
[Out] int(x*(b*x^4+a)^(5/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b x^4 + a\right)^{\frac{5}{4}} x \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x,x, algorithm="maxima")
```

```
[Out] integrate((b*x^4 + a)^(5/4)*x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(b x^5 + a x\right) \left(b x^4 + a\right)^{\frac{1}{4}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x,x, algorithm="fricas")
```

```
[Out] integral((b*x^5 + a*x)*(b*x^4 + a)^(1/4), x)
```

Sympy [A] time = 6.1634, size = 29, normalized size = 0.3

$$\frac{a^{\frac{5}{4}} x^2 {}_2F_1\left(\begin{matrix} -\frac{5}{4}, \frac{1}{2} \\ \frac{3}{2} \end{matrix}\middle| \frac{b x^4 e^{i\pi}}{a}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(b*x**4+a)**(5/4),x)
```

```
[Out] a**(5/4)*x**2*hyper((-5/4, 1/2), (3/2,), b*x**4*exp_polar(I*pi)/a
)/2
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b x^4 + a\right)^{\frac{5}{4}} x \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x,x, algorithm="giac")

[Out] integrate((b*x^4 + a)^(5/4)*x, x)
```

3.1056 $\int \frac{(a+bx^4)^{5/4}}{x^3}\,dx$

Optimal. Leaf size=98

$$\frac{5a^{3/2}\sqrt{b}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{6\left(a+bx^4\right)^{3/4}}+\frac{5}{6}bx^2\sqrt[4]{a+bx^4}-\frac{\left(a+bx^4\right)^{5/4}}{2x^2}$$

```
[Out] (5*b*x^2*(a + b*x^4)^(1/4))/6 - (a + b*x^4)^(5/4)/(2*x^2) + (5*a^
(3/2)*Sqrt[b]*(1 + (b*x^4)/a)^(3/4)*EllipticF[ArcTan[(Sqrt[b]*x^2
)/Sqrt[a]]/2, 2])/(6*(a + b*x^4)^(3/4))
```

Rubi [A] time = 0.130865, antiderivative size = 98, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{5a^{3/2}\sqrt{b}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{6\left(a+bx^4\right)^{3/4}}+\frac{5}{6}bx^2\sqrt[4]{a+bx^4}-\frac{\left(a+bx^4\right)^{5/4}}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(5/4)/x^3,x]
```

```
[Out] (5*b*x^2*(a + b*x^4)^(1/4))/6 - (a + b*x^4)^(5/4)/(2*x^2) + (5*a^
(3/2)*Sqrt[b]*(1 + (b*x^4)/a)^(3/4)*EllipticF[ArcTan[(Sqrt[b]*x^2
)/Sqrt[a]]/2, 2])/(6*(a + b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 12.0032, size = 87, normalized size = 0.89

$$\frac{5a^{\frac{3}{2}}\sqrt{b}\left(1+\frac{bx^4}{a}\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{6\left(a+bx^4\right)^{\frac{3}{4}}}+\frac{5bx^2\sqrt[4]{a+bx^4}}{6}-\frac{\left(a+bx^4\right)^{\frac{5}{4}}}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(5/4)/x**3,x)
```

```
[Out] 5*a**(3/2)*sqrt(b)*(1 + b*x**4/a)**(3/4)*elliptic_f(atan(sqrt(b)*
x**2/sqrt(a))/2, 2)/(6*(a + b*x**4)**(3/4)) + 5*b*x**2*(a + b*x**
4)**(1/4)/6 - (a + b*x**4)**(5/4)/(2*x**2)
```

Mathematica [C] time = 0.049086, size = 79, normalized size = 0.81

$$\frac{-6a^2+5abx^4\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};-\frac{bx^4}{a}\right)-2abx^4+4b^2x^8}{12x^2\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(5/4)/x^3,x]
```

```
[Out] (-6*a^2 - 2*a*b*x^4 + 4*b^2*x^8 + 5*a*b*x^4*(1 + (b*x^4)/a)^(3/4)
*Hypergeometric2F1[1/2, 3/4, 3/2, -((b*x^4)/a)])/(12*x^2*(a + b*x
^4)^(3/4))
```

Maple [F] time = 0.042, size = 0, normalized size = 0.

$$\int \frac{1}{x^3} \left(b x^4 + a\right)^{\frac{5}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(5/4)/x^3,x)

[Out] int((b*x^4+a)^(5/4)/x^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b x^4 + a\right)^{\frac{5}{4}}}{x^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^3,x, algorithm="maxima")

[Out] integrate((b*x^4 + a)^(5/4)/x^3, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(b x^4 + a\right)^{\frac{5}{4}}}{x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^3,x, algorithm="fricas")

[Out] integral((b*x^4 + a)^(5/4)/x^3, x)
```

Sympy [A] time = 6.30136, size = 32, normalized size = 0.33

$$-\frac{a^{\frac{5}{4}} {}_2F_1\left(\left.\begin{matrix} -\frac{5}{4}, -\frac{1}{2} \\ \frac{1}{2} \end{matrix}\right| \frac{b x^4 e^{i\pi}}{a}\right)}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(5/4)/x**3,x)

[Out] -a**(5/4)*hyper((-5/4, -1/2), (1/2,), b*x**4*exp_polar(I*pi)/a)/(
2*x**2)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b x^4 + a\right)^{\frac{5}{4}}}{x^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^3,x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(5/4)/x^3, x)
```

3.1057 $\int \frac{(a+bx^4)^{5/4}}{x^7}\,dx$

Optimal. Leaf size=98

$$\frac{5\sqrt{a}b^{3/2}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{12\left(a+bx^4\right)^{3/4}}-\frac{\left(a+bx^4\right)^{5/4}}{6x^6}-\frac{5b\sqrt[4]{a+bx^4}}{12x^2}$$

```
[Out] (-5*b*(a + b*x^4)^(1/4))/(12*x^2) - (a + b*x^4)^(5/4)/(6*x^6) + (
5*Sqrt[a]*b^(3/2)*(1 + (b*x^4)/a)^(3/4)*EllipticF[ArcTan[(Sqrt[b]
*x^2)/Sqrt[a]]/2, 2])/(12*(a + b*x^4)^(3/4))
```

Rubi [A] time = 0.14064, antiderivative size = 98, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{5\sqrt{a}b^{3/2}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{12\left(a+bx^4\right)^{3/4}}-\frac{\left(a+bx^4\right)^{5/4}}{6x^6}-\frac{5b\sqrt[4]{a+bx^4}}{12x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(5/4)/x^7,x]
```

```
[Out] (-5*b*(a + b*x^4)^(1/4))/(12*x^2) - (a + b*x^4)^(5/4)/(6*x^6) + (
5*Sqrt[a]*b^(3/2)*(1 + (b*x^4)/a)^(3/4)*EllipticF[ArcTan[(Sqrt[b]
*x^2)/Sqrt[a]]/2, 2])/(12*(a + b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 13.7797, size = 87, normalized size = 0.89

$$\frac{5\sqrt{a}b^{\frac{3}{2}}\left(1+\frac{bx^4}{a}\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{12\left(a+bx^4\right)^{\frac{3}{4}}}-\frac{5b\sqrt[4]{a+bx^4}}{12x^2}-\frac{\left(a+bx^4\right)^{\frac{5}{4}}}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(5/4)/x**7,x)
```

```
[Out] 5*sqrt(a)*b**(3/2)*(1 + b*x**4/a)**(3/4)*elliptic_f(atan(sqrt(b)*
x**2/sqrt(a))/2, 2)/(12*(a + b*x**4)**(3/4)) - 5*b*(a + b*x**4)**
(1/4)/(12*x**2) - (a + b*x**4)**(5/4)/(6*x**6)
```

Mathematica [C] time = 0.0571416, size = 85, normalized size = 0.87

$$\frac{5b^2x^2\left(\frac{a+bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};-\frac{bx^4}{a}\right)}{24\left(a+bx^4\right)^{3/4}}+\left(-\frac{a}{6x^6}-\frac{7b}{12x^2}\right)\sqrt[4]{a+bx^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(5/4)/x^7,x]
```

```
[Out] (-a/(6*x^6) - (7*b)/(12*x^2))*(a + b*x^4)^(1/4) + (5*b^2*x^2*((a
+ b*x^4)/a)^(3/4)*Hypergeometric2F1[1/2, 3/4, 3/2, -((b*x^4)/a)])
/(24*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.045, size = 0, normalized size = 0.

$$\int \frac{1}{x^7} \left(bx^4 + a\right)^{\frac{5}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(5/4)/x^7,x)

[Out] int((b*x^4+a)^(5/4)/x^7,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bx^4 + a\right)^{\frac{5}{4}}}{x^7} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^7,x, algorithm="maxima")

[Out] integrate((b*x^4 + a)^(5/4)/x^7, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(bx^4 + a\right)^{\frac{5}{4}}}{x^7}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^7,x, algorithm="fricas")

[Out] integral((b*x^4 + a)^(5/4)/x^7, x)
```

Sympy [A] time = 8.95094, size = 34, normalized size = 0.35

$$-\frac{a^{\frac{5}{4}} {}_2F_1\left(\begin{matrix} -\frac{3}{2}, -\frac{5}{4} \\ -\frac{1}{2} \end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(5/4)/x**7,x)

[Out] -a**(5/4)*hyper((-3/2, -5/4), (-1/2,), b*x**4*exp_polar(I*pi)/a)/
(6*x**6)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bx^4 + a\right)^{\frac{5}{4}}}{x^7} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^7,x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(5/4)/x^7, x)
```

3.1058 $\int \frac{(a+bx^4)^{5/4}}{x^{11}}\,dx$

Optimal. Leaf size=122

$$-\frac{b^{5/2}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{24\sqrt{a}\,(a+bx^4)^{3/4}}-\frac{b^2\sqrt[4]{a+bx^4}}{24ax^2}-\frac{(a+bx^4)^{5/4}}{10x^{10}}-\frac{b\sqrt[4]{a+bx^4}}{12x^6}$$

```
[Out] -(b*(a + b*x^4)^(1/4))/(12*x^6) - (b^2*(a + b*x^4)^(1/4))/(24*a*x
^2) - (a + b*x^4)^(5/4)/(10*x^10) - (b^(5/2)*(1 + (b*x^4)/a)^(3/4
)*EllipticF[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(24*Sqrt[a]*(a +
 b*x^4)^(3/4))
```

Rubi [A] time = 0.182314, antiderivative size = 122, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{b^{5/2}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{24\sqrt{a}\,(a+bx^4)^{3/4}}-\frac{b^2\sqrt[4]{a+bx^4}}{24ax^2}-\frac{(a+bx^4)^{5/4}}{10x^{10}}-\frac{b\sqrt[4]{a+bx^4}}{12x^6}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(5/4)/x^11,x]
```

```
[Out] -(b*(a + b*x^4)^(1/4))/(12*x^6) - (b^2*(a + b*x^4)^(1/4))/(24*a*x
^2) - (a + b*x^4)^(5/4)/(10*x^10) - (b^(5/2)*(1 + (b*x^4)/a)^(3/4
)*EllipticF[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(24*Sqrt[a]*(a +
 b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 18.562, size = 105, normalized size = 0.86

$$-\frac{b\sqrt[4]{a+bx^4}}{12x^6}-\frac{(a+bx^4)^{\frac{5}{4}}}{10x^{10}}-\frac{b^2\sqrt[4]{a+bx^4}}{24ax^2}-\frac{b^{\frac{5}{2}}\left(1+\frac{bx^4}{a}\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{24\sqrt{a}\,(a+bx^4)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(5/4)/x**11,x)
```

```
[Out] -b*(a + b*x**4)**(1/4)/(12*x**6) - (a + b*x**4)**(5/4)/(10*x**10)
 - b**2*(a + b*x**4)**(1/4)/(24*a*x**2) - b**(5/2)*(1 + b*x**4/a)
**(3/4)*elliptic_f(atan(sqrt(b)*x**2/sqrt(a))/2, 2)/(24*sqrt(a)*(
a + b*x**4)**(3/4))
```

Mathematica [C] time = 0.0616857, size = 97, normalized size = 0.8

$$\frac{-2\left(12a^3+34a^2bx^4+27ab^2x^8+5b^3x^{12}\right)-5b^3x^{12}\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};-\frac{bx^4}{a}\right)}{240ax^{10}(a+bx^4)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(5/4)/x^11,x]
```

```
[Out] (-2*(12*a^3 + 34*a^2*b*x^4 + 27*a*b^2*x^8 + 5*b^3*x^12) - 5*b^3*x
^12*(1 + (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/2, 3/4, 3/2, -((b*x
```

```
^4)/a)])/(240*a*x^10*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.052, size = 0, normalized size = 0.

$$\int \frac{1}{x^{11}} \left(b x^4 + a\right)^{\frac{5}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(5/4)/x^11,x)
```

```
[Out] int((b*x^4+a)^(5/4)/x^11,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b x^4 + a\right)^{\frac{5}{4}}}{x^{11}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^11,x, algorithm="maxima")
```

```
[Out] integrate((b*x^4 + a)^(5/4)/x^11, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(b x^4 + a\right)^{\frac{5}{4}}}{x^{11}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^11,x, algorithm="fricas")
```

```
[Out] integral((b*x^4 + a)^(5/4)/x^11, x)
```

Sympy [A] time = 18.7596, size = 34, normalized size = 0.28

$$-\frac{a^{\frac{5}{4}} {}_2F_1\left(\begin{matrix} -\frac{5}{2}, -\frac{5}{4} \\ -\frac{3}{2} \end{matrix}\middle| \frac{b x^4 e^{i\pi}}{a}\right)}{10 x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(5/4)/x**11,x)
```

```
[Out] -a**(5/4)*hyper((-5/2, -5/4), (-3/2,), b*x**4*exp_polar(I*pi)/a)/
(10*x**10)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b x^4 + a\right)^{\frac{5}{4}}}{x^{11}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^11,x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(5/4)/x^11, x)
```

3.1059 $\int \frac{(a+bx^4)^{5/4}}{x^{15}}\,dx$

Optimal. Leaf size=146

$$\frac{5b^{7/2}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{336a^{3/2}(a+bx^4)^{3/4}}+\frac{5b^3\sqrt[4]{a+bx^4}}{336a^2x^2}-\frac{b^2\sqrt[4]{a+bx^4}}{168ax^6}-\frac{(a+bx^4)^{5/4}}{14x^{14}}-\frac{b\sqrt[4]{a+bx^4}}{28x^{10}}$$

```
[Out] -(b*(a + b*x^4)^(1/4))/(28*x^10) - (b^2*(a + b*x^4)^(1/4))/(168*a
*x^6) + (5*b^3*(a + b*x^4)^(1/4))/(336*a^2*x^2) - (a + b*x^4)^(5/
4)/(14*x^14) + (5*b^(7/2)*(1 + (b*x^4)/a)^(3/4)*EllipticF[ArcTan[
(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(336*a^(3/2)*(a + b*x^4)^(3/4))
```

Rubi [A] time = 0.228894, antiderivative size = 146, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$

$$\frac{5b^{7/2}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{336a^{3/2}(a+bx^4)^{3/4}}+\frac{5b^3\sqrt[4]{a+bx^4}}{336a^2x^2}-\frac{b^2\sqrt[4]{a+bx^4}}{168ax^6}-\frac{(a+bx^4)^{5/4}}{14x^{14}}-\frac{b\sqrt[4]{a+bx^4}}{28x^{10}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(5/4)/x^15,x]
```

```
[Out] -(b*(a + b*x^4)^(1/4))/(28*x^10) - (b^2*(a + b*x^4)^(1/4))/(168*a
*x^6) + (5*b^3*(a + b*x^4)^(1/4))/(336*a^2*x^2) - (a + b*x^4)^(5/
4)/(14*x^14) + (5*b^(7/2)*(1 + (b*x^4)/a)^(3/4)*EllipticF[ArcTan[
(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(336*a^(3/2)*(a + b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 23.7917, size = 129, normalized size = 0.88

$$-\frac{b\sqrt[4]{a+bx^4}}{28x^{10}}-\frac{(a+bx^4)^{\frac{5}{4}}}{14x^{14}}-\frac{b^2\sqrt[4]{a+bx^4}}{168ax^6}+\frac{5b^3\sqrt[4]{a+bx^4}}{336a^2x^2}+\frac{5b^{\frac{7}{2}}\left(1+\frac{bx^4}{a}\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{336a^{\frac{3}{2}}(a+bx^4)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(5/4)/x**15,x)
```

```
[Out] -b*(a + b*x**4)**(1/4)/(28*x**10) - (a + b*x**4)**(5/4)/(14*x**14
) - b**2*(a + b*x**4)**(1/4)/(168*a*x**6) + 5*b**3*(a + b*x**4)**
(1/4)/(336*a**2*x**2) + 5*b**(7/2)*(1 + b*x**4/a)**(3/4)*elliptic
_f(atan(sqrt(b)*x**2/sqrt(a))/2, 2)/(336*a**(3/2)*(a + b*x**4)**(
3/4))
```

Mathematica [C] time = 0.0662179, size = 105, normalized size = 0.72

$$\frac{-48a^4-120a^3bx^4-76a^2b^2x^8+5b^4x^{16}\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};-\frac{bx^4}{a}\right)+6ab^3x^{12}+10b^4x^{16}}{672a^2x^{14}(a+bx^4)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(5/4)/x^15,x]
```

```
[Out] (-48*a^4 - 120*a^3*b*x^4 - 76*a^2*b^2*x^8 + 6*a*b^3*x^12 + 10*b^4
*x^16 + 5*b^4*x^16*(1 + (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/2, 3
```

```
/4, 3/2, -((b*x^4)/a)])/(672*a^2*x^14*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.06, size = 0, normalized size = 0.

$$\int \frac{1}{x^{15}} \left(bx^4 + a\right)^{\frac{5}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(5/4)/x^15,x)
```

```
[Out] int((b*x^4+a)^(5/4)/x^15,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bx^4 + a\right)^{\frac{5}{4}}}{x^{15}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^15,x, algorithm="maxima")
```

```
[Out] integrate((b*x^4 + a)^(5/4)/x^15, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(bx^4 + a\right)^{\frac{5}{4}}}{x^{15}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^15,x, algorithm="fricas")
```

```
[Out] integral((b*x^4 + a)^(5/4)/x^15, x)
```

Sympy [A] time = 31.5124, size = 34, normalized size = 0.23

$$-\frac{a^{\frac{5}{4}} {}_{2}F_{1}\left(\begin{matrix} -\frac{7}{2}, -\frac{5}{4} \\ -\frac{5}{2} \end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{14x^{14}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(5/4)/x**15,x)
```

```
[Out] -a**(5/4)*hyper((-7/2, -5/4), (-5/2,), b*x**4*exp_polar(I*pi)/a)/
(14*x**14)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bx^4 + a\right)^{\frac{5}{4}}}{x^{15}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^15,x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(5/4)/x^15, x)
```

3.1060 $\int x^{10} \left(a+bx^4\right)^{5/4} dx$

Optimal. Leaf size=148

$$-\frac{35a^4\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{4096b^{11/4}}+\frac{35a^4\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{4096b^{11/4}}-\frac{35a^3x^3\sqrt[4]{a+bx^4}}{6144b^2}+\frac{5a^2x^7\sqrt[4]{a+bx^4}}{1536b}+\frac{1}{16}x^{11}\left(a+bx^4\right)^{5/4}+\frac{5}{192}ax^{11}\sqrt[4]{a+bx^4}$$

```
[Out] (-35*a^3*x^3*(a + b*x^4)^(1/4))/(6144*b^2) + (5*a^2*x^7*(a + b*x^
4)^(1/4))/(1536*b) + (5*a*x^11*(a + b*x^4)^(1/4))/192 + (x^11*(a
+ b*x^4)^(5/4))/16 - (35*a^4*ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/4)
])/(4096*b^(11/4)) + (35*a^4*ArcTanh[(b^(1/4)*x)/(a + b*x^4)^(1/4
)])/(4096*b^(11/4))
```

Rubi [A] time = 0.179925, antiderivative size = 148, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$-\frac{35a^4\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{4096b^{11/4}}+\frac{35a^4\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{4096b^{11/4}}-\frac{35a^3x^3\sqrt[4]{a+bx^4}}{6144b^2}+\frac{5a^2x^7\sqrt[4]{a+bx^4}}{1536b}+\frac{1}{16}x^{11}\left(a+bx^4\right)^{5/4}+\frac{5}{192}ax^{11}\sqrt[4]{a+bx^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^10*(a + b*x^4)^(5/4),x]
```

```
[Out] (-35*a^3*x^3*(a + b*x^4)^(1/4))/(6144*b^2) + (5*a^2*x^7*(a + b*x^
4)^(1/4))/(1536*b) + (5*a*x^11*(a + b*x^4)^(1/4))/192 + (x^11*(a
+ b*x^4)^(5/4))/16 - (35*a^4*ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/4)
])/(4096*b^(11/4)) + (35*a^4*ArcTanh[(b^(1/4)*x)/(a + b*x^4)^(1/4
)])/(4096*b^(11/4))
```

Rubi in Sympy [A] time = 22.2403, size = 139, normalized size = 0.94

$$-\frac{35a^4\operatorname{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{4096b^{\frac{11}{4}}}+\frac{35a^4\operatorname{atanh}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{4096b^{\frac{11}{4}}}-\frac{35a^3x^3\sqrt[4]{a+bx^4}}{6144b^2}+\frac{5a^2x^7\sqrt[4]{a+bx^4}}{1536b}+\frac{5ax^{11}\sqrt[4]{a+bx^4}}{192}+\frac{x^{11}\left(a+bx^4\right)^{\frac{5}{4}}}{16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**10*(b*x**4+a)**(5/4),x)
```

```
[Out] -35*a**4*atan(b**(1/4)*x/(a + b*x**4)**(1/4))/(4096*b**(11/4)) +
35*a**4*atanh(b**(1/4)*x/(a + b*x**4)**(1/4))/(4096*b**(11/4)) -
35*a**3*x**3*(a + b*x**4)**(1/4)/(6144*b**2) + 5*a**2*x**7*(a + b
*x**4)**(1/4)/(1536*b) + 5*a*x**11*(a + b*x**4)**(1/4)/192 + x**1
1*(a + b*x**4)**(5/4)/16
```

Mathematica [C] time = 0.0714935, size = 102, normalized size = 0.69

$$\frac{x^3\left(35a^4\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{3}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)-35a^4-15a^3bx^4+564a^2b^2x^8+928ab^3x^{12}+384b^4x^{16}\right)}{6144b^2\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^10*(a + b*x^4)^(5/4),x]
```

```
[Out] (x^3*(-35*a^4 - 15*a^3*b*x^4 + 564*a^2*b^2*x^8 + 928*a*b^3*x^12 +
 384*b^4*x^16 + 35*a^4*(1 + (b*x^4)/a)^(3/4)*Hypergeometric2F1[3/
4, 3/4, 7/4, -((b*x^4)/a)]))/(6144*b^2*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.042, size = 0, normalized size = 0.

$$\int x^{10} \left(b x^4 + a\right)^{\frac{5}{4}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^10*(b*x^4+a)^(5/4),x)
```

```
[Out] int(x^10*(b*x^4+a)^(5/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^10,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.277714, size = 313, normalized size = 2.11

$$-\frac{420 \left(\frac{a^{16}}{b^{11}}\right)^{\frac{1}{4}} b^2 \arctan\left(\frac{\left(\frac{a^{16}}{b^{11}}\right)^{\frac{1}{4}} b^3 x}{\left(b x^4 + a\right)^{\frac{1}{4}} a^4 + x \sqrt{\frac{\sqrt{b x^4 + a}\, a^8 + \sqrt{\frac{a^{16}}{b^{11}}}\, b^6 x^2}{x^2}}}\right) - 105 \left(\frac{a^{16}}{b^{11}}\right)^{\frac{1}{4}} b^2 \log\left(\frac{35 \left(\left(b x^4 + a\right)^{\frac{1}{4}} a^4 + \left(\frac{a^{16}}{b^{11}}\right)^{\frac{1}{4}} b^3 x\right)}{x}\right) + 105 \left(\frac{a^{16}}{b^{11}}\right)^{\frac{1}{4}} b^2 \mathrm{lo}}{24576\, b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^10,x, algorithm="fricas")
```

```
[Out] -1/24576*(420*(a^16/b^11)^(1/4)*b^2*arctan((a^16/b^11)^(1/4)*b^3*
x/((b*x^4 + a)^(1/4)*a^4 + x*sqrt((sqrt(b*x^4 + a)*a^8 + sqrt(a^1
6/b^11)*b^6*x^2)/x^2))) - 105*(a^16/b^11)^(1/4)*b^2*log(35*((b*x^
4 + a)^(1/4)*a^4 + (a^16/b^11)^(1/4)*b^3*x)/x) + 105*(a^16/b^11)^
(1/4)*b^2*log(35*((b*x^4 + a)^(1/4)*a^4 - (a^16/b^11)^(1/4)*b^3*x
)/x) - 4*(384*b^3*x^15 + 544*a*b^2*x^11 + 20*a^2*b*x^7 - 35*a^3*x
^3)*(b*x^4 + a)^(1/4))/b^2
```

Sympy [A] time = 28.7002, size = 39, normalized size = 0.26

$$\frac{a^{\frac{5}{4}} x^{11} \Gamma\left(\frac{11}{4}\right) {}_{2}F_{1}\left(\begin{matrix} -\frac{5}{4}, \frac{11}{4} \\ \frac{15}{4} \end{matrix}\middle| \frac{b x^4 e^{i\pi}}{a}\right)}{4 \Gamma\left(\frac{15}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**10*(b*x**4+a)**(5/4),x)
```

```
[Out] a**(5/4)*x**11*gamma(11/4)*hyper((-5/4, 11/4), (15/4,), b*x**4*ex
p_polar(I*pi)/a)/(4*gamma(15/4))
```

GIAC/XCAS [A] time = 0.24454, size = 459, normalized size = 3.1

$$\frac{1}{49152}\left(\frac{8\left(\frac{399\,(bx^4+a)^{\frac{1}{4}}\left(b+\frac{a}{x^4}\right)b^2}{x}-\frac{105\,(bx^4+a)^{\frac{1}{4}}b^3}{x}+\frac{125\,(b^2x^8+2\,abx^4+a^2)\,(bx^4+a)^{\frac{1}{4}}b}{x^9}-\frac{35\,(b^3x^{12}+3\,ab^2x^8+3\,a^2bx^4+a^3)\,(bx^4+a)^{\frac{1}{4}}}{x^{13}}\right)x^{16}}{a^4b^2}+-\right.$$

2

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^10,x, algorithm="giac")
```

```
[Out] 1/49152*(8*(399*(b*x^4 + a)^(1/4)*(b + a/x^4)*b^2/x - 105*(b*x^4
+ a)^(1/4)*b^3/x + 125*(b^2*x^8 + 2*a*b*x^4 + a^2)*(b*x^4 + a)^(1
/4)*b/x^9 - 35*(b^3*x^12 + 3*a*b^2*x^8 + 3*a^2*b*x^4 + a^3)*(b*x^
4 + a)^(1/4)/x^13)*x^16/(a^4*b^2) + 210*sqrt(2)*(-b)^(1/4)*arctan
(1/2*sqrt(2)*(sqrt(2)*(-b)^(1/4) + 2*(b*x^4 + a)^(1/4)/x)/(-b)^(1
/4))/b^3 + 210*sqrt(2)*(-b)^(1/4)*arctan(-1/2*sqrt(2)*(sqrt(2)*(-
b)^(1/4) - 2*(b*x^4 + a)^(1/4)/x)/(-b)^(1/4))/b^3 + 105*sqrt(2)*(
-b)^(1/4)*ln(sqrt(-b) + sqrt(2)*(b*x^4 + a)^(1/4)*(-b)^(1/4)/x +
sqrt(b*x^4 + a)/x^2)/b^3 - 105*sqrt(2)*(-b)^(1/4)*ln(sqrt(-b) - s
qrt(2)*(b*x^4 + a)^(1/4)*(-b)^(1/4)/x + sqrt(b*x^4 + a)/x^2)/b^3)
*a^4
```

3.1061 $\int x^6 \left(a+bx^4\right)^{5/4} dx$

Optimal. Leaf size=124

$$\frac{5a^3 \tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{256b^{7/4}}-\frac{5a^3 \tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{256b^{7/4}}+\frac{5a^2x^3\sqrt[4]{a+bx^4}}{384b}+\frac{1}{12}x^7\left(a+bx^4\right)^{5/4}+\frac{5}{96}ax^7\sqrt[4]{a+bx^4}$$

```
[Out] (5*a^2*x^3*(a + b*x^4)^(1/4))/(384*b) + (5*a*x^7*(a + b*x^4)^(1/4
))/96 + (x^7*(a + b*x^4)^(5/4))/12 + (5*a^3*ArcTan[(b^(1/4)*x)/(a
 + b*x^4)^(1/4)])/(256*b^(7/4)) - (5*a^3*ArcTanh[(b^(1/4)*x)/(a +
 b*x^4)^(1/4)])/(256*b^(7/4))
```

Rubi [A] time = 0.137653, antiderivative size = 124, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$\frac{5a^3 \tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{256b^{7/4}}-\frac{5a^3 \tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{256b^{7/4}}+\frac{5a^2x^3\sqrt[4]{a+bx^4}}{384b}+\frac{1}{12}x^7\left(a+bx^4\right)^{5/4}+\frac{5}{96}ax^7\sqrt[4]{a+bx^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6*(a + b*x^4)^(5/4),x]
```

```
[Out] (5*a^2*x^3*(a + b*x^4)^(1/4))/(384*b) + (5*a*x^7*(a + b*x^4)^(1/4
))/96 + (x^7*(a + b*x^4)^(5/4))/12 + (5*a^3*ArcTan[(b^(1/4)*x)/(a
 + b*x^4)^(1/4)])/(256*b^(7/4)) - (5*a^3*ArcTanh[(b^(1/4)*x)/(a +
 b*x^4)^(1/4)])/(256*b^(7/4))
```

Rubi in Sympy [A] time = 17.6029, size = 116, normalized size = 0.94

$$\frac{5a^3 \operatorname{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{256b^{\frac{7}{4}}}-\frac{5a^3 \operatorname{atanh}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{256b^{\frac{7}{4}}}+\frac{5a^2x^3\sqrt[4]{a+bx^4}}{384b}+\frac{5ax^7\sqrt[4]{a+bx^4}}{96}+\frac{x^7\left(a+bx^4\right)^{\frac{5}{4}}}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6*(b*x**4+a)**(5/4),x)
```

```
[Out] 5*a**3*atan(b**(1/4)*x/(a + b*x**4)**(1/4))/(256*b**(7/4)) - 5*a*
*3*atanh(b**(1/4)*x/(a + b*x**4)**(1/4))/(256*b**(7/4)) + 5*a**2*
x**3*(a + b*x**4)**(1/4)/(384*b) + 5*a*x**7*(a + b*x**4)**(1/4)/9
6 + x**7*(a + b*x**4)**(5/4)/12
```

Mathematica [C] time = 0.0620172, size = 91, normalized size = 0.73

$$\frac{x^3\left(-5a^3\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{3}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)+5a^3+57a^2bx^4+84ab^2x^8+32b^3x^{12}\right)}{384b\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6*(a + b*x^4)^(5/4),x]
```

```
[Out] (x^3*(5*a^3 + 57*a^2*b*x^4 + 84*a*b^2*x^8 + 32*b^3*x^12 - 5*a^3*(
1 + (b*x^4)/a)^(3/4)*Hypergeometric2F1[3/4, 3/4, 7/4, -((b*x^4)/a
```

```
)]))/(384*b*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.04, size = 0, normalized size = 0.

$$\int x^6 \left(bx^4 + a\right)^{\frac{5}{4}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6*(b*x^4+a)^(5/4),x)
```

```
[Out] int(x^6*(b*x^4+a)^(5/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^6,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.278895, size = 290, normalized size = 2.34

$$\frac{60 \left(\frac{a^{12}}{b^7}\right)^{\frac{1}{4}} b \arctan\left(\frac{\left(\frac{a^{12}}{b^7}\right)^{\frac{1}{4}} b^2 x}{\left(bx^4+a\right)^{\frac{1}{4}} a^3 + x\sqrt{\frac{\sqrt{bx^4+a}a^6+\sqrt{\frac{a^{12}}{b^7}}b^4x^2}{x^2}}}\right) - 15 \left(\frac{a^{12}}{b^7}\right)^{\frac{1}{4}} b \log\left(\frac{5\left(\left(bx^4+a\right)^{\frac{1}{4}} a^3 + \left(\frac{a^{12}}{b^7}\right)^{\frac{1}{4}} b^2 x\right)}{x}\right) + 15 \left(\frac{a^{12}}{b^7}\right)^{\frac{1}{4}} b \log\left(\frac{5\left(\left(bx^4\right.\right.}{}\right.}{1536 \, b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^6,x, algorithm="fricas")
```

```
[Out] 1/1536*(60*(a^12/b^7)^(1/4)*b*arctan((a^12/b^7)^(1/4)*b^2*x/((b*x
^4 + a)^(1/4)*a^3 + x*sqrt((sqrt(b*x^4 + a)*a^6 + sqrt(a^12/b^7)*
b^4*x^2)/x^2))) - 15*(a^12/b^7)^(1/4)*b*log(5*((b*x^4 + a)^(1/4)*
a^3 + (a^12/b^7)^(1/4)*b^2*x)/x) + 15*(a^12/b^7)^(1/4)*b*log(5*((
b*x^4 + a)^(1/4)*a^3 - (a^12/b^7)^(1/4)*b^2*x)/x) + 4*(32*b^2*x^1
1 + 52*a*b*x^7 + 5*a^2*x^3)*(b*x^4 + a)^(1/4))/b
```

Sympy [A] time = 17.2165, size = 39, normalized size = 0.31

$$\frac{a^{\frac{5}{4}} x^7 \Gamma\left(\frac{7}{4}\right) {}_2F_1\left(\begin{matrix} -\frac{5}{4}, \frac{7}{4} \\ \frac{11}{4} \end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{4 \Gamma\left(\frac{11}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6*(b*x**4+a)**(5/4),x)
```

```
[Out] a**(5/4)*x**7*gamma(7/4)*hyper((-5/4, 7/4), (11/4,), b*x**4*exp_p
olar(I*pi)/a)/(4*gamma(11/4))
```

GIAC/XCAS [A] time = 0.239202, size = 397, normalized size = 3.2

$$\frac{1}{3072}\left(\frac{8\left(\frac{42\,(bx^4+a)^{\frac{1}{4}}\left(b+\frac{a}{x^4}\right)b}{x}-\frac{15\,(bx^4+a)^{\frac{1}{4}}b^2}{x}+\frac{5\,(b^2x^8+2\,abx^4+a^2)\,(bx^4+a)^{\frac{1}{4}}}{x^9}\right)x^{12}}{a^3b}-\frac{30\,\sqrt{2}\,(-b)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-b)^{\frac{1}{4}}+\frac{2\,(bx^4+a)^{\frac{1}{4}}}{x}\right)}{2\,(-b)^{\frac{1}{4}}}\right)}{b^2}-\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^6,x, algorithm="giac")
```

```
[Out] 1/3072*(8*(42*(b*x^4 + a)^(1/4)*(b + a/x^4)*b/x - 15*(b*x^4 + a)^
(1/4)*b^2/x + 5*(b^2*x^8 + 2*a*b*x^4 + a^2)*(b*x^4 + a)^(1/4)/x^9
)*x^12/(a^3*b) - 30*sqrt(2)*(-b)^(1/4)*arctan(1/2*sqrt(2)*(sqrt(2
)*(-b)^(1/4) + 2*(b*x^4 + a)^(1/4)/x)/(-b)^(1/4))/b^2 - 30*sqrt(2
)*(-b)^(1/4)*arctan(-1/2*sqrt(2)*(sqrt(2)*(-b)^(1/4) - 2*(b*x^4 +
 a)^(1/4)/x)/(-b)^(1/4))/b^2 - 15*sqrt(2)*(-b)^(1/4)*ln(sqrt(-b)
+ sqrt(2)*(b*x^4 + a)^(1/4)*(-b)^(1/4)/x + sqrt(b*x^4 + a)/x^2)/b
^2 + 15*sqrt(2)*(-b)^(1/4)*ln(sqrt(-b) - sqrt(2)*(b*x^4 + a)^(1/4
)*(-b)^(1/4)/x + sqrt(b*x^4 + a)/x^2)/b^2)*a^3
```

3.1062 $\int x^2 (a+bx^4)^{5/4}\,dx$

Optimal. Leaf size=100

$$-\frac{5a^2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{3/4}}+\frac{5a^2\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{3/4}}+\frac{1}{8}x^3\left(a+bx^4\right)^{5/4}+\frac{5}{32}ax^3\sqrt[4]{a+bx^4}$$

```
[Out] (5*a*x^3*(a + b*x^4)^(1/4))/32 + (x^3*(a + b*x^4)^(5/4))/8 - (5*a
^2*ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(64*b^(3/4)) + (5*a^2*A
rcTanh[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(64*b^(3/4))
```

Rubi [A] time = 0.104091, antiderivative size = 100, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{5a^2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{3/4}}+\frac{5a^2\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{3/4}}+\frac{1}{8}x^3\left(a+bx^4\right)^{5/4}+\frac{5}{32}ax^3\sqrt[4]{a+bx^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2*(a + b*x^4)^(5/4),x]
```

```
[Out] (5*a*x^3*(a + b*x^4)^(1/4))/32 + (x^3*(a + b*x^4)^(5/4))/8 - (5*a
^2*ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(64*b^(3/4)) + (5*a^2*A
rcTanh[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(64*b^(3/4))
```

Rubi in Sympy [A] time = 13.5919, size = 94, normalized size = 0.94

$$-\frac{5a^2\operatorname{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{\frac{3}{4}}}+\frac{5a^2\operatorname{atanh}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{\frac{3}{4}}}+\frac{5ax^3\sqrt[4]{a+bx^4}}{32}+\frac{x^3\left(a+bx^4\right)^{\frac{5}{4}}}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(b*x**4+a)**(5/4),x)
```

```
[Out] -5*a**2*atan(b**(1/4)*x/(a + b*x**4)**(1/4))/(64*b**(3/4)) + 5*a*
*2*atanh(b**(1/4)*x/(a + b*x**4)**(1/4))/(64*b**(3/4)) + 5*a*x**3
*(a + b*x**4)**(1/4)/32 + x**3*(a + b*x**4)**(5/4)/8
```

Mathematica [C] time = 0.0528986, size = 77, normalized size = 0.77

$$\frac{x^3\left(5a^2\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{3}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)+27a^2+39abx^4+12b^2x^8\right)}{96\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2*(a + b*x^4)^(5/4),x]
```

```
[Out] (x^3*(27*a^2 + 39*a*b*x^4 + 12*b^2*x^8 + 5*a^2*(1 + (b*x^4)/a)^(3
/4)*Hypergeometric2F1[3/4, 3/4, 7/4, -((b*x^4)/a)]))/(96*(a + b*x
^4)^(3/4))
```

Maple [F] time = 0.039, size = 0, normalized size = 0.

$$\int x^{2} \left(b x^{4}+a \right)^{\frac{5}{4}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(b*x^4+a)^(5/4),x)

[Out] int(x^2*(b*x^4+a)^(5/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^2,x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [A] time = 0.267101, size = 257, normalized size = 2.57

$$\frac{1}{32}\left(4 \, b x^{7} + 9 \, a x^{3}\right) \left(b x^{4} + a\right)^{\frac{1}{4}} - \frac{5}{32} \left(\frac{a^{8}}{b^{3}}\right)^{\frac{1}{4}} \arctan\left(\frac{\left(\frac{a^{8}}{b^{3}}\right)^{\frac{1}{4}} b x}{\left(b x^{4} + a\right)^{\frac{1}{4}} a^{2} + x \sqrt{\frac{\sqrt{b x^{4} + a} a^{4} + \sqrt{\frac{a^{8}}{b^{3}}} b^{2} x^{2}}{x^{2}}}}\right) + \frac{5}{128} \left(\frac{a^{8}}{b^{3}}\right)^{\frac{1}{4}} \log\left(\frac{5 \, \left(\left(b x^{4} + a\right)^{\frac{1}{4}} a^{2} + \left(\frac{a^{8}}{b^{3}}\right)^{\frac{1}{4}} b x\right)}{x}\right) - \frac{5}{128} \left(\frac{a^{8}}{b^{3}}\right)^{\frac{1}{4}} \log\left(\frac{5 \, \left(\left(b x^{4} + a\right)^{\frac{1}{4}} a^{2} - \left(\frac{a^{8}}{b^{3}}\right)^{\frac{1}{4}} b x\right)}{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^2,x, algorithm="fricas")

[Out] 1/32*(4*b*x^7 + 9*a*x^3)*(b*x^4 + a)^(1/4) - 5/32*(a^8/b^3)^(1/4)
*arctan((a^8/b^3)^(1/4)*b*x/((b*x^4 + a)^(1/4)*a^2 + x*sqrt((sqrt
(b*x^4 + a)*a^4 + sqrt(a^8/b^3)*b^2*x^2)/x^2))) + 5/128*(a^8/b^3)
^(1/4)*log(5*((b*x^4 + a)^(1/4)*a^2 + (a^8/b^3)^(1/4)*b*x)/x) - 5
/128*(a^8/b^3)^(1/4)*log(5*((b*x^4 + a)^(1/4)*a^2 - (a^8/b^3)^(1/
4)*b*x)/x)
```

Sympy [A] time = 9.40525, size = 39, normalized size = 0.39

$$\frac{a^{\frac{5}{4}} x^{3} \Gamma\left(\frac{3}{4}\right) {}_{2}F_{1}\left(\begin{matrix} -\frac{5}{4}, \frac{3}{4} \\ \frac{7}{4} \end{matrix}\middle| {\frac{b x^{4} e^{i \pi}}{a}} \right)}{4 \Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(b*x**4+a)**(5/4),x)

[Out] a**(5/4)*x**3*gamma(3/4)*hyper((-5/4, 3/4), (7/4,), b*x**4*exp_po
lar(I*pi)/a)/(4*gamma(7/4))
```

GIAC/XCAS [A] time = 0.241536, size = 346, normalized size = 3.46

$$\frac{1}{256}\left(\frac{8\,x^{8}\left(\frac{9\,(bx^{4}+a)^{\frac{1}{4}}\left(b+\frac{a}{x^{4}}\right)}{x}-\frac{5\,(bx^{4}+a)^{\frac{1}{4}}b}{x}\right)}{a^{2}}+\frac{10\,\sqrt{2}\,(-b)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-b)^{\frac{1}{4}}+\frac{2\,(bx^{4}+a)^{\frac{1}{4}}}{x}\right)}{2\,(-b)^{\frac{1}{4}}}\right)}{b}+\frac{10\,\sqrt{2}\,(-b)^{\frac{1}{4}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-b)^{\frac{1}{4}}\right.}{2\,(}\right.}{b}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^2,x, algorithm="giac")
```

```
[Out] 1/256*(8*x^8*(9*(b*x^4 + a)^(1/4)*(b + a/x^4)/x - 5*(b*x^4 + a)^(
1/4)*b/x)/a^2 + 10*sqrt(2)*(-b)^(1/4)*arctan(1/2*sqrt(2)*(sqrt(2)
*(-b)^(1/4) + 2*(b*x^4 + a)^(1/4)/x)/(-b)^(1/4))/b + 10*sqrt(2)*(
-b)^(1/4)*arctan(-1/2*sqrt(2)*(sqrt(2)*(-b)^(1/4) - 2*(b*x^4 + a)
^(1/4)/x)/(-b)^(1/4))/b + 5*sqrt(2)*(-b)^(1/4)*ln(sqrt(-b) + sqrt
(2)*(b*x^4 + a)^(1/4)*(-b)^(1/4)/x + sqrt(b*x^4 + a)/x^2)/b - 5*s
qrt(2)*(-b)^(1/4)*ln(sqrt(-b) - sqrt(2)*(b*x^4 + a)^(1/4)*(-b)^(1
/4)/x + sqrt(b*x^4 + a)/x^2)/b)*a^2
```

3.1063 $\int \frac{(a+bx^4)^{5/4}}{x^2} dx$

Optimal. Leaf size=94

$$-\frac{(a+bx^4)^{5/4}}{x}-\frac{5}{8}a\sqrt[4]{b}\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)+\frac{5}{8}a\sqrt[4]{b}\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)+\frac{5}{4}bx^3\sqrt[4]{a+bx^4}$$

```
[Out] (5*b*x^3*(a + b*x^4)^(1/4))/4 - (a + b*x^4)^(5/4)/x - (5*a*b^(1/4
)*ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/8 + (5*a*b^(1/4)*ArcTanh
[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/8
```

Rubi [A] time = 0.101425, antiderivative size = 94, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$-\frac{(a+bx^4)^{5/4}}{x}-\frac{5}{8}a\sqrt[4]{b}\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)+\frac{5}{8}a\sqrt[4]{b}\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)+\frac{5}{4}bx^3\sqrt[4]{a+bx^4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(5/4)/x^2,x]
```

```
[Out] (5*b*x^3*(a + b*x^4)^(1/4))/4 - (a + b*x^4)^(5/4)/x - (5*a*b^(1/4
)*ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/8 + (5*a*b^(1/4)*ArcTanh
[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/8
```

Rubi in Sympy [A] time = 13.2339, size = 87, normalized size = 0.93

$$-\frac{5a\sqrt[4]{b}\operatorname{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{8}+\frac{5a\sqrt[4]{b}\operatorname{atanh}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{8}+\frac{5bx^3\sqrt[4]{a+bx^4}}{4}-\frac{(a+bx^4)^{\frac{5}{4}}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(5/4)/x**2,x)
```

```
[Out] -5*a*b**(1/4)*atan(b**(1/4)*x/(a + b*x**4)**(1/4))/8 + 5*a*b**(1/
4)*atanh(b**(1/4)*x/(a + b*x**4)**(1/4))/8 + 5*b*x**3*(a + b*x**4
)**(1/4)/4 - (a + b*x**4)**(5/4)/x
```

Mathematica [C] time = 0.0433878, size = 79, normalized size = 0.84

$$\frac{-12a^2+5abx^4\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{3}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)-9abx^4+3b^2x^8}{12x\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(5/4)/x^2,x]
```

```
[Out] (-12*a^2 - 9*a*b*x^4 + 3*b^2*x^8 + 5*a*b*x^4*(1 + (b*x^4)/a)^(3/4
)*Hypergeometric2F1[3/4, 3/4, 7/4, -((b*x^4)/a)])/(12*x*(a + b*x^
4)^(3/4))
```

Maple [F] time = 0.043, size = 0, normalized size = 0.

$$\int \frac{1}{x^2} \left(b x^4 + a\right)^{\frac{5}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(5/4)/x^2,x)
```

```
[Out] int((b*x^4+a)^(5/4)/x^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^2,x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [A] time = 8.15099, size = 41, normalized size = 0.44

$$\frac{a^{\frac{5}{4}} \Gamma\left(-\frac{1}{4}\right) {}_{2}F_{1}\left(\begin{matrix} -\frac{5}{4}, -\frac{1}{4} \\ \frac{3}{4} \end{matrix}\middle| \frac{b x^4 e^{i\pi}}{a}\right)}{4x\Gamma\left(\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(5/4)/x**2,x)
```

```
[Out] a**(5/4)*gamma(-1/4)*hyper((-5/4, -1/4), (3/4,), b*x**4*exp_polar
(I*pi)/a)/(4*x*gamma(3/4))
```

GIAC/XCAS [A] time = 0.237999, size = 309, normalized size = 3.29

$$\frac{1}{32}\left(\frac{8\left(bx^4+a\right)^{\frac{1}{4}} b x^3}{a} + 10\sqrt{2}(-b)^{\frac{1}{4}} \arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-b)^{\frac{1}{4}} + \frac{2\left(bx^4+a\right)^{\frac{1}{4}}}{x}\right)}{2(-b)^{\frac{1}{4}}}\right) + 10\sqrt{2}(-b)^{\frac{1}{4}} \arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-b)^{\frac{1}{4}} - \frac{2\left(bx^4+a\right)^{\frac{1}{4}}}{x}\right)}{2(-b)^{\frac{1}{4}}}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^2,x, algorithm="giac")
```

```
[Out] 1/32*(8*(b*x^4 + a)^(1/4)*b*x^3/a + 10*sqrt(2)*(-b)^(1/4)*arctan(
1/2*sqrt(2)*(sqrt(2)*(-b)^(1/4) + 2*(b*x^4 + a)^(1/4)/x)/(-b)^(1/
4)) + 10*sqrt(2)*(-b)^(1/4)*arctan(-1/2*sqrt(2)*(sqrt(2)*(-b)^(1/
4) - 2*(b*x^4 + a)^(1/4)/x)/(-b)^(1/4)) + 5*sqrt(2)*(-b)^(1/4)*ln
(sqrt(-b) + sqrt(2)*(b*x^4 + a)^(1/4)*(-b)^(1/4)/x + sqrt(b*x^4 +
 a)/x^2) - 5*sqrt(2)*(-b)^(1/4)*ln(sqrt(-b) - sqrt(2)*(b*x^4 + a)
^(1/4)*(-b)^(1/4)/x + sqrt(b*x^4 + a)/x^2) - 32*(b*x^4 + a)^(1/4)
/x)*a
```

3.1064 $\int \frac{(a+bx^4)^{5/4}}{x^6} dx$

Optimal. Leaf size=92

$$-\frac{1}{2}b^{5/4}\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)+\frac{1}{2}b^{5/4}\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)-\frac{b\sqrt[4]{a+bx^4}}{x}-\frac{(a+bx^4)^{5/4}}{5x^5}$$

```
[Out] -((b*(a + b*x^4)^(1/4))/x) - (a + b*x^4)^(5/4)/(5*x^5) - (b^(5/4)
*ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/2 + (b^(5/4)*ArcTanh[(b^(
1/4)*x)/(a + b*x^4)^(1/4)])/2
```

Rubi [A] time = 0.0966185, antiderivative size = 92, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{1}{2}b^{5/4}\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)+\frac{1}{2}b^{5/4}\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)-\frac{b\sqrt[4]{a+bx^4}}{x}-\frac{(a+bx^4)^{5/4}}{5x^5}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(5/4)/x^6,x]
```

```
[Out] -((b*(a + b*x^4)^(1/4))/x) - (a + b*x^4)^(5/4)/(5*x^5) - (b^(5/4)
*ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/2 + (b^(5/4)*ArcTanh[(b^(
1/4)*x)/(a + b*x^4)^(1/4)])/2
```

Rubi in Sympy [A] time = 13.1615, size = 78, normalized size = 0.85

$$-\frac{b^{\frac{5}{4}}\operatorname{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{2}+\frac{b^{\frac{5}{4}}\operatorname{atanh}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{2}-\frac{b\sqrt[4]{a+bx^4}}{x}-\frac{(a+bx^4)^{\frac{5}{4}}}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(5/4)/x**6,x)
```

```
[Out] -b**(5/4)*atan(b**(1/4)*x/(a + b*x**4)**(1/4))/2 + b**(5/4)*atanh
(b**(1/4)*x/(a + b*x**4)**(1/4))/2 - b*(a + b*x**4)**(1/4)/x - (a
 + b*x**4)**(5/4)/(5*x**5)
```

Mathematica [C] time = 0.0556946, size = 81, normalized size = 0.88

$$\frac{5b^2x^8\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{3}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)-3\left(a^2+7abx^4+6b^2x^8\right)}{15x^5\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(5/4)/x^6,x]
```

```
[Out] (-3*(a^2 + 7*a*b*x^4 + 6*b^2*x^8) + 5*b^2*x^8*(1 + (b*x^4)/a)^(3/
4)*Hypergeometric2F1[3/4, 3/4, 7/4, -((b*x^4)/a)])/(15*x^5*(a + b
*x^4)^(3/4))
```

Maple [F] time = 0.046, size = 0, normalized size = 0.

$$\int \frac{1}{x^6} \left(bx^4 + a\right)^{\frac{5}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(5/4)/x^6,x)
```

```
[Out] int((b*x^4+a)^(5/4)/x^6,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^6,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^6,x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [A] time = 9.03357, size = 46, normalized size = 0.5

$$\frac{a^{\frac{5}{4}} \Gamma\left(-\frac{5}{4}\right) {}_2F_1\left(\begin{matrix} -\frac{5}{4}, -\frac{5}{4} \\ -\frac{1}{4} \end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{4x^5 \Gamma\left(-\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(5/4)/x**6,x)
```

```
[Out] a**(5/4)*gamma(-5/4)*hyper((-5/4, -5/4), (-1/4,), b*x**4*exp_pola
r(I*pi)/a)/(4*x**5*gamma(-1/4))
```

GIAC/XCAS [A] time = 0.238053, size = 316, normalized size = 3.43

$$\frac{1}{4}\sqrt{2}(-b)^{\frac{1}{4}}b\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-b)^{\frac{1}{4}}+\frac{2(bx^4+a)^{\frac{1}{4}}}{x}\right)}{2(-b)^{\frac{1}{4}}}\right)+\frac{1}{4}\sqrt{2}(-b)^{\frac{1}{4}}b\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-b)^{\frac{1}{4}}-\frac{2(bx^4+a)^{\frac{1}{4}}}{x}\right)}{2(-b)^{\frac{1}{4}}}\right)+\frac{1}{8}\sqrt{2}(-b)^{\frac{1}{4}}b\ln\left(\sqrt{-b}+\frac{\sqrt{2}(bx^4+a)^{\frac{1}{4}}(-b)^{\frac{1}{4}}}{x}+\frac{\sqrt{bx^4+a}}{x^2}\right)-\frac{1}{8}\sqrt{2}(-b)^{\frac{1}{4}}b\ln\left(\sqrt{-b}-\frac{\sqrt{2}(bx^4+a)^{\frac{1}{4}}(-b)^{\frac{1}{4}}}{x}+\frac{\sqrt{bx^4+a}}{x^2}\right)-\frac{(bx^4+a)^{\frac{1}{4}}\left(b+\frac{a}{x^4}\right)}{5x}-\frac{(bx^4+a)^{\frac{1}{4}}b}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^6,x, algorithm="giac")
```

```
[Out] 1/4*sqrt(2)*(-b)^(1/4)*b*arctan(1/2*sqrt(2)*(sqrt(2)*(-b)^(1/4) +
 2*(b*x^4 + a)^(1/4)/x)/(-b)^(1/4)) + 1/4*sqrt(2)*(-b)^(1/4)*b*ar
ctan(-1/2*sqrt(2)*(sqrt(2)*(-b)^(1/4) - 2*(b*x^4 + a)^(1/4)/x)/(-
b)^(1/4)) + 1/8*sqrt(2)*(-b)^(1/4)*b*ln(sqrt(-b) + sqrt(2)*(b*x^4
 + a)^(1/4)*(-b)^(1/4)/x + sqrt(b*x^4 + a)/x^2) - 1/8*sqrt(2)*(-b
)^(1/4)*b*ln(sqrt(-b) - sqrt(2)*(b*x^4 + a)^(1/4)*(-b)^(1/4)/x +
sqrt(b*x^4 + a)/x^2) - 1/5*(b*x^4 + a)^(1/4)*(b + a/x^4)/x - (b*x
^4 + a)^(1/4)*b/x
```

3.1065 $\int \frac{(a+bx^4)^{5/4}}{x^{10}} dx$

Optimal. Leaf size=21

$$-\frac{(a+bx^4)^{9/4}}{9ax^9}$$

```
[Out] -(a + b*x^4)^(9/4)/(9*a*x^9)
```

Rubi [A] time = 0.0194422, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{(a+bx^4)^{9/4}}{9ax^9}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^4)^(5/4)/x^10,x]

[Out] -(a + b*x^4)^(9/4)/(9*a*x^9)
```

Rubi in Sympy [A] time = 2.68857, size = 17, normalized size = 0.81

$$-\frac{(a+bx^4)^{\frac{9}{4}}}{9ax^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**4+a)**(5/4)/x**10,x)

[Out] -(a + b*x**4)**(9/4)/(9*a*x**9)
```

Mathematica [A] time = 0.0312985, size = 21, normalized size = 1.

$$-\frac{(a+bx^4)^{9/4}}{9ax^9}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^4)^(5/4)/x^10,x]

[Out] -(a + b*x^4)^(9/4)/(9*a*x^9)
```

Maple [A] time = 0.007, size = 18, normalized size = 0.9

$$-\frac{1}{9\,ax^9}(bx^4+a)^{\frac{9}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x^4+a)^(5/4)/x^10,x)
```

```
[Out] -1/9*(b*x^4+a)^(9/4)/a/x^9
```

Maxima [A] time = 1.42557, size = 23, normalized size = 1.1

$$-\frac{(bx^4+a)^{\frac{9}{4}}}{9\,ax^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^10,x, algorithm="maxima")
```

```
[Out] -1/9*(b*x^4 + a)^(9/4)/(a*x^9)
```

Fricas [A] time = 0.290536, size = 47, normalized size = 2.24

$$-\frac{(b^2x^8+2\,abx^4+a^2)\,(bx^4+a)^{\frac{1}{4}}}{9\,ax^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^10,x, algorithm="fricas")
```

```
[Out] -1/9*(b^2*x^8 + 2*a*b*x^4 + a^2)*(b*x^4 + a)^(1/4)/(a*x^9)
```

Sympy [A] time = 14.8851, size = 105, normalized size = 5.

$$\frac{a\sqrt[4]{b}\sqrt[4]{\frac{a}{bx^4}+1}\,\Gamma\left(-\frac{9}{4}\right)}{4x^8\,\Gamma\left(-\frac{5}{4}\right)}+\frac{b^{\frac{5}{4}}\sqrt[4]{\frac{a}{bx^4}+1}\,\Gamma\left(-\frac{9}{4}\right)}{2x^4\,\Gamma\left(-\frac{5}{4}\right)}+\frac{b^{\frac{9}{4}}\sqrt[4]{\frac{a}{bx^4}+1}\,\Gamma\left(-\frac{9}{4}\right)}{4a\,\Gamma\left(-\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(5/4)/x**10,x)
```

```
[Out] a*b**(1/4)*(a/(b*x**4) + 1)**(1/4)*gamma(-9/4)/(4*x**8*gamma(-5/4
)) + b**(5/4)*(a/(b*x**4) + 1)**(1/4)*gamma(-9/4)/(2*x**4*gamma(-
5/4)) + b**(9/4)*(a/(b*x**4) + 1)**(1/4)*gamma(-9/4)/(4*a*gamma(-
5/4))
```

GIAC/XCAS [A] time = 0.227415, size = 47, normalized size = 2.24

$$-\frac{(b^2x^8+2\,abx^4+a^2)\,(bx^4+a)^{\frac{1}{4}}}{9\,ax^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^10,x, algorithm="giac")
```

```
[Out] -1/9*(b^2*x^8 + 2*a*b*x^4 + a^2)*(b*x^4 + a)^(1/4)/(a*x^9)
```

3.1066 $\int \frac{(a+bx^4)^{5/4}}{x^{14}}\,dx$

Optimal. Leaf size=44

$$\frac{4b\left(a+bx^4\right)^{9/4}}{117a^2x^9}-\frac{\left(a+bx^4\right)^{9/4}}{13ax^{13}}$$

```
[Out] -(a + b*x^4)^(9/4)/(13*a*x^13) + (4*b*(a + b*x^4)^(9/4))/(117*a^2
*x^9)
```

Rubi [A] time = 0.042936, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{4b\left(a+bx^4\right)^{9/4}}{117a^2x^9}-\frac{\left(a+bx^4\right)^{9/4}}{13ax^{13}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(5/4)/x^14,x]
```

```
[Out] -(a + b*x^4)^(9/4)/(13*a*x^13) + (4*b*(a + b*x^4)^(9/4))/(117*a^2
*x^9)
```

Rubi in Sympy [A] time = 4.26326, size = 37, normalized size = 0.84

$$-\frac{\left(a+bx^4\right)^{\frac{9}{4}}}{13ax^{13}}+\frac{4b\left(a+bx^4\right)^{\frac{9}{4}}}{117a^2x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(5/4)/x**14,x)
```

```
[Out] -(a + b*x**4)**(9/4)/(13*a*x**13) + 4*b*(a + b*x**4)**(9/4)/(117*
a**2*x**9)
```

Mathematica [A] time = 0.0388293, size = 31, normalized size = 0.7

$$\frac{\left(a+bx^4\right)^{9/4}\left(4bx^4-9a\right)}{117a^2x^{13}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(5/4)/x^14,x]
```

```
[Out] ((a + b*x^4)^(9/4)*(-9*a + 4*b*x^4))/(117*a^2*x^13)
```

Maple [A] time = 0.007, size = 28, normalized size = 0.6

$$-\frac{-4\,bx^4+9\,a}{117\,x^{13}a^2}\left(bx^4+a\right)^{\frac{9}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(5/4)/x^14,x)
```

```
[Out] -1/117*(b*x^4+a)^(9/4)*(-4*b*x^4+9*a)/x^13/a^2
```

Maxima [A] time = 1.41185, size = 47, normalized size = 1.07

$$\frac{\frac{13\,{\left(b x^{4}+a\right)}^{\frac{9}{4}} b}{x^{9}} - \frac{9\,{\left(b x^{4}+a\right)}^{\frac{13}{4}}}{x^{13}}}{117\,a^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^14,x, algorithm="maxima")
```

```
[Out] 1/117*(13*(b*x^4 + a)^(9/4)*b/x^9 - 9*(b*x^4 + a)^(13/4)/x^13)/a^
2
```

Fricas [A] time = 0.264433, size = 66, normalized size = 1.5

$$\frac{{\left(4\,b^{3} x^{12} - a b^{2} x^{8} - 14\,a^{2} b x^{4} - 9\,a^{3}\right)} {\left(b x^{4} + a\right)}^{\frac{1}{4}}}{117\,a^{2} x^{13}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^14,x, algorithm="fricas")
```

```
[Out] 1/117*(4*b^3*x^12 - a*b^2*x^8 - 14*a^2*b*x^4 - 9*a^3)*(b*x^4 + a)
^(1/4)/(a^2*x^13)
```

Sympy [A] time = 29.8601, size = 148, normalized size = 3.36

$$-\frac{9a\sqrt[4]{b}\sqrt[4]{\frac{a}{bx^{4}}+1}\,\Gamma\left(-\frac{13}{4}\right)}{16x^{12}\,\Gamma\left(-\frac{5}{4}\right)} - \frac{7b^{\frac{5}{4}}\sqrt[4]{\frac{a}{bx^{4}}+1}\,\Gamma\left(-\frac{13}{4}\right)}{8x^{8}\,\Gamma\left(-\frac{5}{4}\right)} - \frac{b^{\frac{9}{4}}\sqrt[4]{\frac{a}{bx^{4}}+1}\,\Gamma\left(-\frac{13}{4}\right)}{16ax^{4}\,\Gamma\left(-\frac{5}{4}\right)} + \frac{b^{\frac{13}{4}}\sqrt[4]{\frac{a}{bx^{4}}+1}\,\Gamma\left(-\frac{13}{4}\right)}{4a^{2}\,\Gamma\left(-\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(5/4)/x**14,x)
```

```
[Out] -9*a*b**(1/4)*(a/(b*x**4) + 1)**(1/4)*gamma(-13/4)/(16*x**12*gamm
a(-5/4)) - 7*b**(5/4)*(a/(b*x**4) + 1)**(1/4)*gamma(-13/4)/(8*x**
8*gamma(-5/4)) - b**(9/4)*(a/(b*x**4) + 1)**(1/4)*gamma(-13/4)/(1
6*a*x**4*gamma(-5/4)) + b**(13/4)*(a/(b*x**4) + 1)**(1/4)*gamma(-
13/4)/(4*a**2*gamma(-5/4))
```

GIAC/XCAS [A] time = 0.228763, size = 234, normalized size = 5.32

$$\frac{\frac{13\left(\frac{9\,{\left(b x^{4}+a\right)}^{\frac{1}{4}} {\left(b+\frac{a}{x^{4}}\right)} b}{x} - \frac{5\,{\left(b^{2} x^{8}+2\,a b x^{4}+a^{2}\right)} {\left(b x^{4}+a\right)}^{\frac{1}{4}}}{x^{9}}\right) b}{a} - \frac{\frac{117\,{\left(b x^{4}+a\right)}^{\frac{1}{4}} {\left(b+\frac{a}{x^{4}}\right)} b^{2}}{x} - \frac{130\,{\left(b^{2} x^{8}+2\,a b x^{4}+a^{2}\right)} {\left(b x^{4}+a\right)}^{\frac{1}{4}} b}{x^{9}} + \frac{45\,{\left(b^{3} x^{12}+3\,a b^{2} x^{8}+3\,a^{2} b x^{4}+a^{3}\right)} {\left(b x^{4}+a\right)}^{\frac{1}{4}}}{x^{13}}}{a}}{585\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^14,x, algorithm="giac")
```

```
[Out] 1/585*(13*(9*(b*x^4 + a)^(1/4)*(b + a/x^4)*b/x - 5*(b^2*x^8 + 2*a
*b*x^4 + a^2)*(b*x^4 + a)^(1/4)/x^9)*b/a - (117*(b*x^4 + a)^(1/4)
*(b + a/x^4)*b^2/x - 130*(b^2*x^8 + 2*a*b*x^4 + a^2)*(b*x^4 + a)^
(1/4)*b/x^9 + 45*(b^3*x^12 + 3*a*b^2*x^8 + 3*a^2*b*x^4 + a^3)*(b*
x^4 + a)^(1/4)/x^13)/a)/a
```

3.1067 $\int \frac{(a+bx^4)^{5/4}}{x^{18}}\,dx$

Optimal. Leaf size=68

$$-\frac{32b^2\left(a+bx^4\right)^{9/4}}{1989a^3x^9}+\frac{8b\left(a+bx^4\right)^{9/4}}{221a^2x^{13}}-\frac{\left(a+bx^4\right)^{9/4}}{17ax^{17}}$$

```
[Out] -(a + b*x^4)^(9/4)/(17*a*x^17) + (8*b*(a + b*x^4)^(9/4))/(221*a^2
*x^13) - (32*b^2*(a + b*x^4)^(9/4))/(1989*a^3*x^9)
```

Rubi [A] time = 0.064739, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{32b^2\left(a+bx^4\right)^{9/4}}{1989a^3x^9}+\frac{8b\left(a+bx^4\right)^{9/4}}{221a^2x^{13}}-\frac{\left(a+bx^4\right)^{9/4}}{17ax^{17}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(5/4)/x^18,x]
```

```
[Out] -(a + b*x^4)^(9/4)/(17*a*x^17) + (8*b*(a + b*x^4)^(9/4))/(221*a^2
*x^13) - (32*b^2*(a + b*x^4)^(9/4))/(1989*a^3*x^9)
```

Rubi in Sympy [A] time = 6.63681, size = 61, normalized size = 0.9

$$-\frac{\left(a+bx^4\right)^{\frac{9}{4}}}{17ax^{17}}+\frac{8b\left(a+bx^4\right)^{\frac{9}{4}}}{221a^2x^{13}}-\frac{32b^2\left(a+bx^4\right)^{\frac{9}{4}}}{1989a^3x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(5/4)/x**18,x)
```

```
[Out] -(a + b*x**4)**(9/4)/(17*a*x**17) + 8*b*(a + b*x**4)**(9/4)/(221*
a**2*x**13) - 32*b**2*(a + b*x**4)**(9/4)/(1989*a**3*x**9)
```

Mathematica [A] time = 0.0510914, size = 42, normalized size = 0.62

$$-\frac{\left(a+bx^4\right)^{9/4}\left(117a^2-72abx^4+32b^2x^8\right)}{1989a^3x^{17}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(5/4)/x^18,x]
```

```
[Out] -((a + b*x^4)^(9/4)*(117*a^2 - 72*a*b*x^4 + 32*b^2*x^8))/(1989*a^
3*x^17)
```

Maple [A] time = 0.008, size = 39, normalized size = 0.6

$$-\frac{32\,b^2x^8-72\,abx^4+117\,a^2}{1989\,x^{17}a^3}\left(bx^4+a\right)^{\frac{9}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((b*x^4+a)^(5/4)/x^18,x)

[Out] -1/1989*(b*x^4+a)^(9/4)*(32*b^2*x^8-72*a*b*x^4+117*a^2)/x^17/a^3
```

Maxima [A] time = 1.42747, size = 70, normalized size = 1.03

$$-\frac{\frac{221\,(bx^4+a)^{\frac{9}{4}}b^2}{x^9}-\frac{306\,(bx^4+a)^{\frac{13}{4}}b}{x^{13}}+\frac{117\,(bx^4+a)^{\frac{17}{4}}}{x^{17}}}{1989\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^4 + a)^(5/4)/x^18,x, algorithm="maxima")

[Out] -1/1989*(221*(b*x^4 + a)^(9/4)*b^2/x^9 - 306*(b*x^4 + a)^(13/4)*b
/x^13 + 117*(b*x^4 + a)^(17/4)/x^17)/a^3
```

Fricas [A] time = 0.255047, size = 81, normalized size = 1.19

$$-\frac{\left(32\,b^4x^{16}-8\,ab^3x^{12}+5\,a^2b^2x^8+162\,a^3bx^4+117\,a^4\right)\left(bx^4+a\right)^{\frac{1}{4}}}{1989\,a^3x^{17}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^4 + a)^(5/4)/x^18,x, algorithm="fricas")

[Out] -1/1989*(32*b^4*x^16 - 8*a*b^3*x^12 + 5*a^2*b^2*x^8 + 162*a^3*b*x
^4 + 117*a^4)*(b*x^4 + a)^(1/4)/(a^3*x^17)
```

Sympy [A] time = 65.0001, size = 609, normalized size = 8.96

$$\frac{117a^6b^{\frac{17}{4}}\sqrt[4]{\frac{a}{bx^4}+1}\,\Gamma\left(-\frac{17}{4}\right)}{64a^5b^4x^{16}\Gamma\left(-\frac{5}{4}\right)+128a^4b^5x^{20}\Gamma\left(-\frac{5}{4}\right)+64a^3b^6x^{24}\Gamma\left(-\frac{5}{4}\right)}+\frac{396a^5b^{\frac{21}{4}}x^4\sqrt[4]{\frac{a}{bx^4}+1}\,\Gamma\left(-\frac{17}{4}\right)}{64a^5b^4x^{16}\Gamma\left(-\frac{5}{4}\right)+128a^4b^5x^{20}\Gamma\left(-\frac{5}{4}\right)+64a^3b^6x^{24}\Gamma\left(-\frac{5}{4}\right)}+\frac{446a^4b^{\frac{25}{4}}x^8\sqrt[4]{\frac{a}{bx^4}+1}\,\Gamma\left(-\frac{17}{4}\right)}{64a^5b^4x^{16}\Gamma\left(-\frac{5}{4}\right)+128a^4b^5x^{20}\Gamma\left(-\frac{5}{4}\right)+64a^3b^6x^{24}\Gamma\left(-\frac{5}{4}\right)}+\frac{164a^3b^{\frac{29}{4}}x^{12}\sqrt[4]{\frac{a}{bx^4}+1}\,\Gamma\left(-\frac{17}{4}\right)}{64a^5b^4x^{16}\Gamma\left(-\frac{5}{4}\right)+128a^4b^5x^{20}\Gamma\left(-\frac{5}{4}\right)+64a^3b^6x^{24}\Gamma\left(-\frac{5}{4}\right)}+\frac{21a^2b^{\frac{33}{4}}x^{16}\sqrt[4]{\frac{a}{bx^4}+1}\,\Gamma\left(-\frac{17}{4}\right)}{64a^5b^4x^{16}\Gamma\left(-\frac{5}{4}\right)+128a^4b^5x^{20}\Gamma\left(-\frac{5}{4}\right)+64a^3b^6x^{24}\Gamma\left(-\frac{5}{4}\right)}+\frac{56ab^{\frac{37}{4}}x^{20}\sqrt[4]{\frac{a}{bx^4}+1}\,\Gamma\left(-\frac{17}{4}\right)}{64a^5b^4x^{16}\Gamma\left(-\frac{5}{4}\right)+128a^4b^5x^{20}\Gamma\left(-\frac{5}{4}\right)+64a^3b^6x^{24}\Gamma\left(-\frac{5}{4}\right)}+\frac{32b^{\frac{41}{4}}x^{24}\sqrt[4]{\frac{a}{bx^4}+1}\,\Gamma\left(-\frac{17}{4}\right)}{64a^5b^4x^{16}\Gamma\left(-\frac{5}{4}\right)+128a^4b^5x^{20}\Gamma\left(-\frac{5}{4}\right)+64a^3b^6x^{24}\Gamma\left(-\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(5/4)/x**18,x)
```

```
[Out] 117*a**6*b**(17/4)*(a/(b*x**4) + 1)**(1/4)*gamma(-17/4)/(64*a**5*
b**4*x**16*gamma(-5/4) + 128*a**4*b**5*x**20*gamma(-5/4) + 64*a**
3*b**6*x**24*gamma(-5/4)) + 396*a**5*b**(21/4)*x**4*(a/(b*x**4) +
 1)**(1/4)*gamma(-17/4)/(64*a**5*b**4*x**16*gamma(-5/4) + 128*a**
4*b**5*x**20*gamma(-5/4) + 64*a**3*b**6*x**24*gamma(-5/4)) + 446*
a**4*b**(25/4)*x**8*(a/(b*x**4) + 1)**(1/4)*gamma(-17/4)/(64*a**5
*b**4*x**16*gamma(-5/4) + 128*a**4*b**5*x**20*gamma(-5/4) + 64*a*
*3*b**6*x**24*gamma(-5/4)) + 164*a**3*b**(29/4)*x**12*(a/(b*x**4)
 + 1)**(1/4)*gamma(-17/4)/(64*a**5*b**4*x**16*gamma(-5/4) + 128*a
**4*b**5*x**20*gamma(-5/4) + 64*a**3*b**6*x**24*gamma(-5/4)) + 21
*a**2*b**(33/4)*x**16*(a/(b*x**4) + 1)**(1/4)*gamma(-17/4)/(64*a*
*5*b**4*x**16*gamma(-5/4) + 128*a**4*b**5*x**20*gamma(-5/4) + 64*
a**3*b**6*x**24*gamma(-5/4)) + 56*a*b**(37/4)*x**20*(a/(b*x**4) +
 1)**(1/4)*gamma(-17/4)/(64*a**5*b**4*x**16*gamma(-5/4) + 128*a**
4*b**5*x**20*gamma(-5/4) + 64*a**3*b**6*x**24*gamma(-5/4)) + 32*b
**(41/4)*x**24*(a/(b*x**4) + 1)**(1/4)*gamma(-17/4)/(64*a**5*b**4
*x**16*gamma(-5/4) + 128*a**4*b**5*x**20*gamma(-5/4) + 64*a**3*b*
*6*x**24*gamma(-5/4))
```

GIAC/XCAS [A] time = 0.230873, size = 373, normalized size = 5.49

$$-\frac{\frac{17\left(\frac{117\left(bx^4+a\right)^{\frac{1}{4}}\left(b+\frac{a}{x^4}\right)b^2}{x}-\frac{130\left(b^2x^8+2\,abx^4+a^2\right)\left(bx^4+a\right)^{\frac{1}{4}}b}{x^9}+\frac{45\left(b^3x^{12}+3\,ab^2x^8+3\,a^2bx^4+a^3\right)\left(bx^4+a\right)^{\frac{1}{4}}}{x^{13}}\right)b}{a^2}-\frac{3\left(\frac{663\left(bx^4+a\right)^{\frac{1}{4}}\left(b+\frac{a}{x^4}\right)b^3}{x}-\frac{1105\left(b^2x^8+2\,abx^4+a^2\right)\left(bx\cdots\right.}{x^9}\cdots\right.}{\cdots}}{9945\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^18,x, algorithm="giac")
```

```
[Out] -1/9945*(17*(117*(b*x^4 + a)^(1/4)*(b + a/x^4)*b^2/x - 130*(b^2*x
^8 + 2*a*b*x^4 + a^2)*(b*x^4 + a)^(1/4)*b/x^9 + 45*(b^3*x^12 + 3*
a*b^2*x^8 + 3*a^2*b*x^4 + a^3)*(b*x^4 + a)^(1/4)/x^13)*b/a^2 - 3*
(663*(b*x^4 + a)^(1/4)*(b + a/x^4)*b^3/x - 1105*(b^2*x^8 + 2*a*b*
x^4 + a^2)*(b*x^4 + a)^(1/4)*b^2/x^9 + 765*(b^3*x^12 + 3*a*b^2*x^
8 + 3*a^2*b*x^4 + a^3)*(b*x^4 + a)^(1/4)*b/x^13 - 195*(b^4*x^16 +
 4*a*b^3*x^12 + 6*a^2*b^2*x^8 + 4*a^3*b*x^4 + a^4)*(b*x^4 + a)^(1
/4)/x^17)/a^2)/a
```

3.1068 $\int \frac{(a+bx^4)^{5/4}}{x^{22}}\,dx$

Optimal. Leaf size=92

$$\frac{128b^3(a+bx^4)^{9/4}}{13923a^4x^9}-\frac{32b^2(a+bx^4)^{9/4}}{1547a^3x^{13}}+\frac{4b(a+bx^4)^{9/4}}{119a^2x^{17}}-\frac{(a+bx^4)^{9/4}}{21ax^{21}}$$

```
[Out] -(a + b*x^4)^(9/4)/(21*a*x^21) + (4*b*(a + b*x^4)^(9/4))/(119*a^2
*x^17) - (32*b^2*(a + b*x^4)^(9/4))/(1547*a^3*x^13) + (128*b^3*(a
 + b*x^4)^(9/4))/(13923*a^4*x^9)
```

Rubi [A] time = 0.0916358, antiderivative size = 92, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{128b^3(a+bx^4)^{9/4}}{13923a^4x^9}-\frac{32b^2(a+bx^4)^{9/4}}{1547a^3x^{13}}+\frac{4b(a+bx^4)^{9/4}}{119a^2x^{17}}-\frac{(a+bx^4)^{9/4}}{21ax^{21}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(5/4)/x^22,x]
```

```
[Out] -(a + b*x^4)^(9/4)/(21*a*x^21) + (4*b*(a + b*x^4)^(9/4))/(119*a^2
*x^17) - (32*b^2*(a + b*x^4)^(9/4))/(1547*a^3*x^13) + (128*b^3*(a
 + b*x^4)^(9/4))/(13923*a^4*x^9)
```

Rubi in Sympy [A] time = 9.80941, size = 85, normalized size = 0.92

$$-\frac{(a+bx^4)^{\frac{9}{4}}}{21ax^{21}}+\frac{4b(a+bx^4)^{\frac{9}{4}}}{119a^2x^{17}}-\frac{32b^2(a+bx^4)^{\frac{9}{4}}}{1547a^3x^{13}}+\frac{128b^3(a+bx^4)^{\frac{9}{4}}}{13923a^4x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(5/4)/x**22,x)
```

```
[Out] -(a + b*x**4)**(9/4)/(21*a*x**21) + 4*b*(a + b*x**4)**(9/4)/(119*
a**2*x**17) - 32*b**2*(a + b*x**4)**(9/4)/(1547*a**3*x**13) + 128
*b**3*(a + b*x**4)**(9/4)/(13923*a**4*x**9)
```

Mathematica [A] time = 0.0574098, size = 53, normalized size = 0.58

$$\frac{(a+bx^4)^{9/4}(-663a^3+468a^2bx^4-288ab^2x^8+128b^3x^{12})}{13923a^4x^{21}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(5/4)/x^22,x]
```

```
[Out] ((a + b*x^4)^(9/4)*(-663*a^3 + 468*a^2*b*x^4 - 288*a*b^2*x^8 + 12
8*b^3*x^12))/(13923*a^4*x^21)
```

Maple [A] time = 0.007, size = 50, normalized size = 0.5

$$-\frac{-128\,b^3x^{12}+288\,ab^2x^8-468\,a^2bx^4+663\,a^3}{13923\,x^{21}a^4}(bx^4+a)^{\frac{9}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(5/4)/x^22,x)
```

```
[Out] -1/13923*(b*x^4+a)^(9/4)*(-128*b^3*x^12+288*a*b^2*x^8-468*a^2*b*x
^4+663*a^3)/x^21/a^4
```

Maxima [A] time = 1.41352, size = 93, normalized size = 1.01

$$\frac{\frac{1547\,(bx^4+a)^{\frac{9}{4}}b^3}{x^9} - \frac{3213\,(bx^4+a)^{\frac{13}{4}}b^2}{x^{13}} + \frac{2457\,(bx^4+a)^{\frac{17}{4}}b}{x^{17}} - \frac{663\,(bx^4+a)^{\frac{21}{4}}}{x^{21}}}{13923\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^22,x, algorithm="maxima")
```

```
[Out] 1/13923*(1547*(b*x^4 + a)^(9/4)*b^3/x^9 - 3213*(b*x^4 + a)^(13/4)
*b^2/x^13 + 2457*(b*x^4 + a)^(17/4)*b/x^17 - 663*(b*x^4 + a)^(21/
4)/x^21)/a^4
```

Fricas [A] time = 0.246788, size = 96, normalized size = 1.04

$$\frac{\left(128\,b^5x^{20} - 32\,ab^4x^{16} + 20\,a^2b^3x^{12} - 15\,a^3b^2x^8 - 858\,a^4bx^4 - 663\,a^5\right)\left(bx^4 + a\right)^{\frac{1}{4}}}{13923\,a^4x^{21}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^22,x, algorithm="fricas")
```

```
[Out] 1/13923*(128*b^5*x^20 - 32*a*b^4*x^16 + 20*a^2*b^3*x^12 - 15*a^3*
b^2*x^8 - 858*a^4*b*x^4 - 663*a^5)*(b*x^4 + a)^(1/4)/(a^4*x^21)
```

Sympy [A] time = 115.477, size = 954, normalized size = 10.37

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(5/4)/x**22,x)
```

```
[Out] -1989*a**8*b**(37/4)*(a/(b*x**4) + 1)**(1/4)*gamma(-21/4)/(256*a*
*7*b**9*x**20*gamma(-5/4) + 768*a**6*b**10*x**24*gamma(-5/4) + 76
8*a**5*b**11*x**28*gamma(-5/4) + 256*a**4*b**12*x**32*gamma(-5/4)
) - 8541*a**7*b**(41/4)*x**4*(a/(b*x**4) + 1)**(1/4)*gamma(-21/4)
/(256*a**7*b**9*x**20*gamma(-5/4) + 768*a**6*b**10*x**24*gamma(-5
/4) + 768*a**5*b**11*x**28*gamma(-5/4) + 256*a**4*b**12*x**32*gam
ma(-5/4)) - 13734*a**6*b**(45/4)*x**8*(a/(b*x**4) + 1)**(1/4)*gam
ma(-21/4)/(256*a**7*b**9*x**20*gamma(-5/4) + 768*a**6*b**10*x**24
*gamma(-5/4) + 768*a**5*b**11*x**28*gamma(-5/4) + 256*a**4*b**12*
x**32*gamma(-5/4)) - 9786*a**5*b**(49/4)*x**12*(a/(b*x**4) + 1)**
(1/4)*gamma(-21/4)/(256*a**7*b**9*x**20*gamma(-5/4) + 768*a**6*b*
*10*x**24*gamma(-5/4) + 768*a**5*b**11*x**28*gamma(-5/4) + 256*a*
*4*b**12*x**32*gamma(-5/4)) - 2625*a**4*b**(53/4)*x**16*(a/(b*x**
4) + 1)**(1/4)*gamma(-21/4)/(256*a**7*b**9*x**20*gamma(-5/4) + 76
8*a**6*b**10*x**24*gamma(-5/4) + 768*a**5*b**11*x**28*gamma(-5/4)
 + 256*a**4*b**12*x**32*gamma(-5/4)) + 231*a**3*b**(57/4)*x**20*(
a/(b*x**4) + 1)**(1/4)*gamma(-21/4)/(256*a**7*b**9*x**20*gamma(-5
/4) + 768*a**6*b**10*x**24*gamma(-5/4) + 768*a**5*b**11*x**28*gam
```

```
ma(-5/4) + 256*a**4*b**12*x**32*gamma(-5/4)) + 924*a**2*b**(61/4)
*x**24*(a/(b*x**4) + 1)**(1/4)*gamma(-21/4)/(256*a**7*b**9*x**20*
gamma(-5/4) + 768*a**6*b**10*x**24*gamma(-5/4) + 768*a**5*b**11*x
**28*gamma(-5/4) + 256*a**4*b**12*x**32*gamma(-5/4)) + 1056*a*b**
(65/4)*x**28*(a/(b*x**4) + 1)**(1/4)*gamma(-21/4)/(256*a**7*b**9*
x**20*gamma(-5/4) + 768*a**6*b**10*x**24*gamma(-5/4) + 768*a**5*b
**11*x**28*gamma(-5/4) + 256*a**4*b**12*x**32*gamma(-5/4)) + 384*
b**(69/4)*x**32*(a/(b*x**4) + 1)**(1/4)*gamma(-21/4)/(256*a**7*b*
*9*x**20*gamma(-5/4) + 768*a**6*b**10*x**24*gamma(-5/4) + 768*a**
5*b**11*x**28*gamma(-5/4) + 256*a**4*b**12*x**32*gamma(-5/4))
```

GIAC/XCAS [A] time = 0.230612, size = 541, normalized size = 5.88

$$\frac{21\left(\frac{663\left(bx^4+a\right)^{\frac{1}{4}}\left(b+\frac{a}{x^4}\right)b^3}{x}-\frac{1105\left(b^2x^8+2\,abx^4+a^2\right)\left(bx^4+a\right)^{\frac{1}{4}}b^2}{x^9}+\frac{765\left(b^3x^{12}+3\,ab^2x^8+3\,a^2bx^4+a^3\right)\left(bx^4+a\right)^{\frac{1}{4}}b}{x^{13}}-\frac{195\left(b^4x^{16}+4\,ab^3x^{12}+6\,a^2b^2x^8+4\,a^3bx^4+a^4\right)\left(bx^4+a\right)^{\frac{1}{4}}}{x^{17}}\right)b}{a^3} -$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^22,x, algorithm="giac")
```

```
[Out] 1/69615*(21*(663*(b*x^4 + a)^(1/4)*(b + a/x^4)*b^3/x - 1105*(b^2*
x^8 + 2*a*b*x^4 + a^2)*(b*x^4 + a)^(1/4)*b^2/x^9 + 765*(b^3*x^12
+ 3*a*b^2*x^8 + 3*a^2*b*x^4 + a^3)*(b*x^4 + a)^(1/4)*b/x^13 - 195
*(b^4*x^16 + 4*a*b^3*x^12 + 6*a^2*b^2*x^8 + 4*a^3*b*x^4 + a^4)*(b
*x^4 + a)^(1/4)/x^17)*b/a^3 - (13923*(b*x^4 + a)^(1/4)*(b + a/x^4
)*b^4/x - 30940*(b^2*x^8 + 2*a*b*x^4 + a^2)*(b*x^4 + a)^(1/4)*b^3
/x^9 + 32130*(b^3*x^12 + 3*a*b^2*x^8 + 3*a^2*b*x^4 + a^3)*(b*x^4
+ a)^(1/4)*b^2/x^13 - 16380*(b^4*x^16 + 4*a*b^3*x^12 + 6*a^2*b^2*
x^8 + 4*a^3*b*x^4 + a^4)*(b*x^4 + a)^(1/4)*b/x^17 + 3315*(b^5*x^2
0 + 5*a*b^4*x^16 + 10*a^2*b^3*x^12 + 10*a^3*b^2*x^8 + 5*a^4*b*x^4
 + a^5)*(b*x^4 + a)^(1/4)/x^21)/a^3)/a
```

3.1069 $\int x^{12}\left(a+bx^4\right)^{5/4}\,dx$

Optimal. Leaf size=171

$$\frac{5a^{9/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{672b^{5/2}\left(a+bx^4\right)^{3/4}}+\frac{5a^4x\sqrt[4]{a+bx^4}}{672b^3}-\frac{a^3x^5\sqrt[4]{a+bx^4}}{336b^2}+\frac{a^2x^9\sqrt[4]{a+bx^4}}{504b}+\frac{1}{18}x^{13}\left(a+bx^4\right)^{5/4}+\frac{5}{252}ax^{13}\sqrt[4]{a+bx^4}$$

```
[Out] (5*a^4*x*(a + b*x^4)^(1/4))/(672*b^3) - (a^3*x^5*(a + b*x^4)^(1/4
))/(336*b^2) + (a^2*x^9*(a + b*x^4)^(1/4))/(504*b) + (5*a*x^13*(a
 + b*x^4)^(1/4))/252 + (x^13*(a + b*x^4)^(5/4))/18 + (5*a^(9/2)*(
1 + a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/
2, 2])/(672*b^(5/2)*(a + b*x^4)^(3/4))
```

Rubi [A] time = 0.244322, antiderivative size = 171, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$\frac{5a^{9/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{672b^{5/2}\left(a+bx^4\right)^{3/4}}+\frac{5a^4x\sqrt[4]{a+bx^4}}{672b^3}-\frac{a^3x^5\sqrt[4]{a+bx^4}}{336b^2}+\frac{a^2x^9\sqrt[4]{a+bx^4}}{504b}+\frac{1}{18}x^{13}\left(a+bx^4\right)^{5/4}+\frac{5}{252}ax^{13}\sqrt[4]{a+bx^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^12*(a + b*x^4)^(5/4),x]
```

```
[Out] (5*a^4*x*(a + b*x^4)^(1/4))/(672*b^3) - (a^3*x^5*(a + b*x^4)^(1/4
))/(336*b^2) + (a^2*x^9*(a + b*x^4)^(1/4))/(504*b) + (5*a*x^13*(a
 + b*x^4)^(1/4))/252 + (x^13*(a + b*x^4)^(5/4))/18 + (5*a^(9/2)*(
1 + a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/
2, 2])/(672*b^(5/2)*(a + b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 27.9464, size = 155, normalized size = 0.91

$$\frac{5a^{\frac{9}{2}}x^3\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{672b^{\frac{5}{2}}\left(a+bx^4\right)^{\frac{3}{4}}}+\frac{5a^4x\sqrt[4]{a+bx^4}}{672b^3}-\frac{a^3x^5\sqrt[4]{a+bx^4}}{336b^2}+\frac{a^2x^9\sqrt[4]{a+bx^4}}{504b}+\frac{5ax^{13}\sqrt[4]{a+bx^4}}{252}+\frac{x^{13}\left(a+bx^4\right)^{\frac{5}{4}}}{18}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**12*(b*x**4+a)**(5/4),x)
```

```
[Out] 5*a**(9/2)*x**3*(a/(b*x**4) + 1)**(3/4)*elliptic_f(atan(sqrt(a)/(
sqrt(b)*x**2))/2, 2)/(672*b**(5/2)*(a + b*x**4)**(3/4)) + 5*a**4*
x*(a + b*x**4)**(1/4)/(672*b**3) - a**3*x**5*(a + b*x**4)**(1/4)/
(336*b**2) + a**2*x**9*(a + b*x**4)**(1/4)/(504*b) + 5*a*x**13*(a
 + b*x**4)**(1/4)/252 + x**13*(a + b*x**4)**(5/4)/18
```

Mathematica [C] time = 0.0620271, size = 112, normalized size = 0.65

$$\frac{-15a^5x\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};-\frac{bx^4}{a}\right)+15a^5x+9a^4bx^5-2a^3b^2x^9+156a^2b^3x^{13}+264ab^4x^{17}+112b^5x^{21}}{2016b^3\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^12*(a + b*x^4)^(5/4),x]
```

```
[Out] (15*a^5*x + 9*a^4*b*x^5 - 2*a^3*b^2*x^9 + 156*a^2*b^3*x^13 + 264*
a*b^4*x^17 + 112*b^5*x^21 - 15*a^5*x*(1 + (b*x^4)/a)^(3/4)*Hyperg
eometric2F1[1/4, 3/4, 5/4, -((b*x^4)/a)])/(2016*b^3*(a + b*x^4)^(
3/4))
```

Maple [F] time = 0.038, size = 0, normalized size = 0.

$$\int x^{12} \left(b x^4 + a\right)^{\frac{5}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^12*(b*x^4+a)^(5/4),x)
```

```
[Out] int(x^12*(b*x^4+a)^(5/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b x^4 + a\right)^{\frac{5}{4}} x^{12} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^12,x, algorithm="maxima")
```

```
[Out] integrate((b*x^4 + a)^(5/4)*x^12, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\left(b x^{16} + a x^{12}\right) \left(b x^4 + a\right)^{\frac{1}{4}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^12,x, algorithm="fricas")
```

```
[Out] integral((b*x^16 + a*x^12)*(b*x^4 + a)^(1/4), x)
```

Sympy [A] time = 34.2498, size = 39, normalized size = 0.23

$$\frac{a^{\frac{5}{4}} x^{13} \Gamma\left(\frac{13}{4}\right) {}_2F_1\left(\begin{matrix} -\frac{5}{4}, \frac{13}{4} \\ \frac{17}{4} \end{matrix}\middle| \frac{b x^4 e^{i\pi}}{a}\right)}{4 \Gamma\left(\frac{17}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**12*(b*x**4+a)**(5/4),x)
```

```
[Out] a**(5/4)*x**13*gamma(13/4)*hyper((-5/4, 13/4), (17/4,), b*x**4*ex
p_polar(I*pi)/a)/(4*gamma(17/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bx^4+a\right)^{\frac{5}{4}}x^{12}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^12,x, algorithm="giac")

[Out] integrate((b*x^4 + a)^(5/4)*x^12, x)
```

3.1070 $\int x^8 \left(a+bx^4\right)^{5/4} dx$

Optimal. Leaf size=147

$$-\frac{5a^{7/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{336b^{3/2}\left(a+bx^4\right)^{3/4}}-\frac{5a^3x\sqrt[4]{a+bx^4}}{336b^2}+\frac{a^2x^5\sqrt[4]{a+bx^4}}{168b}+\frac{1}{14}x^9\left(a+bx^4\right)^{5/4}+\frac{1}{28}ax^9\sqrt[4]{a+bx^4}$$

```
[Out] (-5*a^3*x*(a + b*x^4)^(1/4))/(336*b^2) + (a^2*x^5*(a + b*x^4)^(1/
4))/(168*b) + (a*x^9*(a + b*x^4)^(1/4))/28 + (x^9*(a + b*x^4)^(5/
4))/14 - (5*a^(7/2)*(1 + a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCot[(S
qrt[b]*x^2)/Sqrt[a]]/2, 2])/(336*b^(3/2)*(a + b*x^4)^(3/4))
```

Rubi [A] time = 0.199449, antiderivative size = 147, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.4$

$$-\frac{5a^{7/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{336b^{3/2}\left(a+bx^4\right)^{3/4}}-\frac{5a^3x\sqrt[4]{a+bx^4}}{336b^2}+\frac{a^2x^5\sqrt[4]{a+bx^4}}{168b}+\frac{1}{14}x^9\left(a+bx^4\right)^{5/4}+\frac{1}{28}ax^9\sqrt[4]{a+bx^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8*(a + b*x^4)^(5/4),x]
```

```
[Out] (-5*a^3*x*(a + b*x^4)^(1/4))/(336*b^2) + (a^2*x^5*(a + b*x^4)^(1/
4))/(168*b) + (a*x^9*(a + b*x^4)^(1/4))/28 + (x^9*(a + b*x^4)^(5/
4))/14 - (5*a^(7/2)*(1 + a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCot[(S
qrt[b]*x^2)/Sqrt[a]]/2, 2])/(336*b^(3/2)*(a + b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 22.7772, size = 131, normalized size = 0.89

$$-\frac{5a^{\frac{7}{2}}x^3\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{336b^{\frac{3}{2}}\left(a+bx^4\right)^{\frac{3}{4}}}-\frac{5a^3x\sqrt[4]{a+bx^4}}{336b^2}+\frac{a^2x^5\sqrt[4]{a+bx^4}}{168b}+\frac{ax^9\sqrt[4]{a+bx^4}}{28}+\frac{x^9\left(a+bx^4\right)^{\frac{5}{4}}}{14}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8*(b*x**4+a)**(5/4),x)
```

```
[Out] -5*a**(7/2)*x**3*(a/(b*x**4) + 1)**(3/4)*elliptic_f(atan(sqrt(a)/
(sqrt(b)*x**2))/2, 2)/(336*b**(3/2)*(a + b*x**4)**(3/4)) - 5*a**3
*x*(a + b*x**4)**(1/4)/(336*b**2) + a**2*x**5*(a + b*x**4)**(1/4)
/(168*b) + a*x**9*(a + b*x**4)**(1/4)/28 + x**9*(a + b*x**4)**(5/
4)/14
```

Mathematica [C] time = 0.0554723, size = 101, normalized size = 0.69

$$\frac{5a^4x\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};-\frac{bx^4}{a}\right)-5a^4x-3a^3bx^5+38a^2b^2x^9+60ab^3x^{13}+24b^4x^{17}}{336b^2\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]   Integrate[x^8*(a + b*x^4)^(5/4),x]
```

```
[Out] (-5*a^4*x - 3*a^3*b*x^5 + 38*a^2*b^2*x^9 + 60*a*b^3*x^13 + 24*b^4
*x^17 + 5*a^4*x*(1 + (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/4, 3/4,
 5/4, -((b*x^4)/a)])/(336*b^2*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.039, size = 0, normalized size = 0.

$$\int x^{8} \left(b x^{4}+a \right)^{\frac{5}{4}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^8*(b*x^4+a)^(5/4),x)
```

```
[Out] int(x^8*(b*x^4+a)^(5/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int {\left(b x^{4} + a\right)}^{\frac{5}{4}} x^{8}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^4 + a)^(5/4)*x^8,x, algorithm="maxima")
```

```
[Out] integrate((b*x^4 + a)^(5/4)*x^8, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$${\rm integral}\left({\left(b x^{12} + a x^{8}\right)} {\left(b x^{4} + a\right)}^{\frac{1}{4}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^4 + a)^(5/4)*x^8,x, algorithm="fricas")
```

```
[Out] integral((b*x^12 + a*x^8)*(b*x^4 + a)^(1/4), x)
```

Sympy [A] time = 20.5637, size = 39, normalized size = 0.27

$$\frac{a^{\frac{5}{4}} x^{9} \Gamma\left(\frac{9}{4}\right) {{}_{2}F_{1}\left(\begin{matrix} - \frac{5}{4}, \frac{9}{4} \\ \frac{13}{4} \end{matrix}\middle| {\frac{b x^{4} e^{i \pi}}{a}} \right)}}{4 \Gamma\left(\frac{13}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**8*(b*x**4+a)**(5/4),x)
```

```
[Out] a**(5/4)*x**9*gamma(9/4)*hyper((-5/4, 9/4), (13/4,), b*x**4*exp_p
olar(I*pi)/a)/(4*gamma(13/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bx^4 + a\right)^{\frac{5}{4}} x^8 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^8,x, algorithm="giac")

[Out] integrate((b*x^4 + a)^(5/4)*x^8, x)
```

3.1071 $\int x^4 \left(a+bx^4\right)^{5/4} dx$

Optimal. Leaf size=123

$$\frac{a^{5/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{24\sqrt{b}\left(a+bx^4\right)^{3/4}}+\frac{a^2x\sqrt[4]{a+bx^4}}{24b}+\frac{1}{10}x^5\left(a+bx^4\right)^{5/4}+\frac{1}{12}ax^5\sqrt[4]{a+bx^4}$$

```
[Out] (a^2*x*(a + b*x^4)^(1/4))/(24*b) + (a*x^5*(a + b*x^4)^(1/4))/12 +
 (x^5*(a + b*x^4)^(5/4))/10 + (a^(5/2)*(1 + a/(b*x^4))^(3/4)*x^3*
EllipticF[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(24*Sqrt[b]*(a + b
*x^4)^(3/4))
```

Rubi [A] time = 0.161987, antiderivative size = 123, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$\frac{a^{5/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{24\sqrt{b}\left(a+bx^4\right)^{3/4}}+\frac{a^2x\sqrt[4]{a+bx^4}}{24b}+\frac{1}{10}x^5\left(a+bx^4\right)^{5/4}+\frac{1}{12}ax^5\sqrt[4]{a+bx^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4*(a + b*x^4)^(5/4),x]
```

```
[Out] (a^2*x*(a + b*x^4)^(1/4))/(24*b) + (a*x^5*(a + b*x^4)^(1/4))/12 +
 (x^5*(a + b*x^4)^(5/4))/10 + (a^(5/2)*(1 + a/(b*x^4))^(3/4)*x^3*
EllipticF[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(24*Sqrt[b]*(a + b
*x^4)^(3/4))
```

Rubi in Sympy [A] time = 18.5605, size = 105, normalized size = 0.85

$$\frac{a^{\frac{5}{2}}x^3\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{24\sqrt{b}\left(a+bx^4\right)^{\frac{3}{4}}}+\frac{a^2x\sqrt[4]{a+bx^4}}{24b}+\frac{ax^5\sqrt[4]{a+bx^4}}{12}+\frac{x^5\left(a+bx^4\right)^{\frac{5}{4}}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4*(b*x**4+a)**(5/4),x)
```

```
[Out] a**(5/2)*x**3*(a/(b*x**4) + 1)**(3/4)*elliptic_f(atan(sqrt(a)/(sq
rt(b)*x**2))/2, 2)/(24*sqrt(b)*(a + b*x**4)**(3/4)) + a**2*x*(a +
 b*x**4)**(1/4)/(24*b) + a*x**5*(a + b*x**4)**(1/4)/12 + x**5*(a
+ b*x**4)**(5/4)/10
```

Mathematica [C] time = 0.0518648, size = 90, normalized size = 0.73

$$\frac{-5a^3x\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};-\frac{bx^4}{a}\right)+5a^3x+27a^2bx^5+34ab^2x^9+12b^3x^{13}}{120b\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4*(a + b*x^4)^(5/4),x]
```

```
[Out] (5*a^3*x + 27*a^2*b*x^5 + 34*a*b^2*x^9 + 12*b^3*x^13 - 5*a^3*x*(1
 + (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/4, 3/4, 5/4, -((b*x^4)/a)
```

```
])/(120*b*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.038, size = 0, normalized size = 0.

$$\int x^4 \left(bx^4 + a\right)^{\frac{5}{4}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4*(b*x^4+a)^(5/4),x)

[Out] int(x^4*(b*x^4+a)^(5/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bx^4 + a\right)^{\frac{5}{4}} x^4 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^4,x, algorithm="maxima")

[Out] integrate((b*x^4 + a)^(5/4)*x^4, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(bx^8 + ax^4\right)\left(bx^4 + a\right)^{\frac{1}{4}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^4,x, algorithm="fricas")

[Out] integral((b*x^8 + a*x^4)*(b*x^4 + a)^(1/4), x)
```

Sympy [A] time = 10.3812, size = 39, normalized size = 0.32

$$\frac{a^{\frac{5}{4}} x^5 \Gamma\left(\frac{5}{4}\right) {}_2F_1\left(\begin{matrix} -\frac{5}{4}, \frac{5}{4} \\ \frac{9}{4} \end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{4\Gamma\left(\frac{9}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4*(b*x**4+a)**(5/4),x)

[Out] a**(5/4)*x**5*gamma(5/4)*hyper((-5/4, 5/4), (9/4,), b*x**4*exp_po
lar(I*pi)/a)/(4*gamma(9/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bx^4 + a\right)^{\frac{5}{4}} x^4 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)*x^4,x, algorithm="giac")

[Out] integrate((b*x^4 + a)^(5/4)*x^4, x)
```

3.1072 $\int \left(a+bx^4\right)^{5/4} dx$

Optimal. Leaf size=97

$$-\frac{5a^{3/2}\sqrt{b}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{12\left(a+bx^4\right)^{3/4}}+\frac{1}{6}x\left(a+bx^4\right)^{5/4}+\frac{5}{12}ax\sqrt[4]{a+bx^4}$$

```
[Out] (5*a*x*(a + b*x^4)^(1/4))/12 + (x*(a + b*x^4)^(5/4))/6 - (5*a^(3/
2)*Sqrt[b]*(1 + a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCot[(Sqrt[b]*x^
2)/Sqrt[a]]/2, 2])/(12*(a + b*x^4)^(3/4))
```

Rubi [A] time = 0.107154, antiderivative size = 97, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.454

$$-\frac{5a^{3/2}\sqrt{b}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{12\left(a+bx^4\right)^{3/4}}+\frac{1}{6}x\left(a+bx^4\right)^{5/4}+\frac{5}{12}ax\sqrt[4]{a+bx^4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(5/4),x]
```

```
[Out] (5*a*x*(a + b*x^4)^(1/4))/12 + (x*(a + b*x^4)^(5/4))/6 - (5*a^(3/
2)*Sqrt[b]*(1 + a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCot[(Sqrt[b]*x^
2)/Sqrt[a]]/2, 2])/(12*(a + b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 11.4571, size = 87, normalized size = 0.9

$$-\frac{5a^{\frac{3}{2}}\sqrt{b}x^3\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{12\left(a+bx^4\right)^{\frac{3}{4}}}+\frac{5ax\sqrt[4]{a+bx^4}}{12}+\frac{x\left(a+bx^4\right)^{\frac{5}{4}}}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(5/4),x)
```

```
[Out] -5*a**(3/2)*sqrt(b)*x**3*(a/(b*x**4) + 1)**(3/4)*elliptic_f(atan(
sqrt(a)/(sqrt(b)*x**2))/2, 2)/(12*(a + b*x**4)**(3/4)) + 5*a*x*(a
 + b*x**4)**(1/4)/12 + x*(a + b*x**4)**(5/4)/6
```

Mathematica [C] time = 0.0418823, size = 76, normalized size = 0.78

$$\frac{5a^2x\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};-\frac{bx^4}{a}\right)+7a^2x+9abx^5+2b^2x^9}{12\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(5/4),x]
```

```
[Out] (7*a^2*x + 9*a*b*x^5 + 2*b^2*x^9 + 5*a^2*x*(1 + (b*x^4)/a)^(3/4)*
Hypergeometric2F1[1/4, 3/4, 5/4, -((b*x^4)/a)])/(12*(a + b*x^4)^(
3/4))
```

Maple [F] time = 0.044, size = 0, normalized size = 0.

$$\int \left(b x^{4}+a\right)^{\frac{5}{4}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(5/4),x)
```

```
[Out] int((b*x^4+a)^(5/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b x^{4}+a\right)^{\frac{5}{4}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4),x, algorithm="maxima")
```

```
[Out] integrate((b*x^4 + a)^(5/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\left(b x^{4}+a\right)^{\frac{5}{4}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4),x, algorithm="fricas")
```

```
[Out] integral((b*x^4 + a)^(5/4), x)
```

Sympy [A] time = 5.33077, size = 37, normalized size = 0.38

$$\frac{a^{\frac{5}{4}} x \Gamma\left(\frac{1}{4}\right) {}_{2}F_{1}\left(\begin{matrix} -\frac{5}{4}, \frac{1}{4} \\ \frac{5}{4} \end{matrix}\middle| {\frac{b x^{4} e^{i \pi}}{a}} \right)}{4 \Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(5/4),x)
```

```
[Out] a**(5/4)*x*gamma(1/4)*hyper((-5/4, 1/4), (5/4,), b*x**4*exp_polar
(I*pi)/a)/(4*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b x^{4}+a\right)^{\frac{5}{4}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4),x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(5/4), x)
```

3.1073 $\int \frac{(a+bx^4)^{5/4}}{x^4}\,dx$

Optimal. Leaf size=99

$$-\frac{5\sqrt{a}b^{3/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{6(a+bx^4)^{3/4}}+\frac{5}{6}bx\sqrt[4]{a+bx^4}-\frac{(a+bx^4)^{5/4}}{3x^3}$$

```
[Out] (5*b*x*(a + b*x^4)^(1/4))/6 - (a + b*x^4)^(5/4)/(3*x^3) - (5*Sqrt
[a]*b^(3/2)*(1 + a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCot[(Sqrt[b]*x
^2)/Sqrt[a]]/2, 2])/(6*(a + b*x^4)^(3/4))
```

Rubi [A] time = 0.112679, antiderivative size = 99, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.4$

$$-\frac{5\sqrt{a}b^{3/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{6(a+bx^4)^{3/4}}+\frac{5}{6}bx\sqrt[4]{a+bx^4}-\frac{(a+bx^4)^{5/4}}{3x^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^4)^(5/4)/x^4,x]
```

```
[Out] (5*b*x*(a + b*x^4)^(1/4))/6 - (a + b*x^4)^(5/4)/(3*x^3) - (5*Sqrt
[a]*b^(3/2)*(1 + a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCot[(Sqrt[b]*x
^2)/Sqrt[a]]/2, 2])/(6*(a + b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 13.0411, size = 88, normalized size = 0.89

$$-\frac{5\sqrt{a}b^{\frac{3}{2}}x^3\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{6(a+bx^4)^{\frac{3}{4}}}+\frac{5bx\sqrt[4]{a+bx^4}}{6}-\frac{(a+bx^4)^{\frac{5}{4}}}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**4+a)**(5/4)/x**4,x)
```

```
[Out] -5*sqrt(a)*b**(3/2)*x**3*(a/(b*x**4) + 1)**(3/4)*elliptic_f(atan(
sqrt(a)/(sqrt(b)*x**2))/2, 2)/(6*(a + b*x**4)**(3/4)) + 5*b*x*(a
+ b*x**4)**(1/4)/6 - (a + b*x**4)**(5/4)/(3*x**3)
```

Mathematica [C] time = 0.0488809, size = 80, normalized size = 0.81

$$\frac{5abx\left(\frac{a+bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};-\frac{bx^4}{a}\right)}{6(a+bx^4)^{3/4}}+\sqrt[4]{a+bx^4}\left(\frac{bx}{2}-\frac{a}{3x^3}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^4)^(5/4)/x^4,x]
```

```
[Out] (-a/(3*x^3) + (b*x)/2)*(a + b*x^4)^(1/4) + (5*a*b*x*((a + b*x^4)/
a)^(3/4)*Hypergeometric2F1[1/4, 3/4, 5/4, -((b*x^4)/a)])/(6*(a +
b*x^4)^(3/4))
```

Maple [F] time = 0.041, size = 0, normalized size = 0.

$$\int \frac{1}{x^4}\left(b x^4+a\right)^{\frac{5}{4}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(5/4)/x^4,x)
```

```
[Out] int((b*x^4+a)^(5/4)/x^4,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b x^4+a\right)^{\frac{5}{4}}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^4,x, algorithm="maxima")
```

```
[Out] integrate((b*x^4 + a)^(5/4)/x^4, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\left(b x^4+a\right)^{\frac{5}{4}}}{x^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^4,x, algorithm="fricas")
```

```
[Out] integral((b*x^4 + a)^(5/4)/x^4, x)
```

Sympy [A] time = 6.34283, size = 42, normalized size = 0.42

$$\frac{a^{\frac{5}{4}}\,\Gamma\left(-\frac{3}{4}\right)\,{}_{2}F_{1}\left(\left.\begin{matrix}-\frac{5}{4}, -\frac{3}{4}\\ \frac{1}{4}\end{matrix}\right|\frac{b x^4 e^{i\pi}}{a}\right)}{4x^3\,\Gamma\left(\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(5/4)/x**4,x)
```

```
[Out] a**(5/4)*gamma(-3/4)*hyper((-5/4, -3/4), (1/4,), b*x**4*exp_polar
(I*pi)/a)/(4*x**3*gamma(1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b x^4+a\right)^{\frac{5}{4}}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^4,x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(5/4)/x^4, x)
```

3.1074 $\int \frac{(a+bx^4)^{5/4}}{x^8}\,dx$

Optimal. Leaf size=101

$$-\frac{5b^{5/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{21\sqrt{a}\,(a+bx^4)^{3/4}}-\frac{(a+bx^4)^{5/4}}{7x^7}-\frac{5b\sqrt[4]{a+bx^4}}{21x^3}$$

```
[Out] (-5*b*(a + b*x^4)^(1/4))/(21*x^3) - (a + b*x^4)^(5/4)/(7*x^7) - (
5*b^(5/2)*(1 + a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCot[(Sqrt[b]*x^2
)/Sqrt[a]]/2, 2])/(21*Sqrt[a]*(a + b*x^4)^(3/4))
```

Rubi [A] time = 0.123628, antiderivative size = 101, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{5b^{5/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{21\sqrt{a}\,(a+bx^4)^{3/4}}-\frac{(a+bx^4)^{5/4}}{7x^7}-\frac{5b\sqrt[4]{a+bx^4}}{21x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(5/4)/x^8,x]
```

```
[Out] (-5*b*(a + b*x^4)^(1/4))/(21*x^3) - (a + b*x^4)^(5/4)/(7*x^7) - (
5*b^(5/2)*(1 + a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCot[(Sqrt[b]*x^2
)/Sqrt[a]]/2, 2])/(21*Sqrt[a]*(a + b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 14.4431, size = 92, normalized size = 0.91

$$-\frac{5b\sqrt[4]{a+bx^4}}{21x^3}-\frac{\left(a+bx^4\right)^{\frac{5}{4}}}{7x^7}-\frac{5b^{\frac{5}{2}}x^3\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{21\sqrt{a}\,(a+bx^4)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(5/4)/x**8,x)
```

```
[Out] -5*b*(a + b*x**4)**(1/4)/(21*x**3) - (a + b*x**4)**(5/4)/(7*x**7)
 - 5*b**(5/2)*x**3*(a/(b*x**4) + 1)**(3/4)*elliptic_f(atan(sqrt(a
)/(sqrt(b)*x**2))/2, 2)/(21*sqrt(a)*(a + b*x**4)**(3/4))
```

Mathematica [C] time = 0.0497967, size = 80, normalized size = 0.79

$$\frac{-3a^2+5b^2x^8\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};-\frac{bx^4}{a}\right)-11abx^4-8b^2x^8}{21x^7\,(a+bx^4)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(5/4)/x^8,x]
```

```
[Out] (-3*a^2 - 11*a*b*x^4 - 8*b^2*x^8 + 5*b^2*x^8*(1 + (b*x^4)/a)^(3/4
)*Hypergeometric2F1[1/4, 3/4, 5/4, -((b*x^4)/a)])/(21*x^7*(a + b*
x^4)^(3/4))
```

Maple [F] time = 0.045, size = 0, normalized size = 0.

$$\int \frac{1}{x^8} \left(b x^4+a\right)^{\frac{5}{4}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(5/4)/x^8,x)
```

```
[Out] int((b*x^4+a)^(5/4)/x^8,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b x^4+a\right)^{\frac{5}{4}}}{x^8}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^8,x, algorithm="maxima")
```

```
[Out] integrate((b*x^4 + a)^(5/4)/x^8, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(b x^4+a\right)^{\frac{5}{4}}}{x^8}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^8,x, algorithm="fricas")
```

```
[Out] integral((b*x^4 + a)^(5/4)/x^8, x)
```

Sympy [A] time = 10.9264, size = 31, normalized size = 0.31

$$-\frac{b^{\frac{5}{4}}\,{}_2F_1\left(\begin{matrix} -\frac{5}{4}, \frac{1}{2} \\ \frac{3}{2} \end{matrix}\middle| \frac{a e^{i\pi}}{b x^4}\right)}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(5/4)/x**8,x)
```

```
[Out] -b**(5/4)*hyper((-5/4, 1/2), (3/2,), a*exp_polar(I*pi)/(b*x**4))/
(2*x**2)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b x^4+a\right)^{\frac{5}{4}}}{x^8}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^8,x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(5/4)/x^8, x)
```

3.1075 $\int \frac{(a+bx^4)^{5/4}}{x^{12}}\,dx$

Optimal. Leaf size=125

$$\frac{10b^{7/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{231a^{3/2}(a+bx^4)^{3/4}}-\frac{5b^2\sqrt[4]{a+bx^4}}{231ax^3}-\frac{(a+bx^4)^{5/4}}{11x^{11}}-\frac{5b\sqrt[4]{a+bx^4}}{77x^7}$$

```
[Out] (-5*b*(a + b*x^4)^(1/4))/(77*x^7) - (5*b^2*(a + b*x^4)^(1/4))/(23
1*a*x^3) - (a + b*x^4)^(5/4)/(11*x^11) + (10*b^(7/2)*(1 + a/(b*x^
4))^(3/4)*x^3*EllipticF[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(231
*a^(3/2)*(a + b*x^4)^(3/4))
```

Rubi [A] time = 0.159633, antiderivative size = 125, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$\frac{10b^{7/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{231a^{3/2}(a+bx^4)^{3/4}}-\frac{5b^2\sqrt[4]{a+bx^4}}{231ax^3}-\frac{(a+bx^4)^{5/4}}{11x^{11}}-\frac{5b\sqrt[4]{a+bx^4}}{77x^7}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(5/4)/x^12,x]
```

```
[Out] (-5*b*(a + b*x^4)^(1/4))/(77*x^7) - (5*b^2*(a + b*x^4)^(1/4))/(23
1*a*x^3) - (a + b*x^4)^(5/4)/(11*x^11) + (10*b^(7/2)*(1 + a/(b*x^
4))^(3/4)*x^3*EllipticF[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(231
*a^(3/2)*(a + b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 18.4706, size = 112, normalized size = 0.9

$$-\frac{5b\sqrt[4]{a+bx^4}}{77x^7}-\frac{(a+bx^4)^{\frac{5}{4}}}{11x^{11}}-\frac{5b^2\sqrt[4]{a+bx^4}}{231ax^3}+\frac{10b^{\frac{7}{2}}x^3\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{231a^{\frac{3}{2}}(a+bx^4)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(5/4)/x**12,x)
```

```
[Out] -5*b*(a + b*x**4)**(1/4)/(77*x**7) - (a + b*x**4)**(5/4)/(11*x**1
1) - 5*b**2*(a + b*x**4)**(1/4)/(231*a*x**3) + 10*b**(7/2)*x**3*(
a/(b*x**4) + 1)**(3/4)*elliptic_f(atan(sqrt(a)/(sqrt(b)*x**2))/2,
 2)/(231*a**(3/2)*(a + b*x**4)**(3/4))
```

Mathematica [C] time = 0.0576552, size = 94, normalized size = 0.75

$$\frac{-21a^3-57a^2bx^4-10b^3x^{12}\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};-\frac{bx^4}{a}\right)-41ab^2x^8-5b^3x^{12}}{231ax^{11}(a+bx^4)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(5/4)/x^12,x]
```

```
[Out] (-21*a^3 - 57*a^2*b*x^4 - 41*a*b^2*x^8 - 5*b^3*x^12 - 10*b^3*x^12
*(1 + (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/4, 3/4, 5/4, -((b*x^4)
```

```
/a)])/(231*a*x^11*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.053, size = 0, normalized size = 0.

$$\int \frac{1}{x^{12}} \left(b x^4 + a\right)^{\frac{5}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(5/4)/x^12,x)

[Out] int((b*x^4+a)^(5/4)/x^12,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b x^4 + a\right)^{\frac{5}{4}}}{x^{12}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^12,x, algorithm="maxima")

[Out] integrate((b*x^4 + a)^(5/4)/x^12, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(b x^4 + a\right)^{\frac{5}{4}}}{x^{12}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^12,x, algorithm="fricas")

[Out] integral((b*x^4 + a)^(5/4)/x^12, x)
```

Sympy [A] time = 22.0856, size = 31, normalized size = 0.25

$$-\frac{b^{\frac{5}{4}} {}_2F_1\left(\begin{matrix} -\frac{5}{4}, \frac{3}{2} \\ \frac{5}{2} \end{matrix}\middle| \frac{a e^{i\pi}}{b x^4}\right)}{6 x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(5/4)/x**12,x)

[Out] -b**(5/4)*hyper((-5/4, 3/2), (5/2,), a*exp_polar(I*pi)/(b*x**4))/
(6*x**6)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b x^4 + a\right)^{\frac{5}{4}}}{x^{12}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^12,x, algorithm="giac")

[Out] integrate((b*x^4 + a)^(5/4)/x^12, x)
```

3.1076 $\int \frac{(a+bx^4)^{5/4}}{x^{16}}\,dx$

Optimal. Leaf size=149

$$-\frac{4b^{9/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{231a^{5/2}(a+bx^4)^{3/4}}+\frac{2b^3\sqrt[4]{a+bx^4}}{231a^2x^3}-\frac{b^2\sqrt[4]{a+bx^4}}{231ax^7}-\frac{(a+bx^4)^{5/4}}{15x^{15}}-\frac{b\sqrt[4]{a+bx^4}}{33x^{11}}$$

```
[Out] -(b*(a + b*x^4)^(1/4))/(33*x^11) - (b^2*(a + b*x^4)^(1/4))/(231*a
*x^7) + (2*b^3*(a + b*x^4)^(1/4))/(231*a^2*x^3) - (a + b*x^4)^(5/
4)/(15*x^15) - (4*b^(9/2)*(1 + a/(b*x^4))^(3/4)*x^3*EllipticF[Arc
Cot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(231*a^(5/2)*(a + b*x^4)^(3/4))
```

Rubi [A] time = 0.195359, antiderivative size = 149, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$-\frac{4b^{9/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{231a^{5/2}(a+bx^4)^{3/4}}+\frac{2b^3\sqrt[4]{a+bx^4}}{231a^2x^3}-\frac{b^2\sqrt[4]{a+bx^4}}{231ax^7}-\frac{(a+bx^4)^{5/4}}{15x^{15}}-\frac{b\sqrt[4]{a+bx^4}}{33x^{11}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(5/4)/x^16,x]
```

```
[Out] -(b*(a + b*x^4)^(1/4))/(33*x^11) - (b^2*(a + b*x^4)^(1/4))/(231*a
*x^7) + (2*b^3*(a + b*x^4)^(1/4))/(231*a^2*x^3) - (a + b*x^4)^(5/
4)/(15*x^15) - (4*b^(9/2)*(1 + a/(b*x^4))^(3/4)*x^3*EllipticF[Arc
Cot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(231*a^(5/2)*(a + b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 22.8774, size = 133, normalized size = 0.89

$$-\frac{b\sqrt[4]{a+bx^4}}{33x^{11}}-\frac{(a+bx^4)^{\frac{5}{4}}}{15x^{15}}-\frac{b^2\sqrt[4]{a+bx^4}}{231ax^7}+\frac{2b^3\sqrt[4]{a+bx^4}}{231a^2x^3}-\frac{4b^{\frac{9}{2}}x^3\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{231a^{\frac{5}{2}}(a+bx^4)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(5/4)/x**16,x)
```

```
[Out] -b*(a + b*x**4)**(1/4)/(33*x**11) - (a + b*x**4)**(5/4)/(15*x**15
) - b**2*(a + b*x**4)**(1/4)/(231*a*x**7) + 2*b**3*(a + b*x**4)**
(1/4)/(231*a**2*x**3) - 4*b**(9/2)*x**3*(a/(b*x**4) + 1)**(3/4)*e
lliptic_f(atan(sqrt(a)/(sqrt(b)*x**2))/2, 2)/(231*a**(5/2)*(a + b
*x**4)**(3/4))
```

Mathematica [C] time = 0.0634472, size = 105, normalized size = 0.7

$$\frac{-77a^4-189a^3bx^4-117a^2b^2x^8+20b^4x^{16}\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};-\frac{bx^4}{a}\right)+5ab^3x^{12}+10b^4x^{16}}{1155a^2x^{15}(a+bx^4)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(5/4)/x^16,x]
```

```
[Out] (-77*a^4 - 189*a^3*b*x^4 - 117*a^2*b^2*x^8 + 5*a*b^3*x^12 + 10*b^
4*x^16 + 20*b^4*x^16*(1 + (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/4,
```

```
3/4, 5/4, -((b*x^4)/a)])/(1155*a^2*x^15*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.063, size = 0, normalized size = 0.

$$\int \frac{1}{x^{16}} \left(bx^4+a\right)^{\frac{5}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(5/4)/x^16,x)

[Out] int((b*x^4+a)^(5/4)/x^16,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bx^4+a\right)^{\frac{5}{4}}}{x^{16}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^16,x, algorithm="maxima")

[Out] integrate((b*x^4 + a)^(5/4)/x^16, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(bx^4+a\right)^{\frac{5}{4}}}{x^{16}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^16,x, algorithm="fricas")

[Out] integral((b*x^4 + a)^(5/4)/x^16, x)
```

Sympy [A] time = 36.7347, size = 46, normalized size = 0.31

$$\frac{a^{\frac{5}{4}} \Gamma\left(-\frac{15}{4}\right) {}_{2}F_{1}\left(\begin{matrix} -\frac{15}{4}, -\frac{5}{4} \\ -\frac{11}{4} \end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{4x^{15}\Gamma\left(-\frac{11}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(5/4)/x**16,x)

[Out] a**(5/4)*gamma(-15/4)*hyper((-15/4, -5/4), (-11/4,), b*x**4*exp_p
olar(I*pi)/a)/(4*x**15*gamma(-11/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bx^4+a\right)^{\frac{5}{4}}}{x^{16}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(5/4)/x^16,x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(5/4)/x^16, x)
```

3.1077 $\int \left(a+bx^4\right)^{7/4} dx$

Optimal. Leaf size=96

$$\frac{21a^2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64\sqrt[4]{b}}+\frac{21a^2\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64\sqrt[4]{b}}+\frac{7}{32}ax\left(a+bx^4\right)^{3/4}+\frac{1}{8}x\left(a+bx^4\right)^{7/4}$$

```
[Out] (7*a*x*(a + b*x^4)^(3/4))/32 + (x*(a + b*x^4)^(7/4))/8 + (21*a^2*
ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(64*b^(1/4)) + (21*a^2*Arc
Tanh[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(64*b^(1/4))
```

Rubi [A] time = 0.0659831, antiderivative size = 96, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.454

$$\frac{21a^2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64\sqrt[4]{b}}+\frac{21a^2\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64\sqrt[4]{b}}+\frac{7}{32}ax\left(a+bx^4\right)^{3/4}+\frac{1}{8}x\left(a+bx^4\right)^{7/4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(7/4),x]
```

```
[Out] (7*a*x*(a + b*x^4)^(3/4))/32 + (x*(a + b*x^4)^(7/4))/8 + (21*a^2*
ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(64*b^(1/4)) + (21*a^2*Arc
Tanh[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(64*b^(1/4))
```

Rubi in Sympy [A] time = 7.16391, size = 90, normalized size = 0.94

$$\frac{21a^2\operatorname{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64\sqrt[4]{b}}+\frac{21a^2\operatorname{atanh}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64\sqrt[4]{b}}+\frac{7ax\left(a+bx^4\right)^{\frac{3}{4}}}{32}+\frac{x\left(a+bx^4\right)^{\frac{7}{4}}}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**4+a)**(7/4),x)
```

```
[Out] 21*a**2*atan(b**(1/4)*x/(a + b*x**4)**(1/4))/(64*b**(1/4)) + 21*a
**2*atanh(b**(1/4)*x/(a + b*x**4)**(1/4))/(64*b**(1/4)) + 7*a*x*(
a + b*x**4)**(3/4)/32 + x*(a + b*x**4)**(7/4)/8
```

Mathematica [A] time = 0.174423, size = 107, normalized size = 1.11

$$\frac{21a^2\left(-\log\left(1-\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)+\log\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}+1\right)+2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)\right)}{128\sqrt[4]{b}}+\left(a+bx^4\right)^{3/4}\left(\frac{11ax}{32}+\frac{bx^5}{8}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(7/4),x]
```

```
[Out] (a + b*x^4)^(3/4)*((11*a*x)/32 + (b*x^5)/8) + (21*a^2*(2*ArcTan[(
b^(1/4)*x)/(a + b*x^4)^(1/4)] - Log[1 - (b^(1/4)*x)/(a + b*x^4)^(
1/4)] + Log[1 + (b^(1/4)*x)/(a + b*x^4)^(1/4)]))/(128*b^(1/4))
```

Maple [F] time = 0.046, size = 0, normalized size = 0.

$$\int \left(b x^{4}+a\right)^{\frac{7}{4}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^(7/4),x)

[Out] int((b*x^4+a)^(7/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(7/4),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [A] time = 0.302404, size = 255, normalized size = 2.66

$$\frac{1}{32}\left(4\,bx^{5}+11\,ax\right)\left(bx^{4}+a\right)^{\frac{3}{4}}+\frac{21}{32}\left(\frac{a^{8}}{b}\right)^{\frac{1}{4}}\arctan\left(\frac{\left(\frac{a^{8}}{b}\right)^{\frac{3}{4}}bx}{\left(bx^{4}+a\right)^{\frac{1}{4}}a^{6}+x\sqrt{\frac{\sqrt{bx^{4}+a}a^{12}+\sqrt{\frac{a^{8}}{b}}a^{8}bx^{2}}{x^{2}}}}\right)+\frac{21}{128}\left(\frac{a^{8}}{b}\right)^{\frac{1}{4}}\log\left(\frac{9261\left(\left(bx^{4}+a\right)^{\frac{1}{4}}a^{6}+\left(\frac{a^{8}}{b}\right)^{\frac{3}{4}}bx\right)}{x}\right)-\frac{21}{128}\left(\frac{a^{8}}{b}\right)^{\frac{1}{4}}\log\left(\frac{9261\left(\left(bx^{4}+a\right)^{\frac{1}{4}}a^{6}-\left(\frac{a^{8}}{b}\right)^{\frac{3}{4}}bx\right)}{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(7/4),x, algorithm="fricas")

[Out] 1/32*(4*b*x^5 + 11*a*x)*(b*x^4 + a)^(3/4) + 21/32*(a^8/b)^(1/4)*a
rctan((a^8/b)^(3/4)*b*x/((b*x^4 + a)^(1/4)*a^6 + x*sqrt((sqrt(b*x
^4 + a)*a^12 + sqrt(a^8/b)*a^8*b*x^2)/x^2))) + 21/128*(a^8/b)^(1/
4)*log(9261*((b*x^4 + a)^(1/4)*a^6 + (a^8/b)^(3/4)*b*x)/x) - 21/1
28*(a^8/b)^(1/4)*log(9261*((b*x^4 + a)^(1/4)*a^6 - (a^8/b)^(3/4)*
b*x)/x)
```

Sympy [A] time = 12.4105, size = 37, normalized size = 0.39

$$\frac{a^{\frac{7}{4}}x\,\Gamma\left(\frac{1}{4}\right){}_{2}F_{1}\left(\begin{matrix}-\frac{7}{4},\frac{1}{4}\\\frac{5}{4}\end{matrix}\middle|\frac{bx^{4}e^{i\pi}}{a}\right)}{4\,\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**(7/4),x)
```

```
[Out] a**(7/4)*x*gamma(1/4)*hyper((-7/4, 1/4), (5/4,), b*x**4*exp_polar
(I*pi)/a)/(4*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bx^4 + a\right)^{\frac{7}{4}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(7/4),x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(7/4), x)
```

3.1078 $\int \frac{x^{19}}{\sqrt[4]{a+bx^4}}\,dx$

Optimal. Leaf size=101

$$\frac{a^4(a+bx^4)^{3/4}}{3b^5}-\frac{4a^3(a+bx^4)^{7/4}}{7b^5}+\frac{6a^2(a+bx^4)^{11/4}}{11b^5}+\frac{(a+bx^4)^{19/4}}{19b^5}-\frac{4a(a+bx^4)^{15/4}}{15b^5}$$

```
[Out] (a^4*(a + b*x^4)^(3/4))/(3*b^5) - (4*a^3*(a + b*x^4)^(7/4))/(7*b^
5) + (6*a^2*(a + b*x^4)^(11/4))/(11*b^5) - (4*a*(a + b*x^4)^(15/4
))/(15*b^5) + (a + b*x^4)^(19/4)/(19*b^5)
```

Rubi [A] time = 0.125861, antiderivative size = 101, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^4(a+bx^4)^{3/4}}{3b^5}-\frac{4a^3(a+bx^4)^{7/4}}{7b^5}+\frac{6a^2(a+bx^4)^{11/4}}{11b^5}+\frac{(a+bx^4)^{19/4}}{19b^5}-\frac{4a(a+bx^4)^{15/4}}{15b^5}$$

Antiderivative was successfully verified.

```
[In] Int[x^19/(a + b*x^4)^(1/4),x]
```

```
[Out] (a^4*(a + b*x^4)^(3/4))/(3*b^5) - (4*a^3*(a + b*x^4)^(7/4))/(7*b^
5) + (6*a^2*(a + b*x^4)^(11/4))/(11*b^5) - (4*a*(a + b*x^4)^(15/4
))/(15*b^5) + (a + b*x^4)^(19/4)/(19*b^5)
```

Rubi in Sympy [A] time = 17.3831, size = 92, normalized size = 0.91

$$\frac{a^4(a+bx^4)^{\frac{3}{4}}}{3b^5}-\frac{4a^3(a+bx^4)^{\frac{7}{4}}}{7b^5}+\frac{6a^2(a+bx^4)^{\frac{11}{4}}}{11b^5}-\frac{4a(a+bx^4)^{\frac{15}{4}}}{15b^5}+\frac{(a+bx^4)^{\frac{19}{4}}}{19b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**19/(b*x**4+a)**(1/4),x)
```

```
[Out] a**4*(a + b*x**4)**(3/4)/(3*b**5) - 4*a**3*(a + b*x**4)**(7/4)/(7
*b**5) + 6*a**2*(a + b*x**4)**(11/4)/(11*b**5) - 4*a*(a + b*x**4)
**(15/4)/(15*b**5) + (a + b*x**4)**(19/4)/(19*b**5)
```

Mathematica [A] time = 0.0402484, size = 61, normalized size = 0.6

$$\frac{(a+bx^4)^{3/4}(2048a^4-1536a^3bx^4+1344a^2b^2x^8-1232ab^3x^{12}+1155b^4x^{16})}{21945b^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^19/(a + b*x^4)^(1/4),x]
```

```
[Out] ((a + b*x^4)^(3/4)*(2048*a^4 - 1536*a^3*b*x^4 + 1344*a^2*b^2*x^8
- 1232*a*b^3*x^12 + 1155*b^4*x^16))/(21945*b^5)
```

Maple [A] time = 0.012, size = 58, normalized size = 0.6

$$\frac{1155\,x^{16}b^4-1232\,ax^{12}b^3+1344\,a^2x^8b^2-1536\,a^3x^4b+2048\,a^4}{21945\,b^5}(bx^4+a)^{\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^19/(b*x^4+a)^(1/4),x)
```

```
[Out] 1/21945*(b*x^4+a)^(3/4)*(1155*b^4*x^16-1232*a*b^3*x^12+1344*a^2*b
^2*x^8-1536*a^3*b*x^4+2048*a^4)/b^5
```

Maxima [A] time = 1.44496, size = 109, normalized size = 1.08

$$\frac{(bx^4+a)^{\frac{19}{4}}}{19\,b^5} - \frac{4\,(bx^4+a)^{\frac{15}{4}}a}{15\,b^5} + \frac{6\,(bx^4+a)^{\frac{11}{4}}a^2}{11\,b^5} - \frac{4\,(bx^4+a)^{\frac{7}{4}}a^3}{7\,b^5} + \frac{(bx^4+a)^{\frac{3}{4}}a^4}{3\,b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^19/(b*x^4 + a)^(1/4),x, algorithm="maxima")
```

```
[Out] 1/19*(b*x^4 + a)^(19/4)/b^5 - 4/15*(b*x^4 + a)^(15/4)*a/b^5 + 6/1
1*(b*x^4 + a)^(11/4)*a^2/b^5 - 4/7*(b*x^4 + a)^(7/4)*a^3/b^5 + 1/
3*(b*x^4 + a)^(3/4)*a^4/b^5
```

Fricas [A] time = 0.301186, size = 77, normalized size = 0.76

$$\frac{\left(1155\,b^4x^{16} - 1232\,ab^3x^{12} + 1344\,a^2b^2x^8 - 1536\,a^3bx^4 + 2048\,a^4\right)(bx^4+a)^{\frac{3}{4}}}{21945\,b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^19/(b*x^4 + a)^(1/4),x, algorithm="fricas")
```

```
[Out] 1/21945*(1155*b^4*x^16 - 1232*a*b^3*x^12 + 1344*a^2*b^2*x^8 - 153
6*a^3*b*x^4 + 2048*a^4)*(b*x^4 + a)^(3/4)/b^5
```

Sympy [A] time = 53.1374, size = 116, normalized size = 1.15

$$\begin{cases} \frac{2048a^4(a+bx^4)^{\frac{3}{4}}}{21945b^5} - \frac{512a^3x^4(a+bx^4)^{\frac{3}{4}}}{7315b^4} + \frac{64a^2x^8(a+bx^4)^{\frac{3}{4}}}{1045b^3} - \frac{16ax^{12}(a+bx^4)^{\frac{3}{4}}}{285b^2} + \frac{x^{16}(a+bx^4)^{\frac{3}{4}}}{19b} & \text{for } b \neq 0 \\ \frac{x^{20}}{20\sqrt[4]{a}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**19/(b*x**4+a)**(1/4),x)
```

```
[Out] Piecewise((2048*a**4*(a + b*x**4)**(3/4)/(21945*b**5) - 512*a**3*
x**4*(a + b*x**4)**(3/4)/(7315*b**4) + 64*a**2*x**8*(a + b*x**4)*
*(3/4)/(1045*b**3) - 16*a*x**12*(a + b*x**4)**(3/4)/(285*b**2) +
x**16*(a + b*x**4)**(3/4)/(19*b), Ne(b, 0)), (x**20/(20*a**(1/4))
, True))
```

GIAC/XCAS [A] time = 0.215521, size = 96, normalized size = 0.95

$$\frac{1155\,(bx^4+a)^{\frac{19}{4}} - 5852\,(bx^4+a)^{\frac{15}{4}}a + 11970\,(bx^4+a)^{\frac{11}{4}}a^2 - 12540\,(bx^4+a)^{\frac{7}{4}}a^3 + 7315\,(bx^4+a)^{\frac{3}{4}}a^4}{21945\,b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^19/(b*x^4 + a)^(1/4),x, algorithm="giac")
```

```
[Out] 1/21945*(1155*(b*x^4 + a)^(19/4) - 5852*(b*x^4 + a)^(15/4)*a + 11
970*(b*x^4 + a)^(11/4)*a^2 - 12540*(b*x^4 + a)^(7/4)*a^3 + 7315*(
b*x^4 + a)^(3/4)*a^4)/b^5
```

3.1079 $\int \frac{x^{15}}{\sqrt[4]{a+bx^4}}\,dx$

Optimal. Leaf size=80

$$-\frac{a^3\left(a+bx^4\right)^{3/4}}{3b^4}+\frac{3a^2\left(a+bx^4\right)^{7/4}}{7b^4}+\frac{\left(a+bx^4\right)^{15/4}}{15b^4}-\frac{3a\left(a+bx^4\right)^{11/4}}{11b^4}$$

```
[Out] -(a^3*(a + b*x^4)^(3/4))/(3*b^4) + (3*a^2*(a + b*x^4)^(7/4))/(7*b
^4) - (3*a*(a + b*x^4)^(11/4))/(11*b^4) + (a + b*x^4)^(15/4)/(15*
b^4)
```

Rubi [A] time = 0.108409, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^3\left(a+bx^4\right)^{3/4}}{3b^4}+\frac{3a^2\left(a+bx^4\right)^{7/4}}{7b^4}+\frac{\left(a+bx^4\right)^{15/4}}{15b^4}-\frac{3a\left(a+bx^4\right)^{11/4}}{11b^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^15/(a + b*x^4)^(1/4),x]
```

```
[Out] -(a^3*(a + b*x^4)^(3/4))/(3*b^4) + (3*a^2*(a + b*x^4)^(7/4))/(7*b
^4) - (3*a*(a + b*x^4)^(11/4))/(11*b^4) + (a + b*x^4)^(15/4)/(15*
b^4)
```

Rubi in Sympy [A] time = 14.198, size = 71, normalized size = 0.89

$$-\frac{a^3\left(a+bx^4\right)^{\frac{3}{4}}}{3b^4}+\frac{3a^2\left(a+bx^4\right)^{\frac{7}{4}}}{7b^4}-\frac{3a\left(a+bx^4\right)^{\frac{11}{4}}}{11b^4}+\frac{\left(a+bx^4\right)^{\frac{15}{4}}}{15b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**15/(b*x**4+a)**(1/4),x)
```

```
[Out] -a**3*(a + b*x**4)**(3/4)/(3*b**4) + 3*a**2*(a + b*x**4)**(7/4)/(
7*b**4) - 3*a*(a + b*x**4)**(11/4)/(11*b**4) + (a + b*x**4)**(15/
4)/(15*b**4)
```

Mathematica [A] time = 0.0360742, size = 50, normalized size = 0.62

$$\frac{\left(a+bx^4\right)^{3/4}\left(-128a^3+96a^2bx^4-84ab^2x^8+77b^3x^{12}\right)}{1155b^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^15/(a + b*x^4)^(1/4),x]
```

```
[Out] ((a + b*x^4)^(3/4)*(-128*a^3 + 96*a^2*b*x^4 - 84*a*b^2*x^8 + 77*b
^3*x^12))/(1155*b^4)
```

Maple [A] time = 0.009, size = 47, normalized size = 0.6

$$-\frac{-77\,b^3x^{12}+84\,ab^2x^8-96\,a^2bx^4+128\,a^3}{1155\,b^4}\left(bx^4+a\right)^{\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^15/(b*x^4+a)^(1/4),x)
```

```
[Out] -1/1155*(b*x^4+a)^(3/4)*(-77*b^3*x^12+84*a*b^2*x^8-96*a^2*b*x^4+1
28*a^3)/b^4
```

Maxima [A] time = 1.44371, size = 86, normalized size = 1.08

$$\frac{(bx^4+a)^{\frac{15}{4}}}{15\,b^4} - \frac{3\,(bx^4+a)^{\frac{11}{4}}a}{11\,b^4} + \frac{3\,(bx^4+a)^{\frac{7}{4}}a^2}{7\,b^4} - \frac{(bx^4+a)^{\frac{3}{4}}a^3}{3\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^15/(b*x^4 + a)^(1/4),x, algorithm="maxima")
```

```
[Out] 1/15*(b*x^4 + a)^(15/4)/b^4 - 3/11*(b*x^4 + a)^(11/4)*a/b^4 + 3/7
*(b*x^4 + a)^(7/4)*a^2/b^4 - 1/3*(b*x^4 + a)^(3/4)*a^3/b^4
```

Fricas [A] time = 0.272414, size = 62, normalized size = 0.78

$$\frac{(77\,b^3x^{12} - 84\,ab^2x^8 + 96\,a^2bx^4 - 128\,a^3)\,(bx^4+a)^{\frac{3}{4}}}{1155\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^15/(b*x^4 + a)^(1/4),x, algorithm="fricas")
```

```
[Out] 1/1155*(77*b^3*x^12 - 84*a*b^2*x^8 + 96*a^2*b*x^4 - 128*a^3)*(b*x
^4 + a)^(3/4)/b^4
```

Sympy [A] time = 25.2298, size = 92, normalized size = 1.15

$$\begin{cases} -\frac{128a^3(a+bx^4)^{\frac{3}{4}}}{1155b^4} + \frac{32a^2x^4(a+bx^4)^{\frac{3}{4}}}{385b^3} - \frac{4ax^8(a+bx^4)^{\frac{3}{4}}}{55b^2} + \frac{x^{12}(a+bx^4)^{\frac{3}{4}}}{15b} & \text{for } b \neq 0 \\ \frac{x^{16}}{16\sqrt[4]{a}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**15/(b*x**4+a)**(1/4),x)
```

```
[Out] Piecewise((-128*a**3*(a + b*x**4)**(3/4)/(1155*b**4) + 32*a**2*x*
*4*(a + b*x**4)**(3/4)/(385*b**3) - 4*a*x**8*(a + b*x**4)**(3/4)/
(55*b**2) + x**12*(a + b*x**4)**(3/4)/(15*b), Ne(b, 0)), (x**16/(
16*a**(1/4)), True))
```

GIAC/XCAS [A] time = 0.21663, size = 77, normalized size = 0.96

$$\frac{77\,(bx^4+a)^{\frac{15}{4}} - 315\,(bx^4+a)^{\frac{11}{4}}a + 495\,(bx^4+a)^{\frac{7}{4}}a^2 - 385\,(bx^4+a)^{\frac{3}{4}}a^3}{1155\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^15/(b*x^4 + a)^(1/4),x, algorithm="giac")
```

```
[Out] 1/1155*(77*(b*x^4 + a)^(15/4) - 315*(b*x^4 + a)^(11/4)*a + 495*(b
*x^4 + a)^(7/4)*a^2 - 385*(b*x^4 + a)^(3/4)*a^3)/b^4
```

3.1080 $\int \frac{x^{11}}{\sqrt[4]{a+bx^4}}\,dx$

Optimal. Leaf size=59

$$\frac{a^2\left(a+bx^4\right)^{3/4}}{3b^3}+\frac{\left(a+bx^4\right)^{11/4}}{11b^3}-\frac{2a\left(a+bx^4\right)^{7/4}}{7b^3}$$

```
[Out] (a^2*(a + b*x^4)^(3/4))/(3*b^3) - (2*a*(a + b*x^4)^(7/4))/(7*b^3)
 + (a + b*x^4)^(11/4)/(11*b^3)
```

Rubi [A] time = 0.0859798, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^2\left(a+bx^4\right)^{3/4}}{3b^3}+\frac{\left(a+bx^4\right)^{11/4}}{11b^3}-\frac{2a\left(a+bx^4\right)^{7/4}}{7b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11/(a + b*x^4)^(1/4),x]
```

```
[Out] (a^2*(a + b*x^4)^(3/4))/(3*b^3) - (2*a*(a + b*x^4)^(7/4))/(7*b^3)
 + (a + b*x^4)^(11/4)/(11*b^3)
```

Rubi in Sympy [A] time = 10.5001, size = 51, normalized size = 0.86

$$\frac{a^2\left(a+bx^4\right)^{\frac{3}{4}}}{3b^3}-\frac{2a\left(a+bx^4\right)^{\frac{7}{4}}}{7b^3}+\frac{\left(a+bx^4\right)^{\frac{11}{4}}}{11b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11/(b*x**4+a)**(1/4),x)
```

```
[Out] a**2*(a + b*x**4)**(3/4)/(3*b**3) - 2*a*(a + b*x**4)**(7/4)/(7*b*
*3) + (a + b*x**4)**(11/4)/(11*b**3)
```

Mathematica [A] time = 0.0299792, size = 39, normalized size = 0.66

$$\frac{\left(a+bx^4\right)^{3/4}\left(32a^2-24abx^4+21b^2x^8\right)}{231b^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11/(a + b*x^4)^(1/4),x]
```

```
[Out] ((a + b*x^4)^(3/4)*(32*a^2 - 24*a*b*x^4 + 21*b^2*x^8))/(231*b^3)
```

Maple [A] time = 0.009, size = 36, normalized size = 0.6

$$\frac{21\,b^2x^8-24\,abx^4+32\,a^2}{231\,b^3}\left(bx^4+a\right)^{\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11/(b*x^4+a)^(1/4),x)
```

```
[Out] 1/231*(b*x^4+a)^(3/4)*(21*b^2*x^8-24*a*b*x^4+32*a^2)/b^3
```

Maxima [A] time = 1.44959, size = 63, normalized size = 1.07

$$\frac{(bx^4+a)^{\frac{11}{4}}}{11\,b^3} - \frac{2\,(bx^4+a)^{\frac{7}{4}}a}{7\,b^3} + \frac{(bx^4+a)^{\frac{3}{4}}a^2}{3\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(b*x^4 + a)^(1/4),x, algorithm="maxima")
```

```
[Out] 1/11*(b*x^4 + a)^(11/4)/b^3 - 2/7*(b*x^4 + a)^(7/4)*a/b^3 + 1/3*(
b*x^4 + a)^(3/4)*a^2/b^3
```

Fricas [A] time = 0.262473, size = 47, normalized size = 0.8

$$\frac{(21\,b^2x^8 - 24\,abx^4 + 32\,a^2)\,(bx^4+a)^{\frac{3}{4}}}{231\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(b*x^4 + a)^(1/4),x, algorithm="fricas")
```

```
[Out] 1/231*(21*b^2*x^8 - 24*a*b*x^4 + 32*a^2)*(b*x^4 + a)^(3/4)/b^3
```

Sympy [A] time = 10.8317, size = 68, normalized size = 1.15

$$\begin{cases} \frac{32a^2(a+bx^4)^{\frac{3}{4}}}{231b^3} - \frac{8ax^4(a+bx^4)^{\frac{3}{4}}}{77b^2} + \frac{x^8(a+bx^4)^{\frac{3}{4}}}{11b} & \text{for } b \neq 0 \\ \frac{x^{12}}{12\sqrt[4]{a}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11/(b*x**4+a)**(1/4),x)
```

```
[Out] Piecewise((32*a**2*(a + b*x**4)**(3/4)/(231*b**3) - 8*a*x**4*(a +
 b*x**4)**(3/4)/(77*b**2) + x**8*(a + b*x**4)**(3/4)/(11*b), Ne(b
, 0)), (x**12/(12*a**(1/4)), True))
```

GIAC/XCAS [A] time = 0.214156, size = 58, normalized size = 0.98

$$\frac{21\,(bx^4+a)^{\frac{11}{4}} - 66\,(bx^4+a)^{\frac{7}{4}}a + 77\,(bx^4+a)^{\frac{3}{4}}a^2}{231\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(b*x^4 + a)^(1/4),x, algorithm="giac")
```

```
[Out] 1/231*(21*(b*x^4 + a)^(11/4) - 66*(b*x^4 + a)^(7/4)*a + 77*(b*x^4
 + a)^(3/4)*a^2)/b^3
```

3.1081 $\int \frac{x^7}{\sqrt[4]{a+bx^4}}\,dx$

Optimal. Leaf size=38

$$\frac{\left(a+bx^4\right)^{7/4}}{7b^2}-\frac{a\left(a+bx^4\right)^{3/4}}{3b^2}$$

```
[Out] -(a*(a + b*x^4)^(3/4))/(3*b^2) + (a + b*x^4)^(7/4)/(7*b^2)
```

Rubi [A] time = 0.0592666, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{\left(a+bx^4\right)^{7/4}}{7b^2}-\frac{a\left(a+bx^4\right)^{3/4}}{3b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7/(a + b*x^4)^(1/4),x]

[Out] -(a*(a + b*x^4)^(3/4))/(3*b^2) + (a + b*x^4)^(7/4)/(7*b^2)
```

Rubi in Sympy [A] time = 7.03994, size = 31, normalized size = 0.82

$$-\frac{a\left(a+bx^4\right)^{\frac{3}{4}}}{3b^2}+\frac{\left(a+bx^4\right)^{\frac{7}{4}}}{7b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7/(b*x**4+a)**(1/4),x)

[Out] -a*(a + b*x**4)**(3/4)/(3*b**2) + (a + b*x**4)**(7/4)/(7*b**2)
```

Mathematica [A] time = 0.0243971, size = 28, normalized size = 0.74

$$\frac{\left(a+bx^4\right)^{3/4}\left(3bx^4-4a\right)}{21b^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^7/(a + b*x^4)^(1/4),x]

[Out] ((a + b*x^4)^(3/4)*(-4*a + 3*b*x^4))/(21*b^2)
```

Maple [A] time = 0.007, size = 25, normalized size = 0.7

$$-\frac{-3\,bx^4+4\,a}{21\,b^2}\left(bx^4+a\right)^{\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7/(b*x^4+a)^(1/4),x)
```

```
[Out] -1/21*(b*x^4+a)^(3/4)*(-3*b*x^4+4*a)/b^2
```

Maxima [A] time = 1.44955, size = 41, normalized size = 1.08

$$\frac{\left(bx^4+a\right)^{\frac{7}{4}}}{7\,b^2}-\frac{\left(bx^4+a\right)^{\frac{3}{4}}a}{3\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(b*x^4 + a)^(1/4),x, algorithm="maxima")
```

```
[Out] 1/7*(b*x^4 + a)^(7/4)/b^2 - 1/3*(b*x^4 + a)^(3/4)*a/b^2
```

Fricas [A] time = 0.269957, size = 32, normalized size = 0.84

$$\frac{\left(3\,bx^4-4\,a\right)\left(bx^4+a\right)^{\frac{3}{4}}}{21\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(b*x^4 + a)^(1/4),x, algorithm="fricas")
```

```
[Out] 1/21*(3*b*x^4 - 4*a)*(b*x^4 + a)^(3/4)/b^2
```

Sympy [A] time = 4.23873, size = 44, normalized size = 1.16

$$\begin{cases} -\frac{4a\left(a+bx^4\right)^{\frac{3}{4}}}{21b^2}+\frac{x^4\left(a+bx^4\right)^{\frac{3}{4}}}{7b} & \text{for } b\neq 0 \\ \frac{x^8}{8\sqrt[4]{a}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(b*x**4+a)**(1/4),x)
```

```
[Out] Piecewise((-4*a*(a + b*x**4)**(3/4)/(21*b**2) + x**4*(a + b*x**4)
**(3/4)/(7*b), Ne(b, 0)), (x**8/(8*a**(1/4)), True))
```

GIAC/XCAS [A] time = 0.215455, size = 39, normalized size = 1.03

$$\frac{3\left(bx^4+a\right)^{\frac{7}{4}}-7\left(bx^4+a\right)^{\frac{3}{4}}a}{21\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(b*x^4 + a)^(1/4),x, algorithm="giac")
```

```
[Out] 1/21*(3*(b*x^4 + a)^(7/4) - 7*(b*x^4 + a)^(3/4)*a)/b^2
```

3.1082 $\int \frac{x^3}{\sqrt[4]{a+bx^4}}\,dx$

Optimal. Leaf size=18

$$\frac{(a+bx^4)^{3/4}}{3b}$$

```
[Out] (a + b*x^4)^(3/4)/(3*b)
```

Rubi [A] time = 0.010962, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{(a+bx^4)^{3/4}}{3b}$$

Antiderivative was successfully verified.

```
[In] Int[x^3/(a + b*x^4)^(1/4),x]

[Out] (a + b*x^4)^(3/4)/(3*b)
```

Rubi in Sympy [A] time = 2.11894, size = 12, normalized size = 0.67

$$\frac{(a+bx^4)^{\frac{3}{4}}}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**3/(b*x**4+a)**(1/4),x)

[Out] (a + b*x**4)**(3/4)/(3*b)
```

Mathematica [A] time = 0.00691323, size = 18, normalized size = 1.

$$\frac{(a+bx^4)^{3/4}}{3b}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3/(a + b*x^4)^(1/4),x]

[Out] (a + b*x^4)^(3/4)/(3*b)
```

Maple [A] time = 0.005, size = 15, normalized size = 0.8

$$\frac{1}{3\,b}\left(bx^4+a\right)^{\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(b*x^4+a)^(1/4),x)
```

```
[Out] 1/3*(b*x^4+a)^(3/4)/b
```

Maxima [A] time = 1.44559, size = 19, normalized size = 1.06

$$\frac{\left(bx^4+a\right)^{\frac{3}{4}}}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(b*x^4 + a)^(1/4),x, algorithm="maxima")
```

```
[Out] 1/3*(b*x^4 + a)^(3/4)/b
```

Fricas [A] time = 0.300707, size = 19, normalized size = 1.06

$$\frac{\left(bx^4+a\right)^{\frac{3}{4}}}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(b*x^4 + a)^(1/4),x, algorithm="fricas")
```

```
[Out] 1/3*(b*x^4 + a)^(3/4)/b
```

Sympy [A] time = 1.8692, size = 22, normalized size = 1.22

$$\begin{cases} \frac{\left(a+bx^4\right)^{\frac{3}{4}}}{3b} & \text{for}\ b \neq 0 \\ \frac{x^4}{4\sqrt[4]{a}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(b*x**4+a)**(1/4),x)
```

```
[Out] Piecewise(((a + b*x**4)**(3/4)/(3*b), Ne(b, 0)), (x**4/(4*a**(1/4
)), True))
```

GIAC/XCAS [A] time = 0.215182, size = 19, normalized size = 1.06

$$\frac{\left(bx^4+a\right)^{\frac{3}{4}}}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(b*x^4 + a)^(1/4),x, algorithm="giac")
```

```
[Out] 1/3*(b*x^4 + a)^(3/4)/b
```

3.1083 $\int \frac{1}{x\sqrt[4]{a+bx^4}}\,dx$

Optimal. Leaf size=55

$$\frac{\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{2\sqrt[4]{a}}-\frac{\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{2\sqrt[4]{a}}$$

```
[Out] ArcTan[(a + b*x^4)^(1/4)/a^(1/4)]/(2*a^(1/4)) - ArcTanh[(a + b*x^
4)^(1/4)/a^(1/4)]/(2*a^(1/4))
```

Rubi [A] time = 0.0857372, antiderivative size = 55, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{2\sqrt[4]{a}}-\frac{\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{2\sqrt[4]{a}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a + b*x^4)^(1/4)),x]
```

```
[Out] ArcTan[(a + b*x^4)^(1/4)/a^(1/4)]/(2*a^(1/4)) - ArcTanh[(a + b*x^
4)^(1/4)/a^(1/4)]/(2*a^(1/4))
```

Rubi in Sympy [A] time = 9.37665, size = 46, normalized size = 0.84

$$\frac{\operatorname{atan}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{2\sqrt[4]{a}}-\frac{\operatorname{atanh}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{2\sqrt[4]{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(b*x**4+a)**(1/4),x)
```

```
[Out] atan((a + b*x**4)**(1/4)/a**(1/4))/(2*a**(1/4)) - atanh((a + b*x*
*4)**(1/4)/a**(1/4))/(2*a**(1/4))
```

Mathematica [C] time = 0.0333406, size = 46, normalized size = 0.84

$$-\frac{\sqrt[4]{\frac{a}{bx^4}+1}\,{}_2F_1\left(\frac{1}{4},\frac{1}{4};\frac{5}{4};-\frac{a}{bx^4}\right)}{\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a + b*x^4)^(1/4)),x]
```

```
[Out] -(((1 + a/(b*x^4))^(1/4)*Hypergeometric2F1[1/4, 1/4, 5/4, -(a/(b*
x^4))])/(a + b*x^4)^(1/4))
```

Maple [F] time = 0.028, size = 0, normalized size = 0.

$$\int \frac{1}{x}\frac{1}{\sqrt[4]{bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(b*x^4+a)^(1/4),x)
```

```
[Out] int(1/x/(b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.281615, size = 105, normalized size = 1.91

$$-\frac{\arctan\left(\frac{a^{\frac{1}{4}}}{\sqrt{\sqrt{bx^4+a}+\sqrt{a}}+(bx^4+a)^{\frac{1}{4}}}\right)}{a^{\frac{1}{4}}} - \frac{\log\left((bx^4+a)^{\frac{1}{4}}+a^{\frac{1}{4}}\right)}{4\,a^{\frac{1}{4}}} + \frac{\log\left((bx^4+a)^{\frac{1}{4}}-a^{\frac{1}{4}}\right)}{4\,a^{\frac{1}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x),x, algorithm="fricas")
```

```
[Out] -arctan(a^(1/4)/(sqrt(sqrt(b*x^4 + a) + sqrt(a)) + (b*x^4 + a)^(1
/4)))/a^(1/4) - 1/4*log((b*x^4 + a)^(1/4) + a^(1/4))/a^(1/4) + 1/
4*log((b*x^4 + a)^(1/4) - a^(1/4))/a^(1/4)
```

Sympy [A] time = 3.62277, size = 37, normalized size = 0.67

$$-\frac{\Gamma\left(\frac{1}{4}\right) {}_2F_1\left(\begin{matrix}\frac{1}{4},\frac{1}{4}\\ \frac{5}{4}\end{matrix}\middle|\frac{ae^{i\pi}}{bx^4}\right)}{4\sqrt[4]{b}x\,\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(b*x**4+a)**(1/4),x)
```

```
[Out] -gamma(1/4)*hyper((1/4, 1/4), (5/4,), a*exp_polar(I*pi)/(b*x**4))
/(4*b**(1/4)*x*gamma(5/4))
```

GIAC/XCAS [A] time = 0.231199, size = 251, normalized size = 4.56

$$-\frac{\sqrt{2}\,(-a)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}+2\,(bx^4+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{4\,a} - \frac{\sqrt{2}\,(-a)^{\frac{3}{4}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}-2\,(bx^4+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{4\,a} + \frac{\sqrt{2}\,(-a)^{\frac{3}{4}}\ln\left(\sqrt{2}(bx^4+a)^{\frac{1}{4}}(-a)^{\frac{1}{4}}+\sqrt{bx^4+a}+\sqrt{-a}\right)}{8\,a} - \frac{\sqrt{2}\,(-a)^{\frac{3}{4}}\ln\left(-\sqrt{2}(bx^4+a)^{\frac{1}{4}}(-a)^{\frac{1}{4}}+\sqrt{bx^4+a}+\sqrt{-a}\right)}{8\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x),x, algorithm="giac")
```

```
[Out] -1/4*sqrt(2)*(-a)^(3/4)*arctan(1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) +
2*(b*x^4 + a)^(1/4))/(-a)^(1/4))/a - 1/4*sqrt(2)*(-a)^(3/4)*arcta
n(-1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) - 2*(b*x^4 + a)^(1/4))/(-a)^(1
/4))/a + 1/8*sqrt(2)*(-a)^(3/4)*ln(sqrt(2)*(b*x^4 + a)^(1/4)*(-a)
^(1/4) + sqrt(b*x^4 + a) + sqrt(-a))/a - 1/8*sqrt(2)*(-a)^(3/4)*l
n(-sqrt(2)*(b*x^4 + a)^(1/4)*(-a)^(1/4) + sqrt(b*x^4 + a) + sqrt(
-a))/a
```

3.1084 $\int \frac{1}{x^5 \sqrt[4]{a+bx^4}}\,dx$

Optimal. Leaf size=78

$$-\frac{b\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{8a^{5/4}}+\frac{b\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{8a^{5/4}}-\frac{\left(a+bx^4\right)^{3/4}}{4ax^4}$$

```
[Out] -(a + b*x^4)^(3/4)/(4*a*x^4) - (b*ArcTan[(a + b*x^4)^(1/4)/a^(1/4
)])/(8*a^(5/4)) + (b*ArcTanh[(a + b*x^4)^(1/4)/a^(1/4)])/(8*a^(5/
4))
```

Rubi [A] time = 0.112341, antiderivative size = 78, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$-\frac{b\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{8a^{5/4}}+\frac{b\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{8a^{5/4}}-\frac{\left(a+bx^4\right)^{3/4}}{4ax^4}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^5*(a + b*x^4)^(1/4)),x]
```

```
[Out] -(a + b*x^4)^(3/4)/(4*a*x^4) - (b*ArcTan[(a + b*x^4)^(1/4)/a^(1/4
)])/(8*a^(5/4)) + (b*ArcTanh[(a + b*x^4)^(1/4)/a^(1/4)])/(8*a^(5/
4))
```

Rubi in Sympy [A] time = 12.1201, size = 66, normalized size = 0.85

$$-\frac{\left(a+bx^4\right)^{\frac{3}{4}}}{4ax^4}-\frac{b\,\mathrm{atan}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{8a^{\frac{5}{4}}}+\frac{b\,\mathrm{atanh}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{8a^{\frac{5}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**5/(b*x**4+a)**(1/4),x)
```

```
[Out] -(a + b*x**4)**(3/4)/(4*a*x**4) - b*atan((a + b*x**4)**(1/4)/a**(
1/4))/(8*a**(5/4)) + b*atanh((a + b*x**4)**(1/4)/a**(1/4))/(8*a**
(5/4))
```

Mathematica [C] time = 0.0560111, size = 69, normalized size = 0.88

$$\frac{bx^4\sqrt[4]{\frac{a}{bx^4}+1}\,{}_2F_1\left(\frac{1}{4},\frac{1}{4};\frac{5}{4};-\frac{a}{bx^4}\right)-a-bx^4}{4ax^4\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^5*(a + b*x^4)^(1/4)),x]
```

```
[Out] (-a - b*x^4 + b*(1 + a/(b*x^4))^(1/4)*x^4*Hypergeometric2F1[1/4,
1/4, 5/4, -(a/(b*x^4))])/(4*a*x^4*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.047, size = 0, normalized size = 0.

$$\int \frac{1}{x^5}\frac{1}{\sqrt[4]{bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^5/(b*x^4+a)^(1/4),x)
```

```
[Out] int(1/x^5/(b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^5),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.330745, size = 247, normalized size = 3.17

$$\frac{4\,ax^4\left(\frac{b^4}{a^5}\right)^{\frac14}\arctan\left(\frac{a^4\left(\frac{b^4}{a^5}\right)^{\frac34}}{(bx^4+a)^{\frac14}b^3+\sqrt{a^3b^4\sqrt{\frac{b^4}{a^5}}+\sqrt{bx^4+a}\,ab^6}}\right)+ax^4\left(\frac{b^4}{a^5}\right)^{\frac14}\log\left(a^4\left(\frac{b^4}{a^5}\right)^{\frac34}+\left(bx^4+a\right)^{\frac14}b^3\right)-ax^4\left(\frac{b^4}{a^5}\right)^{\frac14}\log\left(-a^4\left(\frac{b^4}{a^5}\right.\right.}{16\,ax^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^5),x, algorithm="fricas")
```

```
[Out] 1/16*(4*a*x^4*(b^4/a^5)^(1/4)*arctan(a^4*(b^4/a^5)^(3/4)/((b*x^4
+ a)^(1/4)*b^3 + sqrt(a^3*b^4*sqrt(b^4/a^5) + sqrt(b*x^4 + a)*b^6
))) + a*x^4*(b^4/a^5)^(1/4)*log(a^4*(b^4/a^5)^(3/4) + (b*x^4 + a)
^(1/4)*b^3) - a*x^4*(b^4/a^5)^(1/4)*log(-a^4*(b^4/a^5)^(3/4) + (b
*x^4 + a)^(1/4)*b^3) - 4*(b*x^4 + a)^(3/4))/(a*x^4)
```

Sympy [A] time = 5.11182, size = 39, normalized size = 0.5

$$-\frac{\Gamma\left(\frac{5}{4}\right)\,{}_2F_1\left(\left.\begin{matrix}\frac{1}{4},\frac{5}{4}\\ \frac{9}{4}\end{matrix}\right|\frac{ae^{i\pi}}{bx^4}\right)}{4\sqrt[4]{b}x^5\,\Gamma\left(\frac{9}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**5/(b*x**4+a)**(1/4),x)
```

```
[Out] -gamma(5/4)*hyper((1/4, 5/4), (9/4,), a*exp_polar(I*pi)/(b*x**4))
/(4*b**(1/4)*x**5*gamma(9/4))
```

GIAC/XCAS [A] time = 0.226952, size = 281, normalized size = 3.6

$$\frac{1}{32}\,b\left(\frac{2\,\sqrt{2}\,(-a)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}+2\,(bx^4+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{a^2}+\frac{2\,\sqrt{2}\,(-a)^{\frac{3}{4}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}-2\,(bx^4+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{a^2}-\frac{\sqrt{2}\,(-a)^{\frac{3}{4}}\ln\left(\sqrt{2}\left(bx^4+a\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^5),x, algorithm="giac")
```

```
[Out] 1/32*b*(2*sqrt(2)*(-a)^(3/4)*arctan(1/2*sqrt(2)*(sqrt(2)*(-a)^(1/
4) + 2*(b*x^4 + a)^(1/4))/(-a)^(1/4))/a^2 + 2*sqrt(2)*(-a)^(3/4)*
arctan(-1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) - 2*(b*x^4 + a)^(1/4))/(-
a)^(1/4))/a^2 - sqrt(2)*(-a)^(3/4)*ln(sqrt(2)*(b*x^4 + a)^(1/4)*(
-a)^(1/4) + sqrt(b*x^4 + a) + sqrt(-a))/a^2 + sqrt(2)*(-a)^(3/4)*
ln(-sqrt(2)*(b*x^4 + a)^(1/4)*(-a)^(1/4) + sqrt(b*x^4 + a) + sqrt
(-a))/a^2 - 8*(b*x^4 + a)^(3/4)/(a*b*x^4))
```

3.1085 $\int \frac{1}{x^9 \sqrt[4]{a+bx^4}} \, dx$

Optimal. Leaf size=104

$$\frac{5b^2 \tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{9/4}} - \frac{5b^2 \tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{9/4}} + \frac{5b\left(a+bx^4\right)^{3/4}}{32a^2x^4} - \frac{\left(a+bx^4\right)^{3/4}}{8ax^8}$$

```
[Out] -(a + b*x^4)^(3/4)/(8*a*x^8) + (5*b*(a + b*x^4)^(3/4))/(32*a^2*x^
4) + (5*b^2*ArcTan[(a + b*x^4)^(1/4)/a^(1/4)])/(64*a^(9/4)) - (5*
b^2*ArcTanh[(a + b*x^4)^(1/4)/a^(1/4)])/(64*a^(9/4))
```

Rubi [A] time = 0.146527, antiderivative size = 104, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.4$

$$\frac{5b^2 \tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{9/4}} - \frac{5b^2 \tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{9/4}} + \frac{5b\left(a+bx^4\right)^{3/4}}{32a^2x^4} - \frac{\left(a+bx^4\right)^{3/4}}{8ax^8}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^9*(a + b*x^4)^(1/4)),x]
```

```
[Out] -(a + b*x^4)^(3/4)/(8*a*x^8) + (5*b*(a + b*x^4)^(3/4))/(32*a^2*x^
4) + (5*b^2*ArcTan[(a + b*x^4)^(1/4)/a^(1/4)])/(64*a^(9/4)) - (5*
b^2*ArcTanh[(a + b*x^4)^(1/4)/a^(1/4)])/(64*a^(9/4))
```

Rubi in Sympy [A] time = 16.0397, size = 95, normalized size = 0.91

$$-\frac{\left(a+bx^4\right)^{\frac{3}{4}}}{8ax^8} + \frac{5b\left(a+bx^4\right)^{\frac{3}{4}}}{32a^2x^4} + \frac{5b^2 \operatorname{atan}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{\frac{9}{4}}} - \frac{5b^2 \operatorname{atanh}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{\frac{9}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**9/(b*x**4+a)**(1/4),x)
```

```
[Out] -(a + b*x**4)**(3/4)/(8*a*x**8) + 5*b*(a + b*x**4)**(3/4)/(32*a**
2*x**4) + 5*b**2*atan((a + b*x**4)**(1/4)/a**(1/4))/(64*a**(9/4))
 - 5*b**2*atanh((a + b*x**4)**(1/4)/a**(1/4))/(64*a**(9/4))
```

Mathematica [C] time = 0.0677167, size = 82, normalized size = 0.79

$$\frac{-4a^2 - 5b^2x^8 \sqrt[4]{\frac{a}{bx^4}+1}\, {}_2F_1\left(\frac{1}{4},\frac{1}{4};\frac{5}{4};-\frac{a}{bx^4}\right) + abx^4 + 5b^2x^8}{32a^2x^8\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^9*(a + b*x^4)^(1/4)),x]
```

```
[Out] (-4*a^2 + a*b*x^4 + 5*b^2*x^8 - 5*b^2*(1 + a/(b*x^4))^(1/4)*x^8*H
ypergeometric2F1[1/4, 1/4, 5/4, -(a/(b*x^4))])/(32*a^2*x^8*(a + b
*x^4)^(1/4))
```

Maple [F] time = 0.048, size = 0, normalized size = 0.

$$\int \frac{1}{x^9}\frac{1}{\sqrt[4]{bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^9/(b*x^4+a)^(1/4),x)
```

```
[Out] int(1/x^9/(b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^9),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.280814, size = 274, normalized size = 2.63

$$-\frac{20\,a^2x^8\left(\frac{b^8}{a^9}\right)^{\frac{1}{4}}\arctan\left(\frac{a^7\left(\frac{b^8}{a^9}\right)^{\frac{3}{4}}}{(bx^4+a)^{\frac{1}{4}}b^6+\sqrt{a^5b^8\sqrt{\frac{b^8}{a^9}}+\sqrt{bx^4+a}b^{12}}}\right)+5\,a^2x^8\left(\frac{b^8}{a^9}\right)^{\frac{1}{4}}\log\left(125\,a^7\left(\frac{b^8}{a^9}\right)^{\frac{3}{4}}+125\,(bx^4+a)^{\frac{1}{4}}b^6\right)-5\,a^2x^8\left(\frac{b}{a}\right.}{128\,a^2x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^9),x, algorithm="fricas")
```

```
[Out] -1/128*(20*a^2*x^8*(b^8/a^9)^(1/4)*arctan(a^7*(b^8/a^9)^(3/4)/((b
*x^4 + a)^(1/4)*b^6 + sqrt(a^5*b^8*sqrt(b^8/a^9) + sqrt(b*x^4 + a
)*b^12))) + 5*a^2*x^8*(b^8/a^9)^(1/4)*log(125*a^7*(b^8/a^9)^(3/4)
 + 125*(b*x^4 + a)^(1/4)*b^6) - 5*a^2*x^8*(b^8/a^9)^(1/4)*log(-12
5*a^7*(b^8/a^9)^(3/4) + 125*(b*x^4 + a)^(1/4)*b^6) - 4*(5*b*x^4 -
 4*a)*(b*x^4 + a)^(3/4))/(a^2*x^8)
```

Sympy [A] time = 8.5868, size = 39, normalized size = 0.38

$$-\frac{\Gamma\left(\frac{9}{4}\right)\,{}_2F_1\left(\left.\begin{matrix}\frac{1}{4},\frac{9}{4}\\\frac{13}{4}\end{matrix}\right|\frac{ae^{i\pi}}{bx^4}\right)}{4\sqrt[4]{b}x^9\,\Gamma\left(\frac{13}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**9/(b*x**4+a)**(1/4),x)
```

```
[Out] -gamma(9/4)*hyper((1/4, 9/4), (13/4,), a*exp_polar(I*pi)/(b*x**4)
)/(4*b**(1/4)*x**9*gamma(13/4))
```

GIAC/XCAS [A] time = 0.232507, size = 305, normalized size = 2.93

$$-\frac{1}{256}\,b^2\left(\frac{10\,\sqrt{2}\,(-a)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}+2\,(bx^4+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{a^3}+\frac{10\,\sqrt{2}\,(-a)^{\frac{3}{4}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}-2\,(bx^4+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{a^3}-\frac{5\,\sqrt{2}\,(-a)^{\frac{3}{4}}\ln\left(\sqrt{2}\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^9),x, algorithm="giac")
```

```
[Out] -1/256*b^2*(10*sqrt(2)*(-a)^(3/4)*arctan(1/2*sqrt(2)*(sqrt(2)*(-a
)^(1/4) + 2*(b*x^4 + a)^(1/4))/(-a)^(1/4))/a^3 + 10*sqrt(2)*(-a)^
(3/4)*arctan(-1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) - 2*(b*x^4 + a)^(1/
4))/(-a)^(1/4))/a^3 - 5*sqrt(2)*(-a)^(3/4)*ln(sqrt(2)*(b*x^4 + a)
^(1/4)*(-a)^(1/4) + sqrt(b*x^4 + a) + sqrt(-a))/a^3 + 5*sqrt(2)*(
-a)^(3/4)*ln(-sqrt(2)*(b*x^4 + a)^(1/4)*(-a)^(1/4) + sqrt(b*x^4 +
 a) + sqrt(-a))/a^3 - 8*(5*(b*x^4 + a)^(7/4) - 9*(b*x^4 + a)^(3/4
)*a)/(a^2*b^2*x^8))
```

3.1086 $\int \frac{x^{13}}{\sqrt[4]{a+bx^4}}\,dx$

Optimal. Leaf size=152

$$\frac{8a^{7/2}\sqrt[4]{\frac{bx^4}{a}+1}E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{39b^{7/2}\sqrt[4]{a+bx^4}}-\frac{8a^3x^2}{39b^3\sqrt[4]{a+bx^4}}+\frac{4a^2x^2\left(a+bx^4\right)^{3/4}}{39b^3}-\frac{10ax^6\left(a+bx^4\right)^{3/4}}{117b^2}+\frac{x^{10}\left(a+bx^4\right)^{3/4}}{13b}$$

```
[Out] (-8*a^3*x^2)/(39*b^3*(a + b*x^4)^(1/4)) + (4*a^2*x^2*(a + b*x^4)^
(3/4))/(39*b^3) - (10*a*x^6*(a + b*x^4)^(3/4))/(117*b^2) + (x^10*
(a + b*x^4)^(3/4))/(13*b) + (8*a^(7/2)*(1 + (b*x^4)/a)^(1/4)*Elli
pticE[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(39*b^(7/2)*(a + b*x^4
)^(1/4))
```

Rubi [A] time = 0.223283, antiderivative size = 152, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{8a^{7/2}\sqrt[4]{\frac{bx^4}{a}+1}E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{39b^{7/2}\sqrt[4]{a+bx^4}}-\frac{8a^3x^2}{39b^3\sqrt[4]{a+bx^4}}+\frac{4a^2x^2\left(a+bx^4\right)^{3/4}}{39b^3}-\frac{10ax^6\left(a+bx^4\right)^{3/4}}{117b^2}+\frac{x^{10}\left(a+bx^4\right)^{3/4}}{13b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^13/(a + b*x^4)^(1/4),x]
```

```
[Out] (-8*a^3*x^2)/(39*b^3*(a + b*x^4)^(1/4)) + (4*a^2*x^2*(a + b*x^4)^
(3/4))/(39*b^3) - (10*a*x^6*(a + b*x^4)^(3/4))/(117*b^2) + (x^10*
(a + b*x^4)^(3/4))/(13*b) + (8*a^(7/2)*(1 + (b*x^4)/a)^(1/4)*Elli
pticE[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(39*b^(7/2)*(a + b*x^4
)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{4a^4\int^{x^2}\frac{1}{(a+bx^2)^{\frac{5}{4}}}\,dx}{39b^3}-\frac{8a^3x^2}{39b^3\sqrt[4]{a+bx^4}}+\frac{4a^2x^2\left(a+bx^4\right)^{\frac{3}{4}}}{39b^3}-\frac{10ax^6\left(a+bx^4\right)^{\frac{3}{4}}}{117b^2}+\frac{x^{10}\left(a+bx^4\right)^{\frac{3}{4}}}{13b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**13/(b*x**4+a)**(1/4),x)
```

```
[Out] 4*a**4*Integral((a + b*x**2)**(-5/4), (x, x**2))/(39*b**3) - 8*a*
*3*x**2/(39*b**3*(a + b*x**4)**(1/4)) + 4*a**2*x**2*(a + b*x**4)*
*(3/4)/(39*b**3) - 10*a*x**6*(a + b*x**4)**(3/4)/(117*b**2) + x**
10*(a + b*x**4)**(3/4)/(13*b)
```

Mathematica [C] time = 0.076458, size = 91, normalized size = 0.6

$$\frac{x^2\left(-12a^3\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{3}{2};-\frac{bx^4}{a}\right)+12a^3+2a^2bx^4-ab^2x^8+9b^3x^{12}\right)}{117b^3\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]   Integrate[x^13/(a + b*x^4)^(1/4),x]
```

```
[Out] (x^2*(12*a^3 + 2*a^2*b*x^4 - a*b^2*x^8 + 9*b^3*x^12 - 12*a^3*(1 +
 (b*x^4)/a)^(1/4)*Hypergeometric2F1[1/4, 1/2, 3/2, -((b*x^4)/a)])
)/(117*b^3*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.039, size = 0, normalized size = 0.

$$\int x^{13} \frac{1}{\sqrt[4]{bx^4 + a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^13/(b*x^4+a)^(1/4),x)
```

```
[Out] int(x^13/(b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{13}}{(bx^4 + a)^{\frac{1}{4}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^13/(b*x^4 + a)^(1/4),x, algorithm="maxima")
```

```
[Out] integrate(x^13/(b*x^4 + a)^(1/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{13}}{(bx^4 + a)^{\frac{1}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^13/(b*x^4 + a)^(1/4),x, algorithm="fricas")
```

```
[Out] integral(x^13/(b*x^4 + a)^(1/4), x)
```

Sympy [A] time = 8.56957, size = 27, normalized size = 0.18

$$\frac{x^{14}{}_2F_1\left(\begin{matrix}\frac{1}{4}, \frac{7}{2} \\ \frac{9}{2}\end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{14\sqrt[4]{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**13/(b*x**4+a)**(1/4),x)
```

```
[Out] x**14*hyper((1/4, 7/2), (9/2,), b*x**4*exp_polar(I*pi)/a)/(14*a**
(1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{13}}{(bx^4 + a)^{\frac{1}{4}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^13/(b*x^4 + a)^(1/4),x, algorithm="giac")
```

```
[Out] integrate(x^13/(b*x^4 + a)^(1/4), x)
```

3.1087 $\int \frac{x^9}{\sqrt[4]{a+bx^4}}\,dx$

Optimal. Leaf size=128

$$-\frac{4a^{5/2}\sqrt[4]{\frac{bx^4}{a}+1}E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{15b^{5/2}\sqrt[4]{a+bx^4}}+\frac{4a^2x^2}{15b^2\sqrt[4]{a+bx^4}}-\frac{2ax^2\left(a+bx^4\right)^{3/4}}{15b^2}+\frac{x^6\left(a+bx^4\right)^{3/4}}{9b}$$

```
[Out] (4*a^2*x^2)/(15*b^2*(a + b*x^4)^(1/4)) - (2*a*x^2*(a + b*x^4)^(3/
4))/(15*b^2) + (x^6*(a + b*x^4)^(3/4))/(9*b) - (4*a^(5/2)*(1 + (b
*x^4)/a)^(1/4)*EllipticE[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(15
*b^(5/2)*(a + b*x^4)^(1/4))
```

Rubi [A] time = 0.177607, antiderivative size = 128, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{4a^{5/2}\sqrt[4]{\frac{bx^4}{a}+1}E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{15b^{5/2}\sqrt[4]{a+bx^4}}+\frac{4a^2x^2}{15b^2\sqrt[4]{a+bx^4}}-\frac{2ax^2\left(a+bx^4\right)^{3/4}}{15b^2}+\frac{x^6\left(a+bx^4\right)^{3/4}}{9b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^9/(a + b*x^4)^(1/4),x]
```

```
[Out] (4*a^2*x^2)/(15*b^2*(a + b*x^4)^(1/4)) - (2*a*x^2*(a + b*x^4)^(3/
4))/(15*b^2) + (x^6*(a + b*x^4)^(3/4))/(9*b) - (4*a^(5/2)*(1 + (b
*x^4)/a)^(1/4)*EllipticE[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(15
*b^(5/2)*(a + b*x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{2a^2\int^{x^2}\frac{1}{\sqrt[4]{a+bx^2}}\,dx}{15b^2}-\frac{2ax^2\left(a+bx^4\right)^{\frac{3}{4}}}{15b^2}+\frac{x^6\left(a+bx^4\right)^{\frac{3}{4}}}{9b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**9/(b*x**4+a)**(1/4),x)
```

```
[Out] 2*a**2*Integral((a + b*x**2)**(-1/4), (x, x**2))/(15*b**2) - 2*a*
x**2*(a + b*x**4)**(3/4)/(15*b**2) + x**6*(a + b*x**4)**(3/4)/(9*
b)
```

Mathematica [C] time = 0.059169, size = 80, normalized size = 0.62

$$\frac{x^2\left(6a^2\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{3}{2};-\frac{bx^4}{a}\right)-6a^2-abx^4+5b^2x^8\right)}{45b^2\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^9/(a + b*x^4)^(1/4),x]
```

```
[Out] (x^2*(-6*a^2 - a*b*x^4 + 5*b^2*x^8 + 6*a^2*(1 + (b*x^4)/a)^(1/4)*
Hypergeometric2F1[1/4, 1/2, 3/2, -((b*x^4)/a)]))/(45*b^2*(a + b*x
```

```
^4)^(1/4))
```

Maple [F] time = 0.037, size = 0, normalized size = 0.

$$\int x^{9} \frac{1}{\sqrt[4]{b x^{4}+a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^9/(b*x^4+a)^(1/4),x)
```

```
[Out] int(x^9/(b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{9}}{(b x^{4}+a)^{\frac{1}{4}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(b*x^4 + a)^(1/4),x, algorithm="maxima")
```

```
[Out] integrate(x^9/(b*x^4 + a)^(1/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x^{9}}{(b x^{4}+a)^{\frac{1}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(b*x^4 + a)^(1/4),x, algorithm="fricas")
```

```
[Out] integral(x^9/(b*x^4 + a)^(1/4), x)
```

Sympy [A] time = 4.41651, size = 27, normalized size = 0.21

$$\frac{x^{10}{}_{2}F_{1}\left(\begin{matrix}\frac{1}{4}, \frac{5}{2} \\ \frac{7}{2}\end{matrix}\middle| \frac{b x^{4} e^{i\pi}}{a}\right)}{10\sqrt[4]{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**9/(b*x**4+a)**(1/4),x)
```

```
[Out] x**10*hyper((1/4, 5/2), (7/2,), b*x**4*exp_polar(I*pi)/a)/(10*a**
(1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{9}}{(b x^{4}+a)^{\frac{1}{4}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(b*x^4 + a)^(1/4),x, algorithm="giac")
```

```
[Out] integrate(x^9/(b*x^4 + a)^(1/4), x)
```

3.1088 $\int \frac{x^5}{\sqrt[4]{a+bx^4}}\,dx$

Optimal. Leaf size=104

$$\frac{2a^{3/2}\sqrt[4]{\frac{bx^4}{a}+1}E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{5b^{3/2}\sqrt[4]{a+bx^4}}+\frac{x^2\left(a+bx^4\right)^{3/4}}{5b}-\frac{2ax^2}{5b\sqrt[4]{a+bx^4}}$$

```
[Out] (-2*a*x^2)/(5*b*(a + b*x^4)^(1/4)) + (x^2*(a + b*x^4)^(3/4))/(5*b
) + (2*a^(3/2)*(1 + (b*x^4)/a)^(1/4)*EllipticE[ArcTan[(Sqrt[b]*x^
2)/Sqrt[a]]/2, 2])/(5*b^(3/2)*(a + b*x^4)^(1/4))
```

Rubi [A] time = 0.130058, antiderivative size = 104, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{2a^{3/2}\sqrt[4]{\frac{bx^4}{a}+1}E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{5b^{3/2}\sqrt[4]{a+bx^4}}+\frac{x^2\left(a+bx^4\right)^{3/4}}{5b}-\frac{2ax^2}{5b\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In] Int[x^5/(a + b*x^4)^(1/4),x]
```

```
[Out] (-2*a*x^2)/(5*b*(a + b*x^4)^(1/4)) + (x^2*(a + b*x^4)^(3/4))/(5*b
) + (2*a^(3/2)*(1 + (b*x^4)/a)^(1/4)*EllipticE[ArcTan[(Sqrt[b]*x^
2)/Sqrt[a]]/2, 2])/(5*b^(3/2)*(a + b*x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^2\int^{x^2}\frac{1}{(a+bx^2)^{\frac{5}{4}}}\,dx}{5b}-\frac{2ax^2}{5b\sqrt[4]{a+bx^4}}+\frac{x^2\left(a+bx^4\right)^{\frac{3}{4}}}{5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**5/(b*x**4+a)**(1/4),x)
```

```
[Out] a**2*Integral((a + b*x**2)**(-5/4), (x, x**2))/(5*b) - 2*a*x**2/(
5*b*(a + b*x**4)**(1/4)) + x**2*(a + b*x**4)**(3/4)/(5*b)
```

Mathematica [C] time = 0.0533053, size = 64, normalized size = 0.62

$$\frac{x^2\left(-a\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{3}{2};-\frac{bx^4}{a}\right)+a+bx^4\right)}{5b\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5/(a + b*x^4)^(1/4),x]
```

```
[Out] (x^2*(a + b*x^4 - a*(1 + (b*x^4)/a)^(1/4)*Hypergeometric2F1[1/4,
1/2, 3/2, -((b*x^4)/a)]))/(5*b*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.037, size = 0, normalized size = 0.

$$\int x^5 \frac{1}{\sqrt[4]{bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(b*x^4+a)^(1/4),x)

[Out] int(x^5/(b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^5}{(bx^4+a)^{\frac{1}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^4 + a)^(1/4),x, algorithm="maxima")

[Out] integrate(x^5/(b*x^4 + a)^(1/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^5}{(bx^4+a)^{\frac{1}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^4 + a)^(1/4),x, algorithm="fricas")

[Out] integral(x^5/(b*x^4 + a)^(1/4), x)
```

Sympy [A] time = 2.67598, size = 27, normalized size = 0.26

$$\frac{x^6 {}_2F_1\left(\begin{matrix} \frac{1}{4}, \frac{3}{2} \\ \frac{5}{2} \end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{6\sqrt[4]{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(b*x**4+a)**(1/4),x)

[Out] x**6*hyper((1/4, 3/2), (5/2,), b*x**4*exp_polar(I*pi)/a)/(6*a**(1
/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^5}{(bx^4+a)^{\frac{1}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^4 + a)^(1/4),x, algorithm="giac")

[Out] integrate(x^5/(b*x^4 + a)^(1/4), x)
```

3.1089 $\int \frac{x}{\sqrt[4]{a+bx^4}}\,dx$

Optimal. Leaf size=74

$$\frac{x^2}{\sqrt[4]{a+bx^4}}-\frac{\sqrt{a}\sqrt[4]{\frac{bx^4}{a}+1}E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{\sqrt{b}\sqrt[4]{a+bx^4}}$$

```
[Out] x^2/(a + b*x^4)^(1/4) - (Sqrt[a]*(1 + (b*x^4)/a)^(1/4)*EllipticE[
ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(Sqrt[b]*(a + b*x^4)^(1/4))
```

Rubi [A] time = 0.0851433, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{x^2}{\sqrt[4]{a+bx^4}}-\frac{\sqrt{a}\sqrt[4]{\frac{bx^4}{a}+1}E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{\sqrt{b}\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b*x^4)^(1/4),x]
```

```
[Out] x^2/(a + b*x^4)^(1/4) - (Sqrt[a]*(1 + (b*x^4)/a)^(1/4)*EllipticE[
ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(Sqrt[b]*(a + b*x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int^{x^2}\frac{1}{\sqrt[4]{a+bx^2}}\,dx}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(b*x**4+a)**(1/4),x)
```

```
[Out] Integral((a + b*x**2)**(-1/4), (x, x**2))/2
```

Mathematica [C] time = 0.0303462, size = 52, normalized size = 0.7

$$\frac{x^2\sqrt[4]{\frac{a+bx^4}{a}}\,{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{3}{2};-\frac{bx^4}{a}\right)}{2\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b*x^4)^(1/4),x]
```

```
[Out] (x^2*((a + b*x^4)/a)^(1/4)*Hypergeometric2F1[1/4, 1/2, 3/2, -((b*
x^4)/a)])/(2*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.027, size = 0, normalized size = 0.

$$\int x\frac{1}{\sqrt[4]{bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x/(b*x^4+a)^(1/4),x)
```

```
[Out] int(x/(b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{(bx^4+a)^{\frac{1}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(b*x^4 + a)^(1/4),x, algorithm="maxima")
```

```
[Out] integrate(x/(b*x^4 + a)^(1/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x}{(bx^4+a)^{\frac{1}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(b*x^4 + a)^(1/4),x, algorithm="fricas")
```

```
[Out] integral(x/(b*x^4 + a)^(1/4), x)
```

Sympy [A] time = 2.20951, size = 27, normalized size = 0.36

$$\frac{x^2 {}_2F_1\left(\begin{matrix} \frac{1}{4}, \frac{1}{2} \\ \frac{3}{2} \end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{2\sqrt[4]{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(b*x**4+a)**(1/4),x)
```

```
[Out] x**2*hyper((1/4, 1/2), (3/2,), b*x**4*exp_polar(I*pi)/a)/(2*a**(1
/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{(bx^4+a)^{\frac{1}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(b*x^4 + a)^(1/4),x, algorithm="giac")
```

```
[Out] integrate(x/(b*x^4 + a)^(1/4), x)
```

3.1090 $\int \frac{1}{x^3 \sqrt[4]{a + bx^4}} \, dx$

Optimal. Leaf size=104

$$\frac{bx^2}{2a\sqrt[4]{a+bx^4}} - \frac{\left(a+bx^4\right)^{3/4}}{2ax^2} - \frac{\sqrt{b}\sqrt[4]{\frac{bx^4}{a}+1}E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{2\sqrt{a}\sqrt[4]{a+bx^4}}$$

```
[Out] (b*x^2)/(2*a*(a + b*x^4)^(1/4)) - (a + b*x^4)^(3/4)/(2*a*x^2) - (
Sqrt[b]*(1 + (b*x^4)/a)^(1/4)*EllipticE[ArcTan[(Sqrt[b]*x^2)/Sqrt
[a]]/2, 2])/(2*Sqrt[a]*(a + b*x^4)^(1/4))
```

Rubi [A] time = 0.128741, antiderivative size = 104, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{bx^2}{2a\sqrt[4]{a+bx^4}} - \frac{\left(a+bx^4\right)^{3/4}}{2ax^2} - \frac{\sqrt{b}\sqrt[4]{\frac{bx^4}{a}+1}E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{2\sqrt{a}\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(a + b*x^4)^(1/4)),x]
```

```
[Out] (b*x^2)/(2*a*(a + b*x^4)^(1/4)) - (a + b*x^4)^(3/4)/(2*a*x^2) - (
Sqrt[b]*(1 + (b*x^4)/a)^(1/4)*EllipticE[ArcTan[(Sqrt[b]*x^2)/Sqrt
[a]]/2, 2])/(2*Sqrt[a]*(a + b*x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{b\int^{x^2}\frac{1}{\left(a+bx^2\right)^{\frac{5}{4}}}\,dx}{4} + \frac{bx^2}{2a\sqrt[4]{a+bx^4}} - \frac{\left(a+bx^4\right)^{\frac{3}{4}}}{2ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(b*x**4+a)**(1/4),x)
```

```
[Out] -b*Integral((a + b*x**2)**(-5/4), (x, x**2))/4 + b*x**2/(2*a*(a +
 b*x**4)**(1/4)) - (a + b*x**4)**(3/4)/(2*a*x**2)
```

Mathematica [C] time = 0.0491708, size = 69, normalized size = 0.66

$$\frac{bx^4\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{3}{2};-\frac{bx^4}{a}\right) - 2\left(a+bx^4\right)}{4ax^2\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*(a + b*x^4)^(1/4)),x]
```

```
[Out] (-2*(a + b*x^4) + b*x^4*(1 + (b*x^4)/a)^(1/4)*Hypergeometric2F1[1
/4, 1/2, 3/2, -((b*x^4)/a)])/(4*a*x^2*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.039, size = 0, normalized size = 0.

$$\int \frac{1}{x^3}\frac{1}{\sqrt[4]{bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(b*x^4+a)^(1/4),x)
```

```
[Out] int(1/x^3/(b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bx^4+a\right)^{\frac{1}{4}}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^3),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x^4 + a)^(1/4)*x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\left(bx^4+a\right)^{\frac{1}{4}}x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^3),x, algorithm="fricas")
```

```
[Out] integral(1/((b*x^4 + a)^(1/4)*x^3), x)
```

Sympy [A] time = 2.68967, size = 31, normalized size = 0.3

$$-\frac{{}_2F_1\left(\begin{matrix}-\frac{1}{2},\frac{1}{4}\\ \frac{1}{2}\end{matrix}\middle|\frac{bx^4e^{i\pi}}{a}\right)}{2\sqrt[4]{a}x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(b*x**4+a)**(1/4),x)
```

```
[Out] -hyper((-1/2, 1/4), (1/2,), b*x**4*exp_polar(I*pi)/a)/(2*a**(1/4)
*x**2)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bx^4+a\right)^{\frac{1}{4}}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^3),x, algorithm="giac")

[Out] integrate(1/((b*x^4 + a)^(1/4)*x^3), x)
```

3.1091 $\int \frac{1}{x^7 \sqrt[4]{a+bx^4}} dx$

Optimal. Leaf size=128

$$\frac{b^{3/2}\sqrt[4]{\frac{bx^4}{a}+1}E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{4a^{3/2}\sqrt[4]{a+bx^4}}-\frac{b^2x^2}{4a^2\sqrt[4]{a+bx^4}}+\frac{b\left(a+bx^4\right)^{3/4}}{4a^2x^2}-\frac{\left(a+bx^4\right)^{3/4}}{6ax^6}$$

```
[Out] -(b^2*x^2)/(4*a^2*(a + b*x^4)^(1/4)) - (a + b*x^4)^(3/4)/(6*a*x^6
) + (b*(a + b*x^4)^(3/4))/(4*a^2*x^2) + (b^(3/2)*(1 + (b*x^4)/a)^
(1/4)*EllipticE[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(4*a^(3/2)*(
a + b*x^4)^(1/4))
```

Rubi [A] time = 0.172179, antiderivative size = 128, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{b^{3/2}\sqrt[4]{\frac{bx^4}{a}+1}E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{4a^{3/2}\sqrt[4]{a+bx^4}}-\frac{b^2x^2}{4a^2\sqrt[4]{a+bx^4}}+\frac{b\left(a+bx^4\right)^{3/4}}{4a^2x^2}-\frac{\left(a+bx^4\right)^{3/4}}{6ax^6}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^7*(a + b*x^4)^(1/4)),x]
```

```
[Out] -(b^2*x^2)/(4*a^2*(a + b*x^4)^(1/4)) - (a + b*x^4)^(3/4)/(6*a*x^6
) + (b*(a + b*x^4)^(3/4))/(4*a^2*x^2) + (b^(3/2)*(1 + (b*x^4)/a)^
(1/4)*EllipticE[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(4*a^(3/2)*(
a + b*x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\left(a+bx^4\right)^{\frac{3}{4}}}{6ax^6}-\frac{b^2\int^{x^2}\frac{1}{\sqrt[4]{a+bx^2}}dx}{8a^2}+\frac{b\left(a+bx^4\right)^{\frac{3}{4}}}{4a^2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**7/(b*x**4+a)**(1/4),x)
```

```
[Out] -(a + b*x**4)**(3/4)/(6*a*x**6) - b**2*Integral((a + b*x**2)**(-1
/4), (x, x**2))/(8*a**2) + b*(a + b*x**4)**(3/4)/(4*a**2*x**2)
```

Mathematica [C] time = 0.059074, size = 83, normalized size = 0.65

$$\frac{-4a^2-3b^2x^8\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{3}{2};-\frac{bx^4}{a}\right)+2abx^4+6b^2x^8}{24a^2x^6\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^7*(a + b*x^4)^(1/4)),x]
```

```
[Out] (-4*a^2 + 2*a*b*x^4 + 6*b^2*x^8 - 3*b^2*x^8*(1 + (b*x^4)/a)^(1/4)
*Hypergeometric2F1[1/4, 1/2, 3/2, -((b*x^4)/a)])/(24*a^2*x^6*(a +
 b*x^4)^(1/4))
```

Maple [F] time = 0.043, size = 0, normalized size = 0.

$$\int \frac{1}{x^{7}} \frac{1}{\sqrt[4]{b x^{4}+a}} d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^7/(b*x^4+a)^(1/4),x)

[Out] int(1/x^7/(b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(b x^{4}+a\right)^{\frac{1}{4}} x^{7}} d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^7),x, algorithm="maxima")

[Out] integrate(1/((b*x^4 + a)^(1/4)*x^7), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\left(b x^{4}+a\right)^{\frac{1}{4}} x^{7}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^7),x, algorithm="fricas")

[Out] integral(1/((b*x^4 + a)^(1/4)*x^7), x)
```

Sympy [A] time = 4.494, size = 32, normalized size = 0.25

$$-\frac{{}_{2}F_{1}\left(\begin{matrix} -\frac{3}{2}, \frac{1}{4} \\ -\frac{1}{2} \end{matrix}\middle| \frac{b x^{4} e^{i \pi}}{a}\right)}{6 \sqrt[4]{a} x^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**7/(b*x**4+a)**(1/4),x)

[Out] -hyper((-3/2, 1/4), (-1/2,), b*x**4*exp_polar(I*pi)/a)/(6*a**(1/4
)*x**6)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(b x^{4}+a\right)^{\frac{1}{4}} x^{7}} d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^7),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^4 + a)^(1/4)*x^7), x)
```

3.1092 $\int \frac{1}{x^{11}\sqrt[4]{a+bx^4}}\,dx$

Optimal. Leaf size=152

$$-\frac{7b^{5/2}\sqrt[4]{\frac{bx^4}{a}+1}E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{40a^{5/2}\sqrt[4]{a+bx^4}}+\frac{7b^3x^2}{40a^3\sqrt[4]{a+bx^4}}-\frac{7b^2\left(a+bx^4\right)^{3/4}}{40a^3x^2}+\frac{7b\left(a+bx^4\right)^{3/4}}{60a^2x^6}-\frac{\left(a+bx^4\right)^{3/4}}{10ax^{10}}$$

```
[Out] (7*b^3*x^2)/(40*a^3*(a + b*x^4)^(1/4)) - (a + b*x^4)^(3/4)/(10*a*
x^10) + (7*b*(a + b*x^4)^(3/4))/(60*a^2*x^6) - (7*b^2*(a + b*x^4)
^(3/4))/(40*a^3*x^2) - (7*b^(5/2)*(1 + (b*x^4)/a)^(1/4)*EllipticE
[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(40*a^(5/2)*(a + b*x^4)^(1/
4))
```

Rubi [A] time = 0.21462, antiderivative size = 152, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{7b^{5/2}\sqrt[4]{\frac{bx^4}{a}+1}E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{40a^{5/2}\sqrt[4]{a+bx^4}}+\frac{7b^3x^2}{40a^3\sqrt[4]{a+bx^4}}-\frac{7b^2\left(a+bx^4\right)^{3/4}}{40a^3x^2}+\frac{7b\left(a+bx^4\right)^{3/4}}{60a^2x^6}-\frac{\left(a+bx^4\right)^{3/4}}{10ax^{10}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^11*(a + b*x^4)^(1/4)),x]
```

```
[Out] (7*b^3*x^2)/(40*a^3*(a + b*x^4)^(1/4)) - (a + b*x^4)^(3/4)/(10*a*
x^10) + (7*b*(a + b*x^4)^(3/4))/(60*a^2*x^6) - (7*b^2*(a + b*x^4)
^(3/4))/(40*a^3*x^2) - (7*b^(5/2)*(1 + (b*x^4)/a)^(1/4)*EllipticE
[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(40*a^(5/2)*(a + b*x^4)^(1/
4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\left(a+bx^4\right)^{\frac{3}{4}}}{10ax^{10}}-\frac{7b^3\int^{x^2}\frac{1}{(a+bx^2)^{\frac{5}{4}}}\,dx}{80a^2}+\frac{7b\left(a+bx^4\right)^{\frac{3}{4}}}{60a^2x^6}+\frac{7b^3x^2}{40a^3\sqrt[4]{a+bx^4}}-\frac{7b^2\left(a+bx^4\right)^{\frac{3}{4}}}{40a^3x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**11/(b*x**4+a)**(1/4),x)
```

```
[Out] -(a + b*x**4)**(3/4)/(10*a*x**10) - 7*b**3*Integral((a + b*x**2)*
*(-5/4), (x, x**2))/(80*a**2) + 7*b*(a + b*x**4)**(3/4)/(60*a**2*
x**6) + 7*b**3*x**2/(40*a**3*(a + b*x**4)**(1/4)) - 7*b**2*(a + b
*x**4)**(3/4)/(40*a**3*x**2)
```

Mathematica [C] time = 0.0664678, size = 94, normalized size = 0.62

$$\frac{-24a^3+4a^2bx^4+21b^3x^{12}\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{3}{2};-\frac{bx^4}{a}\right)-14ab^2x^8-42b^3x^{12}}{240a^3x^{10}\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^11*(a + b*x^4)^(1/4)),x]
```

```
[Out] (-24*a^3 + 4*a^2*b*x^4 - 14*a*b^2*x^8 - 42*b^3*x^12 + 21*b^3*x^12
*(1 + (b*x^4)/a)^(1/4)*Hypergeometric2F1[1/4, 1/2, 3/2, -((b*x^4)
/a)])/(240*a^3*x^10*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.048, size = 0, normalized size = 0.

$$\int \frac{1}{x^{11}} \frac{1}{\sqrt[4]{bx^4 + a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^11/(b*x^4+a)^(1/4),x)
```

```
[Out] int(1/x^11/(b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4 + a)^{\frac{1}{4}} x^{11}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^11),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x^4 + a)^(1/4)*x^11), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{(bx^4 + a)^{\frac{1}{4}} x^{11}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^11),x, algorithm="fricas")
```

```
[Out] integral(1/((b*x^4 + a)^(1/4)*x^11), x)
```

Sympy [A] time = 8.88039, size = 32, normalized size = 0.21

$$-\frac{{}_2F_1\left(\begin{matrix} -\frac{5}{2}, \frac{1}{4} \\ -\frac{3}{2} \end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{10\sqrt[4]{a}x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**11/(b*x**4+a)**(1/4),x)
```

```
[Out] -hyper((-5/2, 1/4), (-3/2,), b*x**4*exp_polar(I*pi)/a)/(10*a**(1/
4)*x**10)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bx^4 + a\right)^{\frac{1}{4}} x^{11}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^11),x, algorithm="giac")

[Out] integrate(1/((b*x^4 + a)^(1/4)*x^11), x)
```

3.1093 $\int \frac{x^8}{\sqrt[4]{a+bx^4}}\,dx$

Optimal. Leaf size=104

$$\frac{5a^2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{9/4}}+\frac{5a^2\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{9/4}}-\frac{5ax\left(a+bx^4\right)^{3/4}}{32b^2}+\frac{x^5\left(a+bx^4\right)^{3/4}}{8b}$$

```
[Out] (-5*a*x*(a + b*x^4)^(3/4))/(32*b^2) + (x^5*(a + b*x^4)^(3/4))/(8*
b) + (5*a^2*ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(64*b^(9/4)) +
 (5*a^2*ArcTanh[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(64*b^(9/4))
```

Rubi [A] time = 0.0930655, antiderivative size = 104, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{5a^2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{9/4}}+\frac{5a^2\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{9/4}}-\frac{5ax\left(a+bx^4\right)^{3/4}}{32b^2}+\frac{x^5\left(a+bx^4\right)^{3/4}}{8b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8/(a + b*x^4)^(1/4),x]
```

```
[Out] (-5*a*x*(a + b*x^4)^(3/4))/(32*b^2) + (x^5*(a + b*x^4)^(3/4))/(8*
b) + (5*a^2*ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(64*b^(9/4)) +
 (5*a^2*ArcTanh[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(64*b^(9/4))
```

Rubi in Sympy [A] time = 11.2712, size = 97, normalized size = 0.93

$$\frac{5a^2\operatorname{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{\frac{9}{4}}}+\frac{5a^2\operatorname{atanh}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{\frac{9}{4}}}-\frac{5ax\left(a+bx^4\right)^{\frac{3}{4}}}{32b^2}+\frac{x^5\left(a+bx^4\right)^{\frac{3}{4}}}{8b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8/(b*x**4+a)**(1/4),x)
```

```
[Out] 5*a**2*atan(b**(1/4)*x/(a + b*x**4)**(1/4))/(64*b**(9/4)) + 5*a**
2*atanh(b**(1/4)*x/(a + b*x**4)**(1/4))/(64*b**(9/4)) - 5*a*x*(a
+ b*x**4)**(3/4)/(32*b**2) + x**5*(a + b*x**4)**(3/4)/(8*b)
```

Mathematica [A] time = 0.1428, size = 112, normalized size = 1.08

$$\frac{5a^2\left(-\log\left(1-\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)+\log\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}+1\right)+2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)\right)}{128b^{9/4}}+\left(a+bx^4\right)^{3/4}\left(\frac{x^5}{8b}-\frac{5ax}{32b^2}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8/(a + b*x^4)^(1/4),x]
```

```
[Out] (a + b*x^4)^(3/4)*((-5*a*x)/(32*b^2) + x^5/(8*b)) + (5*a^2*(2*Arc
Tan[(b^(1/4)*x)/(a + b*x^4)^(1/4)] - Log[1 - (b^(1/4)*x)/(a + b*x
^4)^(1/4)] + Log[1 + (b^(1/4)*x)/(a + b*x^4)^(1/4)]))/(128*b^(9/4
))
```

Maple [F] time = 0.037, size = 0, normalized size = 0.

$$\int x^8 \frac{1}{\sqrt[4]{bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8/(b*x^4+a)^(1/4),x)
```

```
[Out] int(x^8/(b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^4 + a)^(1/4),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.276555, size = 285, normalized size = 2.74

$$\frac{20\,b^2\left(\frac{a^8}{b^9}\right)^{\frac{1}{4}}\arctan\left(\frac{b^7x\left(\frac{a^8}{b^9}\right)^{\frac{3}{4}}}{(bx^4+a)^{\frac{1}{4}}a^6+x\sqrt{\frac{a^8b^5x^2\sqrt{\frac{a^8}{b^9}}+\sqrt{bx^4+a}a^{12}}{x^2}}}\right)+5\,b^2\left(\frac{a^8}{b^9}\right)^{\frac{1}{4}}\log\left(\frac{125\left(b^7x\left(\frac{a^8}{b^9}\right)^{\frac{3}{4}}+(bx^4+a)^{\frac{1}{4}}a^6\right)}{x}\right)-5\,b^2\left(\frac{a^8}{b^9}\right)^{\frac{1}{4}}\log\left(-\frac{125\left(\right.}{}\right.}{128\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^4 + a)^(1/4),x, algorithm="fricas")
```

```
[Out] 1/128*(20*b^2*(a^8/b^9)^(1/4)*arctan(b^7*x*(a^8/b^9)^(3/4)/((b*x^
4 + a)^(1/4)*a^6 + x*sqrt((a^8*b^5*x^2*sqrt(a^8/b^9) + sqrt(b*x^4
 + a)*a^12)/x^2))) + 5*b^2*(a^8/b^9)^(1/4)*log(125*(b^7*x*(a^8/b^
9)^(3/4) + (b*x^4 + a)^(1/4)*a^6)/x) - 5*b^2*(a^8/b^9)^(1/4)*log(
-125*(b^7*x*(a^8/b^9)^(3/4) - (b*x^4 + a)^(1/4)*a^6)/x) + 4*(4*b*
x^5 - 5*a*x)*(b*x^4 + a)^(3/4))/b^2
```

Sympy [A] time = 6.08321, size = 37, normalized size = 0.36

$$\frac{x^9\,\Gamma\left(\frac{9}{4}\right)\,{}_2F_1\left(\left.\begin{matrix}\frac{1}{4},\frac{9}{4}\\ \frac{13}{4}\end{matrix}\right|\frac{bx^4e^{i\pi}}{a}\right)}{4\sqrt[4]{a}\,\Gamma\left(\frac{13}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8/(b*x**4+a)**(1/4),x)
```

```
[Out] x**9*gamma(9/4)*hyper((1/4, 9/4), (13/4,), b*x**4*exp_polar(I*pi)
/a)/(4*a**(1/4)*gamma(13/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^8}{(bx^4+a)^{\frac{1}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^4 + a)^(1/4),x, algorithm="giac")

[Out] integrate(x^8/(b*x^4 + a)^(1/4), x)
```

3.1094 $\int \frac{x^4}{\sqrt[4]{a+bx^4}}\,dx$

Optimal. Leaf size=78

$$-\frac{a\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{8b^{5/4}}-\frac{a\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{8b^{5/4}}+\frac{x\left(a+bx^4\right)^{3/4}}{4b}$$

```
[Out] (x*(a + b*x^4)^(3/4))/(4*b) - (a*ArcTan[(b^(1/4)*x)/(a + b*x^4)^(
1/4)])/(8*b^(5/4)) - (a*ArcTanh[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(
8*b^(5/4))
```

Rubi [A] time = 0.0603056, antiderivative size = 78, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{a\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{8b^{5/4}}-\frac{a\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{8b^{5/4}}+\frac{x\left(a+bx^4\right)^{3/4}}{4b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a + b*x^4)^(1/4),x]
```

```
[Out] (x*(a + b*x^4)^(3/4))/(4*b) - (a*ArcTan[(b^(1/4)*x)/(a + b*x^4)^(
1/4)])/(8*b^(5/4)) - (a*ArcTanh[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(
8*b^(5/4))
```

Rubi in Sympy [A] time = 7.66322, size = 68, normalized size = 0.87

$$-\frac{a\,\mathrm{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{8b^{\frac{5}{4}}}-\frac{a\,\mathrm{atanh}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{8b^{\frac{5}{4}}}+\frac{x\left(a+bx^4\right)^{\frac{3}{4}}}{4b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(b*x**4+a)**(1/4),x)
```

```
[Out] -a*atan(b**(1/4)*x/(a + b*x**4)**(1/4))/(8*b**(5/4)) - a*atanh(b*
*(1/4)*x/(a + b*x**4)**(1/4))/(8*b**(5/4)) + x*(a + b*x**4)**(3/4
)/(4*b)
```

Mathematica [A] time = 0.0618962, size = 97, normalized size = 1.24

$$\frac{x\left(a+bx^4\right)^{3/4}}{4b}-\frac{a\left(-\log\left(1-\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)+\log\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}+1\right)+2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)\right)}{16b^{5/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(a + b*x^4)^(1/4),x]
```

```
[Out] (x*(a + b*x^4)^(3/4))/(4*b) - (a*(2*ArcTan[(b^(1/4)*x)/(a + b*x^4
)^(1/4)] - Log[1 - (b^(1/4)*x)/(a + b*x^4)^(1/4)] + Log[1 + (b^(1
/4)*x)/(a + b*x^4)^(1/4)]))/(16*b^(5/4))
```

Maple [F] time = 0.036, size = 0, normalized size = 0.

$$\int x^4 \frac{1}{\sqrt[4]{bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(b*x^4+a)^(1/4),x)
```

```
[Out] int(x^4/(b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^4 + a)^(1/4),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.282128, size = 261, normalized size = 3.35

$$-\frac{4\,b\left(\frac{a^4}{b^5}\right)^{\frac{1}{4}}\arctan\left(\frac{b^4x\left(\frac{a^4}{b^5}\right)^{\frac{3}{4}}}{(bx^4+a)^{\frac{1}{4}}a^3+x\sqrt{\frac{a^4b^3x^2\sqrt{\frac{a^4}{b^5}}+\sqrt{bx^4+a}a^6}{x^2}}}\right)+b\left(\frac{a^4}{b^5}\right)^{\frac{1}{4}}\log\left(\frac{b^4x\left(\frac{a^4}{b^5}\right)^{\frac{3}{4}}+(bx^4+a)^{\frac{1}{4}}a^3}{x}\right)-b\left(\frac{a^4}{b^5}\right)^{\frac{1}{4}}\log\left(-\frac{b^4x\left(\frac{a^4}{b^5}\right)^{\frac{3}{4}}-(bx^4+a}{x}\right.}{16\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^4 + a)^(1/4),x, algorithm="fricas")
```

```
[Out] -1/16*(4*b*(a^4/b^5)^(1/4)*arctan(b^4*x*(a^4/b^5)^(3/4)/((b*x^4 +
 a)^(1/4)*a^3 + x*sqrt((a^4*b^3*x^2*sqrt(a^4/b^5) + sqrt(b*x^4 +
a)*a^6)/x^2))) + b*(a^4/b^5)^(1/4)*log((b^4*x*(a^4/b^5)^(3/4) + (
b*x^4 + a)^(1/4)*a^3)/x) - b*(a^4/b^5)^(1/4)*log(-(b^4*x*(a^4/b^5
)^(3/4) - (b*x^4 + a)^(1/4)*a^3)/x) - 4*(b*x^4 + a)^(3/4)*x)/b
```

Sympy [A] time = 4.2417, size = 37, normalized size = 0.47

$$\frac{x^5\,\Gamma\left(\frac{5}{4}\right)\,{}_2F_1\left(\left.\begin{matrix}\frac{1}{4},\frac{5}{4}\\\frac{9}{4}\end{matrix}\right|\frac{bx^4e^{i\pi}}{a}\right)}{4\sqrt[4]{a}\,\Gamma\left(\frac{9}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(b*x**4+a)**(1/4),x)
```

```
[Out] x**5*gamma(5/4)*hyper((1/4, 5/4), (9/4,), b*x**4*exp_polar(I*pi)/
a)/(4*a**(1/4)*gamma(9/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{(bx^4+a)^{\frac{1}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^4 + a)^(1/4),x, algorithm="giac")
```

```
[Out] integrate(x^4/(b*x^4 + a)^(1/4), x)
```

3.1095 $\int \frac{1}{\sqrt[4]{a+bx^4}}\,dx$

Optimal. Leaf size=57

$$\frac{\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{2\sqrt[4]{b}}+\frac{\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{2\sqrt[4]{b}}$$

```
[Out] ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/4)]/(2*b^(1/4)) + ArcTanh[(b^(1
/4)*x)/(a + b*x^4)^(1/4)]/(2*b^(1/4))
```

Rubi [A] time = 0.0334872, antiderivative size = 57, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364

$$\frac{\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{2\sqrt[4]{b}}+\frac{\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{2\sqrt[4]{b}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(-1/4),x]
```

```
[Out] ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/4)]/(2*b^(1/4)) + ArcTanh[(b^(1
/4)*x)/(a + b*x^4)^(1/4)]/(2*b^(1/4))
```

Rubi in Sympy [A] time = 4.0425, size = 49, normalized size = 0.86

$$\frac{\operatorname{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{2\sqrt[4]{b}}+\frac{\operatorname{atanh}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{2\sqrt[4]{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**4+a)**(1/4),x)
```

```
[Out] atan(b**(1/4)*x/(a + b*x**4)**(1/4))/(2*b**(1/4)) + atanh(b**(1/4
)*x/(a + b*x**4)**(1/4))/(2*b**(1/4))
```

Mathematica [A] time = 0.011137, size = 76, normalized size = 1.33

$$\frac{-\log\left(1-\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)+\log\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}+1\right)+2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{4\sqrt[4]{b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(-1/4),x]
```

```
[Out] (2*ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/4)] - Log[1 - (b^(1/4)*x)/(a
 + b*x^4)^(1/4)] + Log[1 + (b^(1/4)*x)/(a + b*x^4)^(1/4)])/(4*b^(
1/4))
```

Maple [F] time = 0.051, size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt[4]{bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^4+a)^(1/4),x)
```

```
[Out] int(1/(b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(-1/4),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.289285, size = 136, normalized size = 2.39

$$\frac{\arctan\left(\frac{b^{\frac{1}{4}}x}{x\sqrt{\frac{\sqrt{b}x^2+\sqrt{bx^4+a}}{x^2}}+(bx^4+a)^{\frac{1}{4}}}\right)}{b^{\frac{1}{4}}}+\frac{\log\left(\frac{b^{\frac{1}{4}}x+(bx^4+a)^{\frac{1}{4}}}{x}\right)}{4\,b^{\frac{1}{4}}}-\frac{\log\left(-\frac{b^{\frac{1}{4}}x-(bx^4+a)^{\frac{1}{4}}}{x}\right)}{4\,b^{\frac{1}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(-1/4),x, algorithm="fricas")
```

```
[Out] arctan(b^(1/4)*x/(x*sqrt((sqrt(b)*x^2 + sqrt(b*x^4 + a))/x^2) + (
b*x^4 + a)^(1/4)))/b^(1/4) + 1/4*log((b^(1/4)*x + (b*x^4 + a)^(1/
4))/x)/b^(1/4) - 1/4*log(-(b^(1/4)*x - (b*x^4 + a)^(1/4))/x)/b^(1
/4)
```

Sympy [A] time = 3.53411, size = 36, normalized size = 0.63

$$\frac{x\,\Gamma\left(\frac{1}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{4},\frac{1}{4}\\ \frac{5}{4}\end{matrix}\middle|\frac{bx^4e^{i\pi}}{a}\right)}{4\sqrt[4]{a}\,\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**4+a)**(1/4),x)
```

```
[Out] x*gamma(1/4)*hyper((1/4, 1/4), (5/4,), b*x**4*exp_polar(I*pi)/a)/
(4*a**(1/4)*gamma(5/4))
```

GIAC/XCAS [A] time = 0.233975, size = 278, normalized size = 4.88

$$\frac{\sqrt{2}\,(-b)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-b)^{\frac{1}{4}}+\frac{2\left(bx^4+a\right)^{\frac{1}{4}}}{x}\right)}{2\,(-b)^{\frac{1}{4}}}\right)}{4\,b}+\frac{\sqrt{2}\,(-b)^{\frac{3}{4}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-b)^{\frac{1}{4}}-\frac{2\left(bx^4+a\right)^{\frac{1}{4}}}{x}\right)}{2\,(-b)^{\frac{1}{4}}}\right)}{4\,b}$$
$$-\frac{\sqrt{2}\,(-b)^{\frac{3}{4}}\ln\left(\sqrt{-b}+\frac{\sqrt{2}\left(bx^4+a\right)^{\frac{1}{4}}(-b)^{\frac{1}{4}}}{x}+\frac{\sqrt{bx^4+a}}{x^2}\right)}{8\,b}+\frac{\sqrt{2}\,(-b)^{\frac{3}{4}}\ln\left(\sqrt{-b}-\frac{\sqrt{2}\left(bx^4+a\right)^{\frac{1}{4}}(-b)^{\frac{1}{4}}}{x}+\frac{\sqrt{bx^4+a}}{x^2}\right)}{8\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(-1/4),x, algorithm="giac")
```

```
[Out] 1/4*sqrt(2)*(-b)^(3/4)*arctan(1/2*sqrt(2)*(sqrt(2)*(-b)^(1/4) + 2
*(b*x^4 + a)^(1/4)/x)/(-b)^(1/4))/b + 1/4*sqrt(2)*(-b)^(3/4)*arct
an(-1/2*sqrt(2)*(sqrt(2)*(-b)^(1/4) - 2*(b*x^4 + a)^(1/4)/x)/(-b)
^(1/4))/b - 1/8*sqrt(2)*(-b)^(3/4)*ln(sqrt(-b) + sqrt(2)*(b*x^4 +
 a)^(1/4)*(-b)^(1/4)/x + sqrt(b*x^4 + a)/x^2)/b + 1/8*sqrt(2)*(-b
)^(3/4)*ln(sqrt(-b) - sqrt(2)*(b*x^4 + a)^(1/4)*(-b)^(1/4)/x + sq
rt(b*x^4 + a)/x^2)/b
```

3.1096 $\int \frac{1}{x^4 \sqrt[4]{a+bx^4}} \, dx$

Optimal. Leaf size=21

$$-\frac{(a+bx^4)^{3/4}}{3ax^3}$$

```
[Out] -(a + b*x^4)^(3/4)/(3*a*x^3)
```

Rubi [A] time = 0.0199625, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$-\frac{(a+bx^4)^{3/4}}{3ax^3}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^4*(a + b*x^4)^(1/4)),x]
```

```
[Out] -(a + b*x^4)^(3/4)/(3*a*x^3)
```

Rubi in Sympy [A] time = 2.69069, size = 17, normalized size = 0.81

$$-\frac{(a+bx^4)^{\frac{3}{4}}}{3ax^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**4/(b*x**4+a)**(1/4),x)
```

```
[Out] -(a + b*x**4)**(3/4)/(3*a*x**3)
```

Mathematica [A] time = 0.0166826, size = 21, normalized size = 1.

$$-\frac{(a+bx^4)^{3/4}}{3ax^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^4*(a + b*x^4)^(1/4)),x]
```

```
[Out] -(a + b*x^4)^(3/4)/(3*a*x^3)
```

Maple [A] time = 0.007, size = 18, normalized size = 0.9

$$-\frac{1}{3\,ax^3}\left(bx^4+a\right)^{\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^4/(b*x^4+a)^(1/4),x)
```

```
[Out] -1/3*(b*x^4+a)^(3/4)/a/x^3
```

Maxima [A] time = 1.42786, size = 23, normalized size = 1.1

$$-\frac{(bx^4+a)^{\frac{3}{4}}}{3\,ax^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^4),x, algorithm="maxima")

[Out] -1/3*(b*x^4 + a)^(3/4)/(a*x^3)
```

Fricas [A] time = 0.259856, size = 23, normalized size = 1.1

$$-\frac{(bx^4+a)^{\frac{3}{4}}}{3\,ax^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^4),x, algorithm="fricas")

[Out] -1/3*(b*x^4 + a)^(3/4)/(a*x^3)
```

Sympy [A] time = 2.45913, size = 31, normalized size = 1.48

$$\frac{b^{\frac{3}{4}}\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}\Gamma\left(-\frac{3}{4}\right)}{4a\,\Gamma\left(\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(b*x**4+a)**(1/4),x)

[Out] b**(3/4)*(a/(b*x**4) + 1)**(3/4)*gamma(-3/4)/(4*a*gamma(1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4+a)^{\frac{1}{4}}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^4),x, algorithm="giac")

[Out] integrate(1/((b*x^4 + a)^(1/4)*x^4), x)
```

3.1097 $\int \frac{1}{x^8 \sqrt[4]{a + bx^4}} \, dx$

Optimal. Leaf size=44

$$\frac{4b\left(a+bx^4\right)^{3/4}}{21a^2x^3}-\frac{\left(a+bx^4\right)^{3/4}}{7ax^7}$$

```
[Out] -(a + b*x^4)^(3/4)/(7*a*x^7) + (4*b*(a + b*x^4)^(3/4))/(21*a^2*x^
3)
```

Rubi [A] time = 0.0412989, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{4b\left(a+bx^4\right)^{3/4}}{21a^2x^3}-\frac{\left(a+bx^4\right)^{3/4}}{7ax^7}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^8*(a + b*x^4)^(1/4)),x]
```

```
[Out] -(a + b*x^4)^(3/4)/(7*a*x^7) + (4*b*(a + b*x^4)^(3/4))/(21*a^2*x^
3)
```

Rubi in Sympy [A] time = 4.25805, size = 37, normalized size = 0.84

$$-\frac{\left(a+bx^4\right)^{\frac{3}{4}}}{7ax^7}+\frac{4b\left(a+bx^4\right)^{\frac{3}{4}}}{21a^2x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**8/(b*x**4+a)**(1/4),x)
```

```
[Out] -(a + b*x**4)**(3/4)/(7*a*x**7) + 4*b*(a + b*x**4)**(3/4)/(21*a**
2*x**3)
```

Mathematica [A] time = 0.0266402, size = 31, normalized size = 0.7

$$\frac{\left(a+bx^4\right)^{3/4}\left(4bx^4-3a\right)}{21a^2x^7}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^8*(a + b*x^4)^(1/4)),x]
```

```
[Out] ((a + b*x^4)^(3/4)*(-3*a + 4*b*x^4))/(21*a^2*x^7)
```

Maple [A] time = 0.007, size = 28, normalized size = 0.6

$$-\frac{-4\,bx^4+3\,a}{21\,a^2x^7}\left(bx^4+a\right)^{\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^8/(b*x^4+a)^(1/4),x)
```

```
[Out] -1/21*(b*x^4+a)^(3/4)*(-4*b*x^4+3*a)/a^2/x^7
```

Maxima [A] time = 1.42221, size = 47, normalized size = 1.07

$$\frac{\frac{7\,(bx^4+a)^{\frac{3}{4}}b}{x^3} - \frac{3\,(bx^4+a)^{\frac{7}{4}}}{x^7}}{21\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^8),x, algorithm="maxima")
```

```
[Out] 1/21*(7*(b*x^4 + a)^(3/4)*b/x^3 - 3*(b*x^4 + a)^(7/4)/x^7)/a^2
```

Fricas [A] time = 0.236807, size = 36, normalized size = 0.82

$$\frac{\left(4\,bx^4 - 3\,a\right)\left(bx^4 + a\right)^{\frac{3}{4}}}{21\,a^2x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^8),x, algorithm="fricas")
```

```
[Out] 1/21*(4*b*x^4 - 3*a)*(b*x^4 + a)^(3/4)/(a^2*x^7)
```

Sympy [A] time = 5.08644, size = 70, normalized size = 1.59

$$-\frac{3b^{\frac{3}{4}}\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}\Gamma\left(-\frac{7}{4}\right)}{16ax^4\,\Gamma\left(\frac{1}{4}\right)} + \frac{b^{\frac{7}{4}}\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}\Gamma\left(-\frac{7}{4}\right)}{4a^2\,\Gamma\left(\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**8/(b*x**4+a)**(1/4),x)
```

```
[Out] -3*b**(3/4)*(a/(b*x**4) + 1)**(3/4)*gamma(-7/4)/(16*a*x**4*gamma(
1/4)) + b**(7/4)*(a/(b*x**4) + 1)**(3/4)*gamma(-7/4)/(4*a**2*gamm
a(1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4+a)^{\frac{1}{4}}x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^8),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^4 + a)^(1/4)*x^8), x)
```

3.1098 $\int \frac{1}{x^{12}\sqrt[4]{a+bx^4}}\,dx$

Optimal. Leaf size=68

$$-\frac{32b^2\left(a+bx^4\right)^{3/4}}{231a^3x^3}+\frac{8b\left(a+bx^4\right)^{3/4}}{77a^2x^7}-\frac{\left(a+bx^4\right)^{3/4}}{11ax^{11}}$$

```
[Out] -(a + b*x^4)^(3/4)/(11*a*x^11) + (8*b*(a + b*x^4)^(3/4))/(77*a^2*
x^7) - (32*b^2*(a + b*x^4)^(3/4))/(231*a^3*x^3)
```

Rubi [A] time = 0.0637947, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{32b^2\left(a+bx^4\right)^{3/4}}{231a^3x^3}+\frac{8b\left(a+bx^4\right)^{3/4}}{77a^2x^7}-\frac{\left(a+bx^4\right)^{3/4}}{11ax^{11}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^12*(a + b*x^4)^(1/4)),x]
```

```
[Out] -(a + b*x^4)^(3/4)/(11*a*x^11) + (8*b*(a + b*x^4)^(3/4))/(77*a^2*
x^7) - (32*b^2*(a + b*x^4)^(3/4))/(231*a^3*x^3)
```

Rubi in Sympy [A] time = 6.69093, size = 61, normalized size = 0.9

$$-\frac{\left(a+bx^4\right)^{\frac{3}{4}}}{11ax^{11}}+\frac{8b\left(a+bx^4\right)^{\frac{3}{4}}}{77a^2x^7}-\frac{32b^2\left(a+bx^4\right)^{\frac{3}{4}}}{231a^3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**12/(b*x**4+a)**(1/4),x)
```

```
[Out] -(a + b*x**4)**(3/4)/(11*a*x**11) + 8*b*(a + b*x**4)**(3/4)/(77*a
**2*x**7) - 32*b**2*(a + b*x**4)**(3/4)/(231*a**3*x**3)
```

Mathematica [A] time = 0.0339857, size = 42, normalized size = 0.62

$$-\frac{\left(a+bx^4\right)^{3/4}\left(21a^2-24abx^4+32b^2x^8\right)}{231a^3x^{11}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^12*(a + b*x^4)^(1/4)),x]
```

```
[Out] -((a + b*x^4)^(3/4)*(21*a^2 - 24*a*b*x^4 + 32*b^2*x^8))/(231*a^3*
x^11)
```

Maple [A] time = 0.007, size = 39, normalized size = 0.6

$$-\frac{32\,b^2x^8-24\,abx^4+21\,a^2}{231\,x^{11}a^3}\left(bx^4+a\right)^{\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^12/(b*x^4+a)^(1/4),x)
```

```
[Out] -1/231*(b*x^4+a)^(3/4)*(32*b^2*x^8-24*a*b*x^4+21*a^2)/x^11/a^3
```

Maxima [A] time = 1.41631, size = 70, normalized size = 1.03

$$-\frac{\frac{77\,(bx^4+a)^{\frac{3}{4}}b^2}{x^3}-\frac{66\,(bx^4+a)^{\frac{7}{4}}b}{x^7}+\frac{21\,(bx^4+a)^{\frac{11}{4}}}{x^{11}}}{231\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((b*x^4 + a)^(1/4)*x^12),x, algorithm="maxima")
```

```
[Out] -1/231*(77*(b*x^4 + a)^(3/4)*b^2/x^3 - 66*(b*x^4 + a)^(7/4)*b/x^7
 + 21*(b*x^4 + a)^(11/4)/x^11)/a^3
```

Fricas [A] time = 0.244139, size = 51, normalized size = 0.75

$$-\frac{\left(32\,b^2x^8-24\,abx^4+21\,a^2\right)\left(bx^4+a\right)^{\frac{3}{4}}}{231\,a^3x^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((b*x^4 + a)^(1/4)*x^12),x, algorithm="fricas")
```

```
[Out] -1/231*(32*b^2*x^8 - 24*a*b*x^4 + 21*a^2)*(b*x^4 + a)^(3/4)/(a^3*
x^11)
```

Sympy [A] time = 11.5983, size = 406, normalized size = 5.97

$$\frac{21a^4b^{\frac{19}{4}}\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}\Gamma\left(-\frac{11}{4}\right)}{64a^5b^4x^8\Gamma\left(\frac{1}{4}\right)+128a^4b^5x^{12}\Gamma\left(\frac{1}{4}\right)+64a^3b^6x^{16}\Gamma\left(\frac{1}{4}\right)}+\frac{18a^3b^{\frac{23}{4}}x^4\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}\Gamma\left(-\frac{11}{4}\right)}{64a^5b^4x^8\Gamma\left(\frac{1}{4}\right)+128a^4b^5x^{12}\Gamma\left(\frac{1}{4}\right)+64a^3b^6x^{16}\Gamma\left(\frac{1}{4}\right)}+\frac{5a^2b^{\frac{27}{4}}x^8\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}\Gamma\left(-\frac{11}{4}\right)}{64a^5b^4x^8\Gamma\left(\frac{1}{4}\right)+128a^4b^5x^{12}\Gamma\left(\frac{1}{4}\right)+64a^3b^6x^{16}\Gamma\left(\frac{1}{4}\right)}+\frac{40ab^{\frac{31}{4}}x^{12}\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}\Gamma\left(-\frac{11}{4}\right)}{64a^5b^4x^8\Gamma\left(\frac{1}{4}\right)+128a^4b^5x^{12}\Gamma\left(\frac{1}{4}\right)+64a^3b^6x^{16}\Gamma\left(\frac{1}{4}\right)}+\frac{32b^{\frac{35}{4}}x^{16}\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}\Gamma\left(-\frac{11}{4}\right)}{64a^5b^4x^8\Gamma\left(\frac{1}{4}\right)+128a^4b^5x^{12}\Gamma\left(\frac{1}{4}\right)+64a^3b^6x^{16}\Gamma\left(\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/x**12/(b*x**4+a)**(1/4),x)
```

```
[Out] 21*a**4*b**(19/4)*(a/(b*x**4) + 1)**(3/4)*gamma(-11/4)/(64*a**5*b
**4*x**8*gamma(1/4) + 128*a**4*b**5*x**12*gamma(1/4) + 64*a**3*b*
*6*x**16*gamma(1/4)) + 18*a**3*b**(23/4)*x**4*(a/(b*x**4) + 1)**(
3/4)*gamma(-11/4)/(64*a**5*b**4*x**8*gamma(1/4) + 128*a**4*b**5*x
**12*gamma(1/4) + 64*a**3*b**6*x**16*gamma(1/4)) + 5*a**2*b**(27/
4)*x**8*(a/(b*x**4) + 1)**(3/4)*gamma(-11/4)/(64*a**5*b**4*x**8*g
amma(1/4) + 128*a**4*b**5*x**12*gamma(1/4) + 64*a**3*b**6*x**16*g
amma(1/4)) + 40*a*b**(31/4)*x**12*(a/(b*x**4) + 1)**(3/4)*gamma(-
11/4)/(64*a**5*b**4*x**8*gamma(1/4) + 128*a**4*b**5*x**12*gamma(1
```

```
/4) + 64*a**3*b**6*x**16*gamma(1/4)) + 32*b**(35/4)*x**16*(a/(b*x
**4) + 1)**(3/4)*gamma(-11/4)/(64*a**5*b**4*x**8*gamma(1/4) + 128
*a**4*b**5*x**12*gamma(1/4) + 64*a**3*b**6*x**16*gamma(1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4+a)^{\frac{1}{4}}x^{12}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^12),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^4 + a)^(1/4)*x^12), x)
```

3.1099 $\int \frac{1}{x^{16} \sqrt[4]{a+bx^4}} \, dx$

Optimal. Leaf size=92

$$\frac{128b^3 \left(a+bx^4\right)^{3/4}}{1155a^4x^3}-\frac{32b^2 \left(a+bx^4\right)^{3/4}}{385a^3x^7}+\frac{4b \left(a+bx^4\right)^{3/4}}{55a^2x^{11}}-\frac{\left(a+bx^4\right)^{3/4}}{15ax^{15}}$$

```
[Out] -(a + b*x^4)^(3/4)/(15*a*x^15) + (4*b*(a + b*x^4)^(3/4))/(55*a^2*
x^11) - (32*b^2*(a + b*x^4)^(3/4))/(385*a^3*x^7) + (128*b^3*(a +
b*x^4)^(3/4))/(1155*a^4*x^3)
```

Rubi [A] time = 0.092293, antiderivative size = 92, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{128b^3 \left(a+bx^4\right)^{3/4}}{1155a^4x^3}-\frac{32b^2 \left(a+bx^4\right)^{3/4}}{385a^3x^7}+\frac{4b \left(a+bx^4\right)^{3/4}}{55a^2x^{11}}-\frac{\left(a+bx^4\right)^{3/4}}{15ax^{15}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^16*(a + b*x^4)^(1/4)),x]
```

```
[Out] -(a + b*x^4)^(3/4)/(15*a*x^15) + (4*b*(a + b*x^4)^(3/4))/(55*a^2*
x^11) - (32*b^2*(a + b*x^4)^(3/4))/(385*a^3*x^7) + (128*b^3*(a +
b*x^4)^(3/4))/(1155*a^4*x^3)
```

Rubi in Sympy [A] time = 9.71904, size = 85, normalized size = 0.92

$$-\frac{\left(a+bx^4\right)^{\frac{3}{4}}}{15ax^{15}}+\frac{4b \left(a+bx^4\right)^{\frac{3}{4}}}{55a^2x^{11}}-\frac{32b^2 \left(a+bx^4\right)^{\frac{3}{4}}}{385a^3x^7}+\frac{128b^3 \left(a+bx^4\right)^{\frac{3}{4}}}{1155a^4x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**16/(b*x**4+a)**(1/4),x)
```

```
[Out] -(a + b*x**4)**(3/4)/(15*a*x**15) + 4*b*(a + b*x**4)**(3/4)/(55*a
**2*x**11) - 32*b**2*(a + b*x**4)**(3/4)/(385*a**3*x**7) + 128*b*
*3*(a + b*x**4)**(3/4)/(1155*a**4*x**3)
```

Mathematica [A] time = 0.0417341, size = 53, normalized size = 0.58

$$\frac{\left(a+bx^4\right)^{3/4} \left(-77a^3+84a^2bx^4-96ab^2x^8+128b^3x^{12}\right)}{1155a^4x^{15}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^16*(a + b*x^4)^(1/4)),x]
```

```
[Out] ((a + b*x^4)^(3/4)*(-77*a^3 + 84*a^2*b*x^4 - 96*a*b^2*x^8 + 128*b
^3*x^12))/(1155*a^4*x^15)
```

Maple [A] time = 0.01, size = 50, normalized size = 0.5

$$-\frac{-128\,b^3x^{12}+96\,ab^2x^8-84\,a^2bx^4+77\,a^3}{1155\,x^{15}a^4} \left(bx^4+a\right)^{\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^16/(b*x^4+a)^(1/4),x)
```

```
[Out] -1/1155*(b*x^4+a)^(3/4)*(-128*b^3*x^12+96*a*b^2*x^8-84*a^2*b*x^4+
77*a^3)/x^15/a^4
```

Maxima [A] time = 1.44381, size = 93, normalized size = 1.01

$$\frac{\frac{385\,{\left(b x^{4} + a\right)}^{\frac{3}{4}} b^{3}}{x^{3}} - \frac{495\,{\left(b x^{4} + a\right)}^{\frac{7}{4}} b^{2}}{x^{7}} + \frac{315\,{\left(b x^{4} + a\right)}^{\frac{11}{4}} b}{x^{11}} - \frac{77\,{\left(b x^{4} + a\right)}^{\frac{15}{4}}}{x^{15}}}{1155\,a^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^16),x, algorithm="maxima")
```

```
[Out] 1/1155*(385*(b*x^4 + a)^(3/4)*b^3/x^3 - 495*(b*x^4 + a)^(7/4)*b^2
/x^7 + 315*(b*x^4 + a)^(11/4)*b/x^11 - 77*(b*x^4 + a)^(15/4)/x^15
)/a^4
```

Fricas [A] time = 0.236278, size = 66, normalized size = 0.72

$$\frac{{\left(128\,b^{3} x^{12} - 96\,a b^{2} x^{8} + 84\,a^{2} b x^{4} - 77\,a^{3}\right)} {\left(b x^{4} + a\right)}^{\frac{3}{4}}}{1155\,a^{4} x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^16),x, algorithm="fricas")
```

```
[Out] 1/1155*(128*b^3*x^12 - 96*a*b^2*x^8 + 84*a^2*b*x^4 - 77*a^3)*(b*x
^4 + a)^(3/4)/(a^4*x^15)
```

Sympy [A] time = 23.7299, size = 692, normalized size = 7.52

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**16/(b*x**4+a)**(1/4),x)
```

```
[Out] -231*a**6*b**(39/4)*(a/(b*x**4) + 1)**(3/4)*gamma(-15/4)/(256*a**
7*b**9*x**12*gamma(1/4) + 768*a**6*b**10*x**16*gamma(1/4) + 768*a
**5*b**11*x**20*gamma(1/4) + 256*a**4*b**12*x**24*gamma(1/4)) - 4
41*a**5*b**(43/4)*x**4*(a/(b*x**4) + 1)**(3/4)*gamma(-15/4)/(256*
a**7*b**9*x**12*gamma(1/4) + 768*a**6*b**10*x**16*gamma(1/4) + 76
8*a**5*b**11*x**20*gamma(1/4) + 256*a**4*b**12*x**24*gamma(1/4))
- 225*a**4*b**(47/4)*x**8*(a/(b*x**4) + 1)**(3/4)*gamma(-15/4)/(2
56*a**7*b**9*x**12*gamma(1/4) + 768*a**6*b**10*x**16*gamma(1/4) +
 768*a**5*b**11*x**20*gamma(1/4) + 256*a**4*b**12*x**24*gamma(1/4
)) + 45*a**3*b**(51/4)*x**12*(a/(b*x**4) + 1)**(3/4)*gamma(-15/4)
/(256*a**7*b**9*x**12*gamma(1/4) + 768*a**6*b**10*x**16*gamma(1/4
) + 768*a**5*b**11*x**20*gamma(1/4) + 256*a**4*b**12*x**24*gamma(
1/4)) + 540*a**2*b**(55/4)*x**16*(a/(b*x**4) + 1)**(3/4)*gamma(-1
5/4)/(256*a**7*b**9*x**12*gamma(1/4) + 768*a**6*b**10*x**16*gamma
(1/4) + 768*a**5*b**11*x**20*gamma(1/4) + 256*a**4*b**12*x**24*ga
mma(1/4)) + 864*a*b**(59/4)*x**20*(a/(b*x**4) + 1)**(3/4)*gamma(-
15/4)/(256*a**7*b**9*x**12*gamma(1/4) + 768*a**6*b**10*x**16*gamm
a(1/4) + 768*a**5*b**11*x**20*gamma(1/4) + 256*a**4*b**12*x**24*g
```

```
amma(1/4)) + 384*b**(63/4)*x**24*(a/(b*x**4) + 1)**(3/4)*gamma(-1
5/4)/(256*a**7*b**9*x**12*gamma(1/4) + 768*a**6*b**10*x**16*gamma
(1/4) + 768*a**5*b**11*x**20*gamma(1/4) + 256*a**4*b**12*x**24*ga
mma(1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4 + a)^{\frac{1}{4}} x^{16}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^16),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^4 + a)^(1/4)*x^16), x)
```

3.1100 $\int \frac{1}{x^{20} \sqrt[4]{a+bx^4}} \, dx$

Optimal. Leaf size=116

$$-\frac{2048b^4 (a+bx^4)^{3/4}}{21945a^5x^3}+\frac{512b^3 (a+bx^4)^{3/4}}{7315a^4x^7}-\frac{64b^2 (a+bx^4)^{3/4}}{1045a^3x^{11}}+\frac{16b (a+bx^4)^{3/4}}{285a^2x^{15}}-\frac{(a+bx^4)^{3/4}}{19ax^{19}}$$

```
[Out] -(a + b*x^4)^(3/4)/(19*a*x^19) + (16*b*(a + b*x^4)^(3/4))/(285*a^
2*x^15) - (64*b^2*(a + b*x^4)^(3/4))/(1045*a^3*x^11) + (512*b^3*(
a + b*x^4)^(3/4))/(7315*a^4*x^7) - (2048*b^4*(a + b*x^4)^(3/4))/(
21945*a^5*x^3)
```

Rubi [A] time = 0.121524, antiderivative size = 116, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2048b^4 (a+bx^4)^{3/4}}{21945a^5x^3}+\frac{512b^3 (a+bx^4)^{3/4}}{7315a^4x^7}-\frac{64b^2 (a+bx^4)^{3/4}}{1045a^3x^{11}}+\frac{16b (a+bx^4)^{3/4}}{285a^2x^{15}}-\frac{(a+bx^4)^{3/4}}{19ax^{19}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^20*(a + b*x^4)^(1/4)),x]
```

```
[Out] -(a + b*x^4)^(3/4)/(19*a*x^19) + (16*b*(a + b*x^4)^(3/4))/(285*a^
2*x^15) - (64*b^2*(a + b*x^4)^(3/4))/(1045*a^3*x^11) + (512*b^3*(
a + b*x^4)^(3/4))/(7315*a^4*x^7) - (2048*b^4*(a + b*x^4)^(3/4))/(
21945*a^5*x^3)
```

Rubi in Sympy [A] time = 13.5241, size = 109, normalized size = 0.94

$$-\frac{(a+bx^4)^{\frac{3}{4}}}{19ax^{19}}+\frac{16b (a+bx^4)^{\frac{3}{4}}}{285a^2x^{15}}-\frac{64b^2 (a+bx^4)^{\frac{3}{4}}}{1045a^3x^{11}}+\frac{512b^3 (a+bx^4)^{\frac{3}{4}}}{7315a^4x^7}-\frac{2048b^4 (a+bx^4)^{\frac{3}{4}}}{21945a^5x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**20/(b*x**4+a)**(1/4),x)
```

```
[Out] -(a + b*x**4)**(3/4)/(19*a*x**19) + 16*b*(a + b*x**4)**(3/4)/(285
*a**2*x**15) - 64*b**2*(a + b*x**4)**(3/4)/(1045*a**3*x**11) + 51
2*b**3*(a + b*x**4)**(3/4)/(7315*a**4*x**7) - 2048*b**4*(a + b*x*
*4)**(3/4)/(21945*a**5*x**3)
```

Mathematica [A] time = 0.0482928, size = 64, normalized size = 0.55

$$-\frac{(a+bx^4)^{3/4} (1155a^4-1232a^3bx^4+1344a^2b^2x^8-1536ab^3x^{12}+2048b^4x^{16})}{21945a^5x^{19}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^20*(a + b*x^4)^(1/4)),x]
```

```
[Out] -((a + b*x^4)^(3/4)*(1155*a^4 - 1232*a^3*b*x^4 + 1344*a^2*b^2*x^8
 - 1536*a*b^3*x^12 + 2048*b^4*x^16))/(21945*a^5*x^19)
```

Maple [A] time = 0.011, size = 61, normalized size = 0.5

$$-\frac{2048\,x^{16}b^{4}-1536\,ax^{12}b^{3}+1344\,a^{2}x^{8}b^{2}-1232\,a^{3}x^{4}b+1155\,a^{4}}{21945\,x^{19}a^{5}}\left(bx^{4}+a\right)^{\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^20/(b*x^4+a)^(1/4),x)
```

```
[Out] -1/21945*(b*x^4+a)^(3/4)*(2048*b^4*x^16-1536*a*b^3*x^12+1344*a^2*
b^2*x^8-1232*a^3*b*x^4+1155*a^4)/x^19/a^5
```

Maxima [A] time = 1.42251, size = 116, normalized size = 1.

$$-\frac{\frac{7315\,\left(bx^{4}+a\right)^{\frac{3}{4}}b^{4}}{x^{3}}-\frac{12540\,\left(bx^{4}+a\right)^{\frac{7}{4}}b^{3}}{x^{7}}+\frac{11970\,\left(bx^{4}+a\right)^{\frac{11}{4}}b^{2}}{x^{11}}-\frac{5852\,\left(bx^{4}+a\right)^{\frac{15}{4}}b}{x^{15}}+\frac{1155\,\left(bx^{4}+a\right)^{\frac{19}{4}}}{x^{19}}}{21945\,a^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^20),x, algorithm="maxima")
```

```
[Out] -1/21945*(7315*(b*x^4 + a)^(3/4)*b^4/x^3 - 12540*(b*x^4 + a)^(7/4
)*b^3/x^7 + 11970*(b*x^4 + a)^(11/4)*b^2/x^11 - 5852*(b*x^4 + a)^
(15/4)*b/x^15 + 1155*(b*x^4 + a)^(19/4)/x^19)/a^5
```

Fricas [A] time = 0.248188, size = 81, normalized size = 0.7

$$-\frac{\left(2048\,b^{4}x^{16}-1536\,ab^{3}x^{12}+1344\,a^{2}b^{2}x^{8}-1232\,a^{3}bx^{4}+1155\,a^{4}\right)\left(bx^{4}+a\right)^{\frac{3}{4}}}{21945\,a^{5}x^{19}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^20),x, algorithm="fricas")
```

```
[Out] -1/21945*(2048*b^4*x^16 - 1536*a*b^3*x^12 + 1344*a^2*b^2*x^8 - 12
32*a^3*b*x^4 + 1155*a^4)*(b*x^4 + a)^(3/4)/(a^5*x^19)
```

Sympy [A] time = 40.2115, size = 1046, normalized size = 9.02

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**20/(b*x**4+a)**(1/4),x)
```

```
[Out] 3465*a**8*b**(67/4)*(a/(b*x**4) + 1)**(3/4)*gamma(-19/4)/(1024*a*
*9*b**16*x**16*gamma(1/4) + 4096*a**8*b**17*x**20*gamma(1/4) + 61
44*a**7*b**18*x**24*gamma(1/4) + 4096*a**6*b**19*x**28*gamma(1/4)
 + 1024*a**5*b**20*x**32*gamma(1/4)) + 10164*a**7*b**(71/4)*x**4*
(a/(b*x**4) + 1)**(3/4)*gamma(-19/4)/(1024*a**9*b**16*x**16*gamma
(1/4) + 4096*a**8*b**17*x**20*gamma(1/4) + 6144*a**7*b**18*x**24*
gamma(1/4) + 4096*a**6*b**19*x**28*gamma(1/4) + 1024*a**5*b**20*x
**32*gamma(1/4)) + 10038*a**6*b**(75/4)*x**8*(a/(b*x**4) + 1)**(3
/4)*gamma(-19/4)/(1024*a**9*b**16*x**16*gamma(1/4) + 4096*a**8*b*
*17*x**20*gamma(1/4) + 6144*a**7*b**18*x**24*gamma(1/4) + 4096*a*
*6*b**19*x**28*gamma(1/4) + 1024*a**5*b**20*x**32*gamma(1/4)) + 3
204*a**5*b**(79/4)*x**12*(a/(b*x**4) + 1)**(3/4)*gamma(-19/4)/(10
```

```
24*a**9*b**16*x**16*gamma(1/4) + 4096*a**8*b**17*x**20*gamma(1/4)
 + 6144*a**7*b**18*x**24*gamma(1/4) + 4096*a**6*b**19*x**28*gamma
(1/4) + 1024*a**5*b**20*x**32*gamma(1/4)) + 585*a**4*b**(83/4)*x*
*16*(a/(b*x**4) + 1)**(3/4)*gamma(-19/4)/(1024*a**9*b**16*x**16*g
amma(1/4) + 4096*a**8*b**17*x**20*gamma(1/4) + 6144*a**7*b**18*x*
*24*gamma(1/4) + 4096*a**6*b**19*x**28*gamma(1/4) + 1024*a**5*b**
20*x**32*gamma(1/4)) + 9360*a**3*b**(87/4)*x**20*(a/(b*x**4) + 1)
**(3/4)*gamma(-19/4)/(1024*a**9*b**16*x**16*gamma(1/4) + 4096*a**
8*b**17*x**20*gamma(1/4) + 6144*a**7*b**18*x**24*gamma(1/4) + 409
6*a**6*b**19*x**28*gamma(1/4) + 1024*a**5*b**20*x**32*gamma(1/4))
 + 22464*a**2*b**(91/4)*x**24*(a/(b*x**4) + 1)**(3/4)*gamma(-19/4
)/(1024*a**9*b**16*x**16*gamma(1/4) + 4096*a**8*b**17*x**20*gamma
(1/4) + 6144*a**7*b**18*x**24*gamma(1/4) + 4096*a**6*b**19*x**28*
gamma(1/4) + 1024*a**5*b**20*x**32*gamma(1/4)) + 19968*a*b**(95/4
)*x**28*(a/(b*x**4) + 1)**(3/4)*gamma(-19/4)/(1024*a**9*b**16*x**
16*gamma(1/4) + 4096*a**8*b**17*x**20*gamma(1/4) + 6144*a**7*b**1
8*x**24*gamma(1/4) + 4096*a**6*b**19*x**28*gamma(1/4) + 1024*a**5
*b**20*x**32*gamma(1/4)) + 6144*b**(99/4)*x**32*(a/(b*x**4) + 1)*
*(3/4)*gamma(-19/4)/(1024*a**9*b**16*x**16*gamma(1/4) + 4096*a**8
*b**17*x**20*gamma(1/4) + 6144*a**7*b**18*x**24*gamma(1/4) + 4096
*a**6*b**19*x**28*gamma(1/4) + 1024*a**5*b**20*x**32*gamma(1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4+a)^{\frac{1}{4}}x^{20}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^20),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^4 + a)^(1/4)*x^20), x)
```

3.1101 $\int \frac{x^{10}}{\sqrt[4]{a+bx^4}}\,dx$

Optimal. Leaf size=129

$$\frac{7a^{5/2}x\sqrt[4]{\frac{a}{bx^4}+1}\,E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{40b^{5/2}\sqrt[4]{a+bx^4}}+\frac{7a^2x^3}{40b^2\sqrt[4]{a+bx^4}}-\frac{7ax^3\left(a+bx^4\right)^{3/4}}{60b^2}+\frac{x^7\left(a+bx^4\right)^{3/4}}{10b}$$

```
[Out] (7*a^2*x^3)/(40*b^2*(a + b*x^4)^(1/4)) - (7*a*x^3*(a + b*x^4)^(3/
4))/(60*b^2) + (x^7*(a + b*x^4)^(3/4))/(10*b) + (7*a^(5/2)*(1 + a
/(b*x^4))^(1/4)*x*EllipticE[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/
(40*b^(5/2)*(a + b*x^4)^(1/4))
```

Rubi [A] time = 0.177832, antiderivative size = 129, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$\frac{7a^{5/2}x\sqrt[4]{\frac{a}{bx^4}+1}\,E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{40b^{5/2}\sqrt[4]{a+bx^4}}+\frac{7a^2x^3}{40b^2\sqrt[4]{a+bx^4}}-\frac{7ax^3\left(a+bx^4\right)^{3/4}}{60b^2}+\frac{x^7\left(a+bx^4\right)^{3/4}}{10b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^10/(a + b*x^4)^(1/4),x]
```

```
[Out] (7*a^2*x^3)/(40*b^2*(a + b*x^4)^(1/4)) - (7*a*x^3*(a + b*x^4)^(3/
4))/(60*b^2) + (x^7*(a + b*x^4)^(3/4))/(10*b) + (7*a^(5/2)*(1 + a
/(b*x^4))^(1/4)*x*EllipticE[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/
(40*b^(5/2)*(a + b*x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{7a^3x\sqrt[4]{\frac{a}{bx^4}+1}\int^{\frac{1}{x^2}}\frac{1}{\sqrt[4]{\frac{ax^2}{b}+1}}\,dx}{80b^3\sqrt[4]{a+bx^4}}+\frac{7a^3}{40b^3x\sqrt[4]{a+bx^4}}+\frac{7a^2x^3}{40b^2\sqrt[4]{a+bx^4}}-\frac{7ax^3\left(a+bx^4\right)^{\frac{3}{4}}}{60b^2}+\frac{x^7\left(a+bx^4\right)^{\frac{3}{4}}}{10b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**10/(b*x**4+a)**(1/4),x)
```

```
[Out] -7*a**3*x*(a/(b*x**4) + 1)**(1/4)*Integral((a*x**2/b + 1)**(-1/4)
, (x, x**(-2)))/(80*b**3*(a + b*x**4)**(1/4)) + 7*a**3/(40*b**3*x
*(a + b*x**4)**(1/4)) + 7*a**2*x**3/(40*b**2*(a + b*x**4)**(1/4))
 - 7*a*x**3*(a + b*x**4)**(3/4)/(60*b**2) + x**7*(a + b*x**4)**(3
/4)/(10*b)
```

Mathematica [C] time = 0.0700062, size = 80, normalized size = 0.62

$$\frac{x^3\left(7a^2\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)-7a^2-abx^4+6b^2x^8\right)}{60b^2\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^10/(a + b*x^4)^(1/4),x]
```

```
[Out] (x^3*(-7*a^2 - a*b*x^4 + 6*b^2*x^8 + 7*a^2*(1 + (b*x^4)/a)^(1/4)*
Hypergeometric2F1[1/4, 3/4, 7/4, -((b*x^4)/a)]))/(60*b^2*(a + b*x
^4)^(1/4))
```

Maple [F] time = 0.04, size = 0, normalized size = 0.

$$\int x^{10}\frac{1}{\sqrt[4]{bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^10/(b*x^4+a)^(1/4),x)
```

```
[Out] int(x^10/(b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{10}}{(bx^4+a)^{\frac{1}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/(b*x^4 + a)^(1/4),x, algorithm="maxima")
```

```
[Out] integrate(x^10/(b*x^4 + a)^(1/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{10}}{(bx^4+a)^{\frac{1}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/(b*x^4 + a)^(1/4),x, algorithm="fricas")
```

```
[Out] integral(x^10/(b*x^4 + a)^(1/4), x)
```

Sympy [A] time = 5.16912, size = 37, normalized size = 0.29

$$\frac{x^{11}\Gamma\left(\frac{11}{4}\right){}_2F_1\left(\begin{matrix}\frac{1}{4},\frac{11}{4}\\ \frac{15}{4}\end{matrix}\middle|\frac{bx^4e^{i\pi}}{a}\right)}{4\sqrt[4]{a}\,\Gamma\left(\frac{15}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**10/(b*x**4+a)**(1/4),x)
```

```
[Out] x**11*gamma(11/4)*hyper((1/4, 11/4), (15/4,), b*x**4*exp_polar(I*
pi)/a)/(4*a**(1/4)*gamma(15/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{10}}{(bx^4 + a)^{\frac{1}{4}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/(b*x^4 + a)^(1/4),x, algorithm="giac")

[Out] integrate(x^10/(b*x^4 + a)^(1/4), x)
```

3.1102 $\int \frac{x^6}{\sqrt[4]{a+bx^4}}\,dx$

Optimal. Leaf size=105

$$-\frac{a^{3/2}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{4b^{3/2}\sqrt[4]{a+bx^4}}+\frac{x^3\left(a+bx^4\right)^{3/4}}{6b}-\frac{ax^3}{4b\sqrt[4]{a+bx^4}}$$

```
[Out] -(a*x^3)/(4*b*(a + b*x^4)^(1/4)) + (x^3*(a + b*x^4)^(3/4))/(6*b)
- (a^(3/2)*(1 + a/(b*x^4))^(1/4)*x*EllipticE[ArcCot[(Sqrt[b]*x^2)
/Sqrt[a]]/2, 2])/(4*b^(3/2)*(a + b*x^4)^(1/4))
```

Rubi [A] time = 0.142803, antiderivative size = 105, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.4$

$$-\frac{a^{3/2}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{4b^{3/2}\sqrt[4]{a+bx^4}}+\frac{x^3\left(a+bx^4\right)^{3/4}}{6b}-\frac{ax^3}{4b\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/(a + b*x^4)^(1/4),x]
```

```
[Out] -(a*x^3)/(4*b*(a + b*x^4)^(1/4)) + (x^3*(a + b*x^4)^(3/4))/(6*b)
- (a^(3/2)*(1 + a/(b*x^4))^(1/4)*x*EllipticE[ArcCot[(Sqrt[b]*x^2)
/Sqrt[a]]/2, 2])/(4*b^(3/2)*(a + b*x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^2x\sqrt[4]{\frac{a}{bx^4}+1}\int^{\frac{1}{x^2}}\frac{1}{\left(\frac{ax^2}{b}+1\right)^{\frac{5}{4}}}\,dx}{8b^2\sqrt[4]{a+bx^4}}-\frac{ax^3}{4b\sqrt[4]{a+bx^4}}+\frac{x^3\left(a+bx^4\right)^{\frac{3}{4}}}{6b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(b*x**4+a)**(1/4),x)
```

```
[Out] -a**2*x*(a/(b*x**4) + 1)**(1/4)*Integral((a*x**2/b + 1)**(-5/4),
(x, x**(-2)))/(8*b**2*(a + b*x**4)**(1/4)) - a*x**3/(4*b*(a + b*x
**4)**(1/4)) + x**3*(a + b*x**4)**(3/4)/(6*b)
```

Mathematica [C] time = 0.0474426, size = 64, normalized size = 0.61

$$\frac{x^3\left(-a\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)+a+bx^4\right)}{6b\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6/(a + b*x^4)^(1/4),x]
```

```
[Out] (x^3*(a + b*x^4 - a*(1 + (b*x^4)/a)^(1/4)*Hypergeometric2F1[1/4,
3/4, 7/4, -((b*x^4)/a)]))/(6*b*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.039, size = 0, normalized size = 0.

$$\int x^{6} \frac{1}{\sqrt[4]{b x^{4}+a}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(b*x^4+a)^(1/4),x)
```

```
[Out] int(x^6/(b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{6}}{\left(b x^{4}+a\right)^{\frac{1}{4}}}\, d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(b*x^4 + a)^(1/4),x, algorithm="maxima")
```

```
[Out] integrate(x^6/(b*x^4 + a)^(1/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{6}}{\left(b x^{4}+a\right)^{\frac{1}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(b*x^4 + a)^(1/4),x, algorithm="fricas")
```

```
[Out] integral(x^6/(b*x^4 + a)^(1/4), x)
```

Sympy [A] time = 2.89067, size = 37, normalized size = 0.35

$$\frac{x^{7}\,\Gamma\left(\frac{7}{4}\right) {}_{2}F_{1}\left(\begin{matrix} \frac{1}{4}, \frac{7}{4} \\ \frac{11}{4} \end{matrix}\middle| \frac{b x^{4} e^{i \pi}}{a}\right)}{4 \sqrt[4]{a}\,\Gamma\left(\frac{11}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(b*x**4+a)**(1/4),x)
```

```
[Out] x**7*gamma(7/4)*hyper((1/4, 7/4), (11/4,), b*x**4*exp_polar(I*pi)
/a)/(4*a**(1/4)*gamma(11/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{6}}{\left(b x^{4}+a\right)^{\frac{1}{4}}}\, d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(b*x^4 + a)^(1/4),x, algorithm="giac")
```

```
[Out] integrate(x^6/(b*x^4 + a)^(1/4), x)
```

3.1103 $\int \frac{x^2}{\sqrt[4]{a+bx^4}}\,dx$

Optimal. Leaf size=80

$$\frac{x^3}{2\sqrt[4]{a+bx^4}}+\frac{\sqrt{a}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{2\sqrt{b}\sqrt[4]{a+bx^4}}$$

```
[Out] x^3/(2*(a + b*x^4)^(1/4)) + (Sqrt[a]*(1 + a/(b*x^4))^(1/4)*x*Elli
pticE[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(2*Sqrt[b]*(a + b*x^4)
^(1/4))
```

Rubi [A] time = 0.113121, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$

$$\frac{x^3}{2\sqrt[4]{a+bx^4}}+\frac{\sqrt{a}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{2\sqrt{b}\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b*x^4)^(1/4),x]
```

```
[Out] x^3/(2*(a + b*x^4)^(1/4)) + (Sqrt[a]*(1 + a/(b*x^4))^(1/4)*x*Elli
pticE[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(2*Sqrt[b]*(a + b*x^4)
^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{ax\sqrt[4]{\frac{a}{bx^4}+1}\int^{\frac{1}{x^2}}\frac{1}{\sqrt[4]{\frac{ax^2}{b}+1}}\,dx}{4b\sqrt[4]{a+bx^4}}+\frac{a}{2bx\sqrt[4]{a+bx^4}}+\frac{x^3}{2\sqrt[4]{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(b*x**4+a)**(1/4),x)
```

```
[Out] -a*x*(a/(b*x**4) + 1)**(1/4)*Integral((a*x**2/b + 1)**(-1/4), (x,
 x**(-2)))/(4*b*(a + b*x**4)**(1/4)) + a/(2*b*x*(a + b*x**4)**(1/
4)) + x**3/(2*(a + b*x**4)**(1/4))
```

Mathematica [C] time = 0.0275473, size = 52, normalized size = 0.65

$$\frac{x^3\sqrt[4]{\frac{a+bx^4}{a}}\,{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)}{3\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a + b*x^4)^(1/4),x]
```

```
[Out] (x^3*((a + b*x^4)/a)^(1/4)*Hypergeometric2F1[1/4, 3/4, 7/4, -((b*
x^4)/a)])/(3*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.027, size = 0, normalized size = 0.

$$\int x^2 \frac{1}{\sqrt[4]{bx^4 + a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(b*x^4+a)^(1/4),x)
```

```
[Out] int(x^2/(b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{(bx^4 + a)^{\frac{1}{4}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^4 + a)^(1/4),x, algorithm="maxima")
```

```
[Out] integrate(x^2/(b*x^4 + a)^(1/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^2}{(bx^4 + a)^{\frac{1}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^4 + a)^(1/4),x, algorithm="fricas")
```

```
[Out] integral(x^2/(b*x^4 + a)^(1/4), x)
```

Sympy [A] time = 2.20825, size = 37, normalized size = 0.46

$$\frac{x^3 \Gamma\left(\frac{3}{4}\right) {}_2F_1\left(\begin{matrix} \frac{1}{4}, \frac{3}{4} \\ \frac{7}{4} \end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{4\sqrt[4]{a}\,\Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(b*x**4+a)**(1/4),x)
```

```
[Out] x**3*gamma(3/4)*hyper((1/4, 3/4), (7/4,), b*x**4*exp_polar(I*pi)/
a)/(4*a**(1/4)*gamma(7/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{(bx^4 + a)^{\frac{1}{4}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^4 + a)^(1/4),x, algorithm="giac")
```

```
[Out] integrate(x^2/(b*x^4 + a)^(1/4), x)
```

3.1104 $\int \frac{1}{x^2\sqrt[4]{a+bx^4}}\,dx$

Optimal. Leaf size=75

$$\frac{\sqrt{b}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{\sqrt{a}\sqrt[4]{a+bx^4}}-\frac{1}{x\sqrt[4]{a+bx^4}}$$

```
[Out] -(1/(x*(a + b*x^4)^(1/4))) + (Sqrt[b]*(1 + a/(b*x^4))^(1/4)*x*Ell
ipticE[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(Sqrt[a]*(a + b*x^4)^
(1/4))
```

Rubi [A] time = 0.112852, antiderivative size = 75, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{\sqrt{b}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{\sqrt{a}\sqrt[4]{a+bx^4}}-\frac{1}{x\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(a + b*x^4)^(1/4)),x]
```

```
[Out] -(1/(x*(a + b*x^4)^(1/4))) + (Sqrt[b]*(1 + a/(b*x^4))^(1/4)*x*Ell
ipticE[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(Sqrt[a]*(a + b*x^4)^
(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{x\sqrt[4]{\frac{a}{bx^4}+1}\int^{\frac{1}{x^2}}\frac{1}{\sqrt[4]{\frac{ax^2}{b}+1}}\,dx}{2\sqrt[4]{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(b*x**4+a)**(1/4),x)
```

```
[Out] -x*(a/(b*x**4) + 1)**(1/4)*Integral((a*x**2/b + 1)**(-1/4), (x, x
**(-2)))/(2*(a + b*x**4)**(1/4))
```

Mathematica [C] time = 0.047097, size = 70, normalized size = 0.93

$$\frac{2bx^4\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)-3\left(a+bx^4\right)}{3ax\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*(a + b*x^4)^(1/4)),x]
```

```
[Out] (-3*(a + b*x^4) + 2*b*x^4*(1 + (b*x^4)/a)^(1/4)*Hypergeometric2F1
[1/4, 3/4, 7/4, -((b*x^4)/a)])/(3*a*x*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.041, size = 0, normalized size = 0.

$$\int \frac{1}{x^2}\frac{1}{\sqrt[4]{bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(b*x^4+a)^(1/4),x)
```

```
[Out] int(1/x^2/(b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4+a)^{\frac{1}{4}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^2),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x^4 + a)^(1/4)*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(bx^4+a)^{\frac{1}{4}}x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^2),x, algorithm="fricas")
```

```
[Out] integral(1/((b*x^4 + a)^(1/4)*x^2), x)
```

Sympy [A] time = 2.52078, size = 39, normalized size = 0.52

$$\frac{\Gamma\left(-\frac{1}{4}\right) {}_2F_1\left(\begin{matrix} -\frac{1}{4}, \frac{1}{4} \\ \frac{3}{4} \end{matrix}\middle| \frac{bx^4e^{i\pi}}{a}\right)}{4\sqrt[4]{a}x\,\Gamma\left(\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(b*x**4+a)**(1/4),x)
```

```
[Out] gamma(-1/4)*hyper((-1/4, 1/4), (3/4,), b*x**4*exp_polar(I*pi)/a)/
(4*a**(1/4)*x*gamma(3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4+a)^{\frac{1}{4}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^4 + a)^(1/4)*x^2), x)
```

3.1105 $\int \frac{1}{x^6 \sqrt[4]{a+bx^4}}\,dx$

Optimal. Leaf size=105

$$-\frac{2b^{3/2}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{5a^{3/2}\sqrt[4]{a+bx^4}}+\frac{2b}{5ax\sqrt[4]{a+bx^4}}-\frac{\left(a+bx^4\right)^{3/4}}{5ax^5}$$

```
[Out] (2*b)/(5*a*x*(a + b*x^4)^(1/4)) - (a + b*x^4)^(3/4)/(5*a*x^5) - (
2*b^(3/2)*(1 + a/(b*x^4))^(1/4)*x*EllipticE[ArcCot[(Sqrt[b]*x^2)/
Sqrt[a]]/2, 2])/(5*a^(3/2)*(a + b*x^4)^(1/4))
```

Rubi [A] time = 0.142548, antiderivative size = 105, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.4$

$$-\frac{2b^{3/2}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{5a^{3/2}\sqrt[4]{a+bx^4}}+\frac{2b}{5ax\sqrt[4]{a+bx^4}}-\frac{\left(a+bx^4\right)^{3/4}}{5ax^5}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^6*(a + b*x^4)^(1/4)),x]
```

```
[Out] (2*b)/(5*a*x*(a + b*x^4)^(1/4)) - (a + b*x^4)^(3/4)/(5*a*x^5) - (
2*b^(3/2)*(1 + a/(b*x^4))^(1/4)*x*EllipticE[ArcCot[(Sqrt[b]*x^2)/
Sqrt[a]]/2, 2])/(5*a^(3/2)*(a + b*x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{bx\sqrt[4]{\frac{a}{bx^4}+1}\int^{\frac{1}{x^2}}\frac{1}{\left(\frac{ax^2}{b}+1\right)^{\frac{5}{4}}}\,dx}{5a\sqrt[4]{a+bx^4}}+\frac{2b}{5ax\sqrt[4]{a+bx^4}}-\frac{\left(a+bx^4\right)^{\frac{3}{4}}}{5ax^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**6/(b*x**4+a)**(1/4),x)
```

```
[Out] -b*x*(a/(b*x**4) + 1)**(1/4)*Integral((a*x**2/b + 1)**(-5/4), (x,
 x**(-2)))/(5*a*(a + b*x**4)**(1/4)) + 2*b/(5*a*x*(a + b*x**4)**(
1/4)) - (a + b*x**4)**(3/4)/(5*a*x**5)
```

Mathematica [C] time = 0.0565743, size = 83, normalized size = 0.79

$$\frac{-3a^2-4b^2x^8\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)+3abx^4+6b^2x^8}{15a^2x^5\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^6*(a + b*x^4)^(1/4)),x]
```

```
[Out] (-3*a^2 + 3*a*b*x^4 + 6*b^2*x^8 - 4*b^2*x^8*(1 + (b*x^4)/a)^(1/4)
*Hypergeometric2F1[1/4, 3/4, 7/4, -((b*x^4)/a)])/(15*a^2*x^5*(a +
 b*x^4)^(1/4))
```

Maple [F] time = 0.046, size = 0, normalized size = 0.

$$\int \frac{1}{x^6}\frac{1}{\sqrt[4]{bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^6/(b*x^4+a)^(1/4),x)
```

```
[Out] int(1/x^6/(b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4+a)^{\frac{1}{4}}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^6),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x^4 + a)^(1/4)*x^6), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(bx^4+a)^{\frac{1}{4}}x^6}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^6),x, algorithm="fricas")
```

```
[Out] integral(1/((b*x^4 + a)^(1/4)*x^6), x)
```

Sympy [A] time = 3.85368, size = 29, normalized size = 0.28

$$-\frac{{}_2F_1\left(\begin{matrix}\frac{1}{4},\frac{3}{2}\\ \frac{5}{2}\end{matrix}\middle|\frac{ae^{i\pi}}{bx^4}\right)}{6\sqrt[4]{b}x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**6/(b*x**4+a)**(1/4),x)
```

```
[Out] -hyper((1/4, 3/2), (5/2,), a*exp_polar(I*pi)/(b*x**4))/(6*b**(1/4
)*x**6)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4+a)^{\frac{1}{4}}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^6),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^4 + a)^(1/4)*x^6), x)
```

3.1106 $\int \frac{1}{x^{10}\sqrt[4]{a+bx^4}}\,dx$

Optimal. Leaf size=129

$$\frac{4b^{5/2}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{15a^{5/2}\sqrt[4]{a+bx^4}}-\frac{4b^2}{15a^2x\sqrt[4]{a+bx^4}}+\frac{2b\left(a+bx^4\right)^{3/4}}{15a^2x^5}-\frac{\left(a+bx^4\right)^{3/4}}{9ax^9}$$

```
[Out] (-4*b^2)/(15*a^2*x*(a + b*x^4)^(1/4)) - (a + b*x^4)^(3/4)/(9*a*x^
9) + (2*b*(a + b*x^4)^(3/4))/(15*a^2*x^5) + (4*b^(5/2)*(1 + a/(b*
x^4))^(1/4)*x*EllipticE[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(15*
a^(5/2)*(a + b*x^4)^(1/4))
```

Rubi [A] time = 0.176704, antiderivative size = 129, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$\frac{4b^{5/2}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{15a^{5/2}\sqrt[4]{a+bx^4}}-\frac{4b^2}{15a^2x\sqrt[4]{a+bx^4}}+\frac{2b\left(a+bx^4\right)^{3/4}}{15a^2x^5}-\frac{\left(a+bx^4\right)^{3/4}}{9ax^9}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^10*(a + b*x^4)^(1/4)),x]
```

```
[Out] (-4*b^2)/(15*a^2*x*(a + b*x^4)^(1/4)) - (a + b*x^4)^(3/4)/(9*a*x^
9) + (2*b*(a + b*x^4)^(3/4))/(15*a^2*x^5) + (4*b^(5/2)*(1 + a/(b*
x^4))^(1/4)*x*EllipticE[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(15*
a^(5/2)*(a + b*x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\left(a+bx^4\right)^{\frac{3}{4}}}{9ax^9}-\frac{2b^2x\sqrt[4]{\frac{a}{bx^4}+1}\int^{\frac{1}{x^2}}\frac{1}{\sqrt[4]{\frac{ax^2}{b}+1}}\,dx}{15a^2\sqrt[4]{a+bx^4}}+\frac{2b\left(a+bx^4\right)^{\frac{3}{4}}}{15a^2x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**10/(b*x**4+a)**(1/4),x)
```

```
[Out] -(a + b*x**4)**(3/4)/(9*a*x**9) - 2*b**2*x*(a/(b*x**4) + 1)**(1/4
)*Integral((a*x**2/b + 1)**(-1/4), (x, x**(-2)))/(15*a**2*(a + b*
x**4)**(1/4)) + 2*b*(a + b*x**4)**(3/4)/(15*a**2*x**5)
```

Mathematica [C] time = 0.068613, size = 93, normalized size = 0.72

$$\frac{-5a^3+a^2bx^4+8b^3x^{12}\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)-6ab^2x^8-12b^3x^{12}}{45a^3x^9\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^10*(a + b*x^4)^(1/4)),x]
```

```
[Out] (-5*a^3 + a^2*b*x^4 - 6*a*b^2*x^8 - 12*b^3*x^12 + 8*b^3*x^12*(1 +
 (b*x^4)/a)^(1/4)*Hypergeometric2F1[1/4, 3/4, 7/4, -((b*x^4)/a)])
```

```
/(45*a^3*x^9*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.049, size = 0, normalized size = 0.

$$\int \frac{1}{x^{10}} \frac{1}{\sqrt[4]{bx^4 + a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^10/(b*x^4+a)^(1/4),x)
```

```
[Out] int(1/x^10/(b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4 + a)^{\frac{1}{4}} x^{10}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^10),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x^4 + a)^(1/4)*x^10), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(bx^4 + a)^{\frac{1}{4}} x^{10}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^10),x, algorithm="fricas")
```

```
[Out] integral(1/((b*x^4 + a)^(1/4)*x^10), x)
```

Sympy [A] time = 7.35426, size = 44, normalized size = 0.34

$$\frac{\Gamma\left(-\frac{9}{4}\right) {}_{2}F_{1}\left(\begin{matrix} -\frac{9}{4}, \frac{1}{4} \\ -\frac{5}{4} \end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{4\sqrt[4]{a}x^9\,\Gamma\left(-\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**10/(b*x**4+a)**(1/4),x)
```

```
[Out] gamma(-9/4)*hyper((-9/4, 1/4), (-5/4,), b*x**4*exp_polar(I*pi)/a)
/(4*a**(1/4)*x**9*gamma(-5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4 + a)^{\frac{1}{4}} x^{10}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^10),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^4 + a)^(1/4)*x^10), x)
```

3.1107 $\int \frac{1}{x^{14}\sqrt[4]{a+bx^4}}\,dx$

Optimal. Leaf size=153

$$-\frac{8b^{7/2}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{39a^{7/2}\sqrt[4]{a+bx^4}}+\frac{8b^3}{39a^3x\sqrt[4]{a+bx^4}}-\frac{4b^2\left(a+bx^4\right)^{3/4}}{39a^3x^5}+\frac{10b\left(a+bx^4\right)^{3/4}}{117a^2x^9}-\frac{\left(a+bx^4\right)^{3/4}}{13ax^{13}}$$

```
[Out] (8*b^3)/(39*a^3*x*(a + b*x^4)^(1/4)) - (a + b*x^4)^(3/4)/(13*a*x^
13) + (10*b*(a + b*x^4)^(3/4))/(117*a^2*x^9) - (4*b^2*(a + b*x^4)
^(3/4))/(39*a^3*x^5) - (8*b^(7/2)*(1 + a/(b*x^4))^(1/4)*x*Ellipti
cE[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(39*a^(7/2)*(a + b*x^4)^(
1/4))
```

Rubi [A] time = 0.206609, antiderivative size = 153, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$-\frac{8b^{7/2}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{39a^{7/2}\sqrt[4]{a+bx^4}}+\frac{8b^3}{39a^3x\sqrt[4]{a+bx^4}}-\frac{4b^2\left(a+bx^4\right)^{3/4}}{39a^3x^5}+\frac{10b\left(a+bx^4\right)^{3/4}}{117a^2x^9}-\frac{\left(a+bx^4\right)^{3/4}}{13ax^{13}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^14*(a + b*x^4)^(1/4)),x]
```

```
[Out] (8*b^3)/(39*a^3*x*(a + b*x^4)^(1/4)) - (a + b*x^4)^(3/4)/(13*a*x^
13) + (10*b*(a + b*x^4)^(3/4))/(117*a^2*x^9) - (4*b^2*(a + b*x^4)
^(3/4))/(39*a^3*x^5) - (8*b^(7/2)*(1 + a/(b*x^4))^(1/4)*x*Ellipti
cE[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(39*a^(7/2)*(a + b*x^4)^(
1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{\left(a+bx^4\right)^{\frac{3}{4}}}{13ax^{13}}+\frac{10b\left(a+bx^4\right)^{\frac{3}{4}}}{117a^2x^9}-\frac{4b^3x\sqrt[4]{\frac{a}{bx^4}+1}\int^{\frac{1}{x^2}}\frac{1}{\left(\frac{ax^2}{b}+1\right)^{\frac{5}{4}}}\,dx}{39a^3\sqrt[4]{a+bx^4}}+\frac{8b^3}{39a^3x\sqrt[4]{a+bx^4}}-\frac{4b^2\left(a+bx^4\right)^{\frac{3}{4}}}{39a^3x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**14/(b*x**4+a)**(1/4),x)
```

```
[Out] -(a + b*x**4)**(3/4)/(13*a*x**13) + 10*b*(a + b*x**4)**(3/4)/(117
*a**2*x**9) - 4*b**3*x*(a/(b*x**4) + 1)**(1/4)*Integral((a*x**2/b
 + 1)**(-5/4), (x, x**(-2)))/(39*a**3*(a + b*x**4)**(1/4)) + 8*b*
*3/(39*a**3*x*(a + b*x**4)**(1/4)) - 4*b**2*(a + b*x**4)**(3/4)/(
39*a**3*x**5)
```

Mathematica [C] time = 0.0704004, size = 104, normalized size = 0.68

$$\frac{-9a^4+a^3bx^4-2a^2b^2x^8-16b^4x^{16}\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)+12ab^3x^{12}+24b^4x^{16}}{117a^4x^{13}\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^14*(a + b*x^4)^(1/4)),x]
```

```
[Out] (-9*a^4 + a^3*b*x^4 - 2*a^2*b^2*x^8 + 12*a*b^3*x^12 + 24*b^4*x^16
 - 16*b^4*x^16*(1 + (b*x^4)/a)^(1/4)*Hypergeometric2F1[1/4, 3/4,
7/4, -((b*x^4)/a)])/(117*a^4*x^13*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.053, size = 0, normalized size = 0.

$$\int \frac{1}{x^{14}} \frac{1}{\sqrt[4]{bx^4 + a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^14/(b*x^4+a)^(1/4),x)
```

```
[Out] int(1/x^14/(b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4 + a)^{\frac{1}{4}} x^{14}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^14),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x^4 + a)^(1/4)*x^14), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(bx^4 + a)^{\frac{1}{4}} x^{14}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^14),x, algorithm="fricas")
```

```
[Out] integral(1/((b*x^4 + a)^(1/4)*x^14), x)
```

Sympy [A] time = 15.364, size = 44, normalized size = 0.29

$$\frac{\Gamma\left(-\frac{13}{4}\right) {}_2F_1\left(\begin{matrix} -\frac{13}{4}, \frac{1}{4} \\ -\frac{9}{4} \end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{4\sqrt[4]{a} x^{13}\, \Gamma\left(-\frac{9}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**14/(b*x**4+a)**(1/4),x)
```

```
[Out] gamma(-13/4)*hyper((-13/4, 1/4), (-9/4,), b*x**4*exp_polar(I*pi)/
a)/(4*a**(1/4)*x**13*gamma(-9/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4 + a)^{\frac{1}{4}} x^{14}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(1/4)*x^14),x, algorithm="giac")

[Out] integrate(1/((b*x^4 + a)^(1/4)*x^14), x)
```

3.1108 $\int \frac{x^{19}}{(a+bx^4)^{3/4}}\,dx$

Optimal. Leaf size=98

$$\frac{a^4\sqrt[4]{a+bx^4}}{b^5}-\frac{4a^3\left(a+bx^4\right)^{5/4}}{5b^5}+\frac{2a^2\left(a+bx^4\right)^{9/4}}{3b^5}+\frac{\left(a+bx^4\right)^{17/4}}{17b^5}-\frac{4a\left(a+bx^4\right)^{13/4}}{13b^5}$$

```
[Out] (a^4*(a + b*x^4)^(1/4))/b^5 - (4*a^3*(a + b*x^4)^(5/4))/(5*b^5) +
 (2*a^2*(a + b*x^4)^(9/4))/(3*b^5) - (4*a*(a + b*x^4)^(13/4))/(13
*b^5) + (a + b*x^4)^(17/4)/(17*b^5)
```

Rubi [A] time = 0.129091, antiderivative size = 98, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^4\sqrt[4]{a+bx^4}}{b^5}-\frac{4a^3\left(a+bx^4\right)^{5/4}}{5b^5}+\frac{2a^2\left(a+bx^4\right)^{9/4}}{3b^5}+\frac{\left(a+bx^4\right)^{17/4}}{17b^5}-\frac{4a\left(a+bx^4\right)^{13/4}}{13b^5}$$

Antiderivative was successfully verified.

```
[In]  Int[x^19/(a + b*x^4)^(3/4),x]
```

```
[Out] (a^4*(a + b*x^4)^(1/4))/b^5 - (4*a^3*(a + b*x^4)^(5/4))/(5*b^5) +
 (2*a^2*(a + b*x^4)^(9/4))/(3*b^5) - (4*a*(a + b*x^4)^(13/4))/(13
*b^5) + (a + b*x^4)^(17/4)/(17*b^5)
```

Rubi in Sympy [A] time = 17.3654, size = 90, normalized size = 0.92

$$\frac{a^4\sqrt[4]{a+bx^4}}{b^5}-\frac{4a^3\left(a+bx^4\right)^{\frac{5}{4}}}{5b^5}+\frac{2a^2\left(a+bx^4\right)^{\frac{9}{4}}}{3b^5}-\frac{4a\left(a+bx^4\right)^{\frac{13}{4}}}{13b^5}+\frac{\left(a+bx^4\right)^{\frac{17}{4}}}{17b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**19/(b*x**4+a)**(3/4),x)
```

```
[Out] a**4*(a + b*x**4)**(1/4)/b**5 - 4*a**3*(a + b*x**4)**(5/4)/(5*b**
5) + 2*a**2*(a + b*x**4)**(9/4)/(3*b**5) - 4*a*(a + b*x**4)**(13/
4)/(13*b**5) + (a + b*x**4)**(17/4)/(17*b**5)
```

Mathematica [A] time = 0.0351482, size = 61, normalized size = 0.62

$$\frac{\sqrt[4]{a+bx^4}\left(2048a^4-512a^3bx^4+320a^2b^2x^8-240ab^3x^{12}+195b^4x^{16}\right)}{3315b^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^19/(a + b*x^4)^(3/4),x]
```

```
[Out] ((a + b*x^4)^(1/4)*(2048*a^4 - 512*a^3*b*x^4 + 320*a^2*b^2*x^8 -
240*a*b^3*x^12 + 195*b^4*x^16))/(3315*b^5)
```

Maple [A] time = 0.011, size = 58, normalized size = 0.6

$$\frac{195\,x^{16}b^4-240\,ax^{12}b^3+320\,a^2x^8b^2-512\,a^3x^4b+2048\,a^4}{3315\,b^5}\sqrt[4]{bx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^19/(b*x^4+a)^(3/4),x)
```

```
[Out] 1/3315*(b*x^4+a)^(1/4)*(195*b^4*x^16-240*a*b^3*x^12+320*a^2*b^2*x
^8-512*a^3*b*x^4+2048*a^4)/b^5
```

Maxima [A] time = 1.41724, size = 108, normalized size = 1.1

$$\frac{\left(bx^4+a\right)^{\frac{17}{4}}}{17\,b^5}-\frac{4\left(bx^4+a\right)^{\frac{13}{4}}a}{13\,b^5}+\frac{2\left(bx^4+a\right)^{\frac{9}{4}}a^2}{3\,b^5}-\frac{4\left(bx^4+a\right)^{\frac{5}{4}}a^3}{5\,b^5}+\frac{\left(bx^4+a\right)^{\frac{1}{4}}a^4}{b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^19/(b*x^4 + a)^(3/4),x, algorithm="maxima")
```

```
[Out] 1/17*(b*x^4 + a)^(17/4)/b^5 - 4/13*(b*x^4 + a)^(13/4)*a/b^5 + 2/3
*(b*x^4 + a)^(9/4)*a^2/b^5 - 4/5*(b*x^4 + a)^(5/4)*a^3/b^5 + (b*x
^4 + a)^(1/4)*a^4/b^5
```

Fricas [A] time = 0.237639, size = 77, normalized size = 0.79

$$\frac{\left(195\,b^4x^{16}-240\,ab^3x^{12}+320\,a^2b^2x^8-512\,a^3bx^4+2048\,a^4\right)\left(bx^4+a\right)^{\frac{1}{4}}}{3315\,b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^19/(b*x^4 + a)^(3/4),x, algorithm="fricas")
```

```
[Out] 1/3315*(195*b^4*x^16 - 240*a*b^3*x^12 + 320*a^2*b^2*x^8 - 512*a^3
*b*x^4 + 2048*a^4)*(b*x^4 + a)^(1/4)/b^5
```

Sympy [A] time = 50.1296, size = 116, normalized size = 1.18

$$\begin{cases} \frac{2048a^4\sqrt[4]{a+bx^4}}{3315b^5}-\frac{512a^3x^4\sqrt[4]{a+bx^4}}{3315b^4}+\frac{64a^2x^8\sqrt[4]{a+bx^4}}{663b^3}-\frac{16ax^{12}\sqrt[4]{a+bx^4}}{221b^2}+\frac{x^{16}\sqrt[4]{a+bx^4}}{17b} & \text{for}\ b\neq 0\\ \frac{x^{20}}{20a^{\frac{3}{4}}} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**19/(b*x**4+a)**(3/4),x)
```

```
[Out] Piecewise((2048*a**4*(a + b*x**4)**(1/4)/(3315*b**5) - 512*a**3*x
**4*(a + b*x**4)**(1/4)/(3315*b**4) + 64*a**2*x**8*(a + b*x**4)**
(1/4)/(663*b**3) - 16*a*x**12*(a + b*x**4)**(1/4)/(221*b**2) + x*
*16*(a + b*x**4)**(1/4)/(17*b), Ne(b, 0)), (x**20/(20*a**(3/4)),
True))
```

GIAC/XCAS [A] time = 0.219883, size = 96, normalized size = 0.98

$$\frac{195\left(bx^4+a\right)^{\frac{17}{4}}-1020\left(bx^4+a\right)^{\frac{13}{4}}a+2210\left(bx^4+a\right)^{\frac{9}{4}}a^2-2652\left(bx^4+a\right)^{\frac{5}{4}}a^3+3315\left(bx^4+a\right)^{\frac{1}{4}}a^4}{3315\,b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^19/(b*x^4 + a)^(3/4),x, algorithm="giac")
```

```
[Out] 1/3315*(195*(b*x^4 + a)^(17/4) - 1020*(b*x^4 + a)^(13/4)*a + 2210
*(b*x^4 + a)^(9/4)*a^2 - 2652*(b*x^4 + a)^(5/4)*a^3 + 3315*(b*x^4
 + a)^(1/4)*a^4)/b^5
```

3.1109 $\int \frac{x^{15}}{(a+bx^4)^{3/4}}\,dx$

Optimal. Leaf size=78

$$-\frac{a^3\sqrt[4]{a+bx^4}}{b^4}+\frac{3a^2\left(a+bx^4\right)^{5/4}}{5b^4}+\frac{\left(a+bx^4\right)^{13/4}}{13b^4}-\frac{a\left(a+bx^4\right)^{9/4}}{3b^4}$$

```
[Out] -((a^3*(a + b*x^4)^(1/4))/b^4) + (3*a^2*(a + b*x^4)^(5/4))/(5*b^4
) - (a*(a + b*x^4)^(9/4))/(3*b^4) + (a + b*x^4)^(13/4)/(13*b^4)
```

Rubi [A] time = 0.107357, antiderivative size = 78, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^3\sqrt[4]{a+bx^4}}{b^4}+\frac{3a^2\left(a+bx^4\right)^{5/4}}{5b^4}+\frac{\left(a+bx^4\right)^{13/4}}{13b^4}-\frac{a\left(a+bx^4\right)^{9/4}}{3b^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^15/(a + b*x^4)^(3/4),x]
```

```
[Out] -((a^3*(a + b*x^4)^(1/4))/b^4) + (3*a^2*(a + b*x^4)^(5/4))/(5*b^4
) - (a*(a + b*x^4)^(9/4))/(3*b^4) + (a + b*x^4)^(13/4)/(13*b^4)
```

Rubi in Sympy [A] time = 14.1173, size = 68, normalized size = 0.87

$$-\frac{a^3\sqrt[4]{a+bx^4}}{b^4}+\frac{3a^2\left(a+bx^4\right)^{\frac{5}{4}}}{5b^4}-\frac{a\left(a+bx^4\right)^{\frac{9}{4}}}{3b^4}+\frac{\left(a+bx^4\right)^{\frac{13}{4}}}{13b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**15/(b*x**4+a)**(3/4),x)
```

```
[Out] -a**3*(a + b*x**4)**(1/4)/b**4 + 3*a**2*(a + b*x**4)**(5/4)/(5*b*
*4) - a*(a + b*x**4)**(9/4)/(3*b**4) + (a + b*x**4)**(13/4)/(13*b
**4)
```

Mathematica [A] time = 0.0310291, size = 50, normalized size = 0.64

$$\frac{\sqrt[4]{a+bx^4}\left(-128a^3+32a^2bx^4-20ab^2x^8+15b^3x^{12}\right)}{195b^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^15/(a + b*x^4)^(3/4),x]
```

```
[Out] ((a + b*x^4)^(1/4)*(-128*a^3 + 32*a^2*b*x^4 - 20*a*b^2*x^8 + 15*b
^3*x^12))/(195*b^4)
```

Maple [A] time = 0.009, size = 47, normalized size = 0.6

$$-\frac{-15\,b^3x^{12}+20\,ab^2x^8-32\,a^2bx^4+128\,a^3}{195\,b^4}\sqrt[4]{bx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^15/(b*x^4+a)^(3/4),x)
```

```
[Out] -1/195*(b*x^4+a)^(1/4)*(-15*b^3*x^12+20*a*b^2*x^8-32*a^2*b*x^4+12
8*a^3)/b^4
```

Maxima [A] time = 1.43708, size = 86, normalized size = 1.1

$$\frac{\left(bx^4+a\right)^{\frac{13}{4}}}{13\,b^4}-\frac{\left(bx^4+a\right)^{\frac{9}{4}}a}{3\,b^4}+\frac{3\,\left(bx^4+a\right)^{\frac{5}{4}}a^2}{5\,b^4}-\frac{\left(bx^4+a\right)^{\frac{1}{4}}a^3}{b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^15/(b*x^4 + a)^(3/4),x, algorithm="maxima")
```

```
[Out] 1/13*(b*x^4 + a)^(13/4)/b^4 - 1/3*(b*x^4 + a)^(9/4)*a/b^4 + 3/5*(
b*x^4 + a)^(5/4)*a^2/b^4 - (b*x^4 + a)^(1/4)*a^3/b^4
```

Fricas [A] time = 0.232329, size = 62, normalized size = 0.79

$$\frac{\left(15\,b^3x^{12}-20\,ab^2x^8+32\,a^2bx^4-128\,a^3\right)\left(bx^4+a\right)^{\frac{1}{4}}}{195\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^15/(b*x^4 + a)^(3/4),x, algorithm="fricas")
```

```
[Out] 1/195*(15*b^3*x^12 - 20*a*b^2*x^8 + 32*a^2*b*x^4 - 128*a^3)*(b*x^
4 + a)^(1/4)/b^4
```

Sympy [A] time = 23.6265, size = 92, normalized size = 1.18

$$\begin{cases} -\frac{128a^3\sqrt[4]{a+bx^4}}{195b^4}+\frac{32a^2x^4\sqrt[4]{a+bx^4}}{195b^3}-\frac{4ax^8\sqrt[4]{a+bx^4}}{39b^2}+\frac{x^{12}\sqrt[4]{a+bx^4}}{13b} & \text{for } b\neq 0 \\ \frac{x^{16}}{16a^{\frac{3}{4}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**15/(b*x**4+a)**(3/4),x)
```

```
[Out] Piecewise((-128*a**3*(a + b*x**4)**(1/4)/(195*b**4) + 32*a**2*x**
4*(a + b*x**4)**(1/4)/(195*b**3) - 4*a*x**8*(a + b*x**4)**(1/4)/(
39*b**2) + x**12*(a + b*x**4)**(1/4)/(13*b), Ne(b, 0)), (x**16/(1
6*a**(3/4)), True))
```

GIAC/XCAS [A] time = 0.215635, size = 77, normalized size = 0.99

$$\frac{15\left(bx^4+a\right)^{\frac{13}{4}}-65\left(bx^4+a\right)^{\frac{9}{4}}a+117\left(bx^4+a\right)^{\frac{5}{4}}a^2-195\left(bx^4+a\right)^{\frac{1}{4}}a^3}{195\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^15/(b*x^4 + a)^(3/4),x, algorithm="giac")
```

```
[Out] 1/195*(15*(b*x^4 + a)^(13/4) - 65*(b*x^4 + a)^(9/4)*a + 117*(b*x^
4 + a)^(5/4)*a^2 - 195*(b*x^4 + a)^(1/4)*a^3)/b^4
```

3.1110 $\int \frac{x^{11}}{(a+bx^4)^{3/4}} dx$

Optimal. Leaf size=56

$$\frac{a^2\sqrt[4]{a+bx^4}}{b^3}+\frac{(a+bx^4)^{9/4}}{9b^3}-\frac{2a(a+bx^4)^{5/4}}{5b^3}$$

```
[Out] (a^2*(a + b*x^4)^(1/4))/b^3 - (2*a*(a + b*x^4)^(5/4))/(5*b^3) + (
a + b*x^4)^(9/4)/(9*b^3)
```

Rubi [A] time = 0.0852534, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^2\sqrt[4]{a+bx^4}}{b^3}+\frac{(a+bx^4)^{9/4}}{9b^3}-\frac{2a(a+bx^4)^{5/4}}{5b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11/(a + b*x^4)^(3/4),x]
```

```
[Out] (a^2*(a + b*x^4)^(1/4))/b^3 - (2*a*(a + b*x^4)^(5/4))/(5*b^3) + (
a + b*x^4)^(9/4)/(9*b^3)
```

Rubi in Sympy [A] time = 10.5072, size = 49, normalized size = 0.88

$$\frac{a^2\sqrt[4]{a+bx^4}}{b^3}-\frac{2a(a+bx^4)^{\frac{5}{4}}}{5b^3}+\frac{(a+bx^4)^{\frac{9}{4}}}{9b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11/(b*x**4+a)**(3/4),x)
```

```
[Out] a**2*(a + b*x**4)**(1/4)/b**3 - 2*a*(a + b*x**4)**(5/4)/(5*b**3)
+ (a + b*x**4)**(9/4)/(9*b**3)
```

Mathematica [A] time = 0.0268645, size = 39, normalized size = 0.7

$$\frac{\sqrt[4]{a+bx^4}\left(32a^2-8abx^4+5b^2x^8\right)}{45b^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11/(a + b*x^4)^(3/4),x]
```

```
[Out] ((a + b*x^4)^(1/4)*(32*a^2 - 8*a*b*x^4 + 5*b^2*x^8))/(45*b^3)
```

Maple [A] time = 0.008, size = 36, normalized size = 0.6

$$\frac{5\,b^2x^8-8\,abx^4+32\,a^2}{45\,b^3}\sqrt[4]{bx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11/(b*x^4+a)^(3/4),x)
```

```
[Out] 1/45*(b*x^4+a)^(1/4)*(5*b^2*x^8-8*a*b*x^4+32*a^2)/b^3
```

Maxima [A] time = 1.41126, size = 62, normalized size = 1.11

$$\frac{\left(bx^4+a\right)^{\frac{9}{4}}}{9\,b^3}-\frac{2\left(bx^4+a\right)^{\frac{5}{4}}a}{5\,b^3}+\frac{\left(bx^4+a\right)^{\frac{1}{4}}a^2}{b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(b*x^4 + a)^(3/4),x, algorithm="maxima")
```

```
[Out] 1/9*(b*x^4 + a)^(9/4)/b^3 - 2/5*(b*x^4 + a)^(5/4)*a/b^3 + (b*x^4
+ a)^(1/4)*a^2/b^3
```

Fricas [A] time = 0.228284, size = 47, normalized size = 0.84

$$\frac{\left(5\,b^2x^8-8\,abx^4+32\,a^2\right)\left(bx^4+a\right)^{\frac{1}{4}}}{45\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(b*x^4 + a)^(3/4),x, algorithm="fricas")
```

```
[Out] 1/45*(5*b^2*x^8 - 8*a*b*x^4 + 32*a^2)*(b*x^4 + a)^(1/4)/b^3
```

Sympy [A] time = 9.98532, size = 68, normalized size = 1.21

$$\begin{cases} \frac{32a^2\sqrt[4]{a+bx^4}}{45b^3}-\frac{8ax^4\sqrt[4]{a+bx^4}}{45b^2}+\frac{x^8\sqrt[4]{a+bx^4}}{9b} & \text{for } b\neq 0 \\ \frac{x^{12}}{12a^{\frac{3}{4}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11/(b*x**4+a)**(3/4),x)
```

```
[Out] Piecewise((32*a**2*(a + b*x**4)**(1/4)/(45*b**3) - 8*a*x**4*(a +
b*x**4)**(1/4)/(45*b**2) + x**8*(a + b*x**4)**(1/4)/(9*b), Ne(b,
0)), (x**12/(12*a**(3/4)), True))
```

GIAC/XCAS [A] time = 0.214636, size = 58, normalized size = 1.04

$$\frac{5\left(bx^4+a\right)^{\frac{9}{4}}-18\left(bx^4+a\right)^{\frac{5}{4}}a+45\left(bx^4+a\right)^{\frac{1}{4}}a^2}{45\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(b*x^4 + a)^(3/4),x, algorithm="giac")
```

```
[Out] 1/45*(5*(b*x^4 + a)^(9/4) - 18*(b*x^4 + a)^(5/4)*a + 45*(b*x^4 +
a)^(1/4)*a^2)/b^3
```

3.1111 $\int \frac{x^7}{(a+bx^4)^{3/4}}\,dx$

Optimal. Leaf size=36

$$\frac{(a+bx^4)^{5/4}}{5b^2}-\frac{a\sqrt[4]{a+bx^4}}{b^2}$$

```
[Out] -((a*(a + b*x^4)^(1/4))/b^2) + (a + b*x^4)^(5/4)/(5*b^2)
```

Rubi [A] time = 0.0598471, antiderivative size = 36, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{(a+bx^4)^{5/4}}{5b^2}-\frac{a\sqrt[4]{a+bx^4}}{b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7/(a + b*x^4)^(3/4),x]
```

```
[Out] -((a*(a + b*x^4)^(1/4))/b^2) + (a + b*x^4)^(5/4)/(5*b^2)
```

Rubi in Sympy [A] time = 7.01839, size = 29, normalized size = 0.81

$$-\frac{a\sqrt[4]{a+bx^4}}{b^2}+\frac{(a+bx^4)^{\frac{5}{4}}}{5b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7/(b*x**4+a)**(3/4),x)
```

```
[Out] -a*(a + b*x**4)**(1/4)/b**2 + (a + b*x**4)**(5/4)/(5*b**2)
```

Mathematica [A] time = 0.0218177, size = 27, normalized size = 0.75

$$\frac{(bx^4-4a)\sqrt[4]{a+bx^4}}{5b^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^7/(a + b*x^4)^(3/4),x]
```

```
[Out] ((-4*a + b*x^4)*(a + b*x^4)^(1/4))/(5*b^2)
```

Maple [A] time = 0.007, size = 25, normalized size = 0.7

$$-\frac{-bx^4+4\,a}{5\,b^2}\sqrt[4]{bx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7/(b*x^4+a)^(3/4),x)
```

```
[Out] -1/5*(b*x^4+a)^(1/4)*(-b*x^4+4*a)/b^2
```

Maxima [A] time = 1.43938, size = 41, normalized size = 1.14

$$\frac{\left(bx^4+a\right)^{\frac{5}{4}}}{5\,b^2}-\frac{\left(bx^4+a\right)^{\frac{1}{4}}a}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(b*x^4 + a)^(3/4),x, algorithm="maxima")
```

```
[Out] 1/5*(b*x^4 + a)^(5/4)/b^2 - (b*x^4 + a)^(1/4)*a/b^2
```

Fricas [A] time = 0.227554, size = 31, normalized size = 0.86

$$\frac{\left(bx^4+a\right)^{\frac{1}{4}}\left(bx^4-4\,a\right)}{5\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(b*x^4 + a)^(3/4),x, algorithm="fricas")
```

```
[Out] 1/5*(b*x^4 + a)^(1/4)*(b*x^4 - 4*a)/b^2
```

Sympy [A] time = 3.84424, size = 44, normalized size = 1.22

$$\begin{cases} -\frac{4a\sqrt[4]{a+bx^4}}{5b^2}+\frac{x^4\sqrt[4]{a+bx^4}}{5b} & \text{for}\ b\neq 0 \\ \frac{x^8}{8a^{\frac{3}{4}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(b*x**4+a)**(3/4),x)
```

```
[Out] Piecewise((-4*a*(a + b*x**4)**(1/4)/(5*b**2) + x**4*(a + b*x**4)*
*(1/4)/(5*b), Ne(b, 0)), (x**8/(8*a**(3/4)), True))
```

GIAC/XCAS [A] time = 0.213693, size = 36, normalized size = 1.

$$\frac{\left(bx^4+a\right)^{\frac{5}{4}}-5\left(bx^4+a\right)^{\frac{1}{4}}a}{5\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(b*x^4 + a)^(3/4),x, algorithm="giac")
```

```
[Out] 1/5*((b*x^4 + a)^(5/4) - 5*(b*x^4 + a)^(1/4)*a)/b^2
```

3.1112 $\int \frac{x^3}{(a+bx^4)^{3/4}}\,dx$

Optimal. Leaf size=15

$$\frac{\sqrt[4]{a+bx^4}}{b}$$

```
[Out] (a + b*x^4)^(1/4)/b
```

Rubi [A] time = 0.010539, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{\sqrt[4]{a+bx^4}}{b}$$

Antiderivative was successfully verified.

```
[In] Int[x^3/(a + b*x^4)^(3/4),x]
```

```
[Out] (a + b*x^4)^(1/4)/b
```

Rubi in Sympy [A] time = 2.12048, size = 10, normalized size = 0.67

$$\frac{\sqrt[4]{a+bx^4}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**3/(b*x**4+a)**(3/4),x)
```

```
[Out] (a + b*x**4)**(1/4)/b
```

Mathematica [A] time = 0.00701659, size = 15, normalized size = 1.

$$\frac{\sqrt[4]{a+bx^4}}{b}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3/(a + b*x^4)^(3/4),x]
```

```
[Out] (a + b*x^4)^(1/4)/b
```

Maple [A] time = 0.005, size = 14, normalized size = 0.9

$$\frac{1}{b}\sqrt[4]{bx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(b*x^4+a)^(3/4),x)
```

```
[Out] (b*x^4+a)^(1/4)/b
```

Maxima [A] time = 1.43685, size = 18, normalized size = 1.2

$$\frac{\left(bx^4+a\right)^{\frac{1}{4}}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^4 + a)^(3/4),x, algorithm="maxima")
```

```
[Out] (b*x^4 + a)^(1/4)/b
```

Fricas [A] time = 0.233547, size = 18, normalized size = 1.2

$$\frac{\left(bx^4+a\right)^{\frac{1}{4}}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^4 + a)^(3/4),x, algorithm="fricas")
```

```
[Out] (b*x^4 + a)^(1/4)/b
```

Sympy [A] time = 1.72993, size = 20, normalized size = 1.33

$$\begin{cases} \frac{\sqrt[4]{a+bx^4}}{b} & \text{for } b \neq 0 \\ \frac{x^4}{4a^{\frac{3}{4}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(b*x**4+a)**(3/4),x)
```

```
[Out] Piecewise(((a + b*x**4)**(1/4)/b, Ne(b, 0)), (x**4/(4*a**(3/4)),
True))
```

GIAC/XCAS [A] time = 0.21365, size = 18, normalized size = 1.2

$$\frac{\left(bx^4+a\right)^{\frac{1}{4}}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^4 + a)^(3/4),x, algorithm="giac")
```

```
[Out] (b*x^4 + a)^(1/4)/b
```

3.1113 $\int \frac{1}{x(a+bx^4)^{3/4}}\,dx$

Optimal. Leaf size=55

$$-\frac{\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{2a^{3/4}}-\frac{\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{2a^{3/4}}$$

```
[Out] -ArcTan[(a + b*x^4)^(1/4)/a^(1/4)]/(2*a^(3/4)) - ArcTanh[(a + b*x
^4)^(1/4)/a^(1/4)]/(2*a^(3/4))
```

Rubi [A] time = 0.0781424, antiderivative size = 55, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{2a^{3/4}}-\frac{\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{2a^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a + b*x^4)^(3/4)),x]
```

```
[Out] -ArcTan[(a + b*x^4)^(1/4)/a^(1/4)]/(2*a^(3/4)) - ArcTanh[(a + b*x
^4)^(1/4)/a^(1/4)]/(2*a^(3/4))
```

Rubi in Sympy [A] time = 8.2933, size = 48, normalized size = 0.87

$$-\frac{\operatorname{atan}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{2a^{\frac{3}{4}}}-\frac{\operatorname{atanh}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{2a^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(b*x**4+a)**(3/4),x)
```

```
[Out] -atan((a + b*x**4)**(1/4)/a**(1/4))/(2*a**(3/4)) - atanh((a + b*x
**4)**(1/4)/a**(1/4))/(2*a**(3/4))
```

Mathematica [C] time = 0.0351953, size = 48, normalized size = 0.87

$$-\frac{\left(\frac{a}{bx^4}+1\right)^{3/4}\,{}_2F_1\left(\frac{3}{4},\frac{3}{4};\frac{7}{4};-\frac{a}{bx^4}\right)}{3\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a + b*x^4)^(3/4)),x]
```

```
[Out] -((1 + a/(b*x^4))^(3/4)*Hypergeometric2F1[3/4, 3/4, 7/4, -(a/(b*x
^4))])/(3*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.031, size = 0, normalized size = 0.

$$\int \frac{1}{x}\left(bx^4+a\right)^{-\frac{3}{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(b*x^4+a)^(3/4),x)
```

```
[Out] int(1/x/(b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.25846, size = 134, normalized size = 2.44

$$\frac{1}{a^3}^{\frac{1}{4}} \arctan\left(\frac{a\frac{1}{a^3}^{\frac{1}{4}}}{\sqrt{a^2\sqrt{\frac{1}{a^3}} + \sqrt{bx^4 + a}} + (bx^4 + a)^{\frac{1}{4}}}\right) - \frac{1}{4}\frac{1}{a^3}^{\frac{1}{4}} \log\left(a\frac{1}{a^3}^{\frac{1}{4}} + (bx^4 + a)^{\frac{1}{4}}\right) + \frac{1}{4}\frac{1}{a^3}^{\frac{1}{4}} \log\left(-a\frac{1}{a^3}^{\frac{1}{4}} + (bx^4 + a)^{\frac{1}{4}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x),x, algorithm="fricas")
```

```
[Out] (a^(-3))^(1/4)*arctan(a*(a^(-3))^(1/4)/(sqrt(a^2*sqrt(a^(-3)) + s
qrt(b*x^4 + a)) + (b*x^4 + a)^(1/4))) - 1/4*(a^(-3))^(1/4)*log(a*
(a^(-3))^(1/4) + (b*x^4 + a)^(1/4)) + 1/4*(a^(-3))^(1/4)*log(-a*(
a^(-3))^(1/4) + (b*x^4 + a)^(1/4))
```

Sympy [A] time = 3.80776, size = 39, normalized size = 0.71

$$-\frac{\Gamma\left(\frac{3}{4}\right) {}_{2}F_{1}\left(\begin{matrix} \frac{3}{4}, \frac{3}{4} \\ \frac{7}{4} \end{matrix}\middle| \frac{ae^{i\pi}}{bx^4}\right)}{4b^{\frac{3}{4}}x^3\Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(b*x**4+a)**(3/4),x)
```

```
[Out] -gamma(3/4)*hyper((3/4, 3/4), (7/4,), a*exp_polar(I*pi)/(b*x**4))
/(4*b**(3/4)*x**3*gamma(7/4))
```

GIAC/XCAS [A] time = 0.220474, size = 251, normalized size = 4.56

$$-\frac{\sqrt{2}\,(-a)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}+2\,(bx^4+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{4\,a}-\frac{\sqrt{2}\,(-a)^{\frac{1}{4}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}-2\,(bx^4+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{4\,a}$$
$$-\frac{\sqrt{2}\,(-a)^{\frac{1}{4}}\ln\left(\sqrt{2}\left(bx^4+a\right)^{\frac{1}{4}}(-a)^{\frac{1}{4}}+\sqrt{bx^4+a}+\sqrt{-a}\right)}{8\,a}$$
$$+\frac{\sqrt{2}\,(-a)^{\frac{1}{4}}\ln\left(-\sqrt{2}\left(bx^4+a\right)^{\frac{1}{4}}(-a)^{\frac{1}{4}}+\sqrt{bx^4+a}+\sqrt{-a}\right)}{8\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x),x, algorithm="giac")
```

```
[Out] -1/4*sqrt(2)*(-a)^(1/4)*arctan(1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) +
2*(b*x^4 + a)^(1/4))/(-a)^(1/4))/a - 1/4*sqrt(2)*(-a)^(1/4)*arcta
n(-1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) - 2*(b*x^4 + a)^(1/4))/(-a)^(1
/4))/a - 1/8*sqrt(2)*(-a)^(1/4)*ln(sqrt(2)*(b*x^4 + a)^(1/4)*(-a)
^(1/4) + sqrt(b*x^4 + a) + sqrt(-a))/a + 1/8*sqrt(2)*(-a)^(1/4)*l
n(-sqrt(2)*(b*x^4 + a)^(1/4)*(-a)^(1/4) + sqrt(b*x^4 + a) + sqrt(
-a))/a
```

3.1114 $\int \frac{1}{x^5(a+bx^4)^{3/4}}\,dx$

Optimal. Leaf size=78

$$\frac{3b\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{8a^{7/4}}+\frac{3b\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{8a^{7/4}}-\frac{\sqrt[4]{a+bx^4}}{4ax^4}$$

```
[Out] -(a + b*x^4)^(1/4)/(4*a*x^4) + (3*b*ArcTan[(a + b*x^4)^(1/4)/a^(1
/4)])/(8*a^(7/4)) + (3*b*ArcTanh[(a + b*x^4)^(1/4)/a^(1/4)])/(8*a
^(7/4))
```

Rubi [A] time = 0.107188, antiderivative size = 78, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$\frac{3b\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{8a^{7/4}}+\frac{3b\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{8a^{7/4}}-\frac{\sqrt[4]{a+bx^4}}{4ax^4}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^5*(a + b*x^4)^(3/4)),x]
```

```
[Out] -(a + b*x^4)^(1/4)/(4*a*x^4) + (3*b*ArcTan[(a + b*x^4)^(1/4)/a^(1
/4)])/(8*a^(7/4)) + (3*b*ArcTanh[(a + b*x^4)^(1/4)/a^(1/4)])/(8*a
^(7/4))
```

Rubi in Sympy [A] time = 11.0096, size = 70, normalized size = 0.9

$$-\frac{\sqrt[4]{a+bx^4}}{4ax^4}+\frac{3b\,\mathrm{atan}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{8a^{\frac{7}{4}}}+\frac{3b\,\mathrm{atanh}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{8a^{\frac{7}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**5/(b*x**4+a)**(3/4),x)
```

```
[Out] -(a + b*x**4)**(1/4)/(4*a*x**4) + 3*b*atan((a + b*x**4)**(1/4)/a*
*(1/4))/(8*a**(7/4)) + 3*b*atanh((a + b*x**4)**(1/4)/a**(1/4))/(8
*a**(7/4))
```

Mathematica [C] time = 0.0524833, size = 69, normalized size = 0.88

$$\frac{bx^4\left(\frac{a}{bx^4}+1\right)^{3/4}{}_2F_1\left(\frac{3}{4},\frac{3}{4};\frac{7}{4};-\frac{a}{bx^4}\right)-a-bx^4}{4ax^4\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^5*(a + b*x^4)^(3/4)),x]
```

```
[Out] (-a - b*x^4 + b*(1 + a/(b*x^4))^(3/4)*x^4*Hypergeometric2F1[3/4,
3/4, 7/4, -(a/(b*x^4))])/(4*a*x^4*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.045, size = 0, normalized size = 0.

$$\int \frac{1}{x^5}\left(bx^4+a\right)^{-\frac{3}{4}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^5/(b*x^4+a)^(3/4),x)
```

```
[Out] int(1/x^5/(b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^5),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.253184, size = 240, normalized size = 3.08

$$-\frac{12\,ax^4\left(\frac{b^4}{a^7}\right)^{\frac{1}{4}}\arctan\left(\frac{a^2\left(\frac{b^4}{a^7}\right)^{\frac{1}{4}}}{(bx^4+a)^{\frac{1}{4}}b+\sqrt{a^4\sqrt{\frac{b^4}{a^7}}+\sqrt{bx^4+a}b^2}}\right)-3\,ax^4\left(\frac{b^4}{a^7}\right)^{\frac{1}{4}}\log\left(3\,a^2\left(\frac{b^4}{a^7}\right)^{\frac{1}{4}}+3\left(bx^4+a\right)^{\frac{1}{4}}b\right)+3\,ax^4\left(\frac{b^4}{a^7}\right)^{\frac{1}{4}}\log\left(-3\right.}{16\,ax^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^5),x, algorithm="fricas")
```

```
[Out] -1/16*(12*a*x^4*(b^4/a^7)^(1/4)*arctan(a^2*(b^4/a^7)^(1/4)/((b*x^
4 + a)^(1/4)*b + sqrt(a^4*sqrt(b^4/a^7) + sqrt(b*x^4 + a)*b^2)))
- 3*a*x^4*(b^4/a^7)^(1/4)*log(3*a^2*(b^4/a^7)^(1/4) + 3*(b*x^4 +
a)^(1/4)*b) + 3*a*x^4*(b^4/a^7)^(1/4)*log(-3*a^2*(b^4/a^7)^(1/4)
+ 3*(b*x^4 + a)^(1/4)*b) + 4*(b*x^4 + a)^(1/4))/(a*x^4)
```

Sympy [A] time = 5.73806, size = 39, normalized size = 0.5

$$-\frac{\Gamma\left(\frac{7}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{3}{4},\frac{7}{4}\\ \frac{11}{4}\end{matrix}\middle|\frac{ae^{i\pi}}{bx^4}\right)}{4b^{\frac{3}{4}}x^7\,\Gamma\left(\frac{11}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**5/(b*x**4+a)**(3/4),x)
```

```
[Out] -gamma(7/4)*hyper((3/4, 7/4), (11/4,), a*exp_polar(I*pi)/(b*x**4)
)/(4*b**(3/4)*x**7*gamma(11/4))
```

GIAC/XCAS [A] time = 0.224246, size = 282, normalized size = 3.62

$$\frac{1}{32}\,b\left(\frac{6\,\sqrt{2}\,(-a)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}+2\,(bx^4+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{a^2}+\frac{6\,\sqrt{2}\,(-a)^{\frac{1}{4}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}-2\,(bx^4+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{a^2}+\frac{3\,\sqrt{2}\,(-a)^{\frac{1}{4}}\ln\left(\sqrt{2}(bx^4+\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^5),x, algorithm="giac")
```

```
[Out] 1/32*b*(6*sqrt(2)*(-a)^(1/4)*arctan(1/2*sqrt(2)*(sqrt(2)*(-a)^(1/
4) + 2*(b*x^4 + a)^(1/4))/(-a)^(1/4))/a^2 + 6*sqrt(2)*(-a)^(1/4)*
arctan(-1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) - 2*(b*x^4 + a)^(1/4))/(-
a)^(1/4))/a^2 + 3*sqrt(2)*(-a)^(1/4)*ln(sqrt(2)*(b*x^4 + a)^(1/4)
*(-a)^(1/4) + sqrt(b*x^4 + a) + sqrt(-a))/a^2 - 3*sqrt(2)*(-a)^(1
/4)*ln(-sqrt(2)*(b*x^4 + a)^(1/4)*(-a)^(1/4) + sqrt(b*x^4 + a) +
sqrt(-a))/a^2 - 8*(b*x^4 + a)^(1/4)/(a*b*x^4))
```

3.1115 $\int \frac{1}{x^9(a+bx^4)^{3/4}}\,dx$

Optimal. Leaf size=104

$$-\frac{21b^2\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{11/4}}-\frac{21b^2\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{11/4}}+\frac{7b\sqrt[4]{a+bx^4}}{32a^2x^4}-\frac{\sqrt[4]{a+bx^4}}{8ax^8}$$

```
[Out] -(a + b*x^4)^(1/4)/(8*a*x^8) + (7*b*(a + b*x^4)^(1/4))/(32*a^2*x^
4) - (21*b^2*ArcTan[(a + b*x^4)^(1/4)/a^(1/4)])/(64*a^(11/4)) - (
21*b^2*ArcTanh[(a + b*x^4)^(1/4)/a^(1/4)])/(64*a^(11/4))
```

Rubi [A] time = 0.144911, antiderivative size = 104, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$-\frac{21b^2\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{11/4}}-\frac{21b^2\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{11/4}}+\frac{7b\sqrt[4]{a+bx^4}}{32a^2x^4}-\frac{\sqrt[4]{a+bx^4}}{8ax^8}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^9*(a + b*x^4)^(3/4)),x]
```

```
[Out] -(a + b*x^4)^(1/4)/(8*a*x^8) + (7*b*(a + b*x^4)^(1/4))/(32*a^2*x^
4) - (21*b^2*ArcTan[(a + b*x^4)^(1/4)/a^(1/4)])/(64*a^(11/4)) - (
21*b^2*ArcTanh[(a + b*x^4)^(1/4)/a^(1/4)])/(64*a^(11/4))
```

Rubi in Sympy [A] time = 15.0302, size = 95, normalized size = 0.91

$$-\frac{\sqrt[4]{a+bx^4}}{8ax^8}+\frac{7b\sqrt[4]{a+bx^4}}{32a^2x^4}-\frac{21b^2\operatorname{atan}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{\frac{11}{4}}}-\frac{21b^2\operatorname{atanh}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{\frac{11}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**9/(b*x**4+a)**(3/4),x)
```

```
[Out] -(a + b*x**4)**(1/4)/(8*a*x**8) + 7*b*(a + b*x**4)**(1/4)/(32*a**
2*x**4) - 21*b**2*atan((a + b*x**4)**(1/4)/a**(1/4))/(64*a**(11/4
)) - 21*b**2*atanh((a + b*x**4)**(1/4)/a**(1/4))/(64*a**(11/4))
```

Mathematica [C] time = 0.05794, size = 83, normalized size = 0.8

$$\frac{-4a^2-7b^2x^8\left(\frac{a}{bx^4}+1\right)^{3/4}{}_2F_1\left(\frac{3}{4},\frac{3}{4};\frac{7}{4};-\frac{a}{bx^4}\right)+3abx^4+7b^2x^8}{32a^2x^8\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^9*(a + b*x^4)^(3/4)),x]
```

```
[Out] (-4*a^2 + 3*a*b*x^4 + 7*b^2*x^8 - 7*b^2*(1 + a/(b*x^4))^(3/4)*x^8
*Hypergeometric2F1[3/4, 3/4, 7/4, -(a/(b*x^4))])/(32*a^2*x^8*(a +
 b*x^4)^(3/4))
```

Maple [F] time = 0.05, size = 0, normalized size = 0.

$$\int \frac{1}{x^9}\left(bx^4+a\right)^{-\frac{3}{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^9/(b*x^4+a)^(3/4),x)
```

```
[Out] int(1/x^9/(b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^9),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.264016, size = 270, normalized size = 2.6

$$\frac{84\,a^2x^8\left(\frac{b^8}{a^{11}}\right)^{\frac14}\arctan\left(\frac{a^3\left(\frac{b^8}{a^{11}}\right)^{\frac14}}{(bx^4+a)^{\frac14}b^2+\sqrt{a^6\sqrt{\frac{b^8}{a^{11}}}+\sqrt{bx^4+a}\,b^4}}\right)-21\,a^2x^8\left(\frac{b^8}{a^{11}}\right)^{\frac14}\log\left(21\,a^3\left(\frac{b^8}{a^{11}}\right)^{\frac14}+21\left(bx^4+a\right)^{\frac14}b^2\right)+21\,a^2x^8\left(\frac{b^8}{a^{11}}\right.}{128\,a^2x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^9),x, algorithm="fricas")
```

```
[Out] 1/128*(84*a^2*x^8*(b^8/a^11)^(1/4)*arctan(a^3*(b^8/a^11)^(1/4)/((
b*x^4 + a)^(1/4)*b^2 + sqrt(a^6*sqrt(b^8/a^11) + sqrt(b*x^4 + a)*
b^4))) - 21*a^2*x^8*(b^8/a^11)^(1/4)*log(21*a^3*(b^8/a^11)^(1/4)
+ 21*(b*x^4 + a)^(1/4)*b^2) + 21*a^2*x^8*(b^8/a^11)^(1/4)*log(-21
*a^3*(b^8/a^11)^(1/4) + 21*(b*x^4 + a)^(1/4)*b^2) + 4*(7*b*x^4 -
4*a)*(b*x^4 + a)^(1/4))/(a^2*x^8)
```

Sympy [A] time = 10.4396, size = 39, normalized size = 0.38

$$-\frac{\Gamma\left(\frac{11}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{3}{4},\frac{11}{4}\\ \frac{15}{4}\end{matrix}\middle|\frac{ae^{i\pi}}{bx^4}\right)}{4b^{\frac{3}{4}}x^{11}\,\Gamma\left(\frac{15}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**9/(b*x**4+a)**(3/4),x)
```

```
[Out] -gamma(11/4)*hyper((3/4, 11/4), (15/4,), a*exp_polar(I*pi)/(b*x**
4))/(4*b**(3/4)*x**11*gamma(15/4))
```

GIAC/XCAS [A] time = 0.224345, size = 305, normalized size = 2.93

$$-\frac{1}{256}\,b^{2}\left(\frac{42\,\sqrt{2}\,(-a)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}+2\,\left(bx^{4}+a\right)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{a^{3}}+\frac{42\,\sqrt{2}\,(-a)^{\frac{1}{4}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}-2\,\left(bx^{4}+a\right)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{a^{3}}+\frac{21\,\sqrt{2}\,(-a)^{\frac{1}{4}}\ln\left(\sqrt{\right.}}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^9),x, algorithm="giac")
```

```
[Out] -1/256*b^2*(42*sqrt(2)*(-a)^(1/4)*arctan(1/2*sqrt(2)*(sqrt(2)*(-a
)^(1/4) + 2*(b*x^4 + a)^(1/4))/(-a)^(1/4))/a^3 + 42*sqrt(2)*(-a)^
(1/4)*arctan(-1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) - 2*(b*x^4 + a)^(1/
4))/(-a)^(1/4))/a^3 + 21*sqrt(2)*(-a)^(1/4)*ln(sqrt(2)*(b*x^4 + a
)^(1/4)*(-a)^(1/4) + sqrt(b*x^4 + a) + sqrt(-a))/a^3 - 21*sqrt(2)
*(-a)^(1/4)*ln(-sqrt(2)*(b*x^4 + a)^(1/4)*(-a)^(1/4) + sqrt(b*x^4
 + a) + sqrt(-a))/a^3 - 8*(7*(b*x^4 + a)^(5/4) - 11*(b*x^4 + a)^(
1/4)*a)/(a^2*b^2*x^8))
```

3.1116 $\int \frac{x^{13}}{(a+bx^4)^{3/4}}\,dx$

Optimal. Leaf size=128

$$-\frac{40a^{7/2}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{77b^{7/2}\left(a+bx^4\right)^{3/4}}+\frac{20a^2x^2\sqrt[4]{a+bx^4}}{77b^3}-\frac{10ax^6\sqrt[4]{a+bx^4}}{77b^2}+\frac{x^{10}\sqrt[4]{a+bx^4}}{11b}$$

```
[Out] (20*a^2*x^2*(a + b*x^4)^(1/4))/(77*b^3) - (10*a*x^6*(a + b*x^4)^(
1/4))/(77*b^2) + (x^10*(a + b*x^4)^(1/4))/(11*b) - (40*a^(7/2)*(1
 + (b*x^4)/a)^(3/4)*EllipticF[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2]
)/(77*b^(7/2)*(a + b*x^4)^(3/4))
```

Rubi [A] time = 0.197787, antiderivative size = 128, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{40a^{7/2}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{77b^{7/2}\left(a+bx^4\right)^{3/4}}+\frac{20a^2x^2\sqrt[4]{a+bx^4}}{77b^3}-\frac{10ax^6\sqrt[4]{a+bx^4}}{77b^2}+\frac{x^{10}\sqrt[4]{a+bx^4}}{11b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^13/(a + b*x^4)^(3/4),x]
```

```
[Out] (20*a^2*x^2*(a + b*x^4)^(1/4))/(77*b^3) - (10*a*x^6*(a + b*x^4)^(
1/4))/(77*b^2) + (x^10*(a + b*x^4)^(1/4))/(11*b) - (40*a^(7/2)*(1
 + (b*x^4)/a)^(3/4)*EllipticF[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2]
)/(77*b^(7/2)*(a + b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 19.623, size = 116, normalized size = 0.91

$$-\frac{40a^{\frac{7}{2}}\left(1+\frac{bx^4}{a}\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{77b^{\frac{7}{2}}\left(a+bx^4\right)^{\frac{3}{4}}}+\frac{20a^2x^2\sqrt[4]{a+bx^4}}{77b^3}-\frac{10ax^6\sqrt[4]{a+bx^4}}{77b^2}+\frac{x^{10}\sqrt[4]{a+bx^4}}{11b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**13/(b*x**4+a)**(3/4),x)
```

```
[Out] -40*a**(7/2)*(1 + b*x**4/a)**(3/4)*elliptic_f(atan(sqrt(b)*x**2/s
qrt(a))/2, 2)/(77*b**(7/2)*(a + b*x**4)**(3/4)) + 20*a**2*x**2*(a
 + b*x**4)**(1/4)/(77*b**3) - 10*a*x**6*(a + b*x**4)**(1/4)/(77*b
**2) + x**10*(a + b*x**4)**(1/4)/(11*b)
```

Mathematica [C] time = 0.0729296, size = 91, normalized size = 0.71

$$\frac{x^2\left(-20a^3\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};-\frac{bx^4}{a}\right)+20a^3+10a^2bx^4-3ab^2x^8+7b^3x^{12}\right)}{77b^3\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^13/(a + b*x^4)^(3/4),x]
```

```
[Out] (x^2*(20*a^3 + 10*a^2*b*x^4 - 3*a*b^2*x^8 + 7*b^3*x^12 - 20*a^3*(
1 + (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/2, 3/4, 3/2, -((b*x^4)/a
```

```
)]))/(77*b^3*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.038, size = 0, normalized size = 0.

$$\int x^{13} \left(b x^4 + a\right)^{-\frac{3}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^13/(b*x^4+a)^(3/4),x)

[Out] int(x^13/(b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{13}}{(b x^4 + a)^{\frac{3}{4}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^13/(b*x^4 + a)^(3/4),x, algorithm="maxima")

[Out] integrate(x^13/(b*x^4 + a)^(3/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{13}}{(b x^4 + a)^{\frac{3}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^13/(b*x^4 + a)^(3/4),x, algorithm="fricas")

[Out] integral(x^13/(b*x^4 + a)^(3/4), x)
```

Sympy [A] time = 8.4009, size = 27, normalized size = 0.21

$$\frac{x^{14} {}_{2}F_{1}\left(\begin{matrix} \frac{3}{4}, \frac{7}{2} \\ \frac{9}{2} \end{matrix}\middle| \frac{b x^4 e^{i\pi}}{a}\right)}{14 a^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**13/(b*x**4+a)**(3/4),x)

[Out] x**14*hyper((3/4, 7/2), (9/2,), b*x**4*exp_polar(I*pi)/a)/(14*a**
(3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{13}}{(b x^4 + a)^{\frac{3}{4}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^13/(b*x^4 + a)^(3/4),x, algorithm="giac")
```

```
[Out] integrate(x^13/(b*x^4 + a)^(3/4), x)
```

3.1117 $\int \frac{x^9}{(a+bx^4)^{3/4}}\,dx$

Optimal. Leaf size=104

$$\frac{4a^{5/2}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{7b^{5/2}(a+bx^4)^{3/4}}-\frac{2ax^2\sqrt[4]{a+bx^4}}{7b^2}+\frac{x^6\sqrt[4]{a+bx^4}}{7b}$$

```
[Out] (-2*a*x^2*(a + b*x^4)^(1/4))/(7*b^2) + (x^6*(a + b*x^4)^(1/4))/(7
*b) + (4*a^(5/2)*(1 + (b*x^4)/a)^(3/4)*EllipticF[ArcTan[(Sqrt[b]*
x^2)/Sqrt[a]]/2, 2])/(7*b^(5/2)*(a + b*x^4)^(3/4))
```

Rubi [A] time = 0.151385, antiderivative size = 104, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{4a^{5/2}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{7b^{5/2}(a+bx^4)^{3/4}}-\frac{2ax^2\sqrt[4]{a+bx^4}}{7b^2}+\frac{x^6\sqrt[4]{a+bx^4}}{7b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^9/(a + b*x^4)^(3/4),x]
```

```
[Out] (-2*a*x^2*(a + b*x^4)^(1/4))/(7*b^2) + (x^6*(a + b*x^4)^(1/4))/(7
*b) + (4*a^(5/2)*(1 + (b*x^4)/a)^(3/4)*EllipticF[ArcTan[(Sqrt[b]*
x^2)/Sqrt[a]]/2, 2])/(7*b^(5/2)*(a + b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 14.8906, size = 92, normalized size = 0.88

$$\frac{4a^{\frac{5}{2}}\left(1+\frac{bx^4}{a}\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{7b^{\frac{5}{2}}(a+bx^4)^{\frac{3}{4}}}-\frac{2ax^2\sqrt[4]{a+bx^4}}{7b^2}+\frac{x^6\sqrt[4]{a+bx^4}}{7b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**9/(b*x**4+a)**(3/4),x)
```

```
[Out] 4*a**(5/2)*(1 + b*x**4/a)**(3/4)*elliptic_f(atan(sqrt(b)*x**2/sqr
t(a))/2, 2)/(7*b**(5/2)*(a + b*x**4)**(3/4)) - 2*a*x**2*(a + b*x*
*4)**(1/4)/(7*b**2) + x**6*(a + b*x**4)**(1/4)/(7*b)
```

Mathematica [C] time = 0.0585937, size = 79, normalized size = 0.76

$$\frac{x^2\left(2a^2\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};-\frac{bx^4}{a}\right)-2a^2-abx^4+b^2x^8\right)}{7b^2(a+bx^4)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^9/(a + b*x^4)^(3/4),x]
```

```
[Out] (x^2*(-2*a^2 - a*b*x^4 + b^2*x^8 + 2*a^2*(1 + (b*x^4)/a)^(3/4)*Hy
pergeometric2F1[1/2, 3/4, 3/2, -((b*x^4)/a)]))/(7*b^2*(a + b*x^4)
^(3/4))
```

Maple [F] time = 0.037, size = 0, normalized size = 0.

$$\int x^9 \left(b x^4+a\right)^{-\frac{3}{4}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^9/(b*x^4+a)^(3/4),x)
```

```
[Out] int(x^9/(b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^9}{(b x^4+a)^{\frac{3}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(b*x^4 + a)^(3/4),x, algorithm="maxima")
```

```
[Out] integrate(x^9/(b*x^4 + a)^(3/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x^9}{(b x^4+a)^{\frac{3}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(b*x^4 + a)^(3/4),x, algorithm="fricas")
```

```
[Out] integral(x^9/(b*x^4 + a)^(3/4), x)
```

Sympy [A] time = 4.27567, size = 27, normalized size = 0.26

$$\frac{x^{10} {}_{2}F_{1}\left(\begin{matrix} \frac{3}{4}, \frac{5}{2} \\ \frac{7}{2} \end{matrix}\middle| {\frac{b x^4 e^{i\pi}}{a}} \right)}{10 a^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**9/(b*x**4+a)**(3/4),x)
```

```
[Out] x**10*hyper((3/4, 5/2), (7/2,), b*x**4*exp_polar(I*pi)/a)/(10*a**
(3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^9}{(b x^4+a)^{\frac{3}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(b*x^4 + a)^(3/4),x, algorithm="giac")
```

```
[Out] integrate(x^9/(b*x^4 + a)^(3/4), x)
```

3.1118 $\int \frac{x^5}{(a+bx^4)^{3/4}}\,dx$

Optimal. Leaf size=82

$$\frac{x^2\sqrt[4]{a+bx^4}}{3b}-\frac{2a^{3/2}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{3b^{3/2}\left(a+bx^4\right)^{3/4}}$$

```
[Out] (x^2*(a + b*x^4)^(1/4))/(3*b) - (2*a^(3/2)*(1 + (b*x^4)/a)^(3/4)*
EllipticF[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(3*b^(3/2)*(a + b*
x^4)^(3/4))
```

Rubi [A] time = 0.113308, antiderivative size = 82, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{x^2\sqrt[4]{a+bx^4}}{3b}-\frac{2a^{3/2}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{3b^{3/2}\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/(a + b*x^4)^(3/4),x]
```

```
[Out] (x^2*(a + b*x^4)^(1/4))/(3*b) - (2*a^(3/2)*(1 + (b*x^4)/a)^(3/4)*
EllipticF[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(3*b^(3/2)*(a + b*
x^4)^(3/4))
```

Rubi in Sympy [A] time = 11.1281, size = 70, normalized size = 0.85

$$-\frac{2a^{\frac{3}{2}}\left(1+\frac{bx^4}{a}\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{3b^{\frac{3}{2}}\left(a+bx^4\right)^{\frac{3}{4}}}+\frac{x^2\sqrt[4]{a+bx^4}}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(b*x**4+a)**(3/4),x)
```

```
[Out] -2*a**(3/2)*(1 + b*x**4/a)**(3/4)*elliptic_f(atan(sqrt(b)*x**2/sq
rt(a))/2, 2)/(3*b**(3/2)*(a + b*x**4)**(3/4)) + x**2*(a + b*x**4)
**(1/4)/(3*b)
```

Mathematica [C] time = 0.0455685, size = 64, normalized size = 0.78

$$\frac{x^2\left(-a\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};-\frac{bx^4}{a}\right)+a+bx^4\right)}{3b\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/(a + b*x^4)^(3/4),x]
```

```
[Out] (x^2*(a + b*x^4 - a*(1 + (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/2,
3/4, 3/2, -((b*x^4)/a)]))/(3*b*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.036, size = 0, normalized size = 0.

$$\int x^{5} \left(b x^{4}+a \right)^{-\frac{3}{4}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(b*x^4+a)^(3/4),x)
```

```
[Out] int(x^5/(b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{5}}{(bx^{4}+a)^{\frac{3}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^4 + a)^(3/4),x, algorithm="maxima")
```

```
[Out] integrate(x^5/(b*x^4 + a)^(3/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{5}}{(bx^{4}+a)^{\frac{3}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^4 + a)^(3/4),x, algorithm="fricas")
```

```
[Out] integral(x^5/(b*x^4 + a)^(3/4), x)
```

Sympy [A] time = 2.67918, size = 27, normalized size = 0.33

$$\frac{x^{6} {}_{2}F_{1}\left(\begin{matrix} \frac{3}{4}, \frac{3}{2} \\ \frac{5}{2} \end{matrix}\middle| {\frac{bx^{4}e^{i\pi}}{a}} \right)}{6a^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(b*x**4+a)**(3/4),x)
```

```
[Out] x**6*hyper((3/4, 3/2), (5/2,), b*x**4*exp_polar(I*pi)/a)/(6*a**(3
/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{5}}{(bx^{4}+a)^{\frac{3}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^4 + a)^(3/4),x, algorithm="giac")

[Out] integrate(x^5/(b*x^4 + a)^(3/4), x)
```

3.1119 $\int \frac{x}{(a+bx^4)^{3/4}}\,dx$

Optimal. Leaf size=57

$$\frac{\sqrt{a}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{\sqrt{b}\left(a+bx^4\right)^{3/4}}$$

```
[Out] (Sqrt[a]*(1 + (b*x^4)/a)^(3/4)*EllipticF[ArcTan[(Sqrt[b]*x^2)/Sqr
t[a]]/2, 2])/(Sqrt[b]*(a + b*x^4)^(3/4))
```

Rubi [A] time = 0.0681445, antiderivative size = 57, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{\sqrt{a}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{\sqrt{b}\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b*x^4)^(3/4),x]
```

```
[Out] (Sqrt[a]*(1 + (b*x^4)/a)^(3/4)*EllipticF[ArcTan[(Sqrt[b]*x^2)/Sqr
t[a]]/2, 2])/(Sqrt[b]*(a + b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 6.70818, size = 49, normalized size = 0.86

$$\frac{\sqrt{a}\left(1+\frac{bx^4}{a}\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{\sqrt{b}\left(a+bx^4\right)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(b*x**4+a)**(3/4),x)
```

```
[Out] sqrt(a)*(1 + b*x**4/a)**(3/4)*elliptic_f(atan(sqrt(b)*x**2/sqrt(a
))/2, 2)/(sqrt(b)*(a + b*x**4)**(3/4))
```

Mathematica [C] time = 0.0285281, size = 52, normalized size = 0.91

$$\frac{x^2\left(\frac{a+bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};-\frac{bx^4}{a}\right)}{2\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b*x^4)^(3/4),x]
```

```
[Out] (x^2*((a + b*x^4)/a)^(3/4)*Hypergeometric2F1[1/2, 3/4, 3/2, -((b*
x^4)/a)])/(2*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.028, size = 0, normalized size = 0.

$$\int x\left(bx^4+a\right)^{-\frac{3}{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(b*x^4+a)^(3/4),x)
```

```
[Out] int(x/(b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{(bx^4+a)^{\frac{3}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^4 + a)^(3/4),x, algorithm="maxima")
```

```
[Out] integrate(x/(b*x^4 + a)^(3/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x}{(bx^4+a)^{\frac{3}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^4 + a)^(3/4),x, algorithm="fricas")
```

```
[Out] integral(x/(b*x^4 + a)^(3/4), x)
```

Sympy [A] time = 2.25065, size = 27, normalized size = 0.47

$$\frac{x^2\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{3}{4}\\ \frac{3}{2}\end{matrix}\middle|\frac{bx^4e^{i\pi}}{a}\right)}{2a^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x**4+a)**(3/4),x)
```

```
[Out] x**2*hyper((1/2, 3/4), (3/2,), b*x**4*exp_polar(I*pi)/a)/(2*a**(3
/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{(bx^4+a)^{\frac{3}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^4 + a)^(3/4),x, algorithm="giac")
```

```
[Out] integrate(x/(b*x^4 + a)^(3/4), x)
```

3.1120 $\int \frac{1}{x^3(a+bx^4)^{3/4}} dx$

Optimal. Leaf size=82

$$-\frac{\sqrt[4]{a+bx^4}}{2ax^2}-\frac{\sqrt{b}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{2\sqrt{a}\left(a+bx^4\right)^{3/4}}$$

```
[Out] -(a + b*x^4)^(1/4)/(2*a*x^2) - (Sqrt[b]*(1 + (b*x^4)/a)^(3/4)*Ell
ipticF[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(2*Sqrt[a]*(a + b*x^4
)^(3/4))
```

Rubi [A] time = 0.107731, antiderivative size = 82, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{\sqrt[4]{a+bx^4}}{2ax^2}-\frac{\sqrt{b}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{2\sqrt{a}\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(a + b*x^4)^(3/4)),x]
```


```
[Out] -(a + b*x^4)^(1/4)/(2*a*x^2) - (Sqrt[b]*(1 + (b*x^4)/a)^(3/4)*Ell
ipticF[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(2*Sqrt[a]*(a + b*x^4
)^(3/4))
```

Rubi in Sympy [A] time = 10.7267, size = 70, normalized size = 0.85

$$-\frac{\sqrt[4]{a+bx^4}}{2ax^2}-\frac{\sqrt{b}\left(1+\frac{bx^4}{a}\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{2\sqrt{a}\left(a+bx^4\right)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(b*x**4+a)**(3/4),x)
```

```
[Out] -(a + b*x**4)**(1/4)/(2*a*x**2) - sqrt(b)*(1 + b*x**4/a)**(3/4)*e
lliptic_f(atan(sqrt(b)*x**2/sqrt(a))/2, 2)/(2*sqrt(a)*(a + b*x**4
)**(3/4))
```

Mathematica [C] time = 0.0453499, size = 70, normalized size = 0.85

$$\frac{-bx^4\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};-\frac{bx^4}{a}\right)-2\left(a+bx^4\right)}{4ax^2\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*(a + b*x^4)^(3/4)),x]
```

```
[Out] (-2*(a + b*x^4) - b*x^4*(1 + (b*x^4)/a)^(3/4)*Hypergeometric2F1[1
/2, 3/4, 3/2, -((b*x^4)/a)])/(4*a*x^2*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.04, size = 0, normalized size = 0.

$$\int \frac{1}{x^{3}} \left(b x^{4}+a \right)^{-\frac{3}{4}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(b*x^4+a)^(3/4),x)

[Out] int(1/x^3/(b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4+a)^{\frac{3}{4}}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^3),x, algorithm="maxima")

[Out] integrate(1/((b*x^4 + a)^(3/4)*x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{(bx^4+a)^{\frac{3}{4}}x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^3),x, algorithm="fricas")

[Out] integral(1/((b*x^4 + a)^(3/4)*x^3), x)
```

Sympy [A] time = 3.06132, size = 31, normalized size = 0.38

$$-\frac{{}_2F_1\left(\begin{matrix} -\frac{1}{2}, \frac{3}{4} \\ \frac{1}{2} \end{matrix}\middle| \frac{bx^4e^{i\pi}}{a}\right)}{2a^{\frac{3}{4}}x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(b*x**4+a)**(3/4),x)

[Out] -hyper((-1/2, 3/4), (1/2,), b*x**4*exp_polar(I*pi)/a)/(2*a**(3/4)
*x**2)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4+a)^{\frac{3}{4}}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^3),x, algorithm="giac")

[Out] integrate(1/((b*x^4 + a)^(3/4)*x^3), x)
```

3.1121 $\int \frac{1}{x^7(a+bx^4)^{3/4}}\,dx$

Optimal. Leaf size=104

$$\frac{5b^{3/2}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{12a^{3/2}\left(a+bx^4\right)^{3/4}}+\frac{5b\sqrt[4]{a+bx^4}}{12a^2x^2}-\frac{\sqrt[4]{a+bx^4}}{6ax^6}$$

```
[Out] -(a + b*x^4)^(1/4)/(6*a*x^6) + (5*b*(a + b*x^4)^(1/4))/(12*a^2*x^
2) + (5*b^(3/2)*(1 + (b*x^4)/a)^(3/4)*EllipticF[ArcTan[(Sqrt[b]*x
^2)/Sqrt[a]]/2, 2])/(12*a^(3/2)*(a + b*x^4)^(3/4))
```

Rubi [A] time = 0.146449, antiderivative size = 104, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{5b^{3/2}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{12a^{3/2}\left(a+bx^4\right)^{3/4}}+\frac{5b\sqrt[4]{a+bx^4}}{12a^2x^2}-\frac{\sqrt[4]{a+bx^4}}{6ax^6}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^7*(a + b*x^4)^(3/4)),x]
```

```
[Out] -(a + b*x^4)^(1/4)/(6*a*x^6) + (5*b*(a + b*x^4)^(1/4))/(12*a^2*x^
2) + (5*b^(3/2)*(1 + (b*x^4)/a)^(3/4)*EllipticF[ArcTan[(Sqrt[b]*x
^2)/Sqrt[a]]/2, 2])/(12*a^(3/2)*(a + b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 14.4912, size = 92, normalized size = 0.88

$$-\frac{\sqrt[4]{a+bx^4}}{6ax^6}+\frac{5b\sqrt[4]{a+bx^4}}{12a^2x^2}+\frac{5b^{\frac{3}{2}}\left(1+\frac{bx^4}{a}\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{12a^{\frac{3}{2}}\left(a+bx^4\right)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**7/(b*x**4+a)**(3/4),x)
```

```
[Out] -(a + b*x**4)**(1/4)/(6*a*x**6) + 5*b*(a + b*x**4)**(1/4)/(12*a**
2*x**2) + 5*b**(3/2)*(1 + b*x**4/a)**(3/4)*elliptic_f(atan(sqrt(b
)*x**2/sqrt(a))/2, 2)/(12*a**(3/2)*(a + b*x**4)**(3/4))
```

Mathematica [C] time = 0.0556687, size = 83, normalized size = 0.8

$$\frac{-4a^2+5b^2x^8\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};-\frac{bx^4}{a}\right)+6abx^4+10b^2x^8}{24a^2x^6\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^7*(a + b*x^4)^(3/4)),x]
```

```
[Out] (-4*a^2 + 6*a*b*x^4 + 10*b^2*x^8 + 5*b^2*x^8*(1 + (b*x^4)/a)^(3/4
)*Hypergeometric2F1[1/2, 3/4, 3/2, -((b*x^4)/a)])/(24*a^2*x^6*(a
+ b*x^4)^(3/4))
```

Maple [F] time = 0.046, size = 0, normalized size = 0.

$$\int \frac{1}{x^7}\left(bx^4+a\right)^{-\frac{3}{4}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^7/(b*x^4+a)^(3/4),x)
```

```
[Out] int(1/x^7/(b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4+a)^{\frac{3}{4}}x^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^7),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x^4 + a)^(3/4)*x^7), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{(bx^4+a)^{\frac{3}{4}}x^7}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^7),x, algorithm="fricas")
```

```
[Out] integral(1/((b*x^4 + a)^(3/4)*x^7), x)
```

Sympy [A] time = 5.77795, size = 32, normalized size = 0.31

$$-\frac{{}_2F_1\left(\begin{matrix}-\frac{3}{2},\frac{3}{4}\\-\frac{1}{2}\end{matrix}\middle|\frac{bx^4e^{i\pi}}{a}\right)}{6a^{\frac{3}{4}}x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**7/(b*x**4+a)**(3/4),x)
```

```
[Out] -hyper((-3/2, 3/4), (-1/2,), b*x**4*exp_polar(I*pi)/a)/(6*a**(3/4
)*x**6)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4+a)^{\frac{3}{4}}x^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^7),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^4 + a)^(3/4)*x^7), x)
```

3.1122 $\int \frac{1}{x^{11}(a+bx^4)^{3/4}}\,dx$

Optimal. Leaf size=128

$$-\frac{3b^{5/2}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{8a^{5/2}\left(a+bx^4\right)^{3/4}}-\frac{3b^2\sqrt[4]{a+bx^4}}{8a^3x^2}+\frac{3b\sqrt[4]{a+bx^4}}{20a^2x^6}-\frac{\sqrt[4]{a+bx^4}}{10ax^{10}}$$

```
[Out] -(a + b*x^4)^(1/4)/(10*a*x^10) + (3*b*(a + b*x^4)^(1/4))/(20*a^2*
x^6) - (3*b^2*(a + b*x^4)^(1/4))/(8*a^3*x^2) - (3*b^(5/2)*(1 + (b
*x^4)/a)^(3/4)*EllipticF[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(8*
a^(5/2)*(a + b*x^4)^(3/4))
```

Rubi [A] time = 0.188425, antiderivative size = 128, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{3b^{5/2}\left(\frac{bx^4}{a}+1\right)^{3/4}F\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{8a^{5/2}\left(a+bx^4\right)^{3/4}}-\frac{3b^2\sqrt[4]{a+bx^4}}{8a^3x^2}+\frac{3b\sqrt[4]{a+bx^4}}{20a^2x^6}-\frac{\sqrt[4]{a+bx^4}}{10ax^{10}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^11*(a + b*x^4)^(3/4)),x]
```

```
[Out] -(a + b*x^4)^(1/4)/(10*a*x^10) + (3*b*(a + b*x^4)^(1/4))/(20*a^2*
x^6) - (3*b^2*(a + b*x^4)^(1/4))/(8*a^3*x^2) - (3*b^(5/2)*(1 + (b
*x^4)/a)^(3/4)*EllipticF[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(8*
a^(5/2)*(a + b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 19.1818, size = 116, normalized size = 0.91

$$-\frac{\sqrt[4]{a+bx^4}}{10ax^{10}}+\frac{3b\sqrt[4]{a+bx^4}}{20a^2x^6}-\frac{3b^2\sqrt[4]{a+bx^4}}{8a^3x^2}-\frac{3b^{\frac{5}{2}}\left(1+\frac{bx^4}{a}\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{8a^{\frac{5}{2}}\left(a+bx^4\right)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**11/(b*x**4+a)**(3/4),x)
```

```
[Out] -(a + b*x**4)**(1/4)/(10*a*x**10) + 3*b*(a + b*x**4)**(1/4)/(20*a
**2*x**6) - 3*b**2*(a + b*x**4)**(1/4)/(8*a**3*x**2) - 3*b**(5/2)
*(1 + b*x**4/a)**(3/4)*elliptic_f(atan(sqrt(b)*x**2/sqrt(a))/2, 2
)/(8*a**(5/2)*(a + b*x**4)**(3/4))
```

Mathematica [C] time = 0.061775, size = 94, normalized size = 0.73

$$\frac{-8a^3+4a^2bx^4-15b^3x^{12}\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};-\frac{bx^4}{a}\right)-18ab^2x^8-30b^3x^{12}}{80a^3x^{10}\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^11*(a + b*x^4)^(3/4)),x]
```

```
[Out] (-8*a^3 + 4*a^2*b*x^4 - 18*a*b^2*x^8 - 30*b^3*x^12 - 15*b^3*x^12*
(1 + (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/2, 3/4, 3/2, -((b*x^4)/
```

```
a)])/(80*a^3*x^10*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.048, size = 0, normalized size = 0.

$$\int \frac{1}{x^{11}} \left(bx^4 + a\right)^{-\frac{3}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^11/(b*x^4+a)^(3/4),x)
```

```
[Out] int(1/x^11/(b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4 + a)^{\frac{3}{4}} x^{11}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^11),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x^4 + a)^(3/4)*x^11), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(bx^4 + a)^{\frac{3}{4}} x^{11}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^11),x, algorithm="fricas")
```

```
[Out] integral(1/((b*x^4 + a)^(3/4)*x^11), x)
```

Sympy [A] time = 12.1984, size = 32, normalized size = 0.25

$$-\frac{{}_2F_1\left(\begin{matrix} -\frac{5}{2}, \frac{3}{4} \\ -\frac{3}{2} \end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{10a^{\frac{3}{4}} x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**11/(b*x**4+a)**(3/4),x)
```

```
[Out] -hyper((-5/2, 3/4), (-3/2,), b*x**4*exp_polar(I*pi)/a)/(10*a**(3/
4)*x**10)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4 + a)^{\frac{3}{4}} x^{11}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^11),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^4 + a)^(3/4)*x^11), x)
```

3.1123 $\int \frac{x^{10}}{(a+bx^4)^{3/4}}\,dx$

Optimal. Leaf size=106

$$-\frac{21a^2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{11/4}}+\frac{21a^2\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{11/4}}-\frac{7ax^3\sqrt[4]{a+bx^4}}{32b^2}+\frac{x^7\sqrt[4]{a+bx^4}}{8b}$$

```
[Out] (-7*a*x^3*(a + b*x^4)^(1/4))/(32*b^2) + (x^7*(a + b*x^4)^(1/4))/(
8*b) - (21*a^2*ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(64*b^(11/4
)) + (21*a^2*ArcTanh[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(64*b^(11/4)
)
```

Rubi [A] time = 0.11014, antiderivative size = 106, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{21a^2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{11/4}}+\frac{21a^2\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{11/4}}-\frac{7ax^3\sqrt[4]{a+bx^4}}{32b^2}+\frac{x^7\sqrt[4]{a+bx^4}}{8b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^10/(a + b*x^4)^(3/4),x]
```

```
[Out] (-7*a*x^3*(a + b*x^4)^(1/4))/(32*b^2) + (x^7*(a + b*x^4)^(1/4))/(
8*b) - (21*a^2*ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(64*b^(11/4
)) + (21*a^2*ArcTanh[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(64*b^(11/4)
)
```

Rubi in Sympy [A] time = 14.1684, size = 99, normalized size = 0.93

$$-\frac{21a^2\operatorname{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{\frac{11}{4}}}+\frac{21a^2\operatorname{atanh}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{\frac{11}{4}}}-\frac{7ax^3\sqrt[4]{a+bx^4}}{32b^2}+\frac{x^7\sqrt[4]{a+bx^4}}{8b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**10/(b*x**4+a)**(3/4),x)
```

```
[Out] -21*a**2*atan(b**(1/4)*x/(a + b*x**4)**(1/4))/(64*b**(11/4)) + 21
*a**2*atanh(b**(1/4)*x/(a + b*x**4)**(1/4))/(64*b**(11/4)) - 7*a*
x**3*(a + b*x**4)**(1/4)/(32*b**2) + x**7*(a + b*x**4)**(1/4)/(8*
b)
```

Mathematica [C] time = 0.0636981, size = 80, normalized size = 0.75

$$\frac{x^3\left(7a^2\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{3}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)-7a^2-3abx^4+4b^2x^8\right)}{32b^2\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^10/(a + b*x^4)^(3/4),x]
```

```
[Out] (x^3*(-7*a^2 - 3*a*b*x^4 + 4*b^2*x^8 + 7*a^2*(1 + (b*x^4)/a)^(3/4
)*Hypergeometric2F1[3/4, 3/4, 7/4, -((b*x^4)/a)]))/(32*b^2*(a + b
```

```
*x^4)^(3/4))
```

Maple [F] time = 0.041, size = 0, normalized size = 0.

$$\int x^{10} \left(bx^4 + a\right)^{-\frac{3}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^10/(b*x^4+a)^(3/4),x)

[Out] int(x^10/(b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/(b*x^4 + a)^(3/4),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [A] time = 0.252819, size = 284, normalized size = 2.68

$$-\frac{84\, b^2 \left(\frac{a^8}{b^{11}}\right)^{\frac{1}{4}} \arctan\left(\frac{b^3 x \left(\frac{a^8}{b^{11}}\right)^{\frac{1}{4}}}{(bx^4+a)^{\frac{1}{4}} a^2 + x\sqrt{\frac{b^6 x^2 \sqrt{\frac{a^8}{b^{11}}} + \sqrt{bx^4+a}a^4}{x^2}}}\right) - 21\, b^2 \left(\frac{a^8}{b^{11}}\right)^{\frac{1}{4}} \log\left(\frac{21\left(b^3 x \left(\frac{a^8}{b^{11}}\right)^{\frac{1}{4}} + (bx^4+a)^{\frac{1}{4}} a^2\right)}{x}\right) + 21\, b^2 \left(\frac{a^8}{b^{11}}\right)^{\frac{1}{4}} \log\left(-\right.}{128\, b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/(b*x^4 + a)^(3/4),x, algorithm="fricas")

[Out] -1/128*(84*b^2*(a^8/b^11)^(1/4)*arctan(b^3*x*(a^8/b^11)^(1/4)/((b
*x^4 + a)^(1/4)*a^2 + x*sqrt((b^6*x^2*sqrt(a^8/b^11) + sqrt(b*x^4
 + a)*a^4)/x^2))) - 21*b^2*(a^8/b^11)^(1/4)*log(21*(b^3*x*(a^8/b^
11)^(1/4) + (b*x^4 + a)^(1/4)*a^2)/x) + 21*b^2*(a^8/b^11)^(1/4)*l
og(-21*(b^3*x*(a^8/b^11)^(1/4) - (b*x^4 + a)^(1/4)*a^2)/x) - 4*(4
*b*x^7 - 7*a*x^3)*(b*x^4 + a)^(1/4))/b^2
```

Sympy [A] time = 7.29836, size = 37, normalized size = 0.35

$$\frac{x^{11}\,\Gamma\left(\frac{11}{4}\right) {}_{2}F_{1}\left(\begin{matrix} \frac{3}{4}, \frac{11}{4} \\ \frac{15}{4} \end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{4a^{\frac{3}{4}}\,\Gamma\left(\frac{15}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**10/(b*x**4+a)**(3/4),x)

[Out] x**11*gamma(11/4)*hyper((3/4, 11/4), (15/4,), b*x**4*exp_polar(I*
pi)/a)/(4*a**(3/4)*gamma(15/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{10}}{\left(bx^4+a\right)^{\frac{3}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/(b*x^4 + a)^(3/4),x, algorithm="giac")
```

```
[Out] integrate(x^10/(b*x^4 + a)^(3/4), x)
```

3.1124 $\int \frac{x^6}{(a+bx^4)^{3/4}}\,dx$

Optimal. Leaf size=80

$$\frac{3a\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{8b^{7/4}}-\frac{3a\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{8b^{7/4}}+\frac{x^3\sqrt[4]{a+bx^4}}{4b}$$

```
[Out] (x^3*(a + b*x^4)^(1/4))/(4*b) + (3*a*ArcTan[(b^(1/4)*x)/(a + b*x^
4)^(1/4)])/(8*b^(7/4)) - (3*a*ArcTanh[(b^(1/4)*x)/(a + b*x^4)^(1/
4)])/(8*b^(7/4))
```

Rubi [A] time = 0.0796956, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{3a\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{8b^{7/4}}-\frac{3a\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{8b^{7/4}}+\frac{x^3\sqrt[4]{a+bx^4}}{4b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/(a + b*x^4)^(3/4),x]
```

```
[Out] (x^3*(a + b*x^4)^(1/4))/(4*b) + (3*a*ArcTan[(b^(1/4)*x)/(a + b*x^
4)^(1/4)])/(8*b^(7/4)) - (3*a*ArcTanh[(b^(1/4)*x)/(a + b*x^4)^(1/
4)])/(8*b^(7/4))
```

Rubi in Sympy [A] time = 10.6395, size = 73, normalized size = 0.91

$$\frac{3a\,\text{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{8b^{\frac{7}{4}}}-\frac{3a\,\text{atanh}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{8b^{\frac{7}{4}}}+\frac{x^3\sqrt[4]{a+bx^4}}{4b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(b*x**4+a)**(3/4),x)
```

```
[Out] 3*a*atan(b**(1/4)*x/(a + b*x**4)**(1/4))/(8*b**(7/4)) - 3*a*atanh
(b**(1/4)*x/(a + b*x**4)**(1/4))/(8*b**(7/4)) + x**3*(a + b*x**4)
**(1/4)/(4*b)
```

Mathematica [C] time = 0.0482144, size = 64, normalized size = 0.8

$$\frac{x^3\left(-a\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{3}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)+a+bx^4\right)}{4b\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6/(a + b*x^4)^(3/4),x]
```

```
[Out] (x^3*(a + b*x^4 - a*(1 + (b*x^4)/a)^(3/4)*Hypergeometric2F1[3/4,
3/4, 7/4, -((b*x^4)/a)]))/(4*b*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.05, size = 0, normalized size = 0.

$$\int x^{6} \left(b x^{4}+a\right)^{-\frac{3}{4}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(b*x^4+a)^(3/4),x)
```

```
[Out] int(x^6/(b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(b*x^4 + a)^(3/4),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.26681, size = 254, normalized size = 3.18

$$\frac{4 \left(b x^{4}+a\right)^{\frac{1}{4}} x^{3}+12 \, b \left(\frac{a^{4}}{b^{7}}\right)^{\frac{1}{4}} \arctan\left(\frac{b^{2} x \left(\frac{a^{4}}{b^{7}}\right)^{\frac{1}{4}}}{x \sqrt{\frac{b^{4} x^{2} \sqrt{\frac{a^{4}}{b^{7}}}+\sqrt{b x^{4}+a} a^{2}}{x^{2}}}+\left(b x^{4}+a\right)^{\frac{1}{4}} a}\right) - 3 \, b \left(\frac{a^{4}}{b^{7}}\right)^{\frac{1}{4}} \log\left(\frac{3 \left(b^{2} x \left(\frac{a^{4}}{b^{7}}\right)^{\frac{1}{4}}+\left(b x^{4}+a\right)^{\frac{1}{4}} a\right)}{x}\right) + 3 \, b \left(\frac{a^{4}}{b^{7}}\right)^{\frac{1}{4}} \mathrm{lo}}{16 \, b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(b*x^4 + a)^(3/4),x, algorithm="fricas")
```

```
[Out] 1/16*(4*(b*x^4 + a)^(1/4)*x^3 + 12*b*(a^4/b^7)^(1/4)*arctan(b^2*x
*(a^4/b^7)^(1/4)/(x*sqrt((b^4*x^2*sqrt(a^4/b^7) + sqrt(b*x^4 + a)
*a^2)/x^2) + (b*x^4 + a)^(1/4)*a)) - 3*b*(a^4/b^7)^(1/4)*log(3*(b
^2*x*(a^4/b^7)^(1/4) + (b*x^4 + a)^(1/4)*a)/x) + 3*b*(a^4/b^7)^(1
/4)*log(-3*(b^2*x*(a^4/b^7)^(1/4) - (b*x^4 + a)^(1/4)*a)/x))/b
```

Sympy [A] time = 4.61782, size = 37, normalized size = 0.46

$$\frac{x^{7} \Gamma\left(\frac{7}{4}\right) {}_{2}F_{1}\left(\begin{matrix} \frac{3}{4}, \frac{7}{4} \\ \frac{11}{4} \end{matrix}\middle| {\frac{b x^{4} e^{i \pi}}{a}} \right)}{4 a^{\frac{3}{4}} \Gamma\left(\frac{11}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(b*x**4+a)**(3/4),x)
```

```
[Out] x**7*gamma(7/4)*hyper((3/4, 7/4), (11/4,), b*x**4*exp_polar(I*pi)
/a)/(4*a**(3/4)*gamma(11/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{6}}{{\left(b x^{4} + a\right)}^{\frac{3}{4}}}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(b*x^4 + a)^(3/4),x, algorithm="giac")

[Out] integrate(x^6/(b*x^4 + a)^(3/4), x)
```

3.1125 $\int \frac{x^2}{(a+bx^4)^{3/4}}\,dx$

Optimal. Leaf size=57

$$\frac{\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{2b^{3/4}}-\frac{\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{2b^{3/4}}$$

```
[Out] -ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/4)]/(2*b^(3/4)) + ArcTanh[(b^(
1/4)*x)/(a + b*x^4)^(1/4)]/(2*b^(3/4))
```

Rubi [A] time = 0.0518494, antiderivative size = 57, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{2b^{3/4}}-\frac{\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{2b^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b*x^4)^(3/4),x]
```

```
[Out] -ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/4)]/(2*b^(3/4)) + ArcTanh[(b^(
1/4)*x)/(a + b*x^4)^(1/4)]/(2*b^(3/4))
```

Rubi in Sympy [A] time = 7.82031, size = 49, normalized size = 0.86

$$-\frac{\operatorname{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{2b^{\frac{3}{4}}}+\frac{\operatorname{atanh}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{2b^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(b*x**4+a)**(3/4),x)
```

```
[Out] -atan(b**(1/4)*x/(a + b*x**4)**(1/4))/(2*b**(3/4)) + atanh(b**(1/
4)*x/(a + b*x**4)**(1/4))/(2*b**(3/4))
```

Mathematica [C] time = 0.0274257, size = 52, normalized size = 0.91

$$\frac{x^3\left(\frac{a+bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{3}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)}{3\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a + b*x^4)^(3/4),x]
```

```
[Out] (x^3*((a + b*x^4)/a)^(3/4)*Hypergeometric2F1[3/4, 3/4, 7/4, -((b*
x^4)/a)])/(3*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.034, size = 0, normalized size = 0.

$$\int x^2\left(bx^4+a\right)^{-\frac{3}{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(b*x^4+a)^(3/4),x)
```

```
[Out] int(x^2/(b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^4 + a)^(3/4),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.266536, size = 165, normalized size = 2.89

$$-\left(\frac{1}{b^3}\right)^{\frac{1}{4}} \arctan\left(\frac{b\left(\frac{1}{b^3}\right)^{\frac{1}{4}} x}{x\sqrt{\frac{b^2\sqrt{\frac{1}{b^3}}x^2+\sqrt{bx^4+a}}{x^2}} + (bx^4+a)^{\frac{1}{4}}}\right) + \frac{1}{4}\left(\frac{1}{b^3}\right)^{\frac{1}{4}} \log\left(\frac{b\left(\frac{1}{b^3}\right)^{\frac{1}{4}} x + (bx^4+a)^{\frac{1}{4}}}{x}\right) - \frac{1}{4}\left(\frac{1}{b^3}\right)^{\frac{1}{4}} \log\left(-\frac{b\left(\frac{1}{b^3}\right)^{\frac{1}{4}} x - (bx^4+a)^{\frac{1}{4}}}{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^4 + a)^(3/4),x, algorithm="fricas")
```

```
[Out] -(b^(-3))^(1/4)*arctan(b*(b^(-3))^(1/4)*x/(x*sqrt((b^2*sqrt(b^(-3
))*x^2 + sqrt(b*x^4 + a))/x^2) + (b*x^4 + a)^(1/4))) + 1/4*(b^(-3
))^(1/4)*log((b*(b^(-3))^(1/4)*x + (b*x^4 + a)^(1/4))/x) - 1/4*(b
^(-3))^(1/4)*log(-(b*(b^(-3))^(1/4)*x - (b*x^4 + a)^(1/4))/x)
```

Sympy [A] time = 3.64719, size = 37, normalized size = 0.65

$$\frac{x^3 \Gamma\left(\frac{3}{4}\right) {}_2F_1\left(\begin{matrix} \frac{3}{4}, \frac{3}{4} \\ \frac{7}{4} \end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{4a^{\frac{3}{4}} \Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(b*x**4+a)**(3/4),x)
```

```
[Out] x**3*gamma(3/4)*hyper((3/4, 3/4), (7/4,), b*x**4*exp_polar(I*pi)/
a)/(4*a**(3/4)*gamma(7/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{(bx^4+a)^{\frac{3}{4}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^4 + a)^(3/4),x, algorithm="giac")

[Out] integrate(x^2/(b*x^4 + a)^(3/4), x)
```

3.1126 $\int \frac{1}{x^2(a+bx^4)^{3/4}}\,dx$

Optimal. Leaf size=19

$$-\frac{\sqrt[4]{a+bx^4}}{ax}$$

```
[Out] -((a + b*x^4)^(1/4)/(a*x))
```

Rubi [A] time = 0.0203061, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$-\frac{\sqrt[4]{a+bx^4}}{ax}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^2*(a + b*x^4)^(3/4)),x]

[Out] -((a + b*x^4)^(1/4)/(a*x))
```

Rubi in Sympy [A] time = 2.66739, size = 14, normalized size = 0.74

$$-\frac{\sqrt[4]{a+bx^4}}{ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**2/(b*x**4+a)**(3/4),x)

[Out] -(a + b*x**4)**(1/4)/(a*x)
```

Mathematica [A] time = 0.0156404, size = 19, normalized size = 1.

$$-\frac{\sqrt[4]{a+bx^4}}{ax}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^2*(a + b*x^4)^(3/4)),x]

[Out] -((a + b*x^4)^(1/4)/(a*x))
```

Maple [A] time = 0.006, size = 18, normalized size = 1.

$$-\frac{1}{ax}\sqrt[4]{bx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(b*x^4+a)^(3/4),x)

[Out] -(b*x^4+a)^(1/4)/a/x
```

Maxima [A] time = 1.43666, size = 23, normalized size = 1.21

$$-\frac{\left(bx^4+a\right)^{\frac{1}{4}}}{ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^2),x, algorithm="maxima")
```

```
[Out] -(b*x^4 + a)^(1/4)/(a*x)
```

Fricas [A] time = 0.239482, size = 23, normalized size = 1.21

$$-\frac{\left(bx^4+a\right)^{\frac{1}{4}}}{ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^2),x, algorithm="fricas")
```

```
[Out] -(b*x^4 + a)^(1/4)/(a*x)
```

Sympy [A] time = 2.41035, size = 31, normalized size = 1.63

$$\frac{\sqrt[4]{b}\sqrt[4]{\frac{a}{bx^4}+1}\,\Gamma\left(-\frac{1}{4}\right)}{4a\,\Gamma\left(\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(b*x**4+a)**(3/4),x)
```

```
[Out] b**(1/4)*(a/(b*x**4) + 1)**(1/4)*gamma(-1/4)/(4*a*gamma(3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bx^4+a\right)^{\frac{3}{4}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^4 + a)^(3/4)*x^2), x)
```

3.1127 $\int \frac{1}{x^6(a+bx^4)^{3/4}}\,dx$

Optimal. Leaf size=44

$$\frac{4b\sqrt[4]{a+bx^4}}{5a^2x}-\frac{\sqrt[4]{a+bx^4}}{5ax^5}$$

```
[Out] -(a + b*x^4)^(1/4)/(5*a*x^5) + (4*b*(a + b*x^4)^(1/4))/(5*a^2*x)
```

Rubi [A] time = 0.041665, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{4b\sqrt[4]{a+bx^4}}{5a^2x}-\frac{\sqrt[4]{a+bx^4}}{5ax^5}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^6*(a + b*x^4)^(3/4)),x]

[Out] -(a + b*x^4)^(1/4)/(5*a*x^5) + (4*b*(a + b*x^4)^(1/4))/(5*a^2*x)
```

Rubi in Sympy [A] time = 4.24671, size = 36, normalized size = 0.82

$$-\frac{\sqrt[4]{a+bx^4}}{5ax^5}+\frac{4b\sqrt[4]{a+bx^4}}{5a^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**6/(b*x**4+a)**(3/4),x)

[Out] -(a + b*x**4)**(1/4)/(5*a*x**5) + 4*b*(a + b*x**4)**(1/4)/(5*a**2
*x)
```

Mathematica [A] time = 0.0225761, size = 29, normalized size = 0.66

$$-\frac{\left(a-4bx^4\right)\sqrt[4]{a+bx^4}}{5a^2x^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^6*(a + b*x^4)^(3/4)),x]

[Out] -((a - 4*b*x^4)*(a + b*x^4)^(1/4))/(5*a^2*x^5)
```

Maple [A] time = 0.007, size = 26, normalized size = 0.6

$$-\frac{-4\,bx^4+a}{5\,x^5a^2}\sqrt[4]{bx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^6/(b*x^4+a)^(3/4),x)
```

```
[Out] -1/5*(b*x^4+a)^(1/4)*(-4*b*x^4+a)/x^5/a^2
```

Maxima [A] time = 1.4426, size = 47, normalized size = 1.07

$$\frac{\frac{5\,(bx^4+a)^{\frac{1}{4}}b}{x} - \frac{(bx^4+a)^{\frac{5}{4}}}{x^5}}{5\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^6),x, algorithm="maxima")
```

```
[Out] 1/5*(5*(b*x^4 + a)^(1/4)*b/x - (b*x^4 + a)^(5/4)/x^5)/a^2
```

Fricas [A] time = 0.237305, size = 36, normalized size = 0.82

$$\frac{\left(4\,bx^4 - a\right)\left(bx^4 + a\right)^{\frac{1}{4}}}{5\,a^2x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^6),x, algorithm="fricas")
```

```
[Out] 1/5*(4*b*x^4 - a)*(b*x^4 + a)^(1/4)/(a^2*x^5)
```

Sympy [A] time = 4.64174, size = 68, normalized size = 1.55

$$-\frac{\sqrt[4]{b}\sqrt[4]{\frac{a}{bx^4}+1}\,\Gamma\left(-\frac{5}{4}\right)}{16ax^4\,\Gamma\left(\frac{3}{4}\right)} + \frac{b^{\frac{5}{4}}\sqrt[4]{\frac{a}{bx^4}+1}\,\Gamma\left(-\frac{5}{4}\right)}{4a^2\,\Gamma\left(\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**6/(b*x**4+a)**(3/4),x)
```

```
[Out] -b**(1/4)*(a/(b*x**4) + 1)**(1/4)*gamma(-5/4)/(16*a*x**4*gamma(3/
4)) + b**(5/4)*(a/(b*x**4) + 1)**(1/4)*gamma(-5/4)/(4*a**2*gamma(
3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4+a)^{\frac{3}{4}}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^6),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^4 + a)^(3/4)*x^6), x)
```

3.1128 $\int \frac{1}{x^{10}(a+bx^4)^{3/4}}\,dx$

Optimal. Leaf size=68

$$-\frac{32b^2\sqrt[4]{a+bx^4}}{45a^3x}+\frac{8b\sqrt[4]{a+bx^4}}{45a^2x^5}-\frac{\sqrt[4]{a+bx^4}}{9ax^9}$$

```
[Out] -(a + b*x^4)^(1/4)/(9*a*x^9) + (8*b*(a + b*x^4)^(1/4))/(45*a^2*x^
5) - (32*b^2*(a + b*x^4)^(1/4))/(45*a^3*x)
```

Rubi [A] time = 0.0648762, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{32b^2\sqrt[4]{a+bx^4}}{45a^3x}+\frac{8b\sqrt[4]{a+bx^4}}{45a^2x^5}-\frac{\sqrt[4]{a+bx^4}}{9ax^9}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^10*(a + b*x^4)^(3/4)),x]
```

```
[Out] -(a + b*x^4)^(1/4)/(9*a*x^9) + (8*b*(a + b*x^4)^(1/4))/(45*a^2*x^
5) - (32*b^2*(a + b*x^4)^(1/4))/(45*a^3*x)
```

Rubi in Sympy [A] time = 6.66349, size = 60, normalized size = 0.88

$$-\frac{\sqrt[4]{a+bx^4}}{9ax^9}+\frac{8b\sqrt[4]{a+bx^4}}{45a^2x^5}-\frac{32b^2\sqrt[4]{a+bx^4}}{45a^3x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**10/(b*x**4+a)**(3/4),x)
```

```
[Out] -(a + b*x**4)**(1/4)/(9*a*x**9) + 8*b*(a + b*x**4)**(1/4)/(45*a**
2*x**5) - 32*b**2*(a + b*x**4)**(1/4)/(45*a**3*x)
```

Mathematica [A] time = 0.0329346, size = 42, normalized size = 0.62

$$-\frac{\sqrt[4]{a+bx^4}\left(5a^2-8abx^4+32b^2x^8\right)}{45a^3x^9}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^10*(a + b*x^4)^(3/4)),x]
```

```
[Out] -((a + b*x^4)^(1/4)*(5*a^2 - 8*a*b*x^4 + 32*b^2*x^8))/(45*a^3*x^9
)
```

Maple [A] time = 0.009, size = 39, normalized size = 0.6

$$-\frac{32\,b^2x^8-8\,abx^4+5\,a^2}{45\,a^3x^9}\sqrt[4]{bx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^10/(b*x^4+a)^(3/4),x)
```

```
[Out] -1/45*(b*x^4+a)^(1/4)*(32*b^2*x^8-8*a*b*x^4+5*a^2)/a^3/x^9
```

Maxima [A] time = 1.43906, size = 70, normalized size = 1.03

$$-\frac{\frac{45\,(bx^4+a)^{\frac{1}{4}}b^2}{x}-\frac{18\,(bx^4+a)^{\frac{5}{4}}b}{x^5}+\frac{5\,(bx^4+a)^{\frac{9}{4}}}{x^9}}{45\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((b*x^4 + a)^(3/4)*x^10),x, algorithm="maxima")
```

```
[Out] -1/45*(45*(b*x^4 + a)^(1/4)*b^2/x - 18*(b*x^4 + a)^(5/4)*b/x^5 +
5*(b*x^4 + a)^(9/4)/x^9)/a^3
```

Fricas [A] time = 0.233882, size = 51, normalized size = 0.75

$$-\frac{\left(32\,b^2x^8-8\,abx^4+5\,a^2\right)\left(bx^4+a\right)^{\frac{1}{4}}}{45\,a^3x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((b*x^4 + a)^(3/4)*x^10),x, algorithm="fricas")
```

```
[Out] -1/45*(32*b^2*x^8 - 8*a*b*x^4 + 5*a^2)*(b*x^4 + a)^(1/4)/(a^3*x^9
)
```

Sympy [A] time = 10.4999, size = 406, normalized size = 5.97

$$\frac{5a^4b^{\frac{17}{4}}\sqrt[4]{\frac{a}{bx^4}+1}\,\Gamma\left(-\frac{9}{4}\right)}{64a^5b^4x^8\,\Gamma\left(\frac{3}{4}\right)+128a^4b^5x^{12}\,\Gamma\left(\frac{3}{4}\right)+64a^3b^6x^{16}\,\Gamma\left(\frac{3}{4}\right)}+\frac{2a^3b^{\frac{21}{4}}x^4\sqrt[4]{\frac{a}{bx^4}+1}\,\Gamma\left(-\frac{9}{4}\right)}{64a^5b^4x^8\,\Gamma\left(\frac{3}{4}\right)+128a^4b^5x^{12}\,\Gamma\left(\frac{3}{4}\right)+64a^3b^6x^{16}\,\Gamma\left(\frac{3}{4}\right)}$$
$$+\frac{21a^2b^{\frac{25}{4}}x^8\sqrt[4]{\frac{a}{bx^4}+1}\,\Gamma\left(-\frac{9}{4}\right)}{64a^5b^4x^8\,\Gamma\left(\frac{3}{4}\right)+128a^4b^5x^{12}\,\Gamma\left(\frac{3}{4}\right)+64a^3b^6x^{16}\,\Gamma\left(\frac{3}{4}\right)}$$
$$+\frac{56ab^{\frac{29}{4}}x^{12}\sqrt[4]{\frac{a}{bx^4}+1}\,\Gamma\left(-\frac{9}{4}\right)}{64a^5b^4x^8\,\Gamma\left(\frac{3}{4}\right)+128a^4b^5x^{12}\,\Gamma\left(\frac{3}{4}\right)+64a^3b^6x^{16}\,\Gamma\left(\frac{3}{4}\right)}$$
$$+\frac{32b^{\frac{33}{4}}x^{16}\sqrt[4]{\frac{a}{bx^4}+1}\,\Gamma\left(-\frac{9}{4}\right)}{64a^5b^4x^8\,\Gamma\left(\frac{3}{4}\right)+128a^4b^5x^{12}\,\Gamma\left(\frac{3}{4}\right)+64a^3b^6x^{16}\,\Gamma\left(\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/x**10/(b*x**4+a)**(3/4),x)
```

```
[Out] 5*a**4*b**(17/4)*(a/(b*x**4) + 1)**(1/4)*gamma(-9/4)/(64*a**5*b**
4*x**8*gamma(3/4) + 128*a**4*b**5*x**12*gamma(3/4) + 64*a**3*b**6
*x**16*gamma(3/4)) + 2*a**3*b**(21/4)*x**4*(a/(b*x**4) + 1)**(1/4
)*gamma(-9/4)/(64*a**5*b**4*x**8*gamma(3/4) + 128*a**4*b**5*x**12
*gamma(3/4) + 64*a**3*b**6*x**16*gamma(3/4)) + 21*a**2*b**(25/4)*
x**8*(a/(b*x**4) + 1)**(1/4)*gamma(-9/4)/(64*a**5*b**4*x**8*gamma
(3/4) + 128*a**4*b**5*x**12*gamma(3/4) + 64*a**3*b**6*x**16*gamma
(3/4)) + 56*a*b**(29/4)*x**12*(a/(b*x**4) + 1)**(1/4)*gamma(-9/4)
```

```
/(64*a**5*b**4*x**8*gamma(3/4) + 128*a**4*b**5*x**12*gamma(3/4) +
 64*a**3*b**6*x**16*gamma(3/4)) + 32*b**(33/4)*x**16*(a/(b*x**4)
+ 1)**(1/4)*gamma(-9/4)/(64*a**5*b**4*x**8*gamma(3/4) + 128*a**4*
b**5*x**12*gamma(3/4) + 64*a**3*b**6*x**16*gamma(3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4 + a)^{\frac{3}{4}} x^{10}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^10),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^4 + a)^(3/4)*x^10), x)
```

3.1129 $\int \frac{1}{x^{14}(a+bx^4)^{3/4}}\,dx$

Optimal. Leaf size=92

$$\frac{128b^3\sqrt[4]{a+bx^4}}{195a^4x}-\frac{32b^2\sqrt[4]{a+bx^4}}{195a^3x^5}+\frac{4b\sqrt[4]{a+bx^4}}{39a^2x^9}-\frac{\sqrt[4]{a+bx^4}}{13ax^{13}}$$

```
[Out] -(a + b*x^4)^(1/4)/(13*a*x^13) + (4*b*(a + b*x^4)^(1/4))/(39*a^2*
x^9) - (32*b^2*(a + b*x^4)^(1/4))/(195*a^3*x^5) + (128*b^3*(a + b
*x^4)^(1/4))/(195*a^4*x)
```

Rubi [A] time = 0.0891185, antiderivative size = 92, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{128b^3\sqrt[4]{a+bx^4}}{195a^4x}-\frac{32b^2\sqrt[4]{a+bx^4}}{195a^3x^5}+\frac{4b\sqrt[4]{a+bx^4}}{39a^2x^9}-\frac{\sqrt[4]{a+bx^4}}{13ax^{13}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^14*(a + b*x^4)^(3/4)),x]
```

```
[Out] -(a + b*x^4)^(1/4)/(13*a*x^13) + (4*b*(a + b*x^4)^(1/4))/(39*a^2*
x^9) - (32*b^2*(a + b*x^4)^(1/4))/(195*a^3*x^5) + (128*b^3*(a + b
*x^4)^(1/4))/(195*a^4*x)
```

Rubi in Sympy [A] time = 9.71617, size = 83, normalized size = 0.9

$$-\frac{\sqrt[4]{a+bx^4}}{13ax^{13}}+\frac{4b\sqrt[4]{a+bx^4}}{39a^2x^9}-\frac{32b^2\sqrt[4]{a+bx^4}}{195a^3x^5}+\frac{128b^3\sqrt[4]{a+bx^4}}{195a^4x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**14/(b*x**4+a)**(3/4),x)
```

```
[Out] -(a + b*x**4)**(1/4)/(13*a*x**13) + 4*b*(a + b*x**4)**(1/4)/(39*a
**2*x**9) - 32*b**2*(a + b*x**4)**(1/4)/(195*a**3*x**5) + 128*b**
3*(a + b*x**4)**(1/4)/(195*a**4*x)
```

Mathematica [A] time = 0.0418656, size = 53, normalized size = 0.58

$$\frac{\sqrt[4]{a+bx^4}\left(-15a^3+20a^2bx^4-32ab^2x^8+128b^3x^{12}\right)}{195a^4x^{13}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^14*(a + b*x^4)^(3/4)),x]
```

```
[Out] ((a + b*x^4)^(1/4)*(-15*a^3 + 20*a^2*b*x^4 - 32*a*b^2*x^8 + 128*b
^3*x^12))/(195*a^4*x^13)
```

Maple [A] time = 0.009, size = 50, normalized size = 0.5

$$-\frac{-128\,b^3x^{12}+32\,ab^2x^8-20\,a^2bx^4+15\,a^3}{195\,x^{13}a^4}\sqrt[4]{bx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^14/(b*x^4+a)^(3/4),x)
```

```
[Out] -1/195*(b*x^4+a)^(1/4)*(-128*b^3*x^12+32*a*b^2*x^8-20*a^2*b*x^4+1
5*a^3)/x^13/a^4
```

Maxima [A] time = 1.43968, size = 93, normalized size = 1.01

$$\frac{\frac{195\,\left(bx^4+a\right)^{\frac{1}{4}}b^3}{x} - \frac{117\,\left(bx^4+a\right)^{\frac{5}{4}}b^2}{x^5} + \frac{65\,\left(bx^4+a\right)^{\frac{9}{4}}b}{x^9} - \frac{15\,\left(bx^4+a\right)^{\frac{13}{4}}}{x^{13}}}{195\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^14),x, algorithm="maxima")
```

```
[Out] 1/195*(195*(b*x^4 + a)^(1/4)*b^3/x - 117*(b*x^4 + a)^(5/4)*b^2/x^
5 + 65*(b*x^4 + a)^(9/4)*b/x^9 - 15*(b*x^4 + a)^(13/4)/x^13)/a^4
```

Fricas [A] time = 0.241879, size = 66, normalized size = 0.72

$$\frac{\left(128\,b^3x^{12} - 32\,ab^2x^8 + 20\,a^2bx^4 - 15\,a^3\right)\left(bx^4 + a\right)^{\frac{1}{4}}}{195\,a^4x^{13}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^14),x, algorithm="fricas")
```

```
[Out] 1/195*(128*b^3*x^12 - 32*a*b^2*x^8 + 20*a^2*b*x^4 - 15*a^3)*(b*x^
4 + a)^(1/4)/(a^4*x^13)
```

Sympy [A] time = 22.7152, size = 692, normalized size = 7.52

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**14/(b*x**4+a)**(3/4),x)
```

```
[Out] -45*a**6*b**(37/4)*(a/(b*x**4) + 1)**(1/4)*gamma(-13/4)/(256*a**7
*b**9*x**12*gamma(3/4) + 768*a**6*b**10*x**16*gamma(3/4) + 768*a*
*5*b**11*x**20*gamma(3/4) + 256*a**4*b**12*x**24*gamma(3/4)) - 75
*a**5*b**(41/4)*x**4*(a/(b*x**4) + 1)**(1/4)*gamma(-13/4)/(256*a*
*7*b**9*x**12*gamma(3/4) + 768*a**6*b**10*x**16*gamma(3/4) + 768*
a**5*b**11*x**20*gamma(3/4) + 256*a**4*b**12*x**24*gamma(3/4)) -
51*a**4*b**(45/4)*x**8*(a/(b*x**4) + 1)**(1/4)*gamma(-13/4)/(256*
a**7*b**9*x**12*gamma(3/4) + 768*a**6*b**10*x**16*gamma(3/4) + 76
8*a**5*b**11*x**20*gamma(3/4) + 256*a**4*b**12*x**24*gamma(3/4))
+ 231*a**3*b**(49/4)*x**12*(a/(b*x**4) + 1)**(1/4)*gamma(-13/4)/(
256*a**7*b**9*x**12*gamma(3/4) + 768*a**6*b**10*x**16*gamma(3/4)
+ 768*a**5*b**11*x**20*gamma(3/4) + 256*a**4*b**12*x**24*gamma(3/
4)) + 924*a**2*b**(53/4)*x**16*(a/(b*x**4) + 1)**(1/4)*gamma(-13/
4)/(256*a**7*b**9*x**12*gamma(3/4) + 768*a**6*b**10*x**16*gamma(3
/4) + 768*a**5*b**11*x**20*gamma(3/4) + 256*a**4*b**12*x**24*gamm
a(3/4)) + 1056*a*b**(57/4)*x**20*(a/(b*x**4) + 1)**(1/4)*gamma(-1
3/4)/(256*a**7*b**9*x**12*gamma(3/4) + 768*a**6*b**10*x**16*gamma
(3/4) + 768*a**5*b**11*x**20*gamma(3/4) + 256*a**4*b**12*x**24*ga
mma(3/4)) + 384*b**(61/4)*x**24*(a/(b*x**4) + 1)**(1/4)*gamma(-13
```

```
/4)/(256*a**7*b**9*x**12*gamma(3/4) + 768*a**6*b**10*x**16*gamma(
3/4) + 768*a**5*b**11*x**20*gamma(3/4) + 256*a**4*b**12*x**24*gam
ma(3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4+a)^{\frac{3}{4}}x^{14}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^14),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^4 + a)^(3/4)*x^14), x)
```

3.1130 $\int \frac{x^{12}}{(a+bx^4)^{3/4}} dx$

Optimal. Leaf size=129

$$\frac{3a^{5/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{8b^{5/2}(a+bx^4)^{3/4}}+\frac{3a^2x\sqrt[4]{a+bx^4}}{8b^3}-\frac{3ax^5\sqrt[4]{a+bx^4}}{20b^2}+\frac{x^9\sqrt[4]{a+bx^4}}{10b}$$

```
[Out] (3*a^2*x*(a + b*x^4)^(1/4))/(8*b^3) - (3*a*x^5*(a + b*x^4)^(1/4))
/(20*b^2) + (x^9*(a + b*x^4)^(1/4))/(10*b) + (3*a^(5/2)*(1 + a/(b
*x^4))^(3/4)*x^3*EllipticF[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(
8*b^(5/2)*(a + b*x^4)^(3/4))
```

Rubi [A] time = 0.163599, antiderivative size = 129, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{3a^{5/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{8b^{5/2}(a+bx^4)^{3/4}}+\frac{3a^2x\sqrt[4]{a+bx^4}}{8b^3}-\frac{3ax^5\sqrt[4]{a+bx^4}}{20b^2}+\frac{x^9\sqrt[4]{a+bx^4}}{10b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^12/(a + b*x^4)^(3/4),x]
```

```
[Out] (3*a^2*x*(a + b*x^4)^(1/4))/(8*b^3) - (3*a*x^5*(a + b*x^4)^(1/4))
/(20*b^2) + (x^9*(a + b*x^4)^(1/4))/(10*b) + (3*a^(5/2)*(1 + a/(b
*x^4))^(3/4)*x^3*EllipticF[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(
8*b^(5/2)*(a + b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 19.0538, size = 117, normalized size = 0.91

$$\frac{3a^{\frac{5}{2}}x^3\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{8b^{\frac{5}{2}}(a+bx^4)^{\frac{3}{4}}}+\frac{3a^2x\sqrt[4]{a+bx^4}}{8b^3}-\frac{3ax^5\sqrt[4]{a+bx^4}}{20b^2}+\frac{x^9\sqrt[4]{a+bx^4}}{10b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**12/(b*x**4+a)**(3/4),x)
```

```
[Out] 3*a**(5/2)*x**3*(a/(b*x**4) + 1)**(3/4)*elliptic_f(atan(sqrt(a)/(
sqrt(b)*x**2))/2, 2)/(8*b**(5/2)*(a + b*x**4)**(3/4)) + 3*a**2*x*
(a + b*x**4)**(1/4)/(8*b**3) - 3*a*x**5*(a + b*x**4)**(1/4)/(20*b
**2) + x**9*(a + b*x**4)**(1/4)/(10*b)
```

Mathematica [C] time = 0.0558742, size = 90, normalized size = 0.7

$$\frac{-15a^3x\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};-\frac{bx^4}{a}\right)+15a^3x+9a^2bx^5-2ab^2x^9+4b^3x^{13}}{40b^3(a+bx^4)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^12/(a + b*x^4)^(3/4),x]
```

```
[Out] (15*a^3*x + 9*a^2*b*x^5 - 2*a*b^2*x^9 + 4*b^3*x^13 - 15*a^3*x*(1
+ (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/4, 3/4, 5/4, -((b*x^4)/a)]
```

```
)/(40*b^3*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.037, size = 0, normalized size = 0.

$$\int x^{12} \left(b x^4 + a\right)^{-\frac{3}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^12/(b*x^4+a)^(3/4),x)
```

```
[Out] int(x^12/(b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{12}}{(bx^4 + a)^{\frac{3}{4}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^12/(b*x^4 + a)^(3/4),x, algorithm="maxima")
```

```
[Out] integrate(x^12/(b*x^4 + a)^(3/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{12}}{(bx^4 + a)^{\frac{3}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^12/(b*x^4 + a)^(3/4),x, algorithm="fricas")
```

```
[Out] integral(x^12/(b*x^4 + a)^(3/4), x)
```

Sympy [A] time = 6.98559, size = 37, normalized size = 0.29

$$\frac{x^{13}\Gamma\left(\frac{13}{4}\right) {}_2F_1\left(\begin{matrix} \frac{3}{4}, \frac{13}{4} \\ \frac{17}{4} \end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{4a^{\frac{3}{4}}\Gamma\left(\frac{17}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**12/(b*x**4+a)**(3/4),x)
```

```
[Out] x**13*gamma(13/4)*hyper((3/4, 13/4), (17/4,), b*x**4*exp_polar(I*
pi)/a)/(4*a**(3/4)*gamma(17/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{12}}{(bx^4 + a)^{\frac{3}{4}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^12/(b*x^4 + a)^(3/4),x, algorithm="giac")
```

```
[Out] integrate(x^12/(b*x^4 + a)^(3/4), x)
```

3.1131 $\int \frac{x^8}{(a+bx^4)^{3/4}}\,dx$

Optimal. Leaf size=105

$$-\frac{5a^{3/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{12b^{3/2}\left(a+bx^4\right)^{3/4}}-\frac{5ax\sqrt[4]{a+bx^4}}{12b^2}+\frac{x^5\sqrt[4]{a+bx^4}}{6b}$$

```
[Out] (-5*a*x*(a + b*x^4)^(1/4))/(12*b^2) + (x^5*(a + b*x^4)^(1/4))/(6*
b) - (5*a^(3/2)*(1 + a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCot[(Sqrt[
b]*x^2)/Sqrt[a]]/2, 2])/(12*b^(3/2)*(a + b*x^4)^(3/4))
```

Rubi [A] time = 0.133324, antiderivative size = 105, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{5a^{3/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{12b^{3/2}\left(a+bx^4\right)^{3/4}}-\frac{5ax\sqrt[4]{a+bx^4}}{12b^2}+\frac{x^5\sqrt[4]{a+bx^4}}{6b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8/(a + b*x^4)^(3/4),x]
```

```
[Out] (-5*a*x*(a + b*x^4)^(1/4))/(12*b^2) + (x^5*(a + b*x^4)^(1/4))/(6*
b) - (5*a^(3/2)*(1 + a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCot[(Sqrt[
b]*x^2)/Sqrt[a]]/2, 2])/(12*b^(3/2)*(a + b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 15.15, size = 94, normalized size = 0.9

$$-\frac{5a^{\frac{3}{2}}x^3\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{12b^{\frac{3}{2}}\left(a+bx^4\right)^{\frac{3}{4}}}-\frac{5ax\sqrt[4]{a+bx^4}}{12b^2}+\frac{x^5\sqrt[4]{a+bx^4}}{6b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8/(b*x**4+a)**(3/4),x)
```

```
[Out] -5*a**(3/2)*x**3*(a/(b*x**4) + 1)**(3/4)*elliptic_f(atan(sqrt(a)/
(sqrt(b)*x**2))/2, 2)/(12*b**(3/2)*(a + b*x**4)**(3/4)) - 5*a*x*(
a + b*x**4)**(1/4)/(12*b**2) + x**5*(a + b*x**4)**(1/4)/(6*b)
```

Mathematica [C] time = 0.0498434, size = 79, normalized size = 0.75

$$\frac{5a^2x\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};-\frac{bx^4}{a}\right)-5a^2x-3abx^5+2b^2x^9}{12b^2\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8/(a + b*x^4)^(3/4),x]
```

```
[Out] (-5*a^2*x - 3*a*b*x^5 + 2*b^2*x^9 + 5*a^2*x*(1 + (b*x^4)/a)^(3/4)
*Hypergeometric2F1[1/4, 3/4, 5/4, -((b*x^4)/a)])/(12*b^2*(a + b*x
^4)^(3/4))
```

Maple [F] time = 0.037, size = 0, normalized size = 0.

$$\int x^{8} \left(b x^{4}+a \right)^{-\frac{3}{4}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8/(b*x^4+a)^(3/4),x)

[Out] int(x^8/(b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{8}}{(bx^{4} + a)^{\frac{3}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^4 + a)^(3/4),x, algorithm="maxima")

[Out] integrate(x^8/(b*x^4 + a)^(3/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x^{8}}{(bx^{4} + a)^{\frac{3}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^4 + a)^(3/4),x, algorithm="fricas")

[Out] integral(x^8/(b*x^4 + a)^(3/4), x)
```

Sympy [A] time = 3.55493, size = 37, normalized size = 0.35

$$\frac{x^{9}\Gamma\left(\frac{9}{4}\right){}_{2}F_{1}\left(\begin{matrix}\frac{3}{4},\frac{9}{4}\\\frac{13}{4}\end{matrix}\middle|\frac{bx^{4}e^{i\pi}}{a}\right)}{4a^{\frac{3}{4}}\Gamma\left(\frac{13}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8/(b*x**4+a)**(3/4),x)

[Out] x**9*gamma(9/4)*hyper((3/4, 9/4), (13/4,), b*x**4*exp_polar(I*pi)
/a)/(4*a**(3/4)*gamma(13/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{8}}{(bx^{4} + a)^{\frac{3}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^4 + a)^(3/4),x, algorithm="giac")
```

```
[Out] integrate(x^8/(b*x^4 + a)^(3/4), x)
```

3.1132 $\int \frac{x^4}{(a+bx^4)^{3/4}}\,dx$

Optimal. Leaf size=83

$$\frac{x\sqrt[4]{a+bx^4}}{2b}+\frac{\sqrt{a}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{2\sqrt{b}\,(a+bx^4)^{3/4}}$$

```
[Out] (x*(a + b*x^4)^(1/4))/(2*b) + (Sqrt[a]*(1 + a/(b*x^4))^(3/4)*x^3*
EllipticF[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(2*Sqrt[b]*(a + b*
x^4)^(3/4))
```

Rubi [A] time = 0.102876, antiderivative size = 83, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{x\sqrt[4]{a+bx^4}}{2b}+\frac{\sqrt{a}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{2\sqrt{b}\,(a+bx^4)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a + b*x^4)^(3/4),x]
```

```
[Out] (x*(a + b*x^4)^(1/4))/(2*b) + (Sqrt[a]*(1 + a/(b*x^4))^(3/4)*x^3*
EllipticF[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(2*Sqrt[b]*(a + b*
x^4)^(3/4))
```

Rubi in Sympy [A] time = 11.8845, size = 70, normalized size = 0.84

$$\frac{\sqrt{a}x^3\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{2\sqrt{b}\,(a+bx^4)^{\frac{3}{4}}}+\frac{x\sqrt[4]{a+bx^4}}{2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(b*x**4+a)**(3/4),x)
```

```
[Out] sqrt(a)*x**3*(a/(b*x**4) + 1)**(3/4)*elliptic_f(atan(sqrt(a)/(sqr
t(b)*x**2))/2, 2)/(2*sqrt(b)*(a + b*x**4)**(3/4)) + x*(a + b*x**4
)**(1/4)/(2*b)
```

Mathematica [C] time = 0.042783, size = 62, normalized size = 0.75

$$\frac{x\left(-a\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};-\frac{bx^4}{a}\right)+a+bx^4\right)}{2b\,(a+bx^4)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(a + b*x^4)^(3/4),x]
```

```
[Out] (x*(a + b*x^4 - a*(1 + (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/4, 3/
4, 5/4, -((b*x^4)/a)]))/(2*b*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.038, size = 0, normalized size = 0.

$$\int x^4 \left(b x^4+a\right)^{-\frac{3}{4}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(b*x^4+a)^(3/4),x)

[Out] int(x^4/(b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{(bx^4+a)^{\frac{3}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^4 + a)^(3/4),x, algorithm="maxima")

[Out] integrate(x^4/(b*x^4 + a)^(3/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x^4}{(bx^4+a)^{\frac{3}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^4 + a)^(3/4),x, algorithm="fricas")

[Out] integral(x^4/(b*x^4 + a)^(3/4), x)
```

Sympy [A] time = 2.44469, size = 37, normalized size = 0.45

$$\frac{x^5\,\Gamma\left(\frac{5}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{3}{4},\frac{5}{4}\\ \frac{9}{4}\end{matrix}\middle|\frac{bx^4e^{i\pi}}{a}\right)}{4a^{\frac{3}{4}}\,\Gamma\left(\frac{9}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(b*x**4+a)**(3/4),x)

[Out] x**5*gamma(5/4)*hyper((3/4, 5/4), (9/4,), b*x**4*exp_polar(I*pi)/
a)/(4*a**(3/4)*gamma(9/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{(bx^4+a)^{\frac{3}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^4 + a)^(3/4),x, algorithm="giac")

[Out] integrate(x^4/(b*x^4 + a)^(3/4), x)
```

3.1133 $\int \frac{1}{(a+bx^4)^{3/4}} \, dx$

Optimal. Leaf size=61

$$-\frac{\sqrt{b}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{\sqrt{a}\,(a+bx^4)^{3/4}}$$

```
[Out] -((Sqrt[b]*(1 + a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCot[(Sqrt[b]*x^
2)/Sqrt[a]]/2, 2])/(Sqrt[a]*(a + b*x^4)^(3/4)))
```

Rubi [A] time = 0.0727929, antiderivative size = 61, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364

$$-\frac{\sqrt{b}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{\sqrt{a}\,(a+bx^4)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(-3/4),x]
```

```
[Out] -((Sqrt[b]*(1 + a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCot[(Sqrt[b]*x^
2)/Sqrt[a]]/2, 2])/(Sqrt[a]*(a + b*x^4)^(3/4)))
```

Rubi in Sympy [A] time = 8.59202, size = 54, normalized size = 0.89

$$-\frac{\sqrt{b}x^3\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{\sqrt{a}\,(a+bx^4)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**4+a)**(3/4),x)
```

```
[Out] -sqrt(b)*x**3*(a/(b*x**4) + 1)**(3/4)*elliptic_f(atan(sqrt(a)/(sq
rt(b)*x**2))/2, 2)/(sqrt(a)*(a + b*x**4)**(3/4))
```

Mathematica [C] time = 0.0205531, size = 47, normalized size = 0.77

$$\frac{x\left(\frac{a+bx^4}{a}\right)^{3/4}\,{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};-\frac{bx^4}{a}\right)}{(a+bx^4)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(-3/4),x]
```

```
[Out] (x*((a + b*x^4)/a)^(3/4)*Hypergeometric2F1[1/4, 3/4, 5/4, -((b*x^
4)/a)])/(a + b*x^4)^(3/4)
```

Maple [F] time = 0.039, size = 0, normalized size = 0.

$$\int \left(bx^4+a\right)^{-\frac{3}{4}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^4+a)^(3/4),x)
```

```
[Out] int(1/(b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4+a)^{\frac{3}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(-3/4),x, algorithm="maxima")
```

```
[Out] integrate((b*x^4 + a)^(-3/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(bx^4+a)^{\frac{3}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(-3/4),x, algorithm="fricas")
```

```
[Out] integral((b*x^4 + a)^(-3/4), x)
```

Sympy [A] time = 2.25052, size = 36, normalized size = 0.59

$$\frac{x\,\Gamma\left(\frac{1}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{4},\frac{3}{4}\\ \frac{5}{4}\end{matrix}\middle|\frac{bx^4e^{i\pi}}{a}\right)}{4a^{\frac{3}{4}}\,\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**4+a)**(3/4),x)
```

```
[Out] x*gamma(1/4)*hyper((1/4, 3/4), (5/4,), b*x**4*exp_polar(I*pi)/a)/
(4*a**(3/4)*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4+a)^{\frac{3}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(-3/4),x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(-3/4), x)
```

3.1134 $\int \frac{1}{x^4(a+bx^4)^{3/4}}\,dx$

Optimal. Leaf size=85

$$\frac{2b^{3/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{3a^{3/2}\left(a+bx^4\right)^{3/4}}-\frac{\sqrt[4]{a+bx^4}}{3ax^3}$$

```
[Out] -(a + b*x^4)^(1/4)/(3*a*x^3) + (2*b^(3/2)*(1 + a/(b*x^4))^(3/4)*x
^3*EllipticF[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(3*a^(3/2)*(a +
 b*x^4)^(3/4))
```

Rubi [A] time = 0.100221, antiderivative size = 85, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{2b^{3/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{3a^{3/2}\left(a+bx^4\right)^{3/4}}-\frac{\sqrt[4]{a+bx^4}}{3ax^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*(a + b*x^4)^(3/4)),x]
```

```
[Out] -(a + b*x^4)^(1/4)/(3*a*x^3) + (2*b^(3/2)*(1 + a/(b*x^4))^(3/4)*x
^3*EllipticF[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(3*a^(3/2)*(a +
 b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 11.7028, size = 73, normalized size = 0.86

$$-\frac{\sqrt[4]{a+bx^4}}{3ax^3}+\frac{2b^{\frac{3}{2}}x^3\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{3a^{\frac{3}{2}}\left(a+bx^4\right)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(b*x**4+a)**(3/4),x)
```

```
[Out] -(a + b*x**4)**(1/4)/(3*a*x**3) + 2*b**(3/2)*x**3*(a/(b*x**4) + 1
)**(3/4)*elliptic_f(atan(sqrt(a)/(sqrt(b)*x**2))/2, 2)/(3*a**(3/2
)*(a + b*x**4)**(3/4))
```

Mathematica [C] time = 0.0454827, size = 70, normalized size = 0.82

$$\frac{-2bx^4\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};-\frac{bx^4}{a}\right)-a-bx^4}{3ax^3\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*(a + b*x^4)^(3/4)),x]
```

```
[Out] (-a - b*x^4 - 2*b*x^4*(1 + (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/4
, 3/4, 5/4, -((b*x^4)/a)])/(3*a*x^3*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.04, size = 0, normalized size = 0.

$$\int \frac{1}{x^4} \left(bx^4 + a\right)^{-\frac{3}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(b*x^4+a)^(3/4),x)

[Out] int(1/x^4/(b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4 + a)^{\frac{3}{4}} x^4} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^4),x, algorithm="maxima")

[Out] integrate(1/((b*x^4 + a)^(3/4)*x^4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(bx^4 + a)^{\frac{3}{4}} x^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^4),x, algorithm="fricas")

[Out] integral(1/((b*x^4 + a)^(3/4)*x^4), x)
```

Sympy [A] time = 3.47346, size = 41, normalized size = 0.48

$$\frac{\Gamma\left(-\frac{3}{4}\right) {}_2F_1\left(\begin{matrix} -\frac{3}{4}, \frac{3}{4} \\ \frac{1}{4} \end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{4a^{\frac{3}{4}} x^3 \Gamma\left(\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(b*x**4+a)**(3/4),x)

[Out] gamma(-3/4)*hyper((-3/4, 3/4), (1/4,), b*x**4*exp_polar(I*pi)/a)/
(4*a**(3/4)*x**3*gamma(1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4 + a)^{\frac{3}{4}} x^4} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^4),x, algorithm="giac")

[Out] integrate(1/((b*x^4 + a)^(3/4)*x^4), x)
```

3.1135 $\int \frac{1}{x^8(a+bx^4)^{3/4}}\,dx$

Optimal. Leaf size=107

$$-\frac{4b^{5/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{7a^{5/2}\left(a+bx^4\right)^{3/4}}+\frac{2b\sqrt[4]{a+bx^4}}{7a^2x^3}-\frac{\sqrt[4]{a+bx^4}}{7ax^7}$$

```
[Out] -(a + b*x^4)^(1/4)/(7*a*x^7) + (2*b*(a + b*x^4)^(1/4))/(7*a^2*x^3
) - (4*b^(5/2)*(1 + a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCot[(Sqrt[b
]*x^2)/Sqrt[a]]/2, 2])/(7*a^(5/2)*(a + b*x^4)^(3/4))
```

Rubi [A] time = 0.130348, antiderivative size = 107, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{4b^{5/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{7a^{5/2}\left(a+bx^4\right)^{3/4}}+\frac{2b\sqrt[4]{a+bx^4}}{7a^2x^3}-\frac{\sqrt[4]{a+bx^4}}{7ax^7}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^8*(a + b*x^4)^(3/4)),x]
```

```
[Out] -(a + b*x^4)^(1/4)/(7*a*x^7) + (2*b*(a + b*x^4)^(1/4))/(7*a^2*x^3
) - (4*b^(5/2)*(1 + a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCot[(Sqrt[b
]*x^2)/Sqrt[a]]/2, 2])/(7*a^(5/2)*(a + b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 15.1045, size = 95, normalized size = 0.89

$$-\frac{\sqrt[4]{a+bx^4}}{7ax^7}+\frac{2b\sqrt[4]{a+bx^4}}{7a^2x^3}-\frac{4b^{\frac{5}{2}}x^3\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{7a^{\frac{5}{2}}\left(a+bx^4\right)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**8/(b*x**4+a)**(3/4),x)
```

```
[Out] -(a + b*x**4)**(1/4)/(7*a*x**7) + 2*b*(a + b*x**4)**(1/4)/(7*a**2
*x**3) - 4*b**(5/2)*x**3*(a/(b*x**4) + 1)**(3/4)*elliptic_f(atan(
sqrt(a)/(sqrt(b)*x**2))/2, 2)/(7*a**(5/2)*(a + b*x**4)**(3/4))
```

Mathematica [C] time = 0.0557465, size = 82, normalized size = 0.77

$$\frac{-a^2+4b^2x^8\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};-\frac{bx^4}{a}\right)+abx^4+2b^2x^8}{7a^2x^7\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^8*(a + b*x^4)^(3/4)),x]
```

```
[Out] (-a^2 + a*b*x^4 + 2*b^2*x^8 + 4*b^2*x^8*(1 + (b*x^4)/a)^(3/4)*Hyp
ergeometric2F1[1/4, 3/4, 5/4, -((b*x^4)/a)])/(7*a^2*x^7*(a + b*x^
4)^(3/4))
```

Maple [F] time = 0.045, size = 0, normalized size = 0.

$$\int \frac{1}{x^8}\left(bx^4+a\right)^{-\frac{3}{4}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^8/(b*x^4+a)^(3/4),x)

[Out] int(1/x^8/(b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4+a)^{\frac{3}{4}}x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^8),x, algorithm="maxima")

[Out] integrate(1/((b*x^4 + a)^(3/4)*x^8), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(bx^4+a)^{\frac{3}{4}}x^8},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^8),x, algorithm="fricas")

[Out] integral(1/((b*x^4 + a)^(3/4)*x^8), x)
```

Sympy [A] time = 7.00327, size = 44, normalized size = 0.41

$$\frac{\Gamma\left(-\frac{7}{4}\right) {}_2F_1\left(\begin{matrix} -\frac{7}{4}, \frac{3}{4} \\ -\frac{3}{4} \end{matrix}\middle| \frac{bx^4e^{i\pi}}{a}\right)}{4a^{\frac{3}{4}}x^7\,\Gamma\left(-\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**8/(b*x**4+a)**(3/4),x)

[Out] gamma(-7/4)*hyper((-7/4, 3/4), (-3/4,), b*x**4*exp_polar(I*pi)/a)
/(4*a**(3/4)*x**7*gamma(-3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4+a)^{\frac{3}{4}}x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^8),x, algorithm="giac")

[Out] integrate(1/((b*x^4 + a)^(3/4)*x^8), x)
```

3.1136 $\int \frac{1}{x^{12}(a+bx^4)^{3/4}}\,dx$

Optimal. Leaf size=131

$$\frac{40b^{7/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{77a^{7/2}\left(a+bx^4\right)^{3/4}}-\frac{20b^2\sqrt[4]{a+bx^4}}{77a^3x^3}+\frac{10b\sqrt[4]{a+bx^4}}{77a^2x^7}-\frac{\sqrt[4]{a+bx^4}}{11ax^{11}}$$

```
[Out] -(a + b*x^4)^(1/4)/(11*a*x^11) + (10*b*(a + b*x^4)^(1/4))/(77*a^2
*x^7) - (20*b^2*(a + b*x^4)^(1/4))/(77*a^3*x^3) + (40*b^(7/2)*(1
+ a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2,
 2])/(77*a^(7/2)*(a + b*x^4)^(3/4))
```

Rubi [A] time = 0.162316, antiderivative size = 131, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{40b^{7/2}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{77a^{7/2}\left(a+bx^4\right)^{3/4}}-\frac{20b^2\sqrt[4]{a+bx^4}}{77a^3x^3}+\frac{10b\sqrt[4]{a+bx^4}}{77a^2x^7}-\frac{\sqrt[4]{a+bx^4}}{11ax^{11}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^12*(a + b*x^4)^(3/4)),x]
```

```
[Out] -(a + b*x^4)^(1/4)/(11*a*x^11) + (10*b*(a + b*x^4)^(1/4))/(77*a^2
*x^7) - (20*b^2*(a + b*x^4)^(1/4))/(77*a^3*x^3) + (40*b^(7/2)*(1
+ a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2,
 2])/(77*a^(7/2)*(a + b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 18.8474, size = 119, normalized size = 0.91

$$-\frac{\sqrt[4]{a+bx^4}}{11ax^{11}}+\frac{10b\sqrt[4]{a+bx^4}}{77a^2x^7}-\frac{20b^2\sqrt[4]{a+bx^4}}{77a^3x^3}+\frac{40b^{\frac{7}{2}}x^3\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{77a^{\frac{7}{2}}\left(a+bx^4\right)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**12/(b*x**4+a)**(3/4),x)
```

```
[Out] -(a + b*x**4)**(1/4)/(11*a*x**11) + 10*b*(a + b*x**4)**(1/4)/(77*
a**2*x**7) - 20*b**2*(a + b*x**4)**(1/4)/(77*a**3*x**3) + 40*b**(
7/2)*x**3*(a/(b*x**4) + 1)**(3/4)*elliptic_f(atan(sqrt(a)/(sqrt(b
)*x**2))/2, 2)/(77*a**(7/2)*(a + b*x**4)**(3/4))
```

Mathematica [C] time = 0.063467, size = 94, normalized size = 0.72

$$\frac{-7a^3+3a^2bx^4-40b^3x^{12}\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};-\frac{bx^4}{a}\right)-10ab^2x^8-20b^3x^{12}}{77a^3x^{11}\left(a+bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^12*(a + b*x^4)^(3/4)),x]
```

```
[Out] (-7*a^3 + 3*a^2*b*x^4 - 10*a*b^2*x^8 - 20*b^3*x^12 - 40*b^3*x^12*
(1 + (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/4, 3/4, 5/4, -((b*x^4)/
```

```
a)])/(77*a^3*x^11*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.048, size = 0, normalized size = 0.

$$\int \frac{1}{x^{12}} \left(bx^4 + a\right)^{-\frac{3}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^12/(b*x^4+a)^(3/4),x)
```

```
[Out] int(1/x^12/(b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4 + a)^{\frac{3}{4}} x^{12}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^12),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x^4 + a)^(3/4)*x^12), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(bx^4 + a)^{\frac{3}{4}} x^{12}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^12),x, algorithm="fricas")
```

```
[Out] integral(1/((b*x^4 + a)^(3/4)*x^12), x)
```

Sympy [A] time = 14.7161, size = 44, normalized size = 0.34

$$\frac{\Gamma\left(-\frac{11}{4}\right) {}_2F_1\left(\begin{matrix} -\frac{11}{4}, \frac{3}{4} \\ -\frac{7}{4} \end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{4a^{\frac{3}{4}} x^{11} \Gamma\left(-\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**12/(b*x**4+a)**(3/4),x)
```

```
[Out] gamma(-11/4)*hyper((-11/4, 3/4), (-7/4,), b*x**4*exp_polar(I*pi)/
a)/(4*a**(3/4)*x**11*gamma(-7/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4 + a)^{\frac{3}{4}} x^{12}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(3/4)*x^12),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^4 + a)^(3/4)*x^12), x)
```

3.1137 $\int \frac{x^{19}}{(a+bx^4)^{5/4}}\,dx$

Optimal. Leaf size=99

$$-\frac{a^4}{b^5\sqrt[4]{a+bx^4}}-\frac{4a^3\left(a+bx^4\right)^{3/4}}{3b^5}+\frac{6a^2\left(a+bx^4\right)^{7/4}}{7b^5}-\frac{4a\left(a+bx^4\right)^{11/4}}{11b^5}+\frac{\left(a+bx^4\right)^{15/4}}{15b^5}$$

```
[Out] -(a^4/(b^5*(a + b*x^4)^(1/4))) - (4*a^3*(a + b*x^4)^(3/4))/(3*b^5
) + (6*a^2*(a + b*x^4)^(7/4))/(7*b^5) - (4*a*(a + b*x^4)^(11/4))/
(11*b^5) + (a + b*x^4)^(15/4)/(15*b^5)
```

Rubi [A] time = 0.128525, antiderivative size = 99, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^4}{b^5\sqrt[4]{a+bx^4}}-\frac{4a^3\left(a+bx^4\right)^{3/4}}{3b^5}+\frac{6a^2\left(a+bx^4\right)^{7/4}}{7b^5}-\frac{4a\left(a+bx^4\right)^{11/4}}{11b^5}+\frac{\left(a+bx^4\right)^{15/4}}{15b^5}$$

Antiderivative was successfully verified.

```
[In]  Int[x^19/(a + b*x^4)^(5/4),x]
```

```
[Out] -(a^4/(b^5*(a + b*x^4)^(1/4))) - (4*a^3*(a + b*x^4)^(3/4))/(3*b^5
) + (6*a^2*(a + b*x^4)^(7/4))/(7*b^5) - (4*a*(a + b*x^4)^(11/4))/
(11*b^5) + (a + b*x^4)^(15/4)/(15*b^5)
```

Rubi in Sympy [A] time = 17.3374, size = 90, normalized size = 0.91

$$-\frac{a^4}{b^5\sqrt[4]{a+bx^4}}-\frac{4a^3\left(a+bx^4\right)^{\frac{3}{4}}}{3b^5}+\frac{6a^2\left(a+bx^4\right)^{\frac{7}{4}}}{7b^5}-\frac{4a\left(a+bx^4\right)^{\frac{11}{4}}}{11b^5}+\frac{\left(a+bx^4\right)^{\frac{15}{4}}}{15b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**19/(b*x**4+a)**(5/4),x)
```

```
[Out] -a**4/(b**5*(a + b*x**4)**(1/4)) - 4*a**3*(a + b*x**4)**(3/4)/(3*
b**5) + 6*a**2*(a + b*x**4)**(7/4)/(7*b**5) - 4*a*(a + b*x**4)**(
11/4)/(11*b**5) + (a + b*x**4)**(15/4)/(15*b**5)
```

Mathematica [A] time = 0.0472433, size = 61, normalized size = 0.62

$$\frac{-2048a^4-512a^3bx^4+192a^2b^2x^8-112ab^3x^{12}+77b^4x^{16}}{1155b^5\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^19/(a + b*x^4)^(5/4),x]
```

```
[Out] (-2048*a^4 - 512*a^3*b*x^4 + 192*a^2*b^2*x^8 - 112*a*b^3*x^12 + 7
7*b^4*x^16)/(1155*b^5*(a + b*x^4)^(1/4))
```

Maple [A] time = 0.011, size = 58, normalized size = 0.6

$$-\frac{-77\,x^{16}b^4+112\,ax^{12}b^3-192\,a^2x^8b^2+512\,a^3x^4b+2048\,a^4}{1155\,b^5}\frac{1}{\sqrt[4]{bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^19/(b*x^4+a)^(5/4),x)
```

```
[Out] -1/1155*(-77*b^4*x^16+112*a*b^3*x^12-192*a^2*b^2*x^8+512*a^3*b*x^
4+2048*a^4)/(b*x^4+a)^(1/4)/b^5
```

Maxima [A] time = 1.41926, size = 109, normalized size = 1.1

$$\frac{\left(bx^4+a\right)^{\frac{15}{4}}}{15\,b^5}-\frac{4\left(bx^4+a\right)^{\frac{11}{4}}a}{11\,b^5}+\frac{6\left(bx^4+a\right)^{\frac{7}{4}}a^2}{7\,b^5}-\frac{4\left(bx^4+a\right)^{\frac{3}{4}}a^3}{3\,b^5}-\frac{a^4}{\left(bx^4+a\right)^{\frac{1}{4}}b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^19/(b*x^4 + a)^(5/4),x, algorithm="maxima")
```

```
[Out] 1/15*(b*x^4 + a)^(15/4)/b^5 - 4/11*(b*x^4 + a)^(11/4)*a/b^5 + 6/7
*(b*x^4 + a)^(7/4)*a^2/b^5 - 4/3*(b*x^4 + a)^(3/4)*a^3/b^5 - a^4/
((b*x^4 + a)^(1/4)*b^5)
```

Fricas [A] time = 0.22977, size = 77, normalized size = 0.78

$$\frac{77\,b^4x^{16}-112\,ab^3x^{12}+192\,a^2b^2x^8-512\,a^3bx^4-2048\,a^4}{1155\,\left(bx^4+a\right)^{\frac{1}{4}}b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^19/(b*x^4 + a)^(5/4),x, algorithm="fricas")
```

```
[Out] 1/1155*(77*b^4*x^16 - 112*a*b^3*x^12 + 192*a^2*b^2*x^8 - 512*a^3*
b*x^4 - 2048*a^4)/((b*x^4 + a)^(1/4)*b^5)
```

Sympy [A] time = 50.527, size = 116, normalized size = 1.17

$$\begin{cases} -\frac{2048a^4}{1155b^5\sqrt[4]{a+bx^4}}-\frac{512a^3x^4}{1155b^4\sqrt[4]{a+bx^4}}+\frac{64a^2x^8}{385b^3\sqrt[4]{a+bx^4}}-\frac{16ax^{12}}{165b^2\sqrt[4]{a+bx^4}}+\frac{x^{16}}{15b\sqrt[4]{a+bx^4}} & \text{for } b\neq 0\\ \frac{x^{20}}{20a^{\frac{5}{4}}} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**19/(b*x**4+a)**(5/4),x)
```

```
[Out] Piecewise((-2048*a**4/(1155*b**5*(a + b*x**4)**(1/4)) - 512*a**3*
x**4/(1155*b**4*(a + b*x**4)**(1/4)) + 64*a**2*x**8/(385*b**3*(a
+ b*x**4)**(1/4)) - 16*a*x**12/(165*b**2*(a + b*x**4)**(1/4)) + x
**16/(15*b*(a + b*x**4)**(1/4)), Ne(b, 0)), (x**20/(20*a**(5/4)),
 True))
```

GIAC/XCAS [A] time = 0.222133, size = 96, normalized size = 0.97

$$\frac{77\left(bx^4+a\right)^{\frac{15}{4}}-420\left(bx^4+a\right)^{\frac{11}{4}}a+990\left(bx^4+a\right)^{\frac{7}{4}}a^2-1540\left(bx^4+a\right)^{\frac{3}{4}}a^3-\frac{1155\,a^4}{\left(bx^4+a\right)^{\frac{1}{4}}}}{1155\,b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^19/(b*x^4 + a)^(5/4),x, algorithm="giac")
```

```
[Out] 1/1155*(77*(b*x^4 + a)^(15/4) - 420*(b*x^4 + a)^(11/4)*a + 990*(b
*x^4 + a)^(7/4)*a^2 - 1540*(b*x^4 + a)^(3/4)*a^3 - 1155*a^4/(b*x^
4 + a)^(1/4))/b^5
```

3.1138 $\int \frac{x^{15}}{(a+bx^4)^{5/4}}\,dx$

Optimal. Leaf size=74

$$\frac{a^3}{b^4\sqrt[4]{a+bx^4}}+\frac{a^2\left(a+bx^4\right)^{3/4}}{b^4}-\frac{3a\left(a+bx^4\right)^{7/4}}{7b^4}+\frac{\left(a+bx^4\right)^{11/4}}{11b^4}$$

```
[Out] a^3/(b^4*(a + b*x^4)^(1/4)) + (a^2*(a + b*x^4)^(3/4))/b^4 - (3*a*
(a + b*x^4)^(7/4))/(7*b^4) + (a + b*x^4)^(11/4)/(11*b^4)
```

Rubi [A] time = 0.106075, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{a^3}{b^4\sqrt[4]{a+bx^4}}+\frac{a^2\left(a+bx^4\right)^{3/4}}{b^4}-\frac{3a\left(a+bx^4\right)^{7/4}}{7b^4}+\frac{\left(a+bx^4\right)^{11/4}}{11b^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^15/(a + b*x^4)^(5/4),x]
```

```
[Out] a^3/(b^4*(a + b*x^4)^(1/4)) + (a^2*(a + b*x^4)^(3/4))/b^4 - (3*a*
(a + b*x^4)^(7/4))/(7*b^4) + (a + b*x^4)^(11/4)/(11*b^4)
```

Rubi in Sympy [A] time = 14.3254, size = 66, normalized size = 0.89

$$\frac{a^3}{b^4\sqrt[4]{a+bx^4}}+\frac{a^2\left(a+bx^4\right)^{\frac{3}{4}}}{b^4}-\frac{3a\left(a+bx^4\right)^{\frac{7}{4}}}{7b^4}+\frac{\left(a+bx^4\right)^{\frac{11}{4}}}{11b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**15/(b*x**4+a)**(5/4),x)
```

```
[Out] a**3/(b**4*(a + b*x**4)**(1/4)) + a**2*(a + b*x**4)**(3/4)/b**4 -
 3*a*(a + b*x**4)**(7/4)/(7*b**4) + (a + b*x**4)**(11/4)/(11*b**4
)
```

Mathematica [A] time = 0.0357664, size = 50, normalized size = 0.68

$$\frac{128a^3+32a^2bx^4-12ab^2x^8+7b^3x^{12}}{77b^4\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^15/(a + b*x^4)^(5/4),x]
```

```
[Out] (128*a^3 + 32*a^2*b*x^4 - 12*a*b^2*x^8 + 7*b^3*x^12)/(77*b^4*(a +
 b*x^4)^(1/4))
```

Maple [A] time = 0.008, size = 47, normalized size = 0.6

$$\frac{7\,b^3x^{12}-12\,ab^2x^8+32\,a^2bx^4+128\,a^3}{77\,b^4}\frac{1}{\sqrt[4]{bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^15/(b*x^4+a)^(5/4),x)
```

```
[Out] 1/77*(7*b^3*x^12-12*a*b^2*x^8+32*a^2*b*x^4+128*a^3)/(b*x^4+a)^(1/
4)/b^4
```

Maxima [A] time = 1.41306, size = 84, normalized size = 1.14

$$\frac{\left(bx^4+a\right)^{\frac{11}{4}}}{11\,b^4}-\frac{3\left(bx^4+a\right)^{\frac{7}{4}}a}{7\,b^4}+\frac{\left(bx^4+a\right)^{\frac{3}{4}}a^2}{b^4}+\frac{a^3}{\left(bx^4+a\right)^{\frac{1}{4}}b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^15/(b*x^4 + a)^(5/4),x, algorithm="maxima")
```

```
[Out] 1/11*(b*x^4 + a)^(11/4)/b^4 - 3/7*(b*x^4 + a)^(7/4)*a/b^4 + (b*x^
4 + a)^(3/4)*a^2/b^4 + a^3/((b*x^4 + a)^(1/4)*b^4)
```

Fricas [A] time = 0.224359, size = 62, normalized size = 0.84

$$\frac{7\,b^3x^{12}-12\,ab^2x^8+32\,a^2bx^4+128\,a^3}{77\,\left(bx^4+a\right)^{\frac{1}{4}}b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^15/(b*x^4 + a)^(5/4),x, algorithm="fricas")
```

```
[Out] 1/77*(7*b^3*x^12 - 12*a*b^2*x^8 + 32*a^2*b*x^4 + 128*a^3)/((b*x^4
 + a)^(1/4)*b^4)
```

Sympy [A] time = 23.8128, size = 92, normalized size = 1.24

$$\begin{cases} \frac{128a^3}{77b^4\sqrt[4]{a+bx^4}}+\frac{32a^2x^4}{77b^3\sqrt[4]{a+bx^4}}-\frac{12ax^8}{77b^2\sqrt[4]{a+bx^4}}+\frac{x^{12}}{11b\sqrt[4]{a+bx^4}} & \text{for}\ b\neq 0 \\ \frac{x^{16}}{16a^{\frac{5}{4}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**15/(b*x**4+a)**(5/4),x)
```

```
[Out] Piecewise((128*a**3/(77*b**4*(a + b*x**4)**(1/4)) + 32*a**2*x**4/
(77*b**3*(a + b*x**4)**(1/4)) - 12*a*x**8/(77*b**2*(a + b*x**4)**
(1/4)) + x**12/(11*b*(a + b*x**4)**(1/4)), Ne(b, 0)), (x**16/(16*
a**(5/4)), True))
```

GIAC/XCAS [A] time = 0.218, size = 77, normalized size = 1.04

$$\frac{7\left(bx^4+a\right)^{\frac{11}{4}}-33\left(bx^4+a\right)^{\frac{7}{4}}a+77\left(bx^4+a\right)^{\frac{3}{4}}a^2+\frac{77\,a^3}{\left(bx^4+a\right)^{\frac{1}{4}}}}{77\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^15/(b*x^4 + a)^(5/4),x, algorithm="giac")
```

```
[Out] 1/77*(7*(b*x^4 + a)^(11/4) - 33*(b*x^4 + a)^(7/4)*a + 77*(b*x^4 +
 a)^(3/4)*a^2 + 77*a^3/(b*x^4 + a)^(1/4))/b^4
```

3.1139 $\int \frac{x^{11}}{(a+bx^4)^{5/4}} dx$

Optimal. Leaf size=57

$$-\frac{a^2}{b^3\sqrt[4]{a+bx^4}}-\frac{2a\left(a+bx^4\right)^{3/4}}{3b^3}+\frac{\left(a+bx^4\right)^{7/4}}{7b^3}$$

```
[Out] -(a^2/(b^3*(a + b*x^4)^(1/4))) - (2*a*(a + b*x^4)^(3/4))/(3*b^3)
+ (a + b*x^4)^(7/4)/(7*b^3)
```

Rubi [A] time = 0.0839911, antiderivative size = 57, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$-\frac{a^2}{b^3\sqrt[4]{a+bx^4}}-\frac{2a\left(a+bx^4\right)^{3/4}}{3b^3}+\frac{\left(a+bx^4\right)^{7/4}}{7b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11/(a + b*x^4)^(5/4),x]
```

```
[Out] -(a^2/(b^3*(a + b*x^4)^(1/4))) - (2*a*(a + b*x^4)^(3/4))/(3*b^3)
+ (a + b*x^4)^(7/4)/(7*b^3)
```

Rubi in Sympy [A] time = 10.5703, size = 49, normalized size = 0.86

$$-\frac{a^2}{b^3\sqrt[4]{a+bx^4}}-\frac{2a\left(a+bx^4\right)^{\frac{3}{4}}}{3b^3}+\frac{\left(a+bx^4\right)^{\frac{7}{4}}}{7b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11/(b*x**4+a)**(5/4),x)
```

```
[Out] -a**2/(b**3*(a + b*x**4)**(1/4)) - 2*a*(a + b*x**4)**(3/4)/(3*b**
3) + (a + b*x**4)**(7/4)/(7*b**3)
```

Mathematica [A] time = 0.0331995, size = 39, normalized size = 0.68

$$\frac{-32a^2-8abx^4+3b^2x^8}{21b^3\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11/(a + b*x^4)^(5/4),x]
```

```
[Out] (-32*a^2 - 8*a*b*x^4 + 3*b^2*x^8)/(21*b^3*(a + b*x^4)^(1/4))
```

Maple [A] time = 0.008, size = 36, normalized size = 0.6

$$-\frac{-3\,b^2x^8+8\,abx^4+32\,a^2}{21\,b^3}\frac{1}{\sqrt[4]{bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11/(b*x^4+a)^(5/4),x)
```

```
[Out] -1/21*(-3*b^2*x^8+8*a*b*x^4+32*a^2)/(b*x^4+a)^(1/4)/b^3
```

Maxima [A] time = 1.41638, size = 63, normalized size = 1.11

$$\frac{\left(bx^4+a\right)^{\frac{7}{4}}}{7\,b^3}-\frac{2\left(bx^4+a\right)^{\frac{3}{4}}a}{3\,b^3}-\frac{a^2}{\left(bx^4+a\right)^{\frac{1}{4}}b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(b*x^4 + a)^(5/4),x, algorithm="maxima")
```

```
[Out] 1/7*(b*x^4 + a)^(7/4)/b^3 - 2/3*(b*x^4 + a)^(3/4)*a/b^3 - a^2/((b
*x^4 + a)^(1/4)*b^3)
```

Fricas [A] time = 0.231002, size = 47, normalized size = 0.82

$$\frac{3\,b^2x^8-8\,abx^4-32\,a^2}{21\left(bx^4+a\right)^{\frac{1}{4}}b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(b*x^4 + a)^(5/4),x, algorithm="fricas")
```

```
[Out] 1/21*(3*b^2*x^8 - 8*a*b*x^4 - 32*a^2)/((b*x^4 + a)^(1/4)*b^3)
```

Sympy [A] time = 10.2773, size = 68, normalized size = 1.19

$$\begin{cases} -\frac{32a^2}{21b^3\sqrt[4]{a+bx^4}}-\frac{8ax^4}{21b^2\sqrt[4]{a+bx^4}}+\frac{x^8}{7b\sqrt[4]{a+bx^4}} & \text{for } b\neq 0\\ \frac{x^{12}}{12a^{\frac{5}{4}}} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11/(b*x**4+a)**(5/4),x)
```

```
[Out] Piecewise((-32*a**2/(21*b**3*(a + b*x**4)**(1/4)) - 8*a*x**4/(21*
b**2*(a + b*x**4)**(1/4)) + x**8/(7*b*(a + b*x**4)**(1/4)), Ne(b,
 0)), (x**12/(12*a**(5/4)), True))
```

GIAC/XCAS [A] time = 0.214441, size = 58, normalized size = 1.02

$$\frac{3\left(bx^4+a\right)^{\frac{7}{4}}-14\left(bx^4+a\right)^{\frac{3}{4}}a-\frac{21\,a^2}{\left(bx^4+a\right)^{\frac{1}{4}}}}{21\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(b*x^4 + a)^(5/4),x, algorithm="giac")
```

```
[Out] 1/21*(3*(b*x^4 + a)^(7/4) - 14*(b*x^4 + a)^(3/4)*a - 21*a^2/(b*x^
4 + a)^(1/4))/b^3
```

3.1140 $\int \frac{x^7}{(a+bx^4)^{5/4}}\,dx$

Optimal. Leaf size=35

$$\frac{a}{b^2\sqrt[4]{a+bx^4}}+\frac{(a+bx^4)^{3/4}}{3b^2}$$

```
[Out] a/(b^2*(a + b*x^4)^(1/4)) + (a + b*x^4)^(3/4)/(3*b^2)
```

Rubi [A] time = 0.0588314, antiderivative size = 35, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a}{b^2\sqrt[4]{a+bx^4}}+\frac{(a+bx^4)^{3/4}}{3b^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^7/(a + b*x^4)^(5/4),x]
```

```
[Out] a/(b^2*(a + b*x^4)^(1/4)) + (a + b*x^4)^(3/4)/(3*b^2)
```

Rubi in Sympy [A] time = 7.0686, size = 29, normalized size = 0.83

$$\frac{a}{b^2\sqrt[4]{a+bx^4}}+\frac{(a+bx^4)^{\frac{3}{4}}}{3b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**7/(b*x**4+a)**(5/4),x)
```

```
[Out] a/(b**2*(a + b*x**4)**(1/4)) + (a + b*x**4)**(3/4)/(3*b**2)
```

Mathematica [A] time = 0.0253759, size = 27, normalized size = 0.77

$$\frac{4a+bx^4}{3b^2\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^7/(a + b*x^4)^(5/4),x]
```

```
[Out] (4*a + b*x^4)/(3*b^2*(a + b*x^4)^(1/4))
```

Maple [A] time = 0.007, size = 24, normalized size = 0.7

$$\frac{bx^4+4\,a}{3\,b^2}\frac{1}{\sqrt[4]{bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^7/(b*x^4+a)^(5/4),x)
```

```
[Out] 1/3*(b*x^4+4*a)/(b*x^4+a)^(1/4)/b^2
```

Maxima [A] time = 1.44187, size = 39, normalized size = 1.11

$$\frac{\left(bx^4+a\right)^{\frac{3}{4}}}{3\,b^2}+\frac{a}{\left(bx^4+a\right)^{\frac{1}{4}}b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(b*x^4 + a)^(5/4),x, algorithm="maxima")
```

```
[Out] 1/3*(b*x^4 + a)^(3/4)/b^2 + a/((b*x^4 + a)^(1/4)*b^2)
```

Fricas [A] time = 0.233416, size = 31, normalized size = 0.89

$$\frac{bx^4+4\,a}{3\left(bx^4+a\right)^{\frac{1}{4}}b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(b*x^4 + a)^(5/4),x, algorithm="fricas")
```

```
[Out] 1/3*(b*x^4 + 4*a)/((b*x^4 + a)^(1/4)*b^2)
```

Sympy [A] time = 4.05691, size = 44, normalized size = 1.26

$$\begin{cases} \frac{4a}{3b^2\sqrt[4]{a+bx^4}}+\frac{x^4}{3b\sqrt[4]{a+bx^4}} & \text{for } b\neq 0 \\ \frac{x^8}{8a^{\frac{5}{4}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(b*x**4+a)**(5/4),x)
```

```
[Out] Piecewise((4*a/(3*b**2*(a + b*x**4)**(1/4)) + x**4/(3*b*(a + b*x*
*4)**(1/4)), Ne(b, 0)), (x**8/(8*a**(5/4)), True))
```

GIAC/XCAS [A] time = 0.214989, size = 36, normalized size = 1.03

$$\frac{\left(bx^4+a\right)^{\frac{3}{4}}+\frac{3\,a}{\left(bx^4+a\right)^{\frac{1}{4}}}}{3\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(b*x^4 + a)^(5/4),x, algorithm="giac")
```

```
[Out] 1/3*((b*x^4 + a)^(3/4) + 3*a/(b*x^4 + a)^(1/4))/b^2
```

3.1141 $\int \frac{x^3}{(a+bx^4)^{5/4}}\,dx$

Optimal. Leaf size=16

$$-\frac{1}{b\sqrt[4]{a+bx^4}}$$

```
[Out] -(1/(b*(a + b*x^4)^(1/4)))
```

Rubi [A] time = 0.010378, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$-\frac{1}{b\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(a + b*x^4)^(5/4),x]

[Out] -(1/(b*(a + b*x^4)^(1/4)))
```

Rubi in Sympy [A] time = 2.1343, size = 14, normalized size = 0.88

$$-\frac{1}{b\sqrt[4]{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(b*x**4+a)**(5/4),x)

[Out] -1/(b*(a + b*x**4)**(1/4))
```

Mathematica [A] time = 0.00756568, size = 16, normalized size = 1.

$$-\frac{1}{b\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(a + b*x^4)^(5/4),x]

[Out] -(1/(b*(a + b*x^4)^(1/4)))
```

Maple [A] time = 0.007, size = 15, normalized size = 0.9

$$-\frac{1}{b}\frac{1}{\sqrt[4]{bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(b*x^4+a)^(5/4),x)

[Out] -1/b/(b*x^4+a)^(1/4)
```

Maxima [A] time = 1.43215, size = 19, normalized size = 1.19

$$-\frac{1}{(bx^4+a)^{\frac{1}{4}}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^4 + a)^(5/4),x, algorithm="maxima")
```

```
[Out] -1/((b*x^4 + a)^(1/4)*b)
```

Fricas [A] time = 0.228796, size = 19, normalized size = 1.19

$$-\frac{1}{(bx^4+a)^{\frac{1}{4}}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^4 + a)^(5/4),x, algorithm="fricas")
```

```
[Out] -1/((b*x^4 + a)^(1/4)*b)
```

Sympy [A] time = 2.61124, size = 24, normalized size = 1.5

$$\begin{cases} -\frac{1}{b\sqrt[4]{a+bx^4}} & \text{for } b \neq 0 \\ \frac{x^4}{4a^{\frac{5}{4}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(b*x**4+a)**(5/4),x)
```

```
[Out] Piecewise((-1/(b*(a + b*x**4)**(1/4)), Ne(b, 0)), (x**4/(4*a**(5/
4)), True))
```

GIAC/XCAS [A] time = 0.212095, size = 19, normalized size = 1.19

$$-\frac{1}{(bx^4+a)^{\frac{1}{4}}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^4 + a)^(5/4),x, algorithm="giac")
```

```
[Out] -1/((b*x^4 + a)^(1/4)*b)
```

3.1142 $\int \frac{1}{x(a+bx^4)^{5/4}} \, dx$

Optimal. Leaf size=70

$$\frac{\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{2a^{5/4}}-\frac{\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{2a^{5/4}}+\frac{1}{a\sqrt[4]{a+bx^4}}$$

```
[Out] 1/(a*(a + b*x^4)^(1/4)) + ArcTan[(a + b*x^4)^(1/4)/a^(1/4)]/(2*a^
(5/4)) - ArcTanh[(a + b*x^4)^(1/4)/a^(1/4)]/(2*a^(5/4))
```

Rubi [A] time = 0.108304, antiderivative size = 70, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$\frac{\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{2a^{5/4}}-\frac{\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{2a^{5/4}}+\frac{1}{a\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a + b*x^4)^(5/4)),x]
```

```
[Out] 1/(a*(a + b*x^4)^(1/4)) + ArcTan[(a + b*x^4)^(1/4)/a^(1/4)]/(2*a^
(5/4)) - ArcTanh[(a + b*x^4)^(1/4)/a^(1/4)]/(2*a^(5/4))
```

Rubi in Sympy [A] time = 12.1933, size = 60, normalized size = 0.86

$$\frac{1}{a\sqrt[4]{a+bx^4}}+\frac{\operatorname{atan}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{2a^{\frac{5}{4}}}-\frac{\operatorname{atanh}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{2a^{\frac{5}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(b*x**4+a)**(5/4),x)
```

```
[Out] 1/(a*(a + b*x**4)**(1/4)) + atan((a + b*x**4)**(1/4)/a**(1/4))/(2
*a**(5/4)) - atanh((a + b*x**4)**(1/4)/a**(1/4))/(2*a**(5/4))
```

Mathematica [C] time = 0.0492092, size = 52, normalized size = 0.74

$$\frac{1-\sqrt[4]{\frac{a}{bx^4}+1}\,{}_2F_1\left(\frac{1}{4},\frac{1}{4};\frac{5}{4};-\frac{a}{bx^4}\right)}{a\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a + b*x^4)^(5/4)),x]
```

```
[Out] (1 - (1 + a/(b*x^4))^(1/4)*Hypergeometric2F1[1/4, 1/4, 5/4, -(a/(
b*x^4))])/(a*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.042, size = 0, normalized size = 0.

$$\int \frac{1}{x}\left(bx^4+a\right)^{-\frac{5}{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(b*x^4+a)^(5/4),x)
```

```
[Out] int(1/x/(b*x^4+a)^(5/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.259961, size = 203, normalized size = 2.9

$$-\frac{4\left(bx^4+a\right)^{\frac{1}{4}}a\frac{1}{a^5}^{\frac{1}{4}}\arctan\left(\frac{a^4\frac{1}{a^5}^{\frac{3}{4}}}{\sqrt{a^3\sqrt{\frac{1}{a^5}}+\sqrt{bx^4+a}}+(bx^4+a)^{\frac{1}{4}}}\right)+\left(bx^4+a\right)^{\frac{1}{4}}a\frac{1}{a^5}^{\frac{1}{4}}\log\left(a^4\frac{1}{a^5}^{\frac{3}{4}}+\left(bx^4+a\right)^{\frac{1}{4}}\right)-\left(bx^4+a\right)^{\frac{1}{4}}a\frac{1}{a^5}^{\frac{1}{4}}\log\left(-\right.}{4\left(bx^4+a\right)^{\frac{1}{4}}a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x),x, algorithm="fricas")
```

```
[Out] -1/4*(4*(b*x^4 + a)^(1/4)*a*(a^(-5))^(1/4)*arctan(a^4*(a^(-5))^(3
/4)/(sqrt(a^3*sqrt(a^(-5)) + sqrt(b*x^4 + a)) + (b*x^4 + a)^(1/4)
)) + (b*x^4 + a)^(1/4)*a*(a^(-5))^(1/4)*log(a^4*(a^(-5))^(3/4) +
(b*x^4 + a)^(1/4)) - (b*x^4 + a)^(1/4)*a*(a^(-5))^(1/4)*log(-a^4*
(a^(-5))^(3/4) + (b*x^4 + a)^(1/4)) - 4)/((b*x^4 + a)^(1/4)*a)
```

Sympy [A] time = 4.34129, size = 39, normalized size = 0.56

$$-\frac{\Gamma\left(\frac{5}{4}\right){}_2F_1\left(\begin{matrix}\frac{5}{4},\frac{5}{4}\\\frac{9}{4}\end{matrix}\middle|\frac{ae^{i\pi}}{bx^4}\right)}{4b^{\frac{5}{4}}x^5\Gamma\left(\frac{9}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(b*x**4+a)**(5/4),x)
```

```
[Out] -gamma(5/4)*hyper((5/4, 5/4), (9/4,), a*exp_polar(I*pi)/(b*x**4))
/(4*b**(5/4)*x**5*gamma(9/4))
```

GIAC/XCAS [A] time = 0.224697, size = 269, normalized size = 3.84

$$-\frac{\sqrt{2}\,(-a)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}+2\,(bx^4+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{4\,a^2}-\frac{\sqrt{2}\,(-a)^{\frac{3}{4}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}-2\,(bx^4+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{4\,a^2}+\frac{\sqrt{2}\,(-a)^{\frac{3}{4}}\ln\left(\sqrt{2}\left(bx^4+a\right)^{\frac{1}{4}}(-a)^{\frac{1}{4}}+\sqrt{bx^4+a}+\sqrt{-a}\right)}{8\,a^2}-\frac{\sqrt{2}\,(-a)^{\frac{3}{4}}\ln\left(-\sqrt{2}\left(bx^4+a\right)^{\frac{1}{4}}(-a)^{\frac{1}{4}}+\sqrt{bx^4+a}+\sqrt{-a}\right)}{8\,a^2}+\frac{1}{(bx^4+a)^{\frac{1}{4}}a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x),x, algorithm="giac")
```

```
[Out] -1/4*sqrt(2)*(-a)^(3/4)*arctan(1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) +
2*(b*x^4 + a)^(1/4))/(-a)^(1/4))/a^2 - 1/4*sqrt(2)*(-a)^(3/4)*arc
tan(-1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) - 2*(b*x^4 + a)^(1/4))/(-a)^
(1/4))/a^2 + 1/8*sqrt(2)*(-a)^(3/4)*ln(sqrt(2)*(b*x^4 + a)^(1/4)*
(-a)^(1/4) + sqrt(b*x^4 + a) + sqrt(-a))/a^2 - 1/8*sqrt(2)*(-a)^(
3/4)*ln(-sqrt(2)*(b*x^4 + a)^(1/4)*(-a)^(1/4) + sqrt(b*x^4 + a) +
 sqrt(-a))/a^2 + 1/((b*x^4 + a)^(1/4)*a)
```

3.1143 $\int \frac{1}{x^5(a+bx^4)^{5/4}}\,dx$

Optimal. Leaf size=96

$$-\frac{5b\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{8a^{9/4}}+\frac{5b\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{8a^{9/4}}-\frac{5\left(a+bx^4\right)^{3/4}}{4a^2x^4}+\frac{1}{ax^4\sqrt[4]{a+bx^4}}$$

```
[Out] 1/(a*x^4*(a + b*x^4)^(1/4)) - (5*(a + b*x^4)^(3/4))/(4*a^2*x^4) -
 (5*b*ArcTan[(a + b*x^4)^(1/4)/a^(1/4)])/(8*a^(9/4)) + (5*b*ArcTa
nh[(a + b*x^4)^(1/4)/a^(1/4)])/(8*a^(9/4))
```

Rubi [A] time = 0.142886, antiderivative size = 96, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$-\frac{5b\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{8a^{9/4}}+\frac{5b\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{8a^{9/4}}-\frac{5\left(a+bx^4\right)^{3/4}}{4a^2x^4}+\frac{1}{ax^4\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^5*(a + b*x^4)^(5/4)),x]
```

```
[Out] 1/(a*x^4*(a + b*x^4)^(1/4)) - (5*(a + b*x^4)^(3/4))/(4*a^2*x^4) -
 (5*b*ArcTan[(a + b*x^4)^(1/4)/a^(1/4)])/(8*a^(9/4)) + (5*b*ArcTa
nh[(a + b*x^4)^(1/4)/a^(1/4)])/(8*a^(9/4))
```

Rubi in Sympy [A] time = 15.5577, size = 90, normalized size = 0.94

$$\frac{1}{ax^4\sqrt[4]{a+bx^4}}-\frac{5\left(a+bx^4\right)^{\frac{3}{4}}}{4a^2x^4}-\frac{5b\,\mathrm{atan}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{8a^{\frac{9}{4}}}+\frac{5b\,\mathrm{atanh}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{8a^{\frac{9}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**5/(b*x**4+a)**(5/4),x)
```

```
[Out] 1/(a*x**4*(a + b*x**4)**(1/4)) - 5*(a + b*x**4)**(3/4)/(4*a**2*x*
*4) - 5*b*atan((a + b*x**4)**(1/4)/a**(1/4))/(8*a**(9/4)) + 5*b*a
tanh((a + b*x**4)**(1/4)/a**(1/4))/(8*a**(9/4))
```

Mathematica [C] time = 0.0625522, size = 70, normalized size = 0.73

$$\frac{5bx^4\sqrt[4]{\frac{a}{bx^4}+1}\,{}_2F_1\left(\frac{1}{4},\frac{1}{4};\frac{5}{4};-\frac{a}{bx^4}\right)-a-5bx^4}{4a^2x^4\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^5*(a + b*x^4)^(5/4)),x]
```

```
[Out] (-a - 5*b*x^4 + 5*b*(1 + a/(b*x^4))^(1/4)*x^4*Hypergeometric2F1[1
/4, 1/4, 5/4, -(a/(b*x^4))])/(4*a^2*x^4*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.076, size = 0, normalized size = 0.

$$\int \frac{1}{x^5}\left(bx^4+a\right)^{-\frac{5}{4}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^5/(b*x^4+a)^(5/4),x)
```

```
[Out] int(1/x^5/(b*x^4+a)^(5/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^5),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.263003, size = 306, normalized size = 3.19

$$\frac{20\left(bx^4+a\right)^{\frac{1}{4}}a^2x^4\left(\frac{b^4}{a^9}\right)^{\frac{1}{4}}\arctan\left(\frac{a^7\left(\frac{b^4}{a^9}\right)^{\frac{3}{4}}}{(bx^4+a)^{\frac{1}{4}}b^3+\sqrt{a^5b^4\sqrt{\frac{b^4}{a^9}}+\sqrt{bx^4+a}b^6}}\right)+5\left(bx^4+a\right)^{\frac{1}{4}}a^2x^4\left(\frac{b^4}{a^9}\right)^{\frac{1}{4}}\log\left(125\,a^7\left(\frac{b^4}{a^9}\right)^{\frac{3}{4}}+125\left(bx^4+\right.\right.}{16\left(bx^4+a\right)^{\frac{1}{4}}a^2x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^5),x, algorithm="fricas")
```

```
[Out] 1/16*(20*(b*x^4 + a)^(1/4)*a^2*x^4*(b^4/a^9)^(1/4)*arctan(a^7*(b^
4/a^9)^(3/4)/((b*x^4 + a)^(1/4)*b^3 + sqrt(a^5*b^4*sqrt(b^4/a^9)
+ sqrt(b*x^4 + a)*b^6))) + 5*(b*x^4 + a)^(1/4)*a^2*x^4*(b^4/a^9)^
(1/4)*log(125*a^7*(b^4/a^9)^(3/4) + 125*(b*x^4 + a)^(1/4)*b^3) -
5*(b*x^4 + a)^(1/4)*a^2*x^4*(b^4/a^9)^(1/4)*log(-125*a^7*(b^4/a^9
)^(3/4) + 125*(b*x^4 + a)^(1/4)*b^3) - 20*b*x^4 - 4*a)/((b*x^4 +
a)^(1/4)*a^2*x^4)
```

Sympy [A] time = 7.2587, size = 39, normalized size = 0.41

$$-\frac{\Gamma\left(\frac{9}{4}\right){}_2F_1\left(\begin{matrix}\frac{5}{4},\frac{9}{4}\\ \frac{13}{4}\end{matrix}\middle|\frac{ae^{i\pi}}{bx^4}\right)}{4b^{\frac{5}{4}}x^9\,\Gamma\left(\frac{13}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**5/(b*x**4+a)**(5/4),x)
```

```
[Out] -gamma(9/4)*hyper((5/4, 9/4), (13/4,), a*exp_polar(I*pi)/(b*x**4)
)/(4*b**(5/4)*x**9*gamma(13/4))
```

GIAC/XCAS [A] time = 0.228684, size = 305, normalized size = 3.18

$$\frac{1}{32}\,b\left(\frac{10\,\sqrt{2}\,(-a)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}+2\,(bx^4+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{a^3}+\frac{10\,\sqrt{2}\,(-a)^{\frac{3}{4}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}-2\,(bx^4+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{a^3}-\frac{5\,\sqrt{2}\,(-a)^{\frac{3}{4}}\ln\left(\sqrt{2}(bx\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^5),x, algorithm="giac")
```

```
[Out] 1/32*b*(10*sqrt(2)*(-a)^(3/4)*arctan(1/2*sqrt(2)*(sqrt(2)*(-a)^(1
/4) + 2*(b*x^4 + a)^(1/4))/(-a)^(1/4))/a^3 + 10*sqrt(2)*(-a)^(3/4
)*arctan(-1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) - 2*(b*x^4 + a)^(1/4))/
(-a)^(1/4))/a^3 - 5*sqrt(2)*(-a)^(3/4)*ln(sqrt(2)*(b*x^4 + a)^(1/
4)*(-a)^(1/4) + sqrt(b*x^4 + a) + sqrt(-a))/a^3 + 5*sqrt(2)*(-a)^
(3/4)*ln(-sqrt(2)*(b*x^4 + a)^(1/4)*(-a)^(1/4) + sqrt(b*x^4 + a)
+ sqrt(-a))/a^3 - 8*(5*b*x^4 + a)/(((b*x^4 + a)^(5/4) - (b*x^4 +
a)^(1/4)*a)*a^2))
```

3.1144 $\int \frac{1}{x^9(a+bx^4)^{5/4}}\,dx$

Optimal. Leaf size=122

$$\frac{45b^2\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{13/4}}-\frac{45b^2\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{13/4}}+\frac{45b\left(a+bx^4\right)^{3/4}}{32a^3x^4}-\frac{9\left(a+bx^4\right)^{3/4}}{8a^2x^8}+\frac{1}{ax^8\sqrt[4]{a+bx^4}}$$

```
[Out] 1/(a*x^8*(a + b*x^4)^(1/4)) - (9*(a + b*x^4)^(3/4))/(8*a^2*x^8) +
 (45*b*(a + b*x^4)^(3/4))/(32*a^3*x^4) + (45*b^2*ArcTan[(a + b*x^
4)^(1/4)/a^(1/4)])/(64*a^(13/4)) - (45*b^2*ArcTanh[(a + b*x^4)^(1
/4)/a^(1/4)])/(64*a^(13/4))
```

Rubi [A] time = 0.180038, antiderivative size = 122, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.4$

$$\frac{45b^2\tan^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{13/4}}-\frac{45b^2\tanh^{-1}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{13/4}}+\frac{45b\left(a+bx^4\right)^{3/4}}{32a^3x^4}-\frac{9\left(a+bx^4\right)^{3/4}}{8a^2x^8}+\frac{1}{ax^8\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^9*(a + b*x^4)^(5/4)),x]
```

```
[Out] 1/(a*x^8*(a + b*x^4)^(1/4)) - (9*(a + b*x^4)^(3/4))/(8*a^2*x^8) +
 (45*b*(a + b*x^4)^(3/4))/(32*a^3*x^4) + (45*b^2*ArcTan[(a + b*x^
4)^(1/4)/a^(1/4)])/(64*a^(13/4)) - (45*b^2*ArcTanh[(a + b*x^4)^(1
/4)/a^(1/4)])/(64*a^(13/4))
```

Rubi in Sympy [A] time = 20.3167, size = 116, normalized size = 0.95

$$\frac{1}{ax^8\sqrt[4]{a+bx^4}}-\frac{9\left(a+bx^4\right)^{\frac{3}{4}}}{8a^2x^8}+\frac{45b\left(a+bx^4\right)^{\frac{3}{4}}}{32a^3x^4}+\frac{45b^2\operatorname{atan}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{\frac{13}{4}}}-\frac{45b^2\operatorname{atanh}\left(\frac{\sqrt[4]{a+bx^4}}{\sqrt[4]{a}}\right)}{64a^{\frac{13}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**9/(b*x**4+a)**(5/4),x)
```

```
[Out] 1/(a*x**8*(a + b*x**4)**(1/4)) - 9*(a + b*x**4)**(3/4)/(8*a**2*x*
*8) + 45*b*(a + b*x**4)**(3/4)/(32*a**3*x**4) + 45*b**2*atan((a +
 b*x**4)**(1/4)/a**(1/4))/(64*a**(13/4)) - 45*b**2*atanh((a + b*x
**4)**(1/4)/a**(1/4))/(64*a**(13/4))
```

Mathematica [C] time = 0.0748056, size = 83, normalized size = 0.68

$$\frac{-4a^2-45b^2x^8\sqrt[4]{\frac{a}{bx^4}+1}\,{}_2F_1\left(\frac{1}{4},\frac{1}{4};\frac{5}{4};-\frac{a}{bx^4}\right)+9abx^4+45b^2x^8}{32a^3x^8\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^9*(a + b*x^4)^(5/4)),x]
```

```
[Out] (-4*a^2 + 9*a*b*x^4 + 45*b^2*x^8 - 45*b^2*(1 + a/(b*x^4))^(1/4)*x
^8*Hypergeometric2F1[1/4, 1/4, 5/4, -(a/(b*x^4))])/(32*a^3*x^8*(a
```

```
+ b*x^4)^(1/4))
```

Maple [F] time = 0.085, size = 0, normalized size = 0.

$$\int \frac{1}{x^9}\left(bx^4+a\right)^{-\frac{5}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^9/(b*x^4+a)^(5/4),x)

[Out] int(1/x^9/(b*x^4+a)^(5/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^9),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [A] time = 0.263259, size = 321, normalized size = 2.63

$$-\frac{180\left(bx^4+a\right)^{\frac{1}{4}}a^3x^8\left(\frac{b^8}{a^{13}}\right)^{\frac{1}{4}}\arctan\left(\frac{a^{10}\left(\frac{b^8}{a^{13}}\right)^{\frac{3}{4}}}{(bx^4+a)^{\frac{1}{4}}b^6+\sqrt{a^7b^8\sqrt{\frac{b^8}{a^{13}}}+\sqrt{bx^4+a}b^{12}}}\right)+45\left(bx^4+a\right)^{\frac{1}{4}}a^3x^8\left(\frac{b^8}{a^{13}}\right)^{\frac{1}{4}}\log\left(91125\,a^{10}\left(\frac{b^8}{a^{13}}\right)^{\frac{3}{4}}+\cdots\right.}{128\,(bx\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^9),x, algorithm="fricas")

[Out] -1/128*(180*(b*x^4 + a)^(1/4)*a^3*x^8*(b^8/a^13)^(1/4)*arctan(a^1
0*(b^8/a^13)^(3/4)/((b*x^4 + a)^(1/4)*b^6 + sqrt(a^7*b^8*sqrt(b^8
/a^13) + sqrt(b*x^4 + a)*b^12))) + 45*(b*x^4 + a)^(1/4)*a^3*x^8*(
b^8/a^13)^(1/4)*log(91125*a^10*(b^8/a^13)^(3/4) + 91125*(b*x^4 +
a)^(1/4)*b^6) - 45*(b*x^4 + a)^(1/4)*a^3*x^8*(b^8/a^13)^(1/4)*log
(-91125*a^10*(b^8/a^13)^(3/4) + 91125*(b*x^4 + a)^(1/4)*b^6) - 18
0*b^2*x^8 - 36*a*b*x^4 + 16*a^2)/((b*x^4 + a)^(1/4)*a^3*x^8)
```

Sympy [A] time = 14.6948, size = 39, normalized size = 0.32

$$-\frac{\Gamma\left(\frac{13}{4}\right){}_2F_1\left(\begin{matrix}\frac{5}{4},\frac{13}{4}\\\frac{17}{4}\end{matrix}\middle|\frac{ae^{i\pi}}{bx^4}\right)}{4b^{\frac{5}{4}}x^{13}\,\Gamma\left(\frac{17}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**9/(b*x**4+a)**(5/4),x)

[Out] -gamma(13/4)*hyper((5/4, 13/4), (17/4,), a*exp_polar(I*pi)/(b*x**
4))/(4*b**(5/4)*x**13*gamma(17/4))
```

GIAC/XCAS [A] time = 0.233033, size = 324, normalized size = 2.66

$$-\frac{1}{256}\,b^{2}\left(\frac{90\,\sqrt{2}\,(-a)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}+2\,(bx^{4}+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{a^{4}}+\frac{90\,\sqrt{2}\,(-a)^{\frac{3}{4}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}-2\,(bx^{4}+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{a^{4}}-\frac{45\,\sqrt{2}\,(-a)^{\frac{3}{4}}\ln\left(\sqrt{\right.}}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^9),x, algorithm="giac")
```

```
[Out] -1/256*b^2*(90*sqrt(2)*(-a)^(3/4)*arctan(1/2*sqrt(2)*(sqrt(2)*(-a
)^(1/4) + 2*(b*x^4 + a)^(1/4))/(-a)^(1/4))/a^4 + 90*sqrt(2)*(-a)^
(3/4)*arctan(-1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) - 2*(b*x^4 + a)^(1/
4))/(-a)^(1/4))/a^4 - 45*sqrt(2)*(-a)^(3/4)*ln(sqrt(2)*(b*x^4 + a
)^(1/4)*(-a)^(1/4) + sqrt(b*x^4 + a) + sqrt(-a))/a^4 + 45*sqrt(2)
*(-a)^(3/4)*ln(-sqrt(2)*(b*x^4 + a)^(1/4)*(-a)^(1/4) + sqrt(b*x^4
 + a) + sqrt(-a))/a^4 - 256/((b*x^4 + a)^(1/4)*a^3) - 8*(13*(b*x^
4 + a)^(7/4) - 17*(b*x^4 + a)^(3/4)*a)/(a^3*b^2*x^8))
```

3.1145 $\int \frac{x^{13}}{(a+bx^4)^{5/4}}\,dx$

Optimal. Leaf size=128

$$-\frac{8a^{5/2}\sqrt[4]{\frac{bx^4}{a}+1}\,E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{3b^{7/2}\sqrt[4]{a+bx^4}}+\frac{4a^2x^2}{3b^3\sqrt[4]{a+bx^4}}-\frac{2ax^6}{9b^2\sqrt[4]{a+bx^4}}+\frac{x^{10}}{9b\sqrt[4]{a+bx^4}}$$

```
[Out] (4*a^2*x^2)/(3*b^3*(a + b*x^4)^(1/4)) - (2*a*x^6)/(9*b^2*(a + b*x
^4)^(1/4)) + x^10/(9*b*(a + b*x^4)^(1/4)) - (8*a^(5/2)*(1 + (b*x^
4)/a)^(1/4)*EllipticE[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(3*b^(
7/2)*(a + b*x^4)^(1/4))
```

Rubi [A] time = 0.202789, antiderivative size = 128, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{8a^{5/2}\sqrt[4]{\frac{bx^4}{a}+1}\,E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{3b^{7/2}\sqrt[4]{a+bx^4}}+\frac{4a^2x^2}{3b^3\sqrt[4]{a+bx^4}}-\frac{2ax^6}{9b^2\sqrt[4]{a+bx^4}}+\frac{x^{10}}{9b\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^13/(a + b*x^4)^(5/4),x]
```

```
[Out] (4*a^2*x^2)/(3*b^3*(a + b*x^4)^(1/4)) - (2*a*x^6)/(9*b^2*(a + b*x
^4)^(1/4)) + x^10/(9*b*(a + b*x^4)^(1/4)) - (8*a^(5/2)*(1 + (b*x^
4)/a)^(1/4)*EllipticE[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(3*b^(
7/2)*(a + b*x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{4a^2x^2}{3b^3\sqrt[4]{a+bx^4}}+\frac{4a^2\int^{x^2}\frac{1}{\sqrt[4]{a+bx^2}}\,dx}{3b^3}-\frac{2ax^6}{9b^2\sqrt[4]{a+bx^4}}+\frac{x^{10}}{9b\sqrt[4]{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**13/(b*x**4+a)**(5/4),x)
```

```
[Out] -4*a**2*x**2/(3*b**3*(a + b*x**4)**(1/4)) + 4*a**2*Integral((a +
b*x**2)**(-1/4), (x, x**2))/(3*b**3) - 2*a*x**6/(9*b**2*(a + b*x*
*4)**(1/4)) + x**10/(9*b*(a + b*x**4)**(1/4))
```

Mathematica [C] time = 0.0736067, size = 79, normalized size = 0.62

$$\frac{x^2\left(12a^2\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{3}{2};-\frac{bx^4}{a}\right)-12a^2-2abx^4+b^2x^8\right)}{9b^3\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^13/(a + b*x^4)^(5/4),x]
```

```
[Out] (x^2*(-12*a^2 - 2*a*b*x^4 + b^2*x^8 + 12*a^2*(1 + (b*x^4)/a)^(1/4
)*Hypergeometric2F1[1/4, 1/2, 3/2, -((b*x^4)/a)]))/(9*b^3*(a + b*
```

```
x^4)^(1/4))
```

Maple [F] time = 0.081, size = 0, normalized size = 0.

$$\int x^{13} \left(bx^4 + a\right)^{-\frac{5}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^13/(b*x^4+a)^(5/4),x)
```

```
[Out] int(x^13/(b*x^4+a)^(5/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{13}}{(bx^4 + a)^{\frac{5}{4}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^13/(b*x^4 + a)^(5/4),x, algorithm="maxima")
```

```
[Out] integrate(x^13/(b*x^4 + a)^(5/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{13}}{(bx^4 + a)^{\frac{5}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^13/(b*x^4 + a)^(5/4),x, algorithm="fricas")
```

```
[Out] integral(x^13/(b*x^4 + a)^(5/4), x)
```

Sympy [A] time = 8.51519, size = 27, normalized size = 0.21

$$\frac{x^{14}{}_{2}F_{1}\left(\begin{matrix} \frac{5}{4}, \frac{7}{2} \\ \frac{9}{2} \end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{14a^{\frac{5}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**13/(b*x**4+a)**(5/4),x)
```

```
[Out] x**14*hyper((5/4, 7/2), (9/2,), b*x**4*exp_polar(I*pi)/a)/(14*a**
(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{13}}{(bx^4 + a)^{\frac{5}{4}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^13/(b*x^4 + a)^(5/4),x, algorithm="giac")
```

```
[Out] integrate(x^13/(b*x^4 + a)^(5/4), x)
```

3.1146 $\int \frac{x^9}{(a+bx^4)^{5/4}}\,dx$

Optimal. Leaf size=104

$$\frac{12a^{3/2}\sqrt[4]{\frac{bx^4}{a}+1}\,E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{5b^{5/2}\sqrt[4]{a+bx^4}}-\frac{6ax^2}{5b^2\sqrt[4]{a+bx^4}}+\frac{x^6}{5b\sqrt[4]{a+bx^4}}$$

```
[Out] (-6*a*x^2)/(5*b^2*(a + b*x^4)^(1/4)) + x^6/(5*b*(a + b*x^4)^(1/4)
) + (12*a^(3/2)*(1 + (b*x^4)/a)^(1/4)*EllipticE[ArcTan[(Sqrt[b]*x
^2)/Sqrt[a]]/2, 2])/(5*b^(5/2)*(a + b*x^4)^(1/4))
```

Rubi [A] time = 0.153423, antiderivative size = 104, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{12a^{3/2}\sqrt[4]{\frac{bx^4}{a}+1}\,E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{5b^{5/2}\sqrt[4]{a+bx^4}}-\frac{6ax^2}{5b^2\sqrt[4]{a+bx^4}}+\frac{x^6}{5b\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^9/(a + b*x^4)^(5/4),x]
```

```
[Out] (-6*a*x^2)/(5*b^2*(a + b*x^4)^(1/4)) + x^6/(5*b*(a + b*x^4)^(1/4)
) + (12*a^(3/2)*(1 + (b*x^4)/a)^(1/4)*EllipticE[ArcTan[(Sqrt[b]*x
^2)/Sqrt[a]]/2, 2])/(5*b^(5/2)*(a + b*x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{6a^2\int^{x^2}\frac{1}{(a+bx^2)^{\frac{5}{4}}}\,dx}{5b^2}-\frac{6ax^2}{5b^2\sqrt[4]{a+bx^4}}+\frac{x^6}{5b\sqrt[4]{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**9/(b*x**4+a)**(5/4),x)
```

```
[Out] 6*a**2*Integral((a + b*x**2)**(-5/4), (x, x**2))/(5*b**2) - 6*a*x
**2/(5*b**2*(a + b*x**4)**(1/4)) + x**6/(5*b*(a + b*x**4)**(1/4))
```

Mathematica [C] time = 0.0583521, size = 66, normalized size = 0.63

$$\frac{x^2\left(-6a\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{3}{2};-\frac{bx^4}{a}\right)+6a+bx^4\right)}{5b^2\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^9/(a + b*x^4)^(5/4),x]
```

```
[Out] (x^2*(6*a + b*x^4 - 6*a*(1 + (b*x^4)/a)^(1/4)*Hypergeometric2F1[1
/4, 1/2, 3/2, -((b*x^4)/a)]))/(5*b^2*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.067, size = 0, normalized size = 0.

$$\int x^{9} \left(b x^{4}+a\right)^{-\frac{5}{4}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^9/(b*x^4+a)^(5/4),x)
```

```
[Out] int(x^9/(b*x^4+a)^(5/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{9}}{(bx^{4}+a)^{\frac{5}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(b*x^4 + a)^(5/4),x, algorithm="maxima")
```

```
[Out] integrate(x^9/(b*x^4 + a)^(5/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x^{9}}{(bx^{4}+a)^{\frac{5}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(b*x^4 + a)^(5/4),x, algorithm="fricas")
```

```
[Out] integral(x^9/(b*x^4 + a)^(5/4), x)
```

Sympy [A] time = 4.30363, size = 27, normalized size = 0.26

$$\frac{x^{10}{}_{2}F_{1}\left(\begin{matrix} \frac{5}{4}, \frac{5}{2} \\ \frac{7}{2} \end{matrix}\middle| \frac{bx^{4}e^{i\pi}}{a}\right)}{10a^{\frac{5}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**9/(b*x**4+a)**(5/4),x)
```

```
[Out] x**10*hyper((5/4, 5/2), (7/2,), b*x**4*exp_polar(I*pi)/a)/(10*a**
(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{9}}{(bx^{4}+a)^{\frac{5}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(b*x^4 + a)^(5/4),x, algorithm="giac")

[Out] integrate(x^9/(b*x^4 + a)^(5/4), x)
```

3.1147 $\int \frac{x^5}{(a+bx^4)^{5/4}}\,dx$

Optimal. Leaf size=77

$$\frac{x^2}{b\sqrt[4]{a+bx^4}}-\frac{2\sqrt{a}\sqrt[4]{\frac{bx^4}{a}+1}E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{b^{3/2}\sqrt[4]{a+bx^4}}$$

```
[Out] x^2/(b*(a + b*x^4)^(1/4)) - (2*Sqrt[a]*(1 + (b*x^4)/a)^(1/4)*Elli
pticE[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(b^(3/2)*(a + b*x^4)^(
1/4))
```

Rubi [A] time = 0.111006, antiderivative size = 77, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{x^2}{b\sqrt[4]{a+bx^4}}-\frac{2\sqrt{a}\sqrt[4]{\frac{bx^4}{a}+1}E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{b^{3/2}\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/(a + b*x^4)^(5/4),x]
```

```
[Out] x^2/(b*(a + b*x^4)^(1/4)) - (2*Sqrt[a]*(1 + (b*x^4)/a)^(1/4)*Elli
pticE[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(b^(3/2)*(a + b*x^4)^(
1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{x^2}{b\sqrt[4]{a+bx^4}}+\frac{\int^{x^2}\frac{1}{\sqrt[4]{a+bx^2}}\,dx}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(b*x**4+a)**(5/4),x)
```

```
[Out] -x**2/(b*(a + b*x**4)**(1/4)) + Integral((a + b*x**2)**(-1/4), (x
, x**2))/b
```

Mathematica [C] time = 0.0510082, size = 54, normalized size = 0.7

$$\frac{x^2\left(\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{3}{2};-\frac{bx^4}{a}\right)-1\right)}{b\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/(a + b*x^4)^(5/4),x]
```

```
[Out] (x^2*(-1 + (1 + (b*x^4)/a)^(1/4)*Hypergeometric2F1[1/4, 1/2, 3/2,
 -((b*x^4)/a)]))/(b*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.036, size = 0, normalized size = 0.

$$\int x^5 \left(b x^4+a\right)^{-\frac{5}{4}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(b*x^4+a)^(5/4),x)

[Out] int(x^5/(b*x^4+a)^(5/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^5}{(bx^4+a)^{\frac{5}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^4 + a)^(5/4),x, algorithm="maxima")

[Out] integrate(x^5/(b*x^4 + a)^(5/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^5}{(bx^4+a)^{\frac{5}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^4 + a)^(5/4),x, algorithm="fricas")

[Out] integral(x^5/(b*x^4 + a)^(5/4), x)
```

Sympy [A] time = 2.63554, size = 27, normalized size = 0.35

$$\frac{x^6 {}_2F_1\left(\begin{matrix}\frac{5}{4}, \frac{3}{2} \\ \frac{5}{2}\end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{6a^{\frac{5}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(b*x**4+a)**(5/4),x)

[Out] x**6*hyper((5/4, 3/2), (5/2,), b*x**4*exp_polar(I*pi)/a)/(6*a**(5
/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^5}{(bx^4+a)^{\frac{5}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^4 + a)^(5/4),x, algorithm="giac")

[Out] integrate(x^5/(b*x^4 + a)^(5/4), x)
```

3.1148 $\int \frac{x}{(a+bx^4)^{5/4}}\,dx$

Optimal. Leaf size=57

$$\frac{\sqrt[4]{\frac{bx^4}{a}+1}E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{\sqrt{a}\sqrt{b}\sqrt[4]{a+bx^4}}$$

```
[Out] ((1 + (b*x^4)/a)^(1/4)*EllipticE[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2,
 2])/(Sqrt[a]*Sqrt[b]*(a + b*x^4)^(1/4))
```

Rubi [A] time = 0.0667427, antiderivative size = 57, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{\sqrt[4]{\frac{bx^4}{a}+1}E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{\sqrt{a}\sqrt{b}\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b*x^4)^(5/4),x]
```

```
[Out] ((1 + (b*x^4)/a)^(1/4)*EllipticE[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2,
 2])/(Sqrt[a]*Sqrt[b]*(a + b*x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int^{x^2}\frac{1}{(a+bx^2)^{\frac{5}{4}}}\,dx}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(b*x**4+a)**(5/4),x)
```

```
[Out] Integral((a + b*x**2)**(-5/4), (x, x**2))/2
```

Mathematica [C] time = 0.0404977, size = 57, normalized size = 1.

$$-\frac{x^2\left(\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{3}{2};-\frac{bx^4}{a}\right)-2\right)}{2a\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b*x^4)^(5/4),x]
```

```
[Out] -(x^2*(-2 + (1 + (b*x^4)/a)^(1/4)*Hypergeometric2F1[1/4, 1/2, 3/2
, -((b*x^4)/a)]))/(2*a*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.032, size = 0, normalized size = 0.

$$\int x\left(bx^4+a\right)^{-\frac{5}{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(b*x^4+a)^(5/4),x)
```

```
[Out] int(x/(b*x^4+a)^(5/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{(bx^4 + a)^{\frac{5}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^4 + a)^(5/4),x, algorithm="maxima")
```

```
[Out] integrate(x/(b*x^4 + a)^(5/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x}{(bx^4 + a)^{\frac{5}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^4 + a)^(5/4),x, algorithm="fricas")
```

```
[Out] integral(x/(b*x^4 + a)^(5/4), x)
```

Sympy [A] time = 2.61752, size = 27, normalized size = 0.47

$$\frac{x^2 {}_2F_1\left(\begin{matrix} \frac{1}{2}, \frac{5}{4} \\ \frac{3}{2} \end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{2a^{\frac{5}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x**4+a)**(5/4),x)
```

```
[Out] x**2*hyper((1/2, 5/4), (3/2,), b*x**4*exp_polar(I*pi)/a)/(2*a**(5
/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{(bx^4 + a)^{\frac{5}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^4 + a)^(5/4),x, algorithm="giac")
```

```
[Out] integrate(x/(b*x^4 + a)^(5/4), x)
```

3.1149 $\int \frac{1}{x^3(a+bx^4)^{5/4}}\,dx$

Optimal. Leaf size=82

$$-\frac{3\sqrt{b}\sqrt[4]{\frac{bx^4}{a}+1}\,E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{2a^{3/2}\sqrt[4]{a+bx^4}}-\frac{1}{2ax^2\sqrt[4]{a+bx^4}}$$

```
[Out] -1/(2*a*x^2*(a + b*x^4)^(1/4)) - (3*Sqrt[b]*(1 + (b*x^4)/a)^(1/4)
*EllipticE[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(2*a^(3/2)*(a + b
*x^4)^(1/4))
```

Rubi [A] time = 0.109789, antiderivative size = 82, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{3\sqrt{b}\sqrt[4]{\frac{bx^4}{a}+1}\,E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{2a^{3/2}\sqrt[4]{a+bx^4}}-\frac{1}{2ax^2\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(a + b*x^4)^(5/4)),x]
```

```
[Out] -1/(2*a*x^2*(a + b*x^4)^(1/4)) - (3*Sqrt[b]*(1 + (b*x^4)/a)^(1/4)
*EllipticE[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(2*a^(3/2)*(a + b
*x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2ax^2\sqrt[4]{a+bx^4}}-\frac{3bx^2}{2a^2\sqrt[4]{a+bx^4}}+\frac{3b\int^{x^2}\frac{1}{\sqrt[4]{a+bx^2}}\,dx}{4a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(b*x**4+a)**(5/4),x)
```

```
[Out] -1/(2*a*x**2*(a + b*x**4)**(1/4)) - 3*b*x**2/(2*a**2*(a + b*x**4)
**(1/4)) + 3*b*Integral((a + b*x**2)**(-1/4), (x, x**2))/(4*a**2)
```

Mathematica [C] time = 0.0536698, size = 71, normalized size = 0.87

$$\frac{3bx^4\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{3}{2};-\frac{bx^4}{a}\right)-2\left(a+3bx^4\right)}{4a^2x^2\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*(a + b*x^4)^(5/4)),x]
```

```
[Out] (-2*(a + 3*b*x^4) + 3*b*x^4*(1 + (b*x^4)/a)^(1/4)*Hypergeometric2
F1[1/4, 1/2, 3/2, -((b*x^4)/a)])/(4*a^2*x^2*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.069, size = 0, normalized size = 0.

$$\int \frac{1}{x^3} \left(b x^4 + a\right)^{-\frac{5}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(b*x^4+a)^(5/4),x)

[Out] int(1/x^3/(b*x^4+a)^(5/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4 + a)^{\frac{5}{4}} x^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^3),x, algorithm="maxima")

[Out] integrate(1/((b*x^4 + a)^(5/4)*x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(bx^7 + ax^3)(bx^4 + a)^{\frac{1}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^3),x, algorithm="fricas")

[Out] integral(1/((b*x^7 + a*x^3)*(b*x^4 + a)^(1/4)), x)
```

Sympy [A] time = 3.97207, size = 31, normalized size = 0.38

$$-\frac{{}_{2}F_{1}\left(\begin{matrix} -\frac{1}{2}, \frac{5}{4} \\ \frac{1}{2} \end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{2a^{\frac{5}{4}} x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(b*x**4+a)**(5/4),x)

[Out] -hyper((-1/2, 5/4), (1/2,), b*x**4*exp_polar(I*pi)/a)/(2*a**(5/4)
*x**2)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4 + a)^{\frac{5}{4}} x^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^3),x, algorithm="giac")

[Out] integrate(1/((b*x^4 + a)^(5/4)*x^3), x)
```

3.1150 $\int \frac{1}{x^7(a+bx^4)^{5/4}}\,dx$

Optimal. Leaf size=104

$$\frac{7b^{3/2}\sqrt[4]{\frac{bx^4}{a}+1}E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{4a^{5/2}\sqrt[4]{a+bx^4}}+\frac{7b}{12a^2x^2\sqrt[4]{a+bx^4}}-\frac{1}{6ax^6\sqrt[4]{a+bx^4}}$$

```
[Out] -1/(6*a*x^6*(a + b*x^4)^(1/4)) + (7*b)/(12*a^2*x^2*(a + b*x^4)^(1
/4)) + (7*b^(3/2)*(1 + (b*x^4)/a)^(1/4)*EllipticE[ArcTan[(Sqrt[b]
*x^2)/Sqrt[a]]/2, 2])/(4*a^(5/2)*(a + b*x^4)^(1/4))
```

Rubi [A] time = 0.150067, antiderivative size = 104, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$

$$\frac{7b^{3/2}\sqrt[4]{\frac{bx^4}{a}+1}E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{4a^{5/2}\sqrt[4]{a+bx^4}}+\frac{7b}{12a^2x^2\sqrt[4]{a+bx^4}}-\frac{1}{6ax^6\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^7*(a + b*x^4)^(5/4)),x]
```

```
[Out] -1/(6*a*x^6*(a + b*x^4)^(1/4)) + (7*b)/(12*a^2*x^2*(a + b*x^4)^(1
/4)) + (7*b^(3/2)*(1 + (b*x^4)/a)^(1/4)*EllipticE[ArcTan[(Sqrt[b]
*x^2)/Sqrt[a]]/2, 2])/(4*a^(5/2)*(a + b*x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{6ax^6\sqrt[4]{a+bx^4}}+\frac{7b^2\int^{x^2}\frac{1}{(a+bx^2)^{\frac{5}{4}}}\,dx}{8a^2}+\frac{7b}{12a^2x^2\sqrt[4]{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**7/(b*x**4+a)**(5/4),x)
```

```
[Out] -1/(6*a*x**6*(a + b*x**4)**(1/4)) + 7*b**2*Integral((a + b*x**2)*
*(-5/4), (x, x**2))/(8*a**2) + 7*b/(12*a**2*x**2*(a + b*x**4)**(1
/4))
```

Mathematica [C] time = 0.0731702, size = 83, normalized size = 0.8

$$\frac{-4a^2-21b^2x^8\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{3}{2};-\frac{bx^4}{a}\right)+14abx^4+42b^2x^8}{24a^3x^6\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^7*(a + b*x^4)^(5/4)),x]
```

```
[Out] (-4*a^2 + 14*a*b*x^4 + 42*b^2*x^8 - 21*b^2*x^8*(1 + (b*x^4)/a)^(1
/4)*Hypergeometric2F1[1/4, 1/2, 3/2, -((b*x^4)/a)])/(24*a^3*x^6*(
a + b*x^4)^(1/4))
```

Maple [F] time = 0.076, size = 0, normalized size = 0.

$$\int \frac{1}{x^{7}}\left(b x^{4}+a\right)^{-\frac{5}{4}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^7/(b*x^4+a)^(5/4),x)
```

```
[Out] int(1/x^7/(b*x^4+a)^(5/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4 + a)^{\frac{5}{4}}x^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^7),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x^4 + a)^(5/4)*x^7), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(bx^{11} + ax^7)(bx^4 + a)^{\frac{1}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^7),x, algorithm="fricas")
```

```
[Out] integral(1/((b*x^11 + a*x^7)*(b*x^4 + a)^(1/4)), x)
```

Sympy [A] time = 8.29714, size = 32, normalized size = 0.31

$$-\frac{{}_{2}F_{1}\left(\begin{matrix} -\frac{3}{2}, \frac{5}{4} \\ -\frac{1}{2} \end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{6a^{\frac{5}{4}}x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**7/(b*x**4+a)**(5/4),x)
```

```
[Out] -hyper((-3/2, 5/4), (-1/2,), b*x**4*exp_polar(I*pi)/a)/(6*a**(5/4
)*x**6)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4 + a)^{\frac{5}{4}}x^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^7),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^4 + a)^(5/4)*x^7), x)
```

3.1151 $\int \frac{1}{x^{11}(a+bx^4)^{5/4}}\,dx$

Optimal. Leaf size=128

$$-\frac{77b^{5/2}\sqrt[4]{\frac{bx^4}{a}+1}E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{40a^{7/2}\sqrt[4]{a+bx^4}}-\frac{77b^2}{120a^3x^2\sqrt[4]{a+bx^4}}+\frac{11b}{60a^2x^6\sqrt[4]{a+bx^4}}-\frac{1}{10ax^{10}\sqrt[4]{a+bx^4}}$$

```
[Out] -1/(10*a*x^10*(a + b*x^4)^(1/4)) + (11*b)/(60*a^2*x^6*(a + b*x^4)
^(1/4)) - (77*b^2)/(120*a^3*x^2*(a + b*x^4)^(1/4)) - (77*b^(5/2)*
(1 + (b*x^4)/a)^(1/4)*EllipticE[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2,
2])/(40*a^(7/2)*(a + b*x^4)^(1/4))
```

Rubi [A] time = 0.194603, antiderivative size = 128, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{77b^{5/2}\sqrt[4]{\frac{bx^4}{a}+1}E\left(\frac{1}{2}\tan^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{40a^{7/2}\sqrt[4]{a+bx^4}}-\frac{77b^2}{120a^3x^2\sqrt[4]{a+bx^4}}+\frac{11b}{60a^2x^6\sqrt[4]{a+bx^4}}-\frac{1}{10ax^{10}\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^11*(a + b*x^4)^(5/4)),x]
```

```
[Out] -1/(10*a*x^10*(a + b*x^4)^(1/4)) + (11*b)/(60*a^2*x^6*(a + b*x^4)
^(1/4)) - (77*b^2)/(120*a^3*x^2*(a + b*x^4)^(1/4)) - (77*b^(5/2)*
(1 + (b*x^4)/a)^(1/4)*EllipticE[ArcTan[(Sqrt[b]*x^2)/Sqrt[a]]/2,
2])/(40*a^(7/2)*(a + b*x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{10ax^{10}\sqrt[4]{a+bx^4}}+\frac{11b}{60a^2x^6\sqrt[4]{a+bx^4}}-\frac{77b^2}{120a^3x^2\sqrt[4]{a+bx^4}}-\frac{77b^3x^2}{40a^4\sqrt[4]{a+bx^4}}+\frac{77b^3\int^{x^2}\frac{1}{\sqrt[4]{a+bx^2}}\,dx}{80a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**11/(b*x**4+a)**(5/4),x)
```

```
[Out] -1/(10*a*x**10*(a + b*x**4)**(1/4)) + 11*b/(60*a**2*x**6*(a + b*x
**4)**(1/4)) - 77*b**2/(120*a**3*x**2*(a + b*x**4)**(1/4)) - 77*b
**3*x**2/(40*a**4*(a + b*x**4)**(1/4)) + 77*b**3*Integral((a + b*
x**2)**(-1/4), (x, x**2))/(80*a**4)
```

Mathematica [C] time = 0.078535, size = 94, normalized size = 0.73

$$\frac{-24a^3+44a^2bx^4+231b^3x^{12}\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{3}{2};-\frac{bx^4}{a}\right)-154ab^2x^8-462b^3x^{12}}{240a^4x^{10}\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^11*(a + b*x^4)^(5/4)),x]
```

```
[Out] (-24*a^3 + 44*a^2*b*x^4 - 154*a*b^2*x^8 - 462*b^3*x^12 + 231*b^3*
x^12*(1 + (b*x^4)/a)^(1/4)*Hypergeometric2F1[1/4, 1/2, 3/2, -((b*
```

```
x^4)/a)])/(240*a^4*x^10*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.084, size = 0, normalized size = 0.

$$\int \frac{1}{x^{11}} \left(bx^4 + a\right)^{-\frac{5}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^11/(b*x^4+a)^(5/4),x)
```

```
[Out] int(1/x^11/(b*x^4+a)^(5/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4 + a)^{\frac{5}{4}} x^{11}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^11),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x^4 + a)^(5/4)*x^11), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(bx^{15} + ax^{11})(bx^4 + a)^{\frac{1}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^11),x, algorithm="fricas")
```

```
[Out] integral(1/((b*x^15 + a*x^11)*(b*x^4 + a)^(1/4)), x)
```

Sympy [A] time = 17.7205, size = 32, normalized size = 0.25

$$-\frac{{}_2F_1\left(\begin{matrix} -\frac{5}{2}, \frac{5}{4} \\ -\frac{3}{2} \end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{10a^{\frac{5}{4}} x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**11/(b*x**4+a)**(5/4),x)
```

```
[Out] -hyper((-5/2, 5/4), (-3/2,), b*x**4*exp_polar(I*pi)/a)/(10*a**(5/
4)*x**10)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4 + a)^{\frac{5}{4}} x^{11}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^11),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^4 + a)^(5/4)*x^11), x)
```

3.1152 $\int \frac{x^{12}}{(a+bx^4)^{5/4}}\,dx$

Optimal. Leaf size=123

$$\frac{45a^2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{13/4}}+\frac{45a^2\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{13/4}}-\frac{45ax\left(a+bx^4\right)^{3/4}}{32b^3}+\frac{9x^5\left(a+bx^4\right)^{3/4}}{8b^2}-\frac{x^9}{b\sqrt[4]{a+bx^4}}$$

```
[Out] -(x^9/(b*(a + b*x^4)^(1/4))) - (45*a*x*(a + b*x^4)^(3/4))/(32*b^3
) + (9*x^5*(a + b*x^4)^(3/4))/(8*b^2) + (45*a^2*ArcTan[(b^(1/4)*x
)/(a + b*x^4)^(1/4)])/(64*b^(13/4)) + (45*a^2*ArcTanh[(b^(1/4)*x)
/(a + b*x^4)^(1/4)])/(64*b^(13/4))
```

Rubi [A] time = 0.127076, antiderivative size = 123, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$\frac{45a^2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{13/4}}+\frac{45a^2\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{13/4}}-\frac{45ax\left(a+bx^4\right)^{3/4}}{32b^3}+\frac{9x^5\left(a+bx^4\right)^{3/4}}{8b^2}-\frac{x^9}{b\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^12/(a + b*x^4)^(5/4),x]
```

```
[Out] -(x^9/(b*(a + b*x^4)^(1/4))) - (45*a*x*(a + b*x^4)^(3/4))/(32*b^3
) + (9*x^5*(a + b*x^4)^(3/4))/(8*b^2) + (45*a^2*ArcTan[(b^(1/4)*x
)/(a + b*x^4)^(1/4)])/(64*b^(13/4)) + (45*a^2*ArcTanh[(b^(1/4)*x)
/(a + b*x^4)^(1/4)])/(64*b^(13/4))
```

Rubi in Sympy [A] time = 15.8159, size = 116, normalized size = 0.94

$$\frac{45a^2\operatorname{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{\frac{13}{4}}}+\frac{45a^2\operatorname{atanh}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{64b^{\frac{13}{4}}}-\frac{45ax\left(a+bx^4\right)^{\frac{3}{4}}}{32b^3}-\frac{x^9}{b\sqrt[4]{a+bx^4}}+\frac{9x^5\left(a+bx^4\right)^{\frac{3}{4}}}{8b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**12/(b*x**4+a)**(5/4),x)
```

```
[Out] 45*a**2*atan(b**(1/4)*x/(a + b*x**4)**(1/4))/(64*b**(13/4)) + 45*
a**2*atanh(b**(1/4)*x/(a + b*x**4)**(1/4))/(64*b**(13/4)) - 45*a*
x*(a + b*x**4)**(3/4)/(32*b**3) - x**9/(b*(a + b*x**4)**(1/4)) +
9*x**5*(a + b*x**4)**(3/4)/(8*b**2)
```

Mathematica [A] time = 0.295309, size = 120, normalized size = 0.98

$$\frac{45a^2\left(-\log\left(1-\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)+\log\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}+1\right)+2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)\right)}{128b^{13/4}}+\frac{-45a^2x-9abx^5+4b^2x^9}{32b^3\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^12/(a + b*x^4)^(5/4),x]
```

```
[Out] (-45*a^2*x - 9*a*b*x^5 + 4*b^2*x^9)/(32*b^3*(a + b*x^4)^(1/4)) +
(45*a^2*(2*ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/4)] - Log[1 - (b^(1/
```

```
4)*x)/(a + b*x^4)^(1/4)] + Log[1 + (b^(1/4)*x)/(a + b*x^4)^(1/4)]
))/(128*b^(13/4))
```

Maple [F] time = 0.066, size = 0, normalized size = 0.

$$\int x^{12} \left(bx^4 + a\right)^{-\frac{5}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^12/(b*x^4+a)^(5/4),x)

[Out] int(x^12/(b*x^4+a)^(5/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^12/(b*x^4 + a)^(5/4),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [A] time = 0.270845, size = 356, normalized size = 2.89

$$\frac{180 \left(b^4x^4 + ab^3\right) \left(\frac{a^8}{b^{13}}\right)^{\frac{1}{4}} \arctan\left(\frac{b^{10}x\left(\frac{a^8}{b^{13}}\right)^{\frac{3}{4}}}{\left(bx^4+a\right)^{\frac{1}{4}} a^6 + x\sqrt{\frac{a^8b^7x^2\sqrt{\frac{a^8}{b^{13}}}+\sqrt{bx^4+a}\,a^{12}}{x^2}}}\right) + 45 \left(b^4x^4 + ab^3\right) \left(\frac{a^8}{b^{13}}\right)^{\frac{1}{4}} \log\left(\frac{91125\left(b^{10}x\left(\frac{a^8}{b^{13}}\right)^{\frac{3}{4}} + \left(bx^4+a\right)^{\frac{1}{4}} \cdots}{x}\right.}{128 \left(b^4x^4 + ab^3 \cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^12/(b*x^4 + a)^(5/4),x, algorithm="fricas")

[Out] 1/128*(180*(b^4*x^4 + a*b^3)*(a^8/b^13)^(1/4)*arctan(b^10*x*(a^8/
b^13)^(3/4)/((b*x^4 + a)^(1/4)*a^6 + x*sqrt((a^8*b^7*x^2*sqrt(a^8
/b^13) + sqrt(b*x^4 + a)*a^12)/x^2))) + 45*(b^4*x^4 + a*b^3)*(a^8
/b^13)^(1/4)*log(91125*(b^10*x*(a^8/b^13)^(3/4) + (b*x^4 + a)^(1/
4)*a^6)/x) - 45*(b^4*x^4 + a*b^3)*(a^8/b^13)^(1/4)*log(-91125*(b^
10*x*(a^8/b^13)^(3/4) - (b*x^4 + a)^(1/4)*a^6)/x) + 4*(4*b^2*x^9
- 9*a*b*x^5 - 45*a^2*x)*(b*x^4 + a)^(3/4))/(b^4*x^4 + a*b^3)
```

Sympy [A] time = 9.44878, size = 37, normalized size = 0.3

$$\frac{x^{13}\,\Gamma\left(\frac{13}{4}\right) {}_{2}F_{1}\left(\begin{matrix}\frac{5}{4}, \frac{13}{4} \\ \frac{17}{4}\end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{4a^{\frac{5}{4}}\,\Gamma\left(\frac{17}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**12/(b*x**4+a)**(5/4),x)
```

```
[Out] x**13*gamma(13/4)*hyper((5/4, 13/4), (17/4,), b*x**4*exp_polar(I*
pi)/a)/(4*a**(5/4)*gamma(17/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{12}}{(bx^4+a)^{\frac{5}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^12/(b*x^4 + a)^(5/4),x, algorithm="giac")
```

```
[Out] integrate(x^12/(b*x^4 + a)^(5/4), x)
```

3.1153 $\int \frac{x^8}{(a+bx^4)^{5/4}}\,dx$

Optimal. Leaf size=97

$$-\frac{5a\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{8b^{9/4}}-\frac{5a\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{8b^{9/4}}+\frac{5x\left(a+bx^4\right)^{3/4}}{4b^2}-\frac{x^5}{b\sqrt[4]{a+bx^4}}$$

```
[Out] -(x^5/(b*(a + b*x^4)^(1/4))) + (5*x*(a + b*x^4)^(3/4))/(4*b^2) -
(5*a*ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(8*b^(9/4)) - (5*a*Ar
cTanh[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(8*b^(9/4))
```

Rubi [A] time = 0.0911436, antiderivative size = 97, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.4$

$$-\frac{5a\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{8b^{9/4}}-\frac{5a\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{8b^{9/4}}+\frac{5x\left(a+bx^4\right)^{3/4}}{4b^2}-\frac{x^5}{b\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8/(a + b*x^4)^(5/4),x]
```

```
[Out] -(x^5/(b*(a + b*x^4)^(1/4))) + (5*x*(a + b*x^4)^(3/4))/(4*b^2) -
(5*a*ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(8*b^(9/4)) - (5*a*Ar
cTanh[(b^(1/4)*x)/(a + b*x^4)^(1/4)])/(8*b^(9/4))
```

Rubi in Sympy [A] time = 11.3282, size = 90, normalized size = 0.93

$$-\frac{5a\,\mathrm{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{8b^{\frac{9}{4}}}-\frac{5a\,\mathrm{atanh}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{8b^{\frac{9}{4}}}-\frac{x^5}{b\sqrt[4]{a+bx^4}}+\frac{5x\left(a+bx^4\right)^{\frac{3}{4}}}{4b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8/(b*x**4+a)**(5/4),x)
```

```
[Out] -5*a*atan(b**(1/4)*x/(a + b*x**4)**(1/4))/(8*b**(9/4)) - 5*a*atan
h(b**(1/4)*x/(a + b*x**4)**(1/4))/(8*b**(9/4)) - x**5/(b*(a + b*x
**4)**(1/4)) + 5*x*(a + b*x**4)**(3/4)/(4*b**2)
```

Mathematica [A] time = 0.200891, size = 106, normalized size = 1.09

$$\frac{x\left(5a+bx^4\right)}{4b^2\sqrt[4]{a+bx^4}}-\frac{5a\left(-\log\left(1-\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)+\log\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}+1\right)+2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)\right)}{16b^{9/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8/(a + b*x^4)^(5/4),x]
```

```
[Out] (x*(5*a + b*x^4))/(4*b^2*(a + b*x^4)^(1/4)) - (5*a*(2*ArcTan[(b^(
1/4)*x)/(a + b*x^4)^(1/4)] - Log[1 - (b^(1/4)*x)/(a + b*x^4)^(1/4
)] + Log[1 + (b^(1/4)*x)/(a + b*x^4)^(1/4)]))/(16*b^(9/4))
```

Maple [F] time = 0.062, size = 0, normalized size = 0.

$$\int x^{8} \left(b x^{4}+a\right)^{-\frac{5}{4}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8/(b*x^4+a)^(5/4),x)
```

```
[Out] int(x^8/(b*x^4+a)^(5/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^4 + a)^(5/4),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.265023, size = 340, normalized size = 3.51

$$-\frac{20\left(b^{3} x^{4}+a b^{2}\right)\left(\frac{a^{4}}{b^{9}}\right)^{\frac{1}{4}} \arctan\left(\frac{b^{7} x\left(\frac{a^{4}}{b^{9}}\right)^{\frac{3}{4}}}{\left(b x^{4}+a\right)^{\frac{1}{4}} a^{3}+x\sqrt{\frac{a^{4} b^{5} x^{2}\sqrt{\frac{a^{4}}{b^{9}}}+\sqrt{b x^{4}+a}\, a a^{6}}{x^{2}}}}\right)+5\left(b^{3} x^{4}+a b^{2}\right)\left(\frac{a^{4}}{b^{9}}\right)^{\frac{1}{4}} \log\left(\frac{125\left(b^{7} x\left(\frac{a^{4}}{b^{9}}\right)^{\frac{3}{4}}+\left(b x^{4}+a\right)^{\frac{1}{4}} a^{3}\right)}{x}\right)-}{16\left(b^{3} x^{4}+a b^{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^4 + a)^(5/4),x, algorithm="fricas")
```

```
[Out] -1/16*(20*(b^3*x^4 + a*b^2)*(a^4/b^9)^(1/4)*arctan(b^7*x*(a^4/b^9
)^(3/4)/((b*x^4 + a)^(1/4)*a^3 + x*sqrt((a^4*b^5*x^2*sqrt(a^4/b^9
) + sqrt(b*x^4 + a)*a^6)/x^2))) + 5*(b^3*x^4 + a*b^2)*(a^4/b^9)^(
1/4)*log(125*(b^7*x*(a^4/b^9)^(3/4) + (b*x^4 + a)^(1/4)*a^3)/x) -
 5*(b^3*x^4 + a*b^2)*(a^4/b^9)^(1/4)*log(-125*(b^7*x*(a^4/b^9)^(3
/4) - (b*x^4 + a)^(1/4)*a^3)/x) - 4*(b*x^5 + 5*a*x)*(b*x^4 + a)^(
3/4))/(b^3*x^4 + a*b^2)
```

Sympy [A] time = 5.41894, size = 37, normalized size = 0.38

$$\frac{x^{9}\,\Gamma\left(\frac{9}{4}\right)\,{}_{2}F_{1}\left(\begin{matrix}\frac{5}{4},\frac{9}{4}\\\frac{13}{4}\end{matrix}\middle|\frac{b x^{4} e^{i\pi}}{a}\right)}{4 a^{\frac{5}{4}}\,\Gamma\left(\frac{13}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8/(b*x**4+a)**(5/4),x)
```

```
[Out] x**9*gamma(9/4)*hyper((5/4, 9/4), (13/4,), b*x**4*exp_polar(I*pi)
/a)/(4*a**(5/4)*gamma(13/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^8}{(bx^4 + a)^{\frac{5}{4}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^4 + a)^(5/4),x, algorithm="giac")
```

```
[Out] integrate(x^8/(b*x^4 + a)^(5/4), x)
```

3.1154 $\int \frac{x^4}{(a+bx^4)^{5/4}}\,dx$

Optimal. Leaf size=74

$$\frac{\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{2b^{5/4}}+\frac{\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{2b^{5/4}}-\frac{x}{b\sqrt[4]{a+bx^4}}$$

```
[Out] -(x/(b*(a + b*x^4)^(1/4))) + ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/4)
]/(2*b^(5/4)) + ArcTanh[(b^(1/4)*x)/(a + b*x^4)^(1/4)]/(2*b^(5/4)
)
```

Rubi [A] time = 0.0598711, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{2b^{5/4}}+\frac{\tanh^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{2b^{5/4}}-\frac{x}{b\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a + b*x^4)^(5/4),x]
```

```
[Out] -(x/(b*(a + b*x^4)^(1/4))) + ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1/4)
]/(2*b^(5/4)) + ArcTanh[(b^(1/4)*x)/(a + b*x^4)^(1/4)]/(2*b^(5/4)
)
```

Rubi in Sympy [A] time = 7.61321, size = 63, normalized size = 0.85

$$-\frac{x}{b\sqrt[4]{a+bx^4}}+\frac{\operatorname{atan}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{2b^{\frac{5}{4}}}+\frac{\operatorname{atanh}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{2b^{\frac{5}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(b*x**4+a)**(5/4),x)
```

```
[Out] -x/(b*(a + b*x**4)**(1/4)) + atan(b**(1/4)*x/(a + b*x**4)**(1/4))
/(2*b**(5/4)) + atanh(b**(1/4)*x/(a + b*x**4)**(1/4))/(2*b**(5/4)
)
```

Mathematica [A] time = 0.0992203, size = 94, normalized size = 1.27

$$\frac{-\log\left(1-\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)+\log\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}+1\right)+2\tan^{-1}\left(\frac{\sqrt[4]{b}x}{\sqrt[4]{a+bx^4}}\right)}{4b^{5/4}}-\frac{x}{b\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(a + b*x^4)^(5/4),x]
```

```
[Out] -(x/(b*(a + b*x^4)^(1/4))) + (2*ArcTan[(b^(1/4)*x)/(a + b*x^4)^(1
/4)] - Log[1 - (b^(1/4)*x)/(a + b*x^4)^(1/4)] + Log[1 + (b^(1/4)*
x)/(a + b*x^4)^(1/4)])/(4*b^(5/4))
```

Maple [F] time = 0.043, size = 0, normalized size = 0.

$$\int x^{4} \left(b x^{4}+a\right)^{-\frac{5}{4}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(b*x^4+a)^(5/4),x)
```

```
[Out] int(x^4/(b*x^4+a)^(5/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^4 + a)^(5/4),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.259574, size = 252, normalized size = 3.41

$$\frac{4 \left(b^{2} x^{4}+a b\right) \frac{1}{b^{5}}^{\frac{1}{4}} \arctan\left(\frac{b^{4} \frac{1}{b^{5}}^{\frac{3}{4}} x}{x \sqrt{\frac{b^{3} \sqrt{\frac{1}{b^{5}}} x^{2}+\sqrt{b x^{4}+a}}{x^{2}}}+\left(b x^{4}+a\right)^{\frac{1}{4}}}\right)+\left(b^{2} x^{4}+a b\right) \frac{1}{b^{5}}^{\frac{1}{4}} \log\left(\frac{b^{4} \frac{1}{b^{5}}^{\frac{3}{4}} x+\left(b x^{4}+a\right)^{\frac{1}{4}}}{x}\right)-\left(b^{2} x^{4}+a b\right) \frac{1}{b^{5}}^{\frac{1}{4}} \log\left(-\frac{b^{4}}{}\right.}{4 \left(b^{2} x^{4}+a b\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^4 + a)^(5/4),x, algorithm="fricas")
```

```
[Out] 1/4*(4*(b^2*x^4 + a*b)*(b^(-5))^(1/4)*arctan(b^4*(b^(-5))^(3/4)*x
/(x*sqrt((b^3*sqrt(b^(-5))*x^2 + sqrt(b*x^4 + a))/x^2) + (b*x^4 +
 a)^(1/4))) + (b^2*x^4 + a*b)*(b^(-5))^(1/4)*log((b^4*(b^(-5))^(3
/4)*x + (b*x^4 + a)^(1/4))/x) - (b^2*x^4 + a*b)*(b^(-5))^(1/4)*lo
g(-(b^4*(b^(-5))^(3/4)*x - (b*x^4 + a)^(1/4))/x) - 4*(b*x^4 + a)^
(3/4)*x)/(b^2*x^4 + a*b)
```

Sympy [A] time = 4.01745, size = 37, normalized size = 0.5

$$\frac{x^{5} \Gamma\left(\frac{5}{4}\right) {}_{2}F_{1}\left(\left.\begin{matrix} \frac{5}{4}, \frac{5}{4} \\ \frac{9}{4} \end{matrix}\right| \frac{b x^{4} e^{i \pi}}{a}\right)}{4 a^{\frac{5}{4}} \Gamma\left(\frac{9}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(b*x**4+a)**(5/4),x)
```

```
[Out] x**5*gamma(5/4)*hyper((5/4, 5/4), (9/4,), b*x**4*exp_polar(I*pi)/
a)/(4*a**(5/4)*gamma(9/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{(bx^4 + a)^{\frac{5}{4}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^4 + a)^(5/4),x, algorithm="giac")
```

```
[Out] integrate(x^4/(b*x^4 + a)^(5/4), x)
```

3.1155 $\int \frac{1}{(a+bx^4)^{5/4}}\,dx$

Optimal. Leaf size=16

$$\frac{x}{a\sqrt[4]{a+bx^4}}$$

```
[Out] x/(a*(a + b*x^4)^(1/4))
```

Rubi [A] time = 0.0090488, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{x}{a\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(-5/4),x]

[Out] x/(a*(a + b*x^4)^(1/4))
```

Rubi in Sympy [A] time = 1.27181, size = 12, normalized size = 0.75

$$\frac{x}{a\sqrt[4]{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**4+a)**(5/4),x)

[Out] x/(a*(a + b*x**4)**(1/4))
```

Mathematica [A] time = 0.0122909, size = 16, normalized size = 1.

$$\frac{x}{a\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(-5/4),x]

[Out] x/(a*(a + b*x^4)^(1/4))
```

Maple [A] time = 0.005, size = 15, normalized size = 0.9

$$\frac{x}{a}\frac{1}{\sqrt[4]{bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^4+a)^(5/4),x)

[Out] x/a/(b*x^4+a)^(1/4)
```

Maxima [A] time = 1.43498, size = 19, normalized size = 1.19

$$\frac{x}{(bx^4+a)^{\frac{1}{4}}a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(-5/4),x, algorithm="maxima")

[Out] x/((b*x^4 + a)^(1/4)*a)
```

Fricas [A] time = 0.232864, size = 31, normalized size = 1.94

$$\frac{(bx^4+a)^{\frac{3}{4}}x}{abx^4+a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(-5/4),x, algorithm="fricas")

[Out] (b*x^4 + a)^(3/4)*x/(a*b*x^4 + a^2)
```

Sympy [A] time = 2.12927, size = 29, normalized size = 1.81

$$\frac{x\,\Gamma\left(\frac{1}{4}\right)}{4a^{\frac{5}{4}}\sqrt[4]{1+\frac{bx^4}{a}}\,\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**4+a)**(5/4),x)

[Out] x*gamma(1/4)/(4*a**(5/4)*(1 + b*x**4/a)**(1/4)*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4+a)^{\frac{5}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(-5/4),x, algorithm="giac")

[Out] integrate((b*x^4 + a)^(-5/4), x)
```

3.1156 $\int \frac{1}{x^4(a+bx^4)^{5/4}}\,dx$

Optimal. Leaf size=42

$$-\frac{4bx}{3a^2\sqrt[4]{a+bx^4}}-\frac{1}{3ax^3\sqrt[4]{a+bx^4}}$$

```
[Out] -1/(3*a*x^3*(a + b*x^4)^(1/4)) - (4*b*x)/(3*a^2*(a + b*x^4)^(1/4)
)
```

Rubi [A] time = 0.0310998, antiderivative size = 42, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$-\frac{4bx}{3a^2\sqrt[4]{a+bx^4}}-\frac{1}{3ax^3\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^4*(a + b*x^4)^(5/4)),x]
```

```
[Out] -1/(3*a*x^3*(a + b*x^4)^(1/4)) - (4*b*x)/(3*a^2*(a + b*x^4)^(1/4)
)
```

Rubi in Sympy [A] time = 3.51984, size = 39, normalized size = 0.93

$$-\frac{1}{3ax^3\sqrt[4]{a+bx^4}}-\frac{4bx}{3a^2\sqrt[4]{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**4/(b*x**4+a)**(5/4),x)
```

```
[Out] -1/(3*a*x**3*(a + b*x**4)**(1/4)) - 4*b*x/(3*a**2*(a + b*x**4)**(
1/4))
```

Mathematica [A] time = 0.0267029, size = 29, normalized size = 0.69

$$-\frac{a+4bx^4}{3a^2x^3\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^4*(a + b*x^4)^(5/4)),x]
```

```
[Out] -(a + 4*b*x^4)/(3*a^2*x^3*(a + b*x^4)^(1/4))
```

Maple [A] time = 0.007, size = 26, normalized size = 0.6

$$-\frac{4\,bx^4+a}{3\,x^3a^2}\frac{1}{\sqrt[4]{bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^4/(b*x^4+a)^(5/4),x)
```

```
[Out] -1/3*(4*b*x^4+a)/x^3/(b*x^4+a)^(1/4)/a^2
```

Maxima [A] time = 1.44252, size = 46, normalized size = 1.1

$$-\frac{bx}{\left(bx^4+a\right)^{\frac{1}{4}}a^2}-\frac{\left(bx^4+a\right)^{\frac{3}{4}}}{3\,a^2x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^4),x, algorithm="maxima")
```

```
[Out] -b*x/((b*x^4 + a)^(1/4)*a^2) - 1/3*(b*x^4 + a)^(3/4)/(a^2*x^3)
```

Fricas [A] time = 0.243377, size = 50, normalized size = 1.19

$$-\frac{\left(4\,bx^4+a\right)\left(bx^4+a\right)^{\frac{3}{4}}}{3\left(a^2bx^7+a^3x^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^4),x, algorithm="fricas")
```

```
[Out] -1/3*(4*b*x^4 + a)*(b*x^4 + a)^(3/4)/(a^2*b*x^7 + a^3*x^3)
```

Sympy [A] time = 4.66138, size = 68, normalized size = 1.62

$$\frac{\Gamma\left(-\frac{3}{4}\right)}{16a\sqrt[4]{b}x^4\sqrt[4]{\frac{a}{bx^4}+1}\,\Gamma\left(\frac{5}{4}\right)}+\frac{b^{\frac{3}{4}}\,\Gamma\left(-\frac{3}{4}\right)}{4a^2\sqrt[4]{\frac{a}{bx^4}+1}\,\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(b*x**4+a)**(5/4),x)
```

```
[Out] gamma(-3/4)/(16*a*b**(1/4)*x**4*(a/(b*x**4) + 1)**(1/4)*gamma(5/4
)) + b**(3/4)*gamma(-3/4)/(4*a**2*(a/(b*x**4) + 1)**(1/4)*gamma(5
/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bx^4+a\right)^{\frac{5}{4}}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^4),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^4 + a)^(5/4)*x^4), x)
```

3.1157 $\int \frac{1}{x^8(a+bx^4)^{5/4}}\,dx$

Optimal. Leaf size=66

$$\frac{32b^2x}{21a^3\sqrt[4]{a+bx^4}}+\frac{8b}{21a^2x^3\sqrt[4]{a+bx^4}}-\frac{1}{7ax^7\sqrt[4]{a+bx^4}}$$

```
[Out] -1/(7*a*x^7*(a + b*x^4)^(1/4)) + (8*b)/(21*a^2*x^3*(a + b*x^4)^(1
/4)) + (32*b^2*x)/(21*a^3*(a + b*x^4)^(1/4))
```

Rubi [A] time = 0.0549516, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{32b^2x}{21a^3\sqrt[4]{a+bx^4}}+\frac{8b}{21a^2x^3\sqrt[4]{a+bx^4}}-\frac{1}{7ax^7\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^8*(a + b*x^4)^(5/4)),x]
```

```
[Out] -1/(7*a*x^7*(a + b*x^4)^(1/4)) + (8*b)/(21*a^2*x^3*(a + b*x^4)^(1
/4)) + (32*b^2*x)/(21*a^3*(a + b*x^4)^(1/4))
```

Rubi in Sympy [A] time = 5.9956, size = 61, normalized size = 0.92

$$-\frac{1}{7ax^7\sqrt[4]{a+bx^4}}+\frac{8b}{21a^2x^3\sqrt[4]{a+bx^4}}+\frac{32b^2x}{21a^3\sqrt[4]{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**8/(b*x**4+a)**(5/4),x)
```

```
[Out] -1/(7*a*x**7*(a + b*x**4)**(1/4)) + 8*b/(21*a**2*x**3*(a + b*x**4
)**(1/4)) + 32*b**2*x/(21*a**3*(a + b*x**4)**(1/4))
```

Mathematica [A] time = 0.0378933, size = 42, normalized size = 0.64

$$\frac{-3a^2+8abx^4+32b^2x^8}{21a^3x^7\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^8*(a + b*x^4)^(5/4)),x]
```

```
[Out] (-3*a^2 + 8*a*b*x^4 + 32*b^2*x^8)/(21*a^3*x^7*(a + b*x^4)^(1/4))
```

Maple [A] time = 0.007, size = 39, normalized size = 0.6

$$-\frac{-32\,b^2x^8-8\,abx^4+3\,a^2}{21\,a^3x^7}\frac{1}{\sqrt[4]{bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^8/(b*x^4+a)^(5/4),x)
```

```
[Out] -1/21*(-32*b^2*x^8-8*a*b*x^4+3*a^2)/x^7/(b*x^4+a)^(1/4)/a^3
```

Maxima [A] time = 1.42526, size = 72, normalized size = 1.09

$$\frac{b^2x}{(bx^4+a)^{\frac{1}{4}}a^3}+\frac{\frac{14\,(bx^4+a)^{\frac{3}{4}}b}{x^3}-\frac{3\,(bx^4+a)^{\frac{7}{4}}}{x^7}}{21\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^8),x, algorithm="maxima")
```

```
[Out] b^2*x/((b*x^4 + a)^(1/4)*a^3) + 1/21*(14*(b*x^4 + a)^(3/4)*b/x^3
- 3*(b*x^4 + a)^(7/4)/x^7)/a^3
```

Fricas [A] time = 0.239904, size = 68, normalized size = 1.03

$$\frac{\left(32\,b^2x^8+8\,abx^4-3\,a^2\right)\left(bx^4+a\right)^{\frac{3}{4}}}{21\,(a^3bx^{11}+a^4x^7)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^8),x, algorithm="fricas")
```

```
[Out] 1/21*(32*b^2*x^8 + 8*a*b*x^4 - 3*a^2)*(b*x^4 + a)^(3/4)/(a^3*b*x^
11 + a^4*x^7)
```

Sympy [A] time = 10.6306, size = 323, normalized size = 4.89

$$-\frac{3a^3b^{\frac{19}{4}}\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}\Gamma\left(-\frac{7}{4}\right)}{64a^5b^4x^4\Gamma\left(\frac{5}{4}\right)+128a^4b^5x^8\Gamma\left(\frac{5}{4}\right)+64a^3b^6x^{12}\Gamma\left(\frac{5}{4}\right)}+\frac{5a^2b^{\frac{23}{4}}x^4\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}\Gamma\left(-\frac{7}{4}\right)}{64a^5b^4x^4\Gamma\left(\frac{5}{4}\right)+128a^4b^5x^8\Gamma\left(\frac{5}{4}\right)+64a^3b^6x^{12}\Gamma\left(\frac{5}{4}\right)}+\frac{40ab^{\frac{27}{4}}x^8\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}\Gamma\left(-\frac{7}{4}\right)}{64a^5b^4x^4\Gamma\left(\frac{5}{4}\right)+128a^4b^5x^8\Gamma\left(\frac{5}{4}\right)+64a^3b^6x^{12}\Gamma\left(\frac{5}{4}\right)}+\frac{32b^{\frac{31}{4}}x^{12}\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}\Gamma\left(-\frac{7}{4}\right)}{64a^5b^4x^4\Gamma\left(\frac{5}{4}\right)+128a^4b^5x^8\Gamma\left(\frac{5}{4}\right)+64a^3b^6x^{12}\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**8/(b*x**4+a)**(5/4),x)
```

```
[Out] -3*a**3*b**(19/4)*(a/(b*x**4) + 1)**(3/4)*gamma(-7/4)/(64*a**5*b*
*4*x**4*gamma(5/4) + 128*a**4*b**5*x**8*gamma(5/4) + 64*a**3*b**6
*x**12*gamma(5/4)) + 5*a**2*b**(23/4)*x**4*(a/(b*x**4) + 1)**(3/4
)*gamma(-7/4)/(64*a**5*b**4*x**4*gamma(5/4) + 128*a**4*b**5*x**8*
gamma(5/4) + 64*a**3*b**6*x**12*gamma(5/4)) + 40*a*b**(27/4)*x**8
*(a/(b*x**4) + 1)**(3/4)*gamma(-7/4)/(64*a**5*b**4*x**4*gamma(5/4
) + 128*a**4*b**5*x**8*gamma(5/4) + 64*a**3*b**6*x**12*gamma(5/4)
) + 32*b**(31/4)*x**12*(a/(b*x**4) + 1)**(3/4)*gamma(-7/4)/(64*a*
*5*b**4*x**4*gamma(5/4) + 128*a**4*b**5*x**8*gamma(5/4) + 64*a**3
*b**6*x**12*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4+a)^{\frac{5}{4}}x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^8),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^4 + a)^(5/4)*x^8), x)
```

3.1158 $\int \frac{1}{x^{12}(a+bx^4)^{5/4}}\,dx$

Optimal. Leaf size=90

$$-\frac{128b^3x}{77a^4\sqrt[4]{a+bx^4}}-\frac{32b^2}{77a^3x^3\sqrt[4]{a+bx^4}}+\frac{12b}{77a^2x^7\sqrt[4]{a+bx^4}}-\frac{1}{11ax^{11}\sqrt[4]{a+bx^4}}$$

```
[Out] -1/(11*a*x^11*(a + b*x^4)^(1/4)) + (12*b)/(77*a^2*x^7*(a + b*x^4)
^(1/4)) - (32*b^2)/(77*a^3*x^3*(a + b*x^4)^(1/4)) - (128*b^3*x)/(
77*a^4*(a + b*x^4)^(1/4))
```

Rubi [A] time = 0.0822382, antiderivative size = 90, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{128b^3x}{77a^4\sqrt[4]{a+bx^4}}-\frac{32b^2}{77a^3x^3\sqrt[4]{a+bx^4}}+\frac{12b}{77a^2x^7\sqrt[4]{a+bx^4}}-\frac{1}{11ax^{11}\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^12*(a + b*x^4)^(5/4)),x]
```

```
[Out] -1/(11*a*x^11*(a + b*x^4)^(1/4)) + (12*b)/(77*a^2*x^7*(a + b*x^4)
^(1/4)) - (32*b^2)/(77*a^3*x^3*(a + b*x^4)^(1/4)) - (128*b^3*x)/(
77*a^4*(a + b*x^4)^(1/4))
```

Rubi in Sympy [A] time = 8.99094, size = 85, normalized size = 0.94

$$-\frac{1}{11ax^{11}\sqrt[4]{a+bx^4}}+\frac{12b}{77a^2x^7\sqrt[4]{a+bx^4}}-\frac{32b^2}{77a^3x^3\sqrt[4]{a+bx^4}}-\frac{128b^3x}{77a^4\sqrt[4]{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**12/(b*x**4+a)**(5/4),x)
```

```
[Out] -1/(11*a*x**11*(a + b*x**4)**(1/4)) + 12*b/(77*a**2*x**7*(a + b*x
**4)**(1/4)) - 32*b**2/(77*a**3*x**3*(a + b*x**4)**(1/4)) - 128*b
**3*x/(77*a**4*(a + b*x**4)**(1/4))
```

Mathematica [A] time = 0.0487353, size = 53, normalized size = 0.59

$$-\frac{7a^3-12a^2bx^4+32ab^2x^8+128b^3x^{12}}{77a^4x^{11}\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^12*(a + b*x^4)^(5/4)),x]
```

```
[Out] -(7*a^3 - 12*a^2*b*x^4 + 32*a*b^2*x^8 + 128*b^3*x^12)/(77*a^4*x^1
1*(a + b*x^4)^(1/4))
```

Maple [A] time = 0.009, size = 50, normalized size = 0.6

$$-\frac{128\,b^3x^{12}+32\,ab^2x^8-12\,a^2bx^4+7\,a^3}{77\,x^{11}a^4}\frac{1}{\sqrt[4]{bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^12/(b*x^4+a)^(5/4),x)
```

```
[Out] -1/77*(128*b^3*x^12+32*a*b^2*x^8-12*a^2*b*x^4+7*a^3)/x^11/(b*x^4+
a)^(1/4)/a^4
```

Maxima [A] time = 1.44094, size = 96, normalized size = 1.07

$$-\frac{b^3x}{\left(bx^4+a\right)^{\frac{1}{4}}a^4}-\frac{\frac{77\left(bx^4+a\right)^{\frac{3}{4}}b^2}{x^3}-\frac{33\left(bx^4+a\right)^{\frac{7}{4}}b}{x^7}+\frac{7\left(bx^4+a\right)^{\frac{11}{4}}}{x^{11}}}{77\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^12),x, algorithm="maxima")
```

```
[Out] -b^3*x/((b*x^4 + a)^(1/4)*a^4) - 1/77*(77*(b*x^4 + a)^(3/4)*b^2/x
^3 - 33*(b*x^4 + a)^(7/4)*b/x^7 + 7*(b*x^4 + a)^(11/4)/x^11)/a^4
```

Fricas [A] time = 0.250339, size = 82, normalized size = 0.91

$$-\frac{\left(128\,b^3x^{12}+32\,ab^2x^8-12\,a^2bx^4+7\,a^3\right)\left(bx^4+a\right)^{\frac{3}{4}}}{77\left(a^4bx^{15}+a^5x^{11}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^12),x, algorithm="fricas")
```

```
[Out] -1/77*(128*b^3*x^12 + 32*a*b^2*x^8 - 12*a^2*b*x^4 + 7*a^3)*(b*x^4
 + a)^(3/4)/(a^4*b*x^15 + a^5*x^11)
```

Sympy [A] time = 23.1003, size = 592, normalized size = 6.58

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**12/(b*x**4+a)**(5/4),x)
```

```
[Out] 21*a**5*b**(39/4)*(a/(b*x**4) + 1)**(3/4)*gamma(-11/4)/(256*a**7*
b**9*x**8*gamma(5/4) + 768*a**6*b**10*x**12*gamma(5/4) + 768*a**5
*b**11*x**16*gamma(5/4) + 256*a**4*b**12*x**20*gamma(5/4)) + 6*a*
*4*b**(43/4)*x**4*(a/(b*x**4) + 1)**(3/4)*gamma(-11/4)/(256*a**7*
b**9*x**8*gamma(5/4) + 768*a**6*b**10*x**12*gamma(5/4) + 768*a**5
*b**11*x**16*gamma(5/4) + 256*a**4*b**12*x**20*gamma(5/4)) + 45*a
**3*b**(47/4)*x**8*(a/(b*x**4) + 1)**(3/4)*gamma(-11/4)/(256*a**7
*b**9*x**8*gamma(5/4) + 768*a**6*b**10*x**12*gamma(5/4) + 768*a**
5*b**11*x**16*gamma(5/4) + 256*a**4*b**12*x**20*gamma(5/4)) + 540
*a**2*b**(51/4)*x**12*(a/(b*x**4) + 1)**(3/4)*gamma(-11/4)/(256*a
**7*b**9*x**8*gamma(5/4) + 768*a**6*b**10*x**12*gamma(5/4) + 768*
a**5*b**11*x**16*gamma(5/4) + 256*a**4*b**12*x**20*gamma(5/4)) +
864*a*b**(55/4)*x**16*(a/(b*x**4) + 1)**(3/4)*gamma(-11/4)/(256*a
**7*b**9*x**8*gamma(5/4) + 768*a**6*b**10*x**12*gamma(5/4) + 768*
a**5*b**11*x**16*gamma(5/4) + 256*a**4*b**12*x**20*gamma(5/4)) +
384*b**(59/4)*x**20*(a/(b*x**4) + 1)**(3/4)*gamma(-11/4)/(256*a**
7*b**9*x**8*gamma(5/4) + 768*a**6*b**10*x**12*gamma(5/4) + 768*a*
*5*b**11*x**16*gamma(5/4) + 256*a**4*b**12*x**20*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4+a)^{\frac{5}{4}}x^{12}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^12),x, algorithm="giac")

[Out] integrate(1/((b*x^4 + a)^(5/4)*x^12), x)
```

3.1159 $\int \frac{1}{x^{16}(a+bx^4)^{5/4}}\,dx$

Optimal. Leaf size=114

$$\frac{2048b^4x}{1155a^5\sqrt[4]{a+bx^4}}+\frac{512b^3}{1155a^4x^3\sqrt[4]{a+bx^4}}-\frac{64b^2}{385a^3x^7\sqrt[4]{a+bx^4}}+\frac{16b}{165a^2x^{11}\sqrt[4]{a+bx^4}}-\frac{1}{15ax^{15}\sqrt[4]{a+bx^4}}$$

```
[Out] -1/(15*a*x^15*(a + b*x^4)^(1/4)) + (16*b)/(165*a^2*x^11*(a + b*x^
4)^(1/4)) - (64*b^2)/(385*a^3*x^7*(a + b*x^4)^(1/4)) + (512*b^3)/
(1155*a^4*x^3*(a + b*x^4)^(1/4)) + (2048*b^4*x)/(1155*a^5*(a + b*
x^4)^(1/4))
```

Rubi [A] time = 0.110963, antiderivative size = 114, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2048b^4x}{1155a^5\sqrt[4]{a+bx^4}}+\frac{512b^3}{1155a^4x^3\sqrt[4]{a+bx^4}}-\frac{64b^2}{385a^3x^7\sqrt[4]{a+bx^4}}+\frac{16b}{165a^2x^{11}\sqrt[4]{a+bx^4}}-\frac{1}{15ax^{15}\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^16*(a + b*x^4)^(5/4)),x]
```

```
[Out] -1/(15*a*x^15*(a + b*x^4)^(1/4)) + (16*b)/(165*a^2*x^11*(a + b*x^
4)^(1/4)) - (64*b^2)/(385*a^3*x^7*(a + b*x^4)^(1/4)) + (512*b^3)/
(1155*a^4*x^3*(a + b*x^4)^(1/4)) + (2048*b^4*x)/(1155*a^5*(a + b*
x^4)^(1/4))
```

Rubi in Sympy [A] time = 12.7195, size = 109, normalized size = 0.96

$$-\frac{1}{15ax^{15}\sqrt[4]{a+bx^4}}+\frac{16b}{165a^2x^{11}\sqrt[4]{a+bx^4}}-\frac{64b^2}{385a^3x^7\sqrt[4]{a+bx^4}}+\frac{512b^3}{1155a^4x^3\sqrt[4]{a+bx^4}}+\frac{2048b^4x}{1155a^5\sqrt[4]{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**16/(b*x**4+a)**(5/4),x)
```

```
[Out] -1/(15*a*x**15*(a + b*x**4)**(1/4)) + 16*b/(165*a**2*x**11*(a + b
*x**4)**(1/4)) - 64*b**2/(385*a**3*x**7*(a + b*x**4)**(1/4)) + 51
2*b**3/(1155*a**4*x**3*(a + b*x**4)**(1/4)) + 2048*b**4*x/(1155*a
**5*(a + b*x**4)**(1/4))
```

Mathematica [A] time = 0.0593613, size = 64, normalized size = 0.56

$$\frac{-77a^4+112a^3bx^4-192a^2b^2x^8+512ab^3x^{12}+2048b^4x^{16}}{1155a^5x^{15}\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^16*(a + b*x^4)^(5/4)),x]
```

```
[Out] (-77*a^4 + 112*a^3*b*x^4 - 192*a^2*b^2*x^8 + 512*a*b^3*x^12 + 204
8*b^4*x^16)/(1155*a^5*x^15*(a + b*x^4)^(1/4))
```

Maple [A] time = 0.009, size = 61, normalized size = 0.5

$$-\frac{-2048\,b^4x^{16}-512\,b^3x^{12}a+192\,a^2x^8b^2-112\,bx^4a^3+77\,a^4}{1155\,a^5x^{15}}\frac{1}{\sqrt[4]{bx^4+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^16/(b*x^4+a)^(5/4),x)
```

```
[Out] -1/1155*(-2048*b^4*x^16-512*a*b^3*x^12+192*a^2*b^2*x^8-112*a^3*b*
x^4+77*a^4)/x^15/(b*x^4+a)^(1/4)/a^5
```

Maxima [A] time = 1.43924, size = 117, normalized size = 1.03

$$\frac{b^4x}{(bx^4+a)^{\frac{1}{4}}a^5}+\frac{\frac{1540\,(bx^4+a)^{\frac{3}{4}}b^3}{x^3}-\frac{990\,(bx^4+a)^{\frac{7}{4}}b^2}{x^7}+\frac{420\,(bx^4+a)^{\frac{11}{4}}b}{x^{11}}-\frac{77\,(bx^4+a)^{\frac{15}{4}}}{x^{15}}}{1155\,a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^16),x, algorithm="maxima")
```

```
[Out] b^4*x/((b*x^4 + a)^(1/4)*a^5) + 1/1155*(1540*(b*x^4 + a)^(3/4)*b^
3/x^3 - 990*(b*x^4 + a)^(7/4)*b^2/x^7 + 420*(b*x^4 + a)^(11/4)*b/
x^11 - 77*(b*x^4 + a)^(15/4)/x^15)/a^5
```

Fricas [A] time = 0.244309, size = 97, normalized size = 0.85

$$\frac{\left(2048\,b^4x^{16}+512\,ab^3x^{12}-192\,a^2b^2x^8+112\,a^3bx^4-77\,a^4\right)\left(bx^4+a\right)^{\frac{3}{4}}}{1155\,(a^5bx^{19}+a^6x^{15})}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^16),x, algorithm="fricas")
```

```
[Out] 1/1155*(2048*b^4*x^16 + 512*a*b^3*x^12 - 192*a^2*b^2*x^8 + 112*a^
3*b*x^4 - 77*a^4)*(b*x^4 + a)^(3/4)/(a^5*b*x^19 + a^6*x^15)
```

Sympy [A] time = 51.5855, size = 928, normalized size = 8.14

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**16/(b*x**4+a)**(5/4),x)
```

```
[Out] -231*a**7*b**(67/4)*(a/(b*x**4) + 1)**(3/4)*gamma(-15/4)/(1024*a*
*9*b**16*x**12*gamma(5/4) + 4096*a**8*b**17*x**16*gamma(5/4) + 61
44*a**7*b**18*x**20*gamma(5/4) + 4096*a**6*b**19*x**24*gamma(5/4)
 + 1024*a**5*b**20*x**28*gamma(5/4)) - 357*a**6*b**(71/4)*x**4*(a
/(b*x**4) + 1)**(3/4)*gamma(-15/4)/(1024*a**9*b**16*x**12*gamma(5
/4) + 4096*a**8*b**17*x**16*gamma(5/4) + 6144*a**7*b**18*x**20*ga
mma(5/4) + 4096*a**6*b**19*x**24*gamma(5/4) + 1024*a**5*b**20*x**
28*gamma(5/4)) - 261*a**5*b**(75/4)*x**8*(a/(b*x**4) + 1)**(3/4)*
gamma(-15/4)/(1024*a**9*b**16*x**12*gamma(5/4) + 4096*a**8*b**17*
x**16*gamma(5/4) + 6144*a**7*b**18*x**20*gamma(5/4) + 4096*a**6*b
**19*x**24*gamma(5/4) + 1024*a**5*b**20*x**28*gamma(5/4)) + 585*a
```

```
**4*b**(79/4)*x**12*(a/(b*x**4) + 1)**(3/4)*gamma(-15/4)/(1024*a*
*9*b**16*x**12*gamma(5/4) + 4096*a**8*b**17*x**16*gamma(5/4) + 61
44*a**7*b**18*x**20*gamma(5/4) + 4096*a**6*b**19*x**24*gamma(5/4)
 + 1024*a**5*b**20*x**28*gamma(5/4)) + 9360*a**3*b**(83/4)*x**16*
(a/(b*x**4) + 1)**(3/4)*gamma(-15/4)/(1024*a**9*b**16*x**12*gamma
(5/4) + 4096*a**8*b**17*x**16*gamma(5/4) + 6144*a**7*b**18*x**20*
gamma(5/4) + 4096*a**6*b**19*x**24*gamma(5/4) + 1024*a**5*b**20*x
**28*gamma(5/4)) + 22464*a**2*b**(87/4)*x**20*(a/(b*x**4) + 1)**(
3/4)*gamma(-15/4)/(1024*a**9*b**16*x**12*gamma(5/4) + 4096*a**8*b
**17*x**16*gamma(5/4) + 6144*a**7*b**18*x**20*gamma(5/4) + 4096*a
**6*b**19*x**24*gamma(5/4) + 1024*a**5*b**20*x**28*gamma(5/4)) +
19968*a*b**(91/4)*x**24*(a/(b*x**4) + 1)**(3/4)*gamma(-15/4)/(102
4*a**9*b**16*x**12*gamma(5/4) + 4096*a**8*b**17*x**16*gamma(5/4)
+ 6144*a**7*b**18*x**20*gamma(5/4) + 4096*a**6*b**19*x**24*gamma(
5/4) + 1024*a**5*b**20*x**28*gamma(5/4)) + 6144*b**(95/4)*x**28*(
a/(b*x**4) + 1)**(3/4)*gamma(-15/4)/(1024*a**9*b**16*x**12*gamma(
5/4) + 4096*a**8*b**17*x**16*gamma(5/4) + 6144*a**7*b**18*x**20*g
amma(5/4) + 4096*a**6*b**19*x**24*gamma(5/4) + 1024*a**5*b**20*x*
*28*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4+a)^{\frac{5}{4}}x^{16}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^16),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^4 + a)^(5/4)*x^16), x)
```

3.1160 $\int \frac{x^{14}}{(a+bx^4)^{5/4}} dx$

Optimal. Leaf size=129

$$\frac{77a^{5/2}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{40b^{7/2}\sqrt[4]{a+bx^4}}+\frac{77a^2x^3}{120b^3\sqrt[4]{a+bx^4}}-\frac{11ax^7}{60b^2\sqrt[4]{a+bx^4}}+\frac{x^{11}}{10b\sqrt[4]{a+bx^4}}$$

```
[Out] (77*a^2*x^3)/(120*b^3*(a + b*x^4)^(1/4)) - (11*a*x^7)/(60*b^2*(a
+ b*x^4)^(1/4)) + x^11/(10*b*(a + b*x^4)^(1/4)) + (77*a^(5/2)*(1
+ a/(b*x^4))^(1/4)*x*EllipticE[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2
])/(40*b^(7/2)*(a + b*x^4)^(1/4))
```

Rubi [A] time = 0.185745, antiderivative size = 129, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{77a^{5/2}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{40b^{7/2}\sqrt[4]{a+bx^4}}+\frac{77a^2x^3}{120b^3\sqrt[4]{a+bx^4}}-\frac{11ax^7}{60b^2\sqrt[4]{a+bx^4}}+\frac{x^{11}}{10b\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^14/(a + b*x^4)^(5/4),x]
```

```
[Out] (77*a^2*x^3)/(120*b^3*(a + b*x^4)^(1/4)) - (11*a*x^7)/(60*b^2*(a
+ b*x^4)^(1/4)) + x^11/(10*b*(a + b*x^4)^(1/4)) + (77*a^(5/2)*(1
+ a/(b*x^4))^(1/4)*x*EllipticE[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2
])/(40*b^(7/2)*(a + b*x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{77a^3x\sqrt[4]{\frac{a}{bx^4}+1}\int^{\frac{1}{x^2}}\frac{1}{\sqrt[4]{\frac{ax^2}{b}+1}}dx}{80b^4\sqrt[4]{a+bx^4}}+\frac{77a^3}{40b^4x\sqrt[4]{a+bx^4}}+\frac{77a^2x^3}{120b^3\sqrt[4]{a+bx^4}}-\frac{11ax^7}{60b^2\sqrt[4]{a+bx^4}}+\frac{x^{11}}{10b\sqrt[4]{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**14/(b*x**4+a)**(5/4),x)
```

```
[Out] -77*a**3*x*(a/(b*x**4) + 1)**(1/4)*Integral((a*x**2/b + 1)**(-1/4
), (x, x**(-2)))/(80*b**4*(a + b*x**4)**(1/4)) + 77*a**3/(40*b**4
*x*(a + b*x**4)**(1/4)) + 77*a**2*x**3/(120*b**3*(a + b*x**4)**(1
/4)) - 11*a*x**7/(60*b**2*(a + b*x**4)**(1/4)) + x**11/(10*b*(a +
 b*x**4)**(1/4))
```

Mathematica [C] time = 0.0700862, size = 80, normalized size = 0.62

$$\frac{x^3\left(77a^2\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)-77a^2-11abx^4+6b^2x^8\right)}{60b^3\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^14/(a + b*x^4)^(5/4),x]
```

```
[Out] (x^3*(-77*a^2 - 11*a*b*x^4 + 6*b^2*x^8 + 77*a^2*(1 + (b*x^4)/a)^(
1/4)*Hypergeometric2F1[1/4, 3/4, 7/4, -((b*x^4)/a)]))/(60*b^3*(a
+ b*x^4)^(1/4))
```

Maple [F] time = 0.072, size = 0, normalized size = 0.

$$\int x^{14} \left(bx^4 + a\right)^{-\frac{5}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^14/(b*x^4+a)^(5/4),x)
```

```
[Out] int(x^14/(b*x^4+a)^(5/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{14}}{\left(bx^4 + a\right)^{\frac{5}{4}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^14/(b*x^4 + a)^(5/4),x, algorithm="maxima")
```

```
[Out] integrate(x^14/(b*x^4 + a)^(5/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{14}}{\left(bx^4 + a\right)^{\frac{5}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^14/(b*x^4 + a)^(5/4),x, algorithm="fricas")
```

```
[Out] integral(x^14/(b*x^4 + a)^(5/4), x)
```

Sympy [A] time = 10.3486, size = 37, normalized size = 0.29

$$\frac{x^{15} \Gamma\left(\frac{15}{4}\right) {}_2F_1\left(\begin{matrix} \frac{5}{4}, \frac{15}{4} \\ \frac{19}{4} \end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{4a^{\frac{5}{4}} \Gamma\left(\frac{19}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**14/(b*x**4+a)**(5/4),x)
```

```
[Out] x**15*gamma(15/4)*hyper((5/4, 15/4), (19/4,), b*x**4*exp_polar(I*
pi)/a)/(4*a**(5/4)*gamma(19/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{14}}{(bx^4 + a)^{\frac{5}{4}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^14/(b*x^4 + a)^(5/4),x, algorithm="giac")

[Out] integrate(x^14/(b*x^4 + a)^(5/4), x)
```

3.1161 $\int \frac{x^{10}}{(a+bx^4)^{5/4}}\,dx$

Optimal. Leaf size=105

$$-\frac{7a^{3/2}x\sqrt[4]{\frac{a}{bx^4}+1}\,E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{4b^{5/2}\sqrt[4]{a+bx^4}}-\frac{7ax^3}{12b^2\sqrt[4]{a+bx^4}}+\frac{x^7}{6b\sqrt[4]{a+bx^4}}$$

```
[Out] (-7*a*x^3)/(12*b^2*(a + b*x^4)^(1/4)) + x^7/(6*b*(a + b*x^4)^(1/4
)) - (7*a^(3/2)*(1 + a/(b*x^4))^(1/4)*x*EllipticE[ArcCot[(Sqrt[b]
*x^2)/Sqrt[a]]/2, 2])/(4*b^(5/2)*(a + b*x^4)^(1/4))
```

Rubi [A] time = 0.145676, antiderivative size = 105, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$

$$-\frac{7a^{3/2}x\sqrt[4]{\frac{a}{bx^4}+1}\,E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{4b^{5/2}\sqrt[4]{a+bx^4}}-\frac{7ax^3}{12b^2\sqrt[4]{a+bx^4}}+\frac{x^7}{6b\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^10/(a + b*x^4)^(5/4),x]
```

```
[Out] (-7*a*x^3)/(12*b^2*(a + b*x^4)^(1/4)) + x^7/(6*b*(a + b*x^4)^(1/4
)) - (7*a^(3/2)*(1 + a/(b*x^4))^(1/4)*x*EllipticE[ArcCot[(Sqrt[b]
*x^2)/Sqrt[a]]/2, 2])/(4*b^(5/2)*(a + b*x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{7a^2x\sqrt[4]{\frac{a}{bx^4}+1}\int^{\frac{1}{x^2}}\frac{1}{\left(\frac{ax^2}{b}+1\right)^{\frac{5}{4}}}\,dx}{8b^3\sqrt[4]{a+bx^4}}-\frac{7ax^3}{12b^2\sqrt[4]{a+bx^4}}+\frac{x^7}{6b\sqrt[4]{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**10/(b*x**4+a)**(5/4),x)
```

```
[Out] -7*a**2*x*(a/(b*x**4) + 1)**(1/4)*Integral((a*x**2/b + 1)**(-5/4)
, (x, x**(-2)))/(8*b**3*(a + b*x**4)**(1/4)) - 7*a*x**3/(12*b**2*
(a + b*x**4)**(1/4)) + x**7/(6*b*(a + b*x**4)**(1/4))
```

Mathematica [C] time = 0.0545817, size = 66, normalized size = 0.63

$$\frac{x^3\left(-7a\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)+7a+bx^4\right)}{6b^2\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^10/(a + b*x^4)^(5/4),x]
```

```
[Out] (x^3*(7*a + b*x^4 - 7*a*(1 + (b*x^4)/a)^(1/4)*Hypergeometric2F1[1
/4, 3/4, 7/4, -((b*x^4)/a)]))/(6*b^2*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.068, size = 0, normalized size = 0.

$$\int x^{10} \left(b x^{4}+a\right)^{-\frac{5}{4}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^10/(b*x^4+a)^(5/4),x)
```

```
[Out] int(x^10/(b*x^4+a)^(5/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{10}}{(bx^4 + a)^{\frac{5}{4}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/(b*x^4 + a)^(5/4),x, algorithm="maxima")
```

```
[Out] integrate(x^10/(b*x^4 + a)^(5/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{10}}{(bx^4 + a)^{\frac{5}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/(b*x^4 + a)^(5/4),x, algorithm="fricas")
```

```
[Out] integral(x^10/(b*x^4 + a)^(5/4), x)
```

Sympy [A] time = 5.0851, size = 37, normalized size = 0.35

$$\frac{x^{11}\Gamma\left(\frac{11}{4}\right){}_{2}F_{1}\left(\begin{matrix}\frac{5}{4},\frac{11}{4}\\ \frac{15}{4}\end{matrix}\middle|\frac{bx^4e^{i\pi}}{a}\right)}{4a^{\frac{5}{4}}\Gamma\left(\frac{15}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**10/(b*x**4+a)**(5/4),x)
```

```
[Out] x**11*gamma(11/4)*hyper((5/4, 11/4), (15/4,), b*x**4*exp_polar(I*
pi)/a)/(4*a**(5/4)*gamma(15/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{10}}{(bx^4 + a)^{\frac{5}{4}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/(b*x^4 + a)^(5/4),x, algorithm="giac")
```

```
[Out] integrate(x^10/(b*x^4 + a)^(5/4), x)
```

3.1162 $\int \frac{x^6}{(a+bx^4)^{5/4}} dx$

Optimal. Leaf size=83

$$\frac{3\sqrt{a}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{2b^{3/2}\sqrt[4]{a+bx^4}}+\frac{x^3}{2b\sqrt[4]{a+bx^4}}$$

```
[Out] x^3/(2*b*(a + b*x^4)^(1/4)) + (3*Sqrt[a]*(1 + a/(b*x^4))^(1/4)*x*
EllipticE[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(2*b^(3/2)*(a + b*
x^4)^(1/4))
```

Rubi [A] time = 0.115264, antiderivative size = 83, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{3\sqrt{a}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{2b^{3/2}\sqrt[4]{a+bx^4}}+\frac{x^3}{2b\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/(a + b*x^4)^(5/4),x]
```

```
[Out] x^3/(2*b*(a + b*x^4)^(1/4)) + (3*Sqrt[a]*(1 + a/(b*x^4))^(1/4)*x*
EllipticE[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(2*b^(3/2)*(a + b*
x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{3ax\sqrt[4]{\frac{a}{bx^4}+1}\int^{\frac{1}{x^2}}\frac{1}{\sqrt[4]{\frac{ax^2}{b}+1}}\,dx}{4b^2\sqrt[4]{a+bx^4}}+\frac{3a}{2b^2x\sqrt[4]{a+bx^4}}+\frac{x^3}{2b\sqrt[4]{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(b*x**4+a)**(5/4),x)
```

```
[Out] -3*a*x*(a/(b*x**4) + 1)**(1/4)*Integral((a*x**2/b + 1)**(-1/4), (
x, x**(-2)))/(4*b**2*(a + b*x**4)**(1/4)) + 3*a/(2*b**2*x*(a + b*
x**4)**(1/4)) + x**3/(2*b*(a + b*x**4)**(1/4))
```

Mathematica [C] time = 0.0481507, size = 54, normalized size = 0.65

$$\frac{x^3\left(\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)-1\right)}{b\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6/(a + b*x^4)^(5/4),x]
```

```
[Out] (x^3*(-1 + (1 + (b*x^4)/a)^(1/4)*Hypergeometric2F1[1/4, 3/4, 7/4,
 -((b*x^4)/a)]))/(b*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.039, size = 0, normalized size = 0.

$$\int x^{6} \left(b x^{4}+a \right)^{-\frac{5}{4}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(b*x^4+a)^(5/4),x)
```

```
[Out] int(x^6/(b*x^4+a)^(5/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{6}}{(bx^{4}+a)^{\frac{5}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(b*x^4 + a)^(5/4),x, algorithm="maxima")
```

```
[Out] integrate(x^6/(b*x^4 + a)^(5/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x^{6}}{(bx^{4}+a)^{\frac{5}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(b*x^4 + a)^(5/4),x, algorithm="fricas")
```

```
[Out] integral(x^6/(b*x^4 + a)^(5/4), x)
```

Sympy [A] time = 2.87816, size = 37, normalized size = 0.45

$$\frac{x^{7}\Gamma\left(\frac{7}{4}\right){}_{2}F_{1}\left(\begin{matrix}\frac{5}{4},\frac{7}{4}\\ \frac{11}{4}\end{matrix}\middle|\frac{bx^{4}e^{i\pi}}{a}\right)}{4a^{\frac{5}{4}}\Gamma\left(\frac{11}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(b*x**4+a)**(5/4),x)
```

```
[Out] x**7*gamma(7/4)*hyper((5/4, 7/4), (11/4,), b*x**4*exp_polar(I*pi)
/a)/(4*a**(5/4)*gamma(11/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{6}}{(bx^{4}+a)^{\frac{5}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(b*x^4 + a)^(5/4),x, algorithm="giac")
```

```
[Out] integrate(x^6/(b*x^4 + a)^(5/4), x)
```

3.1163 $\int \frac{x^2}{(a+bx^4)^{5/4}} dx$

Optimal. Leaf size=59

$$-\frac{x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{\sqrt{a}\sqrt{b}\sqrt[4]{a+bx^4}}$$

```
[Out] -(((1 + a/(b*x^4))^(1/4)*x*EllipticE[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]
]/2, 2])/(Sqrt[a]*Sqrt[b]*(a + b*x^4)^(1/4)))
```

Rubi [A] time = 0.0866284, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{\sqrt{a}\sqrt{b}\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b*x^4)^(5/4),x]
```

```
[Out] -(((1 + a/(b*x^4))^(1/4)*x*EllipticE[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]
]/2, 2])/(Sqrt[a]*Sqrt[b]*(a + b*x^4)^(1/4)))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{x\sqrt[4]{\frac{a}{bx^4}+1}\int^{\frac{1}{x^2}}\frac{1}{\left(\frac{ax^2}{b}+1\right)^{\frac{5}{4}}}\,dx}{2b\sqrt[4]{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(b*x**4+a)**(5/4),x)
```

```
[Out] -x*(a/(b*x**4) + 1)**(1/4)*Integral((a*x**2/b + 1)**(-5/4), (x, x
**(-2)))/(2*b*(a + b*x**4)**(1/4))
```

Mathematica [C] time = 0.0428857, size = 58, normalized size = 0.98

$$-\frac{x^3\left(2\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)-3\right)}{3a\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a + b*x^4)^(5/4),x]
```

```
[Out] -(x^3*(-3 + 2*(1 + (b*x^4)/a)^(1/4)*Hypergeometric2F1[1/4, 3/4, 7
/4, -((b*x^4)/a)]))/(3*a*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.034, size = 0, normalized size = 0.

$$\int x^{2} \left(b x^{4}+a \right)^{-\frac{5}{4}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(b*x^4+a)^(5/4),x)

[Out] int(x^2/(b*x^4+a)^(5/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{2}}{{\left(b x^{4}+a\right)}^{\frac{5}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^4 + a)^(5/4),x, algorithm="maxima")

[Out] integrate(x^2/(b*x^4 + a)^(5/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$${\rm integral}\left(\frac{x^{2}}{{\left(b x^{4}+a\right)}^{\frac{5}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^4 + a)^(5/4),x, algorithm="fricas")

[Out] integral(x^2/(b*x^4 + a)^(5/4), x)
```

Sympy [A] time = 2.64641, size = 37, normalized size = 0.63

$$\frac{x^{3} \Gamma\left(\frac{3}{4}\right) {}_{2}F_{1}\left(\begin{matrix} \frac{3}{4}, \frac{5}{4} \\ \frac{7}{4} \end{matrix}\middle| {\frac{b x^{4} e^{i \pi}}{a}} \right)}{4 a^{\frac{5}{4}} \Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(b*x**4+a)**(5/4),x)

[Out] x**3*gamma(3/4)*hyper((3/4, 5/4), (7/4,), b*x**4*exp_polar(I*pi)/
a)/(4*a**(5/4)*gamma(7/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{2}}{{\left(b x^{4}+a\right)}^{\frac{5}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^4 + a)^(5/4),x, algorithm="giac")

[Out] integrate(x^2/(b*x^4 + a)^(5/4), x)
```

3.1164 $\int \frac{1}{x^2(a+bx^4)^{5/4}}\,dx$

Optimal. Leaf size=79

$$\frac{2\sqrt{b}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{a^{3/2}\sqrt[4]{a+bx^4}}-\frac{1}{ax\sqrt[4]{a+bx^4}}$$

```
[Out] -(1/(a*x*(a + b*x^4)^(1/4))) + (2*Sqrt[b]*(1 + a/(b*x^4))^(1/4)*x
*EllipticE[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(a^(3/2)*(a + b*x
^4)^(1/4))
```

Rubi [A] time = 0.115236, antiderivative size = 79, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{2\sqrt{b}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{a^{3/2}\sqrt[4]{a+bx^4}}-\frac{1}{ax\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(a + b*x^4)^(5/4)),x]
```

```
[Out] -(1/(a*x*(a + b*x^4)^(1/4))) + (2*Sqrt[b]*(1 + a/(b*x^4))^(1/4)*x
*EllipticE[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(a^(3/2)*(a + b*x
^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{x\sqrt[4]{\frac{a}{bx^4}+1}\int^{\frac{1}{x^2}}\frac{1}{\sqrt[4]{\frac{ax^2}{b}+1}}\,dx}{a\sqrt[4]{a+bx^4}}+\frac{1}{ax\sqrt[4]{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(b*x**4+a)**(5/4),x)
```

```
[Out] -x*(a/(b*x**4) + 1)**(1/4)*Integral((a*x**2/b + 1)**(-1/4), (x, x
**(-2)))/(a*(a + b*x**4)**(1/4)) + 1/(a*x*(a + b*x**4)**(1/4))
```

Mathematica [C] time = 0.0502377, size = 71, normalized size = 0.9

$$\frac{4bx^4\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)-3\left(a+2bx^4\right)}{3a^2x\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*(a + b*x^4)^(5/4)),x]
```

```
[Out] (-3*(a + 2*b*x^4) + 4*b*x^4*(1 + (b*x^4)/a)^(1/4)*Hypergeometric2
F1[1/4, 3/4, 7/4, -((b*x^4)/a)])/(3*a^2*x*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.071, size = 0, normalized size = 0.

$$\int \frac{1}{x^2}\left(bx^4+a\right)^{-\frac{5}{4}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(b*x^4+a)^(5/4),x)

[Out] int(1/x^2/(b*x^4+a)^(5/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4+a)^{\frac{5}{4}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^2),x, algorithm="maxima")

[Out] integrate(1/((b*x^4 + a)^(5/4)*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{(bx^6+ax^2)(bx^4+a)^{\frac{1}{4}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^2),x, algorithm="fricas")

[Out] integral(1/((b*x^6 + a*x^2)*(b*x^4 + a)^(1/4)), x)
```

Sympy [A] time = 3.53955, size = 39, normalized size = 0.49

$$\frac{\Gamma\left(-\frac{1}{4}\right)\,{}_2F_1\left(\begin{matrix}-\frac{1}{4},\frac{5}{4}\\ \frac{3}{4}\end{matrix}\middle|\frac{bx^4e^{i\pi}}{a}\right)}{4a^{\frac{5}{4}}x\,\Gamma\left(\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(b*x**4+a)**(5/4),x)

[Out] gamma(-1/4)*hyper((-1/4, 5/4), (3/4,), b*x**4*exp_polar(I*pi)/a)/
(4*a**(5/4)*x*gamma(3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4+a)^{\frac{5}{4}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^2),x, algorithm="giac")

[Out] integrate(1/((b*x^4 + a)^(5/4)*x^2), x)
```

3.1165 $\int \frac{1}{x^6(a+bx^4)^{5/4}}\,dx$

Optimal. Leaf size=105

$$-\frac{12b^{3/2}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{5a^{5/2}\sqrt[4]{a+bx^4}}+\frac{6b}{5a^2x\sqrt[4]{a+bx^4}}-\frac{1}{5ax^5\sqrt[4]{a+bx^4}}$$

```
[Out] -1/(5*a*x^5*(a + b*x^4)^(1/4)) + (6*b)/(5*a^2*x*(a + b*x^4)^(1/4)
) - (12*b^(3/2)*(1 + a/(b*x^4))^(1/4)*x*EllipticE[ArcCot[(Sqrt[b]
*x^2)/Sqrt[a]]/2, 2])/(5*a^(5/2)*(a + b*x^4)^(1/4))
```

Rubi [A] time = 0.144276, antiderivative size = 105, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$

$$-\frac{12b^{3/2}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{5a^{5/2}\sqrt[4]{a+bx^4}}+\frac{6b}{5a^2x\sqrt[4]{a+bx^4}}-\frac{1}{5ax^5\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^6*(a + b*x^4)^(5/4)),x]
```

```
[Out] -1/(5*a*x^5*(a + b*x^4)^(1/4)) + (6*b)/(5*a^2*x*(a + b*x^4)^(1/4)
) - (12*b^(3/2)*(1 + a/(b*x^4))^(1/4)*x*EllipticE[ArcCot[(Sqrt[b]
*x^2)/Sqrt[a]]/2, 2])/(5*a^(5/2)*(a + b*x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{5ax^5\sqrt[4]{a+bx^4}}-\frac{6bx\sqrt[4]{\frac{a}{bx^4}+1}\int^{\frac{1}{x^2}}\frac{1}{\left(\frac{ax^2}{b}+1\right)^{\frac{5}{4}}}\,dx}{5a^2\sqrt[4]{a+bx^4}}+\frac{6b}{5a^2x\sqrt[4]{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**6/(b*x**4+a)**(5/4),x)
```

```
[Out] -1/(5*a*x**5*(a + b*x**4)**(1/4)) - 6*b*x*(a/(b*x**4) + 1)**(1/4)
*Integral((a*x**2/b + 1)**(-5/4), (x, x**(-2)))/(5*a**2*(a + b*x*
*4)**(1/4)) + 6*b/(5*a**2*x*(a + b*x**4)**(1/4))
```

Mathematica [C] time = 0.0644839, size = 83, normalized size = 0.79

$$\frac{-a^2-8b^2x^8\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)+6abx^4+12b^2x^8}{5a^3x^5\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^6*(a + b*x^4)^(5/4)),x]
```

```
[Out] (-a^2 + 6*a*b*x^4 + 12*b^2*x^8 - 8*b^2*x^8*(1 + (b*x^4)/a)^(1/4)*
Hypergeometric2F1[1/4, 3/4, 7/4, -((b*x^4)/a)])/(5*a^3*x^5*(a + b
*x^4)^(1/4))
```

Maple [F] time = 0.077, size = 0, normalized size = 0.

$$\int \frac{1}{x^{6}} \left(b x^{4}+a \right)^{-\frac{5}{4}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^6/(b*x^4+a)^(5/4),x)
```

```
[Out] int(1/x^6/(b*x^4+a)^(5/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4 + a)^{\frac{5}{4}} x^6} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^6),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x^4 + a)^(5/4)*x^6), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(bx^{10} + ax^6)(bx^4 + a)^{\frac{1}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^6),x, algorithm="fricas")
```

```
[Out] integral(1/((b*x^10 + a*x^6)*(b*x^4 + a)^(1/4)), x)
```

Sympy [A] time = 7.03511, size = 44, normalized size = 0.42

$$\frac{\Gamma\left(-\frac{5}{4}\right) {}_{2}F_{1}\left(\begin{matrix} -\frac{5}{4}, \frac{5}{4} \\ -\frac{1}{4} \end{matrix}\middle| {\frac{bx^{4}e^{i\pi}}{a}} \right)}{4a^{\frac{5}{4}}x^{5}\Gamma\left(-\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**6/(b*x**4+a)**(5/4),x)
```

```
[Out] gamma(-5/4)*hyper((-5/4, 5/4), (-1/4,), b*x**4*exp_polar(I*pi)/a)
/(4*a**(5/4)*x**5*gamma(-1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4 + a)^{\frac{5}{4}} x^6} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^6),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^4 + a)^(5/4)*x^6), x)
```

3.1166 $\int \frac{1}{x^{10}(a+bx^4)^{5/4}}\,dx$

Optimal. Leaf size=129

$$\frac{8b^{5/2}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{3a^{7/2}\sqrt[4]{a+bx^4}}-\frac{4b^2}{3a^3x\sqrt[4]{a+bx^4}}+\frac{2b}{9a^2x^5\sqrt[4]{a+bx^4}}-\frac{1}{9ax^9\sqrt[4]{a+bx^4}}$$

```
[Out] -1/(9*a*x^9*(a + b*x^4)^(1/4)) + (2*b)/(9*a^2*x^5*(a + b*x^4)^(1/
4)) - (4*b^2)/(3*a^3*x*(a + b*x^4)^(1/4)) + (8*b^(5/2)*(1 + a/(b*
x^4))^(1/4)*x*EllipticE[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(3*a
^(7/2)*(a + b*x^4)^(1/4))
```

Rubi [A] time = 0.178053, antiderivative size = 129, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{8b^{5/2}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{3a^{7/2}\sqrt[4]{a+bx^4}}-\frac{4b^2}{3a^3x\sqrt[4]{a+bx^4}}+\frac{2b}{9a^2x^5\sqrt[4]{a+bx^4}}-\frac{1}{9ax^9\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^10*(a + b*x^4)^(5/4)),x]
```

```
[Out] -1/(9*a*x^9*(a + b*x^4)^(1/4)) + (2*b)/(9*a^2*x^5*(a + b*x^4)^(1/
4)) - (4*b^2)/(3*a^3*x*(a + b*x^4)^(1/4)) + (8*b^(5/2)*(1 + a/(b*
x^4))^(1/4)*x*EllipticE[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(3*a
^(7/2)*(a + b*x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{9ax^9\sqrt[4]{a+bx^4}}+\frac{2b}{9a^2x^5\sqrt[4]{a+bx^4}}-\frac{4b^2x\sqrt[4]{\frac{a}{bx^4}+1}\int^{\frac{1}{x^2}}\frac{1}{\sqrt[4]{\frac{ax^2}{b}+1}}\,dx}{3a^3\sqrt[4]{a+bx^4}}+\frac{4b^2}{3a^3x\sqrt[4]{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**10/(b*x**4+a)**(5/4),x)
```

```
[Out] -1/(9*a*x**9*(a + b*x**4)**(1/4)) + 2*b/(9*a**2*x**5*(a + b*x**4)
**(1/4)) - 4*b**2*x*(a/(b*x**4) + 1)**(1/4)*Integral((a*x**2/b +
1)**(-1/4), (x, x**(-2)))/(3*a**3*(a + b*x**4)**(1/4)) + 4*b**2/(
3*a**3*x*(a + b*x**4)**(1/4))
```

Mathematica [C] time = 0.0756725, size = 94, normalized size = 0.73

$$\frac{-a^3+2a^2bx^4+16b^3x^{12}\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)-12ab^2x^8-24b^3x^{12}}{9a^4x^9\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^10*(a + b*x^4)^(5/4)),x]
```

```
[Out] (-a^3 + 2*a^2*b*x^4 - 12*a*b^2*x^8 - 24*b^3*x^12 + 16*b^3*x^12*(1
 + (b*x^4)/a)^(1/4)*Hypergeometric2F1[1/4, 3/4, 7/4, -((b*x^4)/a)
])/(9*a^4*x^9*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.087, size = 0, normalized size = 0.

$$\int \frac{1}{x^{10}} \left(bx^4 + a\right)^{-\frac{5}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^10/(b*x^4+a)^(5/4),x)
```

```
[Out] int(1/x^10/(b*x^4+a)^(5/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4 + a)^{\frac{5}{4}} x^{10}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^10),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x^4 + a)^(5/4)*x^10), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(bx^{14} + ax^{10})(bx^4 + a)^{\frac{1}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^10),x, algorithm="fricas")
```

```
[Out] integral(1/((b*x^14 + a*x^10)*(b*x^4 + a)^(1/4)), x)
```

Sympy [A] time = 14.8666, size = 44, normalized size = 0.34

$$\frac{\Gamma\left(-\frac{9}{4}\right) {}_2F_1\left(\begin{matrix} -\frac{9}{4}, \frac{5}{4} \\ -\frac{5}{4} \end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{4a^{\frac{5}{4}} x^9 \Gamma\left(-\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**10/(b*x**4+a)**(5/4),x)
```

```
[Out] gamma(-9/4)*hyper((-9/4, 5/4), (-5/4,), b*x**4*exp_polar(I*pi)/a)
/(4*a**(5/4)*x**9*gamma(-5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4+a)^{\frac{5}{4}}x^{10}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^10),x, algorithm="giac")

[Out] integrate(1/((b*x^4 + a)^(5/4)*x^10), x)
```

3.1167 $\int \frac{1}{x^{14}(a+bx^4)^{5/4}}\,dx$

Optimal. Leaf size=153

$$-\frac{112b^{7/2}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{39a^{9/2}\sqrt[4]{a+bx^4}}+\frac{56b^3}{39a^4x\sqrt[4]{a+bx^4}}-\frac{28b^2}{117a^3x^5\sqrt[4]{a+bx^4}}+\frac{14b}{117a^2x^9\sqrt[4]{a+bx^4}}-\frac{1}{13ax^{13}\sqrt[4]{a+bx^4}}$$

```
[Out] -1/(13*a*x^13*(a + b*x^4)^(1/4)) + (14*b)/(117*a^2*x^9*(a + b*x^4
)^(1/4)) - (28*b^2)/(117*a^3*x^5*(a + b*x^4)^(1/4)) + (56*b^3)/(3
9*a^4*x*(a + b*x^4)^(1/4)) - (112*b^(7/2)*(1 + a/(b*x^4))^(1/4)*x
*EllipticE[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(39*a^(9/2)*(a +
b*x^4)^(1/4))
```

Rubi [A] time = 0.213358, antiderivative size = 153, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{112b^{7/2}x\sqrt[4]{\frac{a}{bx^4}+1}E\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{39a^{9/2}\sqrt[4]{a+bx^4}}+\frac{56b^3}{39a^4x\sqrt[4]{a+bx^4}}-\frac{28b^2}{117a^3x^5\sqrt[4]{a+bx^4}}+\frac{14b}{117a^2x^9\sqrt[4]{a+bx^4}}-\frac{1}{13ax^{13}\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^14*(a + b*x^4)^(5/4)),x]
```

```
[Out] -1/(13*a*x^13*(a + b*x^4)^(1/4)) + (14*b)/(117*a^2*x^9*(a + b*x^4
)^(1/4)) - (28*b^2)/(117*a^3*x^5*(a + b*x^4)^(1/4)) + (56*b^3)/(3
9*a^4*x*(a + b*x^4)^(1/4)) - (112*b^(7/2)*(1 + a/(b*x^4))^(1/4)*x
*EllipticE[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(39*a^(9/2)*(a +
b*x^4)^(1/4))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{13ax^{13}\sqrt[4]{a+bx^4}}+\frac{14b}{117a^2x^9\sqrt[4]{a+bx^4}}-\frac{28b^2}{117a^3x^5\sqrt[4]{a+bx^4}}-\frac{56b^3x\sqrt[4]{\frac{a}{bx^4}+1}\int^{\frac{1}{x^2}}\frac{1}{\left(\frac{ax^2}{b}+1\right)^{\frac{5}{4}}}\,dx}{39a^4\sqrt[4]{a+bx^4}}+\frac{56b^3}{39a^4x\sqrt[4]{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**14/(b*x**4+a)**(5/4),x)
```

```
[Out] -1/(13*a*x**13*(a + b*x**4)**(1/4)) + 14*b/(117*a**2*x**9*(a + b*
x**4)**(1/4)) - 28*b**2/(117*a**3*x**5*(a + b*x**4)**(1/4)) - 56*
b**3*x*(a/(b*x**4) + 1)**(1/4)*Integral((a*x**2/b + 1)**(-5/4), (
x, x**(-2)))/(39*a**4*(a + b*x**4)**(1/4)) + 56*b**3/(39*a**4*x*(
a + b*x**4)**(1/4))
```

Mathematica [C] time = 0.089081, size = 105, normalized size = 0.69

$$\frac{-9a^4+14a^3bx^4-28a^2b^2x^8-224b^4x^{16}\sqrt[4]{\frac{bx^4}{a}+1}\,{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{7}{4};-\frac{bx^4}{a}\right)+168ab^3x^{12}+336b^4x^{16}}{117a^5x^{13}\sqrt[4]{a+bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^14*(a + b*x^4)^(5/4)),x]
```

```
[Out] (-9*a^4 + 14*a^3*b*x^4 - 28*a^2*b^2*x^8 + 168*a*b^3*x^12 + 336*b^
4*x^16 - 224*b^4*x^16*(1 + (b*x^4)/a)^(1/4)*Hypergeometric2F1[1/4
, 3/4, 7/4, -((b*x^4)/a)])/(117*a^5*x^13*(a + b*x^4)^(1/4))
```

Maple [F] time = 0.096, size = 0, normalized size = 0.

$$\int \frac{1}{x^{14}} \left(bx^4 + a\right)^{-\frac{5}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^14/(b*x^4+a)^(5/4),x)
```

```
[Out] int(1/x^14/(b*x^4+a)^(5/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4 + a)^{\frac{5}{4}} x^{14}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^14),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x^4 + a)^(5/4)*x^14), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(bx^{18} + ax^{14})(bx^4 + a)^{\frac{1}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^14),x, algorithm="fricas")
```

```
[Out] integral(1/((b*x^18 + a*x^14)*(b*x^4 + a)^(1/4)), x)
```

Sympy [A] time = 30.8014, size = 44, normalized size = 0.29

$$\frac{\Gamma\left(-\frac{13}{4}\right) {}_2F_1\left(\begin{matrix} -\frac{13}{4}, \frac{5}{4} \\ -\frac{9}{4} \end{matrix}\middle| \frac{bx^4 e^{i\pi}}{a}\right)}{4a^{\frac{5}{4}} x^{13} \Gamma\left(-\frac{9}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**14/(b*x**4+a)**(5/4),x)
```

```
[Out] gamma(-13/4)*hyper((-13/4, 5/4), (-9/4,), b*x**4*exp_polar(I*pi)/
a)/(4*a**(5/4)*x**13*gamma(-9/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4+a)^{\frac{5}{4}}x^{14}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^4 + a)^(5/4)*x^14),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^4 + a)^(5/4)*x^14), x)
```

3.1168 $\int \frac{1}{(a+bx^4)^{7/4}}\,dx$

Optimal. Leaf size=83

$$\frac{x}{3a(a+bx^4)^{3/4}}-\frac{2\sqrt{b}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{3a^{3/2}(a+bx^4)^{3/4}}$$

```
[Out] x/(3*a*(a + b*x^4)^(3/4)) - (2*Sqrt[b]*(1 + a/(b*x^4))^(3/4)*x^3*
EllipticF[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(3*a^(3/2)*(a + b*
x^4)^(3/4))
```

Rubi [A] time = 0.0893953, antiderivative size = 83, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.454

$$\frac{x}{3a(a+bx^4)^{3/4}}-\frac{2\sqrt{b}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{3a^{3/2}(a+bx^4)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(-7/4),x]
```

```
[Out] x/(3*a*(a + b*x^4)^(3/4)) - (2*Sqrt[b]*(1 + a/(b*x^4))^(3/4)*x^3*
EllipticF[ArcCot[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(3*a^(3/2)*(a + b*
x^4)^(3/4))
```

Rubi in Sympy [A] time = 10.1808, size = 71, normalized size = 0.86

$$\frac{x}{3a(a+bx^4)^{\frac{3}{4}}}-\frac{2\sqrt{b}x^3\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{3a^{\frac{3}{2}}(a+bx^4)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**4+a)**(7/4),x)
```

```
[Out] x/(3*a*(a + b*x**4)**(3/4)) - 2*sqrt(b)*x**3*(a/(b*x**4) + 1)**(3
/4)*elliptic_f(atan(sqrt(a)/(sqrt(b)*x**2))/2, 2)/(3*a**(3/2)*(a
+ b*x**4)**(3/4))
```

Mathematica [C] time = 0.0408605, size = 56, normalized size = 0.67

$$\frac{2x\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};-\frac{bx^4}{a}\right)+x}{3a(a+bx^4)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(-7/4),x]
```

```
[Out] (x + 2*x*(1 + (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/4, 3/4, 5/4, -
((b*x^4)/a)])/(3*a*(a + b*x^4)^(3/4))
```

Maple [F] time = 0.049, size = 0, normalized size = 0.

$$\int \left(b x^4+a\right)^{-\frac{7}{4}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^4+a)^(7/4),x)

[Out] int(1/(b*x^4+a)^(7/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(b x^4+a\right)^{\frac{7}{4}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(-7/4),x, algorithm="maxima")

[Out] integrate((b*x^4 + a)^(-7/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{1}{\left(b x^4+a\right)^{\frac{7}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(-7/4),x, algorithm="fricas")

[Out] integral((b*x^4 + a)^(-7/4), x)
```

Sympy [A] time = 3.56327, size = 36, normalized size = 0.43

$$\frac{x\Gamma\left(\frac{1}{4}\right) {}_2F_1\left(\begin{matrix} \frac{1}{4}, \frac{7}{4} \\ \frac{5}{4} \end{matrix}\middle| \frac{b x^4 e^{i\pi}}{a}\right)}{4a^{\frac{7}{4}}\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**4+a)**(7/4),x)

[Out] x*gamma(1/4)*hyper((1/4, 7/4), (5/4,), b*x**4*exp_polar(I*pi)/a)/
(4*a**(7/4)*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(b x^4+a\right)^{\frac{7}{4}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(-7/4),x, algorithm="giac")

[Out] integrate((b*x^4 + a)^(-7/4), x)
```

3.1169 $\int \frac{1}{(a+bx^4)^{9/4}} dx$

Optimal. Leaf size=39

$$\frac{4x}{5a^2\sqrt[4]{a+bx^4}}+\frac{x}{5a(a+bx^4)^{5/4}}$$

[Out] x/(5*a*(a + b*x^4)^(5/4)) + (4*x)/(5*a^2*(a + b*x^4)^(1/4))

Rubi [A] time = 0.0195116, antiderivative size = 39, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{4x}{5a^2\sqrt[4]{a+bx^4}}+\frac{x}{5a(a+bx^4)^{5/4}}$$

Antiderivative was successfully verified.

[In] Int[(a + b*x^4)^(-9/4),x]

[Out] x/(5*a*(a + b*x^4)^(5/4)) + (4*x)/(5*a^2*(a + b*x^4)^(1/4))

Rubi in Sympy [A] time = 2.00274, size = 32, normalized size = 0.82

$$\frac{x}{5a(a+bx^4)^{\frac{5}{4}}}+\frac{4x}{5a^2\sqrt[4]{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(1/(b*x**4+a)**(9/4),x)

[Out] x/(5*a*(a + b*x**4)**(5/4)) + 4*x/(5*a**2*(a + b*x**4)**(1/4))

Mathematica [A] time = 0.0234234, size = 29, normalized size = 0.74

$$\frac{x(5a+4bx^4)}{5a^2(a+bx^4)^{5/4}}$$

Antiderivative was successfully verified.

[In] Integrate[(a + b*x^4)^(-9/4),x]

[Out] (x*(5*a + 4*b*x^4))/(5*a^2*(a + b*x^4)^(5/4))

Maple [A] time = 0.005, size = 26, normalized size = 0.7

$$\frac{x(4bx^4+5a)}{5a^2}(bx^4+a)^{-\frac{5}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(b*x^4+a)^(9/4),x)

[Out] 1/5*x*(4*b*x^4+5*a)/(b*x^4+a)^(5/4)/a^2

Maxima [A] time = 1.43144, size = 42, normalized size = 1.08

$$-\frac{\left(b - \frac{5\,(bx^4+a)}{x^4}\right)x^5}{5\,(bx^4+a)^{\frac{5}{4}}a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(-9/4),x, algorithm="maxima")
```

```
[Out] -1/5*(b - 5*(b*x^4 + a)/x^4)*x^5/((b*x^4 + a)^(5/4)*a^2)
```

Fricas [A] time = 0.249322, size = 63, normalized size = 1.62

$$\frac{\left(4\,bx^5 + 5\,ax\right)\left(bx^4 + a\right)^{\frac{3}{4}}}{5\,(a^2b^2x^8 + 2\,a^3bx^4 + a^4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(-9/4),x, algorithm="fricas")
```

```
[Out] 1/5*(4*b*x^5 + 5*a*x)*(b*x^4 + a)^(3/4)/(a^2*b^2*x^8 + 2*a^3*b*x^
4 + a^4)
```

Sympy [A] time = 6.95164, size = 126, normalized size = 3.23

$$\frac{5ax\,\Gamma\left(\frac{1}{4}\right)}{16a^{\frac{13}{4}}\sqrt[4]{1+\frac{bx^4}{a}}\,\Gamma\left(\frac{9}{4}\right) + 16a^{\frac{9}{4}}bx^4\sqrt[4]{1+\frac{bx^4}{a}}\,\Gamma\left(\frac{9}{4}\right)} + \frac{4bx^5\,\Gamma\left(\frac{1}{4}\right)}{16a^{\frac{13}{4}}\sqrt[4]{1+\frac{bx^4}{a}}\,\Gamma\left(\frac{9}{4}\right) + 16a^{\frac{9}{4}}bx^4\sqrt[4]{1+\frac{bx^4}{a}}\,\Gamma\left(\frac{9}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**4+a)**(9/4),x)
```

```
[Out] 5*a*x*gamma(1/4)/(16*a**(13/4)*(1 + b*x**4/a)**(1/4)*gamma(9/4) +
 16*a**(9/4)*b*x**4*(1 + b*x**4/a)**(1/4)*gamma(9/4)) + 4*b*x**5*
gamma(1/4)/(16*a**(13/4)*(1 + b*x**4/a)**(1/4)*gamma(9/4) + 16*a*
*(9/4)*b*x**4*(1 + b*x**4/a)**(1/4)*gamma(9/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4+a)^{\frac{9}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(-9/4),x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(-9/4), x)
```

3.1170 $\int \frac{1}{(a+bx^4)^{11/4}}\,dx$

Optimal. Leaf size=102

$$-\frac{4\sqrt{b}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{7a^{5/2}\left(a+bx^4\right)^{3/4}}+\frac{2x}{7a^2\left(a+bx^4\right)^{3/4}}+\frac{x}{7a\left(a+bx^4\right)^{7/4}}$$

```
[Out] x/(7*a*(a + b*x^4)^(7/4)) + (2*x)/(7*a^2*(a + b*x^4)^(3/4)) - (4*
Sqrt[b]*(1 + a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCot[(Sqrt[b]*x^2)/
Sqrt[a]]/2, 2])/(7*a^(5/2)*(a + b*x^4)^(3/4))
```

Rubi [A] time = 0.111077, antiderivative size = 102, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.454

$$-\frac{4\sqrt{b}x^3\left(\frac{a}{bx^4}+1\right)^{3/4}F\left(\frac{1}{2}\cot^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{7a^{5/2}\left(a+bx^4\right)^{3/4}}+\frac{2x}{7a^2\left(a+bx^4\right)^{3/4}}+\frac{x}{7a\left(a+bx^4\right)^{7/4}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(-11/4),x]
```

```
[Out] x/(7*a*(a + b*x^4)^(7/4)) + (2*x)/(7*a^2*(a + b*x^4)^(3/4)) - (4*
Sqrt[b]*(1 + a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCot[(Sqrt[b]*x^2)/
Sqrt[a]]/2, 2])/(7*a^(5/2)*(a + b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 12.3813, size = 90, normalized size = 0.88

$$\frac{x}{7a\left(a+bx^4\right)^{\frac{7}{4}}}+\frac{2x}{7a^2\left(a+bx^4\right)^{\frac{3}{4}}}-\frac{4\sqrt{b}x^3\left(\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{atan}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{7a^{\frac{5}{2}}\left(a+bx^4\right)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**4+a)**(11/4),x)
```

```
[Out] x/(7*a*(a + b*x**4)**(7/4)) + 2*x/(7*a**2*(a + b*x**4)**(3/4)) -
4*sqrt(b)*x**3*(a/(b*x**4) + 1)**(3/4)*elliptic_f(atan(sqrt(a)/(s
qrt(b)*x**2))/2, 2)/(7*a**(5/2)*(a + b*x**4)**(3/4))
```

Mathematica [C] time = 0.0812744, size = 72, normalized size = 0.71

$$\frac{4x\left(a+bx^4\right)\left(\frac{bx^4}{a}+1\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};-\frac{bx^4}{a}\right)+3ax+2bx^5}{7a^2\left(a+bx^4\right)^{7/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(-11/4),x]
```

```
[Out] (3*a*x + 2*b*x^5 + 4*x*(a + b*x^4)*(1 + (b*x^4)/a)^(3/4)*Hypergeo
metric2F1[1/4, 3/4, 5/4, -((b*x^4)/a)])/(7*a^2*(a + b*x^4)^(7/4))
```

Maple [F] time = 0.048, size = 0, normalized size = 0.

$$\int \left(bx^4 + a\right)^{-\frac{11}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^4+a)^(11/4),x)

[Out] int(1/(b*x^4+a)^(11/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4 + a)^{\frac{11}{4}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(-11/4),x, algorithm="maxima")

[Out] integrate((b*x^4 + a)^(-11/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(b^2x^8 + 2\,abx^4 + a^2)(bx^4 + a)^{\frac{3}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(-11/4),x, algorithm="fricas")

[Out] integral(1/((b^2*x^8 + 2*a*b*x^4 + a^2)*(b*x^4 + a)^(3/4)), x)
```

Sympy [A] time = 14.7711, size = 36, normalized size = 0.35

$$\frac{x\,\Gamma\left(\frac{1}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{4}, \frac{11}{4} \\ \frac{5}{4}\end{matrix}\middle| \frac{bx^4e^{i\pi}}{a}\right)}{4a^{\frac{11}{4}}\,\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**4+a)**(11/4),x)

[Out] x*gamma(1/4)*hyper((1/4, 11/4), (5/4,), b*x**4*exp_polar(I*pi)/a)
/(4*a**(11/4)*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4 + a)^{\frac{11}{4}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(-11/4),x, algorithm="giac")

[Out] integrate((b*x^4 + a)^(-11/4), x)
```

3.1171 $\int \frac{1}{(a+bx^4)^{13/4}} \, dx$

Optimal. Leaf size=58

$$\frac{32x}{45a^3\sqrt[4]{a+bx^4}}+\frac{8x}{45a^2\left(a+bx^4\right)^{5/4}}+\frac{x}{9a\left(a+bx^4\right)^{9/4}}$$

```
[Out] x/(9*a*(a + b*x^4)^(9/4)) + (8*x)/(45*a^2*(a + b*x^4)^(5/4)) + (3
2*x)/(45*a^3*(a + b*x^4)^(1/4))
```

Rubi [A] time = 0.0312665, antiderivative size = 58, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$

$$\frac{32x}{45a^3\sqrt[4]{a+bx^4}}+\frac{8x}{45a^2\left(a+bx^4\right)^{5/4}}+\frac{x}{9a\left(a+bx^4\right)^{9/4}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(-13/4),x]
```

```
[Out] x/(9*a*(a + b*x^4)^(9/4)) + (8*x)/(45*a^2*(a + b*x^4)^(5/4)) + (3
2*x)/(45*a^3*(a + b*x^4)^(1/4))
```

Rubi in Sympy [A] time = 3.28533, size = 51, normalized size = 0.88

$$\frac{x}{9a\left(a+bx^4\right)^{\frac{9}{4}}}+\frac{8x}{45a^2\left(a+bx^4\right)^{\frac{5}{4}}}+\frac{32x}{45a^3\sqrt[4]{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**4+a)**(13/4),x)
```

```
[Out] x/(9*a*(a + b*x**4)**(9/4)) + 8*x/(45*a**2*(a + b*x**4)**(5/4)) +
 32*x/(45*a**3*(a + b*x**4)**(1/4))
```

Mathematica [A] time = 0.0301808, size = 40, normalized size = 0.69

$$\frac{x\left(45a^2+72abx^4+32b^2x^8\right)}{45a^3\left(a+bx^4\right)^{9/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(-13/4),x]
```

```
[Out] (x*(45*a^2 + 72*a*b*x^4 + 32*b^2*x^8))/(45*a^3*(a + b*x^4)^(9/4))
```

Maple [A] time = 0.005, size = 37, normalized size = 0.6

$$\frac{x\left(32\,b^2x^8+72\,abx^4+45\,a^2\right)}{45\,a^3}\left(bx^4+a\right)^{-\frac{9}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^4+a)^(13/4),x)

[Out] 1/45*x*(32*b^2*x^8+72*a*b*x^4+45*a^2)/(b*x^4+a)^(9/4)/a^3
```

Maxima [A] time = 1.44408, size = 68, normalized size = 1.17

$$\frac{\left(5\,b^2 - \frac{18\,(bx^4+a)\,b}{x^4} + \frac{45\,(bx^4+a)^2}{x^8}\right)x^9}{45\,(bx^4+a)^{\frac{9}{4}}a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(-13/4),x, algorithm="maxima")

[Out] 1/45*(5*b^2 - 18*(b*x^4 + a)*b/x^4 + 45*(b*x^4 + a)^2/x^8)*x^9/((
b*x^4 + a)^(9/4)*a^3)
```

Fricas [A] time = 0.237761, size = 93, normalized size = 1.6

$$\frac{\left(32\,b^2x^9 + 72\,abx^5 + 45\,a^2x\right)\left(bx^4+a\right)^{\frac{3}{4}}}{45\,(a^3b^3x^{12} + 3\,a^4b^2x^8 + 3\,a^5bx^4 + a^6)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(-13/4),x, algorithm="fricas")

[Out] 1/45*(32*b^2*x^9 + 72*a*b*x^5 + 45*a^2*x)*(b*x^4 + a)^(3/4)/(a^3*
b^3*x^12 + 3*a^4*b^2*x^8 + 3*a^5*b*x^4 + a^6)
```

Sympy [A] time = 30.2269, size = 515, normalized size = 8.88

$$\frac{45a^5x\,\Gamma\left(\frac{1}{4}\right)}{64a^{\frac{33}{4}}\sqrt[4]{1+\frac{bx^4}{a}}\,\Gamma\left(\frac{13}{4}\right) + 192a^{\frac{29}{4}}bx^4\sqrt[4]{1+\frac{bx^4}{a}}\,\Gamma\left(\frac{13}{4}\right) + 192a^{\frac{25}{4}}b^2x^8\sqrt[4]{1+\frac{bx^4}{a}}\,\Gamma\left(\frac{13}{4}\right) + 64a^{\frac{21}{4}}b^3x^{12}\sqrt[4]{1+\frac{bx^4}{a}}\,\Gamma\left(\frac{13}{4}\right)}$$
$$+\frac{117a^4bx^5\,\Gamma\left(\frac{1}{4}\right)}{64a^{\frac{33}{4}}\sqrt[4]{1+\frac{bx^4}{a}}\,\Gamma\left(\frac{13}{4}\right) + 192a^{\frac{29}{4}}bx^4\sqrt[4]{1+\frac{bx^4}{a}}\,\Gamma\left(\frac{13}{4}\right) + 192a^{\frac{25}{4}}b^2x^8\sqrt[4]{1+\frac{bx^4}{a}}\,\Gamma\left(\frac{13}{4}\right) + 64a^{\frac{21}{4}}b^3x^{12}\sqrt[4]{1+\frac{bx^4}{a}}\,\Gamma\left(\frac{13}{4}\right)}$$
$$+\frac{104a^3b^2x^9\,\Gamma\left(\frac{1}{4}\right)}{64a^{\frac{33}{4}}\sqrt[4]{1+\frac{bx^4}{a}}\,\Gamma\left(\frac{13}{4}\right) + 192a^{\frac{29}{4}}bx^4\sqrt[4]{1+\frac{bx^4}{a}}\,\Gamma\left(\frac{13}{4}\right) + 192a^{\frac{25}{4}}b^2x^8\sqrt[4]{1+\frac{bx^4}{a}}\,\Gamma\left(\frac{13}{4}\right) + 64a^{\frac{21}{4}}b^3x^{12}\sqrt[4]{1+\frac{bx^4}{a}}\,\Gamma\left(\frac{13}{4}\right)}$$
$$+\frac{32a^2b^3x^{13}\,\Gamma\left(\frac{1}{4}\right)}{64a^{\frac{33}{4}}\sqrt[4]{1+\frac{bx^4}{a}}\,\Gamma\left(\frac{13}{4}\right) + 192a^{\frac{29}{4}}bx^4\sqrt[4]{1+\frac{bx^4}{a}}\,\Gamma\left(\frac{13}{4}\right) + 192a^{\frac{25}{4}}b^2x^8\sqrt[4]{1+\frac{bx^4}{a}}\,\Gamma\left(\frac{13}{4}\right) + 64a^{\frac{21}{4}}b^3x^{12}\sqrt[4]{1+\frac{bx^4}{a}}\,\Gamma\left(\frac{13}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**4+a)**(13/4),x)

[Out] 45*a**5*x*gamma(1/4)/(64*a**(33/4)*(1 + b*x**4/a)**(1/4)*gamma(13
/4) + 192*a**(29/4)*b*x**4*(1 + b*x**4/a)**(1/4)*gamma(13/4) + 19
2*a**(25/4)*b**2*x**8*(1 + b*x**4/a)**(1/4)*gamma(13/4) + 64*a**(
21/4)*b**3*x**12*(1 + b*x**4/a)**(1/4)*gamma(13/4)) + 117*a**4*b*
x**5*gamma(1/4)/(64*a**(33/4)*(1 + b*x**4/a)**(1/4)*gamma(13/4) +
 192*a**(29/4)*b*x**4*(1 + b*x**4/a)**(1/4)*gamma(13/4) + 192*a**
(25/4)*b**2*x**8*(1 + b*x**4/a)**(1/4)*gamma(13/4) + 64*a**(21/4)
```

```
*b**3*x**12*(1 + b*x**4/a)**(1/4)*gamma(13/4)) + 104*a**3*b**2*x*
*9*gamma(1/4)/(64*a**(33/4)*(1 + b*x**4/a)**(1/4)*gamma(13/4) + 1
92*a**(29/4)*b*x**4*(1 + b*x**4/a)**(1/4)*gamma(13/4) + 192*a**(2
5/4)*b**2*x**8*(1 + b*x**4/a)**(1/4)*gamma(13/4) + 64*a**(21/4)*b
**3*x**12*(1 + b*x**4/a)**(1/4)*gamma(13/4)) + 32*a**2*b**3*x**13
*gamma(1/4)/(64*a**(33/4)*(1 + b*x**4/a)**(1/4)*gamma(13/4) + 192
*a**(29/4)*b*x**4*(1 + b*x**4/a)**(1/4)*gamma(13/4) + 192*a**(25/
4)*b**2*x**8*(1 + b*x**4/a)**(1/4)*gamma(13/4) + 64*a**(21/4)*b**
3*x**12*(1 + b*x**4/a)**(1/4)*gamma(13/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4 + a)^{\frac{13}{4}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(-13/4),x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(-13/4), x)
```

3.1172 $\int \frac{1}{(a+bx^4)^{17/4}} dx$

Optimal. Leaf size=77

$$\frac{128x}{195a^4\sqrt[4]{a+bx^4}}+\frac{32x}{195a^3(a+bx^4)^{5/4}}+\frac{4x}{39a^2(a+bx^4)^{9/4}}+\frac{x}{13a(a+bx^4)^{13/4}}$$

```
[Out] x/(13*a*(a + b*x^4)^(13/4)) + (4*x)/(39*a^2*(a + b*x^4)^(9/4)) +
(32*x)/(195*a^3*(a + b*x^4)^(5/4)) + (128*x)/(195*a^4*(a + b*x^4)
^(1/4))
```

Rubi [A] time = 0.0446786, antiderivative size = 77, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{128x}{195a^4\sqrt[4]{a+bx^4}}+\frac{32x}{195a^3(a+bx^4)^{5/4}}+\frac{4x}{39a^2(a+bx^4)^{9/4}}+\frac{x}{13a(a+bx^4)^{13/4}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^4)^(-17/4),x]
```

```
[Out] x/(13*a*(a + b*x^4)^(13/4)) + (4*x)/(39*a^2*(a + b*x^4)^(9/4)) +
(32*x)/(195*a^3*(a + b*x^4)^(5/4)) + (128*x)/(195*a^4*(a + b*x^4)
^(1/4))
```

Rubi in Sympy [A] time = 4.94269, size = 70, normalized size = 0.91

$$\frac{x}{13a(a+bx^4)^{\frac{13}{4}}}+\frac{4x}{39a^2(a+bx^4)^{\frac{9}{4}}}+\frac{32x}{195a^3(a+bx^4)^{\frac{5}{4}}}+\frac{128x}{195a^4\sqrt[4]{a+bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**4+a)**(17/4),x)
```

```
[Out] x/(13*a*(a + b*x**4)**(13/4)) + 4*x/(39*a**2*(a + b*x**4)**(9/4))
 + 32*x/(195*a**3*(a + b*x**4)**(5/4)) + 128*x/(195*a**4*(a + b*x
**4)**(1/4))
```

Mathematica [A] time = 0.034681, size = 51, normalized size = 0.66

$$\frac{x(195a^3+468a^2bx^4+416ab^2x^8+128b^3x^{12})}{195a^4(a+bx^4)^{13/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^4)^(-17/4),x]
```

```
[Out] (x*(195*a^3 + 468*a^2*b*x^4 + 416*a*b^2*x^8 + 128*b^3*x^12))/(195
*a^4*(a + b*x^4)^(13/4))
```

Maple [A] time = 0.008, size = 48, normalized size = 0.6

$$\frac{x(128\,b^3x^{12}+416\,ab^2x^8+468\,a^2bx^4+195\,a^3)}{195\,a^4}(bx^4+a)^{-\frac{13}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^4+a)^(17/4),x)
```

```
[Out] 1/195*x*(128*b^3*x^12+416*a*b^2*x^8+468*a^2*b*x^4+195*a^3)/(b*x^4
+a)^(13/4)/a^4
```

Maxima [A] time = 1.43924, size = 90, normalized size = 1.17

$$-\frac{\left(15\,b^{3}-\frac{65\,(bx^{4}+a)\,b^{2}}{x^{4}}+\frac{117\,(bx^{4}+a)^{2}\,b}{x^{8}}-\frac{195\,(bx^{4}+a)^{3}}{x^{12}}\right)x^{13}}{195\,(bx^{4}+a)^{\frac{13}{4}}\,a^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(-17/4),x, algorithm="maxima")
```

```
[Out] -1/195*(15*b^3 - 65*(b*x^4 + a)*b^2/x^4 + 117*(b*x^4 + a)^2*b/x^8
 - 195*(b*x^4 + a)^3/x^12)*x^13/((b*x^4 + a)^(13/4)*a^4)
```

Fricas [A] time = 0.244398, size = 123, normalized size = 1.6

$$\frac{\left(128\,b^{3}x^{13}+416\,ab^{2}x^{9}+468\,a^{2}bx^{5}+195\,a^{3}x\right)\left(bx^{4}+a\right)^{\frac{3}{4}}}{195\,\left(a^{4}b^{4}x^{16}+4\,a^{5}b^{3}x^{12}+6\,a^{6}b^{2}x^{8}+4\,a^{7}bx^{4}+a^{8}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(-17/4),x, algorithm="fricas")
```

```
[Out] 1/195*(128*b^3*x^13 + 416*a*b^2*x^9 + 468*a^2*b*x^5 + 195*a^3*x)*
(b*x^4 + a)^(3/4)/(a^4*b^4*x^16 + 4*a^5*b^3*x^12 + 6*a^6*b^2*x^8
+ 4*a^7*b*x^4 + a^8)
```

Sympy [A] time = 114.815, size = 1550, normalized size = 20.13

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**4+a)**(17/4),x)
```

```
[Out] 585*a**14*x*gamma(1/4)/(256*a**(73/4)*(1 + b*x**4/a)**(1/4)*gamma
(17/4) + 1536*a**(69/4)*b*x**4*(1 + b*x**4/a)**(1/4)*gamma(17/4)
+ 3840*a**(65/4)*b**2*x**8*(1 + b*x**4/a)**(1/4)*gamma(17/4) + 51
20*a**(61/4)*b**3*x**12*(1 + b*x**4/a)**(1/4)*gamma(17/4) + 3840*
a**(57/4)*b**4*x**16*(1 + b*x**4/a)**(1/4)*gamma(17/4) + 1536*a**
(53/4)*b**5*x**20*(1 + b*x**4/a)**(1/4)*gamma(17/4) + 256*a**(49/
4)*b**6*x**24*(1 + b*x**4/a)**(1/4)*gamma(17/4)) + 3159*a**13*b*x
**5*gamma(1/4)/(256*a**(73/4)*(1 + b*x**4/a)**(1/4)*gamma(17/4) +
 1536*a**(69/4)*b*x**4*(1 + b*x**4/a)**(1/4)*gamma(17/4) + 3840*a
**(65/4)*b**2*x**8*(1 + b*x**4/a)**(1/4)*gamma(17/4) + 5120*a**(6
1/4)*b**3*x**12*(1 + b*x**4/a)**(1/4)*gamma(17/4) + 3840*a**(57/4
)*b**4*x**16*(1 + b*x**4/a)**(1/4)*gamma(17/4) + 1536*a**(53/4)*b
**5*x**20*(1 + b*x**4/a)**(1/4)*gamma(17/4) + 256*a**(49/4)*b**6*
x**24*(1 + b*x**4/a)**(1/4)*gamma(17/4)) + 7215*a**12*b**2*x**9*g
amma(1/4)/(256*a**(73/4)*(1 + b*x**4/a)**(1/4)*gamma(17/4) + 1536
*a**(69/4)*b*x**4*(1 + b*x**4/a)**(1/4)*gamma(17/4) + 3840*a**(65
/4)*b**2*x**8*(1 + b*x**4/a)**(1/4)*gamma(17/4) + 5120*a**(61/4)*
```

```
b**3*x**12*(1 + b*x**4/a)**(1/4)*gamma(17/4) + 3840*a**(57/4)*b**
4*x**16*(1 + b*x**4/a)**(1/4)*gamma(17/4) + 1536*a**(53/4)*b**5*x
**20*(1 + b*x**4/a)**(1/4)*gamma(17/4) + 256*a**(49/4)*b**6*x**24
*(1 + b*x**4/a)**(1/4)*gamma(17/4)) + 8925*a**11*b**3*x**13*gamma
(1/4)/(256*a**(73/4)*(1 + b*x**4/a)**(1/4)*gamma(17/4) + 1536*a**
(69/4)*b*x**4*(1 + b*x**4/a)**(1/4)*gamma(17/4) + 3840*a**(65/4)*
b**2*x**8*(1 + b*x**4/a)**(1/4)*gamma(17/4) + 5120*a**(61/4)*b**3
*x**12*(1 + b*x**4/a)**(1/4)*gamma(17/4) + 3840*a**(57/4)*b**4*x*
*16*(1 + b*x**4/a)**(1/4)*gamma(17/4) + 1536*a**(53/4)*b**5*x**20
*(1 + b*x**4/a)**(1/4)*gamma(17/4) + 256*a**(49/4)*b**6*x**24*(1
+ b*x**4/a)**(1/4)*gamma(17/4)) + 6300*a**10*b**4*x**17*gamma(1/4
)/(256*a**(73/4)*(1 + b*x**4/a)**(1/4)*gamma(17/4) + 1536*a**(69/
4)*b*x**4*(1 + b*x**4/a)**(1/4)*gamma(17/4) + 3840*a**(65/4)*b**2
*x**8*(1 + b*x**4/a)**(1/4)*gamma(17/4) + 5120*a**(61/4)*b**3*x**
12*(1 + b*x**4/a)**(1/4)*gamma(17/4) + 3840*a**(57/4)*b**4*x**16*
(1 + b*x**4/a)**(1/4)*gamma(17/4) + 1536*a**(53/4)*b**5*x**20*(1
+ b*x**4/a)**(1/4)*gamma(17/4) + 256*a**(49/4)*b**6*x**24*(1 + b*
x**4/a)**(1/4)*gamma(17/4)) + 2400*a**9*b**5*x**21*gamma(1/4)/(25
6*a**(73/4)*(1 + b*x**4/a)**(1/4)*gamma(17/4) + 1536*a**(69/4)*b*
x**4*(1 + b*x**4/a)**(1/4)*gamma(17/4) + 3840*a**(65/4)*b**2*x**8
*(1 + b*x**4/a)**(1/4)*gamma(17/4) + 5120*a**(61/4)*b**3*x**12*(1
 + b*x**4/a)**(1/4)*gamma(17/4) + 3840*a**(57/4)*b**4*x**16*(1 +
b*x**4/a)**(1/4)*gamma(17/4) + 1536*a**(53/4)*b**5*x**20*(1 + b*x
**4/a)**(1/4)*gamma(17/4) + 256*a**(49/4)*b**6*x**24*(1 + b*x**4/
a)**(1/4)*gamma(17/4)) + 384*a**8*b**6*x**25*gamma(1/4)/(256*a**(
73/4)*(1 + b*x**4/a)**(1/4)*gamma(17/4) + 1536*a**(69/4)*b*x**4*(
1 + b*x**4/a)**(1/4)*gamma(17/4) + 3840*a**(65/4)*b**2*x**8*(1 +
b*x**4/a)**(1/4)*gamma(17/4) + 5120*a**(61/4)*b**3*x**12*(1 + b*x
**4/a)**(1/4)*gamma(17/4) + 3840*a**(57/4)*b**4*x**16*(1 + b*x**4
/a)**(1/4)*gamma(17/4) + 1536*a**(53/4)*b**5*x**20*(1 + b*x**4/a)
**(1/4)*gamma(17/4) + 256*a**(49/4)*b**6*x**24*(1 + b*x**4/a)**(1
/4)*gamma(17/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^4+a)^{\frac{17}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^(-17/4),x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^(-17/4), x)
```

3.1173 $\int x^{19}\sqrt[4]{a-bx^4}\,dx$

Optimal. Leaf size=106

$$-\frac{a^4\left(a-bx^4\right)^{5/4}}{5b^5}+\frac{4a^3\left(a-bx^4\right)^{9/4}}{9b^5}-\frac{6a^2\left(a-bx^4\right)^{13/4}}{13b^5}-\frac{\left(a-bx^4\right)^{21/4}}{21b^5}+\frac{4a\left(a-bx^4\right)^{17/4}}{17b^5}$$

```
[Out] -(a^4*(a - b*x^4)^(5/4))/(5*b^5) + (4*a^3*(a - b*x^4)^(9/4))/(9*b
^5) - (6*a^2*(a - b*x^4)^(13/4))/(13*b^5) + (4*a*(a - b*x^4)^(17/
4))/(17*b^5) - (a - b*x^4)^(21/4)/(21*b^5)
```

Rubi [A] time = 0.134877, antiderivative size = 106, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125

$$-\frac{a^4\left(a-bx^4\right)^{5/4}}{5b^5}+\frac{4a^3\left(a-bx^4\right)^{9/4}}{9b^5}-\frac{6a^2\left(a-bx^4\right)^{13/4}}{13b^5}-\frac{\left(a-bx^4\right)^{21/4}}{21b^5}+\frac{4a\left(a-bx^4\right)^{17/4}}{17b^5}$$

Antiderivative was successfully verified.

```
[In]  Int[x^19*(a - b*x^4)^(1/4),x]
```

```
[Out] -(a^4*(a - b*x^4)^(5/4))/(5*b^5) + (4*a^3*(a - b*x^4)^(9/4))/(9*b
^5) - (6*a^2*(a - b*x^4)^(13/4))/(13*b^5) + (4*a*(a - b*x^4)^(17/
4))/(17*b^5) - (a - b*x^4)^(21/4)/(21*b^5)
```

Rubi in Sympy [A] time = 19.0817, size = 92, normalized size = 0.87

$$-\frac{a^4\left(a-bx^4\right)^{\frac{5}{4}}}{5b^5}+\frac{4a^3\left(a-bx^4\right)^{\frac{9}{4}}}{9b^5}-\frac{6a^2\left(a-bx^4\right)^{\frac{13}{4}}}{13b^5}+\frac{4a\left(a-bx^4\right)^{\frac{17}{4}}}{17b^5}-\frac{\left(a-bx^4\right)^{\frac{21}{4}}}{21b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**19*(-b*x**4+a)**(1/4),x)
```

```
[Out] -a**4*(a - b*x**4)**(5/4)/(5*b**5) + 4*a**3*(a - b*x**4)**(9/4)/(
9*b**5) - 6*a**2*(a - b*x**4)**(13/4)/(13*b**5) + 4*a*(a - b*x**4
)**(17/4)/(17*b**5) - (a - b*x**4)**(21/4)/(21*b**5)
```

Mathematica [A] time = 0.0365507, size = 73, normalized size = 0.69

$$-\frac{\sqrt[4]{a-bx^4}\left(2048a^5+512a^4bx^4+320a^3b^2x^8+240a^2b^3x^{12}+195ab^4x^{16}-3315b^5x^{20}\right)}{69615b^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^19*(a - b*x^4)^(1/4),x]
```

```
[Out] -((a - b*x^4)^(1/4)*(2048*a^5 + 512*a^4*b*x^4 + 320*a^3*b^2*x^8 +
 240*a^2*b^3*x^12 + 195*a*b^4*x^16 - 3315*b^5*x^20))/(69615*b^5)
```

Maple [A] time = 0.012, size = 59, normalized size = 0.6

$$-\frac{3315\,x^{16}b^4+3120\,ax^{12}b^3+2880\,a^2x^8b^2+2560\,a^3x^4b+2048\,a^4}{69615\,b^5}\left(-bx^4+a\right)^{\frac{5}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^19*(-b*x^4+a)^(1/4),x)
```

```
[Out] -1/69615*(-b*x^4+a)^(5/4)*(3315*b^4*x^16+3120*a*b^3*x^12+2880*a^2
*b^2*x^8+2560*a^3*b*x^4+2048*a^4)/b^5
```

Maxima [A] time = 1.445, size = 116, normalized size = 1.09

$$-\frac{(-bx^4+a)^{\frac{21}{4}}}{21\,b^5}+\frac{4\,(-bx^4+a)^{\frac{17}{4}}a}{17\,b^5}-\frac{6\,(-bx^4+a)^{\frac{13}{4}}a^2}{13\,b^5}+\frac{4\,(-bx^4+a)^{\frac{9}{4}}a^3}{9\,b^5}-\frac{(-bx^4+a)^{\frac{5}{4}}a^4}{5\,b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^19,x, algorithm="maxima")
```

```
[Out] -1/21*(-b*x^4 + a)^(21/4)/b^5 + 4/17*(-b*x^4 + a)^(17/4)*a/b^5 -
6/13*(-b*x^4 + a)^(13/4)*a^2/b^5 + 4/9*(-b*x^4 + a)^(9/4)*a^3/b^5
 - 1/5*(-b*x^4 + a)^(5/4)*a^4/b^5
```

Fricas [A] time = 0.240228, size = 93, normalized size = 0.88

$$\frac{(3315\,b^5x^{20}-195\,ab^4x^{16}-240\,a^2b^3x^{12}-320\,a^3b^2x^8-512\,a^4bx^4-2048\,a^5)(-bx^4+a)^{\frac{1}{4}}}{69615\,b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^19,x, algorithm="fricas")
```

```
[Out] 1/69615*(3315*b^5*x^20 - 195*a*b^4*x^16 - 240*a^2*b^3*x^12 - 320*
a^3*b^2*x^8 - 512*a^4*b*x^4 - 2048*a^5)*(-b*x^4 + a)^(1/4)/b^5
```

Sympy [A] time = 66.8801, size = 134, normalized size = 1.26

$$\begin{cases} -\frac{2048a^5\sqrt[4]{a-bx^4}}{69615b^5}-\frac{512a^4x^4\sqrt[4]{a-bx^4}}{69615b^4}-\frac{64a^3x^8\sqrt[4]{a-bx^4}}{13923b^3}-\frac{16a^2x^{12}\sqrt[4]{a-bx^4}}{4641b^2}-\frac{ax^{16}\sqrt[4]{a-bx^4}}{357b}+\frac{x^{20}\sqrt[4]{a-bx^4}}{21} & \text{for } b\neq 0 \\ \frac{\sqrt[4]{a}x^{20}}{20} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**19*(-b*x**4+a)**(1/4),x)
```

```
[Out] Piecewise((-2048*a**5*(a - b*x**4)**(1/4)/(69615*b**5) - 512*a**4
*x**4*(a - b*x**4)**(1/4)/(69615*b**4) - 64*a**3*x**8*(a - b*x**4
)**(1/4)/(13923*b**3) - 16*a**2*x**12*(a - b*x**4)**(1/4)/(4641*b
**2) - a*x**16*(a - b*x**4)**(1/4)/(357*b) + x**20*(a - b*x**4)**
(1/4)/21, Ne(b, 0)), (a**(1/4)*x**20/20, True))
```

GIAC/XCAS [A] time = 0.248959, size = 162, normalized size = 1.53

$$\frac{3315\,(bx^4-a)^5(-bx^4+a)^{\frac{1}{4}}+16380\,(bx^4-a)^4(-bx^4+a)^{\frac{1}{4}}a+32130\,(bx^4-a)^3(-bx^4+a)^{\frac{1}{4}}a^2+30940\,(bx^4-a)^2(-bx^4}{69615\,b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^19,x, algorithm="giac")
```

```
[Out] 1/69615*(3315*(b*x^4 - a)^5*(-b*x^4 + a)^(1/4) + 16380*(b*x^4 - a
)^4*(-b*x^4 + a)^(1/4)*a + 32130*(b*x^4 - a)^3*(-b*x^4 + a)^(1/4)
*a^2 + 30940*(b*x^4 - a)^2*(-b*x^4 + a)^(1/4)*a^3 - 13923*(-b*x^4
 + a)^(5/4)*a^4)/b^5
```

3.1174 $\int x^{15} \sqrt[4]{a - bx^4}\, dx$

Optimal. Leaf size=84

$$-\frac{a^3 (a - bx^4)^{5/4}}{5b^4} + \frac{a^2 (a - bx^4)^{9/4}}{3b^4} + \frac{(a - bx^4)^{17/4}}{17b^4} - \frac{3a (a - bx^4)^{13/4}}{13b^4}$$

```
[Out] -(a^3*(a - b*x^4)^(5/4))/(5*b^4) + (a^2*(a - b*x^4)^(9/4))/(3*b^4
) - (3*a*(a - b*x^4)^(13/4))/(13*b^4) + (a - b*x^4)^(17/4)/(17*b^
4)
```

Rubi [A] time = 0.113796, antiderivative size = 84, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$

$$-\frac{a^3 (a - bx^4)^{5/4}}{5b^4} + \frac{a^2 (a - bx^4)^{9/4}}{3b^4} + \frac{(a - bx^4)^{17/4}}{17b^4} - \frac{3a (a - bx^4)^{13/4}}{13b^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^15*(a - b*x^4)^(1/4),x]
```

```
[Out] -(a^3*(a - b*x^4)^(5/4))/(5*b^4) + (a^2*(a - b*x^4)^(9/4))/(3*b^4
) - (3*a*(a - b*x^4)^(13/4))/(13*b^4) + (a - b*x^4)^(17/4)/(17*b^
4)
```

Rubi in Sympy [A] time = 15.5245, size = 70, normalized size = 0.83

$$-\frac{a^3 (a - bx^4)^{\frac{5}{4}}}{5b^4} + \frac{a^2 (a - bx^4)^{\frac{9}{4}}}{3b^4} - \frac{3a (a - bx^4)^{\frac{13}{4}}}{13b^4} + \frac{(a - bx^4)^{\frac{17}{4}}}{17b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**15*(-b*x**4+a)**(1/4),x)
```

```
[Out] -a**3*(a - b*x**4)**(5/4)/(5*b**4) + a**2*(a - b*x**4)**(9/4)/(3*
b**4) - 3*a*(a - b*x**4)**(13/4)/(13*b**4) + (a - b*x**4)**(17/4)
/(17*b**4)
```

Mathematica [A] time = 0.0311001, size = 62, normalized size = 0.74

$$-\frac{\sqrt[4]{a - bx^4} (128a^4 + 32a^3bx^4 + 20a^2b^2x^8 + 15ab^3x^{12} - 195b^4x^{16})}{3315b^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^15*(a - b*x^4)^(1/4),x]
```

```
[Out] -((a - b*x^4)^(1/4)*(128*a^4 + 32*a^3*b*x^4 + 20*a^2*b^2*x^8 + 15
*a*b^3*x^12 - 195*b^4*x^16))/(3315*b^4)
```

Maple [A] time = 0.011, size = 48, normalized size = 0.6

$$-\frac{195\, b^3x^{12} + 180\, ab^2x^8 + 160\, a^2bx^4 + 128\, a^3}{3315\, b^4} (-bx^4 + a)^{\frac{5}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^15*(-b*x^4+a)^(1/4),x)
```

```
[Out] -1/3315*(-b*x^4+a)^(5/4)*(195*b^3*x^12+180*a*b^2*x^8+160*a^2*b*x^
4+128*a^3)/b^4
```

Maxima [A] time = 1.44135, size = 92, normalized size = 1.1

$$\frac{\left(-bx^4+a\right)^{\frac{17}{4}}}{17\,b^4} - \frac{3\left(-bx^4+a\right)^{\frac{13}{4}}a}{13\,b^4} + \frac{\left(-bx^4+a\right)^{\frac{9}{4}}a^2}{3\,b^4} - \frac{\left(-bx^4+a\right)^{\frac{5}{4}}a^3}{5\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^15,x, algorithm="maxima")
```

```
[Out] 1/17*(-b*x^4 + a)^(17/4)/b^4 - 3/13*(-b*x^4 + a)^(13/4)*a/b^4 + 1
/3*(-b*x^4 + a)^(9/4)*a^2/b^4 - 1/5*(-b*x^4 + a)^(5/4)*a^3/b^4
```

Fricas [A] time = 0.231497, size = 78, normalized size = 0.93

$$\frac{\left(195\,b^4x^{16} - 15\,ab^3x^{12} - 20\,a^2b^2x^8 - 32\,a^3bx^4 - 128\,a^4\right)\left(-bx^4+a\right)^{\frac{1}{4}}}{3315\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^15,x, algorithm="fricas")
```

```
[Out] 1/3315*(195*b^4*x^16 - 15*a*b^3*x^12 - 20*a^2*b^2*x^8 - 32*a^3*b*
x^4 - 128*a^4)*(-b*x^4 + a)^(1/4)/b^4
```

Sympy [A] time = 36.1937, size = 110, normalized size = 1.31

$$\begin{cases} -\frac{128a^4\sqrt[4]{a-bx^4}}{3315b^4} - \frac{32a^3x^4\sqrt[4]{a-bx^4}}{3315b^3} - \frac{4a^2x^8\sqrt[4]{a-bx^4}}{663b^2} - \frac{ax^{12}\sqrt[4]{a-bx^4}}{221b} + \frac{x^{16}\sqrt[4]{a-bx^4}}{17} & \text{for}\ b \neq 0 \\ \frac{\sqrt[4]{a}x^{16}}{16} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**15*(-b*x**4+a)**(1/4),x)
```

```
[Out] Piecewise((-128*a**4*(a - b*x**4)**(1/4)/(3315*b**4) - 32*a**3*x*
*4*(a - b*x**4)**(1/4)/(3315*b**3) - 4*a**2*x**8*(a - b*x**4)**(1
/4)/(663*b**2) - a*x**12*(a - b*x**4)**(1/4)/(221*b) + x**16*(a -
 b*x**4)**(1/4)/17, Ne(b, 0)), (a**(1/4)*x**16/16, True))
```

GIAC/XCAS [A] time = 0.243589, size = 127, normalized size = 1.51

$$\frac{195\left(bx^4-a\right)^4\left(-bx^4+a\right)^{\frac{1}{4}} + 765\left(bx^4-a\right)^3\left(-bx^4+a\right)^{\frac{1}{4}}a + 1105\left(bx^4-a\right)^2\left(-bx^4+a\right)^{\frac{1}{4}}a^2 - 663\left(-bx^4+a\right)^{\frac{5}{4}}a^3}{3315\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^15,x, algorithm="giac")
```

```
[Out] 1/3315*(195*(b*x^4 - a)^4*(-b*x^4 + a)^(1/4) + 765*(b*x^4 - a)^3*
(-b*x^4 + a)^(1/4)*a + 1105*(b*x^4 - a)^2*(-b*x^4 + a)^(1/4)*a^2
- 663*(-b*x^4 + a)^(5/4)*a^3)/b^4
```

3.1175 $\int x^{11}\sqrt[4]{a-bx^4}\,dx$

Optimal. Leaf size=62

$$-\frac{a^2\left(a-bx^4\right)^{5/4}}{5b^3}-\frac{\left(a-bx^4\right)^{13/4}}{13b^3}+\frac{2a\left(a-bx^4\right)^{9/4}}{9b^3}$$

```
[Out] -(a^2*(a - b*x^4)^(5/4))/(5*b^3) + (2*a*(a - b*x^4)^(9/4))/(9*b^3
) - (a - b*x^4)^(13/4)/(13*b^3)
```

Rubi [A] time = 0.0872046, antiderivative size = 62, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125

$$-\frac{a^2\left(a-bx^4\right)^{5/4}}{5b^3}-\frac{\left(a-bx^4\right)^{13/4}}{13b^3}+\frac{2a\left(a-bx^4\right)^{9/4}}{9b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11*(a - b*x^4)^(1/4),x]
```

```
[Out] -(a^2*(a - b*x^4)^(5/4))/(5*b^3) + (2*a*(a - b*x^4)^(9/4))/(9*b^3
) - (a - b*x^4)^(13/4)/(13*b^3)
```

Rubi in Sympy [A] time = 11.682, size = 51, normalized size = 0.82

$$-\frac{a^2\left(a-bx^4\right)^{\frac{5}{4}}}{5b^3}+\frac{2a\left(a-bx^4\right)^{\frac{9}{4}}}{9b^3}-\frac{\left(a-bx^4\right)^{\frac{13}{4}}}{13b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11*(-b*x**4+a)**(1/4),x)
```

```
[Out] -a**2*(a - b*x**4)**(5/4)/(5*b**3) + 2*a*(a - b*x**4)**(9/4)/(9*b
**3) - (a - b*x**4)**(13/4)/(13*b**3)
```

Mathematica [A] time = 0.028642, size = 51, normalized size = 0.82

$$-\frac{\sqrt[4]{a-bx^4}\left(32a^3+8a^2bx^4+5ab^2x^8-45b^3x^{12}\right)}{585b^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11*(a - b*x^4)^(1/4),x]
```

```
[Out] -((a - b*x^4)^(1/4)*(32*a^3 + 8*a^2*b*x^4 + 5*a*b^2*x^8 - 45*b^3*
x^12))/(585*b^3)
```

Maple [A] time = 0.008, size = 37, normalized size = 0.6

$$-\frac{45\,b^2x^8+40\,abx^4+32\,a^2}{585\,b^3}\left(-bx^4+a\right)^{\frac{5}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11*(-b*x^4+a)^(1/4),x)
```

```
[Out] -1/585*(-b*x^4+a)^(5/4)*(45*b^2*x^8+40*a*b*x^4+32*a^2)/b^3
```

Maxima [A] time = 1.43782, size = 68, normalized size = 1.1

$$-\frac{\left(-bx^4+a\right)^{\frac{13}{4}}}{13\,b^3}+\frac{2\left(-bx^4+a\right)^{\frac{9}{4}}a}{9\,b^3}-\frac{\left(-bx^4+a\right)^{\frac{5}{4}}a^2}{5\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^11,x, algorithm="maxima")
```

```
[Out] -1/13*(-b*x^4 + a)^(13/4)/b^3 + 2/9*(-b*x^4 + a)^(9/4)*a/b^3 - 1/
5*(-b*x^4 + a)^(5/4)*a^2/b^3
```

Fricas [A] time = 0.248306, size = 63, normalized size = 1.02

$$\frac{\left(45\,b^3x^{12}-5\,ab^2x^8-8\,a^2bx^4-32\,a^3\right)\left(-bx^4+a\right)^{\frac{1}{4}}}{585\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^11,x, algorithm="fricas")
```

```
[Out] 1/585*(45*b^3*x^12 - 5*a*b^2*x^8 - 8*a^2*b*x^4 - 32*a^3)*(-b*x^4
+ a)^(1/4)/b^3
```

Sympy [A] time = 15.2017, size = 87, normalized size = 1.4

$$\begin{cases} -\frac{32a^3\sqrt[4]{a-bx^4}}{585b^3}-\frac{8a^2x^4\sqrt[4]{a-bx^4}}{585b^2}-\frac{ax^8\sqrt[4]{a-bx^4}}{117b}+\frac{x^{12}\sqrt[4]{a-bx^4}}{13} & \text{for}\ b\neq 0 \\ \frac{\sqrt[4]{a}x^{12}}{12} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11*(-b*x**4+a)**(1/4),x)
```

```
[Out] Piecewise((-32*a**3*(a - b*x**4)**(1/4)/(585*b**3) - 8*a**2*x**4*
(a - b*x**4)**(1/4)/(585*b**2) - a*x**8*(a - b*x**4)**(1/4)/(117*
b) + x**12*(a - b*x**4)**(1/4)/13, Ne(b, 0)), (a**(1/4)*x**12/12,
 True))
```

GIAC/XCAS [A] time = 0.252277, size = 92, normalized size = 1.48

$$\frac{45\left(bx^4-a\right)^3\left(-bx^4+a\right)^{\frac{1}{4}}+130\left(bx^4-a\right)^2\left(-bx^4+a\right)^{\frac{1}{4}}a-117\left(-bx^4+a\right)^{\frac{5}{4}}a^2}{585\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^11,x, algorithm="giac")
```

```
[Out] 1/585*(45*(b*x^4 - a)^3*(-b*x^4 + a)^(1/4) + 130*(b*x^4 - a)^2*(-
b*x^4 + a)^(1/4)*a - 117*(-b*x^4 + a)^(5/4)*a^2)/b^3
```

3.1176 $\int x^7 \sqrt[4]{a - bx^4} \, dx$

Optimal. Leaf size=40

$$\frac{(a-bx^4)^{9/4}}{9b^2} - \frac{a(a-bx^4)^{5/4}}{5b^2}$$

```
[Out] -(a*(a - b*x^4)^(5/4))/(5*b^2) + (a - b*x^4)^(9/4)/(9*b^2)
```

Rubi [A] time = 0.0608294, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125

$$\frac{(a-bx^4)^{9/4}}{9b^2} - \frac{a(a-bx^4)^{5/4}}{5b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7*(a - b*x^4)^(1/4),x]
```

```
[Out] -(a*(a - b*x^4)^(5/4))/(5*b^2) + (a - b*x^4)^(9/4)/(9*b^2)
```

Rubi in Sympy [A] time = 7.87063, size = 31, normalized size = 0.78

$$-\frac{a(a-bx^4)^{\frac{5}{4}}}{5b^2} + \frac{(a-bx^4)^{\frac{9}{4}}}{9b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7*(-b*x**4+a)**(1/4),x)
```

```
[Out] -a*(a - b*x**4)**(5/4)/(5*b**2) + (a - b*x**4)**(9/4)/(9*b**2)
```

Mathematica [A] time = 0.0243849, size = 29, normalized size = 0.72

$$-\frac{(a-bx^4)^{5/4}(4a+5bx^4)}{45b^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^7*(a - b*x^4)^(1/4),x]
```

```
[Out] -((a - b*x^4)^(5/4)*(4*a + 5*b*x^4))/(45*b^2)
```

Maple [A] time = 0.007, size = 26, normalized size = 0.7

$$-\frac{5bx^4+4a}{45b^2}(-bx^4+a)^{\frac{5}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7*(-b*x^4+a)^(1/4),x)
```

```
[Out] -1/45*(-b*x^4+a)^(5/4)*(5*b*x^4+4*a)/b^2
```

Maxima [A] time = 1.46569, size = 43, normalized size = 1.08

$$\frac{\left(-bx^4+a\right)^{\frac{9}{4}}}{9\,b^2}-\frac{\left(-bx^4+a\right)^{\frac{5}{4}}a}{5\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^7,x, algorithm="maxima")
```

```
[Out] 1/9*(-b*x^4 + a)^(9/4)/b^2 - 1/5*(-b*x^4 + a)^(5/4)*a/b^2
```

Fricas [A] time = 0.243353, size = 49, normalized size = 1.22

$$\frac{\left(5\,b^2x^8-abx^4-4\,a^2\right)\left(-bx^4+a\right)^{\frac{1}{4}}}{45\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^7,x, algorithm="fricas")
```

```
[Out] 1/45*(5*b^2*x^8 - a*b*x^4 - 4*a^2)*(-b*x^4 + a)^(1/4)/b^2
```

Sympy [A] time = 5.31396, size = 63, normalized size = 1.58

$$\begin{cases} -\frac{4a^2\sqrt[4]{a-bx^4}}{45b^2}-\frac{ax^4\sqrt[4]{a-bx^4}}{45b}+\frac{x^8\sqrt[4]{a-bx^4}}{9} & \text{for } b\neq 0 \\ \frac{\sqrt[4]{a}x^8}{8} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7*(-b*x**4+a)**(1/4),x)
```

```
[Out] Piecewise((-4*a**2*(a - b*x**4)**(1/4)/(45*b**2) - a*x**4*(a - b*
x**4)**(1/4)/(45*b) + x**8*(a - b*x**4)**(1/4)/9, Ne(b, 0)), (a**
(1/4)*x**8/8, True))
```

GIAC/XCAS [A] time = 0.250776, size = 57, normalized size = 1.42

$$\frac{5\left(bx^4-a\right)^2\left(-bx^4+a\right)^{\frac{1}{4}}-9\left(-bx^4+a\right)^{\frac{5}{4}}a}{45\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^7,x, algorithm="giac")
```

```
[Out] 1/45*(5*(b*x^4 - a)^2*(-b*x^4 + a)^(1/4) - 9*(-b*x^4 + a)^(5/4)*a
)/b^2
```

3.1177 $\int x^3\sqrt[4]{a-bx^4}\,dx$

Optimal. Leaf size=19

$$-\frac{\left(a-bx^4\right)^{5/4}}{5b}$$

```
[Out] -(a - b*x^4)^(5/4)/(5*b)
```

Rubi [A] time = 0.0108756, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062

$$-\frac{\left(a-bx^4\right)^{5/4}}{5b}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(a - b*x^4)^(1/4),x]

[Out] -(a - b*x^4)^(5/4)/(5*b)
```

Rubi in Sympy [A] time = 2.38956, size = 14, normalized size = 0.74

$$-\frac{\left(a-bx^4\right)^{\frac{5}{4}}}{5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**3*(-b*x**4+a)**(1/4),x)

[Out] -(a - b*x**4)**(5/4)/(5*b)
```

Mathematica [A] time = 0.0093243, size = 19, normalized size = 1.

$$-\frac{\left(a-bx^4\right)^{5/4}}{5b}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(a - b*x^4)^(1/4),x]

[Out] -(a - b*x^4)^(5/4)/(5*b)
```

Maple [A] time = 0.005, size = 16, normalized size = 0.8

$$-\frac{1}{5\,b}\left(-b{x}^{4}+a\right)^{\frac{5}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(-b*x^4+a)^(1/4),x)

[Out] -1/5*(-b*x^4+a)^(5/4)/b
```

Maxima [A] time = 1.41999, size = 20, normalized size = 1.05

$$-\frac{\left(-bx^4+a\right)^{\frac{5}{4}}}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^3,x, algorithm="maxima")
```

```
[Out] -1/5*(-b*x^4 + a)^(5/4)/b
```

Fricas [A] time = 0.234918, size = 32, normalized size = 1.68

$$\frac{\left(bx^4-a\right)\left(-bx^4+a\right)^{\frac{1}{4}}}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^3,x, algorithm="fricas")
```

```
[Out] 1/5*(b*x^4 - a)*(-b*x^4 + a)^(1/4)/b
```

Sympy [A] time = 1.39672, size = 39, normalized size = 2.05

$$\begin{cases} -\frac{a\sqrt[4]{a-bx^4}}{5b}+\frac{x^4\sqrt[4]{a-bx^4}}{5} & \text{for}\ b\neq 0 \\ \frac{\sqrt[4]{a}x^4}{4} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(-b*x**4+a)**(1/4),x)
```

```
[Out] Piecewise((-a*(a - b*x**4)**(1/4)/(5*b) + x**4*(a - b*x**4)**(1/4
)/5, Ne(b, 0)), (a**(1/4)*x**4/4, True))
```

GIAC/XCAS [A] time = 0.253951, size = 20, normalized size = 1.05

$$-\frac{\left(-bx^4+a\right)^{\frac{5}{4}}}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^3,x, algorithm="giac")
```

```
[Out] -1/5*(-b*x^4 + a)^(5/4)/b
```

3.1178 $\int \frac{\sqrt[4]{a-bx^4}}{x}\,dx$

Optimal. Leaf size=69

$$\sqrt[4]{a-bx^4}-\frac{1}{2}\sqrt[4]{a}\tan^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)-\frac{1}{2}\sqrt[4]{a}\tanh^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)$$

```
[Out] (a - b*x^4)^(1/4) - (a^(1/4)*ArcTan[(a - b*x^4)^(1/4)/a^(1/4)])/2
 - (a^(1/4)*ArcTanh[(a - b*x^4)^(1/4)/a^(1/4)])/2
```

Rubi [A] time = 0.103215, antiderivative size = 69, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375

$$\sqrt[4]{a-bx^4}-\frac{1}{2}\sqrt[4]{a}\tan^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)-\frac{1}{2}\sqrt[4]{a}\tanh^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[(a - b*x^4)^(1/4)/x,x]
```

```
[Out] (a - b*x^4)^(1/4) - (a^(1/4)*ArcTan[(a - b*x^4)^(1/4)/a^(1/4)])/2
 - (a^(1/4)*ArcTanh[(a - b*x^4)^(1/4)/a^(1/4)])/2
```

Rubi in Sympy [A] time = 11.24, size = 56, normalized size = 0.81

$$-\frac{\sqrt[4]{a}\operatorname{atan}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{2}-\frac{\sqrt[4]{a}\operatorname{atanh}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{2}+\sqrt[4]{a-bx^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((-b*x**4+a)**(1/4)/x,x)
```

```
[Out] -a**(1/4)*atan((a - b*x**4)**(1/4)/a**(1/4))/2 - a**(1/4)*atanh((
a - b*x**4)**(1/4)/a**(1/4))/2 + (a - b*x**4)**(1/4)
```

Mathematica [C] time = 0.0444338, size = 63, normalized size = 0.91

$$\sqrt[4]{a-bx^4}-\frac{a\left(1-\frac{a}{bx^4}\right)^{3/4}{}_2F_1\left(\frac{3}{4},\frac{3}{4};\frac{7}{4};\frac{a}{bx^4}\right)}{3\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a - b*x^4)^(1/4)/x,x]
```

```
[Out] (a - b*x^4)^(1/4) - (a*(1 - a/(b*x^4))^(3/4)*Hypergeometric2F1[3/
4, 3/4, 7/4, a/(b*x^4)])/(3*(a - b*x^4)^(3/4))
```

Maple [F] time = 0.051, size = 0, normalized size = 0.

$$\int \frac{1}{x}\sqrt[4]{-bx^4+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((-b*x^4+a)^(1/4)/x,x)
```

```
[Out] int((-b*x^4+a)^(1/4)/x,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.269694, size = 123, normalized size = 1.78

$$a^{\frac{1}{4}} \arctan\left(\frac{a^{\frac{1}{4}}}{\sqrt{\sqrt{-bx^4+a}+\sqrt{a}}+\left(-bx^4+a\right)^{\frac{1}{4}}}\right)-\frac{1}{4}\,a^{\frac{1}{4}}\log\left(\left(-bx^4+a\right)^{\frac{1}{4}}+a^{\frac{1}{4}}\right)+\frac{1}{4}\,a^{\frac{1}{4}}\log\left(\left(-bx^4+a\right)^{\frac{1}{4}}-a^{\frac{1}{4}}\right)+\left(-bx^4+a\right)^{\frac{1}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x,x, algorithm="fricas")
```

```
[Out] a^(1/4)*arctan(a^(1/4)/(sqrt(sqrt(-b*x^4 + a) + sqrt(a)) + (-b*x^
4 + a)^(1/4))) - 1/4*a^(1/4)*log((-b*x^4 + a)^(1/4) + a^(1/4)) +
1/4*a^(1/4)*log((-b*x^4 + a)^(1/4) - a^(1/4)) + (-b*x^4 + a)^(1/4
)
```

Sympy [A] time = 4.02041, size = 44, normalized size = 0.64

$$-\frac{\sqrt[4]{b}xe^{\frac{i\pi}{4}}\Gamma\left(-\frac{1}{4}\right){}_2F_1\left(\begin{matrix}-\frac{1}{4},-\frac{1}{4}\\\frac{3}{4}\end{matrix}\middle|\frac{a}{bx^4}\right)}{4\Gamma\left(\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x**4+a)**(1/4)/x,x)
```

```
[Out] -b**(1/4)*x*exp(I*pi/4)*gamma(-1/4)*hyper((-1/4, -1/4), (3/4,), a
/(b*x**4))/(4*gamma(3/4))
```

<u>**GIAC/XCAS**</u> **[A]** time = 0.22328, size = 257, normalized size = 3.72

$$-\frac{1}{4}\sqrt{2}(-a)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}+2\left(-bx^{4}+a\right)^{\frac{1}{4}}\right)}{2(-a)^{\frac{1}{4}}}\right)-\frac{1}{4}\sqrt{2}(-a)^{\frac{1}{4}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}-2\left(-bx^{4}+a\right)^{\frac{1}{4}}\right)}{2(-a)^{\frac{1}{4}}}\right)-\frac{1}{8}\sqrt{2}(-a)^{\frac{1}{4}}\ln\left(\sqrt{2}\left(-bx^{4}+a\right)^{\frac{1}{4}}(-a)^{\frac{1}{4}}+\sqrt{-bx^{4}+a}+\sqrt{-a}\right)+\frac{1}{8}\sqrt{2}(-a)^{\frac{1}{4}}\ln\left(-\sqrt{2}\left(-bx^{4}+a\right)^{\frac{1}{4}}(-a)^{\frac{1}{4}}+\sqrt{-bx^{4}+a}+\sqrt{-a}\right)+\left(-bx^{4}+a\right)^{\frac{1}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x,x, algorithm="giac")
```

```
[Out] -1/4*sqrt(2)*(-a)^(1/4)*arctan(1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) +
2*(-b*x^4 + a)^(1/4))/(-a)^(1/4)) - 1/4*sqrt(2)*(-a)^(1/4)*arctan
(-1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) - 2*(-b*x^4 + a)^(1/4))/(-a)^(1
/4)) - 1/8*sqrt(2)*(-a)^(1/4)*ln(sqrt(2)*(-b*x^4 + a)^(1/4)*(-a)^
(1/4) + sqrt(-b*x^4 + a) + sqrt(-a)) + 1/8*sqrt(2)*(-a)^(1/4)*ln(
-sqrt(2)*(-b*x^4 + a)^(1/4)*(-a)^(1/4) + sqrt(-b*x^4 + a) + sqrt(
-a)) + (-b*x^4 + a)^(1/4)
```

3.1179 $\int \frac{\sqrt[4]{a-bx^4}}{x^5}\,dx$

Optimal. Leaf size=78

$$\frac{b\tan^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{8a^{3/4}}+\frac{b\tanh^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{8a^{3/4}}-\frac{\sqrt[4]{a-bx^4}}{4x^4}$$

```
[Out] -(a - b*x^4)^(1/4)/(4*x^4) + (b*ArcTan[(a - b*x^4)^(1/4)/a^(1/4)]
)/(8*a^(3/4)) + (b*ArcTanh[(a - b*x^4)^(1/4)/a^(1/4)])/(8*a^(3/4)
)
```

Rubi [A] time = 0.107347, antiderivative size = 78, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375

$$\frac{b\tan^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{8a^{3/4}}+\frac{b\tanh^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{8a^{3/4}}-\frac{\sqrt[4]{a-bx^4}}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a - b*x^4)^(1/4)/x^5,x]
```

```
[Out] -(a - b*x^4)^(1/4)/(4*x^4) + (b*ArcTan[(a - b*x^4)^(1/4)/a^(1/4)]
)/(8*a^(3/4)) + (b*ArcTanh[(a - b*x^4)^(1/4)/a^(1/4)])/(8*a^(3/4)
)
```

Rubi in Sympy [A] time = 11.5307, size = 65, normalized size = 0.83

$$-\frac{\sqrt[4]{a-bx^4}}{4x^4}+\frac{b\,\text{atan}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{8a^{\frac{3}{4}}}+\frac{b\,\text{atanh}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{8a^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((-b*x**4+a)**(1/4)/x**5,x)
```

```
[Out] -(a - b*x**4)**(1/4)/(4*x**4) + b*atan((a - b*x**4)**(1/4)/a**(1/
4))/(8*a**(3/4)) + b*atanh((a - b*x**4)**(1/4)/a**(1/4))/(8*a**(3
/4))
```

Mathematica [C] time = 0.040962, size = 67, normalized size = 0.86

$$\frac{bx^4\left(1-\frac{a}{bx^4}\right)^{3/4}{}_2F_1\left(\frac{3}{4},\frac{3}{4};\frac{7}{4};\frac{a}{bx^4}\right)-3a+3bx^4}{12x^4\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a - b*x^4)^(1/4)/x^5,x]
```

```
[Out] (-3*a + 3*b*x^4 + b*(1 - a/(b*x^4))^(3/4)*x^4*Hypergeometric2F1[3
/4, 3/4, 7/4, a/(b*x^4)])/(12*x^4*(a - b*x^4)^(3/4))
```

Maple [F] time = 0.04, size = 0, normalized size = 0.

$$\int \frac{1}{x^5}\sqrt[4]{-bx^4+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((-b*x^4+a)^(1/4)/x^5,x)
```

```
[Out] int((-b*x^4+a)^(1/4)/x^5,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^5,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.263484, size = 225, normalized size = 2.88

$$-\frac{4\left(\frac{b^4}{a^3}\right)^{\frac{1}{4}}x^4\arctan\left(\frac{a\left(\frac{b^4}{a^3}\right)^{\frac{1}{4}}}{(-bx^4+a)^{\frac{1}{4}}b+\sqrt{\sqrt{-bx^4+a}\,b^2+a^2\sqrt{\frac{b^4}{a^3}}}}\right)-\left(\frac{b^4}{a^3}\right)^{\frac{1}{4}}x^4\log\left((-bx^4+a)^{\frac{1}{4}}b+a\left(\frac{b^4}{a^3}\right)^{\frac{1}{4}}\right)+\left(\frac{b^4}{a^3}\right)^{\frac{1}{4}}x^4\log\left((-bx^4+a)\right.}{16\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^5,x, algorithm="fricas")
```

```
[Out] -1/16*(4*(b^4/a^3)^(1/4)*x^4*arctan(a*(b^4/a^3)^(1/4)/((-b*x^4 +
a)^(1/4)*b + sqrt(sqrt(-b*x^4 + a)*b^2 + a^2*sqrt(b^4/a^3)))) - (
b^4/a^3)^(1/4)*x^4*log((-b*x^4 + a)^(1/4)*b + a*(b^4/a^3)^(1/4))
+ (b^4/a^3)^(1/4)*x^4*log((-b*x^4 + a)^(1/4)*b - a*(b^4/a^3)^(1/4
)) + 4*(-b*x^4 + a)^(1/4))/x^4
```

Sympy [A] time = 5.28545, size = 42, normalized size = 0.54

$$\frac{\sqrt[4]{b}e^{-\frac{3i\pi}{4}}\Gamma\left(\frac{3}{4}\right){}_2F_1\left(\begin{matrix}-\frac{1}{4},\frac{3}{4}\\\frac{7}{4}\end{matrix}\middle|\frac{a}{bx^4}\right)}{4x^3\Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x**4+a)**(1/4)/x**5,x)
```

```
[Out] b**(1/4)*exp(-3*I*pi/4)*gamma(3/4)*hyper((-1/4, 3/4), (7/4,), a/(
b*x**4))/(4*x**3*gamma(7/4))
```

GIAC/XCAS [A] time = 0.22668, size = 286, normalized size = 3.67

$$\frac{1}{32}\,b\left(\frac{2\,\sqrt{2}\,(-a)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}+2\,(-bx^4+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{a}+\frac{2\,\sqrt{2}\,(-a)^{\frac{1}{4}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}-2\,(-bx^4+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{a}+\frac{\sqrt{2}\,(-a)^{\frac{1}{4}}\ln\left(\sqrt{2}(-bx^4\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^5,x, algorithm="giac")
```

```
[Out] 1/32*b*(2*sqrt(2)*(-a)^(1/4)*arctan(1/2*sqrt(2)*(sqrt(2)*(-a)^(1/
4) + 2*(-b*x^4 + a)^(1/4))/(-a)^(1/4))/a + 2*sqrt(2)*(-a)^(1/4)*a
rctan(-1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) - 2*(-b*x^4 + a)^(1/4))/(-
a)^(1/4))/a + sqrt(2)*(-a)^(1/4)*ln(sqrt(2)*(-b*x^4 + a)^(1/4)*(-
a)^(1/4) + sqrt(-b*x^4 + a) + sqrt(-a))/a - sqrt(2)*(-a)^(1/4)*ln
(-sqrt(2)*(-b*x^4 + a)^(1/4)*(-a)^(1/4) + sqrt(-b*x^4 + a) + sqrt
(-a))/a - 8*(-b*x^4 + a)^(1/4)/(b*x^4))
```

3.1180 $\int \frac{\sqrt[4]{a-bx^4}}{x^9}\,dx$

Optimal. Leaf size=105

$$\frac{3b^2\tan^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{64a^{7/4}}+\frac{3b^2\tanh^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{64a^{7/4}}+\frac{b\sqrt[4]{a-bx^4}}{32ax^4}-\frac{\sqrt[4]{a-bx^4}}{8x^8}$$

```
[Out] -(a - b*x^4)^(1/4)/(8*x^8) + (b*(a - b*x^4)^(1/4))/(32*a*x^4) + (
3*b^2*ArcTan[(a - b*x^4)^(1/4)/a^(1/4)])/(64*a^(7/4)) + (3*b^2*Ar
cTanh[(a - b*x^4)^(1/4)/a^(1/4)])/(64*a^(7/4))
```

Rubi [A] time = 0.145679, antiderivative size = 105, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.438$

$$\frac{3b^2\tan^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{64a^{7/4}}+\frac{3b^2\tanh^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{64a^{7/4}}+\frac{b\sqrt[4]{a-bx^4}}{32ax^4}-\frac{\sqrt[4]{a-bx^4}}{8x^8}$$

Antiderivative was successfully verified.

```
[In]  Int[(a - b*x^4)^(1/4)/x^9,x]
```

```
[Out] -(a - b*x^4)^(1/4)/(8*x^8) + (b*(a - b*x^4)^(1/4))/(32*a*x^4) + (
3*b^2*ArcTan[(a - b*x^4)^(1/4)/a^(1/4)])/(64*a^(7/4)) + (3*b^2*Ar
cTanh[(a - b*x^4)^(1/4)/a^(1/4)])/(64*a^(7/4))
```

Rubi in Sympy [A] time = 15.6796, size = 90, normalized size = 0.86

$$-\frac{\sqrt[4]{a-bx^4}}{8x^8}+\frac{b\sqrt[4]{a-bx^4}}{32ax^4}+\frac{3b^2\operatorname{atan}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{64a^{\frac{7}{4}}}+\frac{3b^2\operatorname{atanh}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{64a^{\frac{7}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((-b*x**4+a)**(1/4)/x**9,x)
```

```
[Out] -(a - b*x**4)**(1/4)/(8*x**8) + b*(a - b*x**4)**(1/4)/(32*a*x**4)
 + 3*b**2*atan((a - b*x**4)**(1/4)/a**(1/4))/(64*a**(7/4)) + 3*b*
*2*atanh((a - b*x**4)**(1/4)/a**(1/4))/(64*a**(7/4))
```

Mathematica [C] time = 0.0485392, size = 83, normalized size = 0.79

$$\frac{-4a^2+b^2x^8\left(1-\frac{a}{bx^4}\right)^{3/4}\,{}_2F_1\left(\frac{3}{4},\frac{3}{4};\frac{7}{4};\frac{a}{bx^4}\right)+5abx^4-b^2x^8}{32ax^8\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a - b*x^4)^(1/4)/x^9,x]
```

```
[Out] (-4*a^2 + 5*a*b*x^4 - b^2*x^8 + b^2*(1 - a/(b*x^4))^(3/4)*x^8*Hyp
ergeometric2F1[3/4, 3/4, 7/4, a/(b*x^4)])/(32*a*x^8*(a - b*x^4)^(
3/4))
```

Maple [F] time = 0.041, size = 0, normalized size = 0.

$$\int \frac{1}{x^9}\sqrt[4]{-bx^4+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((-b*x^4+a)^(1/4)/x^9,x)
```

```
[Out] int((-b*x^4+a)^(1/4)/x^9,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^9,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.269406, size = 267, normalized size = 2.54

$$-\frac{12\,a\left(\frac{b^8}{a^7}\right)^{\frac{1}{4}}x^8\arctan\left(\frac{a^2\left(\frac{b^8}{a^7}\right)^{\frac{1}{4}}}{(-bx^4+a)^{\frac{1}{4}}b^2+\sqrt{\sqrt{-bx^4+a}b^4+a^4\sqrt{\frac{b^8}{a^7}}}}\right)-3\,a\left(\frac{b^8}{a^7}\right)^{\frac{1}{4}}x^8\log\left(3\left(-bx^4+a\right)^{\frac{1}{4}}b^2+3\,a^2\left(\frac{b^8}{a^7}\right)^{\frac{1}{4}}\right)+3\,a\left(\frac{b^8}{a^7}\right)^{\frac{1}{4}}x^8\,\mathrm{l}}{128\,ax^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^9,x, algorithm="fricas")
```

```
[Out] -1/128*(12*a*(b^8/a^7)^(1/4)*x^8*arctan(a^2*(b^8/a^7)^(1/4)/((-b*
x^4 + a)^(1/4)*b^2 + sqrt(sqrt(-b*x^4 + a)*b^4 + a^4*sqrt(b^8/a^7
)))) - 3*a*(b^8/a^7)^(1/4)*x^8*log(3*(-b*x^4 + a)^(1/4)*b^2 + 3*a
^2*(b^8/a^7)^(1/4)) + 3*a*(b^8/a^7)^(1/4)*x^8*log(3*(-b*x^4 + a)^
(1/4)*b^2 - 3*a^2*(b^8/a^7)^(1/4)) - 4*(b*x^4 - 4*a)*(-b*x^4 + a)
^(1/4))/(a*x^8)
```

Sympy [A] time = 8.56406, size = 44, normalized size = 0.42

$$-\frac{\sqrt[4]{b}e^{-\frac{7i\pi}{4}}\,\Gamma\left(\frac{7}{4}\right)\,{}_2F_1\left(\begin{matrix}-\frac{1}{4},\frac{7}{4}\\\frac{11}{4}\end{matrix}\middle|\frac{a}{bx^4}\right)}{4x^7\,\Gamma\left(\frac{11}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x**4+a)**(1/4)/x**9,x)
```

```
[Out] -b**(1/4)*exp(-7*I*pi/4)*gamma(7/4)*hyper((-1/4, 7/4), (11/4,), a
/(b*x**4))/(4*x**7*gamma(11/4))
```

GIAC/XCAS [A] time = 0.228905, size = 313, normalized size = 2.98

$$\frac{1}{256}\,b^{2}\left(\frac{6\,\sqrt{2}\,(-a)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}+2\,(-bx^{4}+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{a^{2}}+\frac{6\,\sqrt{2}\,(-a)^{\frac{1}{4}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}-2\,(-bx^{4}+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{a^{2}}+\frac{3\,\sqrt{2}\,(-a)^{\frac{1}{4}}\ln\left(\sqrt{2}(-\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^9,x, algorithm="giac")
```

```
[Out] 1/256*b^2*(6*sqrt(2)*(-a)^(1/4)*arctan(1/2*sqrt(2)*(sqrt(2)*(-a)^
(1/4) + 2*(-b*x^4 + a)^(1/4))/(-a)^(1/4))/a^2 + 6*sqrt(2)*(-a)^(1
/4)*arctan(-1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) - 2*(-b*x^4 + a)^(1/4
))/(-a)^(1/4))/a^2 + 3*sqrt(2)*(-a)^(1/4)*ln(sqrt(2)*(-b*x^4 + a)
^(1/4)*(-a)^(1/4) + sqrt(-b*x^4 + a) + sqrt(-a))/a^2 - 3*sqrt(2)*
(-a)^(1/4)*ln(-sqrt(2)*(-b*x^4 + a)^(1/4)*(-a)^(1/4) + sqrt(-b*x^
4 + a) + sqrt(-a))/a^2 - 8*((-b*x^4 + a)^(5/4) + 3*(-b*x^4 + a)^(
1/4)*a)/(a*b^2*x^8))
```

3.1181 $\int x^9 \sqrt[4]{a-bx^4}\,dx$

Optimal. Leaf size=130

$$\frac{4a^{7/2}\left(1-\frac{bx^4}{a}\right)^{3/4}F\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{77b^{5/2}\left(a-bx^4\right)^{3/4}}-\frac{2a^2x^2\sqrt[4]{a-bx^4}}{77b^2}+\frac{1}{11}x^{10}\sqrt[4]{a-bx^4}-\frac{ax^6\sqrt[4]{a-bx^4}}{77b}$$

```
[Out] (-2*a^2*x^2*(a - b*x^4)^(1/4))/(77*b^2) - (a*x^6*(a - b*x^4)^(1/4
))/(77*b) + (x^10*(a - b*x^4)^(1/4))/11 + (4*a^(7/2)*(1 - (b*x^4)
/a)^(3/4)*EllipticF[ArcSin[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(77*b^(5
/2)*(a - b*x^4)^(3/4))
```

Rubi [A] time = 0.208362, antiderivative size = 130, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312

$$\frac{4a^{7/2}\left(1-\frac{bx^4}{a}\right)^{3/4}F\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{77b^{5/2}\left(a-bx^4\right)^{3/4}}-\frac{2a^2x^2\sqrt[4]{a-bx^4}}{77b^2}+\frac{1}{11}x^{10}\sqrt[4]{a-bx^4}-\frac{ax^6\sqrt[4]{a-bx^4}}{77b}$$

Antiderivative was successfully verified.

```
[In] Int[x^9*(a - b*x^4)^(1/4),x]
```

```
[Out] (-2*a^2*x^2*(a - b*x^4)^(1/4))/(77*b^2) - (a*x^6*(a - b*x^4)^(1/4
))/(77*b) + (x^10*(a - b*x^4)^(1/4))/11 + (4*a^(7/2)*(1 - (b*x^4)
/a)^(3/4)*EllipticF[ArcSin[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(77*b^(5
/2)*(a - b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 22.3724, size = 110, normalized size = 0.85

$$\frac{4a^{\frac{7}{2}}\left(1-\frac{bx^4}{a}\right)^{\frac{3}{4}}F\left(\frac{\operatorname{asin}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{77b^{\frac{5}{2}}\left(a-bx^4\right)^{\frac{3}{4}}}-\frac{2a^2x^2\sqrt[4]{a-bx^4}}{77b^2}-\frac{ax^6\sqrt[4]{a-bx^4}}{77b}+\frac{x^{10}\sqrt[4]{a-bx^4}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**9*(-b*x**4+a)**(1/4),x)
```

```
[Out] 4*a**(7/2)*(1 - b*x**4/a)**(3/4)*elliptic_f(asin(sqrt(b)*x**2/sqr
t(a))/2, 2)/(77*b**(5/2)*(a - b*x**4)**(3/4)) - 2*a**2*x**2*(a -
b*x**4)**(1/4)/(77*b**2) - a*x**6*(a - b*x**4)**(1/4)/(77*b) + x*
*10*(a - b*x**4)**(1/4)/11
```

Mathematica [C] time = 0.0711841, size = 91, normalized size = 0.7

$$\frac{x^2\left(2a^3\left(1-\frac{bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};\frac{bx^4}{a}\right)-2a^3+a^2bx^4+8ab^2x^8-7b^3x^{12}\right)}{77b^2\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^9*(a - b*x^4)^(1/4),x]
```

```
[Out] (x^2*(-2*a^3 + a^2*b*x^4 + 8*a*b^2*x^8 - 7*b^3*x^12 + 2*a^3*(1 -
(b*x^4)/a)^(3/4)*Hypergeometric2F1[1/2, 3/4, 3/2, (b*x^4)/a]))/(7
```

```
7*b^2*(a - b*x^4)^(3/4))
```

Maple [F] time = 0.035, size = 0, normalized size = 0.

$$\int x^9 \sqrt[4]{-b x^4 + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^9*(-b*x^4+a)^(1/4),x)
```

```
[Out] int(x^9*(-b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-b x^4 + a\right)^{\frac{1}{4}} x^9\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^9,x, algorithm="maxima")
```

```
[Out] integrate((-b*x^4 + a)^(1/4)*x^9, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(-b x^4 + a\right)^{\frac{1}{4}} x^9, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^9,x, algorithm="fricas")
```

```
[Out] integral((-b*x^4 + a)^(1/4)*x^9, x)
```

Sympy [A] time = 6.02093, size = 31, normalized size = 0.24

$$\frac{\sqrt[4]{a} x^{10} {}_{2}F_{1}\left(\begin{matrix} -\frac{1}{4}, \frac{5}{2} \\ \frac{7}{2} \end{matrix}\middle| {\frac{b x^4 e^{2 i \pi}}{a}} \right)}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**9*(-b*x**4+a)**(1/4),x)
```

```
[Out] a**(1/4)*x**10*hyper((-1/4, 5/2), (7/2,), b*x**4*exp_polar(2*I*pi
)/a)/10
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-b x^4 + a\right)^{\frac{1}{4}} x^9\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^9,x, algorithm="giac")
```

```
[Out] integrate((-b*x^4 + a)^(1/4)*x^9, x)
```

3.1182 $\int x^5\sqrt[4]{a-bx^4}\,dx$

Optimal. Leaf size=105

$$\frac{2a^{5/2}\left(1-\frac{bx^4}{a}\right)^{3/4}F\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{21b^{3/2}\left(a-bx^4\right)^{3/4}}+\frac{1}{7}x^6\sqrt[4]{a-bx^4}-\frac{ax^2\sqrt[4]{a-bx^4}}{21b}$$

```
[Out] -(a*x^2*(a - b*x^4)^(1/4))/(21*b) + (x^6*(a - b*x^4)^(1/4))/7 + (
2*a^(5/2)*(1 - (b*x^4)/a)^(3/4)*EllipticF[ArcSin[(Sqrt[b]*x^2)/Sq
rt[a]]/2, 2])/(21*b^(3/2)*(a - b*x^4)^(3/4))
```

Rubi [A] time = 0.156576, antiderivative size = 105, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312

$$\frac{2a^{5/2}\left(1-\frac{bx^4}{a}\right)^{3/4}F\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{21b^{3/2}\left(a-bx^4\right)^{3/4}}+\frac{1}{7}x^6\sqrt[4]{a-bx^4}-\frac{ax^2\sqrt[4]{a-bx^4}}{21b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5*(a - b*x^4)^(1/4),x]
```

```
[Out] -(a*x^2*(a - b*x^4)^(1/4))/(21*b) + (x^6*(a - b*x^4)^(1/4))/7 + (
2*a^(5/2)*(1 - (b*x^4)/a)^(3/4)*EllipticF[ArcSin[(Sqrt[b]*x^2)/Sq
rt[a]]/2, 2])/(21*b^(3/2)*(a - b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 17.5685, size = 87, normalized size = 0.83

$$\frac{2a^{\frac{5}{2}}\left(1-\frac{bx^4}{a}\right)^{\frac{3}{4}}F\left(\frac{\operatorname{asin}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{21b^{\frac{3}{2}}\left(a-bx^4\right)^{\frac{3}{4}}}-\frac{ax^2\sqrt[4]{a-bx^4}}{21b}+\frac{x^6\sqrt[4]{a-bx^4}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5*(-b*x**4+a)**(1/4),x)
```

```
[Out] 2*a**(5/2)*(1 - b*x**4/a)**(3/4)*elliptic_f(asin(sqrt(b)*x**2/sqr
t(a))/2, 2)/(21*b**(3/2)*(a - b*x**4)**(3/4)) - a*x**2*(a - b*x**
4)**(1/4)/(21*b) + x**6*(a - b*x**4)**(1/4)/7
```

Mathematica [C] time = 0.0742565, size = 80, normalized size = 0.76

$$\frac{x^2\left(a^2\left(1-\frac{bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};\frac{bx^4}{a}\right)-a^2+4abx^4-3b^2x^8\right)}{21b\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5*(a - b*x^4)^(1/4),x]
```

```
[Out] (x^2*(-a^2 + 4*a*b*x^4 - 3*b^2*x^8 + a^2*(1 - (b*x^4)/a)^(3/4)*Hy
pergeometric2F1[1/2, 3/4, 3/2, (b*x^4)/a]))/(21*b*(a - b*x^4)^(3/
4))
```

Maple [F] time = 0.027, size = 0, normalized size = 0.

$$\int x^{5}\sqrt[4]{-b\,x^{4}+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5*(-b*x^4+a)^(1/4),x)

[Out] int(x^5*(-b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-b x^{4}+a\right)^{\frac{1}{4}} x^{5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^5,x, algorithm="maxima")

[Out] integrate((-b*x^4 + a)^(1/4)*x^5, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(-b x^{4}+a\right)^{\frac{1}{4}} x^{5}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^5,x, algorithm="fricas")

[Out] integral((-b*x^4 + a)^(1/4)*x^5, x)
```

Sympy [A] time = 3.30475, size = 31, normalized size = 0.3

$$\frac{\sqrt[4]{a}x^{6}{}_{2}F_{1}\left(\begin{matrix} -\frac{1}{4}, \frac{3}{2} \\ \frac{5}{2} \end{matrix}\middle| {\frac{b x^{4} e^{2 i \pi}}{a}} \right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5*(-b*x**4+a)**(1/4),x)

[Out] a**(1/4)*x**6*hyper((-1/4, 3/2), (5/2,), b*x**4*exp_polar(2*I*pi)
/a)/6
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-b x^{4}+a\right)^{\frac{1}{4}} x^{5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^5,x, algorithm="giac")

[Out] integrate((-b*x^4 + a)^(1/4)*x^5, x)
```

3.1183 $\int x\sqrt[4]{a-bx^4}\,dx$

Optimal. Leaf size=82

$$\frac{a^{3/2}\left(1-\frac{bx^4}{a}\right)^{3/4}F\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{3\sqrt{b}\left(a-bx^4\right)^{3/4}}+\frac{1}{3}x^2\sqrt[4]{a-bx^4}$$

```
[Out] (x^2*(a - b*x^4)^(1/4))/3 + (a^(3/2)*(1 - (b*x^4)/a)^(3/4)*Ellipt
icF[ArcSin[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(3*Sqrt[b]*(a - b*x^4)^(
3/4))
```

Rubi [A] time = 0.100571, antiderivative size = 82, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286

$$\frac{a^{3/2}\left(1-\frac{bx^4}{a}\right)^{3/4}F\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{3\sqrt{b}\left(a-bx^4\right)^{3/4}}+\frac{1}{3}x^2\sqrt[4]{a-bx^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x*(a - b*x^4)^(1/4),x]
```

```
[Out] (x^2*(a - b*x^4)^(1/4))/3 + (a^(3/2)*(1 - (b*x^4)/a)^(3/4)*Ellipt
icF[ArcSin[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(3*Sqrt[b]*(a - b*x^4)^(
3/4))
```

Rubi in Sympy [A] time = 10.2816, size = 66, normalized size = 0.8

$$\frac{a^{\frac{3}{2}}\left(1-\frac{bx^4}{a}\right)^{\frac{3}{4}}F\left(\frac{\operatorname{asin}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{3\sqrt{b}\left(a-bx^4\right)^{\frac{3}{4}}}+\frac{x^2\sqrt[4]{a-bx^4}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(-b*x**4+a)**(1/4),x)
```

```
[Out] a**(3/2)*(1 - b*x**4/a)**(3/4)*elliptic_f(asin(sqrt(b)*x**2/sqrt(
a))/2, 2)/(3*sqrt(b)*(a - b*x**4)**(3/4)) + x**2*(a - b*x**4)**(1
/4)/3
```

Mathematica [C] time = 0.0532167, size = 64, normalized size = 0.78

$$\frac{x^2\left(a\left(1-\frac{bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};\frac{bx^4}{a}\right)+2a-2bx^4\right)}{6\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x*(a - b*x^4)^(1/4),x]
```

```
[Out] (x^2*(2*a - 2*b*x^4 + a*(1 - (b*x^4)/a)^(3/4)*Hypergeometric2F1[1
/2, 3/4, 3/2, (b*x^4)/a]))/(6*(a - b*x^4)^(3/4))
```

Maple [F] time = 0.025, size = 0, normalized size = 0.

$$\int x\sqrt[4]{-b x^4+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(-b*x^4+a)^(1/4),x)
```

```
[Out] int(x*(-b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-b x^4+a\right)^{\frac{1}{4}} x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x,x, algorithm="maxima")
```

```
[Out] integrate((-b*x^4 + a)^(1/4)*x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(-b x^4+a\right)^{\frac{1}{4}} x, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x,x, algorithm="fricas")
```

```
[Out] integral((-b*x^4 + a)^(1/4)*x, x)
```

Sympy [A] time = 2.40872, size = 31, normalized size = 0.38

$$\frac{\sqrt[4]{a}x^2 {}_2F_1\left(\begin{matrix} -\frac{1}{4}, \frac{1}{2} \\ \frac{3}{2} \end{matrix}\middle| \frac{b x^4 e^{2i\pi}}{a}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(-b*x**4+a)**(1/4),x)
```

```
[Out] a**(1/4)*x**2*hyper((-1/4, 1/2), (3/2,), b*x**4*exp_polar(2*I*pi)
/a)/2
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-b x^4+a\right)^{\frac{1}{4}} x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x,x, algorithm="giac")
```

```
[Out] integrate((-b*x^4 + a)^(1/4)*x, x)
```

3.1184 $\int \frac{\sqrt[4]{a-bx^4}}{x^3}\,dx$

Optimal. Leaf size=82

$$-\frac{\sqrt[4]{a-bx^4}}{2x^2}-\frac{\sqrt{a}\sqrt{b}\left(1-\frac{bx^4}{a}\right)^{3/4}F\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{2\left(a-bx^4\right)^{3/4}}$$

```
[Out] -(a - b*x^4)^(1/4)/(2*x^2) - (Sqrt[a]*Sqrt[b]*(1 - (b*x^4)/a)^(3/
4)*EllipticF[ArcSin[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(2*(a - b*x^4)^
(3/4))
```

Rubi [A] time = 0.111953, antiderivative size = 82, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25

$$-\frac{\sqrt[4]{a-bx^4}}{2x^2}-\frac{\sqrt{a}\sqrt{b}\left(1-\frac{bx^4}{a}\right)^{3/4}F\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{2\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a - b*x^4)^(1/4)/x^3,x]
```

```
[Out] -(a - b*x^4)^(1/4)/(2*x^2) - (Sqrt[a]*Sqrt[b]*(1 - (b*x^4)/a)^(3/
4)*EllipticF[ArcSin[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(2*(a - b*x^4)^
(3/4))
```

Rubi in Sympy [A] time = 12.4827, size = 68, normalized size = 0.83

$$-\frac{\sqrt{a}\sqrt{b}\left(1-\frac{bx^4}{a}\right)^{\frac{3}{4}}F\left(\frac{\operatorname{asin}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{2\left(a-bx^4\right)^{\frac{3}{4}}}-\frac{\sqrt[4]{a-bx^4}}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((-b*x**4+a)**(1/4)/x**3,x)
```

```
[Out] -sqrt(a)*sqrt(b)*(1 - b*x**4/a)**(3/4)*elliptic_f(asin(sqrt(b)*x*
*2/sqrt(a))/2, 2)/(2*(a - b*x**4)**(3/4)) - (a - b*x**4)**(1/4)/(
2*x**2)
```

Mathematica [C] time = 0.042127, size = 68, normalized size = 0.83

$$\frac{-bx^4\left(1-\frac{bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};\frac{bx^4}{a}\right)-2a+2bx^4}{4x^2\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a - b*x^4)^(1/4)/x^3,x]
```

```
[Out] (-2*a + 2*b*x^4 - b*x^4*(1 - (b*x^4)/a)^(3/4)*Hypergeometric2F1[1
/2, 3/4, 3/2, (b*x^4)/a])/(4*x^2*(a - b*x^4)^(3/4))
```

Maple [F] time = 0.032, size = 0, normalized size = 0.

$$\int \frac{1}{x^3}\sqrt[4]{-bx^4+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((-b*x^4+a)^(1/4)/x^3,x)
```

```
[Out] int((-b*x^4+a)^(1/4)/x^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-bx^4+a\right)^{\frac{1}{4}}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^3,x, algorithm="maxima")
```

```
[Out] integrate((-b*x^4 + a)^(1/4)/x^3, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\left(-bx^4+a\right)^{\frac{1}{4}}}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^3,x, algorithm="fricas")
```

```
[Out] integral((-b*x^4 + a)^(1/4)/x^3, x)
```

Sympy [A] time = 2.76864, size = 34, normalized size = 0.41

$$-\frac{\sqrt[4]{a}\,{}_2F_1\left(\begin{matrix}-\frac{1}{2},-\frac{1}{4}\\ \frac{1}{2}\end{matrix}\middle|\frac{bx^4e^{2i\pi}}{a}\right)}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x**4+a)**(1/4)/x**3,x)
```

```
[Out] -a**(1/4)*hyper((-1/2, -1/4), (1/2,), b*x**4*exp_polar(2*I*pi)/a)
/(2*x**2)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-bx^4+a\right)^{\frac{1}{4}}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^3,x, algorithm="giac")

[Out] integrate((-b*x^4 + a)^(1/4)/x^3, x)
```

3.1185 $\int \frac{\sqrt[4]{a-bx^4}}{x^7}\,dx$

Optimal. Leaf size=105

$$-\frac{b^{3/2}\left(1-\frac{bx^4}{a}\right)^{3/4}F\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{12\sqrt{a}\left(a-bx^4\right)^{3/4}}-\frac{\sqrt[4]{a-bx^4}}{6x^6}+\frac{b\sqrt[4]{a-bx^4}}{12ax^2}$$

```
[Out] -(a - b*x^4)^(1/4)/(6*x^6) + (b*(a - b*x^4)^(1/4))/(12*a*x^2) - (
b^(3/2)*(1 - (b*x^4)/a)^(3/4)*EllipticF[ArcSin[(Sqrt[b]*x^2)/Sqrt
[a]]/2, 2])/(12*Sqrt[a]*(a - b*x^4)^(3/4))
```

Rubi [A] time = 0.153429, antiderivative size = 105, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312

$$-\frac{b^{3/2}\left(1-\frac{bx^4}{a}\right)^{3/4}F\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{12\sqrt{a}\left(a-bx^4\right)^{3/4}}-\frac{\sqrt[4]{a-bx^4}}{6x^6}+\frac{b\sqrt[4]{a-bx^4}}{12ax^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a - b*x^4)^(1/4)/x^7,x]
```

```
[Out] -(a - b*x^4)^(1/4)/(6*x^6) + (b*(a - b*x^4)^(1/4))/(12*a*x^2) - (
b^(3/2)*(1 - (b*x^4)/a)^(3/4)*EllipticF[ArcSin[(Sqrt[b]*x^2)/Sqrt
[a]]/2, 2])/(12*Sqrt[a]*(a - b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 16.9976, size = 85, normalized size = 0.81

$$-\frac{\sqrt[4]{a-bx^4}}{6x^6}+\frac{b\sqrt[4]{a-bx^4}}{12ax^2}-\frac{b^{\frac{3}{2}}\left(1-\frac{bx^4}{a}\right)^{\frac{3}{4}}F\left(\frac{\operatorname{asin}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{12\sqrt{a}\left(a-bx^4\right)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((-b*x**4+a)**(1/4)/x**7,x)
```

```
[Out] -(a - b*x**4)**(1/4)/(6*x**6) + b*(a - b*x**4)**(1/4)/(12*a*x**2)
 - b**(3/2)*(1 - b*x**4/a)**(3/4)*elliptic_f(asin(sqrt(b)*x**2/sq
rt(a))/2, 2)/(12*sqrt(a)*(a - b*x**4)**(3/4))
```

Mathematica [C] time = 0.0488963, size = 84, normalized size = 0.8

$$\frac{-4a^2-b^2x^8\left(1-\frac{bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};\frac{bx^4}{a}\right)+6abx^4-2b^2x^8}{24ax^6\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a - b*x^4)^(1/4)/x^7,x]
```

```
[Out] (-4*a^2 + 6*a*b*x^4 - 2*b^2*x^8 - b^2*x^8*(1 - (b*x^4)/a)^(3/4)*H
ypergeometric2F1[1/2, 3/4, 3/2, (b*x^4)/a])/(24*a*x^6*(a - b*x^4)
^(3/4))
```

Maple [F] time = 0.037, size = 0, normalized size = 0.

$$\int \frac{1}{x^7}\sqrt[4]{-bx^4+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((-b*x^4+a)^(1/4)/x^7,x)
```

```
[Out] int((-b*x^4+a)^(1/4)/x^7,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-bx^4+a\right)^{\frac{1}{4}}}{x^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^7,x, algorithm="maxima")
```

```
[Out] integrate((-b*x^4 + a)^(1/4)/x^7, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(-bx^4+a\right)^{\frac{1}{4}}}{x^7}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^7,x, algorithm="fricas")
```

```
[Out] integral((-b*x^4 + a)^(1/4)/x^7, x)
```

Sympy [A] time = 4.63661, size = 36, normalized size = 0.34

$$-\frac{\sqrt[4]{a}\,{}_2F_1\left(\begin{matrix}-\frac{3}{2}, -\frac{1}{4}\\ -\frac{1}{2}\end{matrix}\middle|\frac{bx^4e^{2i\pi}}{a}\right)}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x**4+a)**(1/4)/x**7,x)
```

```
[Out] -a**(1/4)*hyper((-3/2, -1/4), (-1/2,), b*x**4*exp_polar(2*I*pi)/a
)/(6*x**6)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-bx^4+a\right)^{\frac{1}{4}}}{x^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^7,x, algorithm="giac")
```

```
[Out] integrate((-b*x^4 + a)^(1/4)/x^7, x)
```

3.1186 $\int \frac{\sqrt[4]{a-bx^4}}{x^{11}} dx$

Optimal. Leaf size=130

$$-\frac{b^{5/2}\left(1-\frac{bx^4}{a}\right)^{3/4} F\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{24a^{3/2}\left(a-bx^4\right)^{3/4}}+\frac{b^2\sqrt[4]{a-bx^4}}{24a^2x^2}-\frac{\sqrt[4]{a-bx^4}}{10x^{10}}+\frac{b\sqrt[4]{a-bx^4}}{60ax^6}$$

```
[Out] -(a - b*x^4)^(1/4)/(10*x^10) + (b*(a - b*x^4)^(1/4))/(60*a*x^6) +
 (b^2*(a - b*x^4)^(1/4))/(24*a^2*x^2) - (b^(5/2)*(1 - (b*x^4)/a)^
(3/4)*EllipticF[ArcSin[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(24*a^(3/2)*
(a - b*x^4)^(3/4))
```

Rubi [A] time = 0.199288, antiderivative size = 130, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312

$$-\frac{b^{5/2}\left(1-\frac{bx^4}{a}\right)^{3/4} F\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{24a^{3/2}\left(a-bx^4\right)^{3/4}}+\frac{b^2\sqrt[4]{a-bx^4}}{24a^2x^2}-\frac{\sqrt[4]{a-bx^4}}{10x^{10}}+\frac{b\sqrt[4]{a-bx^4}}{60ax^6}$$

Antiderivative was successfully verified.

```
[In]  Int[(a - b*x^4)^(1/4)/x^11,x]
```

```
[Out] -(a - b*x^4)^(1/4)/(10*x^10) + (b*(a - b*x^4)^(1/4))/(60*a*x^6) +
 (b^2*(a - b*x^4)^(1/4))/(24*a^2*x^2) - (b^(5/2)*(1 - (b*x^4)/a)^
(3/4)*EllipticF[ArcSin[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(24*a^(3/2)*
(a - b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 21.82, size = 107, normalized size = 0.82

$$-\frac{\sqrt[4]{a-bx^4}}{10x^{10}}+\frac{b\sqrt[4]{a-bx^4}}{60ax^6}+\frac{b^2\sqrt[4]{a-bx^4}}{24a^2x^2}-\frac{b^{\frac{5}{2}}\left(1-\frac{bx^4}{a}\right)^{\frac{3}{4}} F\left(\frac{\operatorname{asin}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{24a^{\frac{3}{2}}\left(a-bx^4\right)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((-b*x**4+a)**(1/4)/x**11,x)
```

```
[Out] -(a - b*x**4)**(1/4)/(10*x**10) + b*(a - b*x**4)**(1/4)/(60*a*x**
6) + b**2*(a - b*x**4)**(1/4)/(24*a**2*x**2) - b**(5/2)*(1 - b*x*
*4/a)**(3/4)*elliptic_f(asin(sqrt(b)*x**2/sqrt(a))/2, 2)/(24*a**(
3/2)*(a - b*x**4)**(3/4))
```

Mathematica [C] time = 0.0597722, size = 95, normalized size = 0.73

$$\frac{-24a^3+28a^2bx^4-5b^3x^{12}\left(1-\frac{bx^4}{a}\right)^{3/4} {}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};\frac{bx^4}{a}\right)+6ab^2x^8-10b^3x^{12}}{240a^2x^{10}\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a - b*x^4)^(1/4)/x^11,x]
```

```
[Out] (-24*a^3 + 28*a^2*b*x^4 + 6*a*b^2*x^8 - 10*b^3*x^12 - 5*b^3*x^12*
(1 - (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/2, 3/4, 3/2, (b*x^4)/a]
```

```
)/(240*a^2*x^10*(a - b*x^4)^(3/4))
```

Maple [F] time = 0.043, size = 0, normalized size = 0.

$$\int \frac{1}{x^{11}} \sqrt[4]{-bx^4 + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((-b*x^4+a)^(1/4)/x^11,x)

[Out] int((-b*x^4+a)^(1/4)/x^11,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-bx^4 + a\right)^{\frac{1}{4}}}{x^{11}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^11,x, algorithm="maxima")

[Out] integrate((-b*x^4 + a)^(1/4)/x^11, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(-bx^4 + a\right)^{\frac{1}{4}}}{x^{11}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^11,x, algorithm="fricas")

[Out] integral((-b*x^4 + a)^(1/4)/x^11, x)
```

Sympy [A] time = 8.8852, size = 36, normalized size = 0.28

$$-\frac{\sqrt[4]{a}\,{}_2F_1\left(\begin{matrix} -\frac{5}{2}, -\frac{1}{4} \\ -\frac{3}{2} \end{matrix}\middle| \frac{bx^4 e^{2i\pi}}{a}\right)}{10x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x**4+a)**(1/4)/x**11,x)

[Out] -a**(1/4)*hyper((-5/2, -1/4), (-3/2,), b*x**4*exp_polar(2*I*pi)/a
)/(10*x**10)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-bx^4 + a\right)^{\frac{1}{4}}}{x^{11}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^11,x, algorithm="giac")

[Out] integrate((-b*x^4 + a)^(1/4)/x^11, x)
```

3.1187 $\int x^6 \sqrt[4]{a-bx^4}\,dx$

Optimal. Leaf size=263

$$-\frac{3a^2\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}\right)}{64\sqrt{2}b^{7/4}}+\frac{3a^2\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+1\right)}{64\sqrt{2}b^{7/4}}+\frac{3a^2\log\left(-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{128\sqrt{2}b^{7/4}}-\frac{3a^2\log\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{128\sqrt{2}b^{7/4}}+\frac{1}{8}x^7\sqrt[4]{a-bx^4}-\frac{ax^3\sqrt[4]{a-bx^4}}{32b}$$

```
[Out] -(a*x^3*(a - b*x^4)^(1/4))/(32*b) + (x^7*(a - b*x^4)^(1/4))/8 - (
3*a^2*ArcTan[1 - (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)])/(64*Sqrt
[2]*b^(7/4)) + (3*a^2*ArcTan[1 + (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^
(1/4)])/(64*Sqrt[2]*b^(7/4)) + (3*a^2*Log[1 + (Sqrt[b]*x^2)/Sqrt[
a - b*x^4] - (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)])/(128*Sqrt[2]
*b^(7/4)) - (3*a^2*Log[1 + (Sqrt[b]*x^2)/Sqrt[a - b*x^4] + (Sqrt[
2]*b^(1/4)*x)/(a - b*x^4)^(1/4)])/(128*Sqrt[2]*b^(7/4))
```

Rubi [A] time = 0.365333, antiderivative size = 263, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 9, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.562

$$-\frac{3a^2\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}\right)}{64\sqrt{2}b^{7/4}}+\frac{3a^2\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+1\right)}{64\sqrt{2}b^{7/4}}+\frac{3a^2\log\left(-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{128\sqrt{2}b^{7/4}}-\frac{3a^2\log\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{128\sqrt{2}b^{7/4}}+\frac{1}{8}x^7\sqrt[4]{a-bx^4}-\frac{ax^3\sqrt[4]{a-bx^4}}{32b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6*(a - b*x^4)^(1/4),x]
```

```
[Out] -(a*x^3*(a - b*x^4)^(1/4))/(32*b) + (x^7*(a - b*x^4)^(1/4))/8 - (
3*a^2*ArcTan[1 - (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)])/(64*Sqrt
[2]*b^(7/4)) + (3*a^2*ArcTan[1 + (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^
(1/4)])/(64*Sqrt[2]*b^(7/4)) + (3*a^2*Log[1 + (Sqrt[b]*x^2)/Sqrt[
a - b*x^4] - (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)])/(128*Sqrt[2]
*b^(7/4)) - (3*a^2*Log[1 + (Sqrt[b]*x^2)/Sqrt[a - b*x^4] + (Sqrt[
2]*b^(1/4)*x)/(a - b*x^4)^(1/4)])/(128*Sqrt[2]*b^(7/4))
```

Rubi in Sympy [A] time = 41.1077, size = 240, normalized size = 0.91

$$\frac{3\sqrt{2}a^2\log\left(-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{256b^{\frac{7}{4}}}-\frac{3\sqrt{2}a^2\log\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{256b^{\frac{7}{4}}}+\frac{3\sqrt{2}a^2\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}-1\right)}{128b^{\frac{7}{4}}}+\frac{3\sqrt{2}a^2\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+1\right)}{128b^{\frac{7}{4}}}-\frac{ax^3\sqrt[4]{a-bx^4}}{32b}+\frac{x^7\sqrt[4]{a-bx^4}}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6*(-b*x**4+a)**(1/4),x)
```

```
[Out] 3*sqrt(2)*a**2*log(-sqrt(2)*b**(1/4)*x/(a - b*x**4)**(1/4) + sqrt
(b)*x**2/sqrt(a - b*x**4) + 1)/(256*b**(7/4)) - 3*sqrt(2)*a**2*lo
g(sqrt(2)*b**(1/4)*x/(a - b*x**4)**(1/4) + sqrt(b)*x**2/sqrt(a -
b*x**4) + 1)/(256*b**(7/4)) + 3*sqrt(2)*a**2*atan(sqrt(2)*b**(1/4
)*x/(a - b*x**4)**(1/4) - 1)/(128*b**(7/4)) + 3*sqrt(2)*a**2*atan
```

```
(sqrt(2)*b**(1/4)*x/(a - b*x**4)**(1/4) + 1)/(128*b**(7/4)) - a*x
**3*(a - b*x**4)**(1/4)/(32*b) + x**7*(a - b*x**4)**(1/4)/8
```

Mathematica [C] time = 0.0746264, size = 80, normalized size = 0.3

$$\frac{x^3\left(a^2\left(1-\frac{bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{3}{4},\frac{3}{4};\frac{7}{4};\frac{bx^4}{a}\right)-a^2+5abx^4-4b^2x^8\right)}{32b\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6*(a - b*x^4)^(1/4),x]
```

```
[Out] (x^3*(-a^2 + 5*a*b*x^4 - 4*b^2*x^8 + a^2*(1 - (b*x^4)/a)^(3/4)*Hy
pergeometric2F1[3/4, 3/4, 7/4, (b*x^4)/a]))/(32*b*(a - b*x^4)^(3/
4))
```

Maple [F] time = 0.036, size = 0, normalized size = 0.

$$\int x^6\sqrt[4]{-bx^4+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6*(-b*x^4+a)^(1/4),x)
```

```
[Out] int(x^6*(-b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^6,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.259153, size = 292, normalized size = 1.11

$$\frac{12\left(-\frac{a^8}{b^7}\right)^{\frac{1}{4}}b\arctan\left(\frac{\left(-\frac{a^8}{b^7}\right)^{\frac{1}{4}}b^2x}{\left(-bx^4+a\right)^{\frac{1}{4}}a^2+x\sqrt{\frac{\sqrt{-\frac{a^8}{b^7}}b^4x^2+\sqrt{-bx^4+a}a^4}{x^2}}}\right)-3\left(-\frac{a^8}{b^7}\right)^{\frac{1}{4}}b\log\left(\frac{3\left(\left(-\frac{a^8}{b^7}\right)^{\frac{1}{4}}b^2x+\left(-bx^4+a\right)^{\frac{1}{4}}a^2\right)}{x}\right)+3\left(-\frac{a^8}{b^7}\right)^{\frac{1}{4}}b\log\left(-\right.}{128\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^6,x, algorithm="fricas")
```

```
[Out] 1/128*(12*(-a^8/b^7)^(1/4)*b*arctan((-a^8/b^7)^(1/4)*b^2*x/((-b*x
^4 + a)^(1/4)*a^2 + x*sqrt((sqrt(-a^8/b^7)*b^4*x^2 + sqrt(-b*x^4
+ a)*a^4)/x^2))) - 3*(-a^8/b^7)^(1/4)*b*log(3*((-a^8/b^7)^(1/4)*b
^2*x + (-b*x^4 + a)^(1/4)*a^2)/x) + 3*(-a^8/b^7)^(1/4)*b*log(-3*(
(-a^8/b^7)^(1/4)*b^2*x - (-b*x^4 + a)^(1/4)*a^2)/x) + 4*(4*b*x^7
```

```
- a*x^3)*(-b*x^4 + a)^(1/4))/b
```

Sympy [A] time = 6.18198, size = 41, normalized size = 0.16

$$\frac{\sqrt[4]{a}x^7\,\Gamma\left(\frac{7}{4}\right)\,{}_2F_1\left(\begin{matrix}-\frac{1}{4},\frac{7}{4}\\ \frac{11}{4}\end{matrix}\middle|\frac{bx^4e^{2i\pi}}{a}\right)}{4\,\Gamma\left(\frac{11}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6*(-b*x**4+a)**(1/4),x)
```

```
[Out] a**(1/4)*x**7*gamma(7/4)*hyper((-1/4, 7/4), (11/4,), b*x**4*exp_p
olar(2*I*pi)/a)/(4*gamma(11/4))
```

GIAC/XCAS [A] time = 0.264567, size = 312, normalized size = 1.19

$$\frac{1}{256}\left(\frac{8\,x^8\left(\frac{\left(-bx^4+a\right)^{\frac{1}{4}}\left(b-\frac{a}{x^4}\right)}{x}+\frac{3\left(-bx^4+a\right)^{\frac{1}{4}}b}{x}\right)}{a^2b}-\frac{6\,\sqrt{2}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}b^{\frac{1}{4}}+\frac{2\left(-bx^4+a\right)^{\frac{1}{4}}}{x}\right)}{2\,b^{\frac{1}{4}}}\right)}{b^{\frac{7}{4}}}-\frac{6\,\sqrt{2}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}b^{\frac{1}{4}}-\frac{2\left(-bx^4+a\right)^{\frac{1}{4}}}{x}\right)}{2\,b^{\frac{1}{4}}}\right)}{b^{\frac{7}{4}}}-\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^6,x, algorithm="giac")
```

```
[Out] 1/256*(8*x^8*((-b*x^4 + a)^(1/4)*(b - a/x^4)/x + 3*(-b*x^4 + a)^(
1/4)*b/x)/(a^2*b) - 6*sqrt(2)*arctan(1/2*sqrt(2)*(sqrt(2)*b^(1/4)
 + 2*(-b*x^4 + a)^(1/4)/x)/b^(1/4))/b^(7/4) - 6*sqrt(2)*arctan(-1
/2*sqrt(2)*(sqrt(2)*b^(1/4) - 2*(-b*x^4 + a)^(1/4)/x)/b^(1/4))/b^
(7/4) - 3*sqrt(2)*ln(sqrt(b) + sqrt(2)*(-b*x^4 + a)^(1/4)*b^(1/4)
/x + sqrt(-b*x^4 + a)/x^2)/b^(7/4) + 3*sqrt(2)*ln(sqrt(b) - sqrt(
2)*(-b*x^4 + a)^(1/4)*b^(1/4)/x + sqrt(-b*x^4 + a)/x^2)/b^(7/4))*
a^2
```

3.1188 $\int x^2 \sqrt[4]{a-bx^4}\,dx$

Optimal. Leaf size=232

$$-\frac{a\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}\right)}{8\sqrt{2}b^{3/4}}+\frac{a\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+1\right)}{8\sqrt{2}b^{3/4}}+\frac{a\log\left(-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{16\sqrt{2}b^{3/4}}-\frac{a\log\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{16\sqrt{2}b^{3/4}}+\frac{1}{4}x^3\sqrt[4]{a-bx^4}$$

```
[Out] (x^3*(a - b*x^4)^(1/4))/4 - (a*ArcTan[1 - (Sqrt[2]*b^(1/4)*x)/(a
- b*x^4)^(1/4)])/(8*Sqrt[2]*b^(3/4)) + (a*ArcTan[1 + (Sqrt[2]*b^(
1/4)*x)/(a - b*x^4)^(1/4)])/(8*Sqrt[2]*b^(3/4)) + (a*Log[1 + (Sqr
t[b]*x^2)/Sqrt[a - b*x^4] - (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)
])/(16*Sqrt[2]*b^(3/4)) - (a*Log[1 + (Sqrt[b]*x^2)/Sqrt[a - b*x^4
] + (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)])/(16*Sqrt[2]*b^(3/4))
```

Rubi [A] time = 0.259012, antiderivative size = 232, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 8, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5

$$-\frac{a\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}\right)}{8\sqrt{2}b^{3/4}}+\frac{a\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+1\right)}{8\sqrt{2}b^{3/4}}+\frac{a\log\left(-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{16\sqrt{2}b^{3/4}}-\frac{a\log\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{16\sqrt{2}b^{3/4}}+\frac{1}{4}x^3\sqrt[4]{a-bx^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2*(a - b*x^4)^(1/4),x]
```

```
[Out] (x^3*(a - b*x^4)^(1/4))/4 - (a*ArcTan[1 - (Sqrt[2]*b^(1/4)*x)/(a
- b*x^4)^(1/4)])/(8*Sqrt[2]*b^(3/4)) + (a*ArcTan[1 + (Sqrt[2]*b^(
1/4)*x)/(a - b*x^4)^(1/4)])/(8*Sqrt[2]*b^(3/4)) + (a*Log[1 + (Sqr
t[b]*x^2)/Sqrt[a - b*x^4] - (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)
])/(16*Sqrt[2]*b^(3/4)) - (a*Log[1 + (Sqrt[b]*x^2)/Sqrt[a - b*x^4
] + (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)])/(16*Sqrt[2]*b^(3/4))
```

Rubi in Sympy [A] time = 35.1296, size = 207, normalized size = 0.89

$$\frac{\sqrt{2}a\log\left(-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{32b^{\frac{3}{4}}}-\frac{\sqrt{2}a\log\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{32b^{\frac{3}{4}}}+\frac{\sqrt{2}a\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}-1\right)}{16b^{\frac{3}{4}}}+\frac{\sqrt{2}a\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+1\right)}{16b^{\frac{3}{4}}}+\frac{x^3\sqrt[4]{a-bx^4}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(-b*x**4+a)**(1/4),x)
```

```
[Out] sqrt(2)*a*log(-sqrt(2)*b**(1/4)*x/(a - b*x**4)**(1/4) + sqrt(b)*x
**2/sqrt(a - b*x**4) + 1)/(32*b**(3/4)) - sqrt(2)*a*log(sqrt(2)*b
**(1/4)*x/(a - b*x**4)**(1/4) + sqrt(b)*x**2/sqrt(a - b*x**4) + 1
)/(32*b**(3/4)) + sqrt(2)*a*atan(sqrt(2)*b**(1/4)*x/(a - b*x**4)*
*(1/4) - 1)/(16*b**(3/4)) + sqrt(2)*a*atan(sqrt(2)*b**(1/4)*x/(a
- b*x**4)**(1/4) + 1)/(16*b**(3/4)) + x**3*(a - b*x**4)**(1/4)/4
```

Mathematica [C] time = 0.0461211, size = 64, normalized size = 0.28

$$\frac{x^3\left(a\left(1-\frac{bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{3}{4},\frac{3}{4};\frac{7}{4};\frac{bx^4}{a}\right)+3a-3bx^4\right)}{12\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2*(a - b*x^4)^(1/4),x]
```

```
[Out] (x^3*(3*a - 3*b*x^4 + a*(1 - (b*x^4)/a)^(3/4)*Hypergeometric2F1[3
/4, 3/4, 7/4, (b*x^4)/a]))/(12*(a - b*x^4)^(3/4))
```

Maple [F] time = 0.029, size = 0, normalized size = 0.

$$\int x^2\sqrt[4]{-bx^4+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(-b*x^4+a)^(1/4),x)
```

```
[Out] int(x^2*(-b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.260762, size = 250, normalized size = 1.08

$$\frac{1}{4}\left(-bx^4+a\right)^{\frac{1}{4}}x^3+\frac{1}{4}\left(-\frac{a^4}{b^3}\right)^{\frac{1}{4}}\arctan\left(\frac{\left(-\frac{a^4}{b^3}\right)^{\frac{1}{4}}bx}{x\sqrt{\frac{\sqrt{-\frac{a^4}{b^3}}b^2x^2+\sqrt{-bx^4+a}a^2}{x^2}}+\left(-bx^4+a\right)^{\frac{1}{4}}a}\right)-\frac{1}{16}\left(-\frac{a^4}{b^3}\right)^{\frac{1}{4}}\log\left(\frac{\left(-\frac{a^4}{b^3}\right)^{\frac{1}{4}}bx+\left(-bx^4+a\right)^{\frac{1}{4}}a}{x}\right)+\frac{1}{16}\left(-\frac{a^4}{b^3}\right)^{\frac{1}{4}}\log\left(-\frac{\left(-\frac{a^4}{b^3}\right)^{\frac{1}{4}}bx-\left(-bx^4+a\right)^{\frac{1}{4}}a}{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^2,x, algorithm="fricas")
```

```
[Out] 1/4*(-b*x^4 + a)^(1/4)*x^3 + 1/4*(-a^4/b^3)^(1/4)*arctan((-a^4/b^
3)^(1/4)*b*x/(x*sqrt((sqrt(-a^4/b^3)*b^2*x^2 + sqrt(-b*x^4 + a)*a
^2)/x^2) + (-b*x^4 + a)^(1/4)*a)) - 1/16*(-a^4/b^3)^(1/4)*log(((-
a^4/b^3)^(1/4)*b*x + (-b*x^4 + a)^(1/4)*a)/x) + 1/16*(-a^4/b^3)^(
1/4)*log(-((-a^4/b^3)^(1/4)*b*x - (-b*x^4 + a)^(1/4)*a)/x)
```

Sympy [A] time = 4.4794, size = 41, normalized size = 0.18

$$\frac{\sqrt[4]{a}x^3\,\Gamma\left(\frac{3}{4}\right)\,{}_2F_1\left(\begin{matrix}-\frac{1}{4},\frac{3}{4}\\ \frac{7}{4}\end{matrix}\middle|\frac{bx^4e^{2i\pi}}{a}\right)}{4\,\Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(-b*x**4+a)**(1/4),x)
```

```
[Out] a**(1/4)*x**3*gamma(3/4)*hyper((-1/4, 3/4), (7/4,), b*x**4*exp_po
lar(2*I*pi)/a)/(4*gamma(7/4))
```

GIAC/XCAS [A] time = 0.266707, size = 265, normalized size = 1.14

$$\frac{1}{32}\left(\frac{8\left(-bx^4+a\right)^{\frac{1}{4}}x^3}{a}-\frac{2\sqrt{2}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}b^{\frac{1}{4}}+\frac{2\left(-bx^4+a\right)^{\frac{1}{4}}}{x}\right)}{2b^{\frac{1}{4}}}\right)}{b^{\frac{3}{4}}}-\frac{2\sqrt{2}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}b^{\frac{1}{4}}-\frac{2\left(-bx^4+a\right)^{\frac{1}{4}}}{x}\right)}{2b^{\frac{1}{4}}}\right)}{b^{\frac{3}{4}}}-\frac{\sqrt{2}\ln\left(\sqrt{b}+\frac{\sqrt{2}\left(-bx^4+a\right.}{x}\right.}{b^{\frac{3}{4}}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^2,x, algorithm="giac")
```

```
[Out] 1/32*(8*(-b*x^4 + a)^(1/4)*x^3/a - 2*sqrt(2)*arctan(1/2*sqrt(2)*(
sqrt(2)*b^(1/4) + 2*(-b*x^4 + a)^(1/4)/x)/b^(1/4))/b^(3/4) - 2*sq
rt(2)*arctan(-1/2*sqrt(2)*(sqrt(2)*b^(1/4) - 2*(-b*x^4 + a)^(1/4)
/x)/b^(1/4))/b^(3/4) - sqrt(2)*ln(sqrt(b) + sqrt(2)*(-b*x^4 + a)^
(1/4)*b^(1/4)/x + sqrt(-b*x^4 + a)/x^2)/b^(3/4) + sqrt(2)*ln(sqrt
(b) - sqrt(2)*(-b*x^4 + a)^(1/4)*b^(1/4)/x + sqrt(-b*x^4 + a)/x^2
)/b^(3/4))*a
```

3.1189 $\int \frac{\sqrt[4]{a-bx^4}}{x^2}\,dx$

Optimal. Leaf size=226

$$-\frac{\sqrt[4]{a-bx^4}}{x}+\frac{\sqrt[4]{b}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}\right)}{2\sqrt{2}}-\frac{\sqrt[4]{b}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+1\right)}{2\sqrt{2}}-\frac{\sqrt[4]{b}\log\left(-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{4\sqrt{2}}+\frac{\sqrt[4]{b}\log\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{4\sqrt{2}}$$

```
[Out] -((a - b*x^4)^(1/4)/x) + (b^(1/4)*ArcTan[1 - (Sqrt[2]*b^(1/4)*x)/
(a - b*x^4)^(1/4)])/(2*Sqrt[2]) - (b^(1/4)*ArcTan[1 + (Sqrt[2]*b^
(1/4)*x)/(a - b*x^4)^(1/4)])/(2*Sqrt[2]) - (b^(1/4)*Log[1 + (Sqrt
[b]*x^2)/Sqrt[a - b*x^4] - (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)]
)/(4*Sqrt[2]) + (b^(1/4)*Log[1 + (Sqrt[b]*x^2)/Sqrt[a - b*x^4] +
(Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)])/(4*Sqrt[2])
```

Rubi [A] time = 0.251496, antiderivative size = 226, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 8, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.5$

$$-\frac{\sqrt[4]{a-bx^4}}{x}+\frac{\sqrt[4]{b}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}\right)}{2\sqrt{2}}-\frac{\sqrt[4]{b}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+1\right)}{2\sqrt{2}}-\frac{\sqrt[4]{b}\log\left(-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{4\sqrt{2}}+\frac{\sqrt[4]{b}\log\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{4\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a - b*x^4)^(1/4)/x^2,x]
```


```
[Out] -((a - b*x^4)^(1/4)/x) + (b^(1/4)*ArcTan[1 - (Sqrt[2]*b^(1/4)*x)/
(a - b*x^4)^(1/4)])/(2*Sqrt[2]) - (b^(1/4)*ArcTan[1 + (Sqrt[2]*b^
(1/4)*x)/(a - b*x^4)^(1/4)])/(2*Sqrt[2]) - (b^(1/4)*Log[1 + (Sqrt
[b]*x^2)/Sqrt[a - b*x^4] - (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)]
)/(4*Sqrt[2]) + (b^(1/4)*Log[1 + (Sqrt[b]*x^2)/Sqrt[a - b*x^4] +
(Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)])/(4*Sqrt[2])
```

Rubi in Sympy [A] time = 35.0631, size = 197, normalized size = 0.87

$$-\frac{\sqrt{2}\sqrt[4]{b}\log\left(-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{8}+\frac{\sqrt{2}\sqrt[4]{b}\log\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{8}-\frac{\sqrt{2}\sqrt[4]{b}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}-1\right)}{4}-\frac{\sqrt{2}\sqrt[4]{b}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+1\right)}{4}-\frac{\sqrt[4]{a-bx^4}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((-b*x**4+a)**(1/4)/x**2,x)
```

```
[Out] -sqrt(2)*b**(1/4)*log(-sqrt(2)*b**(1/4)*x/(a - b*x**4)**(1/4) + s
qrt(b)*x**2/sqrt(a - b*x**4) + 1)/8 + sqrt(2)*b**(1/4)*log(sqrt(2
)*b**(1/4)*x/(a - b*x**4)**(1/4) + sqrt(b)*x**2/sqrt(a - b*x**4)
+ 1)/8 - sqrt(2)*b**(1/4)*atan(sqrt(2)*b**(1/4)*x/(a - b*x**4)**(
1/4) - 1)/4 - sqrt(2)*b**(1/4)*atan(sqrt(2)*b**(1/4)*x/(a - b*x**
4)**(1/4) + 1)/4 - (a - b*x**4)**(1/4)/x
```

Mathematica [C] time = 0.0430172, size = 68, normalized size = 0.3

$$\frac{-bx^4\left(1-\frac{bx^4}{a}\right)^{3/4}\,{}_2F_1\left(\frac{3}{4},\frac{3}{4};\frac{7}{4};\frac{bx^4}{a}\right)-3a+3bx^4}{3x\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a - b*x^4)^(1/4)/x^2,x]
```

```
[Out] (-3*a + 3*b*x^4 - b*x^4*(1 - (b*x^4)/a)^(3/4)*Hypergeometric2F1[3
/4, 3/4, 7/4, (b*x^4)/a])/(3*x*(a - b*x^4)^(3/4))
```

Maple [F] time = 0.033, size = 0, normalized size = 0.

$$\int \frac{1}{x^2}\sqrt[4]{-bx^4+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((-b*x^4+a)^(1/4)/x^2,x)
```

```
[Out] int((-b*x^4+a)^(1/4)/x^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^2,x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [A] time = 4.16674, size = 42, normalized size = 0.19

$$\frac{\sqrt[4]{a}\,\Gamma\left(-\frac{1}{4}\right){}_2F_1\left(\begin{matrix}-\frac{1}{4},-\frac{1}{4}\\ \frac{3}{4}\end{matrix}\middle|\frac{bx^4e^{2i\pi}}{a}\right)}{4x\,\Gamma\left(\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x**4+a)**(1/4)/x**2,x)
```

```
[Out] a**(1/4)*gamma(-1/4)*hyper((-1/4, -1/4), (3/4,), b*x**4*exp_polar
(2*I*pi)/a)/(4*x*gamma(3/4))
```

GIAC/XCAS [A] time = 0.260656, size = 258, normalized size = 1.14

$$\frac{1}{4}\sqrt{2}b^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}b^{\frac{1}{4}}+\frac{2\left(-bx^{4}+a\right)^{\frac{1}{4}}}{x}\right)}{2\,b^{\frac{1}{4}}}\right)+\frac{1}{4}\sqrt{2}b^{\frac{1}{4}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}b^{\frac{1}{4}}-\frac{2\left(-bx^{4}+a\right)^{\frac{1}{4}}}{x}\right)}{2\,b^{\frac{1}{4}}}\right)+\frac{1}{8}\sqrt{2}b^{\frac{1}{4}}\ln\left(\sqrt{b}+\frac{\sqrt{2}\left(-bx^{4}+a\right)^{\frac{1}{4}}b^{\frac{1}{4}}}{x}+\frac{\sqrt{-bx^{4}+a}}{x^{2}}\right)-\frac{1}{8}\sqrt{2}b^{\frac{1}{4}}\ln\left(\sqrt{b}-\frac{\sqrt{2}\left(-bx^{4}+a\right)^{\frac{1}{4}}b^{\frac{1}{4}}}{x}+\frac{\sqrt{-bx^{4}+a}}{x^{2}}\right)-\frac{\left(-bx^{4}+a\right)^{\frac{1}{4}}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^2,x, algorithm="giac")
```

```
[Out] 1/4*sqrt(2)*b^(1/4)*arctan(1/2*sqrt(2)*(sqrt(2)*b^(1/4) + 2*(-b*x
^4 + a)^(1/4)/x)/b^(1/4)) + 1/4*sqrt(2)*b^(1/4)*arctan(-1/2*sqrt(
2)*(sqrt(2)*b^(1/4) - 2*(-b*x^4 + a)^(1/4)/x)/b^(1/4)) + 1/8*sqrt
(2)*b^(1/4)*ln(sqrt(b) + sqrt(2)*(-b*x^4 + a)^(1/4)*b^(1/4)/x + s
qrt(-b*x^4 + a)/x^2) - 1/8*sqrt(2)*b^(1/4)*ln(sqrt(b) - sqrt(2)*(
-b*x^4 + a)^(1/4)*b^(1/4)/x + sqrt(-b*x^4 + a)/x^2) - (-b*x^4 + a
)^(1/4)/x
```

3.1190 $\int \frac{\sqrt[4]{a-bx^4}}{x^6} \, dx$

Optimal. Leaf size=22

$$-\frac{(a-bx^4)^{5/4}}{5ax^5}$$

```
[Out] -(a - b*x^4)^(5/4)/(5*a*x^5)
```

Rubi [A] time = 0.0207531, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062

$$-\frac{(a-bx^4)^{5/4}}{5ax^5}$$

Antiderivative was successfully verified.

```
[In] Int[(a - b*x^4)^(1/4)/x^6,x]
```

```
[Out] -(a - b*x^4)^(5/4)/(5*a*x^5)
```

Rubi in Sympy [A] time = 2.96076, size = 17, normalized size = 0.77

$$-\frac{(a-bx^4)^{\frac{5}{4}}}{5ax^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((-b*x**4+a)**(1/4)/x**6,x)
```

```
[Out] -(a - b*x**4)**(5/4)/(5*a*x**5)
```

Mathematica [A] time = 0.0141624, size = 22, normalized size = 1.

$$-\frac{(a-bx^4)^{5/4}}{5ax^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a - b*x^4)^(1/4)/x^6,x]
```

```
[Out] -(a - b*x^4)^(5/4)/(5*a*x^5)
```

Maple [A] time = 0.006, size = 19, normalized size = 0.9

$$-\frac{1}{5\,a x^5}\left(-bx^4+a\right)^{\frac{5}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-b*x^4+a)^(1/4)/x^6,x)
```

```
[Out] -1/5*(-b*x^4+a)^(5/4)/a/x^5
```

Maxima [A] time = 1.43575, size = 24, normalized size = 1.09

$$-\frac{\left(-bx^4+a\right)^{\frac{5}{4}}}{5\,ax^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-b*x^4 + a)^(1/4)/x^6,x, algorithm="maxima")
```

```
[Out] -1/5*(-b*x^4 + a)^(5/4)/(a*x^5)
```

Fricas [A] time = 0.236871, size = 36, normalized size = 1.64

$$\frac{\left(bx^4-a\right)\left(-bx^4+a\right)^{\frac{1}{4}}}{5\,ax^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-b*x^4 + a)^(1/4)/x^6,x, algorithm="fricas")
```

```
[Out] 1/5*(b*x^4 - a)*(-b*x^4 + a)^(1/4)/(a*x^5)
```

Sympy [A] time = 3.60566, size = 162, normalized size = 7.36

$$\begin{cases} \frac{\sqrt[4]{b}\sqrt[4]{\frac{a}{bx^4}-1}\Gamma\left(-\frac{5}{4}\right)}{4x^4\Gamma\left(-\frac{1}{4}\right)} - \frac{b^{\frac{5}{4}}\sqrt[4]{\frac{a}{bx^4}-1}\Gamma\left(-\frac{5}{4}\right)}{4a\Gamma\left(-\frac{1}{4}\right)} & \text{for}\ \left|\frac{a}{bx^4}\right|>1 \\ \frac{\sqrt[4]{b}\sqrt[4]{-\frac{a}{bx^4}+1}e^{\frac{9i\pi}{4}}\Gamma\left(-\frac{5}{4}\right)}{4x^4\Gamma\left(-\frac{1}{4}\right)} - \frac{b^{\frac{5}{4}}\sqrt[4]{-\frac{a}{bx^4}+1}e^{\frac{9i\pi}{4}}\Gamma\left(-\frac{5}{4}\right)}{4a\Gamma\left(-\frac{1}{4}\right)} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-b*x**4+a)**(1/4)/x**6,x)
```

```
[Out] Piecewise((b**(1/4)*(a/(b*x**4) - 1)**(1/4)*gamma(-5/4)/(4*x**4*g
amma(-1/4)) - b**(5/4)*(a/(b*x**4) - 1)**(1/4)*gamma(-5/4)/(4*a*g
amma(-1/4)), Abs(a/(b*x**4)) > 1), (b**(1/4)*(-a/(b*x**4) + 1)**(
1/4)*exp(9*I*pi/4)*gamma(-5/4)/(4*x**4*gamma(-1/4)) - b**(5/4)*(-
a/(b*x**4) + 1)**(1/4)*exp(9*I*pi/4)*gamma(-5/4)/(4*a*gamma(-1/4)
), True))
```

GIAC/XCAS [A] time = 0.244835, size = 35, normalized size = 1.59

$$\frac{\left(-bx^4+a\right)^{\frac{1}{4}}\left(b-\frac{a}{x^4}\right)}{5\,ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-b*x^4 + a)^(1/4)/x^6,x, algorithm="giac")
```

```
[Out] 1/5*(-b*x^4 + a)^(1/4)*(b - a/x^4)/(a*x)
```

3.1191 $\int \frac{\sqrt[4]{a-bx^4}}{x^{10}}\,dx$

Optimal. Leaf size=46

$$-\frac{4b\left(a-bx^4\right)^{5/4}}{45a^2x^5}-\frac{\left(a-bx^4\right)^{5/4}}{9ax^9}$$

```
[Out] -(a - b*x^4)^(5/4)/(9*a*x^9) - (4*b*(a - b*x^4)^(5/4))/(45*a^2*x^
5)
```

Rubi [A] time = 0.0431228, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125

$$-\frac{4b\left(a-bx^4\right)^{5/4}}{45a^2x^5}-\frac{\left(a-bx^4\right)^{5/4}}{9ax^9}$$

Antiderivative was successfully verified.

```
[In]  Int[(a - b*x^4)^(1/4)/x^10,x]
```

```
[Out] -(a - b*x^4)^(5/4)/(9*a*x^9) - (4*b*(a - b*x^4)^(5/4))/(45*a^2*x^
5)
```

Rubi in Sympy [A] time = 4.71999, size = 39, normalized size = 0.85

$$-\frac{\left(a-bx^4\right)^{\frac{5}{4}}}{9ax^9}-\frac{4b\left(a-bx^4\right)^{\frac{5}{4}}}{45a^2x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((-b*x**4+a)**(1/4)/x**10,x)
```

```
[Out] -(a - b*x**4)**(5/4)/(9*a*x**9) - 4*b*(a - b*x**4)**(5/4)/(45*a**
2*x**5)
```

Mathematica [A] time = 0.0263842, size = 42, normalized size = 0.91

$$\frac{\sqrt[4]{a-bx^4}\left(-5a^2+abx^4+4b^2x^8\right)}{45a^2x^9}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a - b*x^4)^(1/4)/x^10,x]
```

```
[Out] ((a - b*x^4)^(1/4)*(-5*a^2 + a*b*x^4 + 4*b^2*x^8))/(45*a^2*x^9)
```

Maple [A] time = 0.007, size = 29, normalized size = 0.6

$$-\frac{4\,bx^4+5\,a}{45\,a^2x^9}\left(-bx^4+a\right)^{\frac{5}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((-b*x^4+a)^(1/4)/x^10,x)
```

```
[Out] -1/45*(-b*x^4+a)^(5/4)*(4*b*x^4+5*a)/a^2/x^9
```

Maxima [A] time = 1.43261, size = 50, normalized size = 1.09

$$-\frac{\frac{9\left(-bx^4+a\right)^{\frac{5}{4}}b}{x^5}+\frac{5\left(-bx^4+a\right)^{\frac{9}{4}}}{x^9}}{45\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^10,x, algorithm="maxima")
```

```
[Out] -1/45*(9*(-b*x^4 + a)^(5/4)*b/x^5 + 5*(-b*x^4 + a)^(9/4)/x^9)/a^2
```

Fricas [A] time = 0.249515, size = 51, normalized size = 1.11

$$\frac{\left(4\,b^2x^8+abx^4-5\,a^2\right)\left(-bx^4+a\right)^{\frac{1}{4}}}{45\,a^2x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^10,x, algorithm="fricas")
```

```
[Out] 1/45*(4*b^2*x^8 + a*b*x^4 - 5*a^2)*(-b*x^4 + a)^(1/4)/(a^2*x^9)
```

Sympy [A] time = 7.63955, size = 413, normalized size = 8.98

$$\begin{cases} -\frac{5\sqrt[4]{b}\sqrt[4]{\frac{a}{bx^4}-1}\left(-\frac{9}{4}\right)}{16x^8\left(-\frac{1}{4}\right)}+\frac{b^{\frac{5}{4}}\sqrt[4]{\frac{a}{bx^4}-1}\left(-\frac{9}{4}\right)}{16ax^4\left(-\frac{1}{4}\right)}+\frac{b^{\frac{9}{4}}\sqrt[4]{\frac{a}{bx^4}-1}\left(-\frac{9}{4}\right)}{4a^2\left(-\frac{1}{4}\right)} & \text{fo} \\ \frac{5a^3b^{\frac{5}{4}}\sqrt[4]{-\frac{a}{bx^4}+1}e^{\frac{17i\pi}{4}}\left(-\frac{9}{4}\right)}{x^4\left(-16a^3bx^4\left(-\frac{1}{4}\right)+16a^2b^2x^8\left(-\frac{1}{4}\right)\right)}-\frac{6a^2b^{\frac{9}{4}}\sqrt[4]{-\frac{a}{bx^4}+1}e^{\frac{17i\pi}{4}}\left(-\frac{9}{4}\right)}{-16a^3bx^4\left(-\frac{1}{4}\right)+16a^2b^2x^8\left(-\frac{1}{4}\right)}-\frac{3ab^{\frac{13}{4}}x^4\sqrt[4]{-\frac{a}{bx^4}+1}e^{\frac{17i\pi}{4}}\left(-\frac{9}{4}\right)}{-16a^3bx^4\left(-\frac{1}{4}\right)+16a^2b^2x^8\left(-\frac{1}{4}\right)}+\frac{4b^{\frac{17}{4}}x^8\sqrt[4]{-\frac{a}{bx^4}+1}e^{\frac{17i\pi}{4}}\left(-\frac{9}{4}\right)}{-16a^3bx^4\left(-\frac{1}{4}\right)+16a^2b^2x^8\left(-\frac{1}{4}\right)} & \text{ot} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x**4+a)**(1/4)/x**10,x)
```

```
[Out] Piecewise((-5*b**(1/4)*(a/(b*x**4) - 1)**(1/4)*gamma(-9/4)/(16*x*
*8*gamma(-1/4)) + b**(5/4)*(a/(b*x**4) - 1)**(1/4)*gamma(-9/4)/(1
6*a*x**4*gamma(-1/4)) + b**(9/4)*(a/(b*x**4) - 1)**(1/4)*gamma(-9
/4)/(4*a**2*gamma(-1/4)), Abs(a/(b*x**4)) > 1), (5*a**3*b**(5/4)*
(-a/(b*x**4) + 1)**(1/4)*exp(17*I*pi/4)*gamma(-9/4)/(x**4*(-16*a*
*3*b*x**4*gamma(-1/4) + 16*a**2*b**2*x**8*gamma(-1/4))) - 6*a**2*
b**(9/4)*(-a/(b*x**4) + 1)**(1/4)*exp(17*I*pi/4)*gamma(-9/4)/(-16
*a**3*b*x**4*gamma(-1/4) + 16*a**2*b**2*x**8*gamma(-1/4)) - 3*a*b
**(13/4)*x**4*(-a/(b*x**4) + 1)**(1/4)*exp(17*I*pi/4)*gamma(-9/4)
/(-16*a**3*b*x**4*gamma(-1/4) + 16*a**2*b**2*x**8*gamma(-1/4)) +
4*b**(17/4)*x**8*(-a/(b*x**4) + 1)**(1/4)*exp(17*I*pi/4)*gamma(-9
/4)/(-16*a**3*b*x**4*gamma(-1/4) + 16*a**2*b**2*x**8*gamma(-1/4))
, True))
```

GIAC/XCAS [A] time = 0.247327, size = 85, normalized size = 1.85

$$\frac{\frac{9\left(-bx^4+a\right)^{\frac{1}{4}}\left(b-\frac{a}{x^4}\right)b}{x}-\frac{5\left(b^2x^8-2\,abx^4+a^2\right)\left(-bx^4+a\right)^{\frac{1}{4}}}{x^9}}{45\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^10,x, algorithm="giac")
```

```
[Out] 1/45*(9*(-b*x^4 + a)^(1/4)*(b - a/x^4)*b/x - 5*(b^2*x^8 - 2*a*b*x
^4 + a^2)*(-b*x^4 + a)^(1/4)/x^9)/a^2
```

3.1192 $\int \frac{\sqrt[4]{a-bx^4}}{x^{14}} \, dx$

Optimal. Leaf size=71

$$-\frac{32b^2\left(a-bx^4\right)^{5/4}}{585a^3x^5}-\frac{8b\left(a-bx^4\right)^{5/4}}{117a^2x^9}-\frac{\left(a-bx^4\right)^{5/4}}{13ax^{13}}$$

```
[Out] -(a - b*x^4)^(5/4)/(13*a*x^13) - (8*b*(a - b*x^4)^(5/4))/(117*a^2
*x^9) - (32*b^2*(a - b*x^4)^(5/4))/(585*a^3*x^5)
```

Rubi [A] time = 0.0672735, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125

$$-\frac{32b^2\left(a-bx^4\right)^{5/4}}{585a^3x^5}-\frac{8b\left(a-bx^4\right)^{5/4}}{117a^2x^9}-\frac{\left(a-bx^4\right)^{5/4}}{13ax^{13}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a - b*x^4)^(1/4)/x^14,x]
```

```
[Out] -(a - b*x^4)^(5/4)/(13*a*x^13) - (8*b*(a - b*x^4)^(5/4))/(117*a^2
*x^9) - (32*b^2*(a - b*x^4)^(5/4))/(585*a^3*x^5)
```

Rubi in Sympy [A] time = 7.34424, size = 63, normalized size = 0.89

$$-\frac{\left(a-bx^4\right)^{\frac{5}{4}}}{13ax^{13}}-\frac{8b\left(a-bx^4\right)^{\frac{5}{4}}}{117a^2x^9}-\frac{32b^2\left(a-bx^4\right)^{\frac{5}{4}}}{585a^3x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((-b*x**4+a)**(1/4)/x**14,x)
```

```
[Out] -(a - b*x**4)**(5/4)/(13*a*x**13) - 8*b*(a - b*x**4)**(5/4)/(117*
a**2*x**9) - 32*b**2*(a - b*x**4)**(5/4)/(585*a**3*x**5)
```

Mathematica [A] time = 0.0348209, size = 54, normalized size = 0.76

$$\frac{\sqrt[4]{a-bx^4}\left(-45a^3+5a^2bx^4+8ab^2x^8+32b^3x^{12}\right)}{585a^3x^{13}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a - b*x^4)^(1/4)/x^14,x]
```

```
[Out] ((a - b*x^4)^(1/4)*(-45*a^3 + 5*a^2*b*x^4 + 8*a*b^2*x^8 + 32*b^3*
x^12))/(585*a^3*x^13)
```

Maple [A] time = 0.008, size = 40, normalized size = 0.6

$$-\frac{32\,b^2x^8+40\,abx^4+45\,a^2}{585\,x^{13}a^3}\left(-bx^4+a\right)^{\frac{5}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((-b*x^4+a)^(1/4)/x^14,x)
```

```
[Out] -1/585*(-b*x^4+a)^(5/4)*(32*b^2*x^8+40*a*b*x^4+45*a^2)/x^13/a^3
```

Maxima [A] time = 1.41353, size = 74, normalized size = 1.04

$$-\frac{\frac{117\left(-bx^4+a\right)^{\frac{5}{4}}b^2}{x^5}+\frac{130\left(-bx^4+a\right)^{\frac{9}{4}}b}{x^9}+\frac{45\left(-bx^4+a\right)^{\frac{13}{4}}}{x^{13}}}{585\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^14,x, algorithm="maxima")
```

```
[Out] -1/585*(117*(-b*x^4 + a)^(5/4)*b^2/x^5 + 130*(-b*x^4 + a)^(9/4)*b
/x^9 + 45*(-b*x^4 + a)^(13/4)/x^13)/a^3
```

Fricas [A] time = 0.236575, size = 68, normalized size = 0.96

$$\frac{\left(32\,b^3x^{12}+8\,ab^2x^8+5\,a^2bx^4-45\,a^3\right)\left(-bx^4+a\right)^{\frac{1}{4}}}{585\,a^3x^{13}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^14,x, algorithm="fricas")
```

```
[Out] 1/585*(32*b^3*x^12 + 8*a*b^2*x^8 + 5*a^2*b*x^4 - 45*a^3)*(-b*x^4
+ a)^(1/4)/(a^3*x^13)
```

Sympy [A] time = 16.5758, size = 1100, normalized size = 15.49

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x**4+a)**(1/4)/x**14,x)
```

```
[Out] Piecewise((45*a**5*b**(17/4)*(a/(b*x**4) - 1)**(1/4)*gamma(-13/4)
/(64*a**5*b**4*x**12*gamma(-1/4) - 128*a**4*b**5*x**16*gamma(-1/4
) + 64*a**3*b**6*x**20*gamma(-1/4)) - 95*a**4*b**(21/4)*x**4*(a/(
b*x**4) - 1)**(1/4)*gamma(-13/4)/(64*a**5*b**4*x**12*gamma(-1/4)
- 128*a**4*b**5*x**16*gamma(-1/4) + 64*a**3*b**6*x**20*gamma(-1/4
)) + 47*a**3*b**(25/4)*x**8*(a/(b*x**4) - 1)**(1/4)*gamma(-13/4)/
(64*a**5*b**4*x**12*gamma(-1/4) - 128*a**4*b**5*x**16*gamma(-1/4)
 + 64*a**3*b**6*x**20*gamma(-1/4)) - 21*a**2*b**(29/4)*x**12*(a/(
b*x**4) - 1)**(1/4)*gamma(-13/4)/(64*a**5*b**4*x**12*gamma(-1/4)
- 128*a**4*b**5*x**16*gamma(-1/4) + 64*a**3*b**6*x**20*gamma(-1/4
)) + 56*a*b**(33/4)*x**16*(a/(b*x**4) - 1)**(1/4)*gamma(-13/4)/(6
4*a**5*b**4*x**12*gamma(-1/4) - 128*a**4*b**5*x**16*gamma(-1/4) +
 64*a**3*b**6*x**20*gamma(-1/4)) - 32*b**(37/4)*x**20*(a/(b*x**4)
 - 1)**(1/4)*gamma(-13/4)/(64*a**5*b**4*x**12*gamma(-1/4) - 128*a
**4*b**5*x**16*gamma(-1/4) + 64*a**3*b**6*x**20*gamma(-1/4)), Abs
(a/(b*x**4)) > 1), (45*a**5*b**(17/4)*(-a/(b*x**4) + 1)**(1/4)*ex
p(17*I*pi/4)*gamma(-13/4)/(64*a**5*b**4*x**12*gamma(-1/4) - 128*a
**4*b**5*x**16*gamma(-1/4) + 64*a**3*b**6*x**20*gamma(-1/4)) - 95
*a**4*b**(21/4)*x**4*(-a/(b*x**4) + 1)**(1/4)*exp(17*I*pi/4)*gamm
a(-13/4)/(64*a**5*b**4*x**12*gamma(-1/4) - 128*a**4*b**5*x**16*ga
mma(-1/4) + 64*a**3*b**6*x**20*gamma(-1/4)) + 47*a**3*b**(25/4)*x
**8*(-a/(b*x**4) + 1)**(1/4)*exp(17*I*pi/4)*gamma(-13/4)/(64*a**5
```

```
*b**4*x**12*gamma(-1/4) - 128*a**4*b**5*x**16*gamma(-1/4) + 64*a*
*3*b**6*x**20*gamma(-1/4)) - 21*a**2*b**(29/4)*x**12*(-a/(b*x**4)
 + 1)**(1/4)*exp(17*I*pi/4)*gamma(-13/4)/(64*a**5*b**4*x**12*gamm
a(-1/4) - 128*a**4*b**5*x**16*gamma(-1/4) + 64*a**3*b**6*x**20*ga
mma(-1/4)) + 56*a*b**(33/4)*x**16*(-a/(b*x**4) + 1)**(1/4)*exp(17
*I*pi/4)*gamma(-13/4)/(64*a**5*b**4*x**12*gamma(-1/4) - 128*a**4*
b**5*x**16*gamma(-1/4) + 64*a**3*b**6*x**20*gamma(-1/4)) - 32*b**
(37/4)*x**20*(-a/(b*x**4) + 1)**(1/4)*exp(17*I*pi/4)*gamma(-13/4)
/(64*a**5*b**4*x**12*gamma(-1/4) - 128*a**4*b**5*x**16*gamma(-1/4
) + 64*a**3*b**6*x**20*gamma(-1/4)), True))
```

GIAC/XCAS [A] time = 0.258182, size = 151, normalized size = 2.13

$$\frac{\frac{117\left(-bx^4+a\right)^{\frac{1}{4}}\left(b-\frac{a}{x^4}\right)b^2}{x}-\frac{130\left(b^2x^8-2\,abx^4+a^2\right)\left(-bx^4+a\right)^{\frac{1}{4}}b}{x^9}+\frac{45\left(b^3x^{12}-3\,ab^2x^8+3\,a^2bx^4-a^3\right)\left(-bx^4+a\right)^{\frac{1}{4}}}{x^{13}}}{585\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^14,x, algorithm="giac")
```

```
[Out] 1/585*(117*(-b*x^4 + a)^(1/4)*(b - a/x^4)*b^2/x - 130*(b^2*x^8 -
2*a*b*x^4 + a^2)*(-b*x^4 + a)^(1/4)*b/x^9 + 45*(b^3*x^12 - 3*a*b^
2*x^8 + 3*a^2*b*x^4 - a^3)*(-b*x^4 + a)^(1/4)/x^13)/a^3
```

3.1193 $\int \frac{\sqrt[4]{a-bx^4}}{x^{18}}\,dx$

Optimal. Leaf size=96

$$-\frac{128b^3\left(a-bx^4\right)^{5/4}}{3315a^4x^5}-\frac{32b^2\left(a-bx^4\right)^{5/4}}{663a^3x^9}-\frac{12b\left(a-bx^4\right)^{5/4}}{221a^2x^{13}}-\frac{\left(a-bx^4\right)^{5/4}}{17ax^{17}}$$

```
[Out] -(a - b*x^4)^(5/4)/(17*a*x^17) - (12*b*(a - b*x^4)^(5/4))/(221*a^
2*x^13) - (32*b^2*(a - b*x^4)^(5/4))/(663*a^3*x^9) - (128*b^3*(a
- b*x^4)^(5/4))/(3315*a^4*x^5)
```

Rubi [A] time = 0.0941473, antiderivative size = 96, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125

$$-\frac{128b^3\left(a-bx^4\right)^{5/4}}{3315a^4x^5}-\frac{32b^2\left(a-bx^4\right)^{5/4}}{663a^3x^9}-\frac{12b\left(a-bx^4\right)^{5/4}}{221a^2x^{13}}-\frac{\left(a-bx^4\right)^{5/4}}{17ax^{17}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a - b*x^4)^(1/4)/x^18,x]
```

```
[Out] -(a - b*x^4)^(5/4)/(17*a*x^17) - (12*b*(a - b*x^4)^(5/4))/(221*a^
2*x^13) - (32*b^2*(a - b*x^4)^(5/4))/(663*a^3*x^9) - (128*b^3*(a
- b*x^4)^(5/4))/(3315*a^4*x^5)
```

Rubi in Sympy [A] time = 10.7006, size = 87, normalized size = 0.91

$$-\frac{\left(a-bx^4\right)^{\frac{5}{4}}}{17ax^{17}}-\frac{12b\left(a-bx^4\right)^{\frac{5}{4}}}{221a^2x^{13}}-\frac{32b^2\left(a-bx^4\right)^{\frac{5}{4}}}{663a^3x^9}-\frac{128b^3\left(a-bx^4\right)^{\frac{5}{4}}}{3315a^4x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((-b*x**4+a)**(1/4)/x**18,x)
```

```
[Out] -(a - b*x**4)**(5/4)/(17*a*x**17) - 12*b*(a - b*x**4)**(5/4)/(221
*a**2*x**13) - 32*b**2*(a - b*x**4)**(5/4)/(663*a**3*x**9) - 128*
b**3*(a - b*x**4)**(5/4)/(3315*a**4*x**5)
```

Mathematica [A] time = 0.0423197, size = 65, normalized size = 0.68

$$\frac{\sqrt[4]{a-bx^4}\left(-195a^4+15a^3bx^4+20a^2b^2x^8+32ab^3x^{12}+128b^4x^{16}\right)}{3315a^4x^{17}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a - b*x^4)^(1/4)/x^18,x]
```

```
[Out] ((a - b*x^4)^(1/4)*(-195*a^4 + 15*a^3*b*x^4 + 20*a^2*b^2*x^8 + 32
*a*b^3*x^12 + 128*b^4*x^16))/(3315*a^4*x^17)
```

Maple [A] time = 0.01, size = 51, normalized size = 0.5

$$-\frac{128\,b^3x^{12}+160\,ab^2x^8+180\,a^2bx^4+195\,a^3}{3315\,x^{17}a^4}\left(-bx^4+a\right)^{\frac{5}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((-b*x^4+a)^(1/4)/x^18,x)
```

```
[Out] -1/3315*(-b*x^4+a)^(5/4)*(128*b^3*x^12+160*a*b^2*x^8+180*a^2*b*x^
4+195*a^3)/x^17/a^4
```

Maxima [A] time = 1.44093, size = 99, normalized size = 1.03

$$-\frac{\frac{663\,(-bx^4+a)^{\frac{5}{4}}b^3}{x^5}+\frac{1105\,(-bx^4+a)^{\frac{9}{4}}b^2}{x^9}+\frac{765\,(-bx^4+a)^{\frac{13}{4}}b}{x^{13}}+\frac{195\,(-bx^4+a)^{\frac{17}{4}}}{x^{17}}}{3315\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^18,x, algorithm="maxima")
```

```
[Out] -1/3315*(663*(-b*x^4 + a)^(5/4)*b^3/x^5 + 1105*(-b*x^4 + a)^(9/4)
*b^2/x^9 + 765*(-b*x^4 + a)^(13/4)*b/x^13 + 195*(-b*x^4 + a)^(17/
4)/x^17)/a^4
```

Fricas [A] time = 0.236549, size = 82, normalized size = 0.85

$$\frac{\left(128\,b^4x^{16}+32\,ab^3x^{12}+20\,a^2b^2x^8+15\,a^3bx^4-195\,a^4\right)\left(-bx^4+a\right)^{\frac{1}{4}}}{3315\,a^4x^{17}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^18,x, algorithm="fricas")
```

```
[Out] 1/3315*(128*b^4*x^16 + 32*a*b^3*x^12 + 20*a^2*b^2*x^8 + 15*a^3*b*
x^4 - 195*a^4)*(-b*x^4 + a)^(1/4)/(a^4*x^17)
```

Sympy [A] time = 32.8537, size = 1770, normalized size = 18.44

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x**4+a)**(1/4)/x**18,x)
```

```
[Out] Piecewise((585*a**7*b**(37/4)*(a/(b*x**4) - 1)**(1/4)*gamma(-17/4
)/(-256*a**7*b**9*x**16*gamma(-1/4) + 768*a**6*b**10*x**20*gamma(
-1/4) - 768*a**5*b**11*x**24*gamma(-1/4) + 256*a**4*b**12*x**28*g
amma(-1/4)) - 1800*a**6*b**(41/4)*x**4*(a/(b*x**4) - 1)**(1/4)*ga
mma(-17/4)/(-256*a**7*b**9*x**16*gamma(-1/4) + 768*a**6*b**10*x**
20*gamma(-1/4) - 768*a**5*b**11*x**24*gamma(-1/4) + 256*a**4*b**1
2*x**28*gamma(-1/4)) + 1830*a**5*b**(45/4)*x**8*(a/(b*x**4) - 1)*
*(1/4)*gamma(-17/4)/(-256*a**7*b**9*x**16*gamma(-1/4) + 768*a**6*
b**10*x**20*gamma(-1/4) - 768*a**5*b**11*x**24*gamma(-1/4) + 256*
a**4*b**12*x**28*gamma(-1/4)) - 636*a**4*b**(49/4)*x**12*(a/(b*x*
*4) - 1)**(1/4)*gamma(-17/4)/(-256*a**7*b**9*x**16*gamma(-1/4) +
768*a**6*b**10*x**20*gamma(-1/4) - 768*a**5*b**11*x**24*gamma(-1/
4) + 256*a**4*b**12*x**28*gamma(-1/4)) - 231*a**3*b**(53/4)*x**16
*(a/(b*x**4) - 1)**(1/4)*gamma(-17/4)/(-256*a**7*b**9*x**16*gamma
(-1/4) + 768*a**6*b**10*x**20*gamma(-1/4) - 768*a**5*b**11*x**24*
gamma(-1/4) + 256*a**4*b**12*x**28*gamma(-1/4)) + 924*a**2*b**(57
/4)*x**20*(a/(b*x**4) - 1)**(1/4)*gamma(-17/4)/(-256*a**7*b**9*x*
*16*gamma(-1/4) + 768*a**6*b**10*x**20*gamma(-1/4) - 768*a**5*b**
```

```
11*x**24*gamma(-1/4) + 256*a**4*b**12*x**28*gamma(-1/4)) - 1056*a
*b**(61/4)*x**24*(a/(b*x**4) - 1)**(1/4)*gamma(-17/4)/(-256*a**7*
b**9*x**16*gamma(-1/4) + 768*a**6*b**10*x**20*gamma(-1/4) - 768*a
**5*b**11*x**24*gamma(-1/4) + 256*a**4*b**12*x**28*gamma(-1/4)) +
 384*b**(65/4)*x**28*(a/(b*x**4) - 1)**(1/4)*gamma(-17/4)/(-256*a
**7*b**9*x**16*gamma(-1/4) + 768*a**6*b**10*x**20*gamma(-1/4) - 7
68*a**5*b**11*x**24*gamma(-1/4) + 256*a**4*b**12*x**28*gamma(-1/4
)), Abs(a/(b*x**4)) > 1), (585*a**7*b**(37/4)*(-a/(b*x**4) + 1)**
(1/4)*exp(25*I*pi/4)*gamma(-17/4)/(-256*a**7*b**9*x**16*gamma(-1/
4) + 768*a**6*b**10*x**20*gamma(-1/4) - 768*a**5*b**11*x**24*gamm
a(-1/4) + 256*a**4*b**12*x**28*gamma(-1/4)) - 1800*a**6*b**(41/4)
*x**4*(-a/(b*x**4) + 1)**(1/4)*exp(25*I*pi/4)*gamma(-17/4)/(-256*
a**7*b**9*x**16*gamma(-1/4) + 768*a**6*b**10*x**20*gamma(-1/4) -
768*a**5*b**11*x**24*gamma(-1/4) + 256*a**4*b**12*x**28*gamma(-1/
4)) + 1830*a**5*b**(45/4)*x**8*(-a/(b*x**4) + 1)**(1/4)*exp(25*I*
pi/4)*gamma(-17/4)/(-256*a**7*b**9*x**16*gamma(-1/4) + 768*a**6*b
**10*x**20*gamma(-1/4) - 768*a**5*b**11*x**24*gamma(-1/4) + 256*a
**4*b**12*x**28*gamma(-1/4)) - 636*a**4*b**(49/4)*x**12*(-a/(b*x*
*4) + 1)**(1/4)*exp(25*I*pi/4)*gamma(-17/4)/(-256*a**7*b**9*x**16
*gamma(-1/4) + 768*a**6*b**10*x**20*gamma(-1/4) - 768*a**5*b**11*
x**24*gamma(-1/4) + 256*a**4*b**12*x**28*gamma(-1/4)) - 231*a**3*
b**(53/4)*x**16*(-a/(b*x**4) + 1)**(1/4)*exp(25*I*pi/4)*gamma(-17
/4)/(-256*a**7*b**9*x**16*gamma(-1/4) + 768*a**6*b**10*x**20*gamm
a(-1/4) - 768*a**5*b**11*x**24*gamma(-1/4) + 256*a**4*b**12*x**28
*gamma(-1/4)) + 924*a**2*b**(57/4)*x**20*(-a/(b*x**4) + 1)**(1/4)
*exp(25*I*pi/4)*gamma(-17/4)/(-256*a**7*b**9*x**16*gamma(-1/4) +
768*a**6*b**10*x**20*gamma(-1/4) - 768*a**5*b**11*x**24*gamma(-1/
4) + 256*a**4*b**12*x**28*gamma(-1/4)) - 1056*a*b**(61/4)*x**24*(
-a/(b*x**4) + 1)**(1/4)*exp(25*I*pi/4)*gamma(-17/4)/(-256*a**7*b*
*9*x**16*gamma(-1/4) + 768*a**6*b**10*x**20*gamma(-1/4) - 768*a**
5*b**11*x**24*gamma(-1/4) + 256*a**4*b**12*x**28*gamma(-1/4)) + 3
84*b**(65/4)*x**28*(-a/(b*x**4) + 1)**(1/4)*exp(25*I*pi/4)*gamma(
-17/4)/(-256*a**7*b**9*x**16*gamma(-1/4) + 768*a**6*b**10*x**20*g
amma(-1/4) - 768*a**5*b**11*x**24*gamma(-1/4) + 256*a**4*b**12*x*
*28*gamma(-1/4)), True))
```

GIAC/XCAS [A] time = 0.263567, size = 230, normalized size = 2.4

$$\frac{\frac{663 \left(-bx^4+a\right)^{\frac{1}{4}} \left(b-\frac{a}{x^4}\right) b^3}{x} - \frac{1105 \left(b^2x^8-2\,abx^4+a^2\right) \left(-bx^4+a\right)^{\frac{1}{4}} b^2}{x^9} + \frac{765 \left(b^3x^{12}-3\,ab^2x^8+3\,a^2bx^4-a^3\right) \left(-bx^4+a\right)^{\frac{1}{4}} b}{x^{13}} - \frac{195 \left(b^4x^{16}-4\,ab^3x^{12}+6\,a^2b^2x^8- \cdots\right.}{x^{17}}}{3315\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^18,x, algorithm="giac")
```

```
[Out] 1/3315*(663*(-b*x^4 + a)^(1/4)*(b - a/x^4)*b^3/x - 1105*(b^2*x^8
- 2*a*b*x^4 + a^2)*(-b*x^4 + a)^(1/4)*b^2/x^9 + 765*(b^3*x^12 - 3
*a*b^2*x^8 + 3*a^2*b*x^4 - a^3)*(-b*x^4 + a)^(1/4)*b/x^13 - 195*(
b^4*x^16 - 4*a*b^3*x^12 + 6*a^2*b^2*x^8 - 4*a^3*b*x^4 + a^4)*(-b*
x^4 + a)^(1/4)/x^17)/a^4
```

3.1194 $\int x^{12}\sqrt[4]{a-bx^4}\,dx$

Optimal. Leaf size=156

$$-\frac{3a^{7/2}x^3\left(1-\frac{a}{bx^4}\right)^{3/4}F\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{112b^{5/2}\left(a-bx^4\right)^{3/4}}-\frac{3a^3x\sqrt[4]{a-bx^4}}{112b^3}-\frac{3a^2x^5\sqrt[4]{a-bx^4}}{280b^2}+\frac{1}{14}x^{13}\sqrt[4]{a-bx^4}-\frac{ax^9\sqrt[4]{a-bx^4}}{140b}$$

```
[Out] (-3*a^3*x*(a - b*x^4)^(1/4))/(112*b^3) - (3*a^2*x^5*(a - b*x^4)^(
1/4))/(280*b^2) - (a*x^9*(a - b*x^4)^(1/4))/(140*b) + (x^13*(a -
b*x^4)^(1/4))/14 - (3*a^(7/2)*(1 - a/(b*x^4))^(3/4)*x^3*EllipticF
[ArcCsc[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(112*b^(5/2)*(a - b*x^4)^(3
/4))
```

Rubi [A] time = 0.216627, antiderivative size = 156, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375

$$-\frac{3a^{7/2}x^3\left(1-\frac{a}{bx^4}\right)^{3/4}F\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{112b^{5/2}\left(a-bx^4\right)^{3/4}}-\frac{3a^3x\sqrt[4]{a-bx^4}}{112b^3}-\frac{3a^2x^5\sqrt[4]{a-bx^4}}{280b^2}+\frac{1}{14}x^{13}\sqrt[4]{a-bx^4}-\frac{ax^9\sqrt[4]{a-bx^4}}{140b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^12*(a - b*x^4)^(1/4),x]
```

```
[Out] (-3*a^3*x*(a - b*x^4)^(1/4))/(112*b^3) - (3*a^2*x^5*(a - b*x^4)^(
1/4))/(280*b^2) - (a*x^9*(a - b*x^4)^(1/4))/(140*b) + (x^13*(a -
b*x^4)^(1/4))/14 - (3*a^(7/2)*(1 - a/(b*x^4))^(3/4)*x^3*EllipticF
[ArcCsc[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(112*b^(5/2)*(a - b*x^4)^(3
/4))
```

Rubi in Sympy [A] time = 27.1995, size = 136, normalized size = 0.87

$$-\frac{3a^{\frac{7}{2}}x^3\left(-\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{asin}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{112b^{\frac{5}{2}}\left(a-bx^4\right)^{\frac{3}{4}}}-\frac{3a^3x\sqrt[4]{a-bx^4}}{112b^3}-\frac{3a^2x^5\sqrt[4]{a-bx^4}}{280b^2}-\frac{ax^9\sqrt[4]{a-bx^4}}{140b}+\frac{x^{13}\sqrt[4]{a-bx^4}}{14}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**12*(-b*x**4+a)**(1/4),x)
```

```
[Out] -3*a**(7/2)*x**3*(-a/(b*x**4) + 1)**(3/4)*elliptic_f(asin(sqrt(a)
/(sqrt(b)*x**2))/2, 2)/(112*b**(5/2)*(a - b*x**4)**(3/4)) - 3*a**
3*x*(a - b*x**4)**(1/4)/(112*b**3) - 3*a**2*x**5*(a - b*x**4)**(1
/4)/(280*b**2) - a*x**9*(a - b*x**4)**(1/4)/(140*b) + x**13*(a -
b*x**4)**(1/4)/14
```

Mathematica [C] time = 0.0685212, size = 102, normalized size = 0.65

$$\frac{15a^4x\left(1-\frac{bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};\frac{bx^4}{a}\right)-15a^4x+9a^3bx^5+2a^2b^2x^9+44ab^3x^{13}-40b^4x^{17}}{560b^3\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^12*(a - b*x^4)^(1/4),x]
```

```
[Out] (-15*a^4*x + 9*a^3*b*x^5 + 2*a^2*b^2*x^9 + 44*a*b^3*x^13 - 40*b^4
*x^17 + 15*a^4*x*(1 - (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/4, 3/4
, 5/4, (b*x^4)/a])/(560*b^3*(a - b*x^4)^(3/4))
```

Maple [F] time = 0.033, size = 0, normalized size = 0.

$$\int x^{12}\sqrt[4]{-bx^4+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^12*(-b*x^4+a)^(1/4),x)
```

```
[Out] int(x^12*(-b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-bx^4+a\right)^{\frac{1}{4}}x^{12}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^12,x, algorithm="maxima")
```

```
[Out] integrate((-b*x^4 + a)^(1/4)*x^12, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(-bx^4+a\right)^{\frac{1}{4}}x^{12},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^12,x, algorithm="fricas")
```

```
[Out] integral((-b*x^4 + a)^(1/4)*x^12, x)
```

Sympy [A] time = 10.243, size = 41, normalized size = 0.26

$$\frac{\sqrt[4]{a}x^{13}\,\Gamma\left(\frac{13}{4}\right)\,{}_2F_1\left(\begin{matrix}-\frac{1}{4},\frac{13}{4}\\\frac{17}{4}\end{matrix}\middle|\frac{bx^4e^{2i\pi}}{a}\right)}{4\,\Gamma\left(\frac{17}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**12*(-b*x**4+a)**(1/4),x)
```

```
[Out] a**(1/4)*x**13*gamma(13/4)*hyper((-1/4, 13/4), (17/4,), b*x**4*ex
p_polar(2*I*pi)/a)/(4*gamma(17/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-bx^4 + a\right)^{\frac{1}{4}} x^{12} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^12,x, algorithm="giac")
```

```
[Out] integrate((-b*x^4 + a)^(1/4)*x^12, x)
```

3.1195 $\int x^8 \sqrt[4]{a-bx^4}\,dx$

Optimal. Leaf size=131

$$-\frac{a^{5/2}x^3\left(1-\frac{a}{bx^4}\right)^{3/4}F\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{24b^{3/2}\left(a-bx^4\right)^{3/4}}-\frac{a^2x\sqrt[4]{a-bx^4}}{24b^2}+\frac{1}{10}x^9\sqrt[4]{a-bx^4}-\frac{ax^5\sqrt[4]{a-bx^4}}{60b}$$

```
[Out] -(a^2*x*(a - b*x^4)^(1/4))/(24*b^2) - (a*x^5*(a - b*x^4)^(1/4))/(
60*b) + (x^9*(a - b*x^4)^(1/4))/10 - (a^(5/2)*(1 - a/(b*x^4))^(3/
4)*x^3*EllipticF[ArcCsc[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(24*b^(3/2)
*(a - b*x^4)^(3/4))
```

Rubi [A] time = 0.174133, antiderivative size = 131, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375

$$-\frac{a^{5/2}x^3\left(1-\frac{a}{bx^4}\right)^{3/4}F\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{24b^{3/2}\left(a-bx^4\right)^{3/4}}-\frac{a^2x\sqrt[4]{a-bx^4}}{24b^2}+\frac{1}{10}x^9\sqrt[4]{a-bx^4}-\frac{ax^5\sqrt[4]{a-bx^4}}{60b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8*(a - b*x^4)^(1/4),x]
```

```
[Out] -(a^2*x*(a - b*x^4)^(1/4))/(24*b^2) - (a*x^5*(a - b*x^4)^(1/4))/(
60*b) + (x^9*(a - b*x^4)^(1/4))/10 - (a^(5/2)*(1 - a/(b*x^4))^(3/
4)*x^3*EllipticF[ArcCsc[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(24*b^(3/2)
*(a - b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 22.3069, size = 109, normalized size = 0.83

$$-\frac{a^{\frac{5}{2}}x^3\left(-\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{asin}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{24b^{\frac{3}{2}}\left(a-bx^4\right)^{\frac{3}{4}}}-\frac{a^2x\sqrt[4]{a-bx^4}}{24b^2}-\frac{ax^5\sqrt[4]{a-bx^4}}{60b}+\frac{x^9\sqrt[4]{a-bx^4}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8*(-b*x**4+a)**(1/4),x)
```

```
[Out] -a**(5/2)*x**3*(-a/(b*x**4) + 1)**(3/4)*elliptic_f(asin(sqrt(a)/(
sqrt(b)*x**2))/2, 2)/(24*b**(3/2)*(a - b*x**4)**(3/4)) - a**2*x*(
a - b*x**4)**(1/4)/(24*b**2) - a*x**5*(a - b*x**4)**(1/4)/(60*b)
+ x**9*(a - b*x**4)**(1/4)/10
```

Mathematica [C] time = 0.0493603, size = 91, normalized size = 0.69

$$\frac{5a^3x\left(1-\frac{bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};\frac{bx^4}{a}\right)-5a^3x+3a^2bx^5+14ab^2x^9-12b^3x^{13}}{120b^2\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8*(a - b*x^4)^(1/4),x]
```

```
[Out] (-5*a^3*x + 3*a^2*b*x^5 + 14*a*b^2*x^9 - 12*b^3*x^13 + 5*a^3*x*(1
 - (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/4, 3/4, 5/4, (b*x^4)/a])/
```

```
(120*b^2*(a - b*x^4)^(3/4))
```

Maple [F] time = 0.027, size = 0, normalized size = 0.

$$\int x^8 \sqrt[4]{-bx^4 + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8*(-b*x^4+a)^(1/4),x)
```

```
[Out] int(x^8*(-b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-bx^4 + a\right)^{\frac{1}{4}} x^8\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^8,x, algorithm="maxima")
```

```
[Out] integrate((-b*x^4 + a)^(1/4)*x^8, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(-bx^4 + a\right)^{\frac{1}{4}} x^8, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^8,x, algorithm="fricas")
```

```
[Out] integral((-b*x^4 + a)^(1/4)*x^8, x)
```

Sympy [A] time = 5.2515, size = 41, normalized size = 0.31

$$\frac{\sqrt[4]{a} x^9 \Gamma\left(\frac{9}{4}\right) {}_2F_1\left(\begin{matrix} -\frac{1}{4}, \frac{9}{4} \\ \frac{13}{4} \end{matrix}\middle| \frac{bx^4 e^{2i\pi}}{a}\right)}{4\Gamma\left(\frac{13}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8*(-b*x**4+a)**(1/4),x)
```

```
[Out] a**(1/4)*x**9*gamma(9/4)*hyper((-1/4, 9/4), (13/4,), b*x**4*exp_p
olar(2*I*pi)/a)/(4*gamma(13/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-bx^4 + a\right)^{\frac{1}{4}} x^8\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^8,x, algorithm="giac")
```

```
[Out] integrate((-b*x^4 + a)^(1/4)*x^8, x)
```

3.1196 $\int x^4\sqrt[4]{a-bx^4}\,dx$

Optimal. Leaf size=106

$$-\frac{a^{3/2}x^3\left(1-\frac{a}{bx^4}\right)^{3/4}F\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{12\sqrt{b}\left(a-bx^4\right)^{3/4}}-\frac{ax\sqrt[4]{a-bx^4}}{12b}+\frac{1}{6}x^5\sqrt[4]{a-bx^4}$$

```
[Out] -(a*x*(a - b*x^4)^(1/4))/(12*b) + (x^5*(a - b*x^4)^(1/4))/6 - (a^
(3/2)*(1 - a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCsc[(Sqrt[b]*x^2)/Sq
rt[a]]/2, 2])/(12*Sqrt[b]*(a - b*x^4)^(3/4))
```

Rubi [A] time = 0.139298, antiderivative size = 106, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375

$$-\frac{a^{3/2}x^3\left(1-\frac{a}{bx^4}\right)^{3/4}F\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{12\sqrt{b}\left(a-bx^4\right)^{3/4}}-\frac{ax\sqrt[4]{a-bx^4}}{12b}+\frac{1}{6}x^5\sqrt[4]{a-bx^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4*(a - b*x^4)^(1/4),x]
```

```
[Out] -(a*x*(a - b*x^4)^(1/4))/(12*b) + (x^5*(a - b*x^4)^(1/4))/6 - (a^
(3/2)*(1 - a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCsc[(Sqrt[b]*x^2)/Sq
rt[a]]/2, 2])/(12*Sqrt[b]*(a - b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 18.4683, size = 87, normalized size = 0.82

$$-\frac{a^{\frac{3}{2}}x^3\left(-\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{asin}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{12\sqrt{b}\left(a-bx^4\right)^{\frac{3}{4}}}-\frac{ax\sqrt[4]{a-bx^4}}{12b}+\frac{x^5\sqrt[4]{a-bx^4}}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4*(-b*x**4+a)**(1/4),x)
```

```
[Out] -a**(3/2)*x**3*(-a/(b*x**4) + 1)**(3/4)*elliptic_f(asin(sqrt(a)/(
sqrt(b)*x**2))/2, 2)/(12*sqrt(b)*(a - b*x**4)**(3/4)) - a*x*(a -
b*x**4)**(1/4)/(12*b) + x**5*(a - b*x**4)**(1/4)/6
```

Mathematica [C] time = 0.0471236, size = 79, normalized size = 0.75

$$\frac{a^2x\left(1-\frac{bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};\frac{bx^4}{a}\right)-a^2x+3abx^5-2b^2x^9}{12b\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4*(a - b*x^4)^(1/4),x]
```

```
[Out] (-(a^2*x) + 3*a*b*x^5 - 2*b^2*x^9 + a^2*x*(1 - (b*x^4)/a)^(3/4)*H
ypergeometric2F1[1/4, 3/4, 5/4, (b*x^4)/a])/(12*b*(a - b*x^4)^(3/
4))
```

Maple [F] time = 0.028, size = 0, normalized size = 0.

$$\int x^{4}\sqrt[4]{-b x^{4}+a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4*(-b*x^4+a)^(1/4),x)

[Out] int(x^4*(-b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-b x^{4}+a\right)^{\frac{1}{4}} x^{4}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^4,x, algorithm="maxima")

[Out] integrate((-b*x^4 + a)^(1/4)*x^4, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(-b x^{4}+a\right)^{\frac{1}{4}} x^{4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^4,x, algorithm="fricas")

[Out] integral((-b*x^4 + a)^(1/4)*x^4, x)
```

Sympy [A] time = 3.04522, size = 41, normalized size = 0.39

$$\frac{\sqrt[4]{a} x^{5} \Gamma\left(\frac{5}{4}\right) {}_{2}F_{1}\left(\begin{matrix} -\frac{1}{4}, \frac{5}{4} \\ \frac{9}{4} \end{matrix}\middle| {\frac{b x^{4} e^{2 i \pi}}{a}} \right)}{4 \Gamma\left(\frac{9}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4*(-b*x**4+a)**(1/4),x)

[Out] a**(1/4)*x**5*gamma(5/4)*hyper((-1/4, 5/4), (9/4,), b*x**4*exp_po
lar(2*I*pi)/a)/(4*gamma(9/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-b x^{4}+a\right)^{\frac{1}{4}} x^{4}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)*x^4,x, algorithm="giac")

[Out] integrate((-b*x^4 + a)^(1/4)*x^4, x)
```

3.1197 $\int \sqrt[4]{a-bx^4}\,dx$

Optimal. Leaf size=83

$$\frac{1}{2}x\sqrt[4]{a-bx^4}-\frac{\sqrt{a}\sqrt{b}x^3\left(1-\frac{a}{bx^4}\right)^{3/4}F\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{2\left(a-bx^4\right)^{3/4}}$$

```
[Out] (x*(a - b*x^4)^(1/4))/2 - (Sqrt[a]*Sqrt[b]*(1 - a/(b*x^4))^(3/4)*
x^3*EllipticF[ArcCsc[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(2*(a - b*x^4)
^(3/4))
```

Rubi [A] time = 0.0948801, antiderivative size = 83, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.417

$$\frac{1}{2}x\sqrt[4]{a-bx^4}-\frac{\sqrt{a}\sqrt{b}x^3\left(1-\frac{a}{bx^4}\right)^{3/4}F\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{2\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a - b*x^4)^(1/4),x]
```

```
[Out] (x*(a - b*x^4)^(1/4))/2 - (Sqrt[a]*Sqrt[b]*(1 - a/(b*x^4))^(3/4)*
x^3*EllipticF[ArcCsc[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(2*(a - b*x^4)
^(3/4))
```

Rubi in Sympy [A] time = 12.5487, size = 68, normalized size = 0.82

$$-\frac{\sqrt{a}\sqrt{b}x^3\left(-\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{asin}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{2\left(a-bx^4\right)^{\frac{3}{4}}}+\frac{x\sqrt[4]{a-bx^4}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((-b*x**4+a)**(1/4),x)
```

```
[Out] -sqrt(a)*sqrt(b)*x**3*(-a/(b*x**4) + 1)**(3/4)*elliptic_f(asin(sq
rt(a)/(sqrt(b)*x**2))/2, 2)/(2*(a - b*x**4)**(3/4)) + x*(a - b*x*
*4)**(1/4)/2
```

Mathematica [C] time = 0.0371919, size = 62, normalized size = 0.75

$$\frac{ax\left(1-\frac{bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};\frac{bx^4}{a}\right)+ax-bx^5}{2\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a - b*x^4)^(1/4),x]
```

```
[Out] (a*x - b*x^5 + a*x*(1 - (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/4, 3
/4, 5/4, (b*x^4)/a])/(2*(a - b*x^4)^(3/4))
```

Maple [F] time = 0.039, size = 0, normalized size = 0.

$$\int \sqrt[4]{-b x^4 + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((-b*x^4+a)^(1/4),x)

[Out] int((-b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-b x^4 + a\right)^{\frac{1}{4}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4),x, algorithm="maxima")

[Out] integrate((-b*x^4 + a)^(1/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(-b x^4 + a\right)^{\frac{1}{4}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4),x, algorithm="fricas")

[Out] integral((-b*x^4 + a)^(1/4), x)
```

Sympy [A] time = 2.42386, size = 39, normalized size = 0.47

$$\frac{\sqrt[4]{a} x \Gamma\left(\frac{1}{4}\right) {}_{2}F_{1}\left(\begin{matrix} -\frac{1}{4}, \frac{1}{4} \\ \frac{5}{4} \end{matrix}\middle| \frac{b x^4 e^{2 i \pi}}{a}\right)}{4 \Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x**4+a)**(1/4),x)

[Out] a**(1/4)*x*gamma(1/4)*hyper((-1/4, 1/4), (5/4,), b*x**4*exp_polar
(2*I*pi)/a)/(4*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(-b x^4 + a\right)^{\frac{1}{4}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4),x, algorithm="giac")

[Out] integrate((-b*x^4 + a)^(1/4), x)
```

3.1198 $\int \frac{\sqrt[4]{a-bx^4}}{x^4}\,dx$

Optimal. Leaf size=85

$$\frac{b^{3/2}x^3\left(1-\frac{a}{bx^4}\right)^{3/4}F\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{3\sqrt{a}\left(a-bx^4\right)^{3/4}}-\frac{\sqrt[4]{a-bx^4}}{3x^3}$$

```
[Out] -(a - b*x^4)^(1/4)/(3*x^3) + (b^(3/2)*(1 - a/(b*x^4))^(3/4)*x^3*E
llipticF[ArcCsc[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(3*Sqrt[a]*(a - b*x
^4)^(3/4))
```

Rubi [A] time = 0.105709, antiderivative size = 85, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.312$

$$\frac{b^{3/2}x^3\left(1-\frac{a}{bx^4}\right)^{3/4}F\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{3\sqrt{a}\left(a-bx^4\right)^{3/4}}-\frac{\sqrt[4]{a-bx^4}}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a - b*x^4)^(1/4)/x^4,x]
```

```
[Out] -(a - b*x^4)^(1/4)/(3*x^3) + (b^(3/2)*(1 - a/(b*x^4))^(3/4)*x^3*E
llipticF[ArcCsc[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(3*Sqrt[a]*(a - b*x
^4)^(3/4))
```

Rubi in Sympy [A] time = 14.2382, size = 70, normalized size = 0.82

$$-\frac{\sqrt[4]{a-bx^4}}{3x^3}+\frac{b^{\frac{3}{2}}x^3\left(-\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{asin}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{3\sqrt{a}\left(a-bx^4\right)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((-b*x**4+a)**(1/4)/x**4,x)
```

```
[Out] -(a - b*x**4)**(1/4)/(3*x**3) + b**(3/2)*x**3*(-a/(b*x**4) + 1)**
(3/4)*elliptic_f(asin(sqrt(a)/(sqrt(b)*x**2))/2, 2)/(3*sqrt(a)*(a
 - b*x**4)**(3/4))
```

Mathematica [C] time = 0.0399864, size = 67, normalized size = 0.79

$$\frac{-bx^4\left(1-\frac{bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};\frac{bx^4}{a}\right)-a+bx^4}{3x^3\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a - b*x^4)^(1/4)/x^4,x]
```

```
[Out] (-a + b*x^4 - b*x^4*(1 - (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/4,
3/4, 5/4, (b*x^4)/a])/(3*x^3*(a - b*x^4)^(3/4))
```

Maple [F] time = 0.032, size = 0, normalized size = 0.

$$\int \frac{1}{x^4}\sqrt[4]{-bx^4+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((-b*x^4+a)^(1/4)/x^4,x)
```

```
[Out] int((-b*x^4+a)^(1/4)/x^4,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-bx^4+a\right)^{\frac{1}{4}}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^4,x, algorithm="maxima")
```

```
[Out] integrate((-b*x^4 + a)^(1/4)/x^4, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(-bx^4+a\right)^{\frac{1}{4}}}{x^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^4,x, algorithm="fricas")
```

```
[Out] integral((-b*x^4 + a)^(1/4)/x^4, x)
```

Sympy [A] time = 3.14495, size = 36, normalized size = 0.42

$$-\frac{i\sqrt[4]{b}e^{\frac{7i\pi}{4}}\,{}_2F_1\left(\begin{matrix} -\frac{1}{4}, \frac{1}{2} \\ \frac{3}{2} \end{matrix}\middle| \frac{a}{bx^4}\right)}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x**4+a)**(1/4)/x**4,x)
```

```
[Out] -I*b**(1/4)*exp(7*I*pi/4)*hyper((-1/4, 1/2), (3/2,), a/(b*x**4))/
(2*x**2)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-bx^4+a\right)^{\frac{1}{4}}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^4,x, algorithm="giac")

[Out] integrate((-b*x^4 + a)^(1/4)/x^4, x)
```

3.1199 $\int \frac{\sqrt[4]{a-bx^4}}{x^8}\,dx$

Optimal. Leaf size=108

$$\frac{2b^{5/2}x^3\left(1-\frac{a}{bx^4}\right)^{3/4}F\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{21a^{3/2}\left(a-bx^4\right)^{3/4}}-\frac{\sqrt[4]{a-bx^4}}{7x^7}+\frac{b\sqrt[4]{a-bx^4}}{21ax^3}$$

```
[Out] -(a - b*x^4)^(1/4)/(7*x^7) + (b*(a - b*x^4)^(1/4))/(21*a*x^3) + (
2*b^(5/2)*(1 - a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCsc[(Sqrt[b]*x^2
)/Sqrt[a]]/2, 2])/(21*a^(3/2)*(a - b*x^4)^(3/4))
```

Rubi [A] time = 0.141043, antiderivative size = 108, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375

$$\frac{2b^{5/2}x^3\left(1-\frac{a}{bx^4}\right)^{3/4}F\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{21a^{3/2}\left(a-bx^4\right)^{3/4}}-\frac{\sqrt[4]{a-bx^4}}{7x^7}+\frac{b\sqrt[4]{a-bx^4}}{21ax^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a - b*x^4)^(1/4)/x^8,x]
```

```
[Out] -(a - b*x^4)^(1/4)/(7*x^7) + (b*(a - b*x^4)^(1/4))/(21*a*x^3) + (
2*b^(5/2)*(1 - a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCsc[(Sqrt[b]*x^2
)/Sqrt[a]]/2, 2])/(21*a^(3/2)*(a - b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 18.193, size = 90, normalized size = 0.83

$$-\frac{\sqrt[4]{a-bx^4}}{7x^7}+\frac{b\sqrt[4]{a-bx^4}}{21ax^3}+\frac{2b^{\frac{5}{2}}x^3\left(-\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{asin}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{21a^{\frac{3}{2}}\left(a-bx^4\right)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((-b*x**4+a)**(1/4)/x**8,x)
```

```
[Out] -(a - b*x**4)**(1/4)/(7*x**7) + b*(a - b*x**4)**(1/4)/(21*a*x**3)
 + 2*b**(5/2)*x**3*(-a/(b*x**4) + 1)**(3/4)*elliptic_f(asin(sqrt(
a)/(sqrt(b)*x**2))/2, 2)/(21*a**(3/2)*(a - b*x**4)**(3/4))
```

Mathematica [C] time = 0.0489254, size = 84, normalized size = 0.78

$$\frac{-3a^2-2b^2x^8\left(1-\frac{bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};\frac{bx^4}{a}\right)+4abx^4-b^2x^8}{21ax^7\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a - b*x^4)^(1/4)/x^8,x]
```

```
[Out] (-3*a^2 + 4*a*b*x^4 - b^2*x^8 - 2*b^2*x^8*(1 - (b*x^4)/a)^(3/4)*H
ypergeometric2F1[1/4, 3/4, 5/4, (b*x^4)/a])/(21*a*x^7*(a - b*x^4)
^(3/4))
```

Maple [F] time = 0.037, size = 0, normalized size = 0.

$$\int \frac{1}{x^8}\sqrt[4]{-bx^4+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((-b*x^4+a)^(1/4)/x^8,x)
```

```
[Out] int((-b*x^4+a)^(1/4)/x^8,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-bx^4+a\right)^{\frac{1}{4}}}{x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^8,x, algorithm="maxima")
```

```
[Out] integrate((-b*x^4 + a)^(1/4)/x^8, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(-bx^4+a\right)^{\frac{1}{4}}}{x^8}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^8,x, algorithm="fricas")
```

```
[Out] integral((-b*x^4 + a)^(1/4)/x^8, x)
```

Sympy [A] time = 5.57499, size = 34, normalized size = 0.31

$$\frac{i\sqrt[4]{b}e^{\frac{11i\pi}{4}}\,{}_2F_1\left(\begin{matrix}-\frac{1}{4}, \frac{3}{2}\\ \frac{5}{2}\end{matrix}\middle|\frac{a}{bx^4}\right)}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x**4+a)**(1/4)/x**8,x)
```

```
[Out] I*b**(1/4)*exp(11*I*pi/4)*hyper((-1/4, 3/2), (5/2,), a/(b*x**4))/
(6*x**6)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-bx^4+a\right)^{\frac{1}{4}}}{x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^8,x, algorithm="giac")

[Out] integrate((-b*x^4 + a)^(1/4)/x^8, x)
```

3.1200 $\int \frac{\sqrt[4]{a-bx^4}}{x^{12}}\,dx$

Optimal. Leaf size=133

$$\frac{4b^{7/2}x^3\left(1-\frac{a}{bx^4}\right)^{3/4}F\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{77a^{5/2}\left(a-bx^4\right)^{3/4}}+\frac{2b^2\sqrt[4]{a-bx^4}}{77a^2x^3}-\frac{\sqrt[4]{a-bx^4}}{11x^{11}}+\frac{b\sqrt[4]{a-bx^4}}{77ax^7}$$

```
[Out] -(a - b*x^4)^(1/4)/(11*x^11) + (b*(a - b*x^4)^(1/4))/(77*a*x^7) +
 (2*b^2*(a - b*x^4)^(1/4))/(77*a^2*x^3) + (4*b^(7/2)*(1 - a/(b*x^
4))^(3/4)*x^3*EllipticF[ArcCsc[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(77*
a^(5/2)*(a - b*x^4)^(3/4))
```

Rubi [A] time = 0.170006, antiderivative size = 133, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375

$$\frac{4b^{7/2}x^3\left(1-\frac{a}{bx^4}\right)^{3/4}F\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{77a^{5/2}\left(a-bx^4\right)^{3/4}}+\frac{2b^2\sqrt[4]{a-bx^4}}{77a^2x^3}-\frac{\sqrt[4]{a-bx^4}}{11x^{11}}+\frac{b\sqrt[4]{a-bx^4}}{77ax^7}$$

Antiderivative was successfully verified.

```
[In]  Int[(a - b*x^4)^(1/4)/x^12,x]
```

```
[Out] -(a - b*x^4)^(1/4)/(11*x^11) + (b*(a - b*x^4)^(1/4))/(77*a*x^7) +
 (2*b^2*(a - b*x^4)^(1/4))/(77*a^2*x^3) + (4*b^(7/2)*(1 - a/(b*x^
4))^(3/4)*x^3*EllipticF[ArcCsc[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(77*
a^(5/2)*(a - b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 22.1931, size = 114, normalized size = 0.86

$$-\frac{\sqrt[4]{a-bx^4}}{11x^{11}}+\frac{b\sqrt[4]{a-bx^4}}{77ax^7}+\frac{2b^2\sqrt[4]{a-bx^4}}{77a^2x^3}+\frac{4b^{\frac{7}{2}}x^3\left(-\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{asin}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{77a^{\frac{5}{2}}\left(a-bx^4\right)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((-b*x**4+a)**(1/4)/x**12,x)
```

```
[Out] -(a - b*x**4)**(1/4)/(11*x**11) + b*(a - b*x**4)**(1/4)/(77*a*x**
7) + 2*b**2*(a - b*x**4)**(1/4)/(77*a**2*x**3) + 4*b**(7/2)*x**3*
(-a/(b*x**4) + 1)**(3/4)*elliptic_f(asin(sqrt(a)/(sqrt(b)*x**2))/
2, 2)/(77*a**(5/2)*(a - b*x**4)**(3/4))
```

Mathematica [C] time = 0.0584763, size = 94, normalized size = 0.71

$$\frac{-7a^3+8a^2bx^4-4b^3x^{12}\left(1-\frac{bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};\frac{bx^4}{a}\right)+ab^2x^8-2b^3x^{12}}{77a^2x^{11}\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a - b*x^4)^(1/4)/x^12,x]
```

```
[Out] (-7*a^3 + 8*a^2*b*x^4 + a*b^2*x^8 - 2*b^3*x^12 - 4*b^3*x^12*(1 -
(b*x^4)/a)^(3/4)*Hypergeometric2F1[1/4, 3/4, 5/4, (b*x^4)/a])/(77
```

```
*a^2*x^11*(a - b*x^4)^(3/4))
```

Maple [F] time = 0.043, size = 0, normalized size = 0.

$$\int \frac{1}{x^{12}}\sqrt[4]{-bx^4+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((-b*x^4+a)^(1/4)/x^12,x)

[Out] int((-b*x^4+a)^(1/4)/x^12,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-bx^4+a\right)^{\frac{1}{4}}}{x^{12}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^12,x, algorithm="maxima")

[Out] integrate((-b*x^4 + a)^(1/4)/x^12, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(-bx^4+a\right)^{\frac{1}{4}}}{x^{12}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^12,x, algorithm="fricas")

[Out] integral((-b*x^4 + a)^(1/4)/x^12, x)
```

Sympy [A] time = 11.0419, size = 36, normalized size = 0.27

$$-\frac{i\sqrt[4]{b}e^{\frac{15i\pi}{4}}\,{}_2F_1\left(\begin{matrix}-\frac{1}{4},\frac{5}{2}\\\frac{7}{2}\end{matrix}\middle|\frac{a}{bx^4}\right)}{10x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x**4+a)**(1/4)/x**12,x)

[Out] -I*b**(1/4)*exp(15*I*pi/4)*hyper((-1/4, 5/2), (7/2,), a/(b*x**4))
/(10*x**10)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-bx^4+a\right)^{\frac{1}{4}}}{x^{12}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^12,x, algorithm="giac")
```

```
[Out] integrate((-b*x^4 + a)^(1/4)/x^12, x)
```

3.1201 $\int \frac{\sqrt[4]{a-bx^4}}{x^{16}}\,dx$

Optimal. Leaf size=158

$$\frac{8b^{9/2}x^3\left(1-\frac{a}{bx^4}\right)^{3/4}F\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{231a^{7/2}\left(a-bx^4\right)^{3/4}}+\frac{4b^3\sqrt[4]{a-bx^4}}{231a^3x^3}+\frac{2b^2\sqrt[4]{a-bx^4}}{231a^2x^7}-\frac{\sqrt[4]{a-bx^4}}{15x^{15}}+\frac{b\sqrt[4]{a-bx^4}}{165ax^{11}}$$

```
[Out] -(a - b*x^4)^(1/4)/(15*x^15) + (b*(a - b*x^4)^(1/4))/(165*a*x^11)
 + (2*b^2*(a - b*x^4)^(1/4))/(231*a^2*x^7) + (4*b^3*(a - b*x^4)^(
1/4))/(231*a^3*x^3) + (8*b^(9/2)*(1 - a/(b*x^4))^(3/4)*x^3*Ellipt
icF[ArcCsc[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(231*a^(7/2)*(a - b*x^4)
^(3/4))
```

Rubi [A] time = 0.211594, antiderivative size = 158, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375

$$\frac{8b^{9/2}x^3\left(1-\frac{a}{bx^4}\right)^{3/4}F\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{231a^{7/2}\left(a-bx^4\right)^{3/4}}+\frac{4b^3\sqrt[4]{a-bx^4}}{231a^3x^3}+\frac{2b^2\sqrt[4]{a-bx^4}}{231a^2x^7}-\frac{\sqrt[4]{a-bx^4}}{15x^{15}}+\frac{b\sqrt[4]{a-bx^4}}{165ax^{11}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a - b*x^4)^(1/4)/x^16,x]
```

```
[Out] -(a - b*x^4)^(1/4)/(15*x^15) + (b*(a - b*x^4)^(1/4))/(165*a*x^11)
 + (2*b^2*(a - b*x^4)^(1/4))/(231*a^2*x^7) + (4*b^3*(a - b*x^4)^(
1/4))/(231*a^3*x^3) + (8*b^(9/2)*(1 - a/(b*x^4))^(3/4)*x^3*Ellipt
icF[ArcCsc[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(231*a^(7/2)*(a - b*x^4)
^(3/4))
```

Rubi in Sympy [A] time = 27.0169, size = 138, normalized size = 0.87

$$-\frac{\sqrt[4]{a-bx^4}}{15x^{15}}+\frac{b\sqrt[4]{a-bx^4}}{165ax^{11}}+\frac{2b^2\sqrt[4]{a-bx^4}}{231a^2x^7}+\frac{4b^3\sqrt[4]{a-bx^4}}{231a^3x^3}+\frac{8b^{\frac{9}{2}}x^3\left(-\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{asin}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{231a^{\frac{7}{2}}\left(a-bx^4\right)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((-b*x**4+a)**(1/4)/x**16,x)
```

```
[Out] -(a - b*x**4)**(1/4)/(15*x**15) + b*(a - b*x**4)**(1/4)/(165*a*x*
*11) + 2*b**2*(a - b*x**4)**(1/4)/(231*a**2*x**7) + 4*b**3*(a - b
*x**4)**(1/4)/(231*a**3*x**3) + 8*b**(9/2)*x**3*(-a/(b*x**4) + 1)
**(3/4)*elliptic_f(asin(sqrt(a)/(sqrt(b)*x**2))/2, 2)/(231*a**(7/
2)*(a - b*x**4)**(3/4))
```

Mathematica [C] time = 0.0663952, size = 106, normalized size = 0.67

$$\frac{-77a^4+84a^3bx^4+3a^2b^2x^8-40b^4x^{16}\left(1-\frac{bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};\frac{bx^4}{a}\right)+10ab^3x^{12}-20b^4x^{16}}{1155a^3x^{15}\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a - b*x^4)^(1/4)/x^16,x]
```

```
[Out] (-77*a^4 + 84*a^3*b*x^4 + 3*a^2*b^2*x^8 + 10*a*b^3*x^12 - 20*b^4*
x^16 - 40*b^4*x^16*(1 - (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/4, 3
/4, 5/4, (b*x^4)/a])/(1155*a^3*x^15*(a - b*x^4)^(3/4))
```

Maple [F] time = 0.049, size = 0, normalized size = 0.

$$\int \frac{1}{x^{16}}\sqrt[4]{-bx^4+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-b*x^4+a)^(1/4)/x^16,x)
```

```
[Out] int((-b*x^4+a)^(1/4)/x^16,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-bx^4+a\right)^{\frac{1}{4}}}{x^{16}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-b*x^4 + a)^(1/4)/x^16,x, algorithm="maxima")
```

```
[Out] integrate((-b*x^4 + a)^(1/4)/x^16, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(-bx^4+a\right)^{\frac{1}{4}}}{x^{16}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-b*x^4 + a)^(1/4)/x^16,x, algorithm="fricas")
```

```
[Out] integral((-b*x^4 + a)^(1/4)/x^16, x)
```

Sympy [A] time = 22.6187, size = 34, normalized size = 0.22

$$\frac{i\sqrt[4]{b}e^{\frac{19i\pi}{4}}\,{}_2F_1\left(\left.\begin{matrix}-\frac{1}{4}, \frac{7}{2}\\ \frac{9}{2}\end{matrix}\right|\frac{a}{bx^4}\right)}{14x^{14}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-b*x**4+a)**(1/4)/x**16,x)
```

```
[Out] I*b**(1/4)*exp(19*I*pi/4)*hyper((-1/4, 7/2), (9/2,), a/(b*x**4))/
(14*x**14)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(-bx^4 + a\right)^{\frac{1}{4}}}{x^{16}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(1/4)/x^16,x, algorithm="giac")
```

```
[Out] integrate((-b*x^4 + a)^(1/4)/x^16, x)
```

3.1202 $\int \frac{x^{19}}{\sqrt[4]{a-bx^4}} dx$

Optimal. Leaf size=106

$$-\frac{a^4\left(a-bx^4\right)^{3/4}}{3b^5}+\frac{4a^3\left(a-bx^4\right)^{7/4}}{7b^5}-\frac{6a^2\left(a-bx^4\right)^{11/4}}{11b^5}-\frac{\left(a-bx^4\right)^{19/4}}{19b^5}+\frac{4a\left(a-bx^4\right)^{15/4}}{15b^5}$$

```
[Out] -(a^4*(a - b*x^4)^(3/4))/(3*b^5) + (4*a^3*(a - b*x^4)^(7/4))/(7*b
^5) - (6*a^2*(a - b*x^4)^(11/4))/(11*b^5) + (4*a*(a - b*x^4)^(15/
4))/(15*b^5) - (a - b*x^4)^(19/4)/(19*b^5)
```

Rubi [A] time = 0.137289, antiderivative size = 106, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$

$$-\frac{a^4\left(a-bx^4\right)^{3/4}}{3b^5}+\frac{4a^3\left(a-bx^4\right)^{7/4}}{7b^5}-\frac{6a^2\left(a-bx^4\right)^{11/4}}{11b^5}-\frac{\left(a-bx^4\right)^{19/4}}{19b^5}+\frac{4a\left(a-bx^4\right)^{15/4}}{15b^5}$$

Antiderivative was successfully verified.

```
[In]  Int[x^19/(a - b*x^4)^(1/4),x]
```

```
[Out] -(a^4*(a - b*x^4)^(3/4))/(3*b^5) + (4*a^3*(a - b*x^4)^(7/4))/(7*b
^5) - (6*a^2*(a - b*x^4)^(11/4))/(11*b^5) + (4*a*(a - b*x^4)^(15/
4))/(15*b^5) - (a - b*x^4)^(19/4)/(19*b^5)
```

Rubi in Sympy [A] time = 18.8881, size = 92, normalized size = 0.87

$$-\frac{a^4\left(a-bx^4\right)^{\frac{3}{4}}}{3b^5}+\frac{4a^3\left(a-bx^4\right)^{\frac{7}{4}}}{7b^5}-\frac{6a^2\left(a-bx^4\right)^{\frac{11}{4}}}{11b^5}+\frac{4a\left(a-bx^4\right)^{\frac{15}{4}}}{15b^5}-\frac{\left(a-bx^4\right)^{\frac{19}{4}}}{19b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**19/(-b*x**4+a)**(1/4),x)
```

```
[Out] -a**4*(a - b*x**4)**(3/4)/(3*b**5) + 4*a**3*(a - b*x**4)**(7/4)/(
7*b**5) - 6*a**2*(a - b*x**4)**(11/4)/(11*b**5) + 4*a*(a - b*x**4
)**(15/4)/(15*b**5) - (a - b*x**4)**(19/4)/(19*b**5)
```

Mathematica [A] time = 0.0436354, size = 62, normalized size = 0.58

$$-\frac{\left(a-bx^4\right)^{3/4}\left(2048a^4+1536a^3bx^4+1344a^2b^2x^8+1232ab^3x^{12}+1155b^4x^{16}\right)}{21945b^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^19/(a - b*x^4)^(1/4),x]
```

```
[Out] -((a - b*x^4)^(3/4)*(2048*a^4 + 1536*a^3*b*x^4 + 1344*a^2*b^2*x^8
 + 1232*a*b^3*x^12 + 1155*b^4*x^16))/(21945*b^5)
```

Maple [A] time = 0.011, size = 59, normalized size = 0.6

$$-\frac{1155\,x^{16}b^4+1232\,ax^{12}b^3+1344\,a^2x^8b^2+1536\,a^3x^4b+2048\,a^4}{21945\,b^5}\left(-bx^4+a\right)^{\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^19/(-b*x^4+a)^(1/4),x)
```

```
[Out] -1/21945*(-b*x^4+a)^(3/4)*(1155*b^4*x^16+1232*a*b^3*x^12+1344*a^2
*b^2*x^8+1536*a^3*b*x^4+2048*a^4)/b^5
```

Maxima [A] time = 1.43746, size = 116, normalized size = 1.09

$$-\frac{\left(-bx^4+a\right)^{\frac{19}{4}}}{19\,b^5}+\frac{4\left(-bx^4+a\right)^{\frac{15}{4}}a}{15\,b^5}-\frac{6\left(-bx^4+a\right)^{\frac{11}{4}}a^2}{11\,b^5}+\frac{4\left(-bx^4+a\right)^{\frac{7}{4}}a^3}{7\,b^5}-\frac{\left(-bx^4+a\right)^{\frac{3}{4}}a^4}{3\,b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^19/(-b*x^4 + a)^(1/4),x, algorithm="maxima")
```

```
[Out] -1/19*(-b*x^4 + a)^(19/4)/b^5 + 4/15*(-b*x^4 + a)^(15/4)*a/b^5 -
6/11*(-b*x^4 + a)^(11/4)*a^2/b^5 + 4/7*(-b*x^4 + a)^(7/4)*a^3/b^5
 - 1/3*(-b*x^4 + a)^(3/4)*a^4/b^5
```

Fricas [A] time = 0.228591, size = 78, normalized size = 0.74

$$-\frac{\left(1155\,b^4x^{16}+1232\,ab^3x^{12}+1344\,a^2b^2x^8+1536\,a^3bx^4+2048\,a^4\right)\left(-bx^4+a\right)^{\frac{3}{4}}}{21945\,b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^19/(-b*x^4 + a)^(1/4),x, algorithm="fricas")
```

```
[Out] -1/21945*(1155*b^4*x^16 + 1232*a*b^3*x^12 + 1344*a^2*b^2*x^8 + 15
36*a^3*b*x^4 + 2048*a^4)*(-b*x^4 + a)^(3/4)/b^5
```

Sympy [A] time = 53.6587, size = 117, normalized size = 1.1

$$\begin{cases} -\frac{2048a^4\left(a-bx^4\right)^{\frac{3}{4}}}{21945b^5}-\frac{512a^3x^4\left(a-bx^4\right)^{\frac{3}{4}}}{7315b^4}-\frac{64a^2x^8\left(a-bx^4\right)^{\frac{3}{4}}}{1045b^3}-\frac{16ax^{12}\left(a-bx^4\right)^{\frac{3}{4}}}{285b^2}-\frac{x^{16}\left(a-bx^4\right)^{\frac{3}{4}}}{19b} & \text{for}\ b \neq 0 \\ \frac{x^{20}}{20\sqrt[4]{a}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**19/(-b*x**4+a)**(1/4),x)
```

```
[Out] Piecewise((-2048*a**4*(a - b*x**4)**(3/4)/(21945*b**5) - 512*a**3
*x**4*(a - b*x**4)**(3/4)/(7315*b**4) - 64*a**2*x**8*(a - b*x**4)
**(3/4)/(1045*b**3) - 16*a*x**12*(a - b*x**4)**(3/4)/(285*b**2) -
 x**16*(a - b*x**4)**(3/4)/(19*b), Ne(b, 0)), (x**20/(20*a**(1/4)
), True))
```

GIAC/XCAS [A] time = 0.243152, size = 147, normalized size = 1.39

$$-\frac{1155\left(bx^4-a\right)^4\left(-bx^4+a\right)^{\frac{3}{4}}+5852\left(bx^4-a\right)^3\left(-bx^4+a\right)^{\frac{3}{4}}a+11970\left(bx^4-a\right)^2\left(-bx^4+a\right)^{\frac{3}{4}}a^2-12540\left(-bx^4+a\right)^{\frac{7}{4}}a^3+}{21945\,b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^19/(-b*x^4 + a)^(1/4),x, algorithm="giac")
```

```
[Out] -1/21945*(1155*(b*x^4 - a)^4*(-b*x^4 + a)^(3/4) + 5852*(b*x^4 - a
)^3*(-b*x^4 + a)^(3/4)*a + 11970*(b*x^4 - a)^2*(-b*x^4 + a)^(3/4)
*a^2 - 12540*(-b*x^4 + a)^(7/4)*a^3 + 7315*(-b*x^4 + a)^(3/4)*a^4
)/b^5
```

3.1203 $\int \frac{x^{15}}{\sqrt[4]{a-bx^4}}\,dx$

Optimal. Leaf size=84

$$-\frac{a^3\left(a-bx^4\right)^{3/4}}{3b^4}+\frac{3a^2\left(a-bx^4\right)^{7/4}}{7b^4}+\frac{\left(a-bx^4\right)^{15/4}}{15b^4}-\frac{3a\left(a-bx^4\right)^{11/4}}{11b^4}$$

```
[Out] -(a^3*(a - b*x^4)^(3/4))/(3*b^4) + (3*a^2*(a - b*x^4)^(7/4))/(7*b
^4) - (3*a*(a - b*x^4)^(11/4))/(11*b^4) + (a - b*x^4)^(15/4)/(15*
b^4)
```

Rubi [A] time = 0.114764, antiderivative size = 84, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125

$$-\frac{a^3\left(a-bx^4\right)^{3/4}}{3b^4}+\frac{3a^2\left(a-bx^4\right)^{7/4}}{7b^4}+\frac{\left(a-bx^4\right)^{15/4}}{15b^4}-\frac{3a\left(a-bx^4\right)^{11/4}}{11b^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^15/(a - b*x^4)^(1/4),x]
```

```
[Out] -(a^3*(a - b*x^4)^(3/4))/(3*b^4) + (3*a^2*(a - b*x^4)^(7/4))/(7*b
^4) - (3*a*(a - b*x^4)^(11/4))/(11*b^4) + (a - b*x^4)^(15/4)/(15*
b^4)
```

Rubi in Sympy [A] time = 15.397, size = 71, normalized size = 0.85

$$-\frac{a^3\left(a-bx^4\right)^{\frac{3}{4}}}{3b^4}+\frac{3a^2\left(a-bx^4\right)^{\frac{7}{4}}}{7b^4}-\frac{3a\left(a-bx^4\right)^{\frac{11}{4}}}{11b^4}+\frac{\left(a-bx^4\right)^{\frac{15}{4}}}{15b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**15/(-b*x**4+a)**(1/4),x)
```

```
[Out] -a**3*(a - b*x**4)**(3/4)/(3*b**4) + 3*a**2*(a - b*x**4)**(7/4)/(
7*b**4) - 3*a*(a - b*x**4)**(11/4)/(11*b**4) + (a - b*x**4)**(15/
4)/(15*b**4)
```

Mathematica [A] time = 0.035346, size = 51, normalized size = 0.61

$$-\frac{\left(a-bx^4\right)^{3/4}\left(128a^3+96a^2bx^4+84ab^2x^8+77b^3x^{12}\right)}{1155b^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^15/(a - b*x^4)^(1/4),x]
```

```
[Out] -((a - b*x^4)^(3/4)*(128*a^3 + 96*a^2*b*x^4 + 84*a*b^2*x^8 + 77*b
^3*x^12))/(1155*b^4)
```

Maple [A] time = 0.01, size = 48, normalized size = 0.6

$$-\frac{77\,b^3x^{12}+84\,ab^2x^8+96\,a^2bx^4+128\,a^3}{1155\,b^4}\left(-bx^4+a\right)^{\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^15/(-b*x^4+a)^(1/4),x)
```

```
[Out] -1/1155*(-b*x^4+a)^(3/4)*(77*b^3*x^12+84*a*b^2*x^8+96*a^2*b*x^4+1
28*a^3)/b^4
```

Maxima [A] time = 1.44503, size = 92, normalized size = 1.1

$$\frac{\left(-bx^4+a\right)^{\frac{15}{4}}}{15\,b^4} - \frac{3\left(-bx^4+a\right)^{\frac{11}{4}}a}{11\,b^4} + \frac{3\left(-bx^4+a\right)^{\frac{7}{4}}a^2}{7\,b^4} - \frac{\left(-bx^4+a\right)^{\frac{3}{4}}a^3}{3\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^15/(-b*x^4 + a)^(1/4),x, algorithm="maxima")
```

```
[Out] 1/15*(-b*x^4 + a)^(15/4)/b^4 - 3/11*(-b*x^4 + a)^(11/4)*a/b^4 + 3
/7*(-b*x^4 + a)^(7/4)*a^2/b^4 - 1/3*(-b*x^4 + a)^(3/4)*a^3/b^4
```

Fricas [A] time = 0.229917, size = 63, normalized size = 0.75

$$-\frac{\left(77\,b^3x^{12} + 84\,ab^2x^8 + 96\,a^2bx^4 + 128\,a^3\right)\left(-bx^4+a\right)^{\frac{3}{4}}}{1155\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^15/(-b*x^4 + a)^(1/4),x, algorithm="fricas")
```

```
[Out] -1/1155*(77*b^3*x^12 + 84*a*b^2*x^8 + 96*a^2*b*x^4 + 128*a^3)*(-b
*x^4 + a)^(3/4)/b^4
```

Sympy [A] time = 25.8092, size = 94, normalized size = 1.12

$$\begin{cases} -\frac{128a^3(a-bx^4)^{\frac{3}{4}}}{1155b^4} - \frac{32a^2x^4(a-bx^4)^{\frac{3}{4}}}{385b^3} - \frac{4ax^8(a-bx^4)^{\frac{3}{4}}}{55b^2} - \frac{x^{12}(a-bx^4)^{\frac{3}{4}}}{15b} & \text{for } b \neq 0 \\ \frac{x^{16}}{16\sqrt[4]{a}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**15/(-b*x**4+a)**(1/4),x)
```

```
[Out] Piecewise((-128*a**3*(a - b*x**4)**(3/4)/(1155*b**4) - 32*a**2*x*
*4*(a - b*x**4)**(3/4)/(385*b**3) - 4*a*x**8*(a - b*x**4)**(3/4)/
(55*b**2) - x**12*(a - b*x**4)**(3/4)/(15*b), Ne(b, 0)), (x**16/(
16*a**(1/4)), True))
```

GIAC/XCAS [A] time = 0.24409, size = 112, normalized size = 1.33

$$-\frac{77\left(bx^4-a\right)^3\left(-bx^4+a\right)^{\frac{3}{4}} + 315\left(bx^4-a\right)^2\left(-bx^4+a\right)^{\frac{3}{4}}a - 495\left(-bx^4+a\right)^{\frac{7}{4}}a^2 + 385\left(-bx^4+a\right)^{\frac{3}{4}}a^3}{1155\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^15/(-b*x^4 + a)^(1/4),x, algorithm="giac")
```

```
[Out] -1/1155*(77*(b*x^4 - a)^3*(-b*x^4 + a)^(3/4) + 315*(b*x^4 - a)^2*
(-b*x^4 + a)^(3/4)*a - 495*(-b*x^4 + a)^(7/4)*a^2 + 385*(-b*x^4 +
 a)^(3/4)*a^3)/b^4
```

3.1204 $\int \frac{x^{11}}{\sqrt[4]{a-bx^4}}\,dx$

Optimal. Leaf size=62

$$-\frac{a^2\left(a-bx^4\right)^{3/4}}{3b^3}-\frac{\left(a-bx^4\right)^{11/4}}{11b^3}+\frac{2a\left(a-bx^4\right)^{7/4}}{7b^3}$$

```
[Out] -(a^2*(a - b*x^4)^(3/4))/(3*b^3) + (2*a*(a - b*x^4)^(7/4))/(7*b^3
) - (a - b*x^4)^(11/4)/(11*b^3)
```

Rubi [A] time = 0.0892385, antiderivative size = 62, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125

$$-\frac{a^2\left(a-bx^4\right)^{3/4}}{3b^3}-\frac{\left(a-bx^4\right)^{11/4}}{11b^3}+\frac{2a\left(a-bx^4\right)^{7/4}}{7b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11/(a - b*x^4)^(1/4),x]
```

```
[Out] -(a^2*(a - b*x^4)^(3/4))/(3*b^3) + (2*a*(a - b*x^4)^(7/4))/(7*b^3
) - (a - b*x^4)^(11/4)/(11*b^3)
```

Rubi in Sympy [A] time = 11.5577, size = 51, normalized size = 0.82

$$-\frac{a^2\left(a-bx^4\right)^{\frac{3}{4}}}{3b^3}+\frac{2a\left(a-bx^4\right)^{\frac{7}{4}}}{7b^3}-\frac{\left(a-bx^4\right)^{\frac{11}{4}}}{11b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11/(-b*x**4+a)**(1/4),x)
```

```
[Out] -a**2*(a - b*x**4)**(3/4)/(3*b**3) + 2*a*(a - b*x**4)**(7/4)/(7*b
**3) - (a - b*x**4)**(11/4)/(11*b**3)
```

Mathematica [A] time = 0.0314233, size = 40, normalized size = 0.65

$$-\frac{\left(a-bx^4\right)^{3/4}\left(32a^2+24abx^4+21b^2x^8\right)}{231b^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11/(a - b*x^4)^(1/4),x]
```

```
[Out] -((a - b*x^4)^(3/4)*(32*a^2 + 24*a*b*x^4 + 21*b^2*x^8))/(231*b^3)
```

Maple [A] time = 0.009, size = 37, normalized size = 0.6

$$-\frac{21\,b^2x^8+24\,abx^4+32\,a^2}{231\,b^3}\left(-bx^4+a\right)^{\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11/(-b*x^4+a)^(1/4),x)
```

```
[Out] -1/231*(-b*x^4+a)^(3/4)*(21*b^2*x^8+24*a*b*x^4+32*a^2)/b^3
```

Maxima [A] time = 1.43841, size = 68, normalized size = 1.1

$$-\frac{\left(-bx^4+a\right)^{\frac{11}{4}}}{11\,b^3}+\frac{2\left(-bx^4+a\right)^{\frac{7}{4}}a}{7\,b^3}-\frac{\left(-bx^4+a\right)^{\frac{3}{4}}a^2}{3\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(-b*x^4 + a)^(1/4),x, algorithm="maxima")
```

```
[Out] -1/11*(-b*x^4 + a)^(11/4)/b^3 + 2/7*(-b*x^4 + a)^(7/4)*a/b^3 - 1/
3*(-b*x^4 + a)^(3/4)*a^2/b^3
```

Fricas [A] time = 0.230098, size = 49, normalized size = 0.79

$$-\frac{\left(21\,b^2x^8+24\,abx^4+32\,a^2\right)\left(-bx^4+a\right)^{\frac{3}{4}}}{231\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(-b*x^4 + a)^(1/4),x, algorithm="fricas")
```

```
[Out] -1/231*(21*b^2*x^8 + 24*a*b*x^4 + 32*a^2)*(-b*x^4 + a)^(3/4)/b^3
```

Sympy [A] time = 11.0313, size = 70, normalized size = 1.13

$$\begin{cases} -\frac{32a^2(a-bx^4)^{\frac{3}{4}}}{231b^3}-\frac{8ax^4(a-bx^4)^{\frac{3}{4}}}{77b^2}-\frac{x^8(a-bx^4)^{\frac{3}{4}}}{11b} & \text{for } b\neq 0\\ \frac{x^{12}}{12\sqrt[4]{a}} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11/(-b*x**4+a)**(1/4),x)
```

```
[Out] Piecewise((-32*a**2*(a - b*x**4)**(3/4)/(231*b**3) - 8*a*x**4*(a
- b*x**4)**(3/4)/(77*b**2) - x**8*(a - b*x**4)**(3/4)/(11*b), Ne(
b, 0)), (x**12/(12*a**(1/4)), True))
```

GIAC/XCAS [A] time = 0.216756, size = 77, normalized size = 1.24

$$-\frac{21\left(bx^4-a\right)^2\left(-bx^4+a\right)^{\frac{3}{4}}-66\left(-bx^4+a\right)^{\frac{7}{4}}a+77\left(-bx^4+a\right)^{\frac{3}{4}}a^2}{231\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(-b*x^4 + a)^(1/4),x, algorithm="giac")
```

```
[Out] -1/231*(21*(b*x^4 - a)^2*(-b*x^4 + a)^(3/4) - 66*(-b*x^4 + a)^(7/
4)*a + 77*(-b*x^4 + a)^(3/4)*a^2)/b^3
```

3.1205 $\int \frac{x^7}{\sqrt[4]{a-bx^4}}\,dx$

Optimal. Leaf size=40

$$\frac{(a-bx^4)^{7/4}}{7b^2}-\frac{a(a-bx^4)^{3/4}}{3b^2}$$

```
[Out] -(a*(a - b*x^4)^(3/4))/(3*b^2) + (a - b*x^4)^(7/4)/(7*b^2)
```

Rubi [A] time = 0.0634923, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125

$$\frac{(a-bx^4)^{7/4}}{7b^2}-\frac{a(a-bx^4)^{3/4}}{3b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7/(a - b*x^4)^(1/4),x]
```

```
[Out] -(a*(a - b*x^4)^(3/4))/(3*b^2) + (a - b*x^4)^(7/4)/(7*b^2)
```

Rubi in Sympy [A] time = 7.81612, size = 31, normalized size = 0.78

$$-\frac{a\left(a-bx^4\right)^{\frac{3}{4}}}{3b^2}+\frac{\left(a-bx^4\right)^{\frac{7}{4}}}{7b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7/(-b*x**4+a)**(1/4),x)
```

```
[Out] -a*(a - b*x**4)**(3/4)/(3*b**2) + (a - b*x**4)**(7/4)/(7*b**2)
```

Mathematica [A] time = 0.0212168, size = 29, normalized size = 0.72

$$-\frac{(a-bx^4)^{3/4}(4a+3bx^4)}{21b^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^7/(a - b*x^4)^(1/4),x]
```

```
[Out] -((a - b*x^4)^(3/4)*(4*a + 3*b*x^4))/(21*b^2)
```

Maple [A] time = 0.006, size = 26, normalized size = 0.7

$$-\frac{3\,bx^4+4\,a}{21\,b^2}\left(-bx^4+a\right)^{\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7/(-b*x^4+a)^(1/4),x)
```

```
[Out] -1/21*(-b*x^4+a)^(3/4)*(3*b*x^4+4*a)/b^2
```

Maxima [A] time = 1.45014, size = 43, normalized size = 1.08

$$\frac{\left(-bx^4+a\right)^{\frac{7}{4}}}{7\,b^2}-\frac{\left(-bx^4+a\right)^{\frac{3}{4}}a}{3\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(-b*x^4 + a)^(1/4),x, algorithm="maxima")
```

```
[Out] 1/7*(-b*x^4 + a)^(7/4)/b^2 - 1/3*(-b*x^4 + a)^(3/4)*a/b^2
```

Fricas [A] time = 0.230784, size = 34, normalized size = 0.85

$$-\frac{\left(3\,bx^4+4\,a\right)\left(-bx^4+a\right)^{\frac{3}{4}}}{21\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(-b*x^4 + a)^(1/4),x, algorithm="fricas")
```

```
[Out] -1/21*(3*b*x^4 + 4*a)*(-b*x^4 + a)^(3/4)/b^2
```

Sympy [A] time = 4.35455, size = 46, normalized size = 1.15

$$\begin{cases} -\frac{4a\left(a-bx^4\right)^{\frac{3}{4}}}{21b^2}-\frac{x^4\left(a-bx^4\right)^{\frac{3}{4}}}{7b} & \text{for}\ b\neq 0 \\ \frac{x^8}{8\sqrt[4]{a}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(-b*x**4+a)**(1/4),x)
```

```
[Out] Piecewise((-4*a*(a - b*x**4)**(3/4)/(21*b**2) - x**4*(a - b*x**4)
**(3/4)/(7*b), Ne(b, 0)), (x**8/(8*a**(1/4)), True))
```

GIAC/XCAS [A] time = 0.212967, size = 42, normalized size = 1.05

$$\frac{3\left(-bx^4+a\right)^{\frac{7}{4}}-7\left(-bx^4+a\right)^{\frac{3}{4}}a}{21\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(-b*x^4 + a)^(1/4),x, algorithm="giac")
```

```
[Out] 1/21*(3*(-b*x^4 + a)^(7/4) - 7*(-b*x^4 + a)^(3/4)*a)/b^2
```

3.1206 $\int \frac{x^3}{\sqrt[4]{a-bx^4}} \, dx$

Optimal. Leaf size=19

$$-\frac{\left(a-bx^4\right)^{3/4}}{3b}$$

```
[Out] -(a - b*x^4)^(3/4)/(3*b)
```

Rubi [A] time = 0.011328, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062

$$-\frac{\left(a-bx^4\right)^{3/4}}{3b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(a - b*x^4)^(1/4),x]

[Out] -(a - b*x^4)^(3/4)/(3*b)
```

Rubi in Sympy [A] time = 2.37843, size = 14, normalized size = 0.74

$$-\frac{\left(a-bx^4\right)^{\frac{3}{4}}}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(-b*x**4+a)**(1/4),x)

[Out] -(a - b*x**4)**(3/4)/(3*b)
```

Mathematica [A] time = 0.00803349, size = 19, normalized size = 1.

$$-\frac{\left(a-bx^4\right)^{3/4}}{3b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(a - b*x^4)^(1/4),x]

[Out] -(a - b*x^4)^(3/4)/(3*b)
```

Maple [A] time = 0.006, size = 16, normalized size = 0.8

$$-\frac{1}{3\,b}\left(-bx^4+a\right)^{\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(-b*x^4+a)^(1/4),x)
```

```
[Out] -1/3*(-b*x^4+a)^(3/4)/b
```

Maxima [A] time = 1.43804, size = 20, normalized size = 1.05

$$-\frac{\left(-bx^4+a\right)^{\frac{3}{4}}}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(-b*x^4 + a)^(1/4),x, algorithm="maxima")
```

```
[Out] -1/3*(-b*x^4 + a)^(3/4)/b
```

Fricas [A] time = 0.22897, size = 20, normalized size = 1.05

$$-\frac{\left(-bx^4+a\right)^{\frac{3}{4}}}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(-b*x^4 + a)^(1/4),x, algorithm="fricas")
```

```
[Out] -1/3*(-b*x^4 + a)^(3/4)/b
```

Sympy [A] time = 1.93341, size = 24, normalized size = 1.26

$$\begin{cases} -\frac{\left(a-bx^4\right)^{\frac{3}{4}}}{3b} & \text{for}\ b \neq 0 \\ \frac{x^4}{4\sqrt[4]{a}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(-b*x**4+a)**(1/4),x)
```

```
[Out] Piecewise((-(a - b*x**4)**(3/4)/(3*b), Ne(b, 0)), (x**4/(4*a**(1/
4)), True))
```

GIAC/XCAS [A] time = 0.216636, size = 20, normalized size = 1.05

$$-\frac{\left(-bx^4+a\right)^{\frac{3}{4}}}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(-b*x^4 + a)^(1/4),x, algorithm="giac")
```

```
[Out] -1/3*(-b*x^4 + a)^(3/4)/b
```

3.1207 $\int \frac{1}{x\sqrt[4]{a-bx^4}}\,dx$

Optimal. Leaf size=57

$$\frac{\tan^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{2\sqrt[4]{a}}-\frac{\tanh^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{2\sqrt[4]{a}}$$

```
[Out] ArcTan[(a - b*x^4)^(1/4)/a^(1/4)]/(2*a^(1/4)) - ArcTanh[(a - b*x^
4)^(1/4)/a^(1/4)]/(2*a^(1/4))
```

Rubi [A] time = 0.0899578, antiderivative size = 57, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312

$$\frac{\tan^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{2\sqrt[4]{a}}-\frac{\tanh^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{2\sqrt[4]{a}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a - b*x^4)^(1/4)),x]
```

```
[Out] ArcTan[(a - b*x^4)^(1/4)/a^(1/4)]/(2*a^(1/4)) - ArcTanh[(a - b*x^
4)^(1/4)/a^(1/4)]/(2*a^(1/4))
```

Rubi in Sympy [A] time = 9.918, size = 46, normalized size = 0.81

$$\frac{\operatorname{atan}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{2\sqrt[4]{a}}-\frac{\operatorname{atanh}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{2\sqrt[4]{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(-b*x**4+a)**(1/4),x)
```

```
[Out] atan((a - b*x**4)**(1/4)/a**(1/4))/(2*a**(1/4)) - atanh((a - b*x*
*4)**(1/4)/a**(1/4))/(2*a**(1/4))
```

Mathematica [C] time = 0.037766, size = 47, normalized size = 0.82

$$-\frac{\sqrt[4]{1-\frac{a}{bx^4}}\,{}_2F_1\left(\frac{1}{4},\frac{1}{4};\frac{5}{4};\frac{a}{bx^4}\right)}{\sqrt[4]{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a - b*x^4)^(1/4)),x]
```

```
[Out] -(((1 - a/(b*x^4))^(1/4)*Hypergeometric2F1[1/4, 1/4, 5/4, a/(b*x^
4)])/(a - b*x^4)^(1/4))
```

Maple [F] time = 0.033, size = 0, normalized size = 0.

$$\int \frac{1}{x}\frac{1}{\sqrt[4]{-bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(-b*x^4+a)^(1/4),x)
```

```
[Out] int(1/x/(-b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.249457, size = 111, normalized size = 1.95

$$-\frac{\arctan\left(\frac{a^{\frac{1}{4}}}{\sqrt{\sqrt{-bx^4+a}+\sqrt{a}}+(-bx^4+a)^{\frac{1}{4}}}\right)}{a^{\frac{1}{4}}}-\frac{\log\left((-bx^4+a)^{\frac{1}{4}}+a^{\frac{1}{4}}\right)}{4\,a^{\frac{1}{4}}}+\frac{\log\left((-bx^4+a)^{\frac{1}{4}}-a^{\frac{1}{4}}\right)}{4\,a^{\frac{1}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x),x, algorithm="fricas")
```

```
[Out] -arctan(a^(1/4)/(sqrt(sqrt(-b*x^4 + a) + sqrt(a)) + (-b*x^4 + a)^
(1/4)))/a^(1/4) - 1/4*log((-b*x^4 + a)^(1/4) + a^(1/4))/a^(1/4) +
 1/4*log((-b*x^4 + a)^(1/4) - a^(1/4))/a^(1/4)
```

Sympy [A] time = 3.8113, size = 39, normalized size = 0.68

$$-\frac{e^{-\frac{i\pi}{4}}\,\Gamma\left(\frac{1}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{4},\frac{1}{4}\\ \frac{5}{4}\end{matrix}\middle|\frac{a}{bx^4}\right)}{4\sqrt[4]{b}x\,\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(-b*x**4+a)**(1/4),x)
```

```
[Out] -exp(-I*pi/4)*gamma(1/4)*hyper((1/4, 1/4), (5/4,), a/(b*x**4))/(4
*b**(1/4)*x*gamma(5/4))
```

GIAC/XCAS [A] time = 0.226822, size = 259, normalized size = 4.54

$$-\frac{\sqrt{2}\,(-a)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}+2\,(-bx^4+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{4\,a}-\frac{\sqrt{2}\,(-a)^{\frac{3}{4}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}-2\,(-bx^4+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{4\,a}+\frac{\sqrt{2}\,(-a)^{\frac{3}{4}}\ln\left(\sqrt{2}(-bx^4+a)^{\frac{1}{4}}(-a)^{\frac{1}{4}}+\sqrt{-bx^4+a}+\sqrt{-a}\right)}{8\,a}-\frac{\sqrt{2}\,(-a)^{\frac{3}{4}}\ln\left(-\sqrt{2}(-bx^4+a)^{\frac{1}{4}}(-a)^{\frac{1}{4}}+\sqrt{-bx^4+a}+\sqrt{-a}\right)}{8\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x),x, algorithm="giac")
```

```
[Out] -1/4*sqrt(2)*(-a)^(3/4)*arctan(1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) +
2*(-b*x^4 + a)^(1/4))/(-a)^(1/4))/a - 1/4*sqrt(2)*(-a)^(3/4)*arct
an(-1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) - 2*(-b*x^4 + a)^(1/4))/(-a)^
(1/4))/a + 1/8*sqrt(2)*(-a)^(3/4)*ln(sqrt(2)*(-b*x^4 + a)^(1/4)*(
-a)^(1/4) + sqrt(-b*x^4 + a) + sqrt(-a))/a - 1/8*sqrt(2)*(-a)^(3/
4)*ln(-sqrt(2)*(-b*x^4 + a)^(1/4)*(-a)^(1/4) + sqrt(-b*x^4 + a) +
 sqrt(-a))/a
```

3.1208 $\int \frac{1}{x^5 \sqrt[4]{a-bx^4}} \, dx$

Optimal. Leaf size=81

$$\frac{b \tan^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{8a^{5/4}} - \frac{b \tanh^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{8a^{5/4}} - \frac{\left(a-bx^4\right)^{3/4}}{4ax^4}$$

```
[Out] -(a - b*x^4)^(3/4)/(4*a*x^4) + (b*ArcTan[(a - b*x^4)^(1/4)/a^(1/4
)])/(8*a^(5/4)) - (b*ArcTanh[(a - b*x^4)^(1/4)/a^(1/4)])/(8*a^(5/
4))
```

Rubi [A] time = 0.120557, antiderivative size = 81, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375

$$\frac{b \tan^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{8a^{5/4}} - \frac{b \tanh^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{8a^{5/4}} - \frac{\left(a-bx^4\right)^{3/4}}{4ax^4}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^5*(a - b*x^4)^(1/4)),x]
```

```
[Out] -(a - b*x^4)^(3/4)/(4*a*x^4) + (b*ArcTan[(a - b*x^4)^(1/4)/a^(1/4
)])/(8*a^(5/4)) - (b*ArcTanh[(a - b*x^4)^(1/4)/a^(1/4)])/(8*a^(5/
4))
```

Rubi in Sympy [A] time = 12.9221, size = 66, normalized size = 0.81

$$-\frac{\left(a-bx^4\right)^{\frac{3}{4}}}{4ax^4} + \frac{b \operatorname{atan}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{8a^{\frac{5}{4}}} - \frac{b \operatorname{atanh}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{8a^{\frac{5}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**5/(-b*x**4+a)**(1/4),x)
```

```
[Out] -(a - b*x**4)**(3/4)/(4*a*x**4) + b*atan((a - b*x**4)**(1/4)/a**(
1/4))/(8*a**(5/4)) - b*atanh((a - b*x**4)**(1/4)/a**(1/4))/(8*a**
(5/4))
```

Mathematica [C] time = 0.0561116, size = 70, normalized size = 0.86

$$\frac{-bx^4 \sqrt[4]{1-\frac{a}{bx^4}}\, {}_2F_1\left(\frac{1}{4},\frac{1}{4};\frac{5}{4};\frac{a}{bx^4}\right) - a + bx^4}{4ax^4 \sqrt[4]{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^5*(a - b*x^4)^(1/4)),x]
```

```
[Out] (-a + b*x^4 - b*(1 - a/(b*x^4))^(1/4)*x^4*Hypergeometric2F1[1/4,
1/4, 5/4, a/(b*x^4)])/(4*a*x^4*(a - b*x^4)^(1/4))
```

Maple [F] time = 0.046, size = 0, normalized size = 0.

$$\int \frac{1}{x^5}\frac{1}{\sqrt[4]{-bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^5/(-b*x^4+a)^(1/4),x)
```

```
[Out] int(1/x^5/(-b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^5),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.252146, size = 254, normalized size = 3.14

$$-\frac{4\,ax^4\left(\frac{b^4}{a^5}\right)^{\frac{1}{4}}\arctan\left(\frac{a^4\left(\frac{b^4}{a^5}\right)^{\frac{3}{4}}}{(-bx^4+a)^{\frac{1}{4}}b^3+\sqrt{a^3b^4\sqrt{\frac{b^4}{a^5}}+\sqrt{-bx^4+a}b^6}}\right)+ax^4\left(\frac{b^4}{a^5}\right)^{\frac{1}{4}}\log\left(a^4\left(\frac{b^4}{a^5}\right)^{\frac{3}{4}}+(-bx^4+a)^{\frac{1}{4}}b^3\right)-ax^4\left(\frac{b^4}{a^5}\right)^{\frac{1}{4}}\log\left(-a\right.}{16\,ax^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^5),x, algorithm="fricas")
```

```
[Out] -1/16*(4*a*x^4*(b^4/a^5)^(1/4)*arctan(a^4*(b^4/a^5)^(3/4)/((-b*x^
4 + a)^(1/4)*b^3 + sqrt(a^3*b^4*sqrt(b^4/a^5) + sqrt(-b*x^4 + a)*
b^6))) + a*x^4*(b^4/a^5)^(1/4)*log(a^4*(b^4/a^5)^(3/4) + (-b*x^4
+ a)^(1/4)*b^3) - a*x^4*(b^4/a^5)^(1/4)*log(-a^4*(b^4/a^5)^(3/4)
+ (-b*x^4 + a)^(1/4)*b^3) + 4*(-b*x^4 + a)^(3/4))/(a*x^4)
```

Sympy [A] time = 5.25813, size = 41, normalized size = 0.51

$$\frac{e^{-\frac{5i\pi}{4}}\Gamma\left(\frac{5}{4}\right){}_2F_1\left(\begin{matrix}\frac{1}{4},\frac{5}{4}\\ \frac{9}{4}\end{matrix}\middle|\frac{a}{bx^4}\right)}{4\sqrt[4]{b}x^5\,\Gamma\left(\frac{9}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**5/(-b*x**4+a)**(1/4),x)
```

```
[Out] exp(-5*I*pi/4)*gamma(5/4)*hyper((1/4, 5/4), (9/4,), a/(b*x**4))/(
4*b**(1/4)*x**5*gamma(9/4))
```

GIAC/XCAS [A] time = 0.229973, size = 290, normalized size = 3.58

$$-\frac{1}{32}\,b\left(\frac{2\,\sqrt{2}\,(-a)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}+2\,\left(-bx^4+a\right)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{a^2}+\frac{2\,\sqrt{2}\,(-a)^{\frac{3}{4}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}-2\,\left(-bx^4+a\right)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{a^2}-\frac{\sqrt{2}\,(-a)^{\frac{3}{4}}\ln\left(\sqrt{2}(-b\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^5),x, algorithm="giac")
```

```
[Out] -1/32*b*(2*sqrt(2)*(-a)^(3/4)*arctan(1/2*sqrt(2)*(sqrt(2)*(-a)^(1
/4) + 2*(-b*x^4 + a)^(1/4))/(-a)^(1/4))/a^2 + 2*sqrt(2)*(-a)^(3/4
)*arctan(-1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) - 2*(-b*x^4 + a)^(1/4))
/(-a)^(1/4))/a^2 - sqrt(2)*(-a)^(3/4)*ln(sqrt(2)*(-b*x^4 + a)^(1/
4)*(-a)^(1/4) + sqrt(-b*x^4 + a) + sqrt(-a))/a^2 + sqrt(2)*(-a)^(
3/4)*ln(-sqrt(2)*(-b*x^4 + a)^(1/4)*(-a)^(1/4) + sqrt(-b*x^4 + a)
 + sqrt(-a))/a^2 + 8*(-b*x^4 + a)^(3/4)/(a*b*x^4))
```

3.1209 $\int \frac{1}{x^9 \sqrt[4]{a-bx^4}}\,dx$

Optimal. Leaf size=108

$$\frac{5b^2\tan^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{64a^{9/4}}-\frac{5b^2\tanh^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{64a^{9/4}}-\frac{5b\left(a-bx^4\right)^{3/4}}{32a^2x^4}-\frac{\left(a-bx^4\right)^{3/4}}{8ax^8}$$

```
[Out] -(a - b*x^4)^(3/4)/(8*a*x^8) - (5*b*(a - b*x^4)^(3/4))/(32*a^2*x^
4) + (5*b^2*ArcTan[(a - b*x^4)^(1/4)/a^(1/4)])/(64*a^(9/4)) - (5*
b^2*ArcTanh[(a - b*x^4)^(1/4)/a^(1/4)])/(64*a^(9/4))
```

Rubi [A] time = 0.155287, antiderivative size = 108, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.375$

$$\frac{5b^2\tan^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{64a^{9/4}}-\frac{5b^2\tanh^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{64a^{9/4}}-\frac{5b\left(a-bx^4\right)^{3/4}}{32a^2x^4}-\frac{\left(a-bx^4\right)^{3/4}}{8ax^8}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^9*(a - b*x^4)^(1/4)),x]
```

```
[Out] -(a - b*x^4)^(3/4)/(8*a*x^8) - (5*b*(a - b*x^4)^(3/4))/(32*a^2*x^
4) + (5*b^2*ArcTan[(a - b*x^4)^(1/4)/a^(1/4)])/(64*a^(9/4)) - (5*
b^2*ArcTanh[(a - b*x^4)^(1/4)/a^(1/4)])/(64*a^(9/4))
```

Rubi in Sympy [A] time = 18.3292, size = 95, normalized size = 0.88

$$-\frac{\left(a-bx^4\right)^{\frac{3}{4}}}{8ax^8}-\frac{5b\left(a-bx^4\right)^{\frac{3}{4}}}{32a^2x^4}+\frac{5b^2\operatorname{atan}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{64a^{\frac{9}{4}}}-\frac{5b^2\operatorname{atanh}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{64a^{\frac{9}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**9/(-b*x**4+a)**(1/4),x)
```

```
[Out] -(a - b*x**4)**(3/4)/(8*a*x**8) - 5*b*(a - b*x**4)**(3/4)/(32*a**
2*x**4) + 5*b**2*atan((a - b*x**4)**(1/4)/a**(1/4))/(64*a**(9/4))
 - 5*b**2*atanh((a - b*x**4)**(1/4)/a**(1/4))/(64*a**(9/4))
```

Mathematica [C] time = 0.0622709, size = 84, normalized size = 0.78

$$\frac{-4a^2-5b^2x^8\sqrt[4]{1-\frac{a}{bx^4}}\,{}_2F_1\left(\frac{1}{4},\frac{1}{4};\frac{5}{4};\frac{a}{bx^4}\right)-abx^4+5b^2x^8}{32a^2x^8\sqrt[4]{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^9*(a - b*x^4)^(1/4)),x]
```

```
[Out] (-4*a^2 - a*b*x^4 + 5*b^2*x^8 - 5*b^2*(1 - a/(b*x^4))^(1/4)*x^8*H
ypergeometric2F1[1/4, 1/4, 5/4, a/(b*x^4)])/(32*a^2*x^8*(a - b*x^
4)^(1/4))
```

Maple [F] time = 0.049, size = 0, normalized size = 0.

$$\int \frac{1}{x^9}\frac{1}{\sqrt[4]{-bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^9/(-b*x^4+a)^(1/4),x)

[Out] int(1/x^9/(-b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^9),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [A] time = 0.254655, size = 281, normalized size = 2.6

$$-\frac{20\,a^2x^8\left(\frac{b^8}{a^9}\right)^{\frac{1}{4}}\arctan\left(\frac{a^7\left(\frac{b^8}{a^9}\right)^{\frac{3}{4}}}{(-bx^4+a)^{\frac{1}{4}}b^6+\sqrt{a^5b^8\sqrt{\frac{b^8}{a^9}}+\sqrt{-bx^4+a}\,b^{12}}}\right)+5\,a^2x^8\left(\frac{b^8}{a^9}\right)^{\frac{1}{4}}\log\left(125\,a^7\left(\frac{b^8}{a^9}\right)^{\frac{3}{4}}+125\left(-bx^4+a\right)^{\frac{1}{4}}b^6\right)-5\,a^2x}{128\,a^2x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^9),x, algorithm="fricas")

[Out] -1/128*(20*a^2*x^8*(b^8/a^9)^(1/4)*arctan(a^7*(b^8/a^9)^(3/4)/((-
b*x^4 + a)^(1/4)*b^6 + sqrt(a^5*b^8*sqrt(b^8/a^9) + sqrt(-b*x^4 +
 a)*b^12))) + 5*a^2*x^8*(b^8/a^9)^(1/4)*log(125*a^7*(b^8/a^9)^(3/
4) + 125*(-b*x^4 + a)^(1/4)*b^6) - 5*a^2*x^8*(b^8/a^9)^(1/4)*log(
-125*a^7*(b^8/a^9)^(3/4) + 125*(-b*x^4 + a)^(1/4)*b^6) + 4*(5*b*x
^4 + 4*a)*(-b*x^4 + a)^(3/4))/(a^2*x^8)
```

Sympy [A] time = 8.961, size = 42, normalized size = 0.39

$$-\frac{e^{-\frac{9i\pi}{4}}\left(\frac{9}{4}\right)\,{}_2F_1\left(\left.\begin{matrix}\frac{1}{4},\frac{9}{4}\\ \frac{13}{4}\end{matrix}\right|\frac{a}{bx^4}\right)}{4\sqrt[4]{b}x^9\left(\frac{13}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**9/(-b*x**4+a)**(1/4),x)

[Out] -exp(-9*I*pi/4)*gamma(9/4)*hyper((1/4, 9/4), (13/4,), a/(b*x**4))
/(4*b**(1/4)*x**9*gamma(13/4))
```

GIAC/XCAS [A] time = 0.23605, size = 316, normalized size = 2.93

$$-\frac{1}{256}\,b^{2}\left(\frac{10\,\sqrt{2}\,(-a)^{\frac{3}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}+2\,(-bx^{4}+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{a^{3}}+\frac{10\,\sqrt{2}\,(-a)^{\frac{3}{4}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}-2\,(-bx^{4}+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{a^{3}}-\frac{5\,\sqrt{2}\,(-a)^{\frac{3}{4}}\ln\left(\cdots\right.}{\cdots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^9),x, algorithm="giac")
```

```
[Out] -1/256*b^2*(10*sqrt(2)*(-a)^(3/4)*arctan(1/2*sqrt(2)*(sqrt(2)*(-a
)^(1/4) + 2*(-b*x^4 + a)^(1/4))/(-a)^(1/4))/a^3 + 10*sqrt(2)*(-a)
^(3/4)*arctan(-1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) - 2*(-b*x^4 + a)^(
1/4))/(-a)^(1/4))/a^3 - 5*sqrt(2)*(-a)^(3/4)*ln(sqrt(2)*(-b*x^4 +
 a)^(1/4)*(-a)^(1/4) + sqrt(-b*x^4 + a) + sqrt(-a))/a^3 + 5*sqrt(
2)*(-a)^(3/4)*ln(-sqrt(2)*(-b*x^4 + a)^(1/4)*(-a)^(1/4) + sqrt(-b
*x^4 + a) + sqrt(-a))/a^3 - 8*(5*(-b*x^4 + a)^(7/4) - 9*(-b*x^4 +
 a)^(3/4)*a)/(a^2*b^2*x^8))
```

3.1210 $\int \frac{x^{13}}{\sqrt[4]{a-bx^4}}\,dx$

Optimal. Leaf size=133

$$\frac{8a^{7/2}\sqrt[4]{1-\frac{bx^4}{a}}E\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{39b^{7/2}\sqrt[4]{a-bx^4}}-\frac{4a^2x^2\left(a-bx^4\right)^{3/4}}{39b^3}-\frac{10ax^6\left(a-bx^4\right)^{3/4}}{117b^2}-\frac{x^{10}\left(a-bx^4\right)^{3/4}}{13b}$$

```
[Out] (-4*a^2*x^2*(a - b*x^4)^(3/4))/(39*b^3) - (10*a*x^6*(a - b*x^4)^(
3/4))/(117*b^2) - (x^10*(a - b*x^4)^(3/4))/(13*b) + (8*a^(7/2)*(1
 - (b*x^4)/a)^(1/4)*EllipticE[ArcSin[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2]
)/(39*b^(7/2)*(a - b*x^4)^(1/4))
```

Rubi [A] time = 0.210263, antiderivative size = 133, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25

$$\frac{8a^{7/2}\sqrt[4]{1-\frac{bx^4}{a}}E\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{39b^{7/2}\sqrt[4]{a-bx^4}}-\frac{4a^2x^2\left(a-bx^4\right)^{3/4}}{39b^3}-\frac{10ax^6\left(a-bx^4\right)^{3/4}}{117b^2}-\frac{x^{10}\left(a-bx^4\right)^{3/4}}{13b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^13/(a - b*x^4)^(1/4),x]
```

```
[Out] (-4*a^2*x^2*(a - b*x^4)^(3/4))/(39*b^3) - (10*a*x^6*(a - b*x^4)^(
3/4))/(117*b^2) - (x^10*(a - b*x^4)^(3/4))/(13*b) + (8*a^(7/2)*(1
 - (b*x^4)/a)^(1/4)*EllipticE[ArcSin[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2]
)/(39*b^(7/2)*(a - b*x^4)^(1/4))
```

Rubi in Sympy [A] time = 24.0279, size = 116, normalized size = 0.87

$$\frac{8a^{\frac{7}{2}}\sqrt[4]{1-\frac{bx^4}{a}}E\left(\frac{\operatorname{asin}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{39b^{\frac{7}{2}}\sqrt[4]{a-bx^4}}-\frac{4a^2x^2\left(a-bx^4\right)^{\frac{3}{4}}}{39b^3}-\frac{10ax^6\left(a-bx^4\right)^{\frac{3}{4}}}{117b^2}-\frac{x^{10}\left(a-bx^4\right)^{\frac{3}{4}}}{13b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**13/(-b*x**4+a)**(1/4),x)
```

```
[Out] 8*a**(7/2)*(1 - b*x**4/a)**(1/4)*elliptic_e(asin(sqrt(b)*x**2/sqr
t(a))/2, 2)/(39*b**(7/2)*(a - b*x**4)**(1/4)) - 4*a**2*x**2*(a -
b*x**4)**(3/4)/(39*b**3) - 10*a*x**6*(a - b*x**4)**(3/4)/(117*b**
2) - x**10*(a - b*x**4)**(3/4)/(13*b)
```

Mathematica [C] time = 0.0855635, size = 91, normalized size = 0.68

$$\frac{x^2\left(12a^3\sqrt[4]{1-\frac{bx^4}{a}}\,{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{3}{2};\frac{bx^4}{a}\right)-12a^3+2a^2bx^4+ab^2x^8+9b^3x^{12}\right)}{117b^3\sqrt[4]{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^13/(a - b*x^4)^(1/4),x]
```

```
[Out] (x^2*(-12*a^3 + 2*a^2*b*x^4 + a*b^2*x^8 + 9*b^3*x^12 + 12*a^3*(1
- (b*x^4)/a)^(1/4)*Hypergeometric2F1[1/4, 1/2, 3/2, (b*x^4)/a]))/
(117*b^3*(a - b*x^4)^(1/4))
```

Maple [F] time = 0.043, size = 0, normalized size = 0.

$$\int x^{13}\frac{1}{\sqrt[4]{-bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^13/(-b*x^4+a)^(1/4),x)
```

```
[Out] int(x^13/(-b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{13}}{(-bx^4+a)^{\frac{1}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^13/(-b*x^4 + a)^(1/4),x, algorithm="maxima")
```

```
[Out] integrate(x^13/(-b*x^4 + a)^(1/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{13}}{(-bx^4+a)^{\frac{1}{4}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^13/(-b*x^4 + a)^(1/4),x, algorithm="fricas")
```

```
[Out] integral(x^13/(-b*x^4 + a)^(1/4), x)
```

Sympy [A] time = 8.80184, size = 29, normalized size = 0.22

$$\frac{x^{14}{}_2F_1\left(\begin{matrix}\frac{1}{4},\frac{7}{2}\\\frac{9}{2}\end{matrix}\middle|\frac{bx^4e^{2i\pi}}{a}\right)}{14\sqrt[4]{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**13/(-b*x**4+a)**(1/4),x)
```

```
[Out] x**14*hyper((1/4, 7/2), (9/2,), b*x**4*exp_polar(2*I*pi)/a)/(14*a
**(1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{13}}{\left(-bx^4 + a\right)^{\frac{1}{4}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^13/(-b*x^4 + a)^(1/4),x, algorithm="giac")
```

```
[Out] integrate(x^13/(-b*x^4 + a)^(1/4), x)
```

3.1211 $\int \frac{x^9}{\sqrt[4]{a-bx^4}}\,dx$

Optimal. Leaf size=108

$$\frac{4a^{5/2}\sqrt[4]{1-\frac{bx^4}{a}}E\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{15b^{5/2}\sqrt[4]{a-bx^4}}-\frac{2ax^2\left(a-bx^4\right)^{3/4}}{15b^2}-\frac{x^6\left(a-bx^4\right)^{3/4}}{9b}$$

```
[Out] (-2*a*x^2*(a - b*x^4)^(3/4))/(15*b^2) - (x^6*(a - b*x^4)^(3/4))/(
9*b) + (4*a^(5/2)*(1 - (b*x^4)/a)^(1/4)*EllipticE[ArcSin[(Sqrt[b]
*x^2)/Sqrt[a]]/2, 2])/(15*b^(5/2)*(a - b*x^4)^(1/4))
```

Rubi [A] time = 0.160254, antiderivative size = 108, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25

$$\frac{4a^{5/2}\sqrt[4]{1-\frac{bx^4}{a}}E\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{15b^{5/2}\sqrt[4]{a-bx^4}}-\frac{2ax^2\left(a-bx^4\right)^{3/4}}{15b^2}-\frac{x^6\left(a-bx^4\right)^{3/4}}{9b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^9/(a - b*x^4)^(1/4),x]
```

```
[Out] (-2*a*x^2*(a - b*x^4)^(3/4))/(15*b^2) - (x^6*(a - b*x^4)^(3/4))/(
9*b) + (4*a^(5/2)*(1 - (b*x^4)/a)^(1/4)*EllipticE[ArcSin[(Sqrt[b]
*x^2)/Sqrt[a]]/2, 2])/(15*b^(5/2)*(a - b*x^4)^(1/4))
```

Rubi in Sympy [A] time = 18.6241, size = 92, normalized size = 0.85

$$\frac{4a^{\frac{5}{2}}\sqrt[4]{1-\frac{bx^4}{a}}E\left(\frac{\operatorname{asin}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{15b^{\frac{5}{2}}\sqrt[4]{a-bx^4}}-\frac{2ax^2\left(a-bx^4\right)^{\frac{3}{4}}}{15b^2}-\frac{x^6\left(a-bx^4\right)^{\frac{3}{4}}}{9b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**9/(-b*x**4+a)**(1/4),x)
```

```
[Out] 4*a**(5/2)*(1 - b*x**4/a)**(1/4)*elliptic_e(asin(sqrt(b)*x**2/sqr
t(a))/2, 2)/(15*b**(5/2)*(a - b*x**4)**(1/4)) - 2*a*x**2*(a - b*x
**4)**(3/4)/(15*b**2) - x**6*(a - b*x**4)**(3/4)/(9*b)
```

Mathematica [C] time = 0.0701064, size = 80, normalized size = 0.74

$$\frac{x^2\left(6a^2\sqrt[4]{1-\frac{bx^4}{a}}\,{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{3}{2};\frac{bx^4}{a}\right)-6a^2+abx^4+5b^2x^8\right)}{45b^2\sqrt[4]{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^9/(a - b*x^4)^(1/4),x]
```

```
[Out] (x^2*(-6*a^2 + a*b*x^4 + 5*b^2*x^8 + 6*a^2*(1 - (b*x^4)/a)^(1/4)*
Hypergeometric2F1[1/4, 1/2, 3/2, (b*x^4)/a]))/(45*b^2*(a - b*x^4)
^(1/4))
```

Maple [F] time = 0.039, size = 0, normalized size = 0.

$$\int x^{9} \frac{1}{\sqrt[4]{-b x^{4}+a}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^9/(-b*x^4+a)^(1/4),x)
```

```
[Out] int(x^9/(-b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{9}}{\left(-b x^{4}+a\right)^{\frac{1}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(-b*x^4 + a)^(1/4),x, algorithm="maxima")
```

```
[Out] integrate(x^9/(-b*x^4 + a)^(1/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{9}}{\left(-b x^{4}+a\right)^{\frac{1}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(-b*x^4 + a)^(1/4),x, algorithm="fricas")
```

```
[Out] integral(x^9/(-b*x^4 + a)^(1/4), x)
```

Sympy [A] time = 4.56169, size = 29, normalized size = 0.27

$$\frac{x^{10} {}_{2}F_{1}\left(\begin{matrix} \frac{1}{4}, \frac{5}{2} \\ \frac{7}{2} \end{matrix}\middle| {\frac{b x^{4} e^{2 i \pi}}{a}} \right)}{10 \sqrt[4]{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**9/(-b*x**4+a)**(1/4),x)
```

```
[Out] x**10*hyper((1/4, 5/2), (7/2,), b*x**4*exp_polar(2*I*pi)/a)/(10*a
**(1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{9}}{\left(-b x^{4}+a\right)^{\frac{1}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(-b*x^4 + a)^(1/4),x, algorithm="giac")
```

```
[Out] integrate(x^9/(-b*x^4 + a)^(1/4), x)
```

3.1212 $\int \frac{x^5}{\sqrt[4]{a-bx^4}}\,dx$

Optimal. Leaf size=85

$$\frac{2a^{3/2}\sqrt[4]{1-\frac{bx^4}{a}}E\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{5b^{3/2}\sqrt[4]{a-bx^4}}-\frac{x^2\left(a-bx^4\right)^{3/4}}{5b}$$

```
[Out] -(x^2*(a - b*x^4)^(3/4))/(5*b) + (2*a^(3/2)*(1 - (b*x^4)/a)^(1/4)
*EllipticE[ArcSin[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(5*b^(3/2)*(a - b
*x^4)^(1/4))
```

Rubi [A] time = 0.118592, antiderivative size = 85, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25

$$\frac{2a^{3/2}\sqrt[4]{1-\frac{bx^4}{a}}E\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{5b^{3/2}\sqrt[4]{a-bx^4}}-\frac{x^2\left(a-bx^4\right)^{3/4}}{5b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/(a - b*x^4)^(1/4),x]
```

```
[Out] -(x^2*(a - b*x^4)^(3/4))/(5*b) + (2*a^(3/2)*(1 - (b*x^4)/a)^(1/4)
*EllipticE[ArcSin[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(5*b^(3/2)*(a - b
*x^4)^(1/4))
```

Rubi in Sympy [A] time = 14.326, size = 70, normalized size = 0.82

$$\frac{2a^{\frac{3}{2}}\sqrt[4]{1-\frac{bx^4}{a}}E\left(\frac{\operatorname{asin}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{5b^{\frac{3}{2}}\sqrt[4]{a-bx^4}}-\frac{x^2\left(a-bx^4\right)^{\frac{3}{4}}}{5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(-b*x**4+a)**(1/4),x)
```

```
[Out] 2*a**(3/2)*(1 - b*x**4/a)**(1/4)*elliptic_e(asin(sqrt(b)*x**2/sqr
t(a))/2, 2)/(5*b**(3/2)*(a - b*x**4)**(1/4)) - x**2*(a - b*x**4)*
*(3/4)/(5*b)
```

Mathematica [C] time = 0.0547728, size = 66, normalized size = 0.78

$$\frac{x^2\left(a\sqrt[4]{1-\frac{bx^4}{a}}\,{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{3}{2};\frac{bx^4}{a}\right)-a+bx^4\right)}{5b\sqrt[4]{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/(a - b*x^4)^(1/4),x]
```

```
[Out] (x^2*(-a + b*x^4 + a*(1 - (b*x^4)/a)^(1/4)*Hypergeometric2F1[1/4,
 1/2, 3/2, (b*x^4)/a]))/(5*b*(a - b*x^4)^(1/4))
```

Maple [F] time = 0.037, size = 0, normalized size = 0.

$$\int x^{5}\frac{1}{\sqrt[4]{-b x^{4}+a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(-b*x^4+a)^(1/4),x)
```

```
[Out] int(x^5/(-b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{5}}{(-b x^{4}+a)^{\frac{1}{4}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(-b*x^4 + a)^(1/4),x, algorithm="maxima")
```

```
[Out] integrate(x^5/(-b*x^4 + a)^(1/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x^{5}}{(-b x^{4}+a)^{\frac{1}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(-b*x^4 + a)^(1/4),x, algorithm="fricas")
```

```
[Out] integral(x^5/(-b*x^4 + a)^(1/4), x)
```

Sympy [A] time = 2.89388, size = 29, normalized size = 0.34

$$\frac{x^{6}{}_{2}F_{1}\left(\begin{matrix}\frac{1}{4}, \frac{3}{2}\\ \frac{5}{2}\end{matrix}\middle|\frac{b x^{4} e^{2i\pi}}{a}\right)}{6\sqrt[4]{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(-b*x**4+a)**(1/4),x)
```

```
[Out] x**6*hyper((1/4, 3/2), (5/2,), b*x**4*exp_polar(2*I*pi)/a)/(6*a**
(1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{5}}{(-b x^{4}+a)^{\frac{1}{4}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(-b*x^4 + a)^(1/4),x, algorithm="giac")
```

```
[Out] integrate(x^5/(-b*x^4 + a)^(1/4), x)
```

3.1213 $\int \frac{x}{\sqrt[4]{a-bx^4}}\,dx$

Optimal. Leaf size=59

$$\frac{\sqrt{a}\sqrt[4]{1-\frac{bx^4}{a}}E\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{\sqrt{b}\sqrt[4]{a-bx^4}}$$

```
[Out] (Sqrt[a]*(1 - (b*x^4)/a)^(1/4)*EllipticE[ArcSin[(Sqrt[b]*x^2)/Sqr
t[a]]/2, 2])/(Sqrt[b]*(a - b*x^4)^(1/4))
```

Rubi [A] time = 0.0718608, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214

$$\frac{\sqrt{a}\sqrt[4]{1-\frac{bx^4}{a}}E\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{\sqrt{b}\sqrt[4]{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a - b*x^4)^(1/4),x]
```

```
[Out] (Sqrt[a]*(1 - (b*x^4)/a)^(1/4)*EllipticE[ArcSin[(Sqrt[b]*x^2)/Sqr
t[a]]/2, 2])/(Sqrt[b]*(a - b*x^4)^(1/4))
```

Rubi in Sympy [A] time = 8.99127, size = 49, normalized size = 0.83

$$\frac{\sqrt{a}\sqrt[4]{1-\frac{bx^4}{a}}E\left(\frac{\operatorname{asin}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{\sqrt{b}\sqrt[4]{a-bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(-b*x**4+a)**(1/4),x)
```

```
[Out] sqrt(a)*(1 - b*x**4/a)**(1/4)*elliptic_e(asin(sqrt(b)*x**2/sqrt(a
))/2, 2)/(sqrt(b)*(a - b*x**4)**(1/4))
```

Mathematica [C] time = 0.0281153, size = 53, normalized size = 0.9

$$\frac{x^2\sqrt[4]{\frac{a-bx^4}{a}}\,{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{3}{2};\frac{bx^4}{a}\right)}{2\sqrt[4]{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a - b*x^4)^(1/4),x]
```

```
[Out] (x^2*((a - b*x^4)/a)^(1/4)*Hypergeometric2F1[1/4, 1/2, 3/2, (b*x^
4)/a])/(2*(a - b*x^4)^(1/4))
```

Maple [F] time = 0.027, size = 0, normalized size = 0.

$$\int x\frac{1}{\sqrt[4]{-bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(-b*x^4+a)^(1/4),x)
```

```
[Out] int(x/(-b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{(-bx^4+a)^{\frac{1}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(-b*x^4 + a)^(1/4),x, algorithm="maxima")
```

```
[Out] integrate(x/(-b*x^4 + a)^(1/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x}{(-bx^4+a)^{\frac{1}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(-b*x^4 + a)^(1/4),x, algorithm="fricas")
```

```
[Out] integral(x/(-b*x^4 + a)^(1/4), x)
```

Sympy [A] time = 2.32549, size = 29, normalized size = 0.49

$$\frac{x^2 {}_2F_1\left(\begin{matrix} \frac{1}{4}, \frac{1}{2} \\ \frac{3}{2} \end{matrix}\middle| \frac{bx^4 e^{2i\pi}}{a}\right)}{2\sqrt[4]{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(-b*x**4+a)**(1/4),x)
```

```
[Out] x**2*hyper((1/4, 1/2), (3/2,), b*x**4*exp_polar(2*I*pi)/a)/(2*a**
(1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{(-bx^4+a)^{\frac{1}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(-b*x^4 + a)^(1/4),x, algorithm="giac")
```

```
[Out] integrate(x/(-b*x^4 + a)^(1/4), x)
```

3.1214 $\int \frac{1}{x^3 \sqrt[4]{a-bx^4}}\,dx$

Optimal. Leaf size=85

$$-\frac{\left(a-bx^4\right)^{3/4}}{2ax^2}-\frac{\sqrt{b}\sqrt[4]{1-\frac{bx^4}{a}}E\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{2\sqrt{a}\sqrt[4]{a-bx^4}}$$

```
[Out] -(a - b*x^4)^(3/4)/(2*a*x^2) - (Sqrt[b]*(1 - (b*x^4)/a)^(1/4)*Ell
ipticE[ArcSin[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(2*Sqrt[a]*(a - b*x^4
)^(1/4))
```

Rubi [A] time = 0.112398, antiderivative size = 85, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.25$

$$-\frac{\left(a-bx^4\right)^{3/4}}{2ax^2}-\frac{\sqrt{b}\sqrt[4]{1-\frac{bx^4}{a}}E\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{2\sqrt{a}\sqrt[4]{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(a - b*x^4)^(1/4)),x]
```

```
[Out] -(a - b*x^4)^(3/4)/(2*a*x^2) - (Sqrt[b]*(1 - (b*x^4)/a)^(1/4)*Ell
ipticE[ArcSin[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(2*Sqrt[a]*(a - b*x^4
)^(1/4))
```

Rubi in Sympy [A] time = 13.4015, size = 70, normalized size = 0.82

$$-\frac{\left(a-bx^4\right)^{\frac{3}{4}}}{2ax^2}-\frac{\sqrt{b}\sqrt[4]{1-\frac{bx^4}{a}}E\left(\frac{\operatorname{asin}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{2\sqrt{a}\sqrt[4]{a-bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(-b*x**4+a)**(1/4),x)
```

```
[Out] -(a - b*x**4)**(3/4)/(2*a*x**2) - sqrt(b)*(1 - b*x**4/a)**(1/4)*e
lliptic_e(asin(sqrt(b)*x**2/sqrt(a))/2, 2)/(2*sqrt(a)*(a - b*x**4
)**(1/4))
```

Mathematica [C] time = 0.0520952, size = 71, normalized size = 0.84

$$\frac{-bx^4\sqrt[4]{1-\frac{bx^4}{a}}\,{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{3}{2};\frac{bx^4}{a}\right)-2a+2bx^4}{4ax^2\sqrt[4]{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*(a - b*x^4)^(1/4)),x]
```

```
[Out] (-2*a + 2*b*x^4 - b*x^4*(1 - (b*x^4)/a)^(1/4)*Hypergeometric2F1[1
/4, 1/2, 3/2, (b*x^4)/a])/(4*a*x^2*(a - b*x^4)^(1/4))
```

Maple [F] time = 0.043, size = 0, normalized size = 0.

$$\int \frac{1}{x^3} \frac{1}{\sqrt[4]{-bx^4 + a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(-b*x^4+a)^(1/4),x)

[Out] int(1/x^3/(-b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(-bx^4 + a)^{\frac{1}{4}} x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^3),x, algorithm="maxima")

[Out] integrate(1/((-b*x^4 + a)^(1/4)*x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(-bx^4 + a)^{\frac{1}{4}} x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^3),x, algorithm="fricas")

[Out] integral(1/((-b*x^4 + a)^(1/4)*x^3), x)
```

Sympy [A] time = 2.8398, size = 32, normalized size = 0.38

$$-\frac{{}_{2}F_{1}\left(\begin{matrix} -\frac{1}{2}, \frac{1}{4} \\ \frac{1}{2} \end{matrix}\middle| \frac{bx^4 e^{2i\pi}}{a}\right)}{2\sqrt[4]{a}x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(-b*x**4+a)**(1/4),x)

[Out] -hyper((-1/2, 1/4), (1/2,), b*x**4*exp_polar(2*I*pi)/a)/(2*a**(1/
4)*x**2)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(-bx^4 + a)^{\frac{1}{4}} x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^3),x, algorithm="giac")

[Out] integrate(1/((-b*x^4 + a)^(1/4)*x^3), x)
```

3.1215 $\int \frac{1}{x^7 \sqrt[4]{a-bx^4}}\,dx$

Optimal. Leaf size=108

$$-\frac{b^{3/2}\sqrt[4]{1-\frac{bx^4}{a}}E\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{4a^{3/2}\sqrt[4]{a-bx^4}}-\frac{b\left(a-bx^4\right)^{3/4}}{4a^2x^2}-\frac{\left(a-bx^4\right)^{3/4}}{6ax^6}$$

```
[Out] -(a - b*x^4)^(3/4)/(6*a*x^6) - (b*(a - b*x^4)^(3/4))/(4*a^2*x^2)
- (b^(3/2)*(1 - (b*x^4)/a)^(1/4)*EllipticE[ArcSin[(Sqrt[b]*x^2)/S
qrt[a]]/2, 2])/(4*a^(3/2)*(a - b*x^4)^(1/4))
```

Rubi [A] time = 0.15419, antiderivative size = 108, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25

$$-\frac{b^{3/2}\sqrt[4]{1-\frac{bx^4}{a}}E\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{4a^{3/2}\sqrt[4]{a-bx^4}}-\frac{b\left(a-bx^4\right)^{3/4}}{4a^2x^2}-\frac{\left(a-bx^4\right)^{3/4}}{6ax^6}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^7*(a - b*x^4)^(1/4)),x]
```

```
[Out] -(a - b*x^4)^(3/4)/(6*a*x^6) - (b*(a - b*x^4)^(3/4))/(4*a^2*x^2)
- (b^(3/2)*(1 - (b*x^4)/a)^(1/4)*EllipticE[ArcSin[(Sqrt[b]*x^2)/S
qrt[a]]/2, 2])/(4*a^(3/2)*(a - b*x^4)^(1/4))
```

Rubi in Sympy [A] time = 17.4422, size = 90, normalized size = 0.83

$$-\frac{\left(a-bx^4\right)^{\frac{3}{4}}}{6ax^6}-\frac{b\left(a-bx^4\right)^{\frac{3}{4}}}{4a^2x^2}-\frac{b^{\frac{3}{2}}\sqrt[4]{1-\frac{bx^4}{a}}E\left(\frac{\operatorname{asin}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{4a^{\frac{3}{2}}\sqrt[4]{a-bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**7/(-b*x**4+a)**(1/4),x)
```

```
[Out] -(a - b*x**4)**(3/4)/(6*a*x**6) - b*(a - b*x**4)**(3/4)/(4*a**2*x
**2) - b**(3/2)*(1 - b*x**4/a)**(1/4)*elliptic_e(asin(sqrt(b)*x**
2/sqrt(a))/2, 2)/(4*a**(3/2)*(a - b*x**4)**(1/4))
```

Mathematica [C] time = 0.06457, size = 84, normalized size = 0.78

$$\frac{-4a^2-3b^2x^8\sqrt[4]{1-\frac{bx^4}{a}}\,{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{3}{2};\frac{bx^4}{a}\right)-2abx^4+6b^2x^8}{24a^2x^6\sqrt[4]{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^7*(a - b*x^4)^(1/4)),x]
```

```
[Out] (-4*a^2 - 2*a*b*x^4 + 6*b^2*x^8 - 3*b^2*x^8*(1 - (b*x^4)/a)^(1/4)
*Hypergeometric2F1[1/4, 1/2, 3/2, (b*x^4)/a])/(24*a^2*x^6*(a - b*
x^4)^(1/4))
```

Maple [F] time = 0.043, size = 0, normalized size = 0.

$$\int \frac{1}{x^{7}} \frac{1}{\sqrt[4]{-b x^{4}+a}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^7/(-b*x^4+a)^(1/4),x)
```

```
[Out] int(1/x^7/(-b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{{\left(-b x^{4}+a\right)}^{\frac{1}{4}} x^{7}}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^7),x, algorithm="maxima")
```

```
[Out] integrate(1/((-b*x^4 + a)^(1/4)*x^7), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$${\rm integral}\left(\frac{1}{{\left(-b x^{4}+a\right)}^{\frac{1}{4}} x^{7}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^7),x, algorithm="fricas")
```

```
[Out] integral(1/((-b*x^4 + a)^(1/4)*x^7), x)
```

Sympy [A] time = 4.66196, size = 34, normalized size = 0.31

$$-\frac{{}_{2}F_{1}\left(\begin{matrix} -\frac{3}{2}, \frac{1}{4} \\ -\frac{1}{2} \end{matrix}\middle| {\frac{b x^{4} e^{2 i \pi}}{a}} \right)}{6 \sqrt[4]{a} x^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**7/(-b*x**4+a)**(1/4),x)
```

```
[Out] -hyper((-3/2, 1/4), (-1/2,), b*x**4*exp_polar(2*I*pi)/a)/(6*a**(1
/4)*x**6)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{{\left(-b x^{4}+a\right)}^{\frac{1}{4}} x^{7}}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^7),x, algorithm="giac")
```

```
[Out] integrate(1/((-b*x^4 + a)^(1/4)*x^7), x)
```

3.1216 $\int \frac{1}{x^{11}\sqrt[4]{a-bx^4}}\,dx$

Optimal. Leaf size=133

$$-\frac{7b^{5/2}\sqrt[4]{1-\frac{bx^4}{a}}E\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{40a^{5/2}\sqrt[4]{a-bx^4}}-\frac{7b^2\left(a-bx^4\right)^{3/4}}{40a^3x^2}-\frac{7b\left(a-bx^4\right)^{3/4}}{60a^2x^6}-\frac{\left(a-bx^4\right)^{3/4}}{10ax^{10}}$$

```
[Out] -(a - b*x^4)^(3/4)/(10*a*x^10) - (7*b*(a - b*x^4)^(3/4))/(60*a^2*
x^6) - (7*b^2*(a - b*x^4)^(3/4))/(40*a^3*x^2) - (7*b^(5/2)*(1 - (
b*x^4)/a)^(1/4)*EllipticE[ArcSin[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(4
0*a^(5/2)*(a - b*x^4)^(1/4))
```

Rubi [A] time = 0.203147, antiderivative size = 133, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25

$$-\frac{7b^{5/2}\sqrt[4]{1-\frac{bx^4}{a}}E\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{40a^{5/2}\sqrt[4]{a-bx^4}}-\frac{7b^2\left(a-bx^4\right)^{3/4}}{40a^3x^2}-\frac{7b\left(a-bx^4\right)^{3/4}}{60a^2x^6}-\frac{\left(a-bx^4\right)^{3/4}}{10ax^{10}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^11*(a - b*x^4)^(1/4)),x]
```

```
[Out] -(a - b*x^4)^(3/4)/(10*a*x^10) - (7*b*(a - b*x^4)^(3/4))/(60*a^2*
x^6) - (7*b^2*(a - b*x^4)^(3/4))/(40*a^3*x^2) - (7*b^(5/2)*(1 - (
b*x^4)/a)^(1/4)*EllipticE[ArcSin[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(4
0*a^(5/2)*(a - b*x^4)^(1/4))
```

Rubi in Sympy [A] time = 23.3166, size = 117, normalized size = 0.88

$$-\frac{\left(a-bx^4\right)^{\frac{3}{4}}}{10ax^{10}}-\frac{7b\left(a-bx^4\right)^{\frac{3}{4}}}{60a^2x^6}-\frac{7b^2\left(a-bx^4\right)^{\frac{3}{4}}}{40a^3x^2}-\frac{7b^{\frac{5}{2}}\sqrt[4]{1-\frac{bx^4}{a}}E\left(\frac{\operatorname{asin}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{40a^{\frac{5}{2}}\sqrt[4]{a-bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**11/(-b*x**4+a)**(1/4),x)
```

```
[Out] -(a - b*x**4)**(3/4)/(10*a*x**10) - 7*b*(a - b*x**4)**(3/4)/(60*a
**2*x**6) - 7*b**2*(a - b*x**4)**(3/4)/(40*a**3*x**2) - 7*b**(5/2
)*(1 - b*x**4/a)**(1/4)*elliptic_e(asin(sqrt(b)*x**2/sqrt(a))/2,
2)/(40*a**(5/2)*(a - b*x**4)**(1/4))
```

Mathematica [C] time = 0.0744024, size = 95, normalized size = 0.71

$$\frac{-24a^3-4a^2bx^4-21b^3x^{12}\sqrt[4]{1-\frac{bx^4}{a}}\,{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{3}{2};\frac{bx^4}{a}\right)-14ab^2x^8+42b^3x^{12}}{240a^3x^{10}\sqrt[4]{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^11*(a - b*x^4)^(1/4)),x]
```

```
[Out] (-24*a^3 - 4*a^2*b*x^4 - 14*a*b^2*x^8 + 42*b^3*x^12 - 21*b^3*x^12
*(1 - (b*x^4)/a)^(1/4)*Hypergeometric2F1[1/4, 1/2, 3/2, (b*x^4)/a
```

```
])/(240*a^3*x^10*(a - b*x^4)^(1/4))
```

Maple [F] time = 0.049, size = 0, normalized size = 0.

$$\int \frac{1}{x^{11}} \frac{1}{\sqrt[4]{-bx^4 + a}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^11/(-b*x^4+a)^(1/4),x)

[Out] int(1/x^11/(-b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(-bx^4 + a)^{\frac{1}{4}} x^{11}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^11),x, algorithm="maxima")

[Out] integrate(1/((-b*x^4 + a)^(1/4)*x^11), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{(-bx^4 + a)^{\frac{1}{4}} x^{11}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^11),x, algorithm="fricas")

[Out] integral(1/((-b*x^4 + a)^(1/4)*x^11), x)
```

Sympy [A] time = 9.16483, size = 34, normalized size = 0.26

$$-\frac{{}_2F_1\left(\begin{matrix} -\frac{5}{2}, \frac{1}{4} \\ -\frac{3}{2} \end{matrix}\middle| \frac{bx^4 e^{2i\pi}}{a}\right)}{10\sqrt[4]{a}x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**11/(-b*x**4+a)**(1/4),x)

[Out] -hyper((-5/2, 1/4), (-3/2,), b*x**4*exp_polar(2*I*pi)/a)/(10*a**(
1/4)*x**10)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(-bx^4 + a)^{\frac{1}{4}} x^{11}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^11),x, algorithm="giac")

[Out] integrate(1/((-b*x^4 + a)^(1/4)*x^11), x)
```

3.1217 $\int \frac{x^8}{\sqrt[4]{a-bx^4}}\,dx$

Optimal. Leaf size=264

$$-\frac{5a^2\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}\right)}{64\sqrt{2}b^{9/4}}+\frac{5a^2\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+1\right)}{64\sqrt{2}b^{9/4}}-\frac{5a^2\log\left(-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{128\sqrt{2}b^{9/4}}+\frac{5a^2\log\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{128\sqrt{2}b^{9/4}}-\frac{5ax\left(a-bx^4\right)^{3/4}}{32b^2}-\frac{x^5\left(a-bx^4\right)^{3/4}}{8b}$$

```
[Out] (-5*a*x*(a - b*x^4)^(3/4))/(32*b^2) - (x^5*(a - b*x^4)^(3/4))/(8*
b) - (5*a^2*ArcTan[1 - (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)])/(6
4*Sqrt[2]*b^(9/4)) + (5*a^2*ArcTan[1 + (Sqrt[2]*b^(1/4)*x)/(a - b
*x^4)^(1/4)])/(64*Sqrt[2]*b^(9/4)) - (5*a^2*Log[1 + (Sqrt[b]*x^2)
/Sqrt[a - b*x^4] - (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)])/(128*S
qrt[2]*b^(9/4)) + (5*a^2*Log[1 + (Sqrt[b]*x^2)/Sqrt[a - b*x^4] +
(Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)])/(128*Sqrt[2]*b^(9/4))
```

Rubi [A] time = 0.319607, antiderivative size = 264, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 8, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.5$

$$-\frac{5a^2\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}\right)}{64\sqrt{2}b^{9/4}}+\frac{5a^2\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+1\right)}{64\sqrt{2}b^{9/4}}-\frac{5a^2\log\left(-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{128\sqrt{2}b^{9/4}}+\frac{5a^2\log\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{128\sqrt{2}b^{9/4}}-\frac{5ax\left(a-bx^4\right)^{3/4}}{32b^2}-\frac{x^5\left(a-bx^4\right)^{3/4}}{8b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8/(a - b*x^4)^(1/4),x]
```

```
[Out] (-5*a*x*(a - b*x^4)^(3/4))/(32*b^2) - (x^5*(a - b*x^4)^(3/4))/(8*
b) - (5*a^2*ArcTan[1 - (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)])/(6
4*Sqrt[2]*b^(9/4)) + (5*a^2*ArcTan[1 + (Sqrt[2]*b^(1/4)*x)/(a - b
*x^4)^(1/4)])/(64*Sqrt[2]*b^(9/4)) - (5*a^2*Log[1 + (Sqrt[b]*x^2)
/Sqrt[a - b*x^4] - (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)])/(128*S
qrt[2]*b^(9/4)) + (5*a^2*Log[1 + (Sqrt[b]*x^2)/Sqrt[a - b*x^4] +
(Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)])/(128*Sqrt[2]*b^(9/4))
```

Rubi in Sympy [A] time = 41.0717, size = 243, normalized size = 0.92

$$-\frac{5\sqrt{2}a^2\log\left(-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{256b^{\frac{9}{4}}}+\frac{5\sqrt{2}a^2\log\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{256b^{\frac{9}{4}}}+\frac{5\sqrt{2}a^2\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}-1\right)}{128b^{\frac{9}{4}}}+\frac{5\sqrt{2}a^2\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+1\right)}{128b^{\frac{9}{4}}}-\frac{5ax\left(a-bx^4\right)^{\frac{3}{4}}}{32b^2}-\frac{x^5\left(a-bx^4\right)^{\frac{3}{4}}}{8b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8/(-b*x**4+a)**(1/4),x)
```

```
[Out] -5*sqrt(2)*a**2*log(-sqrt(2)*b**(1/4)*x/(a - b*x**4)**(1/4) + sqr
t(b)*x**2/sqrt(a - b*x**4) + 1)/(256*b**(9/4)) + 5*sqrt(2)*a**2*l
og(sqrt(2)*b**(1/4)*x/(a - b*x**4)**(1/4) + sqrt(b)*x**2/sqrt(a -
 b*x**4) + 1)/(256*b**(9/4)) + 5*sqrt(2)*a**2*atan(sqrt(2)*b**(1/
```

```
4)*x/(a - b*x**4)**(1/4) - 1)/(128*b**(9/4)) + 5*sqrt(2)*a**2*ata
n(sqrt(2)*b**(1/4)*x/(a - b*x**4)**(1/4) + 1)/(128*b**(9/4)) - 5*
a*x*(a - b*x**4)**(3/4)/(32*b**2) - x**5*(a - b*x**4)**(3/4)/(8*b
)
```

Mathematica [A] time = 0.324832, size = 210, normalized size = 0.8

$$\frac{5a^2\left(-2\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}\right)+2\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+1\right)-\log\left(-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)+\log\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right.}{128\sqrt{2}b^{9/4}}$$

$$+\left(a-bx^4\right)^{3/4}\left(-\frac{5ax}{32b^2}-\frac{x^5}{8b}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8/(a - b*x^4)^(1/4),x]
```

```
[Out] (a - b*x^4)^(3/4)*((-5*a*x)/(32*b^2) - x^5/(8*b)) + (5*a^2*(-2*Ar
cTan[1 - (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)] + 2*ArcTan[1 + (S
qrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)] - Log[1 + (Sqrt[b]*x^2)/Sqrt
[a - b*x^4] - (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)] + Log[1 + (S
qrt[b]*x^2)/Sqrt[a - b*x^4] + (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/
4)]))/(128*Sqrt[2]*b^(9/4))
```

Maple [F] time = 0.042, size = 0, normalized size = 0.

$$\int x^8\frac{1}{\sqrt[4]{-bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8/(-b*x^4+a)^(1/4),x)
```

```
[Out] int(x^8/(-b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(-b*x^4 + a)^(1/4),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.248765, size = 304, normalized size = 1.15

$$-\frac{20\,b^2\left(-\frac{a^8}{b^9}\right)^{\frac{1}{4}}\arctan\left(\frac{b^7x\left(-\frac{a^8}{b^9}\right)^{\frac{3}{4}}}{\left(-bx^4+a\right)^{\frac{1}{4}}a^6+x\sqrt{-\frac{a^8b^5x^2\sqrt{-\frac{a^8}{b^9}}-\sqrt{-bx^4+a}a^{12}}{x^2}}}\right)+5\,b^2\left(-\frac{a^8}{b^9}\right)^{\frac{1}{4}}\log\left(\frac{125\left(b^7x\left(-\frac{a^8}{b^9}\right)^{\frac{3}{4}}+\left(-bx^4+a\right)^{\frac{1}{4}}a^6\right)}{x}\right)-5\,b^2\left(-\frac{a^8}{b^9}\right.}{128\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(-b*x^4 + a)^(1/4),x, algorithm="fricas")
```

```
[Out] -1/128*(20*b^2*(-a^8/b^9)^(1/4)*arctan(b^7*x*(-a^8/b^9)^(3/4)/((-
b*x^4 + a)^(1/4)*a^6 + x*sqrt(-(a^8*b^5*x^2*sqrt(-a^8/b^9) - sqrt
(-b*x^4 + a)*a^12)/x^2))) + 5*b^2*(-a^8/b^9)^(1/4)*log(125*(b^7*x
*(-a^8/b^9)^(3/4) + (-b*x^4 + a)^(1/4)*a^6)/x) - 5*b^2*(-a^8/b^9)
^(1/4)*log(-125*(b^7*x*(-a^8/b^9)^(3/4) - (-b*x^4 + a)^(1/4)*a^6)
/x) + 4*(4*b*x^5 + 5*a*x)*(-b*x^4 + a)^(3/4))/b^2
```

Sympy [A] time = 6.35276, size = 39, normalized size = 0.15

$$\frac{x^9\,\Gamma\left(\frac{9}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{4},\frac{9}{4}\\ \frac{13}{4}\end{matrix}\middle|\frac{bx^4e^{2i\pi}}{a}\right)}{4\sqrt[4]{a}\,\Gamma\left(\frac{13}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8/(-b*x**4+a)**(1/4),x)
```

```
[Out] x**9*gamma(9/4)*hyper((1/4, 9/4), (13/4,), b*x**4*exp_polar(2*I*p
i)/a)/(4*a**(1/4)*gamma(13/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^8}{(-bx^4+a)^{\frac{1}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(-b*x^4 + a)^(1/4),x, algorithm="giac")
```

```
[Out] integrate(x^8/(-b*x^4 + a)^(1/4), x)
```

3.1218 $\int \frac{x^4}{\sqrt[4]{a-bx^4}}\,dx$

Optimal. Leaf size=233

$$-\frac{a\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}\right)}{8\sqrt{2}b^{5/4}}+\frac{a\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+1\right)}{8\sqrt{2}b^{5/4}}-\frac{a\log\left(-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{16\sqrt{2}b^{5/4}}+\frac{a\log\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{16\sqrt{2}b^{5/4}}-\frac{x\left(a-bx^4\right)^{3/4}}{4b}$$

```
[Out] -(x*(a - b*x^4)^(3/4))/(4*b) - (a*ArcTan[1 - (Sqrt[2]*b^(1/4)*x)/
(a - b*x^4)^(1/4)])/(8*Sqrt[2]*b^(5/4)) + (a*ArcTan[1 + (Sqrt[2]*
b^(1/4)*x)/(a - b*x^4)^(1/4)])/(8*Sqrt[2]*b^(5/4)) - (a*Log[1 + (
Sqrt[b]*x^2)/Sqrt[a - b*x^4] - (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1
/4)])/(16*Sqrt[2]*b^(5/4)) + (a*Log[1 + (Sqrt[b]*x^2)/Sqrt[a - b*
x^4] + (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)])/(16*Sqrt[2]*b^(5/4
))
```

Rubi [A] time = 0.240694, antiderivative size = 233, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 8, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5

$$-\frac{a\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}\right)}{8\sqrt{2}b^{5/4}}+\frac{a\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+1\right)}{8\sqrt{2}b^{5/4}}-\frac{a\log\left(-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{16\sqrt{2}b^{5/4}}+\frac{a\log\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{16\sqrt{2}b^{5/4}}-\frac{x\left(a-bx^4\right)^{3/4}}{4b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a - b*x^4)^(1/4),x]
```

```
[Out] -(x*(a - b*x^4)^(3/4))/(4*b) - (a*ArcTan[1 - (Sqrt[2]*b^(1/4)*x)/
(a - b*x^4)^(1/4)])/(8*Sqrt[2]*b^(5/4)) + (a*ArcTan[1 + (Sqrt[2]*
b^(1/4)*x)/(a - b*x^4)^(1/4)])/(8*Sqrt[2]*b^(5/4)) - (a*Log[1 + (
Sqrt[b]*x^2)/Sqrt[a - b*x^4] - (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1
/4)])/(16*Sqrt[2]*b^(5/4)) + (a*Log[1 + (Sqrt[b]*x^2)/Sqrt[a - b*
x^4] + (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)])/(16*Sqrt[2]*b^(5/4
))
```

Rubi in Sympy [A] time = 34.9547, size = 207, normalized size = 0.89

$$-\frac{\sqrt{2}a\log\left(-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{32b^{\frac{5}{4}}}+\frac{\sqrt{2}a\log\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{32b^{\frac{5}{4}}}+\frac{\sqrt{2}a\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}-1\right)}{16b^{\frac{5}{4}}}+\frac{\sqrt{2}a\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+1\right)}{16b^{\frac{5}{4}}}-\frac{x\left(a-bx^4\right)^{\frac{3}{4}}}{4b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(-b*x**4+a)**(1/4),x)
```

```
[Out] -sqrt(2)*a*log(-sqrt(2)*b**(1/4)*x/(a - b*x**4)**(1/4) + sqrt(b)*
x**2/sqrt(a - b*x**4) + 1)/(32*b**(5/4)) + sqrt(2)*a*log(sqrt(2)*
b**(1/4)*x/(a - b*x**4)**(1/4) + sqrt(b)*x**2/sqrt(a - b*x**4) +
1)/(32*b**(5/4)) + sqrt(2)*a*atan(sqrt(2)*b**(1/4)*x/(a - b*x**4)
```

```
**(1/4) - 1)/(16*b**(5/4)) + sqrt(2)*a*atan(sqrt(2)*b**(1/4)*x/(a
 - b*x**4)**(1/4) + 1)/(16*b**(5/4)) - x*(a - b*x**4)**(3/4)/(4*b
)
```

Mathematica [A] time = 0.125308, size = 195, normalized size = 0.84

$$\frac{a\left(-2\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}\right)+2\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+1\right)-\log\left(-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)+\log\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)\right)}{16\sqrt{2}b^{5/4}}$$
$$-\frac{x\left(a-bx^4\right)^{3/4}}{4b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(a - b*x^4)^(1/4),x]
```

```
[Out] -(x*(a - b*x^4)^(3/4))/(4*b) + (a*(-2*ArcTan[1 - (Sqrt[2]*b^(1/4)
*x)/(a - b*x^4)^(1/4)] + 2*ArcTan[1 + (Sqrt[2]*b^(1/4)*x)/(a - b*
x^4)^(1/4)] - Log[1 + (Sqrt[b]*x^2)/Sqrt[a - b*x^4] - (Sqrt[2]*b^
(1/4)*x)/(a - b*x^4)^(1/4)] + Log[1 + (Sqrt[b]*x^2)/Sqrt[a - b*x^
4] + (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)]))/(16*Sqrt[2]*b^(5/4)
)
```

Maple [F] time = 0.037, size = 0, normalized size = 0.

$$\int x^4 \frac{1}{\sqrt[4]{-bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(-b*x^4+a)^(1/4),x)
```

```
[Out] int(x^4/(-b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(-b*x^4 + a)^(1/4),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.248336, size = 279, normalized size = 1.2

$$-\frac{4\,b\left(-\frac{a^4}{b^5}\right)^{\frac{1}{4}}\arctan\left(\frac{b^4x\left(-\frac{a^4}{b^5}\right)^{\frac{3}{4}}}{(-bx^4+a)^{\frac{1}{4}}a^3+x\sqrt{-\frac{a^4b^3x^2\sqrt{-\frac{a^4}{b^5}}-\sqrt{-bx^4+a}\,a^6}{x^2}}}\right)+b\left(-\frac{a^4}{b^5}\right)^{\frac{1}{4}}\log\left(\frac{b^4x\left(-\frac{a^4}{b^5}\right)^{\frac{3}{4}}+(-bx^4+a)^{\frac{1}{4}}a^3}{x}\right)-b\left(-\frac{a^4}{b^5}\right)^{\frac{1}{4}}\log\left(-\frac{b^4x(\cdots}{\cdots}\right)\cdots}{16\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(-b*x^4 + a)^(1/4),x, algorithm="fricas")
```

```
[Out] -1/16*(4*b*(-a^4/b^5)^(1/4)*arctan(b^4*x*(-a^4/b^5)^(3/4)/((-b*x^
4 + a)^(1/4)*a^3 + x*sqrt(-(a^4*b^3*x^2*sqrt(-a^4/b^5) - sqrt(-b*
x^4 + a)*a^6)/x^2))) + b*(-a^4/b^5)^(1/4)*log((b^4*x*(-a^4/b^5)^(
3/4) + (-b*x^4 + a)^(1/4)*a^3)/x) - b*(-a^4/b^5)^(1/4)*log(-(b^4*
x*(-a^4/b^5)^(3/4) - (-b*x^4 + a)^(1/4)*a^3)/x) + 4*(-b*x^4 + a)^
(3/4)*x)/b
```

Sympy [A] time = 4.43741, size = 39, normalized size = 0.17

$$\frac{x^5\,\Gamma\left(\frac{5}{4}\right)\,{}_2F_1\left(\left.\begin{matrix}\frac{1}{4},\frac{5}{4}\\ \frac{9}{4}\end{matrix}\right|\frac{bx^4e^{2i\pi}}{a}\right)}{4\sqrt[4]{a}\,\Gamma\left(\frac{9}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(-b*x**4+a)**(1/4),x)
```

```
[Out] x**5*gamma(5/4)*hyper((1/4, 5/4), (9/4,), b*x**4*exp_polar(2*I*pi
)/a)/(4*a**(1/4)*gamma(9/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\left(-bx^4+a\right)^{\frac{1}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(-b*x^4 + a)^(1/4),x, algorithm="giac")
```

```
[Out] integrate(x^4/(-b*x^4 + a)^(1/4), x)
```

3.1219 $\int \frac{1}{\sqrt[4]{a-bx^4}}\,dx$

Optimal. Leaf size=209

$$-\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}\right)}{2\sqrt{2}\sqrt[4]{b}}+\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+1\right)}{2\sqrt{2}\sqrt[4]{b}}-\frac{\log\left(-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{4\sqrt{2}\sqrt[4]{b}}+\frac{\log\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{4\sqrt{2}\sqrt[4]{b}}$$

```
[Out] -ArcTan[1 - (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)]/(2*Sqrt[2]*b^(
1/4)) + ArcTan[1 + (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)]/(2*Sqrt
[2]*b^(1/4)) - Log[1 + (Sqrt[b]*x^2)/Sqrt[a - b*x^4] - (Sqrt[2]*b
^(1/4)*x)/(a - b*x^4)^(1/4)]/(4*Sqrt[2]*b^(1/4)) + Log[1 + (Sqrt[
b]*x^2)/Sqrt[a - b*x^4] + (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)]/
(4*Sqrt[2]*b^(1/4))
```

Rubi [A] time = 0.185019, antiderivative size = 209, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 7, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.583

$$-\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}\right)}{2\sqrt{2}\sqrt[4]{b}}+\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+1\right)}{2\sqrt{2}\sqrt[4]{b}}-\frac{\log\left(-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{4\sqrt{2}\sqrt[4]{b}}+\frac{\log\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{4\sqrt{2}\sqrt[4]{b}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a - b*x^4)^(-1/4),x]
```

```
[Out] -ArcTan[1 - (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)]/(2*Sqrt[2]*b^(
1/4)) + ArcTan[1 + (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)]/(2*Sqrt
[2]*b^(1/4)) - Log[1 + (Sqrt[b]*x^2)/Sqrt[a - b*x^4] - (Sqrt[2]*b
^(1/4)*x)/(a - b*x^4)^(1/4)]/(4*Sqrt[2]*b^(1/4)) + Log[1 + (Sqrt[
b]*x^2)/Sqrt[a - b*x^4] + (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)]/
(4*Sqrt[2]*b^(1/4))
```

Rubi in Sympy [A] time = 28.7986, size = 185, normalized size = 0.89

$$-\frac{\sqrt{2}\log\left(-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{8\sqrt[4]{b}}+\frac{\sqrt{2}\log\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{8\sqrt[4]{b}}+\frac{\sqrt{2}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}-1\right)}{4\sqrt[4]{b}}+\frac{\sqrt{2}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+1\right)}{4\sqrt[4]{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(-b*x**4+a)**(1/4),x)
```

```
[Out] -sqrt(2)*log(-sqrt(2)*b**(1/4)*x/(a - b*x**4)**(1/4) + sqrt(b)*x*
*2/sqrt(a - b*x**4) + 1)/(8*b**(1/4)) + sqrt(2)*log(sqrt(2)*b**(1
/4)*x/(a - b*x**4)**(1/4) + sqrt(b)*x**2/sqrt(a - b*x**4) + 1)/(8
*b**(1/4)) + sqrt(2)*atan(sqrt(2)*b**(1/4)*x/(a - b*x**4)**(1/4)
- 1)/(4*b**(1/4)) + sqrt(2)*atan(sqrt(2)*b**(1/4)*x/(a - b*x**4)*
```

```
*(1/4) + 1)/(4*b**(1/4))
```

Mathematica [A] time = 0.0346532, size = 173, normalized size = 0.83

$$\frac{-2\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}\right)+2\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+1\right)-\log\left(-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)+\log\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{4\sqrt{2}\sqrt[4]{b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a - b*x^4)^(-1/4),x]
```

```
[Out] (-2*ArcTan[1 - (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)] + 2*ArcTan[
1 + (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)] - Log[1 + (Sqrt[b]*x^2
)/Sqrt[a - b*x^4] - (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)] + Log[
1 + (Sqrt[b]*x^2)/Sqrt[a - b*x^4] + (Sqrt[2]*b^(1/4)*x)/(a - b*x^
4)^(1/4)])/(4*Sqrt[2]*b^(1/4))
```

Maple [F] time = 0.052, size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt[4]{-bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(-b*x^4+a)^(1/4),x)
```

```
[Out] int(1/(-b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(-1/4),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.238695, size = 190, normalized size = 0.91

$$-\left(-\frac{1}{b}\right)^{\frac{1}{4}}\arctan\left(\frac{bx\left(-\frac{1}{b}\right)^{\frac{3}{4}}}{x\sqrt{-\frac{bx^2\sqrt{-\frac{1}{b}}-\sqrt{-bx^4+a}}{x^2}}+\left(-bx^4+a\right)^{\frac{1}{4}}}\right)-\frac{1}{4}\left(-\frac{1}{b}\right)^{\frac{1}{4}}\log\left(\frac{bx\left(-\frac{1}{b}\right)^{\frac{3}{4}}+\left(-bx^4+a\right)^{\frac{1}{4}}}{x}\right)+\frac{1}{4}\left(-\frac{1}{b}\right)^{\frac{1}{4}}\log\left(-\frac{bx\left(-\frac{1}{b}\right)^{\frac{3}{4}}-\left(-bx^4+a\right)^{\frac{1}{4}}}{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(-1/4),x, algorithm="fricas")
```

```
[Out] -(-1/b)^(1/4)*arctan(b*x*(-1/b)^(3/4)/(x*sqrt(-(b*x^2*sqrt(-1/b)
- sqrt(-b*x^4 + a))/x^2) + (-b*x^4 + a)^(1/4))) - 1/4*(-1/b)^(1/4
```

```
)*log((b*x*(-1/b)^(3/4) + (-b*x^4 + a)^(1/4))/x) + 1/4*(-1/b)^(1/
4)*log(-(b*x*(-1/b)^(3/4) - (-b*x^4 + a)^(1/4))/x)
```

Sympy [A] time = 3.70816, size = 37, normalized size = 0.18

$$\frac{x\,\Gamma\left(\frac{1}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{4},\frac{1}{4}\\ \frac{5}{4}\end{matrix}\middle|\frac{bx^4e^{2i\pi}}{a}\right)}{4\sqrt[4]{a}\,\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(-b*x**4+a)**(1/4),x)
```

```
[Out] x*gamma(1/4)*hyper((1/4, 1/4), (5/4,), b*x**4*exp_polar(2*I*pi)/a
)/(4*a**(1/4)*gamma(5/4))
```

GIAC/XCAS [A] time = 0.232224, size = 238, normalized size = 1.14

$$-\frac{\sqrt{2}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}b^{\frac{1}{4}}+\frac{2\left(-bx^4+a\right)^{\frac{1}{4}}}{x}\right)}{2\,b^{\frac{1}{4}}}\right)}{4\,b^{\frac{1}{4}}}-\frac{\sqrt{2}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}b^{\frac{1}{4}}-\frac{2\left(-bx^4+a\right)^{\frac{1}{4}}}{x}\right)}{2\,b^{\frac{1}{4}}}\right)}{4\,b^{\frac{1}{4}}}+\frac{\sqrt{2}\ln\left(\sqrt{b}+\frac{\sqrt{2}\left(-bx^4+a\right)^{\frac{1}{4}}b^{\frac{1}{4}}}{x}+\frac{\sqrt{-bx^4+a}}{x^2}\right)}{8\,b^{\frac{1}{4}}}-\frac{\sqrt{2}\ln\left(\sqrt{b}-\frac{\sqrt{2}\left(-bx^4+a\right)^{\frac{1}{4}}b^{\frac{1}{4}}}{x}+\frac{\sqrt{-bx^4+a}}{x^2}\right)}{8\,b^{\frac{1}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(-1/4),x, algorithm="giac")
```

```
[Out] -1/4*sqrt(2)*arctan(1/2*sqrt(2)*(sqrt(2)*b^(1/4) + 2*(-b*x^4 + a)
^(1/4)/x)/b^(1/4))/b^(1/4) - 1/4*sqrt(2)*arctan(-1/2*sqrt(2)*(sqr
t(2)*b^(1/4) - 2*(-b*x^4 + a)^(1/4)/x)/b^(1/4))/b^(1/4) + 1/8*sqr
t(2)*ln(sqrt(b) + sqrt(2)*(-b*x^4 + a)^(1/4)*b^(1/4)/x + sqrt(-b*
x^4 + a)/x^2)/b^(1/4) - 1/8*sqrt(2)*ln(sqrt(b) - sqrt(2)*(-b*x^4
+ a)^(1/4)*b^(1/4)/x + sqrt(-b*x^4 + a)/x^2)/b^(1/4)
```

3.1220 $\int \frac{1}{x^4 \sqrt[4]{a-bx^4}}\,dx$

Optimal. Leaf size=22

$$-\frac{\left(a-bx^4\right)^{3/4}}{3ax^3}$$

```
[Out] -(a - b*x^4)^(3/4)/(3*a*x^3)
```

Rubi [A] time = 0.0219694, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062

$$-\frac{\left(a-bx^4\right)^{3/4}}{3ax^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*(a - b*x^4)^(1/4)),x]

[Out] -(a - b*x^4)^(3/4)/(3*a*x^3)
```

Rubi in Sympy [A] time = 3.14442, size = 17, normalized size = 0.77

$$-\frac{\left(a-bx^4\right)^{\frac{3}{4}}}{3ax^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(-b*x**4+a)**(1/4),x)

[Out] -(a - b*x**4)**(3/4)/(3*a*x**3)
```

Mathematica [A] time = 0.0207317, size = 22, normalized size = 1.

$$-\frac{\left(a-bx^4\right)^{3/4}}{3ax^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*(a - b*x^4)^(1/4)),x]

[Out] -(a - b*x^4)^(3/4)/(3*a*x^3)
```

Maple [A] time = 0.006, size = 19, normalized size = 0.9

$$-\frac{1}{3\,a x^3}\left(-bx^4+a\right)^{\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(-b*x^4+a)^(1/4),x)
```

```
[Out] -1/3*(-b*x^4+a)^(3/4)/a/x^3
```

Maxima [A] time = 1.42792, size = 24, normalized size = 1.09

$$-\frac{\left(-bx^4+a\right)^{\frac{3}{4}}}{3\,ax^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((-b*x^4 + a)^(1/4)*x^4),x, algorithm="maxima")
```

```
[Out] -1/3*(-b*x^4 + a)^(3/4)/(a*x^3)
```

Fricas [A] time = 0.223281, size = 24, normalized size = 1.09

$$-\frac{\left(-bx^4+a\right)^{\frac{3}{4}}}{3\,ax^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((-b*x^4 + a)^(1/4)*x^4),x, algorithm="fricas")
```

```
[Out] -1/3*(-b*x^4 + a)^(3/4)/(a*x^3)
```

Sympy [A] time = 2.72743, size = 80, normalized size = 3.64

$$\begin{cases} \frac{b^{\frac{3}{4}}\left(\frac{a}{bx^4}-1\right)^{\frac{3}{4}}\Gamma\left(-\frac{3}{4}\right)}{4a\Gamma\left(\frac{1}{4}\right)} & \text{for}\ \left|\frac{a}{bx^4}\right|>1 \\ -\frac{b^{\frac{3}{4}}\left(-\frac{a}{bx^4}+1\right)^{\frac{3}{4}}e^{\frac{7i\pi}{4}}\Gamma\left(-\frac{3}{4}\right)}{4a\Gamma\left(\frac{1}{4}\right)} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**4/(-b*x**4+a)**(1/4),x)
```

```
[Out] Piecewise((b**(3/4)*(a/(b*x**4) - 1)**(3/4)*gamma(-3/4)/(4*a*gamm
a(1/4)), Abs(a/(b*x**4)) > 1), (-b**(3/4)*(-a/(b*x**4) + 1)**(3/4
)*exp(7*I*pi/4)*gamma(-3/4)/(4*a*gamma(1/4)), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-bx^4+a\right)^{\frac{1}{4}}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((-b*x^4 + a)^(1/4)*x^4),x, algorithm="giac")
```

```
[Out] integrate(1/((-b*x^4 + a)^(1/4)*x^4), x)
```

3.1221 $\int \frac{1}{x^8 \sqrt[4]{a-bx^4}} \, dx$

Optimal. Leaf size=46

$$-\frac{4b\left(a-bx^4\right)^{3/4}}{21a^2x^3}-\frac{\left(a-bx^4\right)^{3/4}}{7ax^7}$$

```
[Out] -(a - b*x^4)^(3/4)/(7*a*x^7) - (4*b*(a - b*x^4)^(3/4))/(21*a^2*x^
3)
```

Rubi [A] time = 0.0437292, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$

$$-\frac{4b\left(a-bx^4\right)^{3/4}}{21a^2x^3}-\frac{\left(a-bx^4\right)^{3/4}}{7ax^7}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^8*(a - b*x^4)^(1/4)),x]
```

```
[Out] -(a - b*x^4)^(3/4)/(7*a*x^7) - (4*b*(a - b*x^4)^(3/4))/(21*a^2*x^
3)
```

Rubi in Sympy [A] time = 5.10602, size = 39, normalized size = 0.85

$$-\frac{\left(a-bx^4\right)^{\frac{3}{4}}}{7ax^7}-\frac{4b\left(a-bx^4\right)^{\frac{3}{4}}}{21a^2x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**8/(-b*x**4+a)**(1/4),x)
```

```
[Out] -(a - b*x**4)**(3/4)/(7*a*x**7) - 4*b*(a - b*x**4)**(3/4)/(21*a**
2*x**3)
```

Mathematica [A] time = 0.0278673, size = 32, normalized size = 0.7

$$-\frac{\left(a-bx^4\right)^{3/4}\left(3a+4bx^4\right)}{21a^2x^7}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^8*(a - b*x^4)^(1/4)),x]
```

```
[Out] -((a - b*x^4)^(3/4)*(3*a + 4*b*x^4))/(21*a^2*x^7)
```

Maple [A] time = 0.006, size = 29, normalized size = 0.6

$$-\frac{4\,bx^4+3\,a}{21\,a^2x^7}\left(-bx^4+a\right)^{\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^8/(-b*x^4+a)^(1/4),x)
```

```
[Out] -1/21*(-b*x^4+a)^(3/4)*(4*b*x^4+3*a)/a^2/x^7
```

Maxima [A] time = 1.42342, size = 50, normalized size = 1.09

$$-\frac{\frac{7\left(-bx^4+a\right)^{\frac{3}{4}}b}{x^3}+\frac{3\left(-bx^4+a\right)^{\frac{7}{4}}}{x^7}}{21\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^8),x, algorithm="maxima")
```

```
[Out] -1/21*(7*(-b*x^4 + a)^(3/4)*b/x^3 + 3*(-b*x^4 + a)^(7/4)/x^7)/a^2
```

Fricas [A] time = 0.226293, size = 38, normalized size = 0.83

$$-\frac{\left(4\,bx^4+3\,a\right)\left(-bx^4+a\right)^{\frac{3}{4}}}{21\,a^2x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^8),x, algorithm="fricas")
```

```
[Out] -1/21*(4*b*x^4 + 3*a)*(-b*x^4 + a)^(3/4)/(a^2*x^7)
```

Sympy [A] time = 5.54024, size = 287, normalized size = 6.24

$$\begin{cases} -\frac{3b^{\frac{3}{4}}\left(\frac{a}{bx^4}-1\right)^{\frac{3}{4}}\left(-\frac{7}{4}\right)}{16ax^4\left(\frac{1}{4}\right)}-\frac{b^{\frac{7}{4}}\left(\frac{a}{bx^4}-1\right)^{\frac{3}{4}}\left(-\frac{7}{4}\right)}{4a^2\left(\frac{1}{4}\right)} & \text{for } \left|\frac{a}{bx^4}\right|>1 \\ -\frac{3a^2b^{\frac{7}{4}}\left(-\frac{a}{bx^4}+1\right)^{\frac{3}{4}}e^{\frac{7i\pi}{4}}\left(-\frac{7}{4}\right)}{-16a^3bx^4\left(\frac{1}{4}\right)+16a^2b^2x^8\left(\frac{1}{4}\right)}-\frac{ab^{\frac{11}{4}}x^4\left(-\frac{a}{bx^4}+1\right)^{\frac{3}{4}}e^{\frac{7i\pi}{4}}\left(-\frac{7}{4}\right)}{-16a^3bx^4\left(\frac{1}{4}\right)+16a^2b^2x^8\left(\frac{1}{4}\right)}+\frac{4b^{\frac{15}{4}}x^8\left(-\frac{a}{bx^4}+1\right)^{\frac{3}{4}}e^{\frac{7i\pi}{4}}\left(-\frac{7}{4}\right)}{-16a^3bx^4\left(\frac{1}{4}\right)+16a^2b^2x^8\left(\frac{1}{4}\right)} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**8/(-b*x**4+a)**(1/4),x)
```

```
[Out] Piecewise((-3*b**(3/4)*(a/(b*x**4) - 1)**(3/4)*gamma(-7/4)/(16*a*
x**4*gamma(1/4)) - b**(7/4)*(a/(b*x**4) - 1)**(3/4)*gamma(-7/4)/(
4*a**2*gamma(1/4)), Abs(a/(b*x**4)) > 1), (-3*a**2*b**(7/4)*(-a/(
b*x**4) + 1)**(3/4)*exp(7*I*pi/4)*gamma(-7/4)/(-16*a**3*b*x**4*ga
mma(1/4) + 16*a**2*b**2*x**8*gamma(1/4)) - a*b**(11/4)*x**4*(-a/(
b*x**4) + 1)**(3/4)*exp(7*I*pi/4)*gamma(-7/4)/(-16*a**3*b*x**4*ga
mma(1/4) + 16*a**2*b**2*x**8*gamma(1/4)) + 4*b**(15/4)*x**8*(-a/(
b*x**4) + 1)**(3/4)*exp(7*I*pi/4)*gamma(-7/4)/(-16*a**3*b*x**4*ga
mma(1/4) + 16*a**2*b**2*x**8*gamma(1/4)), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-bx^4+a\right)^{\frac{1}{4}}x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^8),x, algorithm="giac")

[Out] integrate(1/((-b*x^4 + a)^(1/4)*x^8), x)
```

3.1222 $\int \frac{1}{x^{12}\sqrt[4]{a-bx^4}}\,dx$

Optimal. Leaf size=71

$$-\frac{32b^2\left(a-bx^4\right)^{3/4}}{231a^3x^3}-\frac{8b\left(a-bx^4\right)^{3/4}}{77a^2x^7}-\frac{\left(a-bx^4\right)^{3/4}}{11ax^{11}}$$

```
[Out] -(a - b*x^4)^(3/4)/(11*a*x^11) - (8*b*(a - b*x^4)^(3/4))/(77*a^2*
x^7) - (32*b^2*(a - b*x^4)^(3/4))/(231*a^3*x^3)
```

Rubi [A] time = 0.0699588, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125

$$-\frac{32b^2\left(a-bx^4\right)^{3/4}}{231a^3x^3}-\frac{8b\left(a-bx^4\right)^{3/4}}{77a^2x^7}-\frac{\left(a-bx^4\right)^{3/4}}{11ax^{11}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^12*(a - b*x^4)^(1/4)),x]
```

```
[Out] -(a - b*x^4)^(3/4)/(11*a*x^11) - (8*b*(a - b*x^4)^(3/4))/(77*a^2*
x^7) - (32*b^2*(a - b*x^4)^(3/4))/(231*a^3*x^3)
```

Rubi in Sympy [A] time = 7.96001, size = 63, normalized size = 0.89

$$-\frac{\left(a-bx^4\right)^{\frac{3}{4}}}{11ax^{11}}-\frac{8b\left(a-bx^4\right)^{\frac{3}{4}}}{77a^2x^7}-\frac{32b^2\left(a-bx^4\right)^{\frac{3}{4}}}{231a^3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**12/(-b*x**4+a)**(1/4),x)
```

```
[Out] -(a - b*x**4)**(3/4)/(11*a*x**11) - 8*b*(a - b*x**4)**(3/4)/(77*a
**2*x**7) - 32*b**2*(a - b*x**4)**(3/4)/(231*a**3*x**3)
```

Mathematica [A] time = 0.0360806, size = 43, normalized size = 0.61

$$-\frac{\left(a-bx^4\right)^{3/4}\left(21a^2+24abx^4+32b^2x^8\right)}{231a^3x^{11}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^12*(a - b*x^4)^(1/4)),x]
```

```
[Out] -((a - b*x^4)^(3/4)*(21*a^2 + 24*a*b*x^4 + 32*b^2*x^8))/(231*a^3*
x^11)
```

Maple [A] time = 0.009, size = 40, normalized size = 0.6

$$-\frac{32\,b^2x^8+24\,abx^4+21\,a^2}{231\,x^{11}a^3}\left(-bx^4+a\right)^{\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^12/(-b*x^4+a)^(1/4),x)
```

```
[Out] -1/231*(-b*x^4+a)^(3/4)*(32*b^2*x^8+24*a*b*x^4+21*a^2)/x^11/a^3
```

Maxima [A] time = 1.43097, size = 74, normalized size = 1.04

$$-\frac{\frac{77\,(-bx^4+a)^{\frac{3}{4}}b^2}{x^3}+\frac{66\,(-bx^4+a)^{\frac{7}{4}}b}{x^7}+\frac{21\,(-bx^4+a)^{\frac{11}{4}}}{x^{11}}}{231\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^12),x, algorithm="maxima")
```

```
[Out] -1/231*(77*(-b*x^4 + a)^(3/4)*b^2/x^3 + 66*(-b*x^4 + a)^(7/4)*b/x
^7 + 21*(-b*x^4 + a)^(11/4)/x^11)/a^3
```

Fricas [A] time = 0.225881, size = 53, normalized size = 0.75

$$-\frac{\left(32\,b^2x^8+24\,abx^4+21\,a^2\right)\left(-bx^4+a\right)^{\frac{3}{4}}}{231\,a^3x^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^12),x, algorithm="fricas")
```

```
[Out] -1/231*(32*b^2*x^8 + 24*a*b*x^4 + 21*a^2)*(-b*x^4 + a)^(3/4)/(a^3
*x^11)
```

Sympy [A] time = 12.2911, size = 864, normalized size = 12.17

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**12/(-b*x**4+a)**(1/4),x)
```

```
[Out] Piecewise((21*a**4*b**(19/4)*(a/(b*x**4) - 1)**(3/4)*gamma(-11/4)
/(64*a**5*b**4*x**8*gamma(1/4) - 128*a**4*b**5*x**12*gamma(1/4) +
 64*a**3*b**6*x**16*gamma(1/4)) - 18*a**3*b**(23/4)*x**4*(a/(b*x*
*4) - 1)**(3/4)*gamma(-11/4)/(64*a**5*b**4*x**8*gamma(1/4) - 128*
a**4*b**5*x**12*gamma(1/4) + 64*a**3*b**6*x**16*gamma(1/4)) + 5*a
**2*b**(27/4)*x**8*(a/(b*x**4) - 1)**(3/4)*gamma(-11/4)/(64*a**5*
b**4*x**8*gamma(1/4) - 128*a**4*b**5*x**12*gamma(1/4) + 64*a**3*b
**6*x**16*gamma(1/4)) - 40*a*b**(31/4)*x**12*(a/(b*x**4) - 1)**(3
/4)*gamma(-11/4)/(64*a**5*b**4*x**8*gamma(1/4) - 128*a**4*b**5*x*
*12*gamma(1/4) + 64*a**3*b**6*x**16*gamma(1/4)) + 32*b**(35/4)*x*
*16*(a/(b*x**4) - 1)**(3/4)*gamma(-11/4)/(64*a**5*b**4*x**8*gamma
(1/4) - 128*a**4*b**5*x**12*gamma(1/4) + 64*a**3*b**6*x**16*gamma
(1/4)), Abs(a/(b*x**4)) > 1), (-21*a**4*b**(19/4)*(-a/(b*x**4) +
1)**(3/4)*exp(15*I*pi/4)*gamma(-11/4)/(64*a**5*b**4*x**8*gamma(1/
4) - 128*a**4*b**5*x**12*gamma(1/4) + 64*a**3*b**6*x**16*gamma(1/
4)) + 18*a**3*b**(23/4)*x**4*(-a/(b*x**4) + 1)**(3/4)*exp(15*I*pi
/4)*gamma(-11/4)/(64*a**5*b**4*x**8*gamma(1/4) - 128*a**4*b**5*x*
*12*gamma(1/4) + 64*a**3*b**6*x**16*gamma(1/4)) - 5*a**2*b**(27/4
)*x**8*(-a/(b*x**4) + 1)**(3/4)*exp(15*I*pi/4)*gamma(-11/4)/(64*a
**5*b**4*x**8*gamma(1/4) - 128*a**4*b**5*x**12*gamma(1/4) + 64*a*
*3*b**6*x**16*gamma(1/4)) + 40*a*b**(31/4)*x**12*(-a/(b*x**4) + 1
)**(3/4)*exp(15*I*pi/4)*gamma(-11/4)/(64*a**5*b**4*x**8*gamma(1/4
```

```
) - 128*a**4*b**5*x**12*gamma(1/4) + 64*a**3*b**6*x**16*gamma(1/4
)) - 32*b**(35/4)*x**16*(-a/(b*x**4) + 1)**(3/4)*exp(15*I*pi/4)*g
amma(-11/4)/(64*a**5*b**4*x**8*gamma(1/4) - 128*a**4*b**5*x**12*g
amma(1/4) + 64*a**3*b**6*x**16*gamma(1/4)), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(-bx^4+a)^{\frac{1}{4}}x^{12}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^12),x, algorithm="giac")
```

```
[Out] integrate(1/((-b*x^4 + a)^(1/4)*x^12), x)
```

3.1223 $\int \frac{1}{x^{16}\sqrt[4]{a-bx^4}}\,dx$

Optimal. Leaf size=96

$$-\frac{128b^3\left(a-bx^4\right)^{3/4}}{1155a^4x^3}-\frac{32b^2\left(a-bx^4\right)^{3/4}}{385a^3x^7}-\frac{4b\left(a-bx^4\right)^{3/4}}{55a^2x^{11}}-\frac{\left(a-bx^4\right)^{3/4}}{15ax^{15}}$$

```
[Out] -(a - b*x^4)^(3/4)/(15*a*x^15) - (4*b*(a - b*x^4)^(3/4))/(55*a^2*
x^11) - (32*b^2*(a - b*x^4)^(3/4))/(385*a^3*x^7) - (128*b^3*(a -
b*x^4)^(3/4))/(1155*a^4*x^3)
```

Rubi [A] time = 0.0989685, antiderivative size = 96, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$

$$-\frac{128b^3\left(a-bx^4\right)^{3/4}}{1155a^4x^3}-\frac{32b^2\left(a-bx^4\right)^{3/4}}{385a^3x^7}-\frac{4b\left(a-bx^4\right)^{3/4}}{55a^2x^{11}}-\frac{\left(a-bx^4\right)^{3/4}}{15ax^{15}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^16*(a - b*x^4)^(1/4)),x]
```

```
[Out] -(a - b*x^4)^(3/4)/(15*a*x^15) - (4*b*(a - b*x^4)^(3/4))/(55*a^2*
x^11) - (32*b^2*(a - b*x^4)^(3/4))/(385*a^3*x^7) - (128*b^3*(a -
b*x^4)^(3/4))/(1155*a^4*x^3)
```

Rubi in Sympy [A] time = 11.1863, size = 87, normalized size = 0.91

$$-\frac{\left(a-bx^4\right)^{\frac{3}{4}}}{15ax^{15}}-\frac{4b\left(a-bx^4\right)^{\frac{3}{4}}}{55a^2x^{11}}-\frac{32b^2\left(a-bx^4\right)^{\frac{3}{4}}}{385a^3x^7}-\frac{128b^3\left(a-bx^4\right)^{\frac{3}{4}}}{1155a^4x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**16/(-b*x**4+a)**(1/4),x)
```

```
[Out] -(a - b*x**4)**(3/4)/(15*a*x**15) - 4*b*(a - b*x**4)**(3/4)/(55*a
**2*x**11) - 32*b**2*(a - b*x**4)**(3/4)/(385*a**3*x**7) - 128*b*
*3*(a - b*x**4)**(3/4)/(1155*a**4*x**3)
```

Mathematica [A] time = 0.0423219, size = 54, normalized size = 0.56

$$-\frac{\left(a-bx^4\right)^{3/4}\left(77a^3+84a^2bx^4+96ab^2x^8+128b^3x^{12}\right)}{1155a^4x^{15}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^16*(a - b*x^4)^(1/4)),x]
```

```
[Out] -((a - b*x^4)^(3/4)*(77*a^3 + 84*a^2*b*x^4 + 96*a*b^2*x^8 + 128*b
^3*x^12))/(1155*a^4*x^15)
```

Maple [A] time = 0.008, size = 51, normalized size = 0.5

$$-\frac{128\,b^3x^{12}+96\,ab^2x^8+84\,a^2bx^4+77\,a^3}{1155\,x^{15}a^4}\left(-bx^4+a\right)^{\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^16/(-b*x^4+a)^(1/4),x)
```

```
[Out] -1/1155*(-b*x^4+a)^(3/4)*(128*b^3*x^12+96*a*b^2*x^8+84*a^2*b*x^4+
77*a^3)/x^15/a^4
```

Maxima [A] time = 1.44231, size = 99, normalized size = 1.03

$$-\frac{\frac{385\,(-bx^4+a)^{\frac{3}{4}}b^3}{x^3}+\frac{495\,(-bx^4+a)^{\frac{7}{4}}b^2}{x^7}+\frac{315\,(-bx^4+a)^{\frac{11}{4}}b}{x^{11}}+\frac{77\,(-bx^4+a)^{\frac{15}{4}}}{x^{15}}}{1155\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^16),x, algorithm="maxima")
```

```
[Out] -1/1155*(385*(-b*x^4 + a)^(3/4)*b^3/x^3 + 495*(-b*x^4 + a)^(7/4)*
b^2/x^7 + 315*(-b*x^4 + a)^(11/4)*b/x^11 + 77*(-b*x^4 + a)^(15/4)
/x^15)/a^4
```

Fricas [A] time = 0.228846, size = 68, normalized size = 0.71

$$-\frac{\left(128\,b^3x^{12}+96\,ab^2x^8+84\,a^2bx^4+77\,a^3\right)\left(-bx^4+a\right)^{\frac{3}{4}}}{1155\,a^4x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^16),x, algorithm="fricas")
```

```
[Out] -1/1155*(128*b^3*x^12 + 96*a*b^2*x^8 + 84*a^2*b*x^4 + 77*a^3)*(-b
*x^4 + a)^(3/4)/(a^4*x^15)
```

Sympy [A] time = 24.8791, size = 1452, normalized size = 15.12

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**16/(-b*x**4+a)**(1/4),x)
```

```
[Out] Piecewise((231*a**6*b**(39/4)*(a/(b*x**4) - 1)**(3/4)*gamma(-15/4
)/(-256*a**7*b**9*x**12*gamma(1/4) + 768*a**6*b**10*x**16*gamma(1
/4) - 768*a**5*b**11*x**20*gamma(1/4) + 256*a**4*b**12*x**24*gamm
a(1/4)) - 441*a**5*b**(43/4)*x**4*(a/(b*x**4) - 1)**(3/4)*gamma(-
15/4)/(-256*a**7*b**9*x**12*gamma(1/4) + 768*a**6*b**10*x**16*gam
ma(1/4) - 768*a**5*b**11*x**20*gamma(1/4) + 256*a**4*b**12*x**24*
gamma(1/4)) + 225*a**4*b**(47/4)*x**8*(a/(b*x**4) - 1)**(3/4)*gam
ma(-15/4)/(-256*a**7*b**9*x**12*gamma(1/4) + 768*a**6*b**10*x**16
*gamma(1/4) - 768*a**5*b**11*x**20*gamma(1/4) + 256*a**4*b**12*x*
*24*gamma(1/4)) + 45*a**3*b**(51/4)*x**12*(a/(b*x**4) - 1)**(3/4)
*gamma(-15/4)/(-256*a**7*b**9*x**12*gamma(1/4) + 768*a**6*b**10*x
**16*gamma(1/4) - 768*a**5*b**11*x**20*gamma(1/4) + 256*a**4*b**1
2*x**24*gamma(1/4)) - 540*a**2*b**(55/4)*x**16*(a/(b*x**4) - 1)**
(3/4)*gamma(-15/4)/(-256*a**7*b**9*x**12*gamma(1/4) + 768*a**6*b*
*10*x**16*gamma(1/4) - 768*a**5*b**11*x**20*gamma(1/4) + 256*a**4
*b**12*x**24*gamma(1/4)) + 864*a*b**(59/4)*x**20*(a/(b*x**4) - 1)
**(3/4)*gamma(-15/4)/(-256*a**7*b**9*x**12*gamma(1/4) + 768*a**6*
b**10*x**16*gamma(1/4) - 768*a**5*b**11*x**20*gamma(1/4) + 256*a*
```

```
*4*b**12*x**24*gamma(1/4)) - 384*b**(63/4)*x**24*(a/(b*x**4) - 1)
**(3/4)*gamma(-15/4)/(-256*a**7*b**9*x**12*gamma(1/4) + 768*a**6*
b**10*x**16*gamma(1/4) - 768*a**5*b**11*x**20*gamma(1/4) + 256*a*
*4*b**12*x**24*gamma(1/4)), Abs(a/(b*x**4)) > 1), (-231*a**6*b**(
39/4)*(-a/(b*x**4) + 1)**(3/4)*exp(15*I*pi/4)*gamma(-15/4)/(-256*
a**7*b**9*x**12*gamma(1/4) + 768*a**6*b**10*x**16*gamma(1/4) - 76
8*a**5*b**11*x**20*gamma(1/4) + 256*a**4*b**12*x**24*gamma(1/4))
+ 441*a**5*b**(43/4)*x**4*(-a/(b*x**4) + 1)**(3/4)*exp(15*I*pi/4)
*gamma(-15/4)/(-256*a**7*b**9*x**12*gamma(1/4) + 768*a**6*b**10*x
**16*gamma(1/4) - 768*a**5*b**11*x**20*gamma(1/4) + 256*a**4*b**1
2*x**24*gamma(1/4)) - 225*a**4*b**(47/4)*x**8*(-a/(b*x**4) + 1)**
(3/4)*exp(15*I*pi/4)*gamma(-15/4)/(-256*a**7*b**9*x**12*gamma(1/4
) + 768*a**6*b**10*x**16*gamma(1/4) - 768*a**5*b**11*x**20*gamma(
1/4) + 256*a**4*b**12*x**24*gamma(1/4)) - 45*a**3*b**(51/4)*x**12
*(-a/(b*x**4) + 1)**(3/4)*exp(15*I*pi/4)*gamma(-15/4)/(-256*a**7*
b**9*x**12*gamma(1/4) + 768*a**6*b**10*x**16*gamma(1/4) - 768*a**
5*b**11*x**20*gamma(1/4) + 256*a**4*b**12*x**24*gamma(1/4)) + 540
*a**2*b**(55/4)*x**16*(-a/(b*x**4) + 1)**(3/4)*exp(15*I*pi/4)*gam
ma(-15/4)/(-256*a**7*b**9*x**12*gamma(1/4) + 768*a**6*b**10*x**16
*gamma(1/4) - 768*a**5*b**11*x**20*gamma(1/4) + 256*a**4*b**12*x*
*24*gamma(1/4)) - 864*a*b**(59/4)*x**20*(-a/(b*x**4) + 1)**(3/4)*
exp(15*I*pi/4)*gamma(-15/4)/(-256*a**7*b**9*x**12*gamma(1/4) + 76
8*a**6*b**10*x**16*gamma(1/4) - 768*a**5*b**11*x**20*gamma(1/4) +
 256*a**4*b**12*x**24*gamma(1/4)) + 384*b**(63/4)*x**24*(-a/(b*x*
*4) + 1)**(3/4)*exp(15*I*pi/4)*gamma(-15/4)/(-256*a**7*b**9*x**12
*gamma(1/4) + 768*a**6*b**10*x**16*gamma(1/4) - 768*a**5*b**11*x*
*20*gamma(1/4) + 256*a**4*b**12*x**24*gamma(1/4)), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(-bx^4+a)^{\frac{1}{4}}x^{16}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^16),x, algorithm="giac")
```

```
[Out] integrate(1/((-b*x^4 + a)^(1/4)*x^16), x)
```

3.1224 $\int \frac{1}{x^{20}\sqrt[4]{a-bx^4}}\,dx$

Optimal. Leaf size=121

$$-\frac{2048b^4\left(a-bx^4\right)^{3/4}}{21945a^5x^3}-\frac{512b^3\left(a-bx^4\right)^{3/4}}{7315a^4x^7}-\frac{64b^2\left(a-bx^4\right)^{3/4}}{1045a^3x^{11}}-\frac{16b\left(a-bx^4\right)^{3/4}}{285a^2x^{15}}-\frac{\left(a-bx^4\right)^{3/4}}{19ax^{19}}$$

```
[Out] -(a - b*x^4)^(3/4)/(19*a*x^19) - (16*b*(a - b*x^4)^(3/4))/(285*a^
2*x^15) - (64*b^2*(a - b*x^4)^(3/4))/(1045*a^3*x^11) - (512*b^3*(
a - b*x^4)^(3/4))/(7315*a^4*x^7) - (2048*b^4*(a - b*x^4)^(3/4))/(
21945*a^5*x^3)
```

Rubi [A] time = 0.129507, antiderivative size = 121, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$

$$-\frac{2048b^4\left(a-bx^4\right)^{3/4}}{21945a^5x^3}-\frac{512b^3\left(a-bx^4\right)^{3/4}}{7315a^4x^7}-\frac{64b^2\left(a-bx^4\right)^{3/4}}{1045a^3x^{11}}-\frac{16b\left(a-bx^4\right)^{3/4}}{285a^2x^{15}}-\frac{\left(a-bx^4\right)^{3/4}}{19ax^{19}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^20*(a - b*x^4)^(1/4)),x]
```

```
[Out] -(a - b*x^4)^(3/4)/(19*a*x^19) - (16*b*(a - b*x^4)^(3/4))/(285*a^
2*x^15) - (64*b^2*(a - b*x^4)^(3/4))/(1045*a^3*x^11) - (512*b^3*(
a - b*x^4)^(3/4))/(7315*a^4*x^7) - (2048*b^4*(a - b*x^4)^(3/4))/(
21945*a^5*x^3)
```

Rubi in Sympy [A] time = 15.2427, size = 110, normalized size = 0.91

$$-\frac{\left(a-bx^4\right)^{\frac{3}{4}}}{19ax^{19}}-\frac{16b\left(a-bx^4\right)^{\frac{3}{4}}}{285a^2x^{15}}-\frac{64b^2\left(a-bx^4\right)^{\frac{3}{4}}}{1045a^3x^{11}}-\frac{512b^3\left(a-bx^4\right)^{\frac{3}{4}}}{7315a^4x^7}-\frac{2048b^4\left(a-bx^4\right)^{\frac{3}{4}}}{21945a^5x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**20/(-b*x**4+a)**(1/4),x)
```

```
[Out] -(a - b*x**4)**(3/4)/(19*a*x**19) - 16*b*(a - b*x**4)**(3/4)/(285
*a**2*x**15) - 64*b**2*(a - b*x**4)**(3/4)/(1045*a**3*x**11) - 51
2*b**3*(a - b*x**4)**(3/4)/(7315*a**4*x**7) - 2048*b**4*(a - b*x*
*4)**(3/4)/(21945*a**5*x**3)
```

Mathematica [A] time = 0.0492633, size = 65, normalized size = 0.54

$$-\frac{\left(a-bx^4\right)^{3/4}\left(1155a^4+1232a^3bx^4+1344a^2b^2x^8+1536ab^3x^{12}+2048b^4x^{16}\right)}{21945a^5x^{19}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^20*(a - b*x^4)^(1/4)),x]
```

```
[Out] -((a - b*x^4)^(3/4)*(1155*a^4 + 1232*a^3*b*x^4 + 1344*a^2*b^2*x^8
 + 1536*a*b^3*x^12 + 2048*b^4*x^16))/(21945*a^5*x^19)
```

Maple [A] time = 0.012, size = 62, normalized size = 0.5

$$-\frac{2048\,b^{4}x^{16}+1536\,b^{3}x^{12}a+1344\,b^{2}x^{8}a^{2}+1232\,bx^{4}a^{3}+1155\,a^{4}}{21945\,x^{19}a^{5}}\left(-bx^{4}+a\right)^{\frac{3}{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^20/(-b*x^4+a)^(1/4),x)
```

```
[Out] -1/21945*(-b*x^4+a)^(3/4)*(2048*b^4*x^16+1536*a*b^3*x^12+1344*a^2
*b^2*x^8+1232*a^3*b*x^4+1155*a^4)/x^19/a^5
```

Maxima [A] time = 1.43594, size = 123, normalized size = 1.02

$$-\frac{\frac{7315\left(-bx^{4}+a\right)^{\frac{3}{4}}b^{4}}{x^{3}}+\frac{12540\left(-bx^{4}+a\right)^{\frac{7}{4}}b^{3}}{x^{7}}+\frac{11970\left(-bx^{4}+a\right)^{\frac{11}{4}}b^{2}}{x^{11}}+\frac{5852\left(-bx^{4}+a\right)^{\frac{15}{4}}b}{x^{15}}+\frac{1155\left(-bx^{4}+a\right)^{\frac{19}{4}}}{x^{19}}}{21945\,a^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^20),x, algorithm="maxima")
```

```
[Out] -1/21945*(7315*(-b*x^4 + a)^(3/4)*b^4/x^3 + 12540*(-b*x^4 + a)^(7
/4)*b^3/x^7 + 11970*(-b*x^4 + a)^(11/4)*b^2/x^11 + 5852*(-b*x^4 +
 a)^(15/4)*b/x^15 + 1155*(-b*x^4 + a)^(19/4)/x^19)/a^5
```

Fricas [A] time = 0.227284, size = 82, normalized size = 0.68

$$-\frac{\left(2048\,b^{4}x^{16}+1536\,ab^{3}x^{12}+1344\,a^{2}b^{2}x^{8}+1232\,a^{3}bx^{4}+1155\,a^{4}\right)\left(-bx^{4}+a\right)^{\frac{3}{4}}}{21945\,a^{5}x^{19}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^20),x, algorithm="fricas")
```

```
[Out] -1/21945*(2048*b^4*x^16 + 1536*a*b^3*x^12 + 1344*a^2*b^2*x^8 + 12
32*a^3*b*x^4 + 1155*a^4)*(-b*x^4 + a)^(3/4)/(a^5*x^19)
```

Sympy [A] time = 42.0738, size = 2176, normalized size = 17.98

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**20/(-b*x**4+a)**(1/4),x)
```

```
[Out] Piecewise((3465*a**8*b**(67/4)*(a/(b*x**4) - 1)**(3/4)*gamma(-19/
4)/(1024*a**9*b**16*x**16*gamma(1/4) - 4096*a**8*b**17*x**20*gamm
a(1/4) + 6144*a**7*b**18*x**24*gamma(1/4) - 4096*a**6*b**19*x**28
*gamma(1/4) + 1024*a**5*b**20*x**32*gamma(1/4)) - 10164*a**7*b**(
71/4)*x**4*(a/(b*x**4) - 1)**(3/4)*gamma(-19/4)/(1024*a**9*b**16*
x**16*gamma(1/4) - 4096*a**8*b**17*x**20*gamma(1/4) + 6144*a**7*b
**18*x**24*gamma(1/4) - 4096*a**6*b**19*x**28*gamma(1/4) + 1024*a
**5*b**20*x**32*gamma(1/4)) + 10038*a**6*b**(75/4)*x**8*(a/(b*x**
4) - 1)**(3/4)*gamma(-19/4)/(1024*a**9*b**16*x**16*gamma(1/4) - 4
096*a**8*b**17*x**20*gamma(1/4) + 6144*a**7*b**18*x**24*gamma(1/4
) - 4096*a**6*b**19*x**28*gamma(1/4) + 1024*a**5*b**20*x**32*gamm
a(1/4)) - 3204*a**5*b**(79/4)*x**12*(a/(b*x**4) - 1)**(3/4)*gamma
```

```
(-19/4)/(1024*a**9*b**16*x**16*gamma(1/4) - 4096*a**8*b**17*x**20
*gamma(1/4) + 6144*a**7*b**18*x**24*gamma(1/4) - 4096*a**6*b**19*
x**28*gamma(1/4) + 1024*a**5*b**20*x**32*gamma(1/4)) + 585*a**4*b
**(83/4)*x**16*(a/(b*x**4) - 1)**(3/4)*gamma(-19/4)/(1024*a**9*b*
*16*x**16*gamma(1/4) - 4096*a**8*b**17*x**20*gamma(1/4) + 6144*a*
*7*b**18*x**24*gamma(1/4) - 4096*a**6*b**19*x**28*gamma(1/4) + 10
24*a**5*b**20*x**32*gamma(1/4)) - 9360*a**3*b**(87/4)*x**20*(a/(b
*x**4) - 1)**(3/4)*gamma(-19/4)/(1024*a**9*b**16*x**16*gamma(1/4)
 - 4096*a**8*b**17*x**20*gamma(1/4) + 6144*a**7*b**18*x**24*gamma
(1/4) - 4096*a**6*b**19*x**28*gamma(1/4) + 1024*a**5*b**20*x**32*
gamma(1/4)) + 22464*a**2*b**(91/4)*x**24*(a/(b*x**4) - 1)**(3/4)*
gamma(-19/4)/(1024*a**9*b**16*x**16*gamma(1/4) - 4096*a**8*b**17*
x**20*gamma(1/4) + 6144*a**7*b**18*x**24*gamma(1/4) - 4096*a**6*b
**19*x**28*gamma(1/4) + 1024*a**5*b**20*x**32*gamma(1/4)) - 19968
*a*b**(95/4)*x**28*(a/(b*x**4) - 1)**(3/4)*gamma(-19/4)/(1024*a**
9*b**16*x**16*gamma(1/4) - 4096*a**8*b**17*x**20*gamma(1/4) + 614
4*a**7*b**18*x**24*gamma(1/4) - 4096*a**6*b**19*x**28*gamma(1/4)
+ 1024*a**5*b**20*x**32*gamma(1/4)) + 6144*b**(99/4)*x**32*(a/(b*
x**4) - 1)**(3/4)*gamma(-19/4)/(1024*a**9*b**16*x**16*gamma(1/4)
- 4096*a**8*b**17*x**20*gamma(1/4) + 6144*a**7*b**18*x**24*gamma(
1/4) - 4096*a**6*b**19*x**28*gamma(1/4) + 1024*a**5*b**20*x**32*g
amma(1/4)), Abs(a/(b*x**4)) > 1), (-3465*a**8*b**(67/4)*(-a/(b*x*
*4) + 1)**(3/4)*exp(23*I*pi/4)*gamma(-19/4)/(1024*a**9*b**16*x**1
6*gamma(1/4) - 4096*a**8*b**17*x**20*gamma(1/4) + 6144*a**7*b**18
*x**24*gamma(1/4) - 4096*a**6*b**19*x**28*gamma(1/4) + 1024*a**5*
b**20*x**32*gamma(1/4)) + 10164*a**7*b**(71/4)*x**4*(-a/(b*x**4)
+ 1)**(3/4)*exp(23*I*pi/4)*gamma(-19/4)/(1024*a**9*b**16*x**16*ga
mma(1/4) - 4096*a**8*b**17*x**20*gamma(1/4) + 6144*a**7*b**18*x**
24*gamma(1/4) - 4096*a**6*b**19*x**28*gamma(1/4) + 1024*a**5*b**2
0*x**32*gamma(1/4)) - 10038*a**6*b**(75/4)*x**8*(-a/(b*x**4) + 1)
**(3/4)*exp(23*I*pi/4)*gamma(-19/4)/(1024*a**9*b**16*x**16*gamma(
1/4) - 4096*a**8*b**17*x**20*gamma(1/4) + 6144*a**7*b**18*x**24*g
amma(1/4) - 4096*a**6*b**19*x**28*gamma(1/4) + 1024*a**5*b**20*x*
*32*gamma(1/4)) + 3204*a**5*b**(79/4)*x**12*(-a/(b*x**4) + 1)**(3
/4)*exp(23*I*pi/4)*gamma(-19/4)/(1024*a**9*b**16*x**16*gamma(1/4)
 - 4096*a**8*b**17*x**20*gamma(1/4) + 6144*a**7*b**18*x**24*gamma
(1/4) - 4096*a**6*b**19*x**28*gamma(1/4) + 1024*a**5*b**20*x**32*
gamma(1/4)) - 585*a**4*b**(83/4)*x**16*(-a/(b*x**4) + 1)**(3/4)*e
xp(23*I*pi/4)*gamma(-19/4)/(1024*a**9*b**16*x**16*gamma(1/4) - 40
96*a**8*b**17*x**20*gamma(1/4) + 6144*a**7*b**18*x**24*gamma(1/4)
 - 4096*a**6*b**19*x**28*gamma(1/4) + 1024*a**5*b**20*x**32*gamma
(1/4)) + 9360*a**3*b**(87/4)*x**20*(-a/(b*x**4) + 1)**(3/4)*exp(2
3*I*pi/4)*gamma(-19/4)/(1024*a**9*b**16*x**16*gamma(1/4) - 4096*a
**8*b**17*x**20*gamma(1/4) + 6144*a**7*b**18*x**24*gamma(1/4) - 4
096*a**6*b**19*x**28*gamma(1/4) + 1024*a**5*b**20*x**32*gamma(1/4
)) - 22464*a**2*b**(91/4)*x**24*(-a/(b*x**4) + 1)**(3/4)*exp(23*I
*pi/4)*gamma(-19/4)/(1024*a**9*b**16*x**16*gamma(1/4) - 4096*a**8
*b**17*x**20*gamma(1/4) + 6144*a**7*b**18*x**24*gamma(1/4) - 4096
*a**6*b**19*x**28*gamma(1/4) + 1024*a**5*b**20*x**32*gamma(1/4))
+ 19968*a*b**(95/4)*x**28*(-a/(b*x**4) + 1)**(3/4)*exp(23*I*pi/4)
*gamma(-19/4)/(1024*a**9*b**16*x**16*gamma(1/4) - 4096*a**8*b**17
*x**20*gamma(1/4) + 6144*a**7*b**18*x**24*gamma(1/4) - 4096*a**6*
b**19*x**28*gamma(1/4) + 1024*a**5*b**20*x**32*gamma(1/4)) - 6144
*b**(99/4)*x**32*(-a/(b*x**4) + 1)**(3/4)*exp(23*I*pi/4)*gamma(-1
9/4)/(1024*a**9*b**16*x**16*gamma(1/4) - 4096*a**8*b**17*x**20*ga
mma(1/4) + 6144*a**7*b**18*x**24*gamma(1/4) - 4096*a**6*b**19*x**
28*gamma(1/4) + 1024*a**5*b**20*x**32*gamma(1/4)), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(-bx^4 + a)^{\frac{1}{4}} x^{20}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^20),x, algorithm="giac")
```

```
[Out] integrate(1/((-b*x^4 + a)^(1/4)*x^20), x)
```

3.1225 $\int \frac{x^{10}}{\sqrt[4]{a-bx^4}}\,dx$

Optimal. Leaf size=134

$$\frac{7a^{5/2}x\sqrt[4]{1-\frac{a}{bx^4}}E\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{40b^{5/2}\sqrt[4]{a-bx^4}}-\frac{7a^2\left(a-bx^4\right)^{3/4}}{40b^3x}-\frac{7ax^3\left(a-bx^4\right)^{3/4}}{60b^2}-\frac{x^7\left(a-bx^4\right)^{3/4}}{10b}$$

```
[Out] (-7*a^2*(a - b*x^4)^(3/4))/(40*b^3*x) - (7*a*x^3*(a - b*x^4)^(3/4
))/(60*b^2) - (x^7*(a - b*x^4)^(3/4))/(10*b) + (7*a^(5/2)*(1 - a/
(b*x^4))^(1/4)*x*EllipticE[ArcCsc[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(
40*b^(5/2)*(a - b*x^4)^(1/4))
```

Rubi [A] time = 0.190772, antiderivative size = 134, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375

$$\frac{7a^{5/2}x\sqrt[4]{1-\frac{a}{bx^4}}E\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{40b^{5/2}\sqrt[4]{a-bx^4}}-\frac{7a^2\left(a-bx^4\right)^{3/4}}{40b^3x}-\frac{7ax^3\left(a-bx^4\right)^{3/4}}{60b^2}-\frac{x^7\left(a-bx^4\right)^{3/4}}{10b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^10/(a - b*x^4)^(1/4),x]
```

```
[Out] (-7*a^2*(a - b*x^4)^(3/4))/(40*b^3*x) - (7*a*x^3*(a - b*x^4)^(3/4
))/(60*b^2) - (x^7*(a - b*x^4)^(3/4))/(10*b) + (7*a^(5/2)*(1 - a/
(b*x^4))^(1/4)*x*EllipticE[ArcCsc[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(
40*b^(5/2)*(a - b*x^4)^(1/4))
```

Rubi in Sympy [A] time = 23.8705, size = 116, normalized size = 0.87

$$\frac{7a^{\frac{5}{2}}x\sqrt[4]{-\frac{a}{bx^4}+1}E\left(\frac{\operatorname{asin}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{40b^{\frac{5}{2}}\sqrt[4]{a-bx^4}}-\frac{7a^2\left(a-bx^4\right)^{\frac{3}{4}}}{40b^3x}-\frac{7ax^3\left(a-bx^4\right)^{\frac{3}{4}}}{60b^2}-\frac{x^7\left(a-bx^4\right)^{\frac{3}{4}}}{10b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**10/(-b*x**4+a)**(1/4),x)
```

```
[Out] 7*a**(5/2)*x*(-a/(b*x**4) + 1)**(1/4)*elliptic_e(asin(sqrt(a)/(sq
rt(b)*x**2))/2, 2)/(40*b**(5/2)*(a - b*x**4)**(1/4)) - 7*a**2*(a
- b*x**4)**(3/4)/(40*b**3*x) - 7*a*x**3*(a - b*x**4)**(3/4)/(60*b
**2) - x**7*(a - b*x**4)**(3/4)/(10*b)
```

Mathematica [C] time = 0.0723251, size = 80, normalized size = 0.6

$$\frac{x^3\left(7a^2\sqrt[4]{1-\frac{bx^4}{a}}\,{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{7}{4};\frac{bx^4}{a}\right)-7a^2+abx^4+6b^2x^8\right)}{60b^2\sqrt[4]{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^10/(a - b*x^4)^(1/4),x]
```

```
[Out] (x^3*(-7*a^2 + a*b*x^4 + 6*b^2*x^8 + 7*a^2*(1 - (b*x^4)/a)^(1/4)*
Hypergeometric2F1[1/4, 3/4, 7/4, (b*x^4)/a]))/(60*b^2*(a - b*x^4)
^(1/4))
```

Maple [F] time = 0.051, size = 0, normalized size = 0.

$$\int x^{10}\frac{1}{\sqrt[4]{-bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^10/(-b*x^4+a)^(1/4),x)
```

```
[Out] int(x^10/(-b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{10}}{(-bx^4+a)^{\frac{1}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/(-b*x^4 + a)^(1/4),x, algorithm="maxima")
```

```
[Out] integrate(x^10/(-b*x^4 + a)^(1/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{10}}{(-bx^4+a)^{\frac{1}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/(-b*x^4 + a)^(1/4),x, algorithm="fricas")
```

```
[Out] integral(x^10/(-b*x^4 + a)^(1/4), x)
```

Sympy [A] time = 5.30036, size = 39, normalized size = 0.29

$$\frac{x^{11}\,\Gamma\left(\frac{11}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{4},\frac{11}{4}\\\frac{15}{4}\end{matrix}\middle|\frac{bx^4e^{2i\pi}}{a}\right)}{4\sqrt[4]{a}\,\Gamma\left(\frac{15}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**10/(-b*x**4+a)**(1/4),x)
```

```
[Out] x**11*gamma(11/4)*hyper((1/4, 11/4), (15/4,), b*x**4*exp_polar(2*
I*pi)/a)/(4*a**(1/4)*gamma(15/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{10}}{\left(-bx^4 + a\right)^{\frac{1}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/(-b*x^4 + a)^(1/4),x, algorithm="giac")

[Out] integrate(x^10/(-b*x^4 + a)^(1/4), x)
```

3.1226 $\int \frac{x^6}{\sqrt[4]{a-bx^4}}\,dx$

Optimal. Leaf size=109

$$\frac{a^{3/2}x\sqrt[4]{1-\frac{a}{bx^4}}E\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{4b^{3/2}\sqrt[4]{a-bx^4}}-\frac{a\left(a-bx^4\right)^{3/4}}{4b^2x}-\frac{x^3\left(a-bx^4\right)^{3/4}}{6b}$$

```
[Out] -(a*(a - b*x^4)^(3/4))/(4*b^2*x) - (x^3*(a - b*x^4)^(3/4))/(6*b)
+ (a^(3/2)*(1 - a/(b*x^4))^(1/4)*x*EllipticE[ArcCsc[(Sqrt[b]*x^2)
/Sqrt[a]]/2, 2])/(4*b^(3/2)*(a - b*x^4)^(1/4))
```

Rubi [A] time = 0.153926, antiderivative size = 109, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375

$$\frac{a^{3/2}x\sqrt[4]{1-\frac{a}{bx^4}}E\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{4b^{3/2}\sqrt[4]{a-bx^4}}-\frac{a\left(a-bx^4\right)^{3/4}}{4b^2x}-\frac{x^3\left(a-bx^4\right)^{3/4}}{6b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/(a - b*x^4)^(1/4),x]
```

```
[Out] -(a*(a - b*x^4)^(3/4))/(4*b^2*x) - (x^3*(a - b*x^4)^(3/4))/(6*b)
+ (a^(3/2)*(1 - a/(b*x^4))^(1/4)*x*EllipticE[ArcCsc[(Sqrt[b]*x^2)
/Sqrt[a]]/2, 2])/(4*b^(3/2)*(a - b*x^4)^(1/4))
```

Rubi in Sympy [A] time = 19.6817, size = 88, normalized size = 0.81

$$\frac{a^{\frac{3}{2}}x\sqrt[4]{-\frac{a}{bx^4}+1}E\left(\frac{\operatorname{asin}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{4b^{\frac{3}{2}}\sqrt[4]{a-bx^4}}-\frac{a\left(a-bx^4\right)^{\frac{3}{4}}}{4b^2x}-\frac{x^3\left(a-bx^4\right)^{\frac{3}{4}}}{6b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(-b*x**4+a)**(1/4),x)
```

```
[Out] a**(3/2)*x*(-a/(b*x**4) + 1)**(1/4)*elliptic_e(asin(sqrt(a)/(sqrt
(b)*x**2))/2, 2)/(4*b**(3/2)*(a - b*x**4)**(1/4)) - a*(a - b*x**4
)**(3/4)/(4*b**2*x) - x**3*(a - b*x**4)**(3/4)/(6*b)
```

Mathematica [C] time = 0.0527921, size = 66, normalized size = 0.61

$$\frac{x^3\left(a\sqrt[4]{1-\frac{bx^4}{a}}\,{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{7}{4};\frac{bx^4}{a}\right)-a+bx^4\right)}{6b\sqrt[4]{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6/(a - b*x^4)^(1/4),x]
```

```
[Out] (x^3*(-a + b*x^4 + a*(1 - (b*x^4)/a)^(1/4)*Hypergeometric2F1[1/4,
 3/4, 7/4, (b*x^4)/a]))/(6*b*(a - b*x^4)^(1/4))
```

Maple [F] time = 0.043, size = 0, normalized size = 0.

$$\int x^{6}\frac{1}{\sqrt[4]{-b x^{4}+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(-b*x^4+a)^(1/4),x)
```

```
[Out] int(x^6/(-b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{6}}{(-b x^{4}+a)^{\frac{1}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(-b*x^4 + a)^(1/4),x, algorithm="maxima")
```

```
[Out] integrate(x^6/(-b*x^4 + a)^(1/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x^{6}}{(-b x^{4}+a)^{\frac{1}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(-b*x^4 + a)^(1/4),x, algorithm="fricas")
```

```
[Out] integral(x^6/(-b*x^4 + a)^(1/4), x)
```

Sympy [A] time = 3.05551, size = 39, normalized size = 0.36

$$\frac{x^{7}\Gamma\left(\frac{7}{4}\right){}_{2}F_{1}\left(\begin{matrix}\frac{1}{4},\frac{7}{4}\\ \frac{11}{4}\end{matrix}\middle|\frac{b x^{4}e^{2i\pi}}{a}\right)}{4\sqrt[4]{a}\,\Gamma\left(\frac{11}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(-b*x**4+a)**(1/4),x)
```

```
[Out] x**7*gamma(7/4)*hyper((1/4, 7/4), (11/4,), b*x**4*exp_polar(2*I*p
i)/a)/(4*a**(1/4)*gamma(11/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{6}}{(-b x^{4}+a)^{\frac{1}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(-b*x^4 + a)^(1/4),x, algorithm="giac")
```

```
[Out] integrate(x^6/(-b*x^4 + a)^(1/4), x)
```

3.1227 $\int \frac{x^2}{\sqrt[4]{a-bx^4}}\,dx$

Optimal. Leaf size=86

$$\frac{\sqrt{a}x\sqrt[4]{1-\frac{a}{bx^4}}E\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{2\sqrt{b}\sqrt[4]{a-bx^4}}-\frac{\left(a-bx^4\right)^{3/4}}{2bx}$$

```
[Out] -(a - b*x^4)^(3/4)/(2*b*x) + (Sqrt[a]*(1 - a/(b*x^4))^(1/4)*x*Ell
ipticE[ArcCsc[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(2*Sqrt[b]*(a - b*x^4
)^(1/4))
```

Rubi [A] time = 0.122977, antiderivative size = 86, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312

$$\frac{\sqrt{a}x\sqrt[4]{1-\frac{a}{bx^4}}E\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{2\sqrt{b}\sqrt[4]{a-bx^4}}-\frac{\left(a-bx^4\right)^{3/4}}{2bx}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a - b*x^4)^(1/4),x]
```

```
[Out] -(a - b*x^4)^(3/4)/(2*b*x) + (Sqrt[a]*(1 - a/(b*x^4))^(1/4)*x*Ell
ipticE[ArcCsc[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(2*Sqrt[b]*(a - b*x^4
)^(1/4))
```

Rubi in Sympy [A] time = 16.1321, size = 68, normalized size = 0.79

$$\frac{\sqrt{a}x\sqrt[4]{-\frac{a}{bx^4}+1}E\left(\frac{\operatorname{asin}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{2\sqrt{b}\sqrt[4]{a-bx^4}}-\frac{\left(a-bx^4\right)^{\frac{3}{4}}}{2bx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(-b*x**4+a)**(1/4),x)
```

```
[Out] sqrt(a)*x*(-a/(b*x**4) + 1)**(1/4)*elliptic_e(asin(sqrt(a)/(sqrt(
b)*x**2))/2, 2)/(2*sqrt(b)*(a - b*x**4)**(1/4)) - (a - b*x**4)**(
3/4)/(2*b*x)
```

Mathematica [C] time = 0.0300266, size = 53, normalized size = 0.62

$$\frac{x^3\sqrt[4]{\frac{a-bx^4}{a}}\,{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{7}{4};\frac{bx^4}{a}\right)}{3\sqrt[4]{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a - b*x^4)^(1/4),x]
```

```
[Out] (x^3*((a - b*x^4)/a)^(1/4)*Hypergeometric2F1[1/4, 3/4, 7/4, (b*x^
4)/a])/(3*(a - b*x^4)^(1/4))
```

Maple [F] time = 0.029, size = 0, normalized size = 0.

$$\int x^2 \frac{1}{\sqrt[4]{-bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(-b*x^4+a)^(1/4),x)
```

```
[Out] int(x^2/(-b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{(-bx^4+a)^{\frac{1}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(-b*x^4 + a)^(1/4),x, algorithm="maxima")
```

```
[Out] integrate(x^2/(-b*x^4 + a)^(1/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^2}{(-bx^4+a)^{\frac{1}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(-b*x^4 + a)^(1/4),x, algorithm="fricas")
```

```
[Out] integral(x^2/(-b*x^4 + a)^(1/4), x)
```

Sympy [A] time = 2.36131, size = 39, normalized size = 0.45

$$\frac{x^3 \Gamma\left(\frac{3}{4}\right) {}_2F_1\left(\begin{matrix} \frac{1}{4}, \frac{3}{4} \\ \frac{7}{4} \end{matrix}\middle| \frac{bx^4 e^{2i\pi}}{a}\right)}{4\sqrt[4]{a}\,\Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(-b*x**4+a)**(1/4),x)
```

```
[Out] x**3*gamma(3/4)*hyper((1/4, 3/4), (7/4,), b*x**4*exp_polar(2*I*pi
)/a)/(4*a**(1/4)*gamma(7/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{(-bx^4+a)^{\frac{1}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(-b*x^4 + a)^(1/4),x, algorithm="giac")
```

```
[Out] integrate(x^2/(-b*x^4 + a)^(1/4), x)
```

3.1228 $\int \frac{1}{x^2 \sqrt[4]{a-bx^4}}\,dx$

Optimal. Leaf size=61

$$-\frac{\sqrt{b}x\sqrt[4]{1-\frac{a}{bx^4}}E\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{\sqrt{a}\sqrt[4]{a-bx^4}}$$

```
[Out] -((Sqrt[b]*(1 - a/(b*x^4))^(1/4)*x*EllipticE[ArcCsc[(Sqrt[b]*x^2)
/Sqrt[a]]/2, 2])/(Sqrt[a]*(a - b*x^4)^(1/4)))
```

Rubi [A] time = 0.0908813, antiderivative size = 61, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25

$$-\frac{\sqrt{b}x\sqrt[4]{1-\frac{a}{bx^4}}E\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{\sqrt{a}\sqrt[4]{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(a - b*x^4)^(1/4)),x]
```

```
[Out] -((Sqrt[b]*(1 - a/(b*x^4))^(1/4)*x*EllipticE[ArcCsc[(Sqrt[b]*x^2)
/Sqrt[a]]/2, 2])/(Sqrt[a]*(a - b*x^4)^(1/4)))
```

Rubi in Sympy [A] time = 13.1305, size = 53, normalized size = 0.87

$$-\frac{\sqrt{b}x\sqrt[4]{-\frac{a}{bx^4}+1}E\left(\frac{\operatorname{asin}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{\sqrt{a}\sqrt[4]{a-bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(-b*x**4+a)**(1/4),x)
```

```
[Out] -sqrt(b)*x*(-a/(b*x**4) + 1)**(1/4)*elliptic_e(asin(sqrt(a)/(sqrt
(b)*x**2))/2, 2)/(sqrt(a)*(a - b*x**4)**(1/4))
```

Mathematica [C] time = 0.0494668, size = 71, normalized size = 1.16

$$\frac{-2bx^4\sqrt[4]{1-\frac{bx^4}{a}}\,{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{7}{4};\frac{bx^4}{a}\right)-3a+3bx^4}{3ax\sqrt[4]{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*(a - b*x^4)^(1/4)),x]
```

```
[Out] (-3*a + 3*b*x^4 - 2*b*x^4*(1 - (b*x^4)/a)^(1/4)*Hypergeometric2F1
[1/4, 3/4, 7/4, (b*x^4)/a])/(3*a*x*(a - b*x^4)^(1/4))
```

Maple [F] time = 0.041, size = 0, normalized size = 0.

$$\int \frac{1}{x^2}\frac{1}{\sqrt[4]{-bx^4+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(-b*x^4+a)^(1/4),x)
```

```
[Out] int(1/x^2/(-b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(-bx^4+a)^{\frac{1}{4}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^2),x, algorithm="maxima")
```

```
[Out] integrate(1/((-b*x^4 + a)^(1/4)*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{(-bx^4+a)^{\frac{1}{4}}x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^2),x, algorithm="fricas")
```

```
[Out] integral(1/((-b*x^4 + a)^(1/4)*x^2), x)
```

Sympy [A] time = 2.78362, size = 31, normalized size = 0.51

$$\frac{ie^{\frac{i\pi}{4}}\,{}_2F_1\left(\begin{matrix}\frac{1}{4},\frac{1}{2}\\ \frac{3}{2}\end{matrix}\middle|\frac{a}{bx^4}\right)}{2\sqrt[4]{b}x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(-b*x**4+a)**(1/4),x)
```

```
[Out] I*exp(I*pi/4)*hyper((1/4, 1/2), (3/2,), a/(b*x**4))/(2*b**(1/4)*x
**2)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(-bx^4+a)^{\frac{1}{4}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/((-b*x^4 + a)^(1/4)*x^2), x)
```

3.1229 $\int \frac{1}{x^6 \sqrt[4]{a-bx^4}}\,dx$

Optimal. Leaf size=86

$$-\frac{2b^{3/2}x\sqrt[4]{1-\frac{a}{bx^4}}E\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{5a^{3/2}\sqrt[4]{a-bx^4}}-\frac{\left(a-bx^4\right)^{3/4}}{5ax^5}$$

```
[Out] -(a - b*x^4)^(3/4)/(5*a*x^5) - (2*b^(3/2)*(1 - a/(b*x^4))^(1/4)*x
*EllipticE[ArcCsc[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(5*a^(3/2)*(a - b
*x^4)^(1/4))
```

Rubi [A] time = 0.121565, antiderivative size = 86, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312

$$-\frac{2b^{3/2}x\sqrt[4]{1-\frac{a}{bx^4}}E\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{5a^{3/2}\sqrt[4]{a-bx^4}}-\frac{\left(a-bx^4\right)^{3/4}}{5ax^5}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^6*(a - b*x^4)^(1/4)),x]
```

```
[Out] -(a - b*x^4)^(3/4)/(5*a*x^5) - (2*b^(3/2)*(1 - a/(b*x^4))^(1/4)*x
*EllipticE[ArcCsc[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(5*a^(3/2)*(a - b
*x^4)^(1/4))
```

Rubi in Sympy [A] time = 16.1433, size = 73, normalized size = 0.85

$$-\frac{\left(a-bx^4\right)^{\frac{3}{4}}}{5ax^5}-\frac{2b^{\frac{3}{2}}x\sqrt[4]{-\frac{a}{bx^4}+1}E\left(\frac{\operatorname{asin}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{5a^{\frac{3}{2}}\sqrt[4]{a-bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**6/(-b*x**4+a)**(1/4),x)
```

```
[Out] -(a - b*x**4)**(3/4)/(5*a*x**5) - 2*b**(3/2)*x*(-a/(b*x**4) + 1)*
*(1/4)*elliptic_e(asin(sqrt(a)/(sqrt(b)*x**2))/2, 2)/(5*a**(3/2)*
(a - b*x**4)**(1/4))
```

Mathematica [C] time = 0.0629119, size = 84, normalized size = 0.98

$$\frac{-3\left(a^2+abx^4-2b^2x^8\right)-4b^2x^8\sqrt[4]{1-\frac{bx^4}{a}}\,{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{7}{4};\frac{bx^4}{a}\right)}{15a^2x^5\sqrt[4]{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^6*(a - b*x^4)^(1/4)),x]
```

```
[Out] (-3*(a^2 + a*b*x^4 - 2*b^2*x^8) - 4*b^2*x^8*(1 - (b*x^4)/a)^(1/4)
*Hypergeometric2F1[1/4, 3/4, 7/4, (b*x^4)/a])/(15*a^2*x^5*(a - b*
x^4)^(1/4))
```

Maple [F] time = 0.054, size = 0, normalized size = 0.

$$\int \frac{1}{x^{6}} \frac{1}{\sqrt[4]{-b x^{4}+a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^6/(-b*x^4+a)^(1/4),x)

[Out] int(1/x^6/(-b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(-b x^{4}+a)^{\frac{1}{4}} x^{6}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^6),x, algorithm="maxima")

[Out] integrate(1/((-b*x^4 + a)^(1/4)*x^6), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(-b x^{4}+a)^{\frac{1}{4}} x^{6}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^6),x, algorithm="fricas")

[Out] integral(1/((-b*x^4 + a)^(1/4)*x^6), x)
```

Sympy [A] time = 4.04249, size = 34, normalized size = 0.4

$$-\frac{i e^{\frac{5i\pi}{4}} {}_{2}F_{1}\left(\begin{matrix} \frac{1}{4}, \frac{3}{2} \\ \frac{5}{2} \end{matrix}\middle| \frac{a}{b x^{4}}\right)}{6\sqrt[4]{b} x^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**6/(-b*x**4+a)**(1/4),x)

[Out] -I*exp(5*I*pi/4)*hyper((1/4, 3/2), (5/2,), a/(b*x**4))/(6*b**(1/4
)*x**6)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(-b x^{4}+a)^{\frac{1}{4}} x^{6}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^6),x, algorithm="giac")
```

```
[Out] integrate(1/((-b*x^4 + a)^(1/4)*x^6), x)
```

3.1230 $\int \frac{1}{x^{10}\sqrt[4]{a-bx^4}}\,dx$

Optimal. Leaf size=109

$$-\frac{4b^{5/2}x\sqrt[4]{1-\frac{a}{bx^4}}E\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{15a^{5/2}\sqrt[4]{a-bx^4}}-\frac{2b\left(a-bx^4\right)^{3/4}}{15a^2x^5}-\frac{\left(a-bx^4\right)^{3/4}}{9ax^9}$$

```
[Out] -(a - b*x^4)^(3/4)/(9*a*x^9) - (2*b*(a - b*x^4)^(3/4))/(15*a^2*x^
5) - (4*b^(5/2)*(1 - a/(b*x^4))^(1/4)*x*EllipticE[ArcCsc[(Sqrt[b]
*x^2)/Sqrt[a]]/2, 2])/(15*a^(5/2)*(a - b*x^4)^(1/4))
```

Rubi [A] time = 0.154601, antiderivative size = 109, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312

$$-\frac{4b^{5/2}x\sqrt[4]{1-\frac{a}{bx^4}}E\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{15a^{5/2}\sqrt[4]{a-bx^4}}-\frac{2b\left(a-bx^4\right)^{3/4}}{15a^2x^5}-\frac{\left(a-bx^4\right)^{3/4}}{9ax^9}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^10*(a - b*x^4)^(1/4)),x]
```


```
[Out] -(a - b*x^4)^(3/4)/(9*a*x^9) - (2*b*(a - b*x^4)^(3/4))/(15*a^2*x^
5) - (4*b^(5/2)*(1 - a/(b*x^4))^(1/4)*x*EllipticE[ArcCsc[(Sqrt[b]
*x^2)/Sqrt[a]]/2, 2])/(15*a^(5/2)*(a - b*x^4)^(1/4))
```

Rubi in Sympy [A] time = 19.957, size = 95, normalized size = 0.87

$$-\frac{\left(a-bx^4\right)^{\frac{3}{4}}}{9ax^9}-\frac{2b\left(a-bx^4\right)^{\frac{3}{4}}}{15a^2x^5}-\frac{4b^{\frac{5}{2}}x\sqrt[4]{-\frac{a}{bx^4}+1}E\left(\frac{\operatorname{asin}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{15a^{\frac{5}{2}}\sqrt[4]{a-bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**10/(-b*x**4+a)**(1/4),x)
```

```
[Out] -(a - b*x**4)**(3/4)/(9*a*x**9) - 2*b*(a - b*x**4)**(3/4)/(15*a**
2*x**5) - 4*b**(5/2)*x*(-a/(b*x**4) + 1)**(1/4)*elliptic_e(asin(s
qrt(a)/(sqrt(b)*x**2))/2, 2)/(15*a**(5/2)*(a - b*x**4)**(1/4))
```

Mathematica [C] time = 0.0680857, size = 95, normalized size = 0.87

$$\frac{-5a^3-a^2bx^4-8b^3x^{12}\sqrt[4]{1-\frac{bx^4}{a}}\,{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{7}{4};\frac{bx^4}{a}\right)-6ab^2x^8+12b^3x^{12}}{45a^3x^9\sqrt[4]{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^10*(a - b*x^4)^(1/4)),x]
```

```
[Out] (-5*a^3 - a^2*b*x^4 - 6*a*b^2*x^8 + 12*b^3*x^12 - 8*b^3*x^12*(1 -
 (b*x^4)/a)^(1/4)*Hypergeometric2F1[1/4, 3/4, 7/4, (b*x^4)/a])/(4
5*a^3*x^9*(a - b*x^4)^(1/4))
```

Maple [F] time = 0.051, size = 0, normalized size = 0.

$$\int \frac{1}{x^{10}} \frac{1}{\sqrt[4]{-b x^4 + a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^10/(-b*x^4+a)^(1/4),x)
```

```
[Out] int(1/x^10/(-b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-b x^4 + a\right)^{\frac{1}{4}} x^{10}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^10),x, algorithm="maxima")
```

```
[Out] integrate(1/((-b*x^4 + a)^(1/4)*x^10), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\left(-b x^4 + a\right)^{\frac{1}{4}} x^{10}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^10),x, algorithm="fricas")
```

```
[Out] integral(1/((-b*x^4 + a)^(1/4)*x^10), x)
```

Sympy [A] time = 7.67815, size = 32, normalized size = 0.29

$$\frac{i e^{\frac{9 i \pi}{4}} {}_2F_1\left(\left.\begin{matrix} \frac{1}{4}, \frac{5}{2} \\ \frac{7}{2} \end{matrix}\right| \frac{a}{b x^4}\right)}{10 \sqrt[4]{b} x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**10/(-b*x**4+a)**(1/4),x)
```

```
[Out] I*exp(9*I*pi/4)*hyper((1/4, 5/2), (7/2,), a/(b*x**4))/(10*b**(1/4
)*x**10)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-b x^4 + a\right)^{\frac{1}{4}} x^{10}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^10),x, algorithm="giac")

[Out] integrate(1/((-b*x^4 + a)^(1/4)*x^10), x)
```

3.1231 $\int \frac{1}{x^{14}\sqrt[4]{a-bx^4}}\,dx$

Optimal. Leaf size=134

$$-\frac{8b^{7/2}x\sqrt[4]{1-\frac{a}{bx^4}}E\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{39a^{7/2}\sqrt[4]{a-bx^4}}-\frac{4b^2\left(a-bx^4\right)^{3/4}}{39a^3x^5}-\frac{10b\left(a-bx^4\right)^{3/4}}{117a^2x^9}-\frac{\left(a-bx^4\right)^{3/4}}{13ax^{13}}$$

```
[Out] -(a - b*x^4)^(3/4)/(13*a*x^13) - (10*b*(a - b*x^4)^(3/4))/(117*a^
2*x^9) - (4*b^2*(a - b*x^4)^(3/4))/(39*a^3*x^5) - (8*b^(7/2)*(1 -
 a/(b*x^4))^(1/4)*x*EllipticE[ArcCsc[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2]
)/(39*a^(7/2)*(a - b*x^4)^(1/4))
```

Rubi [A] time = 0.187178, antiderivative size = 134, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312

$$-\frac{8b^{7/2}x\sqrt[4]{1-\frac{a}{bx^4}}E\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{39a^{7/2}\sqrt[4]{a-bx^4}}-\frac{4b^2\left(a-bx^4\right)^{3/4}}{39a^3x^5}-\frac{10b\left(a-bx^4\right)^{3/4}}{117a^2x^9}-\frac{\left(a-bx^4\right)^{3/4}}{13ax^{13}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^14*(a - b*x^4)^(1/4)),x]
```

```
[Out] -(a - b*x^4)^(3/4)/(13*a*x^13) - (10*b*(a - b*x^4)^(3/4))/(117*a^
2*x^9) - (4*b^2*(a - b*x^4)^(3/4))/(39*a^3*x^5) - (8*b^(7/2)*(1 -
 a/(b*x^4))^(1/4)*x*EllipticE[ArcCsc[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2]
)/(39*a^(7/2)*(a - b*x^4)^(1/4))
```

Rubi in Sympy [A] time = 24.0158, size = 119, normalized size = 0.89

$$-\frac{\left(a-bx^4\right)^{\frac{3}{4}}}{13ax^{13}}-\frac{10b\left(a-bx^4\right)^{\frac{3}{4}}}{117a^2x^9}-\frac{4b^2\left(a-bx^4\right)^{\frac{3}{4}}}{39a^3x^5}-\frac{8b^{\frac{7}{2}}x\sqrt[4]{-\frac{a}{bx^4}+1}E\left(\frac{\operatorname{asin}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{39a^{\frac{7}{2}}\sqrt[4]{a-bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**14/(-b*x**4+a)**(1/4),x)
```

```
[Out] -(a - b*x**4)**(3/4)/(13*a*x**13) - 10*b*(a - b*x**4)**(3/4)/(117
*a**2*x**9) - 4*b**2*(a - b*x**4)**(3/4)/(39*a**3*x**5) - 8*b**(7
/2)*x*(-a/(b*x**4) + 1)**(1/4)*elliptic_e(asin(sqrt(a)/(sqrt(b)*x
**2))/2, 2)/(39*a**(7/2)*(a - b*x**4)**(1/4))
```

Mathematica [C] time = 0.0777162, size = 106, normalized size = 0.79

$$\frac{-9a^4-a^3bx^4-2a^2b^2x^8-16b^4x^{16}\sqrt[4]{1-\frac{bx^4}{a}}\,{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{7}{4};\frac{bx^4}{a}\right)-12ab^3x^{12}+24b^4x^{16}}{117a^4x^{13}\sqrt[4]{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^14*(a - b*x^4)^(1/4)),x]
```

```
[Out] (-9*a^4 - a^3*b*x^4 - 2*a^2*b^2*x^8 - 12*a*b^3*x^12 + 24*b^4*x^16
 - 16*b^4*x^16*(1 - (b*x^4)/a)^(1/4)*Hypergeometric2F1[1/4, 3/4,
```

```
7/4, (b*x^4)/a])/(117*a^4*x^13*(a - b*x^4)^(1/4))
```

Maple [F] time = 0.054, size = 0, normalized size = 0.

$$\int \frac{1}{x^{14}} \frac{1}{\sqrt[4]{-bx^4 + a}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^14/(-b*x^4+a)^(1/4),x)
```

```
[Out] int(1/x^14/(-b*x^4+a)^(1/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(-bx^4 + a)^{\frac{1}{4}} x^{14}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^14),x, algorithm="maxima")
```

```
[Out] integrate(1/((-b*x^4 + a)^(1/4)*x^14), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(-bx^4 + a)^{\frac{1}{4}} x^{14}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^14),x, algorithm="fricas")
```

```
[Out] integral(1/((-b*x^4 + a)^(1/4)*x^14), x)
```

Sympy [A] time = 15.8023, size = 34, normalized size = 0.25

$$-\frac{ie^{\frac{13i\pi}{4}} {}_2F_1\left(\begin{matrix} \frac{1}{4}, \frac{7}{2} \\ \frac{9}{2} \end{matrix}\middle| \frac{a}{bx^4}\right)}{14\sqrt[4]{b}x^{14}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**14/(-b*x**4+a)**(1/4),x)
```

```
[Out] -I*exp(13*I*pi/4)*hyper((1/4, 7/2), (9/2,), a/(b*x**4))/(14*b**(1
/4)*x**14)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(-bx^4 + a)^{\frac{1}{4}} x^{14}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(1/4)*x^14),x, algorithm="giac")

[Out] integrate(1/((-b*x^4 + a)^(1/4)*x^14), x)
```

3.1232 $\int \frac{x^{19}}{(a-bx^4)^{3/4}}\,dx$

Optimal. Leaf size=104

$$-\frac{a^4\sqrt[4]{a-bx^4}}{b^5}+\frac{4a^3\left(a-bx^4\right)^{5/4}}{5b^5}-\frac{2a^2\left(a-bx^4\right)^{9/4}}{3b^5}-\frac{\left(a-bx^4\right)^{17/4}}{17b^5}+\frac{4a\left(a-bx^4\right)^{13/4}}{13b^5}$$

```
[Out] -((a^4*(a - b*x^4)^(1/4))/b^5) + (4*a^3*(a - b*x^4)^(5/4))/(5*b^5
) - (2*a^2*(a - b*x^4)^(9/4))/(3*b^5) + (4*a*(a - b*x^4)^(13/4))/
(13*b^5) - (a - b*x^4)^(17/4)/(17*b^5)
```

Rubi [A] time = 0.13652, antiderivative size = 104, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125

$$-\frac{a^4\sqrt[4]{a-bx^4}}{b^5}+\frac{4a^3\left(a-bx^4\right)^{5/4}}{5b^5}-\frac{2a^2\left(a-bx^4\right)^{9/4}}{3b^5}-\frac{\left(a-bx^4\right)^{17/4}}{17b^5}+\frac{4a\left(a-bx^4\right)^{13/4}}{13b^5}$$

Antiderivative was successfully verified.

```
[In]  Int[x^19/(a - b*x^4)^(3/4),x]
```

```
[Out] -((a^4*(a - b*x^4)^(1/4))/b^5) + (4*a^3*(a - b*x^4)^(5/4))/(5*b^5
) - (2*a^2*(a - b*x^4)^(9/4))/(3*b^5) + (4*a*(a - b*x^4)^(13/4))/
(13*b^5) - (a - b*x^4)^(17/4)/(17*b^5)
```

Rubi in Sympy [A] time = 19.6528, size = 90, normalized size = 0.87

$$-\frac{a^4\sqrt[4]{a-bx^4}}{b^5}+\frac{4a^3\left(a-bx^4\right)^{\frac{5}{4}}}{5b^5}-\frac{2a^2\left(a-bx^4\right)^{\frac{9}{4}}}{3b^5}+\frac{4a\left(a-bx^4\right)^{\frac{13}{4}}}{13b^5}-\frac{\left(a-bx^4\right)^{\frac{17}{4}}}{17b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**19/(-b*x**4+a)**(3/4),x)
```

```
[Out] -a**4*(a - b*x**4)**(1/4)/b**5 + 4*a**3*(a - b*x**4)**(5/4)/(5*b*
*5) - 2*a**2*(a - b*x**4)**(9/4)/(3*b**5) + 4*a*(a - b*x**4)**(13
/4)/(13*b**5) - (a - b*x**4)**(17/4)/(17*b**5)
```

Mathematica [A] time = 0.0373174, size = 62, normalized size = 0.6

$$-\frac{\sqrt[4]{a-bx^4}\left(2048a^4+512a^3bx^4+320a^2b^2x^8+240ab^3x^{12}+195b^4x^{16}\right)}{3315b^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^19/(a - b*x^4)^(3/4),x]
```

```
[Out] -((a - b*x^4)^(1/4)*(2048*a^4 + 512*a^3*b*x^4 + 320*a^2*b^2*x^8 +
 240*a*b^3*x^12 + 195*b^4*x^16))/(3315*b^5)
```

Maple [A] time = 0.012, size = 59, normalized size = 0.6

$$-\frac{195\,x^{16}b^4+240\,ax^{12}b^3+320\,a^2x^8b^2+512\,a^3x^4b+2048\,a^4}{3315\,b^5}\sqrt[4]{-bx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^19/(-b*x^4+a)^(3/4),x)
```

```
[Out] -1/3315*(-b*x^4+a)^(1/4)*(195*b^4*x^16+240*a*b^3*x^12+320*a^2*b^2
*x^8+512*a^3*b*x^4+2048*a^4)/b^5
```

Maxima [A] time = 1.43585, size = 116, normalized size = 1.12

$$-\frac{\left(-bx^4+a\right)^{\frac{17}{4}}}{17\,b^5}+\frac{4\left(-bx^4+a\right)^{\frac{13}{4}}a}{13\,b^5}-\frac{2\left(-bx^4+a\right)^{\frac{9}{4}}a^2}{3\,b^5}+\frac{4\left(-bx^4+a\right)^{\frac{5}{4}}a^3}{5\,b^5}-\frac{\left(-bx^4+a\right)^{\frac{1}{4}}a^4}{b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^19/(-b*x^4 + a)^(3/4),x, algorithm="maxima")
```

```
[Out] -1/17*(-b*x^4 + a)^(17/4)/b^5 + 4/13*(-b*x^4 + a)^(13/4)*a/b^5 -
2/3*(-b*x^4 + a)^(9/4)*a^2/b^5 + 4/5*(-b*x^4 + a)^(5/4)*a^3/b^5 -
 (-b*x^4 + a)^(1/4)*a^4/b^5
```

Fricas [A] time = 0.220838, size = 78, normalized size = 0.75

$$-\frac{\left(195\,b^4x^{16}+240\,ab^3x^{12}+320\,a^2b^2x^8+512\,a^3bx^4+2048\,a^4\right)\left(-bx^4+a\right)^{\frac{1}{4}}}{3315\,b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^19/(-b*x^4 + a)^(3/4),x, algorithm="fricas")
```

```
[Out] -1/3315*(195*b^4*x^16 + 240*a*b^3*x^12 + 320*a^2*b^2*x^8 + 512*a^
3*b*x^4 + 2048*a^4)*(-b*x^4 + a)^(1/4)/b^5
```

Sympy [A] time = 50.9439, size = 117, normalized size = 1.12

$$\begin{cases} -\frac{2048a^4\sqrt[4]{a-bx^4}}{3315b^5}-\frac{512a^3x^4\sqrt[4]{a-bx^4}}{3315b^4}-\frac{64a^2x^8\sqrt[4]{a-bx^4}}{663b^3}-\frac{16ax^{12}\sqrt[4]{a-bx^4}}{221b^2}-\frac{x^{16}\sqrt[4]{a-bx^4}}{17b} & \text{for } b\neq 0 \\ \frac{x^{20}}{20a^{\frac{3}{4}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**19/(-b*x**4+a)**(3/4),x)
```

```
[Out] Piecewise((-2048*a**4*(a - b*x**4)**(1/4)/(3315*b**5) - 512*a**3*
x**4*(a - b*x**4)**(1/4)/(3315*b**4) - 64*a**2*x**8*(a - b*x**4)*
*(1/4)/(663*b**3) - 16*a*x**12*(a - b*x**4)**(1/4)/(221*b**2) - x
**16*(a - b*x**4)**(1/4)/(17*b), Ne(b, 0)), (x**20/(20*a**(3/4)),
 True))
```

GIAC/XCAS [A] time = 0.217851, size = 147, normalized size = 1.41

$$-\frac{195\left(bx^4-a\right)^4\left(-bx^4+a\right)^{\frac{1}{4}}+1020\left(bx^4-a\right)^3\left(-bx^4+a\right)^{\frac{1}{4}}a+2210\left(bx^4-a\right)^2\left(-bx^4+a\right)^{\frac{1}{4}}a^2-2652\left(-bx^4+a\right)^{\frac{5}{4}}a^3+33}{3315\,b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^19/(-b*x^4 + a)^(3/4),x, algorithm="giac")
```

```
[Out] -1/3315*(195*(b*x^4 - a)^4*(-b*x^4 + a)^(1/4) + 1020*(b*x^4 - a)^
3*(-b*x^4 + a)^(1/4)*a + 2210*(b*x^4 - a)^2*(-b*x^4 + a)^(1/4)*a^
2 - 2652*(-b*x^4 + a)^(5/4)*a^3 + 3315*(-b*x^4 + a)^(1/4)*a^4)/b^
5
```

3.1233 $\int \frac{x^{15}}{(a-bx^4)^{3/4}}\,dx$

Optimal. Leaf size=82

$$-\frac{a^3\sqrt[4]{a-bx^4}}{b^4}+\frac{3a^2\left(a-bx^4\right)^{5/4}}{5b^4}+\frac{\left(a-bx^4\right)^{13/4}}{13b^4}-\frac{a\left(a-bx^4\right)^{9/4}}{3b^4}$$

```
[Out] -((a^3*(a - b*x^4)^(1/4))/b^4) + (3*a^2*(a - b*x^4)^(5/4))/(5*b^4
) - (a*(a - b*x^4)^(9/4))/(3*b^4) + (a - b*x^4)^(13/4)/(13*b^4)
```

Rubi [A] time = 0.113342, antiderivative size = 82, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125

$$-\frac{a^3\sqrt[4]{a-bx^4}}{b^4}+\frac{3a^2\left(a-bx^4\right)^{5/4}}{5b^4}+\frac{\left(a-bx^4\right)^{13/4}}{13b^4}-\frac{a\left(a-bx^4\right)^{9/4}}{3b^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^15/(a - b*x^4)^(3/4),x]
```

```
[Out] -((a^3*(a - b*x^4)^(1/4))/b^4) + (3*a^2*(a - b*x^4)^(5/4))/(5*b^4
) - (a*(a - b*x^4)^(9/4))/(3*b^4) + (a - b*x^4)^(13/4)/(13*b^4)
```

Rubi in Sympy [A] time = 16.0716, size = 68, normalized size = 0.83

$$-\frac{a^3\sqrt[4]{a-bx^4}}{b^4}+\frac{3a^2\left(a-bx^4\right)^{\frac{5}{4}}}{5b^4}-\frac{a\left(a-bx^4\right)^{\frac{9}{4}}}{3b^4}+\frac{\left(a-bx^4\right)^{\frac{13}{4}}}{13b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**15/(-b*x**4+a)**(3/4),x)
```

```
[Out] -a**3*(a - b*x**4)**(1/4)/b**4 + 3*a**2*(a - b*x**4)**(5/4)/(5*b*
*4) - a*(a - b*x**4)**(9/4)/(3*b**4) + (a - b*x**4)**(13/4)/(13*b
**4)
```

Mathematica [A] time = 0.0344756, size = 51, normalized size = 0.62

$$-\frac{\sqrt[4]{a-bx^4}\left(128a^3+32a^2bx^4+20ab^2x^8+15b^3x^{12}\right)}{195b^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^15/(a - b*x^4)^(3/4),x]
```

```
[Out] -((a - b*x^4)^(1/4)*(128*a^3 + 32*a^2*b*x^4 + 20*a*b^2*x^8 + 15*b
^3*x^12))/(195*b^4)
```

Maple [A] time = 0.009, size = 48, normalized size = 0.6

$$-\frac{15\,b^3x^{12}+20\,ab^2x^8+32\,a^2bx^4+128\,a^3}{195\,b^4}\sqrt[4]{-bx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^15/(-b*x^4+a)^(3/4),x)
```

```
[Out] -1/195*(-b*x^4+a)^(1/4)*(15*b^3*x^12+20*a*b^2*x^8+32*a^2*b*x^4+12
8*a^3)/b^4
```

Maxima [A] time = 1.56651, size = 92, normalized size = 1.12

$$\frac{\left(-bx^4+a\right)^{\frac{13}{4}}}{13\,b^4}-\frac{\left(-bx^4+a\right)^{\frac{9}{4}}a}{3\,b^4}+\frac{3\left(-bx^4+a\right)^{\frac{5}{4}}a^2}{5\,b^4}-\frac{\left(-bx^4+a\right)^{\frac{1}{4}}a^3}{b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^15/(-b*x^4 + a)^(3/4),x, algorithm="maxima")
```

```
[Out] 1/13*(-b*x^4 + a)^(13/4)/b^4 - 1/3*(-b*x^4 + a)^(9/4)*a/b^4 + 3/5
*(-b*x^4 + a)^(5/4)*a^2/b^4 - (-b*x^4 + a)^(1/4)*a^3/b^4
```

Fricas [A] time = 0.220656, size = 63, normalized size = 0.77

$$-\frac{\left(15\,b^3x^{12}+20\,ab^2x^8+32\,a^2bx^4+128\,a^3\right)\left(-bx^4+a\right)^{\frac{1}{4}}}{195\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^15/(-b*x^4 + a)^(3/4),x, algorithm="fricas")
```

```
[Out] -1/195*(15*b^3*x^12 + 20*a*b^2*x^8 + 32*a^2*b*x^4 + 128*a^3)*(-b*
x^4 + a)^(1/4)/b^4
```

Sympy [A] time = 24.016, size = 94, normalized size = 1.15

$$\begin{cases} -\frac{128a^3\sqrt[4]{a-bx^4}}{195b^4}-\frac{32a^2x^4\sqrt[4]{a-bx^4}}{195b^3}-\frac{4ax^8\sqrt[4]{a-bx^4}}{39b^2}-\frac{x^{12}\sqrt[4]{a-bx^4}}{13b} & \text{for } b\neq 0 \\ \frac{x^{16}}{16a^{\frac{3}{4}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**15/(-b*x**4+a)**(3/4),x)
```

```
[Out] Piecewise((-128*a**3*(a - b*x**4)**(1/4)/(195*b**4) - 32*a**2*x**
4*(a - b*x**4)**(1/4)/(195*b**3) - 4*a*x**8*(a - b*x**4)**(1/4)/(
39*b**2) - x**12*(a - b*x**4)**(1/4)/(13*b), Ne(b, 0)), (x**16/(1
6*a**(3/4)), True))
```

GIAC/XCAS [A] time = 0.214721, size = 112, normalized size = 1.37

$$-\frac{15\left(bx^4-a\right)^3\left(-bx^4+a\right)^{\frac{1}{4}}+65\left(bx^4-a\right)^2\left(-bx^4+a\right)^{\frac{1}{4}}a-117\left(-bx^4+a\right)^{\frac{5}{4}}a^2+195\left(-bx^4+a\right)^{\frac{1}{4}}a^3}{195\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^15/(-b*x^4 + a)^(3/4),x, algorithm="giac")
```

```
[Out] -1/195*(15*(b*x^4 - a)^3*(-b*x^4 + a)^(1/4) + 65*(b*x^4 - a)^2*(-
b*x^4 + a)^(1/4)*a - 117*(-b*x^4 + a)^(5/4)*a^2 + 195*(-b*x^4 + a
)^(1/4)*a^3)/b^4
```

3.1234 $\int \frac{x^{11}}{(a-bx^4)^{3/4}}\,dx$

Optimal. Leaf size=60

$$-\frac{a^2\sqrt[4]{a-bx^4}}{b^3}-\frac{\left(a-bx^4\right)^{9/4}}{9b^3}+\frac{2a\left(a-bx^4\right)^{5/4}}{5b^3}$$

```
[Out] -((a^2*(a - b*x^4)^(1/4))/b^3) + (2*a*(a - b*x^4)^(5/4))/(5*b^3)
- (a - b*x^4)^(9/4)/(9*b^3)
```

Rubi [A] time = 0.0909222, antiderivative size = 60, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125

$$-\frac{a^2\sqrt[4]{a-bx^4}}{b^3}-\frac{\left(a-bx^4\right)^{9/4}}{9b^3}+\frac{2a\left(a-bx^4\right)^{5/4}}{5b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11/(a - b*x^4)^(3/4),x]
```

```
[Out] -((a^2*(a - b*x^4)^(1/4))/b^3) + (2*a*(a - b*x^4)^(5/4))/(5*b^3)
- (a - b*x^4)^(9/4)/(9*b^3)
```

Rubi in Sympy [A] time = 11.9874, size = 49, normalized size = 0.82

$$-\frac{a^2\sqrt[4]{a-bx^4}}{b^3}+\frac{2a\left(a-bx^4\right)^{\frac{5}{4}}}{5b^3}-\frac{\left(a-bx^4\right)^{\frac{9}{4}}}{9b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11/(-b*x**4+a)**(3/4),x)
```

```
[Out] -a**2*(a - b*x**4)**(1/4)/b**3 + 2*a*(a - b*x**4)**(5/4)/(5*b**3)
 - (a - b*x**4)**(9/4)/(9*b**3)
```

Mathematica [A] time = 0.0298941, size = 40, normalized size = 0.67

$$-\frac{\sqrt[4]{a-bx^4}\left(32a^2+8abx^4+5b^2x^8\right)}{45b^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11/(a - b*x^4)^(3/4),x]
```

```
[Out] -((a - b*x^4)^(1/4)*(32*a^2 + 8*a*b*x^4 + 5*b^2*x^8))/(45*b^3)
```

Maple [A] time = 0.008, size = 37, normalized size = 0.6

$$-\frac{5\,b^2x^8+8\,abx^4+32\,a^2}{45\,b^3}\sqrt[4]{-bx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11/(-b*x^4+a)^(3/4),x)
```

```
[Out] -1/45*(-b*x^4+a)^(1/4)*(5*b^2*x^8+8*a*b*x^4+32*a^2)/b^3
```

Maxima [A] time = 1.4394, size = 68, normalized size = 1.13

$$-\frac{\left(-bx^4+a\right)^{\frac{9}{4}}}{9\,b^3}+\frac{2\left(-bx^4+a\right)^{\frac{5}{4}}a}{5\,b^3}-\frac{\left(-bx^4+a\right)^{\frac{1}{4}}a^2}{b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(-b*x^4 + a)^(3/4),x, algorithm="maxima")
```

```
[Out] -1/9*(-b*x^4 + a)^(9/4)/b^3 + 2/5*(-b*x^4 + a)^(5/4)*a/b^3 - (-b*
x^4 + a)^(1/4)*a^2/b^3
```

Fricas [A] time = 0.220632, size = 49, normalized size = 0.82

$$-\frac{\left(5\,b^2x^8+8\,abx^4+32\,a^2\right)\left(-bx^4+a\right)^{\frac{1}{4}}}{45\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(-b*x^4 + a)^(3/4),x, algorithm="fricas")
```

```
[Out] -1/45*(5*b^2*x^8 + 8*a*b*x^4 + 32*a^2)*(-b*x^4 + a)^(1/4)/b^3
```

Sympy [A] time = 10.2231, size = 70, normalized size = 1.17

$$\begin{cases}-\frac{32a^2\sqrt[4]{a-bx^4}}{45b^3}-\frac{8ax^4\sqrt[4]{a-bx^4}}{45b^2}-\frac{x^8\sqrt[4]{a-bx^4}}{9b} & \text{for}\ b\neq 0\\ \frac{x^{12}}{12a^{\frac{3}{4}}} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11/(-b*x**4+a)**(3/4),x)
```

```
[Out] Piecewise((-32*a**2*(a - b*x**4)**(1/4)/(45*b**3) - 8*a*x**4*(a -
 b*x**4)**(1/4)/(45*b**2) - x**8*(a - b*x**4)**(1/4)/(9*b), Ne(b,
 0)), (x**12/(12*a**(3/4)), True))
```

GIAC/XCAS [A] time = 0.215399, size = 77, normalized size = 1.28

$$-\frac{5\left(bx^4-a\right)^2\left(-bx^4+a\right)^{\frac{1}{4}}-18\left(-bx^4+a\right)^{\frac{5}{4}}a+45\left(-bx^4+a\right)^{\frac{1}{4}}a^2}{45\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(-b*x^4 + a)^(3/4),x, algorithm="giac")
```

```
[Out] -1/45*(5*(b*x^4 - a)^2*(-b*x^4 + a)^(1/4) - 18*(-b*x^4 + a)^(5/4)
*a + 45*(-b*x^4 + a)^(1/4)*a^2)/b^3
```

3.1235 $\int \frac{x^7}{(a-bx^4)^{3/4}}\,dx$

Optimal. Leaf size=38

$$\frac{(a-bx^4)^{5/4}}{5b^2}-\frac{a\sqrt[4]{a-bx^4}}{b^2}$$

```
[Out] -((a*(a - b*x^4)^(1/4))/b^2) + (a - b*x^4)^(5/4)/(5*b^2)
```

Rubi [A] time = 0.0641227, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125

$$\frac{(a-bx^4)^{5/4}}{5b^2}-\frac{a\sqrt[4]{a-bx^4}}{b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7/(a - b*x^4)^(3/4),x]

[Out] -((a*(a - b*x^4)^(1/4))/b^2) + (a - b*x^4)^(5/4)/(5*b^2)
```

Rubi in Sympy [A] time = 8.16819, size = 29, normalized size = 0.76

$$-\frac{a\sqrt[4]{a-bx^4}}{b^2}+\frac{(a-bx^4)^{\frac{5}{4}}}{5b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7/(-b*x**4+a)**(3/4),x)

[Out] -a*(a - b*x**4)**(1/4)/b**2 + (a - b*x**4)**(5/4)/(5*b**2)
```

Mathematica [A] time = 0.0230871, size = 28, normalized size = 0.74

$$-\frac{\sqrt[4]{a-bx^4}\,(4a+bx^4)}{5b^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^7/(a - b*x^4)^(3/4),x]

[Out] -((a - b*x^4)^(1/4)*(4*a + b*x^4))/(5*b^2)
```

Maple [A] time = 0.008, size = 25, normalized size = 0.7

$$-\frac{bx^4+4\,a}{5\,b^2}\sqrt[4]{-bx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7/(-b*x^4+a)^(3/4),x)
```

```
[Out] -1/5*(-b*x^4+a)^(1/4)*(b*x^4+4*a)/b^2
```

Maxima [A] time = 1.44525, size = 43, normalized size = 1.13

$$\frac{\left(-bx^{4}+a\right)^{\frac{5}{4}}}{5\,b^{2}}-\frac{\left(-bx^{4}+a\right)^{\frac{1}{4}}a}{b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(-b*x^4 + a)^(3/4),x, algorithm="maxima")
```

```
[Out] 1/5*(-b*x^4 + a)^(5/4)/b^2 - (-b*x^4 + a)^(1/4)*a/b^2
```

Fricas [A] time = 0.220126, size = 32, normalized size = 0.84

$$-\frac{\left(bx^{4}+4\,a\right)\left(-bx^{4}+a\right)^{\frac{1}{4}}}{5\,b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(-b*x^4 + a)^(3/4),x, algorithm="fricas")
```

```
[Out] -1/5*(b*x^4 + 4*a)*(-b*x^4 + a)^(1/4)/b^2
```

Sympy [A] time = 3.89012, size = 46, normalized size = 1.21

$$\begin{cases} -\frac{4a\sqrt[4]{a-bx^{4}}}{5b^{2}}-\frac{x^{4}\sqrt[4]{a-bx^{4}}}{5b} & \text{for}\ b\neq 0\\ \frac{x^{8}}{8a^{\frac{3}{4}}} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(-b*x**4+a)**(3/4),x)
```

```
[Out] Piecewise((-4*a*(a - b*x**4)**(1/4)/(5*b**2) - x**4*(a - b*x**4)*
*(1/4)/(5*b), Ne(b, 0)), (x**8/(8*a**(3/4)), True))
```

GIAC/XCAS [A] time = 0.215605, size = 39, normalized size = 1.03

$$\frac{\left(-bx^{4}+a\right)^{\frac{5}{4}}-5\left(-bx^{4}+a\right)^{\frac{1}{4}}a}{5\,b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(-b*x^4 + a)^(3/4),x, algorithm="giac")
```

```
[Out] 1/5*((-b*x^4 + a)^(5/4) - 5*(-b*x^4 + a)^(1/4)*a)/b^2
```

3.1236 $\int \frac{x^3}{(a-bx^4)^{3/4}}\,dx$

Optimal. Leaf size=17

$$-\frac{\sqrt[4]{a-bx^4}}{b}$$

```
[Out] -((a - b*x^4)^(1/4)/b)
```

Rubi [A] time = 0.0114692, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062

$$-\frac{\sqrt[4]{a-bx^4}}{b}$$

Antiderivative was successfully verified.

```
[In] Int[x^3/(a - b*x^4)^(3/4),x]

[Out] -((a - b*x^4)^(1/4)/b)
```

Rubi in Sympy [A] time = 2.46357, size = 12, normalized size = 0.71

$$-\frac{\sqrt[4]{a-bx^4}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**3/(-b*x**4+a)**(3/4),x)

[Out] -(a - b*x**4)**(1/4)/b
```

Mathematica [A] time = 0.00802389, size = 17, normalized size = 1.

$$-\frac{\sqrt[4]{a-bx^4}}{b}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3/(a - b*x^4)^(3/4),x]

[Out] -((a - b*x^4)^(1/4)/b)
```

Maple [A] time = 0.005, size = 16, normalized size = 0.9

$$-\frac{1}{b}\sqrt[4]{-bx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(-b*x^4+a)^(3/4),x)

[Out] -(-b*x^4+a)^(1/4)/b
```

Maxima [A] time = 1.44009, size = 20, normalized size = 1.18

$$-\frac{\left(-bx^4+a\right)^{\frac{1}{4}}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(-b*x^4 + a)^(3/4),x, algorithm="maxima")
```

```
[Out] -(-b*x^4 + a)^(1/4)/b
```

Fricas [A] time = 0.218617, size = 20, normalized size = 1.18

$$-\frac{\left(-bx^4+a\right)^{\frac{1}{4}}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(-b*x^4 + a)^(3/4),x, algorithm="fricas")
```

```
[Out] -(-b*x^4 + a)^(1/4)/b
```

Sympy [A] time = 1.78174, size = 22, normalized size = 1.29

$$\begin{cases} -\frac{\sqrt[4]{a-bx^4}}{b} & \text{for } b \neq 0 \\ \frac{x^4}{4a^{\frac{3}{4}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(-b*x**4+a)**(3/4),x)
```

```
[Out] Piecewise((-(a - b*x**4)**(1/4)/b, Ne(b, 0)), (x**4/(4*a**(3/4)),
 True))
```

GIAC/XCAS [A] time = 0.215924, size = 20, normalized size = 1.18

$$-\frac{\left(-bx^4+a\right)^{\frac{1}{4}}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(-b*x^4 + a)^(3/4),x, algorithm="giac")
```

```
[Out] -(-b*x^4 + a)^(1/4)/b
```

3.1237 $\int \frac{1}{x(a-bx^4)^{3/4}}\,dx$

Optimal. Leaf size=57

$$-\frac{\tan^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{2a^{3/4}}-\frac{\tanh^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{2a^{3/4}}$$

```
[Out] -ArcTan[(a - b*x^4)^(1/4)/a^(1/4)]/(2*a^(3/4)) - ArcTanh[(a - b*x
^4)^(1/4)/a^(1/4)]/(2*a^(3/4))
```

Rubi [A] time = 0.0851296, antiderivative size = 57, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312

$$-\frac{\tan^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{2a^{3/4}}-\frac{\tanh^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{2a^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a - b*x^4)^(3/4)),x]
```

```
[Out] -ArcTan[(a - b*x^4)^(1/4)/a^(1/4)]/(2*a^(3/4)) - ArcTanh[(a - b*x
^4)^(1/4)/a^(1/4)]/(2*a^(3/4))
```

Rubi in Sympy [A] time = 9.30386, size = 48, normalized size = 0.84

$$-\frac{\operatorname{atan}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{2a^{\frac{3}{4}}}-\frac{\operatorname{atanh}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{2a^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(-b*x**4+a)**(3/4),x)
```

```
[Out] -atan((a - b*x**4)**(1/4)/a**(1/4))/(2*a**(3/4)) - atanh((a - b*x
**4)**(1/4)/a**(1/4))/(2*a**(3/4))
```

Mathematica [C] time = 0.0366915, size = 49, normalized size = 0.86

$$-\frac{\left(1-\frac{a}{bx^4}\right)^{3/4}{}_2F_1\left(\frac{3}{4},\frac{3}{4};\frac{7}{4};\frac{a}{bx^4}\right)}{3\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a - b*x^4)^(3/4)),x]
```

```
[Out] -((1 - a/(b*x^4))^(3/4)*Hypergeometric2F1[3/4, 3/4, 7/4, a/(b*x^4
)])/(3*(a - b*x^4)^(3/4))
```

Maple [F] time = 0.036, size = 0, normalized size = 0.

$$\int \frac{1}{x}\left(-bx^4+a\right)^{-\frac{3}{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(-b*x^4+a)^(3/4),x)
```

```
[Out] int(1/x/(-b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.241867, size = 139, normalized size = 2.44

$$\frac{1}{a^3}^{\frac{1}{4}} \arctan\left(\frac{a\frac{1}{a^3}^{\frac{1}{4}}}{\sqrt{a^2\sqrt{\frac{1}{a^3}} + \sqrt{-bx^4 + a}} + (-bx^4 + a)^{\frac{1}{4}}}\right) - \frac{1}{4}\frac{1}{a^3}^{\frac{1}{4}} \log\left(a\frac{1}{a^3}^{\frac{1}{4}} + (-bx^4 + a)^{\frac{1}{4}}\right) + \frac{1}{4}\frac{1}{a^3}^{\frac{1}{4}} \log\left(-a\frac{1}{a^3}^{\frac{1}{4}} + (-bx^4 + a)^{\frac{1}{4}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x),x, algorithm="fricas")
```

```
[Out] (a^(-3))^(1/4)*arctan(a*(a^(-3))^(1/4)/(sqrt(a^2*sqrt(a^(-3)) + s
qrt(-b*x^4 + a)) + (-b*x^4 + a)^(1/4))) - 1/4*(a^(-3))^(1/4)*log(
a*(a^(-3))^(1/4) + (-b*x^4 + a)^(1/4)) + 1/4*(a^(-3))^(1/4)*log(-
a*(a^(-3))^(1/4) + (-b*x^4 + a)^(1/4))
```

Sympy [A] time = 4.10843, size = 42, normalized size = 0.74

$$-\frac{e^{-\frac{3i\pi}{4}}\Gamma\left(\frac{3}{4}\right) {}_2F_1\left(\begin{matrix} \frac{3}{4}, \frac{3}{4} \\ \frac{7}{4} \end{matrix}\middle| \frac{a}{bx^4}\right)}{4b^{\frac{3}{4}}x^3\Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(-b*x**4+a)**(3/4),x)
```

```
[Out] -exp(-3*I*pi/4)*gamma(3/4)*hyper((3/4, 3/4), (7/4,), a/(b*x**4))/
(4*b**(3/4)*x**3*gamma(7/4))
```

GIAC/XCAS [A] time = 0.221382, size = 259, normalized size = 4.54

$$-\frac{\sqrt{2}\,(-a)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}+2\left(-bx^{4}+a\right)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{4\,a}-\frac{\sqrt{2}\,(-a)^{\frac{1}{4}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}-2\left(-bx^{4}+a\right)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{4\,a}-\frac{\sqrt{2}\,(-a)^{\frac{1}{4}}\ln\left(\sqrt{2}\left(-bx^{4}+a\right)^{\frac{1}{4}}(-a)^{\frac{1}{4}}+\sqrt{-bx^{4}+a}+\sqrt{-a}\right)}{8\,a}+\frac{\sqrt{2}\,(-a)^{\frac{1}{4}}\ln\left(-\sqrt{2}\left(-bx^{4}+a\right)^{\frac{1}{4}}(-a)^{\frac{1}{4}}+\sqrt{-bx^{4}+a}+\sqrt{-a}\right)}{8\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x),x, algorithm="giac")
```

```
[Out] -1/4*sqrt(2)*(-a)^(1/4)*arctan(1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) +
2*(-b*x^4 + a)^(1/4))/(-a)^(1/4))/a - 1/4*sqrt(2)*(-a)^(1/4)*arct
an(-1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) - 2*(-b*x^4 + a)^(1/4))/(-a)^
(1/4))/a - 1/8*sqrt(2)*(-a)^(1/4)*ln(sqrt(2)*(-b*x^4 + a)^(1/4)*(
-a)^(1/4) + sqrt(-b*x^4 + a) + sqrt(-a))/a + 1/8*sqrt(2)*(-a)^(1/
4)*ln(-sqrt(2)*(-b*x^4 + a)^(1/4)*(-a)^(1/4) + sqrt(-b*x^4 + a) +
 sqrt(-a))/a
```

3.1238 $\int \frac{1}{x^5(a-bx^4)^{3/4}}\,dx$

Optimal. Leaf size=81

$$-\frac{3b\tan^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{8a^{7/4}}-\frac{3b\tanh^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{8a^{7/4}}-\frac{\sqrt[4]{a-bx^4}}{4ax^4}$$

```
[Out] -(a - b*x^4)^(1/4)/(4*a*x^4) - (3*b*ArcTan[(a - b*x^4)^(1/4)/a^(1
/4)])/(8*a^(7/4)) - (3*b*ArcTanh[(a - b*x^4)^(1/4)/a^(1/4)])/(8*a
^(7/4))
```

Rubi [A] time = 0.115428, antiderivative size = 81, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.375$

$$-\frac{3b\tan^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{8a^{7/4}}-\frac{3b\tanh^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{8a^{7/4}}-\frac{\sqrt[4]{a-bx^4}}{4ax^4}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^5*(a - b*x^4)^(3/4)),x]
```

```
[Out] -(a - b*x^4)^(1/4)/(4*a*x^4) - (3*b*ArcTan[(a - b*x^4)^(1/4)/a^(1
/4)])/(8*a^(7/4)) - (3*b*ArcTanh[(a - b*x^4)^(1/4)/a^(1/4)])/(8*a
^(7/4))
```

Rubi in Sympy [A] time = 12.316, size = 71, normalized size = 0.88

$$-\frac{\sqrt[4]{a-bx^4}}{4ax^4}-\frac{3b\,\mathrm{atan}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{8a^{\frac{7}{4}}}-\frac{3b\,\mathrm{atanh}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{8a^{\frac{7}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**5/(-b*x**4+a)**(3/4),x)
```

```
[Out] -(a - b*x**4)**(1/4)/(4*a*x**4) - 3*b*atan((a - b*x**4)**(1/4)/a*
*(1/4))/(8*a**(7/4)) - 3*b*atanh((a - b*x**4)**(1/4)/a**(1/4))/(8
*a**(7/4))
```

Mathematica [C] time = 0.0498514, size = 70, normalized size = 0.86

$$\frac{-bx^4\left(1-\frac{a}{bx^4}\right)^{3/4}{}_2F_1\left(\frac{3}{4},\frac{3}{4};\frac{7}{4};\frac{a}{bx^4}\right)-a+bx^4}{4ax^4\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^5*(a - b*x^4)^(3/4)),x]
```

```
[Out] (-a + b*x^4 - b*(1 - a/(b*x^4))^(3/4)*x^4*Hypergeometric2F1[3/4,
3/4, 7/4, a/(b*x^4)])/(4*a*x^4*(a - b*x^4)^(3/4))
```

Maple [F] time = 0.036, size = 0, normalized size = 0.

$$\int \frac{1}{x^5}\left(-bx^4+a\right)^{-\frac{3}{4}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^5/(-b*x^4+a)^(3/4),x)
```

```
[Out] int(1/x^5/(-b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^5),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.243827, size = 247, normalized size = 3.05

$$\frac{12\,ax^4\left(\frac{b^4}{a^7}\right)^{\frac{1}{4}}\arctan\left(\frac{a^2\left(\frac{b^4}{a^7}\right)^{\frac{1}{4}}}{\left(-bx^4+a\right)^{\frac{1}{4}}b+\sqrt{a^4\sqrt{\frac{b^4}{a^7}}+\sqrt{-bx^4+a}\,b^2}}\right)-3\,ax^4\left(\frac{b^4}{a^7}\right)^{\frac{1}{4}}\log\left(3\,a^2\left(\frac{b^4}{a^7}\right)^{\frac{1}{4}}+3\left(-bx^4+a\right)^{\frac{1}{4}}b\right)+3\,ax^4\left(\frac{b^4}{a^7}\right)^{\frac{1}{4}}\log\left(\cdot\right.}{16\,ax^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^5),x, algorithm="fricas")
```

```
[Out] 1/16*(12*a*x^4*(b^4/a^7)^(1/4)*arctan(a^2*(b^4/a^7)^(1/4)/((-b*x^
4 + a)^(1/4)*b + sqrt(a^4*sqrt(b^4/a^7) + sqrt(-b*x^4 + a)*b^2)))
 - 3*a*x^4*(b^4/a^7)^(1/4)*log(3*a^2*(b^4/a^7)^(1/4) + 3*(-b*x^4
+ a)^(1/4)*b) + 3*a*x^4*(b^4/a^7)^(1/4)*log(-3*a^2*(b^4/a^7)^(1/4
) + 3*(-b*x^4 + a)^(1/4)*b) - 4*(-b*x^4 + a)^(1/4))/(a*x^4)
```

Sympy [A] time = 5.9684, size = 41, normalized size = 0.51

$$\frac{e^{-\frac{7i\pi}{4}}\,\Gamma\left(\frac{7}{4}\right)\,{}_2F_1\left(\left.\begin{matrix}\frac{3}{4},\frac{7}{4}\\\frac{11}{4}\end{matrix}\right|\frac{a}{bx^4}\right)}{4b^{\frac{3}{4}}x^7\,\Gamma\left(\frac{11}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**5/(-b*x**4+a)**(3/4),x)
```

```
[Out] exp(-7*I*pi/4)*gamma(7/4)*hyper((3/4, 7/4), (11/4,), a/(b*x**4))/
(4*b**(3/4)*x**7*gamma(11/4))
```

GIAC/XCAS [A] time = 0.221876, size = 292, normalized size = 3.6

$$-\frac{1}{32}\,b\left(\frac{6\,\sqrt{2}\,(-a)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}+2\,(-bx^{4}+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{a^{2}}+\frac{6\,\sqrt{2}\,(-a)^{\frac{1}{4}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}-2\,(-bx^{4}+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{a^{2}}+\frac{3\,\sqrt{2}\,(-a)^{\frac{1}{4}}\ln\left(\sqrt{2}(-\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^5),x, algorithm="giac")
```

```
[Out] -1/32*b*(6*sqrt(2)*(-a)^(1/4)*arctan(1/2*sqrt(2)*(sqrt(2)*(-a)^(1
/4) + 2*(-b*x^4 + a)^(1/4))/(-a)^(1/4))/a^2 + 6*sqrt(2)*(-a)^(1/4
)*arctan(-1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) - 2*(-b*x^4 + a)^(1/4))
/(-a)^(1/4))/a^2 + 3*sqrt(2)*(-a)^(1/4)*ln(sqrt(2)*(-b*x^4 + a)^(
1/4)*(-a)^(1/4) + sqrt(-b*x^4 + a) + sqrt(-a))/a^2 - 3*sqrt(2)*(-
a)^(1/4)*ln(-sqrt(2)*(-b*x^4 + a)^(1/4)*(-a)^(1/4) + sqrt(-b*x^4
+ a) + sqrt(-a))/a^2 + 8*(-b*x^4 + a)^(1/4)/(a*b*x^4))
```

3.1239 $\int \frac{1}{x^9(a-bx^4)^{3/4}}\,dx$

Optimal. Leaf size=108

$$-\frac{21b^2\tan^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{64a^{11/4}}-\frac{21b^2\tanh^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{64a^{11/4}}-\frac{7b\sqrt[4]{a-bx^4}}{32a^2x^4}-\frac{\sqrt[4]{a-bx^4}}{8ax^8}$$

```
[Out] -(a - b*x^4)^(1/4)/(8*a*x^8) - (7*b*(a - b*x^4)^(1/4))/(32*a^2*x^
4) - (21*b^2*ArcTan[(a - b*x^4)^(1/4)/a^(1/4)])/(64*a^(11/4)) - (
21*b^2*ArcTanh[(a - b*x^4)^(1/4)/a^(1/4)])/(64*a^(11/4))
```

Rubi [A] time = 0.15376, antiderivative size = 108, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375

$$-\frac{21b^2\tan^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{64a^{11/4}}-\frac{21b^2\tanh^{-1}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{64a^{11/4}}-\frac{7b\sqrt[4]{a-bx^4}}{32a^2x^4}-\frac{\sqrt[4]{a-bx^4}}{8ax^8}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^9*(a - b*x^4)^(3/4)),x]
```

```
[Out] -(a - b*x^4)^(1/4)/(8*a*x^8) - (7*b*(a - b*x^4)^(1/4))/(32*a^2*x^
4) - (21*b^2*ArcTan[(a - b*x^4)^(1/4)/a^(1/4)])/(64*a^(11/4)) - (
21*b^2*ArcTanh[(a - b*x^4)^(1/4)/a^(1/4)])/(64*a^(11/4))
```

Rubi in Sympy [A] time = 16.9187, size = 97, normalized size = 0.9

$$-\frac{\sqrt[4]{a-bx^4}}{8ax^8}-\frac{7b\sqrt[4]{a-bx^4}}{32a^2x^4}-\frac{21b^2\operatorname{atan}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{64a^{\frac{11}{4}}}-\frac{21b^2\operatorname{atanh}\left(\frac{\sqrt[4]{a-bx^4}}{\sqrt[4]{a}}\right)}{64a^{\frac{11}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**9/(-b*x**4+a)**(3/4),x)
```

```
[Out] -(a - b*x**4)**(1/4)/(8*a*x**8) - 7*b*(a - b*x**4)**(1/4)/(32*a**
2*x**4) - 21*b**2*atan((a - b*x**4)**(1/4)/a**(1/4))/(64*a**(11/4
)) - 21*b**2*atanh((a - b*x**4)**(1/4)/a**(1/4))/(64*a**(11/4))
```

Mathematica [C] time = 0.0595981, size = 84, normalized size = 0.78

$$\frac{-4a^2-7b^2x^8\left(1-\frac{a}{bx^4}\right)^{3/4}{}_2F_1\left(\frac{3}{4},\frac{3}{4};\frac{7}{4};\frac{a}{bx^4}\right)-3abx^4+7b^2x^8}{32a^2x^8\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^9*(a - b*x^4)^(3/4)),x]
```

```
[Out] (-4*a^2 - 3*a*b*x^4 + 7*b^2*x^8 - 7*b^2*(1 - a/(b*x^4))^(3/4)*x^8
*Hypergeometric2F1[3/4, 3/4, 7/4, a/(b*x^4)])/(32*a^2*x^8*(a - b*
x^4)^(3/4))
```

Maple [F] time = 0.041, size = 0, normalized size = 0.

$$\int \frac{1}{x^9} \left(-bx^4 + a\right)^{-\frac{3}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^9/(-b*x^4+a)^(3/4),x)
```

```
[Out] int(1/x^9/(-b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^9),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.244555, size = 277, normalized size = 2.56

$$\frac{84\, a^2 x^8 \left(\frac{b^8}{a^{11}}\right)^{\frac{1}{4}} \arctan\left(\frac{a^3 \left(\frac{b^8}{a^{11}}\right)^{\frac{1}{4}}}{\left(-bx^4+a\right)^{\frac{1}{4}} b^2 + \sqrt{a^6 \sqrt{\frac{b^8}{a^{11}}} + \sqrt{-bx^4+a} b^4}}\right) - 21\, a^2 x^8 \left(\frac{b^8}{a^{11}}\right)^{\frac{1}{4}} \log\left(21\, a^3 \left(\frac{b^8}{a^{11}}\right)^{\frac{1}{4}} + 21 \left(-bx^4 + a\right)^{\frac{1}{4}} b^2\right) + 21\, a^2 x^8}{128\, a^2 x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^9),x, algorithm="fricas")
```

```
[Out] 1/128*(84*a^2*x^8*(b^8/a^11)^(1/4)*arctan(a^3*(b^8/a^11)^(1/4)/((
-b*x^4 + a)^(1/4)*b^2 + sqrt(a^6*sqrt(b^8/a^11) + sqrt(-b*x^4 + a
)*b^4))) - 21*a^2*x^8*(b^8/a^11)^(1/4)*log(21*a^3*(b^8/a^11)^(1/4
) + 21*(-b*x^4 + a)^(1/4)*b^2) + 21*a^2*x^8*(b^8/a^11)^(1/4)*log(
-21*a^3*(b^8/a^11)^(1/4) + 21*(-b*x^4 + a)^(1/4)*b^2) - 4*(7*b*x^
4 + 4*a)*(-b*x^4 + a)^(1/4))/(a^2*x^8)
```

Sympy [A] time = 10.7678, size = 42, normalized size = 0.39

$$-\frac{e^{-\frac{11i\pi}{4}} \Gamma\left(\frac{11}{4}\right) {}_2F_1\left(\begin{matrix} \frac{3}{4}, \frac{11}{4} \\ \frac{15}{4} \end{matrix}\middle| \frac{a}{bx^4}\right)}{4b^{\frac{3}{4}} x^{11} \Gamma\left(\frac{15}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**9/(-b*x**4+a)**(3/4),x)
```

```
[Out] -exp(-11*I*pi/4)*gamma(11/4)*hyper((3/4, 11/4), (15/4,), a/(b*x**
4))/(4*b**(3/4)*x**11*gamma(15/4))
```

GIAC/XCAS [A] time = 0.222051, size = 316, normalized size = 2.93

$$-\frac{1}{256}\,b^2\left(\frac{42\,\sqrt{2}\,(-a)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}+2\,(-bx^4+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{a^3}+\frac{42\,\sqrt{2}\,(-a)^{\frac{1}{4}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}(-a)^{\frac{1}{4}}-2\,(-bx^4+a)^{\frac{1}{4}}\right)}{2\,(-a)^{\frac{1}{4}}}\right)}{a^3}+\frac{21\,\sqrt{2}\,(-a)^{\frac{1}{4}}\ln\left(\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^9),x, algorithm="giac")
```

```
[Out] -1/256*b^2*(42*sqrt(2)*(-a)^(1/4)*arctan(1/2*sqrt(2)*(sqrt(2)*(-a
)^(1/4) + 2*(-b*x^4 + a)^(1/4))/(-a)^(1/4))/a^3 + 42*sqrt(2)*(-a)
^(1/4)*arctan(-1/2*sqrt(2)*(sqrt(2)*(-a)^(1/4) - 2*(-b*x^4 + a)^(
1/4))/(-a)^(1/4))/a^3 + 21*sqrt(2)*(-a)^(1/4)*ln(sqrt(2)*(-b*x^4
+ a)^(1/4)*(-a)^(1/4) + sqrt(-b*x^4 + a) + sqrt(-a))/a^3 - 21*sqr
t(2)*(-a)^(1/4)*ln(-sqrt(2)*(-b*x^4 + a)^(1/4)*(-a)^(1/4) + sqrt(
-b*x^4 + a) + sqrt(-a))/a^3 - 8*(7*(-b*x^4 + a)^(5/4) - 11*(-b*x^
4 + a)^(1/4)*a)/(a^2*b^2*x^8))
```

3.1240 $\int \frac{x^{13}}{(a-bx^4)^{3/4}}\,dx$

Optimal. Leaf size=133

$$\frac{40a^{7/2}\left(1-\frac{bx^4}{a}\right)^{3/4}F\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{77b^{7/2}\left(a-bx^4\right)^{3/4}}-\frac{20a^2x^2\sqrt[4]{a-bx^4}}{77b^3}-\frac{10ax^6\sqrt[4]{a-bx^4}}{77b^2}-\frac{x^{10}\sqrt[4]{a-bx^4}}{11b}$$

```
[Out] (-20*a^2*x^2*(a - b*x^4)^(1/4))/(77*b^3) - (10*a*x^6*(a - b*x^4)^
(1/4))/(77*b^2) - (x^10*(a - b*x^4)^(1/4))/(11*b) + (40*a^(7/2)*(
1 - (b*x^4)/a)^(3/4)*EllipticF[ArcSin[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2
])/(77*b^(7/2)*(a - b*x^4)^(3/4))
```

Rubi [A] time = 0.211754, antiderivative size = 133, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25

$$\frac{40a^{7/2}\left(1-\frac{bx^4}{a}\right)^{3/4}F\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{77b^{7/2}\left(a-bx^4\right)^{3/4}}-\frac{20a^2x^2\sqrt[4]{a-bx^4}}{77b^3}-\frac{10ax^6\sqrt[4]{a-bx^4}}{77b^2}-\frac{x^{10}\sqrt[4]{a-bx^4}}{11b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^13/(a - b*x^4)^(3/4),x]
```

```
[Out] (-20*a^2*x^2*(a - b*x^4)^(1/4))/(77*b^3) - (10*a*x^6*(a - b*x^4)^
(1/4))/(77*b^2) - (x^10*(a - b*x^4)^(1/4))/(11*b) + (40*a^(7/2)*(
1 - (b*x^4)/a)^(3/4)*EllipticF[ArcSin[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2
])/(77*b^(7/2)*(a - b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 23.7624, size = 116, normalized size = 0.87

$$\frac{40a^{\frac{7}{2}}\left(1-\frac{bx^4}{a}\right)^{\frac{3}{4}}F\left(\frac{\operatorname{asin}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{77b^{\frac{7}{2}}\left(a-bx^4\right)^{\frac{3}{4}}}-\frac{20a^2x^2\sqrt[4]{a-bx^4}}{77b^3}-\frac{10ax^6\sqrt[4]{a-bx^4}}{77b^2}-\frac{x^{10}\sqrt[4]{a-bx^4}}{11b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**13/(-b*x**4+a)**(3/4),x)
```

```
[Out] 40*a**(7/2)*(1 - b*x**4/a)**(3/4)*elliptic_f(asin(sqrt(b)*x**2/sq
rt(a))/2, 2)/(77*b**(7/2)*(a - b*x**4)**(3/4)) - 20*a**2*x**2*(a
- b*x**4)**(1/4)/(77*b**3) - 10*a*x**6*(a - b*x**4)**(1/4)/(77*b*
*2) - x**10*(a - b*x**4)**(1/4)/(11*b)
```

Mathematica [C] time = 0.0867813, size = 92, normalized size = 0.69

$$\frac{x^2\left(20a^3\left(1-\frac{bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};\frac{bx^4}{a}\right)-20a^3+10a^2bx^4+3ab^2x^8+7b^3x^{12}\right)}{77b^3\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^13/(a - b*x^4)^(3/4),x]
```

```
[Out] (x^2*(-20*a^3 + 10*a^2*b*x^4 + 3*a*b^2*x^8 + 7*b^3*x^12 + 20*a^3*
(1 - (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/2, 3/4, 3/2, (b*x^4)/a]
```

```
))/(77*b^3*(a - b*x^4)^(3/4))
```

Maple [F] time = 0.029, size = 0, normalized size = 0.

$$\int x^{13} \left(-b x^4 + a\right)^{-\frac{3}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^13/(-b*x^4+a)^(3/4),x)
```

```
[Out] int(x^13/(-b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{13}}{\left(-b x^4 + a\right)^{\frac{3}{4}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^13/(-b*x^4 + a)^(3/4),x, algorithm="maxima")
```

```
[Out] integrate(x^13/(-b*x^4 + a)^(3/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{13}}{\left(-b x^4 + a\right)^{\frac{3}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^13/(-b*x^4 + a)^(3/4),x, algorithm="fricas")
```

```
[Out] integral(x^13/(-b*x^4 + a)^(3/4), x)
```

Sympy [A] time = 8.52403, size = 29, normalized size = 0.22

$$\frac{x^{14} {}_{2}F_{1}\left(\begin{matrix} \frac{3}{4}, \frac{7}{2} \\ \frac{9}{2} \end{matrix}\middle| {\frac{b x^4 e^{2 i \pi}}{a}} \right)}{14 a^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**13/(-b*x**4+a)**(3/4),x)
```

```
[Out] x**14*hyper((3/4, 7/2), (9/2,), b*x**4*exp_polar(2*I*pi)/a)/(14*a
**(3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{13}}{\left(-b x^4 + a\right)^{\frac{3}{4}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^13/(-b*x^4 + a)^(3/4),x, algorithm="giac")
```

```
[Out] integrate(x^13/(-b*x^4 + a)^(3/4), x)
```

3.1241 $\int \frac{x^9}{(a-bx^4)^{3/4}}\,dx$

Optimal. Leaf size=108

$$\frac{4a^{5/2}\left(1-\frac{bx^4}{a}\right)^{3/4}F\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{7b^{5/2}(a-bx^4)^{3/4}}-\frac{2ax^2\sqrt[4]{a-bx^4}}{7b^2}-\frac{x^6\sqrt[4]{a-bx^4}}{7b}$$

```
[Out] (-2*a*x^2*(a - b*x^4)^(1/4))/(7*b^2) - (x^6*(a - b*x^4)^(1/4))/(7
*b) + (4*a^(5/2)*(1 - (b*x^4)/a)^(3/4)*EllipticF[ArcSin[(Sqrt[b]*
x^2)/Sqrt[a]]/2, 2])/(7*b^(5/2)*(a - b*x^4)^(3/4))
```

Rubi [A] time = 0.159211, antiderivative size = 108, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25

$$\frac{4a^{5/2}\left(1-\frac{bx^4}{a}\right)^{3/4}F\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{7b^{5/2}(a-bx^4)^{3/4}}-\frac{2ax^2\sqrt[4]{a-bx^4}}{7b^2}-\frac{x^6\sqrt[4]{a-bx^4}}{7b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^9/(a - b*x^4)^(3/4),x]
```

```
[Out] (-2*a*x^2*(a - b*x^4)^(1/4))/(7*b^2) - (x^6*(a - b*x^4)^(1/4))/(7
*b) + (4*a^(5/2)*(1 - (b*x^4)/a)^(3/4)*EllipticF[ArcSin[(Sqrt[b]*
x^2)/Sqrt[a]]/2, 2])/(7*b^(5/2)*(a - b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 18.3386, size = 92, normalized size = 0.85

$$\frac{4a^{\frac{5}{2}}\left(1-\frac{bx^4}{a}\right)^{\frac{3}{4}}F\left(\frac{\operatorname{asin}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{7b^{\frac{5}{2}}(a-bx^4)^{\frac{3}{4}}}-\frac{2ax^2\sqrt[4]{a-bx^4}}{7b^2}-\frac{x^6\sqrt[4]{a-bx^4}}{7b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**9/(-b*x**4+a)**(3/4),x)
```

```
[Out] 4*a**(5/2)*(1 - b*x**4/a)**(3/4)*elliptic_f(asin(sqrt(b)*x**2/sqr
t(a))/2, 2)/(7*b**(5/2)*(a - b*x**4)**(3/4)) - 2*a*x**2*(a - b*x*
*4)**(1/4)/(7*b**2) - x**6*(a - b*x**4)**(1/4)/(7*b)
```

Mathematica [C] time = 0.06398, size = 79, normalized size = 0.73

$$\frac{x^2\left(2a^2\left(1-\frac{bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};\frac{bx^4}{a}\right)-2a^2+abx^4+b^2x^8\right)}{7b^2(a-bx^4)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^9/(a - b*x^4)^(3/4),x]
```

```
[Out] (x^2*(-2*a^2 + a*b*x^4 + b^2*x^8 + 2*a^2*(1 - (b*x^4)/a)^(3/4)*Hy
pergeometric2F1[1/2, 3/4, 3/2, (b*x^4)/a]))/(7*b^2*(a - b*x^4)^(3
/4))
```

Maple [F] time = 0.028, size = 0, normalized size = 0.

$$\int x^{9} \left(-b x^{4}+a\right)^{-\frac{3}{4}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^9/(-b*x^4+a)^(3/4),x)
```

```
[Out] int(x^9/(-b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{9}}{\left(-b x^{4}+a\right)^{\frac{3}{4}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(-b*x^4 + a)^(3/4),x, algorithm="maxima")
```

```
[Out] integrate(x^9/(-b*x^4 + a)^(3/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x^{9}}{\left(-b x^{4}+a\right)^{\frac{3}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(-b*x^4 + a)^(3/4),x, algorithm="fricas")
```

```
[Out] integral(x^9/(-b*x^4 + a)^(3/4), x)
```

Sympy [A] time = 4.44315, size = 29, normalized size = 0.27

$$\frac{x^{10} {}_{2}F_{1}\left(\begin{matrix} \frac{3}{4}, \frac{5}{2} \\ \frac{7}{2} \end{matrix}\middle| \frac{b x^{4} e^{2 i \pi}}{a} \right)}{10 a^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**9/(-b*x**4+a)**(3/4),x)
```

```
[Out] x**10*hyper((3/4, 5/2), (7/2,), b*x**4*exp_polar(2*I*pi)/a)/(10*a
**(3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{9}}{\left(-b x^{4}+a\right)^{\frac{3}{4}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(-b*x^4 + a)^(3/4),x, algorithm="giac")
```

```
[Out] integrate(x^9/(-b*x^4 + a)^(3/4), x)
```

3.1242 $\int \frac{x^5}{(a-bx^4)^{3/4}} dx$

Optimal. Leaf size=85

$$\frac{2a^{3/2}\left(1-\frac{bx^4}{a}\right)^{3/4} F\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{3b^{3/2}(a-bx^4)^{3/4}} - \frac{x^2\sqrt[4]{a-bx^4}}{3b}$$

```
[Out] -(x^2*(a - b*x^4)^(1/4))/(3*b) + (2*a^(3/2)*(1 - (b*x^4)/a)^(3/4)
*EllipticF[ArcSin[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(3*b^(3/2)*(a - b
*x^4)^(3/4))
```

Rubi [A] time = 0.116996, antiderivative size = 85, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25

$$\frac{2a^{3/2}\left(1-\frac{bx^4}{a}\right)^{3/4} F\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{3b^{3/2}(a-bx^4)^{3/4}} - \frac{x^2\sqrt[4]{a-bx^4}}{3b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/(a - b*x^4)^(3/4),x]
```

```
[Out] -(x^2*(a - b*x^4)^(1/4))/(3*b) + (2*a^(3/2)*(1 - (b*x^4)/a)^(3/4)
*EllipticF[ArcSin[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(3*b^(3/2)*(a - b
*x^4)^(3/4))
```

Rubi in Sympy [A] time = 14.0451, size = 70, normalized size = 0.82

$$\frac{2a^{\frac{3}{2}}\left(1-\frac{bx^4}{a}\right)^{\frac{3}{4}} F\left(\frac{\operatorname{asin}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{3b^{\frac{3}{2}}(a-bx^4)^{\frac{3}{4}}} - \frac{x^2\sqrt[4]{a-bx^4}}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(-b*x**4+a)**(3/4),x)
```

```
[Out] 2*a**(3/2)*(1 - b*x**4/a)**(3/4)*elliptic_f(asin(sqrt(b)*x**2/sqr
t(a))/2, 2)/(3*b**(3/2)*(a - b*x**4)**(3/4)) - x**2*(a - b*x**4)*
*(1/4)/(3*b)
```

Mathematica [C] time = 0.0541456, size = 66, normalized size = 0.78

$$\frac{x^2\left(a\left(1-\frac{bx^4}{a}\right)^{3/4} {}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};\frac{bx^4}{a}\right)-a+bx^4\right)}{3b(a-bx^4)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/(a - b*x^4)^(3/4),x]
```

```
[Out] (x^2*(-a + b*x^4 + a*(1 - (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/2,
 3/4, 3/2, (b*x^4)/a]))/(3*b*(a - b*x^4)^(3/4))
```

Maple [F] time = 0.027, size = 0, normalized size = 0.

$$\int x^{5} \left(-b x^{4}+a \right)^{-\frac{3}{4}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(-b*x^4+a)^(3/4),x)
```

```
[Out] int(x^5/(-b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{5}}{\left(-b x^{4}+a\right)^{\frac{3}{4}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(-b*x^4 + a)^(3/4),x, algorithm="maxima")
```

```
[Out] integrate(x^5/(-b*x^4 + a)^(3/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{5}}{\left(-b x^{4}+a\right)^{\frac{3}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(-b*x^4 + a)^(3/4),x, algorithm="fricas")
```

```
[Out] integral(x^5/(-b*x^4 + a)^(3/4), x)
```

Sympy [A] time = 2.78869, size = 29, normalized size = 0.34

$$\frac{x^{6} {}_{2}F_{1}\left(\begin{matrix} \frac{3}{4}, \frac{3}{2} \\ \frac{5}{2} \end{matrix}\middle| {\frac{b x^{4} e^{2 i \pi}}{a}} \right)}{6 a^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(-b*x**4+a)**(3/4),x)
```

```
[Out] x**6*hyper((3/4, 3/2), (5/2,), b*x**4*exp_polar(2*I*pi)/a)/(6*a**
(3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{5}}{\left(-b x^{4}+a\right)^{\frac{3}{4}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(-b*x^4 + a)^(3/4),x, algorithm="giac")

[Out] integrate(x^5/(-b*x^4 + a)^(3/4), x)
```

3.1243 $\int \frac{x}{(a-bx^4)^{3/4}}\,dx$

Optimal. Leaf size=59

$$\frac{\sqrt{a}\left(1-\frac{bx^4}{a}\right)^{3/4}F\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{\sqrt{b}\,(a-bx^4)^{3/4}}$$

```
[Out] (Sqrt[a]*(1 - (b*x^4)/a)^(3/4)*EllipticF[ArcSin[(Sqrt[b]*x^2)/Sqr
t[a]]/2, 2])/(Sqrt[b]*(a - b*x^4)^(3/4))
```

Rubi [A] time = 0.0715815, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214

$$\frac{\sqrt{a}\left(1-\frac{bx^4}{a}\right)^{3/4}F\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{\sqrt{b}\,(a-bx^4)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a - b*x^4)^(3/4),x]
```

```
[Out] (Sqrt[a]*(1 - (b*x^4)/a)^(3/4)*EllipticF[ArcSin[(Sqrt[b]*x^2)/Sqr
t[a]]/2, 2])/(Sqrt[b]*(a - b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 9.10553, size = 49, normalized size = 0.83

$$\frac{\sqrt{a}\left(1-\frac{bx^4}{a}\right)^{\frac{3}{4}}F\left(\frac{\operatorname{asin}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{\sqrt{b}\,(a-bx^4)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(-b*x**4+a)**(3/4),x)
```

```
[Out] sqrt(a)*(1 - b*x**4/a)**(3/4)*elliptic_f(asin(sqrt(b)*x**2/sqrt(a
))/2, 2)/(sqrt(b)*(a - b*x**4)**(3/4))
```

Mathematica [C] time = 0.0321628, size = 53, normalized size = 0.9

$$\frac{x^2\left(\frac{a-bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};\frac{bx^4}{a}\right)}{2\,(a-bx^4)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a - b*x^4)^(3/4),x]
```

```
[Out] (x^2*((a - b*x^4)/a)^(3/4)*Hypergeometric2F1[1/2, 3/4, 3/2, (b*x^
4)/a])/(2*(a - b*x^4)^(3/4))
```

Maple [F] time = 0.032, size = 0, normalized size = 0.

$$\int x\left(-bx^4+a\right)^{-\frac{3}{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x/(-b*x^4+a)^(3/4),x)

[Out] int(x/(-b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{(-bx^4+a)^{\frac{3}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(-b*x^4 + a)^(3/4),x, algorithm="maxima")

[Out] integrate(x/(-b*x^4 + a)^(3/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x}{(-bx^4+a)^{\frac{3}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(-b*x^4 + a)^(3/4),x, algorithm="fricas")

[Out] integral(x/(-b*x^4 + a)^(3/4), x)
```

Sympy [A] time = 2.40522, size = 29, normalized size = 0.49

$$\frac{x^2 {}_2F_1\left(\begin{matrix} \frac{1}{2}, \frac{3}{4} \\ \frac{3}{2} \end{matrix}\middle| \frac{bx^4e^{2i\pi}}{a}\right)}{2a^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(-b*x**4+a)**(3/4),x)

[Out] x**2*hyper((1/2, 3/4), (3/2,), b*x**4*exp_polar(2*I*pi)/a)/(2*a**
(3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{(-bx^4+a)^{\frac{3}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(-b*x^4 + a)^(3/4),x, algorithm="giac")

[Out] integrate(x/(-b*x^4 + a)^(3/4), x)
```

3.1244 $\int \frac{1}{x^3(a-bx^4)^{3/4}}\,dx$

Optimal. Leaf size=85

$$\frac{\sqrt{b}\left(1-\frac{bx^4}{a}\right)^{3/4}F\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{2\sqrt{a}\,(a-bx^4)^{3/4}}-\frac{\sqrt[4]{a-bx^4}}{2ax^2}$$

```
[Out] -(a - b*x^4)^(1/4)/(2*a*x^2) + (Sqrt[b]*(1 - (b*x^4)/a)^(3/4)*Ell
ipticF[ArcSin[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(2*Sqrt[a]*(a - b*x^4
)^(3/4))
```

Rubi [A] time = 0.113596, antiderivative size = 85, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.25$

$$\frac{\sqrt{b}\left(1-\frac{bx^4}{a}\right)^{3/4}F\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{2\sqrt{a}\,(a-bx^4)^{3/4}}-\frac{\sqrt[4]{a-bx^4}}{2ax^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(a - b*x^4)^(3/4)),x]
```

```
[Out] -(a - b*x^4)^(1/4)/(2*a*x^2) + (Sqrt[b]*(1 - (b*x^4)/a)^(3/4)*Ell
ipticF[ArcSin[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(2*Sqrt[a]*(a - b*x^4
)^(3/4))
```

Rubi in Sympy [A] time = 13.5898, size = 68, normalized size = 0.8

$$-\frac{\sqrt[4]{a-bx^4}}{2ax^2}+\frac{\sqrt{b}\left(1-\frac{bx^4}{a}\right)^{\frac{3}{4}}F\left(\frac{\operatorname{asin}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{2\sqrt{a}\,(a-bx^4)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(-b*x**4+a)**(3/4),x)
```

```
[Out] -(a - b*x**4)**(1/4)/(2*a*x**2) + sqrt(b)*(1 - b*x**4/a)**(3/4)*e
lliptic_f(asin(sqrt(b)*x**2/sqrt(a))/2, 2)/(2*sqrt(a)*(a - b*x**4
)**(3/4))
```

Mathematica [C] time = 0.0489164, size = 70, normalized size = 0.82

$$\frac{bx^4\left(1-\frac{bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};\frac{bx^4}{a}\right)-2a+2bx^4}{4ax^2\,(a-bx^4)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*(a - b*x^4)^(3/4)),x]
```

```
[Out] (-2*a + 2*b*x^4 + b*x^4*(1 - (b*x^4)/a)^(3/4)*Hypergeometric2F1[1
/2, 3/4, 3/2, (b*x^4)/a])/(4*a*x^2*(a - b*x^4)^(3/4))
```

Maple [F] time = 0.031, size = 0, normalized size = 0.

$$\int \frac{1}{x^3}\left(-bx^4+a\right)^{-\frac{3}{4}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(-b*x^4+a)^(3/4),x)

[Out] int(1/x^3/(-b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-bx^4+a\right)^{\frac{3}{4}}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^3),x, algorithm="maxima")

[Out] integrate(1/((-b*x^4 + a)^(3/4)*x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\left(-bx^4+a\right)^{\frac{3}{4}}x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^3),x, algorithm="fricas")

[Out] integral(1/((-b*x^4 + a)^(3/4)*x^3), x)
```

Sympy [A] time = 3.27207, size = 32, normalized size = 0.38

$$-\frac{{}_2F_1\left(\begin{matrix}-\frac{1}{2},\frac{3}{4}\\ \frac{1}{2}\end{matrix}\middle|\frac{bx^4e^{2i\pi}}{a}\right)}{2a^{\frac{3}{4}}x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(-b*x**4+a)**(3/4),x)

[Out] -hyper((-1/2, 3/4), (1/2,), b*x**4*exp_polar(2*I*pi)/a)/(2*a**(3/
4)*x**2)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-bx^4+a\right)^{\frac{3}{4}}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^3),x, algorithm="giac")

[Out] integrate(1/((-b*x^4 + a)^(3/4)*x^3), x)
```

3.1245 $\int \frac{1}{x^7(a-bx^4)^{3/4}}\,dx$

Optimal. Leaf size=108

$$\frac{5b^{3/2}\left(1-\frac{bx^4}{a}\right)^{3/4}F\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{12a^{3/2}\left(a-bx^4\right)^{3/4}}-\frac{5b\sqrt[4]{a-bx^4}}{12a^2x^2}-\frac{\sqrt[4]{a-bx^4}}{6ax^6}$$

```
[Out] -(a - b*x^4)^(1/4)/(6*a*x^6) - (5*b*(a - b*x^4)^(1/4))/(12*a^2*x^
2) + (5*b^(3/2)*(1 - (b*x^4)/a)^(3/4)*EllipticF[ArcSin[(Sqrt[b]*x
^2)/Sqrt[a]]/2, 2])/(12*a^(3/2)*(a - b*x^4)^(3/4))
```

Rubi [A] time = 0.158393, antiderivative size = 108, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25

$$\frac{5b^{3/2}\left(1-\frac{bx^4}{a}\right)^{3/4}F\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{12a^{3/2}\left(a-bx^4\right)^{3/4}}-\frac{5b\sqrt[4]{a-bx^4}}{12a^2x^2}-\frac{\sqrt[4]{a-bx^4}}{6ax^6}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^7*(a - b*x^4)^(3/4)),x]
```

```
[Out] -(a - b*x^4)^(1/4)/(6*a*x^6) - (5*b*(a - b*x^4)^(1/4))/(12*a^2*x^
2) + (5*b^(3/2)*(1 - (b*x^4)/a)^(3/4)*EllipticF[ArcSin[(Sqrt[b]*x
^2)/Sqrt[a]]/2, 2])/(12*a^(3/2)*(a - b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 17.8162, size = 92, normalized size = 0.85

$$-\frac{\sqrt[4]{a-bx^4}}{6ax^6}-\frac{5b\sqrt[4]{a-bx^4}}{12a^2x^2}+\frac{5b^{\frac{3}{2}}\left(1-\frac{bx^4}{a}\right)^{\frac{3}{4}}F\left(\frac{\operatorname{asin}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{12a^{\frac{3}{2}}\left(a-bx^4\right)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**7/(-b*x**4+a)**(3/4),x)
```

```
[Out] -(a - b*x**4)**(1/4)/(6*a*x**6) - 5*b*(a - b*x**4)**(1/4)/(12*a**
2*x**2) + 5*b**(3/2)*(1 - b*x**4/a)**(3/4)*elliptic_f(asin(sqrt(b
)*x**2/sqrt(a))/2, 2)/(12*a**(3/2)*(a - b*x**4)**(3/4))
```

Mathematica [C] time = 0.0575134, size = 84, normalized size = 0.78

$$\frac{-4a^2+5b^2x^8\left(1-\frac{bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};\frac{bx^4}{a}\right)-6abx^4+10b^2x^8}{24a^2x^6\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^7*(a - b*x^4)^(3/4)),x]
```

```
[Out] (-4*a^2 - 6*a*b*x^4 + 10*b^2*x^8 + 5*b^2*x^8*(1 - (b*x^4)/a)^(3/4
)*Hypergeometric2F1[1/2, 3/4, 3/2, (b*x^4)/a])/(24*a^2*x^6*(a - b
*x^4)^(3/4))
```

Maple [F] time = 0.036, size = 0, normalized size = 0.

$$\int \frac{1}{x^7} \left(-b x^4 + a\right)^{-\frac{3}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^7/(-b*x^4+a)^(3/4),x)

[Out] int(1/x^7/(-b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-b x^4 + a\right)^{\frac{3}{4}} x^7}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^7),x, algorithm="maxima")

[Out] integrate(1/((-b*x^4 + a)^(3/4)*x^7), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\left(-b x^4 + a\right)^{\frac{3}{4}} x^7}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^7),x, algorithm="fricas")

[Out] integral(1/((-b*x^4 + a)^(3/4)*x^7), x)
```

Sympy [A] time = 5.97555, size = 34, normalized size = 0.31

$$-\frac{{}_2F_1\left(\begin{matrix} -\frac{3}{2}, \frac{3}{4} \\ -\frac{1}{2} \end{matrix}\middle| \frac{b x^4 e^{2i\pi}}{a}\right)}{6 a^{\frac{3}{4}} x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**7/(-b*x**4+a)**(3/4),x)

[Out] -hyper((-3/2, 3/4), (-1/2,), b*x**4*exp_polar(2*I*pi)/a)/(6*a**(3
/4)*x**6)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-b x^4 + a\right)^{\frac{3}{4}} x^7}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^7),x, algorithm="giac")

[Out] integrate(1/((-b*x^4 + a)^(3/4)*x^7), x)
```

3.1246 $\int \frac{1}{x^{11}(a-bx^4)^{3/4}}\,dx$

Optimal. Leaf size=133

$$\frac{3b^{5/2}\left(1-\frac{bx^4}{a}\right)^{3/4}F\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{8a^{5/2}(a-bx^4)^{3/4}}-\frac{3b^2\sqrt[4]{a-bx^4}}{8a^3x^2}-\frac{3b\sqrt[4]{a-bx^4}}{20a^2x^6}-\frac{\sqrt[4]{a-bx^4}}{10ax^{10}}$$

```
[Out] -(a - b*x^4)^(1/4)/(10*a*x^10) - (3*b*(a - b*x^4)^(1/4))/(20*a^2*
x^6) - (3*b^2*(a - b*x^4)^(1/4))/(8*a^3*x^2) + (3*b^(5/2)*(1 - (b
*x^4)/a)^(3/4)*EllipticF[ArcSin[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(8*
a^(5/2)*(a - b*x^4)^(3/4))
```

Rubi [A] time = 0.204491, antiderivative size = 133, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25

$$\frac{3b^{5/2}\left(1-\frac{bx^4}{a}\right)^{3/4}F\left(\frac{1}{2}\sin^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{8a^{5/2}(a-bx^4)^{3/4}}-\frac{3b^2\sqrt[4]{a-bx^4}}{8a^3x^2}-\frac{3b\sqrt[4]{a-bx^4}}{20a^2x^6}-\frac{\sqrt[4]{a-bx^4}}{10ax^{10}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^11*(a - b*x^4)^(3/4)),x]
```

```
[Out] -(a - b*x^4)^(1/4)/(10*a*x^10) - (3*b*(a - b*x^4)^(1/4))/(20*a^2*
x^6) - (3*b^2*(a - b*x^4)^(1/4))/(8*a^3*x^2) + (3*b^(5/2)*(1 - (b
*x^4)/a)^(3/4)*EllipticF[ArcSin[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(8*
a^(5/2)*(a - b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 23.0554, size = 116, normalized size = 0.87

$$-\frac{\sqrt[4]{a-bx^4}}{10ax^{10}}-\frac{3b\sqrt[4]{a-bx^4}}{20a^2x^6}-\frac{3b^2\sqrt[4]{a-bx^4}}{8a^3x^2}+\frac{3b^{\frac{5}{2}}\left(1-\frac{bx^4}{a}\right)^{\frac{3}{4}}F\left(\frac{\operatorname{asin}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)}{2}\middle|2\right)}{8a^{\frac{5}{2}}(a-bx^4)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**11/(-b*x**4+a)**(3/4),x)
```

```
[Out] -(a - b*x**4)**(1/4)/(10*a*x**10) - 3*b*(a - b*x**4)**(1/4)/(20*a
**2*x**6) - 3*b**2*(a - b*x**4)**(1/4)/(8*a**3*x**2) + 3*b**(5/2)
*(1 - b*x**4/a)**(3/4)*elliptic_f(asin(sqrt(b)*x**2/sqrt(a))/2, 2
)/(8*a**(5/2)*(a - b*x**4)**(3/4))
```

Mathematica [C] time = 0.0695509, size = 95, normalized size = 0.71

$$\frac{-8a^3-4a^2bx^4+15b^3x^{12}\left(1-\frac{bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{3}{2};\frac{bx^4}{a}\right)-18ab^2x^8+30b^3x^{12}}{80a^3x^{10}(a-bx^4)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^11*(a - b*x^4)^(3/4)),x]
```

```
[Out] (-8*a^3 - 4*a^2*b*x^4 - 18*a*b^2*x^8 + 30*b^3*x^12 + 15*b^3*x^12*
(1 - (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/2, 3/4, 3/2, (b*x^4)/a]
```

```
)/(80*a^3*x^10*(a - b*x^4)^(3/4))
```

Maple [F] time = 0.039, size = 0, normalized size = 0.

$$\int \frac{1}{x^{11}} \left(-bx^4 + a\right)^{-\frac{3}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^11/(-b*x^4+a)^(3/4),x)
```

```
[Out] int(1/x^11/(-b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(-bx^4 + a)^{\frac{3}{4}} x^{11}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^11),x, algorithm="maxima")
```

```
[Out] integrate(1/((-b*x^4 + a)^(3/4)*x^11), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(-bx^4 + a)^{\frac{3}{4}} x^{11}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^11),x, algorithm="fricas")
```

```
[Out] integral(1/((-b*x^4 + a)^(3/4)*x^11), x)
```

Sympy [A] time = 12.5245, size = 34, normalized size = 0.26

$$-\frac{{}_2F_1\left(\begin{matrix} -\frac{5}{2}, \frac{3}{4} \\ -\frac{3}{2} \end{matrix}\middle| \frac{bx^4 e^{2i\pi}}{a}\right)}{10a^{\frac{3}{4}} x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**11/(-b*x**4+a)**(3/4),x)
```

```
[Out] -hyper((-5/2, 3/4), (-3/2,), b*x**4*exp_polar(2*I*pi)/a)/(10*a**(
3/4)*x**10)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(-bx^4 + a)^{\frac{3}{4}} x^{11}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^11),x, algorithm="giac")
```

```
[Out] integrate(1/((-b*x^4 + a)^(3/4)*x^11), x)
```

3.1247 $\int \frac{x^{10}}{(a-bx^4)^{3/4}}\,dx$

Optimal. Leaf size=266

$$-\frac{21a^2\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}\right)}{64\sqrt{2}b^{11/4}}+\frac{21a^2\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+1\right)}{64\sqrt{2}b^{11/4}}+\frac{21a^2\log\left(-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{128\sqrt{2}b^{11/4}}-\frac{21a^2\log\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{128\sqrt{2}b^{11/4}}-\frac{7ax^3\sqrt[4]{a-bx^4}}{32b^2}-\frac{x^7\sqrt[4]{a-bx^4}}{8b}$$

```
[Out] (-7*a*x^3*(a - b*x^4)^(1/4))/(32*b^2) - (x^7*(a - b*x^4)^(1/4))/(
8*b) - (21*a^2*ArcTan[1 - (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)])
/(64*Sqrt[2]*b^(11/4)) + (21*a^2*ArcTan[1 + (Sqrt[2]*b^(1/4)*x)/(
a - b*x^4)^(1/4)])/(64*Sqrt[2]*b^(11/4)) + (21*a^2*Log[1 + (Sqrt[
b]*x^2)/Sqrt[a - b*x^4] - (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)])
/(128*Sqrt[2]*b^(11/4)) - (21*a^2*Log[1 + (Sqrt[b]*x^2)/Sqrt[a -
b*x^4] + (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)])/(128*Sqrt[2]*b^(
11/4))
```

Rubi [A] time = 0.348705, antiderivative size = 266, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 8, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5

$$-\frac{21a^2\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}\right)}{64\sqrt{2}b^{11/4}}+\frac{21a^2\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+1\right)}{64\sqrt{2}b^{11/4}}+\frac{21a^2\log\left(-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{128\sqrt{2}b^{11/4}}-\frac{21a^2\log\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{128\sqrt{2}b^{11/4}}-\frac{7ax^3\sqrt[4]{a-bx^4}}{32b^2}-\frac{x^7\sqrt[4]{a-bx^4}}{8b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^10/(a - b*x^4)^(3/4),x]
```

```
[Out] (-7*a*x^3*(a - b*x^4)^(1/4))/(32*b^2) - (x^7*(a - b*x^4)^(1/4))/(
8*b) - (21*a^2*ArcTan[1 - (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)])
/(64*Sqrt[2]*b^(11/4)) + (21*a^2*ArcTan[1 + (Sqrt[2]*b^(1/4)*x)/(
a - b*x^4)^(1/4)])/(64*Sqrt[2]*b^(11/4)) + (21*a^2*Log[1 + (Sqrt[
b]*x^2)/Sqrt[a - b*x^4] - (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)])
/(128*Sqrt[2]*b^(11/4)) - (21*a^2*Log[1 + (Sqrt[b]*x^2)/Sqrt[a -
b*x^4] + (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)])/(128*Sqrt[2]*b^(
11/4))
```

Rubi in Sympy [A] time = 43.6869, size = 245, normalized size = 0.92

$$\frac{21\sqrt{2}a^2\log\left(-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{256b^{\frac{11}{4}}}-\frac{21\sqrt{2}a^2\log\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{256b^{\frac{11}{4}}}+\frac{21\sqrt{2}a^2\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}-1\right)}{128b^{\frac{11}{4}}}+\frac{21\sqrt{2}a^2\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+1\right)}{128b^{\frac{11}{4}}}-\frac{7ax^3\sqrt[4]{a-bx^4}}{32b^2}-\frac{x^7\sqrt[4]{a-bx^4}}{8b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**10/(-b*x**4+a)**(3/4),x)
```

```
[Out] 21*sqrt(2)*a**2*log(-sqrt(2)*b**(1/4)*x/(a - b*x**4)**(1/4) + sqr
t(b)*x**2/sqrt(a - b*x**4) + 1)/(256*b**(11/4)) - 21*sqrt(2)*a**2
```

```
*log(sqrt(2)*b**(1/4)*x/(a - b*x**4)**(1/4) + sqrt(b)*x**2/sqrt(a
 - b*x**4) + 1)/(256*b**(11/4)) + 21*sqrt(2)*a**2*atan(sqrt(2)*b*
*(1/4)*x/(a - b*x**4)**(1/4) - 1)/(128*b**(11/4)) + 21*sqrt(2)*a*
*2*atan(sqrt(2)*b**(1/4)*x/(a - b*x**4)**(1/4) + 1)/(128*b**(11/4
)) - 7*a*x**3*(a - b*x**4)**(1/4)/(32*b**2) - x**7*(a - b*x**4)**
(1/4)/(8*b)
```

Mathematica [C] time = 0.0616716, size = 81, normalized size = 0.3

$$\frac{x^3 \left(7a^2 \left(1-\frac{bx^4}{a}\right)^{3/4} {}_2F_1\left(\frac{3}{4},\frac{3}{4};\frac{7}{4};\frac{bx^4}{a}\right) - 7a^2 + 3abx^4 + 4b^2x^8\right)}{32b^2 \left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^10/(a - b*x^4)^(3/4),x]
```

```
[Out] (x^3*(-7*a^2 + 3*a*b*x^4 + 4*b^2*x^8 + 7*a^2*(1 - (b*x^4)/a)^(3/4
)*Hypergeometric2F1[3/4, 3/4, 7/4, (b*x^4)/a]))/(32*b^2*(a - b*x^
4)^(3/4))
```

Maple [F] time = 0.042, size = 0, normalized size = 0.

$$\int x^{10} \left(-bx^4 + a\right)^{-\frac{3}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^10/(-b*x^4+a)^(3/4),x)
```

```
[Out] int(x^10/(-b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/(-b*x^4 + a)^(3/4),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.246655, size = 300, normalized size = 1.13

$$\frac{84\,b^2 \left(-\frac{a^8}{b^{11}}\right)^{\frac{1}{4}} \arctan\left(\frac{b^3 x \left(-\frac{a^8}{b^{11}}\right)^{\frac{1}{4}}}{\left(-bx^4+a\right)^{\frac{1}{4}} a^2 + x\sqrt{\frac{b^6 x^2 \sqrt{-\frac{a^8}{b^{11}}} + \sqrt{-bx^4+a}\, a^4}{x^2}}}\right) - 21\,b^2 \left(-\frac{a^8}{b^{11}}\right)^{\frac{1}{4}} \log\left(\frac{21\left(b^3 x \left(-\frac{a^8}{b^{11}}\right)^{\frac{1}{4}} + \left(-bx^4+a\right)^{\frac{1}{4}} a^2\right)}{x}\right) + 21\,b^2 \left(-\frac{a^8}{b^{11}}\right)}{128\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/(-b*x^4 + a)^(3/4),x, algorithm="fricas")
```

```
[Out] 1/128*(84*b^2*(-a^8/b^11)^(1/4)*arctan(b^3*x*(-a^8/b^11)^(1/4)/((
-b*x^4 + a)^(1/4)*a^2 + x*sqrt((b^6*x^2*sqrt(-a^8/b^11) + sqrt(-b
```

```
*x^4 + a)*a^4)/x^2))) - 21*b^2*(-a^8/b^11)^(1/4)*log(21*(b^3*x*(-
a^8/b^11)^(1/4) + (-b*x^4 + a)^(1/4)*a^2)/x) + 21*b^2*(-a^8/b^11)
^(1/4)*log(-21*(b^3*x*(-a^8/b^11)^(1/4) - (-b*x^4 + a)^(1/4)*a^2)
/x) - 4*(4*b*x^7 + 7*a*x^3)*(-b*x^4 + a)^(1/4))/b^2
```

Sympy [A] time = 7.61004, size = 39, normalized size = 0.15

$$\frac{x^{11}\,\Gamma\left(\frac{11}{4}\right)\,{}_{2}F_{1}\left(\begin{matrix}\frac{3}{4},\frac{11}{4}\\\frac{15}{4}\end{matrix}\middle|\frac{bx^{4}e^{2i\pi}}{a}\right)}{4a^{\frac{3}{4}}\,\Gamma\left(\frac{15}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**10/(-b*x**4+a)**(3/4),x)
```

```
[Out] x**11*gamma(11/4)*hyper((3/4, 11/4), (15/4,), b*x**4*exp_polar(2*
I*pi)/a)/(4*a**(3/4)*gamma(15/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{10}}{(-bx^4+a)^{\frac{3}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/(-b*x^4 + a)^(3/4),x, algorithm="giac")
```

```
[Out] integrate(x^10/(-b*x^4 + a)^(3/4), x)
```

3.1248 $\int \frac{x^6}{(a-bx^4)^{3/4}}\,dx$

Optimal. Leaf size=235

$$-\frac{3a\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}\right)}{8\sqrt{2}b^{7/4}}+\frac{3a\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+1\right)}{8\sqrt{2}b^{7/4}}+\frac{3a\log\left(-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{16\sqrt{2}b^{7/4}}-\frac{3a\log\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{16\sqrt{2}b^{7/4}}-\frac{x^3\sqrt[4]{a-bx^4}}{4b}$$

```
[Out] -(x^3*(a - b*x^4)^(1/4))/(4*b) - (3*a*ArcTan[1 - (Sqrt[2]*b^(1/4)
*x)/(a - b*x^4)^(1/4)])/(8*Sqrt[2]*b^(7/4)) + (3*a*ArcTan[1 + (Sq
rt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)])/(8*Sqrt[2]*b^(7/4)) + (3*a*L
og[1 + (Sqrt[b]*x^2)/Sqrt[a - b*x^4] - (Sqrt[2]*b^(1/4)*x)/(a - b
*x^4)^(1/4)])/(16*Sqrt[2]*b^(7/4)) - (3*a*Log[1 + (Sqrt[b]*x^2)/S
qrt[a - b*x^4] + (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)])/(16*Sqrt
[2]*b^(7/4))
```

Rubi [A] time = 0.263036, antiderivative size = 235, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 8, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5

$$-\frac{3a\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}\right)}{8\sqrt{2}b^{7/4}}+\frac{3a\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+1\right)}{8\sqrt{2}b^{7/4}}+\frac{3a\log\left(-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{16\sqrt{2}b^{7/4}}-\frac{3a\log\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{16\sqrt{2}b^{7/4}}-\frac{x^3\sqrt[4]{a-bx^4}}{4b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/(a - b*x^4)^(3/4),x]
```

```
[Out] -(x^3*(a - b*x^4)^(1/4))/(4*b) - (3*a*ArcTan[1 - (Sqrt[2]*b^(1/4)
*x)/(a - b*x^4)^(1/4)])/(8*Sqrt[2]*b^(7/4)) + (3*a*ArcTan[1 + (Sq
rt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)])/(8*Sqrt[2]*b^(7/4)) + (3*a*L
og[1 + (Sqrt[b]*x^2)/Sqrt[a - b*x^4] - (Sqrt[2]*b^(1/4)*x)/(a - b
*x^4)^(1/4)])/(16*Sqrt[2]*b^(7/4)) - (3*a*Log[1 + (Sqrt[b]*x^2)/S
qrt[a - b*x^4] + (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)])/(16*Sqrt
[2]*b^(7/4))
```

Rubi in Sympy [A] time = 37.0921, size = 216, normalized size = 0.92

$$\frac{3\sqrt{2}a\log\left(-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{32b^{\frac{7}{4}}}-\frac{3\sqrt{2}a\log\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{32b^{\frac{7}{4}}}+\frac{3\sqrt{2}a\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}-1\right)}{16b^{\frac{7}{4}}}+\frac{3\sqrt{2}a\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+1\right)}{16b^{\frac{7}{4}}}-\frac{x^3\sqrt[4]{a-bx^4}}{4b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(-b*x**4+a)**(3/4),x)
```

```
[Out] 3*sqrt(2)*a*log(-sqrt(2)*b**(1/4)*x/(a - b*x**4)**(1/4) + sqrt(b)
*x**2/sqrt(a - b*x**4) + 1)/(32*b**(7/4)) - 3*sqrt(2)*a*log(sqrt(
2)*b**(1/4)*x/(a - b*x**4)**(1/4) + sqrt(b)*x**2/sqrt(a - b*x**4)
 + 1)/(32*b**(7/4)) + 3*sqrt(2)*a*atan(sqrt(2)*b**(1/4)*x/(a - b*
```

```
x**4)**(1/4) - 1)/(16*b**(7/4)) + 3*sqrt(2)*a*atan(sqrt(2)*b**(1/
4)*x/(a - b*x**4)**(1/4) + 1)/(16*b**(7/4)) - x**3*(a - b*x**4)**
(1/4)/(4*b)
```

Mathematica [C] time = 0.0515701, size = 66, normalized size = 0.28

$$\frac{x^3\left(a\left(1-\frac{bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{3}{4},\frac{3}{4};\frac{7}{4};\frac{bx^4}{a}\right)-a+bx^4\right)}{4b\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6/(a - b*x^4)^(3/4),x]
```

```
[Out] (x^3*(-a + b*x^4 + a*(1 - (b*x^4)/a)^(3/4)*Hypergeometric2F1[3/4,
 3/4, 7/4, (b*x^4)/a]))/(4*b*(a - b*x^4)^(3/4))
```

Maple [F] time = 0.031, size = 0, normalized size = 0.

$$\int x^6\left(-bx^4+a\right)^{-\frac{3}{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(-b*x^4+a)^(3/4),x)
```

```
[Out] int(x^6/(-b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(-b*x^4 + a)^(3/4),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.243334, size = 270, normalized size = 1.15

$$-\frac{4\left(-bx^4+a\right)^{\frac{1}{4}}x^3-12\,b\left(-\frac{a^4}{b^7}\right)^{\frac{1}{4}}\arctan\left(\frac{b^2x\left(-\frac{a^4}{b^7}\right)^{\frac{1}{4}}}{x\sqrt{\frac{b^4x^2\sqrt{-\frac{a^4}{b^7}}+\sqrt{-bx^4+a}\,a^2}{x^2}}+\left(-bx^4+a\right)^{\frac{1}{4}}a}\right)+3\,b\left(-\frac{a^4}{b^7}\right)^{\frac{1}{4}}\log\left(\frac{3\left(b^2x\left(-\frac{a^4}{b^7}\right)^{\frac{1}{4}}+\left(-bx^4+a\right)^{\frac{1}{4}}a\right)}{x}\right)-}{16\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(-b*x^4 + a)^(3/4),x, algorithm="fricas")
```

```
[Out] -1/16*(4*(-b*x^4 + a)^(1/4)*x^3 - 12*b*(-a^4/b^7)^(1/4)*arctan(b^
2*x*(-a^4/b^7)^(1/4)/(x*sqrt((b^4*x^2*sqrt(-a^4/b^7) + sqrt(-b*x^
4 + a)*a^2)/x^2) + (-b*x^4 + a)^(1/4)*a)) + 3*b*(-a^4/b^7)^(1/4)*
log(3*(b^2*x*(-a^4/b^7)^(1/4) + (-b*x^4 + a)^(1/4)*a)/x) - 3*b*(-
a^4/b^7)^(1/4)*log(-3*(b^2*x*(-a^4/b^7)^(1/4) - (-b*x^4 + a)^(1/4
```

```
)*a)/x))/b
```

Sympy [A] time = 4.94367, size = 39, normalized size = 0.17

$$\frac{x^7\Gamma\left(\frac{7}{4}\right){}_2F_1\left(\begin{matrix}\frac{3}{4},\frac{7}{4}\\ \frac{11}{4}\end{matrix}\middle|\frac{bx^4e^{2i\pi}}{a}\right)}{4a^{\frac{3}{4}}\Gamma\left(\frac{11}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(-b*x**4+a)**(3/4),x)
```

```
[Out] x**7*gamma(7/4)*hyper((3/4, 7/4), (11/4,), b*x**4*exp_polar(2*I*p
i)/a)/(4*a**(3/4)*gamma(11/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{(-bx^4+a)^{\frac{3}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(-b*x^4 + a)^(3/4),x, algorithm="giac")
```

```
[Out] integrate(x^6/(-b*x^4 + a)^(3/4), x)
```

3.1249 $\int \frac{x^2}{(a-bx^4)^{3/4}}\,dx$

Optimal. Leaf size=209

$$-\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}\right)}{2\sqrt{2}b^{3/4}}+\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+1\right)}{2\sqrt{2}b^{3/4}}+\frac{\log\left(-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{4\sqrt{2}b^{3/4}}-\frac{\log\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{4\sqrt{2}b^{3/4}}$$

```
[Out] -ArcTan[1 - (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)]/(2*Sqrt[2]*b^(
3/4)) + ArcTan[1 + (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)]/(2*Sqrt
[2]*b^(3/4)) + Log[1 + (Sqrt[b]*x^2)/Sqrt[a - b*x^4] - (Sqrt[2]*b
^(1/4)*x)/(a - b*x^4)^(1/4)]/(4*Sqrt[2]*b^(3/4)) - Log[1 + (Sqrt[
b]*x^2)/Sqrt[a - b*x^4] + (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)]/
(4*Sqrt[2]*b^(3/4))
```

Rubi [A] time = 0.200375, antiderivative size = 209, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 7, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.438

$$-\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}\right)}{2\sqrt{2}b^{3/4}}+\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+1\right)}{2\sqrt{2}b^{3/4}}+\frac{\log\left(-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{4\sqrt{2}b^{3/4}}-\frac{\log\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{4\sqrt{2}b^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a - b*x^4)^(3/4),x]
```

```
[Out] -ArcTan[1 - (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)]/(2*Sqrt[2]*b^(
3/4)) + ArcTan[1 + (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)]/(2*Sqrt
[2]*b^(3/4)) + Log[1 + (Sqrt[b]*x^2)/Sqrt[a - b*x^4] - (Sqrt[2]*b
^(1/4)*x)/(a - b*x^4)^(1/4)]/(4*Sqrt[2]*b^(3/4)) - Log[1 + (Sqrt[
b]*x^2)/Sqrt[a - b*x^4] + (Sqrt[2]*b^(1/4)*x)/(a - b*x^4)^(1/4)]/
(4*Sqrt[2]*b^(3/4))
```

Rubi in Sympy [A] time = 32.2555, size = 185, normalized size = 0.89

$$\frac{\sqrt{2}\log\left(-\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{8b^{\frac{3}{4}}}-\frac{\sqrt{2}\log\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+\frac{\sqrt{b}x^2}{\sqrt{a-bx^4}}+1\right)}{8b^{\frac{3}{4}}}+\frac{\sqrt{2}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}-1\right)}{4b^{\frac{3}{4}}}+\frac{\sqrt{2}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[4]{b}x}{\sqrt[4]{a-bx^4}}+1\right)}{4b^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(-b*x**4+a)**(3/4),x)
```

```
[Out] sqrt(2)*log(-sqrt(2)*b**(1/4)*x/(a - b*x**4)**(1/4) + sqrt(b)*x**
2/sqrt(a - b*x**4) + 1)/(8*b**(3/4)) - sqrt(2)*log(sqrt(2)*b**(1/
4)*x/(a - b*x**4)**(1/4) + sqrt(b)*x**2/sqrt(a - b*x**4) + 1)/(8*
b**(3/4)) + sqrt(2)*atan(sqrt(2)*b**(1/4)*x/(a - b*x**4)**(1/4) -
 1)/(4*b**(3/4)) + sqrt(2)*atan(sqrt(2)*b**(1/4)*x/(a - b*x**4)**
(1/4) + 1)/(4*b**(3/4))
```

Mathematica [C] time = 0.0306848, size = 53, normalized size = 0.25

$$\frac{x^3\left(\frac{a-bx^4}{a}\right)^{3/4}\,_2F_1\left(\frac{3}{4},\frac{3}{4};\frac{7}{4};\frac{bx^4}{a}\right)}{3\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a - b*x^4)^(3/4),x]
```

```
[Out] (x^3*((a - b*x^4)/a)^(3/4)*Hypergeometric2F1[3/4, 3/4, 7/4, (b*x^
4)/a])/(3*(a - b*x^4)^(3/4))
```

Maple [F] time = 0.035, size = 0, normalized size = 0.

$$\int x^2\left(-bx^4+a\right)^{-\frac{3}{4}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(-b*x^4+a)^(3/4),x)
```

```
[Out] int(x^2/(-b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(-b*x^4 + a)^(3/4),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.240085, size = 188, normalized size = 0.9

$$\left(-\frac{1}{b^3}\right)^{\frac{1}{4}}\arctan\left(\frac{bx\left(-\frac{1}{b^3}\right)^{\frac{1}{4}}}{x\sqrt{\frac{b^2x^2\sqrt{-\frac{1}{b^3}}+\sqrt{-bx^4+a}}{x^2}}+\left(-bx^4+a\right)^{\frac{1}{4}}}\right)-\frac{1}{4}\left(-\frac{1}{b^3}\right)^{\frac{1}{4}}\log\left(\frac{bx\left(-\frac{1}{b^3}\right)^{\frac{1}{4}}+\left(-bx^4+a\right)^{\frac{1}{4}}}{x}\right)+\frac{1}{4}\left(-\frac{1}{b^3}\right)^{\frac{1}{4}}\log\left(-\frac{bx\left(-\frac{1}{b^3}\right)^{\frac{1}{4}}-\left(-bx^4+a\right)^{\frac{1}{4}}}{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(-b*x^4 + a)^(3/4),x, algorithm="fricas")
```

```
[Out] (-1/b^3)^(1/4)*arctan(b*x*(-1/b^3)^(1/4)/(x*sqrt((b^2*x^2*sqrt(-1
/b^3) + sqrt(-b*x^4 + a))/x^2) + (-b*x^4 + a)^(1/4))) - 1/4*(-1/b
^3)^(1/4)*log((b*x*(-1/b^3)^(1/4) + (-b*x^4 + a)^(1/4))/x) + 1/4*
(-1/b^3)^(1/4)*log(-(b*x*(-1/b^3)^(1/4) - (-b*x^4 + a)^(1/4))/x)
```

Sympy [A] time = 3.91033, size = 39, normalized size = 0.19

$$\frac{x^{3}\Gamma\left(\frac{3}{4}\right){}_{2}F_{1}\left(\begin{matrix}\frac{3}{4},\frac{3}{4}\\ \frac{7}{4}\end{matrix}\middle|\frac{bx^{4}e^{2i\pi}}{a}\right)}{4a^{\frac{3}{4}}\Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(-b*x**4+a)**(3/4),x)
```

```
[Out] x**3*gamma(3/4)*hyper((3/4, 3/4), (7/4,), b*x**4*exp_polar(2*I*pi
)/a)/(4*a**(3/4)*gamma(7/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{2}}{\left(-bx^{4}+a\right)^{\frac{3}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(-b*x^4 + a)^(3/4),x, algorithm="giac")
```

```
[Out] integrate(x^2/(-b*x^4 + a)^(3/4), x)
```

3.1250 $\int \frac{1}{x^2(a-bx^4)^{3/4}}\,dx$

Optimal. Leaf size=20

$$-\frac{\sqrt[4]{a-bx^4}}{ax}$$

```
[Out] -((a - b*x^4)^(1/4)/(a*x))
```

Rubi [A] time = 0.0212421, antiderivative size = 20, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062

$$-\frac{\sqrt[4]{a-bx^4}}{ax}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^2*(a - b*x^4)^(3/4)),x]

[Out] -((a - b*x^4)^(1/4)/(a*x))
```

Rubi in Sympy [A] time = 3.16108, size = 14, normalized size = 0.7

$$-\frac{\sqrt[4]{a-bx^4}}{ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**2/(-b*x**4+a)**(3/4),x)

[Out] -(a - b*x**4)**(1/4)/(a*x)
```

Mathematica [A] time = 0.0181606, size = 20, normalized size = 1.

$$-\frac{\sqrt[4]{a-bx^4}}{ax}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^2*(a - b*x^4)^(3/4)),x]

[Out] -((a - b*x^4)^(1/4)/(a*x))
```

Maple [A] time = 0.007, size = 19, normalized size = 1.

$$-\frac{1}{ax}\sqrt[4]{-bx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(-b*x^4+a)^(3/4),x)

[Out] -(-b*x^4+a)^(1/4)/a/x
```

Maxima [A] time = 1.43654, size = 24, normalized size = 1.2

$$-\frac{\left(-bx^4+a\right)^{\frac{1}{4}}}{ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^2),x, algorithm="maxima")
```

```
[Out] -(-b*x^4 + a)^(1/4)/(a*x)
```

Fricas [A] time = 0.223795, size = 24, normalized size = 1.2

$$-\frac{\left(-bx^4+a\right)^{\frac{1}{4}}}{ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^2),x, algorithm="fricas")
```

```
[Out] -(-b*x^4 + a)^(1/4)/(a*x)
```

Sympy [A] time = 2.67753, size = 80, normalized size = 4.

$$\begin{cases} \frac{\sqrt[4]{b}\sqrt[4]{\frac{a}{bx^4}-1}\Gamma\left(-\frac{1}{4}\right)}{4a\Gamma\left(\frac{3}{4}\right)} & \text{for } \left|\frac{a}{bx^4}\right|>1 \\ -\frac{\sqrt[4]{b}\sqrt[4]{-\frac{a}{bx^4}+1}e^{\frac{5i\pi}{4}}\Gamma\left(-\frac{1}{4}\right)}{4a\Gamma\left(\frac{3}{4}\right)} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(-b*x**4+a)**(3/4),x)
```

```
[Out] Piecewise((b**(1/4)*(a/(b*x**4) - 1)**(1/4)*gamma(-1/4)/(4*a*gamm
a(3/4)), Abs(a/(b*x**4)) > 1), (-b**(1/4)*(-a/(b*x**4) + 1)**(1/4
)*exp(5*I*pi/4)*gamma(-1/4)/(4*a*gamma(3/4)), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-bx^4+a\right)^{\frac{3}{4}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/((-b*x^4 + a)^(3/4)*x^2), x)
```

3.1251 $\int \frac{1}{x^6(a-bx^4)^{3/4}}\,dx$

Optimal. Leaf size=46

$$-\frac{4b\sqrt[4]{a-bx^4}}{5a^2x}-\frac{\sqrt[4]{a-bx^4}}{5ax^5}$$

```
[Out] -(a - b*x^4)^(1/4)/(5*a*x^5) - (4*b*(a - b*x^4)^(1/4))/(5*a^2*x)
```

Rubi [A] time = 0.0439068, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125

$$-\frac{4b\sqrt[4]{a-bx^4}}{5a^2x}-\frac{\sqrt[4]{a-bx^4}}{5ax^5}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^6*(a - b*x^4)^(3/4)),x]
```

```
[Out] -(a - b*x^4)^(1/4)/(5*a*x^5) - (4*b*(a - b*x^4)^(1/4))/(5*a^2*x)
```

Rubi in Sympy [A] time = 4.94272, size = 37, normalized size = 0.8

$$-\frac{\sqrt[4]{a-bx^4}}{5ax^5}-\frac{4b\sqrt[4]{a-bx^4}}{5a^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**6/(-b*x**4+a)**(3/4),x)
```

```
[Out] -(a - b*x**4)**(1/4)/(5*a*x**5) - 4*b*(a - b*x**4)**(1/4)/(5*a**2
*x)
```

Mathematica [A] time = 0.0245878, size = 30, normalized size = 0.65

$$-\frac{\sqrt[4]{a-bx^4}\left(a+4bx^4\right)}{5a^2x^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^6*(a - b*x^4)^(3/4)),x]
```

```
[Out] -((a - b*x^4)^(1/4)*(a + 4*b*x^4))/(5*a^2*x^5)
```

Maple [A] time = 0.007, size = 27, normalized size = 0.6

$$-\frac{4\,bx^4+a}{5\,x^5a^2}\sqrt[4]{-bx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^6/(-b*x^4+a)^(3/4),x)
```

```
[Out] -1/5*(-b*x^4+a)^(1/4)*(4*b*x^4+a)/x^5/a^2
```

Maxima [A] time = 1.44282, size = 49, normalized size = 1.07

$$-\frac{\frac{5\,(-bx^4+a)^{\frac{1}{4}}b}{x}+\frac{(-bx^4+a)^{\frac{5}{4}}}{x^5}}{5\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^6),x, algorithm="maxima")
```

```
[Out] -1/5*(5*(-b*x^4 + a)^(1/4)*b/x + (-b*x^4 + a)^(5/4)/x^5)/a^2
```

Fricas [A] time = 0.225262, size = 35, normalized size = 0.76

$$-\frac{(4\,bx^4+a)\,(-bx^4+a)^{\frac{1}{4}}}{5\,a^2x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^6),x, algorithm="fricas")
```

```
[Out] -1/5*(4*b*x^4 + a)*(-b*x^4 + a)^(1/4)/(a^2*x^5)
```

Sympy [A] time = 5.14577, size = 286, normalized size = 6.22

$$\begin{cases} -\frac{\sqrt[4]{b}\sqrt[4]{\frac{a}{bx^4}-1}\Gamma\left(-\frac{5}{4}\right)}{16ax^4\Gamma\left(\frac{3}{4}\right)}-\frac{b^{\frac{5}{4}}\sqrt[4]{\frac{a}{bx^4}-1}\Gamma\left(-\frac{5}{4}\right)}{4a^2\Gamma\left(\frac{3}{4}\right)} & \text{for } \left|\frac{a}{bx^4}\right|>1 \\ -\frac{a^2b^{\frac{5}{4}}\sqrt[4]{-\frac{a}{bx^4}+1}e^{\frac{5i\pi}{4}}\Gamma\left(-\frac{5}{4}\right)}{-16a^3bx^4\Gamma\left(\frac{3}{4}\right)+16a^2b^2x^8\Gamma\left(\frac{3}{4}\right)}-\frac{3ab^{\frac{9}{4}}x^4\sqrt[4]{-\frac{a}{bx^4}+1}e^{\frac{5i\pi}{4}}\Gamma\left(-\frac{5}{4}\right)}{-16a^3bx^4\Gamma\left(\frac{3}{4}\right)+16a^2b^2x^8\Gamma\left(\frac{3}{4}\right)}+\frac{4b^{\frac{13}{4}}x^8\sqrt[4]{-\frac{a}{bx^4}+1}e^{\frac{5i\pi}{4}}\Gamma\left(-\frac{5}{4}\right)}{-16a^3bx^4\Gamma\left(\frac{3}{4}\right)+16a^2b^2x^8\Gamma\left(\frac{3}{4}\right)} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**6/(-b*x**4+a)**(3/4),x)
```

```
[Out] Piecewise((-b**(1/4)*(a/(b*x**4) - 1)**(1/4)*gamma(-5/4)/(16*a*x*
*4*gamma(3/4)) - b**(5/4)*(a/(b*x**4) - 1)**(1/4)*gamma(-5/4)/(4*
a**2*gamma(3/4)), Abs(a/(b*x**4)) > 1), (-a**2*b**(5/4)*(-a/(b*x*
*4) + 1)**(1/4)*exp(5*I*pi/4)*gamma(-5/4)/(-16*a**3*b*x**4*gamma(
3/4) + 16*a**2*b**2*x**8*gamma(3/4)) - 3*a*b**(9/4)*x**4*(-a/(b*x
**4) + 1)**(1/4)*exp(5*I*pi/4)*gamma(-5/4)/(-16*a**3*b*x**4*gamma
(3/4) + 16*a**2*b**2*x**8*gamma(3/4)) + 4*b**(13/4)*x**8*(-a/(b*x
**4) + 1)**(1/4)*exp(5*I*pi/4)*gamma(-5/4)/(-16*a**3*b*x**4*gamma
(3/4) + 16*a**2*b**2*x**8*gamma(3/4)), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(-bx^4+a)^{\frac{3}{4}}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^6),x, algorithm="giac")
```

```
[Out] integrate(1/((-b*x^4 + a)^(3/4)*x^6), x)
```

3.1252 $\int \frac{1}{x^{10}(a-bx^4)^{3/4}}\,dx$

Optimal. Leaf size=71

$$-\frac{32b^2\sqrt[4]{a-bx^4}}{45a^3x}-\frac{8b\sqrt[4]{a-bx^4}}{45a^2x^5}-\frac{\sqrt[4]{a-bx^4}}{9ax^9}$$

```
[Out] -(a - b*x^4)^(1/4)/(9*a*x^9) - (8*b*(a - b*x^4)^(1/4))/(45*a^2*x^
5) - (32*b^2*(a - b*x^4)^(1/4))/(45*a^3*x)
```

Rubi [A] time = 0.0696853, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125

$$-\frac{32b^2\sqrt[4]{a-bx^4}}{45a^3x}-\frac{8b\sqrt[4]{a-bx^4}}{45a^2x^5}-\frac{\sqrt[4]{a-bx^4}}{9ax^9}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^10*(a - b*x^4)^(3/4)),x]
```

```
[Out] -(a - b*x^4)^(1/4)/(9*a*x^9) - (8*b*(a - b*x^4)^(1/4))/(45*a^2*x^
5) - (32*b^2*(a - b*x^4)^(1/4))/(45*a^3*x)
```

Rubi in Sympy [A] time = 7.69216, size = 61, normalized size = 0.86

$$-\frac{\sqrt[4]{a-bx^4}}{9ax^9}-\frac{8b\sqrt[4]{a-bx^4}}{45a^2x^5}-\frac{32b^2\sqrt[4]{a-bx^4}}{45a^3x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**10/(-b*x**4+a)**(3/4),x)
```

```
[Out] -(a - b*x**4)**(1/4)/(9*a*x**9) - 8*b*(a - b*x**4)**(1/4)/(45*a**
2*x**5) - 32*b**2*(a - b*x**4)**(1/4)/(45*a**3*x)
```

Mathematica [A] time = 0.0325752, size = 43, normalized size = 0.61

$$-\frac{\sqrt[4]{a-bx^4}\left(5a^2+8abx^4+32b^2x^8\right)}{45a^3x^9}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^10*(a - b*x^4)^(3/4)),x]
```

```
[Out] -((a - b*x^4)^(1/4)*(5*a^2 + 8*a*b*x^4 + 32*b^2*x^8))/(45*a^3*x^9
)
```

Maple [A] time = 0.006, size = 40, normalized size = 0.6

$$-\frac{32\,b^2x^8+8\,abx^4+5\,a^2}{45\,a^3x^9}\sqrt[4]{-bx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^10/(-b*x^4+a)^(3/4),x)
```

```
[Out] -1/45*(-b*x^4+a)^(1/4)*(32*b^2*x^8+8*a*b*x^4+5*a^2)/a^3/x^9
```

Maxima [A] time = 1.44039, size = 74, normalized size = 1.04

$$-\frac{\frac{45\,(-bx^4+a)^{\frac{1}{4}}b^2}{x}+\frac{18\,(-bx^4+a)^{\frac{5}{4}}b}{x^5}+\frac{5\,(-bx^4+a)^{\frac{9}{4}}}{x^9}}{45\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^10),x, algorithm="maxima")
```

```
[Out] -1/45*(45*(-b*x^4 + a)^(1/4)*b^2/x + 18*(-b*x^4 + a)^(5/4)*b/x^5
+ 5*(-b*x^4 + a)^(9/4)/x^9)/a^3
```

Fricas [A] time = 0.226916, size = 53, normalized size = 0.75

$$-\frac{\left(32\,b^2x^8+8\,abx^4+5\,a^2\right)\left(-bx^4+a\right)^{\frac{1}{4}}}{45\,a^3x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^10),x, algorithm="fricas")
```

```
[Out] -1/45*(32*b^2*x^8 + 8*a*b*x^4 + 5*a^2)*(-b*x^4 + a)^(1/4)/(a^3*x^
9)
```

Sympy [A] time = 11.2171, size = 864, normalized size = 12.17

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**10/(-b*x**4+a)**(3/4),x)
```

```
[Out] Piecewise((5*a**4*b**(17/4)*(a/(b*x**4) - 1)**(1/4)*gamma(-9/4)/(
64*a**5*b**4*x**8*gamma(3/4) - 128*a**4*b**5*x**12*gamma(3/4) + 6
4*a**3*b**6*x**16*gamma(3/4)) - 2*a**3*b**(21/4)*x**4*(a/(b*x**4)
 - 1)**(1/4)*gamma(-9/4)/(64*a**5*b**4*x**8*gamma(3/4) - 128*a**4
*b**5*x**12*gamma(3/4) + 64*a**3*b**6*x**16*gamma(3/4)) + 21*a**2
*b**(25/4)*x**8*(a/(b*x**4) - 1)**(1/4)*gamma(-9/4)/(64*a**5*b**4
*x**8*gamma(3/4) - 128*a**4*b**5*x**12*gamma(3/4) + 64*a**3*b**6*
x**16*gamma(3/4)) - 56*a*b**(29/4)*x**12*(a/(b*x**4) - 1)**(1/4)*
gamma(-9/4)/(64*a**5*b**4*x**8*gamma(3/4) - 128*a**4*b**5*x**12*g
amma(3/4) + 64*a**3*b**6*x**16*gamma(3/4)) + 32*b**(33/4)*x**16*(
a/(b*x**4) - 1)**(1/4)*gamma(-9/4)/(64*a**5*b**4*x**8*gamma(3/4)
- 128*a**4*b**5*x**12*gamma(3/4) + 64*a**3*b**6*x**16*gamma(3/4))
, Abs(a/(b*x**4)) > 1), (-5*a**4*b**(17/4)*(-a/(b*x**4) + 1)**(1/
4)*exp(13*I*pi/4)*gamma(-9/4)/(64*a**5*b**4*x**8*gamma(3/4) - 128
*a**4*b**5*x**12*gamma(3/4) + 64*a**3*b**6*x**16*gamma(3/4)) + 2*
a**3*b**(21/4)*x**4*(-a/(b*x**4) + 1)**(1/4)*exp(13*I*pi/4)*gamma
(-9/4)/(64*a**5*b**4*x**8*gamma(3/4) - 128*a**4*b**5*x**12*gamma(
3/4) + 64*a**3*b**6*x**16*gamma(3/4)) - 21*a**2*b**(25/4)*x**8*(-
a/(b*x**4) + 1)**(1/4)*exp(13*I*pi/4)*gamma(-9/4)/(64*a**5*b**4*x
**8*gamma(3/4) - 128*a**4*b**5*x**12*gamma(3/4) + 64*a**3*b**6*x*
*16*gamma(3/4)) + 56*a*b**(29/4)*x**12*(-a/(b*x**4) + 1)**(1/4)*e
xp(13*I*pi/4)*gamma(-9/4)/(64*a**5*b**4*x**8*gamma(3/4) - 128*a**
```

```
4*b**5*x**12*gamma(3/4) + 64*a**3*b**6*x**16*gamma(3/4)) - 32*b**
(33/4)*x**16*(-a/(b*x**4) + 1)**(1/4)*exp(13*I*pi/4)*gamma(-9/4)/
(64*a**5*b**4*x**8*gamma(3/4) - 128*a**4*b**5*x**12*gamma(3/4) +
64*a**3*b**6*x**16*gamma(3/4)), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(-bx^4+a)^{\frac{3}{4}}x^{10}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^10),x, algorithm="giac")
```

```
[Out] integrate(1/((-b*x^4 + a)^(3/4)*x^10), x)
```

3.1253 $\int \frac{1}{x^{14}(a-bx^4)^{3/4}}\,dx$

Optimal. Leaf size=96

$$-\frac{128b^3\sqrt[4]{a-bx^4}}{195a^4x}-\frac{32b^2\sqrt[4]{a-bx^4}}{195a^3x^5}-\frac{4b\sqrt[4]{a-bx^4}}{39a^2x^9}-\frac{\sqrt[4]{a-bx^4}}{13ax^{13}}$$

```
[Out] -(a - b*x^4)^(1/4)/(13*a*x^13) - (4*b*(a - b*x^4)^(1/4))/(39*a^2*
x^9) - (32*b^2*(a - b*x^4)^(1/4))/(195*a^3*x^5) - (128*b^3*(a - b
*x^4)^(1/4))/(195*a^4*x)
```

Rubi [A] time = 0.0977074, antiderivative size = 96, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125

$$-\frac{128b^3\sqrt[4]{a-bx^4}}{195a^4x}-\frac{32b^2\sqrt[4]{a-bx^4}}{195a^3x^5}-\frac{4b\sqrt[4]{a-bx^4}}{39a^2x^9}-\frac{\sqrt[4]{a-bx^4}}{13ax^{13}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^14*(a - b*x^4)^(3/4)),x]
```

```
[Out] -(a - b*x^4)^(1/4)/(13*a*x^13) - (4*b*(a - b*x^4)^(1/4))/(39*a^2*
x^9) - (32*b^2*(a - b*x^4)^(1/4))/(195*a^3*x^5) - (128*b^3*(a - b
*x^4)^(1/4))/(195*a^4*x)
```

Rubi in Sympy [A] time = 11.1506, size = 85, normalized size = 0.89

$$-\frac{\sqrt[4]{a-bx^4}}{13ax^{13}}-\frac{4b\sqrt[4]{a-bx^4}}{39a^2x^9}-\frac{32b^2\sqrt[4]{a-bx^4}}{195a^3x^5}-\frac{128b^3\sqrt[4]{a-bx^4}}{195a^4x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**14/(-b*x**4+a)**(3/4),x)
```

```
[Out] -(a - b*x**4)**(1/4)/(13*a*x**13) - 4*b*(a - b*x**4)**(1/4)/(39*a
**2*x**9) - 32*b**2*(a - b*x**4)**(1/4)/(195*a**3*x**5) - 128*b**
3*(a - b*x**4)**(1/4)/(195*a**4*x)
```

Mathematica [A] time = 0.0414992, size = 54, normalized size = 0.56

$$-\frac{\sqrt[4]{a-bx^4}\left(15a^3+20a^2bx^4+32ab^2x^8+128b^3x^{12}\right)}{195a^4x^{13}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^14*(a - b*x^4)^(3/4)),x]
```

```
[Out] -((a - b*x^4)^(1/4)*(15*a^3 + 20*a^2*b*x^4 + 32*a*b^2*x^8 + 128*b
^3*x^12))/(195*a^4*x^13)
```

Maple [A] time = 0.009, size = 51, normalized size = 0.5

$$-\frac{128\,b^3x^{12}+32\,ab^2x^8+20\,a^2bx^4+15\,a^3}{195\,x^{13}a^4}\sqrt[4]{-bx^4+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^14/(-b*x^4+a)^(3/4),x)
```

```
[Out] -1/195*(-b*x^4+a)^(1/4)*(128*b^3*x^12+32*a*b^2*x^8+20*a^2*b*x^4+1
5*a^3)/x^13/a^4
```

Maxima [A] time = 1.44402, size = 99, normalized size = 1.03

$$-\frac{\frac{195 \left(-b x^{4}+a\right)^{\frac{1}{4}} b^{3}}{x}+\frac{117 \left(-b x^{4}+a\right)^{\frac{5}{4}} b^{2}}{x^{5}}+\frac{65 \left(-b x^{4}+a\right)^{\frac{9}{4}} b}{x^{9}}+\frac{15 \left(-b x^{4}+a\right)^{\frac{13}{4}}}{x^{13}}}{195 a^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^14),x, algorithm="maxima")
```

```
[Out] -1/195*(195*(-b*x^4 + a)^(1/4)*b^3/x + 117*(-b*x^4 + a)^(5/4)*b^2
/x^5 + 65*(-b*x^4 + a)^(9/4)*b/x^9 + 15*(-b*x^4 + a)^(13/4)/x^13)
/a^4
```

Fricas [A] time = 0.229411, size = 68, normalized size = 0.71

$$-\frac{\left(128 b^{3} x^{12}+32 a b^{2} x^{8}+20 a^{2} b x^{4}+15 a^{3}\right) \left(-b x^{4}+a\right)^{\frac{1}{4}}}{195 a^{4} x^{13}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^14),x, algorithm="fricas")
```

```
[Out] -1/195*(128*b^3*x^12 + 32*a*b^2*x^8 + 20*a^2*b*x^4 + 15*a^3)*(-b*
x^4 + a)^(1/4)/(a^4*x^13)
```

Sympy [A] time = 23.7669, size = 1452, normalized size = 15.12

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**14/(-b*x**4+a)**(3/4),x)
```

```
[Out] Piecewise((45*a**6*b**(37/4)*(a/(b*x**4) - 1)**(1/4)*gamma(-13/4)
/(-256*a**7*b**9*x**12*gamma(3/4) + 768*a**6*b**10*x**16*gamma(3/
4) - 768*a**5*b**11*x**20*gamma(3/4) + 256*a**4*b**12*x**24*gamma
(3/4)) - 75*a**5*b**(41/4)*x**4*(a/(b*x**4) - 1)**(1/4)*gamma(-13
/4)/(-256*a**7*b**9*x**12*gamma(3/4) + 768*a**6*b**10*x**16*gamma
(3/4) - 768*a**5*b**11*x**20*gamma(3/4) + 256*a**4*b**12*x**24*ga
mma(3/4)) + 51*a**4*b**(45/4)*x**8*(a/(b*x**4) - 1)**(1/4)*gamma(
-13/4)/(-256*a**7*b**9*x**12*gamma(3/4) + 768*a**6*b**10*x**16*ga
mma(3/4) - 768*a**5*b**11*x**20*gamma(3/4) + 256*a**4*b**12*x**24
*gamma(3/4)) + 231*a**3*b**(49/4)*x**12*(a/(b*x**4) - 1)**(1/4)*g
amma(-13/4)/(-256*a**7*b**9*x**12*gamma(3/4) + 768*a**6*b**10*x**
16*gamma(3/4) - 768*a**5*b**11*x**20*gamma(3/4) + 256*a**4*b**12*
x**24*gamma(3/4)) - 924*a**2*b**(53/4)*x**16*(a/(b*x**4) - 1)**(1
/4)*gamma(-13/4)/(-256*a**7*b**9*x**12*gamma(3/4) + 768*a**6*b**1
0*x**16*gamma(3/4) - 768*a**5*b**11*x**20*gamma(3/4) + 256*a**4*b
**12*x**24*gamma(3/4)) + 1056*a*b**(57/4)*x**20*(a/(b*x**4) - 1)*
*(1/4)*gamma(-13/4)/(-256*a**7*b**9*x**12*gamma(3/4) + 768*a**6*b
**10*x**16*gamma(3/4) - 768*a**5*b**11*x**20*gamma(3/4) + 256*a**
```

```
4*b**12*x**24*gamma(3/4)) - 384*b**(61/4)*x**24*(a/(b*x**4) - 1)*
*(1/4)*gamma(-13/4)/(-256*a**7*b**9*x**12*gamma(3/4) + 768*a**6*b
**10*x**16*gamma(3/4) - 768*a**5*b**11*x**20*gamma(3/4) + 256*a**
4*b**12*x**24*gamma(3/4)), Abs(a/(b*x**4)) > 1), (-45*a**6*b**(37
/4)*(-a/(b*x**4) + 1)**(1/4)*exp(13*I*pi/4)*gamma(-13/4)/(-256*a*
*7*b**9*x**12*gamma(3/4) + 768*a**6*b**10*x**16*gamma(3/4) - 768*
a**5*b**11*x**20*gamma(3/4) + 256*a**4*b**12*x**24*gamma(3/4)) +
75*a**5*b**(41/4)*x**4*(-a/(b*x**4) + 1)**(1/4)*exp(13*I*pi/4)*ga
mma(-13/4)/(-256*a**7*b**9*x**12*gamma(3/4) + 768*a**6*b**10*x**1
6*gamma(3/4) - 768*a**5*b**11*x**20*gamma(3/4) + 256*a**4*b**12*x
**24*gamma(3/4)) - 51*a**4*b**(45/4)*x**8*(-a/(b*x**4) + 1)**(1/4
)*exp(13*I*pi/4)*gamma(-13/4)/(-256*a**7*b**9*x**12*gamma(3/4) +
768*a**6*b**10*x**16*gamma(3/4) - 768*a**5*b**11*x**20*gamma(3/4)
 + 256*a**4*b**12*x**24*gamma(3/4)) - 231*a**3*b**(49/4)*x**12*(-
a/(b*x**4) + 1)**(1/4)*exp(13*I*pi/4)*gamma(-13/4)/(-256*a**7*b**
9*x**12*gamma(3/4) + 768*a**6*b**10*x**16*gamma(3/4) - 768*a**5*b
**11*x**20*gamma(3/4) + 256*a**4*b**12*x**24*gamma(3/4)) + 924*a*
*2*b**(53/4)*x**16*(-a/(b*x**4) + 1)**(1/4)*exp(13*I*pi/4)*gamma(
-13/4)/(-256*a**7*b**9*x**12*gamma(3/4) + 768*a**6*b**10*x**16*ga
mma(3/4) - 768*a**5*b**11*x**20*gamma(3/4) + 256*a**4*b**12*x**24
*gamma(3/4)) - 1056*a*b**(57/4)*x**20*(-a/(b*x**4) + 1)**(1/4)*ex
p(13*I*pi/4)*gamma(-13/4)/(-256*a**7*b**9*x**12*gamma(3/4) + 768*
a**6*b**10*x**16*gamma(3/4) - 768*a**5*b**11*x**20*gamma(3/4) + 2
56*a**4*b**12*x**24*gamma(3/4)) + 384*b**(61/4)*x**24*(-a/(b*x**4
) + 1)**(1/4)*exp(13*I*pi/4)*gamma(-13/4)/(-256*a**7*b**9*x**12*g
amma(3/4) + 768*a**6*b**10*x**16*gamma(3/4) - 768*a**5*b**11*x**2
0*gamma(3/4) + 256*a**4*b**12*x**24*gamma(3/4)), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(-bx^4 + a)^{\frac{3}{4}} x^{14}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^14),x, algorithm="giac")
```

```
[Out] integrate(1/((-b*x^4 + a)^(3/4)*x^14), x)
```

3.1254 $\int \frac{x^{12}}{(a-bx^4)^{3/4}}\,dx$

Optimal. Leaf size=134

$$-\frac{3a^{5/2}x^3\left(1-\frac{a}{bx^4}\right)^{3/4}F\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{8b^{5/2}(a-bx^4)^{3/4}}-\frac{3a^2x\sqrt[4]{a-bx^4}}{8b^3}-\frac{3ax^5\sqrt[4]{a-bx^4}}{20b^2}-\frac{x^9\sqrt[4]{a-bx^4}}{10b}$$

```
[Out] (-3*a^2*x*(a - b*x^4)^(1/4))/(8*b^3) - (3*a*x^5*(a - b*x^4)^(1/4)
)/(20*b^2) - (x^9*(a - b*x^4)^(1/4))/(10*b) - (3*a^(5/2)*(1 - a/(
b*x^4))^(3/4)*x^3*EllipticF[ArcCsc[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/
(8*b^(5/2)*(a - b*x^4)^(3/4))
```

Rubi [A] time = 0.172759, antiderivative size = 134, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312

$$-\frac{3a^{5/2}x^3\left(1-\frac{a}{bx^4}\right)^{3/4}F\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{8b^{5/2}(a-bx^4)^{3/4}}-\frac{3a^2x\sqrt[4]{a-bx^4}}{8b^3}-\frac{3ax^5\sqrt[4]{a-bx^4}}{20b^2}-\frac{x^9\sqrt[4]{a-bx^4}}{10b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^12/(a - b*x^4)^(3/4),x]
```

```
[Out] (-3*a^2*x*(a - b*x^4)^(1/4))/(8*b^3) - (3*a*x^5*(a - b*x^4)^(1/4)
)/(20*b^2) - (x^9*(a - b*x^4)^(1/4))/(10*b) - (3*a^(5/2)*(1 - a/(
b*x^4))^(3/4)*x^3*EllipticF[ArcCsc[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/
(8*b^(5/2)*(a - b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 23.5756, size = 119, normalized size = 0.89

$$-\frac{3a^{\frac{5}{2}}x^3\left(-\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{asin}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{8b^{\frac{5}{2}}(a-bx^4)^{\frac{3}{4}}}-\frac{3a^2x\sqrt[4]{a-bx^4}}{8b^3}-\frac{3ax^5\sqrt[4]{a-bx^4}}{20b^2}-\frac{x^9\sqrt[4]{a-bx^4}}{10b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**12/(-b*x**4+a)**(3/4),x)
```

```
[Out] -3*a**(5/2)*x**3*(-a/(b*x**4) + 1)**(3/4)*elliptic_f(asin(sqrt(a)
/(sqrt(b)*x**2))/2, 2)/(8*b**(5/2)*(a - b*x**4)**(3/4)) - 3*a**2*
x*(a - b*x**4)**(1/4)/(8*b**3) - 3*a*x**5*(a - b*x**4)**(1/4)/(20
*b**2) - x**9*(a - b*x**4)**(1/4)/(10*b)
```

Mathematica [C] time = 0.0633525, size = 91, normalized size = 0.68

$$\frac{15a^3x\left(1-\frac{bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};\frac{bx^4}{a}\right)-15a^3x+9a^2bx^5+2ab^2x^9+4b^3x^{13}}{40b^3(a-bx^4)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^12/(a - b*x^4)^(3/4),x]
```

```
[Out] (-15*a^3*x + 9*a^2*b*x^5 + 2*a*b^2*x^9 + 4*b^3*x^13 + 15*a^3*x*(1
 - (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/4, 3/4, 5/4, (b*x^4)/a])/
```

```
(40*b^3*(a - b*x^4)^(3/4))
```

Maple [F] time = 0.028, size = 0, normalized size = 0.

$$\int x^{12} \left(-b x^4 + a\right)^{-\frac{3}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^12/(-b*x^4+a)^(3/4),x)
```

```
[Out] int(x^12/(-b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{12}}{\left(-b x^4 + a\right)^{\frac{3}{4}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^12/(-b*x^4 + a)^(3/4),x, algorithm="maxima")
```

```
[Out] integrate(x^12/(-b*x^4 + a)^(3/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{12}}{\left(-b x^4 + a\right)^{\frac{3}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^12/(-b*x^4 + a)^(3/4),x, algorithm="fricas")
```

```
[Out] integral(x^12/(-b*x^4 + a)^(3/4), x)
```

Sympy [A] time = 7.22891, size = 39, normalized size = 0.29

$$\frac{x^{13} \Gamma\left(\frac{13}{4}\right) {}_2F_1\left(\begin{matrix} \frac{3}{4}, \frac{13}{4} \\ \frac{17}{4} \end{matrix}\middle| \frac{b x^4 e^{2 i \pi}}{a}\right)}{4 a^{\frac{3}{4}} \Gamma\left(\frac{17}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**12/(-b*x**4+a)**(3/4),x)
```

```
[Out] x**13*gamma(13/4)*hyper((3/4, 13/4), (17/4,), b*x**4*exp_polar(2*
I*pi)/a)/(4*a**(3/4)*gamma(17/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{12}}{\left(-b x^4 + a\right)^{\frac{3}{4}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^12/(-b*x^4 + a)^(3/4),x, algorithm="giac")
```

```
[Out] integrate(x^12/(-b*x^4 + a)^(3/4), x)
```

3.1255 $\int \frac{x^8}{(a-bx^4)^{3/4}}\,dx$

Optimal. Leaf size=109

$$-\frac{5a^{3/2}x^3\left(1-\frac{a}{bx^4}\right)^{3/4}F\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{12b^{3/2}\left(a-bx^4\right)^{3/4}}-\frac{5ax\sqrt[4]{a-bx^4}}{12b^2}-\frac{x^5\sqrt[4]{a-bx^4}}{6b}$$

```
[Out] (-5*a*x*(a - b*x^4)^(1/4))/(12*b^2) - (x^5*(a - b*x^4)^(1/4))/(6*
b) - (5*a^(3/2)*(1 - a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCsc[(Sqrt[
b]*x^2)/Sqrt[a]]/2, 2])/(12*b^(3/2)*(a - b*x^4)^(3/4))
```

Rubi [A] time = 0.139454, antiderivative size = 109, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312

$$-\frac{5a^{3/2}x^3\left(1-\frac{a}{bx^4}\right)^{3/4}F\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{12b^{3/2}\left(a-bx^4\right)^{3/4}}-\frac{5ax\sqrt[4]{a-bx^4}}{12b^2}-\frac{x^5\sqrt[4]{a-bx^4}}{6b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8/(a - b*x^4)^(3/4),x]
```

```
[Out] (-5*a*x*(a - b*x^4)^(1/4))/(12*b^2) - (x^5*(a - b*x^4)^(1/4))/(6*
b) - (5*a^(3/2)*(1 - a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCsc[(Sqrt[
b]*x^2)/Sqrt[a]]/2, 2])/(12*b^(3/2)*(a - b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 19.2726, size = 95, normalized size = 0.87

$$-\frac{5a^{\frac{3}{2}}x^3\left(-\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{asin}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{12b^{\frac{3}{2}}\left(a-bx^4\right)^{\frac{3}{4}}}-\frac{5ax\sqrt[4]{a-bx^4}}{12b^2}-\frac{x^5\sqrt[4]{a-bx^4}}{6b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8/(-b*x**4+a)**(3/4),x)
```

```
[Out] -5*a**(3/2)*x**3*(-a/(b*x**4) + 1)**(3/4)*elliptic_f(asin(sqrt(a)
/(sqrt(b)*x**2))/2, 2)/(12*b**(3/2)*(a - b*x**4)**(3/4)) - 5*a*x*
(a - b*x**4)**(1/4)/(12*b**2) - x**5*(a - b*x**4)**(1/4)/(6*b)
```

Mathematica [C] time = 0.0557986, size = 80, normalized size = 0.73

$$\frac{5a^2x\left(1-\frac{bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};\frac{bx^4}{a}\right)-5a^2x+3abx^5+2b^2x^9}{12b^2\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8/(a - b*x^4)^(3/4),x]
```

```
[Out] (-5*a^2*x + 3*a*b*x^5 + 2*b^2*x^9 + 5*a^2*x*(1 - (b*x^4)/a)^(3/4)
*Hypergeometric2F1[1/4, 3/4, 5/4, (b*x^4)/a])/(12*b^2*(a - b*x^4)
^(3/4))
```

Maple [F] time = 0.028, size = 0, normalized size = 0.

$$\int x^{8} \left(-b x^{4}+a \right)^{-\frac{3}{4}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8/(-b*x^4+a)^(3/4),x)
```

```
[Out] int(x^8/(-b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{8}}{(-bx^{4}+a)^{\frac{3}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(-b*x^4 + a)^(3/4),x, algorithm="maxima")
```

```
[Out] integrate(x^8/(-b*x^4 + a)^(3/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{8}}{(-bx^{4}+a)^{\frac{3}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(-b*x^4 + a)^(3/4),x, algorithm="fricas")
```

```
[Out] integral(x^8/(-b*x^4 + a)^(3/4), x)
```

Sympy [A] time = 3.70027, size = 39, normalized size = 0.36

$$\frac{x^{9}\Gamma\left(\frac{9}{4}\right){}_{2}F_{1}\left(\begin{matrix}\frac{3}{4},\frac{9}{4}\\ \frac{13}{4}\end{matrix}\middle|\frac{bx^{4}e^{2i\pi}}{a}\right)}{4a^{\frac{3}{4}}\Gamma\left(\frac{13}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8/(-b*x**4+a)**(3/4),x)
```

```
[Out] x**9*gamma(9/4)*hyper((3/4, 9/4), (13/4,), b*x**4*exp_polar(2*I*p
i)/a)/(4*a**(3/4)*gamma(13/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{8}}{(-bx^{4}+a)^{\frac{3}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(-b*x^4 + a)^(3/4),x, algorithm="giac")
```

```
[Out] integrate(x^8/(-b*x^4 + a)^(3/4), x)
```

3.1256 $\int \frac{x^4}{(a-bx^4)^{3/4}}\,dx$

Optimal. Leaf size=86

$$-\frac{x\sqrt[4]{a-bx^4}}{2b}-\frac{\sqrt{a}x^3\left(1-\frac{a}{bx^4}\right)^{3/4}F\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{2\sqrt{b}\left(a-bx^4\right)^{3/4}}$$

```
[Out] -(x*(a - b*x^4)^(1/4))/(2*b) - (Sqrt[a]*(1 - a/(b*x^4))^(3/4)*x^3
*EllipticF[ArcCsc[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(2*Sqrt[b]*(a - b
*x^4)^(3/4))
```

Rubi [A] time = 0.108521, antiderivative size = 86, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312

$$-\frac{x\sqrt[4]{a-bx^4}}{2b}-\frac{\sqrt{a}x^3\left(1-\frac{a}{bx^4}\right)^{3/4}F\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{2\sqrt{b}\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a - b*x^4)^(3/4),x]
```

```
[Out] -(x*(a - b*x^4)^(1/4))/(2*b) - (Sqrt[a]*(1 - a/(b*x^4))^(3/4)*x^3
*EllipticF[ArcCsc[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(2*Sqrt[b]*(a - b
*x^4)^(3/4))
```

Rubi in Sympy [A] time = 15.725, size = 71, normalized size = 0.83

$$-\frac{\sqrt{a}x^3\left(-\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{asin}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{2\sqrt{b}\left(a-bx^4\right)^{\frac{3}{4}}}-\frac{x\sqrt[4]{a-bx^4}}{2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(-b*x**4+a)**(3/4),x)
```

```
[Out] -sqrt(a)*x**3*(-a/(b*x**4) + 1)**(3/4)*elliptic_f(asin(sqrt(a)/(s
qrt(b)*x**2))/2, 2)/(2*sqrt(b)*(a - b*x**4)**(3/4)) - x*(a - b*x*
*4)**(1/4)/(2*b)
```

Mathematica [C] time = 0.0510693, size = 64, normalized size = 0.74

$$\frac{x\left(a\left(1-\frac{bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};\frac{bx^4}{a}\right)-a+bx^4\right)}{2b\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(a - b*x^4)^(3/4),x]
```

```
[Out] (x*(-a + b*x^4 + a*(1 - (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/4, 3
/4, 5/4, (b*x^4)/a]))/(2*b*(a - b*x^4)^(3/4))
```

Maple [F] time = 0.028, size = 0, normalized size = 0.

$$\int x^4 \left(-b x^4+a\right)^{-\frac{3}{4}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(-b*x^4+a)^(3/4),x)
```

```
[Out] int(x^4/(-b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\left(-b x^4+a\right)^{\frac{3}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(-b*x^4 + a)^(3/4),x, algorithm="maxima")
```

```
[Out] integrate(x^4/(-b*x^4 + a)^(3/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^4}{\left(-b x^4+a\right)^{\frac{3}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(-b*x^4 + a)^(3/4),x, algorithm="fricas")
```

```
[Out] integral(x^4/(-b*x^4 + a)^(3/4), x)
```

Sympy [A] time = 2.65272, size = 39, normalized size = 0.45

$$\frac{x^5 \Gamma\left(\frac{5}{4}\right) {}_2F_1\left(\begin{matrix} \frac{3}{4}, \frac{5}{4} \\ \frac{9}{4} \end{matrix}\middle| \frac{b x^4 e^{2i\pi}}{a}\right)}{4 a^{\frac{3}{4}} \Gamma\left(\frac{9}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(-b*x**4+a)**(3/4),x)
```

```
[Out] x**5*gamma(5/4)*hyper((3/4, 5/4), (9/4,), b*x**4*exp_polar(2*I*pi
)/a)/(4*a**(3/4)*gamma(9/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\left(-b x^4+a\right)^{\frac{3}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(-b*x^4 + a)^(3/4),x, algorithm="giac")

[Out] integrate(x^4/(-b*x^4 + a)^(3/4), x)
```

3.1257 $\int \frac{1}{(a-bx^4)^{3/4}} dx$

Optimal. Leaf size=63

$$-\frac{\sqrt{b}x^3\left(1-\frac{a}{bx^4}\right)^{3/4}F\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{\sqrt{a}\,(a-bx^4)^{3/4}}$$

```
[Out] -((Sqrt[b]*(1 - a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCsc[(Sqrt[b]*x^
2)/Sqrt[a]]/2, 2])/(Sqrt[a]*(a - b*x^4)^(3/4)))
```

Rubi [A] time = 0.0771831, antiderivative size = 63, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{\sqrt{b}x^3\left(1-\frac{a}{bx^4}\right)^{3/4}F\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{\sqrt{a}\,(a-bx^4)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a - b*x^4)^(-3/4),x]
```

```
[Out] -((Sqrt[b]*(1 - a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCsc[(Sqrt[b]*x^
2)/Sqrt[a]]/2, 2])/(Sqrt[a]*(a - b*x^4)^(3/4)))
```

Rubi in Sympy [A] time = 11.7814, size = 54, normalized size = 0.86

$$-\frac{\sqrt{b}x^3\left(-\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{asin}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{\sqrt{a}\,(a-bx^4)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(-b*x**4+a)**(3/4),x)
```

```
[Out] -sqrt(b)*x**3*(-a/(b*x**4) + 1)**(3/4)*elliptic_f(asin(sqrt(a)/(s
qrt(b)*x**2))/2, 2)/(sqrt(a)*(a - b*x**4)**(3/4))
```

Mathematica [C] time = 0.0222526, size = 48, normalized size = 0.76

$$\frac{x\left(\frac{a-bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};\frac{bx^4}{a}\right)}{(a-bx^4)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a - b*x^4)^(-3/4),x]
```

```
[Out] (x*((a - b*x^4)/a)^(3/4)*Hypergeometric2F1[1/4, 3/4, 5/4, (b*x^4)
/a])/(a - b*x^4)^(3/4)
```

Maple [F] time = 0.043, size = 0, normalized size = 0.

$$\int\left(-bx^4+a\right)^{-\frac{3}{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(-b*x^4+a)^(3/4),x)
```

```
[Out] int(1/(-b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-bx^4+a\right)^{\frac{3}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(-3/4),x, algorithm="maxima")
```

```
[Out] integrate((-b*x^4 + a)^(-3/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\left(-bx^4+a\right)^{\frac{3}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(-3/4),x, algorithm="fricas")
```

```
[Out] integral((-b*x^4 + a)^(-3/4), x)
```

Sympy [A] time = 2.37479, size = 37, normalized size = 0.59

$$\frac{x\,\Gamma\left(\frac{1}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{4},\frac{3}{4}\\ \frac{5}{4}\end{matrix}\middle|\frac{bx^4e^{2i\pi}}{a}\right)}{4a^{\frac{3}{4}}\,\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(-b*x**4+a)**(3/4),x)
```

```
[Out] x*gamma(1/4)*hyper((1/4, 3/4), (5/4,), b*x**4*exp_polar(2*I*pi)/a
)/(4*a**(3/4)*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-bx^4+a\right)^{\frac{3}{4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-b*x^4 + a)^(-3/4),x, algorithm="giac")
```

```
[Out] integrate((-b*x^4 + a)^(-3/4), x)
```

3.1258 $\int \frac{1}{x^4(a-bx^4)^{3/4}}\,dx$

Optimal. Leaf size=88

$$-\frac{2b^{3/2}x^3\left(1-\frac{a}{bx^4}\right)^{3/4}F\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{3a^{3/2}\left(a-bx^4\right)^{3/4}}-\frac{\sqrt[4]{a-bx^4}}{3ax^3}$$

```
[Out] -(a - b*x^4)^(1/4)/(3*a*x^3) - (2*b^(3/2)*(1 - a/(b*x^4))^(3/4)*x
^3*EllipticF[ArcCsc[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(3*a^(3/2)*(a -
 b*x^4)^(3/4))
```

Rubi [A] time = 0.107806, antiderivative size = 88, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312

$$-\frac{2b^{3/2}x^3\left(1-\frac{a}{bx^4}\right)^{3/4}F\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{3a^{3/2}\left(a-bx^4\right)^{3/4}}-\frac{\sqrt[4]{a-bx^4}}{3ax^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*(a - b*x^4)^(3/4)),x]
```

```
[Out] -(a - b*x^4)^(1/4)/(3*a*x^3) - (2*b^(3/2)*(1 - a/(b*x^4))^(3/4)*x
^3*EllipticF[ArcCsc[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(3*a^(3/2)*(a -
 b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 15.7925, size = 75, normalized size = 0.85

$$-\frac{\sqrt[4]{a-bx^4}}{3ax^3}-\frac{2b^{\frac{3}{2}}x^3\left(-\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{asin}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{3a^{\frac{3}{2}}\left(a-bx^4\right)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(-b*x**4+a)**(3/4),x)
```

```
[Out] -(a - b*x**4)**(1/4)/(3*a*x**3) - 2*b**(3/2)*x**3*(-a/(b*x**4) +
1)**(3/4)*elliptic_f(asin(sqrt(a)/(sqrt(b)*x**2))/2, 2)/(3*a**(3/
2)*(a - b*x**4)**(3/4))
```

Mathematica [C] time = 0.0469505, size = 70, normalized size = 0.8

$$\frac{2bx^4\left(1-\frac{bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};\frac{bx^4}{a}\right)-a+bx^4}{3ax^3\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*(a - b*x^4)^(3/4)),x]
```

```
[Out] (-a + b*x^4 + 2*b*x^4*(1 - (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/4
, 3/4, 5/4, (b*x^4)/a])/(3*a*x^3*(a - b*x^4)^(3/4))
```

Maple [F] time = 0.033, size = 0, normalized size = 0.

$$\int \frac{1}{x^{4}}\left(-b\,x^{4}+a\right)^{-\frac{3}{4}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(-b*x^4+a)^(3/4),x)
```

```
[Out] int(1/x^4/(-b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-b x^{4}+a\right)^{\frac{3}{4}} x^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^4),x, algorithm="maxima")
```

```
[Out] integrate(1/((-b*x^4 + a)^(3/4)*x^4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\left(-b x^{4}+a\right)^{\frac{3}{4}} x^{4}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^4),x, algorithm="fricas")
```

```
[Out] integral(1/((-b*x^4 + a)^(3/4)*x^4), x)
```

Sympy [A] time = 3.73467, size = 34, normalized size = 0.39

$$-\frac{i e^{\frac{3 i \pi}{4}} {}_{2}F_{1}\left(\begin{matrix} \frac{3}{4}, \frac{3}{2} \\ \frac{5}{2} \end{matrix}\middle| {\frac{a}{b x^{4}}} \right)}{6 b^{\frac{3}{4}} x^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(-b*x**4+a)**(3/4),x)
```

```
[Out] -I*exp(3*I*pi/4)*hyper((3/4, 3/2), (5/2,), a/(b*x**4))/(6*b**(3/4
)*x**6)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-b x^{4}+a\right)^{\frac{3}{4}} x^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^4),x, algorithm="giac")

[Out] integrate(1/((-b*x^4 + a)^(3/4)*x^4), x)
```

3.1259 $\int \frac{1}{x^8(a-bx^4)^{3/4}}\,dx$

Optimal. Leaf size=111

$$-\frac{4b^{5/2}x^3\left(1-\frac{a}{bx^4}\right)^{3/4}F\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{7a^{5/2}\left(a-bx^4\right)^{3/4}}-\frac{2b\sqrt[4]{a-bx^4}}{7a^2x^3}-\frac{\sqrt[4]{a-bx^4}}{7ax^7}$$

```
[Out] -(a - b*x^4)^(1/4)/(7*a*x^7) - (2*b*(a - b*x^4)^(1/4))/(7*a^2*x^3
) - (4*b^(5/2)*(1 - a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCsc[(Sqrt[b
]*x^2)/Sqrt[a]]/2, 2])/(7*a^(5/2)*(a - b*x^4)^(3/4))
```

Rubi [A] time = 0.139882, antiderivative size = 111, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312

$$-\frac{4b^{5/2}x^3\left(1-\frac{a}{bx^4}\right)^{3/4}F\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{7a^{5/2}\left(a-bx^4\right)^{3/4}}-\frac{2b\sqrt[4]{a-bx^4}}{7a^2x^3}-\frac{\sqrt[4]{a-bx^4}}{7ax^7}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^8*(a - b*x^4)^(3/4)),x]
```

```
[Out] -(a - b*x^4)^(1/4)/(7*a*x^7) - (2*b*(a - b*x^4)^(1/4))/(7*a^2*x^3
) - (4*b^(5/2)*(1 - a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCsc[(Sqrt[b
]*x^2)/Sqrt[a]]/2, 2])/(7*a^(5/2)*(a - b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 18.9908, size = 97, normalized size = 0.87

$$-\frac{\sqrt[4]{a-bx^4}}{7ax^7}-\frac{2b\sqrt[4]{a-bx^4}}{7a^2x^3}-\frac{4b^{\frac{5}{2}}x^3\left(-\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{asin}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{7a^{\frac{5}{2}}\left(a-bx^4\right)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**8/(-b*x**4+a)**(3/4),x)
```

```
[Out] -(a - b*x**4)**(1/4)/(7*a*x**7) - 2*b*(a - b*x**4)**(1/4)/(7*a**2
*x**3) - 4*b**(5/2)*x**3*(-a/(b*x**4) + 1)**(3/4)*elliptic_f(asin
(sqrt(a)/(sqrt(b)*x**2))/2, 2)/(7*a**(5/2)*(a - b*x**4)**(3/4))
```

Mathematica [C] time = 0.0602723, size = 84, normalized size = 0.76

$$\frac{-a^2+4b^2x^8\left(1-\frac{bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};\frac{bx^4}{a}\right)-abx^4+2b^2x^8}{7a^2x^7\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^8*(a - b*x^4)^(3/4)),x]
```

```
[Out] (-a^2 - a*b*x^4 + 2*b^2*x^8 + 4*b^2*x^8*(1 - (b*x^4)/a)^(3/4)*Hyp
ergeometric2F1[1/4, 3/4, 5/4, (b*x^4)/a])/(7*a^2*x^7*(a - b*x^4)^
(3/4))
```

Maple [F] time = 0.036, size = 0, normalized size = 0.

$$\int \frac{1}{x^8} \left(-b x^4 + a\right)^{-\frac{3}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^8/(-b*x^4+a)^(3/4),x)
```

```
[Out] int(1/x^8/(-b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-b x^4 + a\right)^{\frac{3}{4}} x^8} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^8),x, algorithm="maxima")
```

```
[Out] integrate(1/((-b*x^4 + a)^(3/4)*x^8), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{\left(-b x^4 + a\right)^{\frac{3}{4}} x^8}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^8),x, algorithm="fricas")
```

```
[Out] integral(1/((-b*x^4 + a)^(3/4)*x^8), x)
```

Sympy [A] time = 7.42708, size = 32, normalized size = 0.29

$$\frac{i e^{\frac{7 i \pi}{4}} {}_{2}F_{1}\left(\left.\begin{matrix} \frac{3}{4}, \frac{5}{2} \\ \frac{7}{2} \end{matrix}\right| \frac{a}{b x^4}\right)}{10 b^{\frac{3}{4}} x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**8/(-b*x**4+a)**(3/4),x)
```

```
[Out] I*exp(7*I*pi/4)*hyper((3/4, 5/2), (7/2,), a/(b*x**4))/(10*b**(3/4
)*x**10)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-b x^4 + a\right)^{\frac{3}{4}} x^8} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^8),x, algorithm="giac")

[Out] integrate(1/((-b*x^4 + a)^(3/4)*x^8), x)
```

3.1260 $\int \frac{1}{x^{12}(a-bx^4)^{3/4}}\,dx$

Optimal. Leaf size=136

$$-\frac{40b^{7/2}x^3\left(1-\frac{a}{bx^4}\right)^{3/4}F\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{77a^{7/2}\left(a-bx^4\right)^{3/4}}-\frac{20b^2\sqrt[4]{a-bx^4}}{77a^3x^3}-\frac{10b\sqrt[4]{a-bx^4}}{77a^2x^7}-\frac{\sqrt[4]{a-bx^4}}{11ax^{11}}$$

```
[Out] -(a - b*x^4)^(1/4)/(11*a*x^11) - (10*b*(a - b*x^4)^(1/4))/(77*a^2
*x^7) - (20*b^2*(a - b*x^4)^(1/4))/(77*a^3*x^3) - (40*b^(7/2)*(1
- a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCsc[(Sqrt[b]*x^2)/Sqrt[a]]/2,
 2])/(77*a^(7/2)*(a - b*x^4)^(3/4))
```

Rubi [A] time = 0.17492, antiderivative size = 136, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312

$$-\frac{40b^{7/2}x^3\left(1-\frac{a}{bx^4}\right)^{3/4}F\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{77a^{7/2}\left(a-bx^4\right)^{3/4}}-\frac{20b^2\sqrt[4]{a-bx^4}}{77a^3x^3}-\frac{10b\sqrt[4]{a-bx^4}}{77a^2x^7}-\frac{\sqrt[4]{a-bx^4}}{11ax^{11}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^12*(a - b*x^4)^(3/4)),x]
```

```
[Out] -(a - b*x^4)^(1/4)/(11*a*x^11) - (10*b*(a - b*x^4)^(1/4))/(77*a^2
*x^7) - (20*b^2*(a - b*x^4)^(1/4))/(77*a^3*x^3) - (40*b^(7/2)*(1
- a/(b*x^4))^(3/4)*x^3*EllipticF[ArcCsc[(Sqrt[b]*x^2)/Sqrt[a]]/2,
 2])/(77*a^(7/2)*(a - b*x^4)^(3/4))
```

Rubi in Sympy [A] time = 23.2864, size = 121, normalized size = 0.89

$$-\frac{\sqrt[4]{a-bx^4}}{11ax^{11}}-\frac{10b\sqrt[4]{a-bx^4}}{77a^2x^7}-\frac{20b^2\sqrt[4]{a-bx^4}}{77a^3x^3}-\frac{40b^{\frac{7}{2}}x^3\left(-\frac{a}{bx^4}+1\right)^{\frac{3}{4}}F\left(\frac{\operatorname{asin}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{77a^{\frac{7}{2}}\left(a-bx^4\right)^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**12/(-b*x**4+a)**(3/4),x)
```

```
[Out] -(a - b*x**4)**(1/4)/(11*a*x**11) - 10*b*(a - b*x**4)**(1/4)/(77*
a**2*x**7) - 20*b**2*(a - b*x**4)**(1/4)/(77*a**3*x**3) - 40*b**(
7/2)*x**3*(-a/(b*x**4) + 1)**(3/4)*elliptic_f(asin(sqrt(a)/(sqrt(
b)*x**2))/2, 2)/(77*a**(7/2)*(a - b*x**4)**(3/4))
```

Mathematica [C] time = 0.0670435, size = 95, normalized size = 0.7

$$\frac{-7a^3-3a^2bx^4+40b^3x^{12}\left(1-\frac{bx^4}{a}\right)^{3/4}{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{5}{4};\frac{bx^4}{a}\right)-10ab^2x^8+20b^3x^{12}}{77a^3x^{11}\left(a-bx^4\right)^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^12*(a - b*x^4)^(3/4)),x]
```

```
[Out] (-7*a^3 - 3*a^2*b*x^4 - 10*a*b^2*x^8 + 20*b^3*x^12 + 40*b^3*x^12*
(1 - (b*x^4)/a)^(3/4)*Hypergeometric2F1[1/4, 3/4, 5/4, (b*x^4)/a]
```

```
)/(77*a^3*x^11*(a - b*x^4)^(3/4))
```

Maple [F] time = 0.039, size = 0, normalized size = 0.

$$\int \frac{1}{x^{12}} \left(-bx^4 + a\right)^{-\frac{3}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^12/(-b*x^4+a)^(3/4),x)
```

```
[Out] int(1/x^12/(-b*x^4+a)^(3/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-bx^4 + a\right)^{\frac{3}{4}} x^{12}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^12),x, algorithm="maxima")
```

```
[Out] integrate(1/((-b*x^4 + a)^(3/4)*x^12), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{\left(-bx^4 + a\right)^{\frac{3}{4}} x^{12}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^12),x, algorithm="fricas")
```

```
[Out] integral(1/((-b*x^4 + a)^(3/4)*x^12), x)
```

Sympy [A] time = 15.1347, size = 34, normalized size = 0.25

$$-\frac{ie^{\frac{11i\pi}{4}} {}_2F_1\left(\begin{matrix} \frac{3}{4}, \frac{7}{2} \\ \frac{9}{2} \end{matrix}\middle| \frac{a}{bx^4}\right)}{14b^{\frac{3}{4}} x^{14}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**12/(-b*x**4+a)**(3/4),x)
```

```
[Out] -I*exp(11*I*pi/4)*hyper((3/4, 7/2), (9/2,), a/(b*x**4))/(14*b**(3
/4)*x**14)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(-bx^4 + a\right)^{\frac{3}{4}} x^{12}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((-b*x^4 + a)^(3/4)*x^12),x, algorithm="giac")

[Out] integrate(1/((-b*x^4 + a)^(3/4)*x^12), x)
```

3.1261 $\int \frac{x^2}{(a-bx^4)^{5/4}} dx$

Optimal. Leaf size=81

$$\frac{1}{bx\sqrt[4]{a-bx^4}} - \frac{x\sqrt[4]{1-\frac{a}{bx^4}}E\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{\sqrt{a}\sqrt{b}\sqrt[4]{a-bx^4}}$$

```
[Out] 1/(b*x*(a - b*x^4)^(1/4)) - ((1 - a/(b*x^4))^(1/4)*x*EllipticE[Ar
cCsc[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(Sqrt[a]*Sqrt[b]*(a - b*x^4)^(
1/4))
```

Rubi [A] time = 0.125127, antiderivative size = 81, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}} = 0.312$

$$\frac{1}{bx\sqrt[4]{a-bx^4}} - \frac{x\sqrt[4]{1-\frac{a}{bx^4}}E\left(\frac{1}{2}\csc^{-1}\left(\frac{\sqrt{b}x^2}{\sqrt{a}}\right)\middle|2\right)}{\sqrt{a}\sqrt{b}\sqrt[4]{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a - b*x^4)^(5/4),x]
```

```
[Out] 1/(b*x*(a - b*x^4)^(1/4)) - ((1 - a/(b*x^4))^(1/4)*x*EllipticE[Ar
cCsc[(Sqrt[b]*x^2)/Sqrt[a]]/2, 2])/(Sqrt[a]*Sqrt[b]*(a - b*x^4)^(
1/4))
```

Rubi in Sympy [A] time = 16.8617, size = 66, normalized size = 0.81

$$\frac{1}{bx\sqrt[4]{a-bx^4}} - \frac{x\sqrt[4]{-\frac{a}{bx^4}+1}E\left(\frac{\operatorname{asin}\left(\frac{\sqrt{a}}{\sqrt{b}x^2}\right)}{2}\middle|2\right)}{\sqrt{a}\sqrt{b}\sqrt[4]{a-bx^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(-b*x**4+a)**(5/4),x)
```

```
[Out] 1/(b*x*(a - b*x**4)**(1/4)) - x*(-a/(b*x**4) + 1)**(1/4)*elliptic
_e(asin(sqrt(a)/(sqrt(b)*x**2))/2, 2)/(sqrt(a)*sqrt(b)*(a - b*x**
4)**(1/4))
```

Mathematica [C] time = 0.0541421, size = 59, normalized size = 0.73

$$-\frac{x^3\left(2\sqrt[4]{1-\frac{bx^4}{a}}\,{}_2F_1\left(\frac{1}{4},\frac{3}{4};\frac{7}{4};\frac{bx^4}{a}\right)-3\right)}{3a\sqrt[4]{a-bx^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a - b*x^4)^(5/4),x]
```

```
[Out] -(x^3*(-3 + 2*(1 - (b*x^4)/a)^(1/4)*Hypergeometric2F1[1/4, 3/4, 7
/4, (b*x^4)/a]))/(3*a*(a - b*x^4)^(1/4))
```

Maple [F] time = 0.039, size = 0, normalized size = 0.

$$\int x^2 \left(-b x^4 + a\right)^{-\frac{5}{4}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(-b*x^4+a)^(5/4),x)
```

```
[Out] int(x^2/(-b*x^4+a)^(5/4),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{(-b x^4 + a)^{\frac{5}{4}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(-b*x^4 + a)^(5/4),x, algorithm="maxima")
```

```
[Out] integrate(x^2/(-b*x^4 + a)^(5/4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{x^2}{(b x^4 - a)(-b x^4 + a)^{\frac{1}{4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(-b*x^4 + a)^(5/4),x, algorithm="fricas")
```

```
[Out] integral(-x^2/((b*x^4 - a)*(-b*x^4 + a)^(1/4)), x)
```

Sympy [A] time = 2.7885, size = 39, normalized size = 0.48

$$\frac{x^3 \Gamma\left(\frac{3}{4}\right) {}_2F_1\left(\begin{matrix} \frac{3}{4}, \frac{5}{4} \\ \frac{7}{4} \end{matrix}\middle| \frac{b x^4 e^{2i\pi}}{a}\right)}{4 a^{\frac{5}{4}} \Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(-b*x**4+a)**(5/4),x)
```

```
[Out] x**3*gamma(3/4)*hyper((3/4, 5/4), (7/4,), b*x**4*exp_polar(2*I*pi
)/a)/(4*a**(5/4)*gamma(7/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{(-b x^4 + a)^{\frac{5}{4}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(-b*x^4 + a)^(5/4),x, algorithm="giac")
```

```
[Out] integrate(x^2/(-b*x^4 + a)^(5/4), x)
```

3.1262 $\int x^7 \left(a+bx^4\right)^p \, dx$

Optimal. Leaf size=48

$$\frac{\left(a+bx^4\right)^{p+2}}{4b^2(p+2)}-\frac{a\left(a+bx^4\right)^{p+1}}{4b^2(p+1)}$$

```
[Out] -(a*(a + b*x^4)^(1 + p))/(4*b^2*(1 + p)) + (a + b*x^4)^(2 + p)/(4
*b^2*(2 + p))
```

Rubi [A] time = 0.0659229, antiderivative size = 48, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{\left(a+bx^4\right)^{p+2}}{4b^2(p+2)}-\frac{a\left(a+bx^4\right)^{p+1}}{4b^2(p+1)}$$

Antiderivative was successfully verified.

```
[In] Int[x^7*(a + b*x^4)^p,x]
```

```
[Out] -(a*(a + b*x^4)^(1 + p))/(4*b^2*(1 + p)) + (a + b*x^4)^(2 + p)/(4
*b^2*(2 + p))
```

Rubi in Sympy [A] time = 10.4618, size = 37, normalized size = 0.77

$$-\frac{a\left(a+bx^4\right)^{p+1}}{4b^2\left(p+1\right)}+\frac{\left(a+bx^4\right)^{p+2}}{4b^2\left(p+2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**7*(b*x**4+a)**p,x)
```

```
[Out] -a*(a + b*x**4)**(p + 1)/(4*b**2*(p + 1)) + (a + b*x**4)**(p + 2)
/(4*b**2*(p + 2))
```

Mathematica [A] time = 0.0346798, size = 40, normalized size = 0.83

$$\frac{\left(a+bx^4\right)^{p+1}\left(b(p+1)x^4-a\right)}{4b^2(p+1)(p+2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^7*(a + b*x^4)^p,x]
```

```
[Out] ((a + b*x^4)^(1 + p)*(-a + b*(1 + p)*x^4))/(4*b^2*(1 + p)*(2 + p)
)
```

Maple [A] time = 0.008, size = 42, normalized size = 0.9

$$-\frac{\left(bx^4+a\right)^{1+p}\left(-x^4pb-bx^4+a\right)}{4\,b^2\left(p^2+3\,p+2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7*(b*x^4+a)^p,x)
```

```
[Out] -1/4*(b*x^4+a)^(1+p)*(-b*p*x^4-b*x^4+a)/b^2/(p^2+3*p+2)
```

Maxima [A] time = 1.45027, size = 63, normalized size = 1.31

$$\frac{\left(b^2(p+1)x^8 + abpx^4 - a^2\right)\left(bx^4+a\right)^p}{4\left(p^2+3\,p+2\right)b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^p*x^7,x, algorithm="maxima")
```

```
[Out] 1/4*(b^2*(p + 1)*x^8 + a*b*p*x^4 - a^2)*(b*x^4 + a)^p/((p^2 + 3*p
 + 2)*b^2)
```

Fricas [A] time = 0.234624, size = 78, normalized size = 1.62

$$\frac{\left(\left(b^2p+b^2\right)x^8 + abpx^4 - a^2\right)\left(bx^4+a\right)^p}{4\left(b^2p^2+3\,b^2p+2\,b^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^p*x^7,x, algorithm="fricas")
```

```
[Out] 1/4*((b^2*p + b^2)*x^8 + a*b*p*x^4 - a^2)*(b*x^4 + a)^p/(b^2*p^2
+ 3*b^2*p + 2*b^2)
```

Sympy [A] time = 28.7692, size = 495, normalized size = 10.31

$$\begin{cases} \frac{a^p x^8}{8} \\ \frac{a\log\left(-\sqrt[4]{-1}\sqrt[4]{a}\sqrt[4]{\frac{1}{b}}+x\right)}{4ab^2+4b^3x^4} + \frac{a\log\left(\sqrt[4]{-1}\sqrt[4]{a}\sqrt[4]{\frac{1}{b}}+x\right)}{4ab^2+4b^3x^4} + \frac{a\log\left(i\sqrt{a}\sqrt{\frac{1}{b}}+x^2\right)}{4ab^2+4b^3x^4} + \frac{a}{4ab^2+4b^3x^4} + \frac{bx^4\log\left(-\sqrt[4]{-1}\sqrt[4]{a}\sqrt[4]{\frac{1}{b}}+x\right)}{4ab^2+4b^3x^4} + \frac{bx^4\log\left(\sqrt[4]{-1}\sqrt[4]{a}\sqrt[4]{\ldots}\right.}{4ab^2+4b^3x^4} \\ -\frac{a\log\left(-\sqrt[4]{-1}\sqrt[4]{a}\sqrt[4]{\frac{1}{b}}+x\right)}{4b^2} - \frac{a\log\left(\sqrt[4]{-1}\sqrt[4]{a}\sqrt[4]{\frac{1}{b}}+x\right)}{4b^2} - \frac{a\log\left(i\sqrt{a}\sqrt{\frac{1}{b}}+x^2\right)}{4b^2} + \frac{x^4}{4b} \\ -\frac{a^2\left(a+bx^4\right)^p}{4b^2p^2+12b^2p+8b^2} + \frac{abpx^4\left(a+bx^4\right)^p}{4b^2p^2+12b^2p+8b^2} + \frac{b^2px^8\left(a+bx^4\right)^p}{4b^2p^2+12b^2p+8b^2} + \frac{b^2x^8\left(a+bx^4\right)^p}{4b^2p^2+12b^2p+8b^2} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7*(b*x**4+a)**p,x)
```

```
[Out] Piecewise((a**p*x**8/8, Eq(b, 0)), (a*log(-(-1)**(1/4)*a**(1/4)*(
1/b)**(1/4) + x)/(4*a*b**2 + 4*b**3*x**4) + a*log((-1)**(1/4)*a**
(1/4)*(1/b)**(1/4) + x)/(4*a*b**2 + 4*b**3*x**4) + a*log(I*sqrt(a
)*sqrt(1/b) + x**2)/(4*a*b**2 + 4*b**3*x**4) + a/(4*a*b**2 + 4*b*
*3*x**4) + b*x**4*log(-(-1)**(1/4)*a**(1/4)*(1/b)**(1/4) + x)/(4*
a*b**2 + 4*b**3*x**4) + b*x**4*log((-1)**(1/4)*a**(1/4)*(1/b)**(1
/4) + x)/(4*a*b**2 + 4*b**3*x**4) + b*x**4*log(I*sqrt(a)*sqrt(1/b
) + x**2)/(4*a*b**2 + 4*b**3*x**4), Eq(p, -2)), (-a*log(-(-1)**(1
/4)*a**(1/4)*(1/b)**(1/4) + x)/(4*b**2) - a*log((-1)**(1/4)*a**(1
/4)*(1/b)**(1/4) + x)/(4*b**2) - a*log(I*sqrt(a)*sqrt(1/b) + x**2
)/(4*b**2) + x**4/(4*b), Eq(p, -1)), (-a**2*(a + b*x**4)**p/(4*b*
*2*p**2 + 12*b**2*p + 8*b**2) + a*b*p*x**4*(a + b*x**4)**p/(4*b**
2*p**2 + 12*b**2*p + 8*b**2) + b**2*p*x**8*(a + b*x**4)**p/(4*b**
2*p**2 + 12*b**2*p + 8*b**2) + b**2*x**8*(a + b*x**4)**p/(4*b**2*
p**2 + 12*b**2*p + 8*b**2), True))
```

GIAC/XCAS [A] time = 0.220958, size = 138, normalized size = 2.88

$$\frac{\left(bx^4+a\right)^2 pe^{\left(p\ln\left(bx^4+a\right)\right)} - \left(bx^4+a\right) ape^{\left(p\ln\left(bx^4+a\right)\right)} + \left(bx^4+a\right)^2 e^{\left(p\ln\left(bx^4+a\right)\right)} - 2\left(bx^4+a\right) ae^{\left(p\ln\left(bx^4+a\right)\right)}}{4\left(p^2+3p+2\right)b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^p*x^7,x, algorithm="giac")
```

```
[Out] 1/4*((b*x^4 + a)^2*p*e^(p*ln(b*x^4 + a)) - (b*x^4 + a)*a*p*e^(p*l
n(b*x^4 + a)) + (b*x^4 + a)^2*e^(p*ln(b*x^4 + a)) - 2*(b*x^4 + a)
*a*e^(p*ln(b*x^4 + a)))/((p^2 + 3*p + 2)*b^2)
```

3.1263 $\int x^3 \left(a + bx^4\right)^p \, dx$

Optimal. Leaf size=23

$$\frac{\left(a + bx^4\right)^{p+1}}{4b(p+1)}$$

```
[Out] (a + b*x^4)^(1 + p)/(4*b*(1 + p))
```

Rubi [A] time = 0.016378, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{\left(a + bx^4\right)^{p+1}}{4b(p+1)}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(a + b*x^4)^p,x]

[Out] (a + b*x^4)^(1 + p)/(4*b*(1 + p))
```

Rubi in Sympy [A] time = 2.74449, size = 15, normalized size = 0.65

$$\frac{\left(a + bx^4\right)^{p+1}}{4b\left(p+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**3*(b*x**4+a)**p,x)

[Out] (a + b*x**4)**(p + 1)/(4*b*(p + 1))
```

Mathematica [A] time = 0.0114634, size = 22, normalized size = 0.96

$$\frac{\left(a + bx^4\right)^{p+1}}{4bp + 4b}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(a + b*x^4)^p,x]

[Out] (a + b*x^4)^(1 + p)/(4*b + 4*b*p)
```

Maple [A] time = 0.005, size = 22, normalized size = 1.

$$\frac{\left(bx^4 + a\right)^{1+p}}{4\,b\left(1+p\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(b*x^4+a)^p,x)
```

```
[Out] 1/4*(b*x^4+a)^(1+p)/b/(1+p)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^p*x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.234595, size = 34, normalized size = 1.48

$$\frac{(bx^4 + a)(bx^4 + a)^p}{4(bp + b)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^p*x^3,x, algorithm="fricas")
```

```
[Out] 1/4*(b*x^4 + a)*(b*x^4 + a)^p/(b*p + b)
```

Sympy [A] time = 8.00935, size = 129, normalized size = 5.61

$$\begin{cases} \frac{x^4}{4a} & \text{for } b = 0 \wedge p = -1 \\ \frac{a^p x^4}{4} & \text{for } b = 0 \\ \frac{\log\left(-\sqrt[4]{-1}\sqrt[4]{a}\sqrt[4]{\frac{1}{b}}+x\right)}{4b} + \frac{\log\left(\sqrt[4]{-1}\sqrt[4]{a}\sqrt[4]{\frac{1}{b}}+x\right)}{4b} + \frac{\log\left(i\sqrt{a}\sqrt{\frac{1}{b}}+x^2\right)}{4b} & \text{for } p = -1 \\ \frac{a(a+bx^4)^p}{4bp+4b} + \frac{bx^4(a+bx^4)^p}{4bp+4b} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(b*x**4+a)**p,x)
```

```
[Out] Piecewise((x**4/(4*a), Eq(b, 0) & Eq(p, -1)), (a**p*x**4/4, Eq(b,
 0)), (log(-(-1)**(1/4)*a**(1/4)*(1/b)**(1/4) + x)/(4*b) + log((-
1)**(1/4)*a**(1/4)*(1/b)**(1/4) + x)/(4*b) + log(I*sqrt(a)*sqrt(1
/b) + x**2)/(4*b), Eq(p, -1)), (a*(a + b*x**4)**p/(4*b*p + 4*b) +
 b*x**4*(a + b*x**4)**p/(4*b*p + 4*b), True))
```

GIAC/XCAS [A] time = 0.21908, size = 28, normalized size = 1.22

$$\frac{(bx^4 + a)^{p+1}}{4b(p + 1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^p*x^3,x, algorithm="giac")
```

```
[Out] 1/4*(b*x^4 + a)^(p + 1)/(b*(p + 1))
```

3.1264 $\int \frac{(a+bx^4)^p}{x} \, dx$

Optimal. Leaf size=41

$$-\frac{(a+bx^4)^{p+1} \,{}_2F_1\left(1,p+1;p+2;\frac{bx^4}{a}+1\right)}{4a(p+1)}$$

```
[Out] -((a + b*x^4)^(1 + p)*Hypergeometric2F1[1, 1 + p, 2 + p, 1 + (b*x
^4)/a])/(4*a*(1 + p))
```

Rubi [A] time = 0.051428, antiderivative size = 41, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{(a+bx^4)^{p+1} \,{}_2F_1\left(1,p+1;p+2;\frac{bx^4}{a}+1\right)}{4a(p+1)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^4)^p/x,x]
```

```
[Out] -((a + b*x^4)^(1 + p)*Hypergeometric2F1[1, 1 + p, 2 + p, 1 + (b*x
^4)/a])/(4*a*(1 + p))
```

Rubi in Sympy [A] time = 5.64421, size = 31, normalized size = 0.76

$$-\frac{(a+bx^4)^{p+1} \,{}_2F_1\left(\begin{matrix} 1,p+1 \\ p+2 \end{matrix}\middle| 1+\frac{bx^4}{a}\right)}{4a\,(p+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**4+a)**p/x,x)
```

```
[Out] -(a + b*x**4)**(p + 1)*hyper((1, p + 1), (p + 2,), 1 + b*x**4/a)/
(4*a*(p + 1))
```

Mathematica [A] time = 0.026868, size = 51, normalized size = 1.24

$$\frac{\left(\frac{a}{bx^4}+1\right)^{-p} (a+bx^4)^p \,{}_2F_1\left(-p,-p;1-p;-\frac{a}{bx^4}\right)}{4p}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^4)^p/x,x]
```

```
[Out] ((a + b*x^4)^p*Hypergeometric2F1[-p, -p, 1 - p, -(a/(b*x^4))])/(4
*p*(1 + a/(b*x^4))^p)
```

Maple [F] time = 0.037, size = 0, normalized size = 0.

$$\int \frac{(bx^4+a)^p}{x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^4+a)^p/x,x)
```

```
[Out] int((b*x^4+a)^p/x,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bx^4+a\right)^p}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^p/x,x, algorithm="maxima")
```

```
[Out] integrate((b*x^4 + a)^p/x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(bx^4+a\right)^p}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^p/x,x, algorithm="fricas")
```

```
[Out] integral((b*x^4 + a)^p/x, x)
```

Sympy [A] time = 48.4367, size = 39, normalized size = 0.95

$$-\frac{b^p x^{4p}\left(-p\right){}_2F_1\left(\begin{matrix}-p,-p\\-p+1\end{matrix}\middle|\frac{ae^{i\pi}}{bx^4}\right)}{4\left(-p+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**4+a)**p/x,x)
```

```
[Out] -b**p*x**(4*p)*gamma(-p)*hyper((-p, -p), (-p + 1,), a*exp_polar(I
*pi)/(b*x**4))/(4*gamma(-p + 1))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bx^4+a\right)^p}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^4 + a)^p/x,x, algorithm="giac")
```

```
[Out] integrate((b*x^4 + a)^p/x, x)
```

3.1265 $\int \frac{x^{24}}{a+bx^5} \, dx$

Optimal. Leaf size=66

$$\frac{a^4 \log \left(a+bx^5\right)}{5b^5}-\frac{a^3x^5}{5b^4}+\frac{a^2x^{10}}{10b^3}-\frac{ax^{15}}{15b^2}+\frac{x^{20}}{20b}$$

```
[Out] -(a^3*x^5)/(5*b^4) + (a^2*x^10)/(10*b^3) - (a*x^15)/(15*b^2) + x^
20/(20*b) + (a^4*Log[a + b*x^5])/(5*b^5)
```

Rubi [A] time = 0.0995864, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$\frac{a^4 \log \left(a+bx^5\right)}{5b^5}-\frac{a^3x^5}{5b^4}+\frac{a^2x^{10}}{10b^3}-\frac{ax^{15}}{15b^2}+\frac{x^{20}}{20b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^24/(a + b*x^5),x]
```

```
[Out] -(a^3*x^5)/(5*b^4) + (a^2*x^10)/(10*b^3) - (a*x^15)/(15*b^2) + x^
20/(20*b) + (a^4*Log[a + b*x^5])/(5*b^5)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^4 \log \left(a+bx^5\right)}{5b^5}+\frac{a^2 \int^{x^5} x \, dx}{5b^3}-\frac{ax^{15}}{15b^2}+\frac{x^{20}}{20b}-\frac{\int^{x^5} a^3 \, dx}{5b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**24/(b*x**5+a),x)
```

```
[Out] a**4*log(a + b*x**5)/(5*b**5) + a**2*Integral(x, (x, x**5))/(5*b*
*3) - a*x**15/(15*b**2) + x**20/(20*b) - Integral(a**3, (x, x**5)
)/(5*b**4)
```

Mathematica [A] time = 0.0131004, size = 66, normalized size = 1.

$$\frac{a^4 \log \left(a+bx^5\right)}{5b^5}-\frac{a^3x^5}{5b^4}+\frac{a^2x^{10}}{10b^3}-\frac{ax^{15}}{15b^2}+\frac{x^{20}}{20b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^24/(a + b*x^5),x]
```

```
[Out] -(a^3*x^5)/(5*b^4) + (a^2*x^10)/(10*b^3) - (a*x^15)/(15*b^2) + x^
20/(20*b) + (a^4*Log[a + b*x^5])/(5*b^5)
```

Maple [A] time = 0.005, size = 57, normalized size = 0.9

$$-\frac{a^3x^5}{5\,b^4}+\frac{a^2x^{10}}{10\,b^3}-\frac{ax^{15}}{15\,b^2}+\frac{x^{20}}{20\,b}+\frac{a^4 \ln \left(bx^5+a\right)}{5\,b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^24/(b*x^5+a),x)
```

```
[Out] -1/5*a^3*x^5/b^4+1/10*a^2*x^10/b^3-1/15*a*x^15/b^2+1/20*x^20/b+1/
5*a^4*ln(b*x^5+a)/b^5
```

Maxima [A] time = 1.44604, size = 77, normalized size = 1.17

$$\frac{a^4 \log\left(bx^5 + a\right)}{5\,b^5} + \frac{3\,b^3x^{20} - 4\,ab^2x^{15} + 6\,a^2bx^{10} - 12\,a^3x^5}{60\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^24/(b*x^5 + a),x, algorithm="maxima")
```

```
[Out] 1/5*a^4*log(b*x^5 + a)/b^5 + 1/60*(3*b^3*x^20 - 4*a*b^2*x^15 + 6*
a^2*b*x^10 - 12*a^3*x^5)/b^4
```

Fricas [A] time = 0.213693, size = 76, normalized size = 1.15

$$\frac{3\,b^4x^{20} - 4\,ab^3x^{15} + 6\,a^2b^2x^{10} - 12\,a^3bx^5 + 12\,a^4 \log\left(bx^5 + a\right)}{60\,b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^24/(b*x^5 + a),x, algorithm="fricas")
```

```
[Out] 1/60*(3*b^4*x^20 - 4*a*b^3*x^15 + 6*a^2*b^2*x^10 - 12*a^3*b*x^5 +
 12*a^4*log(b*x^5 + a))/b^5
```

Sympy [A] time = 1.61809, size = 56, normalized size = 0.85

$$\frac{a^4 \log\left(a + bx^5\right)}{5b^5} - \frac{a^3x^5}{5b^4} + \frac{a^2x^{10}}{10b^3} - \frac{ax^{15}}{15b^2} + \frac{x^{20}}{20b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**24/(b*x**5+a),x)
```

```
[Out] a**4*log(a + b*x**5)/(5*b**5) - a**3*x**5/(5*b**4) + a**2*x**10/(
10*b**3) - a*x**15/(15*b**2) + x**20/(20*b)
```

GIAC/XCAS [A] time = 0.227939, size = 78, normalized size = 1.18

$$\frac{a^4 \ln\left(\left|bx^5 + a\right|\right)}{5\,b^5} + \frac{3\,b^3x^{20} - 4\,ab^2x^{15} + 6\,a^2bx^{10} - 12\,a^3x^5}{60\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^24/(b*x^5 + a),x, algorithm="giac")
```

```
[Out] 1/5*a^4*ln(abs(b*x^5 + a))/b^5 + 1/60*(3*b^3*x^20 - 4*a*b^2*x^15
+ 6*a^2*b*x^10 - 12*a^3*x^5)/b^4
```

3.1266 $\int \frac{x^{19}}{a+bx^5}\,dx$

Optimal. Leaf size=53

$$-\frac{a^3\log\left(a+bx^5\right)}{5b^4}+\frac{a^2x^5}{5b^3}-\frac{ax^{10}}{10b^2}+\frac{x^{15}}{15b}$$

```
[Out] (a^2*x^5)/(5*b^3) - (a*x^10)/(10*b^2) + x^15/(15*b) - (a^3*Log[a
+ b*x^5])/(5*b^4)
```

Rubi [A] time = 0.0772589, antiderivative size = 53, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$-\frac{a^3\log\left(a+bx^5\right)}{5b^4}+\frac{a^2x^5}{5b^3}-\frac{ax^{10}}{10b^2}+\frac{x^{15}}{15b}$$

Antiderivative was successfully verified.

```
[In] Int[x^19/(a + b*x^5),x]
```

```
[Out] (a^2*x^5)/(5*b^3) - (a*x^10)/(10*b^2) + x^15/(15*b) - (a^3*Log[a
+ b*x^5])/(5*b^4)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^3\log\left(a+bx^5\right)}{5b^4}-\frac{a\int^{x^5} x\,dx}{5b^2}+\frac{x^{15}}{15b}+\frac{\int^{x^5} a^2\,dx}{5b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**19/(b*x**5+a),x)
```

```
[Out] -a**3*log(a + b*x**5)/(5*b**4) - a*Integral(x, (x, x**5))/(5*b**2
) + x**15/(15*b) + Integral(a**2, (x, x**5))/(5*b**3)
```

Mathematica [A] time = 0.00960077, size = 53, normalized size = 1.

$$-\frac{a^3\log\left(a+bx^5\right)}{5b^4}+\frac{a^2x^5}{5b^3}-\frac{ax^{10}}{10b^2}+\frac{x^{15}}{15b}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^19/(a + b*x^5),x]
```

```
[Out] (a^2*x^5)/(5*b^3) - (a*x^10)/(10*b^2) + x^15/(15*b) - (a^3*Log[a
+ b*x^5])/(5*b^4)
```

Maple [A] time = 0.004, size = 46, normalized size = 0.9

$$\frac{x^5a^2}{5\,b^3}-\frac{ax^{10}}{10\,b^2}+\frac{x^{15}}{15\,b}-\frac{a^3\ln\left(bx^5+a\right)}{5\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^19/(b*x^5+a),x)
```

```
[Out] 1/5*a^2*x^5/b^3-1/10*a*x^10/b^2+1/15*x^15/b-1/5*a^3*ln(b*x^5+a)/b
^4
```

Maxima [A] time = 1.4278, size = 62, normalized size = 1.17

$$-\frac{a^3\log\left(bx^5+a\right)}{5\,b^4}+\frac{2\,b^2x^{15}-3\,abx^{10}+6\,a^2x^5}{30\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^19/(b*x^5 + a),x, algorithm="maxima")
```

```
[Out] -1/5*a^3*log(b*x^5 + a)/b^4 + 1/30*(2*b^2*x^15 - 3*a*b*x^10 + 6*a
^2*x^5)/b^3
```

Fricas [A] time = 0.215513, size = 61, normalized size = 1.15

$$\frac{2\,b^3x^{15}-3\,ab^2x^{10}+6\,a^2bx^5-6\,a^3\log\left(bx^5+a\right)}{30\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^19/(b*x^5 + a),x, algorithm="fricas")
```

```
[Out] 1/30*(2*b^3*x^15 - 3*a*b^2*x^10 + 6*a^2*b*x^5 - 6*a^3*log(b*x^5 +
 a))/b^4
```

Sympy [A] time = 1.51254, size = 44, normalized size = 0.83

$$-\frac{a^3\log\left(a+bx^5\right)}{5b^4}+\frac{a^2x^5}{5b^3}-\frac{ax^{10}}{10b^2}+\frac{x^{15}}{15b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**19/(b*x**5+a),x)
```

```
[Out] -a**3*log(a + b*x**5)/(5*b**4) + a**2*x**5/(5*b**3) - a*x**10/(10
*b**2) + x**15/(15*b)
```

GIAC/XCAS [A] time = 0.227641, size = 63, normalized size = 1.19

$$-\frac{a^3\ln\left(\left|bx^5+a\right|\right)}{5\,b^4}+\frac{2\,b^2x^{15}-3\,abx^{10}+6\,a^2x^5}{30\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^19/(b*x^5 + a),x, algorithm="giac")
```

```
[Out] -1/5*a^3*ln(abs(b*x^5 + a))/b^4 + 1/30*(2*b^2*x^15 - 3*a*b*x^10 +
 6*a^2*x^5)/b^3
```

3.1267 $\int \frac{x^{14}}{a+bx^5}\,dx$

Optimal. Leaf size=40

$$\frac{a^2\log\left(a+bx^5\right)}{5b^3}-\frac{ax^5}{5b^2}+\frac{x^{10}}{10b}$$

```
[Out] -(a*x^5)/(5*b^2) + x^10/(10*b) + (a^2*Log[a + b*x^5])/(5*b^3)
```

Rubi [A] time = 0.0598736, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^2\log\left(a+bx^5\right)}{5b^3}-\frac{ax^5}{5b^2}+\frac{x^{10}}{10b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^14/(a + b*x^5),x]
```

```
[Out] -(a*x^5)/(5*b^2) + x^10/(10*b) + (a^2*Log[a + b*x^5])/(5*b^3)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^2\log\left(a+bx^5\right)}{5b^3}+\frac{\int^{x^5} x\,dx}{5b}-\frac{\int^{x^5} a\,dx}{5b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**14/(b*x**5+a),x)
```

```
[Out] a**2*log(a + b*x**5)/(5*b**3) + Integral(x, (x, x**5))/(5*b) - In
tegral(a, (x, x**5))/(5*b**2)
```

Mathematica [A] time = 0.010259, size = 40, normalized size = 1.

$$\frac{a^2\log\left(a+bx^5\right)}{5b^3}-\frac{ax^5}{5b^2}+\frac{x^{10}}{10b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^14/(a + b*x^5),x]
```

```
[Out] -(a*x^5)/(5*b^2) + x^10/(10*b) + (a^2*Log[a + b*x^5])/(5*b^3)
```

Maple [A] time = 0.003, size = 35, normalized size = 0.9

$$-\frac{ax^5}{5\,b^2}+\frac{x^{10}}{10\,b}+\frac{a^2\ln\left(bx^5+a\right)}{5\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^14/(b*x^5+a),x)
```

```
[Out] -1/5*a*x^5/b^2+1/10*x^10/b+1/5*a^2*ln(b*x^5+a)/b^3
```

Maxima [A] time = 1.44261, size = 46, normalized size = 1.15

$$\frac{a^2 \log\left(bx^5 + a\right)}{5\,b^3} + \frac{bx^{10} - 2\,ax^5}{10\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^14/(b*x^5 + a),x, algorithm="maxima")
```

```
[Out] 1/5*a^2*log(b*x^5 + a)/b^3 + 1/10*(b*x^10 - 2*a*x^5)/b^2
```

Fricas [A] time = 0.212382, size = 45, normalized size = 1.12

$$\frac{b^2x^{10} - 2\,abx^5 + 2\,a^2 \log\left(bx^5 + a\right)}{10\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^14/(b*x^5 + a),x, algorithm="fricas")
```

```
[Out] 1/10*(b^2*x^10 - 2*a*b*x^5 + 2*a^2*log(b*x^5 + a))/b^3
```

Sympy [A] time = 1.51939, size = 32, normalized size = 0.8

$$\frac{a^2 \log\left(a + bx^5\right)}{5b^3} - \frac{ax^5}{5b^2} + \frac{x^{10}}{10b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**14/(b*x**5+a),x)
```

```
[Out] a**2*log(a + b*x**5)/(5*b**3) - a*x**5/(5*b**2) + x**10/(10*b)
```

GIAC/XCAS [A] time = 0.222877, size = 47, normalized size = 1.18

$$\frac{a^2 \ln\left(\left|bx^5 + a\right|\right)}{5\,b^3} + \frac{bx^{10} - 2\,ax^5}{10\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^14/(b*x^5 + a),x, algorithm="giac")
```

```
[Out] 1/5*a^2*ln(abs(b*x^5 + a))/b^3 + 1/10*(b*x^10 - 2*a*x^5)/b^2
```

3.1268 $\int \frac{x^9}{a+bx^5} \, dx$

Optimal. Leaf size=27

$$\frac{x^5}{5b} - \frac{a \log \left(a + bx^5\right)}{5b^2}$$

```
[Out] x^5/(5*b) - (a*Log[a + b*x^5])/(5*b^2)
```

Rubi [A] time = 0.0444636, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$\frac{x^5}{5b} - \frac{a \log \left(a + bx^5\right)}{5b^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^9/(a + b*x^5),x]

[Out] x^5/(5*b) - (a*Log[a + b*x^5])/(5*b^2)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a \log \left(a + bx^5\right)}{5b^2} + \frac{\int^{x^5} \frac{1}{b} \, dx}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**9/(b*x**5+a),x)

[Out] -a*log(a + b*x**5)/(5*b**2) + Integral(1/b, (x, x**5))/5
```

Mathematica [A] time = 0.00691355, size = 27, normalized size = 1.

$$\frac{x^5}{5b} - \frac{a \log \left(a + bx^5\right)}{5b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^9/(a + b*x^5),x]

[Out] x^5/(5*b) - (a*Log[a + b*x^5])/(5*b^2)
```

Maple [A] time = 0.003, size = 24, normalized size = 0.9

$$\frac{x^5}{5\,b} - \frac{a \ln \left(b x^5 + a\right)}{5\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^9/(b*x^5+a),x)

[Out] 1/5*x^5/b-1/5*a*ln(b*x^5+a)/b^2
```

Maxima [A] time = 1.46607, size = 31, normalized size = 1.15

$$\frac{x^5}{5\,b} - \frac{a\log\left(bx^5 + a\right)}{5\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(b*x^5 + a),x, algorithm="maxima")

[Out] 1/5*x^5/b - 1/5*a*log(b*x^5 + a)/b^2
```

Fricas [A] time = 0.21727, size = 30, normalized size = 1.11

$$\frac{bx^5 - a\log\left(bx^5 + a\right)}{5\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(b*x^5 + a),x, algorithm="fricas")

[Out] 1/5*(b*x^5 - a*log(b*x^5 + a))/b^2
```

Sympy [A] time = 1.42749, size = 20, normalized size = 0.74

$$-\frac{a\log\left(a + bx^5\right)}{5b^2} + \frac{x^5}{5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**9/(b*x**5+a),x)

[Out] -a*log(a + b*x**5)/(5*b**2) + x**5/(5*b)
```

GIAC/XCAS [A] time = 0.22287, size = 32, normalized size = 1.19

$$\frac{x^5}{5\,b} - \frac{a\ln\left(\left|bx^5 + a\right|\right)}{5\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(b*x^5 + a),x, algorithm="giac")

[Out] 1/5*x^5/b - 1/5*a*ln(abs(b*x^5 + a))/b^2
```

3.1269 $\int \frac{x^4}{a+bx^5}\,dx$

Optimal. Leaf size=15

$$\frac{\log\left(a+bx^5\right)}{5b}$$

```
[Out] Log[a + b*x^5]/(5*b)
```

Rubi [A] time = 0.0089736, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{\log\left(a+bx^5\right)}{5b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a + b*x^5),x]

[Out] Log[a + b*x^5]/(5*b)
```

Rubi in Sympy [A] time = 2.16352, size = 10, normalized size = 0.67

$$\frac{\log\left(a+bx^5\right)}{5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(b*x**5+a),x)

[Out] log(a + b*x**5)/(5*b)
```

Mathematica [A] time = 0.00465511, size = 15, normalized size = 1.

$$\frac{\log\left(a+bx^5\right)}{5b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(a + b*x^5),x]

[Out] Log[a + b*x^5]/(5*b)
```

Maple [A] time = 0.001, size = 14, normalized size = 0.9

$$\frac{\ln\left(bx^5+a\right)}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(b*x^5+a),x)

[Out] 1/5*ln(b*x^5+a)/b
```

Maxima [A] time = 1.42531, size = 18, normalized size = 1.2

$$\frac{\log\left(bx^5 + a\right)}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^5 + a),x, algorithm="maxima")
```

```
[Out] 1/5*log(b*x^5 + a)/b
```

Fricas [A] time = 0.215377, size = 18, normalized size = 1.2

$$\frac{\log\left(bx^5 + a\right)}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^5 + a),x, algorithm="fricas")
```

```
[Out] 1/5*log(b*x^5 + a)/b
```

Sympy [A] time = 0.417962, size = 10, normalized size = 0.67

$$\frac{\log\left(a + bx^5\right)}{5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(b*x**5+a),x)
```

```
[Out] log(a + b*x**5)/(5*b)
```

GIAC/XCAS [A] time = 0.227342, size = 19, normalized size = 1.27

$$\frac{\ln\left(\left|bx^5 + a\right|\right)}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^5 + a),x, algorithm="giac")
```

```
[Out] 1/5*ln(abs(b*x^5 + a))/b
```

3.1270 $\int \frac{1}{x(a+bx^5)}\,dx$

Optimal. Leaf size=22

$$\frac{\log(x)}{a}-\frac{\log(a+bx^5)}{5a}$$

```
[Out] Log[x]/a - Log[a + b*x^5]/(5*a)
```

Rubi [A] time = 0.0323554, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{\log(x)}{a}-\frac{\log(a+bx^5)}{5a}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a + b*x^5)),x]

[Out] Log[x]/a - Log[a + b*x^5]/(5*a)
```

Rubi in Sympy [A] time = 5.43705, size = 19, normalized size = 0.86

$$\frac{\log(x^5)}{5a}-\frac{\log(a+bx^5)}{5a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(b*x**5+a),x)

[Out] log(x**5)/(5*a) - log(a + b*x**5)/(5*a)
```

Mathematica [A] time = 0.00885009, size = 22, normalized size = 1.

$$\frac{\log(x)}{a}-\frac{\log(a+bx^5)}{5a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a + b*x^5)),x]

[Out] Log[x]/a - Log[a + b*x^5]/(5*a)
```

Maple [A] time = 0.007, size = 21, normalized size = 1.

$$\frac{\ln(x)}{a}-\frac{\ln(bx^5+a)}{5\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(b*x^5+a),x)

[Out] ln(x)/a-1/5*ln(b*x^5+a)/a
```

Maxima [A] time = 1.42725, size = 31, normalized size = 1.41

$$-\frac{\log\left(bx^5+a\right)}{5\,a}+\frac{\log\left(x^5\right)}{5\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + a)*x),x, algorithm="maxima")
```

```
[Out] -1/5*log(b*x^5 + a)/a + 1/5*log(x^5)/a
```

Fricas [A] time = 0.218365, size = 24, normalized size = 1.09

$$-\frac{\log\left(bx^5+a\right)-5\,\log\left(x\right)}{5\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + a)*x),x, algorithm="fricas")
```

```
[Out] -1/5*(log(b*x^5 + a) - 5*log(x))/a
```

Sympy [A] time = 0.787942, size = 15, normalized size = 0.68

$$\frac{\log\left(x\right)}{a}-\frac{\log\left(\frac{a}{b}+x^5\right)}{5a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(b*x**5+a),x)
```

```
[Out] log(x)/a - log(a/b + x**5)/(5*a)
```

GIAC/XCAS [A] time = 0.22134, size = 30, normalized size = 1.36

$$-\frac{\ln\left(\left|bx^5+a\right|\right)}{5\,a}+\frac{\ln\left(\left|x\right|\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + a)*x),x, algorithm="giac")
```

```
[Out] -1/5*ln(abs(b*x^5 + a))/a + ln(abs(x))/a
```

3.1271 $\int \frac{1}{x^6(a+bx^5)}\,dx$

Optimal. Leaf size=35

$$\frac{b\log\left(a+bx^5\right)}{5a^2}-\frac{b\log(x)}{a^2}-\frac{1}{5ax^5}$$

```
[Out] -1/(5*a*x^5) - (b*Log[x])/a^2 + (b*Log[a + b*x^5])/(5*a^2)
```

Rubi [A] time = 0.0538295, antiderivative size = 35, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{b\log\left(a+bx^5\right)}{5a^2}-\frac{b\log(x)}{a^2}-\frac{1}{5ax^5}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^6*(a + b*x^5)),x]

[Out] -1/(5*a*x^5) - (b*Log[x])/a^2 + (b*Log[a + b*x^5])/(5*a^2)
```

Rubi in Sympy [A] time = 8.0728, size = 34, normalized size = 0.97

$$-\frac{1}{5ax^5}-\frac{b\log\left(x^5\right)}{5a^2}+\frac{b\log\left(a+bx^5\right)}{5a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**6/(b*x**5+a),x)

[Out] -1/(5*a*x**5) - b*log(x**5)/(5*a**2) + b*log(a + b*x**5)/(5*a**2)
```

Mathematica [A] time = 0.0113012, size = 35, normalized size = 1.

$$\frac{b\log\left(a+bx^5\right)}{5a^2}-\frac{b\log(x)}{a^2}-\frac{1}{5ax^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^6*(a + b*x^5)),x]

[Out] -1/(5*a*x^5) - (b*Log[x])/a^2 + (b*Log[a + b*x^5])/(5*a^2)
```

Maple [A] time = 0.009, size = 32, normalized size = 0.9

$$-\frac{1}{5\,ax^5}-\frac{b\ln(x)}{a^2}+\frac{b\ln\left(bx^5+a\right)}{5\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^6/(b*x^5+a),x)

[Out] -1/5/a/x^5-b*ln(x)/a^2+1/5*b*ln(b*x^5+a)/a^2
```

Maxima [A] time = 1.43319, size = 45, normalized size = 1.29

$$\frac{b \log\left(bx^5 + a\right)}{5\,a^2} - \frac{b \log\left(x^5\right)}{5\,a^2} - \frac{1}{5\,ax^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + a)*x^6),x, algorithm="maxima")
```

```
[Out] 1/5*b*log(b*x^5 + a)/a^2 - 1/5*b*log(x^5)/a^2 - 1/5/(a*x^5)
```

Fricas [A] time = 0.219342, size = 45, normalized size = 1.29

$$\frac{bx^5 \log\left(bx^5 + a\right) - 5\,bx^5 \log\left(x\right) - a}{5\,a^2x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + a)*x^6),x, algorithm="fricas")
```

```
[Out] 1/5*(b*x^5*log(b*x^5 + a) - 5*b*x^5*log(x) - a)/(a^2*x^5)
```

Sympy [A] time = 2.9688, size = 31, normalized size = 0.89

$$-\frac{1}{5ax^5} - \frac{b\log\left(x\right)}{a^2} + \frac{b\log\left(\frac{a}{b} + x^5\right)}{5a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**6/(b*x**5+a),x)
```

```
[Out] -1/(5*a*x**5) - b*log(x)/a**2 + b*log(a/b + x**5)/(5*a**2)
```

GIAC/XCAS [A] time = 0.231607, size = 57, normalized size = 1.63

$$\frac{b\ln\left(\left|bx^5 + a\right|\right)}{5\,a^2} - \frac{b\ln\left(\left|x\right|\right)}{a^2} + \frac{bx^5 - a}{5\,a^2x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + a)*x^6),x, algorithm="giac")
```

```
[Out] 1/5*b*ln(abs(b*x^5 + a))/a^2 - b*ln(abs(x))/a^2 + 1/5*(b*x^5 - a)
/(a^2*x^5)
```

3.1272 $\int \frac{1}{x^{11}(a+bx^5)}\,dx$

Optimal. Leaf size=49

$$-\frac{b^2\log\left(a+bx^5\right)}{5a^3}+\frac{b^2\log(x)}{a^3}+\frac{b}{5a^2x^5}-\frac{1}{10ax^{10}}$$

```
[Out] -1/(10*a*x^10) + b/(5*a^2*x^5) + (b^2*Log[x])/a^3 - (b^2*Log[a +
b*x^5])/(5*a^3)
```

Rubi [A] time = 0.0654487, antiderivative size = 49, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{b^2\log\left(a+bx^5\right)}{5a^3}+\frac{b^2\log(x)}{a^3}+\frac{b}{5a^2x^5}-\frac{1}{10ax^{10}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^11*(a + b*x^5)),x]
```

```
[Out] -1/(10*a*x^10) + b/(5*a^2*x^5) + (b^2*Log[x])/a^3 - (b^2*Log[a +
b*x^5])/(5*a^3)
```

Rubi in Sympy [A] time = 10.5353, size = 48, normalized size = 0.98

$$-\frac{1}{10ax^{10}}+\frac{b}{5a^2x^5}+\frac{b^2\log\left(x^5\right)}{5a^3}-\frac{b^2\log\left(a+bx^5\right)}{5a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**11/(b*x**5+a),x)
```

```
[Out] -1/(10*a*x**10) + b/(5*a**2*x**5) + b**2*log(x**5)/(5*a**3) - b**
2*log(a + b*x**5)/(5*a**3)
```

Mathematica [A] time = 0.0119805, size = 49, normalized size = 1.

$$-\frac{b^2\log\left(a+bx^5\right)}{5a^3}+\frac{b^2\log(x)}{a^3}+\frac{b}{5a^2x^5}-\frac{1}{10ax^{10}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^11*(a + b*x^5)),x]
```

```
[Out] -1/(10*a*x^10) + b/(5*a^2*x^5) + (b^2*Log[x])/a^3 - (b^2*Log[a +
b*x^5])/(5*a^3)
```

Maple [A] time = 0.011, size = 44, normalized size = 0.9

$$-\frac{1}{10\,ax^{10}}+\frac{b}{5\,x^5a^2}+\frac{b^2\ln(x)}{a^3}-\frac{b^2\ln\left(bx^5+a\right)}{5\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^11/(b*x^5+a),x)
```

```
[Out] -1/10/a/x^10+1/5*b/x^5/a^2+b^2*ln(x)/a^3-1/5*b^2*ln(b*x^5+a)/a^3
```

Maxima [A] time = 1.44414, size = 63, normalized size = 1.29

$$-\frac{b^2 \log\left(bx^5 + a\right)}{5\,a^3} + \frac{b^2 \log\left(x^5\right)}{5\,a^3} + \frac{2\,bx^5 - a}{10\,a^2x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + a)*x^11),x, algorithm="maxima")
```

```
[Out] -1/5*b^2*log(b*x^5 + a)/a^3 + 1/5*b^2*log(x^5)/a^3 + 1/10*(2*b*x^
5 - a)/(a^2*x^10)
```

Fricas [A] time = 0.22277, size = 61, normalized size = 1.24

$$-\frac{2\,b^2x^{10} \log\left(bx^5 + a\right) - 10\,b^2x^{10} \log\left(x\right) - 2\,abx^5 + a^2}{10\,a^3x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + a)*x^11),x, algorithm="fricas")
```

```
[Out] -1/10*(2*b^2*x^10*log(b*x^5 + a) - 10*b^2*x^10*log(x) - 2*a*b*x^5
 + a^2)/(a^3*x^10)
```

Sympy [A] time = 18.8188, size = 42, normalized size = 0.86

$$\frac{-a + 2bx^5}{10a^2x^{10}} + \frac{b^2 \log\left(x\right)}{a^3} - \frac{b^2 \log\left(\frac{a}{b} + x^5\right)}{5a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**11/(b*x**5+a),x)
```

```
[Out] (-a + 2*b*x**5)/(10*a**2*x**10) + b**2*log(x)/a**3 - b**2*log(a/b
 + x**5)/(5*a**3)
```

GIAC/XCAS [A] time = 0.238084, size = 74, normalized size = 1.51

$$-\frac{b^2 \ln\left(\left|bx^5 + a\right|\right)}{5\,a^3} + \frac{b^2 \ln\left(\left|x\right|\right)}{a^3} - \frac{3\,b^2x^{10} - 2\,abx^5 + a^2}{10\,a^3x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + a)*x^11),x, algorithm="giac")
```

```
[Out] -1/5*b^2*ln(abs(b*x^5 + a))/a^3 + b^2*ln(abs(x))/a^3 - 1/10*(3*b^
2*x^10 - 2*a*b*x^5 + a^2)/(a^3*x^10)
```

3.1273 $\int \frac{1}{x^{16}(a+bx^5)} dx$

Optimal. Leaf size=63

$$\frac{b^3 \log (a + bx^5)}{5a^4} - \frac{b^3 \log(x)}{a^4} - \frac{b^2}{5a^3x^5} + \frac{b}{10a^2x^{10}} - \frac{1}{15ax^{15}}$$

```
[Out] -1/(15*a*x^15) + b/(10*a^2*x^10) - b^2/(5*a^3*x^5) - (b^3*Log[x])
/a^4 + (b^3*Log[a + b*x^5])/(5*a^4)
```

Rubi [A] time = 0.0801135, antiderivative size = 63, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{b^3 \log (a + bx^5)}{5a^4} - \frac{b^3 \log(x)}{a^4} - \frac{b^2}{5a^3x^5} + \frac{b}{10a^2x^{10}} - \frac{1}{15ax^{15}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^16*(a + b*x^5)),x]
```

```
[Out] -1/(15*a*x^15) + b/(10*a^2*x^10) - b^2/(5*a^3*x^5) - (b^3*Log[x])
/a^4 + (b^3*Log[a + b*x^5])/(5*a^4)
```

Rubi in Sympy [A] time = 12.5634, size = 60, normalized size = 0.95

$$-\frac{1}{15ax^{15}} + \frac{b}{10a^2x^{10}} - \frac{b^2}{5a^3x^5} - \frac{b^3 \log (x^5)}{5a^4} + \frac{b^3 \log (a + bx^5)}{5a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**16/(b*x**5+a),x)
```

```
[Out] -1/(15*a*x**15) + b/(10*a**2*x**10) - b**2/(5*a**3*x**5) - b**3*l
og(x**5)/(5*a**4) + b**3*log(a + b*x**5)/(5*a**4)
```

Mathematica [A] time = 0.0121859, size = 63, normalized size = 1.

$$\frac{b^3 \log (a + bx^5)}{5a^4} - \frac{b^3 \log(x)}{a^4} - \frac{b^2}{5a^3x^5} + \frac{b}{10a^2x^{10}} - \frac{1}{15ax^{15}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^16*(a + b*x^5)),x]
```

```
[Out] -1/(15*a*x^15) + b/(10*a^2*x^10) - b^2/(5*a^3*x^5) - (b^3*Log[x])
/a^4 + (b^3*Log[a + b*x^5])/(5*a^4)
```

Maple [A] time = 0.011, size = 56, normalized size = 0.9

$$-\frac{1}{15\,ax^{15}} + \frac{b}{10\,a^2x^{10}} - \frac{b^2}{5\,a^3x^5} - \frac{b^3 \ln (x)}{a^4} + \frac{b^3 \ln (bx^5 + a)}{5\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^16/(b*x^5+a),x)
```

```
[Out] -1/15/a/x^15+1/10*b/a^2/x^10-1/5*b^2/a^3/x^5-b^3*ln(x)/a^4+1/5*b^
3*ln(b*x^5+a)/a^4
```

Maxima [A] time = 1.41469, size = 78, normalized size = 1.24

$$\frac{b^3 \log\left(bx^5 + a\right)}{5\,a^4} - \frac{b^3 \log\left(x^5\right)}{5\,a^4} - \frac{6\,b^2x^{10} - 3\,abx^5 + 2\,a^2}{30\,a^3x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + a)*x^16),x, algorithm="maxima")
```

```
[Out] 1/5*b^3*log(b*x^5 + a)/a^4 - 1/5*b^3*log(x^5)/a^4 - 1/30*(6*b^2*x
^10 - 3*a*b*x^5 + 2*a^2)/(a^3*x^15)
```

Fricas [A] time = 0.222387, size = 78, normalized size = 1.24

$$\frac{6\,b^3x^{15}\log\left(bx^5 + a\right) - 30\,b^3x^{15}\log\left(x\right) - 6\,ab^2x^{10} + 3\,a^2bx^5 - 2\,a^3}{30\,a^4x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + a)*x^16),x, algorithm="fricas")
```

```
[Out] 1/30*(6*b^3*x^15*log(b*x^5 + a) - 30*b^3*x^15*log(x) - 6*a*b^2*x^
10 + 3*a^2*b*x^5 - 2*a^3)/(a^4*x^15)
```

Sympy [A] time = 157.098, size = 56, normalized size = 0.89

$$-\frac{2a^2 - 3abx^5 + 6b^2x^{10}}{30a^3x^{15}} - \frac{b^3\log\left(x\right)}{a^4} + \frac{b^3\log\left(\frac{a}{b} + x^5\right)}{5a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**16/(b*x**5+a),x)
```

```
[Out] -(2*a**2 - 3*a*b*x**5 + 6*b**2*x**10)/(30*a**3*x**15) - b**3*log(
x)/a**4 + b**3*log(a/b + x**5)/(5*a**4)
```

GIAC/XCAS [A] time = 0.238044, size = 93, normalized size = 1.48

$$\frac{b^3\ln\left(\left|bx^5 + a\right|\right)}{5\,a^4} - \frac{b^3\ln\left(\left|x\right|\right)}{a^4} + \frac{11\,b^3x^{15} - 6\,ab^2x^{10} + 3\,a^2bx^5 - 2\,a^3}{30\,a^4x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + a)*x^16),x, algorithm="giac")
```

```
[Out] 1/5*b^3*ln(abs(b*x^5 + a))/a^4 - b^3*ln(abs(x))/a^4 + 1/30*(11*b^
3*x^15 - 6*a*b^2*x^10 + 3*a^2*b*x^5 - 2*a^3)/(a^4*x^15)
```

3.1274 $\int \frac{1}{a+bx^5}\,dx$

Optimal. Leaf size=301

$$-\frac{\left(1-\sqrt{5}\right)\log\left(2a^{2/5}-\left(1-\sqrt{5}\right)\sqrt[5]{a}\sqrt[5]{b}x+2b^{2/5}x^2\right)}{20a^{4/5}\sqrt[5]{b}}-\frac{\left(1+\sqrt{5}\right)\log\left(2a^{2/5}-\left(1+\sqrt{5}\right)\sqrt[5]{a}\sqrt[5]{b}x+2b^{2/5}x^2\right)}{20a^{4/5}\sqrt[5]{b}}+\frac{\log\left(\sqrt[5]{a}+\sqrt[5]{b}x\right)}{5a^{4/5}\sqrt[5]{b}}-\frac{\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\tan^{-1}\left(\frac{\left(1-\sqrt{5}\right)\sqrt[5]{a}-4\sqrt[5]{b}x}{\sqrt{2\left(5+\sqrt{5}\right)}\sqrt[5]{a}}\right)}{5a^{4/5}\sqrt[5]{b}}-\frac{\sqrt{\frac{1}{2}\left(5-\sqrt{5}\right)}\tan^{-1}\left(\frac{\left(1+\sqrt{5}\right)\sqrt[5]{a}-4\sqrt[5]{b}x}{\sqrt{2\left(5-\sqrt{5}\right)}\sqrt[5]{a}}\right)}{5a^{4/5}\sqrt[5]{b}}$$

```
[Out] -(Sqrt[(5 + Sqrt[5])/2]*ArcTan[((1 - Sqrt[5])*a^(1/5) - 4*b^(1/5)
*x)/(Sqrt[2*(5 + Sqrt[5])]*a^(1/5))])/(5*a^(4/5)*b^(1/5)) - (Sqrt
[(5 - Sqrt[5])/2]*ArcTan[((1 + Sqrt[5])*a^(1/5) - 4*b^(1/5)*x)/(S
qrt[2*(5 - Sqrt[5])]*a^(1/5))])/(5*a^(4/5)*b^(1/5)) + Log[a^(1/5)
 + b^(1/5)*x]/(5*a^(4/5)*b^(1/5)) - ((1 - Sqrt[5])*Log[2*a^(2/5)
- (1 - Sqrt[5])*a^(1/5)*b^(1/5)*x + 2*b^(2/5)*x^2])/(20*a^(4/5)*b
^(1/5)) - ((1 + Sqrt[5])*Log[2*a^(2/5) - (1 + Sqrt[5])*a^(1/5)*b^
(1/5)*x + 2*b^(2/5)*x^2])/(20*a^(4/5)*b^(1/5))
```

Rubi [A] time = 1.16663, antiderivative size = 305, normalized size of antiderivative = 1.01, number of steps used = 6, number of rules used = 6, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667

$$-\frac{\left(1-\sqrt{5}\right)\log\left(a^{2/5}-\frac{1}{2}\left(1-\sqrt{5}\right)\sqrt[5]{a}\sqrt[5]{b}x+b^{2/5}x^2\right)}{20a^{4/5}\sqrt[5]{b}}-\frac{\left(1+\sqrt{5}\right)\log\left(a^{2/5}-\frac{1}{2}\left(1+\sqrt{5}\right)\sqrt[5]{a}\sqrt[5]{b}x+b^{2/5}x^2\right)}{20a^{4/5}\sqrt[5]{b}}+\frac{\log\left(\sqrt[5]{a}+\sqrt[5]{b}x\right)}{5a^{4/5}\sqrt[5]{b}}+\frac{\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\tan^{-1}\left(\frac{2\sqrt{\frac{2}{5+\sqrt{5}}}\sqrt[5]{b}x}{\sqrt[5]{a}}+\sqrt{\frac{1}{5}\left(5-2\sqrt{5}\right)}\right)}{5a^{4/5}\sqrt[5]{b}}-\frac{\sqrt{\frac{1}{2}\left(5-\sqrt{5}\right)}\tan^{-1}\left(\sqrt{\frac{1}{5}\left(5+2\sqrt{5}\right)}-\frac{\sqrt{\frac{2}{5}\left(5+\sqrt{5}\right)}\sqrt[5]{b}x}{\sqrt[5]{a}}\right)}{5a^{4/5}\sqrt[5]{b}}$$

Warning: Unable to verify antiderivative.

```
[In]  Int[(a + b*x^5)^(-1),x]
```

```
[Out] (Sqrt[(5 + Sqrt[5])/2]*ArcTan[Sqrt[(5 - 2*Sqrt[5])/5] + (2*Sqrt[2
/(5 + Sqrt[5])]*b^(1/5)*x)/a^(1/5)])/(5*a^(4/5)*b^(1/5)) - (Sqrt[
(5 - Sqrt[5])/2]*ArcTan[Sqrt[(5 + 2*Sqrt[5])/5] - (Sqrt[(2*(5 + S
qrt[5]))/5]*b^(1/5)*x)/a^(1/5)])/(5*a^(4/5)*b^(1/5)) + Log[a^(1/5
) + b^(1/5)*x]/(5*a^(4/5)*b^(1/5)) - ((1 - Sqrt[5])*Log[a^(2/5) -
 ((1 - Sqrt[5])*a^(1/5)*b^(1/5)*x)/2 + b^(2/5)*x^2])/(20*a^(4/5)*
b^(1/5)) - ((1 + Sqrt[5])*Log[a^(2/5) - ((1 + Sqrt[5])*a^(1/5)*b^
(1/5)*x)/2 + b^(2/5)*x^2])/(20*a^(4/5)*b^(1/5))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**5+a),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.308953, size = 311, normalized size = 1.03

$$-\frac{\left(1-\sqrt{5}\right)\log\left(a^{2/5}-\frac{1}{2}\left(1-\sqrt{5}\right)\sqrt[5]{a}\sqrt[5]{b}x+b^{2/5}x^2\right)}{20a^{4/5}\sqrt[5]{b}}-\frac{\left(1+\sqrt{5}\right)\log\left(a^{2/5}-\frac{1}{2}\left(1+\sqrt{5}\right)\sqrt[5]{a}\sqrt[5]{b}x+b^{2/5}x^2\right)}{20a^{4/5}\sqrt[5]{b}}+\frac{\log\left(\sqrt[5]{a}+\sqrt[5]{b}x\right)}{5a^{4/5}\sqrt[5]{b}}+\frac{2\sqrt{\frac{5}{8}+\frac{\sqrt{5}}{8}}\tan^{-1}\left(\frac{\sqrt[5]{b}x-\frac{1}{4}\left(1-\sqrt{5}\right)\sqrt[5]{a}}{\sqrt{\frac{5}{8}+\frac{\sqrt{5}}{8}}\sqrt[5]{a}}\right)}{5a^{4/5}\sqrt[5]{b}}+\frac{2\sqrt{\frac{5}{8}-\frac{\sqrt{5}}{8}}\tan^{-1}\left(\frac{\sqrt[5]{b}x-\frac{1}{4}\left(1+\sqrt{5}\right)\sqrt[5]{a}}{\sqrt{\frac{5}{8}-\frac{\sqrt{5}}{8}}\sqrt[5]{a}}\right)}{5a^{4/5}\sqrt[5]{b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^5)^(-1),x]
```

```
[Out] (2*Sqrt[5/8 + Sqrt[5]/8]*ArcTan[(-((1 - Sqrt[5])*a^(1/5))/4 + b^(
1/5)*x)/(Sqrt[5/8 + Sqrt[5]/8]*a^(1/5))])/(5*a^(4/5)*b^(1/5)) + (
2*Sqrt[5/8 - Sqrt[5]/8]*ArcTan[(-((1 + Sqrt[5])*a^(1/5))/4 + b^(1
/5)*x)/(Sqrt[5/8 - Sqrt[5]/8]*a^(1/5))])/(5*a^(4/5)*b^(1/5)) + Lo
g[a^(1/5) + b^(1/5)*x]/(5*a^(4/5)*b^(1/5)) - ((1 - Sqrt[5])*Log[a
^(2/5) - ((1 - Sqrt[5])*a^(1/5)*b^(1/5)*x)/2 + b^(2/5)*x^2])/(20*
a^(4/5)*b^(1/5)) - ((1 + Sqrt[5])*Log[a^(2/5) - ((1 + Sqrt[5])*a^
(1/5)*b^(1/5)*x)/2 + b^(2/5)*x^2])/(20*a^(4/5)*b^(1/5))
```

Maple [B] time = 0.115, size = 895, normalized size = 3.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^5+a),x)
```

```
[Out] -4/b/(a/b)^(4/5)/(5^(1/2)-5)/(5+5^(1/2))*ln(x+(a/b)^(1/5))+1/b/(a
/b)^(4/5)/(5^(1/2)-5)/(5+5^(1/2))*ln(-(a/b)^(1/5)*x*5^(1/2)+2*(a/
b)^(2/5)-(a/b)^(1/5)*x+2*x^2)*5^(1/2)+1/b/(a/b)^(4/5)/(5^(1/2)-5)
/(5+5^(1/2))*ln(-(a/b)^(1/5)*x*5^(1/2)+2*(a/b)^(2/5)-(a/b)^(1/5)*
x+2*x^2)-20/b/(a/b)^(3/5)/(5^(1/2)-5)/(5+5^(1/2))/(10*(a/b)^(2/5)
-2*(a/b)^(2/5)*5^(1/2))^(1/2)*arctan(-1/(10*(a/b)^(2/5)-2*(a/b)^(
2/5)*5^(1/2))^(1/2)*(a/b)^(1/5)*5^(1/2)-1/(10*(a/b)^(2/5)-2*(a/b)
^(2/5)*5^(1/2))^(1/2)*(a/b)^(1/5)+4/(10*(a/b)^(2/5)-2*(a/b)^(2/5)
*5^(1/2))^(1/2)*x)+4/b/(a/b)^(3/5)/(5^(1/2)-5)/(5+5^(1/2))/(10*(a
/b)^(2/5)-2*(a/b)^(2/5)*5^(1/2))^(1/2)*arctan(-1/(10*(a/b)^(2/5)-
2*(a/b)^(2/5)*5^(1/2))^(1/2)*(a/b)^(1/5)*5^(1/2)-1/(10*(a/b)^(2/5
)-2*(a/b)^(2/5)*5^(1/2))^(1/2)*(a/b)^(1/5)+4/(10*(a/b)^(2/5)-2*(a
/b)^(2/5)*5^(1/2))^(1/2)*x)*5^(1/2)-1/b/(a/b)^(4/5)/(5^(1/2)-5)/(
5+5^(1/2))*ln((a/b)^(1/5)*x*5^(1/2)+2*(a/b)^(2/5)-(a/b)^(1/5)*x+2
*x^2)*5^(1/2)+1/b/(a/b)^(4/5)/(5^(1/2)-5)/(5+5^(1/2))*ln((a/b)^(1
/5)*x*5^(1/2)+2*(a/b)^(2/5)-(a/b)^(1/5)*x+2*x^2)-20/b/(a/b)^(3/5)
/(5^(1/2)-5)/(5+5^(1/2))/(10*(a/b)^(2/5)+2*(a/b)^(2/5)*5^(1/2))^(
1/2)*arctan(1/(10*(a/b)^(2/5)+2*(a/b)^(2/5)*5^(1/2))^(1/2)*(a/b)^
(1/5)*5^(1/2)-1/(10*(a/b)^(2/5)+2*(a/b)^(2/5)*5^(1/2))^(1/2)*(a/b
)^(1/5)+4/(10*(a/b)^(2/5)+2*(a/b)^(2/5)*5^(1/2))^(1/2)*x)-4/b/(a/
b)^(3/5)/(5^(1/2)-5)/(5+5^(1/2))/(10*(a/b)^(2/5)+2*(a/b)^(2/5)*5^
(1/2))^(1/2)*arctan(1/(10*(a/b)^(2/5)+2*(a/b)^(2/5)*5^(1/2))^(1/2
)*(a/b)^(1/5)*5^(1/2)-1/(10*(a/b)^(2/5)+2*(a/b)^(2/5)*5^(1/2))^(1
/2)*(a/b)^(1/5)+4/(10*(a/b)^(2/5)+2*(a/b)^(2/5)*5^(1/2))^(1/2)*x)
*5^(1/2)
```

Maxima [A] time = 1.60496, size = 429, normalized size = 1.43

$$\frac{\sqrt{5}\left(\sqrt{5}-1\right)\log\left(\frac{4\,b^{\frac{2}{5}}x-a^{\frac{1}{5}}b^{\frac{1}{5}}\left(\sqrt{5}+1\right)-a^{\frac{1}{5}}b^{\frac{1}{5}}\sqrt{2\,\sqrt{5}-10}}{4\,b^{\frac{2}{5}}x-a^{\frac{1}{5}}b^{\frac{1}{5}}\left(\sqrt{5}+1\right)+a^{\frac{1}{5}}b^{\frac{1}{5}}\sqrt{2\,\sqrt{5}-10}}\right)}{10\,a^{\frac{4}{5}}b^{\frac{1}{5}}\sqrt{2\,\sqrt{5}-10}}+\frac{\sqrt{5}\left(\sqrt{5}+1\right)\log\left(\frac{4\,b^{\frac{2}{5}}x+a^{\frac{1}{5}}b^{\frac{1}{5}}\left(\sqrt{5}-1\right)-a^{\frac{1}{5}}b^{\frac{1}{5}}\sqrt{-2\,\sqrt{5}-10}}{4\,b^{\frac{2}{5}}x+a^{\frac{1}{5}}b^{\frac{1}{5}}\left(\sqrt{5}-1\right)+a^{\frac{1}{5}}b^{\frac{1}{5}}\sqrt{-2\,\sqrt{5}-10}}\right)}{10\,a^{\frac{4}{5}}b^{\frac{1}{5}}\sqrt{-2\,\sqrt{5}-10}}-\frac{\left(\sqrt{5}+3\right)\log\left(2\,b^{\frac{2}{5}}x^{2}-a^{\frac{1}{5}}b^{\frac{1}{5}}x\left(\sqrt{5}+1\right)+2\,a^{\frac{2}{5}}\right)}{10\,a^{\frac{4}{5}}b^{\frac{1}{5}}\left(\sqrt{5}+1\right)}-\frac{\left(\sqrt{5}-3\right)\log\left(2\,b^{\frac{2}{5}}x^{2}+a^{\frac{1}{5}}b^{\frac{1}{5}}x\left(\sqrt{5}-1\right)+2\,a^{\frac{2}{5}}\right)}{10\,a^{\frac{4}{5}}b^{\frac{1}{5}}\left(\sqrt{5}-1\right)}+\frac{\log\left(b^{\frac{1}{5}}x+a^{\frac{1}{5}}\right)}{5\,a^{\frac{4}{5}}b^{\frac{1}{5}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x^5 + a),x, algorithm="maxima")
```

```
[Out] 1/10*sqrt(5)*(sqrt(5) - 1)*log((4*b^(2/5)*x - a^(1/5)*b^(1/5)*(sq
rt(5) + 1) - a^(1/5)*b^(1/5)*sqrt(2*sqrt(5) - 10))/(4*b^(2/5)*x -
 a^(1/5)*b^(1/5)*(sqrt(5) + 1) + a^(1/5)*b^(1/5)*sqrt(2*sqrt(5) -
 10)))/(a^(4/5)*b^(1/5)*sqrt(2*sqrt(5) - 10)) + 1/10*sqrt(5)*(sqr
t(5) + 1)*log((4*b^(2/5)*x + a^(1/5)*b^(1/5)*(sqrt(5) - 1) - a^(1
/5)*b^(1/5)*sqrt(-2*sqrt(5) - 10))/(4*b^(2/5)*x + a^(1/5)*b^(1/5)
*(sqrt(5) - 1) + a^(1/5)*b^(1/5)*sqrt(-2*sqrt(5) - 10)))/(a^(4/5)
*b^(1/5)*sqrt(-2*sqrt(5) - 10)) - 1/10*(sqrt(5) + 3)*log(2*b^(2/5
)*x^2 - a^(1/5)*b^(1/5)*x*(sqrt(5) + 1) + 2*a^(2/5))/(a^(4/5)*b^(
1/5)*(sqrt(5) + 1)) - 1/10*(sqrt(5) - 3)*log(2*b^(2/5)*x^2 + a^(1
/5)*b^(1/5)*x*(sqrt(5) - 1) + 2*a^(2/5))/(a^(4/5)*b^(1/5)*(sqrt(5
) - 1)) + 1/5*log(b^(1/5)*x + a^(1/5))/(a^(4/5)*b^(1/5))
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x^5 + a),x, algorithm="fricas")
```

```
[Out] Exception raised: NotImplementedError
```

Sympy [A] time = 0.408071, size = 20, normalized size = 0.07

$$\operatorname{RootSum}\left(3125t^{5}a^{4}b-1,\left(t\mapsto t\log\left(5ta+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**5+a),x)
```

```
[Out] RootSum(3125*_t**5*a**4*b - 1, Lambda(_t, _t*log(5*_t*a + x)))
```

GIAC/XCAS [A] time = 0.239199, size = 371, normalized size = 1.23

$$-\frac{\left(-\frac{a}{b}\right)^{\frac{1}{5}}\ln\left(\left|x-\left(-\frac{a}{b}\right)^{\frac{1}{5}}\right|\right)}{5\,a}+\frac{\left(-ab^{4}\right)^{\frac{1}{5}}\sqrt{2\,\sqrt{5}+10}\arctan\left(-\frac{\left(\sqrt{5}-1\right)\left(-\frac{a}{b}\right)^{\frac{1}{5}}-4\,x}{\sqrt{2\,\sqrt{5}+10}\left(-\frac{a}{b}\right)^{\frac{1}{5}}}\right)}{10\,ab}+\frac{\left(-ab^{4}\right)^{\frac{1}{5}}\sqrt{-2\,\sqrt{5}+10}\arctan\left(\frac{\left(\sqrt{5}+1\right)\left(-\frac{a}{b}\right)^{\frac{1}{5}}+4\,x}{\sqrt{-2\,\sqrt{5}+10}\left(-\frac{a}{b}\right)^{\frac{1}{5}}}\right)}{10\,ab}+\frac{\left(-ab^{4}\right)^{\frac{1}{5}}\ln\left(x^{2}+\frac{1}{2}\,x\left(\sqrt{5}\left(-\frac{a}{b}\right)^{\frac{1}{5}}+\left(-\frac{a}{b}\right)^{\frac{1}{5}}\right)+\left(-\frac{a}{b}\right)^{\frac{2}{5}}\right)}{5\,ab\left(\sqrt{5}-1\right)}-\frac{\left(-ab^{4}\right)^{\frac{1}{5}}\ln\left(x^{2}-\frac{1}{2}\,x\left(\sqrt{5}\left(-\frac{a}{b}\right)^{\frac{1}{5}}-\left(-\frac{a}{b}\right)^{\frac{1}{5}}\right)+\left(-\frac{a}{b}\right)^{\frac{2}{5}}\right)}{5\,ab\left(\sqrt{5}+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x^5 + a),x, algorithm="giac")
```

```
[Out] -1/5*(-a/b)^(1/5)*ln(abs(x - (-a/b)^(1/5)))/a + 1/10*(-a*b^4)^(1/
5)*sqrt(2*sqrt(5) + 10)*arctan(-((sqrt(5) - 1)*(-a/b)^(1/5) - 4*x
)/(sqrt(2*sqrt(5) + 10)*(-a/b)^(1/5)))/(a*b) + 1/10*(-a*b^4)^(1/5
)*sqrt(-2*sqrt(5) + 10)*arctan(((sqrt(5) + 1)*(-a/b)^(1/5) + 4*x)
/(sqrt(-2*sqrt(5) + 10)*(-a/b)^(1/5)))/(a*b) + 1/5*(-a*b^4)^(1/5)
*ln(x^2 + 1/2*x*(sqrt(5)*(-a/b)^(1/5) + (-a/b)^(1/5)) + (-a/b)^(2
/5))/(a*b*(sqrt(5) - 1)) - 1/5*(-a*b^4)^(1/5)*ln(x^2 - 1/2*x*(sqr
t(5)*(-a/b)^(1/5) - (-a/b)^(1/5)) + (-a/b)^(2/5))/(a*b*(sqrt(5) +
 1))
```

3.1275 $\int \frac{x^{24}}{(a+bx^5)^2}\,dx$

Optimal. Leaf size=72

$$-\frac{a^4}{5b^5(a+bx^5)}-\frac{4a^3\log(a+bx^5)}{5b^5}+\frac{3a^2x^5}{5b^4}-\frac{ax^{10}}{5b^3}+\frac{x^{15}}{15b^2}$$

```
[Out] (3*a^2*x^5)/(5*b^4) - (a*x^10)/(5*b^3) + x^15/(15*b^2) - a^4/(5*b
^5*(a + b*x^5)) - (4*a^3*Log[a + b*x^5])/(5*b^5)
```

Rubi [A] time = 0.119689, antiderivative size = 72, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^4}{5b^5(a+bx^5)}-\frac{4a^3\log(a+bx^5)}{5b^5}+\frac{3a^2x^5}{5b^4}-\frac{ax^{10}}{5b^3}+\frac{x^{15}}{15b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^24/(a + b*x^5)^2,x]
```

```
[Out] (3*a^2*x^5)/(5*b^4) - (a*x^10)/(5*b^3) + x^15/(15*b^2) - a^4/(5*b
^5*(a + b*x^5)) - (4*a^3*Log[a + b*x^5])/(5*b^5)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^4}{5b^5(a+bx^5)}-\frac{4a^3\log(a+bx^5)}{5b^5}+\frac{3a^2x^5}{5b^4}-\frac{2a\int^{x^5} x\,dx}{5b^3}+\frac{x^{15}}{15b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**24/(b*x**5+a)**2,x)
```

```
[Out] -a**4/(5*b**5*(a + b*x**5)) - 4*a**3*log(a + b*x**5)/(5*b**5) + 3
*a**2*x**5/(5*b**4) - 2*a*Integral(x, (x, x**5))/(5*b**3) + x**15
/(15*b**2)
```

Mathematica [A] time = 0.044246, size = 60, normalized size = 0.83

$$\frac{-\frac{3a^4}{a+bx^5}-12a^3\log(a+bx^5)+9a^2bx^5-3ab^2x^{10}+b^3x^{15}}{15b^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^24/(a + b*x^5)^2,x]
```

```
[Out] (9*a^2*b*x^5 - 3*a*b^2*x^10 + b^3*x^15 - (3*a^4)/(a + b*x^5) - 12
*a^3*Log[a + b*x^5])/(15*b^5)
```

Maple [A] time = 0.01, size = 63, normalized size = 0.9

$$\frac{3\,x^5a^2}{5\,b^4}-\frac{ax^{10}}{5\,b^3}+\frac{x^{15}}{15\,b^2}-\frac{a^4}{5\,b^5(bx^5+a)}-\frac{4\,a^3\ln(bx^5+a)}{5\,b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^24/(b*x^5+a)^2,x)
```

```
[Out] 3/5*a^2*x^5/b^4-1/5*a*x^10/b^3+1/15*x^15/b^2-1/5*a^4/b^5/(b*x^5+a
)-4/5*a^3*ln(b*x^5+a)/b^5
```

Maxima [A] time = 1.43222, size = 88, normalized size = 1.22

$$-\frac{a^4}{5\,(b^6x^5+ab^5)}-\frac{4\,a^3\log\left(bx^5+a\right)}{5\,b^5}+\frac{b^2x^{15}-3\,abx^{10}+9\,a^2x^5}{15\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^24/(b*x^5 + a)^2,x, algorithm="maxima")
```

```
[Out] -1/5*a^4/(b^6*x^5 + a*b^5) - 4/5*a^3*log(b*x^5 + a)/b^5 + 1/15*(b
^2*x^15 - 3*a*b*x^10 + 9*a^2*x^5)/b^4
```

Fricas [A] time = 0.214202, size = 109, normalized size = 1.51

$$\frac{b^4x^{20}-2\,ab^3x^{15}+6\,a^2b^2x^{10}+9\,a^3bx^5-3\,a^4-12\,\left(a^3bx^5+a^4\right)\log\left(bx^5+a\right)}{15\,(b^6x^5+ab^5)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^24/(b*x^5 + a)^2,x, algorithm="fricas")
```

```
[Out] 1/15*(b^4*x^20 - 2*a*b^3*x^15 + 6*a^2*b^2*x^10 + 9*a^3*b*x^5 - 3*
a^4 - 12*(a^3*b*x^5 + a^4)*log(b*x^5 + a))/(b^6*x^5 + a*b^5)
```

Sympy [A] time = 2.96634, size = 68, normalized size = 0.94

$$-\frac{a^4}{5ab^5+5b^6x^5}-\frac{4a^3\log\left(a+bx^5\right)}{5b^5}+\frac{3a^2x^5}{5b^4}-\frac{ax^{10}}{5b^3}+\frac{x^{15}}{15b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**24/(b*x**5+a)**2,x)
```

```
[Out] -a**4/(5*a*b**5 + 5*b**6*x**5) - 4*a**3*log(a + b*x**5)/(5*b**5)
+ 3*a**2*x**5/(5*b**4) - a*x**10/(5*b**3) + x**15/(15*b**2)
```

GIAC/XCAS [A] time = 0.233235, size = 108, normalized size = 1.5

$$-\frac{4\,a^3\ln\left(\left|bx^5+a\right|\right)}{5\,b^5}+\frac{b^4x^{15}-3\,ab^3x^{10}+9\,a^2b^2x^5}{15\,b^6}+\frac{4\,a^3bx^5+3\,a^4}{5\,(bx^5+a)b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^24/(b*x^5 + a)^2,x, algorithm="giac")
```

```
[Out] -4/5*a^3*ln(abs(b*x^5 + a))/b^5 + 1/15*(b^4*x^15 - 3*a*b^3*x^10 +
 9*a^2*b^2*x^5)/b^6 + 1/5*(4*a^3*b*x^5 + 3*a^4)/((b*x^5 + a)*b^5)
```

3.1276 $\int \frac{x^{19}}{(a+bx^5)^2} dx$

Optimal. Leaf size=59

$$\frac{a^3}{5b^4(a+bx^5)}+\frac{3a^2\log(a+bx^5)}{5b^4}-\frac{2ax^5}{5b^3}+\frac{x^{10}}{10b^2}$$

```
[Out] (-2*a*x^5)/(5*b^3) + x^10/(10*b^2) + a^3/(5*b^4*(a + b*x^5)) + (3
*a^2*Log[a + b*x^5])/(5*b^4)
```

Rubi [A] time = 0.103146, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^3}{5b^4(a+bx^5)}+\frac{3a^2\log(a+bx^5)}{5b^4}-\frac{2ax^5}{5b^3}+\frac{x^{10}}{10b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^19/(a + b*x^5)^2,x]
```

```
[Out] (-2*a*x^5)/(5*b^3) + x^10/(10*b^2) + a^3/(5*b^4*(a + b*x^5)) + (3
*a^2*Log[a + b*x^5])/(5*b^4)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^3}{5b^4(a+bx^5)}+\frac{3a^2\log(a+bx^5)}{5b^4}-\frac{2ax^5}{5b^3}+\frac{\int^{x^5} x\,dx}{5b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**19/(b*x**5+a)**2,x)
```

```
[Out] a**3/(5*b**4*(a + b*x**5)) + 3*a**2*log(a + b*x**5)/(5*b**4) - 2*
a*x**5/(5*b**3) + Integral(x, (x, x**5))/(5*b**2)
```

Mathematica [A] time = 0.0283473, size = 49, normalized size = 0.83

$$\frac{\frac{2a^3}{a+bx^5}+6a^2\log(a+bx^5)-4abx^5+b^2x^{10}}{10b^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^19/(a + b*x^5)^2,x]
```

```
[Out] (-4*a*b*x^5 + b^2*x^10 + (2*a^3)/(a + b*x^5) + 6*a^2*Log[a + b*x^
5])/(10*b^4)
```

Maple [A] time = 0.008, size = 52, normalized size = 0.9

$$-\frac{2\,ax^5}{5\,b^3}+\frac{x^{10}}{10\,b^2}+\frac{a^3}{5\,b^4(bx^5+a)}+\frac{3\,a^2\ln(bx^5+a)}{5\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^19/(b*x^5+a)^2,x)
```

```
[Out] -2/5*a*x^5/b^3+1/10*x^10/b^2+1/5*a^3/b^4/(b*x^5+a)+3/5*a^2*ln(b*x
^5+a)/b^4
```

Maxima [A] time = 1.41995, size = 73, normalized size = 1.24

$$\frac{a^3}{5\,(b^5x^5+ab^4)}+\frac{3\,a^2\log\left(bx^5+a\right)}{5\,b^4}+\frac{bx^{10}-4\,ax^5}{10\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^19/(b*x^5 + a)^2,x, algorithm="maxima")
```

```
[Out] 1/5*a^3/(b^5*x^5 + a*b^4) + 3/5*a^2*log(b*x^5 + a)/b^4 + 1/10*(b*
x^10 - 4*a*x^5)/b^3
```

Fricas [A] time = 0.215, size = 95, normalized size = 1.61

$$\frac{b^3x^{15}-3\,ab^2x^{10}-4\,a^2bx^5+2\,a^3+6\,\left(a^2bx^5+a^3\right)\log\left(bx^5+a\right)}{10\,(b^5x^5+ab^4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^19/(b*x^5 + a)^2,x, algorithm="fricas")
```

```
[Out] 1/10*(b^3*x^15 - 3*a*b^2*x^10 - 4*a^2*b*x^5 + 2*a^3 + 6*(a^2*b*x^
5 + a^3)*log(b*x^5 + a))/(b^5*x^5 + a*b^4)
```

Sympy [A] time = 2.89992, size = 56, normalized size = 0.95

$$\frac{a^3}{5ab^4+5b^5x^5}+\frac{3a^2\log\left(a+bx^5\right)}{5b^4}-\frac{2ax^5}{5b^3}+\frac{x^{10}}{10b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**19/(b*x**5+a)**2,x)
```

```
[Out] a**3/(5*a*b**4 + 5*b**5*x**5) + 3*a**2*log(a + b*x**5)/(5*b**4) -
 2*a*x**5/(5*b**3) + x**10/(10*b**2)
```

GIAC/XCAS [A] time = 0.233083, size = 90, normalized size = 1.53

$$\frac{3\,a^2\ln\left(\left|bx^5+a\right|\right)}{5\,b^4}+\frac{b^2x^{10}-4\,abx^5}{10\,b^4}-\frac{3\,a^2bx^5+2\,a^3}{5\,(bx^5+a)b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^19/(b*x^5 + a)^2,x, algorithm="giac")
```

```
[Out] 3/5*a^2*ln(abs(b*x^5 + a))/b^4 + 1/10*(b^2*x^10 - 4*a*b*x^5)/b^4
- 1/5*(3*a^2*b*x^5 + 2*a^3)/((b*x^5 + a)*b^4)
```

3.1277 $\int \frac{x^{14}}{(a+bx^5)^2}\,dx$

Optimal. Leaf size=46

$$-\frac{a^2}{5b^3(a+bx^5)}-\frac{2a\log(a+bx^5)}{5b^3}+\frac{x^5}{5b^2}$$

```
[Out] x^5/(5*b^2) - a^2/(5*b^3*(a + b*x^5)) - (2*a*Log[a + b*x^5])/(5*b
^3)
```

Rubi [A] time = 0.0771601, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^2}{5b^3(a+bx^5)}-\frac{2a\log(a+bx^5)}{5b^3}+\frac{x^5}{5b^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^14/(a + b*x^5)^2,x]
```

```
[Out] x^5/(5*b^2) - a^2/(5*b^3*(a + b*x^5)) - (2*a*Log[a + b*x^5])/(5*b
^3)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^2}{5b^3(a+bx^5)}-\frac{2a\log(a+bx^5)}{5b^3}+\frac{\int^{x^5}\frac{1}{b^2}\,dx}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**14/(b*x**5+a)**2,x)
```

```
[Out] -a**2/(5*b**3*(a + b*x**5)) - 2*a*log(a + b*x**5)/(5*b**3) + Inte
gral(b**(-2), (x, x**5))/5
```

Mathematica [A] time = 0.0279227, size = 38, normalized size = 0.83

$$\frac{-\frac{a^2}{a+bx^5}-2a\log(a+bx^5)+bx^5}{5b^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^14/(a + b*x^5)^2,x]
```

```
[Out] (b*x^5 - a^2/(a + b*x^5) - 2*a*Log[a + b*x^5])/(5*b^3)
```

Maple [A] time = 0.008, size = 41, normalized size = 0.9

$$\frac{x^5}{5\,b^2}-\frac{a^2}{5\,b^3(bx^5+a)}-\frac{2\,a\ln(bx^5+a)}{5\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^14/(b*x^5+a)^2,x)
```

```
[Out] 1/5*x^5/b^2-1/5*a^2/b^3/(b*x^5+a)-2/5*a*ln(b*x^5+a)/b^3
```

Maxima [A] time = 1.43658, size = 58, normalized size = 1.26

$$\frac{x^5}{5\,b^2}-\frac{a^2}{5\,(b^4x^5+ab^3)}-\frac{2\,a\log\left(bx^5+a\right)}{5\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^14/(b*x^5 + a)^2,x, algorithm="maxima")
```

```
[Out] 1/5*x^5/b^2 - 1/5*a^2/(b^4*x^5 + a*b^3) - 2/5*a*log(b*x^5 + a)/b^
3
```

Fricas [A] time = 0.212215, size = 76, normalized size = 1.65

$$\frac{b^2x^{10}+abx^5-a^2-2\left(abx^5+a^2\right)\log\left(bx^5+a\right)}{5\,(b^4x^5+ab^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^14/(b*x^5 + a)^2,x, algorithm="fricas")
```

```
[Out] 1/5*(b^2*x^10 + a*b*x^5 - a^2 - 2*(a*b*x^5 + a^2)*log(b*x^5 + a))
/(b^4*x^5 + a*b^3)
```

Sympy [A] time = 2.78886, size = 42, normalized size = 0.91

$$-\frac{a^2}{5ab^3+5b^4x^5}-\frac{2a\log\left(a+bx^5\right)}{5b^3}+\frac{x^5}{5b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**14/(b*x**5+a)**2,x)
```

```
[Out] -a**2/(5*a*b**3 + 5*b**4*x**5) - 2*a*log(a + b*x**5)/(5*b**3) + x
**5/(5*b**2)
```

GIAC/XCAS [A] time = 0.229926, size = 66, normalized size = 1.43

$$\frac{x^5}{5\,b^2}-\frac{2\,a\ln\left(\left|bx^5+a\right|\right)}{5\,b^3}+\frac{2\,abx^5+a^2}{5\,(bx^5+a)b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^14/(b*x^5 + a)^2,x, algorithm="giac")
```

```
[Out] 1/5*x^5/b^2 - 2/5*a*ln(abs(b*x^5 + a))/b^3 + 1/5*(2*a*b*x^5 + a^2
)/((b*x^5 + a)*b^3)
```

3.1278 $\int \frac{x^9}{(a+bx^5)^2} dx$

Optimal. Leaf size=33

$$\frac{a}{5b^2(a+bx^5)}+\frac{\log(a+bx^5)}{5b^2}$$

```
[Out] a/(5*b^2*(a + b*x^5)) + Log[a + b*x^5]/(5*b^2)
```

Rubi [A] time = 0.0593079, antiderivative size = 33, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a}{5b^2(a+bx^5)}+\frac{\log(a+bx^5)}{5b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^9/(a + b*x^5)^2,x]

[Out] a/(5*b^2*(a + b*x^5)) + Log[a + b*x^5]/(5*b^2)
```

Rubi in Sympy [A] time = 7.77699, size = 26, normalized size = 0.79

$$\frac{a}{5b^2(a+bx^5)}+\frac{\log(a+bx^5)}{5b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**9/(b*x**5+a)**2,x)

[Out] a/(5*b**2*(a + b*x**5)) + log(a + b*x**5)/(5*b**2)
```

Mathematica [A] time = 0.0155022, size = 27, normalized size = 0.82

$$\frac{\frac{a}{a+bx^5}+\log(a+bx^5)}{5b^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^9/(a + b*x^5)^2,x]

[Out] (a/(a + b*x^5) + Log[a + b*x^5])/(5*b^2)
```

Maple [A] time = 0.007, size = 30, normalized size = 0.9

$$\frac{a}{5\,b^2(bx^5+a)}+\frac{\ln(bx^5+a)}{5\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^9/(b*x^5+a)^2,x)
```

```
[Out] 1/5*a/b^2/(b*x^5+a)+1/5*ln(b*x^5+a)/b^2
```

Maxima [A] time = 1.42643, size = 43, normalized size = 1.3

$$\frac{a}{5\,(b^3x^5 + ab^2)} + \frac{\log\left(bx^5 + a\right)}{5\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(b*x^5 + a)^2,x, algorithm="maxima")
```

```
[Out] 1/5*a/(b^3*x^5 + a*b^2) + 1/5*log(b*x^5 + a)/b^2
```

Fricas [A] time = 0.216524, size = 47, normalized size = 1.42

$$\frac{\left(bx^5 + a\right)\log\left(bx^5 + a\right) + a}{5\,(b^3x^5 + ab^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(b*x^5 + a)^2,x, algorithm="fricas")
```

```
[Out] 1/5*((b*x^5 + a)*log(b*x^5 + a) + a)/(b^3*x^5 + a*b^2)
```

Sympy [A] time = 2.54323, size = 29, normalized size = 0.88

$$\frac{a}{5ab^2 + 5b^3x^5} + \frac{\log\left(a + bx^5\right)}{5b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**9/(b*x**5+a)**2,x)
```

```
[Out] a/(5*a*b**2 + 5*b**3*x**5) + log(a + b*x**5)/(5*b**2)
```

GIAC/XCAS [A] time = 0.231069, size = 65, normalized size = 1.97

$$-\frac{\frac{\ln\left(\frac{|bx^5+a|}{\left(bx^5+a\right)^2|b|}\right)}{b} - \frac{a}{(bx^5+a)b}}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(b*x^5 + a)^2,x, algorithm="giac")
```

```
[Out] -1/5*(ln(abs(b*x^5 + a)/((b*x^5 + a)^2*abs(b)))/b - a/((b*x^5 + a
)*b))/b
```

3.1279 $\int \frac{x^4}{(a+bx^5)^2} \, dx$

Optimal. Leaf size=16

$$-\frac{1}{5b\left(a+bx^5\right)}$$

```
[Out] -1/(5*b*(a + b*x^5))
```

Rubi [A] time = 0.00987596, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$-\frac{1}{5b\left(a+bx^5\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a + b*x^5)^2,x]

[Out] -1/(5*b*(a + b*x^5))
```

Rubi in Sympy [A] time = 2.11381, size = 12, normalized size = 0.75

$$-\frac{1}{5b\left(a+bx^5\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(b*x**5+a)**2,x)

[Out] -1/(5*b*(a + b*x**5))
```

Mathematica [A] time = 0.00786806, size = 16, normalized size = 1.

$$-\frac{1}{5b\left(a+bx^5\right)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(a + b*x^5)^2,x]

[Out] -1/(5*b*(a + b*x^5))
```

Maple [A] time = 0.002, size = 15, normalized size = 0.9

$$-\frac{1}{5\,b\left(bx^5+a\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(b*x^5+a)^2,x)

[Out] -1/5/b/(b*x^5+a)
```

Maxima [A] time = 1.43769, size = 19, normalized size = 1.19

$$-\frac{1}{5\,(bx^5+a)b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^5 + a)^2,x, algorithm="maxima")
```

```
[Out] -1/5/((b*x^5 + a)*b)
```

Fricas [A] time = 0.219039, size = 20, normalized size = 1.25

$$-\frac{1}{5\,(b^2x^5+ab)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^5 + a)^2,x, algorithm="fricas")
```

```
[Out] -1/5/(b^2*x^5 + a*b)
```

Sympy [A] time = 2.19796, size = 15, normalized size = 0.94

$$-\frac{1}{5ab+5b^2x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(b*x**5+a)**2,x)
```

```
[Out] -1/(5*a*b + 5*b**2*x**5)
```

GIAC/XCAS [A] time = 0.227402, size = 19, normalized size = 1.19

$$-\frac{1}{5\,(bx^5+a)b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^5 + a)^2,x, algorithm="giac")
```

```
[Out] -1/5/((b*x^5 + a)*b)
```

3.1280 $\int \frac{1}{x(a+bx^5)^2} dx$

Optimal. Leaf size=38

$$-\frac{\log\left(a+bx^5\right)}{5a^2}+\frac{\log(x)}{a^2}+\frac{1}{5a\left(a+bx^5\right)}$$

```
[Out] 1/(5*a*(a + b*x^5)) + Log[x]/a^2 - Log[a + b*x^5]/(5*a^2)
```

Rubi [A] time = 0.0613219, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{\log\left(a+bx^5\right)}{5a^2}+\frac{\log(x)}{a^2}+\frac{1}{5a\left(a+bx^5\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a + b*x^5)^2),x]
```

```
[Out] 1/(5*a*(a + b*x^5)) + Log[x]/a^2 - Log[a + b*x^5]/(5*a^2)
```

Rubi in Sympy [A] time = 8.34999, size = 34, normalized size = 0.89

$$\frac{1}{5a\left(a+bx^5\right)}+\frac{\log\left(x^5\right)}{5a^2}-\frac{\log\left(a+bx^5\right)}{5a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(b*x**5+a)**2,x)
```

```
[Out] 1/(5*a*(a + b*x**5)) + log(x**5)/(5*a**2) - log(a + b*x**5)/(5*a*
*2)
```

Mathematica [A] time = 0.0234349, size = 33, normalized size = 0.87

$$\frac{\frac{a}{a+bx^5}-\log\left(a+bx^5\right)+5\log(x)}{5a^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a + b*x^5)^2),x]
```

```
[Out] (a/(a + b*x^5) + 5*Log[x] - Log[a + b*x^5])/(5*a^2)
```

Maple [A] time = 0.011, size = 35, normalized size = 0.9

$$\frac{1}{5\,a\left(bx^5+a\right)}+\frac{\ln(x)}{a^2}-\frac{\ln\left(bx^5+a\right)}{5\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(b*x^5+a)^2,x)
```

```
[Out] 1/5/a/(b*x^5+a)+ln(x)/a^2-1/5*ln(b*x^5+a)/a^2
```

Maxima [A] time = 1.43865, size = 50, normalized size = 1.32

$$\frac{1}{5\left(abx^5+a^2\right)}-\frac{\log\left(bx^5+a\right)}{5\,a^2}+\frac{\log\left(x^5\right)}{5\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + a)^2*x),x, algorithm="maxima")
```

```
[Out] 1/5/(a*b*x^5 + a^2) - 1/5*log(b*x^5 + a)/a^2 + 1/5*log(x^5)/a^2
```

Fricas [A] time = 0.218849, size = 63, normalized size = 1.66

$$-\frac{\left(bx^5+a\right)\log\left(bx^5+a\right)-5\left(bx^5+a\right)\log\left(x\right)-a}{5\left(a^2bx^5+a^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + a)^2*x),x, algorithm="fricas")
```

```
[Out] -1/5*((b*x^5 + a)*log(b*x^5 + a) - 5*(b*x^5 + a)*log(x) - a)/(a^2
*b*x^5 + a^3)
```

Sympy [A] time = 3.51443, size = 34, normalized size = 0.89

$$\frac{1}{5a^2+5abx^5}+\frac{\log\left(x\right)}{a^2}-\frac{\log\left(\frac{a}{b}+x^5\right)}{5a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(b*x**5+a)**2,x)
```

```
[Out] 1/(5*a**2 + 5*a*b*x**5) + log(x)/a**2 - log(a/b + x**5)/(5*a**2)
```

GIAC/XCAS [A] time = 0.230501, size = 61, normalized size = 1.61

$$-\frac{\ln\left(\left|bx^5+a\right|\right)}{5\,a^2}+\frac{\ln\left(\left|x\right|\right)}{a^2}+\frac{bx^5+2\,a}{5\left(bx^5+a\right)a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + a)^2*x),x, algorithm="giac")
```

```
[Out] -1/5*ln(abs(b*x^5 + a))/a^2 + ln(abs(x))/a^2 + 1/5*(b*x^5 + 2*a)/
((b*x^5 + a)*a^2)
```

3.1281 $\int \frac{1}{x^6(a+bx^5)^2}\,dx$

Optimal. Leaf size=52

$$\frac{2b\log(a+bx^5)}{5a^3}-\frac{2b\log(x)}{a^3}-\frac{b}{5a^2(a+bx^5)}-\frac{1}{5a^2x^5}$$

```
[Out] -1/(5*a^2*x^5) - b/(5*a^2*(a + b*x^5)) - (2*b*Log[x])/a^3 + (2*b*
Log[a + b*x^5])/(5*a^3)
```

Rubi [A] time = 0.0800447, antiderivative size = 52, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{2b\log(a+bx^5)}{5a^3}-\frac{2b\log(x)}{a^3}-\frac{b}{5a^2(a+bx^5)}-\frac{1}{5a^2x^5}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^6*(a + b*x^5)^2),x]
```

```
[Out] -1/(5*a^2*x^5) - b/(5*a^2*(a + b*x^5)) - (2*b*Log[x])/a^3 + (2*b*
Log[a + b*x^5])/(5*a^3)
```

Rubi in Sympy [A] time = 11.4603, size = 53, normalized size = 1.02

$$-\frac{b}{5a^2(a+bx^5)}-\frac{1}{5a^2x^5}-\frac{2b\log(x^5)}{5a^3}+\frac{2b\log(a+bx^5)}{5a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**6/(b*x**5+a)**2,x)
```

```
[Out] -b/(5*a**2*(a + b*x**5)) - 1/(5*a**2*x**5) - 2*b*log(x**5)/(5*a**
3) + 2*b*log(a + b*x**5)/(5*a**3)
```

Mathematica [A] time = 0.0751835, size = 41, normalized size = 0.79

$$-\frac{a\left(\frac{b}{a+bx^5}+\frac{1}{x^5}\right)-2b\log(a+bx^5)+10b\log(x)}{5a^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^6*(a + b*x^5)^2),x]
```

```
[Out] -(a*(x^(-5) + b/(a + b*x^5)) + 10*b*Log[x] - 2*b*Log[a + b*x^5])/
(5*a^3)
```

Maple [A] time = 0.014, size = 47, normalized size = 0.9

$$-\frac{1}{5\,x^5a^2}-\frac{b}{5\,a^2(bx^5+a)}-2\,\frac{b\ln(x)}{a^3}+\frac{2\,b\ln(bx^5+a)}{5\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^6/(b*x^5+a)^2,x)
```

```
[Out] -1/5/x^5/a^2-1/5*b/a^2/(b*x^5+a)-2*b*ln(x)/a^3+2/5*b*ln(b*x^5+a)/
a^3
```

Maxima [A] time = 1.4396, size = 72, normalized size = 1.38

$$-\frac{2\,bx^5+a}{5\,(a^2bx^{10}+a^3x^5)}+\frac{2\,b\log\left(bx^5+a\right)}{5\,a^3}-\frac{2\,b\log\left(x^5\right)}{5\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + a)^2*x^6),x, algorithm="maxima")
```

```
[Out] -1/5*(2*b*x^5 + a)/(a^2*b*x^10 + a^3*x^5) + 2/5*b*log(b*x^5 + a)/
a^3 - 2/5*b*log(x^5)/a^3
```

Fricas [A] time = 0.220529, size = 99, normalized size = 1.9

$$-\frac{2\,abx^5+a^2-2\,\left(b^2x^{10}+abx^5\right)\,\log\left(bx^5+a\right)+10\,\left(b^2x^{10}+abx^5\right)\,\log\left(x\right)}{5\,(a^3bx^{10}+a^4x^5)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + a)^2*x^6),x, algorithm="fricas")
```

```
[Out] -1/5*(2*a*b*x^5 + a^2 - 2*(b^2*x^10 + a*b*x^5)*log(b*x^5 + a) + 1
0*(b^2*x^10 + a*b*x^5)*log(x))/(a^3*b*x^10 + a^4*x^5)
```

Sympy [A] time = 43.2649, size = 53, normalized size = 1.02

$$-\frac{a+2bx^5}{5a^3x^5+5a^2bx^{10}}-\frac{2b\log\left(x\right)}{a^3}+\frac{2b\log\left(\frac{a}{b}+x^5\right)}{5a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**6/(b*x**5+a)**2,x)
```

```
[Out] -(a + 2*b*x**5)/(5*a**3*x**5 + 5*a**2*b*x**10) - 2*b*log(x)/a**3
+ 2*b*log(a/b + x**5)/(5*a**3)
```

GIAC/XCAS [A] time = 0.226623, size = 69, normalized size = 1.33

$$\frac{2\,b\ln\left(\left|bx^5+a\right|\right)}{5\,a^3}-\frac{2\,b\ln\left(\left|x\right|\right)}{a^3}-\frac{2\,bx^5+a}{5\,(bx^{10}+ax^5)a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + a)^2*x^6),x, algorithm="giac")
```

```
[Out] 2/5*b*ln(abs(b*x^5 + a))/a^3 - 2*b*ln(abs(x))/a^3 - 1/5*(2*b*x^5
+ a)/((b*x^10 + a*x^5)*a^2)
```

3.1282 $\int \frac{1}{x^{11}(a+bx^5)^2} dx$

Optimal. Leaf size=69

$$-\frac{3b^2\log(a+bx^5)}{5a^4}+\frac{3b^2\log(x)}{a^4}+\frac{b^2}{5a^3(a+bx^5)}+\frac{2b}{5a^3x^5}-\frac{1}{10a^2x^{10}}$$

```
[Out] -1/(10*a^2*x^10) + (2*b)/(5*a^3*x^5) + b^2/(5*a^3*(a + b*x^5)) +
(3*b^2*Log[x])/a^4 - (3*b^2*Log[a + b*x^5])/(5*a^4)
```

Rubi [A] time = 0.100333, antiderivative size = 69, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{3b^2\log(a+bx^5)}{5a^4}+\frac{3b^2\log(x)}{a^4}+\frac{b^2}{5a^3(a+bx^5)}+\frac{2b}{5a^3x^5}-\frac{1}{10a^2x^{10}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^11*(a + b*x^5)^2),x]
```

```
[Out] -1/(10*a^2*x^10) + (2*b)/(5*a^3*x^5) + b^2/(5*a^3*(a + b*x^5)) +
(3*b^2*Log[x])/a^4 - (3*b^2*Log[a + b*x^5])/(5*a^4)
```

Rubi in Sympy [A] time = 15.6734, size = 70, normalized size = 1.01

$$-\frac{1}{10a^2x^{10}}+\frac{b^2}{5a^3(a+bx^5)}+\frac{2b}{5a^3x^5}+\frac{3b^2\log(x^5)}{5a^4}-\frac{3b^2\log(a+bx^5)}{5a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**11/(b*x**5+a)**2,x)
```

```
[Out] -1/(10*a**2*x**10) + b**2/(5*a**3*(a + b*x**5)) + 2*b/(5*a**3*x**
5) + 3*b**2*log(x**5)/(5*a**4) - 3*b**2*log(a + b*x**5)/(5*a**4)
```

Mathematica [A] time = 0.108411, size = 57, normalized size = 0.83

$$\frac{-6b^2\log(a+bx^5)+a\left(\frac{2b^2}{a+bx^5}-\frac{a}{x^{10}}+\frac{4b}{x^5}\right)+30b^2\log(x)}{10a^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^11*(a + b*x^5)^2),x]
```

```
[Out] (a*(-(a/x^10) + (4*b)/x^5 + (2*b^2)/(a + b*x^5)) + 30*b^2*Log[x]
- 6*b^2*Log[a + b*x^5])/(10*a^4)
```

Maple [A] time = 0.014, size = 62, normalized size = 0.9

$$-\frac{1}{10\,a^2x^{10}}+\frac{2\,b}{5\,a^3x^5}+\frac{b^2}{5\,a^3(bx^5+a)}+3\,\frac{b^2\ln(x)}{a^4}-\frac{3\,b^2\ln(bx^5+a)}{5\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^11/(b*x^5+a)^2,x)
```

```
[Out] -1/10/a^2/x^10+2/5*b/a^3/x^5+1/5*b^2/a^3/(b*x^5+a)+3*b^2*ln(x)/a^
4-3/5*b^2*ln(b*x^5+a)/a^4
```

Maxima [A] time = 1.43829, size = 95, normalized size = 1.38

$$\frac{6\,b^2x^{10}+3\,abx^5-a^2}{10\,(a^3bx^{15}+a^4x^{10})}-\frac{3\,b^2\log\left(bx^5+a\right)}{5\,a^4}+\frac{3\,b^2\log\left(x^5\right)}{5\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + a)^2*x^11),x, algorithm="maxima")
```

```
[Out] 1/10*(6*b^2*x^10 + 3*a*b*x^5 - a^2)/(a^3*b*x^15 + a^4*x^10) - 3/5
*b^2*log(b*x^5 + a)/a^4 + 3/5*b^2*log(x^5)/a^4
```

Fricas [A] time = 0.221131, size = 122, normalized size = 1.77

$$\frac{6\,ab^2x^{10}+3\,a^2bx^5-a^3-6\left(b^3x^{15}+ab^2x^{10}\right)\log\left(bx^5+a\right)+30\left(b^3x^{15}+ab^2x^{10}\right)\log\left(x\right)}{10\,(a^4bx^{15}+a^5x^{10})}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + a)^2*x^11),x, algorithm="fricas")
```

```
[Out] 1/10*(6*a*b^2*x^10 + 3*a^2*b*x^5 - a^3 - 6*(b^3*x^15 + a*b^2*x^10
)*log(b*x^5 + a) + 30*(b^3*x^15 + a*b^2*x^10)*log(x))/(a^4*b*x^15
 + a^5*x^10)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**11/(b*x**5+a)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.228444, size = 115, normalized size = 1.67

$$-\frac{3\,b^2\ln\left(\left|bx^5+a\right|\right)}{5\,a^4}+\frac{3\,b^2\ln\left(\left|x\right|\right)}{a^4}+\frac{3\,b^3x^5+4\,ab^2}{5\,(bx^5+a)a^4}-\frac{9\,b^2x^{10}-4\,abx^5+a^2}{10\,a^4x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + a)^2*x^11),x, algorithm="giac")
```

```
[Out] -3/5*b^2*ln(abs(b*x^5 + a))/a^4 + 3*b^2*ln(abs(x))/a^4 + 1/5*(3*b
^3*x^5 + 4*a*b^2)/((b*x^5 + a)*a^4) - 1/10*(9*b^2*x^10 - 4*a*b*x^
5 + a^2)/(a^4*x^10)
```

3.1283 $\int \frac{x^{14}}{2b+bx^5}\,dx$

Optimal. Leaf size=34

$$\frac{x^{10}}{10b}-\frac{2x^5}{5b}+\frac{4\log\left(x^5+2\right)}{5b}$$

```
[Out] (-2*x^5)/(5*b) + x^10/(10*b) + (4*Log[2 + x^5])/(5*b)
```

Rubi [A] time = 0.0497654, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{x^{10}}{10b}-\frac{2x^5}{5b}+\frac{4\log\left(x^5+2\right)}{5b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^14/(2*b + b*x^5),x]
```

```
[Out] (-2*x^5)/(5*b) + x^10/(10*b) + (4*Log[2 + x^5])/(5*b)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{2x^5}{5b}+\frac{4\log\left(x^5+2\right)}{5b}+\frac{\int^{x^5} x\,dx}{5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**14/(b*x**5+2*b),x)
```

```
[Out] -2*x**5/(5*b) + 4*log(x**5 + 2)/(5*b) + Integral(x, (x, x**5))/(5
*b)
```

Mathematica [A] time = 0.0123581, size = 25, normalized size = 0.74

$$\frac{x^{10}-4x^5+8\log\left(x^5+2\right)-12}{10b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^14/(2*b + b*x^5),x]
```

```
[Out] (-12 - 4*x^5 + x^10 + 8*Log[2 + x^5])/(10*b)
```

Maple [A] time = 0.004, size = 29, normalized size = 0.9

$$-\frac{2\,x^5}{5\,b}+\frac{x^{10}}{10\,b}+\frac{4\,\ln\left(x^5+2\right)}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^14/(b*x^5+2*b),x)
```

```
[Out] -2/5*x^5/b+1/10*x^10/b+4/5*ln(x^5+2)/b
```

Maxima [A] time = 1.44392, size = 35, normalized size = 1.03

$$\frac{x^{10} - 4\,x^5}{10\,b} + \frac{4\,\log\left(x^5 + 2\right)}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^14/(b*x^5 + 2*b),x, algorithm="maxima")
```

```
[Out] 1/10*(x^10 - 4*x^5)/b + 4/5*log(x^5 + 2)/b
```

Fricas [A] time = 0.215766, size = 30, normalized size = 0.88

$$\frac{x^{10} - 4\,x^5 + 8\,\log\left(x^5 + 2\right)}{10\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^14/(b*x^5 + 2*b),x, algorithm="fricas")
```

```
[Out] 1/10*(x^10 - 4*x^5 + 8*log(x^5 + 2))/b
```

Sympy [A] time = 0.500774, size = 26, normalized size = 0.76

$$\frac{x^{10}}{10b} - \frac{2x^5}{5b} + \frac{4\log\left(x^5 + 2\right)}{5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**14/(b*x**5+2*b),x)
```

```
[Out] x**10/(10*b) - 2*x**5/(5*b) + 4*log(x**5 + 2)/(5*b)
```

GIAC/XCAS [A] time = 0.233317, size = 41, normalized size = 1.21

$$\frac{4\ln\left(\left|x^5 + 2\right|\right)}{5\,b} + \frac{bx^{10} - 4\,bx^5}{10\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^14/(b*x^5 + 2*b),x, algorithm="giac")
```

```
[Out] 4/5*ln(abs(x^5 + 2))/b + 1/10*(b*x^10 - 4*b*x^5)/b^2
```

3.1284 $\int \frac{x^9}{2b+bx^5}\,dx$

Optimal. Leaf size=24

$$\frac{x^5}{5b}-\frac{2\log\left(x^5+2\right)}{5b}$$

```
[Out] x^5/(5*b) - (2*Log[2 + x^5])/(5*b)
```

Rubi [A] time = 0.0372038, antiderivative size = 24, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{x^5}{5b}-\frac{2\log\left(x^5+2\right)}{5b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^9/(2*b + b*x^5),x]

[Out] x^5/(5*b) - (2*Log[2 + x^5])/(5*b)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int^{x^5}\frac{1}{b}\,dx}{5}-\frac{2\log\left(x^5+2\right)}{5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**9/(b*x**5+2*b),x)

[Out] Integral(1/b, (x, x**5))/5 - 2*log(x**5 + 2)/(5*b)
```

Mathematica [A] time = 0.00584097, size = 24, normalized size = 1.

$$\frac{x^5}{5b}-\frac{2\log\left(x^5+2\right)}{5b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^9/(2*b + b*x^5),x]

[Out] x^5/(5*b) - (2*Log[2 + x^5])/(5*b)
```

Maple [A] time = 0.002, size = 21, normalized size = 0.9

$$\frac{x^5}{5\,b}-\frac{2\,\ln\left(x^5+2\right)}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^9/(b*x^5+2*b),x)

[Out] 1/5*x^5/b-2/5*ln(x^5+2)/b
```

Maxima [A] time = 1.43104, size = 27, normalized size = 1.12

$$\frac{x^5}{5\,b} - \frac{2\,\log\left(x^5 + 2\right)}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(b*x^5 + 2*b),x, algorithm="maxima")
```

```
[Out] 1/5*x^5/b - 2/5*log(x^5 + 2)/b
```

Fricas [A] time = 0.214822, size = 23, normalized size = 0.96

$$\frac{x^5 - 2\,\log\left(x^5 + 2\right)}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(b*x^5 + 2*b),x, algorithm="fricas")
```

```
[Out] 1/5*(x^5 - 2*log(x^5 + 2))/b
```

Sympy [A] time = 0.482312, size = 17, normalized size = 0.71

$$\frac{x^5}{5b} - \frac{2\log\left(x^5 + 2\right)}{5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**9/(b*x**5+2*b),x)
```

```
[Out] x**5/(5*b) - 2*log(x**5 + 2)/(5*b)
```

GIAC/XCAS [A] time = 0.232032, size = 28, normalized size = 1.17

$$\frac{x^5}{5\,b} - \frac{2\ln\left(\left|x^5 + 2\right|\right)}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(b*x^5 + 2*b),x, algorithm="giac")
```

```
[Out] 1/5*x^5/b - 2/5*ln(abs(x^5 + 2))/b
```

3.1285 $\int \frac{x^4}{2b+bx^5} \, dx$

Optimal. Leaf size=13

$$\frac{\log(x^5+2)}{5b}$$

```
[Out] Log[2 + x^5]/(5*b)
```

Rubi [A] time = 0.0074956, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{\log(x^5+2)}{5b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(2*b + b*x^5),x]

[Out] Log[2 + x^5]/(5*b)
```

Rubi in Sympy [A] time = 2.5478, size = 8, normalized size = 0.62

$$\frac{\log(x^5+2)}{5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(b*x**5+2*b),x)

[Out] log(x**5 + 2)/(5*b)
```

Mathematica [A] time = 0.00524484, size = 17, normalized size = 1.31

$$\frac{\log(bx^5+2b)}{5b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(2*b + b*x^5),x]

[Out] Log[2*b + b*x^5]/(5*b)
```

Maple [A] time = 0., size = 12, normalized size = 0.9

$$\frac{\ln(x^5+2)}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(b*x^5+2*b),x)

[Out] 1/5*ln(x^5+2)/b
```

Maxima [A] time = 1.44687, size = 20, normalized size = 1.54

$$\frac{\log\left(bx^5 + 2\,b\right)}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^5 + 2*b),x, algorithm="maxima")
```

```
[Out] 1/5*log(b*x^5 + 2*b)/b
```

Fricas [A] time = 0.215282, size = 15, normalized size = 1.15

$$\frac{\log\left(x^5 + 2\right)}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^5 + 2*b),x, algorithm="fricas")
```

```
[Out] 1/5*log(x^5 + 2)/b
```

Sympy [A] time = 0.430266, size = 8, normalized size = 0.62

$$\frac{\log\left(x^5 + 2\right)}{5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(b*x**5+2*b),x)
```

```
[Out] log(x**5 + 2)/(5*b)
```

GIAC/XCAS [A] time = 0.23466, size = 22, normalized size = 1.69

$$\frac{\ln\left(\left|bx^5 + 2\,b\right|\right)}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^5 + 2*b),x, algorithm="giac")
```

```
[Out] 1/5*ln(abs(b*x^5 + 2*b))/b
```

3.1286 $\int \frac{1}{x(2b+bx^5)}\,dx$

Optimal. Leaf size=23

$$\frac{\log(x)}{2b}-\frac{\log\left(x^5+2\right)}{10b}$$

```
[Out] Log[x]/(2*b) - Log[2 + x^5]/(10*b)
```

Rubi [A] time = 0.0296823, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{\log(x)}{2b}-\frac{\log\left(x^5+2\right)}{10b}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(2*b + b*x^5)),x]

[Out] Log[x]/(2*b) - Log[2 + x^5]/(10*b)
```

Rubi in Sympy [A] time = 5.87634, size = 17, normalized size = 0.74

$$\frac{\log\left(x^5\right)}{10b}-\frac{\log\left(x^5+2\right)}{10b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(b*x**5+2*b),x)

[Out] log(x**5)/(10*b) - log(x**5 + 2)/(10*b)
```

Mathematica [A] time = 0.0104145, size = 23, normalized size = 1.

$$\frac{\log(x)}{2b}-\frac{\log\left(x^5+2\right)}{10b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(2*b + b*x^5)),x]

[Out] Log[x]/(2*b) - Log[2 + x^5]/(10*b)
```

Maple [A] time = 0.006, size = 20, normalized size = 0.9

$$\frac{\ln(x)}{2\,b}-\frac{\ln\left(x^5+2\right)}{10\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(b*x^5+2*b),x)

[Out] 1/2*ln(x)/b-1/10*ln(x^5+2)/b
```

Maxima [A] time = 1.44085, size = 28, normalized size = 1.22

$$-\frac{\log\left(x^5+2\right)}{10\,b}+\frac{\log\left(x^5\right)}{10\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + 2*b)*x),x, algorithm="maxima")
```

```
[Out] -1/10*log(x^5 + 2)/b + 1/10*log(x^5)/b
```

Fricas [A] time = 0.220929, size = 22, normalized size = 0.96

$$-\frac{\log\left(x^5+2\right)-5\,\log\left(x\right)}{10\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + 2*b)*x),x, algorithm="fricas")
```

```
[Out] -1/10*(log(x^5 + 2) - 5*log(x))/b
```

Sympy [A] time = 0.772315, size = 15, normalized size = 0.65

$$\frac{\log\left(x\right)}{2b}-\frac{\log\left(x^5+2\right)}{10b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(b*x**5+2*b),x)
```

```
[Out] log(x)/(2*b) - log(x**5 + 2)/(10*b)
```

GIAC/XCAS [A] time = 0.237359, size = 28, normalized size = 1.22

$$-\frac{\ln\left(\left|x^5+2\right|\right)}{10\,b}+\frac{\ln\left(\left|x\right|\right)}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + 2*b)*x),x, algorithm="giac")
```

```
[Out] -1/10*ln(abs(x^5 + 2))/b + 1/2*ln(abs(x))/b
```

3.1287 $\int \frac{1}{x^6(2b+bx^5)}\,dx$

Optimal. Leaf size=33

$$-\frac{1}{10bx^5}+\frac{\log\left(x^5+2\right)}{20b}-\frac{\log(x)}{4b}$$

```
[Out] -1/(10*b*x^5) - Log[x]/(4*b) + Log[2 + x^5]/(20*b)
```

Rubi [A] time = 0.0451624, antiderivative size = 33, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$-\frac{1}{10bx^5}+\frac{\log\left(x^5+2\right)}{20b}-\frac{\log(x)}{4b}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^6*(2*b + b*x^5)),x]

[Out] -1/(10*b*x^5) - Log[x]/(4*b) + Log[2 + x^5]/(20*b)
```

Rubi in Sympy [A] time = 8.06092, size = 26, normalized size = 0.79

$$-\frac{\log\left(x^5\right)}{20b}+\frac{\log\left(x^5+2\right)}{20b}-\frac{1}{10bx^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**6/(b*x**5+2*b),x)

[Out] -log(x**5)/(20*b) + log(x**5 + 2)/(20*b) - 1/(10*b*x**5)
```

Mathematica [A] time = 0.00768055, size = 33, normalized size = 1.

$$-\frac{1}{10bx^5}+\frac{\log\left(x^5+2\right)}{20b}-\frac{\log(x)}{4b}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^6*(2*b + b*x^5)),x]

[Out] -1/(10*b*x^5) - Log[x]/(4*b) + Log[2 + x^5]/(20*b)
```

Maple [A] time = 0.01, size = 28, normalized size = 0.9

$$-\frac{1}{10\,bx^5}-\frac{\ln(x)}{4\,b}+\frac{\ln\left(x^5+2\right)}{20\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^6/(b*x^5+2*b),x)

[Out] -1/10/b/x^5-1/4*ln(x)/b+1/20*ln(x^5+2)/b
```

Maxima [A] time = 1.44511, size = 39, normalized size = 1.18

$$\frac{\log\left(x^5+2\right)}{20\,b}-\frac{\log\left(x^5\right)}{20\,b}-\frac{1}{10\,bx^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + 2*b)*x^6),x, algorithm="maxima")
```

```
[Out] 1/20*log(x^5 + 2)/b - 1/20*log(x^5)/b - 1/10/(b*x^5)
```

Fricas [A] time = 0.220432, size = 36, normalized size = 1.09

$$\frac{x^5\log\left(x^5+2\right)-5\,x^5\log\left(x\right)-2}{20\,bx^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + 2*b)*x^6),x, algorithm="fricas")
```

```
[Out] 1/20*(x^5*log(x^5 + 2) - 5*x^5*log(x) - 2)/(b*x^5)
```

Sympy [A] time = 2.80609, size = 24, normalized size = 0.73

$$-\frac{\log\left(x\right)}{4b}+\frac{\log\left(x^5+2\right)}{20b}-\frac{1}{10bx^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**6/(b*x**5+2*b),x)
```

```
[Out] -log(x)/(4*b) + log(x**5 + 2)/(20*b) - 1/(10*b*x**5)
```

GIAC/XCAS [A] time = 0.239208, size = 46, normalized size = 1.39

$$\frac{\ln\left(\left|x^5+2\right|\right)}{20\,b}-\frac{\ln\left(\left|x\right|\right)}{4\,b}+\frac{x^5-2}{20\,bx^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + 2*b)*x^6),x, algorithm="giac")
```

```
[Out] 1/20*ln(abs(x^5 + 2))/b - 1/4*ln(abs(x))/b + 1/20*(x^5 - 2)/(b*x^
5)
```

3.1288 $\int \frac{x^{14}}{3+bx^5} dx$

Optimal. Leaf size=36

$$\frac{9\log(bx^5+3)}{5b^3} - \frac{3x^5}{5b^2} + \frac{x^{10}}{10b}$$

```
[Out] (-3*x^5)/(5*b^2) + x^10/(10*b) + (9*Log[3 + b*x^5])/(5*b^3)
```

Rubi [A] time = 0.056229, antiderivative size = 36, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{9\log(bx^5+3)}{5b^3} - \frac{3x^5}{5b^2} + \frac{x^{10}}{10b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^14/(3 + b*x^5),x]
```

```
[Out] (-3*x^5)/(5*b^2) + x^10/(10*b) + (9*Log[3 + b*x^5])/(5*b^3)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int^{x^5} x\,dx}{5b} - \frac{3x^5}{5b^2} + \frac{9\log(bx^5+3)}{5b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**14/(b*x**5+3),x)
```

```
[Out] Integral(x, (x, x**5))/(5*b) - 3*x**5/(5*b**2) + 9*log(b*x**5 + 3
)/(5*b**3)
```

Mathematica [A] time = 0.00954957, size = 36, normalized size = 1.

$$\frac{9\log(bx^5+3)}{5b^3} - \frac{3x^5}{5b^2} + \frac{x^{10}}{10b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^14/(3 + b*x^5),x]
```

```
[Out] (-3*x^5)/(5*b^2) + x^10/(10*b) + (9*Log[3 + b*x^5])/(5*b^3)
```

Maple [A] time = 0.005, size = 31, normalized size = 0.9

$$-\frac{3\,x^5}{5\,b^2} + \frac{x^{10}}{10\,b} + \frac{9\,\ln(bx^5+3)}{5\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^14/(b*x^5+3),x)
```

```
[Out] -3/5*x^5/b^2+1/10*x^10/b+9/5*ln(b*x^5+3)/b^3
```

Maxima [A] time = 1.43529, size = 41, normalized size = 1.14

$$\frac{bx^{10} - 6\,x^5}{10\,b^2} + \frac{9\,\log\left(bx^5 + 3\right)}{5\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^14/(b*x^5 + 3),x, algorithm="maxima")
```

```
[Out] 1/10*(b*x^10 - 6*x^5)/b^2 + 9/5*log(b*x^5 + 3)/b^3
```

Fricas [A] time = 0.214471, size = 39, normalized size = 1.08

$$\frac{b^2x^{10} - 6\,bx^5 + 18\,\log\left(bx^5 + 3\right)}{10\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^14/(b*x^5 + 3),x, algorithm="fricas")
```

```
[Out] 1/10*(b^2*x^10 - 6*b*x^5 + 18*log(b*x^5 + 3))/b^3
```

Sympy [A] time = 1.34325, size = 31, normalized size = 0.86

$$\frac{x^{10}}{10b} - \frac{3x^5}{5b^2} + \frac{9\log\left(bx^5 + 3\right)}{5b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**14/(b*x**5+3),x)
```

```
[Out] x**10/(10*b) - 3*x**5/(5*b**2) + 9*log(b*x**5 + 3)/(5*b**3)
```

GIAC/XCAS [A] time = 0.289198, size = 42, normalized size = 1.17

$$\frac{bx^{10} - 6\,x^5}{10\,b^2} + \frac{9\ln\left(\left|bx^5 + 3\right|\right)}{5\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^14/(b*x^5 + 3),x, algorithm="giac")
```

```
[Out] 1/10*(b*x^10 - 6*x^5)/b^2 + 9/5*ln(abs(b*x^5 + 3))/b^3
```

3.1289 $\int \frac{x^9}{3+bx^5}\,dx$

Optimal. Leaf size=26

$$\frac{x^5}{5b}-\frac{3\log\left(bx^5+3\right)}{5b^2}$$

```
[Out] x^5/(5*b) - (3*Log[3 + b*x^5])/(5*b^2)
```

Rubi [A] time = 0.0419082, antiderivative size = 26, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{x^5}{5b}-\frac{3\log\left(bx^5+3\right)}{5b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^9/(3 + b*x^5),x]

[Out] x^5/(5*b) - (3*Log[3 + b*x^5])/(5*b^2)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int^{x^5}\frac{1}{b}\,dx}{5}-\frac{3\log\left(bx^5+3\right)}{5b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**9/(b*x**5+3),x)

[Out] Integral(1/b, (x, x**5))/5 - 3*log(b*x**5 + 3)/(5*b**2)
```

Mathematica [A] time = 0.00653757, size = 26, normalized size = 1.

$$\frac{x^5}{5b}-\frac{3\log\left(bx^5+3\right)}{5b^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^9/(3 + b*x^5),x]

[Out] x^5/(5*b) - (3*Log[3 + b*x^5])/(5*b^2)
```

Maple [A] time = 0.003, size = 23, normalized size = 0.9

$$\frac{x^5}{5\,b}-\frac{3\,\ln\left(bx^5+3\right)}{5\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^9/(b*x^5+3),x)

[Out] 1/5*x^5/b-3/5*ln(b*x^5+3)/b^2
```

Maxima [A] time = 1.43831, size = 30, normalized size = 1.15

$$\frac{x^5}{5\,b} - \frac{3\,\log\left(bx^5 + 3\right)}{5\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(b*x^5 + 3),x, algorithm="maxima")

[Out] 1/5*x^5/b - 3/5*log(b*x^5 + 3)/b^2
```

Fricas [A] time = 0.213485, size = 28, normalized size = 1.08

$$\frac{bx^5 - 3\,\log\left(bx^5 + 3\right)}{5\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(b*x^5 + 3),x, algorithm="fricas")

[Out] 1/5*(b*x^5 - 3*log(b*x^5 + 3))/b^2
```

Sympy [A] time = 1.30378, size = 20, normalized size = 0.77

$$\frac{x^5}{5b} - \frac{3\log\left(bx^5 + 3\right)}{5b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**9/(b*x**5+3),x)

[Out] x**5/(5*b) - 3*log(b*x**5 + 3)/(5*b**2)
```

GIAC/XCAS [A] time = 0.287007, size = 31, normalized size = 1.19

$$\frac{x^5}{5\,b} - \frac{3\ln\left(\left|bx^5 + 3\right|\right)}{5\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(b*x^5 + 3),x, algorithm="giac")

[Out] 1/5*x^5/b - 3/5*ln(abs(b*x^5 + 3))/b^2
```

3.1290 $\int \frac{x^4}{3+bx^5}\,dx$

Optimal. Leaf size=15

$$\frac{\log(bx^5+3)}{5b}$$

```
[Out] Log[3 + b*x^5]/(5*b)
```

Rubi [A] time = 0.0090168, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{\log(bx^5+3)}{5b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(3 + b*x^5),x]

[Out] Log[3 + b*x^5]/(5*b)
```

Rubi in Sympy [A] time = 2.24996, size = 10, normalized size = 0.67

$$\frac{\log(bx^5+3)}{5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(b*x**5+3),x)

[Out] log(b*x**5 + 3)/(5*b)
```

Mathematica [A] time = 0.00478631, size = 15, normalized size = 1.

$$\frac{\log(bx^5+3)}{5b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(3 + b*x^5),x]

[Out] Log[3 + b*x^5]/(5*b)
```

Maple [A] time = 0.002, size = 14, normalized size = 0.9

$$\frac{\ln(bx^5+3)}{5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(b*x^5+3),x)

[Out] 1/5*ln(b*x^5+3)/b
```

Maxima [A] time = 1.43626, size = 18, normalized size = 1.2

$$\frac{\log\left(bx^5+3\right)}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^5 + 3),x, algorithm="maxima")

[Out] 1/5*log(b*x^5 + 3)/b
```

Fricas [A] time = 0.221267, size = 18, normalized size = 1.2

$$\frac{\log\left(bx^5+3\right)}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^5 + 3),x, algorithm="fricas")

[Out] 1/5*log(b*x^5 + 3)/b
```

Sympy [A] time = 0.379012, size = 10, normalized size = 0.67

$$\frac{\log\left(bx^5+3\right)}{5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(b*x**5+3),x)

[Out] log(b*x**5 + 3)/(5*b)
```

GIAC/XCAS [A] time = 0.287231, size = 19, normalized size = 1.27

$$\frac{\ln\left(\left|bx^5+3\right|\right)}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^5 + 3),x, algorithm="giac")

[Out] 1/5*ln(abs(b*x^5 + 3))/b
```

3.1291 $\int \frac{1}{x(3+bx^5)}\,dx$

Optimal. Leaf size=19

$$\frac{\log(x)}{3}-\frac{1}{15}\log\left(bx^5+3\right)$$

```
[Out] Log[x]/3 - Log[3 + b*x^5]/15
```

Rubi [A] time = 0.0287537, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{\log(x)}{3}-\frac{1}{15}\log\left(bx^5+3\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(3 + b*x^5)),x]

[Out] Log[x]/3 - Log[3 + b*x^5]/15
```

Rubi in Sympy [A] time = 4.43595, size = 15, normalized size = 0.79

$$\frac{\log\left(x^5\right)}{15}-\frac{\log\left(bx^5+3\right)}{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(b*x**5+3),x)

[Out] log(x**5)/15 - log(b*x**5 + 3)/15
```

Mathematica [A] time = 0.00661949, size = 19, normalized size = 1.

$$\frac{\log(x)}{3}-\frac{1}{15}\log\left(bx^5+3\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(3 + b*x^5)),x]

[Out] Log[x]/3 - Log[3 + b*x^5]/15
```

Maple [A] time = 0.006, size = 16, normalized size = 0.8

$$\frac{\ln(x)}{3}-\frac{\ln\left(bx^5+3\right)}{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(b*x^5+3),x)

[Out] 1/3*ln(x)-1/15*ln(b*x^5+3)
```

Maxima [A] time = 1.44413, size = 23, normalized size = 1.21

$$-\frac{1}{15}\log\left(bx^5+3\right)+\frac{1}{15}\log\left(x^5\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + 3)*x),x, algorithm="maxima")
```

```
[Out] -1/15*log(b*x^5 + 3) + 1/15*log(x^5)
```

Fricas [A] time = 0.21541, size = 20, normalized size = 1.05

$$-\frac{1}{15}\log\left(bx^5+3\right)+\frac{1}{3}\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + 3)*x),x, algorithm="fricas")
```

```
[Out] -1/15*log(b*x^5 + 3) + 1/3*log(x)
```

Sympy [A] time = 0.395792, size = 14, normalized size = 0.74

$$\frac{\log\left(x\right)}{3}-\frac{\log\left(x^5+\frac{3}{b}\right)}{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(b*x**5+3),x)
```

```
[Out] log(x)/3 - log(x**5 + 3/b)/15
```

GIAC/XCAS [A] time = 0.28261, size = 23, normalized size = 1.21

$$-\frac{1}{15}\ln\left(\left|bx^5+3\right|\right)+\frac{1}{3}\ln\left(|x|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + 3)*x),x, algorithm="giac")
```

```
[Out] -1/15*ln(abs(b*x^5 + 3)) + 1/3*ln(abs(x))
```

3.1292 $\int \frac{1}{x^6(3+bx^5)}\,dx$

Optimal. Leaf size=28

$$\frac{1}{45}b\log\left(bx^5+3\right)-\frac{1}{9}b\log(x)-\frac{1}{15x^5}$$

[Out] -1/(15*x^5) - (b*Log[x])/9 + (b*Log[3 + b*x^5])/45

Rubi [A] time = 0.0447055, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{1}{45}b\log\left(bx^5+3\right)-\frac{1}{9}b\log(x)-\frac{1}{15x^5}$$

Antiderivative was successfully verified.

[In] Int[1/(x^6*(3 + b*x^5)),x]

[Out] -1/(15*x^5) - (b*Log[x])/9 + (b*Log[3 + b*x^5])/45

Rubi in Sympy [A] time = 6.23248, size = 26, normalized size = 0.93

$$-\frac{b\log\left(x^5\right)}{45}+\frac{b\log\left(bx^5+3\right)}{45}-\frac{1}{15x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(1/x**6/(b*x**5+3),x)

[Out] -b*log(x**5)/45 + b*log(b*x**5 + 3)/45 - 1/(15*x**5)

Mathematica [A] time = 0.0083346, size = 28, normalized size = 1.

$$\frac{1}{45}b\log\left(bx^5+3\right)-\frac{1}{9}b\log(x)-\frac{1}{15x^5}$$

Antiderivative was successfully verified.

[In] Integrate[1/(x^6*(3 + b*x^5)),x]

[Out] -1/(15*x^5) - (b*Log[x])/9 + (b*Log[3 + b*x^5])/45

Maple [A] time = 0.009, size = 23, normalized size = 0.8

$$-\frac{1}{15\,x^5}-\frac{b\ln(x)}{9}+\frac{b\ln\left(bx^5+3\right)}{45}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/x^6/(b*x^5+3),x)

[Out] -1/15/x^5-1/9*b*ln(x)+1/45*b*ln(b*x^5+3)

Maxima [A] time = 1.43884, size = 32, normalized size = 1.14

$$\frac{1}{45}\,b\log\left(bx^5+3\right)-\frac{1}{45}\,b\log\left(x^5\right)-\frac{1}{15\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + 3)*x^6),x, algorithm="maxima")
```

```
[Out] 1/45*b*log(b*x^5 + 3) - 1/45*b*log(x^5) - 1/15/x^5
```

Fricas [A] time = 0.214911, size = 38, normalized size = 1.36

$$\frac{bx^5\log\left(bx^5+3\right)-5\,bx^5\log\left(x\right)-3}{45\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + 3)*x^6),x, algorithm="fricas")
```

```
[Out] 1/45*(b*x^5*log(b*x^5 + 3) - 5*b*x^5*log(x) - 3)/x^5
```

Sympy [A] time = 2.72954, size = 24, normalized size = 0.86

$$-\frac{b\log\left(x\right)}{9}+\frac{b\log\left(x^5+\frac{3}{b}\right)}{45}-\frac{1}{15x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**6/(b*x**5+3),x)
```

```
[Out] -b*log(x)/9 + b*log(x**5 + 3/b)/45 - 1/(15*x**5)
```

GIAC/XCAS [A] time = 0.284526, size = 42, normalized size = 1.5

$$\frac{1}{45}\,b\ln\left(\left|bx^5+3\right|\right)-\frac{1}{9}\,b\ln\left(\left|x\right|\right)+\frac{bx^5-3}{45\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^5 + 3)*x^6),x, algorithm="giac")
```

```
[Out] 1/45*b*ln(abs(b*x^5 + 3)) - 1/9*b*ln(abs(x)) + 1/45*(b*x^5 - 3)/x
^5
```

3.1293 $\int \frac{x^{14}}{1+x^5} \, dx$

Optimal. Leaf size=25

$$\frac{x^{10}}{10} - \frac{x^5}{5} + \frac{1}{5}\log\left(x^5+1\right)$$

```
[Out] -x^5/5 + x^10/10 + Log[1 + x^5]/5
```

Rubi [A] time = 0.0313599, antiderivative size = 25, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{x^{10}}{10} - \frac{x^5}{5} + \frac{1}{5}\log\left(x^5+1\right)$$

Antiderivative was successfully verified.

```
[In] Int[x^14/(1 + x^5),x]

[Out] -x^5/5 + x^10/10 + Log[1 + x^5]/5
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{x^5}{5} + \frac{\log\left(x^5+1\right)}{5} + \frac{\int^{x^5} x\, dx}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**14/(x**5+1),x)

[Out] -x**5/5 + log(x**5 + 1)/5 + Integral(x, (x, x**5))/5
```

Mathematica [A] time = 0.00861426, size = 22, normalized size = 0.88

$$\frac{1}{10}\left(x^{10} - 2x^5 + 2\log\left(x^5+1\right) - 3\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^14/(1 + x^5),x]

[Out] (-3 - 2*x^5 + x^10 + 2*Log[1 + x^5])/10
```

Maple [A] time = 0.003, size = 20, normalized size = 0.8

$$-\frac{x^5}{5} + \frac{x^{10}}{10} + \frac{\ln\left(x^5+1\right)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^14/(x^5+1),x)

[Out] -1/5*x^5+1/10*x^10+1/5*ln(x^5+1)
```

Maxima [A] time = 1.42698, size = 26, normalized size = 1.04

$$\frac{1}{10}x^{10} - \frac{1}{5}x^5 + \frac{1}{5}\log\left(x^5 + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^14/(x^5 + 1),x, algorithm="maxima")

[Out] 1/10*x^10 - 1/5*x^5 + 1/5*log(x^5 + 1)
```

Fricas [A] time = 0.216397, size = 26, normalized size = 1.04

$$\frac{1}{10}x^{10} - \frac{1}{5}x^5 + \frac{1}{5}\log\left(x^5 + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^14/(x^5 + 1),x, algorithm="fricas")

[Out] 1/10*x^10 - 1/5*x^5 + 1/5*log(x^5 + 1)
```

Sympy [A] time = 0.176321, size = 17, normalized size = 0.68

$$\frac{x^{10}}{10} - \frac{x^5}{5} + \frac{\log\left(x^5 + 1\right)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**14/(x**5+1),x)

[Out] x**10/10 - x**5/5 + log(x**5 + 1)/5
```

GIAC/XCAS [A] time = 0.225786, size = 27, normalized size = 1.08

$$\frac{1}{10}x^{10} - \frac{1}{5}x^5 + \frac{1}{5}\ln\left(\left|x^5 + 1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^14/(x^5 + 1),x, algorithm="giac")

[Out] 1/10*x^10 - 1/5*x^5 + 1/5*ln(abs(x^5 + 1))
```

3.1294 $\int \frac{x^9}{1+x^5} dx$

Optimal. Leaf size=18

$$\frac{x^5}{5} - \frac{1}{5}\log\left(x^5+1\right)$$

```
[Out] x^5/5 - Log[1 + x^5]/5
```

Rubi [A] time = 0.0229031, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{x^5}{5} - \frac{1}{5}\log\left(x^5+1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^9/(1 + x^5),x]

[Out] x^5/5 - Log[1 + x^5]/5
```

Rubi in Sympy [A] time = 3.61391, size = 12, normalized size = 0.67

$$\frac{x^5}{5} - \frac{\log\left(x^5+1\right)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**9/(x**5+1),x)

[Out] x**5/5 - log(x**5 + 1)/5
```

Mathematica [A] time = 0.00397867, size = 18, normalized size = 1.

$$\frac{x^5}{5} - \frac{1}{5}\log\left(x^5+1\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^9/(1 + x^5),x]

[Out] x^5/5 - Log[1 + x^5]/5
```

Maple [A] time = 0.003, size = 15, normalized size = 0.8

$$\frac{x^5}{5} - \frac{\ln\left(x^5+1\right)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^9/(x^5+1),x)

[Out] 1/5*x^5-1/5*ln(x^5+1)
```

Maxima [A] time = 1.43322, size = 19, normalized size = 1.06

$$\frac{1}{5}x^5 - \frac{1}{5}\log\left(x^5 + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(x^5 + 1),x, algorithm="maxima")
```

```
[Out] 1/5*x^5 - 1/5*log(x^5 + 1)
```

Fricas [A] time = 0.218979, size = 19, normalized size = 1.06

$$\frac{1}{5}x^5 - \frac{1}{5}\log\left(x^5 + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(x^5 + 1),x, algorithm="fricas")
```

```
[Out] 1/5*x^5 - 1/5*log(x^5 + 1)
```

Sympy [A] time = 0.170339, size = 12, normalized size = 0.67

$$\frac{x^5}{5} - \frac{\log\left(x^5 + 1\right)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**9/(x**5+1),x)
```

```
[Out] x**5/5 - log(x**5 + 1)/5
```

GIAC/XCAS [A] time = 0.227233, size = 20, normalized size = 1.11

$$\frac{1}{5}x^5 - \frac{1}{5}\ln\left(\left|x^5 + 1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(x^5 + 1),x, algorithm="giac")
```

```
[Out] 1/5*x^5 - 1/5*ln(abs(x^5 + 1))
```

3.1295 $\int \frac{x^4}{1+x^5} \, dx$

Optimal. Leaf size=10

$$\frac{1}{5}\log\left(x^5+1\right)$$

```
[Out] Log[1 + x^5]/5
```

Rubi [A] time = 0.00559394, antiderivative size = 10, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{1}{5}\log\left(x^5+1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(1 + x^5),x]

[Out] Log[1 + x^5]/5
```

Rubi in Sympy [A] time = 1.67403, size = 7, normalized size = 0.7

$$\frac{\log\left(x^5+1\right)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(x**5+1),x)

[Out] log(x**5 + 1)/5
```

Mathematica [A] time = 0.00361357, size = 10, normalized size = 1.

$$\frac{1}{5}\log\left(x^5+1\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(1 + x^5),x]

[Out] Log[1 + x^5]/5
```

Maple [A] time = 0.001, size = 9, normalized size = 0.9

$$\frac{\ln\left(x^5+1\right)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(x^5+1),x)

[Out] 1/5*ln(x^5+1)
```

Maxima [A] time = 1.44382, size = 11, normalized size = 1.1

$$\frac{1}{5}\log\left(x^5+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(x^5 + 1),x, algorithm="maxima")
```

```
[Out] 1/5*log(x^5 + 1)
```

Fricas [A] time = 0.214503, size = 11, normalized size = 1.1

$$\frac{1}{5}\log\left(x^5+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(x^5 + 1),x, algorithm="fricas")
```

```
[Out] 1/5*log(x^5 + 1)
```

Sympy [A] time = 0.159688, size = 7, normalized size = 0.7

$$\frac{\log\left(x^5+1\right)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(x**5+1),x)
```

```
[Out] log(x**5 + 1)/5
```

GIAC/XCAS [A] time = 0.228637, size = 12, normalized size = 1.2

$$\frac{1}{5}\ln\left(\left|x^5+1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(x^5 + 1),x, algorithm="giac")
```

```
[Out] 1/5*ln(abs(x^5 + 1))
```

3.1296 $\int \frac{1}{x(1+x^5)}\,dx$

Optimal. Leaf size=13

$$\log(x) - \frac{1}{5}\log\left(x^5+1\right)$$

```
[Out] Log[x] - Log[1 + x^5]/5
```

Rubi [A] time = 0.0168762, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.364$

$$\log(x) - \frac{1}{5}\log\left(x^5+1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(1 + x^5)),x]
```

```
[Out] Log[x] - Log[1 + x^5]/5
```

Rubi in Sympy [A] time = 3.22916, size = 14, normalized size = 1.08

$$\frac{\log\left(x^5\right)}{5} - \frac{\log\left(x^5+1\right)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(x**5+1),x)
```

```
[Out] log(x**5)/5 - log(x**5 + 1)/5
```

Mathematica [A] time = 0.00472231, size = 13, normalized size = 1.

$$\log(x) - \frac{1}{5}\log\left(x^5+1\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(1 + x^5)),x]
```

```
[Out] Log[x] - Log[1 + x^5]/5
```

Maple [B] time = 0.01, size = 29, normalized size = 2.2

$$\ln(x) - \frac{\ln(1+x)}{5} - \frac{\ln\left(x^4 - x^3 + x^2 - x + 1\right)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(x^5+1),x)
```

```
[Out] ln(x)-1/5*ln(1+x)-1/5*ln(x^4-x^3+x^2-x+1)
```

Maxima [A] time = 1.44393, size = 20, normalized size = 1.54

$$-\frac{1}{5}\log\left(x^5+1\right)+\frac{1}{5}\log\left(x^5\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^5 + 1)*x),x, algorithm="maxima")
```

```
[Out] -1/5*log(x^5 + 1) + 1/5*log(x^5)
```

Fricas [A] time = 0.215933, size = 15, normalized size = 1.15

$$-\frac{1}{5}\log\left(x^5+1\right)+\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^5 + 1)*x),x, algorithm="fricas")
```

```
[Out] -1/5*log(x^5 + 1) + log(x)
```

Sympy [A] time = 0.218647, size = 10, normalized size = 0.77

$$\log\left(x\right)-\frac{\log\left(x^5+1\right)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(x**5+1),x)
```

```
[Out] log(x) - log(x**5 + 1)/5
```

GIAC/XCAS [A] time = 0.228347, size = 18, normalized size = 1.38

$$-\frac{1}{5}\ln\left(\left|x^5+1\right|\right)+\ln\left(|x|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^5 + 1)*x),x, algorithm="giac")
```

```
[Out] -1/5*ln(abs(x^5 + 1)) + ln(abs(x))
```

3.1297 $\int \frac{1}{x^6(1+x^5)}\,dx$

Optimal. Leaf size=22

$$-\frac{1}{5x^5}+\frac{1}{5}\log\left(x^5+1\right)-\log(x)$$

```
[Out] -1/(5*x^5) - Log[x] + Log[1 + x^5]/5
```

Rubi [A] time = 0.026797, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$-\frac{1}{5x^5}+\frac{1}{5}\log\left(x^5+1\right)-\log(x)$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^6*(1 + x^5)),x]

[Out] -1/(5*x^5) - Log[x] + Log[1 + x^5]/5
```

Rubi in Sympy [A] time = 3.85463, size = 20, normalized size = 0.91

$$-\frac{\log\left(x^5\right)}{5}+\frac{\log\left(x^5+1\right)}{5}-\frac{1}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**6/(x**5+1),x)

[Out] -log(x**5)/5 + log(x**5 + 1)/5 - 1/(5*x**5)
```

Mathematica [A] time = 0.00633246, size = 22, normalized size = 1.

$$-\frac{1}{5x^5}+\frac{1}{5}\log\left(x^5+1\right)-\log(x)$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^6*(1 + x^5)),x]

[Out] -1/(5*x^5) - Log[x] + Log[1 + x^5]/5
```

Maple [A] time = 0.011, size = 36, normalized size = 1.6

$$-\frac{1}{5\,x^5}-\ln(x)+\frac{\ln(1+x)}{5}+\frac{\ln\left(x^4-x^3+x^2-x+1\right)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^6/(x^5+1),x)

[Out] -1/5/x^5-ln(x)+1/5*ln(1+x)+1/5*ln(x^4-x^3+x^2-x+1)
```

Maxima [A] time = 1.44966, size = 27, normalized size = 1.23

$$-\frac{1}{5\,x^5}+\frac{1}{5}\,\log\left(x^5+1\right)-\frac{1}{5}\,\log\left(x^5\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^5 + 1)*x^6),x, algorithm="maxima")

[Out] -1/5/x^5 + 1/5*log(x^5 + 1) - 1/5*log(x^5)
```

Fricas [A] time = 0.210938, size = 32, normalized size = 1.45

$$\frac{x^5\log\left(x^5+1\right)-5\,x^5\log\left(x\right)-1}{5\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^5 + 1)*x^6),x, algorithm="fricas")

[Out] 1/5*(x^5*log(x^5 + 1) - 5*x^5*log(x) - 1)/x^5
```

Sympy [A] time = 0.320354, size = 17, normalized size = 0.77

$$-\log\left(x\right)+\frac{\log\left(x^5+1\right)}{5}-\frac{1}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**6/(x**5+1),x)

[Out] -log(x) + log(x**5 + 1)/5 - 1/(5*x**5)
```

GIAC/XCAS [A] time = 0.226598, size = 34, normalized size = 1.55

$$\frac{x^5-1}{5\,x^5}+\frac{1}{5}\ln\left(\left|x^5+1\right|\right)-\ln\left(\left|x\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^5 + 1)*x^6),x, algorithm="giac")

[Out] 1/5*(x^5 - 1)/x^5 + 1/5*ln(abs(x^5 + 1)) - ln(abs(x))
```

3.1298 $\int \frac{x^5}{1+x^5} \, dx$

Optimal. Leaf size=186

$$\frac{1}{20}\left(1-\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1-\sqrt{5}\right)x+1\right)+\frac{1}{20}\left(1+\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1+\sqrt{5}\right)x+1\right)+x-\frac{1}{5}\log(x+1)-\frac{1}{5}\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\tan^{-1}\left(2\sqrt{\frac{2}{5+\sqrt{5}}}x+\sqrt{\frac{1}{5}\left(5-2\sqrt{5}\right)}\right)+\frac{1}{5}\sqrt{\frac{1}{2}\left(5-\sqrt{5}\right)}\tan^{-1}\left(\sqrt{\frac{1}{5}\left(5+2\sqrt{5}\right)}-\sqrt{\frac{2}{5}\left(5+\sqrt{5}\right)}x\right)$$

```
[Out] x - (Sqrt[(5 + Sqrt[5])/2]*ArcTan[Sqrt[(5 - 2*Sqrt[5])/5] + 2*Sqr
t[2/(5 + Sqrt[5])]*x])/5 + (Sqrt[(5 - Sqrt[5])/2]*ArcTan[Sqrt[(5
+ 2*Sqrt[5])/5] - Sqrt[(2*(5 + Sqrt[5]))/5]*x])/5 - Log[1 + x]/5
+ ((1 - Sqrt[5])*Log[1 - ((1 - Sqrt[5])*x)/2 + x^2])/20 + ((1 + S
qrt[5])*Log[1 - ((1 + Sqrt[5])*x)/2 + x^2])/20
```

Rubi [A] time = 0.489856, antiderivative size = 186, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.636

$$\frac{1}{20}\left(1-\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1-\sqrt{5}\right)x+1\right)+\frac{1}{20}\left(1+\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1+\sqrt{5}\right)x+1\right)+x-\frac{1}{5}\log(x+1)-\frac{1}{5}\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\tan^{-1}\left(2\sqrt{\frac{2}{5+\sqrt{5}}}x+\sqrt{\frac{1}{5}\left(5-2\sqrt{5}\right)}\right)+\frac{1}{5}\sqrt{\frac{1}{2}\left(5-\sqrt{5}\right)}\tan^{-1}\left(\sqrt{\frac{1}{5}\left(5+2\sqrt{5}\right)}-\sqrt{\frac{2}{5}\left(5+\sqrt{5}\right)}x\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/(1 + x^5),x]
```

```
[Out] x - (Sqrt[(5 + Sqrt[5])/2]*ArcTan[Sqrt[(5 - 2*Sqrt[5])/5] + 2*Sqr
t[2/(5 + Sqrt[5])]*x])/5 + (Sqrt[(5 - Sqrt[5])/2]*ArcTan[Sqrt[(5
+ 2*Sqrt[5])/5] - Sqrt[(2*(5 + Sqrt[5]))/5]*x])/5 - Log[1 + x]/5
+ ((1 - Sqrt[5])*Log[1 - ((1 - Sqrt[5])*x)/2 + x^2])/20 + ((1 + S
qrt[5])*Log[1 - ((1 + Sqrt[5])*x)/2 + x^2])/20
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(x**5+1),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.231126, size = 147, normalized size = 0.79

$$\frac{1}{20}\left(-\left(\sqrt{5}-1\right)\log\left(x^2+\frac{1}{2}\left(\sqrt{5}-1\right)x+1\right)+\left(1+\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1+\sqrt{5}\right)x+1\right)+20x-4\log(x+1)+2\sqrt{10-2\sqrt{5}}\tan^{-1}\left(\frac{-4x+\sqrt{5}+1}{\sqrt{10-2\sqrt{5}}}\right)-2\sqrt{2\left(5+\sqrt{5}\right)}\tan^{-1}\left(\frac{4x+\sqrt{5}-1}{\sqrt{2\left(5+\sqrt{5}\right)}}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/(1 + x^5),x]
```

```
[Out] (20*x + 2*Sqrt[10 - 2*Sqrt[5]]*ArcTan[(1 + Sqrt[5] - 4*x)/Sqrt[10
 - 2*Sqrt[5]]] - 2*Sqrt[2*(5 + Sqrt[5])]*ArcTan[(-1 + Sqrt[5] + 4
*x)/Sqrt[2*(5 + Sqrt[5])]] - 4*Log[1 + x] - (-1 + Sqrt[5])*Log[1
+ ((-1 + Sqrt[5])*x)/2 + x^2] + (1 + Sqrt[5])*Log[1 - ((1 + Sqrt[
5])*x)/2 + x^2])/20
```

Maple [A] time = 0.049, size = 219, normalized size = 1.2

$$x-\frac{\ln(1+x)}{5}-\frac{\ln\left(x\sqrt{5}+2x^2-x+2\right)\sqrt{5}}{20}+\frac{\ln\left(x\sqrt{5}+2x^2-x+2\right)}{20}-\frac{1}{\sqrt{10+2\sqrt{5}}}\arctan\left(\frac{\sqrt{5}+4x-1}{\sqrt{10+2\sqrt{5}}}\right)-\frac{\sqrt{5}}{5\sqrt{10+2\sqrt{5}}}\arctan\left(\frac{\sqrt{5}+4x-1}{\sqrt{10+2\sqrt{5}}}\right)+\frac{\ln\left(-x\sqrt{5}+2x^2-x+2\right)\sqrt{5}}{20}+\frac{\ln\left(-x\sqrt{5}+2x^2-x+2\right)}{20}-\frac{1}{\sqrt{10-2\sqrt{5}}}\arctan\left(\frac{-\sqrt{5}+4x-1}{\sqrt{10-2\sqrt{5}}}\right)+\frac{\sqrt{5}}{5\sqrt{10-2\sqrt{5}}}\arctan\left(\frac{-\sqrt{5}+4x-1}{\sqrt{10-2\sqrt{5}}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(x^5+1),x)
```

```
[Out] x-1/5*ln(1+x)-1/20*ln(x*5^(1/2)+2*x^2-x+2)*5^(1/2)+1/20*ln(x*5^(1
/2)+2*x^2-x+2)-1/(10+2*5^(1/2))^(1/2)*arctan((5^(1/2)+4*x-1)/(10+
2*5^(1/2))^(1/2))-1/5/(10+2*5^(1/2))^(1/2)*arctan((5^(1/2)+4*x-1)
/(10+2*5^(1/2))^(1/2))*5^(1/2)+1/20*ln(-x*5^(1/2)+2*x^2-x+2)*5^(1
/2)+1/20*ln(-x*5^(1/2)+2*x^2-x+2)-1/(10-2*5^(1/2))^(1/2)*arctan((
-5^(1/2)+4*x-1)/(10-2*5^(1/2))^(1/2))+1/5/(10-2*5^(1/2))^(1/2)*ar
ctan((-5^(1/2)+4*x-1)/(10-2*5^(1/2))^(1/2))*5^(1/2)
```

Maxima [A] time = 1.59608, size = 196, normalized size = 1.05

$$-\frac{\sqrt{5}\left(\sqrt{5}+1\right)\arctan\left(\frac{4x+\sqrt{5}-1}{\sqrt{2\sqrt{5}+10}}\right)}{5\sqrt{2\sqrt{5}+10}}-\frac{\sqrt{5}\left(\sqrt{5}-1\right)\arctan\left(\frac{4x-\sqrt{5}-1}{\sqrt{-2\sqrt{5}+10}}\right)}{5\sqrt{-2\sqrt{5}+10}}+x+\frac{\left(\sqrt{5}+3\right)\log\left(2x^2-x\left(\sqrt{5}+1\right)+2\right)}{10\left(\sqrt{5}+1\right)}+\frac{\left(\sqrt{5}-3\right)\log\left(2x^2+x\left(\sqrt{5}-1\right)+2\right)}{10\left(\sqrt{5}-1\right)}-\frac{1}{5}\log(x+1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(x^5 + 1),x, algorithm="maxima")
```

```
[Out] -1/5*sqrt(5)*(sqrt(5) + 1)*arctan((4*x + sqrt(5) - 1)/sqrt(2*sqrt
(5) + 10))/sqrt(2*sqrt(5) + 10) - 1/5*sqrt(5)*(sqrt(5) - 1)*arcta
n((4*x - sqrt(5) - 1)/sqrt(-2*sqrt(5) + 10))/sqrt(-2*sqrt(5) + 10
) + x + 1/10*(sqrt(5) + 3)*log(2*x^2 - x*(sqrt(5) + 1) + 2)/(sqrt
(5) + 1) + 1/10*(sqrt(5) - 3)*log(2*x^2 + x*(sqrt(5) - 1) + 2)/(s
qrt(5) - 1) - 1/5*log(x + 1)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(x^5 + 1),x, algorithm="fricas")
```

```
[Out] Exception raised: NotImplementedError
```

Sympy [A] time = 2.76767, size = 36, normalized size = 0.19

$$x-\frac{\log(x+1)}{5}+\operatorname{RootSum}\left(625t^4-125t^3+25t^2-5t+1,\left(t\mapsto t\log(-5t+x)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(x**5+1),x)
```

```
[Out] x - log(x + 1)/5 + RootSum(625*_t**4 - 125*_t**3 + 25*_t**2 - 5*_
t + 1, Lambda(_t, _t*log(-5*_t + x)))
```

GIAC/XCAS [A] time = 0.228859, size = 173, normalized size = 0.93

$$-\frac{1}{10}\sqrt{2\sqrt{5}+10}\arctan\left(\frac{4x+\sqrt{5}-1}{\sqrt{2\sqrt{5}+10}}\right)-\frac{1}{10}\sqrt{-2\sqrt{5}+10}\arctan\left(\frac{4x-\sqrt{5}-1}{\sqrt{-2\sqrt{5}+10}}\right)$$
$$+\frac{1}{20}\sqrt{5}\ln\left(x^2-\frac{1}{2}x\left(\sqrt{5}+1\right)+1\right)-\frac{1}{20}\sqrt{5}\ln\left(x^2+\frac{1}{2}x\left(\sqrt{5}-1\right)+1\right)$$
$$+x+\frac{1}{20}\ln\left(x^4-x^3+x^2-x+1\right)-\frac{1}{5}\ln\left(|x+1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(x^5 + 1),x, algorithm="giac")
```

```
[Out] -1/10*sqrt(2*sqrt(5) + 10)*arctan((4*x + sqrt(5) - 1)/sqrt(2*sqrt
(5) + 10)) - 1/10*sqrt(-2*sqrt(5) + 10)*arctan((4*x - sqrt(5) - 1
)/sqrt(-2*sqrt(5) + 10)) + 1/20*sqrt(5)*ln(x^2 - 1/2*x*(sqrt(5) +
 1) + 1) - 1/20*sqrt(5)*ln(x^2 + 1/2*x*(sqrt(5) - 1) + 1) + x + 1
/20*ln(x^4 - x^3 + x^2 - x + 1) - 1/5*ln(abs(x + 1))
```

3.1299 $\int \frac{x^3}{1+x^5}\,dx$

Optimal. Leaf size=185

$$\frac{1}{20}\left(1-\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1-\sqrt{5}\right)x+1\right)+\frac{1}{20}\left(1+\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1+\sqrt{5}\right)x+1\right)-\frac{1}{5}\log(x+1)+\frac{1}{5}\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\tan^{-1}\left(2\sqrt{\frac{2}{5+\sqrt{5}}}x+\sqrt{\frac{1}{5}\left(5-2\sqrt{5}\right)}\right)-\frac{1}{5}\sqrt{\frac{1}{2}\left(5-\sqrt{5}\right)}\tan^{-1}\left(\sqrt{\frac{1}{5}\left(5+2\sqrt{5}\right)}-\sqrt{\frac{2}{5}\left(5+\sqrt{5}\right)}x\right)$$

```
[Out] (Sqrt[(5 + Sqrt[5])/2]*ArcTan[Sqrt[(5 - 2*Sqrt[5])/5] + 2*Sqrt[2/
(5 + Sqrt[5])]*x])/5 - (Sqrt[(5 - Sqrt[5])/2]*ArcTan[Sqrt[(5 + 2*
Sqrt[5])/5] - Sqrt[(2*(5 + Sqrt[5]))/5]*x])/5 - Log[1 + x]/5 + ((
1 - Sqrt[5])*Log[1 - ((1 - Sqrt[5])*x)/2 + x^2])/20 + ((1 + Sqrt[
5])*Log[1 - ((1 + Sqrt[5])*x)/2 + x^2])/20
```

Rubi [A] time = 0.618899, antiderivative size = 185, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.546

$$\frac{1}{20}\left(1-\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1-\sqrt{5}\right)x+1\right)+\frac{1}{20}\left(1+\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1+\sqrt{5}\right)x+1\right)-\frac{1}{5}\log(x+1)+\frac{1}{5}\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\tan^{-1}\left(2\sqrt{\frac{2}{5+\sqrt{5}}}x+\sqrt{\frac{1}{5}\left(5-2\sqrt{5}\right)}\right)-\frac{1}{5}\sqrt{\frac{1}{2}\left(5-\sqrt{5}\right)}\tan^{-1}\left(\sqrt{\frac{1}{5}\left(5+2\sqrt{5}\right)}-\sqrt{\frac{2}{5}\left(5+\sqrt{5}\right)}x\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(1 + x^5),x]
```

```
[Out] (Sqrt[(5 + Sqrt[5])/2]*ArcTan[Sqrt[(5 - 2*Sqrt[5])/5] + 2*Sqrt[2/
(5 + Sqrt[5])]*x])/5 - (Sqrt[(5 - Sqrt[5])/2]*ArcTan[Sqrt[(5 + 2*
Sqrt[5])/5] - Sqrt[(2*(5 + Sqrt[5]))/5]*x])/5 - Log[1 + x]/5 + ((
1 - Sqrt[5])*Log[1 - ((1 - Sqrt[5])*x)/2 + x^2])/20 + ((1 + Sqrt[
5])*Log[1 - ((1 + Sqrt[5])*x)/2 + x^2])/20
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(x**5+1),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.138516, size = 144, normalized size = 0.78

$$\frac{1}{20}\left(-\left(\sqrt{5}-1\right)\log\left(x^2+\frac{1}{2}\left(\sqrt{5}-1\right)x+1\right)+\left(1+\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1+\sqrt{5}\right)x+1\right)\right.$$
$$\left.-4\log(x+1)-2\sqrt{10-2\sqrt{5}}\tan^{-1}\left(\frac{-4x+\sqrt{5}+1}{\sqrt{10-2\sqrt{5}}}\right)+2\sqrt{2\left(5+\sqrt{5}\right)}\tan^{-1}\left(\frac{4x+\sqrt{5}-1}{\sqrt{2\left(5+\sqrt{5}\right)}}\right)\right)$$

Antiderivative was successfully verified.

```
[In]   Integrate[x^3/(1 + x^5),x]
```

```
[Out] (-2*Sqrt[10 - 2*Sqrt[5]]*ArcTan[(1 + Sqrt[5] - 4*x)/Sqrt[10 - 2*S
qrt[5]]] + 2*Sqrt[2*(5 + Sqrt[5])]*ArcTan[(-1 + Sqrt[5] + 4*x)/Sq
rt[2*(5 + Sqrt[5])]] - 4*Log[1 + x] - (-1 + Sqrt[5])*Log[1 + ((-1
 + Sqrt[5])*x)/2 + x^2] + (1 + Sqrt[5])*Log[1 - ((1 + Sqrt[5])*x)
/2 + x^2])/20
```

Maple [A] time = 0.023, size = 216, normalized size = 1.2

$$-\frac{\ln(1+x)}{5}-\frac{\ln\left(x\sqrt{5}+2x^2-x+2\right)\sqrt{5}}{20}+\frac{\ln\left(x\sqrt{5}+2x^2-x+2\right)}{20}$$
$$+\frac{1}{\sqrt{10+2\sqrt{5}}}\arctan\left(\frac{\sqrt{5}+4x-1}{\sqrt{10+2\sqrt{5}}}\right)+\frac{\sqrt{5}}{5\sqrt{10+2\sqrt{5}}}\arctan\left(\frac{\sqrt{5}+4x-1}{\sqrt{10+2\sqrt{5}}}\right)$$
$$+\frac{\ln\left(-x\sqrt{5}+2x^2-x+2\right)\sqrt{5}}{20}+\frac{\ln\left(-x\sqrt{5}+2x^2-x+2\right)}{20}$$
$$+\frac{1}{\sqrt{10-2\sqrt{5}}}\arctan\left(\frac{-\sqrt{5}+4x-1}{\sqrt{10-2\sqrt{5}}}\right)-\frac{\sqrt{5}}{5\sqrt{10-2\sqrt{5}}}\arctan\left(\frac{-\sqrt{5}+4x-1}{\sqrt{10-2\sqrt{5}}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^3/(x^5+1),x)
```

```
[Out] -1/5*ln(1+x)-1/20*ln(x*5^(1/2)+2*x^2-x+2)*5^(1/2)+1/20*ln(x*5^(1/
2)+2*x^2-x+2)+1/(10+2*5^(1/2))^(1/2)*arctan((5^(1/2)+4*x-1)/(10+2
*5^(1/2))^(1/2))+1/5/(10+2*5^(1/2))^(1/2)*arctan((5^(1/2)+4*x-1)/
(10+2*5^(1/2))^(1/2))*5^(1/2)+1/20*ln(-x*5^(1/2)+2*x^2-x+2)*5^(1/
2)+1/20*ln(-x*5^(1/2)+2*x^2-x+2)+1/(10-2*5^(1/2))^(1/2)*arctan((-
5^(1/2)+4*x-1)/(10-2*5^(1/2))^(1/2))-1/5/(10-2*5^(1/2))^(1/2)*arc
tan((-5^(1/2)+4*x-1)/(10-2*5^(1/2))^(1/2))*5^(1/2)
```

Maxima [A] time = 1.58445, size = 194, normalized size = 1.05

$$\frac{\sqrt{5}\left(\sqrt{5}+1\right)\arctan\left(\frac{4x+\sqrt{5}-1}{\sqrt{2\sqrt{5}+10}}\right)}{5\sqrt{2\sqrt{5}+10}}+\frac{\sqrt{5}\left(\sqrt{5}-1\right)\arctan\left(\frac{4x-\sqrt{5}-1}{\sqrt{-2\sqrt{5}+10}}\right)}{5\sqrt{-2\sqrt{5}+10}}$$
$$+\frac{\left(\sqrt{5}+3\right)\log\left(2x^2-x\left(\sqrt{5}+1\right)+2\right)}{10\left(\sqrt{5}+1\right)}+\frac{\left(\sqrt{5}-3\right)\log\left(2x^2+x\left(\sqrt{5}-1\right)+2\right)}{10\left(\sqrt{5}-1\right)}-\frac{1}{5}\log(x+1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^3/(x^5 + 1),x, algorithm="maxima")
```

```
[Out] 1/5*sqrt(5)*(sqrt(5) + 1)*arctan((4*x + sqrt(5) - 1)/sqrt(2*sqrt(
5) + 10))/sqrt(2*sqrt(5) + 10) + 1/5*sqrt(5)*(sqrt(5) - 1)*arctan
((4*x - sqrt(5) - 1)/sqrt(-2*sqrt(5) + 10))/sqrt(-2*sqrt(5) + 10)
 + 1/10*(sqrt(5) + 3)*log(2*x^2 - x*(sqrt(5) + 1) + 2)/(sqrt(5) +
 1) + 1/10*(sqrt(5) - 3)*log(2*x^2 + x*(sqrt(5) - 1) + 2)/(sqrt(5
) - 1) - 1/5*log(x + 1)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(x^5 + 1),x, algorithm="fricas")
```

```
[Out] Exception raised: NotImplementedError
```

Sympy [A] time = 2.68764, size = 36, normalized size = 0.19

$$-\frac{\log(x+1)}{5} + \operatorname{RootSum}\left(625t^4 - 125t^3 + 25t^2 - 5t + 1, \left(t \mapsto t\log\left(625t^4 + x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(x**5+1),x)
```

```
[Out] -log(x + 1)/5 + RootSum(625*_t**4 - 125*_t**3 + 25*_t**2 - 5*_t +
 1, Lambda(_t, _t*log(625*_t**4 + x)))
```

GIAC/XCAS [A] time = 0.233024, size = 151, normalized size = 0.82

$$\frac{1}{20}\left(\sqrt{5}+1\right)\ln\left(x^2-\frac{1}{2}x\left(\sqrt{5}+1\right)+1\right)-\frac{1}{20}\left(\sqrt{5}-1\right)\ln\left(x^2+\frac{1}{2}x\left(\sqrt{5}-1\right)+1\right)+\frac{1}{10}\sqrt{2\sqrt{5}+10}\arctan\left(\frac{4x+\sqrt{5}-1}{\sqrt{2\sqrt{5}+10}}\right)+\frac{1}{10}\sqrt{-2\sqrt{5}+10}\arctan\left(\frac{4x-\sqrt{5}-1}{\sqrt{-2\sqrt{5}+10}}\right)-\frac{1}{5}\ln\left(|x+1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(x^5 + 1),x, algorithm="giac")
```

```
[Out] 1/20*(sqrt(5) + 1)*ln(x^2 - 1/2*x*(sqrt(5) + 1) + 1) - 1/20*(sqrt
(5) - 1)*ln(x^2 + 1/2*x*(sqrt(5) - 1) + 1) + 1/10*sqrt(2*sqrt(5)
+ 10)*arctan((4*x + sqrt(5) - 1)/sqrt(2*sqrt(5) + 10)) + 1/10*sqr
t(-2*sqrt(5) + 10)*arctan((4*x - sqrt(5) - 1)/sqrt(-2*sqrt(5) + 1
0)) - 1/5*ln(abs(x + 1))
```

3.1300 $\int \frac{x^2}{1+x^5}\,dx$

Optimal. Leaf size=185

$$-\frac{1}{20}\left(1+\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1-\sqrt{5}\right)x+1\right)-\frac{1}{20}\left(1-\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1+\sqrt{5}\right)x+1\right)+\frac{1}{5}\log(x+1)-\frac{1}{5}\sqrt{\frac{1}{2}\left(5-\sqrt{5}\right)}\tan^{-1}\left(2\sqrt{\frac{2}{5+\sqrt{5}}}x+\sqrt{\frac{1}{5}\left(5-2\sqrt{5}\right)}\right)-\frac{1}{5}\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\tan^{-1}\left(\sqrt{\frac{1}{5}\left(5+2\sqrt{5}\right)}-\sqrt{\frac{2}{5}\left(5+\sqrt{5}\right)}x\right)$$

```
[Out] -(Sqrt[(5 - Sqrt[5])/2]*ArcTan[Sqrt[(5 - 2*Sqrt[5])/5] + 2*Sqrt[2
/(5 + Sqrt[5])]*x])/5 - (Sqrt[(5 + Sqrt[5])/2]*ArcTan[Sqrt[(5 + 2
*Sqrt[5])/5] - Sqrt[(2*(5 + Sqrt[5]))/5]*x])/5 + Log[1 + x]/5 - (
(1 + Sqrt[5])*Log[1 - ((1 - Sqrt[5])*x)/2 + x^2])/20 - ((1 - Sqrt
[5])*Log[1 - ((1 + Sqrt[5])*x)/2 + x^2])/20
```

Rubi [A] time = 0.611636, antiderivative size = 185, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.546

$$-\frac{1}{20}\left(1+\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1-\sqrt{5}\right)x+1\right)-\frac{1}{20}\left(1-\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1+\sqrt{5}\right)x+1\right)+\frac{1}{5}\log(x+1)-\frac{1}{5}\sqrt{\frac{1}{2}\left(5-\sqrt{5}\right)}\tan^{-1}\left(2\sqrt{\frac{2}{5+\sqrt{5}}}x+\sqrt{\frac{1}{5}\left(5-2\sqrt{5}\right)}\right)-\frac{1}{5}\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\tan^{-1}\left(\sqrt{\frac{1}{5}\left(5+2\sqrt{5}\right)}-\sqrt{\frac{2}{5}\left(5+\sqrt{5}\right)}x\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(1 + x^5),x]
```

```
[Out] -(Sqrt[(5 - Sqrt[5])/2]*ArcTan[Sqrt[(5 - 2*Sqrt[5])/5] + 2*Sqrt[2
/(5 + Sqrt[5])]*x])/5 - (Sqrt[(5 + Sqrt[5])/2]*ArcTan[Sqrt[(5 + 2
*Sqrt[5])/5] - Sqrt[(2*(5 + Sqrt[5]))/5]*x])/5 + Log[1 + x]/5 - (
(1 + Sqrt[5])*Log[1 - ((1 - Sqrt[5])*x)/2 + x^2])/20 - ((1 - Sqrt
[5])*Log[1 - ((1 + Sqrt[5])*x)/2 + x^2])/20
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(x**5+1),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.162224, size = 144, normalized size = 0.78

$$\frac{1}{20}\left(-\left(1+\sqrt{5}\right)\log\left(x^2+\frac{1}{2}\left(\sqrt{5}-1\right)x+1\right)+\left(\sqrt{5}-1\right)\log\left(x^2-\frac{1}{2}\left(1+\sqrt{5}\right)x+1\right)+4\log(x+1)-2\sqrt{2\left(5+\sqrt{5}\right)}\tan^{-1}\left(\frac{-4x+\sqrt{5}+1}{\sqrt{10-2\sqrt{5}}}\right)-2\sqrt{10-2\sqrt{5}}\tan^{-1}\left(\frac{4x+\sqrt{5}-1}{\sqrt{2\left(5+\sqrt{5}\right)}}\right)\right)$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^2/(1 + x^5),x]
```

```
[Out] (-2*Sqrt[2*(5 + Sqrt[5])]*ArcTan[(1 + Sqrt[5] - 4*x)/Sqrt[10 - 2*
Sqrt[5]]] - 2*Sqrt[10 - 2*Sqrt[5]]*ArcTan[(-1 + Sqrt[5] + 4*x)/Sq
rt[2*(5 + Sqrt[5])]] + 4*Log[1 + x] - (1 + Sqrt[5])*Log[1 + ((-1
+ Sqrt[5])*x)/2 + x^2] + (-1 + Sqrt[5])*Log[1 - ((1 + Sqrt[5])*x)
/2 + x^2])/20
```

Maple [A] time = 0.02, size = 156, normalized size = 0.8

$$\frac{\ln(1+x)}{5}-\frac{\ln\left(x\sqrt{5}+2x^2-x+2\right)\sqrt{5}}{20}-\frac{\ln\left(x\sqrt{5}+2x^2-x+2\right)}{20}-\frac{2\sqrt{5}}{5\sqrt{10+2\sqrt{5}}}\arctan\left(\frac{\sqrt{5}+4x-1}{\sqrt{10+2\sqrt{5}}}\right)+\frac{\ln\left(-x\sqrt{5}+2x^2-x+2\right)\sqrt{5}}{20}-\frac{\ln\left(-x\sqrt{5}+2x^2-x+2\right)}{20}+\frac{2\sqrt{5}}{5\sqrt{10-2\sqrt{5}}}\arctan\left(\frac{-\sqrt{5}+4x-1}{\sqrt{10-2\sqrt{5}}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(x^5+1),x)
```

```
[Out] 1/5*ln(1+x)-1/20*ln(x*5^(1/2)+2*x^2-x+2)*5^(1/2)-1/20*ln(x*5^(1/2
)+2*x^2-x+2)-2/5/(10+2*5^(1/2))^(1/2)*arctan((5^(1/2)+4*x-1)/(10+
2*5^(1/2))^(1/2))*5^(1/2)+1/20*ln(-x*5^(1/2)+2*x^2-x+2)*5^(1/2)-1
/20*ln(-x*5^(1/2)+2*x^2-x+2)+2/5/(10-2*5^(1/2))^(1/2)*arctan((-5^
(1/2)+4*x-1)/(10-2*5^(1/2))^(1/2))*5^(1/2)
```

Maxima [A] time = 1.60933, size = 166, normalized size = 0.9

$$-\frac{2\sqrt{5}\arctan\left(\frac{4x+\sqrt{5}-1}{\sqrt{2\sqrt{5}+10}}\right)}{5\sqrt{2\sqrt{5}+10}}+\frac{2\sqrt{5}\arctan\left(\frac{4x-\sqrt{5}-1}{\sqrt{-2\sqrt{5}+10}}\right)}{5\sqrt{-2\sqrt{5}+10}}+\frac{\log\left(2x^2-x\left(\sqrt{5}+1\right)+2\right)}{5\sqrt{5}+5}-\frac{\log\left(2x^2+x\left(\sqrt{5}-1\right)+2\right)}{5\left(\sqrt{5}-1\right)}+\frac{1}{5}\log(x+1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(x^5 + 1),x, algorithm="maxima")
```

```
[Out] -2/5*sqrt(5)*arctan((4*x + sqrt(5) - 1)/sqrt(2*sqrt(5) + 10))/sqr
t(2*sqrt(5) + 10) + 2/5*sqrt(5)*arctan((4*x - sqrt(5) - 1)/sqrt(-
2*sqrt(5) + 10))/sqrt(-2*sqrt(5) + 10) + log(2*x^2 - x*(sqrt(5) +
```

```
 1) + 2)/((5*sqrt(5)) + 5) - 1/5*log(2*x^2 + x*(sqrt(5) - 1) + 2)
/(sqrt(5) - 1) + 1/5*log(x + 1)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(x^5 + 1),x, algorithm="fricas")

[Out] Exception raised: NotImplementedError
```

Sympy [A] time = 4.28137, size = 36, normalized size = 0.19

$$\frac{\log(x+1)}{5} + \operatorname{RootSum}\left(625t^4 + 125t^3 + 25t^2 + 5t + 1, \left(t \mapsto t\log\left(25t^2 + x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(x**5+1),x)

[Out] log(x + 1)/5 + RootSum(625*_t**4 + 125*_t**3 + 25*_t**2 + 5*_t +
1, Lambda(_t, _t*log(25*_t**2 + x)))
```

GIAC/XCAS [A] time = 0.23078, size = 151, normalized size = 0.82

$$\frac{1}{20}\left(\sqrt{5}-1\right)\ln\left(x^2 - \frac{1}{2}x\left(\sqrt{5}+1\right)+1\right) - \frac{1}{20}\left(\sqrt{5}+1\right)\ln\left(x^2+\frac{1}{2}x\left(\sqrt{5}-1\right)+1\right) - \frac{1}{10}\sqrt{-2\sqrt{5}+10}\arctan\left(\frac{4x+\sqrt{5}-1}{\sqrt{2\sqrt{5}+10}}\right) + \frac{1}{10}\sqrt{2\sqrt{5}+10}\arctan\left(\frac{4x-\sqrt{5}-1}{\sqrt{-2\sqrt{5}+10}}\right) + \frac{1}{5}\ln\left(|x+1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(x^5 + 1),x, algorithm="giac")

[Out] 1/20*(sqrt(5) - 1)*ln(x^2 - 1/2*x*(sqrt(5) + 1) + 1) - 1/20*(sqrt
(5) + 1)*ln(x^2 + 1/2*x*(sqrt(5) - 1) + 1) - 1/10*sqrt(-2*sqrt(5)
 + 10)*arctan((4*x + sqrt(5) - 1)/sqrt(2*sqrt(5) + 10)) + 1/10*sq
rt(2*sqrt(5) + 10)*arctan((4*x - sqrt(5) - 1)/sqrt(-2*sqrt(5) + 1
0)) + 1/5*ln(abs(x + 1))
```

3.1301 $\int \frac{x}{1+x^5}\,dx$

Optimal. Leaf size=185

$$\frac{1}{20}\left(1+\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1-\sqrt{5}\right)x+1\right)+\frac{1}{20}\left(1-\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1+\sqrt{5}\right)x+1\right)-\frac{1}{5}\log(x+1)-\frac{1}{5}\sqrt{\frac{1}{2}\left(5-\sqrt{5}\right)}\tan^{-1}\left(2\sqrt{\frac{2}{5+\sqrt{5}}}x+\sqrt{\frac{1}{5}\left(5-2\sqrt{5}\right)}\right)-\frac{1}{5}\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\tan^{-1}\left(\sqrt{\frac{1}{5}\left(5+2\sqrt{5}\right)}-\sqrt{\frac{2}{5}\left(5+\sqrt{5}\right)}x\right)$$

```
[Out] -(Sqrt[(5 - Sqrt[5])/2]*ArcTan[Sqrt[(5 - 2*Sqrt[5])/5] + 2*Sqrt[2
/(5 + Sqrt[5])]*x])/5 - (Sqrt[(5 + Sqrt[5])/2]*ArcTan[Sqrt[(5 + 2
*Sqrt[5])/5] - Sqrt[(2*(5 + Sqrt[5]))/5]*x])/5 - Log[1 + x]/5 + (
(1 + Sqrt[5])*Log[1 - ((1 - Sqrt[5])*x)/2 + x^2])/20 + ((1 - Sqrt
[5])*Log[1 - ((1 + Sqrt[5])*x)/2 + x^2])/20
```

Rubi [A] time = 0.539909, antiderivative size = 185, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667

$$\frac{1}{20}\left(1+\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1-\sqrt{5}\right)x+1\right)+\frac{1}{20}\left(1-\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1+\sqrt{5}\right)x+1\right)-\frac{1}{5}\log(x+1)-\frac{1}{5}\sqrt{\frac{1}{2}\left(5-\sqrt{5}\right)}\tan^{-1}\left(2\sqrt{\frac{2}{5+\sqrt{5}}}x+\sqrt{\frac{1}{5}\left(5-2\sqrt{5}\right)}\right)-\frac{1}{5}\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\tan^{-1}\left(\sqrt{\frac{1}{5}\left(5+2\sqrt{5}\right)}-\sqrt{\frac{2}{5}\left(5+\sqrt{5}\right)}x\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x/(1 + x^5),x]
```

```
[Out] -(Sqrt[(5 - Sqrt[5])/2]*ArcTan[Sqrt[(5 - 2*Sqrt[5])/5] + 2*Sqrt[2
/(5 + Sqrt[5])]*x])/5 - (Sqrt[(5 + Sqrt[5])/2]*ArcTan[Sqrt[(5 + 2
*Sqrt[5])/5] - Sqrt[(2*(5 + Sqrt[5]))/5]*x])/5 - Log[1 + x]/5 + (
(1 + Sqrt[5])*Log[1 - ((1 - Sqrt[5])*x)/2 + x^2])/20 + ((1 - Sqrt
[5])*Log[1 - ((1 + Sqrt[5])*x)/2 + x^2])/20
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(x**5+1),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.257143, size = 144, normalized size = 0.78

$$\frac{1}{20}\left(\left(1+\sqrt{5}\right)\log\left(x^2+\frac{1}{2}\left(\sqrt{5}-1\right)x+1\right)-\left(\sqrt{5}-1\right)\log\left(x^2-\frac{1}{2}\left(1+\sqrt{5}\right)x+1\right)\right.$$
$$\left.-4\log(x+1)-2\sqrt{2\left(5+\sqrt{5}\right)}\tan^{-1}\left(\frac{-4x+\sqrt{5}+1}{\sqrt{10-2\sqrt{5}}}\right)-2\sqrt{10-2\sqrt{5}}\tan^{-1}\left(\frac{4x+\sqrt{5}-1}{\sqrt{2\left(5+\sqrt{5}\right)}}\right)\right)$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x/(1 + x^5),x]
```

```
[Out] (-2*Sqrt[2*(5 + Sqrt[5])]*ArcTan[(1 + Sqrt[5] - 4*x)/Sqrt[10 - 2*
Sqrt[5]]] - 2*Sqrt[10 - 2*Sqrt[5]]*ArcTan[(-1 + Sqrt[5] + 4*x)/Sq
rt[2*(5 + Sqrt[5])]] - 4*Log[1 + x] + (1 + Sqrt[5])*Log[1 + ((-1
+ Sqrt[5])*x)/2 + x^2] - (-1 + Sqrt[5])*Log[1 - ((1 + Sqrt[5])*x)
/2 + x^2])/20
```

Maple [A] time = 0.02, size = 156, normalized size = 0.8

$$-\frac{\ln(1+x)}{5}+\frac{\ln\left(x\sqrt{5}+2x^2-x+2\right)\sqrt{5}}{20}+\frac{\ln\left(x\sqrt{5}+2x^2-x+2\right)}{20}$$
$$-\frac{2\sqrt{5}}{5\sqrt{10+2\sqrt{5}}}\arctan\left(\frac{\sqrt{5}+4x-1}{\sqrt{10+2\sqrt{5}}}\right)-\frac{\ln\left(-x\sqrt{5}+2x^2-x+2\right)\sqrt{5}}{20}$$
$$+\frac{\ln\left(-x\sqrt{5}+2x^2-x+2\right)}{20}+\frac{2\sqrt{5}}{5\sqrt{10-2\sqrt{5}}}\arctan\left(\frac{-\sqrt{5}+4x-1}{\sqrt{10-2\sqrt{5}}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(x^5+1),x)
```

```
[Out] -1/5*ln(1+x)+1/20*ln(x*5^(1/2)+2*x^2-x+2)*5^(1/2)+1/20*ln(x*5^(1/
2)+2*x^2-x+2)-2/5/(10+2*5^(1/2))^(1/2)*arctan((5^(1/2)+4*x-1)/(10
+2*5^(1/2))^(1/2))*5^(1/2)-1/20*ln(-x*5^(1/2)+2*x^2-x+2)*5^(1/2)+
1/20*ln(-x*5^(1/2)+2*x^2-x+2)+2/5/(10-2*5^(1/2))^(1/2)*arctan((-5
^(1/2)+4*x-1)/(10-2*5^(1/2))^(1/2))*5^(1/2)
```

Maxima [A] time = 1.58751, size = 167, normalized size = 0.9

$$-\frac{2\sqrt{5}\arctan\left(\frac{4x+\sqrt{5}-1}{\sqrt{2\sqrt{5}+10}}\right)}{5\sqrt{2\sqrt{5}+10}}+\frac{2\sqrt{5}\arctan\left(\frac{4x-\sqrt{5}-1}{\sqrt{-2\sqrt{5}+10}}\right)}{5\sqrt{-2\sqrt{5}+10}}$$
$$-\frac{\log\left(2x^2-x\left(\sqrt{5}+1\right)+2\right)}{5\sqrt{5}+5}+\frac{\log\left(2x^2+x\left(\sqrt{5}-1\right)+2\right)}{5\left(\sqrt{5}-1\right)}-\frac{1}{5}\log(x+1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(x^5 + 1),x, algorithm="maxima")
```

```
[Out] -2/5*sqrt(5)*arctan((4*x + sqrt(5) - 1)/sqrt(2*sqrt(5) + 10))/sqr
t(2*sqrt(5) + 10) + 2/5*sqrt(5)*arctan((4*x - sqrt(5) - 1)/sqrt(-
2*sqrt(5) + 10))/sqrt(-2*sqrt(5) + 10) - log(2*x^2 - x*(sqrt(5) +
```

```
 1) + 2)/((5*sqrt(5)) + 5) + 1/5*log(2*x^2 + x*(sqrt(5) - 1) + 2)
/(sqrt(5) - 1) - 1/5*log(x + 1)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(x^5 + 1),x, algorithm="fricas")
```

```
[Out] Exception raised: NotImplementedError
```

Sympy [A] time = 2.74226, size = 36, normalized size = 0.19

$$-\frac{\log(x+1)}{5} + \operatorname{RootSum}\left(625t^4 - 125t^3 + 25t^2 - 5t + 1, \left(t \mapsto t\log\left(-125t^3 + x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(x**5+1),x)
```

```
[Out] -log(x + 1)/5 + RootSum(625*_t**4 - 125*_t**3 + 25*_t**2 - 5*_t +
 1, Lambda(_t, _t*log(-125*_t**3 + x)))
```

GIAC/XCAS [A] time = 0.230271, size = 151, normalized size = 0.82

$$-\frac{1}{20}\left(\sqrt{5}-1\right)\ln\left(x^2-\frac{1}{2}x\left(\sqrt{5}+1\right)+1\right)+\frac{1}{20}\left(\sqrt{5}+1\right)\ln\left(x^2+\frac{1}{2}x\left(\sqrt{5}-1\right)+1\right) - \frac{1}{10}\sqrt{-2\sqrt{5}+10}\arctan\left(\frac{4x+\sqrt{5}-1}{\sqrt{2\sqrt{5}+10}}\right)+\frac{1}{10}\sqrt{2\sqrt{5}+10}\arctan\left(\frac{4x-\sqrt{5}-1}{\sqrt{-2\sqrt{5}+10}}\right)-\frac{1}{5}\ln\left(|x+1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(x^5 + 1),x, algorithm="giac")
```

```
[Out] -1/20*(sqrt(5) - 1)*ln(x^2 - 1/2*x*(sqrt(5) + 1) + 1) + 1/20*(sqr
t(5) + 1)*ln(x^2 + 1/2*x*(sqrt(5) - 1) + 1) - 1/10*sqrt(-2*sqrt(5
) + 10)*arctan((4*x + sqrt(5) - 1)/sqrt(2*sqrt(5) + 10)) + 1/10*s
qrt(2*sqrt(5) + 10)*arctan((4*x - sqrt(5) - 1)/sqrt(-2*sqrt(5) +
10)) - 1/5*ln(abs(x + 1))
```

3.1302 $\int \frac{1}{1+x^5}\,dx$

Optimal. Leaf size=168

$$-\frac{1}{20}\left(1-\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1-\sqrt{5}\right)x+1\right)-\frac{1}{20}\left(1+\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1+\sqrt{5}\right)x+1\right)+\frac{1}{5}\log(x+1)-\frac{1}{5}\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\tan^{-1}\left(\frac{-4x-\sqrt{5}+1}{\sqrt{2\left(5+\sqrt{5}\right)}}\right)-\frac{1}{5}\sqrt{\frac{1}{2}\left(5-\sqrt{5}\right)}\tan^{-1}\left(\frac{1}{2}\sqrt{\frac{1}{10}\left(5+\sqrt{5}\right)}\left(-4x+\sqrt{5}+1\right)\right)$$

```
[Out] -(Sqrt[(5 + Sqrt[5])/2]*ArcTan[(1 - Sqrt[5] - 4*x)/Sqrt[2*(5 + Sq
rt[5])]])/5 - (Sqrt[(5 - Sqrt[5])/2]*ArcTan[(Sqrt[(5 + Sqrt[5])/1
0]*(1 + Sqrt[5] - 4*x))/2])/5 + Log[1 + x]/5 - ((1 - Sqrt[5])*Log
[1 - ((1 - Sqrt[5])*x)/2 + x^2])/20 - ((1 + Sqrt[5])*Log[1 - ((1
+ Sqrt[5])*x)/2 + x^2])/20
```

Rubi [A] time = 0.47189, antiderivative size = 185, normalized size of antiderivative = 1.1, number of steps used = 6, number of rules used = 6, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.857

$$-\frac{1}{20}\left(1-\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1-\sqrt{5}\right)x+1\right)-\frac{1}{20}\left(1+\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1+\sqrt{5}\right)x+1\right)+\frac{1}{5}\log(x+1)+\frac{1}{5}\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\tan^{-1}\left(2\sqrt{\frac{2}{5+\sqrt{5}}}x+\sqrt{\frac{1}{5}\left(5-2\sqrt{5}\right)}\right)-\frac{1}{5}\sqrt{\frac{1}{2}\left(5-\sqrt{5}\right)}\tan^{-1}\left(\sqrt{\frac{1}{5}\left(5+2\sqrt{5}\right)}-\sqrt{\frac{2}{5}\left(5+\sqrt{5}\right)}x\right)$$

Warning: Unable to verify antiderivative.

```
[In]  Int[(1 + x^5)^(-1),x]
```

```
[Out] (Sqrt[(5 + Sqrt[5])/2]*ArcTan[Sqrt[(5 - 2*Sqrt[5])/5] + 2*Sqrt[2/
(5 + Sqrt[5])]*x])/5 - (Sqrt[(5 - Sqrt[5])/2]*ArcTan[Sqrt[(5 + 2*
Sqrt[5])/5] - Sqrt[(2*(5 + Sqrt[5]))/5]*x])/5 + Log[1 + x]/5 - ((
1 - Sqrt[5])*Log[1 - ((1 - Sqrt[5])*x)/2 + x^2])/20 - ((1 + Sqrt[
5])*Log[1 - ((1 + Sqrt[5])*x)/2 + x^2])/20
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(x**5+1),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.255772, size = 144, normalized size = 0.86

$$\frac{1}{20}\left(\left(\sqrt{5}-1\right)\log\left(x^2+\frac{1}{2}\left(\sqrt{5}-1\right)x+1\right)-\left(1+\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1+\sqrt{5}\right)x+1\right)+4\log(x+1)-2\sqrt{10-2\sqrt{5}}\tan^{-1}\left(\frac{-4x+\sqrt{5}+1}{\sqrt{10-2\sqrt{5}}}\right)+2\sqrt{2\left(5+\sqrt{5}\right)}\tan^{-1}\left(\frac{4x+\sqrt{5}-1}{\sqrt{2\left(5+\sqrt{5}\right)}}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(1 + x^5)^(-1),x]
```

```
[Out] (-2*Sqrt[10 - 2*Sqrt[5]]*ArcTan[(1 + Sqrt[5] - 4*x)/Sqrt[10 - 2*S
qrt[5]]] + 2*Sqrt[2*(5 + Sqrt[5])]*ArcTan[(-1 + Sqrt[5] + 4*x)/Sq
rt[2*(5 + Sqrt[5])]] + 4*Log[1 + x] + (-1 + Sqrt[5])*Log[1 + ((-1
 + Sqrt[5])*x)/2 + x^2] - (1 + Sqrt[5])*Log[1 - ((1 + Sqrt[5])*x)
/2 + x^2])/20
```

Maple [A] time = 0.02, size = 216, normalized size = 1.3

$$\frac{\ln(1+x)}{5}+\frac{\ln\left(x\sqrt{5}+2x^2-x+2\right)\sqrt{5}}{20}-\frac{\ln\left(x\sqrt{5}+2x^2-x+2\right)}{20}+\frac{1}{\sqrt{10+2\sqrt{5}}}\arctan\left(\frac{\sqrt{5}+4x-1}{\sqrt{10+2\sqrt{5}}}\right)+\frac{\sqrt{5}}{5\sqrt{10+2\sqrt{5}}}\arctan\left(\frac{\sqrt{5}+4x-1}{\sqrt{10+2\sqrt{5}}}\right)-\frac{\ln\left(-x\sqrt{5}+2x^2-x+2\right)\sqrt{5}}{20}-\frac{\ln\left(-x\sqrt{5}+2x^2-x+2\right)}{20}+\frac{1}{\sqrt{10-2\sqrt{5}}}\arctan\left(\frac{-\sqrt{5}+4x-1}{\sqrt{10-2\sqrt{5}}}\right)-\frac{\sqrt{5}}{5\sqrt{10-2\sqrt{5}}}\arctan\left(\frac{-\sqrt{5}+4x-1}{\sqrt{10-2\sqrt{5}}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(x^5+1),x)
```

```
[Out] 1/5*ln(1+x)+1/20*ln(x*5^(1/2)+2*x^2-x+2)*5^(1/2)-1/20*ln(x*5^(1/2
)+2*x^2-x+2)+1/(10+2*5^(1/2))^(1/2)*arctan((5^(1/2)+4*x-1)/(10+2*
5^(1/2))^(1/2))+1/5/(10+2*5^(1/2))^(1/2)*arctan((5^(1/2)+4*x-1)/(
10+2*5^(1/2))^(1/2))*5^(1/2)-1/20*ln(-x*5^(1/2)+2*x^2-x+2)*5^(1/2
)-1/20*ln(-x*5^(1/2)+2*x^2-x+2)+1/(10-2*5^(1/2))^(1/2)*arctan((-5
^(1/2)+4*x-1)/(10-2*5^(1/2))^(1/2))-1/5/(10-2*5^(1/2))^(1/2)*arct
an((-5^(1/2)+4*x-1)/(10-2*5^(1/2))^(1/2))*5^(1/2)
```

Maxima [A] time = 1.58745, size = 194, normalized size = 1.15

$$\frac{\sqrt{5}\left(\sqrt{5}+1\right)\arctan\left(\frac{4x+\sqrt{5}-1}{\sqrt{2\sqrt{5}+10}}\right)}{5\sqrt{2\sqrt{5}+10}}+\frac{\sqrt{5}\left(\sqrt{5}-1\right)\arctan\left(\frac{4x-\sqrt{5}-1}{\sqrt{-2\sqrt{5}+10}}\right)}{5\sqrt{-2\sqrt{5}+10}}-\frac{\left(\sqrt{5}+3\right)\log\left(2x^2-x\left(\sqrt{5}+1\right)+2\right)}{10\left(\sqrt{5}+1\right)}-\frac{\left(\sqrt{5}-3\right)\log\left(2x^2+x\left(\sqrt{5}-1\right)+2\right)}{10\left(\sqrt{5}-1\right)}+\frac{1}{5}\log(x+1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^5 + 1),x, algorithm="maxima")
```

```
[Out] 1/5*sqrt(5)*(sqrt(5) + 1)*arctan((4*x + sqrt(5) - 1)/sqrt(2*sqrt(
5) + 10))/sqrt(2*sqrt(5) + 10) + 1/5*sqrt(5)*(sqrt(5) - 1)*arctan
((4*x - sqrt(5) - 1)/sqrt(-2*sqrt(5) + 10))/sqrt(-2*sqrt(5) + 10)
 - 1/10*(sqrt(5) + 3)*log(2*x^2 - x*(sqrt(5) + 1) + 2)/(sqrt(5) +
 1) - 1/10*(sqrt(5) - 3)*log(2*x^2 + x*(sqrt(5) - 1) + 2)/(sqrt(5
) - 1) + 1/5*log(x + 1)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^5 + 1),x, algorithm="fricas")
```

```
[Out] Exception raised: NotImplementedError
```

Sympy [A] time = 4.20374, size = 34, normalized size = 0.2

$$\frac{\log(x+1)}{5} + \operatorname{RootSum}\left(625t^4 + 125t^3 + 25t^2 + 5t + 1, \left(t \mapsto t\log(5t+x)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x**5+1),x)
```

```
[Out] log(x + 1)/5 + RootSum(625*_t**4 + 125*_t**3 + 25*_t**2 + 5*_t +
1, Lambda(_t, _t*log(5*_t + x)))
```

GIAC/XCAS [A] time = 0.229336, size = 151, normalized size = 0.9

$$-\frac{1}{20}\left(\sqrt{5}+1\right)\ln\left(x^2 - \frac{1}{2}x\left(\sqrt{5}+1\right)+1\right) + \frac{1}{20}\left(\sqrt{5}-1\right)\ln\left(x^2 + \frac{1}{2}x\left(\sqrt{5}-1\right)+1\right) + \frac{1}{10}\sqrt{2\sqrt{5}+10}\arctan\left(\frac{4x+\sqrt{5}-1}{\sqrt{2\sqrt{5}+10}}\right) + \frac{1}{10}\sqrt{-2\sqrt{5}+10}\arctan\left(\frac{4x-\sqrt{5}-1}{\sqrt{-2\sqrt{5}+10}}\right) + \frac{1}{5}\ln\left(|x+1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^5 + 1),x, algorithm="giac")
```

```
[Out] -1/20*(sqrt(5) + 1)*ln(x^2 - 1/2*x*(sqrt(5) + 1) + 1) + 1/20*(sqr
t(5) - 1)*ln(x^2 + 1/2*x*(sqrt(5) - 1) + 1) + 1/10*sqrt(2*sqrt(5)
 + 10)*arctan((4*x + sqrt(5) - 1)/sqrt(2*sqrt(5) + 10)) + 1/10*sq
rt(-2*sqrt(5) + 10)*arctan((4*x - sqrt(5) - 1)/sqrt(-2*sqrt(5) +
10)) + 1/5*ln(abs(x + 1))
```

3.1303 $\int \frac{1}{x^2(1+x^5)} dx$

Optimal. Leaf size=190

$$-\frac{1}{20}\left(1-\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1-\sqrt{5}\right)x+1\right)-\frac{1}{20}\left(1+\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1+\sqrt{5}\right)x+1\right)-\frac{1}{x}+\frac{1}{5}\log(x+1)-\frac{1}{5}\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\tan^{-1}\left(2\sqrt{\frac{2}{5+\sqrt{5}}}x+\sqrt{\frac{1}{5}\left(5-2\sqrt{5}\right)}\right)+\frac{1}{5}\sqrt{\frac{1}{2}\left(5-\sqrt{5}\right)}\tan^{-1}\left(\sqrt{\frac{1}{5}\left(5+2\sqrt{5}\right)}-\sqrt{\frac{2}{5}\left(5+\sqrt{5}\right)}x\right)$$

```
[Out] -x^(-1) - (Sqrt[(5 + Sqrt[5])/2]*ArcTan[Sqrt[(5 - 2*Sqrt[5])/5] +
 2*Sqrt[2/(5 + Sqrt[5])]*x])/5 + (Sqrt[(5 - Sqrt[5])/2]*ArcTan[Sq
rt[(5 + 2*Sqrt[5])/5] - Sqrt[(2*(5 + Sqrt[5]))/5]*x])/5 + Log[1 +
 x]/5 - ((1 - Sqrt[5])*Log[1 - ((1 - Sqrt[5])*x)/2 + x^2])/20 - (
(1 + Sqrt[5])*Log[1 - ((1 + Sqrt[5])*x)/2 + x^2])/20
```

Rubi [A] time = 0.608248, antiderivative size = 190, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.636

$$-\frac{1}{20}\left(1-\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1-\sqrt{5}\right)x+1\right)-\frac{1}{20}\left(1+\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1+\sqrt{5}\right)x+1\right)-\frac{1}{x}+\frac{1}{5}\log(x+1)-\frac{1}{5}\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\tan^{-1}\left(2\sqrt{\frac{2}{5+\sqrt{5}}}x+\sqrt{\frac{1}{5}\left(5-2\sqrt{5}\right)}\right)+\frac{1}{5}\sqrt{\frac{1}{2}\left(5-\sqrt{5}\right)}\tan^{-1}\left(\sqrt{\frac{1}{5}\left(5+2\sqrt{5}\right)}-\sqrt{\frac{2}{5}\left(5+\sqrt{5}\right)}x\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(1 + x^5)),x]
```

```
[Out] -x^(-1) - (Sqrt[(5 + Sqrt[5])/2]*ArcTan[Sqrt[(5 - 2*Sqrt[5])/5] +
 2*Sqrt[2/(5 + Sqrt[5])]*x])/5 + (Sqrt[(5 - Sqrt[5])/2]*ArcTan[Sq
rt[(5 + 2*Sqrt[5])/5] - Sqrt[(2*(5 + Sqrt[5]))/5]*x])/5 + Log[1 +
 x]/5 - ((1 - Sqrt[5])*Log[1 - ((1 - Sqrt[5])*x)/2 + x^2])/20 - (
(1 + Sqrt[5])*Log[1 - ((1 + Sqrt[5])*x)/2 + x^2])/20
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(x**5+1),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.247846, size = 149, normalized size = 0.78

$$\frac{1}{20}\left(\left(\sqrt{5}-1\right)\log\left(x^2+\frac{1}{2}\left(\sqrt{5}-1\right)x+1\right)-\left(1+\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1+\sqrt{5}\right)x+1\right)-\frac{20}{x}\right.$$
$$\left.+4\log(x+1)+2\sqrt{10-2\sqrt{5}}\tan^{-1}\left(\frac{-4x+\sqrt{5}+1}{\sqrt{10-2\sqrt{5}}}\right)-2\sqrt{2\left(5+\sqrt{5}\right)}\tan^{-1}\left(\frac{4x+\sqrt{5}-1}{\sqrt{2\left(5+\sqrt{5}\right)}}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*(1 + x^5)),x]
```

```
[Out] (-20/x + 2*Sqrt[10 - 2*Sqrt[5]]*ArcTan[(1 + Sqrt[5] - 4*x)/Sqrt[1
0 - 2*Sqrt[5]]] - 2*Sqrt[2*(5 + Sqrt[5])]*ArcTan[(-1 + Sqrt[5] +
4*x)/Sqrt[2*(5 + Sqrt[5])]] + 4*Log[1 + x] + (-1 + Sqrt[5])*Log[1
 + ((-1 + Sqrt[5])*x)/2 + x^2] - (1 + Sqrt[5])*Log[1 - ((1 + Sqrt
[5])*x)/2 + x^2])/20
```

Maple [A] time = 0.02, size = 223, normalized size = 1.2

$$\frac{\ln(1+x)}{5}+\frac{\ln\left(x\sqrt{5}+2x^2-x+2\right)\sqrt{5}}{20}-\frac{\ln\left(x\sqrt{5}+2x^2-x+2\right)}{20}$$
$$-\frac{1}{\sqrt{10+2\sqrt{5}}}\arctan\left(\frac{\sqrt{5}+4x-1}{\sqrt{10+2\sqrt{5}}}\right)-\frac{\sqrt{5}}{5\sqrt{10+2\sqrt{5}}}\arctan\left(\frac{\sqrt{5}+4x-1}{\sqrt{10+2\sqrt{5}}}\right)$$
$$-\frac{\ln\left(-x\sqrt{5}+2x^2-x+2\right)\sqrt{5}}{20}-\frac{\ln\left(-x\sqrt{5}+2x^2-x+2\right)}{20}$$
$$-\frac{1}{\sqrt{10-2\sqrt{5}}}\arctan\left(\frac{-\sqrt{5}+4x-1}{\sqrt{10-2\sqrt{5}}}\right)+\frac{\sqrt{5}}{5\sqrt{10-2\sqrt{5}}}\arctan\left(\frac{-\sqrt{5}+4x-1}{\sqrt{10-2\sqrt{5}}}\right)-x^{-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(x^5+1),x)
```

```
[Out] 1/5*ln(1+x)+1/20*ln(x*5^(1/2)+2*x^2-x+2)*5^(1/2)-1/20*ln(x*5^(1/2
)+2*x^2-x+2)-1/(10+2*5^(1/2))^(1/2)*arctan((5^(1/2)+4*x-1)/(10+2*
5^(1/2))^(1/2))-1/5/(10+2*5^(1/2))^(1/2)*arctan((5^(1/2)+4*x-1)/(
10+2*5^(1/2))^(1/2))*5^(1/2)-1/20*ln(-x*5^(1/2)+2*x^2-x+2)*5^(1/2
)-1/20*ln(-x*5^(1/2)+2*x^2-x+2)-1/(10-2*5^(1/2))^(1/2)*arctan((-5
^(1/2)+4*x-1)/(10-2*5^(1/2))^(1/2))+1/5/(10-2*5^(1/2))^(1/2)*arct
an((-5^(1/2)+4*x-1)/(10-2*5^(1/2))^(1/2))*5^(1/2)-1/x
```

Maxima [A] time = 1.58447, size = 201, normalized size = 1.06

$$-\frac{\sqrt{5}\left(\sqrt{5}+1\right)\arctan\left(\frac{4x+\sqrt{5}-1}{\sqrt{2\sqrt{5}+10}}\right)}{5\sqrt{2\sqrt{5}+10}}-\frac{\sqrt{5}\left(\sqrt{5}-1\right)\arctan\left(\frac{4x-\sqrt{5}-1}{\sqrt{-2\sqrt{5}+10}}\right)}{5\sqrt{-2\sqrt{5}+10}}$$
$$-\frac{\left(\sqrt{5}+3\right)\log\left(2x^2-x\left(\sqrt{5}+1\right)+2\right)}{10\left(\sqrt{5}+1\right)}-\frac{\left(\sqrt{5}-3\right)\log\left(2x^2+x\left(\sqrt{5}-1\right)+2\right)}{10\left(\sqrt{5}-1\right)}-\frac{1}{x}+\frac{1}{5}\log(x+1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^5 + 1)*x^2),x, algorithm="maxima")
```

```
[Out] -1/5*sqrt(5)*(sqrt(5) + 1)*arctan((4*x + sqrt(5) - 1)/sqrt(2*sqrt
(5) + 10))/sqrt(2*sqrt(5) + 10) - 1/5*sqrt(5)*(sqrt(5) - 1)*arcta
n((4*x - sqrt(5) - 1)/sqrt(-2*sqrt(5) + 10))/sqrt(-2*sqrt(5) + 10
) - 1/10*(sqrt(5) + 3)*log(2*x^2 - x*(sqrt(5) + 1) + 2)/(sqrt(5)
+ 1) - 1/10*(sqrt(5) - 3)*log(2*x^2 + x*(sqrt(5) - 1) + 2)/(sqrt(
5) - 1) - 1/x + 1/5*log(x + 1)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^5 + 1)*x^2),x, algorithm="fricas")
```

```
[Out] Exception raised: NotImplementedError
```

Sympy [A] time = 4.4953, size = 39, normalized size = 0.21

$$\frac{\log(x+1)}{5} + \operatorname{RootSum}\left(625t^4 + 125t^3 + 25t^2 + 5t + 1, \left(t \mapsto t\log\left(625t^4 + x\right)\right)\right) - \frac{1}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(x**5+1),x)
```

```
[Out] log(x + 1)/5 + RootSum(625*_t**4 + 125*_t**3 + 25*_t**2 + 5*_t +
1, Lambda(_t, _t*log(625*_t**4 + x))) - 1/x
```

GIAC/XCAS [A] time = 0.235124, size = 178, normalized size = 0.94

$$-\frac{1}{10}\sqrt{2\sqrt{5}+10}\arctan\left(\frac{4x+\sqrt{5}-1}{\sqrt{2\sqrt{5}+10}}\right) - \frac{1}{10}\sqrt{-2\sqrt{5}+10}\arctan\left(\frac{4x-\sqrt{5}-1}{\sqrt{-2\sqrt{5}+10}}\right) - \frac{1}{20}\sqrt{5}\ln\left(x^2 - \frac{1}{2}x\left(\sqrt{5}+1\right)+1\right) + \frac{1}{20}\sqrt{5}\ln\left(x^2 + \frac{1}{2}x\left(\sqrt{5}-1\right)+1\right) - \frac{1}{x} - \frac{1}{20}\ln\left(x^4 - x^3 + x^2 - x + 1\right) + \frac{1}{5}\ln\left(|x+1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^5 + 1)*x^2),x, algorithm="giac")
```

```
[Out] -1/10*sqrt(2*sqrt(5) + 10)*arctan((4*x + sqrt(5) - 1)/sqrt(2*sqrt
(5) + 10)) - 1/10*sqrt(-2*sqrt(5) + 10)*arctan((4*x - sqrt(5) - 1
)/sqrt(-2*sqrt(5) + 10)) - 1/20*sqrt(5)*ln(x^2 - 1/2*x*(sqrt(5) +
 1) + 1) + 1/20*sqrt(5)*ln(x^2 + 1/2*x*(sqrt(5) - 1) + 1) - 1/x -
 1/20*ln(x^4 - x^3 + x^2 - x + 1) + 1/5*ln(abs(x + 1))
```

3.1304 $\int \frac{1}{x^3(1+x^5)}\,dx$

Optimal. Leaf size=192

$$-\frac{1}{2x^2}+\frac{1}{20}\left(1+\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1-\sqrt{5}\right)x+1\right)+\frac{1}{20}\left(1-\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1+\sqrt{5}\right)x+1\right)-\frac{1}{5}\log(x+1)+\frac{1}{5}\sqrt{\frac{1}{2}\left(5-\sqrt{5}\right)}\tan^{-1}\left(2\sqrt{\frac{2}{5+\sqrt{5}}}x+\sqrt{\frac{1}{5}\left(5-2\sqrt{5}\right)}\right)+\frac{1}{5}\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\tan^{-1}\left(\sqrt{\frac{1}{5}\left(5+2\sqrt{5}\right)}-\sqrt{\frac{2}{5}\left(5+\sqrt{5}\right)}x\right)$$

```
[Out] -1/(2*x^2) + (Sqrt[(5 - Sqrt[5])/2]*ArcTan[Sqrt[(5 - 2*Sqrt[5])/5
] + 2*Sqrt[2/(5 + Sqrt[5])]*x])/5 + (Sqrt[(5 + Sqrt[5])/2]*ArcTan
[Sqrt[(5 + 2*Sqrt[5])/5] - Sqrt[(2*(5 + Sqrt[5]))/5]*x])/5 - Log[
1 + x]/5 + ((1 + Sqrt[5])*Log[1 - ((1 - Sqrt[5])*x)/2 + x^2])/20
+ ((1 - Sqrt[5])*Log[1 - ((1 + Sqrt[5])*x)/2 + x^2])/20
```

Rubi [A] time = 0.622379, antiderivative size = 192, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.636

$$-\frac{1}{2x^2}+\frac{1}{20}\left(1+\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1-\sqrt{5}\right)x+1\right)+\frac{1}{20}\left(1-\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1+\sqrt{5}\right)x+1\right)-\frac{1}{5}\log(x+1)+\frac{1}{5}\sqrt{\frac{1}{2}\left(5-\sqrt{5}\right)}\tan^{-1}\left(2\sqrt{\frac{2}{5+\sqrt{5}}}x+\sqrt{\frac{1}{5}\left(5-2\sqrt{5}\right)}\right)+\frac{1}{5}\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\tan^{-1}\left(\sqrt{\frac{1}{5}\left(5+2\sqrt{5}\right)}-\sqrt{\frac{2}{5}\left(5+\sqrt{5}\right)}x\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(1 + x^5)),x]
```

```
[Out] -1/(2*x^2) + (Sqrt[(5 - Sqrt[5])/2]*ArcTan[Sqrt[(5 - 2*Sqrt[5])/5
] + 2*Sqrt[2/(5 + Sqrt[5])]*x])/5 + (Sqrt[(5 + Sqrt[5])/2]*ArcTan
[Sqrt[(5 + 2*Sqrt[5])/5] - Sqrt[(2*(5 + Sqrt[5]))/5]*x])/5 - Log[
1 + x]/5 + ((1 + Sqrt[5])*Log[1 - ((1 - Sqrt[5])*x)/2 + x^2])/20
+ ((1 - Sqrt[5])*Log[1 - ((1 + Sqrt[5])*x)/2 + x^2])/20
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(x**5+1),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.275905, size = 149, normalized size = 0.78

$$\frac{1}{20}\left(-\frac{10}{x^2}+\left(1+\sqrt{5}\right)\log\left(x^2+\frac{1}{2}\left(\sqrt{5}-1\right)x+1\right)-\left(\sqrt{5}-1\right)\log\left(x^2-\frac{1}{2}\left(1+\sqrt{5}\right)x+1\right)\right.$$
$$\left.-4\log(x+1)+2\sqrt{2\left(5+\sqrt{5}\right)}\tan^{-1}\left(\frac{-4x+\sqrt{5}+1}{\sqrt{10-2\sqrt{5}}}\right)+2\sqrt{10-2\sqrt{5}}\tan^{-1}\left(\frac{4x+\sqrt{5}-1}{\sqrt{2\left(5+\sqrt{5}\right)}}\right)\right)$$

Warning: Unable to verify antiderivative.

```
[In]   Integrate[1/(x^3*(1 + x^5)),x]
```

```
[Out] (-10/x^2 + 2*Sqrt[2*(5 + Sqrt[5])]*ArcTan[(1 + Sqrt[5] - 4*x)/Sqr
t[10 - 2*Sqrt[5]]] + 2*Sqrt[10 - 2*Sqrt[5]]*ArcTan[(-1 + Sqrt[5]
+ 4*x)/Sqrt[2*(5 + Sqrt[5])]] - 4*Log[1 + x] + (1 + Sqrt[5])*Log[
1 + ((-1 + Sqrt[5])*x)/2 + x^2] - (-1 + Sqrt[5])*Log[1 - ((1 + Sq
rt[5])*x)/2 + x^2])/20
```

Maple [A] time = 0.023, size = 161, normalized size = 0.8

$$-\frac{\ln(1+x)}{5}-\frac{1}{2x^2}+\frac{\ln\left(x\sqrt{5}+2x^2-x+2\right)\sqrt{5}}{20}+\frac{\ln\left(x\sqrt{5}+2x^2-x+2\right)}{20}$$
$$+\frac{2\sqrt{5}}{5\sqrt{10+2\sqrt{5}}}\arctan\left(\frac{\sqrt{5}+4x-1}{\sqrt{10+2\sqrt{5}}}\right)-\frac{\ln\left(-x\sqrt{5}+2x^2-x+2\right)\sqrt{5}}{20}$$
$$+\frac{\ln\left(-x\sqrt{5}+2x^2-x+2\right)}{20}-\frac{2\sqrt{5}}{5\sqrt{10-2\sqrt{5}}}\arctan\left(\frac{-\sqrt{5}+4x-1}{\sqrt{10-2\sqrt{5}}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^3/(x^5+1),x)
```

```
[Out] -1/5*ln(1+x)-1/2/x^2+1/20*ln(x*5^(1/2)+2*x^2-x+2)*5^(1/2)+1/20*ln
(x*5^(1/2)+2*x^2-x+2)+2/5/(10+2*5^(1/2))^(1/2)*arctan((5^(1/2)+4*
x-1)/(10+2*5^(1/2))^(1/2))*5^(1/2)-1/20*ln(-x*5^(1/2)+2*x^2-x+2)*
5^(1/2)+1/20*ln(-x*5^(1/2)+2*x^2-x+2)-2/5/(10-2*5^(1/2))^(1/2)*ar
ctan((-5^(1/2)+4*x-1)/(10-2*5^(1/2))^(1/2))*5^(1/2)
```

Maxima [A] time = 1.6077, size = 174, normalized size = 0.91

$$\frac{2\sqrt{5}\arctan\left(\frac{4x+\sqrt{5}-1}{\sqrt{2\sqrt{5}+10}}\right)}{5\sqrt{2\sqrt{5}+10}}-\frac{2\sqrt{5}\arctan\left(\frac{4x-\sqrt{5}-1}{\sqrt{-2\sqrt{5}+10}}\right)}{5\sqrt{-2\sqrt{5}+10}}-\frac{\log\left(2x^2-x\left(\sqrt{5}+1\right)+2\right)}{5\sqrt{5}+5}$$
$$+\frac{\log\left(2x^2+x\left(\sqrt{5}-1\right)+2\right)}{5\left(\sqrt{5}-1\right)}-\frac{1}{2x^2}-\frac{1}{5}\log(x+1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((x^5 + 1)*x^3),x, algorithm="maxima")
```

```
[Out] 2/5*sqrt(5)*arctan((4*x + sqrt(5) - 1)/sqrt(2*sqrt(5) + 10))/sqrt
(2*sqrt(5) + 10) - 2/5*sqrt(5)*arctan((4*x - sqrt(5) - 1)/sqrt(-2
*sqrt(5) + 10))/sqrt(-2*sqrt(5) + 10) - log(2*x^2 - x*(sqrt(5) +
```

```
1) + 2)/((5*sqrt(5)) + 5) + 1/5*log(2*x^2 + x*(sqrt(5) - 1) + 2)/
(sqrt(5) - 1) - 1/2/x^2 - 1/5*log(x + 1)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^5 + 1)*x^3),x, algorithm="fricas")
```

```
[Out] Exception raised: NotImplementedError
```

Sympy [A] time = 2.82015, size = 42, normalized size = 0.22

$$-\frac{\log(x+1)}{5} + \operatorname{RootSum}\left(625t^4 - 125t^3 + 25t^2 - 5t + 1, \left(t \mapsto t\log\left(25t^2 + x\right)\right)\right) - \frac{1}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(x**5+1),x)
```

```
[Out] -log(x + 1)/5 + RootSum(625*_t**4 - 125*_t**3 + 25*_t**2 - 5*_t +
 1, Lambda(_t, _t*log(25*_t**2 + x))) - 1/(2*x**2)
```

GIAC/XCAS [A] time = 0.234659, size = 178, normalized size = 0.93

$$\frac{1}{10}\sqrt{-2\sqrt{5}+10}\arctan\left(\frac{4x+\sqrt{5}-1}{\sqrt{2\sqrt{5}+10}}\right) - \frac{1}{10}\sqrt{2\sqrt{5}+10}\arctan\left(\frac{4x-\sqrt{5}-1}{\sqrt{-2\sqrt{5}+10}}\right) - \frac{1}{20}\sqrt{5}\ln\left(x^2 - \frac{1}{2}x\left(\sqrt{5}+1\right)+1\right) + \frac{1}{20}\sqrt{5}\ln\left(x^2 + \frac{1}{2}x\left(\sqrt{5}-1\right)+1\right) - \frac{1}{2x^2} + \frac{1}{20}\ln\left(x^4 - x^3 + x^2 - x + 1\right) - \frac{1}{5}\ln\left(|x+1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^5 + 1)*x^3),x, algorithm="giac")
```

```
[Out] 1/10*sqrt(-2*sqrt(5) + 10)*arctan((4*x + sqrt(5) - 1)/sqrt(2*sqrt
(5) + 10)) - 1/10*sqrt(2*sqrt(5) + 10)*arctan((4*x - sqrt(5) - 1)
/sqrt(-2*sqrt(5) + 10)) - 1/20*sqrt(5)*ln(x^2 - 1/2*x*(sqrt(5) +
1) + 1) + 1/20*sqrt(5)*ln(x^2 + 1/2*x*(sqrt(5) - 1) + 1) - 1/2/x^
2 + 1/20*ln(x^4 - x^3 + x^2 - x + 1) - 1/5*ln(abs(x + 1))
```

3.1305 $\int \frac{1}{x^4(1+x^5)} dx$

Optimal. Leaf size=192

$$-\frac{1}{3x^3}-\frac{1}{20}\left(1+\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1-\sqrt{5}\right)x+1\right)-\frac{1}{20}\left(1-\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1+\sqrt{5}\right)x+1\right)+\frac{1}{5}\log(x+1)+\frac{1}{5}\sqrt{\frac{1}{2}\left(5-\sqrt{5}\right)}\tan^{-1}\left(2\sqrt{\frac{2}{5+\sqrt{5}}}x+\sqrt{\frac{1}{5}\left(5-2\sqrt{5}\right)}\right)+\frac{1}{5}\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\tan^{-1}\left(\sqrt{\frac{1}{5}\left(5+2\sqrt{5}\right)}-\sqrt{\frac{2}{5}\left(5+\sqrt{5}\right)}x\right)$$

```
[Out] -1/(3*x^3) + (Sqrt[(5 - Sqrt[5])/2]*ArcTan[Sqrt[(5 - 2*Sqrt[5])/5
] + 2*Sqrt[2/(5 + Sqrt[5])]*x])/5 + (Sqrt[(5 + Sqrt[5])/2]*ArcTan
[Sqrt[(5 + 2*Sqrt[5])/5] - Sqrt[(2*(5 + Sqrt[5]))/5]*x])/5 + Log[
1 + x]/5 - ((1 + Sqrt[5])*Log[1 - ((1 - Sqrt[5])*x)/2 + x^2])/20
- ((1 - Sqrt[5])*Log[1 - ((1 + Sqrt[5])*x)/2 + x^2])/20
```

Rubi [A] time = 0.535079, antiderivative size = 192, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.636

$$-\frac{1}{3x^3}-\frac{1}{20}\left(1+\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1-\sqrt{5}\right)x+1\right)-\frac{1}{20}\left(1-\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1+\sqrt{5}\right)x+1\right)+\frac{1}{5}\log(x+1)+\frac{1}{5}\sqrt{\frac{1}{2}\left(5-\sqrt{5}\right)}\tan^{-1}\left(2\sqrt{\frac{2}{5+\sqrt{5}}}x+\sqrt{\frac{1}{5}\left(5-2\sqrt{5}\right)}\right)+\frac{1}{5}\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\tan^{-1}\left(\sqrt{\frac{1}{5}\left(5+2\sqrt{5}\right)}-\sqrt{\frac{2}{5}\left(5+\sqrt{5}\right)}x\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*(1 + x^5)),x]
```

```
[Out] -1/(3*x^3) + (Sqrt[(5 - Sqrt[5])/2]*ArcTan[Sqrt[(5 - 2*Sqrt[5])/5
] + 2*Sqrt[2/(5 + Sqrt[5])]*x])/5 + (Sqrt[(5 + Sqrt[5])/2]*ArcTan
[Sqrt[(5 + 2*Sqrt[5])/5] - Sqrt[(2*(5 + Sqrt[5]))/5]*x])/5 + Log[
1 + x]/5 - ((1 + Sqrt[5])*Log[1 - ((1 - Sqrt[5])*x)/2 + x^2])/20
- ((1 - Sqrt[5])*Log[1 - ((1 + Sqrt[5])*x)/2 + x^2])/20
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(x**5+1),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.402624, size = 150, normalized size = 0.78

$$\frac{1}{60}\left(-\frac{20}{x^3}-3\left(1+\sqrt{5}\right)\log\left(x^2+\frac{1}{2}\left(\sqrt{5}-1\right)x+1\right)+3\left(\sqrt{5}-1\right)\log\left(x^2-\frac{1}{2}\left(1+\sqrt{5}\right)x+1\right)\right.$$
$$\left.+12\log(x+1)+6\sqrt{2\left(5+\sqrt{5}\right)}\tan^{-1}\left(\frac{-4x+\sqrt{5}+1}{\sqrt{10-2\sqrt{5}}}\right)+6\sqrt{10-2\sqrt{5}}\tan^{-1}\left(\frac{4x+\sqrt{5}-1}{\sqrt{2\left(5+\sqrt{5}\right)}}\right)\right)$$

Warning: Unable to verify antiderivative.

```
[In]   Integrate[1/(x^4*(1 + x^5)),x]
```

```
[Out] (-20/x^3 + 6*Sqrt[2*(5 + Sqrt[5])]*ArcTan[(1 + Sqrt[5] - 4*x)/Sqr
t[10 - 2*Sqrt[5]]] + 6*Sqrt[10 - 2*Sqrt[5]]*ArcTan[(-1 + Sqrt[5]
+ 4*x)/Sqrt[2*(5 + Sqrt[5])]] + 12*Log[1 + x] - 3*(1 + Sqrt[5])*L
og[1 + ((-1 + Sqrt[5])*x)/2 + x^2] + 3*(-1 + Sqrt[5])*Log[1 - ((1
 + Sqrt[5])*x)/2 + x^2])/60
```

Maple [A] time = 0.022, size = 161, normalized size = 0.8

$$-\frac{1}{3x^3}+\frac{\ln(1+x)}{5}-\frac{\ln\left(x\sqrt{5}+2x^2-x+2\right)\sqrt{5}}{20}-\frac{\ln\left(x\sqrt{5}+2x^2-x+2\right)}{20}$$
$$+\frac{2\sqrt{5}}{5\sqrt{10+2\sqrt{5}}}\arctan\left(\frac{\sqrt{5}+4x-1}{\sqrt{10+2\sqrt{5}}}\right)+\frac{\ln\left(-x\sqrt{5}+2x^2-x+2\right)\sqrt{5}}{20}$$
$$-\frac{\ln\left(-x\sqrt{5}+2x^2-x+2\right)}{20}-\frac{2\sqrt{5}}{5\sqrt{10-2\sqrt{5}}}\arctan\left(\frac{-\sqrt{5}+4x-1}{\sqrt{10-2\sqrt{5}}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^4/(x^5+1),x)
```

```
[Out] -1/3/x^3+1/5*ln(1+x)-1/20*ln(x*5^(1/2)+2*x^2-x+2)*5^(1/2)-1/20*ln
(x*5^(1/2)+2*x^2-x+2)+2/5/(10+2*5^(1/2))^(1/2)*arctan((5^(1/2)+4*
x-1)/(10+2*5^(1/2))^(1/2))*5^(1/2)+1/20*ln(-x*5^(1/2)+2*x^2-x+2)*
5^(1/2)-1/20*ln(-x*5^(1/2)+2*x^2-x+2)-2/5/(10-2*5^(1/2))^(1/2)*ar
ctan((-5^(1/2)+4*x-1)/(10-2*5^(1/2))^(1/2))*5^(1/2)
```

Maxima [A] time = 1.60261, size = 173, normalized size = 0.9

$$\frac{2\sqrt{5}\arctan\left(\frac{4x+\sqrt{5}-1}{\sqrt{2\sqrt{5}+10}}\right)}{5\sqrt{2\sqrt{5}+10}}-\frac{2\sqrt{5}\arctan\left(\frac{4x-\sqrt{5}-1}{\sqrt{-2\sqrt{5}+10}}\right)}{5\sqrt{-2\sqrt{5}+10}}+\frac{\log\left(2x^2-x\left(\sqrt{5}+1\right)+2\right)}{5\sqrt{5}+5}$$
$$-\frac{\log\left(2x^2+x\left(\sqrt{5}-1\right)+2\right)}{5\left(\sqrt{5}-1\right)}-\frac{1}{3x^3}+\frac{1}{5}\log(x+1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((x^5 + 1)*x^4),x, algorithm="maxima")
```

```
[Out] 2/5*sqrt(5)*arctan((4*x + sqrt(5) - 1)/sqrt(2*sqrt(5) + 10))/sqrt
(2*sqrt(5) + 10) - 2/5*sqrt(5)*arctan((4*x - sqrt(5) - 1)/sqrt(-2
*sqrt(5) + 10))/sqrt(-2*sqrt(5) + 10) + log(2*x^2 - x*(sqrt(5) +
```

```
1) + 2)/((5*sqrt(5)) + 5) - 1/5*log(2*x^2 + x*(sqrt(5) - 1) + 2)/
(sqrt(5) - 1) - 1/3/x^3 + 1/5*log(x + 1)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((x^5 + 1)*x^4),x, algorithm="fricas")
```

```
[Out] Exception raised: NotImplementedError
```

Sympy [A] time = 4.61751, size = 42, normalized size = 0.22

$$\frac{\log(x+1)}{5} + \operatorname{RootSum}\left(625t^4 + 125t^3 + 25t^2 + 5t + 1, \left(t \mapsto t\log\left(125t^3 + x\right)\right)\right) - \frac{1}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**4/(x**5+1),x)
```

```
[Out] log(x + 1)/5 + RootSum(625*_t**4 + 125*_t**3 + 25*_t**2 + 5*_t +
1, Lambda(_t, _t*log(125*_t**3 + x))) - 1/(3*x**3)
```

GIAC/XCAS [A] time = 0.236997, size = 178, normalized size = 0.93

$$\frac{1}{10}\sqrt{-2\sqrt{5}+10}\arctan\left(\frac{4x+\sqrt{5}-1}{\sqrt{2\sqrt{5}+10}}\right) - \frac{1}{10}\sqrt{2\sqrt{5}+10}\arctan\left(\frac{4x-\sqrt{5}-1}{\sqrt{-2\sqrt{5}+10}}\right) + \frac{1}{20}\sqrt{5}\ln\left(x^2 - \frac{1}{2}x\left(\sqrt{5}+1\right)+1\right) - \frac{1}{20}\sqrt{5}\ln\left(x^2 + \frac{1}{2}x\left(\sqrt{5}-1\right)+1\right) - \frac{1}{3x^3} - \frac{1}{20}\ln\left(x^4 - x^3 + x^2 - x + 1\right) + \frac{1}{5}\ln\left(|x+1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((x^5 + 1)*x^4),x, algorithm="giac")
```

```
[Out] 1/10*sqrt(-2*sqrt(5) + 10)*arctan((4*x + sqrt(5) - 1)/sqrt(2*sqrt
(5) + 10)) - 1/10*sqrt(2*sqrt(5) + 10)*arctan((4*x - sqrt(5) - 1)
/sqrt(-2*sqrt(5) + 10)) + 1/20*sqrt(5)*ln(x^2 - 1/2*x*(sqrt(5) +
1) + 1) - 1/20*sqrt(5)*ln(x^2 + 1/2*x*(sqrt(5) - 1) + 1) - 1/3/x^
3 - 1/20*ln(x^4 - x^3 + x^2 - x + 1) + 1/5*ln(abs(x + 1))
```

3.1306 $\int \frac{x^{23/2}}{\sqrt{a+bx^5}}\,dx$

Optimal. Leaf size=83

$$\frac{3a^2\tanh^{-1}\left(\frac{\sqrt{b}x^{5/2}}{\sqrt{a+bx^5}}\right)}{20b^{5/2}}-\frac{3ax^{5/2}\sqrt{a+bx^5}}{20b^2}+\frac{x^{15/2}\sqrt{a+bx^5}}{10b}$$

```
[Out] (-3*a*x^(5/2)*Sqrt[a + b*x^5])/(20*b^2) + (x^(15/2)*Sqrt[a + b*x^
5])/(10*b) + (3*a^2*ArcTanh[(Sqrt[b]*x^(5/2))/Sqrt[a + b*x^5]])/(
20*b^(5/2))
```

Rubi [A] time = 0.117107, antiderivative size = 83, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.294

$$\frac{3a^2\tanh^{-1}\left(\frac{\sqrt{b}x^{5/2}}{\sqrt{a+bx^5}}\right)}{20b^{5/2}}-\frac{3ax^{5/2}\sqrt{a+bx^5}}{20b^2}+\frac{x^{15/2}\sqrt{a+bx^5}}{10b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(23/2)/Sqrt[a + b*x^5],x]
```

```
[Out] (-3*a*x^(5/2)*Sqrt[a + b*x^5])/(20*b^2) + (x^(15/2)*Sqrt[a + b*x^
5])/(10*b) + (3*a^2*ArcTanh[(Sqrt[b]*x^(5/2))/Sqrt[a + b*x^5]])/(
20*b^(5/2))
```

Rubi in Sympy [A] time = 12.0729, size = 75, normalized size = 0.9

$$\frac{3a^2\operatorname{atanh}\left(\frac{\sqrt{b}x^{\frac{5}{2}}}{\sqrt{a+bx^5}}\right)}{20b^{\frac{5}{2}}}-\frac{3ax^{\frac{5}{2}}\sqrt{a+bx^5}}{20b^2}+\frac{x^{\frac{15}{2}}\sqrt{a+bx^5}}{10b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(23/2)/(b*x**5+a)**(1/2),x)
```

```
[Out] 3*a**2*atanh(sqrt(b)*x**(5/2)/sqrt(a + b*x**5))/(20*b**(5/2)) - 3
*a*x**(5/2)*sqrt(a + b*x**5)/(20*b**2) + x**(15/2)*sqrt(a + b*x**
5)/(10*b)
```

Mathematica [A] time = 0.118315, size = 70, normalized size = 0.84

$$\frac{3a^2\tanh^{-1}\left(\frac{\sqrt{b}x^{5/2}}{\sqrt{a+bx^5}}\right)+\sqrt{b}x^{5/2}\sqrt{a+bx^5}\left(2bx^5-3a\right)}{20b^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(23/2)/Sqrt[a + b*x^5],x]
```

```
[Out] (Sqrt[b]*x^(5/2)*Sqrt[a + b*x^5]*(-3*a + 2*b*x^5) + 3*a^2*ArcTanh
[(Sqrt[b]*x^(5/2))/Sqrt[a + b*x^5]])/(20*b^(5/2))
```

Maple [F] time = 0.076, size = 0, normalized size = 0.

$$\int 1x^{\frac{23}{2}}\frac{1}{\sqrt{bx^5+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(23/2)/(b*x^5+a)^(1/2),x)
```

```
[Out] int(x^(23/2)/(b*x^5+a)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(23/2)/sqrt(b*x^5 + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.733749, size = 1, normalized size = 0.01

$$\left[\frac{3\,a^2\log\left(-4\left(2\,b^2x^7+abx^2\right)\sqrt{bx^5+a}\sqrt{x}-\left(8\,b^2x^{10}+8\,abx^5+a^2\right)\sqrt{b}\right)+4\left(2\,bx^7-3\,ax^2\right)\sqrt{bx^5+a}\sqrt{b}\sqrt{x}}{80\,b^{\frac{5}{2}}}, \frac{3\,a^2\arctan\left(2\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(23/2)/sqrt(b*x^5 + a),x, algorithm="fricas")
```

```
[Out] [1/80*(3*a^2*log(-4*(2*b^2*x^7 + a*b*x^2)*sqrt(b*x^5 + a)*sqrt(x)
 - (8*b^2*x^10 + 8*a*b*x^5 + a^2)*sqrt(b)) + 4*(2*b*x^7 - 3*a*x^2
)*sqrt(b*x^5 + a)*sqrt(b)*sqrt(x))/b^(5/2), 1/40*(3*a^2*arctan(2*
sqrt(b*x^5 + a)*sqrt(-b)*x^(5/2)/(2*b*x^5 + a)) + 2*(2*b*x^7 - 3*
a*x^2)*sqrt(b*x^5 + a)*sqrt(-b)*sqrt(x))/(sqrt(-b)*b^2)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(23/2)/(b*x**5+a)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.258996, size = 78, normalized size = 0.94

$$\frac{1}{20}\sqrt{bx^5+a}\left(\frac{2\,x^5}{b}-\frac{3\,a}{b^2}\right)x^{\frac{5}{2}}-\frac{3\,a^2\ln\left(\left|-\sqrt{b}x^{\frac{5}{2}}+\sqrt{bx^5+a}\right|\right)}{20\,b^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(23/2)/sqrt(b*x^5 + a),x, algorithm="giac")
```

```
[Out] 1/20*sqrt(b*x^5 + a)*(2*x^5/b - 3*a/b^2)*x^(5/2) - 3/20*a^2*ln(ab
s(-sqrt(b)*x^(5/2) + sqrt(b*x^5 + a)))/b^(5/2)
```

3.1307 $\int \frac{x^{13/2}}{\sqrt{a+bx^5}}\,dx$

Optimal. Leaf size=57

$$\frac{x^{5/2}\sqrt{a+bx^5}}{5b}-\frac{a\tanh^{-1}\left(\frac{\sqrt{b}x^{5/2}}{\sqrt{a+bx^5}}\right)}{5b^{3/2}}$$

```
[Out] (x^(5/2)*Sqrt[a + b*x^5])/(5*b) - (a*ArcTanh[(Sqrt[b]*x^(5/2))/Sq
rt[a + b*x^5]])/(5*b^(3/2))
```

Rubi [A] time = 0.0885204, antiderivative size = 57, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.294

$$\frac{x^{5/2}\sqrt{a+bx^5}}{5b}-\frac{a\tanh^{-1}\left(\frac{\sqrt{b}x^{5/2}}{\sqrt{a+bx^5}}\right)}{5b^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^(13/2)/Sqrt[a + b*x^5],x]
```

```
[Out] (x^(5/2)*Sqrt[a + b*x^5])/(5*b) - (a*ArcTanh[(Sqrt[b]*x^(5/2))/Sq
rt[a + b*x^5]])/(5*b^(3/2))
```

Rubi in Sympy [A] time = 8.75827, size = 48, normalized size = 0.84

$$-\frac{a\,\mathrm{atanh}\left(\frac{\sqrt{b}x^{\frac{5}{2}}}{\sqrt{a+bx^5}}\right)}{5b^{\frac{3}{2}}}+\frac{x^{\frac{5}{2}}\sqrt{a+bx^5}}{5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(13/2)/(b*x**5+a)**(1/2),x)
```

```
[Out] -a*atanh(sqrt(b)*x**(5/2)/sqrt(a + b*x**5))/(5*b**(3/2)) + x**(5/
2)*sqrt(a + b*x**5)/(5*b)
```

Mathematica [A] time = 0.10126, size = 57, normalized size = 1.

$$\frac{x^{5/2}\sqrt{a+bx^5}}{5b}-\frac{a\tanh^{-1}\left(\frac{\sqrt{b}x^{5/2}}{\sqrt{a+bx^5}}\right)}{5b^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(13/2)/Sqrt[a + b*x^5],x]
```

```
[Out] (x^(5/2)*Sqrt[a + b*x^5])/(5*b) - (a*ArcTanh[(Sqrt[b]*x^(5/2))/Sq
rt[a + b*x^5]])/(5*b^(3/2))
```

Maple [F] time = 0.053, size = 0, normalized size = 0.

$$\int 1x^{\frac{13}{2}}\frac{1}{\sqrt{bx^5+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(13/2)/(b*x^5+a)^(1/2),x)
```

```
[Out] int(x^(13/2)/(b*x^5+a)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(13/2)/sqrt(b*x^5 + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.720871, size = 1, normalized size = 0.02

$$\left[\frac{4\sqrt{bx^5+a}\sqrt{b}x^{\frac{5}{2}}+a\log\left(4\left(2b^2x^7+abx^2\right)\sqrt{bx^5+a}\sqrt{x}-\left(8b^2x^{10}+8abx^5+a^2\right)\sqrt{b}\right)}{20b^{\frac{3}{2}}}, \frac{2\sqrt{bx^5+a}\sqrt{-b}x^{\frac{5}{2}}-a\arctan\left(\frac{2\sqrt{b}}{}\right.}{10\sqrt{-b}b}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(13/2)/sqrt(b*x^5 + a),x, algorithm="fricas")
```

```
[Out] [1/20*(4*sqrt(b*x^5 + a)*sqrt(b)*x^(5/2) + a*log(4*(2*b^2*x^7 + a
*b*x^2)*sqrt(b*x^5 + a)*sqrt(x) - (8*b^2*x^10 + 8*a*b*x^5 + a^2)*
sqrt(b)))/b^(3/2), 1/10*(2*sqrt(b*x^5 + a)*sqrt(-b)*x^(5/2) - a*a
rctan(2*sqrt(b*x^5 + a)*sqrt(-b)*x^(5/2)/(2*b*x^5 + a)))/(sqrt(-b
)*b)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(13/2)/(b*x**5+a)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.250401, size = 59, normalized size = 1.04

$$\frac{\sqrt{bx^5+a}x^{\frac{5}{2}}}{5b}+\frac{a\ln\left(\left|-\sqrt{b}x^{\frac{5}{2}}+\sqrt{bx^5+a}\right|\right)}{5b^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(13/2)/sqrt(b*x^5 + a),x, algorithm="giac")
```

```
[Out] 1/5*sqrt(b*x^5 + a)*x^(5/2)/b + 1/5*a*ln(abs(-sqrt(b)*x^(5/2) + s
qrt(b*x^5 + a)))/b^(3/2)
```

3.1308 $\int \frac{x^{3/2}}{\sqrt{a+bx^5}}\,dx$

Optimal. Leaf size=32

$$\frac{2\tanh^{-1}\left(\frac{\sqrt{b}x^{5/2}}{\sqrt{a+bx^5}}\right)}{5\sqrt{b}}$$

```
[Out] (2*ArcTanh[(Sqrt[b]*x^(5/2))/Sqrt[a + b*x^5]])/(5*Sqrt[b])
```

Rubi [A] time = 0.0651626, antiderivative size = 32, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.235

$$\frac{2\tanh^{-1}\left(\frac{\sqrt{b}x^{5/2}}{\sqrt{a+bx^5}}\right)}{5\sqrt{b}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(3/2)/Sqrt[a + b*x^5],x]

[Out] (2*ArcTanh[(Sqrt[b]*x^(5/2))/Sqrt[a + b*x^5]])/(5*Sqrt[b])
```

Rubi in Sympy [A] time = 6.80623, size = 29, normalized size = 0.91

$$\frac{2\,\text{atanh}\left(\frac{\sqrt{b}x^{\frac{5}{2}}}{\sqrt{a+bx^5}}\right)}{5\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(3/2)/(b*x**5+a)**(1/2),x)

[Out] 2*atanh(sqrt(b)*x**(5/2)/sqrt(a + b*x**5))/(5*sqrt(b))
```

Mathematica [A] time = 0.0604771, size = 32, normalized size = 1.

$$\frac{2\tanh^{-1}\left(\frac{\sqrt{b}x^{5/2}}{\sqrt{a+bx^5}}\right)}{5\sqrt{b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(3/2)/Sqrt[a + b*x^5],x]

[Out] (2*ArcTanh[(Sqrt[b]*x^(5/2))/Sqrt[a + b*x^5]])/(5*Sqrt[b])
```

Maple [F] time = 0.036, size = 0, normalized size = 0.

$$\int 1x^{\frac{3}{2}}\frac{1}{\sqrt{bx^5+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(3/2)/(b*x^5+a)^(1/2),x)
```

```
[Out] int(x^(3/2)/(b*x^5+a)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2)/sqrt(b*x^5 + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.690606, size = 1, normalized size = 0.03

$$\left[\frac{\log\left(-4\left(2\,b^2x^7 + abx^2\right)\sqrt{bx^5 + a}\sqrt{x} - \left(8\,b^2x^{10} + 8\,abx^5 + a^2\right)\sqrt{b}\right)}{10\,\sqrt{b}}, \frac{\arctan\left(\frac{2\,\sqrt{bx^5+a}\sqrt{-b}x^{\frac{5}{2}}}{2\,bx^5+a}\right)}{5\,\sqrt{-b}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2)/sqrt(b*x^5 + a),x, algorithm="fricas")
```

```
[Out] [1/10*log(-4*(2*b^2*x^7 + a*b*x^2)*sqrt(b*x^5 + a)*sqrt(x) - (8*b
^2*x^10 + 8*a*b*x^5 + a^2)*sqrt(b))/sqrt(b), 1/5*arctan(2*sqrt(b*
x^5 + a)*sqrt(-b)*x^(5/2)/(2*b*x^5 + a))/sqrt(-b)]
```

Sympy [A] time = 6.80554, size = 24, normalized size = 0.75

$$\frac{2\operatorname{asinh}\left(\frac{\sqrt{b}x^{\frac{5}{2}}}{\sqrt{a}}\right)}{5\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(3/2)/(b*x**5+a)**(1/2),x)
```

```
[Out] 2*asinh(sqrt(b)*x**(5/2)/sqrt(a))/(5*sqrt(b))
```

GIAC/XCAS [A] time = 0.23552, size = 55, normalized size = 1.72

$$-\frac{2\,\arctan\left(\frac{\sqrt{b+\frac{a}{x^5}}}{\sqrt{-b}}\right)}{5\,\sqrt{-b}} + \frac{2\,\arctan\left(\frac{\sqrt{b}}{\sqrt{-b}}\right)}{5\,\sqrt{-b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2)/sqrt(b*x^5 + a),x, algorithm="giac")
```

```
[Out] -2/5*arctan(sqrt(b + a/x^5)/sqrt(-b))/sqrt(-b) + 2/5*arctan(sqrt(
b)/sqrt(-b))/sqrt(-b)
```

3.1309 $\int \frac{1}{x^{7/2}\sqrt{a+bx^5}}\,dx$

Optimal. Leaf size=23

$$-\frac{2\sqrt{a+bx^5}}{5ax^{5/2}}$$

```
[Out] (-2*Sqrt[a + b*x^5])/(5*a*x^(5/2))
```

Rubi [A] time = 0.0202456, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.059$

$$-\frac{2\sqrt{a+bx^5}}{5ax^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^(7/2)*Sqrt[a + b*x^5]),x]

[Out] (-2*Sqrt[a + b*x^5])/(5*a*x^(5/2))
```

Rubi in Sympy [A] time = 2.76954, size = 20, normalized size = 0.87

$$-\frac{2\sqrt{a+bx^5}}{5ax^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**(7/2)/(b*x**5+a)**(1/2),x)

[Out] -2*sqrt(a + b*x**5)/(5*a*x**(5/2))
```

Mathematica [A] time = 0.0192553, size = 23, normalized size = 1.

$$-\frac{2\sqrt{a+bx^5}}{5ax^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^(7/2)*Sqrt[a + b*x^5]),x]

[Out] (-2*Sqrt[a + b*x^5])/(5*a*x^(5/2))
```

Maple [A] time = 0.006, size = 18, normalized size = 0.8

$$-\frac{2}{5\,a}\sqrt{bx^5+ax}^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^(7/2)/(b*x^5+a)^(1/2),x)

[Out] -2/5*(b*x^5+a)^(1/2)/a/x^(5/2)
```

Maxima [A] time = 1.44606, size = 23, normalized size = 1.

$$-\frac{2\sqrt{bx^5+a}}{5\,ax^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^5 + a)*x^(7/2)),x, algorithm="maxima")
```

```
[Out] -2/5*sqrt(b*x^5 + a)/(a*x^(5/2))
```

Fricas [A] time = 0.223865, size = 23, normalized size = 1.

$$-\frac{2\sqrt{bx^5+a}}{5\,ax^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^5 + a)*x^(7/2)),x, algorithm="fricas")
```

```
[Out] -2/5*sqrt(b*x^5 + a)/(a*x^(5/2))
```

Sympy [A] time = 152.634, size = 22, normalized size = 0.96

$$-\frac{2\sqrt{b}\sqrt{\frac{a}{bx^5}+1}}{5a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**(7/2)/(b*x**5+a)**(1/2),x)
```

```
[Out] -2*sqrt(b)*sqrt(a/(b*x**5) + 1)/(5*a)
```

GIAC/XCAS [A] time = 0.232367, size = 31, normalized size = 1.35

$$-\frac{2\sqrt{b+\frac{a}{x^5}}}{5\,a}+\frac{2\sqrt{b}}{5\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^5 + a)*x^(7/2)),x, algorithm="giac")
```

```
[Out] -2/5*sqrt(b + a/x^5)/a + 2/5*sqrt(b)/a
```

3.1310 $\int \frac{1}{x^{17/2}\sqrt{a+bx^5}}\,dx$

Optimal. Leaf size=48

$$\frac{4b\sqrt{a+bx^5}}{15a^2x^{5/2}}-\frac{2\sqrt{a+bx^5}}{15ax^{15/2}}$$

```
[Out] (-2*Sqrt[a + b*x^5])/(15*a*x^(15/2)) + (4*b*Sqrt[a + b*x^5])/(15*
a^2*x^(5/2))
```

Rubi [A] time = 0.0427456, antiderivative size = 48, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{4b\sqrt{a+bx^5}}{15a^2x^{5/2}}-\frac{2\sqrt{a+bx^5}}{15ax^{15/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^(17/2)*Sqrt[a + b*x^5]),x]
```

```
[Out] (-2*Sqrt[a + b*x^5])/(15*a*x^(15/2)) + (4*b*Sqrt[a + b*x^5])/(15*
a^2*x^(5/2))
```

Rubi in Sympy [A] time = 4.53086, size = 42, normalized size = 0.88

$$-\frac{2\sqrt{a+bx^5}}{15ax^{\frac{15}{2}}}+\frac{4b\sqrt{a+bx^5}}{15a^2x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**(17/2)/(b*x**5+a)**(1/2),x)
```

```
[Out] -2*sqrt(a + b*x**5)/(15*a*x**(15/2)) + 4*b*sqrt(a + b*x**5)/(15*a
**2*x**(5/2))
```

Mathematica [A] time = 0.0351076, size = 31, normalized size = 0.65

$$-\frac{2\left(a-2bx^5\right)\sqrt{a+bx^5}}{15a^2x^{15/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^(17/2)*Sqrt[a + b*x^5]),x]
```

```
[Out] (-2*(a - 2*b*x^5)*Sqrt[a + b*x^5])/(15*a^2*x^(15/2))
```

Maple [A] time = 0.007, size = 26, normalized size = 0.5

$$-\frac{-4\,bx^5+2\,a}{15\,a^2}\sqrt{bx^5+a}x^{-\frac{15}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^(17/2)/(b*x^5+a)^(1/2),x)
```

```
[Out] -2/15*(b*x^5+a)^(1/2)*(-2*b*x^5+a)/x^(15/2)/a^2
```

Maxima [A] time = 1.43893, size = 47, normalized size = 0.98

$$\frac{2\left(\frac{3\sqrt{bx^5+a}b}{x^{\frac{5}{2}}}-\frac{(bx^5+a)^{\frac{3}{2}}}{x^{\frac{15}{2}}}\right)}{15\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^5 + a)*x^(17/2)),x, algorithm="maxima")
```

```
[Out] 2/15*(3*sqrt(b*x^5 + a)*b/x^(5/2) - (b*x^5 + a)^(3/2)/x^(15/2))/a
^2
```

Fricas [A] time = 0.228314, size = 36, normalized size = 0.75

$$\frac{2\left(2\,bx^5-a\right)\sqrt{bx^5+a}}{15\,a^2x^{\frac{15}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^5 + a)*x^(17/2)),x, algorithm="fricas")
```

```
[Out] 2/15*(2*b*x^5 - a)*sqrt(b*x^5 + a)/(a^2*x^(15/2))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**(17/2)/(b*x**5+a)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.232102, size = 49, normalized size = 1.02

$$-\frac{4\,b^{\frac{3}{2}}}{15\,a^2}-\frac{2\left(\left(b+\frac{a}{x^5}\right)^{\frac{3}{2}}-3\sqrt{b+\frac{a}{x^5}}b\right)}{15\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^5 + a)*x^(17/2)),x, algorithm="giac")
```

```
[Out] -4/15*b^(3/2)/a^2 - 2/15*((b + a/x^5)^(3/2) - 3*sqrt(b + a/x^5)*b
)/a^2
```

3.1311 $\int \frac{x^{23/2}}{\sqrt{1+x^5}}\,dx$

Optimal. Leaf size=47

$$\frac{3}{20}\sinh^{-1}\left(x^{5/2}\right)+\frac{1}{10}\sqrt{x^5+1}x^{15/2}-\frac{3}{20}\sqrt{x^5+1}x^{5/2}$$

```
[Out] (-3*x^(5/2)*Sqrt[1 + x^5])/20 + (x^(15/2)*Sqrt[1 + x^5])/10 + (3*
ArcSinh[x^(5/2)])/20
```

Rubi [A] time = 0.0470733, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{3}{20}\sinh^{-1}\left(x^{5/2}\right)+\frac{1}{10}\sqrt{x^5+1}x^{15/2}-\frac{3}{20}\sqrt{x^5+1}x^{5/2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(23/2)/Sqrt[1 + x^5],x]
```

```
[Out] (-3*x^(5/2)*Sqrt[1 + x^5])/20 + (x^(15/2)*Sqrt[1 + x^5])/10 + (3*
ArcSinh[x^(5/2)])/20
```

Rubi in Sympy [A] time = 6.02558, size = 41, normalized size = 0.87

$$\frac{x^{\frac{15}{2}}\sqrt{x^5+1}}{10}-\frac{3x^{\frac{5}{2}}\sqrt{x^5+1}}{20}+\frac{3\operatorname{asinh}\left(x^{\frac{5}{2}}\right)}{20}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(23/2)/(x**5+1)**(1/2),x)
```

```
[Out] x**(15/2)*sqrt(x**5 + 1)/10 - 3*x**(5/2)*sqrt(x**5 + 1)/20 + 3*as
inh(x**(5/2))/20
```

Mathematica [A] time = 0.0727955, size = 35, normalized size = 0.74

$$\frac{1}{20}\left(3\sinh^{-1}\left(x^{5/2}\right)+\sqrt{x^5+1}\left(2x^5-3\right)x^{5/2}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(23/2)/Sqrt[1 + x^5],x]
```

```
[Out] (x^(5/2)*Sqrt[1 + x^5]*(-3 + 2*x^5) + 3*ArcSinh[x^(5/2)])/20
```

Maple [A] time = 0.073, size = 46, normalized size = 1.

$$\frac{2x^5-3}{20}x^{\frac{5}{2}}\sqrt{x^5+1}+\frac{3}{20}Arcsinh\left(x^{\frac{5}{2}}\right)\sqrt{x\left(x^5+1\right)}\frac{1}{\sqrt{x}}\frac{1}{\sqrt{x^5+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(23/2)/(x^5+1)^(1/2),x)
```

```
[Out] 1/20*x^(5/2)*(2*x^5-3)*(x^5+1)^(1/2)+3/20*arcsinh(x^(5/2))*(x*(x^
5+1))^(1/2)/x^(1/2)/(x^5+1)^(1/2)
```

Maxima [A] time = 1.43045, size = 116, normalized size = 2.47

$$-\frac{\frac{5\sqrt{x^5+1}}{x^{\frac{5}{2}}} - \frac{3\left(x^5+1\right)^{\frac{3}{2}}}{x^{\frac{15}{2}}}}{20\left(\frac{2\left(x^5+1\right)}{x^5} - \frac{\left(x^5+1\right)^2}{x^{10}} - 1\right)} + \frac{3}{40}\log\left(\frac{\sqrt{x^5+1}}{x^{\frac{5}{2}}} + 1\right) - \frac{3}{40}\log\left(\frac{\sqrt{x^5+1}}{x^{\frac{5}{2}}} - 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(23/2)/sqrt(x^5 + 1),x, algorithm="maxima")
```

```
[Out] -1/20*(5*sqrt(x^5 + 1)/x^(5/2) - 3*(x^5 + 1)^(3/2)/x^(15/2))/(2*(
x^5 + 1)/x^5 - (x^5 + 1)^2/x^10 - 1) + 3/40*log(sqrt(x^5 + 1)/x^(
5/2) + 1) - 3/40*log(sqrt(x^5 + 1)/x^(5/2) - 1)
```

Fricas [A] time = 0.269195, size = 62, normalized size = 1.32

$$\frac{1}{20}\left(2x^7 - 3x^2\right)\sqrt{x^5+1}\sqrt{x} + \frac{3}{40}\log\left(2x^5 + 2\sqrt{x^5+1}x^{\frac{5}{2}} + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(23/2)/sqrt(x^5 + 1),x, algorithm="fricas")
```

```
[Out] 1/20*(2*x^7 - 3*x^2)*sqrt(x^5 + 1)*sqrt(x) + 3/40*log(2*x^5 + 2*s
qrt(x^5 + 1)*x^(5/2) + 1)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(23/2)/(x**5+1)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.233545, size = 49, normalized size = 1.04

$$\frac{1}{20}\left(2x^5 - 3\right)\sqrt{x^5+1}x^{\frac{5}{2}} - \frac{3}{20}\ln\left(-x^{\frac{5}{2}} + \sqrt{x^5+1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(23/2)/sqrt(x^5 + 1),x, algorithm="giac")
```

```
[Out] 1/20*(2*x^5 - 3)*sqrt(x^5 + 1)*x^(5/2) - 3/20*ln(-x^(5/2) + sqrt(
x^5 + 1))
```

3.1312 $\int \frac{x^{13/2}}{\sqrt{1+x^5}}\,dx$

Optimal. Leaf size=29

$$\frac{1}{5}x^{5/2}\sqrt{x^5+1}-\frac{1}{5}\sinh^{-1}\left(x^{5/2}\right)$$

```
[Out] (x^(5/2)*Sqrt[1 + x^5])/5 - ArcSinh[x^(5/2)]/5
```

Rubi [A] time = 0.0345988, antiderivative size = 29, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{1}{5}x^{5/2}\sqrt{x^5+1}-\frac{1}{5}\sinh^{-1}\left(x^{5/2}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^(13/2)/Sqrt[1 + x^5],x]
```

```
[Out] (x^(5/2)*Sqrt[1 + x^5])/5 - ArcSinh[x^(5/2)]/5
```

Rubi in Sympy [A] time = 4.94909, size = 22, normalized size = 0.76

$$\frac{x^{\frac{5}{2}}\sqrt{x^5+1}}{5}-\frac{\operatorname{asinh}\left(x^{\frac{5}{2}}\right)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(13/2)/(x**5+1)**(1/2),x)
```

```
[Out] x**(5/2)*sqrt(x**5 + 1)/5 - asinh(x**(5/2))/5
```

Mathematica [A] time = 0.0532852, size = 29, normalized size = 1.

$$\frac{1}{5}x^{5/2}\sqrt{x^5+1}-\frac{1}{5}\sinh^{-1}\left(x^{5/2}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(13/2)/Sqrt[1 + x^5],x]
```

```
[Out] (x^(5/2)*Sqrt[1 + x^5])/5 - ArcSinh[x^(5/2)]/5
```

Maple [A] time = 0.049, size = 39, normalized size = 1.3

$$\frac{1}{5}x^{\frac{5}{2}}\sqrt{x^5+1}-\frac{1}{5}\mathit{Arcsinh}\left(x^{\frac{5}{2}}\right)\sqrt{x\left(x^5+1\right)}\frac{1}{\sqrt{x}}\frac{1}{\sqrt{x^5+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(13/2)/(x^5+1)^(1/2),x)
```

```
[Out] 1/5*x^(5/2)*(x^5+1)^(1/2)-1/5*arcsinh(x^(5/2))*(x*(x^5+1))^(1/2)/
x^(1/2)/(x^5+1)^(1/2)
```

Maxima [A] time = 1.4995, size = 78, normalized size = 2.69

$$\frac{\sqrt{x^5+1}}{5\,x^{\frac{5}{2}}\left(\frac{x^5+1}{x^5}-1\right)}-\frac{1}{10}\,\log\left(\frac{\sqrt{x^5+1}}{x^{\frac{5}{2}}}+1\right)+\frac{1}{10}\,\log\left(\frac{\sqrt{x^5+1}}{x^{\frac{5}{2}}}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(13/2)/sqrt(x^5 + 1),x, algorithm="maxima")
```

```
[Out] 1/5*sqrt(x^5 + 1)/(x^(5/2)*((x^5 + 1)/x^5 - 1)) - 1/10*log(sqrt(x
^5 + 1)/x^(5/2) + 1) + 1/10*log(sqrt(x^5 + 1)/x^(5/2) - 1)
```

Fricas [A] time = 0.2659, size = 47, normalized size = 1.62

$$\frac{1}{5}\,\sqrt{x^5+1}x^{\frac{5}{2}}+\frac{1}{10}\,\log\left(-2\,x^5+2\,\sqrt{x^5+1}x^{\frac{5}{2}}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(13/2)/sqrt(x^5 + 1),x, algorithm="fricas")
```

```
[Out] 1/5*sqrt(x^5 + 1)*x^(5/2) + 1/10*log(-2*x^5 + 2*sqrt(x^5 + 1)*x^(
5/2) - 1)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(13/2)/(x**5+1)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.230682, size = 39, normalized size = 1.34

$$\frac{1}{5}\,\sqrt{x^5+1}x^{\frac{5}{2}}+\frac{1}{5}\,\ln\left(-x^{\frac{5}{2}}+\sqrt{x^5+1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(13/2)/sqrt(x^5 + 1),x, algorithm="giac")
```

```
[Out] 1/5*sqrt(x^5 + 1)*x^(5/2) + 1/5*ln(-x^(5/2) + sqrt(x^5 + 1))
```

3.1313 $\int \frac{x^{3/2}}{\sqrt{1+x^5}}\,dx$

Optimal. Leaf size=10

$$\frac{2}{5}\sinh^{-1}\left(x^{5/2}\right)$$

```
[Out] (2*ArcSinh[x^(5/2)])/5
```

Rubi [A] time = 0.0232676, antiderivative size = 10, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{2}{5}\sinh^{-1}\left(x^{5/2}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^(3/2)/Sqrt[1 + x^5],x]

[Out] (2*ArcSinh[x^(5/2)])/5
```

Rubi in Sympy [A] time = 3.91108, size = 8, normalized size = 0.8

$$\frac{2\operatorname{asinh}\left(x^{\frac{5}{2}}\right)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(3/2)/(x**5+1)**(1/2),x)

[Out] 2*asinh(x**(5/2))/5
```

Mathematica [A] time = 0.0438722, size = 10, normalized size = 1.

$$\frac{2}{5}\sinh^{-1}\left(x^{5/2}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(3/2)/Sqrt[1 + x^5],x]

[Out] (2*ArcSinh[x^(5/2)])/5
```

Maple [A] time = 0.043, size = 7, normalized size = 0.7

$$\frac{2}{5}\mathit{Arcsinh}\left(x^{\frac{5}{2}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(3/2)/(x^5+1)^(1/2),x)

[Out] 2/5*arcsinh(x^(5/2))
```

Maxima [A] time = 1.43817, size = 45, normalized size = 4.5

$$\frac{1}{5}\,\log\left(\frac{\sqrt{x^5+1}}{x^{\frac{5}{2}}}+1\right)-\frac{1}{5}\,\log\left(\frac{\sqrt{x^5+1}}{x^{\frac{5}{2}}}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2)/sqrt(x^5 + 1),x, algorithm="maxima")
```

```
[Out] 1/5*log(sqrt(x^5 + 1)/x^(5/2) + 1) - 1/5*log(sqrt(x^5 + 1)/x^(5/2
) - 1)
```

Fricas [A] time = 0.265184, size = 30, normalized size = 3.

$$\frac{1}{5}\,\log\left(2\,x^5+2\,\sqrt{x^5+1}x^{\frac{5}{2}}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2)/sqrt(x^5 + 1),x, algorithm="fricas")
```

```
[Out] 1/5*log(2*x^5 + 2*sqrt(x^5 + 1)*x^(5/2) + 1)
```

Sympy [A] time = 5.55956, size = 8, normalized size = 0.8

$$\frac{2\operatorname{asinh}\left(x^{\frac{5}{2}}\right)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(3/2)/(x**5+1)**(1/2),x)
```

```
[Out] 2*asinh(x**(5/2))/5
```

GIAC/XCAS [A] time = 0.228861, size = 34, normalized size = 3.4

$$\frac{1}{5}\ln\left(\sqrt{\frac{1}{x^5}+1}+1\right)-\frac{1}{5}\ln\left(\sqrt{\frac{1}{x^5}+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2)/sqrt(x^5 + 1),x, algorithm="giac")
```

```
[Out] 1/5*ln(sqrt(1/x^5 + 1) + 1) - 1/5*ln(sqrt(1/x^5 + 1) - 1)
```

3.1314 $\int \frac{1}{x^{7/2}\sqrt{1+x^5}}\,dx$

Optimal. Leaf size=18

$$-\frac{2\sqrt{x^5+1}}{5x^{5/2}}$$

```
[Out] (-2*Sqrt[1 + x^5])/(5*x^(5/2))
```

Rubi [A] time = 0.0126077, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{2\sqrt{x^5+1}}{5x^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^(7/2)*Sqrt[1 + x^5]),x]

[Out] (-2*Sqrt[1 + x^5])/(5*x^(5/2))
```

Rubi in Sympy [A] time = 2.21964, size = 17, normalized size = 0.94

$$-\frac{2\sqrt{x^5+1}}{5x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**(7/2)/(x**5+1)**(1/2),x)

[Out] -2*sqrt(x**5 + 1)/(5*x**(5/2))
```

Mathematica [A] time = 0.0106426, size = 18, normalized size = 1.

$$-\frac{2\sqrt{x^5+1}}{5x^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^(7/2)*Sqrt[1 + x^5]),x]

[Out] (-2*Sqrt[1 + x^5])/(5*x^(5/2))
```

Maple [B] time = 0.006, size = 32, normalized size = 1.8

$$-\frac{(2+2x)\left(x^4-x^3+x^2-x+1\right)}{5}x^{-\frac{5}{2}}\frac{1}{\sqrt{x^5+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^(7/2)/(x^5+1)^(1/2),x)
```

```
[Out] -2/5/x^(5/2)*(1+x)*(x^4-x^3+x^2-x+1)/(x^5+1)^(1/2)
```

Maxima [A] time = 1.43771, size = 16, normalized size = 0.89

$$-\frac{2\sqrt{x^5+1}}{5\,x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^5 + 1)*x^(7/2)),x, algorithm="maxima")
```

```
[Out] -2/5*sqrt(x^5 + 1)/x^(5/2)
```

Fricas [A] time = 0.227658, size = 16, normalized size = 0.89

$$-\frac{2\sqrt{x^5+1}}{5\,x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^5 + 1)*x^(7/2)),x, algorithm="fricas")
```

```
[Out] -2/5*sqrt(x^5 + 1)/x^(5/2)
```

Sympy [A] time = 133.216, size = 14, normalized size = 0.78

$$-\frac{2\sqrt{1+\frac{1}{x^5}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**(7/2)/(x**5+1)**(1/2),x)
```

```
[Out] -2*sqrt(1 + x**(-5))/5
```

GIAC/XCAS [A] time = 0.225452, size = 15, normalized size = 0.83

$$-\frac{2}{5}\sqrt{\frac{1}{x^5}+1}+\frac{2}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^5 + 1)*x^(7/2)),x, algorithm="giac")
```

```
[Out] -2/5*sqrt(1/x^5 + 1) + 2/5
```

3.1315 $\int \frac{1}{x^{17/2}\sqrt{1+x^5}}\,dx$

Optimal. Leaf size=37

$$\frac{4\sqrt{x^5+1}}{15x^{5/2}}-\frac{2\sqrt{x^5+1}}{15x^{15/2}}$$

```
[Out] (-2*Sqrt[1 + x^5])/(15*x^(15/2)) + (4*Sqrt[1 + x^5])/(15*x^(5/2))
```

Rubi [A] time = 0.0245888, antiderivative size = 37, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{4\sqrt{x^5+1}}{15x^{5/2}}-\frac{2\sqrt{x^5+1}}{15x^{15/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^(17/2)*Sqrt[1 + x^5]),x]

[Out] (-2*Sqrt[1 + x^5])/(15*x^(15/2)) + (4*Sqrt[1 + x^5])/(15*x^(5/2))
```

Rubi in Sympy [A] time = 3.22701, size = 32, normalized size = 0.86

$$\frac{4\sqrt{x^5+1}}{15x^{\frac{5}{2}}}-\frac{2\sqrt{x^5+1}}{15x^{\frac{15}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**(17/2)/(x**5+1)**(1/2),x)

[Out] 4*sqrt(x**5 + 1)/(15*x**(5/2)) - 2*sqrt(x**5 + 1)/(15*x**(15/2))
```

Mathematica [A] time = 0.0150802, size = 25, normalized size = 0.68

$$\frac{2\sqrt{x^5+1}\left(2x^5-1\right)}{15x^{15/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^(17/2)*Sqrt[1 + x^5]),x]

[Out] (2*Sqrt[1 + x^5]*(-1 + 2*x^5))/(15*x^(15/2))
```

Maple [A] time = 0.007, size = 39, normalized size = 1.1

$$\frac{(2+2\,x)\left(x^4-x^3+x^2-x+1\right)\left(2\,x^5-1\right)}{15}x^{-\frac{15}{2}}\frac{1}{\sqrt{x^5+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^(17/2)/(x^5+1)^(1/2),x)
```

```
[Out] 2/15*(1+x)*(x^4-x^3+x^2-x+1)*(2*x^5-1)/x^(15/2)/(x^5+1)^(1/2)
```

Maxima [A] time = 1.57431, size = 34, normalized size = 0.92

$$\frac{2\sqrt{x^5+1}}{5\,x^{\frac{5}{2}}} - \frac{2\left(x^5+1\right)^{\frac{3}{2}}}{15\,x^{\frac{15}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^5 + 1)*x^(17/2)),x, algorithm="maxima")
```

```
[Out] 2/5*sqrt(x^5 + 1)/x^(5/2) - 2/15*(x^5 + 1)^(3/2)/x^(15/2)
```

Fricas [A] time = 0.226632, size = 26, normalized size = 0.7

$$\frac{2\left(2\,x^5-1\right)\sqrt{x^5+1}}{15\,x^{\frac{15}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^5 + 1)*x^(17/2)),x, algorithm="fricas")
```

```
[Out] 2/15*(2*x^5 - 1)*sqrt(x^5 + 1)/x^(15/2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**(17/2)/(x**5+1)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.22572, size = 27, normalized size = 0.73

$$-\frac{2}{15}\left(\frac{1}{x^5}+1\right)^{\frac{3}{2}} + \frac{2}{5}\sqrt{\frac{1}{x^5}+1} - \frac{4}{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^5 + 1)*x^(17/2)),x, algorithm="giac")
```

```
[Out] -2/15*(1/x^5 + 1)^(3/2) + 2/5*sqrt(1/x^5 + 1) - 4/15
```

3.1316 $\int \frac{x^8}{a+bx^6}\,dx$

Optimal. Leaf size=40

$$\frac{x^3}{3b}-\frac{\sqrt{a}\tan^{-1}\left(\frac{\sqrt{b}x^3}{\sqrt{a}}\right)}{3b^{3/2}}$$

```
[Out] x^3/(3*b) - (Sqrt[a]*ArcTan[(Sqrt[b]*x^3)/Sqrt[a]])/(3*b^(3/2))
```

Rubi [A] time = 0.0543462, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{x^3}{3b}-\frac{\sqrt{a}\tan^{-1}\left(\frac{\sqrt{b}x^3}{\sqrt{a}}\right)}{3b^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^8/(a + b*x^6),x]
```

```
[Out] x^3/(3*b) - (Sqrt[a]*ArcTan[(Sqrt[b]*x^3)/Sqrt[a]])/(3*b^(3/2))
```

Rubi in Sympy [A] time = 9.38121, size = 32, normalized size = 0.8

$$-\frac{\sqrt{a}\,\mathrm{atan}\left(\frac{\sqrt{b}x^3}{\sqrt{a}}\right)}{3b^{\frac{3}{2}}}+\frac{x^3}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**8/(b*x**6+a),x)
```

```
[Out] -sqrt(a)*atan(sqrt(b)*x**3/sqrt(a))/(3*b**(3/2)) + x**3/(3*b)
```

Mathematica [A] time = 0.0270648, size = 40, normalized size = 1.

$$\frac{x^3}{3b}-\frac{\sqrt{a}\tan^{-1}\left(\frac{\sqrt{b}x^3}{\sqrt{a}}\right)}{3b^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^8/(a + b*x^6),x]
```

```
[Out] x^3/(3*b) - (Sqrt[a]*ArcTan[(Sqrt[b]*x^3)/Sqrt[a]])/(3*b^(3/2))
```

Maple [A] time = 0.004, size = 32, normalized size = 0.8

$$\frac{x^3}{3\,b}-\frac{a}{3\,b}\arctan\left(bx^3\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^8/(b*x^6+a),x)
```

```
[Out] 1/3*x^3/b-1/3*a/b/(a*b)^(1/2)*arctan(x^3*b/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^6 + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.21969, size = 1, normalized size = 0.02

$$\left[\frac{2\,x^3+\sqrt{-\frac{a}{b}}\log\left(\frac{bx^6-2\,bx^3\sqrt{-\frac{a}{b}}-a}{bx^6+a}\right)}{6\,b},\ \frac{x^3-\sqrt{\frac{a}{b}}\arctan\left(\frac{x^3}{\sqrt{\frac{a}{b}}}\right)}{3\,b}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^6 + a),x, algorithm="fricas")
```

```
[Out] [1/6*(2*x^3 + sqrt(-a/b)*log((b*x^6 - 2*b*x^3*sqrt(-a/b) - a)/(b*
x^6 + a)))/b, 1/3*(x^3 - sqrt(a/b)*arctan(x^3/sqrt(a/b)))/b]
```

Sympy [A] time = 1.49669, size = 63, normalized size = 1.58

$$\frac{\sqrt{-\frac{a}{b^3}}\log\left(-b\sqrt{-\frac{a}{b^3}}+x^3\right)}{6}-\frac{\sqrt{-\frac{a}{b^3}}\log\left(b\sqrt{-\frac{a}{b^3}}+x^3\right)}{6}+\frac{x^3}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8/(b*x**6+a),x)
```

```
[Out] sqrt(-a/b**3)*log(-b*sqrt(-a/b**3) + x**3)/6 - sqrt(-a/b**3)*log(
b*sqrt(-a/b**3) + x**3)/6 + x**3/(3*b)
```

GIAC/XCAS [A] time = 0.223972, size = 42, normalized size = 1.05

$$\frac{x^3}{3\,b}-\frac{a\arctan\left(\frac{bx^3}{\sqrt{ab}}\right)}{3\,\sqrt{ab}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^6 + a),x, algorithm="giac")
```

```
[Out] 1/3*x^3/b - 1/3*a*arctan(b*x^3/sqrt(a*b))/(sqrt(a*b)*b)
```

3.1317 $\int \frac{x^7}{a+bx^6}\,dx$

Optimal. Leaf size=133

$$\frac{\sqrt[3]{a}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x^2+b^{2/3}x^4\right)}{12b^{4/3}}-\frac{\sqrt[3]{a}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{6b^{4/3}}+\frac{\sqrt[3]{a}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x^2}{\sqrt{3}\sqrt[3]{a}}\right)}{2\sqrt{3}b^{4/3}}+\frac{x^2}{2b}$$

```
[Out] x^2/(2*b) + (a^(1/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*x^2)/(Sqrt[3]*a^
(1/3))])/(2*Sqrt[3]*b^(4/3)) - (a^(1/3)*Log[a^(1/3) + b^(1/3)*x^2
])/(6*b^(4/3)) + (a^(1/3)*Log[a^(2/3) - a^(1/3)*b^(1/3)*x^2 + b^(
2/3)*x^4])/(12*b^(4/3))
```

Rubi [A] time = 0.228228, antiderivative size = 133, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615

$$\frac{\sqrt[3]{a}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x^2+b^{2/3}x^4\right)}{12b^{4/3}}-\frac{\sqrt[3]{a}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{6b^{4/3}}+\frac{\sqrt[3]{a}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x^2}{\sqrt{3}\sqrt[3]{a}}\right)}{2\sqrt{3}b^{4/3}}+\frac{x^2}{2b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7/(a + b*x^6),x]
```

```
[Out] x^2/(2*b) + (a^(1/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*x^2)/(Sqrt[3]*a^
(1/3))])/(2*Sqrt[3]*b^(4/3)) - (a^(1/3)*Log[a^(1/3) + b^(1/3)*x^2
])/(6*b^(4/3)) + (a^(1/3)*Log[a^(2/3) - a^(1/3)*b^(1/3)*x^2 + b^(
2/3)*x^4])/(12*b^(4/3))
```

Rubi in Sympy [A] time = 34.4201, size = 121, normalized size = 0.91

$$-\frac{\sqrt[3]{a}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{6b^{\frac{4}{3}}}+\frac{\sqrt[3]{a}\log\left(a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x^2+b^{\frac{2}{3}}x^4\right)}{12b^{\frac{4}{3}}}+\frac{\sqrt{3}\sqrt[3]{a}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}-\frac{2\sqrt[3]{b}x^2}{3}\right)}{\sqrt[3]{a}}\right)}{6b^{\frac{4}{3}}}+\frac{x^2}{2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7/(b*x**6+a),x)
```

```
[Out] -a**(1/3)*log(a**(1/3) + b**(1/3)*x**2)/(6*b**(4/3)) + a**(1/3)*l
og(a**(2/3) - a**(1/3)*b**(1/3)*x**2 + b**(2/3)*x**4)/(12*b**(4/3
)) + sqrt(3)*a**(1/3)*atan(sqrt(3)*(a**(1/3)/3 - 2*b**(1/3)*x**2/
3)/a**(1/3))/(6*b**(4/3)) + x**2/(2*b)
```

Mathematica [A] time = 0.0920674, size = 186, normalized size = 1.4

$$\frac{-2\sqrt[3]{a}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^2\right)+\sqrt[3]{a}\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)+\sqrt[3]{a}\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)+2\sqrt{3}\sqrt[3]{a}\tan^{-1}\left(\sqrt{3}-\frac{2\sqrt[6]{}}{\sqrt[6]{}}\right.}{12b^{4/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^7/(a + b*x^6),x]
```

```
[Out] (6*b^(1/3)*x^2 + 2*Sqrt[3]*a^(1/3)*ArcTan[Sqrt[3] - (2*b^(1/6)*x)
/a^(1/6)] + 2*Sqrt[3]*a^(1/3)*ArcTan[Sqrt[3] + (2*b^(1/6)*x)/a^(1
/6)] - 2*a^(1/3)*Log[a^(1/3) + b^(1/3)*x^2] + a^(1/3)*Log[a^(1/3)
 - Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2] + a^(1/3)*Log[a^(1/3)
 + Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2])/(12*b^(4/3))
```

Maple [A] time = 0.004, size = 108, normalized size = 0.8

$$\frac{x^2}{2\,b} - \frac{a}{6\,b^2}\ln\left(x^2 + \sqrt[3]{\frac{a}{b}}\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}} + \frac{a}{12\,b^2}\ln\left(x^4 - x^2\sqrt[3]{\frac{a}{b}} + \left(\frac{a}{b}\right)^{\frac{2}{3}}\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}} - \frac{a\sqrt{3}}{6\,b^2}\arctan\left(\frac{\sqrt{3}}{3}\left(2\,x^2\frac{1}{\sqrt[3]{\frac{a}{b}}} - 1\right)\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7/(b*x^6+a),x)
```

```
[Out] 1/2*x^2/b-1/6*a/b^2/(a/b)^(2/3)*ln(x^2+(a/b)^(1/3))+1/12*a/b^2/(a
/b)^(2/3)*ln(x^4-x^2*(a/b)^(1/3)+(a/b)^(2/3))-1/6*a/b^2/(a/b)^(2/
3)*3^(1/2)*arctan(1/3*3^(1/2)*(2/(a/b)^(1/3)*x^2-1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(b*x^6 + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.223302, size = 169, normalized size = 1.27

$$\frac{\sqrt{3}\left(6\,\sqrt{3}x^2 - \sqrt{3}\left(-\frac{a}{b}\right)^{\frac{1}{3}}\log\left(x^4 + x^2\left(-\frac{a}{b}\right)^{\frac{1}{3}} + \left(-\frac{a}{b}\right)^{\frac{2}{3}}\right) + 2\,\sqrt{3}\left(-\frac{a}{b}\right)^{\frac{1}{3}}\log\left(x^2 - \left(-\frac{a}{b}\right)^{\frac{1}{3}}\right) - 6\,\left(-\frac{a}{b}\right)^{\frac{1}{3}}\arctan\left(\frac{2\,\sqrt{3}x^2+\sqrt{3}\left(-\frac{a}{b}\right)^{\frac{1}{3}}}{3\left(-\frac{a}{b}\right)^{\frac{1}{3}}}\right.\right.}{36\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(b*x^6 + a),x, algorithm="fricas")
```

```
[Out] 1/36*sqrt(3)*(6*sqrt(3)*x^2 - sqrt(3)*(-a/b)^(1/3)*log(x^4 + x^2*
(-a/b)^(1/3) + (-a/b)^(2/3)) + 2*sqrt(3)*(-a/b)^(1/3)*log(x^2 - (
-a/b)^(1/3)) - 6*(-a/b)^(1/3)*arctan(1/3*(2*sqrt(3)*x^2 + sqrt(3)
*(-a/b)^(1/3))/(-a/b)^(1/3)))/b
```

Sympy [A] time = 1.49776, size = 27, normalized size = 0.2

$$\operatorname{RootSum}\left(216t^3b^4 + a, \left(t \mapsto t\log\left(-6tb + x^2\right)\right)\right) + \frac{x^2}{2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(b*x**6+a),x)
```

```
[Out] RootSum(216*_t**3*b**4 + a, Lambda(_t, _t*log(-6*_t*b + x**2))) +
 x**2/(2*b)
```

GIAC/XCAS [A] time = 0.227445, size = 162, normalized size = 1.22

$$\frac{x^2}{2\,b}+\frac{\left(-\frac{a}{b}\right)^{\frac{1}{3}}\ln\left(\left|x^2-\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right|\right)}{6\,b}-\frac{\sqrt{3}\left(-ab^2\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x^2+\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{a}{b}\right)^{\frac{1}{3}}}\right)}{6\,b^2}-\frac{\left(-ab^2\right)^{\frac{1}{3}}\ln\left(x^4+x^2\left(-\frac{a}{b}\right)^{\frac{1}{3}}+\left(-\frac{a}{b}\right)^{\frac{2}{3}}\right)}{12\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(b*x^6 + a),x, algorithm="giac")
```

```
[Out] 1/2*x^2/b + 1/6*(-a/b)^(1/3)*ln(abs(x^2 - (-a/b)^(1/3)))/b - 1/6*
sqrt(3)*(-a*b^2)^(1/3)*arctan(1/3*sqrt(3)*(2*x^2 + (-a/b)^(1/3))/
(-a/b)^(1/3))/b^2 - 1/12*(-a*b^2)^(1/3)*ln(x^4 + x^2*(-a/b)^(1/3)
 + (-a/b)^(2/3))/b^2
```

3.1318 $\int \frac{x^6}{a+bx^6}\,dx$

Optimal. Leaf size=220

$$\frac{\sqrt[6]{a}\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{4\sqrt{3}b^{7/6}}-\frac{\sqrt[6]{a}\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{4\sqrt{3}b^{7/6}}-\frac{\sqrt[6]{a}\tan^{-1}\left(\frac{\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{3b^{7/6}}+\frac{\sqrt[6]{a}\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{a}-2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{6b^{7/6}}-\frac{\sqrt[6]{a}\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{a}+2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{6b^{7/6}}+\frac{x}{b}$$

```
[Out] x/b - (a^(1/6)*ArcTan[(b^(1/6)*x)/a^(1/6)])/(3*b^(7/6)) + (a^(1/6
)*ArcTan[(Sqrt[3]*a^(1/6) - 2*b^(1/6)*x)/a^(1/6)])/(6*b^(7/6)) -
(a^(1/6)*ArcTan[(Sqrt[3]*a^(1/6) + 2*b^(1/6)*x)/a^(1/6)])/(6*b^(7
/6)) + (a^(1/6)*Log[a^(1/3) - Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)
*x^2])/(4*Sqrt[3]*b^(7/6)) - (a^(1/6)*Log[a^(1/3) + Sqrt[3]*a^(1/
6)*b^(1/6)*x + b^(1/3)*x^2])/(4*Sqrt[3]*b^(7/6))
```

Rubi [A] time = 0.795999, antiderivative size = 220, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538

$$\frac{\sqrt[6]{a}\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{4\sqrt{3}b^{7/6}}-\frac{\sqrt[6]{a}\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{4\sqrt{3}b^{7/6}}-\frac{\sqrt[6]{a}\tan^{-1}\left(\frac{\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{3b^{7/6}}+\frac{\sqrt[6]{a}\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{a}-2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{6b^{7/6}}-\frac{\sqrt[6]{a}\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{a}+2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{6b^{7/6}}+\frac{x}{b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/(a + b*x^6),x]
```

```
[Out] x/b - (a^(1/6)*ArcTan[(b^(1/6)*x)/a^(1/6)])/(3*b^(7/6)) + (a^(1/6
)*ArcTan[(Sqrt[3]*a^(1/6) - 2*b^(1/6)*x)/a^(1/6)])/(6*b^(7/6)) -
(a^(1/6)*ArcTan[(Sqrt[3]*a^(1/6) + 2*b^(1/6)*x)/a^(1/6)])/(6*b^(7
/6)) + (a^(1/6)*Log[a^(1/3) - Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)
*x^2])/(4*Sqrt[3]*b^(7/6)) - (a^(1/6)*Log[a^(1/3) + Sqrt[3]*a^(1/
6)*b^(1/6)*x + b^(1/3)*x^2])/(4*Sqrt[3]*b^(7/6))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(b*x**6+a),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.0672719, size = 182, normalized size = 0.83

$$\frac{\sqrt{3}\sqrt[6]{a}\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)-\sqrt{3}\sqrt[6]{a}\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)-4\sqrt[6]{a}\tan^{-1}\left(\frac{\sqrt[6]{b}x}{\sqrt[6]{a}}\right)+2\sqrt[6]{a}\tan^{-1}\left(\sqrt{3}-\frac{2\sqrt[6]{b}\cdot}{\sqrt[6]{a}}\right.}{12b^{7/6}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6/(a + b*x^6),x]
```

```
[Out] (12*b^(1/6)*x - 4*a^(1/6)*ArcTan[(b^(1/6)*x)/a^(1/6)] + 2*a^(1/6)
*ArcTan[Sqrt[3] - (2*b^(1/6)*x)/a^(1/6)] - 2*a^(1/6)*ArcTan[Sqrt[
3] + (2*b^(1/6)*x)/a^(1/6)] + Sqrt[3]*a^(1/6)*Log[a^(1/3) - Sqrt[
3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2] - Sqrt[3]*a^(1/6)*Log[a^(1/3)
 + Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2])/(12*b^(7/6))
```

Maple [A] time = 0.09, size = 167, normalized size = 0.8

$$\frac{x}{b}-\frac{1}{3\,b}\sqrt[6]{\frac{a}{b}}\arctan\left(x\frac{1}{\sqrt[6]{\frac{a}{b}}}\right)+\frac{\sqrt{3}}{12\,b}\sqrt[6]{\frac{a}{b}}\ln\left(\sqrt{3}\sqrt[6]{\frac{a}{b}}x-x^{2}-\sqrt[3]{\frac{a}{b}}\right)-\frac{1}{6\,b}\sqrt[6]{\frac{a}{b}}\arctan\left(-\sqrt{3}+2\,x\frac{1}{\sqrt[6]{\frac{a}{b}}}\right)$$
$$-\frac{\sqrt{3}}{12\,b}\sqrt[6]{\frac{a}{b}}\ln\left(x^{2}+\sqrt{3}\sqrt[6]{\frac{a}{b}}x+\sqrt[3]{\frac{a}{b}}\right)-\frac{1}{6\,b}\sqrt[6]{\frac{a}{b}}\arctan\left(2\,x\frac{1}{\sqrt[6]{\frac{a}{b}}}+\sqrt{3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(b*x^6+a),x)
```

```
[Out] x/b-1/3/b*(a/b)^(1/6)*arctan(x/(a/b)^(1/6))+1/12/b*3^(1/2)*(a/b)^
(1/6)*ln(3^(1/2)*(a/b)^(1/6)*x-x^2-(a/b)^(1/3))-1/6/b*(a/b)^(1/6)
*arctan(-3^(1/2)+2*x/(a/b)^(1/6))-1/12/b*3^(1/2)*(a/b)^(1/6)*ln(x
^2+3^(1/2)*(a/b)^(1/6)*x+(a/b)^(1/3))-1/6/b*(a/b)^(1/6)*arctan(2*
x/(a/b)^(1/6)+3^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(b*x^6 + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.2362, size = 389, normalized size = 1.77

$$4\,\sqrt{3}b\left(-\frac{a}{b^{7}}\right)^{\frac{1}{6}}\arctan\left(\frac{\sqrt{3}b\left(-\frac{a}{b^{7}}\right)^{\frac{1}{6}}}{b\left(-\frac{a}{b^{7}}\right)^{\frac{1}{6}}+2\,x+2\,\sqrt{b^{2}\left(-\frac{a}{b^{7}}\right)^{\frac{1}{3}}+bx\left(-\frac{a}{b^{7}}\right)^{\frac{1}{6}}+x^{2}}}\right)+4\,\sqrt{3}b\left(-\frac{a}{b^{7}}\right)^{\frac{1}{6}}\arctan\left(-\frac{\sqrt{3}b\left(-\frac{a}{b^{7}}\right)^{\frac{1}{6}}}{b\left(-\frac{a}{b^{7}}\right)^{\frac{1}{6}}-2\,x-2\,\sqrt{b^{2}\left(-\frac{a}{b^{7}}\right)^{\frac{1}{3}}-bx\left(-\frac{a}{b^{7}}\right)^{\frac{1}{6}}}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(b*x^6 + a),x, algorithm="fricas")
```

```
[Out] 1/12*(4*sqrt(3)*b*(-a/b^7)^(1/6)*arctan(sqrt(3)*b*(-a/b^7)^(1/6)/
(b*(-a/b^7)^(1/6) + 2*x + 2*sqrt(b^2*(-a/b^7)^(1/3) + b*x*(-a/b^7
)^(1/6) + x^2))) + 4*sqrt(3)*b*(-a/b^7)^(1/6)*arctan(-sqrt(3)*b*(
-a/b^7)^(1/6)/(b*(-a/b^7)^(1/6) - 2*x - 2*sqrt(b^2*(-a/b^7)^(1/3)
 - b*x*(-a/b^7)^(1/6) + x^2))) - b*(-a/b^7)^(1/6)*log(b^2*(-a/b^7
)^(1/3) + b*x*(-a/b^7)^(1/6) + x^2) + b*(-a/b^7)^(1/6)*log(b^2*(-
a/b^7)^(1/3) - b*x*(-a/b^7)^(1/6) + x^2) - 2*b*(-a/b^7)^(1/6)*log
(b*(-a/b^7)^(1/6) + x) + 2*b*(-a/b^7)^(1/6)*log(-b*(-a/b^7)^(1/6)
 + x) + 12*x)/b
```

Sympy [A] time = 1.38468, size = 22, normalized size = 0.1

$$\operatorname{RootSum}\left(46656t^{6}b^{7}+a,\left(t\mapsto t\log\left(-6tb+x\right)\right)\right)+\frac{x}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(b*x**6+a),x)
```

```
[Out] RootSum(46656*_t**6*b**7 + a, Lambda(_t, _t*log(-6*_t*b + x))) +
x/b
```

GIAC/XCAS [A] time = 0.229521, size = 243, normalized size = 1.1

$$\frac{x}{b}-\frac{\sqrt{3}\left(ab^{5}\right)^{\frac{1}{6}}\ln\left(x^{2}+\sqrt{3}x\left(\frac{a}{b}\right)^{\frac{1}{6}}+\left(\frac{a}{b}\right)^{\frac{1}{3}}\right)}{12\,b^{2}}+\frac{\sqrt{3}\left(ab^{5}\right)^{\frac{1}{6}}\ln\left(x^{2}-\sqrt{3}x\left(\frac{a}{b}\right)^{\frac{1}{6}}+\left(\frac{a}{b}\right)^{\frac{1}{3}}\right)}{12\,b^{2}}-\frac{\left(ab^{5}\right)^{\frac{1}{6}}\arctan\left(\frac{2\,x+\sqrt{3}\left(\frac{a}{b}\right)^{\frac{1}{6}}}{\left(\frac{a}{b}\right)^{\frac{1}{6}}}\right)}{6\,b^{2}}-\frac{\left(ab^{5}\right)^{\frac{1}{6}}\arctan\left(\frac{2\,x-\sqrt{3}\left(\frac{a}{b}\right)^{\frac{1}{6}}}{\left(\frac{a}{b}\right)^{\frac{1}{6}}}\right)}{6\,b^{2}}-\frac{\left(ab^{5}\right)^{\frac{1}{6}}\arctan\left(\frac{x}{\left(\frac{a}{b}\right)^{\frac{1}{6}}}\right)}{3\,b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(b*x^6 + a),x, algorithm="giac")
```

```
[Out] x/b - 1/12*sqrt(3)*(a*b^5)^(1/6)*ln(x^2 + sqrt(3)*x*(a/b)^(1/6) +
 (a/b)^(1/3))/b^2 + 1/12*sqrt(3)*(a*b^5)^(1/6)*ln(x^2 - sqrt(3)*x
*(a/b)^(1/6) + (a/b)^(1/3))/b^2 - 1/6*(a*b^5)^(1/6)*arctan((2*x +
 sqrt(3)*(a/b)^(1/6))/(a/b)^(1/6))/b^2 - 1/6*(a*b^5)^(1/6)*arctan
((2*x - sqrt(3)*(a/b)^(1/6))/(a/b)^(1/6))/b^2 - 1/3*(a*b^5)^(1/6)
*arctan(x/(a/b)^(1/6))/b^2
```

3.1319 $\int \frac{x^5}{a+bx^6} dx$

Optimal. Leaf size=15

$$\frac{\log (a + bx^6)}{6b}$$

```
[Out] Log[a + b*x^6]/(6*b)
```

Rubi [A] time = 0.0094443, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{\log (a + bx^6)}{6b}$$

Antiderivative was successfully verified.

```
[In] Int[x^5/(a + b*x^6),x]

[Out] Log[a + b*x^6]/(6*b)
```

Rubi in Sympy [A] time = 2.17189, size = 10, normalized size = 0.67

$$\frac{\log (a + bx^6)}{6b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**5/(b*x**6+a),x)

[Out] log(a + b*x**6)/(6*b)
```

Mathematica [A] time = 0.00649054, size = 15, normalized size = 1.

$$\frac{\log (a + bx^6)}{6b}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5/(a + b*x^6),x]

[Out] Log[a + b*x^6]/(6*b)
```

Maple [A] time = 0.002, size = 14, normalized size = 0.9

$$\frac{\ln (bx^6 + a)}{6\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5/(b*x^6+a),x)

[Out] 1/6*ln(b*x^6+a)/b
```

Maxima [A] time = 1.43629, size = 18, normalized size = 1.2

$$\frac{\log\left(bx^6+a\right)}{6\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^6 + a),x, algorithm="maxima")
```

```
[Out] 1/6*log(b*x^6 + a)/b
```

Fricas [A] time = 0.212859, size = 18, normalized size = 1.2

$$\frac{\log\left(bx^6+a\right)}{6\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^6 + a),x, algorithm="fricas")
```

```
[Out] 1/6*log(b*x^6 + a)/b
```

Sympy [A] time = 0.515937, size = 10, normalized size = 0.67

$$\frac{\log\left(a+bx^6\right)}{6b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(b*x**6+a),x)
```

```
[Out] log(a + b*x**6)/(6*b)
```

GIAC/XCAS [A] time = 0.2264, size = 19, normalized size = 1.27

$$\frac{\ln\left(\left|bx^6+a\right|\right)}{6\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^6 + a),x, algorithm="giac")
```

```
[Out] 1/6*ln(abs(b*x^6 + a))/b
```

3.1320 $\int \frac{x^4}{a+bx^6}\,dx$

Optimal. Leaf size=215

$$\frac{\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{4\sqrt{3}\sqrt[6]{a}b^{5/6}}-\frac{\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{4\sqrt{3}\sqrt[6]{a}b^{5/6}}+\frac{\tan^{-1}\left(\frac{\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{3\sqrt[6]{a}b^{5/6}}-\frac{\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{a}-2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{6\sqrt[6]{a}b^{5/6}}+\frac{\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{a}+2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{6\sqrt[6]{a}b^{5/6}}$$

```
[Out] ArcTan[(b^(1/6)*x)/a^(1/6)]/(3*a^(1/6)*b^(5/6)) - ArcTan[(Sqrt[3]
*a^(1/6) - 2*b^(1/6)*x)/a^(1/6)]/(6*a^(1/6)*b^(5/6)) + ArcTan[(Sq
rt[3]*a^(1/6) + 2*b^(1/6)*x)/a^(1/6)]/(6*a^(1/6)*b^(5/6)) + Log[a
^(1/3) - Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2]/(4*Sqrt[3]*a^(1
/6)*b^(5/6)) - Log[a^(1/3) + Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*
x^2]/(4*Sqrt[3]*a^(1/6)*b^(5/6))
```

Rubi [A] time = 1.02969, antiderivative size = 215, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 6, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.462

$$\frac{\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{4\sqrt{3}\sqrt[6]{a}b^{5/6}}-\frac{\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{4\sqrt{3}\sqrt[6]{a}b^{5/6}}+\frac{\tan^{-1}\left(\frac{\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{3\sqrt[6]{a}b^{5/6}}-\frac{\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{a}-2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{6\sqrt[6]{a}b^{5/6}}+\frac{\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{a}+2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{6\sqrt[6]{a}b^{5/6}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a + b*x^6),x]
```

```
[Out] ArcTan[(b^(1/6)*x)/a^(1/6)]/(3*a^(1/6)*b^(5/6)) - ArcTan[(Sqrt[3]
*a^(1/6) - 2*b^(1/6)*x)/a^(1/6)]/(6*a^(1/6)*b^(5/6)) + ArcTan[(Sq
rt[3]*a^(1/6) + 2*b^(1/6)*x)/a^(1/6)]/(6*a^(1/6)*b^(5/6)) + Log[a
^(1/3) - Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2]/(4*Sqrt[3]*a^(1
/6)*b^(5/6)) - Log[a^(1/3) + Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*
x^2]/(4*Sqrt[3]*a^(1/6)*b^(5/6))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(b*x**6+a),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.0394209, size = 154, normalized size = 0.72

$$\frac{\sqrt{3}\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)-\sqrt{3}\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)+4\tan^{-1}\left(\frac{\sqrt[6]{b}x}{\sqrt[6]{a}}\right)-2\tan^{-1}\left(\sqrt{3}-\frac{2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)+2\tan^{-1}}{12\sqrt[6]{a}b^{5/6}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(a + b*x^6),x]
```

```
[Out] (4*ArcTan[(b^(1/6)*x)/a^(1/6)] - 2*ArcTan[Sqrt[3] - (2*b^(1/6)*x)
/a^(1/6)] + 2*ArcTan[Sqrt[3] + (2*b^(1/6)*x)/a^(1/6)] + Sqrt[3]*L
og[a^(1/3) - Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2] - Sqrt[3]*L
og[a^(1/3) + Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2])/(12*a^(1/6
)*b^(5/6))
```

Maple [A] time = 0.061, size = 162, normalized size = 0.8

$$\frac{1}{3b}\arctan\left(x\frac{1}{\sqrt[6]{\frac{a}{b}}}\right)\frac{1}{\sqrt[6]{\frac{a}{b}}}+\frac{\sqrt{3}}{12a}\left(\frac{a}{b}\right)^{\frac{5}{6}}\ln\left(\sqrt{3}\sqrt[6]{\frac{a}{b}}x-x^2-\sqrt[3]{\frac{a}{b}}\right)+\frac{1}{6b}\arctan\left(-\sqrt{3}+2x\frac{1}{\sqrt[6]{\frac{a}{b}}}\right)\frac{1}{\sqrt[6]{\frac{a}{b}}}-\frac{\sqrt{3}}{12a}\left(\frac{a}{b}\right)^{\frac{5}{6}}\ln\left(x^2+\sqrt{3}\sqrt[6]{\frac{a}{b}}x+\sqrt[3]{\frac{a}{b}}\right)+\frac{1}{6b}\arctan\left(2x\frac{1}{\sqrt[6]{\frac{a}{b}}}+\sqrt{3}\right)\frac{1}{\sqrt[6]{\frac{a}{b}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(b*x^6+a),x)
```

```
[Out] 1/3/b/(a/b)^(1/6)*arctan(x/(a/b)^(1/6))+1/12/a*3^(1/2)*(a/b)^(5/6
)*ln(3^(1/2)*(a/b)^(1/6)*x-x^2-(a/b)^(1/3))+1/6/b/(a/b)^(1/6)*arc
tan(-3^(1/2)+2*x/(a/b)^(1/6))-1/12/a*3^(1/2)*(a/b)^(5/6)*ln(x^2+3
^(1/2)*(a/b)^(1/6)*x+(a/b)^(1/3))+1/6/b/(a/b)^(1/6)*arctan(2*x/(a
/b)^(1/6)+3^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^6 + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.234888, size = 477, normalized size = 2.22

$$\frac{1}{3}\sqrt{3}\left(-\frac{1}{ab^5}\right)^{\frac{1}{6}}\arctan\left(\frac{\sqrt{3}ab^4\left(-\frac{1}{ab^5}\right)^{\frac{5}{6}}}{ab^4\left(-\frac{1}{ab^5}\right)^{\frac{5}{6}}+2x+2\sqrt{ab^4x\left(-\frac{1}{ab^5}\right)^{\frac{5}{6}}-ab^3\left(-\frac{1}{ab^5}\right)^{\frac{2}{3}}+x^2}}\right)+\frac{1}{3}\sqrt{3}\left(-\frac{1}{ab^5}\right)^{\frac{1}{6}}\arctan\left(-\frac{\sqrt{3}ab^4\left(-\frac{1}{ab^5}\right)^{\frac{5}{6}}}{ab^4\left(-\frac{1}{ab^5}\right)^{\frac{5}{6}}-2x-2\sqrt{-ab^4x\left(-\frac{1}{ab^5}\right)^{\frac{5}{6}}-ab^3\left(-\frac{1}{ab^5}\right)^{\frac{2}{3}}+x^2}}\right)+\frac{1}{12}\left(-\frac{1}{ab^5}\right)^{\frac{1}{6}}\log\left(ab^4x\left(-\frac{1}{ab^5}\right)^{\frac{5}{6}}-ab^3\left(-\frac{1}{ab^5}\right)^{\frac{2}{3}}+x^2\right)-\frac{1}{12}\left(-\frac{1}{ab^5}\right)^{\frac{1}{6}}\log\left(-ab^4x\left(-\frac{1}{ab^5}\right)^{\frac{5}{6}}-ab^3\left(-\frac{1}{ab^5}\right)^{\frac{2}{3}}+x^2\right)+\frac{1}{6}\left(-\frac{1}{ab^5}\right)^{\frac{1}{6}}\log\left(ab^4\left(-\frac{1}{ab^5}\right)^{\frac{5}{6}}+x\right)-\frac{1}{6}\left(-\frac{1}{ab^5}\right)^{\frac{1}{6}}\log\left(-ab^4\left(-\frac{1}{ab^5}\right)^{\frac{5}{6}}+x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^6 + a),x, algorithm="fricas")
```

```
[Out] 1/3*sqrt(3)*(-1/(a*b^5))^(1/6)*arctan(sqrt(3)*a*b^4*(-1/(a*b^5))^
(5/6)/(a*b^4*(-1/(a*b^5))^(5/6) + 2*x + 2*sqrt(a*b^4*x*(-1/(a*b^5
))^(5/6) - a*b^3*(-1/(a*b^5))^(2/3) + x^2))) + 1/3*sqrt(3)*(-1/(a
*b^5))^(1/6)*arctan(-sqrt(3)*a*b^4*(-1/(a*b^5))^(5/6)/(a*b^4*(-1/
(a*b^5))^(5/6) - 2*x - 2*sqrt(-a*b^4*x*(-1/(a*b^5))^(5/6) - a*b^3
*(-1/(a*b^5))^(2/3) + x^2))) + 1/12*(-1/(a*b^5))^(1/6)*log(a*b^4*
x*(-1/(a*b^5))^(5/6) - a*b^3*(-1/(a*b^5))^(2/3) + x^2) - 1/12*(-1
/(a*b^5))^(1/6)*log(-a*b^4*x*(-1/(a*b^5))^(5/6) - a*b^3*(-1/(a*b^
5))^(2/3) + x^2) + 1/6*(-1/(a*b^5))^(1/6)*log(a*b^4*(-1/(a*b^5))^
(5/6) + x) - 1/6*(-1/(a*b^5))^(1/6)*log(-a*b^4*(-1/(a*b^5))^(5/6)
 + x)
```

Sympy [A] time = 0.442016, size = 26, normalized size = 0.12

$$\operatorname{RootSum}\left(46656t^6ab^5+1,\ \left(t\mapsto t\log\left(7776t^5ab^4+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(b*x**6+a),x)
```

```
[Out] RootSum(46656*_t**6*a*b**5 + 1, Lambda(_t, _t*log(7776*_t**5*a*b*
*4 + x)))
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^6 + a),x, algorithm="giac")
```

```
[Out] Exception raised: NotImplementedError
```

3.1321 $\int \frac{x^3}{a+bx^6}\,dx$

Optimal. Leaf size=123

$$\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x^2+b^{2/3}x^4\right)}{12\sqrt[3]{a}b^{2/3}}-\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{6\sqrt[3]{a}b^{2/3}}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x^2}{\sqrt{3}\sqrt[3]{a}}\right)}{2\sqrt{3}\sqrt[3]{a}b^{2/3}}$$

```
[Out] -ArcTan[(a^(1/3) - 2*b^(1/3)*x^2)/(Sqrt[3]*a^(1/3))]/(2*Sqrt[3]*a
^(1/3)*b^(2/3)) - Log[a^(1/3) + b^(1/3)*x^2]/(6*a^(1/3)*b^(2/3))
+ Log[a^(2/3) - a^(1/3)*b^(1/3)*x^2 + b^(2/3)*x^4]/(12*a^(1/3)*b^
(2/3))
```

Rubi [A] time = 0.20066, antiderivative size = 123, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538

$$\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x^2+b^{2/3}x^4\right)}{12\sqrt[3]{a}b^{2/3}}-\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{6\sqrt[3]{a}b^{2/3}}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x^2}{\sqrt{3}\sqrt[3]{a}}\right)}{2\sqrt{3}\sqrt[3]{a}b^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(a + b*x^6),x]
```

```
[Out] -ArcTan[(a^(1/3) - 2*b^(1/3)*x^2)/(Sqrt[3]*a^(1/3))]/(2*Sqrt[3]*a
^(1/3)*b^(2/3)) - Log[a^(1/3) + b^(1/3)*x^2]/(6*a^(1/3)*b^(2/3))
+ Log[a^(2/3) - a^(1/3)*b^(1/3)*x^2 + b^(2/3)*x^4]/(12*a^(1/3)*b^
(2/3))
```

Rubi in Sympy [A] time = 28.6274, size = 114, normalized size = 0.93

$$-\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{6\sqrt[3]{a}b^{\frac{2}{3}}}+\frac{\log\left(a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x^2+b^{\frac{2}{3}}x^4\right)}{12\sqrt[3]{a}b^{\frac{2}{3}}}-\frac{\sqrt{3}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}-\frac{2\sqrt[3]{b}x^2}{3}\right)}{\sqrt[3]{a}}\right)}{6\sqrt[3]{a}b^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(b*x**6+a),x)
```

```
[Out] -log(a**(1/3) + b**(1/3)*x**2)/(6*a**(1/3)*b**(2/3)) + log(a**(2/
3) - a**(1/3)*b**(1/3)*x**2 + b**(2/3)*x**4)/(12*a**(1/3)*b**(2/3
)) - sqrt(3)*atan(sqrt(3)*(a**(1/3)/3 - 2*b**(1/3)*x**2/3)/a**(1/
3))/(6*a**(1/3)*b**(2/3))
```

Mathematica [A] time = 0.043845, size = 154, normalized size = 1.25

$$\frac{-2\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^2\right)+\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)+\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)-2\sqrt{3}\tan^{-1}\left(\sqrt{3}-\frac{2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)-2\sqrt{3}\,\mathrm{t}}{12\sqrt[3]{a}b^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(a + b*x^6),x]
```

```
[Out] (-2*Sqrt[3]*ArcTan[Sqrt[3] - (2*b^(1/6)*x)/a^(1/6)] - 2*Sqrt[3]*A
rcTan[Sqrt[3] + (2*b^(1/6)*x)/a^(1/6)] - 2*Log[a^(1/3) + b^(1/3)*
x^2] + Log[a^(1/3) - Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2] + L
og[a^(1/3) + Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2])/(12*a^(1/3
)*b^(2/3))
```

Maple [A] time = 0.003, size = 97, normalized size = 0.8

$$-\frac{1}{6b}\ln\left(x^2+\sqrt[3]{\frac{a}{b}}\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}+\frac{1}{12b}\ln\left(x^4-x^2\sqrt[3]{\frac{a}{b}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}+\frac{\sqrt{3}}{6b}\arctan\left(\frac{\sqrt{3}}{3}\left(2x^2\frac{1}{\sqrt[3]{\frac{a}{b}}}-1\right)\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(b*x^6+a),x)
```

```
[Out] -1/6/b/(a/b)^(1/3)*ln(x^2+(a/b)^(1/3))+1/12/b/(a/b)^(1/3)*ln(x^4-
x^2*(a/b)^(1/3)+(a/b)^(2/3))+1/6*3^(1/2)/b/(a/b)^(1/3)*arctan(1/3
*3^(1/2)*(2/(a/b)^(1/3)*x^2-1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^6 + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.22185, size = 143, normalized size = 1.16

$$-\frac{\sqrt{3}\left(\sqrt{3}\log\left(\left(-ab^2\right)^{\frac{1}{3}}bx^4+\left(-ab^2\right)^{\frac{2}{3}}x^2-ab\right)-2\sqrt{3}\log\left(\left(-ab^2\right)^{\frac{2}{3}}x^2+ab\right)+6\arctan\left(\frac{2\sqrt{3}\left(-ab^2\right)^{\frac{2}{3}}x^2-\sqrt{3}ab}{3ab}\right)\right)}{36\left(-ab^2\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^6 + a),x, algorithm="fricas")
```

```
[Out] -1/36*sqrt(3)*(sqrt(3)*log((-a*b^2)^(1/3)*b*x^4 + (-a*b^2)^(2/3)*
x^2 - a*b) - 2*sqrt(3)*log((-a*b^2)^(2/3)*x^2 + a*b) + 6*arctan(1
/3*(2*sqrt(3)*(-a*b^2)^(2/3)*x^2 - sqrt(3)*a*b)/(a*b)))/(-a*b^2)^
(1/3)
```

Sympy [A] time = 0.495707, size = 26, normalized size = 0.21

$$\operatorname{RootSum}\left(216t^3ab^2+1,\left(t\mapsto t\log\left(36t^2ab+x^2\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(b*x**6+a),x)
```

```
[Out] RootSum(216*_t**3*a*b**2 + 1, Lambda(_t, _t*log(36*_t**2*a*b + x*
*2)))
```

GIAC/XCAS [A] time = 0.230064, size = 159, normalized size = 1.29

$$-\frac{\left(-\frac{a}{b}\right)^{\frac{2}{3}}\ln\left(\left|x^2-\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right|\right)}{6\,a}-\frac{\sqrt{3}\left(-ab^2\right)^{\frac{2}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x^2+\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{a}{b}\right)^{\frac{1}{3}}}\right)}{6\,ab^2}+\frac{\left(-ab^2\right)^{\frac{2}{3}}\ln\left(x^4+x^2\left(-\frac{a}{b}\right)^{\frac{1}{3}}+\left(-\frac{a}{b}\right)^{\frac{2}{3}}\right)}{12\,ab^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^6 + a),x, algorithm="giac")
```

```
[Out] -1/6*(-a/b)^(2/3)*ln(abs(x^2 - (-a/b)^(1/3)))/a - 1/6*sqrt(3)*(-a
*b^2)^(2/3)*arctan(1/3*sqrt(3)*(2*x^2 + (-a/b)^(1/3))/(-a/b)^(1/3
))/(a*b^2) + 1/12*(-a*b^2)^(2/3)*ln(x^4 + x^2*(-a/b)^(1/3) + (-a/
b)^(2/3))/(a*b^2)
```

3.1322 $\int \frac{x^2}{a+bx^6} dx$

Optimal. Leaf size=29

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}x^3}{\sqrt{a}}\right)}{3\sqrt{a}\sqrt{b}}$$

```
[Out] ArcTan[(Sqrt[b]*x^3)/Sqrt[a]]/(3*Sqrt[a]*Sqrt[b])
```

Rubi [A] time = 0.0372156, antiderivative size = 29, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}x^3}{\sqrt{a}}\right)}{3\sqrt{a}\sqrt{b}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b*x^6),x]

[Out] ArcTan[(Sqrt[b]*x^3)/Sqrt[a]]/(3*Sqrt[a]*Sqrt[b])
```

Rubi in Sympy [A] time = 5.14479, size = 26, normalized size = 0.9

$$\frac{\operatorname{atan}\left(\frac{\sqrt{b}x^3}{\sqrt{a}}\right)}{3\sqrt{a}\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(b*x**6+a),x)

[Out] atan(sqrt(b)*x**3/sqrt(a))/(3*sqrt(a)*sqrt(b))
```

Mathematica [A] time = 0.0111824, size = 29, normalized size = 1.

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}x^3}{\sqrt{a}}\right)}{3\sqrt{a}\sqrt{b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a + b*x^6),x]

[Out] ArcTan[(Sqrt[b]*x^3)/Sqrt[a]]/(3*Sqrt[a]*Sqrt[b])
```

Maple [A] time = 0.002, size = 19, normalized size = 0.7

$$\frac{1}{3}\arctan\left(bx^3\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(b*x^6+a),x)
```

```
[Out] 1/3/(a*b)^(1/2)*arctan(x^3*b/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^6 + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.225422, size = 1, normalized size = 0.03

$$\left[\frac{\log\left(\frac{2\,abx^3+(bx^6-a)\sqrt{-ab}}{bx^6+a}\right)}{6\sqrt{-ab}},\ \frac{\arctan\left(\frac{\sqrt{ab}x^3}{a}\right)}{3\sqrt{ab}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^6 + a),x, algorithm="fricas")
```

```
[Out] [1/6*log((2*a*b*x^3 + (b*x^6 - a)*sqrt(-a*b))/(b*x^6 + a))/sqrt(-
a*b), 1/3*arctan(sqrt(a*b)*x^3/a)/sqrt(a*b)]
```

Sympy [A] time = 0.545832, size = 56, normalized size = 1.93

$$-\frac{\sqrt{-\frac{1}{ab}}\log\left(-a\sqrt{-\frac{1}{ab}}+x^3\right)}{6}+\frac{\sqrt{-\frac{1}{ab}}\log\left(a\sqrt{-\frac{1}{ab}}+x^3\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(b*x**6+a),x)
```

```
[Out] -sqrt(-1/(a*b))*log(-a*sqrt(-1/(a*b)) + x**3)/6 + sqrt(-1/(a*b))*
log(a*sqrt(-1/(a*b)) + x**3)/6
```

GIAC/XCAS [A] time = 0.224465, size = 24, normalized size = 0.83

$$\frac{\arctan\left(\frac{bx^3}{\sqrt{ab}}\right)}{3\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^6 + a),x, algorithm="giac")
```

```
[Out] 1/3*arctan(b*x^3/sqrt(a*b))/sqrt(a*b)
```

3.1323 $\int \frac{x}{a+bx^6}\,dx$

Optimal. Leaf size=123

$$-\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x^2+b^{2/3}x^4\right)}{12a^{2/3}\sqrt[3]{b}}+\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{6a^{2/3}\sqrt[3]{b}}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x^2}{\sqrt{3}\sqrt[3]{a}}\right)}{2\sqrt{3}a^{2/3}\sqrt[3]{b}}$$

```
[Out] -ArcTan[(a^(1/3) - 2*b^(1/3)*x^2)/(Sqrt[3]*a^(1/3))]/(2*Sqrt[3]*a
^(2/3)*b^(1/3)) + Log[a^(1/3) + b^(1/3)*x^2]/(6*a^(2/3)*b^(1/3))
- Log[a^(2/3) - a^(1/3)*b^(1/3)*x^2 + b^(2/3)*x^4]/(12*a^(2/3)*b^
(1/3))
```

Rubi [A] time = 0.172227, antiderivative size = 123, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.636

$$-\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x^2+b^{2/3}x^4\right)}{12a^{2/3}\sqrt[3]{b}}+\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{6a^{2/3}\sqrt[3]{b}}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x^2}{\sqrt{3}\sqrt[3]{a}}\right)}{2\sqrt{3}a^{2/3}\sqrt[3]{b}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b*x^6),x]
```

```
[Out] -ArcTan[(a^(1/3) - 2*b^(1/3)*x^2)/(Sqrt[3]*a^(1/3))]/(2*Sqrt[3]*a
^(2/3)*b^(1/3)) + Log[a^(1/3) + b^(1/3)*x^2]/(6*a^(2/3)*b^(1/3))
- Log[a^(2/3) - a^(1/3)*b^(1/3)*x^2 + b^(2/3)*x^4]/(12*a^(2/3)*b^
(1/3))
```

Rubi in Sympy [A] time = 28.4407, size = 114, normalized size = 0.93

$$\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{6a^{\frac{2}{3}}\sqrt[3]{b}}-\frac{\log\left(a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x^2+b^{\frac{2}{3}}x^4\right)}{12a^{\frac{2}{3}}\sqrt[3]{b}}-\frac{\sqrt{3}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}-\frac{2\sqrt[3]{b}x^2}{3}\right)}{\sqrt[3]{a}}\right)}{6a^{\frac{2}{3}}\sqrt[3]{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(b*x**6+a),x)
```

```
[Out] log(a**(1/3) + b**(1/3)*x**2)/(6*a**(2/3)*b**(1/3)) - log(a**(2/3
) - a**(1/3)*b**(1/3)*x**2 + b**(2/3)*x**4)/(12*a**(2/3)*b**(1/3)
) - sqrt(3)*atan(sqrt(3)*(a**(1/3)/3 - 2*b**(1/3)*x**2/3)/a**(1/3
))/(6*a**(2/3)*b**(1/3))
```

Mathematica [A] time = 0.0510894, size = 154, normalized size = 1.25

$$-\frac{-2\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^2\right)+\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)+\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)+2\sqrt{3}\tan^{-1}\left(\sqrt{3}-\frac{2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)+2\sqrt{3}}{12a^{2/3}\sqrt[3]{b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b*x^6),x]
```

```
[Out] -(2*Sqrt[3]*ArcTan[Sqrt[3] - (2*b^(1/6)*x)/a^(1/6)] + 2*Sqrt[3]*A
rcTan[Sqrt[3] + (2*b^(1/6)*x)/a^(1/6)] - 2*Log[a^(1/3) + b^(1/3)*
x^2] + Log[a^(1/3) - Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2] + L
og[a^(1/3) + Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2])/(12*a^(2/3
)*b^(1/3))
```

Maple [A] time = 0.002, size = 97, normalized size = 0.8

$$\frac{1}{6\,b}\ln\left(x^{2}+\sqrt[3]{\frac{a}{b}}\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}-\frac{1}{12\,b}\ln\left(x^{4}-x^{2}\sqrt[3]{\frac{a}{b}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}+\frac{\sqrt{3}}{6\,b}\arctan\left(\frac{\sqrt{3}}{3}\left(2\,x^{2}\frac{1}{\sqrt[3]{\frac{a}{b}}}-1\right)\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(b*x^6+a),x)
```

```
[Out] 1/6/b/(a/b)^(2/3)*ln(x^2+(a/b)^(1/3))-1/12/b/(a/b)^(2/3)*ln(x^4-x
^2*(a/b)^(1/3)+(a/b)^(2/3))+1/6/b/(a/b)^(2/3)*3^(1/2)*arctan(1/3*
3^(1/2)*(2/(a/b)^(1/3)*x^2-1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^6 + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.224558, size = 128, normalized size = 1.04

$$-\frac{\sqrt{3}\left(\sqrt{3}\log\left(\left(a^{2}b\right)^{\frac{2}{3}}x^{4}-\left(a^{2}b\right)^{\frac{1}{3}}ax^{2}+a^{2}\right)-2\,\sqrt{3}\log\left(\left(a^{2}b\right)^{\frac{1}{3}}x^{2}+a\right)-6\,\arctan\left(\frac{2\,\sqrt{3}\left(a^{2}b\right)^{\frac{1}{3}}x^{2}-\sqrt{3}a}{3\,a}\right)\right)}{36\,\left(a^{2}b\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^6 + a),x, algorithm="fricas")
```

```
[Out] -1/36*sqrt(3)*(sqrt(3)*log((a^2*b)^(2/3)*x^4 - (a^2*b)^(1/3)*a*x^
2 + a^2) - 2*sqrt(3)*log((a^2*b)^(1/3)*x^2 + a) - 6*arctan(1/3*(2
*sqrt(3)*(a^2*b)^(1/3)*x^2 - sqrt(3)*a)/a))/(a^2*b)^(1/3)
```

Sympy [A] time = 0.496687, size = 22, normalized size = 0.18

$$\operatorname{RootSum}\left(216t^{3}a^{2}b-1,\left(t\mapsto t\log\left(6ta+x^{2}\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x**6+a),x)
```

```
[Out] RootSum(216*_t**3*a**2*b - 1, Lambda(_t, _t*log(6*_t*a + x**2)))
```

GIAC/XCAS [A] time = 0.229002, size = 159, normalized size = 1.29

$$-\frac{\left(-\frac{a}{b}\right)^{\frac{1}{3}}\ln\left(\left|x^2-\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right|\right)}{6\,a}+\frac{\sqrt{3}\left(-ab^2\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x^2+\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{a}{b}\right)^{\frac{1}{3}}}\right)}{6\,ab}+\frac{\left(-ab^2\right)^{\frac{1}{3}}\ln\left(x^4+x^2\left(-\frac{a}{b}\right)^{\frac{1}{3}}+\left(-\frac{a}{b}\right)^{\frac{2}{3}}\right)}{12\,ab}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^6 + a),x, algorithm="giac")
```

```
[Out] -1/6*(-a/b)^(1/3)*ln(abs(x^2 - (-a/b)^(1/3)))/a + 1/6*sqrt(3)*(-a
*b^2)^(1/3)*arctan(1/3*sqrt(3)*(2*x^2 + (-a/b)^(1/3))/(-a/b)^(1/3
))/(a*b) + 1/12*(-a*b^2)^(1/3)*ln(x^4 + x^2*(-a/b)^(1/3) + (-a/b)
^(2/3))/(a*b)
```

3.1324 $\int \frac{1}{a+bx^6}\,dx$

Optimal. Leaf size=215

$$-\frac{\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{4\sqrt{3}a^{5/6}\sqrt[6]{b}}+\frac{\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{4\sqrt{3}a^{5/6}\sqrt[6]{b}}+\frac{\tan^{-1}\left(\frac{\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{3a^{5/6}\sqrt[6]{b}}-\frac{\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{a}-2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{6a^{5/6}\sqrt[6]{b}}+\frac{\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{a}+2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{6a^{5/6}\sqrt[6]{b}}$$

```
[Out] ArcTan[(b^(1/6)*x)/a^(1/6)]/(3*a^(5/6)*b^(1/6)) - ArcTan[(Sqrt[3]
*a^(1/6) - 2*b^(1/6)*x)/a^(1/6)]/(6*a^(5/6)*b^(1/6)) + ArcTan[(Sq
rt[3]*a^(1/6) + 2*b^(1/6)*x)/a^(1/6)]/(6*a^(5/6)*b^(1/6)) - Log[a
^(1/3) - Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2]/(4*Sqrt[3]*a^(5
/6)*b^(1/6)) + Log[a^(1/3) + Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*
x^2]/(4*Sqrt[3]*a^(5/6)*b^(1/6))
```

Rubi [A] time = 0.806408, antiderivative size = 215, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 6, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667

$$-\frac{\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{4\sqrt{3}a^{5/6}\sqrt[6]{b}}+\frac{\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{4\sqrt{3}a^{5/6}\sqrt[6]{b}}+\frac{\tan^{-1}\left(\frac{\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{3a^{5/6}\sqrt[6]{b}}-\frac{\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{a}-2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{6a^{5/6}\sqrt[6]{b}}+\frac{\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{a}+2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{6a^{5/6}\sqrt[6]{b}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^6)^(-1),x]
```

```
[Out] ArcTan[(b^(1/6)*x)/a^(1/6)]/(3*a^(5/6)*b^(1/6)) - ArcTan[(Sqrt[3]
*a^(1/6) - 2*b^(1/6)*x)/a^(1/6)]/(6*a^(5/6)*b^(1/6)) + ArcTan[(Sq
rt[3]*a^(1/6) + 2*b^(1/6)*x)/a^(1/6)]/(6*a^(5/6)*b^(1/6)) - Log[a
^(1/3) - Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2]/(4*Sqrt[3]*a^(5
/6)*b^(1/6)) + Log[a^(1/3) + Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*
x^2]/(4*Sqrt[3]*a^(5/6)*b^(1/6))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**6+a),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.0347063, size = 154, normalized size = 0.72

$$\frac{-\sqrt{3}\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)+\sqrt{3}\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)+4\tan^{-1}\left(\frac{\sqrt[6]{b}x}{\sqrt[6]{a}}\right)-2\tan^{-1}\left(\sqrt{3}-\frac{2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)+2\tan}{12a^{5/6}\sqrt[6]{b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^6)^(-1),x]
```

```
[Out] (4*ArcTan[(b^(1/6)*x)/a^(1/6)] - 2*ArcTan[Sqrt[3] - (2*b^(1/6)*x)
/a^(1/6)] + 2*ArcTan[Sqrt[3] + (2*b^(1/6)*x)/a^(1/6)] - Sqrt[3]*L
og[a^(1/3) - Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2] + Sqrt[3]*L
og[a^(1/3) + Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2])/(12*a^(5/6
)*b^(1/6))
```

Maple [A] time = 0.041, size = 162, normalized size = 0.8

$$\frac{1}{3a}\sqrt[6]{\frac{a}{b}}\arctan\left(x\frac{1}{\sqrt[6]{\frac{a}{b}}}\right)-\frac{\sqrt{3}}{12a}\sqrt[6]{\frac{a}{b}}\ln\left(\sqrt{3}\sqrt[6]{\frac{a}{b}}x-x^2-\sqrt[3]{\frac{a}{b}}\right)+\frac{1}{6a}\sqrt[6]{\frac{a}{b}}\arctan\left(-\sqrt{3}+2x\frac{1}{\sqrt[6]{\frac{a}{b}}}\right)+\frac{\sqrt{3}}{12a}\sqrt[6]{\frac{a}{b}}\ln\left(x^2+\sqrt{3}\sqrt[6]{\frac{a}{b}}x+\sqrt[3]{\frac{a}{b}}\right)+\frac{1}{6a}\sqrt[6]{\frac{a}{b}}\arctan\left(2x\frac{1}{\sqrt[6]{\frac{a}{b}}}+\sqrt{3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^6+a),x)
```

```
[Out] 1/3/a*(a/b)^(1/6)*arctan(x/(a/b)^(1/6))-1/12/a*3^(1/2)*(a/b)^(1/6
)*ln(3^(1/2)*(a/b)^(1/6)*x-x^2-(a/b)^(1/3))+1/6/a*(a/b)^(1/6)*arc
tan(-3^(1/2)+2*x/(a/b)^(1/6))+1/12/a*3^(1/2)*(a/b)^(1/6)*ln(x^2+3
^(1/2)*(a/b)^(1/6)*x+(a/b)^(1/3))+1/6/a*(a/b)^(1/6)*arctan(2*x/(a
/b)^(1/6)+3^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x^6 + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.232715, size = 425, normalized size = 1.98

$$-\frac{1}{3}\sqrt{3}\left(-\frac{1}{a^5b}\right)^{\frac{1}{6}}\arctan\left(\frac{\sqrt{3}a\left(-\frac{1}{a^5b}\right)^{\frac{1}{6}}}{a\left(-\frac{1}{a^5b}\right)^{\frac{1}{6}}+2x+2\sqrt{a^2\left(-\frac{1}{a^5b}\right)^{\frac{1}{3}}+ax\left(-\frac{1}{a^5b}\right)^{\frac{1}{6}}+x^2}}\right)-\frac{1}{3}\sqrt{3}\left(-\frac{1}{a^5b}\right)^{\frac{1}{6}}\arctan\left(-\frac{\sqrt{3}a\left(-\frac{1}{a^5b}\right)^{\frac{1}{6}}}{a\left(-\frac{1}{a^5b}\right)^{\frac{1}{6}}-2x-2\sqrt{a^2\left(-\frac{1}{a^5b}\right)^{\frac{1}{3}}-ax\left(-\frac{1}{a^5b}\right)^{\frac{1}{6}}+x^2}}\right)+\frac{1}{12}\left(-\frac{1}{a^5b}\right)^{\frac{1}{6}}\log\left(a^2\left(-\frac{1}{a^5b}\right)^{\frac{1}{3}}+ax\left(-\frac{1}{a^5b}\right)^{\frac{1}{6}}+x^2\right)-\frac{1}{12}\left(-\frac{1}{a^5b}\right)^{\frac{1}{6}}\log\left(a^2\left(-\frac{1}{a^5b}\right)^{\frac{1}{3}}-ax\left(-\frac{1}{a^5b}\right)^{\frac{1}{6}}+x^2\right)+\frac{1}{6}\left(-\frac{1}{a^5b}\right)^{\frac{1}{6}}\log\left(a\left(-\frac{1}{a^5b}\right)^{\frac{1}{6}}+x\right)-\frac{1}{6}\left(-\frac{1}{a^5b}\right)^{\frac{1}{6}}\log\left(-a\left(-\frac{1}{a^5b}\right)^{\frac{1}{6}}+x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x^6 + a),x, algorithm="fricas")
```

```
[Out] -1/3*sqrt(3)*(-1/(a^5*b))^(1/6)*arctan(sqrt(3)*a*(-1/(a^5*b))^(1/
6)/(a*(-1/(a^5*b))^(1/6) + 2*x + 2*sqrt(a^2*(-1/(a^5*b))^(1/3) +
a*x*(-1/(a^5*b))^(1/6) + x^2))) - 1/3*sqrt(3)*(-1/(a^5*b))^(1/6)*
arctan(-sqrt(3)*a*(-1/(a^5*b))^(1/6)/(a*(-1/(a^5*b))^(1/6) - 2*x
- 2*sqrt(a^2*(-1/(a^5*b))^(1/3) - a*x*(-1/(a^5*b))^(1/6) + x^2)))
 + 1/12*(-1/(a^5*b))^(1/6)*log(a^2*(-1/(a^5*b))^(1/3) + a*x*(-1/(
a^5*b))^(1/6) + x^2) - 1/12*(-1/(a^5*b))^(1/6)*log(a^2*(-1/(a^5*b
))^(1/3) - a*x*(-1/(a^5*b))^(1/6) + x^2) + 1/6*(-1/(a^5*b))^(1/6)
*log(a*(-1/(a^5*b))^(1/6) + x) - 1/6*(-1/(a^5*b))^(1/6)*log(-a*(-
1/(a^5*b))^(1/6) + x)
```

Sympy [A] time = 0.430496, size = 20, normalized size = 0.09

$$\operatorname{RootSum}\left(46656t^6a^5b + 1, \left(t \mapsto t\log\left(6ta + x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**6+a),x)
```

```
[Out] RootSum(46656*_t**6*a**5*b + 1, Lambda(_t, _t*log(6*_t*a + x)))
```

GIAC/XCAS [A] time = 0.222479, size = 257, normalized size = 1.2

$$\frac{\sqrt{3}\left(ab^5\right)^{\frac{1}{6}}\ln\left(x^2+\sqrt{3}x\left(\frac{a}{b}\right)^{\frac{1}{6}}+\left(\frac{a}{b}\right)^{\frac{1}{3}}\right)}{12\,ab}-\frac{\sqrt{3}\left(ab^5\right)^{\frac{1}{6}}\ln\left(x^2-\sqrt{3}x\left(\frac{a}{b}\right)^{\frac{1}{6}}+\left(\frac{a}{b}\right)^{\frac{1}{3}}\right)}{12\,ab}+\frac{\left(ab^5\right)^{\frac{1}{6}}\arctan\left(\frac{2\,x+\sqrt{3}\left(\frac{a}{b}\right)^{\frac{1}{6}}}{\left(\frac{a}{b}\right)^{\frac{1}{6}}}\right)}{6\,ab}+\frac{\left(ab^5\right)^{\frac{1}{6}}\arctan\left(\frac{2\,x-\sqrt{3}\left(\frac{a}{b}\right)^{\frac{1}{6}}}{\left(\frac{a}{b}\right)^{\frac{1}{6}}}\right)}{6\,ab}+\frac{\left(ab^5\right)^{\frac{1}{6}}\arctan\left(\frac{x}{\left(\frac{a}{b}\right)^{\frac{1}{6}}}\right)}{3\,ab}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x^6 + a),x, algorithm="giac")
```

```
[Out] 1/12*sqrt(3)*(a*b^5)^(1/6)*ln(x^2 + sqrt(3)*x*(a/b)^(1/6) + (a/b)
^(1/3))/(a*b) - 1/12*sqrt(3)*(a*b^5)^(1/6)*ln(x^2 - sqrt(3)*x*(a/
b)^(1/6) + (a/b)^(1/3))/(a*b) + 1/6*(a*b^5)^(1/6)*arctan((2*x + s
qrt(3)*(a/b)^(1/6))/(a/b)^(1/6))/(a*b) + 1/6*(a*b^5)^(1/6)*arctan
((2*x - sqrt(3)*(a/b)^(1/6))/(a/b)^(1/6))/(a*b) + 1/3*(a*b^5)^(1/
6)*arctan(x/(a/b)^(1/6))/(a*b)
```

3.1325 $\int \frac{1}{x(a+bx^6)}\,dx$

Optimal. Leaf size=22

$$\frac{\log(x)}{a}-\frac{\log\left(a+bx^6\right)}{6a}$$

```
[Out] Log[x]/a - Log[a + b*x^6]/(6*a)
```

Rubi [A] time = 0.0331682, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{\log(x)}{a}-\frac{\log\left(a+bx^6\right)}{6a}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a + b*x^6)),x]

[Out] Log[x]/a - Log[a + b*x^6]/(6*a)
```

Rubi in Sympy [A] time = 5.79293, size = 19, normalized size = 0.86

$$\frac{\log\left(x^6\right)}{6a}-\frac{\log\left(a+bx^6\right)}{6a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(b*x**6+a),x)

[Out] log(x**6)/(6*a) - log(a + b*x**6)/(6*a)
```

Mathematica [A] time = 0.0108346, size = 22, normalized size = 1.

$$\frac{\log(x)}{a}-\frac{\log\left(a+bx^6\right)}{6a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a + b*x^6)),x]

[Out] Log[x]/a - Log[a + b*x^6]/(6*a)
```

Maple [A] time = 0.006, size = 21, normalized size = 1.

$$\frac{\ln(x)}{a}-\frac{\ln\left(bx^6+a\right)}{6\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(b*x^6+a),x)

[Out] ln(x)/a-1/6*ln(b*x^6+a)/a
```

Maxima [A] time = 1.44255, size = 31, normalized size = 1.41

$$-\frac{\log\left(bx^6+a\right)}{6\,a}+\frac{\log\left(x^6\right)}{6\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^6 + a)*x),x, algorithm="maxima")
```

```
[Out] -1/6*log(b*x^6 + a)/a + 1/6*log(x^6)/a
```

Fricas [A] time = 0.218683, size = 24, normalized size = 1.09

$$-\frac{\log\left(bx^6+a\right)-6\,\log\left(x\right)}{6\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^6 + a)*x),x, algorithm="fricas")
```

```
[Out] -1/6*(log(b*x^6 + a) - 6*log(x))/a
```

Sympy [A] time = 0.856905, size = 15, normalized size = 0.68

$$\frac{\log\left(x\right)}{a}-\frac{\log\left(\frac{a}{b}+x^6\right)}{6a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(b*x**6+a),x)
```

```
[Out] log(x)/a - log(a/b + x**6)/(6*a)
```

GIAC/XCAS [A] time = 0.220296, size = 32, normalized size = 1.45

$$\frac{\ln\left(x^6\right)}{6\,a}-\frac{\ln\left(\left|bx^6+a\right|\right)}{6\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^6 + a)*x),x, algorithm="giac")
```

```
[Out] 1/6*ln(x^6)/a - 1/6*ln(abs(b*x^6 + a))/a
```

3.1326 $\int \frac{1}{x^2(a+bx^6)}\,dx$

Optimal. Leaf size=223

$$-\frac{\sqrt[6]{b}\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{4\sqrt{3}a^{7/6}}+\frac{\sqrt[6]{b}\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{4\sqrt{3}a^{7/6}}-\frac{\sqrt[6]{b}\tan^{-1}\left(\frac{\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{3a^{7/6}}+\frac{\sqrt[6]{b}\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{a}-2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{6a^{7/6}}-\frac{\sqrt[6]{b}\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{a}+2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{6a^{7/6}}-\frac{1}{ax}$$

```
[Out] -(1/(a*x)) - (b^(1/6)*ArcTan[(b^(1/6)*x)/a^(1/6)])/(3*a^(7/6)) +
(b^(1/6)*ArcTan[(Sqrt[3]*a^(1/6) - 2*b^(1/6)*x)/a^(1/6)])/(6*a^(7
/6)) - (b^(1/6)*ArcTan[(Sqrt[3]*a^(1/6) + 2*b^(1/6)*x)/a^(1/6)])/
(6*a^(7/6)) - (b^(1/6)*Log[a^(1/3) - Sqrt[3]*a^(1/6)*b^(1/6)*x +
b^(1/3)*x^2])/(4*Sqrt[3]*a^(7/6)) + (b^(1/6)*Log[a^(1/3) + Sqrt[3
]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2])/(4*Sqrt[3]*a^(7/6))
```

Rubi [A] time = 1.07774, antiderivative size = 223, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.538$

$$-\frac{\sqrt[6]{b}\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{4\sqrt{3}a^{7/6}}+\frac{\sqrt[6]{b}\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{4\sqrt{3}a^{7/6}}-\frac{\sqrt[6]{b}\tan^{-1}\left(\frac{\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{3a^{7/6}}+\frac{\sqrt[6]{b}\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{a}-2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{6a^{7/6}}-\frac{\sqrt[6]{b}\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{a}+2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{6a^{7/6}}-\frac{1}{ax}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(a + b*x^6)),x]
```

```
[Out] -(1/(a*x)) - (b^(1/6)*ArcTan[(b^(1/6)*x)/a^(1/6)])/(3*a^(7/6)) +
(b^(1/6)*ArcTan[(Sqrt[3]*a^(1/6) - 2*b^(1/6)*x)/a^(1/6)])/(6*a^(7
/6)) - (b^(1/6)*ArcTan[(Sqrt[3]*a^(1/6) + 2*b^(1/6)*x)/a^(1/6)])/
(6*a^(7/6)) - (b^(1/6)*Log[a^(1/3) - Sqrt[3]*a^(1/6)*b^(1/6)*x +
b^(1/3)*x^2])/(4*Sqrt[3]*a^(7/6)) + (b^(1/6)*Log[a^(1/3) + Sqrt[3
]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2])/(4*Sqrt[3]*a^(7/6))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(b*x**6+a),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.0892535, size = 189, normalized size = 0.85

$$-\frac{\sqrt{3}\sqrt[6]{b}x\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)-\sqrt{3}\sqrt[6]{b}x\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)+4\sqrt[6]{b}x\tan^{-1}\left(\frac{\sqrt[6]{b}x}{\sqrt[6]{a}}\right)-2\sqrt[6]{b}x\tan^{-1}\left(\sqrt{3}\right.}{12a^{7/6}x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*(a + b*x^6)),x]
```

```
[Out] -(12*a^(1/6) + 4*b^(1/6)*x*ArcTan[(b^(1/6)*x)/a^(1/6)] - 2*b^(1/6
)*x*ArcTan[Sqrt[3] - (2*b^(1/6)*x)/a^(1/6)] + 2*b^(1/6)*x*ArcTan[
Sqrt[3] + (2*b^(1/6)*x)/a^(1/6)] + Sqrt[3]*b^(1/6)*x*Log[a^(1/3)
- Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2] - Sqrt[3]*b^(1/6)*x*Lo
g[a^(1/3) + Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2])/(12*a^(7/6)
*x)
```

Maple [A] time = 0.042, size = 172, normalized size = 0.8

$$-\frac{1}{3a}\arctan\left(x\frac{1}{\sqrt[6]{\frac{a}{b}}}\right)\frac{1}{\sqrt[6]{\frac{a}{b}}}-\frac{b\sqrt{3}}{12a^2}\left(\frac{a}{b}\right)^{\frac{5}{6}}\ln\left(\sqrt{3}\sqrt[6]{\frac{a}{b}}x-x^2-\sqrt[3]{\frac{a}{b}}\right)$$
$$-\frac{1}{6a}\arctan\left(-\sqrt{3}+2x\frac{1}{\sqrt[6]{\frac{a}{b}}}\right)\frac{1}{\sqrt[6]{\frac{a}{b}}}+\frac{b\sqrt{3}}{12a^2}\left(\frac{a}{b}\right)^{\frac{5}{6}}\ln\left(x^2+\sqrt{3}\sqrt[6]{\frac{a}{b}}x+\sqrt[3]{\frac{a}{b}}\right)$$
$$-\frac{1}{6a}\arctan\left(2x\frac{1}{\sqrt[6]{\frac{a}{b}}}+\sqrt{3}\right)\frac{1}{\sqrt[6]{\frac{a}{b}}}-\frac{1}{ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(b*x^6+a),x)
```

```
[Out] -1/3/a/(a/b)^(1/6)*arctan(x/(a/b)^(1/6))-1/12*b/a^2*3^(1/2)*(a/b)
^(5/6)*ln(3^(1/2)*(a/b)^(1/6)*x-x^2-(a/b)^(1/3))-1/6/a/(a/b)^(1/6
)*arctan(-3^(1/2)+2*x/(a/b)^(1/6))+1/12*b/a^2*3^(1/2)*(a/b)^(5/6)
*ln(x^2+3^(1/2)*(a/b)^(1/6)*x+(a/b)^(1/3))-1/6/a/(a/b)^(1/6)*arct
an(2*x/(a/b)^(1/6)+3^(1/2))-1/a/x
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^6 + a)*x^2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.238735, size = 463, normalized size = 2.08

$$-\frac{4\sqrt{3}ax\left(-\frac{b}{a^7}\right)^{\frac{1}{6}}\arctan\left(\frac{\sqrt{3}a^6\left(-\frac{b}{a^7}\right)^{\frac{5}{6}}}{a^6\left(-\frac{b}{a^7}\right)^{\frac{5}{6}}+2bx+2b\sqrt{\frac{a^6x\left(-\frac{b}{a^7}\right)^{\frac{5}{6}}-a^5\left(-\frac{b}{a^7}\right)^{\frac{2}{3}}+bx^2}{b}}}\right)+4\sqrt{3}ax\left(-\frac{b}{a^7}\right)^{\frac{1}{6}}\arctan\left(-\frac{\sqrt{3}a^6\left(-\frac{b}{a^7}\right)^{\frac{5}{6}}}{a^6\left(-\frac{b}{a^7}\right)^{\frac{5}{6}}-2bx-2b\sqrt{-\frac{a^6x\left(-\frac{b}{a^7}\right)}{}}}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^6 + a)*x^2),x, algorithm="fricas")
```

```
[Out] -1/12*(4*sqrt(3)*a*x*(-b/a^7)^(1/6)*arctan(sqrt(3)*a^6*(-b/a^7)^(
5/6)/(a^6*(-b/a^7)^(5/6) + 2*b*x + 2*b*sqrt((a^6*x*(-b/a^7)^(5/6)
 - a^5*(-b/a^7)^(2/3) + b*x^2)/b))) + 4*sqrt(3)*a*x*(-b/a^7)^(1/6
```

```
)*arctan(-sqrt(3)*a^6*(-b/a^7)^(5/6)/(a^6*(-b/a^7)^(5/6) - 2*b*x
- 2*b*sqrt(-(a^6*x*(-b/a^7)^(5/6) + a^5*(-b/a^7)^(2/3) - b*x^2)/b
))) + a*x*(-b/a^7)^(1/6)*log(a^6*x*(-b/a^7)^(5/6) - a^5*(-b/a^7)^
(2/3) + b*x^2) - a*x*(-b/a^7)^(1/6)*log(-a^6*x*(-b/a^7)^(5/6) - a
^5*(-b/a^7)^(2/3) + b*x^2) + 2*a*x*(-b/a^7)^(1/6)*log(a^6*(-b/a^7
)^(5/6) + b*x) - 2*a*x*(-b/a^7)^(1/6)*log(-a^6*(-b/a^7)^(5/6) + b
*x) + 12)/(a*x)
```

Sympy [A] time = 1.52605, size = 29, normalized size = 0.13

$$\operatorname{RootSum}\left(46656t^6a^7 + b, \left(t \mapsto t\log\left(-\frac{7776t^5a^6}{b} + x\right)\right)\right) - \frac{1}{ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(b*x**6+a),x)
```

```
[Out] RootSum(46656*_t**6*a**7 + b, Lambda(_t, _t*log(-7776*_t**5*a**6/
b + x))) - 1/(a*x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^6 + a)*x^2),x, algorithm="giac")
```

```
[Out] Exception raised: NotImplementedError
```

3.1327 $\int \frac{1}{x^3(a+bx^6)}\,dx$

Optimal. Leaf size=133

$$-\frac{\sqrt[3]{b}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x^2+b^{2/3}x^4\right)}{12a^{4/3}}+\frac{\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{6a^{4/3}}+\frac{\sqrt[3]{b}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x^2}{\sqrt{3}\sqrt[3]{a}}\right)}{2\sqrt{3}a^{4/3}}-\frac{1}{2ax^2}$$

```
[Out] -1/(2*a*x^2) + (b^(1/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*x^2)/(Sqrt[3]
*a^(1/3))])/(2*Sqrt[3]*a^(4/3)) + (b^(1/3)*Log[a^(1/3) + b^(1/3)*
x^2])/(6*a^(4/3)) - (b^(1/3)*Log[a^(2/3) - a^(1/3)*b^(1/3)*x^2 +
b^(2/3)*x^4])/(12*a^(4/3))
```

Rubi [A] time = 0.22321, antiderivative size = 133, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615

$$-\frac{\sqrt[3]{b}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x^2+b^{2/3}x^4\right)}{12a^{4/3}}+\frac{\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{6a^{4/3}}+\frac{\sqrt[3]{b}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x^2}{\sqrt{3}\sqrt[3]{a}}\right)}{2\sqrt{3}a^{4/3}}-\frac{1}{2ax^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(a + b*x^6)),x]
```

```
[Out] -1/(2*a*x^2) + (b^(1/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*x^2)/(Sqrt[3]
*a^(1/3))])/(2*Sqrt[3]*a^(4/3)) + (b^(1/3)*Log[a^(1/3) + b^(1/3)*
x^2])/(6*a^(4/3)) - (b^(1/3)*Log[a^(2/3) - a^(1/3)*b^(1/3)*x^2 +
b^(2/3)*x^4])/(12*a^(4/3))
```

Rubi in Sympy [A] time = 34.0088, size = 122, normalized size = 0.92

$$-\frac{1}{2ax^2}+\frac{\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{6a^{\frac{4}{3}}}-\frac{\sqrt[3]{b}\log\left(a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x^2+b^{\frac{2}{3}}x^4\right)}{12a^{\frac{4}{3}}}+\frac{\sqrt{3}\sqrt[3]{b}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}-\frac{2\sqrt[3]{b}x^2}{3}\right)}{\sqrt[3]{a}}\right)}{6a^{\frac{4}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(b*x**6+a),x)
```

```
[Out] -1/(2*a*x**2) + b**(1/3)*log(a**(1/3) + b**(1/3)*x**2)/(6*a**(4/3
)) - b**(1/3)*log(a**(2/3) - a**(1/3)*b**(1/3)*x**2 + b**(2/3)*x*
*4)/(12*a**(4/3)) + sqrt(3)*b**(1/3)*atan(sqrt(3)*(a**(1/3)/3 - 2
*b**(1/3)*x**2/3)/a**(1/3))/(6*a**(4/3))
```

Mathematica [A] time = 0.0640942, size = 203, normalized size = 1.53

$$\frac{2\sqrt[3]{b}x^2\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^2\right)-\sqrt[3]{b}x^2\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)-\sqrt[3]{b}x^2\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)+2\sqrt{3}\sqrt[3]{b}x^2\tan^{-1}\left(\cdots\right.}{12a^{4/3}x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*(a + b*x^6)),x]
```

```
[Out] (-6*a^(1/3) + 2*Sqrt[3]*b^(1/3)*x^2*ArcTan[Sqrt[3] - (2*b^(1/6)*x
)/a^(1/6)] + 2*Sqrt[3]*b^(1/3)*x^2*ArcTan[Sqrt[3] + (2*b^(1/6)*x)
/a^(1/6)] + 2*b^(1/3)*x^2*Log[a^(1/3) + b^(1/3)*x^2] - b^(1/3)*x^
2*Log[a^(1/3) - Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2] - b^(1/3
)*x^2*Log[a^(1/3) + Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2])/(12
*a^(4/3)*x^2)
```

Maple [A] time = 0.007, size = 105, normalized size = 0.8

$$\frac{1}{6a}\ln\left(x^2+\sqrt[3]{\frac{a}{b}}\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}-\frac{1}{12a}\ln\left(x^4-x^2\sqrt[3]{\frac{a}{b}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}-\frac{\sqrt{3}}{6a}\arctan\left(\frac{\sqrt{3}}{3}\left(2x^2\frac{1}{\sqrt[3]{\frac{a}{b}}}-1\right)\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}-\frac{1}{2ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(b*x^6+a),x)
```

```
[Out] 1/6/a/(a/b)^(1/3)*ln(x^2+(a/b)^(1/3))-1/12/a/(a/b)^(1/3)*ln(x^4-x
^2*(a/b)^(1/3)+(a/b)^(2/3))-1/6/a*3^(1/2)/(a/b)^(1/3)*arctan(1/3*
3^(1/2)*(2/(a/b)^(1/3)*x^2-1))-1/2/a/x^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^6 + a)*x^3),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.221367, size = 188, normalized size = 1.41

$$-\frac{\sqrt{3}\left(\sqrt{3}x^2\left(\frac{b}{a}\right)^{\frac{1}{3}}\log\left(bx^4-ax^2\left(\frac{b}{a}\right)^{\frac{2}{3}}+a\left(\frac{b}{a}\right)^{\frac{1}{3}}\right)-2\sqrt{3}x^2\left(\frac{b}{a}\right)^{\frac{1}{3}}\log\left(bx^2+a\left(\frac{b}{a}\right)^{\frac{2}{3}}\right)-6x^2\left(\frac{b}{a}\right)^{\frac{1}{3}}\arctan\left(-\frac{2\sqrt{3}bx^2-\sqrt{3}a\left(\frac{b}{a}\right)^{\frac{2}{3}}}{3a\left(\frac{b}{a}\right)^{\frac{2}{3}}}\right)+6\sqrt{3}\right)}{36ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^6 + a)*x^3),x, algorithm="fricas")
```

```
[Out] -1/36*sqrt(3)*(sqrt(3)*x^2*(b/a)^(1/3)*log(b*x^4 - a*x^2*(b/a)^(2
/3) + a*(b/a)^(1/3)) - 2*sqrt(3)*x^2*(b/a)^(1/3)*log(b*x^2 + a*(b
/a)^(2/3)) - 6*x^2*(b/a)^(1/3)*arctan(-1/3*(2*sqrt(3)*b*x^2 - sqr
t(3)*a*(b/a)^(2/3))/(a*(b/a)^(2/3))) + 6*sqrt(3))/(a*x^2)
```

Sympy [A] time = 1.72441, size = 34, normalized size = 0.26

$$\operatorname{RootSum}\left(216t^3a^4-b,\left(t\mapsto t\log\left(\frac{36t^2a^3}{b}+x^2\right)\right)\right)-\frac{1}{2ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(b*x**6+a),x)
```

```
[Out] RootSum(216*_t**3*a**4 - b, Lambda(_t, _t*log(36*_t**2*a**3/b + x
**2))) - 1/(2*a*x**2)
```

GIAC/XCAS [A] time = 0.225764, size = 171, normalized size = 1.29

$$\frac{b\left(-\frac{a}{b}\right)^{\frac{2}{3}}\ln\left(\left|x^2-\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right|\right)}{6\,a^2}+\frac{\sqrt{3}\left(-ab^2\right)^{\frac{2}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x^2+\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{a}{b}\right)^{\frac{1}{3}}}\right)}{6\,a^2b}-\frac{\left(-ab^2\right)^{\frac{2}{3}}\ln\left(x^4+x^2\left(-\frac{a}{b}\right)^{\frac{1}{3}}+\left(-\frac{a}{b}\right)^{\frac{2}{3}}\right)}{12\,a^2b}-\frac{1}{2\,ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^6 + a)*x^3),x, algorithm="giac")
```

```
[Out] 1/6*b*(-a/b)^(2/3)*ln(abs(x^2 - (-a/b)^(1/3)))/a^2 + 1/6*sqrt(3)*
(-a*b^2)^(2/3)*arctan(1/3*sqrt(3)*(2*x^2 + (-a/b)^(1/3))/(-a/b)^(
1/3))/(a^2*b) - 1/12*(-a*b^2)^(2/3)*ln(x^4 + x^2*(-a/b)^(1/3) + (
-a/b)^(2/3))/(a^2*b) - 1/2/(a*x^2)
```

3.1328 $\int \frac{1}{x^4(a+bx^6)}\,dx$

Optimal. Leaf size=40

$$-\frac{\sqrt{b}\tan^{-1}\left(\frac{\sqrt{b}x^3}{\sqrt{a}}\right)}{3a^{3/2}}-\frac{1}{3ax^3}$$

```
[Out] -1/(3*a*x^3) - (Sqrt[b]*ArcTan[(Sqrt[b]*x^3)/Sqrt[a]])/(3*a^(3/2)
)
```

Rubi [A] time = 0.0540656, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{\sqrt{b}\tan^{-1}\left(\frac{\sqrt{b}x^3}{\sqrt{a}}\right)}{3a^{3/2}}-\frac{1}{3ax^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*(a + b*x^6)),x]
```

```
[Out] -1/(3*a*x^3) - (Sqrt[b]*ArcTan[(Sqrt[b]*x^3)/Sqrt[a]])/(3*a^(3/2)
)
```

Rubi in Sympy [A] time = 8.8729, size = 36, normalized size = 0.9

$$-\frac{1}{3ax^3}-\frac{\sqrt{b}\,\mathrm{atan}\left(\frac{\sqrt{b}x^3}{\sqrt{a}}\right)}{3a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(b*x**6+a),x)
```

```
[Out] -1/(3*a*x**3) - sqrt(b)*atan(sqrt(b)*x**3/sqrt(a))/(3*a**(3/2))
```

Mathematica [B] time = 0.0453729, size = 101, normalized size = 2.52

$$\frac{\sqrt{b}x^3\tan^{-1}\left(\frac{\sqrt[6]{b}x}{\sqrt[6]{a}}\right)+\sqrt{b}x^3\tan^{-1}\left(\sqrt{3}-\frac{2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)-\sqrt{b}x^3\tan^{-1}\left(\frac{2\sqrt[6]{b}x}{\sqrt[6]{a}}+\sqrt{3}\right)-\sqrt{a}}{3a^{3/2}x^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*(a + b*x^6)),x]
```

```
[Out] (-Sqrt[a] + Sqrt[b]*x^3*ArcTan[(b^(1/6)*x)/a^(1/6)] + Sqrt[b]*x^3
*ArcTan[Sqrt[3] - (2*b^(1/6)*x)/a^(1/6)] - Sqrt[b]*x^3*ArcTan[Sqr
t[3] + (2*b^(1/6)*x)/a^(1/6)])/(3*a^(3/2)*x^3)
```

Maple [A] time = 0.005, size = 32, normalized size = 0.8

$$-\frac{b}{3\,a}\arctan\left(bx^3\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}-\frac{1}{3\,ax^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(b*x^6+a),x)
```

```
[Out] -1/3*b/a/(a*b)^(1/2)*arctan(x^3*b/(a*b)^(1/2))-1/3/a/x^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^6 + a)*x^4),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.22561, size = 1, normalized size = 0.02

$$\left[\frac{x^3\sqrt{-\frac{b}{a}}\log\left(\frac{bx^6-2\,ax^3\sqrt{-\frac{b}{a}}-a}{bx^6+a}\right)-2}{6\,ax^3}, -\frac{x^3\sqrt{\frac{b}{a}}\arctan\left(\frac{bx^3}{a\sqrt{\frac{b}{a}}}\right)+1}{3\,ax^3}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^6 + a)*x^4),x, algorithm="fricas")
```

```
[Out] [1/6*(x^3*sqrt(-b/a)*log((b*x^6 - 2*a*x^3*sqrt(-b/a) - a)/(b*x^6
+ a)) - 2)/(a*x^3), -1/3*(x^3*sqrt(b/a)*arctan(b*x^3/(a*sqrt(b/a)
)) + 1)/(a*x^3)]
```

Sympy [A] time = 2.0193, size = 71, normalized size = 1.78

$$\frac{\sqrt{-\frac{b}{a^3}}\log\left(-\frac{a^2\sqrt{-\frac{b}{a^3}}}{b}+x^3\right)}{6}-\frac{\sqrt{-\frac{b}{a^3}}\log\left(\frac{a^2\sqrt{-\frac{b}{a^3}}}{b}+x^3\right)}{6}-\frac{1}{3ax^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(b*x**6+a),x)
```

```
[Out] sqrt(-b/a**3)*log(-a**2*sqrt(-b/a**3)/b + x**3)/6 - sqrt(-b/a**3)
*log(a**2*sqrt(-b/a**3)/b + x**3)/6 - 1/(3*a*x**3)
```

GIAC/XCAS [A] time = 0.220301, size = 42, normalized size = 1.05

$$-\frac{b\arctan\left(\frac{bx^3}{\sqrt{ab}}\right)}{3\sqrt{ab}a}-\frac{1}{3\,ax^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^6 + a)*x^4),x, algorithm="giac")
```

```
[Out] -1/3*b*arctan(b*x^3/sqrt(a*b))/(sqrt(a*b)*a) - 1/3/(a*x^3)
```

3.1329 $\int \frac{x^8}{(a+bx^6)^2} dx$

Optimal. Leaf size=49

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}x^3}{\sqrt{a}}\right)}{6\sqrt{a}b^{3/2}} - \frac{x^3}{6b(a+bx^6)}$$

```
[Out] -x^3/(6*b*(a + b*x^6)) + ArcTan[(Sqrt[b]*x^3)/Sqrt[a]]/(6*Sqrt[a]
*b^(3/2))
```

Rubi [A] time = 0.0636449, antiderivative size = 49, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}x^3}{\sqrt{a}}\right)}{6\sqrt{a}b^{3/2}} - \frac{x^3}{6b(a+bx^6)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8/(a + b*x^6)^2,x]
```

```
[Out] -x^3/(6*b*(a + b*x^6)) + ArcTan[(Sqrt[b]*x^3)/Sqrt[a]]/(6*Sqrt[a]
*b^(3/2))
```

Rubi in Sympy [A] time = 8.93265, size = 39, normalized size = 0.8

$$-\frac{x^3}{6b(a+bx^6)} + \frac{\operatorname{atan}\left(\frac{\sqrt{b}x^3}{\sqrt{a}}\right)}{6\sqrt{a}b^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8/(b*x**6+a)**2,x)
```

```
[Out] -x**3/(6*b*(a + b*x**6)) + atan(sqrt(b)*x**3/sqrt(a))/(6*sqrt(a)*
b**(3/2))
```

Mathematica [A] time = 0.0473194, size = 49, normalized size = 1.

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}x^3}{\sqrt{a}}\right)}{6\sqrt{a}b^{3/2}} - \frac{x^3}{6b(a+bx^6)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8/(a + b*x^6)^2,x]
```

```
[Out] -x^3/(6*b*(a + b*x^6)) + ArcTan[(Sqrt[b]*x^3)/Sqrt[a]]/(6*Sqrt[a]
*b^(3/2))
```

Maple [A] time = 0.007, size = 40, normalized size = 0.8

$$-\frac{x^3}{6\,b\,(bx^6+a)} + \frac{1}{6\,b}\arctan\left(bx^3\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8/(b*x^6+a)^2,x)
```

```
[Out] -1/6*x^3/b/(b*x^6+a)+1/6/b/(a*b)^(1/2)*arctan(x^3*b/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^6 + a)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.222615, size = 1, normalized size = 0.02

$$\left[-\frac{2\sqrt{-ab}x^3-\left(bx^6+a\right)\log\left(\frac{2\,abx^3+\left(bx^6-a\right)\sqrt{-ab}}{bx^6+a}\right)}{12\left(b^2x^6+ab\right)\sqrt{-ab}},-\frac{\sqrt{ab}x^3-\left(bx^6+a\right)\arctan\left(\frac{\sqrt{ab}x^3}{a}\right)}{6\left(b^2x^6+ab\right)\sqrt{ab}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^6 + a)^2,x, algorithm="fricas")
```

```
[Out] [-1/12*(2*sqrt(-a*b)*x^3 - (b*x^6 + a)*log((2*a*b*x^3 + (b*x^6 -
a)*sqrt(-a*b))/(b*x^6 + a)))/((b^2*x^6 + a*b)*sqrt(-a*b)), -1/6*(
sqrt(a*b)*x^3 - (b*x^6 + a)*arctan(sqrt(a*b)*x^3/a))/((b^2*x^6 +
a*b)*sqrt(a*b))]
```

Sympy [A] time = 4.2502, size = 83, normalized size = 1.69

$$-\frac{x^3}{6ab+6b^2x^6}-\frac{\sqrt{-\frac{1}{ab^3}}\log\left(-ab\sqrt{-\frac{1}{ab^3}}+x^3\right)}{12}+\frac{\sqrt{-\frac{1}{ab^3}}\log\left(ab\sqrt{-\frac{1}{ab^3}}+x^3\right)}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8/(b*x**6+a)**2,x)
```

```
[Out] -x**3/(6*a*b + 6*b**2*x**6) - sqrt(-1/(a*b**3))*log(-a*b*sqrt(-1/
(a*b**3)) + x**3)/12 + sqrt(-1/(a*b**3))*log(a*b*sqrt(-1/(a*b**3)
) + x**3)/12
```

GIAC/XCAS [A] time = 0.227198, size = 53, normalized size = 1.08

$$-\frac{x^3}{6\left(bx^6+a\right)b}+\frac{\arctan\left(\frac{bx^3}{\sqrt{ab}}\right)}{6\sqrt{ab}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^6 + a)^2,x, algorithm="giac")
```

```
[Out] -1/6*x^3/((b*x^6 + a)*b) + 1/6*arctan(b*x^3/sqrt(a*b))/(sqrt(a*b)
*b)
```

3.1330 $\int \frac{x^7}{(a+bx^6)^2} \, dx$

Optimal. Leaf size=142

$$\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{18a^{2/3}b^{4/3}}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x^2}{\sqrt{3}\sqrt[3]{a}}\right)}{6\sqrt{3}a^{2/3}b^{4/3}}-\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x^2+b^{2/3}x^4\right)}{36a^{2/3}b^{4/3}}-\frac{x^2}{6b\left(a+bx^6\right)}$$

```
[Out] -x^2/(6*b*(a + b*x^6)) - ArcTan[(a^(1/3) - 2*b^(1/3)*x^2)/(Sqrt[3
]*a^(1/3))]/(6*Sqrt[3]*a^(2/3)*b^(4/3)) + Log[a^(1/3) + b^(1/3)*x
^2]/(18*a^(2/3)*b^(4/3)) - Log[a^(2/3) - a^(1/3)*b^(1/3)*x^2 + b^
(2/3)*x^4]/(36*a^(2/3)*b^(4/3))
```

Rubi [A] time = 0.222056, antiderivative size = 142, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615

$$\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{18a^{2/3}b^{4/3}}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x^2}{\sqrt{3}\sqrt[3]{a}}\right)}{6\sqrt{3}a^{2/3}b^{4/3}}-\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x^2+b^{2/3}x^4\right)}{36a^{2/3}b^{4/3}}-\frac{x^2}{6b\left(a+bx^6\right)}$$

Antiderivative was successfully verified.

```
[In] Int[x^7/(a + b*x^6)^2,x]
```

```
[Out] -x^2/(6*b*(a + b*x^6)) - ArcTan[(a^(1/3) - 2*b^(1/3)*x^2)/(Sqrt[3
]*a^(1/3))]/(6*Sqrt[3]*a^(2/3)*b^(4/3)) + Log[a^(1/3) + b^(1/3)*x
^2]/(18*a^(2/3)*b^(4/3)) - Log[a^(2/3) - a^(1/3)*b^(1/3)*x^2 + b^
(2/3)*x^4]/(36*a^(2/3)*b^(4/3))
```

Rubi in Sympy [A] time = 35.7098, size = 128, normalized size = 0.9

$$-\frac{x^2}{6b\left(a+bx^6\right)}+\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{18a^{\frac{2}{3}}b^{\frac{4}{3}}}-\frac{\log\left(a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x^2+b^{\frac{2}{3}}x^4\right)}{36a^{\frac{2}{3}}b^{\frac{4}{3}}}-\frac{\sqrt{3}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}-\frac{2\sqrt[3]{b}x^2}{3}\right)}{\sqrt[3]{a}}\right)}{18a^{\frac{2}{3}}b^{\frac{4}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**7/(b*x**6+a)**2,x)
```

```
[Out] -x**2/(6*b*(a + b*x**6)) + log(a**(1/3) + b**(1/3)*x**2)/(18*a**(
2/3)*b**(4/3)) - log(a**(2/3) - a**(1/3)*b**(1/3)*x**2 + b**(2/3)
*x**4)/(36*a**(2/3)*b**(4/3)) - sqrt(3)*atan(sqrt(3)*(a**(1/3)/3
- 2*b**(1/3)*x**2/3)/a**(1/3))/(18*a**(2/3)*b**(4/3))
```

Mathematica [A] time = 0.383589, size = 197, normalized size = 1.39

$$\frac{\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{a^{2/3}}-\frac{\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{a^{2/3}}-\frac{\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{a^{2/3}}-\frac{2\sqrt{3}\tan^{-1}\left(\sqrt{3}-\frac{2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{a^{2/3}}-\frac{2\sqrt{3}\tan^{-1}\left(\frac{2\sqrt[6]{b}x}{\sqrt[6]{a}}+\sqrt{3}\right)}{a^{2/3}}-\frac{6\sqrt[3]{b}\cdots}{a+bx\cdots}}{36b^{4/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^7/(a + b*x^6)^2,x]
```

```
[Out] ((-6*b^(1/3)*x^2)/(a + b*x^6) - (2*Sqrt[3]*ArcTan[Sqrt[3] - (2*b^
(1/6)*x)/a^(1/6)])/a^(2/3) - (2*Sqrt[3]*ArcTan[Sqrt[3] + (2*b^(1/
6)*x)/a^(1/6)])/a^(2/3) + (2*Log[a^(1/3) + b^(1/3)*x^2])/a^(2/3)
- Log[a^(1/3) - Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2]/a^(2/3)
- Log[a^(1/3) + Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2]/a^(2/3))
/(36*b^(4/3))
```

Maple [A] time = 0.005, size = 114, normalized size = 0.8

$$-\frac{x^2}{6\,b\,(bx^6+a)}+\frac{1}{18\,b^2}\ln\left(x^2+\sqrt[3]{\frac{a}{b}}\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}-\frac{1}{36\,b^2}\ln\left(x^4-x^2\sqrt[3]{\frac{a}{b}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}+\frac{\sqrt{3}}{18\,b^2}\arctan\left(\frac{\sqrt{3}}{3}\left(2\,x^2\frac{1}{\sqrt[3]{\frac{a}{b}}}-1\right)\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7/(b*x^6+a)^2,x)
```

```
[Out] -1/6*x^2/b/(b*x^6+a)+1/18/b^2/(a/b)^(2/3)*ln(x^2+(a/b)^(1/3))-1/3
6/b^2/(a/b)^(2/3)*ln(x^4-x^2*(a/b)^(1/3)+(a/b)^(2/3))+1/18/b^2/(a
/b)^(2/3)*3^(1/2)*arctan(1/3*3^(1/2)*(2/(a/b)^(1/3)*x^2-1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(b*x^6 + a)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.227628, size = 194, normalized size = 1.37

$$-\frac{\sqrt{3}\left(6\,\sqrt{3}\,(a^2b)^{\frac{1}{3}}\,x^2+\sqrt{3}(bx^6+a)\,\log\left((a^2b)^{\frac{2}{3}}\,x^4-(a^2b)^{\frac{1}{3}}\,ax^2+a^2\right)-2\,\sqrt{3}(bx^6+a)\,\log\left((a^2b)^{\frac{1}{3}}\,x^2+a\right)-6\,(bx^6+a)\right.}{108\,(b^2x^6+ab)\,(a^2b)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(b*x^6 + a)^2,x, algorithm="fricas")
```

```
[Out] -1/108*sqrt(3)*(6*sqrt(3)*(a^2*b)^(1/3)*x^2 + sqrt(3)*(b*x^6 + a)
*log((a^2*b)^(2/3)*x^4 - (a^2*b)^(1/3)*a*x^2 + a^2) - 2*sqrt(3)*(
b*x^6 + a)*log((a^2*b)^(1/3)*x^2 + a) - 6*(b*x^6 + a)*arctan(1/3*
(2*sqrt(3)*(a^2*b)^(1/3)*x^2 - sqrt(3)*a)/a))/((b^2*x^6 + a*b)*(a
^2*b)^(1/3))
```

Sympy [A] time = 4.36956, size = 42, normalized size = 0.3

$$-\frac{x^2}{6ab+6b^2x^6}+\operatorname{RootSum}\left(5832t^3a^2b^4-1,\left(t\mapsto t\log\left(18tab+x^2\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**7/(b*x**6+a)**2,x)
```

```
[Out] -x**2/(6*a*b + 6*b**2*x**6) + RootSum(5832*_t**3*a**2*b**4 - 1, L
ambda(_t, _t*log(18*_t*a*b + x**2)))
```

GIAC/XCAS [A]   time = 0.227327, size = 186, normalized size = 1.31

$$-\frac{x^2}{6\,(bx^6+a)b}-\frac{\left(-\frac{a}{b}\right)^{\frac{1}{3}}\ln\left(\left|x^2-\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right|\right)}{18\,ab}+\frac{\sqrt{3}\left(-ab^2\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x^2+\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{a}{b}\right)^{\frac{1}{3}}}\right)}{18\,ab^2}+\frac{\left(-ab^2\right)^{\frac{1}{3}}\ln\left(x^4+x^2\left(-\frac{a}{b}\right)^{\frac{1}{3}}+\left(-\frac{a}{b}\right)^{\frac{2}{3}}\right)}{36\,ab^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^7/(b*x^6 + a)^2,x, algorithm="giac")
```

```
[Out] -1/6*x^2/((b*x^6 + a)*b) - 1/18*(-a/b)^(1/3)*ln(abs(x^2 - (-a/b)^
(1/3)))/(a*b) + 1/18*sqrt(3)*(-a*b^2)^(1/3)*arctan(1/3*sqrt(3)*(2
*x^2 + (-a/b)^(1/3))/(-a/b)^(1/3))/(a*b^2) + 1/36*(-a*b^2)^(1/3)*
ln(x^4 + x^2*(-a/b)^(1/3) + (-a/b)^(2/3))/(a*b^2)
```

3.1331 $\int \frac{x^6}{(a+bx^6)^2}\,dx$

Optimal. Leaf size=232

$$-\frac{\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{24\sqrt{3}a^{5/6}b^{7/6}}+\frac{\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{24\sqrt{3}a^{5/6}b^{7/6}}+\frac{\tan^{-1}\left(\frac{\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{18a^{5/6}b^{7/6}}-\frac{\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{a}-2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{36a^{5/6}b^{7/6}}+\frac{\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{a}+2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{36a^{5/6}b^{7/6}}-\frac{x}{6b\left(a+bx^6\right)}$$

```
[Out] -x/(6*b*(a + b*x^6)) + ArcTan[(b^(1/6)*x)/a^(1/6)]/(18*a^(5/6)*b^
(7/6)) - ArcTan[(Sqrt[3]*a^(1/6) - 2*b^(1/6)*x)/a^(1/6)]/(36*a^(5
/6)*b^(7/6)) + ArcTan[(Sqrt[3]*a^(1/6) + 2*b^(1/6)*x)/a^(1/6)]/(3
6*a^(5/6)*b^(7/6)) - Log[a^(1/3) - Sqrt[3]*a^(1/6)*b^(1/6)*x + b^
(1/3)*x^2]/(24*Sqrt[3]*a^(5/6)*b^(7/6)) + Log[a^(1/3) + Sqrt[3]*a
^(1/6)*b^(1/6)*x + b^(1/3)*x^2]/(24*Sqrt[3]*a^(5/6)*b^(7/6))
```

Rubi [A] time = 0.776916, antiderivative size = 232, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538

$$-\frac{\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{24\sqrt{3}a^{5/6}b^{7/6}}+\frac{\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{24\sqrt{3}a^{5/6}b^{7/6}}+\frac{\tan^{-1}\left(\frac{\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{18a^{5/6}b^{7/6}}-\frac{\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{a}-2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{36a^{5/6}b^{7/6}}+\frac{\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{a}+2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{36a^{5/6}b^{7/6}}-\frac{x}{6b\left(a+bx^6\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/(a + b*x^6)^2,x]
```

```
[Out] -x/(6*b*(a + b*x^6)) + ArcTan[(b^(1/6)*x)/a^(1/6)]/(18*a^(5/6)*b^
(7/6)) - ArcTan[(Sqrt[3]*a^(1/6) - 2*b^(1/6)*x)/a^(1/6)]/(36*a^(5
/6)*b^(7/6)) + ArcTan[(Sqrt[3]*a^(1/6) + 2*b^(1/6)*x)/a^(1/6)]/(3
6*a^(5/6)*b^(7/6)) - Log[a^(1/3) - Sqrt[3]*a^(1/6)*b^(1/6)*x + b^
(1/3)*x^2]/(24*Sqrt[3]*a^(5/6)*b^(7/6)) + Log[a^(1/3) + Sqrt[3]*a
^(1/6)*b^(1/6)*x + b^(1/3)*x^2]/(24*Sqrt[3]*a^(5/6)*b^(7/6))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(b*x**6+a)**2,x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.290074, size = 191, normalized size = 0.82

$$\frac{-\frac{\sqrt{3}\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{a^{5/6}}+\frac{\sqrt{3}\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{a^{5/6}}+\frac{4\tan^{-1}\left(\frac{\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{a^{5/6}}-\frac{2\tan^{-1}\left(\sqrt{3}-\frac{2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{a^{5/6}}+\frac{2\tan^{-1}\left(\frac{2\sqrt[6]{b}x}{\sqrt[6]{a}}+\sqrt{3}\right)}{a^{5/6}}-\frac{12\sqrt[6]{b}x}{a+bx^6}}{72b^{7/6}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6/(a + b*x^6)^2,x]
```

```
[Out] ((-12*b^(1/6)*x)/(a + b*x^6) + (4*ArcTan[(b^(1/6)*x)/a^(1/6)])/a^
(5/6) - (2*ArcTan[Sqrt[3] - (2*b^(1/6)*x)/a^(1/6)])/a^(5/6) + (2*
ArcTan[Sqrt[3] + (2*b^(1/6)*x)/a^(1/6)])/a^(5/6) - (Sqrt[3]*Log[a
^(1/3) - Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2])/a^(5/6) + (Sqr
t[3]*Log[a^(1/3) + Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2])/a^(5
/6))/(72*b^(7/6))
```

Maple [A] time = 0.053, size = 192, normalized size = 0.8

$$-\frac{x}{6\,b\,(bx^6+a)}+\frac{1}{18\,ab}\sqrt[6]{\frac{a}{b}}\arctan\left(x\frac{1}{\sqrt[6]{\frac{a}{b}}}\right)-\frac{\sqrt{3}}{72\,ab}\sqrt[6]{\frac{a}{b}}\ln\left(\sqrt{3}\sqrt[6]{\frac{a}{b}}x-x^2-\sqrt[3]{\frac{a}{b}}\right)+\frac{1}{36\,ab}\sqrt[6]{\frac{a}{b}}\arctan\left(-\sqrt{3}+2\,x\frac{1}{\sqrt[6]{\frac{a}{b}}}\right)+\frac{\sqrt{3}}{72\,ab}\sqrt[6]{\frac{a}{b}}\ln\left(x^2+\sqrt{3}\sqrt[6]{\frac{a}{b}}x+\sqrt[3]{\frac{a}{b}}\right)+\frac{1}{36\,ab}\sqrt[6]{\frac{a}{b}}\arctan\left(2\,x\frac{1}{\sqrt[6]{\frac{a}{b}}}+\sqrt{3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(b*x^6+a)^2,x)
```

```
[Out] -1/6*x/b/(b*x^6+a)+1/18/b/a*(a/b)^(1/6)*arctan(x/(a/b)^(1/6))-1/7
2/b/a*3^(1/2)*(a/b)^(1/6)*ln(3^(1/2)*(a/b)^(1/6)*x-x^2-(a/b)^(1/3
))+1/36/b/a*(a/b)^(1/6)*arctan(-3^(1/2)+2*x/(a/b)^(1/6))+1/72/b/a
*3^(1/2)*(a/b)^(1/6)*ln(x^2+3^(1/2)*(a/b)^(1/6)*x+(a/b)^(1/3))+1/
36/b/a*(a/b)^(1/6)*arctan(2*x/(a/b)^(1/6)+3^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(b*x^6 + a)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.236712, size = 567, normalized size = 2.44

$$-\frac{4\sqrt{3}\left(b^2x^6+ab\right)\left(-\frac{1}{a^5b^7}\right)^{\frac{1}{6}}\arctan\left(\frac{\sqrt{3}ab\left(-\frac{1}{a^5b^7}\right)^{\frac{1}{6}}}{ab\left(-\frac{1}{a^5b^7}\right)^{\frac{1}{6}}+2\,x+2\sqrt{a^2b^2\left(-\frac{1}{a^5b^7}\right)^{\frac{1}{3}}+abx\left(-\frac{1}{a^5b^7}\right)^{\frac{1}{6}}+x^2}}\right)+4\sqrt{3}\left(b^2x^6+ab\right)\left(-\frac{1}{a^5b^7}\right)^{\frac{1}{6}}\arctan\left(\cdots\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(b*x^6 + a)^2,x, algorithm="fricas")
```

```
[Out] -1/72*(4*sqrt(3)*(b^2*x^6 + a*b)*(-1/(a^5*b^7))^(1/6)*arctan(sqrt
(3)*a*b*(-1/(a^5*b^7))^(1/6)/(a*b*(-1/(a^5*b^7))^(1/6) + 2*x + 2*
```

```
sqrt(a^2*b^2*(-1/(a^5*b^7))^(1/3) + a*b*x*(-1/(a^5*b^7))^(1/6) +
x^2))) + 4*sqrt(3)*(b^2*x^6 + a*b)*(-1/(a^5*b^7))^(1/6)*arctan(-s
qrt(3)*a*b*(-1/(a^5*b^7))^(1/6)/(a*b*(-1/(a^5*b^7))^(1/6) - 2*x -
 2*sqrt(a^2*b^2*(-1/(a^5*b^7))^(1/3) - a*b*x*(-1/(a^5*b^7))^(1/6)
 + x^2))) - (b^2*x^6 + a*b)*(-1/(a^5*b^7))^(1/6)*log(a^2*b^2*(-1/
(a^5*b^7))^(1/3) + a*b*x*(-1/(a^5*b^7))^(1/6) + x^2) + (b^2*x^6 +
 a*b)*(-1/(a^5*b^7))^(1/6)*log(a^2*b^2*(-1/(a^5*b^7))^(1/3) - a*b
*x*(-1/(a^5*b^7))^(1/6) + x^2) - 2*(b^2*x^6 + a*b)*(-1/(a^5*b^7))
^(1/6)*log(a*b*(-1/(a^5*b^7))^(1/6) + x) + 2*(b^2*x^6 + a*b)*(-1/
(a^5*b^7))^(1/6)*log(-a*b*(-1/(a^5*b^7))^(1/6) + x) + 12*x)/(b^2*
x^6 + a*b)
```

Sympy [A] time = 4.16358, size = 39, normalized size = 0.17

$$-\frac{x}{6ab+6b^2x^6}+\operatorname{RootSum}\left(2176782336t^6a^5b^7+1,\left(t\mapsto t\log\left(36tab+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(b*x**6+a)**2,x)
```

```
[Out] -x/(6*a*b + 6*b**2*x**6) + RootSum(2176782336*_t**6*a**5*b**7 + 1
, Lambda(_t, _t*log(36*_t*a*b + x)))
```

GIAC/XCAS [A] time = 0.224353, size = 277, normalized size = 1.19

$$-\frac{x}{6\,(bx^6+a)b}+\frac{\sqrt{3}\left(ab^5\right)^{\frac{1}{6}}\ln\left(x^2+\sqrt{3}x\left(\frac{a}{b}\right)^{\frac{1}{6}}+\left(\frac{a}{b}\right)^{\frac{1}{3}}\right)}{72\,ab^2}-\frac{\sqrt{3}\left(ab^5\right)^{\frac{1}{6}}\ln\left(x^2-\sqrt{3}x\left(\frac{a}{b}\right)^{\frac{1}{6}}+\left(\frac{a}{b}\right)^{\frac{1}{3}}\right)}{72\,ab^2}+\frac{\left(ab^5\right)^{\frac{1}{6}}\arctan\left(\frac{2\,x+\sqrt{3}\left(\frac{a}{b}\right)^{\frac{1}{6}}}{\left(\frac{a}{b}\right)^{\frac{1}{6}}}\right)}{36\,ab^2}+\frac{\left(ab^5\right)^{\frac{1}{6}}\arctan\left(\frac{2\,x-\sqrt{3}\left(\frac{a}{b}\right)^{\frac{1}{6}}}{\left(\frac{a}{b}\right)^{\frac{1}{6}}}\right)}{36\,ab^2}+\frac{\left(ab^5\right)^{\frac{1}{6}}\arctan\left(\frac{x}{\left(\frac{a}{b}\right)^{\frac{1}{6}}}\right)}{18\,ab^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(b*x^6 + a)^2,x, algorithm="giac")
```

```
[Out] -1/6*x/((b*x^6 + a)*b) + 1/72*sqrt(3)*(a*b^5)^(1/6)*ln(x^2 + sqrt
(3)*x*(a/b)^(1/6) + (a/b)^(1/3))/(a*b^2) - 1/72*sqrt(3)*(a*b^5)^(
1/6)*ln(x^2 - sqrt(3)*x*(a/b)^(1/6) + (a/b)^(1/3))/(a*b^2) + 1/36
*(a*b^5)^(1/6)*arctan((2*x + sqrt(3)*(a/b)^(1/6))/(a/b)^(1/6))/(a
*b^2) + 1/36*(a*b^5)^(1/6)*arctan((2*x - sqrt(3)*(a/b)^(1/6))/(a/
b)^(1/6))/(a*b^2) + 1/18*(a*b^5)^(1/6)*arctan(x/(a/b)^(1/6))/(a*b
^2)
```

3.1332 $\int \frac{x^5}{(a+bx^6)^2} dx$

Optimal. Leaf size=16

$$-\frac{1}{6b(a+bx^6)}$$

```
[Out] -1/(6*b*(a + b*x^6))
```

Rubi [A] time = 0.0100331, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$-\frac{1}{6b(a+bx^6)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/(a + b*x^6)^2,x]

[Out] -1/(6*b*(a + b*x^6))
```

Rubi in Sympy [A] time = 2.17553, size = 12, normalized size = 0.75

$$-\frac{1}{6b(a+bx^6)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(b*x**6+a)**2,x)

[Out] -1/(6*b*(a + b*x**6))
```

Mathematica [A] time = 0.00690235, size = 16, normalized size = 1.

$$-\frac{1}{6b(a+bx^6)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/(a + b*x^6)^2,x]

[Out] -1/(6*b*(a + b*x^6))
```

Maple [A] time = 0.001, size = 15, normalized size = 0.9

$$-\frac{1}{6\,b\,(bx^6+a)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(b*x^6+a)^2,x)

[Out] -1/6/b/(b*x^6+a)
```

Maxima [A] time = 1.43599, size = 19, normalized size = 1.19

$$-\frac{1}{6\left(bx^{6}+a\right)b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^6 + a)^2,x, algorithm="maxima")
```

```
[Out] -1/6/((b*x^6 + a)*b)
```

Fricas [A] time = 0.204944, size = 20, normalized size = 1.25

$$-\frac{1}{6\left(b^{2}x^{6}+ab\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^6 + a)^2,x, algorithm="fricas")
```

```
[Out] -1/6/(b^2*x^6 + a*b)
```

Sympy [A] time = 3.87259, size = 15, normalized size = 0.94

$$-\frac{1}{6ab+6b^{2}x^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(b*x**6+a)**2,x)
```

```
[Out] -1/(6*a*b + 6*b**2*x**6)
```

GIAC/XCAS [A] time = 0.221674, size = 19, normalized size = 1.19

$$-\frac{1}{6\left(bx^{6}+a\right)b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^6 + a)^2,x, algorithm="giac")
```

```
[Out] -1/6/((b*x^6 + a)*b)
```

3.1333 $\int \frac{x^4}{(a+bx^6)^2} \, dx$

Optimal. Leaf size=234

$$\frac{\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{24\sqrt{3}a^{7/6}b^{5/6}}-\frac{\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{24\sqrt{3}a^{7/6}b^{5/6}}+\frac{\tan^{-1}\left(\frac{\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{18a^{7/6}b^{5/6}}-\frac{\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{a}-2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{36a^{7/6}b^{5/6}}+\frac{\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{a}+2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{36a^{7/6}b^{5/6}}+\frac{x^5}{6a\left(a+bx^6\right)}$$

```
[Out] x^5/(6*a*(a + b*x^6)) + ArcTan[(b^(1/6)*x)/a^(1/6)]/(18*a^(7/6)*b
^(5/6)) - ArcTan[(Sqrt[3]*a^(1/6) - 2*b^(1/6)*x)/a^(1/6)]/(36*a^(
7/6)*b^(5/6)) + ArcTan[(Sqrt[3]*a^(1/6) + 2*b^(1/6)*x)/a^(1/6)]/(
36*a^(7/6)*b^(5/6)) + Log[a^(1/3) - Sqrt[3]*a^(1/6)*b^(1/6)*x + b
^(1/3)*x^2]/(24*Sqrt[3]*a^(7/6)*b^(5/6)) - Log[a^(1/3) + Sqrt[3]*
a^(1/6)*b^(1/6)*x + b^(1/3)*x^2]/(24*Sqrt[3]*a^(7/6)*b^(5/6))
```

Rubi [A] time = 1.08368, antiderivative size = 234, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538

$$\frac{\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{24\sqrt{3}a^{7/6}b^{5/6}}-\frac{\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{24\sqrt{3}a^{7/6}b^{5/6}}+\frac{\tan^{-1}\left(\frac{\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{18a^{7/6}b^{5/6}}-\frac{\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{a}-2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{36a^{7/6}b^{5/6}}+\frac{\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{a}+2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{36a^{7/6}b^{5/6}}+\frac{x^5}{6a\left(a+bx^6\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a + b*x^6)^2,x]
```

```
[Out] x^5/(6*a*(a + b*x^6)) + ArcTan[(b^(1/6)*x)/a^(1/6)]/(18*a^(7/6)*b
^(5/6)) - ArcTan[(Sqrt[3]*a^(1/6) - 2*b^(1/6)*x)/a^(1/6)]/(36*a^(
7/6)*b^(5/6)) + ArcTan[(Sqrt[3]*a^(1/6) + 2*b^(1/6)*x)/a^(1/6)]/(
36*a^(7/6)*b^(5/6)) + Log[a^(1/3) - Sqrt[3]*a^(1/6)*b^(1/6)*x + b
^(1/3)*x^2]/(24*Sqrt[3]*a^(7/6)*b^(5/6)) - Log[a^(1/3) + Sqrt[3]*
a^(1/6)*b^(1/6)*x + b^(1/3)*x^2]/(24*Sqrt[3]*a^(7/6)*b^(5/6))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(b*x**6+a)**2,x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.300508, size = 193, normalized size = 0.82

$$\frac{\frac{\sqrt{3}\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{b^{5/6}}-\frac{\sqrt{3}\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{b^{5/6}}+\frac{4\tan^{-1}\left(\frac{\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{b^{5/6}}-\frac{2\tan^{-1}\left(\sqrt{3}-\frac{2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{b^{5/6}}+\frac{2\tan^{-1}\left(\frac{2\sqrt[6]{b}x}{\sqrt[6]{a}}+\sqrt{3}\right)}{b^{5/6}}+\frac{12\sqrt[6]{a}x^5}{a+bx^6}}{72a^{7/6}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(a + b*x^6)^2,x]
```

```
[Out] ((12*a^(1/6)*x^5)/(a + b*x^6) + (4*ArcTan[(b^(1/6)*x)/a^(1/6)])/b
^(5/6) - (2*ArcTan[Sqrt[3] - (2*b^(1/6)*x)/a^(1/6)])/b^(5/6) + (2
*ArcTan[Sqrt[3] + (2*b^(1/6)*x)/a^(1/6)])/b^(5/6) + (Sqrt[3]*Log[
a^(1/3) - Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2])/b^(5/6) - (Sq
rt[3]*Log[a^(1/3) + Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2])/b^(
5/6))/(72*a^(7/6))
```

Maple [B] time = 0.354, size = 349, normalized size = 1.5

$$\frac{x}{18\,ab}\left(x^2+\sqrt[3]{\frac{a}{b}}\right)^{-1}+\frac{1}{18\,ab}\arctan\left(x\frac{1}{\sqrt[6]{\frac{a}{b}}}\right)\frac{1}{\sqrt[6]{\frac{a}{b}}}$$
$$+\frac{x}{18\,ab}\left(x^2-\sqrt{3}\sqrt[6]{\frac{a}{b}}x+\sqrt[3]{\frac{a}{b}}\right)^{-1}-\frac{\sqrt{3}}{36\,ab}\sqrt[6]{\frac{a}{b}}\left(x^2-\sqrt{3}\sqrt[6]{\frac{a}{b}}x+\sqrt[3]{\frac{a}{b}}\right)^{-1}$$
$$+\frac{\sqrt{3}}{72\,a^2}\left(\frac{a}{b}\right)^{\frac{5}{6}}\ln\left(\sqrt{3}\sqrt[6]{\frac{a}{b}}x-x^2-\sqrt[3]{\frac{a}{b}}\right)+\frac{1}{36\,ab}\arctan\left(-\sqrt{3}+2\,x\frac{1}{\sqrt[6]{\frac{a}{b}}}\right)\frac{1}{\sqrt[6]{\frac{a}{b}}}$$
$$+\frac{x}{18\,ab}\left(x^2+\sqrt{3}\sqrt[6]{\frac{a}{b}}x+\sqrt[3]{\frac{a}{b}}\right)^{-1}+\frac{\sqrt{3}}{36\,ab}\sqrt[6]{\frac{a}{b}}\left(x^2+\sqrt{3}\sqrt[6]{\frac{a}{b}}x+\sqrt[3]{\frac{a}{b}}\right)^{-1}$$
$$-\frac{\sqrt{3}}{72\,a^2}\left(\frac{a}{b}\right)^{\frac{5}{6}}\ln\left(x^2+\sqrt{3}\sqrt[6]{\frac{a}{b}}x+\sqrt[3]{\frac{a}{b}}\right)+\frac{1}{36\,ab}\arctan\left(2\,x\frac{1}{\sqrt[6]{\frac{a}{b}}}+\sqrt{3}\right)\frac{1}{\sqrt[6]{\frac{a}{b}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(b*x^6+a)^2,x)
```

```
[Out] 1/18/b/a*x/(x^2+(a/b)^(1/3))+1/18/b/a/(a/b)^(1/6)*arctan(x/(a/b)^
(1/6))+1/18/b/a/(x^2-3^(1/2)*(a/b)^(1/6)*x+(a/b)^(1/3))*x-1/36/b/
a/(x^2-3^(1/2)*(a/b)^(1/6)*x+(a/b)^(1/3))*3^(1/2)*(a/b)^(1/6)+1/7
2/a^2*3^(1/2)*(a/b)^(5/6)*ln(3^(1/2)*(a/b)^(1/6)*x-x^2-(a/b)^(1/3
))+1/36/b/a/(a/b)^(1/6)*arctan(-3^(1/2)+2*x/(a/b)^(1/6))+1/18/b/a
/(x^2+3^(1/2)*(a/b)^(1/6)*x+(a/b)^(1/3))*x+1/36/b/a/(x^2+3^(1/2)*
(a/b)^(1/6)*x+(a/b)^(1/3))*3^(1/2)*(a/b)^(1/6)-1/72/a^2*3^(1/2)*(
a/b)^(5/6)*ln(x^2+3^(1/2)*(a/b)^(1/6)*x+(a/b)^(1/3))+1/36/b/a/(a/
b)^(1/6)*arctan(2*x/(a/b)^(1/6)+3^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^6 + a)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.244848, size = 620, normalized size = 2.65

$$12\,x^5+4\,\sqrt{3}\left(abx^6+a^2\right)\left(-\frac{1}{a^7b^5}\right)^{\frac{1}{6}}\arctan\left(\frac{\sqrt{3}a^6b^4\left(-\frac{1}{a^7b^5}\right)^{\frac{5}{6}}}{a^6b^4\left(-\frac{1}{a^7b^5}\right)^{\frac{5}{6}}+2\,x+2\,\sqrt{a^6b^4x\left(-\frac{1}{a^7b^5}\right)^{\frac{5}{6}}-a^5b^3\left(-\frac{1}{a^7b^5}\right)^{\frac{2}{3}}+x^2}}\right)+4\,\sqrt{3}\left(abx^6+a^2\right)\left(-\frac{1}{a^7b^5}\right)^{\frac{1}{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^6 + a)^2,x, algorithm="fricas")
```

```
[Out] 1/72*(12*x^5 + 4*sqrt(3)*(a*b*x^6 + a^2)*(-1/(a^7*b^5))^(1/6)*arc
tan(sqrt(3)*a^6*b^4*(-1/(a^7*b^5))^(5/6)/(a^6*b^4*(-1/(a^7*b^5))^
(5/6) + 2*x + 2*sqrt(a^6*b^4*x*(-1/(a^7*b^5))^(5/6) - a^5*b^3*(-1
/(a^7*b^5))^(2/3) + x^2))) + 4*sqrt(3)*(a*b*x^6 + a^2)*(-1/(a^7*b
^5))^(1/6)*arctan(-sqrt(3)*a^6*b^4*(-1/(a^7*b^5))^(5/6)/(a^6*b^4*
(-1/(a^7*b^5))^(5/6) - 2*x - 2*sqrt(-a^6*b^4*x*(-1/(a^7*b^5))^(5/
6) - a^5*b^3*(-1/(a^7*b^5))^(2/3) + x^2))) + (a*b*x^6 + a^2)*(-1/
(a^7*b^5))^(1/6)*log(a^6*b^4*x*(-1/(a^7*b^5))^(5/6) - a^5*b^3*(-1
/(a^7*b^5))^(2/3) + x^2) - (a*b*x^6 + a^2)*(-1/(a^7*b^5))^(1/6)*l
og(-a^6*b^4*x*(-1/(a^7*b^5))^(5/6) - a^5*b^3*(-1/(a^7*b^5))^(2/3)
 + x^2) + 2*(a*b*x^6 + a^2)*(-1/(a^7*b^5))^(1/6)*log(a^6*b^4*(-1/
(a^7*b^5))^(5/6) + x) - 2*(a*b*x^6 + a^2)*(-1/(a^7*b^5))^(1/6)*lo
g(-a^6*b^4*(-1/(a^7*b^5))^(5/6) + x))/(a*b*x^6 + a^2)
```

Sympy [A] time = 4.13771, size = 46, normalized size = 0.2

$$\frac{x^5}{6a^2 + 6abx^6} + \operatorname{RootSum}\left(2176782336t^6a^7b^5 + 1, \left(t \mapsto t\log\left(60466176t^5a^6b^4 + x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(b*x**6+a)**2,x)
```

```
[Out] x**5/(6*a**2 + 6*a*b*x**6) + RootSum(2176782336*_t**6*a**7*b**5 +
 1, Lambda(_t, _t*log(60466176*_t**5*a**6*b**4 + x)))
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^6 + a)^2,x, algorithm="giac")
```

```
[Out] Exception raised: NotImplementedError
```

3.1334 $\int \frac{x^3}{(a+bx^6)^2}\,dx$

Optimal. Leaf size=142

$$-\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{18a^{4/3}b^{2/3}}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x^2}{\sqrt{3}\sqrt[3]{a}}\right)}{6\sqrt{3}a^{4/3}b^{2/3}}+\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x^2+b^{2/3}x^4\right)}{36a^{4/3}b^{2/3}}+\frac{x^4}{6a\left(a+bx^6\right)}$$

```
[Out] x^4/(6*a*(a + b*x^6)) - ArcTan[(a^(1/3) - 2*b^(1/3)*x^2)/(Sqrt[3]
*a^(1/3))]/(6*Sqrt[3]*a^(4/3)*b^(2/3)) - Log[a^(1/3) + b^(1/3)*x^
2]/(18*a^(4/3)*b^(2/3)) + Log[a^(2/3) - a^(1/3)*b^(1/3)*x^2 + b^(
2/3)*x^4]/(36*a^(4/3)*b^(2/3))
```

Rubi [A] time = 0.231423, antiderivative size = 142, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615

$$-\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{18a^{4/3}b^{2/3}}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x^2}{\sqrt{3}\sqrt[3]{a}}\right)}{6\sqrt{3}a^{4/3}b^{2/3}}+\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x^2+b^{2/3}x^4\right)}{36a^{4/3}b^{2/3}}+\frac{x^4}{6a\left(a+bx^6\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(a + b*x^6)^2,x]
```

```
[Out] x^4/(6*a*(a + b*x^6)) - ArcTan[(a^(1/3) - 2*b^(1/3)*x^2)/(Sqrt[3]
*a^(1/3))]/(6*Sqrt[3]*a^(4/3)*b^(2/3)) - Log[a^(1/3) + b^(1/3)*x^
2]/(18*a^(4/3)*b^(2/3)) + Log[a^(2/3) - a^(1/3)*b^(1/3)*x^2 + b^(
2/3)*x^4]/(36*a^(4/3)*b^(2/3))
```

Rubi in Sympy [A] time = 33.7226, size = 128, normalized size = 0.9

$$\frac{x^4}{6a\left(a+bx^6\right)}-\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{18a^{\frac{4}{3}}b^{\frac{2}{3}}}+\frac{\log\left(a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x^2+b^{\frac{2}{3}}x^4\right)}{36a^{\frac{4}{3}}b^{\frac{2}{3}}}-\frac{\sqrt{3}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}-\frac{2\sqrt[3]{b}x^2}{3}\right)}{\sqrt[3]{a}}\right)}{18a^{\frac{4}{3}}b^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(b*x**6+a)**2,x)
```

```
[Out] x**4/(6*a*(a + b*x**6)) - log(a**(1/3) + b**(1/3)*x**2)/(18*a**(4
/3)*b**(2/3)) + log(a**(2/3) - a**(1/3)*b**(1/3)*x**2 + b**(2/3)*
x**4)/(36*a**(4/3)*b**(2/3)) - sqrt(3)*atan(sqrt(3)*(a**(1/3)/3 -
 2*b**(1/3)*x**2/3)/a**(1/3))/(18*a**(4/3)*b**(2/3))
```

Mathematica [A] time = 0.267345, size = 195, normalized size = 1.37

$$\frac{-\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{b^{2/3}}+\frac{\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{b^{2/3}}+\frac{\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{b^{2/3}}-\frac{2\sqrt{3}\tan^{-1}\left(\sqrt{3}-\frac{2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{b^{2/3}}-\frac{2\sqrt{3}\tan^{-1}\left(\frac{2\sqrt[6]{b}x}{\sqrt[6]{a}}+\sqrt{3}\right)}{b^{2/3}}+\frac{6\sqrt[3]{a}\ldots}{a+b\ldots}}{36a^{4/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(a + b*x^6)^2,x]
```

```
[Out] ((6*a^(1/3)*x^4)/(a + b*x^6) - (2*Sqrt[3]*ArcTan[Sqrt[3] - (2*b^(
1/6)*x)/a^(1/6)])/b^(2/3) - (2*Sqrt[3]*ArcTan[Sqrt[3] + (2*b^(1/6
)*x)/a^(1/6)])/b^(2/3) - (2*Log[a^(1/3) + b^(1/3)*x^2])/b^(2/3) +
 Log[a^(1/3) - Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2]/b^(2/3) +
 Log[a^(1/3) + Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2]/b^(2/3))/
(36*a^(4/3))
```

Maple [A] time = 0.006, size = 123, normalized size = 0.9

$$\frac{x^4}{6\,a\,(bx^6+a)}-\frac{1}{18\,ab}\ln\left(x^2+\sqrt[3]{\frac{a}{b}}\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}+\frac{1}{36\,ab}\ln\left(x^4-x^2\sqrt[3]{\frac{a}{b}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}+\frac{\sqrt{3}}{18\,ab}\arctan\left(\frac{\sqrt{3}}{3}\left(2\,x^2\frac{1}{\sqrt[3]{\frac{a}{b}}}-1\right)\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(b*x^6+a)^2,x)
```

```
[Out] 1/6*x^4/a/(b*x^6+a)-1/18/a/b/(a/b)^(1/3)*ln(x^2+(a/b)^(1/3))+1/36
/a/b/(a/b)^(1/3)*ln(x^4-x^2*(a/b)^(1/3)+(a/b)^(2/3))+1/18/a*3^(1/
2)/b/(a/b)^(1/3)*arctan(1/3*3^(1/2)*(2/(a/b)^(1/3)*x^2-1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^6 + a)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.221748, size = 211, normalized size = 1.49

$$\frac{\sqrt{3}\left(6\sqrt{3}\left(-ab^2\right)^{\frac{1}{3}}x^4-\sqrt{3}\left(bx^6+a\right)\log\left(\left(-ab^2\right)^{\frac{1}{3}}bx^4+\left(-ab^2\right)^{\frac{2}{3}}x^2-ab\right)+2\sqrt{3}\left(bx^6+a\right)\log\left(\left(-ab^2\right)^{\frac{2}{3}}x^2+ab\right)-6\left(bx\right.\right.}{108\left(abx^6+a^2\right)\left(-ab^2\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^6 + a)^2,x, algorithm="fricas")
```

```
[Out] 1/108*sqrt(3)*(6*sqrt(3)*(-a*b^2)^(1/3)*x^4 - sqrt(3)*(b*x^6 + a)
*log((-a*b^2)^(1/3)*b*x^4 + (-a*b^2)^(2/3)*x^2 - a*b) + 2*sqrt(3)
*(b*x^6 + a)*log((-a*b^2)^(2/3)*x^2 + a*b) - 6*(b*x^6 + a)*arctan
(1/3*(2*sqrt(3)*(-a*b^2)^(2/3)*x^2 - sqrt(3)*a*b)/(a*b)))/((a*b*x
^6 + a^2)*(-a*b^2)^(1/3))
```

Sympy [A] time = 4.14417, size = 46, normalized size = 0.32

$$\frac{x^4}{6a^2+6abx^6}+\operatorname{RootSum}\left(5832t^3a^4b^2+1,\left(t\mapsto t\log\left(324t^2a^3b+x^2\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(b*x**6+a)**2,x)
```

```
[Out] x**4/(6*a**2 + 6*a*b*x**6) + RootSum(5832*_t**3*a**4*b**2 + 1, La
mbda(_t, _t*log(324*_t**2*a**3*b + x**2)))
```

GIAC/XCAS [A] time = 0.225969, size = 182, normalized size = 1.28

$$\frac{x^4}{6\,(bx^6+a)a} - \frac{\left(-\frac{a}{b}\right)^{\frac{2}{3}} \ln\left(\left|x^2 - \left(-\frac{a}{b}\right)^{\frac{1}{3}}\right|\right)}{18\,a^2} - \frac{\sqrt{3}\left(-ab^2\right)^{\frac{2}{3}} \arctan\left(\frac{\sqrt{3}\left(2\,x^2+\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{a}{b}\right)^{\frac{1}{3}}}\right)}{18\,a^2b^2} + \frac{\left(-ab^2\right)^{\frac{2}{3}} \ln\left(x^4 + x^2\left(-\frac{a}{b}\right)^{\frac{1}{3}} + \left(-\frac{a}{b}\right)^{\frac{2}{3}}\right)}{36\,a^2b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^6 + a)^2,x, algorithm="giac")
```

```
[Out] 1/6*x^4/((b*x^6 + a)*a) - 1/18*(-a/b)^(2/3)*ln(abs(x^2 - (-a/b)^(
1/3)))/a^2 - 1/18*sqrt(3)*(-a*b^2)^(2/3)*arctan(1/3*sqrt(3)*(2*x^
2 + (-a/b)^(1/3))/(-a/b)^(1/3))/(a^2*b^2) + 1/36*(-a*b^2)^(2/3)*l
n(x^4 + x^2*(-a/b)^(1/3) + (-a/b)^(2/3))/(a^2*b^2)
```

3.1335 $\int \frac{x^2}{(a+bx^6)^2} dx$

Optimal. Leaf size=49

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}x^3}{\sqrt{a}}\right)}{6a^{3/2}\sqrt{b}}+\frac{x^3}{6a(a+bx^6)}$$

```
[Out] x^3/(6*a*(a + b*x^6)) + ArcTan[(Sqrt[b]*x^3)/Sqrt[a]]/(6*a^(3/2)*
Sqrt[b])
```

Rubi [A] time = 0.0546486, antiderivative size = 49, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}x^3}{\sqrt{a}}\right)}{6a^{3/2}\sqrt{b}}+\frac{x^3}{6a(a+bx^6)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b*x^6)^2,x]
```

```
[Out] x^3/(6*a*(a + b*x^6)) + ArcTan[(Sqrt[b]*x^3)/Sqrt[a]]/(6*a^(3/2)*
Sqrt[b])
```

Rubi in Sympy [A] time = 6.70321, size = 39, normalized size = 0.8

$$\frac{x^3}{6a(a+bx^6)}+\frac{\operatorname{atan}\left(\frac{\sqrt{b}x^3}{\sqrt{a}}\right)}{6a^{\frac{3}{2}}\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(b*x**6+a)**2,x)
```

```
[Out] x**3/(6*a*(a + b*x**6)) + atan(sqrt(b)*x**3/sqrt(a))/(6*a**(3/2)*
sqrt(b))
```

Mathematica [A] time = 0.0543206, size = 49, normalized size = 1.

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}x^3}{\sqrt{a}}\right)}{6a^{3/2}\sqrt{b}}+\frac{x^3}{6a(a+bx^6)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a + b*x^6)^2,x]
```

```
[Out] x^3/(6*a*(a + b*x^6)) + ArcTan[(Sqrt[b]*x^3)/Sqrt[a]]/(6*a^(3/2)*
Sqrt[b])
```

Maple [A] time = 0.006, size = 40, normalized size = 0.8

$$\frac{x^3}{6\,a\,(bx^6+a)}+\frac{1}{6\,a}\arctan\left(bx^3\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(b*x^6+a)^2,x)
```

```
[Out] 1/6*x^3/a/(b*x^6+a)+1/6/a/(a*b)^(1/2)*arctan(x^3*b/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^6 + a)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.228052, size = 1, normalized size = 0.02

$$\left[\frac{2\sqrt{-ab}x^3 + \left(bx^6 + a\right)\log\left(\frac{2\,abx^3 + \left(bx^6 - a\right)\sqrt{-ab}}{bx^6 + a}\right)}{12\,(abx^6 + a^2)\sqrt{-ab}}, \frac{\sqrt{ab}x^3 + \left(bx^6 + a\right)\arctan\left(\frac{\sqrt{ab}x^3}{a}\right)}{6\,(abx^6 + a^2)\sqrt{ab}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^6 + a)^2,x, algorithm="fricas")
```

```
[Out] [1/12*(2*sqrt(-a*b)*x^3 + (b*x^6 + a)*log((2*a*b*x^3 + (b*x^6 - a
)*sqrt(-a*b))/(b*x^6 + a)))/((a*b*x^6 + a^2)*sqrt(-a*b)), 1/6*(sq
rt(a*b)*x^3 + (b*x^6 + a)*arctan(sqrt(a*b)*x^3/a))/((a*b*x^6 + a^
2)*sqrt(a*b))]
```

Sympy [A] time = 4.17074, size = 83, normalized size = 1.69

$$\frac{x^3}{6a^2 + 6abx^6} - \frac{\sqrt{-\frac{1}{a^3b}}\log\left(-a^2\sqrt{-\frac{1}{a^3b}} + x^3\right)}{12} + \frac{\sqrt{-\frac{1}{a^3b}}\log\left(a^2\sqrt{-\frac{1}{a^3b}} + x^3\right)}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(b*x**6+a)**2,x)
```

```
[Out] x**3/(6*a**2 + 6*a*b*x**6) - sqrt(-1/(a**3*b))*log(-a**2*sqrt(-1/
(a**3*b)) + x**3)/12 + sqrt(-1/(a**3*b))*log(a**2*sqrt(-1/(a**3*b
)) + x**3)/12
```

GIAC/XCAS [A] time = 0.221094, size = 53, normalized size = 1.08

$$\frac{x^3}{6\,(bx^6 + a)a} + \frac{\arctan\left(\frac{bx^3}{\sqrt{ab}}\right)}{6\,\sqrt{ab}a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^6 + a)^2,x, algorithm="giac")
```

```
[Out] 1/6*x^3/((b*x^6 + a)*a) + 1/6*arctan(b*x^3/sqrt(a*b))/(sqrt(a*b)*
a)
```

3.1336 $\int \frac{x}{(a+bx^6)^2}\,dx$

Optimal. Leaf size=142

$$-\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x^2+b^{2/3}x^4\right)}{18a^{5/3}\sqrt[3]{b}}+\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{9a^{5/3}\sqrt[3]{b}}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x^2}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{5/3}\sqrt[3]{b}}+\frac{x^2}{6a\left(a+bx^6\right)}$$

```
[Out] x^2/(6*a*(a + b*x^6)) - ArcTan[(a^(1/3) - 2*b^(1/3)*x^2)/(Sqrt[3]
*a^(1/3))]/(3*Sqrt[3]*a^(5/3)*b^(1/3)) + Log[a^(1/3) + b^(1/3)*x^
2]/(9*a^(5/3)*b^(1/3)) - Log[a^(2/3) - a^(1/3)*b^(1/3)*x^2 + b^(2
/3)*x^4]/(18*a^(5/3)*b^(1/3))
```

Rubi [A] time = 0.203497, antiderivative size = 142, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.727

$$-\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x^2+b^{2/3}x^4\right)}{18a^{5/3}\sqrt[3]{b}}+\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{9a^{5/3}\sqrt[3]{b}}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x^2}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{5/3}\sqrt[3]{b}}+\frac{x^2}{6a\left(a+bx^6\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b*x^6)^2,x]
```

```
[Out] x^2/(6*a*(a + b*x^6)) - ArcTan[(a^(1/3) - 2*b^(1/3)*x^2)/(Sqrt[3]
*a^(1/3))]/(3*Sqrt[3]*a^(5/3)*b^(1/3)) + Log[a^(1/3) + b^(1/3)*x^
2]/(9*a^(5/3)*b^(1/3)) - Log[a^(2/3) - a^(1/3)*b^(1/3)*x^2 + b^(2
/3)*x^4]/(18*a^(5/3)*b^(1/3))
```

Rubi in Sympy [A] time = 32.6616, size = 128, normalized size = 0.9

$$\frac{x^2}{6a\left(a+bx^6\right)}+\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{9a^{\frac{5}{3}}\sqrt[3]{b}}-\frac{\log\left(a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x^2+b^{\frac{2}{3}}x^4\right)}{18a^{\frac{5}{3}}\sqrt[3]{b}}-\frac{\sqrt{3}\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}-\frac{2\sqrt[3]{b}x^2}{3}\right)}{\sqrt[3]{a}}\right)}{9a^{\frac{5}{3}}\sqrt[3]{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(b*x**6+a)**2,x)
```

```
[Out] x**2/(6*a*(a + b*x**6)) + log(a**(1/3) + b**(1/3)*x**2)/(9*a**(5/
3)*b**(1/3)) - log(a**(2/3) - a**(1/3)*b**(1/3)*x**2 + b**(2/3)*x
**4)/(18*a**(5/3)*b**(1/3)) - sqrt(3)*atan(sqrt(3)*(a**(1/3)/3 -
2*b**(1/3)*x**2/3)/a**(1/3))/(9*a**(5/3)*b**(1/3))
```

Mathematica [A] time = 0.316849, size = 197, normalized size = 1.39

$$\frac{\frac{3a^{2/3}x^2}{a+bx^6}+\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{\sqrt[3]{b}}-\frac{\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{\sqrt[3]{b}}-\frac{\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{\sqrt[3]{b}}-\frac{2\sqrt{3}\tan^{-1}\left(\sqrt{3}-\frac{2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{\sqrt[3]{b}}-\frac{2\sqrt{3}\tan^{-1}\left(\frac{2\sqrt[6]{b}x}{\sqrt[6]{a}}+\sqrt{3}\right)}{\sqrt[3]{b}}}{18a^{5/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b*x^6)^2,x]
```

```
[Out] ((3*a^(2/3)*x^2)/(a + b*x^6) - (2*Sqrt[3]*ArcTan[Sqrt[3] - (2*b^(
1/6)*x)/a^(1/6)])/b^(1/3) - (2*Sqrt[3]*ArcTan[Sqrt[3] + (2*b^(1/6
)*x)/a^(1/6)])/b^(1/3) + (2*Log[a^(1/3) + b^(1/3)*x^2])/b^(1/3) -
 Log[a^(1/3) - Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2]/b^(1/3) -
 Log[a^(1/3) + Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2]/b^(1/3))/
(18*a^(5/3))
```

Maple [A] time = 0.006, size = 123, normalized size = 0.9

$$\frac{x^2}{6\,a\,(bx^6+a)}+\frac{1}{9\,ab}\ln\left(x^2+\sqrt[3]{\frac{a}{b}}\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}-\frac{1}{18\,ab}\ln\left(x^4-x^2\sqrt[3]{\frac{a}{b}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}+\frac{\sqrt{3}}{9\,ab}\arctan\left(\frac{\sqrt{3}}{3}\left(2\,x^2\frac{1}{\sqrt[3]{\frac{a}{b}}}-1\right)\right)\left(\frac{a}{b}\right)^{-\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(b*x^6+a)^2,x)
```

```
[Out] 1/6*x^2/a/(b*x^6+a)+1/9/a/b/(a/b)^(2/3)*ln(x^2+(a/b)^(1/3))-1/18/
a/b/(a/b)^(2/3)*ln(x^4-x^2*(a/b)^(1/3)+(a/b)^(2/3))+1/9/a/b/(a/b)
^(2/3)*3^(1/2)*arctan(1/3*3^(1/2)*(2/(a/b)^(1/3)*x^2-1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^6 + a)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.226715, size = 194, normalized size = 1.37

$$\frac{\sqrt{3}\left(3\,\sqrt{3}\,\left(a^2b\right)^{\frac{1}{3}}x^2-\sqrt{3}(bx^6+a)\log\left(\left(a^2b\right)^{\frac{2}{3}}x^4-\left(a^2b\right)^{\frac{1}{3}}ax^2+a^2\right)+2\,\sqrt{3}(bx^6+a)\log\left(\left(a^2b\right)^{\frac{1}{3}}x^2+a\right)+6\,(bx^6+a)\,\mathrm{ar}\right.}{54\,(abx^6+a^2)\,(a^2b)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^6 + a)^2,x, algorithm="fricas")
```

```
[Out] 1/54*sqrt(3)*(3*sqrt(3)*(a^2*b)^(1/3)*x^2 - sqrt(3)*(b*x^6 + a)*l
og((a^2*b)^(2/3)*x^4 - (a^2*b)^(1/3)*a*x^2 + a^2) + 2*sqrt(3)*(b*
x^6 + a)*log((a^2*b)^(1/3)*x^2 + a) + 6*(b*x^6 + a)*arctan(1/3*(2
*sqrt(3)*(a^2*b)^(1/3)*x^2 - sqrt(3)*a)/a))/((a*b*x^6 + a^2)*(a^2
*b)^(1/3))
```

Sympy [A] time = 4.16912, size = 41, normalized size = 0.29

$$\frac{x^2}{6a^2+6abx^6}+\mathrm{RootSum}\left(729t^3a^5b-1,\left(t\mapsto t\log\left(9ta^2+x^2\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x**6+a)**2,x)
```

```
[Out] x**2/(6*a**2 + 6*a*b*x**6) + RootSum(729*_t**3*a**5*b - 1, Lambda
(_t, _t*log(9*_t*a**2 + x**2)))
```

GIAC/XCAS [A] time = 0.225749, size = 182, normalized size = 1.28

$$\frac{x^2}{6\,(bx^6+a)a} - \frac{\left(-\frac{a}{b}\right)^{\frac{1}{3}}\ln\left(\left|x^2-\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right|\right)}{9\,a^2} + \frac{\sqrt{3}\left(-ab^2\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x^2+\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{a}{b}\right)^{\frac{1}{3}}}\right)}{9\,a^2b} + \frac{\left(-ab^2\right)^{\frac{1}{3}}\ln\left(x^4+x^2\left(-\frac{a}{b}\right)^{\frac{1}{3}}+\left(-\frac{a}{b}\right)^{\frac{2}{3}}\right)}{18\,a^2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^6 + a)^2,x, algorithm="giac")
```

```
[Out] 1/6*x^2/((b*x^6 + a)*a) - 1/9*(-a/b)^(1/3)*ln(abs(x^2 - (-a/b)^(1
/3)))/a^2 + 1/9*sqrt(3)*(-a*b^2)^(1/3)*arctan(1/3*sqrt(3)*(2*x^2
+ (-a/b)^(1/3))/(-a/b)^(1/3))/(a^2*b) + 1/18*(-a*b^2)^(1/3)*ln(x^
4 + x^2*(-a/b)^(1/3) + (-a/b)^(2/3))/(a^2*b)
```

3.1337 $\int \frac{1}{(a+bx^6)^2} \, dx$

Optimal. Leaf size=232

$$-\frac{5\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{24\sqrt{3}a^{11/6}\sqrt[6]{b}}+\frac{5\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{24\sqrt{3}a^{11/6}\sqrt[6]{b}}+\frac{5\tan^{-1}\left(\frac{\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{18a^{11/6}\sqrt[6]{b}}-\frac{5\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{a}-2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{36a^{11/6}\sqrt[6]{b}}+\frac{5\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{a}+2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{36a^{11/6}\sqrt[6]{b}}+\frac{x}{6a\left(a+bx^6\right)}$$

```
[Out] x/(6*a*(a + b*x^6)) + (5*ArcTan[(b^(1/6)*x)/a^(1/6)])/(18*a^(11/6
)*b^(1/6)) - (5*ArcTan[(Sqrt[3]*a^(1/6) - 2*b^(1/6)*x)/a^(1/6)])/
(36*a^(11/6)*b^(1/6)) + (5*ArcTan[(Sqrt[3]*a^(1/6) + 2*b^(1/6)*x)
/a^(1/6)])/(36*a^(11/6)*b^(1/6)) - (5*Log[a^(1/3) - Sqrt[3]*a^(1/
6)*b^(1/6)*x + b^(1/3)*x^2])/(24*Sqrt[3]*a^(11/6)*b^(1/6)) + (5*L
og[a^(1/3) + Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2])/(24*Sqrt[3
]*a^(11/6)*b^(1/6))
```

Rubi [A] time = 0.76468, antiderivative size = 232, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 7, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.778

$$-\frac{5\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{24\sqrt{3}a^{11/6}\sqrt[6]{b}}+\frac{5\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{24\sqrt{3}a^{11/6}\sqrt[6]{b}}+\frac{5\tan^{-1}\left(\frac{\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{18a^{11/6}\sqrt[6]{b}}-\frac{5\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{a}-2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{36a^{11/6}\sqrt[6]{b}}+\frac{5\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{a}+2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{36a^{11/6}\sqrt[6]{b}}+\frac{x}{6a\left(a+bx^6\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^6)^(-2),x]
```

```
[Out] x/(6*a*(a + b*x^6)) + (5*ArcTan[(b^(1/6)*x)/a^(1/6)])/(18*a^(11/6
)*b^(1/6)) - (5*ArcTan[(Sqrt[3]*a^(1/6) - 2*b^(1/6)*x)/a^(1/6)])/
(36*a^(11/6)*b^(1/6)) + (5*ArcTan[(Sqrt[3]*a^(1/6) + 2*b^(1/6)*x)
/a^(1/6)])/(36*a^(11/6)*b^(1/6)) - (5*Log[a^(1/3) - Sqrt[3]*a^(1/
6)*b^(1/6)*x + b^(1/3)*x^2])/(24*Sqrt[3]*a^(11/6)*b^(1/6)) + (5*L
og[a^(1/3) + Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2])/(24*Sqrt[3
]*a^(11/6)*b^(1/6))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**6+a)**2,x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.253866, size = 192, normalized size = 0.83

$$\frac{\frac{12a^{5/6}x}{a+bx^6}-\frac{5\sqrt{3}\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{\sqrt[6]{b}}+\frac{5\sqrt{3}\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{\sqrt[6]{b}}+\frac{20\tan^{-1}\left(\frac{\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{\sqrt[6]{b}}-\frac{10\tan^{-1}\left(\sqrt{3}-\frac{2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{\sqrt[6]{b}}+\frac{10\tan^{-1}\left(\frac{2\sqrt[6]{b}x}{\sqrt[6]{a}}+\right.}{\sqrt[6]{b}}}{72a^{11/6}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^6)^(-2),x]
```

```
[Out] ((12*a^(5/6)*x)/(a + b*x^6) + (20*ArcTan[(b^(1/6)*x)/a^(1/6)])/b^
(1/6) - (10*ArcTan[Sqrt[3] - (2*b^(1/6)*x)/a^(1/6)])/b^(1/6) + (1
0*ArcTan[Sqrt[3] + (2*b^(1/6)*x)/a^(1/6)])/b^(1/6) - (5*Sqrt[3]*L
og[a^(1/3) - Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2])/b^(1/6) +
(5*Sqrt[3]*Log[a^(1/3) + Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2]
)/b^(1/6))/(72*a^(11/6))
```

Maple [B] time = 0.322, size = 346, normalized size = 1.5

$$\frac{x}{18\,a^2}\sqrt[3]{\frac{a}{b}}\left(x^2+\sqrt[3]{\frac{a}{b}}\right)^{-1}+\frac{5}{18\,a^2}\sqrt[6]{\frac{a}{b}}\arctan\left(x\frac{1}{\sqrt[6]{\frac{a}{b}}}\right)$$
$$-\frac{x}{36\,a^2}\sqrt[3]{\frac{a}{b}}\left(x^2-\sqrt{3}\sqrt[6]{\frac{a}{b}}x+\sqrt[3]{\frac{a}{b}}\right)^{-1}+\frac{\sqrt{3}}{36\,a^2}\sqrt{\frac{a}{b}}\left(x^2-\sqrt{3}\sqrt[6]{\frac{a}{b}}x+\sqrt[3]{\frac{a}{b}}\right)^{-1}$$
$$-\frac{5\sqrt{3}}{72\,a^2}\sqrt[6]{\frac{a}{b}}\ln\left(\sqrt{3}\sqrt[6]{\frac{a}{b}}x-x^2-\sqrt[3]{\frac{a}{b}}\right)+\frac{5}{36\,a^2}\sqrt[6]{\frac{a}{b}}\arctan\left(-\sqrt{3}+2\,x\frac{1}{\sqrt[6]{\frac{a}{b}}}\right)$$
$$-\frac{x}{36\,a^2}\sqrt[3]{\frac{a}{b}}\left(x^2+\sqrt{3}\sqrt[6]{\frac{a}{b}}x+\sqrt[3]{\frac{a}{b}}\right)^{-1}-\frac{\sqrt{3}}{36\,a^2}\sqrt{\frac{a}{b}}\left(x^2+\sqrt{3}\sqrt[6]{\frac{a}{b}}x+\sqrt[3]{\frac{a}{b}}\right)^{-1}$$
$$+\frac{5\sqrt{3}}{72\,a^2}\sqrt[6]{\frac{a}{b}}\ln\left(x^2+\sqrt{3}\sqrt[6]{\frac{a}{b}}x+\sqrt[3]{\frac{a}{b}}\right)+\frac{5}{36\,a^2}\sqrt[6]{\frac{a}{b}}\arctan\left(2\,x\frac{1}{\sqrt[6]{\frac{a}{b}}}+\sqrt{3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^6+a)^2,x)
```

```
[Out] 1/18*(a/b)^(1/3)/a^2*x/(x^2+(a/b)^(1/3))+5/18*(a/b)^(1/6)/a^2*arc
tan(x/(a/b)^(1/6))-1/36/a^2/(x^2-3^(1/2)*(a/b)^(1/6)*x+(a/b)^(1/3
))*x*(a/b)^(1/3)+1/36/a^2/(x^2-3^(1/2)*(a/b)^(1/6)*x+(a/b)^(1/3))
*(a/b)^(1/2)*3^(1/2)-5/72/a^2*3^(1/2)*(a/b)^(1/6)*ln(3^(1/2)*(a/b
)^(1/6)*x-x^2-(a/b)^(1/3))+5/36/a^2*(a/b)^(1/6)*arctan(-3^(1/2)+2
*x/(a/b)^(1/6))-1/36/a^2/(x^2+3^(1/2)*(a/b)^(1/6)*x+(a/b)^(1/3))*
x*(a/b)^(1/3)-1/36/a^2/(x^2+3^(1/2)*(a/b)^(1/6)*x+(a/b)^(1/3))*(a
/b)^(1/2)*3^(1/2)+5/72/a^2*3^(1/2)*(a/b)^(1/6)*ln(x^2+3^(1/2)*(a/
b)^(1/6)*x+(a/b)^(1/3))+5/36/a^2*(a/b)^(1/6)*arctan(2*x/(a/b)^(1/
6)+3^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^6 + a)^(-2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.242164, size = 556, normalized size = 2.4

$$-\frac{20\,\sqrt{3}\left(abx^6+a^2\right)\left(-\frac{1}{a^{11}b}\right)^{\frac{1}{6}}\arctan\left(\frac{\sqrt{3}a^2\left(-\frac{1}{a^{11}b}\right)^{\frac{1}{6}}}{a^2\left(-\frac{1}{a^{11}b}\right)^{\frac{1}{6}}+2\,x+2\,\sqrt{a^4\left(-\frac{1}{a^{11}b}\right)^{\frac{1}{3}}+a^2x\left(-\frac{1}{a^{11}b}\right)^{\frac{1}{6}}+x^2}}\right)+20\,\sqrt{3}\left(abx^6+a^2\right)\left(-\frac{1}{a^{11}b}\right)^{\frac{1}{6}}\arctan\left(-\cdots\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^6 + a)^(-2),x, algorithm="fricas")
```

```
[Out] -1/72*(20*sqrt(3)*(a*b*x^6 + a^2)*(-1/(a^11*b))^(1/6)*arctan(sqrt
(3)*a^2*(-1/(a^11*b))^(1/6)/(a^2*(-1/(a^11*b))^(1/6) + 2*x + 2*sq
rt(a^4*(-1/(a^11*b))^(1/3) + a^2*x*(-1/(a^11*b))^(1/6) + x^2))) +
 20*sqrt(3)*(a*b*x^6 + a^2)*(-1/(a^11*b))^(1/6)*arctan(-sqrt(3)*a
^2*(-1/(a^11*b))^(1/6)/(a^2*(-1/(a^11*b))^(1/6) - 2*x - 2*sqrt(a^
4*(-1/(a^11*b))^(1/3) - a^2*x*(-1/(a^11*b))^(1/6) + x^2))) - 5*(a
*b*x^6 + a^2)*(-1/(a^11*b))^(1/6)*log(a^4*(-1/(a^11*b))^(1/3) + a
^2*x*(-1/(a^11*b))^(1/6) + x^2) + 5*(a*b*x^6 + a^2)*(-1/(a^11*b))
^(1/6)*log(a^4*(-1/(a^11*b))^(1/3) - a^2*x*(-1/(a^11*b))^(1/6) +
x^2) - 10*(a*b*x^6 + a^2)*(-1/(a^11*b))^(1/6)*log(a^2*(-1/(a^11*b
))^(1/6) + x) + 10*(a*b*x^6 + a^2)*(-1/(a^11*b))^(1/6)*log(-a^2*(
-1/(a^11*b))^(1/6) + x) - 12*x)/(a*b*x^6 + a^2)
```

Sympy [A] time = 4.28605, size = 39, normalized size = 0.17

$$\frac{x}{6a^2+6abx^6}+\operatorname{RootSum}\left(2176782336t^6a^{11}b+15625,\left(t\mapsto t\log\left(\frac{36ta^2}{5}+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**6+a)**2,x)
```

```
[Out] x/(6*a**2 + 6*a*b*x**6) + RootSum(2176782336*_t**6*a**11*b + 1562
5, Lambda(_t, _t*log(36*_t*a**2/5 + x)))
```

GIAC/XCAS [A] time = 0.221906, size = 277, normalized size = 1.19

$$\frac{x}{6\left(bx^6+a\right)a}+\frac{5\sqrt{3}\left(ab^5\right)^{\frac{1}{6}}\ln\left(x^2+\sqrt{3}x\left(\frac{a}{b}\right)^{\frac{1}{6}}+\left(\frac{a}{b}\right)^{\frac{1}{3}}\right)}{72\,a^2b}-\frac{5\sqrt{3}\left(ab^5\right)^{\frac{1}{6}}\ln\left(x^2-\sqrt{3}x\left(\frac{a}{b}\right)^{\frac{1}{6}}+\left(\frac{a}{b}\right)^{\frac{1}{3}}\right)}{72\,a^2b}+\frac{5\left(ab^5\right)^{\frac{1}{6}}\arctan\left(\frac{2\,x+\sqrt{3}\left(\frac{a}{b}\right)^{\frac{1}{6}}}{\left(\frac{a}{b}\right)^{\frac{1}{6}}}\right)}{36\,a^2b}+\frac{5\left(ab^5\right)^{\frac{1}{6}}\arctan\left(\frac{2\,x-\sqrt{3}\left(\frac{a}{b}\right)^{\frac{1}{6}}}{\left(\frac{a}{b}\right)^{\frac{1}{6}}}\right)}{36\,a^2b}+\frac{5\left(ab^5\right)^{\frac{1}{6}}\arctan\left(\frac{x}{\left(\frac{a}{b}\right)^{\frac{1}{6}}}\right)}{18\,a^2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^6 + a)^(-2),x, algorithm="giac")
```

```
[Out] 1/6*x/((b*x^6 + a)*a) + 5/72*sqrt(3)*(a*b^5)^(1/6)*ln(x^2 + sqrt(
3)*x*(a/b)^(1/6) + (a/b)^(1/3))/(a^2*b) - 5/72*sqrt(3)*(a*b^5)^(1
/6)*ln(x^2 - sqrt(3)*x*(a/b)^(1/6) + (a/b)^(1/3))/(a^2*b) + 5/36*
(a*b^5)^(1/6)*arctan((2*x + sqrt(3)*(a/b)^(1/6))/(a/b)^(1/6))/(a^
2*b) + 5/36*(a*b^5)^(1/6)*arctan((2*x - sqrt(3)*(a/b)^(1/6))/(a/b
)^(1/6))/(a^2*b) + 5/18*(a*b^5)^(1/6)*arctan(x/(a/b)^(1/6))/(a^2*
b)
```

3.1338 $\int \frac{1}{x(a+bx^6)^2}\,dx$

Optimal. Leaf size=38

$$-\frac{\log\left(a+bx^6\right)}{6a^2}+\frac{\log(x)}{a^2}+\frac{1}{6a\left(a+bx^6\right)}$$

```
[Out] 1/(6*a*(a + b*x^6)) + Log[x]/a^2 - Log[a + b*x^6]/(6*a^2)
```

Rubi [A] time = 0.0607913, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{\log\left(a+bx^6\right)}{6a^2}+\frac{\log(x)}{a^2}+\frac{1}{6a\left(a+bx^6\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a + b*x^6)^2),x]
```

```
[Out] 1/(6*a*(a + b*x^6)) + Log[x]/a^2 - Log[a + b*x^6]/(6*a^2)
```

Rubi in Sympy [A] time = 8.77783, size = 34, normalized size = 0.89

$$\frac{1}{6a\left(a+bx^6\right)}+\frac{\log\left(x^6\right)}{6a^2}-\frac{\log\left(a+bx^6\right)}{6a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(b*x**6+a)**2,x)
```

```
[Out] 1/(6*a*(a + b*x**6)) + log(x**6)/(6*a**2) - log(a + b*x**6)/(6*a*
*2)
```

Mathematica [A] time = 0.0239814, size = 33, normalized size = 0.87

$$\frac{\frac{a}{a+bx^6}-\log\left(a+bx^6\right)+6\log(x)}{6a^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a + b*x^6)^2),x]
```

```
[Out] (a/(a + b*x^6) + 6*Log[x] - Log[a + b*x^6])/(6*a^2)
```

Maple [A] time = 0.017, size = 35, normalized size = 0.9

$$\frac{1}{6\,a\left(bx^6+a\right)}+\frac{\ln(x)}{a^2}-\frac{\ln\left(bx^6+a\right)}{6\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(b*x^6+a)^2,x)
```

```
[Out] 1/6/a/(b*x^6+a)+ln(x)/a^2-1/6*ln(b*x^6+a)/a^2
```

Maxima [A] time = 1.44505, size = 50, normalized size = 1.32

$$\frac{1}{6\,(abx^6+a^2)}-\frac{\log\left(bx^6+a\right)}{6\,a^2}+\frac{\log\left(x^6\right)}{6\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^6 + a)^2*x),x, algorithm="maxima")
```

```
[Out] 1/6/(a*b*x^6 + a^2) - 1/6*log(b*x^6 + a)/a^2 + 1/6*log(x^6)/a^2
```

Fricas [A] time = 0.223488, size = 63, normalized size = 1.66

$$-\frac{\left(bx^6+a\right)\log\left(bx^6+a\right)-6\left(bx^6+a\right)\log\left(x\right)-a}{6\,(a^2bx^6+a^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^6 + a)^2*x),x, algorithm="fricas")
```

```
[Out] -1/6*((b*x^6 + a)*log(b*x^6 + a) - 6*(b*x^6 + a)*log(x) - a)/(a^2
*b*x^6 + a^3)
```

Sympy [A] time = 6.99444, size = 34, normalized size = 0.89

$$\frac{1}{6a^2+6abx^6}+\frac{\log\left(x\right)}{a^2}-\frac{\log\left(\frac{a}{b}+x^6\right)}{6a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(b*x**6+a)**2,x)
```

```
[Out] 1/(6*a**2 + 6*a*b*x**6) + log(x)/a**2 - log(a/b + x**6)/(6*a**2)
```

GIAC/XCAS [A] time = 0.223051, size = 63, normalized size = 1.66

$$\frac{\ln\left(x^6\right)}{6\,a^2}-\frac{\ln\left(\left|bx^6+a\right|\right)}{6\,a^2}+\frac{bx^6+2\,a}{6\,(bx^6+a)a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^6 + a)^2*x),x, algorithm="giac")
```

```
[Out] 1/6*ln(x^6)/a^2 - 1/6*ln(abs(b*x^6 + a))/a^2 + 1/6*(b*x^6 + 2*a)/
((b*x^6 + a)*a^2)
```

3.1339 $\int \frac{1}{x^2(a+bx^6)^2} \, dx$

Optimal. Leaf size=244

$$-\frac{7\sqrt[6]{b}\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{24\sqrt{3}a^{13/6}}+\frac{7\sqrt[6]{b}\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{24\sqrt{3}a^{13/6}}-\frac{7\sqrt[6]{b}\tan^{-1}\left(\frac{\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{18a^{13/6}}+\frac{7\sqrt[6]{b}\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{a}-2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{36a^{13/6}}-\frac{7\sqrt[6]{b}\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{a}+2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{36a^{13/6}}-\frac{7}{6a^2x}+\frac{1}{6ax(a+bx^6)}$$

```
[Out] -7/(6*a^2*x) + 1/(6*a*x*(a + b*x^6)) - (7*b^(1/6)*ArcTan[(b^(1/6)
*x)/a^(1/6)])/(18*a^(13/6)) + (7*b^(1/6)*ArcTan[(Sqrt[3]*a^(1/6)
- 2*b^(1/6)*x)/a^(1/6)])/(36*a^(13/6)) - (7*b^(1/6)*ArcTan[(Sqrt[
3]*a^(1/6) + 2*b^(1/6)*x)/a^(1/6)])/(36*a^(13/6)) - (7*b^(1/6)*Lo
g[a^(1/3) - Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2])/(24*Sqrt[3]
*a^(13/6)) + (7*b^(1/6)*Log[a^(1/3) + Sqrt[3]*a^(1/6)*b^(1/6)*x +
 b^(1/3)*x^2])/(24*Sqrt[3]*a^(13/6))
```

Rubi [A] time = 1.1646, antiderivative size = 244, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615

$$-\frac{7\sqrt[6]{b}\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{24\sqrt{3}a^{13/6}}+\frac{7\sqrt[6]{b}\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{24\sqrt{3}a^{13/6}}-\frac{7\sqrt[6]{b}\tan^{-1}\left(\frac{\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{18a^{13/6}}+\frac{7\sqrt[6]{b}\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{a}-2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{36a^{13/6}}-\frac{7\sqrt[6]{b}\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{a}+2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)}{36a^{13/6}}-\frac{7}{6a^2x}+\frac{1}{6ax(a+bx^6)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(a + b*x^6)^2),x]
```

```
[Out] -7/(6*a^2*x) + 1/(6*a*x*(a + b*x^6)) - (7*b^(1/6)*ArcTan[(b^(1/6)
*x)/a^(1/6)])/(18*a^(13/6)) + (7*b^(1/6)*ArcTan[(Sqrt[3]*a^(1/6)
- 2*b^(1/6)*x)/a^(1/6)])/(36*a^(13/6)) - (7*b^(1/6)*ArcTan[(Sqrt[
3]*a^(1/6) + 2*b^(1/6)*x)/a^(1/6)])/(36*a^(13/6)) - (7*b^(1/6)*Lo
g[a^(1/3) - Sqrt[3]*a^(1/6)*b^(1/6)*x + b^(1/3)*x^2])/(24*Sqrt[3]
*a^(13/6)) + (7*b^(1/6)*Log[a^(1/3) + Sqrt[3]*a^(1/6)*b^(1/6)*x +
 b^(1/3)*x^2])/(24*Sqrt[3]*a^(13/6))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(b*x**6+a)**2,x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.361149, size = 205, normalized size = 0.84

$$\frac{-7\sqrt{3}\sqrt[6]{b}\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)+7\sqrt{3}\sqrt[6]{b}\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)-\frac{12\sqrt[6]{a}bx^5}{a+bx^6}-28\sqrt[6]{b}\tan^{-1}\left(\frac{\sqrt[6]{b}x}{\sqrt[6]{a}}\right)+14\sqrt[6]{b}}{72a^{13/6}}$$

Antiderivative was successfully verified.

```
[In]   Integrate[1/(x^2*(a + b*x^6)^2),x]
```

```
[Out] ((-72*a^(1/6))/x - (12*a^(1/6)*b*x^5)/(a + b*x^6) - 28*b^(1/6)*Ar
cTan[(b^(1/6)*x)/a^(1/6)] + 14*b^(1/6)*ArcTan[Sqrt[3] - (2*b^(1/6
)*x)/a^(1/6)] - 14*b^(1/6)*ArcTan[Sqrt[3] + (2*b^(1/6)*x)/a^(1/6)
] - 7*Sqrt[3]*b^(1/6)*Log[a^(1/3) - Sqrt[3]*a^(1/6)*b^(1/6)*x + b
^(1/3)*x^2] + 7*Sqrt[3]*b^(1/6)*Log[a^(1/3) + Sqrt[3]*a^(1/6)*b^(
1/6)*x + b^(1/3)*x^2])/(72*a^(13/6))
```

Maple [A] time = 0.017, size = 190, normalized size = 0.8

$$-\frac{1}{xa^{2}}-\frac{bx^{5}}{6\,a^{2}\left(bx^{6}+a\right)}-\frac{7}{18\,a^{2}}\arctan\left(x\frac{1}{\sqrt[6]{\frac{a}{b}}}\right)\frac{1}{\sqrt[6]{\frac{a}{b}}}-\frac{7\,b\sqrt{3}}{72\,a^{3}}\left(\frac{a}{b}\right)^{\frac{5}{6}}\ln\left(\sqrt{3}\sqrt[6]{\frac{a}{b}}x-x^{2}-\sqrt[3]{\frac{a}{b}}\right)-\frac{7}{36\,a^{2}}\arctan\left(-\sqrt{3}+2\,x\frac{1}{\sqrt[6]{\frac{a}{b}}}\right)\frac{1}{\sqrt[6]{\frac{a}{b}}}+\frac{7\,b\sqrt{3}}{72\,a^{3}}\left(\frac{a}{b}\right)^{\frac{5}{6}}\ln\left(x^{2}+\sqrt{3}\sqrt[6]{\frac{a}{b}}x+\sqrt[3]{\frac{a}{b}}\right)-\frac{7}{36\,a^{2}}\arctan\left(2\,x\frac{1}{\sqrt[6]{\frac{a}{b}}}+\sqrt{3}\right)\frac{1}{\sqrt[6]{\frac{a}{b}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^2/(b*x^6+a)^2,x)
```

```
[Out] -1/a^2/x-1/6*b/a^2*x^5/(b*x^6+a)-7/18/a^2/(a/b)^(1/6)*arctan(x/(a
/b)^(1/6))-7/72*b/a^3*3^(1/2)*(a/b)^(5/6)*ln(3^(1/2)*(a/b)^(1/6)*
x-x^2-(a/b)^(1/3))-7/36/a^2/(a/b)^(1/6)*arctan(-3^(1/2)+2*x/(a/b)
^(1/6))+7/72*b/a^3*3^(1/2)*(a/b)^(5/6)*ln(x^2+3^(1/2)*(a/b)^(1/6)
*x+(a/b)^(1/3))-7/36/a^2/(a/b)^(1/6)*arctan(2*x/(a/b)^(1/6)+3^(1/
2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((b*x^6 + a)^2*x^2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.249689, size = 594, normalized size = 2.43

$$-\frac{84\,bx^{6}+28\,\sqrt{3}\left(a^{2}bx^{7}+a^{3}x\right)\left(-\frac{b}{a^{13}}\right)^{\frac{1}{6}}\arctan\left(\frac{\sqrt{3}a^{11}\left(-\frac{b}{a^{13}}\right)^{\frac{5}{6}}}{a^{11}\left(-\frac{b}{a^{13}}\right)^{\frac{5}{6}}+2\,bx+2\,b\sqrt{\frac{a^{11}x\left(-\frac{b}{a^{13}}\right)^{\frac{5}{6}}-a^{9}\left(-\frac{b}{a^{13}}\right)^{\frac{2}{3}}+bx^{2}}{b}}}\right)+28\,\sqrt{3}\left(a^{2}bx^{7}+a^{3}x\right)\left(-\frac{b}{a^{13}}\right)}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^6 + a)^2*x^2),x, algorithm="fricas")
```

```
[Out] -1/72*(84*b*x^6 + 28*sqrt(3)*(a^2*b*x^7 + a^3*x)*(-b/a^13)^(1/6)*
arctan(sqrt(3)*a^11*(-b/a^13)^(5/6)/(a^11*(-b/a^13)^(5/6) + 2*b*x
 + 2*b*sqrt((a^11*x*(-b/a^13)^(5/6) - a^9*(-b/a^13)^(2/3) + b*x^2
)/b))) + 28*sqrt(3)*(a^2*b*x^7 + a^3*x)*(-b/a^13)^(1/6)*arctan(-s
qrt(3)*a^11*(-b/a^13)^(5/6)/(a^11*(-b/a^13)^(5/6) - 2*b*x - 2*b*s
qrt(-(a^11*x*(-b/a^13)^(5/6) + a^9*(-b/a^13)^(2/3) - b*x^2)/b)))
+ 7*(a^2*b*x^7 + a^3*x)*(-b/a^13)^(1/6)*log(16807*a^11*x*(-b/a^13
)^(5/6) - 16807*a^9*(-b/a^13)^(2/3) + 16807*b*x^2) - 7*(a^2*b*x^7
 + a^3*x)*(-b/a^13)^(1/6)*log(-16807*a^11*x*(-b/a^13)^(5/6) - 168
07*a^9*(-b/a^13)^(2/3) + 16807*b*x^2) + 14*(a^2*b*x^7 + a^3*x)*(-
b/a^13)^(1/6)*log(16807*a^11*(-b/a^13)^(5/6) + 16807*b*x) - 14*(a
^2*b*x^7 + a^3*x)*(-b/a^13)^(1/6)*log(-16807*a^11*(-b/a^13)^(5/6)
 + 16807*b*x) + 72*a)/(a^2*b*x^7 + a^3*x)
```

Sympy [A] time = 11.6451, size = 54, normalized size = 0.22

$$-\frac{6a+7bx^6}{6a^3x+6a^2bx^7}+\operatorname{RootSum}\left(2176782336t^6a^{13}+117649b,\left(t\mapsto t\log\left(-\frac{60466176t^5a^{11}}{16807b}+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(b*x**6+a)**2,x)
```

```
[Out] -(6*a + 7*b*x**6)/(6*a**3*x + 6*a**2*b*x**7) + RootSum(2176782336
*_t**6*a**13 + 117649*b, Lambda(_t, _t*log(-60466176*_t**5*a**11/
(16807*b) + x)))
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^6 + a)^2*x^2),x, algorithm="giac")
```

```
[Out] Exception raised: NotImplementedError
```

3.1340 $\int \frac{1}{x^3(a+bx^6)^2} dx$

Optimal. Leaf size=152

$$-\frac{\sqrt[3]{b}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x^2+b^{2/3}x^4\right)}{9a^{7/3}}+\frac{2\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{9a^{7/3}}+\frac{2\sqrt[3]{b}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x^2}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{7/3}}-\frac{2}{3a^2x^2}+\frac{1}{6ax^2(a+bx^6)}$$

```
[Out] -2/(3*a^2*x^2) + 1/(6*a*x^2*(a + b*x^6)) + (2*b^(1/3)*ArcTan[(a^(
1/3) - 2*b^(1/3)*x^2)/(Sqrt[3]*a^(1/3))])/(3*Sqrt[3]*a^(7/3)) + (
2*b^(1/3)*Log[a^(1/3) + b^(1/3)*x^2])/(9*a^(7/3)) - (b^(1/3)*Log[
a^(2/3) - a^(1/3)*b^(1/3)*x^2 + b^(2/3)*x^4])/(9*a^(7/3))
```

Rubi [A] time = 0.261644, antiderivative size = 152, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 9, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.692

$$-\frac{\sqrt[3]{b}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x^2+b^{2/3}x^4\right)}{9a^{7/3}}+\frac{2\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{9a^{7/3}}+\frac{2\sqrt[3]{b}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x^2}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{7/3}}-\frac{2}{3a^2x^2}+\frac{1}{6ax^2(a+bx^6)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(a + b*x^6)^2),x]
```

```
[Out] -2/(3*a^2*x^2) + 1/(6*a*x^2*(a + b*x^6)) + (2*b^(1/3)*ArcTan[(a^(
1/3) - 2*b^(1/3)*x^2)/(Sqrt[3]*a^(1/3))])/(3*Sqrt[3]*a^(7/3)) + (
2*b^(1/3)*Log[a^(1/3) + b^(1/3)*x^2])/(9*a^(7/3)) - (b^(1/3)*Log[
a^(2/3) - a^(1/3)*b^(1/3)*x^2 + b^(2/3)*x^4])/(9*a^(7/3))
```

Rubi in Sympy [A] time = 38.5649, size = 143, normalized size = 0.94

$$\frac{1}{6ax^2(a+bx^6)}-\frac{2}{3a^2x^2}+\frac{2\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^2\right)}{9a^{\frac{7}{3}}}-\frac{\sqrt[3]{b}\log\left(a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x^2+b^{\frac{2}{3}}x^4\right)}{9a^{\frac{7}{3}}}+\frac{2\sqrt{3}\sqrt[3]{b}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}-\frac{2\sqrt[3]{b}x^2}{3}\right)}{\sqrt[3]{a}}\right)}{9a^{\frac{7}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(b*x**6+a)**2,x)
```

```
[Out] 1/(6*a*x**2*(a + b*x**6)) - 2/(3*a**2*x**2) + 2*b**(1/3)*log(a**(
1/3) + b**(1/3)*x**2)/(9*a**(7/3)) - b**(1/3)*log(a**(2/3) - a**(
1/3)*b**(1/3)*x**2 + b**(2/3)*x**4)/(9*a**(7/3)) + 2*sqrt(3)*b**(
1/3)*atan(sqrt(3)*(a**(1/3)/3 - 2*b**(1/3)*x**2/3)/a**(1/3))/(9*a
**(7/3))
```

Mathematica [A] time = 0.33005, size = 208, normalized size = 1.37

$$\frac{4\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^2\right)-2\sqrt[3]{b}\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)-2\sqrt[3]{b}\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}+\sqrt[3]{b}x^2\right)-\frac{3\sqrt[3]{a}bx^4}{a+bx^6}+4\sqrt{3}\sqrt[3]{b}\tan^{-}}{18a^{7/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*(a + b*x^6)^2),x]
```

```
[Out] ((-9*a^(1/3))/x^2 - (3*a^(1/3)*b*x^4)/(a + b*x^6) + 4*Sqrt[3]*b^(
1/3)*ArcTan[Sqrt[3] - (2*b^(1/6)*x)/a^(1/6)] + 4*Sqrt[3]*b^(1/3)*
ArcTan[Sqrt[3] + (2*b^(1/6)*x)/a^(1/6)] + 4*b^(1/3)*Log[a^(1/3) +
 b^(1/3)*x^2] - 2*b^(1/3)*Log[a^(1/3) - Sqrt[3]*a^(1/6)*b^(1/6)*x
 + b^(1/3)*x^2] - 2*b^(1/3)*Log[a^(1/3) + Sqrt[3]*a^(1/6)*b^(1/6)
*x + b^(1/3)*x^2])/(18*a^(7/3))
```

Maple [A] time = 0.019, size = 123, normalized size = 0.8

$$-\frac{1}{2a^2x^2}-\frac{bx^4}{6a^2(bx^6+a)}+\frac{2}{9a^2}\ln\left(x^2+\sqrt[3]{\frac{a}{b}}\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}-\frac{1}{9a^2}\ln\left(x^4-x^2\sqrt[3]{\frac{a}{b}}+\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}-\frac{2\sqrt{3}}{9a^2}\arctan\left(\frac{\sqrt{3}}{3}\left(2x^2\frac{1}{\sqrt[3]{\frac{a}{b}}}-1\right)\right)\frac{1}{\sqrt[3]{\frac{a}{b}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(b*x^6+a)^2,x)
```

```
[Out] -1/2/a^2/x^2-1/6*b/a^2*x^4/(b*x^6+a)+2/9/a^2/(a/b)^(1/3)*ln(x^2+(
a/b)^(1/3))-1/9/a^2/(a/b)^(1/3)*ln(x^4-x^2*(a/b)^(1/3)+(a/b)^(2/3
))-2/9/a^2*3^(1/2)/(a/b)^(1/3)*arctan(1/3*3^(1/2)*(2/(a/b)^(1/3)*
x^2-1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^6 + a)^2*x^3),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.232861, size = 251, normalized size = 1.65

$$-\frac{\sqrt{3}\left(2\sqrt{3}(bx^8+ax^2)\left(\frac{b}{a}\right)^{\frac{1}{3}}\log\left(bx^4-ax^2\left(\frac{b}{a}\right)^{\frac{2}{3}}+a\left(\frac{b}{a}\right)^{\frac{1}{3}}\right)-4\sqrt{3}(bx^8+ax^2)\left(\frac{b}{a}\right)^{\frac{1}{3}}\log\left(bx^2+a\left(\frac{b}{a}\right)^{\frac{2}{3}}\right)-12\left(bx^8+ax^2\right.\right.}{54\left(a^2bx^8+a^3x^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^6 + a)^2*x^3),x, algorithm="fricas")
```

```
[Out] -1/54*sqrt(3)*(2*sqrt(3)*(b*x^8 + a*x^2)*(b/a)^(1/3)*log(b*x^4 -
a*x^2*(b/a)^(2/3) + a*(b/a)^(1/3)) - 4*sqrt(3)*(b*x^8 + a*x^2)*(b
/a)^(1/3)*log(b*x^2 + a*(b/a)^(2/3)) - 12*(b*x^8 + a*x^2)*(b/a)^(
1/3)*arctan(-1/3*(2*sqrt(3)*b*x^2 - sqrt(3)*a*(b/a)^(2/3))/(a*(b/
a)^(2/3))) + 3*sqrt(3)*(4*b*x^6 + 3*a))/(a^2*b*x^8 + a^3*x^2)
```

Sympy [A] time = 21.5891, size = 58, normalized size = 0.38

$$-\frac{3a+4bx^6}{6a^3x^2+6a^2bx^8}+\operatorname{RootSum}\left(729t^3a^7-8b,\left(t\mapsto t\log\left(\frac{81t^2a^5}{4b}+x^2\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(b*x**6+a)**2,x)
```

```
[Out] -(3*a + 4*b*x**6)/(6*a**3*x**2 + 6*a**2*b*x**8) + RootSum(729*_t*
*3*a**7 - 8*b, Lambda(_t, _t*log(81*_t**2*a**5/(4*b) + x**2)))
```

GIAC/XCAS [A] time = 0.228231, size = 198, normalized size = 1.3

$$\frac{2\,b\left(-\frac{a}{b}\right)^{\frac{2}{3}}\ln\left(\left|x^2-\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right|\right)}{9\,a^3}+\frac{2\,\sqrt{3}\left(-ab^2\right)^{\frac{2}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x^2+\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{a}{b}\right)^{\frac{1}{3}}}\right)}{9\,a^3b}-\frac{4\,bx^6+3\,a}{6\,(bx^8+ax^2)a^2}-\frac{\left(-ab^2\right)^{\frac{2}{3}}\ln\left(x^4+x^2\left(-\frac{a}{b}\right)^{\frac{1}{3}}+\left(-\frac{a}{b}\right)^{\frac{2}{3}}\right)}{9\,a^3b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^6 + a)^2*x^3),x, algorithm="giac")
```

```
[Out] 2/9*b*(-a/b)^(2/3)*ln(abs(x^2 - (-a/b)^(1/3)))/a^3 + 2/9*sqrt(3)*
(-a*b^2)^(2/3)*arctan(1/3*sqrt(3)*(2*x^2 + (-a/b)^(1/3))/(-a/b)^(
1/3))/(a^3*b) - 1/6*(4*b*x^6 + 3*a)/((b*x^8 + a*x^2)*a^2) - 1/9*(
-a*b^2)^(2/3)*ln(x^4 + x^2*(-a/b)^(1/3) + (-a/b)^(2/3))/(a^3*b)
```

3.1341 $\int \frac{1}{x^4(a+bx^6)^2}\,dx$

Optimal. Leaf size=59

$$-\frac{\sqrt{b}\tan^{-1}\left(\frac{\sqrt{b}x^3}{\sqrt{a}}\right)}{2a^{5/2}}-\frac{1}{2a^2x^3}+\frac{1}{6ax^3\left(a+bx^6\right)}$$

```
[Out] -1/(2*a^2*x^3) + 1/(6*a*x^3*(a + b*x^6)) - (Sqrt[b]*ArcTan[(Sqrt[
b]*x^3)/Sqrt[a]])/(2*a^(5/2))
```

Rubi [A] time = 0.0776455, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$-\frac{\sqrt{b}\tan^{-1}\left(\frac{\sqrt{b}x^3}{\sqrt{a}}\right)}{2a^{5/2}}-\frac{1}{2a^2x^3}+\frac{1}{6ax^3\left(a+bx^6\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*(a + b*x^6)^2),x]
```

```
[Out] -1/(2*a^2*x^3) + 1/(6*a*x^3*(a + b*x^6)) - (Sqrt[b]*ArcTan[(Sqrt[
b]*x^3)/Sqrt[a]])/(2*a^(5/2))
```

Rubi in Sympy [A] time = 12.5341, size = 51, normalized size = 0.86

$$\frac{1}{6ax^3\left(a+bx^6\right)}-\frac{1}{2a^2x^3}-\frac{\sqrt{b}\,\mathrm{atan}\left(\frac{\sqrt{b}x^3}{\sqrt{a}}\right)}{2a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(b*x**6+a)**2,x)
```

```
[Out] 1/(6*a*x**3*(a + b*x**6)) - 1/(2*a**2*x**3) - sqrt(b)*atan(sqrt(b
)*x**3/sqrt(a))/(2*a**(5/2))
```

Mathematica [A] time = 0.157234, size = 114, normalized size = 1.93

$$\frac{-\frac{\sqrt{a}bx^3}{a+bx^6}+3\sqrt{b}\tan^{-1}\left(\frac{\sqrt[6]{b}x}{\sqrt[6]{a}}\right)+3\sqrt{b}\tan^{-1}\left(\sqrt{3}-\frac{2\sqrt[6]{b}x}{\sqrt[6]{a}}\right)-3\sqrt{b}\tan^{-1}\left(\frac{2\sqrt[6]{b}x}{\sqrt[6]{a}}+\sqrt{3}\right)-\frac{2\sqrt{a}}{x^3}}{6a^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*(a + b*x^6)^2),x]
```

```
[Out] ((-2*Sqrt[a])/x^3 - (Sqrt[a]*b*x^3)/(a + b*x^6) + 3*Sqrt[b]*ArcTa
n[(b^(1/6)*x)/a^(1/6)] + 3*Sqrt[b]*ArcTan[Sqrt[3] - (2*b^(1/6)*x)
/a^(1/6)] - 3*Sqrt[b]*ArcTan[Sqrt[3] + (2*b^(1/6)*x)/a^(1/6)])/(6
*a^(5/2))
```

Maple [A] time = 0.017, size = 50, normalized size = 0.9

$$-\frac{1}{3\,x^3a^2}-\frac{bx^3}{6\,a^2\left(bx^6+a\right)}-\frac{b}{2\,a^2}\arctan\left(bx^3\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(b*x^6+a)^2,x)
```

```
[Out] -1/3/x^3/a^2-1/6*b/a^2*x^3/(b*x^6+a)-1/2*b/a^2/(a*b)^(1/2)*arctan
(x^3*b/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^6 + a)^2*x^4),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.230666, size = 1, normalized size = 0.02

$$\left[-\frac{6\,bx^{6}-3\,\left(bx^{9}+ax^{3}\right)\sqrt{-\frac{b}{a}}\log\left(\frac{bx^{6}-2\,ax^{3}\sqrt{-\frac{b}{a}}-a}{bx^{6}+a}\right)+4\,a}{12\,\left(a^{2}bx^{9}+a^{3}x^{3}\right)},\,-\frac{3\,bx^{6}+3\,\left(bx^{9}+ax^{3}\right)\sqrt{\frac{b}{a}}\arctan\left(\frac{bx^{3}}{a\sqrt{\frac{b}{a}}}\right)+2\,a}{6\,\left(a^{2}bx^{9}+a^{3}x^{3}\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^6 + a)^2*x^4),x, algorithm="fricas")
```

```
[Out] [-1/12*(6*b*x^6 - 3*(b*x^9 + a*x^3)*sqrt(-b/a)*log((b*x^6 - 2*a*x
^3*sqrt(-b/a) - a)/(b*x^6 + a)) + 4*a)/(a^2*b*x^9 + a^3*x^3), -1/
6*(3*b*x^6 + 3*(b*x^9 + a*x^3)*sqrt(b/a)*arctan(b*x^3/(a*sqrt(b/a
))) + 2*a)/(a^2*b*x^9 + a^3*x^3)]
```

Sympy [A] time = 41.0366, size = 92, normalized size = 1.56

$$\frac{\sqrt{-\frac{b}{a^{5}}}\log\left(-\frac{a^{3}\sqrt{-\frac{b}{a^{5}}}}{b}+x^{3}\right)}{4}-\frac{\sqrt{-\frac{b}{a^{5}}}\log\left(\frac{a^{3}\sqrt{-\frac{b}{a^{5}}}}{b}+x^{3}\right)}{4}-\frac{2a+3bx^{6}}{6a^{3}x^{3}+6a^{2}bx^{9}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(b*x**6+a)**2,x)
```

```
[Out] sqrt(-b/a**5)*log(-a**3*sqrt(-b/a**5)/b + x**3)/4 - sqrt(-b/a**5)
*log(a**3*sqrt(-b/a**5)/b + x**3)/4 - (2*a + 3*b*x**6)/(6*a**3*x*
*3 + 6*a**2*b*x**9)
```

GIAC/XCAS [A] time = 0.226304, size = 69, normalized size = 1.17

$$-\frac{b\arctan\left(\frac{bx^{3}}{\sqrt{ab}}\right)}{2\,\sqrt{ab}a^{2}}-\frac{3\,bx^{6}+2\,a}{6\,\left(bx^{9}+ax^{3}\right)a^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^6 + a)^2*x^4),x, algorithm="giac")
```

```
[Out] -1/2*b*arctan(b*x^3/sqrt(a*b))/(sqrt(a*b)*a^2) - 1/6*(3*b*x^6 + 2
*a)/((b*x^9 + a*x^3)*a^2)
```

3.1342 $\int \frac{x^8}{1-x^6} dx$

Optimal. Leaf size=16

$$\frac{1}{3}\tanh^{-1}\left(x^3\right)-\frac{x^3}{3}$$

```
[Out] -x^3/3 + ArcTanh[x^3]/3
```

Rubi [A] time = 0.0254175, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{1}{3}\tanh^{-1}\left(x^3\right)-\frac{x^3}{3}$$

Antiderivative was successfully verified.

```
[In] Int[x^8/(1 - x^6),x]

[Out] -x^3/3 + ArcTanh[x^3]/3
```

Rubi in Sympy [A] time = 5.41662, size = 10, normalized size = 0.62

$$-\frac{x^3}{3}+\frac{\operatorname{atanh}\left(x^3\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**8/(-x**6+1),x)

[Out] -x**3/3 + atanh(x**3)/3
```

Mathematica [A] time = 0.00890097, size = 30, normalized size = 1.88

$$-\frac{x^3}{3}-\frac{1}{6}\log\left(1-x^3\right)+\frac{1}{6}\log\left(x^3+1\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^8/(1 - x^6),x]

[Out] -x^3/3 - Log[1 - x^3]/6 + Log[1 + x^3]/6
```

Maple [A] time = 0.005, size = 23, normalized size = 1.4

$$-\frac{x^3}{3}-\frac{\ln\left(x^3-1\right)}{6}+\frac{\ln\left(x^3+1\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^8/(-x^6+1),x)

[Out] -1/3*x^3-1/6*ln(x^3-1)+1/6*ln(x^3+1)
```

Maxima [A] time = 1.44016, size = 30, normalized size = 1.88

$$-\frac{1}{3}x^3 + \frac{1}{6}\log\left(x^3+1\right) - \frac{1}{6}\log\left(x^3-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^8/(x^6 - 1),x, algorithm="maxima")
```

```
[Out] -1/3*x^3 + 1/6*log(x^3 + 1) - 1/6*log(x^3 - 1)
```

Fricas [A] time = 0.218559, size = 30, normalized size = 1.88

$$-\frac{1}{3}x^3 + \frac{1}{6}\log\left(x^3+1\right) - \frac{1}{6}\log\left(x^3-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^8/(x^6 - 1),x, algorithm="fricas")
```

```
[Out] -1/3*x^3 + 1/6*log(x^3 + 1) - 1/6*log(x^3 - 1)
```

Sympy [A] time = 0.22793, size = 20, normalized size = 1.25

$$-\frac{x^3}{3} - \frac{\log\left(x^3-1\right)}{6} + \frac{\log\left(x^3+1\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8/(-x**6+1),x)
```

```
[Out] -x**3/3 - log(x**3 - 1)/6 + log(x**3 + 1)/6
```

GIAC/XCAS [A] time = 0.223745, size = 32, normalized size = 2.

$$-\frac{1}{3}x^3 + \frac{1}{6}\ln\left(\left|x^3+1\right|\right) - \frac{1}{6}\ln\left(\left|x^3-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^8/(x^6 - 1),x, algorithm="giac")
```

```
[Out] -1/3*x^3 + 1/6*ln(abs(x^3 + 1)) - 1/6*ln(abs(x^3 - 1))
```

3.1343 $\int \frac{x^7}{1-x^6}\,dx$

Optimal. Leaf size=56

$$-\frac{x^2}{2}-\frac{1}{6}\log\left(1-x^2\right)+\frac{\tan^{-1}\left(\frac{2x^2+1}{\sqrt{3}}\right)}{2\sqrt{3}}+\frac{1}{12}\log\left(x^4+x^2+1\right)$$

```
[Out] -x^2/2 + ArcTan[(1 + 2*x^2)/Sqrt[3]]/(2*Sqrt[3]) - Log[1 - x^2]/6
 + Log[1 + x^2 + x^4]/12
```

Rubi [A] time = 0.084001, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615

$$-\frac{x^2}{2}-\frac{1}{6}\log\left(1-x^2\right)+\frac{\tan^{-1}\left(\frac{2x^2+1}{\sqrt{3}}\right)}{2\sqrt{3}}+\frac{1}{12}\log\left(x^4+x^2+1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^7/(1 - x^6),x]
```

```
[Out] -x^2/2 + ArcTan[(1 + 2*x^2)/Sqrt[3]]/(2*Sqrt[3]) - Log[1 - x^2]/6
 + Log[1 + x^2 + x^4]/12
```

Rubi in Sympy [A] time = 9.38667, size = 48, normalized size = 0.86

$$-\frac{x^2}{2}-\frac{\log\left(-x^2+1\right)}{6}+\frac{\log\left(x^4+x^2+1\right)}{12}+\frac{\sqrt{3}\,\mathrm{atan}\left(\sqrt{3}\left(\frac{2x^2}{3}+\frac{1}{3}\right)\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7/(-x**6+1),x)
```

```
[Out] -x**2/2 - log(-x**2 + 1)/6 + log(x**4 + x**2 + 1)/12 + sqrt(3)*at
an(sqrt(3)*(2*x**2/3 + 1/3))/6
```

Mathematica [A] time = 0.0339387, size = 78, normalized size = 1.39

$$\frac{1}{12}\left(-6x^2+\log\left(x^2-x+1\right)+\log\left(x^2+x+1\right)-2\log(1-x)-2\log(x+1)+2\sqrt{3}\tan^{-1}\left(\frac{2x-1}{\sqrt{3}}\right)-2\sqrt{3}\tan^{-1}\left(\frac{2x+1}{\sqrt{3}}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^7/(1 - x^6),x]
```

```
[Out] (-6*x^2 + 2*Sqrt[3]*ArcTan[(-1 + 2*x)/Sqrt[3]] - 2*Sqrt[3]*ArcTan
[(1 + 2*x)/Sqrt[3]] - 2*Log[1 - x] - 2*Log[1 + x] + Log[1 - x + x
^2] + Log[1 + x + x^2])/12
```

Maple [A] time = 0.017, size = 71, normalized size = 1.3

$$-\frac{x^{2}}{2}+\frac{\ln\left(x^{2}+x+1\right)}{12}-\frac{\sqrt{3}}{6}\arctan\left(\frac{(1+2x)\sqrt{3}}{3}\right)-\frac{\ln\left(-1+x\right)}{6}+\frac{\ln\left(x^{2}-x+1\right)}{12}+\frac{\sqrt{3}}{6}\arctan\left(\frac{(2x-1)\sqrt{3}}{3}\right)-\frac{\ln\left(1+x\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^7/(-x^6+1),x)
```

```
[Out] -1/2*x^2+1/12*ln(x^2+x+1)-1/6*arctan(1/3*(1+2*x)*3^(1/2))*3^(1/2)
-1/6*ln(-1+x)+1/12*ln(x^2-x+1)+1/6*3^(1/2)*arctan(1/3*(2*x-1)*3^(
1/2))-1/6*ln(1+x)
```

Maxima [A] time = 1.59159, size = 58, normalized size = 1.04

$$-\frac{1}{2}x^{2}+\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}\left(2x^{2}+1\right)\right)+\frac{1}{12}\log\left(x^{4}+x^{2}+1\right)-\frac{1}{6}\log\left(x^{2}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(-x^7/(x^6 - 1),x, algorithm="maxima")
```

```
[Out] -1/2*x^2 + 1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x^2 + 1)) + 1/12*log
(x^4 + x^2 + 1) - 1/6*log(x^2 - 1)
```

Fricas [A] time = 0.225738, size = 73, normalized size = 1.3

$$-\frac{1}{36}\sqrt{3}\left(6\sqrt{3}x^{2}-\sqrt{3}\log\left(x^{4}+x^{2}+1\right)+2\sqrt{3}\log\left(x^{2}-1\right)-6\arctan\left(\frac{1}{3}\sqrt{3}\left(2x^{2}+1\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(-x^7/(x^6 - 1),x, algorithm="fricas")
```

```
[Out] -1/36*sqrt(3)*(6*sqrt(3)*x^2 - sqrt(3)*log(x^4 + x^2 + 1) + 2*sqr
t(3)*log(x^2 - 1) - 6*arctan(1/3*sqrt(3)*(2*x^2 + 1)))
```

Sympy [A] time = 0.427112, size = 51, normalized size = 0.91

$$-\frac{x^{2}}{2}-\frac{\log\left(x^{2}-1\right)}{6}+\frac{\log\left(x^{4}+x^{2}+1\right)}{12}+\frac{\sqrt{3}\operatorname{atan}\left(\frac{2\sqrt{3}x^{2}}{3}+\frac{\sqrt{3}}{3}\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**7/(-x**6+1),x)
```

```
[Out] -x**2/2 - log(x**2 - 1)/6 + log(x**4 + x**2 + 1)/12 + sqrt(3)*ata
n(2*sqrt(3)*x**2/3 + sqrt(3)/3)/6
```

GIAC/XCAS [A] time = 0.227228, size = 59, normalized size = 1.05

$$-\frac{1}{2}x^{2}+\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}\left(2x^{2}+1\right)\right)+\frac{1}{12}\ln\left(x^{4}+x^{2}+1\right)-\frac{1}{6}\ln\left(\left|x^{2}-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^7/(x^6 - 1),x, algorithm="giac")
```

```
[Out] -1/2*x^2 + 1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x^2 + 1)) + 1/12*ln(
x^4 + x^2 + 1) - 1/6*ln(abs(x^2 - 1))
```

3.1344 $\int \frac{x^6}{1-x^6} dx$

Optimal. Leaf size=50

$$\frac{\tan^{-1}\left(\frac{\sqrt{3}x}{1-x^2}\right)}{2\sqrt{3}}+\frac{1}{6}\tanh^{-1}\left(\frac{x}{x^2+1}\right)-x+\frac{1}{3}\tanh^{-1}(x)$$

```
[Out] -x + ArcTan[(Sqrt[3]*x)/(1 - x^2)]/(2*Sqrt[3]) + ArcTanh[x]/3 + A
rcTanh[x/(1 + x^2)]/6
```

Rubi [A] time = 0.20665, antiderivative size = 76, normalized size of antiderivative = 1.52, number of steps used = 11, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538

$$-\frac{1}{12}\log\left(x^2-x+1\right)+\frac{1}{12}\log\left(x^2+x+1\right)-x-\frac{\tan^{-1}\left(\frac{1-2x}{\sqrt{3}}\right)}{2\sqrt{3}}+\frac{\tan^{-1}\left(\frac{2x+1}{\sqrt{3}}\right)}{2\sqrt{3}}+\frac{1}{3}\tanh^{-1}(x)$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/(1 - x^6),x]
```

```
[Out] -x - ArcTan[(1 - 2*x)/Sqrt[3]]/(2*Sqrt[3]) + ArcTan[(1 + 2*x)/Sqr
t[3]]/(2*Sqrt[3]) + ArcTanh[x]/3 - Log[1 - x + x^2]/12 + Log[1 +
x + x^2]/12
```

Rubi in Sympy [A] time = 36.415, size = 70, normalized size = 1.4

$$-x-\frac{\log\left(x^2-x+1\right)}{12}+\frac{\log\left(x^2+x+1\right)}{12}+\frac{\sqrt{3}\,\mathrm{atan}\left(\sqrt{3}\left(\frac{2x}{3}-\frac{1}{3}\right)\right)}{6}+\frac{\sqrt{3}\,\mathrm{atan}\left(\sqrt{3}\left(\frac{2x}{3}+\frac{1}{3}\right)\right)}{6}+\frac{\mathrm{atanh}(x)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(-x**6+1),x)
```

```
[Out] -x - log(x**2 - x + 1)/12 + log(x**2 + x + 1)/12 + sqrt(3)*atan(s
qrt(3)*(2*x/3 - 1/3))/6 + sqrt(3)*atan(sqrt(3)*(2*x/3 + 1/3))/6 +
 atanh(x)/3
```

Mathematica [A] time = 0.0204156, size = 78, normalized size = 1.56

$$\frac{1}{12}\left(-\log\left(x^2-x+1\right)+\log\left(x^2+x+1\right)-12x-2\log(1-x)+2\log(x+1)+2\sqrt{3}\tan^{-1}\left(\frac{2x-1}{\sqrt{3}}\right)+2\sqrt{3}\tan^{-1}\left(\frac{2x+1}{\sqrt{3}}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6/(1 - x^6),x]
```

```
[Out] (-12*x + 2*Sqrt[3]*ArcTan[(-1 + 2*x)/Sqrt[3]] + 2*Sqrt[3]*ArcTan[
(1 + 2*x)/Sqrt[3]] - 2*Log[1 - x] + 2*Log[1 + x] - Log[1 - x + x^
2] + Log[1 + x + x^2])/12
```

Maple [A] time = 0.013, size = 69, normalized size = 1.4

$$-x+\frac{\ln\left(x^{2}+x+1\right)}{12}+\frac{\sqrt{3}}{6}\arctan\left(\frac{(1+2x)\sqrt{3}}{3}\right)-\frac{\ln(-1+x)}{6}-\frac{\ln\left(x^{2}-x+1\right)}{12}+\frac{\sqrt{3}}{6}\arctan\left(\frac{(2x-1)\sqrt{3}}{3}\right)+\frac{\ln(1+x)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(-x^6+1),x)
```

```
[Out] -x+1/12*ln(x^2+x+1)+1/6*arctan(1/3*(1+2*x)*3^(1/2))*3^(1/2)-1/6*l
n(-1+x)-1/12*ln(x^2-x+1)+1/6*3^(1/2)*arctan(1/3*(2*x-1)*3^(1/2))+
1/6*ln(1+x)
```

Maxima [A] time = 1.58396, size = 92, normalized size = 1.84

$$\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}(2x+1)\right)+\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}(2x-1)\right)-x+\frac{1}{12}\log\left(x^{2}+x+1\right)-\frac{1}{12}\log\left(x^{2}-x+1\right)+\frac{1}{6}\log(x+1)-\frac{1}{6}\log(x-1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^6/(x^6 - 1),x, algorithm="maxima")
```

```
[Out] 1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x + 1)) + 1/6*sqrt(3)*arctan(1/
3*sqrt(3)*(2*x - 1)) - x + 1/12*log(x^2 + x + 1) - 1/12*log(x^2 -
 x + 1) + 1/6*log(x + 1) - 1/6*log(x - 1)
```

Fricas [A] time = 0.227195, size = 109, normalized size = 2.18

$$-\frac{1}{36}\sqrt{3}\left(12\sqrt{3}x-\sqrt{3}\log\left(x^{2}+x+1\right)+\sqrt{3}\log\left(x^{2}-x+1\right)-2\sqrt{3}\log(x+1)+2\sqrt{3}\log(x-1)-6\arctan\left(\frac{1}{3}\sqrt{3}(2x+1)\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^6/(x^6 - 1),x, algorithm="fricas")
```

```
[Out] -1/36*sqrt(3)*(12*sqrt(3)*x - sqrt(3)*log(x^2 + x + 1) + sqrt(3)*
log(x^2 - x + 1) - 2*sqrt(3)*log(x + 1) + 2*sqrt(3)*log(x - 1) -
6*arctan(1/3*sqrt(3)*(2*x + 1)) - 6*arctan(1/3*sqrt(3)*(2*x - 1))
)
```

Sympy [A] time = 0.735801, size = 85, normalized size = 1.7

$$-x-\frac{\log(x-1)}{6}+\frac{\log(x+1)}{6}-\frac{\log\left(x^{2}-x+1\right)}{12}+\frac{\log\left(x^{2}+x+1\right)}{12}+\frac{\sqrt{3}\operatorname{atan}\left(\frac{2\sqrt{3}x}{3}-\frac{\sqrt{3}}{3}\right)}{6}+\frac{\sqrt{3}\operatorname{atan}\left(\frac{2\sqrt{3}x}{3}+\frac{\sqrt{3}}{3}\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(-x**6+1),x)
```

```
[Out] -x - log(x - 1)/6 + log(x + 1)/6 - log(x**2 - x + 1)/12 + log(x**
2 + x + 1)/12 + sqrt(3)*atan(2*sqrt(3)*x/3 - sqrt(3)/3)/6 + sqrt(
```

```
3)*atan(2*sqrt(3)*x/3 + sqrt(3)/3)/6
```

GIAC/XCAS [A] time = 0.227284, size = 95, normalized size = 1.9

$$\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}(2x+1)\right)+\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}(2x-1)\right)-x+\frac{1}{12}\ln\left(x^2+x+1\right)-\frac{1}{12}\ln\left(x^2-x+1\right)+\frac{1}{6}\ln\left(|x+1|\right)-\frac{1}{6}\ln\left(|x-1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^6/(x^6 - 1),x, algorithm="giac")
```

```
[Out] 1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x + 1)) + 1/6*sqrt(3)*arctan(1/
3*sqrt(3)*(2*x - 1)) - x + 1/12*ln(x^2 + x + 1) - 1/12*ln(x^2 - x
 + 1) + 1/6*ln(abs(x + 1)) - 1/6*ln(abs(x - 1))
```

3.1345 $\int \frac{x^5}{1-x^6} \, dx$

Optimal. Leaf size=12

$$-\frac{1}{6} \log \left(1-x^6\right)$$

```
[Out] -Log[1 - x^6]/6
```

Rubi [A] time = 0.00669084, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{1}{6} \log \left(1-x^6\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/(1 - x^6),x]

[Out] -Log[1 - x^6]/6
```

Rubi in Sympy [A] time = 2.19015, size = 24, normalized size = 2.

$$-\frac{\log \left((x-1)(x+1)\left(x^2-x+1\right)\left(x^2+x+1\right)\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(-x**6+1),x)

[Out] -log((x - 1)*(x + 1)*(x**2 - x + 1)*(x**2 + x + 1))/6
```

Mathematica [A] time = 0.00502213, size = 12, normalized size = 1.

$$-\frac{1}{6} \log \left(1-x^6\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/(1 - x^6),x]

[Out] -Log[1 - x^6]/6
```

Maple [A] time = 0.004, size = 18, normalized size = 1.5

$$-\frac{\ln \left(x^3-1\right)}{6}-\frac{\ln \left(x^3+1\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(-x^6+1),x)

[Out] -1/6*ln(x^3-1)-1/6*ln(x^3+1)
```

Maxima [A] time = 1.41554, size = 11, normalized size = 0.92

$$-\frac{1}{6}\log\left(x^6-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^5/(x^6 - 1),x, algorithm="maxima")
```

```
[Out] -1/6*log(x^6 - 1)
```

Fricas [A] time = 0.219095, size = 11, normalized size = 0.92

$$-\frac{1}{6}\log\left(x^6-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^5/(x^6 - 1),x, algorithm="fricas")
```

```
[Out] -1/6*log(x^6 - 1)
```

Sympy [A] time = 0.186533, size = 8, normalized size = 0.67

$$-\frac{\log\left(x^6-1\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(-x**6+1),x)
```

```
[Out] -log(x**6 - 1)/6
```

GIAC/XCAS [A] time = 0.228417, size = 12, normalized size = 1.

$$-\frac{1}{6}\ln\left(\left|x^6-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^5/(x^6 - 1),x, algorithm="giac")
```

```
[Out] -1/6*ln(abs(x^6 - 1))
```

3.1346 $\int \frac{x^4}{1-x^6} \, dx$

Optimal. Leaf size=47

$$-\frac{\tan^{-1}\left(\frac{\sqrt{3}x}{1-x^2}\right)}{2\sqrt{3}}+\frac{1}{6}\tanh^{-1}\left(\frac{x}{x^2+1}\right)+\frac{1}{3}\tanh^{-1}(x)$$

```
[Out] -ArcTan[(Sqrt[3]*x)/(1 - x^2)]/(2*Sqrt[3]) + ArcTanh[x]/3 + ArcTa
nh[x/(1 + x^2)]/6
```

Rubi [A] time = 0.279987, antiderivative size = 73, normalized size of antiderivative = 1.55, number of steps used = 10, number of rules used = 6, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.462

$$-\frac{1}{12}\log\left(x^2-x+1\right)+\frac{1}{12}\log\left(x^2+x+1\right)+\frac{\tan^{-1}\left(\frac{1-2x}{\sqrt{3}}\right)}{2\sqrt{3}}-\frac{\tan^{-1}\left(\frac{2x+1}{\sqrt{3}}\right)}{2\sqrt{3}}+\frac{1}{3}\tanh^{-1}(x)$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(1 - x^6),x]
```

```
[Out] ArcTan[(1 - 2*x)/Sqrt[3]]/(2*Sqrt[3]) - ArcTan[(1 + 2*x)/Sqrt[3]]
/(2*Sqrt[3]) + ArcTanh[x]/3 - Log[1 - x + x^2]/12 + Log[1 + x + x
^2]/12
```

Rubi in Sympy [A] time = 44.548, size = 68, normalized size = 1.45

$$-\frac{\log\left(x^2-x+1\right)}{12}+\frac{\log\left(x^2+x+1\right)}{12}-\frac{\sqrt{3}\operatorname{atan}\left(\sqrt{3}\left(\frac{2x}{3}-\frac{1}{3}\right)\right)}{6}-\frac{\sqrt{3}\operatorname{atan}\left(\sqrt{3}\left(\frac{2x}{3}+\frac{1}{3}\right)\right)}{6}+\frac{\operatorname{atanh}(x)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(-x**6+1),x)
```

```
[Out] -log(x**2 - x + 1)/12 + log(x**2 + x + 1)/12 - sqrt(3)*atan(sqrt(
3)*(2*x/3 - 1/3))/6 - sqrt(3)*atan(sqrt(3)*(2*x/3 + 1/3))/6 + ata
nh(x)/3
```

Mathematica [A] time = 0.0189168, size = 75, normalized size = 1.6

$$\frac{1}{12}\left(-\log\left(x^2-x+1\right)+\log\left(x^2+x+1\right)-2\log(1-x)+2\log(x+1)-2\sqrt{3}\tan^{-1}\left(\frac{2x-1}{\sqrt{3}}\right)-2\sqrt{3}\tan^{-1}\left(\frac{2x+1}{\sqrt{3}}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(1 - x^6),x]
```

```
[Out] (-2*Sqrt[3]*ArcTan[(-1 + 2*x)/Sqrt[3]] - 2*Sqrt[3]*ArcTan[(1 + 2*
x)/Sqrt[3]] - 2*Log[1 - x] + 2*Log[1 + x] - Log[1 - x + x^2] + Lo
g[1 + x + x^2])/12
```

Maple [A] time = 0.013, size = 66, normalized size = 1.4

$$\frac{\ln\left(x^2+x+1\right)}{12}-\frac{\sqrt{3}}{6}\arctan\left(\frac{(1+2x)\sqrt{3}}{3}\right)-\frac{\ln(-1+x)}{6}-\frac{\ln\left(x^2-x+1\right)}{12}-\frac{\sqrt{3}}{6}\arctan\left(\frac{(2x-1)\sqrt{3}}{3}\right)+\frac{\ln(1+x)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(-x^6+1),x)
```

```
[Out] 1/12*ln(x^2+x+1)-1/6*arctan(1/3*(1+2*x)*3^(1/2))*3^(1/2)-1/6*ln(-
1+x)-1/12*ln(x^2-x+1)-1/6*3^(1/2)*arctan(1/3*(2*x-1)*3^(1/2))+1/6
*ln(1+x)
```

Maxima [A] time = 1.58031, size = 88, normalized size = 1.87

$$-\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}(2x+1)\right)-\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}(2x-1)\right)+\frac{1}{12}\log\left(x^2+x+1\right)-\frac{1}{12}\log\left(x^2-x+1\right)+\frac{1}{6}\log(x+1)-\frac{1}{6}\log(x-1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^4/(x^6 - 1),x, algorithm="maxima")
```

```
[Out] -1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x + 1)) - 1/6*sqrt(3)*arctan(1
/3*sqrt(3)*(2*x - 1)) + 1/12*log(x^2 + x + 1) - 1/12*log(x^2 - x
+ 1) + 1/6*log(x + 1) - 1/6*log(x - 1)
```

Fricas [A] time = 0.2312, size = 101, normalized size = 2.15

$$\frac{1}{36}\sqrt{3}\left(\sqrt{3}\log\left(x^2+x+1\right)-\sqrt{3}\log\left(x^2-x+1\right)+2\sqrt{3}\log(x+1)-2\sqrt{3}\log(x-1)-6\arctan\left(\frac{1}{3}\sqrt{3}(2x+1)\right)-6\ \text{arcta}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^4/(x^6 - 1),x, algorithm="fricas")
```

```
[Out] 1/36*sqrt(3)*(sqrt(3)*log(x^2 + x + 1) - sqrt(3)*log(x^2 - x + 1)
 + 2*sqrt(3)*log(x + 1) - 2*sqrt(3)*log(x - 1) - 6*arctan(1/3*sqr
t(3)*(2*x + 1)) - 6*arctan(1/3*sqrt(3)*(2*x - 1)))
```

Sympy [A] time = 0.76904, size = 83, normalized size = 1.77

$$-\frac{\log(x-1)}{6}+\frac{\log(x+1)}{6}-\frac{\log\left(x^2-x+1\right)}{12}+\frac{\log\left(x^2+x+1\right)}{12}-\frac{\sqrt{3}\,\text{atan}\left(\frac{2\sqrt{3}x}{3}-\frac{\sqrt{3}}{3}\right)}{6}-\frac{\sqrt{3}\,\text{atan}\left(\frac{2\sqrt{3}x}{3}+\frac{\sqrt{3}}{3}\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(-x**6+1),x)
```

```
[Out] -log(x - 1)/6 + log(x + 1)/6 - log(x**2 - x + 1)/12 + log(x**2 +
x + 1)/12 - sqrt(3)*atan(2*sqrt(3)*x/3 - sqrt(3)/3)/6 - sqrt(3)*a
```

```
tan(2*sqrt(3)*x/3 + sqrt(3)/3)/6
```

GIAC/XCAS [A] time = 0.223959, size = 90, normalized size = 1.91

$$-\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}(2x+1)\right)-\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}(2x-1)\right)+\frac{1}{12}\ln\left(x^2+x+1\right)-\frac{1}{12}\ln\left(x^2-x+1\right)+\frac{1}{6}\ln\left(|x+1|\right)-\frac{1}{6}\ln\left(|x-1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^4/(x^6 - 1),x, algorithm="giac")
```

```
[Out] -1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x + 1)) - 1/6*sqrt(3)*arctan(1
/3*sqrt(3)*(2*x - 1)) + 1/12*ln(x^2 + x + 1) - 1/12*ln(x^2 - x +
1) + 1/6*ln(abs(x + 1)) - 1/6*ln(abs(x - 1))
```

3.1347 $\int \frac{x^3}{1-x^6} \, dx$

Optimal. Leaf size=49

$$-\frac{1}{6}\log\left(1-x^2\right)-\frac{\tan^{-1}\left(\frac{2x^2+1}{\sqrt{3}}\right)}{2\sqrt{3}}+\frac{1}{12}\log\left(x^4+x^2+1\right)$$

```
[Out] -ArcTan[(1 + 2*x^2)/Sqrt[3]]/(2*Sqrt[3]) - Log[1 - x^2]/6 + Log[1
 + x^2 + x^4]/12
```

Rubi [A] time = 0.0766097, antiderivative size = 49, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538

$$-\frac{1}{6}\log\left(1-x^2\right)-\frac{\tan^{-1}\left(\frac{2x^2+1}{\sqrt{3}}\right)}{2\sqrt{3}}+\frac{1}{12}\log\left(x^4+x^2+1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(1 - x^6),x]
```

```
[Out] -ArcTan[(1 + 2*x^2)/Sqrt[3]]/(2*Sqrt[3]) - Log[1 - x^2]/6 + Log[1
 + x^2 + x^4]/12
```

Rubi in Sympy [A] time = 9.21527, size = 42, normalized size = 0.86

$$-\frac{\log\left(-x^2+1\right)}{6}+\frac{\log\left(x^4+x^2+1\right)}{12}-\frac{\sqrt{3}\,\text{atan}\left(\sqrt{3}\left(\frac{2x^2}{3}+\frac{1}{3}\right)\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(-x**6+1),x)
```

```
[Out] -log(-x**2 + 1)/6 + log(x**4 + x**2 + 1)/12 - sqrt(3)*atan(sqrt(3
)*(2*x**2/3 + 1/3))/6
```

Mathematica [A] time = 0.0156037, size = 73, normalized size = 1.49

$$\frac{1}{12}\left(\log\left(x^2-x+1\right)+\log\left(x^2+x+1\right)-2\log(1-x)-2\log(x+1)-2\sqrt{3}\tan^{-1}\left(\frac{2x-1}{\sqrt{3}}\right)+2\sqrt{3}\tan^{-1}\left(\frac{2x+1}{\sqrt{3}}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(1 - x^6),x]
```

```
[Out] (-2*Sqrt[3]*ArcTan[(-1 + 2*x)/Sqrt[3]] + 2*Sqrt[3]*ArcTan[(1 + 2*
x)/Sqrt[3]] - 2*Log[1 - x] - 2*Log[1 + x] + Log[1 - x + x^2] + Lo
g[1 + x + x^2])/12
```

Maple [A] time = 0.011, size = 66, normalized size = 1.4

$$\frac{\ln\left(x^2+x+1\right)}{12}+\frac{\sqrt{3}}{6}\arctan\left(\frac{(1+2x)\sqrt{3}}{3}\right)-\frac{\ln\left(-1+x\right)}{6}+\frac{\ln\left(x^2-x+1\right)}{12}-\frac{\sqrt{3}}{6}\arctan\left(\frac{(2x-1)\sqrt{3}}{3}\right)-\frac{\ln\left(1+x\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^3/(-x^6+1),x)
```

```
[Out] 1/12*ln(x^2+x+1)+1/6*arctan(1/3*(1+2*x)*3^(1/2))*3^(1/2)-1/6*ln(-
1+x)+1/12*ln(x^2-x+1)-1/6*3^(1/2)*arctan(1/3*(2*x-1)*3^(1/2))-1/6
*ln(1+x)
```

Maxima [A] time = 1.57938, size = 51, normalized size = 1.04

$$-\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}(2x^2+1)\right)+\frac{1}{12}\log\left(x^4+x^2+1\right)-\frac{1}{6}\log\left(x^2-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(-x^3/(x^6 - 1),x, algorithm="maxima")
```

```
[Out] -1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x^2 + 1)) + 1/12*log(x^4 + x^2
 + 1) - 1/6*log(x^2 - 1)
```

Fricas [A] time = 0.222526, size = 61, normalized size = 1.24

$$\frac{1}{36}\sqrt{3}\left(\sqrt{3}\log\left(x^4+x^2+1\right)-2\sqrt{3}\log\left(x^2-1\right)-6\arctan\left(\frac{1}{3}\sqrt{3}(2x^2+1)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(-x^3/(x^6 - 1),x, algorithm="fricas")
```

```
[Out] 1/36*sqrt(3)*(sqrt(3)*log(x^4 + x^2 + 1) - 2*sqrt(3)*log(x^2 - 1)
 - 6*arctan(1/3*sqrt(3)*(2*x^2 + 1)))
```

Sympy [A] time = 0.403312, size = 46, normalized size = 0.94

$$-\frac{\log\left(x^2-1\right)}{6}+\frac{\log\left(x^4+x^2+1\right)}{12}-\frac{\sqrt{3}\operatorname{atan}\left(\frac{2\sqrt{3}x^2}{3}+\frac{\sqrt{3}}{3}\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**3/(-x**6+1),x)
```

```
[Out] -log(x**2 - 1)/6 + log(x**4 + x**2 + 1)/12 - sqrt(3)*atan(2*sqrt(
3)*x**2/3 + sqrt(3)/3)/6
```

GIAC/XCAS [A] time = 0.221662, size = 53, normalized size = 1.08

$$-\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}(2x^2+1)\right)+\frac{1}{12}\ln\left(x^4+x^2+1\right)-\frac{1}{6}\ln\left(\left|x^2-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^3/(x^6 - 1),x, algorithm="giac")
```

```
[Out] -1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x^2 + 1)) + 1/12*ln(x^4 + x^2
+ 1) - 1/6*ln(abs(x^2 - 1))
```

3.1348 $\int \frac{x^2}{1-x^6} dx$

Optimal. Leaf size=8

$$\frac{1}{3}\tanh^{-1}\left(x^3\right)$$

```
[Out] ArcTanh[x^3]/3
```

Rubi [A] time = 0.0134175, antiderivative size = 8, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{1}{3}\tanh^{-1}\left(x^3\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(1 - x^6),x]

[Out] ArcTanh[x^3]/3
```

Rubi in Sympy [A] time = 2.84695, size = 5, normalized size = 0.62

$$\frac{\operatorname{atanh}\left(x^3\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(-x**6+1),x)

[Out] atanh(x**3)/3
```

Mathematica [B] time = 0.00585889, size = 23, normalized size = 2.88

$$\frac{1}{6}\log\left(x^3+1\right)-\frac{1}{6}\log\left(1-x^3\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(1 - x^6),x]

[Out] -Log[1 - x^3]/6 + Log[1 + x^3]/6
```

Maple [B] time = 0.003, size = 18, normalized size = 2.3

$$-\frac{\ln\left(x^3-1\right)}{6}+\frac{\ln\left(x^3+1\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(-x^6+1),x)

[Out] -1/6*ln(x^3-1)+1/6*ln(x^3+1)
```

Maxima [A] time = 1.43538, size = 23, normalized size = 2.88

$$\frac{1}{6}\,\log\left(x^3+1\right)-\frac{1}{6}\,\log\left(x^3-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^2/(x^6 - 1),x, algorithm="maxima")
```

```
[Out] 1/6*log(x^3 + 1) - 1/6*log(x^3 - 1)
```

Fricas [A] time = 0.224507, size = 23, normalized size = 2.88

$$\frac{1}{6}\,\log\left(x^3+1\right)-\frac{1}{6}\,\log\left(x^3-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^2/(x^6 - 1),x, algorithm="fricas")
```

```
[Out] 1/6*log(x^3 + 1) - 1/6*log(x^3 - 1)
```

Sympy [A] time = 0.218665, size = 15, normalized size = 1.88

$$-\frac{\log\left(x^3-1\right)}{6}+\frac{\log\left(x^3+1\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(-x**6+1),x)
```

```
[Out] -log(x**3 - 1)/6 + log(x**3 + 1)/6
```

GIAC/XCAS [A] time = 0.231203, size = 26, normalized size = 3.25

$$\frac{1}{6}\ln\left(\left|x^3+1\right|\right)-\frac{1}{6}\ln\left(\left|x^3-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^2/(x^6 - 1),x, algorithm="giac")
```

```
[Out] 1/6*ln(abs(x^3 + 1)) - 1/6*ln(abs(x^3 - 1))
```

3.1349 $\int \frac{x}{1-x^6} \, dx$

Optimal. Leaf size=49

$$-\frac{1}{6} \log \left(1-x^2\right)+\frac{\tan^{-1}\left(\frac{2x^2+1}{\sqrt{3}}\right)}{2\sqrt{3}}+\frac{1}{12} \log \left(x^4+x^2+1\right)$$

```
[Out] ArcTan[(1 + 2*x^2)/Sqrt[3]]/(2*Sqrt[3]) - Log[1 - x^2]/6 + Log[1
+ x^2 + x^4]/12
```

Rubi [A] time = 0.0696097, antiderivative size = 49, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.636

$$-\frac{1}{6} \log \left(1-x^2\right)+\frac{\tan^{-1}\left(\frac{2x^2+1}{\sqrt{3}}\right)}{2\sqrt{3}}+\frac{1}{12} \log \left(x^4+x^2+1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x/(1 - x^6),x]
```

```
[Out] ArcTan[(1 + 2*x^2)/Sqrt[3]]/(2*Sqrt[3]) - Log[1 - x^2]/6 + Log[1
+ x^2 + x^4]/12
```

Rubi in Sympy [A] time = 6.81902, size = 42, normalized size = 0.86

$$-\frac{\log \left(-x^2+1\right)}{6}+\frac{\log \left(x^4+x^2+1\right)}{12}+\frac{\sqrt{3}\operatorname{atan}\left(\sqrt{3}\left(\frac{2x^2}{3}+\frac{1}{3}\right)\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(-x**6+1),x)
```

```
[Out] -log(-x**2 + 1)/6 + log(x**4 + x**2 + 1)/12 + sqrt(3)*atan(sqrt(3
)*(2*x**2/3 + 1/3))/6
```

Mathematica [A] time = 0.0154609, size = 73, normalized size = 1.49

$$\frac{1}{12}\left(\log \left(x^2-x+1\right)+\log \left(x^2+x+1\right)-2\log(1-x) -2\log(x+1)+2\sqrt{3}\tan^{-1}\left(\frac{2x-1}{\sqrt{3}}\right)-2\sqrt{3}\tan^{-1}\left(\frac{2x+1}{\sqrt{3}}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(1 - x^6),x]
```

```
[Out] (2*Sqrt[3]*ArcTan[(-1 + 2*x)/Sqrt[3]] - 2*Sqrt[3]*ArcTan[(1 + 2*x
)/Sqrt[3]] - 2*Log[1 - x] - 2*Log[1 + x] + Log[1 - x + x^2] + Log
[1 + x + x^2])/12
```

Maple [A] time = 0.011, size = 66, normalized size = 1.4

$$\frac{\ln\left(x^2+x+1\right)}{12}-\frac{\sqrt{3}}{6}\arctan\left(\frac{(1+2x)\sqrt{3}}{3}\right)-\frac{\ln(-1+x)}{6}+\frac{\ln\left(x^2-x+1\right)}{12}+\frac{\sqrt{3}}{6}\arctan\left(\frac{(2x-1)\sqrt{3}}{3}\right)-\frac{\ln(1+x)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x/(-x^6+1),x)
```

```
[Out] 1/12*ln(x^2+x+1)-1/6*arctan(1/3*(1+2*x)*3^(1/2))*3^(1/2)-1/6*ln(-
1+x)+1/12*ln(x^2-x+1)+1/6*3^(1/2)*arctan(1/3*(2*x-1)*3^(1/2))-1/6
*ln(1+x)
```

Maxima [A] time = 1.57199, size = 51, normalized size = 1.04

$$\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}\left(2x^2+1\right)\right)+\frac{1}{12}\log\left(x^4+x^2+1\right)-\frac{1}{6}\log\left(x^2-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(-x/(x^6 - 1),x, algorithm="maxima")
```

```
[Out] 1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x^2 + 1)) + 1/12*log(x^4 + x^2
+ 1) - 1/6*log(x^2 - 1)
```

Fricas [A] time = 0.226139, size = 61, normalized size = 1.24

$$\frac{1}{36}\sqrt{3}\left(\sqrt{3}\log\left(x^4+x^2+1\right)-2\sqrt{3}\log\left(x^2-1\right)+6\arctan\left(\frac{1}{3}\sqrt{3}\left(2x^2+1\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(-x/(x^6 - 1),x, algorithm="fricas")
```

```
[Out] 1/36*sqrt(3)*(sqrt(3)*log(x^4 + x^2 + 1) - 2*sqrt(3)*log(x^2 - 1)
 + 6*arctan(1/3*sqrt(3)*(2*x^2 + 1)))
```

Sympy [A] time = 0.394872, size = 46, normalized size = 0.94

$$-\frac{\log\left(x^2-1\right)}{6}+\frac{\log\left(x^4+x^2+1\right)}{12}+\frac{\sqrt{3}\operatorname{atan}\left(\frac{2\sqrt{3}x^2}{3}+\frac{\sqrt{3}}{3}\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(-x**6+1),x)
```

```
[Out] -log(x**2 - 1)/6 + log(x**4 + x**2 + 1)/12 + sqrt(3)*atan(2*sqrt(
3)*x**2/3 + sqrt(3)/3)/6
```

GIAC/XCAS [A] time = 0.2204, size = 53, normalized size = 1.08

$$\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}\left(2x^2+1\right)\right)+\frac{1}{12}\ln\left(x^4+x^2+1\right)-\frac{1}{6}\ln\left(\left|x^2-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x/(x^6 - 1),x, algorithm="giac")
```

```
[Out] 1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x^2 + 1)) + 1/12*ln(x^4 + x^2 +
 1) - 1/6*ln(abs(x^2 - 1))
```

3.1350 $\int \frac{1}{1-x^6}\,dx$

Optimal. Leaf size=47

$$\frac{\tan^{-1}\left(\frac{\sqrt{3}x}{1-x^2}\right)}{2\sqrt{3}}+\frac{1}{6}\tanh^{-1}\left(\frac{x}{x^2+1}\right)+\frac{1}{3}\tanh^{-1}(x)$$

```
[Out] ArcTan[(Sqrt[3]*x)/(1 - x^2)]/(2*Sqrt[3]) + ArcTanh[x]/3 + ArcTan
h[x/(1 + x^2)]/6
```

Rubi [A] time = 0.194203, antiderivative size = 73, normalized size of antiderivative = 1.55, number of steps used = 10, number of rules used = 6, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667

$$-\frac{1}{12}\log\left(x^2-x+1\right)+\frac{1}{12}\log\left(x^2+x+1\right)-\frac{\tan^{-1}\left(\frac{1-2x}{\sqrt{3}}\right)}{2\sqrt{3}}+\frac{\tan^{-1}\left(\frac{2x+1}{\sqrt{3}}\right)}{2\sqrt{3}}+\frac{1}{3}\tanh^{-1}(x)$$

Antiderivative was successfully verified.

```
[In]  Int[(1 - x^6)^(-1),x]
```

```
[Out] -ArcTan[(1 - 2*x)/Sqrt[3]]/(2*Sqrt[3]) + ArcTan[(1 + 2*x)/Sqrt[3]
]/(2*Sqrt[3]) + ArcTanh[x]/3 - Log[1 - x + x^2]/12 + Log[1 + x +
x^2]/12
```

Rubi in Sympy [A] time = 35.3902, size = 68, normalized size = 1.45

$$-\frac{\log\left(x^2-x+1\right)}{12}+\frac{\log\left(x^2+x+1\right)}{12}+\frac{\sqrt{3}\,\mathrm{atan}\left(\sqrt{3}\left(\frac{2x}{3}-\frac{1}{3}\right)\right)}{6}+\frac{\sqrt{3}\,\mathrm{atan}\left(\sqrt{3}\left(\frac{2x}{3}+\frac{1}{3}\right)\right)}{6}+\frac{\mathrm{atanh}\,(x)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(-x**6+1),x)
```

```
[Out] -log(x**2 - x + 1)/12 + log(x**2 + x + 1)/12 + sqrt(3)*atan(sqrt(
3)*(2*x/3 - 1/3))/6 + sqrt(3)*atan(sqrt(3)*(2*x/3 + 1/3))/6 + ata
nh(x)/3
```

Mathematica [A] time = 0.0151938, size = 75, normalized size = 1.6

$$\frac{1}{12}\left(-\log\left(x^2-x+1\right)+\log\left(x^2+x+1\right)-2\log(1-x)+2\log(x+1)+2\sqrt{3}\tan^{-1}\left(\frac{2x-1}{\sqrt{3}}\right)+2\sqrt{3}\tan^{-1}\left(\frac{2x+1}{\sqrt{3}}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(1 - x^6)^(-1),x]
```

```
[Out] (2*Sqrt[3]*ArcTan[(-1 + 2*x)/Sqrt[3]] + 2*Sqrt[3]*ArcTan[(1 + 2*x
)/Sqrt[3]] - 2*Log[1 - x] + 2*Log[1 + x] - Log[1 - x + x^2] + Log
[1 + x + x^2])/12
```

Maple [A] time = 0.01, size = 66, normalized size = 1.4

$$\frac{\ln\left(x^2+x+1\right)}{12}+\frac{\sqrt{3}}{6}\arctan\left(\frac{(1+2x)\sqrt{3}}{3}\right)-\frac{\ln(-1+x)}{6}-\frac{\ln\left(x^2-x+1\right)}{12}+\frac{\sqrt{3}}{6}\arctan\left(\frac{(2x-1)\sqrt{3}}{3}\right)+\frac{\ln(1+x)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(-x^6+1),x)
```

```
[Out] 1/12*ln(x^2+x+1)+1/6*arctan(1/3*(1+2*x)*3^(1/2))*3^(1/2)-1/6*ln(-
1+x)-1/12*ln(x^2-x+1)+1/6*3^(1/2)*arctan(1/3*(2*x-1)*3^(1/2))+1/6
*ln(1+x)
```

Maxima [A] time = 1.58004, size = 88, normalized size = 1.87

$$\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}(2x+1)\right)+\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}(2x-1)\right)+\frac{1}{12}\log\left(x^2+x+1\right)-\frac{1}{12}\log\left(x^2-x+1\right)+\frac{1}{6}\log(x+1)-\frac{1}{6}\log(x-1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(x^6 - 1),x, algorithm="maxima")
```

```
[Out] 1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x + 1)) + 1/6*sqrt(3)*arctan(1/
3*sqrt(3)*(2*x - 1)) + 1/12*log(x^2 + x + 1) - 1/12*log(x^2 - x +
 1) + 1/6*log(x + 1) - 1/6*log(x - 1)
```

Fricas [A] time = 0.22943, size = 101, normalized size = 2.15

$$\frac{1}{36}\sqrt{3}\left(\sqrt{3}\log\left(x^2+x+1\right)-\sqrt{3}\log\left(x^2-x+1\right)+2\sqrt{3}\log(x+1)-2\sqrt{3}\log(x-1)+6\arctan\left(\frac{1}{3}\sqrt{3}(2x+1)\right)+6\text{ arcta}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(x^6 - 1),x, algorithm="fricas")
```

```
[Out] 1/36*sqrt(3)*(sqrt(3)*log(x^2 + x + 1) - sqrt(3)*log(x^2 - x + 1)
 + 2*sqrt(3)*log(x + 1) - 2*sqrt(3)*log(x - 1) + 6*arctan(1/3*sqr
t(3)*(2*x + 1)) + 6*arctan(1/3*sqrt(3)*(2*x - 1)))
```

Sympy [A] time = 0.772314, size = 83, normalized size = 1.77

$$-\frac{\log(x-1)}{6}+\frac{\log(x+1)}{6}-\frac{\log\left(x^2-x+1\right)}{12}+\frac{\log\left(x^2+x+1\right)}{12}+\frac{\sqrt{3}\operatorname{atan}\left(\frac{2\sqrt{3}x}{3}-\frac{\sqrt{3}}{3}\right)}{6}+\frac{\sqrt{3}\operatorname{atan}\left(\frac{2\sqrt{3}x}{3}+\frac{\sqrt{3}}{3}\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(-x**6+1),x)
```

```
[Out] -log(x - 1)/6 + log(x + 1)/6 - log(x**2 - x + 1)/12 + log(x**2 +
x + 1)/12 + sqrt(3)*atan(2*sqrt(3)*x/3 - sqrt(3)/3)/6 + sqrt(3)*a
```

```
tan(2*sqrt(3)*x/3 + sqrt(3)/3)/6
```

GIAC/XCAS [A] time = 0.222549, size = 90, normalized size = 1.91

$$\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}(2x+1)\right)+\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}(2x-1)\right)+\frac{1}{12}\ln\left(x^2+x+1\right)-\frac{1}{12}\ln\left(x^2-x+1\right)+\frac{1}{6}\ln\left(|x+1|\right)-\frac{1}{6}\ln\left(|x-1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(x^6 - 1),x, algorithm="giac")
```

```
[Out] 1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x + 1)) + 1/6*sqrt(3)*arctan(1/
3*sqrt(3)*(2*x - 1)) + 1/12*ln(x^2 + x + 1) - 1/12*ln(x^2 - x + 1
) + 1/6*ln(abs(x + 1)) - 1/6*ln(abs(x - 1))
```

3.1351 $\int \frac{1}{x(1-x^6)} dx$

Optimal. Leaf size=15

$$\log(x) - \frac{1}{6}\log\left(1 - x^6\right)$$

```
[Out] Log[x] - Log[1 - x^6]/6
```

Rubi [A] time = 0.021795, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\log(x) - \frac{1}{6}\log\left(1 - x^6\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(1 - x^6)),x]

[Out] Log[x] - Log[1 - x^6]/6
```

Rubi in Sympy [A] time = 3.78962, size = 14, normalized size = 0.93

$$\frac{\log\left(x^6\right)}{6} - \frac{\log\left(-x^6 + 1\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(-x**6+1),x)

[Out] log(x**6)/6 - log(-x**6 + 1)/6
```

Mathematica [A] time = 0.00585633, size = 15, normalized size = 1.

$$\log(x) - \frac{1}{6}\log\left(1 - x^6\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(1 - x^6)),x]

[Out] Log[x] - Log[1 - x^6]/6
```

Maple [B] time = 0.013, size = 36, normalized size = 2.4

$$\ln(x) - \frac{\ln\left(x^2 + x + 1\right)}{6} - \frac{\ln(-1 + x)}{6} - \frac{\ln\left(x^2 - x + 1\right)}{6} - \frac{\ln(1 + x)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(-x^6+1),x)

[Out] ln(x)-1/6*ln(x^2+x+1)-1/6*ln(-1+x)-1/6*ln(x^2-x+1)-1/6*ln(1+x)
```

Maxima [A] time = 1.41747, size = 20, normalized size = 1.33

$$-\frac{1}{6}\log\left(x^6-1\right)+\frac{1}{6}\log\left(x^6\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^6 - 1)*x),x, algorithm="maxima")
```

```
[Out] -1/6*log(x^6 - 1) + 1/6*log(x^6)
```

Fricas [A] time = 0.218518, size = 15, normalized size = 1.

$$-\frac{1}{6}\log\left(x^6-1\right)+\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^6 - 1)*x),x, algorithm="fricas")
```

```
[Out] -1/6*log(x^6 - 1) + log(x)
```

Sympy [A] time = 0.243783, size = 10, normalized size = 0.67

$$\log\left(x\right)-\frac{\log\left(x^6-1\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(-x**6+1),x)
```

```
[Out] log(x) - log(x**6 - 1)/6
```

GIAC/XCAS [A] time = 0.235845, size = 22, normalized size = 1.47

$$\frac{1}{6}\ln\left(x^6\right)-\frac{1}{6}\ln\left(\left|x^6-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^6 - 1)*x),x, algorithm="giac")
```

```
[Out] 1/6*ln(x^6) - 1/6*ln(abs(x^6 - 1))
```

3.1352 $\int \frac{1}{x^2(1-x^6)}\,dx$

Optimal. Leaf size=52

$$-\frac{\tan^{-1}\left(\frac{\sqrt{3}x}{1-x^2}\right)}{2\sqrt{3}}+\frac{1}{6}\tanh^{-1}\left(\frac{x}{x^2+1}\right)-\frac{1}{x}+\frac{1}{3}\tanh^{-1}(x)$$

```
[Out] -x^(-1) - ArcTan[(Sqrt[3]*x)/(1 - x^2)]/(2*Sqrt[3]) + ArcTanh[x]/
3 + ArcTanh[x/(1 + x^2)]/6
```

Rubi [A] time = 0.296585, antiderivative size = 78, normalized size of antiderivative = 1.5, number of steps used = 11, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538

$$-\frac{1}{12}\log\left(x^2-x+1\right)+\frac{1}{12}\log\left(x^2+x+1\right)-\frac{1}{x}+\frac{\tan^{-1}\left(\frac{1-2x}{\sqrt{3}}\right)}{2\sqrt{3}}-\frac{\tan^{-1}\left(\frac{2x+1}{\sqrt{3}}\right)}{2\sqrt{3}}+\frac{1}{3}\tanh^{-1}(x)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(1 - x^6)),x]
```

```
[Out] -x^(-1) + ArcTan[(1 - 2*x)/Sqrt[3]]/(2*Sqrt[3]) - ArcTan[(1 + 2*x
)/Sqrt[3]]/(2*Sqrt[3]) + ArcTanh[x]/3 - Log[1 - x + x^2]/12 + Log
[1 + x + x^2]/12
```

Rubi in Sympy [A] time = 49.879, size = 71, normalized size = 1.37

$$-\frac{\log\left(x^2-x+1\right)}{12}+\frac{\log\left(x^2+x+1\right)}{12}-\frac{\sqrt{3}\,\mathrm{atan}\left(\sqrt{3}\left(\frac{2x}{3}-\frac{1}{3}\right)\right)}{6}-\frac{\sqrt{3}\,\mathrm{atan}\left(\sqrt{3}\left(\frac{2x}{3}+\frac{1}{3}\right)\right)}{6}+\frac{\mathrm{atanh}\,(x)}{3}-\frac{1}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(-x**6+1),x)
```

```
[Out] -log(x**2 - x + 1)/12 + log(x**2 + x + 1)/12 - sqrt(3)*atan(sqrt(
3)*(2*x/3 - 1/3))/6 - sqrt(3)*atan(sqrt(3)*(2*x/3 + 1/3))/6 + ata
nh(x)/3 - 1/x
```

Mathematica [A] time = 0.0413572, size = 86, normalized size = 1.65

$$-\frac{x\log\left(x^2-x+1\right)-x\log\left(x^2+x+1\right)+2x\log(1-x)-2x\log(x+1)+2\sqrt{3}x\tan^{-1}\left(\frac{2x-1}{\sqrt{3}}\right)+2\sqrt{3}x\tan^{-1}\left(\frac{2x+1}{\sqrt{3}}\right)+12}{12x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*(1 - x^6)),x]
```

```
[Out] -(12 + 2*Sqrt[3]*x*ArcTan[(-1 + 2*x)/Sqrt[3]] + 2*Sqrt[3]*x*ArcTa
n[(1 + 2*x)/Sqrt[3]] + 2*x*Log[1 - x] - 2*x*Log[1 + x] + x*Log[1
- x + x^2] - x*Log[1 + x + x^2])/(12*x)
```

Maple [A] time = 0.013, size = 71, normalized size = 1.4

$$\frac{\ln\left(x^2+x+1\right)}{12}-\frac{\sqrt{3}}{6}\arctan\left(\frac{(1+2x)\sqrt{3}}{3}\right)-\frac{\ln(-1+x)}{6}-\frac{\ln\left(x^2-x+1\right)}{12}-\frac{\sqrt{3}}{6}\arctan\left(\frac{(2x-1)\sqrt{3}}{3}\right)+\frac{\ln(1+x)}{6}-x^{-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^2/(-x^6+1),x)
```

```
[Out] 1/12*ln(x^2+x+1)-1/6*arctan(1/3*(1+2*x)*3^(1/2))*3^(1/2)-1/6*ln(-
1+x)-1/12*ln(x^2-x+1)-1/6*3^(1/2)*arctan(1/3*(2*x-1)*3^(1/2))+1/6
*ln(1+x)-1/x
```

Maxima [A] time = 1.58067, size = 95, normalized size = 1.83

$$-\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}(2x+1)\right)-\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}(2x-1)\right)-\frac{1}{x}+\frac{1}{12}\log\left(x^2+x+1\right)-\frac{1}{12}\log\left(x^2-x+1\right)+\frac{1}{6}\log(x+1)-\frac{1}{6}\log(x-1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(-1/((x^6 - 1)*x^2),x, algorithm="maxima")
```

```
[Out] -1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x + 1)) - 1/6*sqrt(3)*arctan(1
/3*sqrt(3)*(2*x - 1)) - 1/x + 1/12*log(x^2 + x + 1) - 1/12*log(x^
2 - x + 1) + 1/6*log(x + 1) - 1/6*log(x - 1)
```

Fricas [A] time = 0.227857, size = 120, normalized size = 2.31

$$\frac{\sqrt{3}\left(\sqrt{3}x\log\left(x^2+x+1\right)-\sqrt{3}x\log\left(x^2-x+1\right)+2\sqrt{3}x\log(x+1)-2\sqrt{3}x\log(x-1)-6x\arctan\left(\frac{1}{3}\sqrt{3}(2x+1)\right)-6x\ldots\right.}{36x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(-1/((x^6 - 1)*x^2),x, algorithm="fricas")
```

```
[Out] 1/36*sqrt(3)*(sqrt(3)*x*log(x^2 + x + 1) - sqrt(3)*x*log(x^2 - x
+ 1) + 2*sqrt(3)*x*log(x + 1) - 2*sqrt(3)*x*log(x - 1) - 6*x*arct
an(1/3*sqrt(3)*(2*x + 1)) - 6*x*arctan(1/3*sqrt(3)*(2*x - 1)) - 1
2*sqrt(3))/x
```

Sympy [A] time = 0.825597, size = 87, normalized size = 1.67

$$-\frac{\log(x-1)}{6}+\frac{\log(x+1)}{6}-\frac{\log\left(x^2-x+1\right)}{12}+\frac{\log\left(x^2+x+1\right)}{12}-\frac{\sqrt{3}\operatorname{atan}\left(\frac{2\sqrt{3}x}{3}-\frac{\sqrt{3}}{3}\right)}{6}-\frac{\sqrt{3}\operatorname{atan}\left(\frac{2\sqrt{3}x}{3}+\frac{\sqrt{3}}{3}\right)}{6}-\frac{1}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/x**2/(-x**6+1),x)
```

```
[Out] -log(x - 1)/6 + log(x + 1)/6 - log(x**2 - x + 1)/12 + log(x**2 +
x + 1)/12 - sqrt(3)*atan(2*sqrt(3)*x/3 - sqrt(3)/3)/6 - sqrt(3)*a
tan(2*sqrt(3)*x/3 + sqrt(3)/3)/6 - 1/x
```

GIAC/XCAS [A] time = 0.224792, size = 97, normalized size = 1.87

$$-\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}(2x+1)\right)-\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}(2x-1)\right)-\frac{1}{x}+\frac{1}{12}\ln\left(x^2+x+1\right)-\frac{1}{12}\ln\left(x^2-x+1\right)+\frac{1}{6}\ln\left(|x+1|\right)-\frac{1}{6}\ln\left(|x-1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^6 - 1)*x^2),x, algorithm="giac")
```

```
[Out] -1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x + 1)) - 1/6*sqrt(3)*arctan(1
/3*sqrt(3)*(2*x - 1)) - 1/x + 1/12*ln(x^2 + x + 1) - 1/12*ln(x^2
- x + 1) + 1/6*ln(abs(x + 1)) - 1/6*ln(abs(x - 1))
```

3.1353 $\int \frac{1}{x^3(1-x^6)}\,dx$

Optimal. Leaf size=56

$$-\frac{1}{2x^2}-\frac{1}{6}\log\left(1-x^2\right)-\frac{\tan^{-1}\left(\frac{2x^2+1}{\sqrt{3}}\right)}{2\sqrt{3}}+\frac{1}{12}\log\left(x^4+x^2+1\right)$$

```
[Out] -1/(2*x^2) - ArcTan[(1 + 2*x^2)/Sqrt[3]]/(2*Sqrt[3]) - Log[1 - x^
2]/6 + Log[1 + x^2 + x^4]/12
```

Rubi [A] time = 0.0846454, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615

$$-\frac{1}{2x^2}-\frac{1}{6}\log\left(1-x^2\right)-\frac{\tan^{-1}\left(\frac{2x^2+1}{\sqrt{3}}\right)}{2\sqrt{3}}+\frac{1}{12}\log\left(x^4+x^2+1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(1 - x^6)),x]
```

```
[Out] -1/(2*x^2) - ArcTan[(1 + 2*x^2)/Sqrt[3]]/(2*Sqrt[3]) - Log[1 - x^
2]/6 + Log[1 + x^2 + x^4]/12
```

Rubi in Sympy [A] time = 10.4688, size = 49, normalized size = 0.88

$$-\frac{\log\left(-x^2+1\right)}{6}+\frac{\log\left(x^4+x^2+1\right)}{12}-\frac{\sqrt{3}\,\text{atan}\left(\sqrt{3}\left(\frac{2x^2}{3}+\frac{1}{3}\right)\right)}{6}-\frac{1}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(-x**6+1),x)
```

```
[Out] -log(-x**2 + 1)/6 + log(x**4 + x**2 + 1)/12 - sqrt(3)*atan(sqrt(3
)*(2*x**2/3 + 1/3))/6 - 1/(2*x**2)
```

Mathematica [A] time = 0.0409975, size = 78, normalized size = 1.39

$$\frac{1}{12}\left(-\frac{6}{x^2}+\log\left(x^2-x+1\right)+\log\left(x^2+x+1\right)-2\log(1-x)-2\log(x+1)-2\sqrt{3}\tan^{-1}\left(\frac{2x-1}{\sqrt{3}}\right)+2\sqrt{3}\tan^{-1}\left(\frac{2x+1}{\sqrt{3}}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*(1 - x^6)),x]
```

```
[Out] (-6/x^2 - 2*Sqrt[3]*ArcTan[(-1 + 2*x)/Sqrt[3]] + 2*Sqrt[3]*ArcTan
[(1 + 2*x)/Sqrt[3]] - 2*Log[1 - x] - 2*Log[1 + x] + Log[1 - x + x
^2] + Log[1 + x + x^2])/12
```

Maple [A] time = 0.014, size = 71, normalized size = 1.3

$$\frac{\ln\left(x^2+x+1\right)}{12}+\frac{\sqrt{3}}{6}\arctan\left(\frac{(1+2x)\sqrt{3}}{3}\right)-\frac{\ln(-1+x)}{6}+\frac{\ln\left(x^2-x+1\right)}{12}-\frac{\sqrt{3}}{6}\arctan\left(\frac{(2x-1)\sqrt{3}}{3}\right)-\frac{\ln(1+x)}{6}-\frac{1}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(-x^6+1),x)
```

```
[Out] 1/12*ln(x^2+x+1)+1/6*arctan(1/3*(1+2*x)*3^(1/2))*3^(1/2)-1/6*ln(-
1+x)+1/12*ln(x^2-x+1)-1/6*3^(1/2)*arctan(1/3*(2*x-1)*3^(1/2))-1/6
*ln(1+x)-1/2/x^2
```

Maxima [A] time = 1.57701, size = 58, normalized size = 1.04

$$-\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}\left(2x^2+1\right)\right)-\frac{1}{2x^2}+\frac{1}{12}\log\left(x^4+x^2+1\right)-\frac{1}{6}\log\left(x^2-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^6 - 1)*x^3),x, algorithm="maxima")
```

```
[Out] -1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x^2 + 1)) - 1/2/x^2 + 1/12*log
(x^4 + x^2 + 1) - 1/6*log(x^2 - 1)
```

Fricas [A] time = 0.228073, size = 84, normalized size = 1.5

$$\frac{\sqrt{3}\left(\sqrt{3}x^2\log\left(x^4+x^2+1\right)-2\sqrt{3}x^2\log\left(x^2-1\right)-6x^2\arctan\left(\frac{1}{3}\sqrt{3}\left(2x^2+1\right)\right)-6\sqrt{3}\right)}{36x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^6 - 1)*x^3),x, algorithm="fricas")
```

```
[Out] 1/36*sqrt(3)*(sqrt(3)*x^2*log(x^4 + x^2 + 1) - 2*sqrt(3)*x^2*log(
x^2 - 1) - 6*x^2*arctan(1/3*sqrt(3)*(2*x^2 + 1)) - 6*sqrt(3))/x^2
```

Sympy [A] time = 0.514444, size = 53, normalized size = 0.95

$$-\frac{\log\left(x^2-1\right)}{6}+\frac{\log\left(x^4+x^2+1\right)}{12}-\frac{\sqrt{3}\,\mathrm{atan}\left(\frac{2\sqrt{3}x^2}{3}+\frac{\sqrt{3}}{3}\right)}{6}-\frac{1}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(-x**6+1),x)
```

```
[Out] -log(x**2 - 1)/6 + log(x**4 + x**2 + 1)/12 - sqrt(3)*atan(2*sqrt(
3)*x**2/3 + sqrt(3)/3)/6 - 1/(2*x**2)
```

GIAC/XCAS [A] time = 0.224435, size = 59, normalized size = 1.05

$$-\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}\left(2x^2+1\right)\right)-\frac{1}{2x^2}+\frac{1}{12}\ln\left(x^4+x^2+1\right)-\frac{1}{6}\ln\left(\left|x^2-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^6 - 1)*x^3),x, algorithm="giac")
```

```
[Out] -1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x^2 + 1)) - 1/2/x^2 + 1/12*ln(
x^4 + x^2 + 1) - 1/6*ln(abs(x^2 - 1))
```

3.1354 $\int \frac{1}{x^4(1-x^6)}\,dx$

Optimal. Leaf size=16

$$\frac{1}{3}\tanh^{-1}\left(x^3\right)-\frac{1}{3x^3}$$

```
[Out] -1/(3*x^3) + ArcTanh[x^3]/3
```

Rubi [A] time = 0.0233069, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{1}{3}\tanh^{-1}\left(x^3\right)-\frac{1}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*(1 - x^6)),x]

[Out] -1/(3*x^3) + ArcTanh[x^3]/3
```

Rubi in Sympy [A] time = 5.13423, size = 12, normalized size = 0.75

$$\frac{\operatorname{atanh}\left(x^3\right)}{3}-\frac{1}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(-x**6+1),x)

[Out] atanh(x**3)/3 - 1/(3*x**3)
```

Mathematica [A] time = 0.00761368, size = 30, normalized size = 1.88

$$-\frac{1}{3x^3}-\frac{1}{6}\log\left(1-x^3\right)+\frac{1}{6}\log\left(x^3+1\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*(1 - x^6)),x]

[Out] -1/(3*x^3) - Log[1 - x^3]/6 + Log[1 + x^3]/6
```

Maple [B] time = 0.013, size = 39, normalized size = 2.4

$$-\frac{\ln\left(x^2+x+1\right)}{6}-\frac{\ln\left(-1+x\right)}{6}-\frac{1}{3\,x^3}+\frac{\ln\left(x^2-x+1\right)}{6}+\frac{\ln\left(1+x\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(-x^6+1),x)

[Out] -1/6*ln(x^2+x+1)-1/6*ln(-1+x)-1/3/x^3+1/6*ln(x^2-x+1)+1/6*ln(1+x)
```

Maxima [A] time = 1.44008, size = 30, normalized size = 1.88

$$-\frac{1}{3\,x^3}+\frac{1}{6}\,\log\left(x^3+1\right)-\frac{1}{6}\,\log\left(x^3-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^6 - 1)*x^4),x, algorithm="maxima")

[Out] -1/3/x^3 + 1/6*log(x^3 + 1) - 1/6*log(x^3 - 1)
```

Fricas [A] time = 0.226442, size = 38, normalized size = 2.38

$$\frac{x^3\log\left(x^3+1\right)-x^3\log\left(x^3-1\right)-2}{6\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^6 - 1)*x^4),x, algorithm="fricas")

[Out] 1/6*(x^3*log(x^3 + 1) - x^3*log(x^3 - 1) - 2)/x^3
```

Sympy [A] time = 0.319197, size = 22, normalized size = 1.38

$$-\frac{\log\left(x^3-1\right)}{6}+\frac{\log\left(x^3+1\right)}{6}-\frac{1}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(-x**6+1),x)

[Out] -log(x**3 - 1)/6 + log(x**3 + 1)/6 - 1/(3*x**3)
```

GIAC/XCAS [A] time = 0.223971, size = 32, normalized size = 2.

$$-\frac{1}{3\,x^3}+\frac{1}{6}\ln\left(\left|x^3+1\right|\right)-\frac{1}{6}\ln\left(\left|x^3-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^6 - 1)*x^4),x, algorithm="giac")

[Out] -1/3/x^3 + 1/6*ln(abs(x^3 + 1)) - 1/6*ln(abs(x^3 - 1))
```

3.1355 $\int \frac{1}{x^5(1-x^6)}\,dx$

Optimal. Leaf size=56

$$-\frac{1}{4x^4}-\frac{1}{6}\log\left(1-x^2\right)+\frac{\tan^{-1}\left(\frac{2x^2+1}{\sqrt{3}}\right)}{2\sqrt{3}}+\frac{1}{12}\log\left(x^4+x^2+1\right)$$

```
[Out] -1/(4*x^4) + ArcTan[(1 + 2*x^2)/Sqrt[3]]/(2*Sqrt[3]) - Log[1 - x^
2]/6 + Log[1 + x^2 + x^4]/12
```

Rubi [A] time = 0.0800121, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615

$$-\frac{1}{4x^4}-\frac{1}{6}\log\left(1-x^2\right)+\frac{\tan^{-1}\left(\frac{2x^2+1}{\sqrt{3}}\right)}{2\sqrt{3}}+\frac{1}{12}\log\left(x^4+x^2+1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^5*(1 - x^6)),x]
```

```
[Out] -1/(4*x^4) + ArcTan[(1 + 2*x^2)/Sqrt[3]]/(2*Sqrt[3]) - Log[1 - x^
2]/6 + Log[1 + x^2 + x^4]/12
```

Rubi in Sympy [A] time = 9.15768, size = 49, normalized size = 0.88

$$-\frac{\log\left(-x^2+1\right)}{6}+\frac{\log\left(x^4+x^2+1\right)}{12}+\frac{\sqrt{3}\,\mathrm{atan}\left(\sqrt{3}\left(\frac{2x^2}{3}+\frac{1}{3}\right)\right)}{6}-\frac{1}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**5/(-x**6+1),x)
```

```
[Out] -log(-x**2 + 1)/6 + log(x**4 + x**2 + 1)/12 + sqrt(3)*atan(sqrt(3
)*(2*x**2/3 + 1/3))/6 - 1/(4*x**4)
```

Mathematica [A] time = 0.0437682, size = 78, normalized size = 1.39

$$\frac{1}{12}\left(-\frac{3}{x^4}+\log\left(x^2-x+1\right)+\log\left(x^2+x+1\right)-2\log(1-x)-2\log(x+1)+2\sqrt{3}\tan^{-1}\left(\frac{2x-1}{\sqrt{3}}\right)-2\sqrt{3}\tan^{-1}\left(\frac{2x+1}{\sqrt{3}}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^5*(1 - x^6)),x]
```

```
[Out] (-3/x^4 + 2*Sqrt[3]*ArcTan[(-1 + 2*x)/Sqrt[3]] - 2*Sqrt[3]*ArcTan
[(1 + 2*x)/Sqrt[3]] - 2*Log[1 - x] - 2*Log[1 + x] + Log[1 - x + x
^2] + Log[1 + x + x^2])/12
```

Maple [A] time = 0.015, size = 71, normalized size = 1.3

$$\frac{\ln\left(x^2+x+1\right)}{12}-\frac{\sqrt{3}}{6}\arctan\left(\frac{(1+2x)\sqrt{3}}{3}\right)-\frac{\ln\left(-1+x\right)}{6}-\frac{1}{4x^4}+\frac{\ln\left(x^2-x+1\right)}{12}+\frac{\sqrt{3}}{6}\arctan\left(\frac{(2x-1)\sqrt{3}}{3}\right)-\frac{\ln\left(1+x\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^5/(-x^6+1),x)
```

```
[Out] 1/12*ln(x^2+x+1)-1/6*arctan(1/3*(1+2*x)*3^(1/2))*3^(1/2)-1/6*ln(-
1+x)-1/4/x^4+1/12*ln(x^2-x+1)+1/6*3^(1/2)*arctan(1/3*(2*x-1)*3^(1
/2))-1/6*ln(1+x)
```

Maxima [A] time = 1.64089, size = 58, normalized size = 1.04

$$\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}\left(2x^2+1\right)\right)-\frac{1}{4x^4}+\frac{1}{12}\log\left(x^4+x^2+1\right)-\frac{1}{6}\log\left(x^2-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^6 - 1)*x^5),x, algorithm="maxima")
```

```
[Out] 1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x^2 + 1)) - 1/4/x^4 + 1/12*log(
x^4 + x^2 + 1) - 1/6*log(x^2 - 1)
```

Fricas [A] time = 0.228158, size = 84, normalized size = 1.5

$$\frac{\sqrt{3}\left(\sqrt{3}x^4\log\left(x^4+x^2+1\right)-2\sqrt{3}x^4\log\left(x^2-1\right)+6x^4\arctan\left(\frac{1}{3}\sqrt{3}\left(2x^2+1\right)\right)-3\sqrt{3}\right)}{36x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^6 - 1)*x^5),x, algorithm="fricas")
```

```
[Out] 1/36*sqrt(3)*(sqrt(3)*x^4*log(x^4 + x^2 + 1) - 2*sqrt(3)*x^4*log(
x^2 - 1) + 6*x^4*arctan(1/3*sqrt(3)*(2*x^2 + 1)) - 3*sqrt(3))/x^4
```

Sympy [A] time = 0.543459, size = 53, normalized size = 0.95

$$-\frac{\log\left(x^2-1\right)}{6}+\frac{\log\left(x^4+x^2+1\right)}{12}+\frac{\sqrt{3}\operatorname{atan}\left(\frac{2\sqrt{3}x^2}{3}+\frac{\sqrt{3}}{3}\right)}{6}-\frac{1}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**5/(-x**6+1),x)
```

```
[Out] -log(x**2 - 1)/6 + log(x**4 + x**2 + 1)/12 + sqrt(3)*atan(2*sqrt(
3)*x**2/3 + sqrt(3)/3)/6 - 1/(4*x**4)
```

GIAC/XCAS [A] time = 0.226831, size = 59, normalized size = 1.05

$$\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}\left(2x^2+1\right)\right)-\frac{1}{4x^4}+\frac{1}{12}\ln\left(x^4+x^2+1\right)-\frac{1}{6}\ln\left(\left|x^2-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^6 - 1)*x^5),x, algorithm="giac")
```

```
[Out] 1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x^2 + 1)) - 1/4/x^4 + 1/12*ln(x
^4 + x^2 + 1) - 1/6*ln(abs(x^2 - 1))
```

3.1356 $\int \frac{1}{x^6(1-x^6)}\,dx$

Optimal. Leaf size=80

$$-\frac{1}{5x^5}-\frac{1}{12}\log\left(x^2-x+1\right)+\frac{1}{12}\log\left(x^2+x+1\right)-\frac{\tan^{-1}\left(\frac{1-2x}{\sqrt{3}}\right)}{2\sqrt{3}}+\frac{\tan^{-1}\left(\frac{2x+1}{\sqrt{3}}\right)}{2\sqrt{3}}+\frac{1}{3}\tanh^{-1}(x)$$

```
[Out] -1/(5*x^5) - ArcTan[(1 - 2*x)/Sqrt[3]]/(2*Sqrt[3]) + ArcTan[(1 +
2*x)/Sqrt[3]]/(2*Sqrt[3]) + ArcTanh[x]/3 - Log[1 - x + x^2]/12 +
Log[1 + x + x^2]/12
```

Rubi [A] time = 0.205085, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.538$

$$-\frac{1}{5x^5}-\frac{1}{12}\log\left(x^2-x+1\right)+\frac{1}{12}\log\left(x^2+x+1\right)-\frac{\tan^{-1}\left(\frac{1-2x}{\sqrt{3}}\right)}{2\sqrt{3}}+\frac{\tan^{-1}\left(\frac{2x+1}{\sqrt{3}}\right)}{2\sqrt{3}}+\frac{1}{3}\tanh^{-1}(x)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^6*(1 - x^6)),x]
```

```
[Out] -1/(5*x^5) - ArcTan[(1 - 2*x)/Sqrt[3]]/(2*Sqrt[3]) + ArcTan[(1 +
2*x)/Sqrt[3]]/(2*Sqrt[3]) + ArcTanh[x]/3 - Log[1 - x + x^2]/12 +
Log[1 + x + x^2]/12
```

Rubi in Sympy [A] time = 36.4134, size = 75, normalized size = 0.94

$$-\frac{\log\left(x^2-x+1\right)}{12}+\frac{\log\left(x^2+x+1\right)}{12}+\frac{\sqrt{3}\,\mathrm{atan}\left(\sqrt{3}\left(\frac{2x}{3}-\frac{1}{3}\right)\right)}{6}+\frac{\sqrt{3}\,\mathrm{atan}\left(\sqrt{3}\left(\frac{2x}{3}+\frac{1}{3}\right)\right)}{6}+\frac{\mathrm{atanh}\,(x)}{3}-\frac{1}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**6/(-x**6+1),x)
```

```
[Out] -log(x**2 - x + 1)/12 + log(x**2 + x + 1)/12 + sqrt(3)*atan(sqrt(
3)*(2*x/3 - 1/3))/6 + sqrt(3)*atan(sqrt(3)*(2*x/3 + 1/3))/6 + ata
nh(x)/3 - 1/(5*x**5)
```

Mathematica [A] time = 0.0473911, size = 82, normalized size = 1.02

$$\frac{1}{60}\left(-\frac{12}{x^5}-5\log\left(x^2-x+1\right)+5\log\left(x^2+x+1\right)-10\log(1-x)+10\log(x+1)+10\sqrt{3}\tan^{-1}\left(\frac{2x-1}{\sqrt{3}}\right)+10\sqrt{3}\tan^{-1}\left(\frac{2x+1}{\sqrt{3}}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^6*(1 - x^6)),x]
```

```
[Out] (-12/x^5 + 10*Sqrt[3]*ArcTan[(-1 + 2*x)/Sqrt[3]] + 10*Sqrt[3]*Arc
Tan[(1 + 2*x)/Sqrt[3]] - 10*Log[1 - x] + 10*Log[1 + x] - 5*Log[1
- x + x^2] + 5*Log[1 + x + x^2])/60
```

Maple [A] time = 0.013, size = 71, normalized size = 0.9

$$\frac{\ln\left(x^2+x+1\right)}{12}+\frac{\sqrt{3}}{6}\arctan\left(\frac{(1+2x)\sqrt{3}}{3}\right)-\frac{\ln(-1+x)}{6}-\frac{\ln\left(x^2-x+1\right)}{12}+\frac{\sqrt{3}}{6}\arctan\left(\frac{(2x-1)\sqrt{3}}{3}\right)+\frac{\ln(1+x)}{6}-\frac{1}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^6/(-x^6+1),x)
```

```
[Out] 1/12*ln(x^2+x+1)+1/6*arctan(1/3*(1+2*x)*3^(1/2))*3^(1/2)-1/6*ln(-
1+x)-1/12*ln(x^2-x+1)+1/6*3^(1/2)*arctan(1/3*(2*x-1)*3^(1/2))+1/6
*ln(1+x)-1/5/x^5
```

Maxima [A] time = 1.57971, size = 95, normalized size = 1.19

$$\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}(2x+1)\right)+\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}(2x-1)\right)-\frac{1}{5x^5}+\frac{1}{12}\log\left(x^2+x+1\right)-\frac{1}{12}\log\left(x^2-x+1\right)+\frac{1}{6}\log(x+1)-\frac{1}{6}\log(x-1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^6 - 1)*x^6),x, algorithm="maxima")
```

```
[Out] 1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x + 1)) + 1/6*sqrt(3)*arctan(1/
3*sqrt(3)*(2*x - 1)) - 1/5/x^5 + 1/12*log(x^2 + x + 1) - 1/12*log
(x^2 - x + 1) + 1/6*log(x + 1) - 1/6*log(x - 1)
```

Fricas [A] time = 0.227786, size = 138, normalized size = 1.72

$$\frac{\sqrt{3}\left(5\sqrt{3}x^5\log\left(x^2+x+1\right)-5\sqrt{3}x^5\log\left(x^2-x+1\right)+10\sqrt{3}x^5\log(x+1)-10\sqrt{3}x^5\log(x-1)+30x^5\arctan\left(\frac{1}{3}\sqrt{3}(2x\right.\right.}{180x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^6 - 1)*x^6),x, algorithm="fricas")
```

```
[Out] 1/180*sqrt(3)*(5*sqrt(3)*x^5*log(x^2 + x + 1) - 5*sqrt(3)*x^5*log
(x^2 - x + 1) + 10*sqrt(3)*x^5*log(x + 1) - 10*sqrt(3)*x^5*log(x
- 1) + 30*x^5*arctan(1/3*sqrt(3)*(2*x + 1)) + 30*x^5*arctan(1/3*s
qrt(3)*(2*x - 1)) - 12*sqrt(3))/x^5
```

Sympy [A] time = 0.921895, size = 90, normalized size = 1.12

$$-\frac{\log(x-1)}{6}+\frac{\log(x+1)}{6}-\frac{\log\left(x^2-x+1\right)}{12}+\frac{\log\left(x^2+x+1\right)}{12}+\frac{\sqrt{3}\operatorname{atan}\left(\frac{2\sqrt{3}x}{3}-\frac{\sqrt{3}}{3}\right)}{6}+\frac{\sqrt{3}\operatorname{atan}\left(\frac{2\sqrt{3}x}{3}+\frac{\sqrt{3}}{3}\right)}{6}-\frac{1}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**6/(-x**6+1),x)
```

```
[Out] -log(x - 1)/6 + log(x + 1)/6 - log(x**2 - x + 1)/12 + log(x**2 +
x + 1)/12 + sqrt(3)*atan(2*sqrt(3)*x/3 - sqrt(3)/3)/6 + sqrt(3)*a
tan(2*sqrt(3)*x/3 + sqrt(3)/3)/6 - 1/(5*x**5)
```

GIAC/XCAS [A] time = 0.222093, size = 97, normalized size = 1.21

$$\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}(2x+1)\right)+\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}(2x-1)\right)-\frac{1}{5x^5}+\frac{1}{12}\ln\left(x^2+x+1\right)-\frac{1}{12}\ln\left(x^2-x+1\right)+\frac{1}{6}\ln\left(|x+1|\right)-\frac{1}{6}\ln\left(|x-1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^6 - 1)*x^6),x, algorithm="giac")
```

```
[Out] 1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x + 1)) + 1/6*sqrt(3)*arctan(1/
3*sqrt(3)*(2*x - 1)) - 1/5/x^5 + 1/12*ln(x^2 + x + 1) - 1/12*ln(x
^2 - x + 1) + 1/6*ln(abs(x + 1)) - 1/6*ln(abs(x - 1))
```

3.1357 $\int \frac{1}{x^7(1-x^6)}\,dx$

Optimal. Leaf size=22

$$-\frac{1}{6x^6}-\frac{1}{6}\log\left(1-x^6\right)+\log(x)$$

```
[Out] -1/(6*x^6) + Log[x] - Log[1 - x^6]/6
```

Rubi [A] time = 0.0315833, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{1}{6x^6}-\frac{1}{6}\log\left(1-x^6\right)+\log(x)$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^7*(1 - x^6)),x]

[Out] -1/(6*x^6) + Log[x] - Log[1 - x^6]/6
```

Rubi in Sympy [A] time = 4.77375, size = 20, normalized size = 0.91

$$\frac{\log\left(x^6\right)}{6}-\frac{\log\left(-x^6+1\right)}{6}-\frac{1}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**7/(-x**6+1),x)

[Out] log(x**6)/6 - log(-x**6 + 1)/6 - 1/(6*x**6)
```

Mathematica [A] time = 0.00704123, size = 22, normalized size = 1.

$$-\frac{1}{6x^6}-\frac{1}{6}\log\left(1-x^6\right)+\log(x)$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^7*(1 - x^6)),x]

[Out] -1/(6*x^6) + Log[x] - Log[1 - x^6]/6
```

Maple [B] time = 0.014, size = 41, normalized size = 1.9

$$-\frac{1}{6\,x^6}+\ln(x)-\frac{\ln\left(x^2+x+1\right)}{6}-\frac{\ln(-1+x)}{6}-\frac{\ln\left(x^2-x+1\right)}{6}-\frac{\ln(1+x)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^7/(-x^6+1),x)

[Out] -1/6/x^6+ln(x)-1/6*ln(x^2+x+1)-1/6*ln(-1+x)-1/6*ln(x^2-x+1)-1/6*l
n(1+x)
```

Maxima [A] time = 1.45389, size = 27, normalized size = 1.23

$$-\frac{1}{6\,x^{6}} - \frac{1}{6}\,\log\left(x^{6} - 1\right) + \frac{1}{6}\,\log\left(x^{6}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^6 - 1)*x^7),x, algorithm="maxima")

[Out] -1/6/x^6 - 1/6*log(x^6 - 1) + 1/6*log(x^6)
```

Fricas [A] time = 0.226299, size = 32, normalized size = 1.45

$$-\frac{x^{6}\log\left(x^{6} - 1\right) - 6\,x^{6}\log\left(x\right) + 1}{6\,x^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^6 - 1)*x^7),x, algorithm="fricas")

[Out] -1/6*(x^6*log(x^6 - 1) - 6*x^6*log(x) + 1)/x^6
```

Sympy [A] time = 0.390702, size = 17, normalized size = 0.77

$$\log\left(x\right) - \frac{\log\left(x^{6} - 1\right)}{6} - \frac{1}{6x^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**7/(-x**6+1),x)

[Out] log(x) - log(x**6 - 1)/6 - 1/(6*x**6)
```

GIAC/XCAS [A] time = 0.225196, size = 35, normalized size = 1.59

$$-\frac{x^{6} + 1}{6\,x^{6}} + \frac{1}{6}\,\ln\left(x^{6}\right) - \frac{1}{6}\,\ln\left(\left|x^{6} - 1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^6 - 1)*x^7),x, algorithm="giac")

[Out] -1/6*(x^6 + 1)/x^6 + 1/6*ln(x^6) - 1/6*ln(abs(x^6 - 1))
```

3.1358 $\int \frac{1}{x^8(1-x^6)}\,dx$

Optimal. Leaf size=85

$$-\frac{1}{7x^7}-\frac{1}{12}\log\left(x^2-x+1\right)+\frac{1}{12}\log\left(x^2+x+1\right)-\frac{1}{x}+\frac{\tan^{-1}\left(\frac{1-2x}{\sqrt{3}}\right)}{2\sqrt{3}}-\frac{\tan^{-1}\left(\frac{2x+1}{\sqrt{3}}\right)}{2\sqrt{3}}+\frac{1}{3}\tanh^{-1}(x)$$

```
[Out] -1/(7*x^7) - x^(-1) + ArcTan[(1 - 2*x)/Sqrt[3]]/(2*Sqrt[3]) - Arc
Tan[(1 + 2*x)/Sqrt[3]]/(2*Sqrt[3]) + ArcTanh[x]/3 - Log[1 - x + x
^2]/12 + Log[1 + x + x^2]/12
```

Rubi [A] time = 0.295853, antiderivative size = 85, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538

$$-\frac{1}{7x^7}-\frac{1}{12}\log\left(x^2-x+1\right)+\frac{1}{12}\log\left(x^2+x+1\right)-\frac{1}{x}+\frac{\tan^{-1}\left(\frac{1-2x}{\sqrt{3}}\right)}{2\sqrt{3}}-\frac{\tan^{-1}\left(\frac{2x+1}{\sqrt{3}}\right)}{2\sqrt{3}}+\frac{1}{3}\tanh^{-1}(x)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^8*(1 - x^6)),x]
```

```
[Out] -1/(7*x^7) - x^(-1) + ArcTan[(1 - 2*x)/Sqrt[3]]/(2*Sqrt[3]) - Arc
Tan[(1 + 2*x)/Sqrt[3]]/(2*Sqrt[3]) + ArcTanh[x]/3 - Log[1 - x + x
^2]/12 + Log[1 + x + x^2]/12
```

Rubi in Sympy [A] time = 46.9757, size = 78, normalized size = 0.92

$$-\frac{\log\left(x^2-x+1\right)}{12}+\frac{\log\left(x^2+x+1\right)}{12}-\frac{\sqrt{3}\,\mathrm{atan}\left(\sqrt{3}\left(\frac{2x}{3}-\frac{1}{3}\right)\right)}{6}-\frac{\sqrt{3}\,\mathrm{atan}\left(\sqrt{3}\left(\frac{2x}{3}+\frac{1}{3}\right)\right)}{6}+\frac{\mathrm{atanh}\,(x)}{3}-\frac{1}{x}-\frac{1}{7x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**8/(-x**6+1),x)
```

```
[Out] -log(x**2 - x + 1)/12 + log(x**2 + x + 1)/12 - sqrt(3)*atan(sqrt(
3)*(2*x/3 - 1/3))/6 - sqrt(3)*atan(sqrt(3)*(2*x/3 + 1/3))/6 + ata
nh(x)/3 - 1/x - 1/(7*x**7)
```

Mathematica [A] time = 0.0551721, size = 87, normalized size = 1.02

$$\frac{1}{84}\left(-\frac{12}{x^7}-7\log\left(x^2-x+1\right)+7\log\left(x^2+x+1\right)-\frac{84}{x}-14\log(1-x)+14\log(x+1)-14\sqrt{3}\tan^{-1}\left(\frac{2x-1}{\sqrt{3}}\right)-14\sqrt{3}\tan^{-1}\left(\frac{2x+1}{\sqrt{3}}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^8*(1 - x^6)),x]
```

```
[Out] (-12/x^7 - 84/x - 14*Sqrt[3]*ArcTan[(-1 + 2*x)/Sqrt[3]] - 14*Sqrt
[3]*ArcTan[(1 + 2*x)/Sqrt[3]] - 14*Log[1 - x] + 14*Log[1 + x] - 7
```

```
*Log[1 - x + x^2] + 7*Log[1 + x + x^2])/84
```

Maple [A] time = 0.015, size = 76, normalized size = 0.9

$$-\frac{1}{7x^7}-x^{-1}+\frac{\ln\left(x^2+x+1\right)}{12}-\frac{\sqrt{3}}{6}\arctan\left(\frac{(1+2x)\sqrt{3}}{3}\right)-\frac{\ln(-1+x)}{6}-\frac{\ln\left(x^2-x+1\right)}{12}-\frac{\sqrt{3}}{6}\arctan\left(\frac{(2x-1)\sqrt{3}}{3}\right)+\frac{\ln(1+x)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^8/(-x^6+1),x)
```

```
[Out] -1/7/x^7-1/x+1/12*ln(x^2+x+1)-1/6*arctan(1/3*(1+2*x)*3^(1/2))*3^(
1/2)-1/6*ln(-1+x)-1/12*ln(x^2-x+1)-1/6*3^(1/2)*arctan(1/3*(2*x-1)
*3^(1/2))+1/6*ln(1+x)
```

Maxima [A] time = 1.59913, size = 104, normalized size = 1.22

$$-\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}(2x+1)\right)-\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}(2x-1)\right)-\frac{7x^6+1}{7x^7}+\frac{1}{12}\log\left(x^2+x+1\right)-\frac{1}{12}\log\left(x^2-x+1\right)+\frac{1}{6}\log(x+1)-\frac{1}{6}\log(x-1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(-1/((x^6 - 1)*x^8),x, algorithm="maxima")
```

```
[Out] -1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x + 1)) - 1/6*sqrt(3)*arctan(1
/3*sqrt(3)*(2*x - 1)) - 1/7*(7*x^6 + 1)/x^7 + 1/12*log(x^2 + x +
1) - 1/12*log(x^2 - x + 1) + 1/6*log(x + 1) - 1/6*log(x - 1)
```

Fricas [A] time = 0.226576, size = 147, normalized size = 1.73

$$\frac{\sqrt{3}\left(7\sqrt{3}x^7\log\left(x^2+x+1\right)-7\sqrt{3}x^7\log\left(x^2-x+1\right)+14\sqrt{3}x^7\log(x+1)-14\sqrt{3}x^7\log(x-1)-42x^7\arctan\left(\frac{1}{3}\sqrt{3}(2x\right.\right.}{252x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(-1/((x^6 - 1)*x^8),x, algorithm="fricas")
```

```
[Out] 1/252*sqrt(3)*(7*sqrt(3)*x^7*log(x^2 + x + 1) - 7*sqrt(3)*x^7*log
(x^2 - x + 1) + 14*sqrt(3)*x^7*log(x + 1) - 14*sqrt(3)*x^7*log(x
- 1) - 42*x^7*arctan(1/3*sqrt(3)*(2*x + 1)) - 42*x^7*arctan(1/3*s
qrt(3)*(2*x - 1)) - 12*sqrt(3)*(7*x^6 + 1))/x^7
```

Sympy [A] time = 0.987873, size = 95, normalized size = 1.12

$$-\frac{\log(x-1)}{6}+\frac{\log(x+1)}{6}-\frac{\log\left(x^2-x+1\right)}{12}+\frac{\log\left(x^2+x+1\right)}{12}-\frac{\sqrt{3}\operatorname{atan}\left(\frac{2\sqrt{3}x}{3}-\frac{\sqrt{3}}{3}\right)}{6}-\frac{\sqrt{3}\operatorname{atan}\left(\frac{2\sqrt{3}x}{3}+\frac{\sqrt{3}}{3}\right)}{6}-\frac{7x^6+1}{7x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**8/(-x**6+1),x)
```

```
[Out] -log(x - 1)/6 + log(x + 1)/6 - log(x**2 - x + 1)/12 + log(x**2 +
x + 1)/12 - sqrt(3)*atan(2*sqrt(3)*x/3 - sqrt(3)/3)/6 - sqrt(3)*a
tan(2*sqrt(3)*x/3 + sqrt(3)/3)/6 - (7*x**6 + 1)/(7*x**7)
```

GIAC/XCAS [A] time = 0.222968, size = 107, normalized size = 1.26

$$-\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}(2x+1)\right)-\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}(2x-1)\right)-\frac{7x^6+1}{7x^7}+\frac{1}{12}\ln\left(x^2+x+1\right)-\frac{1}{12}\ln\left(x^2-x+1\right)+\frac{1}{6}\ln\left(|x+1|\right)-\frac{1}{6}\ln\left(|x-1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^6 - 1)*x^8),x, algorithm="giac")
```

```
[Out] -1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x + 1)) - 1/6*sqrt(3)*arctan(1
/3*sqrt(3)*(2*x - 1)) - 1/7*(7*x^6 + 1)/x^7 + 1/12*ln(x^2 + x + 1
) - 1/12*ln(x^2 - x + 1) + 1/6*ln(abs(x + 1)) - 1/6*ln(abs(x - 1)
)
```

3.1359 $\int \frac{x^8}{1+x^6} dx$

Optimal. Leaf size=16

$$\frac{x^3}{3} - \frac{1}{3}\tan^{-1}\left(x^3\right)$$

```
[Out] x^3/3 - ArcTan[x^3]/3
```

Rubi [A] time = 0.0214251, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273

$$\frac{x^3}{3} - \frac{1}{3}\tan^{-1}\left(x^3\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^8/(1 + x^6),x]

[Out] x^3/3 - ArcTan[x^3]/3
```

Rubi in Sympy [A] time = 4.73217, size = 10, normalized size = 0.62

$$\frac{x^3}{3} - \frac{\operatorname{atan}\left(x^3\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8/(x**6+1),x)

[Out] x**3/3 - atan(x**3)/3
```

Mathematica [A] time = 0.00846163, size = 16, normalized size = 1.

$$\frac{x^3}{3} - \frac{1}{3}\tan^{-1}\left(x^3\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8/(1 + x^6),x]

[Out] x^3/3 - ArcTan[x^3]/3
```

Maple [A] time = 0.003, size = 13, normalized size = 0.8

$$\frac{x^3}{3} - \frac{\arctan\left(x^3\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8/(x^6+1),x)

[Out] 1/3*x^3-1/3*arctan(x^3)
```

Maxima [A] time = 1.59426, size = 16, normalized size = 1.

$$\frac{1}{3}x^3 - \frac{1}{3}\arctan\left(x^3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(x^6 + 1),x, algorithm="maxima")
```

```
[Out] 1/3*x^3 - 1/3*arctan(x^3)
```

Fricas [A] time = 0.211003, size = 16, normalized size = 1.

$$\frac{1}{3}x^3 - \frac{1}{3}\arctan\left(x^3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(x^6 + 1),x, algorithm="fricas")
```

```
[Out] 1/3*x^3 - 1/3*arctan(x^3)
```

Sympy [A] time = 0.221464, size = 10, normalized size = 0.62

$$\frac{x^3}{3} - \frac{\operatorname{atan}\left(x^3\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8/(x**6+1),x)
```

```
[Out] x**3/3 - atan(x**3)/3
```

GIAC/XCAS [A] time = 0.228468, size = 16, normalized size = 1.

$$\frac{1}{3}x^3 - \frac{1}{3}\arctan\left(x^3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(x^6 + 1),x, algorithm="giac")
```

```
[Out] 1/3*x^3 - 1/3*arctan(x^3)
```

3.1360 $\int \frac{x^7}{1+x^6} dx$

Optimal. Leaf size=56

$$\frac{x^2}{2} - \frac{1}{6}\log\left(x^2+1\right) + \frac{\tan^{-1}\left(\frac{1-2x^2}{\sqrt{3}}\right)}{2\sqrt{3}} + \frac{1}{12}\log\left(x^4-x^2+1\right)$$

```
[Out] x^2/2 + ArcTan[(1 - 2*x^2)/Sqrt[3]]/(2*Sqrt[3]) - Log[1 + x^2]/6
+ Log[1 - x^2 + x^4]/12
```

Rubi [A] time = 0.0853177, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.727

$$\frac{x^2}{2} - \frac{1}{6}\log\left(x^2+1\right) + \frac{\tan^{-1}\left(\frac{1-2x^2}{\sqrt{3}}\right)}{2\sqrt{3}} + \frac{1}{12}\log\left(x^4-x^2+1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^7/(1 + x^6),x]
```

```
[Out] x^2/2 + ArcTan[(1 - 2*x^2)/Sqrt[3]]/(2*Sqrt[3]) - Log[1 + x^2]/6
+ Log[1 - x^2 + x^4]/12
```

Rubi in Sympy [A] time = 10.3503, size = 48, normalized size = 0.86

$$\frac{x^2}{2} - \frac{\log\left(x^2+1\right)}{6} + \frac{\log\left(x^4-x^2+1\right)}{12} - \frac{\sqrt{3}\,\text{atan}\left(\sqrt{3}\left(\frac{2x^2}{3}-\frac{1}{3}\right)\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7/(x**6+1),x)
```

```
[Out] x**2/2 - log(x**2 + 1)/6 + log(x**4 - x**2 + 1)/12 - sqrt(3)*atan
(sqrt(3)*(2*x**2/3 - 1/3))/6
```

Mathematica [A] time = 0.0297741, size = 79, normalized size = 1.41

$$\frac{1}{12}\left(6x^2 - 2\log\left(x^2+1\right) + \log\left(x^2-\sqrt{3}x+1\right) + \log\left(x^2+\sqrt{3}x+1\right) + 2\sqrt{3}\tan^{-1}\left(\sqrt{3}-2x\right) + 2\sqrt{3}\tan^{-1}\left(2x+\sqrt{3}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^7/(1 + x^6),x]
```

```
[Out] (6*x^2 + 2*Sqrt[3]*ArcTan[Sqrt[3] - 2*x] + 2*Sqrt[3]*ArcTan[Sqrt[
3] + 2*x] - 2*Log[1 + x^2] + Log[1 - Sqrt[3]*x + x^2] + Log[1 + S
qrt[3]*x + x^2])/12
```

Maple [A] time = 0.01, size = 46, normalized size = 0.8

$$\frac{x^2}{2} + \frac{\ln\left(x^4-x^2+1\right)}{12} - \frac{\sqrt{3}}{6}\arctan\left(\frac{\left(2x^2-1\right)\sqrt{3}}{3}\right) - \frac{\ln\left(x^2+1\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^7/(x^6+1),x)
```

```
[Out] 1/2*x^2+1/12*ln(x^4-x^2+1)-1/6*3^(1/2)*arctan(1/3*(2*x^2-1)*3^(1/
2))-1/6*ln(x^2+1)
```

Maxima [A] time = 1.58688, size = 61, normalized size = 1.09

$$\frac{1}{2}x^2 - \frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}(2x^2-1)\right) + \frac{1}{12}\log\left(x^4-x^2+1\right) - \frac{1}{6}\log\left(x^2+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^7/(x^6 + 1),x, algorithm="maxima")
```

```
[Out] 1/2*x^2 - 1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x^2 - 1)) + 1/12*log(
x^4 - x^2 + 1) - 1/6*log(x^2 + 1)
```

Fricas [A] time = 0.21937, size = 74, normalized size = 1.32

$$\frac{1}{36}\sqrt{3}\left(6\sqrt{3}x^2 + \sqrt{3}\log\left(x^4-x^2+1\right) - 2\sqrt{3}\log\left(x^2+1\right) - 6\arctan\left(\frac{1}{3}\sqrt{3}(2x^2-1)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^7/(x^6 + 1),x, algorithm="fricas")
```

```
[Out] 1/36*sqrt(3)*(6*sqrt(3)*x^2 + sqrt(3)*log(x^4 - x^2 + 1) - 2*sqrt
(3)*log(x^2 + 1) - 6*arctan(1/3*sqrt(3)*(2*x^2 - 1)))
```

Sympy [A] time = 0.418709, size = 51, normalized size = 0.91

$$\frac{x^2}{2} - \frac{\log\left(x^2+1\right)}{6} + \frac{\log\left(x^4-x^2+1\right)}{12} - \frac{\sqrt{3}\operatorname{atan}\left(\frac{2\sqrt{3}x^2}{3} - \frac{\sqrt{3}}{3}\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**7/(x**6+1),x)
```

```
[Out] x**2/2 - log(x**2 + 1)/6 + log(x**4 - x**2 + 1)/12 - sqrt(3)*atan
(2*sqrt(3)*x**2/3 - sqrt(3)/3)/6
```

GIAC/XCAS [A] time = 0.221672, size = 61, normalized size = 1.09

$$\frac{1}{2}x^2 - \frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}(2x^2-1)\right) + \frac{1}{12}\ln\left(x^4-x^2+1\right) - \frac{1}{6}\ln\left(x^2+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^7/(x^6 + 1),x, algorithm="giac")
```

```
[Out] 1/2*x^2 - 1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x^2 - 1)) + 1/12*ln(x
^4 - x^2 + 1) - 1/6*ln(x^2 + 1)
```

3.1361 $\int \frac{x^6}{1+x^6}\,dx$

Optimal. Leaf size=81

$$\frac{\log\left(x^2-\sqrt{3}x+1\right)}{4\sqrt{3}}-\frac{\log\left(x^2+\sqrt{3}x+1\right)}{4\sqrt{3}}+x+\frac{1}{6}\tan^{-1}\left(\sqrt{3}-2x\right)-\frac{1}{3}\tan^{-1}(x)-\frac{1}{6}\tan^{-1}\left(2x+\sqrt{3}\right)$$

```
[Out] x + ArcTan[Sqrt[3] - 2*x]/6 - ArcTan[x]/3 - ArcTan[Sqrt[3] + 2*x]
/6 + Log[1 - Sqrt[3]*x + x^2]/(4*Sqrt[3]) - Log[1 + Sqrt[3]*x + x
^2]/(4*Sqrt[3])
```

Rubi [A] time = 0.334236, antiderivative size = 81, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 7, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.636

$$\frac{\log\left(x^2-\sqrt{3}x+1\right)}{4\sqrt{3}}-\frac{\log\left(x^2+\sqrt{3}x+1\right)}{4\sqrt{3}}+x+\frac{1}{6}\tan^{-1}\left(\sqrt{3}-2x\right)-\frac{1}{3}\tan^{-1}(x)-\frac{1}{6}\tan^{-1}\left(2x+\sqrt{3}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/(1 + x^6),x]
```

```
[Out] x + ArcTan[Sqrt[3] - 2*x]/6 - ArcTan[x]/3 - ArcTan[Sqrt[3] + 2*x]
/6 + Log[1 - Sqrt[3]*x + x^2]/(4*Sqrt[3]) - Log[1 + Sqrt[3]*x + x
^2]/(4*Sqrt[3])
```

Rubi in Sympy [A] time = 57.6371, size = 70, normalized size = 0.86

$$x+\frac{\sqrt{3}\log\left(x^2-\sqrt{3}x+1\right)}{12}-\frac{\sqrt{3}\log\left(x^2+\sqrt{3}x+1\right)}{12}-\frac{\operatorname{atan}(x)}{3}-\frac{\operatorname{atan}\left(2x-\sqrt{3}\right)}{6}-\frac{\operatorname{atan}\left(2x+\sqrt{3}\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(x**6+1),x)
```

```
[Out] x + sqrt(3)*log(x**2 - sqrt(3)*x + 1)/12 - sqrt(3)*log(x**2 + sqr
t(3)*x + 1)/12 - atan(x)/3 - atan(2*x - sqrt(3))/6 - atan(2*x + s
qrt(3))/6
```

Mathematica [A] time = 0.0230964, size = 76, normalized size = 0.94

$$\frac{1}{12}\left(\sqrt{3}\log\left(x^2-\sqrt{3}x+1\right)-\sqrt{3}\log\left(x^2+\sqrt{3}x+1\right)+12x+2\tan^{-1}\left(\sqrt{3}-2x\right)-4\tan^{-1}(x)-2\tan^{-1}\left(2x+\sqrt{3}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6/(1 + x^6),x]
```

```
[Out] (12*x + 2*ArcTan[Sqrt[3] - 2*x] - 4*ArcTan[x] - 2*ArcTan[Sqrt[3]
+ 2*x] + Sqrt[3]*Log[1 - Sqrt[3]*x + x^2] - Sqrt[3]*Log[1 + Sqrt[
3]*x + x^2])/12
```

Maple [A] time = 0.032, size = 62, normalized size = 0.8

$$x-\frac{\arctan(x)}{3}-\frac{\arctan\left(2x-\sqrt{3}\right)}{6}-\frac{\arctan\left(2x+\sqrt{3}\right)}{6}+\frac{\ln\left(1+x^2-x\sqrt{3}\right)\sqrt{3}}{12}-\frac{\ln\left(1+x^2+x\sqrt{3}\right)\sqrt{3}}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^6/(x^6+1),x)
```

```
[Out] x-1/3*arctan(x)-1/6*arctan(2*x-3^(1/2))-1/6*arctan(2*x+3^(1/2))+1
/12*ln(1+x^2-x*3^(1/2))*3^(1/2)-1/12*ln(1+x^2+x*3^(1/2))*3^(1/2)
```

Maxima [A] time = 1.59198, size = 82, normalized size = 1.01

$$-\frac{1}{12}\sqrt{3}\log\left(x^2+\sqrt{3}x+1\right)+\frac{1}{12}\sqrt{3}\log\left(x^2-\sqrt{3}x+1\right)+x-\frac{1}{6}\arctan\left(2x+\sqrt{3}\right)-\frac{1}{6}\arctan\left(2x-\sqrt{3}\right)-\frac{1}{3}\arctan(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^6/(x^6 + 1),x, algorithm="maxima")
```

```
[Out] -1/12*sqrt(3)*log(x^2 + sqrt(3)*x + 1) + 1/12*sqrt(3)*log(x^2 - s
qrt(3)*x + 1) + x - 1/6*arctan(2*x + sqrt(3)) - 1/6*arctan(2*x -
sqrt(3)) - 1/3*arctan(x)
```

Fricas [A] time = 0.236685, size = 127, normalized size = 1.57

$$-\frac{1}{12}\sqrt{3}\log\left(x^2+\sqrt{3}x+1\right)+\frac{1}{12}\sqrt{3}\log\left(x^2-\sqrt{3}x+1\right)+x-\frac{1}{3}\arctan(x)+\frac{1}{3}\arctan\left(\frac{1}{2x+\sqrt{3}+2\sqrt{x^2+\sqrt{3}x+1}}\right)+\frac{1}{3}\arctan\left(\frac{1}{2x-\sqrt{3}+2\sqrt{x^2-\sqrt{3}x+1}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^6/(x^6 + 1),x, algorithm="fricas")
```

```
[Out] -1/12*sqrt(3)*log(x^2 + sqrt(3)*x + 1) + 1/12*sqrt(3)*log(x^2 - s
qrt(3)*x + 1) + x - 1/3*arctan(x) + 1/3*arctan(1/(2*x + sqrt(3) +
 2*sqrt(x^2 + sqrt(3)*x + 1))) + 1/3*arctan(1/(2*x - sqrt(3) + 2*
sqrt(x^2 - sqrt(3)*x + 1)))
```

Sympy [A] time = 0.653377, size = 70, normalized size = 0.86

$$x+\frac{\sqrt{3}\log\left(x^2-\sqrt{3}x+1\right)}{12}-\frac{\sqrt{3}\log\left(x^2+\sqrt{3}x+1\right)}{12}-\frac{\operatorname{atan}(x)}{3}-\frac{\operatorname{atan}\left(2x-\sqrt{3}\right)}{6}-\frac{\operatorname{atan}\left(2x+\sqrt{3}\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**6/(x**6+1),x)
```

```
[Out] x + sqrt(3)*log(x**2 - sqrt(3)*x + 1)/12 - sqrt(3)*log(x**2 + sqr
t(3)*x + 1)/12 - atan(x)/3 - atan(2*x - sqrt(3))/6 - atan(2*x + s
qrt(3))/6
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{x^6 + 1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(x^6 + 1),x, algorithm="giac")
```

```
[Out] integrate(x^6/(x^6 + 1), x)
```

3.1362 $\int \frac{x^5}{1+x^6} dx$

Optimal. Leaf size=10

$$\frac{1}{6}\log(x^6+1)$$

```
[Out] Log[1 + x^6]/6
```

Rubi [A] time = 0.00591617, antiderivative size = 10, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$

$$\frac{1}{6}\log(x^6+1)$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/(1 + x^6),x]

[Out] Log[1 + x^6]/6
```

Rubi in Sympy [A] time = 1.65465, size = 7, normalized size = 0.7

$$\frac{\log(x^6+1)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(x**6+1),x)

[Out] log(x**6 + 1)/6
```

Mathematica [A] time = 0.00398635, size = 10, normalized size = 1.

$$\frac{1}{6}\log(x^6+1)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/(1 + x^6),x]

[Out] Log[1 + x^6]/6
```

Maple [A] time = 0.001, size = 9, normalized size = 0.9

$$\frac{\ln(x^6+1)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(x^6+1),x)

[Out] 1/6*ln(x^6+1)
```

Maxima [A] time = 1.44864, size = 11, normalized size = 1.1

$$\frac{1}{6} \log \left(x^6 + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(x^6 + 1),x, algorithm="maxima")

[Out] 1/6*log(x^6 + 1)
```

Fricas [A] time = 0.207723, size = 11, normalized size = 1.1

$$\frac{1}{6} \log \left(x^6 + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(x^6 + 1),x, algorithm="fricas")

[Out] 1/6*log(x^6 + 1)
```

Sympy [A] time = 0.176035, size = 7, normalized size = 0.7

$$\frac{\log \left(x^6 + 1\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(x**6+1),x)

[Out] log(x**6 + 1)/6
```

GIAC/XCAS [A] time = 0.225783, size = 11, normalized size = 1.1

$$\frac{1}{6} \ln \left(x^6 + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(x^6 + 1),x, algorithm="giac")

[Out] 1/6*ln(x^6 + 1)
```

3.1363 $\int \frac{x^4}{1+x^6}\,dx$

Optimal. Leaf size=80

$$\frac{\log\left(x^2-\sqrt{3}x+1\right)}{4\sqrt{3}}-\frac{\log\left(x^2+\sqrt{3}x+1\right)}{4\sqrt{3}}-\frac{1}{6}\tan^{-1}\left(\sqrt{3}-2x\right)+\frac{1}{3}\tan^{-1}(x)+\frac{1}{6}\tan^{-1}\left(2x+\sqrt{3}\right)$$

```
[Out] -ArcTan[Sqrt[3] - 2*x]/6 + ArcTan[x]/3 + ArcTan[Sqrt[3] + 2*x]/6
+ Log[1 - Sqrt[3]*x + x^2]/(4*Sqrt[3]) - Log[1 + Sqrt[3]*x + x^2]
/(4*Sqrt[3])
```

Rubi [A] time = 0.683001, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 6, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.546

$$\frac{\log\left(x^2-\sqrt{3}x+1\right)}{4\sqrt{3}}-\frac{\log\left(x^2+\sqrt{3}x+1\right)}{4\sqrt{3}}-\frac{1}{6}\tan^{-1}\left(\sqrt{3}-2x\right)+\frac{1}{3}\tan^{-1}(x)+\frac{1}{6}\tan^{-1}\left(2x+\sqrt{3}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(1 + x^6),x]
```

```
[Out] -ArcTan[Sqrt[3] - 2*x]/6 + ArcTan[x]/3 + ArcTan[Sqrt[3] + 2*x]/6
+ Log[1 - Sqrt[3]*x + x^2]/(4*Sqrt[3]) - Log[1 + Sqrt[3]*x + x^2]
/(4*Sqrt[3])
```

Rubi in Sympy [A] time = 90.3598, size = 68, normalized size = 0.85

$$\frac{\sqrt{3}\log\left(x^2-\sqrt{3}x+1\right)}{12}-\frac{\sqrt{3}\log\left(x^2+\sqrt{3}x+1\right)}{12}+\frac{\operatorname{atan}(x)}{3}+\frac{\operatorname{atan}\left(2x-\sqrt{3}\right)}{6}+\frac{\operatorname{atan}\left(2x+\sqrt{3}\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(x**6+1),x)
```

```
[Out] sqrt(3)*log(x**2 - sqrt(3)*x + 1)/12 - sqrt(3)*log(x**2 + sqrt(3)
*x + 1)/12 + atan(x)/3 + atan(2*x - sqrt(3))/6 + atan(2*x + sqrt(
3))/6
```

Mathematica [A] time = 0.0202885, size = 73, normalized size = 0.91

$$\frac{1}{12}\left(\sqrt{3}\log\left(x^2-\sqrt{3}x+1\right)-\sqrt{3}\log\left(x^2+\sqrt{3}x+1\right)-2\tan^{-1}\left(\sqrt{3}-2x\right)+4\tan^{-1}(x)+2\tan^{-1}\left(2x+\sqrt{3}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(1 + x^6),x]
```

```
[Out] (-2*ArcTan[Sqrt[3] - 2*x] + 4*ArcTan[x] + 2*ArcTan[Sqrt[3] + 2*x]
 + Sqrt[3]*Log[1 - Sqrt[3]*x + x^2] - Sqrt[3]*Log[1 + Sqrt[3]*x +
 x^2])/12
```

Maple [A] time = 0.002, size = 61, normalized size = 0.8

$$\frac{\arctan(x)}{3}+\frac{\arctan\left(2\,x-\sqrt{3}\right)}{6}+\frac{\arctan\left(2\,x+\sqrt{3}\right)}{6}+\frac{\ln\left(1+x^2-x\sqrt{3}\right)\sqrt{3}}{12}-\frac{\ln\left(1+x^2+x\sqrt{3}\right)\sqrt{3}}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^4/(x^6+1),x)
```

```
[Out] 1/3*arctan(x)+1/6*arctan(2*x-3^(1/2))+1/6*arctan(2*x+3^(1/2))+1/1
2*ln(1+x^2-x*3^(1/2))*3^(1/2)-1/12*ln(1+x^2+x*3^(1/2))*3^(1/2)
```

Maxima [A] time = 1.59595, size = 81, normalized size = 1.01

$$-\frac{1}{12}\sqrt{3}\log\left(x^2+\sqrt{3}x+1\right)+\frac{1}{12}\sqrt{3}\log\left(x^2-\sqrt{3}x+1\right)+\frac{1}{6}\arctan\left(2x+\sqrt{3}\right)+\frac{1}{6}\arctan\left(2x-\sqrt{3}\right)+\frac{1}{3}\arctan(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^4/(x^6 + 1),x, algorithm="maxima")
```

```
[Out] -1/12*sqrt(3)*log(x^2 + sqrt(3)*x + 1) + 1/12*sqrt(3)*log(x^2 - s
qrt(3)*x + 1) + 1/6*arctan(2*x + sqrt(3)) + 1/6*arctan(2*x - sqrt
(3)) + 1/3*arctan(x)
```

Fricas [A] time = 0.237147, size = 126, normalized size = 1.58

$$-\frac{1}{12}\sqrt{3}\log\left(x^2+\sqrt{3}x+1\right)+\frac{1}{12}\sqrt{3}\log\left(x^2-\sqrt{3}x+1\right)+\frac{1}{3}\arctan(x)-\frac{1}{3}\arctan\left(\frac{1}{2x+\sqrt{3}+2\sqrt{x^2+\sqrt{3}x+1}}\right)-\frac{1}{3}\arctan\left(\frac{1}{2x-\sqrt{3}+2\sqrt{x^2-\sqrt{3}x+1}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^4/(x^6 + 1),x, algorithm="fricas")
```

```
[Out] -1/12*sqrt(3)*log(x^2 + sqrt(3)*x + 1) + 1/12*sqrt(3)*log(x^2 - s
qrt(3)*x + 1) + 1/3*arctan(x) - 1/3*arctan(1/(2*x + sqrt(3) + 2*s
qrt(x^2 + sqrt(3)*x + 1))) - 1/3*arctan(1/(2*x - sqrt(3) + 2*sqrt
(x^2 - sqrt(3)*x + 1)))
```

Sympy [A] time = 0.690425, size = 68, normalized size = 0.85

$$\frac{\sqrt{3}\log\left(x^2-\sqrt{3}x+1\right)}{12}-\frac{\sqrt{3}\log\left(x^2+\sqrt{3}x+1\right)}{12}+\frac{\operatorname{atan}(x)}{3}+\frac{\operatorname{atan}\left(2x-\sqrt{3}\right)}{6}+\frac{\operatorname{atan}\left(2x+\sqrt{3}\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**4/(x**6+1),x)
```

```
[Out] sqrt(3)*log(x**2 - sqrt(3)*x + 1)/12 - sqrt(3)*log(x**2 + sqrt(3)
*x + 1)/12 + atan(x)/3 + atan(2*x - sqrt(3))/6 + atan(2*x + sqrt(
3))/6
```

GIAC/XCAS [A] time = 0.226319, size = 81, normalized size = 1.01

$$-\frac{1}{12}\sqrt{3}\ln\left(x^2+\sqrt{3}x+1\right)+\frac{1}{12}\sqrt{3}\ln\left(x^2-\sqrt{3}x+1\right)+\frac{1}{6}\arctan\left(2x+\sqrt{3}\right)+\frac{1}{6}\arctan\left(2x-\sqrt{3}\right)+\frac{1}{3}\arctan(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(x^6 + 1),x, algorithm="giac")
```

```
[Out] -1/12*sqrt(3)*ln(x^2 + sqrt(3)*x + 1) + 1/12*sqrt(3)*ln(x^2 - sqr
t(3)*x + 1) + 1/6*arctan(2*x + sqrt(3)) + 1/6*arctan(2*x - sqrt(3
)) + 1/3*arctan(x)
```

3.1364 $\int \frac{x^3}{1+x^6} dx$

Optimal. Leaf size=49

$$-\frac{1}{6}\log\left(x^2+1\right)-\frac{\tan^{-1}\left(\frac{1-2x^2}{\sqrt{3}}\right)}{2\sqrt{3}}+\frac{1}{12}\log\left(x^4-x^2+1\right)$$

```
[Out] -ArcTan[(1 - 2*x^2)/Sqrt[3]]/(2*Sqrt[3]) - Log[1 + x^2]/6 + Log[1
 - x^2 + x^4]/12
```

Rubi [A] time = 0.0819752, antiderivative size = 49, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.636

$$-\frac{1}{6}\log\left(x^2+1\right)-\frac{\tan^{-1}\left(\frac{1-2x^2}{\sqrt{3}}\right)}{2\sqrt{3}}+\frac{1}{12}\log\left(x^4-x^2+1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(1 + x^6),x]
```

```
[Out] -ArcTan[(1 - 2*x^2)/Sqrt[3]]/(2*Sqrt[3]) - Log[1 + x^2]/6 + Log[1
 - x^2 + x^4]/12
```

Rubi in Sympy [A] time = 8.76427, size = 42, normalized size = 0.86

$$-\frac{\log\left(x^2+1\right)}{6}+\frac{\log\left(x^4-x^2+1\right)}{12}+\frac{\sqrt{3}\operatorname{atan}\left(\sqrt{3}\left(\frac{2x^2}{3}-\frac{1}{3}\right)\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(x**6+1),x)
```

```
[Out] -log(x**2 + 1)/6 + log(x**4 - x**2 + 1)/12 + sqrt(3)*atan(sqrt(3)
*(2*x**2/3 - 1/3))/6
```

Mathematica [A] time = 0.0179459, size = 74, normalized size = 1.51

$$\frac{1}{12}\left(-2\log\left(x^2+1\right)+\log\left(x^2-\sqrt{3}x+1\right)+\log\left(x^2+\sqrt{3}x+1\right)\right.$$
$$\left.-2\sqrt{3}\tan^{-1}\left(\sqrt{3}-2x\right)-2\sqrt{3}\tan^{-1}\left(2x+\sqrt{3}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(1 + x^6),x]
```

```
[Out] (-2*Sqrt[3]*ArcTan[Sqrt[3] - 2*x] - 2*Sqrt[3]*ArcTan[Sqrt[3] + 2*
x] - 2*Log[1 + x^2] + Log[1 - Sqrt[3]*x + x^2] + Log[1 + Sqrt[3]*
x + x^2])/12
```

Maple [A] time = 0.006, size = 41, normalized size = 0.8

$$\frac{\ln\left(x^4-x^2+1\right)}{12}+\frac{\sqrt{3}}{6}\arctan\left(\frac{\left(2x^2-1\right)\sqrt{3}}{3}\right)-\frac{\ln\left(x^2+1\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^3/(x^6+1),x)
```

```
[Out] 1/12*ln(x^4-x^2+1)+1/6*3^(1/2)*arctan(1/3*(2*x^2-1)*3^(1/2))-1/6*
ln(x^2+1)
```

Maxima [A] time = 1.59792, size = 54, normalized size = 1.1

$$\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}(2x^2-1)\right)+\frac{1}{12}\log\left(x^4-x^2+1\right)-\frac{1}{6}\log\left(x^2+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^3/(x^6 + 1),x, algorithm="maxima")
```

```
[Out] 1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x^2 - 1)) + 1/12*log(x^4 - x^2
+ 1) - 1/6*log(x^2 + 1)
```

Fricas [A] time = 0.220784, size = 63, normalized size = 1.29

$$\frac{1}{36}\sqrt{3}\left(\sqrt{3}\log\left(x^4-x^2+1\right)-2\sqrt{3}\log\left(x^2+1\right)+6\arctan\left(\frac{1}{3}\sqrt{3}(2x^2-1)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^3/(x^6 + 1),x, algorithm="fricas")
```

```
[Out] 1/36*sqrt(3)*(sqrt(3)*log(x^4 - x^2 + 1) - 2*sqrt(3)*log(x^2 + 1)
 + 6*arctan(1/3*sqrt(3)*(2*x^2 - 1)))
```

Sympy [A] time = 0.395865, size = 46, normalized size = 0.94

$$-\frac{\log\left(x^2+1\right)}{6}+\frac{\log\left(x^4-x^2+1\right)}{12}+\frac{\sqrt{3}\operatorname{atan}\left(\frac{2\sqrt{3}x^2}{3}-\frac{\sqrt{3}}{3}\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**3/(x**6+1),x)
```

```
[Out] -log(x**2 + 1)/6 + log(x**4 - x**2 + 1)/12 + sqrt(3)*atan(2*sqrt(
3)*x**2/3 - sqrt(3)/3)/6
```

GIAC/XCAS [A] time = 0.22199, size = 54, normalized size = 1.1

$$\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}(2x^2-1)\right)+\frac{1}{12}\ln\left(x^4-x^2+1\right)-\frac{1}{6}\ln\left(x^2+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^3/(x^6 + 1),x, algorithm="giac")
```

```
[Out] 1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x^2 - 1)) + 1/12*ln(x^4 - x^2 +
 1) - 1/6*ln(x^2 + 1)
```

3.1365 $\int \frac{x^2}{1+x^6}\,dx$

Optimal. Leaf size=8

$$\frac{1}{3}\tan^{-1}\left(x^3\right)$$

```
[Out] ArcTan[x^3]/3
```

Rubi [A] time = 0.0120611, antiderivative size = 8, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{1}{3}\tan^{-1}\left(x^3\right)$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(1 + x^6),x]
```

```
[Out] ArcTan[x^3]/3
```

Rubi in Sympy [A] time = 2.55708, size = 5, normalized size = 0.62

$$\frac{\operatorname{atan}\left(x^3\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**2/(x**6+1),x)
```

```
[Out] atan(x**3)/3
```

Mathematica [A] time = 0.00553507, size = 8, normalized size = 1.

$$\frac{1}{3}\tan^{-1}\left(x^3\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(1 + x^6),x]
```

```
[Out] ArcTan[x^3]/3
```

Maple [A] time = 0.002, size = 7, normalized size = 0.9

$$\frac{\arctan\left(x^3\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(x^6+1),x)
```

```
[Out] 1/3*arctan(x^3)
```

Maxima [A] time = 1.57405, size = 8, normalized size = 1.

$$\frac{1}{3}\arctan\left(x^3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(x^6 + 1),x, algorithm="maxima")
```

```
[Out] 1/3*arctan(x^3)
```

Fricas [A] time = 0.212061, size = 8, normalized size = 1.

$$\frac{1}{3}\arctan\left(x^3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(x^6 + 1),x, algorithm="fricas")
```

```
[Out] 1/3*arctan(x^3)
```

Sympy [A] time = 0.200309, size = 5, normalized size = 0.62

$$\frac{\operatorname{atan}\left(x^3\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(x**6+1),x)
```

```
[Out] atan(x**3)/3
```

GIAC/XCAS [A] time = 0.222845, size = 8, normalized size = 1.

$$\frac{1}{3}\arctan\left(x^3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(x^6 + 1),x, algorithm="giac")
```

```
[Out] 1/3*arctan(x^3)
```

3.1366 $\int \frac{x}{1+x^6} \, dx$

Optimal. Leaf size=49

$$\frac{1}{6}\log\left(x^2+1\right)-\frac{\tan^{-1}\left(\frac{1-2x^2}{\sqrt{3}}\right)}{2\sqrt{3}}-\frac{1}{12}\log\left(x^4-x^2+1\right)$$

```
[Out] -ArcTan[(1 - 2*x^2)/Sqrt[3]]/(2*Sqrt[3]) + Log[1 + x^2]/6 - Log[1
 - x^2 + x^4]/12
```

Rubi [A] time = 0.0716426, antiderivative size = 49, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.778

$$\frac{1}{6}\log\left(x^2+1\right)-\frac{\tan^{-1}\left(\frac{1-2x^2}{\sqrt{3}}\right)}{2\sqrt{3}}-\frac{1}{12}\log\left(x^4-x^2+1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x/(1 + x^6),x]
```

```
[Out] -ArcTan[(1 - 2*x^2)/Sqrt[3]]/(2*Sqrt[3]) + Log[1 + x^2]/6 - Log[1
 - x^2 + x^4]/12
```

Rubi in Sympy [A] time = 8.46759, size = 42, normalized size = 0.86

$$\frac{\log\left(x^2+1\right)}{6}-\frac{\log\left(x^4-x^2+1\right)}{12}+\frac{\sqrt{3}\,\mathrm{atan}\left(\sqrt{3}\left(\frac{2x^2}{3}-\frac{1}{3}\right)\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(x**6+1),x)
```

```
[Out] log(x**2 + 1)/6 - log(x**4 - x**2 + 1)/12 + sqrt(3)*atan(sqrt(3)*
(2*x**2/3 - 1/3))/6
```

Mathematica [A] time = 0.0157627, size = 78, normalized size = 1.59

$$\frac{1}{12}\left(2\log\left(x^2+1\right)-\log\left(x^2-\sqrt{3}x+1\right)-\log\left(x^2+\sqrt{3}x+1\right)\right.$$
$$\left.-2\sqrt{3}\tan^{-1}\left(\sqrt{3}-2x\right)-2\sqrt{3}\tan^{-1}\left(2x+\sqrt{3}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(1 + x^6),x]
```

```
[Out] (-2*Sqrt[3]*ArcTan[Sqrt[3] - 2*x] - 2*Sqrt[3]*ArcTan[Sqrt[3] + 2*
x] + 2*Log[1 + x^2] - Log[1 - Sqrt[3]*x + x^2] - Log[1 + Sqrt[3]*
x + x^2])/12
```

Maple [A] time = 0.007, size = 41, normalized size = 0.8

$$-\frac{\ln\left(x^4-x^2+1\right)}{12}+\frac{\sqrt{3}}{6}\arctan\left(\frac{\left(2x^2-1\right)\sqrt{3}}{3}\right)+\frac{\ln\left(x^2+1\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x/(x^6+1),x)
```

```
[Out] -1/12*ln(x^4-x^2+1)+1/6*3^(1/2)*arctan(1/3*(2*x^2-1)*3^(1/2))+1/6
*ln(x^2+1)
```

Maxima [A] time = 1.59311, size = 54, normalized size = 1.1

$$\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}\left(2x^2-1\right)\right)-\frac{1}{12}\log\left(x^4-x^2+1\right)+\frac{1}{6}\log\left(x^2+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(x^6 + 1),x, algorithm="maxima")
```

```
[Out] 1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x^2 - 1)) - 1/12*log(x^4 - x^2
+ 1) + 1/6*log(x^2 + 1)
```

Fricas [A] time = 0.22163, size = 63, normalized size = 1.29

$$-\frac{1}{36}\sqrt{3}\left(\sqrt{3}\log\left(x^4-x^2+1\right)-2\sqrt{3}\log\left(x^2+1\right)-6\arctan\left(\frac{1}{3}\sqrt{3}\left(2x^2-1\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(x^6 + 1),x, algorithm="fricas")
```

```
[Out] -1/36*sqrt(3)*(sqrt(3)*log(x^4 - x^2 + 1) - 2*sqrt(3)*log(x^2 + 1
) - 6*arctan(1/3*sqrt(3)*(2*x^2 - 1)))
```

Sympy [A] time = 0.387298, size = 46, normalized size = 0.94

$$\frac{\log\left(x^2+1\right)}{6}-\frac{\log\left(x^4-x^2+1\right)}{12}+\frac{\sqrt{3}\operatorname{atan}\left(\frac{2\sqrt{3}x^2}{3}-\frac{\sqrt{3}}{3}\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(x**6+1),x)
```

```
[Out] log(x**2 + 1)/6 - log(x**4 - x**2 + 1)/12 + sqrt(3)*atan(2*sqrt(3
)*x**2/3 - sqrt(3)/3)/6
```

GIAC/XCAS [A] time = 0.221457, size = 54, normalized size = 1.1

$$\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}\left(2x^2-1\right)\right)-\frac{1}{12}\ln\left(x^4-x^2+1\right)+\frac{1}{6}\ln\left(x^2+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(x^6 + 1),x, algorithm="giac")
```

```
[Out] 1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x^2 - 1)) - 1/12*ln(x^4 - x^2 +
 1) + 1/6*ln(x^2 + 1)
```

3.1367 $\int \frac{1}{1+x^6}\,dx$

Optimal. Leaf size=80

$$-\frac{\log\left(x^2-\sqrt{3}x+1\right)}{4\sqrt{3}}+\frac{\log\left(x^2+\sqrt{3}x+1\right)}{4\sqrt{3}}-\frac{1}{6}\tan^{-1}\left(\sqrt{3}-2x\right)+\frac{1}{3}\tan^{-1}(x)+\frac{1}{6}\tan^{-1}\left(2x+\sqrt{3}\right)$$

```
[Out] -ArcTan[Sqrt[3] - 2*x]/6 + ArcTan[x]/3 + ArcTan[Sqrt[3] + 2*x]/6
- Log[1 - Sqrt[3]*x + x^2]/(4*Sqrt[3]) + Log[1 + Sqrt[3]*x + x^2]
/(4*Sqrt[3])
```

Rubi [A] time = 0.322, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 6, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.857

$$-\frac{\log\left(x^2-\sqrt{3}x+1\right)}{4\sqrt{3}}+\frac{\log\left(x^2+\sqrt{3}x+1\right)}{4\sqrt{3}}-\frac{1}{6}\tan^{-1}\left(\sqrt{3}-2x\right)+\frac{1}{3}\tan^{-1}(x)+\frac{1}{6}\tan^{-1}\left(2x+\sqrt{3}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[(1 + x^6)^(-1),x]
```

```
[Out] -ArcTan[Sqrt[3] - 2*x]/6 + ArcTan[x]/3 + ArcTan[Sqrt[3] + 2*x]/6
- Log[1 - Sqrt[3]*x + x^2]/(4*Sqrt[3]) + Log[1 + Sqrt[3]*x + x^2]
/(4*Sqrt[3])
```

Rubi in Sympy [A] time = 58.4862, size = 68, normalized size = 0.85

$$-\frac{\sqrt{3}\log\left(x^2-\sqrt{3}x+1\right)}{12}+\frac{\sqrt{3}\log\left(x^2+\sqrt{3}x+1\right)}{12}+\frac{\operatorname{atan}(x)}{3}+\frac{\operatorname{atan}\left(2x-\sqrt{3}\right)}{6}+\frac{\operatorname{atan}\left(2x+\sqrt{3}\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(x**6+1),x)
```

```
[Out] -sqrt(3)*log(x**2 - sqrt(3)*x + 1)/12 + sqrt(3)*log(x**2 + sqrt(3
)*x + 1)/12 + atan(x)/3 + atan(2*x - sqrt(3))/6 + atan(2*x + sqrt
(3))/6
```

Mathematica [A] time = 0.0194892, size = 73, normalized size = 0.91

$$\frac{1}{12}\left(-\sqrt{3}\log\left(x^2-\sqrt{3}x+1\right)+\sqrt{3}\log\left(x^2+\sqrt{3}x+1\right)-2\tan^{-1}\left(\sqrt{3}-2x\right)+4\tan^{-1}(x)+2\tan^{-1}\left(2x+\sqrt{3}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(1 + x^6)^(-1),x]
```

```
[Out] (-2*ArcTan[Sqrt[3] - 2*x] + 4*ArcTan[x] + 2*ArcTan[Sqrt[3] + 2*x]
 - Sqrt[3]*Log[1 - Sqrt[3]*x + x^2] + Sqrt[3]*Log[1 + Sqrt[3]*x +
 x^2])/12
```

Maple [A] time = 0.017, size = 61, normalized size = 0.8

$$\frac{\arctan(x)}{3}+\frac{\arctan\left(2\,x-\sqrt{3}\right)}{6}+\frac{\arctan\left(2\,x+\sqrt{3}\right)}{6}-\frac{\ln\left(1+x^2-x\sqrt{3}\right)\sqrt{3}}{12}+\frac{\ln\left(1+x^2+x\sqrt{3}\right)\sqrt{3}}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/(x^6+1),x)
```

```
[Out] 1/3*arctan(x)+1/6*arctan(2*x-3^(1/2))+1/6*arctan(2*x+3^(1/2))-1/1
2*ln(1+x^2-x*3^(1/2))*3^(1/2)+1/12*ln(1+x^2+x*3^(1/2))*3^(1/2)
```

Maxima [A] time = 1.58691, size = 81, normalized size = 1.01

$$\frac{1}{12}\sqrt{3}\log\left(x^2+\sqrt{3}x+1\right)-\frac{1}{12}\sqrt{3}\log\left(x^2-\sqrt{3}x+1\right)+\frac{1}{6}\arctan\left(2x+\sqrt{3}\right)+\frac{1}{6}\arctan\left(2x-\sqrt{3}\right)+\frac{1}{3}\arctan(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(x^6 + 1),x, algorithm="maxima")
```

```
[Out] 1/12*sqrt(3)*log(x^2 + sqrt(3)*x + 1) - 1/12*sqrt(3)*log(x^2 - sq
rt(3)*x + 1) + 1/6*arctan(2*x + sqrt(3)) + 1/6*arctan(2*x - sqrt(
3)) + 1/3*arctan(x)
```

Fricas [A] time = 0.233131, size = 126, normalized size = 1.58

$$\frac{1}{12}\sqrt{3}\log\left(x^2+\sqrt{3}x+1\right)-\frac{1}{12}\sqrt{3}\log\left(x^2-\sqrt{3}x+1\right)+\frac{1}{3}\arctan(x)-\frac{1}{3}\arctan\left(\frac{1}{2x+\sqrt{3}+2\sqrt{x^2+\sqrt{3}x+1}}\right)-\frac{1}{3}\arctan\left(\frac{1}{2x-\sqrt{3}+2\sqrt{x^2-\sqrt{3}x+1}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(x^6 + 1),x, algorithm="fricas")
```

```
[Out] 1/12*sqrt(3)*log(x^2 + sqrt(3)*x + 1) - 1/12*sqrt(3)*log(x^2 - sq
rt(3)*x + 1) + 1/3*arctan(x) - 1/3*arctan(1/(2*x + sqrt(3) + 2*sq
rt(x^2 + sqrt(3)*x + 1))) - 1/3*arctan(1/(2*x - sqrt(3) + 2*sqrt(
x^2 - sqrt(3)*x + 1)))
```

Sympy [A] time = 0.665653, size = 68, normalized size = 0.85

$$-\frac{\sqrt{3}\log\left(x^2-\sqrt{3}x+1\right)}{12}+\frac{\sqrt{3}\log\left(x^2+\sqrt{3}x+1\right)}{12}+\frac{\operatorname{atan}(x)}{3}+\frac{\operatorname{atan}\left(2x-\sqrt{3}\right)}{6}+\frac{\operatorname{atan}\left(2x+\sqrt{3}\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(x**6+1),x)
```

```
[Out] -sqrt(3)*log(x**2 - sqrt(3)*x + 1)/12 + sqrt(3)*log(x**2 + sqrt(3
)*x + 1)/12 + atan(x)/3 + atan(2*x - sqrt(3))/6 + atan(2*x + sqrt
(3))/6
```

GIAC/XCAS [A] time = 0.226511, size = 81, normalized size = 1.01

$$\frac{1}{12}\sqrt{3}\ln\left(x^2+\sqrt{3}x+1\right)-\frac{1}{12}\sqrt{3}\ln\left(x^2-\sqrt{3}x+1\right)+\frac{1}{6}\arctan\left(2x+\sqrt{3}\right)+\frac{1}{6}\arctan\left(2x-\sqrt{3}\right)+\frac{1}{3}\arctan(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^6 + 1),x, algorithm="giac")
```

```
[Out] 1/12*sqrt(3)*ln(x^2 + sqrt(3)*x + 1) - 1/12*sqrt(3)*ln(x^2 - sqrt
(3)*x + 1) + 1/6*arctan(2*x + sqrt(3)) + 1/6*arctan(2*x - sqrt(3)
) + 1/3*arctan(x)
```

3.1368 $\int \frac{1}{x(1+x^6)}\,dx$

Optimal. Leaf size=13

$$\log(x)-\frac{1}{6}\log\left(x^6+1\right)$$

```
[Out] Log[x] - Log[1 + x^6]/6
```

Rubi [A] time = 0.0175683, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364

$$\log(x)-\frac{1}{6}\log\left(x^6+1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(1 + x^6)),x]

[Out] Log[x] - Log[1 + x^6]/6
```

Rubi in Sympy [A] time = 3.3332, size = 14, normalized size = 1.08

$$\frac{\log\left(x^6\right)}{6}-\frac{\log\left(x^6+1\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(x**6+1),x)

[Out] log(x**6)/6 - log(x**6 + 1)/6
```

Mathematica [A] time = 0.00550371, size = 13, normalized size = 1.

$$\log(x)-\frac{1}{6}\log\left(x^6+1\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(1 + x^6)),x]

[Out] Log[x] - Log[1 + x^6]/6
```

Maple [B] time = 0.01, size = 25, normalized size = 1.9

$$-\frac{\ln\left(x^4-x^2+1\right)}{6}+\ln(x)-\frac{\ln\left(x^2+1\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(x^6+1),x)

[Out] -1/6*ln(x^4-x^2+1)+ln(x)-1/6*ln(x^2+1)
```

Maxima [A] time = 1.43667, size = 20, normalized size = 1.54

$$-\frac{1}{6}\log\left(x^6+1\right)+\frac{1}{6}\log\left(x^6\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 1)*x),x, algorithm="maxima")
```

```
[Out] -1/6*log(x^6 + 1) + 1/6*log(x^6)
```

Fricas [A] time = 0.211558, size = 15, normalized size = 1.15

$$-\frac{1}{6}\log\left(x^6+1\right)+\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 1)*x),x, algorithm="fricas")
```

```
[Out] -1/6*log(x^6 + 1) + log(x)
```

Sympy [A] time = 0.225741, size = 10, normalized size = 0.77

$$\log\left(x\right)-\frac{\log\left(x^6+1\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(x**6+1),x)
```

```
[Out] log(x) - log(x**6 + 1)/6
```

GIAC/XCAS [A] time = 0.227176, size = 20, normalized size = 1.54

$$-\frac{1}{6}\ln\left(x^6+1\right)+\frac{1}{6}\ln\left(x^6\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 1)*x),x, algorithm="giac")
```

```
[Out] -1/6*ln(x^6 + 1) + 1/6*ln(x^6)
```

3.1369 $\int \frac{1}{x^2(1+x^6)}\,dx$

Optimal. Leaf size=85

$$-\frac{\log\left(x^2-\sqrt{3}x+1\right)}{4\sqrt{3}}+\frac{\log\left(x^2+\sqrt{3}x+1\right)}{4\sqrt{3}}-\frac{1}{x}+\frac{1}{6}\tan^{-1}\left(\sqrt{3}-2x\right)-\frac{1}{3}\tan^{-1}(x)-\frac{1}{6}\tan^{-1}\left(2x+\sqrt{3}\right)$$

```
[Out] -x^(-1) + ArcTan[Sqrt[3] - 2*x]/6 - ArcTan[x]/3 - ArcTan[Sqrt[3]
+ 2*x]/6 - Log[1 - Sqrt[3]*x + x^2]/(4*Sqrt[3]) + Log[1 + Sqrt[3]
*x + x^2]/(4*Sqrt[3])
```

Rubi [A] time = 0.507893, antiderivative size = 85, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 7, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.636

$$-\frac{\log\left(x^2-\sqrt{3}x+1\right)}{4\sqrt{3}}+\frac{\log\left(x^2+\sqrt{3}x+1\right)}{4\sqrt{3}}-\frac{1}{x}+\frac{1}{6}\tan^{-1}\left(\sqrt{3}-2x\right)-\frac{1}{3}\tan^{-1}(x)-\frac{1}{6}\tan^{-1}\left(2x+\sqrt{3}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(1 + x^6)),x]
```

```
[Out] -x^(-1) + ArcTan[Sqrt[3] - 2*x]/6 - ArcTan[x]/3 - ArcTan[Sqrt[3]
+ 2*x]/6 - Log[1 - Sqrt[3]*x + x^2]/(4*Sqrt[3]) + Log[1 + Sqrt[3]
*x + x^2]/(4*Sqrt[3])
```

Rubi in Sympy [A] time = 106.733, size = 71, normalized size = 0.84

$$-\frac{\sqrt{3}\log\left(x^2-\sqrt{3}x+1\right)}{12}+\frac{\sqrt{3}\log\left(x^2+\sqrt{3}x+1\right)}{12}-\frac{\operatorname{atan}(x)}{3}-\frac{\operatorname{atan}\left(2x-\sqrt{3}\right)}{6}-\frac{\operatorname{atan}\left(2x+\sqrt{3}\right)}{6}-\frac{1}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(x**6+1),x)
```

```
[Out] -sqrt(3)*log(x**2 - sqrt(3)*x + 1)/12 + sqrt(3)*log(x**2 + sqrt(3
)*x + 1)/12 - atan(x)/3 - atan(2*x - sqrt(3))/6 - atan(2*x + sqrt
(3))/6 - 1/x
```

Mathematica [A] time = 0.0415165, size = 82, normalized size = 0.96

$$-\frac{\sqrt{3}x\log\left(x^2-\sqrt{3}x+1\right)-\sqrt{3}x\log\left(x^2+\sqrt{3}x+1\right)-2x\tan^{-1}\left(\sqrt{3}-2x\right)+4x\tan^{-1}(x)+2x\tan^{-1}\left(2x+\sqrt{3}\right)+12}{12x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*(1 + x^6)),x]
```

```
[Out] -(12 - 2*x*ArcTan[Sqrt[3] - 2*x] + 4*x*ArcTan[x] + 2*x*ArcTan[Sqr
t[3] + 2*x] + Sqrt[3]*x*Log[1 - Sqrt[3]*x + x^2] - Sqrt[3]*x*Log[
1 + Sqrt[3]*x + x^2])/(12*x)
```

Maple [A] time = 0.02, size = 66, normalized size = 0.8

$$-x^{-1}-\frac{\arctan(x)}{3}-\frac{\arctan\left(2x-\sqrt{3}\right)}{6}-\frac{\arctan\left(2x+\sqrt{3}\right)}{6}-\frac{\ln\left(1+x^2-x\sqrt{3}\right)\sqrt{3}}{12}+\frac{\ln\left(1+x^2+x\sqrt{3}\right)\sqrt{3}}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(x^6+1),x)
```

```
[Out] -1/x-1/3*arctan(x)-1/6*arctan(2*x-3^(1/2))-1/6*arctan(2*x+3^(1/2)
)-1/12*ln(1+x^2-x*3^(1/2))*3^(1/2)+1/12*ln(1+x^2+x*3^(1/2))*3^(1/
2)
```

Maxima [A] time = 1.59405, size = 88, normalized size = 1.04

$$\frac{1}{12}\sqrt{3}\log\left(x^2+\sqrt{3}x+1\right)-\frac{1}{12}\sqrt{3}\log\left(x^2-\sqrt{3}x+1\right)-\frac{1}{x}-\frac{1}{6}\arctan\left(2x+\sqrt{3}\right)-\frac{1}{6}\arctan\left(2x-\sqrt{3}\right)-\frac{1}{3}\arctan(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 1)*x^2),x, algorithm="maxima")
```

```
[Out] 1/12*sqrt(3)*log(x^2 + sqrt(3)*x + 1) - 1/12*sqrt(3)*log(x^2 - sq
rt(3)*x + 1) - 1/x - 1/6*arctan(2*x + sqrt(3)) - 1/6*arctan(2*x -
 sqrt(3)) - 1/3*arctan(x)
```

Fricas [A] time = 0.234086, size = 139, normalized size = 1.64

$$\frac{\sqrt{3}x\log\left(x^2+\sqrt{3}x+1\right)-\sqrt{3}x\log\left(x^2-\sqrt{3}x+1\right)-4x\arctan(x)+4x\arctan\left(\frac{1}{2x+\sqrt{3}+2\sqrt{x^2+\sqrt{3}x+1}}\right)+4x\arctan\left(\frac{}{2x-\sqrt{3}+2}\right.}{12x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 1)*x^2),x, algorithm="fricas")
```

```
[Out] 1/12*(sqrt(3)*x*log(x^2 + sqrt(3)*x + 1) - sqrt(3)*x*log(x^2 - sq
rt(3)*x + 1) - 4*x*arctan(x) + 4*x*arctan(1/(2*x + sqrt(3) + 2*sq
rt(x^2 + sqrt(3)*x + 1))) + 4*x*arctan(1/(2*x - sqrt(3) + 2*sqrt(
x^2 - sqrt(3)*x + 1))) - 12)/x
```

Sympy [A] time = 0.7333, size = 71, normalized size = 0.84

$$-\frac{\sqrt{3}\log\left(x^2-\sqrt{3}x+1\right)}{12}+\frac{\sqrt{3}\log\left(x^2+\sqrt{3}x+1\right)}{12}-\frac{\operatorname{atan}(x)}{3}-\frac{\operatorname{atan}\left(2x-\sqrt{3}\right)}{6}-\frac{\operatorname{atan}\left(2x+\sqrt{3}\right)}{6}-\frac{1}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(x**6+1),x)
```

```
[Out] -sqrt(3)*log(x**2 - sqrt(3)*x + 1)/12 + sqrt(3)*log(x**2 + sqrt(3
)*x + 1)/12 - atan(x)/3 - atan(2*x - sqrt(3))/6 - atan(2*x + sqrt
(3))/6 - 1/x
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(x^6 + 1)x^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 1)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/((x^6 + 1)*x^2), x)
```

3.1370 $\int \frac{1}{x^3(1+x^6)}\,dx$

Optimal. Leaf size=56

$$-\frac{1}{2x^2}+\frac{1}{6}\log\left(x^2+1\right)+\frac{\tan^{-1}\left(\frac{1-2x^2}{\sqrt{3}}\right)}{2\sqrt{3}}-\frac{1}{12}\log\left(x^4-x^2+1\right)$$

```
[Out] -1/(2*x^2) + ArcTan[(1 - 2*x^2)/Sqrt[3]]/(2*Sqrt[3]) + Log[1 + x^
2]/6 - Log[1 - x^2 + x^4]/12
```

Rubi [A] time = 0.0878581, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.727

$$-\frac{1}{2x^2}+\frac{1}{6}\log\left(x^2+1\right)+\frac{\tan^{-1}\left(\frac{1-2x^2}{\sqrt{3}}\right)}{2\sqrt{3}}-\frac{1}{12}\log\left(x^4-x^2+1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(1 + x^6)),x]
```

```
[Out] -1/(2*x^2) + ArcTan[(1 - 2*x^2)/Sqrt[3]]/(2*Sqrt[3]) + Log[1 + x^
2]/6 - Log[1 - x^2 + x^4]/12
```

Rubi in Sympy [A] time = 9.68515, size = 49, normalized size = 0.88

$$\frac{\log\left(x^2+1\right)}{6}-\frac{\log\left(x^4-x^2+1\right)}{12}-\frac{\sqrt{3}\,\mathrm{atan}\left(\sqrt{3}\left(\frac{2x^2}{3}-\frac{1}{3}\right)\right)}{6}-\frac{1}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(x**6+1),x)
```

```
[Out] log(x**2 + 1)/6 - log(x**4 - x**2 + 1)/12 - sqrt(3)*atan(sqrt(3)*
(2*x**2/3 - 1/3))/6 - 1/(2*x**2)
```

Mathematica [A] time = 0.0385807, size = 83, normalized size = 1.48

$$\frac{1}{12}\left(-\frac{6}{x^2}+2\log\left(x^2+1\right)-\log\left(x^2-\sqrt{3}x+1\right)-\log\left(x^2+\sqrt{3}x+1\right)\right.$$
$$\left.+2\sqrt{3}\tan^{-1}\left(\sqrt{3}-2x\right)+2\sqrt{3}\tan^{-1}\left(2x+\sqrt{3}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*(1 + x^6)),x]
```

```
[Out] (-6/x^2 + 2*Sqrt[3]*ArcTan[Sqrt[3] - 2*x] + 2*Sqrt[3]*ArcTan[Sqrt
[3] + 2*x] + 2*Log[1 + x^2] - Log[1 - Sqrt[3]*x + x^2] - Log[1 +
Sqrt[3]*x + x^2])/12
```

Maple [A] time = 0.013, size = 46, normalized size = 0.8

$$-\frac{\ln\left(x^4-x^2+1\right)}{12}-\frac{\sqrt{3}}{6}\arctan\left(\frac{\left(2x^2-1\right)\sqrt{3}}{3}\right)-\frac{1}{2x^2}+\frac{\ln\left(x^2+1\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^3/(x^6+1),x)
```

```
[Out] -1/12*ln(x^4-x^2+1)-1/6*3^(1/2)*arctan(1/3*(2*x^2-1)*3^(1/2))-1/2
/x^2+1/6*ln(x^2+1)
```

Maxima [A] time = 1.60931, size = 61, normalized size = 1.09

$$-\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}\left(2x^2-1\right)\right)-\frac{1}{2x^2}-\frac{1}{12}\log\left(x^4-x^2+1\right)+\frac{1}{6}\log\left(x^2+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((x^6 + 1)*x^3),x, algorithm="maxima")
```

```
[Out] -1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x^2 - 1)) - 1/2/x^2 - 1/12*log
(x^4 - x^2 + 1) + 1/6*log(x^2 + 1)
```

Fricas [A] time = 0.219208, size = 86, normalized size = 1.54

$$-\frac{\sqrt{3}\left(\sqrt{3}x^2\log\left(x^4-x^2+1\right)-2\sqrt{3}x^2\log\left(x^2+1\right)+6x^2\arctan\left(\frac{1}{3}\sqrt{3}\left(2x^2-1\right)\right)+6\sqrt{3}\right)}{36x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((x^6 + 1)*x^3),x, algorithm="fricas")
```

```
[Out] -1/36*sqrt(3)*(sqrt(3)*x^2*log(x^4 - x^2 + 1) - 2*sqrt(3)*x^2*log
(x^2 + 1) + 6*x^2*arctan(1/3*sqrt(3)*(2*x^2 - 1)) + 6*sqrt(3))/x^
2
```

Sympy [A] time = 0.478509, size = 53, normalized size = 0.95

$$\frac{\log\left(x^2+1\right)}{6}-\frac{\log\left(x^4-x^2+1\right)}{12}-\frac{\sqrt{3}\operatorname{atan}\left(\frac{2\sqrt{3}x^2}{3}-\frac{\sqrt{3}}{3}\right)}{6}-\frac{1}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/x**3/(x**6+1),x)
```

```
[Out] log(x**2 + 1)/6 - log(x**4 - x**2 + 1)/12 - sqrt(3)*atan(2*sqrt(3
)*x**2/3 - sqrt(3)/3)/6 - 1/(2*x**2)
```

GIAC/XCAS [A] time = 0.227318, size = 61, normalized size = 1.09

$$-\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}\left(2x^2-1\right)\right)-\frac{1}{2x^2}-\frac{1}{12}\ln\left(x^4-x^2+1\right)+\frac{1}{6}\ln\left(x^2+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((x^6 + 1)*x^3),x, algorithm="giac")
```

```
[Out] -1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x^2 - 1)) - 1/2/x^2 - 1/12*ln(
x^4 - x^2 + 1) + 1/6*ln(x^2 + 1)
```

3.1371 $\int \frac{1}{x^4(1+x^6)}\,dx$

Optimal. Leaf size=16

$$-\frac{1}{3x^3}-\frac{1}{3}\tan^{-1}\left(x^3\right)$$

```
[Out] -1/(3*x^3) - ArcTan[x^3]/3
```

Rubi [A] time = 0.0213406, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273

$$-\frac{1}{3x^3}-\frac{1}{3}\tan^{-1}\left(x^3\right)$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^4*(1 + x^6)),x]

[Out] -1/(3*x^3) - ArcTan[x^3]/3
```

Rubi in Sympy [A] time = 4.49828, size = 14, normalized size = 0.88

$$-\frac{\operatorname{atan}\left(x^3\right)}{3}-\frac{1}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**4/(x**6+1),x)

[Out] -atan(x**3)/3 - 1/(3*x**3)
```

Mathematica [A] time = 0.00790838, size = 16, normalized size = 1.

$$\frac{1}{3}\tan^{-1}\left(\frac{1}{x^3}\right)-\frac{1}{3x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^4*(1 + x^6)),x]

[Out] -1/(3*x^3) + ArcTan[x^(-3)]/3
```

Maple [B] time = 0.02, size = 33, normalized size = 2.1

$$-\frac{\arctan\left(2\,x-\sqrt{3}\right)}{3}-\frac{\arctan\left(2\,x+\sqrt{3}\right)}{3}-\frac{1}{3\,x^3}+\frac{\arctan(x)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^4/(x^6+1),x)

[Out] -1/3*arctan(2*x-3^(1/2))-1/3*arctan(2*x+3^(1/2))-1/3/x^3+1/3*arct
an(x)
```

Maxima [A] time = 1.58269, size = 16, normalized size = 1.

$$-\frac{1}{3\,x^3} - \frac{1}{3}\,\arctan\left(x^3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 1)*x^4),x, algorithm="maxima")
```

```
[Out] -1/3/x^3 - 1/3*arctan(x^3)
```

Fricas [A] time = 0.210705, size = 20, normalized size = 1.25

$$-\frac{x^3\arctan\left(x^3\right) + 1}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 1)*x^4),x, algorithm="fricas")
```

```
[Out] -1/3*(x^3*arctan(x^3) + 1)/x^3
```

Sympy [A] time = 0.315279, size = 14, normalized size = 0.88

$$-\frac{\operatorname{atan}\left(x^3\right)}{3} - \frac{1}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(x**6+1),x)
```

```
[Out] -atan(x**3)/3 - 1/(3*x**3)
```

GIAC/XCAS [A] time = 0.222159, size = 16, normalized size = 1.

$$-\frac{1}{3\,x^3} - \frac{1}{3}\,\arctan\left(x^3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 1)*x^4),x, algorithm="giac")
```

```
[Out] -1/3/x^3 - 1/3*arctan(x^3)
```

3.1372 $\int \frac{1}{x^5(1+x^6)}\,dx$

Optimal. Leaf size=56

$$-\frac{1}{4x^4}-\frac{1}{6}\log\left(x^2+1\right)+\frac{\tan^{-1}\left(\frac{1-2x^2}{\sqrt{3}}\right)}{2\sqrt{3}}+\frac{1}{12}\log\left(x^4-x^2+1\right)$$

```
[Out] -1/(4*x^4) + ArcTan[(1 - 2*x^2)/Sqrt[3]]/(2*Sqrt[3]) - Log[1 + x^
2]/6 + Log[1 - x^2 + x^4]/12
```

Rubi [A] time = 0.0808821, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.727

$$-\frac{1}{4x^4}-\frac{1}{6}\log\left(x^2+1\right)+\frac{\tan^{-1}\left(\frac{1-2x^2}{\sqrt{3}}\right)}{2\sqrt{3}}+\frac{1}{12}\log\left(x^4-x^2+1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^5*(1 + x^6)),x]
```

```
[Out] -1/(4*x^4) + ArcTan[(1 - 2*x^2)/Sqrt[3]]/(2*Sqrt[3]) - Log[1 + x^
2]/6 + Log[1 - x^2 + x^4]/12
```

Rubi in Sympy [A] time = 10.2153, size = 49, normalized size = 0.88

$$-\frac{\log\left(x^2+1\right)}{6}+\frac{\log\left(x^4-x^2+1\right)}{12}-\frac{\sqrt{3}\operatorname{atan}\left(\sqrt{3}\left(\frac{2x^2}{3}-\frac{1}{3}\right)\right)}{6}-\frac{1}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**5/(x**6+1),x)
```

```
[Out] -log(x**2 + 1)/6 + log(x**4 - x**2 + 1)/12 - sqrt(3)*atan(sqrt(3)
*(2*x**2/3 - 1/3))/6 - 1/(4*x**4)
```

Mathematica [A] time = 0.040434, size = 79, normalized size = 1.41

$$\frac{1}{12}\left(-\frac{3}{x^4}-2\log\left(x^2+1\right)+\log\left(x^2-\sqrt{3}x+1\right)+\log\left(x^2+\sqrt{3}x+1\right)+2\sqrt{3}\tan^{-1}\left(\sqrt{3}-2x\right)+2\sqrt{3}\tan^{-1}\left(2x+\sqrt{3}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^5*(1 + x^6)),x]
```

```
[Out] (-3/x^4 + 2*Sqrt[3]*ArcTan[Sqrt[3] - 2*x] + 2*Sqrt[3]*ArcTan[Sqrt
[3] + 2*x] - 2*Log[1 + x^2] + Log[1 - Sqrt[3]*x + x^2] + Log[1 +
Sqrt[3]*x + x^2])/12
```

Maple [A] time = 0.013, size = 46, normalized size = 0.8

$$\frac{\ln\left(x^4-x^2+1\right)}{12}-\frac{\sqrt{3}}{6}\arctan\left(\frac{\left(2x^2-1\right)\sqrt{3}}{3}\right)-\frac{1}{4x^4}-\frac{\ln\left(x^2+1\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^5/(x^6+1),x)
```

```
[Out] 1/12*ln(x^4-x^2+1)-1/6*3^(1/2)*arctan(1/3*(2*x^2-1)*3^(1/2))-1/4/
x^4-1/6*ln(x^2+1)
```

Maxima [A] time = 1.58611, size = 61, normalized size = 1.09

$$-\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}\left(2x^2-1\right)\right)-\frac{1}{4x^4}+\frac{1}{12}\log\left(x^4-x^2+1\right)-\frac{1}{6}\log\left(x^2+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 1)*x^5),x, algorithm="maxima")
```

```
[Out] -1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x^2 - 1)) - 1/4/x^4 + 1/12*log
(x^4 - x^2 + 1) - 1/6*log(x^2 + 1)
```

Fricas [A] time = 0.220564, size = 86, normalized size = 1.54

$$\frac{\sqrt{3}\left(\sqrt{3}x^4\log\left(x^4-x^2+1\right)-2\sqrt{3}x^4\log\left(x^2+1\right)-6x^4\arctan\left(\frac{1}{3}\sqrt{3}\left(2x^2-1\right)\right)-3\sqrt{3}\right)}{36x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 1)*x^5),x, algorithm="fricas")
```

```
[Out] 1/36*sqrt(3)*(sqrt(3)*x^4*log(x^4 - x^2 + 1) - 2*sqrt(3)*x^4*log(
x^2 + 1) - 6*x^4*arctan(1/3*sqrt(3)*(2*x^2 - 1)) - 3*sqrt(3))/x^4
```

Sympy [A] time = 0.538572, size = 53, normalized size = 0.95

$$-\frac{\log\left(x^2+1\right)}{6}+\frac{\log\left(x^4-x^2+1\right)}{12}-\frac{\sqrt{3}\operatorname{atan}\left(\frac{2\sqrt{3}x^2}{3}-\frac{\sqrt{3}}{3}\right)}{6}-\frac{1}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**5/(x**6+1),x)
```

```
[Out] -log(x**2 + 1)/6 + log(x**4 - x**2 + 1)/12 - sqrt(3)*atan(2*sqrt(
3)*x**2/3 - sqrt(3)/3)/6 - 1/(4*x**4)
```

GIAC/XCAS [A] time = 0.229357, size = 61, normalized size = 1.09

$$-\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}\left(2x^2-1\right)\right)-\frac{1}{4x^4}+\frac{1}{12}\ln\left(x^4-x^2+1\right)-\frac{1}{6}\ln\left(x^2+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 1)*x^5),x, algorithm="giac")
```

```
[Out] -1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x^2 - 1)) - 1/4/x^4 + 1/12*ln(
x^4 - x^2 + 1) - 1/6*ln(x^2 + 1)
```

3.1373 $\int \frac{1}{x^6(1+x^6)}\,dx$

Optimal. Leaf size=87

$$-\frac{1}{5x^5}+\frac{\log\left(x^2-\sqrt{3}x+1\right)}{4\sqrt{3}}-\frac{\log\left(x^2+\sqrt{3}x+1\right)}{4\sqrt{3}}+\frac{1}{6}\tan^{-1}\left(\sqrt{3}-2x\right)-\frac{1}{3}\tan^{-1}(x)-\frac{1}{6}\tan^{-1}\left(2x+\sqrt{3}\right)$$

```
[Out] -1/(5*x^5) + ArcTan[Sqrt[3] - 2*x]/6 - ArcTan[x]/3 - ArcTan[Sqrt[
3] + 2*x]/6 + Log[1 - Sqrt[3]*x + x^2]/(4*Sqrt[3]) - Log[1 + Sqrt
[3]*x + x^2]/(4*Sqrt[3])
```

Rubi [A] time = 0.339371, antiderivative size = 87, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 7, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.636

$$-\frac{1}{5x^5}+\frac{\log\left(x^2-\sqrt{3}x+1\right)}{4\sqrt{3}}-\frac{\log\left(x^2+\sqrt{3}x+1\right)}{4\sqrt{3}}+\frac{1}{6}\tan^{-1}\left(\sqrt{3}-2x\right)-\frac{1}{3}\tan^{-1}(x)-\frac{1}{6}\tan^{-1}\left(2x+\sqrt{3}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^6*(1 + x^6)),x]
```

```
[Out] -1/(5*x^5) + ArcTan[Sqrt[3] - 2*x]/6 - ArcTan[x]/3 - ArcTan[Sqrt[
3] + 2*x]/6 + Log[1 - Sqrt[3]*x + x^2]/(4*Sqrt[3]) - Log[1 + Sqrt
[3]*x + x^2]/(4*Sqrt[3])
```

Rubi in Sympy [A] time = 58.2856, size = 75, normalized size = 0.86

$$\frac{\sqrt{3}\log\left(x^2-\sqrt{3}x+1\right)}{12}-\frac{\sqrt{3}\log\left(x^2+\sqrt{3}x+1\right)}{12}-\frac{\operatorname{atan}(x)}{3}-\frac{\operatorname{atan}\left(2x-\sqrt{3}\right)}{6}-\frac{\operatorname{atan}\left(2x+\sqrt{3}\right)}{6}-\frac{1}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**6/(x**6+1),x)
```

```
[Out] sqrt(3)*log(x**2 - sqrt(3)*x + 1)/12 - sqrt(3)*log(x**2 + sqrt(3)
*x + 1)/12 - atan(x)/3 - atan(2*x - sqrt(3))/6 - atan(2*x + sqrt(
3))/6 - 1/(5*x**5)
```

Mathematica [A] time = 0.0493651, size = 79, normalized size = 0.91

$$\frac{1}{60}\left(-\frac{12}{x^5}+5\sqrt{3}\log\left(x^2-\sqrt{3}x+1\right)-5\sqrt{3}\log\left(x^2+\sqrt{3}x+1\right)+10\tan^{-1}\left(\sqrt{3}-2x\right)-20\tan^{-1}(x)-10\tan^{-1}\left(2x+\sqrt{3}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^6*(1 + x^6)),x]
```

```
[Out] (-12/x^5 + 10*ArcTan[Sqrt[3] - 2*x] - 20*ArcTan[x] - 10*ArcTan[Sq
rt[3] + 2*x] + 5*Sqrt[3]*Log[1 - Sqrt[3]*x + x^2] - 5*Sqrt[3]*Log
[1 + Sqrt[3]*x + x^2])/60
```

Maple [A] time = 0.01, size = 66, normalized size = 0.8

$$-\frac{1}{5x^5}-\frac{\arctan(x)}{3}-\frac{\arctan\left(2x-\sqrt{3}\right)}{6}-\frac{\arctan\left(2x+\sqrt{3}\right)}{6}+\frac{\ln\left(1+x^2-x\sqrt{3}\right)\sqrt{3}}{12}-\frac{\ln\left(1+x^2+x\sqrt{3}\right)\sqrt{3}}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^6/(x^6+1),x)
```

```
[Out] -1/5/x^5-1/3*arctan(x)-1/6*arctan(2*x-3^(1/2))-1/6*arctan(2*x+3^(
1/2))+1/12*ln(1+x^2-x*3^(1/2))*3^(1/2)-1/12*ln(1+x^2+x*3^(1/2))*3
^(1/2)
```

Maxima [A] time = 1.58665, size = 88, normalized size = 1.01

$$-\frac{1}{12}\sqrt{3}\log\left(x^2+\sqrt{3}x+1\right)+\frac{1}{12}\sqrt{3}\log\left(x^2-\sqrt{3}x+1\right)-\frac{1}{5x^5}-\frac{1}{6}\arctan\left(2x+\sqrt{3}\right)-\frac{1}{6}\arctan\left(2x-\sqrt{3}\right)-\frac{1}{3}\arctan(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((x^6 + 1)*x^6),x, algorithm="maxima")
```

```
[Out] -1/12*sqrt(3)*log(x^2 + sqrt(3)*x + 1) + 1/12*sqrt(3)*log(x^2 - s
qrt(3)*x + 1) - 1/5/x^5 - 1/6*arctan(2*x + sqrt(3)) - 1/6*arctan(
2*x - sqrt(3)) - 1/3*arctan(x)
```

Fricas [A] time = 0.233486, size = 154, normalized size = 1.77

$$-\frac{5\sqrt{3}x^5\log\left(x^2+\sqrt{3}x+1\right)-5\sqrt{3}x^5\log\left(x^2-\sqrt{3}x+1\right)+20x^5\arctan(x)-20x^5\arctan\left(\frac{1}{2x+\sqrt{3}+2\sqrt{x^2+\sqrt{3}x+1}}\right)-20x^5\operatorname{arc}}{60x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((x^6 + 1)*x^6),x, algorithm="fricas")
```

```
[Out] -1/60*(5*sqrt(3)*x^5*log(x^2 + sqrt(3)*x + 1) - 5*sqrt(3)*x^5*log
(x^2 - sqrt(3)*x + 1) + 20*x^5*arctan(x) - 20*x^5*arctan(1/(2*x +
 sqrt(3) + 2*sqrt(x^2 + sqrt(3)*x + 1))) - 20*x^5*arctan(1/(2*x -
 sqrt(3) + 2*sqrt(x^2 - sqrt(3)*x + 1))) + 12)/x^5
```

Sympy [A] time = 0.813958, size = 75, normalized size = 0.86

$$\frac{\sqrt{3}\log\left(x^2-\sqrt{3}x+1\right)}{12}-\frac{\sqrt{3}\log\left(x^2+\sqrt{3}x+1\right)}{12}-\frac{\operatorname{atan}(x)}{3}-\frac{\operatorname{atan}\left(2x-\sqrt{3}\right)}{6}-\frac{\operatorname{atan}\left(2x+\sqrt{3}\right)}{6}-\frac{1}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/x**6/(x**6+1),x)
```

```
[Out] sqrt(3)*log(x**2 - sqrt(3)*x + 1)/12 - sqrt(3)*log(x**2 + sqrt(3)
*x + 1)/12 - atan(x)/3 - atan(2*x - sqrt(3))/6 - atan(2*x + sqrt(
```

```
3))/6 - 1/(5*x**5)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(x^6+1)x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 1)*x^6),x, algorithm="giac")
```

```
[Out] integrate(1/((x^6 + 1)*x^6), x)
```

3.1374 $\int \frac{1}{x^7(1+x^6)} dx$

Optimal. Leaf size=22

$$-\frac{1}{6x^6} + \frac{1}{6}\log\left(x^6+1\right) - \log(x)$$

```
[Out] -1/(6*x^6) - Log[x] + Log[1 + x^6]/6
```

Rubi [A] time = 0.0275422, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$-\frac{1}{6x^6} + \frac{1}{6}\log\left(x^6+1\right) - \log(x)$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^7*(1 + x^6)),x]
```

```
[Out] -1/(6*x^6) - Log[x] + Log[1 + x^6]/6
```

Rubi in Sympy [A] time = 3.90876, size = 20, normalized size = 0.91

$$-\frac{\log\left(x^6\right)}{6} + \frac{\log\left(x^6+1\right)}{6} - \frac{1}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**7/(x**6+1),x)
```

```
[Out] -log(x**6)/6 + log(x**6 + 1)/6 - 1/(6*x**6)
```

Mathematica [A] time = 0.0061104, size = 22, normalized size = 1.

$$-\frac{1}{6x^6} + \frac{1}{6}\log\left(x^6+1\right) - \log(x)$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^7*(1 + x^6)),x]
```

```
[Out] -1/(6*x^6) - Log[x] + Log[1 + x^6]/6
```

Maple [A] time = 0.012, size = 32, normalized size = 1.5

$$\frac{\ln\left(x^4-x^2+1\right)}{6} - \frac{1}{6\,x^6} - \ln(x) + \frac{\ln\left(x^2+1\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^7/(x^6+1),x)
```

```
[Out] 1/6*ln(x^4-x^2+1)-1/6/x^6-ln(x)+1/6*ln(x^2+1)
```

Maxima [A] time = 1.43214, size = 27, normalized size = 1.23

$$-\frac{1}{6\,x^6}+\frac{1}{6}\,\log\left(x^6+1\right)-\frac{1}{6}\,\log\left(x^6\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 1)*x^7),x, algorithm="maxima")
```

```
[Out] -1/6/x^6 + 1/6*log(x^6 + 1) - 1/6*log(x^6)
```

Fricas [A] time = 0.211627, size = 32, normalized size = 1.45

$$\frac{x^6\log\left(x^6+1\right)-6\,x^6\log\left(x\right)-1}{6\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 1)*x^7),x, algorithm="fricas")
```

```
[Out] 1/6*(x^6*log(x^6 + 1) - 6*x^6*log(x) - 1)/x^6
```

Sympy [A] time = 0.389663, size = 17, normalized size = 0.77

$$-\log\left(x\right)+\frac{\log\left(x^6+1\right)}{6}-\frac{1}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**7/(x**6+1),x)
```

```
[Out] -log(x) + log(x**6 + 1)/6 - 1/(6*x**6)
```

GIAC/XCAS [A] time = 0.229271, size = 34, normalized size = 1.55

$$\frac{x^6-1}{6\,x^6}+\frac{1}{6}\ln\left(x^6+1\right)-\frac{1}{6}\ln\left(x^6\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 1)*x^7),x, algorithm="giac")
```

```
[Out] 1/6*(x^6 - 1)/x^6 + 1/6*ln(x^6 + 1) - 1/6*ln(x^6)
```

3.1375 $\int \frac{1}{x^8(1+x^6)}\,dx$

Optimal. Leaf size=90

$$-\frac{1}{7x^7}+\frac{\log\left(x^2-\sqrt{3}x+1\right)}{4\sqrt{3}}-\frac{\log\left(x^2+\sqrt{3}x+1\right)}{4\sqrt{3}}+\frac{1}{x}-\frac{1}{6}\tan^{-1}\left(\sqrt{3}-2x\right)+\frac{1}{3}\tan^{-1}(x)+\frac{1}{6}\tan^{-1}\left(2x+\sqrt{3}\right)$$

```
[Out] -1/(7*x^7) + x^(-1) - ArcTan[Sqrt[3] - 2*x]/6 + ArcTan[x]/3 + Arc
Tan[Sqrt[3] + 2*x]/6 + Log[1 - Sqrt[3]*x + x^2]/(4*Sqrt[3]) - Log
[1 + Sqrt[3]*x + x^2]/(4*Sqrt[3])
```

Rubi [A] time = 0.510526, antiderivative size = 90, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 7, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.636

$$-\frac{1}{7x^7}+\frac{\log\left(x^2-\sqrt{3}x+1\right)}{4\sqrt{3}}-\frac{\log\left(x^2+\sqrt{3}x+1\right)}{4\sqrt{3}}+\frac{1}{x}-\frac{1}{6}\tan^{-1}\left(\sqrt{3}-2x\right)+\frac{1}{3}\tan^{-1}(x)+\frac{1}{6}\tan^{-1}\left(2x+\sqrt{3}\right)$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^8*(1 + x^6)),x]
```

```
[Out] -1/(7*x^7) + x^(-1) - ArcTan[Sqrt[3] - 2*x]/6 + ArcTan[x]/3 + Arc
Tan[Sqrt[3] + 2*x]/6 + Log[1 - Sqrt[3]*x + x^2]/(4*Sqrt[3]) - Log
[1 + Sqrt[3]*x + x^2]/(4*Sqrt[3])
```

Rubi in Sympy [A] time = 92.5218, size = 78, normalized size = 0.87

$$\frac{\sqrt{3}\log\left(x^2-\sqrt{3}x+1\right)}{12}-\frac{\sqrt{3}\log\left(x^2+\sqrt{3}x+1\right)}{12}+\frac{\operatorname{atan}(x)}{3}+\frac{\operatorname{atan}\left(2x-\sqrt{3}\right)}{6}+\frac{\operatorname{atan}\left(2x+\sqrt{3}\right)}{6}+\frac{1}{x}-\frac{1}{7x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**8/(x**6+1),x)
```

```
[Out] sqrt(3)*log(x**2 - sqrt(3)*x + 1)/12 - sqrt(3)*log(x**2 + sqrt(3)
*x + 1)/12 + atan(x)/3 + atan(2*x - sqrt(3))/6 + atan(2*x + sqrt(
3))/6 + 1/x - 1/(7*x**7)
```

Mathematica [A] time = 0.0510462, size = 84, normalized size = 0.93

$$\frac{1}{84}\left(-\frac{12}{x^7}+7\sqrt{3}\log\left(x^2-\sqrt{3}x+1\right)-7\sqrt{3}\log\left(x^2+\sqrt{3}x+1\right)+\frac{84}{x}-14\tan^{-1}\left(\sqrt{3}-2x\right)+28\tan^{-1}(x)+14\tan^{-1}\left(2x+\sqrt{3}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^8*(1 + x^6)),x]
```

```
[Out] (-12/x^7 + 84/x - 14*ArcTan[Sqrt[3] - 2*x] + 28*ArcTan[x] + 14*Ar
cTan[Sqrt[3] + 2*x] + 7*Sqrt[3]*Log[1 - Sqrt[3]*x + x^2] - 7*Sqrt
```

```
[3]*Log[1 + Sqrt[3]*x + x^2])/84
```

Maple [A] time = 0.025, size = 69, normalized size = 0.8

$$-\frac{1}{7\,x^{7}}+x^{-1}+\frac{\arctan\left(x\right)}{3}+\frac{\arctan\left(2\,x-\sqrt{3}\right)}{6}+\frac{\arctan\left(2\,x+\sqrt{3}\right)}{6}+\frac{\ln\left(1+x^{2}-x\sqrt{3}\right)\sqrt{3}}{12}-\frac{\ln\left(1+x^{2}+x\sqrt{3}\right)\sqrt{3}}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^8/(x^6+1),x)
```

```
[Out] -1/7/x^7+1/x+1/3*arctan(x)+1/6*arctan(2*x-3^(1/2))+1/6*arctan(2*x
+3^(1/2))+1/12*ln(1+x^2-x*3^(1/2))*3^(1/2)-1/12*ln(1+x^2+x*3^(1/2
))*3^(1/2)
```

Maxima [A] time = 1.58837, size = 97, normalized size = 1.08

$$-\frac{1}{12}\,\sqrt{3}\log\left(x^{2}+\sqrt{3}x+1\right)+\frac{1}{12}\,\sqrt{3}\log\left(x^{2}-\sqrt{3}x+1\right)+\frac{7\,x^{6}-1}{7\,x^{7}}+\frac{1}{6}\,\arctan\left(2\,x+\sqrt{3}\right)+\frac{1}{6}\,\arctan\left(2\,x-\sqrt{3}\right)+\frac{1}{3}\,\arctan\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 1)*x^8),x, algorithm="maxima")
```

```
[Out] -1/12*sqrt(3)*log(x^2 + sqrt(3)*x + 1) + 1/12*sqrt(3)*log(x^2 - s
qrt(3)*x + 1) + 1/7*(7*x^6 - 1)/x^7 + 1/6*arctan(2*x + sqrt(3)) +
 1/6*arctan(2*x - sqrt(3)) + 1/3*arctan(x)
```

Fricas [A] time = 0.235124, size = 161, normalized size = 1.79

$$-\frac{7\,\sqrt{3}x^{7}\log\left(x^{2}+\sqrt{3}x+1\right)-7\,\sqrt{3}x^{7}\log\left(x^{2}-\sqrt{3}x+1\right)-28\,x^{7}\arctan\left(x\right)+28\,x^{7}\arctan\left(\frac{1}{2\,x+\sqrt{3}+2\,\sqrt{x^{2}+\sqrt{3}x+1}}\right)+28\,x^{7}\mathrm{arc}}{84\,x^{7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 1)*x^8),x, algorithm="fricas")
```

```
[Out] -1/84*(7*sqrt(3)*x^7*log(x^2 + sqrt(3)*x + 1) - 7*sqrt(3)*x^7*log
(x^2 - sqrt(3)*x + 1) - 28*x^7*arctan(x) + 28*x^7*arctan(1/(2*x +
 sqrt(3) + 2*sqrt(x^2 + sqrt(3)*x + 1))) + 28*x^7*arctan(1/(2*x -
 sqrt(3) + 2*sqrt(x^2 - sqrt(3)*x + 1))) - 84*x^6 + 12)/x^7
```

Sympy [A] time = 0.878678, size = 80, normalized size = 0.89

$$\frac{\sqrt{3}\log\left(x^{2}-\sqrt{3}x+1\right)}{12}-\frac{\sqrt{3}\log\left(x^{2}+\sqrt{3}x+1\right)}{12}+\frac{\operatorname{atan}\left(x\right)}{3}+\frac{\operatorname{atan}\left(2x-\sqrt{3}\right)}{6}+\frac{\operatorname{atan}\left(2x+\sqrt{3}\right)}{6}+\frac{7x^{6}-1}{7x^{7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**8/(x**6+1),x)
```

```
[Out] sqrt(3)*log(x**2 - sqrt(3)*x + 1)/12 - sqrt(3)*log(x**2 + sqrt(3)
*x + 1)/12 + atan(x)/3 + atan(2*x - sqrt(3))/6 + atan(2*x + sqrt(
3))/6 + (7*x**6 - 1)/(7*x**7)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(x^6+1)x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 1)*x^8),x, algorithm="giac")
```

```
[Out] integrate(1/((x^6 + 1)*x^8), x)
```

3.1376 $\int \frac{1}{2-3x^6}\,dx$

Optimal. Leaf size=180

$$-\frac{\log\left(\sqrt[3]{3}x^2-\sqrt[6]{6}x+\sqrt[3]{2}\right)}{12\ 2^{5/6}\sqrt[6]{3}}+\frac{\log\left(\sqrt[3]{3}x^2+\sqrt[6]{6}x+\sqrt[3]{2}\right)}{12\ 2^{5/6}\sqrt[6]{3}}-\frac{\tan^{-1}\left(\frac{\sqrt[6]{6}-2\sqrt[3]{3}x}{\sqrt[6]{2}3^{2/3}}\right)}{2\ 2^{5/6}3^{2/3}}+\frac{\tan^{-1}\left(\frac{2\sqrt[3]{3}x+\sqrt[6]{6}}{\sqrt[6]{2}3^{2/3}}\right)}{2\ 2^{5/6}3^{2/3}}+\frac{\tanh^{-1}\left(\sqrt[6]{\frac{3}{2}}x\right)}{3\ 2^{5/6}\sqrt[6]{3}}$$

```
[Out] -ArcTan[(6^(1/6) - 2*3^(1/3)*x)/(2^(1/6)*3^(2/3))]/(2*2^(5/6)*3^(
2/3)) + ArcTan[(6^(1/6) + 2*3^(1/3)*x)/(2^(1/6)*3^(2/3))]/(2*2^(5
/6)*3^(2/3)) + ArcTanh[(3/2)^(1/6)*x]/(3*2^(5/6)*3^(1/6)) - Log[2
^(1/3) - 6^(1/6)*x + 3^(1/3)*x^2]/(12*2^(5/6)*3^(1/6)) + Log[2^(1
/3) + 6^(1/6)*x + 3^(1/3)*x^2]/(12*2^(5/6)*3^(1/6))
```

Rubi [A] time = 0.644452, antiderivative size = 167, normalized size of antiderivative = 0.93, number of steps used = 10, number of rules used = 6, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.667$

$$-\frac{\log\left(\sqrt[3]{3}x^2-\sqrt[6]{6}x+\sqrt[3]{2}\right)}{12\ 2^{5/6}\sqrt[6]{3}}+\frac{\log\left(\sqrt[3]{3}x^2+\sqrt[6]{6}x+\sqrt[3]{2}\right)}{12\ 2^{5/6}\sqrt[6]{3}}-\frac{\tan^{-1}\left(\frac{1}{\sqrt{3}}-\frac{2^{5/6}x}{\sqrt[3]{3}}\right)}{2\ 2^{5/6}3^{2/3}}+\frac{\tan^{-1}\left(\frac{2^{5/6}x}{\sqrt[3]{3}}+\frac{1}{\sqrt{3}}\right)}{2\ 2^{5/6}3^{2/3}}+\frac{\tanh^{-1}\left(\sqrt[6]{\frac{3}{2}}x\right)}{3\ 2^{5/6}\sqrt[6]{3}}$$

Antiderivative was successfully verified.

```
[In]  Int[(2 - 3*x^6)^(-1),x]
```

```
[Out] -ArcTan[1/Sqrt[3] - (2^(5/6)*x)/3^(1/3)]/(2*2^(5/6)*3^(2/3)) + Ar
cTan[1/Sqrt[3] + (2^(5/6)*x)/3^(1/3)]/(2*2^(5/6)*3^(2/3)) + ArcTa
nh[(3/2)^(1/6)*x]/(3*2^(5/6)*3^(1/6)) - Log[2^(1/3) - 6^(1/6)*x +
 3^(1/3)*x^2]/(12*2^(5/6)*3^(1/6)) + Log[2^(1/3) + 6^(1/6)*x + 3^
(1/3)*x^2]/(12*2^(5/6)*3^(1/6))
```

Rubi in Sympy [A] time = 112.783, size = 192, normalized size = 1.07

$$-\frac{\sqrt[6]{2}\cdot 3^{\frac{5}{6}}\log\left(9x^2-3\sqrt[6]{2}\cdot 3^{\frac{5}{6}}x+3\sqrt[3]{2}\cdot 3^{\frac{2}{3}}\right)}{72}+\frac{\sqrt[6]{2}\cdot 3^{\frac{5}{6}}\log\left(9x^2+3\sqrt[6]{2}\cdot 3^{\frac{5}{6}}x+3\sqrt[3]{2}\cdot 3^{\frac{2}{3}}\right)}{72}+\frac{\sqrt[6]{2}\sqrt[3]{3}\,\mathrm{atan}\left(2^{\frac{5}{6}}\cdot 3^{\frac{2}{3}}\left(\frac{x}{3}-\frac{\sqrt[6]{2}\cdot 3^{\frac{5}{6}}}{18}\right)\right)}{12}+\frac{\sqrt[6]{2}\sqrt[3]{3}\,\mathrm{atan}\left(2^{\frac{5}{6}}\cdot 3^{\frac{2}{3}}\left(\frac{x}{3}+\frac{\sqrt[6]{2}\cdot 3^{\frac{5}{6}}}{18}\right)\right)}{12}+\frac{\sqrt[6]{2}\cdot 3^{\frac{5}{6}}\,\mathrm{atanh}\left(\frac{2^{\frac{5}{6}}\sqrt[6]{3}x}{2}\right)}{18}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(-3*x**6+2),x)
```

```
[Out] -2**(1/6)*3**(5/6)*log(9*x**2 - 3*2**(1/6)*3**(5/6)*x + 3*2**(1/3
)*3**(2/3))/72 + 2**(1/6)*3**(5/6)*log(9*x**2 + 3*2**(1/6)*3**(5/
6)*x + 3*2**(1/3)*3**(2/3))/72 + 2**(1/6)*3**(1/3)*atan(2**(5/6)*
3**(2/3)*(x/3 - 2**(1/6)*3**(5/6)/18))/12 + 2**(1/6)*3**(1/3)*ata
n(2**(5/6)*3**(2/3)*(x/3 + 2**(1/6)*3**(5/6)/18))/12 + 2**(1/6)*3
**(5/6)*atanh(2**(5/6)*3**(1/6)*x/2)/18
```

Mathematica [A] time = 0.125515, size = 162, normalized size = 0.9

$$\frac{\sqrt{3}\left(-\log\left(2^{2/3}\sqrt[3]{3}x^2-2^{5/6}\sqrt[6]{3}x+2\right)+\log\left(2^{2/3}\sqrt[3]{3}x^2+2^{5/6}\sqrt[6]{3}x+2\right)-2\log\left(2-2^{5/6}\sqrt[6]{3}x\right)+2\log\left(2^{5/6}\sqrt[6]{3}x+2\right)\right)+6\tan}{12\ 2^{5/6}3^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(2 - 3*x^6)^(-1),x]
```

```
[Out] (6*ArcTan[1/Sqrt[3] + (2^(5/6)*x)/3^(1/3)] + 6*ArcTan[(-1 + 2^(5/
6)*3^(1/6)*x)/Sqrt[3]] + Sqrt[3]*(-2*Log[2 - 2^(5/6)*3^(1/6)*x] +
 2*Log[2 + 2^(5/6)*3^(1/6)*x] - Log[2 - 2^(5/6)*3^(1/6)*x + 2^(2/
3)*3^(1/3)*x^2] + Log[2 + 2^(5/6)*3^(1/6)*x + 2^(2/3)*3^(1/3)*x^2
]))/(12*2^(5/6)*3^(2/3))
```

Maple [A] time = 0.523, size = 228, normalized size = 1.3

$$-\frac{2^{\frac{2}{3}}\sqrt[3]{3}\sqrt{6}\ln\left(-x\sqrt{6}\sqrt[3]{12}+12^{\frac{2}{3}}+6x^2\right)}{144}-\frac{\sqrt[6]{2}\sqrt[3]{3}}{36}\arctan\left(-\frac{\sqrt{2}\sqrt{6}}{6}+\frac{\sqrt{2}12^{\frac{2}{3}}x}{6}\right)+\frac{2^{\frac{5}{6}}3^{\frac{2}{3}}12^{\frac{2}{3}}}{108}\arctan\left(-\frac{\sqrt{2}\sqrt{6}}{6}+\frac{\sqrt{2}12^{\frac{2}{3}}x}{6}\right)+\frac{2^{\frac{2}{3}}\sqrt[3]{3}\sqrt{6}\ln\left(x\sqrt{6}\sqrt[3]{12}+12^{\frac{2}{3}}+6x^2\right)}{144}-\frac{\sqrt[6]{2}\sqrt[3]{3}}{36}\arctan\left(\frac{\sqrt{2}\sqrt{6}}{6}+\frac{\sqrt{2}12^{\frac{2}{3}}x}{6}\right)+\frac{2^{\frac{5}{6}}3^{\frac{2}{3}}12^{\frac{2}{3}}}{108}\arctan\left(\frac{\sqrt{2}\sqrt{6}}{6}+\frac{\sqrt{2}12^{\frac{2}{3}}x}{6}\right)-\frac{\sqrt{6}\sqrt[3]{3}2^{\frac{2}{3}}\ln\left(-\sqrt{6}\sqrt[3]{3}2^{\frac{2}{3}}+6x\right)}{72}+\frac{\sqrt{6}\sqrt[3]{3}2^{\frac{2}{3}}\ln\left(\sqrt{6}\sqrt[3]{3}2^{\frac{2}{3}}+6x\right)}{72}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(-3*x^6+2),x)
```

```
[Out] -1/144*2^(2/3)*3^(1/3)*6^(1/2)*ln(-x*6^(1/2)*12^(1/3)+12^(2/3)+6*
x^2)-1/36*2^(1/6)*3^(1/3)*arctan(-1/6*2^(1/2)*6^(1/2)+1/6*2^(1/2)
*12^(2/3)*x)+1/108*2^(5/6)*3^(2/3)*12^(2/3)*arctan(-1/6*2^(1/2)*6
^(1/2)+1/6*2^(1/2)*12^(2/3)*x)+1/144*2^(2/3)*3^(1/3)*6^(1/2)*ln(x
*6^(1/2)*12^(1/3)+12^(2/3)+6*x^2)-1/36*2^(1/6)*3^(1/3)*arctan(1/6
*2^(1/2)*6^(1/2)+1/6*2^(1/2)*12^(2/3)*x)+1/108*2^(5/6)*3^(2/3)*12
^(2/3)*arctan(1/6*2^(1/2)*6^(1/2)+1/6*2^(1/2)*12^(2/3)*x)-1/72*6^
(1/2)*3^(1/3)*2^(2/3)*ln(-6^(1/2)*3^(1/3)*2^(2/3)+6*x)+1/72*6^(1/
2)*3^(1/3)*2^(2/3)*ln(6^(1/2)*3^(1/3)*2^(2/3)+6*x)
```

Maxima [A] time = 1.60557, size = 302, normalized size = 1.68

$$\frac{1}{12}\cdot 3^{\frac{2}{3}}2^{\frac{1}{6}}\left(\frac{1}{3}\right)^{\frac{1}{3}}\arctan\left(\frac{1}{2}\cdot 3^{\frac{1}{3}}2^{\frac{5}{6}}\left(\frac{1}{3}\right)^{\frac{2}{3}}\left(2x+\left(\frac{1}{3}\right)^{\frac{1}{3}}\left(\sqrt{3}\sqrt{2}\right)^{\frac{1}{3}}\right)\right)+\frac{1}{12}\cdot 3^{\frac{2}{3}}2^{\frac{1}{6}}\left(\frac{1}{3}\right)^{\frac{1}{3}}\arctan\left(\frac{1}{2}\cdot 3^{\frac{1}{3}}2^{\frac{5}{6}}\left(\frac{1}{3}\right)^{\frac{2}{3}}\left(2x-\left(\frac{1}{3}\right)^{\frac{1}{3}}\left(\sqrt{3}\sqrt{2}\right)^{\frac{1}{3}}\right)\right)+\frac{1}{24}\cdot 3^{\frac{1}{6}}2^{\frac{1}{6}}\left(\frac{1}{3}\right)^{\frac{1}{3}}\log\left(x^2+\left(\frac{1}{3}\right)^{\frac{1}{3}}\left(\sqrt{3}\sqrt{2}\right)^{\frac{1}{3}}x+\left(\frac{1}{3}\right)^{\frac{2}{3}}\left(\sqrt{3}\sqrt{2}\right)^{\frac{2}{3}}\right)-\frac{1}{24}\cdot 3^{\frac{1}{6}}2^{\frac{1}{6}}\left(\frac{1}{3}\right)^{\frac{1}{3}}\log\left(x^2-\left(\frac{1}{3}\right)^{\frac{1}{3}}\left(\sqrt{3}\sqrt{2}\right)^{\frac{1}{3}}x+\left(\frac{1}{3}\right)^{\frac{2}{3}}\left(\sqrt{3}\sqrt{2}\right)^{\frac{2}{3}}\right)+\frac{1}{12}\cdot 3^{\frac{1}{6}}2^{\frac{1}{6}}\left(\frac{1}{3}\right)^{\frac{1}{3}}\log\left(x+\left(\frac{1}{3}\right)^{\frac{1}{3}}\left(\sqrt{3}\sqrt{2}\right)^{\frac{1}{3}}\right)-\frac{1}{12}\cdot 3^{\frac{1}{6}}2^{\frac{1}{6}}\left(\frac{1}{3}\right)^{\frac{1}{3}}\log\left(x-\left(\frac{1}{3}\right)^{\frac{1}{3}}\left(\sqrt{3}\sqrt{2}\right)^{\frac{1}{3}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(3*x^6 - 2),x, algorithm="maxima")
```

```
[Out] 1/12*3^(2/3)*2^(1/6)*(1/3)^(1/3)*arctan(1/2*3^(1/3)*2^(5/6)*(1/3)
^(2/3)*(2*x + (1/3)^(1/3)*(sqrt(3)*sqrt(2))^(1/3))) + 1/12*3^(2/3
)*2^(1/6)*(1/3)^(1/3)*arctan(1/2*3^(1/3)*2^(5/6)*(1/3)^(2/3)*(2*x
 - (1/3)^(1/3)*(sqrt(3)*sqrt(2))^(1/3))) + 1/24*3^(1/6)*2^(1/6)*(
1/3)^(1/3)*log(x^2 + (1/3)^(1/3)*(sqrt(3)*sqrt(2))^(1/3)*x + (1/3
)^(2/3)*(sqrt(3)*sqrt(2))^(2/3)) - 1/24*3^(1/6)*2^(1/6)*(1/3)^(1/
3)*log(x^2 - (1/3)^(1/3)*(sqrt(3)*sqrt(2))^(1/3)*x + (1/3)^(2/3)*
(sqrt(3)*sqrt(2))^(2/3)) + 1/12*3^(1/6)*2^(1/6)*(1/3)^(1/3)*log(x
 + (1/3)^(1/3)*(sqrt(3)*sqrt(2))^(1/3)) - 1/12*3^(1/6)*2^(1/6)*(1
/3)^(1/3)*log(x - (1/3)^(1/3)*(sqrt(3)*sqrt(2))^(1/3))
```

Fricas [A] time = 0.229462, size = 215, normalized size = 1.19

$$-\frac{1}{1152} \cdot 96^{\frac{5}{6}} \left(4\sqrt{3}\arctan\left(\frac{2\sqrt{3}}{96^{\frac{1}{6}}\sqrt{\frac{1}{3}}\sqrt{12^{\frac{2}{3}}\left(12^{\frac{1}{3}}x^2 + 96^{\frac{1}{6}}x + 2\right)} + 2\cdot 96^{\frac{1}{6}}x + 2}\right) + 4\sqrt{3}\arctan\left(\frac{2\sqrt{3}}{96^{\frac{1}{6}}\sqrt{\frac{1}{3}}\sqrt{12^{\frac{2}{3}}\left(12^{\frac{1}{3}}x^2 - 96^{\frac{1}{6}}x + 2\right)} + 2\cdot\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(3*x^6 - 2),x, algorithm="fricas")
```

```
[Out] -1/1152*96^(5/6)*(4*sqrt(3)*arctan(2*sqrt(3)/(96^(1/6)*sqrt(1/3)*
sqrt(12^(2/3)*(12^(1/3)*x^2 + 96^(1/6)*x + 2)) + 2*96^(1/6)*x + 2
)) + 4*sqrt(3)*arctan(2*sqrt(3)/(96^(1/6)*sqrt(1/3)*sqrt(12^(2/3)
*(12^(1/3)*x^2 - 96^(1/6)*x + 2)) + 2*96^(1/6)*x - 2)) - log(2*12
^(1/3)*x^2 + 2*96^(1/6)*x + 4) + log(2*12^(1/3)*x^2 - 2*96^(1/6)*
x + 4) - 2*log(96^(1/6)*x + 2) + 2*log(96^(1/6)*x - 2))
```

Sympy [A] time = 2.23669, size = 15, normalized size = 0.08

$$-\operatorname{RootSum}\left(4478976t^6 - 1, \left(t \mapsto t\log\left(-12t + x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(-3*x**6+2),x)
```

```
[Out] -RootSum(4478976*_t**6 - 1, Lambda(_t, _t*log(-12*_t + x)))
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(3*x^6 - 2),x, algorithm="giac")
```

```
[Out] Exception raised: NotImplementedError
```

3.1377 $\int \frac{\sqrt[3]{x}}{1-x^6}\,dx$

Optimal. Leaf size=244

$$-\frac{1}{6}\log\left(1-x^{2/3}\right)+\frac{1}{12}\log\left(x^{4/3}+x^{2/3}+1\right)-\frac{\tan^{-1}\left(\frac{2x^{2/3}+1}{\sqrt{3}}\right)}{2\sqrt{3}}-\frac{1}{6}\cos\left(\frac{2\pi}{9}\right)\log\left(x^{4/3}+2x^{2/3}\cos\left(\frac{\pi}{9}\right)+1\right)+\frac{1}{6}\cos\left(\frac{\pi}{9}\right)\log\left(x^{4/3}-2x^{2/3}\sin\left(\frac{\pi}{18}\right)+1\right)-\frac{1}{6}\sin\left(\frac{\pi}{18}\right)\text{lo}$$

```
[Out] -ArcTan[(1 + 2*x^(2/3))/Sqrt[3]]/(2*Sqrt[3]) + (ArcTan[(x^(2/3) -
 Cos[(2*Pi)/9])*Csc[(2*Pi)/9]]*Cos[Pi/18])/3 - Log[1 - x^(2/3)]/6
 + Log[1 + x^(2/3) + x^(4/3)]/12 - (Cos[(2*Pi)/9]*Log[1 + x^(4/3)
 + 2*x^(2/3)*Cos[Pi/9]])/6 + (Cos[Pi/9]*Log[1 + x^(4/3) - 2*x^(2/
3)*Sin[Pi/18]])/6 - (Log[1 + x^(4/3) - 2*x^(2/3)*Cos[(2*Pi)/9]]*S
in[Pi/18])/6 + (ArcTan[Sec[Pi/18]*(x^(2/3) - Sin[Pi/18])]*Sin[Pi/
9])/3 - (ArcTan[(x^(2/3) + Cos[Pi/9])*Csc[Pi/9]]*Sin[(2*Pi)/9])/3
```

Rubi [A] time = 0.551223, antiderivative size = 244, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.533

$$-\frac{1}{6}\log\left(1-x^{2/3}\right)+\frac{1}{12}\log\left(x^{4/3}+x^{2/3}+1\right)-\frac{\tan^{-1}\left(\frac{2x^{2/3}+1}{\sqrt{3}}\right)}{2\sqrt{3}}-\frac{1}{6}\cos\left(\frac{2\pi}{9}\right)\log\left(x^{4/3}+2x^{2/3}\cos\left(\frac{\pi}{9}\right)+1\right)+\frac{1}{6}\cos\left(\frac{\pi}{9}\right)\log\left(x^{4/3}-2x^{2/3}\sin\left(\frac{\pi}{18}\right)+1\right)-\frac{1}{6}\sin\left(\frac{\pi}{18}\right)\text{lo}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(1/3)/(1 - x^6),x]
```

```
[Out] -ArcTan[(1 + 2*x^(2/3))/Sqrt[3]]/(2*Sqrt[3]) + (ArcTan[(x^(2/3) -
 Cos[(2*Pi)/9])*Csc[(2*Pi)/9]]*Cos[Pi/18])/3 - Log[1 - x^(2/3)]/6
 + Log[1 + x^(2/3) + x^(4/3)]/12 - (Cos[(2*Pi)/9]*Log[1 + x^(4/3)
 + 2*x^(2/3)*Cos[Pi/9]])/6 + (Cos[Pi/9]*Log[1 + x^(4/3) - 2*x^(2/
3)*Sin[Pi/18]])/6 - (Log[1 + x^(4/3) - 2*x^(2/3)*Cos[(2*Pi)/9]]*S
in[Pi/18])/6 + (ArcTan[Sec[Pi/18]*(x^(2/3) - Sin[Pi/18])]*Sin[Pi/
9])/3 - (ArcTan[(x^(2/3) + Cos[Pi/9])*Csc[Pi/9]]*Sin[(2*Pi)/9])/3
```

Rubi in Sympy [A] time = 113.974, size = 298, normalized size = 1.22

$$-\frac{\log\left(-x^{\frac{2}{3}}+1\right)}{6}+\frac{\log\left(x^{\frac{4}{3}}+x^{\frac{2}{3}}+1\right)}{12}-\frac{\log\left(x^{\frac{4}{3}}+2x^{\frac{2}{3}}\cos\left(\frac{\pi}{9}\right)+1\right)\cos\left(\frac{2\pi}{9}\right)}{6}-\frac{\log\left(x^{\frac{4}{3}}-2x^{\frac{2}{3}}\cos\left(\frac{2\pi}{9}\right)+1\right)\cos\left(\frac{4\pi}{9}\right)}{6}+\frac{\log\left(x^{\frac{4}{3}}-2x^{\frac{2}{3}}\cos\left(\frac{4\pi}{9}\right)+1\right)\cos\left(\frac{\pi}{9}\right)}{6}-\frac{\sqrt{3}\operatorname{atan}\left(\sqrt{3}\left(\frac{2x^{\frac{2}{3}}}{3}+\frac{1}{3}\right)\right)}{6}+\frac{\sqrt{2}\sqrt{\sin\left(\frac{7\pi}{18}\right)+1}\sin\left(\frac{\pi}{18}\right)\operatorname{atan}\left(\frac{\sqrt{2}\left(x^{\frac{2}{3}}-\sin\left(\frac{\pi}{18}\right)\right)}{\sqrt{\sin\left(\frac{7\pi}{18}\right)+1}}\right)}{3}-\frac{\sqrt{2}\sqrt{-\sin\left(\frac{5\pi}{18}\right)+1}\sin\left(\frac{7\pi}{18}\right)\operatorname{atan}\left(\frac{\sqrt{2}\left(x^{\frac{2}{3}}+\cos\left(\frac{\pi}{9}\right)\right)}{\sqrt{-\sin\left(\frac{5\pi}{18}\right)+1}}\right)}{3}+\frac{\sqrt{2}\sqrt{-\sin\left(\frac{\pi}{18}\right)+1}\sin\left(\frac{5\pi}{18}\right)\operatorname{atan}\left(\frac{\sqrt{2}\left(x^{\frac{2}{3}}-\cos\left(\frac{2\pi}{9}\right)\right)}{\sqrt{-\sin\left(\frac{\pi}{18}\right)+1}}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(1/3)/(-x**6+1),x)
```

```
[Out] -log(-x**(2/3) + 1)/6 + log(x**(4/3) + x**(2/3) + 1)/12 - log(x**
(4/3) + 2*x**(2/3)*cos(pi/9) + 1)*cos(2*pi/9)/6 - log(x**(4/3) -
2*x**(2/3)*cos(2*pi/9) + 1)*cos(4*pi/9)/6 + log(x**(4/3) - 2*x**(
2/3)*cos(4*pi/9) + 1)*cos(pi/9)/6 - sqrt(3)*atan(sqrt(3)*(2*x**(2
/3)/3 + 1/3))/6 + sqrt(2)*sqrt(sin(7*pi/18) + 1)*sin(pi/18)*atan(
sqrt(2)*(x**(2/3) - sin(pi/18))/sqrt(sin(7*pi/18) + 1))/3 - sqrt(
2)*sqrt(-sin(5*pi/18) + 1)*sin(7*pi/18)*atan(sqrt(2)*(x**(2/3) +
cos(pi/9))/sqrt(-sin(5*pi/18) + 1))/3 + sqrt(2)*sqrt(-sin(pi/18)
+ 1)*sin(5*pi/18)*atan(sqrt(2)*(x**(2/3) - cos(2*pi/9))/sqrt(-sin
(pi/18) + 1))/3
```

Mathematica [A] time = 0.67361, size = 448, normalized size = 1.84

$$\frac{1}{12}\left(\log\left(x^{2/3}-\sqrt[3]{x}+1\right)\right.$$
$$+\log\left(x^{2/3}+\sqrt[3]{x}+1\right)+2\cos\left(\frac{\pi}{9}\right)\log\left(x^{2/3}-2\sqrt[3]{x}\cos\left(\frac{2\pi}{9}\right)+1\right)+2\cos\left(\frac{\pi}{9}\right)\log\left(x^{2/3}+2\sqrt[3]{x}\cos\left(\frac{2\pi}{9}\right)+1\right)-2\cos\left(\frac{2\pi}{9}\right)\log\left(x\right.$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^(1/3)/(1 - x^6),x]
```

```
[Out] (-2*Sqrt[3]*ArcTan[(-1 + 2*x^(1/3))/Sqrt[3]] + 2*Sqrt[3]*ArcTan[(
1 + 2*x^(1/3))/Sqrt[3]] - 4*ArcTan[(x^(1/3) + Cos[Pi/9])*Csc[Pi/9
]]*Cos[Pi/18] - 4*ArcTan[Cot[Pi/9] - x^(1/3)*Csc[Pi/9]]*Cos[Pi/18
] - 2*Log[1 - x^(1/3)] - 2*Log[1 + x^(1/3)] + Log[1 - x^(1/3) + x
^(2/3)] + Log[1 + x^(1/3) + x^(2/3)] + 2*Cos[Pi/9]*Log[1 + x^(2/3
) - 2*x^(1/3)*Cos[(2*Pi)/9]] + 2*Cos[Pi/9]*Log[1 + x^(2/3) + 2*x^
(1/3)*Cos[(2*Pi)/9]] - 2*Cos[(2*Pi)/9]*Log[1 + x^(2/3) - 2*x^(1/3
)*Sin[Pi/18]] - 2*Cos[(2*Pi)/9]*Log[1 + x^(2/3) + 2*x^(1/3)*Sin[P
i/18]] - 2*Log[1 + x^(2/3) - 2*x^(1/3)*Cos[Pi/9]]*Sin[Pi/18] - 2*
Log[1 + x^(2/3) + 2*x^(1/3)*Cos[Pi/9]]*Sin[Pi/18] + 4*ArcTan[(x^(
1/3) - Cos[(2*Pi)/9])*Csc[(2*Pi)/9]]*Sin[Pi/9] - 4*ArcTan[(x^(1/3
) + Cos[(2*Pi)/9])*Csc[(2*Pi)/9]]*Sin[Pi/9] + 4*ArcTan[Sec[Pi/18]
*(x^(1/3) + Sin[Pi/18])]*Sin[(2*Pi)/9] - 4*ArcTan[x^(1/3)*Sec[Pi/
18] - Tan[Pi/18]]*Sin[(2*Pi)/9])/12
```

Maple [C] time = 0.046, size = 162, normalized size = 0.7

$$\frac{1}{12}\ln\left(x^{\frac{2}{3}}+\sqrt[3]{x}+1\right)+\frac{\sqrt{3}}{6}\arctan\left(\frac{\sqrt{3}}{3}\left(2\sqrt[3]{x}+1\right)\right)-\frac{1}{6}\ln\left(\sqrt[3]{x}-1\right)$$
$$-\frac{1}{6}\sum_{\_R=RootOf(\_Z^6+\_Z^3+1)}\frac{-\_R^3+1}{2\_R^5+\_R^2}\ln\left(\sqrt[3]{x}-\_R\right)+\frac{1}{12}\ln\left(x^{\frac{2}{3}}-\sqrt[3]{x}+1\right)$$
$$-\frac{\sqrt{3}}{6}\arctan\left(\frac{\sqrt{3}}{3}\left(2\sqrt[3]{x}-1\right)\right)-\frac{1}{6}\ln\left(1+\sqrt[3]{x}\right)+\frac{1}{6}\sum_{\_R=RootOf(\_Z^6-\_Z^3+1)}\frac{\_R^3+1}{2\_R^5-\_R^2}\ln\left(\sqrt[3]{x}-\_R\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(1/3)/(-x^6+1),x)
```

```
[Out] 1/12*ln(x^(2/3)+x^(1/3)+1)+1/6*3^(1/2)*arctan(1/3*(2*x^(1/3)+1)*3
^(1/2))-1/6*ln(x^(1/3)-1)-1/6*sum((-_R^3+1)/(2*_R^5+_R^2)*ln(x^(1
/3)-_R),_R=RootOf(_Z^6+_Z^3+1))+1/12*ln(x^(2/3)-x^(1/3)+1)-1/6*3^
(1/2)*arctan(1/3*(2*x^(1/3)-1)*3^(1/2))-1/6*ln(1+x^(1/3))+1/6*sum
((_R^3+1)/(2*_R^5-_R^2)*ln(x^(1/3)-_R),_R=RootOf(_Z^6-_Z^3+1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}\left(2x^{\frac{1}{3}}+1\right)\right)-\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}\left(2x^{\frac{1}{3}}-1\right)\right)+\int\frac{x^{\frac{4}{3}}+2x^{\frac{1}{3}}}{6\,(x^2+x+1)}\,dx-\int\frac{x^{\frac{4}{3}}-2x^{\frac{1}{3}}}{6\,(x^2-x+1)}\,dx+\frac{1}{12}\log\left(x^{\frac{2}{3}}+x^{\frac{1}{3}}+1\right)+\frac{1}{12}\log\left(x^{\frac{2}{3}}-x^{\frac{1}{3}}+1\right)-\frac{1}{6}\log\left(x^{\frac{1}{3}}+1\right)-\frac{1}{6}\log\left(x^{\frac{1}{3}}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^(1/3)/(x^6 - 1),x, algorithm="maxima")
```

```
[Out] 1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x^(1/3) + 1)) - 1/6*sqrt(3)*arc
tan(1/3*sqrt(3)*(2*x^(1/3) - 1)) + integrate(1/6*(x^(4/3) + 2*x^(
1/3))/(x^2 + x + 1), x) - integrate(1/6*(x^(4/3) - 2*x^(1/3))/(x^
2 - x + 1), x) + 1/12*log(x^(2/3) + x^(1/3) + 1) + 1/12*log(x^(2/
3) - x^(1/3) + 1) - 1/6*log(x^(1/3) + 1) - 1/6*log(x^(1/3) - 1)
```

Fricas [A] time = 0.264349, size = 671, normalized size = 2.75

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^(1/3)/(x^6 - 1),x, algorithm="fricas")
```

```
[Out] 1/36*sqrt(3)*(2*sqrt(3)*cos(1/9*pi)*log(-3*(2*sqrt(3)*cos(1/9*pi)
*sin(1/9*pi) - 2*cos(1/9*pi)^2 + 1)*x^(2/3) + 3*x^(4/3) + 3) - 8*
sqrt(3)*arctan((2*sqrt(3)*cos(1/9*pi)*sin(1/9*pi) + 6*cos(1/9*pi)
^2 - 3)/(2*sqrt(3)*cos(1/9*pi)^2 - 6*cos(1/9*pi)*sin(1/9*pi) + 2*
sqrt(3)*x^(2/3) - sqrt(3) + 2*sqrt(-3*(2*sqrt(3)*cos(1/9*pi)*sin(
1/9*pi) - 2*cos(1/9*pi)^2 + 1)*x^(2/3) + 3*x^(4/3) + 3)))*sin(1/9
*pi) - 4*(sqrt(3)*sin(1/9*pi) + 3*cos(1/9*pi))*arctan(-2*sqrt(3)*
cos(1/9*pi)*sin(1/9*pi)/(2*sqrt(3)*cos(1/9*pi)^2 - sqrt(3)*x^(2/3
) - sqrt(3) - sqrt(-6*(2*cos(1/9*pi)^2 - 1)*x^(2/3) + 3*x^(4/3) +
 3))) + 4*(sqrt(3)*sin(1/9*pi) - 3*cos(1/9*pi))*arctan((2*sqrt(3)
*cos(1/9*pi)*sin(1/9*pi) - 6*cos(1/9*pi)^2 + 3)/(2*sqrt(3)*cos(1/
9*pi)^2 + 6*cos(1/9*pi)*sin(1/9*pi) + 2*sqrt(3)*x^(2/3) - sqrt(3)
 + 2*sqrt(3*(2*sqrt(3)*cos(1/9*pi)*sin(1/9*pi) + 2*cos(1/9*pi)^2
- 1)*x^(2/3) + 3*x^(4/3) + 3))) - (sqrt(3)*cos(1/9*pi) + 3*sin(1/
9*pi))*log(3*(2*sqrt(3)*cos(1/9*pi)*sin(1/9*pi) + 2*cos(1/9*pi)^2
 - 1)*x^(2/3) + 3*x^(4/3) + 3) - (sqrt(3)*cos(1/9*pi) - 3*sin(1/9
*pi))*log(-6*(2*cos(1/9*pi)^2 - 1)*x^(2/3) + 3*x^(4/3) + 3) + sqr
t(3)*log(x^(4/3) + x^(2/3) + 1) - 2*sqrt(3)*log(x^(2/3) - 1) - 6*
arctan(2/3*sqrt(3)*x^(2/3) + 1/3*sqrt(3)))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(1/3)/(-x**6+1),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 1.10577, size = 293, normalized size = 1.2

$$\frac{2}{3}\arctan\left(\frac{x^{\frac{2}{3}}-\cos\left(\frac{4}{9}\pi\right)}{\sin\left(\frac{4}{9}\pi\right)}\right)\cos\left(\frac{4}{9}\pi\right)\sin\left(\frac{4}{9}\pi\right)+\frac{2}{3}\arctan\left(\frac{x^{\frac{2}{3}}-\cos\left(\frac{2}{9}\pi\right)}{\sin\left(\frac{2}{9}\pi\right)}\right)\cos\left(\frac{2}{9}\pi\right)\sin\left(\frac{2}{9}\pi\right)-\frac{2}{3}\arctan\left(\frac{x^{\frac{2}{3}}+\cos\left(\frac{1}{9}\pi\right)}{\sin\left(\frac{1}{9}\pi\right)}\right)\cos\left(\frac{1}{9}\pi\right)\sin\left(\frac{1}{9}\pi\right)-\frac{1}{6}\left(\cos\left(\frac{4}{9}\pi\right)^{2}-\sin\left(\frac{4}{9}\pi\right)^{2}\right)\ln\left(-2x^{\frac{2}{3}}\cos\left(\frac{4}{9}\pi\right)+x^{\frac{4}{3}}+1\right)-\frac{1}{6}\left(\cos\left(\frac{2}{9}\pi\right)^{2}-\sin\left(\frac{2}{9}\pi\right)^{2}\right)\ln\left(-2x^{\frac{2}{3}}\cos\left(\frac{2}{9}\pi\right)+x^{\frac{4}{3}}+1\right)-\frac{1}{6}\left(\cos\left(\frac{1}{9}\pi\right)^{2}-\sin\left(\frac{1}{9}\pi\right)^{2}\right)\ln\left(2x^{\frac{2}{3}}\cos\left(\frac{1}{9}\pi\right)+x^{\frac{4}{3}}+1\right)-\frac{1}{6}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}\left(2x^{\frac{2}{3}}+1\right)\right)+\frac{1}{12}\ln\left(x^{\frac{4}{3}}+x^{\frac{2}{3}}+1\right)-\frac{1}{6}\ln\left(\left|x^{\frac{2}{3}}-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^(1/3)/(x^6 - 1),x, algorithm="giac")
```

```
[Out] 2/3*arctan((x^(2/3) - cos(4/9*pi))/sin(4/9*pi))*cos(4/9*pi)*sin(4
/9*pi) + 2/3*arctan((x^(2/3) - cos(2/9*pi))/sin(2/9*pi))*cos(2/9*
pi)*sin(2/9*pi) - 2/3*arctan((x^(2/3) + cos(1/9*pi))/sin(1/9*pi))
*cos(1/9*pi)*sin(1/9*pi) - 1/6*(cos(4/9*pi)^2 - sin(4/9*pi)^2)*ln
(-2*x^(2/3)*cos(4/9*pi) + x^(4/3) + 1) - 1/6*(cos(2/9*pi)^2 - sin
(2/9*pi)^2)*ln(-2*x^(2/3)*cos(2/9*pi) + x^(4/3) + 1) - 1/6*(cos(1
/9*pi)^2 - sin(1/9*pi)^2)*ln(2*x^(2/3)*cos(1/9*pi) + x^(4/3) + 1)
 - 1/6*sqrt(3)*arctan(1/3*sqrt(3)*(2*x^(2/3) + 1)) + 1/12*ln(x^(4
/3) + x^(2/3) + 1) - 1/6*ln(abs(x^(2/3) - 1))
```

3.1378 $\int x^8\sqrt{-1+4x^6}\,dx$

Optimal. Leaf size=58

$$\frac{1}{12}\sqrt{4x^6-1}x^9-\frac{1}{96}\sqrt{4x^6-1}x^3-\frac{1}{192}\tanh^{-1}\left(\frac{2x^3}{\sqrt{4x^6-1}}\right)$$

```
[Out] -(x^3*Sqrt[-1 + 4*x^6])/96 + (x^9*Sqrt[-1 + 4*x^6])/12 - ArcTanh[
(2*x^3)/Sqrt[-1 + 4*x^6]]/192
```

Rubi [A] time = 0.0734214, antiderivative size = 58, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{1}{12}\sqrt{4x^6-1}x^9-\frac{1}{96}\sqrt{4x^6-1}x^3-\frac{1}{192}\tanh^{-1}\left(\frac{2x^3}{\sqrt{4x^6-1}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^8*Sqrt[-1 + 4*x^6],x]
```

```
[Out] -(x^3*Sqrt[-1 + 4*x^6])/96 + (x^9*Sqrt[-1 + 4*x^6])/12 - ArcTanh[
(2*x^3)/Sqrt[-1 + 4*x^6]]/192
```

Rubi in Sympy [A] time = 8.12988, size = 48, normalized size = 0.83

$$\frac{x^9\sqrt{4x^6-1}}{12}-\frac{x^3\sqrt{4x^6-1}}{96}-\frac{\operatorname{atanh}\left(\frac{2x^3}{\sqrt{4x^6-1}}\right)}{192}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8*(4*x**6-1)**(1/2),x)
```

```
[Out] x**9*sqrt(4*x**6 - 1)/12 - x**3*sqrt(4*x**6 - 1)/96 - atanh(2*x**
3/sqrt(4*x**6 - 1))/192
```

Mathematica [A] time = 0.0323714, size = 48, normalized size = 0.83

$$\frac{1}{192}\left(2x^3\sqrt{4x^6-1}\left(8x^6-1\right)-\log\left(\sqrt{4x^6-1}+2x^3\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8*Sqrt[-1 + 4*x^6],x]
```

```
[Out] (2*x^3*Sqrt[-1 + 4*x^6]*(-1 + 8*x^6) - Log[2*x^3 + Sqrt[-1 + 4*x^
6]])/192
```

Maple [C] time = 0.074, size = 53, normalized size = 0.9

$$\frac{x^3\left(8x^6-1\right)}{96}\sqrt{4x^6-1}-\frac{\arcsin\left(2x^3\right)}{192}\sqrt{-signum\left(4x^6-1\right)}\frac{1}{\sqrt{signum\left(4x^6-1\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8*(4*x^6-1)^(1/2),x)
```

```
[Out] 1/96*x^3*(8*x^6-1)*(4*x^6-1)^(1/2)-1/192/signum(4*x^6-1)^(1/2)*(-
signum(4*x^6-1))^(1/2)*arcsin(2*x^3)
```

Maxima [A] time = 1.43965, size = 131, normalized size = 2.26

$$-\frac{\frac{4\sqrt{4x^6-1}}{x^3}+\frac{(4x^6-1)^{\frac{3}{2}}}{x^9}}{96\left(\frac{8(4x^6-1)}{x^6}-\frac{(4x^6-1)^2}{x^{12}}-16\right)}-\frac{1}{384}\log\left(\frac{\sqrt{4x^6-1}}{x^3}+2\right)+\frac{1}{384}\log\left(\frac{\sqrt{4x^6-1}}{x^3}-2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(4*x^6 - 1)*x^8,x, algorithm="maxima")
```

```
[Out] -1/96*(4*sqrt(4*x^6 - 1)/x^3 + (4*x^6 - 1)^(3/2)/x^9)/(8*(4*x^6 -
 1)/x^6 - (4*x^6 - 1)^2/x^12 - 16) - 1/384*log(sqrt(4*x^6 - 1)/x^
3 + 2) + 1/384*log(sqrt(4*x^6 - 1)/x^3 - 2)
```

Fricas [A] time = 0.227537, size = 193, normalized size = 3.33

$$-\frac{4096\,x^{24}-2048\,x^{18}+320\,x^{12}-16\,x^6-\left(128\,x^{12}-32\,x^6-8\left(8\,x^9-x^3\right)\sqrt{4\,x^6-1}+1\right)\log\left(-2\,x^3+\sqrt{4\,x^6-1}\right)-2\,(1024}{192\left(128\,x^{12}-32\,x^6-8\,(8\,x^9-x^3)\sqrt{4\,x^6-1}+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(4*x^6 - 1)*x^8,x, algorithm="fricas")
```

```
[Out] -1/192*(4096*x^24 - 2048*x^18 + 320*x^12 - 16*x^6 - (128*x^12 - 3
2*x^6 - 8*(8*x^9 - x^3)*sqrt(4*x^6 - 1) + 1)*log(-2*x^3 + sqrt(4*
x^6 - 1)) - 2*(1024*x^21 - 384*x^15 + 40*x^9 - x^3)*sqrt(4*x^6 -
1))/(128*x^12 - 32*x^6 - 8*(8*x^9 - x^3)*sqrt(4*x^6 - 1) + 1)
```

Sympy [A] time = 10.082, size = 119, normalized size = 2.05

$$\begin{cases} \frac{x^{15}}{3\sqrt{4x^6-1}}-\frac{x^9}{8\sqrt{4x^6-1}}+\frac{x^3}{96\sqrt{4x^6-1}}-\frac{\operatorname{acosh}(2x^3)}{192} & \text{for } 4\left|x^6\right|>1 \\ -\frac{ix^{15}}{3\sqrt{-4x^6+1}}+\frac{ix^9}{8\sqrt{-4x^6+1}}-\frac{ix^3}{96\sqrt{-4x^6+1}}+\frac{i\operatorname{asin}(2x^3)}{192} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8*(4*x**6-1)**(1/2),x)
```

```
[Out] Piecewise((x**15/(3*sqrt(4*x**6 - 1)) - x**9/(8*sqrt(4*x**6 - 1))
 + x**3/(96*sqrt(4*x**6 - 1)) - acosh(2*x**3)/192, 4*Abs(x**6) >
1), (-I*x**15/(3*sqrt(-4*x**6 + 1)) + I*x**9/(8*sqrt(-4*x**6 + 1)
) - I*x**3/(96*sqrt(-4*x**6 + 1)) + I*asin(2*x**3)/192, True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{4\,x^6-1}x^8\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(4*x^6 - 1)*x^8,x, algorithm="giac")

[Out] integrate(sqrt(4*x^6 - 1)*x^8, x)
```

3.1379 $\int x^5\sqrt{a^6-x^6}\,dx$

Optimal. Leaf size=17

$$-\frac{1}{9}\left(a^6-x^6\right)^{3/2}$$

```
[Out] -(a^6 - x^6)^(3/2)/9
```

Rubi [A] time = 0.0089976, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.059

$$-\frac{1}{9}\left(a^6-x^6\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In] Int[x^5*Sqrt[a^6 - x^6],x]

[Out] -(a^6 - x^6)^(3/2)/9
```

Rubi in Sympy [A] time = 2.10305, size = 12, normalized size = 0.71

$$-\frac{\left(a^6-x^6\right)^{\frac{3}{2}}}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**5*(a**6-x**6)**(1/2),x)

[Out] -(a**6 - x**6)**(3/2)/9
```

Mathematica [A] time = 0.00959021, size = 17, normalized size = 1.

$$-\frac{1}{9}\left(a^6-x^6\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5*Sqrt[a^6 - x^6],x]

[Out] -(a^6 - x^6)^(3/2)/9
```

Maple [B] time = 0.01, size = 43, normalized size = 2.5

$$-\frac{(a-x)(x+a)\left(a^2+ax+x^2\right)\left(a^2-ax+x^2\right)}{9}\sqrt{a^6-x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(a^6-x^6)^(1/2),x)

[Out] -1/9*(a-x)*(x+a)*(a^2+a*x+x^2)*(a^2-a*x+x^2)*(a^6-x^6)^(1/2)
```

Maxima [A] time = 1.43565, size = 18, normalized size = 1.06

$$-\frac{1}{9}\left(a^6-x^6\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a^6 - x^6)*x^5,x, algorithm="maxima")
```

```
[Out] -1/9*(a^6 - x^6)^(3/2)
```

Fricas [A] time = 0.220685, size = 18, normalized size = 1.06

$$-\frac{1}{9}\left(a^6-x^6\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a^6 - x^6)*x^5,x, algorithm="fricas")
```

```
[Out] -1/9*(a^6 - x^6)^(3/2)
```

Sympy [A] time = 0.888946, size = 29, normalized size = 1.71

$$-\frac{a^6\sqrt{a^6-x^6}}{9}+\frac{x^6\sqrt{a^6-x^6}}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5*(a**6-x**6)**(1/2),x)
```

```
[Out] -a**6*sqrt(a**6 - x**6)/9 + x**6*sqrt(a**6 - x**6)/9
```

GIAC/XCAS [A] time = 0.221193, size = 18, normalized size = 1.06

$$-\frac{1}{9}\left(a^6-x^6\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a^6 - x^6)*x^5,x, algorithm="giac")
```

```
[Out] -1/9*(a^6 - x^6)^(3/2)
```

3.1380 $\int x^2\sqrt{-2+x^6}\,dx$

Optimal. Leaf size=35

$$\frac{1}{6}x^3\sqrt{x^6-2}-\frac{1}{3}\tanh^{-1}\left(\frac{x^3}{\sqrt{x^6-2}}\right)$$

```
[Out] (x^3*Sqrt[-2 + x^6])/6 - ArcTanh[x^3/Sqrt[-2 + x^6]]/3
```

Rubi [A] time = 0.0319141, antiderivative size = 35, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{1}{6}x^3\sqrt{x^6-2}-\frac{1}{3}\tanh^{-1}\left(\frac{x^3}{\sqrt{x^6-2}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^2*Sqrt[-2 + x^6],x]
```

```
[Out] (x^3*Sqrt[-2 + x^6])/6 - ArcTanh[x^3/Sqrt[-2 + x^6]]/3
```

Rubi in Sympy [A] time = 2.88427, size = 27, normalized size = 0.77

$$\frac{x^3\sqrt{x^6-2}}{6}-\frac{\operatorname{atanh}\left(\frac{x^3}{\sqrt{x^6-2}}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(x**6-2)**(1/2),x)
```

```
[Out] x**3*sqrt(x**6 - 2)/6 - atanh(x**3/sqrt(x**6 - 2))/3
```

Mathematica [A] time = 0.0141157, size = 35, normalized size = 1.

$$\frac{1}{6}x^3\sqrt{x^6-2}-\frac{1}{3}\log\left(\sqrt{x^6-2}+x^3\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2*Sqrt[-2 + x^6],x]
```

```
[Out] (x^3*Sqrt[-2 + x^6])/6 - Log[x^3 + Sqrt[-2 + x^6]]/3
```

Maple [C] time = 0.069, size = 47, normalized size = 1.3

$$\frac{x^3}{6}\sqrt{x^6-2}-\frac{1}{3}\sqrt{-\mathit{signum}\left(-1+\frac{x^6}{2}\right)}\arcsin\left(\frac{x^3\sqrt{2}}{2}\right)\frac{1}{\sqrt{\mathit{signum}\left(-1+\frac{x^6}{2}\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(x^6-2)^(1/2),x)
```

```
[Out] 1/6*x^3*(x^6-2)^(1/2)-1/3/signum(-1+1/2*x^6)^(1/2)*(-signum(-1+1/
2*x^6))^(1/2)*arcsin(1/2*x^3*2^(1/2))
```

Maxima [A] time = 1.43738, size = 78, normalized size = 2.23

$$-\frac{\sqrt{x^6-2}}{3\,x^3\left(\frac{x^6-2}{x^6}-1\right)}-\frac{1}{6}\,\log\left(\frac{\sqrt{x^6-2}}{x^3}+1\right)+\frac{1}{6}\,\log\left(\frac{\sqrt{x^6-2}}{x^3}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^6 - 2)*x^2,x, algorithm="maxima")
```

```
[Out] -1/3*sqrt(x^6 - 2)/(x^3*((x^6 - 2)/x^6 - 1)) - 1/6*log(sqrt(x^6 -
 2)/x^3 + 1) + 1/6*log(sqrt(x^6 - 2)/x^3 - 1)
```

Fricas [A] time = 0.225602, size = 109, normalized size = 3.11

$$-\frac{x^{12}-2\,x^6-2\left(x^6-\sqrt{x^6-2}x^3-1\right)\log\left(-x^3+\sqrt{x^6-2}\right)-\left(x^9-x^3\right)\sqrt{x^6-2}}{6\left(x^6-\sqrt{x^6-2}x^3-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^6 - 2)*x^2,x, algorithm="fricas")
```

```
[Out] -1/6*(x^12 - 2*x^6 - 2*(x^6 - sqrt(x^6 - 2)*x^3 - 1)*log(-x^3 + s
qrt(x^6 - 2)) - (x^9 - x^3)*sqrt(x^6 - 2))/(x^6 - sqrt(x^6 - 2)*x
^3 - 1)
```

Sympy [A] time = 5.47264, size = 90, normalized size = 2.57

$$\begin{cases} \frac{x^9}{6\sqrt{x^6-2}}-\frac{x^3}{3\sqrt{x^6-2}}-\frac{\operatorname{acosh}\left(\frac{\sqrt{2}x^3}{2}\right)}{3} & \text{for}\ \frac{|x^6|}{2}>1 \\ -\frac{ix^9}{6\sqrt{-x^6+2}}+\frac{ix^3}{3\sqrt{-x^6+2}}+\frac{i\operatorname{asin}\left(\frac{\sqrt{2}x^3}{2}\right)}{3} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(x**6-2)**(1/2),x)
```

```
[Out] Piecewise((x**9/(6*sqrt(x**6 - 2)) - x**3/(3*sqrt(x**6 - 2)) - ac
osh(sqrt(2)*x**3/2)/3, Abs(x**6)/2 > 1), (-I*x**9/(6*sqrt(-x**6 +
 2)) + I*x**3/(3*sqrt(-x**6 + 2)) + I*asin(sqrt(2)*x**3/2)/3, Tru
e))
```

GIAC/XCAS [A] time = 0.223445, size = 41, normalized size = 1.17

$$\frac{1}{6}\sqrt{x^6-2}x^3+\frac{1}{3}\ln\left(\left|-x^3+\sqrt{x^6-2}\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^6 - 2)*x^2,x, algorithm="giac")
```

```
[Out] 1/6*sqrt(x^6 - 2)*x^3 + 1/3*ln(abs(-x^3 + sqrt(x^6 - 2)))
```

3.1381 $\int \frac{x^{23}}{\sqrt{2+x^6}}\,dx$

Optimal. Leaf size=53

$$\frac{1}{21}\left(x^6+2\right)^{7/2}-\frac{2}{5}\left(x^6+2\right)^{5/2}+\frac{4}{3}\left(x^6+2\right)^{3/2}-\frac{8\sqrt{x^6+2}}{3}$$

```
[Out] (-8*Sqrt[2 + x^6])/3 + (4*(2 + x^6)^(3/2))/3 - (2*(2 + x^6)^(5/2)
)/5 + (2 + x^6)^(7/2)/21
```

Rubi [A] time = 0.046026, antiderivative size = 53, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{1}{21}\left(x^6+2\right)^{7/2}-\frac{2}{5}\left(x^6+2\right)^{5/2}+\frac{4}{3}\left(x^6+2\right)^{3/2}-\frac{8\sqrt{x^6+2}}{3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^23/Sqrt[2 + x^6],x]

[Out] (-8*Sqrt[2 + x^6])/3 + (4*(2 + x^6)^(3/2))/3 - (2*(2 + x^6)^(5/2)
)/5 + (2 + x^6)^(7/2)/21
```

Rubi in Sympy [A] time = 5.13452, size = 44, normalized size = 0.83

$$\frac{\left(x^6+2\right)^{\frac{7}{2}}}{21}-\frac{2\left(x^6+2\right)^{\frac{5}{2}}}{5}+\frac{4\left(x^6+2\right)^{\frac{3}{2}}}{3}-\frac{8\sqrt{x^6+2}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**23/(x**6+2)**(1/2),x)

[Out] (x**6 + 2)**(7/2)/21 - 2*(x**6 + 2)**(5/2)/5 + 4*(x**6 + 2)**(3/2
)/3 - 8*sqrt(x**6 + 2)/3
```

Mathematica [A] time = 0.0157796, size = 30, normalized size = 0.57

$$\frac{1}{105}\sqrt{x^6+2}\left(5x^{18}-12x^{12}+32x^6-128\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^23/Sqrt[2 + x^6],x]

[Out] (Sqrt[2 + x^6]*(-128 + 32*x^6 - 12*x^12 + 5*x^18))/105
```

Maple [A] time = 0.01, size = 27, normalized size = 0.5

$$\frac{5\,x^{18}-12\,x^{12}+32\,x^{6}-128}{105}\sqrt{x^{6}+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^23/(x^6+2)^(1/2),x)
```

```
[Out] 1/105*(x^6+2)^(1/2)*(5*x^18-12*x^12+32*x^6-128)
```

Maxima [A] time = 1.49822, size = 50, normalized size = 0.94

$$\frac{1}{21}\left(x^{6}+2\right)^{\frac{7}{2}}-\frac{2}{5}\left(x^{6}+2\right)^{\frac{5}{2}}+\frac{4}{3}\left(x^{6}+2\right)^{\frac{3}{2}}-\frac{8}{3}\sqrt{x^{6}+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^23/sqrt(x^6 + 2),x, algorithm="maxima")
```

```
[Out] 1/21*(x^6 + 2)^(7/2) - 2/5*(x^6 + 2)^(5/2) + 4/3*(x^6 + 2)^(3/2)
- 8/3*sqrt(x^6 + 2)
```

Fricas [A] time = 0.221083, size = 35, normalized size = 0.66

$$\frac{1}{105}\left(5\,x^{18}-12\,x^{12}+32\,x^{6}-128\right)\sqrt{x^{6}+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^23/sqrt(x^6 + 2),x, algorithm="fricas")
```

```
[Out] 1/105*(5*x^18 - 12*x^12 + 32*x^6 - 128)*sqrt(x^6 + 2)
```

Sympy [A] time = 40.445, size = 54, normalized size = 1.02

$$\frac{x^{18}\sqrt{x^{6}+2}}{21}-\frac{4x^{12}\sqrt{x^{6}+2}}{35}+\frac{32x^{6}\sqrt{x^{6}+2}}{105}-\frac{128\sqrt{x^{6}+2}}{105}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**23/(x**6+2)**(1/2),x)
```

```
[Out] x**18*sqrt(x**6 + 2)/21 - 4*x**12*sqrt(x**6 + 2)/35 + 32*x**6*sqr
t(x**6 + 2)/105 - 128*sqrt(x**6 + 2)/105
```

GIAC/XCAS [A] time = 0.218453, size = 50, normalized size = 0.94

$$\frac{1}{21}\left(x^{6}+2\right)^{\frac{7}{2}}-\frac{2}{5}\left(x^{6}+2\right)^{\frac{5}{2}}+\frac{4}{3}\left(x^{6}+2\right)^{\frac{3}{2}}-\frac{8}{3}\sqrt{x^{6}+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^23/sqrt(x^6 + 2),x, algorithm="giac")
```

```
[Out] 1/21*(x^6 + 2)^(7/2) - 2/5*(x^6 + 2)^(5/2) + 4/3*(x^6 + 2)^(3/2)
- 8/3*sqrt(x^6 + 2)
```

3.1382 $\int \frac{x^{17}}{\sqrt{2+x^6}} \, dx$

Optimal. Leaf size=40

$$\frac{1}{15}\left(x^6+2\right)^{5/2}-\frac{4}{9}\left(x^6+2\right)^{3/2}+\frac{4\sqrt{x^6+2}}{3}$$

```
[Out] (4*Sqrt[2 + x^6])/3 - (4*(2 + x^6)^(3/2))/9 + (2 + x^6)^(5/2)/15
```

Rubi [A] time = 0.0389995, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{1}{15}\left(x^6+2\right)^{5/2}-\frac{4}{9}\left(x^6+2\right)^{3/2}+\frac{4\sqrt{x^6+2}}{3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^17/Sqrt[2 + x^6],x]

[Out] (4*Sqrt[2 + x^6])/3 - (4*(2 + x^6)^(3/2))/9 + (2 + x^6)^(5/2)/15
```

Rubi in Sympy [A] time = 4.47041, size = 32, normalized size = 0.8

$$\frac{\left(x^6+2\right)^{\frac{5}{2}}}{15}-\frac{4\left(x^6+2\right)^{\frac{3}{2}}}{9}+\frac{4\sqrt{x^6+2}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**17/(x**6+2)**(1/2),x)

[Out] (x**6 + 2)**(5/2)/15 - 4*(x**6 + 2)**(3/2)/9 + 4*sqrt(x**6 + 2)/3
```

Mathematica [A] time = 0.0132902, size = 25, normalized size = 0.62

$$\frac{1}{45}\sqrt{x^6+2}\left(3x^{12}-8x^6+32\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^17/Sqrt[2 + x^6],x]

[Out] (Sqrt[2 + x^6]*(32 - 8*x^6 + 3*x^12))/45
```

Maple [A] time = 0.006, size = 22, normalized size = 0.6

$$\frac{3\,x^{12}-8\,x^6+32}{45}\sqrt{x^6+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^17/(x^6+2)^(1/2),x)

[Out] 1/45*(x^6+2)^(1/2)*(3*x^12-8*x^6+32)
```

Maxima [A] time = 1.41831, size = 38, normalized size = 0.95

$$\frac{1}{15}\left(x^6+2\right)^{\frac{5}{2}}-\frac{4}{9}\left(x^6+2\right)^{\frac{3}{2}}+\frac{4}{3}\sqrt{x^6+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^17/sqrt(x^6 + 2),x, algorithm="maxima")
```

```
[Out] 1/15*(x^6 + 2)^(5/2) - 4/9*(x^6 + 2)^(3/2) + 4/3*sqrt(x^6 + 2)
```

Fricas [A] time = 0.22035, size = 28, normalized size = 0.7

$$\frac{1}{45}\left(3\,x^{12}-8\,x^6+32\right)\sqrt{x^6+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^17/sqrt(x^6 + 2),x, algorithm="fricas")
```

```
[Out] 1/45*(3*x^12 - 8*x^6 + 32)*sqrt(x^6 + 2)
```

Sympy [A] time = 15.8572, size = 39, normalized size = 0.98

$$\frac{x^{12}\sqrt{x^6+2}}{15}-\frac{8x^6\sqrt{x^6+2}}{45}+\frac{32\sqrt{x^6+2}}{45}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**17/(x**6+2)**(1/2),x)
```

```
[Out] x**12*sqrt(x**6 + 2)/15 - 8*x**6*sqrt(x**6 + 2)/45 + 32*sqrt(x**6
 + 2)/45
```

GIAC/XCAS [A] time = 0.220276, size = 38, normalized size = 0.95

$$\frac{1}{15}\left(x^6+2\right)^{\frac{5}{2}}-\frac{4}{9}\left(x^6+2\right)^{\frac{3}{2}}+\frac{4}{3}\sqrt{x^6+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^17/sqrt(x^6 + 2),x, algorithm="giac")
```

```
[Out] 1/15*(x^6 + 2)^(5/2) - 4/9*(x^6 + 2)^(3/2) + 4/3*sqrt(x^6 + 2)
```

3.1383 $\int \frac{x^{11}}{\sqrt{2+x^6}}\,dx$

Optimal. Leaf size=27

$$\frac{1}{9}\left(x^6+2\right)^{3/2}-\frac{2\sqrt{x^6+2}}{3}$$

```
[Out] (-2*Sqrt[2 + x^6])/3 + (2 + x^6)^(3/2)/9
```

Rubi [A] time = 0.0298919, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{1}{9}\left(x^6+2\right)^{3/2}-\frac{2\sqrt{x^6+2}}{3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11/Sqrt[2 + x^6],x]

[Out] (-2*Sqrt[2 + x^6])/3 + (2 + x^6)^(3/2)/9
```

Rubi in Sympy [A] time = 3.63401, size = 20, normalized size = 0.74

$$\frac{\left(x^6+2\right)^{\frac{3}{2}}}{9}-\frac{2\sqrt{x^6+2}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11/(x**6+2)**(1/2),x)

[Out] (x**6 + 2)**(3/2)/9 - 2*sqrt(x**6 + 2)/3
```

Mathematica [A] time = 0.00886449, size = 18, normalized size = 0.67

$$\frac{1}{9}\left(x^6-4\right)\sqrt{x^6+2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11/Sqrt[2 + x^6],x]

[Out] ((-4 + x^6)*Sqrt[2 + x^6])/9
```

Maple [A] time = 0.007, size = 15, normalized size = 0.6

$$\frac{x^6-4}{9}\sqrt{x^6+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11/(x^6+2)^(1/2),x)

[Out] 1/9*(x^6+2)^(1/2)*(x^6-4)
```

Maxima [A] time = 1.45242, size = 26, normalized size = 0.96

$$\frac{1}{9}\left(x^6+2\right)^{\frac{3}{2}}-\frac{2}{3}\sqrt{x^6+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/sqrt(x^6 + 2),x, algorithm="maxima")
```

```
[Out] 1/9*(x^6 + 2)^(3/2) - 2/3*sqrt(x^6 + 2)
```

Fricas [A] time = 0.22047, size = 19, normalized size = 0.7

$$\frac{1}{9}\sqrt{x^6+2}\left(x^6-4\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/sqrt(x^6 + 2),x, algorithm="fricas")
```

```
[Out] 1/9*sqrt(x^6 + 2)*(x^6 - 4)
```

Sympy [A] time = 4.00364, size = 24, normalized size = 0.89

$$\frac{x^6\sqrt{x^6+2}}{9}-\frac{4\sqrt{x^6+2}}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11/(x**6+2)**(1/2),x)
```

```
[Out] x**6*sqrt(x**6 + 2)/9 - 4*sqrt(x**6 + 2)/9
```

GIAC/XCAS [A] time = 0.219433, size = 26, normalized size = 0.96

$$\frac{1}{9}\left(x^6+2\right)^{\frac{3}{2}}-\frac{2}{3}\sqrt{x^6+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/sqrt(x^6 + 2),x, algorithm="giac")
```

```
[Out] 1/9*(x^6 + 2)^(3/2) - 2/3*sqrt(x^6 + 2)
```

3.1384 $\int \frac{x^5}{\sqrt{2+x^6}} dx$

Optimal. Leaf size=13

$$\frac{\sqrt{x^6+2}}{3}$$

```
[Out] Sqrt[2 + x^6]/3
```

Rubi [A] time = 0.00669852, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$\frac{\sqrt{x^6+2}}{3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/Sqrt[2 + x^6],x]

[Out] Sqrt[2 + x^6]/3
```

Rubi in Sympy [A] time = 1.68731, size = 8, normalized size = 0.62

$$\frac{\sqrt{x^6+2}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(x**6+2)**(1/2),x)

[Out] sqrt(x**6 + 2)/3
```

Mathematica [A] time = 0.00409162, size = 13, normalized size = 1.

$$\frac{\sqrt{x^6+2}}{3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/Sqrt[2 + x^6],x]

[Out] Sqrt[2 + x^6]/3
```

Maple [A] time = 0.005, size = 10, normalized size = 0.8

$$\frac{1}{3}\sqrt{x^6+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(x^6+2)^(1/2),x)

[Out] 1/3*(x^6+2)^(1/2)
```

Maxima [A] time = 1.41662, size = 12, normalized size = 0.92

$$\frac{1}{3}\sqrt{x^6+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(x^6 + 2),x, algorithm="maxima")
```

```
[Out] 1/3*sqrt(x^6 + 2)
```

Fricas [A] time = 0.224036, size = 12, normalized size = 0.92

$$\frac{1}{3}\sqrt{x^6+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(x^6 + 2),x, algorithm="fricas")
```

```
[Out] 1/3*sqrt(x^6 + 2)
```

Sympy [A] time = 0.693858, size = 8, normalized size = 0.62

$$\frac{\sqrt{x^6+2}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(x**6+2)**(1/2),x)
```

```
[Out] sqrt(x**6 + 2)/3
```

GIAC/XCAS [A] time = 0.220357, size = 12, normalized size = 0.92

$$\frac{1}{3}\sqrt{x^6+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(x^6 + 2),x, algorithm="giac")
```

```
[Out] 1/3*sqrt(x^6 + 2)
```

3.1385 $\int \frac{1}{x\sqrt{2+x^6}}\,dx$

Optimal. Leaf size=25

$$-\frac{\tanh^{-1}\left(\frac{\sqrt{x^6+2}}{\sqrt{2}}\right)}{3\sqrt{2}}$$

```
[Out] -ArcTanh[Sqrt[2 + x^6]/Sqrt[2]]/(3*Sqrt[2])
```

Rubi [A] time = 0.0327199, antiderivative size = 25, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{\tanh^{-1}\left(\frac{\sqrt{x^6+2}}{\sqrt{2}}\right)}{3\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*Sqrt[2 + x^6]),x]

[Out] -ArcTanh[Sqrt[2 + x^6]/Sqrt[2]]/(3*Sqrt[2])
```

Rubi in Sympy [A] time = 3.5214, size = 24, normalized size = 0.96

$$-\frac{\sqrt{2}\,\operatorname{atanh}\left(\frac{\sqrt{2}\sqrt{x^6+2}}{2}\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(x**6+2)**(1/2),x)

[Out] -sqrt(2)*atanh(sqrt(2)*sqrt(x**6 + 2)/2)/6
```

Mathematica [A] time = 0.0235229, size = 25, normalized size = 1.

$$-\frac{\tanh^{-1}\left(\frac{\sqrt{x^6+2}}{\sqrt{2}}\right)}{3\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*Sqrt[2 + x^6]),x]

[Out] -ArcTanh[Sqrt[2 + x^6]/Sqrt[2]]/(3*Sqrt[2])
```

Maple [A] time = 0.008, size = 26, normalized size = 1.

$$\frac{\sqrt{2}}{6}\ln\left(1\left(\sqrt{x^6+2}-\sqrt{2}\right)\frac{1}{\sqrt{x^6}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(x^6+2)^(1/2),x)
```

```
[Out] 1/6*2^(1/2)*ln(((x^6+2)^(1/2)-2^(1/2))/(x^6)^(1/2))
```

Maxima [A] time = 1.58148, size = 49, normalized size = 1.96

$$\frac{1}{12}\sqrt{2}\log\left(-\frac{2\left(\sqrt{2}-\sqrt{x^6+2}\right)}{2\sqrt{2}+2\sqrt{x^6+2}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^6 + 2)*x),x, algorithm="maxima")
```

```
[Out] 1/12*sqrt(2)*log(-2*(sqrt(2) - sqrt(x^6 + 2))/((2*sqrt(2)) + 2*sq
rt(x^6 + 2)))
```

Fricas [A] time = 0.227217, size = 39, normalized size = 1.56

$$\frac{1}{12}\sqrt{2}\log\left(\frac{\sqrt{2}\left(x^6+4\right)-4\sqrt{x^6+2}}{x^6}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^6 + 2)*x),x, algorithm="fricas")
```

```
[Out] 1/12*sqrt(2)*log((sqrt(2)*(x^6 + 4) - 4*sqrt(x^6 + 2))/x^6)
```

Sympy [A] time = 3.38711, size = 17, normalized size = 0.68

$$-\frac{\sqrt{2}\operatorname{asinh}\left(\frac{\sqrt{2}}{x^3}\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(x**6+2)**(1/2),x)
```

```
[Out] -sqrt(2)*asinh(sqrt(2)/x**3)/6
```

GIAC/XCAS [A] time = 0.223045, size = 50, normalized size = 2.

$$-\frac{1}{12}\sqrt{2}\ln\left(\sqrt{2}+\sqrt{x^6+2}\right)+\frac{1}{12}\sqrt{2}\ln\left(-\sqrt{2}+\sqrt{x^6+2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^6 + 2)*x),x, algorithm="giac")
```

```
[Out] -1/12*sqrt(2)*ln(sqrt(2) + sqrt(x^6 + 2)) + 1/12*sqrt(2)*ln(-sqrt
(2) + sqrt(x^6 + 2))
```

3.1386 $\int \frac{1}{x^7\sqrt{2+x^6}}\,dx$

Optimal. Leaf size=42

$$\frac{\tanh^{-1}\left(\frac{\sqrt{x^6+2}}{\sqrt{2}}\right)}{12\sqrt{2}}-\frac{\sqrt{x^6+2}}{12x^6}$$

```
[Out] -Sqrt[2 + x^6]/(12*x^6) + ArcTanh[Sqrt[2 + x^6]/Sqrt[2]]/(12*Sqrt
[2])
```

Rubi [A] time = 0.0454894, antiderivative size = 42, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{\tanh^{-1}\left(\frac{\sqrt{x^6+2}}{\sqrt{2}}\right)}{12\sqrt{2}}-\frac{\sqrt{x^6+2}}{12x^6}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^7*Sqrt[2 + x^6]),x]
```

```
[Out] -Sqrt[2 + x^6]/(12*x^6) + ArcTanh[Sqrt[2 + x^6]/Sqrt[2]]/(12*Sqrt
[2])
```

Rubi in Sympy [A] time = 4.25512, size = 36, normalized size = 0.86

$$\frac{\sqrt{2}\,\text{atanh}\left(\frac{\sqrt{2}\sqrt{x^6+2}}{2}\right)}{24}-\frac{\sqrt{x^6+2}}{12x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**7/(x**6+2)**(1/2),x)
```

```
[Out] sqrt(2)*atanh(sqrt(2)*sqrt(x**6 + 2)/2)/24 - sqrt(x**6 + 2)/(12*x
**6)
```

Mathematica [A] time = 0.0365888, size = 42, normalized size = 1.

$$\frac{\tanh^{-1}\left(\frac{\sqrt{x^6+2}}{\sqrt{2}}\right)}{12\sqrt{2}}-\frac{\sqrt{x^6+2}}{12x^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^7*Sqrt[2 + x^6]),x]
```

```
[Out] -Sqrt[2 + x^6]/(12*x^6) + ArcTanh[Sqrt[2 + x^6]/Sqrt[2]]/(12*Sqrt
[2])
```

Maple [A] time = 0.035, size = 39, normalized size = 0.9

$$-\frac{1}{12\,x^6}\sqrt{x^6+2}-\frac{\sqrt{2}}{24}\ln\left(1\left(\sqrt{x^6+2}-\sqrt{2}\right)\frac{1}{\sqrt{x^6}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^7/(x^6+2)^(1/2),x)
```

```
[Out] -1/12*(x^6+2)^(1/2)/x^6-1/24*2^(1/2)*ln(((x^6+2)^(1/2)-2^(1/2))/(
x^6)^(1/2))
```

Maxima [A] time = 1.58517, size = 66, normalized size = 1.57

$$-\frac{1}{48}\sqrt{2}\log\left(-\frac{2\left(\sqrt{2}-\sqrt{x^6+2}\right)}{2\sqrt{2}+2\sqrt{x^6+2}}\right)-\frac{\sqrt{x^6+2}}{12\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(x^6 + 2)*x^7),x, algorithm="maxima")
```

```
[Out] -1/48*sqrt(2)*log(-2*(sqrt(2) - sqrt(x^6 + 2))/((2*sqrt(2)) + 2*s
qrt(x^6 + 2))) - 1/12*sqrt(x^6 + 2)/x^6
```

Fricas [A] time = 0.225992, size = 66, normalized size = 1.57

$$\frac{\sqrt{2}\left(x^6\log\left(\frac{\sqrt{2}(x^6+4)+4\sqrt{x^6+2}}{x^6}\right)-2\sqrt{2}\sqrt{x^6+2}\right)}{48\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(x^6 + 2)*x^7),x, algorithm="fricas")
```

```
[Out] 1/48*sqrt(2)*(x^6*log((sqrt(2)*(x^6 + 4) + 4*sqrt(x^6 + 2))/x^6)
- 2*sqrt(2)*sqrt(x^6 + 2))/x^6
```

Sympy [A] time = 7.03888, size = 31, normalized size = 0.74

$$\frac{\sqrt{2}\operatorname{asinh}\left(\frac{\sqrt{2}}{x^3}\right)}{24}-\frac{\sqrt{1+\frac{2}{x^6}}}{12x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/x**7/(x**6+2)**(1/2),x)
```

```
[Out] sqrt(2)*asinh(sqrt(2)/x**3)/24 - sqrt(1 + 2/x**6)/(12*x**3)
```

GIAC/XCAS [A] time = 0.228356, size = 63, normalized size = 1.5

$$-\frac{1}{48}\sqrt{2}\ln\left(-\frac{\sqrt{2}-\sqrt{x^6+2}}{\sqrt{2}+\sqrt{x^6+2}}\right)-\frac{\sqrt{x^6+2}}{12\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(x^6 + 2)*x^7),x, algorithm="giac")
```

```
[Out] -1/48*sqrt(2)*ln(-(sqrt(2) - sqrt(x^6 + 2))/(sqrt(2) + sqrt(x^6 +
 2))) - 1/12*sqrt(x^6 + 2)/x^6
```

3.1387 $\int \frac{1}{x^{13}\sqrt{2+x^6}}\,dx$

Optimal. Leaf size=58

$$\frac{\sqrt{x^6+2}}{32x^6}-\frac{\tanh^{-1}\left(\frac{\sqrt{x^6+2}}{\sqrt{2}}\right)}{32\sqrt{2}}-\frac{\sqrt{x^6+2}}{24x^{12}}$$

```
[Out] -Sqrt[2 + x^6]/(24*x^12) + Sqrt[2 + x^6]/(32*x^6) - ArcTanh[Sqrt[
2 + x^6]/Sqrt[2]]/(32*Sqrt[2])
```

Rubi [A] time = 0.0588679, antiderivative size = 58, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{\sqrt{x^6+2}}{32x^6}-\frac{\tanh^{-1}\left(\frac{\sqrt{x^6+2}}{\sqrt{2}}\right)}{32\sqrt{2}}-\frac{\sqrt{x^6+2}}{24x^{12}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^13*Sqrt[2 + x^6]),x]
```

```
[Out] -Sqrt[2 + x^6]/(24*x^12) + Sqrt[2 + x^6]/(32*x^6) - ArcTanh[Sqrt[
2 + x^6]/Sqrt[2]]/(32*Sqrt[2])
```

Rubi in Sympy [A] time = 5.21242, size = 49, normalized size = 0.84

$$-\frac{\sqrt{2}\operatorname{atanh}\left(\frac{\sqrt{2}\sqrt{x^6+2}}{2}\right)}{64}+\frac{\sqrt{x^6+2}}{32x^6}-\frac{\sqrt{x^6+2}}{24x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**13/(x**6+2)**(1/2),x)
```

```
[Out] -sqrt(2)*atanh(sqrt(2)*sqrt(x**6 + 2)/2)/64 + sqrt(x**6 + 2)/(32*
x**6) - sqrt(x**6 + 2)/(24*x**12)
```

Mathematica [A] time = 0.0498806, size = 51, normalized size = 0.88

$$\left(\frac{1}{32x^6}-\frac{1}{24x^{12}}\right)\sqrt{x^6+2}-\frac{\tanh^{-1}\left(\frac{\sqrt{x^6+2}}{\sqrt{2}}\right)}{32\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^13*Sqrt[2 + x^6]),x]
```

```
[Out] (-1/(24*x^12) + 1/(32*x^6))*Sqrt[2 + x^6] - ArcTanh[Sqrt[2 + x^6]
/Sqrt[2]]/(32*Sqrt[2])
```

Maple [A] time = 0.034, size = 51, normalized size = 0.9

$$\frac{3\,x^{12}+2\,x^6-8}{96\,x^{12}}\frac{1}{\sqrt{x^6+2}}+\frac{\sqrt{2}}{64}\ln\left(1\left(\sqrt{x^6+2}-\sqrt{2}\right)\frac{1}{\sqrt{x^6}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^13/(x^6+2)^(1/2),x)
```

```
[Out] 1/96*(3*x^12+2*x^6-8)/x^12/(x^6+2)^(1/2)+1/64*2^(1/2)*ln(((x^6+2)
^(1/2)-2^(1/2))/(x^6)^(1/2))
```

Maxima [A] time = 1.59047, size = 103, normalized size = 1.78

$$\frac{1}{128}\sqrt{2}\log\left(-\frac{2\left(\sqrt{2}-\sqrt{x^6+2}\right)}{2\sqrt{2}+2\sqrt{x^6+2}}\right)-\frac{3\left(x^6+2\right)^{\frac{3}{2}}-10\sqrt{x^6+2}}{96\left(4x^6-\left(x^6+2\right)^2+4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^6 + 2)*x^13),x, algorithm="maxima")
```

```
[Out] 1/128*sqrt(2)*log(-2*(sqrt(2) - sqrt(x^6 + 2))/((2*sqrt(2)) + 2*s
qrt(x^6 + 2))) - 1/96*(3*(x^6 + 2)^(3/2) - 10*sqrt(x^6 + 2))/(4*x
^6 - (x^6 + 2)^2 + 4)
```

Fricas [A] time = 0.225567, size = 77, normalized size = 1.33

$$\frac{\sqrt{2}\left(3x^{12}\log\left(\frac{\sqrt{2}(x^6+4)-4\sqrt{x^6+2}}{x^6}\right)+2\sqrt{2}\left(3x^6-4\right)\sqrt{x^6+2}\right)}{384x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^6 + 2)*x^13),x, algorithm="fricas")
```

```
[Out] 1/384*sqrt(2)*(3*x^12*log((sqrt(2)*(x^6 + 4) - 4*sqrt(x^6 + 2))/x
^6) + 2*sqrt(2)*(3*x^6 - 4)*sqrt(x^6 + 2))/x^12
```

Sympy [A] time = 16.7862, size = 66, normalized size = 1.14

$$-\frac{\sqrt{2}\operatorname{asinh}\left(\frac{\sqrt{2}}{x^3}\right)}{64}+\frac{1}{32x^3\sqrt{1+\frac{2}{x^6}}}+\frac{1}{48x^9\sqrt{1+\frac{2}{x^6}}}-\frac{1}{12x^{15}\sqrt{1+\frac{2}{x^6}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**13/(x**6+2)**(1/2),x)
```

```
[Out] -sqrt(2)*asinh(sqrt(2)/x**3)/64 + 1/(32*x**3*sqrt(1 + 2/x**6)) +
1/(48*x**9*sqrt(1 + 2/x**6)) - 1/(12*x**15*sqrt(1 + 2/x**6))
```

GIAC/XCAS [A] time = 0.225791, size = 80, normalized size = 1.38

$$\frac{1}{128}\sqrt{2}\ln\left(-\frac{\sqrt{2}-\sqrt{x^6+2}}{\sqrt{2}+\sqrt{x^6+2}}\right)+\frac{3\left(x^6+2\right)^{\frac{3}{2}}-10\sqrt{x^6+2}}{96x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^6 + 2)*x^13),x, algorithm="giac")
```

```
[Out] 1/128*sqrt(2)*ln(-(sqrt(2) - sqrt(x^6 + 2))/(sqrt(2) + sqrt(x^6 +
 2))) + 1/96*(3*(x^6 + 2)^(3/2) - 10*sqrt(x^6 + 2))/x^12
```

3.1388 $\int \frac{x^{14}}{\sqrt{2+x^6}}\,dx$

Optimal. Leaf size=47

$$\frac{1}{2}\sinh^{-1}\left(\frac{x^3}{\sqrt{2}}\right)+\frac{1}{12}\sqrt{x^6+2}x^9-\frac{1}{4}\sqrt{x^6+2}x^3$$

```
[Out] -(x^3*Sqrt[2 + x^6])/4 + (x^9*Sqrt[2 + x^6])/12 + ArcSinh[x^3/Sqr
t[2]]/2
```

Rubi [A] time = 0.0549766, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{1}{2}\sinh^{-1}\left(\frac{x^3}{\sqrt{2}}\right)+\frac{1}{12}\sqrt{x^6+2}x^9-\frac{1}{4}\sqrt{x^6+2}x^3$$

Antiderivative was successfully verified.

```
[In]  Int[x^14/Sqrt[2 + x^6],x]
```

```
[Out] -(x^3*Sqrt[2 + x^6])/4 + (x^9*Sqrt[2 + x^6])/12 + ArcSinh[x^3/Sqr
t[2]]/2
```

Rubi in Sympy [A] time = 6.30844, size = 39, normalized size = 0.83

$$\frac{x^9\sqrt{x^6+2}}{12}-\frac{x^3\sqrt{x^6+2}}{4}+\frac{\operatorname{asinh}\left(\frac{\sqrt{2}x^3}{2}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**14/(x**6+2)**(1/2),x)
```

```
[Out] x**9*sqrt(x**6 + 2)/12 - x**3*sqrt(x**6 + 2)/4 + asinh(sqrt(2)*x*
*3/2)/2
```

Mathematica [A] time = 0.0320508, size = 35, normalized size = 0.74

$$\frac{1}{12}\left(6\sinh^{-1}\left(\frac{x^3}{\sqrt{2}}\right)+\left(x^6-3\right)\sqrt{x^6+2}x^3\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^14/Sqrt[2 + x^6],x]
```

```
[Out] (x^3*(-3 + x^6)*Sqrt[2 + x^6] + 6*ArcSinh[x^3/Sqrt[2]])/12
```

Maple [A] time = 0.045, size = 30, normalized size = 0.6

$$\frac{x^3\left(x^6-3\right)}{12}\sqrt{x^6+2}+\frac{1}{2}Arcsinh\left(\frac{x^3\sqrt{2}}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^14/(x^6+2)^(1/2),x)
```

```
[Out] 1/12*x^3*(x^6-3)*(x^6+2)^(1/2)+1/2*arcsinh(1/2*x^3*2^(1/2))
```

Maxima [A] time = 1.43316, size = 116, normalized size = 2.47

$$-\frac{\frac{5\sqrt{x^6+2}}{x^3}-\frac{3\left(x^6+2\right)^{\frac{3}{2}}}{x^9}}{6\left(\frac{2\left(x^6+2\right)}{x^6}-\frac{\left(x^6+2\right)^2}{x^{12}}-1\right)}+\frac{1}{4}\log\left(\frac{\sqrt{x^6+2}}{x^3}+1\right)-\frac{1}{4}\log\left(\frac{\sqrt{x^6+2}}{x^3}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^14/sqrt(x^6 + 2),x, algorithm="maxima")
```

```
[Out] -1/6*(5*sqrt(x^6 + 2)/x^3 - 3*(x^6 + 2)^(3/2)/x^9)/(2*(x^6 + 2)/x
^6 - (x^6 + 2)^2/x^12 - 1) + 1/4*log(sqrt(x^6 + 2)/x^3 + 1) - 1/4
*log(sqrt(x^6 + 2)/x^3 - 1)
```

Fricas [A] time = 0.226304, size = 165, normalized size = 3.51

$$-\frac{2\,x^{24}-14\,x^{12}-12\,x^{6}+6\left(2\,x^{12}+4\,x^{6}-2\left(x^{9}+x^{3}\right)\sqrt{x^{6}+2}+1\right)\log\left(-x^{3}+\sqrt{x^{6}+2}\right)-\left(2\,x^{21}-2\,x^{15}-11\,x^{9}-3\,x^{3}\right)\sqrt{x}}{12\left(2\,x^{12}+4\,x^{6}-2\left(x^{9}+x^{3}\right)\sqrt{x^{6}+2}+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^14/sqrt(x^6 + 2),x, algorithm="fricas")
```

```
[Out] -1/12*(2*x^24 - 14*x^12 - 12*x^6 + 6*(2*x^12 + 4*x^6 - 2*(x^9 + x
^3)*sqrt(x^6 + 2) + 1)*log(-x^3 + sqrt(x^6 + 2)) - (2*x^21 - 2*x^
15 - 11*x^9 - 3*x^3)*sqrt(x^6 + 2))/(2*x^12 + 4*x^6 - 2*(x^9 + x^
3)*sqrt(x^6 + 2) + 1)
```

Sympy [A] time = 14.8611, size = 53, normalized size = 1.13

$$\frac{x^{15}}{12\sqrt{x^6+2}}-\frac{x^9}{12\sqrt{x^6+2}}-\frac{x^3}{2\sqrt{x^6+2}}+\frac{\operatorname{asinh}\left(\frac{\sqrt{2}x^3}{2}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**14/(x**6+2)**(1/2),x)
```

```
[Out] x**15/(12*sqrt(x**6 + 2)) - x**9/(12*sqrt(x**6 + 2)) - x**3/(2*sq
rt(x**6 + 2)) + asinh(sqrt(2)*x**3/2)/2
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{14}}{\sqrt{x^6+2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^14/sqrt(x^6 + 2),x, algorithm="giac")
```

```
[Out] integrate(x^14/sqrt(x^6 + 2), x)
```

3.1389 $\int \frac{x^8}{\sqrt{2+x^6}}\,dx$

Optimal. Leaf size=31

$$\frac{1}{6}x^3\sqrt{x^6+2}-\frac{1}{3}\sinh^{-1}\left(\frac{x^3}{\sqrt{2}}\right)$$

```
[Out] (x^3*Sqrt[2 + x^6])/6 - ArcSinh[x^3/Sqrt[2]]/3
```

Rubi [A] time = 0.0357034, antiderivative size = 31, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{1}{6}x^3\sqrt{x^6+2}-\frac{1}{3}\sinh^{-1}\left(\frac{x^3}{\sqrt{2}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^8/Sqrt[2 + x^6],x]

[Out] (x^3*Sqrt[2 + x^6])/6 - ArcSinh[x^3/Sqrt[2]]/3
```

Rubi in Sympy [A] time = 4.68166, size = 26, normalized size = 0.84

$$\frac{x^3\sqrt{x^6+2}}{6}-\frac{\operatorname{asinh}\left(\frac{\sqrt{2}x^3}{2}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8/(x**6+2)**(1/2),x)

[Out] x**3*sqrt(x**6 + 2)/6 - asinh(sqrt(2)*x**3/2)/3
```

Mathematica [A] time = 0.01697, size = 31, normalized size = 1.

$$\frac{1}{6}x^3\sqrt{x^6+2}-\frac{1}{3}\sinh^{-1}\left(\frac{x^3}{\sqrt{2}}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8/Sqrt[2 + x^6],x]

[Out] (x^3*Sqrt[2 + x^6])/6 - ArcSinh[x^3/Sqrt[2]]/3
```

Maple [A] time = 0.034, size = 25, normalized size = 0.8

$$-\frac{1}{3}Arcsinh\left(\frac{x^3\sqrt{2}}{2}\right)+\frac{x^3}{6}\sqrt{x^6+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8/(x^6+2)^(1/2),x)
```

```
[Out] -1/3*arcsinh(1/2*x^3*2^(1/2))+1/6*x^3*(x^6+2)^(1/2)
```

Maxima [A] time = 1.43799, size = 78, normalized size = 2.52

$$\frac{\sqrt{x^6+2}}{3\,x^3\left(\frac{x^6+2}{x^6}-1\right)}-\frac{1}{6}\,\log\left(\frac{\sqrt{x^6+2}}{x^3}+1\right)+\frac{1}{6}\,\log\left(\frac{\sqrt{x^6+2}}{x^3}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/sqrt(x^6 + 2),x, algorithm="maxima")
```

```
[Out] 1/3*sqrt(x^6 + 2)/(x^3*((x^6 + 2)/x^6 - 1)) - 1/6*log(sqrt(x^6 +
2)/x^3 + 1) + 1/6*log(sqrt(x^6 + 2)/x^3 - 1)
```

Fricas [A] time = 0.223254, size = 107, normalized size = 3.45

$$-\frac{x^{12}+2\,x^6-2\left(x^6-\sqrt{x^6+2}x^3+1\right)\log\left(-x^3+\sqrt{x^6+2}\right)-\left(x^9+x^3\right)\sqrt{x^6+2}}{6\left(x^6-\sqrt{x^6+2}x^3+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/sqrt(x^6 + 2),x, algorithm="fricas")
```

```
[Out] -1/6*(x^12 + 2*x^6 - 2*(x^6 - sqrt(x^6 + 2)*x^3 + 1)*log(-x^3 + s
qrt(x^6 + 2)) - (x^9 + x^3)*sqrt(x^6 + 2))/(x^6 - sqrt(x^6 + 2)*x
^3 + 1)
```

Sympy [A] time = 6.70722, size = 39, normalized size = 1.26

$$\frac{x^9}{6\sqrt{x^6+2}}+\frac{x^3}{3\sqrt{x^6+2}}-\frac{\operatorname{asinh}\left(\frac{\sqrt{2}x^3}{2}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8/(x**6+2)**(1/2),x)
```

```
[Out] x**9/(6*sqrt(x**6 + 2)) + x**3/(3*sqrt(x**6 + 2)) - asinh(sqrt(2)
*x**3/2)/3
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^8}{\sqrt{x^6+2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/sqrt(x^6 + 2),x, algorithm="giac")
```

```
[Out] integrate(x^8/sqrt(x^6 + 2), x)
```

3.1390 $\int \frac{x^2}{\sqrt{2+x^6}} \, dx$

Optimal. Leaf size=14

$$\frac{1}{3}\sinh^{-1}\left(\frac{x^3}{\sqrt{2}}\right)$$

```
[Out] ArcSinh[x^3/Sqrt[2]]/3
```

Rubi [A] time = 0.0188563, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{1}{3}\sinh^{-1}\left(\frac{x^3}{\sqrt{2}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/Sqrt[2 + x^6],x]

[Out] ArcSinh[x^3/Sqrt[2]]/3
```

Rubi in Sympy [A] time = 2.5975, size = 12, normalized size = 0.86

$$\frac{\operatorname{asinh}\left(\frac{\sqrt{2}x^3}{2}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(x**6+2)**(1/2),x)

[Out] asinh(sqrt(2)*x**3/2)/3
```

Mathematica [A] time = 0.00754584, size = 14, normalized size = 1.

$$\frac{1}{3}\sinh^{-1}\left(\frac{x^3}{\sqrt{2}}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/Sqrt[2 + x^6],x]

[Out] ArcSinh[x^3/Sqrt[2]]/3
```

Maple [A] time = 0.024, size = 12, normalized size = 0.9

$$\frac{1}{3}\mathit{Arcsinh}\left(\frac{x^3\sqrt{2}}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(x^6+2)^(1/2),x)
```

```
[Out] 1/3*arcsinh(1/2*x^3*2^(1/2))
```

Maxima [A] time = 1.42528, size = 45, normalized size = 3.21

$$\frac{1}{6}\log\left(\frac{\sqrt{x^6+2}}{x^3}+1\right)-\frac{1}{6}\log\left(\frac{\sqrt{x^6+2}}{x^3}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(x^6 + 2),x, algorithm="maxima")
```

```
[Out] 1/6*log(sqrt(x^6 + 2)/x^3 + 1) - 1/6*log(sqrt(x^6 + 2)/x^3 - 1)
```

Fricas [A] time = 0.215762, size = 22, normalized size = 1.57

$$-\frac{1}{3}\log\left(-x^3+\sqrt{x^6+2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(x^6 + 2),x, algorithm="fricas")
```

```
[Out] -1/3*log(-x^3 + sqrt(x^6 + 2))
```

Sympy [A] time = 3.30877, size = 12, normalized size = 0.86

$$\frac{\operatorname{asinh}\left(\frac{\sqrt{2}x^3}{2}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(x**6+2)**(1/2),x)
```

```
[Out] asinh(sqrt(2)*x**3/2)/3
```

GIAC/XCAS [A] time = 0.224504, size = 22, normalized size = 1.57

$$-\frac{1}{3}\ln\left(-x^3+\sqrt{x^6+2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(x^6 + 2),x, algorithm="giac")
```

```
[Out] -1/3*ln(-x^3 + sqrt(x^6 + 2))
```

3.1391 $\int \frac{1}{x^4\sqrt{2+x^6}}\,dx$

Optimal. Leaf size=16

$$-\frac{\sqrt{x^6+2}}{6x^3}$$

```
[Out] -Sqrt[2 + x^6]/(6*x^3)
```

Rubi [A] time = 0.0127449, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$-\frac{\sqrt{x^6+2}}{6x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*Sqrt[2 + x^6]),x]

[Out] -Sqrt[2 + x^6]/(6*x^3)
```

Rubi in Sympy [A] time = 2.31973, size = 14, normalized size = 0.88

$$-\frac{\sqrt{x^6+2}}{6x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(x**6+2)**(1/2),x)

[Out] -sqrt(x**6 + 2)/(6*x**3)
```

Mathematica [A] time = 0.00881137, size = 16, normalized size = 1.

$$-\frac{\sqrt{x^6+2}}{6x^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*Sqrt[2 + x^6]),x]

[Out] -Sqrt[2 + x^6]/(6*x^3)
```

Maple [A] time = 0.006, size = 13, normalized size = 0.8

$$-\frac{1}{6\,x^3}\sqrt{x^6+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(x^6+2)^(1/2),x)

[Out] -1/6*(x^6+2)^(1/2)/x^3
```

Maxima [A] time = 1.42232, size = 16, normalized size = 1.

$$-\frac{\sqrt{x^6+2}}{6\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^6 + 2)*x^4),x, algorithm="maxima")
```

```
[Out] -1/6*sqrt(x^6 + 2)/x^3
```

Fricas [A] time = 0.215941, size = 27, normalized size = 1.69

$$\frac{1}{3\left(x^6-\sqrt{x^6+2}x^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^6 + 2)*x^4),x, algorithm="fricas")
```

```
[Out] 1/3/(x^6 - sqrt(x^6 + 2)*x^3)
```

Sympy [A] time = 2.02309, size = 12, normalized size = 0.75

$$-\frac{\sqrt{1+\frac{2}{x^6}}}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(x**6+2)**(1/2),x)
```

```
[Out] -sqrt(1 + 2/x**6)/6
```

GIAC/XCAS [A] time = 0.224655, size = 27, normalized size = 1.69

$$-\frac{\sqrt{\frac{2}{x^6}+1}}{6\,\mathrm{sign}\,(x)}+\frac{1}{6}\,\mathrm{sign}\,(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^6 + 2)*x^4),x, algorithm="giac")
```

```
[Out] -1/6*sqrt(2/x^6 + 1)/sign(x) + 1/6*sign(x)
```

3.1392 $\int \frac{1}{x^{10}\sqrt{2+x^6}}\,dx$

Optimal. Leaf size=33

$$\frac{\sqrt{x^6+2}}{18x^3}-\frac{\sqrt{x^6+2}}{18x^9}$$

```
[Out] -Sqrt[2 + x^6]/(18*x^9) + Sqrt[2 + x^6]/(18*x^3)
```

Rubi [A] time = 0.0251987, antiderivative size = 33, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{\sqrt{x^6+2}}{18x^3}-\frac{\sqrt{x^6+2}}{18x^9}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^10*Sqrt[2 + x^6]),x]

[Out] -Sqrt[2 + x^6]/(18*x^9) + Sqrt[2 + x^6]/(18*x^3)
```

Rubi in Sympy [A] time = 3.22543, size = 26, normalized size = 0.79

$$\frac{\sqrt{x^6+2}}{18x^3}-\frac{\sqrt{x^6+2}}{18x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**10/(x**6+2)**(1/2),x)

[Out] sqrt(x**6 + 2)/(18*x**3) - sqrt(x**6 + 2)/(18*x**9)
```

Mathematica [A] time = 0.0118733, size = 21, normalized size = 0.64

$$\frac{\left(x^6-1\right)\sqrt{x^6+2}}{18x^9}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^10*Sqrt[2 + x^6]),x]

[Out] ((-1 + x^6)*Sqrt[2 + x^6])/(18*x^9)
```

Maple [A] time = 0.006, size = 18, normalized size = 0.6

$$\frac{x^6-1}{18\,x^9}\sqrt{x^6+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^10/(x^6+2)^(1/2),x)

[Out] 1/18*(x^6+2)^(1/2)*(x^6-1)/x^9
```

Maxima [A] time = 1.48146, size = 34, normalized size = 1.03

$$\frac{\sqrt{x^6+2}}{12\,x^3}-\frac{\left(x^6+2\right)^{\frac{3}{2}}}{36\,x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^6 + 2)*x^10),x, algorithm="maxima")
```

```
[Out] 1/12*sqrt(x^6 + 2)/x^3 - 1/36*(x^6 + 2)^(3/2)/x^9
```

Fricas [A] time = 0.218311, size = 70, normalized size = 2.12

$$\frac{3\,x^6-3\,\sqrt{x^6+2}x^3+2}{18\,\left(2\,x^{18}+3\,x^{12}-\left(2\,x^{15}+x^9\right)\sqrt{x^6+2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^6 + 2)*x^10),x, algorithm="fricas")
```

```
[Out] 1/18*(3*x^6 - 3*sqrt(x^6 + 2)*x^3 + 2)/(2*x^18 + 3*x^12 - (2*x^15
 + x^9)*sqrt(x^6 + 2))
```

Sympy [A] time = 5.2497, size = 26, normalized size = 0.79

$$\frac{\sqrt{1+\frac{2}{x^6}}}{18}-\frac{\sqrt{1+\frac{2}{x^6}}}{18x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**10/(x**6+2)**(1/2),x)
```

```
[Out] sqrt(1 + 2/x**6)/18 - sqrt(1 + 2/x**6)/(18*x**6)
```

GIAC/XCAS [A] time = 0.229089, size = 43, normalized size = 1.3

$$-\frac{\left(\frac{2}{x^6}+1\right)^{\frac{3}{2}}-3\,\sqrt{\frac{2}{x^6}+1}}{36\,\mathrm{sign}\left(x\right)}-\frac{1}{18}\,\mathrm{sign}\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^6 + 2)*x^10),x, algorithm="giac")
```

```
[Out] -1/36*((2/x^6 + 1)^(3/2) - 3*sqrt(2/x^6 + 1))/sign(x) - 1/18*sign
(x)
```

3.1393 $\int \frac{1}{x^{16}\sqrt{2+x^6}}\,dx$

Optimal. Leaf size=49

$$-\frac{\sqrt{x^6+2}}{30x^{15}}+\frac{\sqrt{x^6+2}}{45x^9}-\frac{\sqrt{x^6+2}}{45x^3}$$

```
[Out] -Sqrt[2 + x^6]/(30*x^15) + Sqrt[2 + x^6]/(45*x^9) - Sqrt[2 + x^6]
/(45*x^3)
```

Rubi [A] time = 0.0382607, antiderivative size = 49, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{\sqrt{x^6+2}}{30x^{15}}+\frac{\sqrt{x^6+2}}{45x^9}-\frac{\sqrt{x^6+2}}{45x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^16*Sqrt[2 + x^6]),x]
```

```
[Out] -Sqrt[2 + x^6]/(30*x^15) + Sqrt[2 + x^6]/(45*x^9) - Sqrt[2 + x^6]
/(45*x^3)
```

Rubi in Sympy [A] time = 4.31169, size = 39, normalized size = 0.8

$$-\frac{\sqrt{x^6+2}}{45x^3}+\frac{\sqrt{x^6+2}}{45x^9}-\frac{\sqrt{x^6+2}}{30x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**16/(x**6+2)**(1/2),x)
```

```
[Out] -sqrt(x**6 + 2)/(45*x**3) + sqrt(x**6 + 2)/(45*x**9) - sqrt(x**6
+ 2)/(30*x**15)
```

Mathematica [A] time = 0.01534, size = 28, normalized size = 0.57

$$-\frac{\sqrt{x^6+2}\left(2x^{12}-2x^6+3\right)}{90x^{15}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^16*Sqrt[2 + x^6]),x]
```

```
[Out] -(Sqrt[2 + x^6]*(3 - 2*x^6 + 2*x^12))/(90*x^15)
```

Maple [A] time = 0.006, size = 25, normalized size = 0.5

$$-\frac{2\,x^{12}-2\,x^6+3}{90\,x^{15}}\sqrt{x^6+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^16/(x^6+2)^(1/2),x)
```

```
[Out] -1/90*(x^6+2)^(1/2)*(2*x^12-2*x^6+3)/x^15
```

Maxima [A] time = 1.43357, size = 50, normalized size = 1.02

$$-\frac{\sqrt{x^6+2}}{24\,x^3}+\frac{\left(x^6+2\right)^{\frac{3}{2}}}{36\,x^9}-\frac{\left(x^6+2\right)^{\frac{5}{2}}}{120\,x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^6 + 2)*x^16),x, algorithm="maxima")
```

```
[Out] -1/24*sqrt(x^6 + 2)/x^3 + 1/36*(x^6 + 2)^(3/2)/x^9 - 1/120*(x^6 +
 2)^(5/2)/x^15
```

Fricas [A] time = 0.219294, size = 101, normalized size = 2.06

$$\frac{20\,x^{12}+35\,x^6-5\left(4\,x^9+3\,x^3\right)\sqrt{x^6+2}+6}{90\left(4\,x^{30}+10\,x^{24}+5\,x^{18}-\left(4\,x^{27}+6\,x^{21}+x^{15}\right)\sqrt{x^6+2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^6 + 2)*x^16),x, algorithm="fricas")
```

```
[Out] 1/90*(20*x^12 + 35*x^6 - 5*(4*x^9 + 3*x^3)*sqrt(x^6 + 2) + 6)/(4*
x^30 + 10*x^24 + 5*x^18 - (4*x^27 + 6*x^21 + x^15)*sqrt(x^6 + 2))
```

Sympy [A] time = 16.5713, size = 41, normalized size = 0.84

$$-\frac{\sqrt{1+\frac{2}{x^6}}}{45}+\frac{\sqrt{1+\frac{2}{x^6}}}{45x^6}-\frac{\sqrt{1+\frac{2}{x^6}}}{30x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**16/(x**6+2)**(1/2),x)
```

```
[Out] -sqrt(1 + 2/x**6)/45 + sqrt(1 + 2/x**6)/(45*x**6) - sqrt(1 + 2/x*
*6)/(30*x**12)
```

GIAC/XCAS [A] time = 0.226399, size = 61, normalized size = 1.24

$$-\frac{3\left(\frac{2}{x^6}+1\right)^{\frac{5}{2}}-10\left(\frac{2}{x^6}+1\right)^{\frac{3}{2}}+15\sqrt{\frac{2}{x^6}+1}}{360\,\mathrm{sign}\left(x\right)}+\frac{1}{45}\,\mathrm{sign}\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^6 + 2)*x^16),x, algorithm="giac")
```

```
[Out] -1/360*(3*(2/x^6 + 1)^(5/2) - 10*(2/x^6 + 1)^(3/2) + 15*sqrt(2/x^
6 + 1))/sign(x) + 1/45*sign(x)
```

3.1394 $\int \frac{x^7}{\sqrt{2+x^6}}\,dx$

Optimal. Leaf size=186

$$\frac{1}{5}x^2\sqrt{x^6+2}-\frac{2\,2^{5/6}\sqrt{2+\sqrt{3}}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}F\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{5\sqrt[4]{3}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}$$

```
[Out] (x^2*Sqrt[2 + x^6])/5 - (2*2^(5/6)*Sqrt[2 + Sqrt[3]]*(2^(1/3) + x
^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3)*(1 + Sqrt[3]) + x
^2)^2]*EllipticF[ArcSin[(2^(1/3)*(1 - Sqrt[3]) + x^2)/(2^(1/3)*(1
 + Sqrt[3]) + x^2)], -7 - 4*Sqrt[3]])/(5*3^(1/4)*Sqrt[(2^(1/3) +
x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*Sqrt[2 + x^6])
```

Rubi [A] time = 0.264253, antiderivative size = 186, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{1}{5}x^2\sqrt{x^6+2}-\frac{2\,2^{5/6}\sqrt{2+\sqrt{3}}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}F\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{5\sqrt[4]{3}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7/Sqrt[2 + x^6],x]
```

```
[Out] (x^2*Sqrt[2 + x^6])/5 - (2*2^(5/6)*Sqrt[2 + Sqrt[3]]*(2^(1/3) + x
^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3)*(1 + Sqrt[3]) + x
^2)^2]*EllipticF[ArcSin[(2^(1/3)*(1 - Sqrt[3]) + x^2)/(2^(1/3)*(1
 + Sqrt[3]) + x^2)], -7 - 4*Sqrt[3]])/(5*3^(1/4)*Sqrt[(2^(1/3) +
x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*Sqrt[2 + x^6])
```

Rubi in Sympy [A] time = 7.13869, size = 175, normalized size = 0.94

$$\frac{x^2\sqrt{x^6+2}}{5}-\frac{2\cdot 3^{\frac{3}{4}}\sqrt{\frac{2\sqrt[3]{2}x^4-2\cdot 2^{\frac{2}{3}}x^2+4}{\left(2^{\frac{2}{3}}x^2+2+2\sqrt{3}\right)^2}}\sqrt{\sqrt{3}+2}\left(2x^2+2\sqrt[3]{2}\right)F\left(\operatorname{asin}\left(\frac{2^{\frac{2}{3}}x^2-2\sqrt{3}+2}{2^{\frac{2}{3}}x^2+2+2\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{15\sqrt{\frac{2\cdot 2^{\frac{2}{3}}x^2+4}{\left(2^{\frac{2}{3}}x^2+2+2\sqrt{3}\right)^2}}\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7/(x**6+2)**(1/2),x)
```

```
[Out] x**2*sqrt(x**6 + 2)/5 - 2*3**(3/4)*sqrt((2*2**(1/3)*x**4 - 2*2**(
2/3)*x**2 + 4)/(2**(2/3)*x**2 + 2 + 2*sqrt(3))**2)*sqrt(sqrt(3) +
 2)*(2*x**2 + 2*2**(1/3))*elliptic_f(asin((2**(2/3)*x**2 - 2*sqrt
(3) + 2)/(2**(2/3)*x**2 + 2 + 2*sqrt(3))), -7 - 4*sqrt(3))/(15*sq
rt((2*2**(2/3)*x**2 + 4)/(2**(2/3)*x**2 + 2 + 2*sqrt(3))**2)*sqrt
(x**6 + 2))
```

Mathematica [C] time = 0.372098, size = 133, normalized size = 0.72

$$\frac{3x^2(x^6+2)-4\sqrt[6]{-1}\sqrt[3]{2}3^{3/4}\sqrt{(-1)^{5/6}\left(\sqrt[3]{-\frac{1}{2}}x^2-1\right)}\sqrt{\left(-\frac{1}{2}\right)^{2/3}x^4+\sqrt[3]{-\frac{1}{2}}x^2+1}F\left(\sin^{-1}\left(\frac{\sqrt{\left(-i+\sqrt{3}\right)(2^{2/3}x^2+2)}}{2\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)}{15\sqrt{x^6+2}}$$

Warning: Unable to verify antiderivative.

```
[In]   Integrate[x^7/Sqrt[2 + x^6],x]
```

```
[Out] (3*x^2*(2 + x^6) - 4*(-1)^(1/6)*2^(1/3)*3^(3/4)*Sqrt[(-1)^(5/6)*(
-1 + (-1/2)^(1/3)*x^2)]*Sqrt[1 + (-1/2)^(1/3)*x^2 + (-1/2)^(2/3)*
x^4]*EllipticF[ArcSin[Sqrt[(-I + Sqrt[3])*(2 + 2^(2/3)*x^2)]/(2*3
^(1/4))], (-1)^(1/3)])/(15*Sqrt[2 + x^6])
```

Maple [C] time = 0.046, size = 33, normalized size = 0.2

$$\frac{x^2}{5}\sqrt{x^6+2}-\frac{x^2\sqrt{2}}{5}{}_2F_1(\frac{1}{3},\frac{1}{2};\frac{4}{3};-\frac{x^6}{2})$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^7/(x^6+2)^(1/2),x)
```

```
[Out] 1/5*x^2*(x^6+2)^(1/2)-1/5*2^(1/2)*x^2*hypergeom([1/3,1/2],[4/3],-
1/2*x^6)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^7}{\sqrt{x^6+2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^7/sqrt(x^6 + 2),x, algorithm="maxima")
```

```
[Out] integrate(x^7/sqrt(x^6 + 2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^7}{\sqrt{x^6+2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^7/sqrt(x^6 + 2),x, algorithm="fricas")
```

```
[Out] integral(x^7/sqrt(x^6 + 2), x)
```

Sympy [A] time = 2.54144, size = 36, normalized size = 0.19

$$\frac{\sqrt{2}x^8\,\Gamma\left(\frac{4}{3}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{4}{3}\\\frac{7}{3}\end{matrix}\middle|\frac{x^6e^{i\pi}}{2}\right)}{12\,\Gamma\left(\frac{7}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(x**6+2)**(1/2),x)
```

```
[Out] sqrt(2)*x**8*gamma(4/3)*hyper((1/2, 4/3), (7/3,), x**6*exp_polar(
I*pi)/2)/(12*gamma(7/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^7}{\sqrt{x^6+2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(x^6 + 2),x, algorithm="giac")
```

```
[Out] integrate(x^7/sqrt(x^6 + 2), x)
```

3.1395 $\int \frac{x}{\sqrt{2+x^6}}\,dx$

Optimal. Leaf size=166

$$\frac{\sqrt{2+\sqrt{3}}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}F\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{\sqrt[6]{2}\sqrt[4]{3}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}$$

```
[Out] (Sqrt[2 + Sqrt[3]]*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 +
x^4)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*EllipticF[ArcSin[(2^(1/3)*(
1 - Sqrt[3]) + x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)], -7 - 4*Sqrt[3
]])/(2^(1/6)*3^(1/4)*Sqrt[(2^(1/3) + x^2)/(2^(1/3)*(1 + Sqrt[3])
+ x^2)^2]*Sqrt[2 + x^6])
```

Rubi [A] time = 0.143609, antiderivative size = 166, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{\sqrt{2+\sqrt{3}}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}F\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{\sqrt[6]{2}\sqrt[4]{3}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/Sqrt[2 + x^6],x]
```

```
[Out] (Sqrt[2 + Sqrt[3]]*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 +
x^4)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*EllipticF[ArcSin[(2^(1/3)*(
1 - Sqrt[3]) + x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)], -7 - 4*Sqrt[3
]])/(2^(1/6)*3^(1/4)*Sqrt[(2^(1/3) + x^2)/(2^(1/3)*(1 + Sqrt[3])
+ x^2)^2]*Sqrt[2 + x^6])
```

Rubi in Sympy [A] time = 4.36972, size = 160, normalized size = 0.96

$$\frac{3^{\frac{3}{4}}\sqrt{\frac{2\sqrt[3]{2}x^4-2\cdot 2^{\frac{2}{3}}x^2+4}{\left(2^{\frac{2}{3}}x^2+2+2\sqrt{3}\right)^2}}\sqrt{\sqrt{3}+2}\left(2x^2+2\sqrt[3]{2}\right)F\left(\operatorname{asin}\left(\frac{2^{\frac{2}{3}}x^2-2\sqrt{3}+2}{2^{\frac{2}{3}}x^2+2+2\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{6\sqrt{\frac{2\cdot 2^{\frac{2}{3}}x^2+4}{\left(2^{\frac{2}{3}}x^2+2+2\sqrt{3}\right)^2}}\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(x**6+2)**(1/2),x)
```

```
[Out] 3**(3/4)*sqrt((2*2**(1/3)*x**4 - 2*2**(2/3)*x**2 + 4)/(2**(2/3)*x
**2 + 2 + 2*sqrt(3))**2)*sqrt(sqrt(3) + 2)*(2*x**2 + 2*2**(1/3))*
elliptic_f(asin((2**(2/3)*x**2 - 2*sqrt(3) + 2)/(2**(2/3)*x**2 +
2 + 2*sqrt(3))), -7 - 4*sqrt(3))/(6*sqrt((2*2**(2/3)*x**2 + 4)/(2
**(2/3)*x**2 + 2 + 2*sqrt(3))**2)*sqrt(x**6 + 2))
```

Mathematica [A] time = 0.156012, size = 116, normalized size = 0.7

$$\frac{\sqrt[6]{-1}\sqrt[3]{2}\sqrt{(-1)^{5/6}\left(\sqrt[3]{-\frac{1}{2}}x^2-1\right)}\sqrt{\left(-\frac{1}{2}\right)^{2/3}x^4+\sqrt[3]{-\frac{1}{2}}x^2+1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{(-1)^{5/6}x^2}{\sqrt[3]{2}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)}{\sqrt[4]{3}\sqrt{x^6+2}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x/Sqrt[2 + x^6],x]
```

```
[Out] ((-1)^(1/6)*2^(1/3)*Sqrt[(-1)^(5/6)*(-1 + (-1/2)^(1/3)*x^2)]*Sqrt
[1 + (-1/2)^(1/3)*x^2 + (-1/2)^(2/3)*x^4]*EllipticF[ArcSin[Sqrt[-
(-1)^(5/6) - ((-1)^(5/6)*x^2)/2^(1/3)]/3^(1/4)], (-1)^(1/3)])/(3^
(1/4)*Sqrt[2 + x^6])
```

Maple [C] time = 0.023, size = 20, normalized size = 0.1

$$\frac{x^2\sqrt{2}}{4}{}_2F_1\left(\frac{1}{3},\frac{1}{2};\frac{4}{3};-\frac{x^6}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(x^6+2)^(1/2),x)
```

```
[Out] 1/4*2^(1/2)*x^2*hypergeom([1/3,1/2],[4/3],-1/2*x^6)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt{x^6+2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(x^6 + 2),x, algorithm="maxima")
```

```
[Out] integrate(x/sqrt(x^6 + 2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x}{\sqrt{x^6+2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(x^6 + 2),x, algorithm="fricas")
```

```
[Out] integral(x/sqrt(x^6 + 2), x)
```

Sympy [A] time = 1.77284, size = 36, normalized size = 0.22

$$\frac{\sqrt{2}x^2\,\Gamma\left(\frac{1}{3}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{3},\frac{1}{2}\\ \frac{4}{3}\end{matrix}\middle|\frac{x^6e^{i\pi}}{2}\right)}{12\,\Gamma\left(\frac{4}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(x**6+2)**(1/2),x)
```

```
[Out] sqrt(2)*x**2*gamma(1/3)*hyper((1/3, 1/2), (4/3,), x**6*exp_polar(
I*pi)/2)/(12*gamma(4/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt{x^6+2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(x^6 + 2),x, algorithm="giac")
```

```
[Out] integrate(x/sqrt(x^6 + 2), x)
```

3.1396 $\int \frac{1}{x^5\sqrt{2+x^6}}\,dx$

Optimal. Leaf size=186

$$-\frac{\sqrt{x^6+2}}{8x^4}-\frac{\sqrt{2+\sqrt{3}}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}F\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{8\sqrt[6]{2}\sqrt[4]{3}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}$$

```
[Out] -Sqrt[2 + x^6]/(8*x^4) - (Sqrt[2 + Sqrt[3]]*(2^(1/3) + x^2)*Sqrt[
(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*El
lipticF[ArcSin[(2^(1/3)*(1 - Sqrt[3]) + x^2)/(2^(1/3)*(1 + Sqrt[3
]) + x^2)], -7 - 4*Sqrt[3]])/(8*2^(1/6)*3^(1/4)*Sqrt[(2^(1/3) + x
^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*Sqrt[2 + x^6])
```

Rubi [A] time = 0.189669, antiderivative size = 186, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{\sqrt{x^6+2}}{8x^4}-\frac{\sqrt{2+\sqrt{3}}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}F\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{8\sqrt[6]{2}\sqrt[4]{3}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^5*Sqrt[2 + x^6]),x]
```

```
[Out] -Sqrt[2 + x^6]/(8*x^4) - (Sqrt[2 + Sqrt[3]]*(2^(1/3) + x^2)*Sqrt[
(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*El
lipticF[ArcSin[(2^(1/3)*(1 - Sqrt[3]) + x^2)/(2^(1/3)*(1 + Sqrt[3
]) + x^2)], -7 - 4*Sqrt[3]])/(8*2^(1/6)*3^(1/4)*Sqrt[(2^(1/3) + x
^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*Sqrt[2 + x^6])
```

Rubi in Sympy [A] time = 6.92315, size = 175, normalized size = 0.94

$$-\frac{3^{\frac{3}{4}}\sqrt{\frac{2\sqrt[3]{2}x^4-2\cdot 2^{\frac{2}{3}}x^2+4}{\left(2^{\frac{2}{3}}x^2+2+2\sqrt{3}\right)^2}}\sqrt{\sqrt{3}+2}\left(2x^2+2\sqrt[3]{2}\right)F\left(\operatorname{asin}\left(\frac{2^{\frac{2}{3}}x^2-2\sqrt{3}+2}{2^{\frac{2}{3}}x^2+2+2\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{48\sqrt{\frac{2\cdot 2^{\frac{2}{3}}x^2+4}{\left(2^{\frac{2}{3}}x^2+2+2\sqrt{3}\right)^2}}\sqrt{x^6+2}}-\frac{\sqrt{x^6+2}}{8x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**5/(x**6+2)**(1/2),x)
```

```
[Out] -3**(3/4)*sqrt((2*2**(1/3)*x**4 - 2*2**(2/3)*x**2 + 4)/(2**(2/3)*
x**2 + 2 + 2*sqrt(3))**2)*sqrt(sqrt(3) + 2)*(2*x**2 + 2*2**(1/3))
*elliptic_f(asin((2**(2/3)*x**2 - 2*sqrt(3) + 2)/(2**(2/3)*x**2 +
 2 + 2*sqrt(3))), -7 - 4*sqrt(3))/(48*sqrt((2*2**(2/3)*x**2 + 4)/
(2**(2/3)*x**2 + 2 + 2*sqrt(3))**2)*sqrt(x**6 + 2)) - sqrt(x**6 +
 2)/(8*x**4)
```

Mathematica [A] time = 0.430231, size = 136, normalized size = 0.73

$$-\frac{\sqrt{x^6+2}}{8x^4}-\frac{\sqrt[6]{-1}\sqrt{(-1)^{5/6}\left(\sqrt[3]{-\frac{1}{2}}x^2-1\right)}\sqrt{\left(-\frac{1}{2}\right)^{2/3}x^4+\sqrt[3]{-\frac{1}{2}}x^2+1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{(-1)^{5/6}x^2}{\sqrt[3]{2}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)}{4\,2^{2/3}\sqrt[4]{3}\sqrt{x^6+2}}$$

Warning: Unable to verify antiderivative.

```
[In]   Integrate[1/(x^5*Sqrt[2 + x^6]),x]
```

```
[Out] -Sqrt[2 + x^6]/(8*x^4) - ((-1)^(1/6)*Sqrt[(-1)^(5/6)*(-1 + (-1/2)
^(1/3)*x^2)]*Sqrt[1 + (-1/2)^(1/3)*x^2 + (-1/2)^(2/3)*x^4]*Ellipt
icF[ArcSin[Sqrt[-(-1)^(5/6) - ((-1)^(5/6)*x^2)/2^(1/3)]/3^(1/4)],
 (-1)^(1/3)])/(4*2^(2/3)*3^(1/4)*Sqrt[2 + x^6])
```

Maple [C] time = 0.039, size = 33, normalized size = 0.2

$$-\frac{1}{8\,x^4}\sqrt{x^6+2}-\frac{x^2\sqrt{2}}{32}\,{}_2\mathrm{F}_1\!\left(\frac{1}{3},\frac{1}{2};\,\frac{4}{3};\,-\frac{x^6}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^5/(x^6+2)^(1/2),x)
```

```
[Out] -1/8*(x^6+2)^(1/2)/x^4-1/32*2^(1/2)*x^2*hypergeom([1/3,1/2],[4/3]
,-1/2*x^6)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^6+2}x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(x^6 + 2)*x^5),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(x^6 + 2)*x^5), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{x^6+2}x^5},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(x^6 + 2)*x^5),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(x^6 + 2)*x^5), x)
```

Sympy [A] time = 2.58513, size = 39, normalized size = 0.21

$$\frac{\sqrt{2}\,\Gamma\left(-\frac{2}{3}\right){}_2F_1\left(\begin{matrix}-\frac{2}{3},\frac{1}{2}\\ \frac{1}{3}\end{matrix}\middle|\frac{x^6e^{i\pi}}{2}\right)}{12x^4\,\Gamma\left(\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**5/(x**6+2)**(1/2),x)
```

```
[Out] sqrt(2)*gamma(-2/3)*hyper((-2/3, 1/2), (1/3,), x**6*exp_polar(I*p
i)/2)/(12*x**4*gamma(1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^6+2}x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^6 + 2)*x^5),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(x^6 + 2)*x^5), x)
```

3.1397 $\int \frac{x^6}{\sqrt{2+x^6}}\,dx$

Optimal. Leaf size=179

$$\frac{1}{4}x\sqrt{x^6+2}-\frac{x\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}F\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{4\sqrt[3]{2}\sqrt[4]{3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}$$

```
[Out] (x*Sqrt[2 + x^6])/4 - (x*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*
x^2 + x^4)/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*EllipticF[ArcCos[(2^(
1/3) + (1 - Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3])*x^2)], (2 + Sq
rt[3])/4])/(4*2^(1/3)*3^(1/4)*Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/3)
 + (1 + Sqrt[3])*x^2)^2]*Sqrt[2 + x^6])
```

Rubi [A] time = 0.114422, antiderivative size = 179, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{1}{4}x\sqrt{x^6+2}-\frac{x\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}F\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{4\sqrt[3]{2}\sqrt[4]{3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/Sqrt[2 + x^6],x]
```

```
[Out] (x*Sqrt[2 + x^6])/4 - (x*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*
x^2 + x^4)/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*EllipticF[ArcCos[(2^(
1/3) + (1 - Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3])*x^2)], (2 + Sq
rt[3])/4])/(4*2^(1/3)*3^(1/4)*Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/3)
 + (1 + Sqrt[3])*x^2)^2]*Sqrt[2 + x^6])
```

Rubi in Sympy [A] time = 4.32574, size = 153, normalized size = 0.85

$$-\frac{3^{\frac{3}{4}}x\sqrt{\frac{2\sqrt[3]{2}x^4-2\cdot2^{\frac{2}{3}}x^2+4}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\left(x^2+\sqrt[3]{2}\right)F\left(\operatorname{acos}\left(\frac{x^2\left(-\sqrt{3}+1\right)+\sqrt[3]{2}}{x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}}\right)\middle|\frac{\sqrt{3}}{4}+\frac{1}{2}\right)}{24\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}+\frac{x\sqrt{x^6+2}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(x**6+2)**(1/2),x)
```

```
[Out] -3**(3/4)*x*sqrt((2*2**(1/3)*x**4 - 2*2**(2/3)*x**2 + 4)/(x**2*(1
 + sqrt(3)) + 2**(1/3))**2)*(x**2 + 2**(1/3))*elliptic_f(acos((x*
*2*(-sqrt(3) + 1) + 2**(1/3))/(x**2*(1 + sqrt(3)) + 2**(1/3))), s
qrt(3)/4 + 1/2)/(24*sqrt(x**2*(x**2 + 2**(1/3))/(x**2*(1 + sqrt(3
)) + 2**(1/3))**2)*sqrt(x**6 + 2)) + x*sqrt(x**6 + 2)/4
```

Mathematica [A] time = 1.24848, size = 173, normalized size = 0.97

$$\frac{x\left(6\left(x^6+2\right)-\frac{2^{2/3}3^{3/4}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}F\left(\cos^{-1}\left(\frac{\sqrt[3]{2}-\left(-1+\sqrt{3}\right)x^2}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}}\right)}{24\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6/Sqrt[2 + x^6],x]
```

```
[Out] (x*(6*(2 + x^6) - (2^(2/3)*3^(3/4)*(2^(1/3) + x^2)*Sqrt[(2^(2/3)
- 2^(1/3)*x^2 + x^4)/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*EllipticF[A
rcCos[(2^(1/3) - (-1 + Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3])*x^2
)], (2 + Sqrt[3])/4])/Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/3) + (1 +
Sqrt[3])*x^2)^2]))/(24*Sqrt[2 + x^6])
```

Maple [C] time = 0.046, size = 29, normalized size = 0.2

$$\frac{x}{4}\sqrt{x^6+2}-\frac{x\sqrt{2}}{4}{}_2F_1\left(\frac{1}{6},\frac{1}{2};\frac{7}{6};-\frac{x^6}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(x^6+2)^(1/2),x)
```

```
[Out] 1/4*x*(x^6+2)^(1/2)-1/4*2^(1/2)*x*hypergeom([1/6,1/2],[7/6],-1/2*
x^6)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{\sqrt{x^6+2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(x^6 + 2),x, algorithm="maxima")
```

```
[Out] integrate(x^6/sqrt(x^6 + 2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^6}{\sqrt{x^6+2}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(x^6 + 2),x, algorithm="fricas")
```

```
[Out] integral(x^6/sqrt(x^6 + 2), x)
```

Sympy [A] time = 2.26904, size = 36, normalized size = 0.2

$$\frac{\sqrt{2}x^7\,\Gamma\left(\frac{7}{6}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{7}{6}\\\frac{13}{6}\end{matrix}\middle|\frac{x^6e^{i\pi}}{2}\right)}{12\,\Gamma\left(\frac{13}{6}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(x**6+2)**(1/2),x)
```

```
[Out] sqrt(2)*x**7*gamma(7/6)*hyper((1/2, 7/6), (13/6,), x**6*exp_polar
(I*pi)/2)/(12*gamma(13/6))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{\sqrt{x^6+2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(x^6 + 2),x, algorithm="giac")
```

```
[Out] integrate(x^6/sqrt(x^6 + 2), x)
```

3.1398 $\int \frac{1}{\sqrt{2+x^6}}\,dx$

Optimal. Leaf size=164

$$\frac{x\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}F\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{2\sqrt[3]{2}\sqrt[4]{3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}$$

```
[Out] (x*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3) +
(1 + Sqrt[3])*x^2)^2]*EllipticF[ArcCos[(2^(1/3) + (1 - Sqrt[3])*x
^2)/(2^(1/3) + (1 + Sqrt[3])*x^2)], (2 + Sqrt[3])/4])/(2*2^(1/3)*
3^(1/4)*Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/3) + (1 + Sqrt[3])*x^2)^
2]*Sqrt[2 + x^6])
```

Rubi [A] time = 0.0506028, antiderivative size = 164, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111

$$\frac{x\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}F\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{2\sqrt[3]{2}\sqrt[4]{3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[2 + x^6],x]
```

```
[Out] (x*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3) +
(1 + Sqrt[3])*x^2)^2]*EllipticF[ArcCos[(2^(1/3) + (1 - Sqrt[3])*x
^2)/(2^(1/3) + (1 + Sqrt[3])*x^2)], (2 + Sqrt[3])/4])/(2*2^(1/3)*
3^(1/4)*Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/3) + (1 + Sqrt[3])*x^2)^
2]*Sqrt[2 + x^6])
```

Rubi in Sympy [A] time = 1.94604, size = 141, normalized size = 0.86

$$\frac{3^{\frac{3}{4}}x\sqrt{\frac{2\sqrt[3]{2}x^4-2\cdot 2^{\frac{2}{3}}x^2+4}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\left(x^2+\sqrt[3]{2}\right)F\left(\operatorname{acos}\left(\frac{x^2\left(-\sqrt{3}+1\right)+\sqrt[3]{2}}{x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}}\right)\middle|\frac{\sqrt{3}}{4}+\frac{1}{2}\right)}{12\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(x**6+2)**(1/2),x)
```

```
[Out] 3**(3/4)*x*sqrt((2*2**(1/3)*x**4 - 2*2**(2/3)*x**2 + 4)/(x**2*(1
+ sqrt(3)) + 2**(1/3))**2)*(x**2 + 2**(1/3))*elliptic_f(acos((x**
2*(-sqrt(3) + 1) + 2**(1/3))/(x**2*(1 + sqrt(3)) + 2**(1/3))), sq
rt(3)/4 + 1/2)/(12*sqrt(x**2*(x**2 + 2**(1/3))/(x**2*(1 + sqrt(3)
) + 2**(1/3))**2)*sqrt(x**6 + 2))
```

Mathematica [A] time = 0.287898, size = 163, normalized size = 0.99

$$\frac{x\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}F\left(\cos^{-1}\left(\frac{\sqrt[3]{2}-\left(-1+\sqrt{3}\right)x^2}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{2\sqrt[3]{2}\sqrt[4]{3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/Sqrt[2 + x^6],x]
```

```
[Out] (x*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3) +
(1 + Sqrt[3])*x^2)^2]*EllipticF[ArcCos[(2^(1/3) - (-1 + Sqrt[3])*
x^2)/(2^(1/3) + (1 + Sqrt[3])*x^2)], (2 + Sqrt[3])/4])/(2*2^(1/3)
*3^(1/4)*Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/3) + (1 + Sqrt[3])*x^2)
^2]*Sqrt[2 + x^6])
```

Maple [C] time = 0.013, size = 18, normalized size = 0.1

$$\frac{x\sqrt{2}}{2}{}_2F_1\left(\frac{1}{6},\frac{1}{2};\frac{7}{6};-\frac{x^6}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(x^6+2)^(1/2),x)
```

```
[Out] 1/2*2^(1/2)*x*hypergeom([1/6,1/2],[7/6],-1/2*x^6)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^6+2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(x^6 + 2),x, algorithm="maxima")
```

```
[Out] integrate(1/sqrt(x^6 + 2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{x^6+2}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(x^6 + 2),x, algorithm="fricas")
```

```
[Out] integral(1/sqrt(x^6 + 2), x)
```

Sympy [A] time = 1.73869, size = 34, normalized size = 0.21

$$\frac{\sqrt{2}x\,\Gamma\left(\frac{1}{6}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{6},\frac{1}{2}\\\frac{7}{6}\end{matrix}\middle|\frac{x^6e^{i\pi}}{2}\right)}{12\,\Gamma\left(\frac{7}{6}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x**6+2)**(1/2),x)
```

```
[Out] sqrt(2)*x*gamma(1/6)*hyper((1/6, 1/2), (7/6,), x**6*exp_polar(I*p
i)/2)/(12*gamma(7/6))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^6+2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(x^6 + 2),x, algorithm="giac")
```

```
[Out] integrate(1/sqrt(x^6 + 2), x)
```

3.1399 $\int \frac{1}{x^6\sqrt{2+x^6}}\,dx$

Optimal. Leaf size=181

$$-\frac{\sqrt{x^6+2}}{10x^5}-\frac{x\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}F\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{10\sqrt[3]{2}\sqrt[4]{3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}$$

```
[Out] -Sqrt[2 + x^6]/(10*x^5) - (x*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1
/3)*x^2 + x^4)/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*EllipticF[ArcCos[
(2^(1/3) + (1 - Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3])*x^2)], (2
+ Sqrt[3])/4])/(10*2^(1/3)*3^(1/4)*Sqrt[(x^2*(2^(1/3) + x^2))/(2^
(1/3) + (1 + Sqrt[3])*x^2)^2]*Sqrt[2 + x^6])
```

Rubi [A] time = 0.0891908, antiderivative size = 181, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{\sqrt{x^6+2}}{10x^5}-\frac{x\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}F\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{10\sqrt[3]{2}\sqrt[4]{3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^6*Sqrt[2 + x^6]),x]
```

```
[Out] -Sqrt[2 + x^6]/(10*x^5) - (x*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1
/3)*x^2 + x^4)/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*EllipticF[ArcCos[
(2^(1/3) + (1 - Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3])*x^2)], (2
+ Sqrt[3])/4])/(10*2^(1/3)*3^(1/4)*Sqrt[(x^2*(2^(1/3) + x^2))/(2^
(1/3) + (1 + Sqrt[3])*x^2)^2]*Sqrt[2 + x^6])
```

Rubi in Sympy [A] time = 4.15691, size = 156, normalized size = 0.86

$$-\frac{3^{\frac{3}{4}}x\sqrt{\frac{2\sqrt[3]{2}x^4-2\cdot 2^{\frac{2}{3}}x^2+4}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\left(x^2+\sqrt[3]{2}\right)F\left(\operatorname{acos}\left(\frac{x^2\left(-\sqrt{3}+1\right)+\sqrt[3]{2}}{x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}}\right)\middle|\frac{\sqrt{3}}{4}+\frac{1}{2}\right)}{60\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}-\frac{\sqrt{x^6+2}}{10x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**6/(x**6+2)**(1/2),x)
```

```
[Out] -3**(3/4)*x*sqrt((2*2**(1/3)*x**4 - 2*2**(2/3)*x**2 + 4)/(x**2*(1
 + sqrt(3)) + 2**(1/3))**2)*(x**2 + 2**(1/3))*elliptic_f(acos((x*
*2*(-sqrt(3) + 1) + 2**(1/3))/(x**2*(1 + sqrt(3)) + 2**(1/3))), s
qrt(3)/4 + 1/2)/(60*sqrt(x**2*(x**2 + 2**(1/3))/(x**2*(1 + sqrt(3
)) + 2**(1/3))**2)*sqrt(x**6 + 2)) - sqrt(x**6 + 2)/(10*x**5)
```

Mathematica [A] time = 0.833676, size = 178, normalized size = 0.98

$$\frac{-6\left(x^6+2\right)-\frac{2^{2/3}3^{3/4}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}x^6F\left(\cos^{-1}\left(\frac{\sqrt[3]{2}-\left(-1+\sqrt{3}\right)x^2}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}}}{60x^5\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^6*Sqrt[2 + x^6]),x]
```

```
[Out] (-6*(2 + x^6) - (2^(2/3)*3^(3/4)*x^6*(2^(1/3) + x^2)*Sqrt[(2^(2/3
) - 2^(1/3)*x^2 + x^4)/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*EllipticF
[ArcCos[(2^(1/3) - (-1 + Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3])*x
^2)], (2 + Sqrt[3])/4])/Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/3) + (1
+ Sqrt[3])*x^2)^2])/(60*x^5*Sqrt[2 + x^6])
```

Maple [C] time = 0.041, size = 31, normalized size = 0.2

$$-\frac{1}{10\,x^5}\sqrt{x^6+2}-\frac{x\sqrt{2}}{10}{}_2F_1\left(\frac{1}{6},\frac{1}{2};\frac{7}{6};-\frac{x^6}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^6/(x^6+2)^(1/2),x)
```

```
[Out] -1/10*(x^6+2)^(1/2)/x^5-1/10*2^(1/2)*x*hypergeom([1/6,1/2],[7/6],
-1/2*x^6)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^6+2}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^6 + 2)*x^6),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(x^6 + 2)*x^6), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{\sqrt{x^6+2}x^6},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^6 + 2)*x^6),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(x^6 + 2)*x^6), x)
```

Sympy [A] time = 2.82298, size = 39, normalized size = 0.22

$$\frac{\sqrt{2}\,\Gamma\left(-\frac{5}{6}\right)\,{}_2F_1\left(\begin{matrix} -\frac{5}{6}, \frac{1}{2} \\ \frac{1}{6} \end{matrix}\middle| \frac{x^6 e^{i\pi}}{2}\right)}{12x^5\,\Gamma\left(\frac{1}{6}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**6/(x**6+2)**(1/2),x)
```

```
[Out] sqrt(2)*gamma(-5/6)*hyper((-5/6, 1/2), (1/6,), x**6*exp_polar(I*p
i)/2)/(12*x**5*gamma(1/6))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^6 + 2}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^6 + 2)*x^6),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(x^6 + 2)*x^6), x)
```

3.1400 $\int \frac{x^9}{\sqrt{2+x^6}}\,dx$

Optimal. Leaf size=378

$$\frac{1}{7}\sqrt{x^6+2}x^4-\frac{8\sqrt{x^6+2}}{7\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)}-\frac{8\ 2^{2/3}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}F\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{7\sqrt[4]{3}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}+\frac{4\sqrt[6]{2}\sqrt[4]{3}\sqrt{2-\sqrt{3}}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}E\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{7\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}$$

```
[Out] (x^4*Sqrt[2 + x^6])/7 - (8*Sqrt[2 + x^6])/(7*(2^(1/3)*(1 + Sqrt[3
]) + x^2)) + (4*2^(1/6)*3^(1/4)*Sqrt[2 - Sqrt[3]]*(2^(1/3) + x^2)
*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3)*(1 + Sqrt[3]) + x^2)
^2]*EllipticE[ArcSin[(2^(1/3)*(1 - Sqrt[3]) + x^2)/(2^(1/3)*(1 +
Sqrt[3]) + x^2)], -7 - 4*Sqrt[3]])/(7*Sqrt[(2^(1/3) + x^2)/(2^(1/
3)*(1 + Sqrt[3]) + x^2)^2]*Sqrt[2 + x^6]) - (8*2^(2/3)*(2^(1/3) +
 x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3)*(1 + Sqrt[3]) +
 x^2)^2]*EllipticF[ArcSin[(2^(1/3)*(1 - Sqrt[3]) + x^2)/(2^(1/3)*
(1 + Sqrt[3]) + x^2)], -7 - 4*Sqrt[3]])/(7*3^(1/4)*Sqrt[(2^(1/3)
+ x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*Sqrt[2 + x^6])
```

Rubi [A] time = 0.438098, antiderivative size = 378, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385

$$\frac{1}{7}\sqrt{x^6+2}x^4-\frac{8\sqrt{x^6+2}}{7\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)}-\frac{8\ 2^{2/3}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}F\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{7\sqrt[4]{3}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}+\frac{4\sqrt[6]{2}\sqrt[4]{3}\sqrt{2-\sqrt{3}}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}E\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{7\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^9/Sqrt[2 + x^6],x]
```


```
[Out] (x^4*Sqrt[2 + x^6])/7 - (8*Sqrt[2 + x^6])/(7*(2^(1/3)*(1 + Sqrt[3
]) + x^2)) + (4*2^(1/6)*3^(1/4)*Sqrt[2 - Sqrt[3]]*(2^(1/3) + x^2)
*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3)*(1 + Sqrt[3]) + x^2)
^2]*EllipticE[ArcSin[(2^(1/3)*(1 - Sqrt[3]) + x^2)/(2^(1/3)*(1 +
Sqrt[3]) + x^2)], -7 - 4*Sqrt[3]])/(7*Sqrt[(2^(1/3) + x^2)/(2^(1/
3)*(1 + Sqrt[3]) + x^2)^2]*Sqrt[2 + x^6]) - (8*2^(2/3)*(2^(1/3) +
 x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3)*(1 + Sqrt[3]) +
 x^2)^2]*EllipticF[ArcSin[(2^(1/3)*(1 - Sqrt[3]) + x^2)/(2^(1/3)*
```

```
(1 + Sqrt[3]) + x^2)], -7 - 4*Sqrt[3]])/(7*3^(1/4)*Sqrt[(2^(1/3)
+ x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*Sqrt[2 + x^6])
```

Rubi in Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RecursionError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**9/(x**6+2)**(1/2),x)
```

```
[Out] Exception raised: RecursionError
```

Mathematica [C] time = 0.611846, size = 189, normalized size = 0.5

$$\frac{1}{7}\sqrt{x^6+2}x^4 + \frac{8i2^{2/3}\sqrt{(-1)^{5/6}\left(\sqrt[3]{-\frac{1}{2}}x^2-1\right)}\sqrt{\left(-\frac{1}{2}\right)^{2/3}x^4+\sqrt[3]{-\frac{1}{2}}x^2+1}\left(\sqrt[3]{-1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{(-1)^{5/6}x^2}{\sqrt[3]{2}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)-i\sqrt{3}E\left(\sin^{-1}\left(\cdots\right)\right)\right)}{7\sqrt[4]{3}\sqrt{x^6+2}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^9/Sqrt[2 + x^6],x]
```

```
[Out] (x^4*Sqrt[2 + x^6])/7 + (((8*I)/7)*2^(2/3)*Sqrt[(-1)^(5/6)*(-1 +
(-1/2)^(1/3)*x^2)]*Sqrt[1 + (-1/2)^(1/3)*x^2 + (-1/2)^(2/3)*x^4]*
((-I)*Sqrt[3]*EllipticE[ArcSin[Sqrt[-(-1)^(5/6) - ((-1)^(5/6)*x^2
)/2^(1/3)]/3^(1/4)], (-1)^(1/3)] + (-1)^(1/3)*EllipticF[ArcSin[Sq
rt[-(-1)^(5/6) - ((-1)^(5/6)*x^2)/2^(1/3)]/3^(1/4)], (-1)^(1/3)])
)/(3^(1/4)*Sqrt[2 + x^6])
```

Maple [C] time = 0.047, size = 33, normalized size = 0.1

$$\frac{x^4}{7}\sqrt{x^6+2}-\frac{x^4\sqrt{2}}{7}{}_2F_1\left(\frac{1}{2},\frac{2}{3};\frac{5}{3};-\frac{x^6}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^9/(x^6+2)^(1/2),x)
```

```
[Out] 1/7*x^4*(x^6+2)^(1/2)-1/7*2^(1/2)*x^4*hypergeom([1/2,2/3],[5/3],-
1/2*x^6)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^9}{\sqrt{x^6+2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/sqrt(x^6 + 2),x, algorithm="maxima")
```

```
[Out] integrate(x^9/sqrt(x^6 + 2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^9}{\sqrt{x^6+2}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/sqrt(x^6 + 2),x, algorithm="fricas")
```

```
[Out] integral(x^9/sqrt(x^6 + 2), x)
```

Sympy [A] time = 3.2516, size = 36, normalized size = 0.1

$$\frac{\sqrt{2}x^{10}\Gamma\left(\frac{5}{3}\right){}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{5}{3}\\\frac{8}{3}\end{matrix}\middle|\frac{x^6e^{i\pi}}{2}\right)}{12\Gamma\left(\frac{8}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**9/(x**6+2)**(1/2),x)
```

```
[Out] sqrt(2)*x**10*gamma(5/3)*hyper((1/2, 5/3), (8/3,), x**6*exp_polar
(I*pi)/2)/(12*gamma(8/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^9}{\sqrt{x^6+2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/sqrt(x^6 + 2),x, algorithm="giac")
```

```
[Out] integrate(x^9/sqrt(x^6 + 2), x)
```

3.1401 $\int \frac{x^3}{\sqrt{2+x^6}}\,dx$

Optimal. Leaf size=354

$$\frac{\sqrt{x^6+2}}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}+\frac{2^{2/3}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}F\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{\sqrt[4]{3}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}-\frac{\sqrt[4]{3}\sqrt{2-\sqrt{3}}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}E\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{2^{5/6}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}$$

```
[Out] Sqrt[2 + x^6]/(2^(1/3)*(1 + Sqrt[3]) + x^2) - (3^(1/4)*Sqrt[2 - S
qrt[3]]*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/
3)*(1 + Sqrt[3]) + x^2)^2]*EllipticE[ArcSin[(2^(1/3)*(1 - Sqrt[3]
) + x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)], -7 - 4*Sqrt[3]])/(2^(5/6
)*Sqrt[(2^(1/3) + x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*Sqrt[2 +
x^6]) + (2^(2/3)*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^
4)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*EllipticF[ArcSin[(2^(1/3)*(1
- Sqrt[3]) + x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)], -7 - 4*Sqrt[3]]
)/(3^(1/4)*Sqrt[(2^(1/3) + x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*
Sqrt[2 + x^6])
```

Rubi [A] time = 0.390715, antiderivative size = 354, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{\sqrt{x^6+2}}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}+\frac{2^{2/3}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}F\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{\sqrt[4]{3}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}-\frac{\sqrt[4]{3}\sqrt{2-\sqrt{3}}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}E\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{2^{5/6}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/Sqrt[2 + x^6],x]
```


```
[Out] Sqrt[2 + x^6]/(2^(1/3)*(1 + Sqrt[3]) + x^2) - (3^(1/4)*Sqrt[2 - S
qrt[3]]*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/
3)*(1 + Sqrt[3]) + x^2)^2]*EllipticE[ArcSin[(2^(1/3)*(1 - Sqrt[3]
) + x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)], -7 - 4*Sqrt[3]])/(2^(5/6
)*Sqrt[(2^(1/3) + x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*Sqrt[2 +
x^6]) + (2^(2/3)*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^
4)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*EllipticF[ArcSin[(2^(1/3)*(1
- Sqrt[3]) + x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)], -7 - 4*Sqrt[3]]
)/(3^(1/4)*Sqrt[(2^(1/3) + x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*
Sqrt[2 + x^6])
```

Rubi in Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RecursionError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(x**6+2)**(1/2),x)
```

```
[Out] Exception raised: RecursionError
```

Mathematica [C] time = 0.219526, size = 170, normalized size = 0.48

$$-\frac{i2^{2/3}\sqrt{(-1)^{5/6}\left(\sqrt[3]{-\frac{1}{2}}x^2-1\right)}\sqrt{\left(-\frac{1}{2}\right)^{2/3}x^4+\sqrt[3]{-\frac{1}{2}}x^2+1}\left(\sqrt[3]{-1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{(-1)^{5/6}x^2}{\sqrt[3]{2}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)-i\sqrt{3}E\left(\sin^{-1}\left(\frac{\sqrt{-\frac{(-1)^{5/6}x^2}{\sqrt[3]{2}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)\right)}{\sqrt[4]{3}\sqrt{x^6+2}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^3/Sqrt[2 + x^6],x]
```

```
[Out] ((-I)*2^(2/3)*Sqrt[(-1)^(5/6)*(-1 + (-1/2)^(1/3)*x^2)]*Sqrt[1 + (
-1/2)^(1/3)*x^2 + (-1/2)^(2/3)*x^4]*((-I)*Sqrt[3]*EllipticE[ArcSi
n[Sqrt[-(-1)^(5/6) - ((-1)^(5/6)*x^2)/2^(1/3)]/3^(1/4)], (-1)^(1/
3)] + (-1)^(1/3)*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - ((-1)^(5/6)*
x^2)/2^(1/3)]/3^(1/4)], (-1)^(1/3)]))/(3^(1/4)*Sqrt[2 + x^6])
```

Maple [C] time = 0.022, size = 20, normalized size = 0.1

$$\frac{x^4\sqrt{2}}{8}{}_2F_1\left(\frac{1}{2},\frac{2}{3};\frac{5}{3};-\frac{x^6}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(x^6+2)^(1/2),x)
```

```
[Out] 1/8*2^(1/2)*x^4*hypergeom([1/2,2/3],[5/3],-1/2*x^6)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{\sqrt{x^6+2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(x^6 + 2),x, algorithm="maxima")
```

```
[Out] integrate(x^3/sqrt(x^6 + 2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^3}{\sqrt{x^6+2}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(x^6 + 2),x, algorithm="fricas")
```

```
[Out] integral(x^3/sqrt(x^6 + 2), x)
```

Sympy [A] time = 1.91316, size = 36, normalized size = 0.1

$$\frac{\sqrt{2}x^4\left(\frac{2}{3}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{2}{3}\\\frac{5}{3}\end{matrix}\middle|\frac{x^6e^{i\pi}}{2}\right)}{12\left(\frac{5}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(x**6+2)**(1/2),x)
```

```
[Out] sqrt(2)*x**4*gamma(2/3)*hyper((1/2, 2/3), (5/3,), x**6*exp_polar(
I*pi)/2)/(12*gamma(5/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{\sqrt{x^6+2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(x^6 + 2),x, algorithm="giac")
```

```
[Out] integrate(x^3/sqrt(x^6 + 2), x)
```

3.1402 $\int \frac{1}{x^3\sqrt{2+x^6}}\,dx$

Optimal. Leaf size=378

$$\frac{\sqrt{x^6+2}}{4\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)}-\frac{\sqrt{x^6+2}}{4x^2}+\frac{\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}F\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{2\sqrt[3]{2}\sqrt[4]{3}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}-\frac{\sqrt[4]{3}\sqrt{2-\sqrt{3}}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}E\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{4\,2^{5/6}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}$$

```
[Out] -Sqrt[2 + x^6]/(4*x^2) + Sqrt[2 + x^6]/(4*(2^(1/3)*(1 + Sqrt[3])
+ x^2)) - (3^(1/4)*Sqrt[2 - Sqrt[3]]*(2^(1/3) + x^2)*Sqrt[(2^(2/3
) - 2^(1/3)*x^2 + x^4)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*EllipticE
[ArcSin[(2^(1/3)*(1 - Sqrt[3]) + x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^
2)], -7 - 4*Sqrt[3]])/(4*2^(5/6)*Sqrt[(2^(1/3) + x^2)/(2^(1/3)*(1
 + Sqrt[3]) + x^2)^2]*Sqrt[2 + x^6]) + ((2^(1/3) + x^2)*Sqrt[(2^(
2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*Ellipt
icF[ArcSin[(2^(1/3)*(1 - Sqrt[3]) + x^2)/(2^(1/3)*(1 + Sqrt[3]) +
 x^2)], -7 - 4*Sqrt[3]])/(2*2^(1/3)*3^(1/4)*Sqrt[(2^(1/3) + x^2)/
(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*Sqrt[2 + x^6])
```

Rubi [A] time = 0.432728, antiderivative size = 378, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385

$$\frac{\sqrt{x^6+2}}{4\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)}-\frac{\sqrt{x^6+2}}{4x^2}+\frac{\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}F\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{2\sqrt[3]{2}\sqrt[4]{3}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}-\frac{\sqrt[4]{3}\sqrt{2-\sqrt{3}}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}E\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{4\,2^{5/6}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*Sqrt[2 + x^6]),x]
```

```
[Out] -Sqrt[2 + x^6]/(4*x^2) + Sqrt[2 + x^6]/(4*(2^(1/3)*(1 + Sqrt[3])
+ x^2)) - (3^(1/4)*Sqrt[2 - Sqrt[3]]*(2^(1/3) + x^2)*Sqrt[(2^(2/3
) - 2^(1/3)*x^2 + x^4)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*EllipticE
[ArcSin[(2^(1/3)*(1 - Sqrt[3]) + x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^
2)], -7 - 4*Sqrt[3]])/(4*2^(5/6)*Sqrt[(2^(1/3) + x^2)/(2^(1/3)*(1
 + Sqrt[3]) + x^2)^2]*Sqrt[2 + x^6]) + ((2^(1/3) + x^2)*Sqrt[(2^(
2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*Ellipt
icF[ArcSin[(2^(1/3)*(1 - Sqrt[3]) + x^2)/(2^(1/3)*(1 + Sqrt[3]) +
 x^2)], -7 - 4*Sqrt[3]])/(2*2^(1/3)*3^(1/4)*Sqrt[(2^(1/3) + x^2)/
(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*Sqrt[2 + x^6])
```

Rubi in Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RecursionError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(x**6+2)**(1/2),x)
```

```
[Out] Exception raised: RecursionError
```

Mathematica [C] time = 0.791239, size = 189, normalized size = 0.5

$$-\frac{\sqrt{x^6+2}}{4x^2}-\frac{i\sqrt{(-1)^{5/6}\left(\sqrt[3]{-\frac{1}{2}}x^2-1\right)}\sqrt{\left(-\frac{1}{2}\right)^{2/3}x^4+\sqrt[3]{-\frac{1}{2}}x^2+1}\left(\sqrt[3]{-1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{(-1)^{5/6}x^2}{\sqrt[3]{2}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)-i\sqrt{3}E\left(\sin^{-1}\left(\frac{\sqrt{-\frac{(-1)^{5/6}x^2}{\sqrt[3]{2}}\cdots}}{\sqrt[4]{3}}\right.\right.\right.}{2\sqrt[3]{2}\sqrt[4]{3}\sqrt{x^6+2}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/(x^3*Sqrt[2 + x^6]),x]
```

```
[Out] -Sqrt[2 + x^6]/(4*x^2) - ((I/2)*Sqrt[(-1)^(5/6)*(-1 + (-1/2)^(1/3
)*x^2)]*Sqrt[1 + (-1/2)^(1/3)*x^2 + (-1/2)^(2/3)*x^4]*((-I)*Sqrt[
3]*EllipticE[ArcSin[Sqrt[-(-1)^(5/6) - ((-1)^(5/6)*x^2)/2^(1/3)]/
3^(1/4)], (-1)^(1/3)] + (-1)^(1/3)*EllipticF[ArcSin[Sqrt[-(-1)^(5
/6) - ((-1)^(5/6)*x^2)/2^(1/3)]/3^(1/4)], (-1)^(1/3)]))/(2^(1/3)*
3^(1/4)*Sqrt[2 + x^6])
```

Maple [C] time = 0.039, size = 33, normalized size = 0.1

$$-\frac{1}{4\,x^2}\sqrt{x^6+2}+\frac{x^4\sqrt{2}}{32}\,{}_2F_1(\frac{1}{2},\frac{2}{3};\frac{5}{3};-\frac{x^6}{2})$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(x^6+2)^(1/2),x)
```

```
[Out] -1/4*(x^6+2)^(1/2)/x^2+1/32*2^(1/2)*x^4*hypergeom([1/2,2/3],[5/3]
,-1/2*x^6)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\sqrt{x^6+2}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^6 + 2)*x^3),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(x^6 + 2)*x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{x^6+2}x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^6 + 2)*x^3),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(x^6 + 2)*x^3), x)
```

Sympy [A] time = 2.17178, size = 39, normalized size = 0.1

$$\frac{\sqrt{2}\,\Gamma\left(-\frac{1}{3}\right)\,{}_{2}F_{1}\left(\begin{matrix}-\frac{1}{3},\frac{1}{2}\\ \frac{2}{3}\end{matrix}\middle|\frac{x^{6}e^{i\pi}}{2}\right)}{12x^{2}\,\Gamma\left(\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(x**6+2)**(1/2),x)
```

```
[Out] sqrt(2)*gamma(-1/3)*hyper((-1/3, 1/2), (2/3,), x**6*exp_polar(I*p
i)/2)/(12*x**2*gamma(2/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^6+2}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^6 + 2)*x^3),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(x^6 + 2)*x^3), x)
```

3.1403 $\int \frac{x^{10}}{\sqrt{2+x^6}}\,dx$

Optimal. Leaf size=394

$$\frac{1}{8}\sqrt{x^6+2}x^5-\frac{5\left(1+\sqrt{3}\right)\sqrt{x^6+2}x}{8\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)}+\frac{5\left(1-\sqrt{3}\right)\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}xF\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{8\,2^{2/3}\sqrt[4]{3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}+\frac{5\sqrt[4]{3}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}xE\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{4\,2^{2/3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}$$

```
[Out] (x^5*Sqrt[2 + x^6])/8 - (5*(1 + Sqrt[3])*x*Sqrt[2 + x^6])/(8*(2^(
1/3) + (1 + Sqrt[3])*x^2)) + (5*3^(1/4)*x*(2^(1/3) + x^2)*Sqrt[(2
^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*Elli
pticE[ArcCos[(2^(1/3) + (1 - Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3
])*x^2)], (2 + Sqrt[3])/4])/(4*2^(2/3)*Sqrt[(x^2*(2^(1/3) + x^2))
/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*Sqrt[2 + x^6]) + (5*(1 - Sqrt[3
])*x*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3)
+ (1 + Sqrt[3])*x^2)^2]*EllipticF[ArcCos[(2^(1/3) + (1 - Sqrt[3])
*x^2)/(2^(1/3) + (1 + Sqrt[3])*x^2)], (2 + Sqrt[3])/4])/(8*2^(2/3
)*3^(1/4)*Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/3) + (1 + Sqrt[3])*x^2
)^2]*Sqrt[2 + x^6])
```

Rubi [A] time = 0.288599, antiderivative size = 394, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{1}{8}\sqrt{x^6+2}x^5-\frac{5\left(1+\sqrt{3}\right)\sqrt{x^6+2}x}{8\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)}+\frac{5\left(1-\sqrt{3}\right)\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}xF\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{8\,2^{2/3}\sqrt[4]{3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}+\frac{5\sqrt[4]{3}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}xE\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{4\,2^{2/3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^10/Sqrt[2 + x^6],x]
```


```
[Out] (x^5*Sqrt[2 + x^6])/8 - (5*(1 + Sqrt[3])*x*Sqrt[2 + x^6])/(8*(2^(
1/3) + (1 + Sqrt[3])*x^2)) + (5*3^(1/4)*x*(2^(1/3) + x^2)*Sqrt[(2
^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*Elli
pticE[ArcCos[(2^(1/3) + (1 - Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3
```

```
])*x^2)], (2 + Sqrt[3])/4])/(4*2^(2/3)*Sqrt[(x^2*(2^(1/3) + x^2))
/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*Sqrt[2 + x^6]) + (5*(1 - Sqrt[3
])*x*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3)
+ (1 + Sqrt[3])*x^2)^2]*EllipticF[ArcCos[(2^(1/3) + (1 - Sqrt[3])
*x^2)/(2^(1/3) + (1 + Sqrt[3])*x^2)], (2 + Sqrt[3])/4])/(8*2^(2/3
)*3^(1/4)*Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/3) + (1 + Sqrt[3])*x^2
)^2]*Sqrt[2 + x^6])
```

Rubi in Sympy [A] time = 15.1857, size = 357, normalized size = 0.91

$$\frac{x^5\sqrt{x^6+2}}{8}+\frac{5\cdot 2^{\frac{2}{3}}\sqrt[4]{3}x\sqrt{\frac{2\sqrt[3]{2}x^4-2\cdot 2^{\frac{2}{3}}x^2+4}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\left(x^2+\sqrt[3]{2}\right)E\left(\operatorname{acos}\left(\frac{x^2\left(-\sqrt{3}+1\right)+\sqrt[3]{2}}{x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}}\right)\middle|\frac{\sqrt{3}}{4}+\frac{1}{2}\right)}{16\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}+\frac{5\cdot 2^{\frac{2}{3}}\cdot 3^{\frac{3}{4}}x\sqrt{\frac{2\sqrt[3]{2}x^4-2\cdot 2^{\frac{2}{3}}x^2+4}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\left(-4\sqrt{3}+4\right)\left(x^2+\sqrt[3]{2}\right)F\left(\operatorname{acos}\left(\frac{x^2\left(-\sqrt{3}+1\right)+\sqrt[3]{2}}{x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}}\right)\middle|\frac{\sqrt{3}}{4}+\frac{1}{2}\right)}{384\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}-\frac{x\left(\frac{5}{8}+\frac{5\sqrt{3}}{8}\right)\sqrt{x^6+2}}{x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**10/(x**6+2)**(1/2),x)
```

```
[Out] x**5*sqrt(x**6 + 2)/8 + 5*2**(2/3)*3**(1/4)*x*sqrt((2*2**(1/3)*x*
*4 - 2*2**(2/3)*x**2 + 4)/(x**2*(1 + sqrt(3)) + 2**(1/3))**2)*(x*
*2 + 2**(1/3))*elliptic_e(acos((x**2*(-sqrt(3) + 1) + 2**(1/3))/(
x**2*(1 + sqrt(3)) + 2**(1/3))), sqrt(3)/4 + 1/2)/(16*sqrt(x**2*(
x**2 + 2**(1/3))/(x**2*(1 + sqrt(3)) + 2**(1/3))**2)*sqrt(x**6 +
2)) + 5*2**(2/3)*3**(3/4)*x*sqrt((2*2**(1/3)*x**4 - 2*2**(2/3)*x*
*2 + 4)/(x**2*(1 + sqrt(3)) + 2**(1/3))**2)*(-4*sqrt(3) + 4)*(x**
2 + 2**(1/3))*elliptic_f(acos((x**2*(-sqrt(3) + 1) + 2**(1/3))/(x
**2*(1 + sqrt(3)) + 2**(1/3))), sqrt(3)/4 + 1/2)/(384*sqrt(x**2*(
x**2 + 2**(1/3))/(x**2*(1 + sqrt(3)) + 2**(1/3))**2)*sqrt(x**6 +
2)) - x*(5/8 + 5*sqrt(3)/8)*sqrt(x**6 + 2)/(x**2*(1 + sqrt(3)) +
2**(1/3))
```

Mathematica [A] time = 0.83854, size = 279, normalized size = 0.71

$$\frac{6\left(x^6+2\right)x^6-\frac{30\left(1+\sqrt{3}\right)\left(x^6+2\right)x^2}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}+\frac{5\sqrt[3]{2}\sqrt[4]{3}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}x^2\left(\left(\sqrt{3}-3\right)F\left(\cos^{-1}\left(\frac{\sqrt[3]{2}-\left(-1+\sqrt{3}\right)x^2}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)\middle|\frac{1}{4}\left(2+\sqrt{3}\right)\right)+6E\left(\cos^{-1}\left(\frac{\sqrt[3]{2}-\left(-1+\sqrt{3}\right)x^2}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)\right)\right)}{\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}}}{48x\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^10/Sqrt[2 + x^6],x]
```

```
[Out] (6*x^6*(2 + x^6) - (30*(1 + Sqrt[3])*x^2*(2 + x^6))/(2^(1/3) + (1
 + Sqrt[3])*x^2) + (5*2^(1/3)*3^(1/4)*x^2*(2^(1/3) + x^2)*Sqrt[(2
^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*(6*E
```

```
llipticE[ArcCos[(2^(1/3) - (-1 + Sqrt[3])*x^2)/(2^(1/3) + (1 + Sq
rt[3])*x^2)], (2 + Sqrt[3])/4] + (-3 + Sqrt[3])*EllipticF[ArcCos[
(2^(1/3) - (-1 + Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3])*x^2)], (2
 + Sqrt[3])/4]))/Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/3) + (1 + Sqrt[
3])*x^2)^2])/(48*x*Sqrt[2 + x^6])
```

Maple [C] time = 0.049, size = 33, normalized size = 0.1

$$\frac{x^5}{8}\sqrt{x^6+2}-\frac{\sqrt{2}x^5}{8}{}_2\mathrm{F}_1(\frac{1}{2},\frac{5}{6};\ \frac{11}{6};\ -\frac{x^6}{2})$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^10/(x^6+2)^(1/2),x)
```

```
[Out] 1/8*x^5*(x^6+2)^(1/2)-1/8*2^(1/2)*x^5*hypergeom([1/2,5/6],[11/6],
-1/2*x^6)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{10}}{\sqrt{x^6+2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/sqrt(x^6 + 2),x, algorithm="maxima")
```

```
[Out] integrate(x^10/sqrt(x^6 + 2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x^{10}}{\sqrt{x^6+2}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/sqrt(x^6 + 2),x, algorithm="fricas")
```

```
[Out] integral(x^10/sqrt(x^6 + 2), x)
```

Sympy [A] time = 3.76557, size = 36, normalized size = 0.09

$$\frac{\sqrt{2}x^{11}\,\Gamma\left(\frac{11}{6}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{11}{6}\\ \frac{17}{6}\end{matrix}\middle|\frac{x^6e^{i\pi}}{2}\right)}{12\,\Gamma\left(\frac{17}{6}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**10/(x**6+2)**(1/2),x)
```

```
[Out] sqrt(2)*x**11*gamma(11/6)*hyper((1/2, 11/6), (17/6,), x**6*exp_po
lar(I*pi)/2)/(12*gamma(17/6))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{10}}{\sqrt{x^6+2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/sqrt(x^6 + 2),x, algorithm="giac")
```

```
[Out] integrate(x^10/sqrt(x^6 + 2), x)
```

3.1404 $\int \frac{x^4}{\sqrt{2+x^6}}\,dx$

Optimal. Leaf size=376

$$\frac{\left(1+\sqrt{3}\right)\sqrt{x^6+2}\,x}{2\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)}-\frac{\left(1-\sqrt{3}\right)\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\,xF\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{2\,2^{2/3}\sqrt[4]{3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}-\frac{\sqrt[4]{3}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\,xE\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{2^{2/3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}$$

```
[Out] ((1 + Sqrt[3])*x*Sqrt[2 + x^6])/(2*(2^(1/3) + (1 + Sqrt[3])*x^2))
 - (3^(1/4)*x*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/
(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*EllipticE[ArcCos[(2^(1/3) + (1 -
 Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3])*x^2)], (2 + Sqrt[3])/4])/
(2^(2/3)*Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/3) + (1 + Sqrt[3])*x^2)
^2]*Sqrt[2 + x^6]) - ((1 - Sqrt[3])*x*(2^(1/3) + x^2)*Sqrt[(2^(2/
3) - 2^(1/3)*x^2 + x^4)/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*Elliptic
F[ArcCos[(2^(1/3) + (1 - Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3])*x
^2)], (2 + Sqrt[3])/4])/(2*2^(2/3)*3^(1/4)*Sqrt[(x^2*(2^(1/3) + x
^2))/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*Sqrt[2 + x^6])
```

Rubi [A] time = 0.201722, antiderivative size = 376, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$

$$\frac{\left(1+\sqrt{3}\right)\sqrt{x^6+2}\,x}{2\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)}-\frac{\left(1-\sqrt{3}\right)\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\,xF\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{2\,2^{2/3}\sqrt[4]{3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}-\frac{\sqrt[4]{3}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\,xE\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{2^{2/3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/Sqrt[2 + x^6],x]
```


```
[Out] ((1 + Sqrt[3])*x*Sqrt[2 + x^6])/(2*(2^(1/3) + (1 + Sqrt[3])*x^2))
 - (3^(1/4)*x*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/
(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*EllipticE[ArcCos[(2^(1/3) + (1 -
 Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3])*x^2)], (2 + Sqrt[3])/4])/
(2^(2/3)*Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/3) + (1 + Sqrt[3])*x^2)
```

```
^2]*Sqrt[2 + x^6]) - ((1 - Sqrt[3])*x*(2^(1/3) + x^2)*Sqrt[(2^(2/
3) - 2^(1/3)*x^2 + x^4)/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*Elliptic
F[ArcCos[(2^(1/3) + (1 - Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3])*x
^2)], (2 + Sqrt[3])/4])/(2*2^(2/3)*3^(1/4)*Sqrt[(x^2*(2^(1/3) + x
^2))/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*Sqrt[2 + x^6])
```

Rubi in Sympy [A] time = 12.5239, size = 338, normalized size = 0.9

$$-\frac{2^{\frac{2}{3}}\sqrt[4]{3}x\sqrt{\frac{2\sqrt[3]{2}x^4-2\cdot 2^{\frac{2}{3}}x^2+4}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\left(x^2+\sqrt[3]{2}\right)E\left(\operatorname{acos}\left(\frac{x^2\left(-\sqrt{3}+1\right)+\sqrt[3]{2}}{x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}}\right)\middle|\frac{\sqrt{3}}{4}+\frac{1}{2}\right)}{4\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}-\frac{2^{\frac{2}{3}}\cdot 3^{\frac{3}{4}}x\sqrt{\frac{2\sqrt[3]{2}x^4-2\cdot 2^{\frac{2}{3}}x^2+4}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\left(-4\sqrt{3}+4\right)\left(x^2+\sqrt[3]{2}\right)F\left(\operatorname{acos}\left(\frac{x^2\left(-\sqrt{3}+1\right)+\sqrt[3]{2}}{x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}}\right)\middle|\frac{\sqrt{3}}{4}+\frac{1}{2}\right)}{96\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}+\frac{x\left(\frac{1}{2}+\frac{\sqrt{3}}{2}\right)\sqrt{x^6+2}}{x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(x**6+2)**(1/2),x)
```

```
[Out] -2**(2/3)*3**(1/4)*x*sqrt((2*2**(1/3)*x**4 - 2*2**(2/3)*x**2 + 4)
/(x**2*(1 + sqrt(3)) + 2**(1/3))**2)*(x**2 + 2**(1/3))*elliptic_e
(acos((x**2*(-sqrt(3) + 1) + 2**(1/3))/(x**2*(1 + sqrt(3)) + 2**(
1/3))), sqrt(3)/4 + 1/2)/(4*sqrt(x**2*(x**2 + 2**(1/3))/(x**2*(1
+ sqrt(3)) + 2**(1/3))**2)*sqrt(x**6 + 2)) - 2**(2/3)*3**(3/4)*x*
sqrt((2*2**(1/3)*x**4 - 2*2**(2/3)*x**2 + 4)/(x**2*(1 + sqrt(3))
+ 2**(1/3))**2)*(-4*sqrt(3) + 4)*(x**2 + 2**(1/3))*elliptic_f(aco
s((x**2*(-sqrt(3) + 1) + 2**(1/3))/(x**2*(1 + sqrt(3)) + 2**(1/3)
)), sqrt(3)/4 + 1/2)/(96*sqrt(x**2*(x**2 + 2**(1/3))/(x**2*(1 + s
qrt(3)) + 2**(1/3))**2)*sqrt(x**6 + 2)) + x*(1/2 + sqrt(3)/2)*sqr
t(x**6 + 2)/(x**2*(1 + sqrt(3)) + 2**(1/3))
```

Mathematica [A] time = 0.654361, size = 276, normalized size = 0.73

$$\frac{6\left(1+\sqrt{3}\right)x^2\left(x^6+2\right)+\sqrt[3]{2}\sqrt[4]{3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^3\left(-\left(\sqrt{3}-3\right)F\left(\cos^{-1}\left(\frac{\sqrt[3]{2}-\left(-1+\sqrt{3}\right)\ldots}{\left(1+\sqrt{3}\right)x^2+\ldots}\right.\right.\right.}{12x\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/Sqrt[2 + x^6],x]
```

```
[Out] (6*(1 + Sqrt[3])*x^2*(2 + x^6) + 2^(1/3)*3^(1/4)*Sqrt[(x^2*(2^(1/
3) + x^2))/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*(2^(1/3) + (1 + Sqrt[
3])*x^2)^3*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3) + (1 + Sqr
t[3])*x^2)^2]*(-6*EllipticE[ArcCos[(2^(1/3) - (-1 + Sqrt[3])*x^2)
/(2^(1/3) + (1 + Sqrt[3])*x^2)], (2 + Sqrt[3])/4] - (-3 + Sqrt[3]
)*EllipticF[ArcCos[(2^(1/3) - (-1 + Sqrt[3])*x^2)/(2^(1/3) + (1 +
 Sqrt[3])*x^2)], (2 + Sqrt[3])/4]))/(12*x*(2^(1/3) + (1 + Sqrt[3]
)*x^2)*Sqrt[2 + x^6])
```

Maple [C] time = 0.023, size = 20, normalized size = 0.1

$$\frac{\sqrt{2}x^5}{10}{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{5}{6};\frac{11}{6};-\frac{x^6}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(x^6+2)^(1/2),x)
```

```
[Out] 1/10*2^(1/2)*x^5*hypergeom([1/2,5/6],[11/6],-1/2*x^6)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\sqrt{x^6+2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(x^6 + 2),x, algorithm="maxima")
```

```
[Out] integrate(x^4/sqrt(x^6 + 2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x^4}{\sqrt{x^6+2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(x^6 + 2),x, algorithm="fricas")
```

```
[Out] integral(x^4/sqrt(x^6 + 2), x)
```

Sympy [A] time = 2.00661, size = 36, normalized size = 0.1

$$\frac{\sqrt{2}x^5\,\Gamma\left(\frac{5}{6}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{5}{6}\\ \frac{11}{6}\end{matrix}\middle|\frac{x^6e^{i\pi}}{2}\right)}{12\,\Gamma\left(\frac{11}{6}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(x**6+2)**(1/2),x)
```

```
[Out] sqrt(2)*x**5*gamma(5/6)*hyper((1/2, 5/6), (11/6,), x**6*exp_polar
(I*pi)/2)/(12*gamma(11/6))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\sqrt{x^6+2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(x^6 + 2),x, algorithm="giac")

[Out] integrate(x^4/sqrt(x^6 + 2), x)
```

3.1405 $\int \frac{1}{x^2\sqrt{2+x^6}}\,dx$

Optimal. Leaf size=392

$$-\frac{\sqrt{x^6+2}}{2x}+\frac{\left(1+\sqrt{3}\right)\sqrt{x^6+2}\,x}{2\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)}-\frac{\left(1-\sqrt{3}\right)\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\,xF\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{2\,2^{2/3}\sqrt[4]{3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}-\frac{\sqrt[4]{3}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\,xE\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{2^{2/3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}$$

```
[Out] -Sqrt[2 + x^6]/(2*x) + ((1 + Sqrt[3])*x*Sqrt[2 + x^6])/(2*(2^(1/3
) + (1 + Sqrt[3])*x^2)) - (3^(1/4)*x*(2^(1/3) + x^2)*Sqrt[(2^(2/3
) - 2^(1/3)*x^2 + x^4)/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*EllipticE
[ArcCos[(2^(1/3) + (1 - Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3])*x^
2)], (2 + Sqrt[3])/4])/(2^(2/3)*Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/
3) + (1 + Sqrt[3])*x^2)^2]*Sqrt[2 + x^6]) - ((1 - Sqrt[3])*x*(2^(
1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3) + (1 + Sq
rt[3])*x^2)^2]*EllipticF[ArcCos[(2^(1/3) + (1 - Sqrt[3])*x^2)/(2^
(1/3) + (1 + Sqrt[3])*x^2)], (2 + Sqrt[3])/4])/(2*2^(2/3)*3^(1/4)
*Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*Sqrt
[2 + x^6])
```

Rubi [A] time = 0.209219, antiderivative size = 392, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$-\frac{\sqrt{x^6+2}}{2x}+\frac{\left(1+\sqrt{3}\right)\sqrt{x^6+2}\,x}{2\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)}-\frac{\left(1-\sqrt{3}\right)\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\,xF\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{2\,2^{2/3}\sqrt[4]{3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}-\frac{\sqrt[4]{3}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\,xE\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{2^{2/3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*Sqrt[2 + x^6]),x]
```

```
[Out] -Sqrt[2 + x^6]/(2*x) + ((1 + Sqrt[3])*x*Sqrt[2 + x^6])/(2*(2^(1/3
) + (1 + Sqrt[3])*x^2)) - (3^(1/4)*x*(2^(1/3) + x^2)*Sqrt[(2^(2/3
) - 2^(1/3)*x^2 + x^4)/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*EllipticE
[ArcCos[(2^(1/3) + (1 - Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3])*x^
```

```
2)], (2 + Sqrt[3])/4])/(2^(2/3)*Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/
3) + (1 + Sqrt[3])*x^2)^2]*Sqrt[2 + x^6]) - ((1 - Sqrt[3])*x*(2^(
1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3) + (1 + Sq
rt[3])*x^2)^2]*EllipticF[ArcCos[(2^(1/3) + (1 - Sqrt[3])*x^2)/(2^
(1/3) + (1 + Sqrt[3])*x^2)], (2 + Sqrt[3])/4])/(2*2^(2/3)*3^(1/4)
*Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*Sqrt
[2 + x^6])
```

Rubi in Sympy [A] time = 14.1309, size = 350, normalized size = 0.89

$$-\frac{2^{\frac{2}{3}}\sqrt[4]{3}x\sqrt{\frac{2\sqrt[3]{2}x^4-2\cdot 2^{\frac{2}{3}}x^2+4}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\left(x^2+\sqrt[3]{2}\right)E\left(\operatorname{acos}\left(\frac{x^2\left(-\sqrt{3}+1\right)+\sqrt[3]{2}}{x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}}\right)\middle|\frac{\sqrt{3}}{4}+\frac{1}{2}\right)}{4\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}-\frac{2^{\frac{2}{3}}\cdot 3^{\frac{3}{4}}x\sqrt{\frac{2\sqrt[3]{2}x^4-2\cdot 2^{\frac{2}{3}}x^2+4}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\left(-4\sqrt{3}+4\right)\left(x^2+\sqrt[3]{2}\right)F\left(\operatorname{acos}\left(\frac{x^2\left(-\sqrt{3}+1\right)+\sqrt[3]{2}}{x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}}\right)\middle|\frac{\sqrt{3}}{4}+\frac{1}{2}\right)}{96\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}+\frac{x\left(\frac{1}{2}+\frac{\sqrt{3}}{2}\right)\sqrt{x^6+2}}{x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}}-\frac{\sqrt{x^6+2}}{2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(x**6+2)**(1/2),x)
```

```
[Out] -2**(2/3)*3**(1/4)*x*sqrt((2*2**(1/3)*x**4 - 2*2**(2/3)*x**2 + 4)
/(x**2*(1 + sqrt(3)) + 2**(1/3))**2)*(x**2 + 2**(1/3))*elliptic_e
(acos((x**2*(-sqrt(3) + 1) + 2**(1/3))/(x**2*(1 + sqrt(3)) + 2**(
1/3))), sqrt(3)/4 + 1/2)/(4*sqrt(x**2*(x**2 + 2**(1/3))/(x**2*(1
+ sqrt(3)) + 2**(1/3))**2)*sqrt(x**6 + 2)) - 2**(2/3)*3**(3/4)*x*
sqrt((2*2**(1/3)*x**4 - 2*2**(2/3)*x**2 + 4)/(x**2*(1 + sqrt(3))
+ 2**(1/3))**2)*(-4*sqrt(3) + 4)*(x**2 + 2**(1/3))*elliptic_f(aco
s((x**2*(-sqrt(3) + 1) + 2**(1/3))/(x**2*(1 + sqrt(3)) + 2**(1/3)
)), sqrt(3)/4 + 1/2)/(96*sqrt(x**2*(x**2 + 2**(1/3))/(x**2*(1 + s
qrt(3)) + 2**(1/3))**2)*sqrt(x**6 + 2)) + x*(1/2 + sqrt(3)/2)*sqr
t(x**6 + 2)/(x**2*(1 + sqrt(3)) + 2**(1/3)) - sqrt(x**6 + 2)/(2*x
)
```

Mathematica [A] time = 0.712329, size = 276, normalized size = 0.7

$$\frac{-6\left(x^6+2\right)+\frac{6\left(1+\sqrt{3}\right)\left(x^6+2\right)x^2}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}-\frac{\sqrt[3]{2}\sqrt[4]{3}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}x^2\left(\left(\sqrt{3}-3\right)F\left(\cos^{-1}\left(\frac{\sqrt[3]{2}-\left(-1+\sqrt{3}\right)x^2}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)\middle|\frac{1}{4}\left(2+\sqrt{3}\right)\right)+6E\left(\cos^{-1}\left(\frac{\sqrt[3]{2}-\left(-1+\sqrt{3}\right)x^2}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)\middle|\frac{1}{4}\cdots\right)\right)}{\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}}}{12x\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*Sqrt[2 + x^6]),x]
```

```
[Out] (-6*(2 + x^6) + (6*(1 + Sqrt[3])*x^2*(2 + x^6))/(2^(1/3) + (1 + S
qrt[3])*x^2) - (2^(1/3)*3^(1/4)*x^2*(2^(1/3) + x^2)*Sqrt[(2^(2/3)
 - 2^(1/3)*x^2 + x^4)/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*(6*Ellipti
```

```
cE[ArcCos[(2^(1/3) - (-1 + Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3])
*x^2)], (2 + Sqrt[3])/4] + (-3 + Sqrt[3])*EllipticF[ArcCos[(2^(1/
3) - (-1 + Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3])*x^2)], (2 + Sqr
t[3])/4]))/Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/3) + (1 + Sqrt[3])*x^
2)^2])/(12*x*Sqrt[2 + x^6])
```

Maple [C] time = 0.021, size = 33, normalized size = 0.1

$$-\frac{1}{2\,x}\sqrt{x^6+2}+\frac{\sqrt{2}x^5}{10}\,{}_2\mathrm{F}_1(\frac{1}{2},\frac{5}{6};\ \frac{11}{6};\ -\frac{x^6}{2})$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(x^6+2)^(1/2),x)
```

```
[Out] -1/2*(x^6+2)^(1/2)/x+1/10*2^(1/2)*x^5*hypergeom([1/2,5/6],[11/6],
-1/2*x^6)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^6+2x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^6 + 2)*x^2),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(x^6 + 2)*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{\sqrt{x^6+2x^2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^6 + 2)*x^2),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(x^6 + 2)*x^2), x)
```

Sympy [A] time = 2.02498, size = 37, normalized size = 0.09

$$\frac{\sqrt{2}\,\Gamma\left(-\frac{1}{6}\right)\,{}_2F_1\left(\begin{matrix}-\frac{1}{6},\frac{1}{2}\\ \frac{5}{6}\end{matrix}\middle|\frac{x^6e^{i\pi}}{2}\right)}{12x\,\Gamma\left(\frac{5}{6}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(x**6+2)**(1/2),x)
```

```
[Out] sqrt(2)*gamma(-1/6)*hyper((-1/6, 1/2), (5/6,), x**6*exp_polar(I*p
i)/2)/(12*x*gamma(5/6))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^6+2}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^6 + 2)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(x^6 + 2)*x^2), x)
```

3.1406 $\int \frac{x^{23}}{(2+x^6)^{3/2}}\,dx$

Optimal. Leaf size=51

$$\frac{1}{15}\left(x^6+2\right)^{5/2}-\frac{2}{3}\left(x^6+2\right)^{3/2}+4\sqrt{x^6+2}+\frac{8}{3\sqrt{x^6+2}}$$

```
[Out] 8/(3*Sqrt[2 + x^6]) + 4*Sqrt[2 + x^6] - (2*(2 + x^6)^(3/2))/3 + (
2 + x^6)^(5/2)/15
```

Rubi [A] time = 0.0461454, antiderivative size = 51, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{1}{15}\left(x^6+2\right)^{5/2}-\frac{2}{3}\left(x^6+2\right)^{3/2}+4\sqrt{x^6+2}+\frac{8}{3\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^23/(2 + x^6)^(3/2),x]
```

```
[Out] 8/(3*Sqrt[2 + x^6]) + 4*Sqrt[2 + x^6] - (2*(2 + x^6)^(3/2))/3 + (
2 + x^6)^(5/2)/15
```

Rubi in Sympy [A] time = 5.1518, size = 42, normalized size = 0.82

$$\frac{\left(x^6+2\right)^{\frac{5}{2}}}{15}-\frac{2\left(x^6+2\right)^{\frac{3}{2}}}{3}+4\sqrt{x^6+2}+\frac{8}{3\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**23/(x**6+2)**(3/2),x)
```

```
[Out] (x**6 + 2)**(5/2)/15 - 2*(x**6 + 2)**(3/2)/3 + 4*sqrt(x**6 + 2) +
 8/(3*sqrt(x**6 + 2))
```

Mathematica [A] time = 0.017889, size = 28, normalized size = 0.55

$$\frac{x^{18}-4x^{12}+32x^6+128}{15\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^23/(2 + x^6)^(3/2),x]
```

```
[Out] (128 + 32*x^6 - 4*x^12 + x^18)/(15*Sqrt[2 + x^6])
```

Maple [A] time = 0.006, size = 25, normalized size = 0.5

$$\frac{x^{18}-4\,x^{12}+32\,x^6+128}{15}\frac{1}{\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^23/(x^6+2)^(3/2),x)

[Out] 1/15*(x^18-4*x^12+32*x^6+128)/(x^6+2)^(1/2)
```

Maxima [A] time = 1.44514, size = 50, normalized size = 0.98

$$\frac{1}{15}\left(x^6+2\right)^{\frac{5}{2}} - \frac{2}{3}\left(x^6+2\right)^{\frac{3}{2}} + 4\sqrt{x^6+2} + \frac{8}{3\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^23/(x^6 + 2)^(3/2),x, algorithm="maxima")

[Out] 1/15*(x^6 + 2)^(5/2) - 2/3*(x^6 + 2)^(3/2) + 4*sqrt(x^6 + 2) + 8/
3/sqrt(x^6 + 2)
```

Fricas [A] time = 0.216945, size = 32, normalized size = 0.63

$$\frac{x^{18} - 4\,x^{12} + 32\,x^6 + 128}{15\,\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^23/(x^6 + 2)^(3/2),x, algorithm="fricas")

[Out] 1/15*(x^18 - 4*x^12 + 32*x^6 + 128)/sqrt(x^6 + 2)
```

Sympy [A] time = 47.1398, size = 54, normalized size = 1.06

$$\frac{x^{18}}{15\sqrt{x^6+2}} - \frac{4x^{12}}{15\sqrt{x^6+2}} + \frac{32x^6}{15\sqrt{x^6+2}} + \frac{128}{15\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**23/(x**6+2)**(3/2),x)

[Out] x**18/(15*sqrt(x**6 + 2)) - 4*x**12/(15*sqrt(x**6 + 2)) + 32*x**6
/(15*sqrt(x**6 + 2)) + 128/(15*sqrt(x**6 + 2))
```

GIAC/XCAS [A] time = 0.219925, size = 50, normalized size = 0.98

$$\frac{1}{15}\left(x^6+2\right)^{\frac{5}{2}} - \frac{2}{3}\left(x^6+2\right)^{\frac{3}{2}} + 4\sqrt{x^6+2} + \frac{8}{3\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^23/(x^6 + 2)^(3/2),x, algorithm="giac")

[Out] 1/15*(x^6 + 2)^(5/2) - 2/3*(x^6 + 2)^(3/2) + 4*sqrt(x^6 + 2) + 8/
3/sqrt(x^6 + 2)
```

3.1407 $\int \frac{x^{17}}{(2+x^6)^{3/2}}\,dx$

Optimal. Leaf size=40

$$\frac{1}{9}\left(x^6+2\right)^{3/2}-\frac{4\sqrt{x^6+2}}{3}-\frac{4}{3\sqrt{x^6+2}}$$

```
[Out] -4/(3*Sqrt[2 + x^6]) - (4*Sqrt[2 + x^6])/3 + (2 + x^6)^(3/2)/9
```

Rubi [A] time = 0.0402759, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{1}{9}\left(x^6+2\right)^{3/2}-\frac{4\sqrt{x^6+2}}{3}-\frac{4}{3\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^17/(2 + x^6)^(3/2),x]
```

```
[Out] -4/(3*Sqrt[2 + x^6]) - (4*Sqrt[2 + x^6])/3 + (2 + x^6)^(3/2)/9
```

Rubi in Sympy [A] time = 4.51056, size = 32, normalized size = 0.8

$$\frac{\left(x^6+2\right)^{\frac{3}{2}}}{9}-\frac{4\sqrt{x^6+2}}{3}-\frac{4}{3\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**17/(x**6+2)**(3/2),x)
```

```
[Out] (x**6 + 2)**(3/2)/9 - 4*sqrt(x**6 + 2)/3 - 4/(3*sqrt(x**6 + 2))
```

Mathematica [A] time = 0.0150235, size = 23, normalized size = 0.57

$$\frac{x^{12}-8x^6-32}{9\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^17/(2 + x^6)^(3/2),x]
```

```
[Out] (-32 - 8*x^6 + x^12)/(9*Sqrt[2 + x^6])
```

Maple [A] time = 0.008, size = 20, normalized size = 0.5

$${\frac{{x}^{12}-8\,{x}^{6}-32}{9}{\frac{1}{\sqrt{{x}^{6}+2}}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^17/(x^6+2)^(3/2),x)
```

```
[Out] 1/9*(x^12-8*x^6-32)/(x^6+2)^(1/2)
```

Maxima [A] time = 1.43212, size = 38, normalized size = 0.95

$$\frac{1}{9}\left(x^{6}+2\right)^{\frac{3}{2}}-\frac{4}{3}\sqrt{x^{6}+2}-\frac{4}{3\sqrt{x^{6}+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^17/(x^6 + 2)^(3/2),x, algorithm="maxima")
```

```
[Out] 1/9*(x^6 + 2)^(3/2) - 4/3*sqrt(x^6 + 2) - 4/3/sqrt(x^6 + 2)
```

Fricas [A] time = 0.215712, size = 26, normalized size = 0.65

$$\frac{x^{12}-8\,x^{6}-32}{9\sqrt{x^{6}+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^17/(x^6 + 2)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/9*(x^12 - 8*x^6 - 32)/sqrt(x^6 + 2)
```

Sympy [A] time = 19.2386, size = 39, normalized size = 0.98

$$\frac{x^{12}}{9\sqrt{x^{6}+2}}-\frac{8x^{6}}{9\sqrt{x^{6}+2}}-\frac{32}{9\sqrt{x^{6}+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**17/(x**6+2)**(3/2),x)
```

```
[Out] x**12/(9*sqrt(x**6 + 2)) - 8*x**6/(9*sqrt(x**6 + 2)) - 32/(9*sqrt
(x**6 + 2))
```

GIAC/XCAS [A] time = 0.2219, size = 38, normalized size = 0.95

$$\frac{1}{9}\left(x^{6}+2\right)^{\frac{3}{2}}-\frac{4}{3}\sqrt{x^{6}+2}-\frac{4}{3\sqrt{x^{6}+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^17/(x^6 + 2)^(3/2),x, algorithm="giac")
```

```
[Out] 1/9*(x^6 + 2)^(3/2) - 4/3*sqrt(x^6 + 2) - 4/3/sqrt(x^6 + 2)
```

3.1408 $\int \frac{x^{11}}{(2+x^6)^{3/2}}\,dx$

Optimal. Leaf size=27

$$\frac{\sqrt{x^6+2}}{3}+\frac{2}{3\sqrt{x^6+2}}$$

```
[Out] 2/(3*Sqrt[2 + x^6]) + Sqrt[2 + x^6]/3
```

Rubi [A] time = 0.0303273, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{\sqrt{x^6+2}}{3}+\frac{2}{3\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^11/(2 + x^6)^(3/2),x]

[Out] 2/(3*Sqrt[2 + x^6]) + Sqrt[2 + x^6]/3
```

Rubi in Sympy [A] time = 3.67452, size = 20, normalized size = 0.74

$$\frac{\sqrt{x^6+2}}{3}+\frac{2}{3\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11/(x**6+2)**(3/2),x)

[Out] sqrt(x**6 + 2)/3 + 2/(3*sqrt(x**6 + 2))
```

Mathematica [A] time = 0.0105169, size = 18, normalized size = 0.67

$$\frac{x^6+4}{3\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11/(2 + x^6)^(3/2),x]

[Out] (4 + x^6)/(3*Sqrt[2 + x^6])
```

Maple [A] time = 0.006, size = 15, normalized size = 0.6

$$\frac{x^6+4}{3}\frac{1}{\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11/(x^6+2)^(3/2),x)
```

```
[Out] 1/3*(x^6+4)/(x^6+2)^(1/2)
```

Maxima [A] time = 1.44236, size = 26, normalized size = 0.96

$$\frac{1}{3}\sqrt{x^6+2}+\frac{2}{3\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(x^6 + 2)^(3/2),x, algorithm="maxima")
```

```
[Out] 1/3*sqrt(x^6 + 2) + 2/3/sqrt(x^6 + 2)
```

Fricas [A] time = 0.219009, size = 19, normalized size = 0.7

$$\frac{x^6+4}{3\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(x^6 + 2)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/3*(x^6 + 4)/sqrt(x^6 + 2)
```

Sympy [A] time = 5.64897, size = 24, normalized size = 0.89

$$\frac{x^6}{3\sqrt{x^6+2}}+\frac{4}{3\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11/(x**6+2)**(3/2),x)
```

```
[Out] x**6/(3*sqrt(x**6 + 2)) + 4/(3*sqrt(x**6 + 2))
```

GIAC/XCAS [A] time = 0.220907, size = 26, normalized size = 0.96

$$\frac{1}{3}\sqrt{x^6+2}+\frac{2}{3\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/(x^6 + 2)^(3/2),x, algorithm="giac")
```

```
[Out] 1/3*sqrt(x^6 + 2) + 2/3/sqrt(x^6 + 2)
```

3.1409 $\int \frac{x^5}{(2+x^6)^{3/2}} dx$

Optimal. Leaf size=13

$$-\frac{1}{3\sqrt{x^6+2}}$$

```
[Out] -1/(3*Sqrt[2 + x^6])
```

Rubi [A] time = 0.00679804, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$-\frac{1}{3\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^5/(2 + x^6)^(3/2),x]

[Out] -1/(3*Sqrt[2 + x^6])
```

Rubi in Sympy [A] time = 1.67277, size = 12, normalized size = 0.92

$$-\frac{1}{3\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**5/(x**6+2)**(3/2),x)

[Out] -1/(3*sqrt(x**6 + 2))
```

Mathematica [A] time = 0.00474151, size = 13, normalized size = 1.

$$-\frac{1}{3\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5/(2 + x^6)^(3/2),x]

[Out] -1/(3*Sqrt[2 + x^6])
```

Maple [A] time = 0.005, size = 10, normalized size = 0.8

$$-\frac{1}{3}\frac{1}{\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5/(x^6+2)^(3/2),x)

[Out] -1/3/(x^6+2)^(1/2)
```

Maxima [A] time = 1.44099, size = 12, normalized size = 0.92

$$-\frac{1}{3\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(x^6 + 2)^(3/2),x, algorithm="maxima")
```

```
[Out] -1/3/sqrt(x^6 + 2)
```

Fricas [A] time = 0.216788, size = 12, normalized size = 0.92

$$-\frac{1}{3\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(x^6 + 2)^(3/2),x, algorithm="fricas")
```

```
[Out] -1/3/sqrt(x^6 + 2)
```

Sympy [A] time = 1.75664, size = 12, normalized size = 0.92

$$-\frac{1}{3\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(x**6+2)**(3/2),x)
```

```
[Out] -1/(3*sqrt(x**6 + 2))
```

GIAC/XCAS [A] time = 0.217841, size = 12, normalized size = 0.92

$$-\frac{1}{3\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(x^6 + 2)^(3/2),x, algorithm="giac")
```

```
[Out] -1/3/sqrt(x^6 + 2)
```

3.1410 $\int \frac{1}{x(2+x^6)^{3/2}}\,dx$

Optimal. Leaf size=39

$$\frac{1}{6\sqrt{x^6+2}}-\frac{\tanh^{-1}\left(\frac{\sqrt{x^6+2}}{\sqrt{2}}\right)}{6\sqrt{2}}$$

```
[Out] 1/(6*Sqrt[2 + x^6]) - ArcTanh[Sqrt[2 + x^6]/Sqrt[2]]/(6*Sqrt[2])
```

Rubi [A] time = 0.0451154, antiderivative size = 39, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{1}{6\sqrt{x^6+2}}-\frac{\tanh^{-1}\left(\frac{\sqrt{x^6+2}}{\sqrt{2}}\right)}{6\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(2 + x^6)^(3/2)),x]

[Out] 1/(6*Sqrt[2 + x^6]) - ArcTanh[Sqrt[2 + x^6]/Sqrt[2]]/(6*Sqrt[2])
```

Rubi in Sympy [A] time = 4.36297, size = 34, normalized size = 0.87

$$-\frac{\sqrt{2}\operatorname{atanh}\left(\frac{\sqrt{2}\sqrt{x^6+2}}{2}\right)}{12}+\frac{1}{6\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(x**6+2)**(3/2),x)

[Out] -sqrt(2)*atanh(sqrt(2)*sqrt(x**6 + 2)/2)/12 + 1/(6*sqrt(x**6 + 2)
)
```

Mathematica [A] time = 0.0454155, size = 39, normalized size = 1.

$$\frac{1}{6\sqrt{x^6+2}}-\frac{\tanh^{-1}\left(\frac{\sqrt{x^6+2}}{\sqrt{2}}\right)}{6\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(2 + x^6)^(3/2)),x]

[Out] 1/(6*Sqrt[2 + x^6]) - ArcTanh[Sqrt[2 + x^6]/Sqrt[2]]/(6*Sqrt[2])
```

Maple [A] time = 0.027, size = 36, normalized size = 0.9

$$\frac{1}{6}\frac{1}{\sqrt{x^6+2}}+\frac{\sqrt{2}}{12}\ln\left(1\left(\sqrt{x^6+2}-\sqrt{2}\right)\frac{1}{\sqrt{x^6}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(x^6+2)^(3/2),x)
```

```
[Out] 1/6/(x^6+2)^(1/2)+1/12*2^(1/2)*ln(((x^6+2)^(1/2)-2^(1/2))/(x^6)^(
1/2))
```

Maxima [A] time = 1.59787, size = 62, normalized size = 1.59

$$\frac{1}{24}\sqrt{2}\log\left(-\frac{2\left(\sqrt{2}-\sqrt{x^6+2}\right)}{2\sqrt{2}+2\sqrt{x^6+2}}\right)+\frac{1}{6\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 2)^(3/2)*x),x, algorithm="maxima")
```

```
[Out] 1/24*sqrt(2)*log(-2*(sqrt(2) - sqrt(x^6 + 2))/((2*sqrt(2)) + 2*sq
rt(x^6 + 2))) + 1/6/sqrt(x^6 + 2)
```

Fricas [A] time = 0.221216, size = 68, normalized size = 1.74

$$\frac{\sqrt{2}\left(\sqrt{x^6+2}\log\left(\frac{\sqrt{2}(x^6+4)-4\sqrt{x^6+2}}{x^6}\right)+2\sqrt{2}\right)}{24\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 2)^(3/2)*x),x, algorithm="fricas")
```

```
[Out] 1/24*sqrt(2)*(sqrt(x^6 + 2)*log((sqrt(2)*(x^6 + 4) - 4*sqrt(x^6 +
 2))/x^6) + 2*sqrt(2))/sqrt(x^6 + 2)
```

Sympy [A] time = 4.97472, size = 194, normalized size = 4.97

$$\frac{x^6\log\left(x^6\right)}{12\sqrt{2}x^6+24\sqrt{2}}-\frac{2x^6\log\left(\sqrt{\frac{x^6}{2}+1}+1\right)}{12\sqrt{2}x^6+24\sqrt{2}}-\frac{x^6\log\left(2\right)}{12\sqrt{2}x^6+24\sqrt{2}}+\frac{2\sqrt{2}\sqrt{x^6+2}}{12\sqrt{2}x^6+24\sqrt{2}}+\frac{2\log\left(x^6\right)}{12\sqrt{2}x^6+24\sqrt{2}}-\frac{4\log\left(\sqrt{\frac{x^6}{2}+1}+1\right)}{12\sqrt{2}x^6+24\sqrt{2}}-\frac{2\log\left(2\right)}{12\sqrt{2}x^6+24\sqrt{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(x**6+2)**(3/2),x)
```

```
[Out] x**6*log(x**6)/(12*sqrt(2)*x**6 + 24*sqrt(2)) - 2*x**6*log(sqrt(x
**6/2 + 1) + 1)/(12*sqrt(2)*x**6 + 24*sqrt(2)) - x**6*log(2)/(12*
sqrt(2)*x**6 + 24*sqrt(2)) + 2*sqrt(2)*sqrt(x**6 + 2)/(12*sqrt(2)
*x**6 + 24*sqrt(2)) + 2*log(x**6)/(12*sqrt(2)*x**6 + 24*sqrt(2))
- 4*log(sqrt(x**6/2 + 1) + 1)/(12*sqrt(2)*x**6 + 24*sqrt(2)) - 2*
log(2)/(12*sqrt(2)*x**6 + 24*sqrt(2))
```

GIAC/XCAS [A] time = 0.221499, size = 59, normalized size = 1.51

$$\frac{1}{24}\sqrt{2}\ln\left(-\frac{\sqrt{2}-\sqrt{x^6+2}}{\sqrt{2}+\sqrt{x^6+2}}\right)+\frac{1}{6\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 2)^(3/2)*x),x, algorithm="giac")
```

```
[Out] 1/24*sqrt(2)*ln(-(sqrt(2) - sqrt(x^6 + 2))/(sqrt(2) + sqrt(x^6 +
2))) + 1/6/sqrt(x^6 + 2)
```

3.1411 $\int \frac{1}{x^7(2+x^6)^{3/2}}\,dx$

Optimal. Leaf size=58

$$-\frac{\sqrt{x^6+2}}{8x^6}+\frac{1}{6x^6\sqrt{x^6+2}}+\frac{\tanh^{-1}\left(\frac{\sqrt{x^6+2}}{\sqrt{2}}\right)}{8\sqrt{2}}$$

```
[Out] 1/(6*x^6*Sqrt[2 + x^6]) - Sqrt[2 + x^6]/(8*x^6) + ArcTanh[Sqrt[2
+ x^6]/Sqrt[2]]/(8*Sqrt[2])
```

Rubi [A] time = 0.0583377, antiderivative size = 58, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$-\frac{\sqrt{x^6+2}}{8x^6}+\frac{1}{6x^6\sqrt{x^6+2}}+\frac{\tanh^{-1}\left(\frac{\sqrt{x^6+2}}{\sqrt{2}}\right)}{8\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^7*(2 + x^6)^(3/2)),x]
```

```
[Out] 1/(6*x^6*Sqrt[2 + x^6]) - Sqrt[2 + x^6]/(8*x^6) + ArcTanh[Sqrt[2
+ x^6]/Sqrt[2]]/(8*Sqrt[2])
```

Rubi in Sympy [A] time = 5.23687, size = 51, normalized size = 0.88

$$\frac{\sqrt{2}\,\operatorname{atanh}\left(\frac{\sqrt{2}\sqrt{x^6+2}}{2}\right)}{16}-\frac{\sqrt{x^6+2}}{8x^6}+\frac{1}{6x^6\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**7/(x**6+2)**(3/2),x)
```

```
[Out] sqrt(2)*atanh(sqrt(2)*sqrt(x**6 + 2)/2)/16 - sqrt(x**6 + 2)/(8*x*
*6) + 1/(6*x**6*sqrt(x**6 + 2))
```

Mathematica [A] time = 0.072966, size = 49, normalized size = 0.84

$$\frac{1}{48}\left(3\sqrt{2}\tanh^{-1}\left(\frac{\sqrt{x^6+2}}{\sqrt{2}}\right)-\frac{2\left(3x^6+2\right)}{x^6\sqrt{x^6+2}}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^7*(2 + x^6)^(3/2)),x]
```

```
[Out] ((-2*(2 + 3*x^6))/(x^6*Sqrt[2 + x^6]) + 3*Sqrt[2]*ArcTanh[Sqrt[2
+ x^6]/Sqrt[2]])/48
```

Maple [A] time = 0.031, size = 46, normalized size = 0.8

$$-\frac{3\,x^6+2}{24\,x^6}\frac{1}{\sqrt{x^6+2}}-\frac{\sqrt{2}}{16}\ln\left(1\left(\sqrt{x^6+2}-\sqrt{2}\right)\frac{1}{\sqrt{x^6}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^7/(x^6+2)^(3/2),x)
```

```
[Out] -1/24*(3*x^6+2)/x^6/(x^6+2)^(1/2)-1/16*2^(1/2)*ln(((x^6+2)^(1/2)-
2^(1/2))/(x^6)^(1/2))
```

Maxima [A] time = 1.59194, size = 88, normalized size = 1.52

$$-\frac{1}{32}\sqrt{2}\log\left(-\frac{2\left(\sqrt{2}-\sqrt{x^6+2}\right)}{2\sqrt{2}+2\sqrt{x^6+2}}\right)-\frac{3x^6+2}{24\left((x^6+2)^{\frac{3}{2}}-2\sqrt{x^6+2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((x^6 + 2)^(3/2)*x^7),x, algorithm="maxima")
```

```
[Out] -1/32*sqrt(2)*log(-2*(sqrt(2) - sqrt(x^6 + 2))/((2*sqrt(2)) + 2*s
qrt(x^6 + 2))) - 1/24*(3*x^6 + 2)/((x^6 + 2)^(3/2) - 2*sqrt(x^6 +
 2))
```

Fricas [A] time = 0.220217, size = 86, normalized size = 1.48

$$\frac{\sqrt{2}\left(3\sqrt{x^6+2}x^6\log\left(\frac{\sqrt{2}(x^6+4)+4\sqrt{x^6+2}}{x^6}\right)-2\sqrt{2}\left(3x^6+2\right)\right)}{96\sqrt{x^6+2}x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((x^6 + 2)^(3/2)*x^7),x, algorithm="fricas")
```

```
[Out] 1/96*sqrt(2)*(3*sqrt(x^6 + 2)*x^6*log((sqrt(2)*(x^6 + 4) + 4*sqrt
(x^6 + 2))/x^6) - 2*sqrt(2)*(3*x^6 + 2))/(sqrt(x^6 + 2)*x^6)
```

Sympy [A] time = 10.5817, size = 49, normalized size = 0.84

$$\frac{\sqrt{2}\operatorname{asinh}\left(\frac{\sqrt{2}}{x^3}\right)}{16}-\frac{1}{8x^3\sqrt{1+\frac{2}{x^6}}}-\frac{1}{12x^9\sqrt{1+\frac{2}{x^6}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/x**7/(x**6+2)**(3/2),x)
```

```
[Out] sqrt(2)*asinh(sqrt(2)/x**3)/16 - 1/(8*x**3*sqrt(1 + 2/x**6)) - 1/
(12*x**9*sqrt(1 + 2/x**6))
```

GIAC/XCAS [A] time = 0.22471, size = 85, normalized size = 1.47

$$-\frac{1}{32}\sqrt{2}\ln\left(-\frac{\sqrt{2}-\sqrt{x^6+2}}{\sqrt{2}+\sqrt{x^6+2}}\right)-\frac{3x^6+2}{24\left((x^6+2)^{\frac{3}{2}}-2\sqrt{x^6+2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 2)^(3/2)*x^7),x, algorithm="giac")

[Out] -1/32*sqrt(2)*ln(-(sqrt(2) - sqrt(x^6 + 2))/(sqrt(2) + sqrt(x^6 +
 2))) - 1/24*(3*x^6 + 2)/((x^6 + 2)^(3/2) - 2*sqrt(x^6 + 2))
```

3.1412 $\int \frac{1}{x^{13}(2+x^6)^{3/2}}\,dx$

Optimal. Leaf size=74

$$\frac{5\sqrt{x^6+2}}{64x^6}-\frac{5\tanh^{-1}\left(\frac{\sqrt{x^6+2}}{\sqrt{2}}\right)}{64\sqrt{2}}-\frac{5\sqrt{x^6+2}}{48x^{12}}+\frac{1}{6x^{12}\sqrt{x^6+2}}$$

```
[Out] 1/(6*x^12*Sqrt[2 + x^6]) - (5*Sqrt[2 + x^6])/(48*x^12) + (5*Sqrt[
2 + x^6])/(64*x^6) - (5*ArcTanh[Sqrt[2 + x^6]/Sqrt[2]])/(64*Sqrt[
2])
```

Rubi [A] time = 0.0742879, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{5\sqrt{x^6+2}}{64x^6}-\frac{5\tanh^{-1}\left(\frac{\sqrt{x^6+2}}{\sqrt{2}}\right)}{64\sqrt{2}}-\frac{5\sqrt{x^6+2}}{48x^{12}}+\frac{1}{6x^{12}\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^13*(2 + x^6)^(3/2)),x]
```

```
[Out] 1/(6*x^12*Sqrt[2 + x^6]) - (5*Sqrt[2 + x^6])/(48*x^12) + (5*Sqrt[
2 + x^6])/(64*x^6) - (5*ArcTanh[Sqrt[2 + x^6]/Sqrt[2]])/(64*Sqrt[
2])
```

Rubi in Sympy [A] time = 6.11277, size = 70, normalized size = 0.95

$$-\frac{5\sqrt{2}\,\operatorname{atanh}\left(\frac{\sqrt{2}\sqrt{x^6+2}}{2}\right)}{128}+\frac{5\sqrt{x^6+2}}{64x^6}-\frac{5\sqrt{x^6+2}}{48x^{12}}+\frac{1}{6x^{12}\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**13/(x**6+2)**(3/2),x)
```

```
[Out] -5*sqrt(2)*atanh(sqrt(2)*sqrt(x**6 + 2)/2)/128 + 5*sqrt(x**6 + 2)
/(64*x**6) - 5*sqrt(x**6 + 2)/(48*x**12) + 1/(6*x**12*sqrt(x**6 +
 2))
```

Mathematica [A] time = 0.080524, size = 54, normalized size = 0.73

$$\frac{1}{384}\left(\frac{2\left(15x^{12}+10x^6-8\right)}{x^{12}\sqrt{x^6+2}}-15\sqrt{2}\tanh^{-1}\left(\frac{\sqrt{x^6+2}}{\sqrt{2}}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^13*(2 + x^6)^(3/2)),x]
```

```
[Out] ((2*(-8 + 10*x^6 + 15*x^12))/(x^12*Sqrt[2 + x^6]) - 15*Sqrt[2]*Ar
cTanh[Sqrt[2 + x^6]/Sqrt[2]])/384
```

Maple [A] time = 0.037, size = 51, normalized size = 0.7

$$\frac{15\,x^{12}+10\,x^6-8}{192\,x^{12}}\frac{1}{\sqrt{x^6+2}}+\frac{5\sqrt{2}}{128}\ln\left(1\left(\sqrt{x^6+2}-\sqrt{2}\right)\frac{1}{\sqrt{x^6}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^13/(x^6+2)^(3/2),x)
```

```
[Out] 1/192*(15*x^12+10*x^6-8)/x^12/(x^6+2)^(1/2)+5/128*2^(1/2)*ln(((x^
6+2)^(1/2)-2^(1/2))/(x^6)^(1/2))
```

Maxima [A] time = 1.58968, size = 112, normalized size = 1.51

$$\frac{5}{256}\,\sqrt{2}\log\left(-\frac{2\left(\sqrt{2}-\sqrt{x^6+2}\right)}{2\,\sqrt{2}+2\,\sqrt{x^6+2}}\right)-\frac{50\,x^6-15\,\left(x^6+2\right)^2+68}{192\,\left(\left(x^6+2\right)^{\frac{5}{2}}-4\,\left(x^6+2\right)^{\frac{3}{2}}+4\,\sqrt{x^6+2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((x^6 + 2)^(3/2)*x^13),x, algorithm="maxima")
```

```
[Out] 5/256*sqrt(2)*log(-2*(sqrt(2) - sqrt(x^6 + 2))/((2*sqrt(2)) + 2*s
qrt(x^6 + 2))) - 1/192*(50*x^6 - 15*(x^6 + 2)^2 + 68)/((x^6 + 2)^
(5/2) - 4*(x^6 + 2)^(3/2) + 4*sqrt(x^6 + 2))
```

Fricas [A] time = 0.222825, size = 93, normalized size = 1.26

$$\frac{\sqrt{2}\left(15\,\sqrt{x^6+2}x^{12}\log\left(\frac{\sqrt{2}(x^6+4)-4\,\sqrt{x^6+2}}{x^6}\right)+2\,\sqrt{2}\left(15\,x^{12}+10\,x^6-8\right)\right)}{768\,\sqrt{x^6+2}x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((x^6 + 2)^(3/2)*x^13),x, algorithm="fricas")
```

```
[Out] 1/768*sqrt(2)*(15*sqrt(x^6 + 2)*x^12*log((sqrt(2)*(x^6 + 4) - 4*s
qrt(x^6 + 2))/x^6) + 2*sqrt(2)*(15*x^12 + 10*x^6 - 8))/(sqrt(x^6
+ 2)*x^12)
```

Sympy [A] time = 25.5599, size = 68, normalized size = 0.92

$$-\frac{5\sqrt{2}\operatorname{asinh}\left(\frac{\sqrt{2}}{x^3}\right)}{128}+\frac{5}{64x^3\sqrt{1+\frac{2}{x^6}}}+\frac{5}{96x^9\sqrt{1+\frac{2}{x^6}}}-\frac{1}{24x^{15}\sqrt{1+\frac{2}{x^6}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/x**13/(x**6+2)**(3/2),x)
```

```
[Out] -5*sqrt(2)*asinh(sqrt(2)/x**3)/128 + 5/(64*x**3*sqrt(1 + 2/x**6))
 + 5/(96*x**9*sqrt(1 + 2/x**6)) - 1/(24*x**15*sqrt(1 + 2/x**6))
```

GIAC/XCAS [A] time = 0.223227, size = 92, normalized size = 1.24

$$\frac{5}{256}\,\sqrt{2}\ln\left(-\frac{\sqrt{2}-\sqrt{x^6+2}}{\sqrt{2}+\sqrt{x^6+2}}\right)+\frac{1}{24\,\sqrt{x^6+2}}+\frac{7\,\left(x^6+2\right)^{\frac{3}{2}}-18\,\sqrt{x^6+2}}{192\,x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 2)^(3/2)*x^13),x, algorithm="giac")
```

```
[Out] 5/256*sqrt(2)*ln(-(sqrt(2) - sqrt(x^6 + 2))/(sqrt(2) + sqrt(x^6 +
 2))) + 1/24/sqrt(x^6 + 2) + 1/192*(7*(x^6 + 2)^(3/2) - 18*sqrt(x
^6 + 2))/x^12
```

3.1413 $\int \frac{x^{14}}{(2+x^6)^{3/2}}\,dx$

Optimal. Leaf size=45

$$-\sinh^{-1}\left(\frac{x^3}{\sqrt{2}}\right)-\frac{x^9}{3\sqrt{x^6+2}}+\frac{1}{2}\sqrt{x^6+2}x^3$$

```
[Out] -x^9/(3*Sqrt[2 + x^6]) + (x^3*Sqrt[2 + x^6])/2 - ArcSinh[x^3/Sqrt
[2]]
```

Rubi [A] time = 0.055127, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$-\sinh^{-1}\left(\frac{x^3}{\sqrt{2}}\right)-\frac{x^9}{3\sqrt{x^6+2}}+\frac{1}{2}\sqrt{x^6+2}x^3$$

Antiderivative was successfully verified.

```
[In] Int[x^14/(2 + x^6)^(3/2),x]
```

```
[Out] -x^9/(3*Sqrt[2 + x^6]) + (x^3*Sqrt[2 + x^6])/2 - ArcSinh[x^3/Sqrt
[2]]
```

Rubi in Sympy [A] time = 6.49788, size = 37, normalized size = 0.82

$$-\frac{x^9}{3\sqrt{x^6+2}}+\frac{x^3\sqrt{x^6+2}}{2}-\operatorname{asinh}\left(\frac{\sqrt{2}x^3}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**14/(x**6+2)**(3/2),x)
```

```
[Out] -x**9/(3*sqrt(x**6 + 2)) + x**3*sqrt(x**6 + 2)/2 - asinh(sqrt(2)*
x**3/2)
```

Mathematica [A] time = 0.0386232, size = 43, normalized size = 0.96

$$\frac{x^9+6x^3-6\sqrt{x^6+2}\sinh^{-1}\left(\frac{x^3}{\sqrt{2}}\right)}{6\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^14/(2 + x^6)^(3/2),x]
```

```
[Out] (6*x^3 + x^9 - 6*Sqrt[2 + x^6]*ArcSinh[x^3/Sqrt[2]])/(6*Sqrt[2 +
x^6])
```

Maple [A] time = 0.034, size = 30, normalized size = 0.7

$$\frac{x^3\left(x^6+6\right)}{6}\frac{1}{\sqrt{x^6+2}}-\mathit{Arcsinh}\left(\frac{x^3\sqrt{2}}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^14/(x^6+2)^(3/2),x)
```

```
[Out] 1/6*x^3*(x^6+6)/(x^6+2)^(1/2)-arcsinh(1/2*x^3*2^(1/2))
```

Maxima [A] time = 1.436, size = 99, normalized size = 2.2

$$-\frac{\frac{3\,(x^6+2)}{x^6}-2}{3\left(\frac{\sqrt{x^6+2}}{x^3}-\frac{(x^6+2)^{\frac{3}{2}}}{x^9}\right)}-\frac{1}{2}\,\log\left(\frac{\sqrt{x^6+2}}{x^3}+1\right)+\frac{1}{2}\,\log\left(\frac{\sqrt{x^6+2}}{x^3}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^14/(x^6 + 2)^(3/2),x, algorithm="maxima")
```

```
[Out] -1/3*(3*(x^6 + 2)/x^6 - 2)/(sqrt(x^6 + 2)/x^3 - (x^6 + 2)^(3/2)/x
^9) - 1/2*log(sqrt(x^6 + 2)/x^3 + 1) + 1/2*log(sqrt(x^6 + 2)/x^3
- 1)
```

Fricas [A] time = 0.220444, size = 170, normalized size = 3.78

$$-\frac{2\,x^{18}+7\,x^{12}-2\,x^{6}-6\left(2\,x^{12}+5\,x^{6}-\left(2\,x^{9}+3\,x^{3}\right)\sqrt{x^{6}+2}+2\right)\log\left(-x^{3}+\sqrt{x^{6}+2}\right)-\left(2\,x^{15}+5\,x^{9}-6\,x^{3}\right)\sqrt{x^{6}+2}-8}{6\left(2\,x^{12}+5\,x^{6}-(2\,x^{9}+3\,x^{3})\sqrt{x^{6}+2}+2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^14/(x^6 + 2)^(3/2),x, algorithm="fricas")
```

```
[Out] -1/6*(2*x^18 + 7*x^12 - 2*x^6 - 6*(2*x^12 + 5*x^6 - (2*x^9 + 3*x^
3)*sqrt(x^6 + 2) + 2)*log(-x^3 + sqrt(x^6 + 2)) - (2*x^15 + 5*x^9
 - 6*x^3)*sqrt(x^6 + 2) - 8)/(2*x^12 + 5*x^6 - (2*x^9 + 3*x^3)*sq
rt(x^6 + 2) + 2)
```

Sympy [A] time = 14.939, size = 36, normalized size = 0.8

$$\frac{x^9}{6\sqrt{x^6+2}}+\frac{x^3}{\sqrt{x^6+2}}-\operatorname{asinh}\left(\frac{\sqrt{2}x^3}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**14/(x**6+2)**(3/2),x)
```

```
[Out] x**9/(6*sqrt(x**6 + 2)) + x**3/sqrt(x**6 + 2) - asinh(sqrt(2)*x**
3/2)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{14}}{(x^6+2)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^14/(x^6 + 2)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^14/(x^6 + 2)^(3/2), x)
```

3.1414 $\int \frac{x^8}{(2+x^6)^{3/2}}\,dx$

Optimal. Leaf size=31

$$\frac{1}{3}\sinh^{-1}\left(\frac{x^3}{\sqrt{2}}\right)-\frac{x^3}{3\sqrt{x^6+2}}$$

```
[Out] -x^3/(3*Sqrt[2 + x^6]) + ArcSinh[x^3/Sqrt[2]]/3
```

Rubi [A] time = 0.0352522, antiderivative size = 31, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{1}{3}\sinh^{-1}\left(\frac{x^3}{\sqrt{2}}\right)-\frac{x^3}{3\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8/(2 + x^6)^(3/2),x]

[Out] -x^3/(3*Sqrt[2 + x^6]) + ArcSinh[x^3/Sqrt[2]]/3
```

Rubi in Sympy [A] time = 4.45744, size = 26, normalized size = 0.84

$$-\frac{x^3}{3\sqrt{x^6+2}}+\frac{\operatorname{asinh}\left(\frac{\sqrt{2}x^3}{2}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8/(x**6+2)**(3/2),x)

[Out] -x**3/(3*sqrt(x**6 + 2)) + asinh(sqrt(2)*x**3/2)/3
```

Mathematica [A] time = 0.0236983, size = 31, normalized size = 1.

$$\frac{1}{3}\sinh^{-1}\left(\frac{x^3}{\sqrt{2}}\right)-\frac{x^3}{3\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8/(2 + x^6)^(3/2),x]

[Out] -x^3/(3*Sqrt[2 + x^6]) + ArcSinh[x^3/Sqrt[2]]/3
```

Maple [A] time = 0.019, size = 25, normalized size = 0.8

$$\frac{1}{3}Arcsinh\left(\frac{x^3\sqrt{2}}{2}\right)-\frac{x^3}{3}\frac{1}{\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8/(x^6+2)^(3/2),x)
```

```
[Out] 1/3*arcsinh(1/2*x^3*2^(1/2))-1/3*x^3/(x^6+2)^(1/2)
```

Maxima [A] time = 1.44025, size = 61, normalized size = 1.97

$$-\frac{x^3}{3\sqrt{x^6+2}}+\frac{1}{6}\log\left(\frac{\sqrt{x^6+2}}{x^3}+1\right)-\frac{1}{6}\log\left(\frac{\sqrt{x^6+2}}{x^3}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(x^6 + 2)^(3/2),x, algorithm="maxima")
```

```
[Out] -1/3*x^3/sqrt(x^6 + 2) + 1/6*log(sqrt(x^6 + 2)/x^3 + 1) - 1/6*log
(sqrt(x^6 + 2)/x^3 - 1)
```

Fricas [A] time = 0.220378, size = 74, normalized size = 2.39

$$-\frac{\left(x^6-\sqrt{x^6+2}x^3+2\right)\log\left(-x^3+\sqrt{x^6+2}\right)+2}{3\left(x^6-\sqrt{x^6+2}x^3+2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(x^6 + 2)^(3/2),x, algorithm="fricas")
```

```
[Out] -1/3*((x^6 - sqrt(x^6 + 2)*x^3 + 2)*log(-x^3 + sqrt(x^6 + 2)) + 2
)/(x^6 - sqrt(x^6 + 2)*x^3 + 2)
```

Sympy [A] time = 5.63531, size = 26, normalized size = 0.84

$$-\frac{x^3}{3\sqrt{x^6+2}}+\frac{\operatorname{asinh}\left(\frac{\sqrt{2}x^3}{2}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8/(x**6+2)**(3/2),x)
```

```
[Out] -x**3/(3*sqrt(x**6 + 2)) + asinh(sqrt(2)*x**3/2)/3
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^8}{\left(x^6+2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(x^6 + 2)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^8/(x^6 + 2)^(3/2), x)
```

3.1415 $\int \frac{x^2}{(2+x^6)^{3/2}} dx$

Optimal. Leaf size=16

$$\frac{x^3}{6\sqrt{x^6+2}}$$

```
[Out] x^3/(6*Sqrt[2 + x^6])
```

Rubi [A] time = 0.0136617, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{x^3}{6\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(2 + x^6)^(3/2),x]

[Out] x^3/(6*Sqrt[2 + x^6])
```

Rubi in Sympy [A] time = 2.28054, size = 12, normalized size = 0.75

$$\frac{x^3}{6\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**2/(x**6+2)**(3/2),x)

[Out] x**3/(6*sqrt(x**6 + 2))
```

Mathematica [A] time = 0.00915727, size = 16, normalized size = 1.

$$\frac{x^3}{6\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(2 + x^6)^(3/2),x]

[Out] x^3/(6*Sqrt[2 + x^6])
```

Maple [A] time = 0.005, size = 13, normalized size = 0.8

$$\frac{x^3}{6}\frac{1}{\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(x^6+2)^(3/2),x)
```

```
[Out] 1/6*x^3/(x^6+2)^(1/2)
```

Maxima [A] time = 1.43471, size = 16, normalized size = 1.

$$\frac{x^3}{6\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(x^6 + 2)^(3/2),x, algorithm="maxima")
```

```
[Out] 1/6*x^3/sqrt(x^6 + 2)
```

Fricas [A] time = 0.225076, size = 28, normalized size = 1.75

$$\frac{1}{3\left(x^6-\sqrt{x^6+2}x^3+2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(x^6 + 2)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/3/(x^6 - sqrt(x^6 + 2)*x^3 + 2)
```

Sympy [A] time = 1.62997, size = 12, normalized size = 0.75

$$\frac{x^3}{6\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(x**6+2)**(3/2),x)
```

```
[Out] x**3/(6*sqrt(x**6 + 2))
```

GIAC/XCAS [A] time = 0.228558, size = 16, normalized size = 1.

$$\frac{x^3}{6\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(x^6 + 2)^(3/2),x, algorithm="giac")
```

```
[Out] 1/6*x^3/sqrt(x^6 + 2)
```

3.1416 $\int \frac{1}{x^4(2+x^6)^{3/2}}\,dx$

Optimal. Leaf size=33

$$-\frac{x^3}{6\sqrt{x^6+2}}-\frac{1}{6\sqrt{x^6+2}x^3}$$

```
[Out] -1/(6*x^3*Sqrt[2 + x^6]) - x^3/(6*Sqrt[2 + x^6])
```

Rubi [A] time = 0.0243014, antiderivative size = 33, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{x^3}{6\sqrt{x^6+2}}-\frac{1}{6\sqrt{x^6+2}x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*(2 + x^6)^(3/2)),x]

[Out] -1/(6*x^3*Sqrt[2 + x^6]) - x^3/(6*Sqrt[2 + x^6])
```

Rubi in Sympy [A] time = 3.20135, size = 29, normalized size = 0.88

$$-\frac{x^3}{6\sqrt{x^6+2}}-\frac{1}{6x^3\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(x**6+2)**(3/2),x)

[Out] -x**3/(6*sqrt(x**6 + 2)) - 1/(6*x**3*sqrt(x**6 + 2))
```

Mathematica [A] time = 0.01267, size = 21, normalized size = 0.64

$$-\frac{x^6+1}{6x^3\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*(2 + x^6)^(3/2)),x]

[Out] -(1 + x^6)/(6*x^3*Sqrt[2 + x^6])
```

Maple [A] time = 0.006, size = 18, normalized size = 0.6

$$-\frac{x^6+1}{6\,x^3}\frac{1}{\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(x^6+2)^(3/2),x)
```

```
[Out] -1/6*(x^6+1)/x^3/(x^6+2)^(1/2)
```

Maxima [A] time = 1.44011, size = 34, normalized size = 1.03

$$-\frac{x^3}{12\sqrt{x^6+2}}-\frac{\sqrt{x^6+2}}{12\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 2)^(3/2)*x^4),x, algorithm="maxima")
```

```
[Out] -1/12*x^3/sqrt(x^6 + 2) - 1/12*sqrt(x^6 + 2)/x^3
```

Fricas [A] time = 0.218174, size = 39, normalized size = 1.18

$$\frac{1}{6\left(x^{12}+2\,x^6-(x^9+x^3)\sqrt{x^6+2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 2)^(3/2)*x^4),x, algorithm="fricas")
```

```
[Out] 1/6/(x^12 + 2*x^6 - (x^9 + x^3)*sqrt(x^6 + 2))
```

Sympy [A] time = 2.82349, size = 31, normalized size = 0.94

$$-\frac{1}{6\sqrt{1+\frac{2}{x^6}}}-\frac{1}{6x^6\sqrt{1+\frac{2}{x^6}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(x**6+2)**(3/2),x)
```

```
[Out] -1/(6*sqrt(1 + 2/x**6)) - 1/(6*x**6*sqrt(1 + 2/x**6))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(x^6+2)^{\frac{3}{2}}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 2)^(3/2)*x^4),x, algorithm="giac")
```

```
[Out] integrate(1/((x^6 + 2)^(3/2)*x^4), x)
```

3.1417 $\int \frac{1}{x^{10}(2+x^6)^{3/2}}\,dx$

Optimal. Leaf size=49

$$-\frac{1}{18\sqrt{x^6+2}x^9}+\frac{x^3}{9\sqrt{x^6+2}}+\frac{1}{9\sqrt{x^6+2}x^3}$$

```
[Out] -1/(18*x^9*Sqrt[2 + x^6]) + 1/(9*x^3*Sqrt[2 + x^6]) + x^3/(9*Sqrt
[2 + x^6])
```

Rubi [A] time = 0.036567, antiderivative size = 49, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{1}{18\sqrt{x^6+2}x^9}+\frac{x^3}{9\sqrt{x^6+2}}+\frac{1}{9\sqrt{x^6+2}x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^10*(2 + x^6)^(3/2)),x]
```

```
[Out] -1/(18*x^9*Sqrt[2 + x^6]) + 1/(9*x^3*Sqrt[2 + x^6]) + x^3/(9*Sqrt
[2 + x^6])
```

Rubi in Sympy [A] time = 4.34828, size = 42, normalized size = 0.86

$$\frac{x^3}{9\sqrt{x^6+2}}+\frac{1}{9x^3\sqrt{x^6+2}}-\frac{1}{18x^9\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**10/(x**6+2)**(3/2),x)
```

```
[Out] x**3/(9*sqrt(x**6 + 2)) + 1/(9*x**3*sqrt(x**6 + 2)) - 1/(18*x**9*
sqrt(x**6 + 2))
```

Mathematica [A] time = 0.0165642, size = 28, normalized size = 0.57

$$\frac{2x^{12}+2x^6-1}{18x^9\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^10*(2 + x^6)^(3/2)),x]
```

```
[Out] (-1 + 2*x^6 + 2*x^12)/(18*x^9*Sqrt[2 + x^6])
```

Maple [A] time = 0.007, size = 25, normalized size = 0.5

$$\frac{2x^{12}+2x^6-1}{18x^9}\frac{1}{\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^10/(x^6+2)^(3/2),x)
```

```
[Out] 1/18*(2*x^12+2*x^6-1)/x^9/(x^6+2)^(1/2)
```

Maxima [A] time = 1.43894, size = 50, normalized size = 1.02

$$\frac{x^3}{24\sqrt{x^6+2}}+\frac{\sqrt{x^6+2}}{12\,x^3}-\frac{\left(x^6+2\right)^{\frac{3}{2}}}{72\,x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 2)^(3/2)*x^10),x, algorithm="maxima")
```

```
[Out] 1/24*x^3/sqrt(x^6 + 2) + 1/12*sqrt(x^6 + 2)/x^3 - 1/72*(x^6 + 2)^
(3/2)/x^9
```

Fricas [A] time = 0.225412, size = 84, normalized size = 1.71

$$\frac{2\,x^6-2\,\sqrt{x^6+2}x^3+1}{18\left(2\,x^{24}+6\,x^{18}+4\,x^{12}-\left(2\,x^{21}+4\,x^{15}+x^9\right)\sqrt{x^6+2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 2)^(3/2)*x^10),x, algorithm="fricas")
```

```
[Out] 1/18*(2*x^6 - 2*sqrt(x^6 + 2)*x^3 + 1)/(2*x^24 + 6*x^18 + 4*x^12
- (2*x^21 + 4*x^15 + x^9)*sqrt(x^6 + 2))
```

Sympy [A] time = 8.89478, size = 70, normalized size = 1.43

$$\frac{2x^{12}\sqrt{1+\frac{2}{x^6}}}{18x^{12}+36x^6}+\frac{2x^6\sqrt{1+\frac{2}{x^6}}}{18x^{12}+36x^6}-\frac{\sqrt{1+\frac{2}{x^6}}}{18x^{12}+36x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**10/(x**6+2)**(3/2),x)
```

```
[Out] 2*x**12*sqrt(1 + 2/x**6)/(18*x**12 + 36*x**6) + 2*x**6*sqrt(1 + 2
/x**6)/(18*x**12 + 36*x**6) - sqrt(1 + 2/x**6)/(18*x**12 + 36*x**
6)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(x^6+2\right)^{\frac{3}{2}}x^{10}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 2)^(3/2)*x^10),x, algorithm="giac")
```

```
[Out] integrate(1/((x^6 + 2)^(3/2)*x^10), x)
```

3.1418 $\int \frac{x^{13}}{(2+x^6)^{3/2}}\,dx$

Optimal. Leaf size=202

$$-\frac{x^8}{3\sqrt{x^6+2}}+\frac{8}{15}\sqrt{x^6+2}x^2-\frac{16\,2^{5/6}\sqrt{2+\sqrt{3}}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}F\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{15\sqrt[4]{3}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}$$

```
[Out] -x^8/(3*Sqrt[2 + x^6]) + (8*x^2*Sqrt[2 + x^6])/15 - (16*2^(5/6)*S
qrt[2 + Sqrt[3]]*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^
4)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*EllipticF[ArcSin[(2^(1/3)*(1
- Sqrt[3]) + x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)], -7 - 4*Sqrt[3]]
)/(15*3^(1/4)*Sqrt[(2^(1/3) + x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^
2]*Sqrt[2 + x^6])
```

Rubi [A] time = 0.232819, antiderivative size = 202, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$-\frac{x^8}{3\sqrt{x^6+2}}+\frac{8}{15}\sqrt{x^6+2}x^2-\frac{16\,2^{5/6}\sqrt{2+\sqrt{3}}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}F\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{15\sqrt[4]{3}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^13/(2 + x^6)^(3/2),x]
```

```
[Out] -x^8/(3*Sqrt[2 + x^6]) + (8*x^2*Sqrt[2 + x^6])/15 - (16*2^(5/6)*S
qrt[2 + Sqrt[3]]*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^
4)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*EllipticF[ArcSin[(2^(1/3)*(1
- Sqrt[3]) + x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)], -7 - 4*Sqrt[3]]
)/(15*3^(1/4)*Sqrt[(2^(1/3) + x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^
2]*Sqrt[2 + x^6])
```

Rubi in Sympy [A] time = 9.49002, size = 190, normalized size = 0.94

$$-\frac{x^8}{3\sqrt{x^6+2}}+\frac{8x^2\sqrt{x^6+2}}{15}-\frac{16\cdot 3^{\frac{3}{4}}\sqrt{\frac{2\sqrt[3]{2}x^4-2\cdot 2^{\frac{2}{3}}x^2+4}{\left(2^{\frac{2}{3}}x^2+2+2\sqrt{3}\right)^2}}\sqrt{\sqrt{3}+2}\left(2x^2+2\sqrt[3]{2}\right)F\left(\operatorname{asin}\left(\frac{2^{\frac{2}{3}}x^2-2\sqrt{3}+2}{2^{\frac{2}{3}}x^2+2+2\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{45\sqrt{\frac{2\cdot 2^{\frac{2}{3}}x^2+4}{\left(2^{\frac{2}{3}}x^2+2+2\sqrt{3}\right)^2}}\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**13/(x**6+2)**(3/2),x)
```

```
[Out] -x**8/(3*sqrt(x**6 + 2)) + 8*x**2*sqrt(x**6 + 2)/15 - 16*3**(3/4)
*sqrt((2*2**(1/3)*x**4 - 2*2**(2/3)*x**2 + 4)/(2**(2/3)*x**2 + 2
+ 2*sqrt(3))**2)*sqrt(sqrt(3) + 2)*(2*x**2 + 2*2**(1/3))*elliptic
```

```
_f(asin((2**(2/3)*x**2 - 2*sqrt(3) + 2)/(2**(2/3)*x**2 + 2 + 2*sq
rt(3))), -7 - 4*sqrt(3))/(45*sqrt((2*2**(2/3)*x**2 + 4)/(2**(2/3)
*x**2 + 2 + 2*sqrt(3))**2)*sqrt(x**6 + 2))
```

Mathematica [C] time = 0.231441, size = 144, normalized size = 0.71

$$\frac{9x^8+48x^2-16\sqrt[6]{-1}\sqrt[3]{2}3^{3/4}\sqrt{-\sqrt[6]{-1}\left(2^{2/3}x^2+2(-1)^{2/3}\right)}\sqrt{(-1)^{2/3}\sqrt[3]{2}x^4+\sqrt[3]{-1}2^{2/3}x^2+2}F\left(\sin^{-1}\left(\frac{\sqrt{\left(-i+\sqrt{3}\right)\left(2^{2/3}x^2+2\right)}}{2\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)}{45\sqrt{x^6+2}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^13/(2 + x^6)^(3/2),x]
```

```
[Out] (48*x^2 + 9*x^8 - 16*(-1)^(1/6)*2^(1/3)*3^(3/4)*Sqrt[-((-1)^(1/6)
*(2*(-1)^(2/3) + 2^(2/3)*x^2))]*Sqrt[2 + (-1)^(1/3)*2^(2/3)*x^2 +
 (-1)^(2/3)*2^(1/3)*x^4]*EllipticF[ArcSin[Sqrt[(-I + Sqrt[3])*(2
+ 2^(2/3)*x^2)]/(2*3^(1/4))], (-1)^(1/3)])/(45*Sqrt[2 + x^6])
```

Maple [C] time = 0.036, size = 40, normalized size = 0.2

$$\frac{x^2\left(3x^6+16\right)}{15}\frac{1}{\sqrt{x^6+2}}-\frac{8x^2\sqrt{2}}{15}{}_2F_1\left(\frac{1}{3},\frac{1}{2};\frac{4}{3};-\frac{x^6}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^13/(x^6+2)^(3/2),x)
```

```
[Out] 1/15*x^2*(3*x^6+16)/(x^6+2)^(1/2)-8/15*2^(1/2)*x^2*hypergeom([1/3
,1/2],[4/3],-1/2*x^6)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{13}}{(x^6+2)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^13/(x^6 + 2)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^13/(x^6 + 2)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{13}}{(x^6+2)^{\frac{3}{2}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^13/(x^6 + 2)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^13/(x^6 + 2)^(3/2), x)
```

Sympy [A] time = 7.36117, size = 36, normalized size = 0.18

$$\frac{\sqrt{2}x^{14}\Gamma\left(\frac{7}{3}\right){}_2F_1\left(\begin{matrix}\frac{3}{2},\frac{7}{3}\\\frac{10}{3}\end{matrix}\middle|\frac{x^6e^{i\pi}}{2}\right)}{24\Gamma\left(\frac{10}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**13/(x**6+2)**(3/2),x)
```

```
[Out] sqrt(2)*x**14*gamma(7/3)*hyper((3/2, 7/3), (10/3,), x**6*exp_pola
r(I*pi)/2)/(24*gamma(10/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{13}}{(x^6+2)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^13/(x^6 + 2)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^13/(x^6 + 2)^(3/2), x)
```

3.1419 $\int \frac{x^7}{(2+x^6)^{3/2}} dx$

Optimal. Leaf size=186

$$\frac{2^{5/6}\sqrt{2+\sqrt{3}}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}F\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{3\sqrt[4]{3}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}-\frac{x^2}{3\sqrt{x^6+2}}$$

```
[Out] -x^2/(3*Sqrt[2 + x^6]) + (2^(5/6)*Sqrt[2 + Sqrt[3]]*(2^(1/3) + x^
2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3)*(1 + Sqrt[3]) + x^
2)^2]*EllipticF[ArcSin[(2^(1/3)*(1 - Sqrt[3]) + x^2)/(2^(1/3)*(1
+ Sqrt[3]) + x^2)], -7 - 4*Sqrt[3]])/(3*3^(1/4)*Sqrt[(2^(1/3) + x
^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*Sqrt[2 + x^6])
```

Rubi [A] time = 0.193947, antiderivative size = 186, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$

$$\frac{2^{5/6}\sqrt{2+\sqrt{3}}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}F\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{3\sqrt[4]{3}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}-\frac{x^2}{3\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7/(2 + x^6)^(3/2),x]
```

```
[Out] -x^2/(3*Sqrt[2 + x^6]) + (2^(5/6)*Sqrt[2 + Sqrt[3]]*(2^(1/3) + x^
2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3)*(1 + Sqrt[3]) + x^
2)^2]*EllipticF[ArcSin[(2^(1/3)*(1 - Sqrt[3]) + x^2)/(2^(1/3)*(1
+ Sqrt[3]) + x^2)], -7 - 4*Sqrt[3]])/(3*3^(1/4)*Sqrt[(2^(1/3) + x
^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*Sqrt[2 + x^6])
```

Rubi in Sympy [A] time = 7.07628, size = 173, normalized size = 0.93

$$-\frac{x^2}{3\sqrt{x^6+2}}+\frac{3^{\frac{3}{4}}\sqrt{\frac{2\sqrt[3]{2}x^4-2\cdot 2^{\frac{2}{3}}x^2+4}{\left(2^{\frac{2}{3}}x^2+2+2\sqrt{3}\right)^2}}\sqrt{\sqrt{3}+2}\left(2x^2+2\sqrt[3]{2}\right)F\left(\operatorname{asin}\left(\frac{2^{\frac{2}{3}}x^2-2\sqrt{3}+2}{2^{\frac{2}{3}}x^2+2+2\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{9\sqrt{\frac{2\cdot 2^{\frac{2}{3}}x^2+4}{\left(2^{\frac{2}{3}}x^2+2+2\sqrt{3}\right)^2}}\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7/(x**6+2)**(3/2),x)
```

```
[Out] -x**2/(3*sqrt(x**6 + 2)) + 3**(3/4)*sqrt((2*2**(1/3)*x**4 - 2*2**
(2/3)*x**2 + 4)/(2**(2/3)*x**2 + 2 + 2*sqrt(3))**2)*sqrt(sqrt(3)
+ 2)*(2*x**2 + 2*2**(1/3))*elliptic_f(asin((2**(2/3)*x**2 - 2*sqr
t(3) + 2)/(2**(2/3)*x**2 + 2 + 2*sqrt(3))), -7 - 4*sqrt(3))/(9*sq
rt((2*2**(2/3)*x**2 + 4)/(2**(2/3)*x**2 + 2 + 2*sqrt(3))**2)*sqrt
(x**6 + 2))
```

Mathematica [A] time = 0.238463, size = 136, normalized size = 0.73

$$\frac{2\sqrt[6]{-1}\sqrt[3]{2}\sqrt{(-1)^{5/6}\left(\sqrt[3]{-\frac{1}{2}}x^2-1\right)}\sqrt{\left(-\frac{1}{2}\right)^{2/3}x^4+\sqrt[3]{-\frac{1}{2}}x^2+1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{(-1)^{5/6}x^2}{\sqrt[3]{2}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)}{3\sqrt[4]{3}\sqrt{x^6+2}}-\frac{x^2}{3\sqrt{x^6+2}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^7/(2 + x^6)^(3/2),x]
```

```
[Out] -x^2/(3*Sqrt[2 + x^6]) + (2*(-1)^(1/6)*2^(1/3)*Sqrt[(-1)^(5/6)*(-
1 + (-1/2)^(1/3)*x^2)]*Sqrt[1 + (-1/2)^(1/3)*x^2 + (-1/2)^(2/3)*x
^4]*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - ((-1)^(5/6)*x^2)/2^(1/3)]
/3^(1/4)], (-1)^(1/3)])/(3*3^(1/4)*Sqrt[2 + x^6])
```

Maple [C] time = 0.034, size = 33, normalized size = 0.2

$$-\frac{x^2}{3}\frac{1}{\sqrt{x^6+2}}+\frac{x^2\sqrt{2}}{6}{}_2F_1\left(\frac{1}{3},\frac{1}{2};\frac{4}{3};-\frac{x^6}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7/(x^6+2)^(3/2),x)
```

```
[Out] -1/3*x^2/(x^6+2)^(1/2)+1/6*2^(1/2)*x^2*hypergeom([1/3,1/2],[4/3],
-1/2*x^6)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^7}{(x^6+2)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(x^6 + 2)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^7/(x^6 + 2)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^7}{(x^6+2)^{\frac{3}{2}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(x^6 + 2)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^7/(x^6 + 2)^(3/2), x)
```

Sympy [A] time = 2.76032, size = 36, normalized size = 0.19

$$\frac{\sqrt{2}x^{8}\Gamma\left(\frac{4}{3}\right){}_{2}F_{1}\left(\begin{matrix}\frac{4}{3},\frac{3}{2}\\\frac{7}{3}\end{matrix}\middle|\frac{x^{6}e^{i\pi}}{2}\right)}{24\Gamma\left(\frac{7}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(x**6+2)**(3/2),x)
```

```
[Out] sqrt(2)*x**8*gamma(4/3)*hyper((4/3, 3/2), (7/3,), x**6*exp_polar(
I*pi)/2)/(24*gamma(7/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{7}}{(x^{6}+2)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(x^6 + 2)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^7/(x^6 + 2)^(3/2), x)
```

3.1420 $\int \frac{x}{(2+x^6)^{3/2}} \, dx$

Optimal. Leaf size=186

$$\frac{x^2}{6\sqrt{x^6+2}}+\frac{\sqrt{2+\sqrt{3}}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}F\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{6\sqrt[6]{2}\sqrt[4]{3}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}$$

```
[Out] x^2/(6*Sqrt[2 + x^6]) + (Sqrt[2 + Sqrt[3]]*(2^(1/3) + x^2)*Sqrt[(
2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*Ell
ipticF[ArcSin[(2^(1/3)*(1 - Sqrt[3]) + x^2)/(2^(1/3)*(1 + Sqrt[3]
) + x^2)], -7 - 4*Sqrt[3]])/(6*2^(1/6)*3^(1/4)*Sqrt[(2^(1/3) + x^
2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*Sqrt[2 + x^6])
```

Rubi [A] time = 0.183227, antiderivative size = 186, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273

$$\frac{x^2}{6\sqrt{x^6+2}}+\frac{\sqrt{2+\sqrt{3}}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}F\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{6\sqrt[6]{2}\sqrt[4]{3}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(2 + x^6)^(3/2),x]
```

```
[Out] x^2/(6*Sqrt[2 + x^6]) + (Sqrt[2 + Sqrt[3]]*(2^(1/3) + x^2)*Sqrt[(
2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*Ell
ipticF[ArcSin[(2^(1/3)*(1 - Sqrt[3]) + x^2)/(2^(1/3)*(1 + Sqrt[3]
) + x^2)], -7 - 4*Sqrt[3]])/(6*2^(1/6)*3^(1/4)*Sqrt[(2^(1/3) + x^
2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*Sqrt[2 + x^6])
```

Rubi in Sympy [A] time = 5.4895, size = 173, normalized size = 0.93

$$\frac{x^2}{6\sqrt{x^6+2}}+\frac{3^{\frac{3}{4}}\sqrt{\frac{2\sqrt[3]{2}x^4-2\cdot 2^{\frac{2}{3}}x^2+4}{\left(2^{\frac{2}{3}}x^2+2+2\sqrt{3}\right)^2}}\sqrt{\sqrt{3}+2}\left(2x^2+2\sqrt[3]{2}\right)F\left(\operatorname{asin}\left(\frac{2^{\frac{2}{3}}x^2-2\sqrt{3}+2}{2^{\frac{2}{3}}x^2+2+2\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{36\sqrt{\frac{2\cdot 2^{\frac{2}{3}}x^2+4}{\left(2^{\frac{2}{3}}x^2+2+2\sqrt{3}\right)^2}}\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(x**6+2)**(3/2),x)
```

```
[Out] x**2/(6*sqrt(x**6 + 2)) + 3**(3/4)*sqrt((2*2**(1/3)*x**4 - 2*2**(
2/3)*x**2 + 4)/(2**(2/3)*x**2 + 2 + 2*sqrt(3))**2)*sqrt(sqrt(3) +
 2)*(2*x**2 + 2*2**(1/3))*elliptic_f(asin((2**(2/3)*x**2 - 2*sqrt
(3) + 2)/(2**(2/3)*x**2 + 2 + 2*sqrt(3))), -7 - 4*sqrt(3))/(36*sq
rt((2*2**(2/3)*x**2 + 4)/(2**(2/3)*x**2 + 2 + 2*sqrt(3))**2)*sqrt
(x**6 + 2))
```

Mathematica [A] time = 0.226215, size = 136, normalized size = 0.73

$$\frac{x^2}{6\sqrt{x^6+2}}+\frac{\sqrt[6]{-1}\sqrt{(-1)^{5/6}\left(\sqrt[3]{-\frac{1}{2}}x^2-1\right)}\sqrt{\left(-\frac{1}{2}\right)^{2/3}x^4+\sqrt[3]{-\frac{1}{2}}x^2+1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{(-1)^{5/6}x^2}{\sqrt[3]{2}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)}{3\ 2^{2/3}\sqrt[4]{3}\sqrt{x^6+2}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x/(2 + x^6)^(3/2),x]
```

```
[Out] x^2/(6*Sqrt[2 + x^6]) + ((-1)^(1/6)*Sqrt[(-1)^(5/6)*(-1 + (-1/2)^
(1/3)*x^2)]*Sqrt[1 + (-1/2)^(1/3)*x^2 + (-1/2)^(2/3)*x^4]*Ellipti
cF[ArcSin[Sqrt[-(-1)^(5/6) - ((-1)^(5/6)*x^2)/2^(1/3)]/3^(1/4)],
(-1)^(1/3)])/(3*2^(2/3)*3^(1/4)*Sqrt[2 + x^6])
```

Maple [C] time = 0.034, size = 33, normalized size = 0.2

$$\frac{x^2}{6}\frac{1}{\sqrt{x^6+2}}+\frac{x^2\sqrt{2}}{24}{}_2\mathrm{F}_1\left(\frac{1}{3},\frac{1}{2};\frac{4}{3};-\frac{x^6}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(x^6+2)^(3/2),x)
```

```
[Out] 1/6*x^2/(x^6+2)^(1/2)+1/24*2^(1/2)*x^2*hypergeom([1/3,1/2],[4/3],
-1/2*x^6)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{(x^6+2)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(x^6 + 2)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x/(x^6 + 2)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x}{(x^6+2)^{\frac{3}{2}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(x^6 + 2)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x/(x^6 + 2)^(3/2), x)
```

Sympy [A] time = 2.08163, size = 36, normalized size = 0.19

$$\frac{\sqrt{2}x^2\,\Gamma\left(\frac{1}{3}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{3},\frac{3}{2}\\ \frac{4}{3}\end{matrix}\middle|\frac{x^6e^{i\pi}}{2}\right)}{24\,\Gamma\left(\frac{4}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(x**6+2)**(3/2),x)
```

```
[Out] sqrt(2)*x**2*gamma(1/3)*hyper((1/3, 3/2), (4/3,), x**6*exp_polar(
I*pi)/2)/(24*gamma(4/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{(x^6+2)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(x^6 + 2)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x/(x^6 + 2)^(3/2), x)
```

3.1421 $\int \frac{1}{x^5(2+x^6)^{3/2}}\,dx$

Optimal. Leaf size=202

$$-\frac{7\sqrt{x^6+2}}{48x^4}+\frac{1}{6x^4\sqrt{x^6+2}}-\frac{7\sqrt{2+\sqrt{3}}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}F\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{48\sqrt[6]{2}\sqrt[4]{3}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}$$

```
[Out] 1/(6*x^4*Sqrt[2 + x^6]) - (7*Sqrt[2 + x^6])/(48*x^4) - (7*Sqrt[2
+ Sqrt[3]]*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^
(1/3)*(1 + Sqrt[3]) + x^2)^2]*EllipticF[ArcSin[(2^(1/3)*(1 - Sqrt
[3]) + x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)], -7 - 4*Sqrt[3]])/(48*
2^(1/6)*3^(1/4)*Sqrt[(2^(1/3) + x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2
)^2]*Sqrt[2 + x^6])
```

Rubi [A] time = 0.228986, antiderivative size = 202, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$-\frac{7\sqrt{x^6+2}}{48x^4}+\frac{1}{6x^4\sqrt{x^6+2}}-\frac{7\sqrt{2+\sqrt{3}}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}F\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{48\sqrt[6]{2}\sqrt[4]{3}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^5*(2 + x^6)^(3/2)),x]
```

```
[Out] 1/(6*x^4*Sqrt[2 + x^6]) - (7*Sqrt[2 + x^6])/(48*x^4) - (7*Sqrt[2
+ Sqrt[3]]*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^
(1/3)*(1 + Sqrt[3]) + x^2)^2]*EllipticF[ArcSin[(2^(1/3)*(1 - Sqrt
[3]) + x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)], -7 - 4*Sqrt[3]])/(48*
2^(1/6)*3^(1/4)*Sqrt[(2^(1/3) + x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2
)^2]*Sqrt[2 + x^6])
```

Rubi in Sympy [A] time = 9.37393, size = 192, normalized size = 0.95

$$-\frac{7\cdot 3^{\frac{3}{4}}\sqrt{\frac{2\sqrt[3]{2}x^4-2\cdot 2^{\frac{2}{3}}x^2+4}{\left(2^{\frac{2}{3}}x^2+2+2\sqrt{3}\right)^2}}\sqrt{\sqrt{3}+2}\left(2x^2+2\sqrt[3]{2}\right)F\left(\operatorname{asin}\left(\frac{2^{\frac{2}{3}}x^2-2\sqrt{3}+2}{2^{\frac{2}{3}}x^2+2+2\sqrt{3}}\right)\middle|-7-4\sqrt{3}\right)}{288\sqrt{\frac{2\cdot 2^{\frac{2}{3}}x^2+4}{\left(2^{\frac{2}{3}}x^2+2+2\sqrt{3}\right)^2}}\sqrt{x^6+2}}-\frac{7\sqrt{x^6+2}}{48x^4}+\frac{1}{6x^4\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**5/(x**6+2)**(3/2),x)
```

```
[Out] -7*3**(3/4)*sqrt((2*2**(1/3)*x**4 - 2*2**(2/3)*x**2 + 4)/(2**(2/3
)*x**2 + 2 + 2*sqrt(3))**2)*sqrt(sqrt(3) + 2)*(2*x**2 + 2*2**(1/3
))*elliptic_f(asin((2**(2/3)*x**2 - 2*sqrt(3) + 2)/(2**(2/3)*x**2
 + 2 + 2*sqrt(3))), -7 - 4*sqrt(3))/(288*sqrt((2*2**(2/3)*x**2 +
4)/(2**(2/3)*x**2 + 2 + 2*sqrt(3))**2)*sqrt(x**6 + 2)) - 7*sqrt(x
**6 + 2)/(48*x**4) + 1/(6*x**4*sqrt(x**6 + 2))
```

Mathematica [C] time = 0.294255, size = 146, normalized size = 0.72

$$-\frac{42x^6+7\sqrt[6]{-1}\sqrt[3]{2}3^{3/4}\sqrt{-\sqrt[6]{-1}\left(2^{2/3}x^2+2(-1)^{2/3}\right)}\sqrt{(-1)^{2/3}\sqrt[3]{2}x^4+\sqrt[3]{-1}2^{2/3}x^2+2}x^4F\left(\sin^{-1}\left(\frac{\sqrt{\left(-i+\sqrt{3}\right)\left(2^{2/3}x^2+2\right)}}{2\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)+3}{288x^4\sqrt{x^6+2}}$$

Warning: Unable to verify antiderivative.

```
[In]   Integrate[1/(x^5*(2 + x^6)^(3/2)),x]
```

```
[Out] -(36 + 42*x^6 + 7*(-1)^(1/6)*2^(1/3)*3^(3/4)*x^4*Sqrt[-((-1)^(1/6
)*(2*(-1)^(2/3) + 2^(2/3)*x^2))]*Sqrt[2 + (-1)^(1/3)*2^(2/3)*x^2
+ (-1)^(2/3)*2^(1/3)*x^4]*EllipticF[ArcSin[Sqrt[(-I + Sqrt[3])*(2
 + 2^(2/3)*x^2)]/(2*3^(1/4))], (-1)^(1/3)])/(288*x^4*Sqrt[2 + x^6
])
```

Maple [C] time = 0.039, size = 40, normalized size = 0.2

$$-\frac{7x^6+6}{48x^4}\frac{1}{\sqrt{x^6+2}}-\frac{7x^2\sqrt{2}}{192}{}_2F_1\left(\frac{1}{3},\frac{1}{2};\frac{4}{3};-\frac{x^6}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^5/(x^6+2)^(3/2),x)
```

```
[Out] -1/48*(7*x^6+6)/x^4/(x^6+2)^(1/2)-7/192*2^(1/2)*x^2*hypergeom([1/
3,1/2],[4/3],-1/2*x^6)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(x^6+2)^{\frac{3}{2}}x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((x^6 + 2)^(3/2)*x^5),x, algorithm="maxima")
```

```
[Out] integrate(1/((x^6 + 2)^(3/2)*x^5), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(x^{11}+2x^5)\sqrt{x^6+2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((x^6 + 2)^(3/2)*x^5),x, algorithm="fricas")
```

```
[Out] integral(1/((x^11 + 2*x^5)*sqrt(x^6 + 2)), x)
```

Sympy [A] time = 3.42295, size = 39, normalized size = 0.19

$$\frac{\sqrt{2}\,\Gamma\left(-\frac{2}{3}\right){}_2F_1\left(\begin{matrix}-\frac{2}{3},\frac{3}{2}\\ \frac{1}{3}\end{matrix}\middle|\frac{x^6e^{i\pi}}{2}\right)}{24x^4\,\Gamma\left(\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**5/(x**6+2)**(3/2),x)
```

```
[Out] sqrt(2)*gamma(-2/3)*hyper((-2/3, 3/2), (1/3,), x**6*exp_polar(I*p
i)/2)/(24*x**4*gamma(1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(x^6+2)^{\frac{3}{2}}x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 2)^(3/2)*x^5),x, algorithm="giac")
```

```
[Out] integrate(1/((x^6 + 2)^(3/2)*x^5), x)
```

3.1422 $\int \frac{x^{12}}{(2+x^6)^{3/2}}\,dx$

Optimal. Leaf size=195

$$\frac{7}{12}\sqrt{x^6+2}x-\frac{x^7}{3\sqrt{x^6+2}}-\frac{7\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}xF\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{12\sqrt[3]{2}\sqrt[4]{3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}$$

```
[Out] -x^7/(3*Sqrt[2 + x^6]) + (7*x*Sqrt[2 + x^6])/12 - (7*x*(2^(1/3) +
 x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3) + (1 + Sqrt[3])
*x^2)^2]*EllipticF[ArcCos[(2^(1/3) + (1 - Sqrt[3])*x^2)/(2^(1/3)
+ (1 + Sqrt[3])*x^2)], (2 + Sqrt[3])/4])/(12*2^(1/3)*3^(1/4)*Sqrt
[(x^2*(2^(1/3) + x^2))/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*Sqrt[2 +
x^6])
```

Rubi [A] time = 0.128704, antiderivative size = 195, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{7}{12}\sqrt{x^6+2}x-\frac{x^7}{3\sqrt{x^6+2}}-\frac{7\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}xF\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{12\sqrt[3]{2}\sqrt[4]{3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^12/(2 + x^6)^(3/2),x]
```

```
[Out] -x^7/(3*Sqrt[2 + x^6]) + (7*x*Sqrt[2 + x^6])/12 - (7*x*(2^(1/3) +
 x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3) + (1 + Sqrt[3])
*x^2)^2]*EllipticF[ArcCos[(2^(1/3) + (1 - Sqrt[3])*x^2)/(2^(1/3)
+ (1 + Sqrt[3])*x^2)], (2 + Sqrt[3])/4])/(12*2^(1/3)*3^(1/4)*Sqrt
[(x^2*(2^(1/3) + x^2))/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*Sqrt[2 +
x^6])
```

Rubi in Sympy [A] time = 6.47434, size = 170, normalized size = 0.87

$$-\frac{x^7}{3\sqrt{x^6+2}}-\frac{7\cdot 3^{\frac{3}{4}}x\sqrt{\frac{2\sqrt[3]{2}x^4-2\cdot 2^{\frac{2}{3}}x^2+4}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\left(x^2+\sqrt[3]{2}\right)F\left(\operatorname{acos}\left(\frac{x^2\left(-\sqrt{3}+1\right)+\sqrt[3]{2}}{x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}}\right)\middle|\frac{\sqrt{3}}{4}+\frac{1}{2}\right)}{72\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}+\frac{7x\sqrt{x^6+2}}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**12/(x**6+2)**(3/2),x)
```

```
[Out] -x**7/(3*sqrt(x**6 + 2)) - 7*3**(3/4)*x*sqrt((2*2**(1/3)*x**4 - 2
*2**(2/3)*x**2 + 4)/(x**2*(1 + sqrt(3)) + 2**(1/3))**2)*(x**2 + 2
**(1/3))*elliptic_f(acos((x**2*(-sqrt(3) + 1) + 2**(1/3))/(x**2*(
1 + sqrt(3)) + 2**(1/3))), sqrt(3)/4 + 1/2)/(72*sqrt(x**2*(x**2 +
 2**(1/3))/(x**2*(1 + sqrt(3)) + 2**(1/3))**2)*sqrt(x**6 + 2)) +
7*x*sqrt(x**6 + 2)/12
```

Mathematica [A] time = 0.969947, size = 183, normalized size = 0.94

$$\frac{6x^2\left(3x^6+14\right)-\frac{7\,2^{2/3}3^{3/4}x^2\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}F\left(\cos^{-1}\left(\frac{\sqrt[3]{2}-\left(-1+\sqrt{3}\right)x^2}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}}}{72x\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]   Integrate[x^12/(2 + x^6)^(3/2),x]
```

```
[Out] (6*x^2*(14 + 3*x^6) - (7*2^(2/3)*3^(3/4)*x^2*(2^(1/3) + x^2)*Sqrt
[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*E
llipticF[ArcCos[(2^(1/3) - (-1 + Sqrt[3])*x^2)/(2^(1/3) + (1 + Sq
rt[3])*x^2)], (2 + Sqrt[3])/4])/Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/
3) + (1 + Sqrt[3])*x^2)^2])/(72*x*Sqrt[2 + x^6])
```

Maple [C] time = 0.035, size = 36, normalized size = 0.2

$$\frac{x\left(3\,x^6+14\right)}{12}\frac{1}{\sqrt{x^6+2}}-\frac{7\,x\sqrt{2}}{12}{}_2F_1\left(\frac{1}{6},\frac{1}{2};\frac{7}{6};-\frac{x^6}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^12/(x^6+2)^(3/2),x)
```

```
[Out] 1/12*x*(3*x^6+14)/(x^6+2)^(1/2)-7/12*2^(1/2)*x*hypergeom([1/6,1/2
],[7/6],-1/2*x^6)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{12}}{\left(x^6+2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^12/(x^6 + 2)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^12/(x^6 + 2)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{12}}{\left(x^6+2\right)^{\frac{3}{2}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^12/(x^6 + 2)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^12/(x^6 + 2)^(3/2), x)
```

Sympy [A] time = 6.08071, size = 36, normalized size = 0.18

$$\frac{\sqrt{2}x^{13}\Gamma\left(\frac{13}{6}\right){}_2F_1\left(\begin{matrix}\frac{3}{2},\frac{13}{6}\\ \frac{19}{6}\end{matrix}\middle|\frac{x^6e^{i\pi}}{2}\right)}{24\Gamma\left(\frac{19}{6}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**12/(x**6+2)**(3/2),x)
```

```
[Out] sqrt(2)*x**13*gamma(13/6)*hyper((3/2, 13/6), (19/6,), x**6*exp_po
lar(I*pi)/2)/(24*gamma(19/6))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{12}}{(x^6+2)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^12/(x^6 + 2)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^12/(x^6 + 2)^(3/2), x)
```

3.1423 $\int \frac{x^6}{(2+x^6)^{3/2}}\,dx$

Optimal. Leaf size=179

$$\frac{x\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}F\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{6\sqrt[3]{2}\sqrt[4]{3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}-\frac{x}{3\sqrt{x^6+2}}$$

```
[Out] -x/(3*Sqrt[2 + x^6]) + (x*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)
*x^2 + x^4)/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*EllipticF[ArcCos[(2^
(1/3) + (1 - Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3])*x^2)], (2 + S
qrt[3])/4])/(6*2^(1/3)*3^(1/4)*Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/3
) + (1 + Sqrt[3])*x^2)^2]*Sqrt[2 + x^6])
```

Rubi [A] time = 0.0912704, antiderivative size = 179, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{x\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}F\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{6\sqrt[3]{2}\sqrt[4]{3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}-\frac{x}{3\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/(2 + x^6)^(3/2),x]
```

```
[Out] -x/(3*Sqrt[2 + x^6]) + (x*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)
*x^2 + x^4)/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*EllipticF[ArcCos[(2^
(1/3) + (1 - Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3])*x^2)], (2 + S
qrt[3])/4])/(6*2^(1/3)*3^(1/4)*Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/3
) + (1 + Sqrt[3])*x^2)^2]*Sqrt[2 + x^6])
```

Rubi in Sympy [A] time = 4.18713, size = 153, normalized size = 0.85

$$\frac{3^{\frac{3}{4}}x\sqrt{\frac{2\sqrt[3]{2}x^4-2\cdot 2^{\frac{2}{3}}x^2+4}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\left(x^2+\sqrt[3]{2}\right)F\left(\operatorname{acos}\left(\frac{x^2\left(-\sqrt{3}+1\right)+\sqrt[3]{2}}{x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}}\right)\middle|\frac{\sqrt{3}}{4}+\frac{1}{2}\right)}{36\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}-\frac{x}{3\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(x**6+2)**(3/2),x)
```

```
[Out] 3**(3/4)*x*sqrt((2*2**(1/3)*x**4 - 2*2**(2/3)*x**2 + 4)/(x**2*(1
+ sqrt(3)) + 2**(1/3))**2)*(x**2 + 2**(1/3))*elliptic_f(acos((x**
2*(-sqrt(3) + 1) + 2**(1/3))/(x**2*(1 + sqrt(3)) + 2**(1/3))), sq
rt(3)/4 + 1/2)/(36*sqrt(x**2*(x**2 + 2**(1/3))/(x**2*(1 + sqrt(3)
) + 2**(1/3))**2)*sqrt(x**6 + 2)) - x/(3*sqrt(x**6 + 2))
```

Mathematica [A] time = 1.02726, size = 166, normalized size = 0.93

$$\frac{x\left(\frac{2^{2/3}3^{3/4}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}F\left(\cos^{-1}\left(\frac{\sqrt[3]{2}-\left(-1+\sqrt{3}\right)x^2}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}}-12\right)}{36\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6/(2 + x^6)^(3/2),x]
```

```
[Out] (x*(-12 + (2^(2/3)*3^(3/4)*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3
)*x^2 + x^4)/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*EllipticF[ArcCos[(2
^(1/3) - (-1 + Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3])*x^2)], (2 +
 Sqrt[3])/4])/Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/3) + (1 + Sqrt[3])
*x^2)^2]))/(36*Sqrt[2 + x^6])
```

Maple [C] time = 0.033, size = 29, normalized size = 0.2

$$-\frac{x}{3}\frac{1}{\sqrt{x^6+2}}+\frac{x\sqrt{2}}{6}{}_2F_1\left(\frac{1}{6},\frac{1}{2};\frac{7}{6};-\frac{x^6}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(x^6+2)^(3/2),x)
```

```
[Out] -1/3*x/(x^6+2)^(1/2)+1/6*2^(1/2)*x*hypergeom([1/6,1/2],[7/6],-1/2
*x^6)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{(x^6+2)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(x^6 + 2)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^6/(x^6 + 2)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^6}{(x^6+2)^{\frac{3}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(x^6 + 2)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^6/(x^6 + 2)^(3/2), x)
```

Sympy [A] time = 2.43042, size = 36, normalized size = 0.2

$$\frac{\sqrt{2}x^{7}\Gamma\left(\frac{7}{6}\right){}_{2}F_{1}\left(\begin{matrix}\frac{7}{6},\frac{3}{2}\\\frac{13}{6}\end{matrix}\middle|\frac{x^{6}e^{i\pi}}{2}\right)}{24\Gamma\left(\frac{13}{6}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(x**6+2)**(3/2),x)
```

```
[Out] sqrt(2)*x**7*gamma(7/6)*hyper((7/6, 3/2), (13/6,), x**6*exp_polar
(I*pi)/2)/(24*gamma(13/6))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{6}}{(x^{6}+2)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(x^6 + 2)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^6/(x^6 + 2)^(3/2), x)
```

3.1424 $\int \frac{1}{(2+x^6)^{3/2}}\,dx$

Optimal. Leaf size=179

$$\frac{x}{6\sqrt{x^6+2}}+\frac{\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\,xF\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{6\sqrt[3]{2}\sqrt[4]{3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}$$

```
[Out] x/(6*Sqrt[2 + x^6]) + (x*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*
x^2 + x^4)/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*EllipticF[ArcCos[(2^(
1/3) + (1 - Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3])*x^2)], (2 + Sq
rt[3])/4])/(6*2^(1/3)*3^(1/4)*Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/3)
 + (1 + Sqrt[3])*x^2)^2]*Sqrt[2 + x^6])
```

Rubi [A] time = 0.0817227, antiderivative size = 179, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{x}{6\sqrt{x^6+2}}+\frac{\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\,xF\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{6\sqrt[3]{2}\sqrt[4]{3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(2 + x^6)^(-3/2),x]
```

```
[Out] x/(6*Sqrt[2 + x^6]) + (x*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*
x^2 + x^4)/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*EllipticF[ArcCos[(2^(
1/3) + (1 - Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3])*x^2)], (2 + Sq
rt[3])/4])/(6*2^(1/3)*3^(1/4)*Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/3)
 + (1 + Sqrt[3])*x^2)^2]*Sqrt[2 + x^6])
```

Rubi in Sympy [A] time = 2.69903, size = 153, normalized size = 0.85

$$\frac{3^{\frac{3}{4}}x\sqrt{\frac{2\sqrt[3]{2}x^4-2\cdot 2^{\frac{2}{3}}x^2+4}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\left(x^2+\sqrt[3]{2}\right)F\left(\operatorname{acos}\left(\frac{x^2\left(-\sqrt{3}+1\right)+\sqrt[3]{2}}{x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}}\right)\middle|\frac{\sqrt{3}}{4}+\frac{1}{2}\right)}{36\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}+\frac{x}{6\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(x**6+2)**(3/2),x)
```

```
[Out] 3**(3/4)*x*sqrt((2*2**(1/3)*x**4 - 2*2**(2/3)*x**2 + 4)/(x**2*(1
+ sqrt(3)) + 2**(1/3))**2)*(x**2 + 2**(1/3))*elliptic_f(acos((x**
2*(-sqrt(3) + 1) + 2**(1/3))/(x**2*(1 + sqrt(3)) + 2**(1/3))), sq
rt(3)/4 + 1/2)/(36*sqrt(x**2*(x**2 + 2**(1/3))/(x**2*(1 + sqrt(3)
) + 2**(1/3))**2)*sqrt(x**6 + 2)) + x/(6*sqrt(x**6 + 2))
```

Mathematica [A] time = 0.71569, size = 166, normalized size = 0.93

$$\frac{x\left(\frac{2^{2/3}3^{3/4}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}F\left(\cos^{-1}\left(\frac{\sqrt[3]{2}-\left(-1+\sqrt{3}\right)x^2}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}}+6\right)}{36\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(2 + x^6)^(-3/2),x]
```

```
[Out] (x*(6 + (2^(2/3)*3^(3/4)*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*
x^2 + x^4)/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*EllipticF[ArcCos[(2^(
1/3) - (-1 + Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3])*x^2)], (2 + S
qrt[3])/4])/Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/3) + (1 + Sqrt[3])*x
^2)^2]))/(36*Sqrt[2 + x^6])
```

Maple [C] time = 0.023, size = 18, normalized size = 0.1

$$\frac{x\sqrt{2}}{4}{}_2\mathrm{F}_1\left(\frac{1}{6},\frac{3}{2};\frac{7}{6};-\frac{x^6}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(x^6+2)^(3/2),x)
```

```
[Out] 1/4*2^(1/2)*x*hypergeom([1/6,3/2],[7/6],-1/2*x^6)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(x^6+2)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x^6 + 2)^(-3/2),x, algorithm="maxima")
```

```
[Out] integrate((x^6 + 2)^(-3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{(x^6+2)^{\frac{3}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x^6 + 2)^(-3/2),x, algorithm="fricas")
```

```
[Out] integral((x^6 + 2)^(-3/2), x)
```

Sympy [A] time = 1.94845, size = 34, normalized size = 0.19

$$\frac{\sqrt{2}x\left(\frac{1}{6}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{6},\frac{3}{2}\\\frac{7}{6}\end{matrix}\middle|\frac{x^6e^{i\pi}}{2}\right)}{24\left(\frac{7}{6}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x**6+2)**(3/2),x)
```

```
[Out] sqrt(2)*x*gamma(1/6)*hyper((1/6, 3/2), (7/6,), x**6*exp_polar(I*p
i)/2)/(24*gamma(7/6))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(x^6+2)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x^6 + 2)^(-3/2),x, algorithm="giac")
```

```
[Out] integrate((x^6 + 2)^(-3/2), x)
```

3.1425 $\int \frac{1}{x^6(2+x^6)^{3/2}}\,dx$

Optimal. Leaf size=197

$$-\frac{2\sqrt{x^6+2}}{15x^5}+\frac{1}{6x^5\sqrt{x^6+2}}-\frac{2^{2/3}x\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}F\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{15\sqrt[4]{3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}$$

```
[Out] 1/(6*x^5*Sqrt[2 + x^6]) - (2*Sqrt[2 + x^6])/(15*x^5) - (2^(2/3)*x
*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3) + (1
 + Sqrt[3])*x^2)^2]*EllipticF[ArcCos[(2^(1/3) + (1 - Sqrt[3])*x^2
)/(2^(1/3) + (1 + Sqrt[3])*x^2)], (2 + Sqrt[3])/4])/(15*3^(1/4)*S
qrt[(x^2*(2^(1/3) + x^2))/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*Sqrt[2
 + x^6])
```

Rubi [A] time = 0.122748, antiderivative size = 197, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{2\sqrt{x^6+2}}{15x^5}+\frac{1}{6x^5\sqrt{x^6+2}}-\frac{2^{2/3}x\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}F\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{15\sqrt[4]{3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^6*(2 + x^6)^(3/2)),x]
```


```
[Out] 1/(6*x^5*Sqrt[2 + x^6]) - (2*Sqrt[2 + x^6])/(15*x^5) - (2^(2/3)*x
*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3) + (1
 + Sqrt[3])*x^2)^2]*EllipticF[ArcCos[(2^(1/3) + (1 - Sqrt[3])*x^2
)/(2^(1/3) + (1 + Sqrt[3])*x^2)], (2 + Sqrt[3])/4])/(15*3^(1/4)*S
qrt[(x^2*(2^(1/3) + x^2))/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*Sqrt[2
 + x^6])
```

Rubi in Sympy [A] time = 6.09072, size = 172, normalized size = 0.87

$$-\frac{3^{\frac{3}{4}}x\sqrt{\frac{2\sqrt[3]{2}x^4-2\cdot 2^{\frac{2}{3}}x^2+4}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\left(x^2+\sqrt[3]{2}\right)F\left(\operatorname{acos}\left(\frac{x^2\left(-\sqrt{3}+1\right)+\sqrt[3]{2}}{x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}}\right)\middle|\frac{\sqrt{3}}{4}+\frac{1}{2}\right)}{45\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}-\frac{2\sqrt{x^6+2}}{15x^5}+\frac{1}{6x^5\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**6/(x**6+2)**(3/2),x)
```

```
[Out] -3**(3/4)*x*sqrt((2*2**(1/3)*x**4 - 2*2**(2/3)*x**2 + 4)/(x**2*(1
 + sqrt(3)) + 2**(1/3))**2)*(x**2 + 2**(1/3))*elliptic_f(acos((x*
*2*(-sqrt(3) + 1) + 2**(1/3))/(x**2*(1 + sqrt(3)) + 2**(1/3))), s
qrt(3)/4 + 1/2)/(45*sqrt(x**2*(x**2 + 2**(1/3))/(x**2*(1 + sqrt(3
)) + 2**(1/3))**2)*sqrt(x**6 + 2)) - 2*sqrt(x**6 + 2)/(15*x**5) +
 1/(6*x**5*sqrt(x**6 + 2))
```

Mathematica [A] time = 1.2621, size = 183, normalized size = 0.93

$$\frac{-15x^6-9\left(x^6+2\right)-\frac{4\,2^{2/3}3^{3/4}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}x^6F\left(\cos^{-1}\left(\frac{\sqrt[3]{2}-\left(-1+\sqrt{3}\right)x^2}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}}}{180x^5\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^6*(2 + x^6)^(3/2)),x]
```

```
[Out] (-15*x^6 - 9*(2 + x^6) - (4*2^(2/3)*3^(3/4)*x^6*(2^(1/3) + x^2)*S
qrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3) + (1 + Sqrt[3])*x^2)^2
]*EllipticF[ArcCos[(2^(1/3) - (-1 + Sqrt[3])*x^2)/(2^(1/3) + (1 +
 Sqrt[3])*x^2)], (2 + Sqrt[3])/4])/Sqrt[(x^2*(2^(1/3) + x^2))/(2^
(1/3) + (1 + Sqrt[3])*x^2)^2])/(180*x^5*Sqrt[2 + x^6])
```

Maple [C] time = 0.039, size = 38, normalized size = 0.2

$$-\frac{4\,x^6+3}{30\,x^5}\frac{1}{\sqrt{x^6+2}}-\frac{2\,x\sqrt{2}}{15}{}_2F_1(\frac{1}{6},\frac{1}{2};\frac{7}{6};-\frac{x^6}{2})$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^6/(x^6+2)^(3/2),x)
```

```
[Out] -1/30*(4*x^6+3)/x^5/(x^6+2)^(1/2)-2/15*2^(1/2)*x*hypergeom([1/6,1
/2],[7/6],-1/2*x^6)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(x^6+2)^{\frac{3}{2}}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 2)^(3/2)*x^6),x, algorithm="maxima")
```

```
[Out] integrate(1/((x^6 + 2)^(3/2)*x^6), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(x^{12}+2\,x^6)\sqrt{x^6+2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 2)^(3/2)*x^6),x, algorithm="fricas")
```

```
[Out] integral(1/((x^12 + 2*x^6)*sqrt(x^6 + 2)), x)
```

Sympy [A] time = 4.16254, size = 39, normalized size = 0.2

$$\frac{\sqrt{2}\,\Gamma\left(-\frac{5}{6}\right)\,{}_{2}F_{1}\left(\begin{matrix} -\frac{5}{6}, \frac{3}{2} \\ \frac{1}{6} \end{matrix}\middle| \frac{x^{6}e^{i\pi}}{2}\right)}{24x^{5}\,\Gamma\left(\frac{1}{6}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**6/(x**6+2)**(3/2),x)
```

```
[Out] sqrt(2)*gamma(-5/6)*hyper((-5/6, 3/2), (1/6,), x**6*exp_polar(I*p
i)/2)/(24*x**5*gamma(1/6))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(x^{6}+2)^{\frac{3}{2}}x^{6}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 2)^(3/2)*x^6),x, algorithm="giac")
```

```
[Out] integrate(1/((x^6 + 2)^(3/2)*x^6), x)
```

3.1426 $\int \frac{x^{15}}{(2+x^6)^{3/2}}\,dx$

Optimal. Leaf size=394

$$-\frac{x^{10}}{3\sqrt{x^6+2}}+\frac{10}{21}\sqrt{x^6+2}x^4-\frac{80\sqrt{x^6+2}}{21\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)}-\frac{80\,2^{2/3}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}F\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{21\sqrt[4]{3}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}+\frac{40\sqrt[6]{2}\sqrt{2-\sqrt{3}}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}E\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{7\,3^{3/4}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}$$

```
[Out] -x^10/(3*Sqrt[2 + x^6]) + (10*x^4*Sqrt[2 + x^6])/21 - (80*Sqrt[2
+ x^6])/(21*(2^(1/3)*(1 + Sqrt[3]) + x^2)) + (40*2^(1/6)*Sqrt[2 -
 Sqrt[3]]*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(
1/3)*(1 + Sqrt[3]) + x^2)^2]*EllipticE[ArcSin[(2^(1/3)*(1 - Sqrt[
3]) + x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)], -7 - 4*Sqrt[3]])/(7*3^
(3/4)*Sqrt[(2^(1/3) + x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*Sqrt[
2 + x^6]) - (80*2^(2/3)*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x
^2 + x^4)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*EllipticF[ArcSin[(2^(1
/3)*(1 - Sqrt[3]) + x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)], -7 - 4*S
qrt[3]])/(21*3^(1/4)*Sqrt[(2^(1/3) + x^2)/(2^(1/3)*(1 + Sqrt[3])
+ x^2)^2]*Sqrt[2 + x^6])
```

Rubi [A] time = 0.493421, antiderivative size = 394, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.462

$$-\frac{x^{10}}{3\sqrt{x^6+2}}+\frac{10}{21}\sqrt{x^6+2}x^4-\frac{80\sqrt{x^6+2}}{21\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)}-\frac{80\,2^{2/3}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}F\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{21\sqrt[4]{3}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}+\frac{40\sqrt[6]{2}\sqrt{2-\sqrt{3}}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}E\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{7\,3^{3/4}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^15/(2 + x^6)^(3/2),x]
```


```
[Out] -x^10/(3*Sqrt[2 + x^6]) + (10*x^4*Sqrt[2 + x^6])/21 - (80*Sqrt[2
+ x^6])/(21*(2^(1/3)*(1 + Sqrt[3]) + x^2)) + (40*2^(1/6)*Sqrt[2 -
 Sqrt[3]]*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(
1/3)*(1 + Sqrt[3]) + x^2)^2]*EllipticE[ArcSin[(2^(1/3)*(1 - Sqrt[
3]) + x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)], -7 - 4*Sqrt[3]])/(7*3^
(3/4)*Sqrt[(2^(1/3) + x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*Sqrt[
2 + x^6]) - (80*2^(2/3)*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x
```

```
^2 + x^4)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*EllipticF[ArcSin[(2^(1
/3)*(1 - Sqrt[3]) + x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)], -7 - 4*S
qrt[3]])/(21*3^(1/4)*Sqrt[(2^(1/3) + x^2)/(2^(1/3)*(1 + Sqrt[3])
+ x^2)^2]*Sqrt[2 + x^6])
```

Rubi in Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RecursionError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**15/(x**6+2)**(3/2),x)
```

```
[Out] Exception raised: RecursionError
```

Mathematica [C] time = 0.540099, size = 195, normalized size = 0.49

$$\frac{3\left(3x^6+20\right)x^4+40\,2^{2/3}3^{3/4}\sqrt{-\sqrt[6]{-1}\left(2^{2/3}x^2+2(-1)^{2/3}\right)}\sqrt{(-1)^{2/3}\sqrt[3]{2}x^4+\sqrt[3]{-1}2^{2/3}x^2+2}\left((-1)^{5/6}F\left(\sin^{-1}\left(\frac{\sqrt{\left(-i+\sqrt{3}\right)\left(2^{2/3}x^2+\right.}}{2\sqrt[4]{3}}\right.\right.\right.}{63\sqrt{x^6+2}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^15/(2 + x^6)^(3/2),x]
```

```
[Out] (3*x^4*(20 + 3*x^6) + 40*2^(2/3)*3^(3/4)*Sqrt[-((-1)^(1/6)*(2*(-1
)^(2/3) + 2^(2/3)*x^2))]*Sqrt[2 + (-1)^(1/3)*2^(2/3)*x^2 + (-1)^(
2/3)*2^(1/3)*x^4]*(Sqrt[3]*EllipticE[ArcSin[Sqrt[(-I + Sqrt[3])*(
2 + 2^(2/3)*x^2)]/(2*3^(1/4))], (-1)^(1/3)] + (-1)^(5/6)*Elliptic
F[ArcSin[Sqrt[(-I + Sqrt[3])*(2 + 2^(2/3)*x^2)]/(2*3^(1/4))], (-1
)^(1/3)]))/(63*Sqrt[2 + x^6])
```

Maple [C] time = 0.035, size = 40, normalized size = 0.1

$$\frac{x^4\left(3\,x^6+20\right)}{21}\frac{1}{\sqrt{x^6+2}}-\frac{10\,x^4\sqrt{2}}{21}{}_2F_1\left(\frac{1}{2},\frac{2}{3};\frac{5}{3};-\frac{x^6}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^15/(x^6+2)^(3/2),x)
```

```
[Out] 1/21*x^4*(3*x^6+20)/(x^6+2)^(1/2)-10/21*2^(1/2)*x^4*hypergeom([1/
2,2/3],[5/3],-1/2*x^6)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{15}}{(x^6+2)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^15/(x^6 + 2)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^15/(x^6 + 2)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{15}}{(x^6+2)^{\frac{3}{2}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^15/(x^6 + 2)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^15/(x^6 + 2)^(3/2), x)
```

Sympy [A] time = 10.8667, size = 36, normalized size = 0.09

$$\frac{\sqrt{2}x^{16}\,\Gamma\left(\frac{8}{3}\right)\,{}_2F_1\left(\begin{matrix}\frac{3}{2},\frac{8}{3}\\\frac{11}{3}\end{matrix}\middle|\frac{x^6e^{i\pi}}{2}\right)}{24\,\Gamma\left(\frac{11}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**15/(x**6+2)**(3/2),x)
```

```
[Out] sqrt(2)*x**16*gamma(8/3)*hyper((3/2, 8/3), (11/3,), x**6*exp_pola
r(I*pi)/2)/(24*gamma(11/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{15}}{(x^6+2)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^15/(x^6 + 2)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^15/(x^6 + 2)^(3/2), x)
```

3.1427 $\int \frac{x^9}{(2+x^6)^{3/2}}\,dx$

Optimal. Leaf size=376

$$-\frac{x^4}{3\sqrt{x^6+2}}+\frac{4\sqrt{x^6+2}}{3\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)}+\frac{4\,2^{2/3}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}F\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{3\sqrt[4]{3}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}-\frac{2\sqrt[6]{2}\sqrt{2-\sqrt{3}}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}E\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{3^{3/4}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}$$

```
[Out] -x^4/(3*Sqrt[2 + x^6]) + (4*Sqrt[2 + x^6])/(3*(2^(1/3)*(1 + Sqrt[
3]) + x^2)) - (2*2^(1/6)*Sqrt[2 - Sqrt[3]]*(2^(1/3) + x^2)*Sqrt[(
2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*Ell
ipticE[ArcSin[(2^(1/3)*(1 - Sqrt[3]) + x^2)/(2^(1/3)*(1 + Sqrt[3]
) + x^2)], -7 - 4*Sqrt[3]])/(3^(3/4)*Sqrt[(2^(1/3) + x^2)/(2^(1/3
)*(1 + Sqrt[3]) + x^2)^2]*Sqrt[2 + x^6]) + (4*2^(2/3)*(2^(1/3) +
x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3)*(1 + Sqrt[3]) +
x^2)^2]*EllipticF[ArcSin[(2^(1/3)*(1 - Sqrt[3]) + x^2)/(2^(1/3)*(
1 + Sqrt[3]) + x^2)], -7 - 4*Sqrt[3]])/(3*3^(1/4)*Sqrt[(2^(1/3) +
 x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*Sqrt[2 + x^6])
```

Rubi [A] time = 0.429984, antiderivative size = 376, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385

$$-\frac{x^4}{3\sqrt{x^6+2}}+\frac{4\sqrt{x^6+2}}{3\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)}+\frac{4\,2^{2/3}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}F\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{3\sqrt[4]{3}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}-\frac{2\sqrt[6]{2}\sqrt{2-\sqrt{3}}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}E\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{3^{3/4}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^9/(2 + x^6)^(3/2),x]
```


```
[Out] -x^4/(3*Sqrt[2 + x^6]) + (4*Sqrt[2 + x^6])/(3*(2^(1/3)*(1 + Sqrt[
3]) + x^2)) - (2*2^(1/6)*Sqrt[2 - Sqrt[3]]*(2^(1/3) + x^2)*Sqrt[(
2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*Ell
ipticE[ArcSin[(2^(1/3)*(1 - Sqrt[3]) + x^2)/(2^(1/3)*(1 + Sqrt[3]
) + x^2)], -7 - 4*Sqrt[3]])/(3^(3/4)*Sqrt[(2^(1/3) + x^2)/(2^(1/3
)*(1 + Sqrt[3]) + x^2)^2]*Sqrt[2 + x^6]) + (4*2^(2/3)*(2^(1/3) +
x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3)*(1 + Sqrt[3]) +
x^2)^2]*EllipticF[ArcSin[(2^(1/3)*(1 - Sqrt[3]) + x^2)/(2^(1/3)*(
```

```
1 + Sqrt[3]) + x^2)], -7 - 4*Sqrt[3]])/(3*3^(1/4)*Sqrt[(2^(1/3) +
 x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*Sqrt[2 + x^6])
```

Rubi in Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RecursionError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**9/(x**6+2)**(3/2),x)

[Out] Exception raised: RecursionError
```

Mathematica [C] time = 0.616243, size = 177, normalized size = 0.47

$$\frac{-3x^4-4\,2^{2/3}3^{3/4}\sqrt{(-1)^{5/6}\left(\sqrt[3]{-\frac{1}{2}}x^2-1\right)}\sqrt{\left(-\frac{1}{2}\right)^{2/3}x^4+\sqrt[3]{-\frac{1}{2}}x^2+1}\left((-1)^{5/6}F\left(\sin^{-1}\left(\frac{\sqrt{\left(-i+\sqrt{3}\right)\left(2^{2/3}x^2+2\right)}}{2\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)+\sqrt{3}E\left(\right.\right.}{9\sqrt{x^6+2}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^9/(2 + x^6)^(3/2),x]

[Out] (-3*x^4 - 4*2^(2/3)*3^(3/4)*Sqrt[(-1)^(5/6)*(-1 + (-1/2)^(1/3)*x^
2)]*Sqrt[1 + (-1/2)^(1/3)*x^2 + (-1/2)^(2/3)*x^4]*(Sqrt[3]*Ellipt
icE[ArcSin[Sqrt[(-I + Sqrt[3])*(2 + 2^(2/3)*x^2)]/(2*3^(1/4))], (
-1)^(1/3)] + (-1)^(5/6)*EllipticF[ArcSin[Sqrt[(-I + Sqrt[3])*(2 +
 2^(2/3)*x^2)]/(2*3^(1/4))], (-1)^(1/3)]))/(9*Sqrt[2 + x^6])
```

Maple [C] time = 0.036, size = 33, normalized size = 0.1

$$-\frac{x^4}{3}\frac{1}{\sqrt{x^6+2}}+\frac{x^4\sqrt{2}}{6}{}_2F_1\left(\frac{1}{2},\frac{2}{3};\frac{5}{3};-\frac{x^6}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^9/(x^6+2)^(3/2),x)

[Out] -1/3*x^4/(x^6+2)^(1/2)+1/6*2^(1/2)*x^4*hypergeom([1/2,2/3],[5/3],
-1/2*x^6)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^9}{(x^6+2)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(x^6 + 2)^(3/2),x, algorithm="maxima")

[Out] integrate(x^9/(x^6 + 2)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^9}{(x^6+2)^{\frac{3}{2}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(x^6 + 2)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^9/(x^6 + 2)^(3/2), x)
```

Sympy [A] time = 3.69936, size = 36, normalized size = 0.1

$$\frac{\sqrt{2}x^{10}\Gamma\left(\frac{5}{3}\right){}_2F_1\left(\begin{matrix}\frac{3}{2},\frac{5}{3}\\ \frac{8}{3}\end{matrix}\middle|\frac{x^6e^{i\pi}}{2}\right)}{24\Gamma\left(\frac{8}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**9/(x**6+2)**(3/2),x)
```

```
[Out] sqrt(2)*x**10*gamma(5/3)*hyper((3/2, 5/3), (8/3,), x**6*exp_polar
(I*pi)/2)/(24*gamma(8/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^9}{(x^6+2)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(x^6 + 2)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^9/(x^6 + 2)^(3/2), x)
```

3.1428 $\int \frac{x^3}{(2+x^6)^{3/2}}\,dx$

Optimal. Leaf size=378

$$\frac{x^4}{6\sqrt{x^6+2}}-\frac{\sqrt{x^6+2}}{6\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)}-\frac{\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}F\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{3\sqrt[3]{2}\sqrt[4]{3}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}+\frac{\sqrt{2-\sqrt{3}}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}E\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{2\,2^{5/6}3^{3/4}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}$$

```
[Out] x^4/(6*Sqrt[2 + x^6]) - Sqrt[2 + x^6]/(6*(2^(1/3)*(1 + Sqrt[3]) +
 x^2)) + (Sqrt[2 - Sqrt[3]]*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/
3)*x^2 + x^4)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*EllipticE[ArcSin[(
2^(1/3)*(1 - Sqrt[3]) + x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)], -7 -
 4*Sqrt[3]])/(2*2^(5/6)*3^(3/4)*Sqrt[(2^(1/3) + x^2)/(2^(1/3)*(1
+ Sqrt[3]) + x^2)^2]*Sqrt[2 + x^6]) - ((2^(1/3) + x^2)*Sqrt[(2^(2
/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*Ellipti
cF[ArcSin[(2^(1/3)*(1 - Sqrt[3]) + x^2)/(2^(1/3)*(1 + Sqrt[3]) +
x^2)], -7 - 4*Sqrt[3]])/(3*2^(1/3)*3^(1/4)*Sqrt[(2^(1/3) + x^2)/(
2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*Sqrt[2 + x^6])
```

Rubi [A] time = 0.431473, antiderivative size = 378, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385

$$\frac{x^4}{6\sqrt{x^6+2}}-\frac{\sqrt{x^6+2}}{6\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)}-\frac{\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}F\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{3\sqrt[3]{2}\sqrt[4]{3}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}+\frac{\sqrt{2-\sqrt{3}}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}E\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{2\,2^{5/6}3^{3/4}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(2 + x^6)^(3/2),x]
```


```
[Out] x^4/(6*Sqrt[2 + x^6]) - Sqrt[2 + x^6]/(6*(2^(1/3)*(1 + Sqrt[3]) +
 x^2)) + (Sqrt[2 - Sqrt[3]]*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/
3)*x^2 + x^4)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*EllipticE[ArcSin[(
2^(1/3)*(1 - Sqrt[3]) + x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)], -7 -
 4*Sqrt[3]])/(2*2^(5/6)*3^(3/4)*Sqrt[(2^(1/3) + x^2)/(2^(1/3)*(1
+ Sqrt[3]) + x^2)^2]*Sqrt[2 + x^6]) - ((2^(1/3) + x^2)*Sqrt[(2^(2
/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*Ellipti
cF[ArcSin[(2^(1/3)*(1 - Sqrt[3]) + x^2)/(2^(1/3)*(1 + Sqrt[3]) +
```

```
x^2)], -7 - 4*Sqrt[3]])/(3*2^(1/3)*3^(1/4)*Sqrt[(2^(1/3) + x^2)/(
2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*Sqrt[2 + x^6])
```

Rubi in Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RecursionError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(x**6+2)**(3/2),x)
```

```
[Out] Exception raised: RecursionError
```

Mathematica [C] time = 0.833944, size = 189, normalized size = 0.5

$$\frac{x^4}{6\sqrt{x^6+2}} + \frac{i\sqrt{(-1)^{5/6}\left(\sqrt[3]{-\frac{1}{2}}x^2-1\right)}\sqrt{\left(-\frac{1}{2}\right)^{2/3}x^4+\sqrt[3]{-\frac{1}{2}}x^2+1}\left(\sqrt[3]{-1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{(-1)^{5/6}x^2}{\sqrt[3]{2}}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)-i\sqrt{3}E\left(\sin^{-1}\left(\frac{\sqrt{-\frac{(-1)^{5/6}x^2}{\sqrt[3]{2}}-}}{\sqrt[4]{3}}\right.\right.\right.}{3\sqrt[3]{2}\sqrt[4]{3}\sqrt{x^6+2}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^3/(2 + x^6)^(3/2),x]
```

```
[Out] x^4/(6*Sqrt[2 + x^6]) + ((I/3)*Sqrt[(-1)^(5/6)*(-1 + (-1/2)^(1/3)
*x^2)]*Sqrt[1 + (-1/2)^(1/3)*x^2 + (-1/2)^(2/3)*x^4]*((-I)*Sqrt[3
]*EllipticE[ArcSin[Sqrt[-(-1)^(5/6) - ((-1)^(5/6)*x^2)/2^(1/3)]/3
^(1/4)], (-1)^(1/3)] + (-1)^(1/3)*EllipticF[ArcSin[Sqrt[-(-1)^(5/
6) - ((-1)^(5/6)*x^2)/2^(1/3)]/3^(1/4)], (-1)^(1/3)]))/(2^(1/3)*3
^(1/4)*Sqrt[2 + x^6])
```

Maple [C] time = 0.035, size = 33, normalized size = 0.1

$$\frac{x^4}{6}\frac{1}{\sqrt{x^6+2}}-\frac{x^4\sqrt{2}}{48}{}_2F_1\left(\frac{1}{2},\frac{2}{3};\frac{5}{3};-\frac{x^6}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(x^6+2)^(3/2),x)
```

```
[Out] 1/6*x^4/(x^6+2)^(1/2)-1/48*2^(1/2)*x^4*hypergeom([1/2,2/3],[5/3],
-1/2*x^6)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{(x^6+2)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(x^6 + 2)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^3/(x^6 + 2)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^3}{(x^6+2)^{\frac{3}{2}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(x^6 + 2)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^3/(x^6 + 2)^(3/2), x)
```

Sympy [A] time = 1.97544, size = 36, normalized size = 0.1

$$\frac{\sqrt{2}x^4\,\Gamma\left(\frac{2}{3}\right)\,{}_2F_1\left(\begin{matrix}\frac{2}{3},\frac{3}{2}\\ \frac{5}{3}\end{matrix}\middle|\frac{x^6e^{i\pi}}{2}\right)}{24\,\Gamma\left(\frac{5}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(x**6+2)**(3/2),x)
```

```
[Out] sqrt(2)*x**4*gamma(2/3)*hyper((2/3, 3/2), (5/3,), x**6*exp_polar(
I*pi)/2)/(24*gamma(5/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{(x^6+2)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(x^6 + 2)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^3/(x^6 + 2)^(3/2), x)
```

3.1429 $\int \frac{1}{x^3(2+x^6)^{3/2}}\,dx$

Optimal. Leaf size=394

$$\frac{5\sqrt{x^6+2}}{24\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)}-\frac{5\sqrt{x^6+2}}{24x^2}+\frac{1}{6x^2\sqrt{x^6+2}}+\frac{5\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}F\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{12\sqrt[3]{2}\sqrt[4]{3}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}-\frac{5\sqrt{2-\sqrt{3}}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}E\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{8\,2^{5/6}3^{3/4}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}$$

```
[Out] 1/(6*x^2*Sqrt[2 + x^6]) - (5*Sqrt[2 + x^6])/(24*x^2) + (5*Sqrt[2
+ x^6])/(24*(2^(1/3)*(1 + Sqrt[3]) + x^2)) - (5*Sqrt[2 - Sqrt[3]]
*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3)*(1 +
 Sqrt[3]) + x^2)^2]*EllipticE[ArcSin[(2^(1/3)*(1 - Sqrt[3]) + x^2
)/(2^(1/3)*(1 + Sqrt[3]) + x^2)], -7 - 4*Sqrt[3]])/(8*2^(5/6)*3^(
3/4)*Sqrt[(2^(1/3) + x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*Sqrt[2
 + x^6]) + (5*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/
(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*EllipticF[ArcSin[(2^(1/3)*(1 - S
qrt[3]) + x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)], -7 - 4*Sqrt[3]])/(
12*2^(1/3)*3^(1/4)*Sqrt[(2^(1/3) + x^2)/(2^(1/3)*(1 + Sqrt[3]) +
x^2)^2]*Sqrt[2 + x^6])
```

Rubi [A] time = 0.491701, antiderivative size = 394, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.462

$$\frac{5\sqrt{x^6+2}}{24\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)}-\frac{5\sqrt{x^6+2}}{24x^2}+\frac{1}{6x^2\sqrt{x^6+2}}+\frac{5\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}F\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{12\sqrt[3]{2}\sqrt[4]{3}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}-\frac{5\sqrt{2-\sqrt{3}}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}E\left(\sin^{-1}\left(\frac{x^2+\sqrt[3]{2}\left(1-\sqrt{3}\right)}{x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)}\right)|-7-4\sqrt{3}\right)}{8\,2^{5/6}3^{3/4}\sqrt{\frac{x^2+\sqrt[3]{2}}{\left(x^2+\sqrt[3]{2}\left(1+\sqrt{3}\right)\right)^2}}\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(2 + x^6)^(3/2)),x]
```

```
[Out] 1/(6*x^2*Sqrt[2 + x^6]) - (5*Sqrt[2 + x^6])/(24*x^2) + (5*Sqrt[2
+ x^6])/(24*(2^(1/3)*(1 + Sqrt[3]) + x^2)) - (5*Sqrt[2 - Sqrt[3]]
*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3)*(1 +
 Sqrt[3]) + x^2)^2]*EllipticE[ArcSin[(2^(1/3)*(1 - Sqrt[3]) + x^2
)/(2^(1/3)*(1 + Sqrt[3]) + x^2)], -7 - 4*Sqrt[3]])/(8*2^(5/6)*3^(
3/4)*Sqrt[(2^(1/3) + x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*Sqrt[2
 + x^6]) + (5*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/
```

```
(2^(1/3)*(1 + Sqrt[3]) + x^2)^2]*EllipticF[ArcSin[(2^(1/3)*(1 - S
qrt[3]) + x^2)/(2^(1/3)*(1 + Sqrt[3]) + x^2)], -7 - 4*Sqrt[3]])/(
12*2^(1/3)*3^(1/4)*Sqrt[(2^(1/3) + x^2)/(2^(1/3)*(1 + Sqrt[3]) +
x^2)^2]*Sqrt[2 + x^6])
```

Rubi in Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RecursionError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(x**6+2)**(3/2),x)
```

```
[Out] Exception raised: RecursionError
```

Mathematica [C] time = 0.866088, size = 198, normalized size = 0.5

$$\frac{i\left(6ix^6+9i\left(x^6+2\right)+5i2^{2/3}3^{3/4}\sqrt{(-1)^{5/6}\left(\sqrt[3]{-\frac{1}{2}}x^2-1\right)}\sqrt{\left(-\frac{1}{2}\right)^{2/3}x^4+\sqrt[3]{-\frac{1}{2}}x^2+1}x^2\left((-1)^{5/6}F\left(\sin^{-1}\left(\frac{\sqrt{\left(-i+\sqrt{3}\right)\left(2^{2/3}x^2+2\right)}}{2\sqrt[4]{3}}\right.\right.\right.\right.}{72x^2\sqrt{x^6+2}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/(x^3*(2 + x^6)^(3/2)),x]
```

```
[Out] ((I/72)*((6*I)*x^6 + (9*I)*(2 + x^6) + (5*I)*2^(2/3)*3^(3/4)*x^2*
Sqrt[(-1)^(5/6)*(-1 + (-1/2)^(1/3)*x^2)]*Sqrt[1 + (-1/2)^(1/3)*x^
2 + (-1/2)^(2/3)*x^4]*(Sqrt[3]*EllipticE[ArcSin[Sqrt[(-I + Sqrt[3
])*(2 + 2^(2/3)*x^2)]/(2*3^(1/4))], (-1)^(1/3)] + (-1)^(5/6)*Elli
pticF[ArcSin[Sqrt[(-I + Sqrt[3])*(2 + 2^(2/3)*x^2)]/(2*3^(1/4))],
 (-1)^(1/3)])))/(x^2*Sqrt[2 + x^6])
```

Maple [C] time = 0.042, size = 40, normalized size = 0.1

$$-\frac{5\,x^6+6}{24\,x^2}\frac{1}{\sqrt{x^6+2}}+\frac{5\,x^4\sqrt{2}}{192}{}_2F_1(\frac{1}{2},\frac{2}{3};\frac{5}{3};-\frac{x^6}{2})$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(x^6+2)^(3/2),x)
```

```
[Out] -1/24*(5*x^6+6)/x^2/(x^6+2)^(1/2)+5/192*2^(1/2)*x^4*hypergeom([1/
2,2/3],[5/3],-1/2*x^6)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(x^6+2)^{\frac{3}{2}}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 2)^(3/2)*x^3),x, algorithm="maxima")
```

```
[Out] integrate(1/((x^6 + 2)^(3/2)*x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{(x^9+2\,x^3)\sqrt{x^6+2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 2)^(3/2)*x^3),x, algorithm="fricas")
```

```
[Out] integral(1/((x^9 + 2*x^3)*sqrt(x^6 + 2)), x)
```

Sympy [A] time = 2.62887, size = 39, normalized size = 0.1

$$\frac{\sqrt{2}\,\Gamma\left(-\frac{1}{3}\right){}_{2}F_{1}\left(\begin{matrix}-\frac{1}{3},\frac{3}{2}\\ \frac{2}{3}\end{matrix}\middle|\frac{x^6e^{i\pi}}{2}\right)}{24x^2\,\Gamma\left(\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(x**6+2)**(3/2),x)
```

```
[Out] sqrt(2)*gamma(-1/3)*hyper((-1/3, 3/2), (2/3,), x**6*exp_polar(I*p
i)/2)/(24*x**2*gamma(2/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{(x^6+2)^{\frac{3}{2}}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 2)^(3/2)*x^3),x, algorithm="giac")
```

```
[Out] integrate(1/((x^6 + 2)^(3/2)*x^3), x)
```

3.1430 $\int \frac{x^{10}}{(2+x^6)^{3/2}}\,dx$

Optimal. Leaf size=392

$$-\frac{x^5}{3\sqrt{x^6+2}}+\frac{5\left(1+\sqrt{3}\right)\sqrt{x^6+2}x}{6\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)}-\frac{5\left(1-\sqrt{3}\right)\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}xF\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{6\,2^{2/3}\sqrt[4]{3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}-\frac{5\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}xE\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{2^{2/3}3^{3/4}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}$$

```
[Out] -x^5/(3*Sqrt[2 + x^6]) + (5*(1 + Sqrt[3])*x*Sqrt[2 + x^6])/(6*(2^
(1/3) + (1 + Sqrt[3])*x^2)) - (5*x*(2^(1/3) + x^2)*Sqrt[(2^(2/3)
- 2^(1/3)*x^2 + x^4)/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*EllipticE[A
rcCos[(2^(1/3) + (1 - Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3])*x^2)
], (2 + Sqrt[3])/4])/(2^(2/3)*3^(3/4)*Sqrt[(x^2*(2^(1/3) + x^2))/
(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*Sqrt[2 + x^6]) - (5*(1 - Sqrt[3]
)*x*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3) +
 (1 + Sqrt[3])*x^2)^2]*EllipticF[ArcCos[(2^(1/3) + (1 - Sqrt[3])*
x^2)/(2^(1/3) + (1 + Sqrt[3])*x^2)], (2 + Sqrt[3])/4])/(6*2^(2/3)
*3^(1/4)*Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/3) + (1 + Sqrt[3])*x^2)
^2]*Sqrt[2 + x^6])
```

Rubi [A] time = 0.27432, antiderivative size = 392, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$-\frac{x^5}{3\sqrt{x^6+2}}+\frac{5\left(1+\sqrt{3}\right)\sqrt{x^6+2}x}{6\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)}-\frac{5\left(1-\sqrt{3}\right)\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}xF\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{6\,2^{2/3}\sqrt[4]{3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}-\frac{5\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}xE\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{2^{2/3}3^{3/4}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^10/(2 + x^6)^(3/2),x]
```


```
[Out] -x^5/(3*Sqrt[2 + x^6]) + (5*(1 + Sqrt[3])*x*Sqrt[2 + x^6])/(6*(2^
(1/3) + (1 + Sqrt[3])*x^2)) - (5*x*(2^(1/3) + x^2)*Sqrt[(2^(2/3)
- 2^(1/3)*x^2 + x^4)/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*EllipticE[A
rcCos[(2^(1/3) + (1 - Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3])*x^2)
```

```
], (2 + Sqrt[3])/4])/(2^(2/3)*3^(3/4)*Sqrt[(x^2*(2^(1/3) + x^2))/
(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*Sqrt[2 + x^6]) - (5*(1 - Sqrt[3]
)*x*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3) +
 (1 + Sqrt[3])*x^2)^2]*EllipticF[ArcCos[(2^(1/3) + (1 - Sqrt[3])*
x^2)/(2^(1/3) + (1 + Sqrt[3])*x^2)], (2 + Sqrt[3])/4])/(6*2^(2/3)
*3^(1/4)*Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/3) + (1 + Sqrt[3])*x^2)
^2]*Sqrt[2 + x^6])
```

Rubi in Sympy [A] time = 15.6586, size = 357, normalized size = 0.91

$$-\frac{x^5}{3\sqrt{x^6+2}} - \frac{5\cdot 2^{\frac{2}{3}}\sqrt[4]{3}x\sqrt{\frac{2\sqrt[3]{2}x^4-2\cdot 2^{\frac{2}{3}}x^2+4}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\left(x^2+\sqrt[3]{2}\right)E\left(\operatorname{acos}\left(\frac{x^2\left(-\sqrt{3}+1\right)+\sqrt[3]{2}}{x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}}\right)\middle|\frac{\sqrt{3}}{4}+\frac{1}{2}\right)}{12\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}} - \frac{5\cdot 2^{\frac{2}{3}}\cdot 3^{\frac{3}{4}}x\sqrt{\frac{2\sqrt[3]{2}x^4-2\cdot 2^{\frac{2}{3}}x^2+4}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\left(-4\sqrt{3}+4\right)\left(x^2+\sqrt[3]{2}\right)F\left(\operatorname{acos}\left(\frac{x^2\left(-\sqrt{3}+1\right)+\sqrt[3]{2}}{x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}}\right)\middle|\frac{\sqrt{3}}{4}+\frac{1}{2}\right)}{288\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}} + \frac{x\left(\frac{5}{6}+\frac{5\sqrt{3}}{6}\right)\sqrt{x^6+2}}{x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**10/(x**6+2)**(3/2),x)
```

```
[Out] -x**5/(3*sqrt(x**6 + 2)) - 5*2**(2/3)*3**(1/4)*x*sqrt((2*2**(1/3)
*x**4 - 2*2**(2/3)*x**2 + 4)/(x**2*(1 + sqrt(3)) + 2**(1/3))**2)*
(x**2 + 2**(1/3))*elliptic_e(acos((x**2*(-sqrt(3) + 1) + 2**(1/3)
)/(x**2*(1 + sqrt(3)) + 2**(1/3))), sqrt(3)/4 + 1/2)/(12*sqrt(x**
2*(x**2 + 2**(1/3))/(x**2*(1 + sqrt(3)) + 2**(1/3))**2)*sqrt(x**6
 + 2)) - 5*2**(2/3)*3**(3/4)*x*sqrt((2*2**(1/3)*x**4 - 2*2**(2/3)
*x**2 + 4)/(x**2*(1 + sqrt(3)) + 2**(1/3))**2)*(-4*sqrt(3) + 4)*(
x**2 + 2**(1/3))*elliptic_f(acos((x**2*(-sqrt(3) + 1) + 2**(1/3))
/(x**2*(1 + sqrt(3)) + 2**(1/3))), sqrt(3)/4 + 1/2)/(288*sqrt(x**
2*(x**2 + 2**(1/3))/(x**2*(1 + sqrt(3)) + 2**(1/3))**2)*sqrt(x**6
 + 2)) + x*(5/6 + 5*sqrt(3)/6)*sqrt(x**6 + 2)/(x**2*(1 + sqrt(3))
 + 2**(1/3))
```

Mathematica [A] time = 0.81966, size = 274, normalized size = 0.7

$$\frac{-12x^6+\frac{30\left(1+\sqrt{3}\right)\left(x^6+2\right)x^2}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}-\frac{5\sqrt[3]{2}\sqrt[4]{3}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}x^2\left(\left(\sqrt{3}-3\right)F\left(\cos^{-1}\left(\frac{\sqrt[3]{2}-\left(-1+\sqrt{3}\right)x^2}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)\middle|\frac{1}{4}\left(2+\sqrt{3}\right)\right)+6E\left(\cos^{-1}\left(\frac{\sqrt[3]{2}-\left(-1+\sqrt{3}\right)x^2}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)\middle|\frac{1}{4}\left(2+\sqrt{3}\right)\right)\right)}{\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}}}{36x\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^10/(2 + x^6)^(3/2),x]
```

```
[Out] (-12*x^6 + (30*(1 + Sqrt[3])*x^2*(2 + x^6))/(2^(1/3) + (1 + Sqrt[
3])*x^2) - (5*2^(1/3)*3^(1/4)*x^2*(2^(1/3) + x^2)*Sqrt[(2^(2/3) -
 2^(1/3)*x^2 + x^4)/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*(6*EllipticE
```

```
[ArcCos[(2^(1/3) - (-1 + Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3])*x
^2)], (2 + Sqrt[3])/4] + (-3 + Sqrt[3])*EllipticF[ArcCos[(2^(1/3)
 - (-1 + Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3])*x^2)], (2 + Sqrt[
3])/4]))/Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/3) + (1 + Sqrt[3])*x^2)
^2])/(36*x*Sqrt[2 + x^6])
```

Maple [C] time = 0.036, size = 33, normalized size = 0.1

$$-\frac{x^5}{3}\frac{1}{\sqrt{x^6+2}}+\frac{\sqrt{2}x^5}{6}{}_2\mathrm{F}_1(\frac{1}{2},\frac{5}{6};\frac{11}{6};-\frac{x^6}{2})$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^10/(x^6+2)^(3/2),x)
```

```
[Out] -1/3*x^5/(x^6+2)^(1/2)+1/6*2^(1/2)*x^5*hypergeom([1/2,5/6],[11/6]
,-1/2*x^6)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{10}}{(x^6+2)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/(x^6 + 2)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^10/(x^6 + 2)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{10}}{(x^6+2)^{\frac{3}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/(x^6 + 2)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^10/(x^6 + 2)^(3/2), x)
```

Sympy [A] time = 4.32478, size = 36, normalized size = 0.09

$$\frac{\sqrt{2}x^{11}\,\Gamma\left(\frac{11}{6}\right)\,{}_2F_1\left(\left.\begin{matrix}\frac{3}{2},\frac{11}{6}\\\frac{17}{6}\end{matrix}\right|\frac{x^6e^{i\pi}}{2}\right)}{24\,\Gamma\left(\frac{17}{6}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**10/(x**6+2)**(3/2),x)
```

```
[Out] sqrt(2)*x**11*gamma(11/6)*hyper((3/2, 11/6), (17/6,), x**6*exp_po
lar(I*pi)/2)/(24*gamma(17/6))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{10}}{(x^6+2)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/(x^6 + 2)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^10/(x^6 + 2)^(3/2), x)
```

3.1431 $\int \frac{x^4}{(2+x^6)^{3/2}}\,dx$

Optimal. Leaf size=391

$$\frac{x^5}{6\sqrt{x^6+2}}-\frac{\left(1+\sqrt{3}\right)\sqrt{x^6+2}\,x}{6\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)}+\frac{\left(1-\sqrt{3}\right)\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\,xF\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{6\,2^{2/3}\sqrt[4]{3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}+\frac{\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\,xE\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{2^{2/3}3^{3/4}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}$$

```
[Out] x^5/(6*Sqrt[2 + x^6]) - ((1 + Sqrt[3])*x*Sqrt[2 + x^6])/(6*(2^(1/
3) + (1 + Sqrt[3])*x^2)) + (x*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(
1/3)*x^2 + x^4)/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*EllipticE[ArcCos
[(2^(1/3) + (1 - Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3])*x^2)], (2
 + Sqrt[3])/4])/(2^(2/3)*3^(3/4)*Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1
/3) + (1 + Sqrt[3])*x^2)^2]*Sqrt[2 + x^6]) + ((1 - Sqrt[3])*x*(2^
(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3) + (1 + S
qrt[3])*x^2)^2]*EllipticF[ArcCos[(2^(1/3) + (1 - Sqrt[3])*x^2)/(2
^(1/3) + (1 + Sqrt[3])*x^2)], (2 + Sqrt[3])/4])/(6*2^(2/3)*3^(1/4
)*Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*Sqr
t[2 + x^6])
```

Rubi [A] time = 0.257083, antiderivative size = 391, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$

$$\frac{x^5}{6\sqrt{x^6+2}}-\frac{\left(1+\sqrt{3}\right)\sqrt{x^6+2}\,x}{6\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)}+\frac{\left(1-\sqrt{3}\right)\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\,xF\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{6\,2^{2/3}\sqrt[4]{3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}+\frac{\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\,xE\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{2^{2/3}3^{3/4}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(2 + x^6)^(3/2),x]
```


```
[Out] x^5/(6*Sqrt[2 + x^6]) - ((1 + Sqrt[3])*x*Sqrt[2 + x^6])/(6*(2^(1/
3) + (1 + Sqrt[3])*x^2)) + (x*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(
1/3)*x^2 + x^4)/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*EllipticE[ArcCos
[(2^(1/3) + (1 - Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3])*x^2)], (2
```

```
 + Sqrt[3])/4])/(2^(2/3)*3^(3/4)*Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1
/3) + (1 + Sqrt[3])*x^2)^2]*Sqrt[2 + x^6]) + ((1 - Sqrt[3])*x*(2^
(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3) + (1 + S
qrt[3])*x^2)^2]*EllipticF[ArcCos[(2^(1/3) + (1 - Sqrt[3])*x^2)/(2
^(1/3) + (1 + Sqrt[3])*x^2)], (2 + Sqrt[3])/4])/(6*2^(2/3)*3^(1/4
)*Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*Sqr
t[2 + x^6])
```

Rubi in Sympy [A] time = 15.3374, size = 352, normalized size = 0.9

$$\frac{x^5}{6\sqrt{x^6+2}}+\frac{2^{\frac{2}{3}}\sqrt[4]{3}x\sqrt{\frac{2\sqrt[3]{2}x^4-2\cdot 2^{\frac{2}{3}}x^2+4}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\left(x^2+\sqrt[3]{2}\right)E\left(\operatorname{acos}\left(\frac{x^2\left(-\sqrt{3}+1\right)+\sqrt[3]{2}}{x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}}\right)\middle|\frac{\sqrt{3}}{4}+\frac{1}{2}\right)}{12\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}+\frac{2^{\frac{2}{3}}\cdot 3^{\frac{3}{4}}x\sqrt{\frac{2\sqrt[3]{2}x^4-2\cdot 2^{\frac{2}{3}}x^2+4}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\left(-4\sqrt{3}+4\right)\left(x^2+\sqrt[3]{2}\right)F\left(\operatorname{acos}\left(\frac{x^2\left(-\sqrt{3}+1\right)+\sqrt[3]{2}}{x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}}\right)\middle|\frac{\sqrt{3}}{4}+\frac{1}{2}\right)}{288\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}-\frac{x\left(\frac{1}{6}+\frac{\sqrt{3}}{6}\right)\sqrt{x^6+2}}{x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(x**6+2)**(3/2),x)
```

```
[Out] x**5/(6*sqrt(x**6 + 2)) + 2**(2/3)*3**(1/4)*x*sqrt((2*2**(1/3)*x*
*4 - 2*2**(2/3)*x**2 + 4)/(x**2*(1 + sqrt(3)) + 2**(1/3))**2)*(x*
*2 + 2**(1/3))*elliptic_e(acos((x**2*(-sqrt(3) + 1) + 2**(1/3))/(
x**2*(1 + sqrt(3)) + 2**(1/3))), sqrt(3)/4 + 1/2)/(12*sqrt(x**2*(
x**2 + 2**(1/3))/(x**2*(1 + sqrt(3)) + 2**(1/3))**2)*sqrt(x**6 +
2)) + 2**(2/3)*3**(3/4)*x*sqrt((2*2**(1/3)*x**4 - 2*2**(2/3)*x**2
 + 4)/(x**2*(1 + sqrt(3)) + 2**(1/3))**2)*(-4*sqrt(3) + 4)*(x**2
+ 2**(1/3))*elliptic_f(acos((x**2*(-sqrt(3) + 1) + 2**(1/3))/(x**
2*(1 + sqrt(3)) + 2**(1/3))), sqrt(3)/4 + 1/2)/(288*sqrt(x**2*(x*
*2 + 2**(1/3))/(x**2*(1 + sqrt(3)) + 2**(1/3))**2)*sqrt(x**6 + 2)
) - x*(1/6 + sqrt(3)/6)*sqrt(x**6 + 2)/(x**2*(1 + sqrt(3)) + 2**(
1/3))
```

Mathematica [A] time = 0.734228, size = 273, normalized size = 0.7

$$\frac{6x^6-\frac{6\left(1+\sqrt{3}\right)\left(x^6+2\right)x^2}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}+\frac{\sqrt[3]{2}\sqrt[4]{3}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}x^2\left(\left(\sqrt{3}-3\right)F\left(\cos^{-1}\left(\frac{\sqrt[3]{2}-\left(-1+\sqrt{3}\right)x^2}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)\middle|\frac{1}{4}\left(2+\sqrt{3}\right)\right)+6E\left(\cos^{-1}\left(\frac{\sqrt[3]{2}-\left(-1+\sqrt{3}\right)x^2}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)\middle|\frac{1}{4}\left(2+\sqrt{3}\right)\right)\right)}{\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}}}{36x\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(2 + x^6)^(3/2),x]
```

```
[Out] (6*x^6 - (6*(1 + Sqrt[3])*x^2*(2 + x^6))/(2^(1/3) + (1 + Sqrt[3])
*x^2) + (2^(1/3)*3^(1/4)*x^2*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1
/3)*x^2 + x^4)/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*(6*EllipticE[ArcC
```

```
os[(2^(1/3) - (-1 + Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3])*x^2)],
 (2 + Sqrt[3])/4] + (-3 + Sqrt[3])*EllipticF[ArcCos[(2^(1/3) - (-
1 + Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3])*x^2)], (2 + Sqrt[3])/4
]))/Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/3) + (1 + Sqrt[3])*x^2)^2])/
(36*x*Sqrt[2 + x^6])
```

Maple [C] time = 0.035, size = 33, normalized size = 0.1

$$\frac{x^5}{6}\frac{1}{\sqrt{x^6+2}}-\frac{\sqrt{2}x^5}{30}{}_2\mathrm{F}_1(\frac{1}{2},\frac{5}{6};\frac{11}{6};-\frac{x^6}{2})$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(x^6+2)^(3/2),x)
```

```
[Out] 1/6*x^5/(x^6+2)^(1/2)-1/30*2^(1/2)*x^5*hypergeom([1/2,5/6],[11/6]
,-1/2*x^6)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{(x^6+2)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(x^6 + 2)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^4/(x^6 + 2)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x^4}{(x^6+2)^{\frac{3}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(x^6 + 2)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^4/(x^6 + 2)^(3/2), x)
```

Sympy [A] time = 2.05952, size = 36, normalized size = 0.09

$$\frac{\sqrt{2}x^5\,\Gamma\left(\frac{5}{6}\right)\,{}_2F_1\left(\begin{matrix}\frac{5}{6},\frac{3}{2}\\ \frac{11}{6}\end{matrix}\middle|\frac{x^6e^{i\pi}}{2}\right)}{24\,\Gamma\left(\frac{11}{6}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(x**6+2)**(3/2),x)
```

```
[Out] sqrt(2)*x**5*gamma(5/6)*hyper((5/6, 3/2), (11/6,), x**6*exp_polar
(I*pi)/2)/(24*gamma(11/6))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{(x^6+2)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(x^6 + 2)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^4/(x^6 + 2)^(3/2), x)
```

3.1432 $\int \frac{1}{x^2(2+x^6)^{3/2}}\,dx$

Optimal. Leaf size=408

$$-\frac{\sqrt{x^6+2}}{3x}+\frac{1}{6\sqrt{x^6+2}\,x}+\frac{\left(1+\sqrt{3}\right)\sqrt{x^6+2}\,x}{3\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)}-\frac{\left(1-\sqrt{3}\right)\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\,xF\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{3\,2^{2/3}\sqrt[4]{3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}-\frac{\sqrt[3]{2}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\,xE\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{3^{3/4}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}$$

```
[Out] 1/(6*x*Sqrt[2 + x^6]) - Sqrt[2 + x^6]/(3*x) + ((1 + Sqrt[3])*x*Sq
rt[2 + x^6])/(3*(2^(1/3) + (1 + Sqrt[3])*x^2)) - (2^(1/3)*x*(2^(1
/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3) + (1 + Sqr
t[3])*x^2)^2]*EllipticE[ArcCos[(2^(1/3) + (1 - Sqrt[3])*x^2)/(2^(
1/3) + (1 + Sqrt[3])*x^2)], (2 + Sqrt[3])/4])/(3^(3/4)*Sqrt[(x^2*
(2^(1/3) + x^2))/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*Sqrt[2 + x^6])
- ((1 - Sqrt[3])*x*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 +
x^4)/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*EllipticF[ArcCos[(2^(1/3) +
 (1 - Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3])*x^2)], (2 + Sqrt[3])
/4])/(3*2^(2/3)*3^(1/4)*Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/3) + (1
+ Sqrt[3])*x^2)^2]*Sqrt[2 + x^6])
```

Rubi [A] time = 0.275007, antiderivative size = 408, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385

$$-\frac{\sqrt{x^6+2}}{3x}+\frac{1}{6\sqrt{x^6+2}\,x}+\frac{\left(1+\sqrt{3}\right)\sqrt{x^6+2}\,x}{3\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)}-\frac{\left(1-\sqrt{3}\right)\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\,xF\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{3\,2^{2/3}\sqrt[4]{3}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}-\frac{\sqrt[3]{2}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\,xE\left(\cos^{-1}\left(\frac{\left(1-\sqrt{3}\right)x^2+\sqrt[3]{2}}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)|\frac{1}{4}\left(2+\sqrt{3}\right)\right)}{3^{3/4}\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(2 + x^6)^(3/2)),x]
```



```
[Out] 1/(6*x*Sqrt[2 + x^6]) - Sqrt[2 + x^6]/(3*x) + ((1 + Sqrt[3])*x*Sq
rt[2 + x^6])/(3*(2^(1/3) + (1 + Sqrt[3])*x^2)) - (2^(1/3)*x*(2^(1
/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3) + (1 + Sqr
t[3])*x^2)^2]*EllipticE[ArcCos[(2^(1/3) + (1 - Sqrt[3])*x^2)/(2^(
```

```
1/3) + (1 + Sqrt[3])*x^2)], (2 + Sqrt[3])/4])/(3^(3/4)*Sqrt[(x^2*
(2^(1/3) + x^2))/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*Sqrt[2 + x^6])
- ((1 - Sqrt[3])*x*(2^(1/3) + x^2)*Sqrt[(2^(2/3) - 2^(1/3)*x^2 +
x^4)/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]*EllipticF[ArcCos[(2^(1/3) +
 (1 - Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3])*x^2)], (2 + Sqrt[3])
/4])/(3*2^(2/3)*3^(1/4)*Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/3) + (1
+ Sqrt[3])*x^2)^2]*Sqrt[2 + x^6])
```

Rubi in Sympy [A] time = 17.001, size = 364, normalized size = 0.89

$$-\frac{2^{\frac{2}{3}}\sqrt[4]{3}x\sqrt{\frac{2\sqrt[3]{2}x^4-2\cdot 2^{\frac{2}{3}}x^2+4}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\left(x^2+\sqrt[3]{2}\right)E\left(\operatorname{acos}\left(\frac{x^2\left(-\sqrt{3}+1\right)+\sqrt[3]{2}}{x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}}\right)\middle|\frac{\sqrt{3}}{4}+\frac{1}{2}\right)}{6\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}-\frac{2^{\frac{2}{3}}\cdot 3^{\frac{3}{4}}x\sqrt{\frac{2\sqrt[3]{2}x^4-2\cdot 2^{\frac{2}{3}}x^2+4}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\left(-4\sqrt{3}+4\right)\left(x^2+\sqrt[3]{2}\right)F\left(\operatorname{acos}\left(\frac{x^2\left(-\sqrt{3}+1\right)+\sqrt[3]{2}}{x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}}\right)\middle|\frac{\sqrt{3}}{4}+\frac{1}{2}\right)}{144\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}\right)^2}}\sqrt{x^6+2}}+\frac{x\left(\frac{1}{3}+\frac{\sqrt{3}}{3}\right)\sqrt{x^6+2}}{x^2\left(1+\sqrt{3}\right)+\sqrt[3]{2}}-\frac{\sqrt{x^6+2}}{3x}+\frac{1}{6x\sqrt{x^6+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(x**6+2)**(3/2),x)
```

```
[Out] -2**(2/3)*3**(1/4)*x*sqrt((2*2**(1/3)*x**4 - 2*2**(2/3)*x**2 + 4)
/(x**2*(1 + sqrt(3)) + 2**(1/3))**2)*(x**2 + 2**(1/3))*elliptic_e
(acos((x**2*(-sqrt(3) + 1) + 2**(1/3))/(x**2*(1 + sqrt(3)) + 2**(
1/3))), sqrt(3)/4 + 1/2)/(6*sqrt(x**2*(x**2 + 2**(1/3))/(x**2*(1
+ sqrt(3)) + 2**(1/3))**2)*sqrt(x**6 + 2)) - 2**(2/3)*3**(3/4)*x*
sqrt((2*2**(1/3)*x**4 - 2*2**(2/3)*x**2 + 4)/(x**2*(1 + sqrt(3))
+ 2**(1/3))**2)*(-4*sqrt(3) + 4)*(x**2 + 2**(1/3))*elliptic_f(aco
s((x**2*(-sqrt(3) + 1) + 2**(1/3))/(x**2*(1 + sqrt(3)) + 2**(1/3)
)), sqrt(3)/4 + 1/2)/(144*sqrt(x**2*(x**2 + 2**(1/3))/(x**2*(1 +
sqrt(3)) + 2**(1/3))**2)*sqrt(x**6 + 2)) + x*(1/3 + sqrt(3)/3)*sq
rt(x**6 + 2)/(x**2*(1 + sqrt(3)) + 2**(1/3)) - sqrt(x**6 + 2)/(3*
x) + 1/(6*x*sqrt(x**6 + 2))
```

Mathematica [A] time = 0.788172, size = 281, normalized size = 0.69

$$\frac{-3x^6-9\left(x^6+2\right)+\frac{12\left(1+\sqrt{3}\right)\left(x^6+2\right)x^2}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}-\frac{2\sqrt[3]{2}\sqrt[4]{3}\left(x^2+\sqrt[3]{2}\right)\sqrt{\frac{x^4-\sqrt[3]{2}x^2+2^{2/3}}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}x^2\left(\left(\sqrt{3}-3\right)F\left(\cos^{-1}\left(\frac{\sqrt[3]{2}-\left(-1+\sqrt{3}\right)x^2}{\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}}\right)\middle|\frac{1}{4}\left(2+\sqrt{3}\right)\right)+6E\left(\cos^{-1}\left(\frac{\sqrt[3]{2}-\left(-1+\dots\right.}{\left(1+\sqrt{3}\right)x^2\dots}\right.\right.\right.}{\sqrt{\frac{x^2\left(x^2+\sqrt[3]{2}\right)}{\left(\left(1+\sqrt{3}\right)x^2+\sqrt[3]{2}\right)^2}}}}{36x\sqrt{x^6+2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*(2 + x^6)^(3/2)),x]
```

```
[Out] (-3*x^6 - 9*(2 + x^6) + (12*(1 + Sqrt[3])*x^2*(2 + x^6))/(2^(1/3)
 + (1 + Sqrt[3])*x^2) - (2*2^(1/3)*3^(1/4)*x^2*(2^(1/3) + x^2)*Sq
rt[(2^(2/3) - 2^(1/3)*x^2 + x^4)/(2^(1/3) + (1 + Sqrt[3])*x^2)^2]
```

```
*(6*EllipticE[ArcCos[(2^(1/3) - (-1 + Sqrt[3])*x^2)/(2^(1/3) + (1
 + Sqrt[3])*x^2)], (2 + Sqrt[3])/4] + (-3 + Sqrt[3])*EllipticF[Ar
cCos[(2^(1/3) - (-1 + Sqrt[3])*x^2)/(2^(1/3) + (1 + Sqrt[3])*x^2)
], (2 + Sqrt[3])/4]))/Sqrt[(x^2*(2^(1/3) + x^2))/(2^(1/3) + (1 +
Sqrt[3])*x^2)^2])/(36*x*Sqrt[2 + x^6])
```

Maple [C] time = 0.04, size = 40, normalized size = 0.1

$$-\frac{2\,x^{6}+3}{6\,x}\frac{1}{\sqrt{x^{6}+2}}+\frac{\sqrt{2}x^{5}}{15}{}_{2}\mathrm{F}_{1}(\frac{1}{2},\frac{5}{6};\frac{11}{6};-\frac{x^{6}}{2})$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(x^6+2)^(3/2),x)
```

```
[Out] -1/6*(2*x^6+3)/x/(x^6+2)^(1/2)+1/15*2^(1/2)*x^5*hypergeom([1/2,5/
6],[11/6],-1/2*x^6)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(x^{6}+2\right)^{\frac{3}{2}}x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 2)^(3/2)*x^2),x, algorithm="maxima")
```

```
[Out] integrate(1/((x^6 + 2)^(3/2)*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{\left(x^{8}+2\,x^{2}\right)\sqrt{x^{6}+2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 2)^(3/2)*x^2),x, algorithm="fricas")
```

```
[Out] integral(1/((x^8 + 2*x^2)*sqrt(x^6 + 2)), x)
```

Sympy [A] time = 2.47782, size = 37, normalized size = 0.09

$$\frac{\sqrt{2}\,\Gamma\left(-\frac{1}{6}\right)\,{}_{2}F_{1}\left(\begin{matrix}-\frac{1}{6},\frac{3}{2}\\ \frac{5}{6}\end{matrix}\middle|\frac{x^{6}e^{i\pi}}{2}\right)}{24x\,\Gamma\left(\frac{5}{6}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(x**6+2)**(3/2),x)
```

```
[Out] sqrt(2)*gamma(-1/6)*hyper((-1/6, 3/2), (5/6,), x**6*exp_polar(I*p
i)/2)/(24*x*gamma(5/6))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(x^6+2)^{\frac{3}{2}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^6 + 2)^(3/2)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/((x^6 + 2)^(3/2)*x^2), x)
```

3.1433 $\int x^m \left(a+bx^7\right) dx$

Optimal. Leaf size=25

$$\frac{ax^{m+1}}{m+1}+\frac{bx^{m+8}}{m+8}$$

```
[Out] (a*x^(1 + m))/(1 + m) + (b*x^(8 + m))/(8 + m)
```

Rubi [A] time = 0.0211544, antiderivative size = 25, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$

$$\frac{ax^{m+1}}{m+1}+\frac{bx^{m+8}}{m+8}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m*(a + b*x^7),x]

[Out] (a*x^(1 + m))/(1 + m) + (b*x^(8 + m))/(8 + m)
```

Rubi in Sympy [A] time = 3.96495, size = 19, normalized size = 0.76

$$\frac{ax^{m+1}}{m+1}+\frac{bx^{m+8}}{m+8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(b*x**7+a),x)

[Out] a*x**(m + 1)/(m + 1) + b*x**(m + 8)/(m + 8)
```

Mathematica [A] time = 0.0274158, size = 23, normalized size = 0.92

$$x^m\left(\frac{ax}{m+1}+\frac{bx^8}{m+8}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m*(a + b*x^7),x]

[Out] x^m*((a*x)/(1 + m) + (b*x^8)/(8 + m))
```

Maple [A] time = 0.004, size = 35, normalized size = 1.4

$$\frac{x^{1+m}\left(bmx^7+bx^7+am+8\,a\right)}{(8+m)(1+m)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(b*x^7+a),x)

[Out] x^(1+m)*(b*m*x^7+b*x^7+a*m+8*a)/(8+m)/(1+m)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^7 + a)*x^m,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.233144, size = 45, normalized size = 1.8

$$\frac{\left((bm+b)x^8+(am+8\,a)x\right)x^m}{m^2+9\,m+8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^7 + a)*x^m,x, algorithm="fricas")
```

```
[Out] ((b*m + b)*x^8 + (a*m + 8*a)*x)*x^m/(m^2 + 9*m + 8)
```

Sympy [A] time = 5.047, size = 94, normalized size = 3.76

$$\begin{cases} -\frac{a}{7x^7}+b\log(x) & \text{for } m=-8 \\ a\log(x)+\frac{bx^7}{7} & \text{for } m=-1 \\ \frac{amxx^m}{m^2+9m+8}+\frac{8axx^m}{m^2+9m+8}+\frac{bmx^8x^m}{m^2+9m+8}+\frac{bx^8x^m}{m^2+9m+8} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(b*x**7+a),x)
```

```
[Out] Piecewise((-a/(7*x**7) + b*log(x), Eq(m, -8)), (a*log(x) + b*x**7
/7, Eq(m, -1)), (a*m*x*x**m/(m**2 + 9*m + 8) + 8*a*x*x**m/(m**2 +
 9*m + 8) + b*m*x**8*x**m/(m**2 + 9*m + 8) + b*x**8*x**m/(m**2 +
9*m + 8), True))
```

GIAC/XCAS [A] time = 0.2244, size = 69, normalized size = 2.76

$$\frac{bmx^8e^{(m\ln(x))}+bx^8e^{(m\ln(x))}+amxe^{(m\ln(x))}+8\,axe^{(m\ln(x))}}{m^2+9\,m+8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^7 + a)*x^m,x, algorithm="giac")
```

```
[Out] (b*m*x^8*e^(m*ln(x)) + b*x^8*e^(m*ln(x)) + a*m*x*e^(m*ln(x)) + 8*
a*x*e^(m*ln(x)))/(m^2 + 9*m + 8)
```

3.1434 $\int x^8 \left(a + bx^7\right) \, dx$

Optimal. Leaf size=17

$$\frac{ax^9}{9} + \frac{bx^{16}}{16}$$

```
[Out] (a*x^9)/9 + (b*x^16)/16
```

Rubi [A] time = 0.0136834, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$

$$\frac{ax^9}{9} + \frac{bx^{16}}{16}$$

Antiderivative was successfully verified.

```
[In] Int[x^8*(a + b*x^7),x]

[Out] (a*x^9)/9 + (b*x^16)/16
```

Rubi in Sympy [A] time = 2.99811, size = 12, normalized size = 0.71

$$\frac{ax^9}{9} + \frac{bx^{16}}{16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**8*(b*x**7+a),x)

[Out] a*x**9/9 + b*x**16/16
```

Mathematica [A] time = 0.00188502, size = 17, normalized size = 1.

$$\frac{ax^9}{9} + \frac{bx^{16}}{16}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^8*(a + b*x^7),x]

[Out] (a*x^9)/9 + (b*x^16)/16
```

Maple [A] time = 0., size = 14, normalized size = 0.8

$$\frac{ax^9}{9} + \frac{bx^{16}}{16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^8*(b*x^7+a),x)

[Out] 1/9*a*x^9+1/16*b*x^16
```

Maxima [A] time = 1.43871, size = 18, normalized size = 1.06

$$\frac{1}{16}\,bx^{16} + \frac{1}{9}\,ax^9$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^7 + a)*x^8,x, algorithm="maxima")
```

```
[Out] 1/16*b*x^16 + 1/9*a*x^9
```

Fricas [A] time = 0.189639, size = 1, normalized size = 0.06

$$\frac{1}{16}x^{16}b + \frac{1}{9}x^9a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^7 + a)*x^8,x, algorithm="fricas")
```

```
[Out] 1/16*x^16*b + 1/9*x^9*a
```

Sympy [A] time = 0.066645, size = 12, normalized size = 0.71

$$\frac{ax^9}{9} + \frac{bx^{16}}{16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8*(b*x**7+a),x)
```

```
[Out] a*x**9/9 + b*x**16/16
```

GIAC/XCAS [A] time = 0.219435, size = 18, normalized size = 1.06

$$\frac{1}{16}\,bx^{16} + \frac{1}{9}\,ax^9$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^7 + a)*x^8,x, algorithm="giac")
```

```
[Out] 1/16*b*x^16 + 1/9*a*x^9
```

3.1435 $\int \frac{a+bx^7}{x^8} dx$

Optimal. Leaf size=13

$$b\log(x) - \frac{a}{7x^7}$$

```
[Out] -a/(7*x^7) + b*Log[x]
```

Rubi [A] time = 0.0126812, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$b\log(x) - \frac{a}{7x^7}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^7)/x^8,x]

[Out] -a/(7*x^7) + b*Log[x]
```

Rubi in Sympy [A] time = 2.85798, size = 10, normalized size = 0.77

$$-\frac{a}{7x^7} + b\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**7+a)/x**8,x)

[Out] -a/(7*x**7) + b*log(x)
```

Mathematica [A] time = 0.00442504, size = 13, normalized size = 1.

$$b\log(x) - \frac{a}{7x^7}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^7)/x^8,x]

[Out] -a/(7*x^7) + b*Log[x]
```

Maple [A] time = 0.008, size = 12, normalized size = 0.9

$$-\frac{a}{7\,x^7} + b\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x^7+a)/x^8,x)

[Out] -1/7*a/x^7+b*ln(x)
```

Maxima [A] time = 1.43896, size = 19, normalized size = 1.46

$$\frac{1}{7}\,b\log\left(x^{7}\right)-\frac{a}{7\,x^{7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^7 + a)/x^8,x, algorithm="maxima")
```

```
[Out] 1/7*b*log(x^7) - 1/7*a/x^7
```

Fricas [A] time = 0.212063, size = 23, normalized size = 1.77

$$\frac{7\,bx^{7}\log\left(x\right)-a}{7\,x^{7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^7 + a)/x^8,x, algorithm="fricas")
```

```
[Out] 1/7*(7*b*x^7*log(x) - a)/x^7
```

Sympy [A] time = 1.20289, size = 10, normalized size = 0.77

$$-\frac{a}{7x^{7}}+b\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**7+a)/x**8,x)
```

```
[Out] -a/(7*x**7) + b*log(x)
```

GIAC/XCAS [A] time = 0.22062, size = 24, normalized size = 1.85

$$b\ln\left(|x|\right)-\frac{bx^{7}+a}{7\,x^{7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^7 + a)/x^8,x, algorithm="giac")
```

```
[Out] b*ln(abs(x)) - 1/7*(b*x^7 + a)/x^7
```

3.1436 $\int x^m \left(a+bx^7\right)^2 \, dx$

Optimal. Leaf size=43

$$\frac{a^2x^{m+1}}{m+1}+\frac{2abx^{m+8}}{m+8}+\frac{b^2x^{m+15}}{m+15}$$

```
[Out] (a^2*x^(1 + m))/(1 + m) + (2*a*b*x^(8 + m))/(8 + m) + (b^2*x^(15
+ m))/(15 + m)
```

Rubi [A] time = 0.0435868, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{a^2x^{m+1}}{m+1}+\frac{2abx^{m+8}}{m+8}+\frac{b^2x^{m+15}}{m+15}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m*(a + b*x^7)^2,x]
```

```
[Out] (a^2*x^(1 + m))/(1 + m) + (2*a*b*x^(8 + m))/(8 + m) + (b^2*x^(15
+ m))/(15 + m)
```

Rubi in Sympy [A] time = 7.48904, size = 36, normalized size = 0.84

$$\frac{a^2x^{m+1}}{m+1}+\frac{2abx^{m+8}}{m+8}+\frac{b^2x^{m+15}}{m+15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(b*x**7+a)**2,x)
```

```
[Out] a**2*x**(m + 1)/(m + 1) + 2*a*b*x**(m + 8)/(m + 8) + b**2*x**(m +
 15)/(m + 15)
```

Mathematica [A] time = 0.0314434, size = 39, normalized size = 0.91

$$x^m \left(\frac{a^2 x}{m+1}+\frac{2 a b x^8}{m+8}+\frac{b^2 x^{15}}{m+15}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m*(a + b*x^7)^2,x]
```

```
[Out] x^m*((a^2*x)/(1 + m) + (2*a*b*x^8)/(8 + m) + (b^2*x^15)/(15 + m))
```

Maple [B] time = 0.009, size = 93, normalized size = 2.2

$$\frac{x^{1+m}\left(b^2m^2x^{14}+9\,b^2mx^{14}+8\,b^2x^{14}+2\,abm^2x^7+32\,abmx^7+30\,abx^7+a^2m^2+23\,a^2m+120\,a^2\right)}{(1+m)\,(8+m)\,(15+m)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(b*x^7+a)^2,x)
```

```
[Out] x^(1+m)*(b^2*m^2*x^14+9*b^2*m*x^14+8*b^2*x^14+2*a*b*m^2*x^7+32*a*
b*m*x^7+30*a*b*x^7+a^2*m^2+23*a^2*m+120*a^2)/(1+m)/(8+m)/(15+m)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^7 + a)^2*x^m,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.238296, size = 115, normalized size = 2.67

$$\frac{\left(\left(b^2m^2 + 9\,b^2m + 8\,b^2\right)x^{15} + 2\left(abm^2 + 16\,abm + 15\,ab\right)x^8 + \left(a^2m^2 + 23\,a^2m + 120\,a^2\right)x\right)x^m}{m^3 + 24\,m^2 + 143\,m + 120}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^7 + a)^2*x^m,x, algorithm="fricas")
```

```
[Out] ((b^2*m^2 + 9*b^2*m + 8*b^2)*x^15 + 2*(a*b*m^2 + 16*a*b*m + 15*a*
b)*x^8 + (a^2*m^2 + 23*a^2*m + 120*a^2)*x)*x^m/(m^3 + 24*m^2 + 14
3*m + 120)
```

Sympy [A] time = 26.3544, size = 313, normalized size = 7.28

$$\begin{cases} -\frac{a^2}{14x^{14}} - \frac{2ab}{7x^7} + b^2\log(x) \\ -\frac{a^2}{7x^7} + 2ab\log(x) + \frac{b^2x^7}{7} \\ a^2\log(x) + \frac{2abx^7}{7} + \frac{b^2x^{14}}{14} \\ \frac{a^2m^2xx^m}{m^3+24m^2+143m+120} + \frac{23a^2mxx^m}{m^3+24m^2+143m+120} + \frac{120a^2xx^m}{m^3+24m^2+143m+120} + \frac{2abm^2x^8x^m}{m^3+24m^2+143m+120} + \frac{32abmx^8x^m}{m^3+24m^2+143m+120} + \frac{30abx^8x^m}{m^3+24m^2+143m+120} + \frac{}{m^3+} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(b*x**7+a)**2,x)
```

```
[Out] Piecewise((-a**2/(14*x**14) - 2*a*b/(7*x**7) + b**2*log(x), Eq(m,
 -15)), (-a**2/(7*x**7) + 2*a*b*log(x) + b**2*x**7/7, Eq(m, -8)),
 (a**2*log(x) + 2*a*b*x**7/7 + b**2*x**14/14, Eq(m, -1)), (a**2*m
**2*x*x**m/(m**3 + 24*m**2 + 143*m + 120) + 23*a**2*m*x*x**m/(m**
3 + 24*m**2 + 143*m + 120) + 120*a**2*x*x**m/(m**3 + 24*m**2 + 14
3*m + 120) + 2*a*b*m**2*x**8*x**m/(m**3 + 24*m**2 + 143*m + 120)
+ 32*a*b*m*x**8*x**m/(m**3 + 24*m**2 + 143*m + 120) + 30*a*b*x**8
*x**m/(m**3 + 24*m**2 + 143*m + 120) + b**2*m**2*x**15*x**m/(m**3
 + 24*m**2 + 143*m + 120) + 9*b**2*m*x**15*x**m/(m**3 + 24*m**2 +
 143*m + 120) + 8*b**2*x**15*x**m/(m**3 + 24*m**2 + 143*m + 120),
 True))
```

GIAC/XCAS [A] time = 0.228667, size = 182, normalized size = 4.23

$$\frac{b^2m^2x^{15}e^{(m\ln(x))} + 9\,b^2mx^{15}e^{(m\ln(x))} + 8\,b^2x^{15}e^{(m\ln(x))} + 2\,abm^2x^8e^{(m\ln(x))} + 32\,abmx^8e^{(m\ln(x))} + 30\,abx^8e^{(m\ln(x))} + a^2m^2xe^{(m}}{m^3 + 24\,m^2 + 143\,m + 120}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^7 + a)^2*x^m,x, algorithm="giac")
```

```
[Out] (b^2*m^2*x^15*e^(m*ln(x)) + 9*b^2*m*x^15*e^(m*ln(x)) + 8*b^2*x^15
*e^(m*ln(x)) + 2*a*b*m^2*x^8*e^(m*ln(x)) + 32*a*b*m*x^8*e^(m*ln(x
)) + 30*a*b*x^8*e^(m*ln(x)) + a^2*m^2*x*e^(m*ln(x)) + 23*a^2*m*x*
e^(m*ln(x)) + 120*a^2*x*e^(m*ln(x)))/(m^3 + 24*m^2 + 143*m + 120)
```

3.1437 $\int x^8 (a+bx^7)^2 \, dx$

Optimal. Leaf size=30

$$\frac{a^2x^9}{9}+\frac{1}{8}abx^{16}+\frac{b^2x^{23}}{23}$$

```
[Out] (a^2*x^9)/9 + (a*b*x^16)/8 + (b^2*x^23)/23
```

Rubi [A] time = 0.0332043, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{a^2x^9}{9}+\frac{1}{8}abx^{16}+\frac{b^2x^{23}}{23}$$

Antiderivative was successfully verified.

```
[In] Int[x^8*(a + b*x^7)^2,x]

[Out] (a^2*x^9)/9 + (a*b*x^16)/8 + (b^2*x^23)/23
```

Rubi in Sympy [A] time = 5.44697, size = 24, normalized size = 0.8

$$\frac{a^2x^9}{9}+\frac{abx^{16}}{8}+\frac{b^2x^{23}}{23}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**8*(b*x**7+a)**2,x)

[Out] a**2*x**9/9 + a*b*x**16/8 + b**2*x**23/23
```

Mathematica [A] time = 0.0014604, size = 30, normalized size = 1.

$$\frac{a^2x^9}{9}+\frac{1}{8}abx^{16}+\frac{b^2x^{23}}{23}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^8*(a + b*x^7)^2,x]

[Out] (a^2*x^9)/9 + (a*b*x^16)/8 + (b^2*x^23)/23
```

Maple [A] time = 0.001, size = 25, normalized size = 0.8

$$\frac{a^2x^9}{9}+\frac{abx^{16}}{8}+\frac{b^2x^{23}}{23}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^8*(b*x^7+a)^2,x)

[Out] 1/9*a^2*x^9+1/8*a*b*x^16+1/23*b^2*x^23
```

Maxima [A] time = 1.43824, size = 32, normalized size = 1.07

$$\frac{1}{23}\,b^2x^{23} + \frac{1}{8}\,abx^{16} + \frac{1}{9}\,a^2x^9$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^7 + a)^2*x^8,x, algorithm="maxima")

[Out] 1/23*b^2*x^23 + 1/8*a*b*x^16 + 1/9*a^2*x^9
```

Fricas [A] time = 0.190358, size = 1, normalized size = 0.03

$$\frac{1}{23}x^{23}b^2 + \frac{1}{8}x^{16}ba + \frac{1}{9}x^9a^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^7 + a)^2*x^8,x, algorithm="fricas")

[Out] 1/23*x^23*b^2 + 1/8*x^16*b*a + 1/9*x^9*a^2
```

Sympy [A] time = 0.093494, size = 24, normalized size = 0.8

$$\frac{a^2x^9}{9} + \frac{abx^{16}}{8} + \frac{b^2x^{23}}{23}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8*(b*x**7+a)**2,x)

[Out] a**2*x**9/9 + a*b*x**16/8 + b**2*x**23/23
```

GIAC/XCAS [A] time = 0.217949, size = 32, normalized size = 1.07

$$\frac{1}{23}\,b^2x^{23} + \frac{1}{8}\,abx^{16} + \frac{1}{9}\,a^2x^9$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^7 + a)^2*x^8,x, algorithm="giac")

[Out] 1/23*b^2*x^23 + 1/8*a*b*x^16 + 1/9*a^2*x^9
```

3.1438 $\int \frac{(a+bx^7)^2}{x^8} dx$

Optimal. Leaf size=27

$$-\frac{a^2}{7x^7} + 2ab\log(x) + \frac{b^2x^7}{7}$$

```
[Out] -a^2/(7*x^7) + (b^2*x^7)/7 + 2*a*b*Log[x]
```

Rubi [A] time = 0.0393784, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$-\frac{a^2}{7x^7} + 2ab\log(x) + \frac{b^2x^7}{7}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^7)^2/x^8,x]

[Out] -a^2/(7*x^7) + (b^2*x^7)/7 + 2*a*b*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^2}{7x^7} + \frac{2ab\log(x^7)}{7} + \frac{\int^{x^7} b^2\, dx}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**7+a)**2/x**8,x)

[Out] -a**2/(7*x**7) + 2*a*b*log(x**7)/7 + Integral(b**2, (x, x**7))/7
```

Mathematica [A] time = 0.00138905, size = 27, normalized size = 1.

$$-\frac{a^2}{7x^7} + 2ab\log(x) + \frac{b^2x^7}{7}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^7)^2/x^8,x]

[Out] -a^2/(7*x^7) + (b^2*x^7)/7 + 2*a*b*Log[x]
```

Maple [A] time = 0.009, size = 24, normalized size = 0.9

$$-\frac{a^2}{7\,x^7} + \frac{b^2x^7}{7} + 2\,ab\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^7+a)^2/x^8,x)

[Out] -1/7*a^2/x^7+1/7*b^2*x^7+2*a*b*ln(x)
```

Maxima [A] time = 1.43824, size = 34, normalized size = 1.26

$$\frac{1}{7}\,b^{2}x^{7}+\frac{2}{7}\,ab\log\left(x^{7}\right)-\frac{a^{2}}{7\,x^{7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^7 + a)^2/x^8,x, algorithm="maxima")
```

```
[Out] 1/7*b^2*x^7 + 2/7*a*b*log(x^7) - 1/7*a^2/x^7
```

Fricas [A] time = 0.214779, size = 36, normalized size = 1.33

$$\frac{b^{2}x^{14}+14\,abx^{7}\log\left(x\right)-a^{2}}{7\,x^{7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^7 + a)^2/x^8,x, algorithm="fricas")
```

```
[Out] 1/7*(b^2*x^14 + 14*a*b*x^7*log(x) - a^2)/x^7
```

Sympy [A] time = 1.29469, size = 24, normalized size = 0.89

$$-\frac{a^{2}}{7x^{7}}+2ab\log\left(x\right)+\frac{b^{2}x^{7}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**7+a)**2/x**8,x)
```

```
[Out] -a**2/(7*x**7) + 2*a*b*log(x) + b**2*x**7/7
```

GIAC/XCAS [A] time = 0.223603, size = 43, normalized size = 1.59

$$\frac{1}{7}\,b^{2}x^{7}+2\,ab\ln\left(|x|\right)-\frac{2\,abx^{7}+a^{2}}{7\,x^{7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^7 + a)^2/x^8,x, algorithm="giac")
```

```
[Out] 1/7*b^2*x^7 + 2*a*b*ln(abs(x)) - 1/7*(2*a*b*x^7 + a^2)/x^7
```

3.1439 $\int \frac{x^m}{a+bx^7} dx$

Optimal. Leaf size=39

$$\frac{x^{m+1}\,{}_2F_1\left(1,\frac{m+1}{7};\frac{m+8}{7};-\frac{bx^7}{a}\right)}{a(m+1)}$$

```
[Out] (x^(1 + m)*Hypergeometric2F1[1, (1 + m)/7, (8 + m)/7, -((b*x^7)/a
)])/(a*(1 + m))
```

Rubi [A] time = 0.0295114, antiderivative size = 39, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{x^{m+1}\,{}_2F_1\left(1,\frac{m+1}{7};\frac{m+8}{7};-\frac{bx^7}{a}\right)}{a(m+1)}$$

Antiderivative was successfully verified.

```
[In] Int[x^m/(a + b*x^7),x]
```

```
[Out] (x^(1 + m)*Hypergeometric2F1[1, (1 + m)/7, (8 + m)/7, -((b*x^7)/a
)])/(a*(1 + m))
```

Rubi in Sympy [A] time = 4.35935, size = 29, normalized size = 0.74

$$\frac{x^{m+1}{}_2F_1\left(\begin{matrix}1,\frac{m}{7}+\frac{1}{7}\\ \frac{m}{7}+\frac{8}{7}\end{matrix}\middle|-\frac{bx^7}{a}\right)}{a\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**m/(b*x**7+a),x)
```

```
[Out] x**(m + 1)*hyper((1, m/7 + 1/7), (m/7 + 8/7,), -b*x**7/a)/(a*(m +
 1))
```

Mathematica [A] time = 0.0284535, size = 41, normalized size = 1.05

$$\frac{x^{m+1}\,{}_2F_1\left(1,\frac{m+1}{7};\frac{m+1}{7}+1;-\frac{bx^7}{a}\right)}{a(m+1)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^m/(a + b*x^7),x]
```

```
[Out] (x^(1 + m)*Hypergeometric2F1[1, (1 + m)/7, 1 + (1 + m)/7, -((b*x^
7)/a)])/(a*(1 + m))
```

Maple [F] time = 0.054, size = 0, normalized size = 0.

$$\int \frac{x^m}{bx^7+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m/(b*x^7+a),x)
```

```
[Out] int(x^m/(b*x^7+a),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{bx^7 + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^7 + a),x, algorithm="maxima")
```

```
[Out] integrate(x^m/(b*x^7 + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^m}{bx^7 + a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^7 + a),x, algorithm="fricas")
```

```
[Out] integral(x^m/(b*x^7 + a), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m/(b*x**7+a),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{bx^7 + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^7 + a),x, algorithm="giac")
```

```
[Out] integrate(x^m/(b*x^7 + a), x)
```

3.1440 $\int \frac{x^6}{a+bx^7} dx$

Optimal. Leaf size=15

$$\frac{\log(a+bx^7)}{7b}$$

```
[Out] Log[a + b*x^7]/(7*b)
```

Rubi [A] time = 0.00889745, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{\log(a+bx^7)}{7b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/(a + b*x^7),x]

[Out] Log[a + b*x^7]/(7*b)
```

Rubi in Sympy [A] time = 2.16659, size = 10, normalized size = 0.67

$$\frac{\log(a+bx^7)}{7b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(b*x**7+a),x)

[Out] log(a + b*x**7)/(7*b)
```

Mathematica [A] time = 0.00494054, size = 15, normalized size = 1.

$$\frac{\log(a+bx^7)}{7b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6/(a + b*x^7),x]

[Out] Log[a + b*x^7]/(7*b)
```

Maple [A] time = 0.001, size = 14, normalized size = 0.9

$$\frac{\ln(bx^7+a)}{7b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(b*x^7+a),x)

[Out] 1/7*ln(b*x^7+a)/b
```

Maxima [A] time = 1.45968, size = 18, normalized size = 1.2

$$\frac{\log\left(bx^7 + a\right)}{7\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(b*x^7 + a),x, algorithm="maxima")
```

```
[Out] 1/7*log(b*x^7 + a)/b
```

Fricas [A] time = 0.216613, size = 18, normalized size = 1.2

$$\frac{\log\left(bx^7 + a\right)}{7\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(b*x^7 + a),x, algorithm="fricas")
```

```
[Out] 1/7*log(b*x^7 + a)/b
```

Sympy [A] time = 0.553439, size = 10, normalized size = 0.67

$$\frac{\log\left(a + bx^7\right)}{7b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(b*x**7+a),x)
```

```
[Out] log(a + b*x**7)/(7*b)
```

GIAC/XCAS [A] time = 0.221277, size = 19, normalized size = 1.27

$$\frac{\ln\left(\left|bx^7 + a\right|\right)}{7\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(b*x^7 + a),x, algorithm="giac")
```

```
[Out] 1/7*ln(abs(b*x^7 + a))/b
```

3.1441 $\int \frac{1}{a+bx^7}\,dx$

Optimal. Leaf size=335

$$\frac{\sin\left(\frac{3\pi}{14}\right)\log\left(a^{2/7}+2\sqrt[7]{a}\sqrt[7]{b}x\sin\left(\frac{3\pi}{14}\right)+b^{2/7}x^2\right)}{7a^{6/7}\sqrt[7]{b}}-\frac{\sin\left(\frac{\pi}{14}\right)\log\left(a^{2/7}-2\sqrt[7]{a}\sqrt[7]{b}x\sin\left(\frac{\pi}{14}\right)+b^{2/7}x^2\right)}{7a^{6/7}\sqrt[7]{b}}-\frac{\cos\left(\frac{\pi}{7}\right)\log\left(a^{2/7}-2\sqrt[7]{a}\sqrt[7]{b}x\cos\left(\frac{\pi}{7}\right)+b^{2/7}x^2\right)}{7a^{6/7}\sqrt[7]{b}}+\frac{\log\left(\sqrt[7]{a}+\sqrt[7]{b}x\right)}{7a^{6/7}\sqrt[7]{b}}+\frac{2\cos\left(\frac{3\pi}{14}\right)\tan^{-1}\left(\frac{\sqrt[7]{b}x\sec\left(\frac{3\pi}{14}\right)}{\sqrt[7]{a}}+\tan\left(\frac{3\pi}{14}\right)\right)}{7a^{6/7}\sqrt[7]{b}}+\frac{2\cos\left(\frac{\pi}{14}\right)\tan^{-1}\left(\frac{\sqrt[7]{b}x\sec\left(\frac{\pi}{14}\right)}{\sqrt[7]{a}}-\tan\left(\frac{\pi}{14}\right)\right)}{7a^{6/7}\sqrt[7]{b}}-\frac{2\sin\left(\frac{\pi}{7}\right)\tan^{-1}\left(\cot\left(\frac{\pi}{7}\right)-\frac{\sqrt[7]{b}x\csc\left(\frac{\pi}{7}\right)}{\sqrt[7]{a}}\right)}{7a^{6/7}\sqrt[7]{b}}$$

```
[Out] (2*ArcTan[(b^(1/7)*x*Sec[Pi/14])/a^(1/7) - Tan[Pi/14]]*Cos[Pi/14]
)/(7*a^(6/7)*b^(1/7)) + (2*ArcTan[(b^(1/7)*x*Sec[(3*Pi)/14])/a^(1
/7) + Tan[(3*Pi)/14]]*Cos[(3*Pi)/14])/(7*a^(6/7)*b^(1/7)) + Log[a
^(1/7) + b^(1/7)*x]/(7*a^(6/7)*b^(1/7)) - (Cos[Pi/7]*Log[a^(2/7)
+ b^(2/7)*x^2 - 2*a^(1/7)*b^(1/7)*x*Cos[Pi/7]])/(7*a^(6/7)*b^(1/7
)) - (Log[a^(2/7) + b^(2/7)*x^2 - 2*a^(1/7)*b^(1/7)*x*Sin[Pi/14]]
*Sin[Pi/14])/(7*a^(6/7)*b^(1/7)) - (2*ArcTan[Cot[Pi/7] - (b^(1/7)
*x*Csc[Pi/7])/a^(1/7)]*Sin[Pi/7])/(7*a^(6/7)*b^(1/7)) + (Log[a^(2
/7) + b^(2/7)*x^2 + 2*a^(1/7)*b^(1/7)*x*Sin[(3*Pi)/14]]*Sin[(3*Pi
)/14])/(7*a^(6/7)*b^(1/7))
```

Rubi [A] time = 0.90296, antiderivative size = 335, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667

$$\frac{\sin\left(\frac{3\pi}{14}\right)\log\left(a^{2/7}+2\sqrt[7]{a}\sqrt[7]{b}x\sin\left(\frac{3\pi}{14}\right)+b^{2/7}x^2\right)}{7a^{6/7}\sqrt[7]{b}}-\frac{\sin\left(\frac{\pi}{14}\right)\log\left(a^{2/7}-2\sqrt[7]{a}\sqrt[7]{b}x\sin\left(\frac{\pi}{14}\right)+b^{2/7}x^2\right)}{7a^{6/7}\sqrt[7]{b}}-\frac{\cos\left(\frac{\pi}{7}\right)\log\left(a^{2/7}-2\sqrt[7]{a}\sqrt[7]{b}x\cos\left(\frac{\pi}{7}\right)+b^{2/7}x^2\right)}{7a^{6/7}\sqrt[7]{b}}+\frac{\log\left(\sqrt[7]{a}+\sqrt[7]{b}x\right)}{7a^{6/7}\sqrt[7]{b}}+\frac{2\cos\left(\frac{3\pi}{14}\right)\tan^{-1}\left(\frac{\sqrt[7]{b}x\sec\left(\frac{3\pi}{14}\right)}{\sqrt[7]{a}}+\tan\left(\frac{3\pi}{14}\right)\right)}{7a^{6/7}\sqrt[7]{b}}+\frac{2\cos\left(\frac{\pi}{14}\right)\tan^{-1}\left(\frac{\sqrt[7]{b}x\sec\left(\frac{\pi}{14}\right)}{\sqrt[7]{a}}-\tan\left(\frac{\pi}{14}\right)\right)}{7a^{6/7}\sqrt[7]{b}}-\frac{2\sin\left(\frac{\pi}{7}\right)\tan^{-1}\left(\cot\left(\frac{\pi}{7}\right)-\frac{\sqrt[7]{b}x\csc\left(\frac{\pi}{7}\right)}{\sqrt[7]{a}}\right)}{7a^{6/7}\sqrt[7]{b}}$$

Warning: Unable to verify antiderivative.

```
[In] Int[(a + b*x^7)^(-1),x]
```

```
[Out] (2*ArcTan[(b^(1/7)*x*Sec[Pi/14])/a^(1/7) - Tan[Pi/14]]*Cos[Pi/14]
)/(7*a^(6/7)*b^(1/7)) + (2*ArcTan[(b^(1/7)*x*Sec[(3*Pi)/14])/a^(1
/7) + Tan[(3*Pi)/14]]*Cos[(3*Pi)/14])/(7*a^(6/7)*b^(1/7)) + Log[a
^(1/7) + b^(1/7)*x]/(7*a^(6/7)*b^(1/7)) - (Cos[Pi/7]*Log[a^(2/7)
+ b^(2/7)*x^2 - 2*a^(1/7)*b^(1/7)*x*Cos[Pi/7]])/(7*a^(6/7)*b^(1/7
)) - (Log[a^(2/7) + b^(2/7)*x^2 - 2*a^(1/7)*b^(1/7)*x*Sin[Pi/14]]
*Sin[Pi/14])/(7*a^(6/7)*b^(1/7)) - (2*ArcTan[Cot[Pi/7] - (b^(1/7)
*x*Csc[Pi/7])/a^(1/7)]*Sin[Pi/7])/(7*a^(6/7)*b^(1/7)) + (Log[a^(2
```

```
/7) + b^(2/7)*x^2 + 2*a^(1/7)*b^(1/7)*x*Sin[(3*Pi)/14]]*Sin[(3*Pi
)/14])/(7*a^(6/7)*b^(1/7))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**7+a),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.528852, size = 262, normalized size = 0.78

$$\sin\left(\frac{3\pi}{14}\right)\log\left(a^{2/7}+2\sqrt[7]{a}\sqrt[7]{b}x\sin\left(\frac{3\pi}{14}\right)+b^{2/7}x^2\right)-\sin\left(\frac{\pi}{14}\right)\log\left(a^{2/7}-2\sqrt[7]{a}\sqrt[7]{b}x\sin\left(\frac{\pi}{14}\right)+b^{2/7}x^2\right)-\cos\left(\frac{\pi}{7}\right)\log\left(a^{2/7}-2\right.$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[(a + b*x^7)^(-1),x]
```

```
[Out] (2*ArcTan[(b^(1/7)*x*Sec[Pi/14])/a^(1/7) - Tan[Pi/14]]*Cos[Pi/14]
 + 2*ArcTan[(b^(1/7)*x*Sec[(3*Pi)/14])/a^(1/7) + Tan[(3*Pi)/14]]*
Cos[(3*Pi)/14] + Log[a^(1/7) + b^(1/7)*x] - Cos[Pi/7]*Log[a^(2/7)
 + b^(2/7)*x^2 - 2*a^(1/7)*b^(1/7)*x*Cos[Pi/7]] - Log[a^(2/7) + b
^(2/7)*x^2 - 2*a^(1/7)*b^(1/7)*x*Sin[Pi/14]]*Sin[Pi/14] - 2*ArcTa
n[Cot[Pi/7] - (b^(1/7)*x*Csc[Pi/7])/a^(1/7)]*Sin[Pi/7] + Log[a^(2
/7) + b^(2/7)*x^2 + 2*a^(1/7)*b^(1/7)*x*Sin[(3*Pi)/14]]*Sin[(3*Pi
)/14])/(7*a^(6/7)*b^(1/7))
```

Maple [C] time = 0.648, size = 27, normalized size = 0.1

$$\frac{1}{7\,b}\sum_{\_R=RootOf(b\_Z^7+a)}\frac{\ln(x-\_R)}{\_R^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^7+a),x)
```

```
[Out] 1/7/b*sum(1/_R^6*ln(x-_R),_R=RootOf(_Z^7*b+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{bx^7+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x^7 + a),x, algorithm="maxima")
```

```
[Out] integrate(1/(b*x^7 + a), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x^7 + a),x, algorithm="fricas")
```

```
[Out] Exception raised: NotImplementedError
```

Sympy [A] time = 0.448503, size = 20, normalized size = 0.06

$$\operatorname{RootSum}\left(823543t^7a^6b-1,\left(t\mapsto t\log\left(7ta+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**7+a),x)
```

```
[Out] RootSum(823543*_t**7*a**6*b - 1, Lambda(_t, _t*log(7*_t*a + x)))
```

GIAC/XCAS [A] time = 0.228784, size = 419, normalized size = 1.25

$$\frac{\left(-\frac{a}{b}\right)^{\frac{1}{7}}\cos\left(\frac{3}{7}\pi\right)\ln\left(2x\left(-\frac{a}{b}\right)^{\frac{1}{7}}\cos\left(\frac{3}{7}\pi\right)+x^2+\left(-\frac{a}{b}\right)^{\frac{2}{7}}\right)}{7a}-\frac{\left(-\frac{a}{b}\right)^{\frac{1}{7}}\cos\left(\frac{2}{7}\pi\right)\ln\left(-2x\left(-\frac{a}{b}\right)^{\frac{1}{7}}\cos\left(\frac{2}{7}\pi\right)+x^2+\left(-\frac{a}{b}\right)^{\frac{2}{7}}\right)}{7a}+\frac{\left(-\frac{a}{b}\right)^{\frac{1}{7}}\cos\left(\frac{1}{7}\pi\right)\ln\left(2x\left(-\frac{a}{b}\right)^{\frac{1}{7}}\cos\left(\frac{1}{7}\pi\right)+x^2+\left(-\frac{a}{b}\right)^{\frac{2}{7}}\right)}{7a}+\frac{2\left(-\frac{a}{b}\right)^{\frac{1}{7}}\arctan\left(\frac{\left(-\frac{a}{b}\right)^{\frac{1}{7}}\cos\left(\frac{3}{7}\pi\right)+x}{\left(-\frac{a}{b}\right)^{\frac{1}{7}}\sin\left(\frac{3}{7}\pi\right)}\right)\sin\left(\frac{3}{7}\pi\right)}{7a}+\frac{2\left(-\frac{a}{b}\right)^{\frac{1}{7}}\arctan\left(-\frac{\left(-\frac{a}{b}\right)^{\frac{1}{7}}\cos\left(\frac{2}{7}\pi\right)-x}{\left(-\frac{a}{b}\right)^{\frac{1}{7}}\sin\left(\frac{2}{7}\pi\right)}\right)\sin\left(\frac{2}{7}\pi\right)}{7a}+\frac{2\left(-\frac{a}{b}\right)^{\frac{1}{7}}\arctan\left(\frac{\left(-\frac{a}{b}\right)^{\frac{1}{7}}\cos\left(\frac{1}{7}\pi\right)+x}{\left(-\frac{a}{b}\right)^{\frac{1}{7}}\sin\left(\frac{1}{7}\pi\right)}\right)\sin\left(\frac{1}{7}\pi\right)}{7a}-\frac{\left(-\frac{a}{b}\right)^{\frac{1}{7}}\ln\left(\left|x-\left(-\frac{a}{b}\right)^{\frac{1}{7}}\right|\right)}{7a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x^7 + a),x, algorithm="giac")
```

```
[Out] 1/7*(-a/b)^(1/7)*cos(3/7*pi)*ln(2*x*(-a/b)^(1/7)*cos(3/7*pi) + x^
2 + (-a/b)^(2/7))/a - 1/7*(-a/b)^(1/7)*cos(2/7*pi)*ln(-2*x*(-a/b)
^(1/7)*cos(2/7*pi) + x^2 + (-a/b)^(2/7))/a + 1/7*(-a/b)^(1/7)*cos
(1/7*pi)*ln(2*x*(-a/b)^(1/7)*cos(1/7*pi) + x^2 + (-a/b)^(2/7))/a
+ 2/7*(-a/b)^(1/7)*arctan(((-a/b)^(1/7)*cos(3/7*pi) + x)/((-a/b)^
(1/7)*sin(3/7*pi)))*sin(3/7*pi)/a + 2/7*(-a/b)^(1/7)*arctan(-((-a
/b)^(1/7)*cos(2/7*pi) - x)/((-a/b)^(1/7)*sin(2/7*pi)))*sin(2/7*pi
)/a + 2/7*(-a/b)^(1/7)*arctan(((-a/b)^(1/7)*cos(1/7*pi) + x)/((-a
/b)^(1/7)*sin(1/7*pi)))*sin(1/7*pi)/a - 1/7*(-a/b)^(1/7)*ln(abs(x
 - (-a/b)^(1/7)))/a
```

3.1442 $\int \frac{1}{x(a+bx^7)} dx$

Optimal. Leaf size=22

$$\frac{\log(x)}{a} - \frac{\log(a+bx^7)}{7a}$$

```
[Out] Log[x]/a - Log[a + b*x^7]/(7*a)
```

Rubi [A] time = 0.0309884, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{\log(x)}{a} - \frac{\log(a+bx^7)}{7a}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x*(a + b*x^7)),x]

[Out] Log[x]/a - Log[a + b*x^7]/(7*a)
```

Rubi in Sympy [A] time = 5.51768, size = 19, normalized size = 0.86

$$\frac{\log(x^7)}{7a} - \frac{\log(a+bx^7)}{7a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x/(b*x**7+a),x)

[Out] log(x**7)/(7*a) - log(a + b*x**7)/(7*a)
```

Mathematica [A] time = 0.00981516, size = 22, normalized size = 1.

$$\frac{\log(x)}{a} - \frac{\log(a+bx^7)}{7a}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x*(a + b*x^7)),x]

[Out] Log[x]/a - Log[a + b*x^7]/(7*a)
```

Maple [A] time = 0.006, size = 21, normalized size = 1.

$$\frac{\ln(x)}{a} - \frac{\ln(bx^7+a)}{7\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(b*x^7+a),x)

[Out] ln(x)/a-1/7*ln(b*x^7+a)/a
```

Maxima [A] time = 1.44201, size = 31, normalized size = 1.41

$$-\frac{\log\left(bx^7+a\right)}{7\,a}+\frac{\log\left(x^7\right)}{7\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^7 + a)*x),x, algorithm="maxima")

[Out] -1/7*log(b*x^7 + a)/a + 1/7*log(x^7)/a
```

Fricas [A] time = 0.222208, size = 24, normalized size = 1.09

$$-\frac{\log\left(bx^7+a\right)-7\,\log\left(x\right)}{7\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^7 + a)*x),x, algorithm="fricas")

[Out] -1/7*(log(b*x^7 + a) - 7*log(x))/a
```

Sympy [A] time = 0.909634, size = 15, normalized size = 0.68

$$\frac{\log\left(x\right)}{a}-\frac{\log\left(\frac{a}{b}+x^7\right)}{7a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(b*x**7+a),x)

[Out] log(x)/a - log(a/b + x**7)/(7*a)
```

GIAC/XCAS [A] time = 0.223043, size = 30, normalized size = 1.36

$$-\frac{\ln\left(\left|bx^7+a\right|\right)}{7\,a}+\frac{\ln\left(|x|\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^7 + a)*x),x, algorithm="giac")

[Out] -1/7*ln(abs(b*x^7 + a))/a + ln(abs(x))/a
```

3.1443 $\int \frac{x^m}{a-bx^7}\,dx$

Optimal. Leaf size=38

$$\frac{x^{m+1}\,{}_2F_1\left(1,\frac{m+1}{7};\frac{m+8}{7};\frac{bx^7}{a}\right)}{a(m+1)}$$

```
[Out] (x^(1 + m)*Hypergeometric2F1[1, (1 + m)/7, (8 + m)/7, (b*x^7)/a])
/(a*(1 + m))
```

Rubi [A] time = 0.0271509, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.071

$$\frac{x^{m+1}\,{}_2F_1\left(1,\frac{m+1}{7};\frac{m+8}{7};\frac{bx^7}{a}\right)}{a(m+1)}$$

Antiderivative was successfully verified.

```
[In] Int[x^m/(a - b*x^7),x]
```

```
[Out] (x^(1 + m)*Hypergeometric2F1[1, (1 + m)/7, (8 + m)/7, (b*x^7)/a])
/(a*(1 + m))
```

Rubi in Sympy [A] time = 4.75289, size = 27, normalized size = 0.71

$$\frac{x^{m+1}{}_2F_1\left(\begin{matrix}1,\frac{m}{7}+\frac{1}{7}\\ \frac{m}{7}+\frac{8}{7}\end{matrix}\middle|\frac{bx^7}{a}\right)}{a\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**m/(-b*x**7+a),x)
```

```
[Out] x**(m + 1)*hyper((1, m/7 + 1/7), (m/7 + 8/7,), b*x**7/a)/(a*(m +
1))
```

Mathematica [A] time = 0.0322005, size = 40, normalized size = 1.05

$$\frac{x^{m+1}\,{}_2F_1\left(1,\frac{m+1}{7};\frac{m+1}{7}+1;\frac{bx^7}{a}\right)}{a(m+1)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^m/(a - b*x^7),x]
```

```
[Out] (x^(1 + m)*Hypergeometric2F1[1, (1 + m)/7, 1 + (1 + m)/7, (b*x^7)
/a])/(a*(1 + m))
```

Maple [F] time = 0.055, size = 0, normalized size = 0.

$$\int \frac{x^m}{-bx^7+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m/(-b*x^7+a),x)
```

```
[Out] int(x^m/(-b*x^7+a),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\int \frac{x^m}{bx^7 - a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^m/(b*x^7 - a),x, algorithm="maxima")
```

```
[Out] -integrate(x^m/(b*x^7 - a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{x^m}{bx^7 - a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^m/(b*x^7 - a),x, algorithm="fricas")
```

```
[Out] integral(-x^m/(b*x^7 - a), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m/(-b*x**7+a),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{x^m}{bx^7 - a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^m/(b*x^7 - a),x, algorithm="giac")
```

```
[Out] integrate(-x^m/(b*x^7 - a), x)
```

3.1444 $\int \frac{x^6}{a-bx^7} \, dx$

Optimal. Leaf size=16

$$-\frac{\log \left(a-bx^7\right)}{7b}$$

```
[Out] -Log[a - b*x^7]/(7*b)
```

Rubi [A] time = 0.00865842, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.071

$$-\frac{\log \left(a-bx^7\right)}{7b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/(a - b*x^7),x]

[Out] -Log[a - b*x^7]/(7*b)
```

Rubi in Sympy [A] time = 2.4637, size = 12, normalized size = 0.75

$$-\frac{\log \left(a-bx^7\right)}{7b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(-b*x**7+a),x)

[Out] -log(a - b*x**7)/(7*b)
```

Mathematica [A] time = 0.00484294, size = 16, normalized size = 1.

$$-\frac{\log \left(a-bx^7\right)}{7b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6/(a - b*x^7),x]

[Out] -Log[a - b*x^7]/(7*b)
```

Maple [A] time = 0., size = 16, normalized size = 1.

$$-\frac{\ln \left(bx^7-a\right)}{7\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(-b*x^7+a),x)

[Out] -1/7/b*ln(b*x^7-a)
```

Maxima [A] time = 1.44596, size = 20, normalized size = 1.25

$$-\frac{\log\left(bx^7-a\right)}{7\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^6/(b*x^7 - a),x, algorithm="maxima")
```

```
[Out] -1/7*log(b*x^7 - a)/b
```

Fricas [A] time = 0.21131, size = 20, normalized size = 1.25

$$-\frac{\log\left(bx^7-a\right)}{7\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^6/(b*x^7 - a),x, algorithm="fricas")
```

```
[Out] -1/7*log(b*x^7 - a)/b
```

Sympy [A] time = 0.549263, size = 12, normalized size = 0.75

$$-\frac{\log\left(-a+bx^7\right)}{7b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(-b*x**7+a),x)
```

```
[Out] -log(-a + b*x**7)/(7*b)
```

GIAC/XCAS [A] time = 0.222828, size = 22, normalized size = 1.38

$$-\frac{\ln\left(\left|bx^7-a\right|\right)}{7\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^6/(b*x^7 - a),x, algorithm="giac")
```

```
[Out] -1/7*ln(abs(b*x^7 - a))/b
```

3.1445 $\int \frac{1}{a-bx^7}\,dx$

Optimal. Leaf size=335

$$-\frac{\sin\left(\frac{3\pi}{14}\right)\log\left(a^{2/7}-2\sqrt[7]{a}\sqrt[7]{b}x\sin\left(\frac{3\pi}{14}\right)+b^{2/7}x^2\right)}{7a^{6/7}\sqrt[7]{b}}+\frac{\sin\left(\frac{\pi}{14}\right)\log\left(a^{2/7}+2\sqrt[7]{a}\sqrt[7]{b}x\sin\left(\frac{\pi}{14}\right)+b^{2/7}x^2\right)}{7a^{6/7}\sqrt[7]{b}}+\frac{\cos\left(\frac{\pi}{7}\right)\log\left(a^{2/7}+2\sqrt[7]{a}\sqrt[7]{b}x\cos\left(\frac{\pi}{7}\right)+b^{2/7}x^2\right)}{7a^{6/7}\sqrt[7]{b}}-\frac{\log\left(\sqrt[7]{a}-\sqrt[7]{b}x\right)}{7a^{6/7}\sqrt[7]{b}}+\frac{2\cos\left(\frac{3\pi}{14}\right)\tan^{-1}\left(\frac{\sqrt[7]{b}x\sec\left(\frac{3\pi}{14}\right)}{\sqrt[7]{a}}-\tan\left(\frac{3\pi}{14}\right)\right)}{7a^{6/7}\sqrt[7]{b}}+\frac{2\cos\left(\frac{\pi}{14}\right)\tan^{-1}\left(\frac{\sqrt[7]{b}x\sec\left(\frac{\pi}{14}\right)}{\sqrt[7]{a}}+\tan\left(\frac{\pi}{14}\right)\right)}{7a^{6/7}\sqrt[7]{b}}+\frac{2\sin\left(\frac{\pi}{7}\right)\tan^{-1}\left(\frac{\sqrt[7]{b}x\csc\left(\frac{\pi}{7}\right)}{\sqrt[7]{a}}+\cot\left(\frac{\pi}{7}\right)\right)}{7a^{6/7}\sqrt[7]{b}}$$

```
[Out] (2*ArcTan[(b^(1/7)*x*Sec[Pi/14])/a^(1/7) + Tan[Pi/14]]*Cos[Pi/14]
)/(7*a^(6/7)*b^(1/7)) + (2*ArcTan[(b^(1/7)*x*Sec[(3*Pi)/14])/a^(1
/7) - Tan[(3*Pi)/14]]*Cos[(3*Pi)/14])/(7*a^(6/7)*b^(1/7)) - Log[a
^(1/7) - b^(1/7)*x]/(7*a^(6/7)*b^(1/7)) + (Cos[Pi/7]*Log[a^(2/7)
+ b^(2/7)*x^2 + 2*a^(1/7)*b^(1/7)*x*Cos[Pi/7]])/(7*a^(6/7)*b^(1/7
)) + (Log[a^(2/7) + b^(2/7)*x^2 + 2*a^(1/7)*b^(1/7)*x*Sin[Pi/14]]
*Sin[Pi/14])/(7*a^(6/7)*b^(1/7)) + (2*ArcTan[Cot[Pi/7] + (b^(1/7)
*x*Csc[Pi/7])/a^(1/7)]*Sin[Pi/7])/(7*a^(6/7)*b^(1/7)) - (Log[a^(2
/7) + b^(2/7)*x^2 - 2*a^(1/7)*b^(1/7)*x*Sin[(3*Pi)/14]]*Sin[(3*Pi
)/14])/(7*a^(6/7)*b^(1/7))
```

Rubi [A] time = 0.80842, antiderivative size = 335, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 0.6$

$$-\frac{\sin\left(\frac{3\pi}{14}\right)\log\left(a^{2/7}-2\sqrt[7]{a}\sqrt[7]{b}x\sin\left(\frac{3\pi}{14}\right)+b^{2/7}x^2\right)}{7a^{6/7}\sqrt[7]{b}}+\frac{\sin\left(\frac{\pi}{14}\right)\log\left(a^{2/7}+2\sqrt[7]{a}\sqrt[7]{b}x\sin\left(\frac{\pi}{14}\right)+b^{2/7}x^2\right)}{7a^{6/7}\sqrt[7]{b}}+\frac{\cos\left(\frac{\pi}{7}\right)\log\left(a^{2/7}+2\sqrt[7]{a}\sqrt[7]{b}x\cos\left(\frac{\pi}{7}\right)+b^{2/7}x^2\right)}{7a^{6/7}\sqrt[7]{b}}-\frac{\log\left(\sqrt[7]{a}-\sqrt[7]{b}x\right)}{7a^{6/7}\sqrt[7]{b}}+\frac{2\cos\left(\frac{3\pi}{14}\right)\tan^{-1}\left(\frac{\sqrt[7]{b}x\sec\left(\frac{3\pi}{14}\right)}{\sqrt[7]{a}}-\tan\left(\frac{3\pi}{14}\right)\right)}{7a^{6/7}\sqrt[7]{b}}+\frac{2\cos\left(\frac{\pi}{14}\right)\tan^{-1}\left(\frac{\sqrt[7]{b}x\sec\left(\frac{\pi}{14}\right)}{\sqrt[7]{a}}+\tan\left(\frac{\pi}{14}\right)\right)}{7a^{6/7}\sqrt[7]{b}}+\frac{2\sin\left(\frac{\pi}{7}\right)\tan^{-1}\left(\frac{\sqrt[7]{b}x\csc\left(\frac{\pi}{7}\right)}{\sqrt[7]{a}}+\cot\left(\frac{\pi}{7}\right)\right)}{7a^{6/7}\sqrt[7]{b}}$$

Warning: Unable to verify antiderivative.

```
[In]  Int[(a - b*x^7)^(-1),x]
```



```
[Out] (2*ArcTan[(b^(1/7)*x*Sec[Pi/14])/a^(1/7) + Tan[Pi/14]]*Cos[Pi/14]
)/(7*a^(6/7)*b^(1/7)) + (2*ArcTan[(b^(1/7)*x*Sec[(3*Pi)/14])/a^(1
/7) - Tan[(3*Pi)/14]]*Cos[(3*Pi)/14])/(7*a^(6/7)*b^(1/7)) - Log[a
^(1/7) - b^(1/7)*x]/(7*a^(6/7)*b^(1/7)) + (Cos[Pi/7]*Log[a^(2/7)
+ b^(2/7)*x^2 + 2*a^(1/7)*b^(1/7)*x*Cos[Pi/7]])/(7*a^(6/7)*b^(1/7
)) + (Log[a^(2/7) + b^(2/7)*x^2 + 2*a^(1/7)*b^(1/7)*x*Sin[Pi/14]]
*Sin[Pi/14])/(7*a^(6/7)*b^(1/7)) + (2*ArcTan[Cot[Pi/7] + (b^(1/7)
*x*Csc[Pi/7])/a^(1/7)]*Sin[Pi/7])/(7*a^(6/7)*b^(1/7)) - (Log[a^(2
/7) + b^(2/7)*x^2 - 2*a^(1/7)*b^(1/7)*x*Sin[(3*Pi)/14]]*Sin[(3*Pi
)/14])/(7*a^(6/7)*b^(1/7))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(-b*x**7+a),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.549048, size = 263, normalized size = 0.79

$$-\sin\left(\frac{3\pi}{14}\right)\log\left(a^{2/7}-2\sqrt[7]{a}\sqrt[7]{b}x\sin\left(\frac{3\pi}{14}\right)+b^{2/7}x^2\right)+\sin\left(\frac{\pi}{14}\right)\log\left(a^{2/7}+2\sqrt[7]{a}\sqrt[7]{b}x\sin\left(\frac{\pi}{14}\right)+b^{2/7}x^2\right)+\cos\left(\frac{\pi}{7}\right)\log\left(a^{2/7}+\right.$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[(a - b*x^7)^(-1),x]
```

```
[Out] (2*ArcTan[(b^(1/7)*x*Sec[Pi/14])/a^(1/7) + Tan[Pi/14]]*Cos[Pi/14]
 + 2*ArcTan[(b^(1/7)*x*Sec[(3*Pi)/14])/a^(1/7) - Tan[(3*Pi)/14]]*
Cos[(3*Pi)/14] - Log[a^(1/7) - b^(1/7)*x] + Cos[Pi/7]*Log[a^(2/7)
 + b^(2/7)*x^2 + 2*a^(1/7)*b^(1/7)*x*Cos[Pi/7]] + Log[a^(2/7) + b
^(2/7)*x^2 + 2*a^(1/7)*b^(1/7)*x*Sin[Pi/14]]*Sin[Pi/14] + 2*ArcTa
n[Cot[Pi/7] + (b^(1/7)*x*Csc[Pi/7])/a^(1/7)]*Sin[Pi/7] - Log[a^(2
/7) + b^(2/7)*x^2 - 2*a^(1/7)*b^(1/7)*x*Sin[(3*Pi)/14]]*Sin[(3*Pi
)/14])/(7*a^(6/7)*b^(1/7))
```

Maple [C] time = 0.156, size = 29, normalized size = 0.1

$$-\frac{1}{7\,b}\sum_{\_R=RootOf\left(b\_Z^7-a\right)}\frac{\ln\left(x-\_R\right)}{\_R^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(-b*x^7+a),x)
```

```
[Out] -1/7/b*sum(1/_R^6*ln(x-_R),_R=RootOf(_Z^7*b-a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\int\frac{1}{bx^7-a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(b*x^7 - a),x, algorithm="maxima")
```

```
[Out] -integrate(1/(b*x^7 - a), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(b*x^7 - a),x, algorithm="fricas")
```

```
[Out] Exception raised: NotImplementedError
```

Sympy [A] time = 0.476669, size = 22, normalized size = 0.07

$$-\operatorname{RootSum}\left(823543t^7a^6b-1,\left(t\mapsto t\log\left(-7ta+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(-b*x**7+a),x)
```

```
[Out] -RootSum(823543*_t**7*a**6*b - 1, Lambda(_t, _t*log(-7*_t*a + x))
)
```

GIAC/XCAS [A] time = 0.227717, size = 392, normalized size = 1.17

$$\frac{\left(\frac{a}{b}\right)^{\frac{1}{7}}\cos\left(\frac{3}{7}\pi\right)\ln\left(2x\left(\frac{a}{b}\right)^{\frac{1}{7}}\cos\left(\frac{3}{7}\pi\right)+x^2+\left(\frac{a}{b}\right)^{\frac{2}{7}}\right)}{7a}-\frac{\left(\frac{a}{b}\right)^{\frac{1}{7}}\cos\left(\frac{2}{7}\pi\right)\ln\left(-2x\left(\frac{a}{b}\right)^{\frac{1}{7}}\cos\left(\frac{2}{7}\pi\right)+x^2+\left(\frac{a}{b}\right)^{\frac{2}{7}}\right)}{7a}+\frac{\left(\frac{a}{b}\right)^{\frac{1}{7}}\cos\left(\frac{1}{7}\pi\right)\ln\left(2x\left(\frac{a}{b}\right)^{\frac{1}{7}}\cos\left(\frac{1}{7}\pi\right)+x^2+\left(\frac{a}{b}\right)^{\frac{2}{7}}\right)}{7a}+\frac{2\left(\frac{a}{b}\right)^{\frac{1}{7}}\arctan\left(\frac{\left(\frac{a}{b}\right)^{\frac{1}{7}}\cos\left(\frac{3}{7}\pi\right)+x}{\left(\frac{a}{b}\right)^{\frac{1}{7}}\sin\left(\frac{3}{7}\pi\right)}\right)\sin\left(\frac{3}{7}\pi\right)}{7a}+\frac{2\left(\frac{a}{b}\right)^{\frac{1}{7}}\arctan\left(-\frac{\left(\frac{a}{b}\right)^{\frac{1}{7}}\cos\left(\frac{2}{7}\pi\right)-x}{\left(\frac{a}{b}\right)^{\frac{1}{7}}\sin\left(\frac{2}{7}\pi\right)}\right)\sin\left(\frac{2}{7}\pi\right)}{7a}+\frac{2\left(\frac{a}{b}\right)^{\frac{1}{7}}\arctan\left(\frac{\left(\frac{a}{b}\right)^{\frac{1}{7}}\cos\left(\frac{1}{7}\pi\right)+x}{\left(\frac{a}{b}\right)^{\frac{1}{7}}\sin\left(\frac{1}{7}\pi\right)}\right)\sin\left(\frac{1}{7}\pi\right)}{7a}-\frac{\left(\frac{a}{b}\right)^{\frac{1}{7}}\ln\left(\left|x-\left(\frac{a}{b}\right)^{\frac{1}{7}}\right|\right)}{7a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(b*x^7 - a),x, algorithm="giac")
```

```
[Out] 1/7*(a/b)^(1/7)*cos(3/7*pi)*ln(2*x*(a/b)^(1/7)*cos(3/7*pi) + x^2
+ (a/b)^(2/7))/a - 1/7*(a/b)^(1/7)*cos(2/7*pi)*ln(-2*x*(a/b)^(1/7
)*cos(2/7*pi) + x^2 + (a/b)^(2/7))/a + 1/7*(a/b)^(1/7)*cos(1/7*pi
)*ln(2*x*(a/b)^(1/7)*cos(1/7*pi) + x^2 + (a/b)^(2/7))/a + 2/7*(a/
b)^(1/7)*arctan(((a/b)^(1/7)*cos(3/7*pi) + x)/((a/b)^(1/7)*sin(3/
7*pi)))*sin(3/7*pi)/a + 2/7*(a/b)^(1/7)*arctan(-((a/b)^(1/7)*cos(
2/7*pi) - x)/((a/b)^(1/7)*sin(2/7*pi)))*sin(2/7*pi)/a + 2/7*(a/b)
^(1/7)*arctan(((a/b)^(1/7)*cos(1/7*pi) + x)/((a/b)^(1/7)*sin(1/7*
pi)))*sin(1/7*pi)/a - 1/7*(a/b)^(1/7)*ln(abs(x - (a/b)^(1/7)))/a
```

3.1446 $\int \frac{1}{x(a-bx^7)}\,dx$

Optimal. Leaf size=23

$$\frac{\log(x)}{a} - \frac{\log\left(a-bx^7\right)}{7a}$$

```
[Out] Log[x]/a - Log[a - b*x^7]/(7*a)
```

Rubi [A] time = 0.0396933, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286

$$\frac{\log(x)}{a} - \frac{\log\left(a-bx^7\right)}{7a}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a - b*x^7)),x]

[Out] Log[x]/a - Log[a - b*x^7]/(7*a)
```

Rubi in Sympy [A] time = 5.97916, size = 19, normalized size = 0.83

$$\frac{\log\left(x^7\right)}{7a} - \frac{\log\left(a-bx^7\right)}{7a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(-b*x**7+a),x)

[Out] log(x**7)/(7*a) - log(a - b*x**7)/(7*a)
```

Mathematica [A] time = 0.0117085, size = 23, normalized size = 1.

$$\frac{\log(x)}{a} - \frac{\log\left(a-bx^7\right)}{7a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a - b*x^7)),x]

[Out] Log[x]/a - Log[a - b*x^7]/(7*a)
```

Maple [A] time = 0.005, size = 23, normalized size = 1.

$$\frac{\ln(x)}{a} - \frac{\ln\left(bx^7-a\right)}{7\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(-b*x^7+a),x)

[Out] ln(x)/a-1/7/a*ln(b*x^7-a)
```

Maxima [A] time = 1.44683, size = 34, normalized size = 1.48

$$-\frac{\log\left(bx^7 - a\right)}{7\,a} + \frac{\log\left(x^7\right)}{7\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((b*x^7 - a)*x),x, algorithm="maxima")

[Out] -1/7*log(b*x^7 - a)/a + 1/7*log(x^7)/a
```

Fricas [A] time = 0.224001, size = 27, normalized size = 1.17

$$-\frac{\log\left(bx^7 - a\right) - 7\,\log\left(x\right)}{7\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((b*x^7 - a)*x),x, algorithm="fricas")

[Out] -1/7*(log(b*x^7 - a) - 7*log(x))/a
```

Sympy [A] time = 0.948673, size = 15, normalized size = 0.65

$$\frac{\log\left(x\right)}{a} - \frac{\log\left(-\frac{a}{b} + x^7\right)}{7a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(-b*x**7+a),x)

[Out] log(x)/a - log(-a/b + x**7)/(7*a)
```

GIAC/XCAS [A] time = 0.219977, size = 32, normalized size = 1.39

$$-\frac{\ln\left(\left|bx^7 - a\right|\right)}{7\,a} + \frac{\ln\left(\left|x\right|\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((b*x^7 - a)*x),x, algorithm="giac")

[Out] -1/7*ln(abs(b*x^7 - a))/a + ln(abs(x))/a
```

3.1447 $\int \frac{1}{1-x^7}\,dx$

Optimal. Leaf size=166

$$-\frac{1}{7}\sin\left(\frac{3\pi}{14}\right)\log\left(x^2-2x\sin\left(\frac{3\pi}{14}\right)+1\right)+\frac{1}{7}\sin\left(\frac{\pi}{14}\right)\log\left(x^2+2x\sin\left(\frac{\pi}{14}\right)+1\right)+\frac{1}{7}\cos\left(\frac{\pi}{7}\right)\log\left(x^2+2x\cos\left(\frac{\pi}{7}\right)+1\right)-\frac{1}{7}\log(1-x)+\frac{2}{7}\sin\left(\frac{\pi}{7}\right)\tan^{-1}\left(\csc\left(\frac{\pi}{7}\right)\left(x+\cos\left(\frac{\pi}{7}\right)\right)\right)+\frac{2}{7}\cos\left(\frac{3\pi}{14}\right)\tan^{-1}\left(\sec\left(\frac{3\pi}{14}\right)\left(x-\sin\left(\frac{3\pi}{14}\right)\right)\right)+\frac{2}{7}\cos\left(\frac{\pi}{14}\right)\tan^{-1}\left(\sec\left(\frac{\pi}{14}\right)\left(x+\sin\left(\frac{\pi}{14}\right)\right)\right)$$

```
[Out] (2*ArcTan[Sec[Pi/14]*(x + Sin[Pi/14])]*Cos[Pi/14])/7 + (2*ArcTan[
Sec[(3*Pi)/14]*(x - Sin[(3*Pi)/14])]*Cos[(3*Pi)/14])/7 - Log[1 -
x]/7 + (Cos[Pi/7]*Log[1 + x^2 + 2*x*Cos[Pi/7]])/7 + (Log[1 + x^2
+ 2*x*Sin[Pi/14]]*Sin[Pi/14])/7 + (2*ArcTan[(x + Cos[Pi/7])*Csc[P
i/7]]*Sin[Pi/7])/7 - (Log[1 + x^2 - 2*x*Sin[(3*Pi)/14]]*Sin[(3*Pi
)/14])/7
```

Rubi [A] time = 0.272953, antiderivative size = 166, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667

$$-\frac{1}{7}\sin\left(\frac{3\pi}{14}\right)\log\left(x^2-2x\sin\left(\frac{3\pi}{14}\right)+1\right)+\frac{1}{7}\sin\left(\frac{\pi}{14}\right)\log\left(x^2+2x\sin\left(\frac{\pi}{14}\right)+1\right)+\frac{1}{7}\cos\left(\frac{\pi}{7}\right)\log\left(x^2+2x\cos\left(\frac{\pi}{7}\right)+1\right)-\frac{1}{7}\log(1-x)+\frac{2}{7}\sin\left(\frac{\pi}{7}\right)\tan^{-1}\left(\csc\left(\frac{\pi}{7}\right)\left(x+\cos\left(\frac{\pi}{7}\right)\right)\right)+\frac{2}{7}\cos\left(\frac{3\pi}{14}\right)\tan^{-1}\left(\sec\left(\frac{3\pi}{14}\right)\left(x-\sin\left(\frac{3\pi}{14}\right)\right)\right)+\frac{2}{7}\cos\left(\frac{\pi}{14}\right)\tan^{-1}\left(\sec\left(\frac{\pi}{14}\right)\left(x+\sin\left(\frac{\pi}{14}\right)\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Int[(1 - x^7)^(-1),x]
```

```
[Out] (2*ArcTan[Sec[Pi/14]*(x + Sin[Pi/14])]*Cos[Pi/14])/7 + (2*ArcTan[
Sec[(3*Pi)/14]*(x - Sin[(3*Pi)/14])]*Cos[(3*Pi)/14])/7 - Log[1 -
x]/7 + (Cos[Pi/7]*Log[1 + x^2 + 2*x*Cos[Pi/7]])/7 + (Log[1 + x^2
+ 2*x*Sin[Pi/14]]*Sin[Pi/14])/7 + (2*ArcTan[(x + Cos[Pi/7])*Csc[P
i/7]]*Sin[Pi/7])/7 - (Log[1 + x^2 - 2*x*Sin[(3*Pi)/14]]*Sin[(3*Pi
)/14])/7
```

Rubi in Sympy [A] time = 75.8887, size = 211, normalized size = 1.27

$$-\frac{\log(-x+1)}{7}+\frac{\log\left(x^2+2x\cos\left(\frac{\pi}{7}\right)+1\right)\cos\left(\frac{\pi}{7}\right)}{7}-\frac{\log\left(x^2-2x\cos\left(\frac{2\pi}{7}\right)+1\right)\cos\left(\frac{2\pi}{7}\right)}{7}+\frac{\log\left(x^2+2x\cos\left(\frac{3\pi}{7}\right)+1\right)\cos\left(\frac{3\pi}{7}\right)}{7}+\frac{\sqrt{2}\sqrt{-\sin\left(\frac{3\pi}{14}\right)+1}\,\operatorname{atan}\left(\frac{\sqrt{2}\left(x+\cos\left(\frac{\pi}{7}\right)\right)}{\sqrt{-\sin\left(\frac{3\pi}{14}\right)+1}}\right)}{7}+\frac{\sqrt{2}\sqrt{\sin\left(\frac{\pi}{14}\right)+1}\,\operatorname{atan}\left(\frac{\sqrt{2}\left(x-\cos\left(\frac{2\pi}{7}\right)\right)}{\sqrt{\sin\left(\frac{\pi}{14}\right)+1}}\right)}{7}+\frac{\sqrt{2}\sqrt{\sin\left(\frac{5\pi}{14}\right)+1}\,\operatorname{atan}\left(\frac{\sqrt{2}\left(x+\cos\left(\frac{3\pi}{7}\right)\right)}{\sqrt{\sin\left(\frac{5\pi}{14}\right)+1}}\right)}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(-x**7+1),x)
```

```
[Out] -log(-x + 1)/7 + log(x**2 + 2*x*cos(pi/7) + 1)*cos(pi/7)/7 - log(
x**2 - 2*x*cos(2*pi/7) + 1)*cos(2*pi/7)/7 + log(x**2 + 2*x*cos(3*
pi/7) + 1)*cos(3*pi/7)/7 + sqrt(2)*sqrt(-sin(3*pi/14) + 1)*atan(s
qrt(2)*(x + cos(pi/7))/sqrt(-sin(3*pi/14) + 1))/7 + sqrt(2)*sqrt(
sin(pi/14) + 1)*atan(sqrt(2)*(x - cos(2*pi/7))/sqrt(sin(pi/14) +
```

```
1))/7 + sqrt(2)*sqrt(sin(5*pi/14) + 1)*atan(sqrt(2)*(x + cos(3*pi
/7))/sqrt(sin(5*pi/14) + 1))/7
```

Mathematica [A] time = 0.00700955, size = 166, normalized size = 1.

$$-\frac{1}{7}\sin\left(\frac{3\pi}{14}\right)\log\left(x^2-2x\sin\left(\frac{3\pi}{14}\right)+1\right)+\frac{1}{7}\sin\left(\frac{\pi}{14}\right)\log\left(x^2+2x\sin\left(\frac{\pi}{14}\right)+1\right)+\frac{1}{7}\cos\left(\frac{\pi}{7}\right)\log\left(x^2+2x\cos\left(\frac{\pi}{7}\right)+1\right)-\frac{1}{7}\log(1-x)+\frac{2}{7}\sin\left(\frac{\pi}{7}\right)\tan^{-1}\left(\csc\left(\frac{\pi}{7}\right)\left(x+\cos\left(\frac{\pi}{7}\right)\right)\right)+\frac{2}{7}\cos\left(\frac{3\pi}{14}\right)\tan^{-1}\left(\sec\left(\frac{3\pi}{14}\right)\left(x-\sin\left(\frac{3\pi}{14}\right)\right)\right)+\frac{2}{7}\cos\left(\frac{\pi}{14}\right)\tan^{-1}\left(\sec\left(\frac{\pi}{14}\right)\left(x+\sin\left(\frac{\pi}{14}\right)\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(1 - x^7)^(-1),x]
```

```
[Out] (2*ArcTan[Sec[Pi/14]*(x + Sin[Pi/14])]*Cos[Pi/14])/7 + (2*ArcTan[
Sec[(3*Pi)/14]*(x - Sin[(3*Pi)/14])]*Cos[(3*Pi)/14])/7 - Log[1 -
x]/7 + (Cos[Pi/7]*Log[1 + x^2 + 2*x*Cos[Pi/7]])/7 + (Log[1 + x^2
+ 2*x*Sin[Pi/14]]*Sin[Pi/14])/7 + (2*ArcTan[(x + Cos[Pi/7])*Csc[P
i/7]]*Sin[Pi/7])/7 - (Log[1 + x^2 - 2*x*Sin[(3*Pi)/14]]*Sin[(3*Pi
)/14])/7
```

Maple [C] time = 0.014, size = 89, normalized size = 0.5

$$-\frac{\ln(-1+x)}{7}+\frac{1}{7}\sum_{\_R=RootOf(\_Z^6+\_Z^5+\_Z^4+\_Z^3+\_Z^2+\_Z+1)}\frac{(\_R^5+2\_R^4+3\_R^3+4\_R^2+5\_R+6)\ln(x-\_R)}{6\_R^5+5\_R^4+4\_R^3+3\_R^2+2\_R+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(-x^7+1),x)
```

```
[Out] -1/7*ln(-1+x)+1/7*sum((_R^5+2*_R^4+3*_R^3+4*_R^2+5*_R+6)/(6*_R^5+
5*_R^4+4*_R^3+3*_R^2+2*_R+1)*ln(x-_R),_R=RootOf(_Z^6+_Z^5+_Z^4+_Z
^3+_Z^2+_Z+1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{7}\int\frac{x^5+2x^4+3x^3+4x^2+5x+6}{x^6+x^5+x^4+x^3+x^2+x+1}\,dx-\frac{1}{7}\log(x-1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(x^7 - 1),x, algorithm="maxima")
```

```
[Out] 1/7*integrate((x^5 + 2*x^4 + 3*x^3 + 4*x^2 + 5*x + 6)/(x^6 + x^5
+ x^4 + x^3 + x^2 + x + 1), x) - 1/7*log(x - 1)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(x^7 - 1),x, algorithm="fricas")
```

```
[Out] Exception raised: NotImplementedError
```

Sympy [A] time = 0.550645, size = 46, normalized size = 0.28

$$-\frac{\log(x-1)}{7} - \operatorname{RootSum}\left(117649t^6 + 16807t^5 + 2401t^4 + 343t^3 + 49t^2 + 7t + 1, \left(t \mapsto t\log(-7t + x)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(-x**7+1),x)
```

```
[Out] -log(x - 1)/7 - RootSum(117649*_t**6 + 16807*_t**5 + 2401*_t**4 +
 343*_t**3 + 49*_t**2 + 7*_t + 1, Lambda(_t, _t*log(-7*_t + x)))
```

GIAC/XCAS [A] time = 0.218751, size = 171, normalized size = 1.03

$$\frac{1}{7}\cos\left(\frac{3}{7}\pi\right)\ln\left(x^2 + 2x\cos\left(\frac{3}{7}\pi\right) + 1\right) - \frac{1}{7}\cos\left(\frac{2}{7}\pi\right)\ln\left(x^2 - 2x\cos\left(\frac{2}{7}\pi\right) + 1\right) + \frac{1}{7}\cos\left(\frac{1}{7}\pi\right)\ln\left(x^2 + 2x\cos\left(\frac{1}{7}\pi\right) + 1\right) + \frac{2}{7}\arctan\left(\frac{x + \cos\left(\frac{3}{7}\pi\right)}{\sin\left(\frac{3}{7}\pi\right)}\right)\sin\left(\frac{3}{7}\pi\right) + \frac{2}{7}\arctan\left(\frac{x - \cos\left(\frac{2}{7}\pi\right)}{\sin\left(\frac{2}{7}\pi\right)}\right)\sin\left(\frac{2}{7}\pi\right) + \frac{2}{7}\arctan\left(\frac{x + \cos\left(\frac{1}{7}\pi\right)}{\sin\left(\frac{1}{7}\pi\right)}\right)\sin\left(\frac{1}{7}\pi\right) - \frac{1}{7}\ln\left(|x-1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(x^7 - 1),x, algorithm="giac")
```

```
[Out] 1/7*cos(3/7*pi)*ln(x^2 + 2*x*cos(3/7*pi) + 1) - 1/7*cos(2/7*pi)*l
n(x^2 - 2*x*cos(2/7*pi) + 1) + 1/7*cos(1/7*pi)*ln(x^2 + 2*x*cos(1
/7*pi) + 1) + 2/7*arctan((x + cos(3/7*pi))/sin(3/7*pi))*sin(3/7*p
i) + 2/7*arctan((x - cos(2/7*pi))/sin(2/7*pi))*sin(2/7*pi) + 2/7*
arctan((x + cos(1/7*pi))/sin(1/7*pi))*sin(1/7*pi) - 1/7*ln(abs(x
- 1))
```

3.1448 $\int \frac{1}{1+x^7} \, dx$

Optimal. Leaf size=165

$$\frac{1}{7}\sin\left(\frac{3\pi}{14}\right)\log\left(x^2+2x\sin\left(\frac{3\pi}{14}\right)+1\right)-\frac{1}{7}\sin\left(\frac{\pi}{14}\right)\log\left(x^2-2x\sin\left(\frac{\pi}{14}\right)+1\right)-\frac{1}{7}\cos\left(\frac{\pi}{7}\right)\log\left(x^2-2x\cos\left(\frac{\pi}{7}\right)+1\right)+\frac{1}{7}\log(x+1)+\frac{2}{7}\cos\left(\frac{3\pi}{14}\right)\tan^{-1}\left(x\sec\left(\frac{3\pi}{14}\right)+\tan\left(\frac{3\pi}{14}\right)\right)+\frac{2}{7}\cos\left(\frac{\pi}{14}\right)\tan^{-1}\left(x\sec\left(\frac{\pi}{14}\right)-\tan\left(\frac{\pi}{14}\right)\right)-\frac{2}{7}\sin\left(\frac{\pi}{7}\right)\tan^{-1}\left(\cot\left(\frac{\pi}{7}\right)-x\csc\left(\frac{\pi}{7}\right)\right)$$

```
[Out] (2*ArcTan[x*Sec[Pi/14] - Tan[Pi/14]]*Cos[Pi/14])/7 + (2*ArcTan[x*
Sec[(3*Pi)/14] + Tan[(3*Pi)/14]]*Cos[(3*Pi)/14])/7 + Log[1 + x]/7
 - (Cos[Pi/7]*Log[1 + x^2 - 2*x*Cos[Pi/7]])/7 - (Log[1 + x^2 - 2*
x*Sin[Pi/14]]*Sin[Pi/14])/7 - (2*ArcTan[Cot[Pi/7] - x*Csc[Pi/7]]*
Sin[Pi/7])/7 + (Log[1 + x^2 + 2*x*Sin[(3*Pi)/14]]*Sin[(3*Pi)/14])
/7
```

Rubi [A] time = 0.294185, antiderivative size = 165, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.857

$$\frac{1}{7}\sin\left(\frac{3\pi}{14}\right)\log\left(x^2+2x\sin\left(\frac{3\pi}{14}\right)+1\right)-\frac{1}{7}\sin\left(\frac{\pi}{14}\right)\log\left(x^2-2x\sin\left(\frac{\pi}{14}\right)+1\right)-\frac{1}{7}\cos\left(\frac{\pi}{7}\right)\log\left(x^2-2x\cos\left(\frac{\pi}{7}\right)+1\right)+\frac{1}{7}\log(x+1)+\frac{2}{7}\cos\left(\frac{3\pi}{14}\right)\tan^{-1}\left(x\sec\left(\frac{3\pi}{14}\right)+\tan\left(\frac{3\pi}{14}\right)\right)+\frac{2}{7}\cos\left(\frac{\pi}{14}\right)\tan^{-1}\left(x\sec\left(\frac{\pi}{14}\right)-\tan\left(\frac{\pi}{14}\right)\right)-\frac{2}{7}\sin\left(\frac{\pi}{7}\right)\tan^{-1}\left(\cot\left(\frac{\pi}{7}\right)-x\csc\left(\frac{\pi}{7}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Int[(1 + x^7)^(-1),x]
```

```
[Out] (2*ArcTan[x*Sec[Pi/14] - Tan[Pi/14]]*Cos[Pi/14])/7 + (2*ArcTan[x*
Sec[(3*Pi)/14] + Tan[(3*Pi)/14]]*Cos[(3*Pi)/14])/7 + Log[1 + x]/7
 - (Cos[Pi/7]*Log[1 + x^2 - 2*x*Cos[Pi/7]])/7 - (Log[1 + x^2 - 2*
x*Sin[Pi/14]]*Sin[Pi/14])/7 - (2*ArcTan[Cot[Pi/7] - x*Csc[Pi/7]]*
Sin[Pi/7])/7 + (Log[1 + x^2 + 2*x*Sin[(3*Pi)/14]]*Sin[(3*Pi)/14])
/7
```

Rubi in Sympy [A] time = 72.2724, size = 209, normalized size = 1.27

$$\frac{\log(x+1)}{7}-\frac{\log\left(x^2-2x\cos\left(\frac{\pi}{7}\right)+1\right)\cos\left(\frac{\pi}{7}\right)}{7}+\frac{\log\left(x^2+2x\cos\left(\frac{2\pi}{7}\right)+1\right)\cos\left(\frac{2\pi}{7}\right)}{7}-\frac{\log\left(x^2-2x\cos\left(\frac{3\pi}{7}\right)+1\right)\cos\left(\frac{3\pi}{7}\right)}{7}+\frac{\sqrt{2}\sqrt{\sin\left(\frac{5\pi}{14}\right)+1}\operatorname{atan}\left(\frac{\sqrt{2}\left(x-\sin\left(\frac{\pi}{14}\right)\right)}{\sqrt{\sin\left(\frac{5\pi}{14}\right)+1}}\right)}{7}+\frac{\sqrt{2}\sqrt{-\sin\left(\frac{3\pi}{14}\right)+1}\operatorname{atan}\left(\frac{\sqrt{2}\left(x-\cos\left(\frac{\pi}{7}\right)\right)}{\sqrt{-\sin\left(\frac{3\pi}{14}\right)+1}}\right)}{7}+\frac{\sqrt{2}\sqrt{\sin\left(\frac{\pi}{14}\right)+1}\operatorname{atan}\left(\frac{\sqrt{2}\left(x+\cos\left(\frac{2\pi}{7}\right)\right)}{\sqrt{\sin\left(\frac{\pi}{14}\right)+1}}\right)}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(x**7+1),x)
```

```
[Out] log(x + 1)/7 - log(x**2 - 2*x*cos(pi/7) + 1)*cos(pi/7)/7 + log(x*
*2 + 2*x*cos(2*pi/7) + 1)*cos(2*pi/7)/7 - log(x**2 - 2*x*cos(3*pi
/7) + 1)*cos(3*pi/7)/7 + sqrt(2)*sqrt(sin(5*pi/14) + 1)*atan(sqrt
(2)*(x - sin(pi/14))/sqrt(sin(5*pi/14) + 1))/7 + sqrt(2)*sqrt(-si
n(3*pi/14) + 1)*atan(sqrt(2)*(x - cos(pi/7))/sqrt(-sin(3*pi/14) +
```

```
 1))/7 + sqrt(2)*sqrt(sin(pi/14) + 1)*atan(sqrt(2)*(x + cos(2*pi/
7))/sqrt(sin(pi/14) + 1))/7
```

Mathematica [A] time = 0.00675196, size = 166, normalized size = 1.01

$$\frac{1}{7}\sin\left(\frac{3\pi}{14}\right)\log\left(x^2+2x\sin\left(\frac{3\pi}{14}\right)+1\right)-\frac{1}{7}\sin\left(\frac{\pi}{14}\right)\log\left(x^2-2x\sin\left(\frac{\pi}{14}\right)+1\right)-\frac{1}{7}\cos\left(\frac{\pi}{7}\right)\log\left(x^2-2x\cos\left(\frac{\pi}{7}\right)+1\right)+\frac{1}{7}\log(x+1)+\frac{2}{7}\sin\left(\frac{\pi}{7}\right)\tan^{-1}\left(\csc\left(\frac{\pi}{7}\right)\left(x-\cos\left(\frac{\pi}{7}\right)\right)\right)+\frac{2}{7}\cos\left(\frac{3\pi}{14}\right)\tan^{-1}\left(\sec\left(\frac{3\pi}{14}\right)\left(x+\sin\left(\frac{3\pi}{14}\right)\right)\right)+\frac{2}{7}\cos\left(\frac{\pi}{14}\right)\tan^{-1}\left(\sec\left(\frac{\pi}{14}\right)\left(x-\sin\left(\frac{\pi}{14}\right)\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(1 + x^7)^(-1),x]
```

```
[Out] (2*ArcTan[Sec[Pi/14]*(x - Sin[Pi/14])]*Cos[Pi/14])/7 + (2*ArcTan[
Sec[(3*Pi)/14]*(x + Sin[(3*Pi)/14])]*Cos[(3*Pi)/14])/7 + Log[1 +
x]/7 - (Cos[Pi/7]*Log[1 + x^2 - 2*x*Cos[Pi/7]])/7 - (Log[1 + x^2
- 2*x*Sin[Pi/14]]*Sin[Pi/14])/7 + (2*ArcTan[(x - Cos[Pi/7])*Csc[P
i/7]]*Sin[Pi/7])/7 + (Log[1 + x^2 + 2*x*Sin[(3*Pi)/14]]*Sin[(3*Pi
)/14])/7
```

Maple [C] time = 0.014, size = 97, normalized size = 0.6

$$\frac{1}{7}\sum_{\_R=RootOf\left(\_Z^6-\_Z^5+\_Z^4-\_Z^3+\_Z^2-\_Z+1\right)}\frac{\left(-\_R^5+2\_R^4-3\_R^3+4\_R^2-5\_R+6\right)\ln\left(x-\_R\right)}{6\_R^5-5\_R^4+4\_R^3-3\_R^2+2\_R-1}+\frac{\ln\left(1+x\right)}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(x^7+1),x)
```

```
[Out] 1/7*sum((-_R^5+2*_R^4-3*_R^3+4*_R^2-5*_R+6)/(6*_R^5-5*_R^4+4*_R^3
-3*_R^2+2*_R-1)*ln(x-_R),_R=RootOf(_Z^6-_Z^5+_Z^4-_Z^3+_Z^2-_Z+1)
)+1/7*ln(1+x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{7}\int\frac{x^5-2\,x^4+3\,x^3-4\,x^2+5\,x-6}{x^6-x^5+x^4-x^3+x^2-x+1}\,dx+\frac{1}{7}\log\left(x+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^7 + 1),x, algorithm="maxima")
```

```
[Out] -1/7*integrate((x^5 - 2*x^4 + 3*x^3 - 4*x^2 + 5*x - 6)/(x^6 - x^5
 + x^4 - x^3 + x^2 - x + 1), x) + 1/7*log(x + 1)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^7 + 1),x, algorithm="fricas")
```

```
[Out] Exception raised: NotImplementedError
```

Sympy [A] time = 0.546635, size = 44, normalized size = 0.27

$$\frac{\log(x+1)}{7} + \text{RootSum}\left(117649t^6 + 16807t^5 + 2401t^4 + 343t^3 + 49t^2 + 7t + 1, (t \mapsto t\log(7t + x))\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x**7+1),x)
```

```
[Out] log(x + 1)/7 + RootSum(117649*_t**6 + 16807*_t**5 + 2401*_t**4 +
343*_t**3 + 49*_t**2 + 7*_t + 1, Lambda(_t, _t*log(7*_t + x)))
```

GIAC/XCAS [A] time = 0.220261, size = 174, normalized size = 1.05

$$-\frac{1}{7}\cos\left(\frac{3}{7}\pi\right)\ln\left(x^2 - 2x\cos\left(\frac{3}{7}\pi\right) + 1\right) + \frac{1}{7}\cos\left(\frac{2}{7}\pi\right)\ln\left(x^2 + 2x\cos\left(\frac{2}{7}\pi\right) + 1\right) - \frac{1}{7}\cos\left(\frac{1}{7}\pi\right)\ln\left(x^2 - 2x\cos\left(\frac{1}{7}\pi\right) + 1\right) + \frac{2}{7}\arctan\left(\frac{x - \cos\left(\frac{3}{7}\pi\right)}{\sin\left(\frac{3}{7}\pi\right)}\right)\sin\left(\frac{3}{7}\pi\right) + \frac{2}{7}\arctan\left(\frac{x + \cos\left(\frac{2}{7}\pi\right)}{\sin\left(\frac{2}{7}\pi\right)}\right)\sin\left(\frac{2}{7}\pi\right) + \frac{2}{7}\arctan\left(\frac{x - \cos\left(\frac{1}{7}\pi\right)}{\sin\left(\frac{1}{7}\pi\right)}\right)\sin\left(\frac{1}{7}\pi\right) + \frac{1}{7}\ln\left(|x+1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^7 + 1),x, algorithm="giac")
```

```
[Out] -1/7*cos(3/7*pi)*ln(x^2 - 2*x*cos(3/7*pi) + 1) + 1/7*cos(2/7*pi)*
ln(x^2 + 2*x*cos(2/7*pi) + 1) - 1/7*cos(1/7*pi)*ln(x^2 - 2*x*cos(
1/7*pi) + 1) + 2/7*arctan((x - cos(3/7*pi))/sin(3/7*pi))*sin(3/7*
pi) + 2/7*arctan((x + cos(2/7*pi))/sin(2/7*pi))*sin(2/7*pi) + 2/7
*arctan((x - cos(1/7*pi))/sin(1/7*pi))*sin(1/7*pi) + 1/7*ln(abs(x
 + 1))
```

3.1449 $\int \frac{x^9}{a+bx^8} dx$

Optimal. Leaf size=203

$$\frac{\sqrt[4]{a}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x^2}{\sqrt[4]{a}}\right)}{4\sqrt{2}b^{5/4}}-\frac{\sqrt[4]{a}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x^2}{\sqrt[4]{a}}+1\right)}{4\sqrt{2}b^{5/4}}+\frac{\sqrt[4]{a}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^2+\sqrt{a}+\sqrt{b}x^4\right)}{8\sqrt{2}b^{5/4}}-\frac{\sqrt[4]{a}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^2+\sqrt{a}+\sqrt{b}x^4\right)}{8\sqrt{2}b^{5/4}}+\frac{x^2}{2b}$$

```
[Out] x^2/(2*b) + (a^(1/4)*ArcTan[1 - (Sqrt[2]*b^(1/4)*x^2)/a^(1/4)])/(
4*Sqrt[2]*b^(5/4)) - (a^(1/4)*ArcTan[1 + (Sqrt[2]*b^(1/4)*x^2)/a^
(1/4)])/(4*Sqrt[2]*b^(5/4)) + (a^(1/4)*Log[Sqrt[a] - Sqrt[2]*a^(1
/4)*b^(1/4)*x^2 + Sqrt[b]*x^4])/(8*Sqrt[2]*b^(5/4)) - (a^(1/4)*Lo
g[Sqrt[a] + Sqrt[2]*a^(1/4)*b^(1/4)*x^2 + Sqrt[b]*x^4])/(8*Sqrt[2
]*b^(5/4))
```

Rubi [A] time = 0.431605, antiderivative size = 203, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615

$$\frac{\sqrt[4]{a}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x^2}{\sqrt[4]{a}}\right)}{4\sqrt{2}b^{5/4}}-\frac{\sqrt[4]{a}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x^2}{\sqrt[4]{a}}+1\right)}{4\sqrt{2}b^{5/4}}+\frac{\sqrt[4]{a}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^2+\sqrt{a}+\sqrt{b}x^4\right)}{8\sqrt{2}b^{5/4}}-\frac{\sqrt[4]{a}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^2+\sqrt{a}+\sqrt{b}x^4\right)}{8\sqrt{2}b^{5/4}}+\frac{x^2}{2b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^9/(a + b*x^8),x]
```

```
[Out] x^2/(2*b) + (a^(1/4)*ArcTan[1 - (Sqrt[2]*b^(1/4)*x^2)/a^(1/4)])/(
4*Sqrt[2]*b^(5/4)) - (a^(1/4)*ArcTan[1 + (Sqrt[2]*b^(1/4)*x^2)/a^
(1/4)])/(4*Sqrt[2]*b^(5/4)) + (a^(1/4)*Log[Sqrt[a] - Sqrt[2]*a^(1
/4)*b^(1/4)*x^2 + Sqrt[b]*x^4])/(8*Sqrt[2]*b^(5/4)) - (a^(1/4)*Lo
g[Sqrt[a] + Sqrt[2]*a^(1/4)*b^(1/4)*x^2 + Sqrt[b]*x^4])/(8*Sqrt[2
]*b^(5/4))
```

Rubi in Sympy [A] time = 60.8123, size = 185, normalized size = 0.91

$$\frac{\sqrt{2}\sqrt[4]{a}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^2+\sqrt{a}+\sqrt{b}x^4\right)}{16b^{\frac{5}{4}}}-\frac{\sqrt{2}\sqrt[4]{a}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^2+\sqrt{a}+\sqrt{b}x^4\right)}{16b^{\frac{5}{4}}}+\frac{\sqrt{2}\sqrt[4]{a}\,\mathrm{atan}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x^2}{\sqrt[4]{a}}\right)}{8b^{\frac{5}{4}}}-\frac{\sqrt{2}\sqrt[4]{a}\,\mathrm{atan}\left(1+\frac{\sqrt{2}\sqrt[4]{b}x^2}{\sqrt[4]{a}}\right)}{8b^{\frac{5}{4}}}+\frac{x^2}{2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**9/(b*x**8+a),x)
```

```
[Out] sqrt(2)*a**(1/4)*log(-sqrt(2)*a**(1/4)*b**(1/4)*x**2 + sqrt(a) +
sqrt(b)*x**4)/(16*b**(5/4)) - sqrt(2)*a**(1/4)*log(sqrt(2)*a**(1/
4)*b**(1/4)*x**2 + sqrt(a) + sqrt(b)*x**4)/(16*b**(5/4)) + sqrt(2
)*a**(1/4)*atan(1 - sqrt(2)*b**(1/4)*x**2/a**(1/4))/(8*b**(5/4))
- sqrt(2)*a**(1/4)*atan(1 + sqrt(2)*b**(1/4)*x**2/a**(1/4))/(8*b*
*(5/4)) + x**2/(2*b)
```

Mathematica [A] time = 0.456489, size = 361, normalized size = 1.78

$$-\sqrt{2}\sqrt[4]{a}\log\left(-2\sqrt[8]{a}\sqrt[8]{b}x\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{b}x^2\right)-\sqrt{2}\sqrt[4]{a}\log\left(2\sqrt[8]{a}\sqrt[8]{b}x\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{b}x^2\right)+\sqrt{2}\sqrt[4]{a}\log\left(-2\sqrt[8]{a}\sqrt[8]{b}x\cos\left(\frac{\pi}{8}\right.\right.$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^9/(a + b*x^8),x]
```

```
[Out] (8*b^(1/4)*x^2 + 2*Sqrt[2]*a^(1/4)*ArcTan[Cot[Pi/8] - (b^(1/8)*x*
Csc[Pi/8])/a^(1/8)] + 2*Sqrt[2]*a^(1/4)*ArcTan[Cot[Pi/8] + (b^(1/
8)*x*Csc[Pi/8])/a^(1/8)] - 2*Sqrt[2]*a^(1/4)*ArcTan[(b^(1/8)*x*Se
c[Pi/8])/a^(1/8) - Tan[Pi/8]] + 2*Sqrt[2]*a^(1/4)*ArcTan[(b^(1/8)
*x*Sec[Pi/8])/a^(1/8) + Tan[Pi/8]] + Sqrt[2]*a^(1/4)*Log[a^(1/4)
+ b^(1/4)*x^2 - 2*a^(1/8)*b^(1/8)*x*Cos[Pi/8]] + Sqrt[2]*a^(1/4)*
Log[a^(1/4) + b^(1/4)*x^2 + 2*a^(1/8)*b^(1/8)*x*Cos[Pi/8]] - Sqrt
[2]*a^(1/4)*Log[a^(1/4) + b^(1/4)*x^2 - 2*a^(1/8)*b^(1/8)*x*Sin[P
i/8]] - Sqrt[2]*a^(1/4)*Log[a^(1/4) + b^(1/4)*x^2 + 2*a^(1/8)*b^(
1/8)*x*Sin[Pi/8]])/(16*b^(5/4))
```

Maple [A] time = 0.008, size = 144, normalized size = 0.7

$$\frac{x^2}{2b}-\frac{\sqrt{2}}{16b}\sqrt[4]{\frac{a}{b}}\ln\left(1\left(x^4+\sqrt[4]{\frac{a}{b}}x^2\sqrt{2}+\sqrt{\frac{a}{b}}\right)\left(x^4-\sqrt[4]{\frac{a}{b}}x^2\sqrt{2}+\sqrt{\frac{a}{b}}\right)^{-1}\right)-\frac{\sqrt{2}}{8b}\sqrt[4]{\frac{a}{b}}\arctan\left(x^2\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{b}}}+1\right)-\frac{\sqrt{2}}{8b}\sqrt[4]{\frac{a}{b}}\arctan\left(x^2\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{b}}}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^9/(b*x^8+a),x)
```

```
[Out] 1/2*x^2/b-1/16/b*(a/b)^(1/4)*2^(1/2)*ln((x^4+(a/b)^(1/4)*x^2*2^(1
/2)+(a/b)^(1/2))/(x^4-(a/b)^(1/4)*x^2*2^(1/2)+(a/b)^(1/2)))-1/8/b
*(a/b)^(1/4)*2^(1/2)*arctan(2^(1/2)/(a/b)^(1/4)*x^2+1)-1/8/b*(a/b
)^(1/4)*2^(1/2)*arctan(2^(1/2)/(a/b)^(1/4)*x^2-1)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(b*x^8 + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.233384, size = 147, normalized size = 0.72

$$\frac{4b\left(-\frac{a}{b^5}\right)^{\frac{1}{4}}\arctan\left(\frac{b\left(-\frac{a}{b^5}\right)^{\frac{1}{4}}}{x^2+\sqrt{x^4+b^2\sqrt{-\frac{a}{b^5}}}}\right)-b\left(-\frac{a}{b^5}\right)^{\frac{1}{4}}\log\left(x^2+b\left(-\frac{a}{b^5}\right)^{\frac{1}{4}}\right)+b\left(-\frac{a}{b^5}\right)^{\frac{1}{4}}\log\left(x^2-b\left(-\frac{a}{b^5}\right)^{\frac{1}{4}}\right)+4x^2}{8b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(b*x^8 + a),x, algorithm="fricas")
```

```
[Out] 1/8*(4*b*(-a/b^5)^(1/4)*arctan(b*(-a/b^5)^(1/4)/(x^2 + sqrt(x^4 +
 b^2*sqrt(-a/b^5)))) - b*(-a/b^5)^(1/4)*log(x^2 + b*(-a/b^5)^(1/4
)) + b*(-a/b^5)^(1/4)*log(x^2 - b*(-a/b^5)^(1/4)) + 4*x^2)/b
```

Sympy [A] time = 1.50471, size = 27, normalized size = 0.13

$$\operatorname{RootSum}\left(4096t^4b^5 + a, \left(t \mapsto t\log\left(-8tb + x^2\right)\right)\right) + \frac{x^2}{2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**9/(b*x**8+a),x)
```

```
[Out] RootSum(4096*_t**4*b**5 + a, Lambda(_t, _t*log(-8*_t*b + x**2)))
+ x**2/(2*b)
```

GIAC/XCAS [A] time = 0.231077, size = 247, normalized size = 1.22

$$\frac{x^2}{2\,b} - \frac{\sqrt{2}\left(ab^3\right)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x^2+\sqrt{2}\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{b}\right)^{\frac{1}{4}}}\right)}{8\,b^2} - \frac{\sqrt{2}\left(ab^3\right)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x^2-\sqrt{2}\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{b}\right)^{\frac{1}{4}}}\right)}{8\,b^2} - \frac{\sqrt{2}\left(ab^3\right)^{\frac{1}{4}}\ln\left(x^4+\sqrt{2}x^2\left(\frac{a}{b}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{b}}\right)}{16\,b^2} + \frac{\sqrt{2}\left(ab^3\right)^{\frac{1}{4}}\ln\left(x^4-\sqrt{2}x^2\left(\frac{a}{b}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{b}}\right)}{16\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(b*x^8 + a),x, algorithm="giac")
```

```
[Out] 1/2*x^2/b - 1/8*sqrt(2)*(a*b^3)^(1/4)*arctan(1/2*sqrt(2)*(2*x^2 +
 sqrt(2)*(a/b)^(1/4))/(a/b)^(1/4))/b^2 - 1/8*sqrt(2)*(a*b^3)^(1/4
)*arctan(1/2*sqrt(2)*(2*x^2 - sqrt(2)*(a/b)^(1/4))/(a/b)^(1/4))/b
^2 - 1/16*sqrt(2)*(a*b^3)^(1/4)*ln(x^4 + sqrt(2)*x^2*(a/b)^(1/4)
+ sqrt(a/b))/b^2 + 1/16*sqrt(2)*(a*b^3)^(1/4)*ln(x^4 - sqrt(2)*x^
2*(a/b)^(1/4) + sqrt(a/b))/b^2
```

3.1450 $\int \frac{x^7}{a+bx^8}\,dx$

Optimal. Leaf size=15

$$\frac{\log(a+bx^8)}{8b}$$

```
[Out] Log[a + b*x^8]/(8*b)
```

Rubi [A] time = 0.0113408, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{\log(a+bx^8)}{8b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7/(a + b*x^8),x]

[Out] Log[a + b*x^8]/(8*b)
```

Rubi in Sympy [A] time = 2.18258, size = 10, normalized size = 0.67

$$\frac{\log(a+bx^8)}{8b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7/(b*x**8+a),x)

[Out] log(a + b*x**8)/(8*b)
```

Mathematica [A] time = 0.00653661, size = 15, normalized size = 1.

$$\frac{\log(a+bx^8)}{8b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^7/(a + b*x^8),x]

[Out] Log[a + b*x^8]/(8*b)
```

Maple [A] time = 0.002, size = 14, normalized size = 0.9

$$\frac{\ln(bx^8+a)}{8\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7/(b*x^8+a),x)

[Out] 1/8*ln(b*x^8+a)/b
```

Maxima [A] time = 1.42973, size = 18, normalized size = 1.2

$$\frac{\log(bx^8 + a)}{8\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(b*x^8 + a),x, algorithm="maxima")
```

```
[Out] 1/8*log(b*x^8 + a)/b
```

Fricas [A] time = 0.213208, size = 18, normalized size = 1.2

$$\frac{\log(bx^8 + a)}{8\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(b*x^8 + a),x, algorithm="fricas")
```

```
[Out] 1/8*log(b*x^8 + a)/b
```

Sympy [A] time = 0.610208, size = 10, normalized size = 0.67

$$\frac{\log(a + bx^8)}{8b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(b*x**8+a),x)
```

```
[Out] log(a + b*x**8)/(8*b)
```

GIAC/XCAS [A] time = 0.228652, size = 19, normalized size = 1.27

$$\frac{\ln(|bx^8 + a|)}{8\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(b*x^8 + a),x, algorithm="giac")
```

```
[Out] 1/8*ln(abs(b*x^8 + a))/b
```

3.1451 $\int \frac{x^5}{a+bx^8}\,dx$

Optimal. Leaf size=193

$$-\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x^2}{\sqrt[4]{a}}\right)}{4\sqrt{2}\sqrt[4]{a}b^{3/4}}+\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x^2}{\sqrt[4]{a}}+1\right)}{4\sqrt{2}\sqrt[4]{a}b^{3/4}}+\frac{\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^2+\sqrt{a}+\sqrt{b}x^4\right)}{8\sqrt{2}\sqrt[4]{a}b^{3/4}}-\frac{\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^2+\sqrt{a}+\sqrt{b}x^4\right)}{8\sqrt{2}\sqrt[4]{a}b^{3/4}}$$

```
[Out] -ArcTan[1 - (Sqrt[2]*b^(1/4)*x^2)/a^(1/4)]/(4*Sqrt[2]*a^(1/4)*b^(
3/4)) + ArcTan[1 + (Sqrt[2]*b^(1/4)*x^2)/a^(1/4)]/(4*Sqrt[2]*a^(1
/4)*b^(3/4)) + Log[Sqrt[a] - Sqrt[2]*a^(1/4)*b^(1/4)*x^2 + Sqrt[b
]*x^4]/(8*Sqrt[2]*a^(1/4)*b^(3/4)) - Log[Sqrt[a] + Sqrt[2]*a^(1/4
)*b^(1/4)*x^2 + Sqrt[b]*x^4]/(8*Sqrt[2]*a^(1/4)*b^(3/4))
```

Rubi [A] time = 0.348357, antiderivative size = 193, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538

$$-\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x^2}{\sqrt[4]{a}}\right)}{4\sqrt{2}\sqrt[4]{a}b^{3/4}}+\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x^2}{\sqrt[4]{a}}+1\right)}{4\sqrt{2}\sqrt[4]{a}b^{3/4}}+\frac{\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^2+\sqrt{a}+\sqrt{b}x^4\right)}{8\sqrt{2}\sqrt[4]{a}b^{3/4}}-\frac{\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^2+\sqrt{a}+\sqrt{b}x^4\right)}{8\sqrt{2}\sqrt[4]{a}b^{3/4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/(a + b*x^8),x]
```

```
[Out] -ArcTan[1 - (Sqrt[2]*b^(1/4)*x^2)/a^(1/4)]/(4*Sqrt[2]*a^(1/4)*b^(
3/4)) + ArcTan[1 + (Sqrt[2]*b^(1/4)*x^2)/a^(1/4)]/(4*Sqrt[2]*a^(1
/4)*b^(3/4)) + Log[Sqrt[a] - Sqrt[2]*a^(1/4)*b^(1/4)*x^2 + Sqrt[b
]*x^4]/(8*Sqrt[2]*a^(1/4)*b^(3/4)) - Log[Sqrt[a] + Sqrt[2]*a^(1/4
)*b^(1/4)*x^2 + Sqrt[b]*x^4]/(8*Sqrt[2]*a^(1/4)*b^(3/4))
```

Rubi in Sympy [A] time = 55.0707, size = 178, normalized size = 0.92

$$\frac{\sqrt{2}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^2+\sqrt{a}+\sqrt{b}x^4\right)}{16\sqrt[4]{a}b^{\frac{3}{4}}}-\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^2+\sqrt{a}+\sqrt{b}x^4\right)}{16\sqrt[4]{a}b^{\frac{3}{4}}}-\frac{\sqrt{2}\operatorname{atan}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x^2}{\sqrt[4]{a}}\right)}{8\sqrt[4]{a}b^{\frac{3}{4}}}+\frac{\sqrt{2}\operatorname{atan}\left(1+\frac{\sqrt{2}\sqrt[4]{b}x^2}{\sqrt[4]{a}}\right)}{8\sqrt[4]{a}b^{\frac{3}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(b*x**8+a),x)
```

```
[Out] sqrt(2)*log(-sqrt(2)*a**(1/4)*b**(1/4)*x**2 + sqrt(a) + sqrt(b)*x
**4)/(16*a**(1/4)*b**(3/4)) - sqrt(2)*log(sqrt(2)*a**(1/4)*b**(1/
4)*x**2 + sqrt(a) + sqrt(b)*x**4)/(16*a**(1/4)*b**(3/4)) - sqrt(2
)*atan(1 - sqrt(2)*b**(1/4)*x**2/a**(1/4))/(8*a**(1/4)*b**(3/4))
+ sqrt(2)*atan(1 + sqrt(2)*b**(1/4)*x**2/a**(1/4))/(8*a**(1/4)*b*
*(3/4))
```

Mathematica [A] time = 0.421377, size = 279, normalized size = 1.45

$$-\frac{\log\left(-2\sqrt[8]{a}\sqrt[8]{b}x\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{b}x^2\right)+\log\left(2\sqrt[8]{a}\sqrt[8]{b}x\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{b}x^2\right)-\log\left(-2\sqrt[8]{a}\sqrt[8]{b}x\cos\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{b}x^2\right)-1}{}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/(a + b*x^8),x]
```

```
[Out] -(2*ArcTan[Cot[Pi/8] - (b^(1/8)*x*Csc[Pi/8])/a^(1/8)] + 2*ArcTan[
Cot[Pi/8] + (b^(1/8)*x*Csc[Pi/8])/a^(1/8)] - 2*ArcTan[(b^(1/8)*x*
Sec[Pi/8])/a^(1/8) - Tan[Pi/8]] + 2*ArcTan[(b^(1/8)*x*Sec[Pi/8])/
a^(1/8) + Tan[Pi/8]] - Log[a^(1/4) + b^(1/4)*x^2 - 2*a^(1/8)*b^(1
/8)*x*Cos[Pi/8]] - Log[a^(1/4) + b^(1/4)*x^2 + 2*a^(1/8)*b^(1/8)*
x*Cos[Pi/8]] + Log[a^(1/4) + b^(1/4)*x^2 - 2*a^(1/8)*b^(1/8)*x*Si
n[Pi/8]] + Log[a^(1/4) + b^(1/4)*x^2 + 2*a^(1/8)*b^(1/8)*x*Sin[Pi
/8]])/(8*Sqrt[2]*a^(1/4)*b^(3/4))
```

Maple [A] time = 0.003, size = 136, normalized size = 0.7

$$\frac{\sqrt{2}}{16\,b}\ln\left(1\left(x^4-\sqrt[4]{\frac{a}{b}}x^2\sqrt{2}+\sqrt{\frac{a}{b}}\right)\left(x^4+\sqrt[4]{\frac{a}{b}}x^2\sqrt{2}+\sqrt{\frac{a}{b}}\right)^{-1}\right)\frac{1}{\sqrt[4]{\frac{a}{b}}}+\frac{\sqrt{2}}{8\,b}\arctan\left(x^2\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{b}}}+1\right)\frac{1}{\sqrt[4]{\frac{a}{b}}}+\frac{\sqrt{2}}{8\,b}\arctan\left(x^2\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{b}}}-1\right)\frac{1}{\sqrt[4]{\frac{a}{b}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(b*x^8+a),x)
```

```
[Out] 1/16/b/(a/b)^(1/4)*2^(1/2)*ln((x^4-(a/b)^(1/4)*x^2*2^(1/2)+(a/b)^
(1/2))/(x^4+(a/b)^(1/4)*x^2*2^(1/2)+(a/b)^(1/2)))+1/8/b/(a/b)^(1/
4)*2^(1/2)*arctan(2^(1/2)/(a/b)^(1/4)*x^2+1)+1/8/b/(a/b)^(1/4)*2^
(1/2)*arctan(2^(1/2)/(a/b)^(1/4)*x^2-1)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^8 + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.231538, size = 162, normalized size = 0.84

$$\frac{1}{2}\left(-\frac{1}{ab^3}\right)^{\frac{1}{4}}\arctan\left(\frac{ab^2\left(-\frac{1}{ab^3}\right)^{\frac{3}{4}}}{x^2+\sqrt{x^4-ab\sqrt{-\frac{1}{ab^3}}}}\right)+\frac{1}{8}\left(-\frac{1}{ab^3}\right)^{\frac{1}{4}}\log\left(ab^2\left(-\frac{1}{ab^3}\right)^{\frac{3}{4}}+x^2\right)-\frac{1}{8}\left(-\frac{1}{ab^3}\right)^{\frac{1}{4}}\log\left(-ab^2\left(-\frac{1}{ab^3}\right)^{\frac{3}{4}}+x^2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^8 + a),x, algorithm="fricas")
```

```
[Out] 1/2*(-1/(a*b^3))^(1/4)*arctan(a*b^2*(-1/(a*b^3))^(3/4)/(x^2 + sqr
t(x^4 - a*b*sqrt(-1/(a*b^3))))) + 1/8*(-1/(a*b^3))^(1/4)*log(a*b^
2*(-1/(a*b^3))^(3/4) + x^2) - 1/8*(-1/(a*b^3))^(1/4)*log(-a*b^2*(
-1/(a*b^3))^(3/4) + x^2)
```

Sympy [A] time = 0.546369, size = 27, normalized size = 0.14

$$\text{RootSum}\left(4096t^4ab^3 + 1, \left(t \mapsto t\log\left(512t^3ab^2 + x^2\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(b*x**8+a),x)
```

```
[Out] RootSum(4096*_t**4*a*b**3 + 1, Lambda(_t, _t*log(512*_t**3*a*b**2
 + x**2)))
```

GIAC/XCAS [A] time = 0.231252, size = 269, normalized size = 1.39

$$\frac{\sqrt{2}\left(ab^3\right)^{\frac{1}{4}} x^4 \arctan\left(\frac{\sqrt{2}\left(2\,x^2+\sqrt{2}\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{b}\right)^{\frac{1}{4}}}\right)}{8\,ab} + \frac{\sqrt{2}\left(ab^3\right)^{\frac{1}{4}} x^4 \arctan\left(\frac{\sqrt{2}\left(2\,x^2-\sqrt{2}\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{b}\right)^{\frac{1}{4}}}\right)}{8\,ab} + \frac{\sqrt{2}\left(ab^3\right)^{\frac{1}{4}} x^4 \ln\left(x^4 + \sqrt{2}x^2\left(\frac{a}{b}\right)^{\frac{1}{4}} + \sqrt{\frac{a}{b}}\right)}{16\,ab} - \frac{\sqrt{2}\left(ab^3\right)^{\frac{1}{4}} x^4 \ln\left(x^4 - \sqrt{2}x^2\left(\frac{a}{b}\right)^{\frac{1}{4}} + \sqrt{\frac{a}{b}}\right)}{16\,ab}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*x^8 + a),x, algorithm="giac")
```

```
[Out] 1/8*sqrt(2)*(a*b^3)^(1/4)*x^4*arctan(1/2*sqrt(2)*(2*x^2 + sqrt(2)
*(a/b)^(1/4))/(a/b)^(1/4))/(a*b) + 1/8*sqrt(2)*(a*b^3)^(1/4)*x^4*
arctan(1/2*sqrt(2)*(2*x^2 - sqrt(2)*(a/b)^(1/4))/(a/b)^(1/4))/(a*
b) + 1/16*sqrt(2)*(a*b^3)^(1/4)*x^4*ln(x^4 + sqrt(2)*x^2*(a/b)^(1
/4) + sqrt(a/b))/(a*b) - 1/16*sqrt(2)*(a*b^3)^(1/4)*x^4*ln(x^4 -
sqrt(2)*x^2*(a/b)^(1/4) + sqrt(a/b))/(a*b)
```

3.1452 $\int \frac{x^3}{a+bx^8} \, dx$

Optimal. Leaf size=29

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}x^4}{\sqrt{a}}\right)}{4\sqrt{a}\sqrt{b}}$$

```
[Out] ArcTan[(Sqrt[b]*x^4)/Sqrt[a]]/(4*Sqrt[a]*Sqrt[b])
```

Rubi [A] time = 0.0391394, antiderivative size = 29, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}x^4}{\sqrt{a}}\right)}{4\sqrt{a}\sqrt{b}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(a + b*x^8),x]

[Out] ArcTan[(Sqrt[b]*x^4)/Sqrt[a]]/(4*Sqrt[a]*Sqrt[b])
```

Rubi in Sympy [A] time = 5.36744, size = 26, normalized size = 0.9

$$\frac{\operatorname{atan}\left(\frac{\sqrt{b}x^4}{\sqrt{a}}\right)}{4\sqrt{a}\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(b*x**8+a),x)

[Out] atan(sqrt(b)*x**4/sqrt(a))/(4*sqrt(a)*sqrt(b))
```

Mathematica [A] time = 0.0118336, size = 29, normalized size = 1.

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}x^4}{\sqrt{a}}\right)}{4\sqrt{a}\sqrt{b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(a + b*x^8),x]

[Out] ArcTan[(Sqrt[b]*x^4)/Sqrt[a]]/(4*Sqrt[a]*Sqrt[b])
```

Maple [A] time = 0.003, size = 19, normalized size = 0.7

$$\frac{1}{4}\arctan\left(bx^4\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(b*x^8+a),x)
```

```
[Out] 1/4/(a*b)^(1/2)*arctan(x^4*b/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^8 + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.220754, size = 1, normalized size = 0.03

$$\left[\frac{\log\left(\frac{2\,abx^4+(bx^8-a)\sqrt{-ab}}{bx^8+a}\right)}{8\,\sqrt{-ab}},\,-\frac{\arctan\left(\frac{a}{\sqrt{ab}x^4}\right)}{4\,\sqrt{ab}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^8 + a),x, algorithm="fricas")
```

```
[Out] [1/8*log((2*a*b*x^4 + (b*x^8 - a)*sqrt(-a*b))/(b*x^8 + a))/sqrt(-
a*b), -1/4*arctan(a/(sqrt(a*b)*x^4))/sqrt(a*b)]
```

Sympy [A] time = 0.658494, size = 56, normalized size = 1.93

$$-\frac{\sqrt{-\frac{1}{ab}}\log\left(-a\sqrt{-\frac{1}{ab}}+x^4\right)}{8}+\frac{\sqrt{-\frac{1}{ab}}\log\left(a\sqrt{-\frac{1}{ab}}+x^4\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(b*x**8+a),x)
```

```
[Out] -sqrt(-1/(a*b))*log(-a*sqrt(-1/(a*b)) + x**4)/8 + sqrt(-1/(a*b))*
log(a*sqrt(-1/(a*b)) + x**4)/8
```

GIAC/XCAS [A] time = 0.2275, size = 24, normalized size = 0.83

$$\frac{\arctan\left(\frac{bx^4}{\sqrt{ab}}\right)}{4\,\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^8 + a),x, algorithm="giac")
```

```
[Out] 1/4*arctan(b*x^4/sqrt(a*b))/sqrt(a*b)
```

3.1453 $\int \frac{x}{a+bx^8}\,dx$

Optimal. Leaf size=193

$$-\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x^2}{\sqrt[4]{a}}\right)}{4\sqrt{2}a^{3/4}\sqrt[4]{b}}+\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x^2}{\sqrt[4]{a}}+1\right)}{4\sqrt{2}a^{3/4}\sqrt[4]{b}}-\frac{\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^2+\sqrt{a}+\sqrt{b}x^4\right)}{8\sqrt{2}a^{3/4}\sqrt[4]{b}}+\frac{\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^2+\sqrt{a}+\sqrt{b}x^4\right)}{8\sqrt{2}a^{3/4}\sqrt[4]{b}}$$

```
[Out] -ArcTan[1 - (Sqrt[2]*b^(1/4)*x^2)/a^(1/4)]/(4*Sqrt[2]*a^(3/4)*b^(
1/4)) + ArcTan[1 + (Sqrt[2]*b^(1/4)*x^2)/a^(1/4)]/(4*Sqrt[2]*a^(3
/4)*b^(1/4)) - Log[Sqrt[a] - Sqrt[2]*a^(1/4)*b^(1/4)*x^2 + Sqrt[b
]*x^4]/(8*Sqrt[2]*a^(3/4)*b^(1/4)) + Log[Sqrt[a] + Sqrt[2]*a^(1/4
)*b^(1/4)*x^2 + Sqrt[b]*x^4]/(8*Sqrt[2]*a^(3/4)*b^(1/4))
```

Rubi [A] time = 0.33071, antiderivative size = 193, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 7, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.636

$$-\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x^2}{\sqrt[4]{a}}\right)}{4\sqrt{2}a^{3/4}\sqrt[4]{b}}+\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x^2}{\sqrt[4]{a}}+1\right)}{4\sqrt{2}a^{3/4}\sqrt[4]{b}}-\frac{\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^2+\sqrt{a}+\sqrt{b}x^4\right)}{8\sqrt{2}a^{3/4}\sqrt[4]{b}}+\frac{\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^2+\sqrt{a}+\sqrt{b}x^4\right)}{8\sqrt{2}a^{3/4}\sqrt[4]{b}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b*x^8),x]
```

```
[Out] -ArcTan[1 - (Sqrt[2]*b^(1/4)*x^2)/a^(1/4)]/(4*Sqrt[2]*a^(3/4)*b^(
1/4)) + ArcTan[1 + (Sqrt[2]*b^(1/4)*x^2)/a^(1/4)]/(4*Sqrt[2]*a^(3
/4)*b^(1/4)) - Log[Sqrt[a] - Sqrt[2]*a^(1/4)*b^(1/4)*x^2 + Sqrt[b
]*x^4]/(8*Sqrt[2]*a^(3/4)*b^(1/4)) + Log[Sqrt[a] + Sqrt[2]*a^(1/4
)*b^(1/4)*x^2 + Sqrt[b]*x^4]/(8*Sqrt[2]*a^(3/4)*b^(1/4))
```

Rubi in Sympy [A] time = 53.6773, size = 178, normalized size = 0.92

$$-\frac{\sqrt{2}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^2+\sqrt{a}+\sqrt{b}x^4\right)}{16a^{\frac{3}{4}}\sqrt[4]{b}}+\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^2+\sqrt{a}+\sqrt{b}x^4\right)}{16a^{\frac{3}{4}}\sqrt[4]{b}}-\frac{\sqrt{2}\,\mathrm{atan}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x^2}{\sqrt[4]{a}}\right)}{8a^{\frac{3}{4}}\sqrt[4]{b}}+\frac{\sqrt{2}\,\mathrm{atan}\left(1+\frac{\sqrt{2}\sqrt[4]{b}x^2}{\sqrt[4]{a}}\right)}{8a^{\frac{3}{4}}\sqrt[4]{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(b*x**8+a),x)
```

```
[Out] -sqrt(2)*log(-sqrt(2)*a**(1/4)*b**(1/4)*x**2 + sqrt(a) + sqrt(b)*
x**4)/(16*a**(3/4)*b**(1/4)) + sqrt(2)*log(sqrt(2)*a**(1/4)*b**(1
/4)*x**2 + sqrt(a) + sqrt(b)*x**4)/(16*a**(3/4)*b**(1/4)) - sqrt(
2)*atan(1 - sqrt(2)*b**(1/4)*x**2/a**(1/4))/(8*a**(3/4)*b**(1/4))
 + sqrt(2)*atan(1 + sqrt(2)*b**(1/4)*x**2/a**(1/4))/(8*a**(3/4)*b
**(1/4))
```

Mathematica [A] time = 0.334635, size = 279, normalized size = 1.45

$$-\frac{-\log\left(-2\sqrt[8]{a}\sqrt[8]{b}x\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{b}x^2\right)-\log\left(2\sqrt[8]{a}\sqrt[8]{b}x\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{b}x^2\right)+\log\left(-2\sqrt[8]{a}\sqrt[8]{b}x\cos\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{b}x^2\right)+}{}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b*x^8),x]
```

```
[Out] -(2*ArcTan[Cot[Pi/8] - (b^(1/8)*x*Csc[Pi/8])/a^(1/8)] + 2*ArcTan[
Cot[Pi/8] + (b^(1/8)*x*Csc[Pi/8])/a^(1/8)] - 2*ArcTan[(b^(1/8)*x*
Sec[Pi/8])/a^(1/8) - Tan[Pi/8]] + 2*ArcTan[(b^(1/8)*x*Sec[Pi/8])/
a^(1/8) + Tan[Pi/8]] + Log[a^(1/4) + b^(1/4)*x^2 - 2*a^(1/8)*b^(1
/8)*x*Cos[Pi/8]] + Log[a^(1/4) + b^(1/4)*x^2 + 2*a^(1/8)*b^(1/8)*
x*Cos[Pi/8]] - Log[a^(1/4) + b^(1/4)*x^2 - 2*a^(1/8)*b^(1/8)*x*Si
n[Pi/8]] - Log[a^(1/4) + b^(1/4)*x^2 + 2*a^(1/8)*b^(1/8)*x*Sin[Pi
/8]])/(8*Sqrt[2]*a^(3/4)*b^(1/4))
```

Maple [A] time = 0.002, size = 136, normalized size = 0.7

$$\frac{\sqrt{2}}{16\,a}\sqrt[4]{\frac{a}{b}}\ln\left(1\left(x^4+\sqrt[4]{\frac{a}{b}}x^2\sqrt{2}+\sqrt{\frac{a}{b}}\right)\left(x^4-\sqrt[4]{\frac{a}{b}}x^2\sqrt{2}+\sqrt{\frac{a}{b}}\right)^{-1}\right)+\frac{\sqrt{2}}{8\,a}\sqrt[4]{\frac{a}{b}}\arctan\left(x^2\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{b}}}+1\right)+\frac{\sqrt{2}}{8\,a}\sqrt[4]{\frac{a}{b}}\arctan\left(x^2\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{b}}}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(b*x^8+a),x)
```

```
[Out] 1/16*(a/b)^(1/4)/a*2^(1/2)*ln((x^4+(a/b)^(1/4)*x^2*2^(1/2)+(a/b)^
(1/2))/(x^4-(a/b)^(1/4)*x^2*2^(1/2)+(a/b)^(1/2)))+1/8*(a/b)^(1/4)
/a*2^(1/2)*arctan(2^(1/2)/(a/b)^(1/4)*x^2+1)+1/8*(a/b)^(1/4)/a*2^
(1/2)*arctan(2^(1/2)/(a/b)^(1/4)*x^2-1)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^8 + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.230295, size = 150, normalized size = 0.78

$$-\frac{1}{2}\left(-\frac{1}{a^3b}\right)^{\frac{1}{4}}\arctan\left(\frac{a\left(-\frac{1}{a^3b}\right)^{\frac{1}{4}}}{x^2+\sqrt{x^4+a^2\sqrt{-\frac{1}{a^3b}}}}\right)+\frac{1}{8}\left(-\frac{1}{a^3b}\right)^{\frac{1}{4}}\log\left(x^2+a\left(-\frac{1}{a^3b}\right)^{\frac{1}{4}}\right)-\frac{1}{8}\left(-\frac{1}{a^3b}\right)^{\frac{1}{4}}\log\left(x^2-a\left(-\frac{1}{a^3b}\right)^{\frac{1}{4}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^8 + a),x, algorithm="fricas")
```

```
[Out] -1/2*(-1/(a^3*b))^(1/4)*arctan(a*(-1/(a^3*b))^(1/4)/(x^2 + sqrt(x
^4 + a^2*sqrt(-1/(a^3*b))))) + 1/8*(-1/(a^3*b))^(1/4)*log(x^2 + a
*(-1/(a^3*b))^(1/4)) - 1/8*(-1/(a^3*b))^(1/4)*log(x^2 - a*(-1/(a^
3*b))^(1/4))
```

Sympy [A] time = 0.531322, size = 22, normalized size = 0.11

$$\operatorname{RootSum}\left(4096t^4a^3b + 1, \left(t \mapsto t\log\left(8ta + x^2\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x**8+a),x)
```

```
[Out] RootSum(4096*_t**4*a**3*b + 1, Lambda(_t, _t*log(8*_t*a + x**2)))
```

GIAC/XCAS [A] time = 0.235663, size = 252, normalized size = 1.31

$$\frac{\sqrt{2}\left(ab^3\right)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x^2+\sqrt{2}\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{b}\right)^{\frac{1}{4}}}\right)}{8\,ab} + \frac{\sqrt{2}\left(ab^3\right)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(2\,x^2-\sqrt{2}\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{b}\right)^{\frac{1}{4}}}\right)}{8\,ab} + \frac{\sqrt{2}\left(ab^3\right)^{\frac{1}{4}}\ln\left(x^4+\sqrt{2}x^2\left(\frac{a}{b}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{b}}\right)}{16\,ab} - \frac{\sqrt{2}\left(ab^3\right)^{\frac{1}{4}}\ln\left(x^4-\sqrt{2}x^2\left(\frac{a}{b}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{b}}\right)}{16\,ab}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^8 + a),x, algorithm="giac")
```

```
[Out] 1/8*sqrt(2)*(a*b^3)^(1/4)*arctan(1/2*sqrt(2)*(2*x^2 + sqrt(2)*(a/
b)^(1/4))/(a/b)^(1/4))/(a*b) + 1/8*sqrt(2)*(a*b^3)^(1/4)*arctan(1
/2*sqrt(2)*(2*x^2 - sqrt(2)*(a/b)^(1/4))/(a/b)^(1/4))/(a*b) + 1/1
6*sqrt(2)*(a*b^3)^(1/4)*ln(x^4 + sqrt(2)*x^2*(a/b)^(1/4) + sqrt(a
/b))/(a*b) - 1/16*sqrt(2)*(a*b^3)^(1/4)*ln(x^4 - sqrt(2)*x^2*(a/b
)^(1/4) + sqrt(a/b))/(a*b)
```

3.1454 $\int \frac{1}{x(a+bx^8)} dx$

Optimal. Leaf size=22

$$\frac{\log(x)}{a} - \frac{\log(a + bx^8)}{8a}$$

```
[Out] Log[x]/a - Log[a + b*x^8]/(8*a)
```

Rubi [A] time = 0.0371897, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{\log(x)}{a} - \frac{\log(a + bx^8)}{8a}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a + b*x^8)),x]

[Out] Log[x]/a - Log[a + b*x^8]/(8*a)
```

Rubi in Sympy [A] time = 5.65375, size = 19, normalized size = 0.86

$$\frac{\log(x^8)}{8a} - \frac{\log(a + bx^8)}{8a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(b*x**8+a),x)

[Out] log(x**8)/(8*a) - log(a + b*x**8)/(8*a)
```

Mathematica [A] time = 0.0110701, size = 22, normalized size = 1.

$$\frac{\log(x)}{a} - \frac{\log(a + bx^8)}{8a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a + b*x^8)),x]

[Out] Log[x]/a - Log[a + b*x^8]/(8*a)
```

Maple [A] time = 0.005, size = 21, normalized size = 1.

$$\frac{\ln(x)}{a} - \frac{\ln(bx^8 + a)}{8\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(b*x^8+a),x)

[Out] ln(x)/a-1/8*ln(b*x^8+a)/a
```

Maxima [A] time = 1.43078, size = 31, normalized size = 1.41

$$-\frac{\log\left(bx^8+a\right)}{8\,a}+\frac{\log\left(x^8\right)}{8\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^8 + a)*x),x, algorithm="maxima")
```

```
[Out] -1/8*log(b*x^8 + a)/a + 1/8*log(x^8)/a
```

Fricas [A] time = 0.223066, size = 24, normalized size = 1.09

$$-\frac{\log\left(bx^8+a\right)-8\,\log\left(x\right)}{8\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^8 + a)*x),x, algorithm="fricas")
```

```
[Out] -1/8*(log(b*x^8 + a) - 8*log(x))/a
```

Sympy [A] time = 1.0212, size = 15, normalized size = 0.68

$$\frac{\log\left(x\right)}{a}-\frac{\log\left(\frac{a}{b}+x^8\right)}{8a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(b*x**8+a),x)
```

```
[Out] log(x)/a - log(a/b + x**8)/(8*a)
```

GIAC/XCAS [A] time = 0.228475, size = 32, normalized size = 1.45

$$\frac{\ln\left(x^8\right)}{8\,a}-\frac{\ln\left(\left|bx^8+a\right|\right)}{8\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^8 + a)*x),x, algorithm="giac")
```

```
[Out] 1/8*ln(x^8)/a - 1/8*ln(abs(b*x^8 + a))/a
```

3.1455 $\int \frac{1}{x^3(a+bx^8)}\,dx$

Optimal. Leaf size=203

$$\frac{\sqrt[4]{b}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x^2}{\sqrt[4]{a}}\right)}{4\sqrt{2}a^{5/4}}-\frac{\sqrt[4]{b}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x^2}{\sqrt[4]{a}}+1\right)}{4\sqrt{2}a^{5/4}}-\frac{\sqrt[4]{b}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^2+\sqrt{a}+\sqrt{b}x^4\right)}{8\sqrt{2}a^{5/4}}+\frac{\sqrt[4]{b}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^2+\sqrt{a}+\sqrt{b}x^4\right)}{8\sqrt{2}a^{5/4}}-\frac{1}{2ax^2}$$

```
[Out] -1/(2*a*x^2) + (b^(1/4)*ArcTan[1 - (Sqrt[2]*b^(1/4)*x^2)/a^(1/4)]
)/(4*Sqrt[2]*a^(5/4)) - (b^(1/4)*ArcTan[1 + (Sqrt[2]*b^(1/4)*x^2)
/a^(1/4)])/(4*Sqrt[2]*a^(5/4)) - (b^(1/4)*Log[Sqrt[a] - Sqrt[2]*a
^(1/4)*b^(1/4)*x^2 + Sqrt[b]*x^4])/(8*Sqrt[2]*a^(5/4)) + (b^(1/4)
*Log[Sqrt[a] + Sqrt[2]*a^(1/4)*b^(1/4)*x^2 + Sqrt[b]*x^4])/(8*Sqr
t[2]*a^(5/4))
```

Rubi [A] time = 0.383974, antiderivative size = 203, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615

$$\frac{\sqrt[4]{b}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x^2}{\sqrt[4]{a}}\right)}{4\sqrt{2}a^{5/4}}-\frac{\sqrt[4]{b}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x^2}{\sqrt[4]{a}}+1\right)}{4\sqrt{2}a^{5/4}}-\frac{\sqrt[4]{b}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^2+\sqrt{a}+\sqrt{b}x^4\right)}{8\sqrt{2}a^{5/4}}+\frac{\sqrt[4]{b}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^2+\sqrt{a}+\sqrt{b}x^4\right)}{8\sqrt{2}a^{5/4}}-\frac{1}{2ax^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(a + b*x^8)),x]
```

```
[Out] -1/(2*a*x^2) + (b^(1/4)*ArcTan[1 - (Sqrt[2]*b^(1/4)*x^2)/a^(1/4)]
)/(4*Sqrt[2]*a^(5/4)) - (b^(1/4)*ArcTan[1 + (Sqrt[2]*b^(1/4)*x^2)
/a^(1/4)])/(4*Sqrt[2]*a^(5/4)) - (b^(1/4)*Log[Sqrt[a] - Sqrt[2]*a
^(1/4)*b^(1/4)*x^2 + Sqrt[b]*x^4])/(8*Sqrt[2]*a^(5/4)) + (b^(1/4)
*Log[Sqrt[a] + Sqrt[2]*a^(1/4)*b^(1/4)*x^2 + Sqrt[b]*x^4])/(8*Sqr
t[2]*a^(5/4))
```

Rubi in Sympy [A] time = 61.8301, size = 187, normalized size = 0.92

$$-\frac{1}{2ax^2}-\frac{\sqrt{2}\sqrt[4]{b}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^2+\sqrt{a}+\sqrt{b}x^4\right)}{16a^{\frac{5}{4}}}+\frac{\sqrt{2}\sqrt[4]{b}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^2+\sqrt{a}+\sqrt{b}x^4\right)}{16a^{\frac{5}{4}}}+\frac{\sqrt{2}\sqrt[4]{b}\,\mathrm{atan}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x^2}{\sqrt[4]{a}}\right)}{8a^{\frac{5}{4}}}-\frac{\sqrt{2}\sqrt[4]{b}\,\mathrm{atan}\left(1+\frac{\sqrt{2}\sqrt[4]{b}x^2}{\sqrt[4]{a}}\right)}{8a^{\frac{5}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(b*x**8+a),x)
```

```
[Out] -1/(2*a*x**2) - sqrt(2)*b**(1/4)*log(-sqrt(2)*a**(1/4)*b**(1/4)*x
**2 + sqrt(a) + sqrt(b)*x**4)/(16*a**(5/4)) + sqrt(2)*b**(1/4)*lo
g(sqrt(2)*a**(1/4)*b**(1/4)*x**2 + sqrt(a) + sqrt(b)*x**4)/(16*a*
*(5/4)) + sqrt(2)*b**(1/4)*atan(1 - sqrt(2)*b**(1/4)*x**2/a**(1/4
))/(8*a**(5/4)) - sqrt(2)*b**(1/4)*atan(1 + sqrt(2)*b**(1/4)*x**2
/a**(1/4))/(8*a**(5/4))
```

Mathematica [A] time = 0.256655, size = 385, normalized size = 1.9

$$\sqrt{2}\sqrt[4]{b}x^2\log\left(-2\sqrt[8]{a}\sqrt[8]{b}x\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{b}x^2\right)+\sqrt{2}\sqrt[4]{b}x^2\log\left(2\sqrt[8]{a}\sqrt[8]{b}x\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{b}x^2\right)-\sqrt{2}\sqrt[4]{b}x^2\log\left(-2\sqrt[8]{a}\sqrt[8]{b}x\cos\right.$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*(a + b*x^8)),x]
```

```
[Out] (-8*a^(1/4) + 2*Sqrt[2]*b^(1/4)*x^2*ArcTan[Cot[Pi/8] - (b^(1/8)*x
*Csc[Pi/8])/a^(1/8)] + 2*Sqrt[2]*b^(1/4)*x^2*ArcTan[Cot[Pi/8] + (
b^(1/8)*x*Csc[Pi/8])/a^(1/8)] - 2*Sqrt[2]*b^(1/4)*x^2*ArcTan[(b^(
1/8)*x*Sec[Pi/8])/a^(1/8) - Tan[Pi/8]] + 2*Sqrt[2]*b^(1/4)*x^2*Ar
cTan[(b^(1/8)*x*Sec[Pi/8])/a^(1/8) + Tan[Pi/8]] - Sqrt[2]*b^(1/4)
*x^2*Log[a^(1/4) + b^(1/4)*x^2 - 2*a^(1/8)*b^(1/8)*x*Cos[Pi/8]] -
 Sqrt[2]*b^(1/4)*x^2*Log[a^(1/4) + b^(1/4)*x^2 + 2*a^(1/8)*b^(1/8
)*x*Cos[Pi/8]] + Sqrt[2]*b^(1/4)*x^2*Log[a^(1/4) + b^(1/4)*x^2 -
2*a^(1/8)*b^(1/8)*x*Sin[Pi/8]] + Sqrt[2]*b^(1/4)*x^2*Log[a^(1/4)
+ b^(1/4)*x^2 + 2*a^(1/8)*b^(1/8)*x*Sin[Pi/8]])/(16*a^(5/4)*x^2)
```

Maple [A] time = 0.007, size = 144, normalized size = 0.7

$$-\frac{\sqrt{2}}{16\,a}\ln\left(1\left(x^4-\sqrt[4]{\frac{a}{b}}x^2\sqrt{2}+\sqrt{\frac{a}{b}}\right)\left(x^4+\sqrt[4]{\frac{a}{b}}x^2\sqrt{2}+\sqrt{\frac{a}{b}}\right)^{-1}\right)\frac{1}{\sqrt[4]{\frac{a}{b}}}$$
$$-\frac{\sqrt{2}}{8\,a}\arctan\left(x^2\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{b}}}+1\right)\frac{1}{\sqrt[4]{\frac{a}{b}}}-\frac{\sqrt{2}}{8\,a}\arctan\left(x^2\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{b}}}-1\right)\frac{1}{\sqrt[4]{\frac{a}{b}}}-\frac{1}{2\,ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(b*x^8+a),x)
```

```
[Out] -1/16/a/(a/b)^(1/4)*2^(1/2)*ln((x^4-(a/b)^(1/4)*x^2*2^(1/2)+(a/b)
^(1/2))/(x^4+(a/b)^(1/4)*x^2*2^(1/2)+(a/b)^(1/2)))-1/8/a/(a/b)^(1
/4)*2^(1/2)*arctan(2^(1/2)/(a/b)^(1/4)*x^2+1)-1/8/a/(a/b)^(1/4)*2
^(1/2)*arctan(2^(1/2)/(a/b)^(1/4)*x^2-1)-1/2/a/x^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^8 + a)*x^3),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.233486, size = 186, normalized size = 0.92

$$-\frac{4\,ax^2\left(-\frac{b}{a^5}\right)^{\frac{1}{4}}\arctan\left(\frac{a^4\left(-\frac{b}{a^5}\right)^{\frac{3}{4}}}{bx^2+b\sqrt{\frac{bx^4-a^3\sqrt{-\frac{b}{a^5}}}{b}}}\right)+ax^2\left(-\frac{b}{a^5}\right)^{\frac{1}{4}}\log\left(a^4\left(-\frac{b}{a^5}\right)^{\frac{3}{4}}+bx^2\right)-ax^2\left(-\frac{b}{a^5}\right)^{\frac{1}{4}}\log\left(-a^4\left(-\frac{b}{a^5}\right)^{\frac{3}{4}}+bx^2\right)+}{8\,ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^8 + a)*x^3),x, algorithm="fricas")
```

```
[Out] -1/8*(4*a*x^2*(-b/a^5)^(1/4)*arctan(a^4*(-b/a^5)^(3/4)/(b*x^2 + b
*sqrt((b*x^4 - a^3*sqrt(-b/a^5))/b))) + a*x^2*(-b/a^5)^(1/4)*log(
a^4*(-b/a^5)^(3/4) + b*x^2) - a*x^2*(-b/a^5)^(1/4)*log(-a^4*(-b/a
^5)^(3/4) + b*x^2) + 4)/(a*x^2)
```

Sympy [A] time = 1.99331, size = 34, normalized size = 0.17

$$\operatorname{RootSum}\left(4096t^4a^5 + b, \left(t \mapsto t\log\left(-\frac{512t^3a^4}{b} + x^2\right)\right)\right) - \frac{1}{2ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(b*x**8+a),x)
```

```
[Out] RootSum(4096*_t**4*a**5 + b, Lambda(_t, _t*log(-512*_t**3*a**4/b
+ x**2))) - 1/(2*a*x**2)
```

GIAC/XCAS [A] time = 0.231987, size = 263, normalized size = 1.3

$$-\frac{\sqrt{2}\left(ab^3\right)^{\frac{1}{4}}x^4\arctan\left(\frac{\sqrt{2}\left(2\,x^2+\sqrt{2}\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{b}\right)^{\frac{1}{4}}}\right)}{8\,a^2} - \frac{\sqrt{2}\left(ab^3\right)^{\frac{1}{4}}x^4\arctan\left(\frac{\sqrt{2}\left(2\,x^2-\sqrt{2}\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{b}\right)^{\frac{1}{4}}}\right)}{8\,a^2} - \frac{\sqrt{2}\left(ab^3\right)^{\frac{1}{4}}x^4\ln\left(x^4+\sqrt{2}x^2\left(\frac{a}{b}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{b}}\right)}{16\,a^2} + \frac{\sqrt{2}\left(ab^3\right)^{\frac{1}{4}}x^4\ln\left(x^4-\sqrt{2}x^2\left(\frac{a}{b}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{b}}\right)}{16\,a^2} - \frac{1}{2\,ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^8 + a)*x^3),x, algorithm="giac")
```

```
[Out] -1/8*sqrt(2)*(a*b^3)^(1/4)*x^4*arctan(1/2*sqrt(2)*(2*x^2 + sqrt(2
)*(a/b)^(1/4))/(a/b)^(1/4))/a^2 - 1/8*sqrt(2)*(a*b^3)^(1/4)*x^4*a
rctan(1/2*sqrt(2)*(2*x^2 - sqrt(2)*(a/b)^(1/4))/(a/b)^(1/4))/a^2
- 1/16*sqrt(2)*(a*b^3)^(1/4)*x^4*ln(x^4 + sqrt(2)*x^2*(a/b)^(1/4)
 + sqrt(a/b))/a^2 + 1/16*sqrt(2)*(a*b^3)^(1/4)*x^4*ln(x^4 - sqrt(
2)*x^2*(a/b)^(1/4) + sqrt(a/b))/a^2 - 1/2/(a*x^2)
```

3.1456 $\int \frac{1}{x^5(a+bx^8)}\,dx$

Optimal. Leaf size=40

$$-\frac{\sqrt{b}\tan^{-1}\left(\frac{\sqrt{b}x^4}{\sqrt{a}}\right)}{4a^{3/2}}-\frac{1}{4ax^4}$$

```
[Out] -1/(4*a*x^4) - (Sqrt[b]*ArcTan[(Sqrt[b]*x^4)/Sqrt[a]])/(4*a^(3/2)
)
```

Rubi [A] time = 0.0586388, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{\sqrt{b}\tan^{-1}\left(\frac{\sqrt{b}x^4}{\sqrt{a}}\right)}{4a^{3/2}}-\frac{1}{4ax^4}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^5*(a + b*x^8)),x]
```

```
[Out] -1/(4*a*x^4) - (Sqrt[b]*ArcTan[(Sqrt[b]*x^4)/Sqrt[a]])/(4*a^(3/2)
)
```

Rubi in Sympy [A] time = 9.39739, size = 36, normalized size = 0.9

$$-\frac{1}{4ax^4}-\frac{\sqrt{b}\,\text{atan}\left(\frac{\sqrt{b}x^4}{\sqrt{a}}\right)}{4a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**5/(b*x**8+a),x)
```

```
[Out] -1/(4*a*x**4) - sqrt(b)*atan(sqrt(b)*x**4/sqrt(a))/(4*a**(3/2))
```

Mathematica [B] time = 0.272778, size = 164, normalized size = 4.1

$$\frac{\sqrt{b}x^4\tan^{-1}\left(\frac{\sqrt[8]{b}x\sec\left(\frac{\pi}{8}\right)}{\sqrt[8]{a}}-\tan\left(\frac{\pi}{8}\right)\right)-\sqrt{b}x^4\tan^{-1}\left(\frac{\sqrt[8]{b}x\sec\left(\frac{\pi}{8}\right)}{\sqrt[8]{a}}+\tan\left(\frac{\pi}{8}\right)\right)+\sqrt{b}x^4\tan^{-1}\left(\cot\left(\frac{\pi}{8}\right)-\frac{\sqrt[8]{b}x\csc\left(\frac{\pi}{8}\right)}{\sqrt[8]{a}}\right)+\sqrt{b}x^4\,\text{t}}{4a^{3/2}x^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^5*(a + b*x^8)),x]
```

```
[Out] (-Sqrt[a] + Sqrt[b]*x^4*ArcTan[Cot[Pi/8] - (b^(1/8)*x*Csc[Pi/8])/
a^(1/8)] + Sqrt[b]*x^4*ArcTan[Cot[Pi/8] + (b^(1/8)*x*Csc[Pi/8])/a
^(1/8)] + Sqrt[b]*x^4*ArcTan[(b^(1/8)*x*Sec[Pi/8])/a^(1/8) - Tan[
Pi/8]] - Sqrt[b]*x^4*ArcTan[(b^(1/8)*x*Sec[Pi/8])/a^(1/8) + Tan[P
i/8]])/(4*a^(3/2)*x^4)
```

Maple [A] time = 0.007, size = 32, normalized size = 0.8

$$-\frac{b}{4\,a}\arctan\left(bx^4\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}-\frac{1}{4\,ax^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^5/(b*x^8+a),x)
```

```
[Out] -1/4*b/a/(a*b)^(1/2)*arctan(x^4*b/(a*b)^(1/2))-1/4/a/x^4
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^8 + a)*x^5),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.222933, size = 1, normalized size = 0.02

$$\left[\frac{x^{4}\sqrt{-\frac{b}{a}}\log\left(\frac{bx^{8}-2\,ax^{4}\sqrt{-\frac{b}{a}}-a}{bx^{8}+a}\right)-2}{8\,ax^{4}}, \frac{x^{4}\sqrt{\frac{b}{a}}\arctan\left(\frac{a\sqrt{\frac{b}{a}}}{bx^{4}}\right)-1}{4\,ax^{4}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^8 + a)*x^5),x, algorithm="fricas")
```

```
[Out] [1/8*(x^4*sqrt(-b/a)*log((b*x^8 - 2*a*x^4*sqrt(-b/a) - a)/(b*x^8
+ a)) - 2)/(a*x^4), 1/4*(x^4*sqrt(b/a)*arctan(a*sqrt(b/a)/(b*x^4)
) - 1)/(a*x^4)]
```

Sympy [A] time = 3.57367, size = 71, normalized size = 1.78

$$\frac{\sqrt{-\frac{b}{a^{3}}}\log\left(-\frac{a^{2}\sqrt{-\frac{b}{a^{3}}}}{b}+x^{4}\right)}{8}-\frac{\sqrt{-\frac{b}{a^{3}}}\log\left(\frac{a^{2}\sqrt{-\frac{b}{a^{3}}}}{b}+x^{4}\right)}{8}-\frac{1}{4ax^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**5/(b*x**8+a),x)
```

```
[Out] sqrt(-b/a**3)*log(-a**2*sqrt(-b/a**3)/b + x**4)/8 - sqrt(-b/a**3)
*log(a**2*sqrt(-b/a**3)/b + x**4)/8 - 1/(4*a*x**4)
```

GIAC/XCAS [A] time = 0.230718, size = 42, normalized size = 1.05

$$-\frac{b\arctan\left(\frac{bx^{4}}{\sqrt{ab}}\right)}{4\sqrt{ab}a}-\frac{1}{4\,ax^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^8 + a)*x^5),x, algorithm="giac")
```

```
[Out] -1/4*b*arctan(b*x^4/sqrt(a*b))/(sqrt(a*b)*a) - 1/4/(a*x^4)
```

3.1457 $\int \frac{1}{x^7(a+bx^8)}\,dx$

Optimal. Leaf size=203

$$\frac{b^{3/4}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x^2}{\sqrt[4]{a}}\right)}{4\sqrt{2}a^{7/4}}-\frac{b^{3/4}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x^2}{\sqrt[4]{a}}+1\right)}{4\sqrt{2}a^{7/4}}+\frac{b^{3/4}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^2+\sqrt{a}+\sqrt{b}x^4\right)}{8\sqrt{2}a^{7/4}}-\frac{b^{3/4}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^2+\sqrt{a}+\sqrt{b}x^4\right)}{8\sqrt{2}a^{7/4}}-\frac{1}{6ax^6}$$

```
[Out] -1/(6*a*x^6) + (b^(3/4)*ArcTan[1 - (Sqrt[2]*b^(1/4)*x^2)/a^(1/4)]
)/(4*Sqrt[2]*a^(7/4)) - (b^(3/4)*ArcTan[1 + (Sqrt[2]*b^(1/4)*x^2)
/a^(1/4)])/(4*Sqrt[2]*a^(7/4)) + (b^(3/4)*Log[Sqrt[a] - Sqrt[2]*a
^(1/4)*b^(1/4)*x^2 + Sqrt[b]*x^4])/(8*Sqrt[2]*a^(7/4)) - (b^(3/4)
*Log[Sqrt[a] + Sqrt[2]*a^(1/4)*b^(1/4)*x^2 + Sqrt[b]*x^4])/(8*Sqr
t[2]*a^(7/4))
```

Rubi [A] time = 0.383847, antiderivative size = 203, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615

$$\frac{b^{3/4}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x^2}{\sqrt[4]{a}}\right)}{4\sqrt{2}a^{7/4}}-\frac{b^{3/4}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x^2}{\sqrt[4]{a}}+1\right)}{4\sqrt{2}a^{7/4}}+\frac{b^{3/4}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^2+\sqrt{a}+\sqrt{b}x^4\right)}{8\sqrt{2}a^{7/4}}-\frac{b^{3/4}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^2+\sqrt{a}+\sqrt{b}x^4\right)}{8\sqrt{2}a^{7/4}}-\frac{1}{6ax^6}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^7*(a + b*x^8)),x]
```

```
[Out] -1/(6*a*x^6) + (b^(3/4)*ArcTan[1 - (Sqrt[2]*b^(1/4)*x^2)/a^(1/4)]
)/(4*Sqrt[2]*a^(7/4)) - (b^(3/4)*ArcTan[1 + (Sqrt[2]*b^(1/4)*x^2)
/a^(1/4)])/(4*Sqrt[2]*a^(7/4)) + (b^(3/4)*Log[Sqrt[a] - Sqrt[2]*a
^(1/4)*b^(1/4)*x^2 + Sqrt[b]*x^4])/(8*Sqrt[2]*a^(7/4)) - (b^(3/4)
*Log[Sqrt[a] + Sqrt[2]*a^(1/4)*b^(1/4)*x^2 + Sqrt[b]*x^4])/(8*Sqr
t[2]*a^(7/4))
```

Rubi in Sympy [A] time = 60.5455, size = 187, normalized size = 0.92

$$-\frac{1}{6ax^6}+\frac{\sqrt{2}b^{\frac{3}{4}}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^2+\sqrt{a}+\sqrt{b}x^4\right)}{16a^{\frac{7}{4}}}-\frac{\sqrt{2}b^{\frac{3}{4}}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^2+\sqrt{a}+\sqrt{b}x^4\right)}{16a^{\frac{7}{4}}}+\frac{\sqrt{2}b^{\frac{3}{4}}\operatorname{atan}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x^2}{\sqrt[4]{a}}\right)}{8a^{\frac{7}{4}}}-\frac{\sqrt{2}b^{\frac{3}{4}}\operatorname{atan}\left(1+\frac{\sqrt{2}\sqrt[4]{b}x^2}{\sqrt[4]{a}}\right)}{8a^{\frac{7}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**7/(b*x**8+a),x)
```

```
[Out] -1/(6*a*x**6) + sqrt(2)*b**(3/4)*log(-sqrt(2)*a**(1/4)*b**(1/4)*x
**2 + sqrt(a) + sqrt(b)*x**4)/(16*a**(7/4)) - sqrt(2)*b**(3/4)*lo
g(sqrt(2)*a**(1/4)*b**(1/4)*x**2 + sqrt(a) + sqrt(b)*x**4)/(16*a*
*(7/4)) + sqrt(2)*b**(3/4)*atan(1 - sqrt(2)*b**(1/4)*x**2/a**(1/4
))/(8*a**(7/4)) - sqrt(2)*b**(3/4)*atan(1 + sqrt(2)*b**(1/4)*x**2
/a**(1/4))/(8*a**(7/4))
```

Mathematica [A] time = 0.397707, size = 387, normalized size = 1.91

$$-8a^{3/4} - 6\sqrt{2}b^{3/4}x^6 \tan^{-1}\left(\frac{\sqrt[8]{b}x \sec\left(\frac{\pi}{8}\right)}{\sqrt[8]{a}} - \tan\left(\frac{\pi}{8}\right)\right) + 6\sqrt{2}b^{3/4}x^6 \tan^{-1}\left(\frac{\sqrt[8]{b}x \sec\left(\frac{\pi}{8}\right)}{\sqrt[8]{a}} + \tan\left(\frac{\pi}{8}\right)\right) + 6\sqrt{2}b^{3/4}x^6 \tan^{-1}\left(\cot\left(\frac{\pi}{8}\right)\right.$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^7*(a + b*x^8)),x]
```

```
[Out] (-8*a^(3/4) + 6*Sqrt[2]*b^(3/4)*x^6*ArcTan[Cot[Pi/8] - (b^(1/8)*x
*Csc[Pi/8])/a^(1/8)] + 6*Sqrt[2]*b^(3/4)*x^6*ArcTan[Cot[Pi/8] + (
b^(1/8)*x*Csc[Pi/8])/a^(1/8)] - 6*Sqrt[2]*b^(3/4)*x^6*ArcTan[(b^(
1/8)*x*Sec[Pi/8])/a^(1/8) - Tan[Pi/8]] + 6*Sqrt[2]*b^(3/4)*x^6*Ar
cTan[(b^(1/8)*x*Sec[Pi/8])/a^(1/8) + Tan[Pi/8]] + 3*Sqrt[2]*b^(3/
4)*x^6*Log[a^(1/4) + b^(1/4)*x^2 - 2*a^(1/8)*b^(1/8)*x*Cos[Pi/8]]
 + 3*Sqrt[2]*b^(3/4)*x^6*Log[a^(1/4) + b^(1/4)*x^2 + 2*a^(1/8)*b^
(1/8)*x*Cos[Pi/8]] - 3*Sqrt[2]*b^(3/4)*x^6*Log[a^(1/4) + b^(1/4)*
x^2 - 2*a^(1/8)*b^(1/8)*x*Sin[Pi/8]] - 3*Sqrt[2]*b^(3/4)*x^6*Log[
a^(1/4) + b^(1/4)*x^2 + 2*a^(1/8)*b^(1/8)*x*Sin[Pi/8]])/(48*a^(7/
4)*x^6)
```

Maple [A] time = 0.007, size = 147, normalized size = 0.7

$$-\frac{b\sqrt{2}}{16\,a^2}\sqrt[4]{\frac{a}{b}}\ln\left(1\left(x^4+\sqrt[4]{\frac{a}{b}}x^2\sqrt{2}+\sqrt{\frac{a}{b}}\right)\left(x^4-\sqrt[4]{\frac{a}{b}}x^2\sqrt{2}+\sqrt{\frac{a}{b}}\right)^{-1}\right)$$
$$-\frac{b\sqrt{2}}{8\,a^2}\sqrt[4]{\frac{a}{b}}\arctan\left(x^2\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{b}}}+1\right)-\frac{b\sqrt{2}}{8\,a^2}\sqrt[4]{\frac{a}{b}}\arctan\left(x^2\sqrt{2}\frac{1}{\sqrt[4]{\frac{a}{b}}}-1\right)-\frac{1}{6\,x^6a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^7/(b*x^8+a),x)
```

```
[Out] -1/16*b/a^2*(a/b)^(1/4)*2^(1/2)*ln((x^4+(a/b)^(1/4)*x^2*2^(1/2)+(
a/b)^(1/2))/(x^4-(a/b)^(1/4)*x^2*2^(1/2)+(a/b)^(1/2)))-1/8*b/a^2*
(a/b)^(1/4)*2^(1/2)*arctan(2^(1/2)/(a/b)^(1/4)*x^2+1)-1/8*b/a^2*(
a/b)^(1/4)*2^(1/2)*arctan(2^(1/2)/(a/b)^(1/4)*x^2-1)-1/6/x^6/a
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^8 + a)*x^7),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.235699, size = 208, normalized size = 1.02

$$\frac{12\,ax^6\left(-\frac{b^3}{a^7}\right)^{\frac{1}{4}}\arctan\left(\frac{a^2\left(-\frac{b^3}{a^7}\right)^{\frac{1}{4}}}{bx^2+b\sqrt{\frac{b^2x^4+a^4\sqrt{-\frac{b^3}{a^7}}}{b^2}}}\right)-3\,ax^6\left(-\frac{b^3}{a^7}\right)^{\frac{1}{4}}\log\left(bx^2+a^2\left(-\frac{b^3}{a^7}\right)^{\frac{1}{4}}\right)+3\,ax^6\left(-\frac{b^3}{a^7}\right)^{\frac{1}{4}}\log\left(bx^2-a^2\left(-\frac{b^3}{a^7}\right)^{\frac{1}{4}}\right.}{24\,ax^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^8 + a)*x^7),x, algorithm="fricas")
```

```
[Out] 1/24*(12*a*x^6*(-b^3/a^7)^(1/4)*arctan(a^2*(-b^3/a^7)^(1/4)/(b*x^
2 + b*sqrt((b^2*x^4 + a^4*sqrt(-b^3/a^7))/b^2))) - 3*a*x^6*(-b^3/
a^7)^(1/4)*log(b*x^2 + a^2*(-b^3/a^7)^(1/4)) + 3*a*x^6*(-b^3/a^7)
^(1/4)*log(b*x^2 - a^2*(-b^3/a^7)^(1/4)) - 4)/(a*x^6)
```

Sympy [A] time = 9.15608, size = 34, normalized size = 0.17

$$\operatorname{RootSum}\left(4096t^4a^7+b^3,\left(t\mapsto t\log\left(-\frac{8ta^2}{b}+x^2\right)\right)\right)-\frac{1}{6ax^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**7/(b*x**8+a),x)
```

```
[Out] RootSum(4096*_t**4*a**7 + b**3, Lambda(_t, _t*log(-8*_t*a**2/b +
x**2))) - 1/(6*a*x**6)
```

GIAC/XCAS [A] time = 0.23065, size = 247, normalized size = 1.22

$$-\frac{\sqrt{2}\left(ab^3\right)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(2x^2+\sqrt{2}\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{b}\right)^{\frac{1}{4}}}\right)}{8a^2}-\frac{\sqrt{2}\left(ab^3\right)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(2x^2-\sqrt{2}\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{2\left(\frac{a}{b}\right)^{\frac{1}{4}}}\right)}{8a^2}-\frac{\sqrt{2}\left(ab^3\right)^{\frac{1}{4}}\ln\left(x^4+\sqrt{2}x^2\left(\frac{a}{b}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{b}}\right)}{16a^2}+\frac{\sqrt{2}\left(ab^3\right)^{\frac{1}{4}}\ln\left(x^4-\sqrt{2}x^2\left(\frac{a}{b}\right)^{\frac{1}{4}}+\sqrt{\frac{a}{b}}\right)}{16a^2}-\frac{1}{6ax^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^8 + a)*x^7),x, algorithm="giac")
```

```
[Out] -1/8*sqrt(2)*(a*b^3)^(1/4)*arctan(1/2*sqrt(2)*(2*x^2 + sqrt(2)*(a
/b)^(1/4))/(a/b)^(1/4))/a^2 - 1/8*sqrt(2)*(a*b^3)^(1/4)*arctan(1/
2*sqrt(2)*(2*x^2 - sqrt(2)*(a/b)^(1/4))/(a/b)^(1/4))/a^2 - 1/16*s
qrt(2)*(a*b^3)^(1/4)*ln(x^4 + sqrt(2)*x^2*(a/b)^(1/4) + sqrt(a/b)
)/a^2 + 1/16*sqrt(2)*(a*b^3)^(1/4)*ln(x^4 - sqrt(2)*x^2*(a/b)^(1/
4) + sqrt(a/b))/a^2 - 1/6/(a*x^6)
```

3.1458 $\int \frac{1}{x^9(a+bx^8)}\,dx$

Optimal. Leaf size=35

$$\frac{b\log\left(a+bx^8\right)}{8a^2}-\frac{b\log(x)}{a^2}-\frac{1}{8ax^8}$$

```
[Out] -1/(8*a*x^8) - (b*Log[x])/a^2 + (b*Log[a + b*x^8])/(8*a^2)
```

Rubi [A] time = 0.0611305, antiderivative size = 35, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{b\log\left(a+bx^8\right)}{8a^2}-\frac{b\log(x)}{a^2}-\frac{1}{8ax^8}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^9*(a + b*x^8)),x]
```

```
[Out] -1/(8*a*x^8) - (b*Log[x])/a^2 + (b*Log[a + b*x^8])/(8*a^2)
```

Rubi in Sympy [A] time = 8.37455, size = 34, normalized size = 0.97

$$-\frac{1}{8ax^8}-\frac{b\log\left(x^8\right)}{8a^2}+\frac{b\log\left(a+bx^8\right)}{8a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**9/(b*x**8+a),x)
```

```
[Out] -1/(8*a*x**8) - b*log(x**8)/(8*a**2) + b*log(a + b*x**8)/(8*a**2)
```

Mathematica [A] time = 0.0123321, size = 35, normalized size = 1.

$$\frac{b\log\left(a+bx^8\right)}{8a^2}-\frac{b\log(x)}{a^2}-\frac{1}{8ax^8}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^9*(a + b*x^8)),x]
```

```
[Out] -1/(8*a*x^8) - (b*Log[x])/a^2 + (b*Log[a + b*x^8])/(8*a^2)
```

Maple [A] time = 0.008, size = 32, normalized size = 0.9

$$-\frac{1}{8\,ax^8}-\frac{b\ln(x)}{a^2}+\frac{b\ln\left(bx^8+a\right)}{8\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^9/(b*x^8+a),x)
```

```
[Out] -1/8/a/x^8-b*ln(x)/a^2+1/8*b*ln(b*x^8+a)/a^2
```

Maxima [A] time = 1.43521, size = 45, normalized size = 1.29

$$\frac{b\log\left(bx^8+a\right)}{8\,a^2}-\frac{b\log\left(x^8\right)}{8\,a^2}-\frac{1}{8\,ax^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^8 + a)*x^9),x, algorithm="maxima")
```

```
[Out] 1/8*b*log(b*x^8 + a)/a^2 - 1/8*b*log(x^8)/a^2 - 1/8/(a*x^8)
```

Fricas [A] time = 0.224552, size = 45, normalized size = 1.29

$$\frac{bx^8\log\left(bx^8+a\right)-8\,bx^8\log\left(x\right)-a}{8\,a^2x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^8 + a)*x^9),x, algorithm="fricas")
```

```
[Out] 1/8*(b*x^8*log(b*x^8 + a) - 8*b*x^8*log(x) - a)/(a^2*x^8)
```

Sympy [A] time = 26.8054, size = 31, normalized size = 0.89

$$-\frac{1}{8ax^8}-\frac{b\log\left(x\right)}{a^2}+\frac{b\log\left(\frac{a}{b}+x^8\right)}{8a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**9/(b*x**8+a),x)
```

```
[Out] -1/(8*a*x**8) - b*log(x)/a**2 + b*log(a/b + x**8)/(8*a**2)
```

GIAC/XCAS [A] time = 0.228609, size = 58, normalized size = 1.66

$$-\frac{b\ln\left(x^8\right)}{8\,a^2}+\frac{b\ln\left(\left|bx^8+a\right|\right)}{8\,a^2}+\frac{bx^8-a}{8\,a^2x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^8 + a)*x^9),x, algorithm="giac")
```

```
[Out] -1/8*b*ln(x^8)/a^2 + 1/8*b*ln(abs(b*x^8 + a))/a^2 + 1/8*(b*x^8 -
a)/(a^2*x^8)
```

3.1459 $\int \frac{x^8}{a+bx^8}\,dx$

Optimal. Leaf size=272

$$\frac{\sqrt[8]{-a}\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}b^{9/8}}-\frac{\sqrt[8]{-a}\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}b^{9/8}}-\frac{\sqrt[8]{-a}\tan^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4b^{9/8}}+\frac{\sqrt[8]{-a}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4\sqrt{2}b^{9/8}}-\frac{\sqrt[8]{-a}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}+1\right)}{4\sqrt{2}b^{9/8}}-\frac{\sqrt[8]{-a}\tanh^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4b^{9/8}}+\frac{x}{b}$$

```
[Out] x/b - ((-a)^(1/8)*ArcTan[(b^(1/8)*x)/(-a)^(1/8)])/(4*b^(9/8)) + (
(-a)^(1/8)*ArcTan[1 - (Sqrt[2]*b^(1/8)*x)/(-a)^(1/8)])/(4*Sqrt[2]
*b^(9/8)) - ((-a)^(1/8)*ArcTan[1 + (Sqrt[2]*b^(1/8)*x)/(-a)^(1/8)
])/(4*Sqrt[2]*b^(9/8)) - ((-a)^(1/8)*ArcTanh[(b^(1/8)*x)/(-a)^(1/
8)])/(4*b^(9/8)) + ((-a)^(1/8)*Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8
)*b^(1/8)*x + b^(1/4)*x^2])/(8*Sqrt[2]*b^(9/8)) - ((-a)^(1/8)*Log
[(-a)^(1/4) + Sqrt[2]*(-a)^(1/8)*b^(1/8)*x + b^(1/4)*x^2])/(8*Sqr
t[2]*b^(9/8))
```

Rubi [A] time = 0.615694, antiderivative size = 272, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 11, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.846$

$$\frac{\sqrt[8]{-a}\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}b^{9/8}}-\frac{\sqrt[8]{-a}\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}b^{9/8}}-\frac{\sqrt[8]{-a}\tan^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4b^{9/8}}+\frac{\sqrt[8]{-a}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4\sqrt{2}b^{9/8}}-\frac{\sqrt[8]{-a}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}+1\right)}{4\sqrt{2}b^{9/8}}-\frac{\sqrt[8]{-a}\tanh^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4b^{9/8}}+\frac{x}{b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8/(a + b*x^8),x]
```

```
[Out] x/b - ((-a)^(1/8)*ArcTan[(b^(1/8)*x)/(-a)^(1/8)])/(4*b^(9/8)) + (
(-a)^(1/8)*ArcTan[1 - (Sqrt[2]*b^(1/8)*x)/(-a)^(1/8)])/(4*Sqrt[2]
*b^(9/8)) - ((-a)^(1/8)*ArcTan[1 + (Sqrt[2]*b^(1/8)*x)/(-a)^(1/8)
])/(4*Sqrt[2]*b^(9/8)) - ((-a)^(1/8)*ArcTanh[(b^(1/8)*x)/(-a)^(1/
8)])/(4*b^(9/8)) + ((-a)^(1/8)*Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8
)*b^(1/8)*x + b^(1/4)*x^2])/(8*Sqrt[2]*b^(9/8)) - ((-a)^(1/8)*Log
[(-a)^(1/4) + Sqrt[2]*(-a)^(1/8)*b^(1/8)*x + b^(1/4)*x^2])/(8*Sqr
t[2]*b^(9/8))
```

Rubi in Sympy [A] time = 111.698, size = 250, normalized size = 0.92

$$\frac{x}{b}+\frac{\sqrt{2}\sqrt[8]{-a}\log\left(-\sqrt{2}\sqrt[8]{b}x\sqrt[8]{-a}+\sqrt[4]{b}x^2+\sqrt[4]{-a}\right)}{16b^{\frac{9}{8}}}-\frac{\sqrt{2}\sqrt[8]{-a}\log\left(\sqrt{2}\sqrt[8]{b}x\sqrt[8]{-a}+\sqrt[4]{b}x^2+\sqrt[4]{-a}\right)}{16b^{\frac{9}{8}}}-\frac{\sqrt[8]{-a}\,\mathrm{atan}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4b^{\frac{9}{8}}}-\frac{\sqrt{2}\sqrt[8]{-a}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}-1\right)}{8b^{\frac{9}{8}}}-\frac{\sqrt{2}\sqrt[8]{-a}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}+1\right)}{8b^{\frac{9}{8}}}-\frac{\sqrt[8]{-a}\,\mathrm{atanh}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4b^{\frac{9}{8}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8/(b*x**8+a),x)
```

```
[Out] x/b + sqrt(2)*(-a)**(1/8)*log(-sqrt(2)*b**(1/8)*x*(-a)**(1/8) + b
**(1/4)*x**2 + (-a)**(1/4))/(16*b**(9/8)) - sqrt(2)*(-a)**(1/8)*l
og(sqrt(2)*b**(1/8)*x*(-a)**(1/8) + b**(1/4)*x**2 + (-a)**(1/4))/
(16*b**(9/8)) - (-a)**(1/8)*atan(b**(1/8)*x/(-a)**(1/8))/(4*b**(9
/8)) - sqrt(2)*(-a)**(1/8)*atan(sqrt(2)*b**(1/8)*x/(-a)**(1/8) -
1)/(8*b**(9/8)) - sqrt(2)*(-a)**(1/8)*atan(sqrt(2)*b**(1/8)*x/(-a
)**(1/8) + 1)/(8*b**(9/8)) - (-a)**(1/8)*atanh(b**(1/8)*x/(-a)**(
1/8))/(4*b**(9/8))
```

Mathematica [A] time = 0.351058, size = 367, normalized size = 1.35

$$\sqrt[8]{a}\sin\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{b}x\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{b}x^2\right)-\sqrt[8]{a}\sin\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{b}x\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{b}x^2\right)+\sqrt[8]{a}\cos\left(\frac{\pi}{8}\right)\log\left(-2\right.$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8/(a + b*x^8),x]
```

```
[Out] (8*b^(1/8)*x - 2*a^(1/8)*ArcTan[(b^(1/8)*x*Sec[Pi/8])/a^(1/8) - T
an[Pi/8]]*Cos[Pi/8] - 2*a^(1/8)*ArcTan[(b^(1/8)*x*Sec[Pi/8])/a^(1
/8) + Tan[Pi/8]]*Cos[Pi/8] + a^(1/8)*Cos[Pi/8]*Log[a^(1/4) + b^(1
/4)*x^2 - 2*a^(1/8)*b^(1/8)*x*Cos[Pi/8]] - a^(1/8)*Cos[Pi/8]*Log[
a^(1/4) + b^(1/4)*x^2 + 2*a^(1/8)*b^(1/8)*x*Cos[Pi/8]] + 2*a^(1/8
)*ArcTan[Cot[Pi/8] - (b^(1/8)*x*Csc[Pi/8])/a^(1/8)]*Sin[Pi/8] - 2
*a^(1/8)*ArcTan[Cot[Pi/8] + (b^(1/8)*x*Csc[Pi/8])/a^(1/8)]*Sin[Pi
/8] + a^(1/8)*Log[a^(1/4) + b^(1/4)*x^2 - 2*a^(1/8)*b^(1/8)*x*Sin
[Pi/8]]*Sin[Pi/8] - a^(1/8)*Log[a^(1/4) + b^(1/4)*x^2 + 2*a^(1/8)
*b^(1/8)*x*Sin[Pi/8]]*Sin[Pi/8])/(8*b^(9/8))
```

Maple [C] time = 0.023, size = 34, normalized size = 0.1

$$\frac{x}{b}-\frac{a}{8\,b^2}\sum_{\_R=RootOf\left(b\_Z^8+a\right)}\frac{\ln\left(x-\_R\right)}{\_R^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8/(b*x^8+a),x)
```

```
[Out] x/b-1/8*a/b^2*sum(1/_R^7*ln(x-_R),_R=RootOf(_Z^8*b+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a\int\frac{1}{bx^8+a}\,dx}{b}+\frac{x}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^8 + a),x, algorithm="maxima")
```

```
[Out] -a*integrate(1/(b*x^8 + a), x)/b + x/b
```

Fricas [A] time = 0.242761, size = 478, normalized size = 1.76

$$\sqrt{2}\left(4\sqrt{2}b\left(-\frac{a}{b^9}\right)^{\frac{1}{8}}\arctan\left(\frac{b\left(-\frac{a}{b^9}\right)^{\frac{1}{8}}}{x+\sqrt{b^2\left(-\frac{a}{b^9}\right)^{\frac{1}{4}}+x^2}}\right)-\sqrt{2}b\left(-\frac{a}{b^9}\right)^{\frac{1}{8}}\log\left(b\left(-\frac{a}{b^9}\right)^{\frac{1}{8}}+x\right)+\sqrt{2}b\left(-\frac{a}{b^9}\right)^{\frac{1}{8}}\log\left(-b\left(-\frac{a}{b^9}\right)^{\frac{1}{8}}+x\right)+4b\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^8 + a),x, algorithm="fricas")
```

```
[Out] 1/16*sqrt(2)*(4*sqrt(2)*b*(-a/b^9)^(1/8)*arctan(b*(-a/b^9)^(1/8)/
(x + sqrt(b^2*(-a/b^9)^(1/4) + x^2))) - sqrt(2)*b*(-a/b^9)^(1/8)*
log(b*(-a/b^9)^(1/8) + x) + sqrt(2)*b*(-a/b^9)^(1/8)*log(-b*(-a/b
^9)^(1/8) + x) + 4*b*(-a/b^9)^(1/8)*arctan(b*(-a/b^9)^(1/8)/(sqrt
(2)*x + b*(-a/b^9)^(1/8) + sqrt(2)*sqrt(sqrt(2)*b*x*(-a/b^9)^(1/8
) + b^2*(-a/b^9)^(1/4) + x^2))) + 4*b*(-a/b^9)^(1/8)*arctan(b*(-a
/b^9)^(1/8)/(sqrt(2)*x - b*(-a/b^9)^(1/8) + sqrt(2)*sqrt(-sqrt(2)
*b*x*(-a/b^9)^(1/8) + b^2*(-a/b^9)^(1/4) + x^2))) - b*(-a/b^9)^(1
/8)*log(sqrt(2)*b*x*(-a/b^9)^(1/8) + b^2*(-a/b^9)^(1/4) + x^2) +
b*(-a/b^9)^(1/8)*log(-sqrt(2)*b*x*(-a/b^9)^(1/8) + b^2*(-a/b^9)^(
1/4) + x^2) + 8*sqrt(2)*x)/b
```

Sympy [A] time = 1.4112, size = 22, normalized size = 0.08

$$\mathrm{RootSum}\left(16777216t^8b^9+a,\left(t\mapsto t\log\left(-8tb+x\right)\right)\right)+\frac{x}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8/(b*x**8+a),x)
```

```
[Out] RootSum(16777216*_t**8*b**9 + a, Lambda(_t, _t*log(-8*_t*b + x)))
 + x/b
```

GIAC/XCAS [A] time = 0.237656, size = 586, normalized size = 2.15

$$-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}\arctan\left(\frac{2x+\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8b}-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}\arctan\left(\frac{2x-\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8b}$$
$$-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}\arctan\left(\frac{2x+\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8b}-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}\arctan\left(\frac{2x-\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8b}$$
$$-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}\ln\left(x^2+x\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16b}$$
$$+\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}\ln\left(x^2-x\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16b}$$
$$-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}\ln\left(x^2+x\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16b}$$
$$+\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}\ln\left(x^2-x\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16b}+\frac{x}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(b*x^8 + a),x, algorithm="giac")
```

```
[Out] -1/8*sqrt(sqrt(2) + 2)*(a/b)^(1/8)*arctan((2*x + sqrt(-sqrt(2) +
2)*(a/b)^(1/8))/(sqrt(sqrt(2) + 2)*(a/b)^(1/8)))/b - 1/8*sqrt(sqr
t(2) + 2)*(a/b)^(1/8)*arctan((2*x - sqrt(-sqrt(2) + 2)*(a/b)^(1/8
))/(sqrt(sqrt(2) + 2)*(a/b)^(1/8)))/b - 1/8*sqrt(-sqrt(2) + 2)*(a
/b)^(1/8)*arctan((2*x + sqrt(sqrt(2) + 2)*(a/b)^(1/8))/(sqrt(-sqr
t(2) + 2)*(a/b)^(1/8)))/b - 1/8*sqrt(-sqrt(2) + 2)*(a/b)^(1/8)*ar
ctan((2*x - sqrt(sqrt(2) + 2)*(a/b)^(1/8))/(sqrt(-sqrt(2) + 2)*(a
/b)^(1/8)))/b - 1/16*sqrt(sqrt(2) + 2)*(a/b)^(1/8)*ln(x^2 + x*sqr
t(sqrt(2) + 2)*(a/b)^(1/8) + (a/b)^(1/4))/b + 1/16*sqrt(sqrt(2) +
 2)*(a/b)^(1/8)*ln(x^2 - x*sqrt(sqrt(2) + 2)*(a/b)^(1/8) + (a/b)^
(1/4))/b - 1/16*sqrt(-sqrt(2) + 2)*(a/b)^(1/8)*ln(x^2 + x*sqrt(-s
qrt(2) + 2)*(a/b)^(1/8) + (a/b)^(1/4))/b + 1/16*sqrt(-sqrt(2) + 2
)*(a/b)^(1/8)*ln(x^2 - x*sqrt(-sqrt(2) + 2)*(a/b)^(1/8) + (a/b)^(
1/4))/b + x/b
```

3.1460 $\int \frac{x^6}{a+bx^8}\,dx$

Optimal. Leaf size=267

$$\frac{\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}\sqrt[8]{-a}b^{7/8}}-\frac{\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}\sqrt[8]{-a}b^{7/8}}+\frac{\tan^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4\sqrt[8]{-a}b^{7/8}}-\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4\sqrt{2}\sqrt[8]{-a}b^{7/8}}+\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}+1\right)}{4\sqrt{2}\sqrt[8]{-a}b^{7/8}}-\frac{\tanh^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4\sqrt[8]{-a}b^{7/8}}$$

```
[Out] ArcTan[(b^(1/8)*x)/(-a)^(1/8)]/(4*(-a)^(1/8)*b^(7/8)) - ArcTan[1
- (Sqrt[2]*b^(1/8)*x)/(-a)^(1/8)]/(4*Sqrt[2]*(-a)^(1/8)*b^(7/8))
+ ArcTan[1 + (Sqrt[2]*b^(1/8)*x)/(-a)^(1/8)]/(4*Sqrt[2]*(-a)^(1/8
)*b^(7/8)) - ArcTanh[(b^(1/8)*x)/(-a)^(1/8)]/(4*(-a)^(1/8)*b^(7/8
)) + Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*b^(1/8)*x + b^(1/4)*x^2]
/(8*Sqrt[2]*(-a)^(1/8)*b^(7/8)) - Log[(-a)^(1/4) + Sqrt[2]*(-a)^(
1/8)*b^(1/8)*x + b^(1/4)*x^2]/(8*Sqrt[2]*(-a)^(1/8)*b^(7/8))
```

Rubi [A] time = 0.466515, antiderivative size = 267, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 10, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.769

$$\frac{\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}\sqrt[8]{-a}b^{7/8}}-\frac{\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}\sqrt[8]{-a}b^{7/8}}+\frac{\tan^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4\sqrt[8]{-a}b^{7/8}}-\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4\sqrt{2}\sqrt[8]{-a}b^{7/8}}+\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}+1\right)}{4\sqrt{2}\sqrt[8]{-a}b^{7/8}}-\frac{\tanh^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4\sqrt[8]{-a}b^{7/8}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/(a + b*x^8),x]
```

```
[Out] ArcTan[(b^(1/8)*x)/(-a)^(1/8)]/(4*(-a)^(1/8)*b^(7/8)) - ArcTan[1
- (Sqrt[2]*b^(1/8)*x)/(-a)^(1/8)]/(4*Sqrt[2]*(-a)^(1/8)*b^(7/8))
+ ArcTan[1 + (Sqrt[2]*b^(1/8)*x)/(-a)^(1/8)]/(4*Sqrt[2]*(-a)^(1/8
)*b^(7/8)) - ArcTanh[(b^(1/8)*x)/(-a)^(1/8)]/(4*(-a)^(1/8)*b^(7/8
)) + Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*b^(1/8)*x + b^(1/4)*x^2]
/(8*Sqrt[2]*(-a)^(1/8)*b^(7/8)) - Log[(-a)^(1/4) + Sqrt[2]*(-a)^(
1/8)*b^(1/8)*x + b^(1/4)*x^2]/(8*Sqrt[2]*(-a)^(1/8)*b^(7/8))
```

Rubi in Sympy [A] time = 91.6954, size = 246, normalized size = 0.92

$$\frac{\sqrt{2}\log\left(-\sqrt{2}\sqrt[8]{b}x\sqrt[8]{-a}+\sqrt[4]{b}x^2+\sqrt[4]{-a}\right)}{16b^{\frac{7}{8}}\sqrt[8]{-a}}-\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt[8]{b}x\sqrt[8]{-a}+\sqrt[4]{b}x^2+\sqrt[4]{-a}\right)}{16b^{\frac{7}{8}}\sqrt[8]{-a}}+\frac{\operatorname{atan}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4b^{\frac{7}{8}}\sqrt[8]{-a}}+\frac{\sqrt{2}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}-1\right)}{8b^{\frac{7}{8}}\sqrt[8]{-a}}+\frac{\sqrt{2}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}+1\right)}{8b^{\frac{7}{8}}\sqrt[8]{-a}}-\frac{\operatorname{atanh}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4b^{\frac{7}{8}}\sqrt[8]{-a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(b*x**8+a),x)
```

```
[Out] sqrt(2)*log(-sqrt(2)*b**(1/8)*x*(-a)**(1/8) + b**(1/4)*x**2 + (-a
)**(1/4))/(16*b**(7/8)*(-a)**(1/8)) - sqrt(2)*log(sqrt(2)*b**(1/8
)*x*(-a)**(1/8) + b**(1/4)*x**2 + (-a)**(1/4))/(16*b**(7/8)*(-a)*
*(1/8)) + atan(b**(1/8)*x/(-a)**(1/8))/(4*b**(7/8)*(-a)**(1/8)) +
 sqrt(2)*atan(sqrt(2)*b**(1/8)*x/(-a)**(1/8) - 1)/(8*b**(7/8)*(-a
)**(1/8)) + sqrt(2)*atan(sqrt(2)*b**(1/8)*x/(-a)**(1/8) + 1)/(8*b
```

```
**(7/8)*(-a)**(1/8)) - atanh(b**(1/8)*x/(-a)**(1/8))/(4*b**(7/8)*
(-a)**(1/8))
```

Mathematica [A] time = 0.302144, size = 324, normalized size = 1.21

$$\sin\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{b}x\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{b}x^2\right)-\sin\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{b}x\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{b}x^2\right)+\cos\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{b}x\cos\right.$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6/(a + b*x^8),x]
```

```
[Out] (2*ArcTan[(b^(1/8)*x*Sec[Pi/8])/a^(1/8) - Tan[Pi/8]]*Cos[Pi/8] +
2*ArcTan[(b^(1/8)*x*Sec[Pi/8])/a^(1/8) + Tan[Pi/8]]*Cos[Pi/8] + C
os[Pi/8]*Log[a^(1/4) + b^(1/4)*x^2 - 2*a^(1/8)*b^(1/8)*x*Cos[Pi/8
]] - Cos[Pi/8]*Log[a^(1/4) + b^(1/4)*x^2 + 2*a^(1/8)*b^(1/8)*x*Co
s[Pi/8]] - 2*ArcTan[Cot[Pi/8] - (b^(1/8)*x*Csc[Pi/8])/a^(1/8)]*Si
n[Pi/8] + 2*ArcTan[Cot[Pi/8] + (b^(1/8)*x*Csc[Pi/8])/a^(1/8)]*Sin
[Pi/8] + Log[a^(1/4) + b^(1/4)*x^2 - 2*a^(1/8)*b^(1/8)*x*Sin[Pi/8
]]*Sin[Pi/8] - Log[a^(1/4) + b^(1/4)*x^2 + 2*a^(1/8)*b^(1/8)*x*Si
n[Pi/8]]*Sin[Pi/8])/(8*a^(1/8)*b^(7/8))
```

Maple [C] time = 0.016, size = 27, normalized size = 0.1

$$\frac{1}{8\,b}\sum_{\_R=RootOf(\_Z^8b+a)}\frac{\ln(x-\_R)}{\_R}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(b*x^8+a),x)
```

```
[Out] 1/8/b*sum(1/_R*ln(x-_R),_R=RootOf(_Z^8*b+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^6}{bx^8+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(b*x^8 + a),x, algorithm="maxima")
```

```
[Out] integrate(x^6/(b*x^8 + a), x)
```

Fricas [A] time = 0.240528, size = 579, normalized size = 2.17

$$\frac{1}{16}\sqrt{2}\left(4\sqrt{2}\left(-\frac{1}{ab^7}\right)^{\frac{1}{8}}\arctan\left(\frac{ab^6\left(-\frac{1}{ab^7}\right)^{\frac{7}{8}}}{x+\sqrt{-ab^5\left(-\frac{1}{ab^7}\right)^{\frac{3}{4}}+x^2}}\right)+\sqrt{2}\left(-\frac{1}{ab^7}\right)^{\frac{1}{8}}\log\left(ab^6\left(-\frac{1}{ab^7}\right)^{\frac{7}{8}}+x\right)-\sqrt{2}\left(-\frac{1}{ab^7}\right)^{\frac{1}{8}}\log\left(-ab\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(b*x^8 + a),x, algorithm="fricas")
```

```
[Out] 1/16*sqrt(2)*(4*sqrt(2)*(-1/(a*b^7))^(1/8)*arctan(a*b^6*(-1/(a*b^
7))^(7/8)/(x + sqrt(-a*b^5*(-1/(a*b^7))^(3/4) + x^2))) + sqrt(2)*
(-1/(a*b^7))^(1/8)*log(a*b^6*(-1/(a*b^7))^(7/8) + x) - sqrt(2)*(-
1/(a*b^7))^(1/8)*log(-a*b^6*(-1/(a*b^7))^(7/8) + x) + 4*(-1/(a*b^
7))^(1/8)*arctan(a*b^6*(-1/(a*b^7))^(7/8)/(a*b^6*(-1/(a*b^7))^(7/
8) + sqrt(2)*x + sqrt(2)*sqrt(sqrt(2)*a*b^6*x*(-1/(a*b^7))^(7/8)
- a*b^5*(-1/(a*b^7))^(3/4) + x^2))) + 4*(-1/(a*b^7))^(1/8)*arctan
(-a*b^6*(-1/(a*b^7))^(7/8)/(a*b^6*(-1/(a*b^7))^(7/8) - sqrt(2)*x
- sqrt(2)*sqrt(-sqrt(2)*a*b^6*x*(-1/(a*b^7))^(7/8) - a*b^5*(-1/(a
*b^7))^(3/4) + x^2))) + (-1/(a*b^7))^(1/8)*log(sqrt(2)*a*b^6*x*(-
1/(a*b^7))^(7/8) - a*b^5*(-1/(a*b^7))^(3/4) + x^2) - (-1/(a*b^7))
^(1/8)*log(-sqrt(2)*a*b^6*x*(-1/(a*b^7))^(7/8) - a*b^5*(-1/(a*b^7
))^(3/4) + x^2))
```

Sympy [A] time = 0.482933, size = 26, normalized size = 0.1

$$\operatorname{RootSum}\left(16777216t^{8}ab^{7}+1,\left(t\mapsto t\log\left(2097152t^{7}ab^{6}+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(b*x**8+a),x)
```

```
[Out] RootSum(16777216*_t**8*a*b**7 + 1, Lambda(_t, _t*log(2097152*_t**
7*a*b**6 + x)))
```

GIAC/XCAS [A] time = 0.25922, size = 579, normalized size = 2.17

$$\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{7}{8}}\arctan\left(\frac{2x+\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a}+\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{7}{8}}\arctan\left(\frac{2x-\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a}+\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{7}{8}}\arctan\left(\frac{2x+\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a}+\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{7}{8}}\arctan\left(\frac{2x-\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a}-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{7}{8}}\ln\left(x^{2}+x\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a}+\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{7}{8}}\ln\left(x^{2}-x\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a}-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{7}{8}}\ln\left(x^{2}+x\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a}+\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{7}{8}}\ln\left(x^{2}-x\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(b*x^8 + a),x, algorithm="giac")
```

```
[Out] 1/8*sqrt(sqrt(2) + 2)*(a/b)^(7/8)*arctan((2*x + sqrt(-sqrt(2) + 2
)*(a/b)^(1/8))/(sqrt(sqrt(2) + 2)*(a/b)^(1/8)))/a + 1/8*sqrt(sqrt
(2) + 2)*(a/b)^(7/8)*arctan((2*x - sqrt(-sqrt(2) + 2)*(a/b)^(1/8)
)/(sqrt(sqrt(2) + 2)*(a/b)^(1/8)))/a + 1/8*sqrt(-sqrt(2) + 2)*(a/
b)^(7/8)*arctan((2*x + sqrt(sqrt(2) + 2)*(a/b)^(1/8))/(sqrt(-sqrt
(2) + 2)*(a/b)^(1/8)))/a + 1/8*sqrt(-sqrt(2) + 2)*(a/b)^(7/8)*arc
tan((2*x - sqrt(sqrt(2) + 2)*(a/b)^(1/8))/(sqrt(-sqrt(2) + 2)*(a/
b)^(1/8)))/a - 1/16*sqrt(sqrt(2) + 2)*(a/b)^(7/8)*ln(x^2 + x*sqrt
(sqrt(2) + 2)*(a/b)^(1/8) + (a/b)^(1/4))/a + 1/16*sqrt(sqrt(2) +
2)*(a/b)^(7/8)*ln(x^2 - x*sqrt(sqrt(2) + 2)*(a/b)^(1/8) + (a/b)^(
```

```
1/4))/a - 1/16*sqrt(-sqrt(2) + 2)*(a/b)^(7/8)*ln(x^2 + x*sqrt(-sq
rt(2) + 2)*(a/b)^(1/8) + (a/b)^(1/4))/a + 1/16*sqrt(-sqrt(2) + 2)
*(a/b)^(7/8)*ln(x^2 - x*sqrt(-sqrt(2) + 2)*(a/b)^(1/8) + (a/b)^(1
/4))/a
```

3.1461 $\int \frac{x^4}{a+bx^8}\,dx$

Optimal. Leaf size=267

$$-\frac{\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}(-a)^{3/8}b^{5/8}}+\frac{\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}(-a)^{3/8}b^{5/8}}-\frac{\tan^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4(-a)^{3/8}b^{5/8}}-\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4\sqrt{2}(-a)^{3/8}b^{5/8}}+\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}+1\right)}{4\sqrt{2}(-a)^{3/8}b^{5/8}}-\frac{\tanh^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4(-a)^{3/8}b^{5/8}}$$

```
[Out] -ArcTan[(b^(1/8)*x)/(-a)^(1/8)]/(4*(-a)^(3/8)*b^(5/8)) - ArcTan[1
 - (Sqrt[2]*b^(1/8)*x)/(-a)^(1/8)]/(4*Sqrt[2]*(-a)^(3/8)*b^(5/8))
 + ArcTan[1 + (Sqrt[2]*b^(1/8)*x)/(-a)^(1/8)]/(4*Sqrt[2]*(-a)^(3/
8)*b^(5/8)) - ArcTanh[(b^(1/8)*x)/(-a)^(1/8)]/(4*(-a)^(3/8)*b^(5/
8)) - Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*b^(1/8)*x + b^(1/4)*x^2
]/(8*Sqrt[2]*(-a)^(3/8)*b^(5/8)) + Log[(-a)^(1/4) + Sqrt[2]*(-a)^
(1/8)*b^(1/8)*x + b^(1/4)*x^2]/(8*Sqrt[2]*(-a)^(3/8)*b^(5/8))
```

Rubi [A] time = 0.41934, antiderivative size = 267, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 10, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.769$

$$-\frac{\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}(-a)^{3/8}b^{5/8}}+\frac{\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}(-a)^{3/8}b^{5/8}}-\frac{\tan^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4(-a)^{3/8}b^{5/8}}-\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4\sqrt{2}(-a)^{3/8}b^{5/8}}+\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}+1\right)}{4\sqrt{2}(-a)^{3/8}b^{5/8}}-\frac{\tanh^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4(-a)^{3/8}b^{5/8}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a + b*x^8),x]
```

```
[Out] -ArcTan[(b^(1/8)*x)/(-a)^(1/8)]/(4*(-a)^(3/8)*b^(5/8)) - ArcTan[1
 - (Sqrt[2]*b^(1/8)*x)/(-a)^(1/8)]/(4*Sqrt[2]*(-a)^(3/8)*b^(5/8))
 + ArcTan[1 + (Sqrt[2]*b^(1/8)*x)/(-a)^(1/8)]/(4*Sqrt[2]*(-a)^(3/
8)*b^(5/8)) - ArcTanh[(b^(1/8)*x)/(-a)^(1/8)]/(4*(-a)^(3/8)*b^(5/
8)) - Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*b^(1/8)*x + b^(1/4)*x^2
]/(8*Sqrt[2]*(-a)^(3/8)*b^(5/8)) + Log[(-a)^(1/4) + Sqrt[2]*(-a)^
(1/8)*b^(1/8)*x + b^(1/4)*x^2]/(8*Sqrt[2]*(-a)^(3/8)*b^(5/8))
```

Rubi in Sympy [A] time = 93.9288, size = 246, normalized size = 0.92

$$-\frac{\sqrt{2}\log\left(-\sqrt{2}\sqrt[8]{b}x\sqrt[8]{-a}+\sqrt[4]{b}x^2+\sqrt[4]{-a}\right)}{16b^{\frac{5}{8}}\left(-a\right)^{\frac{3}{8}}}+\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt[8]{b}x\sqrt[8]{-a}+\sqrt[4]{b}x^2+\sqrt[4]{-a}\right)}{16b^{\frac{5}{8}}\left(-a\right)^{\frac{3}{8}}}-\frac{\operatorname{atan}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4b^{\frac{5}{8}}\left(-a\right)^{\frac{3}{8}}}+\frac{\sqrt{2}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}-1\right)}{8b^{\frac{5}{8}}\left(-a\right)^{\frac{3}{8}}}+\frac{\sqrt{2}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}+1\right)}{8b^{\frac{5}{8}}\left(-a\right)^{\frac{3}{8}}}-\frac{\operatorname{atanh}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4b^{\frac{5}{8}}\left(-a\right)^{\frac{3}{8}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(b*x**8+a),x)
```

```
[Out] -sqrt(2)*log(-sqrt(2)*b**(1/8)*x*(-a)**(1/8) + b**(1/4)*x**2 + (-
a)**(1/4))/(16*b**(5/8)*(-a)**(3/8)) + sqrt(2)*log(sqrt(2)*b**(1/
8)*x*(-a)**(1/8) + b**(1/4)*x**2 + (-a)**(1/4))/(16*b**(5/8)*(-a)
**(3/8)) - atan(b**(1/8)*x/(-a)**(1/8))/(4*b**(5/8)*(-a)**(3/8))
+ sqrt(2)*atan(sqrt(2)*b**(1/8)*x/(-a)**(1/8) - 1)/(8*b**(5/8)*(-
a)**(3/8)) + sqrt(2)*atan(sqrt(2)*b**(1/8)*x/(-a)**(1/8) + 1)/(8*
```

```
b**(5/8)*(-a)**(3/8)) - atanh(b**(1/8)*x/(-a)**(1/8))/(4*b**(5/8)
*(-a)**(3/8))
```

Mathematica [A] time = 0.446088, size = 324, normalized size = 1.21

$$-\frac{\cos\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{b}x\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{b}x^2\right)-\cos\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{b}x\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{b}x^2\right)-\sin\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{b}x\cos\ldots\right.}{}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(a + b*x^8),x]
```

```
[Out] -(2*ArcTan[Cot[Pi/8] - (b^(1/8)*x*Csc[Pi/8])/a^(1/8)]*Cos[Pi/8] -
 2*ArcTan[Cot[Pi/8] + (b^(1/8)*x*Csc[Pi/8])/a^(1/8)]*Cos[Pi/8] +
Cos[Pi/8]*Log[a^(1/4) + b^(1/4)*x^2 - 2*a^(1/8)*b^(1/8)*x*Sin[Pi/
8]] - Cos[Pi/8]*Log[a^(1/4) + b^(1/4)*x^2 + 2*a^(1/8)*b^(1/8)*x*S
in[Pi/8]] + 2*ArcTan[(b^(1/8)*x*Sec[Pi/8])/a^(1/8) - Tan[Pi/8]]*S
in[Pi/8] + 2*ArcTan[(b^(1/8)*x*Sec[Pi/8])/a^(1/8) + Tan[Pi/8]]*Si
n[Pi/8] - Log[a^(1/4) + b^(1/4)*x^2 - 2*a^(1/8)*b^(1/8)*x*Cos[Pi/
8]]*Sin[Pi/8] + Log[a^(1/4) + b^(1/4)*x^2 + 2*a^(1/8)*b^(1/8)*x*C
os[Pi/8]]*Sin[Pi/8])/(8*a^(3/8)*b^(5/8))
```

Maple [C] time = 0.018, size = 27, normalized size = 0.1

$$\frac{1}{8\,b}\sum_{\_R=RootOf(\_Z^8b+a)}\frac{\ln(x-\_R)}{\_R^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(b*x^8+a),x)
```

```
[Out] 1/8/b*sum(1/_R^3*ln(x-_R),_R=RootOf(_Z^8*b+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^4}{bx^8+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^8 + a),x, algorithm="maxima")
```

```
[Out] integrate(x^4/(b*x^8 + a), x)
```

Fricas [A] time = 0.240745, size = 595, normalized size = 2.23

$$\frac{1}{16}\sqrt{2}\left(4\sqrt{2}\left(-\frac{1}{a^3b^5}\right)^{\frac{1}{8}}\arctan\left(\frac{a^2b^3\left(-\frac{1}{a^3b^5}\right)^{\frac{5}{8}}}{x+\sqrt{-ab\left(-\frac{1}{a^3b^5}\right)^{\frac{1}{4}}+x^2}}\right)-\sqrt{2}\left(-\frac{1}{a^3b^5}\right)^{\frac{1}{8}}\log\left(a^2b^3\left(-\frac{1}{a^3b^5}\right)^{\frac{5}{8}}+x\right)+\sqrt{2}\left(-\frac{1}{a^3b^5}\right)^{\frac{1}{8}}\log\ldots\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^8 + a),x, algorithm="fricas")
```

```
[Out] 1/16*sqrt(2)*(4*sqrt(2)*(-1/(a^3*b^5))^(1/8)*arctan(a^2*b^3*(-1/(
a^3*b^5))^(5/8)/(x + sqrt(-a*b*(-1/(a^3*b^5))^(1/4) + x^2))) - sq
rt(2)*(-1/(a^3*b^5))^(1/8)*log(a^2*b^3*(-1/(a^3*b^5))^(5/8) + x)
+ sqrt(2)*(-1/(a^3*b^5))^(1/8)*log(-a^2*b^3*(-1/(a^3*b^5))^(5/8)
+ x) - 4*(-1/(a^3*b^5))^(1/8)*arctan(a^2*b^3*(-1/(a^3*b^5))^(5/8)
/(a^2*b^3*(-1/(a^3*b^5))^(5/8) + sqrt(2)*x + sqrt(2)*sqrt(sqrt(2)
*a^2*b^3*x*(-1/(a^3*b^5))^(5/8) - a*b*(-1/(a^3*b^5))^(1/4) + x^2)
)) - 4*(-1/(a^3*b^5))^(1/8)*arctan(-a^2*b^3*(-1/(a^3*b^5))^(5/8)/
(a^2*b^3*(-1/(a^3*b^5))^(5/8) - sqrt(2)*x - sqrt(2)*sqrt(-sqrt(2)
*a^2*b^3*x*(-1/(a^3*b^5))^(5/8) - a*b*(-1/(a^3*b^5))^(1/4) + x^2)
)) + (-1/(a^3*b^5))^(1/8)*log(sqrt(2)*a^2*b^3*x*(-1/(a^3*b^5))^(5
/8) - a*b*(-1/(a^3*b^5))^(1/4) + x^2) - (-1/(a^3*b^5))^(1/8)*log(
-sqrt(2)*a^2*b^3*x*(-1/(a^3*b^5))^(5/8) - a*b*(-1/(a^3*b^5))^(1/4
) + x^2))
```

Sympy [A] time = 0.499208, size = 29, normalized size = 0.11

$$\operatorname{RootSum}\left(16777216t^8a^3b^5 + 1, \left(t \mapsto t\log\left(-32768t^5a^2b^3 + x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(b*x**8+a),x)
```

```
[Out] RootSum(16777216*_t**8*a**3*b**5 + 1, Lambda(_t, _t*log(-32768*_t
**5*a**2*b**3 + x)))
```

GIAC/XCAS [A] time = 0.256302, size = 579, normalized size = 2.17

$$-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{5}{8}}\arctan\left(\frac{2x+\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a} - \frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{5}{8}}\arctan\left(\frac{2x-\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a} + \frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{5}{8}}\arctan\left(\frac{2x+\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a} + \frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{5}{8}}\arctan\left(\frac{2x-\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a} - \frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{5}{8}}\ln\left(x^2+x\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a} + \frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{5}{8}}\ln\left(x^2-x\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a} + \frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{5}{8}}\ln\left(x^2+x\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a} - \frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{5}{8}}\ln\left(x^2-x\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^8 + a),x, algorithm="giac")
```

```
[Out] -1/8*sqrt(-sqrt(2) + 2)*(a/b)^(5/8)*arctan((2*x + sqrt(-sqrt(2) +
 2)*(a/b)^(1/8))/(sqrt(sqrt(2) + 2)*(a/b)^(1/8)))/a - 1/8*sqrt(-s
qrt(2) + 2)*(a/b)^(5/8)*arctan((2*x - sqrt(-sqrt(2) + 2)*(a/b)^(1
/8))/(sqrt(sqrt(2) + 2)*(a/b)^(1/8)))/a + 1/8*sqrt(sqrt(2) + 2)*(
a/b)^(5/8)*arctan((2*x + sqrt(sqrt(2) + 2)*(a/b)^(1/8))/(sqrt(-sq
rt(2) + 2)*(a/b)^(1/8)))/a + 1/8*sqrt(sqrt(2) + 2)*(a/b)^(5/8)*ar
ctan((2*x - sqrt(sqrt(2) + 2)*(a/b)^(1/8))/(sqrt(-sqrt(2) + 2)*(a
/b)^(1/8)))/a - 1/16*sqrt(-sqrt(2) + 2)*(a/b)^(5/8)*ln(x^2 + x*sq
rt(sqrt(2) + 2)*(a/b)^(1/8) + (a/b)^(1/4))/a + 1/16*sqrt(-sqrt(2)
 + 2)*(a/b)^(5/8)*ln(x^2 - x*sqrt(sqrt(2) + 2)*(a/b)^(1/8) + (a/b
)^(1/4))/a + 1/16*sqrt(sqrt(2) + 2)*(a/b)^(5/8)*ln(x^2 + x*sqrt(-
```

```
sqrt(2) + 2)*(a/b)^(1/8) + (a/b)^(1/4))/a - 1/16*sqrt(sqrt(2) + 2
)*(a/b)^(5/8)*ln(x^2 - x*sqrt(-sqrt(2) + 2)*(a/b)^(1/8) + (a/b)^(
1/4))/a
```

3.1462 $\int \frac{x^2}{a+bx^8}\,dx$

Optimal. Leaf size=267

$$-\frac{\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}(-a)^{5/8}b^{3/8}}+\frac{\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}(-a)^{5/8}b^{3/8}}+\frac{\tan^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4(-a)^{5/8}b^{3/8}}+\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4\sqrt{2}(-a)^{5/8}b^{3/8}}-\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}+1\right)}{4\sqrt{2}(-a)^{5/8}b^{3/8}}-\frac{\tanh^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4(-a)^{5/8}b^{3/8}}$$

```
[Out] ArcTan[(b^(1/8)*x)/(-a)^(1/8)]/(4*(-a)^(5/8)*b^(3/8)) + ArcTan[1
- (Sqrt[2]*b^(1/8)*x)/(-a)^(1/8)]/(4*Sqrt[2]*(-a)^(5/8)*b^(3/8))
- ArcTan[1 + (Sqrt[2]*b^(1/8)*x)/(-a)^(1/8)]/(4*Sqrt[2]*(-a)^(5/8
)*b^(3/8)) - ArcTanh[(b^(1/8)*x)/(-a)^(1/8)]/(4*(-a)^(5/8)*b^(3/8
)) - Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*b^(1/8)*x + b^(1/4)*x^2]
/(8*Sqrt[2]*(-a)^(5/8)*b^(3/8)) + Log[(-a)^(1/4) + Sqrt[2]*(-a)^(
1/8)*b^(1/8)*x + b^(1/4)*x^2]/(8*Sqrt[2]*(-a)^(5/8)*b^(3/8))
```

Rubi [A] time = 0.451995, antiderivative size = 267, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 10, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.769

$$-\frac{\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}(-a)^{5/8}b^{3/8}}+\frac{\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}(-a)^{5/8}b^{3/8}}+\frac{\tan^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4(-a)^{5/8}b^{3/8}}+\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4\sqrt{2}(-a)^{5/8}b^{3/8}}-\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}+1\right)}{4\sqrt{2}(-a)^{5/8}b^{3/8}}-\frac{\tanh^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4(-a)^{5/8}b^{3/8}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b*x^8),x]
```

```
[Out] ArcTan[(b^(1/8)*x)/(-a)^(1/8)]/(4*(-a)^(5/8)*b^(3/8)) + ArcTan[1
- (Sqrt[2]*b^(1/8)*x)/(-a)^(1/8)]/(4*Sqrt[2]*(-a)^(5/8)*b^(3/8))
- ArcTan[1 + (Sqrt[2]*b^(1/8)*x)/(-a)^(1/8)]/(4*Sqrt[2]*(-a)^(5/8
)*b^(3/8)) - ArcTanh[(b^(1/8)*x)/(-a)^(1/8)]/(4*(-a)^(5/8)*b^(3/8
)) - Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*b^(1/8)*x + b^(1/4)*x^2]
/(8*Sqrt[2]*(-a)^(5/8)*b^(3/8)) + Log[(-a)^(1/4) + Sqrt[2]*(-a)^(
1/8)*b^(1/8)*x + b^(1/4)*x^2]/(8*Sqrt[2]*(-a)^(5/8)*b^(3/8))
```

Rubi in Sympy [A] time = 101.65, size = 246, normalized size = 0.92

$$-\frac{\sqrt{2}\log\left(-\sqrt{2}\sqrt[8]{b}x\sqrt[8]{-a}+\sqrt[4]{b}x^2+\sqrt[4]{-a}\right)}{16b^{\frac{3}{8}}\left(-a\right)^{\frac{5}{8}}}+\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt[8]{b}x\sqrt[8]{-a}+\sqrt[4]{b}x^2+\sqrt[4]{-a}\right)}{16b^{\frac{3}{8}}\left(-a\right)^{\frac{5}{8}}}+\frac{\operatorname{atan}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4b^{\frac{3}{8}}\left(-a\right)^{\frac{5}{8}}}-\frac{\sqrt{2}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}-1\right)}{8b^{\frac{3}{8}}\left(-a\right)^{\frac{5}{8}}}-\frac{\sqrt{2}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}+1\right)}{8b^{\frac{3}{8}}\left(-a\right)^{\frac{5}{8}}}-\frac{\operatorname{atanh}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4b^{\frac{3}{8}}\left(-a\right)^{\frac{5}{8}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(b*x**8+a),x)
```

```
[Out] -sqrt(2)*log(-sqrt(2)*b**(1/8)*x*(-a)**(1/8) + b**(1/4)*x**2 + (-
a)**(1/4))/(16*b**(3/8)*(-a)**(5/8)) + sqrt(2)*log(sqrt(2)*b**(1/
8)*x*(-a)**(1/8) + b**(1/4)*x**2 + (-a)**(1/4))/(16*b**(3/8)*(-a)
**(5/8)) + atan(b**(1/8)*x/(-a)**(1/8))/(4*b**(3/8)*(-a)**(5/8))
- sqrt(2)*atan(sqrt(2)*b**(1/8)*x/(-a)**(1/8) - 1)/(8*b**(3/8)*(-
a)**(5/8)) - sqrt(2)*atan(sqrt(2)*b**(1/8)*x/(-a)**(1/8) + 1)/(8*
```

```
b**(3/8)*(-a)**(5/8)) - atanh(b**(1/8)*x/(-a)**(1/8))/(4*b**(3/8)
*(-a)**(5/8))
```

Mathematica [A] time = 0.208268, size = 324, normalized size = 1.21

$$-\frac{-\cos\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{b}x\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{b}x^2\right)+\cos\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{b}x\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{b}x^2\right)+\sin\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{b}x\right.}{}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a + b*x^8),x]
```

```
[Out] -(2*ArcTan[Cot[Pi/8] - (b^(1/8)*x*Csc[Pi/8])/a^(1/8)]*Cos[Pi/8] -
 2*ArcTan[Cot[Pi/8] + (b^(1/8)*x*Csc[Pi/8])/a^(1/8)]*Cos[Pi/8] -
Cos[Pi/8]*Log[a^(1/4) + b^(1/4)*x^2 - 2*a^(1/8)*b^(1/8)*x*Sin[Pi/
8]] + Cos[Pi/8]*Log[a^(1/4) + b^(1/4)*x^2 + 2*a^(1/8)*b^(1/8)*x*S
in[Pi/8]] + 2*ArcTan[(b^(1/8)*x*Sec[Pi/8])/a^(1/8) - Tan[Pi/8]]*S
in[Pi/8] + 2*ArcTan[(b^(1/8)*x*Sec[Pi/8])/a^(1/8) + Tan[Pi/8]]*Si
n[Pi/8] + Log[a^(1/4) + b^(1/4)*x^2 - 2*a^(1/8)*b^(1/8)*x*Cos[Pi/
8]]*Sin[Pi/8] - Log[a^(1/4) + b^(1/4)*x^2 + 2*a^(1/8)*b^(1/8)*x*C
os[Pi/8]]*Sin[Pi/8])/(8*a^(5/8)*b^(3/8))
```

Maple [C] time = 0.018, size = 27, normalized size = 0.1

$$\frac{1}{8\,b}\sum_{\_R=RootOf(\_Z^8b+a)}\frac{\ln(x-\_R)}{\_R^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(b*x^8+a),x)
```

```
[Out] 1/8/b*sum(1/_R^5*ln(x-_R),_R=RootOf(_Z^8*b+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{bx^8+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^8 + a),x, algorithm="maxima")
```

```
[Out] integrate(x^2/(b*x^8 + a), x)
```

Fricas [A] time = 0.241072, size = 586, normalized size = 2.19

$$-\frac{1}{16}\sqrt{2}\left(4\sqrt{2}\left(-\frac{1}{a^5b^3}\right)^{\frac{1}{8}}\arctan\left(\frac{a^2b\left(-\frac{1}{a^5b^3}\right)^{\frac{3}{8}}}{x+\sqrt{a^4b^2\left(-\frac{1}{a^5b^3}\right)^{\frac{3}{4}}+x^2}}\right)+\sqrt{2}\left(-\frac{1}{a^5b^3}\right)^{\frac{1}{8}}\log\left(a^2b\left(-\frac{1}{a^5b^3}\right)^{\frac{3}{8}}+x\right)-\sqrt{2}\left(-\frac{1}{a^5b^3}\right)^{\frac{1}{8}}\log\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^8 + a),x, algorithm="fricas")
```

```
[Out] -1/16*sqrt(2)*(4*sqrt(2)*(-1/(a^5*b^3))^(1/8)*arctan(a^2*b*(-1/(a
^5*b^3))^(3/8)/(x + sqrt(a^4*b^2*(-1/(a^5*b^3))^(3/4) + x^2))) +
sqrt(2)*(-1/(a^5*b^3))^(1/8)*log(a^2*b*(-1/(a^5*b^3))^(3/8) + x)
- sqrt(2)*(-1/(a^5*b^3))^(1/8)*log(-a^2*b*(-1/(a^5*b^3))^(3/8) +
x) - 4*(-1/(a^5*b^3))^(1/8)*arctan(a^2*b*(-1/(a^5*b^3))^(3/8)/(a^
2*b*(-1/(a^5*b^3))^(3/8) + sqrt(2)*x + sqrt(2)*sqrt(a^4*b^2*(-1/(
a^5*b^3))^(3/4) + sqrt(2)*a^2*b*x*(-1/(a^5*b^3))^(3/8) + x^2))) -
 4*(-1/(a^5*b^3))^(1/8)*arctan(-a^2*b*(-1/(a^5*b^3))^(3/8)/(a^2*b
*(-1/(a^5*b^3))^(3/8) - sqrt(2)*x - sqrt(2)*sqrt(a^4*b^2*(-1/(a^5
*b^3))^(3/4) - sqrt(2)*a^2*b*x*(-1/(a^5*b^3))^(3/8) + x^2))) - (-
1/(a^5*b^3))^(1/8)*log(a^4*b^2*(-1/(a^5*b^3))^(3/4) + sqrt(2)*a^2
*b*x*(-1/(a^5*b^3))^(3/8) + x^2) + (-1/(a^5*b^3))^(1/8)*log(a^4*b
^2*(-1/(a^5*b^3))^(3/4) - sqrt(2)*a^2*b*x*(-1/(a^5*b^3))^(3/8) +
x^2))
```

Sympy [A] time = 0.560124, size = 27, normalized size = 0.1

$$\operatorname{RootSum}\left(16777216t^8a^5b^3 + 1, \left(t \mapsto t\log\left(-512t^3a^2b + x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(b*x**8+a),x)
```

```
[Out] RootSum(16777216*_t**8*a**5*b**3 + 1, Lambda(_t, _t*log(-512*_t**
3*a**2*b + x)))
```

GIAC/XCAS [A] time = 0.268704, size = 579, normalized size = 2.17

$$-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{3}{8}}\arctan\left(\frac{2x+\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a} - \frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{3}{8}}\arctan\left(\frac{2x-\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a} + \frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{3}{8}}\arctan\left(\frac{2x+\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a} + \frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{3}{8}}\arctan\left(\frac{2x-\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a} + \frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{3}{8}}\ln\left(x^2+x\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a} - \frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{3}{8}}\ln\left(x^2-x\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a} - \frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{3}{8}}\ln\left(x^2+x\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a} + \frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{3}{8}}\ln\left(x^2-x\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^8 + a),x, algorithm="giac")
```

```
[Out] -1/8*sqrt(-sqrt(2) + 2)*(a/b)^(3/8)*arctan((2*x + sqrt(-sqrt(2) +
 2)*(a/b)^(1/8))/(sqrt(sqrt(2) + 2)*(a/b)^(1/8)))/a - 1/8*sqrt(-s
qrt(2) + 2)*(a/b)^(3/8)*arctan((2*x - sqrt(-sqrt(2) + 2)*(a/b)^(1
/8))/(sqrt(sqrt(2) + 2)*(a/b)^(1/8)))/a + 1/8*sqrt(sqrt(2) + 2)*(
a/b)^(3/8)*arctan((2*x + sqrt(sqrt(2) + 2)*(a/b)^(1/8))/(sqrt(-sq
rt(2) + 2)*(a/b)^(1/8)))/a + 1/8*sqrt(sqrt(2) + 2)*(a/b)^(3/8)*ar
ctan((2*x - sqrt(sqrt(2) + 2)*(a/b)^(1/8))/(sqrt(-sqrt(2) + 2)*(a
/b)^(1/8)))/a + 1/16*sqrt(-sqrt(2) + 2)*(a/b)^(3/8)*ln(x^2 + x*sq
rt(sqrt(2) + 2)*(a/b)^(1/8) + (a/b)^(1/4))/a - 1/16*sqrt(-sqrt(2)
 + 2)*(a/b)^(3/8)*ln(x^2 - x*sqrt(sqrt(2) + 2)*(a/b)^(1/8) + (a/b
)^(1/4))/a - 1/16*sqrt(sqrt(2) + 2)*(a/b)^(3/8)*ln(x^2 + x*sqrt(-
```

```
sqrt(2) + 2)*(a/b)^(1/8) + (a/b)^(1/4))/a + 1/16*sqrt(sqrt(2) + 2
)*(a/b)^(3/8)*ln(x^2 - x*sqrt(-sqrt(2) + 2)*(a/b)^(1/8) + (a/b)^(
1/4))/a
```

3.1463 $\int \frac{1}{a+bx^8}\,dx$

Optimal. Leaf size=267

$$\frac{\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}(-a)^{7/8}\sqrt[8]{b}}-\frac{\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}(-a)^{7/8}\sqrt[8]{b}}-\frac{\tan^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4(-a)^{7/8}\sqrt[8]{b}}+\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4\sqrt{2}(-a)^{7/8}\sqrt[8]{b}}-\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}+1\right)}{4\sqrt{2}(-a)^{7/8}\sqrt[8]{b}}-\frac{\tanh^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4(-a)^{7/8}\sqrt[8]{b}}$$

```
[Out] -ArcTan[(b^(1/8)*x)/(-a)^(1/8)]/(4*(-a)^(7/8)*b^(1/8)) + ArcTan[1
 - (Sqrt[2]*b^(1/8)*x)/(-a)^(1/8)]/(4*Sqrt[2]*(-a)^(7/8)*b^(1/8))
 - ArcTan[1 + (Sqrt[2]*b^(1/8)*x)/(-a)^(1/8)]/(4*Sqrt[2]*(-a)^(7/
8)*b^(1/8)) - ArcTanh[(b^(1/8)*x)/(-a)^(1/8)]/(4*(-a)^(7/8)*b^(1/
8)) + Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*b^(1/8)*x + b^(1/4)*x^2
]/(8*Sqrt[2]*(-a)^(7/8)*b^(1/8)) - Log[(-a)^(1/4) + Sqrt[2]*(-a)^
(1/8)*b^(1/8)*x + b^(1/4)*x^2]/(8*Sqrt[2]*(-a)^(7/8)*b^(1/8))
```

Rubi [A] time = 0.403607, antiderivative size = 267, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 10, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.111

$$\frac{\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}(-a)^{7/8}\sqrt[8]{b}}-\frac{\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}(-a)^{7/8}\sqrt[8]{b}}-\frac{\tan^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4(-a)^{7/8}\sqrt[8]{b}}+\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4\sqrt{2}(-a)^{7/8}\sqrt[8]{b}}-\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}+1\right)}{4\sqrt{2}(-a)^{7/8}\sqrt[8]{b}}-\frac{\tanh^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4(-a)^{7/8}\sqrt[8]{b}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^8)^(-1),x]
```

```
[Out] -ArcTan[(b^(1/8)*x)/(-a)^(1/8)]/(4*(-a)^(7/8)*b^(1/8)) + ArcTan[1
 - (Sqrt[2]*b^(1/8)*x)/(-a)^(1/8)]/(4*Sqrt[2]*(-a)^(7/8)*b^(1/8))
 - ArcTan[1 + (Sqrt[2]*b^(1/8)*x)/(-a)^(1/8)]/(4*Sqrt[2]*(-a)^(7/
8)*b^(1/8)) - ArcTanh[(b^(1/8)*x)/(-a)^(1/8)]/(4*(-a)^(7/8)*b^(1/
8)) + Log[(-a)^(1/4) - Sqrt[2]*(-a)^(1/8)*b^(1/8)*x + b^(1/4)*x^2
]/(8*Sqrt[2]*(-a)^(7/8)*b^(1/8)) - Log[(-a)^(1/4) + Sqrt[2]*(-a)^
(1/8)*b^(1/8)*x + b^(1/4)*x^2]/(8*Sqrt[2]*(-a)^(7/8)*b^(1/8))
```

Rubi in Sympy [A] time = 99.9133, size = 246, normalized size = 0.92

$$\frac{\sqrt{2}\log\left(-\sqrt{2}\sqrt[8]{b}x\sqrt[8]{-a}+\sqrt[4]{b}x^2+\sqrt[4]{-a}\right)}{16\sqrt[8]{b}\left(-a\right)^{\frac{7}{8}}}-\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt[8]{b}x\sqrt[8]{-a}+\sqrt[4]{b}x^2+\sqrt[4]{-a}\right)}{16\sqrt[8]{b}\left(-a\right)^{\frac{7}{8}}}-\frac{\operatorname{atan}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4\sqrt[8]{b}\left(-a\right)^{\frac{7}{8}}}-\frac{\sqrt{2}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}-1\right)}{8\sqrt[8]{b}\left(-a\right)^{\frac{7}{8}}}-\frac{\sqrt{2}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}+1\right)}{8\sqrt[8]{b}\left(-a\right)^{\frac{7}{8}}}-\frac{\operatorname{atanh}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4\sqrt[8]{b}\left(-a\right)^{\frac{7}{8}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*x**8+a),x)
```

```
[Out] sqrt(2)*log(-sqrt(2)*b**(1/8)*x*(-a)**(1/8) + b**(1/4)*x**2 + (-a
)**(1/4))/(16*b**(1/8)*(-a)**(7/8)) - sqrt(2)*log(sqrt(2)*b**(1/8
)*x*(-a)**(1/8) + b**(1/4)*x**2 + (-a)**(1/4))/(16*b**(1/8)*(-a)*
*(7/8)) - atan(b**(1/8)*x/(-a)**(1/8))/(4*b**(1/8)*(-a)**(7/8)) -
 sqrt(2)*atan(sqrt(2)*b**(1/8)*x/(-a)**(1/8) - 1)/(8*b**(1/8)*(-a
)**(7/8)) - sqrt(2)*atan(sqrt(2)*b**(1/8)*x/(-a)**(1/8) + 1)/(8*b
```

```
**(1/8)*(-a)**(7/8)) - atanh(b**(1/8)*x/(-a)**(1/8))/(4*b**(1/8)*
(-a)**(7/8))
```

Mathematica [A] time = 0.20543, size = 324, normalized size = 1.21

$$-\sin\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{b}x\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{b}x^2\right)+\sin\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{b}x\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{b}x^2\right)-\cos\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{b}x\,c\right.$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^8)^(-1),x]
```

```
[Out] (2*ArcTan[(b^(1/8)*x*Sec[Pi/8])/a^(1/8) - Tan[Pi/8]]*Cos[Pi/8] +
2*ArcTan[(b^(1/8)*x*Sec[Pi/8])/a^(1/8) + Tan[Pi/8]]*Cos[Pi/8] - C
os[Pi/8]*Log[a^(1/4) + b^(1/4)*x^2 - 2*a^(1/8)*b^(1/8)*x*Cos[Pi/8
]] + Cos[Pi/8]*Log[a^(1/4) + b^(1/4)*x^2 + 2*a^(1/8)*b^(1/8)*x*Co
s[Pi/8]] - 2*ArcTan[Cot[Pi/8] - (b^(1/8)*x*Csc[Pi/8])/a^(1/8)]*Si
n[Pi/8] + 2*ArcTan[Cot[Pi/8] + (b^(1/8)*x*Csc[Pi/8])/a^(1/8)]*Sin
[Pi/8] - Log[a^(1/4) + b^(1/4)*x^2 - 2*a^(1/8)*b^(1/8)*x*Sin[Pi/8
]]*Sin[Pi/8] + Log[a^(1/4) + b^(1/4)*x^2 + 2*a^(1/8)*b^(1/8)*x*Si
n[Pi/8]]*Sin[Pi/8])/(8*a^(7/8)*b^(1/8))
```

Maple [C] time = 0.002, size = 27, normalized size = 0.1

$$\frac{1}{8\,b}\sum_{\_R=RootOf\left(\_Z^8b+a\right)}\frac{\ln\left(x-\_R\right)}{\_R^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*x^8+a),x)
```

```
[Out] 1/8/b*sum(1/_R^7*ln(x-_R),_R=RootOf(_Z^8*b+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{bx^8+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x^8 + a),x, algorithm="maxima")
```

```
[Out] integrate(1/(b*x^8 + a), x)
```

Fricas [A] time = 0.235425, size = 518, normalized size = 1.94

$$-\frac{1}{16}\sqrt{2}\left(4\sqrt{2}\left(-\frac{1}{a^7b}\right)^{\frac{1}{8}}\arctan\left(\frac{a\left(-\frac{1}{a^7b}\right)^{\frac{1}{8}}}{x+\sqrt{a^2\left(-\frac{1}{a^7b}\right)^{\frac{1}{4}}+x^2}}\right)-\sqrt{2}\left(-\frac{1}{a^7b}\right)^{\frac{1}{8}}\log\left(a\left(-\frac{1}{a^7b}\right)^{\frac{1}{8}}+x\right)+\sqrt{2}\left(-\frac{1}{a^7b}\right)^{\frac{1}{8}}\log\left(-a\left(-\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x^8 + a),x, algorithm="fricas")
```

```
[Out] -1/16*sqrt(2)*(4*sqrt(2)*(-1/(a^7*b))^(1/8)*arctan(a*(-1/(a^7*b))
^(1/8)/(x + sqrt(a^2*(-1/(a^7*b))^(1/4) + x^2))) - sqrt(2)*(-1/(a
^7*b))^(1/8)*log(a*(-1/(a^7*b))^(1/8) + x) + sqrt(2)*(-1/(a^7*b))
^(1/8)*log(-a*(-1/(a^7*b))^(1/8) + x) + 4*(-1/(a^7*b))^(1/8)*arct
an(a*(-1/(a^7*b))^(1/8)/(sqrt(2)*x + a*(-1/(a^7*b))^(1/8) + sqrt(
2)*sqrt(sqrt(2)*a*x*(-1/(a^7*b))^(1/8) + a^2*(-1/(a^7*b))^(1/4) +
 x^2))) + 4*(-1/(a^7*b))^(1/8)*arctan(a*(-1/(a^7*b))^(1/8)/(sqrt(
2)*x - a*(-1/(a^7*b))^(1/8) + sqrt(2)*sqrt(-sqrt(2)*a*x*(-1/(a^7*
b))^(1/8) + a^2*(-1/(a^7*b))^(1/4) + x^2))) - (-1/(a^7*b))^(1/8)*
log(sqrt(2)*a*x*(-1/(a^7*b))^(1/8) + a^2*(-1/(a^7*b))^(1/4) + x^2
) + (-1/(a^7*b))^(1/8)*log(-sqrt(2)*a*x*(-1/(a^7*b))^(1/8) + a^2*
(-1/(a^7*b))^(1/4) + x^2))
```

Sympy [A] time = 0.464769, size = 20, normalized size = 0.07

$$\operatorname{RootSum}\left(16777216t^8a^7b+1,\left(t\mapsto t\log\left(8ta+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x**8+a),x)
```

```
[Out] RootSum(16777216*_t**8*a**7*b + 1, Lambda(_t, _t*log(8*_t*a + x))
)
```

GIAC/XCAS [A] time = 0.231627, size = 579, normalized size = 2.17

$$\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}\arctan\left(\frac{2x+\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a}+\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}\arctan\left(\frac{2x-\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a}$$
$$+\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}\arctan\left(\frac{2x+\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a}+\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}\arctan\left(\frac{2x-\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a}$$
$$+\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}\ln\left(x^2+x\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a}$$
$$-\frac{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}\ln\left(x^2-x\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a}$$
$$+\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}\ln\left(x^2+x\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a}$$
$$-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}\ln\left(x^2-x\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x^8 + a),x, algorithm="giac")
```

```
[Out] 1/8*sqrt(sqrt(2) + 2)*(a/b)^(1/8)*arctan((2*x + sqrt(-sqrt(2) + 2
)*(a/b)^(1/8))/(sqrt(sqrt(2) + 2)*(a/b)^(1/8)))/a + 1/8*sqrt(sqrt
(2) + 2)*(a/b)^(1/8)*arctan((2*x - sqrt(-sqrt(2) + 2)*(a/b)^(1/8)
)/(sqrt(sqrt(2) + 2)*(a/b)^(1/8)))/a + 1/8*sqrt(-sqrt(2) + 2)*(a/
b)^(1/8)*arctan((2*x + sqrt(sqrt(2) + 2)*(a/b)^(1/8))/(sqrt(-sqrt
(2) + 2)*(a/b)^(1/8)))/a + 1/8*sqrt(-sqrt(2) + 2)*(a/b)^(1/8)*arc
tan((2*x - sqrt(sqrt(2) + 2)*(a/b)^(1/8))/(sqrt(-sqrt(2) + 2)*(a/
b)^(1/8)))/a + 1/16*sqrt(sqrt(2) + 2)*(a/b)^(1/8)*ln(x^2 + x*sqrt
(sqrt(2) + 2)*(a/b)^(1/8) + (a/b)^(1/4))/a - 1/16*sqrt(sqrt(2) +
2)*(a/b)^(1/8)*ln(x^2 - x*sqrt(sqrt(2) + 2)*(a/b)^(1/8) + (a/b)^(
1/4))/a + 1/16*sqrt(-sqrt(2) + 2)*(a/b)^(1/8)*ln(x^2 + x*sqrt(-sq
```

```
rt(2) + 2)*(a/b)^(1/8) + (a/b)^(1/4))/a - 1/16*sqrt(-sqrt(2) + 2)
*(a/b)^(1/8)*ln(x^2 - x*sqrt(-sqrt(2) + 2)*(a/b)^(1/8) + (a/b)^(1
/4))/a
```

3.1464 $\int \frac{1}{x^2(a+bx^8)}\,dx$

Optimal. Leaf size=275

$$\frac{\sqrt[8]{b}\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}(-a)^{9/8}}-\frac{\sqrt[8]{b}\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}(-a)^{9/8}}+\frac{\sqrt[8]{b}\tan^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4(-a)^{9/8}}-\frac{\sqrt[8]{b}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4\sqrt{2}(-a)^{9/8}}+\frac{\sqrt[8]{b}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}+1\right)}{4\sqrt{2}(-a)^{9/8}}-\frac{\sqrt[8]{b}\tanh^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4(-a)^{9/8}}-\frac{1}{ax}$$

```
[Out] -(1/(a*x)) + (b^(1/8)*ArcTan[(b^(1/8)*x)/(-a)^(1/8)])/(4*(-a)^(9/
8)) - (b^(1/8)*ArcTan[1 - (Sqrt[2]*b^(1/8)*x)/(-a)^(1/8)])/(4*Sqr
t[2]*(-a)^(9/8)) + (b^(1/8)*ArcTan[1 + (Sqrt[2]*b^(1/8)*x)/(-a)^(
1/8)])/(4*Sqrt[2]*(-a)^(9/8)) - (b^(1/8)*ArcTanh[(b^(1/8)*x)/(-a)
^(1/8)])/(4*(-a)^(9/8)) + (b^(1/8)*Log[(-a)^(1/4) - Sqrt[2]*(-a)^
(1/8)*b^(1/8)*x + b^(1/4)*x^2])/(8*Sqrt[2]*(-a)^(9/8)) - (b^(1/8)
*Log[(-a)^(1/4) + Sqrt[2]*(-a)^(1/8)*b^(1/8)*x + b^(1/4)*x^2])/(8
*Sqrt[2]*(-a)^(9/8))
```

Rubi [A] time = 0.503133, antiderivative size = 275, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 11, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.846

$$\frac{\sqrt[8]{b}\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}(-a)^{9/8}}-\frac{\sqrt[8]{b}\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}(-a)^{9/8}}+\frac{\sqrt[8]{b}\tan^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4(-a)^{9/8}}-\frac{\sqrt[8]{b}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4\sqrt{2}(-a)^{9/8}}+\frac{\sqrt[8]{b}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}+1\right)}{4\sqrt{2}(-a)^{9/8}}-\frac{\sqrt[8]{b}\tanh^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4(-a)^{9/8}}-\frac{1}{ax}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(a + b*x^8)),x]
```

```
[Out] -(1/(a*x)) + (b^(1/8)*ArcTan[(b^(1/8)*x)/(-a)^(1/8)])/(4*(-a)^(9/
8)) - (b^(1/8)*ArcTan[1 - (Sqrt[2]*b^(1/8)*x)/(-a)^(1/8)])/(4*Sqr
t[2]*(-a)^(9/8)) + (b^(1/8)*ArcTan[1 + (Sqrt[2]*b^(1/8)*x)/(-a)^(
1/8)])/(4*Sqrt[2]*(-a)^(9/8)) - (b^(1/8)*ArcTanh[(b^(1/8)*x)/(-a)
^(1/8)])/(4*(-a)^(9/8)) + (b^(1/8)*Log[(-a)^(1/4) - Sqrt[2]*(-a)^
(1/8)*b^(1/8)*x + b^(1/4)*x^2])/(8*Sqrt[2]*(-a)^(9/8)) - (b^(1/8)
*Log[(-a)^(1/4) + Sqrt[2]*(-a)^(1/8)*b^(1/8)*x + b^(1/4)*x^2])/(8
*Sqrt[2]*(-a)^(9/8))
```

Rubi in Sympy [A] time = 108.675, size = 252, normalized size = 0.92

$$\frac{\sqrt{2}\sqrt[8]{b}\log\left(-\sqrt{2}\sqrt[8]{b}x\sqrt[8]{-a}+\sqrt[4]{b}x^2+\sqrt[4]{-a}\right)}{16\left(-a\right)^{\frac{9}{8}}}-\frac{\sqrt{2}\sqrt[8]{b}\log\left(\sqrt{2}\sqrt[8]{b}x\sqrt[8]{-a}+\sqrt[4]{b}x^2+\sqrt[4]{-a}\right)}{16\left(-a\right)^{\frac{9}{8}}}+\frac{\sqrt[8]{b}\,\mathrm{atan}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4\left(-a\right)^{\frac{9}{8}}}+\frac{\sqrt{2}\sqrt[8]{b}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}-1\right)}{8\left(-a\right)^{\frac{9}{8}}}+\frac{\sqrt{2}\sqrt[8]{b}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}+1\right)}{8\left(-a\right)^{\frac{9}{8}}}-\frac{\sqrt[8]{b}\,\mathrm{atanh}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4\left(-a\right)^{\frac{9}{8}}}-\frac{1}{ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(b*x**8+a),x)
```

```
[Out] sqrt(2)*b**(1/8)*log(-sqrt(2)*b**(1/8)*x*(-a)**(1/8) + b**(1/4)*x
**2 + (-a)**(1/4))/(16*(-a)**(9/8)) - sqrt(2)*b**(1/8)*log(sqrt(2
)*b**(1/8)*x*(-a)**(1/8) + b**(1/4)*x**2 + (-a)**(1/4))/(16*(-a)*
```

```
*(9/8)) + b**(1/8)*atan(b**(1/8)*x/(-a)**(1/8))/(4*(-a)**(9/8)) +
 sqrt(2)*b**(1/8)*atan(sqrt(2)*b**(1/8)*x/(-a)**(1/8) - 1)/(8*(-a
)**(9/8)) + sqrt(2)*b**(1/8)*atan(sqrt(2)*b**(1/8)*x/(-a)**(1/8)
+ 1)/(8*(-a)**(9/8)) - b**(1/8)*atanh(b**(1/8)*x/(-a)**(1/8))/(4*
(-a)**(9/8)) - 1/(a*x)
```

Mathematica [A] time = 0.452668, size = 377, normalized size = 1.37

$$-\frac{\sqrt[8]{b}x\sin\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{b}x\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{b}x^2\right)-\sqrt[8]{b}x\sin\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{b}x\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}+\sqrt[4]{b}x^2\right)+\sqrt[8]{b}x\cos\left(\frac{\pi}{8}\right)\log}{}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*(a + b*x^8)),x]
```

```
[Out] -(8*a^(1/8) + 2*b^(1/8)*x*ArcTan[(b^(1/8)*x*Sec[Pi/8])/a^(1/8) -
Tan[Pi/8]]*Cos[Pi/8] + 2*b^(1/8)*x*ArcTan[(b^(1/8)*x*Sec[Pi/8])/a
^(1/8) + Tan[Pi/8]]*Cos[Pi/8] + b^(1/8)*x*Cos[Pi/8]*Log[a^(1/4) +
 b^(1/4)*x^2 - 2*a^(1/8)*b^(1/8)*x*Cos[Pi/8]] - b^(1/8)*x*Cos[Pi/
8]*Log[a^(1/4) + b^(1/4)*x^2 + 2*a^(1/8)*b^(1/8)*x*Cos[Pi/8]] - 2
*b^(1/8)*x*ArcTan[Cot[Pi/8] - (b^(1/8)*x*Csc[Pi/8])/a^(1/8)]*Sin[
Pi/8] + 2*b^(1/8)*x*ArcTan[Cot[Pi/8] + (b^(1/8)*x*Csc[Pi/8])/a^(1
/8)]*Sin[Pi/8] + b^(1/8)*x*Log[a^(1/4) + b^(1/4)*x^2 - 2*a^(1/8)*
b^(1/8)*x*Sin[Pi/8]]*Sin[Pi/8] - b^(1/8)*x*Log[a^(1/4) + b^(1/4)*
x^2 + 2*a^(1/8)*b^(1/8)*x*Sin[Pi/8]]*Sin[Pi/8])/(8*a^(9/8)*x)
```

Maple [C] time = 0.008, size = 36, normalized size = 0.1

$$-\frac{1}{8a}\sum_{\_R=RootOf(\_Z^8b+a)}\frac{\ln(x-\_R)}{\_R}-\frac{1}{ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(b*x^8+a),x)
```

```
[Out] -1/8/a*sum(1/_R*ln(x-_R),_R=RootOf(_Z^8*b+a))-1/a/x
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{b\int\frac{x^6}{bx^8+a}\,dx}{a}-\frac{1}{ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^8 + a)*x^2),x, algorithm="maxima")
```

```
[Out] -b*integrate(x^6/(b*x^8 + a), x)/a - 1/(a*x)
```

Fricas [A] time = 0.239827, size = 576, normalized size = 2.09

$$-\frac{\sqrt{2}\left(4\sqrt{2}ax\left(-\frac{b}{a^9}\right)^{\frac{1}{8}}\arctan\left(\frac{a^8\left(-\frac{b}{a^9}\right)^{\frac{7}{8}}}{bx+b\sqrt{-\frac{a^7\left(-\frac{b}{a^9}\right)^{\frac{3}{4}}-bx^2}{b}}}\right)+\sqrt{2}ax\left(-\frac{b}{a^9}\right)^{\frac{1}{8}}\log\left(a^8\left(-\frac{b}{a^9}\right)^{\frac{7}{8}}+bx\right)-\sqrt{2}ax\left(-\frac{b}{a^9}\right)^{\frac{1}{8}}\log\left(-a^8\left(-\frac{b}{a^9}\right)\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((b*x^8 + a)*x^2),x, algorithm="fricas")
```

```
[Out] -1/16*sqrt(2)*(4*sqrt(2)*a*x*(-b/a^9)^(1/8)*arctan(a^8*(-b/a^9)^(
7/8)/(b*x + b*sqrt(-(a^7*(-b/a^9)^(3/4) - b*x^2)/b))) + sqrt(2)*a
*x*(-b/a^9)^(1/8)*log(a^8*(-b/a^9)^(7/8) + b*x) - sqrt(2)*a*x*(-b
/a^9)^(1/8)*log(-a^8*(-b/a^9)^(7/8) + b*x) + 4*a*x*(-b/a^9)^(1/8)
*arctan(a^8*(-b/a^9)^(7/8)/(a^8*(-b/a^9)^(7/8) + sqrt(2)*b*x + sq
rt(2)*b*sqrt((sqrt(2)*a^8*x*(-b/a^9)^(7/8) - a^7*(-b/a^9)^(3/4) +
 b*x^2)/b))) + 4*a*x*(-b/a^9)^(1/8)*arctan(-a^8*(-b/a^9)^(7/8)/(a
^8*(-b/a^9)^(7/8) - sqrt(2)*b*x - sqrt(2)*b*sqrt(-(sqrt(2)*a^8*x*
(-b/a^9)^(7/8) + a^7*(-b/a^9)^(3/4) - b*x^2)/b))) + a*x*(-b/a^9)^
(1/8)*log(sqrt(2)*a^8*x*(-b/a^9)^(7/8) - a^7*(-b/a^9)^(3/4) + b*x
^2) - a*x*(-b/a^9)^(1/8)*log(-sqrt(2)*a^8*x*(-b/a^9)^(7/8) - a^7*
(-b/a^9)^(3/4) + b*x^2) + 8*sqrt(2))/(a*x)
```

Sympy [A]   time = 1.65977, size = 29, normalized size = 0.11

$$\operatorname{RootSum}\left(16777216t^8a^9+b,\left(t\mapsto t\log\left(-\frac{2097152t^7a^8}{b}+x\right)\right)\right)-\frac{1}{ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/x**2/(b*x**8+a),x)
```

```
[Out] RootSum(16777216*_t**8*a**9 + b, Lambda(_t, _t*log(-2097152*_t**7
*a**8/b + x))) - 1/(a*x)
```

GIAC/XCAS [A]   time = 0.261067, size = 601, normalized size = 2.19

$$-\frac{b\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{7}{8}}\arctan\left(\frac{2x+\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a^2}-\frac{b\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{7}{8}}\arctan\left(\frac{2x-\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a^2}-\frac{b\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{7}{8}}\arctan\left(\frac{2x+\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a^2}-\frac{b\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{7}{8}}\arctan\left(\frac{2x-\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a^2}+\frac{b\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{7}{8}}\ln\left(x^2+x\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a^2}-\frac{b\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{7}{8}}\ln\left(x^2-x\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a^2}+\frac{b\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{7}{8}}\ln\left(x^2+x\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a^2}-\frac{b\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{7}{8}}\ln\left(x^2-x\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a^2}-\frac{1}{ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((b*x^8 + a)*x^2),x, algorithm="giac")
```

```
[Out] -1/8*b*sqrt(sqrt(2) + 2)*(a/b)^(7/8)*arctan((2*x + sqrt(-sqrt(2)
+ 2)*(a/b)^(1/8))/(sqrt(sqrt(2) + 2)*(a/b)^(1/8)))/a^2 - 1/8*b*sq
rt(sqrt(2) + 2)*(a/b)^(7/8)*arctan((2*x - sqrt(-sqrt(2) + 2)*(a/b
)^(1/8))/(sqrt(sqrt(2) + 2)*(a/b)^(1/8)))/a^2 - 1/8*b*sqrt(-sqrt(
2) + 2)*(a/b)^(7/8)*arctan((2*x + sqrt(sqrt(2) + 2)*(a/b)^(1/8))/
(sqrt(-sqrt(2) + 2)*(a/b)^(1/8)))/a^2 - 1/8*b*sqrt(-sqrt(2) + 2)*
(a/b)^(7/8)*arctan((2*x - sqrt(sqrt(2) + 2)*(a/b)^(1/8))/(sqrt(-s
```

```
qrt(2) + 2)*(a/b)^(1/8)))/a^2 + 1/16*b*sqrt(sqrt(2) + 2)*(a/b)^(7
/8)*ln(x^2 + x*sqrt(sqrt(2) + 2)*(a/b)^(1/8) + (a/b)^(1/4))/a^2 -
 1/16*b*sqrt(sqrt(2) + 2)*(a/b)^(7/8)*ln(x^2 - x*sqrt(sqrt(2) + 2
)*(a/b)^(1/8) + (a/b)^(1/4))/a^2 + 1/16*b*sqrt(-sqrt(2) + 2)*(a/b
)^(7/8)*ln(x^2 + x*sqrt(-sqrt(2) + 2)*(a/b)^(1/8) + (a/b)^(1/4))/
a^2 - 1/16*b*sqrt(-sqrt(2) + 2)*(a/b)^(7/8)*ln(x^2 - x*sqrt(-sqrt
(2) + 2)*(a/b)^(1/8) + (a/b)^(1/4))/a^2 - 1/(a*x)
```

3.1465 $\int \frac{1}{x^4(a+bx^8)}\,dx$

Optimal. Leaf size=277

$$-\frac{b^{3/8}\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}(-a)^{11/8}}+\frac{b^{3/8}\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}(-a)^{11/8}}-\frac{b^{3/8}\tan^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4(-a)^{11/8}}-\frac{b^{3/8}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4\sqrt{2}(-a)^{11/8}}+\frac{b^{3/8}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}+1\right)}{4\sqrt{2}(-a)^{11/8}}-\frac{b^{3/8}\tanh^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4(-a)^{11/8}}-\frac{1}{3ax^3}$$

```
[Out] -1/(3*a*x^3) - (b^(3/8)*ArcTan[(b^(1/8)*x)/(-a)^(1/8)])/(4*(-a)^(
11/8)) - (b^(3/8)*ArcTan[1 - (Sqrt[2]*b^(1/8)*x)/(-a)^(1/8)])/(4*
Sqrt[2]*(-a)^(11/8)) + (b^(3/8)*ArcTan[1 + (Sqrt[2]*b^(1/8)*x)/(-
a)^(1/8)])/(4*Sqrt[2]*(-a)^(11/8)) - (b^(3/8)*ArcTanh[(b^(1/8)*x)
/(-a)^(1/8)])/(4*(-a)^(11/8)) - (b^(3/8)*Log[(-a)^(1/4) - Sqrt[2]
*(-a)^(1/8)*b^(1/8)*x + b^(1/4)*x^2])/(8*Sqrt[2]*(-a)^(11/8)) + (
b^(3/8)*Log[(-a)^(1/4) + Sqrt[2]*(-a)^(1/8)*b^(1/8)*x + b^(1/4)*x
^2])/(8*Sqrt[2]*(-a)^(11/8))
```

Rubi [A] time = 0.510975, antiderivative size = 277, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 11, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.846$

$$-\frac{b^{3/8}\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}(-a)^{11/8}}+\frac{b^{3/8}\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}(-a)^{11/8}}-\frac{b^{3/8}\tan^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4(-a)^{11/8}}-\frac{b^{3/8}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4\sqrt{2}(-a)^{11/8}}+\frac{b^{3/8}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}+1\right)}{4\sqrt{2}(-a)^{11/8}}-\frac{b^{3/8}\tanh^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4(-a)^{11/8}}-\frac{1}{3ax^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*(a + b*x^8)),x]
```

```
[Out] -1/(3*a*x^3) - (b^(3/8)*ArcTan[(b^(1/8)*x)/(-a)^(1/8)])/(4*(-a)^(
11/8)) - (b^(3/8)*ArcTan[1 - (Sqrt[2]*b^(1/8)*x)/(-a)^(1/8)])/(4*
Sqrt[2]*(-a)^(11/8)) + (b^(3/8)*ArcTan[1 + (Sqrt[2]*b^(1/8)*x)/(-
a)^(1/8)])/(4*Sqrt[2]*(-a)^(11/8)) - (b^(3/8)*ArcTanh[(b^(1/8)*x)
/(-a)^(1/8)])/(4*(-a)^(11/8)) - (b^(3/8)*Log[(-a)^(1/4) - Sqrt[2]
*(-a)^(1/8)*b^(1/8)*x + b^(1/4)*x^2])/(8*Sqrt[2]*(-a)^(11/8)) + (
b^(3/8)*Log[(-a)^(1/4) + Sqrt[2]*(-a)^(1/8)*b^(1/8)*x + b^(1/4)*x
^2])/(8*Sqrt[2]*(-a)^(11/8))
```

Rubi in Sympy [A] time = 109.79, size = 255, normalized size = 0.92

$$-\frac{\sqrt{2}b^{\frac{3}{8}}\log\left(-\sqrt{2}\sqrt[8]{b}x\sqrt[8]{-a}+\sqrt[4]{b}x^2+\sqrt[4]{-a}\right)}{16\left(-a\right)^{\frac{11}{8}}}+\frac{\sqrt{2}b^{\frac{3}{8}}\log\left(\sqrt{2}\sqrt[8]{b}x\sqrt[8]{-a}+\sqrt[4]{b}x^2+\sqrt[4]{-a}\right)}{16\left(-a\right)^{\frac{11}{8}}}-\frac{b^{\frac{3}{8}}\operatorname{atan}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4\left(-a\right)^{\frac{11}{8}}}+\frac{\sqrt{2}b^{\frac{3}{8}}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}-1\right)}{8\left(-a\right)^{\frac{11}{8}}}+\frac{\sqrt{2}b^{\frac{3}{8}}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}+1\right)}{8\left(-a\right)^{\frac{11}{8}}}-\frac{b^{\frac{3}{8}}\operatorname{atanh}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4\left(-a\right)^{\frac{11}{8}}}-\frac{1}{3ax^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(b*x**8+a),x)
```

```
[Out] -sqrt(2)*b**(3/8)*log(-sqrt(2)*b**(1/8)*x*(-a)**(1/8) + b**(1/4)*
x**2 + (-a)**(1/4))/(16*(-a)**(11/8)) + sqrt(2)*b**(3/8)*log(sqrt
(2)*b**(1/8)*x*(-a)**(1/8) + b**(1/4)*x**2 + (-a)**(1/4))/(16*(-a
)**(11/8)) - b**(3/8)*atan(b**(1/8)*x/(-a)**(1/8))/(4*(-a)**(11/8
)) + sqrt(2)*b**(3/8)*atan(sqrt(2)*b**(1/8)*x/(-a)**(1/8) - 1)/(8
*(-a)**(11/8)) + sqrt(2)*b**(3/8)*atan(sqrt(2)*b**(1/8)*x/(-a)**(
1/8) + 1)/(8*(-a)**(11/8)) - b**(3/8)*atanh(b**(1/8)*x/(-a)**(1/8
))/(4*(-a)**(11/8)) - 1/(3*a*x**3)
```

Mathematica [A] time = 0.365373, size = 395, normalized size = 1.43

$$-8a^{3/8}+6b^{3/8}x^3\sin\left(\frac{\pi}{8}\right)\tan^{-1}\left(\frac{\sqrt[8]{b}x\sec\left(\frac{\pi}{8}\right)}{\sqrt[8]{a}}-\tan\left(\frac{\pi}{8}\right)\right)+6b^{3/8}x^3\sin\left(\frac{\pi}{8}\right)\tan^{-1}\left(\frac{\sqrt[8]{b}x\sec\left(\frac{\pi}{8}\right)}{\sqrt[8]{a}}+\tan\left(\frac{\pi}{8}\right)\right)+6b^{3/8}x^3\cos\left(\frac{\pi}{8}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*(a + b*x^8)),x]
```

```
[Out] (-8*a^(3/8) + 6*b^(3/8)*x^3*ArcTan[Cot[Pi/8] - (b^(1/8)*x*Csc[Pi/
8])/a^(1/8)]*Cos[Pi/8] - 6*b^(3/8)*x^3*ArcTan[Cot[Pi/8] + (b^(1/8
)*x*Csc[Pi/8])/a^(1/8)]*Cos[Pi/8] + 3*b^(3/8)*x^3*Cos[Pi/8]*Log[a
^(1/4) + b^(1/4)*x^2 - 2*a^(1/8)*b^(1/8)*x*Sin[Pi/8]] - 3*b^(3/8)
*x^3*Cos[Pi/8]*Log[a^(1/4) + b^(1/4)*x^2 + 2*a^(1/8)*b^(1/8)*x*Si
n[Pi/8]] + 6*b^(3/8)*x^3*ArcTan[(b^(1/8)*x*Sec[Pi/8])/a^(1/8) - T
an[Pi/8]]*Sin[Pi/8] + 6*b^(3/8)*x^3*ArcTan[(b^(1/8)*x*Sec[Pi/8])/
a^(1/8) + Tan[Pi/8]]*Sin[Pi/8] - 3*b^(3/8)*x^3*Log[a^(1/4) + b^(1
/4)*x^2 - 2*a^(1/8)*b^(1/8)*x*Cos[Pi/8]]*Sin[Pi/8] + 3*b^(3/8)*x^
3*Log[a^(1/4) + b^(1/4)*x^2 + 2*a^(1/8)*b^(1/8)*x*Cos[Pi/8]]*Sin[
Pi/8])/(24*a^(11/8)*x^3)
```

Maple [C] time = 0.007, size = 36, normalized size = 0.1

$$-\frac{1}{8a}\sum_{\_R=RootOf(\_Z^8b+a)}\frac{\ln(x-\_R)}{\_R^3}-\frac{1}{3ax^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(b*x^8+a),x)
```

```
[Out] -1/8/a*sum(1/_R^3*ln(x-_R),_R=RootOf(_Z^8*b+a))-1/3/a/x^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{b\int\frac{x^4}{bx^8+a}\,dx}{a}-\frac{1}{3ax^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^8 + a)*x^4),x, algorithm="maxima")
```

```
[Out] -b*integrate(x^4/(b*x^8 + a), x)/a - 1/3/(a*x^3)
```

Fricas [A] time = 0.241778, size = 698, normalized size = 2.52

$$-\frac{\sqrt{2}\left(12\sqrt{2}ax^3\left(-\frac{b^3}{a^{11}}\right)^{\frac{1}{8}}\arctan\left(\frac{a^7\left(-\frac{b^3}{a^{11}}\right)^{\frac{5}{8}}}{b^2x+b^2\sqrt{-\frac{a^3\left(-\frac{b^3}{a^{11}}\right)^{\frac{1}{4}}-bx^2}{b}}}\right)-3\sqrt{2}ax^3\left(-\frac{b^3}{a^{11}}\right)^{\frac{1}{8}}\log\left(a^7\left(-\frac{b^3}{a^{11}}\right)^{\frac{5}{8}}+b^2x\right)+3\sqrt{2}ax^3\left(-\frac{b^3}{a^{11}}\right)^{\frac{1}{8}}\log\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^8 + a)*x^4),x, algorithm="fricas")
```

```
[Out] -1/48*sqrt(2)*(12*sqrt(2)*a*x^3*(-b^3/a^11)^(1/8)*arctan(a^7*(-b^
3/a^11)^(5/8)/(b^2*x + b^2*sqrt(-(a^3*(-b^3/a^11)^(1/4) - b*x^2)/
b))) - 3*sqrt(2)*a*x^3*(-b^3/a^11)^(1/8)*log(a^7*(-b^3/a^11)^(5/8
) + b^2*x) + 3*sqrt(2)*a*x^3*(-b^3/a^11)^(1/8)*log(-a^7*(-b^3/a^1
1)^(5/8) + b^2*x) - 12*a*x^3*(-b^3/a^11)^(1/8)*arctan(a^7*(-b^3/a
^11)^(5/8)/(a^7*(-b^3/a^11)^(5/8) + sqrt(2)*b^2*x + sqrt(2)*b^2*s
qrt((sqrt(2)*a^7*x*(-b^3/a^11)^(5/8) - a^3*b*(-b^3/a^11)^(1/4) +
b^2*x^2)/b^2))) - 12*a*x^3*(-b^3/a^11)^(1/8)*arctan(-a^7*(-b^3/a^
11)^(5/8)/(a^7*(-b^3/a^11)^(5/8) - sqrt(2)*b^2*x - sqrt(2)*b^2*sq
rt(-(sqrt(2)*a^7*x*(-b^3/a^11)^(5/8) + a^3*b*(-b^3/a^11)^(1/4) -
b^2*x^2)/b^2))) + 3*a*x^3*(-b^3/a^11)^(1/8)*log(sqrt(2)*a^7*x*(-b
^3/a^11)^(5/8) - a^3*b*(-b^3/a^11)^(1/4) + b^2*x^2) - 3*a*x^3*(-b
^3/a^11)^(1/8)*log(-sqrt(2)*a^7*x*(-b^3/a^11)^(5/8) - a^3*b*(-b^3
/a^11)^(1/4) + b^2*x^2) + 8*sqrt(2))/(a*x^3)
```

Sympy [A] time = 2.50367, size = 36, normalized size = 0.13

$$\operatorname{RootSum}\left(16777216t^8a^{11}+b^3,\left(t\mapsto t\log\left(\frac{32768t^5a^7}{b^2}+x\right)\right)\right)-\frac{1}{3ax^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(b*x**8+a),x)
```

```
[Out] RootSum(16777216*_t**8*a**11 + b**3, Lambda(_t, _t*log(32768*_t**
5*a**7/b**2 + x))) - 1/(3*a*x**3)
```

GIAC/XCAS [A] time = 0.257668, size = 601, normalized size = 2.17

$$\frac{b\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{5}{8}}\arctan\left(\frac{2x+\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a^2}+\frac{b\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{5}{8}}\arctan\left(\frac{2x-\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a^2}$$
$$-\frac{b\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{5}{8}}\arctan\left(\frac{2x+\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a^2}-\frac{b\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{5}{8}}\arctan\left(\frac{2x-\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a^2}$$
$$+\frac{b\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{5}{8}}\ln\left(x^2+x\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a^2}$$
$$-\frac{b\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{5}{8}}\ln\left(x^2-x\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a^2}$$
$$-\frac{b\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{5}{8}}\ln\left(x^2+x\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a^2}$$
$$+\frac{b\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{5}{8}}\ln\left(x^2-x\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a^2}-\frac{1}{3ax^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^8 + a)*x^4),x, algorithm="giac")
```

```
[Out] 1/8*b*sqrt(-sqrt(2) + 2)*(a/b)^(5/8)*arctan((2*x + sqrt(-sqrt(2)
+ 2)*(a/b)^(1/8))/(sqrt(sqrt(2) + 2)*(a/b)^(1/8)))/a^2 + 1/8*b*sq
rt(-sqrt(2) + 2)*(a/b)^(5/8)*arctan((2*x - sqrt(-sqrt(2) + 2)*(a/
b)^(1/8))/(sqrt(sqrt(2) + 2)*(a/b)^(1/8)))/a^2 - 1/8*b*sqrt(sqrt(
2) + 2)*(a/b)^(5/8)*arctan((2*x + sqrt(sqrt(2) + 2)*(a/b)^(1/8))/
(sqrt(-sqrt(2) + 2)*(a/b)^(1/8)))/a^2 - 1/8*b*sqrt(sqrt(2) + 2)*(
a/b)^(5/8)*arctan((2*x - sqrt(sqrt(2) + 2)*(a/b)^(1/8))/(sqrt(-sq
rt(2) + 2)*(a/b)^(1/8)))/a^2 + 1/16*b*sqrt(-sqrt(2) + 2)*(a/b)^(5
/8)*ln(x^2 + x*sqrt(sqrt(2) + 2)*(a/b)^(1/8) + (a/b)^(1/4))/a^2 -
 1/16*b*sqrt(-sqrt(2) + 2)*(a/b)^(5/8)*ln(x^2 - x*sqrt(sqrt(2) +
2)*(a/b)^(1/8) + (a/b)^(1/4))/a^2 - 1/16*b*sqrt(sqrt(2) + 2)*(a/b
)^(5/8)*ln(x^2 + x*sqrt(-sqrt(2) + 2)*(a/b)^(1/8) + (a/b)^(1/4))/
a^2 + 1/16*b*sqrt(sqrt(2) + 2)*(a/b)^(5/8)*ln(x^2 - x*sqrt(-sqrt(
2) + 2)*(a/b)^(1/8) + (a/b)^(1/4))/a^2 - 1/3/(a*x^3)
```

3.1466 $\int \frac{1}{x^6(a+bx^8)}\,dx$

Optimal. Leaf size=277

$$-\frac{b^{5/8}\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}(-a)^{13/8}}+\frac{b^{5/8}\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}(-a)^{13/8}}+\frac{b^{5/8}\tan^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4(-a)^{13/8}}+\frac{b^{5/8}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4\sqrt{2}(-a)^{13/8}}-\frac{b^{5/8}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}+1\right)}{4\sqrt{2}(-a)^{13/8}}-\frac{b^{5/8}\tanh^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4(-a)^{13/8}}-\frac{1}{5ax^5}$$

```
[Out] -1/(5*a*x^5) + (b^(5/8)*ArcTan[(b^(1/8)*x)/(-a)^(1/8)])/(4*(-a)^(
13/8)) + (b^(5/8)*ArcTan[1 - (Sqrt[2]*b^(1/8)*x)/(-a)^(1/8)])/(4*
Sqrt[2]*(-a)^(13/8)) - (b^(5/8)*ArcTan[1 + (Sqrt[2]*b^(1/8)*x)/(-
a)^(1/8)])/(4*Sqrt[2]*(-a)^(13/8)) - (b^(5/8)*ArcTanh[(b^(1/8)*x)
/(-a)^(1/8)])/(4*(-a)^(13/8)) - (b^(5/8)*Log[(-a)^(1/4) - Sqrt[2]
*(-a)^(1/8)*b^(1/8)*x + b^(1/4)*x^2])/(8*Sqrt[2]*(-a)^(13/8)) + (
b^(5/8)*Log[(-a)^(1/4) + Sqrt[2]*(-a)^(1/8)*b^(1/8)*x + b^(1/4)*x
^2])/(8*Sqrt[2]*(-a)^(13/8))
```

Rubi [A] time = 0.542072, antiderivative size = 277, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 11, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.846$

$$-\frac{b^{5/8}\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}(-a)^{13/8}}+\frac{b^{5/8}\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}(-a)^{13/8}}+\frac{b^{5/8}\tan^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4(-a)^{13/8}}+\frac{b^{5/8}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4\sqrt{2}(-a)^{13/8}}-\frac{b^{5/8}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}+1\right)}{4\sqrt{2}(-a)^{13/8}}-\frac{b^{5/8}\tanh^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4(-a)^{13/8}}-\frac{1}{5ax^5}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^6*(a + b*x^8)),x]
```

```
[Out] -1/(5*a*x^5) + (b^(5/8)*ArcTan[(b^(1/8)*x)/(-a)^(1/8)])/(4*(-a)^(
13/8)) + (b^(5/8)*ArcTan[1 - (Sqrt[2]*b^(1/8)*x)/(-a)^(1/8)])/(4*
Sqrt[2]*(-a)^(13/8)) - (b^(5/8)*ArcTan[1 + (Sqrt[2]*b^(1/8)*x)/(-
a)^(1/8)])/(4*Sqrt[2]*(-a)^(13/8)) - (b^(5/8)*ArcTanh[(b^(1/8)*x)
/(-a)^(1/8)])/(4*(-a)^(13/8)) - (b^(5/8)*Log[(-a)^(1/4) - Sqrt[2]
*(-a)^(1/8)*b^(1/8)*x + b^(1/4)*x^2])/(8*Sqrt[2]*(-a)^(13/8)) + (
b^(5/8)*Log[(-a)^(1/4) + Sqrt[2]*(-a)^(1/8)*b^(1/8)*x + b^(1/4)*x
^2])/(8*Sqrt[2]*(-a)^(13/8))
```

Rubi in Sympy [A] time = 117.637, size = 255, normalized size = 0.92

$$-\frac{\sqrt{2}b^{\frac{5}{8}}\log\left(-\sqrt{2}\sqrt[8]{b}x\sqrt[8]{-a}+\sqrt[4]{b}x^2+\sqrt[4]{-a}\right)}{16\left(-a\right)^{\frac{13}{8}}}+\frac{\sqrt{2}b^{\frac{5}{8}}\log\left(\sqrt{2}\sqrt[8]{b}x\sqrt[8]{-a}+\sqrt[4]{b}x^2+\sqrt[4]{-a}\right)}{16\left(-a\right)^{\frac{13}{8}}}+\frac{b^{\frac{5}{8}}\operatorname{atan}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4\left(-a\right)^{\frac{13}{8}}}-\frac{\sqrt{2}b^{\frac{5}{8}}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}-1\right)}{8\left(-a\right)^{\frac{13}{8}}}-\frac{\sqrt{2}b^{\frac{5}{8}}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}+1\right)}{8\left(-a\right)^{\frac{13}{8}}}-\frac{b^{\frac{5}{8}}\operatorname{atanh}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4\left(-a\right)^{\frac{13}{8}}}-\frac{1}{5ax^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**6/(b*x**8+a),x)
```

```
[Out] -sqrt(2)*b**(5/8)*log(-sqrt(2)*b**(1/8)*x*(-a)**(1/8) + b**(1/4)*
x**2 + (-a)**(1/4))/(16*(-a)**(13/8)) + sqrt(2)*b**(5/8)*log(sqrt
(2)*b**(1/8)*x*(-a)**(1/8) + b**(1/4)*x**2 + (-a)**(1/4))/(16*(-a
)**(13/8)) + b**(5/8)*atan(b**(1/8)*x/(-a)**(1/8))/(4*(-a)**(13/8
)) - sqrt(2)*b**(5/8)*atan(sqrt(2)*b**(1/8)*x/(-a)**(1/8) - 1)/(8
*(-a)**(13/8)) - sqrt(2)*b**(5/8)*atan(sqrt(2)*b**(1/8)*x/(-a)**(
1/8) + 1)/(8*(-a)**(13/8)) - b**(5/8)*atanh(b**(1/8)*x/(-a)**(1/8
))/(4*(-a)**(13/8)) - 1/(5*a*x**5)
```

Mathematica [A] time = 0.344398, size = 395, normalized size = 1.43

$$\frac{-8a^{5/8}+10b^{5/8}x^5\sin\left(\frac{\pi}{8}\right)\tan^{-1}\left(\frac{\sqrt[8]{b}x\sec\left(\frac{\pi}{8}\right)}{\sqrt[8]{a}}-\tan\left(\frac{\pi}{8}\right)\right)+10b^{5/8}x^5\sin\left(\frac{\pi}{8}\right)\tan^{-1}\left(\frac{\sqrt[8]{b}x\sec\left(\frac{\pi}{8}\right)}{\sqrt[8]{a}}+\tan\left(\frac{\pi}{8}\right)\right)+10b^{5/8}x^5\cos}{}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^6*(a + b*x^8)),x]
```

```
[Out] (-8*a^(5/8) + 10*b^(5/8)*x^5*ArcTan[Cot[Pi/8] - (b^(1/8)*x*Csc[Pi
/8])/a^(1/8)]*Cos[Pi/8] - 10*b^(5/8)*x^5*ArcTan[Cot[Pi/8] + (b^(1
/8)*x*Csc[Pi/8])/a^(1/8)]*Cos[Pi/8] - 5*b^(5/8)*x^5*Cos[Pi/8]*Log
[a^(1/4) + b^(1/4)*x^2 - 2*a^(1/8)*b^(1/8)*x*Sin[Pi/8]] + 5*b^(5/
8)*x^5*Cos[Pi/8]*Log[a^(1/4) + b^(1/4)*x^2 + 2*a^(1/8)*b^(1/8)*x*
Sin[Pi/8]] + 10*b^(5/8)*x^5*ArcTan[(b^(1/8)*x*Sec[Pi/8])/a^(1/8)
- Tan[Pi/8]]*Sin[Pi/8] + 10*b^(5/8)*x^5*ArcTan[(b^(1/8)*x*Sec[Pi/
8])/a^(1/8) + Tan[Pi/8]]*Sin[Pi/8] + 5*b^(5/8)*x^5*Log[a^(1/4) +
b^(1/4)*x^2 - 2*a^(1/8)*b^(1/8)*x*Cos[Pi/8]]*Sin[Pi/8] - 5*b^(5/8
)*x^5*Log[a^(1/4) + b^(1/4)*x^2 + 2*a^(1/8)*b^(1/8)*x*Cos[Pi/8]]*
Sin[Pi/8])/(40*a^(13/8)*x^5)
```

Maple [C] time = 0.008, size = 36, normalized size = 0.1

$$-\frac{1}{8a}\sum_{\_R=RootOf(\_Z^8b+a)}\frac{\ln(x-\_R)}{\_R^5}-\frac{1}{5ax^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^6/(b*x^8+a),x)
```

```
[Out] -1/8/a*sum(1/_R^5*ln(x-_R),_R=RootOf(_Z^8*b+a))-1/5/a/x^5
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{b\int\frac{x^2}{bx^8+a}\,dx}{a}-\frac{1}{5ax^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^8 + a)*x^6),x, algorithm="maxima")
```

```
[Out] -b*integrate(x^2/(b*x^8 + a), x)/a - 1/5/(a*x^5)
```

Fricas [A] time = 0.238346, size = 703, normalized size = 2.54

$$\frac{\sqrt{2}\left(20\sqrt{2}ax^5\left(-\frac{b^5}{a^{13}}\right)^{\frac{1}{8}}\arctan\left(\frac{a^5\left(-\frac{b^5}{a^{13}}\right)^{\frac{3}{8}}}{b^2x+b^2\sqrt{\frac{a^{10}\left(-\frac{b^5}{a^{13}}\right)^{\frac{3}{4}}+b^4x^2}{b^4}}}\right)+5\sqrt{2}ax^5\left(-\frac{b^5}{a^{13}}\right)^{\frac{1}{8}}\log\left(a^5\left(-\frac{b^5}{a^{13}}\right)^{\frac{3}{8}}+b^2x\right)-5\sqrt{2}ax^5\left(-\frac{b^5}{a^{13}}\right)^{\frac{1}{8}}\log\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^8 + a)*x^6),x, algorithm="fricas")
```

```
[Out] 1/80*sqrt(2)*(20*sqrt(2)*a*x^5*(-b^5/a^13)^(1/8)*arctan(a^5*(-b^5
/a^13)^(3/8)/(b^2*x + b^2*sqrt((a^10*(-b^5/a^13)^(3/4) + b^4*x^2)
/b^4))) + 5*sqrt(2)*a*x^5*(-b^5/a^13)^(1/8)*log(a^5*(-b^5/a^13)^(
3/8) + b^2*x) - 5*sqrt(2)*a*x^5*(-b^5/a^13)^(1/8)*log(-a^5*(-b^5/
a^13)^(3/8) + b^2*x) - 20*a*x^5*(-b^5/a^13)^(1/8)*arctan(a^5*(-b^
5/a^13)^(3/8)/(a^5*(-b^5/a^13)^(3/8) + sqrt(2)*b^2*x + sqrt(2)*b^
2*sqrt((a^10*(-b^5/a^13)^(3/4) + sqrt(2)*a^5*b^2*x*(-b^5/a^13)^(3
/8) + b^4*x^2)/b^4))) - 20*a*x^5*(-b^5/a^13)^(1/8)*arctan(-a^5*(-
b^5/a^13)^(3/8)/(a^5*(-b^5/a^13)^(3/8) - sqrt(2)*b^2*x - sqrt(2)*
b^2*sqrt((a^10*(-b^5/a^13)^(3/4) - sqrt(2)*a^5*b^2*x*(-b^5/a^13)^
(3/8) + b^4*x^2)/b^4))) - 5*a*x^5*(-b^5/a^13)^(1/8)*log(a^10*(-b^
5/a^13)^(3/4) + sqrt(2)*a^5*b^2*x*(-b^5/a^13)^(3/8) + b^4*x^2) +
5*a*x^5*(-b^5/a^13)^(1/8)*log(a^10*(-b^5/a^13)^(3/4) - sqrt(2)*a^
5*b^2*x*(-b^5/a^13)^(3/8) + b^4*x^2) - 8*sqrt(2))/(a*x^5)
```

Sympy [A] time = 5.4171, size = 36, normalized size = 0.13

$$\operatorname{RootSum}\left(16777216t^8a^{13}+b^5,\left(t\mapsto t\log\left(\frac{512t^3a^5}{b^2}+x\right)\right)\right)-\frac{1}{5ax^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**6/(b*x**8+a),x)
```

```
[Out] RootSum(16777216*_t**8*a**13 + b**5, Lambda(_t, _t*log(512*_t**3*
a**5/b**2 + x))) - 1/(5*a*x**5)
```

GIAC/XCAS [A] time = 0.254901, size = 601, normalized size = 2.17

$$\frac{b\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{3}{8}}\arctan\left(\frac{2x+\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a^2}+\frac{b\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{3}{8}}\arctan\left(\frac{2x-\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a^2}$$
$$-\frac{b\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{3}{8}}\arctan\left(\frac{2x+\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a^2}-\frac{b\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{3}{8}}\arctan\left(\frac{2x-\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a^2}$$
$$-\frac{b\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{3}{8}}\ln\left(x^2+x\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a^2}$$
$$+\frac{b\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{3}{8}}\ln\left(x^2-x\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a^2}$$
$$+\frac{b\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{3}{8}}\ln\left(x^2+x\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a^2}$$
$$-\frac{b\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{3}{8}}\ln\left(x^2-x\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a^2}-\frac{1}{5ax^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^8 + a)*x^6),x, algorithm="giac")
```

```
[Out] 1/8*b*sqrt(-sqrt(2) + 2)*(a/b)^(3/8)*arctan((2*x + sqrt(-sqrt(2)
+ 2)*(a/b)^(1/8))/(sqrt(sqrt(2) + 2)*(a/b)^(1/8)))/a^2 + 1/8*b*sq
rt(-sqrt(2) + 2)*(a/b)^(3/8)*arctan((2*x - sqrt(-sqrt(2) + 2)*(a/
b)^(1/8))/(sqrt(sqrt(2) + 2)*(a/b)^(1/8)))/a^2 - 1/8*b*sqrt(sqrt(
2) + 2)*(a/b)^(3/8)*arctan((2*x + sqrt(sqrt(2) + 2)*(a/b)^(1/8))/
(sqrt(-sqrt(2) + 2)*(a/b)^(1/8)))/a^2 - 1/8*b*sqrt(sqrt(2) + 2)*(
a/b)^(3/8)*arctan((2*x - sqrt(sqrt(2) + 2)*(a/b)^(1/8))/(sqrt(-sq
rt(2) + 2)*(a/b)^(1/8)))/a^2 - 1/16*b*sqrt(-sqrt(2) + 2)*(a/b)^(3
/8)*ln(x^2 + x*sqrt(sqrt(2) + 2)*(a/b)^(1/8) + (a/b)^(1/4))/a^2 +
 1/16*b*sqrt(-sqrt(2) + 2)*(a/b)^(3/8)*ln(x^2 - x*sqrt(sqrt(2) +
2)*(a/b)^(1/8) + (a/b)^(1/4))/a^2 + 1/16*b*sqrt(sqrt(2) + 2)*(a/b
)^(3/8)*ln(x^2 + x*sqrt(-sqrt(2) + 2)*(a/b)^(1/8) + (a/b)^(1/4))/
a^2 - 1/16*b*sqrt(sqrt(2) + 2)*(a/b)^(3/8)*ln(x^2 - x*sqrt(-sqrt(
2) + 2)*(a/b)^(1/8) + (a/b)^(1/4))/a^2 - 1/5/(a*x^5)
```

3.1467 $\int \frac{1}{x^8(a+bx^8)}\,dx$

Optimal. Leaf size=277

$$\frac{b^{7/8}\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}(-a)^{15/8}}-\frac{b^{7/8}\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}(-a)^{15/8}}-\frac{b^{7/8}\tan^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4(-a)^{15/8}}+\frac{b^{7/8}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4\sqrt{2}(-a)^{15/8}}-\frac{b^{7/8}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}+1\right)}{4\sqrt{2}(-a)^{15/8}}-\frac{b^{7/8}\tanh^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4(-a)^{15/8}}-\frac{1}{7ax^7}$$

```
[Out] -1/(7*a*x^7) - (b^(7/8)*ArcTan[(b^(1/8)*x)/(-a)^(1/8)])/(4*(-a)^(
15/8)) + (b^(7/8)*ArcTan[1 - (Sqrt[2]*b^(1/8)*x)/(-a)^(1/8)])/(4*
Sqrt[2]*(-a)^(15/8)) - (b^(7/8)*ArcTan[1 + (Sqrt[2]*b^(1/8)*x)/(-
a)^(1/8)])/(4*Sqrt[2]*(-a)^(15/8)) - (b^(7/8)*ArcTanh[(b^(1/8)*x)
/(-a)^(1/8)])/(4*(-a)^(15/8)) + (b^(7/8)*Log[(-a)^(1/4) - Sqrt[2]
*(-a)^(1/8)*b^(1/8)*x + b^(1/4)*x^2])/(8*Sqrt[2]*(-a)^(15/8)) - (
b^(7/8)*Log[(-a)^(1/4) + Sqrt[2]*(-a)^(1/8)*b^(1/8)*x + b^(1/4)*x
^2])/(8*Sqrt[2]*(-a)^(15/8))
```

Rubi [A] time = 0.514474, antiderivative size = 277, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 11, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.846

$$\frac{b^{7/8}\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}(-a)^{15/8}}-\frac{b^{7/8}\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}(-a)^{15/8}}-\frac{b^{7/8}\tan^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4(-a)^{15/8}}+\frac{b^{7/8}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4\sqrt{2}(-a)^{15/8}}-\frac{b^{7/8}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}+1\right)}{4\sqrt{2}(-a)^{15/8}}-\frac{b^{7/8}\tanh^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4(-a)^{15/8}}-\frac{1}{7ax^7}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^8*(a + b*x^8)),x]
```

```
[Out] -1/(7*a*x^7) - (b^(7/8)*ArcTan[(b^(1/8)*x)/(-a)^(1/8)])/(4*(-a)^(
15/8)) + (b^(7/8)*ArcTan[1 - (Sqrt[2]*b^(1/8)*x)/(-a)^(1/8)])/(4*
Sqrt[2]*(-a)^(15/8)) - (b^(7/8)*ArcTan[1 + (Sqrt[2]*b^(1/8)*x)/(-
a)^(1/8)])/(4*Sqrt[2]*(-a)^(15/8)) - (b^(7/8)*ArcTanh[(b^(1/8)*x)
/(-a)^(1/8)])/(4*(-a)^(15/8)) + (b^(7/8)*Log[(-a)^(1/4) - Sqrt[2]
*(-a)^(1/8)*b^(1/8)*x + b^(1/4)*x^2])/(8*Sqrt[2]*(-a)^(15/8)) - (
b^(7/8)*Log[(-a)^(1/4) + Sqrt[2]*(-a)^(1/8)*b^(1/8)*x + b^(1/4)*x
^2])/(8*Sqrt[2]*(-a)^(15/8))
```

Rubi in Sympy [A] time = 115.804, size = 255, normalized size = 0.92

$$\frac{\sqrt{2}b^{\frac{7}{8}}\log\left(-\sqrt{2}\sqrt[8]{b}x\sqrt[8]{-a}+\sqrt[4]{b}x^2+\sqrt[4]{-a}\right)}{16\left(-a\right)^{\frac{15}{8}}}-\frac{\sqrt{2}b^{\frac{7}{8}}\log\left(\sqrt{2}\sqrt[8]{b}x\sqrt[8]{-a}+\sqrt[4]{b}x^2+\sqrt[4]{-a}\right)}{16\left(-a\right)^{\frac{15}{8}}}-\frac{b^{\frac{7}{8}}\operatorname{atan}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4\left(-a\right)^{\frac{15}{8}}}-\frac{\sqrt{2}b^{\frac{7}{8}}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}-1\right)}{8\left(-a\right)^{\frac{15}{8}}}-\frac{\sqrt{2}b^{\frac{7}{8}}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{-a}}+1\right)}{8\left(-a\right)^{\frac{15}{8}}}-\frac{b^{\frac{7}{8}}\operatorname{atanh}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{-a}}\right)}{4\left(-a\right)^{\frac{15}{8}}}-\frac{1}{7ax^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**8/(b*x**8+a),x)
```

```
[Out] sqrt(2)*b**(7/8)*log(-sqrt(2)*b**(1/8)*x*(-a)**(1/8) + b**(1/4)*x
**2 + (-a)**(1/4))/(16*(-a)**(15/8)) - sqrt(2)*b**(7/8)*log(sqrt(
2)*b**(1/8)*x*(-a)**(1/8) + b**(1/4)*x**2 + (-a)**(1/4))/(16*(-a)
**(15/8)) - b**(7/8)*atan(b**(1/8)*x/(-a)**(1/8))/(4*(-a)**(15/8)
) - sqrt(2)*b**(7/8)*atan(sqrt(2)*b**(1/8)*x/(-a)**(1/8) - 1)/(8*
(-a)**(15/8)) - sqrt(2)*b**(7/8)*atan(sqrt(2)*b**(1/8)*x/(-a)**(1
/8) + 1)/(8*(-a)**(15/8)) - b**(7/8)*atanh(b**(1/8)*x/(-a)**(1/8)
)/(4*(-a)**(15/8)) - 1/(7*a*x**7)
```

Mathematica [A] time = 0.563118, size = 395, normalized size = 1.43

$$-\frac{8a^{7/8}+14b^{7/8}x^7\cos\left(\frac{\pi}{8}\right)\tan^{-1}\left(\frac{\sqrt[8]{b}x\sec\left(\frac{\pi}{8}\right)}{\sqrt[8]{a}}-\tan\left(\frac{\pi}{8}\right)\right)+14b^{7/8}x^7\cos\left(\frac{\pi}{8}\right)\tan^{-1}\left(\frac{\sqrt[8]{b}x\sec\left(\frac{\pi}{8}\right)}{\sqrt[8]{a}}+\tan\left(\frac{\pi}{8}\right)\right)-14b^{7/8}x^7\sin}{}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^8*(a + b*x^8)),x]
```

```
[Out] -(8*a^(7/8) + 14*b^(7/8)*x^7*ArcTan[(b^(1/8)*x*Sec[Pi/8])/a^(1/8)
 - Tan[Pi/8]]*Cos[Pi/8] + 14*b^(7/8)*x^7*ArcTan[(b^(1/8)*x*Sec[Pi
/8])/a^(1/8) + Tan[Pi/8]]*Cos[Pi/8] - 7*b^(7/8)*x^7*Cos[Pi/8]*Log
[a^(1/4) + b^(1/4)*x^2 - 2*a^(1/8)*b^(1/8)*x*Cos[Pi/8]] + 7*b^(7/
8)*x^7*Cos[Pi/8]*Log[a^(1/4) + b^(1/4)*x^2 + 2*a^(1/8)*b^(1/8)*x*
Cos[Pi/8]] - 14*b^(7/8)*x^7*ArcTan[Cot[Pi/8] - (b^(1/8)*x*Csc[Pi/
8])/a^(1/8)]*Sin[Pi/8] + 14*b^(7/8)*x^7*ArcTan[Cot[Pi/8] + (b^(1/
8)*x*Csc[Pi/8])/a^(1/8)]*Sin[Pi/8] - 7*b^(7/8)*x^7*Log[a^(1/4) +
b^(1/4)*x^2 - 2*a^(1/8)*b^(1/8)*x*Sin[Pi/8]]*Sin[Pi/8] + 7*b^(7/8
)*x^7*Log[a^(1/4) + b^(1/4)*x^2 + 2*a^(1/8)*b^(1/8)*x*Sin[Pi/8]]*
Sin[Pi/8])/(56*a^(15/8)*x^7)
```

Maple [C] time = 0.007, size = 36, normalized size = 0.1

$$-\frac{1}{8\,a}\sum_{\_R=RootOf\left(\_Z^8b+a\right)}\frac{\ln\left(x-\_R\right)}{\_R^7}-\frac{1}{7\,ax^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^8/(b*x^8+a),x)
```

```
[Out] -1/8/a*sum(1/_R^7*ln(x-_R),_R=RootOf(_Z^8*b+a))-1/7/a/x^7
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{b\int\frac{1}{bx^8+a}\,dx}{a}-\frac{1}{7\,ax^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^8 + a)*x^8),x, algorithm="maxima")
```

```
[Out] -b*integrate(1/(b*x^8 + a), x)/a - 1/7/(a*x^7)
```

Fricas [A] time = 0.242872, size = 671, normalized size = 2.42

$$\frac{\sqrt{2}\left(28\sqrt{2}ax^7\left(-\frac{b^7}{a^{15}}\right)^{\frac{1}{8}}\arctan\left(\frac{a^2\left(-\frac{b^7}{a^{15}}\right)^{\frac{1}{8}}}{bx+b\sqrt{\frac{a^4\left(-\frac{b^7}{a^{15}}\right)^{\frac{1}{4}}+b^2x^2}{b^2}}}\right)-7\sqrt{2}ax^7\left(-\frac{b^7}{a^{15}}\right)^{\frac{1}{8}}\log\left(a^2\left(-\frac{b^7}{a^{15}}\right)^{\frac{1}{8}}+bx\right)+7\sqrt{2}ax^7\left(-\frac{b^7}{a^{15}}\right)^{\frac{1}{8}}\log\left(-a\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^8 + a)*x^8),x, algorithm="fricas")
```

```
[Out] 1/112*sqrt(2)*(28*sqrt(2)*a*x^7*(-b^7/a^15)^(1/8)*arctan(a^2*(-b^
7/a^15)^(1/8)/(b*x + b*sqrt((a^4*(-b^7/a^15)^(1/4) + b^2*x^2)/b^2
))) - 7*sqrt(2)*a*x^7*(-b^7/a^15)^(1/8)*log(a^2*(-b^7/a^15)^(1/8)
 + b*x) + 7*sqrt(2)*a*x^7*(-b^7/a^15)^(1/8)*log(-a^2*(-b^7/a^15)^
(1/8) + b*x) + 28*a*x^7*(-b^7/a^15)^(1/8)*arctan(a^2*(-b^7/a^15)^
(1/8)/(sqrt(2)*b*x + a^2*(-b^7/a^15)^(1/8) + sqrt(2)*b*sqrt((sqrt
(2)*a^2*b*x*(-b^7/a^15)^(1/8) + a^4*(-b^7/a^15)^(1/4) + b^2*x^2)/
b^2))) + 28*a*x^7*(-b^7/a^15)^(1/8)*arctan(a^2*(-b^7/a^15)^(1/8)/
(sqrt(2)*b*x - a^2*(-b^7/a^15)^(1/8) + sqrt(2)*b*sqrt(-(sqrt(2)*a
^2*b*x*(-b^7/a^15)^(1/8) - a^4*(-b^7/a^15)^(1/4) - b^2*x^2)/b^2))
) - 7*a*x^7*(-b^7/a^15)^(1/8)*log(sqrt(2)*a^2*b*x*(-b^7/a^15)^(1/
8) + a^4*(-b^7/a^15)^(1/4) + b^2*x^2) + 7*a*x^7*(-b^7/a^15)^(1/8)
*log(-sqrt(2)*a^2*b*x*(-b^7/a^15)^(1/8) + a^4*(-b^7/a^15)^(1/4) +
 b^2*x^2) - 8*sqrt(2))/(a*x^7)
```

Sympy [A] time = 15.228, size = 32, normalized size = 0.12

$$\operatorname{RootSum}\left(16777216t^8a^{15}+b^7,\left(t\mapsto t\log\left(-\frac{8ta^2}{b}+x\right)\right)\right)-\frac{1}{7ax^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**8/(b*x**8+a),x)
```

```
[Out] RootSum(16777216*_t**8*a**15 + b**7, Lambda(_t, _t*log(-8*_t*a**2
/b + x))) - 1/(7*a*x**7)
```

GIAC/XCAS [A] time = 0.236106, size = 601, normalized size = 2.17

$$-\frac{b\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}\arctan\left(\frac{2x+\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a^2}-\frac{b\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}\arctan\left(\frac{2x-\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a^2}$$
$$-\frac{b\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}\arctan\left(\frac{2x+\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a^2}-\frac{b\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}\arctan\left(\frac{2x-\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a^2}$$
$$-\frac{b\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}\ln\left(x^2+x\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a^2}$$
$$+\frac{b\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}\ln\left(x^2-x\sqrt{\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a^2}$$
$$-\frac{b\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}\ln\left(x^2+x\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a^2}$$
$$+\frac{b\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}\ln\left(x^2-x\sqrt{-\sqrt{2}+2}\left(\frac{a}{b}\right)^{\frac{1}{8}}+\left(\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a^2}-\frac{1}{7ax^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^8 + a)*x^8),x, algorithm="giac")
```

```
[Out] -1/8*b*sqrt(sqrt(2) + 2)*(a/b)^(1/8)*arctan((2*x + sqrt(-sqrt(2)
+ 2)*(a/b)^(1/8))/(sqrt(sqrt(2) + 2)*(a/b)^(1/8)))/a^2 - 1/8*b*sq
rt(sqrt(2) + 2)*(a/b)^(1/8)*arctan((2*x - sqrt(-sqrt(2) + 2)*(a/b
)^(1/8))/(sqrt(sqrt(2) + 2)*(a/b)^(1/8)))/a^2 - 1/8*b*sqrt(-sqrt(
2) + 2)*(a/b)^(1/8)*arctan((2*x + sqrt(sqrt(2) + 2)*(a/b)^(1/8))/
(sqrt(-sqrt(2) + 2)*(a/b)^(1/8)))/a^2 - 1/8*b*sqrt(-sqrt(2) + 2)*
(a/b)^(1/8)*arctan((2*x - sqrt(sqrt(2) + 2)*(a/b)^(1/8))/(sqrt(-s
qrt(2) + 2)*(a/b)^(1/8)))/a^2 - 1/16*b*sqrt(sqrt(2) + 2)*(a/b)^(1
/8)*ln(x^2 + x*sqrt(sqrt(2) + 2)*(a/b)^(1/8) + (a/b)^(1/4))/a^2 +
 1/16*b*sqrt(sqrt(2) + 2)*(a/b)^(1/8)*ln(x^2 - x*sqrt(sqrt(2) + 2
)*(a/b)^(1/8) + (a/b)^(1/4))/a^2 - 1/16*b*sqrt(-sqrt(2) + 2)*(a/b
)^(1/8)*ln(x^2 + x*sqrt(-sqrt(2) + 2)*(a/b)^(1/8) + (a/b)^(1/4))/
a^2 + 1/16*b*sqrt(-sqrt(2) + 2)*(a/b)^(1/8)*ln(x^2 - x*sqrt(-sqrt
(2) + 2)*(a/b)^(1/8) + (a/b)^(1/4))/a^2 - 1/7/(a*x^7)
```

3.1468 $\int \frac{1}{a-bx^8}\,dx$

Optimal. Leaf size=239

$$-\frac{\log\left(-\sqrt{2}\sqrt[8]{a}\sqrt[8]{b}x+\sqrt[4]{a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}a^{7/8}\sqrt[8]{b}}+\frac{\log\left(\sqrt{2}\sqrt[8]{a}\sqrt[8]{b}x+\sqrt[4]{a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}a^{7/8}\sqrt[8]{b}}+\frac{\tan^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{a}}\right)}{4a^{7/8}\sqrt[8]{b}}-\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{a}}\right)}{4\sqrt{2}a^{7/8}\sqrt[8]{b}}+\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{a}}+1\right)}{4\sqrt{2}a^{7/8}\sqrt[8]{b}}+\frac{\tanh^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{a}}\right)}{4a^{7/8}\sqrt[8]{b}}$$

```
[Out] ArcTan[(b^(1/8)*x)/a^(1/8)]/(4*a^(7/8)*b^(1/8)) - ArcTan[1 - (Sqr
t[2]*b^(1/8)*x)/a^(1/8)]/(4*Sqrt[2]*a^(7/8)*b^(1/8)) + ArcTan[1 +
 (Sqrt[2]*b^(1/8)*x)/a^(1/8)]/(4*Sqrt[2]*a^(7/8)*b^(1/8)) + ArcTa
nh[(b^(1/8)*x)/a^(1/8)]/(4*a^(7/8)*b^(1/8)) - Log[a^(1/4) - Sqrt[
2]*a^(1/8)*b^(1/8)*x + b^(1/4)*x^2]/(8*Sqrt[2]*a^(7/8)*b^(1/8)) +
 Log[a^(1/4) + Sqrt[2]*a^(1/8)*b^(1/8)*x + b^(1/4)*x^2]/(8*Sqrt[2
]*a^(7/8)*b^(1/8))
```

Rubi [A] time = 0.377881, antiderivative size = 239, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 10, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}} = 1.$

$$-\frac{\log\left(-\sqrt{2}\sqrt[8]{a}\sqrt[8]{b}x+\sqrt[4]{a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}a^{7/8}\sqrt[8]{b}}+\frac{\log\left(\sqrt{2}\sqrt[8]{a}\sqrt[8]{b}x+\sqrt[4]{a}+\sqrt[4]{b}x^2\right)}{8\sqrt{2}a^{7/8}\sqrt[8]{b}}+\frac{\tan^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{a}}\right)}{4a^{7/8}\sqrt[8]{b}}-\frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{a}}\right)}{4\sqrt{2}a^{7/8}\sqrt[8]{b}}+\frac{\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{a}}+1\right)}{4\sqrt{2}a^{7/8}\sqrt[8]{b}}+\frac{\tanh^{-1}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{a}}\right)}{4a^{7/8}\sqrt[8]{b}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a - b*x^8)^(-1),x]
```

```
[Out] ArcTan[(b^(1/8)*x)/a^(1/8)]/(4*a^(7/8)*b^(1/8)) - ArcTan[1 - (Sqr
t[2]*b^(1/8)*x)/a^(1/8)]/(4*Sqrt[2]*a^(7/8)*b^(1/8)) + ArcTan[1 +
 (Sqrt[2]*b^(1/8)*x)/a^(1/8)]/(4*Sqrt[2]*a^(7/8)*b^(1/8)) + ArcTa
nh[(b^(1/8)*x)/a^(1/8)]/(4*a^(7/8)*b^(1/8)) - Log[a^(1/4) - Sqrt[
2]*a^(1/8)*b^(1/8)*x + b^(1/4)*x^2]/(8*Sqrt[2]*a^(7/8)*b^(1/8)) +
 Log[a^(1/4) + Sqrt[2]*a^(1/8)*b^(1/8)*x + b^(1/4)*x^2]/(8*Sqrt[2
]*a^(7/8)*b^(1/8))
```

Rubi in Sympy [A] time = 73.1661, size = 223, normalized size = 0.93

$$-\frac{\sqrt{2}\log\left(-\sqrt{2}\sqrt[8]{a}\sqrt[8]{b}x+\sqrt[4]{a}+\sqrt[4]{b}x^2\right)}{16a^{\frac{7}{8}}\sqrt[8]{b}}+\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt[8]{a}\sqrt[8]{b}x+\sqrt[4]{a}+\sqrt[4]{b}x^2\right)}{16a^{\frac{7}{8}}\sqrt[8]{b}}+\frac{\operatorname{atan}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{a}}\right)}{4a^{\frac{7}{8}}\sqrt[8]{b}}-\frac{\sqrt{2}\operatorname{atan}\left(1-\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{a}}\right)}{8a^{\frac{7}{8}}\sqrt[8]{b}}+\frac{\sqrt{2}\operatorname{atan}\left(1+\frac{\sqrt{2}\sqrt[8]{b}x}{\sqrt[8]{a}}\right)}{8a^{\frac{7}{8}}\sqrt[8]{b}}+\frac{\operatorname{atanh}\left(\frac{\sqrt[8]{b}x}{\sqrt[8]{a}}\right)}{4a^{\frac{7}{8}}\sqrt[8]{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(-b*x**8+a),x)
```

```
[Out] -sqrt(2)*log(-sqrt(2)*a**(1/8)*b**(1/8)*x + a**(1/4) + b**(1/4)*x
**2)/(16*a**(7/8)*b**(1/8)) + sqrt(2)*log(sqrt(2)*a**(1/8)*b**(1/
8)*x + a**(1/4) + b**(1/4)*x**2)/(16*a**(7/8)*b**(1/8)) + atan(b*
*(1/8)*x/a**(1/8))/(4*a**(7/8)*b**(1/8)) - sqrt(2)*atan(1 - sqrt(
2)*b**(1/8)*x/a**(1/8))/(8*a**(7/8)*b**(1/8)) + sqrt(2)*atan(1 +
sqrt(2)*b**(1/8)*x/a**(1/8))/(8*a**(7/8)*b**(1/8)) + atanh(b**(1/
```

```
8)*x/a**(1/8))/(4*a**(7/8)*b**(1/8))
```

Mathematica [A] time = 0.101395, size = 198, normalized size = 0.83

$$\frac{-\sqrt{2}\log\left(-\sqrt{2}\sqrt[8]{a}\sqrt[8]{b}x+\sqrt[4]{a}+\sqrt[4]{b}x^2\right)+\sqrt{2}\log\left(\sqrt{2}\sqrt[8]{a}\sqrt[8]{b}x+\sqrt[4]{a}+\sqrt[4]{b}x^2\right)-2\log\left(\sqrt[8]{a}-\sqrt[8]{b}x\right)+2\log\left(\sqrt[8]{a}+\sqrt[8]{b}x\right)+4\tan^{-1}}{16a^{7/8}\sqrt[8]{b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a - b*x^8)^(-1),x]

[Out] (4*ArcTan[(b^(1/8)*x)/a^(1/8)] - 2*Sqrt[2]*ArcTan[1 - (Sqrt[2]*b^
(1/8)*x)/a^(1/8)] + 2*Sqrt[2]*ArcTan[1 + (Sqrt[2]*b^(1/8)*x)/a^(1
/8)] - 2*Log[a^(1/8) - b^(1/8)*x] + 2*Log[a^(1/8) + b^(1/8)*x] -
Sqrt[2]*Log[a^(1/4) - Sqrt[2]*a^(1/8)*b^(1/8)*x + b^(1/4)*x^2] +
Sqrt[2]*Log[a^(1/4) + Sqrt[2]*a^(1/8)*b^(1/8)*x + b^(1/4)*x^2])/(
16*a^(7/8)*b^(1/8))
```

Maple [C] time = 0.019, size = 29, normalized size = 0.1

$$-\frac{1}{8b}\sum_{\_R=RootOf(b\_Z^8-a)}\frac{\ln(x-\_R)}{\_R^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(-b*x^8+a),x)

[Out] -1/8/b*sum(1/_R^7*ln(x-_R),_R=RootOf(_Z^8*b-a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\int\frac{1}{bx^8-a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(b*x^8 - a),x, algorithm="maxima")

[Out] -integrate(1/(b*x^8 - a), x)
```

Fricas [A] time = 0.236282, size = 487, normalized size = 2.04

$$-\frac{1}{16}\sqrt{2}\left(4\sqrt{2}\left(\frac{1}{a^7b}\right)^{\frac{1}{8}}\arctan\left(\frac{a\left(\frac{1}{a^7b}\right)^{\frac{1}{8}}}{x+\sqrt{a^2\left(\frac{1}{a^7b}\right)^{\frac{1}{4}}+x^2}}\right)-\sqrt{2}\left(\frac{1}{a^7b}\right)^{\frac{1}{8}}\log\left(a\left(\frac{1}{a^7b}\right)^{\frac{1}{8}}+x\right)+\sqrt{2}\left(\frac{1}{a^7b}\right)^{\frac{1}{8}}\log\left(-a\left(\frac{1}{a^7b}\right)^{\frac{1}{8}}+x\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(b*x^8 - a),x, algorithm="fricas")

[Out] -1/16*sqrt(2)*(4*sqrt(2)*(1/(a^7*b))^(1/8)*arctan(a*(1/(a^7*b))^(
1/8)/(x + sqrt(a^2*(1/(a^7*b))^(1/4) + x^2))) - sqrt(2)*(1/(a^7*b
```

```
))^(1/8)*log(a*(1/(a^7*b))^(1/8) + x) + sqrt(2)*(1/(a^7*b))^(1/8)
*log(-a*(1/(a^7*b))^(1/8) + x) + 4*(1/(a^7*b))^(1/8)*arctan(a*(1/
(a^7*b))^(1/8)/(sqrt(2)*x + a*(1/(a^7*b))^(1/8) + sqrt(2)*sqrt(sq
rt(2)*a*x*(1/(a^7*b))^(1/8) + a^2*(1/(a^7*b))^(1/4) + x^2))) + 4*
(1/(a^7*b))^(1/8)*arctan(a*(1/(a^7*b))^(1/8)/(sqrt(2)*x - a*(1/(a
^7*b))^(1/8) + sqrt(2)*sqrt(-sqrt(2)*a*x*(1/(a^7*b))^(1/8) + a^2*
(1/(a^7*b))^(1/4) + x^2))) - (1/(a^7*b))^(1/8)*log(sqrt(2)*a*x*(1
/(a^7*b))^(1/8) + a^2*(1/(a^7*b))^(1/4) + x^2) + (1/(a^7*b))^(1/8
)*log(-sqrt(2)*a*x*(1/(a^7*b))^(1/8) + a^2*(1/(a^7*b))^(1/4) + x^
2))
```

Sympy [A] time = 0.498425, size = 22, normalized size = 0.09

$$-\operatorname{RootSum}\left(16777216t^8a^7b-1,\left(t\mapsto t\log\left(-8ta+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(-b*x**8+a),x)
```

```
[Out] -RootSum(16777216*_t**8*a**7*b - 1, Lambda(_t, _t*log(-8*_t*a + x
)))
```

GIAC/XCAS [A] time = 0.227837, size = 612, normalized size = 2.56

$$\frac{\sqrt{\sqrt{2}+2}\left(-\frac{a}{b}\right)^{\frac{1}{8}}\arctan\left(\frac{2x+\sqrt{-\sqrt{2}+2}\left(-\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{\sqrt{2}+2}\left(-\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a}+\frac{\sqrt{\sqrt{2}+2}\left(-\frac{a}{b}\right)^{\frac{1}{8}}\arctan\left(\frac{2x-\sqrt{-\sqrt{2}+2}\left(-\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{\sqrt{2}+2}\left(-\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a}+\frac{\sqrt{-\sqrt{2}+2}\left(-\frac{a}{b}\right)^{\frac{1}{8}}\arctan\left(\frac{2x+\sqrt{\sqrt{2}+2}\left(-\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{-\sqrt{2}+2}\left(-\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a}+\frac{\sqrt{-\sqrt{2}+2}\left(-\frac{a}{b}\right)^{\frac{1}{8}}\arctan\left(\frac{2x-\sqrt{\sqrt{2}+2}\left(-\frac{a}{b}\right)^{\frac{1}{8}}}{\sqrt{-\sqrt{2}+2}\left(-\frac{a}{b}\right)^{\frac{1}{8}}}\right)}{8a}+\frac{\sqrt{\sqrt{2}+2}\left(-\frac{a}{b}\right)^{\frac{1}{8}}\ln\left(x^2+x\sqrt{\sqrt{2}+2}\left(-\frac{a}{b}\right)^{\frac{1}{8}}+\left(-\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a}-\frac{\sqrt{\sqrt{2}+2}\left(-\frac{a}{b}\right)^{\frac{1}{8}}\ln\left(x^2-x\sqrt{\sqrt{2}+2}\left(-\frac{a}{b}\right)^{\frac{1}{8}}+\left(-\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a}+\frac{\sqrt{-\sqrt{2}+2}\left(-\frac{a}{b}\right)^{\frac{1}{8}}\ln\left(x^2+x\sqrt{-\sqrt{2}+2}\left(-\frac{a}{b}\right)^{\frac{1}{8}}+\left(-\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a}-\frac{\sqrt{-\sqrt{2}+2}\left(-\frac{a}{b}\right)^{\frac{1}{8}}\ln\left(x^2-x\sqrt{-\sqrt{2}+2}\left(-\frac{a}{b}\right)^{\frac{1}{8}}+\left(-\frac{a}{b}\right)^{\frac{1}{4}}\right)}{16a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(b*x^8 - a),x, algorithm="giac")
```

```
[Out] 1/8*sqrt(sqrt(2) + 2)*(-a/b)^(1/8)*arctan((2*x + sqrt(-sqrt(2) +
2)*(-a/b)^(1/8))/(sqrt(sqrt(2) + 2)*(-a/b)^(1/8)))/a + 1/8*sqrt(s
qrt(2) + 2)*(-a/b)^(1/8)*arctan((2*x - sqrt(-sqrt(2) + 2)*(-a/b)^
(1/8))/(sqrt(sqrt(2) + 2)*(-a/b)^(1/8)))/a + 1/8*sqrt(-sqrt(2) +
2)*(-a/b)^(1/8)*arctan((2*x + sqrt(sqrt(2) + 2)*(-a/b)^(1/8))/(sq
rt(-sqrt(2) + 2)*(-a/b)^(1/8)))/a + 1/8*sqrt(-sqrt(2) + 2)*(-a/b)
^(1/8)*arctan((2*x - sqrt(sqrt(2) + 2)*(-a/b)^(1/8))/(sqrt(-sqrt(
2) + 2)*(-a/b)^(1/8)))/a + 1/16*sqrt(sqrt(2) + 2)*(-a/b)^(1/8)*ln
(x^2 + x*sqrt(sqrt(2) + 2)*(-a/b)^(1/8) + (-a/b)^(1/4))/a - 1/16*
sqrt(sqrt(2) + 2)*(-a/b)^(1/8)*ln(x^2 - x*sqrt(sqrt(2) + 2)*(-a/b
)^(1/8) + (-a/b)^(1/4))/a + 1/16*sqrt(-sqrt(2) + 2)*(-a/b)^(1/8)*
ln(x^2 + x*sqrt(-sqrt(2) + 2)*(-a/b)^(1/8) + (-a/b)^(1/4))/a - 1/
16*sqrt(-sqrt(2) + 2)*(-a/b)^(1/8)*ln(x^2 - x*sqrt(-sqrt(2) + 2)*
(-a/b)^(1/8) + (-a/b)^(1/4))/a
```

3.1469 $\int \frac{x^9}{1-x^8} dx$

Optimal. Leaf size=24

$$-\frac{x^2}{2}+\frac{1}{4}\tan^{-1}\left(x^2\right)+\frac{1}{4}\tanh^{-1}\left(x^2\right)$$

```
[Out] -x^2/2 + ArcTan[x^2]/4 + ArcTanh[x^2]/4
```

Rubi [A] time = 0.033891, antiderivative size = 24, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385

$$-\frac{x^2}{2}+\frac{1}{4}\tan^{-1}\left(x^2\right)+\frac{1}{4}\tanh^{-1}\left(x^2\right)$$

Antiderivative was successfully verified.

```
[In] Int[x^9/(1 - x^8),x]

[Out] -x^2/2 + ArcTan[x^2]/4 + ArcTanh[x^2]/4
```

Rubi in Sympy [A] time = 5.43591, size = 17, normalized size = 0.71

$$-\frac{x^2}{2}+\frac{\operatorname{atan}\left(x^2\right)}{4}+\frac{\operatorname{atanh}\left(x^2\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**9/(-x**8+1),x)

[Out] -x**2/2 + atan(x**2)/4 + atanh(x**2)/4
```

Mathematica [A] time = 0.0105908, size = 38, normalized size = 1.58

$$-\frac{x^2}{2}-\frac{1}{8}\log\left(1-x^2\right)+\frac{1}{8}\log\left(x^2+1\right)-\frac{1}{4}\tan^{-1}\left(\frac{1}{x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^9/(1 - x^8),x]

[Out] -x^2/2 - ArcTan[x^(-2)]/4 - Log[1 - x^2]/8 + Log[1 + x^2]/8
```

Maple [A] time = 0.009, size = 33, normalized size = 1.4

$$-\frac{x^2}{2}-\frac{\ln(-1+x)}{8}-\frac{\ln(1+x)}{8}+\frac{\ln\left(x^2+1\right)}{8}+\frac{\arctan\left(x^2\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^9/(-x^8+1),x)

[Out] -1/2*x^2-1/8*ln(-1+x)-1/8*ln(1+x)+1/8*ln(x^2+1)+1/4*arctan(x^2)
```

Maxima [A] time = 1.58964, size = 38, normalized size = 1.58

$$-\frac{1}{2}\,x^{2}+\frac{1}{4}\,\arctan\left(x^{2}\right)+\frac{1}{8}\,\log\left(x^{2}+1\right)-\frac{1}{8}\,\log\left(x^{2}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^9/(x^8 - 1),x, algorithm="maxima")

[Out] -1/2*x^2 + 1/4*arctan(x^2) + 1/8*log(x^2 + 1) - 1/8*log(x^2 - 1)
```

Fricas [A] time = 0.229462, size = 38, normalized size = 1.58

$$-\frac{1}{2}\,x^{2}+\frac{1}{4}\,\arctan\left(x^{2}\right)+\frac{1}{8}\,\log\left(x^{2}+1\right)-\frac{1}{8}\,\log\left(x^{2}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^9/(x^8 - 1),x, algorithm="fricas")

[Out] -1/2*x^2 + 1/4*arctan(x^2) + 1/8*log(x^2 + 1) - 1/8*log(x^2 - 1)
```

Sympy [A] time = 0.411876, size = 27, normalized size = 1.12

$$-\frac{x^{2}}{2}-\frac{\log\left(x^{2}-1\right)}{8}+\frac{\log\left(x^{2}+1\right)}{8}+\frac{\operatorname{atan}\left(x^{2}\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**9/(-x**8+1),x)

[Out] -x**2/2 - log(x**2 - 1)/8 + log(x**2 + 1)/8 + atan(x**2)/4
```

GIAC/XCAS [A] time = 0.221796, size = 39, normalized size = 1.62

$$-\frac{1}{2}\,x^{2}+\frac{1}{4}\,\arctan\left(x^{2}\right)+\frac{1}{8}\,\ln\left(x^{2}+1\right)-\frac{1}{8}\,\ln\left(\left|x^{2}-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^9/(x^8 - 1),x, algorithm="giac")

[Out] -1/2*x^2 + 1/4*arctan(x^2) + 1/8*ln(x^2 + 1) - 1/8*ln(abs(x^2 - 1
))
```

3.1470 $\int \frac{x^7}{1-x^8} dx$

Optimal. Leaf size=12

$$-\frac{1}{8}\log\left(1-x^8\right)$$

```
[Out] -Log[1 - x^8]/8
```

Rubi [A] time = 0.00751128, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{1}{8}\log\left(1-x^8\right)$$

Antiderivative was successfully verified.

```
[In] Int[x^7/(1 - x^8),x]

[Out] -Log[1 - x^8]/8
```

Rubi in Sympy [A] time = 2.22334, size = 20, normalized size = 1.67

$$-\frac{\log\left((x-1)(x+1)\left(x^2+1\right)\left(x^4+1\right)\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**7/(-x**8+1),x)

[Out] -log((x - 1)*(x + 1)*(x**2 + 1)*(x**4 + 1))/8
```

Mathematica [A] time = 0.00494406, size = 12, normalized size = 1.

$$-\frac{1}{8}\log\left(1-x^8\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^7/(1 - x^8),x]

[Out] -Log[1 - x^8]/8
```

Maple [B] time = 0.008, size = 30, normalized size = 2.5

$$-\frac{\ln(-1+x)}{8}-\frac{\ln(1+x)}{8}-\frac{\ln\left(x^2+1\right)}{8}-\frac{\ln\left(x^4+1\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^7/(-x^8+1),x)

[Out] -1/8*ln(-1+x)-1/8*ln(1+x)-1/8*ln(x^2+1)-1/8*ln(x^4+1)
```

Maxima [A] time = 1.41372, size = 11, normalized size = 0.92

$$-\frac{1}{8}\log\left(x^8-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^7/(x^8 - 1),x, algorithm="maxima")
```

```
[Out] -1/8*log(x^8 - 1)
```

Fricas [A] time = 0.209998, size = 11, normalized size = 0.92

$$-\frac{1}{8}\log\left(x^8-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^7/(x^8 - 1),x, algorithm="fricas")
```

```
[Out] -1/8*log(x^8 - 1)
```

Sympy [A] time = 0.238359, size = 8, normalized size = 0.67

$$-\frac{\log\left(x^8-1\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(-x**8+1),x)
```

```
[Out] -log(x**8 - 1)/8
```

GIAC/XCAS [A] time = 0.219962, size = 12, normalized size = 1.

$$-\frac{1}{8}\ln\left(\left|x^8-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^7/(x^8 - 1),x, algorithm="giac")
```

```
[Out] -1/8*ln(abs(x^8 - 1))
```

3.1471 $\int \frac{x^5}{1-x^8} \, dx$

Optimal. Leaf size=17

$$\frac{1}{4} \tanh^{-1}\left(x^2\right) - \frac{1}{4} \tan^{-1}\left(x^2\right)$$

```
[Out] -ArcTan[x^2]/4 + ArcTanh[x^2]/4
```

Rubi [A] time = 0.0298768, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$

$$\frac{1}{4} \tanh^{-1}\left(x^2\right) - \frac{1}{4} \tan^{-1}\left(x^2\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/(1 - x^8),x]

[Out] -ArcTan[x^2]/4 + ArcTanh[x^2]/4
```

Rubi in Sympy [A] time = 5.12585, size = 12, normalized size = 0.71

$$-\frac{\operatorname{atan}\left(x^2\right)}{4} + \frac{\operatorname{atanh}\left(x^2\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(-x**8+1),x)

[Out] -atan(x**2)/4 + atanh(x**2)/4
```

Mathematica [A] time = 0.00868914, size = 31, normalized size = 1.82

$$-\frac{1}{8} \log\left(1-x^2\right) + \frac{1}{8} \log\left(x^2+1\right) + \frac{1}{4} \tan^{-1}\left(\frac{1}{x^2}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/(1 - x^8),x]

[Out] ArcTan[x^(-2)]/4 - Log[1 - x^2]/8 + Log[1 + x^2]/8
```

Maple [B] time = 0.008, size = 28, normalized size = 1.7

$$-\frac{\ln(-1+x)}{8} - \frac{\ln(1+x)}{8} + \frac{\ln\left(x^2+1\right)}{8} - \frac{\arctan\left(x^2\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(-x^8+1),x)

[Out] -1/8*ln(-1+x)-1/8*ln(1+x)+1/8*ln(x^2+1)-1/4*arctan(x^2)
```

Maxima [A] time = 1.5845, size = 31, normalized size = 1.82

$$-\frac{1}{4}\arctan\left(x^2\right)+\frac{1}{8}\log\left(x^2+1\right)-\frac{1}{8}\log\left(x^2-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^5/(x^8 - 1),x, algorithm="maxima")
```

```
[Out] -1/4*arctan(x^2) + 1/8*log(x^2 + 1) - 1/8*log(x^2 - 1)
```

Fricas [A] time = 0.219865, size = 31, normalized size = 1.82

$$-\frac{1}{4}\arctan\left(x^2\right)+\frac{1}{8}\log\left(x^2+1\right)-\frac{1}{8}\log\left(x^2-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^5/(x^8 - 1),x, algorithm="fricas")
```

```
[Out] -1/4*arctan(x^2) + 1/8*log(x^2 + 1) - 1/8*log(x^2 - 1)
```

Sympy [A] time = 0.438275, size = 22, normalized size = 1.29

$$-\frac{\log\left(x^2-1\right)}{8}+\frac{\log\left(x^2+1\right)}{8}-\frac{\operatorname{atan}\left(x^2\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(-x**8+1),x)
```

```
[Out] -log(x**2 - 1)/8 + log(x**2 + 1)/8 - atan(x**2)/4
```

GIAC/XCAS [A] time = 0.219613, size = 74, normalized size = 4.35

$$\frac{1}{4}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x+\sqrt{2}\right)\right)-\frac{1}{4}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x-\sqrt{2}\right)\right)+\frac{1}{8}\ln\left(x^2+1\right)-\frac{1}{8}\ln\left(|x+1|\right)-\frac{1}{8}\ln\left(|x-1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^5/(x^8 - 1),x, algorithm="giac")
```

```
[Out] 1/4*arctan(1/2*sqrt(2)*(2*x + sqrt(2))) - 1/4*arctan(1/2*sqrt(2)*
(2*x - sqrt(2))) + 1/8*ln(x^2 + 1) - 1/8*ln(abs(x + 1)) - 1/8*ln(
abs(x - 1))
```

3.1472 $\int \frac{x^3}{1-x^8} \, dx$

Optimal. Leaf size=8

$$\frac{1}{4}\tanh^{-1}\left(x^4\right)$$

```
[Out] ArcTanh[x^4]/4
```

Rubi [A] time = 0.0153998, antiderivative size = 8, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{1}{4}\tanh^{-1}\left(x^4\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(1 - x^8),x]

[Out] ArcTanh[x^4]/4
```

Rubi in Sympy [A] time = 2.95082, size = 5, normalized size = 0.62

$$\frac{\operatorname{atanh}\left(x^4\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(-x**8+1),x)

[Out] atanh(x**4)/4
```

Mathematica [B] time = 0.0063379, size = 23, normalized size = 2.88

$$\frac{1}{8}\log\left(x^4+1\right)-\frac{1}{8}\log\left(1-x^4\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(1 - x^8),x]

[Out] -Log[1 - x^4]/8 + Log[1 + x^4]/8
```

Maple [B] time = 0.005, size = 30, normalized size = 3.8

$$-\frac{\ln(-1+x)}{8}-\frac{\ln(1+x)}{8}-\frac{\ln\left(x^2+1\right)}{8}+\frac{\ln\left(x^4+1\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(-x^8+1),x)

[Out] -1/8*ln(-1+x)-1/8*ln(1+x)-1/8*ln(x^2+1)+1/8*ln(x^4+1)
```

Maxima [A] time = 1.41653, size = 23, normalized size = 2.88

$$\frac{1}{8} \log\left(x^4+1\right) - \frac{1}{8} \log\left(x^4-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^3/(x^8 - 1),x, algorithm="maxima")

[Out] 1/8*log(x^4 + 1) - 1/8*log(x^4 - 1)
```

Fricas [A] time = 0.216382, size = 23, normalized size = 2.88

$$\frac{1}{8} \log\left(x^4+1\right) - \frac{1}{8} \log\left(x^4-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^3/(x^8 - 1),x, algorithm="fricas")

[Out] 1/8*log(x^4 + 1) - 1/8*log(x^4 - 1)
```

Sympy [A] time = 0.279371, size = 15, normalized size = 1.88

$$-\frac{\log\left(x^4-1\right)}{8} + \frac{\log\left(x^4+1\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(-x**8+1),x)

[Out] -log(x**4 - 1)/8 + log(x**4 + 1)/8
```

GIAC/XCAS [A] time = 0.217299, size = 24, normalized size = 3.

$$\frac{1}{8} \ln\left(x^4+1\right) - \frac{1}{8} \ln\left(\left|x^4-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^3/(x^8 - 1),x, algorithm="giac")

[Out] 1/8*ln(x^4 + 1) - 1/8*ln(abs(x^4 - 1))
```

3.1473 $\int \frac{x}{1-x^8} dx$

Optimal. Leaf size=17

$$\frac{1}{4}\tan^{-1}\left(x^2\right)+\frac{1}{4}\tanh^{-1}\left(x^2\right)$$

```
[Out] ArcTan[x^2]/4 + ArcTanh[x^2]/4
```

Rubi [A] time = 0.0204018, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364

$$\frac{1}{4}\tan^{-1}\left(x^2\right)+\frac{1}{4}\tanh^{-1}\left(x^2\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x/(1 - x^8),x]

[Out] ArcTan[x^2]/4 + ArcTanh[x^2]/4
```

Rubi in Sympy [A] time = 2.97209, size = 12, normalized size = 0.71

$$\frac{\operatorname{atan}\left(x^2\right)}{4}+\frac{\operatorname{atanh}\left(x^2\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(-x**8+1),x)

[Out] atan(x**2)/4 + atanh(x**2)/4
```

Mathematica [A] time = 0.00772535, size = 31, normalized size = 1.82

$$-\frac{1}{8}\log\left(1-x^2\right)+\frac{1}{8}\log\left(x^2+1\right)-\frac{1}{4}\tan^{-1}\left(\frac{1}{x^2}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(1 - x^8),x]

[Out] -ArcTan[x^(-2)]/4 - Log[1 - x^2]/8 + Log[1 + x^2]/8
```

Maple [B] time = 0.005, size = 28, normalized size = 1.7

$$-\frac{\ln(-1+x)}{8}-\frac{\ln(1+x)}{8}+\frac{\ln\left(x^2+1\right)}{8}+\frac{\arctan\left(x^2\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(-x^8+1),x)

[Out] -1/8*ln(-1+x)-1/8*ln(1+x)+1/8*ln(x^2+1)+1/4*arctan(x^2)
```

Maxima [A] time = 1.58933, size = 31, normalized size = 1.82

$$\frac{1}{4}\arctan\left(x^2\right)+\frac{1}{8}\log\left(x^2+1\right)-\frac{1}{8}\log\left(x^2-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x/(x^8 - 1),x, algorithm="maxima")
```

```
[Out] 1/4*arctan(x^2) + 1/8*log(x^2 + 1) - 1/8*log(x^2 - 1)
```

Fricas [A] time = 0.221076, size = 31, normalized size = 1.82

$$\frac{1}{4}\arctan\left(x^2\right)+\frac{1}{8}\log\left(x^2+1\right)-\frac{1}{8}\log\left(x^2-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x/(x^8 - 1),x, algorithm="fricas")
```

```
[Out] 1/4*arctan(x^2) + 1/8*log(x^2 + 1) - 1/8*log(x^2 - 1)
```

Sympy [A] time = 0.45898, size = 22, normalized size = 1.29

$$-\frac{\log\left(x^2-1\right)}{8}+\frac{\log\left(x^2+1\right)}{8}+\frac{\operatorname{atan}\left(x^2\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(-x**8+1),x)
```

```
[Out] -log(x**2 - 1)/8 + log(x**2 + 1)/8 + atan(x**2)/4
```

GIAC/XCAS [A] time = 0.219596, size = 32, normalized size = 1.88

$$\frac{1}{4}\arctan\left(x^2\right)+\frac{1}{8}\ln\left(x^2+1\right)-\frac{1}{8}\ln\left(\left|x^2-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x/(x^8 - 1),x, algorithm="giac")
```

```
[Out] 1/4*arctan(x^2) + 1/8*ln(x^2 + 1) - 1/8*ln(abs(x^2 - 1))
```

3.1474 $\int \frac{1}{x(1-x^8)}\,dx$

Optimal. Leaf size=15

$$\log(x)-\frac{1}{8}\log\left(1-x^8\right)$$

```
[Out] Log[x] - Log[1 - x^8]/8
```

Rubi [A] time = 0.0249033, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\log(x)-\frac{1}{8}\log\left(1-x^8\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(1 - x^8)),x]

[Out] Log[x] - Log[1 - x^8]/8
```

Rubi in Sympy [A] time = 3.94034, size = 14, normalized size = 0.93

$$\frac{\log\left(x^8\right)}{8}-\frac{\log\left(-x^8+1\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(-x**8+1),x)

[Out] log(x**8)/8 - log(-x**8 + 1)/8
```

Mathematica [A] time = 0.00622879, size = 15, normalized size = 1.

$$\log(x)-\frac{1}{8}\log\left(1-x^8\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(1 - x^8)),x]

[Out] Log[x] - Log[1 - x^8]/8
```

Maple [B] time = 0.015, size = 32, normalized size = 2.1

$$\ln(x)-\frac{\ln(-1+x)}{8}-\frac{\ln\left(x^4+1\right)}{8}-\frac{\ln(1+x)}{8}-\frac{\ln\left(x^2+1\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(-x^8+1),x)

[Out] ln(x)-1/8*ln(-1+x)-1/8*ln(x^4+1)-1/8*ln(1+x)-1/8*ln(x^2+1)
```

Maxima [A] time = 1.41509, size = 20, normalized size = 1.33

$$-\frac{1}{8}\log\left(x^8-1\right)+\frac{1}{8}\log\left(x^8\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^8 - 1)*x),x, algorithm="maxima")
```

```
[Out] -1/8*log(x^8 - 1) + 1/8*log(x^8)
```

Fricas [A] time = 0.213585, size = 15, normalized size = 1.

$$-\frac{1}{8}\log\left(x^8-1\right)+\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^8 - 1)*x),x, algorithm="fricas")
```

```
[Out] -1/8*log(x^8 - 1) + log(x)
```

Sympy [A] time = 0.276096, size = 10, normalized size = 0.67

$$\log\left(x\right)-\frac{\log\left(x^8-1\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(-x**8+1),x)
```

```
[Out] log(x) - log(x**8 - 1)/8
```

GIAC/XCAS [A] time = 0.221763, size = 22, normalized size = 1.47

$$\frac{1}{8}\ln\left(x^8\right)-\frac{1}{8}\ln\left(\left|x^8-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^8 - 1)*x),x, algorithm="giac")
```

```
[Out] 1/8*ln(x^8) - 1/8*ln(abs(x^8 - 1))
```

3.1475 $\int \frac{1}{x^3(1-x^8)}\,dx$

Optimal. Leaf size=24

$$-\frac{1}{2x^2}-\frac{1}{4}\tan^{-1}\left(x^2\right)+\frac{1}{4}\tanh^{-1}\left(x^2\right)$$

```
[Out] -1/(2*x^2) - ArcTan[x^2]/4 + ArcTanh[x^2]/4
```

Rubi [A] time = 0.0378722, antiderivative size = 24, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385

$$-\frac{1}{2x^2}-\frac{1}{4}\tan^{-1}\left(x^2\right)+\frac{1}{4}\tanh^{-1}\left(x^2\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(1 - x^8)),x]
```

```
[Out] -1/(2*x^2) - ArcTan[x^2]/4 + ArcTanh[x^2]/4
```

Rubi in Sympy [A] time = 6.37405, size = 19, normalized size = 0.79

$$-\frac{\operatorname{atan}\left(x^2\right)}{4}+\frac{\operatorname{atanh}\left(x^2\right)}{4}-\frac{1}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(-x**8+1),x)
```

```
[Out] -atan(x**2)/4 + atanh(x**2)/4 - 1/(2*x**2)
```

Mathematica [A] time = 0.00950254, size = 38, normalized size = 1.58

$$-\frac{1}{2x^2}-\frac{1}{8}\log\left(1-x^2\right)+\frac{1}{8}\log\left(x^2+1\right)+\frac{1}{4}\tan^{-1}\left(\frac{1}{x^2}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*(1 - x^8)),x]
```

```
[Out] -1/(2*x^2) + ArcTan[x^(-2)]/4 - Log[1 - x^2]/8 + Log[1 + x^2]/8
```

Maple [A] time = 0.016, size = 33, normalized size = 1.4

$$-\frac{\ln(-1+x)}{8}-\frac{\arctan\left(x^2\right)}{4}-\frac{\ln(1+x)}{8}-\frac{1}{2\,x^2}+\frac{\ln\left(x^2+1\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(-x^8+1),x)
```

```
[Out] -1/8*ln(-1+x)-1/4*arctan(x^2)-1/8*ln(1+x)-1/2/x^2+1/8*ln(x^2+1)
```

Maxima [A] time = 1.61493, size = 38, normalized size = 1.58

$$-\frac{1}{2\,x^2}-\frac{1}{4}\,\arctan\left(x^2\right)+\frac{1}{8}\,\log\left(x^2+1\right)-\frac{1}{8}\,\log\left(x^2-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^8 - 1)*x^3),x, algorithm="maxima")
```

```
[Out] -1/2/x^2 - 1/4*arctan(x^2) + 1/8*log(x^2 + 1) - 1/8*log(x^2 - 1)
```

Fricas [A] time = 0.225356, size = 50, normalized size = 2.08

$$-\frac{2\,x^2\arctan\left(x^2\right)-x^2\log\left(x^2+1\right)+x^2\log\left(x^2-1\right)+4}{8\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^8 - 1)*x^3),x, algorithm="fricas")
```

```
[Out] -1/8*(2*x^2*arctan(x^2) - x^2*log(x^2 + 1) + x^2*log(x^2 - 1) + 4
)/x^2
```

Sympy [A] time = 0.505036, size = 29, normalized size = 1.21

$$-\frac{\log\left(x^2-1\right)}{8}+\frac{\log\left(x^2+1\right)}{8}-\frac{\operatorname{atan}\left(x^2\right)}{4}-\frac{1}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(-x**8+1),x)
```

```
[Out] -log(x**2 - 1)/8 + log(x**2 + 1)/8 - atan(x**2)/4 - 1/(2*x**2)
```

GIAC/XCAS [A] time = 0.217994, size = 39, normalized size = 1.62

$$-\frac{1}{2\,x^2}-\frac{1}{4}\,\arctan\left(x^2\right)+\frac{1}{8}\ln\left(x^2+1\right)-\frac{1}{8}\ln\left(\left|x^2-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^8 - 1)*x^3),x, algorithm="giac")
```

```
[Out] -1/2/x^2 - 1/4*arctan(x^2) + 1/8*ln(x^2 + 1) - 1/8*ln(abs(x^2 - 1
))
```

3.1476 $\int \frac{1}{x^5(1-x^8)}\,dx$

Optimal. Leaf size=16

$$\frac{1}{4}\tanh^{-1}\left(x^4\right)-\frac{1}{4x^4}$$

```
[Out] -1/(4*x^4) + ArcTanh[x^4]/4
```

Rubi [A] time = 0.0245837, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{1}{4}\tanh^{-1}\left(x^4\right)-\frac{1}{4x^4}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^5*(1 - x^8)),x]

[Out] -1/(4*x^4) + ArcTanh[x^4]/4
```

Rubi in Sympy [A] time = 5.37335, size = 12, normalized size = 0.75

$$\frac{\operatorname{atanh}\left(x^4\right)}{4}-\frac{1}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**5/(-x**8+1),x)

[Out] atanh(x**4)/4 - 1/(4*x**4)
```

Mathematica [A] time = 0.00719386, size = 30, normalized size = 1.88

$$-\frac{1}{4x^4}-\frac{1}{8}\log\left(1-x^4\right)+\frac{1}{8}\log\left(x^4+1\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^5*(1 - x^8)),x]

[Out] -1/(4*x^4) - Log[1 - x^4]/8 + Log[1 + x^4]/8
```

Maple [B] time = 0.016, size = 35, normalized size = 2.2

$$-\frac{\ln(-1+x)}{8}-\frac{1}{4\,x^4}+\frac{\ln\left(x^4+1\right)}{8}-\frac{\ln(1+x)}{8}-\frac{\ln\left(x^2+1\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^5/(-x^8+1),x)

[Out] -1/8*ln(-1+x)-1/4/x^4+1/8*ln(x^4+1)-1/8*ln(1+x)-1/8*ln(x^2+1)
```

Maxima [A] time = 1.44005, size = 30, normalized size = 1.88

$$-\frac{1}{4\,x^4}+\frac{1}{8}\,\log\left(x^4+1\right)-\frac{1}{8}\,\log\left(x^4-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^8 - 1)*x^5),x, algorithm="maxima")

[Out] -1/4/x^4 + 1/8*log(x^4 + 1) - 1/8*log(x^4 - 1)
```

Fricas [A] time = 0.214106, size = 38, normalized size = 2.38

$$\frac{x^4\log\left(x^4+1\right)-x^4\log\left(x^4-1\right)-2}{8\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^8 - 1)*x^5),x, algorithm="fricas")

[Out] 1/8*(x^4*log(x^4 + 1) - x^4*log(x^4 - 1) - 2)/x^4
```

Sympy [A] time = 0.39724, size = 22, normalized size = 1.38

$$-\frac{\log\left(x^4-1\right)}{8}+\frac{\log\left(x^4+1\right)}{8}-\frac{1}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**5/(-x**8+1),x)

[Out] -log(x**4 - 1)/8 + log(x**4 + 1)/8 - 1/(4*x**4)
```

GIAC/XCAS [A] time = 0.219388, size = 31, normalized size = 1.94

$$-\frac{1}{4\,x^4}+\frac{1}{8}\ln\left(x^4+1\right)-\frac{1}{8}\ln\left(\left|x^4-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^8 - 1)*x^5),x, algorithm="giac")

[Out] -1/4/x^4 + 1/8*ln(x^4 + 1) - 1/8*ln(abs(x^4 - 1))
```

3.1477 $\int \frac{1}{x^7(1-x^8)} \, dx$

Optimal. Leaf size=24

$$-\frac{1}{6x^6}+\frac{1}{4}\tan^{-1}\left(x^2\right)+\frac{1}{4}\tanh^{-1}\left(x^2\right)$$

```
[Out] -1/(6*x^6) + ArcTan[x^2]/4 + ArcTanh[x^2]/4
```

Rubi [A] time = 0.0288378, antiderivative size = 24, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385

$$-\frac{1}{6x^6}+\frac{1}{4}\tan^{-1}\left(x^2\right)+\frac{1}{4}\tanh^{-1}\left(x^2\right)$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^7*(1 - x^8)),x]
```

```
[Out] -1/(6*x^6) + ArcTan[x^2]/4 + ArcTanh[x^2]/4
```

Rubi in Sympy [A] time = 5.30586, size = 19, normalized size = 0.79

$$\frac{\operatorname{atan}\left(x^2\right)}{4}+\frac{\operatorname{atanh}\left(x^2\right)}{4}-\frac{1}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**7/(-x**8+1),x)
```

```
[Out] atan(x**2)/4 + atanh(x**2)/4 - 1/(6*x**6)
```

Mathematica [A] time = 0.00951309, size = 38, normalized size = 1.58

$$-\frac{1}{6x^6}-\frac{1}{8}\log\left(1-x^2\right)+\frac{1}{8}\log\left(x^2+1\right)-\frac{1}{4}\tan^{-1}\left(\frac{1}{x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^7*(1 - x^8)),x]
```

```
[Out] -1/(6*x^6) - ArcTan[x^(-2)]/4 - Log[1 - x^2]/8 + Log[1 + x^2]/8
```

Maple [A] time = 0.016, size = 33, normalized size = 1.4

$$-\frac{\ln(-1+x)}{8}-\frac{1}{6\,x^6}+\frac{\arctan\left(x^2\right)}{4}-\frac{\ln(1+x)}{8}+\frac{\ln\left(x^2+1\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^7/(-x^8+1),x)
```

```
[Out] -1/8*ln(-1+x)-1/6/x^6+1/4*arctan(x^2)-1/8*ln(1+x)+1/8*ln(x^2+1)
```

Maxima [A] time = 1.58801, size = 38, normalized size = 1.58

$$-\frac{1}{6\,x^6}+\frac{1}{4}\,\arctan\left(x^2\right)+\frac{1}{8}\,\log\left(x^2+1\right)-\frac{1}{8}\,\log\left(x^2-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^8 - 1)*x^7),x, algorithm="maxima")
```

```
[Out] -1/6/x^6 + 1/4*arctan(x^2) + 1/8*log(x^2 + 1) - 1/8*log(x^2 - 1)
```

Fricas [A] time = 0.219623, size = 51, normalized size = 2.12

$$\frac{6\,x^6\,\arctan\left(x^2\right)+3\,x^6\,\log\left(x^2+1\right)-3\,x^6\,\log\left(x^2-1\right)-4}{24\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^8 - 1)*x^7),x, algorithm="fricas")
```

```
[Out] 1/24*(6*x^6*arctan(x^2) + 3*x^6*log(x^2 + 1) - 3*x^6*log(x^2 - 1)
 - 4)/x^6
```

Sympy [A] time = 0.629703, size = 29, normalized size = 1.21

$$-\frac{\log\left(x^2-1\right)}{8}+\frac{\log\left(x^2+1\right)}{8}+\frac{\operatorname{atan}\left(x^2\right)}{4}-\frac{1}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**7/(-x**8+1),x)
```

```
[Out] -log(x**2 - 1)/8 + log(x**2 + 1)/8 + atan(x**2)/4 - 1/(6*x**6)
```

GIAC/XCAS [A] time = 0.224936, size = 39, normalized size = 1.62

$$-\frac{1}{6\,x^6}+\frac{1}{4}\,\arctan\left(x^2\right)+\frac{1}{8}\ln\left(x^2+1\right)-\frac{1}{8}\ln\left(\left|x^2-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^8 - 1)*x^7),x, algorithm="giac")
```

```
[Out] -1/6/x^6 + 1/4*arctan(x^2) + 1/8*ln(x^2 + 1) - 1/8*ln(abs(x^2 - 1
))
```

3.1478 $\int \frac{1}{x^9(1-x^8)} dx$

Optimal. Leaf size=22

$$-\frac{1}{8x^8}-\frac{1}{8}\log\left(1-x^8\right)+\log(x)$$

```
[Out] -1/(8*x^8) + Log[x] - Log[1 - x^8]/8
```

Rubi [A] time = 0.0320517, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{1}{8x^8}-\frac{1}{8}\log\left(1-x^8\right)+\log(x)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^9*(1 - x^8)),x]
```

```
[Out] -1/(8*x^8) + Log[x] - Log[1 - x^8]/8
```

Rubi in Sympy [A] time = 4.95365, size = 20, normalized size = 0.91

$$\frac{\log\left(x^8\right)}{8}-\frac{\log\left(-x^8+1\right)}{8}-\frac{1}{8x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**9/(-x**8+1),x)
```

```
[Out] log(x**8)/8 - log(-x**8 + 1)/8 - 1/(8*x**8)
```

Mathematica [A] time = 0.00660765, size = 22, normalized size = 1.

$$-\frac{1}{8x^8}-\frac{1}{8}\log\left(1-x^8\right)+\log(x)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^9*(1 - x^8)),x]
```

```
[Out] -1/(8*x^8) + Log[x] - Log[1 - x^8]/8
```

Maple [A] time = 0.018, size = 37, normalized size = 1.7

$$-\frac{1}{8\,x^8}+\ln(x)-\frac{\ln(-1+x)}{8}-\frac{\ln\left(x^4+1\right)}{8}-\frac{\ln(1+x)}{8}-\frac{\ln\left(x^2+1\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^9/(-x^8+1),x)
```

```
[Out] -1/8/x^8+ln(x)-1/8*ln(-1+x)-1/8*ln(x^4+1)-1/8*ln(1+x)-1/8*ln(x^2+
1)
```

Maxima [A] time = 1.43906, size = 27, normalized size = 1.23

$$-\frac{1}{8\,x^8}-\frac{1}{8}\,\log\left(x^8-1\right)+\frac{1}{8}\,\log\left(x^8\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^8 - 1)*x^9),x, algorithm="maxima")

[Out] -1/8/x^8 - 1/8*log(x^8 - 1) + 1/8*log(x^8)
```

Fricas [A] time = 0.214903, size = 32, normalized size = 1.45

$$-\frac{x^8\log\left(x^8-1\right)-8\,x^8\log\left(x\right)+1}{8\,x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^8 - 1)*x^9),x, algorithm="fricas")

[Out] -1/8*(x^8*log(x^8 - 1) - 8*x^8*log(x) + 1)/x^8
```

Sympy [A] time = 0.543971, size = 17, normalized size = 0.77

$$\log\left(x\right)-\frac{\log\left(x^8-1\right)}{8}-\frac{1}{8x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**9/(-x**8+1),x)

[Out] log(x) - log(x**8 - 1)/8 - 1/(8*x**8)
```

GIAC/XCAS [A] time = 0.2184, size = 35, normalized size = 1.59

$$-\frac{x^8+1}{8\,x^8}+\frac{1}{8}\ln\left(x^8\right)-\frac{1}{8}\ln\left(\left|x^8-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^8 - 1)*x^9),x, algorithm="giac")

[Out] -1/8*(x^8 + 1)/x^8 + 1/8*ln(x^8) - 1/8*ln(abs(x^8 - 1))
```

3.1479 $\int \frac{x^8}{1-x^8} dx$

Optimal. Leaf size=100

$$-\frac{\log \left(x^2-\sqrt{2} x+1\right)}{8 \sqrt{2}}+\frac{\log \left(x^2+\sqrt{2} x+1\right)}{8 \sqrt{2}}-x+\frac{1}{4} \tan ^{-1}(x)-\frac{\tan ^{-1}\left(1-\sqrt{2} x\right)}{4 \sqrt{2}}+\frac{\tan ^{-1}\left(\sqrt{2} x+1\right)}{4 \sqrt{2}}+\frac{1}{4} \tanh ^{-1}(x)$$

```
[Out] -x + ArcTan[x]/4 - ArcTan[1 - Sqrt[2]*x]/(4*Sqrt[2]) + ArcTan[1 +
 Sqrt[2]*x]/(4*Sqrt[2]) + ArcTanh[x]/4 - Log[1 - Sqrt[2]*x + x^2]
/(8*Sqrt[2]) + Log[1 + Sqrt[2]*x + x^2]/(8*Sqrt[2])
```

Rubi [A] time = 0.1225, antiderivative size = 100, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 11, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.846

$$-\frac{\log \left(x^2-\sqrt{2} x+1\right)}{8 \sqrt{2}}+\frac{\log \left(x^2+\sqrt{2} x+1\right)}{8 \sqrt{2}}-x+\frac{1}{4} \tan ^{-1}(x)-\frac{\tan ^{-1}\left(1-\sqrt{2} x\right)}{4 \sqrt{2}}+\frac{\tan ^{-1}\left(\sqrt{2} x+1\right)}{4 \sqrt{2}}+\frac{1}{4} \tanh ^{-1}(x)$$

Antiderivative was successfully verified.

```
[In]  Int[x^8/(1 - x^8),x]
```

```
[Out] -x + ArcTan[x]/4 - ArcTan[1 - Sqrt[2]*x]/(4*Sqrt[2]) + ArcTan[1 +
 Sqrt[2]*x]/(4*Sqrt[2]) + ArcTanh[x]/4 - Log[1 - Sqrt[2]*x + x^2]
/(8*Sqrt[2]) + Log[1 + Sqrt[2]*x + x^2]/(8*Sqrt[2])
```

Rubi in Sympy [A] time = 17.7037, size = 85, normalized size = 0.85

$$-x-\frac{\sqrt{2} \log \left(x^2-\sqrt{2} x+1\right)}{16}+\frac{\sqrt{2} \log \left(x^2+\sqrt{2} x+1\right)}{16}+\frac{\operatorname{atan}(x)}{4}+\frac{\sqrt{2} \operatorname{atan}\left(\sqrt{2} x-1\right)}{8}+\frac{\sqrt{2} \operatorname{atan}\left(\sqrt{2} x+1\right)}{8}+\frac{\operatorname{atanh}(x)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8/(-x**8+1),x)
```

```
[Out] -x - sqrt(2)*log(x**2 - sqrt(2)*x + 1)/16 + sqrt(2)*log(x**2 + sq
rt(2)*x + 1)/16 + atan(x)/4 + sqrt(2)*atan(sqrt(2)*x - 1)/8 + sqr
t(2)*atan(sqrt(2)*x + 1)/8 + atanh(x)/4
```

Mathematica [A] time = 0.0516753, size = 101, normalized size = 1.01

$$\frac{1}{16}\left(-\sqrt{2} \log \left(x^2-\sqrt{2} x+1\right)+\sqrt{2} \log \left(x^2+\sqrt{2} x+1\right)-16 x-2 \log (1-x)+2 \log (x+1)+4 \tan ^{-1}(x)-2 \sqrt{2} \tan ^{-1}\left(1-\sqrt{2} x\right)+2 \sqrt{2} \tan ^{-1}\left(\sqrt{2} x+1\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8/(1 - x^8),x]
```

```
[Out] (-16*x + 4*ArcTan[x] - 2*Sqrt[2]*ArcTan[1 - Sqrt[2]*x] + 2*Sqrt[2
]*ArcTan[1 + Sqrt[2]*x] - 2*Log[1 - x] + 2*Log[1 + x] - Sqrt[2]*L
og[1 - Sqrt[2]*x + x^2] + Sqrt[2]*Log[1 + Sqrt[2]*x + x^2])/16
```

Maple [A] time = 0.007, size = 77, normalized size = 0.8

$$-x-\frac{\ln\left(-1+x\right)}{8}+\frac{\ln\left(1+x\right)}{8}+\frac{\arctan\left(x\right)}{4}+\frac{\arctan\left(1+x\sqrt{2}\right)\sqrt{2}}{8}+\frac{\arctan\left(x\sqrt{2}-1\right)\sqrt{2}}{8}+\frac{\sqrt{2}}{16}\ln\left(\frac{1+x^{2}+x\sqrt{2}}{1+x^{2}-x\sqrt{2}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8/(-x^8+1),x)
```

```
[Out] -x-1/8*ln(-1+x)+1/8*ln(1+x)+1/4*arctan(x)+1/8*arctan(1+x*2^(1/2))
*2^(1/2)+1/8*arctan(x*2^(1/2)-1)*2^(1/2)+1/16*2^(1/2)*ln((1+x^2+x
*2^(1/2))/(1+x^2-x*2^(1/2)))
```

Maxima [A] time = 1.59145, size = 123, normalized size = 1.23

$$\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x+\sqrt{2}\right)\right)+\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x-\sqrt{2}\right)\right)+\frac{1}{16}\sqrt{2}\log\left(x^{2}+\sqrt{2}x+1\right)-\frac{1}{16}\sqrt{2}\log\left(x^{2}-\sqrt{2}x+1\right)-x+\frac{1}{4}\arctan\left(x\right)+\frac{1}{8}\log\left(x+1\right)-\frac{1}{8}\log\left(x-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^8/(x^8 - 1),x, algorithm="maxima")
```

```
[Out] 1/8*sqrt(2)*arctan(1/2*sqrt(2)*(2*x + sqrt(2))) + 1/8*sqrt(2)*arc
tan(1/2*sqrt(2)*(2*x - sqrt(2))) + 1/16*sqrt(2)*log(x^2 + sqrt(2)
*x + 1) - 1/16*sqrt(2)*log(x^2 - sqrt(2)*x + 1) - x + 1/4*arctan(
x) + 1/8*log(x + 1) - 1/8*log(x - 1)
```

Fricas [A] time = 0.237907, size = 159, normalized size = 1.59

$$-\frac{1}{16}\sqrt{2}\left(8\sqrt{2}x-2\sqrt{2}\arctan\left(x\right)-\sqrt{2}\log\left(x+1\right)+\sqrt{2}\log\left(x-1\right)+4\arctan\left(\frac{1}{\sqrt{2}x+\sqrt{2}\sqrt{x^{2}+\sqrt{2}x+1}+1}\right)+4\arctan\left(-\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^8/(x^8 - 1),x, algorithm="fricas")
```

```
[Out] -1/16*sqrt(2)*(8*sqrt(2)*x - 2*sqrt(2)*arctan(x) - sqrt(2)*log(x
+ 1) + sqrt(2)*log(x - 1) + 4*arctan(1/(sqrt(2)*x + sqrt(2)*sqrt(
x^2 + sqrt(2)*x + 1) + 1)) + 4*arctan(1/(sqrt(2)*x + sqrt(2)*sqrt
(x^2 - sqrt(2)*x + 1) - 1)) - log(x^2 + sqrt(2)*x + 1) + log(x^2
- sqrt(2)*x + 1))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8/(-x**8+1),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.219697, size = 126, normalized size = 1.26

$$\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x+\sqrt{2}\right)\right)+\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x-\sqrt{2}\right)\right)+\frac{1}{16}\sqrt{2}\ln\left(x^2+\sqrt{2}x+1\right)-\frac{1}{16}\sqrt{2}\ln\left(x^2-\sqrt{2}x+1\right)-x+\frac{1}{4}\arctan\left(x\right)+\frac{1}{8}\ln\left(|x+1|\right)-\frac{1}{8}\ln\left(|x-1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^8/(x^8 - 1),x, algorithm="giac")
```

```
[Out] 1/8*sqrt(2)*arctan(1/2*sqrt(2)*(2*x + sqrt(2))) + 1/8*sqrt(2)*arc
tan(1/2*sqrt(2)*(2*x - sqrt(2))) + 1/16*sqrt(2)*ln(x^2 + sqrt(2)*
x + 1) - 1/16*sqrt(2)*ln(x^2 - sqrt(2)*x + 1) - x + 1/4*arctan(x)
 + 1/8*ln(abs(x + 1)) - 1/8*ln(abs(x - 1))
```

3.1480 $\int \frac{x^6}{1-x^8}\,dx$

Optimal. Leaf size=97

$$-\frac{\log\left(x^2-\sqrt{2}x+1\right)}{8\sqrt{2}}+\frac{\log\left(x^2+\sqrt{2}x+1\right)}{8\sqrt{2}}-\frac{1}{4}\tan^{-1}(x)+\frac{\tan^{-1}\left(1-\sqrt{2}x\right)}{4\sqrt{2}}-\frac{\tan^{-1}\left(\sqrt{2}x+1\right)}{4\sqrt{2}}+\frac{1}{4}\tanh^{-1}(x)$$

```
[Out] -ArcTan[x]/4 + ArcTan[1 - Sqrt[2]*x]/(4*Sqrt[2]) - ArcTan[1 + Sqr
t[2]*x]/(4*Sqrt[2]) + ArcTanh[x]/4 - Log[1 - Sqrt[2]*x + x^2]/(8*
Sqrt[2]) + Log[1 + Sqrt[2]*x + x^2]/(8*Sqrt[2])
```

Rubi [A] time = 0.133356, antiderivative size = 97, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 10, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.769

$$-\frac{\log\left(x^2-\sqrt{2}x+1\right)}{8\sqrt{2}}+\frac{\log\left(x^2+\sqrt{2}x+1\right)}{8\sqrt{2}}-\frac{1}{4}\tan^{-1}(x)+\frac{\tan^{-1}\left(1-\sqrt{2}x\right)}{4\sqrt{2}}-\frac{\tan^{-1}\left(\sqrt{2}x+1\right)}{4\sqrt{2}}+\frac{1}{4}\tanh^{-1}(x)$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/(1 - x^8),x]
```

```
[Out] -ArcTan[x]/4 + ArcTan[1 - Sqrt[2]*x]/(4*Sqrt[2]) - ArcTan[1 + Sqr
t[2]*x]/(4*Sqrt[2]) + ArcTanh[x]/4 - Log[1 - Sqrt[2]*x + x^2]/(8*
Sqrt[2]) + Log[1 + Sqrt[2]*x + x^2]/(8*Sqrt[2])
```

Rubi in Sympy [A] time = 19.5793, size = 83, normalized size = 0.86

$$-\frac{\sqrt{2}\log\left(x^2-\sqrt{2}x+1\right)}{16}+\frac{\sqrt{2}\log\left(x^2+\sqrt{2}x+1\right)}{16}-\frac{\operatorname{atan}(x)}{4}-\frac{\sqrt{2}\operatorname{atan}\left(\sqrt{2}x-1\right)}{8}-\frac{\sqrt{2}\operatorname{atan}\left(\sqrt{2}x+1\right)}{8}+\frac{\operatorname{atanh}(x)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(-x**8+1),x)
```

```
[Out] -sqrt(2)*log(x**2 - sqrt(2)*x + 1)/16 + sqrt(2)*log(x**2 + sqrt(2
)*x + 1)/16 - atan(x)/4 - sqrt(2)*atan(sqrt(2)*x - 1)/8 - sqrt(2)
*atan(sqrt(2)*x + 1)/8 + atanh(x)/4
```

Mathematica [A] time = 0.0342507, size = 98, normalized size = 1.01

$$\frac{1}{16}\left(-\sqrt{2}\log\left(x^2-\sqrt{2}x+1\right)+\sqrt{2}\log\left(x^2+\sqrt{2}x+1\right)-2\log(1-x)+2\log(x+1)-4\tan^{-1}(x)+2\sqrt{2}\tan^{-1}\left(1-\sqrt{2}x\right)-2\sqrt{2}\tan^{-1}\left(\sqrt{2}x+1\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6/(1 - x^8),x]
```

```
[Out] (-4*ArcTan[x] + 2*Sqrt[2]*ArcTan[1 - Sqrt[2]*x] - 2*Sqrt[2]*ArcTa
n[1 + Sqrt[2]*x] - 2*Log[1 - x] + 2*Log[1 + x] - Sqrt[2]*Log[1 -
Sqrt[2]*x + x^2] + Sqrt[2]*Log[1 + Sqrt[2]*x + x^2])/16
```

Maple [A] time = 0.007, size = 74, normalized size = 0.8

$$-\frac{\ln(-1+x)}{8}+\frac{\ln(1+x)}{8}-\frac{\arctan(x)}{4}-\frac{\arctan\left(1+x\sqrt{2}\right)\sqrt{2}}{8}-\frac{\arctan\left(x\sqrt{2}-1\right)\sqrt{2}}{8}-\frac{\sqrt{2}}{16}\ln\left(\frac{1+x^2-x\sqrt{2}}{1+x^2+x\sqrt{2}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(-x^8+1),x)
```

```
[Out] -1/8*ln(-1+x)+1/8*ln(1+x)-1/4*arctan(x)-1/8*arctan(1+x*2^(1/2))*2
^(1/2)-1/8*arctan(x*2^(1/2)-1)*2^(1/2)-1/16*2^(1/2)*ln((1+x^2-x*2
^(1/2))/(1+x^2+x*2^(1/2)))
```

Maxima [A] time = 1.59034, size = 119, normalized size = 1.23

$$-\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x+\sqrt{2}\right)\right)-\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x-\sqrt{2}\right)\right)+\frac{1}{16}\sqrt{2}\log\left(x^2+\sqrt{2}x+1\right)-\frac{1}{16}\sqrt{2}\log\left(x^2-\sqrt{2}x+1\right)-\frac{1}{4}\arctan(x)+\frac{1}{8}\log(x+1)-\frac{1}{8}\log(x-1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^6/(x^8 - 1),x, algorithm="maxima")
```

```
[Out] -1/8*sqrt(2)*arctan(1/2*sqrt(2)*(2*x + sqrt(2))) - 1/8*sqrt(2)*ar
ctan(1/2*sqrt(2)*(2*x - sqrt(2))) + 1/16*sqrt(2)*log(x^2 + sqrt(2
)*x + 1) - 1/16*sqrt(2)*log(x^2 - sqrt(2)*x + 1) - 1/4*arctan(x)
+ 1/8*log(x + 1) - 1/8*log(x - 1)
```

Fricas [A] time = 0.239671, size = 151, normalized size = 1.56

$$-\frac{1}{16}\sqrt{2}\left(2\sqrt{2}\arctan(x)-\sqrt{2}\log(x+1)+\sqrt{2}\log(x-1)-4\arctan\left(\frac{1}{\sqrt{2}x+\sqrt{2}\sqrt{x^2+\sqrt{2}x+1}+1}\right)-4\arctan\left(\frac{}{\sqrt{2}x+\sqrt{2}}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^6/(x^8 - 1),x, algorithm="fricas")
```

```
[Out] -1/16*sqrt(2)*(2*sqrt(2)*arctan(x) - sqrt(2)*log(x + 1) + sqrt(2)
*log(x - 1) - 4*arctan(1/(sqrt(2)*x + sqrt(2)*sqrt(x^2 + sqrt(2)*
x + 1) + 1)) - 4*arctan(1/(sqrt(2)*x + sqrt(2)*sqrt(x^2 - sqrt(2)
*x + 1) - 1)) - log(x^2 + sqrt(2)*x + 1) + log(x^2 - sqrt(2)*x +
1))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(-x**8+1),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.232098, size = 122, normalized size = 1.26

$$-\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x+\sqrt{2}\right)\right)-\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x-\sqrt{2}\right)\right)+\frac{1}{16}\sqrt{2}\ln\left(x^2+\sqrt{2}x+1\right)-\frac{1}{16}\sqrt{2}\ln\left(x^2-\sqrt{2}x+1\right)-\frac{1}{4}\arctan(x)+\frac{1}{8}\ln(|x+1|)-\frac{1}{8}\ln(|x-1|)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^6/(x^8 - 1),x, algorithm="giac")
```

```
[Out] -1/8*sqrt(2)*arctan(1/2*sqrt(2)*(2*x + sqrt(2))) - 1/8*sqrt(2)*ar
ctan(1/2*sqrt(2)*(2*x - sqrt(2))) + 1/16*sqrt(2)*ln(x^2 + sqrt(2)
*x + 1) - 1/16*sqrt(2)*ln(x^2 - sqrt(2)*x + 1) - 1/4*arctan(x) +
1/8*ln(abs(x + 1)) - 1/8*ln(abs(x - 1))
```

3.1481 $\int \frac{x^4}{1-x^8}\,dx$

Optimal. Leaf size=97

$$\frac{\log\left(x^2-\sqrt{2}x+1\right)}{8\sqrt{2}}-\frac{\log\left(x^2+\sqrt{2}x+1\right)}{8\sqrt{2}}+\frac{1}{4}\tan^{-1}(x)+\frac{\tan^{-1}\left(1-\sqrt{2}x\right)}{4\sqrt{2}}-\frac{\tan^{-1}\left(\sqrt{2}x+1\right)}{4\sqrt{2}}+\frac{1}{4}\tanh^{-1}(x)$$

```
[Out] ArcTan[x]/4 + ArcTan[1 - Sqrt[2]*x]/(4*Sqrt[2]) - ArcTan[1 + Sqrt
[2]*x]/(4*Sqrt[2]) + ArcTanh[x]/4 + Log[1 - Sqrt[2]*x + x^2]/(8*S
qrt[2]) - Log[1 + Sqrt[2]*x + x^2]/(8*Sqrt[2])
```

Rubi [A] time = 0.119535, antiderivative size = 97, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 10, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.769

$$\frac{\log\left(x^2-\sqrt{2}x+1\right)}{8\sqrt{2}}-\frac{\log\left(x^2+\sqrt{2}x+1\right)}{8\sqrt{2}}+\frac{1}{4}\tan^{-1}(x)+\frac{\tan^{-1}\left(1-\sqrt{2}x\right)}{4\sqrt{2}}-\frac{\tan^{-1}\left(\sqrt{2}x+1\right)}{4\sqrt{2}}+\frac{1}{4}\tanh^{-1}(x)$$

Antiderivative was successfully verified.

```
[In] Int[x^4/(1 - x^8),x]
```

```
[Out] ArcTan[x]/4 + ArcTan[1 - Sqrt[2]*x]/(4*Sqrt[2]) - ArcTan[1 + Sqrt
[2]*x]/(4*Sqrt[2]) + ArcTanh[x]/4 + Log[1 - Sqrt[2]*x + x^2]/(8*S
qrt[2]) - Log[1 + Sqrt[2]*x + x^2]/(8*Sqrt[2])
```

Rubi in Sympy [A] time = 16.8486, size = 83, normalized size = 0.86

$$\frac{\sqrt{2}\log\left(x^2-\sqrt{2}x+1\right)}{16}-\frac{\sqrt{2}\log\left(x^2+\sqrt{2}x+1\right)}{16}+\frac{\operatorname{atan}(x)}{4}-\frac{\sqrt{2}\operatorname{atan}\left(\sqrt{2}x-1\right)}{8}-\frac{\sqrt{2}\operatorname{atan}\left(\sqrt{2}x+1\right)}{8}+\frac{\operatorname{atanh}(x)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**4/(-x**8+1),x)
```

```
[Out] sqrt(2)*log(x**2 - sqrt(2)*x + 1)/16 - sqrt(2)*log(x**2 + sqrt(2)
*x + 1)/16 + atan(x)/4 - sqrt(2)*atan(sqrt(2)*x - 1)/8 - sqrt(2)*
atan(sqrt(2)*x + 1)/8 + atanh(x)/4
```

Mathematica [A] time = 0.0321045, size = 98, normalized size = 1.01

$$\frac{1}{16}\left(\sqrt{2}\log\left(x^2-\sqrt{2}x+1\right)-\sqrt{2}\log\left(x^2+\sqrt{2}x+1\right)-2\log(1-x)+2\log(x+1)+4\tan^{-1}(x)+2\sqrt{2}\tan^{-1}\left(1-\sqrt{2}x\right)-2\sqrt{2}\tan^{-1}\left(\sqrt{2}x+1\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4/(1 - x^8),x]
```

```
[Out] (4*ArcTan[x] + 2*Sqrt[2]*ArcTan[1 - Sqrt[2]*x] - 2*Sqrt[2]*ArcTan
[1 + Sqrt[2]*x] - 2*Log[1 - x] + 2*Log[1 + x] + Sqrt[2]*Log[1 - S
qrt[2]*x + x^2] - Sqrt[2]*Log[1 + Sqrt[2]*x + x^2])/16
```

Maple [A] time = 0.006, size = 74, normalized size = 0.8

$$-\frac{\ln(-1+x)}{8}+\frac{\ln(1+x)}{8}+\frac{\arctan(x)}{4}-\frac{\arctan\left(x\sqrt{2}-1\right)\sqrt{2}}{8}-\frac{\sqrt{2}}{16}\ln\left(\frac{1+x^2+x\sqrt{2}}{1+x^2-x\sqrt{2}}\right)-\frac{\arctan\left(1+x\sqrt{2}\right)\sqrt{2}}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(-x^8+1),x)
```

```
[Out] -1/8*ln(-1+x)+1/8*ln(1+x)+1/4*arctan(x)-1/8*arctan(x*2^(1/2)-1)*2
^(1/2)-1/16*2^(1/2)*ln((1+x^2+x*2^(1/2))/(1+x^2-x*2^(1/2)))-1/8*a
rctan(1+x*2^(1/2))*2^(1/2)
```

Maxima [A] time = 1.60007, size = 119, normalized size = 1.23

$$-\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x+\sqrt{2}\right)\right)-\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x-\sqrt{2}\right)\right)-\frac{1}{16}\sqrt{2}\log\left(x^2+\sqrt{2}x+1\right)+\frac{1}{16}\sqrt{2}\log\left(x^2-\sqrt{2}x+1\right)+\frac{1}{4}\arctan(x)+\frac{1}{8}\log(x+1)-\frac{1}{8}\log(x-1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^4/(x^8 - 1),x, algorithm="maxima")
```

```
[Out] -1/8*sqrt(2)*arctan(1/2*sqrt(2)*(2*x + sqrt(2))) - 1/8*sqrt(2)*ar
ctan(1/2*sqrt(2)*(2*x - sqrt(2))) - 1/16*sqrt(2)*log(x^2 + sqrt(2
)*x + 1) + 1/16*sqrt(2)*log(x^2 - sqrt(2)*x + 1) + 1/4*arctan(x)
+ 1/8*log(x + 1) - 1/8*log(x - 1)
```

Fricas [A] time = 0.237293, size = 151, normalized size = 1.56

$$\frac{1}{16}\sqrt{2}\left(2\sqrt{2}\arctan(x)+\sqrt{2}\log(x+1)-\sqrt{2}\log(x-1)+4\arctan\left(\frac{1}{\sqrt{2}x+\sqrt{2}\sqrt{x^2+\sqrt{2}x+1}+1}\right)+4\arctan\left(\frac{}{\sqrt{2}x+\sqrt{2}\sqrt{}}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^4/(x^8 - 1),x, algorithm="fricas")
```

```
[Out] 1/16*sqrt(2)*(2*sqrt(2)*arctan(x) + sqrt(2)*log(x + 1) - sqrt(2)*
log(x - 1) + 4*arctan(1/(sqrt(2)*x + sqrt(2)*sqrt(x^2 + sqrt(2)*x
 + 1) + 1)) + 4*arctan(1/(sqrt(2)*x + sqrt(2)*sqrt(x^2 - sqrt(2)*
x + 1) - 1)) - log(x^2 + sqrt(2)*x + 1) + log(x^2 - sqrt(2)*x + 1
))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(-x**8+1),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.232209, size = 122, normalized size = 1.26

$$-\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x+\sqrt{2}\right)\right)-\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x-\sqrt{2}\right)\right)-\frac{1}{16}\sqrt{2}\ln\left(x^2+\sqrt{2}x+1\right)+\frac{1}{16}\sqrt{2}\ln\left(x^2-\sqrt{2}x+1\right)+\frac{1}{4}\arctan\left(x\right)+\frac{1}{8}\ln\left(|x+1|\right)-\frac{1}{8}\ln\left(|x-1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^4/(x^8 - 1),x, algorithm="giac")
```

```
[Out] -1/8*sqrt(2)*arctan(1/2*sqrt(2)*(2*x + sqrt(2))) - 1/8*sqrt(2)*ar
ctan(1/2*sqrt(2)*(2*x - sqrt(2))) - 1/16*sqrt(2)*ln(x^2 + sqrt(2)
*x + 1) + 1/16*sqrt(2)*ln(x^2 - sqrt(2)*x + 1) + 1/4*arctan(x) +
1/8*ln(abs(x + 1)) - 1/8*ln(abs(x - 1))
```

3.1482 $\int \frac{x^2}{1-x^8} dx$

Optimal. Leaf size=97

$$\frac{\log\left(x^2-\sqrt{2}x+1\right)}{8\sqrt{2}}-\frac{\log\left(x^2+\sqrt{2}x+1\right)}{8\sqrt{2}}-\frac{1}{4}\tan^{-1}(x)-\frac{\tan^{-1}\left(1-\sqrt{2}x\right)}{4\sqrt{2}}+\frac{\tan^{-1}\left(\sqrt{2}x+1\right)}{4\sqrt{2}}+\frac{1}{4}\tanh^{-1}(x)$$

```
[Out] -ArcTan[x]/4 - ArcTan[1 - Sqrt[2]*x]/(4*Sqrt[2]) + ArcTan[1 + Sqr
t[2]*x]/(4*Sqrt[2]) + ArcTanh[x]/4 + Log[1 - Sqrt[2]*x + x^2]/(8*
Sqrt[2]) - Log[1 + Sqrt[2]*x + x^2]/(8*Sqrt[2])
```

Rubi [A] time = 0.132571, antiderivative size = 97, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 10, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.769

$$\frac{\log\left(x^2-\sqrt{2}x+1\right)}{8\sqrt{2}}-\frac{\log\left(x^2+\sqrt{2}x+1\right)}{8\sqrt{2}}-\frac{1}{4}\tan^{-1}(x)-\frac{\tan^{-1}\left(1-\sqrt{2}x\right)}{4\sqrt{2}}+\frac{\tan^{-1}\left(\sqrt{2}x+1\right)}{4\sqrt{2}}+\frac{1}{4}\tanh^{-1}(x)$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(1 - x^8),x]
```

```
[Out] -ArcTan[x]/4 - ArcTan[1 - Sqrt[2]*x]/(4*Sqrt[2]) + ArcTan[1 + Sqr
t[2]*x]/(4*Sqrt[2]) + ArcTanh[x]/4 + Log[1 - Sqrt[2]*x + x^2]/(8*
Sqrt[2]) - Log[1 + Sqrt[2]*x + x^2]/(8*Sqrt[2])
```

Rubi in Sympy [A] time = 19.4815, size = 83, normalized size = 0.86

$$\frac{\sqrt{2}\log\left(x^2-\sqrt{2}x+1\right)}{16}-\frac{\sqrt{2}\log\left(x^2+\sqrt{2}x+1\right)}{16}-\frac{\operatorname{atan}(x)}{4}+\frac{\sqrt{2}\operatorname{atan}\left(\sqrt{2}x-1\right)}{8}+\frac{\sqrt{2}\operatorname{atan}\left(\sqrt{2}x+1\right)}{8}+\frac{\operatorname{atanh}(x)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**2/(-x**8+1),x)
```

```
[Out] sqrt(2)*log(x**2 - sqrt(2)*x + 1)/16 - sqrt(2)*log(x**2 + sqrt(2)
*x + 1)/16 - atan(x)/4 + sqrt(2)*atan(sqrt(2)*x - 1)/8 + sqrt(2)*
atan(sqrt(2)*x + 1)/8 + atanh(x)/4
```

Mathematica [A] time = 0.029458, size = 98, normalized size = 1.01

$$\frac{1}{16}\left(\sqrt{2}\log\left(x^2-\sqrt{2}x+1\right)-\sqrt{2}\log\left(x^2+\sqrt{2}x+1\right)-2\log(1-x)+2\log(x+1)-4\tan^{-1}(x)-2\sqrt{2}\tan^{-1}\left(1-\sqrt{2}x\right)+2\sqrt{2}\tan^{-1}\left(\sqrt{2}x+1\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(1 - x^8),x]
```

```
[Out] (-4*ArcTan[x] - 2*Sqrt[2]*ArcTan[1 - Sqrt[2]*x] + 2*Sqrt[2]*ArcTa
n[1 + Sqrt[2]*x] - 2*Log[1 - x] + 2*Log[1 + x] + Sqrt[2]*Log[1 -
Sqrt[2]*x + x^2] - Sqrt[2]*Log[1 + Sqrt[2]*x + x^2])/16
```

Maple [A] time = 0.003, size = 74, normalized size = 0.8

$$-\frac{\ln(-1+x)}{8}+\frac{\ln(1+x)}{8}-\frac{\arctan(x)}{4}+\frac{\arctan\left(x\sqrt{2}-1\right)\sqrt{2}}{8}+\frac{\sqrt{2}}{16}\ln\left(\frac{1+x^2-x\sqrt{2}}{1+x^2+x\sqrt{2}}\right)+\frac{\arctan\left(1+x\sqrt{2}\right)\sqrt{2}}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(-x^8+1),x)
```

```
[Out] -1/8*ln(-1+x)+1/8*ln(1+x)-1/4*arctan(x)+1/8*arctan(x*2^(1/2)-1)*2
^(1/2)+1/16*2^(1/2)*ln((1+x^2-x*2^(1/2))/(1+x^2+x*2^(1/2)))+1/8*a
rctan(1+x*2^(1/2))*2^(1/2)
```

Maxima [A] time = 1.6031, size = 119, normalized size = 1.23

$$\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x+\sqrt{2}\right)\right)+\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x-\sqrt{2}\right)\right)-\frac{1}{16}\sqrt{2}\log\left(x^2+\sqrt{2}x+1\right)+\frac{1}{16}\sqrt{2}\log\left(x^2-\sqrt{2}x+1\right)-\frac{1}{4}\arctan(x)+\frac{1}{8}\log(x+1)-\frac{1}{8}\log(x-1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^2/(x^8 - 1),x, algorithm="maxima")
```

```
[Out] 1/8*sqrt(2)*arctan(1/2*sqrt(2)*(2*x + sqrt(2))) + 1/8*sqrt(2)*arc
tan(1/2*sqrt(2)*(2*x - sqrt(2))) - 1/16*sqrt(2)*log(x^2 + sqrt(2)
*x + 1) + 1/16*sqrt(2)*log(x^2 - sqrt(2)*x + 1) - 1/4*arctan(x) +
 1/8*log(x + 1) - 1/8*log(x - 1)
```

Fricas [A] time = 0.237635, size = 151, normalized size = 1.56

$$-\frac{1}{16}\sqrt{2}\left(2\sqrt{2}\arctan(x)-\sqrt{2}\log(x+1)+\sqrt{2}\log(x-1)+4\arctan\left(\frac{1}{\sqrt{2}x+\sqrt{2}\sqrt{x^2+\sqrt{2}x+1}+1}\right)+4\arctan\left(\frac{}{\sqrt{2}x+\sqrt{2}}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^2/(x^8 - 1),x, algorithm="fricas")
```

```
[Out] -1/16*sqrt(2)*(2*sqrt(2)*arctan(x) - sqrt(2)*log(x + 1) + sqrt(2)
*log(x - 1) + 4*arctan(1/(sqrt(2)*x + sqrt(2)*sqrt(x^2 + sqrt(2)*
x + 1) + 1)) + 4*arctan(1/(sqrt(2)*x + sqrt(2)*sqrt(x^2 - sqrt(2)
*x + 1) - 1)) + log(x^2 + sqrt(2)*x + 1) - log(x^2 - sqrt(2)*x +
1))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(-x**8+1),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.27278, size = 122, normalized size = 1.26

$$\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x+\sqrt{2}\right)\right)+\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x-\sqrt{2}\right)\right)-\frac{1}{16}\sqrt{2}\ln\left(x^2+\sqrt{2}x+1\right)+\frac{1}{16}\sqrt{2}\ln\left(x^2-\sqrt{2}x+1\right)-\frac{1}{4}\arctan(x)+\frac{1}{8}\ln(|x+1|)-\frac{1}{8}\ln(|x-1|)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^2/(x^8 - 1),x, algorithm="giac")
```

```
[Out] 1/8*sqrt(2)*arctan(1/2*sqrt(2)*(2*x + sqrt(2))) + 1/8*sqrt(2)*arc
tan(1/2*sqrt(2)*(2*x - sqrt(2))) - 1/16*sqrt(2)*ln(x^2 + sqrt(2)*
x + 1) + 1/16*sqrt(2)*ln(x^2 - sqrt(2)*x + 1) - 1/4*arctan(x) + 1
/8*ln(abs(x + 1)) - 1/8*ln(abs(x - 1))
```

3.1483 $\int \frac{1}{1-x^8} dx$

Optimal. Leaf size=97

$$-\frac{\log \left(x^2-\sqrt{2}x+1\right)}{8\sqrt{2}}+\frac{\log \left(x^2+\sqrt{2}x+1\right)}{8\sqrt{2}}+\frac{1}{4}\tan^{-1}(x)-\frac{\tan^{-1}\left(1-\sqrt{2}x\right)}{4\sqrt{2}}+\frac{\tan^{-1}\left(\sqrt{2}x+1\right)}{4\sqrt{2}}+\frac{1}{4}\tanh^{-1}(x)$$

```
[Out] ArcTan[x]/4 - ArcTan[1 - Sqrt[2]*x]/(4*Sqrt[2]) + ArcTan[1 + Sqrt
[2]*x]/(4*Sqrt[2]) + ArcTanh[x]/4 - Log[1 - Sqrt[2]*x + x^2]/(8*S
qrt[2]) + Log[1 + Sqrt[2]*x + x^2]/(8*Sqrt[2])
```

Rubi [A] time = 0.114057, antiderivative size = 97, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 10, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.111

$$-\frac{\log \left(x^2-\sqrt{2}x+1\right)}{8\sqrt{2}}+\frac{\log \left(x^2+\sqrt{2}x+1\right)}{8\sqrt{2}}+\frac{1}{4}\tan^{-1}(x)-\frac{\tan^{-1}\left(1-\sqrt{2}x\right)}{4\sqrt{2}}+\frac{\tan^{-1}\left(\sqrt{2}x+1\right)}{4\sqrt{2}}+\frac{1}{4}\tanh^{-1}(x)$$

Antiderivative was successfully verified.

```
[In]  Int[(1 - x^8)^(-1),x]
```

```
[Out] ArcTan[x]/4 - ArcTan[1 - Sqrt[2]*x]/(4*Sqrt[2]) + ArcTan[1 + Sqrt
[2]*x]/(4*Sqrt[2]) + ArcTanh[x]/4 - Log[1 - Sqrt[2]*x + x^2]/(8*S
qrt[2]) + Log[1 + Sqrt[2]*x + x^2]/(8*Sqrt[2])
```

Rubi in Sympy [A] time = 14.7991, size = 83, normalized size = 0.86

$$-\frac{\sqrt{2}\log\left(x^2-\sqrt{2}x+1\right)}{16}+\frac{\sqrt{2}\log\left(x^2+\sqrt{2}x+1\right)}{16}+\frac{\operatorname{atan}(x)}{4}+\frac{\sqrt{2}\operatorname{atan}\left(\sqrt{2}x-1\right)}{8}+\frac{\sqrt{2}\operatorname{atan}\left(\sqrt{2}x+1\right)}{8}+\frac{\operatorname{atanh}(x)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(-x**8+1),x)
```

```
[Out] -sqrt(2)*log(x**2 - sqrt(2)*x + 1)/16 + sqrt(2)*log(x**2 + sqrt(2
)*x + 1)/16 + atan(x)/4 + sqrt(2)*atan(sqrt(2)*x - 1)/8 + sqrt(2)
*atan(sqrt(2)*x + 1)/8 + atanh(x)/4
```

Mathematica [A] time = 0.0294202, size = 98, normalized size = 1.01

$$\frac{1}{16}\left(-\sqrt{2}\log\left(x^2-\sqrt{2}x+1\right)+\sqrt{2}\log\left(x^2+\sqrt{2}x+1\right)-2\log(1-x)+2\log(x+1)+4\tan^{-1}(x)-2\sqrt{2}\tan^{-1}\left(1-\sqrt{2}x\right)+2\sqrt{2}\tan^{-1}\left(\sqrt{2}x+1\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(1 - x^8)^(-1),x]
```

```
[Out] (4*ArcTan[x] - 2*Sqrt[2]*ArcTan[1 - Sqrt[2]*x] + 2*Sqrt[2]*ArcTan
[1 + Sqrt[2]*x] - 2*Log[1 - x] + 2*Log[1 + x] - Sqrt[2]*Log[1 - S
qrt[2]*x + x^2] + Sqrt[2]*Log[1 + Sqrt[2]*x + x^2])/16
```

Maple [A] time = 0.003, size = 66, normalized size = 0.7

$$\frac{Artanh(x)}{4}+\frac{\arctan(x)}{4}+\frac{\arctan\left(1+x\sqrt{2}\right)\sqrt{2}}{8}+\frac{\arctan\left(x\sqrt{2}-1\right)\sqrt{2}}{8}+\frac{\sqrt{2}}{16}\ln\left(\frac{1+x^2+x\sqrt{2}}{1+x^2-x\sqrt{2}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(-x^8+1),x)
```

```
[Out] 1/4*arctanh(x)+1/4*arctan(x)+1/8*arctan(1+x*2^(1/2))*2^(1/2)+1/8*
arctan(x*2^(1/2)-1)*2^(1/2)+1/16*2^(1/2)*ln((1+x^2+x*2^(1/2))/(1+
x^2-x*2^(1/2)))
```

Maxima [A] time = 1.60445, size = 119, normalized size = 1.23

$$\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x+\sqrt{2}\right)\right)+\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x-\sqrt{2}\right)\right)+\frac{1}{16}\sqrt{2}\log\left(x^2+\sqrt{2}x+1\right)-\frac{1}{16}\sqrt{2}\log\left(x^2-\sqrt{2}x+1\right)+\frac{1}{4}\arctan(x)+\frac{1}{8}\log(x+1)-\frac{1}{8}\log(x-1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(x^8 - 1),x, algorithm="maxima")
```

```
[Out] 1/8*sqrt(2)*arctan(1/2*sqrt(2)*(2*x + sqrt(2))) + 1/8*sqrt(2)*arc
tan(1/2*sqrt(2)*(2*x - sqrt(2))) + 1/16*sqrt(2)*log(x^2 + sqrt(2)
*x + 1) - 1/16*sqrt(2)*log(x^2 - sqrt(2)*x + 1) + 1/4*arctan(x) +
 1/8*log(x + 1) - 1/8*log(x - 1)
```

Fricas [A] time = 0.236309, size = 151, normalized size = 1.56

$$\frac{1}{16}\sqrt{2}\left(2\sqrt{2}\arctan(x)+\sqrt{2}\log(x+1)-\sqrt{2}\log(x-1)-4\arctan\left(\frac{1}{\sqrt{2}x+\sqrt{2}\sqrt{x^2+\sqrt{2}x+1}+1}\right)-4\arctan\left(\frac{}{\sqrt{2}x+\sqrt{2}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(x^8 - 1),x, algorithm="fricas")
```

```
[Out] 1/16*sqrt(2)*(2*sqrt(2)*arctan(x) + sqrt(2)*log(x + 1) - sqrt(2)*
log(x - 1) - 4*arctan(1/(sqrt(2)*x + sqrt(2)*sqrt(x^2 + sqrt(2)*x
 + 1) + 1)) - 4*arctan(1/(sqrt(2)*x + sqrt(2)*sqrt(x^2 - sqrt(2)*
x + 1) - 1)) + log(x^2 + sqrt(2)*x + 1) - log(x^2 - sqrt(2)*x + 1
))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(-x**8+1),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.233378, size = 122, normalized size = 1.26

$$\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x+\sqrt{2}\right)\right)+\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x-\sqrt{2}\right)\right)+\frac{1}{16}\sqrt{2}\ln\left(x^2+\sqrt{2}x+1\right)-\frac{1}{16}\sqrt{2}\ln\left(x^2-\sqrt{2}x+1\right)+\frac{1}{4}\arctan(x)+\frac{1}{8}\ln\left(|x+1|\right)-\frac{1}{8}\ln\left(|x-1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(x^8 - 1),x, algorithm="giac")
```

```
[Out] 1/8*sqrt(2)*arctan(1/2*sqrt(2)*(2*x + sqrt(2))) + 1/8*sqrt(2)*arc
tan(1/2*sqrt(2)*(2*x - sqrt(2))) + 1/16*sqrt(2)*ln(x^2 + sqrt(2)*
x + 1) - 1/16*sqrt(2)*ln(x^2 - sqrt(2)*x + 1) + 1/4*arctan(x) + 1
/8*ln(abs(x + 1)) - 1/8*ln(abs(x - 1))
```

3.1484 $\int \frac{1}{x^2(1-x^8)}\,dx$

Optimal. Leaf size=102

$$-\frac{\log\left(x^2-\sqrt{2}x+1\right)}{8\sqrt{2}}+\frac{\log\left(x^2+\sqrt{2}x+1\right)}{8\sqrt{2}}-\frac{1}{x}-\frac{1}{4}\tan^{-1}(x)+\frac{\tan^{-1}\left(1-\sqrt{2}x\right)}{4\sqrt{2}}-\frac{\tan^{-1}\left(\sqrt{2}x+1\right)}{4\sqrt{2}}+\frac{1}{4}\tanh^{-1}(x)$$

```
[Out] -x^(-1) - ArcTan[x]/4 + ArcTan[1 - Sqrt[2]*x]/(4*Sqrt[2]) - ArcTa
n[1 + Sqrt[2]*x]/(4*Sqrt[2]) + ArcTanh[x]/4 - Log[1 - Sqrt[2]*x +
 x^2]/(8*Sqrt[2]) + Log[1 + Sqrt[2]*x + x^2]/(8*Sqrt[2])
```

Rubi [A] time = 0.133232, antiderivative size = 102, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 11, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.846

$$-\frac{\log\left(x^2-\sqrt{2}x+1\right)}{8\sqrt{2}}+\frac{\log\left(x^2+\sqrt{2}x+1\right)}{8\sqrt{2}}-\frac{1}{x}-\frac{1}{4}\tan^{-1}(x)+\frac{\tan^{-1}\left(1-\sqrt{2}x\right)}{4\sqrt{2}}-\frac{\tan^{-1}\left(\sqrt{2}x+1\right)}{4\sqrt{2}}+\frac{1}{4}\tanh^{-1}(x)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(1 - x^8)),x]
```

```
[Out] -x^(-1) - ArcTan[x]/4 + ArcTan[1 - Sqrt[2]*x]/(4*Sqrt[2]) - ArcTa
n[1 + Sqrt[2]*x]/(4*Sqrt[2]) + ArcTanh[x]/4 - Log[1 - Sqrt[2]*x +
 x^2]/(8*Sqrt[2]) + Log[1 + Sqrt[2]*x + x^2]/(8*Sqrt[2])
```

Rubi in Sympy [A] time = 21.0885, size = 87, normalized size = 0.85

$$-\frac{\sqrt{2}\log\left(x^2-\sqrt{2}x+1\right)}{16}+\frac{\sqrt{2}\log\left(x^2+\sqrt{2}x+1\right)}{16}-\frac{\operatorname{atan}(x)}{4}-\frac{\sqrt{2}\operatorname{atan}\left(\sqrt{2}x-1\right)}{8}-\frac{\sqrt{2}\operatorname{atan}\left(\sqrt{2}x+1\right)}{8}+\frac{\operatorname{atanh}(x)}{4}-\frac{1}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(-x**8+1),x)
```

```
[Out] -sqrt(2)*log(x**2 - sqrt(2)*x + 1)/16 + sqrt(2)*log(x**2 + sqrt(2
)*x + 1)/16 - atan(x)/4 - sqrt(2)*atan(sqrt(2)*x - 1)/8 - sqrt(2)
*atan(sqrt(2)*x + 1)/8 + atanh(x)/4 - 1/x
```

Mathematica [A] time = 0.0590497, size = 109, normalized size = 1.07

$$-\frac{\sqrt{2}x\log\left(x^2-\sqrt{2}x+1\right)-\sqrt{2}x\log\left(x^2+\sqrt{2}x+1\right)+2x\log(1-x)-2x\log(x+1)+4x\tan^{-1}(x)-2\sqrt{2}x\tan^{-1}\left(1-\sqrt{2}x\right)}{16x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*(1 - x^8)),x]
```

```
[Out] -(16 + 4*x*ArcTan[x] - 2*Sqrt[2]*x*ArcTan[1 - Sqrt[2]*x] + 2*Sqrt
[2]*x*ArcTan[1 + Sqrt[2]*x] + 2*x*Log[1 - x] - 2*x*Log[1 + x] + S
qrt[2]*x*Log[1 - Sqrt[2]*x + x^2] - Sqrt[2]*x*Log[1 + Sqrt[2]*x +
 x^2])/(16*x)
```

Maple [A] time = 0.016, size = 79, normalized size = 0.8

$$-\frac{\ln(-1+x)}{8}-\frac{\arctan\left(1+x\sqrt{2}\right)\sqrt{2}}{8}-\frac{\arctan\left(x\sqrt{2}-1\right)\sqrt{2}}{8}-\frac{\sqrt{2}}{16}\ln\left(\frac{1+x^2-x\sqrt{2}}{1+x^2+x\sqrt{2}}\right)+\frac{\ln(1+x)}{8}-\frac{\arctan(x)}{4}-x^{-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(-x^8+1),x)
```

```
[Out] -1/8*ln(-1+x)-1/8*arctan(1+x*2^(1/2))*2^(1/2)-1/8*arctan(x*2^(1/2
)-1)*2^(1/2)-1/16*2^(1/2)*ln((1+x^2-x*2^(1/2))/(1+x^2+x*2^(1/2)))
+1/8*ln(1+x)-1/4*arctan(x)-1/x
```

Maxima [A] time = 1.59446, size = 126, normalized size = 1.24

$$-\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x+\sqrt{2}\right)\right)-\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x-\sqrt{2}\right)\right)+\frac{1}{16}\sqrt{2}\log\left(x^2+\sqrt{2}x+1\right)-\frac{1}{16}\sqrt{2}\log\left(x^2-\sqrt{2}x+1\right)-\frac{1}{x}-\frac{1}{4}\arctan(x)+\frac{1}{8}\log(x+1)-\frac{1}{8}\log(x-1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^8 - 1)*x^2),x, algorithm="maxima")
```

```
[Out] -1/8*sqrt(2)*arctan(1/2*sqrt(2)*(2*x + sqrt(2))) - 1/8*sqrt(2)*ar
ctan(1/2*sqrt(2)*(2*x - sqrt(2))) + 1/16*sqrt(2)*log(x^2 + sqrt(2
)*x + 1) - 1/16*sqrt(2)*log(x^2 - sqrt(2)*x + 1) - 1/x - 1/4*arct
an(x) + 1/8*log(x + 1) - 1/8*log(x - 1)
```

Fricas [A] time = 0.236241, size = 173, normalized size = 1.7

$$-\frac{\sqrt{2}\left(2\sqrt{2}x\arctan(x)-\sqrt{2}x\log(x+1)+\sqrt{2}x\log(x-1)-4x\arctan\left(\frac{1}{\sqrt{2}x+\sqrt{2}\sqrt{x^2+\sqrt{2}x+1}+1}\right)-4x\arctan\left(\frac{1}{\sqrt{2}x+\sqrt{2}\sqrt{x^2-\sqrt{2}x+1}\right.$$
$$16x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^8 - 1)*x^2),x, algorithm="fricas")
```

```
[Out] -1/16*sqrt(2)*(2*sqrt(2)*x*arctan(x) - sqrt(2)*x*log(x + 1) + sqr
t(2)*x*log(x - 1) - 4*x*arctan(1/(sqrt(2)*x + sqrt(2)*sqrt(x^2 +
sqrt(2)*x + 1) + 1)) - 4*x*arctan(1/(sqrt(2)*x + sqrt(2)*sqrt(x^2
 - sqrt(2)*x + 1) - 1)) - x*log(x^2 + sqrt(2)*x + 1) + x*log(x^2
- sqrt(2)*x + 1) + 8*sqrt(2))/x
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(-x**8+1),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.231379, size = 128, normalized size = 1.25

$$-\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x+\sqrt{2}\right)\right)-\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x-\sqrt{2}\right)\right)+\frac{1}{16}\sqrt{2}\ln\left(x^2+\sqrt{2}x+1\right)-\frac{1}{16}\sqrt{2}\ln\left(x^2-\sqrt{2}x+1\right)-\frac{1}{x}-\frac{1}{4}\arctan\left(x\right)+\frac{1}{8}\ln\left(|x+1|\right)-\frac{1}{8}\ln\left(|x-1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^8 - 1)*x^2),x, algorithm="giac")
```

```
[Out] -1/8*sqrt(2)*arctan(1/2*sqrt(2)*(2*x + sqrt(2))) - 1/8*sqrt(2)*ar
ctan(1/2*sqrt(2)*(2*x - sqrt(2))) + 1/16*sqrt(2)*ln(x^2 + sqrt(2)
*x + 1) - 1/16*sqrt(2)*ln(x^2 - sqrt(2)*x + 1) - 1/x - 1/4*arctan
(x) + 1/8*ln(abs(x + 1)) - 1/8*ln(abs(x - 1))
```

3.1485 $\int \frac{1}{x^4(1-x^8)}\,dx$

Optimal. Leaf size=104

$$-\frac{1}{3x^3}+\frac{\log\left(x^2-\sqrt{2}x+1\right)}{8\sqrt{2}}-\frac{\log\left(x^2+\sqrt{2}x+1\right)}{8\sqrt{2}}+\frac{1}{4}\tan^{-1}(x)+\frac{\tan^{-1}\left(1-\sqrt{2}x\right)}{4\sqrt{2}}-\frac{\tan^{-1}\left(\sqrt{2}x+1\right)}{4\sqrt{2}}+\frac{1}{4}\tanh^{-1}(x)$$

```
[Out] -1/(3*x^3) + ArcTan[x]/4 + ArcTan[1 - Sqrt[2]*x]/(4*Sqrt[2]) - Ar
cTan[1 + Sqrt[2]*x]/(4*Sqrt[2]) + ArcTanh[x]/4 + Log[1 - Sqrt[2]*
x + x^2]/(8*Sqrt[2]) - Log[1 + Sqrt[2]*x + x^2]/(8*Sqrt[2])
```

Rubi [A] time = 0.128195, antiderivative size = 104, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 11, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.846

$$-\frac{1}{3x^3}+\frac{\log\left(x^2-\sqrt{2}x+1\right)}{8\sqrt{2}}-\frac{\log\left(x^2+\sqrt{2}x+1\right)}{8\sqrt{2}}+\frac{1}{4}\tan^{-1}(x)+\frac{\tan^{-1}\left(1-\sqrt{2}x\right)}{4\sqrt{2}}-\frac{\tan^{-1}\left(\sqrt{2}x+1\right)}{4\sqrt{2}}+\frac{1}{4}\tanh^{-1}(x)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*(1 - x^8)),x]
```

```
[Out] -1/(3*x^3) + ArcTan[x]/4 + ArcTan[1 - Sqrt[2]*x]/(4*Sqrt[2]) - Ar
cTan[1 + Sqrt[2]*x]/(4*Sqrt[2]) + ArcTanh[x]/4 + Log[1 - Sqrt[2]*
x + x^2]/(8*Sqrt[2]) - Log[1 + Sqrt[2]*x + x^2]/(8*Sqrt[2])
```

Rubi in Sympy [A] time = 18.3225, size = 90, normalized size = 0.87

$$\frac{\sqrt{2}\log\left(x^2-\sqrt{2}x+1\right)}{16}-\frac{\sqrt{2}\log\left(x^2+\sqrt{2}x+1\right)}{16}+\frac{\operatorname{atan}(x)}{4}-\frac{\sqrt{2}\operatorname{atan}\left(\sqrt{2}x-1\right)}{8}-\frac{\sqrt{2}\operatorname{atan}\left(\sqrt{2}x+1\right)}{8}+\frac{\operatorname{atanh}(x)}{4}-\frac{1}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(-x**8+1),x)
```

```
[Out] sqrt(2)*log(x**2 - sqrt(2)*x + 1)/16 - sqrt(2)*log(x**2 + sqrt(2)
*x + 1)/16 + atan(x)/4 - sqrt(2)*atan(sqrt(2)*x - 1)/8 - sqrt(2)*
atan(sqrt(2)*x + 1)/8 + atanh(x)/4 - 1/(3*x**3)
```

Mathematica [A] time = 0.0762081, size = 104, normalized size = 1.

$$\frac{1}{48}\left(-\frac{16}{x^3}+3\sqrt{2}\log\left(x^2-\sqrt{2}x+1\right)-3\sqrt{2}\log\left(x^2+\sqrt{2}x+1\right)-6\log(1-x)+6\log(x+1)+12\tan^{-1}(x)+6\sqrt{2}\tan^{-1}\left(1-\sqrt{2}x\right)-6\sqrt{2}\tan^{-1}\left(\sqrt{2}x+1\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*(1 - x^8)),x]
```

```
[Out] (-16/x^3 + 12*ArcTan[x] + 6*Sqrt[2]*ArcTan[1 - Sqrt[2]*x] - 6*Sqr
t[2]*ArcTan[1 + Sqrt[2]*x] - 6*Log[1 - x] + 6*Log[1 + x] + 3*Sqrt
[2]*Log[1 - Sqrt[2]*x + x^2] - 3*Sqrt[2]*Log[1 + Sqrt[2]*x + x^2]
)/48
```

Maple [A] time = 0.016, size = 79, normalized size = 0.8

$$-\frac{\ln\left(-1+x\right)}{8}-\frac{\arctan\left(1+x\sqrt{2}\right)\sqrt{2}}{8}-\frac{\arctan\left(x\sqrt{2}-1\right)\sqrt{2}}{8}-\frac{\sqrt{2}}{16}\ln\left(\frac{1+x^2+x\sqrt{2}}{1+x^2-x\sqrt{2}}\right)-\frac{1}{3x^3}+\frac{\ln\left(1+x\right)}{8}+\frac{\arctan\left(x\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(-x^8+1),x)
```

```
[Out] -1/8*ln(-1+x)-1/8*arctan(1+x*2^(1/2))*2^(1/2)-1/8*arctan(x*2^(1/2
)-1)*2^(1/2)-1/16*2^(1/2)*ln((1+x^2+x*2^(1/2))/(1+x^2-x*2^(1/2)))
-1/3/x^3+1/8*ln(1+x)+1/4*arctan(x)
```

Maxima [A] time = 1.59396, size = 126, normalized size = 1.21

$$-\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x+\sqrt{2}\right)\right)-\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x-\sqrt{2}\right)\right)-\frac{1}{16}\sqrt{2}\log\left(x^2+\sqrt{2}x+1\right)+\frac{1}{16}\sqrt{2}\log\left(x^2-\sqrt{2}x+1\right)-\frac{1}{3x^3}+\frac{1}{4}\arctan\left(x\right)+\frac{1}{8}\log\left(x+1\right)-\frac{1}{8}\log\left(x-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^8 - 1)*x^4),x, algorithm="maxima")
```

```
[Out] -1/8*sqrt(2)*arctan(1/2*sqrt(2)*(2*x + sqrt(2))) - 1/8*sqrt(2)*ar
ctan(1/2*sqrt(2)*(2*x - sqrt(2))) - 1/16*sqrt(2)*log(x^2 + sqrt(2
)*x + 1) + 1/16*sqrt(2)*log(x^2 - sqrt(2)*x + 1) - 1/3/x^3 + 1/4*
arctan(x) + 1/8*log(x + 1) - 1/8*log(x - 1)
```

Fricas [A] time = 0.238078, size = 194, normalized size = 1.87

$$\frac{\sqrt{2}\left(6\sqrt{2}x^3\arctan\left(x\right)+3\sqrt{2}x^3\log\left(x+1\right)-3\sqrt{2}x^3\log\left(x-1\right)+12x^3\arctan\left(\frac{1}{\sqrt{2}x+\sqrt{2}\sqrt{x^2+\sqrt{2}x+1}+1}\right)+12x^3\arctan\left(\frac{}{\sqrt{2}x+\sqrt{2}\sqrt{}}\right.}{48x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^8 - 1)*x^4),x, algorithm="fricas")
```

```
[Out] 1/48*sqrt(2)*(6*sqrt(2)*x^3*arctan(x) + 3*sqrt(2)*x^3*log(x + 1)
- 3*sqrt(2)*x^3*log(x - 1) + 12*x^3*arctan(1/(sqrt(2)*x + sqrt(2)
*sqrt(x^2 + sqrt(2)*x + 1) + 1)) + 12*x^3*arctan(1/(sqrt(2)*x + s
qrt(2)*sqrt(x^2 - sqrt(2)*x + 1) - 1)) - 3*x^3*log(x^2 + sqrt(2)*
x + 1) + 3*x^3*log(x^2 - sqrt(2)*x + 1) - 8*sqrt(2))/x^3
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(-x**8+1),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.24, size = 128, normalized size = 1.23

$$-\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x+\sqrt{2}\right)\right)-\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x-\sqrt{2}\right)\right)-\frac{1}{16}\sqrt{2}\ln\left(x^2+\sqrt{2}x+1\right)+\frac{1}{16}\sqrt{2}\ln\left(x^2-\sqrt{2}x+1\right)-\frac{1}{3x^3}+\frac{1}{4}\arctan\left(x\right)+\frac{1}{8}\ln\left(|x+1|\right)-\frac{1}{8}\ln\left(|x-1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^8 - 1)*x^4),x, algorithm="giac")
```

```
[Out] -1/8*sqrt(2)*arctan(1/2*sqrt(2)*(2*x + sqrt(2))) - 1/8*sqrt(2)*ar
ctan(1/2*sqrt(2)*(2*x - sqrt(2))) - 1/16*sqrt(2)*ln(x^2 + sqrt(2)
*x + 1) + 1/16*sqrt(2)*ln(x^2 - sqrt(2)*x + 1) - 1/3/x^3 + 1/4*ar
ctan(x) + 1/8*ln(abs(x + 1)) - 1/8*ln(abs(x - 1))
```

3.1486 $\int \frac{1}{x^6(1-x^8)}\,dx$

Optimal. Leaf size=104

$$-\frac{1}{5x^5}+\frac{\log\left(x^2-\sqrt{2}x+1\right)}{8\sqrt{2}}-\frac{\log\left(x^2+\sqrt{2}x+1\right)}{8\sqrt{2}}-\frac{1}{4}\tan^{-1}(x)-\frac{\tan^{-1}\left(1-\sqrt{2}x\right)}{4\sqrt{2}}+\frac{\tan^{-1}\left(\sqrt{2}x+1\right)}{4\sqrt{2}}+\frac{1}{4}\tanh^{-1}(x)$$

```
[Out] -1/(5*x^5) - ArcTan[x]/4 - ArcTan[1 - Sqrt[2]*x]/(4*Sqrt[2]) + Ar
cTan[1 + Sqrt[2]*x]/(4*Sqrt[2]) + ArcTanh[x]/4 + Log[1 - Sqrt[2]*
x + x^2]/(8*Sqrt[2]) - Log[1 + Sqrt[2]*x + x^2]/(8*Sqrt[2])
```

Rubi [A] time = 0.140047, antiderivative size = 104, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 11, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.846

$$-\frac{1}{5x^5}+\frac{\log\left(x^2-\sqrt{2}x+1\right)}{8\sqrt{2}}-\frac{\log\left(x^2+\sqrt{2}x+1\right)}{8\sqrt{2}}-\frac{1}{4}\tan^{-1}(x)-\frac{\tan^{-1}\left(1-\sqrt{2}x\right)}{4\sqrt{2}}+\frac{\tan^{-1}\left(\sqrt{2}x+1\right)}{4\sqrt{2}}+\frac{1}{4}\tanh^{-1}(x)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^6*(1 - x^8)),x]
```

```
[Out] -1/(5*x^5) - ArcTan[x]/4 - ArcTan[1 - Sqrt[2]*x]/(4*Sqrt[2]) + Ar
cTan[1 + Sqrt[2]*x]/(4*Sqrt[2]) + ArcTanh[x]/4 + Log[1 - Sqrt[2]*
x + x^2]/(8*Sqrt[2]) - Log[1 + Sqrt[2]*x + x^2]/(8*Sqrt[2])
```

Rubi in Sympy [A] time = 20.9346, size = 90, normalized size = 0.87

$$\frac{\sqrt{2}\log\left(x^2-\sqrt{2}x+1\right)}{16}-\frac{\sqrt{2}\log\left(x^2+\sqrt{2}x+1\right)}{16}-\frac{\operatorname{atan}(x)}{4}+\frac{\sqrt{2}\operatorname{atan}\left(\sqrt{2}x-1\right)}{8}+\frac{\sqrt{2}\operatorname{atan}\left(\sqrt{2}x+1\right)}{8}+\frac{\operatorname{atanh}(x)}{4}-\frac{1}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**6/(-x**8+1),x)
```

```
[Out] sqrt(2)*log(x**2 - sqrt(2)*x + 1)/16 - sqrt(2)*log(x**2 + sqrt(2)
*x + 1)/16 - atan(x)/4 + sqrt(2)*atan(sqrt(2)*x - 1)/8 + sqrt(2)*
atan(sqrt(2)*x + 1)/8 + atanh(x)/4 - 1/(5*x**5)
```

Mathematica [A] time = 0.0783238, size = 104, normalized size = 1.

$$\frac{1}{80}\left(-\frac{16}{x^5}+5\sqrt{2}\log\left(x^2-\sqrt{2}x+1\right)-5\sqrt{2}\log\left(x^2+\sqrt{2}x+1\right)-10\log(1-x)+10\log(x+1)-20\tan^{-1}(x)-10\sqrt{2}\tan^{-1}\left(1-\sqrt{2}x\right)+10\sqrt{2}\tan^{-1}\left(\sqrt{2}x+1\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^6*(1 - x^8)),x]
```

```
[Out] (-16/x^5 - 20*ArcTan[x] - 10*Sqrt[2]*ArcTan[1 - Sqrt[2]*x] + 10*S
qrt[2]*ArcTan[1 + Sqrt[2]*x] - 10*Log[1 - x] + 10*Log[1 + x] + 5*
Sqrt[2]*Log[1 - Sqrt[2]*x + x^2] - 5*Sqrt[2]*Log[1 + Sqrt[2]*x +
x^2])/80
```

Maple [A] time = 0.016, size = 79, normalized size = 0.8

$$-\frac{\ln(-1+x)}{8}+\frac{\arctan\left(1+x\sqrt{2}\right)\sqrt{2}}{8}+\frac{\arctan\left(x\sqrt{2}-1\right)\sqrt{2}}{8}+\frac{\sqrt{2}}{16}\ln\left(\frac{1+x^2-x\sqrt{2}}{1+x^2+x\sqrt{2}}\right)+\frac{\ln(1+x)}{8}-\frac{1}{5x^5}-\frac{\arctan(x)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^6/(-x^8+1),x)
```

```
[Out] -1/8*ln(-1+x)+1/8*arctan(1+x*2^(1/2))*2^(1/2)+1/8*arctan(x*2^(1/2
)-1)*2^(1/2)+1/16*2^(1/2)*ln((1+x^2-x*2^(1/2))/(1+x^2+x*2^(1/2)))
+1/8*ln(1+x)-1/5/x^5-1/4*arctan(x)
```

Maxima [A] time = 1.59259, size = 126, normalized size = 1.21

$$\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x+\sqrt{2}\right)\right)+\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x-\sqrt{2}\right)\right)-\frac{1}{16}\sqrt{2}\log\left(x^2+\sqrt{2}x+1\right)+\frac{1}{16}\sqrt{2}\log\left(x^2-\sqrt{2}x+1\right)-\frac{1}{5x^5}-\frac{1}{4}\arctan(x)+\frac{1}{8}\log(x+1)-\frac{1}{8}\log(x-1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^8 - 1)*x^6),x, algorithm="maxima")
```

```
[Out] 1/8*sqrt(2)*arctan(1/2*sqrt(2)*(2*x + sqrt(2))) + 1/8*sqrt(2)*arc
tan(1/2*sqrt(2)*(2*x - sqrt(2))) - 1/16*sqrt(2)*log(x^2 + sqrt(2)
*x + 1) + 1/16*sqrt(2)*log(x^2 - sqrt(2)*x + 1) - 1/5/x^5 - 1/4*a
rctan(x) + 1/8*log(x + 1) - 1/8*log(x - 1)
```

Fricas [A] time = 0.235309, size = 194, normalized size = 1.87

$$-\frac{\sqrt{2}\left(10\sqrt{2}x^5\arctan(x)-5\sqrt{2}x^5\log(x+1)+5\sqrt{2}x^5\log(x-1)+20x^5\arctan\left(\frac{1}{\sqrt{2}x+\sqrt{2}\sqrt{x^2+\sqrt{2}x+1}+1}\right)+20x^5\arctan\left(\frac{}{\sqrt{2}x+\cdots}\right.\right.}{80x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^8 - 1)*x^6),x, algorithm="fricas")
```

```
[Out] -1/80*sqrt(2)*(10*sqrt(2)*x^5*arctan(x) - 5*sqrt(2)*x^5*log(x + 1
) + 5*sqrt(2)*x^5*log(x - 1) + 20*x^5*arctan(1/(sqrt(2)*x + sqrt(
2)*sqrt(x^2 + sqrt(2)*x + 1) + 1)) + 20*x^5*arctan(1/(sqrt(2)*x +
 sqrt(2)*sqrt(x^2 - sqrt(2)*x + 1) - 1)) + 5*x^5*log(x^2 + sqrt(2
)*x + 1) - 5*x^5*log(x^2 - sqrt(2)*x + 1) + 8*sqrt(2))/x^5
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**6/(-x**8+1),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.236809, size = 128, normalized size = 1.23

$$\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x+\sqrt{2}\right)\right)+\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x-\sqrt{2}\right)\right)-\frac{1}{16}\sqrt{2}\ln\left(x^2+\sqrt{2}x+1\right)+\frac{1}{16}\sqrt{2}\ln\left(x^2-\sqrt{2}x+1\right)-\frac{1}{5x^5}-\frac{1}{4}\arctan\left(x\right)+\frac{1}{8}\ln\left(|x+1|\right)-\frac{1}{8}\ln\left(|x-1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^8 - 1)*x^6),x, algorithm="giac")
```

```
[Out] 1/8*sqrt(2)*arctan(1/2*sqrt(2)*(2*x + sqrt(2))) + 1/8*sqrt(2)*arc
tan(1/2*sqrt(2)*(2*x - sqrt(2))) - 1/16*sqrt(2)*ln(x^2 + sqrt(2)*
x + 1) + 1/16*sqrt(2)*ln(x^2 - sqrt(2)*x + 1) - 1/5/x^5 - 1/4*arc
tan(x) + 1/8*ln(abs(x + 1)) - 1/8*ln(abs(x - 1))
```

3.1487 $\int \frac{1}{x^8(1-x^8)}\,dx$

Optimal. Leaf size=104

$$-\frac{1}{7x^7}-\frac{\log\left(x^2-\sqrt{2}x+1\right)}{8\sqrt{2}}+\frac{\log\left(x^2+\sqrt{2}x+1\right)}{8\sqrt{2}}+\frac{1}{4}\tan^{-1}(x)-\frac{\tan^{-1}\left(1-\sqrt{2}x\right)}{4\sqrt{2}}+\frac{\tan^{-1}\left(\sqrt{2}x+1\right)}{4\sqrt{2}}+\frac{1}{4}\tanh^{-1}(x)$$

```
[Out] -1/(7*x^7) + ArcTan[x]/4 - ArcTan[1 - Sqrt[2]*x]/(4*Sqrt[2]) + Ar
cTan[1 + Sqrt[2]*x]/(4*Sqrt[2]) + ArcTanh[x]/4 - Log[1 - Sqrt[2]*
x + x^2]/(8*Sqrt[2]) + Log[1 + Sqrt[2]*x + x^2]/(8*Sqrt[2])
```

Rubi [A] time = 0.119535, antiderivative size = 104, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 11, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.846

$$-\frac{1}{7x^7}-\frac{\log\left(x^2-\sqrt{2}x+1\right)}{8\sqrt{2}}+\frac{\log\left(x^2+\sqrt{2}x+1\right)}{8\sqrt{2}}+\frac{1}{4}\tan^{-1}(x)-\frac{\tan^{-1}\left(1-\sqrt{2}x\right)}{4\sqrt{2}}+\frac{\tan^{-1}\left(\sqrt{2}x+1\right)}{4\sqrt{2}}+\frac{1}{4}\tanh^{-1}(x)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^8*(1 - x^8)),x]
```

```
[Out] -1/(7*x^7) + ArcTan[x]/4 - ArcTan[1 - Sqrt[2]*x]/(4*Sqrt[2]) + Ar
cTan[1 + Sqrt[2]*x]/(4*Sqrt[2]) + ArcTanh[x]/4 - Log[1 - Sqrt[2]*
x + x^2]/(8*Sqrt[2]) + Log[1 + Sqrt[2]*x + x^2]/(8*Sqrt[2])
```

Rubi in Sympy [A] time = 16.9074, size = 90, normalized size = 0.87

$$-\frac{\sqrt{2}\log\left(x^2-\sqrt{2}x+1\right)}{16}+\frac{\sqrt{2}\log\left(x^2+\sqrt{2}x+1\right)}{16}+\frac{\operatorname{atan}(x)}{4}+\frac{\sqrt{2}\operatorname{atan}\left(\sqrt{2}x-1\right)}{8}+\frac{\sqrt{2}\operatorname{atan}\left(\sqrt{2}x+1\right)}{8}+\frac{\operatorname{atanh}(x)}{4}-\frac{1}{7x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**8/(-x**8+1),x)
```

```
[Out] -sqrt(2)*log(x**2 - sqrt(2)*x + 1)/16 + sqrt(2)*log(x**2 + sqrt(2
)*x + 1)/16 + atan(x)/4 + sqrt(2)*atan(sqrt(2)*x - 1)/8 + sqrt(2)
*atan(sqrt(2)*x + 1)/8 + atanh(x)/4 - 1/(7*x**7)
```

Mathematica [A] time = 0.0746562, size = 104, normalized size = 1.

$$\frac{1}{112}\left(-\frac{16}{x^7}-7\sqrt{2}\log\left(x^2-\sqrt{2}x+1\right)+7\sqrt{2}\log\left(x^2+\sqrt{2}x+1\right)-14\log(1-x)+14\log(x+1)+28\tan^{-1}(x)-14\sqrt{2}\tan^{-1}\left(1-\sqrt{2}x\right)+14\sqrt{2}\tan^{-1}\left(\sqrt{2}x+1\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^8*(1 - x^8)),x]
```

```
[Out] (-16/x^7 + 28*ArcTan[x] - 14*Sqrt[2]*ArcTan[1 - Sqrt[2]*x] + 14*S
qrt[2]*ArcTan[1 + Sqrt[2]*x] - 14*Log[1 - x] + 14*Log[1 + x] - 7*
Sqrt[2]*Log[1 - Sqrt[2]*x + x^2] + 7*Sqrt[2]*Log[1 + Sqrt[2]*x +
x^2])/112
```

Maple [A] time = 0.015, size = 79, normalized size = 0.8

$$-\frac{\ln(-1+x)}{8}+\frac{\arctan\left(x\sqrt{2}-1\right)\sqrt{2}}{8}+\frac{\sqrt{2}}{16}\ln\left(\frac{1+x^2+x\sqrt{2}}{1+x^2-x\sqrt{2}}\right)+\frac{\arctan\left(1+x\sqrt{2}\right)\sqrt{2}}{8}+\frac{\ln(1+x)}{8}+\frac{\arctan(x)}{4}-\frac{1}{7x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^8/(-x^8+1),x)
```

```
[Out] -1/8*ln(-1+x)+1/8*arctan(x*2^(1/2)-1)*2^(1/2)+1/16*2^(1/2)*ln((1+
x^2+x*2^(1/2))/(1+x^2-x*2^(1/2)))+1/8*arctan(1+x*2^(1/2))*2^(1/2)
+1/8*ln(1+x)+1/4*arctan(x)-1/7/x^7
```

Maxima [A] time = 1.59589, size = 126, normalized size = 1.21

$$\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x+\sqrt{2}\right)\right)+\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x-\sqrt{2}\right)\right)+\frac{1}{16}\sqrt{2}\log\left(x^2+\sqrt{2}x+1\right)-\frac{1}{16}\sqrt{2}\log\left(x^2-\sqrt{2}x+1\right)-\frac{1}{7x^7}+\frac{1}{4}\arctan(x)+\frac{1}{8}\log(x+1)-\frac{1}{8}\log(x-1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^8 - 1)*x^8),x, algorithm="maxima")
```

```
[Out] 1/8*sqrt(2)*arctan(1/2*sqrt(2)*(2*x + sqrt(2))) + 1/8*sqrt(2)*arc
tan(1/2*sqrt(2)*(2*x - sqrt(2))) + 1/16*sqrt(2)*log(x^2 + sqrt(2)
*x + 1) - 1/16*sqrt(2)*log(x^2 - sqrt(2)*x + 1) - 1/7/x^7 + 1/4*a
rctan(x) + 1/8*log(x + 1) - 1/8*log(x - 1)
```

Fricas [A] time = 0.23559, size = 194, normalized size = 1.87

$$\frac{\sqrt{2}\left(14\sqrt{2}x^7\arctan(x)+7\sqrt{2}x^7\log(x+1)-7\sqrt{2}x^7\log(x-1)-28x^7\arctan\left(\frac{1}{\sqrt{2}x+\sqrt{2}\sqrt{x^2+\sqrt{2}x+1}+1}\right)-28x^7\arctan\left(\frac{}{\sqrt{2}x+\sqrt{}}\right.\right.}{112x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^8 - 1)*x^8),x, algorithm="fricas")
```

```
[Out] 1/112*sqrt(2)*(14*sqrt(2)*x^7*arctan(x) + 7*sqrt(2)*x^7*log(x + 1
) - 7*sqrt(2)*x^7*log(x - 1) - 28*x^7*arctan(1/(sqrt(2)*x + sqrt(
2)*sqrt(x^2 + sqrt(2)*x + 1) + 1)) - 28*x^7*arctan(1/(sqrt(2)*x +
 sqrt(2)*sqrt(x^2 - sqrt(2)*x + 1) - 1)) + 7*x^7*log(x^2 + sqrt(2
)*x + 1) - 7*x^7*log(x^2 - sqrt(2)*x + 1) - 8*sqrt(2))/x^7
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**8/(-x**8+1),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.242682, size = 128, normalized size = 1.23

$$\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x+\sqrt{2}\right)\right)+\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x-\sqrt{2}\right)\right)+\frac{1}{16}\sqrt{2}\ln\left(x^2+\sqrt{2}x+1\right)-\frac{1}{16}\sqrt{2}\ln\left(x^2-\sqrt{2}x+1\right)-\frac{1}{7x^7}+\frac{1}{4}\arctan\left(x\right)+\frac{1}{8}\ln\left(|x+1|\right)-\frac{1}{8}\ln\left(|x-1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/((x^8 - 1)*x^8),x, algorithm="giac")
```

```
[Out] 1/8*sqrt(2)*arctan(1/2*sqrt(2)*(2*x + sqrt(2))) + 1/8*sqrt(2)*arc
tan(1/2*sqrt(2)*(2*x - sqrt(2))) + 1/16*sqrt(2)*ln(x^2 + sqrt(2)*
x + 1) - 1/16*sqrt(2)*ln(x^2 - sqrt(2)*x + 1) - 1/7/x^7 + 1/4*arc
tan(x) + 1/8*ln(abs(x + 1)) - 1/8*ln(abs(x - 1))
```

3.1488 $\int \frac{x^9}{1+x^8} \, dx$

Optimal. Leaf size=100

$$\frac{x^2}{2}+\frac{\tan^{-1}\left(1-\sqrt{2}x^2\right)}{4\sqrt{2}}-\frac{\tan^{-1}\left(\sqrt{2}x^2+1\right)}{4\sqrt{2}}+\frac{\log\left(x^4-\sqrt{2}x^2+1\right)}{8\sqrt{2}}-\frac{\log\left(x^4+\sqrt{2}x^2+1\right)}{8\sqrt{2}}$$

```
[Out] x^2/2 + ArcTan[1 - Sqrt[2]*x^2]/(4*Sqrt[2]) - ArcTan[1 + Sqrt[2]*
x^2]/(4*Sqrt[2]) + Log[1 - Sqrt[2]*x^2 + x^4]/(8*Sqrt[2]) - Log[1
 + Sqrt[2]*x^2 + x^4]/(8*Sqrt[2])
```

Rubi [A] time = 0.148423, antiderivative size = 100, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 8, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.727

$$\frac{x^2}{2}+\frac{\tan^{-1}\left(1-\sqrt{2}x^2\right)}{4\sqrt{2}}-\frac{\tan^{-1}\left(\sqrt{2}x^2+1\right)}{4\sqrt{2}}+\frac{\log\left(x^4-\sqrt{2}x^2+1\right)}{8\sqrt{2}}-\frac{\log\left(x^4+\sqrt{2}x^2+1\right)}{8\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^9/(1 + x^8),x]
```

```
[Out] x^2/2 + ArcTan[1 - Sqrt[2]*x^2]/(4*Sqrt[2]) - ArcTan[1 + Sqrt[2]*
x^2]/(4*Sqrt[2]) + Log[1 - Sqrt[2]*x^2 + x^4]/(8*Sqrt[2]) - Log[1
 + Sqrt[2]*x^2 + x^4]/(8*Sqrt[2])
```

Rubi in Sympy [A] time = 17.1233, size = 85, normalized size = 0.85

$$\frac{x^2}{2}+\frac{\sqrt{2}\log\left(x^4-\sqrt{2}x^2+1\right)}{16}-\frac{\sqrt{2}\log\left(x^4+\sqrt{2}x^2+1\right)}{16}-\frac{\sqrt{2}\,\mathrm{atan}\left(\sqrt{2}x^2-1\right)}{8}-\frac{\sqrt{2}\,\mathrm{atan}\left(\sqrt{2}x^2+1\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**9/(x**8+1),x)
```

```
[Out] x**2/2 + sqrt(2)*log(x**4 - sqrt(2)*x**2 + 1)/16 - sqrt(2)*log(x*
*4 + sqrt(2)*x**2 + 1)/16 - sqrt(2)*atan(sqrt(2)*x**2 - 1)/8 - sq
rt(2)*atan(sqrt(2)*x**2 + 1)/8
```

Mathematica [A] time = 0.150292, size = 191, normalized size = 1.91

$$\frac{1}{16}\left(8x^2-\sqrt{2}\log\left(x^2-2x\sin\left(\frac{\pi}{8}\right)+1\right)-\sqrt{2}\log\left(x^2+2x\sin\left(\frac{\pi}{8}\right)+1\right)\right.$$
$$+\sqrt{2}\log\left(x^2-2x\cos\left(\frac{\pi}{8}\right)+1\right)+\sqrt{2}\log\left(x^2+2x\cos\left(\frac{\pi}{8}\right)+1\right)$$
$$-2\sqrt{2}\tan^{-1}\left(x\sec\left(\frac{\pi}{8}\right)-\tan\left(\frac{\pi}{8}\right)\right)+2\sqrt{2}\tan^{-1}\left(\csc\left(\frac{\pi}{8}\right)\left(x+\cos\left(\frac{\pi}{8}\right)\right)\right)$$
$$\left.+2\sqrt{2}\tan^{-1}\left(\cot\left(\frac{\pi}{8}\right)-x\csc\left(\frac{\pi}{8}\right)\right)+2\sqrt{2}\tan^{-1}\left(\sec\left(\frac{\pi}{8}\right)\left(x+\sin\left(\frac{\pi}{8}\right)\right)\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^9/(1 + x^8),x]
```

```
[Out] (8*x^2 + 2*Sqrt[2]*ArcTan[(x + Cos[Pi/8])*Csc[Pi/8]] + 2*Sqrt[2]*
ArcTan[Cot[Pi/8] - x*Csc[Pi/8]] + 2*Sqrt[2]*ArcTan[Sec[Pi/8]*(x +
 Sin[Pi/8])] - 2*Sqrt[2]*ArcTan[x*Sec[Pi/8] - Tan[Pi/8]] + Sqrt[2
```

```
]*Log[1 + x^2 - 2*x*Cos[Pi/8]] + Sqrt[2]*Log[1 + x^2 + 2*x*Cos[Pi
/8]] - Sqrt[2]*Log[1 + x^2 - 2*x*Sin[Pi/8]] - Sqrt[2]*Log[1 + x^2
 + 2*x*Sin[Pi/8]])/16
```

Maple [A] time = 0.004, size = 71, normalized size = 0.7

$$\frac{x^2}{2} - \frac{\arctan\left(x^2\sqrt{2}-1\right)\sqrt{2}}{8} - \frac{\sqrt{2}}{16}\ln\left(\frac{1+x^4+x^2\sqrt{2}}{1+x^4-x^2\sqrt{2}}\right) - \frac{\arctan\left(1+x^2\sqrt{2}\right)\sqrt{2}}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^9/(x^8+1),x)
```

```
[Out] 1/2*x^2-1/8*arctan(x^2*2^(1/2)-1)*2^(1/2)-1/16*2^(1/2)*ln((1+x^4+
x^2*2^(1/2))/(1+x^4-x^2*2^(1/2)))-1/8*arctan(1+x^2*2^(1/2))*2^(1/
2)
```

Maxima [A] time = 1.59334, size = 115, normalized size = 1.15

$$\frac{1}{2}x^2 - \frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x^2+\sqrt{2}\right)\right) - \frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x^2-\sqrt{2}\right)\right) - \frac{1}{16}\sqrt{2}\log\left(x^4+\sqrt{2}x^2+1\right) + \frac{1}{16}\sqrt{2}\log\left(x^4-\sqrt{2}x^2+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^9/(x^8 + 1),x, algorithm="maxima")
```

```
[Out] 1/2*x^2 - 1/8*sqrt(2)*arctan(1/2*sqrt(2)*(2*x^2 + sqrt(2))) - 1/8
*sqrt(2)*arctan(1/2*sqrt(2)*(2*x^2 - sqrt(2))) - 1/16*sqrt(2)*log
(x^4 + sqrt(2)*x^2 + 1) + 1/16*sqrt(2)*log(x^4 - sqrt(2)*x^2 + 1)
```

Fricas [A] time = 0.228263, size = 154, normalized size = 1.54

$$\frac{1}{2}x^2 + \frac{1}{4}\sqrt{2}\arctan\left(\frac{1}{\sqrt{2}x^2+\sqrt{2}\sqrt{x^4+\sqrt{2}x^2+1}+1}\right) + \frac{1}{4}\sqrt{2}\arctan\left(\frac{1}{\sqrt{2}x^2+\sqrt{2}\sqrt{x^4-\sqrt{2}x^2+1}-1}\right) - \frac{1}{16}\sqrt{2}\log\left(x^4+\sqrt{2}x^2+1\right) + \frac{1}{16}\sqrt{2}\log\left(x^4-\sqrt{2}x^2+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^9/(x^8 + 1),x, algorithm="fricas")
```

```
[Out] 1/2*x^2 + 1/4*sqrt(2)*arctan(1/(sqrt(2)*x^2 + sqrt(2)*sqrt(x^4 +
sqrt(2)*x^2 + 1) + 1)) + 1/4*sqrt(2)*arctan(1/(sqrt(2)*x^2 + sqrt
(2)*sqrt(x^4 - sqrt(2)*x^2 + 1) - 1)) - 1/16*sqrt(2)*log(x^4 + sq
rt(2)*x^2 + 1) + 1/16*sqrt(2)*log(x^4 - sqrt(2)*x^2 + 1)
```

Sympy [A] time = 0.470083, size = 85, normalized size = 0.85

$$\frac{x^2}{2} + \frac{\sqrt{2}\log\left(x^4-\sqrt{2}x^2+1\right)}{16} - \frac{\sqrt{2}\log\left(x^4+\sqrt{2}x^2+1\right)}{16} - \frac{\sqrt{2}\operatorname{atan}\left(\sqrt{2}x^2-1\right)}{8} - \frac{\sqrt{2}\operatorname{atan}\left(\sqrt{2}x^2+1\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**9/(x**8+1),x)
```

```
[Out] x**2/2 + sqrt(2)*log(x**4 - sqrt(2)*x**2 + 1)/16 - sqrt(2)*log(x*
*4 + sqrt(2)*x**2 + 1)/16 - sqrt(2)*atan(sqrt(2)*x**2 - 1)/8 - sq
rt(2)*atan(sqrt(2)*x**2 + 1)/8
```

GIAC/XCAS [A] time = 0.229001, size = 115, normalized size = 1.15

$$\frac{1}{2}x^2 - \frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x^2 + \sqrt{2}\right)\right) - \frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x^2 - \sqrt{2}\right)\right) - \frac{1}{16}\sqrt{2}\ln\left(x^4 + \sqrt{2}x^2 + 1\right) + \frac{1}{16}\sqrt{2}\ln\left(x^4 - \sqrt{2}x^2 + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/(x^8 + 1),x, algorithm="giac")
```

```
[Out] 1/2*x^2 - 1/8*sqrt(2)*arctan(1/2*sqrt(2)*(2*x^2 + sqrt(2))) - 1/8
*sqrt(2)*arctan(1/2*sqrt(2)*(2*x^2 - sqrt(2))) - 1/16*sqrt(2)*ln(
x^4 + sqrt(2)*x^2 + 1) + 1/16*sqrt(2)*ln(x^4 - sqrt(2)*x^2 + 1)
```

3.1489 $\int \frac{x^7}{1+x^8}\,dx$

Optimal. Leaf size=10

$$\frac{1}{8}\log\left(x^8+1\right)$$

```
[Out] Log[1 + x^8]/8
```

Rubi [A] time = 0.0072393, antiderivative size = 10, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{1}{8}\log\left(x^8+1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^7/(1 + x^8),x]

[Out] Log[1 + x^8]/8
```

Rubi in Sympy [A] time = 1.70303, size = 7, normalized size = 0.7

$$\frac{\log\left(x^8+1\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7/(x**8+1),x)

[Out] log(x**8 + 1)/8
```

Mathematica [A] time = 0.00410698, size = 10, normalized size = 1.

$$\frac{1}{8}\log\left(x^8+1\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^7/(1 + x^8),x]

[Out] Log[1 + x^8]/8
```

Maple [A] time = 0.001, size = 9, normalized size = 0.9

$$\frac{\ln\left(x^8+1\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7/(x^8+1),x)

[Out] 1/8*ln(x^8+1)
```

Maxima [A] time = 1.44319, size = 11, normalized size = 1.1

$$\frac{1}{8}\log\left(x^8+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(x^8 + 1),x, algorithm="maxima")

[Out] 1/8*log(x^8 + 1)
```

Fricas [A] time = 0.208027, size = 11, normalized size = 1.1

$$\frac{1}{8}\log\left(x^8+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(x^8 + 1),x, algorithm="fricas")

[Out] 1/8*log(x^8 + 1)
```

Sympy [A] time = 0.213706, size = 7, normalized size = 0.7

$$\frac{\log\left(x^8+1\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(x**8+1),x)

[Out] log(x**8 + 1)/8
```

GIAC/XCAS [A] time = 0.237823, size = 11, normalized size = 1.1

$$\frac{1}{8}\ln\left(x^8+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(x^8 + 1),x, algorithm="giac")

[Out] 1/8*ln(x^8 + 1)
```

3.1490 $\int \frac{x^5}{1+x^8} \, dx$

Optimal. Leaf size=93

$$-\frac{\tan^{-1}\left(1-\sqrt{2}x^2\right)}{4\sqrt{2}}+\frac{\tan^{-1}\left(\sqrt{2}x^2+1\right)}{4\sqrt{2}}+\frac{\log\left(x^4-\sqrt{2}x^2+1\right)}{8\sqrt{2}}-\frac{\log\left(x^4+\sqrt{2}x^2+1\right)}{8\sqrt{2}}$$

```
[Out] -ArcTan[1 - Sqrt[2]*x^2]/(4*Sqrt[2]) + ArcTan[1 + Sqrt[2]*x^2]/(4
*Sqrt[2]) + Log[1 - Sqrt[2]*x^2 + x^4]/(8*Sqrt[2]) - Log[1 + Sqrt
[2]*x^2 + x^4]/(8*Sqrt[2])
```

Rubi [A] time = 0.152285, antiderivative size = 93, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 7, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.636

$$-\frac{\tan^{-1}\left(1-\sqrt{2}x^2\right)}{4\sqrt{2}}+\frac{\tan^{-1}\left(\sqrt{2}x^2+1\right)}{4\sqrt{2}}+\frac{\log\left(x^4-\sqrt{2}x^2+1\right)}{8\sqrt{2}}-\frac{\log\left(x^4+\sqrt{2}x^2+1\right)}{8\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/(1 + x^8),x]
```

```
[Out] -ArcTan[1 - Sqrt[2]*x^2]/(4*Sqrt[2]) + ArcTan[1 + Sqrt[2]*x^2]/(4
*Sqrt[2]) + Log[1 - Sqrt[2]*x^2 + x^4]/(8*Sqrt[2]) - Log[1 + Sqrt
[2]*x^2 + x^4]/(8*Sqrt[2])
```

Rubi in Sympy [A] time = 16.8225, size = 80, normalized size = 0.86

$$\frac{\sqrt{2}\log\left(x^4-\sqrt{2}x^2+1\right)}{16}-\frac{\sqrt{2}\log\left(x^4+\sqrt{2}x^2+1\right)}{16}+\frac{\sqrt{2}\,\text{atan}\left(\sqrt{2}x^2-1\right)}{8}+\frac{\sqrt{2}\,\text{atan}\left(\sqrt{2}x^2+1\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(x**8+1),x)
```

```
[Out] sqrt(2)*log(x**4 - sqrt(2)*x**2 + 1)/16 - sqrt(2)*log(x**4 + sqrt
(2)*x**2 + 1)/16 + sqrt(2)*atan(sqrt(2)*x**2 - 1)/8 + sqrt(2)*ata
n(sqrt(2)*x**2 + 1)/8
```

Mathematica [A] time = 0.0896368, size = 149, normalized size = 1.6

$$-\frac{\log\left(x^2-2x\sin\left(\frac{\pi}{8}\right)+1\right)+\log\left(x^2+2x\sin\left(\frac{\pi}{8}\right)+1\right)-\log\left(x^2-2x\cos\left(\frac{\pi}{8}\right)+1\right)-\log\left(x^2+2x\cos\left(\frac{\pi}{8}\right)+1\right)-2\tan^{-1}(}{8}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/(1 + x^8),x]
```

```
[Out] -(2*ArcTan[(x + Cos[Pi/8])*Csc[Pi/8]] + 2*ArcTan[Cot[Pi/8] - x*Cs
c[Pi/8]] + 2*ArcTan[Sec[Pi/8]*(x + Sin[Pi/8])] - 2*ArcTan[x*Sec[P
i/8] - Tan[Pi/8]] - Log[1 + x^2 - 2*x*Cos[Pi/8]] - Log[1 + x^2 +
2*x*Cos[Pi/8]] + Log[1 + x^2 - 2*x*Sin[Pi/8]] + Log[1 + x^2 + 2*x
*Sin[Pi/8]])/(8*Sqrt[2])
```

Maple [A] time = 0.002, size = 66, normalized size = 0.7

$$\frac{\arctan\left(1+x^{2}\sqrt{2}\right)\sqrt{2}}{8}+\frac{\arctan\left(x^{2}\sqrt{2}-1\right)\sqrt{2}}{8}+\frac{\sqrt{2}}{16}\ln\left(\frac{1+x^{4}-x^{2}\sqrt{2}}{1+x^{4}+x^{2}\sqrt{2}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(x^8+1),x)
```

```
[Out] 1/8*arctan(1+x^2*2^(1/2))*2^(1/2)+1/8*arctan(x^2*2^(1/2)-1)*2^(1/
2)+1/16*2^(1/2)*ln((1+x^4-x^2*2^(1/2))/(1+x^4+x^2*2^(1/2)))
```

Maxima [A] time = 1.59768, size = 108, normalized size = 1.16

$$\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x^{2}+\sqrt{2}\right)\right)+\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x^{2}-\sqrt{2}\right)\right)-\frac{1}{16}\sqrt{2}\log\left(x^{4}+\sqrt{2}x^{2}+1\right)+\frac{1}{16}\sqrt{2}\log\left(x^{4}-\sqrt{2}x^{2}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(x^8 + 1),x, algorithm="maxima")
```

```
[Out] 1/8*sqrt(2)*arctan(1/2*sqrt(2)*(2*x^2 + sqrt(2))) + 1/8*sqrt(2)*a
rctan(1/2*sqrt(2)*(2*x^2 - sqrt(2))) - 1/16*sqrt(2)*log(x^4 + sqr
t(2)*x^2 + 1) + 1/16*sqrt(2)*log(x^4 - sqrt(2)*x^2 + 1)
```

Fricas [A] time = 0.228459, size = 147, normalized size = 1.58

$$-\frac{1}{4}\sqrt{2}\arctan\left(\frac{1}{\sqrt{2}x^{2}+\sqrt{2}\sqrt{x^{4}+\sqrt{2}x^{2}+1}+1}\right)-\frac{1}{4}\sqrt{2}\arctan\left(\frac{1}{\sqrt{2}x^{2}+\sqrt{2}\sqrt{x^{4}-\sqrt{2}x^{2}+1}-1}\right)-\frac{1}{16}\sqrt{2}\log\left(x^{4}+\sqrt{2}x^{2}+1\right)+\frac{1}{16}\sqrt{2}\log\left(x^{4}-\sqrt{2}x^{2}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(x^8 + 1),x, algorithm="fricas")
```

```
[Out] -1/4*sqrt(2)*arctan(1/(sqrt(2)*x^2 + sqrt(2)*sqrt(x^4 + sqrt(2)*x
^2 + 1) + 1)) - 1/4*sqrt(2)*arctan(1/(sqrt(2)*x^2 + sqrt(2)*sqrt(
x^4 - sqrt(2)*x^2 + 1) - 1)) - 1/16*sqrt(2)*log(x^4 + sqrt(2)*x^2
 + 1) + 1/16*sqrt(2)*log(x^4 - sqrt(2)*x^2 + 1)
```

Sympy [A] time = 0.480246, size = 80, normalized size = 0.86

$$\frac{\sqrt{2}\log\left(x^{4}-\sqrt{2}x^{2}+1\right)}{16}-\frac{\sqrt{2}\log\left(x^{4}+\sqrt{2}x^{2}+1\right)}{16}+\frac{\sqrt{2}\operatorname{atan}\left(\sqrt{2}x^{2}-1\right)}{8}+\frac{\sqrt{2}\operatorname{atan}\left(\sqrt{2}x^{2}+1\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(x**8+1),x)
```

```
[Out] sqrt(2)*log(x**4 - sqrt(2)*x**2 + 1)/16 - sqrt(2)*log(x**4 + sqrt
(2)*x**2 + 1)/16 + sqrt(2)*atan(sqrt(2)*x**2 - 1)/8 + sqrt(2)*ata
n(sqrt(2)*x**2 + 1)/8
```

GIAC/XCAS [A] time = 0.263409, size = 269, normalized size = 2.89

$$-\frac{1}{8}\sqrt{2}\arctan\left(\frac{2x+\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)+\frac{1}{8}\sqrt{2}\arctan\left(\frac{2x-\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)-\frac{1}{8}\sqrt{2}\arctan\left(\frac{2x+\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)+\frac{1}{8}\sqrt{2}\arctan\left(\frac{2x-\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)+\frac{1}{16}\sqrt{2}\ln\left(x^2+x\sqrt{\sqrt{2}+2}+1\right)+\frac{1}{16}\sqrt{2}\ln\left(x^2-x\sqrt{\sqrt{2}+2}+1\right)-\frac{1}{16}\sqrt{2}\ln\left(x^2+x\sqrt{-\sqrt{2}+2}+1\right)-\frac{1}{16}\sqrt{2}\ln\left(x^2-x\sqrt{-\sqrt{2}+2}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(x^8 + 1),x, algorithm="giac")
```

```
[Out] -1/8*sqrt(2)*arctan((2*x + sqrt(-sqrt(2) + 2))/sqrt(sqrt(2) + 2))
 + 1/8*sqrt(2)*arctan((2*x - sqrt(-sqrt(2) + 2))/sqrt(sqrt(2) + 2
)) - 1/8*sqrt(2)*arctan((2*x + sqrt(sqrt(2) + 2))/sqrt(-sqrt(2) +
 2)) + 1/8*sqrt(2)*arctan((2*x - sqrt(sqrt(2) + 2))/sqrt(-sqrt(2)
 + 2)) + 1/16*sqrt(2)*ln(x^2 + x*sqrt(sqrt(2) + 2) + 1) + 1/16*sq
rt(2)*ln(x^2 - x*sqrt(sqrt(2) + 2) + 1) - 1/16*sqrt(2)*ln(x^2 + x
*sqrt(-sqrt(2) + 2) + 1) - 1/16*sqrt(2)*ln(x^2 - x*sqrt(-sqrt(2)
+ 2) + 1)
```

3.1491 $\int \frac{x^3}{1+x^8} dx$

Optimal. Leaf size=8

$$\frac{1}{4}\tan^{-1}\left(x^4\right)$$

```
[Out] ArcTan[x^4]/4
```

Rubi [A] time = 0.0144181, antiderivative size = 8, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{1}{4}\tan^{-1}\left(x^4\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(1 + x^8),x]

[Out] ArcTan[x^4]/4
```

Rubi in Sympy [A] time = 2.56164, size = 5, normalized size = 0.62

$$\frac{\operatorname{atan}\left(x^4\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(x**8+1),x)

[Out] atan(x**4)/4
```

Mathematica [A] time = 0.00631838, size = 8, normalized size = 1.

$$\frac{1}{4}\tan^{-1}\left(x^4\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(1 + x^8),x]

[Out] ArcTan[x^4]/4
```

Maple [A] time = 0.001, size = 7, normalized size = 0.9

$$\frac{\arctan\left(x^4\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(x^8+1),x)

[Out] 1/4*arctan(x^4)
```

Maxima [A] time = 1.58507, size = 8, normalized size = 1.

$$\frac{1}{4}\arctan\left(x^4\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(x^8 + 1),x, algorithm="maxima")
```

```
[Out] 1/4*arctan(x^4)
```

Fricas [A] time = 0.214333, size = 8, normalized size = 1.

$$\frac{1}{4}\arctan\left(x^4\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(x^8 + 1),x, algorithm="fricas")
```

```
[Out] 1/4*arctan(x^4)
```

Sympy [A] time = 0.238005, size = 5, normalized size = 0.62

$$\frac{\operatorname{atan}\left(x^4\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(x**8+1),x)
```

```
[Out] atan(x**4)/4
```

GIAC/XCAS [A] time = 0.242136, size = 8, normalized size = 1.

$$\frac{1}{4}\arctan\left(x^4\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(x^8 + 1),x, algorithm="giac")
```

```
[Out] 1/4*arctan(x^4)
```

3.1492 $\int \frac{x}{1+x^8} \, dx$

Optimal. Leaf size=93

$$-\frac{\tan^{-1}\left(1-\sqrt{2}x^2\right)}{4\sqrt{2}}+\frac{\tan^{-1}\left(\sqrt{2}x^2+1\right)}{4\sqrt{2}}-\frac{\log\left(x^4-\sqrt{2}x^2+1\right)}{8\sqrt{2}}+\frac{\log\left(x^4+\sqrt{2}x^2+1\right)}{8\sqrt{2}}$$

```
[Out] -ArcTan[1 - Sqrt[2]*x^2]/(4*Sqrt[2]) + ArcTan[1 + Sqrt[2]*x^2]/(4
*Sqrt[2]) - Log[1 - Sqrt[2]*x^2 + x^4]/(8*Sqrt[2]) + Log[1 + Sqrt
[2]*x^2 + x^4]/(8*Sqrt[2])
```

Rubi [A] time = 0.141226, antiderivative size = 93, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 7, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.778$

$$-\frac{\tan^{-1}\left(1-\sqrt{2}x^2\right)}{4\sqrt{2}}+\frac{\tan^{-1}\left(\sqrt{2}x^2+1\right)}{4\sqrt{2}}-\frac{\log\left(x^4-\sqrt{2}x^2+1\right)}{8\sqrt{2}}+\frac{\log\left(x^4+\sqrt{2}x^2+1\right)}{8\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(1 + x^8),x]
```

```
[Out] -ArcTan[1 - Sqrt[2]*x^2]/(4*Sqrt[2]) + ArcTan[1 + Sqrt[2]*x^2]/(4
*Sqrt[2]) - Log[1 - Sqrt[2]*x^2 + x^4]/(8*Sqrt[2]) + Log[1 + Sqrt
[2]*x^2 + x^4]/(8*Sqrt[2])
```

Rubi in Sympy [A] time = 15.5103, size = 80, normalized size = 0.86

$$-\frac{\sqrt{2}\log\left(x^4-\sqrt{2}x^2+1\right)}{16}+\frac{\sqrt{2}\log\left(x^4+\sqrt{2}x^2+1\right)}{16}+\frac{\sqrt{2}\,\mathrm{atan}\left(\sqrt{2}x^2-1\right)}{8}+\frac{\sqrt{2}\,\mathrm{atan}\left(\sqrt{2}x^2+1\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(x**8+1),x)
```

```
[Out] -sqrt(2)*log(x**4 - sqrt(2)*x**2 + 1)/16 + sqrt(2)*log(x**4 + sqr
t(2)*x**2 + 1)/16 + sqrt(2)*atan(sqrt(2)*x**2 - 1)/8 + sqrt(2)*at
an(sqrt(2)*x**2 + 1)/8
```

Mathematica [A] time = 0.0553939, size = 149, normalized size = 1.6

$$-\frac{-\log\left(x^2-2x\sin\left(\frac{\pi}{8}\right)+1\right)-\log\left(x^2+2x\sin\left(\frac{\pi}{8}\right)+1\right)+\log\left(x^2-2x\cos\left(\frac{\pi}{8}\right)+1\right)+\log\left(x^2+2x\cos\left(\frac{\pi}{8}\right)+1\right)-2\tan^{-1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(1 + x^8),x]
```

```
[Out] -(2*ArcTan[(x + Cos[Pi/8])*Csc[Pi/8]] + 2*ArcTan[Cot[Pi/8] - x*Cs
c[Pi/8]] + 2*ArcTan[Sec[Pi/8]*(x + Sin[Pi/8])] - 2*ArcTan[x*Sec[P
i/8] - Tan[Pi/8]] + Log[1 + x^2 - 2*x*Cos[Pi/8]] + Log[1 + x^2 +
2*x*Cos[Pi/8]] - Log[1 + x^2 - 2*x*Sin[Pi/8]] - Log[1 + x^2 + 2*x
*Sin[Pi/8]])/(8*Sqrt[2])
```

Maple [A] time = 0.003, size = 66, normalized size = 0.7

$$\frac{\arctan\left(1+x^2\sqrt{2}\right)\sqrt{2}}{8}+\frac{\arctan\left(x^2\sqrt{2}-1\right)\sqrt{2}}{8}+\frac{\sqrt{2}}{16}\ln\left(\frac{1+x^4+x^2\sqrt{2}}{1+x^4-x^2\sqrt{2}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(x^8+1),x)
```

```
[Out] 1/8*arctan(1+x^2*2^(1/2))*2^(1/2)+1/8*arctan(x^2*2^(1/2)-1)*2^(1/
2)+1/16*2^(1/2)*ln((1+x^4+x^2*2^(1/2))/(1+x^4-x^2*2^(1/2)))
```

Maxima [A] time = 1.58577, size = 108, normalized size = 1.16

$$\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x^2+\sqrt{2}\right)\right)+\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x^2-\sqrt{2}\right)\right)+\frac{1}{16}\sqrt{2}\log\left(x^4+\sqrt{2}x^2+1\right)-\frac{1}{16}\sqrt{2}\log\left(x^4-\sqrt{2}x^2+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(x^8 + 1),x, algorithm="maxima")
```

```
[Out] 1/8*sqrt(2)*arctan(1/2*sqrt(2)*(2*x^2 + sqrt(2))) + 1/8*sqrt(2)*a
rctan(1/2*sqrt(2)*(2*x^2 - sqrt(2))) + 1/16*sqrt(2)*log(x^4 + sqr
t(2)*x^2 + 1) - 1/16*sqrt(2)*log(x^4 - sqrt(2)*x^2 + 1)
```

Fricas [A] time = 0.230934, size = 147, normalized size = 1.58

$$-\frac{1}{4}\sqrt{2}\arctan\left(\frac{1}{\sqrt{2}x^2+\sqrt{2}\sqrt{x^4+\sqrt{2}x^2+1}+1}\right)-\frac{1}{4}\sqrt{2}\arctan\left(\frac{1}{\sqrt{2}x^2+\sqrt{2}\sqrt{x^4-\sqrt{2}x^2+1}-1}\right)+\frac{1}{16}\sqrt{2}\log\left(x^4+\sqrt{2}x^2+1\right)-\frac{1}{16}\sqrt{2}\log\left(x^4-\sqrt{2}x^2+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(x^8 + 1),x, algorithm="fricas")
```

```
[Out] -1/4*sqrt(2)*arctan(1/(sqrt(2)*x^2 + sqrt(2)*sqrt(x^4 + sqrt(2)*x
^2 + 1) + 1)) - 1/4*sqrt(2)*arctan(1/(sqrt(2)*x^2 + sqrt(2)*sqrt(
x^4 - sqrt(2)*x^2 + 1) - 1)) + 1/16*sqrt(2)*log(x^4 + sqrt(2)*x^2
 + 1) - 1/16*sqrt(2)*log(x^4 - sqrt(2)*x^2 + 1)
```

Sympy [A] time = 0.460552, size = 80, normalized size = 0.86

$$-\frac{\sqrt{2}\log\left(x^4-\sqrt{2}x^2+1\right)}{16}+\frac{\sqrt{2}\log\left(x^4+\sqrt{2}x^2+1\right)}{16}+\frac{\sqrt{2}\operatorname{atan}\left(\sqrt{2}x^2-1\right)}{8}+\frac{\sqrt{2}\operatorname{atan}\left(\sqrt{2}x^2+1\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(x**8+1),x)
```

```
[Out] -sqrt(2)*log(x**4 - sqrt(2)*x**2 + 1)/16 + sqrt(2)*log(x**4 + sqr
t(2)*x**2 + 1)/16 + sqrt(2)*atan(sqrt(2)*x**2 - 1)/8 + sqrt(2)*at
an(sqrt(2)*x**2 + 1)/8
```

GIAC/XCAS [A] time = 0.241424, size = 108, normalized size = 1.16

$$\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x^2+\sqrt{2}\right)\right)+\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x^2-\sqrt{2}\right)\right)+\frac{1}{16}\sqrt{2}\ln\left(x^4+\sqrt{2}x^2+1\right)-\frac{1}{16}\sqrt{2}\ln\left(x^4-\sqrt{2}x^2+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(x^8 + 1),x, algorithm="giac")
```

```
[Out] 1/8*sqrt(2)*arctan(1/2*sqrt(2)*(2*x^2 + sqrt(2))) + 1/8*sqrt(2)*a
rctan(1/2*sqrt(2)*(2*x^2 - sqrt(2))) + 1/16*sqrt(2)*ln(x^4 + sqrt
(2)*x^2 + 1) - 1/16*sqrt(2)*ln(x^4 - sqrt(2)*x^2 + 1)
```

3.1493 $\int \frac{1}{x(1+x^8)} dx$

Optimal. Leaf size=13

$$\log(x) - \frac{1}{8}\log\left(x^8+1\right)$$

```
[Out] Log[x] - Log[1 + x^8]/8
```

Rubi [A] time = 0.0197897, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.364$

$$\log(x) - \frac{1}{8}\log\left(x^8+1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(1 + x^8)),x]

[Out] Log[x] - Log[1 + x^8]/8
```

Rubi in Sympy [A] time = 3.26237, size = 14, normalized size = 1.08

$$\frac{\log\left(x^8\right)}{8} - \frac{\log\left(x^8+1\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(x**8+1),x)

[Out] log(x**8)/8 - log(x**8 + 1)/8
```

Mathematica [A] time = 0.00545347, size = 13, normalized size = 1.

$$\log(x) - \frac{1}{8}\log\left(x^8+1\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(1 + x^8)),x]

[Out] Log[x] - Log[1 + x^8]/8
```

Maple [A] time = 0.006, size = 12, normalized size = 0.9

$$\ln(x) - \frac{\ln\left(x^8+1\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(x^8+1),x)

[Out] ln(x)-1/8*ln(x^8+1)
```

Maxima [A] time = 1.4313, size = 20, normalized size = 1.54

$$-\frac{1}{8}\,\log\left(x^{8}+1\right)+\frac{1}{8}\,\log\left(x^{8}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^8 + 1)*x),x, algorithm="maxima")
```

```
[Out] -1/8*log(x^8 + 1) + 1/8*log(x^8)
```

Fricas [A] time = 0.214796, size = 15, normalized size = 1.15

$$-\frac{1}{8}\,\log\left(x^{8}+1\right)+\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^8 + 1)*x),x, algorithm="fricas")
```

```
[Out] -1/8*log(x^8 + 1) + log(x)
```

Sympy [A] time = 0.264828, size = 10, normalized size = 0.77

$$\log\left(x\right)-\frac{\log\left(x^{8}+1\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(x**8+1),x)
```

```
[Out] log(x) - log(x**8 + 1)/8
```

GIAC/XCAS [A] time = 0.233752, size = 20, normalized size = 1.54

$$-\frac{1}{8}\,\ln\left(x^{8}+1\right)+\frac{1}{8}\,\ln\left(x^{8}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^8 + 1)*x),x, algorithm="giac")
```

```
[Out] -1/8*ln(x^8 + 1) + 1/8*ln(x^8)
```

3.1494 $\int \frac{1}{x^3(1+x^8)}\,dx$

Optimal. Leaf size=100

$$-\frac{1}{2x^2}+\frac{\tan^{-1}\left(1-\sqrt{2}x^2\right)}{4\sqrt{2}}-\frac{\tan^{-1}\left(\sqrt{2}x^2+1\right)}{4\sqrt{2}}-\frac{\log\left(x^4-\sqrt{2}x^2+1\right)}{8\sqrt{2}}+\frac{\log\left(x^4+\sqrt{2}x^2+1\right)}{8\sqrt{2}}$$

```
[Out] -1/(2*x^2) + ArcTan[1 - Sqrt[2]*x^2]/(4*Sqrt[2]) - ArcTan[1 + Sqr
t[2]*x^2]/(4*Sqrt[2]) - Log[1 - Sqrt[2]*x^2 + x^4]/(8*Sqrt[2]) +
Log[1 + Sqrt[2]*x^2 + x^4]/(8*Sqrt[2])
```

Rubi [A] time = 0.153243, antiderivative size = 100, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 8, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.727

$$-\frac{1}{2x^2}+\frac{\tan^{-1}\left(1-\sqrt{2}x^2\right)}{4\sqrt{2}}-\frac{\tan^{-1}\left(\sqrt{2}x^2+1\right)}{4\sqrt{2}}-\frac{\log\left(x^4-\sqrt{2}x^2+1\right)}{8\sqrt{2}}+\frac{\log\left(x^4+\sqrt{2}x^2+1\right)}{8\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(1 + x^8)),x]
```

```
[Out] -1/(2*x^2) + ArcTan[1 - Sqrt[2]*x^2]/(4*Sqrt[2]) - ArcTan[1 + Sqr
t[2]*x^2]/(4*Sqrt[2]) - Log[1 - Sqrt[2]*x^2 + x^4]/(8*Sqrt[2]) +
Log[1 + Sqrt[2]*x^2 + x^4]/(8*Sqrt[2])
```

Rubi in Sympy [A] time = 18.0573, size = 87, normalized size = 0.87

$$-\frac{\sqrt{2}\log\left(x^4-\sqrt{2}x^2+1\right)}{16}+\frac{\sqrt{2}\log\left(x^4+\sqrt{2}x^2+1\right)}{16}-\frac{\sqrt{2}\,\mathrm{atan}\left(\sqrt{2}x^2-1\right)}{8}-\frac{\sqrt{2}\,\mathrm{atan}\left(\sqrt{2}x^2+1\right)}{8}-\frac{1}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(x**8+1),x)
```

```
[Out] -sqrt(2)*log(x**4 - sqrt(2)*x**2 + 1)/16 + sqrt(2)*log(x**4 + sqr
t(2)*x**2 + 1)/16 - sqrt(2)*atan(sqrt(2)*x**2 - 1)/8 - sqrt(2)*at
an(sqrt(2)*x**2 + 1)/8 - 1/(2*x**2)
```

Mathematica [B] time = 0.0879892, size = 208, normalized size = 2.08

$$-\frac{1}{2x^2}+\frac{\log\left(x^2-2x\sin\left(\frac{\pi}{8}\right)+1\right)}{8\sqrt{2}}+\frac{\log\left(x^2+2x\sin\left(\frac{\pi}{8}\right)+1\right)}{8\sqrt{2}}-\frac{\log\left(x^2-2x\cos\left(\frac{\pi}{8}\right)+1\right)}{8\sqrt{2}}-\frac{\log\left(x^2+2x\cos\left(\frac{\pi}{8}\right)+1\right)}{8\sqrt{2}}-\frac{\tan^{-1}\left(\csc\left(\frac{\pi}{8}\right)\left(x-\cos\left(\frac{\pi}{8}\right)\right)\right)}{4\sqrt{2}}+\frac{\tan^{-1}\left(\csc\left(\frac{\pi}{8}\right)\left(x+\cos\left(\frac{\pi}{8}\right)\right)\right)}{4\sqrt{2}}-\frac{\tan^{-1}\left(\sec\left(\frac{\pi}{8}\right)\left(x-\sin\left(\frac{\pi}{8}\right)\right)\right)}{4\sqrt{2}}+\frac{\tan^{-1}\left(\sec\left(\frac{\pi}{8}\right)\left(x+\sin\left(\frac{\pi}{8}\right)\right)\right)}{4\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*(1 + x^8)),x]
```

```
[Out] -1/(2*x^2) - ArcTan[(x - Cos[Pi/8])*Csc[Pi/8]]/(4*Sqrt[2]) + ArcT
an[(x + Cos[Pi/8])*Csc[Pi/8]]/(4*Sqrt[2]) - ArcTan[Sec[Pi/8]*(x -
 Sin[Pi/8])]/(4*Sqrt[2]) + ArcTan[Sec[Pi/8]*(x + Sin[Pi/8])]/(4*S
```

```
qrt[2]) - Log[1 + x^2 - 2*x*Cos[Pi/8]]/(8*Sqrt[2]) - Log[1 + x^2
+ 2*x*Cos[Pi/8]]/(8*Sqrt[2]) + Log[1 + x^2 - 2*x*Sin[Pi/8]]/(8*Sq
rt[2]) + Log[1 + x^2 + 2*x*Sin[Pi/8]]/(8*Sqrt[2])
```

Maple [A] time = 0.006, size = 71, normalized size = 0.7

$$-\frac{\arctan\left(1+x^2\sqrt{2}\right)\sqrt{2}}{8}-\frac{\arctan\left(x^2\sqrt{2}-1\right)\sqrt{2}}{8}-\frac{\sqrt{2}}{16}\ln\left(\frac{1+x^4-x^2\sqrt{2}}{1+x^4+x^2\sqrt{2}}\right)-\frac{1}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(x^8+1),x)
```

```
[Out] -1/8*arctan(1+x^2*2^(1/2))*2^(1/2)-1/8*arctan(x^2*2^(1/2)-1)*2^(1
/2)-1/16*2^(1/2)*ln((1+x^4-x^2*2^(1/2))/(1+x^4+x^2*2^(1/2)))-1/2/
x^2
```

Maxima [A] time = 1.58442, size = 115, normalized size = 1.15

$$-\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2\,x^2+\sqrt{2}\right)\right)-\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2\,x^2-\sqrt{2}\right)\right)+\frac{1}{16}\sqrt{2}\log\left(x^4+\sqrt{2}x^2+1\right)-\frac{1}{16}\sqrt{2}\log\left(x^4-\sqrt{2}x^2+1\right)-\frac{1}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^8 + 1)*x^3),x, algorithm="maxima")
```

```
[Out] -1/8*sqrt(2)*arctan(1/2*sqrt(2)*(2*x^2 + sqrt(2))) - 1/8*sqrt(2)*
arctan(1/2*sqrt(2)*(2*x^2 - sqrt(2))) + 1/16*sqrt(2)*log(x^4 + sq
rt(2)*x^2 + 1) - 1/16*sqrt(2)*log(x^4 - sqrt(2)*x^2 + 1) - 1/2/x^
2
```

Fricas [A] time = 0.231046, size = 170, normalized size = 1.7

$$\frac{4\sqrt{2}x^2\arctan\left(\frac{1}{\sqrt{2}x^2+\sqrt{2}\sqrt{x^4+\sqrt{2}x^2+1}+1}\right)+4\sqrt{2}x^2\arctan\left(\frac{1}{\sqrt{2}x^2+\sqrt{2}\sqrt{x^4-\sqrt{2}x^2+1}-1}\right)+\sqrt{2}x^2\log\left(x^4+\sqrt{2}x^2+1\right)-\sqrt{2}x^2\log\left(x^4-\right.}{16\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^8 + 1)*x^3),x, algorithm="fricas")
```

```
[Out] 1/16*(4*sqrt(2)*x^2*arctan(1/(sqrt(2)*x^2 + sqrt(2)*sqrt(x^4 + sq
rt(2)*x^2 + 1) + 1)) + 4*sqrt(2)*x^2*arctan(1/(sqrt(2)*x^2 + sqrt
(2)*sqrt(x^4 - sqrt(2)*x^2 + 1) - 1)) + sqrt(2)*x^2*log(x^4 + sqr
t(2)*x^2 + 1) - sqrt(2)*x^2*log(x^4 - sqrt(2)*x^2 + 1) - 8)/x^2
```

Sympy [A] time = 0.561488, size = 87, normalized size = 0.87

$$-\frac{\sqrt{2}\log\left(x^4-\sqrt{2}x^2+1\right)}{16}+\frac{\sqrt{2}\log\left(x^4+\sqrt{2}x^2+1\right)}{16}-\frac{\sqrt{2}\,\mathrm{atan}\left(\sqrt{2}x^2-1\right)}{8}-\frac{\sqrt{2}\,\mathrm{atan}\left(\sqrt{2}x^2+1\right)}{8}-\frac{1}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(x**8+1),x)
```

```
[Out] -sqrt(2)*log(x**4 - sqrt(2)*x**2 + 1)/16 + sqrt(2)*log(x**4 + sqr
t(2)*x**2 + 1)/16 - sqrt(2)*atan(sqrt(2)*x**2 - 1)/8 - sqrt(2)*at
an(sqrt(2)*x**2 + 1)/8 - 1/(2*x**2)
```

GIAC/XCAS [A] time = 0.233584, size = 131, normalized size = 1.31

$$-\frac{1}{8}\sqrt{2}x^4\arctan\left(\frac{1}{2}\sqrt{2}\left(2x^2+\sqrt{2}\right)\right)-\frac{1}{8}\sqrt{2}x^4\arctan\left(\frac{1}{2}\sqrt{2}\left(2x^2-\sqrt{2}\right)\right)$$
$$-\frac{1}{16}\sqrt{2}x^4\ln\left(x^4+\sqrt{2}x^2+1\right)+\frac{1}{16}\sqrt{2}x^4\ln\left(x^4-\sqrt{2}x^2+1\right)-\frac{1}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^8 + 1)*x^3),x, algorithm="giac")
```

```
[Out] -1/8*sqrt(2)*x^4*arctan(1/2*sqrt(2)*(2*x^2 + sqrt(2))) - 1/8*sqrt
(2)*x^4*arctan(1/2*sqrt(2)*(2*x^2 - sqrt(2))) - 1/16*sqrt(2)*x^4*
ln(x^4 + sqrt(2)*x^2 + 1) + 1/16*sqrt(2)*x^4*ln(x^4 - sqrt(2)*x^2
 + 1) - 1/2/x^2
```

3.1495 $\int \frac{1}{x^5(1+x^8)}\,dx$

Optimal. Leaf size=16

$$-\frac{1}{4x^4}-\frac{1}{4}\tan^{-1}\left(x^4\right)$$

```
[Out] -1/(4*x^4) - ArcTan[x^4]/4
```

Rubi [A] time = 0.0243344, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273

$$-\frac{1}{4x^4}-\frac{1}{4}\tan^{-1}\left(x^4\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^5*(1 + x^8)),x]

[Out] -1/(4*x^4) - ArcTan[x^4]/4
```

Rubi in Sympy [A] time = 4.72229, size = 14, normalized size = 0.88

$$-\frac{\operatorname{atan}\left(x^4\right)}{4}-\frac{1}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**5/(x**8+1),x)

[Out] -atan(x**4)/4 - 1/(4*x**4)
```

Mathematica [A] time = 0.00776439, size = 16, normalized size = 1.

$$\frac{1}{4}\tan^{-1}\left(\frac{1}{x^4}\right)-\frac{1}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^5*(1 + x^8)),x]

[Out] -1/(4*x^4) + ArcTan[x^(-4)]/4
```

Maple [A] time = 0.008, size = 13, normalized size = 0.8

$$-\frac{1}{4\,x^4}-\frac{\arctan\left(x^4\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^5/(x^8+1),x)

[Out] -1/4/x^4-1/4*arctan(x^4)
```

Maxima [A] time = 1.56746, size = 16, normalized size = 1.

$$-\frac{1}{4\,x^4}-\frac{1}{4}\,\arctan\left(x^4\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^8 + 1)*x^5),x, algorithm="maxima")
```

```
[Out] -1/4/x^4 - 1/4*arctan(x^4)
```

Fricas [A] time = 0.215091, size = 20, normalized size = 1.25

$$-\frac{x^4\arctan\left(x^4\right)+1}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^8 + 1)*x^5),x, algorithm="fricas")
```

```
[Out] -1/4*(x^4*arctan(x^4) + 1)/x^4
```

Sympy [A] time = 0.370067, size = 14, normalized size = 0.88

$$-\frac{\operatorname{atan}\left(x^4\right)}{4}-\frac{1}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**5/(x**8+1),x)
```

```
[Out] -atan(x**4)/4 - 1/(4*x**4)
```

GIAC/XCAS [A] time = 0.233213, size = 16, normalized size = 1.

$$-\frac{1}{4\,x^4}-\frac{1}{4}\,\arctan\left(x^4\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^8 + 1)*x^5),x, algorithm="giac")
```

```
[Out] -1/4/x^4 - 1/4*arctan(x^4)
```

3.1496 $\int \frac{1}{x^7(1+x^8)}\,dx$

Optimal. Leaf size=100

$$-\frac{1}{6x^6}+\frac{\tan^{-1}\left(1-\sqrt{2}x^2\right)}{4\sqrt{2}}-\frac{\tan^{-1}\left(\sqrt{2}x^2+1\right)}{4\sqrt{2}}+\frac{\log\left(x^4-\sqrt{2}x^2+1\right)}{8\sqrt{2}}-\frac{\log\left(x^4+\sqrt{2}x^2+1\right)}{8\sqrt{2}}$$

```
[Out] -1/(6*x^6) + ArcTan[1 - Sqrt[2]*x^2]/(4*Sqrt[2]) - ArcTan[1 + Sqr
t[2]*x^2]/(4*Sqrt[2]) + Log[1 - Sqrt[2]*x^2 + x^4]/(8*Sqrt[2]) -
Log[1 + Sqrt[2]*x^2 + x^4]/(8*Sqrt[2])
```

Rubi [A] time = 0.149932, antiderivative size = 100, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 8, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.727

$$-\frac{1}{6x^6}+\frac{\tan^{-1}\left(1-\sqrt{2}x^2\right)}{4\sqrt{2}}-\frac{\tan^{-1}\left(\sqrt{2}x^2+1\right)}{4\sqrt{2}}+\frac{\log\left(x^4-\sqrt{2}x^2+1\right)}{8\sqrt{2}}-\frac{\log\left(x^4+\sqrt{2}x^2+1\right)}{8\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^7*(1 + x^8)),x]
```

```
[Out] -1/(6*x^6) + ArcTan[1 - Sqrt[2]*x^2]/(4*Sqrt[2]) - ArcTan[1 + Sqr
t[2]*x^2]/(4*Sqrt[2]) + Log[1 - Sqrt[2]*x^2 + x^4]/(8*Sqrt[2]) -
Log[1 + Sqrt[2]*x^2 + x^4]/(8*Sqrt[2])
```

Rubi in Sympy [A] time = 17.2271, size = 87, normalized size = 0.87

$$\frac{\sqrt{2}\log\left(x^4-\sqrt{2}x^2+1\right)}{16}-\frac{\sqrt{2}\log\left(x^4+\sqrt{2}x^2+1\right)}{16}-\frac{\sqrt{2}\,\mathrm{atan}\left(\sqrt{2}x^2-1\right)}{8}-\frac{\sqrt{2}\,\mathrm{atan}\left(\sqrt{2}x^2+1\right)}{8}-\frac{1}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**7/(x**8+1),x)
```

```
[Out] sqrt(2)*log(x**4 - sqrt(2)*x**2 + 1)/16 - sqrt(2)*log(x**4 + sqrt
(2)*x**2 + 1)/16 - sqrt(2)*atan(sqrt(2)*x**2 - 1)/8 - sqrt(2)*ata
n(sqrt(2)*x**2 + 1)/8 - 1/(6*x**6)
```

Mathematica [A] time = 0.18162, size = 193, normalized size = 1.93

$$\frac{1}{48}\left(-\frac{8}{x^6}-3\sqrt{2}\log\left(x^2-2x\sin\left(\frac{\pi}{8}\right)+1\right)-3\sqrt{2}\log\left(x^2+2x\sin\left(\frac{\pi}{8}\right)+1\right)\right.$$
$$+3\sqrt{2}\log\left(x^2-2x\cos\left(\frac{\pi}{8}\right)+1\right)+3\sqrt{2}\log\left(x^2+2x\cos\left(\frac{\pi}{8}\right)+1\right)$$
$$-6\sqrt{2}\tan^{-1}\left(x\sec\left(\frac{\pi}{8}\right)-\tan\left(\frac{\pi}{8}\right)\right)+6\sqrt{2}\tan^{-1}\left(\csc\left(\frac{\pi}{8}\right)\left(x+\cos\left(\frac{\pi}{8}\right)\right)\right)$$
$$\left.+6\sqrt{2}\tan^{-1}\left(\cot\left(\frac{\pi}{8}\right)-x\csc\left(\frac{\pi}{8}\right)\right)+6\sqrt{2}\tan^{-1}\left(\sec\left(\frac{\pi}{8}\right)\left(x+\sin\left(\frac{\pi}{8}\right)\right)\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^7*(1 + x^8)),x]
```

```
[Out] (-8/x^6 + 6*Sqrt[2]*ArcTan[(x + Cos[Pi/8])*Csc[Pi/8]] + 6*Sqrt[2]
*ArcTan[Cot[Pi/8] - x*Csc[Pi/8]] + 6*Sqrt[2]*ArcTan[Sec[Pi/8]*(x
```

```
+ Sin[Pi/8])] - 6*Sqrt[2]*ArcTan[x*Sec[Pi/8] - Tan[Pi/8]] + 3*Sqr
t[2]*Log[1 + x^2 - 2*x*Cos[Pi/8]] + 3*Sqrt[2]*Log[1 + x^2 + 2*x*C
os[Pi/8]] - 3*Sqrt[2]*Log[1 + x^2 - 2*x*Sin[Pi/8]] - 3*Sqrt[2]*Lo
g[1 + x^2 + 2*x*Sin[Pi/8]])/48
```

Maple [A] time = 0.006, size = 71, normalized size = 0.7

$$-\frac{1}{6\,x^{6}}-\frac{\arctan\left(1+x^{2}\sqrt{2}\right)\sqrt{2}}{8}-\frac{\arctan\left(x^{2}\sqrt{2}-1\right)\sqrt{2}}{8}-\frac{\sqrt{2}}{16}\ln\left(\frac{1+x^{4}+x^{2}\sqrt{2}}{1+x^{4}-x^{2}\sqrt{2}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^7/(x^8+1),x)
```

```
[Out] -1/6/x^6-1/8*arctan(1+x^2*2^(1/2))*2^(1/2)-1/8*arctan(x^2*2^(1/2)
-1)*2^(1/2)-1/16*2^(1/2)*ln((1+x^4+x^2*2^(1/2))/(1+x^4-x^2*2^(1/2
)))
```

Maxima [A] time = 1.57174, size = 115, normalized size = 1.15

$$-\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2\,x^{2}+\sqrt{2}\right)\right)-\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2\,x^{2}-\sqrt{2}\right)\right)$$
$$-\frac{1}{16}\sqrt{2}\log\left(x^{4}+\sqrt{2}x^{2}+1\right)+\frac{1}{16}\sqrt{2}\log\left(x^{4}-\sqrt{2}x^{2}+1\right)-\frac{1}{6\,x^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^8 + 1)*x^7),x, algorithm="maxima")
```

```
[Out] -1/8*sqrt(2)*arctan(1/2*sqrt(2)*(2*x^2 + sqrt(2))) - 1/8*sqrt(2)*
arctan(1/2*sqrt(2)*(2*x^2 - sqrt(2))) - 1/16*sqrt(2)*log(x^4 + sq
rt(2)*x^2 + 1) + 1/16*sqrt(2)*log(x^4 - sqrt(2)*x^2 + 1) - 1/6/x^
6
```

Fricas [A] time = 0.230009, size = 171, normalized size = 1.71

$$\frac{12\,\sqrt{2}x^{6}\arctan\left(\frac{1}{\sqrt{2}x^{2}+\sqrt{2}\sqrt{x^{4}+\sqrt{2}x^{2}+1}+1}\right)+12\,\sqrt{2}x^{6}\arctan\left(\frac{1}{\sqrt{2}x^{2}+\sqrt{2}\sqrt{x^{4}-\sqrt{2}x^{2}+1}-1}\right)-3\,\sqrt{2}x^{6}\log\left(x^{4}+\sqrt{2}x^{2}+1\right)+3\,\sqrt{2}x^{6}\log}{48\,x^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^8 + 1)*x^7),x, algorithm="fricas")
```

```
[Out] 1/48*(12*sqrt(2)*x^6*arctan(1/(sqrt(2)*x^2 + sqrt(2)*sqrt(x^4 + s
qrt(2)*x^2 + 1) + 1)) + 12*sqrt(2)*x^6*arctan(1/(sqrt(2)*x^2 + sq
rt(2)*sqrt(x^4 - sqrt(2)*x^2 + 1) - 1)) - 3*sqrt(2)*x^6*log(x^4 +
 sqrt(2)*x^2 + 1) + 3*sqrt(2)*x^6*log(x^4 - sqrt(2)*x^2 + 1) - 8)
/x^6
```

Sympy [A] time = 0.655528, size = 87, normalized size = 0.87

$$\frac{\sqrt{2}\log\left(x^{4}-\sqrt{2}x^{2}+1\right)}{16}-\frac{\sqrt{2}\log\left(x^{4}+\sqrt{2}x^{2}+1\right)}{16}-\frac{\sqrt{2}\,\mathrm{atan}\left(\sqrt{2}x^{2}-1\right)}{8}-\frac{\sqrt{2}\,\mathrm{atan}\left(\sqrt{2}x^{2}+1\right)}{8}-\frac{1}{6x^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**7/(x**8+1),x)
```

```
[Out] sqrt(2)*log(x**4 - sqrt(2)*x**2 + 1)/16 - sqrt(2)*log(x**4 + sqrt
(2)*x**2 + 1)/16 - sqrt(2)*atan(sqrt(2)*x**2 - 1)/8 - sqrt(2)*ata
n(sqrt(2)*x**2 + 1)/8 - 1/(6*x**6)
```

GIAC/XCAS [A] time = 0.239926, size = 115, normalized size = 1.15

$$-\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x^2+\sqrt{2}\right)\right)-\frac{1}{8}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x^2-\sqrt{2}\right)\right)$$
$$-\frac{1}{16}\sqrt{2}\ln\left(x^4+\sqrt{2}x^2+1\right)+\frac{1}{16}\sqrt{2}\ln\left(x^4-\sqrt{2}x^2+1\right)-\frac{1}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^8 + 1)*x^7),x, algorithm="giac")
```

```
[Out] -1/8*sqrt(2)*arctan(1/2*sqrt(2)*(2*x^2 + sqrt(2))) - 1/8*sqrt(2)*
arctan(1/2*sqrt(2)*(2*x^2 - sqrt(2))) - 1/16*sqrt(2)*ln(x^4 + sqr
t(2)*x^2 + 1) + 1/16*sqrt(2)*ln(x^4 - sqrt(2)*x^2 + 1) - 1/6/x^6
```

3.1497 $\int \frac{1}{x^9(1+x^8)} dx$

Optimal. Leaf size=22

$$-\frac{1}{8x^8}+\frac{1}{8}\log\left(x^8+1\right)-\log(x)$$

```
[Out] -1/(8*x^8) - Log[x] + Log[1 + x^8]/8
```

Rubi [A] time = 0.0308534, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$-\frac{1}{8x^8}+\frac{1}{8}\log\left(x^8+1\right)-\log(x)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^9*(1 + x^8)),x]

[Out] -1/(8*x^8) - Log[x] + Log[1 + x^8]/8
```

Rubi in Sympy [A] time = 3.97454, size = 20, normalized size = 0.91

$$-\frac{\log\left(x^8\right)}{8}+\frac{\log\left(x^8+1\right)}{8}-\frac{1}{8x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**9/(x**8+1),x)

[Out] -log(x**8)/8 + log(x**8 + 1)/8 - 1/(8*x**8)
```

Mathematica [A] time = 0.00643646, size = 22, normalized size = 1.

$$-\frac{1}{8x^8}+\frac{1}{8}\log\left(x^8+1\right)-\log(x)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^9*(1 + x^8)),x]

[Out] -1/(8*x^8) - Log[x] + Log[1 + x^8]/8
```

Maple [A] time = 0.009, size = 19, normalized size = 0.9

$$-\frac{1}{8\,x^8}-\ln(x)+\frac{\ln\left(x^8+1\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^9/(x^8+1),x)

[Out] -1/8/x^8-ln(x)+1/8*ln(x^8+1)
```

Maxima [A] time = 1.42303, size = 27, normalized size = 1.23

$$-\frac{1}{8\,x^8} + \frac{1}{8}\,\log\left(x^8 + 1\right) - \frac{1}{8}\,\log\left(x^8\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^8 + 1)*x^9),x, algorithm="maxima")

[Out] -1/8/x^8 + 1/8*log(x^8 + 1) - 1/8*log(x^8)
```

Fricas [A] time = 0.213375, size = 32, normalized size = 1.45

$$\frac{x^8\log\left(x^8 + 1\right) - 8\,x^8\log\left(x\right) - 1}{8\,x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^8 + 1)*x^9),x, algorithm="fricas")

[Out] 1/8*(x^8*log(x^8 + 1) - 8*x^8*log(x) - 1)/x^8
```

Sympy [A] time = 0.479366, size = 17, normalized size = 0.77

$$-\log\left(x\right) + \frac{\log\left(x^8 + 1\right)}{8} - \frac{1}{8x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**9/(x**8+1),x)

[Out] -log(x) + log(x**8 + 1)/8 - 1/(8*x**8)
```

GIAC/XCAS [A] time = 0.238277, size = 34, normalized size = 1.55

$$\frac{x^8 - 1}{8\,x^8} + \frac{1}{8}\ln\left(x^8 + 1\right) - \frac{1}{8}\ln\left(x^8\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^8 + 1)*x^9),x, algorithm="giac")

[Out] 1/8*(x^8 - 1)/x^8 + 1/8*ln(x^8 + 1) - 1/8*ln(x^8)
```

3.1498 $\int \frac{x^8}{1+x^8} dx$

Optimal. Leaf size=340

$$\frac{1}{16}\sqrt{2-\sqrt{2}}\log\left(x^2-\sqrt{2-\sqrt{2}}x+1\right)-\frac{1}{16}\sqrt{2-\sqrt{2}}\log\left(x^2+\sqrt{2-\sqrt{2}}x+1\right)+\frac{1}{16}\sqrt{2+\sqrt{2}}\log\left(x^2-\sqrt{2+\sqrt{2}}x+1\right)-\frac{1}{16}\sqrt{2+\sqrt{2}}\log\left(x^2+\sqrt{2+\sqrt{2}}x+1\right)+x+\frac{\tan^{-1}\left(\frac{\sqrt{2-\sqrt{2}}-2x}{\sqrt{2+\sqrt{2}}}\right)}{4\sqrt{2\left(2-\sqrt{2}\right)}}+\frac{\tan^{-1}\left(\frac{\sqrt{2+\sqrt{2}}-2x}{\sqrt{2-\sqrt{2}}}\right)}{4\sqrt{2\left(2+\sqrt{2}\right)}}-\frac{\tan^{-1}\left(\frac{2x+\sqrt{2-\sqrt{2}}}{\sqrt{2+\sqrt{2}}}\right)}{4\sqrt{2\left(2-\sqrt{2}\right)}}-\frac{\tan^{-1}\left(\frac{2x+\sqrt{2+\sqrt{2}}}{\sqrt{2-\sqrt{2}}}\right)}{4\sqrt{2\left(2+\sqrt{2}\right)}}$$

```
[Out] x + ArcTan[(Sqrt[2 - Sqrt[2]] - 2*x)/Sqrt[2 + Sqrt[2]]]/(4*Sqrt[2
*(2 - Sqrt[2])]) + ArcTan[(Sqrt[2 + Sqrt[2]] - 2*x)/Sqrt[2 - Sqrt
[2]]]/(4*Sqrt[2*(2 + Sqrt[2])]) - ArcTan[(Sqrt[2 - Sqrt[2]] + 2*x
)/Sqrt[2 + Sqrt[2]]]/(4*Sqrt[2*(2 - Sqrt[2])]) - ArcTan[(Sqrt[2 +
 Sqrt[2]] + 2*x)/Sqrt[2 - Sqrt[2]]]/(4*Sqrt[2*(2 + Sqrt[2])]) + (
Sqrt[2 - Sqrt[2]]*Log[1 - Sqrt[2 - Sqrt[2]]*x + x^2])/16 - (Sqrt[
2 - Sqrt[2]]*Log[1 + Sqrt[2 - Sqrt[2]]*x + x^2])/16 + (Sqrt[2 + S
qrt[2]]*Log[1 - Sqrt[2 + Sqrt[2]]*x + x^2])/16 - (Sqrt[2 + Sqrt[2
]]*Log[1 + Sqrt[2 + Sqrt[2]]*x + x^2])/16
```

Rubi [A] time = 0.848379, antiderivative size = 340, normalized size of antiderivative = 1., number of steps used = 20, number of rules used = 7, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.636

$$\frac{1}{16}\sqrt{2-\sqrt{2}}\log\left(x^2-\sqrt{2-\sqrt{2}}x+1\right)-\frac{1}{16}\sqrt{2-\sqrt{2}}\log\left(x^2+\sqrt{2-\sqrt{2}}x+1\right)+\frac{1}{16}\sqrt{2+\sqrt{2}}\log\left(x^2-\sqrt{2+\sqrt{2}}x+1\right)-\frac{1}{16}\sqrt{2+\sqrt{2}}\log\left(x^2+\sqrt{2+\sqrt{2}}x+1\right)+x+\frac{\tan^{-1}\left(\frac{\sqrt{2-\sqrt{2}}-2x}{\sqrt{2+\sqrt{2}}}\right)}{4\sqrt{2\left(2-\sqrt{2}\right)}}+\frac{\tan^{-1}\left(\frac{\sqrt{2+\sqrt{2}}-2x}{\sqrt{2-\sqrt{2}}}\right)}{4\sqrt{2\left(2+\sqrt{2}\right)}}-\frac{\tan^{-1}\left(\frac{2x+\sqrt{2-\sqrt{2}}}{\sqrt{2+\sqrt{2}}}\right)}{4\sqrt{2\left(2-\sqrt{2}\right)}}-\frac{\tan^{-1}\left(\frac{2x+\sqrt{2+\sqrt{2}}}{\sqrt{2-\sqrt{2}}}\right)}{4\sqrt{2\left(2+\sqrt{2}\right)}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8/(1 + x^8),x]
```

```
[Out] x + ArcTan[(Sqrt[2 - Sqrt[2]] - 2*x)/Sqrt[2 + Sqrt[2]]]/(4*Sqrt[2
*(2 - Sqrt[2])]) + ArcTan[(Sqrt[2 + Sqrt[2]] - 2*x)/Sqrt[2 - Sqrt
[2]]]/(4*Sqrt[2*(2 + Sqrt[2])]) - ArcTan[(Sqrt[2 - Sqrt[2]] + 2*x
)/Sqrt[2 + Sqrt[2]]]/(4*Sqrt[2*(2 - Sqrt[2])]) - ArcTan[(Sqrt[2 +
 Sqrt[2]] + 2*x)/Sqrt[2 - Sqrt[2]]]/(4*Sqrt[2*(2 + Sqrt[2])]) + (
Sqrt[2 - Sqrt[2]]*Log[1 - Sqrt[2 - Sqrt[2]]*x + x^2])/16 - (Sqrt[
2 - Sqrt[2]]*Log[1 + Sqrt[2 - Sqrt[2]]*x + x^2])/16 + (Sqrt[2 + S
qrt[2]]*Log[1 - Sqrt[2 + Sqrt[2]]*x + x^2])/16 - (Sqrt[2 + Sqrt[2
]]*Log[1 + Sqrt[2 + Sqrt[2]]*x + x^2])/16
```

Rubi in Sympy [A] time = 62.8155, size = 530, normalized size = 1.56

$$x - \frac{\sqrt{2}\left(-\frac{\sqrt{2}}{2}+\frac{1}{2}\right)\log\left(x^2 - x\sqrt{-\sqrt{2}+2}+1\right)}{8\sqrt{-\sqrt{2}+2}} + \frac{\sqrt{2}\left(-\frac{\sqrt{2}}{2}+\frac{1}{2}\right)\log\left(x^2 + x\sqrt{-\sqrt{2}+2}+1\right)}{8\sqrt{-\sqrt{2}+2}} + \frac{\sqrt{2}\left(\frac{1}{2}+\frac{\sqrt{2}}{2}\right)\log\left(x^2 - x\sqrt{\sqrt{2}+2}+1\right)}{8\sqrt{\sqrt{2}+2}} - \frac{\sqrt{2}\left(\frac{1}{2}+\frac{\sqrt{2}}{2}\right)\log\left(x^2 + x\sqrt{\sqrt{2}+2}+1\right)}{8\sqrt{\sqrt{2}+2}} - \frac{\sqrt{2}\left(-\frac{\left(1+\sqrt{2}\right)\sqrt{\sqrt{2}+2}}{2}+\sqrt{2}\sqrt{\sqrt{2}+2}\right)\operatorname{atan}\left(\frac{2x-\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)}{4\sqrt{-\sqrt{2}+2}\sqrt{\sqrt{2}+2}} - \frac{\sqrt{2}\left(-\frac{\left(1+\sqrt{2}\right)\sqrt{\sqrt{2}+2}}{2}+\sqrt{2}\sqrt{\sqrt{2}+2}\right)\operatorname{atan}\left(\frac{2x+\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)}{4\sqrt{-\sqrt{2}+2}\sqrt{\sqrt{2}+2}} - \frac{\sqrt{2}\left(\frac{\left(-\sqrt{2}+1\right)\sqrt{-\sqrt{2}+2}}{2}+\sqrt{2}\sqrt{-\sqrt{2}+2}\right)\operatorname{atan}\left(\frac{2x-\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)}{4\sqrt{-\sqrt{2}+2}\sqrt{\sqrt{2}+2}} - \frac{\sqrt{2}\left(\frac{\left(-\sqrt{2}+1\right)\sqrt{-\sqrt{2}+2}}{2}+\sqrt{2}\sqrt{-\sqrt{2}+2}\right)\operatorname{atan}\left(\frac{2x+\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)}{4\sqrt{-\sqrt{2}+2}\sqrt{\sqrt{2}+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8/(x**8+1),x)
```

```
[Out] x - sqrt(2)*(-sqrt(2)/2 + 1/2)*log(x**2 - x*sqrt(-sqrt(2) + 2) +
1)/(8*sqrt(-sqrt(2) + 2)) + sqrt(2)*(-sqrt(2)/2 + 1/2)*log(x**2 +
 x*sqrt(-sqrt(2) + 2) + 1)/(8*sqrt(-sqrt(2) + 2)) + sqrt(2)*(1/2
+ sqrt(2)/2)*log(x**2 - x*sqrt(sqrt(2) + 2) + 1)/(8*sqrt(sqrt(2)
+ 2)) - sqrt(2)*(1/2 + sqrt(2)/2)*log(x**2 + x*sqrt(sqrt(2) + 2)
+ 1)/(8*sqrt(sqrt(2) + 2)) - sqrt(2)*(-(1 + sqrt(2))*sqrt(sqrt(2)
 + 2)/2 + sqrt(2)*sqrt(sqrt(2) + 2))*atan((2*x - sqrt(sqrt(2) + 2
))/sqrt(-sqrt(2) + 2))/(4*sqrt(-sqrt(2) + 2)*sqrt(sqrt(2) + 2)) -
 sqrt(2)*(-(1 + sqrt(2))*sqrt(sqrt(2) + 2)/2 + sqrt(2)*sqrt(sqrt(
2) + 2))*atan((2*x + sqrt(sqrt(2) + 2))/sqrt(-sqrt(2) + 2))/(4*sq
rt(-sqrt(2) + 2)*sqrt(sqrt(2) + 2)) - sqrt(2)*((-sqrt(2) + 1)*sqr
t(-sqrt(2) + 2)/2 + sqrt(2)*sqrt(-sqrt(2) + 2))*atan((2*x - sqrt(
-sqrt(2) + 2))/sqrt(sqrt(2) + 2))/(4*sqrt(-sqrt(2) + 2)*sqrt(sqrt
(2) + 2)) - sqrt(2)*((-sqrt(2) + 1)*sqrt(-sqrt(2) + 2)/2 + sqrt(2
)*sqrt(-sqrt(2) + 2))*atan((2*x + sqrt(-sqrt(2) + 2))/sqrt(sqrt(2
) + 2))/(4*sqrt(-sqrt(2) + 2)*sqrt(sqrt(2) + 2))
```

Mathematica [A] time = 0.0103249, size = 210, normalized size = 0.62

$$\frac{1}{8}\sin\left(\frac{\pi}{8}\right)\log\left(x^2-2x\sin\left(\frac{\pi}{8}\right)+1\right)-\frac{1}{8}\sin\left(\frac{\pi}{8}\right)\log\left(x^2+2x\sin\left(\frac{\pi}{8}\right)+1\right)+\frac{1}{8}\cos\left(\frac{\pi}{8}\right)\log\left(x^2-2x\cos\left(\frac{\pi}{8}\right)+1\right)-\frac{1}{8}\cos\left(\frac{\pi}{8}\right)\log\left(x^2+2x\cos\left(\frac{\pi}{8}\right)+1\right)+x-\frac{1}{4}\sin\left(\frac{\pi}{8}\right)\tan^{-1}\left(\csc\left(\frac{\pi}{8}\right)\left(x-\cos\left(\frac{\pi}{8}\right)\right)\right)-\frac{1}{4}\sin\left(\frac{\pi}{8}\right)\tan^{-1}\left(\csc\left(\frac{\pi}{8}\right)\left(x+\cos\left(\frac{\pi}{8}\right)\right)\right)-\frac{1}{4}\cos\left(\frac{\pi}{8}\right)\tan^{-1}\left(\sec\left(\frac{\pi}{8}\right)\left(x-\sin\left(\frac{\pi}{8}\right)\right)\right)-\frac{1}{4}\cos\left(\frac{\pi}{8}\right)\tan^{-1}\left(\sec\left(\frac{\pi}{8}\right)\left(x+\sin\left(\frac{\pi}{8}\right)\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^8/(1 + x^8),x]
```

```
[Out] x - (ArcTan[Sec[Pi/8]*(x - Sin[Pi/8])]*Cos[Pi/8])/4 - (ArcTan[Sec
[Pi/8]*(x + Sin[Pi/8])]*Cos[Pi/8])/4 + (Cos[Pi/8]*Log[1 + x^2 - 2
*x*Cos[Pi/8]])/8 - (Cos[Pi/8]*Log[1 + x^2 + 2*x*Cos[Pi/8]])/8 - (
ArcTan[(x - Cos[Pi/8])*Csc[Pi/8]]*Sin[Pi/8])/4 - (ArcTan[(x + Cos
```

```
[Pi/8])*Csc[Pi/8]]*Sin[Pi/8])/4 + (Log[1 + x^2 - 2*x*Sin[Pi/8]]*S
in[Pi/8])/8 - (Log[1 + x^2 + 2*x*Sin[Pi/8]]*Sin[Pi/8])/8
```

Maple [C] time = 0.006, size = 24, normalized size = 0.1

$$x - \frac{1}{8} \sum_{\_R = RootOf(\_Z^8+1)} \frac{\ln (x - \_R)}{\_R^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8/(x^8+1),x)

[Out] x-1/8*sum(1/_R^7*ln(x-_R),_R=RootOf(_Z^8+1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$x - \int \frac{1}{x^8 + 1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(x^8 + 1),x, algorithm="maxima")

[Out] x - integrate(1/(x^8 + 1), x)
```

Fricas [A] time = 0.24058, size = 1353, normalized size = 3.98

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(x^8 + 1),x, algorithm="fricas")

[Out] 1/64*sqrt(2)*(4*(sqrt(sqrt(2) + 2) + sqrt(-sqrt(2) + 2))*arctan((
sqrt(sqrt(2) + 2) + sqrt(-sqrt(2) + 2))/(2*sqrt(2)*x + 2*sqrt(2)*
sqrt(x^2 + 1/2*sqrt(2)*x*sqrt(sqrt(2) + 2) - 1/2*sqrt(2)*x*sqrt(-
sqrt(2) + 2) + 1) + sqrt(sqrt(2) + 2) - sqrt(-sqrt(2) + 2))) + 4*
(sqrt(sqrt(2) + 2) + sqrt(-sqrt(2) + 2))*arctan((sqrt(sqrt(2) + 2
) + sqrt(-sqrt(2) + 2))/(2*sqrt(2)*x + 2*sqrt(2)*sqrt(x^2 - 1/2*s
qrt(2)*x*sqrt(sqrt(2) + 2) + 1/2*sqrt(2)*x*sqrt(-sqrt(2) + 2) + 1
) - sqrt(sqrt(2) + 2) + sqrt(-sqrt(2) + 2))) - 4*(sqrt(sqrt(2) +
2) - sqrt(-sqrt(2) + 2))*arctan(-(sqrt(sqrt(2) + 2) - sqrt(-sqrt(
2) + 2))/(2*sqrt(2)*x + 2*sqrt(2)*sqrt(x^2 + 1/2*sqrt(2)*x*sqrt(s
qrt(2) + 2) + 1/2*sqrt(2)*x*sqrt(-sqrt(2) + 2) + 1) + sqrt(sqrt(2
) + 2) + sqrt(-sqrt(2) + 2))) - 4*(sqrt(sqrt(2) + 2) - sqrt(-sqrt
(2) + 2))*arctan(-(sqrt(sqrt(2) + 2) - sqrt(-sqrt(2) + 2))/(2*sqr
t(2)*x + 2*sqrt(2)*sqrt(x^2 - 1/2*sqrt(2)*x*sqrt(sqrt(2) + 2) - 1
/2*sqrt(2)*x*sqrt(-sqrt(2) + 2) + 1) - sqrt(sqrt(2) + 2) - sqrt(-
sqrt(2) + 2))) + 4*sqrt(2)*sqrt(sqrt(2) + 2)*arctan(sqrt(sqrt(2)
+ 2)/(2*x + 2*sqrt(x^2 + x*sqrt(-sqrt(2) + 2) + 1) + sqrt(-sqrt(2
) + 2))) + 4*sqrt(2)*sqrt(sqrt(2) + 2)*arctan(sqrt(sqrt(2) + 2)/(
2*x + 2*sqrt(x^2 - x*sqrt(-sqrt(2) + 2) + 1) - sqrt(-sqrt(2) + 2)
)) + 4*sqrt(2)*sqrt(-sqrt(2) + 2)*arctan(sqrt(-sqrt(2) + 2)/(2*x
+ 2*sqrt(x^2 + x*sqrt(sqrt(2) + 2) + 1) + sqrt(sqrt(2) + 2))) + 4
*sqrt(2)*sqrt(-sqrt(2) + 2)*arctan(sqrt(-sqrt(2) + 2)/(2*x + 2*sq
rt(x^2 - x*sqrt(sqrt(2) + 2) + 1) - sqrt(sqrt(2) + 2))) - (sqrt(s
qrt(2) + 2) + sqrt(-sqrt(2) + 2))*log(x^2 + 1/2*sqrt(2)*x*sqrt(sq
rt(2) + 2) + 1/2*sqrt(2)*x*sqrt(-sqrt(2) + 2) + 1) - (sqrt(sqrt(2
) + 2) - sqrt(-sqrt(2) + 2))*log(x^2 + 1/2*sqrt(2)*x*sqrt(sqrt(2)
 + 2) - 1/2*sqrt(2)*x*sqrt(-sqrt(2) + 2) + 1) + (sqrt(sqrt(2) + 2
```

```
) - sqrt(-sqrt(2) + 2))*log(x^2 - 1/2*sqrt(2)*x*sqrt(sqrt(2) + 2)
 + 1/2*sqrt(2)*x*sqrt(-sqrt(2) + 2) + 1) + (sqrt(sqrt(2) + 2) + s
qrt(-sqrt(2) + 2))*log(x^2 - 1/2*sqrt(2)*x*sqrt(sqrt(2) + 2) - 1/
2*sqrt(2)*x*sqrt(-sqrt(2) + 2) + 1) - sqrt(2)*sqrt(sqrt(2) + 2)*l
og(x^2 + x*sqrt(sqrt(2) + 2) + 1) + sqrt(2)*sqrt(sqrt(2) + 2)*log
(x^2 - x*sqrt(sqrt(2) + 2) + 1) - sqrt(2)*sqrt(-sqrt(2) + 2)*log(
x^2 + x*sqrt(-sqrt(2) + 2) + 1) + sqrt(2)*sqrt(-sqrt(2) + 2)*log(
x^2 - x*sqrt(-sqrt(2) + 2) + 1) + 32*sqrt(2)*x)
```

Sympy [A] time = 4.19056, size = 15, normalized size = 0.04

$$x + \operatorname{RootSum}\left(16777216t^8 + 1, \left(t \mapsto t\log\left(-8t + x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8/(x**8+1),x)
```

```
[Out] x + RootSum(16777216*_t**8 + 1, Lambda(_t, _t*log(-8*_t + x)))
```

GIAC/XCAS [A] time = 0.246673, size = 324, normalized size = 0.95

$$-\frac{1}{8}\sqrt{\sqrt{2}+2}\arctan\left(\frac{2x+\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)-\frac{1}{8}\sqrt{\sqrt{2}+2}\arctan\left(\frac{2x-\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)-\frac{1}{8}\sqrt{-\sqrt{2}+2}\arctan\left(\frac{2x+\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)-\frac{1}{8}\sqrt{-\sqrt{2}+2}\arctan\left(\frac{2x-\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)-\frac{1}{16}\sqrt{\sqrt{2}+2}\ln\left(x^2+x\sqrt{\sqrt{2}+2}+1\right)+\frac{1}{16}\sqrt{\sqrt{2}+2}\ln\left(x^2-x\sqrt{\sqrt{2}+2}+1\right)-\frac{1}{16}\sqrt{-\sqrt{2}+2}\ln\left(x^2+x\sqrt{-\sqrt{2}+2}+1\right)+\frac{1}{16}\sqrt{-\sqrt{2}+2}\ln\left(x^2-x\sqrt{-\sqrt{2}+2}+1\right)+x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/(x^8 + 1),x, algorithm="giac")
```

```
[Out] -1/8*sqrt(sqrt(2) + 2)*arctan((2*x + sqrt(-sqrt(2) + 2))/sqrt(sqr
t(2) + 2)) - 1/8*sqrt(sqrt(2) + 2)*arctan((2*x - sqrt(-sqrt(2) +
2))/sqrt(sqrt(2) + 2)) - 1/8*sqrt(-sqrt(2) + 2)*arctan((2*x + sqr
t(sqrt(2) + 2))/sqrt(-sqrt(2) + 2)) - 1/8*sqrt(-sqrt(2) + 2)*arct
an((2*x - sqrt(sqrt(2) + 2))/sqrt(-sqrt(2) + 2)) - 1/16*sqrt(sqrt
(2) + 2)*ln(x^2 + x*sqrt(sqrt(2) + 2) + 1) + 1/16*sqrt(sqrt(2) +
2)*ln(x^2 - x*sqrt(sqrt(2) + 2) + 1) - 1/16*sqrt(-sqrt(2) + 2)*ln
(x^2 + x*sqrt(-sqrt(2) + 2) + 1) + 1/16*sqrt(-sqrt(2) + 2)*ln(x^2
 - x*sqrt(-sqrt(2) + 2) + 1) + x
```

3.1499 $\int \frac{x^6}{1+x^8}\,dx$

Optimal. Leaf size=339

$$\frac{1}{16}\sqrt{2-\sqrt{2}}\log\left(x^2-\sqrt{2-\sqrt{2}}x+1\right)-\frac{1}{16}\sqrt{2-\sqrt{2}}\log\left(x^2+\sqrt{2-\sqrt{2}}x+1\right)+\frac{1}{16}\sqrt{2+\sqrt{2}}\log\left(x^2-\sqrt{2+\sqrt{2}}x+1\right)-\frac{1}{16}\sqrt{2+\sqrt{2}}\log\left(x^2+\sqrt{2+\sqrt{2}}x+1\right)-\frac{\tan^{-1}\left(\frac{\sqrt{2-\sqrt{2}}-2x}{\sqrt{2+\sqrt{2}}}\right)}{4\sqrt{2\left(2-\sqrt{2}\right)}}-\frac{\tan^{-1}\left(\frac{\sqrt{2+\sqrt{2}}-2x}{\sqrt{2-\sqrt{2}}}\right)}{4\sqrt{2\left(2+\sqrt{2}\right)}}+\frac{\tan^{-1}\left(\frac{2x+\sqrt{2-\sqrt{2}}}{\sqrt{2+\sqrt{2}}}\right)}{4\sqrt{2\left(2-\sqrt{2}\right)}}+\frac{\tan^{-1}\left(\frac{2x+\sqrt{2+\sqrt{2}}}{\sqrt{2-\sqrt{2}}}\right)}{4\sqrt{2\left(2+\sqrt{2}\right)}}$$

```
[Out] -ArcTan[(Sqrt[2 - Sqrt[2]] - 2*x)/Sqrt[2 + Sqrt[2]]]/(4*Sqrt[2*(2
 - Sqrt[2])]) - ArcTan[(Sqrt[2 + Sqrt[2]] - 2*x)/Sqrt[2 - Sqrt[2]
]]/(4*Sqrt[2*(2 + Sqrt[2])]) + ArcTan[(Sqrt[2 - Sqrt[2]] + 2*x)/S
qrt[2 + Sqrt[2]]]/(4*Sqrt[2*(2 - Sqrt[2])]) + ArcTan[(Sqrt[2 + Sq
rt[2]] + 2*x)/Sqrt[2 - Sqrt[2]]]/(4*Sqrt[2*(2 + Sqrt[2])]) + (Sqr
t[2 - Sqrt[2]]*Log[1 - Sqrt[2 - Sqrt[2]]*x + x^2])/16 - (Sqrt[2 -
 Sqrt[2]]*Log[1 + Sqrt[2 - Sqrt[2]]*x + x^2])/16 + (Sqrt[2 + Sqrt
[2]]*Log[1 - Sqrt[2 + Sqrt[2]]*x + x^2])/16 - (Sqrt[2 + Sqrt[2]]*
Log[1 + Sqrt[2 + Sqrt[2]]*x + x^2])/16
```

Rubi [A] time = 0.623232, antiderivative size = 339, normalized size of antiderivative = 1., number of steps used = 21, number of rules used = 7, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.636

$$\frac{1}{16}\sqrt{2-\sqrt{2}}\log\left(x^2-\sqrt{2-\sqrt{2}}x+1\right)-\frac{1}{16}\sqrt{2-\sqrt{2}}\log\left(x^2+\sqrt{2-\sqrt{2}}x+1\right)+\frac{1}{16}\sqrt{2+\sqrt{2}}\log\left(x^2-\sqrt{2+\sqrt{2}}x+1\right)-\frac{1}{16}\sqrt{2+\sqrt{2}}\log\left(x^2+\sqrt{2+\sqrt{2}}x+1\right)-\frac{\tan^{-1}\left(\frac{\sqrt{2-\sqrt{2}}-2x}{\sqrt{2+\sqrt{2}}}\right)}{4\sqrt{2\left(2-\sqrt{2}\right)}}-\frac{\tan^{-1}\left(\frac{\sqrt{2+\sqrt{2}}-2x}{\sqrt{2-\sqrt{2}}}\right)}{4\sqrt{2\left(2+\sqrt{2}\right)}}+\frac{\tan^{-1}\left(\frac{2x+\sqrt{2-\sqrt{2}}}{\sqrt{2+\sqrt{2}}}\right)}{4\sqrt{2\left(2-\sqrt{2}\right)}}+\frac{\tan^{-1}\left(\frac{2x+\sqrt{2+\sqrt{2}}}{\sqrt{2-\sqrt{2}}}\right)}{4\sqrt{2\left(2+\sqrt{2}\right)}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/(1 + x^8),x]
```

```
[Out] -ArcTan[(Sqrt[2 - Sqrt[2]] - 2*x)/Sqrt[2 + Sqrt[2]]]/(4*Sqrt[2*(2
 - Sqrt[2])]) - ArcTan[(Sqrt[2 + Sqrt[2]] - 2*x)/Sqrt[2 - Sqrt[2]
]]/(4*Sqrt[2*(2 + Sqrt[2])]) + ArcTan[(Sqrt[2 - Sqrt[2]] + 2*x)/S
qrt[2 + Sqrt[2]]]/(4*Sqrt[2*(2 - Sqrt[2])]) + ArcTan[(Sqrt[2 + Sq
rt[2]] + 2*x)/Sqrt[2 - Sqrt[2]]]/(4*Sqrt[2*(2 + Sqrt[2])]) + (Sqr
t[2 - Sqrt[2]]*Log[1 - Sqrt[2 - Sqrt[2]]*x + x^2])/16 - (Sqrt[2 -
 Sqrt[2]]*Log[1 + Sqrt[2 - Sqrt[2]]*x + x^2])/16 + (Sqrt[2 + Sqrt
[2]]*Log[1 - Sqrt[2 + Sqrt[2]]*x + x^2])/16 - (Sqrt[2 + Sqrt[2]]*
Log[1 + Sqrt[2 + Sqrt[2]]*x + x^2])/16
```

Rubi in Sympy [A] time = 73.9735, size = 508, normalized size = 1.5

$$-\frac{\sqrt{2}\left(-\frac{\sqrt{2}}{2}+\frac{1}{2}\right)\log\left(x^2-x\sqrt{-\sqrt{2}+2}+1\right)}{8\sqrt{-\sqrt{2}+2}}+\frac{\sqrt{2}\left(-\frac{\sqrt{2}}{2}+\frac{1}{2}\right)\log\left(x^2+x\sqrt{-\sqrt{2}+2}+1\right)}{8\sqrt{-\sqrt{2}+2}}$$
$$+\frac{\sqrt{2}\left(\frac{1}{2}+\frac{\sqrt{2}}{2}\right)\log\left(x^2-x\sqrt{\sqrt{2}+2}+1\right)}{8\sqrt{\sqrt{2}+2}}-\frac{\sqrt{2}\left(\frac{1}{2}+\frac{\sqrt{2}}{2}\right)\log\left(x^2+x\sqrt{\sqrt{2}+2}+1\right)}{8\sqrt{\sqrt{2}+2}}$$
$$+\frac{\sqrt{2}\left(-\sqrt{\sqrt{2}+2}+\frac{\left(1+\sqrt{2}\right)\sqrt{\sqrt{2}+2}}{2}\right)\operatorname{atan}\left(\frac{2x-\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)}{4\sqrt{-\sqrt{2}+2}\sqrt{\sqrt{2}+2}}$$
$$+\frac{\sqrt{2}\left(-\sqrt{\sqrt{2}+2}+\frac{\left(1+\sqrt{2}\right)\sqrt{\sqrt{2}+2}}{2}\right)\operatorname{atan}\left(\frac{2x+\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)}{4\sqrt{-\sqrt{2}+2}\sqrt{\sqrt{2}+2}}$$
$$+\frac{\sqrt{2}\left(-\frac{\left(-\sqrt{2}+1\right)\sqrt{-\sqrt{2}+2}}{2}+\sqrt{-\sqrt{2}+2}\right)\operatorname{atan}\left(\frac{2x-\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)}{4\sqrt{-\sqrt{2}+2}\sqrt{\sqrt{2}+2}}$$
$$+\frac{\sqrt{2}\left(-\frac{\left(-\sqrt{2}+1\right)\sqrt{-\sqrt{2}+2}}{2}+\sqrt{-\sqrt{2}+2}\right)\operatorname{atan}\left(\frac{2x+\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)}{4\sqrt{-\sqrt{2}+2}\sqrt{\sqrt{2}+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate(x**6/(x**8+1),x)
```

```
[Out] -sqrt(2)*(-sqrt(2)/2 + 1/2)*log(x**2 - x*sqrt(-sqrt(2) + 2) + 1)/
(8*sqrt(-sqrt(2) + 2)) + sqrt(2)*(-sqrt(2)/2 + 1/2)*log(x**2 + x*
sqrt(-sqrt(2) + 2) + 1)/(8*sqrt(-sqrt(2) + 2)) + sqrt(2)*(1/2 + s
qrt(2)/2)*log(x**2 - x*sqrt(sqrt(2) + 2) + 1)/(8*sqrt(sqrt(2) + 2
)) - sqrt(2)*(1/2 + sqrt(2)/2)*log(x**2 + x*sqrt(sqrt(2) + 2) + 1
)/(8*sqrt(sqrt(2) + 2)) + sqrt(2)*(-sqrt(sqrt(2) + 2) + (1 + sqrt
(2))*sqrt(sqrt(2) + 2)/2)*atan((2*x - sqrt(sqrt(2) + 2))/sqrt(-sq
rt(2) + 2))/(4*sqrt(-sqrt(2) + 2)*sqrt(sqrt(2) + 2)) + sqrt(2)*(-
sqrt(sqrt(2) + 2) + (1 + sqrt(2))*sqrt(sqrt(2) + 2)/2)*atan((2*x
+ sqrt(sqrt(2) + 2))/sqrt(-sqrt(2) + 2))/(4*sqrt(-sqrt(2) + 2)*sq
rt(sqrt(2) + 2)) + sqrt(2)*(-(-sqrt(2) + 1)*sqrt(-sqrt(2) + 2)/2
+ sqrt(-sqrt(2) + 2))*atan((2*x - sqrt(-sqrt(2) + 2))/sqrt(sqrt(2
) + 2))/(4*sqrt(-sqrt(2) + 2)*sqrt(sqrt(2) + 2)) + sqrt(2)*(-(-sq
rt(2) + 1)*sqrt(-sqrt(2) + 2)/2 + sqrt(-sqrt(2) + 2))*atan((2*x +
 sqrt(-sqrt(2) + 2))/sqrt(sqrt(2) + 2))/(4*sqrt(-sqrt(2) + 2)*sqr
t(sqrt(2) + 2))
```

Mathematica [A] time = 0.0102427, size = 209, normalized size = 0.62

$$\frac{1}{8}\sin\left(\frac{\pi}{8}\right)\log\left(x^2-2x\sin\left(\frac{\pi}{8}\right)+1\right)-\frac{1}{8}\sin\left(\frac{\pi}{8}\right)\log\left(x^2+2x\sin\left(\frac{\pi}{8}\right)+1\right)$$
$$+\frac{1}{8}\cos\left(\frac{\pi}{8}\right)\log\left(x^2-2x\cos\left(\frac{\pi}{8}\right)+1\right)-\frac{1}{8}\cos\left(\frac{\pi}{8}\right)\log\left(x^2+2x\cos\left(\frac{\pi}{8}\right)+1\right)$$
$$+\frac{1}{4}\sin\left(\frac{\pi}{8}\right)\tan^{-1}\left(\csc\left(\frac{\pi}{8}\right)\left(x-\cos\left(\frac{\pi}{8}\right)\right)\right)+\frac{1}{4}\sin\left(\frac{\pi}{8}\right)\tan^{-1}\left(\csc\left(\frac{\pi}{8}\right)\left(x+\cos\left(\frac{\pi}{8}\right)\right)\right)$$
$$+\frac{1}{4}\cos\left(\frac{\pi}{8}\right)\tan^{-1}\left(\sec\left(\frac{\pi}{8}\right)\left(x-\sin\left(\frac{\pi}{8}\right)\right)\right)+\frac{1}{4}\cos\left(\frac{\pi}{8}\right)\tan^{-1}\left(\sec\left(\frac{\pi}{8}\right)\left(x+\sin\left(\frac{\pi}{8}\right)\right)\right)$$

Antiderivative was successfully verified.

```
[In]   Integrate[x^6/(1 + x^8),x]
```

```
[Out] (ArcTan[Sec[Pi/8]*(x - Sin[Pi/8])]*Cos[Pi/8])/4 + (ArcTan[Sec[Pi/
8]*(x + Sin[Pi/8])]*Cos[Pi/8])/4 + (Cos[Pi/8]*Log[1 + x^2 - 2*x*C
os[Pi/8]])/8 - (Cos[Pi/8]*Log[1 + x^2 + 2*x*Cos[Pi/8]])/8 + (ArcT
an[(x - Cos[Pi/8])*Csc[Pi/8]]*Sin[Pi/8])/4 + (ArcTan[(x + Cos[Pi/
```

```
8])*Csc[Pi/8]]*Sin[Pi/8])/4 + (Log[1 + x^2 - 2*x*Sin[Pi/8]]*Sin[P
i/8])/8 - (Log[1 + x^2 + 2*x*Sin[Pi/8]]*Sin[Pi/8])/8
```

Maple [C] time = 0.006, size = 22, normalized size = 0.1

$$\frac{1}{8}\sum_{\_R=RootOf(\_Z^8+1)}\frac{\ln(x-\_R)}{\_R}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(x^8+1),x)
```

```
[Out] 1/8*sum(1/_R*ln(x-_R),_R=RootOf(_Z^8+1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^6}{x^8+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(x^8 + 1),x, algorithm="maxima")
```

```
[Out] integrate(x^6/(x^8 + 1), x)
```

Fricas [A] time = 0.256484, size = 3343, normalized size = 9.86

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(x^8 + 1),x, algorithm="fricas")
```

```
[Out] 1/64*sqrt(2)*(4*(sqrt(sqrt(2) + 2) + sqrt(-sqrt(2) + 2))*arctan(-
((sqrt(2) + 2)^(3/2) + 3*sqrt(sqrt(2) + 2)*(sqrt(2) - 2) + 3*(sqr
t(2) + 2)*sqrt(-sqrt(2) + 2) - (-sqrt(2) + 2)^(3/2))/(8*sqrt(2)*x
 + (sqrt(2) + 2)^(3/2) + 3*sqrt(sqrt(2) + 2)*(sqrt(2) - 2) - 3*(s
qrt(2) + 2)*sqrt(-sqrt(2) + 2) + (-sqrt(2) + 2)^(3/2) + sqrt(2)*s
qrt(8*sqrt(2)*x*(sqrt(2) + 2)^(3/2) + (sqrt(2) + 2)^3 + 3*(sqrt(2
) + 2)*(sqrt(2) - 2)^2 - (sqrt(2) - 2)^3 - 24*sqrt(2)*x*(sqrt(2)
+ 2)*sqrt(-sqrt(2) + 2) + 8*sqrt(2)*x*(-sqrt(2) + 2)^(3/2) + 64*x
^2 + 3*(8*sqrt(2)*x*sqrt(sqrt(2) + 2) - (sqrt(2) + 2)^2)*(sqrt(2)
 - 2)))) + 4*(sqrt(sqrt(2) + 2) + sqrt(-sqrt(2) + 2))*arctan(-((s
qrt(2) + 2)^(3/2) + 3*sqrt(sqrt(2) + 2)*(sqrt(2) - 2) + 3*(sqrt(2
) + 2)*sqrt(-sqrt(2) + 2) - (-sqrt(2) + 2)^(3/2))/(8*sqrt(2)*x -
(sqrt(2) + 2)^(3/2) - 3*sqrt(sqrt(2) + 2)*(sqrt(2) - 2) + 3*(sqrt
(2) + 2)*sqrt(-sqrt(2) + 2) - (-sqrt(2) + 2)^(3/2) + 8*sqrt(2)*sq
rt(-1/8*sqrt(2)*x*(sqrt(2) + 2)^(3/2) + 1/64*(sqrt(2) + 2)^3 + 3/
64*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - 1/64*(sqrt(2) - 2)^3 + 3/8*sqr
t(2)*x*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) - 1/8*sqrt(2)*x*(-sqrt(2)
 + 2)^(3/2) + x^2 - 3/64*(8*sqrt(2)*x*sqrt(sqrt(2) + 2) + (sqrt(2
) + 2)^2)*(sqrt(2) - 2)))) + 4*(sqrt(sqrt(2) + 2) - sqrt(-sqrt(2)
 + 2))*arctan(((sqrt(2) + 2)^(3/2) + 3*sqrt(sqrt(2) + 2)*(sqrt(2)
 - 2) - 3*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) + (-sqrt(2) + 2)^(3/2)
)/(8*sqrt(2)*x + (sqrt(2) + 2)^(3/2) + 3*sqrt(sqrt(2) + 2)*(sqrt(
2) - 2) + 3*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) - (-sqrt(2) + 2)^(3/
2) + sqrt(2)*sqrt(8*sqrt(2)*x*(sqrt(2) + 2)^(3/2) + (sqrt(2) + 2)
^3 + 3*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - (sqrt(2) - 2)^3 + 24*sqrt(
2)*x*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) - 8*sqrt(2)*x*(-sqrt(2) + 2
)^(3/2) + 64*x^2 + 3*(8*sqrt(2)*x*sqrt(sqrt(2) + 2) - (sqrt(2) +
```

```
2)^2)*(sqrt(2) - 2)))) + 4*(sqrt(sqrt(2) + 2) - sqrt(-sqrt(2) + 2
))*arctan(((sqrt(2) + 2)^(3/2) + 3*sqrt(sqrt(2) + 2)*(sqrt(2) - 2
) - 3*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) + (-sqrt(2) + 2)^(3/2))/(8
*sqrt(2)*x - (sqrt(2) + 2)^(3/2) - 3*sqrt(sqrt(2) + 2)*(sqrt(2) -
 2) - 3*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) + (-sqrt(2) + 2)^(3/2) +
 8*sqrt(2)*sqrt(-1/8*sqrt(2)*x*(sqrt(2) + 2)^(3/2) + 1/64*(sqrt(2
) + 2)^3 + 3/64*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - 1/64*(sqrt(2) - 2
)^3 - 3/8*sqrt(2)*x*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) + 1/8*sqrt(2
)*x*(-sqrt(2) + 2)^(3/2) + x^2 - 3/64*(8*sqrt(2)*x*sqrt(sqrt(2) +
 2) + (sqrt(2) + 2)^2)*(sqrt(2) - 2)))) + 4*sqrt(2)*sqrt(-sqrt(2)
 + 2)*arctan(-((sqrt(2) + 2)^(3/2) + 3*sqrt(sqrt(2) + 2)*(sqrt(2)
 - 2))/(3*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) - (-sqrt(2) + 2)^(3/2)
 + 8*x + sqrt((sqrt(2) + 2)^3 - 3*(sqrt(2) + 2)^2*(sqrt(2) - 2) +
 3*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - (sqrt(2) - 2)^3 + 48*x*(sqrt(2
) + 2)*sqrt(-sqrt(2) + 2) - 16*x*(-sqrt(2) + 2)^(3/2) + 64*x^2)))
 + 4*sqrt(2)*sqrt(-sqrt(2) + 2)*arctan(((sqrt(2) + 2)^(3/2) + 3*s
qrt(sqrt(2) + 2)*(sqrt(2) - 2))/(3*(sqrt(2) + 2)*sqrt(-sqrt(2) +
2) - (-sqrt(2) + 2)^(3/2) - 8*x - sqrt((sqrt(2) + 2)^3 - 3*(sqrt(
2) + 2)^2*(sqrt(2) - 2) + 3*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - (sqrt
(2) - 2)^3 - 48*x*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) + 16*x*(-sqrt(
2) + 2)^(3/2) + 64*x^2))) + 4*sqrt(2)*sqrt(sqrt(2) + 2)*arctan(-(
3*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) - (-sqrt(2) + 2)^(3/2))/((sqrt
(2) + 2)^(3/2) + 3*sqrt(sqrt(2) + 2)*(sqrt(2) - 2) + 8*x + sqrt((
sqrt(2) + 2)^3 + 3*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - (sqrt(2) - 2)^
3 + 16*x*(sqrt(2) + 2)^(3/2) + 64*x^2 - 3*((sqrt(2) + 2)^2 - 16*x
*sqrt(sqrt(2) + 2))*(sqrt(2) - 2)))) + 4*sqrt(2)*sqrt(sqrt(2) + 2
)*arctan((3*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) - (-sqrt(2) + 2)^(3/
2))/((sqrt(2) + 2)^(3/2) + 3*sqrt(sqrt(2) + 2)*(sqrt(2) - 2) - 8*
x - sqrt((sqrt(2) + 2)^3 + 3*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - (sqr
t(2) - 2)^3 - 16*x*(sqrt(2) + 2)^(3/2) + 64*x^2 - 3*((sqrt(2) + 2
)^2 + 16*x*sqrt(sqrt(2) + 2))*(sqrt(2) - 2)))) - (sqrt(sqrt(2) +
2) + sqrt(-sqrt(2) + 2))*log(1/8*sqrt(2)*x*(sqrt(2) + 2)^(3/2) +
1/64*(sqrt(2) + 2)^3 + 3/64*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - 1/64*
(sqrt(2) - 2)^3 + 3/8*sqrt(2)*x*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2)
- 1/8*sqrt(2)*x*(-sqrt(2) + 2)^(3/2) + x^2 + 3/64*(8*sqrt(2)*x*sq
rt(sqrt(2) + 2) - (sqrt(2) + 2)^2)*(sqrt(2) - 2)) + (sqrt(sqrt(2)
 + 2) - sqrt(-sqrt(2) + 2))*log(1/8*sqrt(2)*x*(sqrt(2) + 2)^(3/2)
 + 1/64*(sqrt(2) + 2)^3 + 3/64*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - 1/
64*(sqrt(2) - 2)^3 - 3/8*sqrt(2)*x*(sqrt(2) + 2)*sqrt(-sqrt(2) +
2) + 1/8*sqrt(2)*x*(-sqrt(2) + 2)^(3/2) + x^2 + 3/64*(8*sqrt(2)*x
*sqrt(sqrt(2) + 2) - (sqrt(2) + 2)^2)*(sqrt(2) - 2)) - (sqrt(sqrt
(2) + 2) - sqrt(-sqrt(2) + 2))*log(-1/8*sqrt(2)*x*(sqrt(2) + 2)^(
3/2) + 1/64*(sqrt(2) + 2)^3 + 3/64*(sqrt(2) + 2)*(sqrt(2) - 2)^2
- 1/64*(sqrt(2) - 2)^3 + 3/8*sqrt(2)*x*(sqrt(2) + 2)*sqrt(-sqrt(2
) + 2) - 1/8*sqrt(2)*x*(-sqrt(2) + 2)^(3/2) + x^2 - 3/64*(8*sqrt(
2)*x*sqrt(sqrt(2) + 2) + (sqrt(2) + 2)^2)*(sqrt(2) - 2)) + (sqrt(
sqrt(2) + 2) + sqrt(-sqrt(2) + 2))*log(-1/8*sqrt(2)*x*(sqrt(2) +
2)^(3/2) + 1/64*(sqrt(2) + 2)^3 + 3/64*(sqrt(2) + 2)*(sqrt(2) - 2
)^2 - 1/64*(sqrt(2) - 2)^3 - 3/8*sqrt(2)*x*(sqrt(2) + 2)*sqrt(-sq
rt(2) + 2) + 1/8*sqrt(2)*x*(-sqrt(2) + 2)^(3/2) + x^2 - 3/64*(8*s
qrt(2)*x*sqrt(sqrt(2) + 2) + (sqrt(2) + 2)^2)*(sqrt(2) - 2)) - sq
rt(2)*sqrt(sqrt(2) + 2)*log(1/64*(sqrt(2) + 2)^3 - 3/64*(sqrt(2)
+ 2)^2*(sqrt(2) - 2) + 3/64*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - 1/64*
(sqrt(2) - 2)^3 + 3/4*x*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) - 1/4*x*
(-sqrt(2) + 2)^(3/2) + x^2) + sqrt(2)*sqrt(sqrt(2) + 2)*log(1/64*
(sqrt(2) + 2)^3 - 3/64*(sqrt(2) + 2)^2*(sqrt(2) - 2) + 3/64*(sqrt
(2) + 2)*(sqrt(2) - 2)^2 - 1/64*(sqrt(2) - 2)^3 - 3/4*x*(sqrt(2)
+ 2)*sqrt(-sqrt(2) + 2) + 1/4*x*(-sqrt(2) + 2)^(3/2) + x^2) - sqr
t(2)*sqrt(-sqrt(2) + 2)*log(1/64*(sqrt(2) + 2)^3 + 3/64*(sqrt(2)
+ 2)*(sqrt(2) - 2)^2 - 1/64*(sqrt(2) - 2)^3 + 1/4*x*(sqrt(2) + 2)
^(3/2) + x^2 - 3/64*((sqrt(2) + 2)^2 - 16*x*sqrt(sqrt(2) + 2))*(s
qrt(2) - 2)) + sqrt(2)*sqrt(-sqrt(2) + 2)*log(1/64*(sqrt(2) + 2)^
3 + 3/64*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - 1/64*(sqrt(2) - 2)^3 - 1
/4*x*(sqrt(2) + 2)^(3/2) + x^2 - 3/64*((sqrt(2) + 2)^2 + 16*x*sqr
t(sqrt(2) + 2))*(sqrt(2) - 2)))
```

Sympy [A] time = 4.29509, size = 15, normalized size = 0.04

$$\operatorname{RootSum}\left(16777216t^{8} + 1, \left(t \mapsto t \log\left(2097152t^{7} + x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(x**8+1),x)
```

```
[Out] RootSum(16777216*_t**8 + 1, Lambda(_t, _t*log(2097152*_t**7 + x))
)
```

GIAC/XCAS [A] time = 0.279965, size = 323, normalized size = 0.95

$$\frac{1}{8}\sqrt{\sqrt{2}+2}\arctan\left(\frac{2x+\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)+\frac{1}{8}\sqrt{\sqrt{2}+2}\arctan\left(\frac{2x-\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)+\frac{1}{8}\sqrt{-\sqrt{2}+2}\arctan\left(\frac{2x+\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)+\frac{1}{8}\sqrt{-\sqrt{2}+2}\arctan\left(\frac{2x-\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)-\frac{1}{16}\sqrt{\sqrt{2}+2}\ln\left(x^2+x\sqrt{\sqrt{2}+2}+1\right)+\frac{1}{16}\sqrt{\sqrt{2}+2}\ln\left(x^2-x\sqrt{\sqrt{2}+2}+1\right)-\frac{1}{16}\sqrt{-\sqrt{2}+2}\ln\left(x^2+x\sqrt{-\sqrt{2}+2}+1\right)+\frac{1}{16}\sqrt{-\sqrt{2}+2}\ln\left(x^2-x\sqrt{-\sqrt{2}+2}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(x^8 + 1),x, algorithm="giac")
```

```
[Out] 1/8*sqrt(sqrt(2) + 2)*arctan((2*x + sqrt(-sqrt(2) + 2))/sqrt(sqrt
(2) + 2)) + 1/8*sqrt(sqrt(2) + 2)*arctan((2*x - sqrt(-sqrt(2) + 2
))/sqrt(sqrt(2) + 2)) + 1/8*sqrt(-sqrt(2) + 2)*arctan((2*x + sqrt
(sqrt(2) + 2))/sqrt(-sqrt(2) + 2)) + 1/8*sqrt(-sqrt(2) + 2)*arcta
n((2*x - sqrt(sqrt(2) + 2))/sqrt(-sqrt(2) + 2)) - 1/16*sqrt(sqrt(
2) + 2)*ln(x^2 + x*sqrt(sqrt(2) + 2) + 1) + 1/16*sqrt(sqrt(2) + 2
)*ln(x^2 - x*sqrt(sqrt(2) + 2) + 1) - 1/16*sqrt(-sqrt(2) + 2)*ln(
x^2 + x*sqrt(-sqrt(2) + 2) + 1) + 1/16*sqrt(-sqrt(2) + 2)*ln(x^2
- x*sqrt(-sqrt(2) + 2) + 1)
```

3.1500 $\int \frac{x^4}{1+x^8} dx$

Optimal. Leaf size=347

$$-\frac{\log\left(x^2-\sqrt{2-\sqrt{2}}x+1\right)}{8\sqrt{2\left(2-\sqrt{2}\right)}}+\frac{\log\left(x^2+\sqrt{2-\sqrt{2}}x+1\right)}{8\sqrt{2\left(2-\sqrt{2}\right)}}+\frac{\log\left(x^2-\sqrt{2+\sqrt{2}}x+1\right)}{8\sqrt{2\left(2+\sqrt{2}\right)}}-\frac{\log\left(x^2+\sqrt{2+\sqrt{2}}x+1\right)}{8\sqrt{2\left(2+\sqrt{2}\right)}}+\frac{\tan^{-1}\left(\frac{\sqrt{2-\sqrt{2}}-2x}{\sqrt{2+\sqrt{2}}}\right)}{4\sqrt{2\left(2+\sqrt{2}\right)}}-\frac{\tan^{-1}\left(\frac{\sqrt{2+\sqrt{2}}-2x}{\sqrt{2-\sqrt{2}}}\right)}{4\sqrt{2\left(2-\sqrt{2}\right)}}-\frac{\tan^{-1}\left(\frac{2x+\sqrt{2-\sqrt{2}}}{\sqrt{2+\sqrt{2}}}\right)}{4\sqrt{2\left(2+\sqrt{2}\right)}}+\frac{\tan^{-1}\left(\frac{2x+\sqrt{2+\sqrt{2}}}{\sqrt{2-\sqrt{2}}}\right)}{4\sqrt{2\left(2-\sqrt{2}\right)}}$$

```
[Out] ArcTan[(Sqrt[2 - Sqrt[2]] - 2*x)/Sqrt[2 + Sqrt[2]]]/(4*Sqrt[2*(2
+ Sqrt[2])]) - ArcTan[(Sqrt[2 + Sqrt[2]] - 2*x)/Sqrt[2 - Sqrt[2]]
]/(4*Sqrt[2*(2 - Sqrt[2])]) - ArcTan[(Sqrt[2 - Sqrt[2]] + 2*x)/Sq
rt[2 + Sqrt[2]]]/(4*Sqrt[2*(2 + Sqrt[2])]) + ArcTan[(Sqrt[2 + Sqr
t[2]] + 2*x)/Sqrt[2 - Sqrt[2]]]/(4*Sqrt[2*(2 - Sqrt[2])]) - Log[1
 - Sqrt[2 - Sqrt[2]]*x + x^2]/(8*Sqrt[2*(2 - Sqrt[2])]) + Log[1 +
 Sqrt[2 - Sqrt[2]]*x + x^2]/(8*Sqrt[2*(2 - Sqrt[2])]) + Log[1 - S
qrt[2 + Sqrt[2]]*x + x^2]/(8*Sqrt[2*(2 + Sqrt[2])]) - Log[1 + Sqr
t[2 + Sqrt[2]]*x + x^2]/(8*Sqrt[2*(2 + Sqrt[2])])
```

Rubi [A] time = 0.549372, antiderivative size = 347, normalized size of antiderivative = 1., number of steps used = 19, number of rules used = 7, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.636

$$-\frac{\log\left(x^2-\sqrt{2-\sqrt{2}}x+1\right)}{8\sqrt{2\left(2-\sqrt{2}\right)}}+\frac{\log\left(x^2+\sqrt{2-\sqrt{2}}x+1\right)}{8\sqrt{2\left(2-\sqrt{2}\right)}}+\frac{\log\left(x^2-\sqrt{2+\sqrt{2}}x+1\right)}{8\sqrt{2\left(2+\sqrt{2}\right)}}-\frac{\log\left(x^2+\sqrt{2+\sqrt{2}}x+1\right)}{8\sqrt{2\left(2+\sqrt{2}\right)}}+\frac{\tan^{-1}\left(\frac{\sqrt{2-\sqrt{2}}-2x}{\sqrt{2+\sqrt{2}}}\right)}{4\sqrt{2\left(2+\sqrt{2}\right)}}-\frac{\tan^{-1}\left(\frac{\sqrt{2+\sqrt{2}}-2x}{\sqrt{2-\sqrt{2}}}\right)}{4\sqrt{2\left(2-\sqrt{2}\right)}}-\frac{\tan^{-1}\left(\frac{2x+\sqrt{2-\sqrt{2}}}{\sqrt{2+\sqrt{2}}}\right)}{4\sqrt{2\left(2+\sqrt{2}\right)}}+\frac{\tan^{-1}\left(\frac{2x+\sqrt{2+\sqrt{2}}}{\sqrt{2-\sqrt{2}}}\right)}{4\sqrt{2\left(2-\sqrt{2}\right)}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(1 + x^8),x]
```

```
[Out] ArcTan[(Sqrt[2 - Sqrt[2]] - 2*x)/Sqrt[2 + Sqrt[2]]]/(4*Sqrt[2*(2
+ Sqrt[2])]) - ArcTan[(Sqrt[2 + Sqrt[2]] - 2*x)/Sqrt[2 - Sqrt[2]]
]/(4*Sqrt[2*(2 - Sqrt[2])]) - ArcTan[(Sqrt[2 - Sqrt[2]] + 2*x)/Sq
rt[2 + Sqrt[2]]]/(4*Sqrt[2*(2 + Sqrt[2])]) + ArcTan[(Sqrt[2 + Sqr
t[2]] + 2*x)/Sqrt[2 - Sqrt[2]]]/(4*Sqrt[2*(2 - Sqrt[2])]) - Log[1
 - Sqrt[2 - Sqrt[2]]*x + x^2]/(8*Sqrt[2*(2 - Sqrt[2])]) + Log[1 +
 Sqrt[2 - Sqrt[2]]*x + x^2]/(8*Sqrt[2*(2 - Sqrt[2])]) + Log[1 - S
qrt[2 + Sqrt[2]]*x + x^2]/(8*Sqrt[2*(2 + Sqrt[2])]) - Log[1 + Sqr
t[2 + Sqrt[2]]*x + x^2]/(8*Sqrt[2*(2 + Sqrt[2])])
```

Rubi in Sympy [A] time = 56.0535, size = 311, normalized size = 0.9

$$-\frac{\sqrt{2}\log\left(x^2-x\sqrt{-\sqrt{2}+2}+1\right)}{16\sqrt{-\sqrt{2}+2}}+\frac{\sqrt{2}\log\left(x^2+x\sqrt{-\sqrt{2}+2}+1\right)}{16\sqrt{-\sqrt{2}+2}}+\frac{\sqrt{2}\log\left(x^2-x\sqrt{\sqrt{2}+2}+1\right)}{16\sqrt{\sqrt{2}+2}}-\frac{\sqrt{2}\log\left(x^2+x\sqrt{\sqrt{2}+2}+1\right)}{16\sqrt{\sqrt{2}+2}}+\frac{\sqrt{2}\operatorname{atan}\left(\frac{2x-\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)}{8\sqrt{-\sqrt{2}+2}}+\frac{\sqrt{2}\operatorname{atan}\left(\frac{2x+\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)}{8\sqrt{-\sqrt{2}+2}}-\frac{\sqrt{2}\operatorname{atan}\left(\frac{2x-\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)}{8\sqrt{\sqrt{2}+2}}-\frac{\sqrt{2}\operatorname{atan}\left(\frac{2x+\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)}{8\sqrt{\sqrt{2}+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate(x**4/(x**8+1),x)
```

```
[Out] -sqrt(2)*log(x**2 - x*sqrt(-sqrt(2) + 2) + 1)/(16*sqrt(-sqrt(2) +
 2)) + sqrt(2)*log(x**2 + x*sqrt(-sqrt(2) + 2) + 1)/(16*sqrt(-sqr
t(2) + 2)) + sqrt(2)*log(x**2 - x*sqrt(sqrt(2) + 2) + 1)/(16*sqrt
(sqrt(2) + 2)) - sqrt(2)*log(x**2 + x*sqrt(sqrt(2) + 2) + 1)/(16*
sqrt(sqrt(2) + 2)) + sqrt(2)*atan((2*x - sqrt(sqrt(2) + 2))/sqrt(
-sqrt(2) + 2))/(8*sqrt(-sqrt(2) + 2)) + sqrt(2)*atan((2*x + sqrt(
sqrt(2) + 2))/sqrt(-sqrt(2) + 2))/(8*sqrt(-sqrt(2) + 2)) - sqrt(2
)*atan((2*x - sqrt(-sqrt(2) + 2))/sqrt(sqrt(2) + 2))/(8*sqrt(sqrt
(2) + 2)) - sqrt(2)*atan((2*x + sqrt(-sqrt(2) + 2))/sqrt(sqrt(2)
+ 2))/(8*sqrt(sqrt(2) + 2))
```

Mathematica [A] time = 0.00982412, size = 209, normalized size = 0.6

$$-\frac{1}{8}\cos\left(\frac{\pi}{8}\right)\log\left(x^2-2x\sin\left(\frac{\pi}{8}\right)+1\right)+\frac{1}{8}\cos\left(\frac{\pi}{8}\right)\log\left(x^2+2x\sin\left(\frac{\pi}{8}\right)+1\right)+\frac{1}{8}\sin\left(\frac{\pi}{8}\right)\log\left(x^2-2x\cos\left(\frac{\pi}{8}\right)+1\right)-\frac{1}{8}\sin\left(\frac{\pi}{8}\right)\log\left(x^2+2x\cos\left(\frac{\pi}{8}\right)+1\right)+\frac{1}{4}\cos\left(\frac{\pi}{8}\right)\tan^{-1}\left(\csc\left(\frac{\pi}{8}\right)\left(x-\cos\left(\frac{\pi}{8}\right)\right)\right)+\frac{1}{4}\cos\left(\frac{\pi}{8}\right)\tan^{-1}\left(\csc\left(\frac{\pi}{8}\right)\left(x+\cos\left(\frac{\pi}{8}\right)\right)\right)-\frac{1}{4}\sin\left(\frac{\pi}{8}\right)\tan^{-1}\left(\sec\left(\frac{\pi}{8}\right)\left(x-\sin\left(\frac{\pi}{8}\right)\right)\right)-\frac{1}{4}\sin\left(\frac{\pi}{8}\right)\tan^{-1}\left(\sec\left(\frac{\pi}{8}\right)\left(x+\sin\left(\frac{\pi}{8}\right)\right)\right)$$

Antiderivative was successfully verified.

```
[In]   Integrate[x^4/(1 + x^8),x]
```

```
[Out] (ArcTan[(x - Cos[Pi/8])*Csc[Pi/8]]*Cos[Pi/8])/4 + (ArcTan[(x + Co
s[Pi/8])*Csc[Pi/8]]*Cos[Pi/8])/4 - (Cos[Pi/8]*Log[1 + x^2 - 2*x*S
in[Pi/8]])/8 + (Cos[Pi/8]*Log[1 + x^2 + 2*x*Sin[Pi/8]])/8 - (ArcT
an[Sec[Pi/8]*(x - Sin[Pi/8])]*Sin[Pi/8])/4 - (ArcTan[Sec[Pi/8]*(x
 + Sin[Pi/8])]*Sin[Pi/8])/4 + (Log[1 + x^2 - 2*x*Cos[Pi/8]]*Sin[P
i/8])/8 - (Log[1 + x^2 + 2*x*Cos[Pi/8]]*Sin[Pi/8])/8
```

Maple [C] time = 0.006, size = 22, normalized size = 0.1

$$\frac{1}{8}\sum_{\_R=RootOf(\_Z^8+1)}\frac{\ln(x-\_R)}{\_R^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^4/(x^8+1),x)
```

```
[Out] 1/8*sum(1/_R^3*ln(x-_R),_R=RootOf(_Z^8+1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{x^8 + 1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(x^8 + 1),x, algorithm="maxima")
```

```
[Out] integrate(x^4/(x^8 + 1), x)
```

Fricas [A] time = 0.240611, size = 1345, normalized size = 3.88

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(x^8 + 1),x, algorithm="fricas")
```

```
[Out] 1/64*sqrt(2)*(4*(sqrt(sqrt(2) + 2) - sqrt(-sqrt(2) + 2))*arctan((
sqrt(sqrt(2) + 2) + sqrt(-sqrt(2) + 2))/(2*sqrt(2)*x + 2*sqrt(2)*
sqrt(x^2 + 1/2*sqrt(2)*x*sqrt(sqrt(2) + 2) - 1/2*sqrt(2)*x*sqrt(-
sqrt(2) + 2) + 1) + sqrt(sqrt(2) + 2) - sqrt(-sqrt(2) + 2))) + 4*
(sqrt(sqrt(2) + 2) - sqrt(-sqrt(2) + 2))*arctan((sqrt(sqrt(2) + 2
) + sqrt(-sqrt(2) + 2))/(2*sqrt(2)*x + 2*sqrt(2)*sqrt(x^2 - 1/2*s
qrt(2)*x*sqrt(sqrt(2) + 2) + 1/2*sqrt(2)*x*sqrt(-sqrt(2) + 2) + 1
) - sqrt(sqrt(2) + 2) + sqrt(-sqrt(2) + 2))) + 4*(sqrt(sqrt(2) +
2) + sqrt(-sqrt(2) + 2))*arctan(-(sqrt(sqrt(2) + 2) - sqrt(-sqrt(
2) + 2))/(2*sqrt(2)*x + 2*sqrt(2)*sqrt(x^2 + 1/2*sqrt(2)*x*sqrt(s
qrt(2) + 2) + 1/2*sqrt(2)*x*sqrt(-sqrt(2) + 2) + 1) + sqrt(sqrt(2
) + 2) + sqrt(-sqrt(2) + 2))) + 4*(sqrt(sqrt(2) + 2) + sqrt(-sqrt
(2) + 2))*arctan(-(sqrt(sqrt(2) + 2) - sqrt(-sqrt(2) + 2))/(2*sqr
t(2)*x + 2*sqrt(2)*sqrt(x^2 - 1/2*sqrt(2)*x*sqrt(sqrt(2) + 2) - 1
/2*sqrt(2)*x*sqrt(-sqrt(2) + 2) + 1) - sqrt(sqrt(2) + 2) - sqrt(-
sqrt(2) + 2))) + 4*sqrt(2)*sqrt(-sqrt(2) + 2)*arctan(sqrt(sqrt(2)
 + 2)/(2*x + 2*sqrt(x^2 + x*sqrt(-sqrt(2) + 2) + 1) + sqrt(-sqrt(
2) + 2))) + 4*sqrt(2)*sqrt(-sqrt(2) + 2)*arctan(sqrt(sqrt(2) + 2)
/(2*x + 2*sqrt(x^2 - x*sqrt(-sqrt(2) + 2) + 1) - sqrt(-sqrt(2) +
2))) - 4*sqrt(2)*sqrt(sqrt(2) + 2)*arctan(sqrt(-sqrt(2) + 2)/(2*x
 + 2*sqrt(x^2 + x*sqrt(sqrt(2) + 2) + 1) + sqrt(sqrt(2) + 2))) -
4*sqrt(2)*sqrt(sqrt(2) + 2)*arctan(sqrt(-sqrt(2) + 2)/(2*x + 2*sq
rt(x^2 - x*sqrt(sqrt(2) + 2) + 1) - sqrt(sqrt(2) + 2))) - (sqrt(s
qrt(2) + 2) - sqrt(-sqrt(2) + 2))*log(x^2 + 1/2*sqrt(2)*x*sqrt(sq
rt(2) + 2) + 1/2*sqrt(2)*x*sqrt(-sqrt(2) + 2) + 1) + (sqrt(sqrt(2
) + 2) + sqrt(-sqrt(2) + 2))*log(x^2 + 1/2*sqrt(2)*x*sqrt(sqrt(2)
 + 2) - 1/2*sqrt(2)*x*sqrt(-sqrt(2) + 2) + 1) - (sqrt(sqrt(2) + 2
) + sqrt(-sqrt(2) + 2))*log(x^2 - 1/2*sqrt(2)*x*sqrt(sqrt(2) + 2)
 + 1/2*sqrt(2)*x*sqrt(-sqrt(2) + 2) + 1) + (sqrt(sqrt(2) + 2) - s
qrt(-sqrt(2) + 2))*log(x^2 - 1/2*sqrt(2)*x*sqrt(sqrt(2) + 2) - 1/
2*sqrt(2)*x*sqrt(-sqrt(2) + 2) + 1) - sqrt(2)*sqrt(-sqrt(2) + 2)*
log(x^2 + x*sqrt(sqrt(2) + 2) + 1) + sqrt(2)*sqrt(-sqrt(2) + 2)*l
og(x^2 - x*sqrt(sqrt(2) + 2) + 1) + sqrt(2)*sqrt(sqrt(2) + 2)*log
(x^2 + x*sqrt(-sqrt(2) + 2) + 1) - sqrt(2)*sqrt(sqrt(2) + 2)*log(
x^2 - x*sqrt(-sqrt(2) + 2) + 1))
```

Sympy [A] time = 4.33024, size = 15, normalized size = 0.04

$$\operatorname{RootSum}\left(16777216t^8 + 1, \left(t \mapsto t \log\left(-32768t^5 + x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(x**8+1),x)
```

```
[Out] RootSum(16777216*_t**8 + 1, Lambda(_t, _t*log(-32768*_t**5 + x)))
```

GIAC/XCAS [A] time = 0.261436, size = 323, normalized size = 0.93

$$-\frac{1}{8}\sqrt{-\sqrt{2}+2}\arctan\left(\frac{2x+\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)-\frac{1}{8}\sqrt{-\sqrt{2}+2}\arctan\left(\frac{2x-\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)+\frac{1}{8}\sqrt{\sqrt{2}+2}\arctan\left(\frac{2x+\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)+\frac{1}{8}\sqrt{\sqrt{2}+2}\arctan\left(\frac{2x-\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)-\frac{1}{16}\sqrt{-\sqrt{2}+2}\ln\left(x^2+x\sqrt{\sqrt{2}+2}+1\right)+\frac{1}{16}\sqrt{-\sqrt{2}+2}\ln\left(x^2-x\sqrt{\sqrt{2}+2}+1\right)+\frac{1}{16}\sqrt{\sqrt{2}+2}\ln\left(x^2+x\sqrt{-\sqrt{2}+2}+1\right)-\frac{1}{16}\sqrt{\sqrt{2}+2}\ln\left(x^2-x\sqrt{-\sqrt{2}+2}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(x^8 + 1),x, algorithm="giac")
```

```
[Out] -1/8*sqrt(-sqrt(2) + 2)*arctan((2*x + sqrt(-sqrt(2) + 2))/sqrt(sq
rt(2) + 2)) - 1/8*sqrt(-sqrt(2) + 2)*arctan((2*x - sqrt(-sqrt(2)
+ 2))/sqrt(sqrt(2) + 2)) + 1/8*sqrt(sqrt(2) + 2)*arctan((2*x + sq
rt(sqrt(2) + 2))/sqrt(-sqrt(2) + 2)) + 1/8*sqrt(sqrt(2) + 2)*arct
an((2*x - sqrt(sqrt(2) + 2))/sqrt(-sqrt(2) + 2)) - 1/16*sqrt(-sqr
t(2) + 2)*ln(x^2 + x*sqrt(sqrt(2) + 2) + 1) + 1/16*sqrt(-sqrt(2)
+ 2)*ln(x^2 - x*sqrt(sqrt(2) + 2) + 1) + 1/16*sqrt(sqrt(2) + 2)*l
n(x^2 + x*sqrt(-sqrt(2) + 2) + 1) - 1/16*sqrt(sqrt(2) + 2)*ln(x^2
 - x*sqrt(-sqrt(2) + 2) + 1)
```

3.1501 $\int \frac{x^2}{1+x^8}\,dx$

Optimal. Leaf size=339

$$\frac{\log\left(x^2-\sqrt{2-\sqrt{2}}x+1\right)}{8\sqrt{2\left(2-\sqrt{2}\right)}}-\frac{\log\left(x^2+\sqrt{2-\sqrt{2}}x+1\right)}{8\sqrt{2\left(2-\sqrt{2}\right)}}-\frac{\log\left(x^2-\sqrt{2+\sqrt{2}}x+1\right)}{8\sqrt{2\left(2+\sqrt{2}\right)}}+\frac{\log\left(x^2+\sqrt{2+\sqrt{2}}x+1\right)}{8\sqrt{2\left(2+\sqrt{2}\right)}}+\frac{1}{8}\sqrt{2-\sqrt{2}}\tan^{-1}\left(\frac{\sqrt{2-\sqrt{2}}-2x}{\sqrt{2+\sqrt{2}}}\right)-\frac{1}{8}\sqrt{2+\sqrt{2}}\tan^{-1}\left(\frac{\sqrt{2+\sqrt{2}}-2x}{\sqrt{2-\sqrt{2}}}\right)-\frac{1}{8}\sqrt{2-\sqrt{2}}\tan^{-1}\left(\frac{2x+\sqrt{2-\sqrt{2}}}{\sqrt{2+\sqrt{2}}}\right)+\frac{1}{8}\sqrt{2+\sqrt{2}}\tan^{-1}\left(\frac{2x+\sqrt{2+\sqrt{2}}}{\sqrt{2-\sqrt{2}}}\right)$$

```
[Out] (Sqrt[2 - Sqrt[2]]*ArcTan[(Sqrt[2 - Sqrt[2]] - 2*x)/Sqrt[2 + Sqrt
[2]]])/8 - (Sqrt[2 + Sqrt[2]]*ArcTan[(Sqrt[2 + Sqrt[2]] - 2*x)/Sq
rt[2 - Sqrt[2]]])/8 - (Sqrt[2 - Sqrt[2]]*ArcTan[(Sqrt[2 - Sqrt[2]
] + 2*x)/Sqrt[2 + Sqrt[2]]])/8 + (Sqrt[2 + Sqrt[2]]*ArcTan[(Sqrt[
2 + Sqrt[2]] + 2*x)/Sqrt[2 - Sqrt[2]]])/8 + Log[1 - Sqrt[2 - Sqrt
[2]]*x + x^2]/(8*Sqrt[2*(2 - Sqrt[2])]) - Log[1 + Sqrt[2 - Sqrt[2
]]*x + x^2]/(8*Sqrt[2*(2 - Sqrt[2])]) - Log[1 - Sqrt[2 + Sqrt[2]]
*x + x^2]/(8*Sqrt[2*(2 + Sqrt[2])]) + Log[1 + Sqrt[2 + Sqrt[2]]*x
 + x^2]/(8*Sqrt[2*(2 + Sqrt[2])])
```

Rubi [A] time = 0.555612, antiderivative size = 339, normalized size of antiderivative = 1., number of steps used = 19, number of rules used = 6, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.546

$$\frac{\log\left(x^2-\sqrt{2-\sqrt{2}}x+1\right)}{8\sqrt{2\left(2-\sqrt{2}\right)}}-\frac{\log\left(x^2+\sqrt{2-\sqrt{2}}x+1\right)}{8\sqrt{2\left(2-\sqrt{2}\right)}}-\frac{\log\left(x^2-\sqrt{2+\sqrt{2}}x+1\right)}{8\sqrt{2\left(2+\sqrt{2}\right)}}+\frac{\log\left(x^2+\sqrt{2+\sqrt{2}}x+1\right)}{8\sqrt{2\left(2+\sqrt{2}\right)}}+\frac{1}{8}\sqrt{2-\sqrt{2}}\tan^{-1}\left(\frac{\sqrt{2-\sqrt{2}}-2x}{\sqrt{2+\sqrt{2}}}\right)-\frac{1}{8}\sqrt{2+\sqrt{2}}\tan^{-1}\left(\frac{\sqrt{2+\sqrt{2}}-2x}{\sqrt{2-\sqrt{2}}}\right)-\frac{1}{8}\sqrt{2-\sqrt{2}}\tan^{-1}\left(\frac{2x+\sqrt{2-\sqrt{2}}}{\sqrt{2+\sqrt{2}}}\right)+\frac{1}{8}\sqrt{2+\sqrt{2}}\tan^{-1}\left(\frac{2x+\sqrt{2+\sqrt{2}}}{\sqrt{2-\sqrt{2}}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(1 + x^8),x]
```


```
[Out] (Sqrt[2 - Sqrt[2]]*ArcTan[(Sqrt[2 - Sqrt[2]] - 2*x)/Sqrt[2 + Sqrt
[2]]])/8 - (Sqrt[2 + Sqrt[2]]*ArcTan[(Sqrt[2 + Sqrt[2]] - 2*x)/Sq
rt[2 - Sqrt[2]]])/8 - (Sqrt[2 - Sqrt[2]]*ArcTan[(Sqrt[2 - Sqrt[2]
] + 2*x)/Sqrt[2 + Sqrt[2]]])/8 + (Sqrt[2 + Sqrt[2]]*ArcTan[(Sqrt[
2 + Sqrt[2]] + 2*x)/Sqrt[2 - Sqrt[2]]])/8 + Log[1 - Sqrt[2 - Sqrt
[2]]*x + x^2]/(8*Sqrt[2*(2 - Sqrt[2])]) - Log[1 + Sqrt[2 - Sqrt[2
]]*x + x^2]/(8*Sqrt[2*(2 - Sqrt[2])]) - Log[1 - Sqrt[2 + Sqrt[2]]
*x + x^2]/(8*Sqrt[2*(2 + Sqrt[2])]) + Log[1 + Sqrt[2 + Sqrt[2]]*x
 + x^2]/(8*Sqrt[2*(2 + Sqrt[2])])
```

Rubi in Sympy [A] time = 37.5607, size = 311, normalized size = 0.92

$$\frac{\sqrt{2}\log\left(x^2 - x\sqrt{-\sqrt{2}+2}+1\right)}{16\sqrt{-\sqrt{2}+2}} - \frac{\sqrt{2}\log\left(x^2 + x\sqrt{-\sqrt{2}+2}+1\right)}{16\sqrt{-\sqrt{2}+2}} - \frac{\sqrt{2}\log\left(x^2 - x\sqrt{\sqrt{2}+2}+1\right)}{16\sqrt{\sqrt{2}+2}} + \frac{\sqrt{2}\log\left(x^2 + x\sqrt{\sqrt{2}+2}+1\right)}{16\sqrt{\sqrt{2}+2}} + \frac{\sqrt{2}\operatorname{atan}\left(\frac{2x-\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)}{8\sqrt{-\sqrt{2}+2}} + \frac{\sqrt{2}\operatorname{atan}\left(\frac{2x+\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)}{8\sqrt{-\sqrt{2}+2}} - \frac{\sqrt{2}\operatorname{atan}\left(\frac{2x-\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)}{8\sqrt{\sqrt{2}+2}} - \frac{\sqrt{2}\operatorname{atan}\left(\frac{2x+\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)}{8\sqrt{\sqrt{2}+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(x**8+1),x)
```

```
[Out] sqrt(2)*log(x**2 - x*sqrt(-sqrt(2) + 2) + 1)/(16*sqrt(-sqrt(2) +
2)) - sqrt(2)*log(x**2 + x*sqrt(-sqrt(2) + 2) + 1)/(16*sqrt(-sqrt
(2) + 2)) - sqrt(2)*log(x**2 - x*sqrt(sqrt(2) + 2) + 1)/(16*sqrt(
sqrt(2) + 2)) + sqrt(2)*log(x**2 + x*sqrt(sqrt(2) + 2) + 1)/(16*s
qrt(sqrt(2) + 2)) + sqrt(2)*atan((2*x - sqrt(sqrt(2) + 2))/sqrt(-
sqrt(2) + 2))/(8*sqrt(-sqrt(2) + 2)) + sqrt(2)*atan((2*x + sqrt(s
qrt(2) + 2))/sqrt(-sqrt(2) + 2))/(8*sqrt(-sqrt(2) + 2)) - sqrt(2)
*atan((2*x - sqrt(-sqrt(2) + 2))/sqrt(sqrt(2) + 2))/(8*sqrt(sqrt(
2) + 2)) - sqrt(2)*atan((2*x + sqrt(-sqrt(2) + 2))/sqrt(sqrt(2) +
 2))/(8*sqrt(sqrt(2) + 2))
```

Mathematica [A] time = 0.00963405, size = 209, normalized size = 0.62

$$\frac{1}{8}\cos\left(\frac{\pi}{8}\right)\log\left(x^2-2x\sin\left(\frac{\pi}{8}\right)+1\right) - \frac{1}{8}\cos\left(\frac{\pi}{8}\right)\log\left(x^2+2x\sin\left(\frac{\pi}{8}\right)+1\right) - \frac{1}{8}\sin\left(\frac{\pi}{8}\right)\log\left(x^2-2x\cos\left(\frac{\pi}{8}\right)+1\right) + \frac{1}{8}\sin\left(\frac{\pi}{8}\right)\log\left(x^2+2x\cos\left(\frac{\pi}{8}\right)+1\right) + \frac{1}{4}\cos\left(\frac{\pi}{8}\right)\tan^{-1}\left(\csc\left(\frac{\pi}{8}\right)\left(x-\cos\left(\frac{\pi}{8}\right)\right)\right) + \frac{1}{4}\cos\left(\frac{\pi}{8}\right)\tan^{-1}\left(\csc\left(\frac{\pi}{8}\right)\left(x+\cos\left(\frac{\pi}{8}\right)\right)\right) - \frac{1}{4}\sin\left(\frac{\pi}{8}\right)\tan^{-1}\left(\sec\left(\frac{\pi}{8}\right)\left(x-\sin\left(\frac{\pi}{8}\right)\right)\right) - \frac{1}{4}\sin\left(\frac{\pi}{8}\right)\tan^{-1}\left(\sec\left(\frac{\pi}{8}\right)\left(x+\sin\left(\frac{\pi}{8}\right)\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(1 + x^8),x]
```

```
[Out] (ArcTan[(x - Cos[Pi/8])*Csc[Pi/8]]*Cos[Pi/8])/4 + (ArcTan[(x + Co
s[Pi/8])*Csc[Pi/8]]*Cos[Pi/8])/4 + (Cos[Pi/8]*Log[1 + x^2 - 2*x*S
in[Pi/8]])/8 - (Cos[Pi/8]*Log[1 + x^2 + 2*x*Sin[Pi/8]])/8 - (ArcT
an[Sec[Pi/8]*(x - Sin[Pi/8])]*Sin[Pi/8])/4 - (ArcTan[Sec[Pi/8]*(x
 + Sin[Pi/8])]*Sin[Pi/8])/4 - (Log[1 + x^2 - 2*x*Cos[Pi/8]]*Sin[P
i/8])/8 + (Log[1 + x^2 + 2*x*Cos[Pi/8]]*Sin[Pi/8])/8
```

Maple [C] time = 0.004, size = 22, normalized size = 0.1

$$\frac{1}{8}\sum_{\_R=RootOf(\_Z^8+1)}\frac{\ln(x-\_R)}{\_R^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(x^8+1),x)
```

```
[Out] 1/8*sum(1/_R^5*ln(x-_R),_R=RootOf(_Z^8+1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{x^8 + 1} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(x^8 + 1),x, algorithm="maxima")
```

```
[Out] integrate(x^2/(x^8 + 1), x)
```

Fricas [A] time = 0.251326, size = 3343, normalized size = 9.86

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(x^8 + 1),x, algorithm="fricas")
```

```
[Out] -1/64*sqrt(2)*(4*(sqrt(sqrt(2) + 2) - sqrt(-sqrt(2) + 2))*arctan(
-((sqrt(2) + 2)^(3/2) + 3*sqrt(sqrt(2) + 2)*(sqrt(2) - 2) + 3*(sq
rt(2) + 2)*sqrt(-sqrt(2) + 2) - (-sqrt(2) + 2)^(3/2))/(8*sqrt(2)*
x + (sqrt(2) + 2)^(3/2) + 3*sqrt(sqrt(2) + 2)*(sqrt(2) - 2) - 3*(
sqrt(2) + 2)*sqrt(-sqrt(2) + 2) + (-sqrt(2) + 2)^(3/2) + sqrt(2)*
sqrt(8*sqrt(2)*x*(sqrt(2) + 2)^(3/2) + (sqrt(2) + 2)^3 + 3*(sqrt(
2) + 2)*(sqrt(2) - 2)^2 - (sqrt(2) - 2)^3 - 24*sqrt(2)*x*(sqrt(2)
 + 2)*sqrt(-sqrt(2) + 2) + 8*sqrt(2)*x*(-sqrt(2) + 2)^(3/2) + 64*
x^2 + 3*(8*sqrt(2)*x*sqrt(sqrt(2) + 2) - (sqrt(2) + 2)^2)*(sqrt(2
) - 2)))) + 4*(sqrt(sqrt(2) + 2) - sqrt(-sqrt(2) + 2))*arctan(-((
sqrt(2) + 2)^(3/2) + 3*sqrt(sqrt(2) + 2)*(sqrt(2) - 2) + 3*(sqrt(
2) + 2)*sqrt(-sqrt(2) + 2) - (-sqrt(2) + 2)^(3/2))/(8*sqrt(2)*x -
 (sqrt(2) + 2)^(3/2) - 3*sqrt(sqrt(2) + 2)*(sqrt(2) - 2) + 3*(sqr
t(2) + 2)*sqrt(-sqrt(2) + 2) - (-sqrt(2) + 2)^(3/2) + 8*sqrt(2)*s
qrt(-1/8*sqrt(2)*x*(sqrt(2) + 2)^(3/2) + 1/64*(sqrt(2) + 2)^3 + 3
/64*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - 1/64*(sqrt(2) - 2)^3 + 3/8*sq
rt(2)*x*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) - 1/8*sqrt(2)*x*(-sqrt(2
) + 2)^(3/2) + x^2 - 3/64*(8*sqrt(2)*x*sqrt(sqrt(2) + 2) + (sqrt(
2) + 2)^2)*(sqrt(2) - 2)))) - 4*(sqrt(sqrt(2) + 2) + sqrt(-sqrt(2
) + 2))*arctan(((sqrt(2) + 2)^(3/2) + 3*sqrt(sqrt(2) + 2)*(sqrt(2
) - 2) - 3*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) + (-sqrt(2) + 2)^(3/2
))/(8*sqrt(2)*x + (sqrt(2) + 2)^(3/2) + 3*sqrt(sqrt(2) + 2)*(sqrt
(2) - 2) + 3*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) - (-sqrt(2) + 2)^(3
/2) + sqrt(2)*sqrt(8*sqrt(2)*x*(sqrt(2) + 2)^(3/2) + (sqrt(2) + 2
)^3 + 3*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - (sqrt(2) - 2)^3 + 24*sqrt
(2)*x*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) - 8*sqrt(2)*x*(-sqrt(2) +
2)^(3/2) + 64*x^2 + 3*(8*sqrt(2)*x*sqrt(sqrt(2) + 2) - (sqrt(2) +
 2)^2)*(sqrt(2) - 2)))) - 4*(sqrt(sqrt(2) + 2) + sqrt(-sqrt(2) +
2))*arctan(((sqrt(2) + 2)^(3/2) + 3*sqrt(sqrt(2) + 2)*(sqrt(2) -
2) - 3*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) + (-sqrt(2) + 2)^(3/2))/(
8*sqrt(2)*x - (sqrt(2) + 2)^(3/2) - 3*sqrt(sqrt(2) + 2)*(sqrt(2)
- 2) - 3*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) + (-sqrt(2) + 2)^(3/2)
+ 8*sqrt(2)*sqrt(-1/8*sqrt(2)*x*(sqrt(2) + 2)^(3/2) + 1/64*(sqrt(
2) + 2)^3 + 3/64*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - 1/64*(sqrt(2) -
2)^3 - 3/8*sqrt(2)*x*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) + 1/8*sqrt(
2)*x*(-sqrt(2) + 2)^(3/2) + x^2 - 3/64*(8*sqrt(2)*x*sqrt(sqrt(2)
+ 2) + (sqrt(2) + 2)^2)*(sqrt(2) - 2)))) - 4*sqrt(2)*sqrt(sqrt(2)
 + 2)*arctan(-((sqrt(2) + 2)^(3/2) + 3*sqrt(sqrt(2) + 2)*(sqrt(2)
 - 2))/(3*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) - (-sqrt(2) + 2)^(3/2)
 + 8*x + sqrt((sqrt(2) + 2)^3 - 3*(sqrt(2) + 2)^2*(sqrt(2) - 2) +
 3*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - (sqrt(2) - 2)^3 + 48*x*(sqrt(2
) + 2)*sqrt(-sqrt(2) + 2) - 16*x*(-sqrt(2) + 2)^(3/2) + 64*x^2)))
 - 4*sqrt(2)*sqrt(sqrt(2) + 2)*arctan(((sqrt(2) + 2)^(3/2) + 3*sq
rt(sqrt(2) + 2)*(sqrt(2) - 2))/(3*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2
) - (-sqrt(2) + 2)^(3/2) - 8*x - sqrt((sqrt(2) + 2)^3 - 3*(sqrt(2
) + 2)^2*(sqrt(2) - 2) + 3*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - (sqrt(
2) - 2)^3 - 48*x*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) + 16*x*(-sqrt(2
```

```
) + 2)^(3/2) + 64*x^2))) + 4*sqrt(2)*sqrt(-sqrt(2) + 2)*arctan(-(
3*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) - (-sqrt(2) + 2)^(3/2))/((sqrt
(2) + 2)^(3/2) + 3*sqrt(sqrt(2) + 2)*(sqrt(2) - 2) + 8*x + sqrt((
sqrt(2) + 2)^3 + 3*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - (sqrt(2) - 2)^
3 + 16*x*(sqrt(2) + 2)^(3/2) + 64*x^2 - 3*((sqrt(2) + 2)^2 - 16*x
*sqrt(sqrt(2) + 2))*(sqrt(2) - 2)))) + 4*sqrt(2)*sqrt(-sqrt(2) +
2)*arctan((3*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) - (-sqrt(2) + 2)^(3
/2))/((sqrt(2) + 2)^(3/2) + 3*sqrt(sqrt(2) + 2)*(sqrt(2) - 2) - 8
*x - sqrt((sqrt(2) + 2)^3 + 3*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - (sq
rt(2) - 2)^3 - 16*x*(sqrt(2) + 2)^(3/2) + 64*x^2 - 3*((sqrt(2) +
2)^2 + 16*x*sqrt(sqrt(2) + 2))*(sqrt(2) - 2)))) - (sqrt(sqrt(2) +
 2) - sqrt(-sqrt(2) + 2))*log(1/8*sqrt(2)*x*(sqrt(2) + 2)^(3/2) +
 1/64*(sqrt(2) + 2)^3 + 3/64*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - 1/64
*(sqrt(2) - 2)^3 + 3/8*sqrt(2)*x*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2)
 - 1/8*sqrt(2)*x*(-sqrt(2) + 2)^(3/2) + x^2 + 3/64*(8*sqrt(2)*x*s
qrt(sqrt(2) + 2) - (sqrt(2) + 2)^2)*(sqrt(2) - 2)) - (sqrt(sqrt(2
) + 2) + sqrt(-sqrt(2) + 2))*log(1/8*sqrt(2)*x*(sqrt(2) + 2)^(3/2
) + 1/64*(sqrt(2) + 2)^3 + 3/64*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - 1
/64*(sqrt(2) - 2)^3 - 3/8*sqrt(2)*x*(sqrt(2) + 2)*sqrt(-sqrt(2) +
 2) + 1/8*sqrt(2)*x*(-sqrt(2) + 2)^(3/2) + x^2 + 3/64*(8*sqrt(2)*
x*sqrt(sqrt(2) + 2) - (sqrt(2) + 2)^2)*(sqrt(2) - 2)) + (sqrt(sqr
t(2) + 2) + sqrt(-sqrt(2) + 2))*log(-1/8*sqrt(2)*x*(sqrt(2) + 2)^
(3/2) + 1/64*(sqrt(2) + 2)^3 + 3/64*(sqrt(2) + 2)*(sqrt(2) - 2)^2
 - 1/64*(sqrt(2) - 2)^3 + 3/8*sqrt(2)*x*(sqrt(2) + 2)*sqrt(-sqrt(
2) + 2) - 1/8*sqrt(2)*x*(-sqrt(2) + 2)^(3/2) + x^2 - 3/64*(8*sqrt
(2)*x*sqrt(sqrt(2) + 2) + (sqrt(2) + 2)^2)*(sqrt(2) - 2)) + (sqrt
(sqrt(2) + 2) - sqrt(-sqrt(2) + 2))*log(-1/8*sqrt(2)*x*(sqrt(2) +
 2)^(3/2) + 1/64*(sqrt(2) + 2)^3 + 3/64*(sqrt(2) + 2)*(sqrt(2) -
2)^2 - 1/64*(sqrt(2) - 2)^3 - 3/8*sqrt(2)*x*(sqrt(2) + 2)*sqrt(-s
qrt(2) + 2) + 1/8*sqrt(2)*x*(-sqrt(2) + 2)^(3/2) + x^2 - 3/64*(8*
sqrt(2)*x*sqrt(sqrt(2) + 2) + (sqrt(2) + 2)^2)*(sqrt(2) - 2)) - s
qrt(2)*sqrt(-sqrt(2) + 2)*log(1/64*(sqrt(2) + 2)^3 - 3/64*(sqrt(2
) + 2)^2*(sqrt(2) - 2) + 3/64*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - 1/6
4*(sqrt(2) - 2)^3 + 3/4*x*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) - 1/4*
x*(-sqrt(2) + 2)^(3/2) + x^2) + sqrt(2)*sqrt(-sqrt(2) + 2)*log(1/
64*(sqrt(2) + 2)^3 - 3/64*(sqrt(2) + 2)^2*(sqrt(2) - 2) + 3/64*(s
qrt(2) + 2)*(sqrt(2) - 2)^2 - 1/64*(sqrt(2) - 2)^3 - 3/4*x*(sqrt(
2) + 2)*sqrt(-sqrt(2) + 2) + 1/4*x*(-sqrt(2) + 2)^(3/2) + x^2) +
sqrt(2)*sqrt(sqrt(2) + 2)*log(1/64*(sqrt(2) + 2)^3 + 3/64*(sqrt(2
) + 2)*(sqrt(2) - 2)^2 - 1/64*(sqrt(2) - 2)^3 + 1/4*x*(sqrt(2) +
2)^(3/2) + x^2 - 3/64*((sqrt(2) + 2)^2 - 16*x*sqrt(sqrt(2) + 2))*
(sqrt(2) - 2)) - sqrt(2)*sqrt(sqrt(2) + 2)*log(1/64*(sqrt(2) + 2)
^3 + 3/64*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - 1/64*(sqrt(2) - 2)^3 -
1/4*x*(sqrt(2) + 2)^(3/2) + x^2 - 3/64*((sqrt(2) + 2)^2 + 16*x*sq
rt(sqrt(2) + 2))*(sqrt(2) - 2)))
```

Sympy [A] time = 4.26652, size = 15, normalized size = 0.04

$$\operatorname{RootSum}\left(16777216t^8 + 1, \left(t \mapsto t \log\left(-512t^3 + x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(x**8+1),x)
```

```
[Out] RootSum(16777216*_t**8 + 1, Lambda(_t, _t*log(-512*_t**3 + x)))
```

GIAC/XCAS [A] time = 0.25497, size = 323, normalized size = 0.95

$$-\frac{1}{8}\sqrt{-\sqrt{2}+2}\arctan\left(\frac{2x+\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)-\frac{1}{8}\sqrt{-\sqrt{2}+2}\arctan\left(\frac{2x-\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)+\frac{1}{8}\sqrt{\sqrt{2}+2}\arctan\left(\frac{2x+\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)+\frac{1}{8}\sqrt{\sqrt{2}+2}\arctan\left(\frac{2x-\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)+\frac{1}{16}\sqrt{-\sqrt{2}+2}\ln\left(x^2+x\sqrt{\sqrt{2}+2}+1\right)-\frac{1}{16}\sqrt{-\sqrt{2}+2}\ln\left(x^2-x\sqrt{\sqrt{2}+2}+1\right)-\frac{1}{16}\sqrt{\sqrt{2}+2}\ln\left(x^2+x\sqrt{-\sqrt{2}+2}+1\right)+\frac{1}{16}\sqrt{\sqrt{2}+2}\ln\left(x^2-x\sqrt{-\sqrt{2}+2}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(x^8 + 1),x, algorithm="giac")
```

```
[Out] -1/8*sqrt(-sqrt(2) + 2)*arctan((2*x + sqrt(-sqrt(2) + 2))/sqrt(sq
rt(2) + 2)) - 1/8*sqrt(-sqrt(2) + 2)*arctan((2*x - sqrt(-sqrt(2)
+ 2))/sqrt(sqrt(2) + 2)) + 1/8*sqrt(sqrt(2) + 2)*arctan((2*x + sq
rt(sqrt(2) + 2))/sqrt(-sqrt(2) + 2)) + 1/8*sqrt(sqrt(2) + 2)*arct
an((2*x - sqrt(sqrt(2) + 2))/sqrt(-sqrt(2) + 2)) + 1/16*sqrt(-sqr
t(2) + 2)*ln(x^2 + x*sqrt(sqrt(2) + 2) + 1) - 1/16*sqrt(-sqrt(2)
+ 2)*ln(x^2 - x*sqrt(sqrt(2) + 2) + 1) - 1/16*sqrt(sqrt(2) + 2)*l
n(x^2 + x*sqrt(-sqrt(2) + 2) + 1) + 1/16*sqrt(sqrt(2) + 2)*ln(x^2
 - x*sqrt(-sqrt(2) + 2) + 1)
```

3.1502 $\int \frac{1}{1+x^8}\,dx$

Optimal. Leaf size=339

$$-\frac{1}{16}\sqrt{2-\sqrt{2}}\log\left(x^2-\sqrt{2-\sqrt{2}}x+1\right)+\frac{1}{16}\sqrt{2-\sqrt{2}}\log\left(x^2+\sqrt{2-\sqrt{2}}x+1\right)-\frac{1}{16}\sqrt{2+\sqrt{2}}\log\left(x^2-\sqrt{2+\sqrt{2}}x+1\right)+\frac{1}{16}\sqrt{2+\sqrt{2}}\log\left(x^2+\sqrt{2+\sqrt{2}}x+1\right)-\frac{\tan^{-1}\left(\frac{\sqrt{2-\sqrt{2}}-2x}{\sqrt{2+\sqrt{2}}}\right)}{4\sqrt{2\left(2-\sqrt{2}\right)}}-\frac{\tan^{-1}\left(\frac{\sqrt{2+\sqrt{2}}-2x}{\sqrt{2-\sqrt{2}}}\right)}{4\sqrt{2\left(2+\sqrt{2}\right)}}+\frac{\tan^{-1}\left(\frac{2x+\sqrt{2-\sqrt{2}}}{\sqrt{2+\sqrt{2}}}\right)}{4\sqrt{2\left(2-\sqrt{2}\right)}}+\frac{\tan^{-1}\left(\frac{2x+\sqrt{2+\sqrt{2}}}{\sqrt{2-\sqrt{2}}}\right)}{4\sqrt{2\left(2+\sqrt{2}\right)}}$$

```
[Out] -ArcTan[(Sqrt[2 - Sqrt[2]] - 2*x)/Sqrt[2 + Sqrt[2]]]/(4*Sqrt[2*(2
 - Sqrt[2])]) - ArcTan[(Sqrt[2 + Sqrt[2]] - 2*x)/Sqrt[2 - Sqrt[2]
]]/(4*Sqrt[2*(2 + Sqrt[2])]) + ArcTan[(Sqrt[2 - Sqrt[2]] + 2*x)/S
qrt[2 + Sqrt[2]]]/(4*Sqrt[2*(2 - Sqrt[2])]) + ArcTan[(Sqrt[2 + Sq
rt[2]] + 2*x)/Sqrt[2 - Sqrt[2]]]/(4*Sqrt[2*(2 + Sqrt[2])]) - (Sqr
t[2 - Sqrt[2]]*Log[1 - Sqrt[2 - Sqrt[2]]*x + x^2])/16 + (Sqrt[2 -
 Sqrt[2]]*Log[1 + Sqrt[2 - Sqrt[2]]*x + x^2])/16 - (Sqrt[2 + Sqrt
[2]]*Log[1 - Sqrt[2 + Sqrt[2]]*x + x^2])/16 + (Sqrt[2 + Sqrt[2]]*
Log[1 + Sqrt[2 + Sqrt[2]]*x + x^2])/16
```

Rubi [A] time = 0.718388, antiderivative size = 339, normalized size of antiderivative = 1., number of steps used = 19, number of rules used = 6, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.857

$$-\frac{1}{16}\sqrt{2-\sqrt{2}}\log\left(x^2-\sqrt{2-\sqrt{2}}x+1\right)+\frac{1}{16}\sqrt{2-\sqrt{2}}\log\left(x^2+\sqrt{2-\sqrt{2}}x+1\right)-\frac{1}{16}\sqrt{2+\sqrt{2}}\log\left(x^2-\sqrt{2+\sqrt{2}}x+1\right)+\frac{1}{16}\sqrt{2+\sqrt{2}}\log\left(x^2+\sqrt{2+\sqrt{2}}x+1\right)-\frac{\tan^{-1}\left(\frac{\sqrt{2-\sqrt{2}}-2x}{\sqrt{2+\sqrt{2}}}\right)}{4\sqrt{2\left(2-\sqrt{2}\right)}}-\frac{\tan^{-1}\left(\frac{\sqrt{2+\sqrt{2}}-2x}{\sqrt{2-\sqrt{2}}}\right)}{4\sqrt{2\left(2+\sqrt{2}\right)}}+\frac{\tan^{-1}\left(\frac{2x+\sqrt{2-\sqrt{2}}}{\sqrt{2+\sqrt{2}}}\right)}{4\sqrt{2\left(2-\sqrt{2}\right)}}+\frac{\tan^{-1}\left(\frac{2x+\sqrt{2+\sqrt{2}}}{\sqrt{2-\sqrt{2}}}\right)}{4\sqrt{2\left(2+\sqrt{2}\right)}}$$

Antiderivative was successfully verified.

```
[In]  Int[(1 + x^8)^(-1),x]
```

```
[Out] -ArcTan[(Sqrt[2 - Sqrt[2]] - 2*x)/Sqrt[2 + Sqrt[2]]]/(4*Sqrt[2*(2
 - Sqrt[2])]) - ArcTan[(Sqrt[2 + Sqrt[2]] - 2*x)/Sqrt[2 - Sqrt[2]
]]/(4*Sqrt[2*(2 + Sqrt[2])]) + ArcTan[(Sqrt[2 - Sqrt[2]] + 2*x)/S
qrt[2 + Sqrt[2]]]/(4*Sqrt[2*(2 - Sqrt[2])]) + ArcTan[(Sqrt[2 + Sq
rt[2]] + 2*x)/Sqrt[2 - Sqrt[2]]]/(4*Sqrt[2*(2 + Sqrt[2])]) - (Sqr
t[2 - Sqrt[2]]*Log[1 - Sqrt[2 - Sqrt[2]]*x + x^2])/16 + (Sqrt[2 -
 Sqrt[2]]*Log[1 + Sqrt[2 - Sqrt[2]]*x + x^2])/16 - (Sqrt[2 + Sqrt
[2]]*Log[1 - Sqrt[2 + Sqrt[2]]*x + x^2])/16 + (Sqrt[2 + Sqrt[2]]*
Log[1 + Sqrt[2 + Sqrt[2]]*x + x^2])/16
```

Rubi in Sympy [A] time = 61.5528, size = 529, normalized size = 1.56

$$\frac{\sqrt{2}\left(-\frac{\sqrt{2}}{2}+\frac{1}{2}\right)\log\left(x^2-x\sqrt{-\sqrt{2}+2}+1\right)}{8\sqrt{-\sqrt{2}+2}}-\frac{\sqrt{2}\left(-\frac{\sqrt{2}}{2}+\frac{1}{2}\right)\log\left(x^2+x\sqrt{-\sqrt{2}+2}+1\right)}{8\sqrt{-\sqrt{2}+2}}-\frac{\sqrt{2}\left(\frac{1}{2}+\frac{\sqrt{2}}{2}\right)\log\left(x^2-x\sqrt{\sqrt{2}+2}+1\right)}{8\sqrt{\sqrt{2}+2}}+\frac{\sqrt{2}\left(\frac{1}{2}+\frac{\sqrt{2}}{2}\right)\log\left(x^2+x\sqrt{\sqrt{2}+2}+1\right)}{8\sqrt{\sqrt{2}+2}}+\frac{\sqrt{2}\left(-\frac{(1+\sqrt{2})\sqrt{\sqrt{2}+2}}{2}+\sqrt{2}\sqrt{\sqrt{2}+2}\right)\operatorname{atan}\left(\frac{2x-\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)}{4\sqrt{-\sqrt{2}+2}\sqrt{\sqrt{2}+2}}+\frac{\sqrt{2}\left(-\frac{(1+\sqrt{2})\sqrt{\sqrt{2}+2}}{2}+\sqrt{2}\sqrt{\sqrt{2}+2}\right)\operatorname{atan}\left(\frac{2x+\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)}{4\sqrt{-\sqrt{2}+2}\sqrt{\sqrt{2}+2}}+\frac{\sqrt{2}\left(\frac{(-\sqrt{2}+1)\sqrt{-\sqrt{2}+2}}{2}+\sqrt{2}\sqrt{-\sqrt{2}+2}\right)\operatorname{atan}\left(\frac{2x-\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)}{4\sqrt{-\sqrt{2}+2}\sqrt{\sqrt{2}+2}}+\frac{\sqrt{2}\left(\frac{(-\sqrt{2}+1)\sqrt{-\sqrt{2}+2}}{2}+\sqrt{2}\sqrt{-\sqrt{2}+2}\right)\operatorname{atan}\left(\frac{2x+\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)}{4\sqrt{-\sqrt{2}+2}\sqrt{\sqrt{2}+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(x**8+1),x)
```

```
[Out] sqrt(2)*(-sqrt(2)/2 + 1/2)*log(x**2 - x*sqrt(-sqrt(2) + 2) + 1)/(
8*sqrt(-sqrt(2) + 2)) - sqrt(2)*(-sqrt(2)/2 + 1/2)*log(x**2 + x*s
qrt(-sqrt(2) + 2) + 1)/(8*sqrt(-sqrt(2) + 2)) - sqrt(2)*(1/2 + sq
rt(2)/2)*log(x**2 - x*sqrt(sqrt(2) + 2) + 1)/(8*sqrt(sqrt(2) + 2)
) + sqrt(2)*(1/2 + sqrt(2)/2)*log(x**2 + x*sqrt(sqrt(2) + 2) + 1)
/(8*sqrt(sqrt(2) + 2)) + sqrt(2)*(-(1 + sqrt(2))*sqrt(sqrt(2) + 2
)/2 + sqrt(2)*sqrt(sqrt(2) + 2))*atan((2*x - sqrt(sqrt(2) + 2))/s
qrt(-sqrt(2) + 2))/(4*sqrt(-sqrt(2) + 2)*sqrt(sqrt(2) + 2)) + sqr
t(2)*(-(1 + sqrt(2))*sqrt(sqrt(2) + 2)/2 + sqrt(2)*sqrt(sqrt(2) +
 2))*atan((2*x + sqrt(sqrt(2) + 2))/sqrt(-sqrt(2) + 2))/(4*sqrt(-
sqrt(2) + 2)*sqrt(sqrt(2) + 2)) + sqrt(2)*((-sqrt(2) + 1)*sqrt(-s
qrt(2) + 2)/2 + sqrt(2)*sqrt(-sqrt(2) + 2))*atan((2*x - sqrt(-sqr
t(2) + 2))/sqrt(sqrt(2) + 2))/(4*sqrt(-sqrt(2) + 2)*sqrt(sqrt(2)
+ 2)) + sqrt(2)*((-sqrt(2) + 1)*sqrt(-sqrt(2) + 2)/2 + sqrt(2)*sq
rt(-sqrt(2) + 2))*atan((2*x + sqrt(-sqrt(2) + 2))/sqrt(sqrt(2) +
2))/(4*sqrt(-sqrt(2) + 2)*sqrt(sqrt(2) + 2))
```

Mathematica [A] time = 0.00919951, size = 209, normalized size = 0.62

$$-\frac{1}{8}\sin\left(\frac{\pi}{8}\right)\log\left(x^2-2x\sin\left(\frac{\pi}{8}\right)+1\right)+\frac{1}{8}\sin\left(\frac{\pi}{8}\right)\log\left(x^2+2x\sin\left(\frac{\pi}{8}\right)+1\right)-\frac{1}{8}\cos\left(\frac{\pi}{8}\right)\log\left(x^2-2x\cos\left(\frac{\pi}{8}\right)+1\right)+\frac{1}{8}\cos\left(\frac{\pi}{8}\right)\log\left(x^2+2x\cos\left(\frac{\pi}{8}\right)+1\right)+\frac{1}{4}\sin\left(\frac{\pi}{8}\right)\tan^{-1}\left(\csc\left(\frac{\pi}{8}\right)\left(x-\cos\left(\frac{\pi}{8}\right)\right)\right)+\frac{1}{4}\sin\left(\frac{\pi}{8}\right)\tan^{-1}\left(\csc\left(\frac{\pi}{8}\right)\left(x+\cos\left(\frac{\pi}{8}\right)\right)\right)+\frac{1}{4}\cos\left(\frac{\pi}{8}\right)\tan^{-1}\left(\sec\left(\frac{\pi}{8}\right)\left(x-\sin\left(\frac{\pi}{8}\right)\right)\right)+\frac{1}{4}\cos\left(\frac{\pi}{8}\right)\tan^{-1}\left(\sec\left(\frac{\pi}{8}\right)\left(x+\sin\left(\frac{\pi}{8}\right)\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(1 + x^8)^(-1),x]
```

```
[Out] (ArcTan[Sec[Pi/8]*(x - Sin[Pi/8])]*Cos[Pi/8])/4 + (ArcTan[Sec[Pi/
8]*(x + Sin[Pi/8])]*Cos[Pi/8])/4 - (Cos[Pi/8]*Log[1 + x^2 - 2*x*C
os[Pi/8]])/8 + (Cos[Pi/8]*Log[1 + x^2 + 2*x*Cos[Pi/8]])/8 + (ArcT
an[(x - Cos[Pi/8])*Csc[Pi/8]]*Sin[Pi/8])/4 + (ArcTan[(x + Cos[Pi/
```

```
8])*Csc[Pi/8]]*Sin[Pi/8])/4 - (Log[1 + x^2 - 2*x*Sin[Pi/8]]*Sin[P
i/8])/8 + (Log[1 + x^2 + 2*x*Sin[Pi/8]]*Sin[Pi/8])/8
```

Maple [C] time = 0.005, size = 22, normalized size = 0.1

$$\frac{1}{8}\sum_{\_R=RootOf(\_Z^8+1)}\frac{\ln(x-\_R)}{\_R^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(x^8+1),x)

[Out] 1/8*sum(1/_R^7*ln(x-_R),_R=RootOf(_Z^8+1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{x^8+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^8 + 1),x, algorithm="maxima")

[Out] integrate(1/(x^8 + 1), x)
```

Fricas [A] time = 0.242885, size = 1345, normalized size = 3.97

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^8 + 1),x, algorithm="fricas")

[Out] -1/64*sqrt(2)*(4*(sqrt(sqrt(2) + 2) + sqrt(-sqrt(2) + 2))*arctan(
(sqrt(sqrt(2) + 2) + sqrt(-sqrt(2) + 2))/(2*sqrt(2)*x + 2*sqrt(2)
*sqrt(x^2 + 1/2*sqrt(2)*x*sqrt(sqrt(2) + 2) - 1/2*sqrt(2)*x*sqrt(
-sqrt(2) + 2) + 1) + sqrt(sqrt(2) + 2) - sqrt(-sqrt(2) + 2))) + 4
*(sqrt(sqrt(2) + 2) + sqrt(-sqrt(2) + 2))*arctan((sqrt(sqrt(2) +
2) + sqrt(-sqrt(2) + 2))/(2*sqrt(2)*x + 2*sqrt(2)*sqrt(x^2 - 1/2*
sqrt(2)*x*sqrt(sqrt(2) + 2) + 1/2*sqrt(2)*x*sqrt(-sqrt(2) + 2) +
1) - sqrt(sqrt(2) + 2) + sqrt(-sqrt(2) + 2))) - 4*(sqrt(sqrt(2) +
 2) - sqrt(-sqrt(2) + 2))*arctan(-(sqrt(sqrt(2) + 2) - sqrt(-sqrt
(2) + 2))/(2*sqrt(2)*x + 2*sqrt(2)*sqrt(x^2 + 1/2*sqrt(2)*x*sqrt(
sqrt(2) + 2) + 1/2*sqrt(2)*x*sqrt(-sqrt(2) + 2) + 1) + sqrt(sqrt(
2) + 2) + sqrt(-sqrt(2) + 2))) - 4*(sqrt(sqrt(2) + 2) - sqrt(-sqr
t(2) + 2))*arctan(-(sqrt(sqrt(2) + 2) - sqrt(-sqrt(2) + 2))/(2*sq
rt(2)*x + 2*sqrt(2)*sqrt(x^2 - 1/2*sqrt(2)*x*sqrt(sqrt(2) + 2) -
1/2*sqrt(2)*x*sqrt(-sqrt(2) + 2) + 1) - sqrt(sqrt(2) + 2) - sqrt(
-sqrt(2) + 2))) + 4*sqrt(2)*sqrt(sqrt(2) + 2)*arctan(sqrt(sqrt(2)
 + 2)/(2*x + 2*sqrt(x^2 + x*sqrt(-sqrt(2) + 2) + 1) + sqrt(-sqrt(
2) + 2))) + 4*sqrt(2)*sqrt(sqrt(2) + 2)*arctan(sqrt(sqrt(2) + 2)/
(2*x + 2*sqrt(x^2 - x*sqrt(-sqrt(2) + 2) + 1) - sqrt(-sqrt(2) + 2
))) + 4*sqrt(2)*sqrt(-sqrt(2) + 2)*arctan(sqrt(-sqrt(2) + 2)/(2*x
 + 2*sqrt(x^2 + x*sqrt(sqrt(2) + 2) + 1) + sqrt(sqrt(2) + 2))) +
4*sqrt(2)*sqrt(-sqrt(2) + 2)*arctan(sqrt(-sqrt(2) + 2)/(2*x + 2*s
qrt(x^2 - x*sqrt(sqrt(2) + 2) + 1) - sqrt(sqrt(2) + 2))) - (sqrt(
sqrt(2) + 2) + sqrt(-sqrt(2) + 2))*log(x^2 + 1/2*sqrt(2)*x*sqrt(s
qrt(2) + 2) + 1/2*sqrt(2)*x*sqrt(-sqrt(2) + 2) + 1) - (sqrt(sqrt(
2) + 2) - sqrt(-sqrt(2) + 2))*log(x^2 + 1/2*sqrt(2)*x*sqrt(sqrt(2
) + 2) - 1/2*sqrt(2)*x*sqrt(-sqrt(2) + 2) + 1) + (sqrt(sqrt(2) +
```

```
2) - sqrt(-sqrt(2) + 2))*log(x^2 - 1/2*sqrt(2)*x*sqrt(sqrt(2) + 2
) + 1/2*sqrt(2)*x*sqrt(-sqrt(2) + 2) + 1) + (sqrt(sqrt(2) + 2) +
sqrt(-sqrt(2) + 2))*log(x^2 - 1/2*sqrt(2)*x*sqrt(sqrt(2) + 2) - 1
/2*sqrt(2)*x*sqrt(-sqrt(2) + 2) + 1) - sqrt(2)*sqrt(sqrt(2) + 2)*
log(x^2 + x*sqrt(sqrt(2) + 2) + 1) + sqrt(2)*sqrt(sqrt(2) + 2)*lo
g(x^2 - x*sqrt(sqrt(2) + 2) + 1) - sqrt(2)*sqrt(-sqrt(2) + 2)*log
(x^2 + x*sqrt(-sqrt(2) + 2) + 1) + sqrt(2)*sqrt(-sqrt(2) + 2)*log
(x^2 - x*sqrt(-sqrt(2) + 2) + 1))
```

Sympy [A] time = 4.26169, size = 14, normalized size = 0.04

$$\operatorname{RootSum}\left(16777216t^8 + 1, \left(t \mapsto t\log\left(8t + x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x**8+1),x)
```

```
[Out] RootSum(16777216*_t**8 + 1, Lambda(_t, _t*log(8*_t + x)))
```

GIAC/XCAS [A] time = 0.243918, size = 323, normalized size = 0.95

$$\frac{1}{8}\sqrt{\sqrt{2}+2}\arctan\left(\frac{2x+\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)+\frac{1}{8}\sqrt{\sqrt{2}+2}\arctan\left(\frac{2x-\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)+\frac{1}{8}\sqrt{-\sqrt{2}+2}\arctan\left(\frac{2x+\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)+\frac{1}{8}\sqrt{-\sqrt{2}+2}\arctan\left(\frac{2x-\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)+\frac{1}{16}\sqrt{\sqrt{2}+2}\ln\left(x^2+x\sqrt{\sqrt{2}+2}+1\right)-\frac{1}{16}\sqrt{\sqrt{2}+2}\ln\left(x^2-x\sqrt{\sqrt{2}+2}+1\right)+\frac{1}{16}\sqrt{-\sqrt{2}+2}\ln\left(x^2+x\sqrt{-\sqrt{2}+2}+1\right)-\frac{1}{16}\sqrt{-\sqrt{2}+2}\ln\left(x^2-x\sqrt{-\sqrt{2}+2}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^8 + 1),x, algorithm="giac")
```

```
[Out] 1/8*sqrt(sqrt(2) + 2)*arctan((2*x + sqrt(-sqrt(2) + 2))/sqrt(sqrt
(2) + 2)) + 1/8*sqrt(sqrt(2) + 2)*arctan((2*x - sqrt(-sqrt(2) + 2
))/sqrt(sqrt(2) + 2)) + 1/8*sqrt(-sqrt(2) + 2)*arctan((2*x + sqrt
(sqrt(2) + 2))/sqrt(-sqrt(2) + 2)) + 1/8*sqrt(-sqrt(2) + 2)*arcta
n((2*x - sqrt(sqrt(2) + 2))/sqrt(-sqrt(2) + 2)) + 1/16*sqrt(sqrt(
2) + 2)*ln(x^2 + x*sqrt(sqrt(2) + 2) + 1) - 1/16*sqrt(sqrt(2) + 2
)*ln(x^2 - x*sqrt(sqrt(2) + 2) + 1) + 1/16*sqrt(-sqrt(2) + 2)*ln(
x^2 + x*sqrt(-sqrt(2) + 2) + 1) - 1/16*sqrt(-sqrt(2) + 2)*ln(x^2
- x*sqrt(-sqrt(2) + 2) + 1)
```

3.1503 $\int \frac{1}{x^2(1+x^8)}\,dx$

Optimal. Leaf size=344

$$-\frac{1}{16}\sqrt{2-\sqrt{2}}\log\left(x^2-\sqrt{2-\sqrt{2}}x+1\right)+\frac{1}{16}\sqrt{2-\sqrt{2}}\log\left(x^2+\sqrt{2-\sqrt{2}}x+1\right)-\frac{1}{16}\sqrt{2+\sqrt{2}}\log\left(x^2-\sqrt{2+\sqrt{2}}x+1\right)+\frac{1}{16}\sqrt{2+\sqrt{2}}\log\left(x^2+\sqrt{2+\sqrt{2}}x+1\right)-\frac{1}{x}+\frac{\tan^{-1}\left(\frac{\sqrt{2-\sqrt{2}}-2x}{\sqrt{2+\sqrt{2}}}\right)}{4\sqrt{2\left(2-\sqrt{2}\right)}}+\frac{\tan^{-1}\left(\frac{\sqrt{2+\sqrt{2}}-2x}{\sqrt{2-\sqrt{2}}}\right)}{4\sqrt{2\left(2+\sqrt{2}\right)}}-\frac{\tan^{-1}\left(\frac{2x+\sqrt{2-\sqrt{2}}}{\sqrt{2+\sqrt{2}}}\right)}{4\sqrt{2\left(2-\sqrt{2}\right)}}-\frac{\tan^{-1}\left(\frac{2x+\sqrt{2+\sqrt{2}}}{\sqrt{2-\sqrt{2}}}\right)}{4\sqrt{2\left(2+\sqrt{2}\right)}}$$

```
[Out] -x^(-1) + ArcTan[(Sqrt[2 - Sqrt[2]] - 2*x)/Sqrt[2 + Sqrt[2]]]/(4*
Sqrt[2*(2 - Sqrt[2])]) + ArcTan[(Sqrt[2 + Sqrt[2]] - 2*x)/Sqrt[2
- Sqrt[2]]]/(4*Sqrt[2*(2 + Sqrt[2])]) - ArcTan[(Sqrt[2 - Sqrt[2]]
 + 2*x)/Sqrt[2 + Sqrt[2]]]/(4*Sqrt[2*(2 - Sqrt[2])]) - ArcTan[(Sq
rt[2 + Sqrt[2]] + 2*x)/Sqrt[2 - Sqrt[2]]]/(4*Sqrt[2*(2 + Sqrt[2])
]) - (Sqrt[2 - Sqrt[2]]*Log[1 - Sqrt[2 - Sqrt[2]]*x + x^2])/16 +
(Sqrt[2 - Sqrt[2]]*Log[1 + Sqrt[2 - Sqrt[2]]*x + x^2])/16 - (Sqrt
[2 + Sqrt[2]]*Log[1 - Sqrt[2 + Sqrt[2]]*x + x^2])/16 + (Sqrt[2 +
Sqrt[2]]*Log[1 + Sqrt[2 + Sqrt[2]]*x + x^2])/16
```

Rubi [A] time = 0.606968, antiderivative size = 344, normalized size of antiderivative = 1., number of steps used = 22, number of rules used = 8, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.727$

$$-\frac{1}{16}\sqrt{2-\sqrt{2}}\log\left(x^2-\sqrt{2-\sqrt{2}}x+1\right)+\frac{1}{16}\sqrt{2-\sqrt{2}}\log\left(x^2+\sqrt{2-\sqrt{2}}x+1\right)-\frac{1}{16}\sqrt{2+\sqrt{2}}\log\left(x^2-\sqrt{2+\sqrt{2}}x+1\right)+\frac{1}{16}\sqrt{2+\sqrt{2}}\log\left(x^2+\sqrt{2+\sqrt{2}}x+1\right)-\frac{1}{x}+\frac{\tan^{-1}\left(\frac{\sqrt{2-\sqrt{2}}-2x}{\sqrt{2+\sqrt{2}}}\right)}{4\sqrt{2\left(2-\sqrt{2}\right)}}+\frac{\tan^{-1}\left(\frac{\sqrt{2+\sqrt{2}}-2x}{\sqrt{2-\sqrt{2}}}\right)}{4\sqrt{2\left(2+\sqrt{2}\right)}}-\frac{\tan^{-1}\left(\frac{2x+\sqrt{2-\sqrt{2}}}{\sqrt{2+\sqrt{2}}}\right)}{4\sqrt{2\left(2-\sqrt{2}\right)}}-\frac{\tan^{-1}\left(\frac{2x+\sqrt{2+\sqrt{2}}}{\sqrt{2-\sqrt{2}}}\right)}{4\sqrt{2\left(2+\sqrt{2}\right)}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(1 + x^8)),x]
```


```
[Out] -x^(-1) + ArcTan[(Sqrt[2 - Sqrt[2]] - 2*x)/Sqrt[2 + Sqrt[2]]]/(4*
Sqrt[2*(2 - Sqrt[2])]) + ArcTan[(Sqrt[2 + Sqrt[2]] - 2*x)/Sqrt[2
- Sqrt[2]]]/(4*Sqrt[2*(2 + Sqrt[2])]) - ArcTan[(Sqrt[2 - Sqrt[2]]
 + 2*x)/Sqrt[2 + Sqrt[2]]]/(4*Sqrt[2*(2 - Sqrt[2])]) - ArcTan[(Sq
rt[2 + Sqrt[2]] + 2*x)/Sqrt[2 - Sqrt[2]]]/(4*Sqrt[2*(2 + Sqrt[2])
]) - (Sqrt[2 - Sqrt[2]]*Log[1 - Sqrt[2 - Sqrt[2]]*x + x^2])/16 +
(Sqrt[2 - Sqrt[2]]*Log[1 + Sqrt[2 - Sqrt[2]]*x + x^2])/16 - (Sqrt
[2 + Sqrt[2]]*Log[1 - Sqrt[2 + Sqrt[2]]*x + x^2])/16 + (Sqrt[2 +
Sqrt[2]]*Log[1 + Sqrt[2 + Sqrt[2]]*x + x^2])/16
```

Rubi in Sympy [A] time = 76.0884, size = 512, normalized size = 1.49

$$\frac{\sqrt{2}\left(-\frac{\sqrt{2}}{2}+\frac{1}{2}\right)\log\left(x^2-x\sqrt{-\sqrt{2}+2}+1\right)}{8\sqrt{-\sqrt{2}+2}}-\frac{\sqrt{2}\left(-\frac{\sqrt{2}}{2}+\frac{1}{2}\right)\log\left(x^2+x\sqrt{-\sqrt{2}+2}+1\right)}{8\sqrt{-\sqrt{2}+2}}-\frac{\sqrt{2}\left(\frac{1}{2}+\frac{\sqrt{2}}{2}\right)\log\left(x^2-x\sqrt{\sqrt{2}+2}+1\right)}{8\sqrt{\sqrt{2}+2}}+\frac{\sqrt{2}\left(\frac{1}{2}+\frac{\sqrt{2}}{2}\right)\log\left(x^2+x\sqrt{\sqrt{2}+2}+1\right)}{8\sqrt{\sqrt{2}+2}}-\frac{\sqrt{2}\left(-\sqrt{\sqrt{2}+2}+\frac{(1+\sqrt{2})\sqrt{\sqrt{2}+2}}{2}\right)\operatorname{atan}\left(\frac{2x-\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)}{4\sqrt{-\sqrt{2}+2}\sqrt{\sqrt{2}+2}}-\frac{\sqrt{2}\left(-\sqrt{\sqrt{2}+2}+\frac{(1+\sqrt{2})\sqrt{\sqrt{2}+2}}{2}\right)\operatorname{atan}\left(\frac{2x+\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)}{4\sqrt{-\sqrt{2}+2}\sqrt{\sqrt{2}+2}}-\frac{\sqrt{2}\left(-\frac{(-\sqrt{2}+1)\sqrt{-\sqrt{2}+2}}{2}+\sqrt{-\sqrt{2}+2}\right)\operatorname{atan}\left(\frac{2x-\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)}{4\sqrt{-\sqrt{2}+2}\sqrt{\sqrt{2}+2}}-\frac{\sqrt{2}\left(-\frac{(-\sqrt{2}+1)\sqrt{-\sqrt{2}+2}}{2}+\sqrt{-\sqrt{2}+2}\right)\operatorname{atan}\left(\frac{2x+\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)}{4\sqrt{-\sqrt{2}+2}\sqrt{\sqrt{2}+2}}-\frac{1}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(x**8+1),x)
```

```
[Out] sqrt(2)*(-sqrt(2)/2 + 1/2)*log(x**2 - x*sqrt(-sqrt(2) + 2) + 1)/(
8*sqrt(-sqrt(2) + 2)) - sqrt(2)*(-sqrt(2)/2 + 1/2)*log(x**2 + x*s
qrt(-sqrt(2) + 2) + 1)/(8*sqrt(-sqrt(2) + 2)) - sqrt(2)*(1/2 + sq
rt(2)/2)*log(x**2 - x*sqrt(sqrt(2) + 2) + 1)/(8*sqrt(sqrt(2) + 2)
) + sqrt(2)*(1/2 + sqrt(2)/2)*log(x**2 + x*sqrt(sqrt(2) + 2) + 1)
/(8*sqrt(sqrt(2) + 2)) - sqrt(2)*(-sqrt(sqrt(2) + 2) + (1 + sqrt(
2))*sqrt(sqrt(2) + 2)/2)*atan((2*x - sqrt(sqrt(2) + 2))/sqrt(-sqr
t(2) + 2))/(4*sqrt(-sqrt(2) + 2)*sqrt(sqrt(2) + 2)) - sqrt(2)*(-s
qrt(sqrt(2) + 2) + (1 + sqrt(2))*sqrt(sqrt(2) + 2)/2)*atan((2*x +
 sqrt(sqrt(2) + 2))/sqrt(-sqrt(2) + 2))/(4*sqrt(-sqrt(2) + 2)*sqr
t(sqrt(2) + 2)) - sqrt(2)*(-(-sqrt(2) + 1)*sqrt(-sqrt(2) + 2)/2 +
 sqrt(-sqrt(2) + 2))*atan((2*x - sqrt(-sqrt(2) + 2))/sqrt(sqrt(2)
 + 2))/(4*sqrt(-sqrt(2) + 2)*sqrt(sqrt(2) + 2)) - sqrt(2)*(-(-sqr
t(2) + 1)*sqrt(-sqrt(2) + 2)/2 + sqrt(-sqrt(2) + 2))*atan((2*x +
sqrt(-sqrt(2) + 2))/sqrt(sqrt(2) + 2))/(4*sqrt(-sqrt(2) + 2)*sqrt
(sqrt(2) + 2)) - 1/x
```

Mathematica [A] time = 0.0114426, size = 214, normalized size = 0.62

$$-\frac{1}{8}\sin\left(\frac{\pi}{8}\right)\log\left(x^2-2x\sin\left(\frac{\pi}{8}\right)+1\right)+\frac{1}{8}\sin\left(\frac{\pi}{8}\right)\log\left(x^2+2x\sin\left(\frac{\pi}{8}\right)+1\right)-\frac{1}{8}\cos\left(\frac{\pi}{8}\right)\log\left(x^2-2x\cos\left(\frac{\pi}{8}\right)+1\right)+\frac{1}{8}\cos\left(\frac{\pi}{8}\right)\log\left(x^2+2x\cos\left(\frac{\pi}{8}\right)+1\right)-\frac{1}{x}-\frac{1}{4}\sin\left(\frac{\pi}{8}\right)\tan^{-1}\left(\csc\left(\frac{\pi}{8}\right)\left(x-\cos\left(\frac{\pi}{8}\right)\right)\right)-\frac{1}{4}\sin\left(\frac{\pi}{8}\right)\tan^{-1}\left(\csc\left(\frac{\pi}{8}\right)\left(x+\cos\left(\frac{\pi}{8}\right)\right)\right)-\frac{1}{4}\cos\left(\frac{\pi}{8}\right)\tan^{-1}\left(\sec\left(\frac{\pi}{8}\right)\left(x-\sin\left(\frac{\pi}{8}\right)\right)\right)-\frac{1}{4}\cos\left(\frac{\pi}{8}\right)\tan^{-1}\left(\sec\left(\frac{\pi}{8}\right)\left(x+\sin\left(\frac{\pi}{8}\right)\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*(1 + x^8)),x]
```

```
[Out] -x^(-1) - (ArcTan[Sec[Pi/8]*(x - Sin[Pi/8])]*Cos[Pi/8])/4 - (ArcT
an[Sec[Pi/8]*(x + Sin[Pi/8])]*Cos[Pi/8])/4 - (Cos[Pi/8]*Log[1 + x
^2 - 2*x*Cos[Pi/8]])/8 + (Cos[Pi/8]*Log[1 + x^2 + 2*x*Cos[Pi/8]])
/8 - (ArcTan[(x - Cos[Pi/8])*Csc[Pi/8]]*Sin[Pi/8])/4 - (ArcTan[(x
```

```
 + Cos[Pi/8])*Csc[Pi/8]]*Sin[Pi/8])/4 - (Log[1 + x^2 - 2*x*Sin[Pi
/8]]*Sin[Pi/8])/8 + (Log[1 + x^2 + 2*x*Sin[Pi/8]]*Sin[Pi/8])/8
```

Maple [C] time = 0.01, size = 28, normalized size = 0.1

$$-\frac{1}{8}\sum_{\_R=RootOf(\_Z^8+1)}\frac{\ln(x-\_R)}{\_R}-x^{-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(x^8+1),x)
```

```
[Out] -1/8*sum(1/_R*ln(x-_R),_R=RootOf(_Z^8+1))-1/x
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{x}-\int\frac{x^6}{x^8+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^8 + 1)*x^2),x, algorithm="maxima")
```

```
[Out] -1/x - integrate(x^6/(x^8 + 1), x)
```

Fricas [A] time = 0.254252, size = 3402, normalized size = 9.89

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^8 + 1)*x^2),x, algorithm="fricas")
```

```
[Out] -1/64*sqrt(2)*(4*sqrt(2)*x*sqrt(-sqrt(2) + 2)*arctan(-((sqrt(2) +
 2)^(3/2) + 3*sqrt(sqrt(2) + 2)*(sqrt(2) - 2))/(3*(sqrt(2) + 2)*s
qrt(-sqrt(2) + 2) - (-sqrt(2) + 2)^(3/2) + 8*x + sqrt((sqrt(2) +
2)^3 - 3*(sqrt(2) + 2)^2*(sqrt(2) - 2) + 3*(sqrt(2) + 2)*(sqrt(2)
 - 2)^2 - (sqrt(2) - 2)^3 + 48*x*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2)
 - 16*x*(-sqrt(2) + 2)^(3/2) + 64*x^2))) + 4*sqrt(2)*x*sqrt(-sqrt
(2) + 2)*arctan(((sqrt(2) + 2)^(3/2) + 3*sqrt(sqrt(2) + 2)*(sqrt(
2) - 2))/(3*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) - (-sqrt(2) + 2)^(3/
2) - 8*x - sqrt((sqrt(2) + 2)^3 - 3*(sqrt(2) + 2)^2*(sqrt(2) - 2)
 + 3*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - (sqrt(2) - 2)^3 - 48*x*(sqrt
(2) + 2)*sqrt(-sqrt(2) + 2) + 16*x*(-sqrt(2) + 2)^(3/2) + 64*x^2)
)) + 4*sqrt(2)*x*sqrt(sqrt(2) + 2)*arctan(-(3*(sqrt(2) + 2)*sqrt(
-sqrt(2) + 2) - (-sqrt(2) + 2)^(3/2))/((sqrt(2) + 2)^(3/2) + 3*sq
rt(sqrt(2) + 2)*(sqrt(2) - 2) + 8*x + sqrt((sqrt(2) + 2)^3 + 3*(s
qrt(2) + 2)*(sqrt(2) - 2)^2 - (sqrt(2) - 2)^3 + 16*x*(sqrt(2) + 2
)^(3/2) + 64*x^2 - 3*((sqrt(2) + 2)^2 - 16*x*sqrt(sqrt(2) + 2))*(
sqrt(2) - 2)))) + 4*sqrt(2)*x*sqrt(sqrt(2) + 2)*arctan((3*(sqrt(2
) + 2)*sqrt(-sqrt(2) + 2) - (-sqrt(2) + 2)^(3/2))/((sqrt(2) + 2)^
(3/2) + 3*sqrt(sqrt(2) + 2)*(sqrt(2) - 2) - 8*x - sqrt((sqrt(2) +
 2)^3 + 3*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - (sqrt(2) - 2)^3 - 16*x*
(sqrt(2) + 2)^(3/2) + 64*x^2 - 3*((sqrt(2) + 2)^2 + 16*x*sqrt(sqr
t(2) + 2))*(sqrt(2) - 2)))) - sqrt(2)*x*sqrt(sqrt(2) + 2)*log(1/6
4*(sqrt(2) + 2)^3 - 3/64*(sqrt(2) + 2)^2*(sqrt(2) - 2) + 3/64*(sq
rt(2) + 2)*(sqrt(2) - 2)^2 - 1/64*(sqrt(2) - 2)^3 + 3/4*x*(sqrt(2
) + 2)*sqrt(-sqrt(2) + 2) - 1/4*x*(-sqrt(2) + 2)^(3/2) + x^2) + s
qrt(2)*x*sqrt(sqrt(2) + 2)*log(1/64*(sqrt(2) + 2)^3 - 3/64*(sqrt(
2) + 2)^2*(sqrt(2) - 2) + 3/64*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - 1/
```

```
64*(sqrt(2) - 2)^3 - 3/4*x*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) + 1/4
*x*(-sqrt(2) + 2)^(3/2) + x^2) - sqrt(2)*x*sqrt(-sqrt(2) + 2)*log
(1/64*(sqrt(2) + 2)^3 + 3/64*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - 1/64
*(sqrt(2) - 2)^3 + 1/4*x*(sqrt(2) + 2)^(3/2) + x^2 - 3/64*((sqrt(
2) + 2)^2 - 16*x*sqrt(sqrt(2) + 2))*(sqrt(2) - 2)) + sqrt(2)*x*sq
rt(-sqrt(2) + 2)*log(1/64*(sqrt(2) + 2)^3 + 3/64*(sqrt(2) + 2)*(s
qrt(2) - 2)^2 - 1/64*(sqrt(2) - 2)^3 - 1/4*x*(sqrt(2) + 2)^(3/2)
+ x^2 - 3/64*((sqrt(2) + 2)^2 + 16*x*sqrt(sqrt(2) + 2))*(sqrt(2)
- 2)) + 4*(x*sqrt(sqrt(2) + 2) + x*sqrt(-sqrt(2) + 2))*arctan(-((
sqrt(2) + 2)^(3/2) + 3*sqrt(sqrt(2) + 2)*(sqrt(2) - 2) + 3*(sqrt(
2) + 2)*sqrt(-sqrt(2) + 2) - (-sqrt(2) + 2)^(3/2))/(8*sqrt(2)*x +
 (sqrt(2) + 2)^(3/2) + 3*sqrt(sqrt(2) + 2)*(sqrt(2) - 2) - 3*(sqr
t(2) + 2)*sqrt(-sqrt(2) + 2) + (-sqrt(2) + 2)^(3/2) + sqrt(2)*sqr
t(8*sqrt(2)*x*(sqrt(2) + 2)^(3/2) + (sqrt(2) + 2)^3 + 3*(sqrt(2)
+ 2)*(sqrt(2) - 2)^2 - (sqrt(2) - 2)^3 - 24*sqrt(2)*x*(sqrt(2) +
2)*sqrt(-sqrt(2) + 2) + 8*sqrt(2)*x*(-sqrt(2) + 2)^(3/2) + 64*x^2
 + 3*(8*sqrt(2)*x*sqrt(sqrt(2) + 2) - (sqrt(2) + 2)^2)*(sqrt(2) -
 2)))) + 4*(x*sqrt(sqrt(2) + 2) + x*sqrt(-sqrt(2) + 2))*arctan(-(
(sqrt(2) + 2)^(3/2) + 3*sqrt(sqrt(2) + 2)*(sqrt(2) - 2) + 3*(sqrt
(2) + 2)*sqrt(-sqrt(2) + 2) - (-sqrt(2) + 2)^(3/2))/(8*sqrt(2)*x
- (sqrt(2) + 2)^(3/2) - 3*sqrt(sqrt(2) + 2)*(sqrt(2) - 2) + 3*(sq
rt(2) + 2)*sqrt(-sqrt(2) + 2) - (-sqrt(2) + 2)^(3/2) + 8*sqrt(2)*
sqrt(-1/8*sqrt(2)*x*(sqrt(2) + 2)^(3/2) + 1/64*(sqrt(2) + 2)^3 +
3/64*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - 1/64*(sqrt(2) - 2)^3 + 3/8*s
qrt(2)*x*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) - 1/8*sqrt(2)*x*(-sqrt(
2) + 2)^(3/2) + x^2 - 3/64*(8*sqrt(2)*x*sqrt(sqrt(2) + 2) + (sqrt
(2) + 2)^2)*(sqrt(2) - 2)))) + 4*(x*sqrt(sqrt(2) + 2) - x*sqrt(-s
qrt(2) + 2))*arctan(((sqrt(2) + 2)^(3/2) + 3*sqrt(sqrt(2) + 2)*(s
qrt(2) - 2) - 3*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) + (-sqrt(2) + 2)
^(3/2))/(8*sqrt(2)*x + (sqrt(2) + 2)^(3/2) + 3*sqrt(sqrt(2) + 2)*
(sqrt(2) - 2) + 3*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) - (-sqrt(2) +
2)^(3/2) + sqrt(2)*sqrt(8*sqrt(2)*x*(sqrt(2) + 2)^(3/2) + (sqrt(2
) + 2)^3 + 3*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - (sqrt(2) - 2)^3 + 24
*sqrt(2)*x*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) - 8*sqrt(2)*x*(-sqrt(
2) + 2)^(3/2) + 64*x^2 + 3*(8*sqrt(2)*x*sqrt(sqrt(2) + 2) - (sqrt
(2) + 2)^2)*(sqrt(2) - 2)))) + 4*(x*sqrt(sqrt(2) + 2) - x*sqrt(-s
qrt(2) + 2))*arctan(((sqrt(2) + 2)^(3/2) + 3*sqrt(sqrt(2) + 2)*(s
qrt(2) - 2) - 3*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) + (-sqrt(2) + 2)
^(3/2))/(8*sqrt(2)*x - (sqrt(2) + 2)^(3/2) - 3*sqrt(sqrt(2) + 2)*
(sqrt(2) - 2) - 3*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) + (-sqrt(2) +
2)^(3/2) + 8*sqrt(2)*sqrt(-1/8*sqrt(2)*x*(sqrt(2) + 2)^(3/2) + 1/
64*(sqrt(2) + 2)^3 + 3/64*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - 1/64*(s
qrt(2) - 2)^3 - 3/8*sqrt(2)*x*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) +
1/8*sqrt(2)*x*(-sqrt(2) + 2)^(3/2) + x^2 - 3/64*(8*sqrt(2)*x*sqrt
(sqrt(2) + 2) + (sqrt(2) + 2)^2)*(sqrt(2) - 2)))) - (x*sqrt(sqrt(
2) + 2) + x*sqrt(-sqrt(2) + 2))*log(1/8*sqrt(2)*x*(sqrt(2) + 2)^(
3/2) + 1/64*(sqrt(2) + 2)^3 + 3/64*(sqrt(2) + 2)*(sqrt(2) - 2)^2
- 1/64*(sqrt(2) - 2)^3 + 3/8*sqrt(2)*x*(sqrt(2) + 2)*sqrt(-sqrt(2
) + 2) - 1/8*sqrt(2)*x*(-sqrt(2) + 2)^(3/2) + x^2 + 3/64*(8*sqrt(
2)*x*sqrt(sqrt(2) + 2) - (sqrt(2) + 2)^2)*(sqrt(2) - 2)) + (x*sqr
t(sqrt(2) + 2) - x*sqrt(-sqrt(2) + 2))*log(1/8*sqrt(2)*x*(sqrt(2)
 + 2)^(3/2) + 1/64*(sqrt(2) + 2)^3 + 3/64*(sqrt(2) + 2)*(sqrt(2)
- 2)^2 - 1/64*(sqrt(2) - 2)^3 - 3/8*sqrt(2)*x*(sqrt(2) + 2)*sqrt(
-sqrt(2) + 2) + 1/8*sqrt(2)*x*(-sqrt(2) + 2)^(3/2) + x^2 + 3/64*(
8*sqrt(2)*x*sqrt(sqrt(2) + 2) - (sqrt(2) + 2)^2)*(sqrt(2) - 2)) -
 (x*sqrt(sqrt(2) + 2) - x*sqrt(-sqrt(2) + 2))*log(-1/8*sqrt(2)*x*
(sqrt(2) + 2)^(3/2) + 1/64*(sqrt(2) + 2)^3 + 3/64*(sqrt(2) + 2)*(
sqrt(2) - 2)^2 - 1/64*(sqrt(2) - 2)^3 + 3/8*sqrt(2)*x*(sqrt(2) +
2)*sqrt(-sqrt(2) + 2) - 1/8*sqrt(2)*x*(-sqrt(2) + 2)^(3/2) + x^2
- 3/64*(8*sqrt(2)*x*sqrt(sqrt(2) + 2) + (sqrt(2) + 2)^2)*(sqrt(2)
 - 2)) + (x*sqrt(sqrt(2) + 2) + x*sqrt(-sqrt(2) + 2))*log(-1/8*sq
rt(2)*x*(sqrt(2) + 2)^(3/2) + 1/64*(sqrt(2) + 2)^3 + 3/64*(sqrt(2
) + 2)*(sqrt(2) - 2)^2 - 1/64*(sqrt(2) - 2)^3 - 3/8*sqrt(2)*x*(sq
rt(2) + 2)*sqrt(-sqrt(2) + 2) + 1/8*sqrt(2)*x*(-sqrt(2) + 2)^(3/2
) + x^2 - 3/64*(8*sqrt(2)*x*sqrt(sqrt(2) + 2) + (sqrt(2) + 2)^2)*
(sqrt(2) - 2)) + 32*sqrt(2))/x
```

Sympy [A] time = 4.29776, size = 19, normalized size = 0.06

$$\operatorname{RootSum}\left(16777216t^8 + 1, \left(t \mapsto t\log\left(-2097152t^7 + x\right)\right)\right) - \frac{1}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(x**8+1),x)
```

```
[Out] RootSum(16777216*_t**8 + 1, Lambda(_t, _t*log(-2097152*_t**7 + x)
)) - 1/x
```

GIAC/XCAS [A] time = 0.263129, size = 329, normalized size = 0.96

$$-\frac{1}{8}\sqrt{\sqrt{2}+2}\arctan\left(\frac{2x+\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)-\frac{1}{8}\sqrt{\sqrt{2}+2}\arctan\left(\frac{2x-\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)-\frac{1}{8}\sqrt{-\sqrt{2}+2}\arctan\left(\frac{2x+\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)-\frac{1}{8}\sqrt{-\sqrt{2}+2}\arctan\left(\frac{2x-\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)+\frac{1}{16}\sqrt{\sqrt{2}+2}\ln\left(x^2+x\sqrt{\sqrt{2}+2}+1\right)-\frac{1}{16}\sqrt{\sqrt{2}+2}\ln\left(x^2-x\sqrt{\sqrt{2}+2}+1\right)+\frac{1}{16}\sqrt{-\sqrt{2}+2}\ln\left(x^2+x\sqrt{-\sqrt{2}+2}+1\right)-\frac{1}{16}\sqrt{-\sqrt{2}+2}\ln\left(x^2-x\sqrt{-\sqrt{2}+2}+1\right)-\frac{1}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^8 + 1)*x^2),x, algorithm="giac")
```

```
[Out] -1/8*sqrt(sqrt(2) + 2)*arctan((2*x + sqrt(-sqrt(2) + 2))/sqrt(sqr
t(2) + 2)) - 1/8*sqrt(sqrt(2) + 2)*arctan((2*x - sqrt(-sqrt(2) +
2))/sqrt(sqrt(2) + 2)) - 1/8*sqrt(-sqrt(2) + 2)*arctan((2*x + sqr
t(sqrt(2) + 2))/sqrt(-sqrt(2) + 2)) - 1/8*sqrt(-sqrt(2) + 2)*arct
an((2*x - sqrt(sqrt(2) + 2))/sqrt(-sqrt(2) + 2)) + 1/16*sqrt(sqrt
(2) + 2)*ln(x^2 + x*sqrt(sqrt(2) + 2) + 1) - 1/16*sqrt(sqrt(2) +
2)*ln(x^2 - x*sqrt(sqrt(2) + 2) + 1) + 1/16*sqrt(-sqrt(2) + 2)*ln
(x^2 + x*sqrt(-sqrt(2) + 2) + 1) - 1/16*sqrt(-sqrt(2) + 2)*ln(x^2
 - x*sqrt(-sqrt(2) + 2) + 1) - 1/x
```

3.1504 $\int \frac{1}{x^4(1+x^8)}\,dx$

Optimal. Leaf size=354

$$-\frac{1}{3x^3}+\frac{\log\left(x^2-\sqrt{2-\sqrt{2}}x+1\right)}{8\sqrt{2\left(2-\sqrt{2}\right)}}-\frac{\log\left(x^2+\sqrt{2-\sqrt{2}}x+1\right)}{8\sqrt{2\left(2-\sqrt{2}\right)}}-\frac{\log\left(x^2-\sqrt{2+\sqrt{2}}x+1\right)}{8\sqrt{2\left(2+\sqrt{2}\right)}}+\frac{\log\left(x^2+\sqrt{2+\sqrt{2}}x+1\right)}{8\sqrt{2\left(2+\sqrt{2}\right)}}-\frac{\tan^{-1}\left(\frac{\sqrt{2-\sqrt{2}}-2x}{\sqrt{2+\sqrt{2}}}\right)}{4\sqrt{2\left(2+\sqrt{2}\right)}}+\frac{\tan^{-1}\left(\frac{\sqrt{2+\sqrt{2}}-2x}{\sqrt{2-\sqrt{2}}}\right)}{4\sqrt{2\left(2-\sqrt{2}\right)}}+\frac{\tan^{-1}\left(\frac{2x+\sqrt{2-\sqrt{2}}}{\sqrt{2+\sqrt{2}}}\right)}{4\sqrt{2\left(2+\sqrt{2}\right)}}-\frac{\tan^{-1}\left(\frac{2x+\sqrt{2+\sqrt{2}}}{\sqrt{2-\sqrt{2}}}\right)}{4\sqrt{2\left(2-\sqrt{2}\right)}}$$

```
[Out] -1/(3*x^3) - ArcTan[(Sqrt[2 - Sqrt[2]] - 2*x)/Sqrt[2 + Sqrt[2]]]/
(4*Sqrt[2*(2 + Sqrt[2])]) + ArcTan[(Sqrt[2 + Sqrt[2]] - 2*x)/Sqrt
[2 - Sqrt[2]]]/(4*Sqrt[2*(2 - Sqrt[2])]) + ArcTan[(Sqrt[2 - Sqrt[
2]] + 2*x)/Sqrt[2 + Sqrt[2]]]/(4*Sqrt[2*(2 + Sqrt[2])]) - ArcTan[
(Sqrt[2 + Sqrt[2]] + 2*x)/Sqrt[2 - Sqrt[2]]]/(4*Sqrt[2*(2 - Sqrt[
2])]) + Log[1 - Sqrt[2 - Sqrt[2]]*x + x^2]/(8*Sqrt[2*(2 - Sqrt[2]
)]) - Log[1 + Sqrt[2 - Sqrt[2]]*x + x^2]/(8*Sqrt[2*(2 - Sqrt[2])]
) - Log[1 - Sqrt[2 + Sqrt[2]]*x + x^2]/(8*Sqrt[2*(2 + Sqrt[2])])
+ Log[1 + Sqrt[2 + Sqrt[2]]*x + x^2]/(8*Sqrt[2*(2 + Sqrt[2])])
```

Rubi [A] time = 0.540179, antiderivative size = 354, normalized size of antiderivative = 1., number of steps used = 20, number of rules used = 8, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.727

$$-\frac{1}{3x^3}+\frac{\log\left(x^2-\sqrt{2-\sqrt{2}}x+1\right)}{8\sqrt{2\left(2-\sqrt{2}\right)}}-\frac{\log\left(x^2+\sqrt{2-\sqrt{2}}x+1\right)}{8\sqrt{2\left(2-\sqrt{2}\right)}}-\frac{\log\left(x^2-\sqrt{2+\sqrt{2}}x+1\right)}{8\sqrt{2\left(2+\sqrt{2}\right)}}+\frac{\log\left(x^2+\sqrt{2+\sqrt{2}}x+1\right)}{8\sqrt{2\left(2+\sqrt{2}\right)}}-\frac{\tan^{-1}\left(\frac{\sqrt{2-\sqrt{2}}-2x}{\sqrt{2+\sqrt{2}}}\right)}{4\sqrt{2\left(2+\sqrt{2}\right)}}+\frac{\tan^{-1}\left(\frac{\sqrt{2+\sqrt{2}}-2x}{\sqrt{2-\sqrt{2}}}\right)}{4\sqrt{2\left(2-\sqrt{2}\right)}}+\frac{\tan^{-1}\left(\frac{2x+\sqrt{2-\sqrt{2}}}{\sqrt{2+\sqrt{2}}}\right)}{4\sqrt{2\left(2+\sqrt{2}\right)}}-\frac{\tan^{-1}\left(\frac{2x+\sqrt{2+\sqrt{2}}}{\sqrt{2-\sqrt{2}}}\right)}{4\sqrt{2\left(2-\sqrt{2}\right)}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*(1 + x^8)),x]
```

```
[Out] -1/(3*x^3) - ArcTan[(Sqrt[2 - Sqrt[2]] - 2*x)/Sqrt[2 + Sqrt[2]]]/
(4*Sqrt[2*(2 + Sqrt[2])]) + ArcTan[(Sqrt[2 + Sqrt[2]] - 2*x)/Sqrt
[2 - Sqrt[2]]]/(4*Sqrt[2*(2 - Sqrt[2])]) + ArcTan[(Sqrt[2 - Sqrt[
2]] + 2*x)/Sqrt[2 + Sqrt[2]]]/(4*Sqrt[2*(2 + Sqrt[2])]) - ArcTan[
(Sqrt[2 + Sqrt[2]] + 2*x)/Sqrt[2 - Sqrt[2]]]/(4*Sqrt[2*(2 - Sqrt[
2])]) + Log[1 - Sqrt[2 - Sqrt[2]]*x + x^2]/(8*Sqrt[2*(2 - Sqrt[2]
)]) - Log[1 + Sqrt[2 - Sqrt[2]]*x + x^2]/(8*Sqrt[2*(2 - Sqrt[2])]
) - Log[1 - Sqrt[2 + Sqrt[2]]*x + x^2]/(8*Sqrt[2*(2 + Sqrt[2])])
+ Log[1 + Sqrt[2 + Sqrt[2]]*x + x^2]/(8*Sqrt[2*(2 + Sqrt[2])])
```

Rubi in Sympy [A] time = 55.8956, size = 318, normalized size = 0.9

$$\frac{\sqrt{2}\log\left(x^2-x\sqrt{-\sqrt{2}+2}+1\right)}{16\sqrt{-\sqrt{2}+2}}-\frac{\sqrt{2}\log\left(x^2+x\sqrt{-\sqrt{2}+2}+1\right)}{16\sqrt{-\sqrt{2}+2}}-\frac{\sqrt{2}\log\left(x^2-x\sqrt{\sqrt{2}+2}+1\right)}{16\sqrt{\sqrt{2}+2}}+\frac{\sqrt{2}\log\left(x^2+x\sqrt{\sqrt{2}+2}+1\right)}{16\sqrt{\sqrt{2}+2}}-\frac{\sqrt{2}\operatorname{atan}\left(\frac{2x-\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)}{8\sqrt{-\sqrt{2}+2}}-\frac{\sqrt{2}\operatorname{atan}\left(\frac{2x+\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)}{8\sqrt{-\sqrt{2}+2}}+\frac{\sqrt{2}\operatorname{atan}\left(\frac{2x-\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)}{8\sqrt{\sqrt{2}+2}}+\frac{\sqrt{2}\operatorname{atan}\left(\frac{2x+\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)}{8\sqrt{\sqrt{2}+2}}-\frac{1}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(x**8+1),x)
```

```
[Out] sqrt(2)*log(x**2 - x*sqrt(-sqrt(2) + 2) + 1)/(16*sqrt(-sqrt(2) +
2)) - sqrt(2)*log(x**2 + x*sqrt(-sqrt(2) + 2) + 1)/(16*sqrt(-sqrt
(2) + 2)) - sqrt(2)*log(x**2 - x*sqrt(sqrt(2) + 2) + 1)/(16*sqrt(
sqrt(2) + 2)) + sqrt(2)*log(x**2 + x*sqrt(sqrt(2) + 2) + 1)/(16*s
qrt(sqrt(2) + 2)) - sqrt(2)*atan((2*x - sqrt(sqrt(2) + 2))/sqrt(-
sqrt(2) + 2))/(8*sqrt(-sqrt(2) + 2)) - sqrt(2)*atan((2*x + sqrt(s
qrt(2) + 2))/sqrt(-sqrt(2) + 2))/(8*sqrt(-sqrt(2) + 2)) + sqrt(2)
*atan((2*x - sqrt(-sqrt(2) + 2))/sqrt(sqrt(2) + 2))/(8*sqrt(sqrt(
2) + 2)) + sqrt(2)*atan((2*x + sqrt(-sqrt(2) + 2))/sqrt(sqrt(2) +
 2))/(8*sqrt(sqrt(2) + 2)) - 1/(3*x**3)
```

Mathematica [A] time = 0.0112836, size = 216, normalized size = 0.61

$$-\frac{1}{3x^3}+\frac{1}{8}\cos\left(\frac{\pi}{8}\right)\log\left(x^2-2x\sin\left(\frac{\pi}{8}\right)+1\right)-\frac{1}{8}\cos\left(\frac{\pi}{8}\right)\log\left(x^2+2x\sin\left(\frac{\pi}{8}\right)+1\right)-\frac{1}{8}\sin\left(\frac{\pi}{8}\right)\log\left(x^2-2x\cos\left(\frac{\pi}{8}\right)+1\right)+\frac{1}{8}\sin\left(\frac{\pi}{8}\right)\log\left(x^2+2x\cos\left(\frac{\pi}{8}\right)+1\right)-\frac{1}{4}\cos\left(\frac{\pi}{8}\right)\tan^{-1}\left(\csc\left(\frac{\pi}{8}\right)\left(x-\cos\left(\frac{\pi}{8}\right)\right)\right)-\frac{1}{4}\cos\left(\frac{\pi}{8}\right)\tan^{-1}\left(\csc\left(\frac{\pi}{8}\right)\left(x+\cos\left(\frac{\pi}{8}\right)\right)\right)+\frac{1}{4}\sin\left(\frac{\pi}{8}\right)\tan^{-1}\left(\sec\left(\frac{\pi}{8}\right)\left(x-\sin\left(\frac{\pi}{8}\right)\right)\right)+\frac{1}{4}\sin\left(\frac{\pi}{8}\right)\tan^{-1}\left(\sec\left(\frac{\pi}{8}\right)\left(x+\sin\left(\frac{\pi}{8}\right)\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*(1 + x^8)),x]
```

```
[Out] -1/(3*x^3) - (ArcTan[(x - Cos[Pi/8])*Csc[Pi/8]]*Cos[Pi/8])/4 - (A
rcTan[(x + Cos[Pi/8])*Csc[Pi/8]]*Cos[Pi/8])/4 + (Cos[Pi/8]*Log[1
+ x^2 - 2*x*Sin[Pi/8]])/8 - (Cos[Pi/8]*Log[1 + x^2 + 2*x*Sin[Pi/8
]])/8 + (ArcTan[Sec[Pi/8]*(x - Sin[Pi/8])]*Sin[Pi/8])/4 + (ArcTan
[Sec[Pi/8]*(x + Sin[Pi/8])]*Sin[Pi/8])/4 - (Log[1 + x^2 - 2*x*Cos
[Pi/8]]*Sin[Pi/8])/8 + (Log[1 + x^2 + 2*x*Cos[Pi/8]]*Sin[Pi/8])/8
```

Maple [C] time = 0.01, size = 28, normalized size = 0.1

$$-\frac{1}{8}\sum_{\_R=RootOf(\_Z^8+1)}\frac{\ln(x-\_R)}{\_R^3}-\frac{1}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(x^8+1),x)
```

```
[Out] -1/8*sum(1/_R^3*ln(x-_R),_R=RootOf(_Z^8+1))-1/3/x^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{3\,x^3} - \int \frac{x^4}{x^8+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^8 + 1)*x^4),x, algorithm="maxima")
```

```
[Out] -1/3/x^3 - integrate(x^4/(x^8 + 1), x)
```

Fricas [A] time = 0.250024, size = 1474, normalized size = 4.16

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^8 + 1)*x^4),x, algorithm="fricas")
```

```
[Out] -1/192*sqrt(2)*(12*sqrt(2)*x^3*sqrt(-sqrt(2) + 2)*arctan(sqrt(sqr
t(2) + 2)/(2*x + 2*sqrt(x^2 + x*sqrt(-sqrt(2) + 2) + 1) + sqrt(-s
qrt(2) + 2))) + 12*sqrt(2)*x^3*sqrt(-sqrt(2) + 2)*arctan(sqrt(sqr
t(2) + 2)/(2*x + 2*sqrt(x^2 - x*sqrt(-sqrt(2) + 2) + 1) - sqrt(-s
qrt(2) + 2))) - 12*sqrt(2)*x^3*sqrt(sqrt(2) + 2)*arctan(sqrt(-sqr
t(2) + 2)/(2*x + 2*sqrt(x^2 + x*sqrt(sqrt(2) + 2) + 1) + sqrt(sqr
t(2) + 2))) - 12*sqrt(2)*x^3*sqrt(sqrt(2) + 2)*arctan(sqrt(-sqrt(
2) + 2)/(2*x + 2*sqrt(x^2 - x*sqrt(sqrt(2) + 2) + 1) - sqrt(sqrt(
2) + 2))) - 3*sqrt(2)*x^3*sqrt(-sqrt(2) + 2)*log(x^2 + x*sqrt(sqr
t(2) + 2) + 1) + 3*sqrt(2)*x^3*sqrt(-sqrt(2) + 2)*log(x^2 - x*sqr
t(sqrt(2) + 2) + 1) + 3*sqrt(2)*x^3*sqrt(sqrt(2) + 2)*log(x^2 + x
*sqrt(-sqrt(2) + 2) + 1) - 3*sqrt(2)*x^3*sqrt(sqrt(2) + 2)*log(x^
2 - x*sqrt(-sqrt(2) + 2) + 1) + 12*(x^3*sqrt(sqrt(2) + 2) - x^3*s
qrt(-sqrt(2) + 2))*arctan((sqrt(sqrt(2) + 2) + sqrt(-sqrt(2) + 2)
)/(2*sqrt(2)*x + 2*sqrt(2)*sqrt(x^2 + 1/2*sqrt(2)*x*sqrt(sqrt(2)
+ 2) - 1/2*sqrt(2)*x*sqrt(-sqrt(2) + 2) + 1) + sqrt(sqrt(2) + 2)
- sqrt(-sqrt(2) + 2))) + 12*(x^3*sqrt(sqrt(2) + 2) - x^3*sqrt(-sq
rt(2) + 2))*arctan((sqrt(sqrt(2) + 2) + sqrt(-sqrt(2) + 2))/(2*sq
rt(2)*x + 2*sqrt(2)*sqrt(x^2 - 1/2*sqrt(2)*x*sqrt(sqrt(2) + 2) +
1/2*sqrt(2)*x*sqrt(-sqrt(2) + 2) + 1) - sqrt(sqrt(2) + 2) + sqrt(
-sqrt(2) + 2))) + 12*(x^3*sqrt(sqrt(2) + 2) + x^3*sqrt(-sqrt(2) +
 2))*arctan(-(sqrt(sqrt(2) + 2) - sqrt(-sqrt(2) + 2))/(2*sqrt(2)*
x + 2*sqrt(2)*sqrt(x^2 + 1/2*sqrt(2)*x*sqrt(sqrt(2) + 2) + 1/2*sq
rt(2)*x*sqrt(-sqrt(2) + 2) + 1) + sqrt(sqrt(2) + 2) + sqrt(-sqrt(
2) + 2))) + 12*(x^3*sqrt(sqrt(2) + 2) + x^3*sqrt(-sqrt(2) + 2))*a
rctan(-(sqrt(sqrt(2) + 2) - sqrt(-sqrt(2) + 2))/(2*sqrt(2)*x + 2*
sqrt(2)*sqrt(x^2 - 1/2*sqrt(2)*x*sqrt(sqrt(2) + 2) - 1/2*sqrt(2)*
x*sqrt(-sqrt(2) + 2) + 1) - sqrt(sqrt(2) + 2) - sqrt(-sqrt(2) + 2
))) - 3*(x^3*sqrt(sqrt(2) + 2) - x^3*sqrt(-sqrt(2) + 2))*log(x^2
+ 1/2*sqrt(2)*x*sqrt(sqrt(2) + 2) + 1/2*sqrt(2)*x*sqrt(-sqrt(2) +
 2) + 1) + 3*(x^3*sqrt(sqrt(2) + 2) + x^3*sqrt(-sqrt(2) + 2))*log
(x^2 + 1/2*sqrt(2)*x*sqrt(sqrt(2) + 2) - 1/2*sqrt(2)*x*sqrt(-sqrt
(2) + 2) + 1) - 3*(x^3*sqrt(sqrt(2) + 2) + x^3*sqrt(-sqrt(2) + 2)
)*log(x^2 - 1/2*sqrt(2)*x*sqrt(sqrt(2) + 2) + 1/2*sqrt(2)*x*sqrt(
-sqrt(2) + 2) + 1) + 3*(x^3*sqrt(sqrt(2) + 2) - x^3*sqrt(-sqrt(2)
 + 2))*log(x^2 - 1/2*sqrt(2)*x*sqrt(sqrt(2) + 2) - 1/2*sqrt(2)*x*
sqrt(-sqrt(2) + 2) + 1) + 32*sqrt(2))/x^3
```

Sympy [A] time = 4.3808, size = 22, normalized size = 0.06

$$\operatorname{RootSum}\left(16777216t^8+1,\left(t\mapsto t\log\left(32768t^5+x\right)\right)\right)-\frac{1}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(x**8+1),x)
```

```
[Out] RootSum(16777216*_t**8 + 1, Lambda(_t, _t*log(32768*_t**5 + x)))
- 1/(3*x**3)
```

GIAC/XCAS [A] time = 0.258338, size = 329, normalized size = 0.93

$$\frac{1}{8}\sqrt{-\sqrt{2}+2}\arctan\left(\frac{2x+\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)+\frac{1}{8}\sqrt{-\sqrt{2}+2}\arctan\left(\frac{2x-\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)-\frac{1}{8}\sqrt{\sqrt{2}+2}\arctan\left(\frac{2x+\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)-\frac{1}{8}\sqrt{\sqrt{2}+2}\arctan\left(\frac{2x-\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)+\frac{1}{16}\sqrt{-\sqrt{2}+2}\ln\left(x^2+x\sqrt{\sqrt{2}+2}+1\right)-\frac{1}{16}\sqrt{-\sqrt{2}+2}\ln\left(x^2-x\sqrt{\sqrt{2}+2}+1\right)-\frac{1}{16}\sqrt{\sqrt{2}+2}\ln\left(x^2+x\sqrt{-\sqrt{2}+2}+1\right)+\frac{1}{16}\sqrt{\sqrt{2}+2}\ln\left(x^2-x\sqrt{-\sqrt{2}+2}+1\right)-\frac{1}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^8 + 1)*x^4),x, algorithm="giac")
```

```
[Out] 1/8*sqrt(-sqrt(2) + 2)*arctan((2*x + sqrt(-sqrt(2) + 2))/sqrt(sqr
t(2) + 2)) + 1/8*sqrt(-sqrt(2) + 2)*arctan((2*x - sqrt(-sqrt(2) +
 2))/sqrt(sqrt(2) + 2)) - 1/8*sqrt(sqrt(2) + 2)*arctan((2*x + sqr
t(sqrt(2) + 2))/sqrt(-sqrt(2) + 2)) - 1/8*sqrt(sqrt(2) + 2)*arcta
n((2*x - sqrt(sqrt(2) + 2))/sqrt(-sqrt(2) + 2)) + 1/16*sqrt(-sqrt
(2) + 2)*ln(x^2 + x*sqrt(sqrt(2) + 2) + 1) - 1/16*sqrt(-sqrt(2) +
 2)*ln(x^2 - x*sqrt(sqrt(2) + 2) + 1) - 1/16*sqrt(sqrt(2) + 2)*ln
(x^2 + x*sqrt(-sqrt(2) + 2) + 1) + 1/16*sqrt(sqrt(2) + 2)*ln(x^2
- x*sqrt(-sqrt(2) + 2) + 1) - 1/3/x^3
```

3.1505 $\int \frac{1}{x^6(1+x^8)}\,dx$

Optimal. Leaf size=346

$$-\frac{1}{5x^5}-\frac{\log\left(x^2-\sqrt{2-\sqrt{2}}x+1\right)}{8\sqrt{2\left(2-\sqrt{2}\right)}}+\frac{\log\left(x^2+\sqrt{2-\sqrt{2}}x+1\right)}{8\sqrt{2\left(2-\sqrt{2}\right)}}+\frac{\log\left(x^2-\sqrt{2+\sqrt{2}}x+1\right)}{8\sqrt{2\left(2+\sqrt{2}\right)}}-\frac{\log\left(x^2+\sqrt{2+\sqrt{2}}x+1\right)}{8\sqrt{2\left(2+\sqrt{2}\right)}}-\frac{1}{8}\sqrt{2-\sqrt{2}}\tan^{-1}\left(\frac{\sqrt{2-\sqrt{2}}-2x}{\sqrt{2+\sqrt{2}}}\right)+\frac{1}{8}\sqrt{2+\sqrt{2}}\tan^{-1}\left(\frac{\sqrt{2+\sqrt{2}}-2x}{\sqrt{2-\sqrt{2}}}\right)+\frac{1}{8}\sqrt{2-\sqrt{2}}\tan^{-1}\left(\frac{2x+\sqrt{2-\sqrt{2}}}{\sqrt{2+\sqrt{2}}}\right)-\frac{1}{8}\sqrt{2+\sqrt{2}}\tan^{-1}\left(\frac{2x+\sqrt{2+\sqrt{2}}}{\sqrt{2-\sqrt{2}}}\right)$$

```
[Out] -1/(5*x^5) - (Sqrt[2 - Sqrt[2]]*ArcTan[(Sqrt[2 - Sqrt[2]] - 2*x)/
Sqrt[2 + Sqrt[2]]])/8 + (Sqrt[2 + Sqrt[2]]*ArcTan[(Sqrt[2 + Sqrt[
2]] - 2*x)/Sqrt[2 - Sqrt[2]]])/8 + (Sqrt[2 - Sqrt[2]]*ArcTan[(Sqr
t[2 - Sqrt[2]] + 2*x)/Sqrt[2 + Sqrt[2]]])/8 - (Sqrt[2 + Sqrt[2]]*
ArcTan[(Sqrt[2 + Sqrt[2]] + 2*x)/Sqrt[2 - Sqrt[2]]])/8 - Log[1 -
Sqrt[2 - Sqrt[2]]*x + x^2]/(8*Sqrt[2*(2 - Sqrt[2])]) + Log[1 + Sq
rt[2 - Sqrt[2]]*x + x^2]/(8*Sqrt[2*(2 - Sqrt[2])]) + Log[1 - Sqrt
[2 + Sqrt[2]]*x + x^2]/(8*Sqrt[2*(2 + Sqrt[2])]) - Log[1 + Sqrt[2
 + Sqrt[2]]*x + x^2]/(8*Sqrt[2*(2 + Sqrt[2])])
```

Rubi [A] time = 0.522588, antiderivative size = 346, normalized size of antiderivative = 1., number of steps used = 20, number of rules used = 7, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.636

$$-\frac{1}{5x^5}-\frac{\log\left(x^2-\sqrt{2-\sqrt{2}}x+1\right)}{8\sqrt{2\left(2-\sqrt{2}\right)}}+\frac{\log\left(x^2+\sqrt{2-\sqrt{2}}x+1\right)}{8\sqrt{2\left(2-\sqrt{2}\right)}}+\frac{\log\left(x^2-\sqrt{2+\sqrt{2}}x+1\right)}{8\sqrt{2\left(2+\sqrt{2}\right)}}-\frac{\log\left(x^2+\sqrt{2+\sqrt{2}}x+1\right)}{8\sqrt{2\left(2+\sqrt{2}\right)}}-\frac{1}{8}\sqrt{2-\sqrt{2}}\tan^{-1}\left(\frac{\sqrt{2-\sqrt{2}}-2x}{\sqrt{2+\sqrt{2}}}\right)+\frac{1}{8}\sqrt{2+\sqrt{2}}\tan^{-1}\left(\frac{\sqrt{2+\sqrt{2}}-2x}{\sqrt{2-\sqrt{2}}}\right)+\frac{1}{8}\sqrt{2-\sqrt{2}}\tan^{-1}\left(\frac{2x+\sqrt{2-\sqrt{2}}}{\sqrt{2+\sqrt{2}}}\right)-\frac{1}{8}\sqrt{2+\sqrt{2}}\tan^{-1}\left(\frac{2x+\sqrt{2+\sqrt{2}}}{\sqrt{2-\sqrt{2}}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^6*(1 + x^8)),x]
```


```
[Out] -1/(5*x^5) - (Sqrt[2 - Sqrt[2]]*ArcTan[(Sqrt[2 - Sqrt[2]] - 2*x)/
Sqrt[2 + Sqrt[2]]])/8 + (Sqrt[2 + Sqrt[2]]*ArcTan[(Sqrt[2 + Sqrt[
2]] - 2*x)/Sqrt[2 - Sqrt[2]]])/8 + (Sqrt[2 - Sqrt[2]]*ArcTan[(Sqr
t[2 - Sqrt[2]] + 2*x)/Sqrt[2 + Sqrt[2]]])/8 - (Sqrt[2 + Sqrt[2]]*
ArcTan[(Sqrt[2 + Sqrt[2]] + 2*x)/Sqrt[2 - Sqrt[2]]])/8 - Log[1 -
Sqrt[2 - Sqrt[2]]*x + x^2]/(8*Sqrt[2*(2 - Sqrt[2])]) + Log[1 + Sq
rt[2 - Sqrt[2]]*x + x^2]/(8*Sqrt[2*(2 - Sqrt[2])]) + Log[1 - Sqrt
[2 + Sqrt[2]]*x + x^2]/(8*Sqrt[2*(2 + Sqrt[2])]) - Log[1 + Sqrt[2
 + Sqrt[2]]*x + x^2]/(8*Sqrt[2*(2 + Sqrt[2])])
```

Rubi in Sympy [A] time = 39.6639, size = 318, normalized size = 0.92

$$-\frac{\sqrt{2}\log\left(x^2-x\sqrt{-\sqrt{2}+2}+1\right)}{16\sqrt{-\sqrt{2}+2}}+\frac{\sqrt{2}\log\left(x^2+x\sqrt{-\sqrt{2}+2}+1\right)}{16\sqrt{-\sqrt{2}+2}}+\frac{\sqrt{2}\log\left(x^2-x\sqrt{\sqrt{2}+2}+1\right)}{16\sqrt{\sqrt{2}+2}}-\frac{\sqrt{2}\log\left(x^2+x\sqrt{\sqrt{2}+2}+1\right)}{16\sqrt{\sqrt{2}+2}}-\frac{\sqrt{2}\operatorname{atan}\left(\frac{2x-\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)}{8\sqrt{-\sqrt{2}+2}}-\frac{\sqrt{2}\operatorname{atan}\left(\frac{2x+\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)}{8\sqrt{-\sqrt{2}+2}}+\frac{\sqrt{2}\operatorname{atan}\left(\frac{2x-\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)}{8\sqrt{\sqrt{2}+2}}+\frac{\sqrt{2}\operatorname{atan}\left(\frac{2x+\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)}{8\sqrt{\sqrt{2}+2}}-\frac{1}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**6/(x**8+1),x)
```

```
[Out] -sqrt(2)*log(x**2 - x*sqrt(-sqrt(2) + 2) + 1)/(16*sqrt(-sqrt(2) +
 2)) + sqrt(2)*log(x**2 + x*sqrt(-sqrt(2) + 2) + 1)/(16*sqrt(-sqr
t(2) + 2)) + sqrt(2)*log(x**2 - x*sqrt(sqrt(2) + 2) + 1)/(16*sqrt
(sqrt(2) + 2)) - sqrt(2)*log(x**2 + x*sqrt(sqrt(2) + 2) + 1)/(16*
sqrt(sqrt(2) + 2)) - sqrt(2)*atan((2*x - sqrt(sqrt(2) + 2))/sqrt(
-sqrt(2) + 2))/(8*sqrt(-sqrt(2) + 2)) - sqrt(2)*atan((2*x + sqrt(
sqrt(2) + 2))/sqrt(-sqrt(2) + 2))/(8*sqrt(-sqrt(2) + 2)) + sqrt(2
)*atan((2*x - sqrt(-sqrt(2) + 2))/sqrt(sqrt(2) + 2))/(8*sqrt(sqrt
(2) + 2)) + sqrt(2)*atan((2*x + sqrt(-sqrt(2) + 2))/sqrt(sqrt(2)
+ 2))/(8*sqrt(sqrt(2) + 2)) - 1/(5*x**5)
```

Mathematica [A] time = 0.0116317, size = 216, normalized size = 0.62

$$-\frac{1}{5x^5}-\frac{1}{8}\cos\left(\frac{\pi}{8}\right)\log\left(x^2-2x\sin\left(\frac{\pi}{8}\right)+1\right)+\frac{1}{8}\cos\left(\frac{\pi}{8}\right)\log\left(x^2+2x\sin\left(\frac{\pi}{8}\right)+1\right)+\frac{1}{8}\sin\left(\frac{\pi}{8}\right)\log\left(x^2-2x\cos\left(\frac{\pi}{8}\right)+1\right)-\frac{1}{8}\sin\left(\frac{\pi}{8}\right)\log\left(x^2+2x\cos\left(\frac{\pi}{8}\right)+1\right)-\frac{1}{4}\cos\left(\frac{\pi}{8}\right)\tan^{-1}\left(\csc\left(\frac{\pi}{8}\right)\left(x-\cos\left(\frac{\pi}{8}\right)\right)\right)-\frac{1}{4}\cos\left(\frac{\pi}{8}\right)\tan^{-1}\left(\csc\left(\frac{\pi}{8}\right)\left(x+\cos\left(\frac{\pi}{8}\right)\right)\right)+\frac{1}{4}\sin\left(\frac{\pi}{8}\right)\tan^{-1}\left(\sec\left(\frac{\pi}{8}\right)\left(x-\sin\left(\frac{\pi}{8}\right)\right)\right)+\frac{1}{4}\sin\left(\frac{\pi}{8}\right)\tan^{-1}\left(\sec\left(\frac{\pi}{8}\right)\left(x+\sin\left(\frac{\pi}{8}\right)\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^6*(1 + x^8)),x]
```

```
[Out] -1/(5*x^5) - (ArcTan[(x - Cos[Pi/8])*Csc[Pi/8]]*Cos[Pi/8])/4 - (A
rcTan[(x + Cos[Pi/8])*Csc[Pi/8]]*Cos[Pi/8])/4 - (Cos[Pi/8]*Log[1
+ x^2 - 2*x*Sin[Pi/8]])/8 + (Cos[Pi/8]*Log[1 + x^2 + 2*x*Sin[Pi/8
]])/8 + (ArcTan[Sec[Pi/8]*(x - Sin[Pi/8])]*Sin[Pi/8])/4 + (ArcTan
[Sec[Pi/8]*(x + Sin[Pi/8])]*Sin[Pi/8])/4 + (Log[1 + x^2 - 2*x*Cos
[Pi/8]]*Sin[Pi/8])/8 - (Log[1 + x^2 + 2*x*Cos[Pi/8]]*Sin[Pi/8])/8
```

Maple [C] time = 0.008, size = 28, normalized size = 0.1

$$-\frac{1}{8}\sum_{\_R=RootOf(\_Z^8+1)}\frac{\ln(x-\_R)}{\_R^5}-\frac{1}{5\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^6/(x^8+1),x)
```

```
[Out] -1/8*sum(1/_R^5*ln(x-_R),_R=RootOf(_Z^8+1))-1/5/x^5
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{5\,x^5} - \int \frac{x^2}{x^8+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^8 + 1)*x^6),x, algorithm="maxima")
```

```
[Out] -1/5/x^5 - integrate(x^2/(x^8 + 1), x)
```

Fricas [A] time = 0.254584, size = 3472, normalized size = 10.03

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^8 + 1)*x^6),x, algorithm="fricas")
```

```
[Out] -1/320*sqrt(2)*(20*sqrt(2)*x^5*sqrt(sqrt(2) + 2)*arctan(-((sqrt(2
) + 2)^(3/2) + 3*sqrt(sqrt(2) + 2)*(sqrt(2) - 2))/(3*(sqrt(2) + 2
)*sqrt(-sqrt(2) + 2) - (-sqrt(2) + 2)^(3/2) + 8*x + sqrt((sqrt(2)
 + 2)^3 - 3*(sqrt(2) + 2)^2*(sqrt(2) - 2) + 3*(sqrt(2) + 2)*(sqrt
(2) - 2)^2 - (sqrt(2) - 2)^3 + 48*x*(sqrt(2) + 2)*sqrt(-sqrt(2) +
 2) - 16*x*(-sqrt(2) + 2)^(3/2) + 64*x^2))) + 20*sqrt(2)*x^5*sqrt
(sqrt(2) + 2)*arctan(((sqrt(2) + 2)^(3/2) + 3*sqrt(sqrt(2) + 2)*(
sqrt(2) - 2))/(3*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) - (-sqrt(2) + 2
)^(3/2) - 8*x - sqrt((sqrt(2) + 2)^3 - 3*(sqrt(2) + 2)^2*(sqrt(2)
 - 2) + 3*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - (sqrt(2) - 2)^3 - 48*x*
(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) + 16*x*(-sqrt(2) + 2)^(3/2) + 64
*x^2))) - 20*sqrt(2)*x^5*sqrt(-sqrt(2) + 2)*arctan(-(3*(sqrt(2) +
 2)*sqrt(-sqrt(2) + 2) - (-sqrt(2) + 2)^(3/2))/((sqrt(2) + 2)^(3/
2) + 3*sqrt(sqrt(2) + 2)*(sqrt(2) - 2) + 8*x + sqrt((sqrt(2) + 2)
^3 + 3*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - (sqrt(2) - 2)^3 + 16*x*(sq
rt(2) + 2)^(3/2) + 64*x^2 - 3*((sqrt(2) + 2)^2 - 16*x*sqrt(sqrt(2
) + 2))*(sqrt(2) - 2)))) - 20*sqrt(2)*x^5*sqrt(-sqrt(2) + 2)*arct
an((3*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) - (-sqrt(2) + 2)^(3/2))/((
sqrt(2) + 2)^(3/2) + 3*sqrt(sqrt(2) + 2)*(sqrt(2) - 2) - 8*x - sq
rt((sqrt(2) + 2)^3 + 3*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - (sqrt(2) -
 2)^3 - 16*x*(sqrt(2) + 2)^(3/2) + 64*x^2 - 3*((sqrt(2) + 2)^2 +
16*x*sqrt(sqrt(2) + 2))*(sqrt(2) - 2)))) + 5*sqrt(2)*x^5*sqrt(-sq
rt(2) + 2)*log(1/64*(sqrt(2) + 2)^3 - 3/64*(sqrt(2) + 2)^2*(sqrt(
2) - 2) + 3/64*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - 1/64*(sqrt(2) - 2)
^3 + 3/4*x*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) - 1/4*x*(-sqrt(2) + 2
)^(3/2) + x^2) - 5*sqrt(2)*x^5*sqrt(-sqrt(2) + 2)*log(1/64*(sqrt(
2) + 2)^3 - 3/64*(sqrt(2) + 2)^2*(sqrt(2) - 2) + 3/64*(sqrt(2) +
2)*(sqrt(2) - 2)^2 - 1/64*(sqrt(2) - 2)^3 - 3/4*x*(sqrt(2) + 2)*s
qrt(-sqrt(2) + 2) + 1/4*x*(-sqrt(2) + 2)^(3/2) + x^2) - 5*sqrt(2)
*x^5*sqrt(sqrt(2) + 2)*log(1/64*(sqrt(2) + 2)^3 + 3/64*(sqrt(2) +
 2)*(sqrt(2) - 2)^2 - 1/64*(sqrt(2) - 2)^3 + 1/4*x*(sqrt(2) + 2)^
(3/2) + x^2 - 3/64*((sqrt(2) + 2)^2 - 16*x*sqrt(sqrt(2) + 2))*(sq
rt(2) - 2)) + 5*sqrt(2)*x^5*sqrt(sqrt(2) + 2)*log(1/64*(sqrt(2) +
 2)^3 + 3/64*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - 1/64*(sqrt(2) - 2)^3
 - 1/4*x*(sqrt(2) + 2)^(3/2) + x^2 - 3/64*((sqrt(2) + 2)^2 + 16*x
*sqrt(sqrt(2) + 2))*(sqrt(2) - 2)) - 20*(x^5*sqrt(sqrt(2) + 2) -
x^5*sqrt(-sqrt(2) + 2))*arctan(-((sqrt(2) + 2)^(3/2) + 3*sqrt(sqr
t(2) + 2)*(sqrt(2) - 2) + 3*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) - (-
sqrt(2) + 2)^(3/2))/(8*sqrt(2)*x + (sqrt(2) + 2)^(3/2) + 3*sqrt(s
qrt(2) + 2)*(sqrt(2) - 2) - 3*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) +
(-sqrt(2) + 2)^(3/2) + sqrt(2)*sqrt(8*sqrt(2)*x*(sqrt(2) + 2)^(3/
2) + (sqrt(2) + 2)^3 + 3*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - (sqrt(2)
 - 2)^3 - 24*sqrt(2)*x*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) + 8*sqrt(
2)*x*(-sqrt(2) + 2)^(3/2) + 64*x^2 + 3*(8*sqrt(2)*x*sqrt(sqrt(2)
+ 2) - (sqrt(2) + 2)^2)*(sqrt(2) - 2)))) - 20*(x^5*sqrt(sqrt(2) +
 2) - x^5*sqrt(-sqrt(2) + 2))*arctan(-((sqrt(2) + 2)^(3/2) + 3*sq
rt(sqrt(2) + 2)*(sqrt(2) - 2) + 3*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2
```

```
) - (-sqrt(2) + 2)^(3/2))/(8*sqrt(2)*x - (sqrt(2) + 2)^(3/2) - 3*
sqrt(sqrt(2) + 2)*(sqrt(2) - 2) + 3*(sqrt(2) + 2)*sqrt(-sqrt(2) +
 2) - (-sqrt(2) + 2)^(3/2) + 8*sqrt(2)*sqrt(-1/8*sqrt(2)*x*(sqrt(
2) + 2)^(3/2) + 1/64*(sqrt(2) + 2)^3 + 3/64*(sqrt(2) + 2)*(sqrt(2
) - 2)^2 - 1/64*(sqrt(2) - 2)^3 + 3/8*sqrt(2)*x*(sqrt(2) + 2)*sqr
t(-sqrt(2) + 2) - 1/8*sqrt(2)*x*(-sqrt(2) + 2)^(3/2) + x^2 - 3/64
*(8*sqrt(2)*x*sqrt(sqrt(2) + 2) + (sqrt(2) + 2)^2)*(sqrt(2) - 2))
)) + 20*(x^5*sqrt(sqrt(2) + 2) + x^5*sqrt(-sqrt(2) + 2))*arctan((
(sqrt(2) + 2)^(3/2) + 3*sqrt(sqrt(2) + 2)*(sqrt(2) - 2) - 3*(sqrt
(2) + 2)*sqrt(-sqrt(2) + 2) + (-sqrt(2) + 2)^(3/2))/(8*sqrt(2)*x
+ (sqrt(2) + 2)^(3/2) + 3*sqrt(sqrt(2) + 2)*(sqrt(2) - 2) + 3*(sq
rt(2) + 2)*sqrt(-sqrt(2) + 2) - (-sqrt(2) + 2)^(3/2) + sqrt(2)*sq
rt(8*sqrt(2)*x*(sqrt(2) + 2)^(3/2) + (sqrt(2) + 2)^3 + 3*(sqrt(2)
 + 2)*(sqrt(2) - 2)^2 - (sqrt(2) - 2)^3 + 24*sqrt(2)*x*(sqrt(2) +
 2)*sqrt(-sqrt(2) + 2) - 8*sqrt(2)*x*(-sqrt(2) + 2)^(3/2) + 64*x^
2 + 3*(8*sqrt(2)*x*sqrt(sqrt(2) + 2) - (sqrt(2) + 2)^2)*(sqrt(2)
- 2)))) + 20*(x^5*sqrt(sqrt(2) + 2) + x^5*sqrt(-sqrt(2) + 2))*arc
tan(((sqrt(2) + 2)^(3/2) + 3*sqrt(sqrt(2) + 2)*(sqrt(2) - 2) - 3*
(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) + (-sqrt(2) + 2)^(3/2))/(8*sqrt(
2)*x - (sqrt(2) + 2)^(3/2) - 3*sqrt(sqrt(2) + 2)*(sqrt(2) - 2) -
3*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) + (-sqrt(2) + 2)^(3/2) + 8*sqr
t(2)*sqrt(-1/8*sqrt(2)*x*(sqrt(2) + 2)^(3/2) + 1/64*(sqrt(2) + 2)
^3 + 3/64*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - 1/64*(sqrt(2) - 2)^3 -
3/8*sqrt(2)*x*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) + 1/8*sqrt(2)*x*(-
sqrt(2) + 2)^(3/2) + x^2 - 3/64*(8*sqrt(2)*x*sqrt(sqrt(2) + 2) +
(sqrt(2) + 2)^2)*(sqrt(2) - 2)))) + 5*(x^5*sqrt(sqrt(2) + 2) - x^
5*sqrt(-sqrt(2) + 2))*log(1/8*sqrt(2)*x*(sqrt(2) + 2)^(3/2) + 1/6
4*(sqrt(2) + 2)^3 + 3/64*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - 1/64*(sq
rt(2) - 2)^3 + 3/8*sqrt(2)*x*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) - 1
/8*sqrt(2)*x*(-sqrt(2) + 2)^(3/2) + x^2 + 3/64*(8*sqrt(2)*x*sqrt(
sqrt(2) + 2) - (sqrt(2) + 2)^2)*(sqrt(2) - 2)) + 5*(x^5*sqrt(sqrt
(2) + 2) + x^5*sqrt(-sqrt(2) + 2))*log(1/8*sqrt(2)*x*(sqrt(2) + 2
)^(3/2) + 1/64*(sqrt(2) + 2)^3 + 3/64*(sqrt(2) + 2)*(sqrt(2) - 2)
^2 - 1/64*(sqrt(2) - 2)^3 - 3/8*sqrt(2)*x*(sqrt(2) + 2)*sqrt(-sqr
t(2) + 2) + 1/8*sqrt(2)*x*(-sqrt(2) + 2)^(3/2) + x^2 + 3/64*(8*sq
rt(2)*x*sqrt(sqrt(2) + 2) - (sqrt(2) + 2)^2)*(sqrt(2) - 2)) - 5*(
x^5*sqrt(sqrt(2) + 2) + x^5*sqrt(-sqrt(2) + 2))*log(-1/8*sqrt(2)*
x*(sqrt(2) + 2)^(3/2) + 1/64*(sqrt(2) + 2)^3 + 3/64*(sqrt(2) + 2)
*(sqrt(2) - 2)^2 - 1/64*(sqrt(2) - 2)^3 + 3/8*sqrt(2)*x*(sqrt(2)
+ 2)*sqrt(-sqrt(2) + 2) - 1/8*sqrt(2)*x*(-sqrt(2) + 2)^(3/2) + x^
2 - 3/64*(8*sqrt(2)*x*sqrt(sqrt(2) + 2) + (sqrt(2) + 2)^2)*(sqrt(
2) - 2)) - 5*(x^5*sqrt(sqrt(2) + 2) - x^5*sqrt(-sqrt(2) + 2))*log
(-1/8*sqrt(2)*x*(sqrt(2) + 2)^(3/2) + 1/64*(sqrt(2) + 2)^3 + 3/64
*(sqrt(2) + 2)*(sqrt(2) - 2)^2 - 1/64*(sqrt(2) - 2)^3 - 3/8*sqrt(
2)*x*(sqrt(2) + 2)*sqrt(-sqrt(2) + 2) + 1/8*sqrt(2)*x*(-sqrt(2) +
 2)^(3/2) + x^2 - 3/64*(8*sqrt(2)*x*sqrt(sqrt(2) + 2) + (sqrt(2)
+ 2)^2)*(sqrt(2) - 2)) + 32*sqrt(2))/x^5
```

Sympy [A] time = 4.45463, size = 22, normalized size = 0.06

$$\operatorname{RootSum}\left(16777216t^8 + 1, \left(t \mapsto t\log\left(512t^3 + x\right)\right)\right) - \frac{1}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**6/(x**8+1),x)
```

```
[Out] RootSum(16777216*_t**8 + 1, Lambda(_t, _t*log(512*_t**3 + x))) -
1/(5*x**5)
```

GIAC/XCAS [A] time = 0.255283, size = 329, normalized size = 0.95

$$\frac{1}{8}\sqrt{-\sqrt{2}+2}\arctan\left(\frac{2x+\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)+\frac{1}{8}\sqrt{-\sqrt{2}+2}\arctan\left(\frac{2x-\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)-\frac{1}{8}\sqrt{\sqrt{2}+2}\arctan\left(\frac{2x+\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)-\frac{1}{8}\sqrt{\sqrt{2}+2}\arctan\left(\frac{2x-\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)-\frac{1}{16}\sqrt{-\sqrt{2}+2}\ln\left(x^2+x\sqrt{\sqrt{2}+2}+1\right)+\frac{1}{16}\sqrt{-\sqrt{2}+2}\ln\left(x^2-x\sqrt{\sqrt{2}+2}+1\right)+\frac{1}{16}\sqrt{\sqrt{2}+2}\ln\left(x^2+x\sqrt{-\sqrt{2}+2}+1\right)-\frac{1}{16}\sqrt{\sqrt{2}+2}\ln\left(x^2-x\sqrt{-\sqrt{2}+2}+1\right)-\frac{1}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^8 + 1)*x^6),x, algorithm="giac")
```

```
[Out] 1/8*sqrt(-sqrt(2) + 2)*arctan((2*x + sqrt(-sqrt(2) + 2))/sqrt(sqr
t(2) + 2)) + 1/8*sqrt(-sqrt(2) + 2)*arctan((2*x - sqrt(-sqrt(2) +
 2))/sqrt(sqrt(2) + 2)) - 1/8*sqrt(sqrt(2) + 2)*arctan((2*x + sqr
t(sqrt(2) + 2))/sqrt(-sqrt(2) + 2)) - 1/8*sqrt(sqrt(2) + 2)*arcta
n((2*x - sqrt(sqrt(2) + 2))/sqrt(-sqrt(2) + 2)) - 1/16*sqrt(-sqrt
(2) + 2)*ln(x^2 + x*sqrt(sqrt(2) + 2) + 1) + 1/16*sqrt(-sqrt(2) +
 2)*ln(x^2 - x*sqrt(sqrt(2) + 2) + 1) + 1/16*sqrt(sqrt(2) + 2)*ln
(x^2 + x*sqrt(-sqrt(2) + 2) + 1) - 1/16*sqrt(sqrt(2) + 2)*ln(x^2
- x*sqrt(-sqrt(2) + 2) + 1) - 1/5/x^5
```

3.1506 $\int \frac{1}{x^8(1+x^8)}\,dx$

Optimal. Leaf size=346

$$-\frac{1}{7x^7}+\frac{1}{16}\sqrt{2-\sqrt{2}}\log\left(x^2-\sqrt{2-\sqrt{2}}x+1\right)-\frac{1}{16}\sqrt{2-\sqrt{2}}\log\left(x^2+\sqrt{2-\sqrt{2}}x+1\right)+\frac{1}{16}\sqrt{2+\sqrt{2}}\log\left(x^2-\sqrt{2+\sqrt{2}}x+1\right)-\frac{1}{16}\sqrt{2+\sqrt{2}}\log\left(x^2+\sqrt{2+\sqrt{2}}x+1\right)+\frac{\tan^{-1}\left(\frac{\sqrt{2-\sqrt{2}}-2x}{\sqrt{2+\sqrt{2}}}\right)}{4\sqrt{2\left(2-\sqrt{2}\right)}}+\frac{\tan^{-1}\left(\frac{\sqrt{2+\sqrt{2}}-2x}{\sqrt{2-\sqrt{2}}}\right)}{4\sqrt{2\left(2+\sqrt{2}\right)}}-\frac{\tan^{-1}\left(\frac{2x+\sqrt{2-\sqrt{2}}}{\sqrt{2+\sqrt{2}}}\right)}{4\sqrt{2\left(2-\sqrt{2}\right)}}-\frac{\tan^{-1}\left(\frac{2x+\sqrt{2+\sqrt{2}}}{\sqrt{2-\sqrt{2}}}\right)}{4\sqrt{2\left(2+\sqrt{2}\right)}}$$

```
[Out] -1/(7*x^7) + ArcTan[(Sqrt[2 - Sqrt[2]] - 2*x)/Sqrt[2 + Sqrt[2]]]/
(4*Sqrt[2*(2 - Sqrt[2])]) + ArcTan[(Sqrt[2 + Sqrt[2]] - 2*x)/Sqrt
[2 - Sqrt[2]]]/(4*Sqrt[2*(2 + Sqrt[2])]) - ArcTan[(Sqrt[2 - Sqrt[
2]] + 2*x)/Sqrt[2 + Sqrt[2]]]/(4*Sqrt[2*(2 - Sqrt[2])]) - ArcTan[
(Sqrt[2 + Sqrt[2]] + 2*x)/Sqrt[2 - Sqrt[2]]]/(4*Sqrt[2*(2 + Sqrt[
2])]) + (Sqrt[2 - Sqrt[2]]*Log[1 - Sqrt[2 - Sqrt[2]]*x + x^2])/16
 - (Sqrt[2 - Sqrt[2]]*Log[1 + Sqrt[2 - Sqrt[2]]*x + x^2])/16 + (S
qrt[2 + Sqrt[2]]*Log[1 - Sqrt[2 + Sqrt[2]]*x + x^2])/16 - (Sqrt[2
 + Sqrt[2]]*Log[1 + Sqrt[2 + Sqrt[2]]*x + x^2])/16
```

Rubi [A] time = 0.736847, antiderivative size = 346, normalized size of antiderivative = 1., number of steps used = 20, number of rules used = 7, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.636

$$-\frac{1}{7x^7}+\frac{1}{16}\sqrt{2-\sqrt{2}}\log\left(x^2-\sqrt{2-\sqrt{2}}x+1\right)-\frac{1}{16}\sqrt{2-\sqrt{2}}\log\left(x^2+\sqrt{2-\sqrt{2}}x+1\right)+\frac{1}{16}\sqrt{2+\sqrt{2}}\log\left(x^2-\sqrt{2+\sqrt{2}}x+1\right)-\frac{1}{16}\sqrt{2+\sqrt{2}}\log\left(x^2+\sqrt{2+\sqrt{2}}x+1\right)+\frac{\tan^{-1}\left(\frac{\sqrt{2-\sqrt{2}}-2x}{\sqrt{2+\sqrt{2}}}\right)}{4\sqrt{2\left(2-\sqrt{2}\right)}}+\frac{\tan^{-1}\left(\frac{\sqrt{2+\sqrt{2}}-2x}{\sqrt{2-\sqrt{2}}}\right)}{4\sqrt{2\left(2+\sqrt{2}\right)}}-\frac{\tan^{-1}\left(\frac{2x+\sqrt{2-\sqrt{2}}}{\sqrt{2+\sqrt{2}}}\right)}{4\sqrt{2\left(2-\sqrt{2}\right)}}-\frac{\tan^{-1}\left(\frac{2x+\sqrt{2+\sqrt{2}}}{\sqrt{2-\sqrt{2}}}\right)}{4\sqrt{2\left(2+\sqrt{2}\right)}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^8*(1 + x^8)),x]
```

```
[Out] -1/(7*x^7) + ArcTan[(Sqrt[2 - Sqrt[2]] - 2*x)/Sqrt[2 + Sqrt[2]]]/
(4*Sqrt[2*(2 - Sqrt[2])]) + ArcTan[(Sqrt[2 + Sqrt[2]] - 2*x)/Sqrt
[2 - Sqrt[2]]]/(4*Sqrt[2*(2 + Sqrt[2])]) - ArcTan[(Sqrt[2 - Sqrt[
2]] + 2*x)/Sqrt[2 + Sqrt[2]]]/(4*Sqrt[2*(2 - Sqrt[2])]) - ArcTan[
(Sqrt[2 + Sqrt[2]] + 2*x)/Sqrt[2 - Sqrt[2]]]/(4*Sqrt[2*(2 + Sqrt[
2])]) + (Sqrt[2 - Sqrt[2]]*Log[1 - Sqrt[2 - Sqrt[2]]*x + x^2])/16
 - (Sqrt[2 - Sqrt[2]]*Log[1 + Sqrt[2 - Sqrt[2]]*x + x^2])/16 + (S
qrt[2 + Sqrt[2]]*Log[1 - Sqrt[2 + Sqrt[2]]*x + x^2])/16 - (Sqrt[2
 + Sqrt[2]]*Log[1 + Sqrt[2 + Sqrt[2]]*x + x^2])/16
```

Rubi in Sympy [A] time = 63.4748, size = 536, normalized size = 1.55

$$-\frac{\sqrt{2}\left(-\frac{\sqrt{2}}{2}+\frac{1}{2}\right)\log\left(x^2-x\sqrt{-\sqrt{2}+2}+1\right)}{8\sqrt{-\sqrt{2}+2}}+\frac{\sqrt{2}\left(-\frac{\sqrt{2}}{2}+\frac{1}{2}\right)\log\left(x^2+x\sqrt{-\sqrt{2}+2}+1\right)}{8\sqrt{-\sqrt{2}+2}}+\frac{\sqrt{2}\left(\frac{1}{2}+\frac{\sqrt{2}}{2}\right)\log\left(x^2-x\sqrt{\sqrt{2}+2}+1\right)}{8\sqrt{\sqrt{2}+2}}-\frac{\sqrt{2}\left(\frac{1}{2}+\frac{\sqrt{2}}{2}\right)\log\left(x^2+x\sqrt{\sqrt{2}+2}+1\right)}{8\sqrt{\sqrt{2}+2}}-\frac{\sqrt{2}\left(-\frac{(1+\sqrt{2})\sqrt{\sqrt{2}+2}}{2}+\sqrt{2}\sqrt{\sqrt{2}+2}\right)\operatorname{atan}\left(\frac{2x-\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)}{4\sqrt{-\sqrt{2}+2}\sqrt{\sqrt{2}+2}}-\frac{\sqrt{2}\left(-\frac{(1+\sqrt{2})\sqrt{\sqrt{2}+2}}{2}+\sqrt{2}\sqrt{\sqrt{2}+2}\right)\operatorname{atan}\left(\frac{2x+\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)}{4\sqrt{-\sqrt{2}+2}\sqrt{\sqrt{2}+2}}-\frac{\sqrt{2}\left(\frac{(-\sqrt{2}+1)\sqrt{-\sqrt{2}+2}}{2}+\sqrt{2}\sqrt{-\sqrt{2}+2}\right)\operatorname{atan}\left(\frac{2x-\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)}{4\sqrt{-\sqrt{2}+2}\sqrt{\sqrt{2}+2}}-\frac{\sqrt{2}\left(\frac{(-\sqrt{2}+1)\sqrt{-\sqrt{2}+2}}{2}+\sqrt{2}\sqrt{-\sqrt{2}+2}\right)\operatorname{atan}\left(\frac{2x+\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)}{4\sqrt{-\sqrt{2}+2}\sqrt{\sqrt{2}+2}}-\frac{1}{7x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate(1/x**8/(x**8+1),x)
```

```
[Out] -sqrt(2)*(-sqrt(2)/2 + 1/2)*log(x**2 - x*sqrt(-sqrt(2) + 2) + 1)/
(8*sqrt(-sqrt(2) + 2)) + sqrt(2)*(-sqrt(2)/2 + 1/2)*log(x**2 + x*
sqrt(-sqrt(2) + 2) + 1)/(8*sqrt(-sqrt(2) + 2)) + sqrt(2)*(1/2 + s
qrt(2)/2)*log(x**2 - x*sqrt(sqrt(2) + 2) + 1)/(8*sqrt(sqrt(2) + 2
)) - sqrt(2)*(1/2 + sqrt(2)/2)*log(x**2 + x*sqrt(sqrt(2) + 2) + 1
)/(8*sqrt(sqrt(2) + 2)) - sqrt(2)*(-(1 + sqrt(2))*sqrt(sqrt(2) +
2)/2 + sqrt(2)*sqrt(sqrt(2) + 2))*atan((2*x - sqrt(sqrt(2) + 2))/
sqrt(-sqrt(2) + 2))/(4*sqrt(-sqrt(2) + 2)*sqrt(sqrt(2) + 2)) - sq
rt(2)*(-(1 + sqrt(2))*sqrt(sqrt(2) + 2)/2 + sqrt(2)*sqrt(sqrt(2)
+ 2))*atan((2*x + sqrt(sqrt(2) + 2))/sqrt(-sqrt(2) + 2))/(4*sqrt(
-sqrt(2) + 2)*sqrt(sqrt(2) + 2)) - sqrt(2)*((-sqrt(2) + 1)*sqrt(-
sqrt(2) + 2)/2 + sqrt(2)*sqrt(-sqrt(2) + 2))*atan((2*x - sqrt(-sq
rt(2) + 2))/sqrt(sqrt(2) + 2))/(4*sqrt(-sqrt(2) + 2)*sqrt(sqrt(2)
 + 2)) - sqrt(2)*((-sqrt(2) + 1)*sqrt(-sqrt(2) + 2)/2 + sqrt(2)*s
qrt(-sqrt(2) + 2))*atan((2*x + sqrt(-sqrt(2) + 2))/sqrt(sqrt(2) +
 2))/(4*sqrt(-sqrt(2) + 2)*sqrt(sqrt(2) + 2)) - 1/(7*x**7)
```

Mathematica [A] time = 0.0112384, size = 216, normalized size = 0.62

$$-\frac{1}{7x^7}+\frac{1}{8}\sin\left(\frac{\pi}{8}\right)\log\left(x^2-2x\sin\left(\frac{\pi}{8}\right)+1\right)-\frac{1}{8}\sin\left(\frac{\pi}{8}\right)\log\left(x^2+2x\sin\left(\frac{\pi}{8}\right)+1\right)+\frac{1}{8}\cos\left(\frac{\pi}{8}\right)\log\left(x^2-2x\cos\left(\frac{\pi}{8}\right)+1\right)-\frac{1}{8}\cos\left(\frac{\pi}{8}\right)\log\left(x^2+2x\cos\left(\frac{\pi}{8}\right)+1\right)-\frac{1}{4}\sin\left(\frac{\pi}{8}\right)\tan^{-1}\left(\csc\left(\frac{\pi}{8}\right)\left(x-\cos\left(\frac{\pi}{8}\right)\right)\right)-\frac{1}{4}\sin\left(\frac{\pi}{8}\right)\tan^{-1}\left(\csc\left(\frac{\pi}{8}\right)\left(x+\cos\left(\frac{\pi}{8}\right)\right)\right)-\frac{1}{4}\cos\left(\frac{\pi}{8}\right)\tan^{-1}\left(\sec\left(\frac{\pi}{8}\right)\left(x-\sin\left(\frac{\pi}{8}\right)\right)\right)-\frac{1}{4}\cos\left(\frac{\pi}{8}\right)\tan^{-1}\left(\sec\left(\frac{\pi}{8}\right)\left(x+\sin\left(\frac{\pi}{8}\right)\right)\right)$$

Antiderivative was successfully verified.

```
[In]   Integrate[1/(x^8*(1 + x^8)),x]
```

```
[Out] -1/(7*x^7) - (ArcTan[Sec[Pi/8]*(x - Sin[Pi/8])]*Cos[Pi/8])/4 - (A
rcTan[Sec[Pi/8]*(x + Sin[Pi/8])]*Cos[Pi/8])/4 + (Cos[Pi/8]*Log[1
+ x^2 - 2*x*Cos[Pi/8]])/8 - (Cos[Pi/8]*Log[1 + x^2 + 2*x*Cos[Pi/8
]])/8 - (ArcTan[(x - Cos[Pi/8])*Csc[Pi/8]]*Sin[Pi/8])/4 - (ArcTan
```

```
[(x + Cos[Pi/8])*Csc[Pi/8]]*Sin[Pi/8])/4 + (Log[1 + x^2 - 2*x*Sin
[Pi/8]]*Sin[Pi/8])/8 - (Log[1 + x^2 + 2*x*Sin[Pi/8]]*Sin[Pi/8])/8
```

Maple [C] time = 0.005, size = 28, normalized size = 0.1

$$-\frac{1}{8}\sum_{\_R=RootOf(\_Z^8+1)}\frac{\ln(x-\_R)}{\_R^7}-\frac{1}{7x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^8/(x^8+1),x)
```

```
[Out] -1/8*sum(1/_R^7*ln(x-_R),_R=RootOf(_Z^8+1))-1/7/x^7
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{7x^7}-\int\frac{1}{x^8+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^8 + 1)*x^8),x, algorithm="maxima")
```

```
[Out] -1/7/x^7 - integrate(1/(x^8 + 1), x)
```

Fricas [A] time = 0.247501, size = 1474, normalized size = 4.26

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^8 + 1)*x^8),x, algorithm="fricas")
```

```
[Out] 1/448*sqrt(2)*(28*sqrt(2)*x^7*sqrt(sqrt(2) + 2)*arctan(sqrt(sqrt(
2) + 2)/(2*x + 2*sqrt(x^2 + x*sqrt(-sqrt(2) + 2) + 1) + sqrt(-sqr
t(2) + 2))) + 28*sqrt(2)*x^7*sqrt(sqrt(2) + 2)*arctan(sqrt(sqrt(2
) + 2)/(2*x + 2*sqrt(x^2 - x*sqrt(-sqrt(2) + 2) + 1) - sqrt(-sqrt
(2) + 2))) + 28*sqrt(2)*x^7*sqrt(-sqrt(2) + 2)*arctan(sqrt(-sqrt(
2) + 2)/(2*x + 2*sqrt(x^2 + x*sqrt(sqrt(2) + 2) + 1) + sqrt(sqrt(
2) + 2))) + 28*sqrt(2)*x^7*sqrt(-sqrt(2) + 2)*arctan(sqrt(-sqrt(2
) + 2)/(2*x + 2*sqrt(x^2 - x*sqrt(sqrt(2) + 2) + 1) - sqrt(sqrt(2
) + 2))) - 7*sqrt(2)*x^7*sqrt(sqrt(2) + 2)*log(x^2 + x*sqrt(sqrt(
2) + 2) + 1) + 7*sqrt(2)*x^7*sqrt(sqrt(2) + 2)*log(x^2 - x*sqrt(s
qrt(2) + 2) + 1) - 7*sqrt(2)*x^7*sqrt(-sqrt(2) + 2)*log(x^2 + x*s
qrt(-sqrt(2) + 2) + 1) + 7*sqrt(2)*x^7*sqrt(-sqrt(2) + 2)*log(x^2
 - x*sqrt(-sqrt(2) + 2) + 1) + 28*(x^7*sqrt(sqrt(2) + 2) + x^7*sq
rt(-sqrt(2) + 2))*arctan((sqrt(sqrt(2) + 2) + sqrt(-sqrt(2) + 2))
/(2*sqrt(2)*x + 2*sqrt(2)*sqrt(x^2 + 1/2*sqrt(2)*x*sqrt(sqrt(2) +
 2) - 1/2*sqrt(2)*x*sqrt(-sqrt(2) + 2) + 1) + sqrt(sqrt(2) + 2) -
 sqrt(-sqrt(2) + 2))) + 28*(x^7*sqrt(sqrt(2) + 2) + x^7*sqrt(-sqr
t(2) + 2))*arctan((sqrt(sqrt(2) + 2) + sqrt(-sqrt(2) + 2))/(2*sqr
t(2)*x + 2*sqrt(2)*sqrt(x^2 - 1/2*sqrt(2)*x*sqrt(sqrt(2) + 2) + 1
/2*sqrt(2)*x*sqrt(-sqrt(2) + 2) + 1) - sqrt(sqrt(2) + 2) + sqrt(-
sqrt(2) + 2))) - 28*(x^7*sqrt(sqrt(2) + 2) - x^7*sqrt(-sqrt(2) +
2))*arctan(-(sqrt(sqrt(2) + 2) - sqrt(-sqrt(2) + 2))/(2*sqrt(2)*x
 + 2*sqrt(2)*sqrt(x^2 + 1/2*sqrt(2)*x*sqrt(sqrt(2) + 2) + 1/2*sqr
t(2)*x*sqrt(-sqrt(2) + 2) + 1) + sqrt(sqrt(2) + 2) + sqrt(-sqrt(2
) + 2))) - 28*(x^7*sqrt(sqrt(2) + 2) - x^7*sqrt(-sqrt(2) + 2))*ar
ctan(-(sqrt(sqrt(2) + 2) - sqrt(-sqrt(2) + 2))/(2*sqrt(2)*x + 2*s
qrt(2)*sqrt(x^2 - 1/2*sqrt(2)*x*sqrt(sqrt(2) + 2) - 1/2*sqrt(2)*x
```

```
*sqrt(-sqrt(2) + 2) + 1) - sqrt(sqrt(2) + 2) - sqrt(-sqrt(2) + 2)
)) - 7*(x^7*sqrt(sqrt(2) + 2) + x^7*sqrt(-sqrt(2) + 2))*log(x^2 +
 1/2*sqrt(2)*x*sqrt(sqrt(2) + 2) + 1/2*sqrt(2)*x*sqrt(-sqrt(2) +
2) + 1) - 7*(x^7*sqrt(sqrt(2) + 2) - x^7*sqrt(-sqrt(2) + 2))*log(
x^2 + 1/2*sqrt(2)*x*sqrt(sqrt(2) + 2) - 1/2*sqrt(2)*x*sqrt(-sqrt(
2) + 2) + 1) + 7*(x^7*sqrt(sqrt(2) + 2) - x^7*sqrt(-sqrt(2) + 2))
*log(x^2 - 1/2*sqrt(2)*x*sqrt(sqrt(2) + 2) + 1/2*sqrt(2)*x*sqrt(-
sqrt(2) + 2) + 1) + 7*(x^7*sqrt(sqrt(2) + 2) + x^7*sqrt(-sqrt(2)
+ 2))*log(x^2 - 1/2*sqrt(2)*x*sqrt(sqrt(2) + 2) - 1/2*sqrt(2)*x*s
qrt(-sqrt(2) + 2) + 1) - 32*sqrt(2))/x^7
```

Sympy [A] time = 4.51423, size = 20, normalized size = 0.06

$$\text{RootSum}\left(16777216t^8+1,(t\mapsto t\log(-8t+x))\right)-\frac{1}{7x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**8/(x**8+1),x)
```

```
[Out] RootSum(16777216*_t**8 + 1, Lambda(_t, _t*log(-8*_t + x))) - 1/(7
*x**7)
```

GIAC/XCAS [A] time = 0.241104, size = 329, normalized size = 0.95

$$-\frac{1}{8}\sqrt{\sqrt{2}+2}\arctan\left(\frac{2x+\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)-\frac{1}{8}\sqrt{\sqrt{2}+2}\arctan\left(\frac{2x-\sqrt{-\sqrt{2}+2}}{\sqrt{\sqrt{2}+2}}\right)$$
$$-\frac{1}{8}\sqrt{-\sqrt{2}+2}\arctan\left(\frac{2x+\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)-\frac{1}{8}\sqrt{-\sqrt{2}+2}\arctan\left(\frac{2x-\sqrt{\sqrt{2}+2}}{\sqrt{-\sqrt{2}+2}}\right)$$
$$-\frac{1}{16}\sqrt{\sqrt{2}+2}\ln\left(x^2+x\sqrt{\sqrt{2}+2}+1\right)+\frac{1}{16}\sqrt{\sqrt{2}+2}\ln\left(x^2-x\sqrt{\sqrt{2}+2}+1\right)$$
$$-\frac{1}{16}\sqrt{-\sqrt{2}+2}\ln\left(x^2+x\sqrt{-\sqrt{2}+2}+1\right)+\frac{1}{16}\sqrt{-\sqrt{2}+2}\ln\left(x^2-x\sqrt{-\sqrt{2}+2}+1\right)-\frac{1}{7x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^8 + 1)*x^8),x, algorithm="giac")
```

```
[Out] -1/8*sqrt(sqrt(2) + 2)*arctan((2*x + sqrt(-sqrt(2) + 2))/sqrt(sqr
t(2) + 2)) - 1/8*sqrt(sqrt(2) + 2)*arctan((2*x - sqrt(-sqrt(2) +
2))/sqrt(sqrt(2) + 2)) - 1/8*sqrt(-sqrt(2) + 2)*arctan((2*x + sqr
t(sqrt(2) + 2))/sqrt(-sqrt(2) + 2)) - 1/8*sqrt(-sqrt(2) + 2)*arct
an((2*x - sqrt(sqrt(2) + 2))/sqrt(-sqrt(2) + 2)) - 1/16*sqrt(sqrt
(2) + 2)*ln(x^2 + x*sqrt(sqrt(2) + 2) + 1) + 1/16*sqrt(sqrt(2) +
2)*ln(x^2 - x*sqrt(sqrt(2) + 2) + 1) - 1/16*sqrt(-sqrt(2) + 2)*ln
(x^2 + x*sqrt(-sqrt(2) + 2) + 1) + 1/16*sqrt(-sqrt(2) + 2)*ln(x^2
 - x*sqrt(-sqrt(2) + 2) + 1) - 1/7/x^7
```

3.1507 $\int x^3\sqrt{1+x^8}\,dx$

Optimal. Leaf size=25

$$\frac{1}{8}\sinh^{-1}\left(x^4\right)+\frac{1}{8}\sqrt{x^8+1}x^4$$

```
[Out] (x^4*Sqrt[1 + x^8])/8 + ArcSinh[x^4]/8
```

Rubi [A] time = 0.026205, antiderivative size = 25, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{1}{8}\sinh^{-1}\left(x^4\right)+\frac{1}{8}\sqrt{x^8+1}x^4$$

Antiderivative was successfully verified.

```
[In]  Int[x^3*Sqrt[1 + x^8],x]

[Out] (x^4*Sqrt[1 + x^8])/8 + ArcSinh[x^4]/8
```

Rubi in Sympy [A] time = 2.72855, size = 19, normalized size = 0.76

$$\frac{x^4\sqrt{x^8+1}}{8}+\frac{\operatorname{asinh}\left(x^4\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3*(x**8+1)**(1/2),x)

[Out] x**4*sqrt(x**8 + 1)/8 + asinh(x**4)/8
```

Mathematica [A] time = 0.0129308, size = 22, normalized size = 0.88

$$\frac{1}{8}\left(\sinh^{-1}\left(x^4\right)+\sqrt{x^8+1}x^4\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3*Sqrt[1 + x^8],x]

[Out] (x^4*Sqrt[1 + x^8] + ArcSinh[x^4])/8
```

Maple [A] time = 0.044, size = 20, normalized size = 0.8

$$\frac{Arcsinh\left(x^4\right)}{8}+\frac{x^4}{8}\sqrt{x^8+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3*(x^8+1)^(1/2),x)

[Out] 1/8*arcsinh(x^4)+1/8*x^4*(x^8+1)^(1/2)
```

Maxima [A] time = 1.42931, size = 78, normalized size = 3.12

$$\frac{\sqrt{x^8+1}}{8\,x^4\left(\frac{x^8+1}{x^8}-1\right)}+\frac{1}{16}\,\log\left(\frac{\sqrt{x^8+1}}{x^4}+1\right)-\frac{1}{16}\,\log\left(\frac{\sqrt{x^8+1}}{x^4}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^8 + 1)*x^3,x, algorithm="maxima")
```

```
[Out] 1/8*sqrt(x^8 + 1)/(x^4*((x^8 + 1)/x^8 - 1)) + 1/16*log(sqrt(x^8 +
 1)/x^4 + 1) - 1/16*log(sqrt(x^8 + 1)/x^4 - 1)
```

Fricas [A] time = 0.221807, size = 116, normalized size = 4.64

$$-\frac{2\,x^{16}+2\,x^8+\left(2\,x^8-2\,\sqrt{x^8+1}x^4+1\right)\log\left(-x^4+\sqrt{x^8+1}\right)-\left(2\,x^{12}+x^4\right)\sqrt{x^8+1}}{8\left(2\,x^8-2\,\sqrt{x^8+1}x^4+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^8 + 1)*x^3,x, algorithm="fricas")
```

```
[Out] -1/8*(2*x^16 + 2*x^8 + (2*x^8 - 2*sqrt(x^8 + 1)*x^4 + 1)*log(-x^4
 + sqrt(x^8 + 1)) - (2*x^12 + x^4)*sqrt(x^8 + 1))/(2*x^8 - 2*sqrt
(x^8 + 1)*x^4 + 1)
```

Sympy [A] time = 5.13698, size = 19, normalized size = 0.76

$$\frac{x^4\sqrt{x^8+1}}{8}+\frac{\operatorname{asinh}\left(x^4\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(x**8+1)**(1/2),x)
```

```
[Out] x**4*sqrt(x**8 + 1)/8 + asinh(x**4)/8
```

GIAC/XCAS [A] time = 0.228873, size = 39, normalized size = 1.56

$$\frac{1}{8}\,\sqrt{x^8+1}x^4-\frac{1}{8}\ln\left(-x^4+\sqrt{x^8+1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^8 + 1)*x^3,x, algorithm="giac")
```

```
[Out] 1/8*sqrt(x^8 + 1)*x^4 - 1/8*ln(-x^4 + sqrt(x^8 + 1))
```

3.1508 $\int x\sqrt{1+x^8}\,dx$

Optimal. Leaf size=62

$$\frac{1}{6}\sqrt{x^8+1}x^2+\frac{(x^4+1)\sqrt{\frac{x^8+1}{(x^4+1)^2}}F\left(2\tan^{-1}(x^2)\mid\frac{1}{2}\right)}{6\sqrt{x^8+1}}$$

```
[Out] (x^2*Sqrt[1 + x^8])/6 + ((1 + x^4)*Sqrt[(1 + x^8)/(1 + x^4)^2]*El
lipticF[2*ArcTan[x^2], 1/2])/(6*Sqrt[1 + x^8])
```

Rubi [A] time = 0.0579022, antiderivative size = 62, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273

$$\frac{1}{6}\sqrt{x^8+1}x^2+\frac{(x^4+1)\sqrt{\frac{x^8+1}{(x^4+1)^2}}F\left(2\tan^{-1}(x^2)\mid\frac{1}{2}\right)}{6\sqrt{x^8+1}}$$

Antiderivative was successfully verified.

```
[In] Int[x*Sqrt[1 + x^8],x]
```

```
[Out] (x^2*Sqrt[1 + x^8])/6 + ((1 + x^4)*Sqrt[(1 + x^8)/(1 + x^4)^2]*El
lipticF[2*ArcTan[x^2], 1/2])/(6*Sqrt[1 + x^8])
```

Rubi in Sympy [A] time = 2.81271, size = 53, normalized size = 0.85

$$\frac{x^2\sqrt{x^8+1}}{6}+\frac{\sqrt{\frac{x^8+1}{(x^4+1)^2}}(x^4+1)F\left(2\operatorname{atan}(x^2)\middle|\frac{1}{2}\right)}{6\sqrt{x^8+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x*(x**8+1)**(1/2),x)
```

```
[Out] x**2*sqrt(x**8 + 1)/6 + sqrt((x**8 + 1)/(x**4 + 1)**2)*(x**4 + 1)
*elliptic_f(2*atan(x**2), 1/2)/(6*sqrt(x**8 + 1))
```

Mathematica [C] time = 0.0253225, size = 34, normalized size = 0.55

$$\frac{1}{6}x^2\left(2\,{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{5}{4};-x^8\right)+\sqrt{x^8+1}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x*Sqrt[1 + x^8],x]
```

```
[Out] (x^2*(Sqrt[1 + x^8] + 2*Hypergeometric2F1[1/4, 1/2, 5/4, -x^8]))/
6
```

Maple [C] time = 0.041, size = 30, normalized size = 0.5

$$\frac{x^2}{6}\sqrt{x^8+1}+\frac{x^2}{3}{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{5}{4};-x^8\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(x^8+1)^(1/2),x)
```

```
[Out] 1/6*x^2*(x^8+1)^(1/2)+1/3*x^2*hypergeom([1/4,1/2],[5/4],-x^8)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{x^8+1}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^8 + 1)*x,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(x^8 + 1)*x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{x^8+1}x, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^8 + 1)*x,x, algorithm="fricas")
```

```
[Out] integral(sqrt(x^8 + 1)*x, x)
```

Sympy [A] time = 1.74249, size = 31, normalized size = 0.5

$$\frac{x^2\left(\frac{1}{4}\right){}_2F_1\left(\begin{matrix}-\frac{1}{2},\frac{1}{4}\\ \frac{5}{4}\end{matrix}\middle|x^8e^{i\pi}\right)}{8\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(x**8+1)**(1/2),x)
```

```
[Out] x**2*gamma(1/4)*hyper((-1/2, 1/4), (5/4,), x**8*exp_polar(I*pi))/
(8*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{x^8+1}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^8 + 1)*x,x, algorithm="giac")
```

```
[Out] integrate(sqrt(x^8 + 1)*x, x)
```

3.1509 $\int \frac{\sqrt{1+x^8}}{x} \, dx$

Optimal. Leaf size=28

$$\frac{\sqrt{x^8+1}}{4}-\frac{1}{4}\tanh^{-1}\left(\sqrt{x^8+1}\right)$$

```
[Out] Sqrt[1 + x^8]/4 - ArcTanh[Sqrt[1 + x^8]]/4
```

Rubi [A] time = 0.0367779, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$

$$\frac{\sqrt{x^8+1}}{4}-\frac{1}{4}\tanh^{-1}\left(\sqrt{x^8+1}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[1 + x^8]/x,x]

[Out] Sqrt[1 + x^8]/4 - ArcTanh[Sqrt[1 + x^8]]/4
```

Rubi in Sympy [A] time = 4.10398, size = 20, normalized size = 0.71

$$\frac{\sqrt{x^8+1}}{4}-\frac{\operatorname{atanh}\left(\sqrt{x^8+1}\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((x**8+1)**(1/2)/x,x)

[Out] sqrt(x**8 + 1)/4 - atanh(sqrt(x**8 + 1))/4
```

Mathematica [A] time = 0.0214165, size = 28, normalized size = 1.

$$\frac{\sqrt{x^8+1}}{4}-\frac{1}{4}\tanh^{-1}\left(\sqrt{x^8+1}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[1 + x^8]/x,x]

[Out] Sqrt[1 + x^8]/4 - ArcTanh[Sqrt[1 + x^8]]/4
```

Maple [B] time = 0.055, size = 56, normalized size = 2.

$$-\frac{1}{16\sqrt{\pi}}\left(-2\left(2-2\ln(2)+8\ln(x)\right)\sqrt{\pi}+4\sqrt{\pi}-4\sqrt{\pi}\sqrt{x^8+1}+4\sqrt{\pi}\ln\left(1/2+1/2\sqrt{x^8+1}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((x^8+1)^(1/2)/x,x)
```

```
[Out] -1/16/Pi^(1/2)*(-2*(2-2*ln(2)+8*ln(x))*Pi^(1/2)+4*Pi^(1/2)-4*Pi^(
1/2)*(x^8+1)^(1/2)+4*Pi^(1/2)*ln(1/2+1/2*(x^8+1)^(1/2)))
```

Maxima [A] time = 1.45816, size = 46, normalized size = 1.64

$$\frac{1}{4}\sqrt{x^8+1}-\frac{1}{8}\log\left(\sqrt{x^8+1}+1\right)+\frac{1}{8}\log\left(\sqrt{x^8+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^8 + 1)/x,x, algorithm="maxima")
```

```
[Out] 1/4*sqrt(x^8 + 1) - 1/8*log(sqrt(x^8 + 1) + 1) + 1/8*log(sqrt(x^8
 + 1) - 1)
```

Fricas [A] time = 0.225928, size = 46, normalized size = 1.64

$$\frac{1}{4}\sqrt{x^8+1}-\frac{1}{8}\log\left(\sqrt{x^8+1}+1\right)+\frac{1}{8}\log\left(\sqrt{x^8+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^8 + 1)/x,x, algorithm="fricas")
```

```
[Out] 1/4*sqrt(x^8 + 1) - 1/8*log(sqrt(x^8 + 1) + 1) + 1/8*log(sqrt(x^8
 + 1) - 1)
```

Sympy [A] time = 4.08762, size = 39, normalized size = 1.39

$$\frac{x^4}{4\sqrt{1+\frac{1}{x^8}}}-\frac{\operatorname{asinh}\left(\frac{1}{x^4}\right)}{4}+\frac{1}{4x^4\sqrt{1+\frac{1}{x^8}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x**8+1)**(1/2)/x,x)
```

```
[Out] x**4/(4*sqrt(1 + x**(-8))) - asinh(x**(-4))/4 + 1/(4*x**4*sqrt(1
+ x**(-8)))
```

GIAC/XCAS [A] time = 0.225921, size = 46, normalized size = 1.64

$$\frac{1}{4}\sqrt{x^8+1}-\frac{1}{8}\ln\left(\sqrt{x^8+1}+1\right)+\frac{1}{8}\ln\left(\sqrt{x^8+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^8 + 1)/x,x, algorithm="giac")
```

```
[Out] 1/4*sqrt(x^8 + 1) - 1/8*ln(sqrt(x^8 + 1) + 1) + 1/8*ln(sqrt(x^8 +
 1) - 1)
```

3.1510 $\int \frac{\sqrt{1+x^8}}{x^3} dx$

Optimal. Leaf size=125

$$-\frac{\sqrt{x^8+1}}{2x^2}+\frac{\sqrt{x^8+1}x^2}{x^4+1}+\frac{(x^4+1)\sqrt{\frac{x^8+1}{(x^4+1)^2}}F\left(2\tan^{-1}\left(x^2\right)\left|\frac{1}{2}\right.\right)}{2\sqrt{x^8+1}}-\frac{(x^4+1)\sqrt{\frac{x^8+1}{(x^4+1)^2}}E\left(2\tan^{-1}\left(x^2\right)\left|\frac{1}{2}\right.\right)}{\sqrt{x^8+1}}$$

```
[Out] -Sqrt[1 + x^8]/(2*x^2) + (x^2*Sqrt[1 + x^8])/(1 + x^4) - ((1 + x^
4)*Sqrt[(1 + x^8)/(1 + x^4)^2]*EllipticE[2*ArcTan[x^2], 1/2])/Sqr
t[1 + x^8] + ((1 + x^4)*Sqrt[(1 + x^8)/(1 + x^4)^2]*EllipticF[2*A
rcTan[x^2], 1/2])/(2*Sqrt[1 + x^8])
```

Rubi [A] time = 0.134705, antiderivative size = 125, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385

$$-\frac{\sqrt{x^8+1}}{2x^2}+\frac{\sqrt{x^8+1}x^2}{x^4+1}+\frac{(x^4+1)\sqrt{\frac{x^8+1}{(x^4+1)^2}}F\left(2\tan^{-1}\left(x^2\right)\left|\frac{1}{2}\right.\right)}{2\sqrt{x^8+1}}-\frac{(x^4+1)\sqrt{\frac{x^8+1}{(x^4+1)^2}}E\left(2\tan^{-1}\left(x^2\right)\left|\frac{1}{2}\right.\right)}{\sqrt{x^8+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[1 + x^8]/x^3,x]
```

```
[Out] -Sqrt[1 + x^8]/(2*x^2) + (x^2*Sqrt[1 + x^8])/(1 + x^4) - ((1 + x^
4)*Sqrt[(1 + x^8)/(1 + x^4)^2]*EllipticE[2*ArcTan[x^2], 1/2])/Sqr
t[1 + x^8] + ((1 + x^4)*Sqrt[(1 + x^8)/(1 + x^4)^2]*EllipticF[2*A
rcTan[x^2], 1/2])/(2*Sqrt[1 + x^8])
```

Rubi in Sympy [A] time = 9.31045, size = 109, normalized size = 0.87

$$\frac{x^2\sqrt{x^8+1}}{x^4+1}-\frac{\sqrt{\frac{x^8+1}{(x^4+1)^2}}\left(x^4+1\right)E\left(2\operatorname{atan}\left(x^2\right)\middle|\frac{1}{2}\right)}{\sqrt{x^8+1}}+\frac{\sqrt{\frac{x^8+1}{(x^4+1)^2}}\left(x^4+1\right)F\left(2\operatorname{atan}\left(x^2\right)\middle|\frac{1}{2}\right)}{2\sqrt{x^8+1}}-\frac{\sqrt{x^8+1}}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((x**8+1)**(1/2)/x**3,x)
```

```
[Out] x**2*sqrt(x**8 + 1)/(x**4 + 1) - sqrt((x**8 + 1)/(x**4 + 1)**2)*(
x**4 + 1)*elliptic_e(2*atan(x**2), 1/2)/sqrt(x**8 + 1) + sqrt((x*
*8 + 1)/(x**4 + 1)**2)*(x**4 + 1)*elliptic_f(2*atan(x**2), 1/2)/(
2*sqrt(x**8 + 1)) - sqrt(x**8 + 1)/(2*x**2)
```

Mathematica [C] time = 0.0288865, size = 39, normalized size = 0.31

$$\frac{1}{3}x^6\,{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-x^8\right)-\frac{\sqrt{x^8+1}}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[1 + x^8]/x^3,x]
```

```
[Out] -Sqrt[1 + x^8]/(2*x^2) + (x^6*Hypergeometric2F1[1/2, 3/4, 7/4, -x
^8])/3
```

Maple [C] time = 0.047, size = 30, normalized size = 0.2

$$-\frac{1}{2\,x^{2}}\sqrt{x^{8}+1}+\frac{x^{6}}{3}\,{}_{2}\mathrm{F}_{1}\!\left(\frac{1}{2},\frac{3}{4};\,\frac{7}{4};\,-x^{8}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((x^8+1)^(1/2)/x^3,x)
```

```
[Out] -1/2*(x^8+1)^(1/2)/x^2+1/3*x^6*hypergeom([1/2,3/4],[7/4],-x^8)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{x^{8}+1}}{x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^8 + 1)/x^3,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(x^8 + 1)/x^3, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\sqrt{x^{8}+1}}{x^{3}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^8 + 1)/x^3,x, algorithm="fricas")
```

```
[Out] integral(sqrt(x^8 + 1)/x^3, x)
```

Sympy [A] time = 1.9858, size = 34, normalized size = 0.27

$$\frac{\Gamma\left(-\frac{1}{4}\right)\,{}_{2}F_{1}\left(\begin{matrix}-\frac{1}{2},-\frac{1}{4}\\ \frac{3}{4}\end{matrix}\middle|\,x^{8}e^{i\pi}\right)}{8x^{2}\,\Gamma\left(\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x**8+1)**(1/2)/x**3,x)
```

```
[Out] gamma(-1/4)*hyper((-1/2, -1/4), (3/4,), x**8*exp_polar(I*pi))/(8*
x**2*gamma(3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{x^{8}+1}}{x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^8 + 1)/x^3,x, algorithm="giac")

[Out] integrate(sqrt(x^8 + 1)/x^3, x)
```

3.1511 $\int x^3\sqrt{-2+x^8}\,dx$

Optimal. Leaf size=35

$$\frac{1}{8}x^4\sqrt{x^8-2}-\frac{1}{4}\tanh^{-1}\left(\frac{x^4}{\sqrt{x^8-2}}\right)$$

```
[Out] (x^4*Sqrt[-2 + x^8])/8 - ArcTanh[x^4/Sqrt[-2 + x^8]]/4
```

Rubi [A] time = 0.0366006, antiderivative size = 35, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{1}{8}x^4\sqrt{x^8-2}-\frac{1}{4}\tanh^{-1}\left(\frac{x^4}{\sqrt{x^8-2}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^3*Sqrt[-2 + x^8],x]

[Out] (x^4*Sqrt[-2 + x^8])/8 - ArcTanh[x^4/Sqrt[-2 + x^8]]/4
```

Rubi in Sympy [A] time = 2.89497, size = 27, normalized size = 0.77

$$\frac{x^4\sqrt{x^8-2}}{8}-\frac{\operatorname{atanh}\left(\frac{x^4}{\sqrt{x^8-2}}\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3*(x**8-2)**(1/2),x)

[Out] x**4*sqrt(x**8 - 2)/8 - atanh(x**4/sqrt(x**8 - 2))/4
```

Mathematica [A] time = 0.0154046, size = 35, normalized size = 1.

$$\frac{1}{8}x^4\sqrt{x^8-2}-\frac{1}{4}\log\left(\sqrt{x^8-2}+x^4\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3*Sqrt[-2 + x^8],x]

[Out] (x^4*Sqrt[-2 + x^8])/8 - Log[x^4 + Sqrt[-2 + x^8]]/4
```

Maple [C] time = 0.069, size = 47, normalized size = 1.3

$$\frac{x^4}{8}\sqrt{x^8-2}-\frac{1}{4}\sqrt{-signum\left(-1+\frac{x^8}{2}\right)}\arcsin\left(\frac{x^4\sqrt{2}}{2}\right)\frac{1}{\sqrt{signum\left(-1+\frac{x^8}{2}\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3*(x^8-2)^(1/2),x)
```

```
[Out] 1/8*x^4*(x^8-2)^(1/2)-1/4/signum(-1+1/2*x^8)^(1/2)*(-signum(-1+1/
2*x^8))^(1/2)*arcsin(1/2*x^4*2^(1/2))
```

Maxima [A] time = 1.43431, size = 78, normalized size = 2.23

$$-\frac{\sqrt{x^8-2}}{4\,x^4\left(\frac{x^8-2}{x^8}-1\right)}-\frac{1}{8}\,\log\left(\frac{\sqrt{x^8-2}}{x^4}+1\right)+\frac{1}{8}\,\log\left(\frac{\sqrt{x^8-2}}{x^4}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sqrt(x^8 - 2)*x^3,x, algorithm="maxima")
```

```
[Out] -1/4*sqrt(x^8 - 2)/(x^4*((x^8 - 2)/x^8 - 1)) - 1/8*log(sqrt(x^8 -
 2)/x^4 + 1) + 1/8*log(sqrt(x^8 - 2)/x^4 - 1)
```

Fricas [A] time = 0.223891, size = 109, normalized size = 3.11

$$-\frac{x^{16}-2\,x^8-2\left(x^8-\sqrt{x^8-2}x^4-1\right)\log\left(-x^4+\sqrt{x^8-2}\right)-\left(x^{12}-x^4\right)\sqrt{x^8-2}}{8\left(x^8-\sqrt{x^8-2}x^4-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sqrt(x^8 - 2)*x^3,x, algorithm="fricas")
```

```
[Out] -1/8*(x^16 - 2*x^8 - 2*(x^8 - sqrt(x^8 - 2)*x^4 - 1)*log(-x^4 + s
qrt(x^8 - 2)) - (x^12 - x^4)*sqrt(x^8 - 2))/(x^8 - sqrt(x^8 - 2)*
x^4 - 1)
```

Sympy [A] time = 5.52243, size = 90, normalized size = 2.57

$$\begin{cases} \frac{x^{12}}{8\sqrt{x^8-2}}-\frac{x^4}{4\sqrt{x^8-2}}-\frac{\operatorname{acosh}\left(\frac{\sqrt{2}x^4}{2}\right)}{4} & \text{for}\ \frac{|x^8|}{2}>1 \\ -\frac{ix^{12}}{8\sqrt{-x^8+2}}+\frac{ix^4}{4\sqrt{-x^8+2}}+\frac{i\operatorname{asin}\left(\frac{\sqrt{2}x^4}{2}\right)}{4} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(x**8-2)**(1/2),x)
```

```
[Out] Piecewise((x**12/(8*sqrt(x**8 - 2)) - x**4/(4*sqrt(x**8 - 2)) - a
cosh(sqrt(2)*x**4/2)/4, Abs(x**8)/2 > 1), (-I*x**12/(8*sqrt(-x**8
 + 2)) + I*x**4/(4*sqrt(-x**8 + 2)) + I*asin(sqrt(2)*x**4/2)/4, T
rue))
```

GIAC/XCAS [A] time = 0.225305, size = 39, normalized size = 1.11

$$\frac{1}{8}\,\sqrt{x^8-2}x^4+\frac{1}{4}\ln\left(x^4-\sqrt{x^8-2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sqrt(x^8 - 2)*x^3,x, algorithm="giac")
```

```
[Out] 1/8*sqrt(x^8 - 2)*x^4 + 1/4*ln(x^4 - sqrt(x^8 - 2))
```

3.1512 $\int \frac{x^{19}}{\sqrt{1+x^8}} \, dx$

Optimal. Leaf size=41

$$\frac{3}{32}\sinh^{-1}\left(x^4\right)+\frac{1}{16}\sqrt{x^8+1}x^{12}-\frac{3}{32}\sqrt{x^8+1}x^4$$

```
[Out] (-3*x^4*Sqrt[1 + x^8])/32 + (x^12*Sqrt[1 + x^8])/16 + (3*ArcSinh[
x^4])/32
```

Rubi [A] time = 0.0564664, antiderivative size = 41, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{3}{32}\sinh^{-1}\left(x^4\right)+\frac{1}{16}\sqrt{x^8+1}x^{12}-\frac{3}{32}\sqrt{x^8+1}x^4$$

Antiderivative was successfully verified.

```
[In]  Int[x^19/Sqrt[1 + x^8],x]
```

```
[Out] (-3*x^4*Sqrt[1 + x^8])/32 + (x^12*Sqrt[1 + x^8])/16 + (3*ArcSinh[
x^4])/32
```

Rubi in Sympy [A] time = 6.29661, size = 36, normalized size = 0.88

$$\frac{x^{12}\sqrt{x^8+1}}{16}-\frac{3x^4\sqrt{x^8+1}}{32}+\frac{3\operatorname{asinh}\left(x^4\right)}{32}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**19/(x**8+1)**(1/2),x)
```

```
[Out] x**12*sqrt(x**8 + 1)/16 - 3*x**4*sqrt(x**8 + 1)/32 + 3*asinh(x**4
)/32
```

Mathematica [A] time = 0.0293303, size = 31, normalized size = 0.76

$$\frac{1}{32}\left(3\sinh^{-1}\left(x^4\right)+\sqrt{x^8+1}\left(2x^8-3\right)x^4\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^19/Sqrt[1 + x^8],x]
```

```
[Out] (x^4*Sqrt[1 + x^8]*(-3 + 2*x^8) + 3*ArcSinh[x^4])/32
```

Maple [A] time = 0.036, size = 27, normalized size = 0.7

$$\frac{x^4\left(2x^8-3\right)}{32}\sqrt{x^8+1}+\frac{3\,Arcsinh\left(x^4\right)}{32}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^19/(x^8+1)^(1/2),x)
```

```
[Out] 1/32*x^4*(2*x^8-3)*(x^8+1)^(1/2)+3/32*arcsinh(x^4)
```

Maxima [A] time = 1.44044, size = 116, normalized size = 2.83

$$-\frac{\frac{5\sqrt{x^8+1}}{x^4}-\frac{3\,(x^8+1)^{\frac{3}{2}}}{x^{12}}}{32\left(\frac{2\,(x^8+1)}{x^8}-\frac{(x^8+1)^2}{x^{16}}-1\right)}+\frac{3}{64}\log\left(\frac{\sqrt{x^8+1}}{x^4}+1\right)-\frac{3}{64}\log\left(\frac{\sqrt{x^8+1}}{x^4}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^19/sqrt(x^8 + 1),x, algorithm="maxima")
```

```
[Out] -1/32*(5*sqrt(x^8 + 1)/x^4 - 3*(x^8 + 1)^(3/2)/x^12)/(2*(x^8 + 1)
/x^8 - (x^8 + 1)^2/x^16 - 1) + 3/64*log(sqrt(x^8 + 1)/x^4 + 1) -
3/64*log(sqrt(x^8 + 1)/x^4 - 1)
```

Fricas [A] time = 0.22338, size = 170, normalized size = 4.15

$$-\frac{16\,x^{32}-28\,x^{16}-12\,x^8+3\left(8\,x^{16}+8\,x^8-4\left(2\,x^{12}+x^4\right)\sqrt{x^8+1}+1\right)\log\left(-x^4+\sqrt{x^8+1}\right)-\left(16\,x^{28}-8\,x^{20}-22\,x^{12}-3\,x\right.}{32\left(8\,x^{16}+8\,x^8-4\,(2\,x^{12}+x^4)\sqrt{x^8+1}+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^19/sqrt(x^8 + 1),x, algorithm="fricas")
```

```
[Out] -1/32*(16*x^32 - 28*x^16 - 12*x^8 + 3*(8*x^16 + 8*x^8 - 4*(2*x^12
 + x^4)*sqrt(x^8 + 1) + 1)*log(-x^4 + sqrt(x^8 + 1)) - (16*x^28 -
 8*x^20 - 22*x^12 - 3*x^4)*sqrt(x^8 + 1))/(8*x^16 + 8*x^8 - 4*(2*
x^12 + x^4)*sqrt(x^8 + 1) + 1)
```

Sympy [A] time = 25.9716, size = 49, normalized size = 1.2

$$\frac{x^{20}}{16\sqrt{x^8+1}}-\frac{x^{12}}{32\sqrt{x^8+1}}-\frac{3x^4}{32\sqrt{x^8+1}}+\frac{3\operatorname{asinh}\left(x^4\right)}{32}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**19/(x**8+1)**(1/2),x)
```

```
[Out] x**20/(16*sqrt(x**8 + 1)) - x**12/(32*sqrt(x**8 + 1)) - 3*x**4/(3
2*sqrt(x**8 + 1)) + 3*asinh(x**4)/32
```

GIAC/XCAS [A] time = 0.239932, size = 59, normalized size = 1.44

$$\frac{1}{32}\left(2\,x^8-3\right)\sqrt{x^8+1}x^4+\frac{3}{64}\ln\left(\sqrt{\frac{1}{x^8}+1}+1\right)-\frac{3}{64}\ln\left(\sqrt{\frac{1}{x^8}+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^19/sqrt(x^8 + 1),x, algorithm="giac")
```

```
[Out] 1/32*(2*x^8 - 3)*sqrt(x^8 + 1)*x^4 + 3/64*ln(sqrt(1/x^8 + 1) + 1)
 - 3/64*ln(sqrt(1/x^8 + 1) - 1)
```

3.1513 $\int \frac{x^{15}}{\sqrt{1+x^8}}\,dx$

Optimal. Leaf size=27

$$\frac{1}{12}\left(x^8+1\right)^{3/2}-\frac{\sqrt{x^8+1}}{4}$$

```
[Out] -Sqrt[1 + x^8]/4 + (1 + x^8)^(3/2)/12
```

Rubi [A] time = 0.0352397, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{1}{12}\left(x^8+1\right)^{3/2}-\frac{\sqrt{x^8+1}}{4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^15/Sqrt[1 + x^8],x]

[Out] -Sqrt[1 + x^8]/4 + (1 + x^8)^(3/2)/12
```

Rubi in Sympy [A] time = 3.55767, size = 19, normalized size = 0.7

$$\frac{\left(x^8+1\right)^{\frac{3}{2}}}{12}-\frac{\sqrt{x^8+1}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**15/(x**8+1)**(1/2),x)

[Out] (x**8 + 1)**(3/2)/12 - sqrt(x**8 + 1)/4
```

Mathematica [A] time = 0.0094315, size = 18, normalized size = 0.67

$$\frac{1}{12}\left(x^8-2\right)\sqrt{x^8+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^15/Sqrt[1 + x^8],x]

[Out] ((-2 + x^8)*Sqrt[1 + x^8])/12
```

Maple [A] time = 0.007, size = 15, normalized size = 0.6

$$\frac{x^8-2}{12}\sqrt{x^8+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^15/(x^8+1)^(1/2),x)

[Out] 1/12*(x^8+1)^(1/2)*(x^8-2)
```

Maxima [A] time = 1.4369, size = 26, normalized size = 0.96

$$\frac{1}{12}\left(x^{8}+1\right)^{\frac{3}{2}}-\frac{1}{4}\sqrt{x^{8}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^15/sqrt(x^8 + 1),x, algorithm="maxima")

[Out] 1/12*(x^8 + 1)^(3/2) - 1/4*sqrt(x^8 + 1)
```

Fricas [A] time = 0.221203, size = 19, normalized size = 0.7

$$\frac{1}{12}\sqrt{x^{8}+1}\left(x^{8}-2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^15/sqrt(x^8 + 1),x, algorithm="fricas")

[Out] 1/12*sqrt(x^8 + 1)*(x^8 - 2)
```

Sympy [A] time = 10.2816, size = 22, normalized size = 0.81

$$\frac{x^{8}\sqrt{x^{8}+1}}{12}-\frac{\sqrt{x^{8}+1}}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**15/(x**8+1)**(1/2),x)

[Out] x**8*sqrt(x**8 + 1)/12 - sqrt(x**8 + 1)/6
```

GIAC/XCAS [A] time = 0.223406, size = 26, normalized size = 0.96

$$\frac{1}{12}\left(x^{8}+1\right)^{\frac{3}{2}}-\frac{1}{4}\sqrt{x^{8}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^15/sqrt(x^8 + 1),x, algorithm="giac")

[Out] 1/12*(x^8 + 1)^(3/2) - 1/4*sqrt(x^8 + 1)
```

3.1514 $\int \frac{x^{11}}{\sqrt{1+x^8}}\,dx$

Optimal. Leaf size=25

$$\frac{1}{8}x^4\sqrt{x^8+1}-\frac{1}{8}\sinh^{-1}\left(x^4\right)$$

```
[Out] (x^4*Sqrt[1 + x^8])/8 - ArcSinh[x^4]/8
```

Rubi [A] time = 0.0364963, antiderivative size = 25, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{1}{8}x^4\sqrt{x^8+1}-\frac{1}{8}\sinh^{-1}\left(x^4\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^11/Sqrt[1 + x^8],x]

[Out] (x^4*Sqrt[1 + x^8])/8 - ArcSinh[x^4]/8
```

Rubi in Sympy [A] time = 4.66603, size = 19, normalized size = 0.76

$$\frac{x^4\sqrt{x^8+1}}{8}-\frac{\operatorname{asinh}\left(x^4\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**11/(x**8+1)**(1/2),x)

[Out] x**4*sqrt(x**8 + 1)/8 - asinh(x**4)/8
```

Mathematica [A] time = 0.0127126, size = 25, normalized size = 1.

$$\frac{1}{8}x^4\sqrt{x^8+1}-\frac{1}{8}\sinh^{-1}\left(x^4\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^11/Sqrt[1 + x^8],x]

[Out] (x^4*Sqrt[1 + x^8])/8 - ArcSinh[x^4]/8
```

Maple [A] time = 0.035, size = 20, normalized size = 0.8

$$-\frac{Arcsinh\left(x^4\right)}{8}+\frac{x^4}{8}\sqrt{x^8+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^11/(x^8+1)^(1/2),x)

[Out] -1/8*arcsinh(x^4)+1/8*x^4*(x^8+1)^(1/2)
```

Maxima [A] time = 1.44347, size = 78, normalized size = 3.12

$$\frac{\sqrt{x^8+1}}{8\,x^4\left(\frac{x^8+1}{x^8}-1\right)}-\frac{1}{16}\,\log\left(\frac{\sqrt{x^8+1}}{x^4}+1\right)+\frac{1}{16}\,\log\left(\frac{\sqrt{x^8+1}}{x^4}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/sqrt(x^8 + 1),x, algorithm="maxima")
```

```
[Out] 1/8*sqrt(x^8 + 1)/(x^4*((x^8 + 1)/x^8 - 1)) - 1/16*log(sqrt(x^8 +
 1)/x^4 + 1) + 1/16*log(sqrt(x^8 + 1)/x^4 - 1)
```

Fricas [A] time = 0.221649, size = 117, normalized size = 4.68

$$-\frac{2\,x^{16}+2\,x^8-\left(2\,x^8-2\,\sqrt{x^8+1}x^4+1\right)\log\left(-x^4+\sqrt{x^8+1}\right)-\left(2\,x^{12}+x^4\right)\sqrt{x^8+1}}{8\left(2\,x^8-2\,\sqrt{x^8+1}x^4+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/sqrt(x^8 + 1),x, algorithm="fricas")
```

```
[Out] -1/8*(2*x^16 + 2*x^8 - (2*x^8 - 2*sqrt(x^8 + 1)*x^4 + 1)*log(-x^4
 + sqrt(x^8 + 1)) - (2*x^12 + x^4)*sqrt(x^8 + 1))/(2*x^8 - 2*sqrt
(x^8 + 1)*x^4 + 1)
```

Sympy [A] time = 8.38976, size = 19, normalized size = 0.76

$$\frac{x^4\sqrt{x^8+1}}{8}-\frac{\operatorname{asinh}\left(x^4\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**11/(x**8+1)**(1/2),x)
```

```
[Out] x**4*sqrt(x**8 + 1)/8 - asinh(x**4)/8
```

GIAC/XCAS [A] time = 0.243473, size = 50, normalized size = 2.

$$\frac{1}{8}\,\sqrt{x^8+1}x^4-\frac{1}{16}\ln\left(\sqrt{\frac{1}{x^8}+1}+1\right)+\frac{1}{16}\ln\left(\sqrt{\frac{1}{x^8}+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^11/sqrt(x^8 + 1),x, algorithm="giac")
```

```
[Out] 1/8*sqrt(x^8 + 1)*x^4 - 1/16*ln(sqrt(1/x^8 + 1) + 1) + 1/16*ln(sq
rt(1/x^8 + 1) - 1)
```

3.1515 $\int \frac{x^7}{\sqrt{1+x^8}}\,dx$

Optimal. Leaf size=13

$$\frac{\sqrt{x^8+1}}{4}$$

```
[Out] Sqrt[1 + x^8]/4
```

Rubi [A] time = 0.00831188, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{\sqrt{x^8+1}}{4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7/Sqrt[1 + x^8],x]

[Out] Sqrt[1 + x^8]/4
```

Rubi in Sympy [A] time = 1.66903, size = 8, normalized size = 0.62

$$\frac{\sqrt{x^8+1}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7/(x**8+1)**(1/2),x)

[Out] sqrt(x**8 + 1)/4
```

Mathematica [A] time = 0.00459624, size = 13, normalized size = 1.

$$\frac{\sqrt{x^8+1}}{4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^7/Sqrt[1 + x^8],x]

[Out] Sqrt[1 + x^8]/4
```

Maple [A] time = 0.005, size = 10, normalized size = 0.8

$$\frac{1}{4}\sqrt{x^8+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7/(x^8+1)^(1/2),x)

[Out] 1/4*(x^8+1)^(1/2)
```

Maxima [A] time = 1.41338, size = 12, normalized size = 0.92

$$\frac{1}{4}\sqrt{x^8+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(x^8 + 1),x, algorithm="maxima")

[Out] 1/4*sqrt(x^8 + 1)
```

Fricas [A] time = 0.218609, size = 12, normalized size = 0.92

$$\frac{1}{4}\sqrt{x^8+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(x^8 + 1),x, algorithm="fricas")

[Out] 1/4*sqrt(x^8 + 1)
```

Sympy [A] time = 1.20962, size = 8, normalized size = 0.62

$$\frac{\sqrt{x^8+1}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(x**8+1)**(1/2),x)

[Out] sqrt(x**8 + 1)/4
```

GIAC/XCAS [A] time = 0.227729, size = 12, normalized size = 0.92

$$\frac{1}{4}\sqrt{x^8+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(x^8 + 1),x, algorithm="giac")

[Out] 1/4*sqrt(x^8 + 1)
```

3.1516 $\int \frac{x^3}{\sqrt{1+x^8}}\,dx$

Optimal. Leaf size=8

$$\frac{1}{4}\sinh^{-1}\left(x^4\right)$$

```
[Out] ArcSinh[x^4]/4
```

Rubi [A] time = 0.015852, antiderivative size = 8, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{1}{4}\sinh^{-1}\left(x^4\right)$$

Antiderivative was successfully verified.

```
[In] Int[x^3/Sqrt[1 + x^8],x]

[Out] ArcSinh[x^4]/4
```

Rubi in Sympy [A] time = 2.56121, size = 5, normalized size = 0.62

$$\frac{\operatorname{asinh}\left(x^4\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**3/(x**8+1)**(1/2),x)

[Out] asinh(x**4)/4
```

Mathematica [A] time = 0.00765015, size = 8, normalized size = 1.

$$\frac{1}{4}\sinh^{-1}\left(x^4\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3/Sqrt[1 + x^8],x]

[Out] ArcSinh[x^4]/4
```

Maple [A] time = 0.023, size = 7, normalized size = 0.9

$$\frac{Arcsinh\left(x^4\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(x^8+1)^(1/2),x)

[Out] 1/4*arcsinh(x^4)
```

Maxima [A] time = 1.44127, size = 45, normalized size = 5.62

$$\frac{1}{8}\,\log\left(\frac{\sqrt{x^8+1}}{x^4}+1\right)-\frac{1}{8}\,\log\left(\frac{\sqrt{x^8+1}}{x^4}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(x^8 + 1),x, algorithm="maxima")
```

```
[Out] 1/8*log(sqrt(x^8 + 1)/x^4 + 1) - 1/8*log(sqrt(x^8 + 1)/x^4 - 1)
```

Fricas [A] time = 0.222058, size = 22, normalized size = 2.75

$$-\frac{1}{4}\,\log\left(-x^4+\sqrt{x^8+1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(x^8 + 1),x, algorithm="fricas")
```

```
[Out] -1/4*log(-x^4 + sqrt(x^8 + 1))
```

Sympy [A] time = 3.32458, size = 5, normalized size = 0.62

$$\frac{\operatorname{asinh}\left(x^4\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(x**8+1)**(1/2),x)
```

```
[Out] asinh(x**4)/4
```

GIAC/XCAS [A] time = 0.234437, size = 22, normalized size = 2.75

$$-\frac{1}{4}\ln\left(-x^4+\sqrt{x^8+1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(x^8 + 1),x, algorithm="giac")
```

```
[Out] -1/4*ln(-x^4 + sqrt(x^8 + 1))
```

3.1517 $\int \frac{1}{x\sqrt{1+x^8}}\,dx$

Optimal. Leaf size=14

$$-\frac{1}{4}\tanh^{-1}\left(\sqrt{x^8+1}\right)$$

```
[Out] -ArcTanh[Sqrt[1 + x^8]]/4
```

Rubi [A] time = 0.0262751, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{1}{4}\tanh^{-1}\left(\sqrt{x^8+1}\right)$$

Antiderivative was successfully verified.

```
[In] Int[1/(x*Sqrt[1 + x^8]),x]

[Out] -ArcTanh[Sqrt[1 + x^8]]/4
```

Rubi in Sympy [A] time = 3.31774, size = 12, normalized size = 0.86

$$-\frac{\operatorname{atanh}\left(\sqrt{x^8+1}\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x/(x**8+1)**(1/2),x)

[Out] -atanh(sqrt(x**8 + 1))/4
```

Mathematica [A] time = 0.0163348, size = 14, normalized size = 1.

$$-\frac{1}{4}\tanh^{-1}\left(\sqrt{x^8+1}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x*Sqrt[1 + x^8]),x]

[Out] -ArcTanh[Sqrt[1 + x^8]]/4
```

Maple [A] time = 0.009, size = 19, normalized size = 1.4

$$\frac{1}{4}\ln\left(1\left(\sqrt{x^8+1}-1\right)\frac{1}{\sqrt{x^8}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(x^8+1)^(1/2),x)

[Out] 1/4*ln(((x^8+1)^(1/2)-1)/(x^8)^(1/2))
```

Maxima [A] time = 1.43722, size = 34, normalized size = 2.43

$$-\frac{1}{8}\log\left(\sqrt{x^8+1}+1\right)+\frac{1}{8}\log\left(\sqrt{x^8+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^8 + 1)*x),x, algorithm="maxima")
```

```
[Out] -1/8*log(sqrt(x^8 + 1) + 1) + 1/8*log(sqrt(x^8 + 1) - 1)
```

Fricas [A] time = 0.240708, size = 34, normalized size = 2.43

$$-\frac{1}{8}\log\left(\sqrt{x^8+1}+1\right)+\frac{1}{8}\log\left(\sqrt{x^8+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^8 + 1)*x),x, algorithm="fricas")
```

```
[Out] -1/8*log(sqrt(x^8 + 1) + 1) + 1/8*log(sqrt(x^8 + 1) - 1)
```

Sympy [A] time = 3.34482, size = 8, normalized size = 0.57

$$-\frac{\operatorname{asinh}\left(\frac{1}{x^4}\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(x**8+1)**(1/2),x)
```

```
[Out] -asinh(x**(-4))/4
```

GIAC/XCAS [A] time = 0.229492, size = 34, normalized size = 2.43

$$-\frac{1}{8}\ln\left(\sqrt{x^8+1}+1\right)+\frac{1}{8}\ln\left(\sqrt{x^8+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^8 + 1)*x),x, algorithm="giac")
```

```
[Out] -1/8*ln(sqrt(x^8 + 1) + 1) + 1/8*ln(sqrt(x^8 + 1) - 1)
```

3.1518 $\int \frac{1}{x^5\sqrt{1+x^8}}\,dx$

Optimal. Leaf size=16

$$-\frac{\sqrt{x^8+1}}{4x^4}$$

```
[Out] -Sqrt[1 + x^8]/(4*x^4)
```

Rubi [A] time = 0.0146453, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$-\frac{\sqrt{x^8+1}}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^5*Sqrt[1 + x^8]),x]

[Out] -Sqrt[1 + x^8]/(4*x^4)
```

Rubi in Sympy [A] time = 2.27655, size = 14, normalized size = 0.88

$$-\frac{\sqrt{x^8+1}}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**5/(x**8+1)**(1/2),x)

[Out] -sqrt(x**8 + 1)/(4*x**4)
```

Mathematica [A] time = 0.00890641, size = 16, normalized size = 1.

$$-\frac{\sqrt{x^8+1}}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^5*Sqrt[1 + x^8]),x]

[Out] -Sqrt[1 + x^8]/(4*x^4)
```

Maple [A] time = 0.005, size = 13, normalized size = 0.8

$$-\frac{1}{4\,x^4}\sqrt{x^8+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^5/(x^8+1)^(1/2),x)

[Out] -1/4*(x^8+1)^(1/2)/x^4
```

Maxima [A] time = 1.44059, size = 16, normalized size = 1.

$$-\frac{\sqrt{x^8+1}}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^8 + 1)*x^5),x, algorithm="maxima")
```

```
[Out] -1/4*sqrt(x^8 + 1)/x^4
```

Fricas [A] time = 0.232099, size = 27, normalized size = 1.69

$$\frac{1}{4\left(x^8-\sqrt{x^8+1}x^4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^8 + 1)*x^5),x, algorithm="fricas")
```

```
[Out] 1/4/(x^8 - sqrt(x^8 + 1)*x^4)
```

Sympy [A] time = 2.18693, size = 12, normalized size = 0.75

$$-\frac{\sqrt{1+\frac{1}{x^8}}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**5/(x**8+1)**(1/2),x)
```

```
[Out] -sqrt(1 + x**(-8))/4
```

GIAC/XCAS [A] time = 0.226487, size = 12, normalized size = 0.75

$$-\frac{1}{4}\sqrt{\frac{1}{x^8}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^8 + 1)*x^5),x, algorithm="giac")
```

```
[Out] -1/4*sqrt(1/x^8 + 1)
```

3.1519 $\int \frac{1}{x^9\sqrt{1+x^8}}\,dx$

Optimal. Leaf size=31

$$\frac{1}{8}\tanh^{-1}\left(\sqrt{x^8+1}\right)-\frac{\sqrt{x^8+1}}{8x^8}$$

```
[Out] -Sqrt[1 + x^8]/(8*x^8) + ArcTanh[Sqrt[1 + x^8]]/8
```

Rubi [A] time = 0.0392923, antiderivative size = 31, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{1}{8}\tanh^{-1}\left(\sqrt{x^8+1}\right)-\frac{\sqrt{x^8+1}}{8x^8}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^9*Sqrt[1 + x^8]),x]

[Out] -Sqrt[1 + x^8]/(8*x^8) + ArcTanh[Sqrt[1 + x^8]]/8
```

Rubi in Sympy [A] time = 4.19084, size = 24, normalized size = 0.77

$$\frac{\operatorname{atanh}\left(\sqrt{x^8+1}\right)}{8}-\frac{\sqrt{x^8+1}}{8x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**9/(x**8+1)**(1/2),x)

[Out] atanh(sqrt(x**8 + 1))/8 - sqrt(x**8 + 1)/(8*x**8)
```

Mathematica [A] time = 0.0311539, size = 31, normalized size = 1.

$$\frac{1}{8}\tanh^{-1}\left(\sqrt{x^8+1}\right)-\frac{\sqrt{x^8+1}}{8x^8}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^9*Sqrt[1 + x^8]),x]

[Out] -Sqrt[1 + x^8]/(8*x^8) + ArcTanh[Sqrt[1 + x^8]]/8
```

Maple [A] time = 0.036, size = 32, normalized size = 1.

$$-\frac{1}{8\,x^8}\sqrt{x^8+1}-\frac{1}{8}\ln\left(1\left(\sqrt{x^8+1}-1\right)\frac{1}{\sqrt{x^8}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^9/(x^8+1)^(1/2),x)
```

```
[Out] -1/8*(x^8+1)^(1/2)/x^8-1/8*ln(((x^8+1)^(1/2)-1)/(x^8)^(1/2))
```

Maxima [A] time = 1.44261, size = 50, normalized size = 1.61

$$-\frac{\sqrt{x^8+1}}{8\,x^8}+\frac{1}{16}\,\log\left(\sqrt{x^8+1}+1\right)-\frac{1}{16}\,\log\left(\sqrt{x^8+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^8 + 1)*x^9),x, algorithm="maxima")
```

```
[Out] -1/8*sqrt(x^8 + 1)/x^8 + 1/16*log(sqrt(x^8 + 1) + 1) - 1/16*log(s
qrt(x^8 + 1) - 1)
```

Fricas [A] time = 0.239145, size = 59, normalized size = 1.9

$$\frac{x^8\log\left(\sqrt{x^8+1}+1\right)-x^8\log\left(\sqrt{x^8+1}-1\right)-2\sqrt{x^8+1}}{16\,x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^8 + 1)*x^9),x, algorithm="fricas")
```

```
[Out] 1/16*(x^8*log(sqrt(x^8 + 1) + 1) - x^8*log(sqrt(x^8 + 1) - 1) - 2
*sqrt(x^8 + 1))/x^8
```

Sympy [A] time = 8.50369, size = 22, normalized size = 0.71

$$\frac{\operatorname{asinh}\left(\frac{1}{x^4}\right)}{8}-\frac{\sqrt{1+\frac{1}{x^8}}}{8x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**9/(x**8+1)**(1/2),x)
```

```
[Out] asinh(x**(-4))/8 - sqrt(1 + x**(-8))/(8*x**4)
```

GIAC/XCAS [A] time = 0.225387, size = 50, normalized size = 1.61

$$-\frac{\sqrt{x^8+1}}{8\,x^8}+\frac{1}{16}\ln\left(\sqrt{x^8+1}+1\right)-\frac{1}{16}\ln\left(\sqrt{x^8+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^8 + 1)*x^9),x, algorithm="giac")
```

```
[Out] -1/8*sqrt(x^8 + 1)/x^8 + 1/16*ln(sqrt(x^8 + 1) + 1) - 1/16*ln(sqr
t(x^8 + 1) - 1)
```

3.1520 $\int \frac{1}{x^{13}\sqrt{1+x^8}}\,dx$

Optimal. Leaf size=33

$$\frac{\sqrt{x^8+1}}{6x^4}-\frac{\sqrt{x^8+1}}{12x^{12}}$$

```
[Out] -Sqrt[1 + x^8]/(12*x^12) + Sqrt[1 + x^8]/(6*x^4)
```

Rubi [A] time = 0.026796, antiderivative size = 33, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{\sqrt{x^8+1}}{6x^4}-\frac{\sqrt{x^8+1}}{12x^{12}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^13*Sqrt[1 + x^8]),x]

[Out] -Sqrt[1 + x^8]/(12*x^12) + Sqrt[1 + x^8]/(6*x^4)
```

Rubi in Sympy [A] time = 3.26514, size = 26, normalized size = 0.79

$$\frac{\sqrt{x^8+1}}{6x^4}-\frac{\sqrt{x^8+1}}{12x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**13/(x**8+1)**(1/2),x)

[Out] sqrt(x**8 + 1)/(6*x**4) - sqrt(x**8 + 1)/(12*x**12)
```

Mathematica [A] time = 0.0130553, size = 25, normalized size = 0.76

$$\left(\frac{1}{6x^4}-\frac{1}{12x^{12}}\right)\sqrt{x^8+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^13*Sqrt[1 + x^8]),x]

[Out] (-1/(12*x^12) + 1/(6*x^4))*Sqrt[1 + x^8]
```

Maple [A] time = 0.005, size = 20, normalized size = 0.6

$$\frac{2\,x^8-1}{12\,x^{12}}\sqrt{x^8+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^13/(x^8+1)^(1/2),x)

[Out] 1/12*(x^8+1)^(1/2)*(2*x^8-1)/x^12
```

Maxima [A] time = 1.42842, size = 34, normalized size = 1.03

$$\frac{\sqrt{x^8+1}}{4\,x^4}-\frac{\left(x^8+1\right)^{\frac{3}{2}}}{12\,x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^8 + 1)*x^13),x, algorithm="maxima")
```

```
[Out] 1/4*sqrt(x^8 + 1)/x^4 - 1/12*(x^8 + 1)^(3/2)/x^12
```

Fricas [A] time = 0.22847, size = 70, normalized size = 2.12

$$\frac{3\,x^8-3\,\sqrt{x^8+1}x^4+1}{12\left(4\,x^{24}+3\,x^{16}-\left(4\,x^{20}+x^{12}\right)\sqrt{x^8+1}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^8 + 1)*x^13),x, algorithm="fricas")
```

```
[Out] 1/12*(3*x^8 - 3*sqrt(x^8 + 1)*x^4 + 1)/(4*x^24 + 3*x^16 - (4*x^20
 + x^12)*sqrt(x^8 + 1))
```

Sympy [A] time = 9.4109, size = 26, normalized size = 0.79

$$\frac{\sqrt{1+\frac{1}{x^8}}}{6}-\frac{\sqrt{1+\frac{1}{x^8}}}{12x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**13/(x**8+1)**(1/2),x)
```

```
[Out] sqrt(1 + x**(-8))/6 - sqrt(1 + x**(-8))/(12*x**8)
```

GIAC/XCAS [A] time = 0.233863, size = 26, normalized size = 0.79

$$-\frac{1}{12}\left(\frac{1}{x^8}+1\right)^{\frac{3}{2}}+\frac{1}{4}\sqrt{\frac{1}{x^8}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^8 + 1)*x^13),x, algorithm="giac")
```

```
[Out] -1/12*(1/x^8 + 1)^(3/2) + 1/4*sqrt(1/x^8 + 1)
```

3.1521 $\int \frac{1}{x^{17}\sqrt{1+x^8}}\,dx$

Optimal. Leaf size=47

$$\frac{3\sqrt{x^8+1}}{32x^8}-\frac{3}{32}\tanh^{-1}\left(\sqrt{x^8+1}\right)-\frac{\sqrt{x^8+1}}{16x^{16}}$$

```
[Out] -Sqrt[1 + x^8]/(16*x^16) + (3*Sqrt[1 + x^8])/(32*x^8) - (3*ArcTan
h[Sqrt[1 + x^8]])/32
```

Rubi [A] time = 0.0528254, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{3\sqrt{x^8+1}}{32x^8}-\frac{3}{32}\tanh^{-1}\left(\sqrt{x^8+1}\right)-\frac{\sqrt{x^8+1}}{16x^{16}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^17*Sqrt[1 + x^8]),x]
```

```
[Out] -Sqrt[1 + x^8]/(16*x^16) + (3*Sqrt[1 + x^8])/(32*x^8) - (3*ArcTan
h[Sqrt[1 + x^8]])/32
```

Rubi in Sympy [A] time = 5.06273, size = 41, normalized size = 0.87

$$-\frac{3\,\mathrm{atanh}\left(\sqrt{x^8+1}\right)}{32}+\frac{3\sqrt{x^8+1}}{32x^8}-\frac{\sqrt{x^8+1}}{16x^{16}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**17/(x**8+1)**(1/2),x)
```

```
[Out] -3*atanh(sqrt(x**8 + 1))/32 + 3*sqrt(x**8 + 1)/(32*x**8) - sqrt(x
**8 + 1)/(16*x**16)
```

Mathematica [A] time = 0.0433811, size = 37, normalized size = 0.79

$$\frac{1}{32}\left(\frac{\sqrt{x^8+1}\left(3x^8-2\right)}{x^{16}}-3\tanh^{-1}\left(\sqrt{x^8+1}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^17*Sqrt[1 + x^8]),x]
```

```
[Out] ((Sqrt[1 + x^8]*(-2 + 3*x^8))/x^16 - 3*ArcTanh[Sqrt[1 + x^8]])/32
```

Maple [A] time = 0.037, size = 42, normalized size = 0.9

$$\frac{3\,x^{16}+x^8-2}{32\,x^{16}}\frac{1}{\sqrt{x^8+1}}+\frac{3}{32}\ln\left(1\left(\sqrt{x^8+1}-1\right)\frac{1}{\sqrt{x^8}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^17/(x^8+1)^(1/2),x)
```

```
[Out] 1/32*(3*x^16+x^8-2)/x^16/(x^8+1)^(1/2)+3/32*ln(((x^8+1)^(1/2)-1)/
(x^8)^(1/2))
```

Maxima [A] time = 1.43816, size = 86, normalized size = 1.83

$$-\frac{3\left(x^{8}+1\right)^{\frac{3}{2}}-5\sqrt{x^{8}+1}}{32\left(2x^{8}-\left(x^{8}+1\right)^{2}+1\right)}-\frac{3}{64}\log\left(\sqrt{x^{8}+1}+1\right)+\frac{3}{64}\log\left(\sqrt{x^{8}+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^8 + 1)*x^17),x, algorithm="maxima")
```

```
[Out] -1/32*(3*(x^8 + 1)^(3/2) - 5*sqrt(x^8 + 1))/(2*x^8 - (x^8 + 1)^2
+ 1) - 3/64*log(sqrt(x^8 + 1) + 1) + 3/64*log(sqrt(x^8 + 1) - 1)
```

Fricas [A] time = 0.237902, size = 70, normalized size = 1.49

$$-\frac{3x^{16}\log\left(\sqrt{x^{8}+1}+1\right)-3x^{16}\log\left(\sqrt{x^{8}+1}-1\right)-2\left(3x^{8}-2\right)\sqrt{x^{8}+1}}{64x^{16}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^8 + 1)*x^17),x, algorithm="fricas")
```

```
[Out] -1/64*(3*x^16*log(sqrt(x^8 + 1) + 1) - 3*x^16*log(sqrt(x^8 + 1) -
 1) - 2*(3*x^8 - 2)*sqrt(x^8 + 1))/x^16
```

Sympy [A] time = 27.263, size = 60, normalized size = 1.28

$$-\frac{3\operatorname{asinh}\left(\frac{1}{x^{4}}\right)}{32}+\frac{3}{32x^{4}\sqrt{1+\frac{1}{x^{8}}}}+\frac{1}{32x^{12}\sqrt{1+\frac{1}{x^{8}}}}-\frac{1}{16x^{20}\sqrt{1+\frac{1}{x^{8}}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**17/(x**8+1)**(1/2),x)
```

```
[Out] -3*asinh(x**(-4))/32 + 3/(32*x**4*sqrt(1 + x**(-8))) + 1/(32*x**1
2*sqrt(1 + x**(-8))) - 1/(16*x**20*sqrt(1 + x**(-8)))
```

GIAC/XCAS [A] time = 0.228642, size = 66, normalized size = 1.4

$$\frac{3\left(x^{8}+1\right)^{\frac{3}{2}}-5\sqrt{x^{8}+1}}{32x^{16}}-\frac{3}{64}\ln\left(\sqrt{x^{8}+1}+1\right)+\frac{3}{64}\ln\left(\sqrt{x^{8}+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^8 + 1)*x^17),x, algorithm="giac")
```

```
[Out] 1/32*(3*(x^8 + 1)^(3/2) - 5*sqrt(x^8 + 1))/x^16 - 3/64*ln(sqrt(x^
8 + 1) + 1) + 3/64*ln(sqrt(x^8 + 1) - 1)
```

3.1522 $\int \frac{x^{13}}{\sqrt{1+x^8}}\,dx$

Optimal. Leaf size=130

$$\frac{1}{10}\sqrt{x^8+1}x^6-\frac{3\sqrt{x^8+1}x^2}{10\left(x^4+1\right)}-\frac{3\left(x^4+1\right)\sqrt{\frac{x^8+1}{\left(x^4+1\right)^2}}F\left(2\tan^{-1}\left(x^2\right)|\frac{1}{2}\right)}{20\sqrt{x^8+1}}+\frac{3\left(x^4+1\right)\sqrt{\frac{x^8+1}{\left(x^4+1\right)^2}}E\left(2\tan^{-1}\left(x^2\right)|\frac{1}{2}\right)}{10\sqrt{x^8+1}}$$

```
[Out] (x^6*Sqrt[1 + x^8])/10 - (3*x^2*Sqrt[1 + x^8])/(10*(1 + x^4)) + (
3*(1 + x^4)*Sqrt[(1 + x^8)/(1 + x^4)^2]*EllipticE[2*ArcTan[x^2],
1/2])/(10*Sqrt[1 + x^8]) - (3*(1 + x^4)*Sqrt[(1 + x^8)/(1 + x^4)^
2]*EllipticF[2*ArcTan[x^2], 1/2])/(20*Sqrt[1 + x^8])
```

Rubi [A] time = 0.137168, antiderivative size = 130, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385

$$\frac{1}{10}\sqrt{x^8+1}x^6-\frac{3\sqrt{x^8+1}x^2}{10\left(x^4+1\right)}-\frac{3\left(x^4+1\right)\sqrt{\frac{x^8+1}{\left(x^4+1\right)^2}}F\left(2\tan^{-1}\left(x^2\right)|\frac{1}{2}\right)}{20\sqrt{x^8+1}}+\frac{3\left(x^4+1\right)\sqrt{\frac{x^8+1}{\left(x^4+1\right)^2}}E\left(2\tan^{-1}\left(x^2\right)|\frac{1}{2}\right)}{10\sqrt{x^8+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^13/Sqrt[1 + x^8],x]
```

```
[Out] (x^6*Sqrt[1 + x^8])/10 - (3*x^2*Sqrt[1 + x^8])/(10*(1 + x^4)) + (
3*(1 + x^4)*Sqrt[(1 + x^8)/(1 + x^4)^2]*EllipticE[2*ArcTan[x^2],
1/2])/(10*Sqrt[1 + x^8]) - (3*(1 + x^4)*Sqrt[(1 + x^8)/(1 + x^4)^
2]*EllipticF[2*ArcTan[x^2], 1/2])/(20*Sqrt[1 + x^8])
```

Rubi in Sympy [A] time = 9.35055, size = 117, normalized size = 0.9

$$\frac{x^6\sqrt{x^8+1}}{10}-\frac{3x^2\sqrt{x^8+1}}{10\left(x^4+1\right)}+\frac{3\sqrt{\frac{x^8+1}{\left(x^4+1\right)^2}}\left(x^4+1\right)E\left(2\operatorname{atan}\left(x^2\right)\middle|\frac{1}{2}\right)}{10\sqrt{x^8+1}}-\frac{3\sqrt{\frac{x^8+1}{\left(x^4+1\right)^2}}\left(x^4+1\right)F\left(2\operatorname{atan}\left(x^2\right)\middle|\frac{1}{2}\right)}{20\sqrt{x^8+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**13/(x**8+1)**(1/2),x)
```

```
[Out] x**6*sqrt(x**8 + 1)/10 - 3*x**2*sqrt(x**8 + 1)/(10*(x**4 + 1)) +
3*sqrt((x**8 + 1)/(x**4 + 1)**2)*(x**4 + 1)*elliptic_e(2*atan(x**
2), 1/2)/(10*sqrt(x**8 + 1)) - 3*sqrt((x**8 + 1)/(x**4 + 1)**2)*(
x**4 + 1)*elliptic_f(2*atan(x**2), 1/2)/(20*sqrt(x**8 + 1))
```

Mathematica [C] time = 0.0292938, size = 34, normalized size = 0.26

$$\frac{1}{10}x^6\left(\sqrt{x^8+1}-{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-x^8\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^13/Sqrt[1 + x^8],x]
```

```
[Out] (x^6*(Sqrt[1 + x^8] - Hypergeometric2F1[1/2, 3/4, 7/4, -x^8]))/10
```

Maple [C] time = 0.036, size = 30, normalized size = 0.2

$$\frac{x^6}{10}\sqrt{x^8+1} - \frac{x^6}{10}{}_2\mathrm{F}_1(\frac{1}{2},\frac{3}{4};\frac{7}{4};-x^8)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^13/(x^8+1)^(1/2),x)
```

```
[Out] 1/10*x^6*(x^8+1)^(1/2)-1/10*x^6*hypergeom([1/2,3/4],[7/4],-x^8)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{13}}{\sqrt{x^8+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^13/sqrt(x^8 + 1),x, algorithm="maxima")
```

```
[Out] integrate(x^13/sqrt(x^8 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{13}}{\sqrt{x^8+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^13/sqrt(x^8 + 1),x, algorithm="fricas")
```

```
[Out] integral(x^13/sqrt(x^8 + 1), x)
```

Sympy [A] time = 6.22477, size = 29, normalized size = 0.22

$$\frac{x^{14}\,\Gamma\left(\frac{7}{4}\right)\,{}_2F_1\left(\left.\begin{matrix}\frac{1}{2},\frac{7}{4}\\ \frac{11}{4}\end{matrix}\right| x^8 e^{i\pi}\right)}{8\,\Gamma\left(\frac{11}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**13/(x**8+1)**(1/2),x)
```

```
[Out] x**14*gamma(7/4)*hyper((1/2, 7/4), (11/4,), x**8*exp_polar(I*pi))
/(8*gamma(11/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{13}}{\sqrt{x^8+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^13/sqrt(x^8 + 1),x, algorithm="giac")

[Out] integrate(x^13/sqrt(x^8 + 1), x)
```

3.1523 $\int \frac{x^9}{\sqrt{1+x^8}}\,dx$

Optimal. Leaf size=62

$$\frac{1}{6}x^2\sqrt{x^8+1}-\frac{\left(x^4+1\right)\sqrt{\frac{x^8+1}{\left(x^4+1\right)^2}}F\left(2\tan^{-1}\left(x^2\right)\mid\frac{1}{2}\right)}{12\sqrt{x^8+1}}$$

```
[Out] (x^2*Sqrt[1 + x^8])/6 - ((1 + x^4)*Sqrt[(1 + x^8)/(1 + x^4)^2]*El
lipticF[2*ArcTan[x^2], 1/2])/(12*Sqrt[1 + x^8])
```

Rubi [A] time = 0.0692216, antiderivative size = 62, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{1}{6}x^2\sqrt{x^8+1}-\frac{\left(x^4+1\right)\sqrt{\frac{x^8+1}{\left(x^4+1\right)^2}}F\left(2\tan^{-1}\left(x^2\right)\mid\frac{1}{2}\right)}{12\sqrt{x^8+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^9/Sqrt[1 + x^8],x]
```

```
[Out] (x^2*Sqrt[1 + x^8])/6 - ((1 + x^4)*Sqrt[(1 + x^8)/(1 + x^4)^2]*El
lipticF[2*ArcTan[x^2], 1/2])/(12*Sqrt[1 + x^8])
```

Rubi in Sympy [A] time = 4.67807, size = 53, normalized size = 0.85

$$\frac{x^2\sqrt{x^8+1}}{6}-\frac{\sqrt{\frac{x^8+1}{\left(x^4+1\right)^2}}\left(x^4+1\right)F\left(2\,\text{atan}\left(x^2\right)\middle|\frac{1}{2}\right)}{12\sqrt{x^8+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**9/(x**8+1)**(1/2),x)
```

```
[Out] x**2*sqrt(x**8 + 1)/6 - sqrt((x**8 + 1)/(x**4 + 1)**2)*(x**4 + 1)
*elliptic_f(2*atan(x**2), 1/2)/(12*sqrt(x**8 + 1))
```

Mathematica [C] time = 0.0284059, size = 34, normalized size = 0.55

$$\frac{1}{6}x^2\left(\sqrt{x^8+1}-{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{5}{4};-x^8\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^9/Sqrt[1 + x^8],x]
```

```
[Out] (x^2*(Sqrt[1 + x^8] - Hypergeometric2F1[1/4, 1/2, 5/4, -x^8]))/6
```

Maple [C] time = 0.033, size = 30, normalized size = 0.5

$$\frac{x^2}{6}\sqrt{x^8+1}-\frac{x^2}{6}{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{5}{4};-x^8\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^9/(x^8+1)^(1/2),x)
```

```
[Out] 1/6*x^2*(x^8+1)^(1/2)-1/6*x^2*hypergeom([1/4,1/2],[5/4],-x^8)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^9}{\sqrt{x^8+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/sqrt(x^8 + 1),x, algorithm="maxima")
```

```
[Out] integrate(x^9/sqrt(x^8 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{x^9}{\sqrt{x^8+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/sqrt(x^8 + 1),x, algorithm="fricas")
```

```
[Out] integral(x^9/sqrt(x^8 + 1), x)
```

Sympy [A] time = 3.17253, size = 29, normalized size = 0.47

$$\frac{x^{10}\,\Gamma\left(\frac{5}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{5}{4}\\ \frac{9}{4}\end{matrix}\middle|\,x^8 e^{i\pi}\right)}{8\,\Gamma\left(\frac{9}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**9/(x**8+1)**(1/2),x)
```

```
[Out] x**10*gamma(5/4)*hyper((1/2, 5/4), (9/4,), x**8*exp_polar(I*pi))/
(8*gamma(9/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^9}{\sqrt{x^8+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^9/sqrt(x^8 + 1),x, algorithm="giac")
```

```
[Out] integrate(x^9/sqrt(x^8 + 1), x)
```

3.1524 $\int \frac{x^5}{\sqrt{1+x^8}}\,dx$

Optimal. Leaf size=114

$$\frac{\sqrt{x^8+1}x^2}{2(x^4+1)}+\frac{(x^4+1)\sqrt{\frac{x^8+1}{(x^4+1)^2}}F\left(2\tan^{-1}(x^2)\mid\frac{1}{2}\right)}{4\sqrt{x^8+1}}-\frac{(x^4+1)\sqrt{\frac{x^8+1}{(x^4+1)^2}}E\left(2\tan^{-1}(x^2)\mid\frac{1}{2}\right)}{2\sqrt{x^8+1}}$$

```
[Out] (x^2*Sqrt[1 + x^8])/(2*(1 + x^4)) - ((1 + x^4)*Sqrt[(1 + x^8)/(1
+ x^4)^2]*EllipticE[2*ArcTan[x^2], 1/2])/(2*Sqrt[1 + x^8]) + ((1
+ x^4)*Sqrt[(1 + x^8)/(1 + x^4)^2]*EllipticF[2*ArcTan[x^2], 1/2])
/(4*Sqrt[1 + x^8])
```

Rubi [A] time = 0.10884, antiderivative size = 114, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{\sqrt{x^8+1}x^2}{2(x^4+1)}+\frac{(x^4+1)\sqrt{\frac{x^8+1}{(x^4+1)^2}}F\left(2\tan^{-1}(x^2)\mid\frac{1}{2}\right)}{4\sqrt{x^8+1}}-\frac{(x^4+1)\sqrt{\frac{x^8+1}{(x^4+1)^2}}E\left(2\tan^{-1}(x^2)\mid\frac{1}{2}\right)}{2\sqrt{x^8+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/Sqrt[1 + x^8],x]
```

```
[Out] (x^2*Sqrt[1 + x^8])/(2*(1 + x^4)) - ((1 + x^4)*Sqrt[(1 + x^8)/(1
+ x^4)^2]*EllipticE[2*ArcTan[x^2], 1/2])/(2*Sqrt[1 + x^8]) + ((1
+ x^4)*Sqrt[(1 + x^8)/(1 + x^4)^2]*EllipticF[2*ArcTan[x^2], 1/2])
/(4*Sqrt[1 + x^8])
```

Rubi in Sympy [A] time = 7.63435, size = 99, normalized size = 0.87

$$\frac{x^2\sqrt{x^8+1}}{2(x^4+1)}-\frac{\sqrt{\frac{x^8+1}{(x^4+1)^2}}(x^4+1)E\left(2\operatorname{atan}(x^2)\middle|\frac{1}{2}\right)}{2\sqrt{x^8+1}}+\frac{\sqrt{\frac{x^8+1}{(x^4+1)^2}}(x^4+1)F\left(2\operatorname{atan}(x^2)\middle|\frac{1}{2}\right)}{4\sqrt{x^8+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(x**8+1)**(1/2),x)
```

```
[Out] x**2*sqrt(x**8 + 1)/(2*(x**4 + 1)) - sqrt((x**8 + 1)/(x**4 + 1)**
2)*(x**4 + 1)*elliptic_e(2*atan(x**2), 1/2)/(2*sqrt(x**8 + 1)) +
sqrt((x**8 + 1)/(x**4 + 1)**2)*(x**4 + 1)*elliptic_f(2*atan(x**2)
, 1/2)/(4*sqrt(x**8 + 1))
```

Mathematica [C] time = 0.0217739, size = 22, normalized size = 0.19

$$\frac{1}{6}x^6\,{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-x^8\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/Sqrt[1 + x^8],x]
```

```
[Out] (x^6*Hypergeometric2F1[1/2, 3/4, 7/4, -x^8])/6
```

Maple [C] time = 0.023, size = 17, normalized size = 0.2

$$\frac{x^{6}}{6} {}_2\mathrm{F}_1\!\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-x^{8}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(x^8+1)^(1/2),x)
```

```
[Out] 1/6*x^6*hypergeom([1/2,3/4],[7/4],-x^8)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{5}}{\sqrt{x^{8}+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(x^8 + 1),x, algorithm="maxima")
```

```
[Out] integrate(x^5/sqrt(x^8 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x^{5}}{\sqrt{x^{8}+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(x^8 + 1),x, algorithm="fricas")
```

```
[Out] integral(x^5/sqrt(x^8 + 1), x)
```

Sympy [A] time = 2.06233, size = 29, normalized size = 0.25

$$\frac{x^{6}\Gamma\left(\frac{3}{4}\right) {}_{2}F_{1}\left(\begin{matrix}\frac{1}{2},\frac{3}{4}\\ \frac{7}{4}\end{matrix}\middle| x^{8}e^{i\pi}\right)}{8\Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(x**8+1)**(1/2),x)
```

```
[Out] x**6*gamma(3/4)*hyper((1/2, 3/4), (7/4,), x**8*exp_polar(I*pi))/(
8*gamma(7/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{5}}{\sqrt{x^{8}+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(x^8 + 1),x, algorithm="giac")

[Out] integrate(x^5/sqrt(x^8 + 1), x)
```

3.1525 $\int \frac{x}{\sqrt{1+x^8}}\,dx$

Optimal. Leaf size=45

$$\frac{\left(x^4+1\right)\sqrt{\frac{x^8+1}{\left(x^4+1\right)^2}}F\left(2\tan^{-1}\left(x^2\right)\mid\frac{1}{2}\right)}{4\sqrt{x^8+1}}$$

```
[Out] ((1 + x^4)*Sqrt[(1 + x^8)/(1 + x^4)^2]*EllipticF[2*ArcTan[x^2], 1
/2])/(4*Sqrt[1 + x^8])
```

Rubi [A] time = 0.0434147, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{\left(x^4+1\right)\sqrt{\frac{x^8+1}{\left(x^4+1\right)^2}}F\left(2\tan^{-1}\left(x^2\right)\mid\frac{1}{2}\right)}{4\sqrt{x^8+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/Sqrt[1 + x^8],x]
```

```
[Out] ((1 + x^4)*Sqrt[(1 + x^8)/(1 + x^4)^2]*EllipticF[2*ArcTan[x^2], 1
/2])/(4*Sqrt[1 + x^8])
```

Rubi in Sympy [A] time = 2.49572, size = 39, normalized size = 0.87

$$\frac{\sqrt{\frac{x^8+1}{\left(x^4+1\right)^2}}\left(x^4+1\right)F\left(2\,\text{atan}\left(x^2\right)\middle|\frac{1}{2}\right)}{4\sqrt{x^8+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(x**8+1)**(1/2),x)
```

```
[Out] sqrt((x**8 + 1)/(x**4 + 1)**2)*(x**4 + 1)*elliptic_f(2*atan(x**2)
, 1/2)/(4*sqrt(x**8 + 1))
```

Mathematica [C] time = 0.0191487, size = 22, normalized size = 0.49

$$\frac{1}{2}x^2\,{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{5}{4};-x^8\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/Sqrt[1 + x^8],x]
```

```
[Out] (x^2*Hypergeometric2F1[1/4, 1/2, 5/4, -x^8])/2
```

Maple [C] time = 0.02, size = 17, normalized size = 0.4

$$\frac{x^2}{2}{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{5}{4};-x^8\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(x^8+1)^(1/2),x)

[Out] 1/2*x^2*hypergeom([1/4,1/2],[5/4],-x^8)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt{x^8+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(x^8 + 1),x, algorithm="maxima")

[Out] integrate(x/sqrt(x^8 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x}{\sqrt{x^8+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(x^8 + 1),x, algorithm="fricas")

[Out] integral(x/sqrt(x^8 + 1), x)
```

Sympy [A] time = 1.64347, size = 29, normalized size = 0.64

$$\frac{x^2\,\Gamma\left(\frac{1}{4}\right)\,{}_2F_1\left(\left.\begin{matrix}\frac{1}{4},\frac{1}{2}\\ \frac{5}{4}\end{matrix}\right| x^8 e^{i\pi}\right)}{8\,\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(x**8+1)**(1/2),x)

[Out] x**2*gamma(1/4)*hyper((1/4, 1/2), (5/4,), x**8*exp_polar(I*pi))/(
8*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt{x^8+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(x^8 + 1),x, algorithm="giac")

[Out] integrate(x/sqrt(x^8 + 1), x)
```

3.1526 $\int \frac{1}{x^3\sqrt{1+x^8}}\,dx$

Optimal. Leaf size=130

$$-\frac{\sqrt{x^8+1}}{2x^2}+\frac{\sqrt{x^8+1}x^2}{2\left(x^4+1\right)}+\frac{\left(x^4+1\right)\sqrt{\frac{x^8+1}{\left(x^4+1\right)^2}}F\left(2\tan^{-1}\left(x^2\right)|\frac{1}{2}\right)}{4\sqrt{x^8+1}}-\frac{\left(x^4+1\right)\sqrt{\frac{x^8+1}{\left(x^4+1\right)^2}}E\left(2\tan^{-1}\left(x^2\right)|\frac{1}{2}\right)}{2\sqrt{x^8+1}}$$

```
[Out] -Sqrt[1 + x^8]/(2*x^2) + (x^2*Sqrt[1 + x^8])/(2*(1 + x^4)) - ((1
+ x^4)*Sqrt[(1 + x^8)/(1 + x^4)^2]*EllipticE[2*ArcTan[x^2], 1/2])
/(2*Sqrt[1 + x^8]) + ((1 + x^4)*Sqrt[(1 + x^8)/(1 + x^4)^2]*Ellip
ticF[2*ArcTan[x^2], 1/2])/(4*Sqrt[1 + x^8])
```

Rubi [A] time = 0.126816, antiderivative size = 130, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385

$$-\frac{\sqrt{x^8+1}}{2x^2}+\frac{\sqrt{x^8+1}x^2}{2\left(x^4+1\right)}+\frac{\left(x^4+1\right)\sqrt{\frac{x^8+1}{\left(x^4+1\right)^2}}F\left(2\tan^{-1}\left(x^2\right)|\frac{1}{2}\right)}{4\sqrt{x^8+1}}-\frac{\left(x^4+1\right)\sqrt{\frac{x^8+1}{\left(x^4+1\right)^2}}E\left(2\tan^{-1}\left(x^2\right)|\frac{1}{2}\right)}{2\sqrt{x^8+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*Sqrt[1 + x^8]),x]
```

```
[Out] -Sqrt[1 + x^8]/(2*x^2) + (x^2*Sqrt[1 + x^8])/(2*(1 + x^4)) - ((1
+ x^4)*Sqrt[(1 + x^8)/(1 + x^4)^2]*EllipticE[2*ArcTan[x^2], 1/2])
/(2*Sqrt[1 + x^8]) + ((1 + x^4)*Sqrt[(1 + x^8)/(1 + x^4)^2]*Ellip
ticF[2*ArcTan[x^2], 1/2])/(4*Sqrt[1 + x^8])
```

Rubi in Sympy [A] time = 9.198, size = 112, normalized size = 0.86

$$\frac{x^2\sqrt{x^8+1}}{2\left(x^4+1\right)}-\frac{\sqrt{\frac{x^8+1}{\left(x^4+1\right)^2}}\left(x^4+1\right)E\left(2\,\mathrm{atan}\left(x^2\right)\middle|\frac{1}{2}\right)}{2\sqrt{x^8+1}}+\frac{\sqrt{\frac{x^8+1}{\left(x^4+1\right)^2}}\left(x^4+1\right)F\left(2\,\mathrm{atan}\left(x^2\right)\middle|\frac{1}{2}\right)}{4\sqrt{x^8+1}}-\frac{\sqrt{x^8+1}}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(x**8+1)**(1/2),x)
```

```
[Out] x**2*sqrt(x**8 + 1)/(2*(x**4 + 1)) - sqrt((x**8 + 1)/(x**4 + 1)**
2)*(x**4 + 1)*elliptic_e(2*atan(x**2), 1/2)/(2*sqrt(x**8 + 1)) +
sqrt((x**8 + 1)/(x**4 + 1)**2)*(x**4 + 1)*elliptic_f(2*atan(x**2)
, 1/2)/(4*sqrt(x**8 + 1)) - sqrt(x**8 + 1)/(2*x**2)
```

Mathematica [C] time = 0.0234624, size = 39, normalized size = 0.3

$$\frac{1}{6}x^6\,{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-x^8\right)-\frac{\sqrt{x^8+1}}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*Sqrt[1 + x^8]),x]
```

```
[Out] -Sqrt[1 + x^8]/(2*x^2) + (x^6*Hypergeometric2F1[1/2, 3/4, 7/4, -x
^8])/6
```

Maple [C] time = 0.023, size = 30, normalized size = 0.2

$$-\frac{1}{2x^2}\sqrt{x^8+1}+\frac{x^6}{6}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-x^8\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(x^8+1)^(1/2),x)
```

```
[Out] -1/2*(x^8+1)^(1/2)/x^2+1/6*x^6*hypergeom([1/2,3/4],[7/4],-x^8)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^8+1}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^8 + 1)*x^3),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(x^8 + 1)*x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{x^8+1}x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^8 + 1)*x^3),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(x^8 + 1)*x^3), x)
```

Sympy [A] time = 2.15357, size = 32, normalized size = 0.25

$$\frac{\Gamma\left(-\frac{1}{4}\right){}_2F_1\left(\begin{matrix}-\frac{1}{4},\frac{1}{2}\\ \frac{3}{4}\end{matrix}\middle| x^8e^{i\pi}\right)}{8x^2\Gamma\left(\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(x**8+1)**(1/2),x)
```

```
[Out] gamma(-1/4)*hyper((-1/4, 1/2), (3/4,), x**8*exp_polar(I*pi))/(8*x
**2*gamma(3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^8+1}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^8 + 1)*x^3),x, algorithm="giac")

[Out] integrate(1/(sqrt(x^8 + 1)*x^3), x)
```

3.1527 $\int \frac{1}{x^7\sqrt{1+x^8}}\,dx$

Optimal. Leaf size=62

$$-\frac{\sqrt{x^8+1}}{6x^6}-\frac{\left(x^4+1\right)\sqrt{\frac{x^8+1}{\left(x^4+1\right)^2}}F\left(2\tan^{-1}\left(x^2\right)|\frac{1}{2}\right)}{12\sqrt{x^8+1}}$$

```
[Out] -Sqrt[1 + x^8]/(6*x^6) - ((1 + x^4)*Sqrt[(1 + x^8)/(1 + x^4)^2]*E
llipticF[2*ArcTan[x^2], 1/2])/(12*Sqrt[1 + x^8])
```

Rubi [A] time = 0.0685701, antiderivative size = 62, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{\sqrt{x^8+1}}{6x^6}-\frac{\left(x^4+1\right)\sqrt{\frac{x^8+1}{\left(x^4+1\right)^2}}F\left(2\tan^{-1}\left(x^2\right)|\frac{1}{2}\right)}{12\sqrt{x^8+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^7*Sqrt[1 + x^8]),x]
```

```
[Out] -Sqrt[1 + x^8]/(6*x^6) - ((1 + x^4)*Sqrt[(1 + x^8)/(1 + x^4)^2]*E
llipticF[2*ArcTan[x^2], 1/2])/(12*Sqrt[1 + x^8])
```

Rubi in Sympy [A] time = 4.71733, size = 54, normalized size = 0.87

$$-\frac{\sqrt{\frac{x^8+1}{\left(x^4+1\right)^2}}\left(x^4+1\right)F\left(2\,\text{atan}\left(x^2\right)\middle|\frac{1}{2}\right)}{12\sqrt{x^8+1}}-\frac{\sqrt{x^8+1}}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**7/(x**8+1)**(1/2),x)
```

```
[Out] -sqrt((x**8 + 1)/(x**4 + 1)**2)*(x**4 + 1)*elliptic_f(2*atan(x**2
), 1/2)/(12*sqrt(x**8 + 1)) - sqrt(x**8 + 1)/(6*x**6)
```

Mathematica [C] time = 0.0258229, size = 36, normalized size = 0.58

$$-\frac{x^8\,{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{5}{4};-x^8\right)+\sqrt{x^8+1}}{6x^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^7*Sqrt[1 + x^8]),x]
```

```
[Out] -(Sqrt[1 + x^8] + x^8*Hypergeometric2F1[1/4, 1/2, 5/4, -x^8])/(6*
x^6)
```

Maple [C] time = 0.027, size = 30, normalized size = 0.5

$$-\frac{1}{6\,x^6}\sqrt{x^8+1}-\frac{x^2}{6}{}_2F_1(\frac{1}{4},\frac{1}{2};\frac{5}{4};-x^8)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^7/(x^8+1)^(1/2),x)
```

```
[Out] -1/6*(x^8+1)^(1/2)/x^6-1/6*x^2*hypergeom([1/4,1/2],[5/4],-x^8)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^8+1}x^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(x^8 + 1)*x^7),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(x^8 + 1)*x^7), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{x^8+1}x^7}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(x^8 + 1)*x^7),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(x^8 + 1)*x^7), x)
```

Sympy [A] time = 3.1458, size = 32, normalized size = 0.52

$$\frac{\Gamma\left(-\frac{3}{4}\right) {}_2F_1\left(\begin{matrix} -\frac{3}{4}, \frac{1}{2} \\ \frac{1}{4} \end{matrix}\middle| x^8 e^{i\pi}\right)}{8x^6\,\Gamma\left(\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/x**7/(x**8+1)**(1/2),x)
```

```
[Out] gamma(-3/4)*hyper((-3/4, 1/2), (1/4,), x**8*exp_polar(I*pi))/(8*x
**6*gamma(1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^8+1}x^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(x^8 + 1)*x^7),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(x^8 + 1)*x^7), x)
```

3.1528 $\int \frac{x^{10}}{\sqrt{1+x^8}} \, dx$

Optimal. Leaf size=239

$$\frac{1}{7}\sqrt{x^8+1}x^3+\frac{3\sqrt{\frac{(x^2+1)^2}{x^2}}\sqrt{-\frac{x^8+1}{x^4}}x^3F\left(\sin^{-1}\left(\frac{1}{2}\sqrt{-\frac{\sqrt{2}x^4-2x^2+\sqrt{2}}{x^2}}\right)|-2\left(1-\sqrt{2}\right)\right)}{14\sqrt{2+\sqrt{2}}\,(x^2+1)\sqrt{x^8+1}}+\frac{3\sqrt{-\frac{(1-x^2)^2}{x^2}}\sqrt{-\frac{x^8+1}{x^4}}x^3F\left(\sin^{-1}\left(\frac{1}{2}\sqrt{\frac{\sqrt{2}x^4+2x^2+\sqrt{2}}{x^2}}\right)|-2\left(1-\sqrt{2}\right)\right)}{14\sqrt{2+\sqrt{2}}\,(1-x^2)\sqrt{x^8+1}}$$

```
[Out] (x^3*Sqrt[1 + x^8])/7 + (3*x^3*Sqrt[(1 + x^2)^2/x^2]*Sqrt[-((1 +
x^8)/x^4)]*EllipticF[ArcSin[Sqrt[-((Sqrt[2] - 2*x^2 + Sqrt[2]*x^4
)/x^2)]/2], -2*(1 - Sqrt[2])])/(14*Sqrt[2 + Sqrt[2]]*(1 + x^2)*Sq
rt[1 + x^8]) + (3*x^3*Sqrt[-((1 - x^2)^2/x^2)]*Sqrt[-((1 + x^8)/x
^4)]*EllipticF[ArcSin[Sqrt[(Sqrt[2] + 2*x^2 + Sqrt[2]*x^4)/x^2]/2
], -2*(1 - Sqrt[2])])/(14*Sqrt[2 + Sqrt[2]]*(1 - x^2)*Sqrt[1 + x^
8])
```

Rubi [A] time = 0.170965, antiderivative size = 239, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{1}{7}\sqrt{x^8+1}x^3+\frac{3\sqrt{\frac{(x^2+1)^2}{x^2}}\sqrt{-\frac{x^8+1}{x^4}}x^3F\left(\sin^{-1}\left(\frac{1}{2}\sqrt{-\frac{\sqrt{2}x^4-2x^2+\sqrt{2}}{x^2}}\right)|-2\left(1-\sqrt{2}\right)\right)}{14\sqrt{2+\sqrt{2}}\,(x^2+1)\sqrt{x^8+1}}+\frac{3\sqrt{-\frac{(1-x^2)^2}{x^2}}\sqrt{-\frac{x^8+1}{x^4}}x^3F\left(\sin^{-1}\left(\frac{1}{2}\sqrt{\frac{\sqrt{2}x^4+2x^2+\sqrt{2}}{x^2}}\right)|-2\left(1-\sqrt{2}\right)\right)}{14\sqrt{2+\sqrt{2}}\,(1-x^2)\sqrt{x^8+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^10/Sqrt[1 + x^8],x]
```

```
[Out] (x^3*Sqrt[1 + x^8])/7 + (3*x^3*Sqrt[(1 + x^2)^2/x^2]*Sqrt[-((1 +
x^8)/x^4)]*EllipticF[ArcSin[Sqrt[-((Sqrt[2] - 2*x^2 + Sqrt[2]*x^4
)/x^2)]/2], -2*(1 - Sqrt[2])])/(14*Sqrt[2 + Sqrt[2]]*(1 + x^2)*Sq
rt[1 + x^8]) + (3*x^3*Sqrt[-((1 - x^2)^2/x^2)]*Sqrt[-((1 + x^8)/x
^4)]*EllipticF[ArcSin[Sqrt[(Sqrt[2] + 2*x^2 + Sqrt[2]*x^4)/x^2]/2
], -2*(1 - Sqrt[2])])/(14*Sqrt[2 + Sqrt[2]]*(1 - x^2)*Sqrt[1 + x^
8])
```

Rubi in Sympy [A] time = 14.939, size = 206, normalized size = 0.86

$$\frac{3x^3\sqrt{\frac{-x^8-1}{x^4}}\sqrt{\frac{(x^2+1)^2}{x^2}}F\left(\operatorname{asin}\left(\frac{\sqrt{-\frac{\sqrt{2}x^4-2x^2+\sqrt{2}}{x^2}}}{2}\right)\middle|-2+2\sqrt{2}\right)}{14\sqrt{\sqrt{2}+2}\,(x^2+1)\sqrt{x^8+1}}+\frac{3x^3\sqrt{\frac{-x^8-1}{x^4}}\sqrt{-\frac{(-x^2+1)^2}{x^2}}F\left(\operatorname{asin}\left(\frac{\sqrt{\frac{\sqrt{2}x^4+2x^2+\sqrt{2}}{x^2}}}{2}\right)\middle|-2+2\sqrt{2}\right)}{14\sqrt{\sqrt{2}+2}\,(-x^2+1)\sqrt{x^8+1}}+\frac{x^3\sqrt{x^8+1}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**10/(x**8+1)**(1/2),x)
```

```
[Out] 3*x**3*sqrt((-x**8 - 1)/x**4)*sqrt((x**2 + 1)**2/x**2)*elliptic_f
(asin(sqrt(-(sqrt(2)*x**4 - 2*x**2 + sqrt(2))/x**2)/2), -2 + 2*sq
```

```
rt(2))/(14*sqrt(sqrt(2) + 2)*(x**2 + 1)*sqrt(x**8 + 1)) + 3*x**3*
sqrt((-x**8 - 1)/x**4)*sqrt(-(-x**2 + 1)**2/x**2)*elliptic_f(asin
(sqrt((sqrt(2)*x**4 + 2*x**2 + sqrt(2))/x**2)/2), -2 + 2*sqrt(2))
/(14*sqrt(sqrt(2) + 2)*(-x**2 + 1)*sqrt(x**8 + 1)) + x**3*sqrt(x*
*8 + 1)/7
```

Mathematica [A] time = 1.32388, size = 215, normalized size = 0.9

$$\frac{x^3\left((x^2-1)\left(2\left(x^{10}+x^8+x^2+1\right)-3\sqrt{x^2+\frac{1}{x^2}+\sqrt{2}}\sqrt{\frac{(x^2+1)^2\left(x^4-\sqrt{2}x^2+1\right)}{\left(\sqrt{2}-2\right)x^4}}F\left(\sin^{-1}\left(\frac{\sqrt{x^2+\sqrt{2}+\frac{1}{x^2}}}{2^{3/4}}\right)\middle|-2\left(1+\sqrt{2}\right)\right)\right)-\frac{3\sqrt{-\frac{(x^2-\cdots}{x^2}}\cdots}{\cdots}\right)}{14\left(x^4-1\right)\sqrt{x^8+1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^10/Sqrt[1 + x^8],x]
```

```
[Out] (x^3*((-3*Sqrt[-((-1 + x^2)^2/x^2)]*(1 + x^2)*Sqrt[-((1 + x^8)/x^
4)]*EllipticF[ArcSin[Sqrt[Sqrt[2] + x^(-2) + x^2]/2^(3/4)], 2*(-1
 + Sqrt[2])])/Sqrt[2 + Sqrt[2]] + (-1 + x^2)*(2*(1 + x^2 + x^8 +
x^10) - 3*Sqrt[Sqrt[2] + x^(-2) + x^2]*Sqrt[((1 + x^2)^2*(1 - Sqr
t[2]*x^2 + x^4))/((-2 + Sqrt[2])*x^4)]*EllipticF[ArcSin[Sqrt[Sqrt
[2] + x^(-2) + x^2]/2^(3/4)], -2*(1 + Sqrt[2])])))/(14*(-1 + x^4)
*Sqrt[1 + x^8])
```

Maple [C] time = 0.049, size = 30, normalized size = 0.1

$$\frac{x^3}{7}\sqrt{x^8+1}-\frac{x^3}{7}{}_2F_1\left(\frac{3}{8},\frac{1}{2};\frac{11}{8};-x^8\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^10/(x^8+1)^(1/2),x)
```

```
[Out] 1/7*x^3*(x^8+1)^(1/2)-1/7*x^3*hypergeom([3/8,1/2],[11/8],-x^8)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{10}}{\sqrt{x^8+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/sqrt(x^8 + 1),x, algorithm="maxima")
```

```
[Out] integrate(x^10/sqrt(x^8 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{10}}{\sqrt{x^8+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/sqrt(x^8 + 1),x, algorithm="fricas")
```

```
[Out] integral(x^10/sqrt(x^8 + 1), x)
```

Sympy [A] time = 3.77194, size = 29, normalized size = 0.12

$$\frac{x^{11}\Gamma\left(\frac{11}{8}\right){}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{11}{8}\\\frac{19}{8}\end{matrix}\middle|x^8e^{i\pi}\right)}{8\Gamma\left(\frac{19}{8}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**10/(x**8+1)**(1/2),x)
```

```
[Out] x**11*gamma(11/8)*hyper((1/2, 11/8), (19/8,), x**8*exp_polar(I*pi
))/(8*gamma(19/8))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{10}}{\sqrt{x^8+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^10/sqrt(x^8 + 1),x, algorithm="giac")
```

```
[Out] integrate(x^10/sqrt(x^8 + 1), x)
```

3.1529 $\int \frac{x^8}{\sqrt{1+x^8}}\,dx$

Optimal. Leaf size=237

$$\frac{1}{5}\sqrt{x^8+1}x-\frac{\sqrt{\frac{(x^2+1)^2}{x^2}}\sqrt{-\frac{x^8+1}{x^4}}x^3F\left(\sin^{-1}\left(\frac{1}{2}\sqrt{-\frac{\sqrt{2}x^4-2x^2+\sqrt{2}}{x^2}}\right)|-2\left(1-\sqrt{2}\right)\right)}{10\sqrt{2+\sqrt{2}}\,(x^2+1)\sqrt{x^8+1}}+\frac{\sqrt{-\frac{(1-x^2)^2}{x^2}}\sqrt{-\frac{x^8+1}{x^4}}x^3F\left(\sin^{-1}\left(\frac{1}{2}\sqrt{\frac{\sqrt{2}x^4+2x^2+\sqrt{2}}{x^2}}\right)|-2\left(1-\sqrt{2}\right)\right)}{10\sqrt{2+\sqrt{2}}\,(1-x^2)\sqrt{x^8+1}}$$

```
[Out] (x*Sqrt[1 + x^8])/5 - (x^3*Sqrt[(1 + x^2)^2/x^2]*Sqrt[-((1 + x^8)
/x^4)]*EllipticF[ArcSin[Sqrt[-((Sqrt[2] - 2*x^2 + Sqrt[2]*x^4)/x^
2)]/2], -2*(1 - Sqrt[2])])/(10*Sqrt[2 + Sqrt[2]]*(1 + x^2)*Sqrt[1
 + x^8]) + (x^3*Sqrt[-((1 - x^2)^2/x^2)]*Sqrt[-((1 + x^8)/x^4)]*E
llipticF[ArcSin[Sqrt[(Sqrt[2] + 2*x^2 + Sqrt[2]*x^4)/x^2]/2], -2*
(1 - Sqrt[2])])/(10*Sqrt[2 + Sqrt[2]]*(1 - x^2)*Sqrt[1 + x^8])
```

Rubi [A] time = 0.154955, antiderivative size = 237, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{1}{5}\sqrt{x^8+1}x-\frac{\sqrt{\frac{(x^2+1)^2}{x^2}}\sqrt{-\frac{x^8+1}{x^4}}x^3F\left(\sin^{-1}\left(\frac{1}{2}\sqrt{-\frac{\sqrt{2}x^4-2x^2+\sqrt{2}}{x^2}}\right)|-2\left(1-\sqrt{2}\right)\right)}{10\sqrt{2+\sqrt{2}}\,(x^2+1)\sqrt{x^8+1}}+\frac{\sqrt{-\frac{(1-x^2)^2}{x^2}}\sqrt{-\frac{x^8+1}{x^4}}x^3F\left(\sin^{-1}\left(\frac{1}{2}\sqrt{\frac{\sqrt{2}x^4+2x^2+\sqrt{2}}{x^2}}\right)|-2\left(1-\sqrt{2}\right)\right)}{10\sqrt{2+\sqrt{2}}\,(1-x^2)\sqrt{x^8+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8/Sqrt[1 + x^8],x]
```

```
[Out] (x*Sqrt[1 + x^8])/5 - (x^3*Sqrt[(1 + x^2)^2/x^2]*Sqrt[-((1 + x^8)
/x^4)]*EllipticF[ArcSin[Sqrt[-((Sqrt[2] - 2*x^2 + Sqrt[2]*x^4)/x^
2)]/2], -2*(1 - Sqrt[2])])/(10*Sqrt[2 + Sqrt[2]]*(1 + x^2)*Sqrt[1
 + x^8]) + (x^3*Sqrt[-((1 - x^2)^2/x^2)]*Sqrt[-((1 + x^8)/x^4)]*E
llipticF[ArcSin[Sqrt[(Sqrt[2] + 2*x^2 + Sqrt[2]*x^4)/x^2]/2], -2*
(1 - Sqrt[2])])/(10*Sqrt[2 + Sqrt[2]]*(1 - x^2)*Sqrt[1 + x^8])
```

Rubi in Sympy [A] time = 13.4595, size = 201, normalized size = 0.85

$$-\frac{x^3\sqrt{\frac{-x^8-1}{x^4}}\sqrt{\frac{(x^2+1)^2}{x^2}}F\left(\operatorname{asin}\left(\frac{\sqrt{-\frac{\sqrt{2}x^4-2x^2+\sqrt{2}}{x^2}}}{2}\right)\middle|-2+2\sqrt{2}\right)}{10\sqrt{\sqrt{2}+2}\,(x^2+1)\sqrt{x^8+1}}+\frac{x^3\sqrt{\frac{-x^8-1}{x^4}}\sqrt{-\frac{(-x^2+1)^2}{x^2}}F\left(\operatorname{asin}\left(\frac{\sqrt{\frac{\sqrt{2}x^4+2x^2+\sqrt{2}}{x^2}}}{2}\right)\middle|-2+2\sqrt{2}\right)}{10\sqrt{\sqrt{2}+2}\,(-x^2+1)\sqrt{x^8+1}}+\frac{x\sqrt{x^8+1}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8/(x**8+1)**(1/2),x)
```

```
[Out] -x**3*sqrt((-x**8 - 1)/x**4)*sqrt((x**2 + 1)**2/x**2)*elliptic_f(
asin(sqrt(-(sqrt(2)*x**4 - 2*x**2 + sqrt(2))/x**2)/2), -2 + 2*sqr
t(2))/(10*sqrt(sqrt(2) + 2)*(x**2 + 1)*sqrt(x**8 + 1)) + x**3*sqr
t((-x**8 - 1)/x**4)*sqrt(-(-x**2 + 1)**2/x**2)*elliptic_f(asin(sq
```

```
rt((sqrt(2)*x**4 + 2*x**2 + sqrt(2))/x**2)/2), -2 + 2*sqrt(2))/(1
0*sqrt(sqrt(2) + 2)*(-x**2 + 1)*sqrt(x**8 + 1)) + x*sqrt(x**8 + 1
)/5
```

Mathematica [A] time = 1.94393, size = 218, normalized size = 0.92

$$\frac{x\left(x^2-1\right)\left(\sqrt{x^2+\frac{1}{x^2}+\sqrt{2}}\sqrt{\frac{\left(x^2+1\right)^2\left(x^4-\sqrt{2}x^2+1\right)}{\left(\sqrt{2}-2\right)x^4}}x^2F\left(\sin^{-1}\left(\frac{\sqrt{x^2+\sqrt{2}+\frac{1}{x^2}}}{2^{3/4}}\right)|-2\left(1+\sqrt{2}\right)\right)+2\left(x^{10}+x^8+x^2+1\right)\right)-\frac{x^3\sqrt{-\frac{\left(x^2-\cdots\right.}{x^2}}\cdots}{\cdots}}{10\left(x^4-1\right)\sqrt{x^8+1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^8/Sqrt[1 + x^8],x]
```

```
[Out] (-((x^3*Sqrt[-((-1 + x^2)^2/x^2)]*(1 + x^2)*Sqrt[-((1 + x^8)/x^4)
]*EllipticF[ArcSin[Sqrt[Sqrt[2] + x^(-2) + x^2]/2^(3/4)], 2*(-1 +
 Sqrt[2])])/Sqrt[2 + Sqrt[2]]) + x*(-1 + x^2)*(2*(1 + x^2 + x^8 +
 x^10) + x^2*Sqrt[Sqrt[2] + x^(-2) + x^2]*Sqrt[((1 + x^2)^2*(1 -
Sqrt[2]*x^2 + x^4))/((-2 + Sqrt[2])*x^4)]*EllipticF[ArcSin[Sqrt[S
qrt[2] + x^(-2) + x^2]/2^(3/4)], -2*(1 + Sqrt[2])]))/(10*(-1 + x^
4)*Sqrt[1 + x^8])
```

Maple [C] time = 0.046, size = 26, normalized size = 0.1

$$\frac{x}{5}\sqrt{x^8+1}-\frac{x}{5}{}_2F_1\left(\frac{1}{8},\frac{1}{2};\frac{9}{8};-x^8\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8/(x^8+1)^(1/2),x)
```

```
[Out] 1/5*x*(x^8+1)^(1/2)-1/5*x*hypergeom([1/8,1/2],[9/8],-x^8)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^8}{\sqrt{x^8+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/sqrt(x^8 + 1),x, algorithm="maxima")
```

```
[Out] integrate(x^8/sqrt(x^8 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^8}{\sqrt{x^8+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/sqrt(x^8 + 1),x, algorithm="fricas")
```

```
[Out] integral(x^8/sqrt(x^8 + 1), x)
```

Sympy [A] time = 2.7386, size = 29, normalized size = 0.12

$$\frac{x^9\Gamma\left(\frac{9}{8}\right){}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{9}{8}\\\frac{17}{8}\end{matrix}\middle|x^8e^{i\pi}\right)}{8\Gamma\left(\frac{17}{8}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8/(x**8+1)**(1/2),x)
```

```
[Out] x**9*gamma(9/8)*hyper((1/2, 9/8), (17/8,), x**8*exp_polar(I*pi))/
(8*gamma(17/8))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^8}{\sqrt{x^8+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^8/sqrt(x^8 + 1),x, algorithm="giac")
```

```
[Out] integrate(x^8/sqrt(x^8 + 1), x)
```

3.1530 $\int \frac{x^6}{\sqrt{1+x^8}}\,dx$

Optimal. Leaf size=22

$$\frac{1}{7}x^7\,{}_2F_1\left(\frac{1}{2},\frac{7}{8};\frac{15}{8};-x^8\right)$$

```
[Out] (x^7*Hypergeometric2F1[1/2, 7/8, 15/8, -x^8])/7
```

Rubi [A] time = 0.0184038, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{1}{7}x^7\,{}_2F_1\left(\frac{1}{2},\frac{7}{8};\frac{15}{8};-x^8\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/Sqrt[1 + x^8],x]
```

```
[Out] (x^7*Hypergeometric2F1[1/2, 7/8, 15/8, -x^8])/7
```

Rubi in Sympy [A] time = 2.81747, size = 15, normalized size = 0.68

$$\frac{x^7\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{7}{8}\\\frac{15}{8}\end{matrix}\middle|-x^8\right)}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(x**8+1)**(1/2),x)
```

```
[Out] x**7*hyper((1/2, 7/8), (15/8,), -x**8)/7
```

Mathematica [A] time = 0.0234589, size = 22, normalized size = 1.

$$\frac{1}{7}x^7\,{}_2F_1\left(\frac{1}{2},\frac{7}{8};\frac{15}{8};-x^8\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6/Sqrt[1 + x^8],x]
```

```
[Out] (x^7*Hypergeometric2F1[1/2, 7/8, 15/8, -x^8])/7
```

Maple [A] time = 0.036, size = 17, normalized size = 0.8

$$\frac{x^7}{7}\,{}_2\mathrm{F}_1\left(\frac{1}{2},\frac{7}{8};\ \frac{15}{8};\ -x^8\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(x^8+1)^(1/2),x)
```

```
[Out] 1/7*x^7*hypergeom([1/2,7/8],[15/8],-x^8)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{\sqrt{x^8+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(x^8 + 1),x, algorithm="maxima")
```

```
[Out] integrate(x^6/sqrt(x^8 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^6}{\sqrt{x^8+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(x^8 + 1),x, algorithm="fricas")
```

```
[Out] integral(x^6/sqrt(x^8 + 1), x)
```

Sympy [A] time = 2.24614, size = 29, normalized size = 1.32

$$\frac{x^7\,\Gamma\left(\frac{7}{8}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{7}{8}\\ \frac{15}{8}\end{matrix}\middle|\,x^8e^{i\pi}\right)}{8\,\Gamma\left(\frac{15}{8}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(x**8+1)**(1/2),x)
```

```
[Out] x**7*gamma(7/8)*hyper((1/2, 7/8), (15/8,), x**8*exp_polar(I*pi))/
(8*gamma(15/8))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{\sqrt{x^8+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(x^8 + 1),x, algorithm="giac")
```

```
[Out] integrate(x^6/sqrt(x^8 + 1), x)
```

3.1531 $\int \frac{x^4}{\sqrt{1+x^8}}\,dx$

Optimal. Leaf size=22

$$\frac{1}{5}x^5\,{}_2F_1\left(\frac{1}{2},\frac{5}{8};\frac{13}{8};-x^8\right)$$

```
[Out] (x^5*Hypergeometric2F1[1/2, 5/8, 13/8, -x^8])/5
```

Rubi [A] time = 0.0189804, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{1}{5}x^5\,{}_2F_1\left(\frac{1}{2},\frac{5}{8};\frac{13}{8};-x^8\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/Sqrt[1 + x^8],x]
```

```
[Out] (x^5*Hypergeometric2F1[1/2, 5/8, 13/8, -x^8])/5
```

Rubi in Sympy [A] time = 2.75843, size = 15, normalized size = 0.68

$$\frac{x^5\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{5}{8}\\ \frac{13}{8}\end{matrix}\middle| -x^8\right)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(x**8+1)**(1/2),x)
```

```
[Out] x**5*hyper((1/2, 5/8), (13/8,), -x**8)/5
```

Mathematica [A] time = 0.0219217, size = 22, normalized size = 1.

$$\frac{1}{5}x^5\,{}_2F_1\left(\frac{1}{2},\frac{5}{8};\frac{13}{8};-x^8\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/Sqrt[1 + x^8],x]
```

```
[Out] (x^5*Hypergeometric2F1[1/2, 5/8, 13/8, -x^8])/5
```

Maple [A] time = 0.036, size = 17, normalized size = 0.8

$$\frac{x^5}{5}{}_2\mathrm{F}_1(\frac{1}{2},\frac{5}{8};\,\frac{13}{8};\,-x^8)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(x^8+1)^(1/2),x)
```

```
[Out] 1/5*x^5*hypergeom([1/2,5/8],[13/8],-x^8)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\sqrt{x^8+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(x^8 + 1),x, algorithm="maxima")
```

```
[Out] integrate(x^4/sqrt(x^8 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^4}{\sqrt{x^8+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(x^8 + 1),x, algorithm="fricas")
```

```
[Out] integral(x^4/sqrt(x^8 + 1), x)
```

Sympy [A] time = 1.92328, size = 29, normalized size = 1.32

$$\frac{x^5\,\Gamma\left(\frac{5}{8}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{5}{8}\\\frac{13}{8}\end{matrix}\middle|\,x^8e^{i\pi}\right)}{8\,\Gamma\left(\frac{13}{8}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(x**8+1)**(1/2),x)
```

```
[Out] x**5*gamma(5/8)*hyper((1/2, 5/8), (13/8,), x**8*exp_polar(I*pi))/
(8*gamma(13/8))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\sqrt{x^8+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(x^8 + 1),x, algorithm="giac")
```

```
[Out] integrate(x^4/sqrt(x^8 + 1), x)
```

3.1532 $\int \frac{x^2}{\sqrt{1+x^8}}\,dx$

Optimal. Leaf size=223

$$-\frac{\sqrt{\frac{(x^2+1)^2}{x^2}}\sqrt{-\frac{x^8+1}{x^4}}x^3F\left(\sin^{-1}\left(\frac{1}{2}\sqrt{-\frac{\sqrt{2}x^4-2x^2+\sqrt{2}}{x^2}}\right)|-2\left(1-\sqrt{2}\right)\right)}{2\sqrt{2+\sqrt{2}}\,(x^2+1)\sqrt{x^8+1}}-\frac{\sqrt{-\frac{(1-x^2)^2}{x^2}}\sqrt{-\frac{x^8+1}{x^4}}x^3F\left(\sin^{-1}\left(\frac{1}{2}\sqrt{\frac{\sqrt{2}x^4+2x^2+\sqrt{2}}{x^2}}\right)|-2\left(1-\sqrt{2}\right)\right)}{2\sqrt{2+\sqrt{2}}\,(1-x^2)\sqrt{x^8+1}}$$

```
[Out] -(x^3*Sqrt[(1 + x^2)^2/x^2]*Sqrt[-((1 + x^8)/x^4)]*EllipticF[ArcS
in[Sqrt[-((Sqrt[2] - 2*x^2 + Sqrt[2]*x^4)/x^2)]/2], -2*(1 - Sqrt[
2])])/(2*Sqrt[2 + Sqrt[2]]*(1 + x^2)*Sqrt[1 + x^8]) - (x^3*Sqrt[-
((1 - x^2)^2/x^2)]*Sqrt[-((1 + x^8)/x^4)]*EllipticF[ArcSin[Sqrt[(
Sqrt[2] + 2*x^2 + Sqrt[2]*x^4)/x^2]/2], -2*(1 - Sqrt[2])])/(2*Sqr
t[2 + Sqrt[2]]*(1 - x^2)*Sqrt[1 + x^8])
```

Rubi [A] time = 0.124264, antiderivative size = 223, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{\sqrt{\frac{(x^2+1)^2}{x^2}}\sqrt{-\frac{x^8+1}{x^4}}x^3F\left(\sin^{-1}\left(\frac{1}{2}\sqrt{-\frac{\sqrt{2}x^4-2x^2+\sqrt{2}}{x^2}}\right)|-2\left(1-\sqrt{2}\right)\right)}{2\sqrt{2+\sqrt{2}}\,(x^2+1)\sqrt{x^8+1}}-\frac{\sqrt{-\frac{(1-x^2)^2}{x^2}}\sqrt{-\frac{x^8+1}{x^4}}x^3F\left(\sin^{-1}\left(\frac{1}{2}\sqrt{\frac{\sqrt{2}x^4+2x^2+\sqrt{2}}{x^2}}\right)|-2\left(1-\sqrt{2}\right)\right)}{2\sqrt{2+\sqrt{2}}\,(1-x^2)\sqrt{x^8+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/Sqrt[1 + x^8],x]
```

```
[Out] -(x^3*Sqrt[(1 + x^2)^2/x^2]*Sqrt[-((1 + x^8)/x^4)]*EllipticF[ArcS
in[Sqrt[-((Sqrt[2] - 2*x^2 + Sqrt[2]*x^4)/x^2)]/2], -2*(1 - Sqrt[
2])])/(2*Sqrt[2 + Sqrt[2]]*(1 + x^2)*Sqrt[1 + x^8]) - (x^3*Sqrt[-
((1 - x^2)^2/x^2)]*Sqrt[-((1 + x^8)/x^4)]*EllipticF[ArcSin[Sqrt[(
Sqrt[2] + 2*x^2 + Sqrt[2]*x^4)/x^2]/2], -2*(1 - Sqrt[2])])/(2*Sqr
t[2 + Sqrt[2]]*(1 - x^2)*Sqrt[1 + x^8])
```

Rubi in Sympy [A] time = 12.3341, size = 190, normalized size = 0.85

$$-\frac{x^3\sqrt{\frac{-x^8-1}{x^4}}\sqrt{\frac{(x^2+1)^2}{x^2}}F\left(\operatorname{asin}\left(\frac{\sqrt{-\frac{\sqrt{2}x^4-2x^2+\sqrt{2}}{x^2}}}{2}\right)\middle|-2+2\sqrt{2}\right)}{2\sqrt{\sqrt{2}+2}\,(x^2+1)\sqrt{x^8+1}}-\frac{x^3\sqrt{\frac{-x^8-1}{x^4}}\sqrt{-\frac{(-x^2+1)^2}{x^2}}F\left(\operatorname{asin}\left(\frac{\sqrt{\frac{\sqrt{2}x^4+2x^2+\sqrt{2}}{x^2}}}{2}\right)\middle|-2+2\sqrt{2}\right)}{2\sqrt{\sqrt{2}+2}\,(-x^2+1)\sqrt{x^8+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(x**8+1)**(1/2),x)
```

```
[Out] -x**3*sqrt((-x**8 - 1)/x**4)*sqrt((x**2 + 1)**2/x**2)*elliptic_f(
asin(sqrt(-(sqrt(2)*x**4 - 2*x**2 + sqrt(2))/x**2)/2), -2 + 2*sqr
t(2))/(2*sqrt(sqrt(2) + 2)*(x**2 + 1)*sqrt(x**8 + 1)) - x**3*sqrt
((-x**8 - 1)/x**4)*sqrt(-(-x**2 + 1)**2/x**2)*elliptic_f(asin(sqr
```

```
t((sqrt(2)*x**4 + 2*x**2 + sqrt(2))/x**2)/2), -2 + 2*sqrt(2))/(2*
sqrt(sqrt(2) + 2)*(-x**2 + 1)*sqrt(x**8 + 1))
```

Mathematica [A] time = 0.465495, size = 166, normalized size = 0.74

$$\frac{x^3\sqrt{-\frac{x^8+1}{x^4}}\left(\sqrt{\frac{\left(\sqrt{2}-2\right)\left(x^2-1\right)^2}{x^2}}\left(x^2+1\right)F\left(\sin^{-1}\left(\frac{\sqrt{x^2+\sqrt{2}+\frac{1}{x^2}}}{2^{3/4}}\right)|2\left(-1+\sqrt{2}\right)\right)+\sqrt{2+\sqrt{2}}\left(x^2-1\right)\sqrt{x^2+\frac{1}{x^2}+2}F\left(\sin^{-1}\left(\frac{\sqrt{x^2+\cdots}}{2^3\cdots}\right.\right.\right.}{2\sqrt{2}\left(x^4-1\right)\sqrt{x^8+1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^2/Sqrt[1 + x^8],x]
```

```
[Out] (x^3*Sqrt[-((1 + x^8)/x^4)]*(Sqrt[((-2 + Sqrt[2])*(-1 + x^2)^2)/x
^2]*(1 + x^2)*EllipticF[ArcSin[Sqrt[Sqrt[2] + x^(-2) + x^2]/2^(3/
4)], 2*(-1 + Sqrt[2])] + Sqrt[2 + Sqrt[2]]*(-1 + x^2)*Sqrt[2 + x^
(-2) + x^2]*EllipticF[ArcSin[Sqrt[Sqrt[2] + x^(-2) + x^2]/2^(3/4)
], -2*(1 + Sqrt[2])]))/(2*Sqrt[2]*(-1 + x^4)*Sqrt[1 + x^8])
```

Maple [C] time = 0.024, size = 17, normalized size = 0.1

$$\frac{x^3}{3}{}_2F_1(\frac{3}{8},\frac{1}{2};\frac{11}{8};-x^8)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(x^8+1)^(1/2),x)
```

```
[Out] 1/3*x^3*hypergeom([3/8,1/2],[11/8],-x^8)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\sqrt{x^8+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(x^8 + 1),x, algorithm="maxima")
```

```
[Out] integrate(x^2/sqrt(x^8 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^2}{\sqrt{x^8+1}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(x^8 + 1),x, algorithm="fricas")
```

```
[Out] integral(x^2/sqrt(x^8 + 1), x)
```

Sympy [A] time = 1.71808, size = 29, normalized size = 0.13

$$\frac{x^3\Gamma\left(\frac{3}{8}\right){}_2F_1\left(\begin{matrix}\frac{3}{8},\frac{1}{2}\\\frac{11}{8}\end{matrix}\middle|x^8e^{i\pi}\right)}{8\Gamma\left(\frac{11}{8}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(x**8+1)**(1/2),x)
```

```
[Out] x**3*gamma(3/8)*hyper((3/8, 1/2), (11/8,), x**8*exp_polar(I*pi))/
(8*gamma(11/8))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\sqrt{x^8+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(x^8 + 1),x, algorithm="giac")
```

```
[Out] integrate(x^2/sqrt(x^8 + 1), x)
```

3.1533 $\int \frac{1}{\sqrt{1+x^8}}\,dx$

Optimal. Leaf size=223

$$\frac{x^3\sqrt{\frac{(x^2+1)^2}{x^2}}\sqrt{-\frac{x^8+1}{x^4}}F\left(\sin^{-1}\left(\frac{1}{2}\sqrt{-\frac{\sqrt{2}x^4-2x^2+\sqrt{2}}{x^2}}\right)|-2\left(1-\sqrt{2}\right)\right)}{2\sqrt{2+\sqrt{2}}\,(x^2+1)\sqrt{x^8+1}}-\frac{x^3\sqrt{-\frac{(1-x^2)^2}{x^2}}\sqrt{-\frac{x^8+1}{x^4}}F\left(\sin^{-1}\left(\frac{1}{2}\sqrt{\frac{\sqrt{2}x^4+2x^2+\sqrt{2}}{x^2}}\right)|-2\left(1-\sqrt{2}\right)\right)}{2\sqrt{2+\sqrt{2}}\,(1-x^2)\sqrt{x^8+1}}$$

```
[Out] (x^3*Sqrt[(1 + x^2)^2/x^2]*Sqrt[-((1 + x^8)/x^4)]*EllipticF[ArcSi
n[Sqrt[-((Sqrt[2] - 2*x^2 + Sqrt[2]*x^4)/x^2)]/2], -2*(1 - Sqrt[2
])])/(2*Sqrt[2 + Sqrt[2]]*(1 + x^2)*Sqrt[1 + x^8]) - (x^3*Sqrt[-(
(1 - x^2)^2/x^2)]*Sqrt[-((1 + x^8)/x^4)]*EllipticF[ArcSin[Sqrt[(S
qrt[2] + 2*x^2 + Sqrt[2]*x^4)/x^2]/2], -2*(1 - Sqrt[2])])/(2*Sqrt
[2 + Sqrt[2]]*(1 - x^2)*Sqrt[1 + x^8])
```

Rubi [A] time = 0.124886, antiderivative size = 223, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{x^3\sqrt{\frac{(x^2+1)^2}{x^2}}\sqrt{-\frac{x^8+1}{x^4}}F\left(\sin^{-1}\left(\frac{1}{2}\sqrt{-\frac{\sqrt{2}x^4-2x^2+\sqrt{2}}{x^2}}\right)|-2\left(1-\sqrt{2}\right)\right)}{2\sqrt{2+\sqrt{2}}\,(x^2+1)\sqrt{x^8+1}}-\frac{x^3\sqrt{-\frac{(1-x^2)^2}{x^2}}\sqrt{-\frac{x^8+1}{x^4}}F\left(\sin^{-1}\left(\frac{1}{2}\sqrt{\frac{\sqrt{2}x^4+2x^2+\sqrt{2}}{x^2}}\right)|-2\left(1-\sqrt{2}\right)\right)}{2\sqrt{2+\sqrt{2}}\,(1-x^2)\sqrt{x^8+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[1 + x^8],x]
```

```
[Out] (x^3*Sqrt[(1 + x^2)^2/x^2]*Sqrt[-((1 + x^8)/x^4)]*EllipticF[ArcSi
n[Sqrt[-((Sqrt[2] - 2*x^2 + Sqrt[2]*x^4)/x^2)]/2], -2*(1 - Sqrt[2
])])/(2*Sqrt[2 + Sqrt[2]]*(1 + x^2)*Sqrt[1 + x^8]) - (x^3*Sqrt[-(
(1 - x^2)^2/x^2)]*Sqrt[-((1 + x^8)/x^4)]*EllipticF[ArcSin[Sqrt[(S
qrt[2] + 2*x^2 + Sqrt[2]*x^4)/x^2]/2], -2*(1 - Sqrt[2])])/(2*Sqrt
[2 + Sqrt[2]]*(1 - x^2)*Sqrt[1 + x^8])
```

Rubi in Sympy [A] time = 11.542, size = 189, normalized size = 0.85

$$\frac{x^3\sqrt{\frac{-x^8-1}{x^4}}\sqrt{\frac{(x^2+1)^2}{x^2}}F\left(\operatorname{asin}\left(\frac{\sqrt{-\frac{\sqrt{2}x^4-2x^2+\sqrt{2}}{x^2}}}{2}\right)\middle|-2+2\sqrt{2}\right)}{2\sqrt{\sqrt{2}+2}\,(x^2+1)\sqrt{x^8+1}}-\frac{x^3\sqrt{\frac{-x^8-1}{x^4}}\sqrt{-\frac{(-x^2+1)^2}{x^2}}F\left(\operatorname{asin}\left(\frac{\sqrt{\frac{\sqrt{2}x^4+2x^2+\sqrt{2}}{x^2}}}{2}\right)\middle|-2+2\sqrt{2}\right)}{2\sqrt{\sqrt{2}+2}\,(-x^2+1)\sqrt{x^8+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(x**8+1)**(1/2),x)
```

```
[Out] x**3*sqrt((-x**8 - 1)/x**4)*sqrt((x**2 + 1)**2/x**2)*elliptic_f(a
sin(sqrt(-(sqrt(2)*x**4 - 2*x**2 + sqrt(2))/x**2)/2), -2 + 2*sqrt
(2))/(2*sqrt(sqrt(2) + 2)*(x**2 + 1)*sqrt(x**8 + 1)) - x**3*sqrt(
(-x**8 - 1)/x**4)*sqrt(-(-x**2 + 1)**2/x**2)*elliptic_f(asin(sqrt
```

```
((sqrt(2)*x**4 + 2*x**2 + sqrt(2))/x**2)/2), -2 + 2*sqrt(2))/(2*s
qrt(sqrt(2) + 2)*(-x**2 + 1)*sqrt(x**8 + 1))
```

Mathematica [A] time = 0.433544, size = 167, normalized size = 0.75

$$\frac{x^3\sqrt{-\frac{x^8+1}{x^4}}\left(\sqrt{\frac{\left(\sqrt{2}-2\right)(x^2-1)^2}{x^2}}\left(x^2+1\right)F\left(\sin^{-1}\left(\frac{\sqrt{x^2+\sqrt{2}+\frac{1}{x^2}}}{2^{3/4}}\right)\middle|2\left(-1+\sqrt{2}\right)\right)-\sqrt{2+\sqrt{2}}\left(x^2-1\right)\sqrt{x^2+\frac{1}{x^2}+2}F\left(\sin^{-1}\left(\frac{\sqrt{x^2+}}{2^3}\right.\right.\right.}{2\sqrt{2}\left(x^4-1\right)\sqrt{x^8+1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/Sqrt[1 + x^8],x]
```

```
[Out] (x^3*Sqrt[-((1 + x^8)/x^4)]*(Sqrt[((-2 + Sqrt[2])*(-1 + x^2)^2)/x
^2]*(1 + x^2)*EllipticF[ArcSin[Sqrt[Sqrt[2] + x^(-2) + x^2]/2^(3/
4)], 2*(-1 + Sqrt[2])] - Sqrt[2 + Sqrt[2]]*(-1 + x^2)*Sqrt[2 + x^
(-2) + x^2]*EllipticF[ArcSin[Sqrt[Sqrt[2] + x^(-2) + x^2]/2^(3/4)
], -2*(1 + Sqrt[2])]))/(2*Sqrt[2]*(-1 + x^4)*Sqrt[1 + x^8])
```

Maple [C] time = 0.013, size = 14, normalized size = 0.1

$$x\,{}_2F_1\left(\frac{1}{8},\frac{1}{2};\frac{9}{8};-x^8\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(x^8+1)^(1/2),x)
```

```
[Out] x*hypergeom([1/8,1/2],[9/8],-x^8)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^8+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(x^8 + 1),x, algorithm="maxima")
```

```
[Out] integrate(1/sqrt(x^8 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{x^8+1}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(x^8 + 1),x, algorithm="fricas")
```

```
[Out] integral(1/sqrt(x^8 + 1), x)
```

Sympy [A] time = 1.67372, size = 27, normalized size = 0.12

$$\frac{x\Gamma\left(\frac{1}{8}\right){}_{2}F_{1}\left(\begin{matrix}\frac{1}{8},\frac{1}{2}\\ \frac{9}{8}\end{matrix}\middle|x^{8}e^{i\pi}\right)}{8\Gamma\left(\frac{9}{8}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(x**8+1)**(1/2),x)
```

```
[Out] x*gamma(1/8)*hyper((1/8, 1/2), (9/8,), x**8*exp_polar(I*pi))/(8*g
amma(9/8))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^8+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/sqrt(x^8 + 1),x, algorithm="giac")
```

```
[Out] integrate(1/sqrt(x^8 + 1), x)
```

3.1534 $\int \frac{1}{x^2\sqrt{1+x^8}}\,dx$

Optimal. Leaf size=37

$$\frac{3}{7}x^7\,{}_2F_1\left(\frac{1}{2},\frac{7}{8};\frac{15}{8};-x^8\right)-\frac{\sqrt{x^8+1}}{x}$$

```
[Out] -(Sqrt[1 + x^8]/x) + (3*x^7*Hypergeometric2F1[1/2, 7/8, 15/8, -x^
8])/7
```

Rubi [A] time = 0.0352554, antiderivative size = 37, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{3}{7}x^7\,{}_2F_1\left(\frac{1}{2},\frac{7}{8};\frac{15}{8};-x^8\right)-\frac{\sqrt{x^8+1}}{x}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*Sqrt[1 + x^8]),x]
```

```
[Out] -(Sqrt[1 + x^8]/x) + (3*x^7*Hypergeometric2F1[1/2, 7/8, 15/8, -x^
8])/7
```

Rubi in Sympy [A] time = 3.99246, size = 27, normalized size = 0.73

$$\frac{3x^7\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{7}{8}\\ \frac{15}{8}\end{matrix}\middle|-x^8\right)}{7}-\frac{\sqrt{x^8+1}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(x**8+1)**(1/2),x)
```

```
[Out] 3*x**7*hyper((1/2, 7/8), (15/8,), -x**8)/7 - sqrt(x**8 + 1)/x
```

Mathematica [A] time = 0.0322194, size = 37, normalized size = 1.

$$\frac{3}{7}x^7\,{}_2F_1\left(\frac{1}{2},\frac{7}{8};\frac{15}{8};-x^8\right)-\frac{\sqrt{x^8+1}}{x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*Sqrt[1 + x^8]),x]
```

```
[Out] -(Sqrt[1 + x^8]/x) + (3*x^7*Hypergeometric2F1[1/2, 7/8, 15/8, -x^
8])/7
```

Maple [A] time = 0.038, size = 30, normalized size = 0.8

$$\frac{3\,x^7}{7}\,{}_2\mathrm{F}_1(\frac{1}{2},\frac{7}{8};\,\frac{15}{8};\,-x^8)-\frac{1}{x}\sqrt{x^8+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(x^8+1)^(1/2),x)

[Out] 3/7*x^7*hypergeom([1/2,7/8],[15/8],-x^8)-(x^8+1)^(1/2)/x
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^8+1}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^8 + 1)*x^2),x, algorithm="maxima")

[Out] integrate(1/(sqrt(x^8 + 1)*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{x^8+1}x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^8 + 1)*x^2),x, algorithm="fricas")

[Out] integral(1/(sqrt(x^8 + 1)*x^2), x)
```

Sympy [A] time = 2.02892, size = 31, normalized size = 0.84

$$\frac{\Gamma\left(-\frac{1}{8}\right) {}_{2}F_{1}\left(\begin{matrix} -\frac{1}{8}, \frac{1}{2} \\ \frac{7}{8} \end{matrix}\middle| x^8 e^{i\pi}\right)}{8x\,\Gamma\left(\frac{7}{8}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(x**8+1)**(1/2),x)

[Out] gamma(-1/8)*hyper((-1/8, 1/2), (7/8,), x**8*exp_polar(I*pi))/(8*x
*gamma(7/8))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^8+1}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^8 + 1)*x^2),x, algorithm="giac")

[Out] integrate(1/(sqrt(x^8 + 1)*x^2), x)
```

3.1535 $\int \frac{1}{x^4\sqrt{1+x^8}}\,dx$

Optimal. Leaf size=39

$$\frac{1}{15}x^5\,{}_2F_1\left(\frac{1}{2},\frac{5}{8};\frac{13}{8};-x^8\right)-\frac{\sqrt{x^8+1}}{3x^3}$$

```
[Out] -Sqrt[1 + x^8]/(3*x^3) + (x^5*Hypergeometric2F1[1/2, 5/8, 13/8, -
x^8])/15
```

Rubi [A] time = 0.0366944, antiderivative size = 39, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{1}{15}x^5\,{}_2F_1\left(\frac{1}{2},\frac{5}{8};\frac{13}{8};-x^8\right)-\frac{\sqrt{x^8+1}}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*Sqrt[1 + x^8]),x]
```

```
[Out] -Sqrt[1 + x^8]/(3*x^3) + (x^5*Hypergeometric2F1[1/2, 5/8, 13/8, -
x^8])/15
```

Rubi in Sympy [A] time = 3.92955, size = 29, normalized size = 0.74

$$\frac{x^5\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{5}{8}\\ \frac{13}{8}\end{matrix}\middle|-x^8\right)}{15}-\frac{\sqrt{x^8+1}}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(x**8+1)**(1/2),x)
```

```
[Out] x**5*hyper((1/2, 5/8), (13/8,), -x**8)/15 - sqrt(x**8 + 1)/(3*x**
3)
```

Mathematica [A] time = 0.0317673, size = 39, normalized size = 1.

$$\frac{1}{15}x^5\,{}_2F_1\left(\frac{1}{2},\frac{5}{8};\frac{13}{8};-x^8\right)-\frac{\sqrt{x^8+1}}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*Sqrt[1 + x^8]),x]
```

```
[Out] -Sqrt[1 + x^8]/(3*x^3) + (x^5*Hypergeometric2F1[1/2, 5/8, 13/8, -
x^8])/15
```

Maple [A] time = 0.039, size = 30, normalized size = 0.8

$$\frac{x^5}{15}{}_2F_1(\frac{1}{2},\frac{5}{8};\,\frac{13}{8};\,-x^8)-\frac{1}{3\,x^3}\sqrt{x^8+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(x^8+1)^(1/2),x)
```

```
[Out] 1/15*x^5*hypergeom([1/2,5/8],[13/8],-x^8)-1/3*(x^8+1)^(1/2)/x^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^8+1}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^8 + 1)*x^4),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(x^8 + 1)*x^4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{x^8+1}x^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^8 + 1)*x^4),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(x^8 + 1)*x^4), x)
```

Sympy [A] time = 2.28194, size = 32, normalized size = 0.82

$$\frac{\Gamma\left(-\frac{3}{8}\right) {}_2F_1\left(\begin{matrix} -\frac{3}{8}, \frac{1}{2} \\ \frac{5}{8} \end{matrix}\middle| x^8 e^{i\pi}\right)}{8x^3\Gamma\left(\frac{5}{8}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(x**8+1)**(1/2),x)
```

```
[Out] gamma(-3/8)*hyper((-3/8, 1/2), (5/8,), x**8*exp_polar(I*pi))/(8*x
**3*gamma(5/8))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^8+1}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^8 + 1)*x^4),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(x^8 + 1)*x^4), x)
```

3.1536 $\int \frac{1}{x^6\sqrt{1+x^8}}\,dx$

Optimal. Leaf size=239

$$-\frac{\sqrt{x^8+1}}{5x^5}+\frac{\sqrt{\frac{(x^2+1)^2}{x^2}}\sqrt{-\frac{x^8+1}{x^4}}x^3F\left(\sin^{-1}\left(\frac{1}{2}\sqrt{-\frac{\sqrt{2}x^4-2x^2+\sqrt{2}}{x^2}}\right)|-2\left(1-\sqrt{2}\right)\right)}{10\sqrt{2+\sqrt{2}}\,(x^2+1)\sqrt{x^8+1}}+\frac{\sqrt{-\frac{(1-x^2)^2}{x^2}}\sqrt{-\frac{x^8+1}{x^4}}x^3F\left(\sin^{-1}\left(\frac{1}{2}\sqrt{\frac{\sqrt{2}x^4+2x^2+\sqrt{2}}{x^2}}\right)|-2\left(1-\sqrt{2}\right)\right)}{10\sqrt{2+\sqrt{2}}\,(1-x^2)\sqrt{x^8+1}}$$

```
[Out] -Sqrt[1 + x^8]/(5*x^5) + (x^3*Sqrt[(1 + x^2)^2/x^2]*Sqrt[-((1 + x
^8)/x^4)]*EllipticF[ArcSin[Sqrt[-((Sqrt[2] - 2*x^2 + Sqrt[2]*x^4)
/x^2)]/2], -2*(1 - Sqrt[2])])/(10*Sqrt[2 + Sqrt[2]]*(1 + x^2)*Sqr
t[1 + x^8]) + (x^3*Sqrt[-((1 - x^2)^2/x^2)]*Sqrt[-((1 + x^8)/x^4)
]*EllipticF[ArcSin[Sqrt[(Sqrt[2] + 2*x^2 + Sqrt[2]*x^4)/x^2]/2],
-2*(1 - Sqrt[2])])/(10*Sqrt[2 + Sqrt[2]]*(1 - x^2)*Sqrt[1 + x^8])
```

Rubi [A] time = 0.16191, antiderivative size = 239, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{\sqrt{x^8+1}}{5x^5}+\frac{\sqrt{\frac{(x^2+1)^2}{x^2}}\sqrt{-\frac{x^8+1}{x^4}}x^3F\left(\sin^{-1}\left(\frac{1}{2}\sqrt{-\frac{\sqrt{2}x^4-2x^2+\sqrt{2}}{x^2}}\right)|-2\left(1-\sqrt{2}\right)\right)}{10\sqrt{2+\sqrt{2}}\,(x^2+1)\sqrt{x^8+1}}+\frac{\sqrt{-\frac{(1-x^2)^2}{x^2}}\sqrt{-\frac{x^8+1}{x^4}}x^3F\left(\sin^{-1}\left(\frac{1}{2}\sqrt{\frac{\sqrt{2}x^4+2x^2+\sqrt{2}}{x^2}}\right)|-2\left(1-\sqrt{2}\right)\right)}{10\sqrt{2+\sqrt{2}}\,(1-x^2)\sqrt{x^8+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^6*Sqrt[1 + x^8]),x]
```

```
[Out] -Sqrt[1 + x^8]/(5*x^5) + (x^3*Sqrt[(1 + x^2)^2/x^2]*Sqrt[-((1 + x
^8)/x^4)]*EllipticF[ArcSin[Sqrt[-((Sqrt[2] - 2*x^2 + Sqrt[2]*x^4)
/x^2)]/2], -2*(1 - Sqrt[2])])/(10*Sqrt[2 + Sqrt[2]]*(1 + x^2)*Sqr
t[1 + x^8]) + (x^3*Sqrt[-((1 - x^2)^2/x^2)]*Sqrt[-((1 + x^8)/x^4)
]*EllipticF[ArcSin[Sqrt[(Sqrt[2] + 2*x^2 + Sqrt[2]*x^4)/x^2]/2],
-2*(1 - Sqrt[2])])/(10*Sqrt[2 + Sqrt[2]]*(1 - x^2)*Sqrt[1 + x^8])
```

Rubi in Sympy [A] time = 13.9414, size = 202, normalized size = 0.85

$$\frac{x^3\sqrt{\frac{-x^8-1}{x^4}}\sqrt{\frac{(x^2+1)^2}{x^2}}F\left(\operatorname{asin}\left(\frac{\sqrt{-\frac{\sqrt{2}x^4-2x^2+\sqrt{2}}{x^2}}}{2}\right)\middle|-2+2\sqrt{2}\right)}{10\sqrt{\sqrt{2}+2}\,(x^2+1)\sqrt{x^8+1}}+\frac{x^3\sqrt{\frac{-x^8-1}{x^4}}\sqrt{-\frac{(-x^2+1)^2}{x^2}}F\left(\operatorname{asin}\left(\frac{\sqrt{\frac{\sqrt{2}x^4+2x^2+\sqrt{2}}{x^2}}}{2}\right)\middle|-2+2\sqrt{2}\right)}{10\sqrt{\sqrt{2}+2}\,(-x^2+1)\sqrt{x^8+1}}-\frac{\sqrt{x^8+1}}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**6/(x**8+1)**(1/2),x)
```

```
[Out] x**3*sqrt((-x**8 - 1)/x**4)*sqrt((x**2 + 1)**2/x**2)*elliptic_f(a
sin(sqrt(-(sqrt(2)*x**4 - 2*x**2 + sqrt(2))/x**2)/2), -2 + 2*sqrt
(2))/(10*sqrt(sqrt(2) + 2)*(x**2 + 1)*sqrt(x**8 + 1)) + x**3*sqrt
((-x**8 - 1)/x**4)*sqrt(-(-x**2 + 1)**2/x**2)*elliptic_f(asin(sqr
```

```
t((sqrt(2)*x**4 + 2*x**2 + sqrt(2))/x**2)/2), -2 + 2*sqrt(2))/(10
*sqrt(sqrt(2) + 2)*(-x**2 + 1)*sqrt(x**8 + 1)) - sqrt(x**8 + 1)/(
5*x**5)
```

Mathematica [A] time = 1.41224, size = 221, normalized size = 0.92

$$-\frac{-\frac{\sqrt{-\frac{(x^2-1)^2}{x^2}}\,(x^2+1)\sqrt{-\frac{x^8+1}{x^4}}\,x^8 F\left(\sin^{-1}\left(\frac{\sqrt{x^2+\sqrt{2}+\frac{1}{x^2}}}{2^{3/4}}\right)\middle|2\left(-1+\sqrt{2}\right)\right)}{\sqrt{2+\sqrt{2}}}-(x^2-1)\left(2\left(x^{10}+x^8+x^2+1\right)+\sqrt{x^2+\frac{1}{x^2}+\sqrt{2}}\sqrt{\frac{(x^2+1)^2\left(x^4-\sqrt{2}x^2+1\right)}{\left(\sqrt{2}-2\right)x^4}}\right.}{10x^5\left(x^4-1\right)\sqrt{x^8+1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/(x^6*Sqrt[1 + x^8]),x]
```

```
[Out] (-((x^8*Sqrt[-((-1 + x^2)^2/x^2)]*(1 + x^2)*Sqrt[-((1 + x^8)/x^4)
]*EllipticF[ArcSin[Sqrt[Sqrt[2] + x^(-2) + x^2]/2^(3/4)], 2*(-1 +
 Sqrt[2])])/Sqrt[2 + Sqrt[2]]) - (-1 + x^2)*(2*(1 + x^2 + x^8 + x
^10) + x^8*Sqrt[Sqrt[2] + x^(-2) + x^2]*Sqrt[((1 + x^2)^2*(1 - Sq
rt[2]*x^2 + x^4))/((-2 + Sqrt[2])*x^4)]*EllipticF[ArcSin[Sqrt[Sqr
t[2] + x^(-2) + x^2]/2^(3/4)], -2*(1 + Sqrt[2])]))/(10*x^5*(-1 +
x^4)*Sqrt[1 + x^8])
```

Maple [C] time = 0.042, size = 30, normalized size = 0.1

$$-\frac{1}{5\,x^5}\sqrt{x^8+1}-\frac{x^3}{15}{}_2F_1\left(\frac{3}{8},\frac{1}{2};\frac{11}{8};-x^8\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^6/(x^8+1)^(1/2),x)
```

```
[Out] -1/5*(x^8+1)^(1/2)/x^5-1/15*x^3*hypergeom([3/8,1/2],[11/8],-x^8)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^8+1}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^8 + 1)*x^6),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(x^8 + 1)*x^6), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{x^8+1}x^6}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^8 + 1)*x^6),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(x^8 + 1)*x^6), x)
```

Sympy [A] time = 2.80788, size = 32, normalized size = 0.13

$$\frac{\Gamma\left(-\frac{5}{8}\right) {}_2F_1\left(\begin{matrix} -\frac{5}{8}, \frac{1}{2} \\ \frac{3}{8} \end{matrix}\middle| x^8 e^{i\pi}\right)}{8x^5 \Gamma\left(\frac{3}{8}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**6/(x**8+1)**(1/2),x)
```

```
[Out] gamma(-5/8)*hyper((-5/8, 1/2), (3/8,), x**8*exp_polar(I*pi))/(8*x
**5*gamma(3/8))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^8 + 1}x^6}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^8 + 1)*x^6),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(x^8 + 1)*x^6), x)
```

3.1537 $\int \frac{1}{x^8\sqrt{1+x^8}}\,dx$

Optimal. Leaf size=239

$$-\frac{\sqrt{x^8+1}}{7x^7}-\frac{3\sqrt{\frac{(x^2+1)^2}{x^2}}\sqrt{-\frac{x^8+1}{x^4}}x^3F\left(\sin^{-1}\left(\frac{1}{2}\sqrt{-\frac{\sqrt{2}x^4-2x^2+\sqrt{2}}{x^2}}\right)|-2\left(1-\sqrt{2}\right)\right)}{14\sqrt{2+\sqrt{2}}\,(x^2+1)\sqrt{x^8+1}}+\frac{3\sqrt{-\frac{(1-x^2)^2}{x^2}}\sqrt{-\frac{x^8+1}{x^4}}x^3F\left(\sin^{-1}\left(\frac{1}{2}\sqrt{\frac{\sqrt{2}x^4+2x^2+\sqrt{2}}{x^2}}\right)|-2\left(1-\sqrt{2}\right)\right)}{14\sqrt{2+\sqrt{2}}\,(1-x^2)\sqrt{x^8+1}}$$

```
[Out] -Sqrt[1 + x^8]/(7*x^7) - (3*x^3*Sqrt[(1 + x^2)^2/x^2]*Sqrt[-((1 +
 x^8)/x^4)]*EllipticF[ArcSin[Sqrt[-((Sqrt[2] - 2*x^2 + Sqrt[2]*x^
4)/x^2)]/2], -2*(1 - Sqrt[2])])/(14*Sqrt[2 + Sqrt[2]]*(1 + x^2)*S
qrt[1 + x^8]) + (3*x^3*Sqrt[-((1 - x^2)^2/x^2)]*Sqrt[-((1 + x^8)/
x^4)]*EllipticF[ArcSin[Sqrt[(Sqrt[2] + 2*x^2 + Sqrt[2]*x^4)/x^2]/
2], -2*(1 - Sqrt[2])])/(14*Sqrt[2 + Sqrt[2]]*(1 - x^2)*Sqrt[1 + x
^8])
```

Rubi [A] time = 0.151553, antiderivative size = 239, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{\sqrt{x^8+1}}{7x^7}-\frac{3\sqrt{\frac{(x^2+1)^2}{x^2}}\sqrt{-\frac{x^8+1}{x^4}}x^3F\left(\sin^{-1}\left(\frac{1}{2}\sqrt{-\frac{\sqrt{2}x^4-2x^2+\sqrt{2}}{x^2}}\right)|-2\left(1-\sqrt{2}\right)\right)}{14\sqrt{2+\sqrt{2}}\,(x^2+1)\sqrt{x^8+1}}+\frac{3\sqrt{-\frac{(1-x^2)^2}{x^2}}\sqrt{-\frac{x^8+1}{x^4}}x^3F\left(\sin^{-1}\left(\frac{1}{2}\sqrt{\frac{\sqrt{2}x^4+2x^2+\sqrt{2}}{x^2}}\right)|-2\left(1-\sqrt{2}\right)\right)}{14\sqrt{2+\sqrt{2}}\,(1-x^2)\sqrt{x^8+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^8*Sqrt[1 + x^8]),x]
```


```
[Out] -Sqrt[1 + x^8]/(7*x^7) - (3*x^3*Sqrt[(1 + x^2)^2/x^2]*Sqrt[-((1 +
 x^8)/x^4)]*EllipticF[ArcSin[Sqrt[-((Sqrt[2] - 2*x^2 + Sqrt[2]*x^
4)/x^2)]/2], -2*(1 - Sqrt[2])])/(14*Sqrt[2 + Sqrt[2]]*(1 + x^2)*S
qrt[1 + x^8]) + (3*x^3*Sqrt[-((1 - x^2)^2/x^2)]*Sqrt[-((1 + x^8)/
x^4)]*EllipticF[ArcSin[Sqrt[(Sqrt[2] + 2*x^2 + Sqrt[2]*x^4)/x^2]/
2], -2*(1 - Sqrt[2])])/(14*Sqrt[2 + Sqrt[2]]*(1 - x^2)*Sqrt[1 + x
^8])
```

Rubi in Sympy [A] time = 13.2122, size = 206, normalized size = 0.86

$$-\frac{3x^3\sqrt{\frac{-x^8-1}{x^4}}\sqrt{\frac{(x^2+1)^2}{x^2}}F\left(\operatorname{asin}\left(\frac{\sqrt{-\frac{\sqrt{2}x^4-2x^2+\sqrt{2}}{x^2}}}{2}\right)\middle|-2+2\sqrt{2}\right)}{14\sqrt{\sqrt{2}+2}\,(x^2+1)\sqrt{x^8+1}}+\frac{3x^3\sqrt{\frac{-x^8-1}{x^4}}\sqrt{-\frac{(-x^2+1)^2}{x^2}}F\left(\operatorname{asin}\left(\frac{\sqrt{\frac{\sqrt{2}x^4+2x^2+\sqrt{2}}{x^2}}}{2}\right)\middle|-2+2\sqrt{2}\right)}{14\sqrt{\sqrt{2}+2}\,(-x^2+1)\sqrt{x^8+1}}-\frac{\sqrt{x^8+1}}{7x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**8/(x**8+1)**(1/2),x)
```

```
[Out] -3*x**3*sqrt((-x**8 - 1)/x**4)*sqrt((x**2 + 1)**2/x**2)*elliptic_
f(asin(sqrt(-(sqrt(2)*x**4 - 2*x**2 + sqrt(2))/x**2)/2), -2 + 2*s
```

```
qrt(2))/(14*sqrt(sqrt(2) + 2)*(x**2 + 1)*sqrt(x**8 + 1)) + 3*x**3
*sqrt((-x**8 - 1)/x**4)*sqrt(-(-x**2 + 1)**2/x**2)*elliptic_f(asi
n(sqrt((sqrt(2)*x**4 + 2*x**2 + sqrt(2))/x**2)/2), -2 + 2*sqrt(2)
)/(14*sqrt(sqrt(2) + 2)*(-x**2 + 1)*sqrt(x**8 + 1)) - sqrt(x**8 +
 1)/(7*x**7)
```

Mathematica [A] time = 1.37423, size = 221, normalized size = 0.92

$$\frac{(x^2-1)\left(3x^{10}\sqrt{x^2+\frac{1}{x^2}+\sqrt{2}}\sqrt{\frac{(x^2+1)^2\left(x^4-\sqrt{2}x^2+1\right)}{\left(\sqrt{2}-2\right)x^4}}F\left(\sin^{-1}\left(\frac{\sqrt{x^2+\sqrt{2}+\frac{1}{x^2}}}{2^{3/4}}\right)\middle|-2\left(1+\sqrt{2}\right)\right)-2\left(x^{10}+x^8+x^2+1\right)\right)-\frac{3x^{10}\sqrt{-\frac{(x \cdots}{\cdots}}}{\cdots}}{14x^7\left(x^4-1\right)\sqrt{x^8+1}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/(x^8*Sqrt[1 + x^8]),x]
```

```
[Out] ((-3*x^10*Sqrt[-((-1 + x^2)^2/x^2)]*(1 + x^2)*Sqrt[-((1 + x^8)/x^
4)]*EllipticF[ArcSin[Sqrt[Sqrt[2] + x^(-2) + x^2]/2^(3/4)], 2*(-1
 + Sqrt[2])])/Sqrt[2 + Sqrt[2]] + (-1 + x^2)*(-2*(1 + x^2 + x^8 +
 x^10) + 3*x^10*Sqrt[Sqrt[2] + x^(-2) + x^2]*Sqrt[((1 + x^2)^2*(1
 - Sqrt[2]*x^2 + x^4))/((-2 + Sqrt[2])*x^4)]*EllipticF[ArcSin[Sqr
t[Sqrt[2] + x^(-2) + x^2]/2^(3/4)], -2*(1 + Sqrt[2])]))/(14*x^7*(
-1 + x^4)*Sqrt[1 + x^8])
```

Maple [C] time = 0.038, size = 28, normalized size = 0.1

$$-\frac{1}{7x^7}\sqrt{x^8+1}-\frac{3x}{7}{}_2F_1\left(\frac{1}{8},\frac{1}{2};\frac{9}{8};-x^8\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^8/(x^8+1)^(1/2),x)
```

```
[Out] -1/7*(x^8+1)^(1/2)/x^7-3/7*x*hypergeom([1/8,1/2],[9/8],-x^8)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^8+1}x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^8 + 1)*x^8),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(x^8 + 1)*x^8), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{x^8+1}x^8}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^8 + 1)*x^8),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(x^8 + 1)*x^8), x)
```

Sympy [A] time = 3.71619, size = 32, normalized size = 0.13

$$\frac{\left(-\frac{7}{8}\right) {}_2F_1\left(\begin{matrix} -\frac{7}{8}, \frac{1}{2} \\ \frac{1}{8} \end{matrix}\middle| x^8 e^{i\pi}\right)}{8x^7 \left(\frac{1}{8}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**8/(x**8+1)**(1/2),x)
```

```
[Out] gamma(-7/8)*hyper((-7/8, 1/2), (1/8,), x**8*exp_polar(I*pi))/(8*x
**7*gamma(1/8))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{x^8+1}x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^8 + 1)*x^8),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(x^8 + 1)*x^8), x)
```

3.1538 $\int \frac{1}{1-x^{10}}\,dx$

Optimal. Leaf size=163

$$\frac{1}{20}\sqrt{10-2\sqrt{5}}\tan^{-1}\left(\frac{\sqrt{10-2\sqrt{5}}x}{2(1-x^2)}\right)+\frac{1}{20}\sqrt{10+2\sqrt{5}}\tan^{-1}\left(\frac{\sqrt{10+2\sqrt{5}}x}{2(1-x^2)}\right)+\frac{1}{20}\left(1-\sqrt{5}\right)\tanh^{-1}\left(\frac{\left(1-\sqrt{5}\right)x}{2(x^2+1)}\right)+\frac{1}{20}\left(1+\sqrt{5}\right)\tanh^{-1}\left(\frac{\left(1+\sqrt{5}\right)x}{2(x^2+1)}\right)+\frac{1}{5}\tanh^{-1}(x)$$

```
[Out] (Sqrt[10 - 2*Sqrt[5]]*ArcTan[(Sqrt[10 - 2*Sqrt[5]]*x)/(2*(1 - x^2
))])/20 + (Sqrt[10 + 2*Sqrt[5]]*ArcTan[(Sqrt[10 + 2*Sqrt[5]]*x)/(
2*(1 - x^2))])/20 + ArcTanh[x]/5 + ((1 - Sqrt[5])*ArcTanh[((1 - S
qrt[5])*x)/(2*(1 + x^2))])/20 + ((1 + Sqrt[5])*ArcTanh[((1 + Sqrt
[5])*x)/(2*(1 + x^2))])/20
```

Rubi [A] time = 0.469714, antiderivative size = 325, normalized size of antiderivative = 1.99, number of steps used = 10, number of rules used = 6, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667

$$-\frac{1}{40}\left(1-\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1-\sqrt{5}\right)x+1\right)+\frac{1}{40}\left(1-\sqrt{5}\right)\log\left(x^2+\frac{1}{2}\left(1-\sqrt{5}\right)x+1\right)-\frac{1}{40}\left(1+\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1+\sqrt{5}\right)x+1\right)+\frac{1}{40}\left(1+\sqrt{5}\right)\log\left(x^2+\frac{1}{2}\left(1+\sqrt{5}\right)x+1\right)-\frac{1}{10}\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\tan^{-1}\left(\frac{-4x-\sqrt{5}+1}{\sqrt{2\left(5+\sqrt{5}\right)}}\right)-\frac{1}{10}\sqrt{\frac{1}{2}\left(5-\sqrt{5}\right)}\tan^{-1}\left(\frac{1}{2}\sqrt{\frac{1}{10}\left(5+\sqrt{5}\right)}\left(-4x+\sqrt{5}+1\right)\right)+\frac{1}{10}\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\tan^{-1}\left(\frac{4x-\sqrt{5}+1}{\sqrt{2\left(5+\sqrt{5}\right)}}\right)+\frac{1}{10}\sqrt{\frac{1}{2}\left(5-\sqrt{5}\right)}\tan^{-1}\left(\frac{1}{2}\sqrt{\frac{1}{10}\left(5+\sqrt{5}\right)}\left(4x+\sqrt{5}+1\right)\right)+\frac{1}{5}\tanh^{-1}(x)$$

Antiderivative was successfully verified.

```
[In] Int[(1 - x^10)^(-1),x]
```

```
[Out] -(Sqrt[(5 + Sqrt[5])/2]*ArcTan[(1 - Sqrt[5] - 4*x)/Sqrt[2*(5 + Sq
rt[5])]])/10 - (Sqrt[(5 - Sqrt[5])/2]*ArcTan[(Sqrt[(5 + Sqrt[5])/
10]*(1 + Sqrt[5] - 4*x))/2])/10 + (Sqrt[(5 + Sqrt[5])/2]*ArcTan[(
1 - Sqrt[5] + 4*x)/Sqrt[2*(5 + Sqrt[5])]])/10 + (Sqrt[(5 - Sqrt[5
])/2]*ArcTan[(Sqrt[(5 + Sqrt[5])/10]*(1 + Sqrt[5] + 4*x))/2])/10
+ ArcTanh[x]/5 - ((1 - Sqrt[5])*Log[1 - ((1 - Sqrt[5])*x)/2 + x^2
])/40 + ((1 - Sqrt[5])*Log[1 + ((1 - Sqrt[5])*x)/2 + x^2])/40 - (
(1 + Sqrt[5])*Log[1 - ((1 + Sqrt[5])*x)/2 + x^2])/40 + ((1 + Sqrt
[5])*Log[1 + ((1 + Sqrt[5])*x)/2 + x^2])/40
```

Rubi in Sympy [A] time = 38.7375, size = 291, normalized size = 1.79

$$-\left(-\frac{\sqrt{5}}{40}+\frac{1}{40}\right)\log\left(x^2+x\left(-\frac{1}{2}+\frac{\sqrt{5}}{2}\right)+1\right)+\left(\frac{1}{40}+\frac{\sqrt{5}}{40}\right)\log\left(x^2+x\left(\frac{1}{2}+\frac{\sqrt{5}}{2}\right)+1\right)-\left(\frac{1}{40}+\frac{\sqrt{5}}{40}\right)\log\left(x^2+x\left(-\frac{\sqrt{5}}{2}-\frac{1}{2}\right)+1\right)+\left(-\frac{\sqrt{5}}{40}+\frac{1}{40}\right)\log\left(x^2+x\left(-\frac{\sqrt{5}}{2}+\frac{1}{2}\right)+1\right)+\frac{\sqrt{-\frac{\sqrt{5}}{8}+\frac{5}{8}}\operatorname{atan}\left(\frac{x+\frac{1}{4}+\frac{\sqrt{5}}{4}}{\sqrt{-\frac{\sqrt{5}}{8}+\frac{5}{8}}}\right)}{5}+\frac{\sqrt{-\frac{\sqrt{5}}{8}+\frac{5}{8}}\operatorname{atan}\left(\frac{x-\frac{\sqrt{5}}{4}-\frac{1}{4}}{\sqrt{-\frac{\sqrt{5}}{8}+\frac{5}{8}}}\right)}{5}+\frac{\sqrt{\frac{\sqrt{5}}{8}+\frac{5}{8}}\operatorname{atan}\left(\frac{x-\frac{1}{4}+\frac{\sqrt{5}}{4}}{\sqrt{\frac{\sqrt{5}}{8}+\frac{5}{8}}}\right)}{5}+\frac{\sqrt{\frac{\sqrt{5}}{8}+\frac{5}{8}}\operatorname{atan}\left(\frac{x-\frac{\sqrt{5}}{4}+\frac{1}{4}}{\sqrt{\frac{\sqrt{5}}{8}+\frac{5}{8}}}\right)}{5}+\frac{\operatorname{atanh}(x)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(-x**10+1),x)
```

```
[Out] -(-sqrt(5)/40 + 1/40)*log(x**2 + x*(-1/2 + sqrt(5)/2) + 1) + (1/4
0 + sqrt(5)/40)*log(x**2 + x*(1/2 + sqrt(5)/2) + 1) - (1/40 + sqr
t(5)/40)*log(x**2 + x*(-sqrt(5)/2 - 1/2) + 1) + (-sqrt(5)/40 + 1/
40)*log(x**2 + x*(-sqrt(5)/2 + 1/2) + 1) + sqrt(-sqrt(5)/8 + 5/8)
*atan((x + 1/4 + sqrt(5)/4)/sqrt(-sqrt(5)/8 + 5/8))/5 + sqrt(-sqr
t(5)/8 + 5/8)*atan((x - sqrt(5)/4 - 1/4)/sqrt(-sqrt(5)/8 + 5/8))/
5 + sqrt(sqrt(5)/8 + 5/8)*atan((x - 1/4 + sqrt(5)/4)/sqrt(sqrt(5)
/8 + 5/8))/5 + sqrt(sqrt(5)/8 + 5/8)*atan((x - sqrt(5)/4 + 1/4)/s
qrt(sqrt(5)/8 + 5/8))/5 + atanh(x)/5
```

Mathematica [A] time = 0.68479, size = 289, normalized size = 1.77

$$\frac{1}{40}\left(-\left(\sqrt{5}-1\right)\log\left(x^2-\frac{1}{2}\left(\sqrt{5}-1\right)x+1\right)+\left(\sqrt{5}-1\right)\log\left(x^2+\frac{1}{2}\left(\sqrt{5}-1\right)x+1\right)-\left(1+\sqrt{5}\right)\log\left(x^2-\frac{1}{2}\left(1+\sqrt{5}\right)x+1\right)+\left(1+\sqrt{5}\right)\log\left(\frac{1}{2}\left(2x^2+\sqrt{5}x+x+2\right)\right)-4\log(1-x)+4\log(x+1)-2\sqrt{10-2\sqrt{5}}\tan^{-1}\left(\frac{-4x+\sqrt{5}+1}{\sqrt{10-2\sqrt{5}}}\right)+2\sqrt{2\left(5+\sqrt{5}\right)}\tan^{-1}\left(\frac{4x-\sqrt{5}+1}{\sqrt{2\left(5+\sqrt{5}\right)}}\right)+2\sqrt{2\left(5+\sqrt{5}\right)}\tan^{-1}\left(\frac{4x+\sqrt{5}-1}{\sqrt{2\left(5+\sqrt{5}\right)}}\right)+2\sqrt{10-2\sqrt{5}}\tan^{-1}\left(\frac{4x+\sqrt{5}+1}{\sqrt{10-2\sqrt{5}}}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(1 - x^10)^(-1),x]
```

```
[Out] (-2*Sqrt[10 - 2*Sqrt[5]]*ArcTan[(1 + Sqrt[5] - 4*x)/Sqrt[10 - 2*S
qrt[5]]] + 2*Sqrt[2*(5 + Sqrt[5])]*ArcTan[(1 - Sqrt[5] + 4*x)/Sqr
t[2*(5 + Sqrt[5])]] + 2*Sqrt[2*(5 + Sqrt[5])]*ArcTan[(-1 + Sqrt[5
] + 4*x)/Sqrt[2*(5 + Sqrt[5])]] + 2*Sqrt[10 - 2*Sqrt[5]]*ArcTan[(
1 + Sqrt[5] + 4*x)/Sqrt[10 - 2*Sqrt[5]]] - 4*Log[1 - x] + 4*Log[1
 + x] - (-1 + Sqrt[5])*Log[1 - ((-1 + Sqrt[5])*x)/2 + x^2] + (-1
+ Sqrt[5])*Log[1 + ((-1 + Sqrt[5])*x)/2 + x^2] - (1 + Sqrt[5])*Lo
g[1 - ((1 + Sqrt[5])*x)/2 + x^2] + (1 + Sqrt[5])*Log[(2 + x + Sqr
t[5]*x + 2*x^2)/2])/40
```

Maple [B] time = 0.04, size = 426, normalized size = 2.6

$$-\frac{\ln(-1+x)}{10}+\frac{\ln\left(x\sqrt{5}+2x^2+x+2\right)\sqrt{5}}{40}+\frac{\ln\left(x\sqrt{5}+2x^2+x+2\right)}{40}$$
$$+\frac{1}{2\sqrt{10-2\sqrt{5}}}\arctan\left(\frac{1+4x+\sqrt{5}}{\sqrt{10-2\sqrt{5}}}\right)-\frac{\sqrt{5}}{10\sqrt{10-2\sqrt{5}}}\arctan\left(\frac{1+4x+\sqrt{5}}{\sqrt{10-2\sqrt{5}}}\right)$$
$$-\frac{\ln\left(-x\sqrt{5}+2x^2+x+2\right)\sqrt{5}}{40}+\frac{\ln\left(-x\sqrt{5}+2x^2+x+2\right)}{40}$$
$$+\frac{1}{2\sqrt{10+2\sqrt{5}}}\arctan\left(\frac{1+4x-\sqrt{5}}{\sqrt{10+2\sqrt{5}}}\right)+\frac{\sqrt{5}}{10\sqrt{10+2\sqrt{5}}}\arctan\left(\frac{1+4x-\sqrt{5}}{\sqrt{10+2\sqrt{5}}}\right)$$
$$+\frac{\ln(1+x)}{10}+\frac{\ln\left(x\sqrt{5}+2x^2-x+2\right)\sqrt{5}}{40}-\frac{\ln\left(x\sqrt{5}+2x^2-x+2\right)}{40}$$
$$+\frac{1}{2\sqrt{10+2\sqrt{5}}}\arctan\left(\frac{\sqrt{5}+4x-1}{\sqrt{10+2\sqrt{5}}}\right)+\frac{\sqrt{5}}{10\sqrt{10+2\sqrt{5}}}\arctan\left(\frac{\sqrt{5}+4x-1}{\sqrt{10+2\sqrt{5}}}\right)$$
$$-\frac{\ln\left(-x\sqrt{5}+2x^2-x+2\right)\sqrt{5}}{40}-\frac{\ln\left(-x\sqrt{5}+2x^2-x+2\right)}{40}$$
$$+\frac{1}{2\sqrt{10-2\sqrt{5}}}\arctan\left(\frac{-\sqrt{5}+4x-1}{\sqrt{10-2\sqrt{5}}}\right)-\frac{\sqrt{5}}{10\sqrt{10-2\sqrt{5}}}\arctan\left(\frac{-\sqrt{5}+4x-1}{\sqrt{10-2\sqrt{5}}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(-x^10+1),x)
```

```
[Out] -1/10*ln(-1+x)+1/40*ln(x*5^(1/2)+2*x^2+x+2)*5^(1/2)+1/40*ln(x*5^(
1/2)+2*x^2+x+2)+1/2/(10-2*5^(1/2))^(1/2)*arctan((1+4*x+5^(1/2))/(
10-2*5^(1/2))^(1/2))-1/10/(10-2*5^(1/2))^(1/2)*arctan((1+4*x+5^(1
/2))/(10-2*5^(1/2))^(1/2))*5^(1/2)-1/40*ln(-x*5^(1/2)+2*x^2+x+2)*
5^(1/2)+1/40*ln(-x*5^(1/2)+2*x^2+x+2)+1/2/(10+2*5^(1/2))^(1/2)*ar
ctan((1+4*x-5^(1/2))/(10+2*5^(1/2))^(1/2))+1/10/(10+2*5^(1/2))^(1
/2)*arctan((1+4*x-5^(1/2))/(10+2*5^(1/2))^(1/2))*5^(1/2)+1/10*ln(
1+x)+1/40*ln(x*5^(1/2)+2*x^2-x+2)*5^(1/2)-1/40*ln(x*5^(1/2)+2*x^2
-x+2)+1/2/(10+2*5^(1/2))^(1/2)*arctan((5^(1/2)+4*x-1)/(10+2*5^(1/
2))^(1/2))+1/10/(10+2*5^(1/2))^(1/2)*arctan((5^(1/2)+4*x-1)/(10+2
*5^(1/2))^(1/2))*5^(1/2)-1/40*ln(-x*5^(1/2)+2*x^2-x+2)*5^(1/2)-1/
40*ln(-x*5^(1/2)+2*x^2-x+2)+1/2/(10-2*5^(1/2))^(1/2)*arctan((-5^(
1/2)+4*x-1)/(10-2*5^(1/2))^(1/2))-1/10/(10-2*5^(1/2))^(1/2)*arcta
n((-5^(1/2)+4*x-1)/(10-2*5^(1/2))^(1/2))*5^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{10}\int\frac{x^3+2x^2+3x+4}{x^4+x^3+x^2+x+1}\,dx-\frac{1}{10}\int\frac{x^3-2x^2+3x-4}{x^4-x^3+x^2-x+1}\,dx+\frac{1}{10}\log(x+1)-\frac{1}{10}\log(x-1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(x^10 - 1),x, algorithm="maxima")
```

```
[Out] 1/10*integrate((x^3 + 2*x^2 + 3*x + 4)/(x^4 + x^3 + x^2 + x + 1),
 x) - 1/10*integrate((x^3 - 2*x^2 + 3*x - 4)/(x^4 - x^3 + x^2 - x
 + 1), x) + 1/10*log(x + 1) - 1/10*log(x - 1)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(x^10 - 1),x, algorithm="fricas")
```

```
[Out] Exception raised: NotImplementedError
```

Sympy [A] time = 12.5254, size = 70, normalized size = 0.43

$$-\frac{\log(x-1)}{10}+\frac{\log(x+1)}{10}-\operatorname{RootSum}\left(10000t^4-1000t^3+100t^2-10t+1,\left(t\mapsto t\log(-10t+x)\right)\right)-\operatorname{RootSum}\left(10000t^4+1000t^3+100t^2+10t+1,\left(t\mapsto t\log(-10t+x)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(-x**10+1),x)
```

```
[Out] -log(x - 1)/10 + log(x + 1)/10 - RootSum(10000*_t**4 - 1000*_t**3
 + 100*_t**2 - 10*_t + 1, Lambda(_t, _t*log(-10*_t + x))) - RootS
um(10000*_t**4 + 1000*_t**3 + 100*_t**2 + 10*_t + 1, Lambda(_t, _
t*log(-10*_t + x)))
```

GIAC/XCAS [A] time = 0.230918, size = 301, normalized size = 1.85

$$\frac{1}{40}\left(\sqrt{5}+1\right)\ln\left(x^2+\frac{1}{2}x\left(\sqrt{5}+1\right)+1\right)-\frac{1}{40}\left(\sqrt{5}+1\right)\ln\left(x^2-\frac{1}{2}x\left(\sqrt{5}+1\right)+1\right)+\frac{1}{40}\left(\sqrt{5}-1\right)\ln\left(x^2+\frac{1}{2}x\left(\sqrt{5}-1\right)+1\right)-\frac{1}{40}\left(\sqrt{5}-1\right)\ln\left(x^2-\frac{1}{2}x\left(\sqrt{5}-1\right)+1\right)+\frac{1}{20}\sqrt{2\sqrt{5}+10}\arctan\left(\frac{4x+\sqrt{5}-1}{\sqrt{2\sqrt{5}+10}}\right)+\frac{1}{20}\sqrt{2\sqrt{5}+10}\arctan\left(\frac{4x-\sqrt{5}+1}{\sqrt{2\sqrt{5}+10}}\right)+\frac{1}{20}\sqrt{-2\sqrt{5}+10}\arctan\left(\frac{4x+\sqrt{5}+1}{\sqrt{-2\sqrt{5}+10}}\right)+\frac{1}{20}\sqrt{-2\sqrt{5}+10}\arctan\left(\frac{4x-\sqrt{5}-1}{\sqrt{-2\sqrt{5}+10}}\right)+\frac{1}{10}\ln\left(|x+1|\right)-\frac{1}{10}\ln\left(|x-1|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(x^10 - 1),x, algorithm="giac")
```

```
[Out] 1/40*(sqrt(5) + 1)*ln(x^2 + 1/2*x*(sqrt(5) + 1) + 1) - 1/40*(sqrt
(5) + 1)*ln(x^2 - 1/2*x*(sqrt(5) + 1) + 1) + 1/40*(sqrt(5) - 1)*l
n(x^2 + 1/2*x*(sqrt(5) - 1) + 1) - 1/40*(sqrt(5) - 1)*ln(x^2 - 1/
2*x*(sqrt(5) - 1) + 1) + 1/20*sqrt(2*sqrt(5) + 10)*arctan((4*x +
sqrt(5) - 1)/sqrt(2*sqrt(5) + 10)) + 1/20*sqrt(2*sqrt(5) + 10)*ar
ctan((4*x - sqrt(5) + 1)/sqrt(2*sqrt(5) + 10)) + 1/20*sqrt(-2*sqr
t(5) + 10)*arctan((4*x + sqrt(5) + 1)/sqrt(-2*sqrt(5) + 10)) + 1/
20*sqrt(-2*sqrt(5) + 10)*arctan((4*x - sqrt(5) - 1)/sqrt(-2*sqrt(
5) + 10)) + 1/10*ln(abs(x + 1)) - 1/10*ln(abs(x - 1))
```

3.1539 $\int \frac{x^4}{\sqrt{1-x^{10}}}\,dx$

Optimal. Leaf size=8

$$\frac{1}{5}\sin^{-1}\left(x^5\right)$$

```
[Out] ArcSin[x^5]/5
```

Rubi [A] time = 0.0182544, antiderivative size = 8, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{1}{5}\sin^{-1}\left(x^5\right)$$

Antiderivative was successfully verified.

```
[In] Int[x^4/Sqrt[1 - x^10],x]

[Out] ArcSin[x^5]/5
```

Rubi in Sympy [A] time = 2.87604, size = 5, normalized size = 0.62

$$\frac{\operatorname{asin}\left(x^5\right)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**4/(-x**10+1)**(1/2),x)

[Out] asin(x**5)/5
```

Mathematica [A] time = 0.00984012, size = 8, normalized size = 1.

$$\frac{1}{5}\sin^{-1}\left(x^5\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4/Sqrt[1 - x^10],x]

[Out] ArcSin[x^5]/5
```

Maple [A] time = 0.051, size = 7, normalized size = 0.9

$$\frac{\arcsin\left(x^5\right)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4/(-x^10+1)^(1/2),x)

[Out] 1/5*arcsin(x^5)
```

Maxima [A] time = 1.5795, size = 22, normalized size = 2.75

$$-\frac{1}{5}\arctan\left(\frac{\sqrt{-x^{10}+1}}{x^5}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(-x^10 + 1),x, algorithm="maxima")
```

```
[Out] -1/5*arctan(sqrt(-x^10 + 1)/x^5)
```

Fricas [A] time = 0.232778, size = 24, normalized size = 3.

$$-\frac{2}{5}\arctan\left(\frac{\sqrt{-x^{10}+1}-1}{x^5}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(-x^10 + 1),x, algorithm="fricas")
```

```
[Out] -2/5*arctan((sqrt(-x^10 + 1) - 1)/x^5)
```

Sympy [A] time = 3.52375, size = 19, normalized size = 2.38

$$\begin{cases} -\frac{i\operatorname{acosh}\left(x^5\right)}{5} & \text{for}\ \left|x^{10}\right| > 1 \\ \frac{\operatorname{asin}\left(x^5\right)}{5} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(-x**10+1)**(1/2),x)
```

```
[Out] Piecewise((-I*acosh(x**5)/5, Abs(x**10) > 1), (asin(x**5)/5, True
))
```

GIAC/XCAS [A] time = 0.233258, size = 8, normalized size = 1.

$$\frac{1}{5}\arcsin\left(x^5\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(-x^10 + 1),x, algorithm="giac")
```

```
[Out] 1/5*arcsin(x^5)
```

3.1540 $\int \frac{x^4}{\sqrt{-2+x^{10}}} \, dx$

Optimal. Leaf size=18

$$\frac{1}{5}\tanh^{-1}\left(\frac{x^5}{\sqrt{x^{10}-2}}\right)$$

```
[Out] ArcTanh[x^5/Sqrt[-2 + x^10]]/5
```

Rubi [A] time = 0.0258492, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{1}{5}\tanh^{-1}\left(\frac{x^5}{\sqrt{x^{10}-2}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/Sqrt[-2 + x^10],x]

[Out] ArcTanh[x^5/Sqrt[-2 + x^10]]/5
```

Rubi in Sympy [A] time = 2.73651, size = 14, normalized size = 0.78

$$\frac{\operatorname{atanh}\left(\frac{x^5}{\sqrt{x^{10}-2}}\right)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(x**10-2)**(1/2),x)

[Out] atanh(x**5/sqrt(x**10 - 2))/5
```

Mathematica [B] time = 0.00798486, size = 42, normalized size = 2.33

$$\frac{1}{10}\log\left(\frac{x^5}{\sqrt{x^{10}-2}}+1\right)-\frac{1}{10}\log\left(1-\frac{x^5}{\sqrt{x^{10}-2}}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/Sqrt[-2 + x^10],x]

[Out] -Log[1 - x^5/Sqrt[-2 + x^10]]/10 + Log[1 + x^5/Sqrt[-2 + x^10]]/1
0
```

Maple [C] time = 0.059, size = 34, normalized size = 1.9

$$\frac{1}{5}\sqrt{-\mathit{signum}\left(-1+\frac{x^{10}}{2}\right)}\arcsin\left(\frac{x^5\sqrt{2}}{2}\right)\frac{1}{\sqrt{\mathit{signum}\left(-1+\frac{x^{10}}{2}\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(x^10-2)^(1/2),x)
```

```
[Out] 1/5/signum(-1+1/2*x^10)^(1/2)*(-signum(-1+1/2*x^10))^(1/2)*arcsin
(1/2*x^5*2^(1/2))
```

Maxima [A] time = 1.4338, size = 45, normalized size = 2.5

$$\frac{1}{10}\log\left(\frac{\sqrt{x^{10}-2}}{x^5}+1\right)-\frac{1}{10}\log\left(\frac{\sqrt{x^{10}-2}}{x^5}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(x^10 - 2),x, algorithm="maxima")
```

```
[Out] 1/10*log(sqrt(x^10 - 2)/x^5 + 1) - 1/10*log(sqrt(x^10 - 2)/x^5 -
1)
```

Fricas [A] time = 0.233529, size = 22, normalized size = 1.22

$$-\frac{1}{5}\log\left(-x^5+\sqrt{x^{10}-2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(x^10 - 2),x, algorithm="fricas")
```

```
[Out] -1/5*log(-x^5 + sqrt(x^10 - 2))
```

Sympy [A] time = 3.68076, size = 34, normalized size = 1.89

$$\begin{cases} \frac{\operatorname{acosh}\left(\frac{\sqrt{2}x^5}{2}\right)}{5} & \text{for}\ \frac{|x^{10}|}{2}>1 \\ -\frac{i\operatorname{asin}\left(\frac{\sqrt{2}x^5}{2}\right)}{5} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(x**10-2)**(1/2),x)
```

```
[Out] Piecewise((acosh(sqrt(2)*x**5/2)/5, Abs(x**10)/2 > 1), (-I*asin(s
qrt(2)*x**5/2)/5, True))
```

GIAC/XCAS [A] time = 0.247061, size = 23, normalized size = 1.28

$$-\frac{1}{5}\ln\left(\left|-x^5+\sqrt{x^{10}-2}\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(x^10 - 2),x, algorithm="giac")
```

```
[Out] -1/5*ln(abs(-x^5 + sqrt(x^10 - 2)))
```

3.1541 $\int \frac{x^5}{9+x^{12}} \, dx$

Optimal. Leaf size=12

$$\frac{1}{18} \tan^{-1}\left(\frac{x^6}{3}\right)$$

```
[Out] ArcTan[x^6/3]/18
```

Rubi [A] time = 0.0169258, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{1}{18} \tan^{-1}\left(\frac{x^6}{3}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/(9 + x^12),x]
```

```
[Out] ArcTan[x^6/3]/18
```

Rubi in Sympy [A] time = 2.70656, size = 7, normalized size = 0.58

$$\frac{\operatorname{atan}\left(\frac{x^6}{3}\right)}{18}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(x**12+9),x)
```

```
[Out] atan(x**6/3)/18
```

Mathematica [A] time = 0.00731801, size = 12, normalized size = 1.

$$\frac{1}{18} \tan^{-1}\left(\frac{x^6}{3}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/(9 + x^12),x]
```

```
[Out] ArcTan[x^6/3]/18
```

Maple [A] time = 0.004, size = 9, normalized size = 0.8

$$\frac{1}{18} \arctan\left(\frac{x^6}{3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(x^12+9),x)
```

```
[Out] 1/18*arctan(1/3*x^6)
```

Maxima [A] time = 1.58771, size = 11, normalized size = 0.92

$$\frac{1}{18}\arctan\left(\frac{1}{3}x^6\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(x^12 + 9),x, algorithm="maxima")
```

```
[Out] 1/18*arctan(1/3*x^6)
```

Fricas [A] time = 0.222916, size = 11, normalized size = 0.92

$$\frac{1}{18}\arctan\left(\frac{1}{3}x^6\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(x^12 + 9),x, algorithm="fricas")
```

```
[Out] 1/18*arctan(1/3*x^6)
```

Sympy [A] time = 0.320024, size = 7, normalized size = 0.58

$$\frac{\operatorname{atan}\left(\frac{x^6}{3}\right)}{18}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(x**12+9),x)
```

```
[Out] atan(x**6/3)/18
```

GIAC/XCAS [A] time = 0.233799, size = 11, normalized size = 0.92

$$\frac{1}{18}\arctan\left(\frac{1}{3}x^6\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(x^12 + 9),x, algorithm="giac")
```

```
[Out] 1/18*arctan(1/3*x^6)
```

3.1542 $\int \frac{x^5}{9-x^{12}} \, dx$

Optimal. Leaf size=12

$$\frac{1}{18} \tanh^{-1}\left(\frac{x^6}{3}\right)$$

```
[Out] ArcTanh[x^6/3]/18
```

Rubi [A] time = 0.0191459, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{1}{18} \tanh^{-1}\left(\frac{x^6}{3}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/(9 - x^12),x]

[Out] ArcTanh[x^6/3]/18
```

Rubi in Sympy [A] time = 3.02734, size = 7, normalized size = 0.58

$$\frac{\operatorname{atanh}\left(\frac{x^6}{3}\right)}{18}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(-x**12+9),x)

[Out] atanh(x**6/3)/18
```

Mathematica [A] time = 0.00614431, size = 23, normalized size = 1.92

$$\frac{1}{36} \log\left(x^6+3\right) - \frac{1}{36} \log\left(3-x^6\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/(9 - x^12),x]

[Out] -Log[3 - x^6]/36 + Log[3 + x^6]/36
```

Maple [B] time = 0.009, size = 18, normalized size = 1.5

$$\frac{\ln\left(x^6+3\right)}{36} - \frac{\ln\left(x^6-3\right)}{36}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(-x^12+9),x)

[Out] 1/36*ln(x^6+3)-1/36*ln(x^6-3)
```

Maxima [A] time = 1.41764, size = 23, normalized size = 1.92

$$\frac{1}{36}\log\left(x^6+3\right)-\frac{1}{36}\log\left(x^6-3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^5/(x^12 - 9),x, algorithm="maxima")
```

```
[Out] 1/36*log(x^6 + 3) - 1/36*log(x^6 - 3)
```

Fricas [A] time = 0.223566, size = 23, normalized size = 1.92

$$\frac{1}{36}\log\left(x^6+3\right)-\frac{1}{36}\log\left(x^6-3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^5/(x^12 - 9),x, algorithm="fricas")
```

```
[Out] 1/36*log(x^6 + 3) - 1/36*log(x^6 - 3)
```

Sympy [A] time = 0.332021, size = 15, normalized size = 1.25

$$-\frac{\log\left(x^6-3\right)}{36}+\frac{\log\left(x^6+3\right)}{36}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(-x**12+9),x)
```

```
[Out] -log(x**6 - 3)/36 + log(x**6 + 3)/36
```

GIAC/XCAS [A] time = 0.228385, size = 24, normalized size = 2.

$$\frac{1}{36}\ln\left(x^6+3\right)-\frac{1}{36}\ln\left(\left|x^6-3\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-x^5/(x^12 - 9),x, algorithm="giac")
```

```
[Out] 1/36*ln(x^6 + 3) - 1/36*ln(abs(x^6 - 3))
```

3.1543 $\int x^5\sqrt{9+x^{12}}\,dx$

Optimal. Leaf size=29

$$\frac{3}{4}\sinh^{-1}\left(\frac{x^6}{3}\right)+\frac{1}{12}\sqrt{x^{12}+9}x^6$$

```
[Out] (x^6*Sqrt[9 + x^12])/12 + (3*ArcSinh[x^6/3])/4
```

Rubi [A] time = 0.0290317, antiderivative size = 29, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{3}{4}\sinh^{-1}\left(\frac{x^6}{3}\right)+\frac{1}{12}\sqrt{x^{12}+9}x^6$$

Antiderivative was successfully verified.

```
[In]  Int[x^5*Sqrt[9 + x^12],x]

[Out] (x^6*Sqrt[9 + x^12])/12 + (3*ArcSinh[x^6/3])/4
```

Rubi in Sympy [A] time = 2.79299, size = 22, normalized size = 0.76

$$\frac{x^6\sqrt{x^{12}+9}}{12}+\frac{3\,\mathrm{asinh}\left(\frac{x^6}{3}\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5*(x**12+9)**(1/2),x)

[Out] x**6*sqrt(x**12 + 9)/12 + 3*asinh(x**6/3)/4
```

Mathematica [A] time = 0.0131558, size = 29, normalized size = 1.

$$\frac{3}{4}\sinh^{-1}\left(\frac{x^6}{3}\right)+\frac{1}{12}\sqrt{x^{12}+9}x^6$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5*Sqrt[9 + x^12],x]

[Out] (x^6*Sqrt[9 + x^12])/12 + (3*ArcSinh[x^6/3])/4
```

Maple [A] time = 0.046, size = 22, normalized size = 0.8

$$\frac{3}{4}\mathit{Arcsinh}\left(\frac{x^6}{3}\right)+\frac{x^6}{12}\sqrt{x^{12}+9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5*(x^12+9)^(1/2),x)
```

```
[Out] 3/4*arcsinh(1/3*x^6)+1/12*x^6*(x^12+9)^(1/2)
```

Maxima [A] time = 1.43614, size = 78, normalized size = 2.69

$$\frac{3\sqrt{x^{12}+9}}{4\,x^6\left(\frac{x^{12}+9}{x^{12}}-1\right)}+\frac{3}{8}\log\left(\frac{\sqrt{x^{12}+9}}{x^6}+1\right)-\frac{3}{8}\log\left(\frac{\sqrt{x^{12}+9}}{x^6}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^12 + 9)*x^5,x, algorithm="maxima")
```

```
[Out] 3/4*sqrt(x^12 + 9)/(x^6*((x^12 + 9)/x^12 - 1)) + 3/8*log(sqrt(x^1
2 + 9)/x^6 + 1) - 3/8*log(sqrt(x^12 + 9)/x^6 - 1)
```

Fricas [A] time = 0.23686, size = 120, normalized size = 4.14

$$-\frac{2\,x^{24}+18\,x^{12}+9\left(2\,x^{12}-2\,\sqrt{x^{12}+9}x^6+9\right)\log\left(-x^6+\sqrt{x^{12}+9}\right)-\left(2\,x^{18}+9\,x^6\right)\sqrt{x^{12}+9}}{12\left(2\,x^{12}-2\,\sqrt{x^{12}+9}x^6+9\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^12 + 9)*x^5,x, algorithm="fricas")
```

```
[Out] -1/12*(2*x^24 + 18*x^12 + 9*(2*x^12 - 2*sqrt(x^12 + 9)*x^6 + 9)*l
og(-x^6 + sqrt(x^12 + 9)) - (2*x^18 + 9*x^6)*sqrt(x^12 + 9))/(2*x
^12 - 2*sqrt(x^12 + 9)*x^6 + 9)
```

Sympy [A] time = 5.5537, size = 37, normalized size = 1.28

$$\frac{x^{18}}{12\sqrt{x^{12}+9}}+\frac{3x^6}{4\sqrt{x^{12}+9}}+\frac{3\,\operatorname{asinh}\left(\frac{x^6}{3}\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5*(x**12+9)**(1/2),x)
```

```
[Out] x**18/(12*sqrt(x**12 + 9)) + 3*x**6/(4*sqrt(x**12 + 9)) + 3*asinh
(x**6/3)/4
```

GIAC/XCAS [A] time = 0.226685, size = 39, normalized size = 1.34

$$\frac{1}{12}\sqrt{x^{12}+9}x^6-\frac{3}{4}\ln\left(-x^6+\sqrt{x^{12}+9}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^12 + 9)*x^5,x, algorithm="giac")
```

```
[Out] 1/12*sqrt(x^12 + 9)*x^6 - 3/4*ln(-x^6 + sqrt(x^12 + 9))
```

3.1544 $\int \left(a+\frac{b}{x}\right) x^6 \, dx$

Optimal. Leaf size=17

$$\frac{ax^7}{7}+\frac{bx^6}{6}$$

```
[Out] (b*x^6)/6 + (a*x^7)/7
```

Rubi [A] time = 0.0275025, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{ax^7}{7}+\frac{bx^6}{6}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x)*x^6,x]

[Out] (b*x^6)/6 + (a*x^7)/7
```

Rubi in Sympy [A] time = 2.88686, size = 12, normalized size = 0.71

$$\frac{ax^7}{7}+\frac{bx^6}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x)*x**6,x)

[Out] a*x**7/7 + b*x**6/6
```

Mathematica [A] time = 0.00239667, size = 17, normalized size = 1.

$$\frac{ax^7}{7}+\frac{bx^6}{6}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x)*x^6,x]

[Out] (b*x^6)/6 + (a*x^7)/7
```

Maple [A] time = 0.001, size = 14, normalized size = 0.8

$$\frac{bx^6}{6}+\frac{ax^7}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x)*x^6,x)

[Out] 1/6*b*x^6+1/7*a*x^7
```

Maxima [A] time = 1.42559, size = 18, normalized size = 1.06

$$\frac{1}{7}\,ax^7 + \frac{1}{6}\,bx^6$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)*x^6,x, algorithm="maxima")
```

```
[Out] 1/7*a*x^7 + 1/6*b*x^6
```

Fricas [A] time = 0.212388, size = 18, normalized size = 1.06

$$\frac{1}{7}\,ax^7 + \frac{1}{6}\,bx^6$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)*x^6,x, algorithm="fricas")
```

```
[Out] 1/7*a*x^7 + 1/6*b*x^6
```

Sympy [A] time = 0.062601, size = 12, normalized size = 0.71

$$\frac{ax^7}{7} + \frac{bx^6}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)*x**6,x)
```

```
[Out] a*x**7/7 + b*x**6/6
```

GIAC/XCAS [A] time = 0.225031, size = 18, normalized size = 1.06

$$\frac{1}{7}\,ax^7 + \frac{1}{6}\,bx^6$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)*x^6,x, algorithm="giac")
```

```
[Out] 1/7*a*x^7 + 1/6*b*x^6
```

3.1545 $\int \left(a+\frac{b}{x}\right) x^5 \, dx$

Optimal. Leaf size=17

$$\frac{ax^6}{6}+\frac{bx^5}{5}$$

```
[Out] (b*x^5)/5 + (a*x^6)/6
```

Rubi [A] time = 0.0245657, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{ax^6}{6}+\frac{bx^5}{5}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x)*x^5,x]

[Out] (b*x^5)/5 + (a*x^6)/6
```

Rubi in Sympy [A] time = 2.8912, size = 12, normalized size = 0.71

$$\frac{ax^6}{6}+\frac{bx^5}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x)*x**5,x)

[Out] a*x**6/6 + b*x**5/5
```

Mathematica [A] time = 0.00185142, size = 17, normalized size = 1.

$$\frac{ax^6}{6}+\frac{bx^5}{5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x)*x^5,x]

[Out] (b*x^5)/5 + (a*x^6)/6
```

Maple [A] time = 0.001, size = 14, normalized size = 0.8

$$\frac{bx^5}{5}+\frac{x^6a}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x)*x^5,x)

[Out] 1/5*b*x^5+1/6*x^6*a
```

Maxima [A] time = 1.4477, size = 18, normalized size = 1.06

$$\frac{1}{6}ax^6 + \frac{1}{5}bx^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)*x^5,x, algorithm="maxima")

[Out] 1/6*a*x^6 + 1/5*b*x^5
```

Fricas [A] time = 0.214707, size = 18, normalized size = 1.06

$$\frac{1}{6}ax^6 + \frac{1}{5}bx^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)*x^5,x, algorithm="fricas")

[Out] 1/6*a*x^6 + 1/5*b*x^5
```

Sympy [A] time = 0.058667, size = 12, normalized size = 0.71

$$\frac{ax^6}{6} + \frac{bx^5}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)*x**5,x)

[Out] a*x**6/6 + b*x**5/5
```

GIAC/XCAS [A] time = 0.224033, size = 18, normalized size = 1.06

$$\frac{1}{6}ax^6 + \frac{1}{5}bx^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)*x^5,x, algorithm="giac")

[Out] 1/6*a*x^6 + 1/5*b*x^5
```

3.1546 $\int \left(a+\frac{b}{x}\right) x^4 \, dx$

Optimal. Leaf size=17

$$\frac{ax^5}{5}+\frac{bx^4}{4}$$

```
[Out] (b*x^4)/4 + (a*x^5)/5
```

Rubi [A] time = 0.0228417, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{ax^5}{5}+\frac{bx^4}{4}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x)*x^4,x]

[Out] (b*x^4)/4 + (a*x^5)/5
```

Rubi in Sympy [A] time = 2.89437, size = 12, normalized size = 0.71

$$\frac{ax^5}{5}+\frac{bx^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x)*x**4,x)

[Out] a*x**5/5 + b*x**4/4
```

Mathematica [A] time = 0.00199669, size = 17, normalized size = 1.

$$\frac{ax^5}{5}+\frac{bx^4}{4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x)*x^4,x]

[Out] (b*x^4)/4 + (a*x^5)/5
```

Maple [A] time = 0.001, size = 14, normalized size = 0.8

$$\frac{bx^4}{4}+\frac{ax^5}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x)*x^4,x)

[Out] 1/4*b*x^4+1/5*a*x^5
```

Maxima [A] time = 1.42683, size = 18, normalized size = 1.06

$$\frac{1}{5}ax^5 + \frac{1}{4}bx^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)*x^4,x, algorithm="maxima")
```

```
[Out] 1/5*a*x^5 + 1/4*b*x^4
```

Fricas [A] time = 0.21267, size = 18, normalized size = 1.06

$$\frac{1}{5}ax^5 + \frac{1}{4}bx^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)*x^4,x, algorithm="fricas")
```

```
[Out] 1/5*a*x^5 + 1/4*b*x^4
```

Sympy [A] time = 0.064104, size = 12, normalized size = 0.71

$$\frac{ax^5}{5} + \frac{bx^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)*x**4,x)
```

```
[Out] a*x**5/5 + b*x**4/4
```

GIAC/XCAS [A] time = 0.22357, size = 18, normalized size = 1.06

$$\frac{1}{5}ax^5 + \frac{1}{4}bx^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)*x^4,x, algorithm="giac")
```

```
[Out] 1/5*a*x^5 + 1/4*b*x^4
```

3.1547 $\int \left(a+\frac{b}{x}\right) x^3 \, dx$

Optimal. Leaf size=17

$$\frac{ax^4}{4}+\frac{bx^3}{3}$$

```
[Out] (b*x^3)/3 + (a*x^4)/4
```

Rubi [A] time = 0.0206139, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{ax^4}{4}+\frac{bx^3}{3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x)*x^3,x]

[Out] (b*x^3)/3 + (a*x^4)/4
```

Rubi in Sympy [A] time = 2.88598, size = 12, normalized size = 0.71

$$\frac{ax^4}{4}+\frac{bx^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x)*x**3,x)

[Out] a*x**4/4 + b*x**3/3
```

Mathematica [A] time = 0.00189654, size = 17, normalized size = 1.

$$\frac{ax^4}{4}+\frac{bx^3}{3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x)*x^3,x]

[Out] (b*x^3)/3 + (a*x^4)/4
```

Maple [A] time = 0.002, size = 14, normalized size = 0.8

$$\frac{bx^3}{3}+\frac{ax^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x)*x^3,x)

[Out] 1/3*b*x^3+1/4*a*x^4
```

Maxima [A] time = 1.42491, size = 18, normalized size = 1.06

$$\frac{1}{4}ax^4 + \frac{1}{3}bx^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)*x^3,x, algorithm="maxima")
```

```
[Out] 1/4*a*x^4 + 1/3*b*x^3
```

Fricas [A] time = 0.21432, size = 18, normalized size = 1.06

$$\frac{1}{4}ax^4 + \frac{1}{3}bx^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)*x^3,x, algorithm="fricas")
```

```
[Out] 1/4*a*x^4 + 1/3*b*x^3
```

Sympy [A] time = 0.066039, size = 12, normalized size = 0.71

$$\frac{ax^4}{4} + \frac{bx^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)*x**3,x)
```

```
[Out] a*x**4/4 + b*x**3/3
```

GIAC/XCAS [A] time = 0.22269, size = 18, normalized size = 1.06

$$\frac{1}{4}ax^4 + \frac{1}{3}bx^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)*x^3,x, algorithm="giac")
```

```
[Out] 1/4*a*x^4 + 1/3*b*x^3
```

3.1548 $\int \left(a+\frac{b}{x}\right) x^2 \, dx$

Optimal. Leaf size=17

$$\frac{ax^3}{3}+\frac{bx^2}{2}$$

```
[Out] (b*x^2)/2 + (a*x^3)/3
```

Rubi [A] time = 0.0182768, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{ax^3}{3}+\frac{bx^2}{2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)*x^2,x]

[Out] (b*x^2)/2 + (a*x^3)/3
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{ax^3}{3}+b\int x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)*x**2,x)

[Out] a*x**3/3 + b*Integral(x, x)
```

Mathematica [A] time = 0.00161591, size = 17, normalized size = 1.

$$\frac{ax^3}{3}+\frac{bx^2}{2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)*x^2,x]

[Out] (b*x^2)/2 + (a*x^3)/3
```

Maple [A] time = 0.001, size = 14, normalized size = 0.8

$$\frac{bx^2}{2}+\frac{ax^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)*x^2,x)

[Out] 1/2*b*x^2+1/3*a*x^3
```

Maxima [A] time = 1.42506, size = 18, normalized size = 1.06

$$\frac{1}{3}ax^3 + \frac{1}{2}bx^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)*x^2,x, algorithm="maxima")
```

```
[Out] 1/3*a*x^3 + 1/2*b*x^2
```

Fricas [A] time = 0.21458, size = 18, normalized size = 1.06

$$\frac{1}{3}ax^3 + \frac{1}{2}bx^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)*x^2,x, algorithm="fricas")
```

```
[Out] 1/3*a*x^3 + 1/2*b*x^2
```

Sympy [A] time = 0.065123, size = 12, normalized size = 0.71

$$\frac{ax^3}{3} + \frac{bx^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)*x**2,x)
```

```
[Out] a*x**3/3 + b*x**2/2
```

GIAC/XCAS [A] time = 0.22597, size = 18, normalized size = 1.06

$$\frac{1}{3}ax^3 + \frac{1}{2}bx^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)*x^2,x, algorithm="giac")
```

```
[Out] 1/3*a*x^3 + 1/2*b*x^2
```

3.1549 $\int \left(a+\frac{b}{x}\right) x \, dx$

Optimal. Leaf size=12

$$\frac{ax^2}{2}+bx$$

```
[Out] b*x + (a*x^2)/2
```

Rubi [A] time = 0.0134137, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111

$$\frac{ax^2}{2}+bx$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)*x,x]
```

```
[Out] b*x + (a*x^2)/2
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$a\int x\,dx+\int b\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)*x,x)
```

```
[Out] a*Integral(x, x) + Integral(b, x)
```

Mathematica [A] time = 0.000895952, size = 12, normalized size = 1.

$$\frac{ax^2}{2}+bx$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)*x,x]
```

```
[Out] b*x + (a*x^2)/2
```

Maple [A] time = 0., size = 11, normalized size = 0.9

$$bx+\frac{ax^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)*x,x)
```

```
[Out] b*x+1/2*a*x^2
```

Maxima [A] time = 1.433, size = 14, normalized size = 1.17

$$\frac{1}{2}\,ax^2 + bx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)*x,x, algorithm="maxima")
```

```
[Out] 1/2*a*x^2 + b*x
```

Fricas [A] time = 0.21299, size = 14, normalized size = 1.17

$$\frac{1}{2}\,ax^2 + bx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)*x,x, algorithm="fricas")
```

```
[Out] 1/2*a*x^2 + b*x
```

Sympy [A] time = 0.062622, size = 8, normalized size = 0.67

$$\frac{ax^2}{2} + bx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)*x,x)
```

```
[Out] a*x**2/2 + b*x
```

GIAC/XCAS [A] time = 0.224759, size = 14, normalized size = 1.17

$$\frac{1}{2}\,ax^2 + bx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)*x,x, algorithm="giac")
```

```
[Out] 1/2*a*x^2 + b*x
```

3.1550 $\int \left(a + \frac{b}{x}\right) dx$

Optimal. Leaf size=8

$$ax + b\log(x)$$

```
[Out] a*x + b*Log[x]
```

Rubi [A] time = 0.00910128, antiderivative size = 8, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 0, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$

$$ax + b\log(x)$$

Antiderivative was successfully verified.

```
[In]  Int[a + b/x,x]

[Out] a*x + b*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$b\log(x) + \int a\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(a+b/x,x)

[Out] b*log(x) + Integral(a, x)
```

Mathematica [A] time = 0.00145592, size = 8, normalized size = 1.

$$ax + b\log(x)$$

Antiderivative was successfully verified.

```
[In]  Integrate[a + b/x,x]

[Out] a*x + b*Log[x]
```

Maple [A] time = 0.002, size = 9, normalized size = 1.1

$$ax + b\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(a+b/x,x)

[Out] a*x+b*ln(x)
```

Maxima [A] time = 1.41533, size = 11, normalized size = 1.38

$$ax + b \log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(a + b/x,x, algorithm="maxima")

[Out] a*x + b*log(x)
```

Fricas [A] time = 0.222659, size = 11, normalized size = 1.38

$$ax + b \log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(a + b/x,x, algorithm="fricas")

[Out] a*x + b*log(x)
```

Sympy [A] time = 0.145719, size = 7, normalized size = 0.88

$$ax + b \log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(a+b/x,x)

[Out] a*x + b*log(x)
```

GIAC/XCAS [A] time = 0.225704, size = 12, normalized size = 1.5

$$ax + b\ln(|x|)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(a + b/x,x, algorithm="giac")

[Out] a*x + b*ln(abs(x))
```

3.1551 $\int \frac{a+\frac{b}{x}}{x}\,dx$

Optimal. Leaf size=11

$$a\log(x) - \frac{b}{x}$$

```
[Out] -(b/x) + a*Log[x]
```

Rubi [A] time = 0.0144776, antiderivative size = 11, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$a\log(x) - \frac{b}{x}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)/x,x]

[Out] -(b/x) + a*Log[x]
```

Rubi in Sympy [A] time = 3.01052, size = 7, normalized size = 0.64

$$a\log(x) - \frac{b}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)/x,x)

[Out] a*log(x) - b/x
```

Mathematica [A] time = 0.00338766, size = 11, normalized size = 1.

$$a\log(x) - \frac{b}{x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)/x,x]

[Out] -(b/x) + a*Log[x]
```

Maple [A] time = 0.007, size = 12, normalized size = 1.1

$$-\frac{b}{x} + a\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)/x,x)

[Out] -b/x+a*ln(x)
```

Maxima [A] time = 1.46568, size = 15, normalized size = 1.36

$$a\log\left(x\right) - \frac{b}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)/x,x, algorithm="maxima")
```

```
[Out] a*log(x) - b/x
```

Fricas [A] time = 0.221038, size = 18, normalized size = 1.64

$$\frac{ax\log\left(x\right) - b}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)/x,x, algorithm="fricas")
```

```
[Out] (a*x*log(x) - b)/x
```

Sympy [A] time = 1.0379, size = 7, normalized size = 0.64

$$a\log\left(x\right) - \frac{b}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)/x,x)
```

```
[Out] a*log(x) - b/x
```

GIAC/XCAS [A] time = 0.227991, size = 16, normalized size = 1.45

$$a\ln\left(|x|\right) - \frac{b}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)/x,x, algorithm="giac")
```

```
[Out] a*ln(abs(x)) - b/x
```

3.1552 $\int \frac{a+\frac{b}{x}}{x^2} dx$

Optimal. Leaf size=15

$$-\frac{a}{x}-\frac{b}{2x^2}$$

```
[Out] -b/(2*x^2) - a/x
```

Rubi [A] time = 0.013566, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$-\frac{a}{x}-\frac{b}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)/x^2,x]

[Out] -b/(2*x^2) - a/x
```

Rubi in Sympy [A] time = 2.94925, size = 10, normalized size = 0.67

$$-\frac{a}{x}-\frac{b}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)/x**2,x)

[Out] -a/x - b/(2*x**2)
```

Mathematica [A] time = 0.0027125, size = 15, normalized size = 1.

$$-\frac{a}{x}-\frac{b}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)/x^2,x]

[Out] -b/(2*x^2) - a/x
```

Maple [A] time = 0.005, size = 14, normalized size = 0.9

$$-\frac{b}{2\,x^2}-\frac{a}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)/x^2,x)

[Out] -1/2*b/x^2-a/x
```

Maxima [A] time = 1.41854, size = 19, normalized size = 1.27

$$-\frac{\left(a+\frac{b}{x}\right)^2}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)/x^2,x, algorithm="maxima")

[Out] -1/2*(a + b/x)^2/b
```

Fricas [A] time = 0.211759, size = 15, normalized size = 1.

$$-\frac{2\,ax+b}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)/x^2,x, algorithm="fricas")

[Out] -1/2*(2*a*x + b)/x^2
```

Sympy [A] time = 1.02543, size = 12, normalized size = 0.8

$$-\frac{2ax+b}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)/x**2,x)

[Out] -(2*a*x + b)/(2*x**2)
```

GIAC/XCAS [A] time = 0.229615, size = 18, normalized size = 1.2

$$-\frac{a}{x}-\frac{b}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)/x^2,x, algorithm="giac")

[Out] -a/x - 1/2*b/x^2
```

3.1553 $\int \frac{a+\frac{b}{x}}{x^3}\,dx$

Optimal. Leaf size=17

$$-\frac{a}{2x^2}-\frac{b}{3x^3}$$

```
[Out] -b/(3*x^3) - a/(2*x^2)
```

Rubi [A] time = 0.0159288, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$-\frac{a}{2x^2}-\frac{b}{3x^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x)/x^3,x]

[Out] -b/(3*x^3) - a/(2*x^2)
```

Rubi in Sympy [A] time = 2.9507, size = 14, normalized size = 0.82

$$-\frac{a}{2x^2}-\frac{b}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x)/x**3,x)

[Out] -a/(2*x**2) - b/(3*x**3)
```

Mathematica [A] time = 0.00337294, size = 17, normalized size = 1.

$$-\frac{a}{2x^2}-\frac{b}{3x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x)/x^3,x]

[Out] -b/(3*x^3) - a/(2*x^2)
```

Maple [A] time = 0.006, size = 14, normalized size = 0.8

$$-\frac{b}{3\,x^3}-\frac{a}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x)/x^3,x)

[Out] -1/3*b/x^3-1/2*a/x^2
```

Maxima [A] time = 1.4564, size = 18, normalized size = 1.06

$$-\frac{3\,ax+2\,b}{6\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)/x^3,x, algorithm="maxima")
```

```
[Out] -1/6*(3*a*x + 2*b)/x^3
```

Fricas [A] time = 0.218678, size = 18, normalized size = 1.06

$$-\frac{3\,ax+2\,b}{6\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)/x^3,x, algorithm="fricas")
```

```
[Out] -1/6*(3*a*x + 2*b)/x^3
```

Sympy [A] time = 1.06811, size = 14, normalized size = 0.82

$$-\frac{3ax+2b}{6x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)/x**3,x)
```

```
[Out] -(3*a*x + 2*b)/(6*x**3)
```

GIAC/XCAS [A] time = 0.229957, size = 18, normalized size = 1.06

$$-\frac{3\,ax+2\,b}{6\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)/x^3,x, algorithm="giac")
```

```
[Out] -1/6*(3*a*x + 2*b)/x^3
```

3.1554 $\int \frac{a+\frac{b}{x}}{x^4}\,dx$

Optimal. Leaf size=17

$$-\frac{a}{3x^3}-\frac{b}{4x^4}$$

```
[Out] -b/(4*x^4) - a/(3*x^3)
```

Rubi [A] time = 0.0154677, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$-\frac{a}{3x^3}-\frac{b}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)/x^4,x]

[Out] -b/(4*x^4) - a/(3*x^3)
```

Rubi in Sympy [A] time = 2.94198, size = 14, normalized size = 0.82

$$-\frac{a}{3x^3}-\frac{b}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)/x**4,x)

[Out] -a/(3*x**3) - b/(4*x**4)
```

Mathematica [A] time = 0.00267858, size = 17, normalized size = 1.

$$-\frac{a}{3x^3}-\frac{b}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)/x^4,x]

[Out] -b/(4*x^4) - a/(3*x^3)
```

Maple [A] time = 0.007, size = 14, normalized size = 0.8

$$-\frac{b}{4\,x^4}-\frac{a}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)/x^4,x)

[Out] -1/4*b/x^4-1/3*a/x^3
```

Maxima [A] time = 1.41674, size = 18, normalized size = 1.06

$$-\frac{4\,ax + 3\,b}{12\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)/x^4,x, algorithm="maxima")
```

```
[Out] -1/12*(4*a*x + 3*b)/x^4
```

Fricas [A] time = 0.218068, size = 18, normalized size = 1.06

$$-\frac{4\,ax + 3\,b}{12\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)/x^4,x, algorithm="fricas")
```

```
[Out] -1/12*(4*a*x + 3*b)/x^4
```

Sympy [A] time = 1.11283, size = 14, normalized size = 0.82

$$-\frac{4ax + 3b}{12x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)/x**4,x)
```

```
[Out] -(4*a*x + 3*b)/(12*x**4)
```

GIAC/XCAS [A] time = 0.224499, size = 18, normalized size = 1.06

$$-\frac{4\,ax + 3\,b}{12\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)/x^4,x, algorithm="giac")
```

```
[Out] -1/12*(4*a*x + 3*b)/x^4
```

3.1555 $\int \frac{a+\frac{b}{x}}{x^5}\,dx$

Optimal. Leaf size=17

$$-\frac{a}{4x^4}-\frac{b}{5x^5}$$

```
[Out] -b/(5*x^5) - a/(4*x^4)
```

Rubi [A] time = 0.0159841, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$-\frac{a}{4x^4}-\frac{b}{5x^5}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)/x^5,x]

[Out] -b/(5*x^5) - a/(4*x^4)
```

Rubi in Sympy [A] time = 2.97283, size = 14, normalized size = 0.82

$$-\frac{a}{4x^4}-\frac{b}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)/x**5,x)

[Out] -a/(4*x**4) - b/(5*x**5)
```

Mathematica [A] time = 0.00352973, size = 17, normalized size = 1.

$$-\frac{a}{4x^4}-\frac{b}{5x^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)/x^5,x]

[Out] -b/(5*x^5) - a/(4*x^4)
```

Maple [A] time = 0.006, size = 14, normalized size = 0.8

$$-\frac{b}{5\,x^5}-\frac{a}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)/x^5,x)

[Out] -1/5*b/x^5-1/4*a/x^4
```

Maxima [A] time = 1.51146, size = 18, normalized size = 1.06

$$-\frac{5\,ax+4\,b}{20\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)/x^5,x, algorithm="maxima")
```

```
[Out] -1/20*(5*a*x + 4*b)/x^5
```

Fricas [A] time = 0.215329, size = 18, normalized size = 1.06

$$-\frac{5\,ax+4\,b}{20\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)/x^5,x, algorithm="fricas")
```

```
[Out] -1/20*(5*a*x + 4*b)/x^5
```

Sympy [A] time = 1.12534, size = 14, normalized size = 0.82

$$-\frac{5ax+4b}{20x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)/x**5,x)
```

```
[Out] -(5*a*x + 4*b)/(20*x**5)
```

GIAC/XCAS [A] time = 0.224858, size = 18, normalized size = 1.06

$$-\frac{5\,ax+4\,b}{20\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)/x^5,x, algorithm="giac")
```

```
[Out] -1/20*(5*a*x + 4*b)/x^5
```

3.1556 $\int \frac{a+\frac{b}{x}}{x^6} \, dx$

Optimal. Leaf size=17

$$-\frac{a}{5x^5}-\frac{b}{6x^6}$$

```
[Out] -b/(6*x^6) - a/(5*x^5)
```

Rubi [A] time = 0.0145442, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$-\frac{a}{5x^5}-\frac{b}{6x^6}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x)/x^6,x]
```

```
[Out] -b/(6*x^6) - a/(5*x^5)
```

Rubi in Sympy [A] time = 3.05298, size = 14, normalized size = 0.82

$$-\frac{a}{5x^5}-\frac{b}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x)/x**6,x)
```

```
[Out] -a/(5*x**5) - b/(6*x**6)
```

Mathematica [A] time = 0.00272178, size = 17, normalized size = 1.

$$-\frac{a}{5x^5}-\frac{b}{6x^6}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x)/x^6,x]
```

```
[Out] -b/(6*x^6) - a/(5*x^5)
```

Maple [A] time = 0.007, size = 14, normalized size = 0.8

$$-\frac{b}{6\,x^6}-\frac{a}{5\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x)/x^6,x)
```

```
[Out] -1/6*b/x^6-1/5*a/x^5
```

Maxima [A] time = 1.44016, size = 18, normalized size = 1.06

$$-\frac{6\,ax+5\,b}{30\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)/x^6,x, algorithm="maxima")
```

```
[Out] -1/30*(6*a*x + 5*b)/x^6
```

Fricas [A] time = 0.216651, size = 18, normalized size = 1.06

$$-\frac{6\,ax+5\,b}{30\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)/x^6,x, algorithm="fricas")
```

```
[Out] -1/30*(6*a*x + 5*b)/x^6
```

Sympy [A] time = 1.17681, size = 14, normalized size = 0.82

$$-\frac{6ax+5b}{30x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)/x**6,x)
```

```
[Out] -(6*a*x + 5*b)/(30*x**6)
```

GIAC/XCAS [A] time = 0.223869, size = 18, normalized size = 1.06

$$-\frac{6\,ax+5\,b}{30\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)/x^6,x, algorithm="giac")
```

```
[Out] -1/30*(6*a*x + 5*b)/x^6
```

3.1557 $\int \left(a+\frac{b}{x}\right)^2 x^5 \, dx$

Optimal. Leaf size=30

$$\frac{a^2x^6}{6}+\frac{2}{5}abx^5+\frac{b^2x^4}{4}$$

```
[Out] (b^2*x^4)/4 + (2*a*b*x^5)/5 + (a^2*x^6)/6
```

Rubi [A] time = 0.0476112, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^2x^6}{6}+\frac{2}{5}abx^5+\frac{b^2x^4}{4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^2*x^5,x]

[Out] (b^2*x^4)/4 + (2*a*b*x^5)/5 + (a^2*x^6)/6
```

Rubi in Sympy [A] time = 7.01771, size = 26, normalized size = 0.87

$$\frac{a^2x^6}{6}+\frac{2abx^5}{5}+\frac{b^2x^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**2*x**5,x)

[Out] a**2*x**6/6 + 2*a*b*x**5/5 + b**2*x**4/4
```

Mathematica [A] time = 0.00304752, size = 30, normalized size = 1.

$$\frac{a^2x^6}{6}+\frac{2}{5}abx^5+\frac{b^2x^4}{4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^2*x^5,x]

[Out] (b^2*x^4)/4 + (2*a*b*x^5)/5 + (a^2*x^6)/6
```

Maple [A] time = 0.001, size = 25, normalized size = 0.8

$$\frac{b^2x^4}{4}+\frac{2\,x^5ab}{5}+\frac{a^2x^6}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^2*x^5,x)

[Out] 1/4*b^2*x^4+2/5*x^5*a*b+1/6*a^2*x^6
```

Maxima [A] time = 1.44145, size = 32, normalized size = 1.07

$$\frac{1}{6}\,a^2x^6 + \frac{2}{5}\,abx^5 + \frac{1}{4}\,b^2x^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2*x^5,x, algorithm="maxima")

[Out] 1/6*a^2*x^6 + 2/5*a*b*x^5 + 1/4*b^2*x^4
```

Fricas [A] time = 0.217434, size = 32, normalized size = 1.07

$$\frac{1}{6}\,a^2x^6 + \frac{2}{5}\,abx^5 + \frac{1}{4}\,b^2x^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2*x^5,x, algorithm="fricas")

[Out] 1/6*a^2*x^6 + 2/5*a*b*x^5 + 1/4*b^2*x^4
```

Sympy [A] time = 0.091553, size = 26, normalized size = 0.87

$$\frac{a^2x^6}{6} + \frac{2abx^5}{5} + \frac{b^2x^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**2*x**5,x)

[Out] a**2*x**6/6 + 2*a*b*x**5/5 + b**2*x**4/4
```

GIAC/XCAS [A] time = 0.222451, size = 32, normalized size = 1.07

$$\frac{1}{6}\,a^2x^6 + \frac{2}{5}\,abx^5 + \frac{1}{4}\,b^2x^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2*x^5,x, algorithm="giac")

[Out] 1/6*a^2*x^6 + 2/5*a*b*x^5 + 1/4*b^2*x^4
```

3.1558 $\int \left(a+\frac{b}{x}\right)^2 x^4 \, dx$

Optimal. Leaf size=30

$$\frac{a^2x^5}{5}+\frac{1}{2}abx^4+\frac{b^2x^3}{3}$$

```
[Out] (b^2*x^3)/3 + (a*b*x^4)/2 + (a^2*x^5)/5
```

Rubi [A] time = 0.0423555, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^2x^5}{5}+\frac{1}{2}abx^4+\frac{b^2x^3}{3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x)^2*x^4,x]
```

```
[Out] (b^2*x^3)/3 + (a*b*x^4)/2 + (a^2*x^5)/5
```

Rubi in Sympy [A] time = 6.69783, size = 24, normalized size = 0.8

$$\frac{a^2x^5}{5}+\frac{abx^4}{2}+\frac{b^2x^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x)**2*x**4,x)
```

```
[Out] a**2*x**5/5 + a*b*x**4/2 + b**2*x**3/3
```

Mathematica [A] time = 0.00285233, size = 30, normalized size = 1.

$$\frac{a^2x^5}{5}+\frac{1}{2}abx^4+\frac{b^2x^3}{3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x)^2*x^4,x]
```

```
[Out] (b^2*x^3)/3 + (a*b*x^4)/2 + (a^2*x^5)/5
```

Maple [A] time = 0.001, size = 25, normalized size = 0.8

$$\frac{b^2x^3}{3}+\frac{abx^4}{2}+\frac{x^5a^2}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x)^2*x^4,x)
```

```
[Out] 1/3*b^2*x^3+1/2*a*b*x^4+1/5*x^5*a^2
```

Maxima [A] time = 1.43979, size = 32, normalized size = 1.07

$$\frac{1}{5}\,a^2x^5 + \frac{1}{2}\,abx^4 + \frac{1}{3}\,b^2x^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2*x^4,x, algorithm="maxima")
```

```
[Out] 1/5*a^2*x^5 + 1/2*a*b*x^4 + 1/3*b^2*x^3
```

Fricas [A] time = 0.219653, size = 32, normalized size = 1.07

$$\frac{1}{5}\,a^2x^5 + \frac{1}{2}\,abx^4 + \frac{1}{3}\,b^2x^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2*x^4,x, algorithm="fricas")
```

```
[Out] 1/5*a^2*x^5 + 1/2*a*b*x^4 + 1/3*b^2*x^3
```

Sympy [A] time = 0.086104, size = 24, normalized size = 0.8

$$\frac{a^2x^5}{5} + \frac{abx^4}{2} + \frac{b^2x^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**2*x**4,x)
```

```
[Out] a**2*x**5/5 + a*b*x**4/2 + b**2*x**3/3
```

GIAC/XCAS [A] time = 0.225928, size = 32, normalized size = 1.07

$$\frac{1}{5}\,a^2x^5 + \frac{1}{2}\,abx^4 + \frac{1}{3}\,b^2x^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2*x^4,x, algorithm="giac")
```

```
[Out] 1/5*a^2*x^5 + 1/2*a*b*x^4 + 1/3*b^2*x^3
```

3.1559 $\int \left(a+\frac{b}{x}\right)^2 x^3 \, dx$

Optimal. Leaf size=30

$$\frac{a^2x^4}{4}+\frac{2}{3}abx^3+\frac{b^2x^2}{2}$$

```
[Out] (b^2*x^2)/2 + (2*a*b*x^3)/3 + (a^2*x^4)/4
```

Rubi [A] time = 0.0396504, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^2x^4}{4}+\frac{2}{3}abx^3+\frac{b^2x^2}{2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x)^2*x^3,x]

[Out] (b^2*x^2)/2 + (2*a*b*x^3)/3 + (a^2*x^4)/4
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^2x^4}{4}+\frac{2abx^3}{3}+b^2\int x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x)**2*x**3,x)

[Out] a**2*x**4/4 + 2*a*b*x**3/3 + b**2*Integral(x, x)
```

Mathematica [A] time = 0.0021698, size = 30, normalized size = 1.

$$\frac{a^2x^4}{4}+\frac{2}{3}abx^3+\frac{b^2x^2}{2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x)^2*x^3,x]

[Out] (b^2*x^2)/2 + (2*a*b*x^3)/3 + (a^2*x^4)/4
```

Maple [A] time = 0.002, size = 25, normalized size = 0.8

$$\frac{b^2x^2}{2}+\frac{2\,abx^3}{3}+\frac{x^4a^2}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x)^2*x^3,x)

[Out] 1/2*b^2*x^2+2/3*a*b*x^3+1/4*x^4*a^2
```

Maxima [A] time = 1.42069, size = 32, normalized size = 1.07

$$\frac{1}{4}\,a^{2}x^{4}+\frac{2}{3}\,abx^{3}+\frac{1}{2}\,b^{2}x^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2*x^3,x, algorithm="maxima")

[Out] 1/4*a^2*x^4 + 2/3*a*b*x^3 + 1/2*b^2*x^2
```

Fricas [A] time = 0.218063, size = 32, normalized size = 1.07

$$\frac{1}{4}\,a^{2}x^{4}+\frac{2}{3}\,abx^{3}+\frac{1}{2}\,b^{2}x^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2*x^3,x, algorithm="fricas")

[Out] 1/4*a^2*x^4 + 2/3*a*b*x^3 + 1/2*b^2*x^2
```

Sympy [A] time = 0.094089, size = 26, normalized size = 0.87

$$\frac{a^{2}x^{4}}{4}+\frac{2abx^{3}}{3}+\frac{b^{2}x^{2}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**2*x**3,x)

[Out] a**2*x**4/4 + 2*a*b*x**3/3 + b**2*x**2/2
```

GIAC/XCAS [A] time = 0.22252, size = 32, normalized size = 1.07

$$\frac{1}{4}\,a^{2}x^{4}+\frac{2}{3}\,abx^{3}+\frac{1}{2}\,b^{2}x^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2*x^3,x, algorithm="giac")

[Out] 1/4*a^2*x^4 + 2/3*a*b*x^3 + 1/2*b^2*x^2
```

3.1560 $\int \left(a+\frac{b}{x}\right)^2 x^2 \, dx$

Optimal. Leaf size=14

$$\frac{(ax+b)^3}{3a}$$

```
[Out] (b + a*x)^3/(3*a)
```

Rubi [A] time = 0.0164609, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$\frac{(ax+b)^3}{3a}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^2*x^2,x]
```

```
[Out] (b + a*x)^3/(3*a)
```

Rubi in Sympy [A] time = 2.96425, size = 8, normalized size = 0.57

$$\frac{(ax+b)^3}{3a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**2*x**2,x)
```

```
[Out] (a*x + b)**3/(3*a)
```

Mathematica [A] time = 0.00283409, size = 14, normalized size = 1.

$$\frac{(ax+b)^3}{3a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^2*x^2,x]
```

```
[Out] (b + a*x)^3/(3*a)
```

Maple [A] time = 0.001, size = 13, normalized size = 0.9

$$\frac{(ax+b)^3}{3\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^2*x^2,x)
```

```
[Out] 1/3*(a*x+b)^3/a
```

Maxima [A] time = 1.446, size = 27, normalized size = 1.93

$$\frac{1}{3}\,a^2x^3 + abx^2 + b^2x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2*x^2,x, algorithm="maxima")

[Out] 1/3*a^2*x^3 + a*b*x^2 + b^2*x
```

Fricas [A] time = 0.217358, size = 27, normalized size = 1.93

$$\frac{1}{3}\,a^2x^3 + abx^2 + b^2x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2*x^2,x, algorithm="fricas")

[Out] 1/3*a^2*x^3 + a*b*x^2 + b^2*x
```

Sympy [A] time = 0.085349, size = 19, normalized size = 1.36

$$\frac{a^2x^3}{3} + abx^2 + b^2x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**2*x**2,x)

[Out] a**2*x**3/3 + a*b*x**2 + b**2*x
```

GIAC/XCAS [A] time = 0.222092, size = 27, normalized size = 1.93

$$\frac{1}{3}\,a^2x^3 + abx^2 + b^2x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2*x^2,x, algorithm="giac")

[Out] 1/3*a^2*x^3 + a*b*x^2 + b^2*x
```

3.1561 $\int \left(a+\frac{b}{x}\right)^2 x\,dx$

Optimal. Leaf size=22

$$\frac{a^2x^2}{2}+2abx+b^2\log(x)$$

```
[Out] 2*a*b*x + (a^2*x^2)/2 + b^2*Log[x]
```

Rubi [A] time = 0.0268559, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{a^2x^2}{2}+2abx+b^2\log(x)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^2*x,x]
```

```
[Out] 2*a*b*x + (a^2*x^2)/2 + b^2*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$a^2\int x\,dx+2abx+b^2\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**2*x,x)
```

```
[Out] a**2*Integral(x, x) + 2*a*b*x + b**2*log(x)
```

Mathematica [A] time = 0.00190614, size = 22, normalized size = 1.

$$\frac{a^2x^2}{2}+2abx+b^2\log(x)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^2*x,x]
```

```
[Out] 2*a*b*x + (a^2*x^2)/2 + b^2*Log[x]
```

Maple [A] time = 0.003, size = 21, normalized size = 1.

$$2\,abx+\frac{a^2x^2}{2}+b^2\ln\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^2*x,x)
```

```
[Out] 2*a*b*x+1/2*a^2*x^2+b^2*ln(x)
```

Maxima [A] time = 1.43738, size = 27, normalized size = 1.23

$$\frac{1}{2}\,a^2x^2 + 2\,abx + b^2\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2*x,x, algorithm="maxima")
```

```
[Out] 1/2*a^2*x^2 + 2*a*b*x + b^2*log(x)
```

Fricas [A] time = 0.223945, size = 27, normalized size = 1.23

$$\frac{1}{2}\,a^2x^2 + 2\,abx + b^2\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2*x,x, algorithm="fricas")
```

```
[Out] 1/2*a^2*x^2 + 2*a*b*x + b^2*log(x)
```

Sympy [A] time = 1.03465, size = 20, normalized size = 0.91

$$\frac{a^2x^2}{2} + 2abx + b^2\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**2*x,x)
```

```
[Out] a**2*x**2/2 + 2*a*b*x + b**2*log(x)
```

GIAC/XCAS [A] time = 0.221837, size = 28, normalized size = 1.27

$$\frac{1}{2}\,a^2x^2 + 2\,abx + b^2\ln\left(|x|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2*x,x, algorithm="giac")
```

```
[Out] 1/2*a^2*x^2 + 2*a*b*x + b^2*ln(abs(x))
```

3.1562 $\int \left(a+\frac{b}{x}\right)^2 dx$

Optimal. Leaf size=20

$$a^2x + 2ab\log(x) - \frac{b^2}{x}$$

```
[Out] -(b^2/x) + a^2*x + 2*a*b*Log[x]
```

Rubi [A] time = 0.0293332, antiderivative size = 20, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$a^2x + 2ab\log(x) - \frac{b^2}{x}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^2,x]

[Out] -(b^2/x) + a^2*x + 2*a*b*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$2ab\log(x) - \frac{b^2}{x} + \int a^2\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**2,x)

[Out] 2*a*b*log(x) - b**2/x + Integral(a**2, x)
```

Mathematica [A] time = 0.00563458, size = 20, normalized size = 1.

$$a^2x + 2ab\log(x) - \frac{b^2}{x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^2,x]

[Out] -(b^2/x) + a^2*x + 2*a*b*Log[x]
```

Maple [A] time = 0.008, size = 21, normalized size = 1.1

$$-\frac{b^2}{x} + xa^2 + 2ab\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^2,x)

[Out] -b^2/x+x*a^2+2*a*b*ln(x)
```

Maxima [A] time = 1.44004, size = 27, normalized size = 1.35

$$a^2x + 2\,ab\log\left(x\right) - \frac{b^2}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2,x, algorithm="maxima")
```

```
[Out] a^2*x + 2*a*b*log(x) - b^2/x
```

Fricas [A] time = 0.225049, size = 32, normalized size = 1.6

$$\frac{a^2x^2 + 2\,abx\log\left(x\right) - b^2}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2,x, algorithm="fricas")
```

```
[Out] (a^2*x^2 + 2*a*b*x*log(x) - b^2)/x
```

Sympy [A] time = 1.08675, size = 17, normalized size = 0.85

$$a^2x + 2ab\log\left(x\right) - \frac{b^2}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**2,x)
```

```
[Out] a**2*x + 2*a*b*log(x) - b**2/x
```

GIAC/XCAS [A] time = 0.222449, size = 28, normalized size = 1.4

$$a^2x + 2\,ab\ln\left(|x|\right) - \frac{b^2}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2,x, algorithm="giac")
```

```
[Out] a^2*x + 2*a*b*ln(abs(x)) - b^2/x
```

3.1563 $\int \frac{\left(a+\frac{b}{x}\right)^2}{x}\,dx$

Optimal. Leaf size=24

$$a^2\log(x)-\frac{2ab}{x}-\frac{b^2}{2x^2}$$

```
[Out] -b^2/(2*x^2) - (2*a*b)/x + a^2*Log[x]
```

Rubi [A] time = 0.0350903, antiderivative size = 24, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$a^2\log(x)-\frac{2ab}{x}-\frac{b^2}{2x^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x)^2/x,x]

[Out] -b^2/(2*x^2) - (2*a*b)/x + a^2*Log[x]
```

Rubi in Sympy [A] time = 6.38225, size = 20, normalized size = 0.83

$$a^2\log(x)-\frac{2ab}{x}-\frac{b^2}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x)**2/x,x)

[Out] a**2*log(x) - 2*a*b/x - b**2/(2*x**2)
```

Mathematica [A] time = 0.00620191, size = 24, normalized size = 1.

$$a^2\log(x)-\frac{2ab}{x}-\frac{b^2}{2x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x)^2/x,x]

[Out] -b^2/(2*x^2) - (2*a*b)/x + a^2*Log[x]
```

Maple [A] time = 0.008, size = 23, normalized size = 1.

$$-\frac{b^2}{2\,x^2}-2\,\frac{ab}{x}+a^2\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x)^2/x,x)

[Out] -1/2*b^2/x^2-2*a*b/x+a^2*ln(x)
```

Maxima [A] time = 1.43652, size = 28, normalized size = 1.17

$$a^2 \log(x) - \frac{4\,abx + b^2}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2/x,x, algorithm="maxima")
```

```
[Out] a^2*log(x) - 1/2*(4*a*b*x + b^2)/x^2
```

Fricas [A] time = 0.228346, size = 35, normalized size = 1.46

$$\frac{2\,a^2x^2\log(x) - 4\,abx - b^2}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2/x,x, algorithm="fricas")
```

```
[Out] 1/2*(2*a^2*x^2*log(x) - 4*a*b*x - b^2)/x^2
```

Sympy [A] time = 1.19741, size = 20, normalized size = 0.83

$$a^2 \log(x) - \frac{4abx + b^2}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**2/x,x)
```

```
[Out] a**2*log(x) - (4*a*b*x + b**2)/(2*x**2)
```

GIAC/XCAS [A] time = 0.225109, size = 30, normalized size = 1.25

$$a^2\ln(|x|) - \frac{4\,abx + b^2}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2/x,x, algorithm="giac")
```

```
[Out] a^2*ln(abs(x)) - 1/2*(4*a*b*x + b^2)/x^2
```

3.1564 $\int \frac{\left(a+\frac{b}{x}\right)^2}{x^2} dx$

Optimal. Leaf size=16

$$-\frac{\left(a+\frac{b}{x}\right)^3}{3b}$$

```
[Out] -(a + b/x)^3/(3*b)
```

Rubi [A] time = 0.0165953, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{\left(a+\frac{b}{x}\right)^3}{3b}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x)^2/x^2,x]

[Out] -(a + b/x)^3/(3*b)
```

Rubi in Sympy [A] time = 2.21854, size = 10, normalized size = 0.62

$$-\frac{\left(a+\frac{b}{x}\right)^3}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x)**2/x**2,x)

[Out] -(a + b/x)**3/(3*b)
```

Mathematica [A] time = 0.0106398, size = 26, normalized size = 1.62

$$-\frac{a^2}{x}-\frac{ab}{x^2}-\frac{b^2}{3x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x)^2/x^2,x]

[Out] -b^2/(3*x^3) - (a*b)/x^2 - a^2/x
```

Maple [A] time = 0.008, size = 25, normalized size = 1.6

$$-\frac{b^2}{3\,x^3}-\frac{ab}{x^2}-\frac{a^2}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x)^2/x^2,x)
```

```
[Out] -1/3*b^2/x^3-a*b/x^2-a^2/x
```

Maxima [A] time = 1.44281, size = 19, normalized size = 1.19

$$-\frac{\left(a+\frac{b}{x}\right)^3}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2/x^2,x, algorithm="maxima")
```

```
[Out] -1/3*(a + b/x)^3/b
```

Fricas [A] time = 0.216595, size = 30, normalized size = 1.88

$$-\frac{3\,a^2x^2+3\,abx+b^2}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2/x^2,x, algorithm="fricas")
```

```
[Out] -1/3*(3*a^2*x^2 + 3*a*b*x + b^2)/x^3
```

Sympy [A] time = 1.20217, size = 24, normalized size = 1.5

$$-\frac{3a^2x^2+3abx+b^2}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**2/x**2,x)
```

```
[Out] -(3*a**2*x**2 + 3*a*b*x + b**2)/(3*x**3)
```

GIAC/XCAS [A] time = 0.226408, size = 19, normalized size = 1.19

$$-\frac{\left(a+\frac{b}{x}\right)^3}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2/x^2,x, algorithm="giac")
```

```
[Out] -1/3*(a + b/x)^3/b
```

3.1565 $\int \frac{\left(a+\frac{b}{x}\right)^2}{x^3} \, dx$

Optimal. Leaf size=30

$$-\frac{a^2}{2x^2}-\frac{2ab}{3x^3}-\frac{b^2}{4x^4}$$

```
[Out] -b^2/(4*x^4) - (2*a*b)/(3*x^3) - a^2/(2*x^2)
```

Rubi [A] time = 0.0366121, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^2}{2x^2}-\frac{2ab}{3x^3}-\frac{b^2}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^2/x^3,x]

[Out] -b^2/(4*x^4) - (2*a*b)/(3*x^3) - a^2/(2*x^2)
```

Rubi in Sympy [A] time = 6.16289, size = 27, normalized size = 0.9

$$-\frac{a^2}{2x^2}-\frac{2ab}{3x^3}-\frac{b^2}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**2/x**3,x)

[Out] -a**2/(2*x**2) - 2*a*b/(3*x**3) - b**2/(4*x**4)
```

Mathematica [A] time = 0.00567778, size = 30, normalized size = 1.

$$-\frac{a^2}{2x^2}-\frac{2ab}{3x^3}-\frac{b^2}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^2/x^3,x]

[Out] -b^2/(4*x^4) - (2*a*b)/(3*x^3) - a^2/(2*x^2)
```

Maple [A] time = 0.007, size = 25, normalized size = 0.8

$$-\frac{b^2}{4\,x^4}-\frac{2\,ab}{3\,x^3}-\frac{a^2}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^2/x^3,x)

[Out] -1/4*b^2/x^4-2/3*a*b/x^3-1/2*a^2/x^2
```

Maxima [A] time = 1.44055, size = 32, normalized size = 1.07

$$-\frac{6\,a^2x^2+8\,abx+3\,b^2}{12\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2/x^3,x, algorithm="maxima")

[Out] -1/12*(6*a^2*x^2 + 8*a*b*x + 3*b^2)/x^4
```

Fricas [A] time = 0.219425, size = 32, normalized size = 1.07

$$-\frac{6\,a^2x^2+8\,abx+3\,b^2}{12\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2/x^3,x, algorithm="fricas")

[Out] -1/12*(6*a^2*x^2 + 8*a*b*x + 3*b^2)/x^4
```

Sympy [A] time = 1.24637, size = 26, normalized size = 0.87

$$-\frac{6a^2x^2+8abx+3b^2}{12x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**2/x**3,x)

[Out] -(6*a**2*x**2 + 8*a*b*x + 3*b**2)/(12*x**4)
```

GIAC/XCAS [A] time = 0.227715, size = 32, normalized size = 1.07

$$-\frac{6\,a^2x^2+8\,abx+3\,b^2}{12\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2/x^3,x, algorithm="giac")

[Out] -1/12*(6*a^2*x^2 + 8*a*b*x + 3*b^2)/x^4
```

3.1566 $\int \frac{\left(a+\frac{b}{x}\right)^2}{x^4}\,dx$

Optimal. Leaf size=30

$$-\frac{a^2}{3x^3}-\frac{ab}{2x^4}-\frac{b^2}{5x^5}$$

```
[Out] -b^2/(5*x^5) - (a*b)/(2*x^4) - a^2/(3*x^3)
```

Rubi [A] time = 0.0350996, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^2}{3x^3}-\frac{ab}{2x^4}-\frac{b^2}{5x^5}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x)^2/x^4,x]

[Out] -b^2/(5*x^5) - (a*b)/(2*x^4) - a^2/(3*x^3)
```

Rubi in Sympy [A] time = 6.15237, size = 26, normalized size = 0.87

$$-\frac{a^2}{3x^3}-\frac{ab}{2x^4}-\frac{b^2}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x)**2/x**4,x)

[Out] -a**2/(3*x**3) - a*b/(2*x**4) - b**2/(5*x**5)
```

Mathematica [A] time = 0.0109626, size = 30, normalized size = 1.

$$-\frac{a^2}{3x^3}-\frac{ab}{2x^4}-\frac{b^2}{5x^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x)^2/x^4,x]

[Out] -b^2/(5*x^5) - (a*b)/(2*x^4) - a^2/(3*x^3)
```

Maple [A] time = 0.007, size = 25, normalized size = 0.8

$$-\frac{b^2}{5\,x^5}-\frac{ab}{2\,x^4}-\frac{a^2}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x)^2/x^4,x)

[Out] -1/5*b^2/x^5-1/2*a*b/x^4-1/3*a^2/x^3
```

Maxima [A] time = 1.44078, size = 32, normalized size = 1.07

$$-\frac{10\,a^2x^2+15\,abx+6\,b^2}{30\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2/x^4,x, algorithm="maxima")
```

```
[Out] -1/30*(10*a^2*x^2 + 15*a*b*x + 6*b^2)/x^5
```

Fricas [A] time = 0.21789, size = 32, normalized size = 1.07

$$-\frac{10\,a^2x^2+15\,abx+6\,b^2}{30\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2/x^4,x, algorithm="fricas")
```

```
[Out] -1/30*(10*a^2*x^2 + 15*a*b*x + 6*b^2)/x^5
```

Sympy [A] time = 1.29355, size = 26, normalized size = 0.87

$$-\frac{10a^2x^2+15abx+6b^2}{30x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**2/x**4,x)
```

```
[Out] -(10*a**2*x**2 + 15*a*b*x + 6*b**2)/(30*x**5)
```

GIAC/XCAS [A] time = 0.226533, size = 32, normalized size = 1.07

$$-\frac{10\,a^2x^2+15\,abx+6\,b^2}{30\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2/x^4,x, algorithm="giac")
```

```
[Out] -1/30*(10*a^2*x^2 + 15*a*b*x + 6*b^2)/x^5
```

3.1567 $\int \frac{\left(a+\frac{b}{x}\right)^2}{x^5} dx$

Optimal. Leaf size=30

$$-\frac{a^2}{4x^4}-\frac{2ab}{5x^5}-\frac{b^2}{6x^6}$$

```
[Out] -b^2/(6*x^6) - (2*a*b)/(5*x^5) - a^2/(4*x^4)
```

Rubi [A] time = 0.0363635, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^2}{4x^4}-\frac{2ab}{5x^5}-\frac{b^2}{6x^6}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x)^2/x^5,x]
```

```
[Out] -b^2/(6*x^6) - (2*a*b)/(5*x^5) - a^2/(4*x^4)
```

Rubi in Sympy [A] time = 6.193, size = 27, normalized size = 0.9

$$-\frac{a^2}{4x^4}-\frac{2ab}{5x^5}-\frac{b^2}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x)**2/x**5,x)
```

```
[Out] -a**2/(4*x**4) - 2*a*b/(5*x**5) - b**2/(6*x**6)
```

Mathematica [A] time = 0.0052618, size = 30, normalized size = 1.

$$-\frac{a^2}{4x^4}-\frac{2ab}{5x^5}-\frac{b^2}{6x^6}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x)^2/x^5,x]
```

```
[Out] -b^2/(6*x^6) - (2*a*b)/(5*x^5) - a^2/(4*x^4)
```

Maple [A] time = 0.007, size = 25, normalized size = 0.8

$$-\frac{b^2}{6\,x^6}-\frac{2\,ab}{5\,x^5}-\frac{a^2}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x)^2/x^5,x)
```

```
[Out] -1/6*b^2/x^6-2/5*a*b/x^5-1/4*a^2/x^4
```

Maxima [A] time = 1.4444, size = 32, normalized size = 1.07

$$-\frac{15\,a^2x^2 + 24\,abx + 10\,b^2}{60\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2/x^5,x, algorithm="maxima")

[Out] -1/60*(15*a^2*x^2 + 24*a*b*x + 10*b^2)/x^6
```

Fricas [A] time = 0.21379, size = 32, normalized size = 1.07

$$-\frac{15\,a^2x^2 + 24\,abx + 10\,b^2}{60\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2/x^5,x, algorithm="fricas")

[Out] -1/60*(15*a^2*x^2 + 24*a*b*x + 10*b^2)/x^6
```

Sympy [A] time = 1.33422, size = 26, normalized size = 0.87

$$-\frac{15a^2x^2 + 24abx + 10b^2}{60x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**2/x**5,x)

[Out] -(15*a**2*x**2 + 24*a*b*x + 10*b**2)/(60*x**6)
```

GIAC/XCAS [A] time = 0.225218, size = 32, normalized size = 1.07

$$-\frac{15\,a^2x^2 + 24\,abx + 10\,b^2}{60\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2/x^5,x, algorithm="giac")

[Out] -1/60*(15*a^2*x^2 + 24*a*b*x + 10*b^2)/x^6
```

3.1568 $\int \left(a+\frac{b}{x}\right)^3 x^6 \, dx$

Optimal. Leaf size=43

$$\frac{a^3x^7}{7}+\frac{1}{2}a^2bx^6+\frac{3}{5}ab^2x^5+\frac{b^3x^4}{4}$$

```
[Out] (b^3*x^4)/4 + (3*a*b^2*x^5)/5 + (a^2*b*x^6)/2 + (a^3*x^7)/7
```

Rubi [A] time = 0.0636702, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^3x^7}{7}+\frac{1}{2}a^2bx^6+\frac{3}{5}ab^2x^5+\frac{b^3x^4}{4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^3*x^6,x]

[Out] (b^3*x^4)/4 + (3*a*b^2*x^5)/5 + (a^2*b*x^6)/2 + (a^3*x^7)/7
```

Rubi in Sympy [A] time = 8.89244, size = 37, normalized size = 0.86

$$\frac{a^3x^7}{7}+\frac{a^2bx^6}{2}+\frac{3ab^2x^5}{5}+\frac{b^3x^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**3*x**6,x)

[Out] a**3*x**7/7 + a**2*b*x**6/2 + 3*a*b**2*x**5/5 + b**3*x**4/4
```

Mathematica [A] time = 0.00308048, size = 43, normalized size = 1.

$$\frac{a^3x^7}{7}+\frac{1}{2}a^2bx^6+\frac{3}{5}ab^2x^5+\frac{b^3x^4}{4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^3*x^6,x]

[Out] (b^3*x^4)/4 + (3*a*b^2*x^5)/5 + (a^2*b*x^6)/2 + (a^3*x^7)/7
```

Maple [A] time = 0.002, size = 36, normalized size = 0.8

$$\frac{b^3x^4}{4}+\frac{3\,ab^2x^5}{5}+\frac{a^2bx^6}{2}+\frac{a^3x^7}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^3*x^6,x)

[Out] 1/4*b^3*x^4+3/5*a*b^2*x^5+1/2*a^2*b*x^6+1/7*a^3*x^7
```

Maxima [A] time = 1.43573, size = 47, normalized size = 1.09

$$\frac{1}{7}a^3x^7 + \frac{1}{2}a^2bx^6 + \frac{3}{5}ab^2x^5 + \frac{1}{4}b^3x^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3*x^6,x, algorithm="maxima")
```

```
[Out] 1/7*a^3*x^7 + 1/2*a^2*b*x^6 + 3/5*a*b^2*x^5 + 1/4*b^3*x^4
```

Fricas [A] time = 0.211766, size = 47, normalized size = 1.09

$$\frac{1}{7}a^3x^7 + \frac{1}{2}a^2bx^6 + \frac{3}{5}ab^2x^5 + \frac{1}{4}b^3x^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3*x^6,x, algorithm="fricas")
```

```
[Out] 1/7*a^3*x^7 + 1/2*a^2*b*x^6 + 3/5*a*b^2*x^5 + 1/4*b^3*x^4
```

Sympy [A] time = 0.099061, size = 37, normalized size = 0.86

$$\frac{a^3x^7}{7} + \frac{a^2bx^6}{2} + \frac{3ab^2x^5}{5} + \frac{b^3x^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**3*x**6,x)
```

```
[Out] a**3*x**7/7 + a**2*b*x**6/2 + 3*a*b**2*x**5/5 + b**3*x**4/4
```

GIAC/XCAS [A] time = 0.220484, size = 47, normalized size = 1.09

$$\frac{1}{7}a^3x^7 + \frac{1}{2}a^2bx^6 + \frac{3}{5}ab^2x^5 + \frac{1}{4}b^3x^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3*x^6,x, algorithm="giac")
```

```
[Out] 1/7*a^3*x^7 + 1/2*a^2*b*x^6 + 3/5*a*b^2*x^5 + 1/4*b^3*x^4
```

3.1569 $\int \left(a+\frac{b}{x}\right)^3 x^5\,dx$

Optimal. Leaf size=43

$$\frac{a^3x^6}{6}+\frac{3}{5}a^2bx^5+\frac{3}{4}ab^2x^4+\frac{b^3x^3}{3}$$

```
[Out] (b^3*x^3)/3 + (3*a*b^2*x^4)/4 + (3*a^2*b*x^5)/5 + (a^3*x^6)/6
```

Rubi [A] time = 0.0582798, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^3x^6}{6}+\frac{3}{5}a^2bx^5+\frac{3}{4}ab^2x^4+\frac{b^3x^3}{3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^3*x^5,x]
```

```
[Out] (b^3*x^3)/3 + (3*a*b^2*x^4)/4 + (3*a^2*b*x^5)/5 + (a^3*x^6)/6
```

Rubi in Sympy [A] time = 8.44488, size = 39, normalized size = 0.91

$$\frac{a^3x^6}{6}+\frac{3a^2bx^5}{5}+\frac{3ab^2x^4}{4}+\frac{b^3x^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**3*x**5,x)
```

```
[Out] a**3*x**6/6 + 3*a**2*b*x**5/5 + 3*a*b**2*x**4/4 + b**3*x**3/3
```

Mathematica [A] time = 0.00322767, size = 43, normalized size = 1.

$$\frac{a^3x^6}{6}+\frac{3}{5}a^2bx^5+\frac{3}{4}ab^2x^4+\frac{b^3x^3}{3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^3*x^5,x]
```

```
[Out] (b^3*x^3)/3 + (3*a*b^2*x^4)/4 + (3*a^2*b*x^5)/5 + (a^3*x^6)/6
```

Maple [A] time = 0.001, size = 36, normalized size = 0.8

$$\frac{b^3x^3}{3}+\frac{3\,ab^2x^4}{4}+\frac{3\,a^2bx^5}{5}+\frac{a^3x^6}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^3*x^5,x)
```

```
[Out] 1/3*b^3*x^3+3/4*a*b^2*x^4+3/5*a^2*b*x^5+1/6*a^3*x^6
```

Maxima [A] time = 1.4344, size = 47, normalized size = 1.09

$$\frac{1}{6}a^3x^6 + \frac{3}{5}a^2bx^5 + \frac{3}{4}ab^2x^4 + \frac{1}{3}b^3x^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3*x^5,x, algorithm="maxima")
```

```
[Out] 1/6*a^3*x^6 + 3/5*a^2*b*x^5 + 3/4*a*b^2*x^4 + 1/3*b^3*x^3
```

Fricas [A] time = 0.216324, size = 47, normalized size = 1.09

$$\frac{1}{6}a^3x^6 + \frac{3}{5}a^2bx^5 + \frac{3}{4}ab^2x^4 + \frac{1}{3}b^3x^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3*x^5,x, algorithm="fricas")
```

```
[Out] 1/6*a^3*x^6 + 3/5*a^2*b*x^5 + 3/4*a*b^2*x^4 + 1/3*b^3*x^3
```

Sympy [A] time = 0.097185, size = 39, normalized size = 0.91

$$\frac{a^3x^6}{6} + \frac{3a^2bx^5}{5} + \frac{3ab^2x^4}{4} + \frac{b^3x^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**3*x**5,x)
```

```
[Out] a**3*x**6/6 + 3*a**2*b*x**5/5 + 3*a*b**2*x**4/4 + b**3*x**3/3
```

GIAC/XCAS [A] time = 0.226684, size = 47, normalized size = 1.09

$$\frac{1}{6}a^3x^6 + \frac{3}{5}a^2bx^5 + \frac{3}{4}ab^2x^4 + \frac{1}{3}b^3x^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3*x^5,x, algorithm="giac")
```

```
[Out] 1/6*a^3*x^6 + 3/5*a^2*b*x^5 + 3/4*a*b^2*x^4 + 1/3*b^3*x^3
```

3.1570 $\int \left(a+\frac{b}{x}\right)^3 x^4\,dx$

Optimal. Leaf size=30

$$\frac{(ax+b)^5}{5a^2}-\frac{b(ax+b)^4}{4a^2}$$

```
[Out] -(b*(b + a*x)^4)/(4*a^2) + (b + a*x)^5/(5*a^2)
```

Rubi [A] time = 0.0391365, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{(ax+b)^5}{5a^2}-\frac{b(ax+b)^4}{4a^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^3*x^4,x]

[Out] -(b*(b + a*x)^4)/(4*a^2) + (b + a*x)^5/(5*a^2)
```

Rubi in Sympy [A] time = 7.65092, size = 24, normalized size = 0.8

$$-\frac{b\,(ax+b)^4}{4a^2}+\frac{(ax+b)^5}{5a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**3*x**4,x)

[Out] -b*(a*x + b)**4/(4*a**2) + (a*x + b)**5/(5*a**2)
```

Mathematica [A] time = 0.00262162, size = 40, normalized size = 1.33

$$\frac{a^3x^5}{5}+\frac{3}{4}a^2bx^4+ab^2x^3+\frac{b^3x^2}{2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^3*x^4,x]

[Out] (b^3*x^2)/2 + a*b^2*x^3 + (3*a^2*b*x^4)/4 + (a^3*x^5)/5
```

Maple [A] time = 0.001, size = 35, normalized size = 1.2

$$\frac{a^3x^5}{5}+\frac{3\,a^2bx^4}{4}+ab^2x^3+\frac{b^3x^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^3*x^4,x)

[Out] 1/5*a^3*x^5+3/4*a^2*b*x^4+a*b^2*x^3+1/2*b^3*x^2
```

Maxima [A] time = 1.44378, size = 46, normalized size = 1.53

$$\frac{1}{5}\,a^3x^5 + \frac{3}{4}\,a^2bx^4 + ab^2x^3 + \frac{1}{2}\,b^3x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3*x^4,x, algorithm="maxima")

[Out] 1/5*a^3*x^5 + 3/4*a^2*b*x^4 + a*b^2*x^3 + 1/2*b^3*x^2
```

Fricas [A] time = 0.209575, size = 46, normalized size = 1.53

$$\frac{1}{5}\,a^3x^5 + \frac{3}{4}\,a^2bx^4 + ab^2x^3 + \frac{1}{2}\,b^3x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3*x^4,x, algorithm="fricas")

[Out] 1/5*a^3*x^5 + 3/4*a^2*b*x^4 + a*b^2*x^3 + 1/2*b^3*x^2
```

Sympy [A] time = 0.091865, size = 36, normalized size = 1.2

$$\frac{a^3x^5}{5} + \frac{3a^2bx^4}{4} + ab^2x^3 + \frac{b^3x^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**3*x**4,x)

[Out] a**3*x**5/5 + 3*a**2*b*x**4/4 + a*b**2*x**3 + b**3*x**2/2
```

GIAC/XCAS [A] time = 0.223652, size = 46, normalized size = 1.53

$$\frac{1}{5}\,a^3x^5 + \frac{3}{4}\,a^2bx^4 + ab^2x^3 + \frac{1}{2}\,b^3x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3*x^4,x, algorithm="giac")

[Out] 1/5*a^3*x^5 + 3/4*a^2*b*x^4 + a*b^2*x^3 + 1/2*b^3*x^2
```

3.1571 $\int \left(a+\frac{b}{x}\right)^3 x^3 \, dx$

Optimal. Leaf size=14

$$\frac{(ax+b)^4}{4a}$$

[Out] (b + a*x)^4/(4*a)

Rubi [A] time = 0.0170673, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{(ax+b)^4}{4a}$$

Antiderivative was successfully verified.

[In] Int[(a + b/x)^3*x^3,x]

[Out] (b + a*x)^4/(4*a)

Rubi in Sympy [A] time = 2.96508, size = 8, normalized size = 0.57

$$\frac{(ax+b)^4}{4a}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((a+b/x)**3*x**3,x)

[Out] (a*x + b)**4/(4*a)

Mathematica [A] time = 0.00254802, size = 14, normalized size = 1.

$$\frac{(ax+b)^4}{4a}$$

Antiderivative was successfully verified.

[In] Integrate[(a + b/x)^3*x^3,x]

[Out] (b + a*x)^4/(4*a)

Maple [A] time = 0.001, size = 13, normalized size = 0.9

$$\frac{(ax+b)^4}{4a}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a+b/x)^3*x^3,x)

[Out] 1/4*(a*x+b)^4/a

Maxima [A] time = 1.44145, size = 42, normalized size = 3.

$$\frac{1}{4}a^3x^4 + a^2bx^3 + \frac{3}{2}ab^2x^2 + b^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3*x^3,x, algorithm="maxima")
```

```
[Out] 1/4*a^3*x^4 + a^2*b*x^3 + 3/2*a*b^2*x^2 + b^3*x
```

Fricas [A] time = 0.210834, size = 42, normalized size = 3.

$$\frac{1}{4}a^3x^4 + a^2bx^3 + \frac{3}{2}ab^2x^2 + b^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3*x^3,x, algorithm="fricas")
```

```
[Out] 1/4*a^3*x^4 + a^2*b*x^3 + 3/2*a*b^2*x^2 + b^3*x
```

Sympy [A] time = 0.105682, size = 32, normalized size = 2.29

$$\frac{a^3x^4}{4} + a^2bx^3 + \frac{3ab^2x^2}{2} + b^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**3*x**3,x)
```

```
[Out] a**3*x**4/4 + a**2*b*x**3 + 3*a*b**2*x**2/2 + b**3*x
```

GIAC/XCAS [A] time = 0.220927, size = 42, normalized size = 3.

$$\frac{1}{4}a^3x^4 + a^2bx^3 + \frac{3}{2}ab^2x^2 + b^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3*x^3,x, algorithm="giac")
```

```
[Out] 1/4*a^3*x^4 + a^2*b*x^3 + 3/2*a*b^2*x^2 + b^3*x
```

3.1572 $\int \left(a+\frac{b}{x}\right)^3 x^2\,dx$

Optimal. Leaf size=35

$$\frac{a^3x^3}{3}+\frac{3}{2}a^2bx^2+3ab^2x+b^3\log(x)$$

```
[Out] 3*a*b^2*x + (3*a^2*b*x^2)/2 + (a^3*x^3)/3 + b^3*Log[x]
```

Rubi [A] time = 0.0501241, antiderivative size = 35, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^3x^3}{3}+\frac{3}{2}a^2bx^2+3ab^2x+b^3\log(x)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^3*x^2,x]
```

```
[Out] 3*a*b^2*x + (3*a^2*b*x^2)/2 + (a^3*x^3)/3 + b^3*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^3x^3}{3}+3a^2b\int x\,dx+3ab^2x+b^3\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**3*x**2,x)
```

```
[Out] a**3*x**3/3 + 3*a**2*b*Integral(x, x) + 3*a*b**2*x + b**3*log(x)
```

Mathematica [A] time = 0.00482502, size = 35, normalized size = 1.

$$\frac{a^3x^3}{3}+\frac{3}{2}a^2bx^2+3ab^2x+b^3\log(x)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^3*x^2,x]
```

```
[Out] 3*a*b^2*x + (3*a^2*b*x^2)/2 + (a^3*x^3)/3 + b^3*Log[x]
```

Maple [A] time = 0.003, size = 32, normalized size = 0.9

$$3\,ab^2x+\frac{3\,a^2bx^2}{2}+\frac{a^3x^3}{3}+b^3\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^3*x^2,x)
```

```
[Out] 3*a*b^2*x+3/2*a^2*b*x^2+1/3*a^3*x^3+b^3*ln(x)
```

Maxima [A] time = 1.44423, size = 42, normalized size = 1.2

$$\frac{1}{3}a^3x^3 + \frac{3}{2}a^2bx^2 + 3ab^2x + b^3\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3*x^2,x, algorithm="maxima")

[Out] 1/3*a^3*x^3 + 3/2*a^2*b*x^2 + 3*a*b^2*x + b^3*log(x)
```

Fricas [A] time = 0.221498, size = 42, normalized size = 1.2

$$\frac{1}{3}a^3x^3 + \frac{3}{2}a^2bx^2 + 3ab^2x + b^3\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3*x^2,x, algorithm="fricas")

[Out] 1/3*a^3*x^3 + 3/2*a^2*b*x^2 + 3*a*b^2*x + b^3*log(x)
```

Sympy [A] time = 1.07052, size = 34, normalized size = 0.97

$$\frac{a^3x^3}{3} + \frac{3a^2bx^2}{2} + 3ab^2x + b^3\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**3*x**2,x)

[Out] a**3*x**3/3 + 3*a**2*b*x**2/2 + 3*a*b**2*x + b**3*log(x)
```

GIAC/XCAS [A] time = 0.226247, size = 43, normalized size = 1.23

$$\frac{1}{3}a^3x^3 + \frac{3}{2}a^2bx^2 + 3ab^2x + b^3\ln(|x|)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3*x^2,x, algorithm="giac")

[Out] 1/3*a^3*x^3 + 3/2*a^2*b*x^2 + 3*a*b^2*x + b^3*ln(abs(x))
```

3.1573 $\int \left(a+\frac{b}{x}\right)^3 x \, dx$

Optimal. Leaf size=34

$$\frac{a^3x^2}{2}+3a^2bx+3ab^2\log(x)-\frac{b^3}{x}$$

```
[Out] -(b^3/x) + 3*a^2*b*x + (a^3*x^2)/2 + 3*a*b^2*Log[x]
```

Rubi [A] time = 0.0464414, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{a^3x^2}{2}+3a^2bx+3ab^2\log(x)-\frac{b^3}{x}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^3*x,x]

[Out] -(b^3/x) + 3*a^2*b*x + (a^3*x^2)/2 + 3*a*b^2*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$a^3\int x\,dx+3a^2bx+3ab^2\log(x)-\frac{b^3}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**3*x,x)

[Out] a**3*Integral(x, x) + 3*a**2*b*x + 3*a*b**2*log(x) - b**3/x
```

Mathematica [A] time = 0.00730713, size = 34, normalized size = 1.

$$\frac{a^3x^2}{2}+3a^2bx+3ab^2\log(x)-\frac{b^3}{x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^3*x,x]

[Out] -(b^3/x) + 3*a^2*b*x + (a^3*x^2)/2 + 3*a*b^2*Log[x]
```

Maple [A] time = 0.007, size = 33, normalized size = 1.

$$-\frac{b^3}{x}+3\,a^2bx+\frac{x^2a^3}{2}+3\,ab^2\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^3*x,x)

[Out] -b^3/x+3*a^2*b*x+1/2*x^2*a^3+3*a*b^2*ln(x)
```

Maxima [A] time = 1.43974, size = 43, normalized size = 1.26

$$\frac{1}{2}\,a^{3}x^{2} + 3\,a^{2}bx + 3\,ab^{2}\log\left(x\right) - \frac{b^{3}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3*x,x, algorithm="maxima")
```

```
[Out] 1/2*a^3*x^2 + 3*a^2*b*x + 3*a*b^2*log(x) - b^3/x
```

Fricas [A] time = 0.219111, size = 49, normalized size = 1.44

$$\frac{a^{3}x^{3} + 6\,a^{2}bx^{2} + 6\,ab^{2}x\log\left(x\right) - 2\,b^{3}}{2\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3*x,x, algorithm="fricas")
```

```
[Out] 1/2*(a^3*x^3 + 6*a^2*b*x^2 + 6*a*b^2*x*log(x) - 2*b^3)/x
```

Sympy [A] time = 1.13904, size = 31, normalized size = 0.91

$$\frac{a^{3}x^{2}}{2} + 3a^{2}bx + 3ab^{2}\log\left(x\right) - \frac{b^{3}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**3*x,x)
```

```
[Out] a**3*x**2/2 + 3*a**2*b*x + 3*a*b**2*log(x) - b**3/x
```

GIAC/XCAS [A] time = 0.222165, size = 45, normalized size = 1.32

$$\frac{1}{2}\,a^{3}x^{2} + 3\,a^{2}bx + 3\,ab^{2}\ln\left(|x|\right) - \frac{b^{3}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3*x,x, algorithm="giac")
```

```
[Out] 1/2*a^3*x^2 + 3*a^2*b*x + 3*a*b^2*ln(abs(x)) - b^3/x
```

3.1574 $\int \left(a+\frac{b}{x}\right)^3 dx$

Optimal. Leaf size=33

$$a^3x+3a^2b\log(x)-\frac{3ab^2}{x}-\frac{b^3}{2x^2}$$

```
[Out] -b^3/(2*x^2) - (3*a*b^2)/x + a^3*x + 3*a^2*b*Log[x]
```

Rubi [A] time = 0.0366301, antiderivative size = 33, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$a^3x+3a^2b\log(x)-\frac{3ab^2}{x}-\frac{b^3}{2x^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x)^3,x]

[Out] -b^3/(2*x^2) - (3*a*b^2)/x + a^3*x + 3*a^2*b*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$3a^2b\log(x)-\frac{3ab^2}{x}-\frac{b^3}{2x^2}+\int a^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x)**3,x)

[Out] 3*a**2*b*log(x) - 3*a*b**2/x - b**3/(2*x**2) + Integral(a**3, x)
```

Mathematica [A] time = 0.00624543, size = 33, normalized size = 1.

$$a^3x+3a^2b\log(x)-\frac{3ab^2}{x}-\frac{b^3}{2x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x)^3,x]

[Out] -b^3/(2*x^2) - (3*a*b^2)/x + a^3*x + 3*a^2*b*Log[x]
```

Maple [A] time = 0.009, size = 32, normalized size = 1.

$$-\frac{b^3}{2\,x^2}-3\,\frac{ab^2}{x}+a^3x+3\,a^2b\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x)^3,x)

[Out] -1/2*b^3/x^2-3*a*b^2/x+a^3*x+3*a^2*b*ln(x)
```

Maxima [A] time = 1.43691, size = 42, normalized size = 1.27

$$a^3x + 3\,a^2b\log(x) - \frac{3\,ab^2}{x} - \frac{b^3}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3,x, algorithm="maxima")

[Out] a^3*x + 3*a^2*b*log(x) - 3*a*b^2/x - 1/2*b^3/x^2
```

Fricas [A] time = 0.218149, size = 50, normalized size = 1.52

$$\frac{2\,a^3x^3 + 6\,a^2bx^2\log(x) - 6\,ab^2x - b^3}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3,x, algorithm="fricas")

[Out] 1/2*(2*a^3*x^3 + 6*a^2*b*x^2*log(x) - 6*a*b^2*x - b^3)/x^2
```

Sympy [A] time = 1.29378, size = 31, normalized size = 0.94

$$a^3x + 3a^2b\log(x) - \frac{6ab^2x + b^3}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**3,x)

[Out] a**3*x + 3*a**2*b*log(x) - (6*a*b**2*x + b**3)/(2*x**2)
```

GIAC/XCAS [A] time = 0.219682, size = 42, normalized size = 1.27

$$a^3x + 3\,a^2b\ln(|x|) - \frac{6\,ab^2x + b^3}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3,x, algorithm="giac")

[Out] a^3*x + 3*a^2*b*ln(abs(x)) - 1/2*(6*a*b^2*x + b^3)/x^2
```

3.1575 $\int \frac{\left(a+\frac{b}{x}\right)^3}{x}\,dx$

Optimal. Leaf size=37

$$a^3\log(x) - \frac{3a^2b}{x} - \frac{3ab^2}{2x^2} - \frac{b^3}{3x^3}$$

```
[Out] -b^3/(3*x^3) - (3*a*b^2)/(2*x^2) - (3*a^2*b)/x + a^3*Log[x]
```

Rubi [A] time = 0.0425869, antiderivative size = 37, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$a^3\log(x) - \frac{3a^2b}{x} - \frac{3ab^2}{2x^2} - \frac{b^3}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^3/x,x]
```

```
[Out] -b^3/(3*x^3) - (3*a*b^2)/(2*x^2) - (3*a^2*b)/x + a^3*Log[x]
```

Rubi in Sympy [A] time = 7.992, size = 34, normalized size = 0.92

$$a^3\log(x) - \frac{3a^2b}{x} - \frac{3ab^2}{2x^2} - \frac{b^3}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**3/x,x)
```

```
[Out] a**3*log(x) - 3*a**2*b/x - 3*a*b**2/(2*x**2) - b**3/(3*x**3)
```

Mathematica [A] time = 0.0061008, size = 37, normalized size = 1.

$$a^3\log(x) - \frac{3a^2b}{x} - \frac{3ab^2}{2x^2} - \frac{b^3}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^3/x,x]
```

```
[Out] -b^3/(3*x^3) - (3*a*b^2)/(2*x^2) - (3*a^2*b)/x + a^3*Log[x]
```

Maple [A] time = 0.01, size = 34, normalized size = 0.9

$$-\frac{b^3}{3\,x^3} - \frac{3\,ab^2}{2\,x^2} - 3\,\frac{a^2b}{x} + a^3\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^3/x,x)
```

```
[Out] -1/3*b^3/x^3-3/2*a*b^2/x^2-3*a^2*b/x+a^3*ln(x)
```

Maxima [A] time = 1.43989, size = 46, normalized size = 1.24

$$a^3 \log(x) - \frac{18 a^2 b x^2 + 9 a b^2 x + 2 b^3}{6 x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3/x,x, algorithm="maxima")

[Out] a^3*log(x) - 1/6*(18*a^2*b*x^2 + 9*a*b^2*x + 2*b^3)/x^3
```

Fricas [A] time = 0.217569, size = 50, normalized size = 1.35

$$\frac{6 a^3 x^3 \log(x) - 18 a^2 b x^2 - 9 a b^2 x - 2 b^3}{6 x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3/x,x, algorithm="fricas")

[Out] 1/6*(6*a^3*x^3*log(x) - 18*a^2*b*x^2 - 9*a*b^2*x - 2*b^3)/x^3
```

Sympy [A] time = 1.35708, size = 34, normalized size = 0.92

$$a^3 \log(x) - \frac{18a^2bx^2 + 9ab^2x + 2b^3}{6x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**3/x,x)

[Out] a**3*log(x) - (18*a**2*b*x**2 + 9*a*b**2*x + 2*b**3)/(6*x**3)
```

GIAC/XCAS [A] time = 0.225378, size = 47, normalized size = 1.27

$$a^3 \ln(|x|) - \frac{18 a^2 b x^2 + 9 a b^2 x + 2 b^3}{6 x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3/x,x, algorithm="giac")

[Out] a^3*ln(abs(x)) - 1/6*(18*a^2*b*x^2 + 9*a*b^2*x + 2*b^3)/x^3
```

3.1576 $\int \frac{\left(a+\frac{b}{x}\right)^3}{x^2} dx$

Optimal. Leaf size=16

$$-\frac{\left(a+\frac{b}{x}\right)^4}{4b}$$

```
[Out] -(a + b/x)^4/(4*b)
```

Rubi [A] time = 0.0160148, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{\left(a+\frac{b}{x}\right)^4}{4b}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^3/x^2,x]

[Out] -(a + b/x)^4/(4*b)
```

Rubi in Sympy [A] time = 2.19363, size = 10, normalized size = 0.62

$$-\frac{\left(a+\frac{b}{x}\right)^4}{4b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**3/x**2,x)

[Out] -(a + b/x)**4/(4*b)
```

Mathematica [B] time = 0.00605344, size = 39, normalized size = 2.44

$$-\frac{a^3}{x}-\frac{3a^2b}{2x^2}-\frac{ab^2}{x^3}-\frac{b^3}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^3/x^2,x]

[Out] -b^3/(4*x^4) - (a*b^2)/x^3 - (3*a^2*b)/(2*x^2) - a^3/x
```

Maple [B] time = 0.007, size = 36, normalized size = 2.3

$$-\frac{b^3}{4\,x^4}-\frac{ab^2}{x^3}-\frac{3\,a^2b}{2\,x^2}-\frac{a^3}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^3/x^2,x)
```

```
[Out] -1/4*b^3/x^4-a*b^2/x^3-3/2*a^2*b/x^2-a^3/x
```

Maxima [A] time = 1.44028, size = 19, normalized size = 1.19

$$-\frac{\left(a+\frac{b}{x}\right)^4}{4\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3/x^2,x, algorithm="maxima")
```

```
[Out] -1/4*(a + b/x)^4/b
```

Fricas [A] time = 0.209471, size = 45, normalized size = 2.81

$$-\frac{4\,a^3x^3+6\,a^2bx^2+4\,ab^2x+b^3}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3/x^2,x, algorithm="fricas")
```

```
[Out] -1/4*(4*a^3*x^3 + 6*a^2*b*x^2 + 4*a*b^2*x + b^3)/x^4
```

Sympy [A] time = 1.4168, size = 36, normalized size = 2.25

$$-\frac{4a^3x^3+6a^2bx^2+4ab^2x+b^3}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**3/x**2,x)
```

```
[Out] -(4*a**3*x**3 + 6*a**2*b*x**2 + 4*a*b**2*x + b**3)/(4*x**4)
```

GIAC/XCAS [A] time = 0.229494, size = 19, normalized size = 1.19

$$-\frac{\left(a+\frac{b}{x}\right)^4}{4\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3/x^2,x, algorithm="giac")
```

```
[Out] -1/4*(a + b/x)^4/b
```

3.1577 $\int \frac{\left(a+\frac{b}{x}\right)^3}{x^3} dx$

Optimal. Leaf size=36

$$\frac{a(ax+b)^4}{20b^2x^4} - \frac{(ax+b)^4}{5bx^5}$$

```
[Out] -(b + a*x)^4/(5*b*x^5) + (a*(b + a*x)^4)/(20*b^2*x^4)
```

Rubi [A] time = 0.0366419, antiderivative size = 36, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$

$$\frac{a(ax+b)^4}{20b^2x^4} - \frac{(ax+b)^4}{5bx^5}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x)^3/x^3,x]

[Out] -(b + a*x)^4/(5*b*x^5) + (a*(b + a*x)^4)/(20*b^2*x^4)
```

Rubi in Sympy [A] time = 7.83464, size = 37, normalized size = 1.03

$$-\frac{a^3}{2x^2} - \frac{a^2b}{x^3} - \frac{3ab^2}{4x^4} - \frac{b^3}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x)**3/x**3,x)

[Out] -a**3/(2*x**2) - a**2*b/x**3 - 3*a*b**2/(4*x**4) - b**3/(5*x**5)
```

Mathematica [A] time = 0.00989323, size = 41, normalized size = 1.14

$$-\frac{a^3}{2x^2} - \frac{a^2b}{x^3} - \frac{3ab^2}{4x^4} - \frac{b^3}{5x^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x)^3/x^3,x]

[Out] -b^3/(5*x^5) - (3*a*b^2)/(4*x^4) - (a^2*b)/x^3 - a^3/(2*x^2)
```

Maple [A] time = 0.007, size = 36, normalized size = 1.

$$-\frac{3\,ab^2}{4\,x^4} - \frac{a^2b}{x^3} - \frac{a^3}{2\,x^2} - \frac{b^3}{5\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x)^3/x^3,x)

[Out] -3/4*a*b^2/x^4-a^2*b/x^3-1/2*a^3/x^2-1/5*b^3/x^5
```

Maxima [A] time = 1.44363, size = 47, normalized size = 1.31

$$-\frac{10\,a^3x^3+20\,a^2bx^2+15\,ab^2x+4\,b^3}{20\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3/x^3,x, algorithm="maxima")
```

```
[Out] -1/20*(10*a^3*x^3 + 20*a^2*b*x^2 + 15*a*b^2*x + 4*b^3)/x^5
```

Fricas [A] time = 0.211327, size = 47, normalized size = 1.31

$$-\frac{10\,a^3x^3+20\,a^2bx^2+15\,ab^2x+4\,b^3}{20\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3/x^3,x, algorithm="fricas")
```

```
[Out] -1/20*(10*a^3*x^3 + 20*a^2*b*x^2 + 15*a*b^2*x + 4*b^3)/x^5
```

Sympy [A] time = 1.46644, size = 37, normalized size = 1.03

$$-\frac{10a^3x^3+20a^2bx^2+15ab^2x+4b^3}{20x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**3/x**3,x)
```

```
[Out] -(10*a**3*x**3 + 20*a**2*b*x**2 + 15*a*b**2*x + 4*b**3)/(20*x**5)
```

GIAC/XCAS [A] time = 0.222589, size = 47, normalized size = 1.31

$$-\frac{10\,a^3x^3+20\,a^2bx^2+15\,ab^2x+4\,b^3}{20\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3/x^3,x, algorithm="giac")
```

```
[Out] -1/20*(10*a^3*x^3 + 20*a^2*b*x^2 + 15*a*b^2*x + 4*b^3)/x^5
```

3.1578 $\int \frac{\left(a+\frac{b}{x}\right)^3}{x^4}\,dx$

Optimal. Leaf size=43

$$-\frac{a^3}{3x^3}-\frac{3a^2b}{4x^4}-\frac{3ab^2}{5x^5}-\frac{b^3}{6x^6}$$

```
[Out] -b^3/(6*x^6) - (3*a*b^2)/(5*x^5) - (3*a^2*b)/(4*x^4) - a^3/(3*x^3
)
```

Rubi [A] time = 0.0454398, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^3}{3x^3}-\frac{3a^2b}{4x^4}-\frac{3ab^2}{5x^5}-\frac{b^3}{6x^6}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^3/x^4,x]
```

```
[Out] -b^3/(6*x^6) - (3*a*b^2)/(5*x^5) - (3*a^2*b)/(4*x^4) - a^3/(3*x^3
)
```

Rubi in Sympy [A] time = 7.95168, size = 41, normalized size = 0.95

$$-\frac{a^3}{3x^3}-\frac{3a^2b}{4x^4}-\frac{3ab^2}{5x^5}-\frac{b^3}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**3/x**4,x)
```

```
[Out] -a**3/(3*x**3) - 3*a**2*b/(4*x**4) - 3*a*b**2/(5*x**5) - b**3/(6*
x**6)
```

Mathematica [A] time = 0.00569218, size = 43, normalized size = 1.

$$-\frac{a^3}{3x^3}-\frac{3a^2b}{4x^4}-\frac{3ab^2}{5x^5}-\frac{b^3}{6x^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^3/x^4,x]
```

```
[Out] -b^3/(6*x^6) - (3*a*b^2)/(5*x^5) - (3*a^2*b)/(4*x^4) - a^3/(3*x^3
)
```

Maple [A] time = 0.006, size = 36, normalized size = 0.8

$$-\frac{b^3}{6\,x^6}-\frac{3\,ab^2}{5\,x^5}-\frac{3\,a^2b}{4\,x^4}-\frac{a^3}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^3/x^4,x)

[Out] -1/6*b^3/x^6-3/5*a*b^2/x^5-3/4*a^2*b/x^4-1/3*a^3/x^3
```

Maxima [A] time = 1.43363, size = 47, normalized size = 1.09

$$-\frac{20\,a^3x^3+45\,a^2bx^2+36\,ab^2x+10\,b^3}{60\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3/x^4,x, algorithm="maxima")

[Out] -1/60*(20*a^3*x^3 + 45*a^2*b*x^2 + 36*a*b^2*x + 10*b^3)/x^6
```

Fricas [A] time = 0.215967, size = 47, normalized size = 1.09

$$-\frac{20\,a^3x^3+45\,a^2bx^2+36\,ab^2x+10\,b^3}{60\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3/x^4,x, algorithm="fricas")

[Out] -1/60*(20*a^3*x^3 + 45*a^2*b*x^2 + 36*a*b^2*x + 10*b^3)/x^6
```

Sympy [A] time = 1.53503, size = 37, normalized size = 0.86

$$-\frac{20a^3x^3+45a^2bx^2+36ab^2x+10b^3}{60x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**3/x**4,x)

[Out] -(20*a**3*x**3 + 45*a**2*b*x**2 + 36*a*b**2*x + 10*b**3)/(60*x**6
)
```

GIAC/XCAS [A] time = 0.21873, size = 47, normalized size = 1.09

$$-\frac{20\,a^3x^3+45\,a^2bx^2+36\,ab^2x+10\,b^3}{60\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3/x^4,x, algorithm="giac")

[Out] -1/60*(20*a^3*x^3 + 45*a^2*b*x^2 + 36*a*b^2*x + 10*b^3)/x^6
```

3.1579 $\int \frac{\left(a+\frac{b}{x}\right)^3}{x^5} dx$

Optimal. Leaf size=43

$$-\frac{a^3}{4x^4}-\frac{3a^2b}{5x^5}-\frac{ab^2}{2x^6}-\frac{b^3}{7x^7}$$

```
[Out] -b^3/(7*x^7) - (a*b^2)/(2*x^6) - (3*a^2*b)/(5*x^5) - a^3/(4*x^4)
```

Rubi [A] time = 0.0463291, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^3}{4x^4}-\frac{3a^2b}{5x^5}-\frac{ab^2}{2x^6}-\frac{b^3}{7x^7}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^3/x^5,x]
```

```
[Out] -b^3/(7*x^7) - (a*b^2)/(2*x^6) - (3*a^2*b)/(5*x^5) - a^3/(4*x^4)
```

Rubi in Sympy [A] time = 8.07578, size = 39, normalized size = 0.91

$$-\frac{a^3}{4x^4}-\frac{3a^2b}{5x^5}-\frac{ab^2}{2x^6}-\frac{b^3}{7x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**3/x**5,x)
```

```
[Out] -a**3/(4*x**4) - 3*a**2*b/(5*x**5) - a*b**2/(2*x**6) - b**3/(7*x*
*7)
```

Mathematica [A] time = 0.00570754, size = 43, normalized size = 1.

$$-\frac{a^3}{4x^4}-\frac{3a^2b}{5x^5}-\frac{ab^2}{2x^6}-\frac{b^3}{7x^7}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^3/x^5,x]
```

```
[Out] -b^3/(7*x^7) - (a*b^2)/(2*x^6) - (3*a^2*b)/(5*x^5) - a^3/(4*x^4)
```

Maple [A] time = 0.009, size = 36, normalized size = 0.8

$$-\frac{b^3}{7\,x^7}-\frac{ab^2}{2\,x^6}-\frac{3\,a^2b}{5\,x^5}-\frac{a^3}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^3/x^5,x)
```

```
[Out] -1/7*b^3/x^7-1/2*a*b^2/x^6-3/5*a^2*b/x^5-1/4*a^3/x^4
```

Maxima [A] time = 1.4368, size = 47, normalized size = 1.09

$$-\frac{35\,a^3x^3 + 84\,a^2bx^2 + 70\,ab^2x + 20\,b^3}{140\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3/x^5,x, algorithm="maxima")
```

```
[Out] -1/140*(35*a^3*x^3 + 84*a^2*b*x^2 + 70*a*b^2*x + 20*b^3)/x^7
```

Fricas [A] time = 0.214236, size = 47, normalized size = 1.09

$$-\frac{35\,a^3x^3 + 84\,a^2bx^2 + 70\,ab^2x + 20\,b^3}{140\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3/x^5,x, algorithm="fricas")
```

```
[Out] -1/140*(35*a^3*x^3 + 84*a^2*b*x^2 + 70*a*b^2*x + 20*b^3)/x^7
```

Sympy [A] time = 1.65233, size = 37, normalized size = 0.86

$$-\frac{35a^3x^3 + 84a^2bx^2 + 70ab^2x + 20b^3}{140x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**3/x**5,x)
```

```
[Out] -(35*a**3*x**3 + 84*a**2*b*x**2 + 70*a*b**2*x + 20*b**3)/(140*x**
7)
```

GIAC/XCAS [A] time = 0.21777, size = 47, normalized size = 1.09

$$-\frac{35\,a^3x^3 + 84\,a^2bx^2 + 70\,ab^2x + 20\,b^3}{140\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3/x^5,x, algorithm="giac")
```

```
[Out] -1/140*(35*a^3*x^3 + 84*a^2*b*x^2 + 70*a*b^2*x + 20*b^3)/x^7
```

3.1580 $\int \frac{\left(a+\frac{b}{x}\right)^3}{x^6}\,dx$

Optimal. Leaf size=43

$$-\frac{a^3}{5x^5}-\frac{a^2b}{2x^6}-\frac{3ab^2}{7x^7}-\frac{b^3}{8x^8}$$

```
[Out] -b^3/(8*x^8) - (3*a*b^2)/(7*x^7) - (a^2*b)/(2*x^6) - a^3/(5*x^5)
```

Rubi [A] time = 0.0467866, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^3}{5x^5}-\frac{a^2b}{2x^6}-\frac{3ab^2}{7x^7}-\frac{b^3}{8x^8}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^3/x^6,x]
```

```
[Out] -b^3/(8*x^8) - (3*a*b^2)/(7*x^7) - (a^2*b)/(2*x^6) - a^3/(5*x^5)
```

Rubi in Sympy [A] time = 8.24555, size = 39, normalized size = 0.91

$$-\frac{a^3}{5x^5}-\frac{a^2b}{2x^6}-\frac{3ab^2}{7x^7}-\frac{b^3}{8x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**3/x**6,x)
```

```
[Out] -a**3/(5*x**5) - a**2*b/(2*x**6) - 3*a*b**2/(7*x**7) - b**3/(8*x*
*8)
```

Mathematica [A] time = 0.0103863, size = 43, normalized size = 1.

$$-\frac{a^3}{5x^5}-\frac{a^2b}{2x^6}-\frac{3ab^2}{7x^7}-\frac{b^3}{8x^8}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^3/x^6,x]
```

```
[Out] -b^3/(8*x^8) - (3*a*b^2)/(7*x^7) - (a^2*b)/(2*x^6) - a^3/(5*x^5)
```

Maple [A] time = 0.007, size = 36, normalized size = 0.8

$$-\frac{b^3}{8\,x^8}-\frac{3\,ab^2}{7\,x^7}-\frac{a^2b}{2\,x^6}-\frac{a^3}{5\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^3/x^6,x)
```

```
[Out] -1/8*b^3/x^8-3/7*a*b^2/x^7-1/2*a^2*b/x^6-1/5*a^3/x^5
```

Maxima [A] time = 1.45743, size = 47, normalized size = 1.09

$$-\frac{56\,a^3x^3 + 140\,a^2bx^2 + 120\,ab^2x + 35\,b^3}{280\,x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3/x^6,x, algorithm="maxima")
```

```
[Out] -1/280*(56*a^3*x^3 + 140*a^2*b*x^2 + 120*a*b^2*x + 35*b^3)/x^8
```

Fricas [A] time = 0.210364, size = 47, normalized size = 1.09

$$-\frac{56\,a^3x^3 + 140\,a^2bx^2 + 120\,ab^2x + 35\,b^3}{280\,x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3/x^6,x, algorithm="fricas")
```

```
[Out] -1/280*(56*a^3*x^3 + 140*a^2*b*x^2 + 120*a*b^2*x + 35*b^3)/x^8
```

Sympy [A] time = 1.62728, size = 37, normalized size = 0.86

$$-\frac{56a^3x^3 + 140a^2bx^2 + 120ab^2x + 35b^3}{280x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**3/x**6,x)
```

```
[Out] -(56*a**3*x**3 + 140*a**2*b*x**2 + 120*a*b**2*x + 35*b**3)/(280*x
**8)
```

GIAC/XCAS [A] time = 0.217919, size = 47, normalized size = 1.09

$$-\frac{56\,a^3x^3 + 140\,a^2bx^2 + 120\,ab^2x + 35\,b^3}{280\,x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3/x^6,x, algorithm="giac")
```

```
[Out] -1/280*(56*a^3*x^3 + 140*a^2*b*x^2 + 120*a*b^2*x + 35*b^3)/x^8
```

3.1581 $\int \left(a+\frac{b}{x}\right)^8 x^{16} \, dx$

Optimal. Leaf size=106

$$\frac{a^8x^{17}}{17}+\frac{1}{2}a^7bx^{16}+\frac{28}{15}a^6b^2x^{15}+4a^5b^3x^{14}+\frac{70}{13}a^4b^4x^{13}+\frac{14}{3}a^3b^5x^{12}+\frac{28}{11}a^2b^6x^{11}+\frac{4}{5}ab^7x^{10}+\frac{b^8x^9}{9}$$

```
[Out] (b^8*x^9)/9 + (4*a*b^7*x^10)/5 + (28*a^2*b^6*x^11)/11 + (14*a^3*b
^5*x^12)/3 + (70*a^4*b^4*x^13)/13 + 4*a^5*b^3*x^14 + (28*a^6*b^2*
x^15)/15 + (a^7*b*x^16)/2 + (a^8*x^17)/17
```

Rubi [A] time = 0.134118, antiderivative size = 106, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$\frac{a^8x^{17}}{17}+\frac{1}{2}a^7bx^{16}+\frac{28}{15}a^6b^2x^{15}+4a^5b^3x^{14}+\frac{70}{13}a^4b^4x^{13}+\frac{14}{3}a^3b^5x^{12}+\frac{28}{11}a^2b^6x^{11}+\frac{4}{5}ab^7x^{10}+\frac{b^8x^9}{9}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^8*x^16,x]
```

```
[Out] (b^8*x^9)/9 + (4*a*b^7*x^10)/5 + (28*a^2*b^6*x^11)/11 + (14*a^3*b
^5*x^12)/3 + (70*a^4*b^4*x^13)/13 + 4*a^5*b^3*x^14 + (28*a^6*b^2*
x^15)/15 + (a^7*b*x^16)/2 + (a^8*x^17)/17
```

Rubi in Sympy [A] time = 23.7752, size = 104, normalized size = 0.98

$$\frac{a^8x^{17}}{17}+\frac{a^7bx^{16}}{2}+\frac{28a^6b^2x^{15}}{15}+4a^5b^3x^{14}+\frac{70a^4b^4x^{13}}{13}+\frac{14a^3b^5x^{12}}{3}+\frac{28a^2b^6x^{11}}{11}+\frac{4ab^7x^{10}}{5}+\frac{b^8x^9}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**8*x**16,x)
```

```
[Out] a**8*x**17/17 + a**7*b*x**16/2 + 28*a**6*b**2*x**15/15 + 4*a**5*b
**3*x**14 + 70*a**4*b**4*x**13/13 + 14*a**3*b**5*x**12/3 + 28*a**
2*b**6*x**11/11 + 4*a*b**7*x**10/5 + b**8*x**9/9
```

Mathematica [A] time = 0.00551171, size = 106, normalized size = 1.

$$\frac{a^8x^{17}}{17}+\frac{1}{2}a^7bx^{16}+\frac{28}{15}a^6b^2x^{15}+4a^5b^3x^{14}+\frac{70}{13}a^4b^4x^{13}+\frac{14}{3}a^3b^5x^{12}+\frac{28}{11}a^2b^6x^{11}+\frac{4}{5}ab^7x^{10}+\frac{b^8x^9}{9}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^8*x^16,x]
```

```
[Out] (b^8*x^9)/9 + (4*a*b^7*x^10)/5 + (28*a^2*b^6*x^11)/11 + (14*a^3*b
^5*x^12)/3 + (70*a^4*b^4*x^13)/13 + 4*a^5*b^3*x^14 + (28*a^6*b^2*
x^15)/15 + (a^7*b*x^16)/2 + (a^8*x^17)/17
```

Maple [A] time = 0.004, size = 91, normalized size = 0.9

$$\frac{b^8x^9}{9}+\frac{4\,ab^7x^{10}}{5}+\frac{28\,a^2b^6x^{11}}{11}+\frac{14\,a^3b^5x^{12}}{3}+\frac{70\,a^4b^4x^{13}}{13}+4\,a^5b^3x^{14}+\frac{28\,a^6b^2x^{15}}{15}+\frac{a^7bx^{16}}{2}+\frac{a^8x^{17}}{17}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^8*x^16,x)
```

```
[Out] 1/9*b^8*x^9+4/5*a*b^7*x^10+28/11*a^2*b^6*x^11+14/3*a^3*b^5*x^12+7
0/13*a^4*b^4*x^13+4*a^5*b^3*x^14+28/15*a^6*b^2*x^15+1/2*a^7*b*x^1
6+1/17*a^8*x^17
```

Maxima [A] time = 1.42684, size = 122, normalized size = 1.15

$$\frac{1}{17}\,a^{8}x^{17}+\frac{1}{2}\,a^{7}bx^{16}+\frac{28}{15}\,a^{6}b^{2}x^{15}+4\,a^{5}b^{3}x^{14}+\frac{70}{13}\,a^{4}b^{4}x^{13}+\frac{14}{3}\,a^{3}b^{5}x^{12}+\frac{28}{11}\,a^{2}b^{6}x^{11}+\frac{4}{5}\,ab^{7}x^{10}+\frac{1}{9}\,b^{8}x^{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^16,x, algorithm="maxima")
```

```
[Out] 1/17*a^8*x^17 + 1/2*a^7*b*x^16 + 28/15*a^6*b^2*x^15 + 4*a^5*b^3*x
^14 + 70/13*a^4*b^4*x^13 + 14/3*a^3*b^5*x^12 + 28/11*a^2*b^6*x^11
 + 4/5*a*b^7*x^10 + 1/9*b^8*x^9
```

Fricas [A] time = 0.211439, size = 122, normalized size = 1.15

$$\frac{1}{17}\,a^{8}x^{17}+\frac{1}{2}\,a^{7}bx^{16}+\frac{28}{15}\,a^{6}b^{2}x^{15}+4\,a^{5}b^{3}x^{14}+\frac{70}{13}\,a^{4}b^{4}x^{13}+\frac{14}{3}\,a^{3}b^{5}x^{12}+\frac{28}{11}\,a^{2}b^{6}x^{11}+\frac{4}{5}\,ab^{7}x^{10}+\frac{1}{9}\,b^{8}x^{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^16,x, algorithm="fricas")
```

```
[Out] 1/17*a^8*x^17 + 1/2*a^7*b*x^16 + 28/15*a^6*b^2*x^15 + 4*a^5*b^3*x
^14 + 70/13*a^4*b^4*x^13 + 14/3*a^3*b^5*x^12 + 28/11*a^2*b^6*x^11
 + 4/5*a*b^7*x^10 + 1/9*b^8*x^9
```

Sympy [A] time = 0.157539, size = 104, normalized size = 0.98

$$\frac{a^{8}x^{17}}{17}+\frac{a^{7}bx^{16}}{2}+\frac{28a^{6}b^{2}x^{15}}{15}+4a^{5}b^{3}x^{14}+\frac{70a^{4}b^{4}x^{13}}{13}+\frac{14a^{3}b^{5}x^{12}}{3}+\frac{28a^{2}b^{6}x^{11}}{11}+\frac{4ab^{7}x^{10}}{5}+\frac{b^{8}x^{9}}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**8*x**16,x)
```

```
[Out] a**8*x**17/17 + a**7*b*x**16/2 + 28*a**6*b**2*x**15/15 + 4*a**5*b
**3*x**14 + 70*a**4*b**4*x**13/13 + 14*a**3*b**5*x**12/3 + 28*a**
2*b**6*x**11/11 + 4*a*b**7*x**10/5 + b**8*x**9/9
```

GIAC/XCAS [A] time = 0.218663, size = 122, normalized size = 1.15

$$\frac{1}{17}\,a^{8}x^{17}+\frac{1}{2}\,a^{7}bx^{16}+\frac{28}{15}\,a^{6}b^{2}x^{15}+4\,a^{5}b^{3}x^{14}+\frac{70}{13}\,a^{4}b^{4}x^{13}+\frac{14}{3}\,a^{3}b^{5}x^{12}+\frac{28}{11}\,a^{2}b^{6}x^{11}+\frac{4}{5}\,ab^{7}x^{10}+\frac{1}{9}\,b^{8}x^{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^16,x, algorithm="giac")
```

```
[Out] 1/17*a^8*x^17 + 1/2*a^7*b*x^16 + 28/15*a^6*b^2*x^15 + 4*a^5*b^3*x
^14 + 70/13*a^4*b^4*x^13 + 14/3*a^3*b^5*x^12 + 28/11*a^2*b^6*x^11
 + 4/5*a*b^7*x^10 + 1/9*b^8*x^9
```

3.1582 $\int \left(a+\frac{b}{x}\right)^8 x^{15}\,dx$

Optimal. Leaf size=106

$$\frac{a^8x^{16}}{16}+\frac{8}{15}a^7bx^{15}+2a^6b^2x^{14}+\frac{56}{13}a^5b^3x^{13}+\frac{35}{6}a^4b^4x^{12}+\frac{56}{11}a^3b^5x^{11}+\frac{14}{5}a^2b^6x^{10}+\frac{8}{9}ab^7x^9+\frac{b^8x^8}{8}$$

```
[Out] (b^8*x^8)/8 + (8*a*b^7*x^9)/9 + (14*a^2*b^6*x^10)/5 + (56*a^3*b^5
*x^11)/11 + (35*a^4*b^4*x^12)/6 + (56*a^5*b^3*x^13)/13 + 2*a^6*b^
2*x^14 + (8*a^7*b*x^15)/15 + (a^8*x^16)/16
```

Rubi [A] time = 0.128805, antiderivative size = 106, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^8x^{16}}{16}+\frac{8}{15}a^7bx^{15}+2a^6b^2x^{14}+\frac{56}{13}a^5b^3x^{13}+\frac{35}{6}a^4b^4x^{12}+\frac{56}{11}a^3b^5x^{11}+\frac{14}{5}a^2b^6x^{10}+\frac{8}{9}ab^7x^9+\frac{b^8x^8}{8}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^8*x^15,x]
```

```
[Out] (b^8*x^8)/8 + (8*a*b^7*x^9)/9 + (14*a^2*b^6*x^10)/5 + (56*a^3*b^5
*x^11)/11 + (35*a^4*b^4*x^12)/6 + (56*a^5*b^3*x^13)/13 + 2*a^6*b^
2*x^14 + (8*a^7*b*x^15)/15 + (a^8*x^16)/16
```

Rubi in Sympy [A] time = 23.0785, size = 105, normalized size = 0.99

$$\frac{a^8x^{16}}{16}+\frac{8a^7bx^{15}}{15}+2a^6b^2x^{14}+\frac{56a^5b^3x^{13}}{13}+\frac{35a^4b^4x^{12}}{6}+\frac{56a^3b^5x^{11}}{11}+\frac{14a^2b^6x^{10}}{5}+\frac{8ab^7x^9}{9}+\frac{b^8x^8}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**8*x**15,x)
```

```
[Out] a**8*x**16/16 + 8*a**7*b*x**15/15 + 2*a**6*b**2*x**14 + 56*a**5*b
**3*x**13/13 + 35*a**4*b**4*x**12/6 + 56*a**3*b**5*x**11/11 + 14*
a**2*b**6*x**10/5 + 8*a*b**7*x**9/9 + b**8*x**8/8
```

Mathematica [A] time = 0.00453576, size = 106, normalized size = 1.

$$\frac{a^8x^{16}}{16}+\frac{8}{15}a^7bx^{15}+2a^6b^2x^{14}+\frac{56}{13}a^5b^3x^{13}+\frac{35}{6}a^4b^4x^{12}+\frac{56}{11}a^3b^5x^{11}+\frac{14}{5}a^2b^6x^{10}+\frac{8}{9}ab^7x^9+\frac{b^8x^8}{8}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^8*x^15,x]
```

```
[Out] (b^8*x^8)/8 + (8*a*b^7*x^9)/9 + (14*a^2*b^6*x^10)/5 + (56*a^3*b^5
*x^11)/11 + (35*a^4*b^4*x^12)/6 + (56*a^5*b^3*x^13)/13 + 2*a^6*b^
2*x^14 + (8*a^7*b*x^15)/15 + (a^8*x^16)/16
```

Maple [A] time = 0.002, size = 91, normalized size = 0.9

$$\frac{b^8x^8}{8}+\frac{8\,ab^7x^9}{9}+\frac{14\,a^2b^6x^{10}}{5}+\frac{56\,a^3b^5x^{11}}{11}+\frac{35\,a^4b^4x^{12}}{6}+\frac{56\,a^5b^3x^{13}}{13}+2\,a^6b^2x^{14}+\frac{8\,a^7bx^{15}}{15}+\frac{a^8x^{16}}{16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((a+b/x)^8*x^15,x)
```

```
[Out] 1/8*b^8*x^8+8/9*a*b^7*x^9+14/5*a^2*b^6*x^10+56/11*a^3*b^5*x^11+35
/6*a^4*b^4*x^12+56/13*a^5*b^3*x^13+2*a^6*b^2*x^14+8/15*a^7*b*x^15
+1/16*a^8*x^16
```

Maxima [A] time = 1.43794, size = 122, normalized size = 1.15

$$\frac{1}{16}a^8x^{16}+\frac{8}{15}a^7bx^{15}+2a^6b^2x^{14}+\frac{56}{13}a^5b^3x^{13}+\frac{35}{6}a^4b^4x^{12}+\frac{56}{11}a^3b^5x^{11}+\frac{14}{5}a^2b^6x^{10}+\frac{8}{9}ab^7x^9+\frac{1}{8}b^8x^8$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a + b/x)^8*x^15,x, algorithm="maxima")
```

```
[Out] 1/16*a^8*x^16 + 8/15*a^7*b*x^15 + 2*a^6*b^2*x^14 + 56/13*a^5*b^3*
x^13 + 35/6*a^4*b^4*x^12 + 56/11*a^3*b^5*x^11 + 14/5*a^2*b^6*x^10
 + 8/9*a*b^7*x^9 + 1/8*b^8*x^8
```

Fricas [A] time = 0.211693, size = 122, normalized size = 1.15

$$\frac{1}{16}a^8x^{16}+\frac{8}{15}a^7bx^{15}+2a^6b^2x^{14}+\frac{56}{13}a^5b^3x^{13}+\frac{35}{6}a^4b^4x^{12}+\frac{56}{11}a^3b^5x^{11}+\frac{14}{5}a^2b^6x^{10}+\frac{8}{9}ab^7x^9+\frac{1}{8}b^8x^8$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a + b/x)^8*x^15,x, algorithm="fricas")
```

```
[Out] 1/16*a^8*x^16 + 8/15*a^7*b*x^15 + 2*a^6*b^2*x^14 + 56/13*a^5*b^3*
x^13 + 35/6*a^4*b^4*x^12 + 56/11*a^3*b^5*x^11 + 14/5*a^2*b^6*x^10
 + 8/9*a*b^7*x^9 + 1/8*b^8*x^8
```

Sympy [A] time = 0.169245, size = 105, normalized size = 0.99

$$\frac{a^8x^{16}}{16}+\frac{8a^7bx^{15}}{15}+2a^6b^2x^{14}+\frac{56a^5b^3x^{13}}{13}+\frac{35a^4b^4x^{12}}{6}+\frac{56a^3b^5x^{11}}{11}+\frac{14a^2b^6x^{10}}{5}+\frac{8ab^7x^9}{9}+\frac{b^8x^8}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a+b/x)**8*x**15,x)
```

```
[Out] a**8*x**16/16 + 8*a**7*b*x**15/15 + 2*a**6*b**2*x**14 + 56*a**5*b
**3*x**13/13 + 35*a**4*b**4*x**12/6 + 56*a**3*b**5*x**11/11 + 14*
a**2*b**6*x**10/5 + 8*a*b**7*x**9/9 + b**8*x**8/8
```

GIAC/XCAS [A] time = 0.218988, size = 122, normalized size = 1.15

$$\frac{1}{16}a^8x^{16}+\frac{8}{15}a^7bx^{15}+2a^6b^2x^{14}+\frac{56}{13}a^5b^3x^{13}+\frac{35}{6}a^4b^4x^{12}+\frac{56}{11}a^3b^5x^{11}+\frac{14}{5}a^2b^6x^{10}+\frac{8}{9}ab^7x^9+\frac{1}{8}b^8x^8$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a + b/x)^8*x^15,x, algorithm="giac")
```

```
[Out] 1/16*a^8*x^16 + 8/15*a^7*b*x^15 + 2*a^6*b^2*x^14 + 56/13*a^5*b^3*
x^13 + 35/6*a^4*b^4*x^12 + 56/11*a^3*b^5*x^11 + 14/5*a^2*b^6*x^10
 + 8/9*a*b^7*x^9 + 1/8*b^8*x^8
```

3.1583 $\int \left(a+\frac{b}{x}\right)^8 x^{13}\,dx$

Optimal. Leaf size=98

$$-\frac{b^5(ax+b)^9}{9a^6}+\frac{b^4(ax+b)^{10}}{2a^6}-\frac{10b^3(ax+b)^{11}}{11a^6}+\frac{5b^2(ax+b)^{12}}{6a^6}+\frac{(ax+b)^{14}}{14a^6}-\frac{5b(ax+b)^{13}}{13a^6}$$

```
[Out] -(b^5*(b + a*x)^9)/(9*a^6) + (b^4*(b + a*x)^10)/(2*a^6) - (10*b^3
*(b + a*x)^11)/(11*a^6) + (5*b^2*(b + a*x)^12)/(6*a^6) - (5*b*(b
+ a*x)^13)/(13*a^6) + (b + a*x)^14/(14*a^6)
```

Rubi [A] time = 0.124814, antiderivative size = 98, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{b^5(ax+b)^9}{9a^6}+\frac{b^4(ax+b)^{10}}{2a^6}-\frac{10b^3(ax+b)^{11}}{11a^6}+\frac{5b^2(ax+b)^{12}}{6a^6}+\frac{(ax+b)^{14}}{14a^6}-\frac{5b(ax+b)^{13}}{13a^6}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^8*x^13,x]
```

```
[Out] -(b^5*(b + a*x)^9)/(9*a^6) + (b^4*(b + a*x)^10)/(2*a^6) - (10*b^3
*(b + a*x)^11)/(11*a^6) + (5*b^2*(b + a*x)^12)/(6*a^6) - (5*b*(b
+ a*x)^13)/(13*a^6) + (b + a*x)^14/(14*a^6)
```

Rubi in Sympy [A] time = 24.4364, size = 90, normalized size = 0.92

$$-\frac{b^5\left(ax+b\right)^9}{9a^6}+\frac{b^4\left(ax+b\right)^{10}}{2a^6}-\frac{10b^3\left(ax+b\right)^{11}}{11a^6}+\frac{5b^2\left(ax+b\right)^{12}}{6a^6}-\frac{5b\left(ax+b\right)^{13}}{13a^6}+\frac{\left(ax+b\right)^{14}}{14a^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**8*x**13,x)
```

```
[Out] -b**5*(a*x + b)**9/(9*a**6) + b**4*(a*x + b)**10/(2*a**6) - 10*b*
*3*(a*x + b)**11/(11*a**6) + 5*b**2*(a*x + b)**12/(6*a**6) - 5*b*
(a*x + b)**13/(13*a**6) + (a*x + b)**14/(14*a**6)
```

Mathematica [A] time = 0.00454728, size = 106, normalized size = 1.08

$$\frac{a^8x^{14}}{14}+\frac{8}{13}a^7bx^{13}+\frac{7}{3}a^6b^2x^{12}+\frac{56}{11}a^5b^3x^{11}+7a^4b^4x^{10}+\frac{56}{9}a^3b^5x^9+\frac{7}{2}a^2b^6x^8+\frac{8}{7}ab^7x^7+\frac{b^8x^6}{6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^8*x^13,x]
```

```
[Out] (b^8*x^6)/6 + (8*a*b^7*x^7)/7 + (7*a^2*b^6*x^8)/2 + (56*a^3*b^5*x
^9)/9 + 7*a^4*b^4*x^10 + (56*a^5*b^3*x^11)/11 + (7*a^6*b^2*x^12)/
3 + (8*a^7*b*x^13)/13 + (a^8*x^14)/14
```

Maple [A] time = 0.003, size = 91, normalized size = 0.9

$$\frac{a^8x^{14}}{14}+\frac{8\,a^7bx^{13}}{13}+\frac{7\,b^2a^6x^{12}}{3}+\frac{56\,a^5b^3x^{11}}{11}+7\,a^4b^4x^{10}+\frac{56\,a^3b^5x^9}{9}+\frac{7\,a^2b^6x^8}{2}+\frac{8\,ab^7x^7}{7}+\frac{b^8x^6}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^8*x^13,x)
```

```
[Out] 1/14*a^8*x^14+8/13*a^7*b*x^13+7/3*b^2*a^6*x^12+56/11*a^5*b^3*x^11
+7*a^4*b^4*x^10+56/9*a^3*b^5*x^9+7/2*a^2*b^6*x^8+8/7*a*b^7*x^7+1/
6*b^8*x^6
```

Maxima [A] time = 1.43021, size = 122, normalized size = 1.24

$$\frac{1}{14}\,a^{8}x^{14}+\frac{8}{13}\,a^{7}bx^{13}+\frac{7}{3}\,a^{6}b^{2}x^{12}+\frac{56}{11}\,a^{5}b^{3}x^{11}+7\,a^{4}b^{4}x^{10}+\frac{56}{9}\,a^{3}b^{5}x^{9}+\frac{7}{2}\,a^{2}b^{6}x^{8}+\frac{8}{7}\,ab^{7}x^{7}+\frac{1}{6}\,b^{8}x^{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^13,x, algorithm="maxima")
```

```
[Out] 1/14*a^8*x^14 + 8/13*a^7*b*x^13 + 7/3*a^6*b^2*x^12 + 56/11*a^5*b^
3*x^11 + 7*a^4*b^4*x^10 + 56/9*a^3*b^5*x^9 + 7/2*a^2*b^6*x^8 + 8/
7*a*b^7*x^7 + 1/6*b^8*x^6
```

Fricas [A] time = 0.213152, size = 122, normalized size = 1.24

$$\frac{1}{14}\,a^{8}x^{14}+\frac{8}{13}\,a^{7}bx^{13}+\frac{7}{3}\,a^{6}b^{2}x^{12}+\frac{56}{11}\,a^{5}b^{3}x^{11}+7\,a^{4}b^{4}x^{10}+\frac{56}{9}\,a^{3}b^{5}x^{9}+\frac{7}{2}\,a^{2}b^{6}x^{8}+\frac{8}{7}\,ab^{7}x^{7}+\frac{1}{6}\,b^{8}x^{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^13,x, algorithm="fricas")
```

```
[Out] 1/14*a^8*x^14 + 8/13*a^7*b*x^13 + 7/3*a^6*b^2*x^12 + 56/11*a^5*b^
3*x^11 + 7*a^4*b^4*x^10 + 56/9*a^3*b^5*x^9 + 7/2*a^2*b^6*x^8 + 8/
7*a*b^7*x^7 + 1/6*b^8*x^6
```

Sympy [A] time = 0.158882, size = 105, normalized size = 1.07

$$\frac{a^{8}x^{14}}{14}+\frac{8a^{7}bx^{13}}{13}+\frac{7a^{6}b^{2}x^{12}}{3}+\frac{56a^{5}b^{3}x^{11}}{11}+7a^{4}b^{4}x^{10}+\frac{56a^{3}b^{5}x^{9}}{9}+\frac{7a^{2}b^{6}x^{8}}{2}+\frac{8ab^{7}x^{7}}{7}+\frac{b^{8}x^{6}}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**8*x**13,x)
```

```
[Out] a**8*x**14/14 + 8*a**7*b*x**13/13 + 7*a**6*b**2*x**12/3 + 56*a**5
*b**3*x**11/11 + 7*a**4*b**4*x**10 + 56*a**3*b**5*x**9/9 + 7*a**2
*b**6*x**8/2 + 8*a*b**7*x**7/7 + b**8*x**6/6
```

GIAC/XCAS [A] time = 0.217178, size = 122, normalized size = 1.24

$$\frac{1}{14}\,a^{8}x^{14}+\frac{8}{13}\,a^{7}bx^{13}+\frac{7}{3}\,a^{6}b^{2}x^{12}+\frac{56}{11}\,a^{5}b^{3}x^{11}+7\,a^{4}b^{4}x^{10}+\frac{56}{9}\,a^{3}b^{5}x^{9}+\frac{7}{2}\,a^{2}b^{6}x^{8}+\frac{8}{7}\,ab^{7}x^{7}+\frac{1}{6}\,b^{8}x^{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^13,x, algorithm="giac")
```

```
[Out] 1/14*a^8*x^14 + 8/13*a^7*b*x^13 + 7/3*a^6*b^2*x^12 + 56/11*a^5*b^
3*x^11 + 7*a^4*b^4*x^10 + 56/9*a^3*b^5*x^9 + 7/2*a^2*b^6*x^8 + 8/
7*a*b^7*x^7 + 1/6*b^8*x^6
```

3.1584 $\int \left(a+\frac{b}{x}\right)^8 x^{12}\, dx$

Optimal. Leaf size=81

$$\frac{b^4(ax+b)^9}{9a^5}-\frac{2b^3(ax+b)^{10}}{5a^5}+\frac{6b^2(ax+b)^{11}}{11a^5}+\frac{(ax+b)^{13}}{13a^5}-\frac{b(ax+b)^{12}}{3a^5}$$

```
[Out] (b^4*(b + a*x)^9)/(9*a^5) - (2*b^3*(b + a*x)^10)/(5*a^5) + (6*b^2
*(b + a*x)^11)/(11*a^5) - (b*(b + a*x)^12)/(3*a^5) + (b + a*x)^13
/(13*a^5)
```

Rubi [A] time = 0.109553, antiderivative size = 81, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{b^4(ax+b)^9}{9a^5}-\frac{2b^3(ax+b)^{10}}{5a^5}+\frac{6b^2(ax+b)^{11}}{11a^5}+\frac{(ax+b)^{13}}{13a^5}-\frac{b(ax+b)^{12}}{3a^5}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^8*x^12,x]
```

```
[Out] (b^4*(b + a*x)^9)/(9*a^5) - (2*b^3*(b + a*x)^10)/(5*a^5) + (6*b^2
*(b + a*x)^11)/(11*a^5) - (b*(b + a*x)^12)/(3*a^5) + (b + a*x)^13
/(13*a^5)
```

Rubi in Sympy [A] time = 21.0719, size = 73, normalized size = 0.9

$$\frac{b^4\left(ax+b\right)^9}{9a^5}-\frac{2b^3\left(ax+b\right)^{10}}{5a^5}+\frac{6b^2\left(ax+b\right)^{11}}{11a^5}-\frac{b\left(ax+b\right)^{12}}{3a^5}+\frac{\left(ax+b\right)^{13}}{13a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**8*x**12,x)
```

```
[Out] b**4*(a*x + b)**9/(9*a**5) - 2*b**3*(a*x + b)**10/(5*a**5) + 6*b*
*2*(a*x + b)**11/(11*a**5) - b*(a*x + b)**12/(3*a**5) + (a*x + b)
**13/(13*a**5)
```

Mathematica [A] time = 0.00551555, size = 104, normalized size = 1.28

$$\frac{a^8x^{13}}{13}+\frac{2}{3}a^7bx^{12}+\frac{28}{11}a^6b^2x^{11}+\frac{28}{5}a^5b^3x^{10}+\frac{70}{9}a^4b^4x^9+7a^3b^5x^8+4a^2b^6x^7+\frac{4}{3}ab^7x^6+\frac{b^8x^5}{5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^8*x^12,x]
```

```
[Out] (b^8*x^5)/5 + (4*a*b^7*x^6)/3 + 4*a^2*b^6*x^7 + 7*a^3*b^5*x^8 + (
70*a^4*b^4*x^9)/9 + (28*a^5*b^3*x^10)/5 + (28*a^6*b^2*x^11)/11 +
(2*a^7*b*x^12)/3 + (a^8*x^13)/13
```

Maple [A] time = 0.003, size = 91, normalized size = 1.1

$$\frac{a^8x^{13}}{13}+\frac{2\,a^7bx^{12}}{3}+\frac{28\,a^6b^2x^{11}}{11}+\frac{28\,a^5b^3x^{10}}{5}+\frac{70\,a^4b^4x^9}{9}+7\,a^3b^5x^8+4\,a^2b^6x^7+\frac{4\,ab^7x^6}{3}+\frac{b^8x^5}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^8*x^12,x)
```

```
[Out] 1/13*a^8*x^13+2/3*a^7*b*x^12+28/11*a^6*b^2*x^11+28/5*a^5*b^3*x^10
+70/9*a^4*b^4*x^9+7*a^3*b^5*x^8+4*a^2*b^6*x^7+4/3*a*b^7*x^6+1/5*b
^8*x^5
```

Maxima [A] time = 1.44445, size = 122, normalized size = 1.51

$$\frac{1}{13}\,a^8x^{13} + \frac{2}{3}\,a^7bx^{12} + \frac{28}{11}\,a^6b^2x^{11} + \frac{28}{5}\,a^5b^3x^{10} + \frac{70}{9}\,a^4b^4x^9 + 7\,a^3b^5x^8 + 4\,a^2b^6x^7 + \frac{4}{3}\,ab^7x^6 + \frac{1}{5}\,b^8x^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^12,x, algorithm="maxima")
```

```
[Out] 1/13*a^8*x^13 + 2/3*a^7*b*x^12 + 28/11*a^6*b^2*x^11 + 28/5*a^5*b^
3*x^10 + 70/9*a^4*b^4*x^9 + 7*a^3*b^5*x^8 + 4*a^2*b^6*x^7 + 4/3*a
*b^7*x^6 + 1/5*b^8*x^5
```

Fricas [A] time = 0.212989, size = 122, normalized size = 1.51

$$\frac{1}{13}\,a^8x^{13} + \frac{2}{3}\,a^7bx^{12} + \frac{28}{11}\,a^6b^2x^{11} + \frac{28}{5}\,a^5b^3x^{10} + \frac{70}{9}\,a^4b^4x^9 + 7\,a^3b^5x^8 + 4\,a^2b^6x^7 + \frac{4}{3}\,ab^7x^6 + \frac{1}{5}\,b^8x^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^12,x, algorithm="fricas")
```

```
[Out] 1/13*a^8*x^13 + 2/3*a^7*b*x^12 + 28/11*a^6*b^2*x^11 + 28/5*a^5*b^
3*x^10 + 70/9*a^4*b^4*x^9 + 7*a^3*b^5*x^8 + 4*a^2*b^6*x^7 + 4/3*a
*b^7*x^6 + 1/5*b^8*x^5
```

Sympy [A] time = 0.154342, size = 104, normalized size = 1.28

$$\frac{a^8x^{13}}{13} + \frac{2a^7bx^{12}}{3} + \frac{28a^6b^2x^{11}}{11} + \frac{28a^5b^3x^{10}}{5} + \frac{70a^4b^4x^9}{9} + 7a^3b^5x^8 + 4a^2b^6x^7 + \frac{4ab^7x^6}{3} + \frac{b^8x^5}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**8*x**12,x)
```

```
[Out] a**8*x**13/13 + 2*a**7*b*x**12/3 + 28*a**6*b**2*x**11/11 + 28*a**
5*b**3*x**10/5 + 70*a**4*b**4*x**9/9 + 7*a**3*b**5*x**8 + 4*a**2*
b**6*x**7 + 4*a*b**7*x**6/3 + b**8*x**5/5
```

GIAC/XCAS [A] time = 0.225425, size = 122, normalized size = 1.51

$$\frac{1}{13}\,a^8x^{13} + \frac{2}{3}\,a^7bx^{12} + \frac{28}{11}\,a^6b^2x^{11} + \frac{28}{5}\,a^5b^3x^{10} + \frac{70}{9}\,a^4b^4x^9 + 7\,a^3b^5x^8 + 4\,a^2b^6x^7 + \frac{4}{3}\,ab^7x^6 + \frac{1}{5}\,b^8x^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^12,x, algorithm="giac")
```

```
[Out] 1/13*a^8*x^13 + 2/3*a^7*b*x^12 + 28/11*a^6*b^2*x^11 + 28/5*a^5*b^
3*x^10 + 70/9*a^4*b^4*x^9 + 7*a^3*b^5*x^8 + 4*a^2*b^6*x^7 + 4/3*a
*b^7*x^6 + 1/5*b^8*x^5
```

3.1585 $\int \left(a+\frac{b}{x}\right)^8 x^{11}\,dx$

Optimal. Leaf size=64

$$-\frac{b^3(ax+b)^9}{9a^4}+\frac{3b^2(ax+b)^{10}}{10a^4}+\frac{(ax+b)^{12}}{12a^4}-\frac{3b(ax+b)^{11}}{11a^4}$$

```
[Out] -(b^3*(b + a*x)^9)/(9*a^4) + (3*b^2*(b + a*x)^10)/(10*a^4) - (3*b
*(b + a*x)^11)/(11*a^4) + (b + a*x)^12/(12*a^4)
```

Rubi [A] time = 0.0922738, antiderivative size = 64, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{b^3(ax+b)^9}{9a^4}+\frac{3b^2(ax+b)^{10}}{10a^4}+\frac{(ax+b)^{12}}{12a^4}-\frac{3b(ax+b)^{11}}{11a^4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^8*x^11,x]
```

```
[Out] -(b^3*(b + a*x)^9)/(9*a^4) + (3*b^2*(b + a*x)^10)/(10*a^4) - (3*b
*(b + a*x)^11)/(11*a^4) + (b + a*x)^12/(12*a^4)
```

Rubi in Sympy [A] time = 18.378, size = 58, normalized size = 0.91

$$-\frac{b^3\left(ax+b\right)^9}{9a^4}+\frac{3b^2\left(ax+b\right)^{10}}{10a^4}-\frac{3b\left(ax+b\right)^{11}}{11a^4}+\frac{\left(ax+b\right)^{12}}{12a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**8*x**11,x)
```

```
[Out] -b**3*(a*x + b)**9/(9*a**4) + 3*b**2*(a*x + b)**10/(10*a**4) - 3*
b*(a*x + b)**11/(11*a**4) + (a*x + b)**12/(12*a**4)
```

Mathematica [A] time = 0.00468903, size = 106, normalized size = 1.66

$$\frac{a^8x^{12}}{12}+\frac{8}{11}a^7bx^{11}+\frac{14}{5}a^6b^2x^{10}+\frac{56}{9}a^5b^3x^9+\frac{35}{4}a^4b^4x^8+8a^3b^5x^7+\frac{14}{3}a^2b^6x^6+\frac{8}{5}ab^7x^5+\frac{b^8x^4}{4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^8*x^11,x]
```

```
[Out] (b^8*x^4)/4 + (8*a*b^7*x^5)/5 + (14*a^2*b^6*x^6)/3 + 8*a^3*b^5*x^
7 + (35*a^4*b^4*x^8)/4 + (56*a^5*b^3*x^9)/9 + (14*a^6*b^2*x^10)/5
 + (8*a^7*b*x^11)/11 + (a^8*x^12)/12
```

Maple [A] time = 0.001, size = 91, normalized size = 1.4

$$\frac{a^8x^{12}}{12}+\frac{8\,a^7bx^{11}}{11}+\frac{14\,a^6b^2x^{10}}{5}+\frac{56\,a^5b^3x^9}{9}+\frac{35\,a^4b^4x^8}{4}+8\,a^3b^5x^7+\frac{14\,a^2b^6x^6}{3}+\frac{8\,ab^7x^5}{5}+\frac{b^8x^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^8*x^11,x)
```

```
[Out] 1/12*a^8*x^12+8/11*a^7*b*x^11+14/5*a^6*b^2*x^10+56/9*a^5*b^3*x^9+
35/4*a^4*b^4*x^8+8*a^3*b^5*x^7+14/3*a^2*b^6*x^6+8/5*a*b^7*x^5+1/4
*b^8*x^4
```

Maxima [A] time = 1.4361, size = 122, normalized size = 1.91

$$\frac{1}{12}\,a^{8}x^{12}+\frac{8}{11}\,a^{7}bx^{11}+\frac{14}{5}\,a^{6}b^{2}x^{10}+\frac{56}{9}\,a^{5}b^{3}x^{9}+\frac{35}{4}\,a^{4}b^{4}x^{8}+8\,a^{3}b^{5}x^{7}+\frac{14}{3}\,a^{2}b^{6}x^{6}+\frac{8}{5}\,ab^{7}x^{5}+\frac{1}{4}\,b^{8}x^{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^11,x, algorithm="maxima")
```

```
[Out] 1/12*a^8*x^12 + 8/11*a^7*b*x^11 + 14/5*a^6*b^2*x^10 + 56/9*a^5*b^
3*x^9 + 35/4*a^4*b^4*x^8 + 8*a^3*b^5*x^7 + 14/3*a^2*b^6*x^6 + 8/5
*a*b^7*x^5 + 1/4*b^8*x^4
```

Fricas [A] time = 0.211117, size = 122, normalized size = 1.91

$$\frac{1}{12}\,a^{8}x^{12}+\frac{8}{11}\,a^{7}bx^{11}+\frac{14}{5}\,a^{6}b^{2}x^{10}+\frac{56}{9}\,a^{5}b^{3}x^{9}+\frac{35}{4}\,a^{4}b^{4}x^{8}+8\,a^{3}b^{5}x^{7}+\frac{14}{3}\,a^{2}b^{6}x^{6}+\frac{8}{5}\,ab^{7}x^{5}+\frac{1}{4}\,b^{8}x^{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^11,x, algorithm="fricas")
```

```
[Out] 1/12*a^8*x^12 + 8/11*a^7*b*x^11 + 14/5*a^6*b^2*x^10 + 56/9*a^5*b^
3*x^9 + 35/4*a^4*b^4*x^8 + 8*a^3*b^5*x^7 + 14/3*a^2*b^6*x^6 + 8/5
*a*b^7*x^5 + 1/4*b^8*x^4
```

Sympy [A] time = 0.154703, size = 105, normalized size = 1.64

$$\frac{a^{8}x^{12}}{12}+\frac{8a^{7}bx^{11}}{11}+\frac{14a^{6}b^{2}x^{10}}{5}+\frac{56a^{5}b^{3}x^{9}}{9}+\frac{35a^{4}b^{4}x^{8}}{4}+8a^{3}b^{5}x^{7}+\frac{14a^{2}b^{6}x^{6}}{3}+\frac{8ab^{7}x^{5}}{5}+\frac{b^{8}x^{4}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**8*x**11,x)
```

```
[Out] a**8*x**12/12 + 8*a**7*b*x**11/11 + 14*a**6*b**2*x**10/5 + 56*a**
5*b**3*x**9/9 + 35*a**4*b**4*x**8/4 + 8*a**3*b**5*x**7 + 14*a**2*
b**6*x**6/3 + 8*a*b**7*x**5/5 + b**8*x**4/4
```

GIAC/XCAS [A] time = 0.221758, size = 122, normalized size = 1.91

$$\frac{1}{12}\,a^{8}x^{12}+\frac{8}{11}\,a^{7}bx^{11}+\frac{14}{5}\,a^{6}b^{2}x^{10}+\frac{56}{9}\,a^{5}b^{3}x^{9}+\frac{35}{4}\,a^{4}b^{4}x^{8}+8\,a^{3}b^{5}x^{7}+\frac{14}{3}\,a^{2}b^{6}x^{6}+\frac{8}{5}\,ab^{7}x^{5}+\frac{1}{4}\,b^{8}x^{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^11,x, algorithm="giac")
```

```
[Out] 1/12*a^8*x^12 + 8/11*a^7*b*x^11 + 14/5*a^6*b^2*x^10 + 56/9*a^5*b^
3*x^9 + 35/4*a^4*b^4*x^8 + 8*a^3*b^5*x^7 + 14/3*a^2*b^6*x^6 + 8/5
*a*b^7*x^5 + 1/4*b^8*x^4
```

3.1586 $\int \left(a+\frac{b}{x}\right)^8 x^{10}\,dx$

Optimal. Leaf size=47

$$\frac{b^2(ax+b)^9}{9a^3}+\frac{(ax+b)^{11}}{11a^3}-\frac{b(ax+b)^{10}}{5a^3}$$

```
[Out] (b^2*(b + a*x)^9)/(9*a^3) - (b*(b + a*x)^10)/(5*a^3) + (b + a*x)^
11/(11*a^3)
```

Rubi [A] time = 0.0775207, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{b^2(ax+b)^9}{9a^3}+\frac{(ax+b)^{11}}{11a^3}-\frac{b(ax+b)^{10}}{5a^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^8*x^10,x]
```

```
[Out] (b^2*(b + a*x)^9)/(9*a^3) - (b*(b + a*x)^10)/(5*a^3) + (b + a*x)^
11/(11*a^3)
```

Rubi in Sympy [A] time = 15.093, size = 39, normalized size = 0.83

$$\frac{b^2\,(ax+b)^9}{9a^3}-\frac{b\,(ax+b)^{10}}{5a^3}+\frac{(ax+b)^{11}}{11a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**8*x**10,x)
```

```
[Out] b**2*(a*x + b)**9/(9*a**3) - b*(a*x + b)**10/(5*a**3) + (a*x + b)
**11/(11*a**3)
```

Mathematica [B] time = 0.00453768, size = 102, normalized size = 2.17

$$\frac{a^8x^{11}}{11}+\frac{4}{5}a^7bx^{10}+\frac{28}{9}a^6b^2x^9+7a^5b^3x^8+10a^4b^4x^7+\frac{28}{3}a^3b^5x^6+\frac{28}{5}a^2b^6x^5+2ab^7x^4+\frac{b^8x^3}{3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^8*x^10,x]
```

```
[Out] (b^8*x^3)/3 + 2*a*b^7*x^4 + (28*a^2*b^6*x^5)/5 + (28*a^3*b^5*x^6)
/3 + 10*a^4*b^4*x^7 + 7*a^5*b^3*x^8 + (28*a^6*b^2*x^9)/9 + (4*a^7
*b*x^10)/5 + (a^8*x^11)/11
```

Maple [B] time = 0.002, size = 91, normalized size = 1.9

$$\frac{a^8x^{11}}{11}+\frac{4\,a^7bx^{10}}{5}+\frac{28\,a^6b^2x^9}{9}+7\,a^5b^3x^8+10\,a^4b^4x^7+\frac{28\,a^3b^5x^6}{3}+\frac{28\,a^2b^6x^5}{5}+2\,ab^7x^4+\frac{b^8x^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^8*x^10,x)
```

```
[Out] 1/11*a^8*x^11+4/5*a^7*b*x^10+28/9*a^6*b^2*x^9+7*a^5*b^3*x^8+10*a^
4*b^4*x^7+28/3*a^3*b^5*x^6+28/5*a^2*b^6*x^5+2*a*b^7*x^4+1/3*b^8*x
^3
```

Maxima [A] time = 1.42572, size = 122, normalized size = 2.6

$$\frac{1}{11}\,a^{8}x^{11} + \frac{4}{5}\,a^{7}bx^{10} + \frac{28}{9}\,a^{6}b^{2}x^{9} + 7\,a^{5}b^{3}x^{8} + 10\,a^{4}b^{4}x^{7} + \frac{28}{3}\,a^{3}b^{5}x^{6} + \frac{28}{5}\,a^{2}b^{6}x^{5} + 2\,ab^{7}x^{4} + \frac{1}{3}\,b^{8}x^{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^10,x, algorithm="maxima")
```

```
[Out] 1/11*a^8*x^11 + 4/5*a^7*b*x^10 + 28/9*a^6*b^2*x^9 + 7*a^5*b^3*x^8
 + 10*a^4*b^4*x^7 + 28/3*a^3*b^5*x^6 + 28/5*a^2*b^6*x^5 + 2*a*b^7
*x^4 + 1/3*b^8*x^3
```

Fricas [A] time = 0.211172, size = 122, normalized size = 2.6

$$\frac{1}{11}\,a^{8}x^{11} + \frac{4}{5}\,a^{7}bx^{10} + \frac{28}{9}\,a^{6}b^{2}x^{9} + 7\,a^{5}b^{3}x^{8} + 10\,a^{4}b^{4}x^{7} + \frac{28}{3}\,a^{3}b^{5}x^{6} + \frac{28}{5}\,a^{2}b^{6}x^{5} + 2\,ab^{7}x^{4} + \frac{1}{3}\,b^{8}x^{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^10,x, algorithm="fricas")
```

```
[Out] 1/11*a^8*x^11 + 4/5*a^7*b*x^10 + 28/9*a^6*b^2*x^9 + 7*a^5*b^3*x^8
 + 10*a^4*b^4*x^7 + 28/3*a^3*b^5*x^6 + 28/5*a^2*b^6*x^5 + 2*a*b^7
*x^4 + 1/3*b^8*x^3
```

Sympy [A] time = 0.149122, size = 102, normalized size = 2.17

$$\frac{a^{8}x^{11}}{11} + \frac{4a^{7}bx^{10}}{5} + \frac{28a^{6}b^{2}x^{9}}{9} + 7a^{5}b^{3}x^{8} + 10a^{4}b^{4}x^{7} + \frac{28a^{3}b^{5}x^{6}}{3} + \frac{28a^{2}b^{6}x^{5}}{5} + 2ab^{7}x^{4} + \frac{b^{8}x^{3}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**8*x**10,x)
```

```
[Out] a**8*x**11/11 + 4*a**7*b*x**10/5 + 28*a**6*b**2*x**9/9 + 7*a**5*b
**3*x**8 + 10*a**4*b**4*x**7 + 28*a**3*b**5*x**6/3 + 28*a**2*b**6
*x**5/5 + 2*a*b**7*x**4 + b**8*x**3/3
```

GIAC/XCAS [A] time = 0.227563, size = 122, normalized size = 2.6

$$\frac{1}{11}\,a^{8}x^{11} + \frac{4}{5}\,a^{7}bx^{10} + \frac{28}{9}\,a^{6}b^{2}x^{9} + 7\,a^{5}b^{3}x^{8} + 10\,a^{4}b^{4}x^{7} + \frac{28}{3}\,a^{3}b^{5}x^{6} + \frac{28}{5}\,a^{2}b^{6}x^{5} + 2\,ab^{7}x^{4} + \frac{1}{3}\,b^{8}x^{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^10,x, algorithm="giac")
```

```
[Out] 1/11*a^8*x^11 + 4/5*a^7*b*x^10 + 28/9*a^6*b^2*x^9 + 7*a^5*b^3*x^8
 + 10*a^4*b^4*x^7 + 28/3*a^3*b^5*x^6 + 28/5*a^2*b^6*x^5 + 2*a*b^7
*x^4 + 1/3*b^8*x^3
```

3.1587 $\int \left(a+\frac{b}{x}\right)^8 x^9\,dx$

Optimal. Leaf size=30

$$\frac{(ax+b)^{10}}{10a^2}-\frac{b(ax+b)^9}{9a^2}$$

```
[Out] -(b*(b + a*x)^9)/(9*a^2) + (b + a*x)^10/(10*a^2)
```

Rubi [A] time = 0.042959, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{(ax+b)^{10}}{10a^2}-\frac{b(ax+b)^9}{9a^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x)^8*x^9,x]
```

```
[Out] -(b*(b + a*x)^9)/(9*a^2) + (b + a*x)^10/(10*a^2)
```

Rubi in Sympy [A] time = 12.1946, size = 24, normalized size = 0.8

$$-\frac{b\,(ax+b)^9}{9a^2}+\frac{(ax+b)^{10}}{10a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x)**8*x**9,x)
```

```
[Out] -b*(a*x + b)**9/(9*a**2) + (a*x + b)**10/(10*a**2)
```

Mathematica [B] time = 0.00431785, size = 104, normalized size = 3.47

$$\frac{a^8x^{10}}{10}+\frac{8}{9}a^7bx^9+\frac{7}{2}a^6b^2x^8+8a^5b^3x^7+\frac{35}{3}a^4b^4x^6+\frac{56}{5}a^3b^5x^5+7a^2b^6x^4+\frac{8}{3}ab^7x^3+\frac{b^8x^2}{2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x)^8*x^9,x]
```

```
[Out] (b^8*x^2)/2 + (8*a*b^7*x^3)/3 + 7*a^2*b^6*x^4 + (56*a^3*b^5*x^5)/
5 + (35*a^4*b^4*x^6)/3 + 8*a^5*b^3*x^7 + (7*a^6*b^2*x^8)/2 + (8*a
^7*b*x^9)/9 + (a^8*x^10)/10
```

Maple [B] time = 0.002, size = 91, normalized size = 3.

$$\frac{a^8x^{10}}{10}+\frac{8\,a^7bx^9}{9}+\frac{7\,a^6b^2x^8}{2}+8\,a^5b^3x^7+\frac{35\,a^4b^4x^6}{3}+\frac{56\,a^3b^5x^5}{5}+7\,a^2b^6x^4+\frac{8\,ab^7x^3}{3}+\frac{x^2b^8}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x)^8*x^9,x)
```

```
[Out] 1/10*a^8*x^10+8/9*a^7*b*x^9+7/2*a^6*b^2*x^8+8*a^5*b^3*x^7+35/3*a^
4*b^4*x^6+56/5*a^3*b^5*x^5+7*a^2*b^6*x^4+8/3*a*b^7*x^3+1/2*x^2*b^
8
```

Maxima [A] time = 1.44819, size = 122, normalized size = 4.07

$$\frac{1}{10}a^8x^{10} + \frac{8}{9}a^7bx^9 + \frac{7}{2}a^6b^2x^8 + 8a^5b^3x^7 + \frac{35}{3}a^4b^4x^6 + \frac{56}{5}a^3b^5x^5 + 7a^2b^6x^4 + \frac{8}{3}ab^7x^3 + \frac{1}{2}b^8x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^9,x, algorithm="maxima")
```

```
[Out] 1/10*a^8*x^10 + 8/9*a^7*b*x^9 + 7/2*a^6*b^2*x^8 + 8*a^5*b^3*x^7 +
 35/3*a^4*b^4*x^6 + 56/5*a^3*b^5*x^5 + 7*a^2*b^6*x^4 + 8/3*a*b^7*
x^3 + 1/2*b^8*x^2
```

Fricas [A] time = 0.211513, size = 122, normalized size = 4.07

$$\frac{1}{10}a^8x^{10} + \frac{8}{9}a^7bx^9 + \frac{7}{2}a^6b^2x^8 + 8a^5b^3x^7 + \frac{35}{3}a^4b^4x^6 + \frac{56}{5}a^3b^5x^5 + 7a^2b^6x^4 + \frac{8}{3}ab^7x^3 + \frac{1}{2}b^8x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^9,x, algorithm="fricas")
```

```
[Out] 1/10*a^8*x^10 + 8/9*a^7*b*x^9 + 7/2*a^6*b^2*x^8 + 8*a^5*b^3*x^7 +
 35/3*a^4*b^4*x^6 + 56/5*a^3*b^5*x^5 + 7*a^2*b^6*x^4 + 8/3*a*b^7*
x^3 + 1/2*b^8*x^2
```

Sympy [A] time = 0.1548, size = 104, normalized size = 3.47

$$\frac{a^8x^{10}}{10} + \frac{8a^7bx^9}{9} + \frac{7a^6b^2x^8}{2} + 8a^5b^3x^7 + \frac{35a^4b^4x^6}{3} + \frac{56a^3b^5x^5}{5} + 7a^2b^6x^4 + \frac{8ab^7x^3}{3} + \frac{b^8x^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**8*x**9,x)
```

```
[Out] a**8*x**10/10 + 8*a**7*b*x**9/9 + 7*a**6*b**2*x**8/2 + 8*a**5*b**
3*x**7 + 35*a**4*b**4*x**6/3 + 56*a**3*b**5*x**5/5 + 7*a**2*b**6*
x**4 + 8*a*b**7*x**3/3 + b**8*x**2/2
```

GIAC/XCAS [A] time = 0.221456, size = 122, normalized size = 4.07

$$\frac{1}{10}a^8x^{10} + \frac{8}{9}a^7bx^9 + \frac{7}{2}a^6b^2x^8 + 8a^5b^3x^7 + \frac{35}{3}a^4b^4x^6 + \frac{56}{5}a^3b^5x^5 + 7a^2b^6x^4 + \frac{8}{3}ab^7x^3 + \frac{1}{2}b^8x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^9,x, algorithm="giac")
```

```
[Out] 1/10*a^8*x^10 + 8/9*a^7*b*x^9 + 7/2*a^6*b^2*x^8 + 8*a^5*b^3*x^7 +
 35/3*a^4*b^4*x^6 + 56/5*a^3*b^5*x^5 + 7*a^2*b^6*x^4 + 8/3*a*b^7*
x^3 + 1/2*b^8*x^2
```

3.1588 $\int \left(a+\frac{b}{x}\right)^8 x^8 \, dx$

Optimal. Leaf size=14

$$\frac{(ax+b)^9}{9a}$$

[Out] (b + a*x)^9/(9*a)

Rubi [A] time = 0.016003, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{(ax+b)^9}{9a}$$

Antiderivative was successfully verified.

[In] Int[(a + b/x)^8*x^8,x]

[Out] (b + a*x)^9/(9*a)

Rubi in Sympy [A] time = 2.92303, size = 8, normalized size = 0.57

$$\frac{(ax+b)^9}{9a}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((a+b/x)**8*x**8,x)

[Out] (a*x + b)**9/(9*a)

Mathematica [A] time = 0.00195446, size = 14, normalized size = 1.

$$\frac{(ax+b)^9}{9a}$$

Antiderivative was successfully verified.

[In] Integrate[(a + b/x)^8*x^8,x]

[Out] (b + a*x)^9/(9*a)

Maple [A] time = 0.002, size = 13, normalized size = 0.9

$$\frac{(ax+b)^9}{9\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a+b/x)^8*x^8,x)

[Out] 1/9*(a*x+b)^9/a

Maxima [A] time = 1.45902, size = 116, normalized size = 8.29

$$\frac{1}{9}\,a^{8}x^{9} + a^{7}bx^{8} + 4\,a^{6}b^{2}x^{7} + \frac{28}{3}\,a^{5}b^{3}x^{6} + 14\,a^{4}b^{4}x^{5} + 14\,a^{3}b^{5}x^{4} + \frac{28}{3}\,a^{2}b^{6}x^{3} + 4\,ab^{7}x^{2} + b^{8}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^8,x, algorithm="maxima")
```

```
[Out] 1/9*a^8*x^9 + a^7*b*x^8 + 4*a^6*b^2*x^7 + 28/3*a^5*b^3*x^6 + 14*a
^4*b^4*x^5 + 14*a^3*b^5*x^4 + 28/3*a^2*b^6*x^3 + 4*a*b^7*x^2 + b^
8*x
```

Fricas [A] time = 0.212527, size = 116, normalized size = 8.29

$$\frac{1}{9}\,a^{8}x^{9} + a^{7}bx^{8} + 4\,a^{6}b^{2}x^{7} + \frac{28}{3}\,a^{5}b^{3}x^{6} + 14\,a^{4}b^{4}x^{5} + 14\,a^{3}b^{5}x^{4} + \frac{28}{3}\,a^{2}b^{6}x^{3} + 4\,ab^{7}x^{2} + b^{8}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^8,x, algorithm="fricas")
```

```
[Out] 1/9*a^8*x^9 + a^7*b*x^8 + 4*a^6*b^2*x^7 + 28/3*a^5*b^3*x^6 + 14*a
^4*b^4*x^5 + 14*a^3*b^5*x^4 + 28/3*a^2*b^6*x^3 + 4*a*b^7*x^2 + b^
8*x
```

Sympy [A] time = 0.147259, size = 94, normalized size = 6.71

$$\frac{a^{8}x^{9}}{9} + a^{7}bx^{8} + 4a^{6}b^{2}x^{7} + \frac{28a^{5}b^{3}x^{6}}{3} + 14a^{4}b^{4}x^{5} + 14a^{3}b^{5}x^{4} + \frac{28a^{2}b^{6}x^{3}}{3} + 4ab^{7}x^{2} + b^{8}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**8*x**8,x)
```

```
[Out] a**8*x**9/9 + a**7*b*x**8 + 4*a**6*b**2*x**7 + 28*a**5*b**3*x**6/
3 + 14*a**4*b**4*x**5 + 14*a**3*b**5*x**4 + 28*a**2*b**6*x**3/3 +
 4*a*b**7*x**2 + b**8*x
```

GIAC/XCAS [A] time = 0.222853, size = 116, normalized size = 8.29

$$\frac{1}{9}\,a^{8}x^{9} + a^{7}bx^{8} + 4\,a^{6}b^{2}x^{7} + \frac{28}{3}\,a^{5}b^{3}x^{6} + 14\,a^{4}b^{4}x^{5} + 14\,a^{3}b^{5}x^{4} + \frac{28}{3}\,a^{2}b^{6}x^{3} + 4\,ab^{7}x^{2} + b^{8}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^8,x, algorithm="giac")
```

```
[Out] 1/9*a^8*x^9 + a^7*b*x^8 + 4*a^6*b^2*x^7 + 28/3*a^5*b^3*x^6 + 14*a
^4*b^4*x^5 + 14*a^3*b^5*x^4 + 28/3*a^2*b^6*x^3 + 4*a*b^7*x^2 + b^
8*x
```

3.1589 $\int \left(a+\frac{b}{x}\right)^8 x^7\,dx$

Optimal. Leaf size=98

$$\frac{a^8x^8}{8}+\frac{8}{7}a^7bx^7+\frac{14}{3}a^6b^2x^6+\frac{56}{5}a^5b^3x^5+\frac{35}{2}a^4b^4x^4+\frac{56}{3}a^3b^5x^3+14a^2b^6x^2+8ab^7x+b^8\log(x)$$

```
[Out] 8*a*b^7*x + 14*a^2*b^6*x^2 + (56*a^3*b^5*x^3)/3 + (35*a^4*b^4*x^4
)/2 + (56*a^5*b^3*x^5)/5 + (14*a^6*b^2*x^6)/3 + (8*a^7*b*x^7)/7 +
 (a^8*x^8)/8 + b^8*Log[x]
```

Rubi [A] time = 0.0930235, antiderivative size = 98, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^8x^8}{8}+\frac{8}{7}a^7bx^7+\frac{14}{3}a^6b^2x^6+\frac{56}{5}a^5b^3x^5+\frac{35}{2}a^4b^4x^4+\frac{56}{3}a^3b^5x^3+14a^2b^6x^2+8ab^7x+b^8\log(x)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^8*x^7,x]
```

```
[Out] 8*a*b^7*x + 14*a^2*b^6*x^2 + (56*a^3*b^5*x^3)/3 + (35*a^4*b^4*x^4
)/2 + (56*a^5*b^3*x^5)/5 + (14*a^6*b^2*x^6)/3 + (8*a^7*b*x^7)/7 +
 (a^8*x^8)/8 + b^8*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^8x^8}{8}+\frac{8a^7bx^7}{7}+\frac{14a^6b^2x^6}{3}+\frac{56a^5b^3x^5}{5}+\frac{35a^4b^4x^4}{2}+\frac{56a^3b^5x^3}{3}+28a^2b^6\int x\,dx+8ab^7x+b^8\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**8*x**7,x)
```

```
[Out] a**8*x**8/8 + 8*a**7*b*x**7/7 + 14*a**6*b**2*x**6/3 + 56*a**5*b**
3*x**5/5 + 35*a**4*b**4*x**4/2 + 56*a**3*b**5*x**3/3 + 28*a**2*b*
*6*Integral(x, x) + 8*a*b**7*x + b**8*log(x)
```

Mathematica [A] time = 0.00603072, size = 98, normalized size = 1.

$$\frac{a^8x^8}{8}+\frac{8}{7}a^7bx^7+\frac{14}{3}a^6b^2x^6+\frac{56}{5}a^5b^3x^5+\frac{35}{2}a^4b^4x^4+\frac{56}{3}a^3b^5x^3+14a^2b^6x^2+8ab^7x+b^8\log(x)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^8*x^7,x]
```

```
[Out] 8*a*b^7*x + 14*a^2*b^6*x^2 + (56*a^3*b^5*x^3)/3 + (35*a^4*b^4*x^4
)/2 + (56*a^5*b^3*x^5)/5 + (14*a^6*b^2*x^6)/3 + (8*a^7*b*x^7)/7 +
 (a^8*x^8)/8 + b^8*Log[x]
```

Maple [A] time = 0.004, size = 87, normalized size = 0.9

$$8\,ab^7x+14\,a^2b^6x^2+\frac{56\,a^3b^5x^3}{3}+\frac{35\,a^4b^4x^4}{2}+\frac{56\,a^5b^3x^5}{5}+\frac{14\,a^6b^2x^6}{3}+\frac{8\,a^7bx^7}{7}+\frac{a^8x^8}{8}+b^8\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^8*x^7,x)
```

```
[Out] 8*a*b^7*x+14*a^2*b^6*x^2+56/3*a^3*b^5*x^3+35/2*a^4*b^4*x^4+56/5*a
^5*b^3*x^5+14/3*a^6*b^2*x^6+8/7*a^7*b*x^7+1/8*a^8*x^8+b^8*ln(x)
```

Maxima [A] time = 1.42842, size = 116, normalized size = 1.18

$$\frac{1}{8}\,a^{8}x^{8}+\frac{8}{7}\,a^{7}bx^{7}+\frac{14}{3}\,a^{6}b^{2}x^{6}+\frac{56}{5}\,a^{5}b^{3}x^{5}+\frac{35}{2}\,a^{4}b^{4}x^{4}+\frac{56}{3}\,a^{3}b^{5}x^{3}+14\,a^{2}b^{6}x^{2}+8\,ab^{7}x+b^{8}\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^7,x, algorithm="maxima")
```

```
[Out] 1/8*a^8*x^8 + 8/7*a^7*b*x^7 + 14/3*a^6*b^2*x^6 + 56/5*a^5*b^3*x^5
 + 35/2*a^4*b^4*x^4 + 56/3*a^3*b^5*x^3 + 14*a^2*b^6*x^2 + 8*a*b^7
*x + b^8*log(x)
```

Fricas [A] time = 0.219125, size = 116, normalized size = 1.18

$$\frac{1}{8}\,a^{8}x^{8}+\frac{8}{7}\,a^{7}bx^{7}+\frac{14}{3}\,a^{6}b^{2}x^{6}+\frac{56}{5}\,a^{5}b^{3}x^{5}+\frac{35}{2}\,a^{4}b^{4}x^{4}+\frac{56}{3}\,a^{3}b^{5}x^{3}+14\,a^{2}b^{6}x^{2}+8\,ab^{7}x+b^{8}\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^7,x, algorithm="fricas")
```

```
[Out] 1/8*a^8*x^8 + 8/7*a^7*b*x^7 + 14/3*a^6*b^2*x^6 + 56/5*a^5*b^3*x^5
 + 35/2*a^4*b^4*x^4 + 56/3*a^3*b^5*x^3 + 14*a^2*b^6*x^2 + 8*a*b^7
*x + b^8*log(x)
```

Sympy [A] time = 1.36282, size = 100, normalized size = 1.02

$$\frac{a^{8}x^{8}}{8}+\frac{8a^{7}bx^{7}}{7}+\frac{14a^{6}b^{2}x^{6}}{3}+\frac{56a^{5}b^{3}x^{5}}{5}+\frac{35a^{4}b^{4}x^{4}}{2}+\frac{56a^{3}b^{5}x^{3}}{3}+14a^{2}b^{6}x^{2}+8ab^{7}x+b^{8}\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**8*x**7,x)
```

```
[Out] a**8*x**8/8 + 8*a**7*b*x**7/7 + 14*a**6*b**2*x**6/3 + 56*a**5*b**
3*x**5/5 + 35*a**4*b**4*x**4/2 + 56*a**3*b**5*x**3/3 + 14*a**2*b*
*6*x**2 + 8*a*b**7*x + b**8*log(x)
```

GIAC/XCAS [A] time = 0.228094, size = 117, normalized size = 1.19

$$\frac{1}{8}\,a^{8}x^{8}+\frac{8}{7}\,a^{7}bx^{7}+\frac{14}{3}\,a^{6}b^{2}x^{6}+\frac{56}{5}\,a^{5}b^{3}x^{5}+\frac{35}{2}\,a^{4}b^{4}x^{4}+\frac{56}{3}\,a^{3}b^{5}x^{3}+14\,a^{2}b^{6}x^{2}+8\,ab^{7}x+b^{8}\ln\left(|x|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^7,x, algorithm="giac")
```

```
[Out] 1/8*a^8*x^8 + 8/7*a^7*b*x^7 + 14/3*a^6*b^2*x^6 + 56/5*a^5*b^3*x^5
 + 35/2*a^4*b^4*x^4 + 56/3*a^3*b^5*x^3 + 14*a^2*b^6*x^2 + 8*a*b^7
*x + b^8*ln(abs(x))
```

3.1590 $\int \left(a+\frac{b}{x}\right)^8 x^6\,dx$

Optimal. Leaf size=95

$$\frac{a^8x^7}{7}+\frac{4}{3}a^7bx^6+\frac{28}{5}a^6b^2x^5+14a^5b^3x^4+\frac{70}{3}a^4b^4x^3+28a^3b^5x^2+28a^2b^6x+8ab^7\log(x)-\frac{b^8}{x}$$

```
[Out] -(b^8/x) + 28*a^2*b^6*x + 28*a^3*b^5*x^2 + (70*a^4*b^4*x^3)/3 + 1
4*a^5*b^3*x^4 + (28*a^6*b^2*x^5)/5 + (4*a^7*b*x^6)/3 + (a^8*x^7)/
7 + 8*a*b^7*Log[x]
```

Rubi [A] time = 0.106537, antiderivative size = 95, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^8x^7}{7}+\frac{4}{3}a^7bx^6+\frac{28}{5}a^6b^2x^5+14a^5b^3x^4+\frac{70}{3}a^4b^4x^3+28a^3b^5x^2+28a^2b^6x+8ab^7\log(x)-\frac{b^8}{x}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x)^8*x^6,x]
```

```
[Out] -(b^8/x) + 28*a^2*b^6*x + 28*a^3*b^5*x^2 + (70*a^4*b^4*x^3)/3 + 1
4*a^5*b^3*x^4 + (28*a^6*b^2*x^5)/5 + (4*a^7*b*x^6)/3 + (a^8*x^7)/
7 + 8*a*b^7*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^8x^7}{7}+\frac{4a^7bx^6}{3}+\frac{28a^6b^2x^5}{5}+14a^5b^3x^4+\frac{70a^4b^4x^3}{3}+56a^3b^5\int x\,dx+28a^2b^6x+8ab^7\log(x)-\frac{b^8}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x)**8*x**6,x)
```

```
[Out] a**8*x**7/7 + 4*a**7*b*x**6/3 + 28*a**6*b**2*x**5/5 + 14*a**5*b**
3*x**4 + 70*a**4*b**4*x**3/3 + 56*a**3*b**5*Integral(x, x) + 28*a
**2*b**6*x + 8*a*b**7*log(x) - b**8/x
```

Mathematica [A] time = 0.0155233, size = 95, normalized size = 1.

$$\frac{a^8x^7}{7}+\frac{4}{3}a^7bx^6+\frac{28}{5}a^6b^2x^5+14a^5b^3x^4+\frac{70}{3}a^4b^4x^3+28a^3b^5x^2+28a^2b^6x+8ab^7\log(x)-\frac{b^8}{x}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x)^8*x^6,x]
```

```
[Out] -(b^8/x) + 28*a^2*b^6*x + 28*a^3*b^5*x^2 + (70*a^4*b^4*x^3)/3 + 1
4*a^5*b^3*x^4 + (28*a^6*b^2*x^5)/5 + (4*a^7*b*x^6)/3 + (a^8*x^7)/
7 + 8*a*b^7*Log[x]
```

Maple [A] time = 0.009, size = 88, normalized size = 0.9

$$-\frac{b^8}{x}+28\,a^2b^6x+28\,a^3b^5x^2+\frac{70\,a^4b^4x^3}{3}+14\,a^5b^3x^4+\frac{28\,a^6b^2x^5}{5}+\frac{4\,a^7bx^6}{3}+\frac{a^8x^7}{7}+8\,ab^7\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^8*x^6,x)
```

```
[Out] -b^8/x+28*a^2*b^6*x+28*a^3*b^5*x^2+70/3*a^4*b^4*x^3+14*a^5*b^3*x^
4+28/5*a^6*b^2*x^5+4/3*a^7*b*x^6+1/7*a^8*x^7+8*a*b^7*ln(x)
```

Maxima [A] time = 1.43913, size = 117, normalized size = 1.23

$$\frac{1}{7}\,a^8x^7 + \frac{4}{3}\,a^7bx^6 + \frac{28}{5}\,a^6b^2x^5 + 14\,a^5b^3x^4 + \frac{70}{3}\,a^4b^4x^3 + 28\,a^3b^5x^2 + 28\,a^2b^6x + 8\,ab^7\log\left(x\right) - \frac{b^8}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^6,x, algorithm="maxima")
```

```
[Out] 1/7*a^8*x^7 + 4/3*a^7*b*x^6 + 28/5*a^6*b^2*x^5 + 14*a^5*b^3*x^4 +
 70/3*a^4*b^4*x^3 + 28*a^3*b^5*x^2 + 28*a^2*b^6*x + 8*a*b^7*log(x
) - b^8/x
```

Fricas [A] time = 0.219128, size = 124, normalized size = 1.31

$$\frac{15\,a^8x^8 + 140\,a^7bx^7 + 588\,a^6b^2x^6 + 1470\,a^5b^3x^5 + 2450\,a^4b^4x^4 + 2940\,a^3b^5x^3 + 2940\,a^2b^6x^2 + 840\,ab^7x\log\left(x\right) - 105\,b^8}{105\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^6,x, algorithm="fricas")
```

```
[Out] 1/105*(15*a^8*x^8 + 140*a^7*b*x^7 + 588*a^6*b^2*x^6 + 1470*a^5*b^
3*x^5 + 2450*a^4*b^4*x^4 + 2940*a^3*b^5*x^3 + 2940*a^2*b^6*x^2 +
840*a*b^7*x*log(x) - 105*b^8)/x
```

Sympy [A] time = 1.40335, size = 95, normalized size = 1.

$$\frac{a^8x^7}{7} + \frac{4a^7bx^6}{3} + \frac{28a^6b^2x^5}{5} + 14a^5b^3x^4 + \frac{70a^4b^4x^3}{3} + 28a^3b^5x^2 + 28a^2b^6x + 8ab^7\log\left(x\right) - \frac{b^8}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**8*x**6,x)
```

```
[Out] a**8*x**7/7 + 4*a**7*b*x**6/3 + 28*a**6*b**2*x**5/5 + 14*a**5*b**
3*x**4 + 70*a**4*b**4*x**3/3 + 28*a**3*b**5*x**2 + 28*a**2*b**6*x
 + 8*a*b**7*log(x) - b**8/x
```

GIAC/XCAS [A] time = 0.227876, size = 119, normalized size = 1.25

$$\frac{1}{7}\,a^8x^7 + \frac{4}{3}\,a^7bx^6 + \frac{28}{5}\,a^6b^2x^5 + 14\,a^5b^3x^4 + \frac{70}{3}\,a^4b^4x^3 + 28\,a^3b^5x^2 + 28\,a^2b^6x + 8\,ab^7\ln\left(|x|\right) - \frac{b^8}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^6,x, algorithm="giac")
```

```
[Out] 1/7*a^8*x^7 + 4/3*a^7*b*x^6 + 28/5*a^6*b^2*x^5 + 14*a^5*b^3*x^4 +
 70/3*a^4*b^4*x^3 + 28*a^3*b^5*x^2 + 28*a^2*b^6*x + 8*a*b^7*ln(ab
s(x)) - b^8/x
```

3.1591 $\int \left(a+\frac{b}{x}\right)^8 x^5 \, dx$

Optimal. Leaf size=95

$$\frac{a^8x^6}{6}+\frac{8}{5}a^7bx^5+7a^6b^2x^4+\frac{56}{3}a^5b^3x^3+35a^4b^4x^2+56a^3b^5x+28a^2b^6\log(x)-\frac{8ab^7}{x}-\frac{b^8}{2x^2}$$

```
[Out] -b^8/(2*x^2) - (8*a*b^7)/x + 56*a^3*b^5*x + 35*a^4*b^4*x^2 + (56*
a^5*b^3*x^3)/3 + 7*a^6*b^2*x^4 + (8*a^7*b*x^5)/5 + (a^8*x^6)/6 +
28*a^2*b^6*Log[x]
```

Rubi [A] time = 0.109227, antiderivative size = 95, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^8x^6}{6}+\frac{8}{5}a^7bx^5+7a^6b^2x^4+\frac{56}{3}a^5b^3x^3+35a^4b^4x^2+56a^3b^5x+28a^2b^6\log(x)-\frac{8ab^7}{x}-\frac{b^8}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^8*x^5,x]
```

```
[Out] -b^8/(2*x^2) - (8*a*b^7)/x + 56*a^3*b^5*x + 35*a^4*b^4*x^2 + (56*
a^5*b^3*x^3)/3 + 7*a^6*b^2*x^4 + (8*a^7*b*x^5)/5 + (a^8*x^6)/6 +
28*a^2*b^6*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^8x^6}{6}+\frac{8a^7bx^5}{5}+7a^6b^2x^4+\frac{56a^5b^3x^3}{3}+70a^4b^4\int x\,dx+56a^3b^5x+28a^2b^6\log(x)-\frac{8ab^7}{x}-\frac{b^8}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**8*x**5,x)
```

```
[Out] a**8*x**6/6 + 8*a**7*b*x**5/5 + 7*a**6*b**2*x**4 + 56*a**5*b**3*x
**3/3 + 70*a**4*b**4*Integral(x, x) + 56*a**3*b**5*x + 28*a**2*b*
*6*log(x) - 8*a*b**7/x - b**8/(2*x**2)
```

Mathematica [A] time = 0.00818389, size = 95, normalized size = 1.

$$\frac{a^8x^6}{6}+\frac{8}{5}a^7bx^5+7a^6b^2x^4+\frac{56}{3}a^5b^3x^3+35a^4b^4x^2+56a^3b^5x+28a^2b^6\log(x)-\frac{8ab^7}{x}-\frac{b^8}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^8*x^5,x]
```

```
[Out] -b^8/(2*x^2) - (8*a*b^7)/x + 56*a^3*b^5*x + 35*a^4*b^4*x^2 + (56*
a^5*b^3*x^3)/3 + 7*a^6*b^2*x^4 + (8*a^7*b*x^5)/5 + (a^8*x^6)/6 +
28*a^2*b^6*Log[x]
```

Maple [A] time = 0.009, size = 88, normalized size = 0.9

$$-\frac{b^8}{2x^2}-8\frac{ab^7}{x}+56a^3b^5x+35a^4b^4x^2+\frac{56a^5b^3x^3}{3}+7a^6b^2x^4+\frac{8a^7bx^5}{5}+\frac{a^8x^6}{6}+28a^2b^6\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^8*x^5,x)
```

```
[Out] -1/2*b^8/x^2-8*a*b^7/x+56*a^3*b^5*x+35*a^4*b^4*x^2+56/3*a^5*b^3*x
^3+7*a^6*b^2*x^4+8/5*a^7*b*x^5+1/6*a^8*x^6+28*a^2*b^6*ln(x)
```

Maxima [A] time = 1.43399, size = 116, normalized size = 1.22

$$\frac{1}{6}\,a^{8}x^{6}+\frac{8}{5}\,a^{7}bx^{5}+7\,a^{6}b^{2}x^{4}+\frac{56}{3}\,a^{5}b^{3}x^{3}+35\,a^{4}b^{4}x^{2}+56\,a^{3}b^{5}x+28\,a^{2}b^{6}\log\left(x\right)-\frac{16\,ab^{7}x+b^{8}}{2\,x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^5,x, algorithm="maxima")
```

```
[Out] 1/6*a^8*x^6 + 8/5*a^7*b*x^5 + 7*a^6*b^2*x^4 + 56/3*a^5*b^3*x^3 +
35*a^4*b^4*x^2 + 56*a^3*b^5*x + 28*a^2*b^6*log(x) - 1/2*(16*a*b^7
*x + b^8)/x^2
```

Fricas [A] time = 0.219777, size = 124, normalized size = 1.31

$$\frac{5\,a^{8}x^{8}+48\,a^{7}bx^{7}+210\,a^{6}b^{2}x^{6}+560\,a^{5}b^{3}x^{5}+1050\,a^{4}b^{4}x^{4}+1680\,a^{3}b^{5}x^{3}+840\,a^{2}b^{6}x^{2}\log\left(x\right)-240\,ab^{7}x-15\,b^{8}}{30\,x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^5,x, algorithm="fricas")
```

```
[Out] 1/30*(5*a^8*x^8 + 48*a^7*b*x^7 + 210*a^6*b^2*x^6 + 560*a^5*b^3*x^
5 + 1050*a^4*b^4*x^4 + 1680*a^3*b^5*x^3 + 840*a^2*b^6*x^2*log(x)
- 240*a*b^7*x - 15*b^8)/x^2
```

Sympy [A] time = 1.53222, size = 95, normalized size = 1.

$$\frac{a^{8}x^{6}}{6}+\frac{8a^{7}bx^{5}}{5}+7a^{6}b^{2}x^{4}+\frac{56a^{5}b^{3}x^{3}}{3}+35a^{4}b^{4}x^{2}+56a^{3}b^{5}x+28a^{2}b^{6}\log\left(x\right)-\frac{16ab^{7}x+b^{8}}{2x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**8*x**5,x)
```

```
[Out] a**8*x**6/6 + 8*a**7*b*x**5/5 + 7*a**6*b**2*x**4 + 56*a**5*b**3*x
**3/3 + 35*a**4*b**4*x**2 + 56*a**3*b**5*x + 28*a**2*b**6*log(x)
- (16*a*b**7*x + b**8)/(2*x**2)
```

GIAC/XCAS [A] time = 0.22386, size = 117, normalized size = 1.23

$$\frac{1}{6}\,a^{8}x^{6}+\frac{8}{5}\,a^{7}bx^{5}+7\,a^{6}b^{2}x^{4}+\frac{56}{3}\,a^{5}b^{3}x^{3}+35\,a^{4}b^{4}x^{2}+56\,a^{3}b^{5}x+28\,a^{2}b^{6}\ln\left(|x|\right)-\frac{16\,ab^{7}x+b^{8}}{2\,x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^5,x, algorithm="giac")
```

```
[Out] 1/6*a^8*x^6 + 8/5*a^7*b*x^5 + 7*a^6*b^2*x^4 + 56/3*a^5*b^3*x^3 +
35*a^4*b^4*x^2 + 56*a^3*b^5*x + 28*a^2*b^6*ln(abs(x)) - 1/2*(16*a
*b^7*x + b^8)/x^2
```

3.1592 $\int \left(a+\frac{b}{x}\right)^8 x^4 \, dx$

Optimal. Leaf size=93

$$\frac{a^8x^5}{5}+2a^7bx^4+\frac{28}{3}a^6b^2x^3+28a^5b^3x^2+70a^4b^4x+56a^3b^5\log(x)-\frac{28a^2b^6}{x}-\frac{4ab^7}{x^2}-\frac{b^8}{3x^3}$$

```
[Out] -b^8/(3*x^3) - (4*a*b^7)/x^2 - (28*a^2*b^6)/x + 70*a^4*b^4*x + 28
*a^5*b^3*x^2 + (28*a^6*b^2*x^3)/3 + 2*a^7*b*x^4 + (a^8*x^5)/5 + 5
6*a^3*b^5*Log[x]
```

Rubi [A] time = 0.110529, antiderivative size = 93, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^8x^5}{5}+2a^7bx^4+\frac{28}{3}a^6b^2x^3+28a^5b^3x^2+70a^4b^4x+56a^3b^5\log(x)-\frac{28a^2b^6}{x}-\frac{4ab^7}{x^2}-\frac{b^8}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^8*x^4,x]
```

```
[Out] -b^8/(3*x^3) - (4*a*b^7)/x^2 - (28*a^2*b^6)/x + 70*a^4*b^4*x + 28
*a^5*b^3*x^2 + (28*a^6*b^2*x^3)/3 + 2*a^7*b*x^4 + (a^8*x^5)/5 + 5
6*a^3*b^5*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^8x^5}{5}+2a^7bx^4+\frac{28a^6b^2x^3}{3}+56a^5b^3\int x\,dx+70a^4b^4x+56a^3b^5\log(x)-\frac{28a^2b^6}{x}-\frac{4ab^7}{x^2}-\frac{b^8}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**8*x**4,x)
```

```
[Out] a**8*x**5/5 + 2*a**7*b*x**4 + 28*a**6*b**2*x**3/3 + 56*a**5*b**3*
Integral(x, x) + 70*a**4*b**4*x + 56*a**3*b**5*log(x) - 28*a**2*b
**6/x - 4*a*b**7/x**2 - b**8/(3*x**3)
```

Mathematica [A] time = 0.0148203, size = 93, normalized size = 1.

$$\frac{a^8x^5}{5}+2a^7bx^4+\frac{28}{3}a^6b^2x^3+28a^5b^3x^2+70a^4b^4x+56a^3b^5\log(x)-\frac{28a^2b^6}{x}-\frac{4ab^7}{x^2}-\frac{b^8}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^8*x^4,x]
```

```
[Out] -b^8/(3*x^3) - (4*a*b^7)/x^2 - (28*a^2*b^6)/x + 70*a^4*b^4*x + 28
*a^5*b^3*x^2 + (28*a^6*b^2*x^3)/3 + 2*a^7*b*x^4 + (a^8*x^5)/5 + 5
6*a^3*b^5*Log[x]
```

Maple [A] time = 0.01, size = 88, normalized size = 1.

$$-\frac{b^8}{3\,x^3}-4\,\frac{ab^7}{x^2}-28\,\frac{a^2b^6}{x}+70\,a^4b^4x+28\,a^5b^3x^2+\frac{28\,a^6b^2x^3}{3}+2\,a^7bx^4+\frac{a^8x^5}{5}+56\,a^3b^5\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^8*x^4,x)
```

```
[Out] -1/3*b^8/x^3-4*a*b^7/x^2-28*a^2*b^6/x+70*a^4*b^4*x+28*a^5*b^3*x^2
+28/3*a^6*b^2*x^3+2*a^7*b*x^4+1/5*a^8*x^5+56*a^3*b^5*ln(x)
```

Maxima [A] time = 1.44625, size = 116, normalized size = 1.25

$$\frac{1}{5}a^8x^5 + 2a^7bx^4 + \frac{28}{3}a^6b^2x^3 + 28a^5b^3x^2 + 70a^4b^4x + 56a^3b^5\log(x) - \frac{84a^2b^6x^2 + 12ab^7x + b^8}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^4,x, algorithm="maxima")
```

```
[Out] 1/5*a^8*x^5 + 2*a^7*b*x^4 + 28/3*a^6*b^2*x^3 + 28*a^5*b^3*x^2 + 7
0*a^4*b^4*x + 56*a^3*b^5*log(x) - 1/3*(84*a^2*b^6*x^2 + 12*a*b^7*
x + b^8)/x^3
```

Fricas [A] time = 0.220032, size = 124, normalized size = 1.33

$$\frac{3a^8x^8 + 30a^7bx^7 + 140a^6b^2x^6 + 420a^5b^3x^5 + 1050a^4b^4x^4 + 840a^3b^5x^3\log(x) - 420a^2b^6x^2 - 60ab^7x - 5b^8}{15x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^4,x, algorithm="fricas")
```

```
[Out] 1/15*(3*a^8*x^8 + 30*a^7*b*x^7 + 140*a^6*b^2*x^6 + 420*a^5*b^3*x^
5 + 1050*a^4*b^4*x^4 + 840*a^3*b^5*x^3*log(x) - 420*a^2*b^6*x^2 -
 60*a*b^7*x - 5*b^8)/x^3
```

Sympy [A] time = 1.72184, size = 94, normalized size = 1.01

$$\frac{a^8x^5}{5} + 2a^7bx^4 + \frac{28a^6b^2x^3}{3} + 28a^5b^3x^2 + 70a^4b^4x + 56a^3b^5\log(x) - \frac{84a^2b^6x^2 + 12ab^7x + b^8}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**8*x**4,x)
```

```
[Out] a**8*x**5/5 + 2*a**7*b*x**4 + 28*a**6*b**2*x**3/3 + 28*a**5*b**3*
x**2 + 70*a**4*b**4*x + 56*a**3*b**5*log(x) - (84*a**2*b**6*x**2
+ 12*a*b**7*x + b**8)/(3*x**3)
```

GIAC/XCAS [A] time = 0.22438, size = 117, normalized size = 1.26

$$\frac{1}{5}a^8x^5 + 2a^7bx^4 + \frac{28}{3}a^6b^2x^3 + 28a^5b^3x^2 + 70a^4b^4x + 56a^3b^5\ln(|x|) - \frac{84a^2b^6x^2 + 12ab^7x + b^8}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^4,x, algorithm="giac")
```

```
[Out] 1/5*a^8*x^5 + 2*a^7*b*x^4 + 28/3*a^6*b^2*x^3 + 28*a^5*b^3*x^2 + 7
0*a^4*b^4*x + 56*a^3*b^5*ln(abs(x)) - 1/3*(84*a^2*b^6*x^2 + 12*a*
b^7*x + b^8)/x^3
```

3.1593 $\int \left(a+\frac{b}{x}\right)^8 x^3\,dx$

Optimal. Leaf size=95

$$\frac{a^8x^4}{4}+\frac{8}{3}a^7bx^3+14a^6b^2x^2+56a^5b^3x+70a^4b^4\log(x)-\frac{56a^3b^5}{x}-\frac{14a^2b^6}{x^2}-\frac{8ab^7}{3x^3}-\frac{b^8}{4x^4}$$

```
[Out] -b^8/(4*x^4) - (8*a*b^7)/(3*x^3) - (14*a^2*b^6)/x^2 - (56*a^3*b^5
)/x + 56*a^5*b^3*x + 14*a^6*b^2*x^2 + (8*a^7*b*x^3)/3 + (a^8*x^4)
/4 + 70*a^4*b^4*Log[x]
```

Rubi [A] time = 0.110693, antiderivative size = 95, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^8x^4}{4}+\frac{8}{3}a^7bx^3+14a^6b^2x^2+56a^5b^3x+70a^4b^4\log(x)-\frac{56a^3b^5}{x}-\frac{14a^2b^6}{x^2}-\frac{8ab^7}{3x^3}-\frac{b^8}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^8*x^3,x]
```

```
[Out] -b^8/(4*x^4) - (8*a*b^7)/(3*x^3) - (14*a^2*b^6)/x^2 - (56*a^3*b^5
)/x + 56*a^5*b^3*x + 14*a^6*b^2*x^2 + (8*a^7*b*x^3)/3 + (a^8*x^4)
/4 + 70*a^4*b^4*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^8x^4}{4}+\frac{8a^7bx^3}{3}+28a^6b^2\int x\,dx+56a^5b^3x+70a^4b^4\log(x)-\frac{56a^3b^5}{x}-\frac{14a^2b^6}{x^2}-\frac{8ab^7}{3x^3}-\frac{b^8}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**8*x**3,x)
```

```
[Out] a**8*x**4/4 + 8*a**7*b*x**3/3 + 28*a**6*b**2*Integral(x, x) + 56*
a**5*b**3*x + 70*a**4*b**4*log(x) - 56*a**3*b**5/x - 14*a**2*b**6
/x**2 - 8*a*b**7/(3*x**3) - b**8/(4*x**4)
```

Mathematica [A] time = 0.00826132, size = 95, normalized size = 1.

$$\frac{a^8x^4}{4}+\frac{8}{3}a^7bx^3+14a^6b^2x^2+56a^5b^3x+70a^4b^4\log(x)-\frac{56a^3b^5}{x}-\frac{14a^2b^6}{x^2}-\frac{8ab^7}{3x^3}-\frac{b^8}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^8*x^3,x]
```

```
[Out] -b^8/(4*x^4) - (8*a*b^7)/(3*x^3) - (14*a^2*b^6)/x^2 - (56*a^3*b^5
)/x + 56*a^5*b^3*x + 14*a^6*b^2*x^2 + (8*a^7*b*x^3)/3 + (a^8*x^4)
/4 + 70*a^4*b^4*Log[x]
```

Maple [A] time = 0.01, size = 88, normalized size = 0.9

$$-\frac{b^8}{4\,x^4}-\frac{8\,ab^7}{3\,x^3}-14\,\frac{a^2b^6}{x^2}-56\,\frac{a^3b^5}{x}+56\,a^5b^3x+14\,a^6b^2x^2+\frac{8\,a^7bx^3}{3}+\frac{a^8x^4}{4}+70\,a^4b^4\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^8*x^3,x)
```

```
[Out] -1/4*b^8/x^4-8/3*a*b^7/x^3-14*a^2*b^6/x^2-56*a^3*b^5/x+56*a^5*b^3
*x+14*a^6*b^2*x^2+8/3*a^7*b*x^3+1/4*a^8*x^4+70*a^4*b^4*ln(x)
```

Maxima [A] time = 1.41908, size = 119, normalized size = 1.25

$$\frac{1}{4}\,a^{8}x^{4} + \frac{8}{3}\,a^{7}bx^{3} + 14\,a^{6}b^{2}x^{2} + 56\,a^{5}b^{3}x + 70\,a^{4}b^{4}\log\left(x\right) - \frac{672\,a^{3}b^{5}x^{3} + 168\,a^{2}b^{6}x^{2} + 32\,ab^{7}x + 3\,b^{8}}{12\,x^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^3,x, algorithm="maxima")
```

```
[Out] 1/4*a^8*x^4 + 8/3*a^7*b*x^3 + 14*a^6*b^2*x^2 + 56*a^5*b^3*x + 70*
a^4*b^4*log(x) - 1/12*(672*a^3*b^5*x^3 + 168*a^2*b^6*x^2 + 32*a*b
^7*x + 3*b^8)/x^4
```

Fricas [A] time = 0.219826, size = 124, normalized size = 1.31

$$\frac{3\,a^{8}x^{8} + 32\,a^{7}bx^{7} + 168\,a^{6}b^{2}x^{6} + 672\,a^{5}b^{3}x^{5} + 840\,a^{4}b^{4}x^{4}\log\left(x\right) - 672\,a^{3}b^{5}x^{3} - 168\,a^{2}b^{6}x^{2} - 32\,ab^{7}x - 3\,b^{8}}{12\,x^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^3,x, algorithm="fricas")
```

```
[Out] 1/12*(3*a^8*x^8 + 32*a^7*b*x^7 + 168*a^6*b^2*x^6 + 672*a^5*b^3*x^
5 + 840*a^4*b^4*x^4*log(x) - 672*a^3*b^5*x^3 - 168*a^2*b^6*x^2 -
32*a*b^7*x - 3*b^8)/x^4
```

Sympy [A] time = 1.87063, size = 95, normalized size = 1.

$$\frac{a^{8}x^{4}}{4} + \frac{8a^{7}bx^{3}}{3} + 14a^{6}b^{2}x^{2} + 56a^{5}b^{3}x + 70a^{4}b^{4}\log\left(x\right) - \frac{672a^{3}b^{5}x^{3} + 168a^{2}b^{6}x^{2} + 32ab^{7}x + 3b^{8}}{12x^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**8*x**3,x)
```

```
[Out] a**8*x**4/4 + 8*a**7*b*x**3/3 + 14*a**6*b**2*x**2 + 56*a**5*b**3*
x + 70*a**4*b**4*log(x) - (672*a**3*b**5*x**3 + 168*a**2*b**6*x**
2 + 32*a*b**7*x + 3*b**8)/(12*x**4)
```

GIAC/XCAS [A] time = 0.225739, size = 120, normalized size = 1.26

$$\frac{1}{4}\,a^{8}x^{4} + \frac{8}{3}\,a^{7}bx^{3} + 14\,a^{6}b^{2}x^{2} + 56\,a^{5}b^{3}x + 70\,a^{4}b^{4}\ln\left(|x|\right) - \frac{672\,a^{3}b^{5}x^{3} + 168\,a^{2}b^{6}x^{2} + 32\,ab^{7}x + 3\,b^{8}}{12\,x^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^3,x, algorithm="giac")
```

```
[Out] 1/4*a^8*x^4 + 8/3*a^7*b*x^3 + 14*a^6*b^2*x^2 + 56*a^5*b^3*x + 70*
a^4*b^4*ln(abs(x)) - 1/12*(672*a^3*b^5*x^3 + 168*a^2*b^6*x^2 + 32
*a*b^7*x + 3*b^8)/x^4
```

3.1594 $\int \left(a+\frac{b}{x}\right)^8 x^2\,dx$

Optimal. Leaf size=93

$$\frac{a^8x^3}{3}+4a^7bx^2+28a^6b^2x+56a^5b^3\log(x)-\frac{70a^4b^4}{x}-\frac{28a^3b^5}{x^2}-\frac{28a^2b^6}{3x^3}-\frac{2ab^7}{x^4}-\frac{b^8}{5x^5}$$

```
[Out] -b^8/(5*x^5) - (2*a*b^7)/x^4 - (28*a^2*b^6)/(3*x^3) - (28*a^3*b^5
)/x^2 - (70*a^4*b^4)/x + 28*a^6*b^2*x + 4*a^7*b*x^2 + (a^8*x^3)/3
 + 56*a^5*b^3*Log[x]
```

Rubi [A] time = 0.109083, antiderivative size = 93, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$\frac{a^8x^3}{3}+4a^7bx^2+28a^6b^2x+56a^5b^3\log(x)-\frac{70a^4b^4}{x}-\frac{28a^3b^5}{x^2}-\frac{28a^2b^6}{3x^3}-\frac{2ab^7}{x^4}-\frac{b^8}{5x^5}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^8*x^2,x]
```

```
[Out] -b^8/(5*x^5) - (2*a*b^7)/x^4 - (28*a^2*b^6)/(3*x^3) - (28*a^3*b^5
)/x^2 - (70*a^4*b^4)/x + 28*a^6*b^2*x + 4*a^7*b*x^2 + (a^8*x^3)/3
 + 56*a^5*b^3*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^8x^3}{3}+8a^7b\int x\,dx+28a^6b^2x+56a^5b^3\log(x)-\frac{70a^4b^4}{x}-\frac{28a^3b^5}{x^2}-\frac{28a^2b^6}{3x^3}-\frac{2ab^7}{x^4}-\frac{b^8}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**8*x**2,x)
```

```
[Out] a**8*x**3/3 + 8*a**7*b*Integral(x, x) + 28*a**6*b**2*x + 56*a**5*
b**3*log(x) - 70*a**4*b**4/x - 28*a**3*b**5/x**2 - 28*a**2*b**6/(
3*x**3) - 2*a*b**7/x**4 - b**8/(5*x**5)
```

Mathematica [A] time = 0.015188, size = 93, normalized size = 1.

$$\frac{a^8x^3}{3}+4a^7bx^2+28a^6b^2x+56a^5b^3\log(x)-\frac{70a^4b^4}{x}-\frac{28a^3b^5}{x^2}-\frac{28a^2b^6}{3x^3}-\frac{2ab^7}{x^4}-\frac{b^8}{5x^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^8*x^2,x]
```

```
[Out] -b^8/(5*x^5) - (2*a*b^7)/x^4 - (28*a^2*b^6)/(3*x^3) - (28*a^3*b^5
)/x^2 - (70*a^4*b^4)/x + 28*a^6*b^2*x + 4*a^7*b*x^2 + (a^8*x^3)/3
 + 56*a^5*b^3*Log[x]
```

Maple [A] time = 0.01, size = 88, normalized size = 1.

$$-\frac{b^8}{5\,x^5}-2\,\frac{ab^7}{x^4}-\frac{28\,a^2b^6}{3\,x^3}-28\,\frac{a^3b^5}{x^2}-70\,\frac{a^4b^4}{x}+28\,a^6b^2x+4\,a^7bx^2+\frac{a^8x^3}{3}+56\,a^5b^3\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^8*x^2,x)
```

```
[Out] -1/5*b^8/x^5-2*a*b^7/x^4-28/3*a^2*b^6/x^3-28*a^3*b^5/x^2-70*a^4*b
^4/x+28*a^6*b^2*x+4*a^7*b*x^2+1/3*a^8*x^3+56*a^5*b^3*ln(x)
```

Maxima [A] time = 1.42995, size = 119, normalized size = 1.28

$$\frac{1}{3}a^8x^3 + 4a^7bx^2 + 28a^6b^2x + 56a^5b^3\log(x) - \frac{1050a^4b^4x^4 + 420a^3b^5x^3 + 140a^2b^6x^2 + 30ab^7x + 3b^8}{15x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^2,x, algorithm="maxima")
```

```
[Out] 1/3*a^8*x^3 + 4*a^7*b*x^2 + 28*a^6*b^2*x + 56*a^5*b^3*log(x) - 1/
15*(1050*a^4*b^4*x^4 + 420*a^3*b^5*x^3 + 140*a^2*b^6*x^2 + 30*a*b
^7*x + 3*b^8)/x^5
```

Fricas [A] time = 0.220996, size = 124, normalized size = 1.33

$$\frac{5a^8x^8 + 60a^7bx^7 + 420a^6b^2x^6 + 840a^5b^3x^5\log(x) - 1050a^4b^4x^4 - 420a^3b^5x^3 - 140a^2b^6x^2 - 30ab^7x - 3b^8}{15x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^2,x, algorithm="fricas")
```

```
[Out] 1/15*(5*a^8*x^8 + 60*a^7*b*x^7 + 420*a^6*b^2*x^6 + 840*a^5*b^3*x^
5*log(x) - 1050*a^4*b^4*x^4 - 420*a^3*b^5*x^3 - 140*a^2*b^6*x^2 -
 30*a*b^7*x - 3*b^8)/x^5
```

Sympy [A] time = 2.43273, size = 94, normalized size = 1.01

$$\frac{a^8x^3}{3} + 4a^7bx^2 + 28a^6b^2x + 56a^5b^3\log(x) - \frac{1050a^4b^4x^4 + 420a^3b^5x^3 + 140a^2b^6x^2 + 30ab^7x + 3b^8}{15x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**8*x**2,x)
```

```
[Out] a**8*x**3/3 + 4*a**7*b*x**2 + 28*a**6*b**2*x + 56*a**5*b**3*log(x
) - (1050*a**4*b**4*x**4 + 420*a**3*b**5*x**3 + 140*a**2*b**6*x**
2 + 30*a*b**7*x + 3*b**8)/(15*x**5)
```

GIAC/XCAS [A] time = 0.225254, size = 120, normalized size = 1.29

$$\frac{1}{3}a^8x^3 + 4a^7bx^2 + 28a^6b^2x + 56a^5b^3\ln(|x|) - \frac{1050a^4b^4x^4 + 420a^3b^5x^3 + 140a^2b^6x^2 + 30ab^7x + 3b^8}{15x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x^2,x, algorithm="giac")
```

```
[Out] 1/3*a^8*x^3 + 4*a^7*b*x^2 + 28*a^6*b^2*x + 56*a^5*b^3*ln(abs(x))
- 1/15*(1050*a^4*b^4*x^4 + 420*a^3*b^5*x^3 + 140*a^2*b^6*x^2 + 30
*a*b^7*x + 3*b^8)/x^5
```

3.1595 $\int \left(a+\frac{b}{x}\right)^8 x\,dx$

Optimal. Leaf size=95

$$\frac{a^8x^2}{2}+8a^7bx+28a^6b^2\log(x)-\frac{56a^5b^3}{x}-\frac{35a^4b^4}{x^2}-\frac{56a^3b^5}{3x^3}-\frac{7a^2b^6}{x^4}-\frac{8ab^7}{5x^5}-\frac{b^8}{6x^6}$$

```
[Out] -b^8/(6*x^6) - (8*a*b^7)/(5*x^5) - (7*a^2*b^6)/x^4 - (56*a^3*b^5)
/(3*x^3) - (35*a^4*b^4)/x^2 - (56*a^5*b^3)/x + 8*a^7*b*x + (a^8*x
^2)/2 + 28*a^6*b^2*Log[x]
```

Rubi [A] time = 0.113331, antiderivative size = 95, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{a^8x^2}{2}+8a^7bx+28a^6b^2\log(x)-\frac{56a^5b^3}{x}-\frac{35a^4b^4}{x^2}-\frac{56a^3b^5}{3x^3}-\frac{7a^2b^6}{x^4}-\frac{8ab^7}{5x^5}-\frac{b^8}{6x^6}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^8*x,x]
```

```
[Out] -b^8/(6*x^6) - (8*a*b^7)/(5*x^5) - (7*a^2*b^6)/x^4 - (56*a^3*b^5)
/(3*x^3) - (35*a^4*b^4)/x^2 - (56*a^5*b^3)/x + 8*a^7*b*x + (a^8*x
^2)/2 + 28*a^6*b^2*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$a^8\int x\,dx+8a^7bx+28a^6b^2\log(x)-\frac{56a^5b^3}{x}-\frac{35a^4b^4}{x^2}-\frac{56a^3b^5}{3x^3}-\frac{7a^2b^6}{x^4}-\frac{8ab^7}{5x^5}-\frac{b^8}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**8*x,x)
```

```
[Out] a**8*Integral(x, x) + 8*a**7*b*x + 28*a**6*b**2*log(x) - 56*a**5*
b**3/x - 35*a**4*b**4/x**2 - 56*a**3*b**5/(3*x**3) - 7*a**2*b**6/
x**4 - 8*a*b**7/(5*x**5) - b**8/(6*x**6)
```

Mathematica [A] time = 0.00892433, size = 95, normalized size = 1.

$$\frac{a^8x^2}{2}+8a^7bx+28a^6b^2\log(x)-\frac{56a^5b^3}{x}-\frac{35a^4b^4}{x^2}-\frac{56a^3b^5}{3x^3}-\frac{7a^2b^6}{x^4}-\frac{8ab^7}{5x^5}-\frac{b^8}{6x^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^8*x,x]
```

```
[Out] -b^8/(6*x^6) - (8*a*b^7)/(5*x^5) - (7*a^2*b^6)/x^4 - (56*a^3*b^5)
/(3*x^3) - (35*a^4*b^4)/x^2 - (56*a^5*b^3)/x + 8*a^7*b*x + (a^8*x
^2)/2 + 28*a^6*b^2*Log[x]
```

Maple [A] time = 0.01, size = 88, normalized size = 0.9

$$-\frac{b^8}{6\,x^6}-\frac{8\,ab^7}{5\,x^5}-7\,\frac{a^2b^6}{x^4}-\frac{56\,a^3b^5}{3\,x^3}-35\,\frac{a^4b^4}{x^2}-56\,\frac{a^5b^3}{x}+8\,a^7bx+\frac{a^8x^2}{2}+28\,a^6b^2\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^8*x,x)
```

```
[Out] -1/6*b^8/x^6-8/5*a*b^7/x^5-7*a^2*b^6/x^4-56/3*a^3*b^5/x^3-35*a^4*
b^4/x^2-56*a^5*b^3/x+8*a^7*b*x+1/2*a^8*x^2+28*a^6*b^2*ln(x)
```

Maxima [A] time = 1.44099, size = 119, normalized size = 1.25

$$\frac{1}{2}\,a^{8}x^{2}+8\,a^{7}bx+28\,a^{6}b^{2}\log\left(x\right)-\frac{1680\,a^{5}b^{3}x^{5}+1050\,a^{4}b^{4}x^{4}+560\,a^{3}b^{5}x^{3}+210\,a^{2}b^{6}x^{2}+48\,ab^{7}x+5\,b^{8}}{30\,x^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x,x, algorithm="maxima")
```

```
[Out] 1/2*a^8*x^2 + 8*a^7*b*x + 28*a^6*b^2*log(x) - 1/30*(1680*a^5*b^3*
x^5 + 1050*a^4*b^4*x^4 + 560*a^3*b^5*x^3 + 210*a^2*b^6*x^2 + 48*a
*b^7*x + 5*b^8)/x^6
```

Fricas [A] time = 0.221656, size = 124, normalized size = 1.31

$$\frac{15\,a^{8}x^{8}+240\,a^{7}bx^{7}+840\,a^{6}b^{2}x^{6}\log\left(x\right)-1680\,a^{5}b^{3}x^{5}-1050\,a^{4}b^{4}x^{4}-560\,a^{3}b^{5}x^{3}-210\,a^{2}b^{6}x^{2}-48\,ab^{7}x-5\,b^{8}}{30\,x^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x,x, algorithm="fricas")
```

```
[Out] 1/30*(15*a^8*x^8 + 240*a^7*b*x^7 + 840*a^6*b^2*x^6*log(x) - 1680*
a^5*b^3*x^5 - 1050*a^4*b^4*x^4 - 560*a^3*b^5*x^3 - 210*a^2*b^6*x^
2 - 48*a*b^7*x - 5*b^8)/x^6
```

Sympy [A] time = 2.26207, size = 94, normalized size = 0.99

$$\frac{a^{8}x^{2}}{2}+8a^{7}bx+28a^{6}b^{2}\log\left(x\right)-\frac{1680a^{5}b^{3}x^{5}+1050a^{4}b^{4}x^{4}+560a^{3}b^{5}x^{3}+210a^{2}b^{6}x^{2}+48ab^{7}x+5b^{8}}{30x^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**8*x,x)
```

```
[Out] a**8*x**2/2 + 8*a**7*b*x + 28*a**6*b**2*log(x) - (1680*a**5*b**3*
x**5 + 1050*a**4*b**4*x**4 + 560*a**3*b**5*x**3 + 210*a**2*b**6*x
**2 + 48*a*b**7*x + 5*b**8)/(30*x**6)
```

GIAC/XCAS [A] time = 0.225792, size = 120, normalized size = 1.26

$$\frac{1}{2}\,a^{8}x^{2}+8\,a^{7}bx+28\,a^{6}b^{2}\ln\left(|x|\right)-\frac{1680\,a^{5}b^{3}x^{5}+1050\,a^{4}b^{4}x^{4}+560\,a^{3}b^{5}x^{3}+210\,a^{2}b^{6}x^{2}+48\,ab^{7}x+5\,b^{8}}{30\,x^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8*x,x, algorithm="giac")
```

```
[Out] 1/2*a^8*x^2 + 8*a^7*b*x + 28*a^6*b^2*ln(abs(x)) - 1/30*(1680*a^5*
b^3*x^5 + 1050*a^4*b^4*x^4 + 560*a^3*b^5*x^3 + 210*a^2*b^6*x^2 +
48*a*b^7*x + 5*b^8)/x^6
```

3.1596 $\int \left(a+\frac{b}{x}\right)^8 dx$

Optimal. Leaf size=94

$$a^8x+8a^7b\log(x)-\frac{28a^6b^2}{x}-\frac{28a^5b^3}{x^2}-\frac{70a^4b^4}{3x^3}-\frac{14a^3b^5}{x^4}-\frac{28a^2b^6}{5x^5}-\frac{4ab^7}{3x^6}-\frac{b^8}{7x^7}$$

```
[Out] -b^8/(7*x^7) - (4*a*b^7)/(3*x^6) - (28*a^2*b^6)/(5*x^5) - (14*a^3
*b^5)/x^4 - (70*a^4*b^4)/(3*x^3) - (28*a^5*b^3)/x^2 - (28*a^6*b^2
)/x + a^8*x + 8*a^7*b*Log[x]
```

Rubi [A] time = 0.105179, antiderivative size = 94, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$a^8x+8a^7b\log(x)-\frac{28a^6b^2}{x}-\frac{28a^5b^3}{x^2}-\frac{70a^4b^4}{3x^3}-\frac{14a^3b^5}{x^4}-\frac{28a^2b^6}{5x^5}-\frac{4ab^7}{3x^6}-\frac{b^8}{7x^7}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x)^8,x]
```

```
[Out] -b^8/(7*x^7) - (4*a*b^7)/(3*x^6) - (28*a^2*b^6)/(5*x^5) - (14*a^3
*b^5)/x^4 - (70*a^4*b^4)/(3*x^3) - (28*a^5*b^3)/x^2 - (28*a^6*b^2
)/x + a^8*x + 8*a^7*b*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$8a^7b\log(x)-\frac{28a^6b^2}{x}-\frac{28a^5b^3}{x^2}-\frac{70a^4b^4}{3x^3}-\frac{14a^3b^5}{x^4}-\frac{28a^2b^6}{5x^5}-\frac{4ab^7}{3x^6}-\frac{b^8}{7x^7}+\int a^8\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x)**8,x)
```

```
[Out] 8*a**7*b*log(x) - 28*a**6*b**2/x - 28*a**5*b**3/x**2 - 70*a**4*b*
*4/(3*x**3) - 14*a**3*b**5/x**4 - 28*a**2*b**6/(5*x**5) - 4*a*b**
7/(3*x**6) - b**8/(7*x**7) + Integral(a**8, x)
```

Mathematica [A] time = 0.00891505, size = 94, normalized size = 1.

$$a^8x+8a^7b\log(x)-\frac{28a^6b^2}{x}-\frac{28a^5b^3}{x^2}-\frac{70a^4b^4}{3x^3}-\frac{14a^3b^5}{x^4}-\frac{28a^2b^6}{5x^5}-\frac{4ab^7}{3x^6}-\frac{b^8}{7x^7}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x)^8,x]
```

```
[Out] -b^8/(7*x^7) - (4*a*b^7)/(3*x^6) - (28*a^2*b^6)/(5*x^5) - (14*a^3
*b^5)/x^4 - (70*a^4*b^4)/(3*x^3) - (28*a^5*b^3)/x^2 - (28*a^6*b^2
)/x + a^8*x + 8*a^7*b*Log[x]
```

Maple [A] time = 0.011, size = 87, normalized size = 0.9

$$-\frac{b^8}{7\,x^7}-\frac{4\,ab^7}{3\,x^6}-\frac{28\,a^2b^6}{5\,x^5}-14\,\frac{a^3b^5}{x^4}-\frac{70\,a^4b^4}{3\,x^3}-28\,\frac{a^5b^3}{x^2}-28\,\frac{a^6b^2}{x}+a^8x+8\,a^7b\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^8,x)
```

```
[Out] -1/7*b^8/x^7-4/3*a*b^7/x^6-28/5*a^2*b^6/x^5-14*a^3*b^5/x^4-70/3*a
^4*b^4/x^3-28*a^5*b^3/x^2-28*a^6*b^2/x+a^8*x+8*a^7*b*ln(x)
```

Maxima [A] time = 1.44189, size = 117, normalized size = 1.24

$$a^8x+8\,a^7b\log\left(x\right)-\frac{2940\,a^6b^2x^6+2940\,a^5b^3x^5+2450\,a^4b^4x^4+1470\,a^3b^5x^3+588\,a^2b^6x^2+140\,ab^7x+15\,b^8}{105\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8,x, algorithm="maxima")
```

```
[Out] a^8*x + 8*a^7*b*log(x) - 1/105*(2940*a^6*b^2*x^6 + 2940*a^5*b^3*x
^5 + 2450*a^4*b^4*x^4 + 1470*a^3*b^5*x^3 + 588*a^2*b^6*x^2 + 140*
a*b^7*x + 15*b^8)/x^7
```

Fricas [A] time = 0.218617, size = 124, normalized size = 1.32

$$\frac{105\,a^8x^8+840\,a^7bx^7\log\left(x\right)-2940\,a^6b^2x^6-2940\,a^5b^3x^5-2450\,a^4b^4x^4-1470\,a^3b^5x^3-588\,a^2b^6x^2-140\,ab^7x-15\,b^8}{105\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8,x, algorithm="fricas")
```

```
[Out] 1/105*(105*a^8*x^8 + 840*a^7*b*x^7*log(x) - 2940*a^6*b^2*x^6 - 29
40*a^5*b^3*x^5 - 2450*a^4*b^4*x^4 - 1470*a^3*b^5*x^3 - 588*a^2*b^
6*x^2 - 140*a*b^7*x - 15*b^8)/x^7
```

Sympy [A] time = 2.62155, size = 92, normalized size = 0.98

$$a^8x+8a^7b\log\left(x\right)-\frac{2940a^6b^2x^6+2940a^5b^3x^5+2450a^4b^4x^4+1470a^3b^5x^3+588a^2b^6x^2+140ab^7x+15b^8}{105x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**8,x)
```

```
[Out] a**8*x + 8*a**7*b*log(x) - (2940*a**6*b**2*x**6 + 2940*a**5*b**3*
x**5 + 2450*a**4*b**4*x**4 + 1470*a**3*b**5*x**3 + 588*a**2*b**6*
x**2 + 140*a*b**7*x + 15*b**8)/(105*x**7)
```

GIAC/XCAS [A] time = 0.222334, size = 119, normalized size = 1.27

$$a^8x+8\,a^7b\ln\left(|x|\right)-\frac{2940\,a^6b^2x^6+2940\,a^5b^3x^5+2450\,a^4b^4x^4+1470\,a^3b^5x^3+588\,a^2b^6x^2+140\,ab^7x+15\,b^8}{105\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8,x, algorithm="giac")
```

```
[Out] a^8*x + 8*a^7*b*ln(abs(x)) - 1/105*(2940*a^6*b^2*x^6 + 2940*a^5*b
^3*x^5 + 2450*a^4*b^4*x^4 + 1470*a^3*b^5*x^3 + 588*a^2*b^6*x^2 +
140*a*b^7*x + 15*b^8)/x^7
```

3.1597 $\int \frac{\left(a+\frac{b}{x}\right)^8}{x}\,dx$

Optimal. Leaf size=100

$$a^8\log(x)-\frac{8a^7b}{x}-\frac{14a^6b^2}{x^2}-\frac{56a^5b^3}{3x^3}-\frac{35a^4b^4}{2x^4}-\frac{56a^3b^5}{5x^5}-\frac{14a^2b^6}{3x^6}-\frac{8ab^7}{7x^7}-\frac{b^8}{8x^8}$$

```
[Out] -b^8/(8*x^8) - (8*a*b^7)/(7*x^7) - (14*a^2*b^6)/(3*x^6) - (56*a^3
*b^5)/(5*x^5) - (35*a^4*b^4)/(2*x^4) - (56*a^5*b^3)/(3*x^3) - (14
*a^6*b^2)/x^2 - (8*a^7*b)/x + a^8*Log[x]
```

Rubi [A] time = 0.108362, antiderivative size = 100, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$a^8\log(x)-\frac{8a^7b}{x}-\frac{14a^6b^2}{x^2}-\frac{56a^5b^3}{3x^3}-\frac{35a^4b^4}{2x^4}-\frac{56a^3b^5}{5x^5}-\frac{14a^2b^6}{3x^6}-\frac{8ab^7}{7x^7}-\frac{b^8}{8x^8}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^8/x,x]
```

```
[Out] -b^8/(8*x^8) - (8*a*b^7)/(7*x^7) - (14*a^2*b^6)/(3*x^6) - (56*a^3
*b^5)/(5*x^5) - (35*a^4*b^4)/(2*x^4) - (56*a^5*b^3)/(3*x^3) - (14
*a^6*b^2)/x^2 - (8*a^7*b)/x + a^8*Log[x]
```

Rubi in Sympy [A] time = 20.3526, size = 100, normalized size = 1.

$$a^8\log(x)-\frac{8a^7b}{x}-\frac{14a^6b^2}{x^2}-\frac{56a^5b^3}{3x^3}-\frac{35a^4b^4}{2x^4}-\frac{56a^3b^5}{5x^5}-\frac{14a^2b^6}{3x^6}-\frac{8ab^7}{7x^7}-\frac{b^8}{8x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**8/x,x)
```

```
[Out] a**8*log(x) - 8*a**7*b/x - 14*a**6*b**2/x**2 - 56*a**5*b**3/(3*x*
*3) - 35*a**4*b**4/(2*x**4) - 56*a**3*b**5/(5*x**5) - 14*a**2*b**
6/(3*x**6) - 8*a*b**7/(7*x**7) - b**8/(8*x**8)
```

Mathematica [A] time = 0.00770999, size = 100, normalized size = 1.

$$a^8\log(x)-\frac{8a^7b}{x}-\frac{14a^6b^2}{x^2}-\frac{56a^5b^3}{3x^3}-\frac{35a^4b^4}{2x^4}-\frac{56a^3b^5}{5x^5}-\frac{14a^2b^6}{3x^6}-\frac{8ab^7}{7x^7}-\frac{b^8}{8x^8}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^8/x,x]
```

```
[Out] -b^8/(8*x^8) - (8*a*b^7)/(7*x^7) - (14*a^2*b^6)/(3*x^6) - (56*a^3
*b^5)/(5*x^5) - (35*a^4*b^4)/(2*x^4) - (56*a^5*b^3)/(3*x^3) - (14
*a^6*b^2)/x^2 - (8*a^7*b)/x + a^8*Log[x]
```

Maple [A] time = 0.012, size = 89, normalized size = 0.9

$$-\frac{b^8}{8\,x^8}-\frac{8\,ab^7}{7\,x^7}-\frac{14\,a^2b^6}{3\,x^6}-\frac{56\,a^3b^5}{5\,x^5}-\frac{35\,a^4b^4}{2\,x^4}-\frac{56\,a^5b^3}{3\,x^3}-14\,\frac{a^6b^2}{x^2}-8\,\frac{a^7b}{x}+a^8\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^8/x,x)
```

```
[Out] -1/8*b^8/x^8-8/7*a*b^7/x^7-14/3*a^2*b^6/x^6-56/5*a^3*b^5/x^5-35/2
*a^4*b^4/x^4-56/3*a^5*b^3/x^3-14*a^6*b^2/x^2-8*a^7*b/x+a^8*ln(x)
```

Maxima [A] time = 1.43028, size = 120, normalized size = 1.2

$$a^8 \log(x) - \frac{6720\, a^7 b x^7 + 11760\, a^6 b^2 x^6 + 15680\, a^5 b^3 x^5 + 14700\, a^4 b^4 x^4 + 9408\, a^3 b^5 x^3 + 3920\, a^2 b^6 x^2 + 960\, a b^7 x + 105\, b^8}{840\, x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8/x,x, algorithm="maxima")
```

```
[Out] a^8*log(x) - 1/840*(6720*a^7*b*x^7 + 11760*a^6*b^2*x^6 + 15680*a^
5*b^3*x^5 + 14700*a^4*b^4*x^4 + 9408*a^3*b^5*x^3 + 3920*a^2*b^6*x
^2 + 960*a*b^7*x + 105*b^8)/x^8
```

Fricas [A] time = 0.219911, size = 124, normalized size = 1.24

$$\frac{840\, a^8 x^8 \log(x) - 6720\, a^7 b x^7 - 11760\, a^6 b^2 x^6 - 15680\, a^5 b^3 x^5 - 14700\, a^4 b^4 x^4 - 9408\, a^3 b^5 x^3 - 3920\, a^2 b^6 x^2 - 960\, a b^7 x - 10}{840\, x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8/x,x, algorithm="fricas")
```

```
[Out] 1/840*(840*a^8*x^8*log(x) - 6720*a^7*b*x^7 - 11760*a^6*b^2*x^6 -
15680*a^5*b^3*x^5 - 14700*a^4*b^4*x^4 - 9408*a^3*b^5*x^3 - 3920*a
^2*b^6*x^2 - 960*a*b^7*x - 105*b^8)/x^8
```

Sympy [A] time = 2.81548, size = 94, normalized size = 0.94

$$a^8 \log(x) - \frac{6720a^7 b x^7 + 11760a^6 b^2 x^6 + 15680a^5 b^3 x^5 + 14700a^4 b^4 x^4 + 9408a^3 b^5 x^3 + 3920a^2 b^6 x^2 + 960ab^7 x + 105b^8}{840x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**8/x,x)
```

```
[Out] a**8*log(x) - (6720*a**7*b*x**7 + 11760*a**6*b**2*x**6 + 15680*a*
*5*b**3*x**5 + 14700*a**4*b**4*x**4 + 9408*a**3*b**5*x**3 + 3920*
a**2*b**6*x**2 + 960*a*b**7*x + 105*b**8)/(840*x**8)
```

GIAC/XCAS [A] time = 0.223878, size = 122, normalized size = 1.22

$$a^8 \ln(|x|) - \frac{6720\, a^7 b x^7 + 11760\, a^6 b^2 x^6 + 15680\, a^5 b^3 x^5 + 14700\, a^4 b^4 x^4 + 9408\, a^3 b^5 x^3 + 3920\, a^2 b^6 x^2 + 960\, a b^7 x + 105\, b^8}{840\, x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8/x,x, algorithm="giac")
```

```
[Out] a^8*ln(abs(x)) - 1/840*(6720*a^7*b*x^7 + 11760*a^6*b^2*x^6 + 1568
0*a^5*b^3*x^5 + 14700*a^4*b^4*x^4 + 9408*a^3*b^5*x^3 + 3920*a^2*b
^6*x^2 + 960*a*b^7*x + 105*b^8)/x^8
```

3.1598 $\int \frac{\left(a+\frac{b}{x}\right)^8}{x^2} dx$

Optimal. Leaf size=16

$$-\frac{\left(a+\frac{b}{x}\right)^9}{9b}$$

```
[Out] -(a + b/x)^9/(9*b)
```

Rubi [A] time = 0.0159928, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{\left(a+\frac{b}{x}\right)^9}{9b}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^8/x^2,x]

[Out] -(a + b/x)^9/(9*b)
```

Rubi in Sympy [A] time = 2.20055, size = 10, normalized size = 0.62

$$-\frac{\left(a+\frac{b}{x}\right)^9}{9b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**8/x**2,x)

[Out] -(a + b/x)**9/(9*b)
```

Mathematica [B] time = 0.0151074, size = 96, normalized size = 6.

$$-\frac{a^8}{x}-\frac{4a^7b}{x^2}-\frac{28a^6b^2}{3x^3}-\frac{14a^5b^3}{x^4}-\frac{14a^4b^4}{x^5}-\frac{28a^3b^5}{3x^6}-\frac{4a^2b^6}{x^7}-\frac{ab^7}{x^8}-\frac{b^8}{9x^9}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^8/x^2,x]

[Out] -b^8/(9*x^9) - (a*b^7)/x^8 - (4*a^2*b^6)/x^7 - (28*a^3*b^5)/(3*x^
6) - (14*a^4*b^4)/x^5 - (14*a^5*b^3)/x^4 - (28*a^6*b^2)/(3*x^3) -
 (4*a^7*b)/x^2 - a^8/x
```

Maple [B] time = 0.008, size = 91, normalized size = 5.7

$$-\frac{28\,a^3b^5}{3\,x^6}-14\,\frac{a^5b^3}{x^4}-\frac{ab^7}{x^8}-\frac{b^8}{9\,x^9}-\frac{28\,a^6b^2}{3\,x^3}-4\,\frac{a^7b}{x^2}-14\,\frac{a^4b^4}{x^5}-\frac{a^8}{x}-4\,\frac{a^2b^6}{x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^8/x^2,x)
```

```
[Out] -28/3*a^3*b^5/x^6-14*a^5*b^3/x^4-a*b^7/x^8-1/9*b^8/x^9-28/3*a^6*b
^2/x^3-4*a^7*b/x^2-14*a^4*b^4/x^5-a^8/x-4*a^2*b^6/x^7
```

Maxima [A] time = 1.55373, size = 19, normalized size = 1.19

$$-\frac{\left(a+\frac{b}{x}\right)^{9}}{9\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8/x^2,x, algorithm="maxima")
```

```
[Out] -1/9*(a + b/x)^9/b
```

Fricas [A] time = 0.216225, size = 119, normalized size = 7.44

$$-\frac{9\,a^{8}x^{8}+36\,a^{7}bx^{7}+84\,a^{6}b^{2}x^{6}+126\,a^{5}b^{3}x^{5}+126\,a^{4}b^{4}x^{4}+84\,a^{3}b^{5}x^{3}+36\,a^{2}b^{6}x^{2}+9\,ab^{7}x+b^{8}}{9\,x^{9}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8/x^2,x, algorithm="fricas")
```

```
[Out] -1/9*(9*a^8*x^8 + 36*a^7*b*x^7 + 84*a^6*b^2*x^6 + 126*a^5*b^3*x^5
 + 126*a^4*b^4*x^4 + 84*a^3*b^5*x^3 + 36*a^2*b^6*x^2 + 9*a*b^7*x
+ b^8)/x^9
```

Sympy [A] time = 3.02233, size = 95, normalized size = 5.94

$$-\frac{9a^{8}x^{8}+36a^{7}bx^{7}+84a^{6}b^{2}x^{6}+126a^{5}b^{3}x^{5}+126a^{4}b^{4}x^{4}+84a^{3}b^{5}x^{3}+36a^{2}b^{6}x^{2}+9ab^{7}x+b^{8}}{9x^{9}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**8/x**2,x)
```

```
[Out] -(9*a**8*x**8 + 36*a**7*b*x**7 + 84*a**6*b**2*x**6 + 126*a**5*b**
3*x**5 + 126*a**4*b**4*x**4 + 84*a**3*b**5*x**3 + 36*a**2*b**6*x*
*2 + 9*a*b**7*x + b**8)/(9*x**9)
```

GIAC/XCAS [A] time = 0.223425, size = 19, normalized size = 1.19

$$-\frac{\left(a+\frac{b}{x}\right)^{9}}{9\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8/x^2,x, algorithm="giac")
```

```
[Out] -1/9*(a + b/x)^9/b
```

3.1599 $\int \frac{\left(a+\frac{b}{x}\right)^8}{x^3}\,dx$

Optimal. Leaf size=36

$$\frac{a(ax+b)^9}{90b^2x^9}-\frac{(ax+b)^9}{10bx^{10}}$$

```
[Out] -(b + a*x)^9/(10*b*x^10) + (a*(b + a*x)^9)/(90*b^2*x^9)
```

Rubi [A] time = 0.038869, antiderivative size = 36, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{a(ax+b)^9}{90b^2x^9}-\frac{(ax+b)^9}{10bx^{10}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^8/x^3,x]

[Out] -(b + a*x)^9/(10*b*x^10) + (a*(b + a*x)^9)/(90*b^2*x^9)
```

Rubi in Sympy [A] time = 5.43205, size = 29, normalized size = 0.81

$$\frac{a\,(ax+b)^9}{90b^2x^9}-\frac{(ax+b)^9}{10bx^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**8/x**3,x)

[Out] a*(a*x + b)**9/(90*b**2*x**9) - (a*x + b)**9/(10*b*x**10)
```

Mathematica [B] time = 0.00734905, size = 104, normalized size = 2.89

$$-\frac{a^8}{2x^2}-\frac{8a^7b}{3x^3}-\frac{7a^6b^2}{x^4}-\frac{56a^5b^3}{5x^5}-\frac{35a^4b^4}{3x^6}-\frac{8a^3b^5}{x^7}-\frac{7a^2b^6}{2x^8}-\frac{8ab^7}{9x^9}-\frac{b^8}{10x^{10}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^8/x^3,x]

[Out] -b^8/(10*x^10) - (8*a*b^7)/(9*x^9) - (7*a^2*b^6)/(2*x^8) - (8*a^3
*b^5)/x^7 - (35*a^4*b^4)/(3*x^6) - (56*a^5*b^3)/(5*x^5) - (7*a^6*
b^2)/x^4 - (8*a^7*b)/(3*x^3) - a^8/(2*x^2)
```

Maple [B] time = 0.009, size = 91, normalized size = 2.5

$$-\frac{35\,a^4b^4}{3\,x^6}-7\,\frac{a^6b^2}{x^4}-\frac{b^8}{10\,x^{10}}-\frac{7\,a^2b^6}{2\,x^8}-\frac{8\,ab^7}{9\,x^9}-\frac{8\,a^7b}{3\,x^3}-\frac{a^8}{2\,x^2}-\frac{56\,a^5b^3}{5\,x^5}-8\,\frac{a^3b^5}{x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^8/x^3,x)
```

```
[Out] -35/3*a^4*b^4/x^6-7*a^6*b^2/x^4-1/10*b^8/x^10-7/2*a^2*b^6/x^8-8/9
*a*b^7/x^9-8/3*a^7*b/x^3-1/2*a^8/x^2-56/5*a^5*b^3/x^5-8*a^3*b^5/x
^7
```

Maxima [A] time = 1.44484, size = 122, normalized size = 3.39

$$-\frac{45\,a^8x^8+240\,a^7bx^7+630\,a^6b^2x^6+1008\,a^5b^3x^5+1050\,a^4b^4x^4+720\,a^3b^5x^3+315\,a^2b^6x^2+80\,ab^7x+9\,b^8}{90\,x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8/x^3,x, algorithm="maxima")
```

```
[Out] -1/90*(45*a^8*x^8 + 240*a^7*b*x^7 + 630*a^6*b^2*x^6 + 1008*a^5*b^
3*x^5 + 1050*a^4*b^4*x^4 + 720*a^3*b^5*x^3 + 315*a^2*b^6*x^2 + 80
*a*b^7*x + 9*b^8)/x^10
```

Fricas [A] time = 0.216041, size = 122, normalized size = 3.39

$$-\frac{45\,a^8x^8+240\,a^7bx^7+630\,a^6b^2x^6+1008\,a^5b^3x^5+1050\,a^4b^4x^4+720\,a^3b^5x^3+315\,a^2b^6x^2+80\,ab^7x+9\,b^8}{90\,x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8/x^3,x, algorithm="fricas")
```

```
[Out] -1/90*(45*a^8*x^8 + 240*a^7*b*x^7 + 630*a^6*b^2*x^6 + 1008*a^5*b^
3*x^5 + 1050*a^4*b^4*x^4 + 720*a^3*b^5*x^3 + 315*a^2*b^6*x^2 + 80
*a*b^7*x + 9*b^8)/x^10
```

Sympy [A] time = 3.14696, size = 97, normalized size = 2.69

$$-\frac{45a^8x^8+240a^7bx^7+630a^6b^2x^6+1008a^5b^3x^5+1050a^4b^4x^4+720a^3b^5x^3+315a^2b^6x^2+80ab^7x+9b^8}{90x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**8/x**3,x)
```

```
[Out] -(45*a**8*x**8 + 240*a**7*b*x**7 + 630*a**6*b**2*x**6 + 1008*a**5
*b**3*x**5 + 1050*a**4*b**4*x**4 + 720*a**3*b**5*x**3 + 315*a**2*
b**6*x**2 + 80*a*b**7*x + 9*b**8)/(90*x**10)
```

GIAC/XCAS [A] time = 0.22792, size = 122, normalized size = 3.39

$$-\frac{45\,a^8x^8+240\,a^7bx^7+630\,a^6b^2x^6+1008\,a^5b^3x^5+1050\,a^4b^4x^4+720\,a^3b^5x^3+315\,a^2b^6x^2+80\,ab^7x+9\,b^8}{90\,x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8/x^3,x, algorithm="giac")
```

```
[Out] -1/90*(45*a^8*x^8 + 240*a^7*b*x^7 + 630*a^6*b^2*x^6 + 1008*a^5*b^
3*x^5 + 1050*a^4*b^4*x^4 + 720*a^3*b^5*x^3 + 315*a^2*b^6*x^2 + 80
*a*b^7*x + 9*b^8)/x^10
```

3.1600 $\int \frac{\left(a+\frac{b}{x}\right)^8}{x^4} dx$

Optimal. Leaf size=56

$$-\frac{a^2(ax+b)^9}{495b^3x^9}+\frac{a(ax+b)^9}{55b^2x^{10}}-\frac{(ax+b)^9}{11bx^{11}}$$

```
[Out] -(b + a*x)^9/(11*b*x^11) + (a*(b + a*x)^9)/(55*b^2*x^10) - (a^2*(
b + a*x)^9)/(495*b^3*x^9)
```

Rubi [A] time = 0.0548057, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$

$$-\frac{a^2(ax+b)^9}{495b^3x^9}+\frac{a(ax+b)^9}{55b^2x^{10}}-\frac{(ax+b)^9}{11bx^{11}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x)^8/x^4,x]
```

```
[Out] -(b + a*x)^9/(11*b*x^11) + (a*(b + a*x)^9)/(55*b^2*x^10) - (a^2*(
b + a*x)^9)/(495*b^3*x^9)
```

Rubi in Sympy [A] time = 7.6067, size = 48, normalized size = 0.86

$$-\frac{a^2\left(ax+b\right)^9}{495b^3x^9}+\frac{a\left(ax+b\right)^9}{55b^2x^{10}}-\frac{\left(ax+b\right)^9}{11bx^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x)**8/x**4,x)
```

```
[Out] -a**2*(a*x + b)**9/(495*b**3*x**9) + a*(a*x + b)**9/(55*b**2*x**1
0) - (a*x + b)**9/(11*b*x**11)
```

Mathematica [A] time = 0.0137641, size = 102, normalized size = 1.82

$$-\frac{a^8}{3x^3}-\frac{2a^7b}{x^4}-\frac{28a^6b^2}{5x^5}-\frac{28a^5b^3}{3x^6}-\frac{10a^4b^4}{x^7}-\frac{7a^3b^5}{x^8}-\frac{28a^2b^6}{9x^9}-\frac{4ab^7}{5x^{10}}-\frac{b^8}{11x^{11}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x)^8/x^4,x]
```

```
[Out] -b^8/(11*x^11) - (4*a*b^7)/(5*x^10) - (28*a^2*b^6)/(9*x^9) - (7*a
^3*b^5)/x^8 - (10*a^4*b^4)/x^7 - (28*a^5*b^3)/(3*x^6) - (28*a^6*b
^2)/(5*x^5) - (2*a^7*b)/x^4 - a^8/(3*x^3)
```

Maple [A] time = 0.009, size = 91, normalized size = 1.6

$$-\frac{28\,a^5b^3}{3\,x^6}-2\,\frac{a^7b}{x^4}-\frac{4\,ab^7}{5\,x^{10}}-7\,\frac{a^3b^5}{x^8}-\frac{b^8}{11\,x^{11}}-\frac{28\,a^2b^6}{9\,x^9}-\frac{a^8}{3\,x^3}-\frac{28\,a^6b^2}{5\,x^5}-10\,\frac{a^4b^4}{x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^8/x^4,x)
```

```
[Out] -28/3*a^5*b^3/x^6-2*a^7*b/x^4-4/5*a*b^7/x^10-7*a^3*b^5/x^8-1/11*b
^8/x^11-28/9*a^2*b^6/x^9-1/3*a^8/x^3-28/5*a^6*b^2/x^5-10*a^4*b^4/
x^7
```

Maxima [A] time = 1.44453, size = 122, normalized size = 2.18

$$-\frac{165\,a^{8}x^{8}+990\,a^{7}bx^{7}+2772\,a^{6}b^{2}x^{6}+4620\,a^{5}b^{3}x^{5}+4950\,a^{4}b^{4}x^{4}+3465\,a^{3}b^{5}x^{3}+1540\,a^{2}b^{6}x^{2}+396\,ab^{7}x+45\,b^{8}}{495\,x^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8/x^4,x, algorithm="maxima")
```

```
[Out] -1/495*(165*a^8*x^8 + 990*a^7*b*x^7 + 2772*a^6*b^2*x^6 + 4620*a^5
*b^3*x^5 + 4950*a^4*b^4*x^4 + 3465*a^3*b^5*x^3 + 1540*a^2*b^6*x^2
 + 396*a*b^7*x + 45*b^8)/x^11
```

Fricas [A] time = 0.213238, size = 122, normalized size = 2.18

$$-\frac{165\,a^{8}x^{8}+990\,a^{7}bx^{7}+2772\,a^{6}b^{2}x^{6}+4620\,a^{5}b^{3}x^{5}+4950\,a^{4}b^{4}x^{4}+3465\,a^{3}b^{5}x^{3}+1540\,a^{2}b^{6}x^{2}+396\,ab^{7}x+45\,b^{8}}{495\,x^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8/x^4,x, algorithm="fricas")
```

```
[Out] -1/495*(165*a^8*x^8 + 990*a^7*b*x^7 + 2772*a^6*b^2*x^6 + 4620*a^5
*b^3*x^5 + 4950*a^4*b^4*x^4 + 3465*a^3*b^5*x^3 + 1540*a^2*b^6*x^2
 + 396*a*b^7*x + 45*b^8)/x^11
```

Sympy [A] time = 3.34295, size = 97, normalized size = 1.73

$$-\frac{165a^{8}x^{8}+990a^{7}bx^{7}+2772a^{6}b^{2}x^{6}+4620a^{5}b^{3}x^{5}+4950a^{4}b^{4}x^{4}+3465a^{3}b^{5}x^{3}+1540a^{2}b^{6}x^{2}+396ab^{7}x+45b^{8}}{495x^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**8/x**4,x)
```

```
[Out] -(165*a**8*x**8 + 990*a**7*b*x**7 + 2772*a**6*b**2*x**6 + 4620*a*
*5*b**3*x**5 + 4950*a**4*b**4*x**4 + 3465*a**3*b**5*x**3 + 1540*a
**2*b**6*x**2 + 396*a*b**7*x + 45*b**8)/(495*x**11)
```

GIAC/XCAS [A] time = 0.225963, size = 122, normalized size = 2.18

$$-\frac{165\,a^{8}x^{8}+990\,a^{7}bx^{7}+2772\,a^{6}b^{2}x^{6}+4620\,a^{5}b^{3}x^{5}+4950\,a^{4}b^{4}x^{4}+3465\,a^{3}b^{5}x^{3}+1540\,a^{2}b^{6}x^{2}+396\,ab^{7}x+45\,b^{8}}{495\,x^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8/x^4,x, algorithm="giac")
```

```
[Out] -1/495*(165*a^8*x^8 + 990*a^7*b*x^7 + 2772*a^6*b^2*x^6 + 4620*a^5
*b^3*x^5 + 4950*a^4*b^4*x^4 + 3465*a^3*b^5*x^3 + 1540*a^2*b^6*x^2
 + 396*a*b^7*x + 45*b^8)/x^11
```

3.1601 $\int \frac{\left(a+\frac{b}{x}\right)^8}{x^5} dx$

Optimal. Leaf size=76

$$\frac{a^3(ax+b)^9}{1980b^4x^9} - \frac{a^2(ax+b)^9}{220b^3x^{10}} + \frac{a(ax+b)^9}{44b^2x^{11}} - \frac{(ax+b)^9}{12bx^{12}}$$

```
[Out] -(b + a*x)^9/(12*b*x^12) + (a*(b + a*x)^9)/(44*b^2*x^11) - (a^2*(
b + a*x)^9)/(220*b^3*x^10) + (a^3*(b + a*x)^9)/(1980*b^4*x^9)
```

Rubi [A] time = 0.0760113, antiderivative size = 76, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$

$$\frac{a^3(ax+b)^9}{1980b^4x^9} - \frac{a^2(ax+b)^9}{220b^3x^{10}} + \frac{a(ax+b)^9}{44b^2x^{11}} - \frac{(ax+b)^9}{12bx^{12}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^8/x^5,x]
```

```
[Out] -(b + a*x)^9/(12*b*x^12) + (a*(b + a*x)^9)/(44*b^2*x^11) - (a^2*(
b + a*x)^9)/(220*b^3*x^10) + (a^3*(b + a*x)^9)/(1980*b^4*x^9)
```

Rubi in Sympy [A] time = 11.1138, size = 66, normalized size = 0.87

$$\frac{a^3\left(ax+b\right)^9}{1980b^4x^9} - \frac{a^2\left(ax+b\right)^9}{220b^3x^{10}} + \frac{a\left(ax+b\right)^9}{44b^2x^{11}} - \frac{\left(ax+b\right)^9}{12bx^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**8/x**5,x)
```

```
[Out] a**3*(a*x + b)**9/(1980*b**4*x**9) - a**2*(a*x + b)**9/(220*b**3*
x**10) + a*(a*x + b)**9/(44*b**2*x**11) - (a*x + b)**9/(12*b*x**1
2)
```

Mathematica [A] time = 0.00734809, size = 106, normalized size = 1.39

$$-\frac{a^8}{4x^4} - \frac{8a^7b}{5x^5} - \frac{14a^6b^2}{3x^6} - \frac{8a^5b^3}{x^7} - \frac{35a^4b^4}{4x^8} - \frac{56a^3b^5}{9x^9} - \frac{14a^2b^6}{5x^{10}} - \frac{8ab^7}{11x^{11}} - \frac{b^8}{12x^{12}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^8/x^5,x]
```

```
[Out] -b^8/(12*x^12) - (8*a*b^7)/(11*x^11) - (14*a^2*b^6)/(5*x^10) - (5
6*a^3*b^5)/(9*x^9) - (35*a^4*b^4)/(4*x^8) - (8*a^5*b^3)/x^7 - (14
*a^6*b^2)/(3*x^6) - (8*a^7*b)/(5*x^5) - a^8/(4*x^4)
```

Maple [A] time = 0.01, size = 91, normalized size = 1.2

$$-\frac{b^8}{12\,x^{12}} - \frac{14\,a^6b^2}{3\,x^6} - \frac{a^8}{4\,x^4} - \frac{14\,a^2b^6}{5\,x^{10}} - \frac{35\,a^4b^4}{4\,x^8} - \frac{8\,ab^7}{11\,x^{11}} - \frac{56\,a^3b^5}{9\,x^9} - \frac{8\,a^7b}{5\,x^5} - 8\,\frac{a^5b^3}{x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^8/x^5,x)
```

```
[Out] -1/12*b^8/x^12-14/3*a^6*b^2/x^6-1/4*a^8/x^4-14/5*a^2*b^6/x^10-35/
4*a^4*b^4/x^8-8/11*a*b^7/x^11-56/9*a^3*b^5/x^9-8/5*a^7*b/x^5-8*a^
5*b^3/x^7
```

Maxima [A] time = 1.44047, size = 122, normalized size = 1.61

$$-\frac{495\,a^{8}x^{8}+3168\,a^{7}bx^{7}+9240\,a^{6}b^{2}x^{6}+15840\,a^{5}b^{3}x^{5}+17325\,a^{4}b^{4}x^{4}+12320\,a^{3}b^{5}x^{3}+5544\,a^{2}b^{6}x^{2}+1440\,ab^{7}x+165\,b^{8}}{1980\,x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8/x^5,x, algorithm="maxima")
```

```
[Out] -1/1980*(495*a^8*x^8 + 3168*a^7*b*x^7 + 9240*a^6*b^2*x^6 + 15840*
a^5*b^3*x^5 + 17325*a^4*b^4*x^4 + 12320*a^3*b^5*x^3 + 5544*a^2*b^
6*x^2 + 1440*a*b^7*x + 165*b^8)/x^12
```

Fricas [A] time = 0.216908, size = 122, normalized size = 1.61

$$-\frac{495\,a^{8}x^{8}+3168\,a^{7}bx^{7}+9240\,a^{6}b^{2}x^{6}+15840\,a^{5}b^{3}x^{5}+17325\,a^{4}b^{4}x^{4}+12320\,a^{3}b^{5}x^{3}+5544\,a^{2}b^{6}x^{2}+1440\,ab^{7}x+165\,b^{8}}{1980\,x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8/x^5,x, algorithm="fricas")
```

```
[Out] -1/1980*(495*a^8*x^8 + 3168*a^7*b*x^7 + 9240*a^6*b^2*x^6 + 15840*
a^5*b^3*x^5 + 17325*a^4*b^4*x^4 + 12320*a^3*b^5*x^3 + 5544*a^2*b^
6*x^2 + 1440*a*b^7*x + 165*b^8)/x^12
```

Sympy [A] time = 3.44365, size = 97, normalized size = 1.28

$$-\frac{495a^{8}x^{8}+3168a^{7}bx^{7}+9240a^{6}b^{2}x^{6}+15840a^{5}b^{3}x^{5}+17325a^{4}b^{4}x^{4}+12320a^{3}b^{5}x^{3}+5544a^{2}b^{6}x^{2}+1440ab^{7}x+165b^{8}}{1980x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**8/x**5,x)
```

```
[Out] -(495*a**8*x**8 + 3168*a**7*b*x**7 + 9240*a**6*b**2*x**6 + 15840*
a**5*b**3*x**5 + 17325*a**4*b**4*x**4 + 12320*a**3*b**5*x**3 + 55
44*a**2*b**6*x**2 + 1440*a*b**7*x + 165*b**8)/(1980*x**12)
```

GIAC/XCAS [A] time = 0.221204, size = 122, normalized size = 1.61

$$-\frac{495\,a^{8}x^{8}+3168\,a^{7}bx^{7}+9240\,a^{6}b^{2}x^{6}+15840\,a^{5}b^{3}x^{5}+17325\,a^{4}b^{4}x^{4}+12320\,a^{3}b^{5}x^{3}+5544\,a^{2}b^{6}x^{2}+1440\,ab^{7}x+165\,b^{8}}{1980\,x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8/x^5,x, algorithm="giac")
```

```
[Out] -1/1980*(495*a^8*x^8 + 3168*a^7*b*x^7 + 9240*a^6*b^2*x^6 + 15840*
a^5*b^3*x^5 + 17325*a^4*b^4*x^4 + 12320*a^3*b^5*x^3 + 5544*a^2*b^
6*x^2 + 1440*a*b^7*x + 165*b^8)/x^12
```

3.1602 $\int \frac{\left(a+\frac{b}{x}\right)^8}{x^6} dx$

Optimal. Leaf size=96

$$-\frac{a^4(ax+b)^9}{6435b^5x^9}+\frac{a^3(ax+b)^9}{715b^4x^{10}}-\frac{a^2(ax+b)^9}{143b^3x^{11}}+\frac{a(ax+b)^9}{39b^2x^{12}}-\frac{(ax+b)^9}{13bx^{13}}$$

```
[Out] -(b + a*x)^9/(13*b*x^13) + (a*(b + a*x)^9)/(39*b^2*x^12) - (a^2*(
b + a*x)^9)/(143*b^3*x^11) + (a^3*(b + a*x)^9)/(715*b^4*x^10) - (
a^4*(b + a*x)^9)/(6435*b^5*x^9)
```

Rubi [A] time = 0.101826, antiderivative size = 96, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{a^4(ax+b)^9}{6435b^5x^9}+\frac{a^3(ax+b)^9}{715b^4x^{10}}-\frac{a^2(ax+b)^9}{143b^3x^{11}}+\frac{a(ax+b)^9}{39b^2x^{12}}-\frac{(ax+b)^9}{13bx^{13}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^8/x^6,x]
```

```
[Out] -(b + a*x)^9/(13*b*x^13) + (a*(b + a*x)^9)/(39*b^2*x^12) - (a^2*(
b + a*x)^9)/(143*b^3*x^11) + (a^3*(b + a*x)^9)/(715*b^4*x^10) - (
a^4*(b + a*x)^9)/(6435*b^5*x^9)
```

Rubi in Sympy [A] time = 20.4684, size = 105, normalized size = 1.09

$$-\frac{a^8}{5x^5}-\frac{4a^7b}{3x^6}-\frac{4a^6b^2}{x^7}-\frac{7a^5b^3}{x^8}-\frac{70a^4b^4}{9x^9}-\frac{28a^3b^5}{5x^{10}}-\frac{28a^2b^6}{11x^{11}}-\frac{2ab^7}{3x^{12}}-\frac{b^8}{13x^{13}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**8/x**6,x)
```

```
[Out] -a**8/(5*x**5) - 4*a**7*b/(3*x**6) - 4*a**6*b**2/x**7 - 7*a**5*b*
*3/x**8 - 70*a**4*b**4/(9*x**9) - 28*a**3*b**5/(5*x**10) - 28*a**
2*b**6/(11*x**11) - 2*a*b**7/(3*x**12) - b**8/(13*x**13)
```

Mathematica [A] time = 0.0155441, size = 104, normalized size = 1.08

$$-\frac{a^8}{5x^5}-\frac{4a^7b}{3x^6}-\frac{4a^6b^2}{x^7}-\frac{7a^5b^3}{x^8}-\frac{70a^4b^4}{9x^9}-\frac{28a^3b^5}{5x^{10}}-\frac{28a^2b^6}{11x^{11}}-\frac{2ab^7}{3x^{12}}-\frac{b^8}{13x^{13}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^8/x^6,x]
```

```
[Out] -b^8/(13*x^13) - (2*a*b^7)/(3*x^12) - (28*a^2*b^6)/(11*x^11) - (2
8*a^3*b^5)/(5*x^10) - (70*a^4*b^4)/(9*x^9) - (7*a^5*b^3)/x^8 - (4
*a^6*b^2)/x^7 - (4*a^7*b)/(3*x^6) - a^8/(5*x^5)
```

Maple [A] time = 0.009, size = 91, normalized size = 1.

$$-\frac{2\,ab^7}{3\,x^{12}}-\frac{b^8}{13\,x^{13}}-\frac{4\,a^7b}{3\,x^6}-\frac{28\,a^3b^5}{5\,x^{10}}-7\,\frac{a^5b^3}{x^8}-\frac{28\,a^2b^6}{11\,x^{11}}-\frac{70\,a^4b^4}{9\,x^9}-\frac{a^8}{5\,x^5}-4\,\frac{a^6b^2}{x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^8/x^6,x)
```

```
[Out] -2/3*a*b^7/x^12-1/13*b^8/x^13-4/3*a^7*b/x^6-28/5*a^3*b^5/x^10-7*a
^5*b^3/x^8-28/11*a^2*b^6/x^11-70/9*a^4*b^4/x^9-1/5*a^8/x^5-4*a^6*
b^2/x^7
```

Maxima [A] time = 1.45311, size = 122, normalized size = 1.27

$$-\frac{1287\,a^8x^8 + 8580\,a^7bx^7 + 25740\,a^6b^2x^6 + 45045\,a^5b^3x^5 + 50050\,a^4b^4x^4 + 36036\,a^3b^5x^3 + 16380\,a^2b^6x^2 + 4290\,ab^7x + 495\,}{6435\,x^{13}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8/x^6,x, algorithm="maxima")
```

```
[Out] -1/6435*(1287*a^8*x^8 + 8580*a^7*b*x^7 + 25740*a^6*b^2*x^6 + 4504
5*a^5*b^3*x^5 + 50050*a^4*b^4*x^4 + 36036*a^3*b^5*x^3 + 16380*a^2
*b^6*x^2 + 4290*a*b^7*x + 495*b^8)/x^13
```

Fricas [A] time = 0.211146, size = 122, normalized size = 1.27

$$-\frac{1287\,a^8x^8 + 8580\,a^7bx^7 + 25740\,a^6b^2x^6 + 45045\,a^5b^3x^5 + 50050\,a^4b^4x^4 + 36036\,a^3b^5x^3 + 16380\,a^2b^6x^2 + 4290\,ab^7x + 495\,}{6435\,x^{13}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8/x^6,x, algorithm="fricas")
```

```
[Out] -1/6435*(1287*a^8*x^8 + 8580*a^7*b*x^7 + 25740*a^6*b^2*x^6 + 4504
5*a^5*b^3*x^5 + 50050*a^4*b^4*x^4 + 36036*a^3*b^5*x^3 + 16380*a^2
*b^6*x^2 + 4290*a*b^7*x + 495*b^8)/x^13
```

Sympy [A] time = 3.63455, size = 97, normalized size = 1.01

$$-\frac{1287a^8x^8 + 8580a^7bx^7 + 25740a^6b^2x^6 + 45045a^5b^3x^5 + 50050a^4b^4x^4 + 36036a^3b^5x^3 + 16380a^2b^6x^2 + 4290ab^7x + 495b^8}{6435x^{13}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**8/x**6,x)
```

```
[Out] -(1287*a**8*x**8 + 8580*a**7*b*x**7 + 25740*a**6*b**2*x**6 + 4504
5*a**5*b**3*x**5 + 50050*a**4*b**4*x**4 + 36036*a**3*b**5*x**3 +
16380*a**2*b**6*x**2 + 4290*a*b**7*x + 495*b**8)/(6435*x**13)
```

GIAC/XCAS [A] time = 0.221118, size = 122, normalized size = 1.27

$$-\frac{1287\,a^8x^8 + 8580\,a^7bx^7 + 25740\,a^6b^2x^6 + 45045\,a^5b^3x^5 + 50050\,a^4b^4x^4 + 36036\,a^3b^5x^3 + 16380\,a^2b^6x^2 + 4290\,ab^7x + 495\,}{6435\,x^{13}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8/x^6,x, algorithm="giac")
```

```
[Out] -1/6435*(1287*a^8*x^8 + 8580*a^7*b*x^7 + 25740*a^6*b^2*x^6 + 4504
5*a^5*b^3*x^5 + 50050*a^4*b^4*x^4 + 36036*a^3*b^5*x^3 + 16380*a^2
*b^6*x^2 + 4290*a*b^7*x + 495*b^8)/x^13
```

3.1603 $\int \frac{\left(a+\frac{b}{x}\right)^8}{x^7}\,dx$

Optimal. Leaf size=106

$$-\frac{a^8}{6x^6}-\frac{8a^7b}{7x^7}-\frac{7a^6b^2}{2x^8}-\frac{56a^5b^3}{9x^9}-\frac{7a^4b^4}{x^{10}}-\frac{56a^3b^5}{11x^{11}}-\frac{7a^2b^6}{3x^{12}}-\frac{8ab^7}{13x^{13}}-\frac{b^8}{14x^{14}}$$

```
[Out] -b^8/(14*x^14) - (8*a*b^7)/(13*x^13) - (7*a^2*b^6)/(3*x^12) - (56
*a^3*b^5)/(11*x^11) - (7*a^4*b^4)/x^10 - (56*a^5*b^3)/(9*x^9) - (
7*a^6*b^2)/(2*x^8) - (8*a^7*b)/(7*x^7) - a^8/(6*x^6)
```

Rubi [A] time = 0.111275, antiderivative size = 106, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^8}{6x^6}-\frac{8a^7b}{7x^7}-\frac{7a^6b^2}{2x^8}-\frac{56a^5b^3}{9x^9}-\frac{7a^4b^4}{x^{10}}-\frac{56a^3b^5}{11x^{11}}-\frac{7a^2b^6}{3x^{12}}-\frac{8ab^7}{13x^{13}}-\frac{b^8}{14x^{14}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^8/x^7,x]
```

```
[Out] -b^8/(14*x^14) - (8*a*b^7)/(13*x^13) - (7*a^2*b^6)/(3*x^12) - (56
*a^3*b^5)/(11*x^11) - (7*a^4*b^4)/x^10 - (56*a^5*b^3)/(9*x^9) - (
7*a^6*b^2)/(2*x^8) - (8*a^7*b)/(7*x^7) - a^8/(6*x^6)
```

Rubi in Sympy [A] time = 20.4514, size = 107, normalized size = 1.01

$$-\frac{a^8}{6x^6}-\frac{8a^7b}{7x^7}-\frac{7a^6b^2}{2x^8}-\frac{56a^5b^3}{9x^9}-\frac{7a^4b^4}{x^{10}}-\frac{56a^3b^5}{11x^{11}}-\frac{7a^2b^6}{3x^{12}}-\frac{8ab^7}{13x^{13}}-\frac{b^8}{14x^{14}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**8/x**7,x)
```

```
[Out] -a**8/(6*x**6) - 8*a**7*b/(7*x**7) - 7*a**6*b**2/(2*x**8) - 56*a*
*5*b**3/(9*x**9) - 7*a**4*b**4/x**10 - 56*a**3*b**5/(11*x**11) -
7*a**2*b**6/(3*x**12) - 8*a*b**7/(13*x**13) - b**8/(14*x**14)
```

Mathematica [A] time = 0.00741721, size = 106, normalized size = 1.

$$-\frac{a^8}{6x^6}-\frac{8a^7b}{7x^7}-\frac{7a^6b^2}{2x^8}-\frac{56a^5b^3}{9x^9}-\frac{7a^4b^4}{x^{10}}-\frac{56a^3b^5}{11x^{11}}-\frac{7a^2b^6}{3x^{12}}-\frac{8ab^7}{13x^{13}}-\frac{b^8}{14x^{14}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^8/x^7,x]
```

```
[Out] -b^8/(14*x^14) - (8*a*b^7)/(13*x^13) - (7*a^2*b^6)/(3*x^12) - (56
*a^3*b^5)/(11*x^11) - (7*a^4*b^4)/x^10 - (56*a^5*b^3)/(9*x^9) - (
7*a^6*b^2)/(2*x^8) - (8*a^7*b)/(7*x^7) - a^8/(6*x^6)
```

Maple [A] time = 0.008, size = 91, normalized size = 0.9

$$-\frac{b^8}{14\,x^{14}}-\frac{8\,ab^7}{13\,x^{13}}-\frac{7\,a^2b^6}{3\,x^{12}}-\frac{56\,a^3b^5}{11\,x^{11}}-7\,\frac{a^4b^4}{x^{10}}-\frac{56\,a^5b^3}{9\,x^9}-\frac{7\,a^6b^2}{2\,x^8}-\frac{8\,a^7b}{7\,x^7}-\frac{a^8}{6\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^8/x^7,x)
```

```
[Out] -1/14*b^8/x^14-8/13*a*b^7/x^13-7/3*a^2*b^6/x^12-56/11*a^3*b^5/x^1
1-7*a^4*b^4/x^10-56/9*a^5*b^3/x^9-7/2*a^6*b^2/x^8-8/7*a^7*b/x^7-1
/6*a^8/x^6
```

Maxima [A] time = 1.44093, size = 122, normalized size = 1.15

$$-\frac{3003\,a^{8}x^{8}+20592\,a^{7}bx^{7}+63063\,a^{6}b^{2}x^{6}+112112\,a^{5}b^{3}x^{5}+126126\,a^{4}b^{4}x^{4}+91728\,a^{3}b^{5}x^{3}+42042\,a^{2}b^{6}x^{2}+11088\,ab^{7}x+}{18018\,x^{14}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8/x^7,x, algorithm="maxima")
```

```
[Out] -1/18018*(3003*a^8*x^8 + 20592*a^7*b*x^7 + 63063*a^6*b^2*x^6 + 11
2112*a^5*b^3*x^5 + 126126*a^4*b^4*x^4 + 91728*a^3*b^5*x^3 + 42042
*a^2*b^6*x^2 + 11088*a*b^7*x + 1287*b^8)/x^14
```

Fricas [A] time = 0.212967, size = 122, normalized size = 1.15

$$-\frac{3003\,a^{8}x^{8}+20592\,a^{7}bx^{7}+63063\,a^{6}b^{2}x^{6}+112112\,a^{5}b^{3}x^{5}+126126\,a^{4}b^{4}x^{4}+91728\,a^{3}b^{5}x^{3}+42042\,a^{2}b^{6}x^{2}+11088\,ab^{7}x+}{18018\,x^{14}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8/x^7,x, algorithm="fricas")
```

```
[Out] -1/18018*(3003*a^8*x^8 + 20592*a^7*b*x^7 + 63063*a^6*b^2*x^6 + 11
2112*a^5*b^3*x^5 + 126126*a^4*b^4*x^4 + 91728*a^3*b^5*x^3 + 42042
*a^2*b^6*x^2 + 11088*a*b^7*x + 1287*b^8)/x^14
```

Sympy [A] time = 3.7595, size = 97, normalized size = 0.92

$$-\frac{3003a^{8}x^{8}+20592a^{7}bx^{7}+63063a^{6}b^{2}x^{6}+112112a^{5}b^{3}x^{5}+126126a^{4}b^{4}x^{4}+91728a^{3}b^{5}x^{3}+42042a^{2}b^{6}x^{2}+11088ab^{7}x+12}{18018x^{14}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**8/x**7,x)
```

```
[Out] -(3003*a**8*x**8 + 20592*a**7*b*x**7 + 63063*a**6*b**2*x**6 + 112
112*a**5*b**3*x**5 + 126126*a**4*b**4*x**4 + 91728*a**3*b**5*x**3
 + 42042*a**2*b**6*x**2 + 11088*a*b**7*x + 1287*b**8)/(18018*x**1
4)
```

GIAC/XCAS [A] time = 0.223739, size = 122, normalized size = 1.15

$$-\frac{3003\,a^{8}x^{8}+20592\,a^{7}bx^{7}+63063\,a^{6}b^{2}x^{6}+112112\,a^{5}b^{3}x^{5}+126126\,a^{4}b^{4}x^{4}+91728\,a^{3}b^{5}x^{3}+42042\,a^{2}b^{6}x^{2}+11088\,ab^{7}x+}{18018\,x^{14}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8/x^7,x, algorithm="giac")
```

```
[Out] -1/18018*(3003*a^8*x^8 + 20592*a^7*b*x^7 + 63063*a^6*b^2*x^6 + 11
2112*a^5*b^3*x^5 + 126126*a^4*b^4*x^4 + 91728*a^3*b^5*x^3 + 42042
*a^2*b^6*x^2 + 11088*a*b^7*x + 1287*b^8)/x^14
```

3.1604 $\int \frac{\left(a+\frac{b}{x}\right)^8}{x^8}\,dx$

Optimal. Leaf size=106

$$-\frac{a^8}{7x^7}-\frac{a^7b}{x^8}-\frac{28a^6b^2}{9x^9}-\frac{28a^5b^3}{5x^{10}}-\frac{70a^4b^4}{11x^{11}}-\frac{14a^3b^5}{3x^{12}}-\frac{28a^2b^6}{13x^{13}}-\frac{4ab^7}{7x^{14}}-\frac{b^8}{15x^{15}}$$

```
[Out] -b^8/(15*x^15) - (4*a*b^7)/(7*x^14) - (28*a^2*b^6)/(13*x^13) - (1
4*a^3*b^5)/(3*x^12) - (70*a^4*b^4)/(11*x^11) - (28*a^5*b^3)/(5*x^
10) - (28*a^6*b^2)/(9*x^9) - (a^7*b)/x^8 - a^8/(7*x^7)
```

Rubi [A] time = 0.113035, antiderivative size = 106, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^8}{7x^7}-\frac{a^7b}{x^8}-\frac{28a^6b^2}{9x^9}-\frac{28a^5b^3}{5x^{10}}-\frac{70a^4b^4}{11x^{11}}-\frac{14a^3b^5}{3x^{12}}-\frac{28a^2b^6}{13x^{13}}-\frac{4ab^7}{7x^{14}}-\frac{b^8}{15x^{15}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^8/x^8,x]
```

```
[Out] -b^8/(15*x^15) - (4*a*b^7)/(7*x^14) - (28*a^2*b^6)/(13*x^13) - (1
4*a^3*b^5)/(3*x^12) - (70*a^4*b^4)/(11*x^11) - (28*a^5*b^3)/(5*x^
10) - (28*a^6*b^2)/(9*x^9) - (a^7*b)/x^8 - a^8/(7*x^7)
```

Rubi in Sympy [A] time = 20.717, size = 105, normalized size = 0.99

$$-\frac{a^8}{7x^7}-\frac{a^7b}{x^8}-\frac{28a^6b^2}{9x^9}-\frac{28a^5b^3}{5x^{10}}-\frac{70a^4b^4}{11x^{11}}-\frac{14a^3b^5}{3x^{12}}-\frac{28a^2b^6}{13x^{13}}-\frac{4ab^7}{7x^{14}}-\frac{b^8}{15x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**8/x**8,x)
```

```
[Out] -a**8/(7*x**7) - a**7*b/x**8 - 28*a**6*b**2/(9*x**9) - 28*a**5*b*
*3/(5*x**10) - 70*a**4*b**4/(11*x**11) - 14*a**3*b**5/(3*x**12) -
 28*a**2*b**6/(13*x**13) - 4*a*b**7/(7*x**14) - b**8/(15*x**15)
```

Mathematica [A] time = 0.0111722, size = 106, normalized size = 1.

$$-\frac{a^8}{7x^7}-\frac{a^7b}{x^8}-\frac{28a^6b^2}{9x^9}-\frac{28a^5b^3}{5x^{10}}-\frac{70a^4b^4}{11x^{11}}-\frac{14a^3b^5}{3x^{12}}-\frac{28a^2b^6}{13x^{13}}-\frac{4ab^7}{7x^{14}}-\frac{b^8}{15x^{15}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^8/x^8,x]
```

```
[Out] -b^8/(15*x^15) - (4*a*b^7)/(7*x^14) - (28*a^2*b^6)/(13*x^13) - (1
4*a^3*b^5)/(3*x^12) - (70*a^4*b^4)/(11*x^11) - (28*a^5*b^3)/(5*x^
10) - (28*a^6*b^2)/(9*x^9) - (a^7*b)/x^8 - a^8/(7*x^7)
```

Maple [A] time = 0.009, size = 91, normalized size = 0.9

$$-\frac{b^8}{15\,x^{15}}-\frac{4\,ab^7}{7\,x^{14}}-\frac{28\,a^2b^6}{13\,x^{13}}-\frac{14\,a^3b^5}{3\,x^{12}}-\frac{70\,a^4b^4}{11\,x^{11}}-\frac{28\,a^5b^3}{5\,x^{10}}-\frac{28\,a^6b^2}{9\,x^9}-\frac{a^7b}{x^8}-\frac{a^8}{7\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^8/x^8,x)
```

```
[Out] -1/15*b^8/x^15-4/7*a*b^7/x^14-28/13*a^2*b^6/x^13-14/3*a^3*b^5/x^1
2-70/11*a^4*b^4/x^11-28/5*a^5*b^3/x^10-28/9*a^6*b^2/x^9-a^7*b/x^8
-1/7*a^8/x^7
```

Maxima [A] time = 1.44572, size = 122, normalized size = 1.15

$$-\frac{6435\,a^8x^8 + 45045\,a^7bx^7 + 140140\,a^6b^2x^6 + 252252\,a^5b^3x^5 + 286650\,a^4b^4x^4 + 210210\,a^3b^5x^3 + 97020\,a^2b^6x^2 + 25740\,ab^7x}{45045\,x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8/x^8,x, algorithm="maxima")
```

```
[Out] -1/45045*(6435*a^8*x^8 + 45045*a^7*b*x^7 + 140140*a^6*b^2*x^6 + 2
52252*a^5*b^3*x^5 + 286650*a^4*b^4*x^4 + 210210*a^3*b^5*x^3 + 970
20*a^2*b^6*x^2 + 25740*a*b^7*x + 3003*b^8)/x^15
```

Fricas [A] time = 0.211984, size = 122, normalized size = 1.15

$$-\frac{6435\,a^8x^8 + 45045\,a^7bx^7 + 140140\,a^6b^2x^6 + 252252\,a^5b^3x^5 + 286650\,a^4b^4x^4 + 210210\,a^3b^5x^3 + 97020\,a^2b^6x^2 + 25740\,ab^7x}{45045\,x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8/x^8,x, algorithm="fricas")
```

```
[Out] -1/45045*(6435*a^8*x^8 + 45045*a^7*b*x^7 + 140140*a^6*b^2*x^6 + 2
52252*a^5*b^3*x^5 + 286650*a^4*b^4*x^4 + 210210*a^3*b^5*x^3 + 970
20*a^2*b^6*x^2 + 25740*a*b^7*x + 3003*b^8)/x^15
```

Sympy [A] time = 3.89265, size = 97, normalized size = 0.92

$$-\frac{6435a^8x^8 + 45045a^7bx^7 + 140140a^6b^2x^6 + 252252a^5b^3x^5 + 286650a^4b^4x^4 + 210210a^3b^5x^3 + 97020a^2b^6x^2 + 25740ab^7x +}{45045x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**8/x**8,x)
```

```
[Out] -(6435*a**8*x**8 + 45045*a**7*b*x**7 + 140140*a**6*b**2*x**6 + 25
2252*a**5*b**3*x**5 + 286650*a**4*b**4*x**4 + 210210*a**3*b**5*x*
*3 + 97020*a**2*b**6*x**2 + 25740*a*b**7*x + 3003*b**8)/(45045*x*
*15)
```

GIAC/XCAS [A] time = 0.22522, size = 122, normalized size = 1.15

$$-\frac{6435\,a^8x^8 + 45045\,a^7bx^7 + 140140\,a^6b^2x^6 + 252252\,a^5b^3x^5 + 286650\,a^4b^4x^4 + 210210\,a^3b^5x^3 + 97020\,a^2b^6x^2 + 25740\,ab^7x}{45045\,x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^8/x^8,x, algorithm="giac")
```

```
[Out] -1/45045*(6435*a^8*x^8 + 45045*a^7*b*x^7 + 140140*a^6*b^2*x^6 + 2
52252*a^5*b^3*x^5 + 286650*a^4*b^4*x^4 + 210210*a^3*b^5*x^3 + 970
20*a^2*b^6*x^2 + 25740*a*b^7*x + 3003*b^8)/x^15
```

3.1605 $\int \frac{x^4}{a+\frac{b}{x}} dx$

Optimal. Leaf size=70

$$-\frac{b^5 \log(ax+b)}{a^6}+\frac{b^4 x}{a^5}-\frac{b^3 x^2}{2a^4}+\frac{b^2 x^3}{3a^3}-\frac{b x^4}{4a^2}+\frac{x^5}{5a}$$

```
[Out] (b^4*x)/a^5 - (b^3*x^2)/(2*a^4) + (b^2*x^3)/(3*a^3) - (b*x^4)/(4*
a^2) + x^5/(5*a) - (b^5*Log[b + a*x])/a^6
```

Rubi [A] time = 0.0998011, antiderivative size = 70, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{b^5 \log(ax+b)}{a^6}+\frac{b^4 x}{a^5}-\frac{b^3 x^2}{2a^4}+\frac{b^2 x^3}{3a^3}-\frac{b x^4}{4a^2}+\frac{x^5}{5a}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a + b/x),x]
```

```
[Out] (b^4*x)/a^5 - (b^3*x^2)/(2*a^4) + (b^2*x^3)/(3*a^3) - (b*x^4)/(4*
a^2) + x^5/(5*a) - (b^5*Log[b + a*x])/a^6
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$b^4 \int \frac{1}{a^5} dx+\frac{x^5}{5a}-\frac{b x^4}{4a^2}+\frac{b^2 x^3}{3a^3}-\frac{b^3 \int x\, dx}{a^4}-\frac{b^5 \log(ax+b)}{a^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(a+b/x),x)
```

```
[Out] b**4*Integral(a**(-5), x) + x**5/(5*a) - b*x**4/(4*a**2) + b**2*x
**3/(3*a**3) - b**3*Integral(x, x)/a**4 - b**5*log(a*x + b)/a**6
```

Mathematica [A] time = 0.00745688, size = 70, normalized size = 1.

$$-\frac{b^5 \log(ax+b)}{a^6}+\frac{b^4 x}{a^5}-\frac{b^3 x^2}{2a^4}+\frac{b^2 x^3}{3a^3}-\frac{b x^4}{4a^2}+\frac{x^5}{5a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(a + b/x),x]
```

```
[Out] (b^4*x)/a^5 - (b^3*x^2)/(2*a^4) + (b^2*x^3)/(3*a^3) - (b*x^4)/(4*
a^2) + x^5/(5*a) - (b^5*Log[b + a*x])/a^6
```

Maple [A] time = 0.006, size = 63, normalized size = 0.9

$$\frac{b^4 x}{a^5}-\frac{b^3 x^2}{2\,a^4}+\frac{b^2 x^3}{3\,a^3}-\frac{b x^4}{4\,a^2}+\frac{x^5}{5\,a}-\frac{b^5 \ln(ax+b)}{a^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(a+b/x),x)
```

```
[Out] b^4*x/a^5-1/2*b^3*x^2/a^4+1/3*b^2*x^3/a^3-1/4*b*x^4/a^2+1/5*x^5/a
-b^5*ln(a*x+b)/a^6
```

Maxima [A] time = 1.44359, size = 86, normalized size = 1.23

$$-\frac{b^{5}\log\left(ax+b\right)}{a^{6}}+\frac{12\,a^{4}x^{5}-15\,a^{3}bx^{4}+20\,a^{2}b^{2}x^{3}-30\,ab^{3}x^{2}+60\,b^{4}x}{60\,a^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(a + b/x),x, algorithm="maxima")
```

```
[Out] -b^5*log(a*x + b)/a^6 + 1/60*(12*a^4*x^5 - 15*a^3*b*x^4 + 20*a^2*
b^2*x^3 - 30*a*b^3*x^2 + 60*b^4*x)/a^5
```

Fricas [A] time = 0.220855, size = 85, normalized size = 1.21

$$\frac{12\,a^{5}x^{5}-15\,a^{4}bx^{4}+20\,a^{3}b^{2}x^{3}-30\,a^{2}b^{3}x^{2}+60\,ab^{4}x-60\,b^{5}\log\left(ax+b\right)}{60\,a^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(a + b/x),x, algorithm="fricas")
```

```
[Out] 1/60*(12*a^5*x^5 - 15*a^4*b*x^4 + 20*a^3*b^2*x^3 - 30*a^2*b^3*x^2
 + 60*a*b^4*x - 60*b^5*log(a*x + b))/a^6
```

Sympy [A] time = 1.16754, size = 61, normalized size = 0.87

$$\frac{x^{5}}{5a}-\frac{bx^{4}}{4a^{2}}+\frac{b^{2}x^{3}}{3a^{3}}-\frac{b^{3}x^{2}}{2a^{4}}+\frac{b^{4}x}{a^{5}}-\frac{b^{5}\log\left(ax+b\right)}{a^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(a+b/x),x)
```

```
[Out] x**5/(5*a) - b*x**4/(4*a**2) + b**2*x**3/(3*a**3) - b**3*x**2/(2*
a**4) + b**4*x/a**5 - b**5*log(a*x + b)/a**6
```

GIAC/XCAS [A] time = 0.229322, size = 88, normalized size = 1.26

$$-\frac{b^{5}\ln\left(|ax+b|\right)}{a^{6}}+\frac{12\,a^{4}x^{5}-15\,a^{3}bx^{4}+20\,a^{2}b^{2}x^{3}-30\,ab^{3}x^{2}+60\,b^{4}x}{60\,a^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(a + b/x),x, algorithm="giac")
```

```
[Out] -b^5*ln(abs(a*x + b))/a^6 + 1/60*(12*a^4*x^5 - 15*a^3*b*x^4 + 20*
a^2*b^2*x^3 - 30*a*b^3*x^2 + 60*b^4*x)/a^5
```

3.1606 $\int \frac{x^3}{a+\frac{b}{x}}\,dx$

Optimal. Leaf size=57

$$\frac{b^4\log(ax+b)}{a^5}-\frac{b^3x}{a^4}+\frac{b^2x^2}{2a^3}-\frac{bx^3}{3a^2}+\frac{x^4}{4a}$$

```
[Out] -((b^3*x)/a^4) + (b^2*x^2)/(2*a^3) - (b*x^3)/(3*a^2) + x^4/(4*a)
+ (b^4*Log[b + a*x])/a^5
```

Rubi [A] time = 0.0770509, antiderivative size = 57, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{b^4\log(ax+b)}{a^5}-\frac{b^3x}{a^4}+\frac{b^2x^2}{2a^3}-\frac{bx^3}{3a^2}+\frac{x^4}{4a}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(a + b/x),x]
```

```
[Out] -((b^3*x)/a^4) + (b^2*x^2)/(2*a^3) - (b*x^3)/(3*a^2) + x^4/(4*a)
+ (b^4*Log[b + a*x])/a^5
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-b^3\int\frac{1}{a^4}\,dx+\frac{x^4}{4a}-\frac{bx^3}{3a^2}+\frac{b^2\int x\,dx}{a^3}+\frac{b^4\log(ax+b)}{a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(a+b/x),x)
```

```
[Out] -b**3*Integral(a**(-4), x) + x**4/(4*a) - b*x**3/(3*a**2) + b**2*
Integral(x, x)/a**3 + b**4*log(a*x + b)/a**5
```

Mathematica [A] time = 0.00749848, size = 57, normalized size = 1.

$$\frac{b^4\log(ax+b)}{a^5}-\frac{b^3x}{a^4}+\frac{b^2x^2}{2a^3}-\frac{bx^3}{3a^2}+\frac{x^4}{4a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(a + b/x),x]
```

```
[Out] -((b^3*x)/a^4) + (b^2*x^2)/(2*a^3) - (b*x^3)/(3*a^2) + x^4/(4*a)
+ (b^4*Log[b + a*x])/a^5
```

Maple [A] time = 0.004, size = 52, normalized size = 0.9

$$-\frac{b^3x}{a^4}+\frac{b^2x^2}{2\,a^3}-\frac{bx^3}{3\,a^2}+\frac{x^4}{4\,a}+\frac{b^4\ln(ax+b)}{a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(a+b/x),x)
```

```
[Out] -b^3*x/a^4+1/2*b^2*x^2/a^3-1/3*b*x^3/a^2+1/4*x^4/a+b^4*ln(a*x+b)/
a^5
```

Maxima [A] time = 1.43825, size = 70, normalized size = 1.23

$$\frac{b^4 \log(ax+b)}{a^5} + \frac{3\,a^3x^4 - 4\,a^2bx^3 + 6\,ab^2x^2 - 12\,b^3x}{12\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(a + b/x),x, algorithm="maxima")
```

```
[Out] b^4*log(a*x + b)/a^5 + 1/12*(3*a^3*x^4 - 4*a^2*b*x^3 + 6*a*b^2*x^
2 - 12*b^3*x)/a^4
```

Fricas [A] time = 0.219245, size = 70, normalized size = 1.23

$$\frac{3\,a^4x^4 - 4\,a^3bx^3 + 6\,a^2b^2x^2 - 12\,ab^3x + 12\,b^4 \log(ax+b)}{12\,a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(a + b/x),x, algorithm="fricas")
```

```
[Out] 1/12*(3*a^4*x^4 - 4*a^3*b*x^3 + 6*a^2*b^2*x^2 - 12*a*b^3*x + 12*b
^4*log(a*x + b))/a^5
```

Sympy [A] time = 1.15064, size = 49, normalized size = 0.86

$$\frac{x^4}{4a} - \frac{bx^3}{3a^2} + \frac{b^2x^2}{2a^3} - \frac{b^3x}{a^4} + \frac{b^4 \log(ax+b)}{a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(a+b/x),x)
```

```
[Out] x**4/(4*a) - b*x**3/(3*a**2) + b**2*x**2/(2*a**3) - b**3*x/a**4 +
 b**4*log(a*x + b)/a**5
```

GIAC/XCAS [A] time = 0.228316, size = 72, normalized size = 1.26

$$\frac{b^4 \ln(|ax+b|)}{a^5} + \frac{3\,a^3x^4 - 4\,a^2bx^3 + 6\,ab^2x^2 - 12\,b^3x}{12\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(a + b/x),x, algorithm="giac")
```

```
[Out] b^4*ln(abs(a*x + b))/a^5 + 1/12*(3*a^3*x^4 - 4*a^2*b*x^3 + 6*a*b^
2*x^2 - 12*b^3*x)/a^4
```

3.1607 $\int \frac{x^2}{a+\frac{b}{x}}\,dx$

Optimal. Leaf size=44

$$-\frac{b^3\log(ax+b)}{a^4}+\frac{b^2x}{a^3}-\frac{bx^2}{2a^2}+\frac{x^3}{3a}$$

```
[Out] (b^2*x)/a^3 - (b*x^2)/(2*a^2) + x^3/(3*a) - (b^3*Log[b + a*x])/a^
4
```

Rubi [A] time = 0.0618754, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{b^3\log(ax+b)}{a^4}+\frac{b^2x}{a^3}-\frac{bx^2}{2a^2}+\frac{x^3}{3a}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b/x),x]
```

```
[Out] (b^2*x)/a^3 - (b*x^2)/(2*a^2) + x^3/(3*a) - (b^3*Log[b + a*x])/a^
4
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$b^2\int \frac{1}{a^3}\,dx+\frac{x^3}{3a}-\frac{b\int x\,dx}{a^2}-\frac{b^3\log(ax+b)}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b/x),x)
```

```
[Out] b**2*Integral(a**(-3), x) + x**3/(3*a) - b*Integral(x, x)/a**2 -
b**3*log(a*x + b)/a**4
```

Mathematica [A] time = 0.00632414, size = 44, normalized size = 1.

$$-\frac{b^3\log(ax+b)}{a^4}+\frac{b^2x}{a^3}-\frac{bx^2}{2a^2}+\frac{x^3}{3a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a + b/x),x]
```

```
[Out] (b^2*x)/a^3 - (b*x^2)/(2*a^2) + x^3/(3*a) - (b^3*Log[b + a*x])/a^
4
```

Maple [A] time = 0.004, size = 41, normalized size = 0.9

$$\frac{b^2x}{a^3}-\frac{bx^2}{2\,a^2}+\frac{x^3}{3\,a}-\frac{b^3\ln(ax+b)}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(a+b/x),x)
```

```
[Out] b^2*x/a^3-1/2*b*x^2/a^2+1/3*x^3/a-b^3*ln(a*x+b)/a^4
```

Maxima [A] time = 1.43947, size = 57, normalized size = 1.3

$$-\frac{b^3 \log (ax+b)}{a^4} + \frac{2\,a^2x^3 - 3\,abx^2 + 6\,b^2x}{6\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x),x, algorithm="maxima")
```

```
[Out] -b^3*log(a*x + b)/a^4 + 1/6*(2*a^2*x^3 - 3*a*b*x^2 + 6*b^2*x)/a^3
```

Fricas [A] time = 0.22032, size = 55, normalized size = 1.25

$$\frac{2\,a^3x^3 - 3\,a^2bx^2 + 6\,ab^2x - 6\,b^3 \log (ax+b)}{6\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x),x, algorithm="fricas")
```

```
[Out] 1/6*(2*a^3*x^3 - 3*a^2*b*x^2 + 6*a*b^2*x - 6*b^3*log(a*x + b))/a^
4
```

Sympy [A] time = 1.12002, size = 37, normalized size = 0.84

$$\frac{x^3}{3a} - \frac{bx^2}{2a^2} + \frac{b^2x}{a^3} - \frac{b^3 \log (ax+b)}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b/x),x)
```

```
[Out] x**3/(3*a) - b*x**2/(2*a**2) + b**2*x/a**3 - b**3*log(a*x + b)/a*
*4
```

GIAC/XCAS [A] time = 0.223908, size = 58, normalized size = 1.32

$$-\frac{b^3 \ln (|ax+b|)}{a^4} + \frac{2\,a^2x^3 - 3\,abx^2 + 6\,b^2x}{6\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x),x, algorithm="giac")
```

```
[Out] -b^3*ln(abs(a*x + b))/a^4 + 1/6*(2*a^2*x^3 - 3*a*b*x^2 + 6*b^2*x)
/a^3
```

3.1608 $\int \frac{x}{a+\frac{b}{x}}\,dx$

Optimal. Leaf size=31

$$\frac{b^2\log(ax+b)}{a^3}-\frac{bx}{a^2}+\frac{x^2}{2a}$$

```
[Out] -((b*x)/a^2) + x^2/(2*a) + (b^2*Log[b + a*x])/a^3
```

Rubi [A] time = 0.0483696, antiderivative size = 31, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{b^2\log(ax+b)}{a^3}-\frac{bx}{a^2}+\frac{x^2}{2a}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b/x),x]
```

```
[Out] -((b*x)/a^2) + x^2/(2*a) + (b^2*Log[b + a*x])/a^3
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int x\,dx}{a}-\frac{\int b\,dx}{a^2}+\frac{b^2\log{(ax+b)}}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b/x),x)
```

```
[Out] Integral(x, x)/a - Integral(b, x)/a**2 + b**2*log(a*x + b)/a**3
```

Mathematica [A] time = 0.00557378, size = 31, normalized size = 1.

$$\frac{b^2\log(ax+b)}{a^3}-\frac{bx}{a^2}+\frac{x^2}{2a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b/x),x]
```

```
[Out] -((b*x)/a^2) + x^2/(2*a) + (b^2*Log[b + a*x])/a^3
```

Maple [A] time = 0.003, size = 30, normalized size = 1.

$$-\frac{bx}{a^2}+\frac{x^2}{2\,a}+\frac{b^2\ln{(ax+b)}}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+b/x),x)
```

```
[Out] -b*x/a^2+1/2*x^2/a+b^2*ln(a*x+b)/a^3
```

Maxima [A] time = 1.43764, size = 39, normalized size = 1.26

$$\frac{b^2 \log(ax+b)}{a^3} + \frac{ax^2 - 2\,bx}{2\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x),x, algorithm="maxima")
```

```
[Out] b^2*log(a*x + b)/a^3 + 1/2*(a*x^2 - 2*b*x)/a^2
```

Fricas [A] time = 0.217784, size = 39, normalized size = 1.26

$$\frac{a^2x^2 - 2\,abx + 2\,b^2 \log(ax+b)}{2\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x),x, algorithm="fricas")
```

```
[Out] 1/2*(a^2*x^2 - 2*a*b*x + 2*b^2*log(a*x + b))/a^3
```

Sympy [A] time = 1.09741, size = 26, normalized size = 0.84

$$\frac{x^2}{2a} - \frac{bx}{a^2} + \frac{b^2 \log(ax+b)}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b/x),x)
```

```
[Out] x**2/(2*a) - b*x/a**2 + b**2*log(a*x + b)/a**3
```

GIAC/XCAS [A] time = 0.223661, size = 41, normalized size = 1.32

$$\frac{b^2 \ln(|ax+b|)}{a^3} + \frac{ax^2 - 2\,bx}{2\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x),x, algorithm="giac")
```

```
[Out] b^2*ln(abs(a*x + b))/a^3 + 1/2*(a*x^2 - 2*b*x)/a^2
```

3.1609 $\int \frac{1}{a+\frac{b}{x}} dx$

Optimal. Leaf size=18

$$\frac{x}{a} - \frac{b\log(ax+b)}{a^2}$$

```
[Out] x/a - (b*Log[b + a*x])/a^2
```

Rubi [A] time = 0.0309238, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{x}{a} - \frac{b\log(ax+b)}{a^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(-1),x]

[Out] x/a - (b*Log[b + a*x])/a^2
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{a} dx - \frac{b\log(ax+b)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x),x)

[Out] Integral(1/a, x) - b*log(a*x + b)/a**2
```

Mathematica [A] time = 0.00440873, size = 18, normalized size = 1.

$$\frac{x}{a} - \frac{b\log(ax+b)}{a^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(-1),x]

[Out] x/a - (b*Log[b + a*x])/a^2
```

Maple [A] time = 0.003, size = 19, normalized size = 1.1

$$\frac{x}{a} - \frac{b\ln(ax+b)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x),x)

[Out] x/a-b*ln(a*x+b)/a^2
```

Maxima [A] time = 1.44092, size = 24, normalized size = 1.33

$$\frac{x}{a} - \frac{b \log (ax + b)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a + b/x),x, algorithm="maxima")
```

```
[Out] x/a - b*log(a*x + b)/a^2
```

Fricas [A] time = 0.218557, size = 23, normalized size = 1.28

$$\frac{ax - b \log (ax + b)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a + b/x),x, algorithm="fricas")
```

```
[Out] (a*x - b*log(a*x + b))/a^2
```

Sympy [A] time = 1.04563, size = 14, normalized size = 0.78

$$\frac{x}{a} - \frac{b \log (ax + b)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x),x)
```

```
[Out] x/a - b*log(a*x + b)/a**2
```

GIAC/XCAS [A] time = 0.225533, size = 26, normalized size = 1.44

$$\frac{x}{a} - \frac{b \ln (|ax + b|)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a + b/x),x, algorithm="giac")
```

```
[Out] x/a - b*ln(abs(a*x + b))/a^2
```

3.1610 $\int \frac{1}{\left(a+\frac{b}{x}\right)x}\,dx$

Optimal. Leaf size=10

$$\frac{\log(ax+b)}{a}$$

```
[Out] Log[b + a*x]/a
```

Rubi [A] time = 0.0159448, antiderivative size = 10, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{\log(ax+b)}{a}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b/x)*x),x]

[Out] Log[b + a*x]/a
```

Rubi in Sympy [A] time = 3.21303, size = 7, normalized size = 0.7

$$\frac{\log(ax+b)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b/x)/x,x)

[Out] log(a*x + b)/a
```

Mathematica [A] time = 0.0018095, size = 10, normalized size = 1.

$$\frac{\log(ax+b)}{a}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b/x)*x),x]

[Out] Log[b + a*x]/a
```

Maple [A] time = 0.002, size = 11, normalized size = 1.1

$$\frac{\ln(ax+b)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b/x)/x,x)

[Out] ln(a*x+b)/a
```

Maxima [A] time = 1.43688, size = 14, normalized size = 1.4

$$\frac{\log(ax+b)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)*x),x, algorithm="maxima")
```

```
[Out] log(a*x + b)/a
```

Fricas [A] time = 0.221061, size = 14, normalized size = 1.4

$$\frac{\log(ax+b)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)*x),x, algorithm="fricas")
```

```
[Out] log(a*x + b)/a
```

Sympy [A] time = 0.0943, size = 7, normalized size = 0.7

$$\frac{\log(ax+b)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)/x,x)
```

```
[Out] log(a*x + b)/a
```

GIAC/XCAS [A] time = 0.225743, size = 15, normalized size = 1.5

$$\frac{\ln(|ax+b|)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)*x),x, algorithm="giac")
```

```
[Out] ln(abs(a*x + b))/a
```

3.1611 $\int \frac{1}{\left(a+\frac{b}{x}\right)x^2}\,dx$

Optimal. Leaf size=13

$$-\frac{\log\left(a+\frac{b}{x}\right)}{b}$$

[Out] -(Log[a + b/x]/b)

Rubi [A] time = 0.0157886, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$-\frac{\log\left(a+\frac{b}{x}\right)}{b}$$

Antiderivative was successfully verified.

[In] Int[1/((a + b/x)*x^2),x]

[Out] -(Log[a + b/x]/b)

Rubi in Sympy [A] time = 2.22634, size = 8, normalized size = 0.62

$$-\frac{\log\left(a+\frac{b}{x}\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(1/(a+b/x)/x**2,x)

[Out] -log(a + b/x)/b

Mathematica [A] time = 0.00620895, size = 18, normalized size = 1.38

$$\frac{\log(x)}{b}-\frac{\log(ax+b)}{b}$$

Antiderivative was successfully verified.

[In] Integrate[1/((a + b/x)*x^2),x]

[Out] Log[x]/b - Log[b + a*x]/b

Maple [A] time = 0.007, size = 19, normalized size = 1.5

$$\frac{\ln(x)}{b}-\frac{\ln(ax+b)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(a+b/x)/x^2,x)

```
[Out] ln(x)/b-1/b*ln(a*x+b)
```

Maxima [A] time = 1.44134, size = 18, normalized size = 1.38

$$-\frac{\log\left(a+\frac{b}{x}\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)*x^2),x, algorithm="maxima")

[Out] -log(a + b/x)/b
```

Fricas [A] time = 0.227326, size = 22, normalized size = 1.69

$$-\frac{\log\left(ax+b\right)-\log\left(x\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)*x^2),x, algorithm="fricas")

[Out] -(log(a*x + b) - log(x))/b
```

Sympy [A] time = 0.32607, size = 10, normalized size = 0.77

$$\frac{\log\left(x\right)-\log\left(x+\frac{b}{a}\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)/x**2,x)

[Out] (log(x) - log(x + b/a))/b
```

GIAC/XCAS [A] time = 0.22333, size = 19, normalized size = 1.46

$$-\frac{\ln\left(\left|a+\frac{b}{x}\right|\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)*x^2),x, algorithm="giac")

[Out] -ln(abs(a + b/x))/b
```

3.1612 $\int \frac{1}{\left(a+\frac{b}{x}\right)x^3} dx$

Optimal. Leaf size=28

$$-\frac{a\log(x)}{b^2}+\frac{a\log(ax+b)}{b^2}-\frac{1}{bx}$$

```
[Out] -(1/(b*x)) - (a*Log[x])/b^2 + (a*Log[b + a*x])/b^2
```

Rubi [A] time = 0.046779, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a\log(x)}{b^2}+\frac{a\log(ax+b)}{b^2}-\frac{1}{bx}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b/x)*x^3),x]
```

```
[Out] -(1/(b*x)) - (a*Log[x])/b^2 + (a*Log[b + a*x])/b^2
```

Rubi in Sympy [A] time = 7.22525, size = 24, normalized size = 0.86

$$-\frac{a\log\left(x\right)}{b^2}+\frac{a\log\left(ax+b\right)}{b^2}-\frac{1}{bx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b/x)/x**3,x)
```

```
[Out] -a*log(x)/b**2 + a*log(a*x + b)/b**2 - 1/(b*x)
```

Mathematica [A] time = 0.00746488, size = 28, normalized size = 1.

$$-\frac{a\log(x)}{b^2}+\frac{a\log(ax+b)}{b^2}-\frac{1}{bx}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b/x)*x^3),x]
```

```
[Out] -(1/(b*x)) - (a*Log[x])/b^2 + (a*Log[b + a*x])/b^2
```

Maple [A] time = 0.012, size = 29, normalized size = 1.

$$-\frac{1}{bx}-\frac{a\ln\left(x\right)}{b^2}+\frac{a\ln\left(ax+b\right)}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b/x)/x^3,x)
```

```
[Out] -1/b/x-a*ln(x)/b^2+a*ln(a*x+b)/b^2
```

Maxima [A] time = 1.43579, size = 38, normalized size = 1.36

$$\frac{a\log\left(ax+b\right)}{b^2}-\frac{a\log\left(x\right)}{b^2}-\frac{1}{bx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)*x^3),x, algorithm="maxima")
```

```
[Out] a*log(a*x + b)/b^2 - a*log(x)/b^2 - 1/(b*x)
```

Fricas [A] time = 0.227891, size = 35, normalized size = 1.25

$$\frac{ax\log\left(ax+b\right)-ax\log\left(x\right)-b}{b^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)*x^3),x, algorithm="fricas")
```

```
[Out] (a*x*log(a*x + b) - a*x*log(x) - b)/(b^2*x)
```

Sympy [A] time = 1.28784, size = 19, normalized size = 0.68

$$\frac{a\left(-\log\left(x\right)+\log\left(x+\frac{b}{a}\right)\right)}{b^2}-\frac{1}{bx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)/x**3,x)
```

```
[Out] a*(-log(x) + log(x + b/a))/b**2 - 1/(b*x)
```

GIAC/XCAS [A] time = 0.223476, size = 41, normalized size = 1.46

$$\frac{a\ln\left(|ax+b|\right)}{b^2}-\frac{a\ln\left(|x|\right)}{b^2}-\frac{1}{bx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)*x^3),x, algorithm="giac")
```

```
[Out] a*ln(abs(a*x + b))/b^2 - a*ln(abs(x))/b^2 - 1/(b*x)
```

3.1613 $\int \frac{1}{\left(a+\frac{b}{x}\right)x^4}\,dx$

Optimal. Leaf size=42

$$\frac{a^2\log(x)}{b^3}-\frac{a^2\log(ax+b)}{b^3}+\frac{a}{b^2x}-\frac{1}{2bx^2}$$

```
[Out] -1/(2*b*x^2) + a/(b^2*x) + (a^2*Log[x])/b^3 - (a^2*Log[b + a*x])/
b^3
```

Rubi [A] time = 0.0552284, antiderivative size = 42, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^2\log(x)}{b^3}-\frac{a^2\log(ax+b)}{b^3}+\frac{a}{b^2x}-\frac{1}{2bx^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)*x^4),x]
```

```
[Out] -1/(2*b*x^2) + a/(b^2*x) + (a^2*Log[x])/b^3 - (a^2*Log[b + a*x])/
b^3
```

Rubi in Sympy [A] time = 9.39716, size = 37, normalized size = 0.88

$$\frac{a^2\log(x)}{b^3}-\frac{a^2\log(ax+b)}{b^3}+\frac{a}{b^2x}-\frac{1}{2bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)/x**4,x)
```

```
[Out] a**2*log(x)/b**3 - a**2*log(a*x + b)/b**3 + a/(b**2*x) - 1/(2*b*x
**2)
```

Mathematica [A] time = 0.00818869, size = 42, normalized size = 1.

$$\frac{a^2\log(x)}{b^3}-\frac{a^2\log(ax+b)}{b^3}+\frac{a}{b^2x}-\frac{1}{2bx^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)*x^4),x]
```

```
[Out] -1/(2*b*x^2) + a/(b^2*x) + (a^2*Log[x])/b^3 - (a^2*Log[b + a*x])/
b^3
```

Maple [A] time = 0.013, size = 41, normalized size = 1.

$$-\frac{1}{2\,bx^2}+\frac{a}{b^2x}+\frac{a^2\ln(x)}{b^3}-\frac{a^2\ln(ax+b)}{b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/(a+b/x)/x^4,x)
```

```
[Out] -1/2/b/x^2+a/b^2/x+a^2*ln(x)/b^3-a^2*ln(a*x+b)/b^3
```

Maxima [A] time = 1.43762, size = 54, normalized size = 1.29

$$-\frac{a^2 \log(ax+b)}{b^3} + \frac{a^2 \log(x)}{b^3} + \frac{2\,ax - b}{2\,b^2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x)*x^4),x, algorithm="maxima")
```

```
[Out] -a^2*log(a*x + b)/b^3 + a^2*log(x)/b^3 + 1/2*(2*a*x - b)/(b^2*x^2
)
```

Fricas [A] time = 0.226613, size = 55, normalized size = 1.31

$$-\frac{2\,a^2x^2 \log(ax+b) - 2\,a^2x^2 \log(x) - 2\,abx + b^2}{2\,b^3x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x)*x^4),x, algorithm="fricas")
```

```
[Out] -1/2*(2*a^2*x^2*log(a*x + b) - 2*a^2*x^2*log(x) - 2*a*b*x + b^2)/
(b^3*x^2)
```

Sympy [A] time = 1.39915, size = 31, normalized size = 0.74

$$\frac{a^2 \left(\log(x) - \log\left(x + \frac{b}{a}\right)\right)}{b^3} + \frac{2ax - b}{2b^2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(a+b/x)/x**4,x)
```

```
[Out] a**2*(log(x) - log(x + b/a))/b**3 + (2*a*x - b)/(2*b**2*x**2)
```

GIAC/XCAS [A] time = 0.223123, size = 61, normalized size = 1.45

$$-\frac{a^2 \ln(|ax+b|)}{b^3} + \frac{a^2 \ln(|x|)}{b^3} + \frac{2\,abx - b^2}{2\,b^3x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x)*x^4),x, algorithm="giac")
```

```
[Out] -a^2*ln(abs(a*x + b))/b^3 + a^2*ln(abs(x))/b^3 + 1/2*(2*a*b*x - b
^2)/(b^3*x^2)
```

3.1614 $\int \frac{1}{\left(a+\frac{b}{x}\right)x^5}\,dx$

Optimal. Leaf size=56

$$-\frac{a^3\log(x)}{b^4}+\frac{a^3\log(ax+b)}{b^4}-\frac{a^2}{b^3x}+\frac{a}{2b^2x^2}-\frac{1}{3bx^3}$$

```
[Out] -1/(3*b*x^3) + a/(2*b^2*x^2) - a^2/(b^3*x) - (a^3*Log[x])/b^4 + (
a^3*Log[b + a*x])/b^4
```

Rubi [A] time = 0.0712666, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^3\log(x)}{b^4}+\frac{a^3\log(ax+b)}{b^4}-\frac{a^2}{b^3x}+\frac{a}{2b^2x^2}-\frac{1}{3bx^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)*x^5),x]
```

```
[Out] -1/(3*b*x^3) + a/(2*b^2*x^2) - a^2/(b^3*x) - (a^3*Log[x])/b^4 + (
a^3*Log[b + a*x])/b^4
```

Rubi in Sympy [A] time = 11.086, size = 49, normalized size = 0.88

$$-\frac{a^3\log(x)}{b^4}+\frac{a^3\log(ax+b)}{b^4}-\frac{a^2}{b^3x}+\frac{a}{2b^2x^2}-\frac{1}{3bx^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)/x**5,x)
```

```
[Out] -a**3*log(x)/b**4 + a**3*log(a*x + b)/b**4 - a**2/(b**3*x) + a/(2
*b**2*x**2) - 1/(3*b*x**3)
```

Mathematica [A] time = 0.00972204, size = 56, normalized size = 1.

$$-\frac{a^3\log(x)}{b^4}+\frac{a^3\log(ax+b)}{b^4}-\frac{a^2}{b^3x}+\frac{a}{2b^2x^2}-\frac{1}{3bx^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)*x^5),x]
```

```
[Out] -1/(3*b*x^3) + a/(2*b^2*x^2) - a^2/(b^3*x) - (a^3*Log[x])/b^4 + (
a^3*Log[b + a*x])/b^4
```

Maple [A] time = 0.011, size = 53, normalized size = 1.

$$-\frac{1}{3\,bx^3}+\frac{a}{2\,b^2x^2}-\frac{a^2}{b^3x}-\frac{a^3\ln(x)}{b^4}+\frac{a^3\ln(ax+b)}{b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/(a+b/x)/x^5,x)
```

```
[Out] -1/3/b/x^3+1/2*a/b^2/x^2-a^2/b^3/x-a^3*ln(x)/b^4+a^3*ln(a*x+b)/b^
4
```

Maxima [A] time = 1.41971, size = 69, normalized size = 1.23

$$\frac{a^3\log(ax+b)}{b^4}-\frac{a^3\log(x)}{b^4}-\frac{6\,a^2x^2-3\,abx+2\,b^2}{6\,b^3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x)*x^5),x, algorithm="maxima")
```

```
[Out] a^3*log(a*x + b)/b^4 - a^3*log(x)/b^4 - 1/6*(6*a^2*x^2 - 3*a*b*x
+ 2*b^2)/(b^3*x^3)
```

Fricas [A] time = 0.227135, size = 73, normalized size = 1.3

$$\frac{6\,a^3x^3\log(ax+b)-6\,a^3x^3\log(x)-6\,a^2bx^2+3\,ab^2x-2\,b^3}{6\,b^4x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x)*x^5),x, algorithm="fricas")
```

```
[Out] 1/6*(6*a^3*x^3*log(a*x + b) - 6*a^3*x^3*log(x) - 6*a^2*b*x^2 + 3*
a*b^2*x - 2*b^3)/(b^4*x^3)
```

Sympy [A] time = 1.54706, size = 44, normalized size = 0.79

$$\frac{a^3\left(-\log(x)+\log\left(x+\frac{b}{a}\right)\right)}{b^4}-\frac{6a^2x^2-3abx+2b^2}{6b^3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(a+b/x)/x**5,x)
```

```
[Out] a**3*(-log(x) + log(x + b/a))/b**4 - (6*a**2*x**2 - 3*a*b*x + 2*b
**2)/(6*b**3*x**3)
```

GIAC/XCAS [A] time = 0.231316, size = 76, normalized size = 1.36

$$\frac{a^3\ln(|ax+b|)}{b^4}-\frac{a^3\ln(|x|)}{b^4}-\frac{6\,a^2bx^2-3\,ab^2x+2\,b^3}{6\,b^4x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x)*x^5),x, algorithm="giac")
```

```
[Out] a^3*ln(abs(a*x + b))/b^4 - a^3*ln(abs(x))/b^4 - 1/6*(6*a^2*b*x^2
- 3*a*b^2*x + 2*b^3)/(b^4*x^3)
```

3.1615 $\int \frac{1}{\left(a+\frac{b}{x}\right)x^6}\,dx$

Optimal. Leaf size=68

$$\frac{a^4\log(x)}{b^5}-\frac{a^4\log(ax+b)}{b^5}+\frac{a^3}{b^4x}-\frac{a^2}{2b^3x^2}+\frac{a}{3b^2x^3}-\frac{1}{4bx^4}$$

```
[Out] -1/(4*b*x^4) + a/(3*b^2*x^3) - a^2/(2*b^3*x^2) + a^3/(b^4*x) + (a
^4*Log[x])/b^5 - (a^4*Log[b + a*x])/b^5
```

Rubi [A] time = 0.0845574, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^4\log(x)}{b^5}-\frac{a^4\log(ax+b)}{b^5}+\frac{a^3}{b^4x}-\frac{a^2}{2b^3x^2}+\frac{a}{3b^2x^3}-\frac{1}{4bx^4}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)*x^6),x]
```

```
[Out] -1/(4*b*x^4) + a/(3*b^2*x^3) - a^2/(2*b^3*x^2) + a^3/(b^4*x) + (a
^4*Log[x])/b^5 - (a^4*Log[b + a*x])/b^5
```

Rubi in Sympy [A] time = 12.9768, size = 61, normalized size = 0.9

$$\frac{a^4\log(x)}{b^5}-\frac{a^4\log(ax+b)}{b^5}+\frac{a^3}{b^4x}-\frac{a^2}{2b^3x^2}+\frac{a}{3b^2x^3}-\frac{1}{4bx^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)/x**6,x)
```

```
[Out] a**4*log(x)/b**5 - a**4*log(a*x + b)/b**5 + a**3/(b**4*x) - a**2/
(2*b**3*x**2) + a/(3*b**2*x**3) - 1/(4*b*x**4)
```

Mathematica [A] time = 0.00818325, size = 68, normalized size = 1.

$$\frac{a^4\log(x)}{b^5}-\frac{a^4\log(ax+b)}{b^5}+\frac{a^3}{b^4x}-\frac{a^2}{2b^3x^2}+\frac{a}{3b^2x^3}-\frac{1}{4bx^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)*x^6),x]
```

```
[Out] -1/(4*b*x^4) + a/(3*b^2*x^3) - a^2/(2*b^3*x^2) + a^3/(b^4*x) + (a
^4*Log[x])/b^5 - (a^4*Log[b + a*x])/b^5
```

Maple [A] time = 0.012, size = 63, normalized size = 0.9

$$-\frac{1}{4\,bx^4}+\frac{a}{3\,b^2x^3}-\frac{a^2}{2\,b^3x^2}+\frac{a^3}{b^4x}+\frac{a^4\ln(x)}{b^5}-\frac{a^4\ln(ax+b)}{b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)/x^6,x)
```

```
[Out] -1/4/b/x^4+1/3*a/b^2/x^3-1/2*a^2/b^3/x^2+a^3/b^4/x+a^4*ln(x)/b^5-
a^4*ln(a*x+b)/b^5
```

Maxima [A] time = 1.43607, size = 84, normalized size = 1.24

$$-\frac{a^4 \log(ax+b)}{b^5} + \frac{a^4 \log(x)}{b^5} + \frac{12\, a^3 x^3 - 6\, a^2 b x^2 + 4\, a b^2 x - 3\, b^3}{12\, b^4 x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)*x^6),x, algorithm="maxima")
```

```
[Out] -a^4*log(a*x + b)/b^5 + a^4*log(x)/b^5 + 1/12*(12*a^3*x^3 - 6*a^2
*b*x^2 + 4*a*b^2*x - 3*b^3)/(b^4*x^4)
```

Fricas [A] time = 0.224339, size = 88, normalized size = 1.29

$$-\frac{12\, a^4 x^4 \log(ax+b) - 12\, a^4 x^4 \log(x) - 12\, a^3 b x^3 + 6\, a^2 b^2 x^2 - 4\, a b^3 x + 3\, b^4}{12\, b^5 x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)*x^6),x, algorithm="fricas")
```

```
[Out] -1/12*(12*a^4*x^4*log(a*x + b) - 12*a^4*x^4*log(x) - 12*a^3*b*x^3
 + 6*a^2*b^2*x^2 - 4*a*b^3*x + 3*b^4)/(b^5*x^4)
```

Sympy [A] time = 1.67637, size = 56, normalized size = 0.82

$$\frac{a^4 \left(\log(x) - \log\left(x + \frac{b}{a}\right)\right)}{b^5} + \frac{12a^3x^3 - 6a^2bx^2 + 4ab^2x - 3b^3}{12b^4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)/x**6,x)
```

```
[Out] a**4*(log(x) - log(x + b/a))/b**5 + (12*a**3*x**3 - 6*a**2*b*x**2
 + 4*a*b**2*x - 3*b**3)/(12*b**4*x**4)
```

GIAC/XCAS [A] time = 0.222521, size = 90, normalized size = 1.32

$$-\frac{a^4 \ln(|ax+b|)}{b^5} + \frac{a^4 \ln(|x|)}{b^5} + \frac{12\, a^3 b x^3 - 6\, a^2 b^2 x^2 + 4\, a b^3 x - 3\, b^4}{12\, b^5 x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)*x^6),x, algorithm="giac")
```

```
[Out] -a^4*ln(abs(a*x + b))/b^5 + a^4*ln(abs(x))/b^5 + 1/12*(12*a^3*b*x
^3 - 6*a^2*b^2*x^2 + 4*a*b^3*x - 3*b^4)/(b^5*x^4)
```

3.1616 $\int \frac{1}{\left(a+\frac{b}{x}\right)x^7}\,dx$

Optimal. Leaf size=82

$$-\frac{a^5\log(x)}{b^6}+\frac{a^5\log(ax+b)}{b^6}-\frac{a^4}{b^5x}+\frac{a^3}{2b^4x^2}-\frac{a^2}{3b^3x^3}+\frac{a}{4b^2x^4}-\frac{1}{5bx^5}$$

```
[Out] -1/(5*b*x^5) + a/(4*b^2*x^4) - a^2/(3*b^3*x^3) + a^3/(2*b^4*x^2)
- a^4/(b^5*x) - (a^5*Log[x])/b^6 + (a^5*Log[b + a*x])/b^6
```

Rubi [A] time = 0.101517, antiderivative size = 82, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^5\log(x)}{b^6}+\frac{a^5\log(ax+b)}{b^6}-\frac{a^4}{b^5x}+\frac{a^3}{2b^4x^2}-\frac{a^2}{3b^3x^3}+\frac{a}{4b^2x^4}-\frac{1}{5bx^5}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)*x^7),x]
```

```
[Out] -1/(5*b*x^5) + a/(4*b^2*x^4) - a^2/(3*b^3*x^3) + a^3/(2*b^4*x^2)
- a^4/(b^5*x) - (a^5*Log[x])/b^6 + (a^5*Log[b + a*x])/b^6
```

Rubi in Sympy [A] time = 14.7726, size = 73, normalized size = 0.89

$$-\frac{a^5\log(x)}{b^6}+\frac{a^5\log(ax+b)}{b^6}-\frac{a^4}{b^5x}+\frac{a^3}{2b^4x^2}-\frac{a^2}{3b^3x^3}+\frac{a}{4b^2x^4}-\frac{1}{5bx^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)/x**7,x)
```

```
[Out] -a**5*log(x)/b**6 + a**5*log(a*x + b)/b**6 - a**4/(b**5*x) + a**3
/(2*b**4*x**2) - a**2/(3*b**3*x**3) + a/(4*b**2*x**4) - 1/(5*b*x*
*5)
```

Mathematica [A] time = 0.00927439, size = 82, normalized size = 1.

$$-\frac{a^5\log(x)}{b^6}+\frac{a^5\log(ax+b)}{b^6}-\frac{a^4}{b^5x}+\frac{a^3}{2b^4x^2}-\frac{a^2}{3b^3x^3}+\frac{a}{4b^2x^4}-\frac{1}{5bx^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)*x^7),x]
```

```
[Out] -1/(5*b*x^5) + a/(4*b^2*x^4) - a^2/(3*b^3*x^3) + a^3/(2*b^4*x^2)
- a^4/(b^5*x) - (a^5*Log[x])/b^6 + (a^5*Log[b + a*x])/b^6
```

Maple [A] time = 0.013, size = 75, normalized size = 0.9

$$-\frac{1}{5\,bx^5}+\frac{a}{4\,b^2x^4}-\frac{a^2}{3\,b^3x^3}+\frac{a^3}{2\,b^4x^2}-\frac{a^4}{b^5x}-\frac{a^5\ln(x)}{b^6}+\frac{a^5\ln(ax+b)}{b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)/x^7,x)
```

```
[Out] -1/5/b/x^5+1/4*a/b^2/x^4-1/3*a^2/b^3/x^3+1/2*a^3/b^4/x^2-a^4/b^5/
x-a^5*ln(x)/b^6+a^5*ln(a*x+b)/b^6
```

Maxima [A] time = 1.44793, size = 99, normalized size = 1.21

$$\frac{a^5 \log(ax+b)}{b^6} - \frac{a^5 \log(x)}{b^6} - \frac{60\, a^4 x^4 - 30\, a^3 b x^3 + 20\, a^2 b^2 x^2 - 15\, a b^3 x + 12\, b^4}{60\, b^5 x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)*x^7),x, algorithm="maxima")
```

```
[Out] a^5*log(a*x + b)/b^6 - a^5*log(x)/b^6 - 1/60*(60*a^4*x^4 - 30*a^3
*b*x^3 + 20*a^2*b^2*x^2 - 15*a*b^3*x + 12*b^4)/(b^5*x^5)
```

Fricas [A] time = 0.226477, size = 103, normalized size = 1.26

$$\frac{60\, a^5 x^5 \log(ax+b) - 60\, a^5 x^5 \log(x) - 60\, a^4 b x^4 + 30\, a^3 b^2 x^3 - 20\, a^2 b^3 x^2 + 15\, a b^4 x - 12\, b^5}{60\, b^6 x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)*x^7),x, algorithm="fricas")
```

```
[Out] 1/60*(60*a^5*x^5*log(a*x + b) - 60*a^5*x^5*log(x) - 60*a^4*b*x^4
+ 30*a^3*b^2*x^3 - 20*a^2*b^3*x^2 + 15*a*b^4*x - 12*b^5)/(b^6*x^5
)
```

Sympy [A] time = 1.79143, size = 68, normalized size = 0.83

$$\frac{a^5 \left(-\log(x) + \log\left(x + \frac{b}{a}\right)\right)}{b^6} - \frac{60a^4x^4 - 30a^3bx^3 + 20a^2b^2x^2 - 15ab^3x + 12b^4}{60b^5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)/x**7,x)
```

```
[Out] a**5*(-log(x) + log(x + b/a))/b**6 - (60*a**4*x**4 - 30*a**3*b*x*
*3 + 20*a**2*b**2*x**2 - 15*a*b**3*x + 12*b**4)/(60*b**5*x**5)
```

GIAC/XCAS [A] time = 0.222957, size = 105, normalized size = 1.28

$$\frac{a^5 \ln(|ax+b|)}{b^6} - \frac{a^5 \ln(|x|)}{b^6} - \frac{60\, a^4 b x^4 - 30\, a^3 b^2 x^3 + 20\, a^2 b^3 x^2 - 15\, a b^4 x + 12\, b^5}{60\, b^6 x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)*x^7),x, algorithm="giac")
```

```
[Out] a^5*ln(abs(a*x + b))/b^6 - a^5*ln(abs(x))/b^6 - 1/60*(60*a^4*b*x^
4 - 30*a^3*b^2*x^3 + 20*a^2*b^3*x^2 - 15*a*b^4*x + 12*b^5)/(b^6*x
^5)
```

3.1617 $\int \frac{x^5}{\left(a+\frac{b}{x}\right)^2} dx$

Optimal. Leaf size=98

$$\frac{b^7}{a^8(ax+b)}+\frac{7b^6\log(ax+b)}{a^8}-\frac{6b^5x}{a^7}+\frac{5b^4x^2}{2a^6}-\frac{4b^3x^3}{3a^5}+\frac{3b^2x^4}{4a^4}-\frac{2bx^5}{5a^3}+\frac{x^6}{6a^2}$$

```
[Out] (-6*b^5*x)/a^7 + (5*b^4*x^2)/(2*a^6) - (4*b^3*x^3)/(3*a^5) + (3*b
^2*x^4)/(4*a^4) - (2*b*x^5)/(5*a^3) + x^6/(6*a^2) + b^7/(a^8*(b +
 a*x)) + (7*b^6*Log[b + a*x])/a^8
```

Rubi [A] time = 0.158466, antiderivative size = 98, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{b^7}{a^8(ax+b)}+\frac{7b^6\log(ax+b)}{a^8}-\frac{6b^5x}{a^7}+\frac{5b^4x^2}{2a^6}-\frac{4b^3x^3}{3a^5}+\frac{3b^2x^4}{4a^4}-\frac{2bx^5}{5a^3}+\frac{x^6}{6a^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/(a + b/x)^2,x]
```

```
[Out] (-6*b^5*x)/a^7 + (5*b^4*x^2)/(2*a^6) - (4*b^3*x^3)/(3*a^5) + (3*b
^2*x^4)/(4*a^4) - (2*b*x^5)/(5*a^3) + x^6/(6*a^2) + b^7/(a^8*(b +
 a*x)) + (7*b^6*Log[b + a*x])/a^8
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{x^6}{6a^2}-\frac{2bx^5}{5a^3}+\frac{3b^2x^4}{4a^4}-\frac{4b^3x^3}{3a^5}+\frac{5b^4\int x\,dx}{a^6}-\frac{6b^5x}{a^7}+\frac{b^7}{a^8\,(ax+b)}+\frac{7b^6\log\,(ax+b)}{a^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(a+b/x)**2,x)
```

```
[Out] x**6/(6*a**2) - 2*b*x**5/(5*a**3) + 3*b**2*x**4/(4*a**4) - 4*b**3
*x**3/(3*a**5) + 5*b**4*Integral(x, x)/a**6 - 6*b**5*x/a**7 + b**
7/(a**8*(a*x + b)) + 7*b**6*log(a*x + b)/a**8
```

Mathematica [A] time = 0.0409777, size = 88, normalized size = 0.9

$$\frac{10a^6x^6-24a^5bx^5+45a^4b^2x^4-80a^3b^3x^3+150a^2b^4x^2+\frac{60b^7}{ax+b}+420b^6\log(ax+b)-360ab^5x}{60a^8}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/(a + b/x)^2,x]
```

```
[Out] (-360*a*b^5*x + 150*a^2*b^4*x^2 - 80*a^3*b^3*x^3 + 45*a^4*b^2*x^4
 - 24*a^5*b*x^5 + 10*a^6*x^6 + (60*b^7)/(b + a*x) + 420*b^6*Log[b
 + a*x])/(60*a^8)
```

Maple [A] time = 0.012, size = 89, normalized size = 0.9

$$-6\,{\frac{{b}^{5}x}{{a}^{7}}}+{\frac{5\,{b}^{4}{x}^{2}}{2\,{a}^{6}}}-{\frac{4\,{b}^{3}{x}^{3}}{3\,{a}^{5}}}+{\frac{3\,{b}^{2}{x}^{4}}{4\,{a}^{4}}}-{\frac{2\,b{x}^{5}}{5\,{a}^{3}}}+{\frac{{x}^{6}}{6\,{a}^{2}}}+{\frac{{b}^{7}}{{a}^{8}\,(ax+b)}}+7\,{\frac{{b}^{6}\ln\,(ax+b)}{{a}^{8}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(a+b/x)^2,x)
```

```
[Out] -6*b^5*x/a^7+5/2*b^4*x^2/a^6-4/3*b^3*x^3/a^5+3/4*b^2*x^4/a^4-2/5*
b*x^5/a^3+1/6*x^6/a^2+b^7/a^8/(a*x+b)+7*b^6*ln(a*x+b)/a^8
```

Maxima [A] time = 1.44087, size = 124, normalized size = 1.27

$$\frac{b^7}{a^9x + a^8b} + \frac{7\,b^6\log\left(ax + b\right)}{a^8} + \frac{10\,a^5x^6 - 24\,a^4bx^5 + 45\,a^3b^2x^4 - 80\,a^2b^3x^3 + 150\,ab^4x^2 - 360\,b^5x}{60\,a^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(a + b/x)^2,x, algorithm="maxima")
```

```
[Out] b^7/(a^9*x + a^8*b) + 7*b^6*log(a*x + b)/a^8 + 1/60*(10*a^5*x^6 -
 24*a^4*b*x^5 + 45*a^3*b^2*x^4 - 80*a^2*b^3*x^3 + 150*a*b^4*x^2 -
 360*b^5*x)/a^7
```

Fricas [A] time = 0.219019, size = 144, normalized size = 1.47

$$\frac{10\,a^7x^7 - 14\,a^6bx^6 + 21\,a^5b^2x^5 - 35\,a^4b^3x^4 + 70\,a^3b^4x^3 - 210\,a^2b^5x^2 - 360\,ab^6x + 60\,b^7 + 420\,\left(ab^6x + b^7\right)\log\left(ax + b\right)}{60\,\left(a^9x + a^8b\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(a + b/x)^2,x, algorithm="fricas")
```

```
[Out] 1/60*(10*a^7*x^7 - 14*a^6*b*x^6 + 21*a^5*b^2*x^5 - 35*a^4*b^3*x^4
 + 70*a^3*b^4*x^3 - 210*a^2*b^5*x^2 - 360*a*b^6*x + 60*b^7 + 420*
(a*b^6*x + b^7)*log(a*x + b))/(a^9*x + a^8*b)
```

Sympy [A] time = 1.5614, size = 99, normalized size = 1.01

$$\frac{b^7}{a^9x + a^8b} + \frac{x^6}{6a^2} - \frac{2bx^5}{5a^3} + \frac{3b^2x^4}{4a^4} - \frac{4b^3x^3}{3a^5} + \frac{5b^4x^2}{2a^6} - \frac{6b^5x}{a^7} + \frac{7b^6\log\left(ax + b\right)}{a^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(a+b/x)**2,x)
```

```
[Out] b**7/(a**9*x + a**8*b) + x**6/(6*a**2) - 2*b*x**5/(5*a**3) + 3*b*
*2*x**4/(4*a**4) - 4*b**3*x**3/(3*a**5) + 5*b**4*x**2/(2*a**6) -
6*b**5*x/a**7 + 7*b**6*log(a*x + b)/a**8
```

GIAC/XCAS [A] time = 0.225835, size = 128, normalized size = 1.31

$$\frac{7\,b^6\ln\left(|ax + b|\right)}{a^8} + \frac{b^7}{(ax + b)a^8} + \frac{10\,a^{10}x^6 - 24\,a^9bx^5 + 45\,a^8b^2x^4 - 80\,a^7b^3x^3 + 150\,a^6b^4x^2 - 360\,a^5b^5x}{60\,a^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(a + b/x)^2,x, algorithm="giac")
```

```
[Out] 7*b^6*ln(abs(a*x + b))/a^8 + b^7/((a*x + b)*a^8) + 1/60*(10*a^10*
x^6 - 24*a^9*b*x^5 + 45*a^8*b^2*x^4 - 80*a^7*b^3*x^3 + 150*a^6*b^
4*x^2 - 360*a^5*b^5*x)/a^12
```

3.1618 $\int \frac{x^4}{\left(a+\frac{b}{x}\right)^2} dx$

Optimal. Leaf size=81

$$-\frac{b^6}{a^7(ax+b)}-\frac{6b^5\log(ax+b)}{a^7}+\frac{5b^4x}{a^6}-\frac{2b^3x^2}{a^5}+\frac{b^2x^3}{a^4}-\frac{bx^4}{2a^3}+\frac{x^5}{5a^2}$$

```
[Out] (5*b^4*x)/a^6 - (2*b^3*x^2)/a^5 + (b^2*x^3)/a^4 - (b*x^4)/(2*a^3)
 + x^5/(5*a^2) - b^6/(a^7*(b + a*x)) - (6*b^5*Log[b + a*x])/a^7
```

Rubi [A] time = 0.132517, antiderivative size = 81, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{b^6}{a^7(ax+b)}-\frac{6b^5\log(ax+b)}{a^7}+\frac{5b^4x}{a^6}-\frac{2b^3x^2}{a^5}+\frac{b^2x^3}{a^4}-\frac{bx^4}{2a^3}+\frac{x^5}{5a^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a + b/x)^2,x]
```



```
[Out] (5*b^4*x)/a^6 - (2*b^3*x^2)/a^5 + (b^2*x^3)/a^4 - (b*x^4)/(2*a^3)
 + x^5/(5*a^2) - b^6/(a^7*(b + a*x)) - (6*b^5*Log[b + a*x])/a^7
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{x^5}{5a^2}-\frac{bx^4}{2a^3}+\frac{b^2x^3}{a^4}-\frac{4b^3\int x\,dx}{a^5}+\frac{5b^4x}{a^6}-\frac{b^6}{a^7(ax+b)}-\frac{6b^5\log(ax+b)}{a^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(a+b/x)**2,x)
```

```
[Out] x**5/(5*a**2) - b*x**4/(2*a**3) + b**2*x**3/a**4 - 4*b**3*Integra
l(x, x)/a**5 + 5*b**4*x/a**6 - b**6/(a**7*(a*x + b)) - 6*b**5*log
(a*x + b)/a**7
```

Mathematica [A] time = 0.0419293, size = 77, normalized size = 0.95

$$\frac{2a^5x^5-5a^4bx^4+10a^3b^2x^3-20a^2b^3x^2-\frac{10b^6}{ax+b}-60b^5\log(ax+b)+50ab^4x}{10a^7}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(a + b/x)^2,x]
```

```
[Out] (50*a*b^4*x - 20*a^2*b^3*x^2 + 10*a^3*b^2*x^3 - 5*a^4*b*x^4 + 2*a
^5*x^5 - (10*b^6)/(b + a*x) - 60*b^5*Log[b + a*x])/(10*a^7)
```

Maple [A] time = 0.011, size = 78, normalized size = 1.

$$5\frac{b^4x}{a^6}-2\frac{b^3x^2}{a^5}+\frac{b^2x^3}{a^4}-\frac{bx^4}{2a^3}+\frac{x^5}{5a^2}-\frac{b^6}{a^7(ax+b)}-6\frac{b^5\ln(ax+b)}{a^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(a+b/x)^2,x)
```

```
[Out] 5*b^4*x/a^6-2*b^3*x^2/a^5+b^2*x^3/a^4-1/2*b*x^4/a^3+1/5*x^5/a^2-b
^6/a^7/(a*x+b)-6*b^5*ln(a*x+b)/a^7
```

Maxima [A] time = 1.43714, size = 111, normalized size = 1.37

$$-\frac{b^6}{a^8x + a^7b} - \frac{6\,b^5\log(ax + b)}{a^7} + \frac{2\,a^4x^5 - 5\,a^3bx^4 + 10\,a^2b^2x^3 - 20\,ab^3x^2 + 50\,b^4x}{10\,a^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(a + b/x)^2,x, algorithm="maxima")
```

```
[Out] -b^6/(a^8*x + a^7*b) - 6*b^5*log(a*x + b)/a^7 + 1/10*(2*a^4*x^5 -
 5*a^3*b*x^4 + 10*a^2*b^2*x^3 - 20*a*b^3*x^2 + 50*b^4*x)/a^6
```

Fricas [A] time = 0.21835, size = 130, normalized size = 1.6

$$\frac{2\,a^6x^6 - 3\,a^5bx^5 + 5\,a^4b^2x^4 - 10\,a^3b^3x^3 + 30\,a^2b^4x^2 + 50\,ab^5x - 10\,b^6 - 60\,\left(ab^5x + b^6\right)\log(ax + b)}{10\,(a^8x + a^7b)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(a + b/x)^2,x, algorithm="fricas")
```

```
[Out] 1/10*(2*a^6*x^6 - 3*a^5*b*x^5 + 5*a^4*b^2*x^4 - 10*a^3*b^3*x^3 +
30*a^2*b^4*x^2 + 50*a*b^5*x - 10*b^6 - 60*(a*b^5*x + b^6)*log(a*x
 + b))/(a^8*x + a^7*b)
```

Sympy [A] time = 1.56412, size = 78, normalized size = 0.96

$$-\frac{b^6}{a^8x + a^7b} + \frac{x^5}{5a^2} - \frac{bx^4}{2a^3} + \frac{b^2x^3}{a^4} - \frac{2b^3x^2}{a^5} + \frac{5b^4x}{a^6} - \frac{6b^5\log(ax + b)}{a^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(a+b/x)**2,x)
```

```
[Out] -b**6/(a**8*x + a**7*b) + x**5/(5*a**2) - b*x**4/(2*a**3) + b**2*
x**3/a**4 - 2*b**3*x**2/a**5 + 5*b**4*x/a**6 - 6*b**5*log(a*x + b
)/a**7
```

GIAC/XCAS [A] time = 0.221983, size = 115, normalized size = 1.42

$$-\frac{6\,b^5\ln(|ax + b|)}{a^7} - \frac{b^6}{(ax + b)a^7} + \frac{2\,a^8x^5 - 5\,a^7bx^4 + 10\,a^6b^2x^3 - 20\,a^5b^3x^2 + 50\,a^4b^4x}{10\,a^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(a + b/x)^2,x, algorithm="giac")
```

```
[Out] -6*b^5*ln(abs(a*x + b))/a^7 - b^6/((a*x + b)*a^7) + 1/10*(2*a^8*x
^5 - 5*a^7*b*x^4 + 10*a^6*b^2*x^3 - 20*a^5*b^3*x^2 + 50*a^4*b^4*x
)/a^10
```

3.1619 $\int \frac{x^3}{\left(a+\frac{b}{x}\right)^2} \, dx$

Optimal. Leaf size=72

$$\frac{b^5}{a^6(ax+b)}+\frac{5b^4\log(ax+b)}{a^6}-\frac{4b^3x}{a^5}+\frac{3b^2x^2}{2a^4}-\frac{2bx^3}{3a^3}+\frac{x^4}{4a^2}$$

```
[Out] (-4*b^3*x)/a^5 + (3*b^2*x^2)/(2*a^4) - (2*b*x^3)/(3*a^3) + x^4/(4
*a^2) + b^5/(a^6*(b + a*x)) + (5*b^4*Log[b + a*x])/a^6
```

Rubi [A] time = 0.112584, antiderivative size = 72, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$\frac{b^5}{a^6(ax+b)}+\frac{5b^4\log(ax+b)}{a^6}-\frac{4b^3x}{a^5}+\frac{3b^2x^2}{2a^4}-\frac{2bx^3}{3a^3}+\frac{x^4}{4a^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^3/(a + b/x)^2,x]
```

```
[Out] (-4*b^3*x)/a^5 + (3*b^2*x^2)/(2*a^4) - (2*b*x^3)/(3*a^3) + x^4/(4
*a^2) + b^5/(a^6*(b + a*x)) + (5*b^4*Log[b + a*x])/a^6
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{x^4}{4a^2}-\frac{2bx^3}{3a^3}+\frac{3b^2\int x\,dx}{a^4}-\frac{4b^3x}{a^5}+\frac{b^5}{a^6(ax+b)}+\frac{5b^4\log(ax+b)}{a^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**3/(a+b/x)**2,x)
```

```
[Out] x**4/(4*a**2) - 2*b*x**3/(3*a**3) + 3*b**2*Integral(x, x)/a**4 -
4*b**3*x/a**5 + b**5/(a**6*(a*x + b)) + 5*b**4*log(a*x + b)/a**6
```

Mathematica [A] time = 0.0327599, size = 66, normalized size = 0.92

$$\frac{3a^4x^4-8a^3bx^3+18a^2b^2x^2+\frac{12b^5}{ax+b}+60b^4\log(ax+b)-48ab^3x}{12a^6}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3/(a + b/x)^2,x]
```

```
[Out] (-48*a*b^3*x + 18*a^2*b^2*x^2 - 8*a^3*b*x^3 + 3*a^4*x^4 + (12*b^5
)/(b + a*x) + 60*b^4*Log[b + a*x])/(12*a^6)
```

Maple [A] time = 0.01, size = 67, normalized size = 0.9

$$-4\,\frac{b^3x}{a^5}+\frac{3\,b^2x^2}{2\,a^4}-\frac{2\,bx^3}{3\,a^3}+\frac{x^4}{4\,a^2}+\frac{b^5}{a^6\,(ax+b)}+5\,\frac{b^4\ln(ax+b)}{a^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^3/(a+b/x)^2,x)
```

```
[Out] -4*b^3*x/a^5+3/2*b^2*x^2/a^4-2/3*b*x^3/a^3+1/4*x^4/a^2+b^5/a^6/(a
*x+b)+5*b^4*ln(a*x+b)/a^6
```

Maxima [A] time = 1.43685, size = 95, normalized size = 1.32

$$\frac{b^5}{a^7x + a^6b} + \frac{5\,b^4\log\left(ax + b\right)}{a^6} + \frac{3\,a^3x^4 - 8\,a^2bx^3 + 18\,ab^2x^2 - 48\,b^3x}{12\,a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^3/(a + b/x)^2,x, algorithm="maxima")
```

```
[Out] b^5/(a^7*x + a^6*b) + 5*b^4*log(a*x + b)/a^6 + 1/12*(3*a^3*x^4 -
8*a^2*b*x^3 + 18*a*b^2*x^2 - 48*b^3*x)/a^5
```

Fricas [A] time = 0.233988, size = 115, normalized size = 1.6

$$\frac{3\,a^5x^5 - 5\,a^4bx^4 + 10\,a^3b^2x^3 - 30\,a^2b^3x^2 - 48\,ab^4x + 12\,b^5 + 60\,\left(ab^4x + b^5\right)\log\left(ax + b\right)}{12\,(a^7x + a^6b)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^3/(a + b/x)^2,x, algorithm="fricas")
```

```
[Out] 1/12*(3*a^5*x^5 - 5*a^4*b*x^4 + 10*a^3*b^2*x^3 - 30*a^2*b^3*x^2 -
 48*a*b^4*x + 12*b^5 + 60*(a*b^4*x + b^5)*log(a*x + b))/(a^7*x +
a^6*b)
```

Sympy [A] time = 1.44939, size = 71, normalized size = 0.99

$$\frac{b^5}{a^7x + a^6b} + \frac{x^4}{4a^2} - \frac{2bx^3}{3a^3} + \frac{3b^2x^2}{2a^4} - \frac{4b^3x}{a^5} + \frac{5b^4\log\left(ax + b\right)}{a^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**3/(a+b/x)**2,x)
```

```
[Out] b**5/(a**7*x + a**6*b) + x**4/(4*a**2) - 2*b*x**3/(3*a**3) + 3*b*
*2*x**2/(2*a**4) - 4*b**3*x/a**5 + 5*b**4*log(a*x + b)/a**6
```

GIAC/XCAS [A] time = 0.232923, size = 99, normalized size = 1.38

$$\frac{5\,b^4\ln\left(|ax + b|\right)}{a^6} + \frac{b^5}{(ax + b)a^6} + \frac{3\,a^6x^4 - 8\,a^5bx^3 + 18\,a^4b^2x^2 - 48\,a^3b^3x}{12\,a^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^3/(a + b/x)^2,x, algorithm="giac")
```

```
[Out] 5*b^4*ln(abs(a*x + b))/a^6 + b^5/((a*x + b)*a^6) + 1/12*(3*a^6*x^
4 - 8*a^5*b*x^3 + 18*a^4*b^2*x^2 - 48*a^3*b^3*x)/a^8
```

3.1620 $\int \frac{x^2}{\left(a+\frac{b}{x}\right)^2} dx$

Optimal. Leaf size=58

$$-\frac{b^4}{a^5(ax+b)}-\frac{4b^3\log(ax+b)}{a^5}+\frac{3b^2x}{a^4}-\frac{bx^2}{a^3}+\frac{x^3}{3a^2}$$

```
[Out] (3*b^2*x)/a^4 - (b*x^2)/a^3 + x^3/(3*a^2) - b^4/(a^5*(b + a*x)) -
 (4*b^3*Log[b + a*x])/a^5
```

Rubi [A] time = 0.0926245, antiderivative size = 58, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$-\frac{b^4}{a^5(ax+b)}-\frac{4b^3\log(ax+b)}{a^5}+\frac{3b^2x}{a^4}-\frac{bx^2}{a^3}+\frac{x^3}{3a^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b/x)^2,x]
```

```
[Out] (3*b^2*x)/a^4 - (b*x^2)/a^3 + x^3/(3*a^2) - b^4/(a^5*(b + a*x)) -
 (4*b^3*Log[b + a*x])/a^5
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{x^3}{3a^2}-\frac{2b\int x\,dx}{a^3}+\frac{3b^2x}{a^4}-\frac{b^4}{a^5\,(ax+b)}-\frac{4b^3\log\,(ax+b)}{a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b/x)**2,x)
```

```
[Out] x**3/(3*a**2) - 2*b*Integral(x, x)/a**3 + 3*b**2*x/a**4 - b**4/(a
**5*(a*x + b)) - 4*b**3*log(a*x + b)/a**5
```

Mathematica [A] time = 0.0373014, size = 54, normalized size = 0.93

$$\frac{a^3x^3-3a^2bx^2-\frac{3b^4}{ax+b}-12b^3\log(ax+b)+9ab^2x}{3a^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a + b/x)^2,x]
```

```
[Out] (9*a*b^2*x - 3*a^2*b*x^2 + a^3*x^3 - (3*b^4)/(b + a*x) - 12*b^3*L
og[b + a*x])/(3*a^5)
```

Maple [A] time = 0.01, size = 57, normalized size = 1.

$$3\,\frac{b^2x}{a^4}-\frac{bx^2}{a^3}+\frac{x^3}{3\,a^2}-\frac{b^4}{a^5\,(ax+b)}-4\,\frac{b^3\ln\,(ax+b)}{a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(a+b/x)^2,x)
```

```
[Out] 3*b^2*x/a^4-b*x^2/a^3+1/3*x^3/a^2-b^4/a^5/(a*x+b)-4*b^3*ln(a*x+b)
/a^5
```

Maxima [A] time = 1.44351, size = 80, normalized size = 1.38

$$-\frac{b^4}{a^6x + a^5b} - \frac{4\,b^3 \log(ax + b)}{a^5} + \frac{a^2x^3 - 3\,abx^2 + 9\,b^2x}{3\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x)^2,x, algorithm="maxima")
```

```
[Out] -b^4/(a^6*x + a^5*b) - 4*b^3*log(a*x + b)/a^5 + 1/3*(a^2*x^3 - 3*
a*b*x^2 + 9*b^2*x)/a^4
```

Fricas [A] time = 0.218982, size = 99, normalized size = 1.71

$$\frac{a^4x^4 - 2\,a^3bx^3 + 6\,a^2b^2x^2 + 9\,ab^3x - 3\,b^4 - 12\left(ab^3x + b^4\right)\log(ax + b)}{3\,(a^6x + a^5b)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x)^2,x, algorithm="fricas")
```

```
[Out] 1/3*(a^4*x^4 - 2*a^3*b*x^3 + 6*a^2*b^2*x^2 + 9*a*b^3*x - 3*b^4 -
12*(a*b^3*x + b^4)*log(a*x + b))/(a^6*x + a^5*b)
```

Sympy [A] time = 1.41563, size = 54, normalized size = 0.93

$$-\frac{b^4}{a^6x + a^5b} + \frac{x^3}{3a^2} - \frac{bx^2}{a^3} + \frac{3b^2x}{a^4} - \frac{4b^3 \log(ax + b)}{a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b/x)**2,x)
```

```
[Out] -b**4/(a**6*x + a**5*b) + x**3/(3*a**2) - b*x**2/a**3 + 3*b**2*x/
a**4 - 4*b**3*log(a*x + b)/a**5
```

GIAC/XCAS [A] time = 0.222332, size = 84, normalized size = 1.45

$$-\frac{4\,b^3\ln(|ax + b|)}{a^5} - \frac{b^4}{(ax + b)a^5} + \frac{a^4x^3 - 3\,a^3bx^2 + 9\,a^2b^2x}{3\,a^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x)^2,x, algorithm="giac")
```

```
[Out] -4*b^3*ln(abs(a*x + b))/a^5 - b^4/((a*x + b)*a^5) + 1/3*(a^4*x^3
- 3*a^3*b*x^2 + 9*a^2*b^2*x)/a^6
```

3.1621 $\int \frac{x}{\left(a+\frac{b}{x}\right)^2}\,dx$

Optimal. Leaf size=46

$$\frac{b^3}{a^4(ax+b)}+\frac{3b^2\log(ax+b)}{a^4}-\frac{2bx}{a^3}+\frac{x^2}{2a^2}$$

```
[Out] (-2*b*x)/a^3 + x^2/(2*a^2) + b^3/(a^4*(b + a*x)) + (3*b^2*Log[b +
 a*x])/a^4
```

Rubi [A] time = 0.0736175, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{b^3}{a^4(ax+b)}+\frac{3b^2\log(ax+b)}{a^4}-\frac{2bx}{a^3}+\frac{x^2}{2a^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b/x)^2,x]
```

```
[Out] (-2*b*x)/a^3 + x^2/(2*a^2) + b^3/(a^4*(b + a*x)) + (3*b^2*Log[b +
 a*x])/a^4
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int x\,dx}{a^2}-\frac{2bx}{a^3}+\frac{b^3}{a^4\,(ax+b)}+\frac{3b^2\log\,(ax+b)}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b/x)**2,x)
```

```
[Out] Integral(x, x)/a**2 - 2*b*x/a**3 + b**3/(a**4*(a*x + b)) + 3*b**2
*log(a*x + b)/a**4
```

Mathematica [A] time = 0.0261896, size = 43, normalized size = 0.93

$$\frac{a^2x^2+\frac{2b^3}{ax+b}+6b^2\log(ax+b)-4abx}{2a^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b/x)^2,x]
```

```
[Out] (-4*a*b*x + a^2*x^2 + (2*b^3)/(b + a*x) + 6*b^2*Log[b + a*x])/(2*
a^4)
```

Maple [A] time = 0.01, size = 45, normalized size = 1.

$$-2\,\frac{bx}{a^3}+\frac{x^2}{2\,a^2}+\frac{b^3}{a^4\,(ax+b)}+3\,\frac{b^2\ln\,(ax+b)}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+b/x)^2,x)
```

```
[Out] -2*b*x/a^3+1/2*x^2/a^2+b^3/a^4/(a*x+b)+3*b^2*ln(a*x+b)/a^4
```

Maxima [A] time = 1.43855, size = 63, normalized size = 1.37

$$\frac{b^3}{a^5x + a^4b} + \frac{3\,b^2\log(ax+b)}{a^4} + \frac{ax^2 - 4\,bx}{2\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x)^2,x, algorithm="maxima")
```

```
[Out] b^3/(a^5*x + a^4*b) + 3*b^2*log(a*x + b)/a^4 + 1/2*(a*x^2 - 4*b*x
)/a^3
```

Fricas [A] time = 0.220106, size = 84, normalized size = 1.83

$$\frac{a^3x^3 - 3\,a^2bx^2 - 4\,ab^2x + 2\,b^3 + 6\left(ab^2x + b^3\right)\log(ax+b)}{2\left(a^5x + a^4b\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x)^2,x, algorithm="fricas")
```

```
[Out] 1/2*(a^3*x^3 - 3*a^2*b*x^2 - 4*a*b^2*x + 2*b^3 + 6*(a*b^2*x + b^3
)*log(a*x + b))/(a^5*x + a^4*b)
```

Sympy [A] time = 1.35851, size = 44, normalized size = 0.96

$$\frac{b^3}{a^5x + a^4b} + \frac{x^2}{2a^2} - \frac{2bx}{a^3} + \frac{3b^2\log(ax+b)}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b/x)**2,x)
```

```
[Out] b**3/(a**5*x + a**4*b) + x**2/(2*a**2) - 2*b*x/a**3 + 3*b**2*log(
a*x + b)/a**4
```

GIAC/XCAS [A] time = 0.226049, size = 65, normalized size = 1.41

$$\frac{3\,b^2\ln(|ax+b|)}{a^4} + \frac{b^3}{(ax+b)a^4} + \frac{a^2x^2 - 4\,abx}{2\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x)^2,x, algorithm="giac")
```

```
[Out] 3*b^2*ln(abs(a*x + b))/a^4 + b^3/((a*x + b)*a^4) + 1/2*(a^2*x^2 -
 4*a*b*x)/a^4
```

3.1622 $\int \frac{1}{\left(a+\frac{b}{x}\right)^2} dx$

Optimal. Leaf size=34

$$-\frac{2b\log(ax+b)}{a^3}+\frac{2x}{a^2}-\frac{x}{a\left(a+\frac{b}{x}\right)}$$

```
[Out] (2*x)/a^2 - x/(a*(a + b/x)) - (2*b*Log[b + a*x])/a^3
```

Rubi [A] time = 0.0418199, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{2b\log(ax+b)}{a^3}+\frac{2x}{a^2}-\frac{x}{a\left(a+\frac{b}{x}\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(-2),x]
```

```
[Out] (2*x)/a^2 - x/(a*(a + b/x)) - (2*b*Log[b + a*x])/a^3
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{x}{a\left(a+\frac{b}{x}\right)}+\frac{2\int \frac{1}{a}\,dx}{a}-\frac{2b\log\left(ax+b\right)}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**2,x)
```

```
[Out] -x/(a*(a + b/x)) + 2*Integral(1/a, x)/a - 2*b*log(a*x + b)/a**3
```

Mathematica [A] time = 0.0209966, size = 29, normalized size = 0.85

$$\frac{-\frac{b^2}{ax+b}-2b\log(ax+b)+ax}{a^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(-2),x]
```

```
[Out] (a*x - b^2/(b + a*x) - 2*b*Log[b + a*x])/a^3
```

Maple [A] time = 0.009, size = 34, normalized size = 1.

$$\frac{x}{a^2}-\frac{b^2}{(ax+b)\,a^3}-2\,\frac{b\ln(ax+b)}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^2,x)
```

```
[Out] x/a^2-b^2/(a*x+b)/a^3-2*b*ln(a*x+b)/a^3
```

Maxima [A] time = 1.44191, size = 49, normalized size = 1.44

$$-\frac{b^2}{a^4x + a^3b} + \frac{x}{a^2} - \frac{2\,b\log(ax + b)}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(-2),x, algorithm="maxima")
```

```
[Out] -b^2/(a^4*x + a^3*b) + x/a^2 - 2*b*log(a*x + b)/a^3
```

Fricas [A] time = 0.219918, size = 63, normalized size = 1.85

$$\frac{a^2x^2 + abx - b^2 - 2\left(abx + b^2\right)\log(ax + b)}{a^4x + a^3b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(-2),x, algorithm="fricas")
```

```
[Out] (a^2*x^2 + a*b*x - b^2 - 2*(a*b*x + b^2)*log(a*x + b))/(a^4*x + a
^3*b)
```

Sympy [A] time = 1.27855, size = 31, normalized size = 0.91

$$-\frac{b^2}{a^4x + a^3b} + \frac{x}{a^2} - \frac{2b\log(ax + b)}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**2,x)
```

```
[Out] -b**2/(a**4*x + a**3*b) + x/a**2 - 2*b*log(a*x + b)/a**3
```

GIAC/XCAS [A] time = 0.232704, size = 46, normalized size = 1.35

$$\frac{x}{a^2} - \frac{2\,b\ln(|ax + b|)}{a^3} - \frac{b^2}{(ax + b)a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(-2),x, algorithm="giac")
```

```
[Out] x/a^2 - 2*b*ln(abs(a*x + b))/a^3 - b^2/((a*x + b)*a^3)
```

3.1623 $\int \frac{1}{\left(a+\frac{b}{x}\right)^2 x} \, dx$

Optimal. Leaf size=23

$$\frac{b}{a^2(ax+b)}+\frac{\log(ax+b)}{a^2}$$

```
[Out] b/(a^2*(b + a*x)) + Log[b + a*x]/a^2
```

Rubi [A] time = 0.0433145, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{b}{a^2(ax+b)}+\frac{\log(ax+b)}{a^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^2*x),x]

[Out] b/(a^2*(b + a*x)) + Log[b + a*x]/a^2
```

Rubi in Sympy [A] time = 7.56412, size = 19, normalized size = 0.83

$$\frac{b}{a^2\,(ax+b)}+\frac{\log\,(ax+b)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**2/x,x)

[Out] b/(a**2*(a*x + b)) + log(a*x + b)/a**2
```

Mathematica [A] time = 0.0125417, size = 20, normalized size = 0.87

$$\frac{\frac{b}{ax+b}+\log(ax+b)}{a^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^2*x),x]

[Out] (b/(b + a*x) + Log[b + a*x])/a^2
```

Maple [A] time = 0.007, size = 24, normalized size = 1.

$$\frac{b}{a^2\,(ax+b)}+\frac{\ln\,(ax+b)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^2/x,x)
```

```
[Out] b/a^2/(a*x+b)+ln(a*x+b)/a^2
```

Maxima [A] time = 1.45658, size = 35, normalized size = 1.52

$$\frac{b}{a^3x + a^2b} + \frac{\log(ax + b)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x),x, algorithm="maxima")
```

```
[Out] b/(a^3*x + a^2*b) + log(a*x + b)/a^2
```

Fricas [A] time = 0.219615, size = 38, normalized size = 1.65

$$\frac{(ax + b)\log(ax + b) + b}{a^3x + a^2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x),x, algorithm="fricas")
```

```
[Out] ((a*x + b)*log(a*x + b) + b)/(a^3*x + a^2*b)
```

Sympy [A] time = 1.16313, size = 20, normalized size = 0.87

$$\frac{b}{a^3x + a^2b} + \frac{\log(ax + b)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**2/x,x)
```

```
[Out] b/(a**3*x + a**2*b) + log(a*x + b)/a**2
```

GIAC/XCAS [A] time = 0.223905, size = 32, normalized size = 1.39

$$\frac{\ln(|ax + b|)}{a^2} + \frac{b}{(ax + b)a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x),x, algorithm="giac")
```

```
[Out] ln(abs(a*x + b))/a^2 + b/((a*x + b)*a^2)
```

3.1624 $\int \frac{1}{\left(a+\frac{b}{x}\right)^2 x^2} dx$

Optimal. Leaf size=13

$$\frac{1}{b\left(a+\frac{b}{x}\right)}$$

```
[Out] 1/(b*(a + b/x))
```

Rubi [A] time = 0.0169857, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{1}{b\left(a+\frac{b}{x}\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^2*x^2),x]

[Out] 1/(b*(a + b/x))
```

Rubi in Sympy [A] time = 2.25561, size = 7, normalized size = 0.54

$$\frac{1}{b\left(a+\frac{b}{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**2/x**2,x)

[Out] 1/(b*(a + b/x))
```

Mathematica [A] time = 0.00548419, size = 12, normalized size = 0.92

$$-\frac{1}{a(ax+b)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^2*x^2),x]

[Out] -(1/(a*(b + a*x)))
```

Maple [A] time = 0.001, size = 13, normalized size = 1.

$$-\frac{1}{(ax+b)\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^2/x^2,x)
```

```
[Out] -1/(a*x+b)/a
```

Maxima [A] time = 1.42094, size = 18, normalized size = 1.38

$$\frac{1}{\left(a+\frac{b}{x}\right)b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^2),x, algorithm="maxima")
```

```
[Out] 1/((a + b/x)*b)
```

Fricas [A] time = 0.211075, size = 18, normalized size = 1.38

$$-\frac{1}{a^2x+ab}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^2),x, algorithm="fricas")
```

```
[Out] -1/(a^2*x + a*b)
```

Sympy [A] time = 1.11713, size = 10, normalized size = 0.77

$$-\frac{1}{a^2x+ab}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**2/x**2,x)
```

```
[Out] -1/(a**2*x + a*b)
```

GIAC/XCAS [A] time = 0.222367, size = 18, normalized size = 1.38

$$\frac{1}{\left(a+\frac{b}{x}\right)b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^2),x, algorithm="giac")
```

```
[Out] 1/((a + b/x)*b)
```

3.1625 $\int \frac{1}{\left(a+\frac{b}{x}\right)^2 x^3} \, dx$

Optimal. Leaf size=29

$$-\frac{\log(ax+b)}{b^2}+\frac{1}{b(ax+b)}+\frac{\log(x)}{b^2}$$

```
[Out] 1/(b*(b + a*x)) + Log[x]/b^2 - Log[b + a*x]/b^2
```

Rubi [A] time = 0.0510818, antiderivative size = 29, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$-\frac{\log(ax+b)}{b^2}+\frac{1}{b(ax+b)}+\frac{\log(x)}{b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^2*x^3),x]

[Out] 1/(b*(b + a*x)) + Log[x]/b^2 - Log[b + a*x]/b^2
```

Rubi in Sympy [A] time = 7.83518, size = 24, normalized size = 0.83

$$\frac{1}{b\left(ax+b\right)}+\frac{\log\left(x\right)}{b^2}-\frac{\log\left(ax+b\right)}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**2/x**3,x)

[Out] 1/(b*(a*x + b)) + log(x)/b**2 - log(a*x + b)/b**2
```

Mathematica [A] time = 0.0165118, size = 24, normalized size = 0.83

$$\frac{\frac{b}{ax+b}-\log(ax+b)+\log(x)}{b^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^2*x^3),x]

[Out] (b/(b + a*x) + Log[x] - Log[b + a*x])/b^2
```

Maple [A] time = 0.012, size = 30, normalized size = 1.

$$\frac{1}{b\left(ax+b\right)}+\frac{\ln\left(x\right)}{b^2}-\frac{\ln\left(ax+b\right)}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^2/x^3,x)
```

```
[Out] 1/b/(a*x+b)+ln(x)/b^2-ln(a*x+b)/b^2
```

Maxima [A] time = 1.4555, size = 38, normalized size = 1.31

$$\frac{1}{abx+b^2}-\frac{\log(ax+b)}{b^2}+\frac{\log(x)}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^3),x, algorithm="maxima")

[Out] 1/(a*b*x + b^2) - log(a*x + b)/b^2 + log(x)/b^2
```

Fricas [A] time = 0.225335, size = 53, normalized size = 1.83

$$-\frac{(ax+b)\log(ax+b)-(ax+b)\log(x)-b}{ab^2x+b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^3),x, algorithm="fricas")

[Out] -((a*x + b)*log(a*x + b) - (a*x + b)*log(x) - b)/(a*b^2*x + b^3)
```

Sympy [A] time = 1.40899, size = 22, normalized size = 0.76

$$\frac{1}{abx+b^2}+\frac{\log(x)-\log\left(x+\frac{b}{a}\right)}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**2/x**3,x)

[Out] 1/(a*b*x + b**2) + (log(x) - log(x + b/a))/b**2
```

GIAC/XCAS [A] time = 0.232606, size = 42, normalized size = 1.45

$$-\frac{\ln(|ax+b|)}{b^2}+\frac{\ln(|x|)}{b^2}+\frac{1}{(ax+b)b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^3),x, algorithm="giac")

[Out] -ln(abs(a*x + b))/b^2 + ln(abs(x))/b^2 + 1/((a*x + b)*b)
```

3.1626 $\int \frac{1}{\left(a+\frac{b}{x}\right)^2 x^4} \, dx$

Optimal. Leaf size=42

$$-\frac{2a\log(x)}{b^3}+\frac{2a\log(ax+b)}{b^3}-\frac{a}{b^2(ax+b)}-\frac{1}{b^2x}$$

```
[Out] -(1/(b^2*x)) - a/(b^2*(b + a*x)) - (2*a*Log[x])/b^3 + (2*a*Log[b
+ a*x])/b^3
```

Rubi [A] time = 0.0678242, antiderivative size = 42, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{2a\log(x)}{b^3}+\frac{2a\log(ax+b)}{b^3}-\frac{a}{b^2(ax+b)}-\frac{1}{b^2x}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b/x)^2*x^4),x]
```

```
[Out] -(1/(b^2*x)) - a/(b^2*(b + a*x)) - (2*a*Log[x])/b^3 + (2*a*Log[b
+ a*x])/b^3
```

Rubi in Sympy [A] time = 9.74181, size = 39, normalized size = 0.93

$$-\frac{a}{b^2\left(ax+b\right)}-\frac{2a\log\left(x\right)}{b^3}+\frac{2a\log\left(ax+b\right)}{b^3}-\frac{1}{b^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b/x)**2/x**4,x)
```

```
[Out] -a/(b**2*(a*x + b)) - 2*a*log(x)/b**3 + 2*a*log(a*x + b)/b**3 - 1
/(b**2*x)
```

Mathematica [A] time = 0.0705966, size = 35, normalized size = 0.83

$$-\frac{b\left(\frac{a}{ax+b}+\frac{1}{x}\right)-2a\log(ax+b)+2a\log(x)}{b^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b/x)^2*x^4),x]
```

```
[Out] -((b*(x^(-1) + a/(b + a*x)) + 2*a*Log[x] - 2*a*Log[b + a*x])/b^3)
```

Maple [A] time = 0.015, size = 43, normalized size = 1.

$$-\frac{1}{b^2x}-\frac{a}{b^2\left(ax+b\right)}-2\,\frac{a\ln\left(x\right)}{b^3}+2\,\frac{a\ln\left(ax+b\right)}{b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b/x)^2/x^4,x)
```

```
[Out] -1/b^2/x-a/b^2/(a*x+b)-2*a*ln(x)/b^3+2*a*ln(a*x+b)/b^3
```

Maxima [A] time = 1.45739, size = 61, normalized size = 1.45

$$-\frac{2\,ax+b}{ab^2x^2+b^3x}+\frac{2\,a\log\left(ax+b\right)}{b^3}-\frac{2\,a\log\left(x\right)}{b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^4),x, algorithm="maxima")
```

```
[Out] -(2*a*x + b)/(a*b^2*x^2 + b^3*x) + 2*a*log(a*x + b)/b^3 - 2*a*log
(x)/b^3
```

Fricas [A] time = 0.221001, size = 85, normalized size = 2.02

$$-\frac{2\,abx+b^2-2\,\left(a^2x^2+abx\right)\log\left(ax+b\right)+2\,\left(a^2x^2+abx\right)\log\left(x\right)}{ab^3x^2+b^4x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^4),x, algorithm="fricas")
```

```
[Out] -(2*a*b*x + b^2 - 2*(a^2*x^2 + a*b*x)*log(a*x + b) + 2*(a^2*x^2 +
 a*b*x)*log(x))/(a*b^3*x^2 + b^4*x)
```

Sympy [A] time = 1.5943, size = 36, normalized size = 0.86

$$\frac{2a\left(-\log\left(x\right)+\log\left(x+\frac{b}{a}\right)\right)}{b^3}-\frac{2ax+b}{ab^2x^2+b^3x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**2/x**4,x)
```

```
[Out] 2*a*(-log(x) + log(x + b/a))/b**3 - (2*a*x + b)/(a*b**2*x**2 + b*
*3*x)
```

GIAC/XCAS [A] time = 0.229185, size = 61, normalized size = 1.45

$$\frac{2\,a\ln\left(|ax+b|\right)}{b^3}-\frac{2\,a\ln\left(|x|\right)}{b^3}-\frac{2\,ax+b}{(ax^2+bx)b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^4),x, algorithm="giac")
```

```
[Out] 2*a*ln(abs(a*x + b))/b^3 - 2*a*ln(abs(x))/b^3 - (2*a*x + b)/((a*x
^2 + b*x)*b^2)
```

3.1627 $\int \frac{1}{\left(a+\frac{b}{x}\right)^2 x^5} \, dx$

Optimal. Leaf size=58

$$\frac{3a^2\log(x)}{b^4} - \frac{3a^2\log(ax+b)}{b^4} + \frac{a^2}{b^3(ax+b)} + \frac{2a}{b^3x} - \frac{1}{2b^2x^2}$$

```
[Out] -1/(2*b^2*x^2) + (2*a)/(b^3*x) + a^2/(b^3*(b + a*x)) + (3*a^2*Log
[x])/b^4 - (3*a^2*Log[b + a*x])/b^4
```

Rubi [A] time = 0.0863852, antiderivative size = 58, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$\frac{3a^2\log(x)}{b^4} - \frac{3a^2\log(ax+b)}{b^4} + \frac{a^2}{b^3(ax+b)} + \frac{2a}{b^3x} - \frac{1}{2b^2x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^2*x^5),x]
```

```
[Out] -1/(2*b^2*x^2) + (2*a)/(b^3*x) + a^2/(b^3*(b + a*x)) + (3*a^2*Log
[x])/b^4 - (3*a^2*Log[b + a*x])/b^4
```

Rubi in Sympy [A] time = 13.0407, size = 56, normalized size = 0.97

$$\frac{a^2}{b^3\left(ax+b\right)} + \frac{3a^2\log\left(x\right)}{b^4} - \frac{3a^2\log\left(ax+b\right)}{b^4} + \frac{2a}{b^3x} - \frac{1}{2b^2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**2/x**5,x)
```

```
[Out] a**2/(b**3*(a*x + b)) + 3*a**2*log(x)/b**4 - 3*a**2*log(a*x + b)/
b**4 + 2*a/(b**3*x) - 1/(2*b**2*x**2)
```

Mathematica [A] time = 0.0956589, size = 53, normalized size = 0.91

$$\frac{b\left(\frac{2a^2}{ax+b} + \frac{4a}{x} - \frac{b}{x^2}\right) - 6a^2\log(ax+b) + 6a^2\log(x)}{2b^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^2*x^5),x]
```

```
[Out] (b*(-(b/x^2) + (4*a)/x + (2*a^2)/(b + a*x)) + 6*a^2*Log[x] - 6*a^
2*Log[b + a*x])/(2*b^4)
```

Maple [A] time = 0.016, size = 57, normalized size = 1.

$$-\frac{1}{2\,b^2x^2} + 2\,\frac{a}{b^3x} + \frac{a^2}{b^3\left(ax+b\right)} + 3\,\frac{a^2\ln\left(x\right)}{b^4} - 3\,\frac{a^2\ln\left(ax+b\right)}{b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^2/x^5,x)
```

```
[Out] -1/2/b^2/x^2+2*a/b^3/x+a^2/b^3/(a*x+b)+3*a^2*ln(x)/b^4-3*a^2*ln(a
*x+b)/b^4
```

Maxima [A] time = 1.45135, size = 86, normalized size = 1.48

$$\frac{6\,a^2x^2 + 3\,abx - b^2}{2\,(ab^3x^3 + b^4x^2)} - \frac{3\,a^2\log\left(ax + b\right)}{b^4} + \frac{3\,a^2\log\left(x\right)}{b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^5),x, algorithm="maxima")
```

```
[Out] 1/2*(6*a^2*x^2 + 3*a*b*x - b^2)/(a*b^3*x^3 + b^4*x^2) - 3*a^2*log
(a*x + b)/b^4 + 3*a^2*log(x)/b^4
```

Fricas [A] time = 0.220625, size = 116, normalized size = 2.

$$\frac{6\,a^2bx^2 + 3\,ab^2x - b^3 - 6\left(a^3x^3 + a^2bx^2\right)\log\left(ax + b\right) + 6\left(a^3x^3 + a^2bx^2\right)\log\left(x\right)}{2\,(ab^4x^3 + b^5x^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^5),x, algorithm="fricas")
```

```
[Out] 1/2*(6*a^2*b*x^2 + 3*a*b^2*x - b^3 - 6*(a^3*x^3 + a^2*b*x^2)*log(
a*x + b) + 6*(a^3*x^3 + a^2*b*x^2)*log(x))/(a*b^4*x^3 + b^5*x^2)
```

Sympy [A] time = 1.75347, size = 54, normalized size = 0.93

$$\frac{3a^2\left(\log\left(x\right) - \log\left(x + \frac{b}{a}\right)\right)}{b^4} + \frac{6a^2x^2 + 3abx - b^2}{2ab^3x^3 + 2b^4x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**2/x**5,x)
```

```
[Out] 3*a**2*(log(x) - log(x + b/a))/b**4 + (6*a**2*x**2 + 3*a*b*x - b*
*2)/(2*a*b**3*x**3 + 2*b**4*x**2)
```

GIAC/XCAS [A] time = 0.224183, size = 86, normalized size = 1.48

$$-\frac{3\,a^2\ln\left(|ax + b|\right)}{b^4} + \frac{3\,a^2\ln\left(|x|\right)}{b^4} + \frac{6\,a^2bx^2 + 3\,ab^2x - b^3}{2\,(ax + b)b^4x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^5),x, algorithm="giac")
```

```
[Out] -3*a^2*ln(abs(a*x + b))/b^4 + 3*a^2*ln(abs(x))/b^4 + 1/2*(6*a^2*b
*x^2 + 3*a*b^2*x - b^3)/((a*x + b)*b^4*x^2)
```

3.1628 $\int \frac{1}{\left(a+\frac{b}{x}\right)^2 x^6} \, dx$

Optimal. Leaf size=69

$$-\frac{4a^3\log(x)}{b^5}+\frac{4a^3\log(ax+b)}{b^5}-\frac{a^3}{b^4(ax+b)}-\frac{3a^2}{b^4x}+\frac{a}{b^3x^2}-\frac{1}{3b^2x^3}$$

```
[Out] -1/(3*b^2*x^3) + a/(b^3*x^2) - (3*a^2)/(b^4*x) - a^3/(b^4*(b + a*
x)) - (4*a^3*Log[x])/b^5 + (4*a^3*Log[b + a*x])/b^5
```

Rubi [A] time = 0.101989, antiderivative size = 69, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$-\frac{4a^3\log(x)}{b^5}+\frac{4a^3\log(ax+b)}{b^5}-\frac{a^3}{b^4(ax+b)}-\frac{3a^2}{b^4x}+\frac{a}{b^3x^2}-\frac{1}{3b^2x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^2*x^6),x]
```

```
[Out] -1/(3*b^2*x^3) + a/(b^3*x^2) - (3*a^2)/(b^4*x) - a^3/(b^4*(b + a*
x)) - (4*a^3*Log[x])/b^5 + (4*a^3*Log[b + a*x])/b^5
```

Rubi in Sympy [A] time = 14.4772, size = 66, normalized size = 0.96

$$-\frac{a^3}{b^4\left(ax+b\right)}-\frac{4a^3\log\left(x\right)}{b^5}+\frac{4a^3\log\left(ax+b\right)}{b^5}-\frac{3a^2}{b^4x}+\frac{a}{b^3x^2}-\frac{1}{3b^2x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**2/x**6,x)
```

```
[Out] -a**3/(b**4*(a*x + b)) - 4*a**3*log(x)/b**5 + 4*a**3*log(a*x + b)
/b**5 - 3*a**2/(b**4*x) + a/(b**3*x**2) - 1/(3*b**2*x**3)
```

Mathematica [A] time = 0.096982, size = 66, normalized size = 0.96

$$-\frac{-12a^3\log(ax+b)+12a^3\log(x)+\frac{b\left(12a^3x^3+6a^2bx^2-2ab^2x+b^3\right)}{x^3(ax+b)}}{3b^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^2*x^6),x]
```

```
[Out] -((b*(b^3 - 2*a*b^2*x + 6*a^2*b*x^2 + 12*a^3*x^3))/(x^3*(b + a*x)
) + 12*a^3*Log[x] - 12*a^3*Log[b + a*x])/(3*b^5)
```

Maple [A] time = 0.017, size = 68, normalized size = 1.

$$-\frac{1}{3\,b^2x^3}+\frac{a}{b^3x^2}-3\,\frac{a^2}{b^4x}-\frac{a^3}{b^4\left(ax+b\right)}-4\,\frac{a^3\ln\left(x\right)}{b^5}+4\,\frac{a^3\ln\left(ax+b\right)}{b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^2/x^6,x)
```

```
[Out] -1/3/b^2/x^3+a/b^3/x^2-3*a^2/b^4/x-a^3/b^4/(a*x+b)-4*a^3*ln(x)/b^
5+4*a^3*ln(a*x+b)/b^5
```

Maxima [A] time = 1.44179, size = 99, normalized size = 1.43

$$-\frac{12\,a^3x^3+6\,a^2bx^2-2\,ab^2x+b^3}{3\,(ab^4x^4+b^5x^3)}+\frac{4\,a^3\log{(ax+b)}}{b^5}-\frac{4\,a^3\log{(x)}}{b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^6),x, algorithm="maxima")
```

```
[Out] -1/3*(12*a^3*x^3 + 6*a^2*b*x^2 - 2*a*b^2*x + b^3)/(a*b^4*x^4 + b^
5*x^3) + 4*a^3*log(a*x + b)/b^5 - 4*a^3*log(x)/b^5
```

Fricas [A] time = 0.227271, size = 128, normalized size = 1.86

$$-\frac{12\,a^3bx^3+6\,a^2b^2x^2-2\,ab^3x+b^4-12\,\left(a^4x^4+a^3bx^3\right)\log{(ax+b)}+12\,\left(a^4x^4+a^3bx^3\right)\log{(x)}}{3\,(ab^5x^4+b^6x^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^6),x, algorithm="fricas")
```

```
[Out] -1/3*(12*a^3*b*x^3 + 6*a^2*b^2*x^2 - 2*a*b^3*x + b^4 - 12*(a^4*x^
4 + a^3*b*x^3)*log(a*x + b) + 12*(a^4*x^4 + a^3*b*x^3)*log(x))/(a
*b^5*x^4 + b^6*x^3)
```

Sympy [A] time = 1.87241, size = 66, normalized size = 0.96

$$\frac{4a^3\left(-\log{(x)}+\log{\left(x+\frac{b}{a}\right)}\right)}{b^5}-\frac{12a^3x^3+6a^2bx^2-2ab^2x+b^3}{3ab^4x^4+3b^5x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**2/x**6,x)
```

```
[Out] 4*a**3*(-log(x) + log(x + b/a))/b**5 - (12*a**3*x**3 + 6*a**2*b*x
**2 - 2*a*b**2*x + b**3)/(3*a*b**4*x**4 + 3*b**5*x**3)
```

GIAC/XCAS [A] time = 0.229466, size = 99, normalized size = 1.43

$$\frac{4\,a^3\ln{(|ax+b|)}}{b^5}-\frac{4\,a^3\ln{(|x|)}}{b^5}-\frac{12\,a^3bx^3+6\,a^2b^2x^2-2\,ab^3x+b^4}{3\,(ax+b)b^5x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^6),x, algorithm="giac")
```

```
[Out] 4*a^3*ln(abs(a*x + b))/b^5 - 4*a^3*ln(abs(x))/b^5 - 1/3*(12*a^3*b
*x^3 + 6*a^2*b^2*x^2 - 2*a*b^3*x + b^4)/((a*x + b)*b^5*x^3)
```

3.1629 $\int \frac{1}{\left(a+\frac{b}{x}\right)^2 x^7}\,dx$

Optimal. Leaf size=84

$$\frac{5a^4\log(x)}{b^6}-\frac{5a^4\log(ax+b)}{b^6}+\frac{a^4}{b^5(ax+b)}+\frac{4a^3}{b^5x}-\frac{3a^2}{2b^4x^2}+\frac{2a}{3b^3x^3}-\frac{1}{4b^2x^4}$$

```
[Out] -1/(4*b^2*x^4) + (2*a)/(3*b^3*x^3) - (3*a^2)/(2*b^4*x^2) + (4*a^3
)/(b^5*x) + a^4/(b^5*(b + a*x)) + (5*a^4*Log[x])/b^6 - (5*a^4*Log
[b + a*x])/b^6
```

Rubi [A] time = 0.118348, antiderivative size = 84, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{5a^4\log(x)}{b^6}-\frac{5a^4\log(ax+b)}{b^6}+\frac{a^4}{b^5(ax+b)}+\frac{4a^3}{b^5x}-\frac{3a^2}{2b^4x^2}+\frac{2a}{3b^3x^3}-\frac{1}{4b^2x^4}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b/x)^2*x^7),x]
```

```
[Out] -1/(4*b^2*x^4) + (2*a)/(3*b^3*x^3) - (3*a^2)/(2*b^4*x^2) + (4*a^3
)/(b^5*x) + a^4/(b^5*(b + a*x)) + (5*a^4*Log[x])/b^6 - (5*a^4*Log
[b + a*x])/b^6
```

Rubi in Sympy [A] time = 17.4817, size = 83, normalized size = 0.99

$$\frac{a^4}{b^5\,(ax+b)}+\frac{5a^4\log\,(x)}{b^6}-\frac{5a^4\log\,(ax+b)}{b^6}+\frac{4a^3}{b^5x}-\frac{3a^2}{2b^4x^2}+\frac{2a}{3b^3x^3}-\frac{1}{4b^2x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b/x)**2/x**7,x)
```

```
[Out] a**4/(b**5*(a*x + b)) + 5*a**4*log(x)/b**6 - 5*a**4*log(a*x + b)/
b**6 + 4*a**3/(b**5*x) - 3*a**2/(2*b**4*x**2) + 2*a/(3*b**3*x**3)
 - 1/(4*b**2*x**4)
```

Mathematica [A] time = 0.0819086, size = 79, normalized size = 0.94

$$\frac{-60a^4\log(ax+b)+60a^4\log(x)+\frac{b\left(60a^4x^4+30a^3bx^3-10a^2b^2x^2+5ab^3x-3b^4\right)}{x^4(ax+b)}}{12b^6}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b/x)^2*x^7),x]
```

```
[Out] ((b*(-3*b^4 + 5*a*b^3*x - 10*a^2*b^2*x^2 + 30*a^3*b*x^3 + 60*a^4*
x^4))/(x^4*(b + a*x)) + 60*a^4*Log[x] - 60*a^4*Log[b + a*x])/(12*
b^6)
```

Maple [A] time = 0.017, size = 79, normalized size = 0.9

$$-\frac{1}{4\,b^2x^4}+\frac{2\,a}{3\,b^3x^3}-\frac{3\,a^2}{2\,b^4x^2}+4\,\frac{a^3}{b^5x}+\frac{a^4}{b^5\,(ax+b)}+5\,\frac{a^4\ln\,(x)}{b^6}-5\,\frac{a^4\ln\,(ax+b)}{b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^2/x^7,x)
```

```
[Out] -1/4/b^2/x^4+2/3*a/b^3/x^3-3/2*a^2/b^4/x^2+4*a^3/b^5/x+a^4/b^5/(a
*x+b)+5*a^4*ln(x)/b^6-5*a^4*ln(a*x+b)/b^6
```

Maxima [A] time = 1.42611, size = 116, normalized size = 1.38

$$\frac{60\,a^4x^4 + 30\,a^3bx^3 - 10\,a^2b^2x^2 + 5\,ab^3x - 3\,b^4}{12\,(ab^5x^5 + b^6x^4)} - \frac{5\,a^4\log\left(ax + b\right)}{b^6} + \frac{5\,a^4\log\left(x\right)}{b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^7),x, algorithm="maxima")
```

```
[Out] 1/12*(60*a^4*x^4 + 30*a^3*b*x^3 - 10*a^2*b^2*x^2 + 5*a*b^3*x - 3*
b^4)/(a*b^5*x^5 + b^6*x^4) - 5*a^4*log(a*x + b)/b^6 + 5*a^4*log(x
)/b^6
```

Fricas [A] time = 0.233272, size = 146, normalized size = 1.74

$$\frac{60\,a^4bx^4 + 30\,a^3b^2x^3 - 10\,a^2b^3x^2 + 5\,ab^4x - 3\,b^5 - 60\,\left(a^5x^5 + a^4bx^4\right)\log\left(ax + b\right) + 60\,\left(a^5x^5 + a^4bx^4\right)\log\left(x\right)}{12\,(ab^6x^5 + b^7x^4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^7),x, algorithm="fricas")
```

```
[Out] 1/12*(60*a^4*b*x^4 + 30*a^3*b^2*x^3 - 10*a^2*b^3*x^2 + 5*a*b^4*x
- 3*b^5 - 60*(a^5*x^5 + a^4*b*x^4)*log(a*x + b) + 60*(a^5*x^5 + a
^4*b*x^4)*log(x))/(a*b^6*x^5 + b^7*x^4)
```

Sympy [A] time = 2.02552, size = 80, normalized size = 0.95

$$\frac{5a^4\left(\log\left(x\right) - \log\left(x + \frac{b}{a}\right)\right)}{b^6} + \frac{60a^4x^4 + 30a^3bx^3 - 10a^2b^2x^2 + 5ab^3x - 3b^4}{12ab^5x^5 + 12b^6x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**2/x**7,x)
```

```
[Out] 5*a**4*(log(x) - log(x + b/a))/b**6 + (60*a**4*x**4 + 30*a**3*b*x
**3 - 10*a**2*b**2*x**2 + 5*a*b**3*x - 3*b**4)/(12*a*b**5*x**5 +
12*b**6*x**4)
```

GIAC/XCAS [A] time = 0.224528, size = 116, normalized size = 1.38

$$-\frac{5\,a^4\ln\left(|ax + b|\right)}{b^6} + \frac{5\,a^4\ln\left(|x|\right)}{b^6} + \frac{60\,a^4bx^4 + 30\,a^3b^2x^3 - 10\,a^2b^3x^2 + 5\,ab^4x - 3\,b^5}{12\,(ax + b)b^6x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^7),x, algorithm="giac")
```

```
[Out] -5*a^4*ln(abs(a*x + b))/b^6 + 5*a^4*ln(abs(x))/b^6 + 1/12*(60*a^4
*b*x^4 + 30*a^3*b^2*x^3 - 10*a^2*b^3*x^2 + 5*a*b^4*x - 3*b^5)/((a
*x + b)*b^6*x^4)
```

3.1630 $\int \frac{1}{\left(a+\frac{b}{x}\right)^2 x^8}\,dx$

Optimal. Leaf size=94

$$-\frac{6a^5\log(x)}{b^7}+\frac{6a^5\log(ax+b)}{b^7}-\frac{a^5}{b^6(ax+b)}-\frac{5a^4}{b^6x}+\frac{2a^3}{b^5x^2}-\frac{a^2}{b^4x^3}+\frac{a}{2b^3x^4}-\frac{1}{5b^2x^5}$$

```
[Out] -1/(5*b^2*x^5) + a/(2*b^3*x^4) - a^2/(b^4*x^3) + (2*a^3)/(b^5*x^2
) - (5*a^4)/(b^6*x) - a^5/(b^6*(b + a*x)) - (6*a^5*Log[x])/b^7 +
(6*a^5*Log[b + a*x])/b^7
```

Rubi [A] time = 0.136887, antiderivative size = 94, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{6a^5\log(x)}{b^7}+\frac{6a^5\log(ax+b)}{b^7}-\frac{a^5}{b^6(ax+b)}-\frac{5a^4}{b^6x}+\frac{2a^3}{b^5x^2}-\frac{a^2}{b^4x^3}+\frac{a}{2b^3x^4}-\frac{1}{5b^2x^5}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b/x)^2*x^8),x]
```

```
[Out] -1/(5*b^2*x^5) + a/(2*b^3*x^4) - a^2/(b^4*x^3) + (2*a^3)/(b^5*x^2
) - (5*a^4)/(b^6*x) - a^5/(b^6*(b + a*x)) - (6*a^5*Log[x])/b^7 +
(6*a^5*Log[b + a*x])/b^7
```

Rubi in Sympy [A] time = 19.3307, size = 90, normalized size = 0.96

$$-\frac{a^5}{b^6\,(ax+b)}-\frac{6a^5\log\,(x)}{b^7}+\frac{6a^5\log\,(ax+b)}{b^7}-\frac{5a^4}{b^6x}+\frac{2a^3}{b^5x^2}-\frac{a^2}{b^4x^3}+\frac{a}{2b^3x^4}-\frac{1}{5b^2x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b/x)**2/x**8,x)
```

```
[Out] -a**5/(b**6*(a*x + b)) - 6*a**5*log(x)/b**7 + 6*a**5*log(a*x + b)
/b**7 - 5*a**4/(b**6*x) + 2*a**3/(b**5*x**2) - a**2/(b**4*x**3) +
 a/(2*b**3*x**4) - 1/(5*b**2*x**5)
```

Mathematica [A] time = 0.132826, size = 90, normalized size = 0.96

$$-\frac{-60a^5\log(ax+b)+60a^5\log(x)+\frac{b\left(60a^5x^5+30a^4bx^4-10a^3b^2x^3+5a^2b^3x^2-3ab^4x+2b^5\right)}{x^5(ax+b)}}{10b^7}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b/x)^2*x^8),x]
```

```
[Out] -((b*(2*b^5 - 3*a*b^4*x + 5*a^2*b^3*x^2 - 10*a^3*b^2*x^3 + 30*a^4
*b*x^4 + 60*a^5*x^5))/(x^5*(b + a*x)) + 60*a^5*Log[x] - 60*a^5*Lo
g[b + a*x])/(10*b^7)
```

Maple [A] time = 0.017, size = 91, normalized size = 1.

$$-\frac{1}{5\,b^2x^5}+\frac{a}{2\,b^3x^4}-\frac{a^2}{b^4x^3}+2\,\frac{a^3}{b^5x^2}-5\,\frac{a^4}{b^6x}-\frac{a^5}{b^6\,(ax+b)}-6\,\frac{a^5\ln\,(x)}{b^7}+6\,\frac{a^5\ln\,(ax+b)}{b^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^2/x^8,x)
```

```
[Out] -1/5/b^2/x^5+1/2*a/b^3/x^4-a^2/b^4/x^3+2*a^3/b^5/x^2-5*a^4/b^6/x-
a^5/b^6/(a*x+b)-6*a^5*ln(x)/b^7+6*a^5*ln(a*x+b)/b^7
```

Maxima [A] time = 1.45136, size = 131, normalized size = 1.39

$$-\frac{60\,a^5x^5 + 30\,a^4bx^4 - 10\,a^3b^2x^3 + 5\,a^2b^3x^2 - 3\,ab^4x + 2\,b^5}{10\,(ab^6x^6 + b^7x^5)} + \frac{6\,a^5\log\left(ax+b\right)}{b^7} - \frac{6\,a^5\log\left(x\right)}{b^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^8),x, algorithm="maxima")
```

```
[Out] -1/10*(60*a^5*x^5 + 30*a^4*b*x^4 - 10*a^3*b^2*x^3 + 5*a^2*b^3*x^2
 - 3*a*b^4*x + 2*b^5)/(a*b^6*x^6 + b^7*x^5) + 6*a^5*log(a*x + b)/
b^7 - 6*a^5*log(x)/b^7
```

Fricas [A] time = 0.225915, size = 161, normalized size = 1.71

$$-\frac{60\,a^5bx^5 + 30\,a^4b^2x^4 - 10\,a^3b^3x^3 + 5\,a^2b^4x^2 - 3\,ab^5x + 2\,b^6 - 60\,\left(a^6x^6 + a^5bx^5\right)\log\left(ax+b\right) + 60\,\left(a^6x^6 + a^5bx^5\right)\log\left(x\right)}{10\,(ab^7x^6 + b^8x^5)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^8),x, algorithm="fricas")
```

```
[Out] -1/10*(60*a^5*b*x^5 + 30*a^4*b^2*x^4 - 10*a^3*b^3*x^3 + 5*a^2*b^4
*x^2 - 3*a*b^5*x + 2*b^6 - 60*(a^6*x^6 + a^5*b*x^5)*log(a*x + b)
+ 60*(a^6*x^6 + a^5*b*x^5)*log(x))/(a*b^7*x^6 + b^8*x^5)
```

Sympy [A] time = 2.22792, size = 92, normalized size = 0.98

$$\frac{6a^5\left(-\log\left(x\right) + \log\left(x + \frac{b}{a}\right)\right)}{b^7} - \frac{60a^5x^5 + 30a^4bx^4 - 10a^3b^2x^3 + 5a^2b^3x^2 - 3ab^4x + 2b^5}{10ab^6x^6 + 10b^7x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**2/x**8,x)
```

```
[Out] 6*a**5*(-log(x) + log(x + b/a))/b**7 - (60*a**5*x**5 + 30*a**4*b*
x**4 - 10*a**3*b**2*x**3 + 5*a**2*b**3*x**2 - 3*a*b**4*x + 2*b**5
)/(10*a*b**6*x**6 + 10*b**7*x**5)
```

GIAC/XCAS [A] time = 0.229164, size = 131, normalized size = 1.39

$$\frac{6\,a^5\ln\left(|ax+b|\right)}{b^7} - \frac{6\,a^5\ln\left(|x|\right)}{b^7} - \frac{60\,a^5bx^5 + 30\,a^4b^2x^4 - 10\,a^3b^3x^3 + 5\,a^2b^4x^2 - 3\,ab^5x + 2\,b^6}{10\,(ax+b)b^7x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^8),x, algorithm="giac")
```

```
[Out] 6*a^5*ln(abs(a*x + b))/b^7 - 6*a^5*ln(abs(x))/b^7 - 1/10*(60*a^5*
b*x^5 + 30*a^4*b^2*x^4 - 10*a^3*b^3*x^3 + 5*a^2*b^4*x^2 - 3*a*b^5
*x + 2*b^6)/((a*x + b)*b^7*x^5)
```

3.1631 $\int \frac{x^4}{\left(a+\frac{b}{x}\right)^3} dx$

Optimal. Leaf size=99

$$\frac{b^7}{2a^8(ax+b)^2}-\frac{7b^6}{a^8(ax+b)}-\frac{21b^5\log(ax+b)}{a^8}+\frac{15b^4x}{a^7}-\frac{5b^3x^2}{a^6}+\frac{2b^2x^3}{a^5}-\frac{3bx^4}{4a^4}+\frac{x^5}{5a^3}$$

```
[Out] (15*b^4*x)/a^7 - (5*b^3*x^2)/a^6 + (2*b^2*x^3)/a^5 - (3*b*x^4)/(4
*a^4) + x^5/(5*a^3) + b^7/(2*a^8*(b + a*x)^2) - (7*b^6)/(a^8*(b +
 a*x)) - (21*b^5*Log[b + a*x])/a^8
```

Rubi [A] time = 0.171119, antiderivative size = 99, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$\frac{b^7}{2a^8(ax+b)^2}-\frac{7b^6}{a^8(ax+b)}-\frac{21b^5\log(ax+b)}{a^8}+\frac{15b^4x}{a^7}-\frac{5b^3x^2}{a^6}+\frac{2b^2x^3}{a^5}-\frac{3bx^4}{4a^4}+\frac{x^5}{5a^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a + b/x)^3,x]
```

```
[Out] (15*b^4*x)/a^7 - (5*b^3*x^2)/a^6 + (2*b^2*x^3)/a^5 - (3*b*x^4)/(4
*a^4) + x^5/(5*a^3) + b^7/(2*a^8*(b + a*x)^2) - (7*b^6)/(a^8*(b +
 a*x)) - (21*b^5*Log[b + a*x])/a^8
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{x^5}{5a^3}-\frac{3bx^4}{4a^4}+\frac{2b^2x^3}{a^5}-\frac{10b^3\int x\,dx}{a^6}+\frac{15b^4x}{a^7}+\frac{b^7}{2a^8\left(ax+b\right)^2}-\frac{7b^6}{a^8\left(ax+b\right)}-\frac{21b^5\log\left(ax+b\right)}{a^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(a+b/x)**3,x)
```

```
[Out] x**5/(5*a**3) - 3*b*x**4/(4*a**4) + 2*b**2*x**3/a**5 - 10*b**3*In
tegral(x, x)/a**6 + 15*b**4*x/a**7 + b**7/(2*a**8*(a*x + b)**2) -
 7*b**6/(a**8*(a*x + b)) - 21*b**5*log(a*x + b)/a**8
```

Mathematica [A] time = 0.0953809, size = 85, normalized size = 0.86

$$\frac{4a^5x^5-15a^4bx^4+40a^3b^2x^3-100a^2b^3x^2-\frac{10b^6(14ax+13b)}{(ax+b)^2}-420b^5\log(ax+b)+300ab^4x}{20a^8}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(a + b/x)^3,x]
```

```
[Out] (300*a*b^4*x - 100*a^2*b^3*x^2 + 40*a^3*b^2*x^3 - 15*a^4*b*x^4 +
4*a^5*x^5 - (10*b^6*(13*b + 14*a*x))/(b + a*x)^2 - 420*b^5*Log[b
+ a*x])/(20*a^8)
```

Maple [A] time = 0.012, size = 94, normalized size = 1.

$$15\,\frac{b^4x}{a^7}-5\,\frac{b^3x^2}{a^6}+2\,\frac{b^2x^3}{a^5}-\frac{3\,bx^4}{4\,a^4}+\frac{x^5}{5\,a^3}+\frac{b^7}{2\,a^8\left(ax+b\right)^2}-7\,\frac{b^6}{a^8\left(ax+b\right)}-21\,\frac{b^5\ln\left(ax+b\right)}{a^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(a+b/x)^3,x)
```

```
[Out] 15*b^4*x/a^7-5*b^3*x^2/a^6+2*b^2*x^3/a^5-3/4*b*x^4/a^4+1/5*x^5/a^
3+1/2*b^7/a^8/(a*x+b)^2-7*b^6/a^8/(a*x+b)-21*b^5*ln(a*x+b)/a^8
```

Maxima [A] time = 1.43136, size = 139, normalized size = 1.4

$$-\frac{14\,ab^6x + 13\,b^7}{2\,(a^{10}x^2 + 2\,a^9bx + a^8b^2)} - \frac{21\,b^5\log(ax+b)}{a^8} + \frac{4\,a^4x^5 - 15\,a^3bx^4 + 40\,a^2b^2x^3 - 100\,ab^3x^2 + 300\,b^4x}{20\,a^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(a + b/x)^3,x, algorithm="maxima")
```

```
[Out] -1/2*(14*a*b^6*x + 13*b^7)/(a^10*x^2 + 2*a^9*b*x + a^8*b^2) - 21*
b^5*log(a*x + b)/a^8 + 1/20*(4*a^4*x^5 - 15*a^3*b*x^4 + 40*a^2*b^
2*x^3 - 100*a*b^3*x^2 + 300*b^4*x)/a^7
```

Fricas [A] time = 0.219393, size = 174, normalized size = 1.76

$$\frac{4\,a^7x^7 - 7\,a^6bx^6 + 14\,a^5b^2x^5 - 35\,a^4b^3x^4 + 140\,a^3b^4x^3 + 500\,a^2b^5x^2 + 160\,ab^6x - 130\,b^7 - 420\,(a^2b^5x^2 + 2\,ab^6x + b^7)\log(a}{20\,(a^{10}x^2 + 2\,a^9bx + a^8b^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(a + b/x)^3,x, algorithm="fricas")
```

```
[Out] 1/20*(4*a^7*x^7 - 7*a^6*b*x^6 + 14*a^5*b^2*x^5 - 35*a^4*b^3*x^4 +
 140*a^3*b^4*x^3 + 500*a^2*b^5*x^2 + 160*a*b^6*x - 130*b^7 - 420*
(a^2*b^5*x^2 + 2*a*b^6*x + b^7)*log(a*x + b))/(a^10*x^2 + 2*a^9*b
*x + a^8*b^2)
```

Sympy [A] time = 1.89033, size = 107, normalized size = 1.08

$$-\frac{14ab^6x + 13b^7}{2a^{10}x^2 + 4a^9bx + 2a^8b^2} + \frac{x^5}{5a^3} - \frac{3bx^4}{4a^4} + \frac{2b^2x^3}{a^5} - \frac{5b^3x^2}{a^6} + \frac{15b^4x}{a^7} - \frac{21b^5\log(ax+b)}{a^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(a+b/x)**3,x)
```

```
[Out] -(14*a*b**6*x + 13*b**7)/(2*a**10*x**2 + 4*a**9*b*x + 2*a**8*b**2
) + x**5/(5*a**3) - 3*b*x**4/(4*a**4) + 2*b**2*x**3/a**5 - 5*b**3
*x**2/a**6 + 15*b**4*x/a**7 - 21*b**5*log(a*x + b)/a**8
```

GIAC/XCAS [A] time = 0.223323, size = 128, normalized size = 1.29

$$-\frac{21\,b^5\ln(|ax+b|)}{a^8} - \frac{14\,ab^6x + 13\,b^7}{2\,(ax+b)^2a^8} + \frac{4\,a^{12}x^5 - 15\,a^{11}bx^4 + 40\,a^{10}b^2x^3 - 100\,a^9b^3x^2 + 300\,a^8b^4x}{20\,a^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(a + b/x)^3,x, algorithm="giac")
```

```
[Out] -21*b^5*ln(abs(a*x + b))/a^8 - 1/2*(14*a*b^6*x + 13*b^7)/((a*x +
b)^2*a^8) + 1/20*(4*a^12*x^5 - 15*a^11*b*x^4 + 40*a^10*b^2*x^3 -
100*a^9*b^3*x^2 + 300*a^8*b^4*x)/a^15
```

3.1632 $\int \frac{x^3}{\left(a+\frac{b}{x}\right)^3}\,dx$

Optimal. Leaf size=86

$$-\frac{b^6}{2a^7(ax+b)^2}+\frac{6b^5}{a^7(ax+b)}+\frac{15b^4\log(ax+b)}{a^7}-\frac{10b^3x}{a^6}+\frac{3b^2x^2}{a^5}-\frac{bx^3}{a^4}+\frac{x^4}{4a^3}$$

```
[Out] (-10*b^3*x)/a^6 + (3*b^2*x^2)/a^5 - (b*x^3)/a^4 + x^4/(4*a^3) - b
^6/(2*a^7*(b + a*x)^2) + (6*b^5)/(a^7*(b + a*x)) + (15*b^4*Log[b
+ a*x])/a^7
```

Rubi [A] time = 0.145027, antiderivative size = 86, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{b^6}{2a^7(ax+b)^2}+\frac{6b^5}{a^7(ax+b)}+\frac{15b^4\log(ax+b)}{a^7}-\frac{10b^3x}{a^6}+\frac{3b^2x^2}{a^5}-\frac{bx^3}{a^4}+\frac{x^4}{4a^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(a + b/x)^3,x]
```

```
[Out] (-10*b^3*x)/a^6 + (3*b^2*x^2)/a^5 - (b*x^3)/a^4 + x^4/(4*a^3) - b
^6/(2*a^7*(b + a*x)^2) + (6*b^5)/(a^7*(b + a*x)) + (15*b^4*Log[b
+ a*x])/a^7
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{x^4}{4a^3}-\frac{bx^3}{a^4}+\frac{6b^2\int x\,dx}{a^5}-\frac{10b^3x}{a^6}-\frac{b^6}{2a^7\left(ax+b\right)^2}+\frac{6b^5}{a^7\left(ax+b\right)}+\frac{15b^4\log\left(ax+b\right)}{a^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(a+b/x)**3,x)
```

```
[Out] x**4/(4*a**3) - b*x**3/a**4 + 6*b**2*Integral(x, x)/a**5 - 10*b**
3*x/a**6 - b**6/(2*a**7*(a*x + b)**2) + 6*b**5/(a**7*(a*x + b)) +
 15*b**4*log(a*x + b)/a**7
```

Mathematica [A] time = 0.0900394, size = 73, normalized size = 0.85

$$\frac{a^4x^4-4a^3bx^3+12a^2b^2x^2+\frac{2b^5(12ax+11b)}{(ax+b)^2}+60b^4\log(ax+b)-40ab^3x}{4a^7}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(a + b/x)^3,x]
```

```
[Out] (-40*a*b^3*x + 12*a^2*b^2*x^2 - 4*a^3*b*x^3 + a^4*x^4 + (2*b^5*(1
1*b + 12*a*x))/(b + a*x)^2 + 60*b^4*Log[b + a*x])/(4*a^7)
```

Maple [A] time = 0.012, size = 83, normalized size = 1.

$$-10\,\frac{b^3x}{a^6}+3\,\frac{b^2x^2}{a^5}-\frac{bx^3}{a^4}+\frac{x^4}{4\,a^3}-\frac{b^6}{2\,a^7\left(ax+b\right)^2}+6\,\frac{b^5}{a^7\left(ax+b\right)}+15\,\frac{b^4\ln\left(ax+b\right)}{a^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(a+b/x)^3,x)
```

```
[Out] -10*b^3*x/a^6+3*b^2*x^2/a^5-b*x^3/a^4+1/4*x^4/a^3-1/2*b^6/a^7/(a*
x+b)^2+6*b^5/a^7/(a*x+b)+15*b^4*ln(a*x+b)/a^7
```

Maxima [A] time = 1.46691, size = 123, normalized size = 1.43

$$\frac{12\,ab^5x + 11\,b^6}{2\,(a^9x^2 + 2\,a^8bx + a^7b^2)} + \frac{15\,b^4\log(ax+b)}{a^7} + \frac{a^3x^4 - 4\,a^2bx^3 + 12\,ab^2x^2 - 40\,b^3x}{4\,a^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(a + b/x)^3,x, algorithm="maxima")
```

```
[Out] 1/2*(12*a*b^5*x + 11*b^6)/(a^9*x^2 + 2*a^8*b*x + a^7*b^2) + 15*b^
4*log(a*x + b)/a^7 + 1/4*(a^3*x^4 - 4*a^2*b*x^3 + 12*a*b^2*x^2 -
40*b^3*x)/a^6
```

Fricas [A] time = 0.217278, size = 158, normalized size = 1.84

$$\frac{a^6x^6 - 2\,a^5bx^5 + 5\,a^4b^2x^4 - 20\,a^3b^3x^3 - 68\,a^2b^4x^2 - 16\,ab^5x + 22\,b^6 + 60\left(a^2b^4x^2 + 2\,ab^5x + b^6\right)\log(ax+b)}{4\,(a^9x^2 + 2\,a^8bx + a^7b^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(a + b/x)^3,x, algorithm="fricas")
```

```
[Out] 1/4*(a^6*x^6 - 2*a^5*b*x^5 + 5*a^4*b^2*x^4 - 20*a^3*b^3*x^3 - 68*
a^2*b^4*x^2 - 16*a*b^5*x + 22*b^6 + 60*(a^2*b^4*x^2 + 2*a*b^5*x +
 b^6)*log(a*x + b))/(a^9*x^2 + 2*a^8*b*x + a^7*b^2)
```

Sympy [A] time = 1.82054, size = 92, normalized size = 1.07

$$\frac{12ab^5x + 11b^6}{2a^9x^2 + 4a^8bx + 2a^7b^2} + \frac{x^4}{4a^3} - \frac{bx^3}{a^4} + \frac{3b^2x^2}{a^5} - \frac{10b^3x}{a^6} + \frac{15b^4\log(ax+b)}{a^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(a+b/x)**3,x)
```

```
[Out] (12*a*b**5*x + 11*b**6)/(2*a**9*x**2 + 4*a**8*b*x + 2*a**7*b**2)
+ x**4/(4*a**3) - b*x**3/a**4 + 3*b**2*x**2/a**5 - 10*b**3*x/a**6
 + 15*b**4*log(a*x + b)/a**7
```

GIAC/XCAS [A] time = 0.22425, size = 112, normalized size = 1.3

$$\frac{15\,b^4\ln(|ax+b|)}{a^7} + \frac{12\,ab^5x + 11\,b^6}{2\,(ax+b)^2a^7} + \frac{a^9x^4 - 4\,a^8bx^3 + 12\,a^7b^2x^2 - 40\,a^6b^3x}{4\,a^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(a + b/x)^3,x, algorithm="giac")
```

```
[Out] 15*b^4*ln(abs(a*x + b))/a^7 + 1/2*(12*a*b^5*x + 11*b^6)/((a*x + b
)^2*a^7) + 1/4*(a^9*x^4 - 4*a^8*b*x^3 + 12*a^7*b^2*x^2 - 40*a^6*b
^3*x)/a^12
```

3.1633 $\int \frac{x^2}{\left(a+\frac{b}{x}\right)^3} \, dx$

Optimal. Leaf size=77

$$\frac{b^5}{2a^6(ax+b)^2}-\frac{5b^4}{a^6(ax+b)}-\frac{10b^3\log(ax+b)}{a^6}+\frac{6b^2x}{a^5}-\frac{3bx^2}{2a^4}+\frac{x^3}{3a^3}$$

```
[Out] (6*b^2*x)/a^5 - (3*b*x^2)/(2*a^4) + x^3/(3*a^3) + b^5/(2*a^6*(b +
 a*x)^2) - (5*b^4)/(a^6*(b + a*x)) - (10*b^3*Log[b + a*x])/a^6
```

Rubi [A] time = 0.12168, antiderivative size = 77, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{b^5}{2a^6(ax+b)^2}-\frac{5b^4}{a^6(ax+b)}-\frac{10b^3\log(ax+b)}{a^6}+\frac{6b^2x}{a^5}-\frac{3bx^2}{2a^4}+\frac{x^3}{3a^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b/x)^3,x]
```

```
[Out] (6*b^2*x)/a^5 - (3*b*x^2)/(2*a^4) + x^3/(3*a^3) + b^5/(2*a^6*(b +
 a*x)^2) - (5*b^4)/(a^6*(b + a*x)) - (10*b^3*Log[b + a*x])/a^6
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{x^3}{3a^3}-\frac{3b\int x\,dx}{a^4}+\frac{6b^2x}{a^5}+\frac{b^5}{2a^6\left(ax+b\right)^2}-\frac{5b^4}{a^6\left(ax+b\right)}-\frac{10b^3\log\left(ax+b\right)}{a^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b/x)**3,x)
```

```
[Out] x**3/(3*a**3) - 3*b*Integral(x, x)/a**4 + 6*b**2*x/a**5 + b**5/(2
*a**6*(a*x + b)**2) - 5*b**4/(a**6*(a*x + b)) - 10*b**3*log(a*x +
 b)/a**6
```

Mathematica [A] time = 0.0803045, size = 63, normalized size = 0.82

$$\frac{2a^3x^3-9a^2bx^2-\frac{3b^4(10ax+9b)}{(ax+b)^2}-60b^3\log(ax+b)+36ab^2x}{6a^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a + b/x)^3,x]
```

```
[Out] (36*a*b^2*x - 9*a^2*b*x^2 + 2*a^3*x^3 - (3*b^4*(9*b + 10*a*x))/(b
 + a*x)^2 - 60*b^3*Log[b + a*x])/(6*a^6)
```

Maple [A] time = 0.01, size = 72, normalized size = 0.9

$$6\,{\frac{{b}^{2}x}{{a}^{5}}}-{\frac{3\,b{x}^{2}}{2\,{a}^{4}}}+{\frac{{x}^{3}}{3\,{a}^{3}}}+{\frac{{b}^{5}}{2\,{a}^{6}\left(ax+b\right)^{2}}}-5\,{\frac{{b}^{4}}{{a}^{6}\left(ax+b\right)}}-10\,{\frac{{b}^{3}\ln\left(ax+b\right)}{{a}^{6}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^2/(a+b/x)^3,x)
```

```
[Out] 6*b^2*x/a^5-3/2*b*x^2/a^4+1/3*x^3/a^3+1/2*b^5/a^6/(a*x+b)^2-5*b^4
/a^6/(a*x+b)-10*b^3*ln(a*x+b)/a^6
```

Maxima [A] time = 1.45262, size = 109, normalized size = 1.42

$$-\frac{10\,ab^4x+9\,b^5}{2\,(a^8x^2+2\,a^7bx+a^6b^2)}-\frac{10\,b^3\log(ax+b)}{a^6}+\frac{2\,a^2x^3-9\,abx^2+36\,b^2x}{6\,a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^2/(a + b/x)^3,x, algorithm="maxima")
```

```
[Out] -1/2*(10*a*b^4*x + 9*b^5)/(a^8*x^2 + 2*a^7*b*x + a^6*b^2) - 10*b^
3*log(a*x + b)/a^6 + 1/6*(2*a^2*x^3 - 9*a*b*x^2 + 36*b^2*x)/a^5
```

Fricas [A] time = 0.218979, size = 144, normalized size = 1.87

$$\frac{2\,a^5x^5-5\,a^4bx^4+20\,a^3b^2x^3+63\,a^2b^3x^2+6\,ab^4x-27\,b^5-60\left(a^2b^3x^2+2\,ab^4x+b^5\right)\log(ax+b)}{6\,(a^8x^2+2\,a^7bx+a^6b^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^2/(a + b/x)^3,x, algorithm="fricas")
```

```
[Out] 1/6*(2*a^5*x^5 - 5*a^4*b*x^4 + 20*a^3*b^2*x^3 + 63*a^2*b^3*x^2 +
6*a*b^4*x - 27*b^5 - 60*(a^2*b^3*x^2 + 2*a*b^4*x + b^5)*log(a*x +
 b))/(a^8*x^2 + 2*a^7*b*x + a^6*b^2)
```

Sympy [A] time = 1.74563, size = 83, normalized size = 1.08

$$-\frac{10ab^4x+9b^5}{2a^8x^2+4a^7bx+2a^6b^2}+\frac{x^3}{3a^3}-\frac{3bx^2}{2a^4}+\frac{6b^2x}{a^5}-\frac{10b^3\log(ax+b)}{a^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**2/(a+b/x)**3,x)
```

```
[Out] -(10*a*b**4*x + 9*b**5)/(2*a**8*x**2 + 4*a**7*b*x + 2*a**6*b**2)
+ x**3/(3*a**3) - 3*b*x**2/(2*a**4) + 6*b**2*x/a**5 - 10*b**3*log
(a*x + b)/a**6
```

GIAC/XCAS [A] time = 0.229542, size = 99, normalized size = 1.29

$$-\frac{10\,b^3\ln(|ax+b|)}{a^6}-\frac{10\,ab^4x+9\,b^5}{2\,(ax+b)^2a^6}+\frac{2\,a^6x^3-9\,a^5bx^2+36\,a^4b^2x}{6\,a^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^2/(a + b/x)^3,x, algorithm="giac")
```

```
[Out] -10*b^3*ln(abs(a*x + b))/a^6 - 1/2*(10*a*b^4*x + 9*b^5)/((a*x + b
)^2*a^6) + 1/6*(2*a^6*x^3 - 9*a^5*b*x^2 + 36*a^4*b^2*x)/a^9
```

3.1634 $\int \frac{x}{\left(a+\frac{b}{x}\right)^3} dx$

Optimal. Leaf size=64

$$-\frac{b^4}{2a^5(ax+b)^2}+\frac{4b^3}{a^5(ax+b)}+\frac{6b^2\log(ax+b)}{a^5}-\frac{3bx}{a^4}+\frac{x^2}{2a^3}$$

```
[Out] (-3*b*x)/a^4 + x^2/(2*a^3) - b^4/(2*a^5*(b + a*x)^2) + (4*b^3)/(a
^5*(b + a*x)) + (6*b^2*Log[b + a*x])/a^5
```

Rubi [A] time = 0.0976534, antiderivative size = 64, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$

$$-\frac{b^4}{2a^5(ax+b)^2}+\frac{4b^3}{a^5(ax+b)}+\frac{6b^2\log(ax+b)}{a^5}-\frac{3bx}{a^4}+\frac{x^2}{2a^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b/x)^3,x]
```

```
[Out] (-3*b*x)/a^4 + x^2/(2*a^3) - b^4/(2*a^5*(b + a*x)^2) + (4*b^3)/(a
^5*(b + a*x)) + (6*b^2*Log[b + a*x])/a^5
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int x\,dx}{a^3}-\frac{3bx}{a^4}-\frac{b^4}{2a^5\left(ax+b\right)^2}+\frac{4b^3}{a^5\left(ax+b\right)}+\frac{6b^2\log\left(ax+b\right)}{a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b/x)**3,x)
```

```
[Out] Integral(x, x)/a**3 - 3*b*x/a**4 - b**4/(2*a**5*(a*x + b)**2) + 4
*b**3/(a**5*(a*x + b)) + 6*b**2*log(a*x + b)/a**5
```

Mathematica [A] time = 0.0699416, size = 50, normalized size = 0.78

$$\frac{a^2x^2+\frac{b^3(8ax+7b)}{(ax+b)^2}+12b^2\log(ax+b)-6abx}{2a^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b/x)^3,x]
```

```
[Out] (-6*a*b*x + a^2*x^2 + (b^3*(7*b + 8*a*x))/(b + a*x)^2 + 12*b^2*Lo
g[b + a*x])/(2*a^5)
```

Maple [A] time = 0.012, size = 61, normalized size = 1.

$$-3\,\frac{bx}{a^4}+\frac{x^2}{2\,a^3}-\frac{b^4}{2\,a^5\left(ax+b\right)^2}+4\,\frac{b^3}{a^5\left(ax+b\right)}+6\,\frac{b^2\ln\left(ax+b\right)}{a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+b/x)^3,x)
```

```
[Out] -3*b*x/a^4+1/2*x^2/a^3-1/2*b^4/a^5/(a*x+b)^2+4*b^3/a^5/(a*x+b)+6*
b^2*ln(a*x+b)/a^5
```

Maxima [A] time = 1.42666, size = 93, normalized size = 1.45

$$\frac{8\,ab^3x + 7\,b^4}{2\,(a^7x^2 + 2\,a^6bx + a^5b^2)} + \frac{6\,b^2\log(ax + b)}{a^5} + \frac{ax^2 - 6\,bx}{2\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x)^3,x, algorithm="maxima")
```

```
[Out] 1/2*(8*a*b^3*x + 7*b^4)/(a^7*x^2 + 2*a^6*b*x + a^5*b^2) + 6*b^2*l
og(a*x + b)/a^5 + 1/2*(a*x^2 - 6*b*x)/a^4
```

Fricas [A] time = 0.219376, size = 128, normalized size = 2.

$$\frac{a^4x^4 - 4\,a^3bx^3 - 11\,a^2b^2x^2 + 2\,ab^3x + 7\,b^4 + 12\,\left(a^2b^2x^2 + 2\,ab^3x + b^4\right)\log(ax + b)}{2\,(a^7x^2 + 2\,a^6bx + a^5b^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x)^3,x, algorithm="fricas")
```

```
[Out] 1/2*(a^4*x^4 - 4*a^3*b*x^3 - 11*a^2*b^2*x^2 + 2*a*b^3*x + 7*b^4 +
 12*(a^2*b^2*x^2 + 2*a*b^3*x + b^4)*log(a*x + b))/(a^7*x^2 + 2*a^
6*b*x + a^5*b^2)
```

Sympy [A] time = 1.70256, size = 70, normalized size = 1.09

$$\frac{8ab^3x + 7b^4}{2a^7x^2 + 4a^6bx + 2a^5b^2} + \frac{x^2}{2a^3} - \frac{3bx}{a^4} + \frac{6b^2\log(ax + b)}{a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b/x)**3,x)
```

```
[Out] (8*a*b**3*x + 7*b**4)/(2*a**7*x**2 + 4*a**6*b*x + 2*a**5*b**2) +
x**2/(2*a**3) - 3*b*x/a**4 + 6*b**2*log(a*x + b)/a**5
```

GIAC/XCAS [A] time = 0.227524, size = 82, normalized size = 1.28

$$\frac{6\,b^2\ln(|ax + b|)}{a^5} + \frac{a^3x^2 - 6\,a^2bx}{2\,a^6} + \frac{8\,ab^3x + 7\,b^4}{2\,(ax + b)^2a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x)^3,x, algorithm="giac")
```

```
[Out] 6*b^2*ln(abs(a*x + b))/a^5 + 1/2*(a^3*x^2 - 6*a^2*b*x)/a^6 + 1/2*
(8*a*b^3*x + 7*b^4)/((a*x + b)^2*a^5)
```

3.1635 $\int \frac{1}{\left(a+\frac{b}{x}\right)^3} dx$

Optimal. Leaf size=53

$$-\frac{3b\log(ax+b)}{a^4}+\frac{3x}{a^3}-\frac{3x}{2a^2\left(a+\frac{b}{x}\right)}-\frac{x}{2a\left(a+\frac{b}{x}\right)^2}$$

```
[Out] (3*x)/a^3 - x/(2*a*(a + b/x)^2) - (3*x)/(2*a^2*(a + b/x)) - (3*b*
Log[b + a*x])/a^4
```

Rubi [A] time = 0.056438, antiderivative size = 53, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 3, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$

$$-\frac{3b\log(ax+b)}{a^4}+\frac{3x}{a^3}-\frac{3x}{2a^2\left(a+\frac{b}{x}\right)}-\frac{x}{2a\left(a+\frac{b}{x}\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(-3),x]
```

```
[Out] (3*x)/a^3 - x/(2*a*(a + b/x)^2) - (3*x)/(2*a^2*(a + b/x)) - (3*b*
Log[b + a*x])/a^4
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{x}{2a\left(a+\frac{b}{x}\right)^2}-\frac{3x}{2a^2\left(a+\frac{b}{x}\right)}+\frac{3\int \frac{1}{a}\,dx}{a^2}-\frac{3b\log(ax+b)}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**3,x)
```

```
[Out] -x/(2*a*(a + b/x)**2) - 3*x/(2*a**2*(a + b/x)) + 3*Integral(1/a,
x)/a**2 - 3*b*log(a*x + b)/a**4
```

Mathematica [A] time = 0.0730867, size = 40, normalized size = 0.75

$$-\frac{\frac{b^2(6ax+5b)}{(ax+b)^2}+6b\log(ax+b)-2ax}{2a^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(-3),x]
```

```
[Out] -(-2*a*x + (b^2*(5*b + 6*a*x))/(b + a*x)^2 + 6*b*Log[b + a*x])/(2
*a^4)
```

Maple [A] time = 0.01, size = 49, normalized size = 0.9

$$\frac{x}{a^3}-3\frac{b^2}{(ax+b)a^4}+\frac{b^3}{2(ax+b)^2a^4}-3\frac{b\ln(ax+b)}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^3,x)
```

```
[Out] x/a^3-3*b^2/(a*x+b)/a^4+1/2*b^3/(a*x+b)^2/a^4-3*b*ln(a*x+b)/a^4
```

Maxima [A] time = 1.42613, size = 77, normalized size = 1.45

$$-\frac{6\,ab^2x+5\,b^3}{2\,(a^6x^2+2\,a^5bx+a^4b^2)}+\frac{x}{a^3}-\frac{3\,b\log\left(ax+b\right)}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(-3),x, algorithm="maxima")
```

```
[Out] -1/2*(6*a*b^2*x + 5*b^3)/(a^6*x^2 + 2*a^5*b*x + a^4*b^2) + x/a^3
- 3*b*log(a*x + b)/a^4
```

Fricas [A] time = 0.218106, size = 112, normalized size = 2.11

$$\frac{2\,a^3x^3+4\,a^2bx^2-4\,ab^2x-5\,b^3-6\,\left(a^2bx^2+2\,ab^2x+b^3\right)\log\left(ax+b\right)}{2\,(a^6x^2+2\,a^5bx+a^4b^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(-3),x, algorithm="fricas")
```

```
[Out] 1/2*(2*a^3*x^3 + 4*a^2*b*x^2 - 4*a*b^2*x - 5*b^3 - 6*(a^2*b*x^2 +
 2*a*b^2*x + b^3)*log(a*x + b))/(a^6*x^2 + 2*a^5*b*x + a^4*b^2)
```

Sympy [A] time = 1.60726, size = 56, normalized size = 1.06

$$-\frac{6ab^2x+5b^3}{2a^6x^2+4a^5bx+2a^4b^2}+\frac{x}{a^3}-\frac{3b\log\left(ax+b\right)}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**3,x)
```

```
[Out] -(6*a*b**2*x + 5*b**3)/(2*a**6*x**2 + 4*a**5*b*x + 2*a**4*b**2) +
 x/a**3 - 3*b*log(a*x + b)/a**4
```

GIAC/XCAS [A] time = 0.224001, size = 59, normalized size = 1.11

$$\frac{x}{a^3}-\frac{3\,b\ln\left(|ax+b|\right)}{a^4}-\frac{6\,ab^2x+5\,b^3}{2\,(ax+b)^2a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(-3),x, algorithm="giac")
```

```
[Out] x/a^3 - 3*b*ln(abs(a*x + b))/a^4 - 1/2*(6*a*b^2*x + 5*b^3)/((a*x
+ b)^2*a^4)
```

3.1636 $\int \frac{1}{\left(a+\frac{b}{x}\right)^3 x} dx$

Optimal. Leaf size=41

$$-\frac{b^2}{2a^3(ax+b)^2}+\frac{2b}{a^3(ax+b)}+\frac{\log(ax+b)}{a^3}$$

```
[Out] -b^2/(2*a^3*(b + a*x)^2) + (2*b)/(a^3*(b + a*x)) + Log[b + a*x]/a
^3
```

Rubi [A] time = 0.0636248, antiderivative size = 41, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{b^2}{2a^3(ax+b)^2}+\frac{2b}{a^3(ax+b)}+\frac{\log(ax+b)}{a^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^3*x),x]
```

```
[Out] -b^2/(2*a^3*(b + a*x)^2) + (2*b)/(a^3*(b + a*x)) + Log[b + a*x]/a
^3
```

Rubi in Sympy [A] time = 11.0221, size = 36, normalized size = 0.88

$$-\frac{b^2}{2a^3\left(ax+b\right)^2}+\frac{2b}{a^3\left(ax+b\right)}+\frac{\log\left(ax+b\right)}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**3/x,x)
```

```
[Out] -b**2/(2*a**3*(a*x + b)**2) + 2*b/(a**3*(a*x + b)) + log(a*x + b)
/a**3
```

Mathematica [A] time = 0.0243065, size = 33, normalized size = 0.8

$$\frac{\frac{b(4ax+3b)}{(ax+b)^2}+2\log(ax+b)}{2a^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^3*x),x]
```

```
[Out] ((b*(3*b + 4*a*x))/(b + a*x)^2 + 2*Log[b + a*x])/(2*a^3)
```

Maple [A] time = 0.009, size = 40, normalized size = 1.

$$-\frac{b^2}{2\,a^3\left(ax+b\right)^2}+2\,\frac{b}{a^3\left(ax+b\right)}+\frac{\ln\left(ax+b\right)}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^3/x,x)
```

```
[Out] -1/2*b^2/a^3/(a*x+b)^2+2*b/a^3/(a*x+b)+ln(a*x+b)/a^3
```

Maxima [A] time = 1.42349, size = 65, normalized size = 1.59

$$\frac{4\,abx+3\,b^2}{2\,(a^5x^2+2\,a^4bx+a^3b^2)}+\frac{\log{(ax+b)}}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x),x, algorithm="maxima")
```

```
[Out] 1/2*(4*a*b*x + 3*b^2)/(a^5*x^2 + 2*a^4*b*x + a^3*b^2) + log(a*x +
 b)/a^3
```

Fricas [A] time = 0.223915, size = 82, normalized size = 2.

$$\frac{4\,abx+3\,b^2+2\,\left(a^2x^2+2\,abx+b^2\right)\log{(ax+b)}}{2\,(a^5x^2+2\,a^4bx+a^3b^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x),x, algorithm="fricas")
```

```
[Out] 1/2*(4*a*b*x + 3*b^2 + 2*(a^2*x^2 + 2*a*b*x + b^2)*log(a*x + b))/
(a^5*x^2 + 2*a^4*b*x + a^3*b^2)
```

Sympy [A] time = 1.39151, size = 46, normalized size = 1.12

$$\frac{4abx+3b^2}{2a^5x^2+4a^4bx+2a^3b^2}+\frac{\log{(ax+b)}}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**3/x,x)
```

```
[Out] (4*a*b*x + 3*b**2)/(2*a**5*x**2 + 4*a**4*b*x + 2*a**3*b**2) + log
(a*x + b)/a**3
```

GIAC/XCAS [A] time = 0.224712, size = 50, normalized size = 1.22

$$\frac{\ln{(|ax+b|)}}{a^3}+\frac{4\,bx+\frac{3\,b^2}{a}}{2\,(ax+b)^2a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x),x, algorithm="giac")
```

```
[Out] ln(abs(a*x + b))/a^3 + 1/2*(4*b*x + 3*b^2/a)/((a*x + b)^2*a^2)
```

3.1637 $\int \frac{1}{\left(a+\frac{b}{x}\right)^3 x^2} dx$

Optimal. Leaf size=16

$$\frac{1}{2b\left(a+\frac{b}{x}\right)^2}$$

```
[Out] 1/(2*b*(a + b/x)^2)
```

Rubi [A] time = 0.0166769, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{1}{2b\left(a+\frac{b}{x}\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^3*x^2),x]

[Out] 1/(2*b*(a + b/x)^2)
```

Rubi in Sympy [A] time = 2.20282, size = 10, normalized size = 0.62

$$\frac{1}{2b\left(a+\frac{b}{x}\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**3/x**2,x)

[Out] 1/(2*b*(a + b/x)**2)
```

Mathematica [A] time = 0.00955149, size = 20, normalized size = 1.25

$$-\frac{2ax+b}{2a^2(ax+b)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^3*x^2),x]

[Out] -(b + 2*a*x)/(2*a^2*(b + a*x)^2)
```

Maple [A] time = 0.007, size = 27, normalized size = 1.7

$$-\frac{1}{(ax+b)a^2}+\frac{b}{2a^2(ax+b)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^3/x^2,x)
```

```
[Out] -1/(a*x+b)/a^2+1/2*b/a^2/(a*x+b)^2
```

Maxima [A] time = 1.41585, size = 19, normalized size = 1.19

$$\frac{1}{2\left(a+\frac{b}{x}\right)^2 b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^2),x, algorithm="maxima")
```

```
[Out] 1/2/((a + b/x)^2*b)
```

Fricas [A] time = 0.215087, size = 43, normalized size = 2.69

$$-\frac{2\,ax+b}{2\,(a^4x^2+2\,a^3bx+a^2b^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^2),x, algorithm="fricas")
```

```
[Out] -1/2*(2*a*x + b)/(a^4*x^2 + 2*a^3*b*x + a^2*b^2)
```

Sympy [A] time = 1.36549, size = 32, normalized size = 2.

$$-\frac{2ax+b}{2a^4x^2+4a^3bx+2a^2b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**3/x**2,x)
```

```
[Out] -(2*a*x + b)/(2*a**4*x**2 + 4*a**3*b*x + 2*a**2*b**2)
```

GIAC/XCAS [A] time = 0.226367, size = 19, normalized size = 1.19

$$\frac{1}{2\left(a+\frac{b}{x}\right)^2 b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^2),x, algorithm="giac")
```

```
[Out] 1/2/((a + b/x)^2*b)
```

3.1638 $\int \frac{1}{\left(a+\frac{b}{x}\right)^3 x^3} dx$

Optimal. Leaf size=14

$$-\frac{1}{2a(ax+b)^2}$$

```
[Out] -1/(2*a*(b + a*x)^2)
```

Rubi [A] time = 0.0168068, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$-\frac{1}{2a(ax+b)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^3*x^3),x]
```

```
[Out] -1/(2*a*(b + a*x)^2)
```

Rubi in Sympy [A] time = 2.90826, size = 12, normalized size = 0.86

$$-\frac{1}{2a\left(ax+b\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**3/x**3,x)
```

```
[Out] -1/(2*a*(a*x + b)**2)
```

Mathematica [A] time = 0.00473479, size = 14, normalized size = 1.

$$-\frac{1}{2a(ax+b)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^3*x^3),x]
```

```
[Out] -1/(2*a*(b + a*x)^2)
```

Maple [A] time = 0.003, size = 13, normalized size = 0.9

$$-\frac{1}{2\,a\left(ax+b\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^3/x^3,x)
```

```
[Out] -1/2/a/(a*x+b)^2
```

Maxima [A] time = 1.44497, size = 32, normalized size = 2.29

$$-\frac{1}{2\left(a^{3}x^{2}+2\,a^{2}bx+ab^{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^3),x, algorithm="maxima")

[Out] -1/2/(a^3*x^2 + 2*a^2*b*x + a*b^2)
```

Fricas [A] time = 0.214101, size = 32, normalized size = 2.29

$$-\frac{1}{2\left(a^{3}x^{2}+2\,a^{2}bx+ab^{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^3),x, algorithm="fricas")

[Out] -1/2/(a^3*x^2 + 2*a^2*b*x + a*b^2)
```

Sympy [A] time = 1.30955, size = 26, normalized size = 1.86

$$-\frac{1}{2a^{3}x^{2}+4a^{2}bx+2ab^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**3/x**3,x)

[Out] -1/(2*a**3*x**2 + 4*a**2*b*x + 2*a*b**2)
```

GIAC/XCAS [A] time = 0.227487, size = 16, normalized size = 1.14

$$-\frac{1}{2\left(ax+b\right)^{2}a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^3),x, algorithm="giac")

[Out] -1/2/((a*x + b)^2*a)
```

3.1639 $\int \frac{1}{\left(a+\frac{b}{x}\right)^3 x^4} dx$

Optimal. Leaf size=43

$$-\frac{\log(ax+b)}{b^3}+\frac{1}{b^2(ax+b)}+\frac{1}{2b(ax+b)^2}+\frac{\log(x)}{b^3}$$

```
[Out] 1/(2*b*(b + a*x)^2) + 1/(b^2*(b + a*x)) + Log[x]/b^3 - Log[b + a*
x]/b^3
```

Rubi [A] time = 0.0645575, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{\log(ax+b)}{b^3}+\frac{1}{b^2(ax+b)}+\frac{1}{2b(ax+b)^2}+\frac{\log(x)}{b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^3*x^4),x]
```

```
[Out] 1/(2*b*(b + a*x)^2) + 1/(b^2*(b + a*x)) + Log[x]/b^3 - Log[b + a*
x]/b^3
```

Rubi in Sympy [A] time = 10.4382, size = 37, normalized size = 0.86

$$\frac{1}{2b\left(ax+b\right)^2}+\frac{1}{b^2\left(ax+b\right)}+\frac{\log\left(x\right)}{b^3}-\frac{\log\left(ax+b\right)}{b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**3/x**4,x)
```

```
[Out] 1/(2*b*(a*x + b)**2) + 1/(b**2*(a*x + b)) + log(x)/b**3 - log(a*x
 + b)/b**3
```

Mathematica [A] time = 0.0518987, size = 37, normalized size = 0.86

$$\frac{\frac{b(2ax+3b)}{(ax+b)^2}-2\log(ax+b)+2\log(x)}{2b^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^3*x^4),x]
```

```
[Out] ((b*(3*b + 2*a*x))/(b + a*x)^2 + 2*Log[x] - 2*Log[b + a*x])/(2*b^
3)
```

Maple [A] time = 0.011, size = 42, normalized size = 1.

$$\frac{1}{2\,b\left(ax+b\right)^2}+\frac{1}{b^2\left(ax+b\right)}+\frac{\ln\left(x\right)}{b^3}-\frac{\ln\left(ax+b\right)}{b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^3/x^4,x)
```

```
[Out] 1/2/b/(a*x+b)^2+1/b^2/(a*x+b)+ln(x)/b^3-ln(a*x+b)/b^3
```

Maxima [A] time = 1.43333, size = 69, normalized size = 1.6

$$\frac{2\,ax+3\,b}{2\,\left(a^{2}b^{2}x^{2}+2\,ab^{3}x+b^{4}\right)}-\frac{\log\left(ax+b\right)}{b^{3}}+\frac{\log\left(x\right)}{b^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^4),x, algorithm="maxima")
```

```
[Out] 1/2*(2*a*x + 3*b)/(a^2*b^2*x^2 + 2*a*b^3*x + b^4) - log(a*x + b)/
b^3 + log(x)/b^3
```

Fricas [A] time = 0.233208, size = 108, normalized size = 2.51

$$\frac{2\,abx+3\,b^{2}-2\,\left(a^{2}x^{2}+2\,abx+b^{2}\right)\log\left(ax+b\right)+2\,\left(a^{2}x^{2}+2\,abx+b^{2}\right)\log\left(x\right)}{2\,\left(a^{2}b^{3}x^{2}+2\,ab^{4}x+b^{5}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^4),x, algorithm="fricas")
```

```
[Out] 1/2*(2*a*b*x + 3*b^2 - 2*(a^2*x^2 + 2*a*b*x + b^2)*log(a*x + b) +
 2*(a^2*x^2 + 2*a*b*x + b^2)*log(x))/(a^2*b^3*x^2 + 2*a*b^4*x + b
^5)
```

Sympy [A] time = 1.70518, size = 46, normalized size = 1.07

$$\frac{2ax+3b}{2a^{2}b^{2}x^{2}+4ab^{3}x+2b^{4}}+\frac{\log\left(x\right)-\log\left(x+\frac{b}{a}\right)}{b^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**3/x**4,x)
```

```
[Out] (2*a*x + 3*b)/(2*a**2*b**2*x**2 + 4*a*b**3*x + 2*b**4) + (log(x)
- log(x + b/a))/b**3
```

GIAC/XCAS [A] time = 0.235995, size = 58, normalized size = 1.35

$$-\frac{\ln\left(|ax+b|\right)}{b^{3}}+\frac{\ln\left(|x|\right)}{b^{3}}+\frac{2\,abx+3\,b^{2}}{2\,\left(ax+b\right)^{2}b^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^4),x, algorithm="giac")
```

```
[Out] -ln(abs(a*x + b))/b^3 + ln(abs(x))/b^3 + 1/2*(2*a*b*x + 3*b^2)/((
a*x + b)^2*b^3)
```

3.1640 $\int \frac{1}{\left(a+\frac{b}{x}\right)^3 x^5} \, dx$

Optimal. Leaf size=57

$$-\frac{3a\log(x)}{b^4}+\frac{3a\log(ax+b)}{b^4}-\frac{2a}{b^3(ax+b)}-\frac{a}{2b^2(ax+b)^2}-\frac{1}{b^3x}$$

```
[Out] -(1/(b^3*x)) - a/(2*b^2*(b + a*x)^2) - (2*a)/(b^3*(b + a*x)) - (3
*a*Log[x])/b^4 + (3*a*Log[b + a*x])/b^4
```

Rubi [A] time = 0.0847683, antiderivative size = 57, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{3a\log(x)}{b^4}+\frac{3a\log(ax+b)}{b^4}-\frac{2a}{b^3(ax+b)}-\frac{a}{2b^2(ax+b)^2}-\frac{1}{b^3x}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b/x)^3*x^5),x]
```

```
[Out] -(1/(b^3*x)) - a/(2*b^2*(b + a*x)^2) - (2*a)/(b^3*(b + a*x)) - (3
*a*Log[x])/b^4 + (3*a*Log[b + a*x])/b^4
```

Rubi in Sympy [A] time = 12.8024, size = 54, normalized size = 0.95

$$-\frac{a}{2b^2\left(ax+b\right)^2}-\frac{2a}{b^3\left(ax+b\right)}-\frac{3a\log\left(x\right)}{b^4}+\frac{3a\log\left(ax+b\right)}{b^4}-\frac{1}{b^3x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b/x)**3/x**5,x)
```

```
[Out] -a/(2*b**2*(a*x + b)**2) - 2*a/(b**3*(a*x + b)) - 3*a*log(x)/b**4
 + 3*a*log(a*x + b)/b**4 - 1/(b**3*x)
```

Mathematica [A] time = 0.0911174, size = 53, normalized size = 0.93

$$-\frac{\frac{b\left(6a^2x^2+9abx+2b^2\right)}{x(ax+b)^2}-6a\log(ax+b)+6a\log(x)}{2b^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b/x)^3*x^5),x]
```

```
[Out] -((b*(2*b^2 + 9*a*b*x + 6*a^2*x^2))/(x*(b + a*x)^2) + 6*a*Log[x]
- 6*a*Log[b + a*x])/(2*b^4)
```

Maple [A] time = 0.016, size = 56, normalized size = 1.

$$-\frac{1}{b^3x}-\frac{a}{2\,b^2\left(ax+b\right)^2}-2\,\frac{a}{b^3\left(ax+b\right)}-3\,\frac{a\ln\left(x\right)}{b^4}+3\,\frac{a\ln\left(ax+b\right)}{b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^3/x^5,x)
```

```
[Out] -1/b^3/x-1/2*a/b^2/(a*x+b)^2-2*a/b^3/(a*x+b)-3*a*ln(x)/b^4+3*a*ln
(a*x+b)/b^4
```

Maxima [A] time = 1.43135, size = 93, normalized size = 1.63

$$-\frac{6\,a^2x^2+9\,abx+2\,b^2}{2\,(a^2b^3x^3+2\,ab^4x^2+b^5x)}+\frac{3\,a\log(ax+b)}{b^4}-\frac{3\,a\log(x)}{b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^5),x, algorithm="maxima")
```

```
[Out] -1/2*(6*a^2*x^2 + 9*a*b*x + 2*b^2)/(a^2*b^3*x^3 + 2*a*b^4*x^2 + b
^5*x) + 3*a*log(a*x + b)/b^4 - 3*a*log(x)/b^4
```

Fricas [A] time = 0.231205, size = 147, normalized size = 2.58

$$-\frac{6\,a^2bx^2+9\,ab^2x+2\,b^3-6\,\left(a^3x^3+2\,a^2bx^2+ab^2x\right)\log(ax+b)+6\,\left(a^3x^3+2\,a^2bx^2+ab^2x\right)\log(x)}{2\,(a^2b^4x^3+2\,ab^5x^2+b^6x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^5),x, algorithm="fricas")
```

```
[Out] -1/2*(6*a^2*b*x^2 + 9*a*b^2*x + 2*b^3 - 6*(a^3*x^3 + 2*a^2*b*x^2
+ a*b^2*x)*log(a*x + b) + 6*(a^3*x^3 + 2*a^2*b*x^2 + a*b^2*x)*log
(x))/(a^2*b^4*x^3 + 2*a*b^5*x^2 + b^6*x)
```

Sympy [A] time = 1.94664, size = 65, normalized size = 1.14

$$\frac{3a\left(-\log(x)+\log\left(x+\frac{b}{a}\right)\right)}{b^4}-\frac{6a^2x^2+9abx+2b^2}{2a^2b^3x^3+4ab^4x^2+2b^5x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**3/x**5,x)
```

```
[Out] 3*a*(-log(x) + log(x + b/a))/b**4 - (6*a**2*x**2 + 9*a*b*x + 2*b*
*2)/(2*a**2*b**3*x**3 + 4*a*b**4*x**2 + 2*b**5*x)
```

GIAC/XCAS [A] time = 0.226337, size = 81, normalized size = 1.42

$$\frac{3\,a\ln(|ax+b|)}{b^4}-\frac{3\,a\ln(|x|)}{b^4}-\frac{6\,a^2bx^2+9\,ab^2x+2\,b^3}{2\,(ax+b)^2b^4x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^5),x, algorithm="giac")
```

```
[Out] 3*a*ln(abs(a*x + b))/b^4 - 3*a*ln(abs(x))/b^4 - 1/2*(6*a^2*b*x^2
+ 9*a*b^2*x + 2*b^3)/((a*x + b)^2*b^4*x)
```

3.1641 $\int \frac{1}{\left(a+\frac{b}{x}\right)^3 x^6} dx$

Optimal. Leaf size=76

$$\frac{6a^2\log(x)}{b^5} - \frac{6a^2\log(ax+b)}{b^5} + \frac{3a^2}{b^4(ax+b)} + \frac{a^2}{2b^3(ax+b)^2} + \frac{3a}{b^4x} - \frac{1}{2b^3x^2}$$

```
[Out] -1/(2*b^3*x^2) + (3*a)/(b^4*x) + a^2/(2*b^3*(b + a*x)^2) + (3*a^2
)/(b^4*(b + a*x)) + (6*a^2*Log[x])/b^5 - (6*a^2*Log[b + a*x])/b^5
```

Rubi [A] time = 0.109722, antiderivative size = 76, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$\frac{6a^2\log(x)}{b^5} - \frac{6a^2\log(ax+b)}{b^5} + \frac{3a^2}{b^4(ax+b)} + \frac{a^2}{2b^3(ax+b)^2} + \frac{3a}{b^4x} - \frac{1}{2b^3x^2}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b/x)^3*x^6),x]
```

```
[Out] -1/(2*b^3*x^2) + (3*a)/(b^4*x) + a^2/(2*b^3*(b + a*x)^2) + (3*a^2
)/(b^4*(b + a*x)) + (6*a^2*Log[x])/b^5 - (6*a^2*Log[b + a*x])/b^5
```

Rubi in Sympy [A] time = 16.4262, size = 73, normalized size = 0.96

$$\frac{a^2}{2b^3(ax+b)^2} + \frac{3a^2}{b^4(ax+b)} + \frac{6a^2\log(x)}{b^5} - \frac{6a^2\log(ax+b)}{b^5} + \frac{3a}{b^4x} - \frac{1}{2b^3x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b/x)**3/x**6,x)
```

```
[Out] a**2/(2*b**3*(a*x + b)**2) + 3*a**2/(b**4*(a*x + b)) + 6*a**2*log
(x)/b**5 - 6*a**2*log(a*x + b)/b**5 + 3*a/(b**4*x) - 1/(2*b**3*x*
*2)
```

Mathematica [A] time = 0.104586, size = 68, normalized size = 0.89

$$\frac{-12a^2\log(ax+b) + 12a^2\log(x) + \frac{b(12a^3x^3+18a^2bx^2+4ab^2x-b^3)}{x^2(ax+b)^2}}{2b^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b/x)^3*x^6),x]
```

```
[Out] ((b*(-b^3 + 4*a*b^2*x + 18*a^2*b*x^2 + 12*a^3*x^3))/(x^2*(b + a*x
)^2) + 12*a^2*Log[x] - 12*a^2*Log[b + a*x])/(2*b^5)
```

Maple [A] time = 0.016, size = 73, normalized size = 1.

$$-\frac{1}{2\,b^3x^2} + 3\,\frac{a}{b^4x} + \frac{a^2}{2\,b^3\,(ax+b)^2} + 3\,\frac{a^2}{b^4\,(ax+b)} + 6\,\frac{a^2\ln(x)}{b^5} - 6\,\frac{a^2\ln(ax+b)}{b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^3/x^6,x)
```

```
[Out] -1/2/b^3/x^2+3*a/b^4/x+1/2*a^2/b^3/(a*x+b)^2+3*a^2/b^4/(a*x+b)+6*
a^2*ln(x)/b^5-6*a^2*ln(a*x+b)/b^5
```

Maxima [A] time = 1.44425, size = 116, normalized size = 1.53

$$\frac{12\,a^{3}x^{3}+18\,a^{2}bx^{2}+4\,ab^{2}x-b^{3}}{2\,(a^{2}b^{4}x^{4}+2\,ab^{5}x^{3}+b^{6}x^{2})}-\frac{6\,a^{2}\log\left(ax+b\right)}{b^{5}}+\frac{6\,a^{2}\log\left(x\right)}{b^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^6),x, algorithm="maxima")
```

```
[Out] 1/2*(12*a^3*x^3 + 18*a^2*b*x^2 + 4*a*b^2*x - b^3)/(a^2*b^4*x^4 +
2*a*b^5*x^3 + b^6*x^2) - 6*a^2*log(a*x + b)/b^5 + 6*a^2*log(x)/b^
5
```

Fricas [A] time = 0.229501, size = 176, normalized size = 2.32

$$\frac{12\,a^{3}bx^{3}+18\,a^{2}b^{2}x^{2}+4\,ab^{3}x-b^{4}-12\,\left(a^{4}x^{4}+2\,a^{3}bx^{3}+a^{2}b^{2}x^{2}\right)\log\left(ax+b\right)+12\,\left(a^{4}x^{4}+2\,a^{3}bx^{3}+a^{2}b^{2}x^{2}\right)\log\left(x\right)}{2\,(a^{2}b^{5}x^{4}+2\,ab^{6}x^{3}+b^{7}x^{2})}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^6),x, algorithm="fricas")
```

```
[Out] 1/2*(12*a^3*b*x^3 + 18*a^2*b^2*x^2 + 4*a*b^3*x - b^4 - 12*(a^4*x^
4 + 2*a^3*b*x^3 + a^2*b^2*x^2)*log(a*x + b) + 12*(a^4*x^4 + 2*a^3
*b*x^3 + a^2*b^2*x^2)*log(x))/(a^2*b^5*x^4 + 2*a*b^6*x^3 + b^7*x^
2)
```

Sympy [A] time = 2.06232, size = 78, normalized size = 1.03

$$\frac{6a^{2}\left(\log\left(x\right)-\log\left(x+\frac{b}{a}\right)\right)}{b^{5}}+\frac{12a^{3}x^{3}+18a^{2}bx^{2}+4ab^{2}x-b^{3}}{2a^{2}b^{4}x^{4}+4ab^{5}x^{3}+2b^{6}x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**3/x**6,x)
```

```
[Out] 6*a**2*(log(x) - log(x + b/a))/b**5 + (12*a**3*x**3 + 18*a**2*b*x
**2 + 4*a*b**2*x - b**3)/(2*a**2*b**4*x**4 + 4*a*b**5*x**3 + 2*b*
*6*x**2)
```

GIAC/XCAS [A] time = 0.222919, size = 99, normalized size = 1.3

$$-\frac{6\,a^{2}\ln\left(|ax+b|\right)}{b^{5}}+\frac{6\,a^{2}\ln\left(|x|\right)}{b^{5}}+\frac{12\,a^{3}x^{3}+18\,a^{2}bx^{2}+4\,ab^{2}x-b^{3}}{2\,(ax^{2}+bx)^{2}b^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^6),x, algorithm="giac")
```

```
[Out] -6*a^2*ln(abs(a*x + b))/b^5 + 6*a^2*ln(abs(x))/b^5 + 1/2*(12*a^3*
x^3 + 18*a^2*b*x^2 + 4*a*b^2*x - b^3)/((a*x^2 + b*x)^2*b^4)
```

3.1642 $\int \frac{1}{\left(a+\frac{b}{x}\right)^3 x^7} \, dx$

Optimal. Leaf size=89

$$-\frac{10a^3\log(x)}{b^6}+\frac{10a^3\log(ax+b)}{b^6}-\frac{4a^3}{b^5(ax+b)}-\frac{a^3}{2b^4(ax+b)^2}-\frac{6a^2}{b^5x}+\frac{3a}{2b^4x^2}-\frac{1}{3b^3x^3}$$

```
[Out] -1/(3*b^3*x^3) + (3*a)/(2*b^4*x^2) - (6*a^2)/(b^5*x) - a^3/(2*b^4
*(b + a*x)^2) - (4*a^3)/(b^5*(b + a*x)) - (10*a^3*Log[x])/b^6 + (
10*a^3*Log[b + a*x])/b^6
```

Rubi [A] time = 0.128025, antiderivative size = 89, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{10a^3\log(x)}{b^6}+\frac{10a^3\log(ax+b)}{b^6}-\frac{4a^3}{b^5(ax+b)}-\frac{a^3}{2b^4(ax+b)^2}-\frac{6a^2}{b^5x}+\frac{3a}{2b^4x^2}-\frac{1}{3b^3x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^3*x^7),x]
```

```
[Out] -1/(3*b^3*x^3) + (3*a)/(2*b^4*x^2) - (6*a^2)/(b^5*x) - a^3/(2*b^4
*(b + a*x)^2) - (4*a^3)/(b^5*(b + a*x)) - (10*a^3*Log[x])/b^6 + (
10*a^3*Log[b + a*x])/b^6
```

Rubi in Sympy [A] time = 18.8407, size = 87, normalized size = 0.98

$$-\frac{a^3}{2b^4\left(ax+b\right)^2}-\frac{4a^3}{b^5\left(ax+b\right)}-\frac{10a^3\log\left(x\right)}{b^6}+\frac{10a^3\log\left(ax+b\right)}{b^6}-\frac{6a^2}{b^5x}+\frac{3a}{2b^4x^2}-\frac{1}{3b^3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**3/x**7,x)
```

```
[Out] -a**3/(2*b**4*(a*x + b)**2) - 4*a**3/(b**5*(a*x + b)) - 10*a**3*l
og(x)/b**6 + 10*a**3*log(a*x + b)/b**6 - 6*a**2/(b**5*x) + 3*a/(2
*b**4*x**2) - 1/(3*b**3*x**3)
```

Mathematica [A] time = 0.127842, size = 79, normalized size = 0.89

$$-\frac{-60a^3\log(ax+b)+60a^3\log(x)+\frac{b\left(60a^4x^4+90a^3bx^3+20a^2b^2x^2-5ab^3x+2b^4\right)}{x^3(ax+b)^2}}{6b^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^3*x^7),x]
```

```
[Out] -((b*(2*b^4 - 5*a*b^3*x + 20*a^2*b^2*x^2 + 90*a^3*b*x^3 + 60*a^4*
x^4))/(x^3*(b + a*x)^2) + 60*a^3*Log[x] - 60*a^3*Log[b + a*x])/(6
*b^6)
```

Maple [A] time = 0.017, size = 84, normalized size = 0.9

$$-\frac{1}{3\,b^3x^3}+\frac{3\,a}{2\,b^4x^2}-6\,\frac{a^2}{b^5x}-\frac{a^3}{2\,b^4\left(ax+b\right)^2}-4\,\frac{a^3}{b^5\left(ax+b\right)}-10\,\frac{a^3\ln\left(x\right)}{b^6}+10\,\frac{a^3\ln\left(ax+b\right)}{b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/(a+b/x)^3/x^7,x)
```

```
[Out] -1/3/b^3/x^3+3/2*a/b^4/x^2-6*a^2/b^5/x-1/2*a^3/b^4/(a*x+b)^2-4*a^
3/b^5/(a*x+b)-10*a^3*ln(x)/b^6+10*a^3*ln(a*x+b)/b^6
```

Maxima [A] time = 1.44994, size = 131, normalized size = 1.47

$$-\frac{60\,a^4x^4 + 90\,a^3bx^3 + 20\,a^2b^2x^2 - 5\,ab^3x + 2\,b^4}{6\,(a^2b^5x^5 + 2\,ab^6x^4 + b^7x^3)} + \frac{10\,a^3\log(ax+b)}{b^6} - \frac{10\,a^3\log(x)}{b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x)^3*x^7),x, algorithm="maxima")
```

```
[Out] -1/6*(60*a^4*x^4 + 90*a^3*b*x^3 + 20*a^2*b^2*x^2 - 5*a*b^3*x + 2*
b^4)/(a^2*b^5*x^5 + 2*a*b^6*x^4 + b^7*x^3) + 10*a^3*log(a*x + b)/
b^6 - 10*a^3*log(x)/b^6
```

Fricas [A] time = 0.231806, size = 190, normalized size = 2.13

$$-\frac{60\,a^4bx^4 + 90\,a^3b^2x^3 + 20\,a^2b^3x^2 - 5\,ab^4x + 2\,b^5 - 60\,\left(a^5x^5 + 2\,a^4bx^4 + a^3b^2x^3\right)\log(ax+b) + 60\,\left(a^5x^5 + 2\,a^4bx^4 + a^3b^2x\right)}{6\,(a^2b^6x^5 + 2\,ab^7x^4 + b^8x^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x)^3*x^7),x, algorithm="fricas")
```

```
[Out] -1/6*(60*a^4*b*x^4 + 90*a^3*b^2*x^3 + 20*a^2*b^3*x^2 - 5*a*b^4*x
+ 2*b^5 - 60*(a^5*x^5 + 2*a^4*b*x^4 + a^3*b^2*x^3)*log(a*x + b) +
 60*(a^5*x^5 + 2*a^4*b*x^4 + a^3*b^2*x^3)*log(x))/(a^2*b^6*x^5 +
2*a*b^7*x^4 + b^8*x^3)
```

Sympy [A] time = 2.29455, size = 92, normalized size = 1.03

$$\frac{10a^3\left(-\log(x) + \log\left(x + \frac{b}{a}\right)\right)}{b^6} - \frac{60a^4x^4 + 90a^3bx^3 + 20a^2b^2x^2 - 5ab^3x + 2b^4}{6a^2b^5x^5 + 12ab^6x^4 + 6b^7x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(a+b/x)**3/x**7,x)
```

```
[Out] 10*a**3*(-log(x) + log(x + b/a))/b**6 - (60*a**4*x**4 + 90*a**3*b
*x**3 + 20*a**2*b**2*x**2 - 5*a*b**3*x + 2*b**4)/(6*a**2*b**5*x**
5 + 12*a*b**6*x**4 + 6*b**7*x**3)
```

GIAC/XCAS [A] time = 0.228485, size = 116, normalized size = 1.3

$$\frac{10\,a^3\ln(|ax+b|)}{b^6} - \frac{10\,a^3\ln(|x|)}{b^6} - \frac{60\,a^4bx^4 + 90\,a^3b^2x^3 + 20\,a^2b^3x^2 - 5\,ab^4x + 2\,b^5}{6\,(ax+b)^2b^6x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^7),x, algorithm="giac")
```

```
[Out] 10*a^3*ln(abs(a*x + b))/b^6 - 10*a^3*ln(abs(x))/b^6 - 1/6*(60*a^4
*b*x^4 + 90*a^3*b^2*x^3 + 20*a^2*b^3*x^2 - 5*a*b^4*x + 2*b^5)/((a
*x + b)^2*b^6*x^3)
```

3.1643 $\int \frac{1}{\left(a+\frac{b}{x}\right)^3 x^8} \, dx$

Optimal. Leaf size=97

$$\frac{15a^4 \log(x)}{b^7} - \frac{15a^4 \log(ax+b)}{b^7} + \frac{5a^4}{b^6(ax+b)} + \frac{a^4}{2b^5(ax+b)^2} + \frac{10a^3}{b^6x} - \frac{3a^2}{b^5x^2} + \frac{a}{b^4x^3} - \frac{1}{4b^3x^4}$$

```
[Out] -1/(4*b^3*x^4) + a/(b^4*x^3) - (3*a^2)/(b^5*x^2) + (10*a^3)/(b^6*
x) + a^4/(2*b^5*(b + a*x)^2) + (5*a^4)/(b^6*(b + a*x)) + (15*a^4*
Log[x])/b^7 - (15*a^4*Log[b + a*x])/b^7
```

Rubi [A] time = 0.148779, antiderivative size = 97, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$\frac{15a^4 \log(x)}{b^7} - \frac{15a^4 \log(ax+b)}{b^7} + \frac{5a^4}{b^6(ax+b)} + \frac{a^4}{2b^5(ax+b)^2} + \frac{10a^3}{b^6x} - \frac{3a^2}{b^5x^2} + \frac{a}{b^4x^3} - \frac{1}{4b^3x^4}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^3*x^8),x]
```

```
[Out] -1/(4*b^3*x^4) + a/(b^4*x^3) - (3*a^2)/(b^5*x^2) + (10*a^3)/(b^6*
x) + a^4/(2*b^5*(b + a*x)^2) + (5*a^4)/(b^6*(b + a*x)) + (15*a^4*
Log[x])/b^7 - (15*a^4*Log[b + a*x])/b^7
```

Rubi in Sympy [A] time = 22.1856, size = 95, normalized size = 0.98

$$\frac{a^4}{2b^5(ax+b)^2} + \frac{5a^4}{b^6(ax+b)} + \frac{15a^4 \log(x)}{b^7} - \frac{15a^4 \log(ax+b)}{b^7} + \frac{10a^3}{b^6x} - \frac{3a^2}{b^5x^2} + \frac{a}{b^4x^3} - \frac{1}{4b^3x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**3/x**8,x)
```

```
[Out] a**4/(2*b**5*(a*x + b)**2) + 5*a**4/(b**6*(a*x + b)) + 15*a**4*lo
g(x)/b**7 - 15*a**4*log(a*x + b)/b**7 + 10*a**3/(b**6*x) - 3*a**2
/(b**5*x**2) + a/(b**4*x**3) - 1/(4*b**3*x**4)
```

Mathematica [A] time = 0.104404, size = 90, normalized size = 0.93

$$\frac{-60a^4 \log(ax+b) + 60a^4 \log(x) + \frac{b(60a^5x^5+90a^4bx^4+20a^3b^2x^3-5a^2b^3x^2+2ab^4x-b^5)}{x^4(ax+b)^2}}{4b^7}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^3*x^8),x]
```

```
[Out] ((b*(-b^5 + 2*a*b^4*x - 5*a^2*b^3*x^2 + 20*a^3*b^2*x^3 + 90*a^4*b
*x^4 + 60*a^5*x^5))/(x^4*(b + a*x)^2) + 60*a^4*Log[x] - 60*a^4*Lo
g[b + a*x])/(4*b^7)
```

Maple [A] time = 0.018, size = 94, normalized size = 1.

$$-\frac{1}{4b^3x^4} + \frac{a}{b^4x^3} - 3\frac{a^2}{b^5x^2} + 10\frac{a^3}{b^6x} + \frac{a^4}{2b^5(ax+b)^2} + 5\frac{a^4}{b^6(ax+b)} + 15\frac{a^4\ln(x)}{b^7} - 15\frac{a^4\ln(ax+b)}{b^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/(a+b/x)^3/x^8,x)
```

```
[Out] -1/4/b^3/x^4+a/b^4/x^3-3*a^2/b^5/x^2+10*a^3/b^6/x+1/2*a^4/b^5/(a*
x+b)^2+5*a^4/b^6/(a*x+b)+15*a^4*ln(x)/b^7-15*a^4*ln(a*x+b)/b^7
```

Maxima [A] time = 1.44143, size = 146, normalized size = 1.51

$$\frac{60\,a^5x^5 + 90\,a^4bx^4 + 20\,a^3b^2x^3 - 5\,a^2b^3x^2 + 2\,ab^4x - b^5}{4\,(a^2b^6x^6 + 2\,ab^7x^5 + b^8x^4)} - \frac{15\,a^4\log(ax+b)}{b^7} + \frac{15\,a^4\log(x)}{b^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x)^3*x^8),x, algorithm="maxima")
```

```
[Out] 1/4*(60*a^5*x^5 + 90*a^4*b*x^4 + 20*a^3*b^2*x^3 - 5*a^2*b^3*x^2 +
 2*a*b^4*x - b^5)/(a^2*b^6*x^6 + 2*a*b^7*x^5 + b^8*x^4) - 15*a^4*
log(a*x + b)/b^7 + 15*a^4*log(x)/b^7
```

Fricas [A] time = 0.230334, size = 205, normalized size = 2.11

$$\frac{60\,a^5bx^5 + 90\,a^4b^2x^4 + 20\,a^3b^3x^3 - 5\,a^2b^4x^2 + 2\,ab^5x - b^6 - 60\,\left(a^6x^6 + 2\,a^5bx^5 + a^4b^2x^4\right)\log(ax+b) + 60\,\left(a^6x^6 + 2\,a^5bx^5\right.}{4\,(a^2b^7x^6 + 2\,ab^8x^5 + b^9x^4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x)^3*x^8),x, algorithm="fricas")
```

```
[Out] 1/4*(60*a^5*b*x^5 + 90*a^4*b^2*x^4 + 20*a^3*b^3*x^3 - 5*a^2*b^4*x
^2 + 2*a*b^5*x - b^6 - 60*(a^6*x^6 + 2*a^5*b*x^5 + a^4*b^2*x^4)*l
og(a*x + b) + 60*(a^6*x^6 + 2*a^5*b*x^5 + a^4*b^2*x^4)*log(x))/(a
^2*b^7*x^6 + 2*a*b^8*x^5 + b^9*x^4)
```

Sympy [A] time = 2.44337, size = 102, normalized size = 1.05

$$\frac{15a^4\left(\log(x) - \log\left(x + \frac{b}{a}\right)\right)}{b^7} + \frac{60a^5x^5 + 90a^4bx^4 + 20a^3b^2x^3 - 5a^2b^3x^2 + 2ab^4x - b^5}{4a^2b^6x^6 + 8ab^7x^5 + 4b^8x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(a+b/x)**3/x**8,x)
```

```
[Out] 15*a**4*(log(x) - log(x + b/a))/b**7 + (60*a**5*x**5 + 90*a**4*b*
x**4 + 20*a**3*b**2*x**3 - 5*a**2*b**3*x**2 + 2*a*b**4*x - b**5)/
(4*a**2*b**6*x**6 + 8*a*b**7*x**5 + 4*b**8*x**4)
```

GIAC/XCAS [A] time = 0.228772, size = 131, normalized size = 1.35

$$-\frac{15\,a^4\ln(|ax+b|)}{b^7} + \frac{15\,a^4\ln(|x|)}{b^7} + \frac{60\,a^5bx^5 + 90\,a^4b^2x^4 + 20\,a^3b^3x^3 - 5\,a^2b^4x^2 + 2\,ab^5x - b^6}{4\,(ax+b)^2b^7x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^8),x, algorithm="giac")
```

```
[Out] -15*a^4*ln(abs(a*x + b))/b^7 + 15*a^4*ln(abs(x))/b^7 + 1/4*(60*a^
5*b*x^5 + 90*a^4*b^2*x^4 + 20*a^3*b^3*x^3 - 5*a^2*b^4*x^2 + 2*a*b
^5*x - b^6)/((a*x + b)^2*b^7*x^4)
```

3.1644 $\int \frac{1}{\left(a+\frac{b}{x}\right)^3 x^9} \, dx$

Optimal. Leaf size=111

$$-\frac{21a^5\log(x)}{b^8}+\frac{21a^5\log(ax+b)}{b^8}-\frac{6a^5}{b^7(ax+b)}-\frac{a^5}{2b^6(ax+b)^2}-\frac{15a^4}{b^7x}+\frac{5a^3}{b^6x^2}-\frac{2a^2}{b^5x^3}+\frac{3a}{4b^4x^4}-\frac{1}{5b^3x^5}$$

```
[Out] -1/(5*b^3*x^5) + (3*a)/(4*b^4*x^4) - (2*a^2)/(b^5*x^3) + (5*a^3)/
(b^6*x^2) - (15*a^4)/(b^7*x) - a^5/(2*b^6*(b + a*x)^2) - (6*a^5)/
(b^7*(b + a*x)) - (21*a^5*Log[x])/b^8 + (21*a^5*Log[b + a*x])/b^8
```

Rubi [A] time = 0.170024, antiderivative size = 111, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{21a^5\log(x)}{b^8}+\frac{21a^5\log(ax+b)}{b^8}-\frac{6a^5}{b^7(ax+b)}-\frac{a^5}{2b^6(ax+b)^2}-\frac{15a^4}{b^7x}+\frac{5a^3}{b^6x^2}-\frac{2a^2}{b^5x^3}+\frac{3a}{4b^4x^4}-\frac{1}{5b^3x^5}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^3*x^9),x]
```

```
[Out] -1/(5*b^3*x^5) + (3*a)/(4*b^4*x^4) - (2*a^2)/(b^5*x^3) + (5*a^3)/
(b^6*x^2) - (15*a^4)/(b^7*x) - a^5/(2*b^6*(b + a*x)^2) - (6*a^5)/
(b^7*(b + a*x)) - (21*a^5*Log[x])/b^8 + (21*a^5*Log[b + a*x])/b^8
```

Rubi in Sympy [A] time = 25.914, size = 110, normalized size = 0.99

$$-\frac{a^5}{2b^6\left(ax+b\right)^2}-\frac{6a^5}{b^7\left(ax+b\right)}-\frac{21a^5\log\left(x\right)}{b^8}+\frac{21a^5\log\left(ax+b\right)}{b^8}-\frac{15a^4}{b^7x}+\frac{5a^3}{b^6x^2}-\frac{2a^2}{b^5x^3}+\frac{3a}{4b^4x^4}-\frac{1}{5b^3x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**3/x**9,x)
```

```
[Out] -a**5/(2*b**6*(a*x + b)**2) - 6*a**5/(b**7*(a*x + b)) - 21*a**5*l
og(x)/b**8 + 21*a**5*log(a*x + b)/b**8 - 15*a**4/(b**7*x) + 5*a**
3/(b**6*x**2) - 2*a**2/(b**5*x**3) + 3*a/(4*b**4*x**4) - 1/(5*b**
3*x**5)
```

Mathematica [A] time = 0.165946, size = 101, normalized size = 0.91

$$-\frac{-420a^5\log(ax+b)+420a^5\log(x)+\frac{b\left(420a^6x^6+630a^5bx^5+140a^4b^2x^4-35a^3b^3x^3+14a^2b^4x^2-7ab^5x+4b^6\right)}{x^5(ax+b)^2}}{20b^8}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^3*x^9),x]
```

```
[Out] -((b*(4*b^6 - 7*a*b^5*x + 14*a^2*b^4*x^2 - 35*a^3*b^3*x^3 + 140*a
^4*b^2*x^4 + 630*a^5*b*x^5 + 420*a^6*x^6))/(x^5*(b + a*x)^2) + 42
0*a^5*Log[x] - 420*a^5*Log[b + a*x])/(20*b^8)
```

Maple [A] time = 0.017, size = 106, normalized size = 1.

$$-\frac{1}{5\,b^{3}x^{5}}+\frac{3\,a}{4\,b^{4}x^{4}}-2\,\frac{a^{2}}{b^{5}x^{3}}+5\,\frac{a^{3}}{b^{6}x^{2}}-15\,\frac{a^{4}}{b^{7}x}-\frac{a^{5}}{2\,b^{6}\left(ax+b\right)^{2}}-6\,\frac{a^{5}}{b^{7}\left(ax+b\right)}-21\,\frac{a^{5}\ln\left(x\right)}{b^{8}}+21\,\frac{a^{5}\ln\left(ax+b\right)}{b^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^3/x^9,x)
```

```
[Out] -1/5/b^3/x^5+3/4*a/b^4/x^4-2*a^2/b^5/x^3+5*a^3/b^6/x^2-15*a^4/b^7
/x-1/2*a^5/b^6/(a*x+b)^2-6*a^5/b^7/(a*x+b)-21*a^5*ln(x)/b^8+21*a^
5*ln(a*x+b)/b^8
```

Maxima [A] time = 1.44598, size = 161, normalized size = 1.45

$$-\frac{420\,a^{6}x^{6}+630\,a^{5}bx^{5}+140\,a^{4}b^{2}x^{4}-35\,a^{3}b^{3}x^{3}+14\,a^{2}b^{4}x^{2}-7\,ab^{5}x+4\,b^{6}}{20\,\left(a^{2}b^{7}x^{7}+2\,ab^{8}x^{6}+b^{9}x^{5}\right)}+\frac{21\,a^{5}\log\left(ax+b\right)}{b^{8}}-\frac{21\,a^{5}\log\left(x\right)}{b^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^9),x, algorithm="maxima")
```

```
[Out] -1/20*(420*a^6*x^6 + 630*a^5*b*x^5 + 140*a^4*b^2*x^4 - 35*a^3*b^3
*x^3 + 14*a^2*b^4*x^2 - 7*a*b^5*x + 4*b^6)/(a^2*b^7*x^7 + 2*a*b^8
*x^6 + b^9*x^5) + 21*a^5*log(a*x + b)/b^8 - 21*a^5*log(x)/b^8
```

Fricas [A] time = 0.227151, size = 220, normalized size = 1.98

$$-\frac{420\,a^{6}bx^{6}+630\,a^{5}b^{2}x^{5}+140\,a^{4}b^{3}x^{4}-35\,a^{3}b^{4}x^{3}+14\,a^{2}b^{5}x^{2}-7\,ab^{6}x+4\,b^{7}-420\,\left(a^{7}x^{7}+2\,a^{6}bx^{6}+a^{5}b^{2}x^{5}\right)\log\left(ax+b\right)}{20\,\left(a^{2}b^{8}x^{7}+2\,ab^{9}x^{6}+b^{10}x^{5}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^9),x, algorithm="fricas")
```

```
[Out] -1/20*(420*a^6*b*x^6 + 630*a^5*b^2*x^5 + 140*a^4*b^3*x^4 - 35*a^3
*b^4*x^3 + 14*a^2*b^5*x^2 - 7*a*b^6*x + 4*b^7 - 420*(a^7*x^7 + 2*
a^6*b*x^6 + a^5*b^2*x^5)*log(a*x + b) + 420*(a^7*x^7 + 2*a^6*b*x^
6 + a^5*b^2*x^5)*log(x))/(a^2*b^8*x^7 + 2*a*b^9*x^6 + b^10*x^5)
```

Sympy [A] time = 2.7389, size = 116, normalized size = 1.05

$$\frac{21a^{5}\left(-\log\left(x\right)+\log\left(x+\frac{b}{a}\right)\right)}{b^{8}}-\frac{420a^{6}x^{6}+630a^{5}bx^{5}+140a^{4}b^{2}x^{4}-35a^{3}b^{3}x^{3}+14a^{2}b^{4}x^{2}-7ab^{5}x+4b^{6}}{20a^{2}b^{7}x^{7}+40ab^{8}x^{6}+20b^{9}x^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**3/x**9,x)
```

```
[Out] 21*a**5*(-log(x) + log(x + b/a))/b**8 - (420*a**6*x**6 + 630*a**5
*b*x**5 + 140*a**4*b**2*x**4 - 35*a**3*b**3*x**3 + 14*a**2*b**4*x
**2 - 7*a*b**5*x + 4*b**6)/(20*a**2*b**7*x**7 + 40*a*b**8*x**6 +
20*b**9*x**5)
```

GIAC/XCAS [A] time = 0.223901, size = 146, normalized size = 1.32

$$\frac{21\,a^5\ln\left(|ax+b|\right)}{b^8} - \frac{21\,a^5\ln\left(|x|\right)}{b^8} - \frac{420\,a^6bx^6 + 630\,a^5b^2x^5 + 140\,a^4b^3x^4 - 35\,a^3b^4x^3 + 14\,a^2b^5x^2 - 7\,ab^6x + 4\,b^7}{20\,(ax+b)^2b^8x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^9),x, algorithm="giac")
```

```
[Out] 21*a^5*ln(abs(a*x + b))/b^8 - 21*a^5*ln(abs(x))/b^8 - 1/20*(420*a
^6*b*x^6 + 630*a^5*b^2*x^5 + 140*a^4*b^3*x^4 - 35*a^3*b^4*x^3 + 1
4*a^2*b^5*x^2 - 7*a*b^6*x + 4*b^7)/((a*x + b)^2*b^8*x^5)
```

3.1645 $\int \left(a+\frac{b}{x}\right) x^{5/2}\,dx$

Optimal. Leaf size=21

$$\frac{2}{7}ax^{7/2}+\frac{2}{5}bx^{5/2}$$

```
[Out] (2*b*x^(5/2))/5 + (2*a*x^(7/2))/7
```

Rubi [A] time = 0.0146677, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{2}{7}ax^{7/2}+\frac{2}{5}bx^{5/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)*x^(5/2),x]

[Out] (2*b*x^(5/2))/5 + (2*a*x^(7/2))/7
```

Rubi in Sympy [A] time = 2.83753, size = 19, normalized size = 0.9

$$\frac{2ax^{\frac{7}{2}}}{7}+\frac{2bx^{\frac{5}{2}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)*x**(5/2),x)

[Out] 2*a*x**(7/2)/7 + 2*b*x**(5/2)/5
```

Mathematica [A] time = 0.00662717, size = 17, normalized size = 0.81

$$\frac{2}{35}x^{5/2}(5ax+7b)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)*x^(5/2),x]

[Out] (2*x^(5/2)*(7*b + 5*a*x))/35
```

Maple [A] time = 0.005, size = 14, normalized size = 0.7

$$\frac{10\,ax+14\,b}{35}x^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)*x^(5/2),x)

[Out] 2/35*(5*a*x+7*b)*x^(5/2)
```

Maxima [A] time = 1.4446, size = 20, normalized size = 0.95

$$\frac{2}{35}\left(5\,a+\frac{7\,b}{x}\right)x^{\frac{7}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)*x^(5/2),x, algorithm="maxima")
```

```
[Out] 2/35*(5*a + 7*b/x)*x^(7/2)
```

Fricas [A] time = 0.227039, size = 24, normalized size = 1.14

$$\frac{2}{35}\left(5\,ax^3+7\,bx^2\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)*x^(5/2),x, algorithm="fricas")
```

```
[Out] 2/35*(5*a*x^3 + 7*b*x^2)*sqrt(x)
```

Sympy [A] time = 5.92101, size = 19, normalized size = 0.9

$$\frac{2ax^{\frac{7}{2}}}{7}+\frac{2bx^{\frac{5}{2}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)*x**(5/2),x)
```

```
[Out] 2*a*x**(7/2)/7 + 2*b*x**(5/2)/5
```

GIAC/XCAS [A] time = 0.22279, size = 18, normalized size = 0.86

$$\frac{2}{7}\,ax^{\frac{7}{2}}+\frac{2}{5}\,bx^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)*x^(5/2),x, algorithm="giac")
```

```
[Out] 2/7*a*x^(7/2) + 2/5*b*x^(5/2)
```

3.1646 $\int \left(a+\frac{b}{x}\right) x^{3/2} \, dx$

Optimal. Leaf size=21

$$\frac{2}{5}ax^{5/2}+\frac{2}{3}bx^{3/2}$$

```
[Out] (2*b*x^(3/2))/3 + (2*a*x^(5/2))/5
```

Rubi [A] time = 0.0138204, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{2}{5}ax^{5/2}+\frac{2}{3}bx^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)*x^(3/2),x]
```

```
[Out] (2*b*x^(3/2))/3 + (2*a*x^(5/2))/5
```

Rubi in Sympy [A] time = 2.78427, size = 19, normalized size = 0.9

$$\frac{2ax^{\frac{5}{2}}}{5}+\frac{2bx^{\frac{3}{2}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)*x**(3/2),x)
```

```
[Out] 2*a*x**(5/2)/5 + 2*b*x**(3/2)/3
```

Mathematica [A] time = 0.00625823, size = 17, normalized size = 0.81

$$\frac{2}{15}x^{3/2}(3ax+5b)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)*x^(3/2),x]
```

```
[Out] (2*x^(3/2)*(5*b + 3*a*x))/15
```

Maple [A] time = 0.003, size = 14, normalized size = 0.7

$$\frac{6\,ax+10\,b}{15}x^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)*x^(3/2),x)
```

```
[Out] 2/15*(3*a*x+5*b)*x^(3/2)
```

Maxima [A] time = 1.43811, size = 20, normalized size = 0.95

$$\frac{2}{15}\left(3\,a+\frac{5\,b}{x}\right)x^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)*x^(3/2),x, algorithm="maxima")
```

```
[Out] 2/15*(3*a + 5*b/x)*x^(5/2)
```

Fricas [A] time = 0.227104, size = 22, normalized size = 1.05

$$\frac{2}{15}\left(3\,ax^{2}+5\,bx\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)*x^(3/2),x, algorithm="fricas")
```

```
[Out] 2/15*(3*a*x^2 + 5*b*x)*sqrt(x)
```

Sympy [A] time = 1.83358, size = 19, normalized size = 0.9

$$\frac{2ax^{\frac{5}{2}}}{5}+\frac{2bx^{\frac{3}{2}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)*x**(3/2),x)
```

```
[Out] 2*a*x**(5/2)/5 + 2*b*x**(3/2)/3
```

GIAC/XCAS [A] time = 0.229559, size = 18, normalized size = 0.86

$$\frac{2}{5}\,ax^{\frac{5}{2}}+\frac{2}{3}\,bx^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)*x^(3/2),x, algorithm="giac")
```

```
[Out] 2/5*a*x^(5/2) + 2/3*b*x^(3/2)
```

3.1647 $\int \left(a+\frac{b}{x}\right)\sqrt{x}\,dx$

Optimal. Leaf size=19

$$\frac{2}{3}ax^{3/2}+2b\sqrt{x}$$

```
[Out] 2*b*Sqrt[x] + (2*a*x^(3/2))/3
```

Rubi [A] time = 0.0136521, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{2}{3}ax^{3/2}+2b\sqrt{x}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)*Sqrt[x],x]

[Out] 2*b*Sqrt[x] + (2*a*x^(3/2))/3
```

Rubi in Sympy [A] time = 2.85467, size = 17, normalized size = 0.89

$$\frac{2ax^{\frac{3}{2}}}{3}+2b\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)*x**(1/2),x)

[Out] 2*a*x**(3/2)/3 + 2*b*sqrt(x)
```

Mathematica [A] time = 0.00542563, size = 16, normalized size = 0.84

$$\frac{2}{3}\sqrt{x}(ax+3b)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)*Sqrt[x],x]

[Out] (2*Sqrt[x]*(3*b + a*x))/3
```

Maple [A] time = 0.005, size = 13, normalized size = 0.7

$$\frac{2\,ax+6\,b}{3}\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)*x^(1/2),x)

[Out] 2/3*(a*x+3*b)*x^(1/2)
```

Maxima [A] time = 1.43671, size = 18, normalized size = 0.95

$$\frac{2}{3}\left(a+\frac{3\,b}{x}\right)x^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)*sqrt(x),x, algorithm="maxima")
```

```
[Out] 2/3*(a + 3*b/x)*x^(3/2)
```

Fricas [A] time = 0.224643, size = 16, normalized size = 0.84

$$\frac{2}{3}\,(ax+3\,b)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)*sqrt(x),x, algorithm="fricas")
```

```
[Out] 2/3*(a*x + 3*b)*sqrt(x)
```

Sympy [A] time = 0.545696, size = 17, normalized size = 0.89

$$\frac{2ax^{\frac{3}{2}}}{3}+2b\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)*x**(1/2),x)
```

```
[Out] 2*a*x**(3/2)/3 + 2*b*sqrt(x)
```

GIAC/XCAS [A] time = 0.222567, size = 18, normalized size = 0.95

$$\frac{2}{3}\,ax^{\frac{3}{2}}+2\,b\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)*sqrt(x),x, algorithm="giac")
```

```
[Out] 2/3*a*x^(3/2) + 2*b*sqrt(x)
```

3.1648 $\int \frac{a+\frac{b}{x}}{\sqrt{x}} \, dx$

Optimal. Leaf size=17

$$2a\sqrt{x} - \frac{2b}{\sqrt{x}}$$

```
[Out] (-2*b)/Sqrt[x] + 2*a*Sqrt[x]
```

Rubi [A] time = 0.0140354, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$2a\sqrt{x} - \frac{2b}{\sqrt{x}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)/Sqrt[x],x]

[Out] (-2*b)/Sqrt[x] + 2*a*Sqrt[x]
```

Rubi in Sympy [A] time = 2.83582, size = 15, normalized size = 0.88

$$2a\sqrt{x} - \frac{2b}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)/x**(1/2),x)

[Out] 2*a*sqrt(x) - 2*b/sqrt(x)
```

Mathematica [A] time = 0.00744568, size = 14, normalized size = 0.82

$$\frac{2(ax - b)}{\sqrt{x}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)/Sqrt[x],x]

[Out] (2*(-b + a*x))/Sqrt[x]
```

Maple [A] time = 0.004, size = 13, normalized size = 0.8

$$2\,\frac{ax - b}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)/x^(1/2),x)
```

```
[Out] 2*(a*x-b)/x^(1/2)
```

Maxima [A] time = 1.43797, size = 18, normalized size = 1.06

$$2\,a\sqrt{x} - \frac{2\,b}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a + b/x)/sqrt(x),x, algorithm="maxima")

[Out] 2*a*sqrt(x) - 2*b/sqrt(x)
```

Fricas [A] time = 0.22516, size = 16, normalized size = 0.94

$$\frac{2\,(ax - b)}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a + b/x)/sqrt(x),x, algorithm="fricas")

[Out] 2*(a*x - b)/sqrt(x)
```

Sympy [A] time = 1.3605, size = 15, normalized size = 0.88

$$2a\sqrt{x} - \frac{2b}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b/x)/x**(1/2),x)

[Out] 2*a*sqrt(x) - 2*b/sqrt(x)
```

GIAC/XCAS [A] time = 0.21857, size = 18, normalized size = 1.06

$$2\,a\sqrt{x} - \frac{2\,b}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a + b/x)/sqrt(x),x, algorithm="giac")

[Out] 2*a*sqrt(x) - 2*b/sqrt(x)
```

3.1649 $\int \frac{a+\frac{b}{x}}{x^{3/2}}\,dx$

Optimal. Leaf size=19

$$-\frac{2a}{\sqrt{x}}-\frac{2b}{3x^{3/2}}$$

```
[Out] (-2*b)/(3*x^(3/2)) - (2*a)/Sqrt[x]
```

Rubi [A] time = 0.0135852, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{2a}{\sqrt{x}}-\frac{2b}{3x^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)/x^(3/2),x]

[Out] (-2*b)/(3*x^(3/2)) - (2*a)/Sqrt[x]
```

Rubi in Sympy [A] time = 2.82218, size = 19, normalized size = 1.

$$-\frac{2a}{\sqrt{x}}-\frac{2b}{3x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)/x**(3/2),x)

[Out] -2*a/sqrt(x) - 2*b/(3*x**(3/2))
```

Mathematica [A] time = 0.00700763, size = 15, normalized size = 0.79

$$-\frac{2(3ax+b)}{3x^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)/x^(3/2),x]

[Out] (-2*(b + 3*a*x))/(3*x^(3/2))
```

Maple [A] time = 0.003, size = 12, normalized size = 0.6

$$-\frac{6\,ax+2\,b}{3}x^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)/x^(3/2),x)

[Out] -2/3*(3*a*x+b)/x^(3/2)
```

Maxima [A] time = 1.43532, size = 18, normalized size = 0.95

$$-\frac{2\,a}{\sqrt{x}}-\frac{2\,b}{3\,x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)/x^(3/2),x, algorithm="maxima")
```

```
[Out] -2*a/sqrt(x) - 2/3*b/x^(3/2)
```

Fricas [A] time = 0.224405, size = 15, normalized size = 0.79

$$-\frac{2\,(3\,ax+b)}{3\,x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)/x^(3/2),x, algorithm="fricas")
```

```
[Out] -2/3*(3*a*x + b)/x^(3/2)
```

Sympy [A] time = 1.81571, size = 19, normalized size = 1.

$$-\frac{2a}{\sqrt{x}}-\frac{2b}{3x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)/x**(3/2),x)
```

```
[Out] -2*a/sqrt(x) - 2*b/(3*x**(3/2))
```

GIAC/XCAS [A] time = 0.230573, size = 15, normalized size = 0.79

$$-\frac{2\,(3\,ax+b)}{3\,x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)/x^(3/2),x, algorithm="giac")
```

```
[Out] -2/3*(3*a*x + b)/x^(3/2)
```

3.1650 $\int \frac{a+\frac{b}{x}}{x^{5/2}}\,dx$

Optimal. Leaf size=21

$$-\frac{2a}{3x^{3/2}}-\frac{2b}{5x^{5/2}}$$

```
[Out] (-2*b)/(5*x^(5/2)) - (2*a)/(3*x^(3/2))
```

Rubi [A] time = 0.014278, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{2a}{3x^{3/2}}-\frac{2b}{5x^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x)/x^(5/2),x]
```

```
[Out] (-2*b)/(5*x^(5/2)) - (2*a)/(3*x^(3/2))
```

Rubi in Sympy [A] time = 2.83557, size = 20, normalized size = 0.95

$$-\frac{2a}{3x^{\frac{3}{2}}}-\frac{2b}{5x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x)/x**(5/2),x)
```

```
[Out] -2*a/(3*x**(3/2)) - 2*b/(5*x**(5/2))
```

Mathematica [A] time = 0.00752632, size = 17, normalized size = 0.81

$$-\frac{2(5ax+3b)}{15x^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x)/x^(5/2),x]
```

```
[Out] (-2*(3*b + 5*a*x))/(15*x^(5/2))
```

Maple [A] time = 0.004, size = 14, normalized size = 0.7

$$-\frac{10\,ax+6\,b}{15}x^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x)/x^(5/2),x)
```

```
[Out] -2/15*(5*a*x+3*b)/x^(5/2)
```

Maxima [A] time = 1.44323, size = 18, normalized size = 0.86

$$-\frac{2\,a}{3\,x^{\frac{3}{2}}} - \frac{2\,b}{5\,x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)/x^(5/2),x, algorithm="maxima")
```

```
[Out] -2/3*a/x^(3/2) - 2/5*b/x^(5/2)
```

Fricas [A] time = 0.230219, size = 18, normalized size = 0.86

$$-\frac{2\,(5\,ax + 3\,b)}{15\,x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)/x^(5/2),x, algorithm="fricas")
```

```
[Out] -2/15*(5*a*x + 3*b)/x^(5/2)
```

Sympy [A] time = 2.99475, size = 20, normalized size = 0.95

$$-\frac{2a}{3x^{\frac{3}{2}}} - \frac{2b}{5x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)/x**(5/2),x)
```

```
[Out] -2*a/(3*x**(3/2)) - 2*b/(5*x**(5/2))
```

GIAC/XCAS [A] time = 0.221512, size = 18, normalized size = 0.86

$$-\frac{2\,(5\,ax + 3\,b)}{15\,x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)/x^(5/2),x, algorithm="giac")
```

```
[Out] -2/15*(5*a*x + 3*b)/x^(5/2)
```

3.1651 $\int \left(a+\frac{b}{x}\right)^2 x^{5/2}\,dx$

Optimal. Leaf size=36

$$\frac{2}{7}a^2x^{7/2}+\frac{4}{5}abx^{5/2}+\frac{2}{3}b^2x^{3/2}$$

```
[Out] (2*b^2*x^(3/2))/3 + (4*a*b*x^(5/2))/5 + (2*a^2*x^(7/2))/7
```

Rubi [A] time = 0.0351325, antiderivative size = 36, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2}{7}a^2x^{7/2}+\frac{4}{5}abx^{5/2}+\frac{2}{3}b^2x^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^2*x^(5/2),x]
```

```
[Out] (2*b^2*x^(3/2))/3 + (4*a*b*x^(5/2))/5 + (2*a^2*x^(7/2))/7
```

Rubi in Sympy [A] time = 5.48002, size = 34, normalized size = 0.94

$$\frac{2a^2x^{\frac{7}{2}}}{7}+\frac{4abx^{\frac{5}{2}}}{5}+\frac{2b^2x^{\frac{3}{2}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**2*x**(5/2),x)
```

```
[Out] 2*a**2*x**(7/2)/7 + 4*a*b*x**(5/2)/5 + 2*b**2*x**(3/2)/3
```

Mathematica [A] time = 0.0118147, size = 28, normalized size = 0.78

$$\frac{2}{105}x^{3/2}\left(15a^2x^2+42abx+35b^2\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^2*x^(5/2),x]
```

```
[Out] (2*x^(3/2)*(35*b^2 + 42*a*b*x + 15*a^2*x^2))/105
```

Maple [A] time = 0.007, size = 25, normalized size = 0.7

$$\frac{30\,a^2x^2+84\,abx+70\,b^2}{105}x^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^2*x^(5/2),x)
```

```
[Out] 2/105*(15*a^2*x^2+42*a*b*x+35*b^2)*x^(3/2)
```

Maxima [A] time = 1.43676, size = 35, normalized size = 0.97

$$\frac{2}{105}\left(15\,a^2 + \frac{42\,ab}{x} + \frac{35\,b^2}{x^2}\right)x^{\frac{7}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2*x^(5/2),x, algorithm="maxima")
```

```
[Out] 2/105*(15*a^2 + 42*a*b/x + 35*b^2/x^2)*x^(7/2)
```

Fricas [A] time = 0.230686, size = 36, normalized size = 1.

$$\frac{2}{105}\left(15\,a^2x^3 + 42\,abx^2 + 35\,b^2x\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2*x^(5/2),x, algorithm="fricas")
```

```
[Out] 2/105*(15*a^2*x^3 + 42*a*b*x^2 + 35*b^2*x)*sqrt(x)
```

Sympy [A] time = 9.34088, size = 34, normalized size = 0.94

$$\frac{2a^2x^{\frac{7}{2}}}{7} + \frac{4abx^{\frac{5}{2}}}{5} + \frac{2b^2x^{\frac{3}{2}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**2*x**(5/2),x)
```

```
[Out] 2*a**2*x**(7/2)/7 + 4*a*b*x**(5/2)/5 + 2*b**2*x**(3/2)/3
```

GIAC/XCAS [A] time = 0.226156, size = 32, normalized size = 0.89

$$\frac{2}{7}\,a^2x^{\frac{7}{2}} + \frac{4}{5}\,abx^{\frac{5}{2}} + \frac{2}{3}\,b^2x^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2*x^(5/2),x, algorithm="giac")
```

```
[Out] 2/7*a^2*x^(7/2) + 4/5*a*b*x^(5/2) + 2/3*b^2*x^(3/2)
```

3.1652 $\int \left(a+\frac{b}{x}\right)^2 x^{3/2}\,dx$

Optimal. Leaf size=34

$$\frac{2}{5}a^2x^{5/2}+\frac{4}{3}abx^{3/2}+2b^2\sqrt{x}$$

```
[Out] 2*b^2*Sqrt[x] + (4*a*b*x^(3/2))/3 + (2*a^2*x^(5/2))/5
```

Rubi [A] time = 0.0335745, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2}{5}a^2x^{5/2}+\frac{4}{3}abx^{3/2}+2b^2\sqrt{x}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x)^2*x^(3/2),x]
```

```
[Out] 2*b^2*Sqrt[x] + (4*a*b*x^(3/2))/3 + (2*a^2*x^(5/2))/5
```

Rubi in Sympy [A] time = 5.45849, size = 32, normalized size = 0.94

$$\frac{2a^2x^{\frac{5}{2}}}{5}+\frac{4abx^{\frac{3}{2}}}{3}+2b^2\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x)**2*x**(3/2),x)
```

```
[Out] 2*a**2*x**(5/2)/5 + 4*a*b*x**(3/2)/3 + 2*b**2*sqrt(x)
```

Mathematica [A] time = 0.010315, size = 28, normalized size = 0.82

$$\frac{2}{15}\sqrt{x}\left(3a^2x^2+10abx+15b^2\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x)^2*x^(3/2),x]
```

```
[Out] (2*Sqrt[x]*(15*b^2 + 10*a*b*x + 3*a^2*x^2))/15
```

Maple [A] time = 0.006, size = 25, normalized size = 0.7

$$\frac{6\,a^2x^2+20\,abx+30\,b^2}{15}\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x)^2*x^(3/2),x)
```

```
[Out] 2/15*(3*a^2*x^2+10*a*b*x+15*b^2)*x^(1/2)
```

Maxima [A] time = 1.4503, size = 35, normalized size = 1.03

$$\frac{2}{15}\left(3\,a^2+\frac{10\,ab}{x}+\frac{15\,b^2}{x^2}\right)x^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2*x^(3/2),x, algorithm="maxima")
```

```
[Out] 2/15*(3*a^2 + 10*a*b/x + 15*b^2/x^2)*x^(5/2)
```

Fricas [A] time = 0.227482, size = 32, normalized size = 0.94

$$\frac{2}{15}\left(3\,a^2x^2+10\,abx+15\,b^2\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2*x^(3/2),x, algorithm="fricas")
```

```
[Out] 2/15*(3*a^2*x^2 + 10*a*b*x + 15*b^2)*sqrt(x)
```

Sympy [A] time = 3.29041, size = 32, normalized size = 0.94

$$\frac{2a^2x^{\frac{5}{2}}}{5}+\frac{4abx^{\frac{3}{2}}}{3}+2b^2\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**2*x**(3/2),x)
```

```
[Out] 2*a**2*x**(5/2)/5 + 4*a*b*x**(3/2)/3 + 2*b**2*sqrt(x)
```

GIAC/XCAS [A] time = 0.228209, size = 32, normalized size = 0.94

$$\frac{2}{5}\,a^2x^{\frac{5}{2}}+\frac{4}{3}\,abx^{\frac{3}{2}}+2\,b^2\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2*x^(3/2),x, algorithm="giac")
```

```
[Out] 2/5*a^2*x^(5/2) + 4/3*a*b*x^(3/2) + 2*b^2*sqrt(x)
```

3.1653 $\int \left(a+\frac{b}{x}\right)^2 \sqrt{x}\,dx$

Optimal. Leaf size=32

$$\frac{2}{3}a^2x^{3/2}+4ab\sqrt{x}-\frac{2b^2}{\sqrt{x}}$$

```
[Out] (-2*b^2)/Sqrt[x] + 4*a*b*Sqrt[x] + (2*a^2*x^(3/2))/3
```

Rubi [A] time = 0.0349985, antiderivative size = 32, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2}{3}a^2x^{3/2}+4ab\sqrt{x}-\frac{2b^2}{\sqrt{x}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^2*Sqrt[x],x]

[Out] (-2*b^2)/Sqrt[x] + 4*a*b*Sqrt[x] + (2*a^2*x^(3/2))/3
```

Rubi in Sympy [A] time = 5.58337, size = 31, normalized size = 0.97

$$\frac{2a^2x^{\frac{3}{2}}}{3}+4ab\sqrt{x}-\frac{2b^2}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**2*x**(1/2),x)

[Out] 2*a**2*x**(3/2)/3 + 4*a*b*sqrt(x) - 2*b**2/sqrt(x)
```

Mathematica [A] time = 0.013038, size = 27, normalized size = 0.84

$$\frac{2\left(a^2x^2+6abx-3b^2\right)}{3\sqrt{x}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^2*Sqrt[x],x]

[Out] (2*(-3*b^2 + 6*a*b*x + a^2*x^2))/(3*Sqrt[x])
```

Maple [A] time = 0.007, size = 24, normalized size = 0.8

$$\frac{2\,a^2x^2+12\,abx-6\,b^2}{3}\frac{1}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^2*x^(1/2),x)
```

```
[Out] 2/3*(a^2*x^2+6*a*b*x-3*b^2)/x^(1/2)
```

Maxima [A] time = 1.44129, size = 34, normalized size = 1.06

$$\frac{2}{3}\left(a^2 + \frac{6\,ab}{x}\right)x^{\frac{3}{2}} - \frac{2\,b^2}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2*sqrt(x),x, algorithm="maxima")
```

```
[Out] 2/3*(a^2 + 6*a*b/x)*x^(3/2) - 2*b^2/sqrt(x)
```

Fricas [A] time = 0.22572, size = 31, normalized size = 0.97

$$\frac{2\left(a^2x^2 + 6\,abx - 3\,b^2\right)}{3\,\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2*sqrt(x),x, algorithm="fricas")
```

```
[Out] 2/3*(a^2*x^2 + 6*a*b*x - 3*b^2)/sqrt(x)
```

Sympy [A] time = 1.89636, size = 31, normalized size = 0.97

$$\frac{2a^2x^{\frac{3}{2}}}{3} + 4ab\sqrt{x} - \frac{2b^2}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**2*x**(1/2),x)
```

```
[Out] 2*a**2*x**(3/2)/3 + 4*a*b*sqrt(x) - 2*b**2/sqrt(x)
```

GIAC/XCAS [A] time = 0.225498, size = 32, normalized size = 1.

$$\frac{2}{3}\,a^2x^{\frac{3}{2}} + 4\,ab\sqrt{x} - \frac{2\,b^2}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2*sqrt(x),x, algorithm="giac")
```

```
[Out] 2/3*a^2*x^(3/2) + 4*a*b*sqrt(x) - 2*b^2/sqrt(x)
```

3.1654 $\int \frac{\left(a+\frac{b}{x}\right)^2}{\sqrt{x}}\,dx$

Optimal. Leaf size=32

$$2a^2\sqrt{x}-\frac{4ab}{\sqrt{x}}-\frac{2b^2}{3x^{3/2}}$$

```
[Out] (-2*b^2)/(3*x^(3/2)) - (4*a*b)/Sqrt[x] + 2*a^2*Sqrt[x]
```

Rubi [A] time = 0.0343118, antiderivative size = 32, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$2a^2\sqrt{x}-\frac{4ab}{\sqrt{x}}-\frac{2b^2}{3x^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^2/Sqrt[x],x]

[Out] (-2*b^2)/(3*x^(3/2)) - (4*a*b)/Sqrt[x] + 2*a^2*Sqrt[x]
```

Rubi in Sympy [A] time = 5.75081, size = 31, normalized size = 0.97

$$2a^2\sqrt{x}-\frac{4ab}{\sqrt{x}}-\frac{2b^2}{3x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**2/x**(1/2),x)

[Out] 2*a**2*sqrt(x) - 4*a*b/sqrt(x) - 2*b**2/(3*x**(3/2))
```

Mathematica [A] time = 0.0128656, size = 26, normalized size = 0.81

$$-\frac{2\left(-3a^2x^2+6abx+b^2\right)}{3x^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^2/Sqrt[x],x]

[Out] (-2*(b^2 + 6*a*b*x - 3*a^2*x^2))/(3*x^(3/2))
```

Maple [A] time = 0.007, size = 25, normalized size = 0.8

$$\frac{6\,a^2x^2-12\,abx-2\,b^2}{3}x^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^2/x^(1/2),x)
```

```
[Out] 2/3*(3*a^2*x^2-6*a*b*x-b^2)/x^(3/2)
```

Maxima [A] time = 1.44025, size = 32, normalized size = 1.

$$2\,a^2\sqrt{x} - \frac{4\,ab}{\sqrt{x}} - \frac{2\,b^2}{3\,x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2/sqrt(x),x, algorithm="maxima")

[Out] 2*a^2*sqrt(x) - 4*a*b/sqrt(x) - 2/3*b^2/x^(3/2)
```

Fricas [A] time = 0.229627, size = 32, normalized size = 1.

$$\frac{2\,\left(3\,a^2x^2 - 6\,abx - b^2\right)}{3\,x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2/sqrt(x),x, algorithm="fricas")

[Out] 2/3*(3*a^2*x^2 - 6*a*b*x - b^2)/x^(3/2)
```

Sympy [A] time = 1.89755, size = 31, normalized size = 0.97

$$2a^2\sqrt{x} - \frac{4ab}{\sqrt{x}} - \frac{2b^2}{3x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**2/x**(1/2),x)

[Out] 2*a**2*sqrt(x) - 4*a*b/sqrt(x) - 2*b**2/(3*x**(3/2))
```

GIAC/XCAS [A] time = 0.221466, size = 31, normalized size = 0.97

$$2\,a^2\sqrt{x} - \frac{2\,\left(6\,abx + b^2\right)}{3\,x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2/sqrt(x),x, algorithm="giac")

[Out] 2*a^2*sqrt(x) - 2/3*(6*a*b*x + b^2)/x^(3/2)
```

3.1655 $\int \frac{\left(a+\frac{b}{x}\right)^2}{x^{3/2}}\,dx$

Optimal. Leaf size=34

$$-\frac{2a^2}{\sqrt{x}}-\frac{4ab}{3x^{3/2}}-\frac{2b^2}{5x^{5/2}}$$

```
[Out] (-2*b^2)/(5*x^(5/2)) - (4*a*b)/(3*x^(3/2)) - (2*a^2)/Sqrt[x]
```

Rubi [A] time = 0.0348254, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2a^2}{\sqrt{x}}-\frac{4ab}{3x^{3/2}}-\frac{2b^2}{5x^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^2/x^(3/2),x]

[Out] (-2*b^2)/(5*x^(5/2)) - (4*a*b)/(3*x^(3/2)) - (2*a^2)/Sqrt[x]
```

Rubi in Sympy [A] time = 5.62512, size = 34, normalized size = 1.

$$-\frac{2a^2}{\sqrt{x}}-\frac{4ab}{3x^{\frac{3}{2}}}-\frac{2b^2}{5x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**2/x**(3/2),x)

[Out] -2*a**2/sqrt(x) - 4*a*b/(3*x**(3/2)) - 2*b**2/(5*x**(5/2))
```

Mathematica [A] time = 0.0121773, size = 28, normalized size = 0.82

$$-\frac{2\left(15a^2x^2+10abx+3b^2\right)}{15x^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^2/x^(3/2),x]

[Out] (-2*(3*b^2 + 10*a*b*x + 15*a^2*x^2))/(15*x^(5/2))
```

Maple [A] time = 0.006, size = 25, normalized size = 0.7

$$-\frac{30\,a^2x^2+20\,abx+6\,b^2}{15}x^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^2/x^(3/2),x)
```

```
[Out] -2/15*(15*a^2*x^2+10*a*b*x+3*b^2)/x^(5/2)
```

Maxima [A] time = 1.43988, size = 32, normalized size = 0.94

$$-\frac{2\,a^{2}}{\sqrt{x}}-\frac{4\,ab}{3\,x^{\frac{3}{2}}}-\frac{2\,b^{2}}{5\,x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2/x^(3/2),x, algorithm="maxima")
```

```
[Out] -2*a^2/sqrt(x) - 4/3*a*b/x^(3/2) - 2/5*b^2/x^(5/2)
```

Fricas [A] time = 0.227801, size = 32, normalized size = 0.94

$$-\frac{2\,\left(15\,a^{2}x^{2}+10\,abx+3\,b^{2}\right)}{15\,x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2/x^(3/2),x, algorithm="fricas")
```

```
[Out] -2/15*(15*a^2*x^2 + 10*a*b*x + 3*b^2)/x^(5/2)
```

Sympy [A] time = 2.59578, size = 34, normalized size = 1.

$$-\frac{2a^{2}}{\sqrt{x}}-\frac{4ab}{3x^{\frac{3}{2}}}-\frac{2b^{2}}{5x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**2/x**(3/2),x)
```

```
[Out] -2*a**2/sqrt(x) - 4*a*b/(3*x**(3/2)) - 2*b**2/(5*x**(5/2))
```

GIAC/XCAS [A] time = 0.216333, size = 32, normalized size = 0.94

$$-\frac{2\,\left(15\,a^{2}x^{2}+10\,abx+3\,b^{2}\right)}{15\,x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2/x^(3/2),x, algorithm="giac")
```

```
[Out] -2/15*(15*a^2*x^2 + 10*a*b*x + 3*b^2)/x^(5/2)
```

3.1656 $\int \frac{\left(a+\frac{b}{x}\right)^2}{x^{5/2}}\,dx$

Optimal. Leaf size=36

$$-\frac{2a^2}{3x^{3/2}}-\frac{4ab}{5x^{5/2}}-\frac{2b^2}{7x^{7/2}}$$

```
[Out] (-2*b^2)/(7*x^(7/2)) - (4*a*b)/(5*x^(5/2)) - (2*a^2)/(3*x^(3/2))
```

Rubi [A] time = 0.0340564, antiderivative size = 36, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2a^2}{3x^{3/2}}-\frac{4ab}{5x^{5/2}}-\frac{2b^2}{7x^{7/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^2/x^(5/2),x]

[Out] (-2*b^2)/(7*x^(7/2)) - (4*a*b)/(5*x^(5/2)) - (2*a^2)/(3*x^(3/2))
```

Rubi in Sympy [A] time = 5.52632, size = 36, normalized size = 1.

$$-\frac{2a^2}{3x^{\frac{3}{2}}}-\frac{4ab}{5x^{\frac{5}{2}}}-\frac{2b^2}{7x^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**2/x**(5/2),x)

[Out] -2*a**2/(3*x**(3/2)) - 4*a*b/(5*x**(5/2)) - 2*b**2/(7*x**(7/2))
```

Mathematica [A] time = 0.0127769, size = 28, normalized size = 0.78

$$-\frac{2\left(35a^2x^2+42abx+15b^2\right)}{105x^{7/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^2/x^(5/2),x]

[Out] (-2*(15*b^2 + 42*a*b*x + 35*a^2*x^2))/(105*x^(7/2))
```

Maple [A] time = 0.005, size = 25, normalized size = 0.7

$$-\frac{70\,a^2x^2+84\,abx+30\,b^2}{105}x^{-\frac{7}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^2/x^(5/2),x)
```

```
[Out] -2/105*(35*a^2*x^2+42*a*b*x+15*b^2)/x^(7/2)
```

Maxima [A] time = 1.4417, size = 32, normalized size = 0.89

$$-\frac{2\,a^2}{3\,x^{\frac{3}{2}}}-\frac{4\,ab}{5\,x^{\frac{5}{2}}}-\frac{2\,b^2}{7\,x^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2/x^(5/2),x, algorithm="maxima")
```

```
[Out] -2/3*a^2/x^(3/2) - 4/5*a*b/x^(5/2) - 2/7*b^2/x^(7/2)
```

Fricas [A] time = 0.226834, size = 32, normalized size = 0.89

$$-\frac{2\left(35\,a^2x^2+42\,abx+15\,b^2\right)}{105\,x^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2/x^(5/2),x, algorithm="fricas")
```

```
[Out] -2/105*(35*a^2*x^2 + 42*a*b*x + 15*b^2)/x^(7/2)
```

Sympy [A] time = 4.9372, size = 36, normalized size = 1.

$$-\frac{2a^2}{3x^{\frac{3}{2}}}-\frac{4ab}{5x^{\frac{5}{2}}}-\frac{2b^2}{7x^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**2/x**(5/2),x)
```

```
[Out] -2*a**2/(3*x**(3/2)) - 4*a*b/(5*x**(5/2)) - 2*b**2/(7*x**(7/2))
```

GIAC/XCAS [A] time = 0.221695, size = 32, normalized size = 0.89

$$-\frac{2\left(35\,a^2x^2+42\,abx+15\,b^2\right)}{105\,x^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^2/x^(5/2),x, algorithm="giac")
```

```
[Out] -2/105*(35*a^2*x^2 + 42*a*b*x + 15*b^2)/x^(7/2)
```

3.1657 $\int \left(a+\frac{b}{x}\right)^3 x^{5/2}\,dx$

Optimal. Leaf size=47

$$\frac{2}{7}a^3x^{7/2}+\frac{6}{5}a^2bx^{5/2}+2ab^2x^{3/2}+2b^3\sqrt{x}$$

```
[Out] 2*b^3*Sqrt[x] + 2*a*b^2*x^(3/2) + (6*a^2*b*x^(5/2))/5 + (2*a^3*x^
(7/2))/7
```

Rubi [A] time = 0.0454168, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2}{7}a^3x^{7/2}+\frac{6}{5}a^2bx^{5/2}+2ab^2x^{3/2}+2b^3\sqrt{x}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^3*x^(5/2),x]
```

```
[Out] 2*b^3*Sqrt[x] + 2*a*b^2*x^(3/2) + (6*a^2*b*x^(5/2))/5 + (2*a^3*x^
(7/2))/7
```

Rubi in Sympy [A] time = 6.84821, size = 46, normalized size = 0.98

$$\frac{2a^3x^{\frac{7}{2}}}{7}+\frac{6a^2bx^{\frac{5}{2}}}{5}+2ab^2x^{\frac{3}{2}}+2b^3\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**3*x**(5/2),x)
```

```
[Out] 2*a**3*x**(7/2)/7 + 6*a**2*b*x**(5/2)/5 + 2*a*b**2*x**(3/2) + 2*b
**3*sqrt(x)
```

Mathematica [A] time = 0.013087, size = 39, normalized size = 0.83

$$\frac{2}{35}\sqrt{x}\left(5a^3x^3+21a^2bx^2+35ab^2x+35b^3\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^3*x^(5/2),x]
```

```
[Out] (2*Sqrt[x]*(35*b^3 + 35*a*b^2*x + 21*a^2*b*x^2 + 5*a^3*x^3))/35
```

Maple [A] time = 0.007, size = 36, normalized size = 0.8

$$\frac{10\,a^3x^3+42\,a^2bx^2+70\,ab^2x+70\,b^3}{35}\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^3*x^(5/2),x)
```

```
[Out] 2/35*(5*a^3*x^3+21*a^2*b*x^2+35*a*b^2*x+35*b^3)*x^(1/2)
```

Maxima [A] time = 1.44526, size = 50, normalized size = 1.06

$$\frac{2}{35}\left(5\,a^3 + \frac{21\,a^2b}{x} + \frac{35\,ab^2}{x^2} + \frac{35\,b^3}{x^3}\right)x^{\frac{7}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3*x^(5/2),x, algorithm="maxima")
```

```
[Out] 2/35*(5*a^3 + 21*a^2*b/x + 35*a*b^2/x^2 + 35*b^3/x^3)*x^(7/2)
```

Fricas [A] time = 0.228466, size = 47, normalized size = 1.

$$\frac{2}{35}\left(5\,a^3x^3 + 21\,a^2bx^2 + 35\,ab^2x + 35\,b^3\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3*x^(5/2),x, algorithm="fricas")
```

```
[Out] 2/35*(5*a^3*x^3 + 21*a^2*b*x^2 + 35*a*b^2*x + 35*b^3)*sqrt(x)
```

Sympy [A] time = 14.8014, size = 46, normalized size = 0.98

$$\frac{2a^3x^{\frac{7}{2}}}{7} + \frac{6a^2bx^{\frac{5}{2}}}{5} + 2ab^2x^{\frac{3}{2}} + 2b^3\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**3*x**(5/2),x)
```

```
[Out] 2*a**3*x**(7/2)/7 + 6*a**2*b*x**(5/2)/5 + 2*a*b**2*x**(3/2) + 2*b
**3*sqrt(x)
```

GIAC/XCAS [A] time = 0.223068, size = 47, normalized size = 1.

$$\frac{2}{7}\,a^3x^{\frac{7}{2}} + \frac{6}{5}\,a^2bx^{\frac{5}{2}} + 2\,ab^2x^{\frac{3}{2}} + 2\,b^3\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3*x^(5/2),x, algorithm="giac")
```

```
[Out] 2/7*a^3*x^(7/2) + 6/5*a^2*b*x^(5/2) + 2*a*b^2*x^(3/2) + 2*b^3*sqr
t(x)
```

3.1658 $\int \left(a+\frac{b}{x}\right)^3 x^{3/2}\,dx$

Optimal. Leaf size=45

$$\frac{2}{5}a^3x^{5/2}+2a^2bx^{3/2}+6ab^2\sqrt{x}-\frac{2b^3}{\sqrt{x}}$$

```
[Out] (-2*b^3)/Sqrt[x] + 6*a*b^2*Sqrt[x] + 2*a^2*b*x^(3/2) + (2*a^3*x^(
5/2))/5
```

Rubi [A] time = 0.0444258, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2}{5}a^3x^{5/2}+2a^2bx^{3/2}+6ab^2\sqrt{x}-\frac{2b^3}{\sqrt{x}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^3*x^(3/2),x]
```

```
[Out] (-2*b^3)/Sqrt[x] + 6*a*b^2*Sqrt[x] + 2*a^2*b*x^(3/2) + (2*a^3*x^(
5/2))/5
```

Rubi in Sympy [A] time = 6.92123, size = 44, normalized size = 0.98

$$\frac{2a^3x^{\frac{5}{2}}}{5}+2a^2bx^{\frac{3}{2}}+6ab^2\sqrt{x}-\frac{2b^3}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**3*x**(3/2),x)
```

```
[Out] 2*a**3*x**(5/2)/5 + 2*a**2*b*x**(3/2) + 6*a*b**2*sqrt(x) - 2*b**3
/sqrt(x)
```

Mathematica [A] time = 0.0139925, size = 38, normalized size = 0.84

$$\frac{2\left(a^3x^3+5a^2bx^2+15ab^2x-5b^3\right)}{5\sqrt{x}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^3*x^(3/2),x]
```

```
[Out] (2*(-5*b^3 + 15*a*b^2*x + 5*a^2*b*x^2 + a^3*x^3))/(5*Sqrt[x])
```

Maple [A] time = 0.007, size = 35, normalized size = 0.8

$$\frac{2\,a^3x^3+10\,a^2bx^2+30\,ab^2x-10\,b^3}{5}\frac{1}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^3*x^(3/2),x)
```

```
[Out] 2/5*(a^3*x^3+5*a^2*b*x^2+15*a*b^2*x-5*b^3)/x^(1/2)
```

Maxima [A] time = 1.4392, size = 49, normalized size = 1.09

$$\frac{2}{5}\left(a^3 + \frac{5\,a^2 b}{x} + \frac{15\,ab^2}{x^2}\right)x^{\frac{5}{2}} - \frac{2\,b^3}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3*x^(3/2),x, algorithm="maxima")
```

```
[Out] 2/5*(a^3 + 5*a^2*b/x + 15*a*b^2/x^2)*x^(5/2) - 2*b^3/sqrt(x)
```

Fricas [A] time = 0.228005, size = 46, normalized size = 1.02

$$\frac{2\left(a^3x^3 + 5\,a^2bx^2 + 15\,ab^2x - 5\,b^3\right)}{5\,\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3*x^(3/2),x, algorithm="fricas")
```

```
[Out] 2/5*(a^3*x^3 + 5*a^2*b*x^2 + 15*a*b^2*x - 5*b^3)/sqrt(x)
```

Sympy [A] time = 6.69417, size = 44, normalized size = 0.98

$$\frac{2a^3x^{\frac{5}{2}}}{5} + 2a^2bx^{\frac{3}{2}} + 6ab^2\sqrt{x} - \frac{2b^3}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**3*x**(3/2),x)
```

```
[Out] 2*a**3*x**(5/2)/5 + 2*a**2*b*x**(3/2) + 6*a*b**2*sqrt(x) - 2*b**3
/sqrt(x)
```

GIAC/XCAS [A] time = 0.22244, size = 47, normalized size = 1.04

$$\frac{2}{5}\,a^3x^{\frac{5}{2}} + 2\,a^2bx^{\frac{3}{2}} + 6\,ab^2\sqrt{x} - \frac{2\,b^3}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3*x^(3/2),x, algorithm="giac")
```

```
[Out] 2/5*a^3*x^(5/2) + 2*a^2*b*x^(3/2) + 6*a*b^2*sqrt(x) - 2*b^3/sqrt(
x)
```

3.1659 $\int \left(a+\frac{b}{x}\right)^3 \sqrt{x}\,dx$

Optimal. Leaf size=47

$$\frac{2}{3}a^3x^{3/2}+6a^2b\sqrt{x}-\frac{6ab^2}{\sqrt{x}}-\frac{2b^3}{3x^{3/2}}$$

```
[Out] (-2*b^3)/(3*x^(3/2)) - (6*a*b^2)/Sqrt[x] + 6*a^2*b*Sqrt[x] + (2*a
^3*x^(3/2))/3
```

Rubi [A] time = 0.0441103, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2}{3}a^3x^{3/2}+6a^2b\sqrt{x}-\frac{6ab^2}{\sqrt{x}}-\frac{2b^3}{3x^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^3*Sqrt[x],x]
```

```
[Out] (-2*b^3)/(3*x^(3/2)) - (6*a*b^2)/Sqrt[x] + 6*a^2*b*Sqrt[x] + (2*a
^3*x^(3/2))/3
```

Rubi in Sympy [A] time = 6.78454, size = 46, normalized size = 0.98

$$\frac{2a^3x^{\frac{3}{2}}}{3}+6a^2b\sqrt{x}-\frac{6ab^2}{\sqrt{x}}-\frac{2b^3}{3x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**3*x**(1/2),x)
```

```
[Out] 2*a**3*x**(3/2)/3 + 6*a**2*b*sqrt(x) - 6*a*b**2/sqrt(x) - 2*b**3/
(3*x**(3/2))
```

Mathematica [A] time = 0.0141429, size = 38, normalized size = 0.81

$$\frac{2\left(a^3x^3+9a^2bx^2-9ab^2x-b^3\right)}{3x^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^3*Sqrt[x],x]
```

```
[Out] (2*(-b^3 - 9*a*b^2*x + 9*a^2*b*x^2 + a^3*x^3))/(3*x^(3/2))
```

Maple [A] time = 0.007, size = 35, normalized size = 0.7

$$\frac{2\,a^3x^3+18\,a^2bx^2-18\,ab^2x-2\,b^3}{3}x^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^3*x^(1/2),x)
```

```
[Out] 2/3*(a^3*x^3+9*a^2*b*x^2-9*a*b^2*x-b^3)/x^(3/2)
```

Maxima [A] time = 1.44135, size = 49, normalized size = 1.04

$$-\frac{6\,ab^2}{\sqrt{x}} + \frac{2}{3}\left(a^3 + \frac{9\,a^2b}{x}\right)x^{\frac{3}{2}} - \frac{2\,b^3}{3\,x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3*sqrt(x),x, algorithm="maxima")
```

```
[Out] -6*a*b^2/sqrt(x) + 2/3*(a^3 + 9*a^2*b/x)*x^(3/2) - 2/3*b^3/x^(3/2
)
```

Fricas [A] time = 0.226768, size = 46, normalized size = 0.98

$$\frac{2\left(a^3x^3 + 9\,a^2bx^2 - 9\,ab^2x - b^3\right)}{3\,x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3*sqrt(x),x, algorithm="fricas")
```

```
[Out] 2/3*(a^3*x^3 + 9*a^2*b*x^2 - 9*a*b^2*x - b^3)/x^(3/2)
```

Sympy [A] time = 2.70472, size = 46, normalized size = 0.98

$$\frac{2a^3x^{\frac{3}{2}}}{3} + 6a^2b\sqrt{x} - \frac{6ab^2}{\sqrt{x}} - \frac{2b^3}{3x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**3*x**(1/2),x)
```

```
[Out] 2*a**3*x**(3/2)/3 + 6*a**2*b*sqrt(x) - 6*a*b**2/sqrt(x) - 2*b**3/
(3*x**(3/2))
```

GIAC/XCAS [A] time = 0.229915, size = 46, normalized size = 0.98

$$\frac{2}{3}\,a^3x^{\frac{3}{2}} + 6\,a^2b\sqrt{x} - \frac{2\left(9\,ab^2x + b^3\right)}{3\,x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3*sqrt(x),x, algorithm="giac")
```

```
[Out] 2/3*a^3*x^(3/2) + 6*a^2*b*sqrt(x) - 2/3*(9*a*b^2*x + b^3)/x^(3/2)
```

3.1660 $\int \frac{\left(a+\frac{b}{x}\right)^3}{\sqrt{x}}\,dx$

Optimal. Leaf size=45

$$2a^3\sqrt{x}-\frac{6a^2b}{\sqrt{x}}-\frac{2ab^2}{x^{3/2}}-\frac{2b^3}{5x^{5/2}}$$

```
[Out] (-2*b^3)/(5*x^(5/2)) - (2*a*b^2)/x^(3/2) - (6*a^2*b)/Sqrt[x] + 2*
a^3*Sqrt[x]
```

Rubi [A] time = 0.0437228, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$2a^3\sqrt{x}-\frac{6a^2b}{\sqrt{x}}-\frac{2ab^2}{x^{3/2}}-\frac{2b^3}{5x^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^3/Sqrt[x],x]
```

```
[Out] (-2*b^3)/(5*x^(5/2)) - (2*a*b^2)/x^(3/2) - (6*a^2*b)/Sqrt[x] + 2*
a^3*Sqrt[x]
```

Rubi in Sympy [A] time = 6.88763, size = 44, normalized size = 0.98

$$2a^3\sqrt{x}-\frac{6a^2b}{\sqrt{x}}-\frac{2ab^2}{x^{\frac{3}{2}}}-\frac{2b^3}{5x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**3/x**(1/2),x)
```

```
[Out] 2*a**3*sqrt(x) - 6*a**2*b/sqrt(x) - 2*a*b**2/x**(3/2) - 2*b**3/(5
*x**(5/2))
```

Mathematica [A] time = 0.0148408, size = 39, normalized size = 0.87

$$\frac{2\left(5a^3x^3-15a^2bx^2-5ab^2x-b^3\right)}{5x^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^3/Sqrt[x],x]
```

```
[Out] (2*(-b^3 - 5*a*b^2*x - 15*a^2*b*x^2 + 5*a^3*x^3))/(5*x^(5/2))
```

Maple [A] time = 0.008, size = 36, normalized size = 0.8

$$\frac{10\,a^3x^3-30\,a^2bx^2-10\,ab^2x-2\,b^3}{5}x^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^3/x^(1/2),x)

[Out] 2/5*(5*a^3*x^3-15*a^2*b*x^2-5*a*b^2*x-b^3)/x^(5/2)
```

Maxima [A] time = 1.43719, size = 47, normalized size = 1.04

$$2\,a^3\sqrt{x} - \frac{6\,a^2b}{\sqrt{x}} - \frac{2\,ab^2}{x^{\frac{3}{2}}} - \frac{2\,b^3}{5\,x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3/sqrt(x),x, algorithm="maxima")

[Out] 2*a^3*sqrt(x) - 6*a^2*b/sqrt(x) - 2*a*b^2/x^(3/2) - 2/5*b^3/x^(5/
2)
```

Fricas [A] time = 0.225973, size = 47, normalized size = 1.04

$$\frac{2\left(5\,a^3x^3 - 15\,a^2bx^2 - 5\,ab^2x - b^3\right)}{5\,x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3/sqrt(x),x, algorithm="fricas")

[Out] 2/5*(5*a^3*x^3 - 15*a^2*b*x^2 - 5*a*b^2*x - b^3)/x^(5/2)
```

Sympy [A] time = 2.6717, size = 44, normalized size = 0.98

$$2a^3\sqrt{x} - \frac{6a^2b}{\sqrt{x}} - \frac{2ab^2}{x^{\frac{3}{2}}} - \frac{2b^3}{5x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**3/x**(1/2),x)

[Out] 2*a**3*sqrt(x) - 6*a**2*b/sqrt(x) - 2*a*b**2/x**(3/2) - 2*b**3/(5
*x**(5/2))
```

GIAC/XCAS [A] time = 0.222939, size = 46, normalized size = 1.02

$$2\,a^3\sqrt{x} - \frac{2\left(15\,a^2bx^2 + 5\,ab^2x + b^3\right)}{5\,x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3/sqrt(x),x, algorithm="giac")

[Out] 2*a^3*sqrt(x) - 2/5*(15*a^2*b*x^2 + 5*a*b^2*x + b^3)/x^(5/2)
```

3.1661 $\int \frac{\left(a+\frac{b}{x}\right)^3}{x^{3/2}}\,dx$

Optimal. Leaf size=47

$$-\frac{2a^3}{\sqrt{x}}-\frac{2a^2b}{x^{3/2}}-\frac{6ab^2}{5x^{5/2}}-\frac{2b^3}{7x^{7/2}}$$

```
[Out] (-2*b^3)/(7*x^(7/2)) - (6*a*b^2)/(5*x^(5/2)) - (2*a^2*b)/x^(3/2)
- (2*a^3)/Sqrt[x]
```

Rubi [A] time = 0.0443205, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2a^3}{\sqrt{x}}-\frac{2a^2b}{x^{3/2}}-\frac{6ab^2}{5x^{5/2}}-\frac{2b^3}{7x^{7/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^3/x^(3/2),x]
```

```
[Out] (-2*b^3)/(7*x^(7/2)) - (6*a*b^2)/(5*x^(5/2)) - (2*a^2*b)/x^(3/2)
- (2*a^3)/Sqrt[x]
```

Rubi in Sympy [A] time = 6.91969, size = 48, normalized size = 1.02

$$-\frac{2a^3}{\sqrt{x}}-\frac{2a^2b}{x^{\frac{3}{2}}}-\frac{6ab^2}{5x^{\frac{5}{2}}}-\frac{2b^3}{7x^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**3/x**(3/2),x)
```

```
[Out] -2*a**3/sqrt(x) - 2*a**2*b/x**(3/2) - 6*a*b**2/(5*x**(5/2)) - 2*b
**3/(7*x**(7/2))
```

Mathematica [A] time = 0.015259, size = 39, normalized size = 0.83

$$-\frac{2\left(35a^3x^3+35a^2bx^2+21ab^2x+5b^3\right)}{35x^{7/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^3/x^(3/2),x]
```

```
[Out] (-2*(5*b^3 + 21*a*b^2*x + 35*a^2*b*x^2 + 35*a^3*x^3))/(35*x^(7/2)
)
```

Maple [A] time = 0.006, size = 36, normalized size = 0.8

$$-\frac{70\,a^3x^3+70\,a^2bx^2+42\,ab^2x+10\,b^3}{35}x^{-\frac{7}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^3/x^(3/2),x)
```

```
[Out] -2/35*(35*a^3*x^3+35*a^2*b*x^2+21*a*b^2*x+5*b^3)/x^(7/2)
```

Maxima [A] time = 1.4354, size = 47, normalized size = 1.

$$-\frac{2\,a^3}{\sqrt{x}}-\frac{2\,a^2b}{x^{\frac{3}{2}}}-\frac{6\,ab^2}{5\,x^{\frac{5}{2}}}-\frac{2\,b^3}{7\,x^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3/x^(3/2),x, algorithm="maxima")
```

```
[Out] -2*a^3/sqrt(x) - 2*a^2*b/x^(3/2) - 6/5*a*b^2/x^(5/2) - 2/7*b^3/x^
(7/2)
```

Fricas [A] time = 0.22739, size = 47, normalized size = 1.

$$-\frac{2\,\left(35\,a^3x^3+35\,a^2bx^2+21\,ab^2x+5\,b^3\right)}{35\,x^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3/x^(3/2),x, algorithm="fricas")
```

```
[Out] -2/35*(35*a^3*x^3 + 35*a^2*b*x^2 + 21*a*b^2*x + 5*b^3)/x^(7/2)
```

Sympy [A] time = 4.06745, size = 48, normalized size = 1.02

$$-\frac{2a^3}{\sqrt{x}}-\frac{2a^2b}{x^{\frac{3}{2}}}-\frac{6ab^2}{5x^{\frac{5}{2}}}-\frac{2b^3}{7x^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**3/x**(3/2),x)
```

```
[Out] -2*a**3/sqrt(x) - 2*a**2*b/x**(3/2) - 6*a*b**2/(5*x**(5/2)) - 2*b
**3/(7*x**(7/2))
```

GIAC/XCAS [A] time = 0.225696, size = 47, normalized size = 1.

$$-\frac{2\,\left(35\,a^3x^3+35\,a^2bx^2+21\,ab^2x+5\,b^3\right)}{35\,x^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3/x^(3/2),x, algorithm="giac")
```

```
[Out] -2/35*(35*a^3*x^3 + 35*a^2*b*x^2 + 21*a*b^2*x + 5*b^3)/x^(7/2)
```

3.1662 $\int \frac{\left(a+\frac{b}{x}\right)^3}{x^{5/2}}\,dx$

Optimal. Leaf size=51

$$-\frac{2a^3}{3x^{3/2}}-\frac{6a^2b}{5x^{5/2}}-\frac{6ab^2}{7x^{7/2}}-\frac{2b^3}{9x^{9/2}}$$

```
[Out] (-2*b^3)/(9*x^(9/2)) - (6*a*b^2)/(7*x^(7/2)) - (6*a^2*b)/(5*x^(5/
2)) - (2*a^3)/(3*x^(3/2))
```

Rubi [A] time = 0.0454709, antiderivative size = 51, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2a^3}{3x^{3/2}}-\frac{6a^2b}{5x^{5/2}}-\frac{6ab^2}{7x^{7/2}}-\frac{2b^3}{9x^{9/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^3/x^(5/2),x]
```

```
[Out] (-2*b^3)/(9*x^(9/2)) - (6*a*b^2)/(7*x^(7/2)) - (6*a^2*b)/(5*x^(5/
2)) - (2*a^3)/(3*x^(3/2))
```

Rubi in Sympy [A] time = 6.82682, size = 51, normalized size = 1.

$$-\frac{2a^3}{3x^{\frac{3}{2}}}-\frac{6a^2b}{5x^{\frac{5}{2}}}-\frac{6ab^2}{7x^{\frac{7}{2}}}-\frac{2b^3}{9x^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**3/x**(5/2),x)
```

```
[Out] -2*a**3/(3*x**(3/2)) - 6*a**2*b/(5*x**(5/2)) - 6*a*b**2/(7*x**(7/
2)) - 2*b**3/(9*x**(9/2))
```

Mathematica [A] time = 0.0163428, size = 39, normalized size = 0.76

$$-\frac{2\left(105a^3x^3+189a^2bx^2+135ab^2x+35b^3\right)}{315x^{9/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^3/x^(5/2),x]
```

```
[Out] (-2*(35*b^3 + 135*a*b^2*x + 189*a^2*b*x^2 + 105*a^3*x^3))/(315*x^
(9/2))
```

Maple [A] time = 0.006, size = 36, normalized size = 0.7

$$-\frac{210\,a^3x^3+378\,a^2bx^2+270\,ab^2x+70\,b^3}{315}x^{-\frac{9}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^3/x^(5/2),x)
```

```
[Out] -2/315*(105*a^3*x^3+189*a^2*b*x^2+135*a*b^2*x+35*b^3)/x^(9/2)
```

Maxima [A] time = 1.43946, size = 47, normalized size = 0.92

$$-\frac{2\,a^3}{3\,x^{\frac{3}{2}}}-\frac{6\,a^2b}{5\,x^{\frac{5}{2}}}-\frac{6\,ab^2}{7\,x^{\frac{7}{2}}}-\frac{2\,b^3}{9\,x^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3/x^(5/2),x, algorithm="maxima")
```

```
[Out] -2/3*a^3/x^(3/2) - 6/5*a^2*b/x^(5/2) - 6/7*a*b^2/x^(7/2) - 2/9*b^
3/x^(9/2)
```

Fricas [A] time = 0.224823, size = 47, normalized size = 0.92

$$-\frac{2\left(105\,a^3x^3+189\,a^2bx^2+135\,ab^2x+35\,b^3\right)}{315\,x^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3/x^(5/2),x, algorithm="fricas")
```

```
[Out] -2/315*(105*a^3*x^3 + 189*a^2*b*x^2 + 135*a*b^2*x + 35*b^3)/x^(9/
2)
```

Sympy [A] time = 7.51885, size = 51, normalized size = 1.

$$-\frac{2a^3}{3x^{\frac{3}{2}}}-\frac{6a^2b}{5x^{\frac{5}{2}}}-\frac{6ab^2}{7x^{\frac{7}{2}}}-\frac{2b^3}{9x^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**3/x**(5/2),x)
```

```
[Out] -2*a**3/(3*x**(3/2)) - 6*a**2*b/(5*x**(5/2)) - 6*a*b**2/(7*x**(7/
2)) - 2*b**3/(9*x**(9/2))
```

GIAC/XCAS [A] time = 0.230429, size = 47, normalized size = 0.92

$$-\frac{2\left(105\,a^3x^3+189\,a^2bx^2+135\,ab^2x+35\,b^3\right)}{315\,x^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^3/x^(5/2),x, algorithm="giac")
```

```
[Out] -2/315*(105*a^3*x^3 + 189*a^2*b*x^2 + 135*a*b^2*x + 35*b^3)/x^(9/
2)
```

3.1663 $\int \frac{x^{5/2}}{a+\frac{b}{x}}\,dx$

Optimal. Leaf size=83

$$\frac{2b^{7/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{9/2}}-\frac{2b^3\sqrt{x}}{a^4}+\frac{2b^2x^{3/2}}{3a^3}-\frac{2bx^{5/2}}{5a^2}+\frac{2x^{7/2}}{7a}$$

```
[Out] (-2*b^3*Sqrt[x])/a^4 + (2*b^2*x^(3/2))/(3*a^3) - (2*b*x^(5/2))/(5
*a^2) + (2*x^(7/2))/(7*a) + (2*b^(7/2)*ArcTan[(Sqrt[a]*Sqrt[x])/S
qrt[b]])/a^(9/2)
```

Rubi [A] time = 0.113574, antiderivative size = 83, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{2b^{7/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{9/2}}-\frac{2b^3\sqrt{x}}{a^4}+\frac{2b^2x^{3/2}}{3a^3}-\frac{2bx^{5/2}}{5a^2}+\frac{2x^{7/2}}{7a}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(5/2)/(a + b/x),x]
```

```
[Out] (-2*b^3*Sqrt[x])/a^4 + (2*b^2*x^(3/2))/(3*a^3) - (2*b*x^(5/2))/(5
*a^2) + (2*x^(7/2))/(7*a) + (2*b^(7/2)*ArcTan[(Sqrt[a]*Sqrt[x])/S
qrt[b]])/a^(9/2)
```

Rubi in Sympy [A] time = 17.7212, size = 80, normalized size = 0.96

$$\frac{2x^{\frac{7}{2}}}{7a}-\frac{2bx^{\frac{5}{2}}}{5a^2}+\frac{2b^2x^{\frac{3}{2}}}{3a^3}-\frac{2b^3\sqrt{x}}{a^4}+\frac{2b^{\frac{7}{2}}\operatorname{atan}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(5/2)/(a+b/x),x)
```

```
[Out] 2*x**(7/2)/(7*a) - 2*b*x**(5/2)/(5*a**2) + 2*b**2*x**(3/2)/(3*a**
3) - 2*b**3*sqrt(x)/a**4 + 2*b**(7/2)*atan(sqrt(a)*sqrt(x)/sqrt(b
))/a**(9/2)
```

Mathematica [A] time = 0.056533, size = 72, normalized size = 0.87

$$\frac{2b^{7/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{9/2}}+\frac{2\sqrt{x}\left(15a^3x^3-21a^2bx^2+35ab^2x-105b^3\right)}{105a^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(5/2)/(a + b/x),x]
```

```
[Out] (2*Sqrt[x]*(-105*b^3 + 35*a*b^2*x - 21*a^2*b*x^2 + 15*a^3*x^3))/(
105*a^4) + (2*b^(7/2)*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/a^(9/2)
```

Maple [A] time = 0.012, size = 65, normalized size = 0.8

$$\frac{2}{7\,a}x^{\frac{7}{2}}-\frac{2\,b}{5\,a^2}x^{\frac{5}{2}}+\frac{2\,b^2}{3\,a^3}x^{\frac{3}{2}}-2\,\frac{b^3\sqrt{x}}{a^4}+2\,\frac{b^4}{a^4\sqrt{ab}}\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(5/2)/(a+b/x),x)
```

```
[Out] 2/7*x^(7/2)/a-2/5*b*x^(5/2)/a^2+2/3*b^2*x^(3/2)/a^3-2*b^3*x^(1/2)
/a^4+2*b^4/a^4/(a*b)^(1/2)*arctan(a*x^(1/2)/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5/2)/(a + b/x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.240978, size = 1, normalized size = 0.01

$$\left[\frac{105\,b^3\sqrt{-\frac{b}{a}}\log\left(\frac{ax+2\,a\sqrt{x}\sqrt{-\frac{b}{a}}-b}{ax+b}\right)+2\left(15\,a^3x^3-21\,a^2bx^2+35\,ab^2x-105\,b^3\right)\sqrt{x}}{105\,a^4}, \frac{2\left(105\,b^3\sqrt{\frac{b}{a}}\arctan\left(\frac{\sqrt{x}}{\sqrt{\frac{b}{a}}}\right)+\left(15\,a^3x^3-\right.\right.}{105\,a}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5/2)/(a + b/x),x, algorithm="fricas")
```

```
[Out] [1/105*(105*b^3*sqrt(-b/a)*log((a*x + 2*a*sqrt(x)*sqrt(-b/a) - b)
/(a*x + b)) + 2*(15*a^3*x^3 - 21*a^2*b*x^2 + 35*a*b^2*x - 105*b^3
)*sqrt(x))/a^4, 2/105*(105*b^3*sqrt(b/a)*arctan(sqrt(x)/sqrt(b/a)
) + (15*a^3*x^3 - 21*a^2*b*x^2 + 35*a*b^2*x - 105*b^3)*sqrt(x))/a
^4]
```

Sympy [A] time = 73.2032, size = 136, normalized size = 1.64

$$\begin{cases} \frac{2x^{\frac{7}{2}}}{7a} - \frac{2bx^{\frac{5}{2}}}{5a^2} + \frac{2b^2x^{\frac{3}{2}}}{3a^3} - \frac{2b^3\sqrt{x}}{a^4} - \frac{ib^{\frac{7}{2}}\log\left(-i\sqrt{b}\sqrt{\frac{1}{a}}+\sqrt{x}\right)}{a^5\sqrt{\frac{1}{a}}} + \frac{ib^{\frac{7}{2}}\log\left(i\sqrt{b}\sqrt{\frac{1}{a}}+\sqrt{x}\right)}{a^5\sqrt{\frac{1}{a}}} & \text{for } a \neq 0 \\ \frac{2x^{\frac{9}{2}}}{9b} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(5/2)/(a+b/x),x)
```

```
[Out] Piecewise((2*x**(7/2)/(7*a) - 2*b*x**(5/2)/(5*a**2) + 2*b**2*x**(
3/2)/(3*a**3) - 2*b**3*sqrt(x)/a**4 - I*b**(7/2)*log(-I*sqrt(b)*s
qrt(1/a) + sqrt(x))/(a**5*sqrt(1/a)) + I*b**(7/2)*log(I*sqrt(b)*s
qrt(1/a) + sqrt(x))/(a**5*sqrt(1/a)), Ne(a, 0)), (2*x**(9/2)/(9*b
), True))
```

GIAC/XCAS [A] time = 0.224548, size = 95, normalized size = 1.14

$$\frac{2\,b^4\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)}{\sqrt{ab}a^4} + \frac{2\left(15\,a^6x^{\frac{7}{2}} - 21\,a^5bx^{\frac{5}{2}} + 35\,a^4b^2x^{\frac{3}{2}} - 105\,a^3b^3\sqrt{x}\right)}{105\,a^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5/2)/(a + b/x),x, algorithm="giac")
```

```
[Out] 2*b^4*arctan(a*sqrt(x)/sqrt(a*b))/(sqrt(a*b)*a^4) + 2/105*(15*a^6
*x^(7/2) - 21*a^5*b*x^(5/2) + 35*a^4*b^2*x^(3/2) - 105*a^3*b^3*sq
rt(x))/a^7
```

3.1664 $\int \frac{x^{3/2}}{a+\frac{b}{x}}\,dx$

Optimal. Leaf size=68

$$-\frac{2b^{5/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{7/2}}+\frac{2b^2\sqrt{x}}{a^3}-\frac{2bx^{3/2}}{3a^2}+\frac{2x^{5/2}}{5a}$$

```
[Out] (2*b^2*Sqrt[x])/a^3 - (2*b*x^(3/2))/(3*a^2) + (2*x^(5/2))/(5*a) -
 (2*b^(5/2)*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/a^(7/2)
```

Rubi [A] time = 0.0766494, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{2b^{5/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{7/2}}+\frac{2b^2\sqrt{x}}{a^3}-\frac{2bx^{3/2}}{3a^2}+\frac{2x^{5/2}}{5a}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(3/2)/(a + b/x),x]
```

```
[Out] (2*b^2*Sqrt[x])/a^3 - (2*b*x^(3/2))/(3*a^2) + (2*x^(5/2))/(5*a) -
 (2*b^(5/2)*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/a^(7/2)
```

Rubi in Sympy [A] time = 13.8625, size = 65, normalized size = 0.96

$$\frac{2x^{\frac{5}{2}}}{5a}-\frac{2bx^{\frac{3}{2}}}{3a^2}+\frac{2b^2\sqrt{x}}{a^3}-\frac{2b^{\frac{5}{2}}\operatorname{atan}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(3/2)/(a+b/x),x)
```

```
[Out] 2*x**(5/2)/(5*a) - 2*b*x**(3/2)/(3*a**2) + 2*b**2*sqrt(x)/a**3 -
2*b**(5/2)*atan(sqrt(a)*sqrt(x)/sqrt(b))/a**(7/2)
```

Mathematica [A] time = 0.0456197, size = 61, normalized size = 0.9

$$\frac{2\sqrt{x}\left(3a^2x^2-5abx+15b^2\right)}{15a^3}-\frac{2b^{5/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{7/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(3/2)/(a + b/x),x]
```

```
[Out] (2*Sqrt[x]*(15*b^2 - 5*a*b*x + 3*a^2*x^2))/(15*a^3) - (2*b^(5/2)*
ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/a^(7/2)
```

Maple [A] time = 0.008, size = 54, normalized size = 0.8

$$\frac{2}{5\,a}x^{\frac{5}{2}}-\frac{2\,b}{3\,a^2}x^{\frac{3}{2}}+2\,\frac{b^2\sqrt{x}}{a^3}-2\,\frac{b^3}{a^3\sqrt{ab}}\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(3/2)/(a+b/x),x)
```

```
[Out] 2/5/a*x^(5/2)-2/3*b*x^(3/2)/a^2+2*b^2*x^(1/2)/a^3-2*b^3/a^3/(a*b)
^(1/2)*arctan(a*x^(1/2)/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2)/(a + b/x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.239522, size = 1, normalized size = 0.01

$$\left[\frac{15\,b^2\sqrt{-\frac{b}{a}}\log\left(\frac{ax-2\,a\sqrt{x}\sqrt{-\frac{b}{a}}-b}{ax+b}\right)+2\left(3\,a^2x^2-5\,abx+15\,b^2\right)\sqrt{x}}{15\,a^3},\ -\frac{2\left(15\,b^2\sqrt{\frac{b}{a}}\arctan\left(\frac{\sqrt{x}}{\sqrt{\frac{b}{a}}}\right)-\left(3\,a^2x^2-5\,abx+15\,b^2\right)\sqrt{x}\right)}{15\,a^3}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2)/(a + b/x),x, algorithm="fricas")
```

```
[Out] [1/15*(15*b^2*sqrt(-b/a)*log((a*x - 2*a*sqrt(x)*sqrt(-b/a) - b)/(
a*x + b)) + 2*(3*a^2*x^2 - 5*a*b*x + 15*b^2)*sqrt(x))/a^3, -2/15*
(15*b^2*sqrt(b/a)*arctan(sqrt(x)/sqrt(b/a)) - (3*a^2*x^2 - 5*a*b*
x + 15*b^2)*sqrt(x))/a^3]
```

Sympy [A] time = 23.197, size = 121, normalized size = 1.78

$$\begin{cases} \frac{2x^{\frac{5}{2}}}{5a} - \frac{2bx^{\frac{3}{2}}}{3a^2} + \frac{2b^2\sqrt{x}}{a^3} + \frac{ib^{\frac{5}{2}}\log\left(-i\sqrt{b}\sqrt{\frac{1}{a}}+\sqrt{x}\right)}{a^4\sqrt{\frac{1}{a}}} - \frac{ib^{\frac{5}{2}}\log\left(i\sqrt{b}\sqrt{\frac{1}{a}}+\sqrt{x}\right)}{a^4\sqrt{\frac{1}{a}}} & \text{for } a \neq 0 \\ \frac{2x^{\frac{7}{2}}}{7b} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(3/2)/(a+b/x),x)
```

```
[Out] Piecewise((2*x**(5/2)/(5*a) - 2*b*x**(3/2)/(3*a**2) + 2*b**2*sqrt
(x)/a**3 + I*b**(5/2)*log(-I*sqrt(b)*sqrt(1/a) + sqrt(x))/(a**4*s
qrt(1/a)) - I*b**(5/2)*log(I*sqrt(b)*sqrt(1/a) + sqrt(x))/(a**4*s
qrt(1/a)), Ne(a, 0)), (2*x**(7/2)/(7*b), True))
```

GIAC/XCAS [A] time = 0.217959, size = 80, normalized size = 1.18

$$-\frac{2\,b^{3}\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)}{\sqrt{ab}a^{3}}+\frac{2\,\left(3\,a^{4}x^{\frac{5}{2}}-5\,a^{3}bx^{\frac{3}{2}}+15\,a^{2}b^{2}\sqrt{x}\right)}{15\,a^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2)/(a + b/x),x, algorithm="giac")
```

```
[Out] -2*b^3*arctan(a*sqrt(x)/sqrt(a*b))/(sqrt(a*b)*a^3) + 2/15*(3*a^4*
x^(5/2) - 5*a^3*b*x^(3/2) + 15*a^2*b^2*sqrt(x))/a^5
```

3.1665 $\int \frac{\sqrt{x}}{a+\frac{b}{x}}\,dx$

Optimal. Leaf size=53

$$\frac{2b^{3/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{5/2}}-\frac{2b\sqrt{x}}{a^2}+\frac{2x^{3/2}}{3a}$$

```
[Out] (-2*b*Sqrt[x])/a^2 + (2*x^(3/2))/(3*a) + (2*b^(3/2)*ArcTan[(Sqrt[
a]*Sqrt[x])/Sqrt[b]])/a^(5/2)
```

Rubi [A] time = 0.0602211, antiderivative size = 53, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{2b^{3/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{5/2}}-\frac{2b\sqrt{x}}{a^2}+\frac{2x^{3/2}}{3a}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[x]/(a + b/x),x]
```

```
[Out] (-2*b*Sqrt[x])/a^2 + (2*x^(3/2))/(3*a) + (2*b^(3/2)*ArcTan[(Sqrt[
a]*Sqrt[x])/Sqrt[b]])/a^(5/2)
```

Rubi in Sympy [A] time = 10.8104, size = 49, normalized size = 0.92

$$\frac{2x^{\frac{3}{2}}}{3a}-\frac{2b\sqrt{x}}{a^2}+\frac{2b^{\frac{3}{2}}\operatorname{atan}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(1/2)/(a+b/x),x)
```

```
[Out] 2*x**(3/2)/(3*a) - 2*b*sqrt(x)/a**2 + 2*b**(3/2)*atan(sqrt(a)*sqr
t(x)/sqrt(b))/a**(5/2)
```

Mathematica [A] time = 0.0368486, size = 49, normalized size = 0.92

$$\frac{2b^{3/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{5/2}}+\frac{2\sqrt{x}(ax-3b)}{3a^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[x]/(a + b/x),x]
```

```
[Out] (2*Sqrt[x]*(-3*b + a*x))/(3*a^2) + (2*b^(3/2)*ArcTan[(Sqrt[a]*Sqr
t[x])/Sqrt[b]])/a^(5/2)
```

Maple [A] time = 0.007, size = 43, normalized size = 0.8

$$\frac{2}{3\,a}x^{\frac{3}{2}}-2\,\frac{b\sqrt{x}}{a^2}+2\,\frac{b^2}{a^2\sqrt{ab}}\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(1/2)/(a+b/x),x)
```

```
[Out] 2/3*x^(3/2)/a-2*b*x^(1/2)/a^2+2/a^2*b^2/(a*b)^(1/2)*arctan(a*x^(1
/2)/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(a + b/x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.239363, size = 1, normalized size = 0.02

$$\left[\frac{3\,b\sqrt{-\frac{b}{a}}\log\left(\frac{ax+2\,a\sqrt{x}\sqrt{-\frac{b}{a}}-b}{ax+b}\right)+2\,(ax-3\,b)\sqrt{x}}{3\,a^2},\ \frac{2\left(3\,b\sqrt{\frac{b}{a}}\arctan\left(\frac{\sqrt{x}}{\sqrt{\frac{b}{a}}}\right)+(ax-3\,b)\sqrt{x}\right)}{3\,a^2}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(a + b/x),x, algorithm="fricas")
```

```
[Out] [1/3*(3*b*sqrt(-b/a)*log((a*x + 2*a*sqrt(x)*sqrt(-b/a) - b)/(a*x
+ b)) + 2*(a*x - 3*b)*sqrt(x))/a^2, 2/3*(3*b*sqrt(b/a)*arctan(sqr
t(x)/sqrt(b/a)) + (a*x - 3*b)*sqrt(x))/a^2]
```

Sympy [A] time = 4.73743, size = 105, normalized size = 1.98

$$\begin{cases} \frac{2x^{\frac{3}{2}}}{3a} - \frac{2b\sqrt{x}}{a^2} - \frac{ib^{\frac{3}{2}}\log\left(-i\sqrt{b}\sqrt{\frac{1}{a}}+\sqrt{x}\right)}{a^3\sqrt{\frac{1}{a}}} + \frac{ib^{\frac{3}{2}}\log\left(i\sqrt{b}\sqrt{\frac{1}{a}}+\sqrt{x}\right)}{a^3\sqrt{\frac{1}{a}}} & \text{for } a \neq 0 \\ \frac{2x^{\frac{5}{2}}}{5b} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(1/2)/(a+b/x),x)
```

```
[Out] Piecewise((2*x**(3/2)/(3*a) - 2*b*sqrt(x)/a**2 - I*b**(3/2)*log(-
I*sqrt(b)*sqrt(1/a) + sqrt(x))/(a**3*sqrt(1/a)) + I*b**(3/2)*log(
I*sqrt(b)*sqrt(1/a) + sqrt(x))/(a**3*sqrt(1/a)), Ne(a, 0)), (2*x*
*(5/2)/(5*b), True))
```

GIAC/XCAS [A] time = 0.223446, size = 61, normalized size = 1.15

$$\frac{2\,b^2\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)}{\sqrt{ab}a^2} + \frac{2\left(a^2x^{\frac{3}{2}} - 3\,ab\sqrt{x}\right)}{3\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(a + b/x),x, algorithm="giac")
```

```
[Out] 2*b^2*arctan(a*sqrt(x)/sqrt(a*b))/(sqrt(a*b)*a^2) + 2/3*(a^2*x^(3
/2) - 3*a*b*sqrt(x))/a^3
```

3.1666 $\int \frac{1}{\left(a+\frac{b}{x}\right)\sqrt{x}}\,dx$

Optimal. Leaf size=40

$$\frac{2\sqrt{x}}{a}-\frac{2\sqrt{b}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{3/2}}$$

```
[Out] (2*Sqrt[x])/a - (2*Sqrt[b]*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/a^(
3/2)
```

Rubi [A] time = 0.0454216, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{2\sqrt{x}}{a}-\frac{2\sqrt{b}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b/x)*Sqrt[x]),x]
```

```
[Out] (2*Sqrt[x])/a - (2*Sqrt[b]*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/a^(
3/2)
```

Rubi in Sympy [A] time = 8.22622, size = 36, normalized size = 0.9

$$\frac{2\sqrt{x}}{a}-\frac{2\sqrt{b}\operatorname{atan}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b/x)/x**(1/2),x)
```

```
[Out] 2*sqrt(x)/a - 2*sqrt(b)*atan(sqrt(a)*sqrt(x)/sqrt(b))/a**(3/2)
```

Mathematica [A] time = 0.0208891, size = 40, normalized size = 1.

$$\frac{2\sqrt{x}}{a}-\frac{2\sqrt{b}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b/x)*Sqrt[x]),x]
```

```
[Out] (2*Sqrt[x])/a - (2*Sqrt[b]*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/a^(
3/2)
```

Maple [A] time = 0.008, size = 32, normalized size = 0.8

$$2\,\frac{\sqrt{x}}{a}-2\,\frac{b}{a\sqrt{ab}}\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)/x^(1/2),x)
```

```
[Out] 2*x^(1/2)/a-2*b/a/(a*b)^(1/2)*arctan(a*x^(1/2)/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)*sqrt(x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.239034, size = 1, normalized size = 0.02

$$\left[\frac{\sqrt{-\frac{b}{a}}\log\left(\frac{ax-2\,a\sqrt{x}\sqrt{-\frac{b}{a}}-b}{ax+b}\right)+2\,\sqrt{x}}{a}, -\frac{2\left(\sqrt{\frac{b}{a}}\arctan\left(\frac{\sqrt{x}}{\sqrt{\frac{b}{a}}}\right)-\sqrt{x}\right)}{a}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)*sqrt(x)),x, algorithm="fricas")
```

```
[Out] [(sqrt(-b/a)*log((a*x - 2*a*sqrt(x)*sqrt(-b/a) - b)/(a*x + b)) +
2*sqrt(x))/a, -2*(sqrt(b/a)*arctan(sqrt(x)/sqrt(b/a)) - sqrt(x))/
a]
```

Sympy [A] time = 4.90047, size = 92, normalized size = 2.3

$$\begin{cases} \frac{2\sqrt{x}}{a} + \frac{i\sqrt{b}\log\left(-i\sqrt{b}\sqrt{\frac{1}{a}}+\sqrt{x}\right)}{a^2\sqrt{\frac{1}{a}}} - \frac{i\sqrt{b}\log\left(i\sqrt{b}\sqrt{\frac{1}{a}}+\sqrt{x}\right)}{a^2\sqrt{\frac{1}{a}}} & \text{for}\: a \neq 0 \\ \frac{2x^{\frac{3}{2}}}{3b} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)/x**(1/2),x)
```

```
[Out] Piecewise((2*sqrt(x)/a + I*sqrt(b)*log(-I*sqrt(b)*sqrt(1/a) + sqr
t(x))/(a**2*sqrt(1/a)) - I*sqrt(b)*log(I*sqrt(b)*sqrt(1/a) + sqrt
(x))/(a**2*sqrt(1/a)), Ne(a, 0)), (2*x**(3/2)/(3*b), True))
```

GIAC/XCAS [A] time = 0.220006, size = 42, normalized size = 1.05

$$-\frac{2\,b\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)}{\sqrt{ab}a} + \frac{2\,\sqrt{x}}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)*sqrt(x)),x, algorithm="giac")
```

```
[Out] -2*b*arctan(a*sqrt(x)/sqrt(a*b))/(sqrt(a*b)*a) + 2*sqrt(x)/a
```

3.1667 $\int \frac{1}{\left(a+\frac{b}{x}\right)x^{3/2}}\,dx$

Optimal. Leaf size=29

$$\frac{2\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}}$$

```
[Out] (2*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/(Sqrt[a]*Sqrt[b])
```

Rubi [A] time = 0.0357949, antiderivative size = 29, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{2\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)*x^(3/2)),x]

[Out] (2*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/(Sqrt[a]*Sqrt[b])
```

Rubi in Sympy [A] time = 6.27091, size = 27, normalized size = 0.93

$$\frac{2\,\text{atan}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)/x**(3/2),x)

[Out] 2*atan(sqrt(a)*sqrt(x)/sqrt(b))/(sqrt(a)*sqrt(b))
```

Mathematica [A] time = 0.00949198, size = 29, normalized size = 1.

$$\frac{2\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)*x^(3/2)),x]

[Out] (2*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/(Sqrt[a]*Sqrt[b])
```

Maple [A] time = 0.007, size = 19, normalized size = 0.7

$$2\,\frac{1}{\sqrt{ab}}\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)/x^(3/2),x)
```

```
[Out] 2/(a*b)^(1/2)*arctan(a*x^(1/2)/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)*x^(3/2)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.244768, size = 1, normalized size = 0.03

$$\left[\frac{\log\left(\frac{2\,ab\sqrt{x}+\sqrt{-ab}(ax-b)}{ax+b}\right)}{\sqrt{-ab}}, -\frac{2\arctan\left(\frac{b}{\sqrt{ab}\sqrt{x}}\right)}{\sqrt{ab}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)*x^(3/2)),x, algorithm="fricas")
```

```
[Out] [log((2*a*b*sqrt(x) + sqrt(-a*b)*(a*x - b))/(a*x + b))/sqrt(-a*b)
, -2*arctan(b/(sqrt(a*b)*sqrt(x)))/sqrt(a*b)]
```

Sympy [A] time = 10.6707, size = 94, normalized size = 3.24

$$\begin{cases} \tilde{\infty}\sqrt{x} & \text{for}\ a = 0 \wedge b = 0 \\ -\frac{2}{a\sqrt{x}} & \text{for}\ b = 0 \\ \frac{2\sqrt{x}}{b} & \text{for}\ a = 0 \\ -\frac{i\log\left(-i\sqrt{b}\sqrt{\frac{1}{a}}+\sqrt{x}\right)}{a\sqrt{b}\sqrt{\frac{1}{a}}} + \frac{i\log\left(i\sqrt{b}\sqrt{\frac{1}{a}}+\sqrt{x}\right)}{a\sqrt{b}\sqrt{\frac{1}{a}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)/x**(3/2),x)
```

```
[Out] Piecewise((zoo*sqrt(x), Eq(a, 0) & Eq(b, 0)), (-2/(a*sqrt(x)), Eq
(b, 0)), (2*sqrt(x)/b, Eq(a, 0)), (-I*log(-I*sqrt(b)*sqrt(1/a) +
sqrt(x))/(a*sqrt(b)*sqrt(1/a)) + I*log(I*sqrt(b)*sqrt(1/a) + sqrt
(x))/(a*sqrt(b)*sqrt(1/a)), True))
```

GIAC/XCAS [A] time = 0.222967, size = 24, normalized size = 0.83

$$\frac{2\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)*x^(3/2)),x, algorithm="giac")
```

```
[Out] 2*arctan(a*sqrt(x)/sqrt(a*b))/sqrt(a*b)
```

3.1668 $\int \frac{1}{\left(a+\frac{b}{x}\right)x^{5/2}}\,dx$

Optimal. Leaf size=40

$$-\frac{2\sqrt{a}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{b^{3/2}}-\frac{2}{b\sqrt{x}}$$

```
[Out] -2/(b*Sqrt[x]) - (2*Sqrt[a]*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/b^
(3/2)
```

Rubi [A] time = 0.0493267, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{2\sqrt{a}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{b^{3/2}}-\frac{2}{b\sqrt{x}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)*x^(5/2)),x]
```

```
[Out] -2/(b*Sqrt[x]) - (2*Sqrt[a]*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/b^
(3/2)
```

Rubi in Sympy [A] time = 8.46567, size = 37, normalized size = 0.92

$$-\frac{2\sqrt{a}\,\mathrm{atan}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{b^{\frac{3}{2}}}-\frac{2}{b\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)/x**(5/2),x)
```

```
[Out] -2*sqrt(a)*atan(sqrt(a)*sqrt(x)/sqrt(b))/b**(3/2) - 2/(b*sqrt(x))
```

Mathematica [A] time = 0.0233428, size = 40, normalized size = 1.

$$-\frac{2\sqrt{a}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{b^{3/2}}-\frac{2}{b\sqrt{x}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)*x^(5/2)),x]
```

```
[Out] -2/(b*Sqrt[x]) - (2*Sqrt[a]*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/b^
(3/2)
```

Maple [A] time = 0.01, size = 32, normalized size = 0.8

$$-2\,\frac{a}{b\sqrt{ab}}\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)-2\,\frac{1}{b\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)/x^(5/2),x)
```

```
[Out] -2*a/b/(a*b)^(1/2)*arctan(a*x^(1/2)/(a*b)^(1/2))-2/b/x^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)*x^(5/2)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.24552, size = 1, normalized size = 0.02

$$\left[\frac{\sqrt{x}\sqrt{-\frac{a}{b}}\log\left(\frac{ax-2\,b\sqrt{x}\sqrt{-\frac{a}{b}}-b}{ax+b}\right)-2}{b\sqrt{x}}, \frac{2\left(\sqrt{x}\sqrt{\frac{a}{b}}\arctan\left(\frac{b\sqrt{\frac{a}{b}}}{a\sqrt{x}}\right)-1\right)}{b\sqrt{x}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)*x^(5/2)),x, algorithm="fricas")
```

```
[Out] [(sqrt(x)*sqrt(-a/b)*log((a*x - 2*b*sqrt(x)*sqrt(-a/b) - b)/(a*x
+ b)) - 2)/(b*sqrt(x)), 2*(sqrt(x)*sqrt(a/b)*arctan(b*sqrt(a/b)/(
a*sqrt(x))) - 1)/(b*sqrt(x))]
```

Sympy [A] time = 30.4701, size = 102, normalized size = 2.55

$$\begin{cases} \frac{\tilde{\infty}}{\sqrt{x}} & \text{for}\: a = 0 \wedge b = 0 \\ - \frac{2}{3 a x^{\frac{3}{2}}} & \text{for}\: b = 0 \\ - \frac{2}{b \sqrt{x}} & \text{for}\: a = 0 \\ - \frac{2}{b \sqrt{x}} + \frac{i \log{\left(- i \sqrt{b} \sqrt{\frac{1}{a}} + \sqrt{x} \right)}}{b^{\frac{3}{2}} \sqrt{\frac{1}{a}}} - \frac{i \log{\left(i \sqrt{b} \sqrt{\frac{1}{a}} + \sqrt{x} \right)}}{b^{\frac{3}{2}} \sqrt{\frac{1}{a}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)/x**(5/2),x)
```

```
[Out] Piecewise((zoo/sqrt(x), Eq(a, 0) & Eq(b, 0)), (-2/(3*a*x**(3/2)),
 Eq(b, 0)), (-2/(b*sqrt(x)), Eq(a, 0)), (-2/(b*sqrt(x)) + I*log(-
I*sqrt(b)*sqrt(1/a) + sqrt(x))/(b**(3/2)*sqrt(1/a)) - I*log(I*sqr
t(b)*sqrt(1/a) + sqrt(x))/(b**(3/2)*sqrt(1/a)), True))
```

GIAC/XCAS [A] time = 0.220667, size = 42, normalized size = 1.05

$$-\frac{2\,a\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)}{\sqrt{ab}b}-\frac{2}{b\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)*x^(5/2)),x, algorithm="giac")
```

```
[Out] -2*a*arctan(a*sqrt(x)/sqrt(a*b))/(sqrt(a*b)*b) - 2/(b*sqrt(x))
```

3.1669 $\int \frac{1}{\left(a+\frac{b}{x}\right)x^{7/2}}\,dx$

Optimal. Leaf size=53

$$\frac{2a^{3/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{b^{5/2}}+\frac{2a}{b^2\sqrt{x}}-\frac{2}{3bx^{3/2}}$$

```
[Out] -2/(3*b*x^(3/2)) + (2*a)/(b^2*Sqrt[x]) + (2*a^(3/2)*ArcTan[(Sqrt[
a]*Sqrt[x])/Sqrt[b]])/b^(5/2)
```

Rubi [A] time = 0.0649546, antiderivative size = 53, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{2a^{3/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{b^{5/2}}+\frac{2a}{b^2\sqrt{x}}-\frac{2}{3bx^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)*x^(7/2)),x]
```

```
[Out] -2/(3*b*x^(3/2)) + (2*a)/(b^2*Sqrt[x]) + (2*a^(3/2)*ArcTan[(Sqrt[
a]*Sqrt[x])/Sqrt[b]])/b^(5/2)
```

Rubi in Sympy [A] time = 10.7323, size = 49, normalized size = 0.92

$$\frac{2a^{\frac{3}{2}}\operatorname{atan}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{b^{\frac{5}{2}}}+\frac{2a}{b^2\sqrt{x}}-\frac{2}{3bx^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)/x**(7/2),x)
```

```
[Out] 2*a**(3/2)*atan(sqrt(a)*sqrt(x)/sqrt(b))/b**(5/2) + 2*a/(b**2*sqr
t(x)) - 2/(3*b*x**(3/2))
```

Mathematica [A] time = 0.044517, size = 50, normalized size = 0.94

$$\frac{2a^{3/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{b^{5/2}}+\frac{2(3ax-b)}{3b^2x^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)*x^(7/2)),x]
```

```
[Out] (2*(-b + 3*a*x))/(3*b^2*x^(3/2)) + (2*a^(3/2)*ArcTan[(Sqrt[a]*Sqr
t[x])/Sqrt[b]])/b^(5/2)
```

Maple [A] time = 0.013, size = 43, normalized size = 0.8

$$-\frac{2}{3\,b}x^{-\frac{3}{2}}+2\,\frac{a}{b^2\sqrt{x}}+2\,\frac{a^2}{b^2\sqrt{ab}}\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)/x^(7/2),x)
```

```
[Out] -2/3/b/x^(3/2)+2*a/b^2/x^(1/2)+2*a^2/b^2/(a*b)^(1/2)*arctan(a*x^(
1/2)/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)*x^(7/2)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.245342, size = 1, normalized size = 0.02

$$\left[\frac{3\,ax^{\frac{3}{2}}\sqrt{-\frac{a}{b}}\log\left(\frac{ax+2\,b\sqrt{x}\sqrt{-\frac{a}{b}}-b}{ax+b}\right)+6\,ax-2\,b}{3\,b^2x^{\frac{3}{2}}}, -\frac{2\left(3\,ax^{\frac{3}{2}}\sqrt{\frac{a}{b}}\arctan\left(\frac{b\sqrt{\frac{a}{b}}}{a\sqrt{x}}\right)-3\,ax+b\right)}{3\,b^2x^{\frac{3}{2}}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)*x^(7/2)),x, algorithm="fricas")
```

```
[Out] [1/3*(3*a*x^(3/2)*sqrt(-a/b)*log((a*x + 2*b*sqrt(x)*sqrt(-a/b) -
b)/(a*x + b)) + 6*a*x - 2*b)/(b^2*x^(3/2)), -2/3*(3*a*x^(3/2)*sqr
t(a/b)*arctan(b*sqrt(a/b)/(a*sqrt(x))) - 3*a*x + b)/(b^2*x^(3/2))
]
```

Sympy [A] time = 116.555, size = 121, normalized size = 2.28

$$\begin{cases} \frac{\tilde{\infty}}{x^{\frac{3}{2}}} & \text{for } a = 0 \wedge b = 0 \\ -\frac{2}{5ax^{\frac{5}{2}}} & \text{for } b = 0 \\ -\frac{2}{3bx^{\frac{3}{2}}} & \text{for } a = 0 \\ \frac{2a}{b^2\sqrt{x}} - \frac{ia\log\left(-i\sqrt{b}\sqrt{\frac{1}{a}}+\sqrt{x}\right)}{b^{\frac{5}{2}}\sqrt{\frac{1}{a}}} + \frac{ia\log\left(i\sqrt{b}\sqrt{\frac{1}{a}}+\sqrt{x}\right)}{b^{\frac{5}{2}}\sqrt{\frac{1}{a}}} - \frac{2}{3bx^{\frac{3}{2}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)/x**(7/2),x)
```

```
[Out] Piecewise((zoo/x**(3/2), Eq(a, 0) & Eq(b, 0)), (-2/(5*a*x**(5/2))
, Eq(b, 0)), (-2/(3*b*x**(3/2)), Eq(a, 0)), (2*a/(b**2*sqrt(x)) -
 I*a*log(-I*sqrt(b)*sqrt(1/a) + sqrt(x))/(b**(5/2)*sqrt(1/a)) + I
*a*log(I*sqrt(b)*sqrt(1/a) + sqrt(x))/(b**(5/2)*sqrt(1/a)) - 2/(3
*b*x**(3/2)), True))
```

GIAC/XCAS [A] time = 0.219167, size = 55, normalized size = 1.04

$$\frac{2\,a^2\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)}{\sqrt{ab}b^2}+\frac{2\,(3\,ax-b)}{3\,b^2x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)*x^(7/2)),x, algorithm="giac")
```

```
[Out] 2*a^2*arctan(a*sqrt(x)/sqrt(a*b))/(sqrt(a*b)*b^2) + 2/3*(3*a*x -
b)/(b^2*x^(3/2))
```

3.1670 $\int \frac{1}{\left(a+\frac{b}{x}\right)x^{9/2}}\,dx$

Optimal. Leaf size=68

$$-\frac{2a^{5/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{b^{7/2}}-\frac{2a^2}{b^3\sqrt{x}}+\frac{2a}{3b^2x^{3/2}}-\frac{2}{5bx^{5/2}}$$

```
[Out] -2/(5*b*x^(5/2)) + (2*a)/(3*b^2*x^(3/2)) - (2*a^2)/(b^3*Sqrt[x])
- (2*a^(5/2)*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/b^(7/2)
```

Rubi [A] time = 0.0814021, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{2a^{5/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{b^{7/2}}-\frac{2a^2}{b^3\sqrt{x}}+\frac{2a}{3b^2x^{3/2}}-\frac{2}{5bx^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)*x^(9/2)),x]
```

```
[Out] -2/(5*b*x^(5/2)) + (2*a)/(3*b^2*x^(3/2)) - (2*a^2)/(b^3*Sqrt[x])
- (2*a^(5/2)*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/b^(7/2)
```

Rubi in Sympy [A] time = 14.0524, size = 65, normalized size = 0.96

$$-\frac{2a^{\frac{5}{2}}\operatorname{atan}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{b^{\frac{7}{2}}}-\frac{2a^2}{b^3\sqrt{x}}+\frac{2a}{3b^2x^{\frac{3}{2}}}-\frac{2}{5bx^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)/x**(9/2),x)
```

```
[Out] -2*a**(5/2)*atan(sqrt(a)*sqrt(x)/sqrt(b))/b**(7/2) - 2*a**2/(b**3
*sqrt(x)) + 2*a/(3*b**2*x**(3/2)) - 2/(5*b*x**(5/2))
```

Mathematica [A] time = 0.0552518, size = 61, normalized size = 0.9

$$-\frac{2a^{5/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{b^{7/2}}-\frac{2\left(15a^2x^2-5abx+3b^2\right)}{15b^3x^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)*x^(9/2)),x]
```

```
[Out] (-2*(3*b^2 - 5*a*b*x + 15*a^2*x^2))/(15*b^3*x^(5/2)) - (2*a^(5/2)
*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/b^(7/2)
```

Maple [A] time = 0.014, size = 54, normalized size = 0.8

$$-\frac{2}{5\,b}x^{-\frac{5}{2}}-2\,\frac{a^2}{b^3\sqrt{x}}+\frac{2\,a}{3\,b^2}x^{-\frac{3}{2}}-2\,\frac{a^3}{b^3\sqrt{ab}}\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)/x^(9/2),x)
```

```
[Out] -2/5/b/x^(5/2)-2*a^2/b^3/x^(1/2)+2/3*a/b^2/x^(3/2)-2*a^3/b^3/(a*b
)^(1/2)*arctan(a*x^(1/2)/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)*x^(9/2)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.242949, size = 1, normalized size = 0.01

$$\left[\frac{15\,a^2x^{\frac{5}{2}}\sqrt{-\frac{a}{b}}\log\left(\frac{ax-2\,b\sqrt{x}\sqrt{-\frac{a}{b}}-b}{ax+b}\right)-30\,a^2x^2+10\,abx-6\,b^2}{15\,b^3x^{\frac{5}{2}}},\ \frac{2\left(15\,a^2x^{\frac{5}{2}}\sqrt{\frac{a}{b}}\arctan\left(\frac{b\sqrt{\frac{a}{b}}}{a\sqrt{x}}\right)-15\,a^2x^2+5\,abx-3\,b^2\right)}{15\,b^3x^{\frac{5}{2}}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)*x^(9/2)),x, algorithm="fricas")
```

```
[Out] [1/15*(15*a^2*x^(5/2)*sqrt(-a/b)*log((a*x - 2*b*sqrt(x)*sqrt(-a/b
) - b)/(a*x + b)) - 30*a^2*x^2 + 10*a*b*x - 6*b^2)/(b^3*x^(5/2)),
 2/15*(15*a^2*x^(5/2)*sqrt(a/b)*arctan(b*sqrt(a/b)/(a*sqrt(x))) -
 15*a^2*x^2 + 5*a*b*x - 3*b^2)/(b^3*x^(5/2))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)/x**(9/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.220148, size = 70, normalized size = 1.03

$$-\frac{2\,a^3\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)}{\sqrt{ab}b^3}-\frac{2\left(15\,a^2x^2-5\,abx+3\,b^2\right)}{15\,b^3x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)*x^(9/2)),x, algorithm="giac")
```

```
[Out] -2*a^3*arctan(a*sqrt(x)/sqrt(a*b))/(sqrt(a*b)*b^3) - 2/15*(15*a^2
*x^2 - 5*a*b*x + 3*b^2)/(b^3*x^(5/2))
```

3.1671 $\int \frac{x^{5/2}}{\left(a+\frac{b}{x}\right)^2} dx$

Optimal. Leaf size=98

$$\frac{9b^{7/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{11/2}}-\frac{9b^3\sqrt{x}}{a^5}+\frac{3b^2x^{3/2}}{a^4}-\frac{9bx^{5/2}}{5a^3}+\frac{9x^{7/2}}{7a^2}-\frac{x^{9/2}}{a(ax+b)}$$

```
[Out] (-9*b^3*Sqrt[x])/a^5 + (3*b^2*x^(3/2))/a^4 - (9*b*x^(5/2))/(5*a^3
) + (9*x^(7/2))/(7*a^2) - x^(9/2)/(a*(b + a*x)) + (9*b^(7/2)*ArcT
an[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/a^(11/2)
```

Rubi [A] time = 0.121125, antiderivative size = 98, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{9b^{7/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{11/2}}-\frac{9b^3\sqrt{x}}{a^5}+\frac{3b^2x^{3/2}}{a^4}-\frac{9bx^{5/2}}{5a^3}+\frac{9x^{7/2}}{7a^2}-\frac{x^{9/2}}{a(ax+b)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(5/2)/(a + b/x)^2,x]
```

```
[Out] (-9*b^3*Sqrt[x])/a^5 + (3*b^2*x^(3/2))/a^4 - (9*b*x^(5/2))/(5*a^3
) + (9*x^(7/2))/(7*a^2) - x^(9/2)/(a*(b + a*x)) + (9*b^(7/2)*ArcT
an[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/a^(11/2)
```

Rubi in Sympy [A] time = 22.2268, size = 92, normalized size = 0.94

$$-\frac{x^{\frac{9}{2}}}{a\left(ax+b\right)}+\frac{9x^{\frac{7}{2}}}{7a^2}-\frac{9bx^{\frac{5}{2}}}{5a^3}+\frac{3b^2x^{\frac{3}{2}}}{a^4}-\frac{9b^3\sqrt{x}}{a^5}+\frac{9b^{\frac{7}{2}}\operatorname{atan}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{\frac{11}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(5/2)/(a+b/x)**2,x)
```

```
[Out] -x**(9/2)/(a*(a*x + b)) + 9*x**(7/2)/(7*a**2) - 9*b*x**(5/2)/(5*a
**3) + 3*b**2*x**(3/2)/a**4 - 9*b**3*sqrt(x)/a**5 + 9*b**(7/2)*at
an(sqrt(a)*sqrt(x)/sqrt(b))/a**(11/2)
```

Mathematica [A] time = 0.0989349, size = 90, normalized size = 0.92

$$\frac{9b^{7/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{11/2}}+\frac{\sqrt{x}\left(10a^4x^4-18a^3bx^3+42a^2b^2x^2-210ab^3x-315b^4\right)}{35a^5(ax+b)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(5/2)/(a + b/x)^2,x]
```

```
[Out] (Sqrt[x]*(-315*b^4 - 210*a*b^3*x + 42*a^2*b^2*x^2 - 18*a^3*b*x^3
+ 10*a^4*x^4))/(35*a^5*(b + a*x)) + (9*b^(7/2)*ArcTan[(Sqrt[a]*Sq
rt[x])/Sqrt[b]])/a^(11/2)
```

Maple [A] time = 0.015, size = 83, normalized size = 0.9

$$\frac{2}{7 a^2} x^{\frac{7}{2}} - \frac{4 b}{5 a^3} x^{\frac{5}{2}} + 2 \frac{b^2 x^{3/2}}{a^4} - 8 \frac{b^3 \sqrt{x}}{a^5} - \frac{b^4}{a^5 (ax + b)} \sqrt{x} + 9 \frac{b^4}{a^5 \sqrt{ab}} \arctan\left(\frac{a \sqrt{x}}{\sqrt{ab}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(5/2)/(a+b/x)^2,x)
```

```
[Out] 2/7*x^(7/2)/a^2-4/5*b*x^(5/2)/a^3+2*b^2*x^(3/2)/a^4-8*b^3*x^(1/2)
/a^5-1/a^5*b^4*x^(1/2)/(a*x+b)+9/a^5*b^4/(a*b)^(1/2)*arctan(a*x^(
1/2)/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5/2)/(a + b/x)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.240039, size = 1, normalized size = 0.01

$$\left[\frac{315 \left(ab^3 x + b^4\right) \sqrt{-\frac{b}{a}} \log\left(\frac{ax + 2 a \sqrt{x} \sqrt{-\frac{b}{a}} - b}{ax + b}\right) + 2 \left(10 a^4 x^4 - 18 a^3 b x^3 + 42 a^2 b^2 x^2 - 210 ab^3 x - 315 b^4\right) \sqrt{x}}{70 \left(a^6 x + a^5 b\right)}, \frac{315 \left(ab^3 x + b^4\right)}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5/2)/(a + b/x)^2,x, algorithm="fricas")
```

```
[Out] [1/70*(315*(a*b^3*x + b^4)*sqrt(-b/a)*log((a*x + 2*a*sqrt(x)*sqrt
(-b/a) - b)/(a*x + b)) + 2*(10*a^4*x^4 - 18*a^3*b*x^3 + 42*a^2*b^
2*x^2 - 210*a*b^3*x - 315*b^4)*sqrt(x))/(a^6*x + a^5*b), 1/35*(31
5*(a*b^3*x + b^4)*sqrt(b/a)*arctan(sqrt(x)/sqrt(b/a)) + (10*a^4*x
^4 - 18*a^3*b*x^3 + 42*a^2*b^2*x^2 - 210*a*b^3*x - 315*b^4)*sqrt(
x))/(a^6*x + a^5*b)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(5/2)/(a+b/x)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.218882, size = 119, normalized size = 1.21

$$\frac{9 b^4 \arctan\left(\frac{a \sqrt{x}}{\sqrt{ab}}\right)}{\sqrt{ab} a^5} - \frac{b^4 \sqrt{x}}{(ax + b) a^5} + \frac{2 \left(5 a^{12} x^{\frac{7}{2}} - 14 a^{11} b x^{\frac{5}{2}} + 35 a^{10} b^2 x^{\frac{3}{2}} - 140 a^9 b^3 \sqrt{x}\right)}{35 a^{14}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5/2)/(a + b/x)^2,x, algorithm="giac")
```

```
[Out] 9*b^4*arctan(a*sqrt(x)/sqrt(a*b))/(sqrt(a*b)*a^5) - b^4*sqrt(x)/(
(a*x + b)*a^5) + 2/35*(5*a^12*x^(7/2) - 14*a^11*b*x^(5/2) + 35*a^
10*b^2*x^(3/2) - 140*a^9*b^3*sqrt(x))/a^14
```

3.1672 $\int \frac{x^{3/2}}{\left(a+\frac{b}{x}\right)^2} dx$

Optimal. Leaf size=85

$$-\frac{7b^{5/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{9/2}}+\frac{7b^2\sqrt{x}}{a^4}-\frac{7bx^{3/2}}{3a^3}+\frac{7x^{5/2}}{5a^2}-\frac{x^{7/2}}{a(ax+b)}$$

```
[Out] (7*b^2*Sqrt[x])/a^4 - (7*b*x^(3/2))/(3*a^3) + (7*x^(5/2))/(5*a^2)
 - x^(7/2)/(a*(b + a*x)) - (7*b^(5/2)*ArcTan[(Sqrt[a]*Sqrt[x])/Sq
rt[b]])/a^(9/2)
```

Rubi [A] time = 0.0982764, antiderivative size = 85, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{7b^{5/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{9/2}}+\frac{7b^2\sqrt{x}}{a^4}-\frac{7bx^{3/2}}{3a^3}+\frac{7x^{5/2}}{5a^2}-\frac{x^{7/2}}{a(ax+b)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(3/2)/(a + b/x)^2,x]
```

```
[Out] (7*b^2*Sqrt[x])/a^4 - (7*b*x^(3/2))/(3*a^3) + (7*x^(5/2))/(5*a^2)
 - x^(7/2)/(a*(b + a*x)) - (7*b^(5/2)*ArcTan[(Sqrt[a]*Sqrt[x])/Sq
rt[b]])/a^(9/2)
```

Rubi in Sympy [A] time = 17.764, size = 78, normalized size = 0.92

$$-\frac{x^{\frac{7}{2}}}{a\,(ax+b)}+\frac{7x^{\frac{5}{2}}}{5a^2}-\frac{7bx^{\frac{3}{2}}}{3a^3}+\frac{7b^2\sqrt{x}}{a^4}-\frac{7b^{\frac{5}{2}}\operatorname{atan}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(3/2)/(a+b/x)**2,x)
```

```
[Out] -x**(7/2)/(a*(a*x + b)) + 7*x**(5/2)/(5*a**2) - 7*b*x**(3/2)/(3*a
**3) + 7*b**2*sqrt(x)/a**4 - 7*b**(5/2)*atan(sqrt(a)*sqrt(x)/sqrt
(b))/a**(9/2)
```

Mathematica [A] time = 0.0857948, size = 79, normalized size = 0.93

$$\frac{\sqrt{x}\left(6a^3x^3-14a^2bx^2+70ab^2x+105b^3\right)}{15a^4(ax+b)}-\frac{7b^{5/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{9/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(3/2)/(a + b/x)^2,x]
```

```
[Out] (Sqrt[x]*(105*b^3 + 70*a*b^2*x - 14*a^2*b*x^2 + 6*a^3*x^3))/(15*a
^4*(b + a*x)) - (7*b^(5/2)*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/a^(
9/2)
```

Maple [A] time = 0.017, size = 71, normalized size = 0.8

$$\frac{2}{5a^{2}}x^{\frac{5}{2}}-\frac{4b}{3a^{3}}x^{\frac{3}{2}}+6\frac{b^{2}\sqrt{x}}{a^{4}}+\frac{b^{3}}{a^{4}(ax+b)}\sqrt{x}-7\frac{b^{3}}{a^{4}\sqrt{ab}}\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(3/2)/(a+b/x)^2,x)
```

```
[Out] 2/5*x^(5/2)/a^2-4/3*b*x^(3/2)/a^3+6*b^2*x^(1/2)/a^4+1/a^4*b^3*x^(
1/2)/(a*x+b)-7/a^4*b^3/(a*b)^(1/2)*arctan(a*x^(1/2)/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2)/(a + b/x)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.240419, size = 1, normalized size = 0.01

$$\left[\frac{105\left(ab^{2}x+b^{3}\right)\sqrt{-\frac{b}{a}}\log\left(\frac{ax-2a\sqrt{x}\sqrt{-\frac{b}{a}}-b}{ax+b}\right)+2\left(6a^{3}x^{3}-14a^{2}bx^{2}+70ab^{2}x+105b^{3}\right)\sqrt{x}}{30\left(a^{5}x+a^{4}b\right)},\right.$$
$$\left.-\frac{105\left(ab^{2}x+b^{3}\right)\sqrt{\frac{b}{a}}\arctan\left(\frac{\sqrt{x}}{\sqrt{\frac{b}{a}}}\right)-\left(6a^{3}x^{3}-14a^{2}bx^{2}+70ab^{2}x+105b^{3}\right)\sqrt{x}}{15\left(a^{5}x+a^{4}b\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2)/(a + b/x)^2,x, algorithm="fricas")
```

```
[Out] [1/30*(105*(a*b^2*x + b^3)*sqrt(-b/a)*log((a*x - 2*a*sqrt(x)*sqrt
(-b/a) - b)/(a*x + b)) + 2*(6*a^3*x^3 - 14*a^2*b*x^2 + 70*a*b^2*x
 + 105*b^3)*sqrt(x))/(a^5*x + a^4*b), -1/15*(105*(a*b^2*x + b^3)*
sqrt(b/a)*arctan(sqrt(x)/sqrt(b/a)) - (6*a^3*x^3 - 14*a^2*b*x^2 +
 70*a*b^2*x + 105*b^3)*sqrt(x))/(a^5*x + a^4*b)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(3/2)/(a+b/x)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.22281, size = 103, normalized size = 1.21

$$-\frac{7\,b^{3}\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)}{\sqrt{ab}a^{4}}+\frac{b^{3}\sqrt{x}}{(ax+b)a^{4}}+\frac{2\left(3\,a^{8}x^{\frac{5}{2}}-10\,a^{7}bx^{\frac{3}{2}}+45\,a^{6}b^{2}\sqrt{x}\right)}{15\,a^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2)/(a + b/x)^2,x, algorithm="giac")
```

```
[Out] -7*b^3*arctan(a*sqrt(x)/sqrt(a*b))/(sqrt(a*b)*a^4) + b^3*sqrt(x)/
((a*x + b)*a^4) + 2/15*(3*a^8*x^(5/2) - 10*a^7*b*x^(3/2) + 45*a^6
*b^2*sqrt(x))/a^10
```

3.1673 $\int \frac{\sqrt{x}}{\left(a+\frac{b}{x}\right)^2} dx$

Optimal. Leaf size=70

$$\frac{5b^{3/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{7/2}}-\frac{5b\sqrt{x}}{a^3}+\frac{5x^{3/2}}{3a^2}-\frac{x^{5/2}}{a(ax+b)}$$

```
[Out] (-5*b*Sqrt[x])/a^3 + (5*x^(3/2))/(3*a^2) - x^(5/2)/(a*(b + a*x))
+ (5*b^(3/2)*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/a^(7/2)
```

Rubi [A] time = 0.0777431, antiderivative size = 70, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{5b^{3/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{7/2}}-\frac{5b\sqrt{x}}{a^3}+\frac{5x^{3/2}}{3a^2}-\frac{x^{5/2}}{a(ax+b)}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[x]/(a + b/x)^2,x]
```

```
[Out] (-5*b*Sqrt[x])/a^3 + (5*x^(3/2))/(3*a^2) - x^(5/2)/(a*(b + a*x))
+ (5*b^(3/2)*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/a^(7/2)
```

Rubi in Sympy [A] time = 13.9459, size = 63, normalized size = 0.9

$$-\frac{x^{\frac{5}{2}}}{a\left(ax+b\right)}+\frac{5x^{\frac{3}{2}}}{3a^2}-\frac{5b\sqrt{x}}{a^3}+\frac{5b^{\frac{3}{2}}\operatorname{atan}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(1/2)/(a+b/x)**2,x)
```

```
[Out] -x**(5/2)/(a*(a*x + b)) + 5*x**(3/2)/(3*a**2) - 5*b*sqrt(x)/a**3
+ 5*b**(3/2)*atan(sqrt(a)*sqrt(x)/sqrt(b))/a**(7/2)
```

Mathematica [A] time = 0.0743033, size = 68, normalized size = 0.97

$$\frac{5b^{3/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{7/2}}+\frac{\sqrt{x}\left(2a^2x^2-10abx-15b^2\right)}{3a^3(ax+b)}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[x]/(a + b/x)^2,x]
```

```
[Out] (Sqrt[x]*(-15*b^2 - 10*a*b*x + 2*a^2*x^2))/(3*a^3*(b + a*x)) + (5
*b^(3/2)*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/a^(7/2)
```

Maple [A] time = 0.016, size = 61, normalized size = 0.9

$$\frac{2}{3\,a^2}x^{\frac{3}{2}}-4\,\frac{b\sqrt{x}}{a^3}-\frac{b^2}{a^3\left(ax+b\right)}\sqrt{x}+5\,\frac{b^2}{a^3\sqrt{ab}}\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(1/2)/(a+b/x)^2,x)
```

```
[Out] 2/3*x^(3/2)/a^2-4*b*x^(1/2)/a^3-1/a^3*b^2*x^(1/2)/(a*x+b)+5/a^3*b
^2/(a*b)^(1/2)*arctan(a*x^(1/2)/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(a + b/x)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.242955, size = 1, normalized size = 0.01

$$\left[\frac{15\,\left(abx+b^2\right)\sqrt{-\frac{b}{a}}\log\left(\frac{ax+2\,a\sqrt{x}\sqrt{-\frac{b}{a}}-b}{ax+b}\right)+2\,\left(2\,a^2x^2-10\,abx-15\,b^2\right)\sqrt{x}}{6\,\left(a^4x+a^3b\right)},\ \frac{15\,\left(abx+b^2\right)\sqrt{\frac{b}{a}}\arctan\left(\frac{\sqrt{x}}{\sqrt{\frac{b}{a}}}\right)+\left(2\,a^2x^2-10\right.}{3\,\left(a^4x+a^3b\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(a + b/x)^2,x, algorithm="fricas")
```

```
[Out] [1/6*(15*(a*b*x + b^2)*sqrt(-b/a)*log((a*x + 2*a*sqrt(x)*sqrt(-b/
a) - b)/(a*x + b)) + 2*(2*a^2*x^2 - 10*a*b*x - 15*b^2)*sqrt(x))/(
a^4*x + a^3*b), 1/3*(15*(a*b*x + b^2)*sqrt(b/a)*arctan(sqrt(x)/sq
rt(b/a)) + (2*a^2*x^2 - 10*a*b*x - 15*b^2)*sqrt(x))/(a^4*x + a^3*
b)]
```

Sympy [A] time = 32.0277, size = 479, normalized size = 6.84

$$\begin{cases} \tilde{\infty}x^{\frac{7}{2}} \\ \frac{2x^{\frac{3}{2}}}{3a^2} \\ \frac{2x^{\frac{7}{2}}}{7b^2} \\ \frac{4ia^3\sqrt{b}x^{\frac{5}{2}}\sqrt{\frac{1}{a}}}{6ia^5\sqrt{b}x\sqrt{\frac{1}{a}}+6ia^4b^{\frac{3}{2}}\sqrt{\frac{1}{a}}}-\frac{20ia^2b^{\frac{3}{2}}x^{\frac{3}{2}}\sqrt{\frac{1}{a}}}{6ia^5\sqrt{b}x\sqrt{\frac{1}{a}}+6ia^4b^{\frac{3}{2}}\sqrt{\frac{1}{a}}}-\frac{30iab^{\frac{5}{2}}\sqrt{x}\sqrt{\frac{1}{a}}}{6ia^5\sqrt{b}x\sqrt{\frac{1}{a}}+6ia^4b^{\frac{3}{2}}\sqrt{\frac{1}{a}}}+\frac{15ab^2x\log\left(-i\sqrt{b}\sqrt{\frac{1}{a}}+\sqrt{x}\right)}{6ia^5\sqrt{b}x\sqrt{\frac{1}{a}}+6ia^4b^{\frac{3}{2}}\sqrt{\frac{1}{a}}}-\frac{15ab^2x\log\left(i\sqrt{b}\sqrt{\frac{1}{a}}+\sqrt{x}\right)}{6ia^5\sqrt{b}x\sqrt{\frac{1}{a}}+6ia^4b^{\frac{3}{2}}\sqrt{\frac{1}{a}}}+\frac{15b}{6ia} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(1/2)/(a+b/x)**2,x)
```

```
[Out] Piecewise((zoo*x**(7/2), Eq(a, 0) & Eq(b, 0)), (2*x**(3/2)/(3*a**
2), Eq(b, 0)), (2*x**(7/2)/(7*b**2), Eq(a, 0)), (4*I*a**3*sqrt(b)
*x**(5/2)*sqrt(1/a)/(6*I*a**5*sqrt(b)*x*sqrt(1/a) + 6*I*a**4*b**(
3/2)*sqrt(1/a)) - 20*I*a**2*b**(3/2)*x**(3/2)*sqrt(1/a)/(6*I*a**5
*sqrt(b)*x*sqrt(1/a) + 6*I*a**4*b**(3/2)*sqrt(1/a)) - 30*I*a*b**(
5/2)*sqrt(x)*sqrt(1/a)/(6*I*a**5*sqrt(b)*x*sqrt(1/a) + 6*I*a**4*b
**(3/2)*sqrt(1/a)) + 15*a*b**2*x*log(-I*sqrt(b)*sqrt(1/a) + sqrt(
x))/(6*I*a**5*sqrt(b)*x*sqrt(1/a) + 6*I*a**4*b**(3/2)*sqrt(1/a))
- 15*a*b**2*x*log(I*sqrt(b)*sqrt(1/a) + sqrt(x))/(6*I*a**5*sqrt(b
```

```
)*x*sqrt(1/a) + 6*I*a**4*b**(3/2)*sqrt(1/a)) + 15*b**3*log(-I*sqr
t(b)*sqrt(1/a) + sqrt(x))/(6*I*a**5*sqrt(b)*x*sqrt(1/a) + 6*I*a**
4*b**(3/2)*sqrt(1/a)) - 15*b**3*log(I*sqrt(b)*sqrt(1/a) + sqrt(x)
)/(6*I*a**5*sqrt(b)*x*sqrt(1/a) + 6*I*a**4*b**(3/2)*sqrt(1/a)), T
rue))
```

GIAC/XCAS [A] time = 0.228191, size = 88, normalized size = 1.26

$$\frac{5\,b^{2}\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)}{\sqrt{ab}a^{3}}-\frac{b^{2}\sqrt{x}}{(ax+b)a^{3}}+\frac{2\left(a^{4}x^{\frac{3}{2}}-6\,a^{3}b\sqrt{x}\right)}{3\,a^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(a + b/x)^2,x, algorithm="giac")
```

```
[Out] 5*b^2*arctan(a*sqrt(x)/sqrt(a*b))/(sqrt(a*b)*a^3) - b^2*sqrt(x)/(
(a*x + b)*a^3) + 2/3*(a^4*x^(3/2) - 6*a^3*b*sqrt(x))/a^6
```

3.1674 $\int \frac{1}{\left(a+\frac{b}{x}\right)^2 \sqrt{x}}\,dx$

Optimal. Leaf size=57

$$-\frac{3\sqrt{b}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{5/2}}+\frac{3\sqrt{x}}{a^2}-\frac{x^{3/2}}{a(ax+b)}$$

```
[Out] (3*Sqrt[x])/a^2 - x^(3/2)/(a*(b + a*x)) - (3*Sqrt[b]*ArcTan[(Sqrt
[a]*Sqrt[x])/Sqrt[b]])/a^(5/2)
```

Rubi [A] time = 0.0635048, antiderivative size = 57, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{3\sqrt{b}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{5/2}}+\frac{3\sqrt{x}}{a^2}-\frac{x^{3/2}}{a(ax+b)}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b/x)^2*Sqrt[x]),x]
```

```
[Out] (3*Sqrt[x])/a^2 - x^(3/2)/(a*(b + a*x)) - (3*Sqrt[b]*ArcTan[(Sqrt
[a]*Sqrt[x])/Sqrt[b]])/a^(5/2)
```

Rubi in Sympy [A] time = 11.1167, size = 49, normalized size = 0.86

$$-\frac{x^{\frac{3}{2}}}{a\,(ax+b)}+\frac{3\sqrt{x}}{a^2}-\frac{3\sqrt{b}\,\mathrm{atan}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b/x)**2/x**(1/2),x)
```

```
[Out] -x**(3/2)/(a*(a*x + b)) + 3*sqrt(x)/a**2 - 3*sqrt(b)*atan(sqrt(a)
*sqrt(x)/sqrt(b))/a**(5/2)
```

Mathematica [A] time = 0.0612655, size = 54, normalized size = 0.95

$$\frac{\sqrt{x}(2ax+3b)}{a^2(ax+b)}-\frac{3\sqrt{b}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b/x)^2*Sqrt[x]),x]
```

```
[Out] (Sqrt[x]*(3*b + 2*a*x))/(a^2*(b + a*x)) - (3*Sqrt[b]*ArcTan[(Sqrt
[a]*Sqrt[x])/Sqrt[b]])/a^(5/2)
```

Maple [A] time = 0.016, size = 47, normalized size = 0.8

$$2\,\frac{\sqrt{x}}{a^2}+\frac{b}{a^2\,(ax+b)}\sqrt{x}-3\,\frac{b}{a^2\sqrt{ab}}\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^2/x^(1/2),x)
```

```
[Out] 2*x^(1/2)/a^2+b/a^2*x^(1/2)/(a*x+b)-3*b/a^2/(a*b)^(1/2)*arctan(a*
x^(1/2)/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*sqrt(x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.241943, size = 1, normalized size = 0.02

$$\left[\frac{3\,(ax+b)\sqrt{-\frac{b}{a}}\log\left(\frac{ax-2\,a\sqrt{x}\sqrt{-\frac{b}{a}}-b}{ax+b}\right)+2\,(2\,ax+3\,b)\sqrt{x}}{2\,(a^3x+a^2b)},-\frac{3\,(ax+b)\sqrt{\frac{b}{a}}\arctan\left(\frac{\sqrt{x}}{\sqrt{\frac{b}{a}}}\right)-(2\,ax+3\,b)\sqrt{x}}{a^3x+a^2b}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*sqrt(x)),x, algorithm="fricas")
```

```
[Out] [1/2*(3*(a*x + b)*sqrt(-b/a)*log((a*x - 2*a*sqrt(x)*sqrt(-b/a) -
b)/(a*x + b)) + 2*(2*a*x + 3*b)*sqrt(x))/(a^3*x + a^2*b), -(3*(a*
x + b)*sqrt(b/a)*arctan(sqrt(x)/sqrt(b/a)) - (2*a*x + 3*b)*sqrt(x
))/(a^3*x + a^2*b)]
```

Sympy [A] time = 32.9017, size = 411, normalized size = 7.21

$$\begin{cases} \tilde{\infty}x^{\frac{5}{2}} \\ \frac{2\sqrt{x}}{a^2} \\ \frac{2x^{\frac{5}{2}}}{5b^2} \\ \frac{4ia^2\sqrt{b}x^{\frac{3}{2}}\sqrt{\frac{1}{a}}}{2ia^4\sqrt{b}x\sqrt{\frac{1}{a}}+2ia^3b^{\frac{3}{2}}\sqrt{\frac{1}{a}}}+\frac{6iab^{\frac{3}{2}}\sqrt{x}\sqrt{\frac{1}{a}}}{2ia^4\sqrt{b}x\sqrt{\frac{1}{a}}+2ia^3b^{\frac{3}{2}}\sqrt{\frac{1}{a}}}-\frac{3abx\log\left(-i\sqrt{b}\sqrt{\frac{1}{a}}+\sqrt{x}\right)}{2ia^4\sqrt{b}x\sqrt{\frac{1}{a}}+2ia^3b^{\frac{3}{2}}\sqrt{\frac{1}{a}}}+\frac{3abx\log\left(i\sqrt{b}\sqrt{\frac{1}{a}}+\sqrt{x}\right)}{2ia^4\sqrt{b}x\sqrt{\frac{1}{a}}+2ia^3b^{\frac{3}{2}}\sqrt{\frac{1}{a}}}-\frac{3b^2\log\left(-i\sqrt{b}\sqrt{\frac{1}{a}}+\sqrt{x}\right)}{2ia^4\sqrt{b}x\sqrt{\frac{1}{a}}+2ia^3b^{\frac{3}{2}}\sqrt{\frac{1}{a}}}+\frac{3b^2 l}{2ia^4\sqrt{}} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**2/x**(1/2),x)
```

```
[Out] Piecewise((zoo*x**(5/2), Eq(a, 0) & Eq(b, 0)), (2*sqrt(x)/a**2, E
q(b, 0)), (2*x**(5/2)/(5*b**2), Eq(a, 0)), (4*I*a**2*sqrt(b)*x**(
3/2)*sqrt(1/a)/(2*I*a**4*sqrt(b)*x*sqrt(1/a) + 2*I*a**3*b**(3/2)*
sqrt(1/a)) + 6*I*a*b**(3/2)*sqrt(x)*sqrt(1/a)/(2*I*a**4*sqrt(b)*x
*sqrt(1/a) + 2*I*a**3*b**(3/2)*sqrt(1/a)) - 3*a*b*x*log(-I*sqrt(b
)*sqrt(1/a) + sqrt(x))/(2*I*a**4*sqrt(b)*x*sqrt(1/a) + 2*I*a**3*b
**(3/2)*sqrt(1/a)) + 3*a*b*x*log(I*sqrt(b)*sqrt(1/a) + sqrt(x))/(
2*I*a**4*sqrt(b)*x*sqrt(1/a) + 2*I*a**3*b**(3/2)*sqrt(1/a)) - 3*b
**2*log(-I*sqrt(b)*sqrt(1/a) + sqrt(x))/(2*I*a**4*sqrt(b)*x*sqrt(
1/a) + 2*I*a**3*b**(3/2)*sqrt(1/a)) + 3*b**2*log(I*sqrt(b)*sqrt(1
```

```
/a) + sqrt(x))/(2*I*a**4*sqrt(b)*x*sqrt(1/a) + 2*I*a**3*b**(3/2)*
sqrt(1/a)), True))
```

GIAC/XCAS [A] time = 0.233561, size = 62, normalized size = 1.09

$$-\frac{3\,b\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)}{\sqrt{ab}a^2}+\frac{2\,\sqrt{x}}{a^2}+\frac{b\sqrt{x}}{(ax+b)a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*sqrt(x)),x, algorithm="giac")
```

```
[Out] -3*b*arctan(a*sqrt(x)/sqrt(a*b))/(sqrt(a*b)*a^2) + 2*sqrt(x)/a^2
+ b*sqrt(x)/((a*x + b)*a^2)
```

3.1675 $\int \frac{1}{\left(a+\frac{b}{x}\right)^2 x^{3/2}} \, dx$

Optimal. Leaf size=46

$$\frac{\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{3/2}\sqrt{b}} - \frac{\sqrt{x}}{a(ax+b)}$$

```
[Out] -(Sqrt[x]/(a*(b + a*x))) + ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]]/(a^(
3/2)*Sqrt[b])
```

Rubi [A] time = 0.0513336, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$

$$\frac{\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{3/2}\sqrt{b}} - \frac{\sqrt{x}}{a(ax+b)}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b/x)^2*x^(3/2)),x]
```

```
[Out] -(Sqrt[x]/(a*(b + a*x))) + ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]]/(a^(
3/2)*Sqrt[b])
```

Rubi in Sympy [A] time = 8.833, size = 37, normalized size = 0.8

$$-\frac{\sqrt{x}}{a\left(ax+b\right)} + \frac{\operatorname{atan}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{\frac{3}{2}}\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b/x)**2/x**(3/2),x)
```

```
[Out] -sqrt(x)/(a*(a*x + b)) + atan(sqrt(a)*sqrt(x)/sqrt(b))/(a**(3/2)*
sqrt(b))
```

Mathematica [A] time = 0.0360141, size = 46, normalized size = 1.

$$\frac{\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{3/2}\sqrt{b}} - \frac{\sqrt{x}}{a(ax+b)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b/x)^2*x^(3/2)),x]
```

```
[Out] -(Sqrt[x]/(a*(b + a*x))) + ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]]/(a^(
3/2)*Sqrt[b])
```

Maple [A] time = 0.015, size = 37, normalized size = 0.8

$$-\frac{1}{a\left(ax+b\right)}\sqrt{x} + \frac{1}{a}\arctan\left(a\sqrt{x}\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^2/x^(3/2),x)
```

```
[Out] -x^(1/2)/a/(a*x+b)+1/a/(a*b)^(1/2)*arctan(a*x^(1/2)/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^(3/2)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.238939, size = 1, normalized size = 0.02

$$\left[\frac{(ax+b)\log\left(\frac{2\,ab\sqrt{x}+\sqrt{-ab}(ax-b)}{ax+b}\right)-2\,\sqrt{-ab}\sqrt{x}}{2\,(a^2x+ab)\sqrt{-ab}}, -\frac{(ax+b)\arctan\left(\frac{b}{\sqrt{ab}\sqrt{x}}\right)+\sqrt{ab}\sqrt{x}}{(a^2x+ab)\sqrt{ab}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^(3/2)),x, algorithm="fricas")
```

```
[Out] [1/2*((a*x + b)*log((2*a*b*sqrt(x) + sqrt(-a*b)*(a*x - b))/(a*x +
 b)) - 2*sqrt(-a*b)*sqrt(x))/((a^2*x + a*b)*sqrt(-a*b)), -((a*x +
 b)*arctan(b/(sqrt(a*b)*sqrt(x))) + sqrt(a*b)*sqrt(x))/((a^2*x +
a*b)*sqrt(a*b))]
```

Sympy [A] time = 84.2155, size = 337, normalized size = 7.33

$$\begin{cases} \tilde{\infty}x^{\frac{3}{2}} & \text{for} \\ \frac{2x^{\frac{3}{2}}}{3b^2} & \text{for} \\ -\frac{2}{a^2\sqrt{x}} & \text{for} \\ -\frac{2ia\sqrt{b}\sqrt{x}\sqrt{\frac{1}{a}}}{2ia^3\sqrt{b}x\sqrt{\frac{1}{a}}+2ia^2b^{\frac{3}{2}}\sqrt{\frac{1}{a}}}+\frac{ax\log\left(-i\sqrt{b}\sqrt{\frac{1}{a}}+\sqrt{x}\right)}{2ia^3\sqrt{b}x\sqrt{\frac{1}{a}}+2ia^2b^{\frac{3}{2}}\sqrt{\frac{1}{a}}}-\frac{ax\log\left(i\sqrt{b}\sqrt{\frac{1}{a}}+\sqrt{x}\right)}{2ia^3\sqrt{b}x\sqrt{\frac{1}{a}}+2ia^2b^{\frac{3}{2}}\sqrt{\frac{1}{a}}}+\frac{b\log\left(-i\sqrt{b}\sqrt{\frac{1}{a}}+\sqrt{x}\right)}{2ia^3\sqrt{b}x\sqrt{\frac{1}{a}}+2ia^2b^{\frac{3}{2}}\sqrt{\frac{1}{a}}}-\frac{b\log\left(i\sqrt{b}\sqrt{\frac{1}{a}}+\sqrt{x}\right)}{2ia^3\sqrt{b}x\sqrt{\frac{1}{a}}+2ia^2b^{\frac{3}{2}}\sqrt{\frac{1}{a}}} & \text{oth} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**2/x**(3/2),x)
```

```
[Out] Piecewise((zoo*x**(3/2), Eq(a, 0) & Eq(b, 0)), (2*x**(3/2)/(3*b**
2), Eq(a, 0)), (-2/(a**2*sqrt(x)), Eq(b, 0)), (-2*I*a*sqrt(b)*sqr
t(x)*sqrt(1/a)/(2*I*a**3*sqrt(b)*x*sqrt(1/a) + 2*I*a**2*b**(3/2)*
sqrt(1/a)) + a*x*log(-I*sqrt(b)*sqrt(1/a) + sqrt(x))/(2*I*a**3*sq
rt(b)*x*sqrt(1/a) + 2*I*a**2*b**(3/2)*sqrt(1/a)) - a*x*log(I*sqrt
(b)*sqrt(1/a) + sqrt(x))/(2*I*a**3*sqrt(b)*x*sqrt(1/a) + 2*I*a**2
*b**(3/2)*sqrt(1/a)) + b*log(-I*sqrt(b)*sqrt(1/a) + sqrt(x))/(2*I
*a**3*sqrt(b)*x*sqrt(1/a) + 2*I*a**2*b**(3/2)*sqrt(1/a)) - b*log(
I*sqrt(b)*sqrt(1/a) + sqrt(x))/(2*I*a**3*sqrt(b)*x*sqrt(1/a) + 2*
I*a**2*b**(3/2)*sqrt(1/a)), True))
```

GIAC/XCAS [A] time = 0.232223, size = 49, normalized size = 1.07

$$\frac{\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)}{\sqrt{ab}a} - \frac{\sqrt{x}}{(ax+b)a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^(3/2)),x, algorithm="giac")
```

```
[Out] arctan(a*sqrt(x)/sqrt(a*b))/(sqrt(a*b)*a) - sqrt(x)/((a*x + b)*a)
```

3.1676 $\int \frac{1}{\left(a+\frac{b}{x}\right)^2 x^{5/2}}\,dx$

Optimal. Leaf size=45

$$\frac{\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{\sqrt{a}b^{3/2}}+\frac{\sqrt{x}}{b(ax+b)}$$

```
[Out] Sqrt[x]/(b*(b + a*x)) + ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]]/(Sqrt[a
]*b^(3/2))
```

Rubi [A] time = 0.048847, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{\sqrt{a}b^{3/2}}+\frac{\sqrt{x}}{b(ax+b)}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b/x)^2*x^(5/2)),x]
```

```
[Out] Sqrt[x]/(b*(b + a*x)) + ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]]/(Sqrt[a
]*b^(3/2))
```

Rubi in Sympy [A] time = 8.59332, size = 37, normalized size = 0.82

$$\frac{\sqrt{x}}{b\,(ax+b)}+\frac{\operatorname{atan}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{\sqrt{a}b^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b/x)**2/x**(5/2),x)
```

```
[Out] sqrt(x)/(b*(a*x + b)) + atan(sqrt(a)*sqrt(x)/sqrt(b))/(sqrt(a)*b*
*(3/2))
```

Mathematica [A] time = 0.0367219, size = 45, normalized size = 1.

$$\frac{\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{\sqrt{a}b^{3/2}}+\frac{\sqrt{x}}{b(ax+b)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b/x)^2*x^(5/2)),x]
```

```
[Out] Sqrt[x]/(b*(b + a*x)) + ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]]/(Sqrt[a
]*b^(3/2))
```

Maple [A] time = 0.01, size = 36, normalized size = 0.8

$$\frac{1}{b\,(ax+b)}\sqrt{x}+\frac{1}{b}\arctan\left(a\sqrt{x}\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/(a+b/x)^2/x^(5/2),x)
```

```
[Out] x^(1/2)/b/(a*x+b)+1/b/(a*b)^(1/2)*arctan(a*x^(1/2)/(a*b)^(1/2))
```

Maxima [F]   time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x)^2*x^(5/2)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A]   time = 0.23615, size = 1, normalized size = 0.02

$$\left[\frac{(ax+b)\log\left(\frac{2\,ab\sqrt{x}+\sqrt{-ab}(ax-b)}{ax+b}\right)+2\,\sqrt{-ab}\sqrt{x}}{2\,(abx+b^2)\sqrt{-ab}},-\frac{(ax+b)\arctan\left(\frac{b}{\sqrt{ab}\sqrt{x}}\right)-\sqrt{ab}\sqrt{x}}{(abx+b^2)\sqrt{ab}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x)^2*x^(5/2)),x, algorithm="fricas")
```

```
[Out] [1/2*((a*x + b)*log((2*a*b*sqrt(x) + sqrt(-a*b)*(a*x - b))/(a*x +
 b)) + 2*sqrt(-a*b)*sqrt(x))/((a*b*x + b^2)*sqrt(-a*b)), -((a*x +
 b)*arctan(b/(sqrt(a*b)*sqrt(x))) - sqrt(a*b)*sqrt(x))/((a*b*x +
b^2)*sqrt(a*b))]
```

Sympy [F(-1)]   time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(a+b/x)**2/x**(5/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A]   time = 0.230426, size = 47, normalized size = 1.04

$$\frac{\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)}{\sqrt{ab}b}+\frac{\sqrt{x}}{(ax+b)b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x)^2*x^(5/2)),x, algorithm="giac")
```

```
[Out] arctan(a*sqrt(x)/sqrt(a*b))/(sqrt(a*b)*b) + sqrt(x)/((a*x + b)*b)
```

3.1677 $\int \frac{1}{\left(a+\frac{b}{x}\right)^2 x^{7/2}}\,dx$

Optimal. Leaf size=56

$$-\frac{3\sqrt{a}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{b^{5/2}}+\frac{1}{b\sqrt{x}(ax+b)}-\frac{3}{b^2\sqrt{x}}$$

```
[Out] -3/(b^2*Sqrt[x]) + 1/(b*Sqrt[x]*(b + a*x)) - (3*Sqrt[a]*ArcTan[(S
qrt[a]*Sqrt[x])/Sqrt[b]])/b^(5/2)
```

Rubi [A] time = 0.064875, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{3\sqrt{a}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{b^{5/2}}+\frac{1}{b\sqrt{x}(ax+b)}-\frac{3}{b^2\sqrt{x}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^2*x^(7/2)),x]
```

```
[Out] -3/(b^2*Sqrt[x]) + 1/(b*Sqrt[x]*(b + a*x)) - (3*Sqrt[a]*ArcTan[(S
qrt[a]*Sqrt[x])/Sqrt[b]])/b^(5/2)
```

Rubi in Sympy [A] time = 11.0875, size = 51, normalized size = 0.91

$$-\frac{3\sqrt{a}\,\mathrm{atan}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{b^{\frac{5}{2}}}+\frac{1}{b\sqrt{x}\,(ax+b)}-\frac{3}{b^2\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**2/x**(7/2),x)
```

```
[Out] -3*sqrt(a)*atan(sqrt(a)*sqrt(x)/sqrt(b))/b**(5/2) + 1/(b*sqrt(x)*
(a*x + b)) - 3/(b**2*sqrt(x))
```

Mathematica [A] time = 0.0623813, size = 54, normalized size = 0.96

$$\frac{-3ax-2b}{b^2\sqrt{x}(ax+b)}-\frac{3\sqrt{a}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{b^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^2*x^(7/2)),x]
```

```
[Out] (-2*b - 3*a*x)/(b^2*Sqrt[x]*(b + a*x)) - (3*Sqrt[a]*ArcTan[(Sqrt[
a]*Sqrt[x])/Sqrt[b]])/b^(5/2)
```

Maple [A] time = 0.018, size = 48, normalized size = 0.9

$$-2\,\frac{1}{b^2\sqrt{x}}-\frac{a}{b^2\,(ax+b)}\sqrt{x}-3\,\frac{a}{b^2\sqrt{ab}}\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^2/x^(7/2),x)
```

```
[Out] -2/b^2/x^(1/2)-a/b^2*x^(1/2)/(a*x+b)-3*a/b^2/(a*b)^(1/2)*arctan(a
*x^(1/2)/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^(7/2)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.247833, size = 1, normalized size = 0.02

$$\left[\frac{3\,(ax+b)\sqrt{x}\sqrt{-\frac{a}{b}}\log\left(\frac{ax-2\,b\sqrt{x}\sqrt{-\frac{a}{b}}-b}{ax+b}\right)-6\,ax-4\,b}{2\,(ab^2x+b^3)\sqrt{x}},\frac{3\,(ax+b)\sqrt{x}\sqrt{\frac{a}{b}}\arctan\left(\frac{b\sqrt{\frac{a}{b}}}{a\sqrt{x}}\right)-3\,ax-2\,b}{(ab^2x+b^3)\sqrt{x}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^(7/2)),x, algorithm="fricas")
```

```
[Out] [1/2*(3*(a*x + b)*sqrt(x)*sqrt(-a/b)*log((a*x - 2*b*sqrt(x)*sqrt(
-a/b) - b)/(a*x + b)) - 6*a*x - 4*b)/((a*b^2*x + b^3)*sqrt(x)), (
3*(a*x + b)*sqrt(x)*sqrt(a/b)*arctan(b*sqrt(a/b)/(a*sqrt(x))) - 3
*a*x - 2*b)/((a*b^2*x + b^3)*sqrt(x))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**2/x**(7/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.222794, size = 66, normalized size = 1.18

$$-\frac{3\,a\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)}{\sqrt{ab}b^2}-\frac{3\,ax+2\,b}{\left(ax^{\frac{3}{2}}+b\sqrt{x}\right)b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^(7/2)),x, algorithm="giac")
```

```
[Out] -3*a*arctan(a*sqrt(x)/sqrt(a*b))/(sqrt(a*b)*b^2) - (3*a*x + 2*b)/
((a*x^(3/2) + b*sqrt(x))*b^2)
```

3.1678 $\int \frac{1}{\left(a+\frac{b}{x}\right)^2 x^{9/2}} \, dx$

Optimal. Leaf size=69

$$\frac{5a^{3/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{b^{7/2}}+\frac{5a}{b^3\sqrt{x}}+\frac{1}{bx^{3/2}(ax+b)}-\frac{5}{3b^2x^{3/2}}$$

```
[Out] -5/(3*b^2*x^(3/2)) + (5*a)/(b^3*Sqrt[x]) + 1/(b*x^(3/2)*(b + a*x)
) + (5*a^(3/2)*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/b^(7/2)
```

Rubi [A] time = 0.0798524, antiderivative size = 69, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{5a^{3/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{b^{7/2}}+\frac{5a}{b^3\sqrt{x}}+\frac{1}{bx^{3/2}(ax+b)}-\frac{5}{3b^2x^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b/x)^2*x^(9/2)),x]
```

```
[Out] -5/(3*b^2*x^(3/2)) + (5*a)/(b^3*Sqrt[x]) + 1/(b*x^(3/2)*(b + a*x)
) + (5*a^(3/2)*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/b^(7/2)
```

Rubi in Sympy [A] time = 14.0516, size = 65, normalized size = 0.94

$$\frac{5a^{\frac{3}{2}}\operatorname{atan}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{b^{\frac{7}{2}}}+\frac{5a}{b^3\sqrt{x}}+\frac{1}{bx^{\frac{3}{2}}(ax+b)}-\frac{5}{3b^2x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b/x)**2/x**(9/2),x)
```

```
[Out] 5*a**(3/2)*atan(sqrt(a)*sqrt(x)/sqrt(b))/b**(7/2) + 5*a/(b**3*sqr
t(x)) + 1/(b*x**(3/2)*(a*x + b)) - 5/(3*b**2*x**(3/2))
```

Mathematica [A] time = 0.0753566, size = 68, normalized size = 0.99

$$\frac{5a^{3/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{b^{7/2}}+\frac{15a^2x^2+10abx-2b^2}{3b^3x^{3/2}(ax+b)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b/x)^2*x^(9/2)),x]
```

```
[Out] (-2*b^2 + 10*a*b*x + 15*a^2*x^2)/(3*b^3*x^(3/2)*(b + a*x)) + (5*a
^(3/2)*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/b^(7/2)
```

Maple [A] time = 0.02, size = 60, normalized size = 0.9

$$-\frac{2}{3\,b^2}x^{-\frac{3}{2}}+4\,\frac{a}{b^3\sqrt{x}}+\frac{a^2}{b^3\,(ax+b)}\sqrt{x}+5\,\frac{a^2}{b^3\sqrt{ab}}\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^2/x^(9/2),x)
```

```
[Out] -2/3/b^2/x^(3/2)+4*a/b^3/x^(1/2)+a^2/b^3*x^(1/2)/(a*x+b)+5*a^2/b^
3/(a*b)^(1/2)*arctan(a*x^(1/2)/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^(9/2)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.239867, size = 1, normalized size = 0.01

$$\left[\frac{30\,a^2x^2 + 20\,abx + 15\,\left(a^2x^2 + abx\right)\sqrt{x}\sqrt{-\frac{a}{b}}\log\left(\frac{ax+2\,b\sqrt{x}\sqrt{-\frac{a}{b}}-b}{ax+b}\right) - 4\,b^2}{6\,(ab^3x^2 + b^4x)\sqrt{x}}, \frac{15\,a^2x^2 + 10\,abx - 15\,\left(a^2x^2 + abx\right)\sqrt{x}\sqrt{\frac{a}{b}}\,\text{arcta}}{3\,(ab^3x^2 + b^4x)\sqrt{x}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^(9/2)),x, algorithm="fricas")
```

```
[Out] [1/6*(30*a^2*x^2 + 20*a*b*x + 15*(a^2*x^2 + a*b*x)*sqrt(x)*sqrt(-
a/b)*log((a*x + 2*b*sqrt(x)*sqrt(-a/b) - b)/(a*x + b)) - 4*b^2)/(
(a*b^3*x^2 + b^4*x)*sqrt(x)), 1/3*(15*a^2*x^2 + 10*a*b*x - 15*(a^
2*x^2 + a*b*x)*sqrt(x)*sqrt(a/b)*arctan(b*sqrt(a/b)/(a*sqrt(x)))
- 2*b^2)/((a*b^3*x^2 + b^4*x)*sqrt(x))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**2/x**(9/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.219286, size = 78, normalized size = 1.13

$$\frac{5\,a^2\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)}{\sqrt{ab}b^3} + \frac{a^2\sqrt{x}}{(ax+b)b^3} + \frac{2\,(6\,ax - b)}{3\,b^3x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^(9/2)),x, algorithm="giac")
```

```
[Out] 5*a^2*arctan(a*sqrt(x)/sqrt(a*b))/(sqrt(a*b)*b^3) + a^2*sqrt(x)/(
(a*x + b)*b^3) + 2/3*(6*a*x - b)/(b^3*x^(3/2))
```

3.1679 $\int \frac{1}{\left(a+\frac{b}{x}\right)^2 x^{11/2}}\,dx$

Optimal. Leaf size=84

$$-\frac{7a^{5/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{b^{9/2}}-\frac{7a^2}{b^4\sqrt{x}}+\frac{7a}{3b^3x^{3/2}}+\frac{1}{bx^{5/2}(ax+b)}-\frac{7}{5b^2x^{5/2}}$$

```
[Out] -7/(5*b^2*x^(5/2)) + (7*a)/(3*b^3*x^(3/2)) - (7*a^2)/(b^4*Sqrt[x]
) + 1/(b*x^(5/2)*(b + a*x)) - (7*a^(5/2)*ArcTan[(Sqrt[a]*Sqrt[x])
/Sqrt[b]])/b^(9/2)
```

Rubi [A] time = 0.101034, antiderivative size = 84, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{7a^{5/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{b^{9/2}}-\frac{7a^2}{b^4\sqrt{x}}+\frac{7a}{3b^3x^{3/2}}+\frac{1}{bx^{5/2}(ax+b)}-\frac{7}{5b^2x^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^2*x^(11/2)),x]
```

```
[Out] -7/(5*b^2*x^(5/2)) + (7*a)/(3*b^3*x^(3/2)) - (7*a^2)/(b^4*Sqrt[x]
) + 1/(b*x^(5/2)*(b + a*x)) - (7*a^(5/2)*ArcTan[(Sqrt[a]*Sqrt[x])
/Sqrt[b]])/b^(9/2)
```

Rubi in Sympy [A] time = 17.7116, size = 80, normalized size = 0.95

$$-\frac{7a^{\frac{5}{2}}\operatorname{atan}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{b^{\frac{9}{2}}}-\frac{7a^2}{b^4\sqrt{x}}+\frac{7a}{3b^3x^{\frac{3}{2}}}+\frac{1}{bx^{\frac{5}{2}}(ax+b)}-\frac{7}{5b^2x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**2/x**(11/2),x)
```

```
[Out] -7*a**(5/2)*atan(sqrt(a)*sqrt(x)/sqrt(b))/b**(9/2) - 7*a**2/(b**4
*sqrt(x)) + 7*a/(3*b**3*x**(3/2)) + 1/(b*x**(5/2)*(a*x + b)) - 7/
(5*b**2*x**(5/2))
```

Mathematica [A] time = 0.10279, size = 79, normalized size = 0.94

$$\frac{-105a^3x^3-70a^2bx^2+14ab^2x-6b^3}{15b^4x^{5/2}(ax+b)}-\frac{7a^{5/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{b^{9/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^2*x^(11/2)),x]
```

```
[Out] (-6*b^3 + 14*a*b^2*x - 70*a^2*b*x^2 - 105*a^3*x^3)/(15*b^4*x^(5/2
)*(b + a*x)) - (7*a^(5/2)*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/b^(9
/2)
```

Maple [A] time = 0.022, size = 72, normalized size = 0.9

$$-\frac{2}{5\,b^{2}}x^{-\frac{5}{2}}-6\,\frac{a^{2}}{b^{4}\sqrt{x}}+\frac{4\,a}{3\,b^{3}}x^{-\frac{3}{2}}-\frac{a^{3}}{b^{4}\left(ax+b\right)}\sqrt{x}-7\,\frac{a^{3}}{b^{4}\sqrt{ab}}\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^2/x^(11/2),x)
```

```
[Out] -2/5/b^2/x^(5/2)-6*a^2/b^4/x^(1/2)+4/3*a/b^3/x^(3/2)-a^3/b^4*x^(1
/2)/(a*x+b)-7*a^3/b^4/(a*b)^(1/2)*arctan(a*x^(1/2)/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^(11/2)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.240822, size = 1, normalized size = 0.01

$$\left[-\frac{210\,a^{3}x^{3}+140\,a^{2}bx^{2}-28\,ab^{2}x+12\,b^{3}-105\,\left(a^{3}x^{3}+a^{2}bx^{2}\right)\sqrt{x}\sqrt{-\frac{a}{b}}\log\left(\frac{ax-2\,b\sqrt{x}\sqrt{-\frac{a}{b}}-b}{ax+b}\right)}{30\,\left(ab^{4}x^{3}+b^{5}x^{2}\right)\sqrt{x}},\right.$$
$$\left.-\frac{105\,a^{3}x^{3}+70\,a^{2}bx^{2}-14\,ab^{2}x+6\,b^{3}-105\,\left(a^{3}x^{3}+a^{2}bx^{2}\right)\sqrt{x}\sqrt{\frac{a}{b}}\arctan\left(\frac{b\sqrt{\frac{a}{b}}}{a\sqrt{x}}\right)}{15\,\left(ab^{4}x^{3}+b^{5}x^{2}\right)\sqrt{x}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^(11/2)),x, algorithm="fricas")
```

```
[Out] [-1/30*(210*a^3*x^3 + 140*a^2*b*x^2 - 28*a*b^2*x + 12*b^3 - 105*(
a^3*x^3 + a^2*b*x^2)*sqrt(x)*sqrt(-a/b)*log((a*x - 2*b*sqrt(x)*sq
rt(-a/b) - b)/(a*x + b)))/((a*b^4*x^3 + b^5*x^2)*sqrt(x)), -1/15*
(105*a^3*x^3 + 70*a^2*b*x^2 - 14*a*b^2*x + 6*b^3 - 105*(a^3*x^3 +
 a^2*b*x^2)*sqrt(x)*sqrt(a/b)*arctan(b*sqrt(a/b)/(a*sqrt(x))))/((
a*b^4*x^3 + b^5*x^2)*sqrt(x))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**2/x**(11/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.221498, size = 95, normalized size = 1.13

$$-\frac{7\,a^{3}\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)}{\sqrt{ab}b^{4}}-\frac{a^{3}\sqrt{x}}{(ax+b)b^{4}}-\frac{2\,\left(45\,a^{2}x^{2}-10\,abx+3\,b^{2}\right)}{15\,b^{4}x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^2*x^(11/2)),x, algorithm="giac")
```

```
[Out] -7*a^3*arctan(a*sqrt(x)/sqrt(a*b))/(sqrt(a*b)*b^4) - a^3*sqrt(x)/
((a*x + b)*b^4) - 2/15*(45*a^2*x^2 - 10*a*b*x + 3*b^2)/(b^4*x^(5/
2))
```

3.1680 $\int \frac{x^{3/2}}{\left(a+\frac{b}{x}\right)^3} dx$

Optimal. Leaf size=110

$$-\frac{63b^{5/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4a^{11/2}}+\frac{63b^2\sqrt{x}}{4a^5}-\frac{21bx^{3/2}}{4a^4}+\frac{63x^{5/2}}{20a^3}-\frac{9x^{7/2}}{4a^2(ax+b)}-\frac{x^{9/2}}{2a(ax+b)^2}$$

```
[Out] (63*b^2*Sqrt[x])/(4*a^5) - (21*b*x^(3/2))/(4*a^4) + (63*x^(5/2))/
(20*a^3) - x^(9/2)/(2*a*(b + a*x)^2) - (9*x^(7/2))/(4*a^2*(b + a*
x)) - (63*b^(5/2)*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/(4*a^(11/2))
```

Rubi [A] time = 0.121253, antiderivative size = 110, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{63b^{5/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4a^{11/2}}+\frac{63b^2\sqrt{x}}{4a^5}-\frac{21bx^{3/2}}{4a^4}+\frac{63x^{5/2}}{20a^3}-\frac{9x^{7/2}}{4a^2(ax+b)}-\frac{x^{9/2}}{2a(ax+b)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(3/2)/(a + b/x)^3,x]
```

```
[Out] (63*b^2*Sqrt[x])/(4*a^5) - (21*b*x^(3/2))/(4*a^4) + (63*x^(5/2))/
(20*a^3) - x^(9/2)/(2*a*(b + a*x)^2) - (9*x^(7/2))/(4*a^2*(b + a*
x)) - (63*b^(5/2)*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/(4*a^(11/2))
```

Rubi in Sympy [A] time = 22.2779, size = 102, normalized size = 0.93

$$-\frac{x^{\frac{9}{2}}}{2a\left(ax+b\right)^2}-\frac{9x^{\frac{7}{2}}}{4a^2\left(ax+b\right)}+\frac{63x^{\frac{5}{2}}}{20a^3}-\frac{21bx^{\frac{3}{2}}}{4a^4}+\frac{63b^2\sqrt{x}}{4a^5}-\frac{63b^{\frac{5}{2}}\operatorname{atan}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4a^{\frac{11}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(3/2)/(a+b/x)**3,x)
```

```
[Out] -x**(9/2)/(2*a*(a*x + b)**2) - 9*x**(7/2)/(4*a**2*(a*x + b)) + 63
*x**(5/2)/(20*a**3) - 21*b*x**(3/2)/(4*a**4) + 63*b**2*sqrt(x)/(4
*a**5) - 63*b**(5/2)*atan(sqrt(a)*sqrt(x)/sqrt(b))/(4*a**(11/2))
```

Mathematica [A] time = 0.0854287, size = 92, normalized size = 0.84

$$\frac{\sqrt{x}\left(8a^4x^4-24a^3bx^3+168a^2b^2x^2+525ab^3x+315b^4\right)}{20a^5(ax+b)^2}-\frac{63b^{5/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4a^{11/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(3/2)/(a + b/x)^3,x]
```

```
[Out] (Sqrt[x]*(315*b^4 + 525*a*b^3*x + 168*a^2*b^2*x^2 - 24*a^3*b*x^3
+ 8*a^4*x^4))/(20*a^5*(b + a*x)^2) - (63*b^(5/2)*ArcTan[(Sqrt[a]*
Sqrt[x])/Sqrt[b]])/(4*a^(11/2))
```

Maple [A] time = 0.019, size = 90, normalized size = 0.8

$$\frac{2}{5\,a^{3}}x^{\frac{5}{2}}-2\,\frac{b x^{3/2}}{a^{4}}+12\,\frac{b^{2}\sqrt{x}}{a^{5}}+\frac{17\,b^{3}}{4\,a^{4}\left(ax+b\right)^{2}}x^{\frac{3}{2}}+\frac{15\,b^{4}}{4\,a^{5}\left(ax+b\right)^{2}}\sqrt{x}-\frac{63\,b^{3}}{4\,a^{5}}\arctan\left(a\sqrt{x}\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(3/2)/(a+b/x)^3,x)
```

```
[Out] 2/5*x^(5/2)/a^3-2*b*x^(3/2)/a^4+12*b^2*x^(1/2)/a^5+17/4/a^4*b^3/(
a*x+b)^2*x^(3/2)+15/4/a^5*b^4/(a*x+b)^2*x^(1/2)-63/4/a^5*b^3/(a*b
)^(1/2)*arctan(a*x^(1/2)/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2)/(a + b/x)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.239578, size = 1, normalized size = 0.01

$$\left[\frac{315\,\left(a^{2}b^{2}x^{2}+2\,ab^{3}x+b^{4}\right)\sqrt{-\frac{b}{a}}\log\left(\frac{ax-2\,a\sqrt{x}\sqrt{-\frac{b}{a}}-b}{ax+b}\right)+2\,\left(8\,a^{4}x^{4}-24\,a^{3}bx^{3}+168\,a^{2}b^{2}x^{2}+525\,ab^{3}x+315\,b^{4}\right)\sqrt{x}}{40\,\left(a^{7}x^{2}+2\,a^{6}bx+a^{5}b^{2}\right)},\right.$$
$$\left.-\frac{315\,\left(a^{2}b^{2}x^{2}+2\,ab^{3}x+b^{4}\right)\sqrt{\frac{b}{a}}\arctan\left(\frac{\sqrt{x}}{\sqrt{\frac{b}{a}}}\right)-\left(8\,a^{4}x^{4}-24\,a^{3}bx^{3}+168\,a^{2}b^{2}x^{2}+525\,ab^{3}x+315\,b^{4}\right)\sqrt{x}}{20\,\left(a^{7}x^{2}+2\,a^{6}bx+a^{5}b^{2}\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2)/(a + b/x)^3,x, algorithm="fricas")
```

```
[Out] [1/40*(315*(a^2*b^2*x^2 + 2*a*b^3*x + b^4)*sqrt(-b/a)*log((a*x -
2*a*sqrt(x)*sqrt(-b/a) - b)/(a*x + b)) + 2*(8*a^4*x^4 - 24*a^3*b*
x^3 + 168*a^2*b^2*x^2 + 525*a*b^3*x + 315*b^4)*sqrt(x))/(a^7*x^2
+ 2*a^6*b*x + a^5*b^2), -1/20*(315*(a^2*b^2*x^2 + 2*a*b^3*x + b^4
)*sqrt(b/a)*arctan(sqrt(x)/sqrt(b/a)) - (8*a^4*x^4 - 24*a^3*b*x^3
 + 168*a^2*b^2*x^2 + 525*a*b^3*x + 315*b^4)*sqrt(x))/(a^7*x^2 + 2
*a^6*b*x + a^5*b^2)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(3/2)/(a+b/x)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.229399, size = 119, normalized size = 1.08

$$-\frac{63\,b^3\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)}{4\,\sqrt{ab}a^5}+\frac{17\,ab^3x^{\frac{3}{2}}+15\,b^4\sqrt{x}}{4\,(ax+b)^2a^5}+\frac{2\left(a^{12}x^{\frac{5}{2}}-5\,a^{11}bx^{\frac{3}{2}}+30\,a^{10}b^2\sqrt{x}\right)}{5\,a^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2)/(a + b/x)^3,x, algorithm="giac")
```

```
[Out] -63/4*b^3*arctan(a*sqrt(x)/sqrt(a*b))/(sqrt(a*b)*a^5) + 1/4*(17*a
*b^3*x^(3/2) + 15*b^4*sqrt(x))/((a*x + b)^2*a^5) + 2/5*(a^12*x^(5
/2) - 5*a^11*b*x^(3/2) + 30*a^10*b^2*sqrt(x))/a^15
```

3.1681 $\int \frac{\sqrt{x}}{\left(a+\frac{b}{x}\right)^3} dx$

Optimal. Leaf size=95

$$\frac{35b^{3/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4a^{9/2}}-\frac{35b\sqrt{x}}{4a^4}+\frac{35x^{3/2}}{12a^3}-\frac{7x^{5/2}}{4a^2(ax+b)}-\frac{x^{7/2}}{2a(ax+b)^2}$$

```
[Out] (-35*b*Sqrt[x])/(4*a^4) + (35*x^(3/2))/(12*a^3) - x^(7/2)/(2*a*(b
 + a*x)^2) - (7*x^(5/2))/(4*a^2*(b + a*x)) + (35*b^(3/2)*ArcTan[(
Sqrt[a]*Sqrt[x])/Sqrt[b]])/(4*a^(9/2))
```

Rubi [A] time = 0.096592, antiderivative size = 95, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$

$$\frac{35b^{3/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4a^{9/2}}-\frac{35b\sqrt{x}}{4a^4}+\frac{35x^{3/2}}{12a^3}-\frac{7x^{5/2}}{4a^2(ax+b)}-\frac{x^{7/2}}{2a(ax+b)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[x]/(a + b/x)^3,x]
```

```
[Out] (-35*b*Sqrt[x])/(4*a^4) + (35*x^(3/2))/(12*a^3) - x^(7/2)/(2*a*(b
 + a*x)^2) - (7*x^(5/2))/(4*a^2*(b + a*x)) + (35*b^(3/2)*ArcTan[(
Sqrt[a]*Sqrt[x])/Sqrt[b]])/(4*a^(9/2))
```

Rubi in Sympy [A] time = 17.7114, size = 87, normalized size = 0.92

$$-\frac{x^{\frac{7}{2}}}{2a\left(ax+b\right)^2}-\frac{7x^{\frac{5}{2}}}{4a^2\left(ax+b\right)}+\frac{35x^{\frac{3}{2}}}{12a^3}-\frac{35b\sqrt{x}}{4a^4}+\frac{35b^{\frac{3}{2}}\operatorname{atan}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4a^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(1/2)/(a+b/x)**3,x)
```

```
[Out] -x**(7/2)/(2*a*(a*x + b)**2) - 7*x**(5/2)/(4*a**2*(a*x + b)) + 35
*x**(3/2)/(12*a**3) - 35*b*sqrt(x)/(4*a**4) + 35*b**(3/2)*atan(sq
rt(a)*sqrt(x)/sqrt(b))/(4*a**(9/2))
```

Mathematica [A] time = 0.0750287, size = 81, normalized size = 0.85

$$\frac{35b^{3/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4a^{9/2}}+\frac{\sqrt{x}\left(8a^3x^3-56a^2bx^2-175ab^2x-105b^3\right)}{12a^4(ax+b)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[x]/(a + b/x)^3,x]
```

```
[Out] (Sqrt[x]*(-105*b^3 - 175*a*b^2*x - 56*a^2*b*x^2 + 8*a^3*x^3))/(12
*a^4*(b + a*x)^2) + (35*b^(3/2)*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]]
)/(4*a^(9/2))
```

Maple [A] time = 0.018, size = 79, normalized size = 0.8

$$\frac{2}{3 a^{3}} x^{\frac{3}{2}}-6 \frac{b \sqrt{x}}{a^{4}}-\frac{13 b^{2}}{4 a^{3}(a x+b)^{2}} x^{\frac{3}{2}}-\frac{11 b^{3}}{4 a^{4}(a x+b)^{2}} \sqrt{x}+\frac{35 b^{2}}{4 a^{4}} \arctan \left(a \sqrt{x} \frac{1}{\sqrt{a b}}\right) \frac{1}{\sqrt{a b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(1/2)/(a+b/x)^3,x)
```

```
[Out] 2/3*x^(3/2)/a^3-6*b*x^(1/2)/a^4-13/4/a^3*b^2/(a*x+b)^2*x^(3/2)-11
/4/a^4*b^3/(a*x+b)^2*x^(1/2)+35/4/a^4*b^2/(a*b)^(1/2)*arctan(a*x^
(1/2)/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(a + b/x)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.244782, size = 1, normalized size = 0.01

$$\left[\frac{105\left(a^{2} b x^{2}+2 a b^{2} x+b^{3}\right) \sqrt{-\frac{b}{a}} \log \left(\frac{a x+2 a \sqrt{x} \sqrt{-\frac{b}{a}}-b}{a x+b}\right)+2\left(8 a^{3} x^{3}-56 a^{2} b x^{2}-175 a b^{2} x-105 b^{3}\right) \sqrt{x}}{24\left(a^{6} x^{2}+2 a^{5} b x+a^{4} b^{2}\right)}, \frac{105\left(a^{2} b x^{2}+2 a b^{2} x\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(a + b/x)^3,x, algorithm="fricas")
```

```
[Out] [1/24*(105*(a^2*b*x^2 + 2*a*b^2*x + b^3)*sqrt(-b/a)*log((a*x + 2*
a*sqrt(x)*sqrt(-b/a) - b)/(a*x + b)) + 2*(8*a^3*x^3 - 56*a^2*b*x^
2 - 175*a*b^2*x - 105*b^3)*sqrt(x))/(a^6*x^2 + 2*a^5*b*x + a^4*b^
2), 1/12*(105*(a^2*b*x^2 + 2*a*b^2*x + b^3)*sqrt(b/a)*arctan(sqrt
(x)/sqrt(b/a)) + (8*a^3*x^3 - 56*a^2*b*x^2 - 175*a*b^2*x - 105*b^
3)*sqrt(x))/(a^6*x^2 + 2*a^5*b*x + a^4*b^2)]
```

Sympy [A] time = 144.891, size = 906, normalized size = 9.54

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(1/2)/(a+b/x)**3,x)
```

```
[Out] Piecewise((zoo*x**(9/2), Eq(a, 0) & Eq(b, 0)), (2*x**(3/2)/(3*a**
3), Eq(b, 0)), (2*x**(9/2)/(9*b**3), Eq(a, 0)), (16*I*a**4*sqrt(b
)*x**(7/2)*sqrt(1/a)/(24*I*a**7*sqrt(b)*x**2*sqrt(1/a) + 48*I*a**
6*b**(3/2)*x*sqrt(1/a) + 24*I*a**5*b**(5/2)*sqrt(1/a)) - 112*I*a*
*3*b**(3/2)*x**(5/2)*sqrt(1/a)/(24*I*a**7*sqrt(b)*x**2*sqrt(1/a)
+ 48*I*a**6*b**(3/2)*x*sqrt(1/a) + 24*I*a**5*b**(5/2)*sqrt(1/a))
- 350*I*a**2*b**(5/2)*x**(3/2)*sqrt(1/a)/(24*I*a**7*sqrt(b)*x**2*
```

```
sqrt(1/a) + 48*I*a**6*b**(3/2)*x*sqrt(1/a) + 24*I*a**5*b**(5/2)*s
qrt(1/a)) + 105*a**2*b**2*x**2*log(-I*sqrt(b)*sqrt(1/a) + sqrt(x)
)/(24*I*a**7*sqrt(b)*x**2*sqrt(1/a) + 48*I*a**6*b**(3/2)*x*sqrt(1
/a) + 24*I*a**5*b**(5/2)*sqrt(1/a)) - 105*a**2*b**2*x**2*log(I*sq
rt(b)*sqrt(1/a) + sqrt(x))/(24*I*a**7*sqrt(b)*x**2*sqrt(1/a) + 48
*I*a**6*b**(3/2)*x*sqrt(1/a) + 24*I*a**5*b**(5/2)*sqrt(1/a)) - 21
0*I*a*b**(7/2)*sqrt(x)*sqrt(1/a)/(24*I*a**7*sqrt(b)*x**2*sqrt(1/a
) + 48*I*a**6*b**(3/2)*x*sqrt(1/a) + 24*I*a**5*b**(5/2)*sqrt(1/a)
) + 210*a*b**3*x*log(-I*sqrt(b)*sqrt(1/a) + sqrt(x))/(24*I*a**7*s
qrt(b)*x**2*sqrt(1/a) + 48*I*a**6*b**(3/2)*x*sqrt(1/a) + 24*I*a**
5*b**(5/2)*sqrt(1/a)) - 210*a*b**3*x*log(I*sqrt(b)*sqrt(1/a) + sq
rt(x))/(24*I*a**7*sqrt(b)*x**2*sqrt(1/a) + 48*I*a**6*b**(3/2)*x*s
qrt(1/a) + 24*I*a**5*b**(5/2)*sqrt(1/a)) + 105*b**4*log(-I*sqrt(b
)*sqrt(1/a) + sqrt(x))/(24*I*a**7*sqrt(b)*x**2*sqrt(1/a) + 48*I*a
**6*b**(3/2)*x*sqrt(1/a) + 24*I*a**5*b**(5/2)*sqrt(1/a)) - 105*b*
*4*log(I*sqrt(b)*sqrt(1/a) + sqrt(x))/(24*I*a**7*sqrt(b)*x**2*sqr
t(1/a) + 48*I*a**6*b**(3/2)*x*sqrt(1/a) + 24*I*a**5*b**(5/2)*sqrt
(1/a)), True))
```

GIAC/XCAS [A] time = 0.222773, size = 104, normalized size = 1.09

$$\frac{35\,b^2\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)}{4\,\sqrt{ab}a^4}-\frac{13\,ab^2x^{\frac{3}{2}}+11\,b^3\sqrt{x}}{4\,(ax+b)^2a^4}+\frac{2\left(a^6x^{\frac{3}{2}}-9\,a^5b\sqrt{x}\right)}{3\,a^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(a + b/x)^3,x, algorithm="giac")
```

```
[Out] 35/4*b^2*arctan(a*sqrt(x)/sqrt(a*b))/(sqrt(a*b)*a^4) - 1/4*(13*a*
b^2*x^(3/2) + 11*b^3*sqrt(x))/((a*x + b)^2*a^4) + 2/3*(a^6*x^(3/2
) - 9*a^5*b*sqrt(x))/a^9
```

3.1682 $\int \frac{1}{\left(a+\frac{b}{x}\right)^3\sqrt{x}}\,dx$

Optimal. Leaf size=82

$$-\frac{15\sqrt{b}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4a^{7/2}}+\frac{15\sqrt{x}}{4a^3}-\frac{5x^{3/2}}{4a^2(ax+b)}-\frac{x^{5/2}}{2a(ax+b)^2}$$

```
[Out] (15*Sqrt[x])/(4*a^3) - x^(5/2)/(2*a*(b + a*x)^2) - (5*x^(3/2))/(4
*a^2*(b + a*x)) - (15*Sqrt[b]*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/
(4*a^(7/2))
```

Rubi [A] time = 0.0798338, antiderivative size = 82, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{15\sqrt{b}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4a^{7/2}}+\frac{15\sqrt{x}}{4a^3}-\frac{5x^{3/2}}{4a^2(ax+b)}-\frac{x^{5/2}}{2a(ax+b)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^3*Sqrt[x]),x]
```

```
[Out] (15*Sqrt[x])/(4*a^3) - x^(5/2)/(2*a*(b + a*x)^2) - (5*x^(3/2))/(4
*a^2*(b + a*x)) - (15*Sqrt[b]*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/
(4*a^(7/2))
```

Rubi in Sympy [A] time = 14.4742, size = 73, normalized size = 0.89

$$-\frac{x^{\frac{5}{2}}}{2a\left(ax+b\right)^2}-\frac{5x^{\frac{3}{2}}}{4a^2\left(ax+b\right)}+\frac{15\sqrt{x}}{4a^3}-\frac{15\sqrt{b}\,\mathrm{atan}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4a^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**3/x**(1/2),x)
```

```
[Out] -x**(5/2)/(2*a*(a*x + b)**2) - 5*x**(3/2)/(4*a**2*(a*x + b)) + 15
*sqrt(x)/(4*a**3) - 15*sqrt(b)*atan(sqrt(a)*sqrt(x)/sqrt(b))/(4*a
**(7/2))
```

Mathematica [A] time = 0.0668844, size = 70, normalized size = 0.85

$$\frac{\sqrt{x}\left(8a^2x^2+25abx+15b^2\right)}{4a^3(ax+b)^2}-\frac{15\sqrt{b}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4a^{7/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^3*Sqrt[x]),x]
```

```
[Out] (Sqrt[x]*(15*b^2 + 25*a*b*x + 8*a^2*x^2))/(4*a^3*(b + a*x)^2) - (
15*Sqrt[b]*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/(4*a^(7/2))
```

Maple [A] time = 0.019, size = 66, normalized size = 0.8

$$2\frac{\sqrt{x}}{a^{3}}+\frac{9b}{4a^{2}\left(ax+b\right)^{2}}x^{\frac{3}{2}}+\frac{7b^{2}}{4a^{3}\left(ax+b\right)^{2}}\sqrt{x}-\frac{15b}{4a^{3}}\arctan\left(a\sqrt{x}\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^3/x^(1/2),x)
```

```
[Out] 2*x^(1/2)/a^3+9/4/a^2*b/(a*x+b)^2*x^(3/2)+7/4/a^3*b^2/(a*x+b)^2*x
^(1/2)-15/4/a^3*b/(a*b)^(1/2)*arctan(a*x^(1/2)/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*sqrt(x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.245743, size = 1, normalized size = 0.01

$$\left[\frac{15\left(a^{2}x^{2}+2abx+b^{2}\right)\sqrt{-\frac{b}{a}}\log\left(\frac{ax-2a\sqrt{x}\sqrt{-\frac{b}{a}}-b}{ax+b}\right)+2\left(8a^{2}x^{2}+25abx+15b^{2}\right)\sqrt{x}}{8\left(a^{5}x^{2}+2a^{4}bx+a^{3}b^{2}\right)},\ -\frac{15\left(a^{2}x^{2}+2abx+b^{2}\right)\sqrt{\frac{b}{a}}\arctan\left(\frac{\sqrt{x}}{\sqrt{\frac{b}{a}}}\right)-\left(8a^{2}x^{2}+25abx+15b^{2}\right)\sqrt{x}}{4\left(a^{5}x^{2}+2a^{4}bx+a^{3}b^{2}\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*sqrt(x)),x, algorithm="fricas")
```

```
[Out] [1/8*(15*(a^2*x^2 + 2*a*b*x + b^2)*sqrt(-b/a)*log((a*x - 2*a*sqrt
(x)*sqrt(-b/a) - b)/(a*x + b)) + 2*(8*a^2*x^2 + 25*a*b*x + 15*b^2
)*sqrt(x))/(a^5*x^2 + 2*a^4*b*x + a^3*b^2), -1/4*(15*(a^2*x^2 + 2
*a*b*x + b^2)*sqrt(b/a)*arctan(sqrt(x)/sqrt(b/a)) - (8*a^2*x^2 +
25*a*b*x + 15*b^2)*sqrt(x))/(a^5*x^2 + 2*a^4*b*x + a^3*b^2)]
```

Sympy [A] time = 144.385, size = 816, normalized size = 9.95

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**3/x**(1/2),x)
```

```
[Out] Piecewise((zoo*x**(7/2), Eq(a, 0) & Eq(b, 0)), (2*sqrt(x)/a**3, E
q(b, 0)), (2*x**(7/2)/(7*b**3), Eq(a, 0)), (16*I*a**3*sqrt(b)*x**
(5/2)*sqrt(1/a)/(8*I*a**6*sqrt(b)*x**2*sqrt(1/a) + 16*I*a**5*b**(
```

```
3/2)*x*sqrt(1/a) + 8*I*a**4*b**(5/2)*sqrt(1/a)) + 50*I*a**2*b**(3
/2)*x**(3/2)*sqrt(1/a)/(8*I*a**6*sqrt(b)*x**2*sqrt(1/a) + 16*I*a*
*5*b**(3/2)*x*sqrt(1/a) + 8*I*a**4*b**(5/2)*sqrt(1/a)) - 15*a**2*
b*x**2*log(-I*sqrt(b)*sqrt(1/a) + sqrt(x))/(8*I*a**6*sqrt(b)*x**2
*sqrt(1/a) + 16*I*a**5*b**(3/2)*x*sqrt(1/a) + 8*I*a**4*b**(5/2)*s
qrt(1/a)) + 15*a**2*b*x**2*log(I*sqrt(b)*sqrt(1/a) + sqrt(x))/(8*
I*a**6*sqrt(b)*x**2*sqrt(1/a) + 16*I*a**5*b**(3/2)*x*sqrt(1/a) +
8*I*a**4*b**(5/2)*sqrt(1/a)) + 30*I*a*b**(5/2)*sqrt(x)*sqrt(1/a)/
(8*I*a**6*sqrt(b)*x**2*sqrt(1/a) + 16*I*a**5*b**(3/2)*x*sqrt(1/a)
 + 8*I*a**4*b**(5/2)*sqrt(1/a)) - 30*a*b**2*x*log(-I*sqrt(b)*sqrt
(1/a) + sqrt(x))/(8*I*a**6*sqrt(b)*x**2*sqrt(1/a) + 16*I*a**5*b**
(3/2)*x*sqrt(1/a) + 8*I*a**4*b**(5/2)*sqrt(1/a)) + 30*a*b**2*x*lo
g(I*sqrt(b)*sqrt(1/a) + sqrt(x))/(8*I*a**6*sqrt(b)*x**2*sqrt(1/a)
 + 16*I*a**5*b**(3/2)*x*sqrt(1/a) + 8*I*a**4*b**(5/2)*sqrt(1/a))
- 15*b**3*log(-I*sqrt(b)*sqrt(1/a) + sqrt(x))/(8*I*a**6*sqrt(b)*x
**2*sqrt(1/a) + 16*I*a**5*b**(3/2)*x*sqrt(1/a) + 8*I*a**4*b**(5/2
)*sqrt(1/a)) + 15*b**3*log(I*sqrt(b)*sqrt(1/a) + sqrt(x))/(8*I*a*
*6*sqrt(b)*x**2*sqrt(1/a) + 16*I*a**5*b**(3/2)*x*sqrt(1/a) + 8*I*
a**4*b**(5/2)*sqrt(1/a)), True))
```

GIAC/XCAS [A] time = 0.219049, size = 80, normalized size = 0.98

$$-\frac{15\, b \arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)}{4\,\sqrt{ab}a^{3}} + \frac{2\,\sqrt{x}}{a^{3}} + \frac{9\, abx^{\frac{3}{2}} + 7\, b^{2}\sqrt{x}}{4\,(ax+b)^{2}a^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*sqrt(x)),x, algorithm="giac")
```

```
[Out] -15/4*b*arctan(a*sqrt(x)/sqrt(a*b))/(sqrt(a*b)*a^3) + 2*sqrt(x)/a
^3 + 1/4*(9*a*b*x^(3/2) + 7*b^2*sqrt(x))/((a*x + b)^2*a^3)
```

3.1683 $\int \frac{1}{\left(a+\frac{b}{x}\right)^3 x^{3/2}}\,dx$

Optimal. Leaf size=70

$$\frac{3\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4a^{5/2}\sqrt{b}}-\frac{3\sqrt{x}}{4a^2(ax+b)}-\frac{x^{3/2}}{2a(ax+b)^2}$$

```
[Out] -x^(3/2)/(2*a*(b + a*x)^2) - (3*Sqrt[x])/(4*a^2*(b + a*x)) + (3*A
rcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/(4*a^(5/2)*Sqrt[b])
```

Rubi [A] time = 0.0677862, antiderivative size = 70, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{3\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4a^{5/2}\sqrt{b}}-\frac{3\sqrt{x}}{4a^2(ax+b)}-\frac{x^{3/2}}{2a(ax+b)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^3*x^(3/2)),x]
```

```
[Out] -x^(3/2)/(2*a*(b + a*x)^2) - (3*Sqrt[x])/(4*a^2*(b + a*x)) + (3*A
rcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/(4*a^(5/2)*Sqrt[b])
```

Rubi in Sympy [A] time = 11.8574, size = 61, normalized size = 0.87

$$-\frac{x^{\frac{3}{2}}}{2a\left(ax+b\right)^2}-\frac{3\sqrt{x}}{4a^2\left(ax+b\right)}+\frac{3\,\mathrm{atan}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4a^{\frac{5}{2}}\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**3/x**(3/2),x)
```

```
[Out] -x**(3/2)/(2*a*(a*x + b)**2) - 3*sqrt(x)/(4*a**2*(a*x + b)) + 3*a
tan(sqrt(a)*sqrt(x)/sqrt(b))/(4*a**(5/2)*sqrt(b))
```

Mathematica [A] time = 0.0626015, size = 59, normalized size = 0.84

$$\frac{3\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4a^{5/2}\sqrt{b}}-\frac{\sqrt{x}(5ax+3b)}{4a^2(ax+b)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^3*x^(3/2)),x]
```

```
[Out] -(Sqrt[x]*(3*b + 5*a*x))/(4*a^2*(b + a*x)^2) + (3*ArcTan[(Sqrt[a]
*Sqrt[x])/Sqrt[b]])/(4*a^(5/2)*Sqrt[b])
```

Maple [A] time = 0.016, size = 50, normalized size = 0.7

$$2\,\frac{1}{(ax+b)^2}\left(-5/8\,\frac{x^{3/2}}{a}-3/8\,\frac{b\sqrt{x}}{a^2}\right)+\frac{3}{4\,a^2}\arctan\left(a\sqrt{x}\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^3/x^(3/2),x)
```

```
[Out] 2*(-5/8*x^(3/2)/a-3/8*b*x^(1/2)/a^2)/(a*x+b)^2+3/4/a^2/(a*b)^(1/2
)*arctan(a*x^(1/2)/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^(3/2)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.245491, size = 1, normalized size = 0.01

$$\left[-\frac{2\sqrt{-ab}(5\,ax+3\,b)\sqrt{x}-3\left(a^2x^2+2\,abx+b^2\right)\log\left(\frac{2\,ab\sqrt{x}+\sqrt{-ab}(ax-b)}{ax+b}\right)}{8\left(a^4x^2+2\,a^3bx+a^2b^2\right)\sqrt{-ab}},\right.$$
$$\left.-\frac{\sqrt{ab}(5\,ax+3\,b)\sqrt{x}+3\left(a^2x^2+2\,abx+b^2\right)\arctan\left(\frac{b}{\sqrt{ab}\sqrt{x}}\right)}{4\left(a^4x^2+2\,a^3bx+a^2b^2\right)\sqrt{ab}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^(3/2)),x, algorithm="fricas")
```

```
[Out] [-1/8*(2*sqrt(-a*b)*(5*a*x + 3*b)*sqrt(x) - 3*(a^2*x^2 + 2*a*b*x
+ b^2)*log((2*a*b*sqrt(x) + sqrt(-a*b)*(a*x - b))/(a*x + b)))/((a
^4*x^2 + 2*a^3*b*x + a^2*b^2)*sqrt(-a*b)), -1/4*(sqrt(a*b)*(5*a*x
 + 3*b)*sqrt(x) + 3*(a^2*x^2 + 2*a*b*x + b^2)*arctan(b/(sqrt(a*b)
*sqrt(x))))/((a^4*x^2 + 2*a^3*b*x + a^2*b^2)*sqrt(a*b))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**3/x**(3/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.221305, size = 63, normalized size = 0.9

$$\frac{3\,\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)}{4\,\sqrt{ab}a^2}-\frac{5\,ax^{\frac{3}{2}}+3\,b\sqrt{x}}{4\,(ax+b)^2a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^(3/2)),x, algorithm="giac")
```

```
[Out] 3/4*arctan(a*sqrt(x)/sqrt(a*b))/(sqrt(a*b)*a^2) - 1/4*(5*a*x^(3/2
) + 3*b*sqrt(x))/((a*x + b)^2*a^2)
```

3.1684 $\int \frac{1}{\left(a+\frac{b}{x}\right)^3 x^{5/2}}\,dx$

Optimal. Leaf size=73

$$\frac{\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4a^{3/2}b^{3/2}}+\frac{\sqrt{x}}{4ab(ax+b)}-\frac{\sqrt{x}}{2a(ax+b)^2}$$

```
[Out] -Sqrt[x]/(2*a*(b + a*x)^2) + Sqrt[x]/(4*a*b*(b + a*x)) + ArcTan[(
Sqrt[a]*Sqrt[x])/Sqrt[b]]/(4*a^(3/2)*b^(3/2))
```

Rubi [A] time = 0.0694629, antiderivative size = 73, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4a^{3/2}b^{3/2}}+\frac{\sqrt{x}}{4ab(ax+b)}-\frac{\sqrt{x}}{2a(ax+b)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^3*x^(5/2)),x]
```

```
[Out] -Sqrt[x]/(2*a*(b + a*x)^2) + Sqrt[x]/(4*a*b*(b + a*x)) + ArcTan[(
Sqrt[a]*Sqrt[x])/Sqrt[b]]/(4*a^(3/2)*b^(3/2))
```

Rubi in Sympy [A] time = 12.2391, size = 58, normalized size = 0.79

$$-\frac{\sqrt{x}}{2a\left(ax+b\right)^2}+\frac{\sqrt{x}}{4ab\left(ax+b\right)}+\frac{\operatorname{atan}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4a^{\frac{3}{2}}b^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**3/x**(5/2),x)
```

```
[Out] -sqrt(x)/(2*a*(a*x + b)**2) + sqrt(x)/(4*a*b*(a*x + b)) + atan(sq
rt(a)*sqrt(x)/sqrt(b))/(4*a**(3/2)*b**(3/2))
```

Mathematica [A] time = 0.059393, size = 62, normalized size = 0.85

$$\frac{\frac{\sqrt{a}\sqrt{b}\sqrt{x}(ax-b)}{(ax+b)^2}+\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4a^{3/2}b^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^3*x^(5/2)),x]
```

```
[Out] ((Sqrt[a]*Sqrt[b]*Sqrt[x]*(-b + a*x))/(b + a*x)^2 + ArcTan[(Sqrt[
a]*Sqrt[x])/Sqrt[b]])/(4*a^(3/2)*b^(3/2))
```

Maple [A] time = 0.016, size = 52, normalized size = 0.7

$$2\,\frac{1}{(ax+b)^2}\left(1/8\,\frac{x^{3/2}}{b}-1/8\,\frac{\sqrt{x}}{a}\right)+\frac{1}{4\,ab}\arctan\left(a\sqrt{x}\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^3/x^(5/2),x)
```

```
[Out] 2*(1/8*x^(3/2)/b-1/8*x^(1/2)/a)/(a*x+b)^2+1/4/b/a/(a*b)^(1/2)*arc
tan(a*x^(1/2)/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^(5/2)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.244173, size = 1, normalized size = 0.01

$$\left[\frac{2\sqrt{-ab}(ax-b)\sqrt{x}+\left(a^2x^2+2\,abx+b^2\right)\log\left(\frac{2\,ab\sqrt{x}+\sqrt{-ab}(ax-b)}{ax+b}\right)}{8\left(a^3bx^2+2\,a^2b^2x+ab^3\right)\sqrt{-ab}}, \frac{\sqrt{ab}(ax-b)\sqrt{x}-\left(a^2x^2+2\,abx+b^2\right)\arctan\left(\frac{b}{\sqrt{ab}\sqrt{x}}\right)}{4\left(a^3bx^2+2\,a^2b^2x+ab^3\right)\sqrt{ab}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^(5/2)),x, algorithm="fricas")
```

```
[Out] [1/8*(2*sqrt(-a*b)*(a*x - b)*sqrt(x) + (a^2*x^2 + 2*a*b*x + b^2)*
log((2*a*b*sqrt(x) + sqrt(-a*b)*(a*x - b))/(a*x + b)))/((a^3*b*x^
2 + 2*a^2*b^2*x + a*b^3)*sqrt(-a*b)), 1/4*(sqrt(a*b)*(a*x - b)*sq
rt(x) - (a^2*x^2 + 2*a*b*x + b^2)*arctan(b/(sqrt(a*b)*sqrt(x))))/
((a^3*b*x^2 + 2*a^2*b^2*x + a*b^3)*sqrt(a*b))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**3/x**(5/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.217877, size = 70, normalized size = 0.96

$$\frac{\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)}{4\sqrt{ab}ab}+\frac{ax^{\frac{3}{2}}-b\sqrt{x}}{4\left(ax+b\right)^2ab}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^(5/2)),x, algorithm="giac")
```

```
[Out] 1/4*arctan(a*sqrt(x)/sqrt(a*b))/(sqrt(a*b)*a*b) + 1/4*(a*x^(3/2)
- b*sqrt(x))/((a*x + b)^2*a*b)
```

3.1685 $\int \frac{1}{\left(a+\frac{b}{x}\right)^3 x^{7/2}}\,dx$

Optimal. Leaf size=70

$$\frac{3\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4\sqrt{a}b^{5/2}}+\frac{3\sqrt{x}}{4b^2(ax+b)}+\frac{\sqrt{x}}{2b(ax+b)^2}$$

```
[Out] Sqrt[x]/(2*b*(b + a*x)^2) + (3*Sqrt[x])/(4*b^2*(b + a*x)) + (3*Ar
cTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/(4*Sqrt[a]*b^(5/2))
```

Rubi [A] time = 0.0681785, antiderivative size = 70, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{3\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4\sqrt{a}b^{5/2}}+\frac{3\sqrt{x}}{4b^2(ax+b)}+\frac{\sqrt{x}}{2b(ax+b)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^3*x^(7/2)),x]
```

```
[Out] Sqrt[x]/(2*b*(b + a*x)^2) + (3*Sqrt[x])/(4*b^2*(b + a*x)) + (3*Ar
cTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/(4*Sqrt[a]*b^(5/2))
```

Rubi in Sympy [A] time = 11.5646, size = 61, normalized size = 0.87

$$\frac{\sqrt{x}}{2b\left(ax+b\right)^2}+\frac{3\sqrt{x}}{4b^2\left(ax+b\right)}+\frac{3\,\mathrm{atan}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4\sqrt{a}b^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**3/x**(7/2),x)
```

```
[Out] sqrt(x)/(2*b*(a*x + b)**2) + 3*sqrt(x)/(4*b**2*(a*x + b)) + 3*ata
n(sqrt(a)*sqrt(x)/sqrt(b))/(4*sqrt(a)*b**(5/2))
```

Mathematica [A] time = 0.051301, size = 59, normalized size = 0.84

$$\frac{3\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4\sqrt{a}b^{5/2}}+\frac{\sqrt{x}(3ax+5b)}{4b^2(ax+b)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^3*x^(7/2)),x]
```

```
[Out] (Sqrt[x]*(5*b + 3*a*x))/(4*b^2*(b + a*x)^2) + (3*ArcTan[(Sqrt[a]*
Sqrt[x])/Sqrt[b]])/(4*Sqrt[a]*b^(5/2))
```

Maple [A] time = 0.01, size = 53, normalized size = 0.8

$$\frac{1}{2\,b\left(ax+b\right)^2}\sqrt{x}+\frac{3}{4\,b^2\left(ax+b\right)}\sqrt{x}+\frac{3}{4\,b^2}\arctan\left(a\sqrt{x}\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^3/x^(7/2),x)
```

```
[Out] 1/2*x^(1/2)/b/(a*x+b)^2+3/4*x^(1/2)/b^2/(a*x+b)+3/4/b^2/(a*b)^(1/
2)*arctan(a*x^(1/2)/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^(7/2)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.24224, size = 1, normalized size = 0.01

$$\left[\frac{2\sqrt{-ab}(3\,ax+5\,b)\sqrt{x}+3\left(a^2x^2+2\,abx+b^2\right)\log\left(\frac{2\,ab\sqrt{x}+\sqrt{-ab}(ax-b)}{ax+b}\right)}{8\left(a^2b^2x^2+2\,ab^3x+b^4\right)\sqrt{-ab}},\ \frac{\sqrt{ab}(3\,ax+5\,b)\sqrt{x}-3\left(a^2x^2+2\,abx+b^2\right)\arctan\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^(7/2)),x, algorithm="fricas")
```

```
[Out] [1/8*(2*sqrt(-a*b)*(3*a*x + 5*b)*sqrt(x) + 3*(a^2*x^2 + 2*a*b*x +
 b^2)*log((2*a*b*sqrt(x) + sqrt(-a*b)*(a*x - b))/(a*x + b)))/((a^
2*b^2*x^2 + 2*a*b^3*x + b^4)*sqrt(-a*b)), 1/4*(sqrt(a*b)*(3*a*x +
 5*b)*sqrt(x) - 3*(a^2*x^2 + 2*a*b*x + b^2)*arctan(b/(sqrt(a*b)*s
qrt(x))))/((a^2*b^2*x^2 + 2*a*b^3*x + b^4)*sqrt(a*b))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**3/x**(7/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.222764, size = 63, normalized size = 0.9

$$\frac{3\,\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)}{4\sqrt{ab}b^2}+\frac{3\,ax^{\frac{3}{2}}+5\,b\sqrt{x}}{4\,(ax+b)^2b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^(7/2)),x, algorithm="giac")
```

```
[Out] 3/4*arctan(a*sqrt(x)/sqrt(a*b))/(sqrt(a*b)*b^2) + 1/4*(3*a*x^(3/2
) + 5*b*sqrt(x))/((a*x + b)^2*b^2)
```

3.1686 $\int \frac{1}{\left(a+\frac{b}{x}\right)^3 x^{9/2}} dx$

Optimal. Leaf size=82

$$-\frac{15\sqrt{a}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4b^{7/2}}+\frac{5}{4b^2\sqrt{x}(ax+b)}+\frac{1}{2b\sqrt{x}(ax+b)^2}-\frac{15}{4b^3\sqrt{x}}$$

```
[Out] -15/(4*b^3*Sqrt[x]) + 1/(2*b*Sqrt[x]*(b + a*x)^2) + 5/(4*b^2*Sqrt
[x]*(b + a*x)) - (15*Sqrt[a]*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/(
4*b^(7/2))
```

Rubi [A] time = 0.0843754, antiderivative size = 82, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{15\sqrt{a}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4b^{7/2}}+\frac{5}{4b^2\sqrt{x}(ax+b)}+\frac{1}{2b\sqrt{x}(ax+b)^2}-\frac{15}{4b^3\sqrt{x}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^3*x^(9/2)),x]
```

```
[Out] -15/(4*b^3*Sqrt[x]) + 1/(2*b*Sqrt[x]*(b + a*x)^2) + 5/(4*b^2*Sqrt
[x]*(b + a*x)) - (15*Sqrt[a]*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/(
4*b^(7/2))
```

Rubi in Sympy [A] time = 14.3435, size = 75, normalized size = 0.91

$$-\frac{15\sqrt{a}\,\mathrm{atan}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4b^{\frac{7}{2}}}+\frac{1}{2b\sqrt{x}\,(ax+b)^2}+\frac{5}{4b^2\sqrt{x}\,(ax+b)}-\frac{15}{4b^3\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**3/x**(9/2),x)
```

```
[Out] -15*sqrt(a)*atan(sqrt(a)*sqrt(x)/sqrt(b))/(4*b**(7/2)) + 1/(2*b*s
qrt(x)*(a*x + b)**2) + 5/(4*b**2*sqrt(x)*(a*x + b)) - 15/(4*b**3*
sqrt(x))
```

Mathematica [A] time = 0.0706817, size = 70, normalized size = 0.85

$$-\frac{15a^2x^2+25abx+8b^2}{4b^3\sqrt{x}(ax+b)^2}-\frac{15\sqrt{a}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4b^{7/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^3*x^(9/2)),x]
```

```
[Out] -(8*b^2 + 25*a*b*x + 15*a^2*x^2)/(4*b^3*Sqrt[x]*(b + a*x)^2) - (1
5*Sqrt[a]*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/(4*b^(7/2))
```

Maple [A] time = 0.02, size = 66, normalized size = 0.8

$$-2\frac{1}{b^{3}\sqrt{x}}-\frac{7a^{2}}{4b^{3}(ax+b)^{2}}x^{\frac{3}{2}}-\frac{9a}{4b^{2}(ax+b)^{2}}\sqrt{x}-\frac{15a}{4b^{3}}\arctan\left(a\sqrt{x}\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^3/x^(9/2),x)
```

```
[Out] -2/b^3/x^(1/2)-7/4/b^3*a^2/(a*x+b)^2*x^(3/2)-9/4/b^2*a/(a*x+b)^2*
x^(1/2)-15/4/b^3*a/(a*b)^(1/2)*arctan(a*x^(1/2)/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^(9/2)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.246333, size = 1, normalized size = 0.01

$$\left[-\frac{30\,a^{2}x^{2}+50\,abx-15\,(a^{2}x^{2}+2\,abx+b^{2})\sqrt{x}\sqrt{-\frac{a}{b}}\log\left(\frac{ax-2\,b\sqrt{x}\sqrt{-\frac{a}{b}}-b}{ax+b}\right)+16\,b^{2}}{8\,(a^{2}b^{3}x^{2}+2\,ab^{4}x+b^{5})\sqrt{x}},\right.$$
$$\left.-\frac{15\,a^{2}x^{2}+25\,abx-15\,(a^{2}x^{2}+2\,abx+b^{2})\sqrt{x}\sqrt{\frac{a}{b}}\arctan\left(\frac{b\sqrt{\frac{a}{b}}}{a\sqrt{x}}\right)+8\,b^{2}}{4\,(a^{2}b^{3}x^{2}+2\,ab^{4}x+b^{5})\sqrt{x}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^(9/2)),x, algorithm="fricas")
```

```
[Out] [-1/8*(30*a^2*x^2 + 50*a*b*x - 15*(a^2*x^2 + 2*a*b*x + b^2)*sqrt(
x)*sqrt(-a/b)*log((a*x - 2*b*sqrt(x)*sqrt(-a/b) - b)/(a*x + b)) +
 16*b^2)/((a^2*b^3*x^2 + 2*a*b^4*x + b^5)*sqrt(x)), -1/4*(15*a^2*
x^2 + 25*a*b*x - 15*(a^2*x^2 + 2*a*b*x + b^2)*sqrt(x)*sqrt(a/b)*a
rctan(b*sqrt(a/b)/(a*sqrt(x))) + 8*b^2)/((a^2*b^3*x^2 + 2*a*b^4*x
 + b^5)*sqrt(x))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**3/x**(9/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.216672, size = 80, normalized size = 0.98

$$-\frac{15\,a\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)}{4\,\sqrt{ab}b^{3}}-\frac{2}{b^{3}\sqrt{x}}-\frac{7\,a^{2}x^{\frac{3}{2}}+9\,ab\sqrt{x}}{4\,(ax+b)^{2}b^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^(9/2)),x, algorithm="giac")
```

```
[Out] -15/4*a*arctan(a*sqrt(x)/sqrt(a*b))/(sqrt(a*b)*b^3) - 2/(b^3*sqrt
(x)) - 1/4*(7*a^2*x^(3/2) + 9*a*b*sqrt(x))/((a*x + b)^2*b^3)
```

3.1687 $\int \frac{1}{\left(a+\frac{b}{x}\right)^3 x^{11/2}}\,dx$

Optimal. Leaf size=95

$$\frac{35a^{3/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4b^{9/2}}+\frac{35a}{4b^4\sqrt{x}}+\frac{7}{4b^2x^{3/2}(ax+b)}+\frac{1}{2bx^{3/2}(ax+b)^2}-\frac{35}{12b^3x^{3/2}}$$

```
[Out] -35/(12*b^3*x^(3/2)) + (35*a)/(4*b^4*Sqrt[x]) + 1/(2*b*x^(3/2)*(b
 + a*x)^2) + 7/(4*b^2*x^(3/2)*(b + a*x)) + (35*a^(3/2)*ArcTan[(Sq
rt[a]*Sqrt[x])/Sqrt[b]])/(4*b^(9/2))
```

Rubi [A] time = 0.100227, antiderivative size = 95, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{35a^{3/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4b^{9/2}}+\frac{35a}{4b^4\sqrt{x}}+\frac{7}{4b^2x^{3/2}(ax+b)}+\frac{1}{2bx^{3/2}(ax+b)^2}-\frac{35}{12b^3x^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^3*x^(11/2)),x]
```

```
[Out] -35/(12*b^3*x^(3/2)) + (35*a)/(4*b^4*Sqrt[x]) + 1/(2*b*x^(3/2)*(b
 + a*x)^2) + 7/(4*b^2*x^(3/2)*(b + a*x)) + (35*a^(3/2)*ArcTan[(Sq
rt[a]*Sqrt[x])/Sqrt[b]])/(4*b^(9/2))
```

Rubi in Sympy [A] time = 17.5837, size = 88, normalized size = 0.93

$$\frac{35a^{\frac{3}{2}}\operatorname{atan}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4b^{\frac{9}{2}}}+\frac{35a}{4b^4\sqrt{x}}+\frac{1}{2bx^{\frac{3}{2}}\left(ax+b\right)^2}+\frac{7}{4b^2x^{\frac{3}{2}}\left(ax+b\right)}-\frac{35}{12b^3x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**3/x**(11/2),x)
```

```
[Out] 35*a**(3/2)*atan(sqrt(a)*sqrt(x)/sqrt(b))/(4*b**(9/2)) + 35*a/(4*
b**4*sqrt(x)) + 1/(2*b*x**(3/2)*(a*x + b)**2) + 7/(4*b**2*x**(3/2
)*(a*x + b)) - 35/(12*b**3*x**(3/2))
```

Mathematica [A] time = 0.0800841, size = 81, normalized size = 0.85

$$\frac{35a^{3/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4b^{9/2}}+\frac{105a^3x^3+175a^2bx^2+56ab^2x-8b^3}{12b^4x^{3/2}(ax+b)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^3*x^(11/2)),x]
```

```
[Out] (-8*b^3 + 56*a*b^2*x + 175*a^2*b*x^2 + 105*a^3*x^3)/(12*b^4*x^(3/
2)*(b + a*x)^2) + (35*a^(3/2)*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/
(4*b^(9/2))
```

Maple [A] time = 0.023, size = 79, normalized size = 0.8

$$-\frac{2}{3\,b^3}x^{-\frac{3}{2}}+6\,\frac{a}{b^4\sqrt{x}}+\frac{11\,a^3}{4\,b^4\,(ax+b)^2}x^{\frac{3}{2}}+\frac{13\,a^2}{4\,b^3\,(ax+b)^2}\sqrt{x}+\frac{35\,a^2}{4\,b^4}\arctan\left(a\sqrt{x}\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^3/x^(11/2),x)
```

```
[Out] -2/3/b^3/x^(3/2)+6*a/b^4/x^(1/2)+11/4/b^4*a^3/(a*x+b)^2*x^(3/2)+1
3/4/b^3*a^2/(a*x+b)^2*x^(1/2)+35/4/b^4*a^2/(a*b)^(1/2)*arctan(a*x
^(1/2)/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^(11/2)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.24596, size = 1, normalized size = 0.01

$$\left[\frac{210\,a^3x^3+350\,a^2bx^2+112\,ab^2x-16\,b^3+105\,\left(a^3x^3+2\,a^2bx^2+ab^2x\right)\sqrt{x}\sqrt{-\frac{a}{b}}\log\left(\frac{ax+2\,b\sqrt{x}\sqrt{-\frac{a}{b}}-b}{ax+b}\right)}{24\,(a^2b^4x^3+2\,ab^5x^2+b^6x)\sqrt{x}},\ \frac{105\,a^3x^3+175\,a^2b\ldots}{\ldots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^(11/2)),x, algorithm="fricas")
```

```
[Out] [1/24*(210*a^3*x^3 + 350*a^2*b*x^2 + 112*a*b^2*x - 16*b^3 + 105*(
a^3*x^3 + 2*a^2*b*x^2 + a*b^2*x)*sqrt(x)*sqrt(-a/b)*log((a*x + 2*
b*sqrt(x)*sqrt(-a/b) - b)/(a*x + b)))/((a^2*b^4*x^3 + 2*a*b^5*x^2
 + b^6*x)*sqrt(x)), 1/12*(105*a^3*x^3 + 175*a^2*b*x^2 + 56*a*b^2*
x - 8*b^3 - 105*(a^3*x^3 + 2*a^2*b*x^2 + a*b^2*x)*sqrt(x)*sqrt(a/
b)*arctan(b*sqrt(a/b)/(a*sqrt(x))))/((a^2*b^4*x^3 + 2*a*b^5*x^2 +
 b^6*x)*sqrt(x))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**3/x**(11/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.222389, size = 96, normalized size = 1.01

$$\frac{35\,a^2\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)}{4\,\sqrt{ab}b^4}+\frac{2\,(9\,ax-b)}{3\,b^4x^{\frac{3}{2}}}+\frac{11\,a^3x^{\frac{3}{2}}+13\,a^2b\sqrt{x}}{4\,(ax+b)^2b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^(11/2)),x, algorithm="giac")
```

```
[Out] 35/4*a^2*arctan(a*sqrt(x)/sqrt(a*b))/(sqrt(a*b)*b^4) + 2/3*(9*a*x
 - b)/(b^4*x^(3/2)) + 1/4*(11*a^3*x^(3/2) + 13*a^2*b*sqrt(x))/((a
*x + b)^2*b^4)
```

3.1688 $\int \frac{1}{\left(a+\frac{b}{x}\right)^3 x^{13/2}}\,dx$

Optimal. Leaf size=110

$$-\frac{63a^{5/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4b^{11/2}}-\frac{63a^2}{4b^5\sqrt{x}}+\frac{21a}{4b^4x^{3/2}}+\frac{9}{4b^2x^{5/2}(ax+b)}+\frac{1}{2bx^{5/2}(ax+b)^2}-\frac{63}{20b^3x^{5/2}}$$

```
[Out] -63/(20*b^3*x^(5/2)) + (21*a)/(4*b^4*x^(3/2)) - (63*a^2)/(4*b^5*S
qrt[x]) + 1/(2*b*x^(5/2)*(b + a*x)^2) + 9/(4*b^2*x^(5/2)*(b + a*x
)) - (63*a^(5/2)*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/(4*b^(11/2))
```

Rubi [A] time = 0.123342, antiderivative size = 110, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{63a^{5/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4b^{11/2}}-\frac{63a^2}{4b^5\sqrt{x}}+\frac{21a}{4b^4x^{3/2}}+\frac{9}{4b^2x^{5/2}(ax+b)}+\frac{1}{2bx^{5/2}(ax+b)^2}-\frac{63}{20b^3x^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^3*x^(13/2)),x]
```

```
[Out] -63/(20*b^3*x^(5/2)) + (21*a)/(4*b^4*x^(3/2)) - (63*a^2)/(4*b^5*S
qrt[x]) + 1/(2*b*x^(5/2)*(b + a*x)^2) + 9/(4*b^2*x^(5/2)*(b + a*x
)) - (63*a^(5/2)*ArcTan[(Sqrt[a]*Sqrt[x])/Sqrt[b]])/(4*b^(11/2))
```

Rubi in Sympy [A] time = 22.2454, size = 104, normalized size = 0.95

$$-\frac{63a^{\frac{5}{2}}\operatorname{atan}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4b^{\frac{11}{2}}}-\frac{63a^2}{4b^5\sqrt{x}}+\frac{21a}{4b^4x^{\frac{3}{2}}}+\frac{1}{2bx^{\frac{5}{2}}\left(ax+b\right)^2}+\frac{9}{4b^2x^{\frac{5}{2}}\left(ax+b\right)}-\frac{63}{20b^3x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**3/x**(13/2),x)
```

```
[Out] -63*a**(5/2)*atan(sqrt(a)*sqrt(x)/sqrt(b))/(4*b**(11/2)) - 63*a**
2/(4*b**5*sqrt(x)) + 21*a/(4*b**4*x**(3/2)) + 1/(2*b*x**(5/2)*(a*
x + b)**2) + 9/(4*b**2*x**(5/2)*(a*x + b)) - 63/(20*b**3*x**(5/2)
)
```

Mathematica [A] time = 0.0951834, size = 92, normalized size = 0.84

$$-\frac{63a^{5/2}\tan^{-1}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4b^{11/2}}-\frac{315a^4x^4+525a^3bx^3+168a^2b^2x^2-24ab^3x+8b^4}{20b^5x^{5/2}(ax+b)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^3*x^(13/2)),x]
```

```
[Out] -(8*b^4 - 24*a*b^3*x + 168*a^2*b^2*x^2 + 525*a^3*b*x^3 + 315*a^4*
x^4)/(20*b^5*x^(5/2)*(b + a*x)^2) - (63*a^(5/2)*ArcTan[(Sqrt[a]*S
qrt[x])/Sqrt[b]])/(4*b^(11/2))
```

Maple [A] time = 0.023, size = 90, normalized size = 0.8

$$-\frac{2}{5\,b^3}x^{-\frac{5}{2}}-12\,\frac{a^2}{b^5\sqrt{x}}+2\,\frac{a}{b^4x^{3/2}}-\frac{15\,a^4}{4\,b^5\,(ax+b)^2}x^{\frac{3}{2}}-\frac{17\,a^3}{4\,b^4\,(ax+b)^2}\sqrt{x}-\frac{63\,a^3}{4\,b^5}\arctan\left(a\sqrt{x}\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^3/x^(13/2),x)
```

```
[Out] -2/5/b^3/x^(5/2)-12*a^2/b^5/x^(1/2)+2*a/b^4/x^(3/2)-15/4/b^5*a^4/
(a*x+b)^2*x^(3/2)-17/4/b^4*a^3/(a*x+b)^2*x^(1/2)-63/4/b^5*a^3/(a*
b)^(1/2)*arctan(a*x^(1/2)/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^(13/2)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.241508, size = 1, normalized size = 0.01

$$\left[-\frac{630\,a^4x^4+1050\,a^3bx^3+336\,a^2b^2x^2-48\,ab^3x+16\,b^4-315\,\left(a^4x^4+2\,a^3bx^3+a^2b^2x^2\right)\sqrt{x}\sqrt{-\frac{a}{b}}\log\left(\frac{ax-2\,b\sqrt{x}\sqrt{-\frac{a}{b}}-b}{ax+b}\right)}{40\,(a^2b^5x^4+2\,ab^6x^3+b^7x^2)\sqrt{x}},\right.$$
$$\left.-\frac{315\,a^4x^4+525\,a^3bx^3+168\,a^2b^2x^2-24\,ab^3x+8\,b^4-315\,\left(a^4x^4+2\,a^3bx^3+a^2b^2x^2\right)\sqrt{x}\sqrt{\frac{a}{b}}\arctan\left(\frac{b\sqrt{\frac{a}{b}}}{a\sqrt{x}}\right)}{20\,(a^2b^5x^4+2\,ab^6x^3+b^7x^2)\sqrt{x}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^(13/2)),x, algorithm="fricas")
```

```
[Out] [-1/40*(630*a^4*x^4 + 1050*a^3*b*x^3 + 336*a^2*b^2*x^2 - 48*a*b^3
*x + 16*b^4 - 315*(a^4*x^4 + 2*a^3*b*x^3 + a^2*b^2*x^2)*sqrt(x)*s
qrt(-a/b)*log((a*x - 2*b*sqrt(x)*sqrt(-a/b) - b)/(a*x + b)))/((a^
2*b^5*x^4 + 2*a*b^6*x^3 + b^7*x^2)*sqrt(x)), -1/20*(315*a^4*x^4 +
 525*a^3*b*x^3 + 168*a^2*b^2*x^2 - 24*a*b^3*x + 8*b^4 - 315*(a^4*
x^4 + 2*a^3*b*x^3 + a^2*b^2*x^2)*sqrt(x)*sqrt(a/b)*arctan(b*sqrt(
a/b)/(a*sqrt(x))))/((a^2*b^5*x^4 + 2*a*b^6*x^3 + b^7*x^2)*sqrt(x)
)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**3/x**(13/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.220981, size = 108, normalized size = 0.98

$$-\frac{63\,a^3\arctan\left(\frac{a\sqrt{x}}{\sqrt{ab}}\right)}{4\,\sqrt{ab}b^5}-\frac{15\,a^4x^{\frac{3}{2}}+17\,a^3b\sqrt{x}}{4\,(ax+b)^2b^5}-\frac{2\,\left(30\,a^2x^2-5\,abx+b^2\right)}{5\,b^5x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^3*x^(13/2)),x, algorithm="giac")
```

```
[Out] -63/4*a^3*arctan(a*sqrt(x)/sqrt(a*b))/(sqrt(a*b)*b^5) - 1/4*(15*a
^4*x^(3/2) + 17*a^3*b*sqrt(x))/((a*x + b)^2*b^5) - 2/5*(30*a^2*x^
2 - 5*a*b*x + b^2)/(b^5*x^(5/2))
```

3.1689 $\int \sqrt{a+\frac{b}{x}}x^3\,dx$

Optimal. Leaf size=117

$$-\frac{5b^4\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{64a^{7/2}}+\frac{5b^3x\sqrt{a+\frac{b}{x}}}{64a^3}-\frac{5b^2x^2\sqrt{a+\frac{b}{x}}}{96a^2}+\frac{1}{4}x^4\sqrt{a+\frac{b}{x}}+\frac{bx^3\sqrt{a+\frac{b}{x}}}{24a}$$

```
[Out] (5*b^3*Sqrt[a + b/x]*x)/(64*a^3) - (5*b^2*Sqrt[a + b/x]*x^2)/(96*
a^2) + (b*Sqrt[a + b/x]*x^3)/(24*a) + (Sqrt[a + b/x]*x^4)/4 - (5*
b^4*ArcTanh[Sqrt[a + b/x]/Sqrt[a]])/(64*a^(7/2))
```

Rubi [A] time = 0.170805, antiderivative size = 117, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{5b^4\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{64a^{7/2}}+\frac{5b^3x\sqrt{a+\frac{b}{x}}}{64a^3}-\frac{5b^2x^2\sqrt{a+\frac{b}{x}}}{96a^2}+\frac{1}{4}x^4\sqrt{a+\frac{b}{x}}+\frac{bx^3\sqrt{a+\frac{b}{x}}}{24a}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x]*x^3,x]
```

```
[Out] (5*b^3*Sqrt[a + b/x]*x)/(64*a^3) - (5*b^2*Sqrt[a + b/x]*x^2)/(96*
a^2) + (b*Sqrt[a + b/x]*x^3)/(24*a) + (Sqrt[a + b/x]*x^4)/4 - (5*
b^4*ArcTanh[Sqrt[a + b/x]/Sqrt[a]])/(64*a^(7/2))
```

Rubi in Sympy [A] time = 16.068, size = 99, normalized size = 0.85

$$\frac{x^4\sqrt{a+\frac{b}{x}}}{4}+\frac{bx^3\sqrt{a+\frac{b}{x}}}{24a}-\frac{5b^2x^2\sqrt{a+\frac{b}{x}}}{96a^2}+\frac{5b^3x\sqrt{a+\frac{b}{x}}}{64a^3}-\frac{5b^4\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{64a^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3*(a+b/x)**(1/2),x)
```

```
[Out] x**4*sqrt(a + b/x)/4 + b*x**3*sqrt(a + b/x)/(24*a) - 5*b**2*x**2*
sqrt(a + b/x)/(96*a**2) + 5*b**3*x*sqrt(a + b/x)/(64*a**3) - 5*b*
*4*atanh(sqrt(a + b/x)/sqrt(a))/(64*a**(7/2))
```

Mathematica [A] time = 0.13792, size = 90, normalized size = 0.77

$$\frac{2\sqrt{a}x\sqrt{a+\frac{b}{x}}\left(48a^3x^3+8a^2bx^2-10ab^2x+15b^3\right)-15b^4\log\left(2\sqrt{a}x\sqrt{a+\frac{b}{x}}+2ax+b\right)}{384a^{7/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x]*x^3,x]
```

```
[Out] (2*Sqrt[a]*Sqrt[a + b/x]*x*(15*b^3 - 10*a*b^2*x + 8*a^2*b*x^2 + 4
8*a^3*x^3) - 15*b^4*Log[b + 2*a*x + 2*Sqrt[a]*Sqrt[a + b/x]*x])/(
384*a^(7/2))
```

Maple [A] time = 0.02, size = 135, normalized size = 1.2

$$-\frac{x}{384}\sqrt{\frac{ax+b}{x}}\left(-96\,x\left(ax^{2}+bx\right)^{3/2}a^{7/2}+80\,a^{5/2}\left(ax^{2}+bx\right)^{3/2}b-60\,a^{5/2}\sqrt{ax^{2}+bx}xb^{2}-30\,a^{3/2}\sqrt{ax^{2}+bx}b^{3}+15\,\ln\left(1\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3*(a+b/x)^(1/2),x)
```

```
[Out] -1/384*((a*x+b)/x)^(1/2)*x*(-96*x*(a*x^2+b*x)^(3/2)*a^(7/2)+80*a^
(5/2)*(a*x^2+b*x)^(3/2)*b-60*a^(5/2)*(a*x^2+b*x)^(1/2)*x*b^2-30*a
^(3/2)*(a*x^2+b*x)^(1/2)*b^3+15*ln(1/2*(2*(a*x^2+b*x)^(1/2)*a^(1/
2)+2*a*x+b)/a^(1/2))*a*b^4)/(x*(a*x+b))^(1/2)/a^(9/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)*x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.245576, size = 1, normalized size = 0.01

$$\left[\frac{15\,b^{4}\log\left(-2\,ax\sqrt{\frac{ax+b}{x}}+(2\,ax+b)\sqrt{a}\right)+2\left(48\,a^{3}x^{4}+8\,a^{2}bx^{3}-10\,ab^{2}x^{2}+15\,b^{3}x\right)\sqrt{a}\sqrt{\frac{ax+b}{x}}}{384\,a^{\frac{7}{2}}},\frac{15\,b^{4}\arctan\left(\frac{a}{\sqrt{-a}\sqrt{\frac{ax+b}{x}}}\right)\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)*x^3,x, algorithm="fricas")
```

```
[Out] [1/384*(15*b^4*log(-2*a*x*sqrt((a*x + b)/x) + (2*a*x + b)*sqrt(a)
) + 2*(48*a^3*x^4 + 8*a^2*b*x^3 - 10*a*b^2*x^2 + 15*b^3*x)*sqrt(a
)*sqrt((a*x + b)/x))/a^(7/2), 1/192*(15*b^4*arctan(a/(sqrt(-a)*sq
rt((a*x + b)/x))) + (48*a^3*x^4 + 8*a^2*b*x^3 - 10*a*b^2*x^2 + 15
*b^3*x)*sqrt(-a)*sqrt((a*x + b)/x))/(sqrt(-a)*a^3)]
```

Sympy [A] time = 29.5256, size = 153, normalized size = 1.31

$$\frac{ax^{\frac{9}{2}}}{4\sqrt{b}\sqrt{\frac{ax}{b}+1}}+\frac{7\sqrt{b}x^{\frac{7}{2}}}{24\sqrt{\frac{ax}{b}+1}}-\frac{b^{\frac{3}{2}}x^{\frac{5}{2}}}{96a\sqrt{\frac{ax}{b}+1}}+\frac{5b^{\frac{5}{2}}x^{\frac{3}{2}}}{192a^{2}\sqrt{\frac{ax}{b}+1}}+\frac{5b^{\frac{7}{2}}\sqrt{x}}{64a^{3}\sqrt{\frac{ax}{b}+1}}-\frac{5b^{4}\operatorname{asinh}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{64a^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(a+b/x)**(1/2),x)
```

```
[Out] a*x**(9/2)/(4*sqrt(b)*sqrt(a*x/b + 1)) + 7*sqrt(b)*x**(7/2)/(24*s
qrt(a*x/b + 1)) - b**(3/2)*x**(5/2)/(96*a*sqrt(a*x/b + 1)) + 5*b*
*(5/2)*x**(3/2)/(192*a**2*sqrt(a*x/b + 1)) + 5*b**(7/2)*sqrt(x)/(
```

```
64*a**3*sqrt(a*x/b + 1)) - 5*b**4*asinh(sqrt(a)*sqrt(x)/sqrt(b))/
(64*a**(7/2))
```

GIAC/XCAS [A] time = 0.240663, size = 146, normalized size = 1.25

$$\frac{5\,b^4\ln\left(\left|-2\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)\sqrt{a}-b\right|\right)\,\mathrm{sign}\left(x\right)}{128\,a^{\frac{7}{2}}}-\frac{5\,b^4\ln\left(\left|b\right|\right)\mathrm{sign}\left(x\right)}{128\,a^{\frac{7}{2}}}+\frac{1}{192}\,\sqrt{ax^2+bx}\left(2\left(4\left(6\,x\mathrm{sign}\left(x\right)+\frac{b\mathrm{sign}\left(x\right)}{a}\right)x-\frac{5\,b^2\mathrm{sign}\left(x\right)}{a^2}\right)x+\frac{15\,b^3\mathrm{sign}\left(x\right)}{a^3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)*x^3,x, algorithm="giac")
```

```
[Out] 5/128*b^4*ln(abs(-2*(sqrt(a)*x - sqrt(a*x^2 + b*x))*sqrt(a) - b))
*sign(x)/a^(7/2) - 5/128*b^4*ln(abs(b))*sign(x)/a^(7/2) + 1/192*s
qrt(a*x^2 + b*x)*(2*(4*(6*x*sign(x) + b*sign(x)/a)*x - 5*b^2*sign
(x)/a^2)*x + 15*b^3*sign(x)/a^3)
```

3.1690 $\int \sqrt{a+\frac{b}{x}}x^2\,dx$

Optimal. Leaf size=93

$$\frac{b^3\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{8a^{5/2}}-\frac{b^2x\sqrt{a+\frac{b}{x}}}{8a^2}+\frac{1}{3}x^3\sqrt{a+\frac{b}{x}}+\frac{bx^2\sqrt{a+\frac{b}{x}}}{12a}$$

```
[Out] -(b^2*Sqrt[a + b/x]*x)/(8*a^2) + (b*Sqrt[a + b/x]*x^2)/(12*a) + (
Sqrt[a + b/x]*x^3)/3 + (b^3*ArcTanh[Sqrt[a + b/x]/Sqrt[a]])/(8*a^
(5/2))
```

Rubi [A] time = 0.12909, antiderivative size = 93, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{b^3\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{8a^{5/2}}-\frac{b^2x\sqrt{a+\frac{b}{x}}}{8a^2}+\frac{1}{3}x^3\sqrt{a+\frac{b}{x}}+\frac{bx^2\sqrt{a+\frac{b}{x}}}{12a}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x]*x^2,x]
```

```
[Out] -(b^2*Sqrt[a + b/x]*x)/(8*a^2) + (b*Sqrt[a + b/x]*x^2)/(12*a) + (
Sqrt[a + b/x]*x^3)/3 + (b^3*ArcTanh[Sqrt[a + b/x]/Sqrt[a]])/(8*a^
(5/2))
```

Rubi in Sympy [A] time = 12.2253, size = 73, normalized size = 0.78

$$\frac{x^3\sqrt{a+\frac{b}{x}}}{3}+\frac{bx^2\sqrt{a+\frac{b}{x}}}{12a}-\frac{b^2x\sqrt{a+\frac{b}{x}}}{8a^2}+\frac{b^3\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{8a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(a+b/x)**(1/2),x)
```

```
[Out] x**3*sqrt(a + b/x)/3 + b*x**2*sqrt(a + b/x)/(12*a) - b**2*x*sqrt(
a + b/x)/(8*a**2) + b**3*atanh(sqrt(a + b/x)/sqrt(a))/(8*a**(5/2)
)
```

Mathematica [A] time = 0.0946769, size = 79, normalized size = 0.85

$$\frac{2\sqrt{a}x\sqrt{a+\frac{b}{x}}\left(8a^2x^2+2abx-3b^2\right)+3b^3\log\left(2\sqrt{a}x\sqrt{a+\frac{b}{x}}+2ax+b\right)}{48a^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x]*x^2,x]
```

```
[Out] (2*Sqrt[a]*Sqrt[a + b/x]*x*(-3*b^2 + 2*a*b*x + 8*a^2*x^2) + 3*b^3
*Log[b + 2*a*x + 2*Sqrt[a]*Sqrt[a + b/x]*x])/(48*a^(5/2))
```

Maple [A] time = 0.012, size = 115, normalized size = 1.2

$$\frac{x}{48}\sqrt{\frac{ax+b}{x}}\left(16\left(ax^2+bx\right)^{3/2}a^{5/2}-12\sqrt{ax^2+bx}a^{5/2}xb-6\sqrt{ax^2+bx}a^{3/2}b^2+3\ln\left(1/2\,\frac{2\sqrt{ax^2+bx}\sqrt{a}+2ax+b}{\sqrt{a}}\right)ab^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^2*(a+b/x)^(1/2),x)
```

```
[Out] 1/48*((a*x+b)/x)^(1/2)*x*(16*(a*x^2+b*x)^(3/2)*a^(5/2)-12*(a*x^2+
b*x)^(1/2)*a^(5/2)*x*b-6*(a*x^2+b*x)^(1/2)*a^(3/2)*b^2+3*ln(1/2*(
2*(a*x^2+b*x)^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*a*b^3)/(x*(a*x+b))^
(1/2)/a^(7/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(a + b/x)*x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.240159, size = 1, normalized size = 0.01

$$\left[\frac{3\,b^3\log\left(2\,ax\sqrt{\frac{ax+b}{x}}+(2\,ax+b)\sqrt{a}\right)+2\left(8\,a^2x^3+2\,abx^2-3\,b^2x\right)\sqrt{a}\sqrt{\frac{ax+b}{x}}}{48\,a^{\frac{5}{2}}},\ -\frac{3\,b^3\arctan\left(\frac{a}{\sqrt{-a}\sqrt{\frac{ax+b}{x}}}\right)-\left(8\,a^2x^3+2\,abx^2-3\,b^2x\right)\sqrt{-a}\sqrt{\frac{ax+b}{x}}}{24\,\sqrt{-a}a^2}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(a + b/x)*x^2,x, algorithm="fricas")
```

```
[Out] [1/48*(3*b^3*log(2*a*x*sqrt((a*x + b)/x) + (2*a*x + b)*sqrt(a)) +
 2*(8*a^2*x^3 + 2*a*b*x^2 - 3*b^2*x)*sqrt(a)*sqrt((a*x + b)/x))/a
^(5/2), -1/24*(3*b^3*arctan(a/(sqrt(-a)*sqrt((a*x + b)/x))) - (8*
a^2*x^3 + 2*a*b*x^2 - 3*b^2*x)*sqrt(-a)*sqrt((a*x + b)/x))/(sqrt(
-a)*a^2)]
```

Sympy [A] time = 19.3046, size = 122, normalized size = 1.31

$$\frac{ax^{\frac{7}{2}}}{3\sqrt{b}\sqrt{\frac{ax}{b}+1}}+\frac{5\sqrt{b}x^{\frac{5}{2}}}{12\sqrt{\frac{ax}{b}+1}}-\frac{b^{\frac{3}{2}}x^{\frac{3}{2}}}{24a\sqrt{\frac{ax}{b}+1}}-\frac{b^{\frac{5}{2}}\sqrt{x}}{8a^2\sqrt{\frac{ax}{b}+1}}+\frac{b^3\operatorname{asinh}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{8a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(a+b/x)**(1/2),x)
```

```
[Out] a*x**(7/2)/(3*sqrt(b)*sqrt(a*x/b + 1)) + 5*sqrt(b)*x**(5/2)/(12*s
qrt(a*x/b + 1)) - b**(3/2)*x**(3/2)/(24*a*sqrt(a*x/b + 1)) - b**(
5/2)*sqrt(x)/(8*a**2*sqrt(a*x/b + 1)) + b**3*asinh(sqrt(a)*sqrt(x
)/sqrt(b))/(8*a**(5/2))
```

GIAC/XCAS [A] time = 0.241532, size = 127, normalized size = 1.37

$$-\frac{b^3\ln\left(\left|-2\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)\sqrt{a}-b\right|\right)\operatorname{sign}(x)}{16\,a^{\frac{5}{2}}}+\frac{b^3\ln\left(|b|\right)\operatorname{sign}(x)}{16\,a^{\frac{5}{2}}}+\frac{1}{24}\sqrt{ax^2+bx}\left(2\left(4\,x\operatorname{sign}(x)+\frac{b\operatorname{sign}(x)}{a}\right)x-\frac{3\,b^2\operatorname{sign}(x)}{a^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)*x^2,x, algorithm="giac")
```

```
[Out] -1/16*b^3*ln(abs(-2*(sqrt(a)*x - sqrt(a*x^2 + b*x))*sqrt(a) - b))
*sign(x)/a^(5/2) + 1/16*b^3*ln(abs(b))*sign(x)/a^(5/2) + 1/24*sqr
t(a*x^2 + b*x)*(2*(4*x*sign(x) + b*sign(x)/a)*x - 3*b^2*sign(x)/a
^2)
```

3.1691 $\int \sqrt{a+\frac{b}{x}}x\,dx$

Optimal. Leaf size=69

$$-\frac{b^2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{4a^{3/2}}+\frac{1}{2}x^2\sqrt{a+\frac{b}{x}}+\frac{bx\sqrt{a+\frac{b}{x}}}{4a}$$

```
[Out] (b*Sqrt[a + b/x]*x)/(4*a) + (Sqrt[a + b/x]*x^2)/2 - (b^2*ArcTanh[
Sqrt[a + b/x]/Sqrt[a]])/(4*a^(3/2))
```

Rubi [A] time = 0.0903853, antiderivative size = 69, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385

$$-\frac{b^2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{4a^{3/2}}+\frac{1}{2}x^2\sqrt{a+\frac{b}{x}}+\frac{bx\sqrt{a+\frac{b}{x}}}{4a}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x]*x,x]
```

```
[Out] (b*Sqrt[a + b/x]*x)/(4*a) + (Sqrt[a + b/x]*x^2)/2 - (b^2*ArcTanh[
Sqrt[a + b/x]/Sqrt[a]])/(4*a^(3/2))
```

Rubi in Sympy [A] time = 8.8529, size = 53, normalized size = 0.77

$$\frac{x^2\sqrt{a+\frac{b}{x}}}{2}+\frac{bx\sqrt{a+\frac{b}{x}}}{4a}-\frac{b^2\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{4a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(a+b/x)**(1/2),x)
```

```
[Out] x**2*sqrt(a + b/x)/2 + b*x*sqrt(a + b/x)/(4*a) - b**2*atanh(sqrt(
a + b/x)/sqrt(a))/(4*a**(3/2))
```

Mathematica [A] time = 0.0963773, size = 64, normalized size = 0.93

$$\frac{x\sqrt{a+\frac{b}{x}}(2ax+b)}{4a}-\frac{b^2\log\left(2\sqrt{a}x\sqrt{a+\frac{b}{x}}+2ax+b\right)}{8a^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x]*x,x]
```

```
[Out] (Sqrt[a + b/x]*x*(b + 2*a*x))/(4*a) - (b^2*Log[b + 2*a*x + 2*Sqrt
[a]*Sqrt[a + b/x]*x])/(8*a^(3/2))
```

Maple [A] time = 0.01, size = 96, normalized size = 1.4

$$\frac{x}{8}\sqrt{\frac{ax+b}{x}}\left(4\sqrt{ax^2+bx}a^{5/2}x+2\sqrt{ax^2+bx}a^{3/2}b-b^2\ln\left(\frac{1}{2}\left(2\sqrt{ax^2+bx}\sqrt{a}+2ax+b\right)\frac{1}{\sqrt{a}}\right)a\right)\frac{1}{\sqrt{x(ax+b)}}a^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x*(a+b/x)^(1/2),x)
```

```
[Out] 1/8*((a*x+b)/x)^(1/2)*x*(4*(a*x^2+b*x)^(1/2)*a^(5/2)*x+2*(a*x^2+b
*x)^(1/2)*a^(3/2)*b-b^2*ln(1/2*(2*(a*x^2+b*x)^(1/2)*a^(1/2)+2*a*x
+b)/a^(1/2))*a)/(x*(a*x+b))^(1/2)/a^(5/2)
```

Maxima [F]   time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(a + b/x)*x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A]   time = 0.241606, size = 1, normalized size = 0.01

$$\left[\frac{b^2 \log\left(-2\,ax\sqrt{\frac{ax+b}{x}} + (2\,ax+b)\sqrt{a}\right) + 2\left(2\,ax^2+bx\right)\sqrt{a}\sqrt{\frac{ax+b}{x}}}{8\,a^{\frac{3}{2}}}, \frac{b^2 \arctan\left(\frac{a}{\sqrt{-a}\sqrt{\frac{ax+b}{x}}}\right) + \left(2\,ax^2+bx\right)\sqrt{-a}\sqrt{\frac{ax+b}{x}}}{4\sqrt{-a}a}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(a + b/x)*x,x, algorithm="fricas")
```

```
[Out] [1/8*(b^2*log(-2*a*x*sqrt((a*x + b)/x) + (2*a*x + b)*sqrt(a)) + 2
*(2*a*x^2 + b*x)*sqrt(a)*sqrt((a*x + b)/x))/a^(3/2), 1/4*(b^2*arc
tan(a/(sqrt(-a)*sqrt((a*x + b)/x))) + (2*a*x^2 + b*x)*sqrt(-a)*sq
rt((a*x + b)/x))/(sqrt(-a)*a)]
```

Sympy [A]   time = 12.1334, size = 97, normalized size = 1.41

$$\frac{ax^{\frac{5}{2}}}{2\sqrt{b}\sqrt{\frac{ax}{b}+1}} + \frac{3\sqrt{b}x^{\frac{3}{2}}}{4\sqrt{\frac{ax}{b}+1}} + \frac{b^{\frac{3}{2}}\sqrt{x}}{4a\sqrt{\frac{ax}{b}+1}} - \frac{b^2 \operatorname{asinh}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x*(a+b/x)**(1/2),x)
```

```
[Out] a*x**(5/2)/(2*sqrt(b)*sqrt(a*x/b + 1)) + 3*sqrt(b)*x**(3/2)/(4*sq
rt(a*x/b + 1)) + b**(3/2)*sqrt(x)/(4*a*sqrt(a*x/b + 1)) - b**2*as
inh(sqrt(a)*sqrt(x)/sqrt(b))/(4*a**(3/2))
```

GIAC/XCAS [A]   time = 0.244618, size = 105, normalized size = 1.52

$$-\frac{b^2 \ln\left(|b|\right) \operatorname{sign}\left(x\right)}{8\,a^{\frac{3}{2}}} + \frac{1}{8}\left(2\sqrt{ax^2+bx}\left(2\,x+\frac{b}{a}\right) + \frac{b^2 \ln\left(\left|-2\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)\sqrt{a}-b\right|\right)}{a^{\frac{3}{2}}}\right)\operatorname{sign}\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)*x,x, algorithm="giac")
```

```
[Out] -1/8*b^2*ln(abs(b))*sign(x)/a^(3/2) + 1/8*(2*sqrt(a*x^2 + b*x)*(2
*x + b/a) + b^2*ln(abs(-2*(sqrt(a)*x - sqrt(a*x^2 + b*x))*sqrt(a)
 - b))/a^(3/2))*sign(x)
```

3.1692 $\int \sqrt{a+\frac{b}{x}}\,dx$

Optimal. Leaf size=39

$$x\sqrt{a+\frac{b}{x}}+\frac{b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{\sqrt{a}}$$

```
[Out] Sqrt[a + b/x]*x + (b*ArcTanh[Sqrt[a + b/x]/Sqrt[a]])/Sqrt[a]
```

Rubi [A] time = 0.0594468, antiderivative size = 39, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364

$$x\sqrt{a+\frac{b}{x}}+\frac{b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x],x]
```

```
[Out] Sqrt[a + b/x]*x + (b*ArcTanh[Sqrt[a + b/x]/Sqrt[a]])/Sqrt[a]
```

Rubi in Sympy [A] time = 5.55811, size = 31, normalized size = 0.79

$$x\sqrt{a+\frac{b}{x}}+\frac{b\,\mathrm{atanh}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(1/2),x)
```

```
[Out] x*sqrt(a + b/x) + b*atanh(sqrt(a + b/x)/sqrt(a))/sqrt(a)
```

Mathematica [A] time = 0.038269, size = 50, normalized size = 1.28

$$x\sqrt{a+\frac{b}{x}}+\frac{b\log\left(2\sqrt{a}x\sqrt{a+\frac{b}{x}}+2ax+b\right)}{2\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x],x]
```

```
[Out] Sqrt[a + b/x]*x + (b*Log[b + 2*a*x + 2*Sqrt[a]*Sqrt[a + b/x]*x])/
(2*Sqrt[a])
```

Maple [B] time = 0.008, size = 74, normalized size = 1.9

$$\frac{x}{2}\sqrt{\frac{ax+b}{x}}\left(2\sqrt{ax^2+bx}\sqrt{a}+b\ln\left(\frac{1}{2}\left(2\sqrt{ax^2+bx}\sqrt{a}+2ax+b\right)\frac{1}{\sqrt{a}}\right)\right)\frac{1}{\sqrt{x(ax+b)}}\frac{1}{\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(1/2),x)
```

```
[Out] 1/2*((a*x+b)/x)^(1/2)*x*(2*(a*x^2+b*x)^(1/2)*a^(1/2)+b*ln(1/2*(2*
(a*x^2+b*x)^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2)))/(x*(a*x+b))^(1/2)/a^
(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.23788, size = 1, normalized size = 0.03

$$\left[\frac{2\sqrt{a}x\sqrt{\frac{ax+b}{x}}+b\log\left(2\,ax\sqrt{\frac{ax+b}{x}}+(2\,ax+b)\sqrt{a}\right)}{2\sqrt{a}},\ \frac{\sqrt{-a}x\sqrt{\frac{ax+b}{x}}-b\arctan\left(\frac{a}{\sqrt{-a}\sqrt{\frac{ax+b}{x}}}\right)}{\sqrt{-a}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x),x, algorithm="fricas")
```

```
[Out] [1/2*(2*sqrt(a)*x*sqrt((a*x + b)/x) + b*log(2*a*x*sqrt((a*x + b)/
x) + (2*a*x + b)*sqrt(a)))/sqrt(a), (sqrt(-a)*x*sqrt((a*x + b)/x)
 - b*arctan(a/(sqrt(-a)*sqrt((a*x + b)/x))))/sqrt(-a)]
```

Sympy [A] time = 6.52929, size = 42, normalized size = 1.08

$$\sqrt{b}\sqrt{x}\sqrt{\frac{ax}{b}+1}+\frac{b\,\mathrm{asinh}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(1/2),x)
```

```
[Out] sqrt(b)*sqrt(x)*sqrt(a*x/b + 1) + b*asinh(sqrt(a)*sqrt(x)/sqrt(b)
)/sqrt(a)
```

GIAC/XCAS [A] time = 0.248094, size = 86, normalized size = 2.21

$$-\frac{b\ln\left(\left|-2\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)\sqrt{a}-b\right|\right)\mathrm{sign}(x)}{2\sqrt{a}}+\frac{b\ln(|b|)\,\mathrm{sign}(x)}{2\sqrt{a}}+\sqrt{ax^2+bx}\,\mathrm{sign}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x),x, algorithm="giac")
```

```
[Out] -1/2*b*ln(abs(-2*(sqrt(a)*x - sqrt(a*x^2 + b*x))*sqrt(a) - b))*si
gn(x)/sqrt(a) + 1/2*b*ln(abs(b))*sign(x)/sqrt(a) + sqrt(a*x^2 + b
*x)*sign(x)
```

3.1693 $\int \frac{\sqrt{a+\frac{b}{x}}}{x}\,dx$

Optimal. Leaf size=39

$$2\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)-2\sqrt{a+\frac{b}{x}}$$

```
[Out] -2*Sqrt[a + b/x] + 2*Sqrt[a]*ArcTanh[Sqrt[a + b/x]/Sqrt[a]]
```

Rubi [A] time = 0.0664272, antiderivative size = 39, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$2\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)-2\sqrt{a+\frac{b}{x}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[a + b/x]/x,x]
```

```
[Out] -2*Sqrt[a + b/x] + 2*Sqrt[a]*ArcTanh[Sqrt[a + b/x]/Sqrt[a]]
```

Rubi in Sympy [A] time = 6.73073, size = 31, normalized size = 0.79

$$2\sqrt{a}\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)-2\sqrt{a+\frac{b}{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x)**(1/2)/x,x)
```

```
[Out] 2*sqrt(a)*atanh(sqrt(a + b/x)/sqrt(a)) - 2*sqrt(a + b/x)
```

Mathematica [A] time = 0.0259487, size = 46, normalized size = 1.18

$$\sqrt{a}\log\left(2\sqrt{a}x\sqrt{a+\frac{b}{x}}+2ax+b\right)-2\sqrt{a+\frac{b}{x}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[a + b/x]/x,x]
```

```
[Out] -2*Sqrt[a + b/x] + Sqrt[a]*Log[b + 2*a*x + 2*Sqrt[a]*Sqrt[a + b/x
]*x]
```

Maple [B] time = 0.01, size = 103, normalized size = 2.6

$$-\frac{1}{bx}\sqrt{\frac{ax+b}{x}}\left(-2\sqrt{ax^2+bx}a^{3/2}x^2-\ln\left(\frac{1}{2}\left(2\sqrt{ax^2+bx}\sqrt{a}+2ax+b\right)\frac{1}{\sqrt{a}}\right)x^2ab+2\left(ax^2+bx\right)^{3/2}\sqrt{a}\right)\frac{1}{\sqrt{x(ax+b)}}\frac{1}{\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(1/2)/x,x)
```

```
[Out] -((a*x+b)/x)^(1/2)/x*(-2*(a*x^2+b*x)^(1/2)*a^(3/2)*x^2-ln(1/2*(2*
(a*x^2+b*x)^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*x^2*a*b+2*(a*x^2+b*x)
^(3/2)*a^(1/2))/(x*(a*x+b))^(1/2)/b/a^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.238334, size = 1, normalized size = 0.03

$$\left[\sqrt{a}\log\left(2\,ax + 2\,\sqrt{a}x\sqrt{\frac{ax+b}{x}} + b\right) - 2\,\sqrt{\frac{ax+b}{x}}, 2\,\sqrt{-a}\arctan\left(\frac{\sqrt{\frac{ax+b}{x}}}{\sqrt{-a}}\right) - 2\,\sqrt{\frac{ax+b}{x}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)/x,x, algorithm="fricas")
```

```
[Out] [sqrt(a)*log(2*a*x + 2*sqrt(a)*x*sqrt((a*x + b)/x) + b) - 2*sqrt(
(a*x + b)/x), 2*sqrt(-a)*arctan(sqrt((a*x + b)/x)/sqrt(-a)) - 2*s
qrt((a*x + b)/x)]
```

Sympy [A] time = 4.94588, size = 68, normalized size = 1.74

$$2\sqrt{a}\operatorname{asinh}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right) - \frac{2a\sqrt{x}}{\sqrt{b}\sqrt{\frac{ax}{b}+1}} - \frac{2\sqrt{b}}{\sqrt{x}\sqrt{\frac{ax}{b}+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(1/2)/x,x)
```

```
[Out] 2*sqrt(a)*asinh(sqrt(a)*sqrt(x)/sqrt(b)) - 2*a*sqrt(x)/(sqrt(b)*s
qrt(a*x/b + 1)) - 2*sqrt(b)/(sqrt(x)*sqrt(a*x/b + 1))
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)/x,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError
```

3.1694 $\int \frac{\sqrt{a+\frac{b}{x}}}{x^2}\,dx$

Optimal. Leaf size=18

$$-\frac{2\left(a+\frac{b}{x}\right)^{3/2}}{3b}$$

```
[Out] (-2*(a + b/x)^(3/2))/(3*b)
```

Rubi [A] time = 0.0259538, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{2\left(a+\frac{b}{x}\right)^{3/2}}{3b}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x]/x^2,x]

[Out] (-2*(a + b/x)^(3/2))/(3*b)
```

Rubi in Sympy [A] time = 2.22485, size = 14, normalized size = 0.78

$$-\frac{2\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(1/2)/x**2,x)

[Out] -2*(a + b/x)**(3/2)/(3*b)
```

Mathematica [A] time = 0.0167095, size = 18, normalized size = 1.

$$-\frac{2\left(a+\frac{b}{x}\right)^{3/2}}{3b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x]/x^2,x]

[Out] (-2*(a + b/x)^(3/2))/(3*b)
```

Maple [A] time = 0.008, size = 25, normalized size = 1.4

$$-\frac{2\,ax+2\,b}{3\,bx}\sqrt{\frac{ax+b}{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(1/2)/x^2,x)

[Out] -2/3/x*(a*x+b)/b*((a*x+b)/x)^(1/2)
```

Maxima [A] time = 1.43968, size = 19, normalized size = 1.06

$$-\frac{2\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)/x^2,x, algorithm="maxima")

[Out] -2/3*(a + b/x)^(3/2)/b
```

Fricas [A] time = 0.222922, size = 32, normalized size = 1.78

$$-\frac{2\,(ax+b)\sqrt{\frac{ax+b}{x}}}{3\,bx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)/x^2,x, algorithm="fricas")

[Out] -2/3*(a*x + b)*sqrt((a*x + b)/x)/(b*x)
```

Sympy [A] time = 2.99631, size = 41, normalized size = 2.28

$$-\frac{2a^{\frac{3}{2}}\sqrt{1+\frac{b}{ax}}}{3b}-\frac{2\sqrt{a}\sqrt{1+\frac{b}{ax}}}{3x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(1/2)/x**2,x)

[Out] -2*a**(3/2)*sqrt(1 + b/(a*x))/(3*b) - 2*sqrt(a)*sqrt(1 + b/(a*x))
/(3*x)
```

GIAC/XCAS [A] time = 0.24907, size = 112, normalized size = 6.22

$$\frac{2\left(3\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^2 a\mathrm{sign}\left(x\right)+3\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)\sqrt{a}b\mathrm{sign}\left(x\right)+b^2\mathrm{sign}\left(x\right)\right)}{3\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)/x^2,x, algorithm="giac")

[Out] 2/3*(3*(sqrt(a)*x - sqrt(a*x^2 + b*x))^2*a*sign(x) + 3*(sqrt(a)*x
 - sqrt(a*x^2 + b*x))*sqrt(a)*b*sign(x) + b^2*sign(x))/(sqrt(a)*x
 - sqrt(a*x^2 + b*x))^3
```

3.1695 $\int \frac{\sqrt{a+\frac{b}{x}}}{x^3}\,dx$

Optimal. Leaf size=38

$$\frac{2a\left(a+\frac{b}{x}\right)^{3/2}}{3b^2}-\frac{2\left(a+\frac{b}{x}\right)^{5/2}}{5b^2}$$

```
[Out] (2*a*(a + b/x)^(3/2))/(3*b^2) - (2*(a + b/x)^(5/2))/(5*b^2)
```

Rubi [A] time = 0.0578148, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2a\left(a+\frac{b}{x}\right)^{3/2}}{3b^2}-\frac{2\left(a+\frac{b}{x}\right)^{5/2}}{5b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x]/x^3,x]

[Out] (2*a*(a + b/x)^(3/2))/(3*b^2) - (2*(a + b/x)^(5/2))/(5*b^2)
```

Rubi in Sympy [A] time = 6.78929, size = 31, normalized size = 0.82

$$\frac{2a\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{3b^2}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{5b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(1/2)/x**3,x)

[Out] 2*a*(a + b/x)**(3/2)/(3*b**2) - 2*(a + b/x)**(5/2)/(5*b**2)
```

Mathematica [A] time = 0.0249001, size = 40, normalized size = 1.05

$$\frac{2\sqrt{a+\frac{b}{x}}\left(2a^2x^2-abx-3b^2\right)}{15b^2x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x]/x^3,x]

[Out] (2*Sqrt[a + b/x]*(-3*b^2 - a*b*x + 2*a^2*x^2))/(15*b^2*x^2)
```

Maple [A] time = 0.008, size = 33, normalized size = 0.9

$$\frac{(2\,ax+2\,b)(2\,ax-3\,b)}{15\,b^2x^2}\sqrt{\frac{ax+b}{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(1/2)/x^3,x)
```

```
[Out] 2/15*(a*x+b)*(2*a*x-3*b)*((a*x+b)/x)^(1/2)/b^2/x^2
```

Maxima [A] time = 1.43872, size = 41, normalized size = 1.08

$$-\frac{2\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{5\,b^2}+\frac{2\left(a+\frac{b}{x}\right)^{\frac{3}{2}}a}{3\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)/x^3,x, algorithm="maxima")
```

```
[Out] -2/5*(a + b/x)^(5/2)/b^2 + 2/3*(a + b/x)^(3/2)*a/b^2
```

Fricas [A] time = 0.227165, size = 51, normalized size = 1.34

$$\frac{2\left(2\,a^2x^2-abx-3\,b^2\right)\sqrt{\frac{ax+b}{x}}}{15\,b^2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)/x^3,x, algorithm="fricas")
```

```
[Out] 2/15*(2*a^2*x^2 - a*b*x - 3*b^2)*sqrt((a*x + b)/x)/(b^2*x^2)
```

Sympy [A] time = 4.30176, size = 304, normalized size = 8.

$$\frac{4a^{\frac{11}{2}}b^{\frac{3}{2}}x^3\sqrt{\frac{ax}{b}+1}}{15a^{\frac{7}{2}}b^3x^{\frac{7}{2}}+15a^{\frac{5}{2}}b^4x^{\frac{5}{2}}}+\frac{2a^{\frac{9}{2}}b^{\frac{5}{2}}x^2\sqrt{\frac{ax}{b}+1}}{15a^{\frac{7}{2}}b^3x^{\frac{7}{2}}+15a^{\frac{5}{2}}b^4x^{\frac{5}{2}}}-\frac{8a^{\frac{7}{2}}b^{\frac{7}{2}}x\sqrt{\frac{ax}{b}+1}}{15a^{\frac{7}{2}}b^3x^{\frac{7}{2}}+15a^{\frac{5}{2}}b^4x^{\frac{5}{2}}}-\frac{6a^{\frac{5}{2}}b^{\frac{9}{2}}\sqrt{\frac{ax}{b}+1}}{15a^{\frac{7}{2}}b^3x^{\frac{7}{2}}+15a^{\frac{5}{2}}b^4x^{\frac{5}{2}}}-\frac{4a^6bx^{\frac{7}{2}}}{15a^{\frac{7}{2}}b^3x^{\frac{7}{2}}+15a^{\frac{5}{2}}b^4x^{\frac{5}{2}}}-\frac{4a^5b^2x^{\frac{5}{2}}}{15a^{\frac{7}{2}}b^3x^{\frac{7}{2}}+15a^{\frac{5}{2}}b^4x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(1/2)/x**3,x)
```

```
[Out] 4*a**(11/2)*b**(3/2)*x**3*sqrt(a*x/b + 1)/(15*a**(7/2)*b**3*x**(7
/2) + 15*a**(5/2)*b**4*x**(5/2)) + 2*a**(9/2)*b**(5/2)*x**2*sqrt(
a*x/b + 1)/(15*a**(7/2)*b**3*x**(7/2) + 15*a**(5/2)*b**4*x**(5/2)
) - 8*a**(7/2)*b**(7/2)*x*sqrt(a*x/b + 1)/(15*a**(7/2)*b**3*x**(7
/2) + 15*a**(5/2)*b**4*x**(5/2)) - 6*a**(5/2)*b**(9/2)*sqrt(a*x/b
 + 1)/(15*a**(7/2)*b**3*x**(7/2) + 15*a**(5/2)*b**4*x**(5/2)) - 4
*a**6*b*x**(7/2)/(15*a**(7/2)*b**3*x**(7/2) + 15*a**(5/2)*b**4*x*
*(5/2)) - 4*a**5*b**2*x**(5/2)/(15*a**(7/2)*b**3*x**(7/2) + 15*a*
*(5/2)*b**4*x**(5/2))
```

GIAC/XCAS [A] time = 0.262161, size = 155, normalized size = 4.08

$$\frac{2\left(15\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^3a^{\frac{3}{2}}\mathrm{sign}\left(x\right)+25\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^2ab\mathrm{sign}\left(x\right)+15\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)\sqrt{a}b^2\mathrm{sign}\left(x\right)+3\,b^3\mathrm{sigr}}{15\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)/x^3,x, algorithm="giac")
```

```
[Out] 2/15*(15*(sqrt(a)*x - sqrt(a*x^2 + b*x))^3*a^(3/2)*sign(x) + 25*(
sqrt(a)*x - sqrt(a*x^2 + b*x))^2*a*b*sign(x) + 15*(sqrt(a)*x - sq
rt(a*x^2 + b*x))*sqrt(a)*b^2*sign(x) + 3*b^3*sign(x))/(sqrt(a)*x
- sqrt(a*x^2 + b*x))^5
```

3.1696 $\int \frac{\sqrt{a+\frac{b}{x}}}{x^4} dx$

Optimal. Leaf size=59

$$-\frac{2a^2\left(a+\frac{b}{x}\right)^{3/2}}{3b^3}-\frac{2\left(a+\frac{b}{x}\right)^{7/2}}{7b^3}+\frac{4a\left(a+\frac{b}{x}\right)^{5/2}}{5b^3}$$

```
[Out] (-2*a^2*(a + b/x)^(3/2))/(3*b^3) + (4*a*(a + b/x)^(5/2))/(5*b^3)
- (2*(a + b/x)^(7/2))/(7*b^3)
```

Rubi [A] time = 0.0779898, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2a^2\left(a+\frac{b}{x}\right)^{3/2}}{3b^3}-\frac{2\left(a+\frac{b}{x}\right)^{7/2}}{7b^3}+\frac{4a\left(a+\frac{b}{x}\right)^{5/2}}{5b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x]/x^4,x]
```

```
[Out] (-2*a^2*(a + b/x)^(3/2))/(3*b^3) + (4*a*(a + b/x)^(5/2))/(5*b^3)
- (2*(a + b/x)^(7/2))/(7*b^3)
```

Rubi in Sympy [A] time = 9.79602, size = 49, normalized size = 0.83

$$-\frac{2a^2\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{3b^3}+\frac{4a\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{5b^3}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{7b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(1/2)/x**4,x)
```

```
[Out] -2*a**2*(a + b/x)**(3/2)/(3*b**3) + 4*a*(a + b/x)**(5/2)/(5*b**3)
 - 2*(a + b/x)**(7/2)/(7*b**3)
```

Mathematica [A] time = 0.0246777, size = 51, normalized size = 0.86

$$-\frac{2\sqrt{a+\frac{b}{x}}\left(8a^3x^3-4a^2bx^2+3ab^2x+15b^3\right)}{105b^3x^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x]/x^4,x]
```

```
[Out] (-2*Sqrt[a + b/x]*(15*b^3 + 3*a*b^2*x - 4*a^2*b*x^2 + 8*a^3*x^3))
/(105*b^3*x^3)
```

Maple [A] time = 0.007, size = 44, normalized size = 0.8

$$-\frac{(2\,ax+2\,b)\left(8\,a^2x^2-12\,abx+15\,b^2\right)}{105\,b^3x^3}\sqrt{\frac{ax+b}{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((a+b/x)^(1/2)/x^4,x)
```

```
[Out] -2/105*(a*x+b)*(8*a^2*x^2-12*a*b*x+15*b^2)*((a*x+b)/x)^(1/2)/b^3/
x^3
```

Maxima [A] time = 1.44091, size = 63, normalized size = 1.07

$$-\frac{2\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{7\,b^{3}}+\frac{4\left(a+\frac{b}{x}\right)^{\frac{5}{2}}a}{5\,b^{3}}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{3}{2}}a^{2}}{3\,b^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(a + b/x)/x^4,x, algorithm="maxima")
```

```
[Out] -2/7*(a + b/x)^(7/2)/b^3 + 4/5*(a + b/x)^(5/2)*a/b^3 - 2/3*(a + b
/x)^(3/2)*a^2/b^3
```

Fricas [A] time = 0.225879, size = 66, normalized size = 1.12

$$-\frac{2\left(8\,a^{3}x^{3}-4\,a^{2}bx^{2}+3\,ab^{2}x+15\,b^{3}\right)\sqrt{\frac{ax+b}{x}}}{105\,b^{3}x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(a + b/x)/x^4,x, algorithm="fricas")
```

```
[Out] -2/105*(8*a^3*x^3 - 4*a^2*b*x^2 + 3*a*b^2*x + 15*b^3)*sqrt((a*x +
 b)/x)/(b^3*x^3)
```

Sympy [A] time = 6.48161, size = 899, normalized size = 15.24

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a+b/x)**(1/2)/x**4,x)
```

```
[Out] -16*a**(19/2)*b**(9/2)*x**6*sqrt(a*x/b + 1)/(105*a**(13/2)*b**7*x
**(13/2) + 315*a**(11/2)*b**8*x**(11/2) + 315*a**(9/2)*b**9*x**(9
/2) + 105*a**(7/2)*b**10*x**(7/2)) - 40*a**(17/2)*b**(11/2)*x**5*
sqrt(a*x/b + 1)/(105*a**(13/2)*b**7*x**(13/2) + 315*a**(11/2)*b**
8*x**(11/2) + 315*a**(9/2)*b**9*x**(9/2) + 105*a**(7/2)*b**10*x**
(7/2)) - 30*a**(15/2)*b**(13/2)*x**4*sqrt(a*x/b + 1)/(105*a**(13/
2)*b**7*x**(13/2) + 315*a**(11/2)*b**8*x**(11/2) + 315*a**(9/2)*b
**9*x**(9/2) + 105*a**(7/2)*b**10*x**(7/2)) - 40*a**(13/2)*b**(15
/2)*x**3*sqrt(a*x/b + 1)/(105*a**(13/2)*b**7*x**(13/2) + 315*a**(
11/2)*b**8*x**(11/2) + 315*a**(9/2)*b**9*x**(9/2) + 105*a**(7/2)*
b**10*x**(7/2)) - 100*a**(11/2)*b**(17/2)*x**2*sqrt(a*x/b + 1)/(1
05*a**(13/2)*b**7*x**(13/2) + 315*a**(11/2)*b**8*x**(11/2) + 315*
a**(9/2)*b**9*x**(9/2) + 105*a**(7/2)*b**10*x**(7/2)) - 96*a**(9/
2)*b**(19/2)*x*sqrt(a*x/b + 1)/(105*a**(13/2)*b**7*x**(13/2) + 31
5*a**(11/2)*b**8*x**(11/2) + 315*a**(9/2)*b**9*x**(9/2) + 105*a**
(7/2)*b**10*x**(7/2)) - 30*a**(7/2)*b**(21/2)*sqrt(a*x/b + 1)/(10
5*a**(13/2)*b**7*x**(13/2) + 315*a**(11/2)*b**8*x**(11/2) + 315*a
**(9/2)*b**9*x**(9/2) + 105*a**(7/2)*b**10*x**(7/2)) + 16*a**10*b
**4*x**(13/2)/(105*a**(13/2)*b**7*x**(13/2) + 315*a**(11/2)*b**8*
```

```
x**(11/2) + 315*a**(9/2)*b**9*x**(9/2) + 105*a**(7/2)*b**10*x**(7
/2)) + 48*a**9*b**5*x**(11/2)/(105*a**(13/2)*b**7*x**(13/2) + 315
*a**(11/2)*b**8*x**(11/2) + 315*a**(9/2)*b**9*x**(9/2) + 105*a**(
7/2)*b**10*x**(7/2)) + 48*a**8*b**6*x**(9/2)/(105*a**(13/2)*b**7*
x**(13/2) + 315*a**(11/2)*b**8*x**(11/2) + 315*a**(9/2)*b**9*x**(
9/2) + 105*a**(7/2)*b**10*x**(7/2)) + 16*a**7*b**7*x**(7/2)/(105*
a**(13/2)*b**7*x**(13/2) + 315*a**(11/2)*b**8*x**(11/2) + 315*a**
(9/2)*b**9*x**(9/2) + 105*a**(7/2)*b**10*x**(7/2))
```

GIAC/XCAS [A] time = 0.256476, size = 197, normalized size = 3.34

$$\frac{2\left(140\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^4a^2\mathrm{sign}\left(x\right)+315\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^3a^{\frac{3}{2}}b\mathrm{sign}\left(x\right)+273\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^2ab^2\mathrm{sign}\left(x\right)+105}{105\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)/x^4,x, algorithm="giac")
```

```
[Out] 2/105*(140*(sqrt(a)*x - sqrt(a*x^2 + b*x))^4*a^2*sign(x) + 315*(s
qrt(a)*x - sqrt(a*x^2 + b*x))^3*a^(3/2)*b*sign(x) + 273*(sqrt(a)*
x - sqrt(a*x^2 + b*x))^2*a*b^2*sign(x) + 105*(sqrt(a)*x - sqrt(a*
x^2 + b*x))*sqrt(a)*b^3*sign(x) + 15*b^4*sign(x))/(sqrt(a)*x - sq
rt(a*x^2 + b*x))^7
```

3.1697 $\int \frac{\sqrt{a+\frac{b}{x}}}{x^5}\,dx$

Optimal. Leaf size=80

$$\frac{2a^3\left(a+\frac{b}{x}\right)^{3/2}}{3b^4}-\frac{6a^2\left(a+\frac{b}{x}\right)^{5/2}}{5b^4}-\frac{2\left(a+\frac{b}{x}\right)^{9/2}}{9b^4}+\frac{6a\left(a+\frac{b}{x}\right)^{7/2}}{7b^4}$$

```
[Out] (2*a^3*(a + b/x)^(3/2))/(3*b^4) - (6*a^2*(a + b/x)^(5/2))/(5*b^4)
 + (6*a*(a + b/x)^(7/2))/(7*b^4) - (2*(a + b/x)^(9/2))/(9*b^4)
```

Rubi [A] time = 0.0967987, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2a^3\left(a+\frac{b}{x}\right)^{3/2}}{3b^4}-\frac{6a^2\left(a+\frac{b}{x}\right)^{5/2}}{5b^4}-\frac{2\left(a+\frac{b}{x}\right)^{9/2}}{9b^4}+\frac{6a\left(a+\frac{b}{x}\right)^{7/2}}{7b^4}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x]/x^5,x]
```

```
[Out] (2*a^3*(a + b/x)^(3/2))/(3*b^4) - (6*a^2*(a + b/x)^(5/2))/(5*b^4)
 + (6*a*(a + b/x)^(7/2))/(7*b^4) - (2*(a + b/x)^(9/2))/(9*b^4)
```

Rubi in Sympy [A] time = 13.1763, size = 68, normalized size = 0.85

$$\frac{2a^3\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{3b^4}-\frac{6a^2\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{5b^4}+\frac{6a\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{7b^4}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{9}{2}}}{9b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(1/2)/x**5,x)
```

```
[Out] 2*a**3*(a + b/x)**(3/2)/(3*b**4) - 6*a**2*(a + b/x)**(5/2)/(5*b**
4) + 6*a*(a + b/x)**(7/2)/(7*b**4) - 2*(a + b/x)**(9/2)/(9*b**4)
```

Mathematica [A] time = 0.03159, size = 62, normalized size = 0.78

$$\frac{2\sqrt{a+\frac{b}{x}}\left(16a^4x^4-8a^3bx^3+6a^2b^2x^2-5ab^3x-35b^4\right)}{315b^4x^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x]/x^5,x]
```

```
[Out] (2*Sqrt[a + b/x]*(-35*b^4 - 5*a*b^3*x + 6*a^2*b^2*x^2 - 8*a^3*b*x
^3 + 16*a^4*x^4))/(315*b^4*x^4)
```

Maple [A] time = 0.01, size = 55, normalized size = 0.7

$$\frac{(2\,ax+2\,b)\left(16\,a^3x^3-24\,a^2bx^2+30\,ab^2x-35\,b^3\right)}{315\,x^4b^4}\sqrt{\frac{ax+b}{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(1/2)/x^5,x)
```

```
[Out] 2/315*(a*x+b)*(16*a^3*x^3-24*a^2*b*x^2+30*a*b^2*x-35*b^3)*((a*x+b
)/x)^(1/2)/x^4/b^4
```

Maxima [A] time = 1.43562, size = 86, normalized size = 1.08

$$-\frac{2\left(a+\frac{b}{x}\right)^{\frac{9}{2}}}{9\,b^4}+\frac{6\left(a+\frac{b}{x}\right)^{\frac{7}{2}}a}{7\,b^4}-\frac{6\left(a+\frac{b}{x}\right)^{\frac{5}{2}}a^2}{5\,b^4}+\frac{2\left(a+\frac{b}{x}\right)^{\frac{3}{2}}a^3}{3\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)/x^5,x, algorithm="maxima")
```

```
[Out] -2/9*(a + b/x)^(9/2)/b^4 + 6/7*(a + b/x)^(7/2)*a/b^4 - 6/5*(a + b
/x)^(5/2)*a^2/b^4 + 2/3*(a + b/x)^(3/2)*a^3/b^4
```

Fricas [A] time = 0.224562, size = 81, normalized size = 1.01

$$\frac{2\left(16\,a^4x^4-8\,a^3bx^3+6\,a^2b^2x^2-5\,ab^3x-35\,b^4\right)\sqrt{\frac{ax+b}{x}}}{315\,b^4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)/x^5,x, algorithm="fricas")
```

```
[Out] 2/315*(16*a^4*x^4 - 8*a^3*b*x^3 + 6*a^2*b^2*x^2 - 5*a*b^3*x - 35*
b^4)*sqrt((a*x + b)/x)/(b^4*x^4)
```

Sympy [A] time = 9.61742, size = 2297, normalized size = 28.71

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(1/2)/x**5,x)
```

```
[Out] 32*a**(29/2)*b**(23/2)*x**10*sqrt(a*x/b + 1)/(315*a**(21/2)*b**15
*x**(21/2) + 1890*a**(19/2)*b**16*x**(19/2) + 4725*a**(17/2)*b**1
7*x**(17/2) + 6300*a**(15/2)*b**18*x**(15/2) + 4725*a**(13/2)*b**
19*x**(13/2) + 1890*a**(11/2)*b**20*x**(11/2) + 315*a**(9/2)*b**2
1*x**(9/2)) + 176*a**(27/2)*b**(25/2)*x**9*sqrt(a*x/b + 1)/(315*a
**(21/2)*b**15*x**(21/2) + 1890*a**(19/2)*b**16*x**(19/2) + 4725*
a**(17/2)*b**17*x**(17/2) + 6300*a**(15/2)*b**18*x**(15/2) + 4725
*a**(13/2)*b**19*x**(13/2) + 1890*a**(11/2)*b**20*x**(11/2) + 315
*a**(9/2)*b**21*x**(9/2)) + 396*a**(25/2)*b**(27/2)*x**8*sqrt(a*x
/b + 1)/(315*a**(21/2)*b**15*x**(21/2) + 1890*a**(19/2)*b**16*x**
(19/2) + 4725*a**(17/2)*b**17*x**(17/2) + 6300*a**(15/2)*b**18*x*
*(15/2) + 4725*a**(13/2)*b**19*x**(13/2) + 1890*a**(11/2)*b**20*x
**(11/2) + 315*a**(9/2)*b**21*x**(9/2)) + 462*a**(23/2)*b**(29/2)
*x**7*sqrt(a*x/b + 1)/(315*a**(21/2)*b**15*x**(21/2) + 1890*a**(1
9/2)*b**16*x**(19/2) + 4725*a**(17/2)*b**17*x**(17/2) + 6300*a**(
15/2)*b**18*x**(15/2) + 4725*a**(13/2)*b**19*x**(13/2) + 1890*a**
(11/2)*b**20*x**(11/2) + 315*a**(9/2)*b**21*x**(9/2)) + 210*a**(2
1/2)*b**(31/2)*x**6*sqrt(a*x/b + 1)/(315*a**(21/2)*b**15*x**(21/2
) + 1890*a**(19/2)*b**16*x**(19/2) + 4725*a**(17/2)*b**17*x**(17/
```

```
2) + 6300*a**(15/2)*b**18*x**(15/2) + 4725*a**(13/2)*b**19*x**(13
/2) + 1890*a**(11/2)*b**20*x**(11/2) + 315*a**(9/2)*b**21*x**(9/2
)) - 378*a**(19/2)*b**(33/2)*x**5*sqrt(a*x/b + 1)/(315*a**(21/2)*
b**15*x**(21/2) + 1890*a**(19/2)*b**16*x**(19/2) + 4725*a**(17/2)
*b**17*x**(17/2) + 6300*a**(15/2)*b**18*x**(15/2) + 4725*a**(13/2
)*b**19*x**(13/2) + 1890*a**(11/2)*b**20*x**(11/2) + 315*a**(9/2)
*b**21*x**(9/2)) - 1134*a**(17/2)*b**(35/2)*x**4*sqrt(a*x/b + 1)/
(315*a**(21/2)*b**15*x**(21/2) + 1890*a**(19/2)*b**16*x**(19/2) +
 4725*a**(17/2)*b**17*x**(17/2) + 6300*a**(15/2)*b**18*x**(15/2)
+ 4725*a**(13/2)*b**19*x**(13/2) + 1890*a**(11/2)*b**20*x**(11/2)
 + 315*a**(9/2)*b**21*x**(9/2)) - 1494*a**(15/2)*b**(37/2)*x**3*s
qrt(a*x/b + 1)/(315*a**(21/2)*b**15*x**(21/2) + 1890*a**(19/2)*b*
*16*x**(19/2) + 4725*a**(17/2)*b**17*x**(17/2) + 6300*a**(15/2)*b
**18*x**(15/2) + 4725*a**(13/2)*b**19*x**(13/2) + 1890*a**(11/2)*
b**20*x**(11/2) + 315*a**(9/2)*b**21*x**(9/2)) - 1098*a**(13/2)*b
**(39/2)*x**2*sqrt(a*x/b + 1)/(315*a**(21/2)*b**15*x**(21/2) + 18
90*a**(19/2)*b**16*x**(19/2) + 4725*a**(17/2)*b**17*x**(17/2) + 6
300*a**(15/2)*b**18*x**(15/2) + 4725*a**(13/2)*b**19*x**(13/2) +
1890*a**(11/2)*b**20*x**(11/2) + 315*a**(9/2)*b**21*x**(9/2)) - 4
30*a**(11/2)*b**(41/2)*x*sqrt(a*x/b + 1)/(315*a**(21/2)*b**15*x**
(21/2) + 1890*a**(19/2)*b**16*x**(19/2) + 4725*a**(17/2)*b**17*x*
*(17/2) + 6300*a**(15/2)*b**18*x**(15/2) + 4725*a**(13/2)*b**19*x
**(13/2) + 1890*a**(11/2)*b**20*x**(11/2) + 315*a**(9/2)*b**21*x*
*(9/2)) - 70*a**(9/2)*b**(43/2)*sqrt(a*x/b + 1)/(315*a**(21/2)*b*
*15*x**(21/2) + 1890*a**(19/2)*b**16*x**(19/2) + 4725*a**(17/2)*b
**17*x**(17/2) + 6300*a**(15/2)*b**18*x**(15/2) + 4725*a**(13/2)*
b**19*x**(13/2) + 1890*a**(11/2)*b**20*x**(11/2) + 315*a**(9/2)*b
**21*x**(9/2)) - 32*a**15*b**11*x**(21/2)/(315*a**(21/2)*b**15*x*
*(21/2) + 1890*a**(19/2)*b**16*x**(19/2) + 4725*a**(17/2)*b**17*x
**(17/2) + 6300*a**(15/2)*b**18*x**(15/2) + 4725*a**(13/2)*b**19*
x**(13/2) + 1890*a**(11/2)*b**20*x**(11/2) + 315*a**(9/2)*b**21*x
**(9/2)) - 192*a**14*b**12*x**(19/2)/(315*a**(21/2)*b**15*x**(21/
2) + 1890*a**(19/2)*b**16*x**(19/2) + 4725*a**(17/2)*b**17*x**(17
/2) + 6300*a**(15/2)*b**18*x**(15/2) + 4725*a**(13/2)*b**19*x**(1
3/2) + 1890*a**(11/2)*b**20*x**(11/2) + 315*a**(9/2)*b**21*x**(9/
2)) - 480*a**13*b**13*x**(17/2)/(315*a**(21/2)*b**15*x**(21/2) +
1890*a**(19/2)*b**16*x**(19/2) + 4725*a**(17/2)*b**17*x**(17/2) +
 6300*a**(15/2)*b**18*x**(15/2) + 4725*a**(13/2)*b**19*x**(13/2)
+ 1890*a**(11/2)*b**20*x**(11/2) + 315*a**(9/2)*b**21*x**(9/2)) -
 640*a**12*b**14*x**(15/2)/(315*a**(21/2)*b**15*x**(21/2) + 1890*
a**(19/2)*b**16*x**(19/2) + 4725*a**(17/2)*b**17*x**(17/2) + 6300
*a**(15/2)*b**18*x**(15/2) + 4725*a**(13/2)*b**19*x**(13/2) + 189
0*a**(11/2)*b**20*x**(11/2) + 315*a**(9/2)*b**21*x**(9/2)) - 480*
a**11*b**15*x**(13/2)/(315*a**(21/2)*b**15*x**(21/2) + 1890*a**(1
9/2)*b**16*x**(19/2) + 4725*a**(17/2)*b**17*x**(17/2) + 6300*a**(
15/2)*b**18*x**(15/2) + 4725*a**(13/2)*b**19*x**(13/2) + 1890*a**
(11/2)*b**20*x**(11/2) + 315*a**(9/2)*b**21*x**(9/2)) - 192*a**10
*b**16*x**(11/2)/(315*a**(21/2)*b**15*x**(21/2) + 1890*a**(19/2)*
b**16*x**(19/2) + 4725*a**(17/2)*b**17*x**(17/2) + 6300*a**(15/2)
*b**18*x**(15/2) + 4725*a**(13/2)*b**19*x**(13/2) + 1890*a**(11/2
)*b**20*x**(11/2) + 315*a**(9/2)*b**21*x**(9/2)) - 32*a**9*b**17*
x**(9/2)/(315*a**(21/2)*b**15*x**(21/2) + 1890*a**(19/2)*b**16*x*
*(19/2) + 4725*a**(17/2)*b**17*x**(17/2) + 6300*a**(15/2)*b**18*x
**(15/2) + 4725*a**(13/2)*b**19*x**(13/2) + 1890*a**(11/2)*b**20*
x**(11/2) + 315*a**(9/2)*b**21*x**(9/2))
```

GIAC/XCAS [A] time = 0.263627, size = 239, normalized size = 2.99

$$\frac{2\left(630\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^5a^{\frac{5}{2}}\mathrm{sign}\left(x\right)+1764\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^4a^2b\mathrm{sign}\left(x\right)+1995\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^3a^{\frac{3}{2}}b^2\mathrm{sign}\left(x\right)+\right.}{315\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)/x^5,x, algorithm="giac")
```

```
[Out] 2/315*(630*(sqrt(a)*x - sqrt(a*x^2 + b*x))^5*a^(5/2)*sign(x) + 17
64*(sqrt(a)*x - sqrt(a*x^2 + b*x))^4*a^2*b*sign(x) + 1995*(sqrt(a
)*x - sqrt(a*x^2 + b*x))^3*a^(3/2)*b^2*sign(x) + 1125*(sqrt(a)*x
```

```
- sqrt(a*x^2 + b*x))^2*a*b^3*sign(x) + 315*(sqrt(a)*x - sqrt(a*x^
2 + b*x))*sqrt(a)*b^4*sign(x) + 35*b^5*sign(x))/(sqrt(a)*x - sqrt
(a*x^2 + b*x))^9
```

3.1698 $\int \frac{\sqrt{a+\frac{b}{x}}}{x^6} dx$

Optimal. Leaf size=101

$$-\frac{2a^4\left(a+\frac{b}{x}\right)^{3/2}}{3b^5}+\frac{8a^3\left(a+\frac{b}{x}\right)^{5/2}}{5b^5}-\frac{12a^2\left(a+\frac{b}{x}\right)^{7/2}}{7b^5}-\frac{2\left(a+\frac{b}{x}\right)^{11/2}}{11b^5}+\frac{8a\left(a+\frac{b}{x}\right)^{9/2}}{9b^5}$$

```
[Out] (-2*a^4*(a + b/x)^(3/2))/(3*b^5) + (8*a^3*(a + b/x)^(5/2))/(5*b^5
) - (12*a^2*(a + b/x)^(7/2))/(7*b^5) + (8*a*(a + b/x)^(9/2))/(9*b
^5) - (2*(a + b/x)^(11/2))/(11*b^5)
```

Rubi [A] time = 0.116262, antiderivative size = 101, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2a^4\left(a+\frac{b}{x}\right)^{3/2}}{3b^5}+\frac{8a^3\left(a+\frac{b}{x}\right)^{5/2}}{5b^5}-\frac{12a^2\left(a+\frac{b}{x}\right)^{7/2}}{7b^5}-\frac{2\left(a+\frac{b}{x}\right)^{11/2}}{11b^5}+\frac{8a\left(a+\frac{b}{x}\right)^{9/2}}{9b^5}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x]/x^6,x]
```

```
[Out] (-2*a^4*(a + b/x)^(3/2))/(3*b^5) + (8*a^3*(a + b/x)^(5/2))/(5*b^5
) - (12*a^2*(a + b/x)^(7/2))/(7*b^5) + (8*a*(a + b/x)^(9/2))/(9*b
^5) - (2*(a + b/x)^(11/2))/(11*b^5)
```

Rubi in Sympy [A] time = 16.0787, size = 87, normalized size = 0.86

$$-\frac{2a^4\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{3b^5}+\frac{8a^3\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{5b^5}-\frac{12a^2\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{7b^5}+\frac{8a\left(a+\frac{b}{x}\right)^{\frac{9}{2}}}{9b^5}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{11}{2}}}{11b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(1/2)/x**6,x)
```

```
[Out] -2*a**4*(a + b/x)**(3/2)/(3*b**5) + 8*a**3*(a + b/x)**(5/2)/(5*b*
*5) - 12*a**2*(a + b/x)**(7/2)/(7*b**5) + 8*a*(a + b/x)**(9/2)/(9
*b**5) - 2*(a + b/x)**(11/2)/(11*b**5)
```

Mathematica [A] time = 0.0348282, size = 73, normalized size = 0.72

$$-\frac{2\sqrt{a+\frac{b}{x}}\left(128a^5x^5-64a^4bx^4+48a^3b^2x^3-40a^2b^3x^2+35ab^4x+315b^5\right)}{3465b^5x^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x]/x^6,x]
```

```
[Out] (-2*Sqrt[a + b/x]*(315*b^5 + 35*a*b^4*x - 40*a^2*b^3*x^2 + 48*a^3
*b^2*x^3 - 64*a^4*b*x^4 + 128*a^5*x^5))/(3465*b^5*x^5)
```

Maple [A] time = 0.009, size = 66, normalized size = 0.7

$$-\frac{(2\,ax+2\,b)\left(128\,a^4x^4-192\,a^3x^3b+240\,a^2x^2b^2-280\,axb^3+315\,b^4\right)}{3465\,x^5b^5}\sqrt{\frac{ax+b}{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(1/2)/x^6,x)
```

```
[Out] -2/3465*(a*x+b)*(128*a^4*x^4-192*a^3*b*x^3+240*a^2*b^2*x^2-280*a*
b^3*x+315*b^4)*((a*x+b)/x)^(1/2)/x^5/b^5
```

Maxima [A] time = 1.43809, size = 109, normalized size = 1.08

$$-\frac{2\left(a+\frac{b}{x}\right)^{\frac{11}{2}}}{11\,b^5}+\frac{8\left(a+\frac{b}{x}\right)^{\frac{9}{2}}a}{9\,b^5}-\frac{12\left(a+\frac{b}{x}\right)^{\frac{7}{2}}a^2}{7\,b^5}+\frac{8\left(a+\frac{b}{x}\right)^{\frac{5}{2}}a^3}{5\,b^5}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{3}{2}}a^4}{3\,b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)/x^6,x, algorithm="maxima")
```

```
[Out] -2/11*(a + b/x)^(11/2)/b^5 + 8/9*(a + b/x)^(9/2)*a/b^5 - 12/7*(a
+ b/x)^(7/2)*a^2/b^5 + 8/5*(a + b/x)^(5/2)*a^3/b^5 - 2/3*(a + b/x
)^(3/2)*a^4/b^5
```

Fricas [A] time = 0.222849, size = 96, normalized size = 0.95

$$-\frac{2\left(128\,a^5x^5-64\,a^4bx^4+48\,a^3b^2x^3-40\,a^2b^3x^2+35\,ab^4x+315\,b^5\right)\sqrt{\frac{ax+b}{x}}}{3465\,b^5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)/x^6,x, algorithm="fricas")
```

```
[Out] -2/3465*(128*a^5*x^5 - 64*a^4*b*x^4 + 48*a^3*b^2*x^3 - 40*a^2*b^3
*x^2 + 35*a*b^4*x + 315*b^5)*sqrt((a*x + b)/x)/(b^5*x^5)
```

Sympy [A] time = 16.7957, size = 5095, normalized size = 50.45

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(1/2)/x**6,x)
```

```
[Out] -256*a**(41/2)*b**(49/2)*x**15*sqrt(a*x/b + 1)/(3465*a**(31/2)*b*
*29*x**(31/2) + 34650*a**(29/2)*b**30*x**(29/2) + 155925*a**(27/2
)*b**31*x**(27/2) + 415800*a**(25/2)*b**32*x**(25/2) + 727650*a**
(23/2)*b**33*x**(23/2) + 873180*a**(21/2)*b**34*x**(21/2) + 72765
0*a**(19/2)*b**35*x**(19/2) + 415800*a**(17/2)*b**36*x**(17/2) +
155925*a**(15/2)*b**37*x**(15/2) + 34650*a**(13/2)*b**38*x**(13/2
) + 3465*a**(11/2)*b**39*x**(11/2)) - 2432*a**(39/2)*b**(51/2)*x*
*14*sqrt(a*x/b + 1)/(3465*a**(31/2)*b**29*x**(31/2) + 34650*a**(2
9/2)*b**30*x**(29/2) + 155925*a**(27/2)*b**31*x**(27/2) + 415800*
a**(25/2)*b**32*x**(25/2) + 727650*a**(23/2)*b**33*x**(23/2) + 87
3180*a**(21/2)*b**34*x**(21/2) + 727650*a**(19/2)*b**35*x**(19/2)
```

```
 + 415800*a**(17/2)*b**36*x**(17/2) + 155925*a**(15/2)*b**37*x**(
15/2) + 34650*a**(13/2)*b**38*x**(13/2) + 3465*a**(11/2)*b**39*x*
*(11/2)) - 10336*a**(37/2)*b**(53/2)*x**13*sqrt(a*x/b + 1)/(3465*
a**(31/2)*b**29*x**(31/2) + 34650*a**(29/2)*b**30*x**(29/2) + 155
925*a**(27/2)*b**31*x**(27/2) + 415800*a**(25/2)*b**32*x**(25/2)
 + 727650*a**(23/2)*b**33*x**(23/2) + 873180*a**(21/2)*b**34*x**(2
1/2) + 727650*a**(19/2)*b**35*x**(19/2) + 415800*a**(17/2)*b**36*
x**(17/2) + 155925*a**(15/2)*b**37*x**(15/2) + 34650*a**(13/2)*b*
*38*x**(13/2) + 3465*a**(11/2)*b**39*x**(11/2)) - 25840*a**(35/2)
*b**(55/2)*x**12*sqrt(a*x/b + 1)/(3465*a**(31/2)*b**29*x**(31/2)
 + 34650*a**(29/2)*b**30*x**(29/2) + 155925*a**(27/2)*b**31*x**(27
/2) + 415800*a**(25/2)*b**32*x**(25/2) + 727650*a**(23/2)*b**33*x
**(23/2) + 873180*a**(21/2)*b**34*x**(21/2) + 727650*a**(19/2)*b*
*35*x**(19/2) + 415800*a**(17/2)*b**36*x**(17/2) + 155925*a**(15/
2)*b**37*x**(15/2) + 34650*a**(13/2)*b**38*x**(13/2) + 3465*a**(1
1/2)*b**39*x**(11/2)) - 41990*a**(33/2)*b**(57/2)*x**11*sqrt(a*x/
b + 1)/(3465*a**(31/2)*b**29*x**(31/2) + 34650*a**(29/2)*b**30*x*
*(29/2) + 155925*a**(27/2)*b**31*x**(27/2) + 415800*a**(25/2)*b**
32*x**(25/2) + 727650*a**(23/2)*b**33*x**(23/2) + 873180*a**(21/2
)*b**34*x**(21/2) + 727650*a**(19/2)*b**35*x**(19/2) + 415800*a**
(17/2)*b**36*x**(17/2) + 155925*a**(15/2)*b**37*x**(15/2) + 34650
*a**(13/2)*b**38*x**(13/2) + 3465*a**(11/2)*b**39*x**(11/2)) - 46
882*a**(31/2)*b**(59/2)*x**10*sqrt(a*x/b + 1)/(3465*a**(31/2)*b**
29*x**(31/2) + 34650*a**(29/2)*b**30*x**(29/2) + 155925*a**(27/2)
*b**31*x**(27/2) + 415800*a**(25/2)*b**32*x**(25/2) + 727650*a**(
23/2)*b**33*x**(23/2) + 873180*a**(21/2)*b**34*x**(21/2) + 727650
*a**(19/2)*b**35*x**(19/2) + 415800*a**(17/2)*b**36*x**(17/2) + 1
55925*a**(15/2)*b**37*x**(15/2) + 34650*a**(13/2)*b**38*x**(13/2)
 + 3465*a**(11/2)*b**39*x**(11/2)) - 41514*a**(29/2)*b**(61/2)*x*
*9*sqrt(a*x/b + 1)/(3465*a**(31/2)*b**29*x**(31/2) + 34650*a**(29
/2)*b**30*x**(29/2) + 155925*a**(27/2)*b**31*x**(27/2) + 415800*a
**(25/2)*b**32*x**(25/2) + 727650*a**(23/2)*b**33*x**(23/2) + 873
180*a**(21/2)*b**34*x**(21/2) + 727650*a**(19/2)*b**35*x**(19/2)
 + 415800*a**(17/2)*b**36*x**(17/2) + 155925*a**(15/2)*b**37*x**(1
5/2) + 34650*a**(13/2)*b**38*x**(13/2) + 3465*a**(11/2)*b**39*x**
(11/2)) - 47982*a**(27/2)*b**(63/2)*x**8*sqrt(a*x/b + 1)/(3465*a*
*(31/2)*b**29*x**(31/2) + 34650*a**(29/2)*b**30*x**(29/2) + 15592
5*a**(27/2)*b**31*x**(27/2) + 415800*a**(25/2)*b**32*x**(25/2) +
727650*a**(23/2)*b**33*x**(23/2) + 873180*a**(21/2)*b**34*x**(21/
2) + 727650*a**(19/2)*b**35*x**(19/2) + 415800*a**(17/2)*b**36*x*
*(17/2) + 155925*a**(15/2)*b**37*x**(15/2) + 34650*a**(13/2)*b**3
8*x**(13/2) + 3465*a**(11/2)*b**39*x**(11/2)) - 86460*a**(25/2)*b
**(65/2)*x**7*sqrt(a*x/b + 1)/(3465*a**(31/2)*b**29*x**(31/2) + 3
4650*a**(29/2)*b**30*x**(29/2) + 155925*a**(27/2)*b**31*x**(27/2)
 + 415800*a**(25/2)*b**32*x**(25/2) + 727650*a**(23/2)*b**33*x**(
23/2) + 873180*a**(21/2)*b**34*x**(21/2) + 727650*a**(19/2)*b**35
*x**(19/2) + 415800*a**(17/2)*b**36*x**(17/2) + 155925*a**(15/2)*
b**37*x**(15/2) + 34650*a**(13/2)*b**38*x**(13/2) + 3465*a**(11/2
)*b**39*x**(11/2)) - 141460*a**(23/2)*b**(67/2)*x**6*sqrt(a*x/b +
 1)/(3465*a**(31/2)*b**29*x**(31/2) + 34650*a**(29/2)*b**30*x**(2
9/2) + 155925*a**(27/2)*b**31*x**(27/2) + 415800*a**(25/2)*b**32*
x**(25/2) + 727650*a**(23/2)*b**33*x**(23/2) + 873180*a**(21/2)*b
**34*x**(21/2) + 727650*a**(19/2)*b**35*x**(19/2) + 415800*a**(17
/2)*b**36*x**(17/2) + 155925*a**(15/2)*b**37*x**(15/2) + 34650*a*
*(13/2)*b**38*x**(13/2) + 3465*a**(11/2)*b**39*x**(11/2)) - 16715
6*a**(21/2)*b**(69/2)*x**5*sqrt(a*x/b + 1)/(3465*a**(31/2)*b**29*
x**(31/2) + 34650*a**(29/2)*b**30*x**(29/2) + 155925*a**(27/2)*b*
*31*x**(27/2) + 415800*a**(25/2)*b**32*x**(25/2) + 727650*a**(23/
2)*b**33*x**(23/2) + 873180*a**(21/2)*b**34*x**(21/2) + 727650*a*
*(19/2)*b**35*x**(19/2) + 415800*a**(17/2)*b**36*x**(17/2) + 1559
25*a**(15/2)*b**37*x**(15/2) + 34650*a**(13/2)*b**38*x**(13/2) +
3465*a**(11/2)*b**39*x**(11/2)) - 137932*a**(19/2)*b**(71/2)*x**4
*sqrt(a*x/b + 1)/(3465*a**(31/2)*b**29*x**(31/2) + 34650*a**(29/2
)*b**30*x**(29/2) + 155925*a**(27/2)*b**31*x**(27/2) + 415800*a**
(25/2)*b**32*x**(25/2) + 727650*a**(23/2)*b**33*x**(23/2) + 87318
0*a**(21/2)*b**34*x**(21/2) + 727650*a**(19/2)*b**35*x**(19/2) +
415800*a**(17/2)*b**36*x**(17/2) + 155925*a**(15/2)*b**37*x**(15/
2) + 34650*a**(13/2)*b**38*x**(13/2) + 3465*a**(11/2)*b**39*x**(1
1/2)) - 78046*a**(17/2)*b**(73/2)*x**3*sqrt(a*x/b + 1)/(3465*a**(
31/2)*b**29*x**(31/2) + 34650*a**(29/2)*b**30*x**(29/2) + 155925*
a**(27/2)*b**31*x**(27/2) + 415800*a**(25/2)*b**32*x**(25/2) + 72
7650*a**(23/2)*b**33*x**(23/2) + 873180*a**(21/2)*b**34*x**(21/2)
 + 727650*a**(19/2)*b**35*x**(19/2) + 415800*a**(17/2)*b**36*x**(
17/2) + 155925*a**(15/2)*b**37*x**(15/2) + 34650*a**(13/2)*b**38*
```

x**(13/2) + 3465*a**(11/2)*b**39*x**(11/2)) - 28970*a**(15/2)*b**
(75/2)*x**2*sqrt(a*x/b + 1)/(3465*a**(31/2)*b**29*x**(31/2) + 346
50*a**(29/2)*b**30*x**(29/2) + 155925*a**(27/2)*b**31*x**(27/2) +
415800*a**(25/2)*b**32*x**(25/2) + 727650*a**(23/2)*b**33*x**(23
/2) + 873180*a**(21/2)*b**34*x**(21/2) + 727650*a**(19/2)*b**35*x
(19/2) + 415800*a(17/2)*b**36*x**(17/2) + 155925*a**(15/2)*b*
*37*x**(15/2) + 34650*a**(13/2)*b**38*x**(13/2) + 3465*a**(11/2)*
b**39*x**(11/2)) - 6370*a**(13/2)*b**(77/2)*x*sqrt(a*x/b + 1)/(34
65*a**(31/2)*b**29*x**(31/2) + 34650*a**(29/2)*b**30*x**(29/2) +
155925*a**(27/2)*b**31*x**(27/2) + 415800*a**(25/2)*b**32*x**(25/
2) + 727650*a**(23/2)*b**33*x**(23/2) + 873180*a**(21/2)*b**34*x*
*(21/2) + 727650*a**(19/2)*b**35*x**(19/2) + 415800*a**(17/2)*b**
36*x**(17/2) + 155925*a**(15/2)*b**37*x**(15/2) + 34650*a**(13/2)
*b**38*x**(13/2) + 3465*a**(11/2)*b**39*x**(11/2)) - 630*a**(11/2
)*b**(79/2)*sqrt(a*x/b + 1)/(3465*a**(31/2)*b**29*x**(31/2) + 346
50*a**(29/2)*b**30*x**(29/2) + 155925*a**(27/2)*b**31*x**(27/2) +
415800*a**(25/2)*b**32*x**(25/2) + 727650*a**(23/2)*b**33*x**(23
/2) + 873180*a**(21/2)*b**34*x**(21/2) + 727650*a**(19/2)*b**35*x
(19/2) + 415800*a(17/2)*b**36*x**(17/2) + 155925*a**(15/2)*b*
*37*x**(15/2) + 34650*a**(13/2)*b**38*x**(13/2) + 3465*a**(11/2)*
b**39*x**(11/2)) + 256*a**21*b**24*x**(31/2)/(3465*a**(31/2)*b**2
9*x**(31/2) + 34650*a**(29/2)*b**30*x**(29/2) + 155925*a**(27/2)*
b**31*x**(27/2) + 415800*a**(25/2)*b**32*x**(25/2) + 727650*a**(2
3/2)*b**33*x**(23/2) + 873180*a**(21/2)*b**34*x**(21/2) + 727650*
a**(19/2)*b**35*x**(19/2) + 415800*a**(17/2)*b**36*x**(17/2) + 15
5925*a**(15/2)*b**37*x**(15/2) + 34650*a**(13/2)*b**38*x**(13/2)
+ 3465*a**(11/2)*b**39*x**(11/2)) + 2560*a**20*b**25*x**(29/2)/(3
465*a**(31/2)*b**29*x**(31/2) + 34650*a**(29/2)*b**30*x**(29/2) +
155925*a**(27/2)*b**31*x**(27/2) + 415800*a**(25/2)*b**32*x**(25
/2) + 727650*a**(23/2)*b**33*x**(23/2) + 873180*a**(21/2)*b**34*x
(21/2) + 727650*a(19/2)*b**35*x**(19/2) + 415800*a**(17/2)*b*
*36*x**(17/2) + 155925*a**(15/2)*b**37*x**(15/2) + 34650*a**(13/2
)*b**38*x**(13/2) + 3465*a**(11/2)*b**39*x**(11/2)) + 11520*a**19
*b**26*x**(27/2)/(3465*a**(31/2)*b**29*x**(31/2) + 34650*a**(29/2
)*b**30*x**(29/2) + 155925*a**(27/2)*b**31*x**(27/2) + 415800*a**
(25/2)*b**32*x**(25/2) + 727650*a**(23/2)*b**33*x**(23/2) + 87318
0*a**(21/2)*b**34*x**(21/2) + 727650*a**(19/2)*b**35*x**(19/2) +
415800*a**(17/2)*b**36*x**(17/2) + 155925*a**(15/2)*b**37*x**(15/
2) + 34650*a**(13/2)*b**38*x**(13/2) + 3465*a**(11/2)*b**39*x**(1
1/2)) + 30720*a**18*b**27*x**(25/2)/(3465*a**(31/2)*b**29*x**(31/
2) + 34650*a**(29/2)*b**30*x**(29/2) + 155925*a**(27/2)*b**31*x**
(27/2) + 415800*a**(25/2)*b**32*x**(25/2) + 727650*a**(23/2)*b**3
3*x**(23/2) + 873180*a**(21/2)*b**34*x**(21/2) + 727650*a**(19/2)
*b**35*x**(19/2) + 415800*a**(17/2)*b**36*x**(17/2) + 155925*a**(
15/2)*b**37*x**(15/2) + 34650*a**(13/2)*b**38*x**(13/2) + 3465*a*
*(11/2)*b**39*x**(11/2)) + 53760*a**17*b**28*x**(23/2)/(3465*a**(
31/2)*b**29*x**(31/2) + 34650*a**(29/2)*b**30*x**(29/2) + 155925*
a**(27/2)*b**31*x**(27/2) + 415800*a**(25/2)*b**32*x**(25/2) + 72
7650*a**(23/2)*b**33*x**(23/2) + 873180*a**(21/2)*b**34*x**(21/2)
+ 727650*a**(19/2)*b**35*x**(19/2) + 415800*a**(17/2)*b**36*x**(
17/2) + 155925*a**(15/2)*b**37*x**(15/2) + 34650*a**(13/2)*b**38*
x**(13/2) + 3465*a**(11/2)*b**39*x**(11/2)) + 64512*a**16*b**29*x
(21/2)/(3465*a(31/2)*b**29*x**(31/2) + 34650*a**(29/2)*b**30*
x**(29/2) + 155925*a**(27/2)*b**31*x**(27/2) + 415800*a**(25/2)*b
32*x(25/2) + 727650*a**(23/2)*b**33*x**(23/2) + 873180*a**(21
/2)*b**34*x**(21/2) + 727650*a**(19/2)*b**35*x**(19/2) + 415800*a
(17/2)*b36*x**(17/2) + 155925*a**(15/2)*b**37*x**(15/2) + 346
50*a**(13/2)*b**38*x**(13/2) + 3465*a**(11/2)*b**39*x**(11/2)) +
53760*a**15*b**30*x**(19/2)/(3465*a**(31/2)*b**29*x**(31/2) + 346
50*a**(29/2)*b**30*x**(29/2) + 155925*a**(27/2)*b**31*x**(27/2) +
415800*a**(25/2)*b**32*x**(25/2) + 727650*a**(23/2)*b**33*x**(23
/2) + 873180*a**(21/2)*b**34*x**(21/2) + 727650*a**(19/2)*b**35*x
(19/2) + 415800*a(17/2)*b**36*x**(17/2) + 155925*a**(15/2)*b*
*37*x**(15/2) + 34650*a**(13/2)*b**38*x**(13/2) + 3465*a**(11/2)*
b**39*x**(11/2)) + 30720*a**14*b**31*x**(17/2)/(3465*a**(31/2)*b*
*29*x**(31/2) + 34650*a**(29/2)*b**30*x**(29/2) + 155925*a**(27/2
)*b**31*x**(27/2) + 415800*a**(25/2)*b**32*x**(25/2) + 727650*a**
(23/2)*b**33*x**(23/2) + 873180*a**(21/2)*b**34*x**(21/2) + 72765
0*a**(19/2)*b**35*x**(19/2) + 415800*a**(17/2)*b**36*x**(17/2) +
155925*a**(15/2)*b**37*x**(15/2) + 34650*a**(13/2)*b**38*x**(13/2
) + 3465*a**(11/2)*b**39*x**(11/2)) + 11520*a**13*b**32*x**(15/2)
/(3465*a**(31/2)*b**29*x**(31/2) + 34650*a**(29/2)*b**30*x**(29/2
) + 155925*a**(27/2)*b**31*x**(27/2) + 415800*a**(25/2)*b**32*x**
(25/2) + 727650*a**(23/2)*b**33*x**(23/2) + 873180*a**(21/2)*b**3

```
4*x**(21/2) + 727650*a**(19/2)*b**35*x**(19/2) + 415800*a**(17/2)
*b**36*x**(17/2) + 155925*a**(15/2)*b**37*x**(15/2) + 34650*a**(1
3/2)*b**38*x**(13/2) + 3465*a**(11/2)*b**39*x**(11/2)) + 2560*a**
12*b**33*x**(13/2)/(3465*a**(31/2)*b**29*x**(31/2) + 34650*a**(29
/2)*b**30*x**(29/2) + 155925*a**(27/2)*b**31*x**(27/2) + 415800*a
**(25/2)*b**32*x**(25/2) + 727650*a**(23/2)*b**33*x**(23/2) + 873
180*a**(21/2)*b**34*x**(21/2) + 727650*a**(19/2)*b**35*x**(19/2)
+ 415800*a**(17/2)*b**36*x**(17/2) + 155925*a**(15/2)*b**37*x**(1
5/2) + 34650*a**(13/2)*b**38*x**(13/2) + 3465*a**(11/2)*b**39*x**
(11/2)) + 256*a**11*b**34*x**(11/2)/(3465*a**(31/2)*b**29*x**(31/
2) + 34650*a**(29/2)*b**30*x**(29/2) + 155925*a**(27/2)*b**31*x**
(27/2) + 415800*a**(25/2)*b**32*x**(25/2) + 727650*a**(23/2)*b**3
3*x**(23/2) + 873180*a**(21/2)*b**34*x**(21/2) + 727650*a**(19/2)
*b**35*x**(19/2) + 415800*a**(17/2)*b**36*x**(17/2) + 155925*a**(
15/2)*b**37*x**(15/2) + 34650*a**(13/2)*b**38*x**(13/2) + 3465*a*
*(11/2)*b**39*x**(11/2))
```

GIAC/XCAS [A] time = 0.263888, size = 281, normalized size = 2.78

$$\frac{2\left(11088\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^6a^3\mathrm{sign}\left(x\right)+36960\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^5a^{\frac{5}{2}}b\mathrm{sign}\left(x\right)+51480\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^4a^2b^2\mathrm{sign}\left(x\right)\right.}{346}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)/x^6,x, algorithm="giac")
```

```
[Out] 2/3465*(11088*(sqrt(a)*x - sqrt(a*x^2 + b*x))^6*a^3*sign(x) + 369
60*(sqrt(a)*x - sqrt(a*x^2 + b*x))^5*a^(5/2)*b*sign(x) + 51480*(s
qrt(a)*x - sqrt(a*x^2 + b*x))^4*a^2*b^2*sign(x) + 38115*(sqrt(a)*
x - sqrt(a*x^2 + b*x))^3*a^(3/2)*b^3*sign(x) + 15785*(sqrt(a)*x -
 sqrt(a*x^2 + b*x))^2*a*b^4*sign(x) + 3465*(sqrt(a)*x - sqrt(a*x^
2 + b*x))*sqrt(a)*b^5*sign(x) + 315*b^6*sign(x))/(sqrt(a)*x - sqr
t(a*x^2 + b*x))^11
```

3.1699 $\int \left(a+\frac{b}{x}\right)^{3/2} x^3 \, dx$

Optimal. Leaf size=114

$$\frac{3b^4 \tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{64a^{5/2}} - \frac{3b^3x\sqrt{a+\frac{b}{x}}}{64a^2} + \frac{b^2x^2\sqrt{a+\frac{b}{x}}}{32a} + \frac{1}{4}x^4\left(a+\frac{b}{x}\right)^{3/2} + \frac{1}{8}bx^3\sqrt{a+\frac{b}{x}}$$

```
[Out] (-3*b^3*Sqrt[a + b/x]*x)/(64*a^2) + (b^2*Sqrt[a + b/x]*x^2)/(32*a
) + (b*Sqrt[a + b/x]*x^3)/8 + ((a + b/x)^(3/2)*x^4)/4 + (3*b^4*Ar
cTanh[Sqrt[a + b/x]/Sqrt[a]])/(64*a^(5/2))
```

Rubi [A] time = 0.162232, antiderivative size = 114, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{3b^4 \tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{64a^{5/2}} - \frac{3b^3x\sqrt{a+\frac{b}{x}}}{64a^2} + \frac{b^2x^2\sqrt{a+\frac{b}{x}}}{32a} + \frac{1}{4}x^4\left(a+\frac{b}{x}\right)^{3/2} + \frac{1}{8}bx^3\sqrt{a+\frac{b}{x}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(3/2)*x^3,x]
```

```
[Out] (-3*b^3*Sqrt[a + b/x]*x)/(64*a^2) + (b^2*Sqrt[a + b/x]*x^2)/(32*a
) + (b*Sqrt[a + b/x]*x^3)/8 + ((a + b/x)^(3/2)*x^4)/4 + (3*b^4*Ar
cTanh[Sqrt[a + b/x]/Sqrt[a]])/(64*a^(5/2))
```

Rubi in Sympy [A] time = 15.6965, size = 94, normalized size = 0.82

$$\frac{bx^3\sqrt{a+\frac{b}{x}}}{8} + \frac{x^4\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{4} + \frac{b^2x^2\sqrt{a+\frac{b}{x}}}{32a} - \frac{3b^3x\sqrt{a+\frac{b}{x}}}{64a^2} + \frac{3b^4 \operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{64a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(3/2)*x**3,x)
```

```
[Out] b*x**3*sqrt(a + b/x)/8 + x**4*(a + b/x)**(3/2)/4 + b**2*x**2*sqrt
(a + b/x)/(32*a) - 3*b**3*x*sqrt(a + b/x)/(64*a**2) + 3*b**4*atan
h(sqrt(a + b/x)/sqrt(a))/(64*a**(5/2))
```

Mathematica [A] time = 0.126748, size = 90, normalized size = 0.79

$$\frac{2\sqrt{a}x\sqrt{a+\frac{b}{x}}\left(16a^3x^3+24a^2bx^2+2ab^2x-3b^3\right)+3b^4\log\left(2\sqrt{a}x\sqrt{a+\frac{b}{x}}+2ax+b\right)}{128a^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(3/2)*x^3,x]
```

```
[Out] (2*Sqrt[a]*Sqrt[a + b/x]*x*(-3*b^3 + 2*a*b^2*x + 24*a^2*b*x^2 + 1
6*a^3*x^3) + 3*b^4*Log[b + 2*a*x + 2*Sqrt[a]*Sqrt[a + b/x]*x])/(1
```

```
28*a^(5/2))
```

Maple [A] time = 0.012, size = 137, normalized size = 1.2

$$\frac{x}{128}\sqrt{\frac{ax+b}{x}}\left(32\,x\left(ax^2+bx\right)^{3/2}a^{9/2}+16\,b\left(ax^2+bx\right)^{3/2}a^{7/2}-12\,b^2\sqrt{ax^2+bx}xa^{7/2}-6\,b^3\sqrt{ax^2+bx}a^{5/2}+3\,b^4\ln\left(1/2\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(3/2)*x^3,x)
```

```
[Out] 1/128*((a*x+b)/x)^(1/2)*x*(32*x*(a*x^2+b*x)^(3/2)*a^(9/2)+16*b*(a
*x^2+b*x)^(3/2)*a^(7/2)-12*b^2*(a*x^2+b*x)^(1/2)*x*a^(7/2)-6*b^3*
(a*x^2+b*x)^(1/2)*a^(5/2)+3*b^4*ln(1/2*(2*(a*x^2+b*x)^(1/2)*a^(1/
2)+2*a*x+b)/a^(1/2))*a^2)/(x*(a*x+b))^(1/2)/a^(9/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)*x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.23794, size = 1, normalized size = 0.01

$$\left[\frac{3\,b^4\log\left(2\,ax\sqrt{\frac{ax+b}{x}}+(2\,ax+b)\sqrt{a}\right)+2\left(16\,a^3x^4+24\,a^2bx^3+2\,ab^2x^2-3\,b^3x\right)\sqrt{a}\sqrt{\frac{ax+b}{x}}}{128\,a^{\frac{5}{2}}},\right.$$
$$\left.-\frac{3\,b^4\arctan\left(\frac{a}{\sqrt{-a}\sqrt{\frac{ax+b}{x}}}\right)-\left(16\,a^3x^4+24\,a^2bx^3+2\,ab^2x^2-3\,b^3x\right)\sqrt{-a}\sqrt{\frac{ax+b}{x}}}{64\,\sqrt{-a}a^2}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)*x^3,x, algorithm="fricas")
```

```
[Out] [1/128*(3*b^4*log(2*a*x*sqrt((a*x + b)/x) + (2*a*x + b)*sqrt(a))
+ 2*(16*a^3*x^4 + 24*a^2*b*x^3 + 2*a*b^2*x^2 - 3*b^3*x)*sqrt(a)*s
qrt((a*x + b)/x))/a^(5/2), -1/64*(3*b^4*arctan(a/(sqrt(-a)*sqrt((
a*x + b)/x))) - (16*a^3*x^4 + 24*a^2*b*x^3 + 2*a*b^2*x^2 - 3*b^3*
x)*sqrt(-a)*sqrt((a*x + b)/x))/(sqrt(-a)*a^2)]
```

Sympy [A] time = 28.8789, size = 153, normalized size = 1.34

$$\frac{a^2x^{\frac{9}{2}}}{4\sqrt{b}\sqrt{\frac{ax}{b}+1}}+\frac{5a\sqrt{b}x^{\frac{7}{2}}}{8\sqrt{\frac{ax}{b}+1}}+\frac{13b^{\frac{3}{2}}x^{\frac{5}{2}}}{32\sqrt{\frac{ax}{b}+1}}-\frac{b^{\frac{5}{2}}x^{\frac{3}{2}}}{64a\sqrt{\frac{ax}{b}+1}}-\frac{3b^{\frac{7}{2}}\sqrt{x}}{64a^2\sqrt{\frac{ax}{b}+1}}+\frac{3b^4\operatorname{asinh}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{64a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(3/2)*x**3,x)
```

```
[Out] a**2*x**(9/2)/(4*sqrt(b)*sqrt(a*x/b + 1)) + 5*a*sqrt(b)*x**(7/2)/
(8*sqrt(a*x/b + 1)) + 13*b**(3/2)*x**(5/2)/(32*sqrt(a*x/b + 1)) -
 b**(5/2)*x**(3/2)/(64*a*sqrt(a*x/b + 1)) - 3*b**(7/2)*sqrt(x)/(6
4*a**2*sqrt(a*x/b + 1)) + 3*b**4*asinh(sqrt(a)*sqrt(x)/sqrt(b))/(
64*a**(5/2))
```

GIAC/XCAS [A] time = 0.258776, size = 143, normalized size = 1.25

$$-\frac{3\,b^4 \ln\left(\left|-2\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)\sqrt{a}-b\right|\right)\,\mathrm{sign}\,(x)}{128\,a^{\frac{5}{2}}}+\frac{3\,b^4 \ln\left(|b|\right)\mathrm{sign}\,(x)}{128\,a^{\frac{5}{2}}}+\frac{1}{64}\sqrt{ax^2+bx}\left(2\left(4\left(2\,ax\mathrm{sign}\,(x)+3\,b\mathrm{sign}\,(x)\right)x+\frac{b^2\mathrm{sign}\,(x)}{a}\right)x-\frac{3\,b^3\mathrm{sign}\,(x)}{a^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)*x^3,x, algorithm="giac")
```

```
[Out] -3/128*b^4*ln(abs(-2*(sqrt(a)*x - sqrt(a*x^2 + b*x))*sqrt(a) - b)
)*sign(x)/a^(5/2) + 3/128*b^4*ln(abs(b))*sign(x)/a^(5/2) + 1/64*s
qrt(a*x^2 + b*x)*(2*(4*(2*a*x*sign(x) + 3*b*sign(x))*x + b^2*sign
(x)/a)*x - 3*b^3*sign(x)/a^2)
```

3.1700 $\int \left(a+\frac{b}{x}\right)^{3/2} x^2\,dx$

Optimal. Leaf size=90

$$-\frac{b^3\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{8a^{3/2}}+\frac{b^2x\sqrt{a+\frac{b}{x}}}{8a}+\frac{1}{3}x^3\left(a+\frac{b}{x}\right)^{3/2}+\frac{1}{4}bx^2\sqrt{a+\frac{b}{x}}$$

```
[Out] (b^2*Sqrt[a + b/x]*x)/(8*a) + (b*Sqrt[a + b/x]*x^2)/4 + ((a + b/x
)^(3/2)*x^3)/3 - (b^3*ArcTanh[Sqrt[a + b/x]/Sqrt[a]])/(8*a^(3/2))
```

Rubi [A] time = 0.123743, antiderivative size = 90, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{b^3\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{8a^{3/2}}+\frac{b^2x\sqrt{a+\frac{b}{x}}}{8a}+\frac{1}{3}x^3\left(a+\frac{b}{x}\right)^{3/2}+\frac{1}{4}bx^2\sqrt{a+\frac{b}{x}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(3/2)*x^2,x]
```

```
[Out] (b^2*Sqrt[a + b/x]*x)/(8*a) + (b*Sqrt[a + b/x]*x^2)/4 + ((a + b/x
)^(3/2)*x^3)/3 - (b^3*ArcTanh[Sqrt[a + b/x]/Sqrt[a]])/(8*a^(3/2))
```

Rubi in Sympy [A] time = 11.9163, size = 70, normalized size = 0.78

$$\frac{bx^2\sqrt{a+\frac{b}{x}}}{4}+\frac{x^3\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{3}+\frac{b^2x\sqrt{a+\frac{b}{x}}}{8a}-\frac{b^3\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{8a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(3/2)*x**2,x)
```

```
[Out] b*x**2*sqrt(a + b/x)/4 + x**3*(a + b/x)**(3/2)/3 + b**2*x*sqrt(a
+ b/x)/(8*a) - b**3*atanh(sqrt(a + b/x)/sqrt(a))/(8*a**(3/2))
```

Mathematica [A] time = 0.109118, size = 79, normalized size = 0.88

$$\frac{2\sqrt{a}x\sqrt{a+\frac{b}{x}}\left(8a^2x^2+14abx+3b^2\right)-3b^3\log\left(2\sqrt{a}x\sqrt{a+\frac{b}{x}}+2ax+b\right)}{48a^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(3/2)*x^2,x]
```

```
[Out] (2*Sqrt[a]*Sqrt[a + b/x]*x*(3*b^2 + 14*a*b*x + 8*a^2*x^2) - 3*b^3
*Log[b + 2*a*x + 2*Sqrt[a]*Sqrt[a + b/x]*x])/(48*a^(3/2))
```

Maple [A] time = 0.012, size = 115, normalized size = 1.3

$$-\frac{x}{48}\sqrt{\frac{ax+b}{x}}\left(-16\left(ax^{2}+bx\right)^{3/2}a^{5/2}-12\sqrt{ax^{2}+bx}a^{5/2}xb-6\sqrt{ax^{2}+bx}a^{3/2}b^{2}+3\ln\left(1/2\,\frac{2\sqrt{ax^{2}+bx}\sqrt{a}+2\,ax+b}{\sqrt{a}}\right)\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((a+b/x)^(3/2)*x^2,x)
```

```
[Out] -1/48*((a*x+b)/x)^(1/2)*x*(-16*(a*x^2+b*x)^(3/2)*a^(5/2)-12*(a*x^
2+b*x)^(1/2)*a^(5/2)*x*b-6*(a*x^2+b*x)^(1/2)*a^(3/2)*b^2+3*ln(1/2
*(2*(a*x^2+b*x)^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*a*b^3)/(x*(a*x+b)
)^(1/2)/a^(5/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a + b/x)^(3/2)*x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.24039, size = 1, normalized size = 0.01

$$\left[\frac{3\,b^{3}\log\left(-2\,ax\sqrt{\frac{ax+b}{x}}+(2\,ax+b)\sqrt{a}\right)+2\left(8\,a^{2}x^{3}+14\,abx^{2}+3\,b^{2}x\right)\sqrt{a}\sqrt{\frac{ax+b}{x}}}{48\,a^{\frac{3}{2}}},\ \frac{3\,b^{3}\arctan\left(\frac{a}{\sqrt{-a}\sqrt{\frac{ax+b}{x}}}\right)+\left(8\,a^{2}x^{3}+14\,ab\right.}{24\sqrt{-a}a}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a + b/x)^(3/2)*x^2,x, algorithm="fricas")
```

```
[Out] [1/48*(3*b^3*log(-2*a*x*sqrt((a*x + b)/x) + (2*a*x + b)*sqrt(a))
+ 2*(8*a^2*x^3 + 14*a*b*x^2 + 3*b^2*x)*sqrt(a)*sqrt((a*x + b)/x))
/a^(3/2), 1/24*(3*b^3*arctan(a/(sqrt(-a)*sqrt((a*x + b)/x))) + (8
*a^2*x^3 + 14*a*b*x^2 + 3*b^2*x)*sqrt(-a)*sqrt((a*x + b)/x))/(sqr
t(-a)*a)]
```

Sympy [A] time = 18.7739, size = 124, normalized size = 1.38

$$\frac{a^{2}x^{\frac{7}{2}}}{3\sqrt{b}\sqrt{\frac{ax}{b}+1}}+\frac{11a\sqrt{b}x^{\frac{5}{2}}}{12\sqrt{\frac{ax}{b}+1}}+\frac{17b^{\frac{3}{2}}x^{\frac{3}{2}}}{24\sqrt{\frac{ax}{b}+1}}+\frac{b^{\frac{5}{2}}\sqrt{x}}{8a\sqrt{\frac{ax}{b}+1}}-\frac{b^{3}\operatorname{asinh}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{8a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a+b/x)**(3/2)*x**2,x)
```

```
[Out] a**2*x**(7/2)/(3*sqrt(b)*sqrt(a*x/b + 1)) + 11*a*sqrt(b)*x**(5/2)
/(12*sqrt(a*x/b + 1)) + 17*b**(3/2)*x**(3/2)/(24*sqrt(a*x/b + 1))
 + b**(5/2)*sqrt(x)/(8*a*sqrt(a*x/b + 1)) - b**3*asinh(sqrt(a)*sq
rt(x)/sqrt(b))/(8*a**(3/2))
```

GIAC/XCAS [A] time = 0.24759, size = 126, normalized size = 1.4

$$\frac{b^3\ln\left(\left|-2\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)\sqrt{a}-b\right|\right)\operatorname{sign}(x)}{16\,a^{\frac{3}{2}}}-\frac{b^3\ln\left(|b|\right)\operatorname{sign}(x)}{16\,a^{\frac{3}{2}}}+\frac{1}{24}\sqrt{ax^2+bx}\left(2\left(4\,ax\operatorname{sign}(x)+7\,b\operatorname{sign}(x)\right)x+\frac{3\,b^2\operatorname{sign}(x)}{a}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)*x^2,x, algorithm="giac")
```

```
[Out] 1/16*b^3*ln(abs(-2*(sqrt(a)*x - sqrt(a*x^2 + b*x))*sqrt(a) - b))*
sign(x)/a^(3/2) - 1/16*b^3*ln(abs(b))*sign(x)/a^(3/2) + 1/24*sqrt
(a*x^2 + b*x)*(2*(4*a*x*sign(x) + 7*b*sign(x))*x + 3*b^2*sign(x)/
a)
```

3.1701 $\int \left(a+\frac{b}{x}\right)^{3/2} x\,dx$

Optimal. Leaf size=66

$$\frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{4\sqrt{a}}+\frac{1}{2}x^2\left(a+\frac{b}{x}\right)^{3/2}+\frac{3}{4}bx\sqrt{a+\frac{b}{x}}$$

```
[Out] (3*b*Sqrt[a + b/x]*x)/4 + ((a + b/x)^(3/2)*x^2)/2 + (3*b^2*ArcTan
h[Sqrt[a + b/x]/Sqrt[a]])/(4*Sqrt[a])
```

Rubi [A] time = 0.0876603, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{4\sqrt{a}}+\frac{1}{2}x^2\left(a+\frac{b}{x}\right)^{3/2}+\frac{3}{4}bx\sqrt{a+\frac{b}{x}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(3/2)*x,x]
```

```
[Out] (3*b*Sqrt[a + b/x]*x)/4 + ((a + b/x)^(3/2)*x^2)/2 + (3*b^2*ArcTan
h[Sqrt[a + b/x]/Sqrt[a]])/(4*Sqrt[a])
```

Rubi in Sympy [A] time = 8.8261, size = 54, normalized size = 0.82

$$\frac{3bx\sqrt{a+\frac{b}{x}}}{4}+\frac{x^2\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{2}+\frac{3b^2\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{4\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(3/2)*x,x)
```

```
[Out] 3*b*x*sqrt(a + b/x)/4 + x**2*(a + b/x)**(3/2)/2 + 3*b**2*atanh(sq
rt(a + b/x)/sqrt(a))/(4*sqrt(a))
```

Mathematica [A] time = 0.089129, size = 63, normalized size = 0.95

$$\frac{3b^2\log\left(2\sqrt{a}x\sqrt{a+\frac{b}{x}}+2ax+b\right)}{8\sqrt{a}}+\frac{1}{4}x\sqrt{a+\frac{b}{x}}(2ax+5b)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(3/2)*x,x]
```

```
[Out] (Sqrt[a + b/x]*x*(5*b + 2*a*x))/4 + (3*b^2*Log[b + 2*a*x + 2*Sqrt
[a]*Sqrt[a + b/x]*x])/(8*Sqrt[a])
```

Maple [A] time = 0.013, size = 95, normalized size = 1.4

$$\frac{x}{8}\sqrt{\frac{ax+b}{x}}\left(4\,a^{3/2}\sqrt{ax^{2}+bx}x+3\,b^{2}\ln\left(1/2\,\frac{2\,\sqrt{ax^{2}+bx}\sqrt{a}+2\,ax+b}{\sqrt{a}}\right)+10\,\sqrt{ax^{2}+bx}b\sqrt{a}\right)\frac{1}{\sqrt{x\,(ax+b)}}\frac{1}{\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(3/2)*x,x)
```

```
[Out] 1/8*((a*x+b)/x)^(1/2)*x*(4*a^(3/2)*(a*x^2+b*x)^(1/2)*x+3*b^2*ln(1
/2*(2*(a*x^2+b*x)^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))+10*(a*x^2+b*x)^
(1/2)*b*a^(1/2))/(x*(a*x+b))^(1/2)/a^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)*x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.236976, size = 1, normalized size = 0.02

$$\left[\frac{3\,b^{2}\log\left(2\,ax\sqrt{\frac{ax+b}{x}}+(2\,ax+b)\sqrt{a}\right)+2\left(2\,ax^{2}+5\,bx\right)\sqrt{a}\sqrt{\frac{ax+b}{x}}}{8\,\sqrt{a}},\right.$$
$$\left.-\frac{3\,b^{2}\arctan\left(\frac{a}{\sqrt{-a}\sqrt{\frac{ax+b}{x}}}\right)-\left(2\,ax^{2}+5\,bx\right)\sqrt{-a}\sqrt{\frac{ax+b}{x}}}{4\,\sqrt{-a}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)*x,x, algorithm="fricas")
```

```
[Out] [1/8*(3*b^2*log(2*a*x*sqrt((a*x + b)/x) + (2*a*x + b)*sqrt(a)) +
2*(2*a*x^2 + 5*b*x)*sqrt(a)*sqrt((a*x + b)/x))/sqrt(a), -1/4*(3*b
^2*arctan(a/(sqrt(-a)*sqrt((a*x + b)/x))) - (2*a*x^2 + 5*b*x)*sqr
t(-a)*sqrt((a*x + b)/x))/sqrt(-a)]
```

Sympy [A] time = 11.2653, size = 75, normalized size = 1.14

$$\frac{a\sqrt{b}x^{\frac{3}{2}}\sqrt{\frac{ax}{b}+1}}{2}+\frac{5b^{\frac{3}{2}}\sqrt{x}\sqrt{\frac{ax}{b}+1}}{4}+\frac{3b^{2}\operatorname{asinh}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(3/2)*x,x)
```

```
[Out] a*sqrt(b)*x**(3/2)*sqrt(a*x/b + 1)/2 + 5*b**(3/2)*sqrt(x)*sqrt(a*
x/b + 1)/4 + 3*b**2*asinh(sqrt(a)*sqrt(x)/sqrt(b))/(4*sqrt(a))
```

GIAC/XCAS [A] time = 0.238864, size = 107, normalized size = 1.62

$$-\frac{3\,b^2\ln\left(\left|-2\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)\sqrt{a}-b\right|\right)\mathrm{sign}\left(x\right)}{8\,\sqrt{a}}+\frac{3\,b^2\ln\left(|b|\right)\mathrm{sign}\left(x\right)}{8\,\sqrt{a}}+\frac{1}{4}\,\sqrt{ax^2+bx}(2\,ax\mathrm{sign}\left(x\right)+5\,b\mathrm{sign}\left(x\right))$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)*x,x, algorithm="giac")
```

```
[Out] -3/8*b^2*ln(abs(-2*(sqrt(a)*x - sqrt(a*x^2 + b*x))*sqrt(a) - b))*
sign(x)/sqrt(a) + 3/8*b^2*ln(abs(b))*sign(x)/sqrt(a) + 1/4*sqrt(a
*x^2 + b*x)*(2*a*x*sign(x) + 5*b*sign(x))
```

3.1702 $\int \left(a+\frac{b}{x}\right)^{3/2} dx$

Optimal. Leaf size=54

$$x\left(a+\frac{b}{x}\right)^{3/2}-3b\sqrt{a+\frac{b}{x}}+3\sqrt{a}b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)$$

```
[Out] -3*b*Sqrt[a + b/x] + (a + b/x)^(3/2)*x + 3*Sqrt[a]*b*ArcTanh[Sqrt
[a + b/x]/Sqrt[a]]
```

Rubi [A] time = 0.0839546, antiderivative size = 54, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.454

$$x\left(a+\frac{b}{x}\right)^{3/2}-3b\sqrt{a+\frac{b}{x}}+3\sqrt{a}b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(3/2),x]
```

```
[Out] -3*b*Sqrt[a + b/x] + (a + b/x)^(3/2)*x + 3*Sqrt[a]*b*ArcTanh[Sqrt
[a + b/x]/Sqrt[a]]
```

Rubi in Sympy [A] time = 7.35797, size = 44, normalized size = 0.81

$$3\sqrt{a}b\,\mathrm{atanh}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)-3b\sqrt{a+\frac{b}{x}}+x\left(a+\frac{b}{x}\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(3/2),x)
```

```
[Out] 3*sqrt(a)*b*atanh(sqrt(a + b/x)/sqrt(a)) - 3*b*sqrt(a + b/x) + x*
(a + b/x)**(3/2)
```

Mathematica [A] time = 0.0381999, size = 56, normalized size = 1.04

$$\sqrt{a+\frac{b}{x}}(ax-2b)+\frac{3}{2}\sqrt{a}b\log\left(2\sqrt{a}x\sqrt{a+\frac{b}{x}}+2ax+b\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(3/2),x]
```

```
[Out] Sqrt[a + b/x]*(-2*b + a*x) + (3*Sqrt[a]*b*Log[b + 2*a*x + 2*Sqrt[
a]*Sqrt[a + b/x]*x])/2
```

Maple [B] time = 0.011, size = 94, normalized size = 1.7

$$\frac{1}{2x}\sqrt{\frac{ax+b}{x}}\left(3\sqrt{a}b\ln\left(1/2\,\frac{2\sqrt{ax^2+bx}\sqrt{a}+2ax+b}{\sqrt{a}}\right)x^2+6a\sqrt{ax^2+bx}x^2-4\left(ax^2+bx\right)^{3/2}\right)\frac{1}{\sqrt{x(ax+b)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(3/2),x)
```

```
[Out] 1/2*((a*x+b)/x)^(1/2)/x*(3*a^(1/2)*b*ln(1/2*(2*(a*x^2+b*x)^(1/2)*
a^(1/2)+2*a*x+b)/a^(1/2))*x^2+6*a*(a*x^2+b*x)^(1/2)*x^2-4*(a*x^2+
b*x)^(3/2))/(x*(a*x+b))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.235524, size = 1, normalized size = 0.02

$$\left[\frac{3}{2}\sqrt{a}b\log\left(2\,ax+2\,\sqrt{a}x\sqrt{\frac{ax+b}{x}}+b\right)+(ax-2\,b)\sqrt{\frac{ax+b}{x}},3\,\sqrt{-a}b\arctan\left(\frac{\sqrt{\frac{ax+b}{x}}}{\sqrt{-a}}\right)+(ax-2\,b)\sqrt{\frac{ax+b}{x}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2),x, algorithm="fricas")
```

```
[Out] [3/2*sqrt(a)*b*log(2*a*x + 2*sqrt(a)*x*sqrt((a*x + b)/x) + b) + (
a*x - 2*b)*sqrt((a*x + b)/x), 3*sqrt(-a)*b*arctan(sqrt((a*x + b)/
x)/sqrt(-a)) + (a*x - 2*b)*sqrt((a*x + b)/x)]
```

Sympy [A] time = 8.99481, size = 92, normalized size = 1.7

$$3\sqrt{a}b\,\mathrm{asinh}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)+\frac{a^2x^{\frac{3}{2}}}{\sqrt{b}\sqrt{\frac{ax}{b}+1}}-\frac{a\sqrt{b}\sqrt{x}}{\sqrt{\frac{ax}{b}+1}}-\frac{2b^{\frac{3}{2}}}{\sqrt{x}\sqrt{\frac{ax}{b}+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(3/2),x)
```

```
[Out] 3*sqrt(a)*b*asinh(sqrt(a)*sqrt(x)/sqrt(b)) + a**2*x**(3/2)/(sqrt(
b)*sqrt(a*x/b + 1)) - a*sqrt(b)*sqrt(x)/sqrt(a*x/b + 1) - 2*b**(3
/2)/(sqrt(x)*sqrt(a*x/b + 1))
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError
```

3.1703 $\int \frac{\left(a+\frac{b}{x}\right)^{3/2}}{x} dx$

Optimal. Leaf size=55

$$2a^{3/2}\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)-2a\sqrt{a+\frac{b}{x}}-\frac{2}{3}\left(a+\frac{b}{x}\right)^{3/2}$$

```
[Out] -2*a*Sqrt[a + b/x] - (2*(a + b/x)^(3/2))/3 + 2*a^(3/2)*ArcTanh[Sq
rt[a + b/x]/Sqrt[a]]
```

Rubi [A] time = 0.0865256, antiderivative size = 55, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$2a^{3/2}\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)-2a\sqrt{a+\frac{b}{x}}-\frac{2}{3}\left(a+\frac{b}{x}\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(3/2)/x,x]
```

```
[Out] -2*a*Sqrt[a + b/x] - (2*(a + b/x)^(3/2))/3 + 2*a^(3/2)*ArcTanh[Sq
rt[a + b/x]/Sqrt[a]]
```

Rubi in Sympy [A] time = 8.54465, size = 44, normalized size = 0.8

$$2a^{\frac{3}{2}}\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)-2a\sqrt{a+\frac{b}{x}}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(3/2)/x,x)
```

```
[Out] 2*a**(3/2)*atanh(sqrt(a + b/x)/sqrt(a)) - 2*a*sqrt(a + b/x) - 2*(
a + b/x)**(3/2)/3
```

Mathematica [A] time = 0.0855327, size = 57, normalized size = 1.04

$$a^{3/2}\log\left(2\sqrt{a}x\sqrt{a+\frac{b}{x}}+2ax+b\right)-\frac{2\sqrt{a+\frac{b}{x}}(4ax+b)}{3x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(3/2)/x,x]
```

```
[Out] (-2*Sqrt[a + b/x]*(b + 4*a*x))/(3*x) + a^(3/2)*Log[b + 2*a*x + 2*
Sqrt[a]*Sqrt[a + b/x]*x]
```

Maple [B] time = 0.016, size = 115, normalized size = 2.1

$$\frac{1}{3\,b x^2}\sqrt{\frac{ax+b}{x}}\left(3\,a^{3/2}\ln\left(1/2\,\frac{2\,\sqrt{ax^2+bx}\sqrt{a}+2\,ax+b}{\sqrt{a}}\right)x^3b+6\,a^2\sqrt{ax^2+bx}x^3-6\,a\left(ax^2+bx\right)^{3/2}x-2\,\left(ax^2+bx\right)^{3/2}b$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(3/2)/x,x)
```

```
[Out] 1/3*((a*x+b)/x)^(1/2)/x^2*(3*a^(3/2)*ln(1/2*(2*(a*x^2+b*x)^(1/2)*
a^(1/2)+2*a*x+b)/a^(1/2))*x^3*b+6*a^2*(a*x^2+b*x)^(1/2)*x^3-6*a*(
a*x^2+b*x)^(3/2)*x-2*(a*x^2+b*x)^(3/2)*b)/(x*(a*x+b))^(1/2)/b
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.237224, size = 1, normalized size = 0.02

$$\left[\frac{3\,a^{\frac{3}{2}}x\log\left(2\,ax+2\,\sqrt{a}x\sqrt{\frac{ax+b}{x}}+b\right)-2\,(4\,ax+b)\sqrt{\frac{ax+b}{x}}}{3\,x},\frac{2\left(3\,\sqrt{-a}ax\arctan\left(\frac{\sqrt{\frac{ax+b}{x}}}{\sqrt{-a}}\right)-(4\,ax+b)\sqrt{\frac{ax+b}{x}}\right)}{3\,x}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)/x,x, algorithm="fricas")
```

```
[Out] [1/3*(3*a^(3/2)*x*log(2*a*x + 2*sqrt(a)*x*sqrt((a*x + b)/x) + b)
- 2*(4*a*x + b)*sqrt((a*x + b)/x))/x, 2/3*(3*sqrt(-a)*a*x*arctan(
sqrt((a*x + b)/x)/sqrt(-a)) - (4*a*x + b)*sqrt((a*x + b)/x))/x]
```

Sympy [A] time = 7.53769, size = 71, normalized size = 1.29

$$-\frac{8a^{\frac{3}{2}}\sqrt{1+\frac{b}{ax}}}{3}-a^{\frac{3}{2}}\log\left(\frac{b}{ax}\right)+2a^{\frac{3}{2}}\log\left(\sqrt{1+\frac{b}{ax}}+1\right)-\frac{2\sqrt{a}b\sqrt{1+\frac{b}{ax}}}{3x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(3/2)/x,x)
```

```
[Out] -8*a**(3/2)*sqrt(1 + b/(a*x))/3 - a**(3/2)*log(b/(a*x)) + 2*a**(3
/2)*log(sqrt(1 + b/(a*x)) + 1) - 2*sqrt(a)*b*sqrt(1 + b/(a*x))/(3
*x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)/x,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError
```

3.1704 $\int \frac{\left(a+\frac{b}{x}\right)^{3/2}}{x^2}\,dx$

Optimal. Leaf size=18

$$-\frac{2\left(a+\frac{b}{x}\right)^{5/2}}{5b}$$

```
[Out] (-2*(a + b/x)^(5/2))/(5*b)
```

Rubi [A] time = 0.0248153, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{2\left(a+\frac{b}{x}\right)^{5/2}}{5b}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(3/2)/x^2,x]

[Out] (-2*(a + b/x)^(5/2))/(5*b)
```

Rubi in Sympy [A] time = 2.18905, size = 14, normalized size = 0.78

$$-\frac{2\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(3/2)/x**2,x)

[Out] -2*(a + b/x)**(5/2)/(5*b)
```

Mathematica [A] time = 0.0219896, size = 18, normalized size = 1.

$$-\frac{2\left(a+\frac{b}{x}\right)^{5/2}}{5b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(3/2)/x^2,x]

[Out] (-2*(a + b/x)^(5/2))/(5*b)
```

Maple [A] time = 0.008, size = 25, normalized size = 1.4

$$-\frac{2\,ax+2\,b}{5\,bx}\left(\frac{ax+b}{x}\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(3/2)/x^2,x)

[Out] -2/5/x*(a*x+b)/b*((a*x+b)/x)^(3/2)
```

Maxima [A] time = 1.43651, size = 19, normalized size = 1.06

$$-\frac{2\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)/x^2,x, algorithm="maxima")

[Out] -2/5*(a + b/x)^(5/2)/b
```

Fricas [A] time = 0.221582, size = 47, normalized size = 2.61

$$-\frac{2\left(a^2x^2+2\,abx+b^2\right)\sqrt{\frac{ax+b}{x}}}{5\,bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)/x^2,x, algorithm="fricas")

[Out] -2/5*(a^2*x^2 + 2*a*b*x + b^2)*sqrt((a*x + b)/x)/(b*x^2)
```

Sympy [A] time = 4.1317, size = 65, normalized size = 3.61

$$-\frac{2a^{\frac{5}{2}}\sqrt{1+\frac{b}{ax}}}{5b}-\frac{4a^{\frac{3}{2}}\sqrt{1+\frac{b}{ax}}}{5x}-\frac{2\sqrt{a}b\sqrt{1+\frac{b}{ax}}}{5x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(3/2)/x**2,x)

[Out] -2*a**(5/2)*sqrt(1 + b/(a*x))/(5*b) - 4*a**(3/2)*sqrt(1 + b/(a*x)
)/(5*x) - 2*sqrt(a)*b*sqrt(1 + b/(a*x))/(5*x**2)
```

GIAC/XCAS [A] time = 0.256799, size = 196, normalized size = 10.89

$$\frac{2\left(5\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^4a^2\mathrm{sign}\left(x\right)+10\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^3a^{\frac{3}{2}}b\mathrm{sign}\left(x\right)+10\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^2ab^2\mathrm{sign}\left(x\right)+5\left(\sqrt{a}x-\right.\right.}{5\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)/x^2,x, algorithm="giac")

[Out] 2/5*(5*(sqrt(a)*x - sqrt(a*x^2 + b*x))^4*a^2*sign(x) + 10*(sqrt(a
)*x - sqrt(a*x^2 + b*x))^3*a^(3/2)*b*sign(x) + 10*(sqrt(a)*x - sq
rt(a*x^2 + b*x))^2*a*b^2*sign(x) + 5*(sqrt(a)*x - sqrt(a*x^2 + b*
x))*sqrt(a)*b^3*sign(x) + b^4*sign(x))/(sqrt(a)*x - sqrt(a*x^2 +
b*x))^5
```

3.1705 $\int \frac{\left(a+\frac{b}{x}\right)^{3/2}}{x^3}\,dx$

Optimal. Leaf size=38

$$\frac{2a\left(a+\frac{b}{x}\right)^{5/2}}{5b^2}-\frac{2\left(a+\frac{b}{x}\right)^{7/2}}{7b^2}$$

```
[Out] (2*a*(a + b/x)^(5/2))/(5*b^2) - (2*(a + b/x)^(7/2))/(7*b^2)
```

Rubi [A] time = 0.0574782, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2a\left(a+\frac{b}{x}\right)^{5/2}}{5b^2}-\frac{2\left(a+\frac{b}{x}\right)^{7/2}}{7b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(3/2)/x^3,x]

[Out] (2*a*(a + b/x)^(5/2))/(5*b^2) - (2*(a + b/x)^(7/2))/(7*b^2)
```

Rubi in Sympy [A] time = 6.83348, size = 31, normalized size = 0.82

$$\frac{2a\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{5b^2}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{7b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(3/2)/x**3,x)

[Out] 2*a*(a + b/x)**(5/2)/(5*b**2) - 2*(a + b/x)**(7/2)/(7*b**2)
```

Mathematica [A] time = 0.0378322, size = 36, normalized size = 0.95

$$\frac{2\sqrt{a+\frac{b}{x}}(ax+b)^2(2ax-5b)}{35b^2x^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(3/2)/x^3,x]

[Out] (2*Sqrt[a + b/x]*(b + a*x)^2*(-5*b + 2*a*x))/(35*b^2*x^3)
```

Maple [A] time = 0.007, size = 33, normalized size = 0.9

$$\frac{(2\,ax+2\,b)(2\,ax-5\,b)}{35\,b^2x^2}\left(\frac{ax+b}{x}\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(3/2)/x^3,x)

[Out] 2/35*(a*x+b)*(2*a*x-5*b)*((a*x+b)/x)^(3/2)/b^2/x^2
```

Maxima [A] time = 1.44632, size = 41, normalized size = 1.08

$$-\frac{2\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{7\,b^2}+\frac{2\left(a+\frac{b}{x}\right)^{\frac{5}{2}}a}{5\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)/x^3,x, algorithm="maxima")

[Out] -2/7*(a + b/x)^(7/2)/b^2 + 2/5*(a + b/x)^(5/2)*a/b^2
```

Fricas [A] time = 0.225054, size = 66, normalized size = 1.74

$$\frac{2\left(2\,a^3x^3-a^2bx^2-8\,ab^2x-5\,b^3\right)\sqrt{\frac{ax+b}{x}}}{35\,b^2x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)/x^3,x, algorithm="fricas")

[Out] 2/35*(2*a^3*x^3 - a^2*b*x^2 - 8*a*b^2*x - 5*b^3)*sqrt((a*x + b)/x
)/(b^2*x^3)
```

Sympy [A] time = 5.52838, size = 360, normalized size = 9.47

$$\frac{4a^{\frac{15}{2}}b^{\frac{3}{2}}x^4\sqrt{\frac{ax}{b}+1}}{35a^{\frac{9}{2}}b^3x^{\frac{9}{2}}+35a^{\frac{7}{2}}b^4x^{\frac{7}{2}}}+\frac{2a^{\frac{13}{2}}b^{\frac{5}{2}}x^3\sqrt{\frac{ax}{b}+1}}{35a^{\frac{9}{2}}b^3x^{\frac{9}{2}}+35a^{\frac{7}{2}}b^4x^{\frac{7}{2}}}-\frac{18a^{\frac{11}{2}}b^{\frac{7}{2}}x^2\sqrt{\frac{ax}{b}+1}}{35a^{\frac{9}{2}}b^3x^{\frac{9}{2}}+35a^{\frac{7}{2}}b^4x^{\frac{7}{2}}}-\frac{26a^{\frac{9}{2}}b^{\frac{9}{2}}x\sqrt{\frac{ax}{b}+1}}{35a^{\frac{9}{2}}b^3x^{\frac{9}{2}}+35a^{\frac{7}{2}}b^4x^{\frac{7}{2}}}-\frac{10a^{\frac{7}{2}}b^{\frac{11}{2}}\sqrt{\frac{ax}{b}+1}}{35a^{\frac{9}{2}}b^3x^{\frac{9}{2}}+35a^{\frac{7}{2}}b^4x^{\frac{7}{2}}}-\frac{4a^8bx^{\frac{9}{2}}}{35a^{\frac{9}{2}}b^3x^{\frac{9}{2}}+35a^{\frac{7}{2}}b^4x^{\frac{7}{2}}}-\frac{4a^7b^2x^{\frac{7}{2}}}{35a^{\frac{9}{2}}b^3x^{\frac{9}{2}}+35a^{\frac{7}{2}}b^4x^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(3/2)/x**3,x)

[Out] 4*a**(15/2)*b**(3/2)*x**4*sqrt(a*x/b + 1)/(35*a**(9/2)*b**3*x**(9
/2) + 35*a**(7/2)*b**4*x**(7/2)) + 2*a**(13/2)*b**(5/2)*x**3*sqrt
(a*x/b + 1)/(35*a**(9/2)*b**3*x**(9/2) + 35*a**(7/2)*b**4*x**(7/2
)) - 18*a**(11/2)*b**(7/2)*x**2*sqrt(a*x/b + 1)/(35*a**(9/2)*b**3
*x**(9/2) + 35*a**(7/2)*b**4*x**(7/2)) - 26*a**(9/2)*b**(9/2)*x*s
qrt(a*x/b + 1)/(35*a**(9/2)*b**3*x**(9/2) + 35*a**(7/2)*b**4*x**(
7/2)) - 10*a**(7/2)*b**(11/2)*sqrt(a*x/b + 1)/(35*a**(9/2)*b**3*x
**(9/2) + 35*a**(7/2)*b**4*x**(7/2)) - 4*a**8*b*x**(9/2)/(35*a**(
9/2)*b**3*x**(9/2) + 35*a**(7/2)*b**4*x**(7/2)) - 4*a**7*b**2*x**
(7/2)/(35*a**(9/2)*b**3*x**(9/2) + 35*a**(7/2)*b**4*x**(7/2))
```

GIAC/XCAS [A] time = 0.261406, size = 239, normalized size = 6.29

$$\frac{2\left(35\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^5a^{\frac{5}{2}}\mathrm{sign}\left(x\right)+105\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^4a^2b\mathrm{sign}\left(x\right)+140\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^3a^{\frac{3}{2}}b^2\mathrm{sign}\left(x\right)+98\left(\right.}{35\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)/x^3,x, algorithm="giac")
```

```
[Out] 2/35*(35*(sqrt(a)*x - sqrt(a*x^2 + b*x))^5*a^(5/2)*sign(x) + 105*
(sqrt(a)*x - sqrt(a*x^2 + b*x))^4*a^2*b*sign(x) + 140*(sqrt(a)*x
- sqrt(a*x^2 + b*x))^3*a^(3/2)*b^2*sign(x) + 98*(sqrt(a)*x - sqrt
(a*x^2 + b*x))^2*a*b^3*sign(x) + 35*(sqrt(a)*x - sqrt(a*x^2 + b*x
))*sqrt(a)*b^4*sign(x) + 5*b^5*sign(x))/(sqrt(a)*x - sqrt(a*x^2 +
 b*x))^7
```

3.1706 $\int \frac{\left(a+\frac{b}{x}\right)^{3/2}}{x^4} dx$

Optimal. Leaf size=59

$$-\frac{2a^2\left(a+\frac{b}{x}\right)^{5/2}}{5b^3}-\frac{2\left(a+\frac{b}{x}\right)^{9/2}}{9b^3}+\frac{4a\left(a+\frac{b}{x}\right)^{7/2}}{7b^3}$$

```
[Out] (-2*a^2*(a + b/x)^(5/2))/(5*b^3) + (4*a*(a + b/x)^(7/2))/(7*b^3)
- (2*(a + b/x)^(9/2))/(9*b^3)
```

Rubi [A] time = 0.0781626, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2a^2\left(a+\frac{b}{x}\right)^{5/2}}{5b^3}-\frac{2\left(a+\frac{b}{x}\right)^{9/2}}{9b^3}+\frac{4a\left(a+\frac{b}{x}\right)^{7/2}}{7b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(3/2)/x^4,x]
```

```
[Out] (-2*a^2*(a + b/x)^(5/2))/(5*b^3) + (4*a*(a + b/x)^(7/2))/(7*b^3)
- (2*(a + b/x)^(9/2))/(9*b^3)
```

Rubi in Sympy [A] time = 10.0348, size = 49, normalized size = 0.83

$$-\frac{2a^2\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{5b^3}+\frac{4a\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{7b^3}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{9}{2}}}{9b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(3/2)/x**4,x)
```

```
[Out] -2*a**2*(a + b/x)**(5/2)/(5*b**3) + 4*a*(a + b/x)**(7/2)/(7*b**3)
 - 2*(a + b/x)**(9/2)/(9*b**3)
```

Mathematica [A] time = 0.038733, size = 47, normalized size = 0.8

$$-\frac{2\sqrt{a+\frac{b}{x}}(ax+b)^2\left(8a^2x^2-20abx+35b^2\right)}{315b^3x^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(3/2)/x^4,x]
```

```
[Out] (-2*Sqrt[a + b/x]*(b + a*x)^2*(35*b^2 - 20*a*b*x + 8*a^2*x^2))/(3
15*b^3*x^4)
```

Maple [A] time = 0.008, size = 44, normalized size = 0.8

$$-\frac{(2\,ax+2\,b)\left(8\,a^2x^2-20\,abx+35\,b^2\right)}{315\,b^3x^3}\left(\frac{ax+b}{x}\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(3/2)/x^4,x)
```

```
[Out] -2/315*(a*x+b)*(8*a^2*x^2-20*a*b*x+35*b^2)*((a*x+b)/x)^(3/2)/b^3/
x^3
```

Maxima [A] time = 1.44267, size = 63, normalized size = 1.07

$$-\frac{2\left(a+\frac{b}{x}\right)^{\frac{9}{2}}}{9\,b^3}+\frac{4\left(a+\frac{b}{x}\right)^{\frac{7}{2}}a}{7\,b^3}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{5}{2}}a^2}{5\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)/x^4,x, algorithm="maxima")
```

```
[Out] -2/9*(a + b/x)^(9/2)/b^3 + 4/7*(a + b/x)^(7/2)*a/b^3 - 2/5*(a + b
/x)^(5/2)*a^2/b^3
```

Fricas [A] time = 0.221235, size = 81, normalized size = 1.37

$$-\frac{2\left(8\,a^4x^4-4\,a^3bx^3+3\,a^2b^2x^2+50\,ab^3x+35\,b^4\right)\sqrt{\frac{ax+b}{x}}}{315\,b^3x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)/x^4,x, algorithm="fricas")
```

```
[Out] -2/315*(8*a^4*x^4 - 4*a^3*b*x^3 + 3*a^2*b^2*x^2 + 50*a*b^3*x + 35
*b^4)*sqrt((a*x + b)/x)/(b^3*x^4)
```

Sympy [A] time = 7.54556, size = 986, normalized size = 16.71

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(3/2)/x**4,x)
```

```
[Out] -16*a**(23/2)*b**(9/2)*x**7*sqrt(a*x/b + 1)/(315*a**(15/2)*b**7*x
**(15/2) + 945*a**(13/2)*b**8*x**(13/2) + 945*a**(11/2)*b**9*x**(
11/2) + 315*a**(9/2)*b**10*x**(9/2)) - 40*a**(21/2)*b**(11/2)*x**
6*sqrt(a*x/b + 1)/(315*a**(15/2)*b**7*x**(15/2) + 945*a**(13/2)*b
**8*x**(13/2) + 945*a**(11/2)*b**9*x**(11/2) + 315*a**(9/2)*b**10
*x**(9/2)) - 30*a**(19/2)*b**(13/2)*x**5*sqrt(a*x/b + 1)/(315*a**
(15/2)*b**7*x**(15/2) + 945*a**(13/2)*b**8*x**(13/2) + 945*a**(11
/2)*b**9*x**(11/2) + 315*a**(9/2)*b**10*x**(9/2)) - 110*a**(17/2)
*b**(15/2)*x**4*sqrt(a*x/b + 1)/(315*a**(15/2)*b**7*x**(15/2) + 9
45*a**(13/2)*b**8*x**(13/2) + 945*a**(11/2)*b**9*x**(11/2) + 315*
a**(9/2)*b**10*x**(9/2)) - 380*a**(15/2)*b**(17/2)*x**3*sqrt(a*x/
b + 1)/(315*a**(15/2)*b**7*x**(15/2) + 945*a**(13/2)*b**8*x**(13/
2) + 945*a**(11/2)*b**9*x**(11/2) + 315*a**(9/2)*b**10*x**(9/2))
- 516*a**(13/2)*b**(19/2)*x**2*sqrt(a*x/b + 1)/(315*a**(15/2)*b**
7*x**(15/2) + 945*a**(13/2)*b**8*x**(13/2) + 945*a**(11/2)*b**9*x
**(11/2) + 315*a**(9/2)*b**10*x**(9/2)) - 310*a**(11/2)*b**(21/2)
*x*sqrt(a*x/b + 1)/(315*a**(15/2)*b**7*x**(15/2) + 945*a**(13/2)*
b**8*x**(13/2) + 945*a**(11/2)*b**9*x**(11/2) + 315*a**(9/2)*b**1
0*x**(9/2)) - 70*a**(9/2)*b**(23/2)*sqrt(a*x/b + 1)/(315*a**(15/2
```

```
)*b**7*x**(15/2) + 945*a**(13/2)*b**8*x**(13/2) + 945*a**(11/2)*b
**9*x**(11/2) + 315*a**(9/2)*b**10*x**(9/2)) + 16*a**12*b**4*x**(
15/2)/(315*a**(15/2)*b**7*x**(15/2) + 945*a**(13/2)*b**8*x**(13/2
) + 945*a**(11/2)*b**9*x**(11/2) + 315*a**(9/2)*b**10*x**(9/2)) +
 48*a**11*b**5*x**(13/2)/(315*a**(15/2)*b**7*x**(15/2) + 945*a**(
13/2)*b**8*x**(13/2) + 945*a**(11/2)*b**9*x**(11/2) + 315*a**(9/2
)*b**10*x**(9/2)) + 48*a**10*b**6*x**(11/2)/(315*a**(15/2)*b**7*x
**(15/2) + 945*a**(13/2)*b**8*x**(13/2) + 945*a**(11/2)*b**9*x**(
11/2) + 315*a**(9/2)*b**10*x**(9/2)) + 16*a**9*b**7*x**(9/2)/(315
*a**(15/2)*b**7*x**(15/2) + 945*a**(13/2)*b**8*x**(13/2) + 945*a*
*(11/2)*b**9*x**(11/2) + 315*a**(9/2)*b**10*x**(9/2))
```

GIAC/XCAS [A] time = 0.261963, size = 281, normalized size = 4.76

$$\frac{2\left(420\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^6a^3\operatorname{sign}(x)+1575\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^5a^{\frac{5}{2}}b\operatorname{sign}(x)+2583\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^4a^2b^2\operatorname{sign}(x)+2\cdots\right.}{315\left(\sqrt{\cdots}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)/x^4,x, algorithm="giac")
```

```
[Out] 2/315*(420*(sqrt(a)*x - sqrt(a*x^2 + b*x))^6*a^3*sign(x) + 1575*(
sqrt(a)*x - sqrt(a*x^2 + b*x))^5*a^(5/2)*b*sign(x) + 2583*(sqrt(a
)*x - sqrt(a*x^2 + b*x))^4*a^2*b^2*sign(x) + 2310*(sqrt(a)*x - sq
rt(a*x^2 + b*x))^3*a^(3/2)*b^3*sign(x) + 1170*(sqrt(a)*x - sqrt(a
*x^2 + b*x))^2*a*b^4*sign(x) + 315*(sqrt(a)*x - sqrt(a*x^2 + b*x)
)*sqrt(a)*b^5*sign(x) + 35*b^6*sign(x))/(sqrt(a)*x - sqrt(a*x^2 +
 b*x))^9
```

3.1707 $\int \frac{\left(a+\frac{b}{x}\right)^{3/2}}{x^5}\,dx$

Optimal. Leaf size=80

$$\frac{2a^3\left(a+\frac{b}{x}\right)^{5/2}}{5b^4}-\frac{6a^2\left(a+\frac{b}{x}\right)^{7/2}}{7b^4}-\frac{2\left(a+\frac{b}{x}\right)^{11/2}}{11b^4}+\frac{2a\left(a+\frac{b}{x}\right)^{9/2}}{3b^4}$$

```
[Out] (2*a^3*(a + b/x)^(5/2))/(5*b^4) - (6*a^2*(a + b/x)^(7/2))/(7*b^4)
 + (2*a*(a + b/x)^(9/2))/(3*b^4) - (2*(a + b/x)^(11/2))/(11*b^4)
```

Rubi [A] time = 0.0926805, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2a^3\left(a+\frac{b}{x}\right)^{5/2}}{5b^4}-\frac{6a^2\left(a+\frac{b}{x}\right)^{7/2}}{7b^4}-\frac{2\left(a+\frac{b}{x}\right)^{11/2}}{11b^4}+\frac{2a\left(a+\frac{b}{x}\right)^{9/2}}{3b^4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(3/2)/x^5,x]
```

```
[Out] (2*a^3*(a + b/x)^(5/2))/(5*b^4) - (6*a^2*(a + b/x)^(7/2))/(7*b^4)
 + (2*a*(a + b/x)^(9/2))/(3*b^4) - (2*(a + b/x)^(11/2))/(11*b^4)
```

Rubi in Sympy [A] time = 13.6506, size = 68, normalized size = 0.85

$$\frac{2a^3\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{5b^4}-\frac{6a^2\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{7b^4}+\frac{2a\left(a+\frac{b}{x}\right)^{\frac{9}{2}}}{3b^4}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{11}{2}}}{11b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(3/2)/x**5,x)
```

```
[Out] 2*a**3*(a + b/x)**(5/2)/(5*b**4) - 6*a**2*(a + b/x)**(7/2)/(7*b**
4) + 2*a*(a + b/x)**(9/2)/(3*b**4) - 2*(a + b/x)**(11/2)/(11*b**4
)
```

Mathematica [A] time = 0.0454782, size = 58, normalized size = 0.72

$$\frac{2\sqrt{a+\frac{b}{x}}(ax+b)^2\left(16a^3x^3-40a^2bx^2+70ab^2x-105b^3\right)}{1155b^4x^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(3/2)/x^5,x]
```

```
[Out] (2*Sqrt[a + b/x]*(b + a*x)^2*(-105*b^3 + 70*a*b^2*x - 40*a^2*b*x^
2 + 16*a^3*x^3))/(1155*b^4*x^5)
```

Maple [A] time = 0.008, size = 55, normalized size = 0.7

$$\frac{(2\,ax+2\,b)\left(16\,a^3x^3-40\,a^2bx^2+70\,ab^2x-105\,b^3\right)}{1155\,x^4b^4}\left(\frac{ax+b}{x}\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(3/2)/x^5,x)
```

```
[Out] 2/1155*(a*x+b)*(16*a^3*x^3-40*a^2*b*x^2+70*a*b^2*x-105*b^3)*((a*x
+b)/x)^(3/2)/x^4/b^4
```

Maxima [A] time = 1.43848, size = 86, normalized size = 1.08

$$-\frac{2\left(a+\frac{b}{x}\right)^{\frac{11}{2}}}{11\,b^4}+\frac{2\left(a+\frac{b}{x}\right)^{\frac{9}{2}}a}{3\,b^4}-\frac{6\left(a+\frac{b}{x}\right)^{\frac{7}{2}}a^2}{7\,b^4}+\frac{2\left(a+\frac{b}{x}\right)^{\frac{5}{2}}a^3}{5\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)/x^5,x, algorithm="maxima")
```

```
[Out] -2/11*(a + b/x)^(11/2)/b^4 + 2/3*(a + b/x)^(9/2)*a/b^4 - 6/7*(a +
 b/x)^(7/2)*a^2/b^4 + 2/5*(a + b/x)^(5/2)*a^3/b^4
```

Fricas [A] time = 0.223761, size = 96, normalized size = 1.2

$$\frac{2\left(16\,a^5x^5-8\,a^4bx^4+6\,a^3b^2x^3-5\,a^2b^3x^2-140\,ab^4x-105\,b^5\right)\sqrt{\frac{ax+b}{x}}}{1155\,b^4x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)/x^5,x, algorithm="fricas")
```

```
[Out] 2/1155*(16*a^5*x^5 - 8*a^4*b*x^4 + 6*a^3*b^2*x^3 - 5*a^2*b^3*x^2
- 140*a*b^4*x - 105*b^5)*sqrt((a*x + b)/x)/(b^4*x^5)
```

Sympy [A] time = 11.2887, size = 2297, normalized size = 28.71

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(3/2)/x**5,x)
```

```
[Out] 32*a**(33/2)*b**(23/2)*x**11*sqrt(a*x/b + 1)/(1155*a**(23/2)*b**1
5*x**(23/2) + 6930*a**(21/2)*b**16*x**(21/2) + 17325*a**(19/2)*b*
*17*x**(19/2) + 23100*a**(17/2)*b**18*x**(17/2) + 17325*a**(15/2)
*b**19*x**(15/2) + 6930*a**(13/2)*b**20*x**(13/2) + 1155*a**(11/2
)*b**21*x**(11/2)) + 176*a**(31/2)*b**(25/2)*x**10*sqrt(a*x/b + 1
)/(1155*a**(23/2)*b**15*x**(23/2) + 6930*a**(21/2)*b**16*x**(21/2
) + 17325*a**(19/2)*b**17*x**(19/2) + 23100*a**(17/2)*b**18*x**(1
7/2) + 17325*a**(15/2)*b**19*x**(15/2) + 6930*a**(13/2)*b**20*x**
(13/2) + 1155*a**(11/2)*b**21*x**(11/2)) + 396*a**(29/2)*b**(27/2
)*x**9*sqrt(a*x/b + 1)/(1155*a**(23/2)*b**15*x**(23/2) + 6930*a**
(21/2)*b**16*x**(21/2) + 17325*a**(19/2)*b**17*x**(19/2) + 23100*
a**(17/2)*b**18*x**(17/2) + 17325*a**(15/2)*b**19*x**(15/2) + 693
0*a**(13/2)*b**20*x**(13/2) + 1155*a**(11/2)*b**21*x**(11/2)) + 4
62*a**(27/2)*b**(29/2)*x**8*sqrt(a*x/b + 1)/(1155*a**(23/2)*b**15
*x**(23/2) + 6930*a**(21/2)*b**16*x**(21/2) + 17325*a**(19/2)*b**
17*x**(19/2) + 23100*a**(17/2)*b**18*x**(17/2) + 17325*a**(15/2)*
b**19*x**(15/2) + 6930*a**(13/2)*b**20*x**(13/2) + 1155*a**(11/2)
*b**21*x**(11/2)) - 1848*a**(23/2)*b**(33/2)*x**6*sqrt(a*x/b + 1)
/(1155*a**(23/2)*b**15*x**(23/2) + 6930*a**(21/2)*b**16*x**(21/2)
```

```
 + 17325*a**(19/2)*b**17*x**(19/2) + 23100*a**(17/2)*b**18*x**(17
/2) + 17325*a**(15/2)*b**19*x**(15/2) + 6930*a**(13/2)*b**20*x**(
13/2) + 1155*a**(11/2)*b**21*x**(11/2)) - 5544*a**(21/2)*b**(35/2
)*x**5*sqrt(a*x/b + 1)/(1155*a**(23/2)*b**15*x**(23/2) + 6930*a**
(21/2)*b**16*x**(21/2) + 17325*a**(19/2)*b**17*x**(19/2) + 23100*
a**(17/2)*b**18*x**(17/2) + 17325*a**(15/2)*b**19*x**(15/2) + 693
0*a**(13/2)*b**20*x**(13/2) + 1155*a**(11/2)*b**21*x**(11/2)) - 8
844*a**(19/2)*b**(37/2)*x**4*sqrt(a*x/b + 1)/(1155*a**(23/2)*b**1
5*x**(23/2) + 6930*a**(21/2)*b**16*x**(21/2) + 17325*a**(19/2)*b*
*17*x**(19/2) + 23100*a**(17/2)*b**18*x**(17/2) + 17325*a**(15/2)
*b**19*x**(15/2) + 6930*a**(13/2)*b**20*x**(13/2) + 1155*a**(11/2
)*b**21*x**(11/2)) - 8448*a**(17/2)*b**(39/2)*x**3*sqrt(a*x/b + 1
)/(1155*a**(23/2)*b**15*x**(23/2) + 6930*a**(21/2)*b**16*x**(21/2
) + 17325*a**(19/2)*b**17*x**(19/2) + 23100*a**(17/2)*b**18*x**(1
7/2) + 17325*a**(15/2)*b**19*x**(15/2) + 6930*a**(13/2)*b**20*x**
(13/2) + 1155*a**(11/2)*b**21*x**(11/2)) - 4840*a**(15/2)*b**(41/
2)*x**2*sqrt(a*x/b + 1)/(1155*a**(23/2)*b**15*x**(23/2) + 6930*a*
*(21/2)*b**16*x**(21/2) + 17325*a**(19/2)*b**17*x**(19/2) + 23100
*a**(17/2)*b**18*x**(17/2) + 17325*a**(15/2)*b**19*x**(15/2) + 69
30*a**(13/2)*b**20*x**(13/2) + 1155*a**(11/2)*b**21*x**(11/2)) -
1540*a**(13/2)*b**(43/2)*x*sqrt(a*x/b + 1)/(1155*a**(23/2)*b**15*
x**(23/2) + 6930*a**(21/2)*b**16*x**(21/2) + 17325*a**(19/2)*b**1
7*x**(19/2) + 23100*a**(17/2)*b**18*x**(17/2) + 17325*a**(15/2)*b
**19*x**(15/2) + 6930*a**(13/2)*b**20*x**(13/2) + 1155*a**(11/2)*
b**21*x**(11/2)) - 210*a**(11/2)*b**(45/2)*sqrt(a*x/b + 1)/(1155*
a**(23/2)*b**15*x**(23/2) + 6930*a**(21/2)*b**16*x**(21/2) + 1732
5*a**(19/2)*b**17*x**(19/2) + 23100*a**(17/2)*b**18*x**(17/2) + 1
7325*a**(15/2)*b**19*x**(15/2) + 6930*a**(13/2)*b**20*x**(13/2) +
 1155*a**(11/2)*b**21*x**(11/2)) - 32*a**17*b**11*x**(23/2)/(1155
*a**(23/2)*b**15*x**(23/2) + 6930*a**(21/2)*b**16*x**(21/2) + 173
25*a**(19/2)*b**17*x**(19/2) + 23100*a**(17/2)*b**18*x**(17/2) +
17325*a**(15/2)*b**19*x**(15/2) + 6930*a**(13/2)*b**20*x**(13/2)
+ 1155*a**(11/2)*b**21*x**(11/2)) - 192*a**16*b**12*x**(21/2)/(11
55*a**(23/2)*b**15*x**(23/2) + 6930*a**(21/2)*b**16*x**(21/2) + 1
7325*a**(19/2)*b**17*x**(19/2) + 23100*a**(17/2)*b**18*x**(17/2)
+ 17325*a**(15/2)*b**19*x**(15/2) + 6930*a**(13/2)*b**20*x**(13/2
) + 1155*a**(11/2)*b**21*x**(11/2)) - 480*a**15*b**13*x**(19/2)/(
1155*a**(23/2)*b**15*x**(23/2) + 6930*a**(21/2)*b**16*x**(21/2) +
 17325*a**(19/2)*b**17*x**(19/2) + 23100*a**(17/2)*b**18*x**(17/2
) + 17325*a**(15/2)*b**19*x**(15/2) + 6930*a**(13/2)*b**20*x**(13
/2) + 1155*a**(11/2)*b**21*x**(11/2)) - 640*a**14*b**14*x**(17/2)
/(1155*a**(23/2)*b**15*x**(23/2) + 6930*a**(21/2)*b**16*x**(21/2)
 + 17325*a**(19/2)*b**17*x**(19/2) + 23100*a**(17/2)*b**18*x**(17
/2) + 17325*a**(15/2)*b**19*x**(15/2) + 6930*a**(13/2)*b**20*x**(
13/2) + 1155*a**(11/2)*b**21*x**(11/2)) - 480*a**13*b**15*x**(15/
2)/(1155*a**(23/2)*b**15*x**(23/2) + 6930*a**(21/2)*b**16*x**(21/
2) + 17325*a**(19/2)*b**17*x**(19/2) + 23100*a**(17/2)*b**18*x**(
17/2) + 17325*a**(15/2)*b**19*x**(15/2) + 6930*a**(13/2)*b**20*x*
*(13/2) + 1155*a**(11/2)*b**21*x**(11/2)) - 192*a**12*b**16*x**(1
3/2)/(1155*a**(23/2)*b**15*x**(23/2) + 6930*a**(21/2)*b**16*x**(2
1/2) + 17325*a**(19/2)*b**17*x**(19/2) + 23100*a**(17/2)*b**18*x*
*(17/2) + 17325*a**(15/2)*b**19*x**(15/2) + 6930*a**(13/2)*b**20*
x**(13/2) + 1155*a**(11/2)*b**21*x**(11/2)) - 32*a**11*b**17*x**(
11/2)/(1155*a**(23/2)*b**15*x**(23/2) + 6930*a**(21/2)*b**16*x**(
21/2) + 17325*a**(19/2)*b**17*x**(19/2) + 23100*a**(17/2)*b**18*x
**(17/2) + 17325*a**(15/2)*b**19*x**(15/2) + 6930*a**(13/2)*b**20
*x**(13/2) + 1155*a**(11/2)*b**21*x**(11/2))
```

GIAC/XCAS [A] time = 0.266856, size = 323, normalized size = 4.04

$$2\left(2310\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^7 a^{\frac{7}{2}}\mathrm{sign}\left(x\right)+10164\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^6 a^3 b\,\mathrm{sign}\left(x\right)+19635\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^5 a^{\frac{5}{2}} b^2\mathrm{sign}\left(x\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)/x^5,x, algorithm="giac")
```

```
[Out] 2/1155*(2310*(sqrt(a)*x - sqrt(a*x^2 + b*x))^7*a^(7/2)*sign(x) +
```

```
10164*(sqrt(a)*x - sqrt(a*x^2 + b*x))^6*a^3*b*sign(x) + 19635*(sq
rt(a)*x - sqrt(a*x^2 + b*x))^5*a^(5/2)*b^2*sign(x) + 21285*(sqrt(
a)*x - sqrt(a*x^2 + b*x))^4*a^2*b^3*sign(x) + 13860*(sqrt(a)*x -
sqrt(a*x^2 + b*x))^3*a^(3/2)*b^4*sign(x) + 5390*(sqrt(a)*x - sqrt
(a*x^2 + b*x))^2*a*b^5*sign(x) + 1155*(sqrt(a)*x - sqrt(a*x^2 + b
*x))*sqrt(a)*b^6*sign(x) + 105*b^7*sign(x))/(sqrt(a)*x - sqrt(a*x
^2 + b*x))^11
```

3.1708 $\int \frac{\left(a+\frac{b}{x}\right)^{3/2}}{x^6}\,dx$

Optimal. Leaf size=101

$$-\frac{2a^4\left(a+\frac{b}{x}\right)^{5/2}}{5b^5}+\frac{8a^3\left(a+\frac{b}{x}\right)^{7/2}}{7b^5}-\frac{4a^2\left(a+\frac{b}{x}\right)^{9/2}}{3b^5}-\frac{2\left(a+\frac{b}{x}\right)^{13/2}}{13b^5}+\frac{8a\left(a+\frac{b}{x}\right)^{11/2}}{11b^5}$$

```
[Out] (-2*a^4*(a + b/x)^(5/2))/(5*b^5) + (8*a^3*(a + b/x)^(7/2))/(7*b^5
) - (4*a^2*(a + b/x)^(9/2))/(3*b^5) + (8*a*(a + b/x)^(11/2))/(11*
b^5) - (2*(a + b/x)^(13/2))/(13*b^5)
```

Rubi [A] time = 0.112906, antiderivative size = 101, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2a^4\left(a+\frac{b}{x}\right)^{5/2}}{5b^5}+\frac{8a^3\left(a+\frac{b}{x}\right)^{7/2}}{7b^5}-\frac{4a^2\left(a+\frac{b}{x}\right)^{9/2}}{3b^5}-\frac{2\left(a+\frac{b}{x}\right)^{13/2}}{13b^5}+\frac{8a\left(a+\frac{b}{x}\right)^{11/2}}{11b^5}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(3/2)/x^6,x]
```

```
[Out] (-2*a^4*(a + b/x)^(5/2))/(5*b^5) + (8*a^3*(a + b/x)^(7/2))/(7*b^5
) - (4*a^2*(a + b/x)^(9/2))/(3*b^5) + (8*a*(a + b/x)^(11/2))/(11*
b^5) - (2*(a + b/x)^(13/2))/(13*b^5)
```

Rubi in Sympy [A] time = 16.1421, size = 87, normalized size = 0.86

$$-\frac{2a^4\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{5b^5}+\frac{8a^3\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{7b^5}-\frac{4a^2\left(a+\frac{b}{x}\right)^{\frac{9}{2}}}{3b^5}+\frac{8a\left(a+\frac{b}{x}\right)^{\frac{11}{2}}}{11b^5}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{13}{2}}}{13b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(3/2)/x**6,x)
```

```
[Out] -2*a**4*(a + b/x)**(5/2)/(5*b**5) + 8*a**3*(a + b/x)**(7/2)/(7*b*
*5) - 4*a**2*(a + b/x)**(9/2)/(3*b**5) + 8*a*(a + b/x)**(11/2)/(1
1*b**5) - 2*(a + b/x)**(13/2)/(13*b**5)
```

Mathematica [A] time = 0.0453003, size = 69, normalized size = 0.68

$$-\frac{2\sqrt{a+\frac{b}{x}}(ax+b)^2\left(128a^4x^4-320a^3bx^3+560a^2b^2x^2-840ab^3x+1155b^4\right)}{15015b^5x^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(3/2)/x^6,x]
```

```
[Out] (-2*Sqrt[a + b/x]*(b + a*x)^2*(1155*b^4 - 840*a*b^3*x + 560*a^2*b
^2*x^2 - 320*a^3*b*x^3 + 128*a^4*x^4))/(15015*b^5*x^6)
```

Maple [A] time = 0.007, size = 66, normalized size = 0.7

$$-\frac{(2ax+2b)\left(128a^4x^4-320a^3x^3b+560a^2x^2b^2-840axb^3+1155b^4\right)}{15015x^5b^5}\left(\frac{ax+b}{x}\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(3/2)/x^6,x)
```

```
[Out] -2/15015*(a*x+b)*(128*a^4*x^4-320*a^3*b*x^3+560*a^2*b^2*x^2-840*a
*b^3*x+1155*b^4)*((a*x+b)/x)^(3/2)/x^5/b^5
```

Maxima [A] time = 1.45531, size = 109, normalized size = 1.08

$$-\frac{2\left(a+\frac{b}{x}\right)^{\frac{13}{2}}}{13b^5}+\frac{8\left(a+\frac{b}{x}\right)^{\frac{11}{2}}a}{11b^5}-\frac{4\left(a+\frac{b}{x}\right)^{\frac{9}{2}}a^2}{3b^5}+\frac{8\left(a+\frac{b}{x}\right)^{\frac{7}{2}}a^3}{7b^5}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{5}{2}}a^4}{5b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)/x^6,x, algorithm="maxima")
```

```
[Out] -2/13*(a + b/x)^(13/2)/b^5 + 8/11*(a + b/x)^(11/2)*a/b^5 - 4/3*(a
 + b/x)^(9/2)*a^2/b^5 + 8/7*(a + b/x)^(7/2)*a^3/b^5 - 2/5*(a + b/
x)^(5/2)*a^4/b^5
```

Fricas [A] time = 0.22288, size = 111, normalized size = 1.1

$$-\frac{2\left(128a^6x^6-64a^5bx^5+48a^4b^2x^4-40a^3b^3x^3+35a^2b^4x^2+1470ab^5x+1155b^6\right)\sqrt{\frac{ax+b}{x}}}{15015b^5x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)/x^6,x, algorithm="fricas")
```

```
[Out] -2/15015*(128*a^6*x^6 - 64*a^5*b*x^5 + 48*a^4*b^2*x^4 - 40*a^3*b^
3*x^3 + 35*a^2*b^4*x^2 + 1470*a*b^5*x + 1155*b^6)*sqrt((a*x + b)/
x)/(b^5*x^6)
```

Sympy [A] time = 19.3604, size = 5289, normalized size = 52.37

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(3/2)/x**6,x)
```

```
[Out] -256*a**(45/2)*b**(49/2)*x**16*sqrt(a*x/b + 1)/(15015*a**(33/2)*b
**29*x**(33/2) + 150150*a**(31/2)*b**30*x**(31/2) + 675675*a**(29
/2)*b**31*x**(29/2) + 1801800*a**(27/2)*b**32*x**(27/2) + 3153150
*a**(25/2)*b**33*x**(25/2) + 3783780*a**(23/2)*b**34*x**(23/2) +
3153150*a**(21/2)*b**35*x**(21/2) + 1801800*a**(19/2)*b**36*x**(1
9/2) + 675675*a**(17/2)*b**37*x**(17/2) + 150150*a**(15/2)*b**38*
x**(15/2) + 15015*a**(13/2)*b**39*x**(13/2)) - 2432*a**(43/2)*b**
(51/2)*x**15*sqrt(a*x/b + 1)/(15015*a**(33/2)*b**29*x**(33/2) + 1
50150*a**(31/2)*b**30*x**(31/2) + 675675*a**(29/2)*b**31*x**(29/2
) + 1801800*a**(27/2)*b**32*x**(27/2) + 3153150*a**(25/2)*b**33*x
```

```
**(25/2) + 3783780*a**(23/2)*b**34*x**(23/2) + 3153150*a**(21/2)*
b**35*x**(21/2) + 1801800*a**(19/2)*b**36*x**(19/2) + 675675*a**(
17/2)*b**37*x**(17/2) + 150150*a**(15/2)*b**38*x**(15/2) + 15015*
a**(13/2)*b**39*x**(13/2)) - 10336*a**(41/2)*b**(53/2)*x**14*sqrt
(a*x/b + 1)/(15015*a**(33/2)*b**29*x**(33/2) + 150150*a**(31/2)*b
**30*x**(31/2) + 675675*a**(29/2)*b**31*x**(29/2) + 1801800*a**(2
7/2)*b**32*x**(27/2) + 3153150*a**(25/2)*b**33*x**(25/2) + 378378
0*a**(23/2)*b**34*x**(23/2) + 3153150*a**(21/2)*b**35*x**(21/2) +
 1801800*a**(19/2)*b**36*x**(19/2) + 675675*a**(17/2)*b**37*x**(1
7/2) + 150150*a**(15/2)*b**38*x**(15/2) + 15015*a**(13/2)*b**39*x
**(13/2)) - 25840*a**(39/2)*b**(55/2)*x**13*sqrt(a*x/b + 1)/(1501
5*a**(33/2)*b**29*x**(33/2) + 150150*a**(31/2)*b**30*x**(31/2) +
675675*a**(29/2)*b**31*x**(29/2) + 1801800*a**(27/2)*b**32*x**(27
/2) + 3153150*a**(25/2)*b**33*x**(25/2) + 3783780*a**(23/2)*b**34
*x**(23/2) + 3153150*a**(21/2)*b**35*x**(21/2) + 1801800*a**(19/2
)*b**36*x**(19/2) + 675675*a**(17/2)*b**37*x**(17/2) + 150150*a**
(15/2)*b**38*x**(15/2) + 15015*a**(13/2)*b**39*x**(13/2)) - 41990
*a**(37/2)*b**(57/2)*x**12*sqrt(a*x/b + 1)/(15015*a**(33/2)*b**29
*x**(33/2) + 150150*a**(31/2)*b**30*x**(31/2) + 675675*a**(29/2)*
b**31*x**(29/2) + 1801800*a**(27/2)*b**32*x**(27/2) + 3153150*a**
(25/2)*b**33*x**(25/2) + 3783780*a**(23/2)*b**34*x**(23/2) + 3153
150*a**(21/2)*b**35*x**(21/2) + 1801800*a**(19/2)*b**36*x**(19/2)
 + 675675*a**(17/2)*b**37*x**(17/2) + 150150*a**(15/2)*b**38*x**(
15/2) + 15015*a**(13/2)*b**39*x**(13/2)) - 49192*a**(35/2)*b**(59
/2)*x**11*sqrt(a*x/b + 1)/(15015*a**(33/2)*b**29*x**(33/2) + 1501
50*a**(31/2)*b**30*x**(31/2) + 675675*a**(29/2)*b**31*x**(29/2) +
 1801800*a**(27/2)*b**32*x**(27/2) + 3153150*a**(25/2)*b**33*x**(
25/2) + 3783780*a**(23/2)*b**34*x**(23/2) + 3153150*a**(21/2)*b**
35*x**(21/2) + 1801800*a**(19/2)*b**36*x**(19/2) + 675675*a**(17/
2)*b**37*x**(17/2) + 150150*a**(15/2)*b**38*x**(15/2) + 15015*a**
(13/2)*b**39*x**(13/2)) - 66924*a**(33/2)*b**(61/2)*x**10*sqrt(a*
x/b + 1)/(15015*a**(33/2)*b**29*x**(33/2) + 150150*a**(31/2)*b**3
0*x**(31/2) + 675675*a**(29/2)*b**31*x**(29/2) + 1801800*a**(27/2
)*b**32*x**(27/2) + 3153150*a**(25/2)*b**33*x**(25/2) + 3783780*a
**(23/2)*b**34*x**(23/2) + 3153150*a**(21/2)*b**35*x**(21/2) + 18
01800*a**(19/2)*b**36*x**(19/2) + 675675*a**(17/2)*b**37*x**(17/2
) + 150150*a**(15/2)*b**38*x**(15/2) + 15015*a**(13/2)*b**39*x**(
13/2)) - 175032*a**(31/2)*b**(63/2)*x**9*sqrt(a*x/b + 1)/(15015*a
**(33/2)*b**29*x**(33/2) + 150150*a**(31/2)*b**30*x**(31/2) + 675
675*a**(29/2)*b**31*x**(29/2) + 1801800*a**(27/2)*b**32*x**(27/2)
 + 3153150*a**(25/2)*b**33*x**(25/2) + 3783780*a**(23/2)*b**34*x*
*(23/2) + 3153150*a**(21/2)*b**35*x**(21/2) + 1801800*a**(19/2)*b
**36*x**(19/2) + 675675*a**(17/2)*b**37*x**(17/2) + 150150*a**(15
/2)*b**38*x**(15/2) + 15015*a**(13/2)*b**39*x**(13/2)) - 467610*a
**(29/2)*b**(65/2)*x**8*sqrt(a*x/b + 1)/(15015*a**(33/2)*b**29*x*
*(33/2) + 150150*a**(31/2)*b**30*x**(31/2) + 675675*a**(29/2)*b**
31*x**(29/2) + 1801800*a**(27/2)*b**32*x**(27/2) + 3153150*a**(25
/2)*b**33*x**(25/2) + 3783780*a**(23/2)*b**34*x**(23/2) + 3153150
*a**(21/2)*b**35*x**(21/2) + 1801800*a**(19/2)*b**36*x**(19/2) +
675675*a**(17/2)*b**37*x**(17/2) + 150150*a**(15/2)*b**38*x**(15/
2) + 15015*a**(13/2)*b**39*x**(13/2)) - 903760*a**(27/2)*b**(67/2
)*x**7*sqrt(a*x/b + 1)/(15015*a**(33/2)*b**29*x**(33/2) + 150150*
a**(31/2)*b**30*x**(31/2) + 675675*a**(29/2)*b**31*x**(29/2) + 18
01800*a**(27/2)*b**32*x**(27/2) + 3153150*a**(25/2)*b**33*x**(25/
2) + 3783780*a**(23/2)*b**34*x**(23/2) + 3153150*a**(21/2)*b**35*
x**(21/2) + 1801800*a**(19/2)*b**36*x**(19/2) + 675675*a**(17/2)*
b**37*x**(17/2) + 150150*a**(15/2)*b**38*x**(15/2) + 15015*a**(13
/2)*b**39*x**(13/2)) - 1234376*a**(25/2)*b**(69/2)*x**6*sqrt(a*x/
b + 1)/(15015*a**(33/2)*b**29*x**(33/2) + 150150*a**(31/2)*b**30*
x**(31/2) + 675675*a**(29/2)*b**31*x**(29/2) + 1801800*a**(27/2)*
b**32*x**(27/2) + 3153150*a**(25/2)*b**33*x**(25/2) + 3783780*a**
(23/2)*b**34*x**(23/2) + 3153150*a**(21/2)*b**35*x**(21/2) + 1801
800*a**(19/2)*b**36*x**(19/2) + 675675*a**(17/2)*b**37*x**(17/2)
+ 150150*a**(15/2)*b**38*x**(15/2) + 15015*a**(13/2)*b**39*x**(13
/2)) - 1205152*a**(23/2)*b**(71/2)*x**5*sqrt(a*x/b + 1)/(15015*a*
*(33/2)*b**29*x**(33/2) + 150150*a**(31/2)*b**30*x**(31/2) + 6756
75*a**(29/2)*b**31*x**(29/2) + 1801800*a**(27/2)*b**32*x**(27/2)
+ 3153150*a**(25/2)*b**33*x**(25/2) + 3783780*a**(23/2)*b**34*x**
(23/2) + 3153150*a**(21/2)*b**35*x**(21/2) + 1801800*a**(19/2)*b*
*36*x**(19/2) + 675675*a**(17/2)*b**37*x**(17/2) + 150150*a**(15/
2)*b**38*x**(15/2) + 15015*a**(13/2)*b**39*x**(13/2)) - 840346*a*
*(21/2)*b**(73/2)*x**4*sqrt(a*x/b + 1)/(15015*a**(33/2)*b**29*x**
(33/2) + 150150*a**(31/2)*b**30*x**(31/2) + 675675*a**(29/2)*b**3
1*x**(29/2) + 1801800*a**(27/2)*b**32*x**(27/2) + 3153150*a**(25/
```

2)*b**33*x**(25/2) + 3783780*a**(23/2)*b**34*x**(23/2) + 3153150*
a**(21/2)*b**35*x**(21/2) + 1801800*a**(19/2)*b**36*x**(19/2) + 6
75675*a**(17/2)*b**37*x**(17/2) + 150150*a**(15/2)*b**38*x**(15/2
) + 15015*a**(13/2)*b**39*x**(13/2)) - 410120*a**(19/2)*b**(75/2)
*x**3*sqrt(a*x/b + 1)/(15015*a**(33/2)*b**29*x**(33/2) + 150150*a
(31/2)*b30*x**(31/2) + 675675*a**(29/2)*b**31*x**(29/2) + 180
1800*a**(27/2)*b**32*x**(27/2) + 3153150*a**(25/2)*b**33*x**(25/2
) + 3783780*a**(23/2)*b**34*x**(23/2) + 3153150*a**(21/2)*b**35*x
(21/2) + 1801800*a(19/2)*b**36*x**(19/2) + 675675*a**(17/2)*b
37*x(17/2) + 150150*a**(15/2)*b**38*x**(15/2) + 15015*a**(13/
2)*b**39*x**(13/2)) - 133420*a**(17/2)*b**(77/2)*x**2*sqrt(a*x/b
+ 1)/(15015*a**(33/2)*b**29*x**(33/2) + 150150*a**(31/2)*b**30*x*
*(31/2) + 675675*a**(29/2)*b**31*x**(29/2) + 1801800*a**(27/2)*b*
*32*x**(27/2) + 3153150*a**(25/2)*b**33*x**(25/2) + 3783780*a**(2
3/2)*b**34*x**(23/2) + 3153150*a**(21/2)*b**35*x**(21/2) + 180180
0*a**(19/2)*b**36*x**(19/2) + 675675*a**(17/2)*b**37*x**(17/2) +
150150*a**(15/2)*b**38*x**(15/2) + 15015*a**(13/2)*b**39*x**(13/2
)) - 26040*a**(15/2)*b**(79/2)*x*sqrt(a*x/b + 1)/(15015*a**(33/2)
*b**29*x**(33/2) + 150150*a**(31/2)*b**30*x**(31/2) + 675675*a**(
29/2)*b**31*x**(29/2) + 1801800*a**(27/2)*b**32*x**(27/2) + 31531
50*a**(25/2)*b**33*x**(25/2) + 3783780*a**(23/2)*b**34*x**(23/2)
+ 3153150*a**(21/2)*b**35*x**(21/2) + 1801800*a**(19/2)*b**36*x**
(19/2) + 675675*a**(17/2)*b**37*x**(17/2) + 150150*a**(15/2)*b**3
8*x**(15/2) + 15015*a**(13/2)*b**39*x**(13/2)) - 2310*a**(13/2)*b
(81/2)*sqrt(a*x/b + 1)/(15015*a(33/2)*b**29*x**(33/2) + 15015
0*a**(31/2)*b**30*x**(31/2) + 675675*a**(29/2)*b**31*x**(29/2) +
1801800*a**(27/2)*b**32*x**(27/2) + 3153150*a**(25/2)*b**33*x**(2
5/2) + 3783780*a**(23/2)*b**34*x**(23/2) + 3153150*a**(21/2)*b**3
5*x**(21/2) + 1801800*a**(19/2)*b**36*x**(19/2) + 675675*a**(17/2
)*b**37*x**(17/2) + 150150*a**(15/2)*b**38*x**(15/2) + 15015*a**(
13/2)*b**39*x**(13/2)) + 256*a**23*b**24*x**(33/2)/(15015*a**(33/
2)*b**29*x**(33/2) + 150150*a**(31/2)*b**30*x**(31/2) + 675675*a*
*(29/2)*b**31*x**(29/2) + 1801800*a**(27/2)*b**32*x**(27/2) + 315
3150*a**(25/2)*b**33*x**(25/2) + 3783780*a**(23/2)*b**34*x**(23/2
) + 3153150*a**(21/2)*b**35*x**(21/2) + 1801800*a**(19/2)*b**36*x
(19/2) + 675675*a(17/2)*b**37*x**(17/2) + 150150*a**(15/2)*b*
*38*x**(15/2) + 15015*a**(13/2)*b**39*x**(13/2)) + 2560*a**22*b**
25*x**(31/2)/(15015*a**(33/2)*b**29*x**(33/2) + 150150*a**(31/2)*
b**30*x**(31/2) + 675675*a**(29/2)*b**31*x**(29/2) + 1801800*a**(
27/2)*b**32*x**(27/2) + 3153150*a**(25/2)*b**33*x**(25/2) + 37837
80*a**(23/2)*b**34*x**(23/2) + 3153150*a**(21/2)*b**35*x**(21/2)
+ 1801800*a**(19/2)*b**36*x**(19/2) + 675675*a**(17/2)*b**37*x**(
17/2) + 150150*a**(15/2)*b**38*x**(15/2) + 15015*a**(13/2)*b**39*
x**(13/2)) + 11520*a**21*b**26*x**(29/2)/(15015*a**(33/2)*b**29*x
(33/2) + 150150*a(31/2)*b**30*x**(31/2) + 675675*a**(29/2)*b*
*31*x**(29/2) + 1801800*a**(27/2)*b**32*x**(27/2) + 3153150*a**(2
5/2)*b**33*x**(25/2) + 3783780*a**(23/2)*b**34*x**(23/2) + 315315
0*a**(21/2)*b**35*x**(21/2) + 1801800*a**(19/2)*b**36*x**(19/2) +
 675675*a**(17/2)*b**37*x**(17/2) + 150150*a**(15/2)*b**38*x**(15
/2) + 15015*a**(13/2)*b**39*x**(13/2)) + 30720*a**20*b**27*x**(27
/2)/(15015*a**(33/2)*b**29*x**(33/2) + 150150*a**(31/2)*b**30*x**
(31/2) + 675675*a**(29/2)*b**31*x**(29/2) + 1801800*a**(27/2)*b**
32*x**(27/2) + 3153150*a**(25/2)*b**33*x**(25/2) + 3783780*a**(23
/2)*b**34*x**(23/2) + 3153150*a**(21/2)*b**35*x**(21/2) + 1801800
*a**(19/2)*b**36*x**(19/2) + 675675*a**(17/2)*b**37*x**(17/2) + 1
50150*a**(15/2)*b**38*x**(15/2) + 15015*a**(13/2)*b**39*x**(13/2)
) + 53760*a**19*b**28*x**(25/2)/(15015*a**(33/2)*b**29*x**(33/2)
+ 150150*a**(31/2)*b**30*x**(31/2) + 675675*a**(29/2)*b**31*x**(2
9/2) + 1801800*a**(27/2)*b**32*x**(27/2) + 3153150*a**(25/2)*b**3
3*x**(25/2) + 3783780*a**(23/2)*b**34*x**(23/2) + 3153150*a**(21/
2)*b**35*x**(21/2) + 1801800*a**(19/2)*b**36*x**(19/2) + 675675*a
(17/2)*b37*x**(17/2) + 150150*a**(15/2)*b**38*x**(15/2) + 150
15*a**(13/2)*b**39*x**(13/2)) + 64512*a**18*b**29*x**(23/2)/(1501
5*a**(33/2)*b**29*x**(33/2) + 150150*a**(31/2)*b**30*x**(31/2) +
675675*a**(29/2)*b**31*x**(29/2) + 1801800*a**(27/2)*b**32*x**(27
/2) + 3153150*a**(25/2)*b**33*x**(25/2) + 3783780*a**(23/2)*b**34
*x**(23/2) + 3153150*a**(21/2)*b**35*x**(21/2) + 1801800*a**(19/2
)*b**36*x**(19/2) + 675675*a**(17/2)*b**37*x**(17/2) + 150150*a**
(15/2)*b**38*x**(15/2) + 15015*a**(13/2)*b**39*x**(13/2)) + 53760
*a**17*b**30*x**(21/2)/(15015*a**(33/2)*b**29*x**(33/2) + 150150*
a**(31/2)*b**30*x**(31/2) + 675675*a**(29/2)*b**31*x**(29/2) + 18
01800*a**(27/2)*b**32*x**(27/2) + 3153150*a**(25/2)*b**33*x**(25/
2) + 3783780*a**(23/2)*b**34*x**(23/2) + 3153150*a**(21/2)*b**35*
x**(21/2) + 1801800*a**(19/2)*b**36*x**(19/2) + 675675*a**(17/2)*

```
b**37*x**(17/2) + 150150*a**(15/2)*b**38*x**(15/2) + 15015*a**(13
/2)*b**39*x**(13/2)) + 30720*a**16*b**31*x**(19/2)/(15015*a**(33/
2)*b**29*x**(33/2) + 150150*a**(31/2)*b**30*x**(31/2) + 675675*a*
*(29/2)*b**31*x**(29/2) + 1801800*a**(27/2)*b**32*x**(27/2) + 315
3150*a**(25/2)*b**33*x**(25/2) + 3783780*a**(23/2)*b**34*x**(23/2
) + 3153150*a**(21/2)*b**35*x**(21/2) + 1801800*a**(19/2)*b**36*x
**(19/2) + 675675*a**(17/2)*b**37*x**(17/2) + 150150*a**(15/2)*b*
*38*x**(15/2) + 15015*a**(13/2)*b**39*x**(13/2)) + 11520*a**15*b*
*32*x**(17/2)/(15015*a**(33/2)*b**29*x**(33/2) + 150150*a**(31/2)
*b**30*x**(31/2) + 675675*a**(29/2)*b**31*x**(29/2) + 1801800*a**
(27/2)*b**32*x**(27/2) + 3153150*a**(25/2)*b**33*x**(25/2) + 3783
780*a**(23/2)*b**34*x**(23/2) + 3153150*a**(21/2)*b**35*x**(21/2)
 + 1801800*a**(19/2)*b**36*x**(19/2) + 675675*a**(17/2)*b**37*x**
(17/2) + 150150*a**(15/2)*b**38*x**(15/2) + 15015*a**(13/2)*b**39
*x**(13/2)) + 2560*a**14*b**33*x**(15/2)/(15015*a**(33/2)*b**29*x
**(33/2) + 150150*a**(31/2)*b**30*x**(31/2) + 675675*a**(29/2)*b*
*31*x**(29/2) + 1801800*a**(27/2)*b**32*x**(27/2) + 3153150*a**(2
5/2)*b**33*x**(25/2) + 3783780*a**(23/2)*b**34*x**(23/2) + 315315
0*a**(21/2)*b**35*x**(21/2) + 1801800*a**(19/2)*b**36*x**(19/2) +
 675675*a**(17/2)*b**37*x**(17/2) + 150150*a**(15/2)*b**38*x**(15
/2) + 15015*a**(13/2)*b**39*x**(13/2)) + 256*a**13*b**34*x**(13/2
)/(15015*a**(33/2)*b**29*x**(33/2) + 150150*a**(31/2)*b**30*x**(3
1/2) + 675675*a**(29/2)*b**31*x**(29/2) + 1801800*a**(27/2)*b**32
*x**(27/2) + 3153150*a**(25/2)*b**33*x**(25/2) + 3783780*a**(23/2
)*b**34*x**(23/2) + 3153150*a**(21/2)*b**35*x**(21/2) + 1801800*a
**(19/2)*b**36*x**(19/2) + 675675*a**(17/2)*b**37*x**(17/2) + 150
150*a**(15/2)*b**38*x**(15/2) + 15015*a**(13/2)*b**39*x**(13/2))
```

GIAC/XCAS [A] time = 0.267718, size = 365, normalized size = 3.61

$$\frac{2\left(48048\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^8a^4\operatorname{sign}(x)+240240\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^7a^{\frac{7}{2}}b\operatorname{sign}(x)+531960\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^6a^3b^2\operatorname{sign}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)/x^6,x, algorithm="giac")
```

```
[Out] 2/15015*(48048*(sqrt(a)*x - sqrt(a*x^2 + b*x))^8*a^4*sign(x) + 24
0240*(sqrt(a)*x - sqrt(a*x^2 + b*x))^7*a^(7/2)*b*sign(x) + 531960
*(sqrt(a)*x - sqrt(a*x^2 + b*x))^6*a^3*b^2*sign(x) + 675675*(sqrt
(a)*x - sqrt(a*x^2 + b*x))^5*a^(5/2)*b^3*sign(x) + 535535*(sqrt(a
)*x - sqrt(a*x^2 + b*x))^4*a^2*b^4*sign(x) + 270270*(sqrt(a)*x -
sqrt(a*x^2 + b*x))^3*a^(3/2)*b^5*sign(x) + 84630*(sqrt(a)*x - sqr
t(a*x^2 + b*x))^2*a*b^6*sign(x) + 15015*(sqrt(a)*x - sqrt(a*x^2 +
 b*x))*sqrt(a)*b^7*sign(x) + 1155*b^8*sign(x))/(sqrt(a)*x - sqrt(
a*x^2 + b*x))^13
```

3.1709 $\int \frac{\left(a+\frac{b}{x}\right)^{3/2}}{x^7} dx$

Optimal. Leaf size=122

$$\frac{2a^5\left(a+\frac{b}{x}\right)^{5/2}}{5b^6}-\frac{10a^4\left(a+\frac{b}{x}\right)^{7/2}}{7b^6}+\frac{20a^3\left(a+\frac{b}{x}\right)^{9/2}}{9b^6}-\frac{20a^2\left(a+\frac{b}{x}\right)^{11/2}}{11b^6}-\frac{2\left(a+\frac{b}{x}\right)^{15/2}}{15b^6}+\frac{10a\left(a+\frac{b}{x}\right)^{13/2}}{13b^6}$$

```
[Out] (2*a^5*(a + b/x)^(5/2))/(5*b^6) - (10*a^4*(a + b/x)^(7/2))/(7*b^6
) + (20*a^3*(a + b/x)^(9/2))/(9*b^6) - (20*a^2*(a + b/x)^(11/2))/
(11*b^6) + (10*a*(a + b/x)^(13/2))/(13*b^6) - (2*(a + b/x)^(15/2)
)/(15*b^6)
```

Rubi [A] time = 0.137286, antiderivative size = 122, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2a^5\left(a+\frac{b}{x}\right)^{5/2}}{5b^6}-\frac{10a^4\left(a+\frac{b}{x}\right)^{7/2}}{7b^6}+\frac{20a^3\left(a+\frac{b}{x}\right)^{9/2}}{9b^6}-\frac{20a^2\left(a+\frac{b}{x}\right)^{11/2}}{11b^6}-\frac{2\left(a+\frac{b}{x}\right)^{15/2}}{15b^6}+\frac{10a\left(a+\frac{b}{x}\right)^{13/2}}{13b^6}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(3/2)/x^7,x]
```

```
[Out] (2*a^5*(a + b/x)^(5/2))/(5*b^6) - (10*a^4*(a + b/x)^(7/2))/(7*b^6
) + (20*a^3*(a + b/x)^(9/2))/(9*b^6) - (20*a^2*(a + b/x)^(11/2))/
(11*b^6) + (10*a*(a + b/x)^(13/2))/(13*b^6) - (2*(a + b/x)^(15/2)
)/(15*b^6)
```

Rubi in Sympy [A] time = 19.622, size = 105, normalized size = 0.86

$$\frac{2a^5\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{5b^6}-\frac{10a^4\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{7b^6}+\frac{20a^3\left(a+\frac{b}{x}\right)^{\frac{9}{2}}}{9b^6}-\frac{20a^2\left(a+\frac{b}{x}\right)^{\frac{11}{2}}}{11b^6}+\frac{10a\left(a+\frac{b}{x}\right)^{\frac{13}{2}}}{13b^6}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{15}{2}}}{15b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(3/2)/x**7,x)
```

```
[Out] 2*a**5*(a + b/x)**(5/2)/(5*b**6) - 10*a**4*(a + b/x)**(7/2)/(7*b*
*6) + 20*a**3*(a + b/x)**(9/2)/(9*b**6) - 20*a**2*(a + b/x)**(11/
2)/(11*b**6) + 10*a*(a + b/x)**(13/2)/(13*b**6) - 2*(a + b/x)**(1
5/2)/(15*b**6)
```

Mathematica [A] time = 0.0561426, size = 80, normalized size = 0.66

$$\frac{2\sqrt{a+\frac{b}{x}}(ax+b)^2\left(256a^5x^5-640a^4bx^4+1120a^3b^2x^3-1680a^2b^3x^2+2310ab^4x-3003b^5\right)}{45045b^6x^7}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(3/2)/x^7,x]
```

```
[Out] (2*Sqrt[a + b/x]*(b + a*x)^2*(-3003*b^5 + 2310*a*b^4*x - 1680*a^2
*b^3*x^2 + 1120*a^3*b^2*x^3 - 640*a^4*b*x^4 + 256*a^5*x^5))/(4504
5*b^6*x^7)
```

Maple [A] time = 0.009, size = 77, normalized size = 0.6

$$\frac{(2ax+2b)\left(256a^5x^5-640a^4bx^4+1120a^3b^2x^3-1680a^2b^3x^2+2310ab^4x-3003b^5\right)}{45045x^6b^6}\left(\frac{ax+b}{x}\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(3/2)/x^7,x)
```

```
[Out] 2/45045*(a*x+b)*(256*a^5*x^5-640*a^4*b*x^4+1120*a^3*b^2*x^3-1680*
a^2*b^3*x^2+2310*a*b^4*x-3003*b^5)*((a*x+b)/x)^(3/2)/x^6/b^6
```

Maxima [A] time = 1.43036, size = 132, normalized size = 1.08

$$-\frac{2\left(a+\frac{b}{x}\right)^{\frac{15}{2}}}{15b^6}+\frac{10\left(a+\frac{b}{x}\right)^{\frac{13}{2}}a}{13b^6}-\frac{20\left(a+\frac{b}{x}\right)^{\frac{11}{2}}a^2}{11b^6}+\frac{20\left(a+\frac{b}{x}\right)^{\frac{9}{2}}a^3}{9b^6}-\frac{10\left(a+\frac{b}{x}\right)^{\frac{7}{2}}a^4}{7b^6}+\frac{2\left(a+\frac{b}{x}\right)^{\frac{5}{2}}a^5}{5b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)/x^7,x, algorithm="maxima")
```

```
[Out] -2/15*(a + b/x)^(15/2)/b^6 + 10/13*(a + b/x)^(13/2)*a/b^6 - 20/11
*(a + b/x)^(11/2)*a^2/b^6 + 20/9*(a + b/x)^(9/2)*a^3/b^6 - 10/7*(
a + b/x)^(7/2)*a^4/b^6 + 2/5*(a + b/x)^(5/2)*a^5/b^6
```

Fricas [A] time = 0.223227, size = 126, normalized size = 1.03

$$\frac{2\left(256a^7x^7-128a^6bx^6+96a^5b^2x^5-80a^4b^3x^4+70a^3b^4x^3-63a^2b^5x^2-3696ab^6x-3003b^7\right)\sqrt{\frac{ax+b}{x}}}{45045b^6x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)/x^7,x, algorithm="fricas")
```

```
[Out] 2/45045*(256*a^7*x^7 - 128*a^6*b*x^6 + 96*a^5*b^2*x^5 - 80*a^4*b^
3*x^4 + 70*a^3*b^4*x^3 - 63*a^2*b^5*x^2 - 3696*a*b^6*x - 3003*b^7
)*sqrt((a*x + b)/x)/(b^6*x^7)
```

Sympy [A] time = 34.4196, size = 10344, normalized size = 84.79

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(3/2)/x**7,x)
```

```
[Out] 512*a**(59/2)*b**(91/2)*x**22*sqrt(a*x/b + 1)/(45045*a**(45/2)*b*
*51*x**(45/2) + 675675*a**(43/2)*b**52*x**(43/2) + 4729725*a**(41
/2)*b**53*x**(41/2) + 20495475*a**(39/2)*b**54*x**(39/2) + 614864
25*a**(37/2)*b**55*x**(37/2) + 135270135*a**(35/2)*b**56*x**(35/2
) + 225450225*a**(33/2)*b**57*x**(33/2) + 289864575*a**(31/2)*b**
58*x**(31/2) + 289864575*a**(29/2)*b**59*x**(29/2) + 225450225*a*
*(27/2)*b**60*x**(27/2) + 135270135*a**(25/2)*b**61*x**(25/2) + 6
1486425*a**(23/2)*b**62*x**(23/2) + 20495475*a**(21/2)*b**63*x**(
```

```
21/2) + 4729725*a**(19/2)*b**64*x**(19/2) + 675675*a**(17/2)*b**6
5*x**(17/2) + 45045*a**(15/2)*b**66*x**(15/2)) + 7424*a**(57/2)*b
**(93/2)*x**21*sqrt(a*x/b + 1)/(45045*a**(45/2)*b**51*x**(45/2) +
 675675*a**(43/2)*b**52*x**(43/2) + 4729725*a**(41/2)*b**53*x**(4
1/2) + 20495475*a**(39/2)*b**54*x**(39/2) + 61486425*a**(37/2)*b*
*55*x**(37/2) + 135270135*a**(35/2)*b**56*x**(35/2) + 225450225*a
**(33/2)*b**57*x**(33/2) + 289864575*a**(31/2)*b**58*x**(31/2) +
289864575*a**(29/2)*b**59*x**(29/2) + 225450225*a**(27/2)*b**60*x
**(27/2) + 135270135*a**(25/2)*b**61*x**(25/2) + 61486425*a**(23/
2)*b**62*x**(23/2) + 20495475*a**(21/2)*b**63*x**(21/2) + 4729725
*a**(19/2)*b**64*x**(19/2) + 675675*a**(17/2)*b**65*x**(17/2) + 4
5045*a**(15/2)*b**66*x**(15/2)) + 50112*a**(55/2)*b**(95/2)*x**20
*sqrt(a*x/b + 1)/(45045*a**(45/2)*b**51*x**(45/2) + 675675*a**(43
/2)*b**52*x**(43/2) + 4729725*a**(41/2)*b**53*x**(41/2) + 2049547
5*a**(39/2)*b**54*x**(39/2) + 61486425*a**(37/2)*b**55*x**(37/2)
+ 135270135*a**(35/2)*b**56*x**(35/2) + 225450225*a**(33/2)*b**57
*x**(33/2) + 289864575*a**(31/2)*b**58*x**(31/2) + 289864575*a**(
29/2)*b**59*x**(29/2) + 225450225*a**(27/2)*b**60*x**(27/2) + 135
270135*a**(25/2)*b**61*x**(25/2) + 61486425*a**(23/2)*b**62*x**(2
3/2) + 20495475*a**(21/2)*b**63*x**(21/2) + 4729725*a**(19/2)*b**
64*x**(19/2) + 675675*a**(17/2)*b**65*x**(17/2) + 45045*a**(15/2)
*b**66*x**(15/2)) + 208800*a**(53/2)*b**(97/2)*x**19*sqrt(a*x/b +
 1)/(45045*a**(45/2)*b**51*x**(45/2) + 675675*a**(43/2)*b**52*x**
(43/2) + 4729725*a**(41/2)*b**53*x**(41/2) + 20495475*a**(39/2)*b
**54*x**(39/2) + 61486425*a**(37/2)*b**55*x**(37/2) + 135270135*a
**(35/2)*b**56*x**(35/2) + 225450225*a**(33/2)*b**57*x**(33/2) +
289864575*a**(31/2)*b**58*x**(31/2) + 289864575*a**(29/2)*b**59*x
**(29/2) + 225450225*a**(27/2)*b**60*x**(27/2) + 135270135*a**(25
/2)*b**61*x**(25/2) + 61486425*a**(23/2)*b**62*x**(23/2) + 204954
75*a**(21/2)*b**63*x**(21/2) + 4729725*a**(19/2)*b**64*x**(19/2)
+ 675675*a**(17/2)*b**65*x**(17/2) + 45045*a**(15/2)*b**66*x**(15
/2)) + 600300*a**(51/2)*b**(99/2)*x**18*sqrt(a*x/b + 1)/(45045*a*
*(45/2)*b**51*x**(45/2) + 675675*a**(43/2)*b**52*x**(43/2) + 4729
725*a**(41/2)*b**53*x**(41/2) + 20495475*a**(39/2)*b**54*x**(39/2
) + 61486425*a**(37/2)*b**55*x**(37/2) + 135270135*a**(35/2)*b**5
6*x**(35/2) + 225450225*a**(33/2)*b**57*x**(33/2) + 289864575*a**
(31/2)*b**58*x**(31/2) + 289864575*a**(29/2)*b**59*x**(29/2) + 22
5450225*a**(27/2)*b**60*x**(27/2) + 135270135*a**(25/2)*b**61*x**
(25/2) + 61486425*a**(23/2)*b**62*x**(23/2) + 20495475*a**(21/2)*
b**63*x**(21/2) + 4729725*a**(19/2)*b**64*x**(19/2) + 675675*a**(
17/2)*b**65*x**(17/2) + 45045*a**(15/2)*b**66*x**(15/2)) + 126063
0*a**(49/2)*b**(101/2)*x**17*sqrt(a*x/b + 1)/(45045*a**(45/2)*b**
51*x**(45/2) + 675675*a**(43/2)*b**52*x**(43/2) + 4729725*a**(41/
2)*b**53*x**(41/2) + 20495475*a**(39/2)*b**54*x**(39/2) + 6148642
5*a**(37/2)*b**55*x**(37/2) + 135270135*a**(35/2)*b**56*x**(35/2)
 + 225450225*a**(33/2)*b**57*x**(33/2) + 289864575*a**(31/2)*b**5
8*x**(31/2) + 289864575*a**(29/2)*b**59*x**(29/2) + 225450225*a**
(27/2)*b**60*x**(27/2) + 135270135*a**(25/2)*b**61*x**(25/2) + 61
486425*a**(23/2)*b**62*x**(23/2) + 20495475*a**(21/2)*b**63*x**(2
1/2) + 4729725*a**(19/2)*b**64*x**(19/2) + 675675*a**(17/2)*b**65
*x**(17/2) + 45045*a**(15/2)*b**66*x**(15/2)) + 1988490*a**(47/2)
*b**(103/2)*x**16*sqrt(a*x/b + 1)/(45045*a**(45/2)*b**51*x**(45/2
) + 675675*a**(43/2)*b**52*x**(43/2) + 4729725*a**(41/2)*b**53*x*
*(41/2) + 20495475*a**(39/2)*b**54*x**(39/2) + 61486425*a**(37/2)
*b**55*x**(37/2) + 135270135*a**(35/2)*b**56*x**(35/2) + 22545022
5*a**(33/2)*b**57*x**(33/2) + 289864575*a**(31/2)*b**58*x**(31/2)
 + 289864575*a**(29/2)*b**59*x**(29/2) + 225450225*a**(27/2)*b**6
0*x**(27/2) + 135270135*a**(25/2)*b**61*x**(25/2) + 61486425*a**(
23/2)*b**62*x**(23/2) + 20495475*a**(21/2)*b**63*x**(21/2) + 4729
725*a**(19/2)*b**64*x**(19/2) + 675675*a**(17/2)*b**65*x**(17/2)
+ 45045*a**(15/2)*b**66*x**(15/2)) + 2305200*a**(45/2)*b**(105/2)
*x**15*sqrt(a*x/b + 1)/(45045*a**(45/2)*b**51*x**(45/2) + 675675*
a**(43/2)*b**52*x**(43/2) + 4729725*a**(41/2)*b**53*x**(41/2) + 2
0495475*a**(39/2)*b**54*x**(39/2) + 61486425*a**(37/2)*b**55*x**(
37/2) + 135270135*a**(35/2)*b**56*x**(35/2) + 225450225*a**(33/2)
*b**57*x**(33/2) + 289864575*a**(31/2)*b**58*x**(31/2) + 28986457
5*a**(29/2)*b**59*x**(29/2) + 225450225*a**(27/2)*b**60*x**(27/2)
 + 135270135*a**(25/2)*b**61*x**(25/2) + 61486425*a**(23/2)*b**62
*x**(23/2) + 20495475*a**(21/2)*b**63*x**(21/2) + 4729725*a**(19/
2)*b**64*x**(19/2) + 675675*a**(17/2)*b**65*x**(17/2) + 45045*a**
(15/2)*b**66*x**(15/2)) + 1395360*a**(43/2)*b**(107/2)*x**14*sqrt
(a*x/b + 1)/(45045*a**(45/2)*b**51*x**(45/2) + 675675*a**(43/2)*b
**52*x**(43/2) + 4729725*a**(41/2)*b**53*x**(41/2) + 20495475*a**
(39/2)*b**54*x**(39/2) + 61486425*a**(37/2)*b**55*x**(37/2) + 135
```

```
270135*a**(35/2)*b**56*x**(35/2) + 225450225*a**(33/2)*b**57*x**(
33/2) + 289864575*a**(31/2)*b**58*x**(31/2) + 289864575*a**(29/2)
*b**59*x**(29/2) + 225450225*a**(27/2)*b**60*x**(27/2) + 13527013
5*a**(25/2)*b**61*x**(25/2) + 61486425*a**(23/2)*b**62*x**(23/2)
 + 20495475*a**(21/2)*b**63*x**(21/2) + 4729725*a**(19/2)*b**64*x*
*(19/2) + 675675*a**(17/2)*b**65*x**(17/2) + 45045*a**(15/2)*b**6
6*x**(15/2)) - 2395640*a**(41/2)*b**(109/2)*x**13*sqrt(a*x/b + 1)
/(45045*a**(45/2)*b**51*x**(45/2) + 675675*a**(43/2)*b**52*x**(43
/2) + 4729725*a**(41/2)*b**53*x**(41/2) + 20495475*a**(39/2)*b**5
4*x**(39/2) + 61486425*a**(37/2)*b**55*x**(37/2) + 135270135*a**(
35/2)*b**56*x**(35/2) + 225450225*a**(33/2)*b**57*x**(33/2) + 289
864575*a**(31/2)*b**58*x**(31/2) + 289864575*a**(29/2)*b**59*x**(
29/2) + 225450225*a**(27/2)*b**60*x**(27/2) + 135270135*a**(25/2)
*b**61*x**(25/2) + 61486425*a**(23/2)*b**62*x**(23/2) + 20495475*
a**(21/2)*b**63*x**(21/2) + 4729725*a**(19/2)*b**64*x**(19/2) + 6
75675*a**(17/2)*b**65*x**(17/2) + 45045*a**(15/2)*b**66*x**(15/2)
) - 12038312*a**(39/2)*b**(111/2)*x**12*sqrt(a*x/b + 1)/(45045*a*
*(45/2)*b**51*x**(45/2) + 675675*a**(43/2)*b**52*x**(43/2) + 4729
725*a**(41/2)*b**53*x**(41/2) + 20495475*a**(39/2)*b**54*x**(39/2
) + 61486425*a**(37/2)*b**55*x**(37/2) + 135270135*a**(35/2)*b**5
6*x**(35/2) + 225450225*a**(33/2)*b**57*x**(33/2) + 289864575*a**
(31/2)*b**58*x**(31/2) + 289864575*a**(29/2)*b**59*x**(29/2) + 22
5450225*a**(27/2)*b**60*x**(27/2) + 135270135*a**(25/2)*b**61*x**
(25/2) + 61486425*a**(23/2)*b**62*x**(23/2) + 20495475*a**(21/2)*
b**63*x**(21/2) + 4729725*a**(19/2)*b**64*x**(19/2) + 675675*a**(
17/2)*b**65*x**(17/2) + 45045*a**(15/2)*b**66*x**(15/2)) - 302646
24*a**(37/2)*b**(113/2)*x**11*sqrt(a*x/b + 1)/(45045*a**(45/2)*b*
*51*x**(45/2) + 675675*a**(43/2)*b**52*x**(43/2) + 4729725*a**(41
/2)*b**53*x**(41/2) + 20495475*a**(39/2)*b**54*x**(39/2) + 614864
25*a**(37/2)*b**55*x**(37/2) + 135270135*a**(35/2)*b**56*x**(35/2
) + 225450225*a**(33/2)*b**57*x**(33/2) + 289864575*a**(31/2)*b**
58*x**(31/2) + 289864575*a**(29/2)*b**59*x**(29/2) + 225450225*a*
*(27/2)*b**60*x**(27/2) + 135270135*a**(25/2)*b**61*x**(25/2) + 6
1486425*a**(23/2)*b**62*x**(23/2) + 20495475*a**(21/2)*b**63*x**(
21/2) + 4729725*a**(19/2)*b**64*x**(19/2) + 675675*a**(17/2)*b**6
5*x**(17/2) + 45045*a**(15/2)*b**66*x**(15/2)) - 55283592*a**(35/
2)*b**(115/2)*x**10*sqrt(a*x/b + 1)/(45045*a**(45/2)*b**51*x**(45
/2) + 675675*a**(43/2)*b**52*x**(43/2) + 4729725*a**(41/2)*b**53*
x**(41/2) + 20495475*a**(39/2)*b**54*x**(39/2) + 61486425*a**(37/
2)*b**55*x**(37/2) + 135270135*a**(35/2)*b**56*x**(35/2) + 225450
225*a**(33/2)*b**57*x**(33/2) + 289864575*a**(31/2)*b**58*x**(31/
2) + 289864575*a**(29/2)*b**59*x**(29/2) + 225450225*a**(27/2)*b*
*60*x**(27/2) + 135270135*a**(25/2)*b**61*x**(25/2) + 61486425*a*
*(23/2)*b**62*x**(23/2) + 20495475*a**(21/2)*b**63*x**(21/2) + 47
29725*a**(19/2)*b**64*x**(19/2) + 675675*a**(17/2)*b**65*x**(17/2
) + 45045*a**(15/2)*b**66*x**(15/2)) - 78018780*a**(33/2)*b**(117
/2)*x**9*sqrt(a*x/b + 1)/(45045*a**(45/2)*b**51*x**(45/2) + 67567
5*a**(43/2)*b**52*x**(43/2) + 4729725*a**(41/2)*b**53*x**(41/2) +
 20495475*a**(39/2)*b**54*x**(39/2) + 61486425*a**(37/2)*b**55*x*
*(37/2) + 135270135*a**(35/2)*b**56*x**(35/2) + 225450225*a**(33/
2)*b**57*x**(33/2) + 289864575*a**(31/2)*b**58*x**(31/2) + 289864
575*a**(29/2)*b**59*x**(29/2) + 225450225*a**(27/2)*b**60*x**(27/
2) + 135270135*a**(25/2)*b**61*x**(25/2) + 61486425*a**(23/2)*b**
62*x**(23/2) + 20495475*a**(21/2)*b**63*x**(21/2) + 4729725*a**(1
9/2)*b**64*x**(19/2) + 675675*a**(17/2)*b**65*x**(17/2) + 45045*a
**(15/2)*b**66*x**(15/2)) - 86576580*a**(31/2)*b**(119/2)*x**8*sq
rt(a*x/b + 1)/(45045*a**(45/2)*b**51*x**(45/2) + 675675*a**(43/2)
*b**52*x**(43/2) + 4729725*a**(41/2)*b**53*x**(41/2) + 20495475*a
**(39/2)*b**54*x**(39/2) + 61486425*a**(37/2)*b**55*x**(37/2) + 1
35270135*a**(35/2)*b**56*x**(35/2) + 225450225*a**(33/2)*b**57*x*
*(33/2) + 289864575*a**(31/2)*b**58*x**(31/2) + 289864575*a**(29/
2)*b**59*x**(29/2) + 225450225*a**(27/2)*b**60*x**(27/2) + 135270
135*a**(25/2)*b**61*x**(25/2) + 61486425*a**(23/2)*b**62*x**(23/2
) + 20495475*a**(21/2)*b**63*x**(21/2) + 4729725*a**(19/2)*b**64*
x**(19/2) + 675675*a**(17/2)*b**65*x**(17/2) + 45045*a**(15/2)*b*
*66*x**(15/2)) - 75888816*a**(29/2)*b**(121/2)*x**7*sqrt(a*x/b +
1)/(45045*a**(45/2)*b**51*x**(45/2) + 675675*a**(43/2)*b**52*x**(
43/2) + 4729725*a**(41/2)*b**53*x**(41/2) + 20495475*a**(39/2)*b*
*54*x**(39/2) + 61486425*a**(37/2)*b**55*x**(37/2) + 135270135*a*
*(35/2)*b**56*x**(35/2) + 225450225*a**(33/2)*b**57*x**(33/2) + 2
89864575*a**(31/2)*b**58*x**(31/2) + 289864575*a**(29/2)*b**59*x*
*(29/2) + 225450225*a**(27/2)*b**60*x**(27/2) + 135270135*a**(25/
2)*b**61*x**(25/2) + 61486425*a**(23/2)*b**62*x**(23/2) + 2049547
5*a**(21/2)*b**63*x**(21/2) + 4729725*a**(19/2)*b**64*x**(19/2) +
```

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 675675*a**(17/2)*b**65*x**(17/2) + 45045*a**(15/2)*b**66*x**(15/
2)) - 52380672*a**(27/2)*b**(123/2)*x**6*sqrt(a*x/b + 1)/(45045*a
**(45/2)*b**51*x**(45/2) + 675675*a**(43/2)*b**52*x**(43/2) + 472
9725*a**(41/2)*b**53*x**(41/2) + 20495475*a**(39/2)*b**54*x**(39/
2) + 61486425*a**(37/2)*b**55*x**(37/2) + 135270135*a**(35/2)*b**
56*x**(35/2) + 225450225*a**(33/2)*b**57*x**(33/2) + 289864575*a*
*(31/2)*b**58*x**(31/2) + 289864575*a**(29/2)*b**59*x**(29/2) + 2
25450225*a**(27/2)*b**60*x**(27/2) + 135270135*a**(25/2)*b**61*x*
*(25/2) + 61486425*a**(23/2)*b**62*x**(23/2) + 20495475*a**(21/2)
*b**63*x**(21/2) + 4729725*a**(19/2)*b**64*x**(19/2) + 675675*a**
(17/2)*b**65*x**(17/2) + 45045*a**(15/2)*b**66*x**(15/2)) - 28170
936*a**(25/2)*b**(125/2)*x**5*sqrt(a*x/b + 1)/(45045*a**(45/2)*b*
*51*x**(45/2) + 675675*a**(43/2)*b**52*x**(43/2) + 4729725*a**(41
/2)*b**53*x**(41/2) + 20495475*a**(39/2)*b**54*x**(39/2) + 614864
25*a**(37/2)*b**55*x**(37/2) + 135270135*a**(35/2)*b**56*x**(35/2
) + 225450225*a**(33/2)*b**57*x**(33/2) + 289864575*a**(31/2)*b**
58*x**(31/2) + 289864575*a**(29/2)*b**59*x**(29/2) + 225450225*a*
*(27/2)*b**60*x**(27/2) + 135270135*a**(25/2)*b**61*x**(25/2) + 6
1486425*a**(23/2)*b**62*x**(23/2) + 20495475*a**(21/2)*b**63*x**(
21/2) + 4729725*a**(19/2)*b**64*x**(19/2) + 675675*a**(17/2)*b**6
5*x**(17/2) + 45045*a**(15/2)*b**66*x**(15/2)) - 11572840*a**(23/
2)*b**(127/2)*x**4*sqrt(a*x/b + 1)/(45045*a**(45/2)*b**51*x**(45/
2) + 675675*a**(43/2)*b**52*x**(43/2) + 4729725*a**(41/2)*b**53*x
**(41/2) + 20495475*a**(39/2)*b**54*x**(39/2) + 61486425*a**(37/2
)*b**55*x**(37/2) + 135270135*a**(35/2)*b**56*x**(35/2) + 2254502
25*a**(33/2)*b**57*x**(33/2) + 289864575*a**(31/2)*b**58*x**(31/2
) + 289864575*a**(29/2)*b**59*x**(29/2) + 225450225*a**(27/2)*b**
60*x**(27/2) + 135270135*a**(25/2)*b**61*x**(25/2) + 61486425*a**
(23/2)*b**62*x**(23/2) + 20495475*a**(21/2)*b**63*x**(21/2) + 472
9725*a**(19/2)*b**64*x**(19/2) + 675675*a**(17/2)*b**65*x**(17/2)
 + 45045*a**(15/2)*b**66*x**(15/2)) - 3510640*a**(21/2)*b**(129/2
)*x**3*sqrt(a*x/b + 1)/(45045*a**(45/2)*b**51*x**(45/2) + 675675*
a**(43/2)*b**52*x**(43/2) + 4729725*a**(41/2)*b**53*x**(41/2) + 2
0495475*a**(39/2)*b**54*x**(39/2) + 61486425*a**(37/2)*b**55*x**(
37/2) + 135270135*a**(35/2)*b**56*x**(35/2) + 225450225*a**(33/2)
*b**57*x**(33/2) + 289864575*a**(31/2)*b**58*x**(31/2) + 28986457
5*a**(29/2)*b**59*x**(29/2) + 225450225*a**(27/2)*b**60*x**(27/2)
 + 135270135*a**(25/2)*b**61*x**(25/2) + 61486425*a**(23/2)*b**62
*x**(23/2) + 20495475*a**(21/2)*b**63*x**(21/2) + 4729725*a**(19/
2)*b**64*x**(19/2) + 675675*a**(17/2)*b**65*x**(17/2) + 45045*a**
(15/2)*b**66*x**(15/2)) - 741636*a**(19/2)*b**(131/2)*x**2*sqrt(a
*x/b + 1)/(45045*a**(45/2)*b**51*x**(45/2) + 675675*a**(43/2)*b**
52*x**(43/2) + 4729725*a**(41/2)*b**53*x**(41/2) + 20495475*a**(3
9/2)*b**54*x**(39/2) + 61486425*a**(37/2)*b**55*x**(37/2) + 13527
0135*a**(35/2)*b**56*x**(35/2) + 225450225*a**(33/2)*b**57*x**(33
/2) + 289864575*a**(31/2)*b**58*x**(31/2) + 289864575*a**(29/2)*b
**59*x**(29/2) + 225450225*a**(27/2)*b**60*x**(27/2) + 135270135*
a**(25/2)*b**61*x**(25/2) + 61486425*a**(23/2)*b**62*x**(23/2) +
20495475*a**(21/2)*b**63*x**(21/2) + 4729725*a**(19/2)*b**64*x**(
19/2) + 675675*a**(17/2)*b**65*x**(17/2) + 45045*a**(15/2)*b**66*
x**(15/2)) - 97482*a**(17/2)*b**(133/2)*x*sqrt(a*x/b + 1)/(45045*
a**(45/2)*b**51*x**(45/2) + 675675*a**(43/2)*b**52*x**(43/2) + 47
29725*a**(41/2)*b**53*x**(41/2) + 20495475*a**(39/2)*b**54*x**(39
/2) + 61486425*a**(37/2)*b**55*x**(37/2) + 135270135*a**(35/2)*b*
*56*x**(35/2) + 225450225*a**(33/2)*b**57*x**(33/2) + 289864575*a
**(31/2)*b**58*x**(31/2) + 289864575*a**(29/2)*b**59*x**(29/2) +
225450225*a**(27/2)*b**60*x**(27/2) + 135270135*a**(25/2)*b**61*x
**(25/2) + 61486425*a**(23/2)*b**62*x**(23/2) + 20495475*a**(21/2
)*b**63*x**(21/2) + 4729725*a**(19/2)*b**64*x**(19/2) + 675675*a*
*(17/2)*b**65*x**(17/2) + 45045*a**(15/2)*b**66*x**(15/2)) - 6006
*a**(15/2)*b**(135/2)*sqrt(a*x/b + 1)/(45045*a**(45/2)*b**51*x**(
45/2) + 675675*a**(43/2)*b**52*x**(43/2) + 4729725*a**(41/2)*b**5
3*x**(41/2) + 20495475*a**(39/2)*b**54*x**(39/2) + 61486425*a**(3
7/2)*b**55*x**(37/2) + 135270135*a**(35/2)*b**56*x**(35/2) + 2254
50225*a**(33/2)*b**57*x**(33/2) + 289864575*a**(31/2)*b**58*x**(3
1/2) + 289864575*a**(29/2)*b**59*x**(29/2) + 225450225*a**(27/2)*
b**60*x**(27/2) + 135270135*a**(25/2)*b**61*x**(25/2) + 61486425*
a**(23/2)*b**62*x**(23/2) + 20495475*a**(21/2)*b**63*x**(21/2) +
4729725*a**(19/2)*b**64*x**(19/2) + 675675*a**(17/2)*b**65*x**(17
/2) + 45045*a**(15/2)*b**66*x**(15/2)) - 512*a**30*b**45*x**(45/2
)/(45045*a**(45/2)*b**51*x**(45/2) + 675675*a**(43/2)*b**52*x**(4
3/2) + 4729725*a**(41/2)*b**53*x**(41/2) + 20495475*a**(39/2)*b**
54*x**(39/2) + 61486425*a**(37/2)*b**55*x**(37/2) + 135270135*a**
(35/2)*b**56*x**(35/2) + 225450225*a**(33/2)*b**57*x**(33/2) + 28
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9864575*a**(31/2)*b**58*x**(31/2) + 289864575*a**(29/2)*b**59*x**
(29/2) + 225450225*a**(27/2)*b**60*x**(27/2) + 135270135*a**(25/2
)*b**61*x**(25/2) + 61486425*a**(23/2)*b**62*x**(23/2) + 20495475
*a**(21/2)*b**63*x**(21/2) + 4729725*a**(19/2)*b**64*x**(19/2) +
675675*a**(17/2)*b**65*x**(17/2) + 45045*a**(15/2)*b**66*x**(15/2
)) - 7680*a**29*b**46*x**(43/2)/(45045*a**(45/2)*b**51*x**(45/2)
+ 675675*a**(43/2)*b**52*x**(43/2) + 4729725*a**(41/2)*b**53*x**(
41/2) + 20495475*a**(39/2)*b**54*x**(39/2) + 61486425*a**(37/2)*b
55*x(37/2) + 135270135*a**(35/2)*b**56*x**(35/2) + 225450225*
a**(33/2)*b**57*x**(33/2) + 289864575*a**(31/2)*b**58*x**(31/2) +
 289864575*a**(29/2)*b**59*x**(29/2) + 225450225*a**(27/2)*b**60*
x**(27/2) + 135270135*a**(25/2)*b**61*x**(25/2) + 61486425*a**(23
/2)*b**62*x**(23/2) + 20495475*a**(21/2)*b**63*x**(21/2) + 472972
5*a**(19/2)*b**64*x**(19/2) + 675675*a**(17/2)*b**65*x**(17/2) +
45045*a**(15/2)*b**66*x**(15/2)) - 53760*a**28*b**47*x**(41/2)/(4
5045*a**(45/2)*b**51*x**(45/2) + 675675*a**(43/2)*b**52*x**(43/2)
 + 4729725*a**(41/2)*b**53*x**(41/2) + 20495475*a**(39/2)*b**54*x
(39/2) + 61486425*a(37/2)*b**55*x**(37/2) + 135270135*a**(35/
2)*b**56*x**(35/2) + 225450225*a**(33/2)*b**57*x**(33/2) + 289864
575*a**(31/2)*b**58*x**(31/2) + 289864575*a**(29/2)*b**59*x**(29/
2) + 225450225*a**(27/2)*b**60*x**(27/2) + 135270135*a**(25/2)*b*
*61*x**(25/2) + 61486425*a**(23/2)*b**62*x**(23/2) + 20495475*a**
(21/2)*b**63*x**(21/2) + 4729725*a**(19/2)*b**64*x**(19/2) + 6756
75*a**(17/2)*b**65*x**(17/2) + 45045*a**(15/2)*b**66*x**(15/2)) -
 232960*a**27*b**48*x**(39/2)/(45045*a**(45/2)*b**51*x**(45/2) +
675675*a**(43/2)*b**52*x**(43/2) + 4729725*a**(41/2)*b**53*x**(41
/2) + 20495475*a**(39/2)*b**54*x**(39/2) + 61486425*a**(37/2)*b**
55*x**(37/2) + 135270135*a**(35/2)*b**56*x**(35/2) + 225450225*a*
*(33/2)*b**57*x**(33/2) + 289864575*a**(31/2)*b**58*x**(31/2) + 2
89864575*a**(29/2)*b**59*x**(29/2) + 225450225*a**(27/2)*b**60*x*
*(27/2) + 135270135*a**(25/2)*b**61*x**(25/2) + 61486425*a**(23/2
)*b**62*x**(23/2) + 20495475*a**(21/2)*b**63*x**(21/2) + 4729725*
a**(19/2)*b**64*x**(19/2) + 675675*a**(17/2)*b**65*x**(17/2) + 45
045*a**(15/2)*b**66*x**(15/2)) - 698880*a**26*b**49*x**(37/2)/(45
045*a**(45/2)*b**51*x**(45/2) + 675675*a**(43/2)*b**52*x**(43/2)
+ 4729725*a**(41/2)*b**53*x**(41/2) + 20495475*a**(39/2)*b**54*x*
*(39/2) + 61486425*a**(37/2)*b**55*x**(37/2) + 135270135*a**(35/2
)*b**56*x**(35/2) + 225450225*a**(33/2)*b**57*x**(33/2) + 2898645
75*a**(31/2)*b**58*x**(31/2) + 289864575*a**(29/2)*b**59*x**(29/2
) + 225450225*a**(27/2)*b**60*x**(27/2) + 135270135*a**(25/2)*b**
61*x**(25/2) + 61486425*a**(23/2)*b**62*x**(23/2) + 20495475*a**(
21/2)*b**63*x**(21/2) + 4729725*a**(19/2)*b**64*x**(19/2) + 67567
5*a**(17/2)*b**65*x**(17/2) + 45045*a**(15/2)*b**66*x**(15/2)) -
1537536*a**25*b**50*x**(35/2)/(45045*a**(45/2)*b**51*x**(45/2) +
675675*a**(43/2)*b**52*x**(43/2) + 4729725*a**(41/2)*b**53*x**(41
/2) + 20495475*a**(39/2)*b**54*x**(39/2) + 61486425*a**(37/2)*b**
55*x**(37/2) + 135270135*a**(35/2)*b**56*x**(35/2) + 225450225*a*
*(33/2)*b**57*x**(33/2) + 289864575*a**(31/2)*b**58*x**(31/2) + 2
89864575*a**(29/2)*b**59*x**(29/2) + 225450225*a**(27/2)*b**60*x*
*(27/2) + 135270135*a**(25/2)*b**61*x**(25/2) + 61486425*a**(23/2
)*b**62*x**(23/2) + 20495475*a**(21/2)*b**63*x**(21/2) + 4729725*
a**(19/2)*b**64*x**(19/2) + 675675*a**(17/2)*b**65*x**(17/2) + 45
045*a**(15/2)*b**66*x**(15/2)) - 2562560*a**24*b**51*x**(33/2)/(4
5045*a**(45/2)*b**51*x**(45/2) + 675675*a**(43/2)*b**52*x**(43/2)
 + 4729725*a**(41/2)*b**53*x**(41/2) + 20495475*a**(39/2)*b**54*x
(39/2) + 61486425*a(37/2)*b**55*x**(37/2) + 135270135*a**(35/
2)*b**56*x**(35/2) + 225450225*a**(33/2)*b**57*x**(33/2) + 289864
575*a**(31/2)*b**58*x**(31/2) + 289864575*a**(29/2)*b**59*x**(29/
2) + 225450225*a**(27/2)*b**60*x**(27/2) + 135270135*a**(25/2)*b*
*61*x**(25/2) + 61486425*a**(23/2)*b**62*x**(23/2) + 20495475*a**
(21/2)*b**63*x**(21/2) + 4729725*a**(19/2)*b**64*x**(19/2) + 6756
75*a**(17/2)*b**65*x**(17/2) + 45045*a**(15/2)*b**66*x**(15/2)) -
 3294720*a**23*b**52*x**(31/2)/(45045*a**(45/2)*b**51*x**(45/2) +
 675675*a**(43/2)*b**52*x**(43/2) + 4729725*a**(41/2)*b**53*x**(4
1/2) + 20495475*a**(39/2)*b**54*x**(39/2) + 61486425*a**(37/2)*b*
*55*x**(37/2) + 135270135*a**(35/2)*b**56*x**(35/2) + 225450225*a
(33/2)*b57*x**(33/2) + 289864575*a**(31/2)*b**58*x**(31/2) +
289864575*a**(29/2)*b**59*x**(29/2) + 225450225*a**(27/2)*b**60*x
(27/2) + 135270135*a(25/2)*b**61*x**(25/2) + 61486425*a**(23/
2)*b**62*x**(23/2) + 20495475*a**(21/2)*b**63*x**(21/2) + 4729725
*a**(19/2)*b**64*x**(19/2) + 675675*a**(17/2)*b**65*x**(17/2) + 4
5045*a**(15/2)*b**66*x**(15/2)) - 3294720*a**22*b**53*x**(29/2)/(
45045*a**(45/2)*b**51*x**(45/2) + 675675*a**(43/2)*b**52*x**(43/2
) + 4729725*a**(41/2)*b**53*x**(41/2) + 20495475*a**(39/2)*b**54*

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x**(39/2) + 61486425*a**(37/2)*b**55*x**(37/2) + 135270135*a**(35
/2)*b**56*x**(35/2) + 225450225*a**(33/2)*b**57*x**(33/2) + 28986
4575*a**(31/2)*b**58*x**(31/2) + 289864575*a**(29/2)*b**59*x**(29
/2) + 225450225*a**(27/2)*b**60*x**(27/2) + 135270135*a**(25/2)*b
**61*x**(25/2) + 61486425*a**(23/2)*b**62*x**(23/2) + 20495475*a*
*(21/2)*b**63*x**(21/2) + 4729725*a**(19/2)*b**64*x**(19/2) + 675
675*a**(17/2)*b**65*x**(17/2) + 45045*a**(15/2)*b**66*x**(15/2))
- 2562560*a**21*b**54*x**(27/2)/(45045*a**(45/2)*b**51*x**(45/2)
+ 675675*a**(43/2)*b**52*x**(43/2) + 4729725*a**(41/2)*b**53*x**(
41/2) + 20495475*a**(39/2)*b**54*x**(39/2) + 61486425*a**(37/2)*b
**55*x**(37/2) + 135270135*a**(35/2)*b**56*x**(35/2) + 225450225*
a**(33/2)*b**57*x**(33/2) + 289864575*a**(31/2)*b**58*x**(31/2) +
 289864575*a**(29/2)*b**59*x**(29/2) + 225450225*a**(27/2)*b**60*
x**(27/2) + 135270135*a**(25/2)*b**61*x**(25/2) + 61486425*a**(23
/2)*b**62*x**(23/2) + 20495475*a**(21/2)*b**63*x**(21/2) + 472972
5*a**(19/2)*b**64*x**(19/2) + 675675*a**(17/2)*b**65*x**(17/2) +
45045*a**(15/2)*b**66*x**(15/2)) - 1537536*a**20*b**55*x**(25/2)/
(45045*a**(45/2)*b**51*x**(45/2) + 675675*a**(43/2)*b**52*x**(43/
2) + 4729725*a**(41/2)*b**53*x**(41/2) + 20495475*a**(39/2)*b**54
*x**(39/2) + 61486425*a**(37/2)*b**55*x**(37/2) + 135270135*a**(3
5/2)*b**56*x**(35/2) + 225450225*a**(33/2)*b**57*x**(33/2) + 2898
64575*a**(31/2)*b**58*x**(31/2) + 289864575*a**(29/2)*b**59*x**(2
9/2) + 225450225*a**(27/2)*b**60*x**(27/2) + 135270135*a**(25/2)*
b**61*x**(25/2) + 61486425*a**(23/2)*b**62*x**(23/2) + 20495475*a
**(21/2)*b**63*x**(21/2) + 4729725*a**(19/2)*b**64*x**(19/2) + 67
5675*a**(17/2)*b**65*x**(17/2) + 45045*a**(15/2)*b**66*x**(15/2))
 - 698880*a**19*b**56*x**(23/2)/(45045*a**(45/2)*b**51*x**(45/2)
+ 675675*a**(43/2)*b**52*x**(43/2) + 4729725*a**(41/2)*b**53*x**(
41/2) + 20495475*a**(39/2)*b**54*x**(39/2) + 61486425*a**(37/2)*b
**55*x**(37/2) + 135270135*a**(35/2)*b**56*x**(35/2) + 225450225*
a**(33/2)*b**57*x**(33/2) + 289864575*a**(31/2)*b**58*x**(31/2) +
 289864575*a**(29/2)*b**59*x**(29/2) + 225450225*a**(27/2)*b**60*
x**(27/2) + 135270135*a**(25/2)*b**61*x**(25/2) + 61486425*a**(23
/2)*b**62*x**(23/2) + 20495475*a**(21/2)*b**63*x**(21/2) + 472972
5*a**(19/2)*b**64*x**(19/2) + 675675*a**(17/2)*b**65*x**(17/2) +
45045*a**(15/2)*b**66*x**(15/2)) - 232960*a**18*b**57*x**(21/2)/(
45045*a**(45/2)*b**51*x**(45/2) + 675675*a**(43/2)*b**52*x**(43/2
) + 4729725*a**(41/2)*b**53*x**(41/2) + 20495475*a**(39/2)*b**54*
x**(39/2) + 61486425*a**(37/2)*b**55*x**(37/2) + 135270135*a**(35
/2)*b**56*x**(35/2) + 225450225*a**(33/2)*b**57*x**(33/2) + 28986
4575*a**(31/2)*b**58*x**(31/2) + 289864575*a**(29/2)*b**59*x**(29
/2) + 225450225*a**(27/2)*b**60*x**(27/2) + 135270135*a**(25/2)*b
**61*x**(25/2) + 61486425*a**(23/2)*b**62*x**(23/2) + 20495475*a*
*(21/2)*b**63*x**(21/2) + 4729725*a**(19/2)*b**64*x**(19/2) + 675
675*a**(17/2)*b**65*x**(17/2) + 45045*a**(15/2)*b**66*x**(15/2))
- 53760*a**17*b**58*x**(19/2)/(45045*a**(45/2)*b**51*x**(45/2) +
675675*a**(43/2)*b**52*x**(43/2) + 4729725*a**(41/2)*b**53*x**(41
/2) + 20495475*a**(39/2)*b**54*x**(39/2) + 61486425*a**(37/2)*b**
55*x**(37/2) + 135270135*a**(35/2)*b**56*x**(35/2) + 225450225*a*
*(33/2)*b**57*x**(33/2) + 289864575*a**(31/2)*b**58*x**(31/2) + 2
89864575*a**(29/2)*b**59*x**(29/2) + 225450225*a**(27/2)*b**60*x*
*(27/2) + 135270135*a**(25/2)*b**61*x**(25/2) + 61486425*a**(23/2
)*b**62*x**(23/2) + 20495475*a**(21/2)*b**63*x**(21/2) + 4729725*
a**(19/2)*b**64*x**(19/2) + 675675*a**(17/2)*b**65*x**(17/2) + 45
045*a**(15/2)*b**66*x**(15/2)) - 7680*a**16*b**59*x**(17/2)/(4504
5*a**(45/2)*b**51*x**(45/2) + 675675*a**(43/2)*b**52*x**(43/2) +
4729725*a**(41/2)*b**53*x**(41/2) + 20495475*a**(39/2)*b**54*x**(
39/2) + 61486425*a**(37/2)*b**55*x**(37/2) + 135270135*a**(35/2)*
b**56*x**(35/2) + 225450225*a**(33/2)*b**57*x**(33/2) + 289864575
*a**(31/2)*b**58*x**(31/2) + 289864575*a**(29/2)*b**59*x**(29/2)
+ 225450225*a**(27/2)*b**60*x**(27/2) + 135270135*a**(25/2)*b**61
*x**(25/2) + 61486425*a**(23/2)*b**62*x**(23/2) + 20495475*a**(21
/2)*b**63*x**(21/2) + 4729725*a**(19/2)*b**64*x**(19/2) + 675675*
a**(17/2)*b**65*x**(17/2) + 45045*a**(15/2)*b**66*x**(15/2)) - 51
2*a**15*b**60*x**(15/2)/(45045*a**(45/2)*b**51*x**(45/2) + 675675
*a**(43/2)*b**52*x**(43/2) + 4729725*a**(41/2)*b**53*x**(41/2) +
20495475*a**(39/2)*b**54*x**(39/2) + 61486425*a**(37/2)*b**55*x**
(37/2) + 135270135*a**(35/2)*b**56*x**(35/2) + 225450225*a**(33/2
)*b**57*x**(33/2) + 289864575*a**(31/2)*b**58*x**(31/2) + 2898645
75*a**(29/2)*b**59*x**(29/2) + 225450225*a**(27/2)*b**60*x**(27/2
) + 135270135*a**(25/2)*b**61*x**(25/2) + 61486425*a**(23/2)*b**6
2*x**(23/2) + 20495475*a**(21/2)*b**63*x**(21/2) + 4729725*a**(19
/2)*b**64*x**(19/2) + 675675*a**(17/2)*b**65*x**(17/2) + 45045*a*
*(15/2)*b**66*x**(15/2))
```

GIAC/XCAS [A] time = 0.281368, size = 406, normalized size = 3.33

$$\frac{2\left(240240\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^9a^{\frac{9}{2}}\operatorname{sign}(x)+1338480\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^8a^4b\operatorname{sign}(x)+3333330\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^7a^{\frac{7}{2}}b^2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)/x^7,x, algorithm="giac")
```

```
[Out] 2/45045*(240240*(sqrt(a)*x - sqrt(a*x^2 + b*x))^9*a^(9/2)*sign(x)
 + 1338480*(sqrt(a)*x - sqrt(a*x^2 + b*x))^8*a^4*b*sign(x) + 3333
330*(sqrt(a)*x - sqrt(a*x^2 + b*x))^7*a^(7/2)*b^2*sign(x) + 48448
40*(sqrt(a)*x - sqrt(a*x^2 + b*x))^6*a^3*b^3*sign(x) + 4513509*(s
qrt(a)*x - sqrt(a*x^2 + b*x))^5*a^(5/2)*b^4*sign(x) + 2788695*(sq
rt(a)*x - sqrt(a*x^2 + b*x))^4*a^2*b^5*sign(x) + 1141140*(sqrt(a)
*x - sqrt(a*x^2 + b*x))^3*a^(3/2)*b^6*sign(x) + 297990*(sqrt(a)*x
 - sqrt(a*x^2 + b*x))^2*a*b^7*sign(x) + 45045*(sqrt(a)*x - sqrt(a
*x^2 + b*x))*sqrt(a)*b^8*sign(x) + 3003*b^9*sign(x))/(sqrt(a)*x -
 sqrt(a*x^2 + b*x))^15
```

3.1710 $\int \left(a+\frac{b}{x}\right)^{5/2} x^3 \, dx$

Optimal. Leaf size=111

$$-\frac{5b^4\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{64a^{3/2}}+\frac{5b^3x\sqrt{a+\frac{b}{x}}}{64a}+\frac{5}{32}b^2x^2\sqrt{a+\frac{b}{x}}+\frac{1}{4}x^4\left(a+\frac{b}{x}\right)^{5/2}+\frac{5}{24}bx^3\left(a+\frac{b}{x}\right)^{3/2}$$

```
[Out] (5*b^3*Sqrt[a + b/x]*x)/(64*a) + (5*b^2*Sqrt[a + b/x]*x^2)/32 + (
5*b*(a + b/x)^(3/2)*x^3)/24 + ((a + b/x)^(5/2)*x^4)/4 - (5*b^4*Ar
cTanh[Sqrt[a + b/x]/Sqrt[a]])/(64*a^(3/2))
```

Rubi [A] time = 0.155996, antiderivative size = 111, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{5b^4\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{64a^{3/2}}+\frac{5b^3x\sqrt{a+\frac{b}{x}}}{64a}+\frac{5}{32}b^2x^2\sqrt{a+\frac{b}{x}}+\frac{1}{4}x^4\left(a+\frac{b}{x}\right)^{5/2}+\frac{5}{24}bx^3\left(a+\frac{b}{x}\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(5/2)*x^3,x]
```

```
[Out] (5*b^3*Sqrt[a + b/x]*x)/(64*a) + (5*b^2*Sqrt[a + b/x]*x^2)/32 + (
5*b*(a + b/x)^(3/2)*x^3)/24 + ((a + b/x)^(5/2)*x^4)/4 - (5*b^4*Ar
cTanh[Sqrt[a + b/x]/Sqrt[a]])/(64*a^(3/2))
```

Rubi in Sympy [A] time = 15.2372, size = 94, normalized size = 0.85

$$\frac{5b^2x^2\sqrt{a+\frac{b}{x}}}{32}+\frac{5bx^3\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{24}+\frac{x^4\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{4}+\frac{5b^3x\sqrt{a+\frac{b}{x}}}{64a}-\frac{5b^4\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{64a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(5/2)*x**3,x)
```

```
[Out] 5*b**2*x**2*sqrt(a + b/x)/32 + 5*b*x**3*(a + b/x)**(3/2)/24 + x**
4*(a + b/x)**(5/2)/4 + 5*b**3*x*sqrt(a + b/x)/(64*a) - 5*b**4*ata
nh(sqrt(a + b/x)/sqrt(a))/(64*a**(3/2))
```

Mathematica [A] time = 0.151282, size = 90, normalized size = 0.81

$$\frac{2\sqrt{a}x\sqrt{a+\frac{b}{x}}\left(48a^3x^3+136a^2bx^2+118ab^2x+15b^3\right)-15b^4\log\left(2\sqrt{a}x\sqrt{a+\frac{b}{x}}+2ax+b\right)}{384a^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(5/2)*x^3,x]
```

```
[Out] (2*Sqrt[a]*Sqrt[a + b/x]*x*(15*b^3 + 118*a*b^2*x + 136*a^2*b*x^2
+ 48*a^3*x^3) - 15*b^4*Log[b + 2*a*x + 2*Sqrt[a]*Sqrt[a + b/x]*x]
```

```
)/(384*a^(3/2))
```

Maple [A] time = 0.014, size = 135, normalized size = 1.2

$$-\frac{x}{384}\sqrt{\frac{ax+b}{x}}\left(-96\,x\left(ax^{2}+bx\right)^{3/2}a^{7/2}-176\,a^{5/2}\left(ax^{2}+bx\right)^{3/2}b-60\,a^{5/2}\sqrt{ax^{2}+bx}xb^{2}-30\,a^{3/2}\sqrt{ax^{2}+bx}b^{3}+15\ln\left(\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(5/2)*x^3,x)
```

```
[Out] -1/384*((a*x+b)/x)^(1/2)*x*(-96*x*(a*x^2+b*x)^(3/2)*a^(7/2)-176*a
^(5/2)*(a*x^2+b*x)^(3/2)*b-60*a^(5/2)*(a*x^2+b*x)^(1/2)*x*b^2-30*
a^(3/2)*(a*x^2+b*x)^(1/2)*b^3+15*ln(1/2*(2*(a*x^2+b*x)^(1/2)*a^(1
/2)+2*a*x+b)/a^(1/2))*a*b^4)/(x*(a*x+b))^(1/2)/a^(5/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)*x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.236891, size = 1, normalized size = 0.01

$$\left[\frac{15\,b^{4}\log\left(-2\,ax\sqrt{\frac{ax+b}{x}}+(2\,ax+b)\sqrt{a}\right)+2\left(48\,a^{3}x^{4}+136\,a^{2}bx^{3}+118\,ab^{2}x^{2}+15\,b^{3}x\right)\sqrt{a}\sqrt{\frac{ax+b}{x}}}{384\,a^{\frac{3}{2}}},\frac{15\,b^{4}\arctan\left(\frac{a}{\sqrt{-a}\sqrt{\frac{ax+b}{x}}}\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)*x^3,x, algorithm="fricas")
```

```
[Out] [1/384*(15*b^4*log(-2*a*x*sqrt((a*x + b)/x) + (2*a*x + b)*sqrt(a)
) + 2*(48*a^3*x^4 + 136*a^2*b*x^3 + 118*a*b^2*x^2 + 15*b^3*x)*sqr
t(a)*sqrt((a*x + b)/x))/a^(3/2), 1/192*(15*b^4*arctan(a/(sqrt(-a)
*sqrt((a*x + b)/x))) + (48*a^3*x^4 + 136*a^2*b*x^3 + 118*a*b^2*x^
2 + 15*b^3*x)*sqrt(-a)*sqrt((a*x + b)/x))/(sqrt(-a)*a)]
```

Sympy [A] time = 30.6708, size = 155, normalized size = 1.4

$$\frac{a^{3}x^{\frac{9}{2}}}{4\sqrt{b}\sqrt{\frac{ax}{b}+1}}+\frac{23a^{2}\sqrt{b}x^{\frac{7}{2}}}{24\sqrt{\frac{ax}{b}+1}}+\frac{127ab^{\frac{3}{2}}x^{\frac{5}{2}}}{96\sqrt{\frac{ax}{b}+1}}+\frac{133b^{\frac{5}{2}}x^{\frac{3}{2}}}{192\sqrt{\frac{ax}{b}+1}}+\frac{5b^{\frac{7}{2}}\sqrt{x}}{64a\sqrt{\frac{ax}{b}+1}}-\frac{5b^{4}\operatorname{asinh}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{64a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(5/2)*x**3,x)
```

```
[Out] a**3*x**(9/2)/(4*sqrt(b)*sqrt(a*x/b + 1)) + 23*a**2*sqrt(b)*x**(7
/2)/(24*sqrt(a*x/b + 1)) + 127*a*b**(3/2)*x**(5/2)/(96*sqrt(a*x/b
 + 1)) + 133*b**(5/2)*x**(3/2)/(192*sqrt(a*x/b + 1)) + 5*b**(7/2)
*sqrt(x)/(64*a*sqrt(a*x/b + 1)) - 5*b**4*asinh(sqrt(a)*sqrt(x)/sq
rt(b))/(64*a**(3/2))
```

GIAC/XCAS [A] time = 0.25067, size = 144, normalized size = 1.3

$$\frac{5\,b^4\ln\left(\left|-2\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)\sqrt{a}-b\right|\right)\operatorname{sign}(x)}{128\,a^{\frac{3}{2}}}-\frac{5\,b^4\ln\left(|b|\right)\operatorname{sign}(x)}{128\,a^{\frac{3}{2}}}+\frac{1}{192}\sqrt{ax^2+bx}\left(\frac{15\,b^3\operatorname{sign}(x)}{a}+2\left(59\,b^2\operatorname{sign}(x)+4\left(6\,a^2x\operatorname{sign}(x)+17\,ab\operatorname{sign}(x)\right)x\right)x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)*x^3,x, algorithm="giac")
```

```
[Out] 5/128*b^4*ln(abs(-2*(sqrt(a)*x - sqrt(a*x^2 + b*x))*sqrt(a) - b))
*sign(x)/a^(3/2) - 5/128*b^4*ln(abs(b))*sign(x)/a^(3/2) + 1/192*s
qrt(a*x^2 + b*x)*(15*b^3*sign(x)/a + 2*(59*b^2*sign(x) + 4*(6*a^2
*x*sign(x) + 17*a*b*sign(x))*x)*x)
```

3.1711 $\int \left(a+\frac{b}{x}\right)^{5/2} x^2\,dx$

Optimal. Leaf size=87

$$\frac{5b^3\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{8\sqrt{a}}+\frac{5}{8}b^2x\sqrt{a+\frac{b}{x}}+\frac{1}{3}x^3\left(a+\frac{b}{x}\right)^{5/2}+\frac{5}{12}bx^2\left(a+\frac{b}{x}\right)^{3/2}$$

```
[Out] (5*b^2*Sqrt[a + b/x]*x)/8 + (5*b*(a + b/x)^(3/2)*x^2)/12 + ((a +
b/x)^(5/2)*x^3)/3 + (5*b^3*ArcTanh[Sqrt[a + b/x]/Sqrt[a]])/(8*Sqr
t[a])
```

Rubi [A] time = 0.119454, antiderivative size = 87, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{5b^3\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{8\sqrt{a}}+\frac{5}{8}b^2x\sqrt{a+\frac{b}{x}}+\frac{1}{3}x^3\left(a+\frac{b}{x}\right)^{5/2}+\frac{5}{12}bx^2\left(a+\frac{b}{x}\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(5/2)*x^2,x]
```

```
[Out] (5*b^2*Sqrt[a + b/x]*x)/8 + (5*b*(a + b/x)^(3/2)*x^2)/12 + ((a +
b/x)^(5/2)*x^3)/3 + (5*b^3*ArcTanh[Sqrt[a + b/x]/Sqrt[a]])/(8*Sqr
t[a])
```

Rubi in Sympy [A] time = 11.717, size = 73, normalized size = 0.84

$$\frac{5b^2x\sqrt{a+\frac{b}{x}}}{8}+\frac{5bx^2\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{12}+\frac{x^3\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{3}+\frac{5b^3\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{8\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(5/2)*x**2,x)
```

```
[Out] 5*b**2*x*sqrt(a + b/x)/8 + 5*b*x**2*(a + b/x)**(3/2)/12 + x**3*(a
 + b/x)**(5/2)/3 + 5*b**3*atanh(sqrt(a + b/x)/sqrt(a))/(8*sqrt(a)
)
```

Mathematica [A] time = 0.117392, size = 74, normalized size = 0.85

$$\frac{1}{24}x\sqrt{a+\frac{b}{x}}\left(8a^2x^2+26abx+33b^2\right)+\frac{5b^3\log\left(2\sqrt{a}x\sqrt{a+\frac{b}{x}}+2ax+b\right)}{16\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(5/2)*x^2,x]
```

```
[Out] (Sqrt[a + b/x]*x*(33*b^2 + 26*a*b*x + 8*a^2*x^2))/24 + (5*b^3*Log
[b + 2*a*x + 2*Sqrt[a]*Sqrt[a + b/x]*x])/(16*Sqrt[a])
```

Maple [A] time = 0.012, size = 114, normalized size = 1.3

$$\frac{x}{48}\sqrt{\frac{ax+b}{x}}\left(16\,a^{3/2}\left(ax^2+bx\right)^{3/2}+36\,a^{3/2}b\sqrt{ax^2+bx}x+15\,b^3\ln\left(1/2\,\frac{2\,\sqrt{ax^2+bx}\sqrt{a}+2\,ax+b}{\sqrt{a}}\right)+66\,b^2\sqrt{ax^2+bx}\sqrt{a}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(5/2)*x^2,x)
```

```
[Out] 1/48*((a*x+b)/x)^(1/2)*x*(16*a^(3/2)*(a*x^2+b*x)^(3/2)+36*a^(3/2)
*b*(a*x^2+b*x)^(1/2)*x+15*b^3*ln(1/2*(2*(a*x^2+b*x)^(1/2)*a^(1/2)
+2*a*x+b)/a^(1/2))+66*b^2*(a*x^2+b*x)^(1/2)*a^(1/2))/(x*(a*x+b))^
(1/2)/a^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)*x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.238937, size = 1, normalized size = 0.01

$$\left[\frac{15\,b^3\log\left(2\,ax\sqrt{\frac{ax+b}{x}}+(2\,ax+b)\sqrt{a}\right)+2\left(8\,a^2x^3+26\,abx^2+33\,b^2x\right)\sqrt{a}\sqrt{\frac{ax+b}{x}}}{48\,\sqrt{a}},\ -\frac{15\,b^3\arctan\left(\frac{a}{\sqrt{-a}\sqrt{\frac{ax+b}{x}}}\right)-\left(8\,a^2x^3+26\,abx^2+33\,b^2x\right)\sqrt{-a}\sqrt{\frac{ax+b}{x}}}{24\,\sqrt{-a}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)*x^2,x, algorithm="fricas")
```

```
[Out] [1/48*(15*b^3*log(2*a*x*sqrt((a*x + b)/x) + (2*a*x + b)*sqrt(a))
+ 2*(8*a^2*x^3 + 26*a*b*x^2 + 33*b^2*x)*sqrt(a)*sqrt((a*x + b)/x)
)/sqrt(a), -1/24*(15*b^3*arctan(a/(sqrt(-a)*sqrt((a*x + b)/x))) -
 (8*a^2*x^3 + 26*a*b*x^2 + 33*b^2*x)*sqrt(-a)*sqrt((a*x + b)/x))/
sqrt(-a)]
```

Sympy [A] time = 19.3715, size = 102, normalized size = 1.17

$$\frac{a^2\sqrt{b}x^{\frac{5}{2}}\sqrt{\frac{ax}{b}+1}}{3}+\frac{13ab^{\frac{3}{2}}x^{\frac{3}{2}}\sqrt{\frac{ax}{b}+1}}{12}+\frac{11b^{\frac{5}{2}}\sqrt{x}\sqrt{\frac{ax}{b}+1}}{8}+\frac{5b^3\operatorname{asinh}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{8\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(5/2)*x**2,x)
```

```
[Out] a**2*sqrt(b)*x**(5/2)*sqrt(a*x/b + 1)/3 + 13*a*b**(3/2)*x**(3/2)*
sqrt(a*x/b + 1)/12 + 11*b**(5/2)*sqrt(x)*sqrt(a*x/b + 1)/8 + 5*b*
*3*asinh(sqrt(a)*sqrt(x)/sqrt(b))/(8*sqrt(a))
```

GIAC/XCAS [A] time = 0.24466, size = 126, normalized size = 1.45

$$-\frac{5\,b^3\ln\left(\left|-2\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)\sqrt{a}-b\right|\right)\operatorname{sign}(x)}{16\,\sqrt{a}}+\frac{5\,b^3\ln\left(|b|\right)\operatorname{sign}(x)}{16\,\sqrt{a}}+\frac{1}{24}\,\sqrt{ax^2+bx}\left(33\,b^2\operatorname{sign}(x)+2\left(4\,a^2x\operatorname{sign}(x)+13\,ab\operatorname{sign}(x)\right)x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)*x^2,x, algorithm="giac")
```

```
[Out] -5/16*b^3*ln(abs(-2*(sqrt(a)*x - sqrt(a*x^2 + b*x))*sqrt(a) - b))
*sign(x)/sqrt(a) + 5/16*b^3*ln(abs(b))*sign(x)/sqrt(a) + 1/24*sqr
t(a*x^2 + b*x)*(33*b^2*sign(x) + 2*(4*a^2*x*sign(x) + 13*a*b*sign
(x))*x)
```

3.1712 $\int \left(a+\frac{b}{x}\right)^{5/2} x\,dx$

Optimal. Leaf size=84

$$-\frac{15}{4}b^2\sqrt{a+\frac{b}{x}}+\frac{15}{4}\sqrt{a}b^2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)+\frac{1}{2}x^2\left(a+\frac{b}{x}\right)^{5/2}+\frac{5}{4}bx\left(a+\frac{b}{x}\right)^{3/2}$$

```
[Out] (-15*b^2*Sqrt[a + b/x])/4 + (5*b*(a + b/x)^(3/2)*x)/4 + ((a + b/x
)^(5/2)*x^2)/2 + (15*Sqrt[a]*b^2*ArcTanh[Sqrt[a + b/x]/Sqrt[a]])/
4
```

Rubi [A] time = 0.111506, antiderivative size = 84, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385

$$-\frac{15}{4}b^2\sqrt{a+\frac{b}{x}}+\frac{15}{4}\sqrt{a}b^2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)+\frac{1}{2}x^2\left(a+\frac{b}{x}\right)^{5/2}+\frac{5}{4}bx\left(a+\frac{b}{x}\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(5/2)*x,x]
```

```
[Out] (-15*b^2*Sqrt[a + b/x])/4 + (5*b*(a + b/x)^(3/2)*x)/4 + ((a + b/x
)^(5/2)*x^2)/2 + (15*Sqrt[a]*b^2*ArcTanh[Sqrt[a + b/x]/Sqrt[a]])/
4
```

Rubi in Sympy [A] time = 11.061, size = 70, normalized size = 0.83

$$\frac{15\sqrt{a}b^2\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{4}-\frac{15b^2\sqrt{a+\frac{b}{x}}}{4}+\frac{5bx\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{4}+\frac{x^2\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(5/2)*x,x)
```

```
[Out] 15*sqrt(a)*b**2*atanh(sqrt(a + b/x)/sqrt(a))/4 - 15*b**2*sqrt(a +
 b/x)/4 + 5*b*x*(a + b/x)**(3/2)/4 + x**2*(a + b/x)**(5/2)/2
```

Mathematica [A] time = 0.0674233, size = 73, normalized size = 0.87

$$\frac{1}{4}\sqrt{a+\frac{b}{x}}\left(2a^2x^2+9abx-8b^2\right)+\frac{15}{8}\sqrt{a}b^2\log\left(2\sqrt{a}x\sqrt{a+\frac{b}{x}}+2ax+b\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(5/2)*x,x]
```

```
[Out] (Sqrt[a + b/x]*(-8*b^2 + 9*a*b*x + 2*a^2*x^2))/4 + (15*Sqrt[a]*b^
2*Log[b + 2*a*x + 2*Sqrt[a]*Sqrt[a + b/x]*x])/8
```

Maple [A] time = 0.017, size = 117, normalized size = 1.4

$$\frac{1}{8x}\sqrt{\frac{ax+b}{x}}\left(15\sqrt{a}b^2\ln\left(1/2\,\frac{2\sqrt{ax^2+bx}\sqrt{a}+2\,ax+b}{\sqrt{a}}\right)x^2+4\,a^2\sqrt{ax^2+bx}x^3+34\,a\sqrt{ax^2+bx}bx^2-16\,\left(ax^2+bx\right)^{3/2}b$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((a+b/x)^(5/2)*x,x)
```

```
[Out] 1/8*((a*x+b)/x)^(1/2)/x*(15*a^(1/2)*b^2*ln(1/2*(2*(a*x^2+b*x)^(1/
2)*a^(1/2)+2*a*x+b)/a^(1/2))*x^2+4*a^2*(a*x^2+b*x)^(1/2)*x^3+34*a
*(a*x^2+b*x)^(1/2)*b*x^2-16*(a*x^2+b*x)^(3/2)*b)/(x*(a*x+b))^(1/2
)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a + b/x)^(5/2)*x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.235525, size = 1, normalized size = 0.01

$$\left[\frac{15}{8}\sqrt{a}b^2\log\left(2\,ax+2\,\sqrt{a}x\sqrt{\frac{ax+b}{x}}+b\right)+\frac{1}{4}\left(2\,a^2x^2+9\,abx-8\,b^2\right)\sqrt{\frac{ax+b}{x}},\ \frac{15}{4}\sqrt{-a}b^2\arctan\left(\frac{\sqrt{\frac{ax+b}{x}}}{\sqrt{-a}}\right)+\frac{1}{4}\left(2\,a^2x^2+9\,abx-8\,b^2\right)\sqrt{\frac{ax+b}{x}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a + b/x)^(5/2)*x,x, algorithm="fricas")
```

```
[Out] [15/8*sqrt(a)*b^2*log(2*a*x + 2*sqrt(a)*x*sqrt((a*x + b)/x) + b)
+ 1/4*(2*a^2*x^2 + 9*a*b*x - 8*b^2)*sqrt((a*x + b)/x), 15/4*sqrt(
-a)*b^2*arctan(sqrt((a*x + b)/x)/sqrt(-a)) + 1/4*(2*a^2*x^2 + 9*a
*b*x - 8*b^2)*sqrt((a*x + b)/x)]
```

Sympy [A] time = 15.9782, size = 126, normalized size = 1.5

$$\frac{15\sqrt{a}b^2\operatorname{asinh}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4}+\frac{a^3x^{\frac{5}{2}}}{2\sqrt{b}\sqrt{\frac{ax}{b}+1}}+\frac{11a^2\sqrt{b}x^{\frac{3}{2}}}{4\sqrt{\frac{ax}{b}+1}}+\frac{ab^{\frac{3}{2}}\sqrt{x}}{4\sqrt{\frac{ax}{b}+1}}-\frac{2b^{\frac{5}{2}}}{\sqrt{x}\sqrt{\frac{ax}{b}+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a+b/x)**(5/2)*x,x)
```

```
[Out] 15*sqrt(a)*b**2*asinh(sqrt(a)*sqrt(x)/sqrt(b))/4 + a**3*x**(5/2)/
(2*sqrt(b)*sqrt(a*x/b + 1)) + 11*a**2*sqrt(b)*x**(3/2)/(4*sqrt(a*
x/b + 1)) + a*b**(3/2)*sqrt(x)/(4*sqrt(a*x/b + 1)) - 2*b**(5/2)/(
sqrt(x)*sqrt(a*x/b + 1))
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)*x,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError
```

3.1713 $\int \left(a+\frac{b}{x}\right)^{5/2} dx$

Optimal. Leaf size=71

$$5a^{3/2}b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)+x\left(a+\frac{b}{x}\right)^{5/2}-\frac{5}{3}b\left(a+\frac{b}{x}\right)^{3/2}-5ab\sqrt{a+\frac{b}{x}}$$

```
[Out] -5*a*b*Sqrt[a + b/x] - (5*b*(a + b/x)^(3/2))/3 + (a + b/x)^(5/2)*
x + 5*a^(3/2)*b*ArcTanh[Sqrt[a + b/x]/Sqrt[a]]
```

Rubi [A] time = 0.11446, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.454

$$5a^{3/2}b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)+x\left(a+\frac{b}{x}\right)^{5/2}-\frac{5}{3}b\left(a+\frac{b}{x}\right)^{3/2}-5ab\sqrt{a+\frac{b}{x}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(5/2),x]
```

```
[Out] -5*a*b*Sqrt[a + b/x] - (5*b*(a + b/x)^(3/2))/3 + (a + b/x)^(5/2)*
x + 5*a^(3/2)*b*ArcTanh[Sqrt[a + b/x]/Sqrt[a]]
```

Rubi in Sympy [A] time = 9.51426, size = 60, normalized size = 0.85

$$5a^{\frac{3}{2}}b\,\mathrm{atanh}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)-5ab\sqrt{a+\frac{b}{x}}-\frac{5b\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{3}+x\left(a+\frac{b}{x}\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(5/2),x)
```

```
[Out] 5*a**(3/2)*b*atanh(sqrt(a + b/x)/sqrt(a)) - 5*a*b*sqrt(a + b/x) -
 5*b*(a + b/x)**(3/2)/3 + x*(a + b/x)**(5/2)
```

Mathematica [A] time = 0.112019, size = 71, normalized size = 1.

$$\frac{5}{2}a^{3/2}b\log\left(2\sqrt{a}x\sqrt{a+\frac{b}{x}}+2ax+b\right)+\sqrt{a+\frac{b}{x}}\left(a^2x-\frac{14ab}{3}-\frac{2b^2}{3x}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(5/2),x]
```

```
[Out] Sqrt[a + b/x]*((-14*a*b)/3 - (2*b^2)/(3*x) + a^2*x) + (5*a^(3/2)*
b*Log[b + 2*a*x + 2*Sqrt[a]*Sqrt[a + b/x]*x])/2
```

Maple [A] time = 0.013, size = 112, normalized size = 1.6

$$\frac{1}{6x^2}\sqrt{\frac{ax+b}{x}}\left(15a^{3/2}\ln\left(1/2\frac{2\sqrt{ax^2+bx}\sqrt{a}+2ax+b}{\sqrt{a}}\right)x^3b+30a^2\sqrt{ax^2+bx}x^3-24a\left(ax^2+bx\right)^{3/2}x-4\left(ax^2+bx\right)^{3/2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(5/2),x)
```

```
[Out] 1/6*((a*x+b)/x)^(1/2)/x^2*(15*a^(3/2)*ln(1/2*(2*(a*x^2+b*x)^(1/2)
*a^(1/2)+2*a*x+b)/a^(1/2))*x^3*b+30*a^2*(a*x^2+b*x)^(1/2)*x^3-24*
a*(a*x^2+b*x)^(3/2)*x-4*(a*x^2+b*x)^(3/2)*b)/(x*(a*x+b))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.2386, size = 1, normalized size = 0.01

$$\left[\frac{15a^{\frac{3}{2}}bx\log\left(2ax+2\sqrt{a}x\sqrt{\frac{ax+b}{x}}+b\right)+2\left(3a^2x^2-14abx-2b^2\right)\sqrt{\frac{ax+b}{x}}}{6x}, \frac{15\sqrt{-a}abx\arctan\left(\frac{\sqrt{\frac{ax+b}{x}}}{\sqrt{-a}}\right)+\left(3a^2x^2-14ab\right.}{3x}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2),x, algorithm="fricas")
```

```
[Out] [1/6*(15*a^(3/2)*b*x*log(2*a*x + 2*sqrt(a)*x*sqrt((a*x + b)/x) +
b) + 2*(3*a^2*x^2 - 14*a*b*x - 2*b^2)*sqrt((a*x + b)/x))/x, 1/3*(
15*sqrt(-a)*a*b*x*arctan(sqrt((a*x + b)/x)/sqrt(-a)) + (3*a^2*x^2
 - 14*a*b*x - 2*b^2)*sqrt((a*x + b)/x))/x]
```

Sympy [A] time = 12.9866, size = 99, normalized size = 1.39

$$a^{\frac{5}{2}}x\sqrt{1+\frac{b}{ax}}-\frac{14a^{\frac{3}{2}}b\sqrt{1+\frac{b}{ax}}}{3}-\frac{5a^{\frac{3}{2}}b\log\left(\frac{b}{ax}\right)}{2}+5a^{\frac{3}{2}}b\log\left(\sqrt{1+\frac{b}{ax}}+1\right)-\frac{2\sqrt{a}b^2\sqrt{1+\frac{b}{ax}}}{3x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(5/2),x)
```

```
[Out] a**(5/2)*x*sqrt(1 + b/(a*x)) - 14*a**(3/2)*b*sqrt(1 + b/(a*x))/3
- 5*a**(3/2)*b*log(b/(a*x))/2 + 5*a**(3/2)*b*log(sqrt(1 + b/(a*x)
) + 1) - 2*sqrt(a)*b**2*sqrt(1 + b/(a*x))/(3*x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError
```

3.1714 $\int \frac{\left(a+\frac{b}{x}\right)^{5/2}}{x}\,dx$

Optimal. Leaf size=73

$$2a^{5/2}\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)-2a^2\sqrt{a+\frac{b}{x}}-\frac{2}{3}a\left(a+\frac{b}{x}\right)^{3/2}-\frac{2}{5}\left(a+\frac{b}{x}\right)^{5/2}$$

```
[Out] -2*a^2*Sqrt[a + b/x] - (2*a*(a + b/x)^(3/2))/3 - (2*(a + b/x)^(5/
2))/5 + 2*a^(5/2)*ArcTanh[Sqrt[a + b/x]/Sqrt[a]]
```

Rubi [A] time = 0.110465, antiderivative size = 73, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$2a^{5/2}\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)-2a^2\sqrt{a+\frac{b}{x}}-\frac{2}{3}a\left(a+\frac{b}{x}\right)^{3/2}-\frac{2}{5}\left(a+\frac{b}{x}\right)^{5/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(5/2)/x,x]
```

```
[Out] -2*a^2*Sqrt[a + b/x] - (2*a*(a + b/x)^(3/2))/3 - (2*(a + b/x)^(5/
2))/5 + 2*a^(5/2)*ArcTanh[Sqrt[a + b/x]/Sqrt[a]]
```

Rubi in Sympy [A] time = 10.6851, size = 60, normalized size = 0.82

$$2a^{\frac{5}{2}}\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)-2a^2\sqrt{a+\frac{b}{x}}-\frac{2a\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{3}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(5/2)/x,x)
```

```
[Out] 2*a**(5/2)*atanh(sqrt(a + b/x)/sqrt(a)) - 2*a**2*sqrt(a + b/x) -
2*a*(a + b/x)**(3/2)/3 - 2*(a + b/x)**(5/2)/5
```

Mathematica [A] time = 0.108304, size = 70, normalized size = 0.96

$$a^{5/2}\log\left(2\sqrt{a}x\sqrt{a+\frac{b}{x}}+2ax+b\right)-\frac{2\sqrt{a+\frac{b}{x}}\left(23a^2x^2+11abx+3b^2\right)}{15x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(5/2)/x,x]
```

```
[Out] (-2*Sqrt[a + b/x]*(3*b^2 + 11*a*b*x + 23*a^2*x^2))/(15*x^2) + a^(
5/2)*Log[b + 2*a*x + 2*Sqrt[a]*Sqrt[a + b/x]*x]
```

Maple [B] time = 0.015, size = 137, normalized size = 1.9

$$\frac{1}{15\,bx^3}\sqrt{\frac{ax+b}{x}}\left(15\,a^{5/2}\ln\left(1/2\,\frac{2\,\sqrt{ax^2+bx}\sqrt{a}+2\,ax+b}{\sqrt{a}}\right)bx^4+30\,a^3\sqrt{ax^2+bx}x^4-30\,a^2\left(ax^2+bx\right)^{3/2}x^2-16\,a\left(ax^2\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(5/2)/x,x)
```

```
[Out] 1/15*((a*x+b)/x)^(1/2)/x^3/b*(15*a^(5/2)*ln(1/2*(2*(a*x^2+b*x)^(1
/2)*a^(1/2)+2*a*x+b)/a^(1/2))*b*x^4+30*a^3*(a*x^2+b*x)^(1/2)*x^4-
30*a^2*(a*x^2+b*x)^(3/2)*x^2-16*a*(a*x^2+b*x)^(3/2)*b*x-6*(a*x^2+
b*x)^(3/2)*b^2)/(x*(a*x+b))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.239777, size = 1, normalized size = 0.01

$$\left[\frac{15\,a^{\frac{5}{2}}x^2\log\left(2\,ax+2\,\sqrt{a}x\sqrt{\frac{ax+b}{x}}+b\right)-2\left(23\,a^2x^2+11\,abx+3\,b^2\right)\sqrt{\frac{ax+b}{x}}}{15\,x^2},\ \frac{2\left(15\,\sqrt{-a}a^2x^2\arctan\left(\frac{\sqrt{\frac{ax+b}{x}}}{\sqrt{-a}}\right)-\left(23\,a^2x^2+\right.\right.}{15\,x^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)/x,x, algorithm="fricas")
```

```
[Out] [1/15*(15*a^(5/2)*x^2*log(2*a*x + 2*sqrt(a)*x*sqrt((a*x + b)/x) +
 b) - 2*(23*a^2*x^2 + 11*a*b*x + 3*b^2)*sqrt((a*x + b)/x))/x^2, 2
/15*(15*sqrt(-a)*a^2*x^2*arctan(sqrt((a*x + b)/x)/sqrt(-a)) - (23
*a^2*x^2 + 11*a*b*x + 3*b^2)*sqrt((a*x + b)/x))/x^2]
```

Sympy [A] time = 13.8969, size = 97, normalized size = 1.33

$$-\frac{46a^{\frac{5}{2}}\sqrt{1+\frac{b}{ax}}}{15}-a^{\frac{5}{2}}\log\left(\frac{b}{ax}\right)+2a^{\frac{5}{2}}\log\left(\sqrt{1+\frac{b}{ax}}+1\right)-\frac{22a^{\frac{3}{2}}b\sqrt{1+\frac{b}{ax}}}{15x}-\frac{2\sqrt{a}b^2\sqrt{1+\frac{b}{ax}}}{5x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(5/2)/x,x)
```

```
[Out] -46*a**(5/2)*sqrt(1 + b/(a*x))/15 - a**(5/2)*log(b/(a*x)) + 2*a**
(5/2)*log(sqrt(1 + b/(a*x)) + 1) - 22*a**(3/2)*b*sqrt(1 + b/(a*x)
)/(15*x) - 2*sqrt(a)*b**2*sqrt(1 + b/(a*x))/(5*x**2)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)/x,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError
```

3.1715 $\int \frac{\left(a+\frac{b}{x}\right)^{5/2}}{x^2} dx$

Optimal. Leaf size=18

$$-\frac{2\left(a+\frac{b}{x}\right)^{7/2}}{7b}$$

```
[Out] (-2*(a + b/x)^(7/2))/(7*b)
```

Rubi [A] time = 0.0263247, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{2\left(a+\frac{b}{x}\right)^{7/2}}{7b}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x)^(5/2)/x^2,x]

[Out] (-2*(a + b/x)^(7/2))/(7*b)
```

Rubi in Sympy [A] time = 2.18791, size = 14, normalized size = 0.78

$$-\frac{2\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{7b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x)**(5/2)/x**2,x)

[Out] -2*(a + b/x)**(7/2)/(7*b)
```

Mathematica [A] time = 0.024816, size = 18, normalized size = 1.

$$-\frac{2\left(a+\frac{b}{x}\right)^{7/2}}{7b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x)^(5/2)/x^2,x]

[Out] (-2*(a + b/x)^(7/2))/(7*b)
```

Maple [A] time = 0.009, size = 25, normalized size = 1.4

$$-\frac{2\,ax+2\,b}{7\,bx}\left(\frac{ax+b}{x}\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(5/2)/x^2,x)
```

```
[Out] -2/7/x*(a*x+b)/b*((a*x+b)/x)^(5/2)
```

Maxima [A] time = 1.42586, size = 19, normalized size = 1.06

$$-\frac{2\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{7\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)/x^2,x, algorithm="maxima")
```

```
[Out] -2/7*(a + b/x)^(7/2)/b
```

Fricas [A] time = 0.22674, size = 62, normalized size = 3.44

$$-\frac{2\left(a^{3}x^{3}+3\,a^{2}bx^{2}+3\,ab^{2}x+b^{3}\right)\sqrt{\frac{ax+b}{x}}}{7\,bx^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)/x^2,x, algorithm="fricas")
```

```
[Out] -2/7*(a^3*x^3 + 3*a^2*b*x^2 + 3*a*b^2*x + b^3)*sqrt((a*x + b)/x)/
(b*x^3)
```

Sympy [A] time = 10.6268, size = 80, normalized size = 4.44

$$\begin{cases} -\frac{2a^{3}\sqrt{a+\frac{b}{x}}}{7b}-\frac{6a^{2}\sqrt{a+\frac{b}{x}}}{7x}-\frac{6ab\sqrt{a+\frac{b}{x}}}{7x^{2}}-\frac{2b^{2}\sqrt{a+\frac{b}{x}}}{7x^{3}} & \text{for}\ b\neq 0\\ -\frac{a^{\frac{5}{2}}}{x} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(5/2)/x**2,x)
```

```
[Out] Piecewise((-2*a**3*sqrt(a + b/x)/(7*b) - 6*a**2*sqrt(a + b/x)/(7*
x) - 6*a*b*sqrt(a + b/x)/(7*x**2) - 2*b**2*sqrt(a + b/x)/(7*x**3)
, Ne(b, 0)), (-a**(5/2)/x, True))
```

GIAC/XCAS [A] time = 0.264229, size = 279, normalized size = 15.5

$$\frac{2\left(7\left(\sqrt{a}x-\sqrt{ax^{2}+bx}\right)^{6}a^{3}\mathrm{sign}\left(x\right)+21\left(\sqrt{a}x-\sqrt{ax^{2}+bx}\right)^{5}a^{\frac{5}{2}}b\,\mathrm{sign}\left(x\right)+35\left(\sqrt{a}x-\sqrt{ax^{2}+bx}\right)^{4}a^{2}b^{2}\mathrm{sign}\left(x\right)+35\left(\sqrt{a}x\right.}{7\left(\sqrt{a}x-\sqrt{ax\right.}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)/x^2,x, algorithm="giac")
```

```
[Out] 2/7*(7*(sqrt(a)*x - sqrt(a*x^2 + b*x))^6*a^3*sign(x) + 21*(sqrt(a
)*x - sqrt(a*x^2 + b*x))^5*a^(5/2)*b*sign(x) + 35*(sqrt(a)*x - sq
rt(a*x^2 + b*x))^4*a^2*b^2*sign(x) + 35*(sqrt(a)*x - sqrt(a*x^2 +
 b*x))^3*a^(3/2)*b^3*sign(x) + 21*(sqrt(a)*x - sqrt(a*x^2 + b*x))
^2*a*b^4*sign(x) + 7*(sqrt(a)*x - sqrt(a*x^2 + b*x))*sqrt(a)*b^5*
sign(x) + b^6*sign(x))/(sqrt(a)*x - sqrt(a*x^2 + b*x))^7
```

3.1716 $\int \frac{\left(a+\frac{b}{x}\right)^{5/2}}{x^3}\,dx$

Optimal. Leaf size=38

$$\frac{2a\left(a+\frac{b}{x}\right)^{7/2}}{7b^2}-\frac{2\left(a+\frac{b}{x}\right)^{9/2}}{9b^2}$$

```
[Out] (2*a*(a + b/x)^(7/2))/(7*b^2) - (2*(a + b/x)^(9/2))/(9*b^2)
```

Rubi [A] time = 0.0556546, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2a\left(a+\frac{b}{x}\right)^{7/2}}{7b^2}-\frac{2\left(a+\frac{b}{x}\right)^{9/2}}{9b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(5/2)/x^3,x]

[Out] (2*a*(a + b/x)^(7/2))/(7*b^2) - (2*(a + b/x)^(9/2))/(9*b^2)
```

Rubi in Sympy [A] time = 6.93288, size = 31, normalized size = 0.82

$$\frac{2a\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{7b^2}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{9}{2}}}{9b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(5/2)/x**3,x)

[Out] 2*a*(a + b/x)**(7/2)/(7*b**2) - 2*(a + b/x)**(9/2)/(9*b**2)
```

Mathematica [A] time = 0.0434502, size = 36, normalized size = 0.95

$$\frac{2\sqrt{a+\frac{b}{x}}(ax+b)^3(2ax-7b)}{63b^2x^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(5/2)/x^3,x]

[Out] (2*Sqrt[a + b/x]*(b + a*x)^3*(-7*b + 2*a*x))/(63*b^2*x^4)
```

Maple [A] time = 0.007, size = 33, normalized size = 0.9

$$\frac{(2\,ax+2\,b)\,(2\,ax-7\,b)}{63\,b^2x^2}\left(\frac{ax+b}{x}\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(5/2)/x^3,x)
```

```
[Out] 2/63*(a*x+b)*(2*a*x-7*b)*((a*x+b)/x)^(5/2)/b^2/x^2
```

Maxima [A] time = 1.41531, size = 41, normalized size = 1.08

$$-\frac{2\left(a+\frac{b}{x}\right)^{\frac{9}{2}}}{9\,b^2}+\frac{2\left(a+\frac{b}{x}\right)^{\frac{7}{2}}a}{7\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)/x^3,x, algorithm="maxima")
```

```
[Out] -2/9*(a + b/x)^(9/2)/b^2 + 2/7*(a + b/x)^(7/2)*a/b^2
```

Fricas [A] time = 0.227142, size = 81, normalized size = 2.13

$$\frac{2\left(2\,a^4x^4-a^3bx^3-15\,a^2b^2x^2-19\,ab^3x-7\,b^4\right)\sqrt{\frac{ax+b}{x}}}{63\,b^2x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)/x^3,x, algorithm="fricas")
```

```
[Out] 2/63*(2*a^4*x^4 - a^3*b*x^3 - 15*a^2*b^2*x^2 - 19*a*b^3*x - 7*b^4
)*sqrt((a*x + b)/x)/(b^2*x^4)
```

Sympy [A] time = 7.77481, size = 416, normalized size = 10.95

$$\frac{4a^{\frac{19}{2}}b^{\frac{3}{2}}x^5\sqrt{\frac{ax}{b}+1}}{63a^{\frac{11}{2}}b^3x^{\frac{11}{2}}+63a^{\frac{9}{2}}b^4x^{\frac{9}{2}}}+\frac{2a^{\frac{17}{2}}b^{\frac{5}{2}}x^4\sqrt{\frac{ax}{b}+1}}{63a^{\frac{11}{2}}b^3x^{\frac{11}{2}}+63a^{\frac{9}{2}}b^4x^{\frac{9}{2}}}-\frac{32a^{\frac{15}{2}}b^{\frac{7}{2}}x^3\sqrt{\frac{ax}{b}+1}}{63a^{\frac{11}{2}}b^3x^{\frac{11}{2}}+63a^{\frac{9}{2}}b^4x^{\frac{9}{2}}}-\frac{68a^{\frac{13}{2}}b^{\frac{9}{2}}x^2\sqrt{\frac{ax}{b}+1}}{63a^{\frac{11}{2}}b^3x^{\frac{11}{2}}+63a^{\frac{9}{2}}b^4x^{\frac{9}{2}}}-\frac{52a^{\frac{11}{2}}b^{\frac{11}{2}}x\sqrt{\frac{ax}{b}+1}}{63a^{\frac{11}{2}}b^3x^{\frac{11}{2}}+63a^{\frac{9}{2}}b^4x^{\frac{9}{2}}}-\frac{14a^{\frac{9}{2}}b^{\frac{13}{2}}\sqrt{\frac{ax}{b}+1}}{63a^{\frac{11}{2}}b^3x^{\frac{11}{2}}+63a^{\frac{9}{2}}b^4x^{\frac{9}{2}}}-\frac{4a^{10}bx^{\frac{11}{2}}}{63a^{\frac{11}{2}}b^3x^{\frac{11}{2}}+63a^{\frac{9}{2}}b^4x^{\frac{9}{2}}}-\frac{4a^9b^2x^{\frac{9}{2}}}{63a^{\frac{11}{2}}b^3x^{\frac{11}{2}}+63a^{\frac{9}{2}}b^4x^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(5/2)/x**3,x)
```

```
[Out] 4*a**(19/2)*b**(3/2)*x**5*sqrt(a*x/b + 1)/(63*a**(11/2)*b**3*x**(
11/2) + 63*a**(9/2)*b**4*x**(9/2)) + 2*a**(17/2)*b**(5/2)*x**4*sq
rt(a*x/b + 1)/(63*a**(11/2)*b**3*x**(11/2) + 63*a**(9/2)*b**4*x**
(9/2)) - 32*a**(15/2)*b**(7/2)*x**3*sqrt(a*x/b + 1)/(63*a**(11/2)
*b**3*x**(11/2) + 63*a**(9/2)*b**4*x**(9/2)) - 68*a**(13/2)*b**(9
/2)*x**2*sqrt(a*x/b + 1)/(63*a**(11/2)*b**3*x**(11/2) + 63*a**(9/
2)*b**4*x**(9/2)) - 52*a**(11/2)*b**(11/2)*x*sqrt(a*x/b + 1)/(63*
a**(11/2)*b**3*x**(11/2) + 63*a**(9/2)*b**4*x**(9/2)) - 14*a**(9/
2)*b**(13/2)*sqrt(a*x/b + 1)/(63*a**(11/2)*b**3*x**(11/2) + 63*a*
*(9/2)*b**4*x**(9/2)) - 4*a**10*b*x**(11/2)/(63*a**(11/2)*b**3*x*
*(11/2) + 63*a**(9/2)*b**4*x**(9/2)) - 4*a**9*b**2*x**(9/2)/(63*a
**(11/2)*b**3*x**(11/2) + 63*a**(9/2)*b**4*x**(9/2))
```

GIAC/XCAS [A] time = 0.269879, size = 323, normalized size = 8.5

$$\frac{2\left(63\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^7a^{\frac{7}{2}}\operatorname{sign}(x)+273\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^6a^3b\operatorname{sign}(x)+567\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^5a^{\frac{5}{2}}b^2\operatorname{sign}(x)+693\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)/x^3,x, algorithm="giac")
```

```
[Out] 2/63*(63*(sqrt(a)*x - sqrt(a*x^2 + b*x))^7*a^(7/2)*sign(x) + 273*
(sqrt(a)*x - sqrt(a*x^2 + b*x))^6*a^3*b*sign(x) + 567*(sqrt(a)*x
- sqrt(a*x^2 + b*x))^5*a^(5/2)*b^2*sign(x) + 693*(sqrt(a)*x - sqr
t(a*x^2 + b*x))^4*a^2*b^3*sign(x) + 525*(sqrt(a)*x - sqrt(a*x^2 +
 b*x))^3*a^(3/2)*b^4*sign(x) + 243*(sqrt(a)*x - sqrt(a*x^2 + b*x)
)^2*a*b^5*sign(x) + 63*(sqrt(a)*x - sqrt(a*x^2 + b*x))*sqrt(a)*b^
6*sign(x) + 7*b^7*sign(x))/(sqrt(a)*x - sqrt(a*x^2 + b*x))^9
```

3.1717 $\int \frac{\left(a+\frac{b}{x}\right)^{5/2}}{x^4}\,dx$

Optimal. Leaf size=59

$$-\frac{2a^2\left(a+\frac{b}{x}\right)^{7/2}}{7b^3}-\frac{2\left(a+\frac{b}{x}\right)^{11/2}}{11b^3}+\frac{4a\left(a+\frac{b}{x}\right)^{9/2}}{9b^3}$$

```
[Out] (-2*a^2*(a + b/x)^(7/2))/(7*b^3) + (4*a*(a + b/x)^(9/2))/(9*b^3)
- (2*(a + b/x)^(11/2))/(11*b^3)
```

Rubi [A] time = 0.0796185, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2a^2\left(a+\frac{b}{x}\right)^{7/2}}{7b^3}-\frac{2\left(a+\frac{b}{x}\right)^{11/2}}{11b^3}+\frac{4a\left(a+\frac{b}{x}\right)^{9/2}}{9b^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x)^(5/2)/x^4,x]
```

```
[Out] (-2*a^2*(a + b/x)^(7/2))/(7*b^3) + (4*a*(a + b/x)^(9/2))/(9*b^3)
- (2*(a + b/x)^(11/2))/(11*b^3)
```

Rubi in Sympy [A] time = 10.2944, size = 49, normalized size = 0.83

$$-\frac{2a^2\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{7b^3}+\frac{4a\left(a+\frac{b}{x}\right)^{\frac{9}{2}}}{9b^3}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{11}{2}}}{11b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x)**(5/2)/x**4,x)
```

```
[Out] -2*a**2*(a + b/x)**(7/2)/(7*b**3) + 4*a*(a + b/x)**(9/2)/(9*b**3)
 - 2*(a + b/x)**(11/2)/(11*b**3)
```

Mathematica [A] time = 0.0429404, size = 47, normalized size = 0.8

$$-\frac{2\sqrt{a+\frac{b}{x}}(ax+b)^3\left(8a^2x^2-28abx+63b^2\right)}{693b^3x^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x)^(5/2)/x^4,x]
```

```
[Out] (-2*Sqrt[a + b/x]*(b + a*x)^3*(63*b^2 - 28*a*b*x + 8*a^2*x^2))/(6
93*b^3*x^5)
```

Maple [A] time = 0.007, size = 44, normalized size = 0.8

$$-\frac{(2\,ax+2\,b)\left(8\,a^2x^2-28\,abx+63\,b^2\right)}{693\,b^3x^3}\left(\frac{ax+b}{x}\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((a+b/x)^(5/2)/x^4,x)
```

```
[Out] -2/693*(a*x+b)*(8*a^2*x^2-28*a*b*x+63*b^2)*((a*x+b)/x)^(5/2)/b^3/
x^3
```

Maxima [A] time = 1.42421, size = 63, normalized size = 1.07

$$-\frac{2\left(a+\frac{b}{x}\right)^{\frac{11}{2}}}{11\,b^3}+\frac{4\left(a+\frac{b}{x}\right)^{\frac{9}{2}}a}{9\,b^3}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{7}{2}}a^2}{7\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a + b/x)^(5/2)/x^4,x, algorithm="maxima")
```

```
[Out] -2/11*(a + b/x)^(11/2)/b^3 + 4/9*(a + b/x)^(9/2)*a/b^3 - 2/7*(a +
 b/x)^(7/2)*a^2/b^3
```

Fricas [A] time = 0.226791, size = 96, normalized size = 1.63

$$-\frac{2\left(8\,a^5x^5-4\,a^4bx^4+3\,a^3b^2x^3+113\,a^2b^3x^2+161\,ab^4x+63\,b^5\right)\sqrt{\frac{ax+b}{x}}}{693\,b^3x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a + b/x)^(5/2)/x^4,x, algorithm="fricas")
```

```
[Out] -2/693*(8*a^5*x^5 - 4*a^4*b*x^4 + 3*a^3*b^2*x^3 + 113*a^2*b^3*x^2
 + 161*a*b^4*x + 63*b^5)*sqrt((a*x + b)/x)/(b^3*x^5)
```

Sympy [A] time = 9.8642, size = 1073, normalized size = 18.19

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a+b/x)**(5/2)/x**4,x)
```

```
[Out] -16*a**(27/2)*b**(9/2)*x**8*sqrt(a*x/b + 1)/(693*a**(17/2)*b**7*x
**(17/2) + 2079*a**(15/2)*b**8*x**(15/2) + 2079*a**(13/2)*b**9*x*
*(13/2) + 693*a**(11/2)*b**10*x**(11/2)) - 40*a**(25/2)*b**(11/2)
*x**7*sqrt(a*x/b + 1)/(693*a**(17/2)*b**7*x**(17/2) + 2079*a**(15
/2)*b**8*x**(15/2) + 2079*a**(13/2)*b**9*x**(13/2) + 693*a**(11/2
)*b**10*x**(11/2)) - 30*a**(23/2)*b**(13/2)*x**6*sqrt(a*x/b + 1)/
(693*a**(17/2)*b**7*x**(17/2) + 2079*a**(15/2)*b**8*x**(15/2) + 2
079*a**(13/2)*b**9*x**(13/2) + 693*a**(11/2)*b**10*x**(11/2)) - 2
36*a**(21/2)*b**(15/2)*x**5*sqrt(a*x/b + 1)/(693*a**(17/2)*b**7*x
**(17/2) + 2079*a**(15/2)*b**8*x**(15/2) + 2079*a**(13/2)*b**9*x*
*(13/2) + 693*a**(11/2)*b**10*x**(11/2)) - 1010*a**(19/2)*b**(17/
2)*x**4*sqrt(a*x/b + 1)/(693*a**(17/2)*b**7*x**(17/2) + 2079*a**(
15/2)*b**8*x**(15/2) + 2079*a**(13/2)*b**9*x**(13/2) + 693*a**(11
/2)*b**10*x**(11/2)) - 1776*a**(17/2)*b**(19/2)*x**3*sqrt(a*x/b +
 1)/(693*a**(17/2)*b**7*x**(17/2) + 2079*a**(15/2)*b**8*x**(15/2)
 + 2079*a**(13/2)*b**9*x**(13/2) + 693*a**(11/2)*b**10*x**(11/2))
 - 1570*a**(15/2)*b**(21/2)*x**2*sqrt(a*x/b + 1)/(693*a**(17/2)*b
**7*x**(17/2) + 2079*a**(15/2)*b**8*x**(15/2) + 2079*a**(13/2)*b*
*9*x**(13/2) + 693*a**(11/2)*b**10*x**(11/2)) - 700*a**(13/2)*b**
```

```
(23/2)*x*sqrt(a*x/b + 1)/(693*a**(17/2)*b**7*x**(17/2) + 2079*a**
(15/2)*b**8*x**(15/2) + 2079*a**(13/2)*b**9*x**(13/2) + 693*a**(1
1/2)*b**10*x**(11/2)) - 126*a**(11/2)*b**(25/2)*sqrt(a*x/b + 1)/(
693*a**(17/2)*b**7*x**(17/2) + 2079*a**(15/2)*b**8*x**(15/2) + 20
79*a**(13/2)*b**9*x**(13/2) + 693*a**(11/2)*b**10*x**(11/2)) + 16
*a**14*b**4*x**(17/2)/(693*a**(17/2)*b**7*x**(17/2) + 2079*a**(15
/2)*b**8*x**(15/2) + 2079*a**(13/2)*b**9*x**(13/2) + 693*a**(11/2
)*b**10*x**(11/2)) + 48*a**13*b**5*x**(15/2)/(693*a**(17/2)*b**7*
x**(17/2) + 2079*a**(15/2)*b**8*x**(15/2) + 2079*a**(13/2)*b**9*x
**(13/2) + 693*a**(11/2)*b**10*x**(11/2)) + 48*a**12*b**6*x**(13/
2)/(693*a**(17/2)*b**7*x**(17/2) + 2079*a**(15/2)*b**8*x**(15/2)
+ 2079*a**(13/2)*b**9*x**(13/2) + 693*a**(11/2)*b**10*x**(11/2))
+ 16*a**11*b**7*x**(11/2)/(693*a**(17/2)*b**7*x**(17/2) + 2079*a*
*(15/2)*b**8*x**(15/2) + 2079*a**(13/2)*b**9*x**(13/2) + 693*a**(
11/2)*b**10*x**(11/2))
```

GIAC/XCAS [A] time = 0.272934, size = 365, normalized size = 6.19

$$\frac{2\left(924\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^8a^4\mathrm{sign}\left(x\right)+4851\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^7a^{\frac{7}{2}}b\mathrm{sign}\left(x\right)+11781\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^6a^3b^2\mathrm{sign}\left(x\right)+\cdots\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)/x^4,x, algorithm="giac")
```

```
[Out] 2/693*(924*(sqrt(a)*x - sqrt(a*x^2 + b*x))^8*a^4*sign(x) + 4851*(
sqrt(a)*x - sqrt(a*x^2 + b*x))^7*a^(7/2)*b*sign(x) + 11781*(sqrt(
a)*x - sqrt(a*x^2 + b*x))^6*a^3*b^2*sign(x) + 16863*(sqrt(a)*x -
sqrt(a*x^2 + b*x))^5*a^(5/2)*b^3*sign(x) + 15345*(sqrt(a)*x - sqr
t(a*x^2 + b*x))^4*a^2*b^4*sign(x) + 9009*(sqrt(a)*x - sqrt(a*x^2
+ b*x))^3*a^(3/2)*b^5*sign(x) + 3311*(sqrt(a)*x - sqrt(a*x^2 + b*
x))^2*a*b^6*sign(x) + 693*(sqrt(a)*x - sqrt(a*x^2 + b*x))*sqrt(a)
*b^7*sign(x) + 63*b^8*sign(x))/(sqrt(a)*x - sqrt(a*x^2 + b*x))^11
```

3.1718 $\int \frac{\left(a+\frac{b}{x}\right)^{5/2}}{x^5}\,dx$

Optimal. Leaf size=80

$$\frac{2a^3\left(a+\frac{b}{x}\right)^{7/2}}{7b^4}-\frac{2a^2\left(a+\frac{b}{x}\right)^{9/2}}{3b^4}-\frac{2\left(a+\frac{b}{x}\right)^{13/2}}{13b^4}+\frac{6a\left(a+\frac{b}{x}\right)^{11/2}}{11b^4}$$

```
[Out] (2*a^3*(a + b/x)^(7/2))/(7*b^4) - (2*a^2*(a + b/x)^(9/2))/(3*b^4)
 + (6*a*(a + b/x)^(11/2))/(11*b^4) - (2*(a + b/x)^(13/2))/(13*b^4
)
```

Rubi [A] time = 0.0986914, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{2a^3\left(a+\frac{b}{x}\right)^{7/2}}{7b^4}-\frac{2a^2\left(a+\frac{b}{x}\right)^{9/2}}{3b^4}-\frac{2\left(a+\frac{b}{x}\right)^{13/2}}{13b^4}+\frac{6a\left(a+\frac{b}{x}\right)^{11/2}}{11b^4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(5/2)/x^5,x]
```

```
[Out] (2*a^3*(a + b/x)^(7/2))/(7*b^4) - (2*a^2*(a + b/x)^(9/2))/(3*b^4)
 + (6*a*(a + b/x)^(11/2))/(11*b^4) - (2*(a + b/x)^(13/2))/(13*b^4
)
```

Rubi in Sympy [A] time = 13.3809, size = 68, normalized size = 0.85

$$\frac{2a^3\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{7b^4}-\frac{2a^2\left(a+\frac{b}{x}\right)^{\frac{9}{2}}}{3b^4}+\frac{6a\left(a+\frac{b}{x}\right)^{\frac{11}{2}}}{11b^4}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{13}{2}}}{13b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(5/2)/x**5,x)
```

```
[Out] 2*a**3*(a + b/x)**(7/2)/(7*b**4) - 2*a**2*(a + b/x)**(9/2)/(3*b**
4) + 6*a*(a + b/x)**(11/2)/(11*b**4) - 2*(a + b/x)**(13/2)/(13*b*
*4)
```

Mathematica [A] time = 0.0528353, size = 58, normalized size = 0.72

$$\frac{2\sqrt{a+\frac{b}{x}}(ax+b)^3\left(16a^3x^3-56a^2bx^2+126ab^2x-231b^3\right)}{3003b^4x^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(5/2)/x^5,x]
```

```
[Out] (2*Sqrt[a + b/x]*(b + a*x)^3*(-231*b^3 + 126*a*b^2*x - 56*a^2*b*x
^2 + 16*a^3*x^3))/(3003*b^4*x^6)
```

Maple [A] time = 0.008, size = 55, normalized size = 0.7

$$\frac{(2ax+2b)\left(16a^3x^3-56a^2bx^2+126ab^2x-231b^3\right)}{3003x^4b^4}\left(\frac{ax+b}{x}\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(5/2)/x^5,x)
```

```
[Out] 2/3003*(a*x+b)*(16*a^3*x^3-56*a^2*b*x^2+126*a*b^2*x-231*b^3)*((a*
x+b)/x)^(5/2)/x^4/b^4
```

Maxima [A] time = 1.41819, size = 86, normalized size = 1.08

$$-\frac{2\left(a+\frac{b}{x}\right)^{\frac{13}{2}}}{13b^4}+\frac{6\left(a+\frac{b}{x}\right)^{\frac{11}{2}}a}{11b^4}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{9}{2}}a^2}{3b^4}+\frac{2\left(a+\frac{b}{x}\right)^{\frac{7}{2}}a^3}{7b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)/x^5,x, algorithm="maxima")
```

```
[Out] -2/13*(a + b/x)^(13/2)/b^4 + 6/11*(a + b/x)^(11/2)*a/b^4 - 2/3*(a
 + b/x)^(9/2)*a^2/b^4 + 2/7*(a + b/x)^(7/2)*a^3/b^4
```

Fricas [A] time = 0.220064, size = 111, normalized size = 1.39

$$\frac{2\left(16a^6x^6-8a^5bx^5+6a^4b^2x^4-5a^3b^3x^3-371a^2b^4x^2-567ab^5x-231b^6\right)\sqrt{\frac{ax+b}{x}}}{3003b^4x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)/x^5,x, algorithm="fricas")
```

```
[Out] 2/3003*(16*a^6*x^6 - 8*a^5*b*x^5 + 6*a^4*b^2*x^4 - 5*a^3*b^3*x^3
- 371*a^2*b^4*x^2 - 567*a*b^5*x - 231*b^6)*sqrt((a*x + b)/x)/(b^4
*x^6)
```

Sympy [A] time = 12.8976, size = 2562, normalized size = 32.02

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(5/2)/x**5,x)
```

```
[Out] 32*a**(37/2)*b**(23/2)*x**12*sqrt(a*x/b + 1)/(3003*a**(25/2)*b**1
5*x**(25/2) + 18018*a**(23/2)*b**16*x**(23/2) + 45045*a**(21/2)*b
**17*x**(21/2) + 60060*a**(19/2)*b**18*x**(19/2) + 45045*a**(17/2
)*b**19*x**(17/2) + 18018*a**(15/2)*b**20*x**(15/2) + 3003*a**(13
/2)*b**21*x**(13/2)) + 176*a**(35/2)*b**(25/2)*x**11*sqrt(a*x/b +
 1)/(3003*a**(25/2)*b**15*x**(25/2) + 18018*a**(23/2)*b**16*x**(2
3/2) + 45045*a**(21/2)*b**17*x**(21/2) + 60060*a**(19/2)*b**18*x*
*(19/2) + 45045*a**(17/2)*b**19*x**(17/2) + 18018*a**(15/2)*b**20
*x**(15/2) + 3003*a**(13/2)*b**21*x**(13/2)) + 396*a**(33/2)*b**(
27/2)*x**10*sqrt(a*x/b + 1)/(3003*a**(25/2)*b**15*x**(25/2) + 180
18*a**(23/2)*b**16*x**(23/2) + 45045*a**(21/2)*b**17*x**(21/2) +
```

```
60060*a**(19/2)*b**18*x**(19/2) + 45045*a**(17/2)*b**19*x**(17/2)
 + 18018*a**(15/2)*b**20*x**(15/2) + 3003*a**(13/2)*b**21*x**(13/
2)) + 462*a**(31/2)*b**(29/2)*x**9*sqrt(a*x/b + 1)/(3003*a**(25/2
)*b**15*x**(25/2) + 18018*a**(23/2)*b**16*x**(23/2) + 45045*a**(2
1/2)*b**17*x**(21/2) + 60060*a**(19/2)*b**18*x**(19/2) + 45045*a*
*(17/2)*b**19*x**(17/2) + 18018*a**(15/2)*b**20*x**(15/2) + 3003*
a**(13/2)*b**21*x**(13/2)) - 462*a**(29/2)*b**(31/2)*x**8*sqrt(a*
x/b + 1)/(3003*a**(25/2)*b**15*x**(25/2) + 18018*a**(23/2)*b**16*
x**(23/2) + 45045*a**(21/2)*b**17*x**(21/2) + 60060*a**(19/2)*b**
18*x**(19/2) + 45045*a**(17/2)*b**19*x**(17/2) + 18018*a**(15/2)*
b**20*x**(15/2) + 3003*a**(13/2)*b**21*x**(13/2)) - 5544*a**(27/2
)*b**(33/2)*x**7*sqrt(a*x/b + 1)/(3003*a**(25/2)*b**15*x**(25/2)
 + 18018*a**(23/2)*b**16*x**(23/2) + 45045*a**(21/2)*b**17*x**(21/
2) + 60060*a**(19/2)*b**18*x**(19/2) + 45045*a**(17/2)*b**19*x**(
17/2) + 18018*a**(15/2)*b**20*x**(15/2) + 3003*a**(13/2)*b**21*x*
*(13/2)) - 18480*a**(25/2)*b**(35/2)*x**6*sqrt(a*x/b + 1)/(3003*a
**(25/2)*b**15*x**(25/2) + 18018*a**(23/2)*b**16*x**(23/2) + 4504
5*a**(21/2)*b**17*x**(21/2) + 60060*a**(19/2)*b**18*x**(19/2) + 4
5045*a**(17/2)*b**19*x**(17/2) + 18018*a**(15/2)*b**20*x**(15/2)
 + 3003*a**(13/2)*b**21*x**(13/2)) - 34716*a**(23/2)*b**(37/2)*x**
5*sqrt(a*x/b + 1)/(3003*a**(25/2)*b**15*x**(25/2) + 18018*a**(23/
2)*b**16*x**(23/2) + 45045*a**(21/2)*b**17*x**(21/2) + 60060*a**(
19/2)*b**18*x**(19/2) + 45045*a**(17/2)*b**19*x**(17/2) + 18018*a
**(15/2)*b**20*x**(15/2) + 3003*a**(13/2)*b**21*x**(13/2)) - 4078
8*a**(21/2)*b**(39/2)*x**4*sqrt(a*x/b + 1)/(3003*a**(25/2)*b**15*
x**(25/2) + 18018*a**(23/2)*b**16*x**(23/2) + 45045*a**(21/2)*b**
17*x**(21/2) + 60060*a**(19/2)*b**18*x**(19/2) + 45045*a**(17/2)*
b**19*x**(17/2) + 18018*a**(15/2)*b**20*x**(15/2) + 3003*a**(13/2
)*b**21*x**(13/2)) - 30712*a**(19/2)*b**(41/2)*x**3*sqrt(a*x/b +
1)/(3003*a**(25/2)*b**15*x**(25/2) + 18018*a**(23/2)*b**16*x**(23
/2) + 45045*a**(21/2)*b**17*x**(21/2) + 60060*a**(19/2)*b**18*x**
(19/2) + 45045*a**(17/2)*b**19*x**(17/2) + 18018*a**(15/2)*b**20*
x**(15/2) + 3003*a**(13/2)*b**21*x**(13/2)) - 14476*a**(17/2)*b**
(43/2)*x**2*sqrt(a*x/b + 1)/(3003*a**(25/2)*b**15*x**(25/2) + 180
18*a**(23/2)*b**16*x**(23/2) + 45045*a**(21/2)*b**17*x**(21/2) +
60060*a**(19/2)*b**18*x**(19/2) + 45045*a**(17/2)*b**19*x**(17/2)
 + 18018*a**(15/2)*b**20*x**(15/2) + 3003*a**(13/2)*b**21*x**(13/
2)) - 3906*a**(15/2)*b**(45/2)*x*sqrt(a*x/b + 1)/(3003*a**(25/2)*
b**15*x**(25/2) + 18018*a**(23/2)*b**16*x**(23/2) + 45045*a**(21/
2)*b**17*x**(21/2) + 60060*a**(19/2)*b**18*x**(19/2) + 45045*a**(
17/2)*b**19*x**(17/2) + 18018*a**(15/2)*b**20*x**(15/2) + 3003*a*
*(13/2)*b**21*x**(13/2)) - 462*a**(13/2)*b**(47/2)*sqrt(a*x/b + 1
)/(3003*a**(25/2)*b**15*x**(25/2) + 18018*a**(23/2)*b**16*x**(23/
2) + 45045*a**(21/2)*b**17*x**(21/2) + 60060*a**(19/2)*b**18*x**(
19/2) + 45045*a**(17/2)*b**19*x**(17/2) + 18018*a**(15/2)*b**20*x
**(15/2) + 3003*a**(13/2)*b**21*x**(13/2)) - 32*a**19*b**11*x**(2
5/2)/(3003*a**(25/2)*b**15*x**(25/2) + 18018*a**(23/2)*b**16*x**(
23/2) + 45045*a**(21/2)*b**17*x**(21/2) + 60060*a**(19/2)*b**18*x
**(19/2) + 45045*a**(17/2)*b**19*x**(17/2) + 18018*a**(15/2)*b**2
0*x**(15/2) + 3003*a**(13/2)*b**21*x**(13/2)) - 192*a**18*b**12*x
**(23/2)/(3003*a**(25/2)*b**15*x**(25/2) + 18018*a**(23/2)*b**16*
x**(23/2) + 45045*a**(21/2)*b**17*x**(21/2) + 60060*a**(19/2)*b**
18*x**(19/2) + 45045*a**(17/2)*b**19*x**(17/2) + 18018*a**(15/2)*
b**20*x**(15/2) + 3003*a**(13/2)*b**21*x**(13/2)) - 480*a**17*b**
13*x**(21/2)/(3003*a**(25/2)*b**15*x**(25/2) + 18018*a**(23/2)*b*
*16*x**(23/2) + 45045*a**(21/2)*b**17*x**(21/2) + 60060*a**(19/2)
*b**18*x**(19/2) + 45045*a**(17/2)*b**19*x**(17/2) + 18018*a**(15
/2)*b**20*x**(15/2) + 3003*a**(13/2)*b**21*x**(13/2)) - 640*a**16
*b**14*x**(19/2)/(3003*a**(25/2)*b**15*x**(25/2) + 18018*a**(23/2
)*b**16*x**(23/2) + 45045*a**(21/2)*b**17*x**(21/2) + 60060*a**(1
9/2)*b**18*x**(19/2) + 45045*a**(17/2)*b**19*x**(17/2) + 18018*a*
*(15/2)*b**20*x**(15/2) + 3003*a**(13/2)*b**21*x**(13/2)) - 480*a
**15*b**15*x**(17/2)/(3003*a**(25/2)*b**15*x**(25/2) + 18018*a**(
23/2)*b**16*x**(23/2) + 45045*a**(21/2)*b**17*x**(21/2) + 60060*a
**(19/2)*b**18*x**(19/2) + 45045*a**(17/2)*b**19*x**(17/2) + 1801
8*a**(15/2)*b**20*x**(15/2) + 3003*a**(13/2)*b**21*x**(13/2)) - 1
92*a**14*b**16*x**(15/2)/(3003*a**(25/2)*b**15*x**(25/2) + 18018*
a**(23/2)*b**16*x**(23/2) + 45045*a**(21/2)*b**17*x**(21/2) + 600
60*a**(19/2)*b**18*x**(19/2) + 45045*a**(17/2)*b**19*x**(17/2) +
18018*a**(15/2)*b**20*x**(15/2) + 3003*a**(13/2)*b**21*x**(13/2))
 - 32*a**13*b**17*x**(13/2)/(3003*a**(25/2)*b**15*x**(25/2) + 180
18*a**(23/2)*b**16*x**(23/2) + 45045*a**(21/2)*b**17*x**(21/2) +
60060*a**(19/2)*b**18*x**(19/2) + 45045*a**(17/2)*b**19*x**(17/2)
 + 18018*a**(15/2)*b**20*x**(15/2) + 3003*a**(13/2)*b**21*x**(13/
```

```
2))
```

GIAC/XCAS [A] time = 0.291966, size = 406, normalized size = 5.08

$$\frac{2\left(6006\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^9a^{\frac{9}{2}}\operatorname{sign}(x)+36036\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^8a^4b\operatorname{sign}(x)+99099\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^7a^{\frac{7}{2}}b^2\operatorname{sign}(x\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)/x^5,x, algorithm="giac")
```

```
[Out] 2/3003*(6006*(sqrt(a)*x - sqrt(a*x^2 + b*x))^9*a^(9/2)*sign(x) +
36036*(sqrt(a)*x - sqrt(a*x^2 + b*x))^8*a^4*b*sign(x) + 99099*(sq
rt(a)*x - sqrt(a*x^2 + b*x))^7*a^(7/2)*b^2*sign(x) + 161733*(sqrt
(a)*x - sqrt(a*x^2 + b*x))^6*a^3*b^3*sign(x) + 171171*(sqrt(a)*x
- sqrt(a*x^2 + b*x))^5*a^(5/2)*b^4*sign(x) + 121121*(sqrt(a)*x -
sqrt(a*x^2 + b*x))^4*a^2*b^5*sign(x) + 57057*(sqrt(a)*x - sqrt(a*
x^2 + b*x))^3*a^(3/2)*b^6*sign(x) + 17199*(sqrt(a)*x - sqrt(a*x^2
 + b*x))^2*a*b^7*sign(x) + 3003*(sqrt(a)*x - sqrt(a*x^2 + b*x))*s
qrt(a)*b^8*sign(x) + 231*b^9*sign(x))/(sqrt(a)*x - sqrt(a*x^2 + b
*x))^13
```

3.1719 $\int \frac{\left(a+\frac{b}{x}\right)^{5/2}}{x^6}\,dx$

Optimal. Leaf size=101

$$-\frac{2a^4\left(a+\frac{b}{x}\right)^{7/2}}{7b^5}+\frac{8a^3\left(a+\frac{b}{x}\right)^{9/2}}{9b^5}-\frac{12a^2\left(a+\frac{b}{x}\right)^{11/2}}{11b^5}-\frac{2\left(a+\frac{b}{x}\right)^{15/2}}{15b^5}+\frac{8a\left(a+\frac{b}{x}\right)^{13/2}}{13b^5}$$

```
[Out] (-2*a^4*(a + b/x)^(7/2))/(7*b^5) + (8*a^3*(a + b/x)^(9/2))/(9*b^5
) - (12*a^2*(a + b/x)^(11/2))/(11*b^5) + (8*a*(a + b/x)^(13/2))/(
13*b^5) - (2*(a + b/x)^(15/2))/(15*b^5)
```

Rubi [A] time = 0.113334, antiderivative size = 101, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2a^4\left(a+\frac{b}{x}\right)^{7/2}}{7b^5}+\frac{8a^3\left(a+\frac{b}{x}\right)^{9/2}}{9b^5}-\frac{12a^2\left(a+\frac{b}{x}\right)^{11/2}}{11b^5}-\frac{2\left(a+\frac{b}{x}\right)^{15/2}}{15b^5}+\frac{8a\left(a+\frac{b}{x}\right)^{13/2}}{13b^5}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x)^(5/2)/x^6,x]
```

```
[Out] (-2*a^4*(a + b/x)^(7/2))/(7*b^5) + (8*a^3*(a + b/x)^(9/2))/(9*b^5
) - (12*a^2*(a + b/x)^(11/2))/(11*b^5) + (8*a*(a + b/x)^(13/2))/(
13*b^5) - (2*(a + b/x)^(15/2))/(15*b^5)
```

Rubi in Sympy [A] time = 16.3577, size = 87, normalized size = 0.86

$$-\frac{2a^4\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{7b^5}+\frac{8a^3\left(a+\frac{b}{x}\right)^{\frac{9}{2}}}{9b^5}-\frac{12a^2\left(a+\frac{b}{x}\right)^{\frac{11}{2}}}{11b^5}+\frac{8a\left(a+\frac{b}{x}\right)^{\frac{13}{2}}}{13b^5}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{15}{2}}}{15b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x)**(5/2)/x**6,x)
```

```
[Out] -2*a**4*(a + b/x)**(7/2)/(7*b**5) + 8*a**3*(a + b/x)**(9/2)/(9*b*
*5) - 12*a**2*(a + b/x)**(11/2)/(11*b**5) + 8*a*(a + b/x)**(13/2)
/(13*b**5) - 2*(a + b/x)**(15/2)/(15*b**5)
```

Mathematica [A] time = 0.0506143, size = 69, normalized size = 0.68

$$-\frac{2\sqrt{a+\frac{b}{x}}(ax+b)^3\left(128a^4x^4-448a^3bx^3+1008a^2b^2x^2-1848ab^3x+3003b^4\right)}{45045b^5x^7}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x)^(5/2)/x^6,x]
```

```
[Out] (-2*Sqrt[a + b/x]*(b + a*x)^3*(3003*b^4 - 1848*a*b^3*x + 1008*a^2
*b^2*x^2 - 448*a^3*b*x^3 + 128*a^4*x^4))/(45045*b^5*x^7)
```

Maple [A] time = 0.007, size = 66, normalized size = 0.7

$$-\frac{(2\,ax+2\,b)\left(128\,a^{4}x^{4}-448\,a^{3}x^{3}b+1008\,a^{2}x^{2}b^{2}-1848\,axb^{3}+3003\,b^{4}\right)}{45045\,x^{5}b^{5}}\left(\frac{ax+b}{x}\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(5/2)/x^6,x)
```

```
[Out] -2/45045*(a*x+b)*(128*a^4*x^4-448*a^3*b*x^3+1008*a^2*b^2*x^2-1848
*a*b^3*x+3003*b^4)*((a*x+b)/x)^(5/2)/x^5/b^5
```

Maxima [A] time = 1.42626, size = 109, normalized size = 1.08

$$-\frac{2\left(a+\frac{b}{x}\right)^{\frac{15}{2}}}{15\,b^{5}}+\frac{8\left(a+\frac{b}{x}\right)^{\frac{13}{2}}a}{13\,b^{5}}-\frac{12\left(a+\frac{b}{x}\right)^{\frac{11}{2}}a^{2}}{11\,b^{5}}+\frac{8\left(a+\frac{b}{x}\right)^{\frac{9}{2}}a^{3}}{9\,b^{5}}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{7}{2}}a^{4}}{7\,b^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)/x^6,x, algorithm="maxima")
```

```
[Out] -2/15*(a + b/x)^(15/2)/b^5 + 8/13*(a + b/x)^(13/2)*a/b^5 - 12/11*
(a + b/x)^(11/2)*a^2/b^5 + 8/9*(a + b/x)^(9/2)*a^3/b^5 - 2/7*(a +
 b/x)^(7/2)*a^4/b^5
```

Fricas [A] time = 0.223789, size = 126, normalized size = 1.25

$$-\frac{2\left(128\,a^{7}x^{7}-64\,a^{6}bx^{6}+48\,a^{5}b^{2}x^{5}-40\,a^{4}b^{3}x^{4}+35\,a^{3}b^{4}x^{3}+4473\,a^{2}b^{5}x^{2}+7161\,ab^{6}x+3003\,b^{7}\right)\sqrt{\frac{ax+b}{x}}}{45045\,b^{5}x^{7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)/x^6,x, algorithm="fricas")
```

```
[Out] -2/45045*(128*a^7*x^7 - 64*a^6*b*x^6 + 48*a^5*b^2*x^5 - 40*a^4*b^
3*x^4 + 35*a^3*b^4*x^3 + 4473*a^2*b^5*x^2 + 7161*a*b^6*x + 3003*b
^7)*sqrt((a*x + b)/x)/(b^5*x^7)
```

Sympy [A] time = 20.7414, size = 5482, normalized size = 54.28

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(5/2)/x**6,x)
```

```
[Out] -256*a**(49/2)*b**(49/2)*x**17*sqrt(a*x/b + 1)/(45045*a**(35/2)*b
**29*x**(35/2) + 450450*a**(33/2)*b**30*x**(33/2) + 2027025*a**(3
1/2)*b**31*x**(31/2) + 5405400*a**(29/2)*b**32*x**(29/2) + 945945
0*a**(27/2)*b**33*x**(27/2) + 11351340*a**(25/2)*b**34*x**(25/2)
+ 9459450*a**(23/2)*b**35*x**(23/2) + 5405400*a**(21/2)*b**36*x**
(21/2) + 2027025*a**(19/2)*b**37*x**(19/2) + 450450*a**(17/2)*b**
38*x**(17/2) + 45045*a**(15/2)*b**39*x**(15/2)) - 2432*a**(47/2)*
b**(51/2)*x**16*sqrt(a*x/b + 1)/(45045*a**(35/2)*b**29*x**(35/2)
+ 450450*a**(33/2)*b**30*x**(33/2) + 2027025*a**(31/2)*b**31*x**(
31/2) + 5405400*a**(29/2)*b**32*x**(29/2) + 9459450*a**(27/2)*b**
```

```
33*x**(27/2) + 11351340*a**(25/2)*b**34*x**(25/2) + 9459450*a**(2
3/2)*b**35*x**(23/2) + 5405400*a**(21/2)*b**36*x**(21/2) + 202702
5*a**(19/2)*b**37*x**(19/2) + 450450*a**(17/2)*b**38*x**(17/2) +
45045*a**(15/2)*b**39*x**(15/2)) - 10336*a**(45/2)*b**(53/2)*x**1
5*sqrt(a*x/b + 1)/(45045*a**(35/2)*b**29*x**(35/2) + 450450*a**(3
3/2)*b**30*x**(33/2) + 2027025*a**(31/2)*b**31*x**(31/2) + 540540
0*a**(29/2)*b**32*x**(29/2) + 9459450*a**(27/2)*b**33*x**(27/2) +
 11351340*a**(25/2)*b**34*x**(25/2) + 9459450*a**(23/2)*b**35*x**
(23/2) + 5405400*a**(21/2)*b**36*x**(21/2) + 2027025*a**(19/2)*b*
*37*x**(19/2) + 450450*a**(17/2)*b**38*x**(17/2) + 45045*a**(15/2
)*b**39*x**(15/2)) - 25840*a**(43/2)*b**(55/2)*x**14*sqrt(a*x/b +
 1)/(45045*a**(35/2)*b**29*x**(35/2) + 450450*a**(33/2)*b**30*x**
(33/2) + 2027025*a**(31/2)*b**31*x**(31/2) + 5405400*a**(29/2)*b*
*32*x**(29/2) + 9459450*a**(27/2)*b**33*x**(27/2) + 11351340*a**(
25/2)*b**34*x**(25/2) + 9459450*a**(23/2)*b**35*x**(23/2) + 54054
00*a**(21/2)*b**36*x**(21/2) + 2027025*a**(19/2)*b**37*x**(19/2)
+ 450450*a**(17/2)*b**38*x**(17/2) + 45045*a**(15/2)*b**39*x**(15
/2)) - 41990*a**(41/2)*b**(57/2)*x**13*sqrt(a*x/b + 1)/(45045*a**
(35/2)*b**29*x**(35/2) + 450450*a**(33/2)*b**30*x**(33/2) + 20270
25*a**(31/2)*b**31*x**(31/2) + 5405400*a**(29/2)*b**32*x**(29/2)
+ 9459450*a**(27/2)*b**33*x**(27/2) + 11351340*a**(25/2)*b**34*x*
*(25/2) + 9459450*a**(23/2)*b**35*x**(23/2) + 5405400*a**(21/2)*b
**36*x**(21/2) + 2027025*a**(19/2)*b**37*x**(19/2) + 450450*a**(1
7/2)*b**38*x**(17/2) + 45045*a**(15/2)*b**39*x**(15/2)) - 55198*a
**(39/2)*b**(59/2)*x**12*sqrt(a*x/b + 1)/(45045*a**(35/2)*b**29*x
**(35/2) + 450450*a**(33/2)*b**30*x**(33/2) + 2027025*a**(31/2)*b
**31*x**(31/2) + 5405400*a**(29/2)*b**32*x**(29/2) + 9459450*a**(
27/2)*b**33*x**(27/2) + 11351340*a**(25/2)*b**34*x**(25/2) + 9459
450*a**(23/2)*b**35*x**(23/2) + 5405400*a**(21/2)*b**36*x**(21/2)
 + 2027025*a**(19/2)*b**37*x**(19/2) + 450450*a**(17/2)*b**38*x**
(17/2) + 45045*a**(15/2)*b**39*x**(15/2)) - 138996*a**(37/2)*b**(
61/2)*x**11*sqrt(a*x/b + 1)/(45045*a**(35/2)*b**29*x**(35/2) + 45
0450*a**(33/2)*b**30*x**(33/2) + 2027025*a**(31/2)*b**31*x**(31/2
) + 5405400*a**(29/2)*b**32*x**(29/2) + 9459450*a**(27/2)*b**33*x
**(27/2) + 11351340*a**(25/2)*b**34*x**(25/2) + 9459450*a**(23/2)
*b**35*x**(23/2) + 5405400*a**(21/2)*b**36*x**(21/2) + 2027025*a*
*(19/2)*b**37*x**(19/2) + 450450*a**(17/2)*b**38*x**(17/2) + 4504
5*a**(15/2)*b**39*x**(15/2)) - 571428*a**(35/2)*b**(63/2)*x**10*s
qrt(a*x/b + 1)/(45045*a**(35/2)*b**29*x**(35/2) + 450450*a**(33/2
)*b**30*x**(33/2) + 2027025*a**(31/2)*b**31*x**(31/2) + 5405400*a
**(29/2)*b**32*x**(29/2) + 9459450*a**(27/2)*b**33*x**(27/2) + 11
351340*a**(25/2)*b**34*x**(25/2) + 9459450*a**(23/2)*b**35*x**(23
/2) + 5405400*a**(21/2)*b**36*x**(21/2) + 2027025*a**(19/2)*b**37
*x**(19/2) + 450450*a**(17/2)*b**38*x**(17/2) + 45045*a**(15/2)*b
**39*x**(15/2)) - 1788930*a**(33/2)*b**(65/2)*x**9*sqrt(a*x/b + 1
)/(45045*a**(35/2)*b**29*x**(35/2) + 450450*a**(33/2)*b**30*x**(3
3/2) + 2027025*a**(31/2)*b**31*x**(31/2) + 5405400*a**(29/2)*b**3
2*x**(29/2) + 9459450*a**(27/2)*b**33*x**(27/2) + 11351340*a**(25
/2)*b**34*x**(25/2) + 9459450*a**(23/2)*b**35*x**(23/2) + 5405400
*a**(21/2)*b**36*x**(21/2) + 2027025*a**(19/2)*b**37*x**(19/2) +
450450*a**(17/2)*b**38*x**(17/2) + 45045*a**(15/2)*b**39*x**(15/2
)) - 3876730*a**(31/2)*b**(67/2)*x**8*sqrt(a*x/b + 1)/(45045*a**(
35/2)*b**29*x**(35/2) + 450450*a**(33/2)*b**30*x**(33/2) + 202702
5*a**(31/2)*b**31*x**(31/2) + 5405400*a**(29/2)*b**32*x**(29/2) +
 9459450*a**(27/2)*b**33*x**(27/2) + 11351340*a**(25/2)*b**34*x**
(25/2) + 9459450*a**(23/2)*b**35*x**(23/2) + 5405400*a**(21/2)*b*
*36*x**(21/2) + 2027025*a**(19/2)*b**37*x**(19/2) + 450450*a**(17
/2)*b**38*x**(17/2) + 45045*a**(15/2)*b**39*x**(15/2)) - 5991128*
a**(29/2)*b**(69/2)*x**7*sqrt(a*x/b + 1)/(45045*a**(35/2)*b**29*x
**(35/2) + 450450*a**(33/2)*b**30*x**(33/2) + 2027025*a**(31/2)*b
**31*x**(31/2) + 5405400*a**(29/2)*b**32*x**(29/2) + 9459450*a**(
27/2)*b**33*x**(27/2) + 11351340*a**(25/2)*b**34*x**(25/2) + 9459
450*a**(23/2)*b**35*x**(23/2) + 5405400*a**(21/2)*b**36*x**(21/2)
 + 2027025*a**(19/2)*b**37*x**(19/2) + 450450*a**(17/2)*b**38*x**
(17/2) + 45045*a**(15/2)*b**39*x**(15/2)) - 6754696*a**(27/2)*b**
(71/2)*x**6*sqrt(a*x/b + 1)/(45045*a**(35/2)*b**29*x**(35/2) + 45
0450*a**(33/2)*b**30*x**(33/2) + 2027025*a**(31/2)*b**31*x**(31/2
) + 5405400*a**(29/2)*b**32*x**(29/2) + 9459450*a**(27/2)*b**33*x
**(27/2) + 11351340*a**(25/2)*b**34*x**(25/2) + 9459450*a**(23/2)
*b**35*x**(23/2) + 5405400*a**(21/2)*b**36*x**(21/2) + 2027025*a*
*(19/2)*b**37*x**(19/2) + 450450*a**(17/2)*b**38*x**(17/2) + 4504
5*a**(15/2)*b**39*x**(15/2)) - 5597098*a**(25/2)*b**(73/2)*x**5*s
qrt(a*x/b + 1)/(45045*a**(35/2)*b**29*x**(35/2) + 450450*a**(33/2
)*b**30*x**(33/2) + 2027025*a**(31/2)*b**31*x**(31/2) + 5405400*a
```

```
**(29/2)*b**32*x**(29/2) + 9459450*a**(27/2)*b**33*x**(27/2) + 11
351340*a**(25/2)*b**34*x**(25/2) + 9459450*a**(23/2)*b**35*x**(23
/2) + 5405400*a**(21/2)*b**36*x**(21/2) + 2027025*a**(19/2)*b**37
*x**(19/2) + 450450*a**(17/2)*b**38*x**(17/2) + 45045*a**(15/2)*b
**39*x**(15/2)) - 3383090*a**(23/2)*b**(75/2)*x**4*sqrt(a*x/b + 1
)/(45045*a**(35/2)*b**29*x**(35/2) + 450450*a**(33/2)*b**30*x**(3
3/2) + 2027025*a**(31/2)*b**31*x**(31/2) + 5405400*a**(29/2)*b**3
2*x**(29/2) + 9459450*a**(27/2)*b**33*x**(27/2) + 11351340*a**(25
/2)*b**34*x**(25/2) + 9459450*a**(23/2)*b**35*x**(23/2) + 5405400
*a**(21/2)*b**36*x**(21/2) + 2027025*a**(19/2)*b**37*x**(19/2) +
450450*a**(17/2)*b**38*x**(17/2) + 45045*a**(15/2)*b**39*x**(15/2
)) - 1454740*a**(21/2)*b**(77/2)*x**3*sqrt(a*x/b + 1)/(45045*a**(
35/2)*b**29*x**(35/2) + 450450*a**(33/2)*b**30*x**(33/2) + 202702
5*a**(31/2)*b**31*x**(31/2) + 5405400*a**(29/2)*b**32*x**(29/2) +
 9459450*a**(27/2)*b**33*x**(27/2) + 11351340*a**(25/2)*b**34*x**
(25/2) + 9459450*a**(23/2)*b**35*x**(23/2) + 5405400*a**(21/2)*b*
*36*x**(21/2) + 2027025*a**(19/2)*b**37*x**(19/2) + 450450*a**(17
/2)*b**38*x**(17/2) + 45045*a**(15/2)*b**39*x**(15/2)) - 422436*a
**(19/2)*b**(79/2)*x**2*sqrt(a*x/b + 1)/(45045*a**(35/2)*b**29*x*
*(35/2) + 450450*a**(33/2)*b**30*x**(33/2) + 2027025*a**(31/2)*b*
*31*x**(31/2) + 5405400*a**(29/2)*b**32*x**(29/2) + 9459450*a**(2
7/2)*b**33*x**(27/2) + 11351340*a**(25/2)*b**34*x**(25/2) + 94594
50*a**(23/2)*b**35*x**(23/2) + 5405400*a**(21/2)*b**36*x**(21/2)
 + 2027025*a**(19/2)*b**37*x**(19/2) + 450450*a**(17/2)*b**38*x**(
17/2) + 45045*a**(15/2)*b**39*x**(15/2)) - 74382*a**(17/2)*b**(81
/2)*x*sqrt(a*x/b + 1)/(45045*a**(35/2)*b**29*x**(35/2) + 450450*a
**(33/2)*b**30*x**(33/2) + 2027025*a**(31/2)*b**31*x**(31/2) + 54
05400*a**(29/2)*b**32*x**(29/2) + 9459450*a**(27/2)*b**33*x**(27/
2) + 11351340*a**(25/2)*b**34*x**(25/2) + 9459450*a**(23/2)*b**35
*x**(23/2) + 5405400*a**(21/2)*b**36*x**(21/2) + 2027025*a**(19/2
)*b**37*x**(19/2) + 450450*a**(17/2)*b**38*x**(17/2) + 45045*a**(
15/2)*b**39*x**(15/2)) - 6006*a**(15/2)*b**(83/2)*sqrt(a*x/b + 1)
/(45045*a**(35/2)*b**29*x**(35/2) + 450450*a**(33/2)*b**30*x**(33
/2) + 2027025*a**(31/2)*b**31*x**(31/2) + 5405400*a**(29/2)*b**32
*x**(29/2) + 9459450*a**(27/2)*b**33*x**(27/2) + 11351340*a**(25/
2)*b**34*x**(25/2) + 9459450*a**(23/2)*b**35*x**(23/2) + 5405400*
a**(21/2)*b**36*x**(21/2) + 2027025*a**(19/2)*b**37*x**(19/2) + 4
50450*a**(17/2)*b**38*x**(17/2) + 45045*a**(15/2)*b**39*x**(15/2)
) + 256*a**25*b**24*x**(35/2)/(45045*a**(35/2)*b**29*x**(35/2) +
450450*a**(33/2)*b**30*x**(33/2) + 2027025*a**(31/2)*b**31*x**(31
/2) + 5405400*a**(29/2)*b**32*x**(29/2) + 9459450*a**(27/2)*b**33
*x**(27/2) + 11351340*a**(25/2)*b**34*x**(25/2) + 9459450*a**(23/
2)*b**35*x**(23/2) + 5405400*a**(21/2)*b**36*x**(21/2) + 2027025*
a**(19/2)*b**37*x**(19/2) + 450450*a**(17/2)*b**38*x**(17/2) + 45
045*a**(15/2)*b**39*x**(15/2)) + 2560*a**24*b**25*x**(33/2)/(4504
5*a**(35/2)*b**29*x**(35/2) + 450450*a**(33/2)*b**30*x**(33/2) +
2027025*a**(31/2)*b**31*x**(31/2) + 5405400*a**(29/2)*b**32*x**(2
9/2) + 9459450*a**(27/2)*b**33*x**(27/2) + 11351340*a**(25/2)*b**
34*x**(25/2) + 9459450*a**(23/2)*b**35*x**(23/2) + 5405400*a**(21
/2)*b**36*x**(21/2) + 2027025*a**(19/2)*b**37*x**(19/2) + 450450*
a**(17/2)*b**38*x**(17/2) + 45045*a**(15/2)*b**39*x**(15/2)) + 11
520*a**23*b**26*x**(31/2)/(45045*a**(35/2)*b**29*x**(35/2) + 4504
50*a**(33/2)*b**30*x**(33/2) + 2027025*a**(31/2)*b**31*x**(31/2)
 + 5405400*a**(29/2)*b**32*x**(29/2) + 9459450*a**(27/2)*b**33*x**
(27/2) + 11351340*a**(25/2)*b**34*x**(25/2) + 9459450*a**(23/2)*b
**35*x**(23/2) + 5405400*a**(21/2)*b**36*x**(21/2) + 2027025*a**(
19/2)*b**37*x**(19/2) + 450450*a**(17/2)*b**38*x**(17/2) + 45045*
a**(15/2)*b**39*x**(15/2)) + 30720*a**22*b**27*x**(29/2)/(45045*a
**(35/2)*b**29*x**(35/2) + 450450*a**(33/2)*b**30*x**(33/2) + 202
7025*a**(31/2)*b**31*x**(31/2) + 5405400*a**(29/2)*b**32*x**(29/2
) + 9459450*a**(27/2)*b**33*x**(27/2) + 11351340*a**(25/2)*b**34*
x**(25/2) + 9459450*a**(23/2)*b**35*x**(23/2) + 5405400*a**(21/2)
*b**36*x**(21/2) + 2027025*a**(19/2)*b**37*x**(19/2) + 450450*a**
(17/2)*b**38*x**(17/2) + 45045*a**(15/2)*b**39*x**(15/2)) + 53760
*a**21*b**28*x**(27/2)/(45045*a**(35/2)*b**29*x**(35/2) + 450450*
a**(33/2)*b**30*x**(33/2) + 2027025*a**(31/2)*b**31*x**(31/2) + 5
405400*a**(29/2)*b**32*x**(29/2) + 9459450*a**(27/2)*b**33*x**(27
/2) + 11351340*a**(25/2)*b**34*x**(25/2) + 9459450*a**(23/2)*b**3
5*x**(23/2) + 5405400*a**(21/2)*b**36*x**(21/2) + 2027025*a**(19/
2)*b**37*x**(19/2) + 450450*a**(17/2)*b**38*x**(17/2) + 45045*a**
(15/2)*b**39*x**(15/2)) + 64512*a**20*b**29*x**(25/2)/(45045*a**(
35/2)*b**29*x**(35/2) + 450450*a**(33/2)*b**30*x**(33/2) + 202702
5*a**(31/2)*b**31*x**(31/2) + 5405400*a**(29/2)*b**32*x**(29/2) +
 9459450*a**(27/2)*b**33*x**(27/2) + 11351340*a**(25/2)*b**34*x**
```

```
(25/2) + 9459450*a**(23/2)*b**35*x**(23/2) + 5405400*a**(21/2)*b*
*36*x**(21/2) + 2027025*a**(19/2)*b**37*x**(19/2) + 450450*a**(17
/2)*b**38*x**(17/2) + 45045*a**(15/2)*b**39*x**(15/2)) + 53760*a*
*19*b**30*x**(23/2)/(45045*a**(35/2)*b**29*x**(35/2) + 450450*a**
(33/2)*b**30*x**(33/2) + 2027025*a**(31/2)*b**31*x**(31/2) + 5405
400*a**(29/2)*b**32*x**(29/2) + 9459450*a**(27/2)*b**33*x**(27/2)
 + 11351340*a**(25/2)*b**34*x**(25/2) + 9459450*a**(23/2)*b**35*x
**(23/2) + 5405400*a**(21/2)*b**36*x**(21/2) + 2027025*a**(19/2)*
b**37*x**(19/2) + 450450*a**(17/2)*b**38*x**(17/2) + 45045*a**(15
/2)*b**39*x**(15/2)) + 30720*a**18*b**31*x**(21/2)/(45045*a**(35/
2)*b**29*x**(35/2) + 450450*a**(33/2)*b**30*x**(33/2) + 2027025*a
**(31/2)*b**31*x**(31/2) + 5405400*a**(29/2)*b**32*x**(29/2) + 94
59450*a**(27/2)*b**33*x**(27/2) + 11351340*a**(25/2)*b**34*x**(25
/2) + 9459450*a**(23/2)*b**35*x**(23/2) + 5405400*a**(21/2)*b**36
*x**(21/2) + 2027025*a**(19/2)*b**37*x**(19/2) + 450450*a**(17/2)
*b**38*x**(17/2) + 45045*a**(15/2)*b**39*x**(15/2)) + 11520*a**17
*b**32*x**(19/2)/(45045*a**(35/2)*b**29*x**(35/2) + 450450*a**(33
/2)*b**30*x**(33/2) + 2027025*a**(31/2)*b**31*x**(31/2) + 5405400
*a**(29/2)*b**32*x**(29/2) + 9459450*a**(27/2)*b**33*x**(27/2) +
11351340*a**(25/2)*b**34*x**(25/2) + 9459450*a**(23/2)*b**35*x**(
23/2) + 5405400*a**(21/2)*b**36*x**(21/2) + 2027025*a**(19/2)*b**
37*x**(19/2) + 450450*a**(17/2)*b**38*x**(17/2) + 45045*a**(15/2)
*b**39*x**(15/2)) + 2560*a**16*b**33*x**(17/2)/(45045*a**(35/2)*b
**29*x**(35/2) + 450450*a**(33/2)*b**30*x**(33/2) + 2027025*a**(3
1/2)*b**31*x**(31/2) + 5405400*a**(29/2)*b**32*x**(29/2) + 945945
0*a**(27/2)*b**33*x**(27/2) + 11351340*a**(25/2)*b**34*x**(25/2)
+ 9459450*a**(23/2)*b**35*x**(23/2) + 5405400*a**(21/2)*b**36*x**
(21/2) + 2027025*a**(19/2)*b**37*x**(19/2) + 450450*a**(17/2)*b**
38*x**(17/2) + 45045*a**(15/2)*b**39*x**(15/2)) + 256*a**15*b**34
*x**(15/2)/(45045*a**(35/2)*b**29*x**(35/2) + 450450*a**(33/2)*b*
*30*x**(33/2) + 2027025*a**(31/2)*b**31*x**(31/2) + 5405400*a**(2
9/2)*b**32*x**(29/2) + 9459450*a**(27/2)*b**33*x**(27/2) + 113513
40*a**(25/2)*b**34*x**(25/2) + 9459450*a**(23/2)*b**35*x**(23/2)
+ 5405400*a**(21/2)*b**36*x**(21/2) + 2027025*a**(19/2)*b**37*x**
(19/2) + 450450*a**(17/2)*b**38*x**(17/2) + 45045*a**(15/2)*b**39
*x**(15/2))
```

GIAC/XCAS [A] time = 0.278243, size = 448, normalized size = 4.44

$$\frac{2\left(144144\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^{10}a^5\operatorname{sign}(x)+960960\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^9a^{\frac{9}{2}}b\operatorname{sign}(x)+2934360\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)^8a^4b^2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)/x^6,x, algorithm="giac")
```

```
[Out] 2/45045*(144144*(sqrt(a)*x - sqrt(a*x^2 + b*x))^10*a^5*sign(x) +
960960*(sqrt(a)*x - sqrt(a*x^2 + b*x))^9*a^(9/2)*b*sign(x) + 2934
360*(sqrt(a)*x - sqrt(a*x^2 + b*x))^8*a^4*b^2*sign(x) + 5360355*(
sqrt(a)*x - sqrt(a*x^2 + b*x))^7*a^(7/2)*b^3*sign(x) + 6451445*(s
qrt(a)*x - sqrt(a*x^2 + b*x))^6*a^3*b^4*sign(x) + 5324319*(sqrt(a
)*x - sqrt(a*x^2 + b*x))^5*a^(5/2)*b^5*sign(x) + 3042585*(sqrt(a)
*x - sqrt(a*x^2 + b*x))^4*a^2*b^6*sign(x) + 1186185*(sqrt(a)*x -
sqrt(a*x^2 + b*x))^3*a^(3/2)*b^7*sign(x) + 301455*(sqrt(a)*x - sq
rt(a*x^2 + b*x))^2*a*b^8*sign(x) + 45045*(sqrt(a)*x - sqrt(a*x^2
+ b*x))*sqrt(a)*b^9*sign(x) + 3003*b^10*sign(x))/(sqrt(a)*x - sqr
t(a*x^2 + b*x))^15
```

3.1720 $\int \frac{x^3}{\sqrt{a+\frac{b}{x}}}\,dx$

Optimal. Leaf size=120

$$\frac{35b^4\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{64a^{9/2}}-\frac{35b^3x\sqrt{a+\frac{b}{x}}}{64a^4}+\frac{35b^2x^2\sqrt{a+\frac{b}{x}}}{96a^3}-\frac{7bx^3\sqrt{a+\frac{b}{x}}}{24a^2}+\frac{x^4\sqrt{a+\frac{b}{x}}}{4a}$$

```
[Out] (-35*b^3*Sqrt[a + b/x]*x)/(64*a^4) + (35*b^2*Sqrt[a + b/x]*x^2)/(
96*a^3) - (7*b*Sqrt[a + b/x]*x^3)/(24*a^2) + (Sqrt[a + b/x]*x^4)/
(4*a) + (35*b^4*ArcTanh[Sqrt[a + b/x]/Sqrt[a]])/(64*a^(9/2))
```

Rubi [A] time = 0.166242, antiderivative size = 120, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{35b^4\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{64a^{9/2}}-\frac{35b^3x\sqrt{a+\frac{b}{x}}}{64a^4}+\frac{35b^2x^2\sqrt{a+\frac{b}{x}}}{96a^3}-\frac{7bx^3\sqrt{a+\frac{b}{x}}}{24a^2}+\frac{x^4\sqrt{a+\frac{b}{x}}}{4a}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/Sqrt[a + b/x],x]
```

```
[Out] (-35*b^3*Sqrt[a + b/x]*x)/(64*a^4) + (35*b^2*Sqrt[a + b/x]*x^2)/(
96*a^3) - (7*b*Sqrt[a + b/x]*x^3)/(24*a^2) + (Sqrt[a + b/x]*x^4)/
(4*a) + (35*b^4*ArcTanh[Sqrt[a + b/x]/Sqrt[a]])/(64*a^(9/2))
```

Rubi in Sympy [A] time = 16.352, size = 104, normalized size = 0.87

$$\frac{x^4\sqrt{a+\frac{b}{x}}}{4a}-\frac{7bx^3\sqrt{a+\frac{b}{x}}}{24a^2}+\frac{35b^2x^2\sqrt{a+\frac{b}{x}}}{96a^3}-\frac{35b^3x\sqrt{a+\frac{b}{x}}}{64a^4}+\frac{35b^4\,\mathrm{atanh}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{64a^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(a+b/x)**(1/2),x)
```

```
[Out] x**4*sqrt(a + b/x)/(4*a) - 7*b*x**3*sqrt(a + b/x)/(24*a**2) + 35*
b**2*x**2*sqrt(a + b/x)/(96*a**3) - 35*b**3*x*sqrt(a + b/x)/(64*a
**4) + 35*b**4*atanh(sqrt(a + b/x)/sqrt(a))/(64*a**(9/2))
```

Mathematica [A] time = 0.134642, size = 90, normalized size = 0.75

$$\frac{2\sqrt{a}x\sqrt{a+\frac{b}{x}}\left(48a^3x^3-56a^2bx^2+70ab^2x-105b^3\right)+105b^4\log\left(2\sqrt{a}x\sqrt{a+\frac{b}{x}}+2ax+b\right)}{384a^{9/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/Sqrt[a + b/x],x]
```

```
[Out] (2*Sqrt[a]*Sqrt[a + b/x]*x*(-105*b^3 + 70*a*b^2*x - 56*a^2*b*x^2
+ 48*a^3*x^3) + 105*b^4*Log[b + 2*a*x + 2*Sqrt[a]*Sqrt[a + b/x]*x
```

```
])/(384*a^(9/2))
```

Maple [A] time = 0.017, size = 188, normalized size = 1.6

$$-\frac{x}{384}\sqrt{\frac{ax+b}{x}}\left(-96\,x\left(ax^2+bx\right)^{3/2}a^{13/2}+208\,b\left(ax^2+bx\right)^{3/2}a^{11/2}-348\,b^2\sqrt{ax^2+bx}xa^{11/2}-174\,b^3\sqrt{ax^2+bx}a^{9/2}+38\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(a+b/x)^(1/2),x)
```

```
[Out] -1/384*((a*x+b)/x)^(1/2)*x*(-96*x*(a*x^2+b*x)^(3/2)*a^(13/2)+208*
b*(a*x^2+b*x)^(3/2)*a^(11/2)-348*b^2*(a*x^2+b*x)^(1/2)*x*a^(11/2)
-174*b^3*(a*x^2+b*x)^(1/2)*a^(9/2)+384*b^3*(x*(a*x+b))^(1/2)*a^(9
/2)+87*b^4*ln(1/2*(2*(a*x^2+b*x)^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*
a^4-192*b^4*ln(1/2*(2*(x*(a*x+b))^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))
*a^4)/(x*(a*x+b))^(1/2)/a^(17/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(a + b/x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.242826, size = 1, normalized size = 0.01

$$\left[\frac{105\,b^4\log\left(2\,ax\sqrt{\frac{ax+b}{x}}+(2\,ax+b)\sqrt{a}\right)+2\left(48\,a^3x^4-56\,a^2bx^3+70\,ab^2x^2-105\,b^3x\right)\sqrt{a}\sqrt{\frac{ax+b}{x}}}{384\,a^{\frac{9}{2}}},\right.$$
$$\left.-\frac{105\,b^4\arctan\left(\frac{a}{\sqrt{-a}\sqrt{\frac{ax+b}{x}}}\right)-\left(48\,a^3x^4-56\,a^2bx^3+70\,ab^2x^2-105\,b^3x\right)\sqrt{-a}\sqrt{\frac{ax+b}{x}}}{192\,\sqrt{-a}a^4}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(a + b/x),x, algorithm="fricas")
```

```
[Out] [1/384*(105*b^4*log(2*a*x*sqrt((a*x + b)/x) + (2*a*x + b)*sqrt(a)
) + 2*(48*a^3*x^4 - 56*a^2*b*x^3 + 70*a*b^2*x^2 - 105*b^3*x)*sqrt
(a)*sqrt((a*x + b)/x))/a^(9/2), -1/192*(105*b^4*arctan(a/(sqrt(-a
)*sqrt((a*x + b)/x))) - (48*a^3*x^4 - 56*a^2*b*x^3 + 70*a*b^2*x^2
 - 105*b^3*x)*sqrt(-a)*sqrt((a*x + b)/x))/(sqrt(-a)*a^4)]
```

Sympy [A] time = 31.0611, size = 155, normalized size = 1.29

$$\frac{x^{\frac{9}{2}}}{4\sqrt{b}\sqrt{\frac{ax}{b}+1}}-\frac{\sqrt{b}x^{\frac{7}{2}}}{24a\sqrt{\frac{ax}{b}+1}}+\frac{7b^{\frac{3}{2}}x^{\frac{5}{2}}}{96a^2\sqrt{\frac{ax}{b}+1}}-\frac{35b^{\frac{5}{2}}x^{\frac{3}{2}}}{192a^3\sqrt{\frac{ax}{b}+1}}-\frac{35b^{\frac{7}{2}}\sqrt{x}}{64a^4\sqrt{\frac{ax}{b}+1}}+\frac{35b^4\operatorname{asinh}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{64a^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(a+b/x)**(1/2),x)
```

```
[Out] x**(9/2)/(4*sqrt(b)*sqrt(a*x/b + 1)) - sqrt(b)*x**(7/2)/(24*a*sqr
t(a*x/b + 1)) + 7*b**(3/2)*x**(5/2)/(96*a**2*sqrt(a*x/b + 1)) - 3
5*b**(5/2)*x**(3/2)/(192*a**3*sqrt(a*x/b + 1)) - 35*b**(7/2)*sqrt
(x)/(64*a**4*sqrt(a*x/b + 1)) + 35*b**4*asinh(sqrt(a)*sqrt(x)/sqr
t(b))/(64*a**(9/2))
```

GIAC/XCAS [A] time = 0.249167, size = 208, normalized size = 1.73

$$-\frac{1}{192}\,b\left(\frac{105\,b^3\arctan\left(\frac{\sqrt{\frac{ax+b}{x}}}{\sqrt{-a}}\right)}{\sqrt{-a}a^4}-\frac{279\,a^3b^3\sqrt{\frac{ax+b}{x}}-\frac{511\,(ax+b)a^2b^3\sqrt{\frac{ax+b}{x}}}{x}+\frac{385\,(ax+b)^2ab^3\sqrt{\frac{ax+b}{x}}}{x^2}-\frac{105\,(ax+b)^3b^3\sqrt{\frac{ax+b}{x}}}{x^3}}{\left(a-\frac{ax+b}{x}\right)^4a^4}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(a + b/x),x, algorithm="giac")
```

```
[Out] -1/192*b*(105*b^3*arctan(sqrt((a*x + b)/x)/sqrt(-a))/(sqrt(-a)*a^
4) - (279*a^3*b^3*sqrt((a*x + b)/x) - 511*(a*x + b)*a^2*b^3*sqrt(
(a*x + b)/x)/x + 385*(a*x + b)^2*a*b^3*sqrt((a*x + b)/x)/x^2 - 10
5*(a*x + b)^3*b^3*sqrt((a*x + b)/x)/x^3)/((a - (a*x + b)/x)^4*a^4
))
```

3.1721 $\int \frac{x^2}{\sqrt{a+\frac{b}{x}}}\,dx$

Optimal. Leaf size=96

$$-\frac{5b^3\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{8a^{7/2}}+\frac{5b^2x\sqrt{a+\frac{b}{x}}}{8a^3}-\frac{5bx^2\sqrt{a+\frac{b}{x}}}{12a^2}+\frac{x^3\sqrt{a+\frac{b}{x}}}{3a}$$

```
[Out] (5*b^2*Sqrt[a + b/x]*x)/(8*a^3) - (5*b*Sqrt[a + b/x]*x^2)/(12*a^2
) + (Sqrt[a + b/x]*x^3)/(3*a) - (5*b^3*ArcTanh[Sqrt[a + b/x]/Sqrt
[a]])/(8*a^(7/2))
```

Rubi [A] time = 0.129853, antiderivative size = 96, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{5b^3\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{8a^{7/2}}+\frac{5b^2x\sqrt{a+\frac{b}{x}}}{8a^3}-\frac{5bx^2\sqrt{a+\frac{b}{x}}}{12a^2}+\frac{x^3\sqrt{a+\frac{b}{x}}}{3a}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/Sqrt[a + b/x],x]
```

```
[Out] (5*b^2*Sqrt[a + b/x]*x)/(8*a^3) - (5*b*Sqrt[a + b/x]*x^2)/(12*a^2
) + (Sqrt[a + b/x]*x^3)/(3*a) - (5*b^3*ArcTanh[Sqrt[a + b/x]/Sqrt
[a]])/(8*a^(7/2))
```

Rubi in Sympy [A] time = 12.4221, size = 82, normalized size = 0.85

$$\frac{x^3\sqrt{a+\frac{b}{x}}}{3a}-\frac{5bx^2\sqrt{a+\frac{b}{x}}}{12a^2}+\frac{5b^2x\sqrt{a+\frac{b}{x}}}{8a^3}-\frac{5b^3\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{8a^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b/x)**(1/2),x)
```

```
[Out] x**3*sqrt(a + b/x)/(3*a) - 5*b*x**2*sqrt(a + b/x)/(12*a**2) + 5*b
**2*x*sqrt(a + b/x)/(8*a**3) - 5*b**3*atanh(sqrt(a + b/x)/sqrt(a)
)/(8*a**(7/2))
```

Mathematica [A] time = 0.11871, size = 77, normalized size = 0.8

$$\frac{x\sqrt{a+\frac{b}{x}}\left(8a^2x^2-10abx+15b^2\right)}{24a^3}-\frac{5b^3\log\left(2\sqrt{a}x\sqrt{a+\frac{b}{x}}+2ax+b\right)}{16a^{7/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/Sqrt[a + b/x],x]
```

```
[Out] (Sqrt[a + b/x]*x*(15*b^2 - 10*a*b*x + 8*a^2*x^2))/(24*a^3) - (5*b
^3*Log[b + 2*a*x + 2*Sqrt[a]*Sqrt[a + b/x]*x])/(16*a^(7/2))
```

Maple [B] time = 0.014, size = 168, normalized size = 1.8

$$\frac{x}{48}\sqrt{\frac{ax+b}{x}}\left(16\left(ax^2+bx\right)^{3/2}a^{9/2}-36\,b\sqrt{ax^2+bx}xa^{9/2}-18\sqrt{ax^2+bx}b^2a^{7/2}+48\,b^2\sqrt{x\left(ax+b\right)}a^{7/2}+9\,b^3\ln\left(1/2\,\frac{2\sqrt{a}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(a+b/x)^(1/2),x)
```

```
[Out] 1/48*((a*x+b)/x)^(1/2)*x*(16*(a*x^2+b*x)^(3/2)*a^(9/2)-36*b*(a*x^
2+b*x)^(1/2)*x*a^(9/2)-18*(a*x^2+b*x)^(1/2)*b^2*a^(7/2)+48*b^2*(x
*(a*x+b))^(1/2)*a^(7/2)+9*b^3*ln(1/2*(2*(a*x^2+b*x)^(1/2)*a^(1/2)
+2*a*x+b)/a^(1/2))*a^3-24*b^3*ln(1/2*(2*(x*(a*x+b))^(1/2)*a^(1/2)
+2*a*x+b)/a^(1/2))*a^3)/(x*(a*x+b))^(1/2)/a^(13/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(a + b/x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.236446, size = 1, normalized size = 0.01

$$\left[\frac{15\,b^3\log\left(-2\,ax\sqrt{\frac{ax+b}{x}}+(2\,ax+b)\sqrt{a}\right)+2\left(8\,a^2x^3-10\,abx^2+15\,b^2x\right)\sqrt{a}\sqrt{\frac{ax+b}{x}}}{48\,a^{\frac{7}{2}}},\ \frac{15\,b^3\arctan\left(\frac{a}{\sqrt{-a}\sqrt{\frac{ax+b}{x}}}\right)+\left(8\,a^2x^3-1\right.}{24\sqrt{-a}a^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(a + b/x),x, algorithm="fricas")
```

```
[Out] [1/48*(15*b^3*log(-2*a*x*sqrt((a*x + b)/x) + (2*a*x + b)*sqrt(a))
 + 2*(8*a^2*x^3 - 10*a*b*x^2 + 15*b^2*x)*sqrt(a)*sqrt((a*x + b)/x
))/a^(7/2), 1/24*(15*b^3*arctan(a/(sqrt(-a)*sqrt((a*x + b)/x))) +
 (8*a^2*x^3 - 10*a*b*x^2 + 15*b^2*x)*sqrt(-a)*sqrt((a*x + b)/x))/
(sqrt(-a)*a^3)]
```

Sympy [A] time = 20.7485, size = 128, normalized size = 1.33

$$\frac{x^{\frac{7}{2}}}{3\sqrt{b}\sqrt{\frac{ax}{b}+1}}-\frac{\sqrt{b}x^{\frac{5}{2}}}{12a\sqrt{\frac{ax}{b}+1}}+\frac{5b^{\frac{3}{2}}x^{\frac{3}{2}}}{24a^2\sqrt{\frac{ax}{b}+1}}+\frac{5b^{\frac{5}{2}}\sqrt{x}}{8a^3\sqrt{\frac{ax}{b}+1}}-\frac{5b^3\operatorname{asinh}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{8a^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b/x)**(1/2),x)
```

```
[Out] x**(7/2)/(3*sqrt(b)*sqrt(a*x/b + 1)) - sqrt(b)*x**(5/2)/(12*a*sqr
t(a*x/b + 1)) + 5*b**(3/2)*x**(3/2)/(24*a**2*sqrt(a*x/b + 1)) + 5
```

```
*b**(5/2)*sqrt(x)/(8*a**3*sqrt(a*x/b + 1)) - 5*b**3*asinh(sqrt(a)
*sqrt(x)/sqrt(b))/(8*a**(7/2))
```

GIAC/XCAS [A] time = 0.253, size = 169, normalized size = 1.76

$$\frac{1}{24}\,b\left(\frac{15\,b^2\arctan\left(\frac{\sqrt{\frac{ax+b}{x}}}{\sqrt{-a}}\right)}{\sqrt{-a}a^3}-\frac{33\,a^2b^2\sqrt{\frac{ax+b}{x}}-\frac{40\,(ax+b)ab^2\sqrt{\frac{ax+b}{x}}}{x}+\frac{15\,(ax+b)^2b^2\sqrt{\frac{ax+b}{x}}}{x^2}}{\left(a-\frac{ax+b}{x}\right)^3a^3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(a + b/x),x, algorithm="giac")
```

```
[Out] 1/24*b*(15*b^2*arctan(sqrt((a*x + b)/x)/sqrt(-a))/(sqrt(-a)*a^3)
- (33*a^2*b^2*sqrt((a*x + b)/x) - 40*(a*x + b)*a*b^2*sqrt((a*x +
b)/x)/x + 15*(a*x + b)^2*b^2*sqrt((a*x + b)/x)/x^2)/((a - (a*x +
b)/x)^3*a^3))
```

3.1722 $\int \frac{x}{\sqrt{a+\frac{b}{x}}} dx$

Optimal. Leaf size=72

$$\frac{3b^2 \tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{4a^{5/2}} - \frac{3bx\sqrt{a+\frac{b}{x}}}{4a^2} + \frac{x^2\sqrt{a+\frac{b}{x}}}{2a}$$

```
[Out] (-3*b*Sqrt[a + b/x]*x)/(4*a^2) + (Sqrt[a + b/x]*x^2)/(2*a) + (3*b
^2*ArcTanh[Sqrt[a + b/x]/Sqrt[a]])/(4*a^(5/2))
```

Rubi [A] time = 0.0933906, antiderivative size = 72, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{3b^2 \tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{4a^{5/2}} - \frac{3bx\sqrt{a+\frac{b}{x}}}{4a^2} + \frac{x^2\sqrt{a+\frac{b}{x}}}{2a}$$

Antiderivative was successfully verified.

```
[In]  Int[x/Sqrt[a + b/x],x]
```

```
[Out] (-3*b*Sqrt[a + b/x]*x)/(4*a^2) + (Sqrt[a + b/x]*x^2)/(2*a) + (3*b
^2*ArcTanh[Sqrt[a + b/x]/Sqrt[a]])/(4*a^(5/2))
```

Rubi in Sympy [A] time = 9.01738, size = 60, normalized size = 0.83

$$\frac{x^2\sqrt{a+\frac{b}{x}}}{2a} - \frac{3bx\sqrt{a+\frac{b}{x}}}{4a^2} + \frac{3b^2 \operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{4a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b/x)**(1/2),x)
```

```
[Out] x**2*sqrt(a + b/x)/(2*a) - 3*b*x*sqrt(a + b/x)/(4*a**2) + 3*b**2*
atanh(sqrt(a + b/x)/sqrt(a))/(4*a**(5/2))
```

Mathematica [A] time = 0.099932, size = 66, normalized size = 0.92

$$\frac{3b^2 \log\left(2\sqrt{a}x\sqrt{a+\frac{b}{x}}+2ax+b\right)}{8a^{5/2}} + \frac{x\sqrt{a+\frac{b}{x}}(2ax-3b)}{4a^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/Sqrt[a + b/x],x]
```

```
[Out] (Sqrt[a + b/x]*x*(-3*b + 2*a*x))/(4*a^2) + (3*b^2*Log[b + 2*a*x +
 2*Sqrt[a]*Sqrt[a + b/x]*x])/(8*a^(5/2))
```

Maple [B] time = 0.013, size = 146, normalized size = 2.

$$-\frac{x}{8}\sqrt{\frac{ax+b}{x}}\left(-4\sqrt{ax^2+bx}\,x a^{7/2}-2\sqrt{ax^2+bx}\,b a^{5/2}+8\,b\sqrt{x\,(ax+b)}\,a^{5/2}+b^2\ln\left(\frac{1}{2}\left(2\sqrt{ax^2+bx}\sqrt{a}+2\,ax+b\right)\frac{1}{\sqrt{a}}\right)a^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+b/x)^(1/2),x)
```

```
[Out] -1/8*((a*x+b)/x)^(1/2)*x*(-4*(a*x^2+b*x)^(1/2)*x*a^(7/2)-2*(a*x^2
+b*x)^(1/2)*b*a^(5/2)+8*b*(x*(a*x+b))^(1/2)*a^(5/2)+b^2*ln(1/2*(2
*(a*x^2+b*x)^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*a^2-4*b^2*ln(1/2*(2*
(x*(a*x+b))^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*a^2)/(x*(a*x+b))^(1/2
)/a^(9/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(a + b/x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.240279, size = 1, normalized size = 0.01

$$\left[\frac{3\,b^2\log\left(2\,ax\sqrt{\frac{ax+b}{x}}+(2\,ax+b)\sqrt{a}\right)+2\left(2\,ax^2-3\,bx\right)\sqrt{a}\sqrt{\frac{ax+b}{x}}}{8\,a^{\frac{5}{2}}},\ -\frac{3\,b^2\arctan\left(\frac{a}{\sqrt{-a}\sqrt{\frac{ax+b}{x}}}\right)-\left(2\,ax^2-3\,bx\right)\sqrt{-a}\sqrt{\frac{ax+b}{x}}}{4\sqrt{-a}a^2}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(a + b/x),x, algorithm="fricas")
```

```
[Out] [1/8*(3*b^2*log(2*a*x*sqrt((a*x + b)/x) + (2*a*x + b)*sqrt(a)) +
2*(2*a*x^2 - 3*b*x)*sqrt(a)*sqrt((a*x + b)/x))/a^(5/2), -1/4*(3*b
^2*arctan(a/(sqrt(-a)*sqrt((a*x + b)/x))) - (2*a*x^2 - 3*b*x)*sqr
t(-a)*sqrt((a*x + b)/x))/(sqrt(-a)*a^2)]
```

Sympy [A] time = 13.2237, size = 100, normalized size = 1.39

$$\frac{x^{\frac{5}{2}}}{2\sqrt{b}\sqrt{\frac{ax}{b}+1}}-\frac{\sqrt{b}x^{\frac{3}{2}}}{4a\sqrt{\frac{ax}{b}+1}}-\frac{3b^{\frac{3}{2}}\sqrt{x}}{4a^2\sqrt{\frac{ax}{b}+1}}+\frac{3b^2\operatorname{asinh}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b/x)**(1/2),x)
```

```
[Out] x**(5/2)/(2*sqrt(b)*sqrt(a*x/b + 1)) - sqrt(b)*x**(3/2)/(4*a*sqrt
(a*x/b + 1)) - 3*b**(3/2)*sqrt(x)/(4*a**2*sqrt(a*x/b + 1)) + 3*b*
*2*asinh(sqrt(a)*sqrt(x)/sqrt(b))/(4*a**(5/2))
```

GIAC/XCAS [A] time = 0.25098, size = 120, normalized size = 1.67

$$-\frac{1}{4}\,b^2\left(\frac{3\,\arctan\left(\frac{\sqrt{\frac{ax+b}{x}}}{\sqrt{-a}}\right)}{\sqrt{-a}a^2}-\frac{5\,a\sqrt{\frac{ax+b}{x}}-\frac{3\,(ax+b)\sqrt{\frac{ax+b}{x}}}{x}}{\left(a-\frac{ax+b}{x}\right)^2a^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(a + b/x),x, algorithm="giac")
```

```
[Out] -1/4*b^2*(3*arctan(sqrt((a*x + b)/x)/sqrt(-a))/(sqrt(-a)*a^2) - (
5*a*sqrt((a*x + b)/x) - 3*(a*x + b)*sqrt((a*x + b)/x)/x)/((a - (a
*x + b)/x)^2*a^2))
```

3.1723 $\int \frac{1}{\sqrt{a+\frac{b}{x}}}\,dx$

Optimal. Leaf size=43

$$\frac{x\sqrt{a+\frac{b}{x}}}{a}-\frac{b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{a^{3/2}}$$

```
[Out] (Sqrt[a + b/x]*x)/a - (b*ArcTanh[Sqrt[a + b/x]/Sqrt[a]])/a^(3/2)
```

Rubi [A] time = 0.0563672, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364

$$\frac{x\sqrt{a+\frac{b}{x}}}{a}-\frac{b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{a^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[a + b/x],x]
```

```
[Out] (Sqrt[a + b/x]*x)/a - (b*ArcTanh[Sqrt[a + b/x]/Sqrt[a]])/a^(3/2)
```

Rubi in Sympy [A] time = 5.34937, size = 32, normalized size = 0.74

$$\frac{x\sqrt{a+\frac{b}{x}}}{a}-\frac{b\,\mathrm{atanh}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**(1/2),x)
```

```
[Out] x*sqrt(a + b/x)/a - b*atanh(sqrt(a + b/x)/sqrt(a))/a**(3/2)
```

Mathematica [A] time = 0.0471581, size = 53, normalized size = 1.23

$$\frac{x\sqrt{a+\frac{b}{x}}}{a}-\frac{b\log\left(2\sqrt{a}x\sqrt{a+\frac{b}{x}}+2ax+b\right)}{2a^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/Sqrt[a + b/x],x]
```

```
[Out] (Sqrt[a + b/x]*x)/a - (b*Log[b + 2*a*x + 2*Sqrt[a]*Sqrt[a + b/x]*
x])/(2*a^(3/2))
```

Maple [A] time = 0.009, size = 70, normalized size = 1.6

$$-\frac{x}{2}\sqrt{\frac{ax+b}{x}}\left(b\ln\left(\frac{1}{2}\left(2\sqrt{x(ax+b)}\sqrt{a}+2ax+b\right)\frac{1}{\sqrt{a}}\right)-2\sqrt{x(ax+b)}\sqrt{a}\right)\frac{1}{\sqrt{x(ax+b)}}a^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^(1/2),x)
```

```
[Out] -1/2*((a*x+b)/x)^(1/2)*x*(b*ln(1/2*(2*(x*(a*x+b))^(1/2)*a^(1/2)+2
*a*x+b)/a^(1/2))-2*(x*(a*x+b))^(1/2)*a^(1/2))/(x*(a*x+b))^(1/2)/a
^(3/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(a + b/x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.238768, size = 1, normalized size = 0.02

$$\left[\frac{2\sqrt{a}x\sqrt{\frac{ax+b}{x}}+b\log\left(-2\,ax\sqrt{\frac{ax+b}{x}}+(2\,ax+b)\sqrt{a}\right)}{2\,a^{\frac{3}{2}}}, \frac{\sqrt{-a}x\sqrt{\frac{ax+b}{x}}+b\arctan\left(\frac{a}{\sqrt{-a}\sqrt{\frac{ax+b}{x}}}\right)}{\sqrt{-a}a}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(a + b/x),x, algorithm="fricas")
```

```
[Out] [1/2*(2*sqrt(a)*x*sqrt((a*x + b)/x) + b*log(-2*a*x*sqrt((a*x + b)
/x) + (2*a*x + b)*sqrt(a)))/a^(3/2), (sqrt(-a)*x*sqrt((a*x + b)/x
) + b*arctan(a/(sqrt(-a)*sqrt((a*x + b)/x))))/(sqrt(-a)*a)]
```

Sympy [A] time = 7.67019, size = 44, normalized size = 1.02

$$\frac{\sqrt{b}\sqrt{x}\sqrt{\frac{ax}{b}+1}}{a}-\frac{b\operatorname{asinh}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(1/2),x)
```

```
[Out] sqrt(b)*sqrt(x)*sqrt(a*x/b + 1)/a - b*asinh(sqrt(a)*sqrt(x)/sqrt(
b))/a**(3/2)
```

GIAC/XCAS [A] time = 0.248816, size = 96, normalized size = 2.23

$$-\frac{b\ln\left(|b|\right)\operatorname{sign}\left(x\right)}{2\,a^{\frac{3}{2}}}+\frac{b\ln\left(\left|-2\left(\sqrt{a}x-\sqrt{ax^2+bx}\right)\sqrt{a}-b\right|\right)}{2\,a^{\frac{3}{2}}\operatorname{sign}\left(x\right)}+\frac{\sqrt{ax^2+bx}}{a\operatorname{sign}\left(x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(a + b/x),x, algorithm="giac")
```

```
[Out] -1/2*b*ln(abs(b))*sign(x)/a^(3/2) + 1/2*b*ln(abs(-2*(sqrt(a)*x -
sqrt(a*x^2 + b*x))*sqrt(a) - b))/(a^(3/2)*sign(x)) + sqrt(a*x^2 +
 b*x)/(a*sign(x))
```

3.1724 $\int \frac{1}{\sqrt{a+\frac{b}{x}}x} dx$

Optimal. Leaf size=25

$$\frac{2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{\sqrt{a}}$$

```
[Out] (2*ArcTanh[Sqrt[a + b/x]/Sqrt[a]])/Sqrt[a]
```

Rubi [A] time = 0.0505647, antiderivative size = 25, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b/x]*x),x]

[Out] (2*ArcTanh[Sqrt[a + b/x]/Sqrt[a]])/Sqrt[a]
```

Rubi in Sympy [A] time = 5.07538, size = 20, normalized size = 0.8

$$\frac{2\,\text{atanh}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(a+b/x)**(1/2),x)

[Out] 2*atanh(sqrt(a + b/x)/sqrt(a))/sqrt(a)
```

Mathematica [A] time = 0.0190876, size = 34, normalized size = 1.36

$$\frac{\log\left(2\sqrt{a}x\sqrt{\frac{ax+b}{x}}+2ax+b\right)}{\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b/x]*x),x]

[Out] Log[b + 2*a*x + 2*Sqrt[a]*x*Sqrt[(b + a*x)/x]]/Sqrt[a]
```

Maple [B] time = 0.016, size = 119, normalized size = 4.8

$$\frac{x}{2b}\sqrt{\frac{ax+b}{x}}\left(b\ln\left(\frac{1}{2}\left(2\sqrt{ax^2+bx}\sqrt{a}+2ax+b\right)\frac{1}{\sqrt{a}}\right)+b\ln\left(\frac{1}{2}\left(2\sqrt{x(ax+b)}\sqrt{a}+2ax+b\right)\frac{1}{\sqrt{a}}\right)+2\sqrt{ax^2+bx}\sqrt{a}-2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(a+b/x)^(1/2),x)
```

```
[Out] 1/2*((a*x+b)/x)^(1/2)*x*(b*ln(1/2*(2*(a*x^2+b*x)^(1/2)*a^(1/2)+2*
a*x+b)/a^(1/2))+b*ln(1/2*(2*(x*(a*x+b))^(1/2)*a^(1/2)+2*a*x+b)/a^
(1/2))+2*(a*x^2+b*x)^(1/2)*a^(1/2)-2*(x*(a*x+b))^(1/2)*a^(1/2))/(
x*(a*x+b))^(1/2)/b/a^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.238194, size = 1, normalized size = 0.04

$$\left[\frac{\log\left(2\,ax\sqrt{\frac{ax+b}{x}}+(2\,ax+b)\sqrt{a}\right)}{\sqrt{a}}, -\frac{2\,\arctan\left(\frac{a}{\sqrt{-a}\sqrt{\frac{ax+b}{x}}}\right)}{\sqrt{-a}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*x),x, algorithm="fricas")
```

```
[Out] [log(2*a*x*sqrt((a*x + b)/x) + (2*a*x + b)*sqrt(a))/sqrt(a), -2*a
rctan(a/(sqrt(-a)*sqrt((a*x + b)/x)))/sqrt(-a)]
```

Sympy [A] time = 4.11737, size = 22, normalized size = 0.88

$$\frac{2\,\operatorname{asinh}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(a+b/x)**(1/2),x)
```

```
[Out] 2*asinh(sqrt(a)*sqrt(x)/sqrt(b))/sqrt(a)
```

GIAC/XCAS [A] time = 0.243754, size = 34, normalized size = 1.36

$$-\frac{2\,\arctan\left(\frac{\sqrt{\frac{ax+b}{x}}}{\sqrt{-a}}\right)}{\sqrt{-a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*x),x, algorithm="giac")

[Out] -2*arctan(sqrt((a*x + b)/x)/sqrt(-a))/sqrt(-a)
```

3.1725 $\int \frac{1}{\sqrt{a+\frac{b}{x}}x^2}\,dx$

Optimal. Leaf size=16

$$-\frac{2\sqrt{a+\frac{b}{x}}}{b}$$

[Out] (-2*Sqrt[a + b/x])/b

Rubi [A] time = 0.0262674, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{2\sqrt{a+\frac{b}{x}}}{b}$$

Antiderivative was successfully verified.

[In] Int[1/(Sqrt[a + b/x]*x^2),x]

[Out] (-2*Sqrt[a + b/x])/b

Rubi in Sympy [A] time = 2.21049, size = 12, normalized size = 0.75

$$-\frac{2\sqrt{a+\frac{b}{x}}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(1/x**2/(a+b/x)**(1/2),x)

[Out] -2*sqrt(a + b/x)/b

Mathematica [A] time = 0.0136972, size = 16, normalized size = 1.

$$-\frac{2\sqrt{a+\frac{b}{x}}}{b}$$

Antiderivative was successfully verified.

[In] Integrate[1/(Sqrt[a + b/x]*x^2),x]

[Out] (-2*Sqrt[a + b/x])/b

Maple [A] time = 0.007, size = 25, normalized size = 1.6

$$-2\,\frac{ax+b}{bx}\frac{1}{\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(a+b/x)^(1/2),x)

[Out] -2/x*(a*x+b)/b/((a*x+b)/x)^(1/2)
```

Maxima [A]   time = 1.44046, size = 19, normalized size = 1.19

$$-\frac{2\sqrt{a+\frac{b}{x}}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*x^2),x, algorithm="maxima")

[Out] -2*sqrt(a + b/x)/b
```

Fricas [A]   time = 0.224532, size = 22, normalized size = 1.38

$$-\frac{2\sqrt{\frac{ax+b}{x}}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*x^2),x, algorithm="fricas")

[Out] -2*sqrt((a*x + b)/x)/b
```

Sympy [A]   time = 2.87512, size = 22, normalized size = 1.38

$$\begin{cases} -\frac{2\sqrt{a+\frac{b}{x}}}{b} & \text{for}\ b \neq 0 \\ -\frac{1}{\sqrt{a}x} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(a+b/x)**(1/2),x)

[Out] Piecewise((-2*sqrt(a + b/x)/b, Ne(b, 0)), (-1/(sqrt(a)*x), True))
```

GIAC/XCAS [A]   time = 0.230186, size = 19, normalized size = 1.19

$$-\frac{2\sqrt{a+\frac{b}{x}}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*x^2),x, algorithm="giac")

[Out] -2*sqrt(a + b/x)/b
```

3.1726 $\int \frac{1}{\sqrt{a+\frac{b}{x}}x^3} dx$

Optimal. Leaf size=36

$$\frac{2a\sqrt{a+\frac{b}{x}}}{b^2}-\frac{2\left(a+\frac{b}{x}\right)^{3/2}}{3b^2}$$

```
[Out] (2*a*Sqrt[a + b/x])/b^2 - (2*(a + b/x)^(3/2))/(3*b^2)
```

Rubi [A] time = 0.0575781, antiderivative size = 36, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2a\sqrt{a+\frac{b}{x}}}{b^2}-\frac{2\left(a+\frac{b}{x}\right)^{3/2}}{3b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b/x]*x^3),x]

[Out] (2*a*Sqrt[a + b/x])/b^2 - (2*(a + b/x)^(3/2))/(3*b^2)
```

Rubi in Sympy [A] time = 6.83025, size = 29, normalized size = 0.81

$$\frac{2a\sqrt{a+\frac{b}{x}}}{b^2}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{3b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(a+b/x)**(1/2),x)

[Out] 2*a*sqrt(a + b/x)/b**2 - 2*(a + b/x)**(3/2)/(3*b**2)
```

Mathematica [A] time = 0.0278904, size = 29, normalized size = 0.81

$$\frac{2\sqrt{a+\frac{b}{x}}(2ax-b)}{3b^2x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b/x]*x^3),x]

[Out] (2*Sqrt[a + b/x]*(-b + 2*a*x))/(3*b^2*x)
```

Maple [A] time = 0.007, size = 33, normalized size = 0.9

$$\frac{(2\,ax+2\,b)(2\,ax-b)}{3\,b^2x^2}\frac{1}{\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(a+b/x)^(1/2),x)

[Out] 2/3*(a*x+b)*(2*a*x-b)/x^2/b^2/((a*x+b)/x)^(1/2)
```

Maxima [A] time = 1.4473, size = 41, normalized size = 1.14

$$-\frac{2\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{3\,b^2}+\frac{2\sqrt{a+\frac{b}{x}}\,a}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*x^3),x, algorithm="maxima")

[Out] -2/3*(a + b/x)^(3/2)/b^2 + 2*sqrt(a + b/x)*a/b^2
```

Fricas [A] time = 0.226688, size = 36, normalized size = 1.

$$\frac{2\,(2\,ax-b)\sqrt{\frac{ax+b}{x}}}{3\,b^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*x^3),x, algorithm="fricas")

[Out] 2/3*(2*a*x - b)*sqrt((a*x + b)/x)/(b^2*x)
```

Sympy [A] time = 4.43846, size = 248, normalized size = 6.89

$$\frac{4a^{\frac{7}{2}}b^{\frac{3}{2}}x^2\sqrt{\frac{ax}{b}+1}}{3a^{\frac{5}{2}}b^3x^{\frac{5}{2}}+3a^{\frac{3}{2}}b^4x^{\frac{3}{2}}}+\frac{2a^{\frac{5}{2}}b^{\frac{5}{2}}x\sqrt{\frac{ax}{b}+1}}{3a^{\frac{5}{2}}b^3x^{\frac{5}{2}}+3a^{\frac{3}{2}}b^4x^{\frac{3}{2}}}-\frac{2a^{\frac{3}{2}}b^{\frac{7}{2}}\sqrt{\frac{ax}{b}+1}}{3a^{\frac{5}{2}}b^3x^{\frac{5}{2}}+3a^{\frac{3}{2}}b^4x^{\frac{3}{2}}}-\frac{4a^4bx^{\frac{5}{2}}}{3a^{\frac{5}{2}}b^3x^{\frac{5}{2}}+3a^{\frac{3}{2}}b^4x^{\frac{3}{2}}}-\frac{4a^3b^2x^{\frac{3}{2}}}{3a^{\frac{5}{2}}b^3x^{\frac{5}{2}}+3a^{\frac{3}{2}}b^4x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(a+b/x)**(1/2),x)

[Out] 4*a**(7/2)*b**(3/2)*x**2*sqrt(a*x/b + 1)/(3*a**(5/2)*b**3*x**(5/2
) + 3*a**(3/2)*b**4*x**(3/2)) + 2*a**(5/2)*b**(5/2)*x*sqrt(a*x/b
+ 1)/(3*a**(5/2)*b**3*x**(5/2) + 3*a**(3/2)*b**4*x**(3/2)) - 2*a*
*(3/2)*b**(7/2)*sqrt(a*x/b + 1)/(3*a**(5/2)*b**3*x**(5/2) + 3*a**
(3/2)*b**4*x**(3/2)) - 4*a**4*b*x**(5/2)/(3*a**(5/2)*b**3*x**(5/2
) + 3*a**(3/2)*b**4*x**(3/2)) - 4*a**3*b**2*x**(3/2)/(3*a**(5/2)*
b**3*x**(5/2) + 3*a**(3/2)*b**4*x**(3/2))
```

GIAC/XCAS [A] time = 0.248594, size = 63, normalized size = 1.75

$$\frac{2\left(3\,ab^6\sqrt{\frac{ax+b}{x}}-\frac{(ax+b)b^6\sqrt{\frac{ax+b}{x}}}{x}\right)}{3\,b^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*x^3),x, algorithm="giac")
```

```
[Out] 2/3*(3*a*b^6*sqrt((a*x + b)/x) - (a*x + b)*b^6*sqrt((a*x + b)/x)/
x)/b^8
```

3.1727 $\int \frac{1}{\sqrt{a+\frac{b}{x}}x^4}\,dx$

Optimal. Leaf size=57

$$-\frac{2a^2\sqrt{a+\frac{b}{x}}}{b^3}-\frac{2\left(a+\frac{b}{x}\right)^{5/2}}{5b^3}+\frac{4a\left(a+\frac{b}{x}\right)^{3/2}}{3b^3}$$

```
[Out] (-2*a^2*Sqrt[a + b/x])/b^3 + (4*a*(a + b/x)^(3/2))/(3*b^3) - (2*(
a + b/x)^(5/2))/(5*b^3)
```

Rubi [A] time = 0.0776676, antiderivative size = 57, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2a^2\sqrt{a+\frac{b}{x}}}{b^3}-\frac{2\left(a+\frac{b}{x}\right)^{5/2}}{5b^3}+\frac{4a\left(a+\frac{b}{x}\right)^{3/2}}{3b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b/x]*x^4),x]
```

```
[Out] (-2*a^2*Sqrt[a + b/x])/b^3 + (4*a*(a + b/x)^(3/2))/(3*b^3) - (2*(
a + b/x)^(5/2))/(5*b^3)
```

Rubi in Sympy [A] time = 9.91601, size = 48, normalized size = 0.84

$$-\frac{2a^2\sqrt{a+\frac{b}{x}}}{b^3}+\frac{4a\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{3b^3}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{5b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(a+b/x)**(1/2),x)
```

```
[Out] -2*a**2*sqrt(a + b/x)/b**3 + 4*a*(a + b/x)**(3/2)/(3*b**3) - 2*(a
 + b/x)**(5/2)/(5*b**3)
```

Mathematica [A] time = 0.0345345, size = 40, normalized size = 0.7

$$-\frac{2\sqrt{a+\frac{b}{x}}\left(8a^2x^2-4abx+3b^2\right)}{15b^3x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b/x]*x^4),x]
```

```
[Out] (-2*Sqrt[a + b/x]*(3*b^2 - 4*a*b*x + 8*a^2*x^2))/(15*b^3*x^2)
```

Maple [A] time = 0.008, size = 44, normalized size = 0.8

$$-\frac{(2\,ax+2\,b)\left(8\,a^2x^2-4\,abx+3\,b^2\right)}{15\,b^3x^3}\frac{1}{\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(a+b/x)^(1/2),x)
```

```
[Out] -2/15*(a*x+b)*(8*a^2*x^2-4*a*b*x+3*b^2)/x^3/b^3/((a*x+b)/x)^(1/2)
```

Maxima [A] time = 1.4461, size = 63, normalized size = 1.11

$$-\frac{2\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{5\,b^{3}}+\frac{4\left(a+\frac{b}{x}\right)^{\frac{3}{2}}a}{3\,b^{3}}-\frac{2\sqrt{a+\frac{b}{x}}a^{2}}{b^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*x^4),x, algorithm="maxima")
```

```
[Out] -2/5*(a + b/x)^(5/2)/b^3 + 4/3*(a + b/x)^(3/2)*a/b^3 - 2*sqrt(a +
 b/x)*a^2/b^3
```

Fricas [A] time = 0.221959, size = 51, normalized size = 0.89

$$-\frac{2\left(8\,a^{2}x^{2}-4\,abx+3\,b^{2}\right)\sqrt{\frac{ax+b}{x}}}{15\,b^{3}x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*x^4),x, algorithm="fricas")
```

```
[Out] -2/15*(8*a^2*x^2 - 4*a*b*x + 3*b^2)*sqrt((a*x + b)/x)/(b^3*x^2)
```

Sympy [A] time = 6.7646, size = 813, normalized size = 14.26

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(a+b/x)**(1/2),x)
```

```
[Out] -16*a**(15/2)*b**(9/2)*x**5*sqrt(a*x/b + 1)/(15*a**(11/2)*b**7*x*
*(11/2) + 45*a**(9/2)*b**8*x**(9/2) + 45*a**(7/2)*b**9*x**(7/2) +
 15*a**(5/2)*b**10*x**(5/2)) - 40*a**(13/2)*b**(11/2)*x**4*sqrt(a
*x/b + 1)/(15*a**(11/2)*b**7*x**(11/2) + 45*a**(9/2)*b**8*x**(9/2
) + 45*a**(7/2)*b**9*x**(7/2) + 15*a**(5/2)*b**10*x**(5/2)) - 30*
a**(11/2)*b**(13/2)*x**3*sqrt(a*x/b + 1)/(15*a**(11/2)*b**7*x**(1
1/2) + 45*a**(9/2)*b**8*x**(9/2) + 45*a**(7/2)*b**9*x**(7/2) + 15
*a**(5/2)*b**10*x**(5/2)) - 10*a**(9/2)*b**(15/2)*x**2*sqrt(a*x/b
 + 1)/(15*a**(11/2)*b**7*x**(11/2) + 45*a**(9/2)*b**8*x**(9/2) +
45*a**(7/2)*b**9*x**(7/2) + 15*a**(5/2)*b**10*x**(5/2)) - 10*a**(
7/2)*b**(17/2)*x*sqrt(a*x/b + 1)/(15*a**(11/2)*b**7*x**(11/2) + 4
5*a**(9/2)*b**8*x**(9/2) + 45*a**(7/2)*b**9*x**(7/2) + 15*a**(5/2
)*b**10*x**(5/2)) - 6*a**(5/2)*b**(19/2)*sqrt(a*x/b + 1)/(15*a**(
11/2)*b**7*x**(11/2) + 45*a**(9/2)*b**8*x**(9/2) + 45*a**(7/2)*b*
*9*x**(7/2) + 15*a**(5/2)*b**10*x**(5/2)) + 16*a**8*b**4*x**(11/2
)/(15*a**(11/2)*b**7*x**(11/2) + 45*a**(9/2)*b**8*x**(9/2) + 45*a
**(7/2)*b**9*x**(7/2) + 15*a**(5/2)*b**10*x**(5/2)) + 48*a**7*b**
5*x**(9/2)/(15*a**(11/2)*b**7*x**(11/2) + 45*a**(9/2)*b**8*x**(9/
2) + 45*a**(7/2)*b**9*x**(7/2) + 15*a**(5/2)*b**10*x**(5/2)) + 48
*a**6*b**6*x**(7/2)/(15*a**(11/2)*b**7*x**(11/2) + 45*a**(9/2)*b*
*8*x**(9/2) + 45*a**(7/2)*b**9*x**(7/2) + 15*a**(5/2)*b**10*x**(5
```

```
/2)) + 16*a**5*b**7*x**(5/2)/(15*a**(11/2)*b**7*x**(11/2) + 45*a*
*(9/2)*b**8*x**(9/2) + 45*a**(7/2)*b**9*x**(7/2) + 15*a**(5/2)*b*
*10*x**(5/2))
```

GIAC/XCAS [A] time = 0.250839, size = 103, normalized size = 1.81

$$-\frac{2\left(15\,a^{2}b^{16}\sqrt{\frac{ax+b}{x}}-\frac{10\,(ax+b)ab^{16}\sqrt{\frac{ax+b}{x}}}{x}+\frac{3\,(ax+b)^{2}b^{16}\sqrt{\frac{ax+b}{x}}}{x^{2}}\right)}{15\,b^{19}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*x^4),x, algorithm="giac")
```

```
[Out] -2/15*(15*a^2*b^16*sqrt((a*x + b)/x) - 10*(a*x + b)*a*b^16*sqrt((
a*x + b)/x)/x + 3*(a*x + b)^2*b^16*sqrt((a*x + b)/x)/x^2)/b^19
```

3.1728 $\int \frac{1}{\sqrt{a+\frac{b}{x}}x^5} dx$

Optimal. Leaf size=76

$$\frac{2a^3\sqrt{a+\frac{b}{x}}}{b^4}-\frac{2a^2\left(a+\frac{b}{x}\right)^{3/2}}{b^4}-\frac{2\left(a+\frac{b}{x}\right)^{7/2}}{7b^4}+\frac{6a\left(a+\frac{b}{x}\right)^{5/2}}{5b^4}$$

```
[Out] (2*a^3*Sqrt[a + b/x])/b^4 - (2*a^2*(a + b/x)^(3/2))/b^4 + (6*a*(a
 + b/x)^(5/2))/(5*b^4) - (2*(a + b/x)^(7/2))/(7*b^4)
```

Rubi [A] time = 0.0978687, antiderivative size = 76, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2a^3\sqrt{a+\frac{b}{x}}}{b^4}-\frac{2a^2\left(a+\frac{b}{x}\right)^{3/2}}{b^4}-\frac{2\left(a+\frac{b}{x}\right)^{7/2}}{7b^4}+\frac{6a\left(a+\frac{b}{x}\right)^{5/2}}{5b^4}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b/x]*x^5),x]
```

```
[Out] (2*a^3*Sqrt[a + b/x])/b^4 - (2*a^2*(a + b/x)^(3/2))/b^4 + (6*a*(a
 + b/x)^(5/2))/(5*b^4) - (2*(a + b/x)^(7/2))/(7*b^4)
```

Rubi in Sympy [A] time = 13.2217, size = 65, normalized size = 0.86

$$\frac{2a^3\sqrt{a+\frac{b}{x}}}{b^4}-\frac{2a^2\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{b^4}+\frac{6a\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{5b^4}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{7b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**5/(a+b/x)**(1/2),x)
```

```
[Out] 2*a**3*sqrt(a + b/x)/b**4 - 2*a**2*(a + b/x)**(3/2)/b**4 + 6*a*(a
 + b/x)**(5/2)/(5*b**4) - 2*(a + b/x)**(7/2)/(7*b**4)
```

Mathematica [A] time = 0.0383784, size = 51, normalized size = 0.67

$$\frac{2\sqrt{a+\frac{b}{x}}\left(16a^3x^3-8a^2bx^2+6ab^2x-5b^3\right)}{35b^4x^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b/x]*x^5),x]
```

```
[Out] (2*Sqrt[a + b/x]*(-5*b^3 + 6*a*b^2*x - 8*a^2*b*x^2 + 16*a^3*x^3))
/(35*b^4*x^3)
```

Maple [A] time = 0.008, size = 55, normalized size = 0.7

$$\frac{(2\,ax+2\,b)\left(16\,a^3x^3-8\,a^2bx^2+6\,ab^2x-5\,b^3\right)}{35\,x^4b^4}\frac{1}{\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^5/(a+b/x)^(1/2),x)
```

```
[Out] 2/35*(a*x+b)*(16*a^3*x^3-8*a^2*b*x^2+6*a*b^2*x-5*b^3)/x^4/b^4/((a
*x+b)/x)^(1/2)
```

Maxima [A] time = 1.44965, size = 86, normalized size = 1.13

$$-\frac{2\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{7\,b^4}+\frac{6\left(a+\frac{b}{x}\right)^{\frac{5}{2}}a}{5\,b^4}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{3}{2}}a^2}{b^4}+\frac{2\sqrt{a+\frac{b}{x}}\,a^3}{b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*x^5),x, algorithm="maxima")
```

```
[Out] -2/7*(a + b/x)^(7/2)/b^4 + 6/5*(a + b/x)^(5/2)*a/b^4 - 2*(a + b/x
)^(3/2)*a^2/b^4 + 2*sqrt(a + b/x)*a^3/b^4
```

Fricas [A] time = 0.224399, size = 66, normalized size = 0.87

$$\frac{2\left(16\,a^3x^3-8\,a^2bx^2+6\,ab^2x-5\,b^3\right)\sqrt{\frac{ax+b}{x}}}{35\,b^4x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*x^5),x, algorithm="fricas")
```

```
[Out] 2/35*(16*a^3*x^3 - 8*a^2*b*x^2 + 6*a*b^2*x - 5*b^3)*sqrt((a*x + b
)/x)/(b^4*x^3)
```

Sympy [A] time = 10.2633, size = 2164, normalized size = 28.47

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**5/(a+b/x)**(1/2),x)
```

```
[Out] 32*a**(25/2)*b**(23/2)*x**9*sqrt(a*x/b + 1)/(35*a**(19/2)*b**15*x
**(19/2) + 210*a**(17/2)*b**16*x**(17/2) + 525*a**(15/2)*b**17*x*
*(15/2) + 700*a**(13/2)*b**18*x**(13/2) + 525*a**(11/2)*b**19*x**
(11/2) + 210*a**(9/2)*b**20*x**(9/2) + 35*a**(7/2)*b**21*x**(7/2)
) + 176*a**(23/2)*b**(25/2)*x**8*sqrt(a*x/b + 1)/(35*a**(19/2)*b*
*15*x**(19/2) + 210*a**(17/2)*b**16*x**(17/2) + 525*a**(15/2)*b**
17*x**(15/2) + 700*a**(13/2)*b**18*x**(13/2) + 525*a**(11/2)*b**1
9*x**(11/2) + 210*a**(9/2)*b**20*x**(9/2) + 35*a**(7/2)*b**21*x**
(7/2)) + 396*a**(21/2)*b**(27/2)*x**7*sqrt(a*x/b + 1)/(35*a**(19/
2)*b**15*x**(19/2) + 210*a**(17/2)*b**16*x**(17/2) + 525*a**(15/2
)*b**17*x**(15/2) + 700*a**(13/2)*b**18*x**(13/2) + 525*a**(11/2)
*b**19*x**(11/2) + 210*a**(9/2)*b**20*x**(9/2) + 35*a**(7/2)*b**2
1*x**(7/2)) + 462*a**(19/2)*b**(29/2)*x**6*sqrt(a*x/b + 1)/(35*a*
*(19/2)*b**15*x**(19/2) + 210*a**(17/2)*b**16*x**(17/2) + 525*a**
(15/2)*b**17*x**(15/2) + 700*a**(13/2)*b**18*x**(13/2) + 525*a**(
11/2)*b**19*x**(11/2) + 210*a**(9/2)*b**20*x**(9/2) + 35*a**(7/2)
*b**21*x**(7/2)) + 280*a**(17/2)*b**(31/2)*x**5*sqrt(a*x/b + 1)/(
35*a**(19/2)*b**15*x**(19/2) + 210*a**(17/2)*b**16*x**(17/2) + 52
5*a**(15/2)*b**17*x**(15/2) + 700*a**(13/2)*b**18*x**(13/2) + 525
```

```
*a**(11/2)*b**19*x**(11/2) + 210*a**(9/2)*b**20*x**(9/2) + 35*a**
(7/2)*b**21*x**(7/2)) + 42*a**(15/2)*b**(33/2)*x**4*sqrt(a*x/b +
1)/(35*a**(19/2)*b**15*x**(19/2) + 210*a**(17/2)*b**16*x**(17/2)
+ 525*a**(15/2)*b**17*x**(15/2) + 700*a**(13/2)*b**18*x**(13/2) +
 525*a**(11/2)*b**19*x**(11/2) + 210*a**(9/2)*b**20*x**(9/2) + 35
*a**(7/2)*b**21*x**(7/2)) - 84*a**(13/2)*b**(35/2)*x**3*sqrt(a*x/
b + 1)/(35*a**(19/2)*b**15*x**(19/2) + 210*a**(17/2)*b**16*x**(17
/2) + 525*a**(15/2)*b**17*x**(15/2) + 700*a**(13/2)*b**18*x**(13/
2) + 525*a**(11/2)*b**19*x**(11/2) + 210*a**(9/2)*b**20*x**(9/2)
+ 35*a**(7/2)*b**21*x**(7/2)) - 94*a**(11/2)*b**(37/2)*x**2*sqrt(
a*x/b + 1)/(35*a**(19/2)*b**15*x**(19/2) + 210*a**(17/2)*b**16*x*
*(17/2) + 525*a**(15/2)*b**17*x**(15/2) + 700*a**(13/2)*b**18*x**
(13/2) + 525*a**(11/2)*b**19*x**(11/2) + 210*a**(9/2)*b**20*x**(9
/2) + 35*a**(7/2)*b**21*x**(7/2)) - 48*a**(9/2)*b**(39/2)*x*sqrt(
a*x/b + 1)/(35*a**(19/2)*b**15*x**(19/2) + 210*a**(17/2)*b**16*x*
*(17/2) + 525*a**(15/2)*b**17*x**(15/2) + 700*a**(13/2)*b**18*x**
(13/2) + 525*a**(11/2)*b**19*x**(11/2) + 210*a**(9/2)*b**20*x**(9
/2) + 35*a**(7/2)*b**21*x**(7/2)) - 10*a**(7/2)*b**(41/2)*sqrt(a*
x/b + 1)/(35*a**(19/2)*b**15*x**(19/2) + 210*a**(17/2)*b**16*x**(
17/2) + 525*a**(15/2)*b**17*x**(15/2) + 700*a**(13/2)*b**18*x**(1
3/2) + 525*a**(11/2)*b**19*x**(11/2) + 210*a**(9/2)*b**20*x**(9/2
) + 35*a**(7/2)*b**21*x**(7/2)) - 32*a**13*b**11*x**(19/2)/(35*a*
*(19/2)*b**15*x**(19/2) + 210*a**(17/2)*b**16*x**(17/2) + 525*a**
(15/2)*b**17*x**(15/2) + 700*a**(13/2)*b**18*x**(13/2) + 525*a**(
11/2)*b**19*x**(11/2) + 210*a**(9/2)*b**20*x**(9/2) + 35*a**(7/2)
*b**21*x**(7/2)) - 192*a**12*b**12*x**(17/2)/(35*a**(19/2)*b**15*
x**(19/2) + 210*a**(17/2)*b**16*x**(17/2) + 525*a**(15/2)*b**17*x
**(15/2) + 700*a**(13/2)*b**18*x**(13/2) + 525*a**(11/2)*b**19*x*
*(11/2) + 210*a**(9/2)*b**20*x**(9/2) + 35*a**(7/2)*b**21*x**(7/2
)) - 480*a**11*b**13*x**(15/2)/(35*a**(19/2)*b**15*x**(19/2) + 21
0*a**(17/2)*b**16*x**(17/2) + 525*a**(15/2)*b**17*x**(15/2) + 700
*a**(13/2)*b**18*x**(13/2) + 525*a**(11/2)*b**19*x**(11/2) + 210*
a**(9/2)*b**20*x**(9/2) + 35*a**(7/2)*b**21*x**(7/2)) - 640*a**10
*b**14*x**(13/2)/(35*a**(19/2)*b**15*x**(19/2) + 210*a**(17/2)*b*
*16*x**(17/2) + 525*a**(15/2)*b**17*x**(15/2) + 700*a**(13/2)*b**
18*x**(13/2) + 525*a**(11/2)*b**19*x**(11/2) + 210*a**(9/2)*b**20
*x**(9/2) + 35*a**(7/2)*b**21*x**(7/2)) - 480*a**9*b**15*x**(11/2
)/(35*a**(19/2)*b**15*x**(19/2) + 210*a**(17/2)*b**16*x**(17/2) +
 525*a**(15/2)*b**17*x**(15/2) + 700*a**(13/2)*b**18*x**(13/2) +
525*a**(11/2)*b**19*x**(11/2) + 210*a**(9/2)*b**20*x**(9/2) + 35*
a**(7/2)*b**21*x**(7/2)) - 192*a**8*b**16*x**(9/2)/(35*a**(19/2)*
b**15*x**(19/2) + 210*a**(17/2)*b**16*x**(17/2) + 525*a**(15/2)*b
**17*x**(15/2) + 700*a**(13/2)*b**18*x**(13/2) + 525*a**(11/2)*b*
*19*x**(11/2) + 210*a**(9/2)*b**20*x**(9/2) + 35*a**(7/2)*b**21*x
**(7/2)) - 32*a**7*b**17*x**(7/2)/(35*a**(19/2)*b**15*x**(19/2) +
 210*a**(17/2)*b**16*x**(17/2) + 525*a**(15/2)*b**17*x**(15/2) +
700*a**(13/2)*b**18*x**(13/2) + 525*a**(11/2)*b**19*x**(11/2) + 2
10*a**(9/2)*b**20*x**(9/2) + 35*a**(7/2)*b**21*x**(7/2))
```

GIAC/XCAS [A] time = 0.248859, size = 142, normalized size = 1.87

$$\frac{2\left(35\,a^3b^{30}\sqrt{\frac{ax+b}{x}} - \frac{35\,(ax+b)a^2b^{30}\sqrt{\frac{ax+b}{x}}}{x} + \frac{21\,(ax+b)^2ab^{30}\sqrt{\frac{ax+b}{x}}}{x^2} - \frac{5\,(ax+b)^3b^{30}\sqrt{\frac{ax+b}{x}}}{x^3}\right)}{35\,b^{34}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*x^5),x, algorithm="giac")
```

```
[Out] 2/35*(35*a^3*b^30*sqrt((a*x + b)/x) - 35*(a*x + b)*a^2*b^30*sqrt(
(a*x + b)/x)/x + 21*(a*x + b)^2*a*b^30*sqrt((a*x + b)/x)/x^2 - 5*
(a*x + b)^3*b^30*sqrt((a*x + b)/x)/x^3)/b^34
```

3.1729 $\int \frac{1}{\sqrt{a+\frac{b}{x}}x^6}\,dx$

Optimal. Leaf size=99

$$-\frac{2a^4\sqrt{a+\frac{b}{x}}}{b^5}+\frac{8a^3\left(a+\frac{b}{x}\right)^{3/2}}{3b^5}-\frac{12a^2\left(a+\frac{b}{x}\right)^{5/2}}{5b^5}-\frac{2\left(a+\frac{b}{x}\right)^{9/2}}{9b^5}+\frac{8a\left(a+\frac{b}{x}\right)^{7/2}}{7b^5}$$

```
[Out] (-2*a^4*Sqrt[a + b/x])/b^5 + (8*a^3*(a + b/x)^(3/2))/(3*b^5) - (1
2*a^2*(a + b/x)^(5/2))/(5*b^5) + (8*a*(a + b/x)^(7/2))/(7*b^5) -
(2*(a + b/x)^(9/2))/(9*b^5)
```

Rubi [A] time = 0.11411, antiderivative size = 99, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2a^4\sqrt{a+\frac{b}{x}}}{b^5}+\frac{8a^3\left(a+\frac{b}{x}\right)^{3/2}}{3b^5}-\frac{12a^2\left(a+\frac{b}{x}\right)^{5/2}}{5b^5}-\frac{2\left(a+\frac{b}{x}\right)^{9/2}}{9b^5}+\frac{8a\left(a+\frac{b}{x}\right)^{7/2}}{7b^5}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[a + b/x]*x^6),x]
```

```
[Out] (-2*a^4*Sqrt[a + b/x])/b^5 + (8*a^3*(a + b/x)^(3/2))/(3*b^5) - (1
2*a^2*(a + b/x)^(5/2))/(5*b^5) + (8*a*(a + b/x)^(7/2))/(7*b^5) -
(2*(a + b/x)^(9/2))/(9*b^5)
```

Rubi in Sympy [A] time = 16.4331, size = 85, normalized size = 0.86

$$-\frac{2a^4\sqrt{a+\frac{b}{x}}}{b^5}+\frac{8a^3\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{3b^5}-\frac{12a^2\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{5b^5}+\frac{8a\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{7b^5}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{9}{2}}}{9b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**6/(a+b/x)**(1/2),x)
```

```
[Out] -2*a**4*sqrt(a + b/x)/b**5 + 8*a**3*(a + b/x)**(3/2)/(3*b**5) - 1
2*a**2*(a + b/x)**(5/2)/(5*b**5) + 8*a*(a + b/x)**(7/2)/(7*b**5)
- 2*(a + b/x)**(9/2)/(9*b**5)
```

Mathematica [A] time = 0.0433638, size = 62, normalized size = 0.63

$$-\frac{2\sqrt{a+\frac{b}{x}}\left(128a^4x^4-64a^3bx^3+48a^2b^2x^2-40ab^3x+35b^4\right)}{315b^5x^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(Sqrt[a + b/x]*x^6),x]
```

```
[Out] (-2*Sqrt[a + b/x]*(35*b^4 - 40*a*b^3*x + 48*a^2*b^2*x^2 - 64*a^3*
b*x^3 + 128*a^4*x^4))/(315*b^5*x^4)
```

Maple [A] time = 0.008, size = 66, normalized size = 0.7

$$-\frac{(2ax+2b)(128a^4x^4-64a^3x^3b+48a^2x^2b^2-40axb^3+35b^4)}{315x^5b^5}\frac{1}{\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^6/(a+b/x)^(1/2),x)
```

```
[Out] -2/315*(a*x+b)*(128*a^4*x^4-64*a^3*b*x^3+48*a^2*b^2*x^2-40*a*b^3*
x+35*b^4)/x^5/b^5/((a*x+b)/x)^(1/2)
```

Maxima [A] time = 1.44645, size = 109, normalized size = 1.1

$$-\frac{2\left(a+\frac{b}{x}\right)^{\frac{9}{2}}}{9b^5}+\frac{8\left(a+\frac{b}{x}\right)^{\frac{7}{2}}a}{7b^5}-\frac{12\left(a+\frac{b}{x}\right)^{\frac{5}{2}}a^2}{5b^5}+\frac{8\left(a+\frac{b}{x}\right)^{\frac{3}{2}}a^3}{3b^5}-\frac{2\sqrt{a+\frac{b}{x}}a^4}{b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*x^6),x, algorithm="maxima")
```

```
[Out] -2/9*(a + b/x)^(9/2)/b^5 + 8/7*(a + b/x)^(7/2)*a/b^5 - 12/5*(a +
b/x)^(5/2)*a^2/b^5 + 8/3*(a + b/x)^(3/2)*a^3/b^5 - 2*sqrt(a + b/x
)*a^4/b^5
```

Fricas [A] time = 0.221999, size = 81, normalized size = 0.82

$$-\frac{2\left(128a^4x^4-64a^3bx^3+48a^2b^2x^2-40ab^3x+35b^4\right)\sqrt{\frac{ax+b}{x}}}{315b^5x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*x^6),x, algorithm="fricas")
```

```
[Out] -2/315*(128*a^4*x^4 - 64*a^3*b*x^3 + 48*a^2*b^2*x^2 - 40*a*b^3*x
+ 35*b^4)*sqrt((a*x + b)/x)/(b^5*x^4)
```

Sympy [A] time = 17.8442, size = 4901, normalized size = 49.51

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**6/(a+b/x)**(1/2),x)
```

```
[Out] -256*a**(37/2)*b**(49/2)*x**14*sqrt(a*x/b + 1)/(315*a**(29/2)*b**
29*x**(29/2) + 3150*a**(27/2)*b**30*x**(27/2) + 14175*a**(25/2)*b
**31*x**(25/2) + 37800*a**(23/2)*b**32*x**(23/2) + 66150*a**(21/2
)*b**33*x**(21/2) + 79380*a**(19/2)*b**34*x**(19/2) + 66150*a**(1
7/2)*b**35*x**(17/2) + 37800*a**(15/2)*b**36*x**(15/2) + 14175*a*
*(13/2)*b**37*x**(13/2) + 3150*a**(11/2)*b**38*x**(11/2) + 315*a*
*(9/2)*b**39*x**(9/2)) - 2432*a**(35/2)*b**(51/2)*x**13*sqrt(a*x/
b + 1)/(315*a**(29/2)*b**29*x**(29/2) + 3150*a**(27/2)*b**30*x**(
27/2) + 14175*a**(25/2)*b**31*x**(25/2) + 37800*a**(23/2)*b**32*x
**(23/2) + 66150*a**(21/2)*b**33*x**(21/2) + 79380*a**(19/2)*b**3
```

4*x**(19/2) + 66150*a**(17/2)*b**35*x**(17/2) + 37800*a**(15/2)*b
36*x(15/2) + 14175*a**(13/2)*b**37*x**(13/2) + 3150*a**(11/2)
*b**38*x**(11/2) + 315*a**(9/2)*b**39*x**(9/2)) - 10336*a**(33/2)
*b**(53/2)*x**12*sqrt(a*x/b + 1)/(315*a**(29/2)*b**29*x**(29/2) +
 3150*a**(27/2)*b**30*x**(27/2) + 14175*a**(25/2)*b**31*x**(25/2)
 + 37800*a**(23/2)*b**32*x**(23/2) + 66150*a**(21/2)*b**33*x**(21
/2) + 79380*a**(19/2)*b**34*x**(19/2) + 66150*a**(17/2)*b**35*x**
(17/2) + 37800*a**(15/2)*b**36*x**(15/2) + 14175*a**(13/2)*b**37*
x**(13/2) + 3150*a**(11/2)*b**38*x**(11/2) + 315*a**(9/2)*b**39*x
(9/2)) - 25840*a(31/2)*b**(55/2)*x**11*sqrt(a*x/b + 1)/(315*a
(29/2)*b29*x**(29/2) + 3150*a**(27/2)*b**30*x**(27/2) + 14175
*a**(25/2)*b**31*x**(25/2) + 37800*a**(23/2)*b**32*x**(23/2) + 66
150*a**(21/2)*b**33*x**(21/2) + 79380*a**(19/2)*b**34*x**(19/2) +
 66150*a**(17/2)*b**35*x**(17/2) + 37800*a**(15/2)*b**36*x**(15/2
) + 14175*a**(13/2)*b**37*x**(13/2) + 3150*a**(11/2)*b**38*x**(11
/2) + 315*a**(9/2)*b**39*x**(9/2)) - 41990*a**(29/2)*b**(57/2)*x*
*10*sqrt(a*x/b + 1)/(315*a**(29/2)*b**29*x**(29/2) + 3150*a**(27/
2)*b**30*x**(27/2) + 14175*a**(25/2)*b**31*x**(25/2) + 37800*a**(
23/2)*b**32*x**(23/2) + 66150*a**(21/2)*b**33*x**(21/2) + 79380*a
(19/2)*b34*x**(19/2) + 66150*a**(17/2)*b**35*x**(17/2) + 3780
0*a**(15/2)*b**36*x**(15/2) + 14175*a**(13/2)*b**37*x**(13/2) + 3
150*a**(11/2)*b**38*x**(11/2) + 315*a**(9/2)*b**39*x**(9/2)) - 46
252*a**(27/2)*b**(59/2)*x**9*sqrt(a*x/b + 1)/(315*a**(29/2)*b**29
*x**(29/2) + 3150*a**(27/2)*b**30*x**(27/2) + 14175*a**(25/2)*b**
31*x**(25/2) + 37800*a**(23/2)*b**32*x**(23/2) + 66150*a**(21/2)*
b**33*x**(21/2) + 79380*a**(19/2)*b**34*x**(19/2) + 66150*a**(17/
2)*b**35*x**(17/2) + 37800*a**(15/2)*b**36*x**(15/2) + 14175*a**(
13/2)*b**37*x**(13/2) + 3150*a**(11/2)*b**38*x**(11/2) + 315*a**(
9/2)*b**39*x**(9/2)) - 35214*a**(25/2)*b**(61/2)*x**8*sqrt(a*x/b
 + 1)/(315*a**(29/2)*b**29*x**(29/2) + 3150*a**(27/2)*b**30*x**(27
/2) + 14175*a**(25/2)*b**31*x**(25/2) + 37800*a**(23/2)*b**32*x**
(23/2) + 66150*a**(21/2)*b**33*x**(21/2) + 79380*a**(19/2)*b**34*
x**(19/2) + 66150*a**(17/2)*b**35*x**(17/2) + 37800*a**(15/2)*b**
36*x**(15/2) + 14175*a**(13/2)*b**37*x**(13/2) + 3150*a**(11/2)*b
38*x(11/2) + 315*a**(9/2)*b**39*x**(9/2)) - 19632*a**(23/2)*b
(63/2)*x7*sqrt(a*x/b + 1)/(315*a**(29/2)*b**29*x**(29/2) + 31
50*a**(27/2)*b**30*x**(27/2) + 14175*a**(25/2)*b**31*x**(25/2) +
37800*a**(23/2)*b**32*x**(23/2) + 66150*a**(21/2)*b**33*x**(21/2)
 + 79380*a**(19/2)*b**34*x**(19/2) + 66150*a**(17/2)*b**35*x**(17
/2) + 37800*a**(15/2)*b**36*x**(15/2) + 14175*a**(13/2)*b**37*x**
(13/2) + 3150*a**(11/2)*b**38*x**(11/2) + 315*a**(9/2)*b**39*x**(
9/2)) - 10860*a**(21/2)*b**(65/2)*x**6*sqrt(a*x/b + 1)/(315*a**(2
9/2)*b**29*x**(29/2) + 3150*a**(27/2)*b**30*x**(27/2) + 14175*a**
(25/2)*b**31*x**(25/2) + 37800*a**(23/2)*b**32*x**(23/2) + 66150*
a**(21/2)*b**33*x**(21/2) + 79380*a**(19/2)*b**34*x**(19/2) + 661
50*a**(17/2)*b**35*x**(17/2) + 37800*a**(15/2)*b**36*x**(15/2) +
14175*a**(13/2)*b**37*x**(13/2) + 3150*a**(11/2)*b**38*x**(11/2)
 + 315*a**(9/2)*b**39*x**(9/2)) - 9160*a**(19/2)*b**(67/2)*x**5*sq
rt(a*x/b + 1)/(315*a**(29/2)*b**29*x**(29/2) + 3150*a**(27/2)*b**
30*x**(27/2) + 14175*a**(25/2)*b**31*x**(25/2) + 37800*a**(23/2)*
b**32*x**(23/2) + 66150*a**(21/2)*b**33*x**(21/2) + 79380*a**(19/
2)*b**34*x**(19/2) + 66150*a**(17/2)*b**35*x**(17/2) + 37800*a**(
15/2)*b**36*x**(15/2) + 14175*a**(13/2)*b**37*x**(13/2) + 3150*a*
*(11/2)*b**38*x**(11/2) + 315*a**(9/2)*b**39*x**(9/2)) - 8396*a**
(17/2)*b**(69/2)*x**4*sqrt(a*x/b + 1)/(315*a**(29/2)*b**29*x**(29
/2) + 3150*a**(27/2)*b**30*x**(27/2) + 14175*a**(25/2)*b**31*x**(
25/2) + 37800*a**(23/2)*b**32*x**(23/2) + 66150*a**(21/2)*b**33*x
(21/2) + 79380*a(19/2)*b**34*x**(19/2) + 66150*a**(17/2)*b**3
5*x**(17/2) + 37800*a**(15/2)*b**36*x**(15/2) + 14175*a**(13/2)*b
37*x(13/2) + 3150*a**(11/2)*b**38*x**(11/2) + 315*a**(9/2)*b*
*39*x**(9/2)) - 5632*a**(15/2)*b**(71/2)*x**3*sqrt(a*x/b + 1)/(31
5*a**(29/2)*b**29*x**(29/2) + 3150*a**(27/2)*b**30*x**(27/2) + 14
175*a**(25/2)*b**31*x**(25/2) + 37800*a**(23/2)*b**32*x**(23/2) +
 66150*a**(21/2)*b**33*x**(21/2) + 79380*a**(19/2)*b**34*x**(19/2
) + 66150*a**(17/2)*b**35*x**(17/2) + 37800*a**(15/2)*b**36*x**(1
5/2) + 14175*a**(13/2)*b**37*x**(13/2) + 3150*a**(11/2)*b**38*x**
(11/2) + 315*a**(9/2)*b**39*x**(9/2)) - 2446*a**(13/2)*b**(73/2)*
x**2*sqrt(a*x/b + 1)/(315*a**(29/2)*b**29*x**(29/2) + 3150*a**(27
/2)*b**30*x**(27/2) + 14175*a**(25/2)*b**31*x**(25/2) + 37800*a**
(23/2)*b**32*x**(23/2) + 66150*a**(21/2)*b**33*x**(21/2) + 79380*
a**(19/2)*b**34*x**(19/2) + 66150*a**(17/2)*b**35*x**(17/2) + 378
00*a**(15/2)*b**36*x**(15/2) + 14175*a**(13/2)*b**37*x**(13/2) +
3150*a**(11/2)*b**38*x**(11/2) + 315*a**(9/2)*b**39*x**(9/2)) - 6
20*a**(11/2)*b**(75/2)*x*sqrt(a*x/b + 1)/(315*a**(29/2)*b**29*x**

(29/2) + 3150*a**(27/2)*b**30*x**(27/2) + 14175*a**(25/2)*b**31*x
(25/2) + 37800*a(23/2)*b**32*x**(23/2) + 66150*a**(21/2)*b**3
3*x**(21/2) + 79380*a**(19/2)*b**34*x**(19/2) + 66150*a**(17/2)*b
35*x(17/2) + 37800*a**(15/2)*b**36*x**(15/2) + 14175*a**(13/2
)*b**37*x**(13/2) + 3150*a**(11/2)*b**38*x**(11/2) + 315*a**(9/2)
*b**39*x**(9/2)) - 70*a**(9/2)*b**(77/2)*sqrt(a*x/b + 1)/(315*a**
(29/2)*b**29*x**(29/2) + 3150*a**(27/2)*b**30*x**(27/2) + 14175*a
(25/2)*b31*x**(25/2) + 37800*a**(23/2)*b**32*x**(23/2) + 6615
0*a**(21/2)*b**33*x**(21/2) + 79380*a**(19/2)*b**34*x**(19/2) + 6
6150*a**(17/2)*b**35*x**(17/2) + 37800*a**(15/2)*b**36*x**(15/2)
+ 14175*a**(13/2)*b**37*x**(13/2) + 3150*a**(11/2)*b**38*x**(11/2
) + 315*a**(9/2)*b**39*x**(9/2)) + 256*a**19*b**24*x**(29/2)/(315
*a**(29/2)*b**29*x**(29/2) + 3150*a**(27/2)*b**30*x**(27/2) + 141
75*a**(25/2)*b**31*x**(25/2) + 37800*a**(23/2)*b**32*x**(23/2) +
66150*a**(21/2)*b**33*x**(21/2) + 79380*a**(19/2)*b**34*x**(19/2)
+ 66150*a**(17/2)*b**35*x**(17/2) + 37800*a**(15/2)*b**36*x**(15
/2) + 14175*a**(13/2)*b**37*x**(13/2) + 3150*a**(11/2)*b**38*x**(
11/2) + 315*a**(9/2)*b**39*x**(9/2)) + 2560*a**18*b**25*x**(27/2)
/(315*a**(29/2)*b**29*x**(29/2) + 3150*a**(27/2)*b**30*x**(27/2)
+ 14175*a**(25/2)*b**31*x**(25/2) + 37800*a**(23/2)*b**32*x**(23/
2) + 66150*a**(21/2)*b**33*x**(21/2) + 79380*a**(19/2)*b**34*x**(
19/2) + 66150*a**(17/2)*b**35*x**(17/2) + 37800*a**(15/2)*b**36*x
(15/2) + 14175*a(13/2)*b**37*x**(13/2) + 3150*a**(11/2)*b**38
*x**(11/2) + 315*a**(9/2)*b**39*x**(9/2)) + 11520*a**17*b**26*x**
(25/2)/(315*a**(29/2)*b**29*x**(29/2) + 3150*a**(27/2)*b**30*x**(
27/2) + 14175*a**(25/2)*b**31*x**(25/2) + 37800*a**(23/2)*b**32*x
(23/2) + 66150*a(21/2)*b**33*x**(21/2) + 79380*a**(19/2)*b**3
4*x**(19/2) + 66150*a**(17/2)*b**35*x**(17/2) + 37800*a**(15/2)*b
36*x(15/2) + 14175*a**(13/2)*b**37*x**(13/2) + 3150*a**(11/2)
*b**38*x**(11/2) + 315*a**(9/2)*b**39*x**(9/2)) + 30720*a**16*b**
27*x**(23/2)/(315*a**(29/2)*b**29*x**(29/2) + 3150*a**(27/2)*b**3
0*x**(27/2) + 14175*a**(25/2)*b**31*x**(25/2) + 37800*a**(23/2)*b
32*x(23/2) + 66150*a**(21/2)*b**33*x**(21/2) + 79380*a**(19/2
)*b**34*x**(19/2) + 66150*a**(17/2)*b**35*x**(17/2) + 37800*a**(1
5/2)*b**36*x**(15/2) + 14175*a**(13/2)*b**37*x**(13/2) + 3150*a**
(11/2)*b**38*x**(11/2) + 315*a**(9/2)*b**39*x**(9/2)) + 53760*a**
15*b**28*x**(21/2)/(315*a**(29/2)*b**29*x**(29/2) + 3150*a**(27/2
)*b**30*x**(27/2) + 14175*a**(25/2)*b**31*x**(25/2) + 37800*a**(2
3/2)*b**32*x**(23/2) + 66150*a**(21/2)*b**33*x**(21/2) + 79380*a*
*(19/2)*b**34*x**(19/2) + 66150*a**(17/2)*b**35*x**(17/2) + 37800
*a**(15/2)*b**36*x**(15/2) + 14175*a**(13/2)*b**37*x**(13/2) + 31
50*a**(11/2)*b**38*x**(11/2) + 315*a**(9/2)*b**39*x**(9/2)) + 645
12*a**14*b**29*x**(19/2)/(315*a**(29/2)*b**29*x**(29/2) + 3150*a*
*(27/2)*b**30*x**(27/2) + 14175*a**(25/2)*b**31*x**(25/2) + 37800
*a**(23/2)*b**32*x**(23/2) + 66150*a**(21/2)*b**33*x**(21/2) + 79
380*a**(19/2)*b**34*x**(19/2) + 66150*a**(17/2)*b**35*x**(17/2) +
37800*a**(15/2)*b**36*x**(15/2) + 14175*a**(13/2)*b**37*x**(13/2
) + 3150*a**(11/2)*b**38*x**(11/2) + 315*a**(9/2)*b**39*x**(9/2))
+ 53760*a**13*b**30*x**(17/2)/(315*a**(29/2)*b**29*x**(29/2) + 3
150*a**(27/2)*b**30*x**(27/2) + 14175*a**(25/2)*b**31*x**(25/2) +
37800*a**(23/2)*b**32*x**(23/2) + 66150*a**(21/2)*b**33*x**(21/2
) + 79380*a**(19/2)*b**34*x**(19/2) + 66150*a**(17/2)*b**35*x**(1
7/2) + 37800*a**(15/2)*b**36*x**(15/2) + 14175*a**(13/2)*b**37*x*
*(13/2) + 3150*a**(11/2)*b**38*x**(11/2) + 315*a**(9/2)*b**39*x**
(9/2)) + 30720*a**12*b**31*x**(15/2)/(315*a**(29/2)*b**29*x**(29/
2) + 3150*a**(27/2)*b**30*x**(27/2) + 14175*a**(25/2)*b**31*x**(2
5/2) + 37800*a**(23/2)*b**32*x**(23/2) + 66150*a**(21/2)*b**33*x*
*(21/2) + 79380*a**(19/2)*b**34*x**(19/2) + 66150*a**(17/2)*b**35
*x**(17/2) + 37800*a**(15/2)*b**36*x**(15/2) + 14175*a**(13/2)*b*
*37*x**(13/2) + 3150*a**(11/2)*b**38*x**(11/2) + 315*a**(9/2)*b**
39*x**(9/2)) + 11520*a**11*b**32*x**(13/2)/(315*a**(29/2)*b**29*x
(29/2) + 3150*a(27/2)*b**30*x**(27/2) + 14175*a**(25/2)*b**31
*x**(25/2) + 37800*a**(23/2)*b**32*x**(23/2) + 66150*a**(21/2)*b*
*33*x**(21/2) + 79380*a**(19/2)*b**34*x**(19/2) + 66150*a**(17/2)
*b**35*x**(17/2) + 37800*a**(15/2)*b**36*x**(15/2) + 14175*a**(13
/2)*b**37*x**(13/2) + 3150*a**(11/2)*b**38*x**(11/2) + 315*a**(9/
2)*b**39*x**(9/2)) + 2560*a**10*b**33*x**(11/2)/(315*a**(29/2)*b*
*29*x**(29/2) + 3150*a**(27/2)*b**30*x**(27/2) + 14175*a**(25/2)*
b**31*x**(25/2) + 37800*a**(23/2)*b**32*x**(23/2) + 66150*a**(21/
2)*b**33*x**(21/2) + 79380*a**(19/2)*b**34*x**(19/2) + 66150*a**(
17/2)*b**35*x**(17/2) + 37800*a**(15/2)*b**36*x**(15/2) + 14175*a
(13/2)*b37*x**(13/2) + 3150*a**(11/2)*b**38*x**(11/2) + 315*a
(9/2)*b39*x**(9/2)) + 256*a**9*b**34*x**(9/2)/(315*a**(29/2)*
b**29*x**(29/2) + 3150*a**(27/2)*b**30*x**(27/2) + 14175*a**(25/2

```
)*b**31*x**(25/2) + 37800*a**(23/2)*b**32*x**(23/2) + 66150*a**(2
1/2)*b**33*x**(21/2) + 79380*a**(19/2)*b**34*x**(19/2) + 66150*a*
*(17/2)*b**35*x**(17/2) + 37800*a**(15/2)*b**36*x**(15/2) + 14175
*a**(13/2)*b**37*x**(13/2) + 3150*a**(11/2)*b**38*x**(11/2) + 315
*a**(9/2)*b**39*x**(9/2))
```

GIAC/XCAS [A] time = 0.254545, size = 181, normalized size = 1.83

$$-\frac{2\left(315\,a^{4}b^{48}\sqrt{\frac{ax+b}{x}}-\frac{420\,(ax+b)a^{3}b^{48}\sqrt{\frac{ax+b}{x}}}{x}+\frac{378\,(ax+b)^{2}a^{2}b^{48}\sqrt{\frac{ax+b}{x}}}{x^{2}}-\frac{180\,(ax+b)^{3}ab^{48}\sqrt{\frac{ax+b}{x}}}{x^{3}}+\frac{35\,(ax+b)^{4}b^{48}\sqrt{\frac{ax+b}{x}}}{x^{4}}\right)}{315\,b^{53}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*x^6),x, algorithm="giac")
```

```
[Out] -2/315*(315*a^4*b^48*sqrt((a*x + b)/x) - 420*(a*x + b)*a^3*b^48*s
qrt((a*x + b)/x)/x + 378*(a*x + b)^2*a^2*b^48*sqrt((a*x + b)/x)/x
^2 - 180*(a*x + b)^3*a*b^48*sqrt((a*x + b)/x)/x^3 + 35*(a*x + b)^
4*b^48*sqrt((a*x + b)/x)/x^4)/b^53
```

3.1730 $\int \frac{x^2}{\left(a+\frac{b}{x}\right)^{3/2}}\,dx$

Optimal. Leaf size=115

$$-\frac{35b^3\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{8a^{9/2}}+\frac{35b^2x\sqrt{a+\frac{b}{x}}}{8a^4}-\frac{35bx^2\sqrt{a+\frac{b}{x}}}{12a^3}+\frac{7x^3\sqrt{a+\frac{b}{x}}}{3a^2}-\frac{2x^3}{a\sqrt{a+\frac{b}{x}}}$$

```
[Out] (35*b^2*Sqrt[a + b/x]*x)/(8*a^4) - (35*b*Sqrt[a + b/x]*x^2)/(12*a
^3) - (2*x^3)/(a*Sqrt[a + b/x]) + (7*Sqrt[a + b/x]*x^3)/(3*a^2) -
 (35*b^3*ArcTanh[Sqrt[a + b/x]/Sqrt[a]])/(8*a^(9/2))
```

Rubi [A] time = 0.162194, antiderivative size = 115, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{35b^3\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{8a^{9/2}}+\frac{35b^2x\sqrt{a+\frac{b}{x}}}{8a^4}-\frac{35bx^2\sqrt{a+\frac{b}{x}}}{12a^3}+\frac{7x^3\sqrt{a+\frac{b}{x}}}{3a^2}-\frac{2x^3}{a\sqrt{a+\frac{b}{x}}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b/x)^(3/2),x]
```

```
[Out] (35*b^2*Sqrt[a + b/x]*x)/(8*a^4) - (35*b*Sqrt[a + b/x]*x^2)/(12*a
^3) - (2*x^3)/(a*Sqrt[a + b/x]) + (7*Sqrt[a + b/x]*x^3)/(3*a^2) -
 (35*b^3*ArcTanh[Sqrt[a + b/x]/Sqrt[a]])/(8*a^(9/2))
```

Rubi in Sympy [A] time = 16.8451, size = 100, normalized size = 0.87

$$-\frac{2x^3}{a\sqrt{a+\frac{b}{x}}}+\frac{7x^3\sqrt{a+\frac{b}{x}}}{3a^2}-\frac{35bx^2\sqrt{a+\frac{b}{x}}}{12a^3}+\frac{35b^2x\sqrt{a+\frac{b}{x}}}{8a^4}-\frac{35b^3\,\mathrm{atanh}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{8a^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b/x)**(3/2),x)
```

```
[Out] -2*x**3/(a*sqrt(a + b/x)) + 7*x**3*sqrt(a + b/x)/(3*a**2) - 35*b*
x**2*sqrt(a + b/x)/(12*a**3) + 35*b**2*x*sqrt(a + b/x)/(8*a**4) -
 35*b**3*atanh(sqrt(a + b/x)/sqrt(a))/(8*a**(9/2))
```

Mathematica [A] time = 0.185158, size = 95, normalized size = 0.83

$$\frac{x\sqrt{a+\frac{b}{x}}\left(8a^3x^3-14a^2bx^2+35ab^2x+105b^3\right)}{24a^4(ax+b)}-\frac{35b^3\log\left(2\sqrt{a}x\sqrt{a+\frac{b}{x}}+2ax+b\right)}{16a^{9/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a + b/x)^(3/2),x]
```

```
[Out] (Sqrt[a + b/x]*x*(105*b^3 + 35*a*b^2*x - 14*a^2*b*x^2 + 8*a^3*x^3
))/(24*a^4*(b + a*x)) - (35*b^3*Log[b + 2*a*x + 2*Sqrt[a]*Sqrt[a
+ b/x]*x])/(16*a^(9/2))
```

Maple [B] time = 0.023, size = 462, normalized size = 4.

$$\frac{x}{48\,(ax+b)^2}\sqrt{\frac{ax+b}{x}}\left(16\,a^{15/2}\left(ax^2+bx\right)^{3/2}x^2-60\,a^{15/2}\sqrt{ax^2+bx}x^3b+32\,a^{13/2}\left(ax^2+bx\right)^{3/2}xb-150\,a^{13/2}\sqrt{ax^2+bx}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(a+b/x)^(3/2),x)
```

```
[Out] 1/48*((a*x+b)/x)^(1/2)*x/a^(17/2)*(16*a^(15/2)*(a*x^2+b*x)^(3/2)*
x^2-60*a^(15/2)*(a*x^2+b*x)^(1/2)*x^3*b+32*a^(13/2)*(a*x^2+b*x)^(
3/2)*x*b-150*a^(13/2)*(a*x^2+b*x)^(1/2)*x^2*b^2+240*a^(13/2)*(x*(
a*x+b))^(1/2)*x^2*b^2+16*a^(11/2)*(a*x^2+b*x)^(3/2)*b^2-120*a^(11
/2)*(a*x^2+b*x)^(1/2)*x*b^3-96*b^2*a^(11/2)*(x*(a*x+b))^(3/2)+480
*a^(11/2)*(x*(a*x+b))^(1/2)*x*b^3-30*a^(9/2)*(a*x^2+b*x)^(1/2)*b^
4+240*a^(9/2)*(x*(a*x+b))^(1/2)*b^4+15*ln(1/2*(2*(a*x^2+b*x)^(1/2
)*a^(1/2)+2*a*x+b)/a^(1/2))*x^2*a^6*b^3-120*ln(1/2*(2*(x*(a*x+b))
^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*x^2*a^6*b^3+30*ln(1/2*(2*(a*x^2+
b*x)^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*x*a^5*b^4-240*ln(1/2*(2*(x*(
a*x+b))^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*x*a^5*b^4+15*ln(1/2*(2*(a
*x^2+b*x)^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*a^4*b^5-120*ln(1/2*(2*(
x*(a*x+b))^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*a^4*b^5)/(x*(a*x+b))^(
1/2)/(a*x+b)^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.243995, size = 1, normalized size = 0.01

$$\left[\frac{105\,b^3\sqrt{\frac{ax+b}{x}}\log\left(-2\,ax\sqrt{\frac{ax+b}{x}}+(2\,ax+b)\sqrt{a}\right)+2\left(8\,a^3x^3-14\,a^2bx^2+35\,ab^2x+105\,b^3\right)\sqrt{a}}{48\,a^{\frac{9}{2}}\sqrt{\frac{ax+b}{x}}},\frac{105\,b^3\sqrt{\frac{ax+b}{x}}\arctan\left(\frac{}{\sqrt{-a}}\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x)^(3/2),x, algorithm="fricas")
```

```
[Out] [1/48*(105*b^3*sqrt((a*x + b)/x)*log(-2*a*x*sqrt((a*x + b)/x) + (
2*a*x + b)*sqrt(a)) + 2*(8*a^3*x^3 - 14*a^2*b*x^2 + 35*a*b^2*x +
105*b^3)*sqrt(a))/(a^(9/2)*sqrt((a*x + b)/x)), 1/24*(105*b^3*sqrt
((a*x + b)/x)*arctan(a/(sqrt(-a)*sqrt((a*x + b)/x))) + (8*a^3*x^3
 - 14*a^2*b*x^2 + 35*a*b^2*x + 105*b^3)*sqrt(-a))/(sqrt(-a)*a^4*s
qrt((a*x + b)/x))]
```

Sympy [A] time = 27.0753, size = 133, normalized size = 1.16

$$\frac{x^{\frac{7}{2}}}{3a\sqrt{b}\sqrt{\frac{ax}{b}+1}}-\frac{7\sqrt{b}x^{\frac{5}{2}}}{12a^2\sqrt{\frac{ax}{b}+1}}+\frac{35b^{\frac{3}{2}}x^{\frac{3}{2}}}{24a^3\sqrt{\frac{ax}{b}+1}}+\frac{35b^{\frac{5}{2}}\sqrt{x}}{8a^4\sqrt{\frac{ax}{b}+1}}-\frac{35b^3\operatorname{asinh}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{8a^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b/x)**(3/2),x)
```

```
[Out] x**(7/2)/(3*a*sqrt(b)*sqrt(a*x/b + 1)) - 7*sqrt(b)*x**(5/2)/(12*a
**2*sqrt(a*x/b + 1)) + 35*b**(3/2)*x**(3/2)/(24*a**3*sqrt(a*x/b +
 1)) + 35*b**(5/2)*sqrt(x)/(8*a**4*sqrt(a*x/b + 1)) - 35*b**3*asi
nh(sqrt(a)*sqrt(x)/sqrt(b))/(8*a**(9/2))
```

GIAC/XCAS [A] time = 0.260497, size = 194, normalized size = 1.69

$$\frac{1}{24}b\left(\frac{105\,b^2\arctan\left(\frac{\sqrt{\frac{ax+b}{x}}}{\sqrt{-a}}\right)}{\sqrt{-a}a^4}+\frac{48\,b^2}{a^4\sqrt{\frac{ax+b}{x}}}-\frac{87\,a^2b^2\sqrt{\frac{ax+b}{x}}-\frac{136\,(ax+b)ab^2\sqrt{\frac{ax+b}{x}}}{x}+\frac{57\,(ax+b)^2b^2\sqrt{\frac{ax+b}{x}}}{x^2}}{\left(a-\frac{ax+b}{x}\right)^3a^4}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x)^(3/2),x, algorithm="giac")
```

```
[Out] 1/24*b*(105*b^2*arctan(sqrt((a*x + b)/x)/sqrt(-a))/(sqrt(-a)*a^4)
 + 48*b^2/(a^4*sqrt((a*x + b)/x)) - (87*a^2*b^2*sqrt((a*x + b)/x)
 - 136*(a*x + b)*a*b^2*sqrt((a*x + b)/x)/x + 57*(a*x + b)^2*b^2*s
qrt((a*x + b)/x)/x^2)/((a - (a*x + b)/x)^3*a^4))
```

3.1731 $\int \frac{x}{\left(a+\frac{b}{x}\right)^{3/2}}\,dx$

Optimal. Leaf size=91

$$\frac{15b^2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{4a^{7/2}}-\frac{15bx\sqrt{a+\frac{b}{x}}}{4a^3}+\frac{5x^2\sqrt{a+\frac{b}{x}}}{2a^2}-\frac{2x^2}{a\sqrt{a+\frac{b}{x}}}$$

```
[Out] (-15*b*Sqrt[a + b/x]*x)/(4*a^3) - (2*x^2)/(a*Sqrt[a + b/x]) + (5*
Sqrt[a + b/x]*x^2)/(2*a^2) + (15*b^2*ArcTanh[Sqrt[a + b/x]/Sqrt[a
]])/(4*a^(7/2))
```

Rubi [A] time = 0.119663, antiderivative size = 91, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{15b^2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{4a^{7/2}}-\frac{15bx\sqrt{a+\frac{b}{x}}}{4a^3}+\frac{5x^2\sqrt{a+\frac{b}{x}}}{2a^2}-\frac{2x^2}{a\sqrt{a+\frac{b}{x}}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b/x)^(3/2),x]
```

```
[Out] (-15*b*Sqrt[a + b/x]*x)/(4*a^3) - (2*x^2)/(a*Sqrt[a + b/x]) + (5*
Sqrt[a + b/x]*x^2)/(2*a^2) + (15*b^2*ArcTanh[Sqrt[a + b/x]/Sqrt[a
]])/(4*a^(7/2))
```

Rubi in Sympy [A] time = 12.2943, size = 78, normalized size = 0.86

$$-\frac{2x^2}{a\sqrt{a+\frac{b}{x}}}+\frac{5x^2\sqrt{a+\frac{b}{x}}}{2a^2}-\frac{15bx\sqrt{a+\frac{b}{x}}}{4a^3}+\frac{15b^2\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{4a^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b/x)**(3/2),x)
```

```
[Out] -2*x**2/(a*sqrt(a + b/x)) + 5*x**2*sqrt(a + b/x)/(2*a**2) - 15*b*
x*sqrt(a + b/x)/(4*a**3) + 15*b**2*atanh(sqrt(a + b/x)/sqrt(a))/(
4*a**(7/2))
```

Mathematica [A] time = 0.139778, size = 84, normalized size = 0.92

$$\frac{15b^2\log\left(2\sqrt{a}x\sqrt{a+\frac{b}{x}}+2ax+b\right)}{8a^{7/2}}+\frac{x\sqrt{a+\frac{b}{x}}\left(2a^2x^2-5abx-15b^2\right)}{4a^3(ax+b)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b/x)^(3/2),x]
```

```
[Out] (Sqrt[a + b/x]*x*(-15*b^2 - 5*a*b*x + 2*a^2*x^2))/(4*a^3*(b + a*x
)) + (15*b^2*Log[b + 2*a*x + 2*Sqrt[a]*Sqrt[a + b/x]*x])/(8*a^(7/
2))
```

Maple [B] time = 0.018, size = 397, normalized size = 4.4

$$-\frac{x}{8\,(ax+b)^2}\sqrt{\frac{ax+b}{x}}\left(-4\,a^{13/2}\sqrt{ax^2+bx}x^3-10\,a^{11/2}\sqrt{ax^2+bx}x^2b+32\,a^{11/2}\sqrt{x\,(ax+b)}x^2b-8\,a^{9/2}\sqrt{ax^2+bx}xb^2-16\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a+b/x)^(3/2),x)
```

```
[Out] -1/8*((a*x+b)/x)^(1/2)*x/a^(13/2)*(-4*a^(13/2)*(a*x^2+b*x)^(1/2)*
x^3-10*a^(11/2)*(a*x^2+b*x)^(1/2)*x^2*b+32*a^(11/2)*(x*(a*x+b))^(
1/2)*x^2*b-8*a^(9/2)*(a*x^2+b*x)^(1/2)*x*b^2-16*b*a^(9/2)*(x*(a*x
+b))^(3/2)+64*a^(9/2)*(x*(a*x+b))^(1/2)*x*b^2-2*a^(7/2)*(a*x^2+b*
x)^(1/2)*b^3+32*a^(7/2)*(x*(a*x+b))^(1/2)*b^3+ln(1/2*(2*(a*x^2+b*
x)^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*x^2*a^5*b^2-16*ln(1/2*(2*(x*(a
*x+b))^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*x^2*a^5*b^2+2*ln(1/2*(2*(a
*x^2+b*x)^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*x*a^4*b^3-32*ln(1/2*(2*
(x*(a*x+b))^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*x*a^4*b^3+ln(1/2*(2*(
a*x^2+b*x)^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*a^3*b^4-16*ln(1/2*(2*(
x*(a*x+b))^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*a^3*b^4)/(x*(a*x+b))^(
1/2)/(a*x+b)^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a + b/x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.243053, size = 1, normalized size = 0.01

$$\left[\frac{15\,b^2\sqrt{\frac{ax+b}{x}}\log\left(2\,ax\sqrt{\frac{ax+b}{x}}+(2\,ax+b)\sqrt{a}\right)+2\left(2\,a^2x^2-5\,abx-15\,b^2\right)\sqrt{a}}{8\,a^{\frac{7}{2}}\sqrt{\frac{ax+b}{x}}},\ -\frac{15\,b^2\sqrt{\frac{ax+b}{x}}\arctan\left(\frac{a}{\sqrt{-a}\sqrt{\frac{ax+b}{x}}}\right)-\left(2\,a^2x^2-5\,abx-15\,b^2\right)\sqrt{-a}}{4\,\sqrt{-a}a^3\sqrt{\frac{ax+b}{x}}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a + b/x)^(3/2),x, algorithm="fricas")
```

```
[Out] [1/8*(15*b^2*sqrt((a*x + b)/x)*log(2*a*x*sqrt((a*x + b)/x) + (2*a
*x + b)*sqrt(a)) + 2*(2*a^2*x^2 - 5*a*b*x - 15*b^2)*sqrt(a))/(a^(
7/2)*sqrt((a*x + b)/x)), -1/4*(15*b^2*sqrt((a*x + b)/x)*arctan(a/
(sqrt(-a)*sqrt((a*x + b)/x))) - (2*a^2*x^2 - 5*a*b*x - 15*b^2)*sq
rt(-a))/(sqrt(-a)*a^3*sqrt((a*x + b)/x))]
```

Sympy [A] time = 18.1049, size = 105, normalized size = 1.15

$$\frac{x^{\frac{5}{2}}}{2a\sqrt{b}\sqrt{\frac{ax}{b}+1}}-\frac{5\sqrt{b}x^{\frac{3}{2}}}{4a^{2}\sqrt{\frac{ax}{b}+1}}-\frac{15b^{\frac{3}{2}}\sqrt{x}}{4a^{3}\sqrt{\frac{ax}{b}+1}}+\frac{15b^{2}\operatorname{asinh}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{4a^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b/x)**(3/2),x)
```

```
[Out] x**(5/2)/(2*a*sqrt(b)*sqrt(a*x/b + 1)) - 5*sqrt(b)*x**(3/2)/(4*a*
*2*sqrt(a*x/b + 1)) - 15*b**(3/2)*sqrt(x)/(4*a**3*sqrt(a*x/b + 1)
) + 15*b**2*asinh(sqrt(a)*sqrt(x)/sqrt(b))/(4*a**(7/2))
```

GIAC/XCAS [A] time = 0.260516, size = 142, normalized size = 1.56

$$-\frac{1}{4}b^{2}\left(\frac{15\arctan\left(\frac{\sqrt{\frac{ax+b}{x}}}{\sqrt{-a}}\right)}{\sqrt{-a}a^{3}}+\frac{8}{a^{3}\sqrt{\frac{ax+b}{x}}}-\frac{9a\sqrt{\frac{ax+b}{x}}-\frac{7(ax+b)\sqrt{\frac{ax+b}{x}}}{x}}{\left(a-\frac{ax+b}{x}\right)^{2}a^{3}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x)^(3/2),x, algorithm="giac")
```

```
[Out] -1/4*b^2*(15*arctan(sqrt((a*x + b)/x)/sqrt(-a))/(sqrt(-a)*a^3) +
8/(a^3*sqrt((a*x + b)/x)) - (9*a*sqrt((a*x + b)/x) - 7*(a*x + b)*
sqrt((a*x + b)/x)/x)/((a - (a*x + b)/x)^2*a^3))
```

3.1732 $\int \frac{1}{\left(a+\frac{b}{x}\right)^{3/2}}\,dx$

Optimal. Leaf size=61

$$-\frac{3b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{a^{5/2}}+\frac{3x\sqrt{a+\frac{b}{x}}}{a^2}-\frac{2x}{a\sqrt{a+\frac{b}{x}}}$$

```
[Out] (-2*x)/(a*Sqrt[a + b/x]) + (3*Sqrt[a + b/x]*x)/a^2 - (3*b*ArcTanh
[Sqrt[a + b/x]/Sqrt[a]])/a^(5/2)
```

Rubi [A] time = 0.0809007, antiderivative size = 61, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364

$$-\frac{3b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{a^{5/2}}+\frac{3x\sqrt{a+\frac{b}{x}}}{a^2}-\frac{2x}{a\sqrt{a+\frac{b}{x}}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(-3/2),x]
```

```
[Out] (-2*x)/(a*Sqrt[a + b/x]) + (3*Sqrt[a + b/x]*x)/a^2 - (3*b*ArcTanh
[Sqrt[a + b/x]/Sqrt[a]])/a^(5/2)
```

Rubi in Sympy [A] time = 8.13374, size = 51, normalized size = 0.84

$$-\frac{2x}{a\sqrt{a+\frac{b}{x}}}+\frac{3x\sqrt{a+\frac{b}{x}}}{a^2}-\frac{3b\,\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**(3/2),x)
```

```
[Out] -2*x/(a*sqrt(a + b/x)) + 3*x*sqrt(a + b/x)/a**2 - 3*b*atanh(sqrt(
a + b/x)/sqrt(a))/a**(5/2)
```

Mathematica [A] time = 0.116646, size = 67, normalized size = 1.1

$$\frac{x\sqrt{a+\frac{b}{x}}(ax+3b)}{a^2(ax+b)}-\frac{3b\log\left(2\sqrt{a}x\sqrt{a+\frac{b}{x}}+2ax+b\right)}{2a^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(-3/2),x]
```

```
[Out] (Sqrt[a + b/x]*x*(3*b + a*x))/(a^2*(b + a*x)) - (3*b*Log[b + 2*a*
x + 2*Sqrt[a]*Sqrt[a + b/x]*x])/(2*a^(5/2))
```

Maple [B] time = 0.013, size = 203, normalized size = 3.3

$$-\frac{x}{2\,(ax+b)^2}\sqrt{\frac{ax+b}{x}}\left(-6\,a^{9/2}\sqrt{x\,(ax+b)}x^2+4\,a^{7/2}\,(x\,(ax+b))^{3/2}-12\,a^{7/2}\sqrt{x\,(ax+b)}xb+3\,\ln\left(1/2\,\frac{2\,\sqrt{x\,(ax+b)}\sqrt{a}+}{\sqrt{a}}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^(3/2),x)
```

```
[Out] -1/2*((a*x+b)/x)^(1/2)*x/a^(9/2)*(-6*a^(9/2)*(x*(a*x+b))^(1/2)*x^
2+4*a^(7/2)*(x*(a*x+b))^(3/2)-12*a^(7/2)*(x*(a*x+b))^(1/2)*x*b+3*
ln(1/2*(2*(x*(a*x+b))^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*x^2*a^4*b-6
*a^(5/2)*(x*(a*x+b))^(1/2)*b^2+6*ln(1/2*(2*(x*(a*x+b))^(1/2)*a^(1
/2)+2*a*x+b)/a^(1/2))*x*a^3*b^2+3*ln(1/2*(2*(x*(a*x+b))^(1/2)*a^(
1/2)+2*a*x+b)/a^(1/2))*a^2*b^3)/(x*(a*x+b))^(1/2)/(a*x+b)^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(-3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.255671, size = 1, normalized size = 0.02

$$\left[\frac{3\,b\sqrt{\frac{ax+b}{x}}\log\left(-2\,ax\sqrt{\frac{ax+b}{x}}+(2\,ax+b)\sqrt{a}\right)+2\,(ax+3\,b)\sqrt{a}}{2\,a^{\frac{5}{2}}\sqrt{\frac{ax+b}{x}}},\ \frac{3\,b\sqrt{\frac{ax+b}{x}}\arctan\left(\frac{a}{\sqrt{-a}\sqrt{\frac{ax+b}{x}}}\right)+(ax+3\,b)\sqrt{-a}}{\sqrt{-a}a^2\sqrt{\frac{ax+b}{x}}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(-3/2),x, algorithm="fricas")
```

```
[Out] [1/2*(3*b*sqrt((a*x + b)/x)*log(-2*a*x*sqrt((a*x + b)/x) + (2*a*x
 + b)*sqrt(a)) + 2*(a*x + 3*b)*sqrt(a))/(a^(5/2)*sqrt((a*x + b)/x
)), (3*b*sqrt((a*x + b)/x)*arctan(a/(sqrt(-a)*sqrt((a*x + b)/x)))
 + (a*x + 3*b)*sqrt(-a))/(sqrt(-a)*a^2*sqrt((a*x + b)/x))]
```

Sympy [A] time = 10.9909, size = 71, normalized size = 1.16

$$\frac{x^{\frac{3}{2}}}{a\sqrt{b}\sqrt{\frac{ax}{b}+1}}+\frac{3\sqrt{b}\sqrt{x}}{a^2\sqrt{\frac{ax}{b}+1}}-\frac{3b\,\mathrm{asinh}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(3/2),x)
```

```
[Out] x**(3/2)/(a*sqrt(b)*sqrt(a*x/b + 1)) + 3*sqrt(b)*sqrt(x)/(a**2*sq
rt(a*x/b + 1)) - 3*b*asinh(sqrt(a)*sqrt(x)/sqrt(b))/a**(5/2)
```

GIAC/XCAS [A] time = 0.270231, size = 116, normalized size = 1.9

$$b\left(\frac{3\,\arctan\left(\frac{\sqrt{\frac{ax+b}{x}}}{\sqrt{-a}}\right)}{\sqrt{-a}a^2} + \frac{2\,a - \frac{3\,(ax+b)}{x}}{\left(a\sqrt{\frac{ax+b}{x}} - \frac{(ax+b)\sqrt{\frac{ax+b}{x}}}{x}\right)a^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(-3/2),x, algorithm="giac")
```

```
[Out] b*(3*arctan(sqrt((a*x + b)/x)/sqrt(-a))/(sqrt(-a)*a^2) + (2*a - 3
*(a*x + b)/x)/((a*sqrt((a*x + b)/x) - (a*x + b)*sqrt((a*x + b)/x)
/x)*a^2))
```

3.1733 $\int \frac{1}{\left(a+\frac{b}{x}\right)^{3/2} x} \, dx$

Optimal. Leaf size=42

$$\frac{2 \tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{a^{3/2}}-\frac{2}{a \sqrt{a+\frac{b}{x}}}$$

```
[Out] -2/(a*Sqrt[a + b/x]) + (2*ArcTanh[Sqrt[a + b/x]/Sqrt[a]])/a^(3/2)
```

Rubi [A] time = 0.0714656, antiderivative size = 42, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{2 \tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{a^{3/2}}-\frac{2}{a \sqrt{a+\frac{b}{x}}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b/x)^(3/2)*x),x]
```

```
[Out] -2/(a*Sqrt[a + b/x]) + (2*ArcTanh[Sqrt[a + b/x]/Sqrt[a]])/a^(3/2)
```

Rubi in Sympy [A] time = 6.9679, size = 32, normalized size = 0.76

$$-\frac{2}{a \sqrt{a+\frac{b}{x}}}+\frac{2 \operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b/x)**(3/2)/x,x)
```

```
[Out] -2/(a*sqrt(a + b/x)) + 2*atanh(sqrt(a + b/x)/sqrt(a))/a**(3/2)
```

Mathematica [A] time = 0.0763326, size = 57, normalized size = 1.36

$$\frac{\log \left(2 \sqrt{a} x \sqrt{a+\frac{b}{x}}+2 a x+b\right)}{a^{3/2}}-\frac{2 x \sqrt{a+\frac{b}{x}}}{a(a x+b)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b/x)^(3/2)*x),x]
```

```
[Out] (-2*Sqrt[a + b/x]*x)/(a*(b + a*x)) + Log[b + 2*a*x + 2*Sqrt[a]*Sq
rt[a + b/x]*x]/a^(3/2)
```

Maple [B] time = 0.011, size = 198, normalized size = 4.7

$$\frac{x}{b\,(ax+b)^2}\sqrt{\frac{ax+b}{x}}\left(\ln\left(\frac{1}{2}\left(2\sqrt{x\,(ax+b)}\sqrt{a}+2\,ax+b\right)\frac{1}{\sqrt{a}}\right)x^2a^2b-2\,a^{5/2}\sqrt{x\,(ax+b)}x^2+2\,\ln\left(1/2\,\frac{2\sqrt{x\,(ax+b)}\sqrt{a}+\cdots}{\sqrt{a}}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^(3/2)/x,x)
```

```
[Out] ((a*x+b)/x)^(1/2)*x/a^(3/2)*(ln(1/2*(2*(x*(a*x+b))^(1/2)*a^(1/2)+
2*a*x+b)/a^(1/2))*x^2*a^2*b-2*a^(5/2)*(x*(a*x+b))^(1/2)*x^2+2*ln(
1/2*(2*(x*(a*x+b))^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*x*a*b^2+2*a^(3
/2)*(x*(a*x+b))^(3/2)-4*a^(3/2)*(x*(a*x+b))^(1/2)*x*b+ln(1/2*(2*(
x*(a*x+b))^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*b^3-2*a^(1/2)*(x*(a*x+
b))^(1/2)*b^2)/(x*(a*x+b))^(1/2)/b/(a*x+b)^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.248218, size = 1, normalized size = 0.02

$$\left[\frac{\sqrt{\frac{ax+b}{x}}\log\left(2\,ax\sqrt{\frac{ax+b}{x}}+(2\,ax+b)\sqrt{a}\right)-2\,\sqrt{a}}{a^{\frac{3}{2}}\sqrt{\frac{ax+b}{x}}},\,-\frac{2\left(\sqrt{\frac{ax+b}{x}}\arctan\left(\frac{a}{\sqrt{-a}\sqrt{\frac{ax+b}{x}}}\right)+\sqrt{-a}\right)}{\sqrt{-a}a\sqrt{\frac{ax+b}{x}}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x),x, algorithm="fricas")
```

```
[Out] [(sqrt((a*x + b)/x)*log(2*a*x*sqrt((a*x + b)/x) + (2*a*x + b)*sqr
t(a)) - 2*sqrt(a))/(a^(3/2)*sqrt((a*x + b)/x)), -2*(sqrt((a*x + b
)/x)*arctan(a/(sqrt(-a)*sqrt((a*x + b)/x))) + sqrt(-a))/(sqrt(-a)
*a*sqrt((a*x + b)/x))]
```

Sympy [A] time = 6.63779, size = 148, normalized size = 3.52

$$-\frac{2a^3x\sqrt{1+\frac{b}{ax}}}{a^{\frac{9}{2}}x+a^{\frac{7}{2}}b}-\frac{a^3x\log\left(\frac{b}{ax}\right)}{a^{\frac{9}{2}}x+a^{\frac{7}{2}}b}+\frac{2a^3x\log\left(\sqrt{1+\frac{b}{ax}}+1\right)}{a^{\frac{9}{2}}x+a^{\frac{7}{2}}b}-\frac{a^2b\log\left(\frac{b}{ax}\right)}{a^{\frac{9}{2}}x+a^{\frac{7}{2}}b}+\frac{2a^2b\log\left(\sqrt{1+\frac{b}{ax}}+1\right)}{a^{\frac{9}{2}}x+a^{\frac{7}{2}}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(3/2)/x,x)
```

```
[Out] -2*a**3*x*sqrt(1 + b/(a*x))/(a**(9/2)*x + a**(7/2)*b) - a**3*x*lo
g(b/(a*x))/(a**(9/2)*x + a**(7/2)*b) + 2*a**3*x*log(sqrt(1 + b/(a
*x)) + 1)/(a**(9/2)*x + a**(7/2)*b) - a**2*b*log(b/(a*x))/(a**(9/
```

```
2)*x + a**(7/2)*b) + 2*a**2*b*log(sqrt(1 + b/(a*x)) + 1)/(a**(9/2
)*x + a**(7/2)*b)
```

GIAC/XCAS [A] time = 0.263957, size = 70, normalized size = 1.67

$$-2\,b\left(\frac{\arctan\left(\frac{\sqrt{\frac{ax+b}{x}}}{\sqrt{-a}}\right)}{\sqrt{-a}ab}+\frac{1}{ab\sqrt{\frac{ax+b}{x}}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x),x, algorithm="giac")
```

```
[Out] -2*b*(arctan(sqrt((a*x + b)/x)/sqrt(-a))/(sqrt(-a)*a*b) + 1/(a*b*
sqrt((a*x + b)/x)))
```

3.1734 $\int \frac{1}{\left(a+\frac{b}{x}\right)^{3/2} x^2} \, dx$

Optimal. Leaf size=16

$$\frac{2}{b\sqrt{a+\frac{b}{x}}}$$

```
[Out] 2/(b*Sqrt[a + b/x])
```

Rubi [A] time = 0.0271752, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$\frac{2}{b\sqrt{a+\frac{b}{x}}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b/x)^(3/2)*x^2),x]

[Out] 2/(b*Sqrt[a + b/x])
```

Rubi in Sympy [A] time = 2.17046, size = 10, normalized size = 0.62

$$\frac{2}{b\sqrt{a+\frac{b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b/x)**(3/2)/x**2,x)

[Out] 2/(b*sqrt(a + b/x))
```

Mathematica [A] time = 0.0219579, size = 16, normalized size = 1.

$$\frac{2}{b\sqrt{a+\frac{b}{x}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b/x)^(3/2)*x^2),x]

[Out] 2/(b*Sqrt[a + b/x])
```

Maple [A] time = 0.008, size = 25, normalized size = 1.6

$$2\,\frac{ax+b}{bx}\left(\frac{ax+b}{x}\right)^{-3/2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^(3/2)/x^2,x)
```

```
[Out] 2/x*(a*x+b)/b/((a*x+b)/x)^(3/2)
```

Maxima [A] time = 1.43695, size = 19, normalized size = 1.19

$$\frac{2}{\sqrt{a+\frac{b}{x}}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x^2),x, algorithm="maxima")
```

```
[Out] 2/(sqrt(a + b/x)*b)
```

Fricas [A] time = 0.230679, size = 22, normalized size = 1.38

$$\frac{2}{b\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x^2),x, algorithm="fricas")
```

```
[Out] 2/(b*sqrt((a*x + b)/x))
```

Sympy [A] time = 4.43499, size = 20, normalized size = 1.25

$$\begin{cases} \frac{2}{b\sqrt{a+\frac{b}{x}}} & \text{for } b \neq 0 \\ -\frac{1}{a^{\frac{3}{2}}x} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(3/2)/x**2,x)
```

```
[Out] Piecewise((2/(b*sqrt(a + b/x)), Ne(b, 0)), (-1/(a**(3/2)*x), True
))
```

GIAC/XCAS [A] time = 0.263057, size = 19, normalized size = 1.19

$$\frac{2}{\sqrt{a+\frac{b}{x}}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x^2),x, algorithm="giac")
```

```
[Out] 2/(sqrt(a + b/x)*b)
```

3.1735 $\int \frac{1}{\left(a+\frac{b}{x}\right)^{3/2} x^3} dx$

Optimal. Leaf size=34

$$-\frac{2a}{b^2\sqrt{a+\frac{b}{x}}}-\frac{2\sqrt{a+\frac{b}{x}}}{b^2}$$

```
[Out] (-2*a)/(b^2*Sqrt[a + b/x]) - (2*Sqrt[a + b/x])/b^2
```

Rubi [A] time = 0.0572949, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2a}{b^2\sqrt{a+\frac{b}{x}}}-\frac{2\sqrt{a+\frac{b}{x}}}{b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^(3/2)*x^3),x]
```

```
[Out] (-2*a)/(b^2*Sqrt[a + b/x]) - (2*Sqrt[a + b/x])/b^2
```

Rubi in Sympy [A] time = 6.74981, size = 29, normalized size = 0.85

$$-\frac{2a}{b^2\sqrt{a+\frac{b}{x}}}-\frac{2\sqrt{a+\frac{b}{x}}}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**(3/2)/x**3,x)
```

```
[Out] -2*a/(b**2*sqrt(a + b/x)) - 2*sqrt(a + b/x)/b**2
```

Mathematica [A] time = 0.0340849, size = 29, normalized size = 0.85

$$-\frac{2\sqrt{a+\frac{b}{x}}(2ax+b)}{b^2(ax+b)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^(3/2)*x^3),x]
```

```
[Out] (-2*Sqrt[a + b/x]*(b + 2*a*x))/(b^2*(b + a*x))
```

Maple [A] time = 0.008, size = 31, normalized size = 0.9

$$-2\,\frac{(ax+b)(2\,ax+b)}{b^2x^2}\left(\frac{ax+b}{x}\right)^{-3/2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^(3/2)/x^3,x)
```

```
[Out] -2*(a*x+b)*(2*a*x+b)/x^2/b^2/((a*x+b)/x)^(3/2)
```

Maxima [A] time = 1.43811, size = 41, normalized size = 1.21

$$-\frac{2\sqrt{a+\frac{b}{x}}}{b^2}-\frac{2a}{\sqrt{a+\frac{b}{x}}b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x^3),x, algorithm="maxima")
```

```
[Out] -2*sqrt(a + b/x)/b^2 - 2*a/(sqrt(a + b/x)*b^2)
```

Fricas [A] time = 0.233898, size = 34, normalized size = 1.

$$-\frac{2(2ax+b)}{b^2x\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x^3),x, algorithm="fricas")
```

```
[Out] -2*(2*a*x + b)/(b^2*x*sqrt((a*x + b)/x))
```

Sympy [A] time = 5.73243, size = 42, normalized size = 1.24

$$\begin{cases} -\frac{4a}{b^2\sqrt{a+\frac{b}{x}}}-\frac{2}{bx\sqrt{a+\frac{b}{x}}} & \text{for } b\neq 0 \\ -\frac{1}{2a^{\frac{3}{2}}x^2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(3/2)/x**3,x)
```

```
[Out] Piecewise((-4*a/(b**2*sqrt(a + b/x)) - 2/(b*x*sqrt(a + b/x)), Ne(
b, 0)), (-1/(2*a**(3/2)*x**2), True))
```

GIAC/XCAS [A] time = 0.256332, size = 47, normalized size = 1.38

$$-2b\left(\frac{a}{b^3\sqrt{\frac{ax+b}{x}}}+\frac{\sqrt{\frac{ax+b}{x}}}{b^3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x^3),x, algorithm="giac")
```

```
[Out] -2*b*(a/(b^3*sqrt((a*x + b)/x)) + sqrt((a*x + b)/x)/b^3)
```

3.1736 $\int \frac{1}{\left(a+\frac{b}{x}\right)^{3/2} x^4}\,dx$

Optimal. Leaf size=55

$$\frac{2a^2}{b^3\sqrt{a+\frac{b}{x}}}+\frac{4a\sqrt{a+\frac{b}{x}}}{b^3}-\frac{2\left(a+\frac{b}{x}\right)^{3/2}}{3b^3}$$

```
[Out] (2*a^2)/(b^3*Sqrt[a + b/x]) + (4*a*Sqrt[a + b/x])/b^3 - (2*(a + b
/x)^(3/2))/(3*b^3)
```

Rubi [A] time = 0.0781181, antiderivative size = 55, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2a^2}{b^3\sqrt{a+\frac{b}{x}}}+\frac{4a\sqrt{a+\frac{b}{x}}}{b^3}-\frac{2\left(a+\frac{b}{x}\right)^{3/2}}{3b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^(3/2)*x^4),x]
```

```
[Out] (2*a^2)/(b^3*Sqrt[a + b/x]) + (4*a*Sqrt[a + b/x])/b^3 - (2*(a + b
/x)^(3/2))/(3*b^3)
```

Rubi in Sympy [A] time = 9.74647, size = 46, normalized size = 0.84

$$\frac{2a^2}{b^3\sqrt{a+\frac{b}{x}}}+\frac{4a\sqrt{a+\frac{b}{x}}}{b^3}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{3b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**(3/2)/x**4,x)
```

```
[Out] 2*a**2/(b**3*sqrt(a + b/x)) + 4*a*sqrt(a + b/x)/b**3 - 2*(a + b/x
)**(3/2)/(3*b**3)
```

Mathematica [A] time = 0.0411181, size = 46, normalized size = 0.84

$$\sqrt{\frac{ax+b}{x}}\left(\frac{16a}{3b^3}-\frac{2a}{b^2(ax+b)}-\frac{2}{3b^2x}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^(3/2)*x^4),x]
```

```
[Out] Sqrt[(b + a*x)/x]*((16*a)/(3*b^3) - 2/(3*b^2*x) - (2*a)/(b^2*(b +
 a*x)))
```

Maple [A] time = 0.009, size = 44, normalized size = 0.8

$$\frac{(2\,ax+2\,b)\left(8\,a^2x^2+4\,abx-b^2\right)}{3\,b^3x^3}\left(\frac{ax+b}{x}\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^(3/2)/x^4,x)
```

```
[Out] 2/3*(a*x+b)*(8*a^2*x^2+4*a*b*x-b^2)/x^3/b^3/((a*x+b)/x)^(3/2)
```

Maxima [A] time = 1.43559, size = 63, normalized size = 1.15

$$-\frac{2\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{3\,b^{3}}+\frac{4\,\sqrt{a+\frac{b}{x}}a}{b^{3}}+\frac{2\,a^{2}}{\sqrt{a+\frac{b}{x}}b^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x^4),x, algorithm="maxima")
```

```
[Out] -2/3*(a + b/x)^(3/2)/b^3 + 4*sqrt(a + b/x)*a/b^3 + 2*a^2/(sqrt(a
+ b/x)*b^3)
```

Fricas [A] time = 0.236646, size = 51, normalized size = 0.93

$$\frac{2\left(8\,a^{2}x^{2}+4\,abx-b^{2}\right)}{3\,b^{3}x^{2}\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x^4),x, algorithm="fricas")
```

```
[Out] 2/3*(8*a^2*x^2 + 4*a*b*x - b^2)/(b^3*x^2*sqrt((a*x + b)/x))
```

Sympy [A] time = 7.9295, size = 457, normalized size = 8.31

$$\frac{16a^{\frac{9}{2}}b^{\frac{7}{2}}x^{3}\sqrt{\frac{ax}{b}+1}}{3a^{\frac{7}{2}}b^{6}x^{\frac{7}{2}}+6a^{\frac{5}{2}}b^{7}x^{\frac{5}{2}}+3a^{\frac{3}{2}}b^{8}x^{\frac{3}{2}}}+\frac{24a^{\frac{7}{2}}b^{\frac{9}{2}}x^{2}\sqrt{\frac{ax}{b}+1}}{3a^{\frac{7}{2}}b^{6}x^{\frac{7}{2}}+6a^{\frac{5}{2}}b^{7}x^{\frac{5}{2}}+3a^{\frac{3}{2}}b^{8}x^{\frac{3}{2}}}+\frac{6a^{\frac{5}{2}}b^{\frac{11}{2}}x\sqrt{\frac{ax}{b}+1}}{3a^{\frac{7}{2}}b^{6}x^{\frac{7}{2}}+6a^{\frac{5}{2}}b^{7}x^{\frac{5}{2}}+3a^{\frac{3}{2}}b^{8}x^{\frac{3}{2}}}-\frac{2a^{\frac{3}{2}}b^{\frac{13}{2}}\sqrt{\frac{ax}{b}+1}}{3a^{\frac{7}{2}}b^{6}x^{\frac{7}{2}}+6a^{\frac{5}{2}}b^{7}x^{\frac{5}{2}}+3a^{\frac{3}{2}}b^{8}x^{\frac{3}{2}}}-\frac{16a^{5}b^{3}x^{\frac{7}{2}}}{3a^{\frac{7}{2}}b^{6}x^{\frac{7}{2}}+6a^{\frac{5}{2}}b^{7}x^{\frac{5}{2}}+3a^{\frac{3}{2}}b^{8}x^{\frac{3}{2}}}-\frac{32a^{4}b^{4}x^{\frac{5}{2}}}{3a^{\frac{7}{2}}b^{6}x^{\frac{7}{2}}+6a^{\frac{5}{2}}b^{7}x^{\frac{5}{2}}+3a^{\frac{3}{2}}b^{8}x^{\frac{3}{2}}}-\frac{16a^{3}b^{5}x^{\frac{3}{2}}}{3a^{\frac{7}{2}}b^{6}x^{\frac{7}{2}}+6a^{\frac{5}{2}}b^{7}x^{\frac{5}{2}}+3a^{\frac{3}{2}}b^{8}x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(3/2)/x**4,x)
```

```
[Out] 16*a**(9/2)*b**(7/2)*x**3*sqrt(a*x/b + 1)/(3*a**(7/2)*b**6*x**(7/
2) + 6*a**(5/2)*b**7*x**(5/2) + 3*a**(3/2)*b**8*x**(3/2)) + 24*a*
*(7/2)*b**(9/2)*x**2*sqrt(a*x/b + 1)/(3*a**(7/2)*b**6*x**(7/2) +
6*a**(5/2)*b**7*x**(5/2) + 3*a**(3/2)*b**8*x**(3/2)) + 6*a**(5/2)
*b**(11/2)*x*sqrt(a*x/b + 1)/(3*a**(7/2)*b**6*x**(7/2) + 6*a**(5/
2)*b**7*x**(5/2) + 3*a**(3/2)*b**8*x**(3/2)) - 2*a**(3/2)*b**(13/
2)*sqrt(a*x/b + 1)/(3*a**(7/2)*b**6*x**(7/2) + 6*a**(5/2)*b**7*x*
*(5/2) + 3*a**(3/2)*b**8*x**(3/2)) - 16*a**5*b**3*x**(7/2)/(3*a**
(7/2)*b**6*x**(7/2) + 6*a**(5/2)*b**7*x**(5/2) + 3*a**(3/2)*b**8*
x**(3/2)) - 32*a**4*b**4*x**(5/2)/(3*a**(7/2)*b**6*x**(7/2) + 6*a
**(5/2)*b**7*x**(5/2) + 3*a**(3/2)*b**8*x**(3/2)) - 16*a**3*b**5*
x**(3/2)/(3*a**(7/2)*b**6*x**(7/2) + 6*a**(5/2)*b**7*x**(5/2) + 3
```

```
*a**(3/2)*b**8*x**(3/2))
```

GIAC/XCAS [A] time = 0.256802, size = 93, normalized size = 1.69

$$\frac{2}{3}\,b\left(\frac{3\,a^2}{b^4\sqrt{\frac{ax+b}{x}}}+\frac{6\,ab^8\sqrt{\frac{ax+b}{x}}-\frac{(ax+b)b^8\sqrt{\frac{ax+b}{x}}}{x}}{b^{12}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x^4),x, algorithm="giac")
```

```
[Out] 2/3*b*(3*a^2/(b^4*sqrt((a*x + b)/x)) + (6*a*b^8*sqrt((a*x + b)/x)
 - (a*x + b)*b^8*sqrt((a*x + b)/x)/x)/b^12)
```

3.1737 $\int \frac{1}{\left(a+\frac{b}{x}\right)^{3/2} x^5} \, dx$

Optimal. Leaf size=74

$$-\frac{2a^3}{b^4\sqrt{a+\frac{b}{x}}}-\frac{6a^2\sqrt{a+\frac{b}{x}}}{b^4}+\frac{2a\left(a+\frac{b}{x}\right)^{3/2}}{b^4}-\frac{2\left(a+\frac{b}{x}\right)^{5/2}}{5b^4}$$

```
[Out] (-2*a^3)/(b^4*Sqrt[a + b/x]) - (6*a^2*Sqrt[a + b/x])/b^4 + (2*a*(
a + b/x)^(3/2))/b^4 - (2*(a + b/x)^(5/2))/(5*b^4)
```

Rubi [A] time = 0.0978012, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2a^3}{b^4\sqrt{a+\frac{b}{x}}}-\frac{6a^2\sqrt{a+\frac{b}{x}}}{b^4}+\frac{2a\left(a+\frac{b}{x}\right)^{3/2}}{b^4}-\frac{2\left(a+\frac{b}{x}\right)^{5/2}}{5b^4}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^(3/2)*x^5),x]
```

```
[Out] (-2*a^3)/(b^4*Sqrt[a + b/x]) - (6*a^2*Sqrt[a + b/x])/b^4 + (2*a*(
a + b/x)^(3/2))/b^4 - (2*(a + b/x)^(5/2))/(5*b^4)
```

Rubi in Sympy [A] time = 12.9987, size = 63, normalized size = 0.85

$$-\frac{2a^3}{b^4\sqrt{a+\frac{b}{x}}}-\frac{6a^2\sqrt{a+\frac{b}{x}}}{b^4}+\frac{2a\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{b^4}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{5b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**(3/2)/x**5,x)
```

```
[Out] -2*a**3/(b**4*sqrt(a + b/x)) - 6*a**2*sqrt(a + b/x)/b**4 + 2*a*(a
 + b/x)**(3/2)/b**4 - 2*(a + b/x)**(5/2)/(5*b**4)
```

Mathematica [A] time = 0.0507906, size = 56, normalized size = 0.76

$$-\frac{2\sqrt{a+\frac{b}{x}}\left(16a^3x^3+8a^2bx^2-2ab^2x+b^3\right)}{5b^4x^2(ax+b)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^(3/2)*x^5),x]
```

```
[Out] (-2*Sqrt[a + b/x]*(b^3 - 2*a*b^2*x + 8*a^2*b*x^2 + 16*a^3*x^3))/(
5*b^4*x^2*(b + a*x))
```

Maple [A] time = 0.009, size = 53, normalized size = 0.7

$$-\frac{(2ax+2b)\left(16a^3x^3+8a^2bx^2-2ab^2x+b^3\right)}{5x^4b^4}\left(\frac{ax+b}{x}\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^(3/2)/x^5,x)
```

```
[Out] -2/5*(a*x+b)*(16*a^3*x^3+8*a^2*b*x^2-2*a*b^2*x+b^3)/x^4/b^4/((a*x
+b)/x)^(3/2)
```

Maxima [A] time = 1.44167, size = 86, normalized size = 1.16

$$-\frac{2\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{5b^4}+\frac{2\left(a+\frac{b}{x}\right)^{\frac{3}{2}}a}{b^4}-\frac{6\sqrt{a+\frac{b}{x}}a^2}{b^4}-\frac{2a^3}{\sqrt{a+\frac{b}{x}}b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x^5),x, algorithm="maxima")
```

```
[Out] -2/5*(a + b/x)^(5/2)/b^4 + 2*(a + b/x)^(3/2)*a/b^4 - 6*sqrt(a + b
/x)*a^2/b^4 - 2*a^3/(sqrt(a + b/x)*b^4)
```

Fricas [A] time = 0.236297, size = 63, normalized size = 0.85

$$-\frac{2\left(16a^3x^3+8a^2bx^2-2ab^2x+b^3\right)}{5b^4x^3\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x^5),x, algorithm="fricas")
```

```
[Out] -2/5*(16*a^3*x^3 + 8*a^2*b*x^2 - 2*a*b^2*x + b^3)/(b^4*x^3*sqrt((
a*x + b)/x))
```

Sympy [A] time = 12.9356, size = 2032, normalized size = 27.46

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(3/2)/x**5,x)
```

```
[Out] -32*a**(21/2)*b**(23/2)*x**8*sqrt(a*x/b + 1)/(5*a**(17/2)*b**15*x
**(17/2) + 30*a**(15/2)*b**16*x**(15/2) + 75*a**(13/2)*b**17*x**(
13/2) + 100*a**(11/2)*b**18*x**(11/2) + 75*a**(9/2)*b**19*x**(9/2
) + 30*a**(7/2)*b**20*x**(7/2) + 5*a**(5/2)*b**21*x**(5/2)) - 176
*a**(19/2)*b**(25/2)*x**7*sqrt(a*x/b + 1)/(5*a**(17/2)*b**15*x**(
17/2) + 30*a**(15/2)*b**16*x**(15/2) + 75*a**(13/2)*b**17*x**(13/
2) + 100*a**(11/2)*b**18*x**(11/2) + 75*a**(9/2)*b**19*x**(9/2) +
 30*a**(7/2)*b**20*x**(7/2) + 5*a**(5/2)*b**21*x**(5/2)) - 396*a*
*(17/2)*b**(27/2)*x**6*sqrt(a*x/b + 1)/(5*a**(17/2)*b**15*x**(17/
2) + 30*a**(15/2)*b**16*x**(15/2) + 75*a**(13/2)*b**17*x**(13/2)
```

```
+ 100*a**(11/2)*b**18*x**(11/2) + 75*a**(9/2)*b**19*x**(9/2) + 30
*a**(7/2)*b**20*x**(7/2) + 5*a**(5/2)*b**21*x**(5/2)) - 462*a**(1
5/2)*b**(29/2)*x**5*sqrt(a*x/b + 1)/(5*a**(17/2)*b**15*x**(17/2)
+ 30*a**(15/2)*b**16*x**(15/2) + 75*a**(13/2)*b**17*x**(13/2) + 1
00*a**(11/2)*b**18*x**(11/2) + 75*a**(9/2)*b**19*x**(9/2) + 30*a*
*(7/2)*b**20*x**(7/2) + 5*a**(5/2)*b**21*x**(5/2)) - 290*a**(13/2
)*b**(31/2)*x**4*sqrt(a*x/b + 1)/(5*a**(17/2)*b**15*x**(17/2) + 3
0*a**(15/2)*b**16*x**(15/2) + 75*a**(13/2)*b**17*x**(13/2) + 100*
a**(11/2)*b**18*x**(11/2) + 75*a**(9/2)*b**19*x**(9/2) + 30*a**(7
/2)*b**20*x**(7/2) + 5*a**(5/2)*b**21*x**(5/2)) - 92*a**(11/2)*b*
*(33/2)*x**3*sqrt(a*x/b + 1)/(5*a**(17/2)*b**15*x**(17/2) + 30*a*
*(15/2)*b**16*x**(15/2) + 75*a**(13/2)*b**17*x**(13/2) + 100*a**(
11/2)*b**18*x**(11/2) + 75*a**(9/2)*b**19*x**(9/2) + 30*a**(7/2)*
b**20*x**(7/2) + 5*a**(5/2)*b**21*x**(5/2)) - 16*a**(9/2)*b**(35/
2)*x**2*sqrt(a*x/b + 1)/(5*a**(17/2)*b**15*x**(17/2) + 30*a**(15/
2)*b**16*x**(15/2) + 75*a**(13/2)*b**17*x**(13/2) + 100*a**(11/2)
*b**18*x**(11/2) + 75*a**(9/2)*b**19*x**(9/2) + 30*a**(7/2)*b**20
*x**(7/2) + 5*a**(5/2)*b**21*x**(5/2)) - 6*a**(7/2)*b**(37/2)*x*s
qrt(a*x/b + 1)/(5*a**(17/2)*b**15*x**(17/2) + 30*a**(15/2)*b**16*
x**(15/2) + 75*a**(13/2)*b**17*x**(13/2) + 100*a**(11/2)*b**18*x*
*(11/2) + 75*a**(9/2)*b**19*x**(9/2) + 30*a**(7/2)*b**20*x**(7/2)
 + 5*a**(5/2)*b**21*x**(5/2)) - 2*a**(5/2)*b**(39/2)*sqrt(a*x/b +
 1)/(5*a**(17/2)*b**15*x**(17/2) + 30*a**(15/2)*b**16*x**(15/2) +
 75*a**(13/2)*b**17*x**(13/2) + 100*a**(11/2)*b**18*x**(11/2) + 7
5*a**(9/2)*b**19*x**(9/2) + 30*a**(7/2)*b**20*x**(7/2) + 5*a**(5/
2)*b**21*x**(5/2)) + 32*a**11*b**11*x**(17/2)/(5*a**(17/2)*b**15*
x**(17/2) + 30*a**(15/2)*b**16*x**(15/2) + 75*a**(13/2)*b**17*x**
(13/2) + 100*a**(11/2)*b**18*x**(11/2) + 75*a**(9/2)*b**19*x**(9/
2) + 30*a**(7/2)*b**20*x**(7/2) + 5*a**(5/2)*b**21*x**(5/2)) + 19
2*a**10*b**12*x**(15/2)/(5*a**(17/2)*b**15*x**(17/2) + 30*a**(15/
2)*b**16*x**(15/2) + 75*a**(13/2)*b**17*x**(13/2) + 100*a**(11/2)
*b**18*x**(11/2) + 75*a**(9/2)*b**19*x**(9/2) + 30*a**(7/2)*b**20
*x**(7/2) + 5*a**(5/2)*b**21*x**(5/2)) + 480*a**9*b**13*x**(13/2)
/(5*a**(17/2)*b**15*x**(17/2) + 30*a**(15/2)*b**16*x**(15/2) + 75
*a**(13/2)*b**17*x**(13/2) + 100*a**(11/2)*b**18*x**(11/2) + 75*a
**(9/2)*b**19*x**(9/2) + 30*a**(7/2)*b**20*x**(7/2) + 5*a**(5/2)*
b**21*x**(5/2)) + 640*a**8*b**14*x**(11/2)/(5*a**(17/2)*b**15*x**
(17/2) + 30*a**(15/2)*b**16*x**(15/2) + 75*a**(13/2)*b**17*x**(13
/2) + 100*a**(11/2)*b**18*x**(11/2) + 75*a**(9/2)*b**19*x**(9/2)
+ 30*a**(7/2)*b**20*x**(7/2) + 5*a**(5/2)*b**21*x**(5/2)) + 480*a
**7*b**15*x**(9/2)/(5*a**(17/2)*b**15*x**(17/2) + 30*a**(15/2)*b*
*16*x**(15/2) + 75*a**(13/2)*b**17*x**(13/2) + 100*a**(11/2)*b**1
8*x**(11/2) + 75*a**(9/2)*b**19*x**(9/2) + 30*a**(7/2)*b**20*x**(
7/2) + 5*a**(5/2)*b**21*x**(5/2)) + 192*a**6*b**16*x**(7/2)/(5*a*
*(17/2)*b**15*x**(17/2) + 30*a**(15/2)*b**16*x**(15/2) + 75*a**(1
3/2)*b**17*x**(13/2) + 100*a**(11/2)*b**18*x**(11/2) + 75*a**(9/2
)*b**19*x**(9/2) + 30*a**(7/2)*b**20*x**(7/2) + 5*a**(5/2)*b**21*
x**(5/2)) + 32*a**5*b**17*x**(5/2)/(5*a**(17/2)*b**15*x**(17/2) +
 30*a**(15/2)*b**16*x**(15/2) + 75*a**(13/2)*b**17*x**(13/2) + 10
0*a**(11/2)*b**18*x**(11/2) + 75*a**(9/2)*b**19*x**(9/2) + 30*a**
(7/2)*b**20*x**(7/2) + 5*a**(5/2)*b**21*x**(5/2))
```

GIAC/XCAS [A] time = 0.2645, size = 131, normalized size = 1.77

$$-\frac{2}{5}\,b\left(\frac{5\,a^3}{b^5\sqrt{\frac{ax+b}{x}}}+\frac{15\,a^2b^{20}\sqrt{\frac{ax+b}{x}}-\frac{5\,(ax+b)ab^{20}\sqrt{\frac{ax+b}{x}}}{x}+\frac{(ax+b)^2b^{20}\sqrt{\frac{ax+b}{x}}}{x^2}}{b^{25}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x^5),x, algorithm="giac")
```

```
[Out] -2/5*b*(5*a^3/(b^5*sqrt((a*x + b)/x)) + (15*a^2*b^20*sqrt((a*x +
b)/x) - 5*(a*x + b)*a*b^20*sqrt((a*x + b)/x)/x + (a*x + b)^2*b^20
*sqrt((a*x + b)/x)/x^2)/b^25)
```

3.1738 $\int \frac{1}{\left(a+\frac{b}{x}\right)^{3/2} x^6} dx$

Optimal. Leaf size=95

$$\frac{2a^4}{b^5\sqrt{a+\frac{b}{x}}}+\frac{8a^3\sqrt{a+\frac{b}{x}}}{b^5}-\frac{4a^2\left(a+\frac{b}{x}\right)^{3/2}}{b^5}+\frac{8a\left(a+\frac{b}{x}\right)^{5/2}}{5b^5}-\frac{2\left(a+\frac{b}{x}\right)^{7/2}}{7b^5}$$

```
[Out] (2*a^4)/(b^5*Sqrt[a + b/x]) + (8*a^3*Sqrt[a + b/x])/b^5 - (4*a^2*
(a + b/x)^(3/2))/b^5 + (8*a*(a + b/x)^(5/2))/(5*b^5) - (2*(a + b/
x)^(7/2))/(7*b^5)
```

Rubi [A] time = 0.115017, antiderivative size = 95, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{2a^4}{b^5\sqrt{a+\frac{b}{x}}}+\frac{8a^3\sqrt{a+\frac{b}{x}}}{b^5}-\frac{4a^2\left(a+\frac{b}{x}\right)^{3/2}}{b^5}+\frac{8a\left(a+\frac{b}{x}\right)^{5/2}}{5b^5}-\frac{2\left(a+\frac{b}{x}\right)^{7/2}}{7b^5}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^(3/2)*x^6),x]
```

```
[Out] (2*a^4)/(b^5*Sqrt[a + b/x]) + (8*a^3*Sqrt[a + b/x])/b^5 - (4*a^2*
(a + b/x)^(3/2))/b^5 + (8*a*(a + b/x)^(5/2))/(5*b^5) - (2*(a + b/
x)^(7/2))/(7*b^5)
```

Rubi in Sympy [A] time = 16.0452, size = 82, normalized size = 0.86

$$\frac{2a^4}{b^5\sqrt{a+\frac{b}{x}}}+\frac{8a^3\sqrt{a+\frac{b}{x}}}{b^5}-\frac{4a^2\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{b^5}+\frac{8a\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{5b^5}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{7b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**(3/2)/x**6,x)
```

```
[Out] 2*a**4/(b**5*sqrt(a + b/x)) + 8*a**3*sqrt(a + b/x)/b**5 - 4*a**2*
(a + b/x)**(3/2)/b**5 + 8*a*(a + b/x)**(5/2)/(5*b**5) - 2*(a + b/
x)**(7/2)/(7*b**5)
```

Mathematica [A] time = 0.0484931, size = 69, normalized size = 0.73

$$\frac{2\sqrt{a+\frac{b}{x}}\left(128a^4x^4+64a^3bx^3-16a^2b^2x^2+8ab^3x-5b^4\right)}{35b^5x^3(ax+b)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^(3/2)*x^6),x]
```

```
[Out] (2*Sqrt[a + b/x]*(-5*b^4 + 8*a*b^3*x - 16*a^2*b^2*x^2 + 64*a^3*b*
x^3 + 128*a^4*x^4))/(35*b^5*x^3*(b + a*x))
```

Maple [A] time = 0.008, size = 66, normalized size = 0.7

$$\frac{(2ax+2b)\left(128a^4x^4+64a^3x^3b-16a^2x^2b^2+8axb^3-5b^4\right)\left(\frac{ax+b}{x}\right)^{-\frac{3}{2}}}{35x^5b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^(3/2)/x^6,x)
```

```
[Out] 2/35*(a*x+b)*(128*a^4*x^4+64*a^3*b*x^3-16*a^2*b^2*x^2+8*a*b^3*x-5
*b^4)/x^5/b^5/((a*x+b)/x)^(3/2)
```

Maxima [A] time = 1.44271, size = 109, normalized size = 1.15

$$-\frac{2\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{7b^5}+\frac{8\left(a+\frac{b}{x}\right)^{\frac{5}{2}}a}{5b^5}-\frac{4\left(a+\frac{b}{x}\right)^{\frac{3}{2}}a^2}{b^5}+\frac{8\sqrt{a+\frac{b}{x}}a^3}{b^5}+\frac{2a^4}{\sqrt{a+\frac{b}{x}}b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x^6),x, algorithm="maxima")
```

```
[Out] -2/7*(a + b/x)^(7/2)/b^5 + 8/5*(a + b/x)^(5/2)*a/b^5 - 4*(a + b/x
)^(3/2)*a^2/b^5 + 8*sqrt(a + b/x)*a^3/b^5 + 2*a^4/(sqrt(a + b/x)*
b^5)
```

Fricas [A] time = 0.233181, size = 81, normalized size = 0.85

$$\frac{2\left(128a^4x^4+64a^3bx^3-16a^2b^2x^2+8ab^3x-5b^4\right)}{35b^5x^4\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x^6),x, algorithm="fricas")
```

```
[Out] 2/35*(128*a^4*x^4 + 64*a^3*b*x^3 - 16*a^2*b^2*x^2 + 8*a*b^3*x - 5
*b^4)/(b^5*x^4*sqrt((a*x + b)/x))
```

Sympy [A] time = 19.5361, size = 4707, normalized size = 49.55

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(3/2)/x**6,x)
```

```
[Out] 256*a**(33/2)*b**(49/2)*x**13*sqrt(a*x/b + 1)/(35*a**(27/2)*b**29
*x**(27/2) + 350*a**(25/2)*b**30*x**(25/2) + 1575*a**(23/2)*b**31
*x**(23/2) + 4200*a**(21/2)*b**32*x**(21/2) + 7350*a**(19/2)*b**3
3*x**(19/2) + 8820*a**(17/2)*b**34*x**(17/2) + 7350*a**(15/2)*b**
35*x**(15/2) + 4200*a**(13/2)*b**36*x**(13/2) + 1575*a**(11/2)*b*
*37*x**(11/2) + 350*a**(9/2)*b**38*x**(9/2) + 35*a**(7/2)*b**39*x
**(7/2)) + 2432*a**(31/2)*b**(51/2)*x**12*sqrt(a*x/b + 1)/(35*a**
(27/2)*b**29*x**(27/2) + 350*a**(25/2)*b**30*x**(25/2) + 1575*a**
```

```
(23/2)*b**31*x**(23/2) + 4200*a**(21/2)*b**32*x**(21/2) + 7350*a*
*(19/2)*b**33*x**(19/2) + 8820*a**(17/2)*b**34*x**(17/2) + 7350*a
**(15/2)*b**35*x**(15/2) + 4200*a**(13/2)*b**36*x**(13/2) + 1575*
a**(11/2)*b**37*x**(11/2) + 350*a**(9/2)*b**38*x**(9/2) + 35*a**(
7/2)*b**39*x**(7/2)) + 10336*a**(29/2)*b**(53/2)*x**11*sqrt(a*x/b
 + 1)/(35*a**(27/2)*b**29*x**(27/2) + 350*a**(25/2)*b**30*x**(25/
2) + 1575*a**(23/2)*b**31*x**(23/2) + 4200*a**(21/2)*b**32*x**(21
/2) + 7350*a**(19/2)*b**33*x**(19/2) + 8820*a**(17/2)*b**34*x**(1
7/2) + 7350*a**(15/2)*b**35*x**(15/2) + 4200*a**(13/2)*b**36*x**(
13/2) + 1575*a**(11/2)*b**37*x**(11/2) + 350*a**(9/2)*b**38*x**(9
/2) + 35*a**(7/2)*b**39*x**(7/2)) + 25840*a**(27/2)*b**(55/2)*x**
10*sqrt(a*x/b + 1)/(35*a**(27/2)*b**29*x**(27/2) + 350*a**(25/2)*
b**30*x**(25/2) + 1575*a**(23/2)*b**31*x**(23/2) + 4200*a**(21/2)
*b**32*x**(21/2) + 7350*a**(19/2)*b**33*x**(19/2) + 8820*a**(17/2
)*b**34*x**(17/2) + 7350*a**(15/2)*b**35*x**(15/2) + 4200*a**(13/
2)*b**36*x**(13/2) + 1575*a**(11/2)*b**37*x**(11/2) + 350*a**(9/2
)*b**38*x**(9/2) + 35*a**(7/2)*b**39*x**(7/2)) + 41990*a**(25/2)*
b**(57/2)*x**9*sqrt(a*x/b + 1)/(35*a**(27/2)*b**29*x**(27/2) + 35
0*a**(25/2)*b**30*x**(25/2) + 1575*a**(23/2)*b**31*x**(23/2) + 42
00*a**(21/2)*b**32*x**(21/2) + 7350*a**(19/2)*b**33*x**(19/2) + 8
820*a**(17/2)*b**34*x**(17/2) + 7350*a**(15/2)*b**35*x**(15/2) +
4200*a**(13/2)*b**36*x**(13/2) + 1575*a**(11/2)*b**37*x**(11/2) +
 350*a**(9/2)*b**38*x**(9/2) + 35*a**(7/2)*b**39*x**(7/2)) + 4618
2*a**(23/2)*b**(59/2)*x**8*sqrt(a*x/b + 1)/(35*a**(27/2)*b**29*x*
*(27/2) + 350*a**(25/2)*b**30*x**(25/2) + 1575*a**(23/2)*b**31*x*
*(23/2) + 4200*a**(21/2)*b**32*x**(21/2) + 7350*a**(19/2)*b**33*x
**(19/2) + 8820*a**(17/2)*b**34*x**(17/2) + 7350*a**(15/2)*b**35*
x**(15/2) + 4200*a**(13/2)*b**36*x**(13/2) + 1575*a**(11/2)*b**37
*x**(11/2) + 350*a**(9/2)*b**38*x**(9/2) + 35*a**(7/2)*b**39*x**(
7/2)) + 34584*a**(21/2)*b**(61/2)*x**7*sqrt(a*x/b + 1)/(35*a**(27
/2)*b**29*x**(27/2) + 350*a**(25/2)*b**30*x**(25/2) + 1575*a**(23
/2)*b**31*x**(23/2) + 4200*a**(21/2)*b**32*x**(21/2) + 7350*a**(1
9/2)*b**33*x**(19/2) + 8820*a**(17/2)*b**34*x**(17/2) + 7350*a**(
15/2)*b**35*x**(15/2) + 4200*a**(13/2)*b**36*x**(13/2) + 1575*a**
(11/2)*b**37*x**(11/2) + 350*a**(9/2)*b**38*x**(9/2) + 35*a**(7/2
)*b**39*x**(7/2)) + 17112*a**(19/2)*b**(63/2)*x**6*sqrt(a*x/b + 1
)/(35*a**(27/2)*b**29*x**(27/2) + 350*a**(25/2)*b**30*x**(25/2) +
 1575*a**(23/2)*b**31*x**(23/2) + 4200*a**(21/2)*b**32*x**(21/2)
+ 7350*a**(19/2)*b**33*x**(19/2) + 8820*a**(17/2)*b**34*x**(17/2)
 + 7350*a**(15/2)*b**35*x**(15/2) + 4200*a**(13/2)*b**36*x**(13/2
) + 1575*a**(11/2)*b**37*x**(11/2) + 350*a**(9/2)*b**38*x**(9/2)
+ 35*a**(7/2)*b**39*x**(7/2)) + 4980*a**(17/2)*b**(65/2)*x**5*sqr
t(a*x/b + 1)/(35*a**(27/2)*b**29*x**(27/2) + 350*a**(25/2)*b**30*
x**(25/2) + 1575*a**(23/2)*b**31*x**(23/2) + 4200*a**(21/2)*b**32
*x**(21/2) + 7350*a**(19/2)*b**33*x**(19/2) + 8820*a**(17/2)*b**3
4*x**(17/2) + 7350*a**(15/2)*b**35*x**(15/2) + 4200*a**(13/2)*b**
36*x**(13/2) + 1575*a**(11/2)*b**37*x**(11/2) + 350*a**(9/2)*b**3
8*x**(9/2) + 35*a**(7/2)*b**39*x**(7/2)) + 340*a**(15/2)*b**(67/2
)*x**4*sqrt(a*x/b + 1)/(35*a**(27/2)*b**29*x**(27/2) + 350*a**(25
/2)*b**30*x**(25/2) + 1575*a**(23/2)*b**31*x**(23/2) + 4200*a**(2
1/2)*b**32*x**(21/2) + 7350*a**(19/2)*b**33*x**(19/2) + 8820*a**(
17/2)*b**34*x**(17/2) + 7350*a**(15/2)*b**35*x**(15/2) + 4200*a**
(13/2)*b**36*x**(13/2) + 1575*a**(11/2)*b**37*x**(11/2) + 350*a**
(9/2)*b**38*x**(9/2) + 35*a**(7/2)*b**39*x**(7/2)) - 424*a**(13/2
)*b**(69/2)*x**3*sqrt(a*x/b + 1)/(35*a**(27/2)*b**29*x**(27/2) +
350*a**(25/2)*b**30*x**(25/2) + 1575*a**(23/2)*b**31*x**(23/2) +
4200*a**(21/2)*b**32*x**(21/2) + 7350*a**(19/2)*b**33*x**(19/2) +
 8820*a**(17/2)*b**34*x**(17/2) + 7350*a**(15/2)*b**35*x**(15/2)
+ 4200*a**(13/2)*b**36*x**(13/2) + 1575*a**(11/2)*b**37*x**(11/2)
 + 350*a**(9/2)*b**38*x**(9/2) + 35*a**(7/2)*b**39*x**(7/2)) - 24
8*a**(11/2)*b**(71/2)*x**2*sqrt(a*x/b + 1)/(35*a**(27/2)*b**29*x*
*(27/2) + 350*a**(25/2)*b**30*x**(25/2) + 1575*a**(23/2)*b**31*x*
*(23/2) + 4200*a**(21/2)*b**32*x**(21/2) + 7350*a**(19/2)*b**33*x
**(19/2) + 8820*a**(17/2)*b**34*x**(17/2) + 7350*a**(15/2)*b**35*
x**(15/2) + 4200*a**(13/2)*b**36*x**(13/2) + 1575*a**(11/2)*b**37
*x**(11/2) + 350*a**(9/2)*b**38*x**(9/2) + 35*a**(7/2)*b**39*x**(
7/2)) - 74*a**(9/2)*b**(73/2)*x*sqrt(a*x/b + 1)/(35*a**(27/2)*b**
29*x**(27/2) + 350*a**(25/2)*b**30*x**(25/2) + 1575*a**(23/2)*b**
31*x**(23/2) + 4200*a**(21/2)*b**32*x**(21/2) + 7350*a**(19/2)*b*
*33*x**(19/2) + 8820*a**(17/2)*b**34*x**(17/2) + 7350*a**(15/2)*b
**35*x**(15/2) + 4200*a**(13/2)*b**36*x**(13/2) + 1575*a**(11/2)*
b**37*x**(11/2) + 350*a**(9/2)*b**38*x**(9/2) + 35*a**(7/2)*b**39
*x**(7/2)) - 10*a**(7/2)*b**(75/2)*sqrt(a*x/b + 1)/(35*a**(27/2)*
b**29*x**(27/2) + 350*a**(25/2)*b**30*x**(25/2) + 1575*a**(23/2)*
```

b**31*x**(23/2) + 4200*a**(21/2)*b**32*x**(21/2) + 7350*a**(19/2)*b**33*x**(19/2) + 8820*a**(17/2)*b**34*x**(17/2) + 7350*a**(15/2)*b**35*x**(15/2) + 4200*a**(13/2)*b**36*x**(13/2) + 1575*a**(11/2)*b**37*x**(11/2) + 350*a**(9/2)*b**38*x**(9/2) + 35*a**(7/2)*b**39*x**(7/2)) - 256*a**17*b**24*x**(27/2)/(35*a**(27/2)*b**29*x**(27/2) + 350*a**(25/2)*b**30*x**(25/2) + 1575*a**(23/2)*b**31*x**(23/2) + 4200*a**(21/2)*b**32*x**(21/2) + 7350*a**(19/2)*b**33*x**(19/2) + 8820*a**(17/2)*b**34*x**(17/2) + 7350*a**(15/2)*b**35*x**(15/2) + 4200*a**(13/2)*b**36*x**(13/2) + 1575*a**(11/2)*b**37*x**(11/2) + 350*a**(9/2)*b**38*x**(9/2) + 35*a**(7/2)*b**39*x**(7/2)) - 2560*a**16*b**25*x**(25/2)/(35*a**(27/2)*b**29*x**(27/2) + 350*a**(25/2)*b**30*x**(25/2) + 1575*a**(23/2)*b**31*x**(23/2) + 4200*a**(21/2)*b**32*x**(21/2) + 7350*a**(19/2)*b**33*x**(19/2) + 8820*a**(17/2)*b**34*x**(17/2) + 7350*a**(15/2)*b**35*x**(15/2) + 4200*a**(13/2)*b**36*x**(13/2) + 1575*a**(11/2)*b**37*x**(11/2) + 350*a**(9/2)*b**38*x**(9/2) + 35*a**(7/2)*b**39*x**(7/2)) - 11520*a**15*b**26*x**(23/2)/(35*a**(27/2)*b**29*x**(27/2) + 350*a**(25/2)*b**30*x**(25/2) + 1575*a**(23/2)*b**31*x**(23/2) + 4200*a**(21/2)*b**32*x**(21/2) + 7350*a**(19/2)*b**33*x**(19/2) + 8820*a**(17/2)*b**34*x**(17/2) + 7350*a**(15/2)*b**35*x**(15/2) + 4200*a**(13/2)*b**36*x**(13/2) + 1575*a**(11/2)*b**37*x**(11/2) + 350*a**(9/2)*b**38*x**(9/2) + 35*a**(7/2)*b**39*x**(7/2)) - 30720*a**14*b**27*x**(21/2)/(35*a**(27/2)*b**29*x**(27/2) + 350*a**(25/2)*b**30*x**(25/2) + 1575*a**(23/2)*b**31*x**(23/2) + 4200*a**(21/2)*b**32*x**(21/2) + 7350*a**(19/2)*b**33*x**(19/2) + 8820*a**(17/2)*b**34*x**(17/2) + 7350*a**(15/2)*b**35*x**(15/2) + 4200*a**(13/2)*b**36*x**(13/2) + 1575*a**(11/2)*b**37*x**(11/2) + 350*a**(9/2)*b**38*x**(9/2) + 35*a**(7/2)*b**39*x**(7/2)) - 53760*a**13*b**28*x**(19/2)/(35*a**(27/2)*b**29*x**(27/2) + 350*a**(25/2)*b**30*x**(25/2) + 1575*a**(23/2)*b**31*x**(23/2) + 4200*a**(21/2)*b**32*x**(21/2) + 7350*a**(19/2)*b**33*x**(19/2) + 8820*a**(17/2)*b**34*x**(17/2) + 7350*a**(15/2)*b**35*x**(15/2) + 4200*a**(13/2)*b**36*x**(13/2) + 1575*a**(11/2)*b**37*x**(11/2) + 350*a**(9/2)*b**38*x**(9/2) + 35*a**(7/2)*b**39*x**(7/2)) - 64512*a**12*b**29*x**(17/2)/(35*a**(27/2)*b**29*x**(27/2) + 350*a**(25/2)*b**30*x**(25/2) + 1575*a**(23/2)*b**31*x**(23/2) + 4200*a**(21/2)*b**32*x**(21/2) + 7350*a**(19/2)*b**33*x**(19/2) + 8820*a**(17/2)*b**34*x**(17/2) + 7350*a**(15/2)*b**35*x**(15/2) + 4200*a**(13/2)*b**36*x**(13/2) + 1575*a**(11/2)*b**37*x**(11/2) + 350*a**(9/2)*b**38*x**(9/2) + 35*a**(7/2)*b**39*x**(7/2)) - 53760*a**11*b**30*x**(15/2)/(35*a**(27/2)*b**29*x**(27/2) + 350*a**(25/2)*b**30*x**(25/2) + 1575*a**(23/2)*b**31*x**(23/2) + 4200*a**(21/2)*b**32*x**(21/2) + 7350*a**(19/2)*b**33*x**(19/2) + 8820*a**(17/2)*b**34*x**(17/2) + 7350*a**(15/2)*b**35*x**(15/2) + 4200*a**(13/2)*b**36*x**(13/2) + 1575*a**(11/2)*b**37*x**(11/2) + 350*a**(9/2)*b**38*x**(9/2) + 35*a**(7/2)*b**39*x**(7/2)) - 30720*a**10*b**31*x**(13/2)/(35*a**(27/2)*b**29*x**(27/2) + 350*a**(25/2)*b**30*x**(25/2) + 1575*a**(23/2)*b**31*x**(23/2) + 4200*a**(21/2)*b**32*x**(21/2) + 7350*a**(19/2)*b**33*x**(19/2) + 8820*a**(17/2)*b**34*x**(17/2) + 7350*a**(15/2)*b**35*x**(15/2) + 4200*a**(13/2)*b**36*x**(13/2) + 1575*a**(11/2)*b**37*x**(11/2) + 350*a**(9/2)*b**38*x**(9/2) + 35*a**(7/2)*b**39*x**(7/2)) - 11520*a**9*b**32*x**(11/2)/(35*a**(27/2)*b**29*x**(27/2) + 350*a**(25/2)*b**30*x**(25/2) + 1575*a**(23/2)*b**31*x**(23/2) + 4200*a**(21/2)*b**32*x**(21/2) + 7350*a**(19/2)*b**33*x**(19/2) + 8820*a**(17/2)*b**34*x**(17/2) + 7350*a**(15/2)*b**35*x**(15/2) + 4200*a**(13/2)*b**36*x**(13/2) + 1575*a**(11/2)*b**37*x**(11/2) + 350*a**(9/2)*b**38*x**(9/2) + 35*a**(7/2)*b**39*x**(7/2)) - 2560*a**8*b**33*x**(9/2)/(35*a**(27/2)*b**29*x**(27/2) + 350*a**(25/2)*b**30*x**(25/2) + 1575*a**(23/2)*b**31*x**(23/2) + 4200*a**(21/2)*b**32*x**(21/2) + 7350*a**(19/2)*b**33*x**(19/2) + 8820*a**(17/2)*b**34*x**(17/2) + 7350*a**(15/2)*b**35*x**(15/2) + 4200*a**(13/2)*b**36*x**(13/2) + 1575*a**(11/2)*b**37*x**(11/2) + 350*a**(9/2)*b**38*x**(9/2) + 35*a**(7/2)*b**39*x**(7/2)) - 256*a**7*b**34*x**(7/2)/(35*a**(27/2)*b**29*x**(27/2) + 350*a**(25/2)*b**30*x**(25/2) + 1575*a**(23/2)*b**31*x**(23/2) + 4200*a**(21/2)*b**32*x**(21/2) + 7350*a**(19/2)*b**33*x**(19/2) + 8820*a**(17/2)*b**34*x**(17/2) + 7350*a**(15/2)*b**35*x**(15/2) + 4200*a**(13/2)*b**36*x**(13/2) + 1575*a**(11/2)*b**37*x**(11/2) + 350*a**(9/2)*b**38*x**(9/2) + 35*a**(7/2)*b**39*x**(7/2))

GIAC/XCAS [A] time = 0.266196, size = 171, normalized size = 1.8

$$\frac{2}{35}\,b\left(\frac{35\,a^{4}}{b^{6}\sqrt{\frac{ax+b}{x}}}+\frac{140\,a^{3}b^{36}\sqrt{\frac{ax+b}{x}}-\frac{70\,(ax+b)a^{2}b^{36}\sqrt{\frac{ax+b}{x}}}{x}+\frac{28\,(ax+b)^{2}ab^{36}\sqrt{\frac{ax+b}{x}}}{x^{2}}-\frac{5\,(ax+b)^{3}b^{36}\sqrt{\frac{ax+b}{x}}}{x^{3}}}{b^{42}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x^6),x, algorithm="giac")
```

```
[Out] 2/35*b*(35*a^4/(b^6*sqrt((a*x + b)/x)) + (140*a^3*b^36*sqrt((a*x
+ b)/x) - 70*(a*x + b)*a^2*b^36*sqrt((a*x + b)/x)/x + 28*(a*x + b
)^2*a*b^36*sqrt((a*x + b)/x)/x^2 - 5*(a*x + b)^3*b^36*sqrt((a*x +
 b)/x)/x^3)/b^42)
```

3.1739 $\int \frac{1}{\left(a+\frac{b}{x}\right)^{3/2} x^7} \, dx$

Optimal. Leaf size=116

$$-\frac{2a^5}{b^6\sqrt{a+\frac{b}{x}}}-\frac{10a^4\sqrt{a+\frac{b}{x}}}{b^6}+\frac{20a^3\left(a+\frac{b}{x}\right)^{3/2}}{3b^6}-\frac{4a^2\left(a+\frac{b}{x}\right)^{5/2}}{b^6}+\frac{10a\left(a+\frac{b}{x}\right)^{7/2}}{7b^6}-\frac{2\left(a+\frac{b}{x}\right)^{9/2}}{9b^6}$$

```
[Out] (-2*a^5)/(b^6*Sqrt[a + b/x]) - (10*a^4*Sqrt[a + b/x])/b^6 + (20*a
^3*(a + b/x)^(3/2))/(3*b^6) - (4*a^2*(a + b/x)^(5/2))/b^6 + (10*a
*(a + b/x)^(7/2))/(7*b^6) - (2*(a + b/x)^(9/2))/(9*b^6)
```

Rubi [A] time = 0.137062, antiderivative size = 116, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2a^5}{b^6\sqrt{a+\frac{b}{x}}}-\frac{10a^4\sqrt{a+\frac{b}{x}}}{b^6}+\frac{20a^3\left(a+\frac{b}{x}\right)^{3/2}}{3b^6}-\frac{4a^2\left(a+\frac{b}{x}\right)^{5/2}}{b^6}+\frac{10a\left(a+\frac{b}{x}\right)^{7/2}}{7b^6}-\frac{2\left(a+\frac{b}{x}\right)^{9/2}}{9b^6}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^(3/2)*x^7),x]
```

```
[Out] (-2*a^5)/(b^6*Sqrt[a + b/x]) - (10*a^4*Sqrt[a + b/x])/b^6 + (20*a
^3*(a + b/x)^(3/2))/(3*b^6) - (4*a^2*(a + b/x)^(5/2))/b^6 + (10*a
*(a + b/x)^(7/2))/(7*b^6) - (2*(a + b/x)^(9/2))/(9*b^6)
```

Rubi in Sympy [A] time = 19.4454, size = 100, normalized size = 0.86

$$-\frac{2a^5}{b^6\sqrt{a+\frac{b}{x}}}-\frac{10a^4\sqrt{a+\frac{b}{x}}}{b^6}+\frac{20a^3\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{3b^6}-\frac{4a^2\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{b^6}+\frac{10a\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{7b^6}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{9}{2}}}{9b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**(3/2)/x**7,x)
```

```
[Out] -2*a**5/(b**6*sqrt(a + b/x)) - 10*a**4*sqrt(a + b/x)/b**6 + 20*a*
*3*(a + b/x)**(3/2)/(3*b**6) - 4*a**2*(a + b/x)**(5/2)/b**6 + 10*
a*(a + b/x)**(7/2)/(7*b**6) - 2*(a + b/x)**(9/2)/(9*b**6)
```

Mathematica [A] time = 0.0564802, size = 80, normalized size = 0.69

$$-\frac{2\sqrt{a+\frac{b}{x}}\left(256a^5x^5+128a^4bx^4-32a^3b^2x^3+16a^2b^3x^2-10ab^4x+7b^5\right)}{63b^6x^4(ax+b)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^(3/2)*x^7),x]
```

```
[Out] (-2*Sqrt[a + b/x]*(7*b^5 - 10*a*b^4*x + 16*a^2*b^3*x^2 - 32*a^3*b
^2*x^3 + 128*a^4*b*x^4 + 256*a^5*x^5))/(63*b^6*x^4*(b + a*x))
```

Maple [A] time = 0.01, size = 77, normalized size = 0.7

$$-\frac{(2ax+2b)\left(256a^5x^5+128a^4bx^4-32a^3b^2x^3+16a^2b^3x^2-10ab^4x+7b^5\right)}{63x^6b^6}\left(\frac{ax+b}{x}\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^(3/2)/x^7,x)
```

```
[Out] -2/63*(a*x+b)*(256*a^5*x^5+128*a^4*b*x^4-32*a^3*b^2*x^3+16*a^2*b^
3*x^2-10*a*b^4*x+7*b^5)/x^6/b^6/((a*x+b)/x)^(3/2)
```

Maxima [A] time = 1.44032, size = 132, normalized size = 1.14

$$-\frac{2\left(a+\frac{b}{x}\right)^{\frac{9}{2}}}{9b^6}+\frac{10\left(a+\frac{b}{x}\right)^{\frac{7}{2}}a}{7b^6}-\frac{4\left(a+\frac{b}{x}\right)^{\frac{5}{2}}a^2}{b^6}+\frac{20\left(a+\frac{b}{x}\right)^{\frac{3}{2}}a^3}{3b^6}-\frac{10\sqrt{a+\frac{b}{x}}a^4}{b^6}-\frac{2a^5}{\sqrt{a+\frac{b}{x}}b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x^7),x, algorithm="maxima")
```

```
[Out] -2/9*(a + b/x)^(9/2)/b^6 + 10/7*(a + b/x)^(7/2)*a/b^6 - 4*(a + b/
x)^(5/2)*a^2/b^6 + 20/3*(a + b/x)^(3/2)*a^3/b^6 - 10*sqrt(a + b/x
)*a^4/b^6 - 2*a^5/(sqrt(a + b/x)*b^6)
```

Fricas [A] time = 0.238616, size = 96, normalized size = 0.83

$$-\frac{2\left(256a^5x^5+128a^4bx^4-32a^3b^2x^3+16a^2b^3x^2-10ab^4x+7b^5\right)}{63b^6x^5\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x^7),x, algorithm="fricas")
```

```
[Out] -2/63*(256*a^5*x^5 + 128*a^4*b*x^4 - 32*a^3*b^2*x^3 + 16*a^2*b^3*
x^2 - 10*a*b^4*x + 7*b^5)/(b^6*x^5*sqrt((a*x + b)/x))
```

Sympy [A] time = 37.5092, size = 9534, normalized size = 82.19

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(3/2)/x**7,x)
```

```
[Out] -512*a**(47/2)*b**(91/2)*x**19*sqrt(a*x/b + 1)/(63*a**(39/2)*b**5
1*x**(39/2) + 945*a**(37/2)*b**52*x**(37/2) + 6615*a**(35/2)*b**5
3*x**(35/2) + 28665*a**(33/2)*b**54*x**(33/2) + 85995*a**(31/2)*b
**55*x**(31/2) + 189189*a**(29/2)*b**56*x**(29/2) + 315315*a**(27
/2)*b**57*x**(27/2) + 405405*a**(25/2)*b**58*x**(25/2) + 405405*a
**(23/2)*b**59*x**(23/2) + 315315*a**(21/2)*b**60*x**(21/2) + 189
189*a**(19/2)*b**61*x**(19/2) + 85995*a**(17/2)*b**62*x**(17/2) +
 28665*a**(15/2)*b**63*x**(15/2) + 6615*a**(13/2)*b**64*x**(13/2)
```

```
 + 945*a**(11/2)*b**65*x**(11/2) + 63*a**(9/2)*b**66*x**(9/2)) -
7424*a**(45/2)*b**(93/2)*x**18*sqrt(a*x/b + 1)/(63*a**(39/2)*b**5
1*x**(39/2) + 945*a**(37/2)*b**52*x**(37/2) + 6615*a**(35/2)*b**5
3*x**(35/2) + 28665*a**(33/2)*b**54*x**(33/2) + 85995*a**(31/2)*b
**55*x**(31/2) + 189189*a**(29/2)*b**56*x**(29/2) + 315315*a**(27
/2)*b**57*x**(27/2) + 405405*a**(25/2)*b**58*x**(25/2) + 405405*a
**(23/2)*b**59*x**(23/2) + 315315*a**(21/2)*b**60*x**(21/2) + 189
189*a**(19/2)*b**61*x**(19/2) + 85995*a**(17/2)*b**62*x**(17/2) +
 28665*a**(15/2)*b**63*x**(15/2) + 6615*a**(13/2)*b**64*x**(13/2)
 + 945*a**(11/2)*b**65*x**(11/2) + 63*a**(9/2)*b**66*x**(9/2)) -
50112*a**(43/2)*b**(95/2)*x**17*sqrt(a*x/b + 1)/(63*a**(39/2)*b**
51*x**(39/2) + 945*a**(37/2)*b**52*x**(37/2) + 6615*a**(35/2)*b**
53*x**(35/2) + 28665*a**(33/2)*b**54*x**(33/2) + 85995*a**(31/2)*
b**55*x**(31/2) + 189189*a**(29/2)*b**56*x**(29/2) + 315315*a**(2
7/2)*b**57*x**(27/2) + 405405*a**(25/2)*b**58*x**(25/2) + 405405*
a**(23/2)*b**59*x**(23/2) + 315315*a**(21/2)*b**60*x**(21/2) + 18
9189*a**(19/2)*b**61*x**(19/2) + 85995*a**(17/2)*b**62*x**(17/2)
+ 28665*a**(15/2)*b**63*x**(15/2) + 6615*a**(13/2)*b**64*x**(13/2
) + 945*a**(11/2)*b**65*x**(11/2) + 63*a**(9/2)*b**66*x**(9/2)) -
 208800*a**(41/2)*b**(97/2)*x**16*sqrt(a*x/b + 1)/(63*a**(39/2)*b
**51*x**(39/2) + 945*a**(37/2)*b**52*x**(37/2) + 6615*a**(35/2)*b
**53*x**(35/2) + 28665*a**(33/2)*b**54*x**(33/2) + 85995*a**(31/2
)*b**55*x**(31/2) + 189189*a**(29/2)*b**56*x**(29/2) + 315315*a**
(27/2)*b**57*x**(27/2) + 405405*a**(25/2)*b**58*x**(25/2) + 40540
5*a**(23/2)*b**59*x**(23/2) + 315315*a**(21/2)*b**60*x**(21/2) +
189189*a**(19/2)*b**61*x**(19/2) + 85995*a**(17/2)*b**62*x**(17/2
) + 28665*a**(15/2)*b**63*x**(15/2) + 6615*a**(13/2)*b**64*x**(13
/2) + 945*a**(11/2)*b**65*x**(11/2) + 63*a**(9/2)*b**66*x**(9/2))
 - 600300*a**(39/2)*b**(99/2)*x**15*sqrt(a*x/b + 1)/(63*a**(39/2)
*b**51*x**(39/2) + 945*a**(37/2)*b**52*x**(37/2) + 6615*a**(35/2)
*b**53*x**(35/2) + 28665*a**(33/2)*b**54*x**(33/2) + 85995*a**(31
/2)*b**55*x**(31/2) + 189189*a**(29/2)*b**56*x**(29/2) + 315315*a
**(27/2)*b**57*x**(27/2) + 405405*a**(25/2)*b**58*x**(25/2) + 405
405*a**(23/2)*b**59*x**(23/2) + 315315*a**(21/2)*b**60*x**(21/2)
+ 189189*a**(19/2)*b**61*x**(19/2) + 85995*a**(17/2)*b**62*x**(17
/2) + 28665*a**(15/2)*b**63*x**(15/2) + 6615*a**(13/2)*b**64*x**(
13/2) + 945*a**(11/2)*b**65*x**(11/2) + 63*a**(9/2)*b**66*x**(9/2
)) - 1260630*a**(37/2)*b**(101/2)*x**14*sqrt(a*x/b + 1)/(63*a**(3
9/2)*b**51*x**(39/2) + 945*a**(37/2)*b**52*x**(37/2) + 6615*a**(3
5/2)*b**53*x**(35/2) + 28665*a**(33/2)*b**54*x**(33/2) + 85995*a*
*(31/2)*b**55*x**(31/2) + 189189*a**(29/2)*b**56*x**(29/2) + 3153
15*a**(27/2)*b**57*x**(27/2) + 405405*a**(25/2)*b**58*x**(25/2) +
 405405*a**(23/2)*b**59*x**(23/2) + 315315*a**(21/2)*b**60*x**(21
/2) + 189189*a**(19/2)*b**61*x**(19/2) + 85995*a**(17/2)*b**62*x*
*(17/2) + 28665*a**(15/2)*b**63*x**(15/2) + 6615*a**(13/2)*b**64*
x**(13/2) + 945*a**(11/2)*b**65*x**(11/2) + 63*a**(9/2)*b**66*x**
(9/2)) - 1996008*a**(35/2)*b**(103/2)*x**13*sqrt(a*x/b + 1)/(63*a
**(39/2)*b**51*x**(39/2) + 945*a**(37/2)*b**52*x**(37/2) + 6615*a
**(35/2)*b**53*x**(35/2) + 28665*a**(33/2)*b**54*x**(33/2) + 8599
5*a**(31/2)*b**55*x**(31/2) + 189189*a**(29/2)*b**56*x**(29/2) +
315315*a**(27/2)*b**57*x**(27/2) + 405405*a**(25/2)*b**58*x**(25/
2) + 405405*a**(23/2)*b**59*x**(23/2) + 315315*a**(21/2)*b**60*x*
*(21/2) + 189189*a**(19/2)*b**61*x**(19/2) + 85995*a**(17/2)*b**6
2*x**(17/2) + 28665*a**(15/2)*b**63*x**(15/2) + 6615*a**(13/2)*b*
*64*x**(13/2) + 945*a**(11/2)*b**65*x**(11/2) + 63*a**(9/2)*b**66
*x**(9/2)) - 2423850*a**(33/2)*b**(105/2)*x**12*sqrt(a*x/b + 1)/(
63*a**(39/2)*b**51*x**(39/2) + 945*a**(37/2)*b**52*x**(37/2) + 66
15*a**(35/2)*b**53*x**(35/2) + 28665*a**(33/2)*b**54*x**(33/2) +
85995*a**(31/2)*b**55*x**(31/2) + 189189*a**(29/2)*b**56*x**(29/2
) + 315315*a**(27/2)*b**57*x**(27/2) + 405405*a**(25/2)*b**58*x**
(25/2) + 405405*a**(23/2)*b**59*x**(23/2) + 315315*a**(21/2)*b**6
0*x**(21/2) + 189189*a**(19/2)*b**61*x**(19/2) + 85995*a**(17/2)*
b**62*x**(17/2) + 28665*a**(15/2)*b**63*x**(15/2) + 6615*a**(13/2
)*b**64*x**(13/2) + 945*a**(11/2)*b**65*x**(11/2) + 63*a**(9/2)*b
**66*x**(9/2)) - 2273076*a**(31/2)*b**(107/2)*x**11*sqrt(a*x/b +
1)/(63*a**(39/2)*b**51*x**(39/2) + 945*a**(37/2)*b**52*x**(37/2)
+ 6615*a**(35/2)*b**53*x**(35/2) + 28665*a**(33/2)*b**54*x**(33/2
) + 85995*a**(31/2)*b**55*x**(31/2) + 189189*a**(29/2)*b**56*x**(
29/2) + 315315*a**(27/2)*b**57*x**(27/2) + 405405*a**(25/2)*b**58
*x**(25/2) + 405405*a**(23/2)*b**59*x**(23/2) + 315315*a**(21/2)*
b**60*x**(21/2) + 189189*a**(19/2)*b**61*x**(19/2) + 85995*a**(17
/2)*b**62*x**(17/2) + 28665*a**(15/2)*b**63*x**(15/2) + 6615*a**(
13/2)*b**64*x**(13/2) + 945*a**(11/2)*b**65*x**(11/2) + 63*a**(9/
2)*b**66*x**(9/2)) - 1644214*a**(29/2)*b**(109/2)*x**10*sqrt(a*x/
```

```
b + 1)/(63*a**(39/2)*b**51*x**(39/2) + 945*a**(37/2)*b**52*x**(37
/2) + 6615*a**(35/2)*b**53*x**(35/2) + 28665*a**(33/2)*b**54*x**(
33/2) + 85995*a**(31/2)*b**55*x**(31/2) + 189189*a**(29/2)*b**56*
x**(29/2) + 315315*a**(27/2)*b**57*x**(27/2) + 405405*a**(25/2)*b
**58*x**(25/2) + 405405*a**(23/2)*b**59*x**(23/2) + 315315*a**(21
/2)*b**60*x**(21/2) + 189189*a**(19/2)*b**61*x**(19/2) + 85995*a*
*(17/2)*b**62*x**(17/2) + 28665*a**(15/2)*b**63*x**(15/2) + 6615*
a**(13/2)*b**64*x**(13/2) + 945*a**(11/2)*b**65*x**(11/2) + 63*a*
*(9/2)*b**66*x**(9/2)) - 910624*a**(27/2)*b**(111/2)*x**9*sqrt(a*
x/b + 1)/(63*a**(39/2)*b**51*x**(39/2) + 945*a**(37/2)*b**52*x**(
37/2) + 6615*a**(35/2)*b**53*x**(35/2) + 28665*a**(33/2)*b**54*x*
*(33/2) + 85995*a**(31/2)*b**55*x**(31/2) + 189189*a**(29/2)*b**5
6*x**(29/2) + 315315*a**(27/2)*b**57*x**(27/2) + 405405*a**(25/2)
*b**58*x**(25/2) + 405405*a**(23/2)*b**59*x**(23/2) + 315315*a**(
21/2)*b**60*x**(21/2) + 189189*a**(19/2)*b**61*x**(19/2) + 85995*
a**(17/2)*b**62*x**(17/2) + 28665*a**(15/2)*b**63*x**(15/2) + 661
5*a**(13/2)*b**64*x**(13/2) + 945*a**(11/2)*b**65*x**(11/2) + 63*
a**(9/2)*b**66*x**(9/2)) - 383994*a**(25/2)*b**(113/2)*x**8*sqrt(
a*x/b + 1)/(63*a**(39/2)*b**51*x**(39/2) + 945*a**(37/2)*b**52*x*
*(37/2) + 6615*a**(35/2)*b**53*x**(35/2) + 28665*a**(33/2)*b**54*
x**(33/2) + 85995*a**(31/2)*b**55*x**(31/2) + 189189*a**(29/2)*b*
*56*x**(29/2) + 315315*a**(27/2)*b**57*x**(27/2) + 405405*a**(25/
2)*b**58*x**(25/2) + 405405*a**(23/2)*b**59*x**(23/2) + 315315*a*
*(21/2)*b**60*x**(21/2) + 189189*a**(19/2)*b**61*x**(19/2) + 8599
5*a**(17/2)*b**62*x**(17/2) + 28665*a**(15/2)*b**63*x**(15/2) + 6
615*a**(13/2)*b**64*x**(13/2) + 945*a**(11/2)*b**65*x**(11/2) + 6
3*a**(9/2)*b**66*x**(9/2)) - 127764*a**(23/2)*b**(115/2)*x**7*sqr
t(a*x/b + 1)/(63*a**(39/2)*b**51*x**(39/2) + 945*a**(37/2)*b**52*
x**(37/2) + 6615*a**(35/2)*b**53*x**(35/2) + 28665*a**(33/2)*b**5
4*x**(33/2) + 85995*a**(31/2)*b**55*x**(31/2) + 189189*a**(29/2)*
b**56*x**(29/2) + 315315*a**(27/2)*b**57*x**(27/2) + 405405*a**(2
5/2)*b**58*x**(25/2) + 405405*a**(23/2)*b**59*x**(23/2) + 315315*
a**(21/2)*b**60*x**(21/2) + 189189*a**(19/2)*b**61*x**(19/2) + 85
995*a**(17/2)*b**62*x**(17/2) + 28665*a**(15/2)*b**63*x**(15/2) +
 6615*a**(13/2)*b**64*x**(13/2) + 945*a**(11/2)*b**65*x**(11/2) +
 63*a**(9/2)*b**66*x**(9/2)) - 41202*a**(21/2)*b**(117/2)*x**6*sq
rt(a*x/b + 1)/(63*a**(39/2)*b**51*x**(39/2) + 945*a**(37/2)*b**52
*x**(37/2) + 6615*a**(35/2)*b**53*x**(35/2) + 28665*a**(33/2)*b**
54*x**(33/2) + 85995*a**(31/2)*b**55*x**(31/2) + 189189*a**(29/2)
*b**56*x**(29/2) + 315315*a**(27/2)*b**57*x**(27/2) + 405405*a**(
25/2)*b**58*x**(25/2) + 405405*a**(23/2)*b**59*x**(23/2) + 315315
*a**(21/2)*b**60*x**(21/2) + 189189*a**(19/2)*b**61*x**(19/2) + 8
5995*a**(17/2)*b**62*x**(17/2) + 28665*a**(15/2)*b**63*x**(15/2)
+ 6615*a**(13/2)*b**64*x**(13/2) + 945*a**(11/2)*b**65*x**(11/2)
+ 63*a**(9/2)*b**66*x**(9/2)) - 17928*a**(19/2)*b**(119/2)*x**5*s
qrt(a*x/b + 1)/(63*a**(39/2)*b**51*x**(39/2) + 945*a**(37/2)*b**5
2*x**(37/2) + 6615*a**(35/2)*b**53*x**(35/2) + 28665*a**(33/2)*b*
*54*x**(33/2) + 85995*a**(31/2)*b**55*x**(31/2) + 189189*a**(29/2
)*b**56*x**(29/2) + 315315*a**(27/2)*b**57*x**(27/2) + 405405*a**
(25/2)*b**58*x**(25/2) + 405405*a**(23/2)*b**59*x**(23/2) + 31531
5*a**(21/2)*b**60*x**(21/2) + 189189*a**(19/2)*b**61*x**(19/2) +
85995*a**(17/2)*b**62*x**(17/2) + 28665*a**(15/2)*b**63*x**(15/2)
 + 6615*a**(13/2)*b**64*x**(13/2) + 945*a**(11/2)*b**65*x**(11/2)
 + 63*a**(9/2)*b**66*x**(9/2)) - 9006*a**(17/2)*b**(121/2)*x**4*s
qrt(a*x/b + 1)/(63*a**(39/2)*b**51*x**(39/2) + 945*a**(37/2)*b**5
2*x**(37/2) + 6615*a**(35/2)*b**53*x**(35/2) + 28665*a**(33/2)*b*
*54*x**(33/2) + 85995*a**(31/2)*b**55*x**(31/2) + 189189*a**(29/2
)*b**56*x**(29/2) + 315315*a**(27/2)*b**57*x**(27/2) + 405405*a**
(25/2)*b**58*x**(25/2) + 405405*a**(23/2)*b**59*x**(23/2) + 31531
5*a**(21/2)*b**60*x**(21/2) + 189189*a**(19/2)*b**61*x**(19/2) +
85995*a**(17/2)*b**62*x**(17/2) + 28665*a**(15/2)*b**63*x**(15/2)
 + 6615*a**(13/2)*b**64*x**(13/2) + 945*a**(11/2)*b**65*x**(11/2)
 + 63*a**(9/2)*b**66*x**(9/2)) - 3660*a**(15/2)*b**(123/2)*x**3*s
qrt(a*x/b + 1)/(63*a**(39/2)*b**51*x**(39/2) + 945*a**(37/2)*b**5
2*x**(37/2) + 6615*a**(35/2)*b**53*x**(35/2) + 28665*a**(33/2)*b*
*54*x**(33/2) + 85995*a**(31/2)*b**55*x**(31/2) + 189189*a**(29/2
)*b**56*x**(29/2) + 315315*a**(27/2)*b**57*x**(27/2) + 405405*a**
(25/2)*b**58*x**(25/2) + 405405*a**(23/2)*b**59*x**(23/2) + 31531
5*a**(21/2)*b**60*x**(21/2) + 189189*a**(19/2)*b**61*x**(19/2) +
85995*a**(17/2)*b**62*x**(17/2) + 28665*a**(15/2)*b**63*x**(15/2)
 + 6615*a**(13/2)*b**64*x**(13/2) + 945*a**(11/2)*b**65*x**(11/2)
 + 63*a**(9/2)*b**66*x**(9/2)) - 1026*a**(13/2)*b**(125/2)*x**2*s
qrt(a*x/b + 1)/(63*a**(39/2)*b**51*x**(39/2) + 945*a**(37/2)*b**5
2*x**(37/2) + 6615*a**(35/2)*b**53*x**(35/2) + 28665*a**(33/2)*b*
```

```
*54*x**(33/2) + 85995*a**(31/2)*b**55*x**(31/2) + 189189*a**(29/2
)*b**56*x**(29/2) + 315315*a**(27/2)*b**57*x**(27/2) + 405405*a**
(25/2)*b**58*x**(25/2) + 405405*a**(23/2)*b**59*x**(23/2) + 31531
5*a**(21/2)*b**60*x**(21/2) + 189189*a**(19/2)*b**61*x**(19/2) +
85995*a**(17/2)*b**62*x**(17/2) + 28665*a**(15/2)*b**63*x**(15/2)
 + 6615*a**(13/2)*b**64*x**(13/2) + 945*a**(11/2)*b**65*x**(11/2)
 + 63*a**(9/2)*b**66*x**(9/2)) - 176*a**(11/2)*b**(127/2)*x*sqrt(
a*x/b + 1)/(63*a**(39/2)*b**51*x**(39/2) + 945*a**(37/2)*b**52*x*
*(37/2) + 6615*a**(35/2)*b**53*x**(35/2) + 28665*a**(33/2)*b**54*
x**(33/2) + 85995*a**(31/2)*b**55*x**(31/2) + 189189*a**(29/2)*b*
*56*x**(29/2) + 315315*a**(27/2)*b**57*x**(27/2) + 405405*a**(25/
2)*b**58*x**(25/2) + 405405*a**(23/2)*b**59*x**(23/2) + 315315*a*
*(21/2)*b**60*x**(21/2) + 189189*a**(19/2)*b**61*x**(19/2) + 8599
5*a**(17/2)*b**62*x**(17/2) + 28665*a**(15/2)*b**63*x**(15/2) + 6
615*a**(13/2)*b**64*x**(13/2) + 945*a**(11/2)*b**65*x**(11/2) + 6
3*a**(9/2)*b**66*x**(9/2)) - 14*a**(9/2)*b**(129/2)*sqrt(a*x/b +
1)/(63*a**(39/2)*b**51*x**(39/2) + 945*a**(37/2)*b**52*x**(37/2)
+ 6615*a**(35/2)*b**53*x**(35/2) + 28665*a**(33/2)*b**54*x**(33/2
) + 85995*a**(31/2)*b**55*x**(31/2) + 189189*a**(29/2)*b**56*x**(
29/2) + 315315*a**(27/2)*b**57*x**(27/2) + 405405*a**(25/2)*b**58
*x**(25/2) + 405405*a**(23/2)*b**59*x**(23/2) + 315315*a**(21/2)*
b**60*x**(21/2) + 189189*a**(19/2)*b**61*x**(19/2) + 85995*a**(17
/2)*b**62*x**(17/2) + 28665*a**(15/2)*b**63*x**(15/2) + 6615*a**(
13/2)*b**64*x**(13/2) + 945*a**(11/2)*b**65*x**(11/2) + 63*a**(9/
2)*b**66*x**(9/2)) + 512*a**24*b**45*x**(39/2)/(63*a**(39/2)*b**5
1*x**(39/2) + 945*a**(37/2)*b**52*x**(37/2) + 6615*a**(35/2)*b**5
3*x**(35/2) + 28665*a**(33/2)*b**54*x**(33/2) + 85995*a**(31/2)*b
**55*x**(31/2) + 189189*a**(29/2)*b**56*x**(29/2) + 315315*a**(27
/2)*b**57*x**(27/2) + 405405*a**(25/2)*b**58*x**(25/2) + 405405*a
**(23/2)*b**59*x**(23/2) + 315315*a**(21/2)*b**60*x**(21/2) + 189
189*a**(19/2)*b**61*x**(19/2) + 85995*a**(17/2)*b**62*x**(17/2) +
 28665*a**(15/2)*b**63*x**(15/2) + 6615*a**(13/2)*b**64*x**(13/2)
 + 945*a**(11/2)*b**65*x**(11/2) + 63*a**(9/2)*b**66*x**(9/2)) +
7680*a**23*b**46*x**(37/2)/(63*a**(39/2)*b**51*x**(39/2) + 945*a*
*(37/2)*b**52*x**(37/2) + 6615*a**(35/2)*b**53*x**(35/2) + 28665*
a**(33/2)*b**54*x**(33/2) + 85995*a**(31/2)*b**55*x**(31/2) + 189
189*a**(29/2)*b**56*x**(29/2) + 315315*a**(27/2)*b**57*x**(27/2)
+ 405405*a**(25/2)*b**58*x**(25/2) + 405405*a**(23/2)*b**59*x**(2
3/2) + 315315*a**(21/2)*b**60*x**(21/2) + 189189*a**(19/2)*b**61*
x**(19/2) + 85995*a**(17/2)*b**62*x**(17/2) + 28665*a**(15/2)*b**
63*x**(15/2) + 6615*a**(13/2)*b**64*x**(13/2) + 945*a**(11/2)*b**
65*x**(11/2) + 63*a**(9/2)*b**66*x**(9/2)) + 53760*a**22*b**47*x*
*(35/2)/(63*a**(39/2)*b**51*x**(39/2) + 945*a**(37/2)*b**52*x**(3
7/2) + 6615*a**(35/2)*b**53*x**(35/2) + 28665*a**(33/2)*b**54*x**
(33/2) + 85995*a**(31/2)*b**55*x**(31/2) + 189189*a**(29/2)*b**56
*x**(29/2) + 315315*a**(27/2)*b**57*x**(27/2) + 405405*a**(25/2)*
b**58*x**(25/2) + 405405*a**(23/2)*b**59*x**(23/2) + 315315*a**(2
1/2)*b**60*x**(21/2) + 189189*a**(19/2)*b**61*x**(19/2) + 85995*a
**(17/2)*b**62*x**(17/2) + 28665*a**(15/2)*b**63*x**(15/2) + 6615
*a**(13/2)*b**64*x**(13/2) + 945*a**(11/2)*b**65*x**(11/2) + 63*a
**(9/2)*b**66*x**(9/2)) + 232960*a**21*b**48*x**(33/2)/(63*a**(39
/2)*b**51*x**(39/2) + 945*a**(37/2)*b**52*x**(37/2) + 6615*a**(35
/2)*b**53*x**(35/2) + 28665*a**(33/2)*b**54*x**(33/2) + 85995*a**
(31/2)*b**55*x**(31/2) + 189189*a**(29/2)*b**56*x**(29/2) + 31531
5*a**(27/2)*b**57*x**(27/2) + 405405*a**(25/2)*b**58*x**(25/2) +
405405*a**(23/2)*b**59*x**(23/2) + 315315*a**(21/2)*b**60*x**(21/
2) + 189189*a**(19/2)*b**61*x**(19/2) + 85995*a**(17/2)*b**62*x**
(17/2) + 28665*a**(15/2)*b**63*x**(15/2) + 6615*a**(13/2)*b**64*x
**(13/2) + 945*a**(11/2)*b**65*x**(11/2) + 63*a**(9/2)*b**66*x**(
9/2)) + 698880*a**20*b**49*x**(31/2)/(63*a**(39/2)*b**51*x**(39/2
) + 945*a**(37/2)*b**52*x**(37/2) + 6615*a**(35/2)*b**53*x**(35/2
) + 28665*a**(33/2)*b**54*x**(33/2) + 85995*a**(31/2)*b**55*x**(3
1/2) + 189189*a**(29/2)*b**56*x**(29/2) + 315315*a**(27/2)*b**57*
x**(27/2) + 405405*a**(25/2)*b**58*x**(25/2) + 405405*a**(23/2)*b
**59*x**(23/2) + 315315*a**(21/2)*b**60*x**(21/2) + 189189*a**(19
/2)*b**61*x**(19/2) + 85995*a**(17/2)*b**62*x**(17/2) + 28665*a**
(15/2)*b**63*x**(15/2) + 6615*a**(13/2)*b**64*x**(13/2) + 945*a**
(11/2)*b**65*x**(11/2) + 63*a**(9/2)*b**66*x**(9/2)) + 1537536*a*
*19*b**50*x**(29/2)/(63*a**(39/2)*b**51*x**(39/2) + 945*a**(37/2)
*b**52*x**(37/2) + 6615*a**(35/2)*b**53*x**(35/2) + 28665*a**(33/
2)*b**54*x**(33/2) + 85995*a**(31/2)*b**55*x**(31/2) + 189189*a**
(29/2)*b**56*x**(29/2) + 315315*a**(27/2)*b**57*x**(27/2) + 40540
5*a**(25/2)*b**58*x**(25/2) + 405405*a**(23/2)*b**59*x**(23/2) +
315315*a**(21/2)*b**60*x**(21/2) + 189189*a**(19/2)*b**61*x**(19/
```

2) + 85995*a**(17/2)*b**62*x**(17/2) + 28665*a**(15/2)*b**63*x**(
15/2) + 6615*a**(13/2)*b**64*x**(13/2) + 945*a**(11/2)*b**65*x**(
11/2) + 63*a**(9/2)*b**66*x**(9/2)) + 2562560*a**18*b**51*x**(27/
2)/(63*a**(39/2)*b**51*x**(39/2) + 945*a**(37/2)*b**52*x**(37/2)
+ 6615*a**(35/2)*b**53*x**(35/2) + 28665*a**(33/2)*b**54*x**(33/2
) + 85995*a**(31/2)*b**55*x**(31/2) + 189189*a**(29/2)*b**56*x**(
29/2) + 315315*a**(27/2)*b**57*x**(27/2) + 405405*a**(25/2)*b**58
*x**(25/2) + 405405*a**(23/2)*b**59*x**(23/2) + 315315*a**(21/2)*
b**60*x**(21/2) + 189189*a**(19/2)*b**61*x**(19/2) + 85995*a**(17
/2)*b**62*x**(17/2) + 28665*a**(15/2)*b**63*x**(15/2) + 6615*a**(
13/2)*b**64*x**(13/2) + 945*a**(11/2)*b**65*x**(11/2) + 63*a**(9/
2)*b**66*x**(9/2)) + 3294720*a**17*b**52*x**(25/2)/(63*a**(39/2)*
b**51*x**(39/2) + 945*a**(37/2)*b**52*x**(37/2) + 6615*a**(35/2)*
b**53*x**(35/2) + 28665*a**(33/2)*b**54*x**(33/2) + 85995*a**(31/
2)*b**55*x**(31/2) + 189189*a**(29/2)*b**56*x**(29/2) + 315315*a*
*(27/2)*b**57*x**(27/2) + 405405*a**(25/2)*b**58*x**(25/2) + 4054
05*a**(23/2)*b**59*x**(23/2) + 315315*a**(21/2)*b**60*x**(21/2) +
 189189*a**(19/2)*b**61*x**(19/2) + 85995*a**(17/2)*b**62*x**(17/
2) + 28665*a**(15/2)*b**63*x**(15/2) + 6615*a**(13/2)*b**64*x**(1
3/2) + 945*a**(11/2)*b**65*x**(11/2) + 63*a**(9/2)*b**66*x**(9/2)
) + 3294720*a**16*b**53*x**(23/2)/(63*a**(39/2)*b**51*x**(39/2) +
 945*a**(37/2)*b**52*x**(37/2) + 6615*a**(35/2)*b**53*x**(35/2) +
 28665*a**(33/2)*b**54*x**(33/2) + 85995*a**(31/2)*b**55*x**(31/2
) + 189189*a**(29/2)*b**56*x**(29/2) + 315315*a**(27/2)*b**57*x**
(27/2) + 405405*a**(25/2)*b**58*x**(25/2) + 405405*a**(23/2)*b**5
9*x**(23/2) + 315315*a**(21/2)*b**60*x**(21/2) + 189189*a**(19/2)
*b**61*x**(19/2) + 85995*a**(17/2)*b**62*x**(17/2) + 28665*a**(15
/2)*b**63*x**(15/2) + 6615*a**(13/2)*b**64*x**(13/2) + 945*a**(11
/2)*b**65*x**(11/2) + 63*a**(9/2)*b**66*x**(9/2)) + 2562560*a**15
*b**54*x**(21/2)/(63*a**(39/2)*b**51*x**(39/2) + 945*a**(37/2)*b*
*52*x**(37/2) + 6615*a**(35/2)*b**53*x**(35/2) + 28665*a**(33/2)*
b**54*x**(33/2) + 85995*a**(31/2)*b**55*x**(31/2) + 189189*a**(29
/2)*b**56*x**(29/2) + 315315*a**(27/2)*b**57*x**(27/2) + 405405*a
(25/2)*b58*x**(25/2) + 405405*a**(23/2)*b**59*x**(23/2) + 315
315*a**(21/2)*b**60*x**(21/2) + 189189*a**(19/2)*b**61*x**(19/2)
+ 85995*a**(17/2)*b**62*x**(17/2) + 28665*a**(15/2)*b**63*x**(15/
2) + 6615*a**(13/2)*b**64*x**(13/2) + 945*a**(11/2)*b**65*x**(11/
2) + 63*a**(9/2)*b**66*x**(9/2)) + 1537536*a**14*b**55*x**(19/2)/
(63*a**(39/2)*b**51*x**(39/2) + 945*a**(37/2)*b**52*x**(37/2) + 6
615*a**(35/2)*b**53*x**(35/2) + 28665*a**(33/2)*b**54*x**(33/2) +
 85995*a**(31/2)*b**55*x**(31/2) + 189189*a**(29/2)*b**56*x**(29/
2) + 315315*a**(27/2)*b**57*x**(27/2) + 405405*a**(25/2)*b**58*x*
*(25/2) + 405405*a**(23/2)*b**59*x**(23/2) + 315315*a**(21/2)*b**
60*x**(21/2) + 189189*a**(19/2)*b**61*x**(19/2) + 85995*a**(17/2)
*b**62*x**(17/2) + 28665*a**(15/2)*b**63*x**(15/2) + 6615*a**(13/
2)*b**64*x**(13/2) + 945*a**(11/2)*b**65*x**(11/2) + 63*a**(9/2)*
b**66*x**(9/2)) + 698880*a**13*b**56*x**(17/2)/(63*a**(39/2)*b**5
1*x**(39/2) + 945*a**(37/2)*b**52*x**(37/2) + 6615*a**(35/2)*b**5
3*x**(35/2) + 28665*a**(33/2)*b**54*x**(33/2) + 85995*a**(31/2)*b
55*x(31/2) + 189189*a**(29/2)*b**56*x**(29/2) + 315315*a**(27
/2)*b**57*x**(27/2) + 405405*a**(25/2)*b**58*x**(25/2) + 405405*a
(23/2)*b59*x**(23/2) + 315315*a**(21/2)*b**60*x**(21/2) + 189
189*a**(19/2)*b**61*x**(19/2) + 85995*a**(17/2)*b**62*x**(17/2) +
 28665*a**(15/2)*b**63*x**(15/2) + 6615*a**(13/2)*b**64*x**(13/2)
 + 945*a**(11/2)*b**65*x**(11/2) + 63*a**(9/2)*b**66*x**(9/2)) +
232960*a**12*b**57*x**(15/2)/(63*a**(39/2)*b**51*x**(39/2) + 945*
a**(37/2)*b**52*x**(37/2) + 6615*a**(35/2)*b**53*x**(35/2) + 2866
5*a**(33/2)*b**54*x**(33/2) + 85995*a**(31/2)*b**55*x**(31/2) + 1
89189*a**(29/2)*b**56*x**(29/2) + 315315*a**(27/2)*b**57*x**(27/2
) + 405405*a**(25/2)*b**58*x**(25/2) + 405405*a**(23/2)*b**59*x**
(23/2) + 315315*a**(21/2)*b**60*x**(21/2) + 189189*a**(19/2)*b**6
1*x**(19/2) + 85995*a**(17/2)*b**62*x**(17/2) + 28665*a**(15/2)*b
63*x(15/2) + 6615*a**(13/2)*b**64*x**(13/2) + 945*a**(11/2)*b
65*x(11/2) + 63*a**(9/2)*b**66*x**(9/2)) + 53760*a**11*b**58*
x**(13/2)/(63*a**(39/2)*b**51*x**(39/2) + 945*a**(37/2)*b**52*x**
(37/2) + 6615*a**(35/2)*b**53*x**(35/2) + 28665*a**(33/2)*b**54*x
(33/2) + 85995*a(31/2)*b**55*x**(31/2) + 189189*a**(29/2)*b**
56*x**(29/2) + 315315*a**(27/2)*b**57*x**(27/2) + 405405*a**(25/2
)*b**58*x**(25/2) + 405405*a**(23/2)*b**59*x**(23/2) + 315315*a**
(21/2)*b**60*x**(21/2) + 189189*a**(19/2)*b**61*x**(19/2) + 85995
*a**(17/2)*b**62*x**(17/2) + 28665*a**(15/2)*b**63*x**(15/2) + 66
15*a**(13/2)*b**64*x**(13/2) + 945*a**(11/2)*b**65*x**(11/2) + 63
*a**(9/2)*b**66*x**(9/2)) + 7680*a**10*b**59*x**(11/2)/(63*a**(39
/2)*b**51*x**(39/2) + 945*a**(37/2)*b**52*x**(37/2) + 6615*a**(35

```
/2)*b**53*x**(35/2) + 28665*a**(33/2)*b**54*x**(33/2) + 85995*a**
(31/2)*b**55*x**(31/2) + 189189*a**(29/2)*b**56*x**(29/2) + 31531
5*a**(27/2)*b**57*x**(27/2) + 405405*a**(25/2)*b**58*x**(25/2) +
405405*a**(23/2)*b**59*x**(23/2) + 315315*a**(21/2)*b**60*x**(21/
2) + 189189*a**(19/2)*b**61*x**(19/2) + 85995*a**(17/2)*b**62*x**
(17/2) + 28665*a**(15/2)*b**63*x**(15/2) + 6615*a**(13/2)*b**64*x
**(13/2) + 945*a**(11/2)*b**65*x**(11/2) + 63*a**(9/2)*b**66*x**(
9/2)) + 512*a**9*b**60*x**(9/2)/(63*a**(39/2)*b**51*x**(39/2) + 9
45*a**(37/2)*b**52*x**(37/2) + 6615*a**(35/2)*b**53*x**(35/2) + 2
8665*a**(33/2)*b**54*x**(33/2) + 85995*a**(31/2)*b**55*x**(31/2)
+ 189189*a**(29/2)*b**56*x**(29/2) + 315315*a**(27/2)*b**57*x**(2
7/2) + 405405*a**(25/2)*b**58*x**(25/2) + 405405*a**(23/2)*b**59*
x**(23/2) + 315315*a**(21/2)*b**60*x**(21/2) + 189189*a**(19/2)*b
**61*x**(19/2) + 85995*a**(17/2)*b**62*x**(17/2) + 28665*a**(15/2
)*b**63*x**(15/2) + 6615*a**(13/2)*b**64*x**(13/2) + 945*a**(11/2
)*b**65*x**(11/2) + 63*a**(9/2)*b**66*x**(9/2))
```

GIAC/XCAS [A] time = 0.261277, size = 211, normalized size = 1.82

$$-\frac{2}{63}\,b\left(\frac{63\,a^{5}}{b^{7}\sqrt{\frac{ax+b}{x}}}+\frac{315\,a^{4}b^{56}\sqrt{\frac{ax+b}{x}}-\frac{210\,(ax+b)a^{3}b^{56}\sqrt{\frac{ax+b}{x}}}{x}+\frac{126\,(ax+b)^{2}a^{2}b^{56}\sqrt{\frac{ax+b}{x}}}{x^{2}}-\frac{45\,(ax+b)^{3}ab^{56}\sqrt{\frac{ax+b}{x}}}{x^{3}}+\frac{7\,(ax+b)^{4}b^{56}\sqrt{\frac{ax+b}{x}}}{x^{4}}}{b^{63}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x^7),x, algorithm="giac")
```

```
[Out] -2/63*b*(63*a^5/(b^7*sqrt((a*x + b)/x)) + (315*a^4*b^56*sqrt((a*x
 + b)/x) - 210*(a*x + b)*a^3*b^56*sqrt((a*x + b)/x)/x + 126*(a*x
+ b)^2*a^2*b^56*sqrt((a*x + b)/x)/x^2 - 45*(a*x + b)^3*a*b^56*sqr
t((a*x + b)/x)/x^3 + 7*(a*x + b)^4*b^56*sqrt((a*x + b)/x)/x^4)/b^
63)
```

3.1740 $\int \frac{x^2}{\left(a+\frac{b}{x}\right)^{5/2}}\,dx$

Optimal. Leaf size=134

$$-\frac{105b^3\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{8a^{11/2}}+\frac{105b^2x\sqrt{a+\frac{b}{x}}}{8a^5}-\frac{35bx^2\sqrt{a+\frac{b}{x}}}{4a^4}+\frac{7x^3\sqrt{a+\frac{b}{x}}}{a^3}-\frac{6x^3}{a^2\sqrt{a+\frac{b}{x}}}-\frac{2x^3}{3a\left(a+\frac{b}{x}\right)^{3/2}}$$

```
[Out] (105*b^2*Sqrt[a + b/x]*x)/(8*a^5) - (35*b*Sqrt[a + b/x]*x^2)/(4*a
^4) - (2*x^3)/(3*a*(a + b/x)^(3/2)) - (6*x^3)/(a^2*Sqrt[a + b/x])
 + (7*Sqrt[a + b/x]*x^3)/a^3 - (105*b^3*ArcTanh[Sqrt[a + b/x]/Sqr
t[a]])/(8*a^(11/2))
```

Rubi [A] time = 0.197683, antiderivative size = 134, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{105b^3\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{8a^{11/2}}+\frac{105b^2x\sqrt{a+\frac{b}{x}}}{8a^5}-\frac{35bx^2\sqrt{a+\frac{b}{x}}}{4a^4}+\frac{7x^3\sqrt{a+\frac{b}{x}}}{a^3}-\frac{6x^3}{a^2\sqrt{a+\frac{b}{x}}}-\frac{2x^3}{3a\left(a+\frac{b}{x}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b/x)^(5/2),x]
```

```
[Out] (105*b^2*Sqrt[a + b/x]*x)/(8*a^5) - (35*b*Sqrt[a + b/x]*x^2)/(4*a
^4) - (2*x^3)/(3*a*(a + b/x)^(3/2)) - (6*x^3)/(a^2*Sqrt[a + b/x])
 + (7*Sqrt[a + b/x]*x^3)/a^3 - (105*b^3*ArcTanh[Sqrt[a + b/x]/Sqr
t[a]])/(8*a^(11/2))
```

Rubi in Sympy [A] time = 21.1459, size = 117, normalized size = 0.87

$$-\frac{2x^3}{3a\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}-\frac{6x^3}{a^2\sqrt{a+\frac{b}{x}}}+\frac{7x^3\sqrt{a+\frac{b}{x}}}{a^3}-\frac{35bx^2\sqrt{a+\frac{b}{x}}}{4a^4}+\frac{105b^2x\sqrt{a+\frac{b}{x}}}{8a^5}-\frac{105b^3\,\mathrm{atanh}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{8a^{\frac{11}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b/x)**(5/2),x)
```

```
[Out] -2*x**3/(3*a*(a + b/x)**(3/2)) - 6*x**3/(a**2*sqrt(a + b/x)) + 7*
x**3*sqrt(a + b/x)/a**3 - 35*b*x**2*sqrt(a + b/x)/(4*a**4) + 105*
b**2*x*sqrt(a + b/x)/(8*a**5) - 105*b**3*atanh(sqrt(a + b/x)/sqrt
(a))/(8*a**(11/2))
```

Mathematica [A] time = 0.193822, size = 106, normalized size = 0.79

$$\frac{x\sqrt{a+\frac{b}{x}}\left(8a^4x^4-18a^3bx^3+63a^2b^2x^2+420ab^3x+315b^4\right)}{24a^5(ax+b)^2}-\frac{105b^3\log\left(2\sqrt{a}x\sqrt{a+\frac{b}{x}}+2ax+b\right)}{16a^{11/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a + b/x)^(5/2),x]
```

```
[Out] (Sqrt[a + b/x]*x*(315*b^4 + 420*a*b^3*x + 63*a^2*b^2*x^2 - 18*a^3
*b*x^3 + 8*a^4*x^4))/(24*a^5*(b + a*x)^2) - (105*b^3*Log[b + 2*a*
x + 2*Sqrt[a]*Sqrt[a + b/x]*x])/(16*a^(11/2))
```

Maple [B] time = 0.023, size = 620, normalized size = 4.6

$$\frac{x}{48\,(ax+b)^{3}}\sqrt{\frac{ax+b}{x}}\left(16\,a^{19/2}\left(ax^{2}+bx\right)^{3/2}x^{3}-84\,a^{19/2}\sqrt{ax^{2}+bx}x^{4}b+48\,a^{17/2}\left(ax^{2}+bx\right)^{3/2}x^{2}b-294\,a^{17/2}\sqrt{ax^{2}+bx}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(a+b/x)^(5/2),x)
```

```
[Out] 1/48*((a*x+b)/x)^(1/2)*x/a^(21/2)*(16*a^(19/2)*(a*x^2+b*x)^(3/2)*
x^3-84*a^(19/2)*(a*x^2+b*x)^(1/2)*x^4*b+48*a^(17/2)*(a*x^2+b*x)^(
3/2)*x^2*b-294*a^(17/2)*(a*x^2+b*x)^(1/2)*x^3*b^2+672*a^(17/2)*(x
*(a*x+b))^(1/2)*x^3*b^2+48*a^(15/2)*(a*x^2+b*x)^(3/2)*x*b^2-378*a
^(15/2)*(a*x^2+b*x)^(1/2)*x^2*b^3-384*a^(15/2)*(x*(a*x+b))^(3/2)*
x*b^2+2016*a^(15/2)*(x*(a*x+b))^(1/2)*x^2*b^3+16*a^(13/2)*(a*x^2+
b*x)^(3/2)*b^3-210*a^(13/2)*(a*x^2+b*x)^(1/2)*x*b^4-352*b^3*a^(13
/2)*(x*(a*x+b))^(3/2)+2016*a^(13/2)*(x*(a*x+b))^(1/2)*x*b^4-42*a^
(11/2)*(a*x^2+b*x)^(1/2)*b^5+672*a^(11/2)*(x*(a*x+b))^(1/2)*b^5+2
1*ln(1/2*(2*(a*x^2+b*x)^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*x^3*a^8*b
^3-336*ln(1/2*(2*(x*(a*x+b))^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*x^3*
a^8*b^3+63*ln(1/2*(2*(a*x^2+b*x)^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*
x^2*a^7*b^4-1008*ln(1/2*(2*(x*(a*x+b))^(1/2)*a^(1/2)+2*a*x+b)/a^(
1/2))*x^2*a^7*b^4+63*ln(1/2*(2*(a*x^2+b*x)^(1/2)*a^(1/2)+2*a*x+b)
/a^(1/2))*x*a^6*b^5-1008*ln(1/2*(2*(x*(a*x+b))^(1/2)*a^(1/2)+2*a*
x+b)/a^(1/2))*x*a^6*b^5+21*ln(1/2*(2*(a*x^2+b*x)^(1/2)*a^(1/2)+2*
a*x+b)/a^(1/2))*a^5*b^6-336*ln(1/2*(2*(x*(a*x+b))^(1/2)*a^(1/2)+2
*a*x+b)/a^(1/2))*a^5*b^6)/(x*(a*x+b))^(1/2)/(a*x+b)^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.256672, size = 1, normalized size = 0.01

$$\left[\frac{315\left(ab^{3}x+b^{4}\right)\sqrt{\frac{ax+b}{x}}\log\left(-2\,ax\sqrt{\frac{ax+b}{x}}+(2\,ax+b)\sqrt{a}\right)+2\left(8\,a^{4}x^{4}-18\,a^{3}bx^{3}+63\,a^{2}b^{2}x^{2}+420\,ab^{3}x+315\,b^{4}\right)\sqrt{a}}{48\left(a^{6}x+a^{5}b\right)\sqrt{a}\sqrt{\frac{ax+b}{x}}},\ 315\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x)^(5/2),x, algorithm="fricas")
```

```
[Out] [1/48*(315*(a*b^3*x + b^4)*sqrt((a*x + b)/x)*log(-2*a*x*sqrt((a*x
 + b)/x) + (2*a*x + b)*sqrt(a)) + 2*(8*a^4*x^4 - 18*a^3*b*x^3 + 6
```

```
3*a^2*b^2*x^2 + 420*a*b^3*x + 315*b^4)*sqrt(a))/((a^6*x + a^5*b)*
sqrt(a)*sqrt((a*x + b)/x)), 1/24*(315*(a*b^3*x + b^4)*sqrt((a*x +
 b)/x)*arctan(a/(sqrt(-a)*sqrt((a*x + b)/x))) + (8*a^4*x^4 - 18*a
^3*b*x^3 + 63*a^2*b^2*x^2 + 420*a*b^3*x + 315*b^4)*sqrt(-a))/((a^
6*x + a^5*b)*sqrt(-a)*sqrt((a*x + b)/x))]
```

Sympy [A] time = 39.3637, size = 532, normalized size = 3.97

$$\frac{8a^{\frac{133}{2}}b^{128}x^{72}}{24a^{\frac{137}{2}}b^{\frac{257}{2}}x^{\frac{137}{2}}\sqrt{\frac{ax}{b}+1}+24a^{\frac{135}{2}}b^{\frac{259}{2}}x^{\frac{135}{2}}\sqrt{\frac{ax}{b}+1}} - \frac{18a^{\frac{131}{2}}b^{129}x^{71}}{24a^{\frac{137}{2}}b^{\frac{257}{2}}x^{\frac{137}{2}}\sqrt{\frac{ax}{b}+1}+24a^{\frac{135}{2}}b^{\frac{259}{2}}x^{\frac{135}{2}}\sqrt{\frac{ax}{b}+1}} + \frac{63a^{\frac{129}{2}}b^{130}x^{70}}{24a^{\frac{137}{2}}b^{\frac{257}{2}}x^{\frac{137}{2}}\sqrt{\frac{ax}{b}+1}+24a^{\frac{135}{2}}b^{\frac{259}{2}}x^{\frac{135}{2}}\sqrt{\frac{ax}{b}+1}} + \frac{420a^{\frac{127}{2}}b^{131}x^{69}}{24a^{\frac{137}{2}}b^{\frac{257}{2}}x^{\frac{137}{2}}\sqrt{\frac{ax}{b}+1}+24a^{\frac{135}{2}}b^{\frac{259}{2}}x^{\frac{135}{2}}\sqrt{\frac{ax}{b}+1}} + \frac{315a^{\frac{125}{2}}b^{132}x^{68}}{24a^{\frac{137}{2}}b^{\frac{257}{2}}x^{\frac{137}{2}}\sqrt{\frac{ax}{b}+1}+24a^{\frac{135}{2}}b^{\frac{259}{2}}x^{\frac{135}{2}}\sqrt{\frac{ax}{b}+1}} - \frac{315a^{63}b^{\frac{263}{2}}x^{\frac{137}{2}}\sqrt{\frac{ax}{b}+1}\operatorname{asinh}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{24a^{\frac{137}{2}}b^{\frac{257}{2}}x^{\frac{137}{2}}\sqrt{\frac{ax}{b}+1}+24a^{\frac{135}{2}}b^{\frac{259}{2}}x^{\frac{135}{2}}\sqrt{\frac{ax}{b}+1}} - \frac{315a^{62}b^{\frac{265}{2}}x^{\frac{135}{2}}\sqrt{\frac{ax}{b}+1}\operatorname{asinh}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{24a^{\frac{137}{2}}b^{\frac{257}{2}}x^{\frac{137}{2}}\sqrt{\frac{ax}{b}+1}+24a^{\frac{135}{2}}b^{\frac{259}{2}}x^{\frac{135}{2}}\sqrt{\frac{ax}{b}+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b/x)**(5/2),x)
```

```
[Out] 8*a**(133/2)*b**128*x**72/(24*a**(137/2)*b**(257/2)*x**(137/2)*sq
rt(a*x/b + 1) + 24*a**(135/2)*b**(259/2)*x**(135/2)*sqrt(a*x/b +
1)) - 18*a**(131/2)*b**129*x**71/(24*a**(137/2)*b**(257/2)*x**(13
7/2)*sqrt(a*x/b + 1) + 24*a**(135/2)*b**(259/2)*x**(135/2)*sqrt(a
*x/b + 1)) + 63*a**(129/2)*b**130*x**70/(24*a**(137/2)*b**(257/2)
*x**(137/2)*sqrt(a*x/b + 1) + 24*a**(135/2)*b**(259/2)*x**(135/2)
*sqrt(a*x/b + 1)) + 420*a**(127/2)*b**131*x**69/(24*a**(137/2)*b*
*(257/2)*x**(137/2)*sqrt(a*x/b + 1) + 24*a**(135/2)*b**(259/2)*x*
*(135/2)*sqrt(a*x/b + 1)) + 315*a**(125/2)*b**132*x**68/(24*a**(1
37/2)*b**(257/2)*x**(137/2)*sqrt(a*x/b + 1) + 24*a**(135/2)*b**(2
59/2)*x**(135/2)*sqrt(a*x/b + 1)) - 315*a**63*b**(263/2)*x**(137/
2)*sqrt(a*x/b + 1)*asinh(sqrt(a)*sqrt(x)/sqrt(b))/(24*a**(137/2)*
b**(257/2)*x**(137/2)*sqrt(a*x/b + 1) + 24*a**(135/2)*b**(259/2)*
x**(135/2)*sqrt(a*x/b + 1)) - 315*a**62*b**(265/2)*x**(135/2)*sqr
t(a*x/b + 1)*asinh(sqrt(a)*sqrt(x)/sqrt(b))/(24*a**(137/2)*b**(25
7/2)*x**(137/2)*sqrt(a*x/b + 1) + 24*a**(135/2)*b**(259/2)*x**(13
5/2)*sqrt(a*x/b + 1))
```

GIAC/XCAS [A] time = 0.264804, size = 203, normalized size = 1.51

$$\frac{1}{24}b\left(\frac{315\,b^2\arctan\left(\frac{\sqrt{\frac{ax+b}{x}}}{\sqrt{-a}}\right)}{\sqrt{-a}a^5}+\frac{16\,a^4b^2+\frac{144\,(ax+b)a^3b^2}{x}-\frac{693\,(ax+b)^2a^2b^2}{x^2}+\frac{840\,(ax+b)^3ab^2}{x^3}-\frac{315\,(ax+b)^4b^2}{x^4}}{\left(a\sqrt{\frac{ax+b}{x}}-\frac{(ax+b)\sqrt{\frac{ax+b}{x}}}{x}\right)^3a^5}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x)^(5/2),x, algorithm="giac")
```

```
[Out] 1/24*b*(315*b^2*arctan(sqrt((a*x + b)/x)/sqrt(-a))/(sqrt(-a)*a^5)
 + (16*a^4*b^2 + 144*(a*x + b)*a^3*b^2/x - 693*(a*x + b)^2*a^2*b^
2/x^2 + 840*(a*x + b)^3*a*b^2/x^3 - 315*(a*x + b)^4*b^2/x^4)/((a*
sqrt((a*x + b)/x) - (a*x + b)*sqrt((a*x + b)/x)/x)^3*a^5))
```

3.1741 $\int \frac{x}{\left(a+\frac{b}{x}\right)^{5/2}} dx$

Optimal. Leaf size=114

$$\frac{35b^2 \tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{4a^{9/2}} - \frac{35bx\sqrt{a+\frac{b}{x}}}{4a^4} + \frac{35x^2\sqrt{a+\frac{b}{x}}}{6a^3} - \frac{14x^2}{3a^2\sqrt{a+\frac{b}{x}}} - \frac{2x^2}{3a\left(a+\frac{b}{x}\right)^{3/2}}$$

```
[Out] (-35*b*Sqrt[a + b/x]*x)/(4*a^4) - (2*x^2)/(3*a*(a + b/x)^(3/2)) -
 (14*x^2)/(3*a^2*Sqrt[a + b/x]) + (35*Sqrt[a + b/x]*x^2)/(6*a^3)
+ (35*b^2*ArcTanh[Sqrt[a + b/x]/Sqrt[a]])/(4*a^(9/2))
```

Rubi [A] time = 0.152204, antiderivative size = 114, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{35b^2 \tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{4a^{9/2}} - \frac{35bx\sqrt{a+\frac{b}{x}}}{4a^4} + \frac{35x^2\sqrt{a+\frac{b}{x}}}{6a^3} - \frac{14x^2}{3a^2\sqrt{a+\frac{b}{x}}} - \frac{2x^2}{3a\left(a+\frac{b}{x}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b/x)^(5/2),x]
```

```
[Out] (-35*b*Sqrt[a + b/x]*x)/(4*a^4) - (2*x^2)/(3*a*(a + b/x)^(3/2)) -
 (14*x^2)/(3*a^2*Sqrt[a + b/x]) + (35*Sqrt[a + b/x]*x^2)/(6*a^3)
+ (35*b^2*ArcTanh[Sqrt[a + b/x]/Sqrt[a]])/(4*a^(9/2))
```

Rubi in Sympy [A] time = 16.3529, size = 99, normalized size = 0.87

$$-\frac{2x^2}{3a\left(a+\frac{b}{x}\right)^{\frac{3}{2}}} - \frac{14x^2}{3a^2\sqrt{a+\frac{b}{x}}} + \frac{35x^2\sqrt{a+\frac{b}{x}}}{6a^3} - \frac{35bx\sqrt{a+\frac{b}{x}}}{4a^4} + \frac{35b^2 \operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{4a^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b/x)**(5/2),x)
```

```
[Out] -2*x**2/(3*a*(a + b/x)**(3/2)) - 14*x**2/(3*a**2*sqrt(a + b/x)) +
 35*x**2*sqrt(a + b/x)/(6*a**3) - 35*b*x*sqrt(a + b/x)/(4*a**4) +
 35*b**2*atanh(sqrt(a + b/x)/sqrt(a))/(4*a**(9/2))
```

Mathematica [A] time = 0.156256, size = 95, normalized size = 0.83

$$\frac{35b^2 \log\left(2\sqrt{a}x\sqrt{a+\frac{b}{x}}+2ax+b\right)}{8a^{9/2}} + \frac{x\sqrt{a+\frac{b}{x}}\left(6a^3x^3-21a^2bx^2-140ab^2x-105b^3\right)}{12a^4(ax+b)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b/x)^(5/2),x]
```

```
[Out] (Sqrt[a + b/x]*x*(-105*b^3 - 140*a*b^2*x - 21*a^2*b*x^2 + 6*a^3*x
^3))/(12*a^4*(b + a*x)^2) + (35*b^2*Log[b + 2*a*x + 2*Sqrt[a]*Sqr
t[a + b/x]*x])/(8*a^(9/2))
```

Maple [B] time = 0.017, size = 535, normalized size = 4.7

$$-\frac{x}{24\,(ax+b)^3}\sqrt{\frac{ax+b}{x}}\left(-12\,a^{17/2}\sqrt{ax^2+bx}x^4-42\,a^{15/2}\sqrt{ax^2+bx}x^3b+216\,a^{15/2}\sqrt{x\,(ax+b)}x^3b-54\,a^{13/2}\sqrt{ax^2+bx}x^2b\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+b/x)^(5/2),x)
```

```
[Out] -1/24*((a*x+b)/x)^(1/2)*x/a^(17/2)*(-12*a^(17/2)*(a*x^2+b*x)^(1/2
)*x^4-42*a^(15/2)*(a*x^2+b*x)^(1/2)*x^3*b+216*a^(15/2)*(x*(a*x+b)
)^(1/2)*x^3*b-54*a^(13/2)*(a*x^2+b*x)^(1/2)*x^2*b^2-144*a^(13/2)*
(x*(a*x+b))^(3/2)*x*b+648*a^(13/2)*(x*(a*x+b))^(1/2)*x^2*b^2-30*a
^(11/2)*(a*x^2+b*x)^(1/2)*x*b^3-128*b^2*a^(11/2)*(x*(a*x+b))^(3/2
)+648*a^(11/2)*(x*(a*x+b))^(1/2)*x*b^3-6*a^(9/2)*(a*x^2+b*x)^(1/2
)*b^4+216*a^(9/2)*(x*(a*x+b))^(1/2)*b^4+3*ln(1/2*(2*(a*x^2+b*x)^(
1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*x^3*a^7*b^2-108*ln(1/2*(2*(x*(a*x+
b))^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*x^3*a^7*b^2+9*ln(1/2*(2*(a*x^
2+b*x)^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*x^2*a^6*b^3-324*ln(1/2*(2*
(x*(a*x+b))^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*x^2*a^6*b^3+9*ln(1/2*
(2*(a*x^2+b*x)^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*x*a^5*b^4-324*ln(1
/2*(2*(x*(a*x+b))^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*x*a^5*b^4+3*ln(
1/2*(2*(a*x^2+b*x)^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*a^4*b^5-108*ln
(1/2*(2*(x*(a*x+b))^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*a^4*b^5)/(x*(
a*x+b))^(1/2)/(a*x+b)^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.259129, size = 1, normalized size = 0.01

$$\left[\frac{105\left(ab^2x+b^3\right)\sqrt{\frac{ax+b}{x}}\log\left(2\,ax\sqrt{\frac{ax+b}{x}}+(2\,ax+b)\sqrt{a}\right)+2\left(6\,a^3x^3-21\,a^2bx^2-140\,ab^2x-105\,b^3\right)\sqrt{a}}{24\,(a^5x+a^4b)\sqrt{a}\sqrt{\frac{ax+b}{x}}},\right.$$
$$\left.-\frac{105\left(ab^2x+b^3\right)\sqrt{\frac{ax+b}{x}}\arctan\left(\frac{a}{\sqrt{-a}\sqrt{\frac{ax+b}{x}}}\right)-\left(6\,a^3x^3-21\,a^2bx^2-140\,ab^2x-105\,b^3\right)\sqrt{-a}}{12\,(a^5x+a^4b)\sqrt{-a}\sqrt{\frac{ax+b}{x}}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x)^(5/2),x, algorithm="fricas")
```

```
[Out] [1/24*(105*(a*b^2*x + b^3)*sqrt((a*x + b)/x)*log(2*a*x*sqrt((a*x
+ b)/x) + (2*a*x + b)*sqrt(a)) + 2*(6*a^3*x^3 - 21*a^2*b*x^2 - 14
```

```
0*a*b^2*x - 105*b^3)*sqrt(a))/((a^5*x + a^4*b)*sqrt(a)*sqrt((a*x
+ b)/x)), -1/12*(105*(a*b^2*x + b^3)*sqrt((a*x + b)/x)*arctan(a/(
sqrt(-a)*sqrt((a*x + b)/x))) - (6*a^3*x^3 - 21*a^2*b*x^2 - 140*a*
b^2*x - 105*b^3)*sqrt(-a))/((a^5*x + a^4*b)*sqrt(-a)*sqrt((a*x +
b)/x))]
```

Sympy [A] time = 26.341, size = 464, normalized size = 4.07

$$\frac{6a^{\frac{89}{2}}b^{75}x^{49}}{12a^{\frac{93}{2}}b^{\frac{151}{2}}x^{\frac{93}{2}}\sqrt{\frac{ax}{b}+1}+12a^{\frac{91}{2}}b^{\frac{153}{2}}x^{\frac{91}{2}}\sqrt{\frac{ax}{b}+1}} - \frac{21a^{\frac{87}{2}}b^{76}x^{48}}{12a^{\frac{93}{2}}b^{\frac{151}{2}}x^{\frac{93}{2}}\sqrt{\frac{ax}{b}+1}+12a^{\frac{91}{2}}b^{\frac{153}{2}}x^{\frac{91}{2}}\sqrt{\frac{ax}{b}+1}} - \frac{140a^{\frac{85}{2}}b^{77}x^{47}}{12a^{\frac{93}{2}}b^{\frac{151}{2}}x^{\frac{93}{2}}\sqrt{\frac{ax}{b}+1}+12a^{\frac{91}{2}}b^{\frac{153}{2}}x^{\frac{91}{2}}\sqrt{\frac{ax}{b}+1}} - \frac{105a^{\frac{83}{2}}b^{78}x^{46}}{12a^{\frac{93}{2}}b^{\frac{151}{2}}x^{\frac{93}{2}}\sqrt{\frac{ax}{b}+1}+12a^{\frac{91}{2}}b^{\frac{153}{2}}x^{\frac{91}{2}}\sqrt{\frac{ax}{b}+1}} + \frac{105a^{42}b^{\frac{155}{2}}x^{\frac{93}{2}}\sqrt{\frac{ax}{b}+1}\operatorname{asinh}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{12a^{\frac{93}{2}}b^{\frac{151}{2}}x^{\frac{93}{2}}\sqrt{\frac{ax}{b}+1}+12a^{\frac{91}{2}}b^{\frac{153}{2}}x^{\frac{91}{2}}\sqrt{\frac{ax}{b}+1}} + \frac{105a^{41}b^{\frac{157}{2}}x^{\frac{91}{2}}\sqrt{\frac{ax}{b}+1}\operatorname{asinh}\left(\frac{\sqrt{a}\sqrt{x}}{\sqrt{b}}\right)}{12a^{\frac{93}{2}}b^{\frac{151}{2}}x^{\frac{93}{2}}\sqrt{\frac{ax}{b}+1}+12a^{\frac{91}{2}}b^{\frac{153}{2}}x^{\frac{91}{2}}\sqrt{\frac{ax}{b}+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b/x)**(5/2),x)
```

```
[Out] 6*a**(89/2)*b**75*x**49/(12*a**(93/2)*b**(151/2)*x**(93/2)*sqrt(a
*x/b + 1) + 12*a**(91/2)*b**(153/2)*x**(91/2)*sqrt(a*x/b + 1)) -
21*a**(87/2)*b**76*x**48/(12*a**(93/2)*b**(151/2)*x**(93/2)*sqrt(
a*x/b + 1) + 12*a**(91/2)*b**(153/2)*x**(91/2)*sqrt(a*x/b + 1)) -
 140*a**(85/2)*b**77*x**47/(12*a**(93/2)*b**(151/2)*x**(93/2)*sqr
t(a*x/b + 1) + 12*a**(91/2)*b**(153/2)*x**(91/2)*sqrt(a*x/b + 1))
 - 105*a**(83/2)*b**78*x**46/(12*a**(93/2)*b**(151/2)*x**(93/2)*s
qrt(a*x/b + 1) + 12*a**(91/2)*b**(153/2)*x**(91/2)*sqrt(a*x/b + 1
)) + 105*a**42*b**(155/2)*x**(93/2)*sqrt(a*x/b + 1)*asinh(sqrt(a)
*sqrt(x)/sqrt(b))/(12*a**(93/2)*b**(151/2)*x**(93/2)*sqrt(a*x/b +
 1) + 12*a**(91/2)*b**(153/2)*x**(91/2)*sqrt(a*x/b + 1)) + 105*a*
*41*b**(157/2)*x**(91/2)*sqrt(a*x/b + 1)*asinh(sqrt(a)*sqrt(x)/sq
rt(b))/(12*a**(93/2)*b**(151/2)*x**(93/2)*sqrt(a*x/b + 1) + 12*a*
*(91/2)*b**(153/2)*x**(91/2)*sqrt(a*x/b + 1))
```

GIAC/XCAS [A] time = 0.262774, size = 169, normalized size = 1.48

$$-\frac{1}{12}\,b^2\left(\frac{8\left(a+\frac{9\,(ax+b)}{x}\right)x}{(ax+b)a^4\sqrt{\frac{ax+b}{x}}}+\frac{105\,\arctan\left(\frac{\sqrt{\frac{ax+b}{x}}}{\sqrt{-a}}\right)}{\sqrt{-a}a^4}-\frac{3\left(13\,a\sqrt{\frac{ax+b}{x}}-\frac{11\,(ax+b)\sqrt{\frac{ax+b}{x}}}{x}\right)}{\left(a-\frac{ax+b}{x}\right)^2a^4}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x)^(5/2),x, algorithm="giac")
```

```
[Out] -1/12*b^2*(8*(a + 9*(a*x + b)/x)*x/((a*x + b)*a^4*sqrt((a*x + b)/
x)) + 105*arctan(sqrt((a*x + b)/x)/sqrt(-a))/(sqrt(-a)*a^4) - 3*(
13*a*sqrt((a*x + b)/x) - 11*(a*x + b)*sqrt((a*x + b)/x)/x)/((a -
(a*x + b)/x)^2*a^4))
```

3.1742 $\int \frac{1}{\left(a+\frac{b}{x}\right)^{5/2}}\,dx$

Optimal. Leaf size=82

$$-\frac{5b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{a^{7/2}}+\frac{5x\sqrt{a+\frac{b}{x}}}{a^3}-\frac{10x}{3a^2\sqrt{a+\frac{b}{x}}}-\frac{2x}{3a\left(a+\frac{b}{x}\right)^{3/2}}$$

```
[Out] (-2*x)/(3*a*(a + b/x)^(3/2)) - (10*x)/(3*a^2*Sqrt[a + b/x]) + (5*
Sqrt[a + b/x]*x)/a^3 - (5*b*ArcTanh[Sqrt[a + b/x]/Sqrt[a]])/a^(7/
2)
```

Rubi [A] time = 0.106736, antiderivative size = 82, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364

$$-\frac{5b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{a^{7/2}}+\frac{5x\sqrt{a+\frac{b}{x}}}{a^3}-\frac{10x}{3a^2\sqrt{a+\frac{b}{x}}}-\frac{2x}{3a\left(a+\frac{b}{x}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(-5/2),x]
```

```
[Out] (-2*x)/(3*a*(a + b/x)^(3/2)) - (10*x)/(3*a^2*Sqrt[a + b/x]) + (5*
Sqrt[a + b/x]*x)/a^3 - (5*b*ArcTanh[Sqrt[a + b/x]/Sqrt[a]])/a^(7/
2)
```

Rubi in Sympy [A] time = 11.1873, size = 70, normalized size = 0.85

$$-\frac{2x}{3a\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}-\frac{10x}{3a^2\sqrt{a+\frac{b}{x}}}+\frac{5x\sqrt{a+\frac{b}{x}}}{a^3}-\frac{5b\,\mathrm{atanh}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{a^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**(5/2),x)
```

```
[Out] -2*x/(3*a*(a + b/x)**(3/2)) - 10*x/(3*a**2*sqrt(a + b/x)) + 5*x*s
qrt(a + b/x)/a**3 - 5*b*atanh(sqrt(a + b/x)/sqrt(a))/a**(7/2)
```

Mathematica [A] time = 0.126751, size = 82, normalized size = 1.

$$\frac{x\sqrt{a+\frac{b}{x}}\left(3a^2x^2+20abx+15b^2\right)}{3a^3(ax+b)^2}-\frac{5b\log\left(2\sqrt{a}x\sqrt{a+\frac{b}{x}}+2ax+b\right)}{2a^{7/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(-5/2),x]
```

```
[Out] (Sqrt[a + b/x]*x*(15*b^2 + 20*a*b*x + 3*a^2*x^2))/(3*a^3*(b + a*x
)^2) - (5*b*Log[b + 2*a*x + 2*Sqrt[a]*Sqrt[a + b/x]*x])/(2*a^(7/2
))
```

Maple [B] time = 0.014, size = 276, normalized size = 3.4

$$-\frac{x}{6\left(ax+b\right)^{3}}\sqrt{\frac{ax+b}{x}}\left(-30\,a^{13/2}\sqrt{x\left(ax+b\right)}x^{3}+24\,a^{11/2}\left(x\left(ax+b\right)\right)^{3/2}x-90\,a^{11/2}\sqrt{x\left(ax+b\right)}x^{2}b+20\,ba^{9/2}\left(x\left(ax+b\right)\right)^{3/}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^(5/2),x)
```

```
[Out] -1/6*((a*x+b)/x)^(1/2)*x/a^(13/2)*(-30*a^(13/2)*(x*(a*x+b))^(1/2)
*x^3+24*a^(11/2)*(x*(a*x+b))^(3/2)*x-90*a^(11/2)*(x*(a*x+b))^(1/2
)*x^2*b+20*b*a^(9/2)*(x*(a*x+b))^(3/2)-90*a^(9/2)*(x*(a*x+b))^(1/
2)*x*b^2+15*ln(1/2*(2*(x*(a*x+b))^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))
*x^3*a^6*b-30*a^(7/2)*(x*(a*x+b))^(1/2)*b^3+45*ln(1/2*(2*(x*(a*x+
b))^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*x^2*a^5*b^2+45*ln(1/2*(2*(x*(
a*x+b))^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*x*a^4*b^3+15*ln(1/2*(2*(x
*(a*x+b))^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*a^3*b^4)/(x*(a*x+b))^(1
/2)/(a*x+b)^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(-5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.248177, size = 1, normalized size = 0.01

$$\left[\frac{15\left(abx+b^{2}\right)\sqrt{\frac{ax+b}{x}}\log\left(-2\,ax\sqrt{\frac{ax+b}{x}}+\left(2\,ax+b\right)\sqrt{a}\right)+2\left(3\,a^{2}x^{2}+20\,abx+15\,b^{2}\right)\sqrt{a}}{6\left(a^{4}x+a^{3}b\right)\sqrt{a}\sqrt{\frac{ax+b}{x}}},\ \frac{15\left(abx+b^{2}\right)\sqrt{\frac{ax+b}{x}}\arctan\left(\frac{}{\sqrt{-}}\right.}{3\left(a^{4}x+\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(-5/2),x, algorithm="fricas")
```

```
[Out] [1/6*(15*(a*b*x + b^2)*sqrt((a*x + b)/x)*log(-2*a*x*sqrt((a*x + b
)/x) + (2*a*x + b)*sqrt(a)) + 2*(3*a^2*x^2 + 20*a*b*x + 15*b^2)*s
qrt(a))/((a^4*x + a^3*b)*sqrt(a)*sqrt((a*x + b)/x)), 1/3*(15*(a*b
*x + b^2)*sqrt((a*x + b)/x)*arctan(a/(sqrt(-a)*sqrt((a*x + b)/x))
) + (3*a^2*x^2 + 20*a*b*x + 15*b^2)*sqrt(-a))/((a^4*x + a^3*b)*sq
rt(-a)*sqrt((a*x + b)/x))]
```

Sympy [A] time = 17.3799, size = 774, normalized size = 9.44

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(5/2),x)
```

```
[Out] 6*a**17*x**4*sqrt(1 + b/(a*x))/(6*a**(39/2)*x**3 + 18*a**(37/2)*b
*x**2 + 18*a**(35/2)*b**2*x + 6*a**(33/2)*b**3) + 46*a**16*b*x**3
*sqrt(1 + b/(a*x))/(6*a**(39/2)*x**3 + 18*a**(37/2)*b*x**2 + 18*a
**(35/2)*b**2*x + 6*a**(33/2)*b**3) + 15*a**16*b*x**3*log(b/(a*x)
)/(6*a**(39/2)*x**3 + 18*a**(37/2)*b*x**2 + 18*a**(35/2)*b**2*x +
 6*a**(33/2)*b**3) - 30*a**16*b*x**3*log(sqrt(1 + b/(a*x)) + 1)/(
6*a**(39/2)*x**3 + 18*a**(37/2)*b*x**2 + 18*a**(35/2)*b**2*x + 6*
a**(33/2)*b**3) + 70*a**15*b**2*x**2*sqrt(1 + b/(a*x))/(6*a**(39/
2)*x**3 + 18*a**(37/2)*b*x**2 + 18*a**(35/2)*b**2*x + 6*a**(33/2)
*b**3) + 45*a**15*b**2*x**2*log(b/(a*x))/(6*a**(39/2)*x**3 + 18*a
**(37/2)*b*x**2 + 18*a**(35/2)*b**2*x + 6*a**(33/2)*b**3) - 90*a*
*15*b**2*x**2*log(sqrt(1 + b/(a*x)) + 1)/(6*a**(39/2)*x**3 + 18*a
**(37/2)*b*x**2 + 18*a**(35/2)*b**2*x + 6*a**(33/2)*b**3) + 30*a*
*14*b**3*x*sqrt(1 + b/(a*x))/(6*a**(39/2)*x**3 + 18*a**(37/2)*b*x
**2 + 18*a**(35/2)*b**2*x + 6*a**(33/2)*b**3) + 45*a**14*b**3*x*l
og(b/(a*x))/(6*a**(39/2)*x**3 + 18*a**(37/2)*b*x**2 + 18*a**(35/2
)*b**2*x + 6*a**(33/2)*b**3) - 90*a**14*b**3*x*log(sqrt(1 + b/(a*
x)) + 1)/(6*a**(39/2)*x**3 + 18*a**(37/2)*b*x**2 + 18*a**(35/2)*b
**2*x + 6*a**(33/2)*b**3) + 15*a**13*b**4*log(b/(a*x))/(6*a**(39/
2)*x**3 + 18*a**(37/2)*b*x**2 + 18*a**(35/2)*b**2*x + 6*a**(33/2)
*b**3) - 30*a**13*b**4*log(sqrt(1 + b/(a*x)) + 1)/(6*a**(39/2)*x*
*3 + 18*a**(37/2)*b*x**2 + 18*a**(35/2)*b**2*x + 6*a**(33/2)*b**3
)
```

GIAC/XCAS [A] time = 0.270145, size = 132, normalized size = 1.61

$$\frac{1}{3}\,b\left(\frac{2\left(a+\frac{6\,(ax+b)}{x}\right)x}{(ax+b)a^{3}\sqrt{\frac{ax+b}{x}}}+\frac{15\,\arctan\left(\frac{\sqrt{\frac{ax+b}{x}}}{\sqrt{-a}}\right)}{\sqrt{-a}a^{3}}-\frac{3\,\sqrt{\frac{ax+b}{x}}}{\left(a-\frac{ax+b}{x}\right)a^{3}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(-5/2),x, algorithm="giac")
```

```
[Out] 1/3*b*(2*(a + 6*(a*x + b)/x)*x/((a*x + b)*a^3*sqrt((a*x + b)/x))
+ 15*arctan(sqrt((a*x + b)/x)/sqrt(-a))/(sqrt(-a)*a^3) - 3*sqrt((
a*x + b)/x)/((a - (a*x + b)/x)*a^3))
```

3.1743 $\int \frac{1}{\left(a+\frac{b}{x}\right)^{5/2} x} \, dx$

Optimal. Leaf size=60

$$\frac{2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{a^{5/2}}-\frac{2}{a^2\sqrt{a+\frac{b}{x}}}-\frac{2}{3a\left(a+\frac{b}{x}\right)^{3/2}}$$

```
[Out] -2/(3*a*(a + b/x)^(3/2)) - 2/(a^2*Sqrt[a + b/x]) + (2*ArcTanh[Sqr
t[a + b/x]/Sqrt[a]])/a^(5/2)
```

Rubi [A] time = 0.0953389, antiderivative size = 60, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$

$$\frac{2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{a^{5/2}}-\frac{2}{a^2\sqrt{a+\frac{b}{x}}}-\frac{2}{3a\left(a+\frac{b}{x}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^(5/2)*x),x]
```

```
[Out] -2/(3*a*(a + b/x)^(3/2)) - 2/(a^2*Sqrt[a + b/x]) + (2*ArcTanh[Sqr
t[a + b/x]/Sqrt[a]])/a^(5/2)
```

Rubi in Sympy [A] time = 9.35803, size = 48, normalized size = 0.8

$$-\frac{2}{3a\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}-\frac{2}{a^2\sqrt{a+\frac{b}{x}}}+\frac{2\,\mathrm{atanh}\left(\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{a}}\right)}{a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**(5/2)/x,x)
```

```
[Out] -2/(3*a*(a + b/x)**(3/2)) - 2/(a**2*sqrt(a + b/x)) + 2*atanh(sqrt
(a + b/x)/sqrt(a))/a**(5/2)
```

Mathematica [A] time = 0.14214, size = 67, normalized size = 1.12

$$\frac{\log\left(2\sqrt{a}x\sqrt{a+\frac{b}{x}}+2ax+b\right)}{a^{5/2}}-\frac{2x\sqrt{a+\frac{b}{x}}(4ax+3b)}{3a^2(ax+b)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^(5/2)*x),x]
```

```
[Out] (-2*Sqrt[a + b/x]*x*(3*b + 4*a*x))/(3*a^2*(b + a*x)^2) + Log[b +
2*a*x + 2*Sqrt[a]*Sqrt[a + b/x]*x]/a^(5/2)
```

Maple [B] time = 0.014, size = 279, normalized size = 4.7

$$\frac{x}{3b(ax+b)^3}\sqrt{\frac{ax+b}{x}}\left(-6a^{11/2}\sqrt{x(ax+b)}x^3+6a^{9/2}(x(ax+b))^{3/2}x-18a^{9/2}\sqrt{x(ax+b)}x^2b+3\ln\left(1/2\frac{2\sqrt{x(ax+b)}\sqrt{a}}{\sqrt{a}}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^(5/2)/x,x)
```

```
[Out] 1/3*((a*x+b)/x)^(1/2)*x/a^(9/2)*(-6*a^(11/2)*(x*(a*x+b))^(1/2)*x^
3+6*a^(9/2)*(x*(a*x+b))^(3/2)*x-18*a^(9/2)*(x*(a*x+b))^(1/2)*x^2*
b+3*ln(1/2*(2*(x*(a*x+b))^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*x^3*a^5
*b+4*a^(7/2)*(x*(a*x+b))^(3/2)*b-18*a^(7/2)*(x*(a*x+b))^(1/2)*x*b
^2+9*ln(1/2*(2*(x*(a*x+b))^(1/2)*a^(1/2)+2*a*x+b)/a^(1/2))*x^2*a^
4*b^2-6*a^(5/2)*(x*(a*x+b))^(1/2)*b^3+9*ln(1/2*(2*(x*(a*x+b))^(1/
2)*a^(1/2)+2*a*x+b)/a^(1/2))*x*a^3*b^3+3*ln(1/2*(2*(x*(a*x+b))^(1
/2)*a^(1/2)+2*a*x+b)/a^(1/2))*a^2*b^4)/(x*(a*x+b))^(1/2)/b/(a*x+b
)^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.253083, size = 1, normalized size = 0.02

$$\left[\frac{3(ax+b)\sqrt{\frac{ax+b}{x}}\log\left(2ax\sqrt{\frac{ax+b}{x}}+(2ax+b)\sqrt{a}\right)-2(4ax+3b)\sqrt{a}}{3(a^3x+a^2b)\sqrt{a}\sqrt{\frac{ax+b}{x}}},\right.$$
$$\left.-\frac{2\left(3(ax+b)\sqrt{\frac{ax+b}{x}}\arctan\left(\frac{a}{\sqrt{-a}\sqrt{\frac{ax+b}{x}}}\right)+(4ax+3b)\sqrt{-a}\right)}{3(a^3x+a^2b)\sqrt{-a}\sqrt{\frac{ax+b}{x}}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x),x, algorithm="fricas")
```

```
[Out] [1/3*(3*(a*x + b)*sqrt((a*x + b)/x)*log(2*a*x*sqrt((a*x + b)/x) +
 (2*a*x + b)*sqrt(a)) - 2*(4*a*x + 3*b)*sqrt(a))/((a^3*x + a^2*b)
*sqrt(a)*sqrt((a*x + b)/x)), -2/3*(3*(a*x + b)*sqrt((a*x + b)/x)*
arctan(a/(sqrt(-a)*sqrt((a*x + b)/x))) + (4*a*x + 3*b)*sqrt(-a))/
((a^3*x + a^2*b)*sqrt(-a)*sqrt((a*x + b)/x))]
```

Sympy [A] time = 11.4478, size = 700, normalized size = 11.67

$$-\frac{8a^7x^3\sqrt{1+\frac{b}{ax}}}{3a^{\frac{19}{2}}x^3+9a^{\frac{17}{2}}bx^2+9a^{\frac{15}{2}}b^2x+3a^{\frac{13}{2}}b^3}-\frac{3a^7x^3\log\left(\frac{b}{ax}\right)}{3a^{\frac{19}{2}}x^3+9a^{\frac{17}{2}}bx^2+9a^{\frac{15}{2}}b^2x+3a^{\frac{13}{2}}b^3}+\frac{6a^7x^3\log\left(\sqrt{1+\frac{b}{ax}}+1\right)}{3a^{\frac{19}{2}}x^3+9a^{\frac{17}{2}}bx^2+9a^{\frac{15}{2}}b^2x+3a^{\frac{13}{2}}b^3}-\frac{14a^6bx^2\sqrt{1+\frac{b}{ax}}}{3a^{\frac{19}{2}}x^3+9a^{\frac{17}{2}}bx^2+9a^{\frac{15}{2}}b^2x+3a^{\frac{13}{2}}b^3}-\frac{9a^6bx^2\log\left(\frac{b}{ax}\right)}{3a^{\frac{19}{2}}x^3+9a^{\frac{17}{2}}bx^2+9a^{\frac{15}{2}}b^2x+3a^{\frac{13}{2}}b^3}+\frac{18a^6bx^2\log\left(\sqrt{1+\frac{b}{ax}}+1\right)}{3a^{\frac{19}{2}}x^3+9a^{\frac{17}{2}}bx^2+9a^{\frac{15}{2}}b^2x+3a^{\frac{13}{2}}b^3}-\frac{6a^5b^2x\sqrt{1+\frac{b}{ax}}}{3a^{\frac{19}{2}}x^3+9a^{\frac{17}{2}}bx^2+9a^{\frac{15}{2}}b^2x+3a^{\frac{13}{2}}b^3}-\frac{9a^5b^2x\log\left(\frac{b}{ax}\right)}{3a^{\frac{19}{2}}x^3+9a^{\frac{17}{2}}bx^2+9a^{\frac{15}{2}}b^2x+3a^{\frac{13}{2}}b^3}+\frac{18a^5b^2x\log\left(\sqrt{1+\frac{b}{ax}}+1\right)}{3a^{\frac{19}{2}}x^3+9a^{\frac{17}{2}}bx^2+9a^{\frac{15}{2}}b^2x+3a^{\frac{13}{2}}b^3}-\frac{3a^4b^3\log\left(\frac{b}{ax}\right)}{3a^{\frac{19}{2}}x^3+9a^{\frac{17}{2}}bx^2+9a^{\frac{15}{2}}b^2x+3a^{\frac{13}{2}}b^3}+\frac{6a^4b^3\log\left(\sqrt{1+\frac{b}{ax}}+1\right)}{3a^{\frac{19}{2}}x^3+9a^{\frac{17}{2}}bx^2+9a^{\frac{15}{2}}b^2x+3a^{\frac{13}{2}}b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(5/2)/x,x)
```

```
[Out] -8*a**7*x**3*sqrt(1 + b/(a*x))/(3*a**(19/2)*x**3 + 9*a**(17/2)*b*
x**2 + 9*a**(15/2)*b**2*x + 3*a**(13/2)*b**3) - 3*a**7*x**3*log(b
/(a*x))/(3*a**(19/2)*x**3 + 9*a**(17/2)*b*x**2 + 9*a**(15/2)*b**2
*x + 3*a**(13/2)*b**3) + 6*a**7*x**3*log(sqrt(1 + b/(a*x)) + 1)/(
3*a**(19/2)*x**3 + 9*a**(17/2)*b*x**2 + 9*a**(15/2)*b**2*x + 3*a*
*(13/2)*b**3) - 14*a**6*b*x**2*sqrt(1 + b/(a*x))/(3*a**(19/2)*x**
3 + 9*a**(17/2)*b*x**2 + 9*a**(15/2)*b**2*x + 3*a**(13/2)*b**3) -
 9*a**6*b*x**2*log(b/(a*x))/(3*a**(19/2)*x**3 + 9*a**(17/2)*b*x**
2 + 9*a**(15/2)*b**2*x + 3*a**(13/2)*b**3) + 18*a**6*b*x**2*log(s
qrt(1 + b/(a*x)) + 1)/(3*a**(19/2)*x**3 + 9*a**(17/2)*b*x**2 + 9*
a**(15/2)*b**2*x + 3*a**(13/2)*b**3) - 6*a**5*b**2*x*sqrt(1 + b/(
a*x))/(3*a**(19/2)*x**3 + 9*a**(17/2)*b*x**2 + 9*a**(15/2)*b**2*x
 + 3*a**(13/2)*b**3) - 9*a**5*b**2*x*log(b/(a*x))/(3*a**(19/2)*x*
*3 + 9*a**(17/2)*b*x**2 + 9*a**(15/2)*b**2*x + 3*a**(13/2)*b**3)
+ 18*a**5*b**2*x*log(sqrt(1 + b/(a*x)) + 1)/(3*a**(19/2)*x**3 + 9
*a**(17/2)*b*x**2 + 9*a**(15/2)*b**2*x + 3*a**(13/2)*b**3) - 3*a*
*4*b**3*log(b/(a*x))/(3*a**(19/2)*x**3 + 9*a**(17/2)*b*x**2 + 9*a
**(15/2)*b**2*x + 3*a**(13/2)*b**3) + 6*a**4*b**3*log(sqrt(1 + b/
(a*x)) + 1)/(3*a**(19/2)*x**3 + 9*a**(17/2)*b*x**2 + 9*a**(15/2)*
b**2*x + 3*a**(13/2)*b**3)
```

GIAC/XCAS [A] time = 0.261727, size = 99, normalized size = 1.65

$$-\frac{2}{3}\,b\left(\frac{\left(a+\frac{3\,(ax+b)}{x}\right)x}{(ax+b)a^2b\sqrt{\frac{ax+b}{x}}}+\frac{3\,\arctan\left(\frac{\sqrt{\frac{ax+b}{x}}}{\sqrt{-a}}\right)}{\sqrt{-a}a^2b}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x),x, algorithm="giac")
```

```
[Out] -2/3*b*((a + 3*(a*x + b)/x)*x/((a*x + b)*a^2*b*sqrt((a*x + b)/x))
 + 3*arctan(sqrt((a*x + b)/x)/sqrt(-a))/(sqrt(-a)*a^2*b))
```

3.1744 $\int \frac{1}{\left(a+\frac{b}{x}\right)^{5/2} x^2} \, dx$

Optimal. Leaf size=18

$$\frac{2}{3b\left(a+\frac{b}{x}\right)^{3/2}}$$

```
[Out] 2/(3*b*(a + b/x)^(3/2))
```

Rubi [A] time = 0.0271003, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{2}{3b\left(a+\frac{b}{x}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^(5/2)*x^2),x]

[Out] 2/(3*b*(a + b/x)^(3/2))
```

Rubi in Sympy [A] time = 2.20045, size = 12, normalized size = 0.67

$$\frac{2}{3b\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**(5/2)/x**2,x)

[Out] 2/(3*b*(a + b/x)**(3/2))
```

Mathematica [A] time = 0.0250144, size = 18, normalized size = 1.

$$\frac{2}{3b\left(a+\frac{b}{x}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^(5/2)*x^2),x]

[Out] 2/(3*b*(a + b/x)^(3/2))
```

Maple [A] time = 0.007, size = 25, normalized size = 1.4

$$\frac{2\,ax+2\,b}{3\,bx}\left(\frac{ax+b}{x}\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^(5/2)/x^2,x)
```

```
[Out] 2/3/x*(a*x+b)/b/((a*x+b)/x)^(5/2)
```

Maxima [A] time = 1.43015, size = 19, normalized size = 1.06

$$\frac{2}{3\left(a+\frac{b}{x}\right)^{\frac{3}{2}}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^2),x, algorithm="maxima")
```

```
[Out] 2/3/((a + b/x)^(3/2)*b)
```

Fricas [A] time = 0.237275, size = 32, normalized size = 1.78

$$\frac{2x}{3\left(abx+b^2\right)\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^2),x, algorithm="fricas")
```

```
[Out] 2/3*x/((a*b*x + b^2)*sqrt((a*x + b)/x))
```

Sympy [A] time = 8.50829, size = 39, normalized size = 2.17

$$\begin{cases} \frac{2}{3ab\sqrt{a+\frac{b}{x}}+\frac{3b^2\sqrt{a+\frac{b}{x}}}{x}} & \text{for}\ b\neq 0 \\ -\frac{1}{a^{\frac{5}{2}}x} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(5/2)/x**2,x)
```

```
[Out] Piecewise((2/(3*a*b*sqrt(a + b/x) + 3*b**2*sqrt(a + b/x)/x), Ne(b
, 0)), (-1/(a**(5/2)*x), True))
```

GIAC/XCAS [A] time = 0.273901, size = 19, normalized size = 1.06

$$\frac{2}{3\left(a+\frac{b}{x}\right)^{\frac{3}{2}}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^2),x, algorithm="giac")
```

```
[Out] 2/3/((a + b/x)^(3/2)*b)
```

3.1745 $\int \frac{1}{\left(a+\frac{b}{x}\right)^{5/2} x^3} dx$

Optimal. Leaf size=36

$$\frac{2}{b^2\sqrt{a+\frac{b}{x}}}-\frac{2a}{3b^2\left(a+\frac{b}{x}\right)^{3/2}}$$

```
[Out] (-2*a)/(3*b^2*(a + b/x)^(3/2)) + 2/(b^2*Sqrt[a + b/x])
```

Rubi [A] time = 0.0575557, antiderivative size = 36, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{2}{b^2\sqrt{a+\frac{b}{x}}}-\frac{2a}{3b^2\left(a+\frac{b}{x}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^(5/2)*x^3),x]

[Out] (-2*a)/(3*b^2*(a + b/x)^(3/2)) + 2/(b^2*Sqrt[a + b/x])
```

Rubi in Sympy [A] time = 6.80363, size = 29, normalized size = 0.81

$$-\frac{2a}{3b^2\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}+\frac{2}{b^2\sqrt{a+\frac{b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**(5/2)/x**3,x)

[Out] -2*a/(3*b**2*(a + b/x)**(3/2)) + 2/(b**2*sqrt(a + b/x))
```

Mathematica [A] time = 0.0378262, size = 34, normalized size = 0.94

$$\frac{2x\sqrt{a+\frac{b}{x}}(2ax+3b)}{3b^2(ax+b)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^(5/2)*x^3),x]

[Out] (2*Sqrt[a + b/x]*x*(3*b + 2*a*x))/(3*b^2*(b + a*x)^2)
```

Maple [A] time = 0.007, size = 33, normalized size = 0.9

$$\frac{(2\,ax+2\,b)(2\,ax+3\,b)}{3\,b^2x^2}\left(\frac{ax+b}{x}\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^(5/2)/x^3,x)

[Out] 2/3*(a*x+b)*(2*a*x+3*b)/x^2/b^2/((a*x+b)/x)^(5/2)
```

Maxima [A] time = 1.43444, size = 41, normalized size = 1.14

$$\frac{2}{\sqrt{a+\frac{b}{x}}b^2} - \frac{2a}{3\left(a+\frac{b}{x}\right)^{\frac{3}{2}}b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^3),x, algorithm="maxima")

[Out] 2/(sqrt(a + b/x)*b^2) - 2/3*a/((a + b/x)^(3/2)*b^2)
```

Fricas [A] time = 0.233373, size = 45, normalized size = 1.25

$$\frac{2(2ax+3b)}{3(ab^2x+b^3)\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^3),x, algorithm="fricas")

[Out] 2/3*(2*a*x + 3*b)/((a*b^2*x + b^3)*sqrt((a*x + b)/x))
```

Sympy [A] time = 11.2442, size = 82, normalized size = 2.28

$$\begin{cases} \frac{4ax}{3ab^2x\sqrt{a+\frac{b}{x}}+3b^3\sqrt{a+\frac{b}{x}}} + \frac{6b}{3ab^2x\sqrt{a+\frac{b}{x}}+3b^3\sqrt{a+\frac{b}{x}}} & \text{for } b \neq 0 \\ -\frac{1}{2a^{\frac{5}{2}}x^2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(5/2)/x**3,x)

[Out] Piecewise((4*a*x/(3*a*b**2*x*sqrt(a + b/x) + 3*b**3*sqrt(a + b/x)
) + 6*b/(3*a*b**2*x*sqrt(a + b/x) + 3*b**3*sqrt(a + b/x)), Ne(b,
0)), (-1/(2*a**(5/2)*x**2), True))
```

GIAC/XCAS [A] time = 0.269592, size = 49, normalized size = 1.36

$$-\frac{2\left(a-\frac{3(ax+b)}{x}\right)x}{3(ax+b)b^2\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^3),x, algorithm="giac")

[Out] -2/3*(a - 3*(a*x + b)/x)*x/((a*x + b)*b^2*sqrt((a*x + b)/x))
```

3.1746 $\int \frac{1}{\left(a+\frac{b}{x}\right)^{5/2} x^4} \, dx$

Optimal. Leaf size=55

$$\frac{2a^2}{3b^3\left(a+\frac{b}{x}\right)^{3/2}}-\frac{4a}{b^3\sqrt{a+\frac{b}{x}}}-\frac{2\sqrt{a+\frac{b}{x}}}{b^3}$$

```
[Out] (2*a^2)/(3*b^3*(a + b/x)^(3/2)) - (4*a)/(b^3*Sqrt[a + b/x]) - (2*
Sqrt[a + b/x])/b^3
```

Rubi [A] time = 0.0782579, antiderivative size = 55, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2a^2}{3b^3\left(a+\frac{b}{x}\right)^{3/2}}-\frac{4a}{b^3\sqrt{a+\frac{b}{x}}}-\frac{2\sqrt{a+\frac{b}{x}}}{b^3}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b/x)^(5/2)*x^4),x]
```

```
[Out] (2*a^2)/(3*b^3*(a + b/x)^(3/2)) - (4*a)/(b^3*Sqrt[a + b/x]) - (2*
Sqrt[a + b/x])/b^3
```

Rubi in Sympy [A] time = 9.91689, size = 46, normalized size = 0.84

$$\frac{2a^2}{3b^3\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}-\frac{4a}{b^3\sqrt{a+\frac{b}{x}}}-\frac{2\sqrt{a+\frac{b}{x}}}{b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b/x)**(5/2)/x**4,x)
```

```
[Out] 2*a**2/(3*b**3*(a + b/x)**(3/2)) - 4*a/(b**3*sqrt(a + b/x)) - 2*s
qrt(a + b/x)/b**3
```

Mathematica [A] time = 0.040834, size = 44, normalized size = 0.8

$$-\frac{2\sqrt{a+\frac{b}{x}}\left(8a^2x^2+12abx+3b^2\right)}{3b^3(ax+b)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b/x)^(5/2)*x^4),x]
```

```
[Out] (-2*Sqrt[a + b/x]*(3*b^2 + 12*a*b*x + 8*a^2*x^2))/(3*b^3*(b + a*x
)^2)
```

Maple [A] time = 0.008, size = 44, normalized size = 0.8

$$-\frac{(2\,ax+2\,b)\left(8\,a^2x^2+12\,abx+3\,b^2\right)}{3\,b^3x^3}\left(\frac{ax+b}{x}\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^(5/2)/x^4,x)
```

```
[Out] -2/3*(a*x+b)*(8*a^2*x^2+12*a*b*x+3*b^2)/x^3/b^3/((a*x+b)/x)^(5/2)
```

Maxima [A] time = 1.43613, size = 63, normalized size = 1.15

$$-\frac{2\sqrt{a+\frac{b}{x}}}{b^3}-\frac{4\,a}{\sqrt{a+\frac{b}{x}}\,b^3}+\frac{2\,a^2}{3\left(a+\frac{b}{x}\right)^{\frac{3}{2}}b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^4),x, algorithm="maxima")
```

```
[Out] -2*sqrt(a + b/x)/b^3 - 4*a/(sqrt(a + b/x)*b^3) + 2/3*a^2/((a + b/
x)^(3/2)*b^3)
```

Fricas [A] time = 0.238412, size = 65, normalized size = 1.18

$$-\frac{2\left(8\,a^2x^2+12\,abx+3\,b^2\right)}{3\left(ab^3x^2+b^4x\right)\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^4),x, algorithm="fricas")
```

```
[Out] -2/3*(8*a^2*x^2 + 12*a*b*x + 3*b^2)/((a*b^3*x^2 + b^4*x)*sqrt((a*
x + b)/x))
```

Sympy [A] time = 14.0104, size = 136, normalized size = 2.47

$$\begin{cases} -\frac{16a^2x^2}{3ab^3x^2\sqrt{a+\frac{b}{x}}+3b^4x\sqrt{a+\frac{b}{x}}}-\frac{24abx}{3ab^3x^2\sqrt{a+\frac{b}{x}}+3b^4x\sqrt{a+\frac{b}{x}}}-\frac{6b^2}{3ab^3x^2\sqrt{a+\frac{b}{x}}+3b^4x\sqrt{a+\frac{b}{x}}} & \text{for } b\neq 0 \\ -\frac{1}{3a^{\frac{5}{2}}x^3} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(5/2)/x**4,x)
```

```
[Out] Piecewise((-16*a**2*x**2/(3*a*b**3*x**2*sqrt(a + b/x) + 3*b**4*x*
sqrt(a + b/x)) - 24*a*b*x/(3*a*b**3*x**2*sqrt(a + b/x) + 3*b**4*x
*sqrt(a + b/x)) - 6*b**2/(3*a*b**3*x**2*sqrt(a + b/x) + 3*b**4*x*
sqrt(a + b/x)), Ne(b, 0)), (-1/(3*a**(5/2)*x**3), True))
```

GIAC/XCAS [A] time = 0.270123, size = 78, normalized size = 1.42

$$\frac{2}{3}\,b\left(\frac{\left(a^2-\frac{6\,(ax+b)a}{x}\right)x}{(ax+b)b^4\sqrt{\frac{ax+b}{x}}}-\frac{3\,\sqrt{\frac{ax+b}{x}}}{b^4}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^4),x, algorithm="giac")
```

```
[Out] 2/3*b*((a^2 - 6*(a*x + b)*a/x)*x/((a*x + b)*b^4*sqrt((a*x + b)/x)
) - 3*sqrt((a*x + b)/x)/b^4)
```

3.1747 $\int \frac{1}{\left(a+\frac{b}{x}\right)^{5/2} x^5}\,dx$

Optimal. Leaf size=76

$$-\frac{2a^3}{3b^4\left(a+\frac{b}{x}\right)^{3/2}}+\frac{6a^2}{b^4\sqrt{a+\frac{b}{x}}}+\frac{6a\sqrt{a+\frac{b}{x}}}{b^4}-\frac{2\left(a+\frac{b}{x}\right)^{3/2}}{3b^4}$$

```
[Out] (-2*a^3)/(3*b^4*(a + b/x)^(3/2)) + (6*a^2)/(b^4*Sqrt[a + b/x]) +
(6*a*Sqrt[a + b/x])/b^4 - (2*(a + b/x)^(3/2))/(3*b^4)
```

Rubi [A] time = 0.0967667, antiderivative size = 76, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2a^3}{3b^4\left(a+\frac{b}{x}\right)^{3/2}}+\frac{6a^2}{b^4\sqrt{a+\frac{b}{x}}}+\frac{6a\sqrt{a+\frac{b}{x}}}{b^4}-\frac{2\left(a+\frac{b}{x}\right)^{3/2}}{3b^4}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^(5/2)*x^5),x]
```

```
[Out] (-2*a^3)/(3*b^4*(a + b/x)^(3/2)) + (6*a^2)/(b^4*Sqrt[a + b/x]) +
(6*a*Sqrt[a + b/x])/b^4 - (2*(a + b/x)^(3/2))/(3*b^4)
```

Rubi in Sympy [A] time = 13.0037, size = 65, normalized size = 0.86

$$-\frac{2a^3}{3b^4\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}+\frac{6a^2}{b^4\sqrt{a+\frac{b}{x}}}+\frac{6a\sqrt{a+\frac{b}{x}}}{b^4}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{3b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**(5/2)/x**5,x)
```

```
[Out] -2*a**3/(3*b**4*(a + b/x)**(3/2)) + 6*a**2/(b**4*sqrt(a + b/x)) +
 6*a*sqrt(a + b/x)/b**4 - 2*(a + b/x)**(3/2)/(3*b**4)
```

Mathematica [A] time = 0.0474628, size = 58, normalized size = 0.76

$$\frac{2\sqrt{a+\frac{b}{x}}\left(16a^3x^3+24a^2bx^2+6ab^2x-b^3\right)}{3b^4x(ax+b)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^(5/2)*x^5),x]
```

```
[Out] (2*Sqrt[a + b/x]*(-b^3 + 6*a*b^2*x + 24*a^2*b*x^2 + 16*a^3*x^3))/
(3*b^4*x*(b + a*x)^2)
```

Maple [A] time = 0.008, size = 55, normalized size = 0.7

$$\frac{(2ax+2b)\left(16a^3x^3+24a^2bx^2+6ab^2x-b^3\right)}{3x^4b^4}\left(\frac{ax+b}{x}\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^(5/2)/x^5,x)
```

```
[Out] 2/3*(a*x+b)*(16*a^3*x^3+24*a^2*b*x^2+6*a*b^2*x-b^3)/x^4/b^4/((a*x
+b)/x)^(5/2)
```

Maxima [A] time = 1.43812, size = 86, normalized size = 1.13

$$-\frac{2\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{3b^4}+\frac{6\sqrt{a+\frac{b}{x}}a}{b^4}+\frac{6a^2}{\sqrt{a+\frac{b}{x}}b^4}-\frac{2a^3}{3\left(a+\frac{b}{x}\right)^{\frac{3}{2}}b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^5),x, algorithm="maxima")
```

```
[Out] -2/3*(a + b/x)^(3/2)/b^4 + 6*sqrt(a + b/x)*a/b^4 + 6*a^2/(sqrt(a
+ b/x)*b^4) - 2/3*a^3/((a + b/x)^(3/2)*b^4)
```

Fricas [A] time = 0.234988, size = 82, normalized size = 1.08

$$\frac{2\left(16a^3x^3+24a^2bx^2+6ab^2x-b^3\right)}{3\left(ab^4x^3+b^5x^2\right)\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^5),x, algorithm="fricas")
```

```
[Out] 2/3*(16*a^3*x^3 + 24*a^2*b*x^2 + 6*a*b^2*x - b^3)/((a*b^4*x^3 + b
^5*x^2)*sqrt((a*x + b)/x))
```

Sympy [A] time = 17.3151, size = 187, normalized size = 2.46

$$\begin{cases} \frac{32a^3x^3}{3ab^4x^3\sqrt{a+\frac{b}{x}}+3b^5x^2\sqrt{a+\frac{b}{x}}}+\frac{48a^2bx^2}{3ab^4x^3\sqrt{a+\frac{b}{x}}+3b^5x^2\sqrt{a+\frac{b}{x}}}+\frac{12ab^2x}{3ab^4x^3\sqrt{a+\frac{b}{x}}+3b^5x^2\sqrt{a+\frac{b}{x}}}-\frac{2b^3}{3ab^4x^3\sqrt{a+\frac{b}{x}}+3b^5x^2\sqrt{a+\frac{b}{x}}} & \text{for } b\neq 0 \\ -\frac{1}{4a^{\frac{5}{2}}x^4} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(5/2)/x**5,x)
```

```
[Out] Piecewise((32*a**3*x**3/(3*a*b**4*x**3*sqrt(a + b/x) + 3*b**5*x**
2*sqrt(a + b/x)) + 48*a**2*b*x**2/(3*a*b**4*x**3*sqrt(a + b/x) +
3*b**5*x**2*sqrt(a + b/x)) + 12*a*b**2*x/(3*a*b**4*x**3*sqrt(a +
b/x) + 3*b**5*x**2*sqrt(a + b/x)) - 2*b**3/(3*a*b**4*x**3*sqrt(a
+ b/x) + 3*b**5*x**2*sqrt(a + b/x)), Ne(b, 0)), (-1/(4*a**(5/2)*x
**4), True))
```

GIAC/XCAS [A] time = 0.261653, size = 123, normalized size = 1.62

$$-\frac{2}{3}\,b\left(\frac{\left(a^3-\frac{9\,(ax+b)a^2}{x}\right)x}{(ax+b)b^5\sqrt{\frac{ax+b}{x}}}-\frac{9\,ab^{10}\sqrt{\frac{ax+b}{x}}-\frac{(ax+b)b^{10}\sqrt{\frac{ax+b}{x}}}{x}}{b^{15}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^5),x, algorithm="giac")
```

```
[Out] -2/3*b*((a^3 - 9*(a*x + b)*a^2/x)*x/((a*x + b)*b^5*sqrt((a*x + b)
/x)) - (9*a*b^10*sqrt((a*x + b)/x) - (a*x + b)*b^10*sqrt((a*x + b
)/x)/x)/b^15)
```

3.1748 $\int \frac{1}{\left(a+\frac{b}{x}\right)^{5/2} x^6} \, dx$

Optimal. Leaf size=97

$$\frac{2a^4}{3b^5\left(a+\frac{b}{x}\right)^{3/2}}-\frac{8a^3}{b^5\sqrt{a+\frac{b}{x}}}-\frac{12a^2\sqrt{a+\frac{b}{x}}}{b^5}+\frac{8a\left(a+\frac{b}{x}\right)^{3/2}}{3b^5}-\frac{2\left(a+\frac{b}{x}\right)^{5/2}}{5b^5}$$

```
[Out] (2*a^4)/(3*b^5*(a + b/x)^(3/2)) - (8*a^3)/(b^5*Sqrt[a + b/x]) - (
12*a^2*Sqrt[a + b/x])/b^5 + (8*a*(a + b/x)^(3/2))/(3*b^5) - (2*(a
 + b/x)^(5/2))/(5*b^5)
```

Rubi [A] time = 0.11455, antiderivative size = 97, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2a^4}{3b^5\left(a+\frac{b}{x}\right)^{3/2}}-\frac{8a^3}{b^5\sqrt{a+\frac{b}{x}}}-\frac{12a^2\sqrt{a+\frac{b}{x}}}{b^5}+\frac{8a\left(a+\frac{b}{x}\right)^{3/2}}{3b^5}-\frac{2\left(a+\frac{b}{x}\right)^{5/2}}{5b^5}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^(5/2)*x^6),x]
```

```
[Out] (2*a^4)/(3*b^5*(a + b/x)^(3/2)) - (8*a^3)/(b^5*Sqrt[a + b/x]) - (
12*a^2*Sqrt[a + b/x])/b^5 + (8*a*(a + b/x)^(3/2))/(3*b^5) - (2*(a
 + b/x)^(5/2))/(5*b^5)
```

Rubi in Sympy [A] time = 15.9257, size = 83, normalized size = 0.86

$$\frac{2a^4}{3b^5\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}-\frac{8a^3}{b^5\sqrt{a+\frac{b}{x}}}-\frac{12a^2\sqrt{a+\frac{b}{x}}}{b^5}+\frac{8a\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{3b^5}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{5b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**(5/2)/x**6,x)
```

```
[Out] 2*a**4/(3*b**5*(a + b/x)**(3/2)) - 8*a**3/(b**5*sqrt(a + b/x)) -
12*a**2*sqrt(a + b/x)/b**5 + 8*a*(a + b/x)**(3/2)/(3*b**5) - 2*(a
 + b/x)**(5/2)/(5*b**5)
```

Mathematica [A] time = 0.051476, size = 69, normalized size = 0.71

$$-\frac{2\sqrt{a+\frac{b}{x}}\left(128a^4x^4+192a^3bx^3+48a^2b^2x^2-8ab^3x+3b^4\right)}{15b^5x^2(ax+b)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^(5/2)*x^6),x]
```

```
[Out] (-2*Sqrt[a + b/x]*(3*b^4 - 8*a*b^3*x + 48*a^2*b^2*x^2 + 192*a^3*b
*x^3 + 128*a^4*x^4))/(15*b^5*x^2*(b + a*x)^2)
```

Maple [A] time = 0.009, size = 66, normalized size = 0.7

$$-\frac{\left(2 a x+2 b\right)\left(128 a^{4} x^{4}+192 a^{3} x^{3} b+48 a^{2} x^{2} b^{2}-8 a x b^{3}+3 b^{4}\right)}{15 x^{5} b^{5}} \left(\frac{a x+b}{x}\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^(5/2)/x^6,x)
```

```
[Out] -2/15*(a*x+b)*(128*a^4*x^4+192*a^3*b*x^3+48*a^2*b^2*x^2-8*a*b^3*x
+3*b^4)/x^5/b^5/((a*x+b)/x)^(5/2)
```

Maxima [A] time = 1.4496, size = 109, normalized size = 1.12

$$-\frac{2\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{5 b^{5}}+\frac{8\left(a+\frac{b}{x}\right)^{\frac{3}{2}} a}{3 b^{5}}-\frac{12 \sqrt{a+\frac{b}{x}}\, a^{2}}{b^{5}}-\frac{8 a^{3}}{\sqrt{a+\frac{b}{x}}\, b^{5}}+\frac{2 a^{4}}{3\left(a+\frac{b}{x}\right)^{\frac{3}{2}} b^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^6),x, algorithm="maxima")
```

```
[Out] -2/5*(a + b/x)^(5/2)/b^5 + 8/3*(a + b/x)^(3/2)*a/b^5 - 12*sqrt(a
+ b/x)*a^2/b^5 - 8*a^3/(sqrt(a + b/x)*b^5) + 2/3*a^4/((a + b/x)^(
3/2)*b^5)
```

Fricas [A] time = 0.243568, size = 97, normalized size = 1.

$$-\frac{2\left(128 a^{4} x^{4}+192 a^{3} b x^{3}+48 a^{2} b^{2} x^{2}-8 a b^{3} x+3 b^{4}\right)}{15\left(a b^{5} x^{4}+b^{6} x^{3}\right) \sqrt{\frac{a x+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^6),x, algorithm="fricas")
```

```
[Out] -2/15*(128*a^4*x^4 + 192*a^3*b*x^3 + 48*a^2*b^2*x^2 - 8*a*b^3*x +
 3*b^4)/((a*b^5*x^4 + b^6*x^3)*sqrt((a*x + b)/x))
```

Sympy [A] time = 23.1788, size = 2032, normalized size = 20.95

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(5/2)/x**6,x)
```

```
[Out] -256*a**(21/2)*b**(33/2)*x**8*sqrt(a*x/b + 1)/(15*a**(17/2)*b**21
*x**(17/2) + 90*a**(15/2)*b**22*x**(15/2) + 225*a**(13/2)*b**23*x
**(13/2) + 300*a**(11/2)*b**24*x**(11/2) + 225*a**(9/2)*b**25*x**
(9/2) + 90*a**(7/2)*b**26*x**(7/2) + 15*a**(5/2)*b**27*x**(5/2))
- 1408*a**(19/2)*b**(35/2)*x**7*sqrt(a*x/b + 1)/(15*a**(17/2)*b**
21*x**(17/2) + 90*a**(15/2)*b**22*x**(15/2) + 225*a**(13/2)*b**23
*x**(13/2) + 300*a**(11/2)*b**24*x**(11/2) + 225*a**(9/2)*b**25*x
```

```
**(9/2) + 90*a**(7/2)*b**26*x**(7/2) + 15*a**(5/2)*b**27*x**(5/2)
) - 3168*a**(17/2)*b**(37/2)*x**6*sqrt(a*x/b + 1)/(15*a**(17/2)*b
**21*x**(17/2) + 90*a**(15/2)*b**22*x**(15/2) + 225*a**(13/2)*b**
23*x**(13/2) + 300*a**(11/2)*b**24*x**(11/2) + 225*a**(9/2)*b**25
*x**(9/2) + 90*a**(7/2)*b**26*x**(7/2) + 15*a**(5/2)*b**27*x**(5/
2)) - 3696*a**(15/2)*b**(39/2)*x**5*sqrt(a*x/b + 1)/(15*a**(17/2)
*b**21*x**(17/2) + 90*a**(15/2)*b**22*x**(15/2) + 225*a**(13/2)*b
**23*x**(13/2) + 300*a**(11/2)*b**24*x**(11/2) + 225*a**(9/2)*b**
25*x**(9/2) + 90*a**(7/2)*b**26*x**(7/2) + 15*a**(5/2)*b**27*x**(
5/2)) - 2310*a**(13/2)*b**(41/2)*x**4*sqrt(a*x/b + 1)/(15*a**(17/
2)*b**21*x**(17/2) + 90*a**(15/2)*b**22*x**(15/2) + 225*a**(13/2)
*b**23*x**(13/2) + 300*a**(11/2)*b**24*x**(11/2) + 225*a**(9/2)*b
**25*x**(9/2) + 90*a**(7/2)*b**26*x**(7/2) + 15*a**(5/2)*b**27*x*
*(5/2)) - 696*a**(11/2)*b**(43/2)*x**3*sqrt(a*x/b + 1)/(15*a**(17
/2)*b**21*x**(17/2) + 90*a**(15/2)*b**22*x**(15/2) + 225*a**(13/2
)*b**23*x**(13/2) + 300*a**(11/2)*b**24*x**(11/2) + 225*a**(9/2)*
b**25*x**(9/2) + 90*a**(7/2)*b**26*x**(7/2) + 15*a**(5/2)*b**27*x
**(5/2)) - 68*a**(9/2)*b**(45/2)*x**2*sqrt(a*x/b + 1)/(15*a**(17/
2)*b**21*x**(17/2) + 90*a**(15/2)*b**22*x**(15/2) + 225*a**(13/2)
*b**23*x**(13/2) + 300*a**(11/2)*b**24*x**(11/2) + 225*a**(9/2)*b
**25*x**(9/2) + 90*a**(7/2)*b**26*x**(7/2) + 15*a**(5/2)*b**27*x*
*(5/2)) - 8*a**(7/2)*b**(47/2)*x*sqrt(a*x/b + 1)/(15*a**(17/2)*b*
*21*x**(17/2) + 90*a**(15/2)*b**22*x**(15/2) + 225*a**(13/2)*b**2
3*x**(13/2) + 300*a**(11/2)*b**24*x**(11/2) + 225*a**(9/2)*b**25*
x**(9/2) + 90*a**(7/2)*b**26*x**(7/2) + 15*a**(5/2)*b**27*x**(5/2
)) - 6*a**(5/2)*b**(49/2)*sqrt(a*x/b + 1)/(15*a**(17/2)*b**21*x**
(17/2) + 90*a**(15/2)*b**22*x**(15/2) + 225*a**(13/2)*b**23*x**(1
3/2) + 300*a**(11/2)*b**24*x**(11/2) + 225*a**(9/2)*b**25*x**(9/2
) + 90*a**(7/2)*b**26*x**(7/2) + 15*a**(5/2)*b**27*x**(5/2)) + 25
6*a**11*b**16*x**(17/2)/(15*a**(17/2)*b**21*x**(17/2) + 90*a**(15
/2)*b**22*x**(15/2) + 225*a**(13/2)*b**23*x**(13/2) + 300*a**(11/
2)*b**24*x**(11/2) + 225*a**(9/2)*b**25*x**(9/2) + 90*a**(7/2)*b*
*26*x**(7/2) + 15*a**(5/2)*b**27*x**(5/2)) + 1536*a**10*b**17*x**
(15/2)/(15*a**(17/2)*b**21*x**(17/2) + 90*a**(15/2)*b**22*x**(15/
2) + 225*a**(13/2)*b**23*x**(13/2) + 300*a**(11/2)*b**24*x**(11/2
) + 225*a**(9/2)*b**25*x**(9/2) + 90*a**(7/2)*b**26*x**(7/2) + 15
*a**(5/2)*b**27*x**(5/2)) + 3840*a**9*b**18*x**(13/2)/(15*a**(17/
2)*b**21*x**(17/2) + 90*a**(15/2)*b**22*x**(15/2) + 225*a**(13/2)
*b**23*x**(13/2) + 300*a**(11/2)*b**24*x**(11/2) + 225*a**(9/2)*b
**25*x**(9/2) + 90*a**(7/2)*b**26*x**(7/2) + 15*a**(5/2)*b**27*x*
*(5/2)) + 5120*a**8*b**19*x**(11/2)/(15*a**(17/2)*b**21*x**(17/2)
 + 90*a**(15/2)*b**22*x**(15/2) + 225*a**(13/2)*b**23*x**(13/2) +
 300*a**(11/2)*b**24*x**(11/2) + 225*a**(9/2)*b**25*x**(9/2) + 90
*a**(7/2)*b**26*x**(7/2) + 15*a**(5/2)*b**27*x**(5/2)) + 3840*a**
7*b**20*x**(9/2)/(15*a**(17/2)*b**21*x**(17/2) + 90*a**(15/2)*b**
22*x**(15/2) + 225*a**(13/2)*b**23*x**(13/2) + 300*a**(11/2)*b**2
4*x**(11/2) + 225*a**(9/2)*b**25*x**(9/2) + 90*a**(7/2)*b**26*x**
(7/2) + 15*a**(5/2)*b**27*x**(5/2)) + 1536*a**6*b**21*x**(7/2)/(1
5*a**(17/2)*b**21*x**(17/2) + 90*a**(15/2)*b**22*x**(15/2) + 225*
a**(13/2)*b**23*x**(13/2) + 300*a**(11/2)*b**24*x**(11/2) + 225*a
**(9/2)*b**25*x**(9/2) + 90*a**(7/2)*b**26*x**(7/2) + 15*a**(5/2)
*b**27*x**(5/2)) + 256*a**5*b**22*x**(5/2)/(15*a**(17/2)*b**21*x*
*(17/2) + 90*a**(15/2)*b**22*x**(15/2) + 225*a**(13/2)*b**23*x**(
13/2) + 300*a**(11/2)*b**24*x**(11/2) + 225*a**(9/2)*b**25*x**(9/
2) + 90*a**(7/2)*b**26*x**(7/2) + 15*a**(5/2)*b**27*x**(5/2))
```

GIAC/XCAS [A] time = 0.270572, size = 163, normalized size = 1.68

$$\frac{2}{15}\,b\left(\frac{5\left(a^4-\frac{12\,(ax+b)a^3}{x}\right)x}{(ax+b)b^6\sqrt{\frac{ax+b}{x}}}-\frac{90\,a^2b^{24}\sqrt{\frac{ax+b}{x}}-\frac{20\,(ax+b)ab^{24}\sqrt{\frac{ax+b}{x}}}{x}+\frac{3\,(ax+b)^2b^{24}\sqrt{\frac{ax+b}{x}}}{x^2}}{b^{30}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^6),x, algorithm="giac")
```

```
[Out] 2/15*b*(5*(a^4 - 12*(a*x + b)*a^3/x)*x/((a*x + b)*b^6*sqrt((a*x +
 b)/x)) - (90*a^2*b^24*sqrt((a*x + b)/x) - 20*(a*x + b)*a*b^24*sq
rt((a*x + b)/x)/x + 3*(a*x + b)^2*b^24*sqrt((a*x + b)/x)/x^2)/b^3
```

0)

3.1749 $\int \frac{1}{\left(a+\frac{b}{x}\right)^{5/2} x^7} \, dx$

Optimal. Leaf size=116

$$-\frac{2a^5}{3b^6\left(a+\frac{b}{x}\right)^{3/2}}+\frac{10a^4}{b^6\sqrt{a+\frac{b}{x}}}+\frac{20a^3\sqrt{a+\frac{b}{x}}}{b^6}-\frac{20a^2\left(a+\frac{b}{x}\right)^{3/2}}{3b^6}+\frac{2a\left(a+\frac{b}{x}\right)^{5/2}}{b^6}-\frac{2\left(a+\frac{b}{x}\right)^{7/2}}{7b^6}$$

```
[Out] (-2*a^5)/(3*b^6*(a + b/x)^(3/2)) + (10*a^4)/(b^6*Sqrt[a + b/x]) +
 (20*a^3*Sqrt[a + b/x])/b^6 - (20*a^2*(a + b/x)^(3/2))/(3*b^6) +
(2*a*(a + b/x)^(5/2))/b^6 - (2*(a + b/x)^(7/2))/(7*b^6)
```

Rubi [A] time = 0.135187, antiderivative size = 116, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2a^5}{3b^6\left(a+\frac{b}{x}\right)^{3/2}}+\frac{10a^4}{b^6\sqrt{a+\frac{b}{x}}}+\frac{20a^3\sqrt{a+\frac{b}{x}}}{b^6}-\frac{20a^2\left(a+\frac{b}{x}\right)^{3/2}}{3b^6}+\frac{2a\left(a+\frac{b}{x}\right)^{5/2}}{b^6}-\frac{2\left(a+\frac{b}{x}\right)^{7/2}}{7b^6}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^(5/2)*x^7),x]
```

```
[Out] (-2*a^5)/(3*b^6*(a + b/x)^(3/2)) + (10*a^4)/(b^6*Sqrt[a + b/x]) +
 (20*a^3*Sqrt[a + b/x])/b^6 - (20*a^2*(a + b/x)^(3/2))/(3*b^6) +
(2*a*(a + b/x)^(5/2))/b^6 - (2*(a + b/x)^(7/2))/(7*b^6)
```

Rubi in Sympy [A] time = 19.4184, size = 100, normalized size = 0.86

$$-\frac{2a^5}{3b^6\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}+\frac{10a^4}{b^6\sqrt{a+\frac{b}{x}}}+\frac{20a^3\sqrt{a+\frac{b}{x}}}{b^6}-\frac{20a^2\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{3b^6}+\frac{2a\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{b^6}-\frac{2\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{7b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**(5/2)/x**7,x)
```

```
[Out] -2*a**5/(3*b**6*(a + b/x)**(3/2)) + 10*a**4/(b**6*sqrt(a + b/x))
+ 20*a**3*sqrt(a + b/x)/b**6 - 20*a**2*(a + b/x)**(3/2)/(3*b**6)
+ 2*a*(a + b/x)**(5/2)/b**6 - 2*(a + b/x)**(7/2)/(7*b**6)
```

Mathematica [A] time = 0.0610729, size = 80, normalized size = 0.69

$$\frac{2\sqrt{a+\frac{b}{x}}\left(256a^5x^5+384a^4bx^4+96a^3b^2x^3-16a^2b^3x^2+6ab^4x-3b^5\right)}{21b^6x^3(ax+b)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^(5/2)*x^7),x]
```

```
[Out] (2*Sqrt[a + b/x]*(-3*b^5 + 6*a*b^4*x - 16*a^2*b^3*x^2 + 96*a^3*b^
2*x^3 + 384*a^4*b*x^4 + 256*a^5*x^5))/(21*b^6*x^3*(b + a*x)^2)
```

Maple [A] time = 0.009, size = 77, normalized size = 0.7

$$\frac{(2\,ax+2\,b)\,(256\,a^5x^5+384\,a^4bx^4+96\,a^3b^2x^3-16\,a^2b^3x^2+6\,ab^4x-3\,b^5)}{21\,x^6b^6}\left(\frac{ax+b}{x}\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^(5/2)/x^7,x)
```

```
[Out] 2/21*(a*x+b)*(256*a^5*x^5+384*a^4*b*x^4+96*a^3*b^2*x^3-16*a^2*b^3
*x^2+6*a*b^4*x-3*b^5)/x^6/b^6/((a*x+b)/x)^(5/2)
```

Maxima [A] time = 1.46381, size = 132, normalized size = 1.14

$$-\frac{2\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{7\,b^6}+\frac{2\left(a+\frac{b}{x}\right)^{\frac{5}{2}}a}{b^6}-\frac{20\left(a+\frac{b}{x}\right)^{\frac{3}{2}}a^2}{3\,b^6}+\frac{20\sqrt{a+\frac{b}{x}}a^3}{b^6}+\frac{10\,a^4}{\sqrt{a+\frac{b}{x}}b^6}-\frac{2\,a^5}{3\left(a+\frac{b}{x}\right)^{\frac{3}{2}}b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^7),x, algorithm="maxima")
```

```
[Out] -2/7*(a + b/x)^(7/2)/b^6 + 2*(a + b/x)^(5/2)*a/b^6 - 20/3*(a + b/
x)^(3/2)*a^2/b^6 + 20*sqrt(a + b/x)*a^3/b^6 + 10*a^4/(sqrt(a + b/
x)*b^6) - 2/3*a^5/((a + b/x)^(3/2)*b^6)
```

Fricas [A] time = 0.24142, size = 112, normalized size = 0.97

$$\frac{2\,(256\,a^5x^5+384\,a^4bx^4+96\,a^3b^2x^3-16\,a^2b^3x^2+6\,ab^4x-3\,b^5)}{21\,(ab^6x^5+b^7x^4)\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^7),x, algorithm="fricas")
```

```
[Out] 2/21*(256*a^5*x^5 + 384*a^4*b*x^4 + 96*a^3*b^2*x^3 - 16*a^2*b^3*x
^2 + 6*a*b^4*x - 3*b^5)/((a*b^6*x^5 + b^7*x^4)*sqrt((a*x + b)/x))
```

Sympy [A] time = 43.1632, size = 9263, normalized size = 79.85

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(5/2)/x**7,x)
```

```
[Out] 512*a**(43/2)*b**(91/2)*x**18*sqrt(a*x/b + 1)/(21*a**(37/2)*b**51
*x**(37/2) + 315*a**(35/2)*b**52*x**(35/2) + 2205*a**(33/2)*b**53
*x**(33/2) + 9555*a**(31/2)*b**54*x**(31/2) + 28665*a**(29/2)*b**
55*x**(29/2) + 63063*a**(27/2)*b**56*x**(27/2) + 105105*a**(25/2)
*b**57*x**(25/2) + 135135*a**(23/2)*b**58*x**(23/2) + 135135*a**(
21/2)*b**59*x**(21/2) + 105105*a**(19/2)*b**60*x**(19/2) + 63063*
a**(17/2)*b**61*x**(17/2) + 28665*a**(15/2)*b**62*x**(15/2) + 955
```

5*a**(13/2)*b**63*x**(13/2) + 2205*a**(11/2)*b**64*x**(11/2) + 31
5*a**(9/2)*b**65*x**(9/2) + 21*a**(7/2)*b**66*x**(7/2)) + 7424*a*
*(41/2)*b**(93/2)*x**17*sqrt(a*x/b + 1)/(21*a**(37/2)*b**51*x**(3
7/2) + 315*a**(35/2)*b**52*x**(35/2) + 2205*a**(33/2)*b**53*x**(3
3/2) + 9555*a**(31/2)*b**54*x**(31/2) + 28665*a**(29/2)*b**55*x**
(29/2) + 63063*a**(27/2)*b**56*x**(27/2) + 105105*a**(25/2)*b**57
*x**(25/2) + 135135*a**(23/2)*b**58*x**(23/2) + 135135*a**(21/2)*
b**59*x**(21/2) + 105105*a**(19/2)*b**60*x**(19/2) + 63063*a**(17
/2)*b**61*x**(17/2) + 28665*a**(15/2)*b**62*x**(15/2) + 9555*a**(
13/2)*b**63*x**(13/2) + 2205*a**(11/2)*b**64*x**(11/2) + 315*a**(
9/2)*b**65*x**(9/2) + 21*a**(7/2)*b**66*x**(7/2)) + 50112*a**(39/
2)*b**(95/2)*x**16*sqrt(a*x/b + 1)/(21*a**(37/2)*b**51*x**(37/2)
+ 315*a**(35/2)*b**52*x**(35/2) + 2205*a**(33/2)*b**53*x**(33/2)
+ 9555*a**(31/2)*b**54*x**(31/2) + 28665*a**(29/2)*b**55*x**(29/2
) + 63063*a**(27/2)*b**56*x**(27/2) + 105105*a**(25/2)*b**57*x**(
25/2) + 135135*a**(23/2)*b**58*x**(23/2) + 135135*a**(21/2)*b**59
*x**(21/2) + 105105*a**(19/2)*b**60*x**(19/2) + 63063*a**(17/2)*b
61*x(17/2) + 28665*a**(15/2)*b**62*x**(15/2) + 9555*a**(13/2)
*b**63*x**(13/2) + 2205*a**(11/2)*b**64*x**(11/2) + 315*a**(9/2)*
b**65*x**(9/2) + 21*a**(7/2)*b**66*x**(7/2)) + 208800*a**(37/2)*b
(97/2)*x15*sqrt(a*x/b + 1)/(21*a**(37/2)*b**51*x**(37/2) + 31
5*a**(35/2)*b**52*x**(35/2) + 2205*a**(33/2)*b**53*x**(33/2) + 95
55*a**(31/2)*b**54*x**(31/2) + 28665*a**(29/2)*b**55*x**(29/2) +
63063*a**(27/2)*b**56*x**(27/2) + 105105*a**(25/2)*b**57*x**(25/2
) + 135135*a**(23/2)*b**58*x**(23/2) + 135135*a**(21/2)*b**59*x**
(21/2) + 105105*a**(19/2)*b**60*x**(19/2) + 63063*a**(17/2)*b**61
*x**(17/2) + 28665*a**(15/2)*b**62*x**(15/2) + 9555*a**(13/2)*b**
63*x**(13/2) + 2205*a**(11/2)*b**64*x**(11/2) + 315*a**(9/2)*b**6
5*x**(9/2) + 21*a**(7/2)*b**66*x**(7/2)) + 600300*a**(35/2)*b**(9
9/2)*x**14*sqrt(a*x/b + 1)/(21*a**(37/2)*b**51*x**(37/2) + 315*a*
*(35/2)*b**52*x**(35/2) + 2205*a**(33/2)*b**53*x**(33/2) + 9555*a
(31/2)*b54*x**(31/2) + 28665*a**(29/2)*b**55*x**(29/2) + 6306
3*a**(27/2)*b**56*x**(27/2) + 105105*a**(25/2)*b**57*x**(25/2) +
135135*a**(23/2)*b**58*x**(23/2) + 135135*a**(21/2)*b**59*x**(21/
2) + 105105*a**(19/2)*b**60*x**(19/2) + 63063*a**(17/2)*b**61*x**
(17/2) + 28665*a**(15/2)*b**62*x**(15/2) + 9555*a**(13/2)*b**63*x
(13/2) + 2205*a(11/2)*b**64*x**(11/2) + 315*a**(9/2)*b**65*x*
*(9/2) + 21*a**(7/2)*b**66*x**(7/2)) + 1260630*a**(33/2)*b**(101/
2)*x**13*sqrt(a*x/b + 1)/(21*a**(37/2)*b**51*x**(37/2) + 315*a**(
35/2)*b**52*x**(35/2) + 2205*a**(33/2)*b**53*x**(33/2) + 9555*a**
(31/2)*b**54*x**(31/2) + 28665*a**(29/2)*b**55*x**(29/2) + 63063*
a**(27/2)*b**56*x**(27/2) + 105105*a**(25/2)*b**57*x**(25/2) + 13
5135*a**(23/2)*b**58*x**(23/2) + 135135*a**(21/2)*b**59*x**(21/2)
+ 105105*a**(19/2)*b**60*x**(19/2) + 63063*a**(17/2)*b**61*x**(1
7/2) + 28665*a**(15/2)*b**62*x**(15/2) + 9555*a**(13/2)*b**63*x**
(13/2) + 2205*a**(11/2)*b**64*x**(11/2) + 315*a**(9/2)*b**65*x**(
9/2) + 21*a**(7/2)*b**66*x**(7/2)) + 1995994*a**(31/2)*b**(103/2)
*x**12*sqrt(a*x/b + 1)/(21*a**(37/2)*b**51*x**(37/2) + 315*a**(35
/2)*b**52*x**(35/2) + 2205*a**(33/2)*b**53*x**(33/2) + 9555*a**(3
1/2)*b**54*x**(31/2) + 28665*a**(29/2)*b**55*x**(29/2) + 63063*a*
*(27/2)*b**56*x**(27/2) + 105105*a**(25/2)*b**57*x**(25/2) + 1351
35*a**(23/2)*b**58*x**(23/2) + 135135*a**(21/2)*b**59*x**(21/2) +
105105*a**(19/2)*b**60*x**(19/2) + 63063*a**(17/2)*b**61*x**(17/
2) + 28665*a**(15/2)*b**62*x**(15/2) + 9555*a**(13/2)*b**63*x**(1
3/2) + 2205*a**(11/2)*b**64*x**(11/2) + 315*a**(9/2)*b**65*x**(9/
2) + 21*a**(7/2)*b**66*x**(7/2)) + 2423668*a**(29/2)*b**(105/2)*x
11*sqrt(a*x/b + 1)/(21*a(37/2)*b**51*x**(37/2) + 315*a**(35/2
)*b**52*x**(35/2) + 2205*a**(33/2)*b**53*x**(33/2) + 9555*a**(31/
2)*b**54*x**(31/2) + 28665*a**(29/2)*b**55*x**(29/2) + 63063*a**(
27/2)*b**56*x**(27/2) + 105105*a**(25/2)*b**57*x**(25/2) + 135135
*a**(23/2)*b**58*x**(23/2) + 135135*a**(21/2)*b**59*x**(21/2) + 1
05105*a**(19/2)*b**60*x**(19/2) + 63063*a**(17/2)*b**61*x**(17/2)
+ 28665*a**(15/2)*b**62*x**(15/2) + 9555*a**(13/2)*b**63*x**(13/
2) + 2205*a**(11/2)*b**64*x**(11/2) + 315*a**(9/2)*b**65*x**(9/2)
+ 21*a**(7/2)*b**66*x**(7/2)) + 2271984*a**(27/2)*b**(107/2)*x**
10*sqrt(a*x/b + 1)/(21*a**(37/2)*b**51*x**(37/2) + 315*a**(35/2)*
b**52*x**(35/2) + 2205*a**(33/2)*b**53*x**(33/2) + 9555*a**(31/2)
*b**54*x**(31/2) + 28665*a**(29/2)*b**55*x**(29/2) + 63063*a**(27
/2)*b**56*x**(27/2) + 105105*a**(25/2)*b**57*x**(25/2) + 135135*a
(23/2)*b58*x**(23/2) + 135135*a**(21/2)*b**59*x**(21/2) + 105
105*a**(19/2)*b**60*x**(19/2) + 63063*a**(17/2)*b**61*x**(17/2) +
28665*a**(15/2)*b**62*x**(15/2) + 9555*a**(13/2)*b**63*x**(13/2)
+ 2205*a**(11/2)*b**64*x**(11/2) + 315*a**(9/2)*b**65*x**(9/2) +
21*a**(7/2)*b**66*x**(7/2)) + 1640210*a**(25/2)*b**(109/2)*x**9*

```
sqrt(a*x/b + 1)/(21*a**(37/2)*b**51*x**(37/2) + 315*a**(35/2)*b**
52*x**(35/2) + 2205*a**(33/2)*b**53*x**(33/2) + 9555*a**(31/2)*b*
*54*x**(31/2) + 28665*a**(29/2)*b**55*x**(29/2) + 63063*a**(27/2)
*b**56*x**(27/2) + 105105*a**(25/2)*b**57*x**(25/2) + 135135*a**(
23/2)*b**58*x**(23/2) + 135135*a**(21/2)*b**59*x**(21/2) + 105105
*a**(19/2)*b**60*x**(19/2) + 63063*a**(17/2)*b**61*x**(17/2) + 28
665*a**(15/2)*b**62*x**(15/2) + 9555*a**(13/2)*b**63*x**(13/2) +
2205*a**(11/2)*b**64*x**(11/2) + 315*a**(9/2)*b**65*x**(9/2) + 21
*a**(7/2)*b**66*x**(7/2)) + 900614*a**(23/2)*b**(111/2)*x**8*sqrt
(a*x/b + 1)/(21*a**(37/2)*b**51*x**(37/2) + 315*a**(35/2)*b**52*x
**(35/2) + 2205*a**(33/2)*b**53*x**(33/2) + 9555*a**(31/2)*b**54*
x**(31/2) + 28665*a**(29/2)*b**55*x**(29/2) + 63063*a**(27/2)*b**
56*x**(27/2) + 105105*a**(25/2)*b**57*x**(25/2) + 135135*a**(23/2
)*b**58*x**(23/2) + 135135*a**(21/2)*b**59*x**(21/2) + 105105*a**
(19/2)*b**60*x**(19/2) + 63063*a**(17/2)*b**61*x**(17/2) + 28665*
a**(15/2)*b**62*x**(15/2) + 9555*a**(13/2)*b**63*x**(13/2) + 2205
*a**(11/2)*b**64*x**(11/2) + 315*a**(9/2)*b**65*x**(9/2) + 21*a**
(7/2)*b**66*x**(7/2)) + 365976*a**(21/2)*b**(113/2)*x**7*sqrt(a*x
/b + 1)/(21*a**(37/2)*b**51*x**(37/2) + 315*a**(35/2)*b**52*x**(3
5/2) + 2205*a**(33/2)*b**53*x**(33/2) + 9555*a**(31/2)*b**54*x**(
31/2) + 28665*a**(29/2)*b**55*x**(29/2) + 63063*a**(27/2)*b**56*x
**(27/2) + 105105*a**(25/2)*b**57*x**(25/2) + 135135*a**(23/2)*b*
*58*x**(23/2) + 135135*a**(21/2)*b**59*x**(21/2) + 105105*a**(19/
2)*b**60*x**(19/2) + 63063*a**(17/2)*b**61*x**(17/2) + 28665*a**(
15/2)*b**62*x**(15/2) + 9555*a**(13/2)*b**63*x**(13/2) + 2205*a**
(11/2)*b**64*x**(11/2) + 315*a**(9/2)*b**65*x**(9/2) + 21*a**(7/2
)*b**66*x**(7/2)) + 103740*a**(19/2)*b**(115/2)*x**6*sqrt(a*x/b +
 1)/(21*a**(37/2)*b**51*x**(37/2) + 315*a**(35/2)*b**52*x**(35/2)
 + 2205*a**(33/2)*b**53*x**(33/2) + 9555*a**(31/2)*b**54*x**(31/2
) + 28665*a**(29/2)*b**55*x**(29/2) + 63063*a**(27/2)*b**56*x**(2
7/2) + 105105*a**(25/2)*b**57*x**(25/2) + 135135*a**(23/2)*b**58*
x**(23/2) + 135135*a**(21/2)*b**59*x**(21/2) + 105105*a**(19/2)*b
**60*x**(19/2) + 63063*a**(17/2)*b**61*x**(17/2) + 28665*a**(15/2
)*b**62*x**(15/2) + 9555*a**(13/2)*b**63*x**(13/2) + 2205*a**(11/
2)*b**64*x**(11/2) + 315*a**(9/2)*b**65*x**(9/2) + 21*a**(7/2)*b*
*66*x**(7/2)) + 17178*a**(17/2)*b**(117/2)*x**5*sqrt(a*x/b + 1)/(
21*a**(37/2)*b**51*x**(37/2) + 315*a**(35/2)*b**52*x**(35/2) + 22
05*a**(33/2)*b**53*x**(33/2) + 9555*a**(31/2)*b**54*x**(31/2) + 2
8665*a**(29/2)*b**55*x**(29/2) + 63063*a**(27/2)*b**56*x**(27/2)
+ 105105*a**(25/2)*b**57*x**(25/2) + 135135*a**(23/2)*b**58*x**(2
3/2) + 135135*a**(21/2)*b**59*x**(21/2) + 105105*a**(19/2)*b**60*
x**(19/2) + 63063*a**(17/2)*b**61*x**(17/2) + 28665*a**(15/2)*b**
62*x**(15/2) + 9555*a**(13/2)*b**63*x**(13/2) + 2205*a**(11/2)*b*
*64*x**(11/2) + 315*a**(9/2)*b**65*x**(9/2) + 21*a**(7/2)*b**66*x
**(7/2)) - 90*a**(15/2)*b**(119/2)*x**4*sqrt(a*x/b + 1)/(21*a**(3
7/2)*b**51*x**(37/2) + 315*a**(35/2)*b**52*x**(35/2) + 2205*a**(3
3/2)*b**53*x**(33/2) + 9555*a**(31/2)*b**54*x**(31/2) + 28665*a**
(29/2)*b**55*x**(29/2) + 63063*a**(27/2)*b**56*x**(27/2) + 105105
*a**(25/2)*b**57*x**(25/2) + 135135*a**(23/2)*b**58*x**(23/2) + 1
35135*a**(21/2)*b**59*x**(21/2) + 105105*a**(19/2)*b**60*x**(19/2
) + 63063*a**(17/2)*b**61*x**(17/2) + 28665*a**(15/2)*b**62*x**(1
5/2) + 9555*a**(13/2)*b**63*x**(13/2) + 2205*a**(11/2)*b**64*x**(
11/2) + 315*a**(9/2)*b**65*x**(9/2) + 21*a**(7/2)*b**66*x**(7/2))
 - 1004*a**(13/2)*b**(121/2)*x**3*sqrt(a*x/b + 1)/(21*a**(37/2)*b
**51*x**(37/2) + 315*a**(35/2)*b**52*x**(35/2) + 2205*a**(33/2)*b
**53*x**(33/2) + 9555*a**(31/2)*b**54*x**(31/2) + 28665*a**(29/2)
*b**55*x**(29/2) + 63063*a**(27/2)*b**56*x**(27/2) + 105105*a**(2
5/2)*b**57*x**(25/2) + 135135*a**(23/2)*b**58*x**(23/2) + 135135*
a**(21/2)*b**59*x**(21/2) + 105105*a**(19/2)*b**60*x**(19/2) + 63
063*a**(17/2)*b**61*x**(17/2) + 28665*a**(15/2)*b**62*x**(15/2) +
 9555*a**(13/2)*b**63*x**(13/2) + 2205*a**(11/2)*b**64*x**(11/2)
+ 315*a**(9/2)*b**65*x**(9/2) + 21*a**(7/2)*b**66*x**(7/2)) - 344
*a**(11/2)*b**(123/2)*x**2*sqrt(a*x/b + 1)/(21*a**(37/2)*b**51*x*
*(37/2) + 315*a**(35/2)*b**52*x**(35/2) + 2205*a**(33/2)*b**53*x*
*(33/2) + 9555*a**(31/2)*b**54*x**(31/2) + 28665*a**(29/2)*b**55*
x**(29/2) + 63063*a**(27/2)*b**56*x**(27/2) + 105105*a**(25/2)*b*
*57*x**(25/2) + 135135*a**(23/2)*b**58*x**(23/2) + 135135*a**(21/
2)*b**59*x**(21/2) + 105105*a**(19/2)*b**60*x**(19/2) + 63063*a**
(17/2)*b**61*x**(17/2) + 28665*a**(15/2)*b**62*x**(15/2) + 9555*a
**(13/2)*b**63*x**(13/2) + 2205*a**(11/2)*b**64*x**(11/2) + 315*a
**(9/2)*b**65*x**(9/2) + 21*a**(7/2)*b**66*x**(7/2)) - 66*a**(9/2
)*b**(125/2)*x*sqrt(a*x/b + 1)/(21*a**(37/2)*b**51*x**(37/2) + 31
5*a**(35/2)*b**52*x**(35/2) + 2205*a**(33/2)*b**53*x**(33/2) + 95
55*a**(31/2)*b**54*x**(31/2) + 28665*a**(29/2)*b**55*x**(29/2) +
```

```
63063*a**(27/2)*b**56*x**(27/2) + 105105*a**(25/2)*b**57*x**(25/2
) + 135135*a**(23/2)*b**58*x**(23/2) + 135135*a**(21/2)*b**59*x**
(21/2) + 105105*a**(19/2)*b**60*x**(19/2) + 63063*a**(17/2)*b**61
*x**(17/2) + 28665*a**(15/2)*b**62*x**(15/2) + 9555*a**(13/2)*b**
63*x**(13/2) + 2205*a**(11/2)*b**64*x**(11/2) + 315*a**(9/2)*b**6
5*x**(9/2) + 21*a**(7/2)*b**66*x**(7/2)) - 6*a**(7/2)*b**(127/2)*
sqrt(a*x/b + 1)/(21*a**(37/2)*b**51*x**(37/2) + 315*a**(35/2)*b**
52*x**(35/2) + 2205*a**(33/2)*b**53*x**(33/2) + 9555*a**(31/2)*b*
*54*x**(31/2) + 28665*a**(29/2)*b**55*x**(29/2) + 63063*a**(27/2)
*b**56*x**(27/2) + 105105*a**(25/2)*b**57*x**(25/2) + 135135*a**(
23/2)*b**58*x**(23/2) + 135135*a**(21/2)*b**59*x**(21/2) + 105105
*a**(19/2)*b**60*x**(19/2) + 63063*a**(17/2)*b**61*x**(17/2) + 28
665*a**(15/2)*b**62*x**(15/2) + 9555*a**(13/2)*b**63*x**(13/2) +
2205*a**(11/2)*b**64*x**(11/2) + 315*a**(9/2)*b**65*x**(9/2) + 21
*a**(7/2)*b**66*x**(7/2)) - 512*a**22*b**45*x**(37/2)/(21*a**(37/
2)*b**51*x**(37/2) + 315*a**(35/2)*b**52*x**(35/2) + 2205*a**(33/
2)*b**53*x**(33/2) + 9555*a**(31/2)*b**54*x**(31/2) + 28665*a**(2
9/2)*b**55*x**(29/2) + 63063*a**(27/2)*b**56*x**(27/2) + 105105*a
**(25/2)*b**57*x**(25/2) + 135135*a**(23/2)*b**58*x**(23/2) + 135
135*a**(21/2)*b**59*x**(21/2) + 105105*a**(19/2)*b**60*x**(19/2)
+ 63063*a**(17/2)*b**61*x**(17/2) + 28665*a**(15/2)*b**62*x**(15/
2) + 9555*a**(13/2)*b**63*x**(13/2) + 2205*a**(11/2)*b**64*x**(11
/2) + 315*a**(9/2)*b**65*x**(9/2) + 21*a**(7/2)*b**66*x**(7/2)) -
 7680*a**21*b**46*x**(35/2)/(21*a**(37/2)*b**51*x**(37/2) + 315*a
**(35/2)*b**52*x**(35/2) + 2205*a**(33/2)*b**53*x**(33/2) + 9555*
a**(31/2)*b**54*x**(31/2) + 28665*a**(29/2)*b**55*x**(29/2) + 630
63*a**(27/2)*b**56*x**(27/2) + 105105*a**(25/2)*b**57*x**(25/2) +
 135135*a**(23/2)*b**58*x**(23/2) + 135135*a**(21/2)*b**59*x**(21
/2) + 105105*a**(19/2)*b**60*x**(19/2) + 63063*a**(17/2)*b**61*x*
*(17/2) + 28665*a**(15/2)*b**62*x**(15/2) + 9555*a**(13/2)*b**63*
x**(13/2) + 2205*a**(11/2)*b**64*x**(11/2) + 315*a**(9/2)*b**65*x
**(9/2) + 21*a**(7/2)*b**66*x**(7/2)) - 53760*a**20*b**47*x**(33/
2)/(21*a**(37/2)*b**51*x**(37/2) + 315*a**(35/2)*b**52*x**(35/2)
+ 2205*a**(33/2)*b**53*x**(33/2) + 9555*a**(31/2)*b**54*x**(31/2)
 + 28665*a**(29/2)*b**55*x**(29/2) + 63063*a**(27/2)*b**56*x**(27
/2) + 105105*a**(25/2)*b**57*x**(25/2) + 135135*a**(23/2)*b**58*x
**(23/2) + 135135*a**(21/2)*b**59*x**(21/2) + 105105*a**(19/2)*b*
*60*x**(19/2) + 63063*a**(17/2)*b**61*x**(17/2) + 28665*a**(15/2)
*b**62*x**(15/2) + 9555*a**(13/2)*b**63*x**(13/2) + 2205*a**(11/2
)*b**64*x**(11/2) + 315*a**(9/2)*b**65*x**(9/2) + 21*a**(7/2)*b**
66*x**(7/2)) - 232960*a**19*b**48*x**(31/2)/(21*a**(37/2)*b**51*x
**(37/2) + 315*a**(35/2)*b**52*x**(35/2) + 2205*a**(33/2)*b**53*x
**(33/2) + 9555*a**(31/2)*b**54*x**(31/2) + 28665*a**(29/2)*b**55
*x**(29/2) + 63063*a**(27/2)*b**56*x**(27/2) + 105105*a**(25/2)*b
**57*x**(25/2) + 135135*a**(23/2)*b**58*x**(23/2) + 135135*a**(21
/2)*b**59*x**(21/2) + 105105*a**(19/2)*b**60*x**(19/2) + 63063*a*
*(17/2)*b**61*x**(17/2) + 28665*a**(15/2)*b**62*x**(15/2) + 9555*
a**(13/2)*b**63*x**(13/2) + 2205*a**(11/2)*b**64*x**(11/2) + 315*
a**(9/2)*b**65*x**(9/2) + 21*a**(7/2)*b**66*x**(7/2)) - 698880*a*
*18*b**49*x**(29/2)/(21*a**(37/2)*b**51*x**(37/2) + 315*a**(35/2)
*b**52*x**(35/2) + 2205*a**(33/2)*b**53*x**(33/2) + 9555*a**(31/2
)*b**54*x**(31/2) + 28665*a**(29/2)*b**55*x**(29/2) + 63063*a**(2
7/2)*b**56*x**(27/2) + 105105*a**(25/2)*b**57*x**(25/2) + 135135*
a**(23/2)*b**58*x**(23/2) + 135135*a**(21/2)*b**59*x**(21/2) + 10
5105*a**(19/2)*b**60*x**(19/2) + 63063*a**(17/2)*b**61*x**(17/2)
+ 28665*a**(15/2)*b**62*x**(15/2) + 9555*a**(13/2)*b**63*x**(13/2
) + 2205*a**(11/2)*b**64*x**(11/2) + 315*a**(9/2)*b**65*x**(9/2)
+ 21*a**(7/2)*b**66*x**(7/2)) - 1537536*a**17*b**50*x**(27/2)/(21
*a**(37/2)*b**51*x**(37/2) + 315*a**(35/2)*b**52*x**(35/2) + 2205
*a**(33/2)*b**53*x**(33/2) + 9555*a**(31/2)*b**54*x**(31/2) + 286
65*a**(29/2)*b**55*x**(29/2) + 63063*a**(27/2)*b**56*x**(27/2) +
105105*a**(25/2)*b**57*x**(25/2) + 135135*a**(23/2)*b**58*x**(23/
2) + 135135*a**(21/2)*b**59*x**(21/2) + 105105*a**(19/2)*b**60*x*
*(19/2) + 63063*a**(17/2)*b**61*x**(17/2) + 28665*a**(15/2)*b**62
*x**(15/2) + 9555*a**(13/2)*b**63*x**(13/2) + 2205*a**(11/2)*b**6
4*x**(11/2) + 315*a**(9/2)*b**65*x**(9/2) + 21*a**(7/2)*b**66*x**
(7/2)) - 2562560*a**16*b**51*x**(25/2)/(21*a**(37/2)*b**51*x**(37
/2) + 315*a**(35/2)*b**52*x**(35/2) + 2205*a**(33/2)*b**53*x**(33
/2) + 9555*a**(31/2)*b**54*x**(31/2) + 28665*a**(29/2)*b**55*x**(
29/2) + 63063*a**(27/2)*b**56*x**(27/2) + 105105*a**(25/2)*b**57*
x**(25/2) + 135135*a**(23/2)*b**58*x**(23/2) + 135135*a**(21/2)*b
**59*x**(21/2) + 105105*a**(19/2)*b**60*x**(19/2) + 63063*a**(17/
2)*b**61*x**(17/2) + 28665*a**(15/2)*b**62*x**(15/2) + 9555*a**(1
3/2)*b**63*x**(13/2) + 2205*a**(11/2)*b**64*x**(11/2) + 315*a**(9
```

/2)*b**65*x**(9/2) + 21*a**(7/2)*b**66*x**(7/2)) - 3294720*a**15*
b**52*x**(23/2)/(21*a**(37/2)*b**51*x**(37/2) + 315*a**(35/2)*b**
52*x**(35/2) + 2205*a**(33/2)*b**53*x**(33/2) + 9555*a**(31/2)*b*
*54*x**(31/2) + 28665*a**(29/2)*b**55*x**(29/2) + 63063*a**(27/2)
*b**56*x**(27/2) + 105105*a**(25/2)*b**57*x**(25/2) + 135135*a**(
23/2)*b**58*x**(23/2) + 135135*a**(21/2)*b**59*x**(21/2) + 105105
*a**(19/2)*b**60*x**(19/2) + 63063*a**(17/2)*b**61*x**(17/2) + 28
665*a**(15/2)*b**62*x**(15/2) + 9555*a**(13/2)*b**63*x**(13/2) +
2205*a**(11/2)*b**64*x**(11/2) + 315*a**(9/2)*b**65*x**(9/2) + 21
*a**(7/2)*b**66*x**(7/2)) - 3294720*a**14*b**53*x**(21/2)/(21*a**
(37/2)*b**51*x**(37/2) + 315*a**(35/2)*b**52*x**(35/2) + 2205*a**
(33/2)*b**53*x**(33/2) + 9555*a**(31/2)*b**54*x**(31/2) + 28665*a
(29/2)*b55*x**(29/2) + 63063*a**(27/2)*b**56*x**(27/2) + 1051
05*a**(25/2)*b**57*x**(25/2) + 135135*a**(23/2)*b**58*x**(23/2) +
 135135*a**(21/2)*b**59*x**(21/2) + 105105*a**(19/2)*b**60*x**(19
/2) + 63063*a**(17/2)*b**61*x**(17/2) + 28665*a**(15/2)*b**62*x**
(15/2) + 9555*a**(13/2)*b**63*x**(13/2) + 2205*a**(11/2)*b**64*x*
*(11/2) + 315*a**(9/2)*b**65*x**(9/2) + 21*a**(7/2)*b**66*x**(7/2
)) - 2562560*a**13*b**54*x**(19/2)/(21*a**(37/2)*b**51*x**(37/2)
+ 315*a**(35/2)*b**52*x**(35/2) + 2205*a**(33/2)*b**53*x**(33/2)
+ 9555*a**(31/2)*b**54*x**(31/2) + 28665*a**(29/2)*b**55*x**(29/2
) + 63063*a**(27/2)*b**56*x**(27/2) + 105105*a**(25/2)*b**57*x**(
25/2) + 135135*a**(23/2)*b**58*x**(23/2) + 135135*a**(21/2)*b**59
*x**(21/2) + 105105*a**(19/2)*b**60*x**(19/2) + 63063*a**(17/2)*b
61*x(17/2) + 28665*a**(15/2)*b**62*x**(15/2) + 9555*a**(13/2)
*b**63*x**(13/2) + 2205*a**(11/2)*b**64*x**(11/2) + 315*a**(9/2)*
b**65*x**(9/2) + 21*a**(7/2)*b**66*x**(7/2)) - 1537536*a**12*b**5
5*x**(17/2)/(21*a**(37/2)*b**51*x**(37/2) + 315*a**(35/2)*b**52*x
(35/2) + 2205*a(33/2)*b**53*x**(33/2) + 9555*a**(31/2)*b**54*
x**(31/2) + 28665*a**(29/2)*b**55*x**(29/2) + 63063*a**(27/2)*b**
56*x**(27/2) + 105105*a**(25/2)*b**57*x**(25/2) + 135135*a**(23/2
)*b**58*x**(23/2) + 135135*a**(21/2)*b**59*x**(21/2) + 105105*a**
(19/2)*b**60*x**(19/2) + 63063*a**(17/2)*b**61*x**(17/2) + 28665*
a**(15/2)*b**62*x**(15/2) + 9555*a**(13/2)*b**63*x**(13/2) + 2205
*a**(11/2)*b**64*x**(11/2) + 315*a**(9/2)*b**65*x**(9/2) + 21*a**
(7/2)*b**66*x**(7/2)) - 698880*a**11*b**56*x**(15/2)/(21*a**(37/2
)*b**51*x**(37/2) + 315*a**(35/2)*b**52*x**(35/2) + 2205*a**(33/2
)*b**53*x**(33/2) + 9555*a**(31/2)*b**54*x**(31/2) + 28665*a**(29
/2)*b**55*x**(29/2) + 63063*a**(27/2)*b**56*x**(27/2) + 105105*a*
*(25/2)*b**57*x**(25/2) + 135135*a**(23/2)*b**58*x**(23/2) + 1351
35*a**(21/2)*b**59*x**(21/2) + 105105*a**(19/2)*b**60*x**(19/2) +
 63063*a**(17/2)*b**61*x**(17/2) + 28665*a**(15/2)*b**62*x**(15/2
) + 9555*a**(13/2)*b**63*x**(13/2) + 2205*a**(11/2)*b**64*x**(11/
2) + 315*a**(9/2)*b**65*x**(9/2) + 21*a**(7/2)*b**66*x**(7/2)) -
232960*a**10*b**57*x**(13/2)/(21*a**(37/2)*b**51*x**(37/2) + 315*
a**(35/2)*b**52*x**(35/2) + 2205*a**(33/2)*b**53*x**(33/2) + 9555
*a**(31/2)*b**54*x**(31/2) + 28665*a**(29/2)*b**55*x**(29/2) + 63
063*a**(27/2)*b**56*x**(27/2) + 105105*a**(25/2)*b**57*x**(25/2)
+ 135135*a**(23/2)*b**58*x**(23/2) + 135135*a**(21/2)*b**59*x**(2
1/2) + 105105*a**(19/2)*b**60*x**(19/2) + 63063*a**(17/2)*b**61*x
(17/2) + 28665*a(15/2)*b**62*x**(15/2) + 9555*a**(13/2)*b**63
*x**(13/2) + 2205*a**(11/2)*b**64*x**(11/2) + 315*a**(9/2)*b**65*
x**(9/2) + 21*a**(7/2)*b**66*x**(7/2)) - 53760*a**9*b**58*x**(11/
2)/(21*a**(37/2)*b**51*x**(37/2) + 315*a**(35/2)*b**52*x**(35/2)
+ 2205*a**(33/2)*b**53*x**(33/2) + 9555*a**(31/2)*b**54*x**(31/2)
 + 28665*a**(29/2)*b**55*x**(29/2) + 63063*a**(27/2)*b**56*x**(27
/2) + 105105*a**(25/2)*b**57*x**(25/2) + 135135*a**(23/2)*b**58*x
(23/2) + 135135*a(21/2)*b**59*x**(21/2) + 105105*a**(19/2)*b*
*60*x**(19/2) + 63063*a**(17/2)*b**61*x**(17/2) + 28665*a**(15/2)
*b**62*x**(15/2) + 9555*a**(13/2)*b**63*x**(13/2) + 2205*a**(11/2
)*b**64*x**(11/2) + 315*a**(9/2)*b**65*x**(9/2) + 21*a**(7/2)*b**
66*x**(7/2)) - 7680*a**8*b**59*x**(9/2)/(21*a**(37/2)*b**51*x**(3
7/2) + 315*a**(35/2)*b**52*x**(35/2) + 2205*a**(33/2)*b**53*x**(3
3/2) + 9555*a**(31/2)*b**54*x**(31/2) + 28665*a**(29/2)*b**55*x**
(29/2) + 63063*a**(27/2)*b**56*x**(27/2) + 105105*a**(25/2)*b**57
*x**(25/2) + 135135*a**(23/2)*b**58*x**(23/2) + 135135*a**(21/2)*
b**59*x**(21/2) + 105105*a**(19/2)*b**60*x**(19/2) + 63063*a**(17
/2)*b**61*x**(17/2) + 28665*a**(15/2)*b**62*x**(15/2) + 9555*a**(
13/2)*b**63*x**(13/2) + 2205*a**(11/2)*b**64*x**(11/2) + 315*a**(
9/2)*b**65*x**(9/2) + 21*a**(7/2)*b**66*x**(7/2)) - 512*a**7*b**6
0*x**(7/2)/(21*a**(37/2)*b**51*x**(37/2) + 315*a**(35/2)*b**52*x*
*(35/2) + 2205*a**(33/2)*b**53*x**(33/2) + 9555*a**(31/2)*b**54*x
(31/2) + 28665*a(29/2)*b**55*x**(29/2) + 63063*a**(27/2)*b**5
6*x**(27/2) + 105105*a**(25/2)*b**57*x**(25/2) + 135135*a**(23/2)

```
*b**58*x**(23/2) + 135135*a**(21/2)*b**59*x**(21/2) + 105105*a**(
19/2)*b**60*x**(19/2) + 63063*a**(17/2)*b**61*x**(17/2) + 28665*a
**(15/2)*b**62*x**(15/2) + 9555*a**(13/2)*b**63*x**(13/2) + 2205*
a**(11/2)*b**64*x**(11/2) + 315*a**(9/2)*b**65*x**(9/2) + 21*a**(
7/2)*b**66*x**(7/2))
```

GIAC/XCAS [A] time = 0.271226, size = 203, normalized size = 1.75

$$-\frac{2}{21}\,b\left(\frac{7\left(a^5-\frac{15\,(ax+b)a^4}{x}\right)x}{(ax+b)b^7\sqrt{\frac{ax+b}{x}}}-\frac{210\,a^3b^{42}\sqrt{\frac{ax+b}{x}}-\frac{70\,(ax+b)a^2b^{42}\sqrt{\frac{ax+b}{x}}}{x}+\frac{21\,(ax+b)^2ab^{42}\sqrt{\frac{ax+b}{x}}}{x^2}-\frac{3\,(ax+b)^3b^{42}\sqrt{\frac{ax+b}{x}}}{x^3}}{b^{49}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^7),x, algorithm="giac")
```

```
[Out] -2/21*b*(7*(a^5 - 15*(a*x + b)*a^4/x)*x/((a*x + b)*b^7*sqrt((a*x
+ b)/x)) - (210*a^3*b^42*sqrt((a*x + b)/x) - 70*(a*x + b)*a^2*b^4
2*sqrt((a*x + b)/x)/x + 21*(a*x + b)^2*a*b^42*sqrt((a*x + b)/x)/x
^2 - 3*(a*x + b)^3*b^42*sqrt((a*x + b)/x)/x^3)/b^49)
```

3.1750 $\int \sqrt{a+\frac{b}{x}}x^{7/2}\,dx$

Optimal. Leaf size=100

$$-\frac{32b^3x^{3/2}\left(a+\frac{b}{x}\right)^{3/2}}{315a^4}+\frac{16b^2x^{5/2}\left(a+\frac{b}{x}\right)^{3/2}}{105a^3}-\frac{4bx^{7/2}\left(a+\frac{b}{x}\right)^{3/2}}{21a^2}+\frac{2x^{9/2}\left(a+\frac{b}{x}\right)^{3/2}}{9a}$$

```
[Out] (-32*b^3*(a + b/x)^(3/2)*x^(3/2))/(315*a^4) + (16*b^2*(a + b/x)^(
3/2)*x^(5/2))/(105*a^3) - (4*b*(a + b/x)^(3/2)*x^(7/2))/(21*a^2)
+ (2*(a + b/x)^(3/2)*x^(9/2))/(9*a)
```

Rubi [A] time = 0.116207, antiderivative size = 100, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$

$$-\frac{32b^3x^{3/2}\left(a+\frac{b}{x}\right)^{3/2}}{315a^4}+\frac{16b^2x^{5/2}\left(a+\frac{b}{x}\right)^{3/2}}{105a^3}-\frac{4bx^{7/2}\left(a+\frac{b}{x}\right)^{3/2}}{21a^2}+\frac{2x^{9/2}\left(a+\frac{b}{x}\right)^{3/2}}{9a}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x]*x^(7/2),x]
```

```
[Out] (-32*b^3*(a + b/x)^(3/2)*x^(3/2))/(315*a^4) + (16*b^2*(a + b/x)^(
3/2)*x^(5/2))/(105*a^3) - (4*b*(a + b/x)^(3/2)*x^(7/2))/(21*a^2)
+ (2*(a + b/x)^(3/2)*x^(9/2))/(9*a)
```

Rubi in Sympy [A] time = 10.2459, size = 87, normalized size = 0.87

$$\frac{2x^{\frac{9}{2}}\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{9a}-\frac{4bx^{\frac{7}{2}}\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{21a^2}+\frac{16b^2x^{\frac{5}{2}}\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{105a^3}-\frac{32b^3x^{\frac{3}{2}}\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{315a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(1/2)*x**(7/2),x)
```

```
[Out] 2*x**(9/2)*(a + b/x)**(3/2)/(9*a) - 4*b*x**(7/2)*(a + b/x)**(3/2)
/(21*a**2) + 16*b**2*x**(5/2)*(a + b/x)**(3/2)/(105*a**3) - 32*b*
*3*x**(3/2)*(a + b/x)**(3/2)/(315*a**4)
```

Mathematica [A] time = 0.0463412, size = 64, normalized size = 0.64

$$\frac{2\sqrt{x}\sqrt{a+\frac{b}{x}}\left(35a^4x^4+5a^3bx^3-6a^2b^2x^2+8ab^3x-16b^4\right)}{315a^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x]*x^(7/2),x]
```

```
[Out] (2*Sqrt[a + b/x]*Sqrt[x]*(-16*b^4 + 8*a*b^3*x - 6*a^2*b^2*x^2 + 5
*a^3*b*x^3 + 35*a^4*x^4))/(315*a^4)
```

Maple [A] time = 0.008, size = 55, normalized size = 0.6

$$\frac{(2ax+2b)(35a^3x^3-30a^2bx^2+24ab^2x-16b^3)}{315a^4}\sqrt{x}\sqrt{\frac{ax+b}{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(1/2)*x^(7/2),x)
```

```
[Out] 2/315*(a*x+b)*(35*a^3*x^3-30*a^2*b*x^2+24*a*b^2*x-16*b^3)*x^(1/2)
*((a*x+b)/x)^(1/2)/a^4
```

Maxima [A] time = 1.43662, size = 93, normalized size = 0.93

$$\frac{2\left(35\left(a+\frac{b}{x}\right)^{\frac{9}{2}}x^{\frac{9}{2}}-135\left(a+\frac{b}{x}\right)^{\frac{7}{2}}bx^{\frac{7}{2}}+189\left(a+\frac{b}{x}\right)^{\frac{5}{2}}b^2x^{\frac{5}{2}}-105\left(a+\frac{b}{x}\right)^{\frac{3}{2}}b^3x^{\frac{3}{2}}\right)}{315a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)*x^(7/2),x, algorithm="maxima")
```

```
[Out] 2/315*(35*(a + b/x)^(9/2)*x^(9/2) - 135*(a + b/x)^(7/2)*b*x^(7/2)
 + 189*(a + b/x)^(5/2)*b^2*x^(5/2) - 105*(a + b/x)^(3/2)*b^3*x^(3
/2))/a^4
```

Fricas [A] time = 0.243547, size = 81, normalized size = 0.81

$$\frac{2\left(35a^4x^4+5a^3bx^3-6a^2b^2x^2+8ab^3x-16b^4\right)\sqrt{x}\sqrt{\frac{ax+b}{x}}}{315a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)*x^(7/2),x, algorithm="fricas")
```

```
[Out] 2/315*(35*a^4*x^4 + 5*a^3*b*x^3 - 6*a^2*b^2*x^2 + 8*a*b^3*x - 16*
b^4)*sqrt(x)*sqrt((a*x + b)/x)/a^4
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(1/2)*x**(7/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.228357, size = 82, normalized size = 0.82

$$\frac{2}{315}\left(\frac{16b^{\frac{9}{2}}}{a^4}+\frac{35(ax+b)^{\frac{9}{2}}-135(ax+b)^{\frac{7}{2}}b+189(ax+b)^{\frac{5}{2}}b^2-105(ax+b)^{\frac{3}{2}}b^3}{a^4}\right)\mathrm{sign}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)*x^(7/2),x, algorithm="giac")
```

```
[Out] 2/315*(16*b^(9/2)/a^4 + (35*(a*x + b)^(9/2) - 135*(a*x + b)^(7/2)
*b + 189*(a*x + b)^(5/2)*b^2 - 105*(a*x + b)^(3/2)*b^3)/a^4)*sign
(x)
```

3.1751 $\int \sqrt{a+\frac{b}{x}}x^{5/2}\,dx$

Optimal. Leaf size=74

$$\frac{16b^2x^{3/2}\left(a+\frac{b}{x}\right)^{3/2}}{105a^3}-\frac{8bx^{5/2}\left(a+\frac{b}{x}\right)^{3/2}}{35a^2}+\frac{2x^{7/2}\left(a+\frac{b}{x}\right)^{3/2}}{7a}$$

```
[Out] (16*b^2*(a + b/x)^(3/2)*x^(3/2))/(105*a^3) - (8*b*(a + b/x)^(3/2)
*x^(5/2))/(35*a^2) + (2*(a + b/x)^(3/2)*x^(7/2))/(7*a)
```

Rubi [A] time = 0.0823326, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{16b^2x^{3/2}\left(a+\frac{b}{x}\right)^{3/2}}{105a^3}-\frac{8bx^{5/2}\left(a+\frac{b}{x}\right)^{3/2}}{35a^2}+\frac{2x^{7/2}\left(a+\frac{b}{x}\right)^{3/2}}{7a}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x]*x^(5/2),x]
```

```
[Out] (16*b^2*(a + b/x)^(3/2)*x^(3/2))/(105*a^3) - (8*b*(a + b/x)^(3/2)
*x^(5/2))/(35*a^2) + (2*(a + b/x)^(3/2)*x^(7/2))/(7*a)
```

Rubi in Sympy [A] time = 6.71071, size = 63, normalized size = 0.85

$$\frac{2x^{\frac{7}{2}}\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{7a}-\frac{8bx^{\frac{5}{2}}\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{35a^2}+\frac{16b^2x^{\frac{3}{2}}\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{105a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(1/2)*x**(5/2),x)
```

```
[Out] 2*x**(7/2)*(a + b/x)**(3/2)/(7*a) - 8*b*x**(5/2)*(a + b/x)**(3/2)
/(35*a**2) + 16*b**2*x**(3/2)*(a + b/x)**(3/2)/(105*a**3)
```

Mathematica [A] time = 0.038405, size = 53, normalized size = 0.72

$$\frac{2\sqrt{x}\sqrt{a+\frac{b}{x}}\left(15a^3x^3+3a^2bx^2-4ab^2x+8b^3\right)}{105a^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x]*x^(5/2),x]
```

```
[Out] (2*Sqrt[a + b/x]*Sqrt[x]*(8*b^3 - 4*a*b^2*x + 3*a^2*b*x^2 + 15*a^
3*x^3))/(105*a^3)
```

Maple [A] time = 0.007, size = 44, normalized size = 0.6

$$\frac{(2\,ax+2\,b)\left(15\,a^2x^2-12\,abx+8\,b^2\right)}{105\,a^3}\sqrt{x}\sqrt{\frac{ax+b}{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(1/2)*x^(5/2),x)
```

```
[Out] 2/105*(a*x+b)*(15*a^2*x^2-12*a*b*x+8*b^2)*x^(1/2)*((a*x+b)/x)^(1/
2)/a^3
```

Maxima [A] time = 1.42952, size = 70, normalized size = 0.95

$$\frac{2\left(15\left(a+\frac{b}{x}\right)^{\frac{7}{2}}x^{\frac{7}{2}}-42\left(a+\frac{b}{x}\right)^{\frac{5}{2}}bx^{\frac{5}{2}}+35\left(a+\frac{b}{x}\right)^{\frac{3}{2}}b^{2}x^{\frac{3}{2}}\right)}{105\,a^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)*x^(5/2),x, algorithm="maxima")
```

```
[Out] 2/105*(15*(a + b/x)^(7/2)*x^(7/2) - 42*(a + b/x)^(5/2)*b*x^(5/2)
+ 35*(a + b/x)^(3/2)*b^2*x^(3/2))/a^3
```

Fricas [A] time = 0.247368, size = 66, normalized size = 0.89

$$\frac{2\left(15\,a^{3}x^{3}+3\,a^{2}bx^{2}-4\,ab^{2}x+8\,b^{3}\right)\sqrt{x}\sqrt{\frac{ax+b}{x}}}{105\,a^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)*x^(5/2),x, algorithm="fricas")
```

```
[Out] 2/105*(15*a^3*x^3 + 3*a^2*b*x^2 - 4*a*b^2*x + 8*b^3)*sqrt(x)*sqrt
((a*x + b)/x)/a^3
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(1/2)*x**(5/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.235461, size = 68, normalized size = 0.92

$$-\frac{2}{105}\left(\frac{8\,b^{\frac{7}{2}}}{a^{3}}-\frac{15\,(ax+b)^{\frac{7}{2}}-42\,(ax+b)^{\frac{5}{2}}b+35\,(ax+b)^{\frac{3}{2}}b^{2}}{a^{3}}\right)\mathrm{sign}\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)*x^(5/2),x, algorithm="giac")
```

```
[Out] -2/105*(8*b^(7/2)/a^3 - (15*(a*x + b)^(7/2) - 42*(a*x + b)^(5/2)*
b + 35*(a*x + b)^(3/2)*b^2)/a^3)*sign(x)
```

3.1752 $\int \sqrt{a+\frac{b}{x}}x^{3/2}\,dx$

Optimal. Leaf size=48

$$\frac{2x^{5/2}\left(a+\frac{b}{x}\right)^{3/2}}{5a}-\frac{4bx^{3/2}\left(a+\frac{b}{x}\right)^{3/2}}{15a^2}$$

```
[Out] (-4*b*(a + b/x)^(3/2)*x^(3/2))/(15*a^2) + (2*(a + b/x)^(3/2)*x^(5
/2))/(5*a)
```

Rubi [A] time = 0.051524, antiderivative size = 48, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{2x^{5/2}\left(a+\frac{b}{x}\right)^{3/2}}{5a}-\frac{4bx^{3/2}\left(a+\frac{b}{x}\right)^{3/2}}{15a^2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x]*x^(3/2),x]
```

```
[Out] (-4*b*(a + b/x)^(3/2)*x^(3/2))/(15*a^2) + (2*(a + b/x)^(3/2)*x^(5
/2))/(5*a)
```

Rubi in Sympy [A] time = 4.21269, size = 39, normalized size = 0.81

$$\frac{2x^{\frac{5}{2}}\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{5a}-\frac{4bx^{\frac{3}{2}}\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{15a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(1/2)*x**(3/2),x)
```

```
[Out] 2*x**(5/2)*(a + b/x)**(3/2)/(5*a) - 4*b*x**(3/2)*(a + b/x)**(3/2)
/(15*a**2)
```

Mathematica [A] time = 0.0344929, size = 41, normalized size = 0.85

$$\frac{2\sqrt{x}\sqrt{a+\frac{b}{x}}\left(3a^2x^2+abx-2b^2\right)}{15a^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x]*x^(3/2),x]
```

```
[Out] (2*Sqrt[a + b/x]*Sqrt[x]*(-2*b^2 + a*b*x + 3*a^2*x^2))/(15*a^2)
```

Maple [A] time = 0.004, size = 33, normalized size = 0.7

$$\frac{(2\,ax+2\,b)(3\,ax-2\,b)}{15\,a^2}\sqrt{\frac{ax+b}{x}}\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(1/2)*x^(3/2),x)

[Out] 2/15*(a*x+b)*(3*a*x-2*b)*x^(1/2)*((a*x+b)/x)^(1/2)/a^2
```

Maxima [A] time = 1.45693, size = 47, normalized size = 0.98

$$\frac{2\left(3\left(a+\frac{b}{x}\right)^{\frac{5}{2}}x^{\frac{5}{2}}-5\left(a+\frac{b}{x}\right)^{\frac{3}{2}}bx^{\frac{3}{2}}\right)}{15\,a^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)*x^(3/2),x, algorithm="maxima")

[Out] 2/15*(3*(a + b/x)^(5/2)*x^(5/2) - 5*(a + b/x)^(3/2)*b*x^(3/2))/a^
2
```

Fricas [A] time = 0.237594, size = 50, normalized size = 1.04

$$\frac{2\left(3\,a^{2}x^{2}+abx-2\,b^{2}\right)\sqrt{x}\sqrt{\frac{ax+b}{x}}}{15\,a^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)*x^(3/2),x, algorithm="fricas")

[Out] 2/15*(3*a^2*x^2 + a*b*x - 2*b^2)*sqrt(x)*sqrt((a*x + b)/x)/a^2
```

Sympy [A] time = 91.0332, size = 65, normalized size = 1.35

$$\frac{2\sqrt{b}x^{2}\sqrt{\frac{ax}{b}+1}}{5}+\frac{2b^{\frac{3}{2}}x\sqrt{\frac{ax}{b}+1}}{15a}-\frac{4b^{\frac{5}{2}}\sqrt{\frac{ax}{b}+1}}{15a^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(1/2)*x**(3/2),x)

[Out] 2*sqrt(b)*x**2*sqrt(a*x/b + 1)/5 + 2*b**(3/2)*x*sqrt(a*x/b + 1)/(
15*a) - 4*b**(5/2)*sqrt(a*x/b + 1)/(15*a**2)
```

GIAC/XCAS [A] time = 0.234291, size = 50, normalized size = 1.04

$$\frac{2}{15}\left(\frac{2\,b^{\frac{5}{2}}}{a^{2}}+\frac{3\,(ax+b)^{\frac{5}{2}}-5\,(ax+b)^{\frac{3}{2}}b}{a^{2}}\right)\mathrm{sign}\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)*x^(3/2),x, algorithm="giac")

[Out] 2/15*(2*b^(5/2)/a^2 + (3*(a*x + b)^(5/2) - 5*(a*x + b)^(3/2)*b)/a
^2)*sign(x)
```

3.1753 $\int \sqrt{a+\frac{b}{x}}\sqrt{x}\,dx$

Optimal. Leaf size=23

$$\frac{2x^{3/2}\left(a+\frac{b}{x}\right)^{3/2}}{3a}$$

```
[Out] (2*(a + b/x)^(3/2)*x^(3/2))/(3*a)
```

Rubi [A] time = 0.0247132, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.059

$$\frac{2x^{3/2}\left(a+\frac{b}{x}\right)^{3/2}}{3a}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x]*Sqrt[x],x]

[Out] (2*(a + b/x)^(3/2)*x^(3/2))/(3*a)
```

Rubi in Sympy [A] time = 2.69183, size = 17, normalized size = 0.74

$$\frac{2x^{\frac{3}{2}}\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{3a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(1/2)*x**(1/2),x)

[Out] 2*x**(3/2)*(a + b/x)**(3/2)/(3*a)
```

Mathematica [A] time = 0.0292823, size = 28, normalized size = 1.22

$$\frac{2\sqrt{x}\sqrt{a+\frac{b}{x}}(ax+b)}{3a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x]*Sqrt[x],x]

[Out] (2*Sqrt[a + b/x]*Sqrt[x]*(b + a*x))/(3*a)
```

Maple [A] time = 0.003, size = 25, normalized size = 1.1

$$\frac{2\,ax+2\,b}{3\,a}\sqrt{\frac{ax+b}{x}}\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(1/2)*x^(1/2),x)
```

```
[Out] 2/3*(a*x+b)*((a*x+b)/x)^(1/2)*x^(1/2)/a
```

Maxima [A] time = 1.46116, size = 23, normalized size = 1.

$$\frac{2\left(a+\frac{b}{x}\right)^{\frac{3}{2}}x^{\frac{3}{2}}}{3\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)*sqrt(x),x, algorithm="maxima")
```

```
[Out] 2/3*(a + b/x)^(3/2)*x^(3/2)/a
```

Fricas [A] time = 0.234832, size = 32, normalized size = 1.39

$$\frac{2\,(ax+b)\sqrt{x}\sqrt{\frac{ax+b}{x}}}{3\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)*sqrt(x),x, algorithm="fricas")
```

```
[Out] 2/3*(a*x + b)*sqrt(x)*sqrt((a*x + b)/x)/a
```

Sympy [A] time = 9.01955, size = 39, normalized size = 1.7

$$\frac{2\sqrt{b}x\sqrt{\frac{ax}{b}+1}}{3}+\frac{2b^{\frac{3}{2}}\sqrt{\frac{ax}{b}+1}}{3a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(1/2)*x**(1/2),x)
```

```
[Out] 2*sqrt(b)*x*sqrt(a*x/b + 1)/3 + 2*b**(3/2)*sqrt(a*x/b + 1)/(3*a)
```

GIAC/XCAS [A] time = 0.225942, size = 32, normalized size = 1.39

$$\frac{2}{3}\left(\frac{(ax+b)^{\frac{3}{2}}}{a}-\frac{b^{\frac{3}{2}}}{a}\right)\mathrm{sign}\,(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)*sqrt(x),x, algorithm="giac")
```

```
[Out] 2/3*((a*x + b)^(3/2)/a - b^(3/2)/a)*sign(x)
```

3.1754 $\int \frac{\sqrt{a+\frac{b}{x}}}{\sqrt{x}}\,dx$

Optimal. Leaf size=49

$$2\sqrt{x}\sqrt{a+\frac{b}{x}}-2\sqrt{b}\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)$$

```
[Out] 2*Sqrt[a + b/x]*Sqrt[x] - 2*Sqrt[b]*ArcTanh[Sqrt[b]/(Sqrt[a + b/x
]*Sqrt[x])]
```

Rubi [A] time = 0.0734367, antiderivative size = 49, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.235

$$2\sqrt{x}\sqrt{a+\frac{b}{x}}-2\sqrt{b}\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x]/Sqrt[x],x]
```

```
[Out] 2*Sqrt[a + b/x]*Sqrt[x] - 2*Sqrt[b]*ArcTanh[Sqrt[b]/(Sqrt[a + b/x
]*Sqrt[x])]
```

Rubi in Sympy [A] time = 7.22513, size = 41, normalized size = 0.84

$$-2\sqrt{b}\,\text{atanh}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)+2\sqrt{x}\sqrt{a+\frac{b}{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(1/2)/x**(1/2),x)
```

```
[Out] -2*sqrt(b)*atanh(sqrt(b)/(sqrt(x)*sqrt(a + b/x))) + 2*sqrt(x)*sqr
t(a + b/x)
```

Mathematica [A] time = 0.0627394, size = 59, normalized size = 1.2

$$2\sqrt{x}\sqrt{a+\frac{b}{x}}-2\sqrt{b}\log\left(\sqrt{b}\sqrt{x}\sqrt{a+\frac{b}{x}}+b\right)+\sqrt{b}\log(x)$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x]/Sqrt[x],x]
```

```
[Out] 2*Sqrt[a + b/x]*Sqrt[x] - 2*Sqrt[b]*Log[b + Sqrt[b]*Sqrt[a + b/x]
*Sqrt[x]] + Sqrt[b]*Log[x]
```

Maple [A] time = 0.015, size = 50, normalized size = 1.

$$-2\,\frac{\sqrt{x}}{\sqrt{ax+b}}\sqrt{\frac{ax+b}{x}}\left(\sqrt{b}Artanh\left(\frac{\sqrt{ax+b}}{\sqrt{b}}\right)-\sqrt{ax+b}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(1/2)/x^(1/2),x)
```

```
[Out] -2*((a*x+b)/x)^(1/2)*x^(1/2)*(b^(1/2)*arctanh((a*x+b)^(1/2)/b^(1/
2))-(a*x+b)^(1/2))/(a*x+b)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)/sqrt(x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.247281, size = 1, normalized size = 0.02

$$\left[\sqrt{b}\log\left(\frac{ax-2\sqrt{b}\sqrt{x}\sqrt{\frac{ax+b}{x}}+2b}{x}\right)+2\sqrt{x}\sqrt{\frac{ax+b}{x}},-2\sqrt{-b}\arctan\left(\frac{\sqrt{x}\sqrt{\frac{ax+b}{x}}}{\sqrt{-b}}\right)+2\sqrt{x}\sqrt{\frac{ax+b}{x}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)/sqrt(x),x, algorithm="fricas")
```

```
[Out] [sqrt(b)*log((a*x - 2*sqrt(b)*sqrt(x)*sqrt((a*x + b)/x) + 2*b)/x)
 + 2*sqrt(x)*sqrt((a*x + b)/x), -2*sqrt(-b)*arctan(sqrt(x)*sqrt((
a*x + b)/x)/sqrt(-b)) + 2*sqrt(x)*sqrt((a*x + b)/x)]
```

Sympy [A] time = 8.64725, size = 68, normalized size = 1.39

$$\frac{2\sqrt{a}\sqrt{x}}{\sqrt{1+\frac{b}{ax}}}-2\sqrt{b}\operatorname{asinh}\left(\frac{\sqrt{b}}{\sqrt{a}\sqrt{x}}\right)+\frac{2b}{\sqrt{a}\sqrt{x}\sqrt{1+\frac{b}{ax}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(1/2)/x**(1/2),x)
```

```
[Out] 2*sqrt(a)*sqrt(x)/sqrt(1 + b/(a*x)) - 2*sqrt(b)*asinh(sqrt(b)/(sq
rt(a)*sqrt(x))) + 2*b/(sqrt(a)*sqrt(x)*sqrt(1 + b/(a*x)))
```

GIAC/XCAS [A] time = 0.241553, size = 84, normalized size = 1.71

$$2\left(\frac{b\arctan\left(\frac{\sqrt{ax+b}}{\sqrt{-b}}\right)}{\sqrt{-b}}+\sqrt{ax+b}-\frac{b\arctan\left(\frac{\sqrt{b}}{\sqrt{-b}}\right)+\sqrt{-b}\sqrt{b}}{\sqrt{-b}}\right)\operatorname{sign}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)/sqrt(x),x, algorithm="giac")
```

```
[Out] 2*(b*arctan(sqrt(a*x + b)/sqrt(-b))/sqrt(-b) + sqrt(a*x + b) - (b
*arctan(sqrt(b)/sqrt(-b)) + sqrt(-b)*sqrt(b))/sqrt(-b))*sign(x)
```

3.1755 $\int \frac{\sqrt{a+\frac{b}{x}}}{x^{3/2}} dx$

Optimal. Leaf size=50

$$-\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{x}}-\frac{a\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{\sqrt{b}}$$

```
[Out] -(Sqrt[a + b/x]/Sqrt[x]) - (a*ArcTanh[Sqrt[b]/(Sqrt[a + b/x]*Sqrt
[x])])/Sqrt[b]
```

Rubi [A] time = 0.0645598, antiderivative size = 50, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.235$

$$-\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{x}}-\frac{a\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{\sqrt{b}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[a + b/x]/x^(3/2),x]
```

```
[Out] -(Sqrt[a + b/x]/Sqrt[x]) - (a*ArcTanh[Sqrt[b]/(Sqrt[a + b/x]*Sqrt
[x])])/Sqrt[b]
```

Rubi in Sympy [A] time = 5.437, size = 41, normalized size = 0.82

$$-\frac{a\,\text{atanh}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{\sqrt{b}}-\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x)**(1/2)/x**(3/2),x)
```

```
[Out] -a*atanh(sqrt(b)/(sqrt(x)*sqrt(a + b/x)))/sqrt(b) - sqrt(a + b/x)
/sqrt(x)
```

Mathematica [A] time = 0.0958227, size = 64, normalized size = 1.28

$$-\frac{\sqrt{a+\frac{b}{x}}}{\sqrt{x}}-\frac{a\log\left(\sqrt{b}\sqrt{x}\sqrt{a+\frac{b}{x}}+b\right)}{\sqrt{b}}+\frac{a\log(x)}{2\sqrt{b}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[a + b/x]/x^(3/2),x]
```

```
[Out] -(Sqrt[a + b/x]/Sqrt[x]) - (a*Log[b + Sqrt[b]*Sqrt[a + b/x]*Sqrt[
x]])/Sqrt[b] + (a*Log[x])/(2*Sqrt[b])
```

Maple [A] time = 0.021, size = 54, normalized size = 1.1

$$-1\sqrt{\frac{ax+b}{x}}\left(Artanh\left(1\sqrt{ax+b}\frac{1}{\sqrt{b}}\right)ax+\sqrt{ax+b}\sqrt{b}\right)\frac{1}{\sqrt{x}}\frac{1}{\sqrt{ax+b}}\frac{1}{\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(1/2)/x^(3/2),x)
```

```
[Out] -((a*x+b)/x)^(1/2)*(arctanh((a*x+b)^(1/2)/b^(1/2))*a*x+(a*x+b)^(1
/2)*b^(1/2))/x^(1/2)/(a*x+b)^(1/2)/b^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)/x^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.251096, size = 1, normalized size = 0.02

$$\left[\frac{ax\log\left(-\frac{2\,b\sqrt{x}\sqrt{\frac{ax+b}{x}}-(ax+2\,b)\sqrt{b}}{x}\right)-2\,\sqrt{b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}{2\,\sqrt{b}x},\ \frac{ax\arctan\left(\frac{b}{\sqrt{-b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}\right)-\sqrt{-b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}{\sqrt{-b}x}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)/x^(3/2),x, algorithm="fricas")
```

```
[Out] [1/2*(a*x*log(-(2*b*sqrt(x)*sqrt((a*x + b)/x) - (a*x + 2*b)*sqrt(
b))/x) - 2*sqrt(b)*sqrt(x)*sqrt((a*x + b)/x))/(sqrt(b)*x), (a*x*a
rctan(b/(sqrt(-b)*sqrt(x)*sqrt((a*x + b)/x))) - sqrt(-b)*sqrt(x)*
sqrt((a*x + b)/x))/(sqrt(-b)*x)]
```

Sympy [A] time = 19.0155, size = 44, normalized size = 0.88

$$-\frac{\sqrt{a}\sqrt{1+\frac{b}{ax}}}{\sqrt{x}}-\frac{a\operatorname{asinh}\left(\frac{\sqrt{b}}{\sqrt{a}\sqrt{x}}\right)}{\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(1/2)/x**(3/2),x)
```

```
[Out] -sqrt(a)*sqrt(1 + b/(a*x))/sqrt(x) - a*asinh(sqrt(b)/(sqrt(a)*sqr
t(x)))/sqrt(b)
```

GIAC/XCAS [A] time = 0.28006, size = 54, normalized size = 1.08

$$a\left(\frac{\arctan\left(\frac{\sqrt{ax+b}}{\sqrt{-b}}\right)}{\sqrt{-b}}-\frac{\sqrt{ax+b}}{ax}\right)\operatorname{sign}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)/x^(3/2),x, algorithm="giac")
```

```
[Out] a*(arctan(sqrt(a*x + b)/sqrt(-b))/sqrt(-b) - sqrt(a*x + b)/(a*x))
*sign(x)
```

3.1756 $\int \frac{\sqrt{a+\frac{b}{x}}}{x^{5/2}}\,dx$

Optimal. Leaf size=80

$$\frac{a^2\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{4b^{3/2}}-\frac{\sqrt{a+\frac{b}{x}}}{2x^{3/2}}-\frac{a\sqrt{a+\frac{b}{x}}}{4b\sqrt{x}}$$

```
[Out] -Sqrt[a + b/x]/(2*x^(3/2)) - (a*Sqrt[a + b/x])/(4*b*Sqrt[x]) + (a
^2*ArcTanh[Sqrt[b]/(Sqrt[a + b/x]*Sqrt[x])])/(4*b^(3/2))
```

Rubi [A] time = 0.116938, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.294

$$\frac{a^2\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{4b^{3/2}}-\frac{\sqrt{a+\frac{b}{x}}}{2x^{3/2}}-\frac{a\sqrt{a+\frac{b}{x}}}{4b\sqrt{x}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x]/x^(5/2),x]
```

```
[Out] -Sqrt[a + b/x]/(2*x^(3/2)) - (a*Sqrt[a + b/x])/(4*b*Sqrt[x]) + (a
^2*ArcTanh[Sqrt[b]/(Sqrt[a + b/x]*Sqrt[x])])/(4*b^(3/2))
```

Rubi in Sympy [A] time = 11.6502, size = 63, normalized size = 0.79

$$\frac{a^2\operatorname{atanh}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{4b^{\frac{3}{2}}}-\frac{a\sqrt{a+\frac{b}{x}}}{4b\sqrt{x}}-\frac{\sqrt{a+\frac{b}{x}}}{2x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(1/2)/x**(5/2),x)
```

```
[Out] a**2*atanh(sqrt(b)/(sqrt(x)*sqrt(a + b/x)))/(4*b**(3/2)) - a*sqrt
(a + b/x)/(4*b*sqrt(x)) - sqrt(a + b/x)/(2*x**(3/2))
```

Mathematica [A] time = 0.222108, size = 77, normalized size = 0.96

$$\frac{2a^2\log\left(\sqrt{b}\sqrt{x}\sqrt{a+\frac{b}{x}}+b\right)-a^2\log(x)-\frac{2\sqrt{b}\sqrt{a+\frac{b}{x}}(ax+2b)}{x^{3/2}}}{8b^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x]/x^(5/2),x]
```

```
[Out] ((-2*Sqrt[b]*Sqrt[a + b/x]*(2*b + a*x))/x^(3/2) + 2*a^2*Log[b + S
qrt[b]*Sqrt[a + b/x]*Sqrt[x]] - a^2*Log[x])/(8*b^(3/2))
```

Maple [A] time = 0.023, size = 73, normalized size = 0.9

$$-\frac{1}{4}\sqrt{\frac{ax+b}{x}}\left(-Artanh\left(1\sqrt{ax+b}\frac{1}{\sqrt{b}}\right)a^{2}x^{2}+2\,b^{3/2}\sqrt{ax+b}+xa\sqrt{ax+b}\sqrt{b}\right)x^{-\frac{3}{2}}b^{-\frac{3}{2}}\frac{1}{\sqrt{ax+b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(1/2)/x^(5/2),x)
```

```
[Out] -1/4*((a*x+b)/x)^(1/2)*(-arctanh((a*x+b)^(1/2)/b^(1/2))*a^2*x^2+2
*b^(3/2)*(a*x+b)^(1/2)+x*a*(a*x+b)^(1/2)*b^(1/2))/x^(3/2)/b^(3/2)
/(a*x+b)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)/x^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.24984, size = 1, normalized size = 0.01

$$\left[\frac{a^{2}x^{2}\log\left(\frac{2\,b\sqrt{x}\sqrt{\frac{ax+b}{x}}+(ax+2\,b)\sqrt{b}}{x}\right)-2\,(ax+2\,b)\sqrt{b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}{8\,b^{\frac{3}{2}}x^{2}},\right.$$
$$\left.-\frac{a^{2}x^{2}\arctan\left(\frac{b}{\sqrt{-b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}\right)+(ax+2\,b)\sqrt{-b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}{4\,\sqrt{-b}bx^{2}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)/x^(5/2),x, algorithm="fricas")
```

```
[Out] [1/8*(a^2*x^2*log((2*b*sqrt(x)*sqrt((a*x + b)/x) + (a*x + 2*b)*sq
rt(b))/x) - 2*(a*x + 2*b)*sqrt(b)*sqrt(x)*sqrt((a*x + b)/x))/(b^(
3/2)*x^2), -1/4*(a^2*x^2*arctan(b/(sqrt(-b)*sqrt(x)*sqrt((a*x + b
)/x))) + (a*x + 2*b)*sqrt(-b)*sqrt(x)*sqrt((a*x + b)/x))/(sqrt(-b
)*b*x^2)]
```

Sympy [A] time = 101.326, size = 97, normalized size = 1.21

$$-\frac{a^{\frac{3}{2}}}{4b\sqrt{x}\sqrt{1+\frac{b}{ax}}}-\frac{3\sqrt{a}}{4x^{\frac{3}{2}}\sqrt{1+\frac{b}{ax}}}+\frac{a^{2}\operatorname{asinh}\left(\frac{\sqrt{b}}{\sqrt{a}\sqrt{x}}\right)}{4b^{\frac{3}{2}}}-\frac{b}{2\sqrt{a}x^{\frac{5}{2}}\sqrt{1+\frac{b}{ax}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(1/2)/x**(5/2),x)
```

```
[Out] -a**(3/2)/(4*b*sqrt(x)*sqrt(1 + b/(a*x))) - 3*sqrt(a)/(4*x**(3/2)
*sqrt(1 + b/(a*x))) + a**2*asinh(sqrt(b)/(sqrt(a)*sqrt(x)))/(4*b*
*(3/2)) - b/(2*sqrt(a)*x**(5/2)*sqrt(1 + b/(a*x)))
```

GIAC/XCAS [A] time = 0.272548, size = 78, normalized size = 0.98

$$-\frac{1}{4}\,a^2\left(\frac{\arctan\left(\frac{\sqrt{ax+b}}{\sqrt{-b}}\right)}{\sqrt{-b}b}+\frac{(ax+b)^{\frac{3}{2}}+\sqrt{ax+b}b}{a^2bx^2}\right)\operatorname{sign}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)/x^(5/2),x, algorithm="giac")
```

```
[Out] -1/4*a^2*(arctan(sqrt(a*x + b)/sqrt(-b))/(sqrt(-b)*b) + ((a*x + b
)^(3/2) + sqrt(a*x + b)*b)/(a^2*b*x^2))*sign(x)
```

3.1757 $\int \frac{\sqrt{a+\frac{b}{x}}}{x^{7/2}}\,dx$

Optimal. Leaf size=106

$$-\frac{a^3\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{8b^{5/2}}+\frac{a^2\sqrt{a+\frac{b}{x}}}{8b^2\sqrt{x}}-\frac{a\sqrt{a+\frac{b}{x}}}{12bx^{3/2}}-\frac{\sqrt{a+\frac{b}{x}}}{3x^{5/2}}$$

```
[Out] -Sqrt[a + b/x]/(3*x^(5/2)) - (a*Sqrt[a + b/x])/(12*b*x^(3/2)) + (
a^2*Sqrt[a + b/x])/(8*b^2*Sqrt[x]) - (a^3*ArcTanh[Sqrt[b]/(Sqrt[a
 + b/x]*Sqrt[x])])/(8*b^(5/2))
```

Rubi [A] time = 0.160151, antiderivative size = 106, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.294

$$-\frac{a^3\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{8b^{5/2}}+\frac{a^2\sqrt{a+\frac{b}{x}}}{8b^2\sqrt{x}}-\frac{a\sqrt{a+\frac{b}{x}}}{12bx^{3/2}}-\frac{\sqrt{a+\frac{b}{x}}}{3x^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x]/x^(7/2),x]
```

```
[Out] -Sqrt[a + b/x]/(3*x^(5/2)) - (a*Sqrt[a + b/x])/(12*b*x^(3/2)) + (
a^2*Sqrt[a + b/x])/(8*b^2*Sqrt[x]) - (a^3*ArcTanh[Sqrt[b]/(Sqrt[a
 + b/x]*Sqrt[x])])/(8*b^(5/2))
```

Rubi in Sympy [A] time = 15.7509, size = 85, normalized size = 0.8

$$-\frac{a^3\operatorname{atanh}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{8b^{\frac{5}{2}}}+\frac{a^2\sqrt{a+\frac{b}{x}}}{8b^2\sqrt{x}}-\frac{a\sqrt{a+\frac{b}{x}}}{12bx^{\frac{3}{2}}}-\frac{\sqrt{a+\frac{b}{x}}}{3x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(1/2)/x**(7/2),x)
```

```
[Out] -a**3*atanh(sqrt(b)/(sqrt(x)*sqrt(a + b/x)))/(8*b**(5/2)) + a**2*
sqrt(a + b/x)/(8*b**2*sqrt(x)) - a*sqrt(a + b/x)/(12*b*x**(3/2))
- sqrt(a + b/x)/(3*x**(5/2))
```

Mathematica [A] time = 0.308427, size = 89, normalized size = 0.84

$$\frac{-6a^3\log\left(\sqrt{b}\sqrt{x}\sqrt{a+\frac{b}{x}}+b\right)+3a^3\log(x)+\frac{2\sqrt{b}\sqrt{a+\frac{b}{x}}\left(3a^2x^2-2abx-8b^2\right)}{x^{5/2}}}{48b^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x]/x^(7/2),x]
```

```
[Out] ((2*Sqrt[b]*Sqrt[a + b/x]*(-8*b^2 - 2*a*b*x + 3*a^2*x^2))/x^(5/2)
 - 6*a^3*Log[b + Sqrt[b]*Sqrt[a + b/x]*Sqrt[x]] + 3*a^3*Log[x])/(
```

```
48*b^(5/2))
```

Maple [A] time = 0.025, size = 92, normalized size = 0.9

$$-\frac{1}{24}\sqrt{\frac{ax+b}{x}}\left(3\,Artanh\left(\frac{\sqrt{ax+b}}{\sqrt{b}}\right)a^3x^3-3\,x^2a^2\sqrt{b}\sqrt{ax+b}+2\,xab^{3/2}\sqrt{ax+b}+8\,b^{5/2}\sqrt{ax+b}\right)x^{-\frac{5}{2}}b^{-\frac{5}{2}}\frac{1}{\sqrt{ax+b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(1/2)/x^(7/2),x)
```

```
[Out] -1/24*((a*x+b)/x)^(1/2)/x^(5/2)/b^(5/2)*(3*arctanh((a*x+b)^(1/2)/
b^(1/2))*a^3*x^3-3*x^2*a^2*b^(1/2)*(a*x+b)^(1/2)+2*x*a*b^(3/2)*(a
*x+b)^(1/2)+8*b^(5/2)*(a*x+b)^(1/2))/(a*x+b)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)/x^(7/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.248045, size = 1, normalized size = 0.01

$$\left[\frac{3\,a^3x^3\log\left(-\frac{2\,b\sqrt{x}\sqrt{\frac{ax+b}{x}}-(ax+2\,b)\sqrt{b}}{x}\right)+2\left(3\,a^2x^2-2\,abx-8\,b^2\right)\sqrt{b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}{48\,b^{\frac{5}{2}}x^3},\ \frac{3\,a^3x^3\arctan\left(\frac{b}{\sqrt{-b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}\right)+\left(3\,a^2x^2-2\,a\right.}{24\,\sqrt{-b}b^2x^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)/x^(7/2),x, algorithm="fricas")
```

```
[Out] [1/48*(3*a^3*x^3*log(-(2*b*sqrt(x)*sqrt((a*x + b)/x) - (a*x + 2*b
)*sqrt(b))/x) + 2*(3*a^2*x^2 - 2*a*b*x - 8*b^2)*sqrt(b)*sqrt(x)*s
qrt((a*x + b)/x))/(b^(5/2)*x^3), 1/24*(3*a^3*x^3*arctan(b/(sqrt(-
b)*sqrt(x)*sqrt((a*x + b)/x))) + (3*a^2*x^2 - 2*a*b*x - 8*b^2)*sq
rt(-b)*sqrt(x)*sqrt((a*x + b)/x))/(sqrt(-b)*b^2*x^3)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(1/2)/x**(7/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.301185, size = 100, normalized size = 0.94

$$\frac{1}{24}\,a^{3}\left(\frac{3\,\arctan\left(\frac{\sqrt{ax+b}}{\sqrt{-b}}\right)}{\sqrt{-b}b^{2}}+\frac{3\,(ax+b)^{\frac{5}{2}}-8\,(ax+b)^{\frac{3}{2}}b-3\,\sqrt{ax+b}b^{2}}{a^{3}b^{2}x^{3}}\right)\operatorname{sign}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x)/x^(7/2),x, algorithm="giac")
```

```
[Out] 1/24*a^3*(3*arctan(sqrt(a*x + b)/sqrt(-b))/(sqrt(-b)*b^2) + (3*(a
*x + b)^(5/2) - 8*(a*x + b)^(3/2)*b - 3*sqrt(a*x + b)*b^2)/(a^3*b
^2*x^3))*sign(x)
```

3.1758 $\int \left(a+\frac{b}{x}\right)^{3/2} x^{9/2} \, dx$

Optimal. Leaf size=100

$$-\frac{32b^3x^{5/2}\left(a+\frac{b}{x}\right)^{5/2}}{1155a^4}+\frac{16b^2x^{7/2}\left(a+\frac{b}{x}\right)^{5/2}}{231a^3}-\frac{4bx^{9/2}\left(a+\frac{b}{x}\right)^{5/2}}{33a^2}+\frac{2x^{11/2}\left(a+\frac{b}{x}\right)^{5/2}}{11a}$$

```
[Out] (-32*b^3*(a + b/x)^(5/2)*x^(5/2))/(1155*a^4) + (16*b^2*(a + b/x)^
(5/2)*x^(7/2))/(231*a^3) - (4*b*(a + b/x)^(5/2)*x^(9/2))/(33*a^2)
 + (2*(a + b/x)^(5/2)*x^(11/2))/(11*a)
```

Rubi [A] time = 0.115986, antiderivative size = 100, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$

$$-\frac{32b^3x^{5/2}\left(a+\frac{b}{x}\right)^{5/2}}{1155a^4}+\frac{16b^2x^{7/2}\left(a+\frac{b}{x}\right)^{5/2}}{231a^3}-\frac{4bx^{9/2}\left(a+\frac{b}{x}\right)^{5/2}}{33a^2}+\frac{2x^{11/2}\left(a+\frac{b}{x}\right)^{5/2}}{11a}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(3/2)*x^(9/2),x]
```

```
[Out] (-32*b^3*(a + b/x)^(5/2)*x^(5/2))/(1155*a^4) + (16*b^2*(a + b/x)^
(5/2)*x^(7/2))/(231*a^3) - (4*b*(a + b/x)^(5/2)*x^(9/2))/(33*a^2)
 + (2*(a + b/x)^(5/2)*x^(11/2))/(11*a)
```

Rubi in Sympy [A] time = 9.60424, size = 87, normalized size = 0.87

$$\frac{2x^{\frac{11}{2}}\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{11a}-\frac{4bx^{\frac{9}{2}}\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{33a^2}+\frac{16b^2x^{\frac{7}{2}}\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{231a^3}-\frac{32b^3x^{\frac{5}{2}}\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{1155a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(3/2)*x**(9/2),x)
```

```
[Out] 2*x**(11/2)*(a + b/x)**(5/2)/(11*a) - 4*b*x**(9/2)*(a + b/x)**(5/
2)/(33*a**2) + 16*b**2*x**(7/2)*(a + b/x)**(5/2)/(231*a**3) - 32*
b**3*x**(5/2)*(a + b/x)**(5/2)/(1155*a**4)
```

Mathematica [A] time = 0.0600247, size = 60, normalized size = 0.6

$$\frac{2\sqrt{x}\sqrt{a+\frac{b}{x}}(ax+b)^2\left(105a^3x^3-70a^2bx^2+40ab^2x-16b^3\right)}{1155a^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(3/2)*x^(9/2),x]
```

```
[Out] (2*Sqrt[a + b/x]*Sqrt[x]*(b + a*x)^2*(-16*b^3 + 40*a*b^2*x - 70*a
^2*b*x^2 + 105*a^3*x^3))/(1155*a^4)
```

Maple [A] time = 0.007, size = 55, normalized size = 0.6

$$\frac{(2\,ax+2\,b)\,(105\,a^3x^3-70\,a^2bx^2+40\,ab^2x-16\,b^3)}{1155\,a^4}x^{\frac{3}{2}}\left(\frac{ax+b}{x}\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((a+b/x)^(3/2)*x^(9/2),x)
```

```
[Out] 2/1155*(a*x+b)*(105*a^3*x^3-70*a^2*b*x^2+40*a*b^2*x-16*b^3)*x^(3/
2)*((a*x+b)/x)^(3/2)/a^4
```

Maxima [A] time = 1.42921, size = 93, normalized size = 0.93

$$\frac{2\left(105\left(a+\frac{b}{x}\right)^{\frac{11}{2}}x^{\frac{11}{2}}-385\left(a+\frac{b}{x}\right)^{\frac{9}{2}}bx^{\frac{9}{2}}+495\left(a+\frac{b}{x}\right)^{\frac{7}{2}}b^2x^{\frac{7}{2}}-231\left(a+\frac{b}{x}\right)^{\frac{5}{2}}b^3x^{\frac{5}{2}}\right)}{1155\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a + b/x)^(3/2)*x^(9/2),x, algorithm="maxima")
```

```
[Out] 2/1155*(105*(a + b/x)^(11/2)*x^(11/2) - 385*(a + b/x)^(9/2)*b*x^(
9/2) + 495*(a + b/x)^(7/2)*b^2*x^(7/2) - 231*(a + b/x)^(5/2)*b^3*
x^(5/2))/a^4
```

Fricas [A] time = 0.238769, size = 96, normalized size = 0.96

$$\frac{2\,(105\,a^5x^5+140\,a^4bx^4+5\,a^3b^2x^3-6\,a^2b^3x^2+8\,ab^4x-16\,b^5)\,\sqrt{x}\sqrt{\frac{ax+b}{x}}}{1155\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a + b/x)^(3/2)*x^(9/2),x, algorithm="fricas")
```

```
[Out] 2/1155*(105*a^5*x^5 + 140*a^4*b*x^4 + 5*a^3*b^2*x^3 - 6*a^2*b^3*x
^2 + 8*a*b^4*x - 16*b^5)*sqrt(x)*sqrt((a*x + b)/x)/a^4
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a+b/x)**(3/2)*x**(9/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.236617, size = 186, normalized size = 1.86

$$\frac{2}{315}\,b\left(\frac{16\,b^{\frac{9}{2}}}{a^4}+\frac{35\,(ax+b)^{\frac{9}{2}}-135\,(ax+b)^{\frac{7}{2}}b+189\,(ax+b)^{\frac{5}{2}}b^2-105\,(ax+b)^{\frac{3}{2}}b^3}{a^4}\right)\mathrm{sign}\,(x)$$
$$-\frac{2}{3465}\,a\left(\frac{128\,b^{\frac{11}{2}}}{a^5}-\frac{315\,(ax+b)^{\frac{11}{2}}-1540\,(ax+b)^{\frac{9}{2}}b+2970\,(ax+b)^{\frac{7}{2}}b^2-2772\,(ax+b)^{\frac{5}{2}}b^3+1155\,(ax+b)^{\frac{3}{2}}b^4}{a^5}\right)\mathrm{sign}\,(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)*x^(9/2),x, algorithm="giac")
```

```
[Out] 2/315*b*(16*b^(9/2)/a^4 + (35*(a*x + b)^(9/2) - 135*(a*x + b)^(7/
2)*b + 189*(a*x + b)^(5/2)*b^2 - 105*(a*x + b)^(3/2)*b^3)/a^4)*si
gn(x) - 2/3465*a*(128*b^(11/2)/a^5 - (315*(a*x + b)^(11/2) - 1540
*(a*x + b)^(9/2)*b + 2970*(a*x + b)^(7/2)*b^2 - 2772*(a*x + b)^(5
/2)*b^3 + 1155*(a*x + b)^(3/2)*b^4)/a^5)*sign(x)
```

3.1759 $\int \left(a+\frac{b}{x}\right)^{3/2} x^{7/2}\,dx$

Optimal. Leaf size=74

$$\frac{16b^2x^{5/2}\left(a+\frac{b}{x}\right)^{5/2}}{315a^3}-\frac{8bx^{7/2}\left(a+\frac{b}{x}\right)^{5/2}}{63a^2}+\frac{2x^{9/2}\left(a+\frac{b}{x}\right)^{5/2}}{9a}$$

```
[Out] (16*b^2*(a + b/x)^(5/2)*x^(5/2))/(315*a^3) - (8*b*(a + b/x)^(5/2)
*x^(7/2))/(63*a^2) + (2*(a + b/x)^(5/2)*x^(9/2))/(9*a)
```

Rubi [A] time = 0.0840323, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{16b^2x^{5/2}\left(a+\frac{b}{x}\right)^{5/2}}{315a^3}-\frac{8bx^{7/2}\left(a+\frac{b}{x}\right)^{5/2}}{63a^2}+\frac{2x^{9/2}\left(a+\frac{b}{x}\right)^{5/2}}{9a}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(3/2)*x^(7/2),x]
```

```
[Out] (16*b^2*(a + b/x)^(5/2)*x^(5/2))/(315*a^3) - (8*b*(a + b/x)^(5/2)
*x^(7/2))/(63*a^2) + (2*(a + b/x)^(5/2)*x^(9/2))/(9*a)
```

Rubi in Sympy [A] time = 6.60996, size = 63, normalized size = 0.85

$$\frac{2x^{\frac{9}{2}}\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{9a}-\frac{8bx^{\frac{7}{2}}\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{63a^2}+\frac{16b^2x^{\frac{5}{2}}\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{315a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(3/2)*x**(7/2),x)
```

```
[Out] 2*x**(9/2)*(a + b/x)**(5/2)/(9*a) - 8*b*x**(7/2)*(a + b/x)**(5/2)
/(63*a**2) + 16*b**2*x**(5/2)*(a + b/x)**(5/2)/(315*a**3)
```

Mathematica [A] time = 0.0491955, size = 49, normalized size = 0.66

$$\frac{2\sqrt{x}\sqrt{a+\frac{b}{x}}(ax+b)^2\left(35a^2x^2-20abx+8b^2\right)}{315a^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(3/2)*x^(7/2),x]
```

```
[Out] (2*Sqrt[a + b/x]*Sqrt[x]*(b + a*x)^2*(8*b^2 - 20*a*b*x + 35*a^2*x
^2))/(315*a^3)
```

Maple [A] time = 0.008, size = 44, normalized size = 0.6

$$\frac{(2\,ax+2\,b)\left(35\,a^2x^2-20\,abx+8\,b^2\right)}{315\,a^3}x^{\frac{3}{2}}\left(\frac{ax+b}{x}\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(3/2)*x^(7/2),x)
```

```
[Out] 2/315*(a*x+b)*(35*a^2*x^2-20*a*b*x+8*b^2)*x^(3/2)*((a*x+b)/x)^(3/
2)/a^3
```

Maxima [A] time = 1.45053, size = 70, normalized size = 0.95

$$\frac{2\left(35\left(a+\frac{b}{x}\right)^{\frac{9}{2}}x^{\frac{9}{2}}-90\left(a+\frac{b}{x}\right)^{\frac{7}{2}}bx^{\frac{7}{2}}+63\left(a+\frac{b}{x}\right)^{\frac{5}{2}}b^2x^{\frac{5}{2}}\right)}{315\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)*x^(7/2),x, algorithm="maxima")
```

```
[Out] 2/315*(35*(a + b/x)^(9/2)*x^(9/2) - 90*(a + b/x)^(7/2)*b*x^(7/2)
+ 63*(a + b/x)^(5/2)*b^2*x^(5/2))/a^3
```

Fricas [A] time = 0.235437, size = 81, normalized size = 1.09

$$\frac{2\left(35\,a^4x^4+50\,a^3bx^3+3\,a^2b^2x^2-4\,ab^3x+8\,b^4\right)\sqrt{x}\sqrt{\frac{ax+b}{x}}}{315\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)*x^(7/2),x, algorithm="fricas")
```

```
[Out] 2/315*(35*a^4*x^4 + 50*a^3*b*x^3 + 3*a^2*b^2*x^2 - 4*a*b^3*x + 8*
b^4)*sqrt(x)*sqrt((a*x + b)/x)/a^3
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(3/2)*x**(7/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.242122, size = 154, normalized size = 2.08

$$-\frac{2}{105}\,b\left(\frac{8\,b^{\frac{7}{2}}}{a^3}-\frac{15\,(ax+b)^{\frac{7}{2}}-42\,(ax+b)^{\frac{5}{2}}b+35\,(ax+b)^{\frac{3}{2}}b^2}{a^3}\right)\mathrm{sign}\,(x)$$
$$+\frac{2}{315}\,a\left(\frac{16\,b^{\frac{9}{2}}}{a^4}+\frac{35\,(ax+b)^{\frac{9}{2}}-135\,(ax+b)^{\frac{7}{2}}b+189\,(ax+b)^{\frac{5}{2}}b^2-105\,(ax+b)^{\frac{3}{2}}b^3}{a^4}\right)\mathrm{sign}\,(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)*x^(7/2),x, algorithm="giac")
```

```
[Out] -2/105*b*(8*b^(7/2)/a^3 - (15*(a*x + b)^(7/2) - 42*(a*x + b)^(5/2
)*b + 35*(a*x + b)^(3/2)*b^2)/a^3)*sign(x) + 2/315*a*(16*b^(9/2)/
a^4 + (35*(a*x + b)^(9/2) - 135*(a*x + b)^(7/2)*b + 189*(a*x + b)
^(5/2)*b^2 - 105*(a*x + b)^(3/2)*b^3)/a^4)*sign(x)
```

3.1760 $\int \left(a+\frac{b}{x}\right)^{3/2} x^{5/2} \, dx$

Optimal. Leaf size=48

$$\frac{2x^{7/2}\left(a+\frac{b}{x}\right)^{5/2}}{7a}-\frac{4bx^{5/2}\left(a+\frac{b}{x}\right)^{5/2}}{35a^2}$$

```
[Out] (-4*b*(a + b/x)^(5/2)*x^(5/2))/(35*a^2) + (2*(a + b/x)^(5/2)*x^(7
/2))/(7*a)
```

Rubi [A] time = 0.0541184, antiderivative size = 48, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{2x^{7/2}\left(a+\frac{b}{x}\right)^{5/2}}{7a}-\frac{4bx^{5/2}\left(a+\frac{b}{x}\right)^{5/2}}{35a^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(3/2)*x^(5/2),x]
```

```
[Out] (-4*b*(a + b/x)^(5/2)*x^(5/2))/(35*a^2) + (2*(a + b/x)^(5/2)*x^(7
/2))/(7*a)
```

Rubi in Sympy [A] time = 4.19298, size = 39, normalized size = 0.81

$$\frac{2x^{\frac{7}{2}}\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{7a}-\frac{4bx^{\frac{5}{2}}\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{35a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(3/2)*x**(5/2),x)
```

```
[Out] 2*x**(7/2)*(a + b/x)**(5/2)/(7*a) - 4*b*x**(5/2)*(a + b/x)**(5/2)
/(35*a**2)
```

Mathematica [A] time = 0.0447067, size = 38, normalized size = 0.79

$$\frac{2\sqrt{x}\sqrt{a+\frac{b}{x}}(ax+b)^2(5ax-2b)}{35a^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(3/2)*x^(5/2),x]
```

```
[Out] (2*Sqrt[a + b/x]*Sqrt[x]*(b + a*x)^2*(-2*b + 5*a*x))/(35*a^2)
```

Maple [A] time = 0.006, size = 33, normalized size = 0.7

$$\frac{(2\,ax+2\,b)(5\,ax-2\,b)}{35\,a^2}\left(\frac{ax+b}{x}\right)^{\frac{3}{2}}x^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(3/2)*x^(5/2),x)
```

```
[Out] 2/35*(a*x+b)*(5*a*x-2*b)*x^(3/2)*((a*x+b)/x)^(3/2)/a^2
```

Maxima [A] time = 1.42424, size = 47, normalized size = 0.98

$$\frac{2\left(5\left(a+\frac{b}{x}\right)^{\frac{7}{2}}x^{\frac{7}{2}}-7\left(a+\frac{b}{x}\right)^{\frac{5}{2}}bx^{\frac{5}{2}}\right)}{35\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)*x^(5/2),x, algorithm="maxima")
```

```
[Out] 2/35*(5*(a + b/x)^(7/2)*x^(7/2) - 7*(a + b/x)^(5/2)*b*x^(5/2))/a^
2
```

Fricas [A] time = 0.231821, size = 65, normalized size = 1.35

$$\frac{2\left(5\,a^3x^3+8\,a^2bx^2+ab^2x-2\,b^3\right)\sqrt{x}\sqrt{\frac{ax+b}{x}}}{35\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)*x^(5/2),x, algorithm="fricas")
```

```
[Out] 2/35*(5*a^3*x^3 + 8*a^2*b*x^2 + a*b^2*x - 2*b^3)*sqrt(x)*sqrt((a*
x + b)/x)/a^2
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(3/2)*x**(5/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.240434, size = 122, normalized size = 2.54

$$\frac{2}{15}\,b\left(\frac{2\,b^{\frac{5}{2}}}{a^2}+\frac{3\,(ax+b)^{\frac{5}{2}}-5\,(ax+b)^{\frac{3}{2}}b}{a^2}\right)\mathrm{sign}\,(x)-\frac{2}{105}\,a\left(\frac{8\,b^{\frac{7}{2}}}{a^3}-\frac{15\,(ax+b)^{\frac{7}{2}}-42\,(ax+b)^{\frac{5}{2}}b+35\,(ax+b)^{\frac{3}{2}}b^2}{a^3}\right)\mathrm{sign}\,(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)*x^(5/2),x, algorithm="giac")
```

```
[Out] 2/15*b*(2*b^(5/2)/a^2 + (3*(a*x + b)^(5/2) - 5*(a*x + b)^(3/2)*b)
/a^2)*sign(x) - 2/105*a*(8*b^(7/2)/a^3 - (15*(a*x + b)^(7/2) - 42
*(a*x + b)^(5/2)*b + 35*(a*x + b)^(3/2)*b^2)/a^3)*sign(x)
```

3.1761 $\int \left(a+\frac{b}{x}\right)^{3/2} x^{3/2}\,dx$

Optimal. Leaf size=23

$$\frac{2x^{5/2}\left(a+\frac{b}{x}\right)^{5/2}}{5a}$$

```
[Out] (2*(a + b/x)^(5/2)*x^(5/2))/(5*a)
```

Rubi [A] time = 0.0262079, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.059

$$\frac{2x^{5/2}\left(a+\frac{b}{x}\right)^{5/2}}{5a}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(3/2)*x^(3/2),x]

[Out] (2*(a + b/x)^(5/2)*x^(5/2))/(5*a)
```

Rubi in Sympy [A] time = 2.67117, size = 17, normalized size = 0.74

$$\frac{2x^{\frac{5}{2}}\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{5a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(3/2)*x**(3/2),x)

[Out] 2*x**(5/2)*(a + b/x)**(5/2)/(5*a)
```

Mathematica [A] time = 0.0373606, size = 30, normalized size = 1.3

$$\frac{2\sqrt{x}\sqrt{a+\frac{b}{x}}(ax+b)^2}{5a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(3/2)*x^(3/2),x]

[Out] (2*Sqrt[a + b/x]*Sqrt[x]*(b + a*x)^2)/(5*a)
```

Maple [A] time = 0.005, size = 25, normalized size = 1.1

$$\frac{2\,ax+2\,b}{5\,a}\left(\frac{ax+b}{x}\right)^{\frac{3}{2}}x^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(3/2)*x^(3/2),x)

[Out] 2/5*(a*x+b)*((a*x+b)/x)^(3/2)*x^(3/2)/a
```

Maxima [A] time = 1.44039, size = 23, normalized size = 1.

$$\frac{2\left(a+\frac{b}{x}\right)^{\frac{5}{2}}x^{\frac{5}{2}}}{5a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)*x^(3/2),x, algorithm="maxima")

[Out] 2/5*(a + b/x)^(5/2)*x^(5/2)/a
```

Fricas [A] time = 0.241455, size = 47, normalized size = 2.04

$$\frac{2\left(a^2x^2+2\,abx+b^2\right)\sqrt{x}\sqrt{\frac{ax+b}{x}}}{5a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)*x^(3/2),x, algorithm="fricas")

[Out] 2/5*(a^2*x^2 + 2*a*b*x + b^2)*sqrt(x)*sqrt((a*x + b)/x)/a
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(3/2)*x**(3/2),x)

[Out] Timed out
```

GIAC/XCAS [A] time = 0.226788, size = 16, normalized size = 0.7

$$\frac{2\,(ax+b)^{\frac{5}{2}}}{5a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)*x^(3/2),x, algorithm="giac")

[Out] 2/5*(a*x + b)^(5/2)/a
```

3.1762 $\int \left(a+\frac{b}{x}\right)^{3/2} \sqrt{x}\,dx$

Optimal. Leaf size=70

$$-2b^{3/2}\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)+\frac{2}{3}x^{3/2}\left(a+\frac{b}{x}\right)^{3/2}+2b\sqrt{x}\sqrt{a+\frac{b}{x}}$$

```
[Out] 2*b*Sqrt[a + b/x]*Sqrt[x] + (2*(a + b/x)^(3/2)*x^(3/2))/3 - 2*b^(
3/2)*ArcTanh[Sqrt[b]/(Sqrt[a + b/x]*Sqrt[x])]
```

Rubi [A] time = 0.10432, antiderivative size = 70, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.235

$$-2b^{3/2}\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)+\frac{2}{3}x^{3/2}\left(a+\frac{b}{x}\right)^{3/2}+2b\sqrt{x}\sqrt{a+\frac{b}{x}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(3/2)*Sqrt[x],x]
```

```
[Out] 2*b*Sqrt[a + b/x]*Sqrt[x] + (2*(a + b/x)^(3/2)*x^(3/2))/3 - 2*b^(
3/2)*ArcTanh[Sqrt[b]/(Sqrt[a + b/x]*Sqrt[x])]
```

Rubi in Sympy [A] time = 10.0489, size = 60, normalized size = 0.86

$$-2b^{\frac{3}{2}}\operatorname{atanh}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)+2b\sqrt{x}\sqrt{a+\frac{b}{x}}+\frac{2x^{\frac{3}{2}}\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(3/2)*x**(1/2),x)
```

```
[Out] -2*b**(3/2)*atanh(sqrt(b)/(sqrt(x)*sqrt(a + b/x))) + 2*b*sqrt(x)*
sqrt(a + b/x) + 2*x**(3/2)*(a + b/x)**(3/2)/3
```

Mathematica [A] time = 0.11073, size = 68, normalized size = 0.97

$$-2b^{3/2}\log\left(\sqrt{b}\sqrt{x}\sqrt{a+\frac{b}{x}}+b\right)+\frac{2}{3}\sqrt{x}\sqrt{a+\frac{b}{x}}(ax+4b)+b^{3/2}\log(x)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(3/2)*Sqrt[x],x]
```

```
[Out] (2*Sqrt[a + b/x]*Sqrt[x]*(4*b + a*x))/3 - 2*b^(3/2)*Log[b + Sqrt[
b]*Sqrt[a + b/x]*Sqrt[x]] + b^(3/2)*Log[x]
```

Maple [A] time = 0.014, size = 63, normalized size = 0.9

$$-\frac{2}{3}\sqrt{\frac{ax+b}{x}}\sqrt{x}\left(3\,b^{3/2}Artanh\left(\frac{\sqrt{ax+b}}{\sqrt{b}}\right)-xa\sqrt{ax+b}-4\,\sqrt{ax+b}b\right)\frac{1}{\sqrt{ax+b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((a+b/x)^(3/2)*x^(1/2),x)
```

```
[Out] -2/3*((a*x+b)/x)^(1/2)*x^(1/2)*(3*b^(3/2)*arctanh((a*x+b)^(1/2)/b
^(1/2))-x*a*(a*x+b)^(1/2)-4*(a*x+b)^(1/2)*b)/(a*x+b)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a + b/x)^(3/2)*sqrt(x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.254045, size = 1, normalized size = 0.01

$$\left[b^{\frac{3}{2}}\log\left(\frac{ax-2\,\sqrt{b}\sqrt{x}\sqrt{\frac{ax+b}{x}}+2\,b}{x}\right)+\frac{2}{3}\,(ax+4\,b)\sqrt{x}\sqrt{\frac{ax+b}{x}},\right.$$
$$\left.-2\,\sqrt{-b}b\arctan\left(\frac{\sqrt{x}\sqrt{\frac{ax+b}{x}}}{\sqrt{-b}}\right)+\frac{2}{3}\,(ax+4\,b)\sqrt{x}\sqrt{\frac{ax+b}{x}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a + b/x)^(3/2)*sqrt(x),x, algorithm="fricas")
```

```
[Out] [b^(3/2)*log((a*x - 2*sqrt(b)*sqrt(x)*sqrt((a*x + b)/x) + 2*b)/x)
 + 2/3*(a*x + 4*b)*sqrt(x)*sqrt((a*x + b)/x), -2*sqrt(-b)*b*arcta
n(sqrt(x)*sqrt((a*x + b)/x)/sqrt(-b)) + 2/3*(a*x + 4*b)*sqrt(x)*s
qrt((a*x + b)/x)]
```

Sympy [A] time = 94.2167, size = 71, normalized size = 1.01

$$\frac{2a\sqrt{b}x\sqrt{\frac{ax}{b}+1}}{3}+\frac{8b^{\frac{3}{2}}\sqrt{\frac{ax}{b}+1}}{3}+b^{\frac{3}{2}}\log\left(\frac{ax}{b}\right)-2b^{\frac{3}{2}}\log\left(\sqrt{\frac{ax}{b}+1}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a+b/x)**(3/2)*x**(1/2),x)
```

```
[Out] 2*a*sqrt(b)*x*sqrt(a*x/b + 1)/3 + 8*b**(3/2)*sqrt(a*x/b + 1)/3 +
b**(3/2)*log(a*x/b) - 2*b**(3/2)*log(sqrt(a*x/b + 1) + 1)
```

GIAC/XCAS [A] time = 0.238729, size = 59, normalized size = 0.84

$$\frac{2\,b^2\arctan\left(\frac{\sqrt{ax+b}}{\sqrt{-b}}\right)}{\sqrt{-b}}+\frac{2}{3}\,(ax+b)^{\frac{3}{2}}+2\,\sqrt{ax+b}b$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)*sqrt(x),x, algorithm="giac")
```

```
[Out] 2*b^2*arctan(sqrt(a*x + b)/sqrt(-b))/sqrt(-b) + 2/3*(a*x + b)^(3/
2) + 2*sqrt(a*x + b)*b
```

3.1763 $\int \frac{\left(a+\frac{b}{x}\right)^{3/2}}{\sqrt{x}}\,dx$

Optimal. Leaf size=69

$$2\sqrt{x}\left(a+\frac{b}{x}\right)^{3/2}-\frac{3b\sqrt{a+\frac{b}{x}}}{\sqrt{x}}-3a\sqrt{b}\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)$$

```
[Out] (-3*b*Sqrt[a + b/x])/Sqrt[x] + 2*(a + b/x)^(3/2)*Sqrt[x] - 3*a*Sq
rt[b]*ArcTanh[Sqrt[b]/(Sqrt[a + b/x]*Sqrt[x])]
```

Rubi [A] time = 0.0947284, antiderivative size = 69, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.294

$$2\sqrt{x}\left(a+\frac{b}{x}\right)^{3/2}-\frac{3b\sqrt{a+\frac{b}{x}}}{\sqrt{x}}-3a\sqrt{b}\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(3/2)/Sqrt[x],x]
```

```
[Out] (-3*b*Sqrt[a + b/x])/Sqrt[x] + 2*(a + b/x)^(3/2)*Sqrt[x] - 3*a*Sq
rt[b]*ArcTanh[Sqrt[b]/(Sqrt[a + b/x]*Sqrt[x])]
```

Rubi in Sympy [A] time = 8.35803, size = 60, normalized size = 0.87

$$-3a\sqrt{b}\,\mathrm{atanh}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)-\frac{3b\sqrt{a+\frac{b}{x}}}{\sqrt{x}}+2\sqrt{x}\left(a+\frac{b}{x}\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(3/2)/x**(1/2),x)
```

```
[Out] -3*a*sqrt(b)*atanh(sqrt(b)/(sqrt(x)*sqrt(a + b/x))) - 3*b*sqrt(a
+ b/x)/sqrt(x) + 2*sqrt(x)*(a + b/x)**(3/2)
```

Mathematica [A] time = 0.180888, size = 71, normalized size = 1.03

$$\frac{\sqrt{a+\frac{b}{x}}(2ax-b)}{\sqrt{x}}-3a\sqrt{b}\log\left(\sqrt{b}\sqrt{x}\sqrt{a+\frac{b}{x}}+b\right)+\frac{3}{2}a\sqrt{b}\log(x)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(3/2)/Sqrt[x],x]
```

```
[Out] (Sqrt[a + b/x]*(-b + 2*a*x))/Sqrt[x] - 3*a*Sqrt[b]*Log[b + Sqrt[b
]*Sqrt[a + b/x]*Sqrt[x]] + (3*a*Sqrt[b]*Log[x])/2
```

Maple [A] time = 0.022, size = 70, normalized size = 1.

$$-1\sqrt{\frac{ax+b}{x}}\left(b^{\frac{3}{2}}\sqrt{ax+b}-2xa\sqrt{ax+b}\sqrt{b}+3\,Artanh\left(\frac{\sqrt{ax+b}}{\sqrt{b}}\right)xab\right)\frac{1}{\sqrt{x}}\frac{1}{\sqrt{ax+b}}\frac{1}{\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(3/2)/x^(1/2),x)
```

```
[Out] -((a*x+b)/x)^(1/2)*(b^(3/2)*(a*x+b)^(1/2)-2*x*a*(a*x+b)^(1/2)*b^(
1/2)+3*arctanh((a*x+b)^(1/2)/b^(1/2))*x*a*b)/x^(1/2)/(a*x+b)^(1/2
)/b^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)/sqrt(x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.244022, size = 1, normalized size = 0.01

$$\left[\frac{3\,a\sqrt{b}x\log\left(\frac{ax-2\,\sqrt{b}\sqrt{x}\sqrt{\frac{ax+b}{x}}+2\,b}{x}\right)+2\,(2\,ax-b)\sqrt{x}\sqrt{\frac{ax+b}{x}}}{2\,x},\right.$$
$$\left.-\frac{3\,a\sqrt{-b}x\arctan\left(\frac{\sqrt{x}\sqrt{\frac{ax+b}{x}}}{\sqrt{-b}}\right)-(2\,ax-b)\sqrt{x}\sqrt{\frac{ax+b}{x}}}{x}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)/sqrt(x),x, algorithm="fricas")
```

```
[Out] [1/2*(3*a*sqrt(b)*x*log((a*x - 2*sqrt(b)*sqrt(x)*sqrt((a*x + b)/x
) + 2*b)/x) + 2*(2*a*x - b)*sqrt(x)*sqrt((a*x + b)/x))/x, -(3*a*s
qrt(-b)*x*arctan(sqrt(x)*sqrt((a*x + b)/x)/sqrt(-b)) - (2*a*x - b
)*sqrt(x)*sqrt((a*x + b)/x))/x]
```

Sympy [A] time = 48.0271, size = 92, normalized size = 1.33

$$\frac{2a^{\frac{3}{2}}\sqrt{x}}{\sqrt{1+\frac{b}{ax}}}+\frac{\sqrt{a}b}{\sqrt{x}\sqrt{1+\frac{b}{ax}}}-3a\sqrt{b}\operatorname{asinh}\left(\frac{\sqrt{b}}{\sqrt{a}\sqrt{x}}\right)-\frac{b^2}{\sqrt{a}x^{\frac{3}{2}}\sqrt{1+\frac{b}{ax}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(3/2)/x**(1/2),x)
```

```
[Out] 2*a**(3/2)*sqrt(x)/sqrt(1 + b/(a*x)) + sqrt(a)*b/(sqrt(x)*sqrt(1
+ b/(a*x))) - 3*a*sqrt(b)*asinh(sqrt(b)/(sqrt(a)*sqrt(x))) - b**2
/(sqrt(a)*x**(3/2)*sqrt(1 + b/(a*x)))
```

GIAC/XCAS [A] time = 0.26841, size = 68, normalized size = 0.99

$$\left(\frac{3\,b\arctan\left(\frac{\sqrt{ax+b}}{\sqrt{-b}}\right)}{\sqrt{-b}} + 2\,\sqrt{ax+b} - \frac{\sqrt{ax+b}b}{ax}\right)a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)/sqrt(x),x, algorithm="giac")
```

```
[Out] (3*b*arctan(sqrt(a*x + b)/sqrt(-b))/sqrt(-b) + 2*sqrt(a*x + b) -
sqrt(a*x + b)*b/(a*x))*a
```

3.1764 $\int \frac{\left(a+\frac{b}{x}\right)^{3/2}}{x^{3/2}} \, dx$

Optimal. Leaf size=77

$$-\frac{3a^2\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{4\sqrt{b}}-\frac{3a\sqrt{a+\frac{b}{x}}}{4\sqrt{x}}-\frac{\left(a+\frac{b}{x}\right)^{3/2}}{2\sqrt{x}}$$

```
[Out] (-3*a*Sqrt[a + b/x])/(4*Sqrt[x]) - (a + b/x)^(3/2)/(2*Sqrt[x]) -
(3*a^2*ArcTanh[Sqrt[b]/(Sqrt[a + b/x]*Sqrt[x])])/(4*Sqrt[b])
```

Rubi [A] time = 0.0864968, antiderivative size = 77, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.235

$$-\frac{3a^2\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{4\sqrt{b}}-\frac{3a\sqrt{a+\frac{b}{x}}}{4\sqrt{x}}-\frac{\left(a+\frac{b}{x}\right)^{3/2}}{2\sqrt{x}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(3/2)/x^(3/2),x]
```

```
[Out] (-3*a*Sqrt[a + b/x])/(4*Sqrt[x]) - (a + b/x)^(3/2)/(2*Sqrt[x]) -
(3*a^2*ArcTanh[Sqrt[b]/(Sqrt[a + b/x]*Sqrt[x])])/(4*Sqrt[b])
```

Rubi in Sympy [A] time = 6.99027, size = 66, normalized size = 0.86

$$-\frac{3a^2\,\mathrm{atanh}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{4\sqrt{b}}-\frac{3a\sqrt{a+\frac{b}{x}}}{4\sqrt{x}}-\frac{\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{2\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(3/2)/x**(3/2),x)
```

```
[Out] -3*a**2*atanh(sqrt(b)/(sqrt(x)*sqrt(a + b/x)))/(4*sqrt(b)) - 3*a*
sqrt(a + b/x)/(4*sqrt(x)) - (a + b/x)**(3/2)/(2*sqrt(x))
```

Mathematica [A] time = 0.198958, size = 80, normalized size = 1.04

$$-\frac{3a^2\log\left(\sqrt{b}\sqrt{x}\sqrt{a+\frac{b}{x}}+b\right)}{4\sqrt{b}}+\frac{3a^2\log(x)}{8\sqrt{b}}-\frac{\sqrt{a+\frac{b}{x}}(5ax+2b)}{4x^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(3/2)/x^(3/2),x]
```

```
[Out] -(Sqrt[a + b/x]*(2*b + 5*a*x))/(4*x^(3/2)) - (3*a^2*Log[b + Sqrt[
b]*Sqrt[a + b/x]*Sqrt[x]])/(4*Sqrt[b]) + (3*a^2*Log[x])/(8*Sqrt[b
])
```

Maple [A] time = 0.023, size = 74, normalized size = 1.

$$-\frac{1}{4}\sqrt{\frac{ax+b}{x}}\left(3\,\mathit{Artanh}\left(\frac{\sqrt{ax+b}}{\sqrt{b}}\right)a^{2}x^{2}+5\,xa\sqrt{ax+b}\sqrt{b}+2\,b^{3/2}\sqrt{ax+b}\right)x^{-\frac{3}{2}}\frac{1}{\sqrt{ax+b}}\frac{1}{\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(3/2)/x^(3/2),x)
```

```
[Out] -1/4*((a*x+b)/x)^(1/2)/x^(3/2)*(3*arctanh((a*x+b)^(1/2)/b^(1/2))*
a^2*x^2+5*x*a*(a*x+b)^(1/2)*b^(1/2)+2*b^(3/2)*(a*x+b)^(1/2))/(a*x
+b)^(1/2)/b^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)/x^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.253894, size = 1, normalized size = 0.01

$$\left[\frac{3\,a^{2}x^{2}\log\left(-\frac{2\,b\sqrt{x}\sqrt{\frac{ax+b}{x}}-(ax+2\,b)\sqrt{b}}{x}\right)-2\,(5\,ax+2\,b)\sqrt{b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}{8\,\sqrt{b}x^{2}},\ \frac{3\,a^{2}x^{2}\arctan\left(\frac{b}{\sqrt{-b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}\right)-(5\,ax+2\,b)\sqrt{-b}\sqrt{x}\sqrt{\frac{ax}{x}}}{4\,\sqrt{-b}x^{2}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)/x^(3/2),x, algorithm="fricas")
```

```
[Out] [1/8*(3*a^2*x^2*log(-(2*b*sqrt(x)*sqrt((a*x + b)/x) - (a*x + 2*b)
*sqrt(b))/x) - 2*(5*a*x + 2*b)*sqrt(b)*sqrt(x)*sqrt((a*x + b)/x))
/(sqrt(b)*x^2), 1/4*(3*a^2*x^2*arctan(b/(sqrt(-b)*sqrt(x)*sqrt((a
*x + b)/x))) - (5*a*x + 2*b)*sqrt(-b)*sqrt(x)*sqrt((a*x + b)/x))/
(sqrt(-b)*x^2)]
```

Sympy [A] time = 50.0428, size = 76, normalized size = 0.99

$$-\frac{5a^{\frac{3}{2}}\sqrt{1+\frac{b}{ax}}}{4\sqrt{x}}-\frac{\sqrt{a}b\sqrt{1+\frac{b}{ax}}}{2x^{\frac{3}{2}}}-\frac{3a^{2}\operatorname{asinh}\left(\frac{\sqrt{b}}{\sqrt{a}\sqrt{x}}\right)}{4\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(3/2)/x**(3/2),x)
```

```
[Out] -5*a**(3/2)*sqrt(1 + b/(a*x))/(4*sqrt(x)) - sqrt(a)*b*sqrt(1 + b/
(a*x))/(2*x**(3/2)) - 3*a**2*asinh(sqrt(b)/(sqrt(a)*sqrt(x)))/(4*
sqrt(b))
```

GIAC/XCAS [A] time = 0.269391, size = 74, normalized size = 0.96

$$\frac{1}{4}\,a^2\left(\frac{3\,\arctan\left(\frac{\sqrt{ax+b}}{\sqrt{-b}}\right)}{\sqrt{-b}} - \frac{5\,(ax+b)^{\frac{3}{2}} - 3\,\sqrt{ax+b}\,b}{a^2x^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)/x^(3/2),x, algorithm="giac")
```

```
[Out] 1/4*a^2*(3*arctan(sqrt(a*x + b)/sqrt(-b))/sqrt(-b) - (5*(a*x + b)
^(3/2) - 3*sqrt(a*x + b)*b)/(a^2*x^2))
```

3.1765 $\int \frac{\left(a+\frac{b}{x}\right)^{3/2}}{x^{5/2}}\,dx$

Optimal. Leaf size=103

$$\frac{a^3\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{8b^{3/2}}-\frac{a^2\sqrt{a+\frac{b}{x}}}{8b\sqrt{x}}-\frac{a\sqrt{a+\frac{b}{x}}}{4x^{3/2}}-\frac{\left(a+\frac{b}{x}\right)^{3/2}}{3x^{3/2}}$$

```
[Out] -(a*Sqrt[a + b/x])/(4*x^(3/2)) - (a + b/x)^(3/2)/(3*x^(3/2)) - (a
^2*Sqrt[a + b/x])/(8*b*Sqrt[x]) + (a^3*ArcTanh[Sqrt[b]/(Sqrt[a +
b/x]*Sqrt[x])])/(8*b^(3/2))
```

Rubi [A] time = 0.154021, antiderivative size = 103, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.294

$$\frac{a^3\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{8b^{3/2}}-\frac{a^2\sqrt{a+\frac{b}{x}}}{8b\sqrt{x}}-\frac{a\sqrt{a+\frac{b}{x}}}{4x^{3/2}}-\frac{\left(a+\frac{b}{x}\right)^{3/2}}{3x^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(3/2)/x^(5/2),x]
```

```
[Out] -(a*Sqrt[a + b/x])/(4*x^(3/2)) - (a + b/x)^(3/2)/(3*x^(3/2)) - (a
^2*Sqrt[a + b/x])/(8*b*Sqrt[x]) + (a^3*ArcTanh[Sqrt[b]/(Sqrt[a +
b/x]*Sqrt[x])])/(8*b^(3/2))
```

Rubi in Sympy [A] time = 15.4583, size = 82, normalized size = 0.8

$$\frac{a^3\operatorname{atanh}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{8b^{\frac{3}{2}}}-\frac{a^2\sqrt{a+\frac{b}{x}}}{8b\sqrt{x}}-\frac{a\sqrt{a+\frac{b}{x}}}{4x^{\frac{3}{2}}}-\frac{\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{3x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(3/2)/x**(5/2),x)
```

```
[Out] a**3*atanh(sqrt(b)/(sqrt(x)*sqrt(a + b/x)))/(8*b**(3/2)) - a**2*s
qrt(a + b/x)/(8*b*sqrt(x)) - a*sqrt(a + b/x)/(4*x**(3/2)) - (a +
b/x)**(3/2)/(3*x**(3/2))
```

Mathematica [A] time = 0.299942, size = 89, normalized size = 0.86

$$\frac{6a^3\log\left(\sqrt{b}\sqrt{x}\sqrt{a+\frac{b}{x}}+b\right)-3a^3\log(x)-\frac{2\sqrt{b}\sqrt{a+\frac{b}{x}}\left(3a^2x^2+14abx+8b^2\right)}{x^{5/2}}}{48b^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(3/2)/x^(5/2),x]
```

```
[Out] ((-2*Sqrt[b]*Sqrt[a + b/x]*(8*b^2 + 14*a*b*x + 3*a^2*x^2))/x^(5/2
) + 6*a^3*Log[b + Sqrt[b]*Sqrt[a + b/x]*Sqrt[x]] - 3*a^3*Log[x])/
```

```
(48*b^(3/2))
```

Maple [A] time = 0.024, size = 92, normalized size = 0.9

$$-\frac{1}{24}\sqrt{\frac{ax+b}{x}}\left(-3\,Artanh\left(\frac{\sqrt{ax+b}}{\sqrt{b}}\right)a^3x^3+8\,b^{5/2}\sqrt{ax+b}+14\,xab^{3/2}\sqrt{ax+b}+3\,x^2a^2\sqrt{b}\sqrt{ax+b}\right)x^{-\frac{5}{2}}b^{-\frac{3}{2}}\frac{1}{\sqrt{ax+b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(3/2)/x^(5/2),x)
```

```
[Out] -1/24*((a*x+b)/x)^(1/2)*(-3*arctanh((a*x+b)^(1/2)/b^(1/2))*a^3*x^
3+8*b^(5/2)*(a*x+b)^(1/2)+14*x*a*b^(3/2)*(a*x+b)^(1/2)+3*x^2*a^2*
b^(1/2)*(a*x+b)^(1/2))/x^(5/2)/b^(3/2)/(a*x+b)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)/x^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.247099, size = 1, normalized size = 0.01

$$\left[\frac{3\,a^3x^3\log\left(\frac{2\,b\sqrt{x}\sqrt{\frac{ax+b}{x}}+(ax+2\,b)\sqrt{b}}{x}\right)-2\left(3\,a^2x^2+14\,abx+8\,b^2\right)\sqrt{b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}{48\,b^{\frac{3}{2}}x^3},\ -\frac{3\,a^3x^3\arctan\left(\frac{b}{\sqrt{-b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}\right)+\left(3\,a^2x^2+14\,abx+8\,b^2\right)\sqrt{-b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}{24\,\sqrt{-b}bx^3}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)/x^(5/2),x, algorithm="fricas")
```

```
[Out] [1/48*(3*a^3*x^3*log((2*b*sqrt(x)*sqrt((a*x + b)/x) + (a*x + 2*b)
*sqrt(b))/x) - 2*(3*a^2*x^2 + 14*a*b*x + 8*b^2)*sqrt(b)*sqrt(x)*s
qrt((a*x + b)/x))/(b^(3/2)*x^3), -1/24*(3*a^3*x^3*arctan(b/(sqrt(
-b)*sqrt(x)*sqrt((a*x + b)/x))) + (3*a^2*x^2 + 14*a*b*x + 8*b^2)*
sqrt(-b)*sqrt(x)*sqrt((a*x + b)/x))/(sqrt(-b)*b*x^3)]
```

Sympy [A] time = 156.394, size = 124, normalized size = 1.2

$$-\frac{a^{\frac{5}{2}}}{8b\sqrt{x}\sqrt{1+\frac{b}{ax}}}-\frac{17a^{\frac{3}{2}}}{24x^{\frac{3}{2}}\sqrt{1+\frac{b}{ax}}}-\frac{11\sqrt{a}b}{12x^{\frac{5}{2}}\sqrt{1+\frac{b}{ax}}}+\frac{a^3\operatorname{asinh}\left(\frac{\sqrt{b}}{\sqrt{a}\sqrt{x}}\right)}{8b^{\frac{3}{2}}}-\frac{b^2}{3\sqrt{a}x^{\frac{7}{2}}\sqrt{1+\frac{b}{ax}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(3/2)/x**(5/2),x)
```

```
[Out] -a**(5/2)/(8*b*sqrt(x)*sqrt(1 + b/(a*x))) - 17*a**(3/2)/(24*x**(3
/2)*sqrt(1 + b/(a*x))) - 11*sqrt(a)*b/(12*x**(5/2)*sqrt(1 + b/(a*
x))) + a**3*asinh(sqrt(b)/(sqrt(a)*sqrt(x)))/(8*b**(3/2)) - b**2/
(3*sqrt(a)*x**(7/2)*sqrt(1 + b/(a*x)))
```

GIAC/XCAS [A] time = 0.29852, size = 97, normalized size = 0.94

$$-\frac{1}{24}\,a^3\left(\frac{3\,\arctan\left(\frac{\sqrt{ax+b}}{\sqrt{-b}}\right)}{\sqrt{-b}b}+\frac{3\,(ax+b)^{\frac{5}{2}}+8\,(ax+b)^{\frac{3}{2}}b-3\,\sqrt{ax+b}b^2}{a^3bx^3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(3/2)/x^(5/2),x, algorithm="giac")
```

```
[Out] -1/24*a^3*(3*arctan(sqrt(a*x + b)/sqrt(-b))/(sqrt(-b)*b) + (3*(a*
x + b)^(5/2) + 8*(a*x + b)^(3/2)*b - 3*sqrt(a*x + b)*b^2)/(a^3*b*
x^3))
```

3.1766 $\int \left(a+\frac{b}{x}\right)^{5/2} x^{11/2}\,dx$

Optimal. Leaf size=100

$$-\frac{32b^3x^{7/2}\left(a+\frac{b}{x}\right)^{7/2}}{3003a^4}+\frac{16b^2x^{9/2}\left(a+\frac{b}{x}\right)^{7/2}}{429a^3}-\frac{12bx^{11/2}\left(a+\frac{b}{x}\right)^{7/2}}{143a^2}+\frac{2x^{13/2}\left(a+\frac{b}{x}\right)^{7/2}}{13a}$$

```
[Out] (-32*b^3*(a + b/x)^(7/2)*x^(7/2))/(3003*a^4) + (16*b^2*(a + b/x)^
(7/2)*x^(9/2))/(429*a^3) - (12*b*(a + b/x)^(7/2)*x^(11/2))/(143*a
^2) + (2*(a + b/x)^(7/2)*x^(13/2))/(13*a)
```

Rubi [A] time = 0.115908, antiderivative size = 100, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$

$$-\frac{32b^3x^{7/2}\left(a+\frac{b}{x}\right)^{7/2}}{3003a^4}+\frac{16b^2x^{9/2}\left(a+\frac{b}{x}\right)^{7/2}}{429a^3}-\frac{12bx^{11/2}\left(a+\frac{b}{x}\right)^{7/2}}{143a^2}+\frac{2x^{13/2}\left(a+\frac{b}{x}\right)^{7/2}}{13a}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x)^(5/2)*x^(11/2),x]
```

```
[Out] (-32*b^3*(a + b/x)^(7/2)*x^(7/2))/(3003*a^4) + (16*b^2*(a + b/x)^
(7/2)*x^(9/2))/(429*a^3) - (12*b*(a + b/x)^(7/2)*x^(11/2))/(143*a
^2) + (2*(a + b/x)^(7/2)*x^(13/2))/(13*a)
```

Rubi in Sympy [A] time = 9.63752, size = 87, normalized size = 0.87

$$\frac{2x^{\frac{13}{2}}\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{13a}-\frac{12bx^{\frac{11}{2}}\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{143a^2}+\frac{16b^2x^{\frac{9}{2}}\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{429a^3}-\frac{32b^3x^{\frac{7}{2}}\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{3003a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x)**(5/2)*x**(11/2),x)
```

```
[Out] 2*x**(13/2)*(a + b/x)**(7/2)/(13*a) - 12*b*x**(11/2)*(a + b/x)**(
7/2)/(143*a**2) + 16*b**2*x**(9/2)*(a + b/x)**(7/2)/(429*a**3) -
32*b**3*x**(7/2)*(a + b/x)**(7/2)/(3003*a**4)
```

Mathematica [A] time = 0.0644155, size = 60, normalized size = 0.6

$$\frac{2\sqrt{x}\sqrt{a+\frac{b}{x}}(ax+b)^3\left(231a^3x^3-126a^2bx^2+56ab^2x-16b^3\right)}{3003a^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x)^(5/2)*x^(11/2),x]
```

```
[Out] (2*Sqrt[a + b/x]*Sqrt[x]*(b + a*x)^3*(-16*b^3 + 56*a*b^2*x - 126*
a^2*b*x^2 + 231*a^3*x^3))/(3003*a^4)
```

Maple [A] time = 0.008, size = 55, normalized size = 0.6

$$\frac{(2\,ax+2\,b)\left(231\,a^{3}x^{3}-126\,a^{2}bx^{2}+56\,ab^{2}x-16\,b^{3}\right)}{3003\,a^{4}}x^{\frac{5}{2}}\left(\frac{ax+b}{x}\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(5/2)*x^(11/2),x)
```

```
[Out] 2/3003*(a*x+b)*(231*a^3*x^3-126*a^2*b*x^2+56*a*b^2*x-16*b^3)*x^(5
/2)*((a*x+b)/x)^(5/2)/a^4
```

Maxima [A] time = 1.41766, size = 93, normalized size = 0.93

$$\frac{2\left(231\left(a+\frac{b}{x}\right)^{\frac{13}{2}}x^{\frac{13}{2}}-819\left(a+\frac{b}{x}\right)^{\frac{11}{2}}bx^{\frac{11}{2}}+1001\left(a+\frac{b}{x}\right)^{\frac{9}{2}}b^{2}x^{\frac{9}{2}}-429\left(a+\frac{b}{x}\right)^{\frac{7}{2}}b^{3}x^{\frac{7}{2}}\right)}{3003\,a^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)*x^(11/2),x, algorithm="maxima")
```

```
[Out] 2/3003*(231*(a + b/x)^(13/2)*x^(13/2) - 819*(a + b/x)^(11/2)*b*x^
(11/2) + 1001*(a + b/x)^(9/2)*b^2*x^(9/2) - 429*(a + b/x)^(7/2)*b
^3*x^(7/2))/a^4
```

Fricas [A] time = 0.242532, size = 111, normalized size = 1.11

$$\frac{2\left(231\,a^{6}x^{6}+567\,a^{5}bx^{5}+371\,a^{4}b^{2}x^{4}+5\,a^{3}b^{3}x^{3}-6\,a^{2}b^{4}x^{2}+8\,ab^{5}x-16\,b^{6}\right)\sqrt{x}\sqrt{\frac{ax+b}{x}}}{3003\,a^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)*x^(11/2),x, algorithm="fricas")
```

```
[Out] 2/3003*(231*a^6*x^6 + 567*a^5*b*x^5 + 371*a^4*b^2*x^4 + 5*a^3*b^3
*x^3 - 6*a^2*b^4*x^2 + 8*a*b^5*x - 16*b^6)*sqrt(x)*sqrt((a*x + b)
/x)/a^4
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(5/2)*x**(11/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.243959, size = 309, normalized size = 3.09

$$\frac{2}{315}\,b^2\left(\frac{16\,b^{\frac{9}{2}}}{a^4}+\frac{35\,(ax+b)^{\frac{9}{2}}-135\,(ax+b)^{\frac{7}{2}}b+189\,(ax+b)^{\frac{5}{2}}b^2-105\,(ax+b)^{\frac{3}{2}}b^3}{a^4}\right)\mathrm{sign}\,(x)-\frac{4}{3465}\,ab\left(\frac{128\,b^{\frac{11}{2}}}{a^5}-\frac{315\,(ax+b)^{\frac{11}{2}}-1540\,(ax+b)^{\frac{9}{2}}b+2970\,(ax+b)^{\frac{7}{2}}b^2-2772\,(ax+b)^{\frac{5}{2}}b^3+1155\,(ax+b)^{\frac{3}{2}}b^4}{a^5}\right)\mathrm{sign}\,(x)+\frac{2}{9009}\,a^2\left(\frac{256\,b^{\frac{13}{2}}}{a^6}+\frac{693\,(ax+b)^{\frac{13}{2}}-4095\,(ax+b)^{\frac{11}{2}}b+10010\,(ax+b)^{\frac{9}{2}}b^2-12870\,(ax+b)^{\frac{7}{2}}b^3+9009\,(ax+b)^{\frac{5}{2}}b^4-3003\,(\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)*x^(11/2),x, algorithm="giac")
```

```
[Out] 2/315*b^2*(16*b^(9/2)/a^4 + (35*(a*x + b)^(9/2) - 135*(a*x + b)^(
7/2)*b + 189*(a*x + b)^(5/2)*b^2 - 105*(a*x + b)^(3/2)*b^3)/a^4)*
sign(x) - 4/3465*a*b*(128*b^(11/2)/a^5 - (315*(a*x + b)^(11/2) -
1540*(a*x + b)^(9/2)*b + 2970*(a*x + b)^(7/2)*b^2 - 2772*(a*x + b
)^(5/2)*b^3 + 1155*(a*x + b)^(3/2)*b^4)/a^5)*sign(x) + 2/9009*a^2
*(256*b^(13/2)/a^6 + (693*(a*x + b)^(13/2) - 4095*(a*x + b)^(11/2
)*b + 10010*(a*x + b)^(9/2)*b^2 - 12870*(a*x + b)^(7/2)*b^3 + 900
9*(a*x + b)^(5/2)*b^4 - 3003*(a*x + b)^(3/2)*b^5)/a^6)*sign(x)
```

3.1767 $\int \left(a+\frac{b}{x}\right)^{5/2} x^{9/2}\,dx$

Optimal. Leaf size=74

$$\frac{16b^2x^{7/2}\left(a+\frac{b}{x}\right)^{7/2}}{693a^3}-\frac{8bx^{9/2}\left(a+\frac{b}{x}\right)^{7/2}}{99a^2}+\frac{2x^{11/2}\left(a+\frac{b}{x}\right)^{7/2}}{11a}$$

```
[Out] (16*b^2*(a + b/x)^(7/2)*x^(7/2))/(693*a^3) - (8*b*(a + b/x)^(7/2)
*x^(9/2))/(99*a^2) + (2*(a + b/x)^(7/2)*x^(11/2))/(11*a)
```

Rubi [A] time = 0.0830801, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{16b^2x^{7/2}\left(a+\frac{b}{x}\right)^{7/2}}{693a^3}-\frac{8bx^{9/2}\left(a+\frac{b}{x}\right)^{7/2}}{99a^2}+\frac{2x^{11/2}\left(a+\frac{b}{x}\right)^{7/2}}{11a}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(5/2)*x^(9/2),x]
```

```
[Out] (16*b^2*(a + b/x)^(7/2)*x^(7/2))/(693*a^3) - (8*b*(a + b/x)^(7/2)
*x^(9/2))/(99*a^2) + (2*(a + b/x)^(7/2)*x^(11/2))/(11*a)
```

Rubi in Sympy [A] time = 6.58583, size = 63, normalized size = 0.85

$$\frac{2x^{\frac{11}{2}}\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{11a}-\frac{8bx^{\frac{9}{2}}\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{99a^2}+\frac{16b^2x^{\frac{7}{2}}\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{693a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(5/2)*x**(9/2),x)
```

```
[Out] 2*x**(11/2)*(a + b/x)**(7/2)/(11*a) - 8*b*x**(9/2)*(a + b/x)**(7/
2)/(99*a**2) + 16*b**2*x**(7/2)*(a + b/x)**(7/2)/(693*a**3)
```

Mathematica [A] time = 0.0561321, size = 49, normalized size = 0.66

$$\frac{2\sqrt{x}\sqrt{a+\frac{b}{x}}(ax+b)^3\left(63a^2x^2-28abx+8b^2\right)}{693a^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(5/2)*x^(9/2),x]
```

```
[Out] (2*Sqrt[a + b/x]*Sqrt[x]*(b + a*x)^3*(8*b^2 - 28*a*b*x + 63*a^2*x
^2))/(693*a^3)
```

Maple [A] time = 0.007, size = 44, normalized size = 0.6

$$\frac{(2\,ax+2\,b)\left(63\,a^2x^2-28\,abx+8\,b^2\right)}{693\,a^3}x^{\frac{5}{2}}\left(\frac{ax+b}{x}\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(5/2)*x^(9/2),x)
```

```
[Out] 2/693*(a*x+b)*(63*a^2*x^2-28*a*b*x+8*b^2)*x^(5/2)*((a*x+b)/x)^(5/
2)/a^3
```

Maxima [A] time = 1.42366, size = 70, normalized size = 0.95

$$\frac{2\left(63\left(a+\frac{b}{x}\right)^{\frac{11}{2}}x^{\frac{11}{2}}-154\left(a+\frac{b}{x}\right)^{\frac{9}{2}}bx^{\frac{9}{2}}+99\left(a+\frac{b}{x}\right)^{\frac{7}{2}}b^{2}x^{\frac{7}{2}}\right)}{693\,a^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)*x^(9/2),x, algorithm="maxima")
```

```
[Out] 2/693*(63*(a + b/x)^(11/2)*x^(11/2) - 154*(a + b/x)^(9/2)*b*x^(9/
2) + 99*(a + b/x)^(7/2)*b^2*x^(7/2))/a^3
```

Fricas [A] time = 0.228156, size = 96, normalized size = 1.3

$$\frac{2\left(63\,a^{5}x^{5}+161\,a^{4}bx^{4}+113\,a^{3}b^{2}x^{3}+3\,a^{2}b^{3}x^{2}-4\,ab^{4}x+8\,b^{5}\right)\sqrt{x}\sqrt{\frac{ax+b}{x}}}{693\,a^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)*x^(9/2),x, algorithm="fricas")
```

```
[Out] 2/693*(63*a^5*x^5 + 161*a^4*b*x^4 + 113*a^3*b^2*x^3 + 3*a^2*b^3*x
^2 - 4*a*b^4*x + 8*b^5)*sqrt(x)*sqrt((a*x + b)/x)/a^3
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(5/2)*x**(9/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.241249, size = 262, normalized size = 3.54

$$-\frac{2}{105}\,b^{2}\left(\frac{8\,b^{\frac{7}{2}}}{a^{3}}-\frac{15\,(ax+b)^{\frac{7}{2}}-42\,(ax+b)^{\frac{5}{2}}b+35\,(ax+b)^{\frac{3}{2}}b^{2}}{a^{3}}\right)\mathrm{sign}\,(x)$$
$$+\frac{4}{315}\,ab\left(\frac{16\,b^{\frac{9}{2}}}{a^{4}}+\frac{35\,(ax+b)^{\frac{9}{2}}-135\,(ax+b)^{\frac{7}{2}}b+189\,(ax+b)^{\frac{5}{2}}b^{2}-105\,(ax+b)^{\frac{3}{2}}b^{3}}{a^{4}}\right)\mathrm{sign}\,(x)$$
$$-\frac{2}{3465}\,a^{2}\left(\frac{128\,b^{\frac{11}{2}}}{a^{5}}-\frac{315\,(ax+b)^{\frac{11}{2}}-1540\,(ax+b)^{\frac{9}{2}}b+2970\,(ax+b)^{\frac{7}{2}}b^{2}-2772\,(ax+b)^{\frac{5}{2}}b^{3}+1155\,(ax+b)^{\frac{3}{2}}b^{4}}{a^{5}}\right)\mathrm{sign}\,(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)*x^(9/2),x, algorithm="giac")
```

```
[Out] -2/105*b^2*(8*b^(7/2)/a^3 - (15*(a*x + b)^(7/2) - 42*(a*x + b)^(5
/2)*b + 35*(a*x + b)^(3/2)*b^2)/a^3)*sign(x) + 4/315*a*b*(16*b^(9
/2)/a^4 + (35*(a*x + b)^(9/2) - 135*(a*x + b)^(7/2)*b + 189*(a*x
+ b)^(5/2)*b^2 - 105*(a*x + b)^(3/2)*b^3)/a^4)*sign(x) - 2/3465*a
^2*(128*b^(11/2)/a^5 - (315*(a*x + b)^(11/2) - 1540*(a*x + b)^(9/
2)*b + 2970*(a*x + b)^(7/2)*b^2 - 2772*(a*x + b)^(5/2)*b^3 + 1155
*(a*x + b)^(3/2)*b^4)/a^5)*sign(x)
```

3.1768 $\int \left(a+\frac{b}{x}\right)^{5/2} x^{7/2}\,dx$

Optimal. Leaf size=48

$$\frac{2x^{9/2}\left(a+\frac{b}{x}\right)^{7/2}}{9a}-\frac{4bx^{7/2}\left(a+\frac{b}{x}\right)^{7/2}}{63a^2}$$

```
[Out] (-4*b*(a + b/x)^(7/2)*x^(7/2))/(63*a^2) + (2*(a + b/x)^(7/2)*x^(9
/2))/(9*a)
```

Rubi [A] time = 0.0541357, antiderivative size = 48, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{2x^{9/2}\left(a+\frac{b}{x}\right)^{7/2}}{9a}-\frac{4bx^{7/2}\left(a+\frac{b}{x}\right)^{7/2}}{63a^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(5/2)*x^(7/2),x]
```

```
[Out] (-4*b*(a + b/x)^(7/2)*x^(7/2))/(63*a^2) + (2*(a + b/x)^(7/2)*x^(9
/2))/(9*a)
```

Rubi in Sympy [A] time = 4.20156, size = 39, normalized size = 0.81

$$\frac{2x^{\frac{9}{2}}\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{9a}-\frac{4bx^{\frac{7}{2}}\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{63a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(5/2)*x**(7/2),x)
```

```
[Out] 2*x**(9/2)*(a + b/x)**(7/2)/(9*a) - 4*b*x**(7/2)*(a + b/x)**(7/2)
/(63*a**2)
```

Mathematica [A] time = 0.0494556, size = 38, normalized size = 0.79

$$\frac{2\sqrt{x}\sqrt{a+\frac{b}{x}}(ax+b)^3(7ax-2b)}{63a^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(5/2)*x^(7/2),x]
```

```
[Out] (2*Sqrt[a + b/x]*Sqrt[x]*(b + a*x)^3*(-2*b + 7*a*x))/(63*a^2)
```

Maple [A] time = 0.004, size = 33, normalized size = 0.7

$$\frac{(2\,ax+2\,b)\,(7\,ax-2\,b)}{63\,a^2}\left(\frac{ax+b}{x}\right)^{\frac{5}{2}}x^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((a+b/x)^(5/2)*x^(7/2),x)
```

```
[Out] 2/63*(a*x+b)*(7*a*x-2*b)*x^(5/2)*((a*x+b)/x)^(5/2)/a^2
```

Maxima [A] time = 1.43179, size = 47, normalized size = 0.98

$$\frac{2\left(7\left(a+\frac{b}{x}\right)^{\frac{9}{2}}x^{\frac{9}{2}}-9\left(a+\frac{b}{x}\right)^{\frac{7}{2}}bx^{\frac{7}{2}}\right)}{63\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a + b/x)^(5/2)*x^(7/2),x, algorithm="maxima")
```

```
[Out] 2/63*(7*(a + b/x)^(9/2)*x^(9/2) - 9*(a + b/x)^(7/2)*b*x^(7/2))/a^
2
```

Fricas [A] time = 0.235698, size = 80, normalized size = 1.67

$$\frac{2\left(7\,a^4x^4+19\,a^3bx^3+15\,a^2b^2x^2+ab^3x-2\,b^4\right)\sqrt{x}\sqrt{\frac{ax+b}{x}}}{63\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a + b/x)^(5/2)*x^(7/2),x, algorithm="fricas")
```

```
[Out] 2/63*(7*a^4*x^4 + 19*a^3*b*x^3 + 15*a^2*b^2*x^2 + a*b^3*x - 2*b^4
)*sqrt(x)*sqrt((a*x + b)/x)/a^2
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a+b/x)**(5/2)*x**(7/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.237031, size = 212, normalized size = 4.42

$$\frac{2}{15}\,b^2\left(\frac{2\,b^{\frac{5}{2}}}{a^2}+\frac{3\,(ax+b)^{\frac{5}{2}}-5\,(ax+b)^{\frac{3}{2}}b}{a^2}\right)\mathrm{sign}\,(x)$$
$$-\frac{4}{105}\,ab\left(\frac{8\,b^{\frac{7}{2}}}{a^3}-\frac{15\,(ax+b)^{\frac{7}{2}}-42\,(ax+b)^{\frac{5}{2}}b+35\,(ax+b)^{\frac{3}{2}}b^2}{a^3}\right)\mathrm{sign}\,(x)$$
$$+\frac{2}{315}\,a^2\left(\frac{16\,b^{\frac{9}{2}}}{a^4}+\frac{35\,(ax+b)^{\frac{9}{2}}-135\,(ax+b)^{\frac{7}{2}}b+189\,(ax+b)^{\frac{5}{2}}b^2-105\,(ax+b)^{\frac{3}{2}}b^3}{a^4}\right)\mathrm{sign}\,(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)*x^(7/2),x, algorithm="giac")
```

```
[Out] 2/15*b^2*(2*b^(5/2)/a^2 + (3*(a*x + b)^(5/2) - 5*(a*x + b)^(3/2)*
b)/a^2)*sign(x) - 4/105*a*b*(8*b^(7/2)/a^3 - (15*(a*x + b)^(7/2)
- 42*(a*x + b)^(5/2)*b + 35*(a*x + b)^(3/2)*b^2)/a^3)*sign(x) + 2
/315*a^2*(16*b^(9/2)/a^4 + (35*(a*x + b)^(9/2) - 135*(a*x + b)^(7
/2)*b + 189*(a*x + b)^(5/2)*b^2 - 105*(a*x + b)^(3/2)*b^3)/a^4)*s
ign(x)
```

3.1769 $\int \left(a+\frac{b}{x}\right)^{5/2} x^{5/2}\, dx$

Optimal. Leaf size=23

$$\frac{2x^{7/2}\left(a+\frac{b}{x}\right)^{7/2}}{7a}$$

[Out] (2*(a + b/x)^(7/2)*x^(7/2))/(7*a)

Rubi [A] time = 0.0262264, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.059

$$\frac{2x^{7/2}\left(a+\frac{b}{x}\right)^{7/2}}{7a}$$

Antiderivative was successfully verified.

[In] Int[(a + b/x)^(5/2)*x^(5/2),x]

[Out] (2*(a + b/x)^(7/2)*x^(7/2))/(7*a)

Rubi in Sympy [A] time = 2.65608, size = 17, normalized size = 0.74

$$\frac{2x^{\frac{7}{2}}\left(a+\frac{b}{x}\right)^{\frac{7}{2}}}{7a}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((a+b/x)**(5/2)*x**(5/2),x)

[Out] 2*x**(7/2)*(a + b/x)**(7/2)/(7*a)

Mathematica [A] time = 0.0457233, size = 30, normalized size = 1.3

$$\frac{2\sqrt{x}\sqrt{a+\frac{b}{x}}(ax+b)^3}{7a}$$

Antiderivative was successfully verified.

[In] Integrate[(a + b/x)^(5/2)*x^(5/2),x]

[Out] (2*Sqrt[a + b/x]*Sqrt[x]*(b + a*x)^3)/(7*a)

Maple [A] time = 0.004, size = 25, normalized size = 1.1

$$\frac{2\,ax+2\,b}{7\,a}\left(\frac{ax+b}{x}\right)^{\frac{5}{2}}x^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(5/2)*x^(5/2),x)

[Out] 2/7*(a*x+b)*((a*x+b)/x)^(5/2)*x^(5/2)/a
```

Maxima [A] time = 1.43819, size = 23, normalized size = 1.

$$\frac{2\left(a+\frac{b}{x}\right)^{\frac{7}{2}}x^{\frac{7}{2}}}{7\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)*x^(5/2),x, algorithm="maxima")

[Out] 2/7*(a + b/x)^(7/2)*x^(7/2)/a
```

Fricas [A] time = 0.232119, size = 62, normalized size = 2.7

$$\frac{2\left(a^{3}x^{3}+3\,a^{2}bx^{2}+3\,ab^{2}x+b^{3}\right)\sqrt{x}\sqrt{\frac{ax+b}{x}}}{7\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)*x^(5/2),x, algorithm="fricas")

[Out] 2/7*(a^3*x^3 + 3*a^2*b*x^2 + 3*a*b^2*x + b^3)*sqrt(x)*sqrt((a*x +
 b)/x)/a
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(5/2)*x**(5/2),x)

[Out] Timed out
```

GIAC/XCAS [A] time = 0.23479, size = 81, normalized size = 3.52

$$\frac{2\left(15\,(ax+b)^{\frac{7}{2}}-42\,(ax+b)^{\frac{5}{2}}b+70\,(ax+b)^{\frac{3}{2}}b^{2}+14\left(3\,(ax+b)^{\frac{5}{2}}-5\,(ax+b)^{\frac{3}{2}}b\right)b\right)}{105\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)*x^(5/2),x, algorithm="giac")

[Out] 2/105*(15*(a*x + b)^(7/2) - 42*(a*x + b)^(5/2)*b + 70*(a*x + b)^(
3/2)*b^2 + 14*(3*(a*x + b)^(5/2) - 5*(a*x + b)^(3/2)*b)*b)/a
```

3.1770 $\int \left(a+\frac{b}{x}\right)^{5/2} x^{3/2}\, dx$

Optimal. Leaf size=93

$$-2b^{5/2}\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)+2b^2\sqrt{x}\sqrt{a+\frac{b}{x}}+\frac{2}{3}bx^{3/2}\left(a+\frac{b}{x}\right)^{3/2}+\frac{2}{5}x^{5/2}\left(a+\frac{b}{x}\right)^{5/2}$$

```
[Out] 2*b^2*Sqrt[a + b/x]*Sqrt[x] + (2*b*(a + b/x)^(3/2)*x^(3/2))/3 + (
2*(a + b/x)^(5/2)*x^(5/2))/5 - 2*b^(5/2)*ArcTanh[Sqrt[b]/(Sqrt[a
+ b/x]*Sqrt[x])]
```

Rubi [A] time = 0.135878, antiderivative size = 93, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.235

$$-2b^{5/2}\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)+2b^2\sqrt{x}\sqrt{a+\frac{b}{x}}+\frac{2}{3}bx^{3/2}\left(a+\frac{b}{x}\right)^{3/2}+\frac{2}{5}x^{5/2}\left(a+\frac{b}{x}\right)^{5/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(5/2)*x^(3/2),x]
```

```
[Out] 2*b^2*Sqrt[a + b/x]*Sqrt[x] + (2*b*(a + b/x)^(3/2)*x^(3/2))/3 + (
2*(a + b/x)^(5/2)*x^(5/2))/5 - 2*b^(5/2)*ArcTanh[Sqrt[b]/(Sqrt[a
+ b/x]*Sqrt[x])]
```

Rubi in Sympy [A] time = 13.2526, size = 80, normalized size = 0.86

$$-2b^{\frac{5}{2}}\operatorname{atanh}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)+2b^2\sqrt{x}\sqrt{a+\frac{b}{x}}+\frac{2bx^{\frac{3}{2}}\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{3}+\frac{2x^{\frac{5}{2}}\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(5/2)*x**(3/2),x)
```

```
[Out] -2*b**(5/2)*atanh(sqrt(b)/(sqrt(x)*sqrt(a + b/x))) + 2*b**2*sqrt(
x)*sqrt(a + b/x) + 2*b*x**(3/2)*(a + b/x)**(3/2)/3 + 2*x**(5/2)*(
a + b/x)**(5/2)/5
```

Mathematica [A] time = 0.137847, size = 80, normalized size = 0.86

$$\frac{2}{15}\sqrt{x}\sqrt{a+\frac{b}{x}}\left(3a^2x^2+11abx+23b^2\right)-2b^{5/2}\log\left(\sqrt{b}\sqrt{x}\sqrt{a+\frac{b}{x}}+b\right)+b^{5/2}\log(x)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(5/2)*x^(3/2),x]
```

```
[Out] (2*Sqrt[a + b/x]*Sqrt[x]*(23*b^2 + 11*a*b*x + 3*a^2*x^2))/15 - 2*
b^(5/2)*Log[b + Sqrt[b]*Sqrt[a + b/x]*Sqrt[x]] + b^(5/2)*Log[x]
```

Maple [A] time = 0.015, size = 81, normalized size = 0.9

$$-\frac{2}{15}\sqrt{\frac{ax+b}{x}}\sqrt{x}\left(-3\,x^2a^2\sqrt{ax+b}+15\,b^{5/2}Artanh\left(\frac{\sqrt{ax+b}}{\sqrt{b}}\right)-11\,xab\sqrt{ax+b}-23\,\sqrt{ax+b}b^2\right)\frac{1}{\sqrt{ax+b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(5/2)*x^(3/2),x)
```

```
[Out] -2/15*((a*x+b)/x)^(1/2)*x^(1/2)*(-3*x^2*a^2*(a*x+b)^(1/2)+15*b^(5
/2)*arctanh((a*x+b)^(1/2)/b^(1/2))-11*x*a*b*(a*x+b)^(1/2)-23*(a*x
+b)^(1/2)*b^2)/(a*x+b)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)*x^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.24861, size = 1, normalized size = 0.01

$$\left[b^{\frac{5}{2}}\log\left(\frac{ax-2\,\sqrt{b}\sqrt{x}\sqrt{\frac{ax+b}{x}}+2\,b}{x}\right)+\frac{2}{15}\left(3\,a^2x^2+11\,abx+23\,b^2\right)\sqrt{x}\sqrt{\frac{ax+b}{x}},\right.$$
$$\left.-2\,\sqrt{-b}b^2\arctan\left(\frac{\sqrt{x}\sqrt{\frac{ax+b}{x}}}{\sqrt{-b}}\right)+\frac{2}{15}\left(3\,a^2x^2+11\,abx+23\,b^2\right)\sqrt{x}\sqrt{\frac{ax+b}{x}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)*x^(3/2),x, algorithm="fricas")
```

```
[Out] [b^(5/2)*log((a*x - 2*sqrt(b)*sqrt(x)*sqrt((a*x + b)/x) + 2*b)/x)
 + 2/15*(3*a^2*x^2 + 11*a*b*x + 23*b^2)*sqrt(x)*sqrt((a*x + b)/x)
, -2*sqrt(-b)*b^2*arctan(sqrt(x)*sqrt((a*x + b)/x)/sqrt(-b)) + 2/
15*(3*a^2*x^2 + 11*a*b*x + 23*b^2)*sqrt(x)*sqrt((a*x + b)/x)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(5/2)*x**(3/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.237444, size = 76, normalized size = 0.82

$$\frac{2\,b^3\arctan\left(\frac{\sqrt{ax+b}}{\sqrt{-b}}\right)}{\sqrt{-b}}+\frac{2}{5}\,(ax+b)^{\frac{5}{2}}+\frac{2}{3}\,(ax+b)^{\frac{3}{2}}b+2\,\sqrt{ax+b}b^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)*x^(3/2),x, algorithm="giac")
```

```
[Out] 2*b^3*arctan(sqrt(a*x + b)/sqrt(-b))/sqrt(-b) + 2/5*(a*x + b)^(5/
2) + 2/3*(a*x + b)^(3/2)*b + 2*sqrt(a*x + b)*b^2
```

3.1771 $\int \left(a+\frac{b}{x}\right)^{5/2} \sqrt{x}\,dx$

Optimal. Leaf size=94

$$-5ab^{3/2}\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)-\frac{5b^2\sqrt{a+\frac{b}{x}}}{\sqrt{x}}+\frac{2}{3}x^{3/2}\left(a+\frac{b}{x}\right)^{5/2}+\frac{10}{3}b\sqrt{x}\left(a+\frac{b}{x}\right)^{3/2}$$

```
[Out] (-5*b^2*Sqrt[a + b/x])/Sqrt[x] + (10*b*(a + b/x)^(3/2)*Sqrt[x])/3
 + (2*(a + b/x)^(5/2)*x^(3/2))/3 - 5*a*b^(3/2)*ArcTanh[Sqrt[b]/(S
qrt[a + b/x]*Sqrt[x])]
```

Rubi [A] time = 0.130284, antiderivative size = 94, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.294

$$-5ab^{3/2}\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)-\frac{5b^2\sqrt{a+\frac{b}{x}}}{\sqrt{x}}+\frac{2}{3}x^{3/2}\left(a+\frac{b}{x}\right)^{5/2}+\frac{10}{3}b\sqrt{x}\left(a+\frac{b}{x}\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(5/2)*Sqrt[x],x]
```

```
[Out] (-5*b^2*Sqrt[a + b/x])/Sqrt[x] + (10*b*(a + b/x)^(3/2)*Sqrt[x])/3
 + (2*(a + b/x)^(5/2)*x^(3/2))/3 - 5*a*b^(3/2)*ArcTanh[Sqrt[b]/(S
qrt[a + b/x]*Sqrt[x])]
```

Rubi in Sympy [A] time = 11.6508, size = 82, normalized size = 0.87

$$-5ab^{\frac{3}{2}}\operatorname{atanh}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)-\frac{5b^2\sqrt{a+\frac{b}{x}}}{\sqrt{x}}+\frac{10b\sqrt{x}\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{3}+\frac{2x^{\frac{3}{2}}\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(5/2)*x**(1/2),x)
```

```
[Out] -5*a*b**(3/2)*atanh(sqrt(b)/(sqrt(x)*sqrt(a + b/x))) - 5*b**2*sqr
t(a + b/x)/sqrt(x) + 10*b*sqrt(x)*(a + b/x)**(3/2)/3 + 2*x**(3/2)
*(a + b/x)**(5/2)/3
```

Mathematica [A] time = 0.231975, size = 85, normalized size = 0.9

$$\frac{\sqrt{a+\frac{b}{x}}\left(2a^2x^2+14abx-3b^2\right)}{3\sqrt{x}}-5ab^{3/2}\log\left(\sqrt{b}\sqrt{x}\sqrt{a+\frac{b}{x}}+b\right)+\frac{5}{2}ab^{3/2}\log(x)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(5/2)*Sqrt[x],x]
```

```
[Out] (Sqrt[a + b/x]*(-3*b^2 + 14*a*b*x + 2*a^2*x^2))/(3*Sqrt[x]) - 5*a
*b^(3/2)*Log[b + Sqrt[b]*Sqrt[a + b/x]*Sqrt[x]] + (5*a*b^(3/2)*Lo
g[x])/2
```

Maple [A] time = 0.022, size = 91, normalized size = 1.

$$-\frac{1}{3}\sqrt{\frac{ax+b}{x}}\left(-2x^2a^2\sqrt{b}\sqrt{ax+b}+15\,Artanh\left(\frac{\sqrt{ax+b}}{\sqrt{b}}\right)xab^2-14\,xab^{3/2}\sqrt{ax+b}+3\,b^{5/2}\sqrt{ax+b}\right)\frac{1}{\sqrt{x}}\frac{1}{\sqrt{ax+b}}\frac{1}{\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((a+b/x)^(5/2)*x^(1/2),x)
```

```
[Out] -1/3*((a*x+b)/x)^(1/2)/x^(1/2)*(-2*x^2*a^2*b^(1/2)*(a*x+b)^(1/2)+
15*arctanh((a*x+b)^(1/2)/b^(1/2))*x*a*b^2-14*x*a*b^(3/2)*(a*x+b)^
(1/2)+3*b^(5/2)*(a*x+b)^(1/2))/(a*x+b)^(1/2)/b^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a + b/x)^(5/2)*sqrt(x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.25096, size = 1, normalized size = 0.01

$$\left[\frac{15\,ab^{\frac{3}{2}}x\log\left(\frac{ax-2\sqrt{b}\sqrt{x}\sqrt{\frac{ax+b}{x}}+2\,b}{x}\right)+2\left(2\,a^2x^2+14\,abx-3\,b^2\right)\sqrt{x}\sqrt{\frac{ax+b}{x}}}{6\,x},\ -\frac{15\,a\sqrt{-b}bx\arctan\left(\frac{\sqrt{x}\sqrt{\frac{ax+b}{x}}}{\sqrt{-b}}\right)-\left(2\,a^2x^2+14\,abx-3\,b^2\right)\sqrt{x}\sqrt{\frac{ax+b}{x}}}{3\,x}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a + b/x)^(5/2)*sqrt(x),x, algorithm="fricas")
```

```
[Out] [1/6*(15*a*b^(3/2)*x*log((a*x - 2*sqrt(b)*sqrt(x)*sqrt((a*x + b)/
x) + 2*b)/x) + 2*(2*a^2*x^2 + 14*a*b*x - 3*b^2)*sqrt(x)*sqrt((a*x
 + b)/x))/x, -1/3*(15*a*sqrt(-b)*b*x*arctan(sqrt(x)*sqrt((a*x + b
)/x)/sqrt(-b)) - (2*a^2*x^2 + 14*a*b*x - 3*b^2)*sqrt(x)*sqrt((a*x
 + b)/x))/x]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a+b/x)**(5/2)*x**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.294612, size = 88, normalized size = 0.94

$$\frac{1}{3}\left(\frac{15\,b^2\arctan\left(\frac{\sqrt{ax+b}}{\sqrt{-b}}\right)}{\sqrt{-b}}+2\,(ax+b)^{\frac{3}{2}}+12\,\sqrt{ax+b}b-\frac{3\,\sqrt{ax+b}b^2}{ax}\right)a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)*sqrt(x),x, algorithm="giac")
```

```
[Out] 1/3*(15*b^2*arctan(sqrt(a*x + b)/sqrt(-b))/sqrt(-b) + 2*(a*x + b)
^(3/2) + 12*sqrt(a*x + b)*b - 3*sqrt(a*x + b)*b^2/(a*x))*a
```

3.1772 $\int \frac{\left(a+\frac{b}{x}\right)^{5/2}}{\sqrt{x}}\,dx$

Optimal. Leaf size=97

$$-\frac{15}{4}a^2\sqrt{b}\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)+2\sqrt{x}\left(a+\frac{b}{x}\right)^{5/2}-\frac{5b\left(a+\frac{b}{x}\right)^{3/2}}{2\sqrt{x}}-\frac{15ab\sqrt{a+\frac{b}{x}}}{4\sqrt{x}}$$

```
[Out] (-15*a*b*Sqrt[a + b/x])/(4*Sqrt[x]) - (5*b*(a + b/x)^(3/2))/(2*Sq
rt[x]) + 2*(a + b/x)^(5/2)*Sqrt[x] - (15*a^2*Sqrt[b]*ArcTanh[Sqrt
[b]/(Sqrt[a + b/x]*Sqrt[x])])/4
```

Rubi [A] time = 0.123352, antiderivative size = 97, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.294

$$-\frac{15}{4}a^2\sqrt{b}\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)+2\sqrt{x}\left(a+\frac{b}{x}\right)^{5/2}-\frac{5b\left(a+\frac{b}{x}\right)^{3/2}}{2\sqrt{x}}-\frac{15ab\sqrt{a+\frac{b}{x}}}{4\sqrt{x}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(5/2)/Sqrt[x],x]
```

```
[Out] (-15*a*b*Sqrt[a + b/x])/(4*Sqrt[x]) - (5*b*(a + b/x)^(3/2))/(2*Sq
rt[x]) + 2*(a + b/x)^(5/2)*Sqrt[x] - (15*a^2*Sqrt[b]*ArcTanh[Sqrt
[b]/(Sqrt[a + b/x]*Sqrt[x])])/4
```

Rubi in Sympy [A] time = 10.3093, size = 85, normalized size = 0.88

$$-\frac{15a^2\sqrt{b}\,\mathrm{atanh}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{4}-\frac{15ab\sqrt{a+\frac{b}{x}}}{4\sqrt{x}}-\frac{5b\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{2\sqrt{x}}+2\sqrt{x}\left(a+\frac{b}{x}\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(5/2)/x**(1/2),x)
```

```
[Out] -15*a**2*sqrt(b)*atanh(sqrt(b)/(sqrt(x)*sqrt(a + b/x)))/4 - 15*a*
b*sqrt(a + b/x)/(4*sqrt(x)) - 5*b*(a + b/x)**(3/2)/(2*sqrt(x)) +
2*sqrt(x)*(a + b/x)**(5/2)
```

Mathematica [A] time = 0.232231, size = 91, normalized size = 0.94

$$\frac{\sqrt{a+\frac{b}{x}}\left(8a^2x^2-9abx-2b^2\right)}{4x^{3/2}}-\frac{15}{4}a^2\sqrt{b}\log\left(\sqrt{b}\sqrt{x}\sqrt{a+\frac{b}{x}}+b\right)+\frac{15}{8}a^2\sqrt{b}\log(x)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(5/2)/Sqrt[x],x]
```

```
[Out] (Sqrt[a + b/x]*(-2*b^2 - 9*a*b*x + 8*a^2*x^2))/(4*x^(3/2)) - (15*
a^2*Sqrt[b]*Log[b + Sqrt[b]*Sqrt[a + b/x]*Sqrt[x]])/4 + (15*a^2*S
```

```
qrt[b]*Log[x])/8
```

Maple [A] time = 0.023, size = 93, normalized size = 1.

$$-\frac{1}{4}\sqrt{\frac{ax+b}{x}}\left(15\,\mathit{Artanh}\left(\frac{\sqrt{ax+b}}{\sqrt{b}}\right)a^2bx^2-8\,x^2a^2\sqrt{b}\sqrt{ax+b}+9\,xab^{3/2}\sqrt{ax+b}+2\,b^{5/2}\sqrt{ax+b}\right)x^{-\frac{3}{2}}\frac{1}{\sqrt{ax+b}}\frac{1}{\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(5/2)/x^(1/2),x)
```

```
[Out] -1/4*((a*x+b)/x)^(1/2)/x^(3/2)*(15*arctanh((a*x+b)^(1/2)/b^(1/2))
*a^2*b*x^2-8*x^2*a^2*b^(1/2)*(a*x+b)^(1/2)+9*x*a*b^(3/2)*(a*x+b)^
(1/2)+2*b^(5/2)*(a*x+b)^(1/2))/(a*x+b)^(1/2)/b^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)/sqrt(x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.246082, size = 1, normalized size = 0.01

$$\left[\frac{15\,a^2\sqrt{b}x^2\log\left(\frac{ax-2\,\sqrt{b}\sqrt{x}\sqrt{\frac{ax+b}{x}}+2\,b}{x}\right)+2\,\left(8\,a^2x^2-9\,abx-2\,b^2\right)\sqrt{x}\sqrt{\frac{ax+b}{x}}}{8\,x^2},\right.$$
$$\left.-\frac{15\,a^2\sqrt{-b}x^2\arctan\left(\frac{\sqrt{x}\sqrt{\frac{ax+b}{x}}}{\sqrt{-b}}\right)-\left(8\,a^2x^2-9\,abx-2\,b^2\right)\sqrt{x}\sqrt{\frac{ax+b}{x}}}{4\,x^2}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)/sqrt(x),x, algorithm="fricas")
```

```
[Out] [1/8*(15*a^2*sqrt(b)*x^2*log((a*x - 2*sqrt(b)*sqrt(x)*sqrt((a*x +
 b)/x) + 2*b)/x) + 2*(8*a^2*x^2 - 9*a*b*x - 2*b^2)*sqrt(x)*sqrt((
a*x + b)/x))/x^2, -1/4*(15*a^2*sqrt(-b)*x^2*arctan(sqrt(x)*sqrt((
a*x + b)/x)/sqrt(-b)) - (8*a^2*x^2 - 9*a*b*x - 2*b^2)*sqrt(x)*sqr
t((a*x + b)/x))/x^2]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(5/2)/x**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.294607, size = 92, normalized size = 0.95

$$\frac{1}{4}\left(\frac{15\,b\arctan\left(\frac{\sqrt{ax+b}}{\sqrt{-b}}\right)}{\sqrt{-b}}+8\,\sqrt{ax+b}-\frac{9\,(ax+b)^{\frac{3}{2}}b-7\,\sqrt{ax+b}b^{2}}{a^{2}x^{2}}\right)a^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)/sqrt(x),x, algorithm="giac")
```

```
[Out] 1/4*(15*b*arctan(sqrt(a*x + b)/sqrt(-b))/sqrt(-b) + 8*sqrt(a*x +
b) - (9*(a*x + b)^(3/2)*b - 7*sqrt(a*x + b)*b^2)/(a^2*x^2))*a^2
```

3.1773 $\int \frac{\left(a+\frac{b}{x}\right)^{5/2}}{x^{3/2}}\,dx$

Optimal. Leaf size=100

$$-\frac{5a^3\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{8\sqrt{b}}-\frac{5a^2\sqrt{a+\frac{b}{x}}}{8\sqrt{x}}-\frac{5a\left(a+\frac{b}{x}\right)^{3/2}}{12\sqrt{x}}-\frac{\left(a+\frac{b}{x}\right)^{5/2}}{3\sqrt{x}}$$

```
[Out] (-5*a^2*Sqrt[a + b/x])/(8*Sqrt[x]) - (5*a*(a + b/x)^(3/2))/(12*Sq
rt[x]) - (a + b/x)^(5/2)/(3*Sqrt[x]) - (5*a^3*ArcTanh[Sqrt[b]/(Sq
rt[a + b/x]*Sqrt[x])])/(8*Sqrt[b])
```

Rubi [A] time = 0.110722, antiderivative size = 100, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.235

$$-\frac{5a^3\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{8\sqrt{b}}-\frac{5a^2\sqrt{a+\frac{b}{x}}}{8\sqrt{x}}-\frac{5a\left(a+\frac{b}{x}\right)^{3/2}}{12\sqrt{x}}-\frac{\left(a+\frac{b}{x}\right)^{5/2}}{3\sqrt{x}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(5/2)/x^(3/2),x]
```

```
[Out] (-5*a^2*Sqrt[a + b/x])/(8*Sqrt[x]) - (5*a*(a + b/x)^(3/2))/(12*Sq
rt[x]) - (a + b/x)^(5/2)/(3*Sqrt[x]) - (5*a^3*ArcTanh[Sqrt[b]/(Sq
rt[a + b/x]*Sqrt[x])])/(8*Sqrt[b])
```

Rubi in Sympy [A] time = 8.61431, size = 87, normalized size = 0.87

$$-\frac{5a^3\operatorname{atanh}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{8\sqrt{b}}-\frac{5a^2\sqrt{a+\frac{b}{x}}}{8\sqrt{x}}-\frac{5a\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{12\sqrt{x}}-\frac{\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{3\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(5/2)/x**(3/2),x)
```

```
[Out] -5*a**3*atanh(sqrt(b)/(sqrt(x)*sqrt(a + b/x)))/(8*sqrt(b)) - 5*a*
*2*sqrt(a + b/x)/(8*sqrt(x)) - 5*a*(a + b/x)**(3/2)/(12*sqrt(x))
- (a + b/x)**(5/2)/(3*sqrt(x))
```

Mathematica [A] time = 0.268146, size = 91, normalized size = 0.91

$$-\frac{5a^3\log\left(\sqrt{b}\sqrt{x}\sqrt{a+\frac{b}{x}}+b\right)}{8\sqrt{b}}+\frac{5a^3\log(x)}{16\sqrt{b}}-\frac{\sqrt{a+\frac{b}{x}}\left(33a^2x^2+26abx+8b^2\right)}{24x^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(5/2)/x^(3/2),x]
```

```
[Out] -(Sqrt[a + b/x]*(8*b^2 + 26*a*b*x + 33*a^2*x^2))/(24*x^(5/2)) - (
5*a^3*Log[b + Sqrt[b]*Sqrt[a + b/x]*Sqrt[x]])/(8*Sqrt[b]) + (5*a^
```

```
3*Log[x])/(16*Sqrt[b])
```

Maple [A] time = 0.024, size = 92, normalized size = 0.9

$$-\frac{1}{24}\sqrt{\frac{ax+b}{x}}\left(15\,Artanh\left(\frac{\sqrt{ax+b}}{\sqrt{b}}\right)a^3x^3+33\,x^2a^2\sqrt{b}\sqrt{ax+b}+26\,xab^{3/2}\sqrt{ax+b}+8\,b^{5/2}\sqrt{ax+b}\right)x^{-\frac{5}{2}}\frac{1}{\sqrt{ax+b}}\frac{1}{\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(5/2)/x^(3/2),x)
```

```
[Out] -1/24*((a*x+b)/x)^(1/2)/x^(5/2)*(15*arctanh((a*x+b)^(1/2)/b^(1/2)
)*a^3*x^3+33*x^2*a^2*b^(1/2)*(a*x+b)^(1/2)+26*x*a*b^(3/2)*(a*x+b)
^(1/2)+8*b^(5/2)*(a*x+b)^(1/2))/(a*x+b)^(1/2)/b^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)/x^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.248528, size = 1, normalized size = 0.01

$$\left[\frac{15\,a^3x^3\log\left(-\frac{2\,b\sqrt{x}\sqrt{\frac{ax+b}{x}}-(ax+2\,b)\sqrt{b}}{x}\right)-2\left(33\,a^2x^2+26\,abx+8\,b^2\right)\sqrt{b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}{48\,\sqrt{b}x^3},\ \frac{15\,a^3x^3\arctan\left(\frac{b}{\sqrt{-b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}\right)-\left(33\,a^2x\right.}{24\,\sqrt{-b}x}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)/x^(3/2),x, algorithm="fricas")
```

```
[Out] [1/48*(15*a^3*x^3*log(-(2*b*sqrt(x)*sqrt((a*x + b)/x) - (a*x + 2*
b)*sqrt(b))/x) - 2*(33*a^2*x^2 + 26*a*b*x + 8*b^2)*sqrt(b)*sqrt(x
)*sqrt((a*x + b)/x))/(sqrt(b)*x^3), 1/24*(15*a^3*x^3*arctan(b/(sq
rt(-b)*sqrt(x)*sqrt((a*x + b)/x))) - (33*a^2*x^2 + 26*a*b*x + 8*b
^2)*sqrt(-b)*sqrt(x)*sqrt((a*x + b)/x))/(sqrt(-b)*x^3)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(5/2)/x**(3/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.312344, size = 90, normalized size = 0.9

$$\frac{1}{24}\,a^3\left(\frac{15\,\arctan\left(\frac{\sqrt{ax+b}}{\sqrt{-b}}\right)}{\sqrt{-b}}-\frac{33\,(ax+b)^{\frac{5}{2}}-40\,(ax+b)^{\frac{3}{2}}b+15\,\sqrt{ax+b}b^2}{a^3x^3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)/x^(3/2),x, algorithm="giac")
```

```
[Out] 1/24*a^3*(15*arctan(sqrt(a*x + b)/sqrt(-b))/sqrt(-b) - (33*(a*x +
 b)^(5/2) - 40*(a*x + b)^(3/2)*b + 15*sqrt(a*x + b)*b^2)/(a^3*x^3
))
```

3.1774 $\int \frac{\left(a+\frac{b}{x}\right)^{5/2}}{x^{5/2}}\,dx$

Optimal. Leaf size=126

$$\frac{5a^4\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{64b^{3/2}}-\frac{5a^3\sqrt{a+\frac{b}{x}}}{64b\sqrt{x}}-\frac{5a^2\sqrt{a+\frac{b}{x}}}{32x^{3/2}}-\frac{5a\left(a+\frac{b}{x}\right)^{3/2}}{24x^{3/2}}-\frac{\left(a+\frac{b}{x}\right)^{5/2}}{4x^{3/2}}$$

```
[Out] (-5*a^2*Sqrt[a + b/x])/(32*x^(3/2)) - (5*a*(a + b/x)^(3/2))/(24*x
^(3/2)) - (a + b/x)^(5/2)/(4*x^(3/2)) - (5*a^3*Sqrt[a + b/x])/(64
*b*Sqrt[x]) + (5*a^4*ArcTanh[Sqrt[b]/(Sqrt[a + b/x]*Sqrt[x])])/(6
4*b^(3/2))
```

Rubi [A] time = 0.19238, antiderivative size = 126, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.294

$$\frac{5a^4\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{64b^{3/2}}-\frac{5a^3\sqrt{a+\frac{b}{x}}}{64b\sqrt{x}}-\frac{5a^2\sqrt{a+\frac{b}{x}}}{32x^{3/2}}-\frac{5a\left(a+\frac{b}{x}\right)^{3/2}}{24x^{3/2}}-\frac{\left(a+\frac{b}{x}\right)^{5/2}}{4x^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^(5/2)/x^(5/2),x]
```

```
[Out] (-5*a^2*Sqrt[a + b/x])/(32*x^(3/2)) - (5*a*(a + b/x)^(3/2))/(24*x
^(3/2)) - (a + b/x)^(5/2)/(4*x^(3/2)) - (5*a^3*Sqrt[a + b/x])/(64
*b*Sqrt[x]) + (5*a^4*ArcTanh[Sqrt[b]/(Sqrt[a + b/x]*Sqrt[x])])/(6
4*b^(3/2))
```

Rubi in Sympy [A] time = 19.5006, size = 107, normalized size = 0.85

$$\frac{5a^4\operatorname{atanh}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{64b^{\frac{3}{2}}}-\frac{5a^3\sqrt{a+\frac{b}{x}}}{64b\sqrt{x}}-\frac{5a^2\sqrt{a+\frac{b}{x}}}{32x^{\frac{3}{2}}}-\frac{5a\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}{24x^{\frac{3}{2}}}-\frac{\left(a+\frac{b}{x}\right)^{\frac{5}{2}}}{4x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**(5/2)/x**(5/2),x)
```

```
[Out] 5*a**4*atanh(sqrt(b)/(sqrt(x)*sqrt(a + b/x)))/(64*b**(3/2)) - 5*a
**3*sqrt(a + b/x)/(64*b*sqrt(x)) - 5*a**2*sqrt(a + b/x)/(32*x**(3
/2)) - 5*a*(a + b/x)**(3/2)/(24*x**(3/2)) - (a + b/x)**(5/2)/(4*x
**(3/2))
```

Mathematica [A] time = 0.375347, size = 100, normalized size = 0.79

$$\frac{30a^4\log\left(\sqrt{b}\sqrt{x}\sqrt{a+\frac{b}{x}}+b\right)-15a^4\log(x)-\frac{2\sqrt{b}\sqrt{a+\frac{b}{x}}\left(15a^3x^3+118a^2bx^2+136ab^2x+48b^3\right)}{x^{7/2}}}{384b^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^(5/2)/x^(5/2),x]
```

```
[Out] ((-2*Sqrt[b]*Sqrt[a + b/x]*(48*b^3 + 136*a*b^2*x + 118*a^2*b*x^2
+ 15*a^3*x^3))/x^(7/2) + 30*a^4*Log[b + Sqrt[b]*Sqrt[a + b/x]*Sqr
t[x]] - 15*a^4*Log[x])/(384*b^(3/2))
```

Maple [A] time = 0.026, size = 110, normalized size = 0.9

$$-\frac{1}{192}\sqrt{\frac{ax+b}{x}}\left(-15\,Artanh\left(\frac{\sqrt{ax+b}}{\sqrt{b}}\right)a^4x^4+48\,b^{7/2}\sqrt{ax+b}+136\,xab^{5/2}\sqrt{ax+b}+118\,x^2a^2b^{3/2}\sqrt{ax+b}+15\,x^3a^3\sqrt{ax+}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^(5/2)/x^(5/2),x)
```

```
[Out] -1/192*((a*x+b)/x)^(1/2)*(-15*arctanh((a*x+b)^(1/2)/b^(1/2))*a^4*
x^4+48*b^(7/2)*(a*x+b)^(1/2)+136*x*a*b^(5/2)*(a*x+b)^(1/2)+118*x^
2*a^2*b^(3/2)*(a*x+b)^(1/2)+15*x^3*a^3*(a*x+b)^(1/2)*b^(1/2))/x^(
7/2)/b^(3/2)/(a*x+b)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)/x^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.24971, size = 1, normalized size = 0.01

$$\left[\frac{15\,a^4x^4\log\left(\frac{2\,b\sqrt{x}\sqrt{\frac{ax+b}{x}}+(ax+2\,b)\sqrt{b}}{x}\right)-2\left(15\,a^3x^3+118\,a^2bx^2+136\,ab^2x+48\,b^3\right)\sqrt{b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}{384\,b^{\frac{3}{2}}x^4},\right.$$
$$\left.-\frac{15\,a^4x^4\arctan\left(\frac{b}{\sqrt{-b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}\right)+\left(15\,a^3x^3+118\,a^2bx^2+136\,ab^2x+48\,b^3\right)\sqrt{-b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}{192\,\sqrt{-b}bx^4}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)/x^(5/2),x, algorithm="fricas")
```

```
[Out] [1/384*(15*a^4*x^4*log((2*b*sqrt(x)*sqrt((a*x + b)/x) + (a*x + 2*
b)*sqrt(b))/x) - 2*(15*a^3*x^3 + 118*a^2*b*x^2 + 136*a*b^2*x + 48
*b^3)*sqrt(b)*sqrt(x)*sqrt((a*x + b)/x))/(b^(3/2)*x^4), -1/192*(1
5*a^4*x^4*arctan(b/(sqrt(-b)*sqrt(x)*sqrt((a*x + b)/x))) + (15*a^
3*x^3 + 118*a^2*b*x^2 + 136*a*b^2*x + 48*b^3)*sqrt(-b)*sqrt(x)*sq
rt((a*x + b)/x))/(sqrt(-b)*b*x^4)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**(5/2)/x**(5/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.327285, size = 113, normalized size = 0.9

$$-\frac{1}{192}\,a^4\left(\frac{15\,\arctan\left(\frac{\sqrt{ax+b}}{\sqrt{-b}}\right)}{\sqrt{-b}b}+\frac{15\,(ax+b)^{\frac{7}{2}}+73\,(ax+b)^{\frac{5}{2}}b-55\,(ax+b)^{\frac{3}{2}}b^2+15\,\sqrt{ax+b}b^3}{a^4bx^4}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x)^(5/2)/x^(5/2),x, algorithm="giac")
```

```
[Out] -1/192*a^4*(15*arctan(sqrt(a*x + b)/sqrt(-b))/(sqrt(-b)*b) + (15*
(a*x + b)^(7/2) + 73*(a*x + b)^(5/2)*b - 55*(a*x + b)^(3/2)*b^2 +
 15*sqrt(a*x + b)*b^3)/(a^4*b*x^4))
```

3.1775 $\int \frac{x^{7/2}}{\sqrt{a+\frac{b}{x}}} dx$

Optimal. Leaf size=126

$$\frac{256b^4\sqrt{x}\sqrt{a+\frac{b}{x}}}{315a^5}-\frac{128b^3x^{3/2}\sqrt{a+\frac{b}{x}}}{315a^4}+\frac{32b^2x^{5/2}\sqrt{a+\frac{b}{x}}}{105a^3}-\frac{16bx^{7/2}\sqrt{a+\frac{b}{x}}}{63a^2}+\frac{2x^{9/2}\sqrt{a+\frac{b}{x}}}{9a}$$

```
[Out] (256*b^4*Sqrt[a + b/x]*Sqrt[x])/(315*a^5) - (128*b^3*Sqrt[a + b/x
]*x^(3/2))/(315*a^4) + (32*b^2*Sqrt[a + b/x]*x^(5/2))/(105*a^3) -
 (16*b*Sqrt[a + b/x]*x^(7/2))/(63*a^2) + (2*Sqrt[a + b/x]*x^(9/2)
)/(9*a)
```

Rubi [A] time = 0.155256, antiderivative size = 126, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{256b^4\sqrt{x}\sqrt{a+\frac{b}{x}}}{315a^5}-\frac{128b^3x^{3/2}\sqrt{a+\frac{b}{x}}}{315a^4}+\frac{32b^2x^{5/2}\sqrt{a+\frac{b}{x}}}{105a^3}-\frac{16bx^{7/2}\sqrt{a+\frac{b}{x}}}{63a^2}+\frac{2x^{9/2}\sqrt{a+\frac{b}{x}}}{9a}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(7/2)/Sqrt[a + b/x],x]
```

```
[Out] (256*b^4*Sqrt[a + b/x]*Sqrt[x])/(315*a^5) - (128*b^3*Sqrt[a + b/x
]*x^(3/2))/(315*a^4) + (32*b^2*Sqrt[a + b/x]*x^(5/2))/(105*a^3) -
 (16*b*Sqrt[a + b/x]*x^(7/2))/(63*a^2) + (2*Sqrt[a + b/x]*x^(9/2)
)/(9*a)
```

Rubi in Sympy [A] time = 13.6008, size = 110, normalized size = 0.87

$$\frac{2x^{\frac{9}{2}}\sqrt{a+\frac{b}{x}}}{9a}-\frac{16bx^{\frac{7}{2}}\sqrt{a+\frac{b}{x}}}{63a^2}+\frac{32b^2x^{\frac{5}{2}}\sqrt{a+\frac{b}{x}}}{105a^3}-\frac{128b^3x^{\frac{3}{2}}\sqrt{a+\frac{b}{x}}}{315a^4}+\frac{256b^4\sqrt{x}\sqrt{a+\frac{b}{x}}}{315a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(7/2)/(a+b/x)**(1/2),x)
```

```
[Out] 2*x**(9/2)*sqrt(a + b/x)/(9*a) - 16*b*x**(7/2)*sqrt(a + b/x)/(63*
a**2) + 32*b**2*x**(5/2)*sqrt(a + b/x)/(105*a**3) - 128*b**3*x**(
3/2)*sqrt(a + b/x)/(315*a**4) + 256*b**4*sqrt(x)*sqrt(a + b/x)/(3
15*a**5)
```

Mathematica [A] time = 0.0571691, size = 64, normalized size = 0.51

$$\frac{2\sqrt{x}\sqrt{a+\frac{b}{x}}\left(35a^4x^4-40a^3bx^3+48a^2b^2x^2-64ab^3x+128b^4\right)}{315a^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(7/2)/Sqrt[a + b/x],x]
```

```
[Out] (2*Sqrt[a + b/x]*Sqrt[x]*(128*b^4 - 64*a*b^3*x + 48*a^2*b^2*x^2 -
 40*a^3*b*x^3 + 35*a^4*x^4))/(315*a^5)
```

Maple [A] time = 0.007, size = 66, normalized size = 0.5

$$\frac{(2\,ax+2\,b)\,(35\,x^4a^4-40\,bx^3a^3+48\,b^2x^2a^2-64\,b^3xa+128\,b^4)}{315\,a^5}\frac{1}{\sqrt{x}}\frac{1}{\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(7/2)/(a+b/x)^(1/2),x)
```

```
[Out] 2/315*(a*x+b)*(35*a^4*x^4-40*a^3*b*x^3+48*a^2*b^2*x^2-64*a*b^3*x+
128*b^4)/a^5/x^(1/2)/((a*x+b)/x)^(1/2)
```

Maxima [A] time = 1.43875, size = 116, normalized size = 0.92

$$\frac{2\left(35\left(a+\frac{b}{x}\right)^{\frac{9}{2}}x^{\frac{9}{2}}-180\left(a+\frac{b}{x}\right)^{\frac{7}{2}}bx^{\frac{7}{2}}+378\left(a+\frac{b}{x}\right)^{\frac{5}{2}}b^2x^{\frac{5}{2}}-420\left(a+\frac{b}{x}\right)^{\frac{3}{2}}b^3x^{\frac{3}{2}}+315\sqrt{a+\frac{b}{x}}b^4\sqrt{x}\right)}{315\,a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(7/2)/sqrt(a + b/x),x, algorithm="maxima")
```

```
[Out] 2/315*(35*(a + b/x)^(9/2)*x^(9/2) - 180*(a + b/x)^(7/2)*b*x^(7/2)
 + 378*(a + b/x)^(5/2)*b^2*x^(5/2) - 420*(a + b/x)^(3/2)*b^3*x^(3
/2) + 315*sqrt(a + b/x)*b^4*sqrt(x))/a^5
```

Fricas [A] time = 0.234517, size = 81, normalized size = 0.64

$$\frac{2\,(35\,a^4x^4-40\,a^3bx^3+48\,a^2b^2x^2-64\,ab^3x+128\,b^4)\,\sqrt{x}\sqrt{\frac{ax+b}{x}}}{315\,a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(7/2)/sqrt(a + b/x),x, algorithm="fricas")
```

```
[Out] 2/315*(35*a^4*x^4 - 40*a^3*b*x^3 + 48*a^2*b^2*x^2 - 64*a*b^3*x +
128*b^4)*sqrt(x)*sqrt((a*x + b)/x)/a^5
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(7/2)/(a+b/x)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.229347, size = 95, normalized size = 0.75

$$-\frac{256\,b^{\frac{9}{2}}}{315\,a^5}+\frac{2\left(35\,(ax+b)^{\frac{9}{2}}-180\,(ax+b)^{\frac{7}{2}}b+378\,(ax+b)^{\frac{5}{2}}b^2-420\,(ax+b)^{\frac{3}{2}}b^3+315\,\sqrt{ax+b}b^4\right)}{315\,a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(7/2)/sqrt(a + b/x),x, algorithm="giac")
```

```
[Out] -256/315*b^(9/2)/a^5 + 2/315*(35*(a*x + b)^(9/2) - 180*(a*x + b)^
(7/2)*b + 378*(a*x + b)^(5/2)*b^2 - 420*(a*x + b)^(3/2)*b^3 + 315
*sqrt(a*x + b)*b^4)/a^5
```

3.1776 $\int \frac{x^{5/2}}{\sqrt{a+\frac{b}{x}}}\,dx$

Optimal. Leaf size=100

$$-\frac{32b^3\sqrt{x}\sqrt{a+\frac{b}{x}}}{35a^4}+\frac{16b^2x^{3/2}\sqrt{a+\frac{b}{x}}}{35a^3}-\frac{12bx^{5/2}\sqrt{a+\frac{b}{x}}}{35a^2}+\frac{2x^{7/2}\sqrt{a+\frac{b}{x}}}{7a}$$

```
[Out] (-32*b^3*Sqrt[a + b/x]*Sqrt[x])/(35*a^4) + (16*b^2*Sqrt[a + b/x]*
x^(3/2))/(35*a^3) - (12*b*Sqrt[a + b/x]*x^(5/2))/(35*a^2) + (2*Sq
rt[a + b/x]*x^(7/2))/(7*a)
```

Rubi [A] time = 0.114401, antiderivative size = 100, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{32b^3\sqrt{x}\sqrt{a+\frac{b}{x}}}{35a^4}+\frac{16b^2x^{3/2}\sqrt{a+\frac{b}{x}}}{35a^3}-\frac{12bx^{5/2}\sqrt{a+\frac{b}{x}}}{35a^2}+\frac{2x^{7/2}\sqrt{a+\frac{b}{x}}}{7a}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(5/2)/Sqrt[a + b/x],x]
```

```
[Out] (-32*b^3*Sqrt[a + b/x]*Sqrt[x])/(35*a^4) + (16*b^2*Sqrt[a + b/x]*
x^(3/2))/(35*a^3) - (12*b*Sqrt[a + b/x]*x^(5/2))/(35*a^2) + (2*Sq
rt[a + b/x]*x^(7/2))/(7*a)
```

Rubi in Sympy [A] time = 9.84751, size = 87, normalized size = 0.87

$$\frac{2x^{\frac{7}{2}}\sqrt{a+\frac{b}{x}}}{7a}-\frac{12bx^{\frac{5}{2}}\sqrt{a+\frac{b}{x}}}{35a^2}+\frac{16b^2x^{\frac{3}{2}}\sqrt{a+\frac{b}{x}}}{35a^3}-\frac{32b^3\sqrt{x}\sqrt{a+\frac{b}{x}}}{35a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(5/2)/(a+b/x)**(1/2),x)
```

```
[Out] 2*x**(7/2)*sqrt(a + b/x)/(7*a) - 12*b*x**(5/2)*sqrt(a + b/x)/(35*
a**2) + 16*b**2*x**(3/2)*sqrt(a + b/x)/(35*a**3) - 32*b**3*sqrt(x
)*sqrt(a + b/x)/(35*a**4)
```

Mathematica [A] time = 0.0445848, size = 53, normalized size = 0.53

$$\frac{2\sqrt{x}\sqrt{a+\frac{b}{x}}\left(5a^3x^3-6a^2bx^2+8ab^2x-16b^3\right)}{35a^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(5/2)/Sqrt[a + b/x],x]
```

```
[Out] (2*Sqrt[a + b/x]*Sqrt[x]*(-16*b^3 + 8*a*b^2*x - 6*a^2*b*x^2 + 5*a
^3*x^3))/(35*a^4)
```

Maple [A] time = 0.007, size = 55, normalized size = 0.6

$$\frac{(2ax+2b)\left(5a^3x^3-6a^2bx^2+8ab^2x-16b^3\right)}{35a^4}\frac{1}{\sqrt{x}}\frac{1}{\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(5/2)/(a+b/x)^(1/2),x)
```

```
[Out] 2/35*(a*x+b)*(5*a^3*x^3-6*a^2*b*x^2+8*a*b^2*x-16*b^3)/a^4/x^(1/2)
/((a*x+b)/x)^(1/2)
```

Maxima [A] time = 1.44442, size = 93, normalized size = 0.93

$$\frac{2\left(5\left(a+\frac{b}{x}\right)^{\frac{7}{2}}x^{\frac{7}{2}}-21\left(a+\frac{b}{x}\right)^{\frac{5}{2}}bx^{\frac{5}{2}}+35\left(a+\frac{b}{x}\right)^{\frac{3}{2}}b^2x^{\frac{3}{2}}-35\sqrt{a+\frac{b}{x}}b^3\sqrt{x}\right)}{35a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5/2)/sqrt(a + b/x),x, algorithm="maxima")
```

```
[Out] 2/35*(5*(a + b/x)^(7/2)*x^(7/2) - 21*(a + b/x)^(5/2)*b*x^(5/2) +
35*(a + b/x)^(3/2)*b^2*x^(3/2) - 35*sqrt(a + b/x)*b^3*sqrt(x))/a^
4
```

Fricas [A] time = 0.240728, size = 66, normalized size = 0.66

$$\frac{2\left(5a^3x^3-6a^2bx^2+8ab^2x-16b^3\right)\sqrt{x}\sqrt{\frac{ax+b}{x}}}{35a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5/2)/sqrt(a + b/x),x, algorithm="fricas")
```

```
[Out] 2/35*(5*a^3*x^3 - 6*a^2*b*x^2 + 8*a*b^2*x - 16*b^3)*sqrt(x)*sqrt(
(a*x + b)/x)/a^4
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(5/2)/(a+b/x)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.232322, size = 78, normalized size = 0.78

$$\frac{32b^{\frac{7}{2}}}{35a^4}+\frac{2\left(5(ax+b)^{\frac{7}{2}}-21(ax+b)^{\frac{5}{2}}b+35(ax+b)^{\frac{3}{2}}b^2-35\sqrt{ax+b}b^3\right)}{35a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5/2)/sqrt(a + b/x),x, algorithm="giac")
```

```
[Out] 32/35*b^(7/2)/a^4 + 2/35*(5*(a*x + b)^(7/2) - 21*(a*x + b)^(5/2)*
b + 35*(a*x + b)^(3/2)*b^2 - 35*sqrt(a*x + b)*b^3)/a^4
```

3.1777 $\int \frac{x^{3/2}}{\sqrt{a+\frac{b}{x}}}\,dx$

Optimal. Leaf size=74

$$\frac{16b^2\sqrt{x}\sqrt{a+\frac{b}{x}}}{15a^3}-\frac{8bx^{3/2}\sqrt{a+\frac{b}{x}}}{15a^2}+\frac{2x^{5/2}\sqrt{a+\frac{b}{x}}}{5a}$$

```
[Out] (16*b^2*Sqrt[a + b/x]*Sqrt[x])/(15*a^3) - (8*b*Sqrt[a + b/x]*x^(3
/2))/(15*a^2) + (2*Sqrt[a + b/x]*x^(5/2))/(5*a)
```

Rubi [A] time = 0.0822299, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{16b^2\sqrt{x}\sqrt{a+\frac{b}{x}}}{15a^3}-\frac{8bx^{3/2}\sqrt{a+\frac{b}{x}}}{15a^2}+\frac{2x^{5/2}\sqrt{a+\frac{b}{x}}}{5a}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(3/2)/Sqrt[a + b/x],x]
```

```
[Out] (16*b^2*Sqrt[a + b/x]*Sqrt[x])/(15*a^3) - (8*b*Sqrt[a + b/x]*x^(3
/2))/(15*a^2) + (2*Sqrt[a + b/x]*x^(5/2))/(5*a)
```

Rubi in Sympy [A] time = 6.8025, size = 63, normalized size = 0.85

$$\frac{2x^{\frac{5}{2}}\sqrt{a+\frac{b}{x}}}{5a}-\frac{8bx^{\frac{3}{2}}\sqrt{a+\frac{b}{x}}}{15a^2}+\frac{16b^2\sqrt{x}\sqrt{a+\frac{b}{x}}}{15a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(3/2)/(a+b/x)**(1/2),x)
```

```
[Out] 2*x**(5/2)*sqrt(a + b/x)/(5*a) - 8*b*x**(3/2)*sqrt(a + b/x)/(15*a
**2) + 16*b**2*sqrt(x)*sqrt(a + b/x)/(15*a**3)
```

Mathematica [A] time = 0.0412756, size = 42, normalized size = 0.57

$$\frac{2\sqrt{x}\sqrt{a+\frac{b}{x}}\left(3a^2x^2-4abx+8b^2\right)}{15a^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(3/2)/Sqrt[a + b/x],x]
```

```
[Out] (2*Sqrt[a + b/x]*Sqrt[x]*(8*b^2 - 4*a*b*x + 3*a^2*x^2))/(15*a^3)
```

Maple [A] time = 0.007, size = 44, normalized size = 0.6

$$\frac{(2\,ax+2\,b)\left(3\,a^2x^2-4\,abx+8\,b^2\right)}{15\,a^3}\frac{1}{\sqrt{x}}\frac{1}{\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^(3/2)/(a+b/x)^(1/2),x)
```

```
[Out] 2/15*(a*x+b)*(3*a^2*x^2-4*a*b*x+8*b^2)/a^3/x^(1/2)/((a*x+b)/x)^(1
/2)
```

Maxima [A] time = 1.43946, size = 70, normalized size = 0.95

$$\frac{2\left(3\left(a+\frac{b}{x}\right)^{\frac{5}{2}}x^{\frac{5}{2}}-10\left(a+\frac{b}{x}\right)^{\frac{3}{2}}bx^{\frac{3}{2}}+15\sqrt{a+\frac{b}{x}}b^{2}\sqrt{x}\right)}{15\,a^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^(3/2)/sqrt(a + b/x),x, algorithm="maxima")
```

```
[Out] 2/15*(3*(a + b/x)^(5/2)*x^(5/2) - 10*(a + b/x)^(3/2)*b*x^(3/2) +
15*sqrt(a + b/x)*b^2*sqrt(x))/a^3
```

Fricas [A] time = 0.239447, size = 51, normalized size = 0.69

$$\frac{2\left(3\,a^{2}x^{2}-4\,abx+8\,b^{2}\right)\sqrt{x}\sqrt{\frac{ax+b}{x}}}{15\,a^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^(3/2)/sqrt(a + b/x),x, algorithm="fricas")
```

```
[Out] 2/15*(3*a^2*x^2 - 4*a*b*x + 8*b^2)*sqrt(x)*sqrt((a*x + b)/x)/a^3
```

Sympy [A] time = 43.8497, size = 260, normalized size = 3.51

$$\frac{6a^{4}b^{\frac{9}{2}}x^{4}\sqrt{\frac{ax}{b}+1}}{15a^{5}b^{4}x^{2}+30a^{4}b^{5}x+15a^{3}b^{6}}+\frac{4a^{3}b^{\frac{11}{2}}x^{3}\sqrt{\frac{ax}{b}+1}}{15a^{5}b^{4}x^{2}+30a^{4}b^{5}x+15a^{3}b^{6}}+\frac{6a^{2}b^{\frac{13}{2}}x^{2}\sqrt{\frac{ax}{b}+1}}{15a^{5}b^{4}x^{2}+30a^{4}b^{5}x+15a^{3}b^{6}}+\frac{24ab^{\frac{15}{2}}x\sqrt{\frac{ax}{b}+1}}{15a^{5}b^{4}x^{2}+30a^{4}b^{5}x+15a^{3}b^{6}}+\frac{16b^{\frac{17}{2}}\sqrt{\frac{ax}{b}+1}}{15a^{5}b^{4}x^{2}+30a^{4}b^{5}x+15a^{3}b^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**(3/2)/(a+b/x)**(1/2),x)
```

```
[Out] 6*a**4*b**(9/2)*x**4*sqrt(a*x/b + 1)/(15*a**5*b**4*x**2 + 30*a**4
*b**5*x + 15*a**3*b**6) + 4*a**3*b**(11/2)*x**3*sqrt(a*x/b + 1)/(
15*a**5*b**4*x**2 + 30*a**4*b**5*x + 15*a**3*b**6) + 6*a**2*b**(1
3/2)*x**2*sqrt(a*x/b + 1)/(15*a**5*b**4*x**2 + 30*a**4*b**5*x + 1
5*a**3*b**6) + 24*a*b**(15/2)*x*sqrt(a*x/b + 1)/(15*a**5*b**4*x**
2 + 30*a**4*b**5*x + 15*a**3*b**6) + 16*b**(17/2)*sqrt(a*x/b + 1)
/(15*a**5*b**4*x**2 + 30*a**4*b**5*x + 15*a**3*b**6)
```

GIAC/XCAS [A] time = 0.228059, size = 62, normalized size = 0.84

$$-\frac{16\,b^{\frac{5}{2}}}{15\,a^{3}}+\frac{2\left(3\,(ax+b)^{\frac{5}{2}}-10\,(ax+b)^{\frac{3}{2}}b+15\,\sqrt{ax+b}b^{2}\right)}{15\,a^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2)/sqrt(a + b/x),x, algorithm="giac")
```

```
[Out] -16/15*b^(5/2)/a^3 + 2/15*(3*(a*x + b)^(5/2) - 10*(a*x + b)^(3/2)
*b + 15*sqrt(a*x + b)*b^2)/a^3
```

3.1778 $\int \frac{\sqrt{x}}{\sqrt{a+\frac{b}{x}}}\,dx$

Optimal. Leaf size=48

$$\frac{2x^{3/2}\sqrt{a+\frac{b}{x}}}{3a}-\frac{4b\sqrt{x}\sqrt{a+\frac{b}{x}}}{3a^2}$$

```
[Out] (-4*b*Sqrt[a + b/x]*Sqrt[x])/(3*a^2) + (2*Sqrt[a + b/x]*x^(3/2))/
(3*a)
```

Rubi [A] time = 0.0518068, antiderivative size = 48, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{2x^{3/2}\sqrt{a+\frac{b}{x}}}{3a}-\frac{4b\sqrt{x}\sqrt{a+\frac{b}{x}}}{3a^2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[x]/Sqrt[a + b/x],x]
```

```
[Out] (-4*b*Sqrt[a + b/x]*Sqrt[x])/(3*a^2) + (2*Sqrt[a + b/x]*x^(3/2))/
(3*a)
```

Rubi in Sympy [A] time = 4.36381, size = 39, normalized size = 0.81

$$\frac{2x^{\frac{3}{2}}\sqrt{a+\frac{b}{x}}}{3a}-\frac{4b\sqrt{x}\sqrt{a+\frac{b}{x}}}{3a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(1/2)/(a+b/x)**(1/2),x)
```

```
[Out] 2*x**(3/2)*sqrt(a + b/x)/(3*a) - 4*b*sqrt(x)*sqrt(a + b/x)/(3*a**
2)
```

Mathematica [A] time = 0.0356013, size = 30, normalized size = 0.62

$$\frac{2\sqrt{x}\sqrt{a+\frac{b}{x}}(ax-2b)}{3a^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[x]/Sqrt[a + b/x],x]
```

```
[Out] (2*Sqrt[a + b/x]*Sqrt[x]*(-2*b + a*x))/(3*a^2)
```

Maple [A] time = 0.003, size = 32, normalized size = 0.7

$$\frac{(2\,ax+2\,b)(ax-2\,b)}{3\,a^2}\frac{1}{\sqrt{x}}\frac{1}{\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(1/2)/(a+b/x)^(1/2),x)
```

```
[Out] 2/3*(a*x+b)*(a*x-2*b)/a^2/x^(1/2)/((a*x+b)/x)^(1/2)
```

Maxima [A] time = 1.44007, size = 46, normalized size = 0.96

$$\frac{2\left(\left(a+\frac{b}{x}\right)^{\frac{3}{2}}x^{\frac{3}{2}}-3\sqrt{a+\frac{b}{x}}\,b\sqrt{x}\right)}{3\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/sqrt(a + b/x),x, algorithm="maxima")
```

```
[Out] 2/3*((a + b/x)^(3/2)*x^(3/2) - 3*sqrt(a + b/x)*b*sqrt(x))/a^2
```

Fricas [A] time = 0.231161, size = 35, normalized size = 0.73

$$\frac{2\,(ax-2\,b)\sqrt{x}\sqrt{\frac{ax+b}{x}}}{3\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/sqrt(a + b/x),x, algorithm="fricas")
```

```
[Out] 2/3*(a*x - 2*b)*sqrt(x)*sqrt((a*x + b)/x)/a^2
```

Sympy [A] time = 5.74571, size = 42, normalized size = 0.88

$$\frac{2\sqrt{b}x\sqrt{\frac{ax}{b}+1}}{3a}-\frac{4b^{\frac{3}{2}}\sqrt{\frac{ax}{b}+1}}{3a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(1/2)/(a+b/x)**(1/2),x)
```

```
[Out] 2*sqrt(b)*x*sqrt(a*x/b + 1)/(3*a) - 4*b**(3/2)*sqrt(a*x/b + 1)/(3
*a**2)
```

GIAC/XCAS [A] time = 0.227837, size = 43, normalized size = 0.9

$$\frac{4\,b^{\frac{3}{2}}}{3\,a^2}+\frac{2\left((ax+b)^{\frac{3}{2}}-3\sqrt{ax+b}\,b\right)}{3\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/sqrt(a + b/x),x, algorithm="giac")
```

```
[Out] 4/3*b^(3/2)/a^2 + 2/3*((a*x + b)^(3/2) - 3*sqrt(a*x + b)*b)/a^2
```

3.1779 $\int \frac{1}{\sqrt{a+\frac{b}{x}}\sqrt{x}}\,dx$

Optimal. Leaf size=21

$$\frac{2\sqrt{x}\sqrt{a+\frac{b}{x}}}{a}$$

```
[Out] (2*Sqrt[a + b/x]*Sqrt[x])/a
```

Rubi [A] time = 0.0247353, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.059

$$\frac{2\sqrt{x}\sqrt{a+\frac{b}{x}}}{a}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b/x]*Sqrt[x]),x]

[Out] (2*Sqrt[a + b/x]*Sqrt[x])/a
```

Rubi in Sympy [A] time = 3.08494, size = 15, normalized size = 0.71

$$\frac{2\sqrt{x}\sqrt{a+\frac{b}{x}}}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**(1/2)/x**(1/2),x)

[Out] 2*sqrt(x)*sqrt(a + b/x)/a
```

Mathematica [A] time = 0.0276699, size = 23, normalized size = 1.1

$$\frac{2\sqrt{x}\sqrt{\frac{ax+b}{x}}}{a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b/x]*Sqrt[x]),x]

[Out] (2*Sqrt[x]*Sqrt[(b + a*x)/x])/a
```

Maple [A] time = 0.003, size = 25, normalized size = 1.2

$$2\,\frac{ax+b}{a\sqrt{x}}\frac{1}{\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^(1/2)/x^(1/2),x)

[Out] 2*(a*x+b)/a/((a*x+b)/x)^(1/2)/x^(1/2)
```

Maxima [A] time = 1.44128, size = 23, normalized size = 1.1

$$\frac{2\sqrt{a+\frac{b}{x}}\sqrt{x}}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*sqrt(x)),x, algorithm="maxima")

[Out] 2*sqrt(a + b/x)*sqrt(x)/a
```

Fricas [A] time = 0.229055, size = 26, normalized size = 1.24

$$\frac{2\sqrt{x}\sqrt{\frac{ax+b}{x}}}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*sqrt(x)),x, algorithm="fricas")

[Out] 2*sqrt(x)*sqrt((a*x + b)/x)/a
```

Sympy [A] time = 8.94276, size = 17, normalized size = 0.81

$$\frac{2\sqrt{b}\sqrt{\frac{ax}{b}+1}}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(1/2)/x**(1/2),x)

[Out] 2*sqrt(b)*sqrt(a*x/b + 1)/a
```

GIAC/XCAS [A] time = 0.23001, size = 28, normalized size = 1.33

$$\frac{2\sqrt{ax+b}}{a}-\frac{2\sqrt{b}}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*sqrt(x)),x, algorithm="giac")

[Out] 2*sqrt(a*x + b)/a - 2*sqrt(b)/a
```

3.1780 $\int \frac{1}{\sqrt{a+\frac{b}{x}}\,x^{3/2}}\,dx$

Optimal. Leaf size=30

$$-\frac{2\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{\sqrt{b}}$$

```
[Out] (-2*ArcTanh[Sqrt[b]/(Sqrt[a + b/x]*Sqrt[x])])/Sqrt[b]
```

Rubi [A] time = 0.0454773, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176

$$-\frac{2\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{\sqrt{b}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b/x]*x^(3/2)),x]

[Out] (-2*ArcTanh[Sqrt[b]/(Sqrt[a + b/x]*Sqrt[x])])/Sqrt[b]
```

Rubi in Sympy [A] time = 5.37622, size = 27, normalized size = 0.9

$$-\frac{2\,\mathrm{atanh}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**(1/2)/x**(3/2),x)

[Out] -2*atanh(sqrt(b)/(sqrt(x)*sqrt(a + b/x)))/sqrt(b)
```

Mathematica [A] time = 0.0276437, size = 36, normalized size = 1.2

$$\frac{\log(x)-2\log\left(\sqrt{b}\sqrt{x}\sqrt{a+\frac{b}{x}}+b\right)}{\sqrt{b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b/x]*x^(3/2)),x]

[Out] (-2*Log[b + Sqrt[b]*Sqrt[a + b/x]*Sqrt[x]] + Log[x])/Sqrt[b]
```

Maple [A] time = 0.014, size = 39, normalized size = 1.3

$$-2\,\frac{\sqrt{x}}{\sqrt{ax+b}\sqrt{b}}\sqrt{\frac{ax+b}{x}}\,Artanh\left(\frac{\sqrt{ax+b}}{\sqrt{b}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^(1/2)/x^(3/2),x)
```

```
[Out] -2*((a*x+b)/x)^(1/2)*x^(1/2)/(a*x+b)^(1/2)/b^(1/2)*arctanh((a*x+b
)^(1/2)/b^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*x^(3/2)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.2407, size = 1, normalized size = 0.03

$$\left[\frac{\log\left(-\frac{2\,b\sqrt{x}\sqrt{\frac{ax+b}{x}}-(ax+2\,b)\sqrt{b}}{x}\right)}{\sqrt{b}}, \frac{2\,\arctan\left(\frac{b}{\sqrt{-b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}\right)}{\sqrt{-b}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*x^(3/2)),x, algorithm="fricas")
```

```
[Out] [log(-(2*b*sqrt(x)*sqrt((a*x + b)/x) - (a*x + 2*b)*sqrt(b))/x)/sq
rt(b), 2*arctan(b/(sqrt(-b)*sqrt(x)*sqrt((a*x + b)/x)))/sqrt(-b)]
```

Sympy [A] time = 25.1049, size = 24, normalized size = 0.8

$$-\frac{2\,\operatorname{asinh}\left(\frac{\sqrt{b}}{\sqrt{a}\sqrt{x}}\right)}{\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(1/2)/x**(3/2),x)
```

```
[Out] -2*asinh(sqrt(b)/(sqrt(a)*sqrt(x)))/sqrt(b)
```

GIAC/XCAS [A] time = 0.230429, size = 53, normalized size = 1.77

$$\frac{2\,\arctan\left(\frac{\sqrt{ax+b}}{\sqrt{-b}}\right)}{\sqrt{-b}} - \frac{2\,\arctan\left(\frac{\sqrt{b}}{\sqrt{-b}}\right)}{\sqrt{-b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*x^(3/2)),x, algorithm="giac")
```

```
[Out] 2*arctan(sqrt(a*x + b)/sqrt(-b))/sqrt(-b) - 2*arctan(sqrt(b)/sqrt
(-b))/sqrt(-b)
```

3.1781 $\int \frac{1}{\sqrt{a+\frac{b}{x}}\,x^{5/2}}\,dx$

Optimal. Leaf size=52

$$\frac{a\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{b^{3/2}}-\frac{\sqrt{a+\frac{b}{x}}}{b\sqrt{x}}$$

```
[Out] -(Sqrt[a + b/x]/(b*Sqrt[x])) + (a*ArcTanh[Sqrt[b]/(Sqrt[a + b/x]*
Sqrt[x])])/b^(3/2)
```

Rubi [A] time = 0.0790806, antiderivative size = 52, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.235

$$\frac{a\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{b^{3/2}}-\frac{\sqrt{a+\frac{b}{x}}}{b\sqrt{x}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b/x]*x^(5/2)),x]
```

```
[Out] -(Sqrt[a + b/x]/(b*Sqrt[x])) + (a*ArcTanh[Sqrt[b]/(Sqrt[a + b/x]*
Sqrt[x])])/b^(3/2)
```

Rubi in Sympy [A] time = 8.20154, size = 41, normalized size = 0.79

$$\frac{a\,\mathrm{atanh}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{b^{\frac{3}{2}}}-\frac{\sqrt{a+\frac{b}{x}}}{b\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**(1/2)/x**(5/2),x)
```

```
[Out] a*atanh(sqrt(b)/(sqrt(x)*sqrt(a + b/x)))/b**(3/2) - sqrt(a + b/x)
/(b*sqrt(x))
```

Mathematica [A] time = 0.117005, size = 64, normalized size = 1.23

$$\frac{-\frac{\sqrt{b}\sqrt{a+\frac{b}{x}}}{\sqrt{x}}+a\log\left(\sqrt{b}\sqrt{x}\sqrt{a+\frac{b}{x}}+b\right)-\frac{1}{2}a\log(x)}{b^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b/x]*x^(5/2)),x]
```

```
[Out] (-((Sqrt[b]*Sqrt[a + b/x])/Sqrt[x]) + a*Log[b + Sqrt[b]*Sqrt[a +
b/x]*Sqrt[x]] - (a*Log[x])/2)/b^(3/2)
```

Maple [A] time = 0.017, size = 55, normalized size = 1.1

$$-1\sqrt{\frac{ax+b}{x}}\left(-Artanh\left(1\sqrt{ax+b}\frac{1}{\sqrt{b}}\right)ax+\sqrt{ax+b}\sqrt{b}\right)\frac{1}{\sqrt{x}}b^{-\frac{3}{2}}\frac{1}{\sqrt{ax+b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^(1/2)/x^(5/2),x)
```

```
[Out] -((a*x+b)/x)^(1/2)*(-arctanh((a*x+b)^(1/2)/b^(1/2))*a*x+(a*x+b)^(
1/2)*b^(1/2))/x^(1/2)/b^(3/2)/(a*x+b)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*x^(5/2)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.251408, size = 1, normalized size = 0.02

$$\left[\frac{ax\log\left(\frac{2\,b\sqrt{x}\sqrt{\frac{ax+b}{x}}+(ax+2\,b)\sqrt{b}}{x}\right)-2\sqrt{b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}{2\,b^{\frac{3}{2}}x},-\frac{ax\arctan\left(\frac{b}{\sqrt{-b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}\right)+\sqrt{-b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}{\sqrt{-b}bx}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*x^(5/2)),x, algorithm="fricas")
```

```
[Out] [1/2*(a*x*log((2*b*sqrt(x)*sqrt((a*x + b)/x) + (a*x + 2*b)*sqrt(b
))/x) - 2*sqrt(b)*sqrt(x)*sqrt((a*x + b)/x))/(b^(3/2)*x), -(a*x*a
rctan(b/(sqrt(-b)*sqrt(x)*sqrt((a*x + b)/x))) + sqrt(-b)*sqrt(x)*
sqrt((a*x + b)/x))/(sqrt(-b)*b*x)]
```

Sympy [A] time = 147.587, size = 44, normalized size = 0.85

$$-\frac{\sqrt{a}\sqrt{1+\frac{b}{ax}}}{b\sqrt{x}}+\frac{a\operatorname{asinh}\left(\frac{\sqrt{b}}{\sqrt{a}\sqrt{x}}\right)}{b^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(1/2)/x**(5/2),x)
```

```
[Out] -sqrt(a)*sqrt(1 + b/(a*x))/(b*sqrt(x)) + a*asinh(sqrt(b)/(sqrt(a)
*sqrt(x)))/b**(3/2)
```

GIAC/XCAS [A] time = 0.250556, size = 59, normalized size = 1.13

$$-a\left(\frac{\arctan\left(\frac{\sqrt{ax+b}}{\sqrt{-b}}\right)}{\sqrt{-b}b}+\frac{\sqrt{ax+b}}{abx}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*x^(5/2)),x, algorithm="giac")
```

```
[Out] -a*(arctan(sqrt(a*x + b)/sqrt(-b))/(sqrt(-b)*b) + sqrt(a*x + b)/(
a*b*x))
```

3.1782 $\int \frac{1}{\sqrt{a+\frac{b}{x}}x^{7/2}}\,dx$

Optimal. Leaf size=83

$$-\frac{3a^2\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{4b^{5/2}}+\frac{3a\sqrt{a+\frac{b}{x}}}{4b^2\sqrt{x}}-\frac{\sqrt{a+\frac{b}{x}}}{2bx^{3/2}}$$

```
[Out] -Sqrt[a + b/x]/(2*b*x^(3/2)) + (3*a*Sqrt[a + b/x])/(4*b^2*Sqrt[x]
) - (3*a^2*ArcTanh[Sqrt[b]/(Sqrt[a + b/x]*Sqrt[x])])/(4*b^(5/2))
```

Rubi [A] time = 0.117942, antiderivative size = 83, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.235

$$-\frac{3a^2\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{4b^{5/2}}+\frac{3a\sqrt{a+\frac{b}{x}}}{4b^2\sqrt{x}}-\frac{\sqrt{a+\frac{b}{x}}}{2bx^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b/x]*x^(7/2)),x]
```

```
[Out] -Sqrt[a + b/x]/(2*b*x^(3/2)) + (3*a*Sqrt[a + b/x])/(4*b^2*Sqrt[x]
) - (3*a^2*ArcTanh[Sqrt[b]/(Sqrt[a + b/x]*Sqrt[x])])/(4*b^(5/2))
```

Rubi in Sympy [A] time = 11.9218, size = 70, normalized size = 0.84

$$-\frac{3a^2\operatorname{atanh}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{4b^{\frac{5}{2}}}+\frac{3a\sqrt{a+\frac{b}{x}}}{4b^2\sqrt{x}}-\frac{\sqrt{a+\frac{b}{x}}}{2bx^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**(1/2)/x**(7/2),x)
```

```
[Out] -3*a**2*atanh(sqrt(b)/(sqrt(x)*sqrt(a + b/x)))/(4*b**(5/2)) + 3*a
*sqrt(a + b/x)/(4*b**2*sqrt(x)) - sqrt(a + b/x)/(2*b*x**(3/2))
```

Mathematica [A] time = 0.242186, size = 78, normalized size = 0.94

$$\frac{-6a^2\log\left(\sqrt{b}\sqrt{x}\sqrt{a+\frac{b}{x}}+b\right)+3a^2\log(x)+\frac{2\sqrt{b}\sqrt{a+\frac{b}{x}}(3ax-2b)}{x^{3/2}}}{8b^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b/x]*x^(7/2)),x]
```

```
[Out] ((2*Sqrt[b]*Sqrt[a + b/x]*(-2*b + 3*a*x))/x^(3/2) - 6*a^2*Log[b +
 Sqrt[b]*Sqrt[a + b/x]*Sqrt[x]] + 3*a^2*Log[x])/(8*b^(5/2))
```

Maple [A] time = 0.019, size = 74, normalized size = 0.9

$$-\frac{1}{4}\sqrt{\frac{ax+b}{x}}\left(3\,Artanh\left(\frac{\sqrt{ax+b}}{\sqrt{b}}\right)a^2x^2-3\,xa\sqrt{ax+b}\sqrt{b}+2\,b^{3/2}\sqrt{ax+b}\right)x^{-\frac{3}{2}}b^{-\frac{5}{2}}\frac{1}{\sqrt{ax+b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^(1/2)/x^(7/2),x)
```

```
[Out] -1/4*((a*x+b)/x)^(1/2)/x^(3/2)/b^(5/2)*(3*arctanh((a*x+b)^(1/2)/b
^(1/2))*a^2*x^2-3*x*a*(a*x+b)^(1/2)*b^(1/2)+2*b^(3/2)*(a*x+b)^(1/
2))/(a*x+b)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*x^(7/2)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.253822, size = 1, normalized size = 0.01

$$\left[\frac{3\,a^2x^2\log\left(-\frac{2\,b\sqrt{x}\sqrt{\frac{ax+b}{x}}-(ax+2\,b)\sqrt{b}}{x}\right)+2\,(3\,ax-2\,b)\sqrt{b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}{8\,b^{\frac{5}{2}}x^2},\frac{3\,a^2x^2\arctan\left(\frac{b}{\sqrt{-b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}\right)+(3\,ax-2\,b)\sqrt{-b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}{4\,\sqrt{-b}b^2x^2}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*x^(7/2)),x, algorithm="fricas")
```

```
[Out] [1/8*(3*a^2*x^2*log(-(2*b*sqrt(x)*sqrt((a*x + b)/x) - (a*x + 2*b)
*sqrt(b))/x) + 2*(3*a*x - 2*b)*sqrt(b)*sqrt(x)*sqrt((a*x + b)/x))
/(b^(5/2)*x^2), 1/4*(3*a^2*x^2*arctan(b/(sqrt(-b)*sqrt(x)*sqrt((a
*x + b)/x))) + (3*a*x - 2*b)*sqrt(-b)*sqrt(x)*sqrt((a*x + b)/x))/
(sqrt(-b)*b^2*x^2)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(1/2)/x**(7/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.251149, size = 81, normalized size = 0.98

$$\frac{1}{4}\,a^2\left(\frac{3\,\arctan\left(\frac{\sqrt{ax+b}}{\sqrt{-b}}\right)}{\sqrt{-b}b^2}+\frac{3\,(ax+b)^{\frac{3}{2}}-5\,\sqrt{ax+b}b}{a^2b^2x^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*x^(7/2)),x, algorithm="giac")
```

```
[Out] 1/4*a^2*(3*arctan(sqrt(a*x + b)/sqrt(-b))/(sqrt(-b)*b^2) + (3*(a*
x + b)^(3/2) - 5*sqrt(a*x + b)*b)/(a^2*b^2*x^2))
```

3.1783 $\int \frac{1}{\sqrt{a+\frac{b}{x}}x^{9/2}}\,dx$

Optimal. Leaf size=109

$$\frac{5a^3\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{8b^{7/2}}-\frac{5a^2\sqrt{a+\frac{b}{x}}}{8b^3\sqrt{x}}+\frac{5a\sqrt{a+\frac{b}{x}}}{12b^2x^{3/2}}-\frac{\sqrt{a+\frac{b}{x}}}{3bx^{5/2}}$$

```
[Out] -Sqrt[a + b/x]/(3*b*x^(5/2)) + (5*a*Sqrt[a + b/x])/(12*b^2*x^(3/2
)) - (5*a^2*Sqrt[a + b/x])/(8*b^3*Sqrt[x]) + (5*a^3*ArcTanh[Sqrt[
b]/(Sqrt[a + b/x]*Sqrt[x])])/(8*b^(7/2))
```

Rubi [A] time = 0.163302, antiderivative size = 109, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.235

$$\frac{5a^3\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{8b^{7/2}}-\frac{5a^2\sqrt{a+\frac{b}{x}}}{8b^3\sqrt{x}}+\frac{5a\sqrt{a+\frac{b}{x}}}{12b^2x^{3/2}}-\frac{\sqrt{a+\frac{b}{x}}}{3bx^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b/x]*x^(9/2)),x]
```

```
[Out] -Sqrt[a + b/x]/(3*b*x^(5/2)) + (5*a*Sqrt[a + b/x])/(12*b^2*x^(3/2
)) - (5*a^2*Sqrt[a + b/x])/(8*b^3*Sqrt[x]) + (5*a^3*ArcTanh[Sqrt[
b]/(Sqrt[a + b/x]*Sqrt[x])])/(8*b^(7/2))
```

Rubi in Sympy [A] time = 16.3804, size = 94, normalized size = 0.86

$$\frac{5a^3\operatorname{atanh}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{8b^{\frac{7}{2}}}-\frac{5a^2\sqrt{a+\frac{b}{x}}}{8b^3\sqrt{x}}+\frac{5a\sqrt{a+\frac{b}{x}}}{12b^2x^{\frac{3}{2}}}-\frac{\sqrt{a+\frac{b}{x}}}{3bx^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**(1/2)/x**(9/2),x)
```

```
[Out] 5*a**3*atanh(sqrt(b)/(sqrt(x)*sqrt(a + b/x)))/(8*b**(7/2)) - 5*a*
*2*sqrt(a + b/x)/(8*b**3*sqrt(x)) + 5*a*sqrt(a + b/x)/(12*b**2*x*
*(3/2)) - sqrt(a + b/x)/(3*b*x**(5/2))
```

Mathematica [A] time = 0.332162, size = 89, normalized size = 0.82

$$\frac{30a^3\log\left(\sqrt{b}\sqrt{x}\sqrt{a+\frac{b}{x}}+b\right)-15a^3\log(x)-\frac{2\sqrt{b}\sqrt{a+\frac{b}{x}}\left(15a^2x^2-10abx+8b^2\right)}{x^{5/2}}}{48b^{7/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b/x]*x^(9/2)),x]
```

```
[Out] ((-2*Sqrt[b]*Sqrt[a + b/x]*(8*b^2 - 10*a*b*x + 15*a^2*x^2))/x^(5/
2) + 30*a^3*Log[b + Sqrt[b]*Sqrt[a + b/x]*Sqrt[x]] - 15*a^3*Log[x
```

```
])/(48*b^(7/2))
```

Maple [A] time = 0.018, size = 92, normalized size = 0.8

$$-\frac{1}{24}\sqrt{\frac{ax+b}{x}}\left(-15\,Artanh\left(\frac{\sqrt{ax+b}}{\sqrt{b}}\right)a^{3}x^{3}+8\,b^{5/2}\sqrt{ax+b}-10\,xab^{3/2}\sqrt{ax+b}+15\,x^{2}a^{2}\sqrt{b}\sqrt{ax+b}\right)x^{-\frac{5}{2}}b^{-\frac{7}{2}}\frac{1}{\sqrt{ax+b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^(1/2)/x^(9/2),x)
```

```
[Out] -1/24*((a*x+b)/x)^(1/2)*(-15*arctanh((a*x+b)^(1/2)/b^(1/2))*a^3*x
^3+8*b^(5/2)*(a*x+b)^(1/2)-10*x*a*b^(3/2)*(a*x+b)^(1/2)+15*x^2*a^
2*b^(1/2)*(a*x+b)^(1/2))/x^(5/2)/b^(7/2)/(a*x+b)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*x^(9/2)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.241659, size = 1, normalized size = 0.01

$$\left[\frac{15\,a^{3}x^{3}\log\left(\frac{2\,b\sqrt{x}\sqrt{\frac{ax+b}{x}}+(ax+2\,b)\sqrt{b}}{x}\right)-2\left(15\,a^{2}x^{2}-10\,abx+8\,b^{2}\right)\sqrt{b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}{48\,b^{\frac{7}{2}}x^{3}},\ -\frac{15\,a^{3}x^{3}\arctan\left(\frac{b}{\sqrt{-b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}\right)+\left(15\,a^{2}x^{2}-10\,abx+8\,b^{2}\right)\sqrt{-b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}{24\,\sqrt{-b}b^{3}x^{3}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*x^(9/2)),x, algorithm="fricas")
```

```
[Out] [1/48*(15*a^3*x^3*log((2*b*sqrt(x)*sqrt((a*x + b)/x) + (a*x + 2*b
)*sqrt(b))/x) - 2*(15*a^2*x^2 - 10*a*b*x + 8*b^2)*sqrt(b)*sqrt(x)
*sqrt((a*x + b)/x))/(b^(7/2)*x^3), -1/24*(15*a^3*x^3*arctan(b/(sq
rt(-b)*sqrt(x)*sqrt((a*x + b)/x))) + (15*a^2*x^2 - 10*a*b*x + 8*b
^2)*sqrt(-b)*sqrt(x)*sqrt((a*x + b)/x))/(sqrt(-b)*b^3*x^3)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(1/2)/x**(9/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.272582, size = 97, normalized size = 0.89

$$-\frac{1}{24}\,a^3\left(\frac{15\,\arctan\left(\frac{\sqrt{ax+b}}{\sqrt{-b}}\right)}{\sqrt{-b}b^3}+\frac{15\,(ax+b)^{\frac{5}{2}}-40\,(ax+b)^{\frac{3}{2}}b+33\,\sqrt{ax+b}b^2}{a^3b^3x^3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x)*x^(9/2)),x, algorithm="giac")
```

```
[Out] -1/24*a^3*(15*arctan(sqrt(a*x + b)/sqrt(-b))/(sqrt(-b)*b^3) + (15
*(a*x + b)^(5/2) - 40*(a*x + b)^(3/2)*b + 33*sqrt(a*x + b)*b^2)/(
a^3*b^3*x^3))
```

3.1784 $\int \frac{x^{5/2}}{\left(a+\frac{b}{x}\right)^{3/2}}\,dx$

Optimal. Leaf size=126

$$-\frac{256b^4}{35a^5\sqrt{x}\sqrt{a+\frac{b}{x}}}-\frac{128b^3\sqrt{x}}{35a^4\sqrt{a+\frac{b}{x}}}+\frac{32b^2x^{3/2}}{35a^3\sqrt{a+\frac{b}{x}}}-\frac{16bx^{5/2}}{35a^2\sqrt{a+\frac{b}{x}}}+\frac{2x^{7/2}}{7a\sqrt{a+\frac{b}{x}}}$$

```
[Out] (-256*b^4)/(35*a^5*Sqrt[a + b/x]*Sqrt[x]) - (128*b^3*Sqrt[x])/(35
*a^4*Sqrt[a + b/x]) + (32*b^2*x^(3/2))/(35*a^3*Sqrt[a + b/x]) - (
16*b*x^(5/2))/(35*a^2*Sqrt[a + b/x]) + (2*x^(7/2))/(7*a*Sqrt[a +
b/x])
```

Rubi [A] time = 0.15138, antiderivative size = 126, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{256b^4}{35a^5\sqrt{x}\sqrt{a+\frac{b}{x}}}-\frac{128b^3\sqrt{x}}{35a^4\sqrt{a+\frac{b}{x}}}+\frac{32b^2x^{3/2}}{35a^3\sqrt{a+\frac{b}{x}}}-\frac{16bx^{5/2}}{35a^2\sqrt{a+\frac{b}{x}}}+\frac{2x^{7/2}}{7a\sqrt{a+\frac{b}{x}}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(5/2)/(a + b/x)^(3/2),x]
```

```
[Out] (-256*b^4)/(35*a^5*Sqrt[a + b/x]*Sqrt[x]) - (128*b^3*Sqrt[x])/(35
*a^4*Sqrt[a + b/x]) + (32*b^2*x^(3/2))/(35*a^3*Sqrt[a + b/x]) - (
16*b*x^(5/2))/(35*a^2*Sqrt[a + b/x]) + (2*x^(7/2))/(7*a*Sqrt[a +
b/x])
```

Rubi in Sympy [A] time = 13.4756, size = 110, normalized size = 0.87

$$\frac{2x^{\frac{7}{2}}}{7a\sqrt{a+\frac{b}{x}}}-\frac{16bx^{\frac{5}{2}}}{35a^2\sqrt{a+\frac{b}{x}}}+\frac{32b^2x^{\frac{3}{2}}}{35a^3\sqrt{a+\frac{b}{x}}}-\frac{128b^3\sqrt{x}}{35a^4\sqrt{a+\frac{b}{x}}}-\frac{256b^4}{35a^5\sqrt{x}\sqrt{a+\frac{b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(5/2)/(a+b/x)**(3/2),x)
```

```
[Out] 2*x**(7/2)/(7*a*sqrt(a + b/x)) - 16*b*x**(5/2)/(35*a**2*sqrt(a +
b/x)) + 32*b**2*x**(3/2)/(35*a**3*sqrt(a + b/x)) - 128*b**3*sqrt(
x)/(35*a**4*sqrt(a + b/x)) - 256*b**4/(35*a**5*sqrt(x)*sqrt(a + b
/x))
```

Mathematica [A] time = 0.0622255, size = 71, normalized size = 0.56

$$\frac{2\sqrt{x}\sqrt{a+\frac{b}{x}}\left(5a^4x^4-8a^3bx^3+16a^2b^2x^2-64ab^3x-128b^4\right)}{35a^5(ax+b)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(5/2)/(a + b/x)^(3/2),x]
```

```
[Out] (2*Sqrt[a + b/x]*Sqrt[x]*(-128*b^4 - 64*a*b^3*x + 16*a^2*b^2*x^2
- 8*a^3*b*x^3 + 5*a^4*x^4))/(35*a^5*(b + a*x))
```

Maple [A] time = 0.008, size = 66, normalized size = 0.5

$$\frac{(2\,ax+2\,b)\left(5\,x^4a^4-8\,bx^3a^3+16\,b^2x^2a^2-64\,b^3xa-128\,b^4\right)x^{-\frac{3}{2}}}{35\,a^5}\left(\frac{ax+b}{x}\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(5/2)/(a+b/x)^(3/2),x)
```

```
[Out] 2/35*(a*x+b)*(5*a^4*x^4-8*a^3*b*x^3+16*a^2*b^2*x^2-64*a*b^3*x-128
*b^4)/a^5/x^(3/2)/((a*x+b)/x)^(3/2)
```

Maxima [A] time = 1.44638, size = 122, normalized size = 0.97

$$-\frac{2\,b^4}{\sqrt{a+\frac{b}{x}}a^5\sqrt{x}}+\frac{2\left(5\left(a+\frac{b}{x}\right)^{\frac{7}{2}}x^{\frac{7}{2}}-28\left(a+\frac{b}{x}\right)^{\frac{5}{2}}bx^{\frac{5}{2}}+70\left(a+\frac{b}{x}\right)^{\frac{3}{2}}b^2x^{\frac{3}{2}}-140\sqrt{a+\frac{b}{x}}b^3\sqrt{x}\right)}{35\,a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5/2)/(a + b/x)^(3/2),x, algorithm="maxima")
```

```
[Out] -2*b^4/(sqrt(a + b/x)*a^5*sqrt(x)) + 2/35*(5*(a + b/x)^(7/2)*x^(7
/2) - 28*(a + b/x)^(5/2)*b*x^(5/2) + 70*(a + b/x)^(3/2)*b^2*x^(3/
2) - 140*sqrt(a + b/x)*b^3*sqrt(x))/a^5
```

Fricas [A] time = 0.234759, size = 81, normalized size = 0.64

$$\frac{2\left(5\,a^4x^4-8\,a^3bx^3+16\,a^2b^2x^2-64\,ab^3x-128\,b^4\right)}{35\,a^5\sqrt{x}\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5/2)/(a + b/x)^(3/2),x, algorithm="fricas")
```

```
[Out] 2/35*(5*a^4*x^4 - 8*a^3*b*x^3 + 16*a^2*b^2*x^2 - 64*a*b^3*x - 128
*b^4)/(a^5*sqrt(x)*sqrt((a*x + b)/x))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(5/2)/(a+b/x)**(3/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.231839, size = 95, normalized size = 0.75

$$\frac{256\,b^{\frac{7}{2}}}{35\,a^5}+\frac{2\left(5\,(ax+b)^{\frac{7}{2}}-28\,(ax+b)^{\frac{5}{2}}b+70\,(ax+b)^{\frac{3}{2}}b^2-140\,\sqrt{ax+b}b^3-\frac{35\,b^4}{\sqrt{ax+b}}\right)}{35\,a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5/2)/(a + b/x)^(3/2),x, algorithm="giac")
```

```
[Out] 256/35*b^(7/2)/a^5 + 2/35*(5*(a*x + b)^(7/2) - 28*(a*x + b)^(5/2)
*b + 70*(a*x + b)^(3/2)*b^2 - 140*sqrt(a*x + b)*b^3 - 35*b^4/sqrt
(a*x + b))/a^5
```

3.1785 $\int \frac{x^{3/2}}{\left(a+\frac{b}{x}\right)^{3/2}}\,dx$

Optimal. Leaf size=100

$$\frac{32b^3}{5a^4\sqrt{x}\sqrt{a+\frac{b}{x}}}+\frac{16b^2\sqrt{x}}{5a^3\sqrt{a+\frac{b}{x}}}-\frac{4bx^{3/2}}{5a^2\sqrt{a+\frac{b}{x}}}+\frac{2x^{5/2}}{5a\sqrt{a+\frac{b}{x}}}$$

```
[Out] (32*b^3)/(5*a^4*Sqrt[a + b/x]*Sqrt[x]) + (16*b^2*Sqrt[x])/(5*a^3*
Sqrt[a + b/x]) - (4*b*x^(3/2))/(5*a^2*Sqrt[a + b/x]) + (2*x^(5/2)
)/(5*a*Sqrt[a + b/x])
```

Rubi [A] time = 0.116165, antiderivative size = 100, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{32b^3}{5a^4\sqrt{x}\sqrt{a+\frac{b}{x}}}+\frac{16b^2\sqrt{x}}{5a^3\sqrt{a+\frac{b}{x}}}-\frac{4bx^{3/2}}{5a^2\sqrt{a+\frac{b}{x}}}+\frac{2x^{5/2}}{5a\sqrt{a+\frac{b}{x}}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(3/2)/(a + b/x)^(3/2),x]
```

```
[Out] (32*b^3)/(5*a^4*Sqrt[a + b/x]*Sqrt[x]) + (16*b^2*Sqrt[x])/(5*a^3*
Sqrt[a + b/x]) - (4*b*x^(3/2))/(5*a^2*Sqrt[a + b/x]) + (2*x^(5/2)
)/(5*a*Sqrt[a + b/x])
```

Rubi in Sympy [A] time = 9.78856, size = 87, normalized size = 0.87

$$\frac{2x^{\frac{5}{2}}}{5a\sqrt{a+\frac{b}{x}}}-\frac{4bx^{\frac{3}{2}}}{5a^2\sqrt{a+\frac{b}{x}}}+\frac{16b^2\sqrt{x}}{5a^3\sqrt{a+\frac{b}{x}}}+\frac{32b^3}{5a^4\sqrt{x}\sqrt{a+\frac{b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(3/2)/(a+b/x)**(3/2),x)
```

```
[Out] 2*x**(5/2)/(5*a*sqrt(a + b/x)) - 4*b*x**(3/2)/(5*a**2*sqrt(a + b/
x)) + 16*b**2*sqrt(x)/(5*a**3*sqrt(a + b/x)) + 32*b**3/(5*a**4*sq
rt(x)*sqrt(a + b/x))
```

Mathematica [A] time = 0.0523591, size = 59, normalized size = 0.59

$$\frac{2\sqrt{x}\sqrt{a+\frac{b}{x}}\left(a^3x^3-2a^2bx^2+8ab^2x+16b^3\right)}{5a^4(ax+b)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(3/2)/(a + b/x)^(3/2),x]
```

```
[Out] (2*Sqrt[a + b/x]*Sqrt[x]*(16*b^3 + 8*a*b^2*x - 2*a^2*b*x^2 + a^3*
x^3))/(5*a^4*(b + a*x))
```

Maple [A] time = 0.007, size = 54, normalized size = 0.5

$$\frac{(2\,ax+2\,b)\left(a^{3}x^{3}-2\,a^{2}bx^{2}+8\,ab^{2}x+16\,b^{3}\right)}{5\,a^{4}}x^{-\frac{3}{2}}\left(\frac{ax+b}{x}\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(3/2)/(a+b/x)^(3/2),x)
```

```
[Out] 2/5*(a*x+b)*(a^3*x^3-2*a^2*b*x^2+8*a*b^2*x+16*b^3)/a^4/x^(3/2)/((
a*x+b)/x)^(3/2)
```

Maxima [A] time = 1.43729, size = 97, normalized size = 0.97

$$\frac{2\,b^{3}}{\sqrt{a+\frac{b}{x}}a^{4}\sqrt{x}}+\frac{2\left(\left(a+\frac{b}{x}\right)^{\frac{5}{2}}x^{\frac{5}{2}}-5\left(a+\frac{b}{x}\right)^{\frac{3}{2}}bx^{\frac{3}{2}}+15\,\sqrt{a+\frac{b}{x}}b^{2}\sqrt{x}\right)}{5\,a^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2)/(a + b/x)^(3/2),x, algorithm="maxima")
```

```
[Out] 2*b^3/(sqrt(a + b/x)*a^4*sqrt(x)) + 2/5*((a + b/x)^(5/2)*x^(5/2)
- 5*(a + b/x)^(3/2)*b*x^(3/2) + 15*sqrt(a + b/x)*b^2*sqrt(x))/a^4
```

Fricas [A] time = 0.240053, size = 65, normalized size = 0.65

$$\frac{2\left(a^{3}x^{3}-2\,a^{2}bx^{2}+8\,ab^{2}x+16\,b^{3}\right)}{5\,a^{4}\sqrt{x}\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2)/(a + b/x)^(3/2),x, algorithm="fricas")
```

```
[Out] 2/5*(a^3*x^3 - 2*a^2*b*x^2 + 8*a*b^2*x + 16*b^3)/(a^4*sqrt(x)*sqr
t((a*x + b)/x))
```

Sympy [A] time = 67.3706, size = 320, normalized size = 3.2

$$\frac{2a^{5}b^{\frac{19}{2}}x^{5}\sqrt{\frac{ax}{b}+1}}{5a^{7}b^{9}x^{3}+15a^{6}b^{10}x^{2}+15a^{5}b^{11}x+5a^{4}b^{12}}+\frac{10a^{3}b^{\frac{23}{2}}x^{3}\sqrt{\frac{ax}{b}+1}}{5a^{7}b^{9}x^{3}+15a^{6}b^{10}x^{2}+15a^{5}b^{11}x+5a^{4}b^{12}}+\frac{60a^{2}b^{\frac{25}{2}}x^{2}\sqrt{\frac{ax}{b}+1}}{5a^{7}b^{9}x^{3}+15a^{6}b^{10}x^{2}+15a^{5}b^{11}x+5a^{4}b^{12}}+\frac{80ab^{\frac{27}{2}}x\sqrt{\frac{ax}{b}+1}}{5a^{7}b^{9}x^{3}+15a^{6}b^{10}x^{2}+15a^{5}b^{11}x+5a^{4}b^{12}}+\frac{32b^{\frac{29}{2}}\sqrt{\frac{ax}{b}+1}}{5a^{7}b^{9}x^{3}+15a^{6}b^{10}x^{2}+15a^{5}b^{11}x+5a^{4}b^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(3/2)/(a+b/x)**(3/2),x)
```

```
[Out] 2*a**5*b**(19/2)*x**5*sqrt(a*x/b + 1)/(5*a**7*b**9*x**3 + 15*a**6
*b**10*x**2 + 15*a**5*b**11*x + 5*a**4*b**12) + 10*a**3*b**(23/2)
*x**3*sqrt(a*x/b + 1)/(5*a**7*b**9*x**3 + 15*a**6*b**10*x**2 + 15
*a**5*b**11*x + 5*a**4*b**12) + 60*a**2*b**(25/2)*x**2*sqrt(a*x/b
```

```
 + 1)/(5*a**7*b**9*x**3 + 15*a**6*b**10*x**2 + 15*a**5*b**11*x +
5*a**4*b**12) + 80*a*b**(27/2)*x*sqrt(a*x/b + 1)/(5*a**7*b**9*x**
3 + 15*a**6*b**10*x**2 + 15*a**5*b**11*x + 5*a**4*b**12) + 32*b**
(29/2)*sqrt(a*x/b + 1)/(5*a**7*b**9*x**3 + 15*a**6*b**10*x**2 + 1
5*a**5*b**11*x + 5*a**4*b**12)
```

GIAC/XCAS [A] time = 0.227292, size = 76, normalized size = 0.76

$$-\frac{32\,b^{\frac{5}{2}}}{5\,a^4}+\frac{2\left((ax+b)^{\frac{5}{2}}-5\,(ax+b)^{\frac{3}{2}}b+15\,\sqrt{ax+b}b^2+\frac{5\,b^3}{\sqrt{ax+b}}\right)}{5\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2)/(a + b/x)^(3/2),x, algorithm="giac")
```

```
[Out] -32/5*b^(5/2)/a^4 + 2/5*((a*x + b)^(5/2) - 5*(a*x + b)^(3/2)*b +
15*sqrt(a*x + b)*b^2 + 5*b^3/sqrt(a*x + b))/a^4
```

3.1786 $\int \frac{\sqrt{x}}{\left(a+\frac{b}{x}\right)^{3/2}}\,dx$

Optimal. Leaf size=74

$$-\frac{16b^2}{3a^3\sqrt{x}\sqrt{a+\frac{b}{x}}}-\frac{8b\sqrt{x}}{3a^2\sqrt{a+\frac{b}{x}}}+\frac{2x^{3/2}}{3a\sqrt{a+\frac{b}{x}}}$$

```
[Out] (-16*b^2)/(3*a^3*Sqrt[a + b/x]*Sqrt[x]) - (8*b*Sqrt[x])/(3*a^2*Sq
rt[a + b/x]) + (2*x^(3/2))/(3*a*Sqrt[a + b/x])
```

Rubi [A] time = 0.0818078, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{16b^2}{3a^3\sqrt{x}\sqrt{a+\frac{b}{x}}}-\frac{8b\sqrt{x}}{3a^2\sqrt{a+\frac{b}{x}}}+\frac{2x^{3/2}}{3a\sqrt{a+\frac{b}{x}}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[x]/(a + b/x)^(3/2),x]
```

```
[Out] (-16*b^2)/(3*a^3*Sqrt[a + b/x]*Sqrt[x]) - (8*b*Sqrt[x])/(3*a^2*Sq
rt[a + b/x]) + (2*x^(3/2))/(3*a*Sqrt[a + b/x])
```

Rubi in Sympy [A] time = 6.73129, size = 63, normalized size = 0.85

$$\frac{2x^{\frac{3}{2}}}{3a\sqrt{a+\frac{b}{x}}}-\frac{8b\sqrt{x}}{3a^2\sqrt{a+\frac{b}{x}}}-\frac{16b^2}{3a^3\sqrt{x}\sqrt{a+\frac{b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(1/2)/(a+b/x)**(3/2),x)
```

```
[Out] 2*x**(3/2)/(3*a*sqrt(a + b/x)) - 8*b*sqrt(x)/(3*a**2*sqrt(a + b/x
)) - 16*b**2/(3*a**3*sqrt(x)*sqrt(a + b/x))
```

Mathematica [A] time = 0.0510546, size = 48, normalized size = 0.65

$$\frac{2\sqrt{x}\sqrt{a+\frac{b}{x}}\left(a^2x^2-4abx-8b^2\right)}{3a^3(ax+b)}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[x]/(a + b/x)^(3/2),x]
```

```
[Out] (2*Sqrt[a + b/x]*Sqrt[x]*(-8*b^2 - 4*a*b*x + a^2*x^2))/(3*a^3*(b
+ a*x))
```

Maple [A] time = 0.007, size = 43, normalized size = 0.6

$$\frac{(2\,ax+2\,b)\left(a^2x^2-4\,abx-8\,b^2\right)}{3\,a^3}x^{-\frac{3}{2}}\left(\frac{ax+b}{x}\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(1/2)/(a+b/x)^(3/2),x)
```

```
[Out] 2/3*(a*x+b)*(a^2*x^2-4*a*b*x-8*b^2)/a^3/x^(3/2)/((a*x+b)/x)^(3/2)
```

Maxima [A] time = 1.44394, size = 74, normalized size = 1.

$$\frac{2\left(\left(a+\frac{b}{x}\right)^{\frac{3}{2}}x^{\frac{3}{2}}-6\sqrt{a+\frac{b}{x}}b\sqrt{x}\right)}{3a^{3}}-\frac{2b^{2}}{\sqrt{a+\frac{b}{x}}a^{3}\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(a + b/x)^(3/2),x, algorithm="maxima")
```

```
[Out] 2/3*((a + b/x)^(3/2)*x^(3/2) - 6*sqrt(a + b/x)*b*sqrt(x))/a^3 - 2
*b^2/(sqrt(a + b/x)*a^3*sqrt(x))
```

Fricas [A] time = 0.227952, size = 50, normalized size = 0.68

$$\frac{2\left(a^{2}x^{2}-4abx-8b^{2}\right)}{3a^{3}\sqrt{x}\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(a + b/x)^(3/2),x, algorithm="fricas")
```

```
[Out] 2/3*(a^2*x^2 - 4*a*b*x - 8*b^2)/(a^3*sqrt(x)*sqrt((a*x + b)/x))
```

Sympy [A] time = 16.802, size = 206, normalized size = 2.78

$$\frac{2a^{3}b^{\frac{9}{2}}x^{3}\sqrt{\frac{ax}{b}+1}}{3a^{5}b^{4}x^{2}+6a^{4}b^{5}x+3a^{3}b^{6}}-\frac{6a^{2}b^{\frac{11}{2}}x^{2}\sqrt{\frac{ax}{b}+1}}{3a^{5}b^{4}x^{2}+6a^{4}b^{5}x+3a^{3}b^{6}}-\frac{24ab^{\frac{13}{2}}x\sqrt{\frac{ax}{b}+1}}{3a^{5}b^{4}x^{2}+6a^{4}b^{5}x+3a^{3}b^{6}}-\frac{16b^{\frac{15}{2}}\sqrt{\frac{ax}{b}+1}}{3a^{5}b^{4}x^{2}+6a^{4}b^{5}x+3a^{3}b^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(1/2)/(a+b/x)**(3/2),x)
```

```
[Out] 2*a**3*b**(9/2)*x**3*sqrt(a*x/b + 1)/(3*a**5*b**4*x**2 + 6*a**4*b
**5*x + 3*a**3*b**6) - 6*a**2*b**(11/2)*x**2*sqrt(a*x/b + 1)/(3*a
**5*b**4*x**2 + 6*a**4*b**5*x + 3*a**3*b**6) - 24*a*b**(13/2)*x*s
qrt(a*x/b + 1)/(3*a**5*b**4*x**2 + 6*a**4*b**5*x + 3*a**3*b**6) -
 16*b**(15/2)*sqrt(a*x/b + 1)/(3*a**5*b**4*x**2 + 6*a**4*b**5*x +
 3*a**3*b**6)
```

GIAC/XCAS [A] time = 0.234486, size = 59, normalized size = 0.8

$$\frac{16b^{\frac{3}{2}}}{3a^{3}}+\frac{2\left((ax+b)^{\frac{3}{2}}-6\sqrt{ax+b}b-\frac{3b^{2}}{\sqrt{ax+b}}\right)}{3a^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(a + b/x)^(3/2),x, algorithm="giac")
```

```
[Out] 16/3*b^(3/2)/a^3 + 2/3*((a*x + b)^(3/2) - 6*sqrt(a*x + b)*b - 3*b
^2/sqrt(a*x + b))/a^3
```

3.1787 $\int \frac{1}{\left(a+\frac{b}{x}\right)^{3/2}\sqrt{x}}\,dx$

Optimal. Leaf size=44

$$\frac{4b}{a^2\sqrt{x}\sqrt{a+\frac{b}{x}}}+\frac{2\sqrt{x}}{a\sqrt{a+\frac{b}{x}}}$$

```
[Out] (4*b)/(a^2*Sqrt[a + b/x]*Sqrt[x]) + (2*Sqrt[x])/(a*Sqrt[a + b/x])
```

Rubi [A] time = 0.0531805, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{4b}{a^2\sqrt{x}\sqrt{a+\frac{b}{x}}}+\frac{2\sqrt{x}}{a\sqrt{a+\frac{b}{x}}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^(3/2)*Sqrt[x]),x]
```

```
[Out] (4*b)/(a^2*Sqrt[a + b/x]*Sqrt[x]) + (2*Sqrt[x])/(a*Sqrt[a + b/x])
```

Rubi in Sympy [A] time = 4.29511, size = 36, normalized size = 0.82

$$\frac{2\sqrt{x}}{a\sqrt{a+\frac{b}{x}}}+\frac{4b}{a^2\sqrt{x}\sqrt{a+\frac{b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**(3/2)/x**(1/2),x)
```

```
[Out] 2*sqrt(x)/(a*sqrt(a + b/x)) + 4*b/(a**2*sqrt(x)*sqrt(a + b/x))
```

Mathematica [A] time = 0.0438773, size = 35, normalized size = 0.8

$$\frac{2\sqrt{x}\sqrt{a+\frac{b}{x}}(ax+2b)}{a^2(ax+b)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^(3/2)*Sqrt[x]),x]
```

```
[Out] (2*Sqrt[a + b/x]*Sqrt[x]*(2*b + a*x))/(a^2*(b + a*x))
```

Maple [A] time = 0.004, size = 32, normalized size = 0.7

$$2\,\frac{(ax+b)(ax+2\,b)}{a^2x^{3/2}}\left(\frac{ax+b}{x}\right)^{-3/2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^(3/2)/x^(1/2),x)

[Out] 2*(a*x+b)*(a*x+2*b)/a^2/x^(3/2)/((a*x+b)/x)^(3/2)
```

Maxima [A] time = 1.44857, size = 49, normalized size = 1.11

$$\frac{2\sqrt{a+\frac{b}{x}}\sqrt{x}}{a^2}+\frac{2\,b}{\sqrt{a+\frac{b}{x}}a^2\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*sqrt(x)),x, algorithm="maxima")

[Out] 2*sqrt(a + b/x)*sqrt(x)/a^2 + 2*b/(sqrt(a + b/x)*a^2*sqrt(x))
```

Fricas [A] time = 0.234281, size = 35, normalized size = 0.8

$$\frac{2\,(ax+2\,b)}{a^2\sqrt{x}\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*sqrt(x)),x, algorithm="fricas")

[Out] 2*(a*x + 2*b)/(a^2*sqrt(x)*sqrt((a*x + b)/x))
```

Sympy [A] time = 26.7802, size = 39, normalized size = 0.89

$$\frac{2x}{a\sqrt{b}\sqrt{\frac{ax}{b}+1}}+\frac{4\sqrt{b}}{a^2\sqrt{\frac{ax}{b}+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(3/2)/x**(1/2),x)

[Out] 2*x/(a*sqrt(b)*sqrt(a*x/b + 1)) + 4*sqrt(b)/(a**2*sqrt(a*x/b + 1)
)
```

GIAC/XCAS [A] time = 0.229112, size = 42, normalized size = 0.95

$$\frac{2\left(\sqrt{ax+b}+\frac{b}{\sqrt{ax+b}}\right)}{a^2}-\frac{4\sqrt{b}}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*sqrt(x)),x, algorithm="giac")

[Out] 2*(sqrt(a*x + b) + b/sqrt(a*x + b))/a^2 - 4*sqrt(b)/a^2
```

3.1788 $\int \frac{1}{\left(a+\frac{b}{x}\right)^{3/2} x^{3/2}} \, dx$

Optimal. Leaf size=21

$$-\frac{2}{a\sqrt{x}\sqrt{a+\frac{b}{x}}}$$

```
[Out] -2/(a*Sqrt[a + b/x]*Sqrt[x])
```

Rubi [A] time = 0.025686, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.059$

$$-\frac{2}{a\sqrt{x}\sqrt{a+\frac{b}{x}}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b/x)^(3/2)*x^(3/2)),x]
```

```
[Out] -2/(a*Sqrt[a + b/x]*Sqrt[x])
```

Rubi in Sympy [A] time = 2.73657, size = 17, normalized size = 0.81

$$-\frac{2}{a\sqrt{x}\sqrt{a+\frac{b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b/x)**(3/2)/x**(3/2),x)
```

```
[Out] -2/(a*sqrt(x)*sqrt(a + b/x))
```

Mathematica [A] time = 0.0339656, size = 30, normalized size = 1.43

$$-\frac{2\sqrt{x}\sqrt{\frac{ax+b}{x}}}{a(ax+b)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b/x)^(3/2)*x^(3/2)),x]
```

```
[Out] (-2*Sqrt[x]*Sqrt[(b + a*x)/x])/(a*(b + a*x))
```

Maple [A] time = 0.004, size = 25, normalized size = 1.2

$$-2\,\frac{ax+b}{ax^{3/2}}\left(\frac{ax+b}{x}\right)^{-3/2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^(3/2)/x^(3/2),x)
```

```
[Out] -2*(a*x+b)/a/((a*x+b)/x)^(3/2)/x^(3/2)
```

Maxima [A] time = 1.43356, size = 23, normalized size = 1.1

$$-\frac{2}{\sqrt{a+\frac{b}{x}}a\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x^(3/2)),x, algorithm="maxima")
```

```
[Out] -2/(sqrt(a + b/x)*a*sqrt(x))
```

Fricas [A] time = 0.234193, size = 26, normalized size = 1.24

$$-\frac{2}{a\sqrt{x}\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x^(3/2)),x, algorithm="fricas")
```

```
[Out] -2/(a*sqrt(x)*sqrt((a*x + b)/x))
```

Sympy [A] time = 107.435, size = 19, normalized size = 0.9

$$-\frac{2}{a\sqrt{b}\sqrt{\frac{ax}{b}+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(3/2)/x**(3/2),x)
```

```
[Out] -2/(a*sqrt(b)*sqrt(a*x/b + 1))
```

GIAC/XCAS [A] time = 0.232329, size = 28, normalized size = 1.33

$$-\frac{2}{\sqrt{ax+b}a}+\frac{2}{a\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x^(3/2)),x, algorithm="giac")
```

```
[Out] -2/(sqrt(a*x + b)*a) + 2/(a*sqrt(b))
```

3.1789 $\int \frac{1}{\left(a+\frac{b}{x}\right)^{3/2} x^{5/2}} \, dx$

Optimal. Leaf size=52

$$\frac{2}{b\sqrt{x}\sqrt{a+\frac{b}{x}}}-\frac{2\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{b^{3/2}}$$

```
[Out] 2/(b*Sqrt[a + b/x]*Sqrt[x]) - (2*ArcTanh[Sqrt[b]/(Sqrt[a + b/x]*S
qrt[x])])/b^(3/2)
```

Rubi [A] time = 0.0778538, antiderivative size = 52, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.235

$$\frac{2}{b\sqrt{x}\sqrt{a+\frac{b}{x}}}-\frac{2\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{b^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^(3/2)*x^(5/2)),x]
```

```
[Out] 2/(b*Sqrt[a + b/x]*Sqrt[x]) - (2*ArcTanh[Sqrt[b]/(Sqrt[a + b/x]*S
qrt[x])])/b^(3/2)
```

Rubi in Sympy [A] time = 8.1495, size = 42, normalized size = 0.81

$$\frac{2}{b\sqrt{x}\sqrt{a+\frac{b}{x}}}-\frac{2\,\mathrm{atanh}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{b^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**(3/2)/x**(5/2),x)
```

```
[Out] 2/(b*sqrt(x)*sqrt(a + b/x)) - 2*atanh(sqrt(b)/(sqrt(x)*sqrt(a + b
/x)))/b**(3/2)
```

Mathematica [A] time = 0.146486, size = 66, normalized size = 1.27

$$\frac{\frac{2\sqrt{b}\sqrt{x}\sqrt{a+\frac{b}{x}}}{ax+b}-2\log\left(\sqrt{b}\sqrt{x}\sqrt{a+\frac{b}{x}}+b\right)+\log(x)}{b^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^(3/2)*x^(5/2)),x]
```

```
[Out] ((2*Sqrt[b]*Sqrt[a + b/x]*Sqrt[x])/(b + a*x) - 2*Log[b + Sqrt[b]*
Sqrt[a + b/x]*Sqrt[x]] + Log[x])/b^(3/2)
```

Maple [A] time = 0.019, size = 52, normalized size = 1.

$$2\frac{\sqrt{x}}{b^{3/2}(ax+b)}\sqrt{\frac{ax+b}{x}}\left(-Artanh\left(\frac{\sqrt{ax+b}}{\sqrt{b}}\right)\sqrt{ax+b}+\sqrt{b}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^(3/2)/x^(5/2),x)
```

```
[Out] 2*((a*x+b)/x)^(1/2)*x^(1/2)*(-arctanh((a*x+b)^(1/2)/b^(1/2))*(a*x
+b)^(1/2)+b^(1/2))/b^(3/2)/(a*x+b)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x^(5/2)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.250448, size = 1, normalized size = 0.02

$$\left[\frac{\sqrt{x}\sqrt{\frac{ax+b}{x}}\log\left(-\frac{2\,b\sqrt{x}\sqrt{\frac{ax+b}{x}}-(ax+2\,b)\sqrt{b}}{x}\right)+2\,\sqrt{b}}{b^{\frac{3}{2}}\sqrt{x}\sqrt{\frac{ax+b}{x}}},\ \frac{2\left(\sqrt{x}\sqrt{\frac{ax+b}{x}}\arctan\left(\frac{b}{\sqrt{-b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}\right)+\sqrt{-b}\right)}{\sqrt{-b}b\sqrt{x}\sqrt{\frac{ax+b}{x}}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x^(5/2)),x, algorithm="fricas")
```

```
[Out] [(sqrt(x)*sqrt((a*x + b)/x)*log(-(2*b*sqrt(x)*sqrt((a*x + b)/x) -
 (a*x + 2*b)*sqrt(b))/x) + 2*sqrt(b))/(b^(3/2)*sqrt(x)*sqrt((a*x
+ b)/x)), 2*(sqrt(x)*sqrt((a*x + b)/x)*arctan(b/(sqrt(-b)*sqrt(x)
*sqrt((a*x + b)/x))) + sqrt(-b))/(sqrt(-b)*b*sqrt(x)*sqrt((a*x +
b)/x))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(3/2)/x**(5/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.228967, size = 90, normalized size = 1.73

$$\frac{2\,\arctan\left(\frac{\sqrt{ax+b}}{\sqrt{-b}}\right)}{\sqrt{-b}b}-\frac{2\left(\sqrt{b}\arctan\left(\frac{\sqrt{b}}{\sqrt{-b}}\right)+\sqrt{-b}\right)}{\sqrt{-b}b^{\frac{3}{2}}}+\frac{2}{\sqrt{ax+b}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x^(5/2)),x, algorithm="giac")
```

```
[Out] 2*arctan(sqrt(a*x + b)/sqrt(-b))/(sqrt(-b)*b) - 2*(sqrt(b)*arctan
(sqrt(b)/sqrt(-b)) + sqrt(-b))/(sqrt(-b)*b^(3/2)) + 2/(sqrt(a*x +
 b)*b)
```

3.1790 $\int \frac{1}{\left(a+\frac{b}{x}\right)^{3/2} x^{7/2}} \, dx$

Optimal. Leaf size=74

$$\frac{3a\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{b^{5/2}}-\frac{3\sqrt{a+\frac{b}{x}}}{b^2\sqrt{x}}+\frac{2}{bx^{3/2}\sqrt{a+\frac{b}{x}}}$$

```
[Out] 2/(b*Sqrt[a + b/x]*x^(3/2)) - (3*Sqrt[a + b/x])/(b^2*Sqrt[x]) + (
3*a*ArcTanh[Sqrt[b]/(Sqrt[a + b/x]*Sqrt[x])])/b^(5/2)
```

Rubi [A] time = 0.116558, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.294

$$\frac{3a\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{b^{5/2}}-\frac{3\sqrt{a+\frac{b}{x}}}{b^2\sqrt{x}}+\frac{2}{bx^{3/2}\sqrt{a+\frac{b}{x}}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^(3/2)*x^(7/2)),x]
```

```
[Out] 2/(b*Sqrt[a + b/x]*x^(3/2)) - (3*Sqrt[a + b/x])/(b^2*Sqrt[x]) + (
3*a*ArcTanh[Sqrt[b]/(Sqrt[a + b/x]*Sqrt[x])])/b^(5/2)
```

Rubi in Sympy [A] time = 11.9811, size = 63, normalized size = 0.85

$$\frac{3a\operatorname{atanh}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{b^{\frac{5}{2}}}+\frac{2}{bx^{\frac{3}{2}}\sqrt{a+\frac{b}{x}}}-\frac{3\sqrt{a+\frac{b}{x}}}{b^2\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**(3/2)/x**(7/2),x)
```

```
[Out] 3*a*atanh(sqrt(b)/(sqrt(x)*sqrt(a + b/x)))/b**(5/2) + 2/(b*x**(3/
2)*sqrt(a + b/x)) - 3*sqrt(a + b/x)/(b**2*sqrt(x))
```

Mathematica [A] time = 0.395971, size = 79, normalized size = 1.07

$$\frac{-\frac{2\sqrt{b}\sqrt{a+\frac{b}{x}}(3ax+b)}{\sqrt{x}(ax+b)}+6a\log\left(\sqrt{b}\sqrt{x}\sqrt{a+\frac{b}{x}}+b\right)-3a\log(x)}{2b^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^(3/2)*x^(7/2)),x]
```

```
[Out] ((-2*Sqrt[b]*Sqrt[a + b/x]*(b + 3*a*x))/(Sqrt[x]*(b + a*x)) + 6*a
*Log[b + Sqrt[b]*Sqrt[a + b/x]*Sqrt[x]] - 3*a*Log[x])/(2*b^(5/2))
```

Maple [A] time = 0.027, size = 61, normalized size = 0.8

$$-\frac{1}{ax+b}\sqrt{\frac{ax+b}{x}}\left(-3\,Artanh\left(\frac{\sqrt{ax+b}}{\sqrt{b}}\right)\sqrt{ax+b}xa+3\,ax\sqrt{b}+b^{\frac{3}{2}}\right)\frac{1}{\sqrt{x}}b^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^(3/2)/x^(7/2),x)
```

```
[Out] -((a*x+b)/x)^(1/2)*(-3*arctanh((a*x+b)^(1/2)/b^(1/2))*(a*x+b)^(1/
2)*x*a+3*a*x*b^(1/2)+b^(3/2))/x^(1/2)/(a*x+b)/b^(5/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x^(7/2)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.249103, size = 1, normalized size = 0.01

$$\left[\frac{3\,ax^{\frac{3}{2}}\sqrt{\frac{ax+b}{x}}\log\left(\frac{2\,b\sqrt{x}\sqrt{\frac{ax+b}{x}}+(ax+2\,b)\sqrt{b}}{x}\right)-2\,(3\,ax+b)\sqrt{b}}{2\,b^{\frac{5}{2}}x^{\frac{3}{2}}\sqrt{\frac{ax+b}{x}}},\ -\frac{3\,ax^{\frac{3}{2}}\sqrt{\frac{ax+b}{x}}\arctan\left(\frac{b}{\sqrt{-b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}\right)+(3\,ax+b)\sqrt{-b}}{\sqrt{-b}b^{2}x^{\frac{3}{2}}\sqrt{\frac{ax+b}{x}}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x^(7/2)),x, algorithm="fricas")
```

```
[Out] [1/2*(3*a*x^(3/2)*sqrt((a*x + b)/x)*log((2*b*sqrt(x)*sqrt((a*x +
b)/x) + (a*x + 2*b)*sqrt(b))/x) - 2*(3*a*x + b)*sqrt(b))/(b^(5/2)
*x^(3/2)*sqrt((a*x + b)/x)), -(3*a*x^(3/2)*sqrt((a*x + b)/x)*arct
an(b/(sqrt(-b)*sqrt(x)*sqrt((a*x + b)/x))) + (3*a*x + b)*sqrt(-b)
)/(sqrt(-b)*b^2*x^(3/2)*sqrt((a*x + b)/x))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(3/2)/x**(7/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.25126, size = 78, normalized size = 1.05

$$-a\left(\frac{3\arctan\left(\frac{\sqrt{ax+b}}{\sqrt{-b}}\right)}{\sqrt{-b}b^2}+\frac{3\,ax+b}{\left((ax+b)^{\frac{3}{2}}-\sqrt{ax+b}b\right)b^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x^(7/2)),x, algorithm="giac")
```

```
[Out] -a*(3*arctan(sqrt(a*x + b)/sqrt(-b))/(sqrt(-b)*b^2) + (3*a*x + b)
/(((a*x + b)^(3/2) - sqrt(a*x + b)*b)*b^2))
```

3.1791 $\int \frac{1}{\left(a+\frac{b}{x}\right)^{3/2} x^{9/2}} dx$

Optimal. Leaf size=104

$$-\frac{15a^2 \tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{4b^{7/2}}+\frac{15a\sqrt{a+\frac{b}{x}}}{4b^3\sqrt{x}}-\frac{5\sqrt{a+\frac{b}{x}}}{2b^2x^{3/2}}+\frac{2}{bx^{5/2}\sqrt{a+\frac{b}{x}}}$$

```
[Out] 2/(b*Sqrt[a + b/x]*x^(5/2)) - (5*Sqrt[a + b/x])/(2*b^2*x^(3/2)) +
 (15*a*Sqrt[a + b/x])/(4*b^3*Sqrt[x]) - (15*a^2*ArcTanh[Sqrt[b]/(
Sqrt[a + b/x]*Sqrt[x])])/(4*b^(7/2))
```

Rubi [A] time = 0.158061, antiderivative size = 104, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.294

$$-\frac{15a^2 \tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{4b^{7/2}}+\frac{15a\sqrt{a+\frac{b}{x}}}{4b^3\sqrt{x}}-\frac{5\sqrt{a+\frac{b}{x}}}{2b^2x^{3/2}}+\frac{2}{bx^{5/2}\sqrt{a+\frac{b}{x}}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^(3/2)*x^(9/2)),x]
```

```
[Out] 2/(b*Sqrt[a + b/x]*x^(5/2)) - (5*Sqrt[a + b/x])/(2*b^2*x^(3/2)) +
 (15*a*Sqrt[a + b/x])/(4*b^3*Sqrt[x]) - (15*a^2*ArcTanh[Sqrt[b]/(
Sqrt[a + b/x]*Sqrt[x])])/(4*b^(7/2))
```

Rubi in Sympy [A] time = 16.3229, size = 90, normalized size = 0.87

$$-\frac{15a^2 \operatorname{atanh}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{4b^{\frac{7}{2}}}+\frac{15a\sqrt{a+\frac{b}{x}}}{4b^3\sqrt{x}}+\frac{2}{bx^{\frac{5}{2}}\sqrt{a+\frac{b}{x}}}-\frac{5\sqrt{a+\frac{b}{x}}}{2b^2x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**(3/2)/x**(9/2),x)
```

```
[Out] -15*a**2*atanh(sqrt(b)/(sqrt(x)*sqrt(a + b/x)))/(4*b**(7/2)) + 15
*a*sqrt(a + b/x)/(4*b**3*sqrt(x)) + 2/(b*x**(5/2)*sqrt(a + b/x))
- 5*sqrt(a + b/x)/(2*b**2*x**(3/2))
```

Mathematica [A] time = 0.413656, size = 96, normalized size = 0.92

$$\frac{\frac{2\sqrt{b}\sqrt{a+\frac{b}{x}}(15a^2x^2+5abx-2b^2)}{x^{3/2}(ax+b)}-30a^2\log\left(\sqrt{b}\sqrt{x}\sqrt{a+\frac{b}{x}}+b\right)+15a^2\log(x)}{8b^{7/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^(3/2)*x^(9/2)),x]
```

```
[Out] ((2*Sqrt[b]*Sqrt[a + b/x]*(-2*b^2 + 5*a*b*x + 15*a^2*x^2))/(x^(3/
2)*(b + a*x)) - 30*a^2*Log[b + Sqrt[b]*Sqrt[a + b/x]*Sqrt[x]] + 1
5*a^2*Log[x])/(8*b^(7/2))
```

Maple [A] time = 0.028, size = 78, normalized size = 0.8

$$-\frac{1}{4\,ax+4\,b}\sqrt{\frac{ax+b}{x}}\left(15\,Artanh\left(\frac{\sqrt{ax+b}}{\sqrt{b}}\right)\sqrt{ax+b}x^{2}a^{2}-5\,b^{3/2}xa-15\,a^{2}x^{2}\sqrt{b}+2\,b^{5/2}\right)x^{-\frac{3}{2}}b^{-\frac{7}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^(3/2)/x^(9/2),x)
```

```
[Out] -1/4*((a*x+b)/x)^(1/2)/x^(3/2)*(15*arctanh((a*x+b)^(1/2)/b^(1/2))
*(a*x+b)^(1/2)*x^2*a^2-5*b^(3/2)*x*a-15*a^2*x^2*b^(1/2)+2*b^(5/2)
)/(a*x+b)/b^(7/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x^(9/2)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.248783, size = 1, normalized size = 0.01

$$\left[\frac{15\,a^{2}x^{\frac{5}{2}}\sqrt{\frac{ax+b}{x}}\log\left(-\frac{2\,b\sqrt{x}\sqrt{\frac{ax+b}{x}}-(ax+2\,b)\sqrt{b}}{x}\right)+2\left(15\,a^{2}x^{2}+5\,abx-2\,b^{2}\right)\sqrt{b}}{8\,b^{\frac{7}{2}}x^{\frac{5}{2}}\sqrt{\frac{ax+b}{x}}},\frac{15\,a^{2}x^{\frac{5}{2}}\sqrt{\frac{ax+b}{x}}\arctan\left(\frac{b}{\sqrt{-b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}\right)+(15}{4\sqrt{-b}b^{3}x^{\frac{5}{2}}\sqrt{\frac{ax+b}{x}}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x^(9/2)),x, algorithm="fricas")
```

```
[Out] [1/8*(15*a^2*x^(5/2)*sqrt((a*x + b)/x)*log(-(2*b*sqrt(x)*sqrt((a*
x + b)/x) - (a*x + 2*b)*sqrt(b))/x) + 2*(15*a^2*x^2 + 5*a*b*x - 2
*b^2)*sqrt(b))/(b^(7/2)*x^(5/2)*sqrt((a*x + b)/x)), 1/4*(15*a^2*x
^(5/2)*sqrt((a*x + b)/x)*arctan(b/(sqrt(-b)*sqrt(x)*sqrt((a*x + b
)/x))) + (15*a^2*x^2 + 5*a*b*x - 2*b^2)*sqrt(-b))/(sqrt(-b)*b^3*x
^(5/2)*sqrt((a*x + b)/x))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(3/2)/x**(9/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.261755, size = 97, normalized size = 0.93

$$\frac{1}{4}\,a^2\left(\frac{15\,\arctan\left(\frac{\sqrt{ax+b}}{\sqrt{-b}}\right)}{\sqrt{-b}b^3}+\frac{8}{\sqrt{ax+b}b^3}+\frac{7\,(ax+b)^{\frac{3}{2}}-9\,\sqrt{ax+b}b}{a^2b^3x^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x^(9/2)),x, algorithm="giac")
```

```
[Out] 1/4*a^2*(15*arctan(sqrt(a*x + b)/sqrt(-b))/(sqrt(-b)*b^3) + 8/(sq
rt(a*x + b)*b^3) + (7*(a*x + b)^(3/2) - 9*sqrt(a*x + b)*b)/(a^2*b
^3*x^2))
```

3.1792 $\int \frac{1}{\left(a+\frac{b}{x}\right)^{3/2} x^{11/2}} dx$

Optimal. Leaf size=130

$$\frac{35a^3\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{8b^{9/2}}-\frac{35a^2\sqrt{a+\frac{b}{x}}}{8b^4\sqrt{x}}+\frac{35a\sqrt{a+\frac{b}{x}}}{12b^3x^{3/2}}-\frac{7\sqrt{a+\frac{b}{x}}}{3b^2x^{5/2}}+\frac{2}{bx^{7/2}\sqrt{a+\frac{b}{x}}}$$

```
[Out] 2/(b*Sqrt[a + b/x]*x^(7/2)) - (7*Sqrt[a + b/x])/(3*b^2*x^(5/2)) +
 (35*a*Sqrt[a + b/x])/(12*b^3*x^(3/2)) - (35*a^2*Sqrt[a + b/x])/(
8*b^4*Sqrt[x]) + (35*a^3*ArcTanh[Sqrt[b]/(Sqrt[a + b/x]*Sqrt[x])]
)/(8*b^(9/2))
```

Rubi [A] time = 0.204955, antiderivative size = 130, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.294

$$\frac{35a^3\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{8b^{9/2}}-\frac{35a^2\sqrt{a+\frac{b}{x}}}{8b^4\sqrt{x}}+\frac{35a\sqrt{a+\frac{b}{x}}}{12b^3x^{3/2}}-\frac{7\sqrt{a+\frac{b}{x}}}{3b^2x^{5/2}}+\frac{2}{bx^{7/2}\sqrt{a+\frac{b}{x}}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^(3/2)*x^(11/2)),x]
```

```
[Out] 2/(b*Sqrt[a + b/x]*x^(7/2)) - (7*Sqrt[a + b/x])/(3*b^2*x^(5/2)) +
 (35*a*Sqrt[a + b/x])/(12*b^3*x^(3/2)) - (35*a^2*Sqrt[a + b/x])/(
8*b^4*Sqrt[x]) + (35*a^3*ArcTanh[Sqrt[b]/(Sqrt[a + b/x]*Sqrt[x])]
)/(8*b^(9/2))
```

Rubi in Sympy [A] time = 21.1822, size = 114, normalized size = 0.88

$$\frac{35a^3\operatorname{atanh}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{8b^{\frac{9}{2}}}-\frac{35a^2\sqrt{a+\frac{b}{x}}}{8b^4\sqrt{x}}+\frac{35a\sqrt{a+\frac{b}{x}}}{12b^3x^{\frac{3}{2}}}+\frac{2}{bx^{\frac{7}{2}}\sqrt{a+\frac{b}{x}}}-\frac{7\sqrt{a+\frac{b}{x}}}{3b^2x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**(3/2)/x**(11/2),x)
```

```
[Out] 35*a**3*atanh(sqrt(b)/(sqrt(x)*sqrt(a + b/x)))/(8*b**(9/2)) - 35*
a**2*sqrt(a + b/x)/(8*b**4*sqrt(x)) + 35*a*sqrt(a + b/x)/(12*b**3
*x**(3/2)) + 2/(b*x**(7/2)*sqrt(a + b/x)) - 7*sqrt(a + b/x)/(3*b*
*2*x**(5/2))
```

Mathematica [A] time = 0.424966, size = 107, normalized size = 0.82

$$\frac{210a^3\log\left(\sqrt{b}\sqrt{x}\sqrt{a+\frac{b}{x}}+b\right)-105a^3\log(x)-\frac{2\sqrt{b}\sqrt{a+\frac{b}{x}}\left(105a^3x^3+35a^2bx^2-14ab^2x+8b^3\right)}{x^{5/2}(ax+b)}}{48b^{9/2}}$$

Antiderivative was successfully verified.

```
[In]   Integrate[1/((a + b/x)^(3/2)*x^(11/2)),x]
```

```
[Out] ((-2*Sqrt[b]*Sqrt[a + b/x]*(8*b^3 - 14*a*b^2*x + 35*a^2*b*x^2 + 1
05*a^3*x^3))/(x^(5/2)*(b + a*x)) + 210*a^3*Log[b + Sqrt[b]*Sqrt[a
 + b/x]*Sqrt[x]] - 105*a^3*Log[x])/(48*b^(9/2))
```

Maple [A] time = 0.028, size = 89, normalized size = 0.7

$$-\frac{1}{24\,ax+24\,b}\sqrt{\frac{ax+b}{x}}\left(-105\,Artanh\left(\frac{\sqrt{ax+b}}{\sqrt{b}}\right)\sqrt{ax+b}x^3a^3-14\,b^{5/2}xa+35\,b^{3/2}x^2a^2+105\,x^3a^3\sqrt{b}+8\,b^{7/2}\right)x^{-\frac{5}{2}}b^{-\frac{9}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/(a+b/x)^(3/2)/x^(11/2),x)
```

```
[Out] -1/24*((a*x+b)/x)^(1/2)*(-105*arctanh((a*x+b)^(1/2)/b^(1/2))*(a*x
+b)^(1/2)*x^3*a^3-14*b^(5/2)*x*a+35*b^(3/2)*x^2*a^2+105*x^3*a^3*b
^(1/2)+8*b^(7/2))/x^(5/2)/(a*x+b)/b^(9/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x)^(3/2)*x^(11/2)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.24994, size = 1, normalized size = 0.01

$$\left[\frac{105\,a^3x^{\frac{7}{2}}\sqrt{\frac{ax+b}{x}}\log\left(\frac{2\,b\sqrt{x}\sqrt{\frac{ax+b}{x}}+(ax+2\,b)\sqrt{b}}{x}\right)-2\left(105\,a^3x^3+35\,a^2bx^2-14\,ab^2x+8\,b^3\right)\sqrt{b}}{48\,b^{\frac{9}{2}}x^{\frac{7}{2}}\sqrt{\frac{ax+b}{x}}},\right.$$
$$\left.-\frac{105\,a^3x^{\frac{7}{2}}\sqrt{\frac{ax+b}{x}}\arctan\left(\frac{b}{\sqrt{-b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}\right)+\left(105\,a^3x^3+35\,a^2bx^2-14\,ab^2x+8\,b^3\right)\sqrt{-b}}{24\,\sqrt{-b}b^4x^{\frac{7}{2}}\sqrt{\frac{ax+b}{x}}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x)^(3/2)*x^(11/2)),x, algorithm="fricas")
```

```
[Out] [1/48*(105*a^3*x^(7/2)*sqrt((a*x + b)/x)*log((2*b*sqrt(x)*sqrt((a
*x + b)/x) + (a*x + 2*b)*sqrt(b))/x) - 2*(105*a^3*x^3 + 35*a^2*b*
x^2 - 14*a*b^2*x + 8*b^3)*sqrt(b))/(b^(9/2)*x^(7/2)*sqrt((a*x + b
)/x)), -1/24*(105*a^3*x^(7/2)*sqrt((a*x + b)/x)*arctan(b/(sqrt(-b
)*sqrt(x)*sqrt((a*x + b)/x))) + (105*a^3*x^3 + 35*a^2*b*x^2 - 14*
a*b^2*x + 8*b^3)*sqrt(-b))/(sqrt(-b)*b^4*x^(7/2)*sqrt((a*x + b)/x
))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(3/2)/x**(11/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.365273, size = 113, normalized size = 0.87

$$-\frac{1}{24}\,a^{3}\left(\frac{105\,\arctan\left(\frac{\sqrt{ax+b}}{\sqrt{-b}}\right)}{\sqrt{-b}b^{4}}+\frac{48}{\sqrt{ax+b}b^{4}}+\frac{57\,(ax+b)^{\frac{5}{2}}-136\,(ax+b)^{\frac{3}{2}}b+87\,\sqrt{ax+b}b^{2}}{a^{3}b^{4}x^{3}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(3/2)*x^(11/2)),x, algorithm="giac")
```

```
[Out] -1/24*a^3*(105*arctan(sqrt(a*x + b)/sqrt(-b))/(sqrt(-b)*b^4) + 48
/(sqrt(a*x + b)*b^4) + (57*(a*x + b)^(5/2) - 136*(a*x + b)^(3/2)*
b + 87*sqrt(a*x + b)*b^2)/(a^3*b^4*x^3))
```

3.1793 $\int \frac{x^{5/2}}{\left(a+\frac{b}{x}\right)^{5/2}} dx$

Optimal. Leaf size=152

$$-\frac{512b^5}{21a^6x^{3/2}\left(a+\frac{b}{x}\right)^{3/2}}-\frac{256b^4}{7a^5\sqrt{x}\left(a+\frac{b}{x}\right)^{3/2}}-\frac{64b^3\sqrt{x}}{7a^4\left(a+\frac{b}{x}\right)^{3/2}}+\frac{32b^2x^{3/2}}{21a^3\left(a+\frac{b}{x}\right)^{3/2}}-\frac{4bx^{5/2}}{7a^2\left(a+\frac{b}{x}\right)^{3/2}}+\frac{2x^{7/2}}{7a\left(a+\frac{b}{x}\right)^{3/2}}$$

```
[Out] (-512*b^5)/(21*a^6*(a + b/x)^(3/2)*x^(3/2)) - (256*b^4)/(7*a^5*(a
 + b/x)^(3/2)*Sqrt[x]) - (64*b^3*Sqrt[x])/(7*a^4*(a + b/x)^(3/2))
 + (32*b^2*x^(3/2))/(21*a^3*(a + b/x)^(3/2)) - (4*b*x^(5/2))/(7*a
^2*(a + b/x)^(3/2)) + (2*x^(7/2))/(7*a*(a + b/x)^(3/2))
```

Rubi [A] time = 0.194291, antiderivative size = 152, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{512b^5}{21a^6x^{3/2}\left(a+\frac{b}{x}\right)^{3/2}}-\frac{256b^4}{7a^5\sqrt{x}\left(a+\frac{b}{x}\right)^{3/2}}-\frac{64b^3\sqrt{x}}{7a^4\left(a+\frac{b}{x}\right)^{3/2}}+\frac{32b^2x^{3/2}}{21a^3\left(a+\frac{b}{x}\right)^{3/2}}-\frac{4bx^{5/2}}{7a^2\left(a+\frac{b}{x}\right)^{3/2}}+\frac{2x^{7/2}}{7a\left(a+\frac{b}{x}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(5/2)/(a + b/x)^(5/2),x]
```

```
[Out] (-512*b^5)/(21*a^6*(a + b/x)^(3/2)*x^(3/2)) - (256*b^4)/(7*a^5*(a
 + b/x)^(3/2)*Sqrt[x]) - (64*b^3*Sqrt[x])/(7*a^4*(a + b/x)^(3/2))
 + (32*b^2*x^(3/2))/(21*a^3*(a + b/x)^(3/2)) - (4*b*x^(5/2))/(7*a
^2*(a + b/x)^(3/2)) + (2*x^(7/2))/(7*a*(a + b/x)^(3/2))
```

Rubi in Sympy [A] time = 17.8956, size = 134, normalized size = 0.88

$$\frac{2x^{\frac{7}{2}}}{7a\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}-\frac{4bx^{\frac{5}{2}}}{7a^2\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}+\frac{32b^2x^{\frac{3}{2}}}{21a^3\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}-\frac{64b^3\sqrt{x}}{7a^4\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}-\frac{256b^4}{7a^5\sqrt{x}\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}-\frac{512b^5}{21a^6x^{\frac{3}{2}}\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(5/2)/(a+b/x)**(5/2),x)
```

```
[Out] 2*x**(7/2)/(7*a*(a + b/x)**(3/2)) - 4*b*x**(5/2)/(7*a**2*(a + b/x
)**(3/2)) + 32*b**2*x**(3/2)/(21*a**3*(a + b/x)**(3/2)) - 64*b**3
*sqrt(x)/(7*a**4*(a + b/x)**(3/2)) - 256*b**4/(7*a**5*sqrt(x)*(a
+ b/x)**(3/2)) - 512*b**5/(21*a**6*x**(3/2)*(a + b/x)**(3/2))
```

Mathematica [A] time = 0.0740892, size = 82, normalized size = 0.54

$$\frac{2\sqrt{x}\sqrt{a+\frac{b}{x}}\left(3a^5x^5-6a^4bx^4+16a^3b^2x^3-96a^2b^3x^2-384ab^4x-256b^5\right)}{21a^6(ax+b)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(5/2)/(a + b/x)^(5/2),x]
```

```
[Out] (2*Sqrt[a + b/x]*Sqrt[x]*(-256*b^5 - 384*a*b^4*x - 96*a^2*b^3*x^2
 + 16*a^3*b^2*x^3 - 6*a^4*b*x^4 + 3*a^5*x^5))/(21*a^6*(b + a*x)^2
)
```

Maple [A] time = 0.011, size = 77, normalized size = 0.5

$$\frac{(2\,ax+2\,b)\left(3\,a^5x^5-6\,a^4bx^4+16\,a^3b^2x^3-96\,a^2b^3x^2-384\,ab^4x-256\,b^5\right)}{21\,a^6}x^{-\frac{5}{2}}\left(\frac{ax+b}{x}\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(5/2)/(a+b/x)^(5/2),x)
```

```
[Out] 2/21*(a*x+b)*(3*a^5*x^5-6*a^4*b*x^4+16*a^3*b^2*x^3-96*a^2*b^3*x^2
-384*a*b^4*x-256*b^5)/a^6/x^(5/2)/((a*x+b)/x)^(5/2)
```

Maxima [A] time = 1.5005, size = 143, normalized size = 0.94

$$\frac{2\left(3\left(a+\frac{b}{x}\right)^{\frac{7}{2}}x^{\frac{7}{2}}-21\left(a+\frac{b}{x}\right)^{\frac{5}{2}}bx^{\frac{5}{2}}+70\left(a+\frac{b}{x}\right)^{\frac{3}{2}}b^2x^{\frac{3}{2}}-210\sqrt{a+\frac{b}{x}}b^3\sqrt{x}\right)}{21\,a^6}-\frac{2\left(15\left(a+\frac{b}{x}\right)b^4x-b^5\right)}{3\left(a+\frac{b}{x}\right)^{\frac{3}{2}}a^6x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5/2)/(a + b/x)^(5/2),x, algorithm="maxima")
```

```
[Out] 2/21*(3*(a + b/x)^(7/2)*x^(7/2) - 21*(a + b/x)^(5/2)*b*x^(5/2) +
70*(a + b/x)^(3/2)*b^2*x^(3/2) - 210*sqrt(a + b/x)*b^3*sqrt(x))/a
^6 - 2/3*(15*(a + b/x)*b^4*x - b^5)/((a + b/x)^(3/2)*a^6*x^(3/2))
```

Fricas [A] time = 0.236813, size = 109, normalized size = 0.72

$$\frac{2\left(3\,a^5x^5-6\,a^4bx^4+16\,a^3b^2x^3-96\,a^2b^3x^2-384\,ab^4x-256\,b^5\right)}{21\left(a^7x+a^6b\right)\sqrt{x}\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5/2)/(a + b/x)^(5/2),x, algorithm="fricas")
```

```
[Out] 2/21*(3*a^5*x^5 - 6*a^4*b*x^4 + 16*a^3*b^2*x^3 - 96*a^2*b^3*x^2 -
 384*a*b^4*x - 256*b^5)/((a^7*x + a^6*b)*sqrt(x)*sqrt((a*x + b)/x
))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(5/2)/(a+b/x)**(5/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.241311, size = 112, normalized size = 0.74

$$\frac{512\,b^{\frac{7}{2}}}{21\,a^{6}} + \frac{2\left(3\,(ax+b)^{\frac{7}{2}} - 21\,(ax+b)^{\frac{5}{2}}b + 70\,(ax+b)^{\frac{3}{2}}b^{2} - 210\,\sqrt{ax+b}\,b b^{3} - \frac{7\,(15\,(ax+b)b^{4} - b^{5})}{(ax+b)^{\frac{3}{2}}}\right)}{21\,a^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5/2)/(a + b/x)^(5/2),x, algorithm="giac")
```

```
[Out] 512/21*b^(7/2)/a^6 + 2/21*(3*(a*x + b)^(7/2) - 21*(a*x + b)^(5/2)
*b + 70*(a*x + b)^(3/2)*b^2 - 210*sqrt(a*x + b)*b^3 - 7*(15*(a*x
+ b)*b^4 - b^5)/(a*x + b)^(3/2))/a^6
```

3.1794 $\int \frac{x^{3/2}}{\left(a+\frac{b}{x}\right)^{5/2}} \, dx$

Optimal. Leaf size=126

$$\frac{256b^4}{15a^5x^{3/2}\left(a+\frac{b}{x}\right)^{3/2}}+\frac{128b^3}{5a^4\sqrt{x}\left(a+\frac{b}{x}\right)^{3/2}}+\frac{32b^2\sqrt{x}}{5a^3\left(a+\frac{b}{x}\right)^{3/2}}-\frac{16bx^{3/2}}{15a^2\left(a+\frac{b}{x}\right)^{3/2}}+\frac{2x^{5/2}}{5a\left(a+\frac{b}{x}\right)^{3/2}}$$

```
[Out] (256*b^4)/(15*a^5*(a + b/x)^(3/2)*x^(3/2)) + (128*b^3)/(5*a^4*(a
+ b/x)^(3/2)*Sqrt[x]) + (32*b^2*Sqrt[x])/(5*a^3*(a + b/x)^(3/2))
- (16*b*x^(3/2))/(15*a^2*(a + b/x)^(3/2)) + (2*x^(5/2))/(5*a*(a +
 b/x)^(3/2))
```

Rubi [A] time = 0.15417, antiderivative size = 126, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{256b^4}{15a^5x^{3/2}\left(a+\frac{b}{x}\right)^{3/2}}+\frac{128b^3}{5a^4\sqrt{x}\left(a+\frac{b}{x}\right)^{3/2}}+\frac{32b^2\sqrt{x}}{5a^3\left(a+\frac{b}{x}\right)^{3/2}}-\frac{16bx^{3/2}}{15a^2\left(a+\frac{b}{x}\right)^{3/2}}+\frac{2x^{5/2}}{5a\left(a+\frac{b}{x}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(3/2)/(a + b/x)^(5/2),x]
```

```
[Out] (256*b^4)/(15*a^5*(a + b/x)^(3/2)*x^(3/2)) + (128*b^3)/(5*a^4*(a
+ b/x)^(3/2)*Sqrt[x]) + (32*b^2*Sqrt[x])/(5*a^3*(a + b/x)^(3/2))
- (16*b*x^(3/2))/(15*a^2*(a + b/x)^(3/2)) + (2*x^(5/2))/(5*a*(a +
 b/x)^(3/2))
```

Rubi in Sympy [A] time = 13.5451, size = 110, normalized size = 0.87

$$\frac{2x^{\frac{5}{2}}}{5a\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}-\frac{16bx^{\frac{3}{2}}}{15a^2\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}+\frac{32b^2\sqrt{x}}{5a^3\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}+\frac{128b^3}{5a^4\sqrt{x}\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}+\frac{256b^4}{15a^5x^{\frac{3}{2}}\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(3/2)/(a+b/x)**(5/2),x)
```

```
[Out] 2*x**(5/2)/(5*a*(a + b/x)**(3/2)) - 16*b*x**(3/2)/(15*a**2*(a + b
/x)**(3/2)) + 32*b**2*sqrt(x)/(5*a**3*(a + b/x)**(3/2)) + 128*b**
3/(5*a**4*sqrt(x)*(a + b/x)**(3/2)) + 256*b**4/(15*a**5*x**(3/2)*
(a + b/x)**(3/2))
```

Mathematica [A] time = 0.0615491, size = 71, normalized size = 0.56

$$\frac{2\sqrt{x}\sqrt{a+\frac{b}{x}}\left(3a^4x^4-8a^3bx^3+48a^2b^2x^2+192ab^3x+128b^4\right)}{15a^5(ax+b)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(3/2)/(a + b/x)^(5/2),x]
```

```
[Out] (2*Sqrt[a + b/x]*Sqrt[x]*(128*b^4 + 192*a*b^3*x + 48*a^2*b^2*x^2
- 8*a^3*b*x^3 + 3*a^4*x^4))/(15*a^5*(b + a*x)^2)
```

Maple [A] time = 0.01, size = 66, normalized size = 0.5

$$\frac{(2\,ax+2\,b)\left(3\,x^{4}a^{4}-8\,bx^{3}a^{3}+48\,b^{2}x^{2}a^{2}+192\,b^{3}xa+128\,b^{4}\right)}{15\,a^{5}}x^{-\frac{5}{2}}\left(\frac{ax+b}{x}\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(3/2)/(a+b/x)^(5/2),x)
```

```
[Out] 2/15*(a*x+b)*(3*a^4*x^4-8*a^3*b*x^3+48*a^2*b^2*x^2+192*a*b^3*x+12
8*b^4)/a^5/x^(5/2)/((a*x+b)/x)^(5/2)
```

Maxima [A] time = 1.4363, size = 120, normalized size = 0.95

$$\frac{2\left(3\left(a+\frac{b}{x}\right)^{\frac{5}{2}}x^{\frac{5}{2}}-20\left(a+\frac{b}{x}\right)^{\frac{3}{2}}bx^{\frac{3}{2}}+90\sqrt{a+\frac{b}{x}}b^{2}\sqrt{x}\right)}{15\,a^{5}}+\frac{2\left(12\left(a+\frac{b}{x}\right)b^{3}x-b^{4}\right)}{3\left(a+\frac{b}{x}\right)^{\frac{3}{2}}a^{5}x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2)/(a + b/x)^(5/2),x, algorithm="maxima")
```

```
[Out] 2/15*(3*(a + b/x)^(5/2)*x^(5/2) - 20*(a + b/x)^(3/2)*b*x^(3/2) +
90*sqrt(a + b/x)*b^2*sqrt(x))/a^5 + 2/3*(12*(a + b/x)*b^3*x - b^4
)/((a + b/x)^(3/2)*a^5*x^(3/2))
```

Fricas [A] time = 0.230484, size = 95, normalized size = 0.75

$$\frac{2\left(3\,a^{4}x^{4}-8\,a^{3}bx^{3}+48\,a^{2}b^{2}x^{2}+192\,ab^{3}x+128\,b^{4}\right)}{15\,(a^{6}x+a^{5}b)\sqrt{x}\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2)/(a + b/x)^(5/2),x, algorithm="fricas")
```

```
[Out] 2/15*(3*a^4*x^4 - 8*a^3*b*x^3 + 48*a^2*b^2*x^2 + 192*a*b^3*x + 12
8*b^4)/((a^6*x + a^5*b)*sqrt(x)*sqrt((a*x + b)/x))
```

Sympy [A] time = 163.459, size = 536, normalized size = 4.25

$$\frac{6a^{6}b^{\frac{33}{2}}x^{6}\sqrt{\frac{ax}{b}+1}}{15a^{9}b^{16}x^{4}+60a^{8}b^{17}x^{3}+90a^{7}b^{18}x^{2}+60a^{6}b^{19}x+15a^{5}b^{20}} - \frac{4a^{5}b^{\frac{35}{2}}x^{5}\sqrt{\frac{ax}{b}+1}}{15a^{9}b^{16}x^{4}+60a^{8}b^{17}x^{3}+90a^{7}b^{18}x^{2}+60a^{6}b^{19}x+15a^{5}b^{20}} + \frac{70a^{4}b^{\frac{37}{2}}x^{4}\sqrt{\frac{ax}{b}+1}}{15a^{9}b^{16}x^{4}+60a^{8}b^{17}x^{3}+90a^{7}b^{18}x^{2}+60a^{6}b^{19}x+15a^{5}b^{20}} + \frac{560a^{3}b^{\frac{39}{2}}x^{3}\sqrt{\frac{ax}{b}+1}}{15a^{9}b^{16}x^{4}+60a^{8}b^{17}x^{3}+90a^{7}b^{18}x^{2}+60a^{6}b^{19}x+15a^{5}b^{20}} + \frac{1120a^{2}b^{\frac{41}{2}}x^{2}\sqrt{\frac{ax}{b}+1}}{15a^{9}b^{16}x^{4}+60a^{8}b^{17}x^{3}+90a^{7}b^{18}x^{2}+60a^{6}b^{19}x+15a^{5}b^{20}} + \frac{896ab^{\frac{43}{2}}x\sqrt{\frac{ax}{b}+1}}{15a^{9}b^{16}x^{4}+60a^{8}b^{17}x^{3}+90a^{7}b^{18}x^{2}+60a^{6}b^{19}x+15a^{5}b^{20}} + \frac{256b^{\frac{45}{2}}\sqrt{\frac{ax}{b}+1}}{15a^{9}b^{16}x^{4}+60a^{8}b^{17}x^{3}+90a^{7}b^{18}x^{2}+60a^{6}b^{19}x+15a^{5}b^{20}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(3/2)/(a+b/x)**(5/2),x)
```

```
[Out] 6*a**6*b**(33/2)*x**6*sqrt(a*x/b + 1)/(15*a**9*b**16*x**4 + 60*a*
*8*b**17*x**3 + 90*a**7*b**18*x**2 + 60*a**6*b**19*x + 15*a**5*b*
*20) - 4*a**5*b**(35/2)*x**5*sqrt(a*x/b + 1)/(15*a**9*b**16*x**4
+ 60*a**8*b**17*x**3 + 90*a**7*b**18*x**2 + 60*a**6*b**19*x + 15*
a**5*b**20) + 70*a**4*b**(37/2)*x**4*sqrt(a*x/b + 1)/(15*a**9*b**
16*x**4 + 60*a**8*b**17*x**3 + 90*a**7*b**18*x**2 + 60*a**6*b**19
*x + 15*a**5*b**20) + 560*a**3*b**(39/2)*x**3*sqrt(a*x/b + 1)/(15
*a**9*b**16*x**4 + 60*a**8*b**17*x**3 + 90*a**7*b**18*x**2 + 60*a
**6*b**19*x + 15*a**5*b**20) + 1120*a**2*b**(41/2)*x**2*sqrt(a*x/
b + 1)/(15*a**9*b**16*x**4 + 60*a**8*b**17*x**3 + 90*a**7*b**18*x
**2 + 60*a**6*b**19*x + 15*a**5*b**20) + 896*a*b**(43/2)*x*sqrt(a
*x/b + 1)/(15*a**9*b**16*x**4 + 60*a**8*b**17*x**3 + 90*a**7*b**1
8*x**2 + 60*a**6*b**19*x + 15*a**5*b**20) + 256*b**(45/2)*sqrt(a*
x/b + 1)/(15*a**9*b**16*x**4 + 60*a**8*b**17*x**3 + 90*a**7*b**18
*x**2 + 60*a**6*b**19*x + 15*a**5*b**20)
```

GIAC/XCAS [A] time = 0.233638, size = 96, normalized size = 0.76

$$-\frac{256\, b^{\frac{5}{2}}}{15\, a^{5}} + \frac{2 \left(3 \, (ax + b)^{\frac{5}{2}} - 20 \, (ax + b)^{\frac{3}{2}} b + 90 \, \sqrt{ax + b} b^{2} + \frac{5 \, \left(12 \, (ax + b) b^{3} - b^{4}\right)}{(ax + b)^{\frac{3}{2}}}\right)}{15 \, a^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2)/(a + b/x)^(5/2),x, algorithm="giac")
```

```
[Out] -256/15*b^(5/2)/a^5 + 2/15*(3*(a*x + b)^(5/2) - 20*(a*x + b)^(3/2
)*b + 90*sqrt(a*x + b)*b^2 + 5*(12*(a*x + b)*b^3 - b^4)/(a*x + b)
^(3/2))/a^5
```

3.1795 $\int \frac{\sqrt{x}}{\left(a+\frac{b}{x}\right)^{5/2}}\,dx$

Optimal. Leaf size=96

$$-\frac{32b^3}{3a^4x^{3/2}\left(a+\frac{b}{x}\right)^{3/2}}-\frac{16b^2}{a^3\sqrt{x}\left(a+\frac{b}{x}\right)^{3/2}}-\frac{4b\sqrt{x}}{a^2\left(a+\frac{b}{x}\right)^{3/2}}+\frac{2x^{3/2}}{3a\left(a+\frac{b}{x}\right)^{3/2}}$$

```
[Out] (-32*b^3)/(3*a^4*(a + b/x)^(3/2)*x^(3/2)) - (16*b^2)/(a^3*(a + b/
x)^(3/2)*Sqrt[x]) - (4*b*Sqrt[x])/(a^2*(a + b/x)^(3/2)) + (2*x^(3
/2))/(3*a*(a + b/x)^(3/2))
```

Rubi [A] time = 0.114544, antiderivative size = 96, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{32b^3}{3a^4x^{3/2}\left(a+\frac{b}{x}\right)^{3/2}}-\frac{16b^2}{a^3\sqrt{x}\left(a+\frac{b}{x}\right)^{3/2}}-\frac{4b\sqrt{x}}{a^2\left(a+\frac{b}{x}\right)^{3/2}}+\frac{2x^{3/2}}{3a\left(a+\frac{b}{x}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[x]/(a + b/x)^(5/2),x]
```

```
[Out] (-32*b^3)/(3*a^4*(a + b/x)^(3/2)*x^(3/2)) - (16*b^2)/(a^3*(a + b/
x)^(3/2)*Sqrt[x]) - (4*b*Sqrt[x])/(a^2*(a + b/x)^(3/2)) + (2*x^(3
/2))/(3*a*(a + b/x)^(3/2))
```

Rubi in Sympy [A] time = 9.84762, size = 83, normalized size = 0.86

$$\frac{2x^{\frac{3}{2}}}{3a\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}-\frac{4b\sqrt{x}}{a^2\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}-\frac{16b^2}{a^3\sqrt{x}\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}-\frac{32b^3}{3a^4x^{\frac{3}{2}}\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(1/2)/(a+b/x)**(5/2),x)
```

```
[Out] 2*x**(3/2)/(3*a*(a + b/x)**(3/2)) - 4*b*sqrt(x)/(a**2*(a + b/x)**
(3/2)) - 16*b**2/(a**3*sqrt(x)*(a + b/x)**(3/2)) - 32*b**3/(3*a**
4*x**(3/2)*(a + b/x)**(3/2))
```

Mathematica [A] time = 0.057692, size = 59, normalized size = 0.61

$$\frac{2\sqrt{x}\sqrt{a+\frac{b}{x}}\left(a^3x^3-6a^2bx^2-24ab^2x-16b^3\right)}{3a^4(ax+b)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[x]/(a + b/x)^(5/2),x]
```

```
[Out] (2*Sqrt[a + b/x]*Sqrt[x]*(-16*b^3 - 24*a*b^2*x - 6*a^2*b*x^2 + a^
3*x^3))/(3*a^4*(b + a*x)^2)
```

Maple [A] time = 0.007, size = 54, normalized size = 0.6

$$\frac{(2\,ax+2\,b)\left(a^3x^3-6\,a^2bx^2-24\,ab^2x-16\,b^3\right)}{3\,a^4}x^{-\frac{5}{2}}\left(\frac{ax+b}{x}\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(1/2)/(a+b/x)^(5/2),x)
```

```
[Out] 2/3*(a*x+b)*(a^3*x^3-6*a^2*b*x^2-24*a*b^2*x-16*b^3)/a^4/x^(5/2)/(
(a*x+b)/x)^(5/2)
```

Maxima [A] time = 1.43585, size = 96, normalized size = 1.

$$\frac{2\left(\left(a+\frac{b}{x}\right)^{\frac{3}{2}}x^{\frac{3}{2}}-9\sqrt{a+\frac{b}{x}}b\sqrt{x}\right)}{3\,a^4}-\frac{2\left(9\left(a+\frac{b}{x}\right)b^2x-b^3\right)}{3\left(a+\frac{b}{x}\right)^{\frac{3}{2}}a^4x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(a + b/x)^(5/2),x, algorithm="maxima")
```

```
[Out] 2/3*((a + b/x)^(3/2)*x^(3/2) - 9*sqrt(a + b/x)*b*sqrt(x))/a^4 - 2
/3*(9*(a + b/x)*b^2*x - b^3)/((a + b/x)^(3/2)*a^4*x^(3/2))
```

Fricas [A] time = 0.23434, size = 78, normalized size = 0.81

$$\frac{2\left(a^3x^3-6\,a^2bx^2-24\,ab^2x-16\,b^3\right)}{3\left(a^5x+a^4b\right)\sqrt{x}\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(a + b/x)^(5/2),x, algorithm="fricas")
```

```
[Out] 2/3*(a^3*x^3 - 6*a^2*b*x^2 - 24*a*b^2*x - 16*b^3)/((a^5*x + a^4*b
)*sqrt(x)*sqrt((a*x + b)/x))
```

Sympy [A] time = 90.0592, size = 320, normalized size = 3.33

$$\frac{2a^4b^{\frac{19}{2}}x^4\sqrt{\frac{ax}{b}+1}}{3a^7b^9x^3+9a^6b^{10}x^2+9a^5b^{11}x+3a^4b^{12}}-\frac{10a^3b^{\frac{21}{2}}x^3\sqrt{\frac{ax}{b}+1}}{3a^7b^9x^3+9a^6b^{10}x^2+9a^5b^{11}x+3a^4b^{12}}-\frac{60a^2b^{\frac{23}{2}}x^2\sqrt{\frac{ax}{b}+1}}{3a^7b^9x^3+9a^6b^{10}x^2+9a^5b^{11}x+3a^4b^{12}}-\frac{80ab^{\frac{25}{2}}x\sqrt{\frac{ax}{b}+1}}{3a^7b^9x^3+9a^6b^{10}x^2+9a^5b^{11}x+3a^4b^{12}}-\frac{32b^{\frac{27}{2}}\sqrt{\frac{ax}{b}+1}}{3a^7b^9x^3+9a^6b^{10}x^2+9a^5b^{11}x+3a^4b^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(1/2)/(a+b/x)**(5/2),x)
```

```
[Out] 2*a**4*b**(19/2)*x**4*sqrt(a*x/b + 1)/(3*a**7*b**9*x**3 + 9*a**6*
b**10*x**2 + 9*a**5*b**11*x + 3*a**4*b**12) - 10*a**3*b**(21/2)*x
**3*sqrt(a*x/b + 1)/(3*a**7*b**9*x**3 + 9*a**6*b**10*x**2 + 9*a**
```

```
5*b**11*x + 3*a**4*b**12) - 60*a**2*b**(23/2)*x**2*sqrt(a*x/b + 1
)/(3*a**7*b**9*x**3 + 9*a**6*b**10*x**2 + 9*a**5*b**11*x + 3*a**4
*b**12) - 80*a*b**(25/2)*x*sqrt(a*x/b + 1)/(3*a**7*b**9*x**3 + 9*
a**6*b**10*x**2 + 9*a**5*b**11*x + 3*a**4*b**12) - 32*b**(27/2)*s
qrt(a*x/b + 1)/(3*a**7*b**9*x**3 + 9*a**6*b**10*x**2 + 9*a**5*b**
11*x + 3*a**4*b**12)
```

GIAC/XCAS [A] time = 0.234062, size = 77, normalized size = 0.8

$$\frac{32\, b^{\frac{3}{2}}}{3\, a^4} + \frac{2\left((ax+b)^{\frac{3}{2}} - 9\sqrt{ax+b}b - \frac{9\,(ax+b)b^2 - b^3}{(ax+b)^{\frac{3}{2}}}\right)}{3\, a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(a + b/x)^(5/2),x, algorithm="giac")
```

```
[Out] 32/3*b^(3/2)/a^4 + 2/3*((a*x + b)^(3/2) - 9*sqrt(a*x + b)*b - (9*
(a*x + b)*b^2 - b^3)/(a*x + b)^(3/2))/a^4
```

3.1796 $\int \frac{1}{\left(a+\frac{b}{x}\right)^{5/2}\sqrt{x}}\,dx$

Optimal. Leaf size=70

$$\frac{16b^2}{3a^3x^{3/2}\left(a+\frac{b}{x}\right)^{3/2}}+\frac{8b}{a^2\sqrt{x}\left(a+\frac{b}{x}\right)^{3/2}}+\frac{2\sqrt{x}}{a\left(a+\frac{b}{x}\right)^{3/2}}$$

```
[Out] (16*b^2)/(3*a^3*(a + b/x)^(3/2)*x^(3/2)) + (8*b)/(a^2*(a + b/x)^(
3/2)*Sqrt[x]) + (2*Sqrt[x])/(a*(a + b/x)^(3/2))
```

Rubi [A] time = 0.0821112, antiderivative size = 70, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{16b^2}{3a^3x^{3/2}\left(a+\frac{b}{x}\right)^{3/2}}+\frac{8b}{a^2\sqrt{x}\left(a+\frac{b}{x}\right)^{3/2}}+\frac{2\sqrt{x}}{a\left(a+\frac{b}{x}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^(5/2)*Sqrt[x]),x]
```

```
[Out] (16*b^2)/(3*a^3*(a + b/x)^(3/2)*x^(3/2)) + (8*b)/(a^2*(a + b/x)^(
3/2)*Sqrt[x]) + (2*Sqrt[x])/(a*(a + b/x)^(3/2))
```

Rubi in Sympy [A] time = 6.84131, size = 60, normalized size = 0.86

$$\frac{2\sqrt{x}}{a\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}+\frac{8b}{a^2\sqrt{x}\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}+\frac{16b^2}{3a^3x^{\frac{3}{2}}\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**(5/2)/x**(1/2),x)
```

```
[Out] 2*sqrt(x)/(a*(a + b/x)**(3/2)) + 8*b/(a**2*sqrt(x)*(a + b/x)**(3/
2)) + 16*b**2/(3*a**3*x**(3/2)*(a + b/x)**(3/2))
```

Mathematica [A] time = 0.0517752, size = 49, normalized size = 0.7

$$\frac{2\sqrt{x}\sqrt{a+\frac{b}{x}}\left(3a^2x^2+12abx+8b^2\right)}{3a^3(ax+b)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^(5/2)*Sqrt[x]),x]
```

```
[Out] (2*Sqrt[a + b/x]*Sqrt[x]*(8*b^2 + 12*a*b*x + 3*a^2*x^2))/(3*a^3*(
b + a*x)^2)
```

Maple [A] time = 0.009, size = 44, normalized size = 0.6

$$\frac{(2\,ax+2\,b)\left(3\,a^2x^2+12\,abx+8\,b^2\right)}{3\,a^3}x^{-\frac{5}{2}}\left(\frac{ax+b}{x}\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/(a+b/x)^(5/2)/x^(1/2),x)
```

```
[Out] 2/3*(a*x+b)*(3*a^2*x^2+12*a*b*x+8*b^2)/a^3/x^(5/2)/((a*x+b)/x)^(5
/2)
```

Maxima [A] time = 1.43223, size = 70, normalized size = 1.

$$\frac{2\sqrt{a+\frac{b}{x}}\sqrt{x}}{a^3}+\frac{2\left(6\left(a+\frac{b}{x}\right)bx-b^2\right)}{3\left(a+\frac{b}{x}\right)^{\frac{3}{2}}a^3x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x)^(5/2)*sqrt(x)),x, algorithm="maxima")
```

```
[Out] 2*sqrt(a + b/x)*sqrt(x)/a^3 + 2/3*(6*(a + b/x)*b*x - b^2)/((a + b
/x)^(3/2)*a^3*x^(3/2))
```

Fricas [A] time = 0.231567, size = 65, normalized size = 0.93

$$\frac{2\left(3\,a^2x^2+12\,abx+8\,b^2\right)}{3\left(a^4x+a^3b\right)\sqrt{x}\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x)^(5/2)*sqrt(x)),x, algorithm="fricas")
```

```
[Out] 2/3*(3*a^2*x^2 + 12*a*b*x + 8*b^2)/((a^4*x + a^3*b)*sqrt(x)*sqrt(
(a*x + b)/x))
```

Sympy [A] time = 171.696, size = 151, normalized size = 2.16

$$\frac{6a^2b^{\frac{9}{2}}x^2\sqrt{\frac{ax}{b}+1}}{3a^5b^4x^2+6a^4b^5x+3a^3b^6}+\frac{24ab^{\frac{11}{2}}x\sqrt{\frac{ax}{b}+1}}{3a^5b^4x^2+6a^4b^5x+3a^3b^6}+\frac{16b^{\frac{13}{2}}\sqrt{\frac{ax}{b}+1}}{3a^5b^4x^2+6a^4b^5x+3a^3b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(a+b/x)**(5/2)/x**(1/2),x)
```

```
[Out] 6*a**2*b**(9/2)*x**2*sqrt(a*x/b + 1)/(3*a**5*b**4*x**2 + 6*a**4*b
**5*x + 3*a**3*b**6) + 24*a*b**(11/2)*x*sqrt(a*x/b + 1)/(3*a**5*b
**4*x**2 + 6*a**4*b**5*x + 3*a**3*b**6) + 16*b**(13/2)*sqrt(a*x/b
 + 1)/(3*a**5*b**4*x**2 + 6*a**4*b**5*x + 3*a**3*b**6)
```

GIAC/XCAS [A] time = 0.233449, size = 62, normalized size = 0.89

$$\frac{2\left(3\sqrt{ax+b}+\frac{6(ax+b)b-b^2}{(ax+b)^{\frac{3}{2}}}\right)}{3\,a^3}-\frac{16\sqrt{b}}{3\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*sqrt(x)),x, algorithm="giac")

[Out] 2/3*(3*sqrt(a*x + b) + (6*(a*x + b)*b - b^2)/(a*x + b)^(3/2))/a^3
 - 16/3*sqrt(b)/a^3
```

3.1797 $\int \frac{1}{\left(a+\frac{b}{x}\right)^{5/2} x^{3/2}} \, dx$

Optimal. Leaf size=46

$$-\frac{4b}{3a^2x^{3/2}\left(a+\frac{b}{x}\right)^{3/2}}-\frac{2}{a\sqrt{x}\left(a+\frac{b}{x}\right)^{3/2}}$$

```
[Out] (-4*b)/(3*a^2*(a + b/x)^(3/2)*x^(3/2)) - 2/(a*(a + b/x)^(3/2)*Sqr
t[x])
```

Rubi [A] time = 0.0532577, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{4b}{3a^2x^{3/2}\left(a+\frac{b}{x}\right)^{3/2}}-\frac{2}{a\sqrt{x}\left(a+\frac{b}{x}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^(5/2)*x^(3/2)),x]
```

```
[Out] (-4*b)/(3*a^2*(a + b/x)^(3/2)*x^(3/2)) - 2/(a*(a + b/x)^(3/2)*Sqr
t[x])
```

Rubi in Sympy [A] time = 4.40001, size = 39, normalized size = 0.85

$$-\frac{2}{a\sqrt{x}\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}-\frac{4b}{3a^2x^{\frac{3}{2}}\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**(5/2)/x**(3/2),x)
```

```
[Out] -2/(a*sqrt(x)*(a + b/x)**(3/2)) - 4*b/(3*a**2*x**(3/2)*(a + b/x)*
*(3/2))
```

Mathematica [A] time = 0.0467815, size = 38, normalized size = 0.83

$$-\frac{2\sqrt{x}\sqrt{a+\frac{b}{x}}(3ax+2b)}{3a^2(ax+b)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^(5/2)*x^(3/2)),x]
```

```
[Out] (-2*Sqrt[a + b/x]*Sqrt[x]*(2*b + 3*a*x))/(3*a^2*(b + a*x)^2)
```

Maple [A] time = 0.005, size = 33, normalized size = 0.7

$$-\frac{(2\,ax+2\,b)(3\,ax+2\,b)}{3\,a^2}x^{-\frac{5}{2}}\left(\frac{ax+b}{x}\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^(5/2)/x^(3/2),x)
```

```
[Out] -2/3*(a*x+b)*(3*a*x+2*b)/a^2/x^(5/2)/((a*x+b)/x)^(5/2)
```

Maxima [A] time = 1.44978, size = 42, normalized size = 0.91

$$-\frac{2\left(3\left(a+\frac{b}{x}\right)x-b\right)}{3\left(a+\frac{b}{x}\right)^{\frac{3}{2}}a^{2}x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^(3/2)),x, algorithm="maxima")
```

```
[Out] -2/3*(3*(a + b/x)*x - b)/((a + b/x)^(3/2)*a^2*x^(3/2))
```

Fricas [A] time = 0.23224, size = 50, normalized size = 1.09

$$-\frac{2\left(3\,ax+2\,b\right)}{3\left(a^{3}x+a^{2}b\right)\sqrt{x}\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^(3/2)),x, algorithm="fricas")
```

```
[Out] -2/3*(3*a*x + 2*b)/((a^3*x + a^2*b)*sqrt(x)*sqrt((a*x + b)/x))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(5/2)/x**(3/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.242552, size = 39, normalized size = 0.85

$$-\frac{2\left(3\,ax+2\,b\right)}{3\left(ax+b\right)^{\frac{3}{2}}a^{2}}+\frac{4}{3\,a^{2}\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^(3/2)),x, algorithm="giac")
```

```
[Out] -2/3*(3*a*x + 2*b)/((a*x + b)^(3/2)*a^2) + 4/3/(a^2*sqrt(b))
```

3.1798 $\int \frac{1}{\left(a+\frac{b}{x}\right)^{5/2} x^{5/2}} \, dx$

Optimal. Leaf size=23

$$-\frac{2}{3ax^{3/2}\left(a+\frac{b}{x}\right)^{3/2}}$$

```
[Out] -2/(3*a*(a + b/x)^(3/2)*x^(3/2))
```

Rubi [A] time = 0.0261001, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.059

$$-\frac{2}{3ax^{3/2}\left(a+\frac{b}{x}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^(5/2)*x^(5/2)),x]
```

```
[Out] -2/(3*a*(a + b/x)^(3/2)*x^(3/2))
```

Rubi in Sympy [A] time = 2.66811, size = 19, normalized size = 0.83

$$-\frac{2}{3ax^{\frac{3}{2}}\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**(5/2)/x**(5/2),x)
```

```
[Out] -2/(3*a*x**(3/2)*(a + b/x)**(3/2))
```

Mathematica [A] time = 0.0361117, size = 32, normalized size = 1.39

$$-\frac{2\sqrt{x}\sqrt{\frac{ax+b}{x}}}{3a(ax+b)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^(5/2)*x^(5/2)),x]
```

```
[Out] (-2*Sqrt[x]*Sqrt[(b + a*x)/x])/(3*a*(b + a*x)^2)
```

Maple [A] time = 0.004, size = 25, normalized size = 1.1

$$-\frac{2\,ax+2\,b}{3\,a}\left(\frac{ax+b}{x}\right)^{-\frac{5}{2}}x^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^(5/2)/x^(5/2),x)

[Out] -2/3*(a*x+b)/a/((a*x+b)/x)^(5/2)/x^(5/2)
```

Maxima [A] time = 1.45287, size = 23, normalized size = 1.

$$-\frac{2}{3\left(a+\frac{b}{x}\right)^{\frac{3}{2}}ax^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^(5/2)),x, algorithm="maxima")

[Out] -2/3/((a + b/x)^(3/2)*a*x^(3/2))
```

Fricas [A] time = 0.233572, size = 36, normalized size = 1.57

$$-\frac{2}{3\left(a^2x+ab\right)\sqrt{x}\sqrt{\frac{ax+b}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^(5/2)),x, algorithm="fricas")

[Out] -2/3/((a^2*x + a*b)*sqrt(x)*sqrt((a*x + b)/x))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(5/2)/x**(5/2),x)

[Out] Timed out
```

GIAC/XCAS [A] time = 0.228608, size = 28, normalized size = 1.22

$$-\frac{2}{3\left(ax+b\right)^{\frac{3}{2}}a}+\frac{2}{3\,ab^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^(5/2)),x, algorithm="giac")

[Out] -2/3/((a*x + b)^(3/2)*a) + 2/3/(a*b^(3/2))
```

3.1799 $\int \frac{1}{\left(a+\frac{b}{x}\right)^{5/2} x^{7/2}} \, dx$

Optimal. Leaf size=75

$$-\frac{2\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{b^{5/2}}+\frac{2}{b^2\sqrt{x}\sqrt{a+\frac{b}{x}}}+\frac{2}{3bx^{3/2}\left(a+\frac{b}{x}\right)^{3/2}}$$

```
[Out] 2/(3*b*(a + b/x)^(3/2)*x^(3/2)) + 2/(b^2*Sqrt[a + b/x]*Sqrt[x]) -
 (2*ArcTanh[Sqrt[b]/(Sqrt[a + b/x]*Sqrt[x])])/b^(5/2)
```

Rubi [A] time = 0.112363, antiderivative size = 75, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.235

$$-\frac{2\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{b^{5/2}}+\frac{2}{b^2\sqrt{x}\sqrt{a+\frac{b}{x}}}+\frac{2}{3bx^{3/2}\left(a+\frac{b}{x}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^(5/2)*x^(7/2)),x]
```

```
[Out] 2/(3*b*(a + b/x)^(3/2)*x^(3/2)) + 2/(b^2*Sqrt[a + b/x]*Sqrt[x]) -
 (2*ArcTanh[Sqrt[b]/(Sqrt[a + b/x]*Sqrt[x])])/b^(5/2)
```

Rubi in Sympy [A] time = 11.6955, size = 63, normalized size = 0.84

$$\frac{2}{3bx^{\frac{3}{2}}\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}+\frac{2}{b^2\sqrt{x}\sqrt{a+\frac{b}{x}}}-\frac{2\,\mathrm{atanh}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{b^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**(5/2)/x**(7/2),x)
```

```
[Out] 2/(3*b*x**(3/2)*(a + b/x)**(3/2)) + 2/(b**2*sqrt(x)*sqrt(a + b/x)
) - 2*atanh(sqrt(b)/(sqrt(x)*sqrt(a + b/x)))/b**(5/2)
```

Mathematica [A] time = 0.247573, size = 79, normalized size = 1.05

$$-\frac{2\log\left(\sqrt{b}\sqrt{x}\sqrt{a+\frac{b}{x}}+b\right)}{b^{5/2}}+\frac{2\sqrt{x}\sqrt{a+\frac{b}{x}}(3ax+4b)}{3b^2(ax+b)^2}+\frac{\log(x)}{b^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^(5/2)*x^(7/2)),x]
```

```
[Out] (2*Sqrt[a + b/x]*Sqrt[x]*(4*b + 3*a*x))/(3*b^2*(b + a*x)^2) - (2*
Log[b + Sqrt[b]*Sqrt[a + b/x]*Sqrt[x]])/b^(5/2) + Log[x]/b^(5/2)
```

Maple [A] time = 0.023, size = 85, normalized size = 1.1

$$\frac{2}{3\,(ax+b)^2}\sqrt{\frac{ax+b}{x}}\sqrt{x}\left(-3\,Artanh\left(\frac{\sqrt{ax+b}}{\sqrt{b}}\right)\sqrt{ax+b}xa+4\,b^{3/2}+3\,ax\sqrt{b}-3\,Artanh\left(\frac{\sqrt{ax+b}}{\sqrt{b}}\right)b\sqrt{ax+b}\right)b^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^(5/2)/x^(7/2),x)
```

```
[Out] 2/3*((a*x+b)/x)^(1/2)*x^(1/2)*(-3*arctanh((a*x+b)^(1/2)/b^(1/2))*
(a*x+b)^(1/2)*x*a+4*b^(3/2)+3*a*x*b^(1/2)-3*arctanh((a*x+b)^(1/2)
/b^(1/2))*b*(a*x+b)^(1/2))/b^(5/2)/(a*x+b)^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^(7/2)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.251399, size = 1, normalized size = 0.01

$$\left[\frac{3\,(ax+b)\sqrt{x}\sqrt{\frac{ax+b}{x}}\log\left(-\frac{2\,b\sqrt{x}\sqrt{\frac{ax+b}{x}}-(ax+2\,b)\sqrt{b}}{x}\right)+2\,(3\,ax+4\,b)\sqrt{b}}{3\,(ab^2x+b^3)\sqrt{b}\sqrt{x}\sqrt{\frac{ax+b}{x}}},\frac{2\left(3\,(ax+b)\sqrt{x}\sqrt{\frac{ax+b}{x}}\arctan\left(\frac{b}{\sqrt{-b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}\right)+(3\,ax\right.}{3\,(ab^2x+b^3)\sqrt{-b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^(7/2)),x, algorithm="fricas")
```

```
[Out] [1/3*(3*(a*x + b)*sqrt(x)*sqrt((a*x + b)/x)*log(-(2*b*sqrt(x)*sqr
t((a*x + b)/x) - (a*x + 2*b)*sqrt(b))/x) + 2*(3*a*x + 4*b)*sqrt(b
))/((a*b^2*x + b^3)*sqrt(b)*sqrt(x)*sqrt((a*x + b)/x)), 2/3*(3*(a
*x + b)*sqrt(x)*sqrt((a*x + b)/x)*arctan(b/(sqrt(-b)*sqrt(x)*sqrt
((a*x + b)/x))) + (3*a*x + 4*b)*sqrt(-b))/((a*b^2*x + b^3)*sqrt(-
b)*sqrt(x)*sqrt((a*x + b)/x))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(5/2)/x**(7/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.236917, size = 105, normalized size = 1.4

$$\frac{2\arctan\left(\frac{\sqrt{ax+b}}{\sqrt{-b}}\right)}{\sqrt{-b}b^2} - \frac{2\left(3\sqrt{b}\arctan\left(\frac{\sqrt{b}}{\sqrt{-b}}\right) + 4\sqrt{-b}\right)}{3\sqrt{-b}b^{\frac{5}{2}}} + \frac{2(3ax + 4b)}{3(ax+b)^{\frac{3}{2}}b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^(7/2)),x, algorithm="giac")
```

```
[Out] 2*arctan(sqrt(a*x + b)/sqrt(-b))/(sqrt(-b)*b^2) - 2/3*(3*sqrt(b)*
arctan(sqrt(b)/sqrt(-b)) + 4*sqrt(-b))/(sqrt(-b)*b^(5/2)) + 2/3*(
3*a*x + 4*b)/((a*x + b)^(3/2)*b^2)
```

3.1800 $\int \frac{1}{\left(a+\frac{b}{x}\right)^{5/2} x^{9/2}}\,dx$

Optimal. Leaf size=99

$$\frac{5a\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{b^{7/2}}-\frac{5\sqrt{a+\frac{b}{x}}}{b^3\sqrt{x}}+\frac{10}{3b^2x^{3/2}\sqrt{a+\frac{b}{x}}}+\frac{2}{3bx^{5/2}\left(a+\frac{b}{x}\right)^{3/2}}$$

```
[Out] 2/(3*b*(a + b/x)^(3/2)*x^(5/2)) + 10/(3*b^2*Sqrt[a + b/x]*x^(3/2)
) - (5*Sqrt[a + b/x])/(b^3*Sqrt[x]) + (5*a*ArcTanh[Sqrt[b]/(Sqrt[
a + b/x]*Sqrt[x])])/b^(7/2)
```

Rubi [A] time = 0.153591, antiderivative size = 99, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.294

$$\frac{5a\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{b^{7/2}}-\frac{5\sqrt{a+\frac{b}{x}}}{b^3\sqrt{x}}+\frac{10}{3b^2x^{3/2}\sqrt{a+\frac{b}{x}}}+\frac{2}{3bx^{5/2}\left(a+\frac{b}{x}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^(5/2)*x^(9/2)),x]
```

```
[Out] 2/(3*b*(a + b/x)^(3/2)*x^(5/2)) + 10/(3*b^2*Sqrt[a + b/x]*x^(3/2)
) - (5*Sqrt[a + b/x])/(b^3*Sqrt[x]) + (5*a*ArcTanh[Sqrt[b]/(Sqrt[
a + b/x]*Sqrt[x])])/b^(7/2)
```

Rubi in Sympy [A] time = 16.0685, size = 85, normalized size = 0.86

$$\frac{5a\,\mathrm{atanh}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{b^{\frac{7}{2}}}+\frac{2}{3bx^{\frac{5}{2}}\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}+\frac{10}{3b^2x^{\frac{3}{2}}\sqrt{a+\frac{b}{x}}}-\frac{5\sqrt{a+\frac{b}{x}}}{b^3\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**(5/2)/x**(9/2),x)
```

```
[Out] 5*a*atanh(sqrt(b)/(sqrt(x)*sqrt(a + b/x)))/b**(7/2) + 2/(3*b*x**(
5/2)*(a + b/x)**(3/2)) + 10/(3*b**2*x**(3/2)*sqrt(a + b/x)) - 5*s
qrt(a + b/x)/(b**3*sqrt(x))
```

Mathematica [A] time = 0.269147, size = 92, normalized size = 0.93

$$\frac{-\frac{2\sqrt{b}\sqrt{a+\frac{b}{x}}\left(15a^2x^2+20abx+3b^2\right)}{\sqrt{x}(ax+b)^2}+30a\log\left(\sqrt{b}\sqrt{x}\sqrt{a+\frac{b}{x}}+b\right)-15a\log(x)}{6b^{7/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^(5/2)*x^(9/2)),x]
```

```
[Out] ((-2*Sqrt[b]*Sqrt[a + b/x]*(3*b^2 + 20*a*b*x + 15*a^2*x^2))/(Sqrt
[x]*(b + a*x)^2) + 30*a*Log[b + Sqrt[b]*Sqrt[a + b/x]*Sqrt[x]] -
15*a*Log[x])/(6*b^(7/2))
```

Maple [A] time = 0.028, size = 102, normalized size = 1.

$$-\frac{1}{3\,(ax+b)^2}\sqrt{\frac{ax+b}{x}}\left(-15\,\mathit{Artanh}\left(\frac{\sqrt{ax+b}}{\sqrt{b}}\right)\sqrt{ax+b}x^2a^2+3\,b^{5/2}+20\,b^{3/2}xa+15\,a^2x^2\sqrt{b}-15\,\mathit{Artanh}\left(\frac{\sqrt{ax+b}}{\sqrt{b}}\right)xab$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^(5/2)/x^(9/2),x)
```

```
[Out] -1/3*((a*x+b)/x)^(1/2)*(-15*arctanh((a*x+b)^(1/2)/b^(1/2))*(a*x+b
)^(1/2)*x^2*a^2+3*b^(5/2)+20*b^(3/2)*x*a+15*a^2*x^2*b^(1/2)-15*ar
ctanh((a*x+b)^(1/2)/b^(1/2))*x*a*b*(a*x+b)^(1/2))/x^(1/2)/(a*x+b)
^2/b^(7/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^(9/2)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.25235, size = 1, normalized size = 0.01

$$\left[\frac{15\left(a^2x^2+abx\right)\sqrt{x}\sqrt{\frac{ax+b}{x}}\log\left(\frac{2\,b\sqrt{x}\sqrt{\frac{ax+b}{x}}+(ax+2\,b)\sqrt{b}}{x}\right)-2\left(15\,a^2x^2+20\,abx+3\,b^2\right)\sqrt{b}}{6\,(ab^3x^2+b^4x)\sqrt{b}\sqrt{x}\sqrt{\frac{ax+b}{x}}},\right.$$
$$\left.-\frac{15\left(a^2x^2+abx\right)\sqrt{x}\sqrt{\frac{ax+b}{x}}\arctan\left(\frac{b}{\sqrt{-b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}\right)+\left(15\,a^2x^2+20\,abx+3\,b^2\right)\sqrt{-b}}{3\,(ab^3x^2+b^4x)\sqrt{-b}\sqrt{x}\sqrt{\frac{ax+b}{x}}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^(9/2)),x, algorithm="fricas")
```

```
[Out] [1/6*(15*(a^2*x^2 + a*b*x)*sqrt(x)*sqrt((a*x + b)/x)*log((2*b*sqr
t(x)*sqrt((a*x + b)/x) + (a*x + 2*b)*sqrt(b))/x) - 2*(15*a^2*x^2
+ 20*a*b*x + 3*b^2)*sqrt(b))/((a*b^3*x^2 + b^4*x)*sqrt(b)*sqrt(x)
*sqrt((a*x + b)/x)), -1/3*(15*(a^2*x^2 + a*b*x)*sqrt(x)*sqrt((a*x
 + b)/x)*arctan(b/(sqrt(-b)*sqrt(x)*sqrt((a*x + b)/x))) + (15*a^2
*x^2 + 20*a*b*x + 3*b^2)*sqrt(-b))/((a*b^3*x^2 + b^4*x)*sqrt(-b)*
sqrt(x)*sqrt((a*x + b)/x))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(5/2)/x**(9/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.265042, size = 89, normalized size = 0.9

$$-\frac{1}{3}\,a\left(\frac{15\,\arctan\left(\frac{\sqrt{ax+b}}{\sqrt{-b}}\right)}{\sqrt{-b}b^{3}}+\frac{2\,(6\,ax+7\,b)}{(ax+b)^{\frac{3}{2}}b^{3}}+\frac{3\,\sqrt{ax+b}}{ab^{3}x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^(9/2)),x, algorithm="giac")
```

```
[Out] -1/3*a*(15*arctan(sqrt(a*x + b)/sqrt(-b))/(sqrt(-b)*b^3) + 2*(6*a
*x + 7*b)/((a*x + b)^(3/2)*b^3) + 3*sqrt(a*x + b)/(a*b^3*x))
```

3.1801 $\int \frac{1}{\left(a+\frac{b}{x}\right)^{5/2} x^{11/2}} dx$

Optimal. Leaf size=129

$$-\frac{35a^2\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{4b^{9/2}}+\frac{35a\sqrt{a+\frac{b}{x}}}{4b^4\sqrt{x}}-\frac{35\sqrt{a+\frac{b}{x}}}{6b^3x^{3/2}}+\frac{14}{3b^2x^{5/2}\sqrt{a+\frac{b}{x}}}+\frac{2}{3bx^{7/2}\left(a+\frac{b}{x}\right)^{3/2}}$$

```
[Out] 2/(3*b*(a + b/x)^(3/2)*x^(7/2)) + 14/(3*b^2*Sqrt[a + b/x]*x^(5/2)
) - (35*Sqrt[a + b/x])/(6*b^3*x^(3/2)) + (35*a*Sqrt[a + b/x])/(4*
b^4*Sqrt[x]) - (35*a^2*ArcTanh[Sqrt[b]/(Sqrt[a + b/x]*Sqrt[x])])/
(4*b^(9/2))
```

Rubi [A] time = 0.198109, antiderivative size = 129, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.294

$$-\frac{35a^2\tanh^{-1}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{4b^{9/2}}+\frac{35a\sqrt{a+\frac{b}{x}}}{4b^4\sqrt{x}}-\frac{35\sqrt{a+\frac{b}{x}}}{6b^3x^{3/2}}+\frac{14}{3b^2x^{5/2}\sqrt{a+\frac{b}{x}}}+\frac{2}{3bx^{7/2}\left(a+\frac{b}{x}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x)^(5/2)*x^(11/2)),x]
```

```
[Out] 2/(3*b*(a + b/x)^(3/2)*x^(7/2)) + 14/(3*b^2*Sqrt[a + b/x]*x^(5/2)
) - (35*Sqrt[a + b/x])/(6*b^3*x^(3/2)) + (35*a*Sqrt[a + b/x])/(4*
b^4*Sqrt[x]) - (35*a^2*ArcTanh[Sqrt[b]/(Sqrt[a + b/x]*Sqrt[x])])/
(4*b^(9/2))
```

Rubi in Sympy [A] time = 20.9956, size = 112, normalized size = 0.87

$$-\frac{35a^2\operatorname{atanh}\left(\frac{\sqrt{b}}{\sqrt{x}\sqrt{a+\frac{b}{x}}}\right)}{4b^{\frac{9}{2}}}+\frac{35a\sqrt{a+\frac{b}{x}}}{4b^4\sqrt{x}}+\frac{2}{3bx^{\frac{7}{2}}\left(a+\frac{b}{x}\right)^{\frac{3}{2}}}+\frac{14}{3b^2x^{\frac{5}{2}}\sqrt{a+\frac{b}{x}}}-\frac{35\sqrt{a+\frac{b}{x}}}{6b^3x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x)**(5/2)/x**(11/2),x)
```

```
[Out] -35*a**2*atanh(sqrt(b)/(sqrt(x)*sqrt(a + b/x)))/(4*b**(9/2)) + 35
*a*sqrt(a + b/x)/(4*b**4*sqrt(x)) + 2/(3*b*x**(7/2)*(a + b/x)**(3
/2)) + 14/(3*b**2*x**(5/2)*sqrt(a + b/x)) - 35*sqrt(a + b/x)/(6*b
**3*x**(3/2))
```

Mathematica [A] time = 0.32784, size = 107, normalized size = 0.83

$$\frac{-210a^2\log\left(\sqrt{b}\sqrt{x}\sqrt{a+\frac{b}{x}}+b\right)+105a^2\log(x)+\frac{2\sqrt{b}\sqrt{a+\frac{b}{x}}\left(105a^3x^3+140a^2bx^2+21ab^2x-6b^3\right)}{x^{3/2}(ax+b)^2}}{24b^{9/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x)^(5/2)*x^(11/2)),x]
```

```
[Out] ((2*Sqrt[b]*Sqrt[a + b/x]*(-6*b^3 + 21*a*b^2*x + 140*a^2*b*x^2 +
105*a^3*x^3))/(x^(3/2)*(b + a*x)^2) - 210*a^2*Log[b + Sqrt[b]*Sqr
t[a + b/x]*Sqrt[x]] + 105*a^2*Log[x])/(24*b^(9/2))
```

Maple [A] time = 0.031, size = 117, normalized size = 0.9

$$-\frac{1}{12\,(ax+b)^2}\sqrt{\frac{ax+b}{x}}\left(105\,Artanh\left(\frac{\sqrt{ax+b}}{\sqrt{b}}\right)\sqrt{ax+b}x^3a^3+105\,Artanh\left(\frac{\sqrt{ax+b}}{\sqrt{b}}\right)x^2a^2b\sqrt{ax+b}-105\,x^3a^3\sqrt{b}-140\,$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x)^(5/2)/x^(11/2),x)
```

```
[Out] -1/12*((a*x+b)/x)^(1/2)/x^(3/2)*(105*arctanh((a*x+b)^(1/2)/b^(1/2
))*(a*x+b)^(1/2)*x^3*a^3+105*arctanh((a*x+b)^(1/2)/b^(1/2))*x^2*a
^2*b*(a*x+b)^(1/2)-105*x^3*a^3*b^(1/2)-140*b^(3/2)*x^2*a^2-21*b^(
5/2)*x*a+6*b^(7/2))/(a*x+b)^2/b^(9/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^(11/2)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.254303, size = 1, normalized size = 0.01

$$\left[\frac{105\,(a^3x^3+a^2bx^2)\sqrt{x}\sqrt{\frac{ax+b}{x}}\log\left(-\frac{2\,b\sqrt{x}\sqrt{\frac{ax+b}{x}}-(ax+2\,b)\sqrt{b}}{x}\right)+2\,(105\,a^3x^3+140\,a^2bx^2+21\,ab^2x-6\,b^3)\sqrt{b}}{24\,(ab^4x^3+b^5x^2)\sqrt{b}\sqrt{x}\sqrt{\frac{ax+b}{x}}},\;105\,(a^3x^3+a\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^(11/2)),x, algorithm="fricas")
```

```
[Out] [1/24*(105*(a^3*x^3 + a^2*b*x^2)*sqrt(x)*sqrt((a*x + b)/x)*log(-(
2*b*sqrt(x)*sqrt((a*x + b)/x) - (a*x + 2*b)*sqrt(b))/x) + 2*(105*
a^3*x^3 + 140*a^2*b*x^2 + 21*a*b^2*x - 6*b^3)*sqrt(b))/((a*b^4*x^
3 + b^5*x^2)*sqrt(b)*sqrt(x)*sqrt((a*x + b)/x)), 1/12*(105*(a^3*x
^3 + a^2*b*x^2)*sqrt(x)*sqrt((a*x + b)/x)*arctan(b/(sqrt(-b)*sqrt
(x)*sqrt((a*x + b)/x))) + (105*a^3*x^3 + 140*a^2*b*x^2 + 21*a*b^2
*x - 6*b^3)*sqrt(-b))/((a*b^4*x^3 + b^5*x^2)*sqrt(-b)*sqrt(x)*sqr
t((a*x + b)/x))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x)**(5/2)/x**(11/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.268367, size = 109, normalized size = 0.84

$$\frac{1}{12}\,a^{2}\left(\frac{105\,\arctan\left(\frac{\sqrt{ax+b}}{\sqrt{-b}}\right)}{\sqrt{-b}b^{4}}+\frac{8\,(9\,ax+10\,b)}{(ax+b)^{\frac{3}{2}}b^{4}}+\frac{3\left(11\,(ax+b)^{\frac{3}{2}}-13\,\sqrt{ax+b}b\right)}{a^{2}b^{4}x^{2}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x)^(5/2)*x^(11/2)),x, algorithm="giac")
```

```
[Out] 1/12*a^2*(105*arctan(sqrt(a*x + b)/sqrt(-b))/(sqrt(-b)*b^4) + 8*(
9*a*x + 10*b)/((a*x + b)^(3/2)*b^4) + 3*(11*(a*x + b)^(3/2) - 13*
sqrt(a*x + b)*b)/(a^2*b^4*x^2))
```

3.1802 $\int \left(a+\frac{b}{x^2}\right) x^6 \, dx$

Optimal. Leaf size=17

$$\frac{ax^7}{7}+\frac{bx^5}{5}$$

```
[Out] (b*x^5)/5 + (a*x^7)/7
```

Rubi [A] time = 0.0152977, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{ax^7}{7}+\frac{bx^5}{5}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)*x^6,x]

[Out] (b*x^5)/5 + (a*x^7)/7
```

Rubi in Sympy [A] time = 2.78817, size = 12, normalized size = 0.71

$$\frac{ax^7}{7}+\frac{bx^5}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)*x**6,x)

[Out] a*x**7/7 + b*x**5/5
```

Mathematica [A] time = 0.00247123, size = 17, normalized size = 1.

$$\frac{ax^7}{7}+\frac{bx^5}{5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)*x^6,x]

[Out] (b*x^5)/5 + (a*x^7)/7
```

Maple [A] time = 0.001, size = 14, normalized size = 0.8

$$\frac{bx^5}{5}+\frac{ax^7}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)*x^6,x)

[Out] 1/5*b*x^5+1/7*a*x^7
```

Maxima [A] time = 1.42556, size = 18, normalized size = 1.06

$$\frac{1}{7}ax^7 + \frac{1}{5}bx^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)*x^6,x, algorithm="maxima")
```

```
[Out] 1/7*a*x^7 + 1/5*b*x^5
```

Fricas [A] time = 0.221802, size = 18, normalized size = 1.06

$$\frac{1}{7}ax^7 + \frac{1}{5}bx^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)*x^6,x, algorithm="fricas")
```

```
[Out] 1/7*a*x^7 + 1/5*b*x^5
```

Sympy [A] time = 0.071475, size = 12, normalized size = 0.71

$$\frac{ax^7}{7} + \frac{bx^5}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)*x**6,x)
```

```
[Out] a*x**7/7 + b*x**5/5
```

GIAC/XCAS [A] time = 0.227856, size = 18, normalized size = 1.06

$$\frac{1}{7}ax^7 + \frac{1}{5}bx^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)*x^6,x, algorithm="giac")
```

```
[Out] 1/7*a*x^7 + 1/5*b*x^5
```

3.1803 $\int \left(a+\frac{b}{x^2}\right) x^5 \, dx$

Optimal. Leaf size=17

$$\frac{ax^6}{6}+\frac{bx^4}{4}$$

```
[Out] (b*x^4)/4 + (a*x^6)/6
```

Rubi [A] time = 0.0156776, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{ax^6}{6}+\frac{bx^4}{4}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x^2)*x^5,x]

[Out] (b*x^4)/4 + (a*x^6)/6
```

Rubi in Sympy [A] time = 2.77246, size = 12, normalized size = 0.71

$$\frac{ax^6}{6}+\frac{bx^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x**2)*x**5,x)

[Out] a*x**6/6 + b*x**4/4
```

Mathematica [A] time = 0.00202293, size = 17, normalized size = 1.

$$\frac{ax^6}{6}+\frac{bx^4}{4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x^2)*x^5,x]

[Out] (b*x^4)/4 + (a*x^6)/6
```

Maple [A] time = 0.002, size = 14, normalized size = 0.8

$$\frac{bx^4}{4}+\frac{x^6a}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x^2)*x^5,x)

[Out] 1/4*b*x^4+1/6*x^6*a
```

Maxima [A] time = 1.43229, size = 18, normalized size = 1.06

$$\frac{1}{6}\,ax^6 + \frac{1}{4}\,bx^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)*x^5,x, algorithm="maxima")
```

```
[Out] 1/6*a*x^6 + 1/4*b*x^4
```

Fricas [A] time = 0.22366, size = 18, normalized size = 1.06

$$\frac{1}{6}\,ax^6 + \frac{1}{4}\,bx^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)*x^5,x, algorithm="fricas")
```

```
[Out] 1/6*a*x^6 + 1/4*b*x^4
```

Sympy [A] time = 0.067162, size = 12, normalized size = 0.71

$$\frac{ax^6}{6} + \frac{bx^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)*x**5,x)
```

```
[Out] a*x**6/6 + b*x**4/4
```

GIAC/XCAS [A] time = 0.226768, size = 18, normalized size = 1.06

$$\frac{1}{6}\,ax^6 + \frac{1}{4}\,bx^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)*x^5,x, algorithm="giac")
```

```
[Out] 1/6*a*x^6 + 1/4*b*x^4
```

3.1804 $\int \left(a+\frac{b}{x^2}\right) x^4 \, dx$

Optimal. Leaf size=17

$$\frac{ax^5}{5}+\frac{bx^3}{3}$$

```
[Out] (b*x^3)/3 + (a*x^5)/5
```

Rubi [A] time = 0.015812, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{ax^5}{5}+\frac{bx^3}{3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)*x^4,x]

[Out] (b*x^3)/3 + (a*x^5)/5
```

Rubi in Sympy [A] time = 2.77901, size = 12, normalized size = 0.71

$$\frac{ax^5}{5}+\frac{bx^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)*x**4,x)

[Out] a*x**5/5 + b*x**3/3
```

Mathematica [A] time = 0.00210709, size = 17, normalized size = 1.

$$\frac{ax^5}{5}+\frac{bx^3}{3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)*x^4,x]

[Out] (b*x^3)/3 + (a*x^5)/5
```

Maple [A] time = 0.001, size = 14, normalized size = 0.8

$$\frac{bx^3}{3}+\frac{ax^5}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)*x^4,x)

[Out] 1/3*b*x^3+1/5*a*x^5
```

Maxima [A] time = 1.43008, size = 18, normalized size = 1.06

$$\frac{1}{5}ax^5 + \frac{1}{3}bx^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)*x^4,x, algorithm="maxima")
```

```
[Out] 1/5*a*x^5 + 1/3*b*x^3
```

Fricas [A] time = 0.223325, size = 18, normalized size = 1.06

$$\frac{1}{5}ax^5 + \frac{1}{3}bx^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)*x^4,x, algorithm="fricas")
```

```
[Out] 1/5*a*x^5 + 1/3*b*x^3
```

Sympy [A] time = 0.065885, size = 12, normalized size = 0.71

$$\frac{ax^5}{5} + \frac{bx^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)*x**4,x)
```

```
[Out] a*x**5/5 + b*x**3/3
```

GIAC/XCAS [A] time = 0.228078, size = 18, normalized size = 1.06

$$\frac{1}{5}ax^5 + \frac{1}{3}bx^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)*x^4,x, algorithm="giac")
```

```
[Out] 1/5*a*x^5 + 1/3*b*x^3
```

3.1805 $\int \left(a+\frac{b}{x^2}\right) x^3 \, dx$

Optimal. Leaf size=17

$$\frac{ax^4}{4}+\frac{bx^2}{2}$$

```
[Out] (b*x^2)/2 + (a*x^4)/4
```

Rubi [A] time = 0.0161627, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{ax^4}{4}+\frac{bx^2}{2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)*x^3,x]

[Out] (b*x^2)/2 + (a*x^4)/4
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{ax^4}{4}+b\int x \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)*x**3,x)

[Out] a*x**4/4 + b*Integral(x, x)
```

Mathematica [A] time = 0.00180982, size = 17, normalized size = 1.

$$\frac{ax^4}{4}+\frac{bx^2}{2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)*x^3,x]

[Out] (b*x^2)/2 + (a*x^4)/4
```

Maple [A] time = 0.002, size = 14, normalized size = 0.8

$$\frac{bx^2}{2}+\frac{ax^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)*x^3,x)

[Out] 1/2*b*x^2+1/4*a*x^4
```

Maxima [A] time = 1.43386, size = 18, normalized size = 1.06

$$\frac{1}{4}\,ax^4 + \frac{1}{2}\,bx^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)*x^3,x, algorithm="maxima")
```

```
[Out] 1/4*a*x^4 + 1/2*b*x^2
```

Fricas [A] time = 0.222844, size = 18, normalized size = 1.06

$$\frac{1}{4}\,ax^4 + \frac{1}{2}\,bx^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)*x^3,x, algorithm="fricas")
```

```
[Out] 1/4*a*x^4 + 1/2*b*x^2
```

Sympy [A] time = 0.069796, size = 12, normalized size = 0.71

$$\frac{ax^4}{4} + \frac{bx^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)*x**3,x)
```

```
[Out] a*x**4/4 + b*x**2/2
```

GIAC/XCAS [A] time = 0.226542, size = 18, normalized size = 1.06

$$\frac{1}{4}\,ax^4 + \frac{1}{2}\,bx^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)*x^3,x, algorithm="giac")
```

```
[Out] 1/4*a*x^4 + 1/2*b*x^2
```

3.1806 $\int \left(a+\frac{b}{x^2}\right) x^2 \, dx$

Optimal. Leaf size=12

$$\frac{ax^3}{3}+bx$$

```
[Out] b*x + (a*x^3)/3
```

Rubi [A] time = 0.0132819, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{ax^3}{3}+bx$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x^2)*x^2,x]
```

```
[Out] b*x + (a*x^3)/3
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{ax^3}{3}+\int b\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x**2)*x**2,x)
```

```
[Out] a*x**3/3 + Integral(b, x)
```

Mathematica [A] time = 0.000962509, size = 12, normalized size = 1.

$$\frac{ax^3}{3}+bx$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x^2)*x^2,x]
```

```
[Out] b*x + (a*x^3)/3
```

Maple [A] time = 0.001, size = 11, normalized size = 0.9

$$bx+\frac{ax^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x^2)*x^2,x)
```

```
[Out] b*x+1/3*a*x^3
```

Maxima [A] time = 1.47025, size = 14, normalized size = 1.17

$$\frac{1}{3}\,ax^3 + bx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)*x^2,x, algorithm="maxima")
```

```
[Out] 1/3*a*x^3 + b*x
```

Fricas [A] time = 0.221343, size = 14, normalized size = 1.17

$$\frac{1}{3}\,ax^3 + bx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)*x^2,x, algorithm="fricas")
```

```
[Out] 1/3*a*x^3 + b*x
```

Sympy [A] time = 0.064747, size = 8, normalized size = 0.67

$$\frac{ax^3}{3} + bx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)*x**2,x)
```

```
[Out] a*x**3/3 + b*x
```

GIAC/XCAS [A] time = 0.2295, size = 14, normalized size = 1.17

$$\frac{1}{3}\,ax^3 + bx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)*x^2,x, algorithm="giac")
```

```
[Out] 1/3*a*x^3 + b*x
```

3.1807 $\int \left(a+\frac{b}{x^2}\right) x \, dx$

Optimal. Leaf size=13

$$\frac{ax^2}{2}+b\log(x)$$

```
[Out] (a*x^2)/2 + b*Log[x]
```

Rubi [A] time = 0.0135458, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111

$$\frac{ax^2}{2}+b\log(x)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)*x,x]

[Out] (a*x^2)/2 + b*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$a\int x\,dx+b\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)*x,x)

[Out] a*Integral(x, x) + b*log(x)
```

Mathematica [A] time = 0.00526564, size = 13, normalized size = 1.

$$\frac{ax^2}{2}+b\log(x)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)*x,x]

[Out] (a*x^2)/2 + b*Log[x]
```

Maple [A] time = 0.003, size = 12, normalized size = 0.9

$$\frac{ax^2}{2}+b\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)*x,x)

[Out] 1/2*a*x^2+b*ln(x)
```

Maxima [A] time = 1.42977, size = 19, normalized size = 1.46

$$\frac{1}{2}ax^2 + \frac{1}{2}b\log\left(x^2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)*x,x, algorithm="maxima")
```

```
[Out] 1/2*a*x^2 + 1/2*b*log(x^2)
```

Fricas [A] time = 0.234629, size = 15, normalized size = 1.15

$$\frac{1}{2}ax^2 + b\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)*x,x, algorithm="fricas")
```

```
[Out] 1/2*a*x^2 + b*log(x)
```

Sympy [A] time = 0.143045, size = 10, normalized size = 0.77

$$\frac{ax^2}{2} + b\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)*x,x)
```

```
[Out] a*x**2/2 + b*log(x)
```

GIAC/XCAS [A] time = 0.228145, size = 16, normalized size = 1.23

$$\frac{1}{2}ax^2 + b\ln\left(|x|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)*x,x, algorithm="giac")
```

```
[Out] 1/2*a*x^2 + b*ln(abs(x))
```

3.1808 $\int \left(a+\frac{b}{x^2}\right) dx$

Optimal. Leaf size=10

$$ax-\frac{b}{x}$$

```
[Out] -(b/x) + a*x
```

Rubi [A] time = 0.0094699, antiderivative size = 10, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 0, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.

$$ax-\frac{b}{x}$$

Antiderivative was successfully verified.

```
[In] Int[a + b/x^2,x]
```

```
[Out] -(b/x) + a*x
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{b}{x}+\int a\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(a+b/x**2,x)
```

```
[Out] -b/x + Integral(a, x)
```

Mathematica [A] time = 0.000349421, size = 10, normalized size = 1.

$$ax-\frac{b}{x}$$

Antiderivative was successfully verified.

```
[In] Integrate[a + b/x^2,x]
```

```
[Out] -(b/x) + a*x
```

Maple [A] time = 0.002, size = 11, normalized size = 1.1

$$-\frac{b}{x}+ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(a+b/x^2,x)
```

```
[Out] -b/x+a*x
```

Maxima [A] time = 1.43336, size = 14, normalized size = 1.4

$$ax - \frac{b}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(a + b/x^2,x, algorithm="maxima")
```

```
[Out] a*x - b/x
```

Fricas [A] time = 0.216677, size = 18, normalized size = 1.8

$$\frac{ax^2 - b}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(a + b/x^2,x, algorithm="fricas")
```

```
[Out] (a*x^2 - b)/x
```

Sympy [A] time = 0.970894, size = 5, normalized size = 0.5

$$ax - \frac{b}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(a+b/x**2,x)
```

```
[Out] a*x - b/x
```

GIAC/XCAS [A] time = 0.22677, size = 14, normalized size = 1.4

$$ax - \frac{b}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(a + b/x^2,x, algorithm="giac")
```

```
[Out] a*x - b/x
```

3.1809 $\int \frac{a+\frac{b}{x^2}}{x}\,dx$

Optimal. Leaf size=13

$$a\log(x)-\frac{b}{2x^2}$$

```
[Out] -b/(2*x^2) + a*Log[x]
```

Rubi [A] time = 0.0148258, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$a\log(x)-\frac{b}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)/x,x]

[Out] -b/(2*x^2) + a*Log[x]
```

Rubi in Sympy [A] time = 2.78942, size = 10, normalized size = 0.77

$$a\log(x)-\frac{b}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)/x,x)

[Out] a*log(x) - b/(2*x**2)
```

Mathematica [A] time = 0.00431721, size = 13, normalized size = 1.

$$a\log(x)-\frac{b}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)/x,x]

[Out] -b/(2*x^2) + a*Log[x]
```

Maple [A] time = 0.008, size = 12, normalized size = 0.9

$$-\frac{b}{2\,x^2}+a\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)/x,x)

[Out] -1/2*b/x^2+a*ln(x)
```

Maxima [A] time = 1.425, size = 19, normalized size = 1.46

$$\frac{1}{2}\,a\log\left(x^2\right) - \frac{b}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)/x,x, algorithm="maxima")
```

```
[Out] 1/2*a*log(x^2) - 1/2*b/x^2
```

Fricas [A] time = 0.220093, size = 23, normalized size = 1.77

$$\frac{2\,ax^2\log\left(x\right) - b}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)/x,x, algorithm="fricas")
```

```
[Out] 1/2*(2*a*x^2*log(x) - b)/x^2
```

Sympy [A] time = 1.0533, size = 10, normalized size = 0.77

$$a\log\left(x\right) - \frac{b}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)/x,x)
```

```
[Out] a*log(x) - b/(2*x**2)
```

GIAC/XCAS [A] time = 0.229645, size = 27, normalized size = 2.08

$$\frac{1}{2}\,a\ln\left(x^2\right) - \frac{ax^2 + b}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)/x,x, algorithm="giac")
```

```
[Out] 1/2*a*ln(x^2) - 1/2*(a*x^2 + b)/x^2
```

3.1810 $\int \frac{a+\frac{b}{x^2}}{x^2} dx$

Optimal. Leaf size=15

$$-\frac{a}{x}-\frac{b}{3x^3}$$

```
[Out] -b/(3*x^3) - a/x
```

Rubi [A] time = 0.0164766, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$-\frac{a}{x}-\frac{b}{3x^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x^2)/x^2,x]

[Out] -b/(3*x^3) - a/x
```

Rubi in Sympy [A] time = 3.04694, size = 10, normalized size = 0.67

$$-\frac{a}{x}-\frac{b}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x**2)/x**2,x)

[Out] -a/x - b/(3*x**3)
```

Mathematica [A] time = 0.00379276, size = 15, normalized size = 1.

$$-\frac{a}{x}-\frac{b}{3x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x^2)/x^2,x]

[Out] -b/(3*x^3) - a/x
```

Maple [A] time = 0.008, size = 14, normalized size = 0.9

$$-\frac{b}{3\,x^3}-\frac{a}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x^2)/x^2,x)

[Out] -1/3*b/x^3-a/x
```

Maxima [A] time = 1.53122, size = 18, normalized size = 1.2

$$-\frac{3\,ax^2+b}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)/x^2,x, algorithm="maxima")
```

```
[Out] -1/3*(3*a*x^2 + b)/x^3
```

Fricas [A] time = 0.218322, size = 18, normalized size = 1.2

$$-\frac{3\,ax^2+b}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)/x^2,x, algorithm="fricas")
```

```
[Out] -1/3*(3*a*x^2 + b)/x^3
```

Sympy [A] time = 1.09921, size = 14, normalized size = 0.93

$$-\frac{3ax^2+b}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)/x**2,x)
```

```
[Out] -(3*a*x**2 + b)/(3*x**3)
```

GIAC/XCAS [A] time = 0.224691, size = 18, normalized size = 1.2

$$-\frac{3\,ax^2+b}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)/x^2,x, algorithm="giac")
```

```
[Out] -1/3*(3*a*x^2 + b)/x^3
```

3.1811 $\int \frac{a+\frac{b}{x^2}}{x^3}\,dx$

Optimal. Leaf size=17

$$-\frac{a}{2x^2}-\frac{b}{4x^4}$$

```
[Out] -b/(4*x^4) - a/(2*x^2)
```

Rubi [A] time = 0.0150459, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$-\frac{a}{2x^2}-\frac{b}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)/x^3,x]

[Out] -b/(4*x^4) - a/(2*x^2)
```

Rubi in Sympy [A] time = 2.87073, size = 14, normalized size = 0.82

$$-\frac{a}{2x^2}-\frac{b}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)/x**3,x)

[Out] -a/(2*x**2) - b/(4*x**4)
```

Mathematica [A] time = 0.00383628, size = 17, normalized size = 1.

$$-\frac{a}{2x^2}-\frac{b}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)/x^3,x]

[Out] -b/(4*x^4) - a/(2*x^2)
```

Maple [A] time = 0.006, size = 14, normalized size = 0.8

$$-\frac{b}{4\,x^4}-\frac{a}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)/x^3,x)

[Out] -1/4*b/x^4-1/2*a/x^2
```

Maxima [A] time = 1.44467, size = 19, normalized size = 1.12

$$-\frac{\left(a+\frac{b}{x^2}\right)^2}{4\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)/x^3,x, algorithm="maxima")

[Out] -1/4*(a + b/x^2)^2/b
```

Fricas [A] time = 0.218902, size = 18, normalized size = 1.06

$$-\frac{2\,ax^2+b}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)/x^3,x, algorithm="fricas")

[Out] -1/4*(2*a*x^2 + b)/x^4
```

Sympy [A] time = 1.12329, size = 14, normalized size = 0.82

$$-\frac{2ax^2+b}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)/x**3,x)

[Out] -(2*a*x**2 + b)/(4*x**4)
```

GIAC/XCAS [A] time = 0.22647, size = 18, normalized size = 1.06

$$-\frac{2\,ax^2+b}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)/x^3,x, algorithm="giac")

[Out] -1/4*(2*a*x^2 + b)/x^4
```

3.1812 $\int \frac{a+\frac{b}{x^2}}{x^4} dx$

Optimal. Leaf size=17

$$-\frac{a}{3x^3} - \frac{b}{5x^5}$$

```
[Out] -b/(5*x^5) - a/(3*x^3)
```

Rubi [A] time = 0.0159713, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$-\frac{a}{3x^3} - \frac{b}{5x^5}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)/x^4,x]

[Out] -b/(5*x^5) - a/(3*x^3)
```

Rubi in Sympy [A] time = 2.86867, size = 14, normalized size = 0.82

$$-\frac{a}{3x^3} - \frac{b}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)/x**4,x)

[Out] -a/(3*x**3) - b/(5*x**5)
```

Mathematica [A] time = 0.00380172, size = 17, normalized size = 1.

$$-\frac{a}{3x^3} - \frac{b}{5x^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)/x^4,x]

[Out] -b/(5*x^5) - a/(3*x^3)
```

Maple [A] time = 0.006, size = 14, normalized size = 0.8

$$-\frac{b}{5\,x^5} - \frac{a}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)/x^4,x)

[Out] -1/5*b/x^5-1/3*a/x^3
```

Maxima [A] time = 1.43559, size = 20, normalized size = 1.18

$$-\frac{5\,ax^2 + 3\,b}{15\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)/x^4,x, algorithm="maxima")
```

```
[Out] -1/15*(5*a*x^2 + 3*b)/x^5
```

Fricas [A] time = 0.21962, size = 20, normalized size = 1.18

$$-\frac{5\,ax^2 + 3\,b}{15\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)/x^4,x, algorithm="fricas")
```

```
[Out] -1/15*(5*a*x^2 + 3*b)/x^5
```

Sympy [A] time = 1.16954, size = 15, normalized size = 0.88

$$-\frac{5ax^2 + 3b}{15x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)/x**4,x)
```

```
[Out] -(5*a*x**2 + 3*b)/(15*x**5)
```

GIAC/XCAS [A] time = 0.227119, size = 20, normalized size = 1.18

$$-\frac{5\,ax^2 + 3\,b}{15\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)/x^4,x, algorithm="giac")
```

```
[Out] -1/15*(5*a*x^2 + 3*b)/x^5
```

3.1813 $\int \frac{a+\frac{b}{x^2}}{x^5} \, dx$

Optimal. Leaf size=17

$$-\frac{a}{4x^4}-\frac{b}{6x^6}$$

```
[Out] -b/(6*x^6) - a/(4*x^4)
```

Rubi [A] time = 0.0160299, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$-\frac{a}{4x^4}-\frac{b}{6x^6}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)/x^5,x]

[Out] -b/(6*x^6) - a/(4*x^4)
```

Rubi in Sympy [A] time = 2.87779, size = 14, normalized size = 0.82

$$-\frac{a}{4x^4}-\frac{b}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)/x**5,x)

[Out] -a/(4*x**4) - b/(6*x**6)
```

Mathematica [A] time = 0.00361709, size = 17, normalized size = 1.

$$-\frac{a}{4x^4}-\frac{b}{6x^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)/x^5,x]

[Out] -b/(6*x^6) - a/(4*x^4)
```

Maple [A] time = 0.008, size = 14, normalized size = 0.8

$$-\frac{b}{6\,x^6}-\frac{a}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)/x^5,x)

[Out] -1/6*b/x^6-1/4*a/x^4
```

Maxima [A] time = 1.44189, size = 20, normalized size = 1.18

$$-\frac{3\,ax^2+2\,b}{12\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)/x^5,x, algorithm="maxima")
```

```
[Out] -1/12*(3*a*x^2 + 2*b)/x^6
```

Fricas [A] time = 0.215956, size = 20, normalized size = 1.18

$$-\frac{3\,ax^2+2\,b}{12\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)/x^5,x, algorithm="fricas")
```

```
[Out] -1/12*(3*a*x^2 + 2*b)/x^6
```

Sympy [A] time = 1.16136, size = 15, normalized size = 0.88

$$-\frac{3ax^2+2b}{12x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)/x**5,x)
```

```
[Out] -(3*a*x**2 + 2*b)/(12*x**6)
```

GIAC/XCAS [A] time = 0.223297, size = 20, normalized size = 1.18

$$-\frac{3\,ax^2+2\,b}{12\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)/x^5,x, algorithm="giac")
```

```
[Out] -1/12*(3*a*x^2 + 2*b)/x^6
```

3.1814 $\int \frac{a+\frac{b}{x^2}}{x^6} \, dx$

Optimal. Leaf size=17

$$-\frac{a}{5x^5}-\frac{b}{7x^7}$$

```
[Out] -b/(7*x^7) - a/(5*x^5)
```

Rubi [A] time = 0.0156606, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$-\frac{a}{5x^5}-\frac{b}{7x^7}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)/x^6,x]

[Out] -b/(7*x^7) - a/(5*x^5)
```

Rubi in Sympy [A] time = 2.93819, size = 14, normalized size = 0.82

$$-\frac{a}{5x^5}-\frac{b}{7x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)/x**6,x)

[Out] -a/(5*x**5) - b/(7*x**7)
```

Mathematica [A] time = 0.00339726, size = 17, normalized size = 1.

$$-\frac{a}{5x^5}-\frac{b}{7x^7}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)/x^6,x]

[Out] -b/(7*x^7) - a/(5*x^5)
```

Maple [A] time = 0.006, size = 14, normalized size = 0.8

$$-\frac{b}{7\,x^7}-\frac{a}{5\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)/x^6,x)

[Out] -1/7*b/x^7-1/5*a/x^5
```

Maxima [A] time = 1.44, size = 20, normalized size = 1.18

$$-\frac{7\,ax^2+5\,b}{35\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)/x^6,x, algorithm="maxima")
```

```
[Out] -1/35*(7*a*x^2 + 5*b)/x^7
```

Fricas [A] time = 0.215507, size = 20, normalized size = 1.18

$$-\frac{7\,ax^2+5\,b}{35\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)/x^6,x, algorithm="fricas")
```

```
[Out] -1/35*(7*a*x^2 + 5*b)/x^7
```

Sympy [A] time = 1.21881, size = 15, normalized size = 0.88

$$-\frac{7ax^2+5b}{35x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)/x**6,x)
```

```
[Out] -(7*a*x**2 + 5*b)/(35*x**7)
```

GIAC/XCAS [A] time = 0.229471, size = 20, normalized size = 1.18

$$-\frac{7\,ax^2+5\,b}{35\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)/x^6,x, algorithm="giac")
```

```
[Out] -1/35*(7*a*x^2 + 5*b)/x^7
```

3.1815 $\int \left(a+\frac{b}{x^2}\right)^2 x^6\,dx$

Optimal. Leaf size=30

$$\frac{a^2x^7}{7}+\frac{2}{5}abx^5+\frac{b^2x^3}{3}$$

```
[Out] (b^2*x^3)/3 + (2*a*b*x^5)/5 + (a^2*x^7)/7
```

Rubi [A] time = 0.0460609, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^2x^7}{7}+\frac{2}{5}abx^5+\frac{b^2x^3}{3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x^2)^2*x^6,x]

[Out] (b^2*x^3)/3 + (2*a*b*x^5)/5 + (a^2*x^7)/7
```

Rubi in Sympy [A] time = 6.99374, size = 26, normalized size = 0.87

$$\frac{a^2x^7}{7}+\frac{2abx^5}{5}+\frac{b^2x^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x**2)**2*x**6,x)

[Out] a**2*x**7/7 + 2*a*b*x**5/5 + b**2*x**3/3
```

Mathematica [A] time = 0.00188246, size = 30, normalized size = 1.

$$\frac{a^2x^7}{7}+\frac{2}{5}abx^5+\frac{b^2x^3}{3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x^2)^2*x^6,x]

[Out] (b^2*x^3)/3 + (2*a*b*x^5)/5 + (a^2*x^7)/7
```

Maple [A] time = 0.001, size = 25, normalized size = 0.8

$$\frac{b^2x^3}{3}+\frac{2\,x^5ab}{5}+\frac{a^2x^7}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x^2)^2*x^6,x)

[Out] 1/3*b^2*x^3+2/5*x^5*a*b+1/7*a^2*x^7
```

Maxima [A] time = 1.43765, size = 32, normalized size = 1.07

$$\frac{1}{7}\,a^{2}x^{7}+\frac{2}{5}\,abx^{5}+\frac{1}{3}\,b^{2}x^{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2*x^6,x, algorithm="maxima")
```

```
[Out] 1/7*a^2*x^7 + 2/5*a*b*x^5 + 1/3*b^2*x^3
```

Fricas [A] time = 0.217644, size = 32, normalized size = 1.07

$$\frac{1}{7}\,a^{2}x^{7}+\frac{2}{5}\,abx^{5}+\frac{1}{3}\,b^{2}x^{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2*x^6,x, algorithm="fricas")
```

```
[Out] 1/7*a^2*x^7 + 2/5*a*b*x^5 + 1/3*b^2*x^3
```

Sympy [A] time = 0.091593, size = 26, normalized size = 0.87

$$\frac{a^{2}x^{7}}{7}+\frac{2abx^{5}}{5}+\frac{b^{2}x^{3}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**2*x**6,x)
```

```
[Out] a**2*x**7/7 + 2*a*b*x**5/5 + b**2*x**3/3
```

GIAC/XCAS [A] time = 0.228062, size = 32, normalized size = 1.07

$$\frac{1}{7}\,a^{2}x^{7}+\frac{2}{5}\,abx^{5}+\frac{1}{3}\,b^{2}x^{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2*x^6,x, algorithm="giac")
```

```
[Out] 1/7*a^2*x^7 + 2/5*a*b*x^5 + 1/3*b^2*x^3
```

3.1816 $\int \left(a+\frac{b}{x^2}\right)^2 x^5 \, dx$

Optimal. Leaf size=16

$$\frac{(ax^2+b)^3}{6a}$$

```
[Out] (b + a*x^2)^3/(6*a)
```

Rubi [A] time = 0.0212066, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{(ax^2+b)^3}{6a}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^2*x^5,x]
```

```
[Out] (b + a*x^2)^3/(6*a)
```

Rubi in Sympy [A] time = 3.4856, size = 10, normalized size = 0.62

$$\frac{(ax^2+b)^3}{6a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**2*x**5,x)
```

```
[Out] (a*x**2 + b)**3/(6*a)
```

Mathematica [A] time = 0.00385963, size = 16, normalized size = 1.

$$\frac{(ax^2+b)^3}{6a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^2*x^5,x]
```

```
[Out] (b + a*x^2)^3/(6*a)
```

Maple [A] time = 0.001, size = 25, normalized size = 1.6

$$\frac{a^2x^6}{6}+\frac{abx^4}{2}+\frac{b^2x^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^2*x^5,x)
```

```
[Out] 1/6*a^2*x^6+1/2*a*b*x^4+1/2*b^2*x^2
```

Maxima [A] time = 1.44141, size = 32, normalized size = 2.

$$\frac{1}{6}\,a^{2}x^{6} + \frac{1}{2}\,abx^{4} + \frac{1}{2}\,b^{2}x^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2*x^5,x, algorithm="maxima")
```

```
[Out] 1/6*a^2*x^6 + 1/2*a*b*x^4 + 1/2*b^2*x^2
```

Fricas [A] time = 0.218408, size = 32, normalized size = 2.

$$\frac{1}{6}\,a^{2}x^{6} + \frac{1}{2}\,abx^{4} + \frac{1}{2}\,b^{2}x^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2*x^5,x, algorithm="fricas")
```

```
[Out] 1/6*a^2*x^6 + 1/2*a*b*x^4 + 1/2*b^2*x^2
```

Sympy [A] time = 0.088102, size = 24, normalized size = 1.5

$$\frac{a^{2}x^{6}}{6} + \frac{abx^{4}}{2} + \frac{b^{2}x^{2}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**2*x**5,x)
```

```
[Out] a**2*x**6/6 + a*b*x**4/2 + b**2*x**2/2
```

GIAC/XCAS [A] time = 0.226538, size = 32, normalized size = 2.

$$\frac{1}{6}\,a^{2}x^{6} + \frac{1}{2}\,abx^{4} + \frac{1}{2}\,b^{2}x^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2*x^5,x, algorithm="giac")
```

```
[Out] 1/6*a^2*x^6 + 1/2*a*b*x^4 + 1/2*b^2*x^2
```

3.1817 $\int \left(a+\frac{b}{x^2}\right)^2 x^4 \, dx$

Optimal. Leaf size=25

$$\frac{a^2x^5}{5}+\frac{2}{3}abx^3+b^2x$$

```
[Out] b^2*x + (2*a*b*x^3)/3 + (a^2*x^5)/5
```

Rubi [A] time = 0.0303961, antiderivative size = 25, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^2x^5}{5}+\frac{2}{3}abx^3+b^2x$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x^2)^2*x^4,x]
```

```
[Out] b^2*x + (2*a*b*x^3)/3 + (a^2*x^5)/5
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^2x^5}{5}+\frac{2abx^3}{3}+\int b^2\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x**2)**2*x**4,x)
```

```
[Out] a**2*x**5/5 + 2*a*b*x**3/3 + Integral(b**2, x)
```

Mathematica [A] time = 0.00166711, size = 25, normalized size = 1.

$$\frac{a^2x^5}{5}+\frac{2}{3}abx^3+b^2x$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x^2)^2*x^4,x]
```

```
[Out] b^2*x + (2*a*b*x^3)/3 + (a^2*x^5)/5
```

Maple [A] time = 0.001, size = 22, normalized size = 0.9

$$b^2x+\frac{2\,abx^3}{3}+\frac{x^5a^2}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x^2)^2*x^4,x)
```

```
[Out] b^2*x+2/3*a*b*x^3+1/5*x^5*a^2
```

Maxima [A] time = 1.44408, size = 28, normalized size = 1.12

$$\frac{1}{5}a^2x^5 + \frac{2}{3}abx^3 + b^2x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2*x^4,x, algorithm="maxima")
```

```
[Out] 1/5*a^2*x^5 + 2/3*a*b*x^3 + b^2*x
```

Fricas [A] time = 0.218809, size = 28, normalized size = 1.12

$$\frac{1}{5}a^2x^5 + \frac{2}{3}abx^3 + b^2x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2*x^4,x, algorithm="fricas")
```

```
[Out] 1/5*a^2*x^5 + 2/3*a*b*x^3 + b^2*x
```

Sympy [A] time = 0.085168, size = 22, normalized size = 0.88

$$\frac{a^2x^5}{5} + \frac{2abx^3}{3} + b^2x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**2*x**4,x)
```

```
[Out] a**2*x**5/5 + 2*a*b*x**3/3 + b**2*x
```

GIAC/XCAS [A] time = 0.227624, size = 28, normalized size = 1.12

$$\frac{1}{5}a^2x^5 + \frac{2}{3}abx^3 + b^2x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2*x^4,x, algorithm="giac")
```

```
[Out] 1/5*a^2*x^5 + 2/3*a*b*x^3 + b^2*x
```

3.1818 $\int \left(a+\frac{b}{x^2}\right)^2 x^3 \, dx$

Optimal. Leaf size=23

$$\frac{a^2x^4}{4}+abx^2+b^2\log(x)$$

```
[Out] a*b*x^2 + (a^2*x^4)/4 + b^2*Log[x]
```

Rubi [A] time = 0.0457592, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{a^2x^4}{4}+abx^2+b^2\log(x)$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x^2)^2*x^3,x]
```

```
[Out] a*b*x^2 + (a^2*x^4)/4 + b^2*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^2\int^{x^2} x\,dx}{2}+abx^2+\frac{b^2\log\left(x^2\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x**2)**2*x**3,x)
```

```
[Out] a**2*Integral(x, (x, x**2))/2 + a*b*x**2 + b**2*log(x**2)/2
```

Mathematica [A] time = 0.00210901, size = 23, normalized size = 1.

$$\frac{a^2x^4}{4}+abx^2+b^2\log(x)$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x^2)^2*x^3,x]
```

```
[Out] a*b*x^2 + (a^2*x^4)/4 + b^2*Log[x]
```

Maple [A] time = 0.003, size = 22, normalized size = 1.

$$abx^2+\frac{x^4a^2}{4}+b^2\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x^2)^2*x^3,x)
```

```
[Out] a*b*x^2+1/4*x^4*a^2+b^2*ln(x)
```

Maxima [A] time = 1.44281, size = 32, normalized size = 1.39

$$\frac{1}{4}\,a^2x^4 + abx^2 + \frac{1}{2}\,b^2\log\left(x^2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2*x^3,x, algorithm="maxima")
```

```
[Out] 1/4*a^2*x^4 + a*b*x^2 + 1/2*b^2*log(x^2)
```

Fricas [A] time = 0.231294, size = 28, normalized size = 1.22

$$\frac{1}{4}\,a^2x^4 + abx^2 + b^2\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2*x^3,x, algorithm="fricas")
```

```
[Out] 1/4*a^2*x^4 + a*b*x^2 + b^2*log(x)
```

Sympy [A] time = 1.07473, size = 20, normalized size = 0.87

$$\frac{a^2x^4}{4} + abx^2 + b^2\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**2*x**3,x)
```

```
[Out] a**2*x**4/4 + a*b*x**2 + b**2*log(x)
```

GIAC/XCAS [A] time = 0.228774, size = 30, normalized size = 1.3

$$\frac{1}{4}\,a^2x^4 + abx^2 + b^2\ln\left(|x|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2*x^3,x, algorithm="giac")
```

```
[Out] 1/4*a^2*x^4 + a*b*x^2 + b^2*ln(abs(x))
```

3.1819 $\int \left(a+\frac{b}{x^2}\right)^2 x^2\,dx$

Optimal. Leaf size=24

$$\frac{a^2x^3}{3}+2abx-\frac{b^2}{x}$$

```
[Out] -(b^2/x) + 2*a*b*x + (a^2*x^3)/3
```

Rubi [A] time = 0.0404836, antiderivative size = 24, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^2x^3}{3}+2abx-\frac{b^2}{x}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^2*x^2,x]

[Out] -(b^2/x) + 2*a*b*x + (a^2*x^3)/3
```

Rubi in Sympy [A] time = 6.64783, size = 19, normalized size = 0.79

$$\frac{a^2x^3}{3}+2abx-\frac{b^2}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**2*x**2,x)

[Out] a**2*x**3/3 + 2*a*b*x - b**2/x
```

Mathematica [A] time = 0.00180374, size = 24, normalized size = 1.

$$\frac{a^2x^3}{3}+2abx-\frac{b^2}{x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^2*x^2,x]

[Out] -(b^2/x) + 2*a*b*x + (a^2*x^3)/3
```

Maple [A] time = 0.005, size = 23, normalized size = 1.

$$-\frac{b^2}{x}+2\,abx+\frac{x^3a^2}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^2*x^2,x)

[Out] -b^2/x+2*a*b*x+1/3*x^3*a^2
```

Maxima [A] time = 1.44128, size = 30, normalized size = 1.25

$$\frac{1}{3}\,a^2x^3 + 2\,abx - \frac{b^2}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2*x^2,x, algorithm="maxima")
```

```
[Out] 1/3*a^2*x^3 + 2*a*b*x - b^2/x
```

Fricas [A] time = 0.220409, size = 34, normalized size = 1.42

$$\frac{a^2x^4 + 6\,abx^2 - 3\,b^2}{3\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2*x^2,x, algorithm="fricas")
```

```
[Out] 1/3*(a^2*x^4 + 6*a*b*x^2 - 3*b^2)/x
```

Sympy [A] time = 1.09608, size = 19, normalized size = 0.79

$$\frac{a^2x^3}{3} + 2abx - \frac{b^2}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**2*x**2,x)
```

```
[Out] a**2*x**3/3 + 2*a*b*x - b**2/x
```

GIAC/XCAS [A] time = 0.226212, size = 30, normalized size = 1.25

$$\frac{1}{3}\,a^2x^3 + 2\,abx - \frac{b^2}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2*x^2,x, algorithm="giac")
```

```
[Out] 1/3*a^2*x^3 + 2*a*b*x - b^2/x
```

3.1820 $\int \left(a+\frac{b}{x^2}\right)^2 x\,dx$

Optimal. Leaf size=27

$$\frac{a^2x^2}{2}+2ab\log(x)-\frac{b^2}{2x^2}$$

```
[Out] -b^2/(2*x^2) + (a^2*x^2)/2 + 2*a*b*Log[x]
```

Rubi [A] time = 0.0515083, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273

$$\frac{a^2x^2}{2}+2ab\log(x)-\frac{b^2}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^2*x,x]

[Out] -b^2/(2*x^2) + (a^2*x^2)/2 + 2*a*b*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$ab\log\left(x^2\right)-\frac{b^2}{2x^2}+\frac{\int^{x^2}a^2\,dx}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**2*x,x)

[Out] a*b*log(x**2) - b**2/(2*x**2) + Integral(a**2, (x, x**2))/2
```

Mathematica [A] time = 0.00895152, size = 27, normalized size = 1.

$$\frac{a^2x^2}{2}+2ab\log(x)-\frac{b^2}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^2*x,x]

[Out] -b^2/(2*x^2) + (a^2*x^2)/2 + 2*a*b*Log[x]
```

Maple [A] time = 0.008, size = 24, normalized size = 0.9

$$-\frac{b^2}{2\,x^2}+\frac{a^2x^2}{2}+2\,ab\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^2*x,x)

[Out] -1/2*b^2/x^2+1/2*a^2*x^2+2*a*b*ln(x)
```

Maxima [A] time = 1.43881, size = 32, normalized size = 1.19

$$\frac{1}{2}a^2x^2 + ab\log\left(x^2\right) - \frac{b^2}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2*x,x, algorithm="maxima")
```

```
[Out] 1/2*a^2*x^2 + a*b*log(x^2) - 1/2*b^2/x^2
```

Fricas [A] time = 0.222102, size = 36, normalized size = 1.33

$$\frac{a^2x^4 + 4\,abx^2\log\left(x\right) - b^2}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2*x,x, algorithm="fricas")
```

```
[Out] 1/2*(a^2*x^4 + 4*a*b*x^2*log(x) - b^2)/x^2
```

Sympy [A] time = 1.16373, size = 24, normalized size = 0.89

$$\frac{a^2x^2}{2} + 2ab\log\left(x\right) - \frac{b^2}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**2*x,x)
```

```
[Out] a**2*x**2/2 + 2*a*b*log(x) - b**2/(2*x**2)
```

GIAC/XCAS [A] time = 0.229232, size = 32, normalized size = 1.19

$$\frac{1}{2}a^2x^2 + 2\,ab\ln\left(|x|\right) - \frac{b^2}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2*x,x, algorithm="giac")
```

```
[Out] 1/2*a^2*x^2 + 2*a*b*ln(abs(x)) - 1/2*b^2/x^2
```

3.1821 $\int \left(a+\frac{b}{x^2}\right)^2 \, dx$

Optimal. Leaf size=23

$$a^2x-\frac{2ab}{x}-\frac{b^2}{3x^3}$$

```
[Out] -b^2/(3*x^3) - (2*a*b)/x + a^2*x
```

Rubi [A] time = 0.0334907, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$a^2x-\frac{2ab}{x}-\frac{b^2}{3x^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x^2)^2,x]

[Out] -b^2/(3*x^3) - (2*a*b)/x + a^2*x
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{2ab}{x}-\frac{b^2}{3x^3}+\int a^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x**2)**2,x)

[Out] -2*a*b/x - b**2/(3*x**3) + Integral(a**2, x)
```

Mathematica [A] time = 0.00878449, size = 23, normalized size = 1.

$$a^2x-\frac{2ab}{x}-\frac{b^2}{3x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x^2)^2,x]

[Out] -b^2/(3*x^3) - (2*a*b)/x + a^2*x
```

Maple [A] time = 0.008, size = 22, normalized size = 1.

$$-\frac{b^2}{3\,x^3}-2\,\frac{ab}{x}+xa^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x^2)^2,x)

[Out] -1/3*b^2/x^3-2*a*b/x+x*a^2
```

Maxima [A] time = 1.43518, size = 28, normalized size = 1.22

$$a^2x - \frac{2\,ab}{x} - \frac{b^2}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2,x, algorithm="maxima")

[Out] a^2*x - 2*a*b/x - 1/3*b^2/x^3
```

Fricas [A] time = 0.212713, size = 35, normalized size = 1.52

$$\frac{3\,a^2x^4 - 6\,abx^2 - b^2}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2,x, algorithm="fricas")

[Out] 1/3*(3*a^2*x^4 - 6*a*b*x^2 - b^2)/x^3
```

Sympy [A] time = 1.17635, size = 20, normalized size = 0.87

$$a^2x - \frac{6abx^2 + b^2}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**2,x)

[Out] a**2*x - (6*a*b*x**2 + b**2)/(3*x**3)
```

GIAC/XCAS [A] time = 0.227513, size = 30, normalized size = 1.3

$$a^2x - \frac{6\,abx^2 + b^2}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2,x, algorithm="giac")

[Out] a^2*x - 1/3*(6*a*b*x^2 + b^2)/x^3
```

3.1822 $\int \frac{\left(a+\frac{b}{x^2}\right)^2}{x} dx$

Optimal. Leaf size=24

$$a^2 \log(x) - \frac{ab}{x^2} - \frac{b^2}{4x^4}$$

```
[Out] -b^2/(4*x^4) - (a*b)/x^2 + a^2*Log[x]
```

Rubi [A] time = 0.0498924, antiderivative size = 24, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$a^2 \log(x) - \frac{ab}{x^2} - \frac{b^2}{4x^4}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x^2)^2/x,x]

[Out] -b^2/(4*x^4) - (a*b)/x^2 + a^2*Log[x]
```

Rubi in Sympy [A] time = 8.15532, size = 24, normalized size = 1.

$$\frac{a^2 \log(x^2)}{2} - \frac{ab}{x^2} - \frac{b^2}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x**2)**2/x,x)

[Out] a**2*log(x**2)/2 - a*b/x**2 - b**2/(4*x**4)
```

Mathematica [A] time = 0.00146136, size = 24, normalized size = 1.

$$a^2 \log(x) - \frac{ab}{x^2} - \frac{b^2}{4x^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x^2)^2/x,x]

[Out] -b^2/(4*x^4) - (a*b)/x^2 + a^2*Log[x]
```

Maple [A] time = 0.009, size = 23, normalized size = 1.

$$-\frac{b^2}{4\,x^4} - \frac{ab}{x^2} + a^2 \ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x^2)^2/x,x)

[Out] -1/4*b^2/x^4-a*b/x^2+a^2*ln(x)
```

Maxima [A] time = 1.43841, size = 35, normalized size = 1.46

$$\frac{1}{2}\,a^2\log\left(x^2\right) - \frac{4\,abx^2 + b^2}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2/x,x, algorithm="maxima")

[Out] 1/2*a^2*log(x^2) - 1/4*(4*a*b*x^2 + b^2)/x^4
```

Fricas [A] time = 0.228801, size = 38, normalized size = 1.58

$$\frac{4\,a^2x^4\log\left(x\right) - 4\,abx^2 - b^2}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2/x,x, algorithm="fricas")

[Out] 1/4*(4*a^2*x^4*log(x) - 4*a*b*x^2 - b^2)/x^4
```

Sympy [A] time = 1.28235, size = 22, normalized size = 0.92

$$a^2\log\left(x\right) - \frac{4abx^2 + b^2}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**2/x,x)

[Out] a**2*log(x) - (4*a*b*x**2 + b**2)/(4*x**4)
```

GIAC/XCAS [A] time = 0.234907, size = 46, normalized size = 1.92

$$\frac{1}{2}\,a^2\ln\left(x^2\right) - \frac{3\,a^2x^4 + 4\,abx^2 + b^2}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2/x,x, algorithm="giac")

[Out] 1/2*a^2*ln(x^2) - 1/4*(3*a^2*x^4 + 4*a*b*x^2 + b^2)/x^4
```

3.1823 $\int \frac{\left(a+\frac{b}{x^2}\right)^2}{x^2} dx$

Optimal. Leaf size=28

$$-\frac{a^2}{x}-\frac{2ab}{3x^3}-\frac{b^2}{5x^5}$$

```
[Out] -b^2/(5*x^5) - (2*a*b)/(3*x^3) - a^2/x
```

Rubi [A] time = 0.0417866, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^2}{x}-\frac{2ab}{3x^3}-\frac{b^2}{5x^5}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^2/x^2,x]

[Out] -b^2/(5*x^5) - (2*a*b)/(3*x^3) - a^2/x
```

Rubi in Sympy [A] time = 6.96934, size = 24, normalized size = 0.86

$$-\frac{a^2}{x}-\frac{2ab}{3x^3}-\frac{b^2}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**2/x**2,x)

[Out] -a**2/x - 2*a*b/(3*x**3) - b**2/(5*x**5)
```

Mathematica [A] time = 0.00157272, size = 28, normalized size = 1.

$$-\frac{a^2}{x}-\frac{2ab}{3x^3}-\frac{b^2}{5x^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^2/x^2,x]

[Out] -b^2/(5*x^5) - (2*a*b)/(3*x^3) - a^2/x
```

Maple [A] time = 0.007, size = 25, normalized size = 0.9

$$-\frac{b^2}{5\,x^5}-\frac{2\,ab}{3\,x^3}-\frac{a^2}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^2/x^2,x)

[Out] -1/5*b^2/x^5-2/3*a*b/x^3-a^2/x
```

Maxima [A] time = 1.44009, size = 35, normalized size = 1.25

$$-\frac{15\,a^2x^4 + 10\,abx^2 + 3\,b^2}{15\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2/x^2,x, algorithm="maxima")

[Out] -1/15*(15*a^2*x^4 + 10*a*b*x^2 + 3*b^2)/x^5
```

Fricas [A] time = 0.21654, size = 35, normalized size = 1.25

$$-\frac{15\,a^2x^4 + 10\,abx^2 + 3\,b^2}{15\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2/x^2,x, algorithm="fricas")

[Out] -1/15*(15*a^2*x^4 + 10*a*b*x^2 + 3*b^2)/x^5
```

Sympy [A] time = 1.32736, size = 27, normalized size = 0.96

$$-\frac{15a^2x^4 + 10abx^2 + 3b^2}{15x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**2/x**2,x)

[Out] -(15*a**2*x**4 + 10*a*b*x**2 + 3*b**2)/(15*x**5)
```

GIAC/XCAS [A] time = 0.229926, size = 35, normalized size = 1.25

$$-\frac{15\,a^2x^4 + 10\,abx^2 + 3\,b^2}{15\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2/x^2,x, algorithm="giac")

[Out] -1/15*(15*a^2*x^4 + 10*a*b*x^2 + 3*b^2)/x^5
```

3.1824 $\int \frac{\left(a+\frac{b}{x^2}\right)^2}{x^3}\,dx$

Optimal. Leaf size=16

$$-\frac{\left(a+\frac{b}{x^2}\right)^3}{6b}$$

```
[Out] -(a + b/x^2)^3/(6*b)
```

Rubi [A] time = 0.0188534, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{\left(a+\frac{b}{x^2}\right)^3}{6b}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^2/x^3,x]

[Out] -(a + b/x^2)^3/(6*b)
```

Rubi in Sympy [A] time = 2.13121, size = 12, normalized size = 0.75

$$-\frac{\left(a+\frac{b}{x^2}\right)^3}{6b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**2/x**3,x)

[Out] -(a + b/x**2)**3/(6*b)
```

Mathematica [A] time = 0.00160343, size = 30, normalized size = 1.88

$$-\frac{a^2}{2x^2}-\frac{ab}{2x^4}-\frac{b^2}{6x^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^2/x^3,x]

[Out] -b^2/(6*x^6) - (a*b)/(2*x^4) - a^2/(2*x^2)
```

Maple [A] time = 0.007, size = 25, normalized size = 1.6

$$-\frac{b^2}{6\,x^6}-\frac{ab}{2\,x^4}-\frac{a^2}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^2/x^3,x)
```

```
[Out] -1/6*b^2/x^6-1/2*a*b/x^4-1/2*a^2/x^2
```

Maxima [A] time = 1.4382, size = 19, normalized size = 1.19

$$-\frac{\left(a+\frac{b}{x^2}\right)^3}{6\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2/x^3,x, algorithm="maxima")
```

```
[Out] -1/6*(a + b/x^2)^3/b
```

Fricas [A] time = 0.219369, size = 32, normalized size = 2.

$$-\frac{3\,a^2x^4+3\,abx^2+b^2}{6\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2/x^3,x, algorithm="fricas")
```

```
[Out] -1/6*(3*a^2*x^4 + 3*a*b*x^2 + b^2)/x^6
```

Sympy [A] time = 1.33933, size = 26, normalized size = 1.62

$$-\frac{3a^2x^4+3abx^2+b^2}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**2/x**3,x)
```

```
[Out] -(3*a**2*x**4 + 3*a*b*x**2 + b**2)/(6*x**6)
```

GIAC/XCAS [A] time = 0.226394, size = 32, normalized size = 2.

$$-\frac{3\,a^2x^4+3\,abx^2+b^2}{6\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2/x^3,x, algorithm="giac")
```

```
[Out] -1/6*(3*a^2*x^4 + 3*a*b*x^2 + b^2)/x^6
```

3.1825 $\int \frac{\left(a+\frac{b}{x^2}\right)^2}{x^4} \, dx$

Optimal. Leaf size=30

$$-\frac{a^2}{3x^3}-\frac{2ab}{5x^5}-\frac{b^2}{7x^7}$$

```
[Out] -b^2/(7*x^7) - (2*a*b)/(5*x^5) - a^2/(3*x^3)
```

Rubi [A] time = 0.0427113, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^2}{3x^3}-\frac{2ab}{5x^5}-\frac{b^2}{7x^7}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^2/x^4,x]

[Out] -b^2/(7*x^7) - (2*a*b)/(5*x^5) - a^2/(3*x^3)
```

Rubi in Sympy [A] time = 6.84685, size = 27, normalized size = 0.9

$$-\frac{a^2}{3x^3}-\frac{2ab}{5x^5}-\frac{b^2}{7x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**2/x**4,x)

[Out] -a**2/(3*x**3) - 2*a*b/(5*x**5) - b**2/(7*x**7)
```

Mathematica [A] time = 0.00149432, size = 30, normalized size = 1.

$$-\frac{a^2}{3x^3}-\frac{2ab}{5x^5}-\frac{b^2}{7x^7}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^2/x^4,x]

[Out] -b^2/(7*x^7) - (2*a*b)/(5*x^5) - a^2/(3*x^3)
```

Maple [A] time = 0.007, size = 25, normalized size = 0.8

$$-\frac{b^2}{7\,x^7}-\frac{2\,ab}{5\,x^5}-\frac{a^2}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^2/x^4,x)

[Out] -1/7*b^2/x^7-2/5*a*b/x^5-1/3*a^2/x^3
```

Maxima [A] time = 1.43876, size = 35, normalized size = 1.17

$$-\frac{35\,a^2x^4 + 42\,abx^2 + 15\,b^2}{105\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2/x^4,x, algorithm="maxima")
```

```
[Out] -1/105*(35*a^2*x^4 + 42*a*b*x^2 + 15*b^2)/x^7
```

Fricas [A] time = 0.219236, size = 35, normalized size = 1.17

$$-\frac{35\,a^2x^4 + 42\,abx^2 + 15\,b^2}{105\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2/x^4,x, algorithm="fricas")
```

```
[Out] -1/105*(35*a^2*x^4 + 42*a*b*x^2 + 15*b^2)/x^7
```

Sympy [A] time = 1.40507, size = 27, normalized size = 0.9

$$-\frac{35a^2x^4 + 42abx^2 + 15b^2}{105x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**2/x**4,x)
```

```
[Out] -(35*a**2*x**4 + 42*a*b*x**2 + 15*b**2)/(105*x**7)
```

GIAC/XCAS [A] time = 0.224848, size = 35, normalized size = 1.17

$$-\frac{35\,a^2x^4 + 42\,abx^2 + 15\,b^2}{105\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2/x^4,x, algorithm="giac")
```

```
[Out] -1/105*(35*a^2*x^4 + 42*a*b*x^2 + 15*b^2)/x^7
```

3.1826 $\int \frac{\left(a+\frac{b}{x^2}\right)^2}{x^5}\,dx$

Optimal. Leaf size=30

$$-\frac{a^2}{4x^4}-\frac{ab}{3x^6}-\frac{b^2}{8x^8}$$

```
[Out] -b^2/(8*x^8) - (a*b)/(3*x^6) - a^2/(4*x^4)
```

Rubi [A] time = 0.0519524, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{a^2}{4x^4}-\frac{ab}{3x^6}-\frac{b^2}{8x^8}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^2/x^5,x]

[Out] -b^2/(8*x^8) - (a*b)/(3*x^6) - a^2/(4*x^4)
```

Rubi in Sympy [A] time = 8.19193, size = 26, normalized size = 0.87

$$-\frac{a^2}{4x^4}-\frac{ab}{3x^6}-\frac{b^2}{8x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**2/x**5,x)

[Out] -a**2/(4*x**4) - a*b/(3*x**6) - b**2/(8*x**8)
```

Mathematica [A] time = 0.00162967, size = 30, normalized size = 1.

$$-\frac{a^2}{4x^4}-\frac{ab}{3x^6}-\frac{b^2}{8x^8}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^2/x^5,x]

[Out] -b^2/(8*x^8) - (a*b)/(3*x^6) - a^2/(4*x^4)
```

Maple [A] time = 0.01, size = 25, normalized size = 0.8

$$-\frac{b^2}{8\,x^8}-\frac{ab}{3\,x^6}-\frac{a^2}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^2/x^5,x)

[Out] -1/8*b^2/x^8-1/3*a*b/x^6-1/4*a^2/x^4
```

Maxima [A] time = 1.43831, size = 35, normalized size = 1.17

$$-\frac{6\,a^{2}x^{4}+8\,abx^{2}+3\,b^{2}}{24\,x^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2/x^5,x, algorithm="maxima")

[Out] -1/24*(6*a^2*x^4 + 8*a*b*x^2 + 3*b^2)/x^8
```

Fricas [A] time = 0.215899, size = 35, normalized size = 1.17

$$-\frac{6\,a^{2}x^{4}+8\,abx^{2}+3\,b^{2}}{24\,x^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2/x^5,x, algorithm="fricas")

[Out] -1/24*(6*a^2*x^4 + 8*a*b*x^2 + 3*b^2)/x^8
```

Sympy [A] time = 1.42908, size = 27, normalized size = 0.9

$$-\frac{6a^{2}x^{4}+8abx^{2}+3b^{2}}{24x^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**2/x**5,x)

[Out] -(6*a**2*x**4 + 8*a*b*x**2 + 3*b**2)/(24*x**8)
```

GIAC/XCAS [A] time = 0.231567, size = 35, normalized size = 1.17

$$-\frac{6\,a^{2}x^{4}+8\,abx^{2}+3\,b^{2}}{24\,x^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2/x^5,x, algorithm="giac")

[Out] -1/24*(6*a^2*x^4 + 8*a*b*x^2 + 3*b^2)/x^8
```

3.1827 $\int \frac{\left(a+\frac{b}{x^2}\right)^2}{x^6} dx$

Optimal. Leaf size=30

$$-\frac{a^2}{5x^5}-\frac{2ab}{7x^7}-\frac{b^2}{9x^9}$$

```
[Out] -b^2/(9*x^9) - (2*a*b)/(7*x^7) - a^2/(5*x^5)
```

Rubi [A] time = 0.0414464, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^2}{5x^5}-\frac{2ab}{7x^7}-\frac{b^2}{9x^9}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x^2)^2/x^6,x]

[Out] -b^2/(9*x^9) - (2*a*b)/(7*x^7) - a^2/(5*x^5)
```

Rubi in Sympy [A] time = 6.91994, size = 27, normalized size = 0.9

$$-\frac{a^2}{5x^5}-\frac{2ab}{7x^7}-\frac{b^2}{9x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x**2)**2/x**6,x)

[Out] -a**2/(5*x**5) - 2*a*b/(7*x**7) - b**2/(9*x**9)
```

Mathematica [A] time = 0.0021906, size = 30, normalized size = 1.

$$-\frac{a^2}{5x^5}-\frac{2ab}{7x^7}-\frac{b^2}{9x^9}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x^2)^2/x^6,x]

[Out] -b^2/(9*x^9) - (2*a*b)/(7*x^7) - a^2/(5*x^5)
```

Maple [A] time = 0.007, size = 25, normalized size = 0.8

$$-\frac{b^2}{9\,x^9}-\frac{2\,ab}{7\,x^7}-\frac{a^2}{5\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x^2)^2/x^6,x)

[Out] -1/9*b^2/x^9-2/7*a*b/x^7-1/5*a^2/x^5
```

Maxima [A] time = 1.43788, size = 35, normalized size = 1.17

$$-\frac{63\,a^2x^4 + 90\,abx^2 + 35\,b^2}{315\,x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2/x^6,x, algorithm="maxima")

[Out] -1/315*(63*a^2*x^4 + 90*a*b*x^2 + 35*b^2)/x^9
```

Fricas [A] time = 0.214745, size = 35, normalized size = 1.17

$$-\frac{63\,a^2x^4 + 90\,abx^2 + 35\,b^2}{315\,x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2/x^6,x, algorithm="fricas")

[Out] -1/315*(63*a^2*x^4 + 90*a*b*x^2 + 35*b^2)/x^9
```

Sympy [A] time = 1.50328, size = 27, normalized size = 0.9

$$-\frac{63a^2x^4 + 90abx^2 + 35b^2}{315x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**2/x**6,x)

[Out] -(63*a**2*x**4 + 90*a*b*x**2 + 35*b**2)/(315*x**9)
```

GIAC/XCAS [A] time = 0.224208, size = 35, normalized size = 1.17

$$-\frac{63\,a^2x^4 + 90\,abx^2 + 35\,b^2}{315\,x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^2/x^6,x, algorithm="giac")

[Out] -1/315*(63*a^2*x^4 + 90*a*b*x^2 + 35*b^2)/x^9
```

3.1828 $\int \left(a+\frac{b}{x^2}\right)^3 x^6 \, dx$

Optimal. Leaf size=35

$$\frac{a^3x^7}{7}+\frac{3}{5}a^2bx^5+ab^2x^3+b^3x$$

```
[Out] b^3*x + a*b^2*x^3 + (3*a^2*b*x^5)/5 + (a^3*x^7)/7
```

Rubi [A] time = 0.0441234, antiderivative size = 35, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^3x^7}{7}+\frac{3}{5}a^2bx^5+ab^2x^3+b^3x$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^3*x^6,x]
```

```
[Out] b^3*x + a*b^2*x^3 + (3*a^2*b*x^5)/5 + (a^3*x^7)/7
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^3x^7}{7}+\frac{3a^2bx^5}{5}+ab^2x^3+\int b^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**3*x**6,x)
```

```
[Out] a**3*x**7/7 + 3*a**2*b*x**5/5 + a*b**2*x**3 + Integral(b**3, x)
```

Mathematica [A] time = 0.00204309, size = 35, normalized size = 1.

$$\frac{a^3x^7}{7}+\frac{3}{5}a^2bx^5+ab^2x^3+b^3x$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^3*x^6,x]
```

```
[Out] b^3*x + a*b^2*x^3 + (3*a^2*b*x^5)/5 + (a^3*x^7)/7
```

Maple [A] time = 0.002, size = 32, normalized size = 0.9

$$b^3x+ab^2x^3+\frac{3\,a^2bx^5}{5}+\frac{a^3x^7}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^3*x^6,x)
```

```
[Out] b^3*x+a*b^2*x^3+3/5*a^2*b*x^5+1/7*a^3*x^7
```

Maxima [A] time = 1.4482, size = 42, normalized size = 1.2

$$\frac{1}{7}a^3x^7 + \frac{3}{5}a^2bx^5 + ab^2x^3 + b^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3*x^6,x, algorithm="maxima")
```

```
[Out] 1/7*a^3*x^7 + 3/5*a^2*b*x^5 + a*b^2*x^3 + b^3*x
```

Fricas [A] time = 0.216728, size = 42, normalized size = 1.2

$$\frac{1}{7}a^3x^7 + \frac{3}{5}a^2bx^5 + ab^2x^3 + b^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3*x^6,x, algorithm="fricas")
```

```
[Out] 1/7*a^3*x^7 + 3/5*a^2*b*x^5 + a*b^2*x^3 + b^3*x
```

Sympy [A] time = 0.096353, size = 32, normalized size = 0.91

$$\frac{a^3x^7}{7} + \frac{3a^2bx^5}{5} + ab^2x^3 + b^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**3*x**6,x)
```

```
[Out] a**3*x**7/7 + 3*a**2*b*x**5/5 + a*b**2*x**3 + b**3*x
```

GIAC/XCAS [A] time = 0.226234, size = 42, normalized size = 1.2

$$\frac{1}{7}a^3x^7 + \frac{3}{5}a^2bx^5 + ab^2x^3 + b^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3*x^6,x, algorithm="giac")
```

```
[Out] 1/7*a^3*x^7 + 3/5*a^2*b*x^5 + a*b^2*x^3 + b^3*x
```

3.1829 $\int \left(a+\frac{b}{x^2}\right)^3 x^5\,dx$

Optimal. Leaf size=39

$$\frac{a^3x^6}{6}+\frac{3}{4}a^2bx^4+\frac{3}{2}ab^2x^2+b^3\log(x)$$

```
[Out] (3*a*b^2*x^2)/2 + (3*a^2*b*x^4)/4 + (a^3*x^6)/6 + b^3*Log[x]
```

Rubi [A] time = 0.0620908, antiderivative size = 39, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{a^3x^6}{6}+\frac{3}{4}a^2bx^4+\frac{3}{2}ab^2x^2+b^3\log(x)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^3*x^5,x]
```

```
[Out] (3*a*b^2*x^2)/2 + (3*a^2*b*x^4)/4 + (a^3*x^6)/6 + b^3*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^3x^6}{6}+\frac{3a^2b\int^{x^2}x\,dx}{2}+\frac{3ab^2x^2}{2}+\frac{b^3\log\left(x^2\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**3*x**5,x)
```

```
[Out] a**3*x**6/6 + 3*a**2*b*Integral(x, (x, x**2))/2 + 3*a*b**2*x**2/2
 + b**3*log(x**2)/2
```

Mathematica [A] time = 0.00776631, size = 39, normalized size = 1.

$$\frac{a^3x^6}{6}+\frac{3}{4}a^2bx^4+\frac{3}{2}ab^2x^2+b^3\log(x)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^3*x^5,x]
```

```
[Out] (3*a*b^2*x^2)/2 + (3*a^2*b*x^4)/4 + (a^3*x^6)/6 + b^3*Log[x]
```

Maple [A] time = 0.003, size = 34, normalized size = 0.9

$$\frac{3\,ab^2x^2}{2}+\frac{3\,a^2bx^4}{4}+\frac{a^3x^6}{6}+b^3\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^3*x^5,x)
```

```
[Out] 3/2*a*b^2*x^2+3/4*a^2*b*x^4+1/6*a^3*x^6+b^3*ln(x)
```

Maxima [A] time = 1.43471, size = 49, normalized size = 1.26

$$\frac{1}{6}a^3x^6 + \frac{3}{4}a^2bx^4 + \frac{3}{2}ab^2x^2 + \frac{1}{2}b^3\log\left(x^2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3*x^5,x, algorithm="maxima")
```

```
[Out] 1/6*a^3*x^6 + 3/4*a^2*b*x^4 + 3/2*a*b^2*x^2 + 1/2*b^3*log(x^2)
```

Fricas [A] time = 0.233753, size = 45, normalized size = 1.15

$$\frac{1}{6}a^3x^6 + \frac{3}{4}a^2bx^4 + \frac{3}{2}ab^2x^2 + b^3\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3*x^5,x, algorithm="fricas")
```

```
[Out] 1/6*a^3*x^6 + 3/4*a^2*b*x^4 + 3/2*a*b^2*x^2 + b^3*log(x)
```

Sympy [A] time = 1.11896, size = 37, normalized size = 0.95

$$\frac{a^3x^6}{6} + \frac{3a^2bx^4}{4} + \frac{3ab^2x^2}{2} + b^3\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**3*x**5,x)
```

```
[Out] a**3*x**6/6 + 3*a**2*b*x**4/4 + 3*a*b**2*x**2/2 + b**3*log(x)
```

GIAC/XCAS [A] time = 0.225501, size = 49, normalized size = 1.26

$$\frac{1}{6}a^3x^6 + \frac{3}{4}a^2bx^4 + \frac{3}{2}ab^2x^2 + \frac{1}{2}b^3\ln\left(x^2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3*x^5,x, algorithm="giac")
```

```
[Out] 1/6*a^3*x^6 + 3/4*a^2*b*x^4 + 3/2*a*b^2*x^2 + 1/2*b^3*ln(x^2)
```

3.1830 $\int \left(a+\frac{b}{x^2}\right)^3 x^4 \, dx$

Optimal. Leaf size=34

$$\frac{a^3x^5}{5}+a^2bx^3+3ab^2x-\frac{b^3}{x}$$

```
[Out] -(b^3/x) + 3*a*b^2*x + a^2*b*x^3 + (a^3*x^5)/5
```

Rubi [A] time = 0.0494339, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^3x^5}{5}+a^2bx^3+3ab^2x-\frac{b^3}{x}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^3*x^4,x]
```

```
[Out] -(b^3/x) + 3*a*b^2*x + a^2*b*x^3 + (a^3*x^5)/5
```

Rubi in Sympy [A] time = 8.07824, size = 29, normalized size = 0.85

$$\frac{a^3x^5}{5}+a^2bx^3+3ab^2x-\frac{b^3}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**3*x**4,x)
```

```
[Out] a**3*x**5/5 + a**2*b*x**3 + 3*a*b**2*x - b**3/x
```

Mathematica [A] time = 0.00721594, size = 34, normalized size = 1.

$$\frac{a^3x^5}{5}+a^2bx^3+3ab^2x-\frac{b^3}{x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^3*x^4,x]
```

```
[Out] -(b^3/x) + 3*a*b^2*x + a^2*b*x^3 + (a^3*x^5)/5
```

Maple [A] time = 0.005, size = 33, normalized size = 1.

$$-\frac{b^3}{x}+3\,ab^2x+a^2bx^3+\frac{a^3x^5}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^3*x^4,x)
```

```
[Out] -b^3/x+3*a*b^2*x+a^2*b*x^3+1/5*a^3*x^5
```

Maxima [A] time = 1.44086, size = 43, normalized size = 1.26

$$\frac{1}{5}\,a^3x^5 + a^2bx^3 + 3\,ab^2x - \frac{b^3}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3*x^4,x, algorithm="maxima")
```

```
[Out] 1/5*a^3*x^5 + a^2*b*x^3 + 3*a*b^2*x - b^3/x
```

Fricas [A] time = 0.215482, size = 49, normalized size = 1.44

$$\frac{a^3x^6 + 5\,a^2bx^4 + 15\,ab^2x^2 - 5\,b^3}{5\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3*x^4,x, algorithm="fricas")
```

```
[Out] 1/5*(a^3*x^6 + 5*a^2*b*x^4 + 15*a*b^2*x^2 - 5*b^3)/x
```

Sympy [A] time = 1.09121, size = 29, normalized size = 0.85

$$\frac{a^3x^5}{5} + a^2bx^3 + 3ab^2x - \frac{b^3}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**3*x**4,x)
```

```
[Out] a**3*x**5/5 + a**2*b*x**3 + 3*a*b**2*x - b**3/x
```

GIAC/XCAS [A] time = 0.22815, size = 43, normalized size = 1.26

$$\frac{1}{5}\,a^3x^5 + a^2bx^3 + 3\,ab^2x - \frac{b^3}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3*x^4,x, algorithm="giac")
```

```
[Out] 1/5*a^3*x^5 + a^2*b*x^3 + 3*a*b^2*x - b^3/x
```

3.1831 $\int \left(a+\frac{b}{x^2}\right)^3 x^3\,dx$

Optimal. Leaf size=40

$$\frac{a^3x^4}{4}+\frac{3}{2}a^2bx^2+3ab^2\log(x)-\frac{b^3}{2x^2}$$

```
[Out] -b^3/(2*x^2) + (3*a^2*b*x^2)/2 + (a^3*x^4)/4 + 3*a*b^2*Log[x]
```

Rubi [A] time = 0.0692082, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{a^3x^4}{4}+\frac{3}{2}a^2bx^2+3ab^2\log(x)-\frac{b^3}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^3*x^3,x]
```

```
[Out] -b^3/(2*x^2) + (3*a^2*b*x^2)/2 + (a^3*x^4)/4 + 3*a*b^2*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^3\int^{x^2} x\,dx}{2}+\frac{3a^2bx^2}{2}+\frac{3ab^2\log\left(x^2\right)}{2}-\frac{b^3}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**3*x**3,x)
```

```
[Out] a**3*Integral(x, (x, x**2))/2 + 3*a**2*b*x**2/2 + 3*a*b**2*log(x*
*2)/2 - b**3/(2*x**2)
```

Mathematica [A] time = 0.012776, size = 40, normalized size = 1.

$$\frac{a^3x^4}{4}+\frac{3}{2}a^2bx^2+3ab^2\log(x)-\frac{b^3}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^3*x^3,x]
```

```
[Out] -b^3/(2*x^2) + (3*a^2*b*x^2)/2 + (a^3*x^4)/4 + 3*a*b^2*Log[x]
```

Maple [A] time = 0.008, size = 35, normalized size = 0.9

$$-\frac{b^3}{2\,x^2}+\frac{3\,a^2bx^2}{2}+\frac{a^3x^4}{4}+3\,ab^2\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^3*x^3,x)
```

```
[Out] -1/2*b^3/x^2+3/2*a^2*b*x^2+1/4*a^3*x^4+3*a*b^2*ln(x)
```

Maxima [A] time = 1.44562, size = 49, normalized size = 1.22

$$\frac{1}{4}a^3x^4 + \frac{3}{2}a^2bx^2 + \frac{3}{2}ab^2\log\left(x^2\right) - \frac{b^3}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3*x^3,x, algorithm="maxima")
```

```
[Out] 1/4*a^3*x^4 + 3/2*a^2*b*x^2 + 3/2*a*b^2*log(x^2) - 1/2*b^3/x^2
```

Fricas [A] time = 0.219785, size = 51, normalized size = 1.27

$$\frac{a^3x^6 + 6a^2bx^4 + 12ab^2x^2\log(x) - 2b^3}{4x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3*x^3,x, algorithm="fricas")
```

```
[Out] 1/4*(a^3*x^6 + 6*a^2*b*x^4 + 12*a*b^2*x^2*log(x) - 2*b^3)/x^2
```

Sympy [A] time = 1.24156, size = 37, normalized size = 0.92

$$\frac{a^3x^4}{4} + \frac{3a^2bx^2}{2} + 3ab^2\log(x) - \frac{b^3}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**3*x**3,x)
```

```
[Out] a**3*x**4/4 + 3*a**2*b*x**2/2 + 3*a*b**2*log(x) - b**3/(2*x**2)
```

GIAC/XCAS [A] time = 0.22813, size = 47, normalized size = 1.18

$$\frac{1}{4}a^3x^4 + \frac{3}{2}a^2bx^2 + 3ab^2\ln(|x|) - \frac{b^3}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3*x^3,x, algorithm="giac")
```

```
[Out] 1/4*a^3*x^4 + 3/2*a^2*b*x^2 + 3*a*b^2*ln(abs(x)) - 1/2*b^3/x^2
```

3.1832 $\int \left(a+\frac{b}{x^2}\right)^3 x^2 \, dx$

Optimal. Leaf size=37

$$\frac{a^3x^3}{3}+3a^2bx-\frac{3ab^2}{x}-\frac{b^3}{3x^3}$$

```
[Out] -b^3/(3*x^3) - (3*a*b^2)/x + 3*a^2*b*x + (a^3*x^3)/3
```

Rubi [A] time = 0.05034, antiderivative size = 37, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^3x^3}{3}+3a^2bx-\frac{3ab^2}{x}-\frac{b^3}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^3*x^2,x]

[Out] -b^3/(3*x^3) - (3*a*b^2)/x + 3*a^2*b*x + (a^3*x^3)/3
```

Rubi in Sympy [A] time = 8.18191, size = 32, normalized size = 0.86

$$\frac{a^3x^3}{3}+3a^2bx-\frac{3ab^2}{x}-\frac{b^3}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**3*x**2,x)

[Out] a**3*x**3/3 + 3*a**2*b*x - 3*a*b**2/x - b**3/(3*x**3)
```

Mathematica [A] time = 0.00767255, size = 37, normalized size = 1.

$$\frac{a^3x^3}{3}+3a^2bx-\frac{3ab^2}{x}-\frac{b^3}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^3*x^2,x]

[Out] -b^3/(3*x^3) - (3*a*b^2)/x + 3*a^2*b*x + (a^3*x^3)/3
```

Maple [A] time = 0.007, size = 34, normalized size = 0.9

$$-\frac{b^3}{3\,x^3}-3\,\frac{ab^2}{x}+3\,a^2bx+\frac{a^3x^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^3*x^2,x)

[Out] -1/3*b^3/x^3-3*a*b^2/x+3*a^2*b*x+1/3*a^3*x^3
```

Maxima [A] time = 1.43807, size = 46, normalized size = 1.24

$$\frac{1}{3}\,a^3x^3 + 3\,a^2bx - \frac{9\,ab^2x^2 + b^3}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3*x^2,x, algorithm="maxima")
```

```
[Out] 1/3*a^3*x^3 + 3*a^2*b*x - 1/3*(9*a*b^2*x^2 + b^3)/x^3
```

Fricas [A] time = 0.210652, size = 49, normalized size = 1.32

$$\frac{a^3x^6 + 9\,a^2bx^4 - 9\,ab^2x^2 - b^3}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3*x^2,x, algorithm="fricas")
```

```
[Out] 1/3*(a^3*x^6 + 9*a^2*b*x^4 - 9*a*b^2*x^2 - b^3)/x^3
```

Sympy [A] time = 1.24373, size = 34, normalized size = 0.92

$$\frac{a^3x^3}{3} + 3a^2bx - \frac{9ab^2x^2 + b^3}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**3*x**2,x)
```

```
[Out] a**3*x**3/3 + 3*a**2*b*x - (9*a*b**2*x**2 + b**3)/(3*x**3)
```

GIAC/XCAS [A] time = 0.232118, size = 46, normalized size = 1.24

$$\frac{1}{3}\,a^3x^3 + 3\,a^2bx - \frac{9\,ab^2x^2 + b^3}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3*x^2,x, algorithm="giac")
```

```
[Out] 1/3*a^3*x^3 + 3*a^2*b*x - 1/3*(9*a*b^2*x^2 + b^3)/x^3
```

3.1833 $\int \left(a+\frac{b}{x^2}\right)^3 x\,dx$

Optimal. Leaf size=40

$$\frac{a^3x^2}{2}+3a^2b\log(x)-\frac{3ab^2}{2x^2}-\frac{b^3}{4x^4}$$

```
[Out] -b^3/(4*x^4) - (3*a*b^2)/(2*x^2) + (a^3*x^2)/2 + 3*a^2*b*Log[x]
```

Rubi [A] time = 0.0626124, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273

$$\frac{a^3x^2}{2}+3a^2b\log(x)-\frac{3ab^2}{2x^2}-\frac{b^3}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^3*x,x]
```

```
[Out] -b^3/(4*x^4) - (3*a*b^2)/(2*x^2) + (a^3*x^2)/2 + 3*a^2*b*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{3a^2b\log\left(x^2\right)}{2}-\frac{3ab^2}{2x^2}-\frac{b^3}{4x^4}+\frac{\int^{x^2}a^3\,dx}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**3*x,x)
```

```
[Out] 3*a**2*b*log(x**2)/2 - 3*a*b**2/(2*x**2) - b**3/(4*x**4) + Integr
al(a**3, (x, x**2))/2
```

Mathematica [A] time = 0.00912048, size = 40, normalized size = 1.

$$\frac{a^3x^2}{2}+3a^2b\log(x)-\frac{3ab^2}{2x^2}-\frac{b^3}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^3*x,x]
```

```
[Out] -b^3/(4*x^4) - (3*a*b^2)/(2*x^2) + (a^3*x^2)/2 + 3*a^2*b*Log[x]
```

Maple [A] time = 0.008, size = 35, normalized size = 0.9

$$-\frac{b^3}{4\,x^4}-\frac{3\,ab^2}{2\,x^2}+\frac{x^2a^3}{2}+3\,a^2b\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^3*x,x)
```

```
[Out] -1/4*b^3/x^4-3/2*a*b^2/x^2+1/2*x^2*a^3+3*a^2*b*ln(x)
```

Maxima [A] time = 1.44224, size = 50, normalized size = 1.25

$$\frac{1}{2}\,a^3x^2 + \frac{3}{2}\,a^2b\log\left(x^2\right) - \frac{6\,ab^2x^2 + b^3}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3*x,x, algorithm="maxima")
```

```
[Out] 1/2*a^3*x^2 + 3/2*a^2*b*log(x^2) - 1/4*(6*a*b^2*x^2 + b^3)/x^4
```

Fricas [A] time = 0.219988, size = 53, normalized size = 1.32

$$\frac{2\,a^3x^6 + 12\,a^2bx^4\log\left(x\right) - 6\,ab^2x^2 - b^3}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3*x,x, algorithm="fricas")
```

```
[Out] 1/4*(2*a^3*x^6 + 12*a^2*b*x^4*log(x) - 6*a*b^2*x^2 - b^3)/x^4
```

Sympy [A] time = 1.35052, size = 36, normalized size = 0.9

$$\frac{a^3x^2}{2} + 3a^2b\log\left(x\right) - \frac{6ab^2x^2 + b^3}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**3*x,x)
```

```
[Out] a**3*x**2/2 + 3*a**2*b*log(x) - (6*a*b**2*x**2 + b**3)/(4*x**4)
```

GIAC/XCAS [A] time = 0.235653, size = 49, normalized size = 1.22

$$\frac{1}{2}\,a^3x^2 + 3\,a^2b\ln\left(|x|\right) - \frac{6\,ab^2x^2 + b^3}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3*x,x, algorithm="giac")
```

```
[Out] 1/2*a^3*x^2 + 3*a^2*b*ln(abs(x)) - 1/4*(6*a*b^2*x^2 + b^3)/x^4
```

3.1834 $\int \left(a+\frac{b}{x^2}\right)^3 dx$

Optimal. Leaf size=34

$$a^3x-\frac{3a^2b}{x}-\frac{ab^2}{x^3}-\frac{b^3}{5x^5}$$

```
[Out] -b^3/(5*x^5) - (a*b^2)/x^3 - (3*a^2*b)/x + a^3*x
```

Rubi [A] time = 0.042375, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$a^3x-\frac{3a^2b}{x}-\frac{ab^2}{x^3}-\frac{b^3}{5x^5}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^3,x]
```

```
[Out] -b^3/(5*x^5) - (a*b^2)/x^3 - (3*a^2*b)/x + a^3*x
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{3a^2b}{x}-\frac{ab^2}{x^3}-\frac{b^3}{5x^5}+\int a^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**3,x)
```

```
[Out] -3*a**2*b/x - a*b**2/x**3 - b**3/(5*x**5) + Integral(a**3, x)
```

Mathematica [A] time = 0.00849875, size = 34, normalized size = 1.

$$a^3x-\frac{3a^2b}{x}-\frac{ab^2}{x^3}-\frac{b^3}{5x^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^3,x]
```

```
[Out] -b^3/(5*x^5) - (a*b^2)/x^3 - (3*a^2*b)/x + a^3*x
```

Maple [A] time = 0.008, size = 33, normalized size = 1.

$$-\frac{b^3}{5\,x^5}-\frac{ab^2}{x^3}-3\,\frac{a^2b}{x}+a^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^3,x)
```

```
[Out] -1/5*b^3/x^5-a*b^2/x^3-3*a^2*b/x+a^3*x
```

Maxima [A] time = 1.44265, size = 43, normalized size = 1.26

$$a^3x - \frac{3\,a^2b}{x} - \frac{ab^2}{x^3} - \frac{b^3}{5\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3,x, algorithm="maxima")

[Out] a^3*x - 3*a^2*b/x - a*b^2/x^3 - 1/5*b^3/x^5
```

Fricas [A] time = 0.211238, size = 50, normalized size = 1.47

$$\frac{5\,a^3x^6 - 15\,a^2bx^4 - 5\,ab^2x^2 - b^3}{5\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3,x, algorithm="fricas")

[Out] 1/5*(5*a^3*x^6 - 15*a^2*b*x^4 - 5*a*b^2*x^2 - b^3)/x^5
```

Sympy [A] time = 1.41336, size = 32, normalized size = 0.94

$$a^3x - \frac{15a^2bx^4 + 5ab^2x^2 + b^3}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**3,x)

[Out] a**3*x - (15*a**2*b*x**4 + 5*a*b**2*x**2 + b**3)/(5*x**5)
```

GIAC/XCAS [A] time = 0.226127, size = 45, normalized size = 1.32

$$a^3x - \frac{15\,a^2bx^4 + 5\,ab^2x^2 + b^3}{5\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3,x, algorithm="giac")

[Out] a^3*x - 1/5*(15*a^2*b*x^4 + 5*a*b^2*x^2 + b^3)/x^5
```

3.1835 $\int \frac{\left(a+\frac{b}{x^2}\right)^3}{x}\,dx$

Optimal. Leaf size=39

$$a^3\log(x)-\frac{3a^2b}{2x^2}-\frac{3ab^2}{4x^4}-\frac{b^3}{6x^6}$$

```
[Out] -b^3/(6*x^6) - (3*a*b^2)/(4*x^4) - (3*a^2*b)/(2*x^2) + a^3*Log[x]
```

Rubi [A] time = 0.0608169, antiderivative size = 39, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$a^3\log(x)-\frac{3a^2b}{2x^2}-\frac{3ab^2}{4x^4}-\frac{b^3}{6x^6}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^3/x,x]

[Out] -b^3/(6*x^6) - (3*a*b^2)/(4*x^4) - (3*a^2*b)/(2*x^2) + a^3*Log[x]
```

Rubi in Sympy [A] time = 10.1853, size = 41, normalized size = 1.05

$$\frac{a^3\log\left(x^2\right)}{2}-\frac{3a^2b}{2x^2}-\frac{3ab^2}{4x^4}-\frac{b^3}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**3/x,x)

[Out] a**3*log(x**2)/2 - 3*a**2*b/(2*x**2) - 3*a*b**2/(4*x**4) - b**3/(
6*x**6)
```

Mathematica [A] time = 0.00717146, size = 39, normalized size = 1.

$$a^3\log(x)-\frac{3a^2b}{2x^2}-\frac{3ab^2}{4x^4}-\frac{b^3}{6x^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^3/x,x]

[Out] -b^3/(6*x^6) - (3*a*b^2)/(4*x^4) - (3*a^2*b)/(2*x^2) + a^3*Log[x]
```

Maple [A] time = 0.008, size = 34, normalized size = 0.9

$$-\frac{b^3}{6\,x^6}-\frac{3\,ab^2}{4\,x^4}-\frac{3\,a^2b}{2\,x^2}+a^3\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^3/x,x)
```

```
[Out] -1/6*b^3/x^6-3/4*a*b^2/x^4-3/2*a^2*b/x^2+a^3*ln(x)
```

Maxima [A] time = 1.48768, size = 53, normalized size = 1.36

$$\frac{1}{2}a^3\log\left(x^2\right) - \frac{18\,a^2bx^4 + 9\,ab^2x^2 + 2\,b^3}{12\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3/x,x, algorithm="maxima")
```

```
[Out] 1/2*a^3*log(x^2) - 1/12*(18*a^2*b*x^4 + 9*a*b^2*x^2 + 2*b^3)/x^6
```

Fricas [A] time = 0.218572, size = 53, normalized size = 1.36

$$\frac{12\,a^3x^6\log\left(x\right) - 18\,a^2bx^4 - 9\,ab^2x^2 - 2\,b^3}{12\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3/x,x, algorithm="fricas")
```

```
[Out] 1/12*(12*a^3*x^6*log(x) - 18*a^2*b*x^4 - 9*a*b^2*x^2 - 2*b^3)/x^6
```

Sympy [A] time = 1.58206, size = 36, normalized size = 0.92

$$a^3\log\left(x\right) - \frac{18a^2bx^4 + 9ab^2x^2 + 2b^3}{12x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**3/x,x)
```

```
[Out] a**3*log(x) - (18*a**2*b*x**4 + 9*a*b**2*x**2 + 2*b**3)/(12*x**6)
```

GIAC/XCAS [A] time = 0.22929, size = 63, normalized size = 1.62

$$\frac{1}{2}a^3\ln\left(x^2\right) - \frac{11\,a^3x^6 + 18\,a^2bx^4 + 9\,ab^2x^2 + 2\,b^3}{12\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3/x,x, algorithm="giac")
```

```
[Out] 1/2*a^3*ln(x^2) - 1/12*(11*a^3*x^6 + 18*a^2*b*x^4 + 9*a*b^2*x^2 +
 2*b^3)/x^6
```

3.1836 $\int \frac{\left(a+\frac{b}{x^2}\right)^3}{x^2}\,dx$

Optimal. Leaf size=39

$$-\frac{a^3}{x}-\frac{a^2b}{x^3}-\frac{3ab^2}{5x^5}-\frac{b^3}{7x^7}$$

```
[Out] -b^3/(7*x^7) - (3*a*b^2)/(5*x^5) - (a^2*b)/x^3 - a^3/x
```

Rubi [A] time = 0.0505893, antiderivative size = 39, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^3}{x}-\frac{a^2b}{x^3}-\frac{3ab^2}{5x^5}-\frac{b^3}{7x^7}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^3/x^2,x]

[Out] -b^3/(7*x^7) - (3*a*b^2)/(5*x^5) - (a^2*b)/x^3 - a^3/x
```

Rubi in Sympy [A] time = 8.63712, size = 34, normalized size = 0.87

$$-\frac{a^3}{x}-\frac{a^2b}{x^3}-\frac{3ab^2}{5x^5}-\frac{b^3}{7x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**3/x**2,x)

[Out] -a**3/x - a**2*b/x**3 - 3*a*b**2/(5*x**5) - b**3/(7*x**7)
```

Mathematica [A] time = 0.00700091, size = 39, normalized size = 1.

$$-\frac{a^3}{x}-\frac{a^2b}{x^3}-\frac{3ab^2}{5x^5}-\frac{b^3}{7x^7}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^3/x^2,x]

[Out] -b^3/(7*x^7) - (3*a*b^2)/(5*x^5) - (a^2*b)/x^3 - a^3/x
```

Maple [A] time = 0.007, size = 36, normalized size = 0.9

$$-\frac{b^3}{7\,x^7}-\frac{3\,ab^2}{5\,x^5}-\frac{a^2b}{x^3}-\frac{a^3}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^3/x^2,x)

[Out] -1/7*b^3/x^7-3/5*a*b^2/x^5-a^2*b/x^3-a^3/x
```

Maxima [A] time = 1.43254, size = 50, normalized size = 1.28

$$-\frac{35\,a^3x^6+35\,a^2bx^4+21\,ab^2x^2+5\,b^3}{35\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3/x^2,x, algorithm="maxima")
```

```
[Out] -1/35*(35*a^3*x^6 + 35*a^2*b*x^4 + 21*a*b^2*x^2 + 5*b^3)/x^7
```

Fricas [A] time = 0.210301, size = 50, normalized size = 1.28

$$-\frac{35\,a^3x^6+35\,a^2bx^4+21\,ab^2x^2+5\,b^3}{35\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3/x^2,x, algorithm="fricas")
```

```
[Out] -1/35*(35*a^3*x^6 + 35*a^2*b*x^4 + 21*a*b^2*x^2 + 5*b^3)/x^7
```

Sympy [A] time = 1.5551, size = 39, normalized size = 1.

$$-\frac{35a^3x^6+35a^2bx^4+21ab^2x^2+5b^3}{35x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**3/x**2,x)
```

```
[Out] -(35*a**3*x**6 + 35*a**2*b*x**4 + 21*a*b**2*x**2 + 5*b**3)/(35*x*
*7)
```

GIAC/XCAS [A] time = 0.22975, size = 50, normalized size = 1.28

$$-\frac{35\,a^3x^6+35\,a^2bx^4+21\,ab^2x^2+5\,b^3}{35\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3/x^2,x, algorithm="giac")
```

```
[Out] -1/35*(35*a^3*x^6 + 35*a^2*b*x^4 + 21*a*b^2*x^2 + 5*b^3)/x^7
```

3.1837 $\int \frac{\left(a+\frac{b}{x^2}\right)^3}{x^3} dx$

Optimal. Leaf size=16

$$-\frac{\left(a+\frac{b}{x^2}\right)^4}{8b}$$

```
[Out] -(a + b/x^2)^4/(8*b)
```

Rubi [A] time = 0.0173156, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{\left(a+\frac{b}{x^2}\right)^4}{8b}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^3/x^3,x]

[Out] -(a + b/x^2)^4/(8*b)
```

Rubi in Sympy [A] time = 2.11074, size = 12, normalized size = 0.75

$$-\frac{\left(a+\frac{b}{x^2}\right)^4}{8b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**3/x**3,x)

[Out] -(a + b/x**2)**4/(8*b)
```

Mathematica [B] time = 0.0125398, size = 43, normalized size = 2.69

$$-\frac{a^3}{2x^2}-\frac{3a^2b}{4x^4}-\frac{ab^2}{2x^6}-\frac{b^3}{8x^8}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^3/x^3,x]

[Out] -b^3/(8*x^8) - (a*b^2)/(2*x^6) - (3*a^2*b)/(4*x^4) - a^3/(2*x^2)
```

Maple [B] time = 0.008, size = 36, normalized size = 2.3

$$-\frac{ab^2}{2\,x^6}-\frac{3\,a^2b}{4\,x^4}-\frac{b^3}{8\,x^8}-\frac{a^3}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^3/x^3,x)
```

```
[Out] -1/2*a*b^2/x^6-3/4*a^2*b/x^4-1/8*b^3/x^8-1/2*a^3/x^2
```

Maxima [A] time = 1.43356, size = 19, normalized size = 1.19

$$-\frac{\left(a+\frac{b}{x^2}\right)^4}{8\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a + b/x^2)^3/x^3,x, algorithm="maxima")
```

```
[Out] -1/8*(a + b/x^2)^4/b
```

Fricas [A] time = 0.219847, size = 47, normalized size = 2.94

$$-\frac{4\,a^3x^6+6\,a^2bx^4+4\,ab^2x^2+b^3}{8\,x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a + b/x^2)^3/x^3,x, algorithm="fricas")
```

```
[Out] -1/8*(4*a^3*x^6 + 6*a^2*b*x^4 + 4*a*b^2*x^2 + b^3)/x^8
```

Sympy [A] time = 1.62681, size = 37, normalized size = 2.31

$$-\frac{4a^3x^6+6a^2bx^4+4ab^2x^2+b^3}{8x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b/x**2)**3/x**3,x)
```

```
[Out] -(4*a**3*x**6 + 6*a**2*b*x**4 + 4*a*b**2*x**2 + b**3)/(8*x**8)
```

GIAC/XCAS [A] time = 0.225791, size = 47, normalized size = 2.94

$$-\frac{4\,a^3x^6+6\,a^2bx^4+4\,ab^2x^2+b^3}{8\,x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a + b/x^2)^3/x^3,x, algorithm="giac")
```

```
[Out] -1/8*(4*a^3*x^6 + 6*a^2*b*x^4 + 4*a*b^2*x^2 + b^3)/x^8
```

3.1838 $\int \frac{\left(a+\frac{b}{x^2}\right)^3}{x^4}\,dx$

Optimal. Leaf size=43

$$-\frac{a^3}{3x^3}-\frac{3a^2b}{5x^5}-\frac{3ab^2}{7x^7}-\frac{b^3}{9x^9}$$

```
[Out] -b^3/(9*x^9) - (3*a*b^2)/(7*x^7) - (3*a^2*b)/(5*x^5) - a^3/(3*x^3
)
```

Rubi [A] time = 0.0514414, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^3}{3x^3}-\frac{3a^2b}{5x^5}-\frac{3ab^2}{7x^7}-\frac{b^3}{9x^9}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^3/x^4,x]
```

```
[Out] -b^3/(9*x^9) - (3*a*b^2)/(7*x^7) - (3*a^2*b)/(5*x^5) - a^3/(3*x^3
)
```

Rubi in Sympy [A] time = 8.56886, size = 41, normalized size = 0.95

$$-\frac{a^3}{3x^3}-\frac{3a^2b}{5x^5}-\frac{3ab^2}{7x^7}-\frac{b^3}{9x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**3/x**4,x)
```

```
[Out] -a**3/(3*x**3) - 3*a**2*b/(5*x**5) - 3*a*b**2/(7*x**7) - b**3/(9*
x**9)
```

Mathematica [A] time = 0.00722554, size = 43, normalized size = 1.

$$-\frac{a^3}{3x^3}-\frac{3a^2b}{5x^5}-\frac{3ab^2}{7x^7}-\frac{b^3}{9x^9}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^3/x^4,x]
```

```
[Out] -b^3/(9*x^9) - (3*a*b^2)/(7*x^7) - (3*a^2*b)/(5*x^5) - a^3/(3*x^3
)
```

Maple [A] time = 0.007, size = 36, normalized size = 0.8

$$-\frac{b^3}{9\,x^9}-\frac{3\,ab^2}{7\,x^7}-\frac{3\,a^2b}{5\,x^5}-\frac{a^3}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^3/x^4,x)

[Out] -1/9*b^3/x^9-3/7*a*b^2/x^7-3/5*a^2*b/x^5-1/3*a^3/x^3
```

Maxima [A] time = 1.43293, size = 50, normalized size = 1.16

$$-\frac{105 a^3 x^6 + 189 a^2 b x^4 + 135 a b^2 x^2 + 35 b^3}{315 x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3/x^4,x, algorithm="maxima")

[Out] -1/315*(105*a^3*x^6 + 189*a^2*b*x^4 + 135*a*b^2*x^2 + 35*b^3)/x^9
```

Fricas [A] time = 0.217135, size = 50, normalized size = 1.16

$$-\frac{105 a^3 x^6 + 189 a^2 b x^4 + 135 a b^2 x^2 + 35 b^3}{315 x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3/x^4,x, algorithm="fricas")

[Out] -1/315*(105*a^3*x^6 + 189*a^2*b*x^4 + 135*a*b^2*x^2 + 35*b^3)/x^9
```

Sympy [A] time = 1.66424, size = 39, normalized size = 0.91

$$-\frac{105a^3x^6 + 189a^2bx^4 + 135ab^2x^2 + 35b^3}{315x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**3/x**4,x)

[Out] -(105*a**3*x**6 + 189*a**2*b*x**4 + 135*a*b**2*x**2 + 35*b**3)/(3
15*x**9)
```

GIAC/XCAS [A] time = 0.227055, size = 50, normalized size = 1.16

$$-\frac{105 a^3 x^6 + 189 a^2 b x^4 + 135 a b^2 x^2 + 35 b^3}{315 x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3/x^4,x, algorithm="giac")

[Out] -1/315*(105*a^3*x^6 + 189*a^2*b*x^4 + 135*a*b^2*x^2 + 35*b^3)/x^9
```

3.1839 $\int \frac{\left(a+\frac{b}{x^2}\right)^3}{x^5} dx$

Optimal. Leaf size=40

$$\frac{a\left(ax^2+b\right)^4}{40b^2x^8}-\frac{\left(ax^2+b\right)^4}{10bx^{10}}$$

```
[Out] -(b + a*x^2)^4/(10*b*x^10) + (a*(b + a*x^2)^4)/(40*b^2*x^8)
```

Rubi [A] time = 0.064114, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{a\left(ax^2+b\right)^4}{40b^2x^8}-\frac{\left(ax^2+b\right)^4}{10bx^{10}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^3/x^5,x]

[Out] -(b + a*x^2)^4/(10*b*x^10) + (a*(b + a*x^2)^4)/(40*b^2*x^8)
```

Rubi in Sympy [A] time = 10.1987, size = 39, normalized size = 0.98

$$-\frac{a^3}{4x^4}-\frac{a^2b}{2x^6}-\frac{3ab^2}{8x^8}-\frac{b^3}{10x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**3/x**5,x)

[Out] -a**3/(4*x**4) - a**2*b/(2*x**6) - 3*a*b**2/(8*x**8) - b**3/(10*x
**10)
```

Mathematica [A] time = 0.00717978, size = 43, normalized size = 1.08

$$-\frac{a^3}{4x^4}-\frac{a^2b}{2x^6}-\frac{3ab^2}{8x^8}-\frac{b^3}{10x^{10}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^3/x^5,x]

[Out] -b^3/(10*x^10) - (3*a*b^2)/(8*x^8) - (a^2*b)/(2*x^6) - a^3/(4*x^4
)
```

Maple [A] time = 0.007, size = 36, normalized size = 0.9

$$-\frac{a^2b}{2\,x^6}-\frac{a^3}{4\,x^4}-\frac{b^3}{10\,x^{10}}-\frac{3\,ab^2}{8\,x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^3/x^5,x)
```

```
[Out] -1/2*a^2*b/x^6-1/4*a^3/x^4-1/10*b^3/x^10-3/8*a*b^2/x^8
```

Maxima [A] time = 1.48167, size = 50, normalized size = 1.25

$$-\frac{10\,a^{3}x^{6}+20\,a^{2}bx^{4}+15\,ab^{2}x^{2}+4\,b^{3}}{40\,x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3/x^5,x, algorithm="maxima")
```

```
[Out] -1/40*(10*a^3*x^6 + 20*a^2*b*x^4 + 15*a*b^2*x^2 + 4*b^3)/x^10
```

Fricas [A] time = 0.219906, size = 50, normalized size = 1.25

$$-\frac{10\,a^{3}x^{6}+20\,a^{2}bx^{4}+15\,ab^{2}x^{2}+4\,b^{3}}{40\,x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3/x^5,x, algorithm="fricas")
```

```
[Out] -1/40*(10*a^3*x^6 + 20*a^2*b*x^4 + 15*a*b^2*x^2 + 4*b^3)/x^10
```

Sympy [A] time = 1.77216, size = 39, normalized size = 0.98

$$-\frac{10a^{3}x^{6}+20a^{2}bx^{4}+15ab^{2}x^{2}+4b^{3}}{40x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**3/x**5,x)
```

```
[Out] -(10*a**3*x**6 + 20*a**2*b*x**4 + 15*a*b**2*x**2 + 4*b**3)/(40*x*
*10)
```

GIAC/XCAS [A] time = 0.221473, size = 50, normalized size = 1.25

$$-\frac{10\,a^{3}x^{6}+20\,a^{2}bx^{4}+15\,ab^{2}x^{2}+4\,b^{3}}{40\,x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3/x^5,x, algorithm="giac")
```

```
[Out] -1/40*(10*a^3*x^6 + 20*a^2*b*x^4 + 15*a*b^2*x^2 + 4*b^3)/x^10
```

3.1840 $\int \frac{\left(a+\frac{b}{x^2}\right)^3}{x^6}\,dx$

Optimal. Leaf size=43

$$-\frac{a^3}{5x^5}-\frac{3a^2b}{7x^7}-\frac{ab^2}{3x^9}-\frac{b^3}{11x^{11}}$$

```
[Out] -b^3/(11*x^11) - (a*b^2)/(3*x^9) - (3*a^2*b)/(7*x^7) - a^3/(5*x^5
)
```

Rubi [A] time = 0.0506904, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^3}{5x^5}-\frac{3a^2b}{7x^7}-\frac{ab^2}{3x^9}-\frac{b^3}{11x^{11}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^3/x^6,x]
```

```
[Out] -b^3/(11*x^11) - (a*b^2)/(3*x^9) - (3*a^2*b)/(7*x^7) - a^3/(5*x^5
)
```

Rubi in Sympy [A] time = 8.62173, size = 39, normalized size = 0.91

$$-\frac{a^3}{5x^5}-\frac{3a^2b}{7x^7}-\frac{ab^2}{3x^9}-\frac{b^3}{11x^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**3/x**6,x)
```

```
[Out] -a**3/(5*x**5) - 3*a**2*b/(7*x**7) - a*b**2/(3*x**9) - b**3/(11*x
**11)
```

Mathematica [A] time = 0.0125785, size = 43, normalized size = 1.

$$-\frac{a^3}{5x^5}-\frac{3a^2b}{7x^7}-\frac{ab^2}{3x^9}-\frac{b^3}{11x^{11}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^3/x^6,x]
```

```
[Out] -b^3/(11*x^11) - (a*b^2)/(3*x^9) - (3*a^2*b)/(7*x^7) - a^3/(5*x^5
)
```

Maple [A] time = 0.008, size = 36, normalized size = 0.8

$$-\frac{b^3}{11\,x^{11}}-\frac{ab^2}{3\,x^9}-\frac{3\,a^2b}{7\,x^7}-\frac{a^3}{5\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^3/x^6,x)

[Out] -1/11*b^3/x^11-1/3*a*b^2/x^9-3/7*a^2*b/x^7-1/5*a^3/x^5
```

Maxima [A] time = 1.43475, size = 50, normalized size = 1.16

$$-\frac{231\,a^3x^6+495\,a^2bx^4+385\,ab^2x^2+105\,b^3}{1155\,x^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3/x^6,x, algorithm="maxima")

[Out] -1/1155*(231*a^3*x^6 + 495*a^2*b*x^4 + 385*a*b^2*x^2 + 105*b^3)/x
^11
```

Fricas [A] time = 0.214452, size = 50, normalized size = 1.16

$$-\frac{231\,a^3x^6+495\,a^2bx^4+385\,ab^2x^2+105\,b^3}{1155\,x^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3/x^6,x, algorithm="fricas")

[Out] -1/1155*(231*a^3*x^6 + 495*a^2*b*x^4 + 385*a*b^2*x^2 + 105*b^3)/x
^11
```

Sympy [A] time = 1.77952, size = 39, normalized size = 0.91

$$-\frac{231a^3x^6+495a^2bx^4+385ab^2x^2+105b^3}{1155x^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**3/x**6,x)

[Out] -(231*a**3*x**6 + 495*a**2*b*x**4 + 385*a*b**2*x**2 + 105*b**3)/(
1155*x**11)
```

GIAC/XCAS [A] time = 0.220084, size = 50, normalized size = 1.16

$$-\frac{231\,a^3x^6+495\,a^2bx^4+385\,ab^2x^2+105\,b^3}{1155\,x^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^3/x^6,x, algorithm="giac")

[Out] -1/1155*(231*a^3*x^6 + 495*a^2*b*x^4 + 385*a*b^2*x^2 + 105*b^3)/x
^11
```

3.1841 $\int \frac{x^6}{a+\frac{b}{x^2}}\,dx$

Optimal. Leaf size=68

$$\frac{b^{7/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{a^{9/2}}-\frac{b^3x}{a^4}+\frac{b^2x^3}{3a^3}-\frac{bx^5}{5a^2}+\frac{x^7}{7a}$$

```
[Out] -((b^3*x)/a^4) + (b^2*x^3)/(3*a^3) - (b*x^5)/(5*a^2) + x^7/(7*a)
+ (b^(7/2)*ArcTan[(Sqrt[a]*x)/Sqrt[b]])/a^(9/2)
```

Rubi [A] time = 0.0876424, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{b^{7/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{a^{9/2}}-\frac{b^3x}{a^4}+\frac{b^2x^3}{3a^3}-\frac{bx^5}{5a^2}+\frac{x^7}{7a}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/(a + b/x^2),x]
```

```
[Out] -((b^3*x)/a^4) + (b^2*x^3)/(3*a^3) - (b*x^5)/(5*a^2) + x^7/(7*a)
+ (b^(7/2)*ArcTan[(Sqrt[a]*x)/Sqrt[b]])/a^(9/2)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-b^3\int \frac{1}{a^4}\,dx+\frac{x^7}{7a}-\frac{bx^5}{5a^2}+\frac{b^2x^3}{3a^3}+\frac{b^{\frac{7}{2}}\operatorname{atan}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{a^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(a+b/x**2),x)
```

```
[Out] -b**3*Integral(a**(-4), x) + x**7/(7*a) - b*x**5/(5*a**2) + b**2*
x**3/(3*a**3) + b**(7/2)*atan(sqrt(a)*x/sqrt(b))/a**(9/2)
```

Mathematica [A] time = 0.0486531, size = 68, normalized size = 1.

$$\frac{b^{7/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{a^{9/2}}-\frac{b^3x}{a^4}+\frac{b^2x^3}{3a^3}-\frac{bx^5}{5a^2}+\frac{x^7}{7a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6/(a + b/x^2),x]
```

```
[Out] -((b^3*x)/a^4) + (b^2*x^3)/(3*a^3) - (b*x^5)/(5*a^2) + x^7/(7*a)
+ (b^(7/2)*ArcTan[(Sqrt[a]*x)/Sqrt[b]])/a^(9/2)
```

Maple [A] time = 0.004, size = 60, normalized size = 0.9

$$\frac{x^7}{7\,a}-\frac{bx^5}{5\,a^2}+\frac{b^2x^3}{3\,a^3}-\frac{b^3x}{a^4}+\frac{b^4}{a^4}\arctan\left(ax\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(a+b/x^2),x)
```

```
[Out] 1/7*x^7/a-1/5*b*x^5/a^2+1/3*b^2*x^3/a^3-b^3*x/a^4+b^4/a^4/(a*b)^(
1/2)*arctan(a*x/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(a + b/x^2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.232932, size = 1, normalized size = 0.01

$$\left[\frac{30\,a^3x^7 - 42\,a^2bx^5 + 70\,ab^2x^3 + 105\,b^3\sqrt{-\frac{b}{a}}\log\left(\frac{ax^2+2\,ax\sqrt{-\frac{b}{a}}-b}{ax^2+b}\right) - 210\,b^3x}{210\,a^4}, \frac{15\,a^3x^7 - 21\,a^2bx^5 + 35\,ab^2x^3 + 105\,b^3\sqrt{\frac{b}{a}}\,a\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(a + b/x^2),x, algorithm="fricas")
```

```
[Out] [1/210*(30*a^3*x^7 - 42*a^2*b*x^5 + 70*a*b^2*x^3 + 105*b^3*sqrt(-
b/a)*log((a*x^2 + 2*a*x*sqrt(-b/a) - b)/(a*x^2 + b)) - 210*b^3*x)
/a^4, 1/105*(15*a^3*x^7 - 21*a^2*b*x^5 + 35*a*b^2*x^3 + 105*b^3*s
qrt(b/a)*arctan(x/sqrt(b/a)) - 105*b^3*x)/a^4]
```

Sympy [A] time = 1.34158, size = 107, normalized size = 1.57

$$-\frac{\sqrt{-\frac{b^7}{a^9}}\log\left(-\frac{a^4\sqrt{-\frac{b^7}{a^9}}}{b^3}+x\right)}{2} + \frac{\sqrt{-\frac{b^7}{a^9}}\log\left(\frac{a^4\sqrt{-\frac{b^7}{a^9}}}{b^3}+x\right)}{2} + \frac{x^7}{7a} - \frac{bx^5}{5a^2} + \frac{b^2x^3}{3a^3} - \frac{b^3x}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(a+b/x**2),x)
```

```
[Out] -sqrt(-b**7/a**9)*log(-a**4*sqrt(-b**7/a**9)/b**3 + x)/2 + sqrt(-
b**7/a**9)*log(a**4*sqrt(-b**7/a**9)/b**3 + x)/2 + x**7/(7*a) - b
*x**5/(5*a**2) + b**2*x**3/(3*a**3) - b**3*x/a**4
```

GIAC/XCAS [A] time = 0.230374, size = 88, normalized size = 1.29

$$\frac{b^4\arctan\left(\frac{ax}{\sqrt{ab}}\right)}{\sqrt{ab}a^4} + \frac{15\,a^6x^7 - 21\,a^5bx^5 + 35\,a^4b^2x^3 - 105\,a^3b^3x}{105\,a^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(a + b/x^2),x, algorithm="giac")
```

```
[Out] b^4*arctan(a*x/sqrt(a*b))/(sqrt(a*b)*a^4) + 1/105*(15*a^6*x^7 - 2
1*a^5*b*x^5 + 35*a^4*b^2*x^3 - 105*a^3*b^3*x)/a^7
```

3.1842 $\int \frac{x^5}{a+\frac{b}{x^2}}\,dx$

Optimal. Leaf size=53

$$-\frac{b^3\log\left(ax^2+b\right)}{2a^4}+\frac{b^2x^2}{2a^3}-\frac{bx^4}{4a^2}+\frac{x^6}{6a}$$

```
[Out] (b^2*x^2)/(2*a^3) - (b*x^4)/(4*a^2) + x^6/(6*a) - (b^3*Log[b + a*
x^2])/(2*a^4)
```

Rubi [A] time = 0.102726, antiderivative size = 53, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{b^3\log\left(ax^2+b\right)}{2a^4}+\frac{b^2x^2}{2a^3}-\frac{bx^4}{4a^2}+\frac{x^6}{6a}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/(a + b/x^2),x]
```

```
[Out] (b^2*x^2)/(2*a^3) - (b*x^4)/(4*a^2) + x^6/(6*a) - (b^3*Log[b + a*
x^2])/(2*a^4)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{b^2\int^{x^2}\frac{1}{a^3}\,dx}{2}+\frac{x^6}{6a}-\frac{b\int^{x^2}x\,dx}{2a^2}-\frac{b^3\log\left(ax^2+b\right)}{2a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(a+b/x**2),x)
```

```
[Out] b**2*Integral(a**(-3), (x, x**2))/2 + x**6/(6*a) - b*Integral(x,
(x, x**2))/(2*a**2) - b**3*log(a*x**2 + b)/(2*a**4)
```

Mathematica [A] time = 0.00945838, size = 53, normalized size = 1.

$$-\frac{b^3\log\left(ax^2+b\right)}{2a^4}+\frac{b^2x^2}{2a^3}-\frac{bx^4}{4a^2}+\frac{x^6}{6a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/(a + b/x^2),x]
```

```
[Out] (b^2*x^2)/(2*a^3) - (b*x^4)/(4*a^2) + x^6/(6*a) - (b^3*Log[b + a*
x^2])/(2*a^4)
```

Maple [A] time = 0.004, size = 46, normalized size = 0.9

$$\frac{b^2x^2}{2\,a^3}-\frac{bx^4}{4\,a^2}+\frac{x^6}{6\,a}-\frac{b^3\ln\left(ax^2+b\right)}{2\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(a+b/x^2),x)

[Out] 1/2*b^2*x^2/a^3-1/4*b*x^4/a^2+1/6*x^6/a-1/2*b^3*ln(a*x^2+b)/a^4
```

Maxima [A] time = 1.45781, size = 62, normalized size = 1.17

$$-\frac{b^3 \log\left(ax^2+b\right)}{2\,a^4}+\frac{2\,a^2x^6-3\,abx^4+6\,b^2x^2}{12\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(a + b/x^2),x, algorithm="maxima")

[Out] -1/2*b^3*log(a*x^2 + b)/a^4 + 1/12*(2*a^2*x^6 - 3*a*b*x^4 + 6*b^2
*x^2)/a^3
```

Fricas [A] time = 0.223901, size = 61, normalized size = 1.15

$$\frac{2\,a^3x^6-3\,a^2bx^4+6\,ab^2x^2-6\,b^3\log\left(ax^2+b\right)}{12\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(a + b/x^2),x, algorithm="fricas")

[Out] 1/12*(2*a^3*x^6 - 3*a^2*b*x^4 + 6*a*b^2*x^2 - 6*b^3*log(a*x^2 + b
))/a^4
```

Sympy [A] time = 1.32283, size = 44, normalized size = 0.83

$$\frac{x^6}{6a}-\frac{bx^4}{4a^2}+\frac{b^2x^2}{2a^3}-\frac{b^3\log\left(ax^2+b\right)}{2a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(a+b/x**2),x)

[Out] x**6/(6*a) - b*x**4/(4*a**2) + b**2*x**2/(2*a**3) - b**3*log(a*x*
*2 + b)/(2*a**4)
```

GIAC/XCAS [A] time = 0.230714, size = 63, normalized size = 1.19

$$-\frac{b^3\ln\left(\left|ax^2+b\right|\right)}{2\,a^4}+\frac{2\,a^2x^6-3\,abx^4+6\,b^2x^2}{12\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(a + b/x^2),x, algorithm="giac")

[Out] -1/2*b^3*ln(abs(a*x^2 + b))/a^4 + 1/12*(2*a^2*x^6 - 3*a*b*x^4 + 6
*b^2*x^2)/a^3
```

3.1843 $\int \frac{x^4}{a+\frac{b}{x^2}} dx$

Optimal. Leaf size=55

$$-\frac{b^{5/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{a^{7/2}}+\frac{b^2x}{a^3}-\frac{bx^3}{3a^2}+\frac{x^5}{5a}$$

```
[Out] (b^2*x)/a^3 - (b*x^3)/(3*a^2) + x^5/(5*a) - (b^(5/2)*ArcTan[(Sqrt
[a]*x)/Sqrt[b]])/a^(7/2)
```

Rubi [A] time = 0.0755646, antiderivative size = 55, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{b^{5/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{a^{7/2}}+\frac{b^2x}{a^3}-\frac{bx^3}{3a^2}+\frac{x^5}{5a}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a + b/x^2),x]
```

```
[Out] (b^2*x)/a^3 - (b*x^3)/(3*a^2) + x^5/(5*a) - (b^(5/2)*ArcTan[(Sqrt
[a]*x)/Sqrt[b]])/a^(7/2)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$b^2\int \frac{1}{a^3}\,dx+\frac{x^5}{5a}-\frac{bx^3}{3a^2}-\frac{b^{\frac{5}{2}}\,\mathrm{atan}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{a^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(a+b/x**2),x)
```

```
[Out] b**2*Integral(a**(-3), x) + x**5/(5*a) - b*x**3/(3*a**2) - b**(5/
2)*atan(sqrt(a)*x/sqrt(b))/a**(7/2)
```

Mathematica [A] time = 0.0430345, size = 55, normalized size = 1.

$$-\frac{b^{5/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{a^{7/2}}+\frac{b^2x}{a^3}-\frac{bx^3}{3a^2}+\frac{x^5}{5a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(a + b/x^2),x]
```

```
[Out] (b^2*x)/a^3 - (b*x^3)/(3*a^2) + x^5/(5*a) - (b^(5/2)*ArcTan[(Sqrt
[a]*x)/Sqrt[b]])/a^(7/2)
```

Maple [A] time = 0.003, size = 49, normalized size = 0.9

$$\frac{x^5}{5\,a}-\frac{bx^3}{3\,a^2}+\frac{b^2x}{a^3}-\frac{b^3}{a^3}\arctan\left(ax\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^4/(a+b/x^2),x)
```

```
[Out] 1/5*x^5/a-1/3*b*x^3/a^2+b^2*x/a^3-b^3/a^3/(a*b)^(1/2)*arctan(a*x/
(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^4/(a + b/x^2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.235821, size = 1, normalized size = 0.02

$$\left[\frac{6\,a^2x^5 - 10\,abx^3 + 15\,b^2\sqrt{-\frac{b}{a}}\log\left(\frac{ax^2-2\,ax\sqrt{-\frac{b}{a}}-b}{ax^2+b}\right) + 30\,b^2x}{30\,a^3}, \frac{3\,a^2x^5 - 5\,abx^3 - 15\,b^2\sqrt{\frac{b}{a}}\arctan\left(\frac{x}{\sqrt{\frac{b}{a}}}\right) + 15\,b^2x}{15\,a^3}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^4/(a + b/x^2),x, algorithm="fricas")
```

```
[Out] [1/30*(6*a^2*x^5 - 10*a*b*x^3 + 15*b^2*sqrt(-b/a)*log((a*x^2 - 2*
a*x*sqrt(-b/a) - b)/(a*x^2 + b)) + 30*b^2*x)/a^3, 1/15*(3*a^2*x^5
 - 5*a*b*x^3 - 15*b^2*sqrt(b/a)*arctan(x/sqrt(b/a)) + 15*b^2*x)/a
^3]
```

Sympy [A] time = 1.33417, size = 95, normalized size = 1.73

$$\frac{\sqrt{-\frac{b^5}{a^7}}\log\left(-\frac{a^3\sqrt{-\frac{b^5}{a^7}}}{b^2} + x\right)}{2} - \frac{\sqrt{-\frac{b^5}{a^7}}\log\left(\frac{a^3\sqrt{-\frac{b^5}{a^7}}}{b^2} + x\right)}{2} + \frac{x^5}{5a} - \frac{bx^3}{3a^2} + \frac{b^2x}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**4/(a+b/x**2),x)
```

```
[Out] sqrt(-b**5/a**7)*log(-a**3*sqrt(-b**5/a**7)/b**2 + x)/2 - sqrt(-b
**5/a**7)*log(a**3*sqrt(-b**5/a**7)/b**2 + x)/2 + x**5/(5*a) - b*
x**3/(3*a**2) + b**2*x/a**3
```

GIAC/XCAS [A] time = 0.220951, size = 74, normalized size = 1.35

$$-\frac{b^3\arctan\left(\frac{ax}{\sqrt{ab}}\right)}{\sqrt{ab}a^3} + \frac{3\,a^4x^5 - 5\,a^3bx^3 + 15\,a^2b^2x}{15\,a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(a + b/x^2),x, algorithm="giac")
```

```
[Out] -b^3*arctan(a*x/sqrt(a*b))/(sqrt(a*b)*a^3) + 1/15*(3*a^4*x^5 - 5*
a^3*b*x^3 + 15*a^2*b^2*x)/a^5
```

3.1844 $\int \frac{x^3}{a+\frac{b}{x^2}}\,dx$

Optimal. Leaf size=40

$$\frac{b^2\log\left(ax^2+b\right)}{2a^3}-\frac{bx^2}{2a^2}+\frac{x^4}{4a}$$

```
[Out] -(b*x^2)/(2*a^2) + x^4/(4*a) + (b^2*Log[b + a*x^2])/(2*a^3)
```

Rubi [A] time = 0.0779655, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{b^2\log\left(ax^2+b\right)}{2a^3}-\frac{bx^2}{2a^2}+\frac{x^4}{4a}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(a + b/x^2),x]

[Out] -(b*x^2)/(2*a^2) + x^4/(4*a) + (b^2*Log[b + a*x^2])/(2*a^3)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int^{x^2} x\,dx}{2a}-\frac{\int^{x^2} b\,dx}{2a^2}+\frac{b^2\log\left(ax^2+b\right)}{2a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(a+b/x**2),x)

[Out] Integral(x, (x, x**2))/(2*a) - Integral(b, (x, x**2))/(2*a**2) +
b**2*log(a*x**2 + b)/(2*a**3)
```

Mathematica [A] time = 0.00863538, size = 40, normalized size = 1.

$$\frac{b^2\log\left(ax^2+b\right)}{2a^3}-\frac{bx^2}{2a^2}+\frac{x^4}{4a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(a + b/x^2),x]

[Out] -(b*x^2)/(2*a^2) + x^4/(4*a) + (b^2*Log[b + a*x^2])/(2*a^3)
```

Maple [A] time = 0.005, size = 35, normalized size = 0.9

$$-\frac{bx^2}{2\,a^2}+\frac{x^4}{4\,a}+\frac{b^2\ln\left(ax^2+b\right)}{2\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(a+b/x^2),x)
```

```
[Out] -1/2*b*x^2/a^2+1/4*x^4/a+1/2*b^2*ln(a*x^2+b)/a^3
```

Maxima [A] time = 1.42446, size = 46, normalized size = 1.15

$$\frac{b^2 \log\left(ax^2+b\right)}{2\,a^3}+\frac{ax^4-2\,bx^2}{4\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(a + b/x^2),x, algorithm="maxima")
```

```
[Out] 1/2*b^2*log(a*x^2 + b)/a^3 + 1/4*(a*x^4 - 2*b*x^2)/a^2
```

Fricas [A] time = 0.223489, size = 45, normalized size = 1.12

$$\frac{a^2x^4-2\,abx^2+2\,b^2\log\left(ax^2+b\right)}{4\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(a + b/x^2),x, algorithm="fricas")
```

```
[Out] 1/4*(a^2*x^4 - 2*a*b*x^2 + 2*b^2*log(a*x^2 + b))/a^3
```

Sympy [A] time = 1.21156, size = 32, normalized size = 0.8

$$\frac{x^4}{4a}-\frac{bx^2}{2a^2}+\frac{b^2\log\left(ax^2+b\right)}{2a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(a+b/x**2),x)
```

```
[Out] x**4/(4*a) - b*x**2/(2*a**2) + b**2*log(a*x**2 + b)/(2*a**3)
```

GIAC/XCAS [A] time = 0.22876, size = 47, normalized size = 1.18

$$\frac{b^2\ln\left(\left|ax^2+b\right|\right)}{2\,a^3}+\frac{ax^4-2\,bx^2}{4\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(a + b/x^2),x, algorithm="giac")
```

```
[Out] 1/2*b^2*ln(abs(a*x^2 + b))/a^3 + 1/4*(a*x^4 - 2*b*x^2)/a^2
```

3.1845 $\int \frac{x^2}{a+\frac{b}{x^2}}\,dx$

Optimal. Leaf size=42

$$\frac{b^{3/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{a^{5/2}}-\frac{bx}{a^2}+\frac{x^3}{3a}$$

```
[Out] -((b*x)/a^2) + x^3/(3*a) + (b^(3/2)*ArcTan[(Sqrt[a]*x)/Sqrt[b]])/
a^(5/2)
```

Rubi [A] time = 0.0652061, antiderivative size = 42, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{b^{3/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{a^{5/2}}-\frac{bx}{a^2}+\frac{x^3}{3a}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b/x^2),x]
```

```
[Out] -((b*x)/a^2) + x^3/(3*a) + (b^(3/2)*ArcTan[(Sqrt[a]*x)/Sqrt[b]])/
a^(5/2)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{x^3}{3a}-\frac{\int b\,dx}{a^2}+\frac{b^{\frac{3}{2}}\operatorname{atan}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b/x**2),x)
```

```
[Out] x**3/(3*a) - Integral(b, x)/a**2 + b**(3/2)*atan(sqrt(a)*x/sqrt(b
))/a**(5/2)
```

Mathematica [A] time = 0.0361789, size = 42, normalized size = 1.

$$\frac{b^{3/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{a^{5/2}}-\frac{bx}{a^2}+\frac{x^3}{3a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a + b/x^2),x]
```

```
[Out] -((b*x)/a^2) + x^3/(3*a) + (b^(3/2)*ArcTan[(Sqrt[a]*x)/Sqrt[b]])/
a^(5/2)
```

Maple [A] time = 0.001, size = 38, normalized size = 0.9

$$\frac{x^3}{3\,a}-\frac{bx}{a^2}+\frac{b^2}{a^2}\arctan\left(ax\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(a+b/x^2),x)
```

```
[Out] 1/3*x^3/a-b*x/a^2+1/a^2*b^2/(a*b)^(1/2)*arctan(a*x/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x^2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.229478, size = 1, normalized size = 0.02

$$\left[\frac{2\,ax^3 + 3\,b\sqrt{-\frac{b}{a}}\log\left(\frac{ax^2+2\,ax\sqrt{-\frac{b}{a}}-b}{ax^2+b}\right) - 6\,bx}{6\,a^2}, \frac{ax^3 + 3\,b\sqrt{\frac{b}{a}}\arctan\left(\frac{x}{\sqrt{\frac{b}{a}}}\right) - 3\,bx}{3\,a^2}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x^2),x, algorithm="fricas")
```

```
[Out] [1/6*(2*a*x^3 + 3*b*sqrt(-b/a)*log((a*x^2 + 2*a*x*sqrt(-b/a) - b)
/(a*x^2 + b)) - 6*b*x)/a^2, 1/3*(a*x^3 + 3*b*sqrt(b/a)*arctan(x/s
qrt(b/a)) - 3*b*x)/a^2]
```

Sympy [A] time = 1.28698, size = 80, normalized size = 1.9

$$-\frac{\sqrt{-\frac{b^3}{a^5}}\log\left(-\frac{a^2\sqrt{-\frac{b^3}{a^5}}}{b} + x\right)}{2} + \frac{\sqrt{-\frac{b^3}{a^5}}\log\left(\frac{a^2\sqrt{-\frac{b^3}{a^5}}}{b} + x\right)}{2} + \frac{x^3}{3a} - \frac{bx}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b/x**2),x)
```

```
[Out] -sqrt(-b**3/a**5)*log(-a**2*sqrt(-b**3/a**5)/b + x)/2 + sqrt(-b**
3/a**5)*log(a**2*sqrt(-b**3/a**5)/b + x)/2 + x**3/(3*a) - b*x/a**
2
```

GIAC/XCAS [A] time = 0.220723, size = 54, normalized size = 1.29

$$\frac{b^2\arctan\left(\frac{ax}{\sqrt{ab}}\right)}{\sqrt{ab}a^2} + \frac{a^2x^3 - 3\,abx}{3\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x^2),x, algorithm="giac")
```

```
[Out] b^2*arctan(a*x/sqrt(a*b))/(sqrt(a*b)*a^2) + 1/3*(a^2*x^3 - 3*a*b*
x)/a^3
```

3.1846 $\int \frac{x}{a+\frac{b}{x^2}}\,dx$

Optimal. Leaf size=27

$$\frac{x^2}{2a} - \frac{b\log\left(ax^2+b\right)}{2a^2}$$

```
[Out] x^2/(2*a) - (b*Log[b + a*x^2])/(2*a^2)
```

Rubi [A] time = 0.0575099, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273

$$\frac{x^2}{2a} - \frac{b\log\left(ax^2+b\right)}{2a^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b/x^2),x]

[Out] x^2/(2*a) - (b*Log[b + a*x^2])/(2*a^2)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int^{x^2} \frac{1}{a}\,dx}{2} - \frac{b\log\left(ax^2+b\right)}{2a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b/x**2),x)

[Out] Integral(1/a, (x, x**2))/2 - b*log(a*x**2 + b)/(2*a**2)
```

Mathematica [A] time = 0.00865874, size = 27, normalized size = 1.

$$\frac{x^2}{2a} - \frac{b\log\left(ax^2+b\right)}{2a^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b/x^2),x]

[Out] x^2/(2*a) - (b*Log[b + a*x^2])/(2*a^2)
```

Maple [A] time = 0.005, size = 24, normalized size = 0.9

$$\frac{x^2}{2\,a} - \frac{b\ln\left(ax^2+b\right)}{2\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+b/x^2),x)

[Out] 1/2*x^2/a-1/2*b*ln(a*x^2+b)/a^2
```

Maxima [A] time = 1.45208, size = 31, normalized size = 1.15

$$\frac{x^2}{2\,a} - \frac{b\log\left(ax^2+b\right)}{2\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x^2),x, algorithm="maxima")
```

```
[Out] 1/2*x^2/a - 1/2*b*log(a*x^2 + b)/a^2
```

Fricas [A] time = 0.223204, size = 30, normalized size = 1.11

$$\frac{ax^2 - b\log\left(ax^2+b\right)}{2\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x^2),x, algorithm="fricas")
```

```
[Out] 1/2*(a*x^2 - b*log(a*x^2 + b))/a^2
```

Sympy [A] time = 1.16343, size = 20, normalized size = 0.74

$$\frac{x^2}{2a} - \frac{b\log\left(ax^2+b\right)}{2a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b/x**2),x)
```

```
[Out] x**2/(2*a) - b*log(a*x**2 + b)/(2*a**2)
```

GIAC/XCAS [A] time = 0.226527, size = 32, normalized size = 1.19

$$\frac{x^2}{2\,a} - \frac{b\ln\left(\left|ax^2+b\right|\right)}{2\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x^2),x, algorithm="giac")
```

```
[Out] 1/2*x^2/a - 1/2*b*ln(abs(a*x^2 + b))/a^2
```

3.1847 $\int \frac{1}{a+\frac{b}{x^2}} dx$

Optimal. Leaf size=31

$$\frac{x}{a} - \frac{\sqrt{b}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{a^{3/2}}$$

```
[Out] x/a - (Sqrt[b]*ArcTan[(Sqrt[a]*x)/Sqrt[b]])/a^(3/2)
```

Rubi [A] time = 0.0393342, antiderivative size = 31, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{x}{a} - \frac{\sqrt{b}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{a^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^(-1),x]

[Out] x/a - (Sqrt[b]*ArcTan[(Sqrt[a]*x)/Sqrt[b]])/a^(3/2)
```

Rubi in Sympy [A] time = 6.44295, size = 26, normalized size = 0.84

$$\frac{x}{a} - \frac{\sqrt{b}\,\mathrm{atan}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2),x)

[Out] x/a - sqrt(b)*atan(sqrt(a)*x/sqrt(b))/a**(3/2)
```

Mathematica [A] time = 0.0157899, size = 31, normalized size = 1.

$$\frac{x}{a} - \frac{\sqrt{b}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{a^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^(-1),x]

[Out] x/a - (Sqrt[b]*ArcTan[(Sqrt[a]*x)/Sqrt[b]])/a^(3/2)
```

Maple [A] time = 0.002, size = 27, normalized size = 0.9

$$\frac{x}{a} - \frac{b}{a}\arctan\left(ax\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2),x)
```

```
[Out] x/a-b/a/(a*b)^(1/2)*arctan(a*x/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a + b/x^2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.237185, size = 1, normalized size = 0.03

$$\left[\frac{\sqrt{-\frac{b}{a}}\log\left(\frac{ax^2-2\,ax\sqrt{-\frac{b}{a}}-b}{ax^2+b}\right)+2\,x}{2\,a}, -\frac{\sqrt{\frac{b}{a}}\arctan\left(\frac{x}{\sqrt{\frac{b}{a}}}\right)-x}{a}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a + b/x^2),x, algorithm="fricas")
```

```
[Out] [1/2*(sqrt(-b/a)*log((a*x^2 - 2*a*x*sqrt(-b/a) - b)/(a*x^2 + b))
+ 2*x)/a, -(sqrt(b/a)*arctan(x/sqrt(b/a)) - x)/a]
```

Sympy [A] time = 1.18514, size = 56, normalized size = 1.81

$$\frac{\sqrt{-\frac{b}{a^3}}\log\left(-a\sqrt{-\frac{b}{a^3}}+x\right)}{2}-\frac{\sqrt{-\frac{b}{a^3}}\log\left(a\sqrt{-\frac{b}{a^3}}+x\right)}{2}+\frac{x}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2),x)
```

```
[Out] sqrt(-b/a**3)*log(-a*sqrt(-b/a**3) + x)/2 - sqrt(-b/a**3)*log(a*s
qrt(-b/a**3) + x)/2 + x/a
```

GIAC/XCAS [A] time = 0.225645, size = 35, normalized size = 1.13

$$-\frac{b\arctan\left(\frac{ax}{\sqrt{ab}}\right)}{\sqrt{ab}a}+\frac{x}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a + b/x^2),x, algorithm="giac")
```

```
[Out] -b*arctan(a*x/sqrt(a*b))/(sqrt(a*b)*a) + x/a
```

3.1848 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)x}\,dx$

Optimal. Leaf size=15

$$\frac{\log(ax^2+b)}{2a}$$

```
[Out] Log[b + a*x^2]/(2*a)
```

Rubi [A] time = 0.0194303, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$\frac{\log(ax^2+b)}{2a}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)*x),x]

[Out] Log[b + a*x^2]/(2*a)
```

Rubi in Sympy [A] time = 3.62748, size = 10, normalized size = 0.67

$$\frac{\log(ax^2+b)}{2a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)/x,x)

[Out] log(a*x**2 + b)/(2*a)
```

Mathematica [A] time = 0.00356557, size = 15, normalized size = 1.

$$\frac{\log(ax^2+b)}{2a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)*x),x]

[Out] Log[b + a*x^2]/(2*a)
```

Maple [A] time = 0.002, size = 14, normalized size = 0.9

$$\frac{\ln(ax^2+b)}{2a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)/x,x)

[Out] 1/2*ln(a*x^2+b)/a
```

Maxima [A] time = 1.42423, size = 18, normalized size = 1.2

$$\frac{\log\left(ax^2+b\right)}{2\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)*x),x, algorithm="maxima")
```

```
[Out] 1/2*log(a*x^2 + b)/a
```

Fricas [A] time = 0.225488, size = 18, normalized size = 1.2

$$\frac{\log\left(ax^2+b\right)}{2\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)*x),x, algorithm="fricas")
```

```
[Out] 1/2*log(a*x^2 + b)/a
```

Sympy [A] time = 0.23468, size = 10, normalized size = 0.67

$$\frac{\log\left(ax^2+b\right)}{2a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)/x,x)
```

```
[Out] log(a*x**2 + b)/(2*a)
```

GIAC/XCAS [A] time = 0.227975, size = 19, normalized size = 1.27

$$\frac{\ln\left(\left|ax^2+b\right|\right)}{2\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)*x),x, algorithm="giac")
```

```
[Out] 1/2*ln(abs(a*x^2 + b))/a
```

3.1849 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)x^2}\,dx$

Optimal. Leaf size=24

$$\frac{\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}}$$

```
[Out] ArcTan[(Sqrt[a]*x)/Sqrt[b]]/(Sqrt[a]*Sqrt[b])
```

Rubi [A] time = 0.0282907, antiderivative size = 24, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)*x^2),x]

[Out] ArcTan[(Sqrt[a]*x)/Sqrt[b]]/(Sqrt[a]*Sqrt[b])
```

Rubi in Sympy [A] time = 4.10977, size = 22, normalized size = 0.92

$$\frac{\operatorname{atan}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)/x**2,x)

[Out] atan(sqrt(a)*x/sqrt(b))/(sqrt(a)*sqrt(b))
```

Mathematica [A] time = 0.00812181, size = 24, normalized size = 1.

$$\frac{\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{\sqrt{a}\sqrt{b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)*x^2),x]

[Out] ArcTan[(Sqrt[a]*x)/Sqrt[b]]/(Sqrt[a]*Sqrt[b])
```

Maple [A] time = 0.001, size = 16, normalized size = 0.7

$$1\arctan\left(ax\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)/x^2,x)
```

```
[Out] 1/(a*b)^(1/2)*arctan(a*x/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)*x^2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.231282, size = 1, normalized size = 0.04

$$\left[\frac{\log\left(\frac{2\,abx+(ax^2-b)\sqrt{-ab}}{ax^2+b}\right)}{2\sqrt{-ab}},\ \frac{\arctan\left(\frac{\sqrt{ab}x}{b}\right)}{\sqrt{ab}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)*x^2),x, algorithm="fricas")
```

```
[Out] [1/2*log((2*a*b*x + (a*x^2 - b)*sqrt(-a*b))/(a*x^2 + b))/sqrt(-a*
b), arctan(sqrt(a*b)*x/b)/sqrt(a*b)]
```

Sympy [A] time = 0.313873, size = 53, normalized size = 2.21

$$-\frac{\sqrt{-\frac{1}{ab}}\log\left(-b\sqrt{-\frac{1}{ab}}+x\right)}{2}+\frac{\sqrt{-\frac{1}{ab}}\log\left(b\sqrt{-\frac{1}{ab}}+x\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)/x**2,x)
```

```
[Out] -sqrt(-1/(a*b))*log(-b*sqrt(-1/(a*b)) + x)/2 + sqrt(-1/(a*b))*log
(b*sqrt(-1/(a*b)) + x)/2
```

GIAC/XCAS [A] time = 0.231668, size = 20, normalized size = 0.83

$$\frac{\arctan\left(\frac{ax}{\sqrt{ab}}\right)}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)*x^2),x, algorithm="giac")
```

```
[Out] arctan(a*x/sqrt(a*b))/sqrt(a*b)
```

3.1850 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)x^3}\,dx$

Optimal. Leaf size=15

$$-\frac{\log\left(a+\frac{b}{x^2}\right)}{2b}$$

```
[Out] -Log[a + b/x^2]/(2*b)
```

Rubi [A] time = 0.0183334, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{\log\left(a+\frac{b}{x^2}\right)}{2b}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)*x^3),x]

[Out] -Log[a + b/x^2]/(2*b)
```

Rubi in Sympy [A] time = 2.12996, size = 12, normalized size = 0.8

$$-\frac{\log\left(a+\frac{b}{x^2}\right)}{2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)/x**3,x)

[Out] -log(a + b/x**2)/(2*b)
```

Mathematica [A] time = 0.00962509, size = 22, normalized size = 1.47

$$\frac{\log(x)}{b}-\frac{\log\left(ax^2+b\right)}{2b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)*x^3),x]

[Out] Log[x]/b - Log[b + a*x^2]/(2*b)
```

Maple [A] time = 0.005, size = 21, normalized size = 1.4

$$\frac{\ln(x)}{b}-\frac{\ln\left(ax^2+b\right)}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)/x^3,x)
```

```
[Out] ln(x)/b-1/2/b*ln(a*x^2+b)
```

Maxima [A] time = 1.42265, size = 18, normalized size = 1.2

$$-\frac{\log\left(a+\frac{b}{x^2}\right)}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)*x^3),x, algorithm="maxima")
```

```
[Out] -1/2*log(a + b/x^2)/b
```

Fricas [A] time = 0.226803, size = 24, normalized size = 1.6

$$-\frac{\log\left(ax^2+b\right)-2\,\log\left(x\right)}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)*x^3),x, algorithm="fricas")
```

```
[Out] -1/2*(log(a*x^2 + b) - 2*log(x))/b
```

Sympy [A] time = 0.527612, size = 15, normalized size = 1.

$$\frac{\log\left(x\right)}{b}-\frac{\log\left(x^2+\frac{b}{a}\right)}{2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)/x**3,x)
```

```
[Out] log(x)/b - log(x**2 + b/a)/(2*b)
```

GIAC/XCAS [A] time = 0.225048, size = 32, normalized size = 2.13

$$\frac{\ln\left(x^2\right)}{2\,b}-\frac{\ln\left(\left|ax^2+b\right|\right)}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)*x^3),x, algorithm="giac")
```

```
[Out] 1/2*ln(x^2)/b - 1/2*ln(abs(a*x^2 + b))/b
```

3.1851 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)x^4}\,dx$

Optimal. Leaf size=34

$$-\frac{\sqrt{a}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{b^{3/2}}-\frac{1}{bx}$$

```
[Out] -(1/(b*x)) - (Sqrt[a]*ArcTan[(Sqrt[a]*x)/Sqrt[b]])/b^(3/2)
```

Rubi [A] time = 0.046018, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{\sqrt{a}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{b^{3/2}}-\frac{1}{bx}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)*x^4),x]

[Out] -(1/(b*x)) - (Sqrt[a]*ArcTan[(Sqrt[a]*x)/Sqrt[b]])/b^(3/2)
```

Rubi in Sympy [A] time = 7.64168, size = 29, normalized size = 0.85

$$-\frac{\sqrt{a}\,\text{atan}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{b^{\frac{3}{2}}}-\frac{1}{bx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)/x**4,x)

[Out] -sqrt(a)*atan(sqrt(a)*x/sqrt(b))/b**(3/2) - 1/(b*x)
```

Mathematica [A] time = 0.0229773, size = 34, normalized size = 1.

$$-\frac{\sqrt{a}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{b^{3/2}}-\frac{1}{bx}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)*x^4),x]

[Out] -(1/(b*x)) - (Sqrt[a]*ArcTan[(Sqrt[a]*x)/Sqrt[b]])/b^(3/2)
```

Maple [A] time = 0.004, size = 30, normalized size = 0.9

$$-\frac{a}{b}\arctan\left(ax\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}-\frac{1}{bx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)/x^4,x)
```

```
[Out] -a/b/(a*b)^(1/2)*arctan(a*x/(a*b)^(1/2))-1/b/x
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)*x^4),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [A] time = 0.233231, size = 1, normalized size = 0.03

$$\left[\frac{x\sqrt{-\frac{a}{b}}\log\left(\frac{ax^2-2\,bx\sqrt{-\frac{a}{b}}-b}{ax^2+b}\right)-2}{2\,bx}, -\frac{x\sqrt{\frac{a}{b}}\arctan\left(\frac{ax}{b\sqrt{\frac{a}{b}}}\right)+1}{bx}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)*x^4),x, algorithm="fricas")

[Out] [1/2*(x*sqrt(-a/b)*log((a*x^2 - 2*b*x*sqrt(-a/b) - b)/(a*x^2 + b)
) - 2)/(b*x), -(x*sqrt(a/b)*arctan(a*x/(b*sqrt(a/b))) + 1)/(b*x)]
```

Sympy [A] time = 1.32007, size = 65, normalized size = 1.91

$$\frac{\sqrt{-\frac{a}{b^3}}\log\left(x-\frac{b^2\sqrt{-\frac{a}{b^3}}}{a}\right)}{2}-\frac{\sqrt{-\frac{a}{b^3}}\log\left(x+\frac{b^2\sqrt{-\frac{a}{b^3}}}{a}\right)}{2}-\frac{1}{bx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)/x**4,x)

[Out] sqrt(-a/b**3)*log(x - b**2*sqrt(-a/b**3)/a)/2 - sqrt(-a/b**3)*log
(x + b**2*sqrt(-a/b**3)/a)/2 - 1/(b*x)
```

GIAC/XCAS [A] time = 0.223114, size = 39, normalized size = 1.15

$$-\frac{a\arctan\left(\frac{ax}{\sqrt{ab}}\right)}{\sqrt{ab}b}-\frac{1}{bx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)*x^4),x, algorithm="giac")

[Out] -a*arctan(a*x/sqrt(a*b))/(sqrt(a*b)*b) - 1/(b*x)
```

3.1852 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)x^5}\,dx$

Optimal. Leaf size=35

$$\frac{a\log\left(ax^2+b\right)}{2b^2}-\frac{a\log(x)}{b^2}-\frac{1}{2bx^2}$$

[Out] -1/(2*b*x^2) - (a*Log[x])/b^2 + (a*Log[b + a*x^2])/(2*b^2)

Rubi [A] time = 0.0688594, antiderivative size = 35, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{a\log\left(ax^2+b\right)}{2b^2}-\frac{a\log(x)}{b^2}-\frac{1}{2bx^2}$$

Antiderivative was successfully verified.

[In] Int[1/((a + b/x^2)*x^5),x]

[Out] -1/(2*b*x^2) - (a*Log[x])/b^2 + (a*Log[b + a*x^2])/(2*b^2)

Rubi in Sympy [A] time = 9.68781, size = 34, normalized size = 0.97

$$-\frac{a\log\left(x^2\right)}{2b^2}+\frac{a\log\left(ax^2+b\right)}{2b^2}-\frac{1}{2bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(1/(a+b/x**2)/x**5,x)

[Out] -a*log(x**2)/(2*b**2) + a*log(a*x**2 + b)/(2*b**2) - 1/(2*b*x**2)

Mathematica [A] time = 0.0119715, size = 35, normalized size = 1.

$$\frac{a\log\left(ax^2+b\right)}{2b^2}-\frac{a\log(x)}{b^2}-\frac{1}{2bx^2}$$

Antiderivative was successfully verified.

[In] Integrate[1/((a + b/x^2)*x^5),x]

[Out] -1/(2*b*x^2) - (a*Log[x])/b^2 + (a*Log[b + a*x^2])/(2*b^2)

Maple [A] time = 0.009, size = 32, normalized size = 0.9

$$-\frac{1}{2\,bx^2}-\frac{a\ln(x)}{b^2}+\frac{a\ln\left(ax^2+b\right)}{2\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(a+b/x^2)/x^5,x)

[Out] -1/2/b/x^2-a*ln(x)/b^2+1/2*a*ln(a*x^2+b)/b^2

Maxima [A] time = 1.54631, size = 45, normalized size = 1.29

$$\frac{a\log\left(ax^2+b\right)}{2\,b^2}-\frac{a\log\left(x^2\right)}{2\,b^2}-\frac{1}{2\,bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)*x^5),x, algorithm="maxima")
```

```
[Out] 1/2*a*log(a*x^2 + b)/b^2 - 1/2*a*log(x^2)/b^2 - 1/2/(b*x^2)
```

Fricas [A] time = 0.237591, size = 45, normalized size = 1.29

$$\frac{ax^2\log\left(ax^2+b\right)-2\,ax^2\log\left(x\right)-b}{2\,b^2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)*x^5),x, algorithm="fricas")
```

```
[Out] 1/2*(a*x^2*log(a*x^2 + b) - 2*a*x^2*log(x) - b)/(b^2*x^2)
```

Sympy [A] time = 1.57859, size = 31, normalized size = 0.89

$$-\frac{a\log\left(x\right)}{b^2}+\frac{a\log\left(x^2+\frac{b}{a}\right)}{2b^2}-\frac{1}{2bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)/x**5,x)
```

```
[Out] -a*log(x)/b**2 + a*log(x**2 + b/a)/(2*b**2) - 1/(2*b*x**2)
```

GIAC/XCAS [A] time = 0.225572, size = 58, normalized size = 1.66

$$-\frac{a\ln\left(x^2\right)}{2\,b^2}+\frac{a\ln\left(\left|ax^2+b\right|\right)}{2\,b^2}+\frac{ax^2-b}{2\,b^2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)*x^5),x, algorithm="giac")
```

```
[Out] -1/2*a*ln(x^2)/b^2 + 1/2*a*ln(abs(a*x^2 + b))/b^2 + 1/2*(a*x^2 -
b)/(b^2*x^2)
```

3.1853 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)x^6}\,dx$

Optimal. Leaf size=43

$$\frac{a^{3/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{b^{5/2}}+\frac{a}{b^2x}-\frac{1}{3bx^3}$$

```
[Out] -1/(3*b*x^3) + a/(b^2*x) + (a^(3/2)*ArcTan[(Sqrt[a]*x)/Sqrt[b]])/
b^(5/2)
```

Rubi [A] time = 0.0637973, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{a^{3/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{b^{5/2}}+\frac{a}{b^2x}-\frac{1}{3bx^3}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b/x^2)*x^6),x]
```

```
[Out] -1/(3*b*x^3) + a/(b^2*x) + (a^(3/2)*ArcTan[(Sqrt[a]*x)/Sqrt[b]])/
b^(5/2)
```

Rubi in Sympy [A] time = 11.1869, size = 37, normalized size = 0.86

$$\frac{a^{\frac{3}{2}}\operatorname{atan}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{b^{\frac{5}{2}}}+\frac{a}{b^2x}-\frac{1}{3bx^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b/x**2)/x**6,x)
```

```
[Out] a**(3/2)*atan(sqrt(a)*x/sqrt(b))/b**(5/2) + a/(b**2*x) - 1/(3*b*x
**3)
```

Mathematica [A] time = 0.0382578, size = 43, normalized size = 1.

$$\frac{a^{3/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{b^{5/2}}+\frac{a}{b^2x}-\frac{1}{3bx^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b/x^2)*x^6),x]
```

```
[Out] -1/(3*b*x^3) + a/(b^2*x) + (a^(3/2)*ArcTan[(Sqrt[a]*x)/Sqrt[b]])/
b^(5/2)
```

Maple [A] time = 0.005, size = 39, normalized size = 0.9

$$-\frac{1}{3\,bx^3}+\frac{a}{b^2x}+\frac{a^2}{b^2}\arctan\left(ax\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)/x^6,x)
```

```
[Out] -1/3/b/x^3+a/b^2/x+a^2/b^2/(a*b)^(1/2)*arctan(a*x/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)*x^6),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.238518, size = 1, normalized size = 0.02

$$\left[\frac{3\,ax^3\sqrt{-\frac{a}{b}}\log\left(\frac{ax^2+2\,bx\sqrt{-\frac{a}{b}}-b}{ax^2+b}\right)+6\,ax^2-2\,b}{6\,b^2x^3},\ \frac{3\,ax^3\sqrt{\frac{a}{b}}\arctan\left(\frac{ax}{b\sqrt{\frac{a}{b}}}\right)+3\,ax^2-b}{3\,b^2x^3}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)*x^6),x, algorithm="fricas")
```

```
[Out] [1/6*(3*a*x^3*sqrt(-a/b)*log((a*x^2 + 2*b*x*sqrt(-a/b) - b)/(a*x^
2 + b)) + 6*a*x^2 - 2*b)/(b^2*x^3), 1/3*(3*a*x^3*sqrt(a/b)*arctan
(a*x/(b*sqrt(a/b))) + 3*a*x^2 - b)/(b^2*x^3)]
```

Sympy [A] time = 1.48079, size = 87, normalized size = 2.02

$$-\frac{\sqrt{-\frac{a^3}{b^5}}\log\left(x-\frac{b^3\sqrt{-\frac{a^3}{b^5}}}{a^2}\right)}{2}+\frac{\sqrt{-\frac{a^3}{b^5}}\log\left(x+\frac{b^3\sqrt{-\frac{a^3}{b^5}}}{a^2}\right)}{2}+\frac{3ax^2-b}{3b^2x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)/x**6,x)
```

```
[Out] -sqrt(-a**3/b**5)*log(x - b**3*sqrt(-a**3/b**5)/a**2)/2 + sqrt(-a
**3/b**5)*log(x + b**3*sqrt(-a**3/b**5)/a**2)/2 + (3*a*x**2 - b)/
(3*b**2*x**3)
```

GIAC/XCAS [A] time = 0.227875, size = 54, normalized size = 1.26

$$\frac{a^2\arctan\left(\frac{ax}{\sqrt{ab}}\right)}{\sqrt{ab}b^2}+\frac{3\,ax^2-b}{3\,b^2x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)*x^6),x, algorithm="giac")
```

```
[Out] a^2*arctan(a*x/sqrt(a*b))/(sqrt(a*b)*b^2) + 1/3*(3*a*x^2 - b)/(b^
2*x^3)
```

3.1854 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)x^7}\,dx$

Optimal. Leaf size=49

$$-\frac{a^2\log\left(ax^2+b\right)}{2b^3}+\frac{a^2\log(x)}{b^3}+\frac{a}{2b^2x^2}-\frac{1}{4bx^4}$$

```
[Out] -1/(4*b*x^4) + a/(2*b^2*x^2) + (a^2*Log[x])/b^3 - (a^2*Log[b + a*
x^2])/(2*b^3)
```

Rubi [A] time = 0.0841565, antiderivative size = 49, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{a^2\log\left(ax^2+b\right)}{2b^3}+\frac{a^2\log(x)}{b^3}+\frac{a}{2b^2x^2}-\frac{1}{4bx^4}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)*x^7),x]
```

```
[Out] -1/(4*b*x^4) + a/(2*b^2*x^2) + (a^2*Log[x])/b^3 - (a^2*Log[b + a*
x^2])/(2*b^3)
```

Rubi in Sympy [A] time = 12.3505, size = 48, normalized size = 0.98

$$\frac{a^2\log\left(x^2\right)}{2b^3}-\frac{a^2\log\left(ax^2+b\right)}{2b^3}+\frac{a}{2b^2x^2}-\frac{1}{4bx^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)/x**7,x)
```

```
[Out] a**2*log(x**2)/(2*b**3) - a**2*log(a*x**2 + b)/(2*b**3) + a/(2*b*
*2*x**2) - 1/(4*b*x**4)
```

Mathematica [A] time = 0.0125104, size = 49, normalized size = 1.

$$-\frac{a^2\log\left(ax^2+b\right)}{2b^3}+\frac{a^2\log(x)}{b^3}+\frac{a}{2b^2x^2}-\frac{1}{4bx^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)*x^7),x]
```

```
[Out] -1/(4*b*x^4) + a/(2*b^2*x^2) + (a^2*Log[x])/b^3 - (a^2*Log[b + a*
x^2])/(2*b^3)
```

Maple [A] time = 0.009, size = 44, normalized size = 0.9

$$-\frac{1}{4\,bx^4}+\frac{a}{2\,b^2x^2}+\frac{a^2\ln(x)}{b^3}-\frac{a^2\ln\left(ax^2+b\right)}{2\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)/x^7,x)
```

```
[Out] -1/4/b/x^4+1/2*a/b^2/x^2+a^2*ln(x)/b^3-1/2*a^2*ln(a*x^2+b)/b^3
```

Maxima [A] time = 1.43549, size = 63, normalized size = 1.29

$$-\frac{a^2 \log\left(ax^2+b\right)}{2\,b^3}+\frac{a^2 \log\left(x^2\right)}{2\,b^3}+\frac{2\,ax^2-b}{4\,b^2x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)*x^7),x, algorithm="maxima")
```

```
[Out] -1/2*a^2*log(a*x^2 + b)/b^3 + 1/2*a^2*log(x^2)/b^3 + 1/4*(2*a*x^2
 - b)/(b^2*x^4)
```

Fricas [A] time = 0.230024, size = 61, normalized size = 1.24

$$-\frac{2\,a^2x^4 \log\left(ax^2+b\right)-4\,a^2x^4 \log\left(x\right)-2\,abx^2+b^2}{4\,b^3x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)*x^7),x, algorithm="fricas")
```

```
[Out] -1/4*(2*a^2*x^4*log(a*x^2 + b) - 4*a^2*x^4*log(x) - 2*a*b*x^2 + b
^2)/(b^3*x^4)
```

Sympy [A] time = 1.86721, size = 42, normalized size = 0.86

$$\frac{a^2 \log\left(x\right)}{b^3}-\frac{a^2 \log\left(x^2+\frac{b}{a}\right)}{2b^3}+\frac{2ax^2-b}{4b^2x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)/x**7,x)
```

```
[Out] a**2*log(x)/b**3 - a**2*log(x**2 + b/a)/(2*b**3) + (2*a*x**2 - b)
/(4*b**2*x**4)
```

GIAC/XCAS [A] time = 0.222999, size = 77, normalized size = 1.57

$$\frac{a^2 \ln\left(x^2\right)}{2\,b^3}-\frac{a^2 \ln\left(\left|ax^2+b\right|\right)}{2\,b^3}-\frac{3\,a^2x^4-2\,abx^2+b^2}{4\,b^3x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)*x^7),x, algorithm="giac")
```

```
[Out] 1/2*a^2*ln(x^2)/b^3 - 1/2*a^2*ln(abs(a*x^2 + b))/b^3 - 1/4*(3*a^2
*x^4 - 2*a*b*x^2 + b^2)/(b^3*x^4)
```

3.1855 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)x^8}\,dx$

Optimal. Leaf size=58

$$-\frac{a^{5/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{b^{7/2}}-\frac{a^2}{b^3x}+\frac{a}{3b^2x^3}-\frac{1}{5bx^5}$$

```
[Out] -1/(5*b*x^5) + a/(3*b^2*x^3) - a^2/(b^3*x) - (a^(5/2)*ArcTan[(Sqr
t[a]*x)/Sqrt[b]])/b^(7/2)
```

Rubi [A] time = 0.0835069, antiderivative size = 58, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{a^{5/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{b^{7/2}}-\frac{a^2}{b^3x}+\frac{a}{3b^2x^3}-\frac{1}{5bx^5}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)*x^8),x]
```

```
[Out] -1/(5*b*x^5) + a/(3*b^2*x^3) - a^2/(b^3*x) - (a^(5/2)*ArcTan[(Sqr
t[a]*x)/Sqrt[b]])/b^(7/2)
```

Rubi in Sympy [A] time = 15.4592, size = 49, normalized size = 0.84

$$-\frac{a^{\frac{5}{2}}\operatorname{atan}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{b^{\frac{7}{2}}}-\frac{a^2}{b^3x}+\frac{a}{3b^2x^3}-\frac{1}{5bx^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)/x**8,x)
```

```
[Out] -a**(5/2)*atan(sqrt(a)*x/sqrt(b))/b**(7/2) - a**2/(b**3*x) + a/(3
*b**2*x**3) - 1/(5*b*x**5)
```

Mathematica [A] time = 0.0500393, size = 58, normalized size = 1.

$$-\frac{a^{5/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{b^{7/2}}-\frac{a^2}{b^3x}+\frac{a}{3b^2x^3}-\frac{1}{5bx^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)*x^8),x]
```

```
[Out] -1/(5*b*x^5) + a/(3*b^2*x^3) - a^2/(b^3*x) - (a^(5/2)*ArcTan[(Sqr
t[a]*x)/Sqrt[b]])/b^(7/2)
```

Maple [A] time = 0.006, size = 52, normalized size = 0.9

$$-\frac{1}{5\,bx^5}-\frac{a^2}{b^3x}+\frac{a}{3\,b^2x^3}-\frac{a^3}{b^3}\arctan\left(ax\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/(a+b/x^2)/x^8,x)
```

```
[Out] -1/5/b/x^5-a^2/b^3/x+1/3*a/b^2/x^3-a^3/b^3/(a*b)^(1/2)*arctan(a*x
/(a*b)^(1/2))
```

Maxima [F]   time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x^2)*x^8),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A]   time = 0.229053, size = 1, normalized size = 0.02

$$\left[\frac{15\,a^2x^5\sqrt{-\frac{a}{b}}\log\left(\frac{ax^2-2\,bx\sqrt{-\frac{a}{b}}-b}{ax^2+b}\right)-30\,a^2x^4+10\,abx^2-6\,b^2}{30\,b^3x^5},\ -\frac{15\,a^2x^5\sqrt{\frac{a}{b}}\arctan\left(\frac{ax}{b\sqrt{\frac{a}{b}}}\right)+15\,a^2x^4-5\,abx^2+3\,b^2}{15\,b^3x^5}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x^2)*x^8),x, algorithm="fricas")
```

```
[Out] [1/30*(15*a^2*x^5*sqrt(-a/b)*log((a*x^2 - 2*b*x*sqrt(-a/b) - b)/(
a*x^2 + b)) - 30*a^2*x^4 + 10*a*b*x^2 - 6*b^2)/(b^3*x^5), -1/15*(
15*a^2*x^5*sqrt(a/b)*arctan(a*x/(b*sqrt(a/b))) + 15*a^2*x^4 - 5*a
*b*x^2 + 3*b^2)/(b^3*x^5)]
```

Sympy [A]   time = 1.79658, size = 100, normalized size = 1.72

$$\frac{\sqrt{-\frac{a^5}{b^7}}\log\left(x-\frac{b^4\sqrt{-\frac{a^5}{b^7}}}{a^3}\right)}{2}-\frac{\sqrt{-\frac{a^5}{b^7}}\log\left(x+\frac{b^4\sqrt{-\frac{a^5}{b^7}}}{a^3}\right)}{2}-\frac{15a^2x^4-5abx^2+3b^2}{15b^3x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(a+b/x**2)/x**8,x)
```

```
[Out] sqrt(-a**5/b**7)*log(x - b**4*sqrt(-a**5/b**7)/a**3)/2 - sqrt(-a*
*5/b**7)*log(x + b**4*sqrt(-a**5/b**7)/a**3)/2 - (15*a**2*x**4 -
5*a*b*x**2 + 3*b**2)/(15*b**3*x**5)
```

GIAC/XCAS [A] time = 0.225045, size = 70, normalized size = 1.21

$$-\frac{a^{3}\arctan\left(\frac{ax}{\sqrt{ab}}\right)}{\sqrt{ab}b^{3}}-\frac{15\,a^{2}x^{4}-5\,abx^{2}+3\,b^{2}}{15\,b^{3}x^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)*x^8),x, algorithm="giac")
```

```
[Out] -a^3*arctan(a*x/sqrt(a*b))/(sqrt(a*b)*b^3) - 1/15*(15*a^2*x^4 - 5
*a*b*x^2 + 3*b^2)/(b^3*x^5)
```

3.1856 $\int \frac{x^6}{\left(a+\frac{b}{x^2}\right)^2} dx$

Optimal. Leaf size=92

$$\frac{9b^{7/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2a^{11/2}} - \frac{9b^3x}{2a^5} + \frac{3b^2x^3}{2a^4} - \frac{9bx^5}{10a^3} + \frac{9x^7}{14a^2} - \frac{x^9}{2a(ax^2+b)}$$

```
[Out] (-9*b^3*x)/(2*a^5) + (3*b^2*x^3)/(2*a^4) - (9*b*x^5)/(10*a^3) + (
9*x^7)/(14*a^2) - x^9/(2*a*(b + a*x^2)) + (9*b^(7/2)*ArcTan[(Sqrt
[a]*x)/Sqrt[b]])/(2*a^(11/2))
```

Rubi [A] time = 0.110552, antiderivative size = 92, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$

$$\frac{9b^{7/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2a^{11/2}} - \frac{9b^3x}{2a^5} + \frac{3b^2x^3}{2a^4} - \frac{9bx^5}{10a^3} + \frac{9x^7}{14a^2} - \frac{x^9}{2a(ax^2+b)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/(a + b/x^2)^2,x]
```

```
[Out] (-9*b^3*x)/(2*a^5) + (3*b^2*x^3)/(2*a^4) - (9*b*x^5)/(10*a^3) + (
9*x^7)/(14*a^2) - x^9/(2*a*(b + a*x^2)) + (9*b^(7/2)*ArcTan[(Sqrt
[a]*x)/Sqrt[b]])/(2*a^(11/2))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{9b^3\int \frac{1}{a^4}\,dx}{2a} - \frac{x^9}{2a(ax^2+b)} + \frac{9x^7}{14a^2} - \frac{9bx^5}{10a^3} + \frac{3b^2x^3}{2a^4} + \frac{9b^{\frac{7}{2}}\operatorname{atan}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2a^{\frac{11}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(a+b/x**2)**2,x)
```

```
[Out] -9*b**3*Integral(a**(-4), x)/(2*a) - x**9/(2*a*(a*x**2 + b)) + 9*
x**7/(14*a**2) - 9*b*x**5/(10*a**3) + 3*b**2*x**3/(2*a**4) + 9*b*
*(7/2)*atan(sqrt(a)*x/sqrt(b))/(2*a**(11/2))
```

Mathematica [A] time = 0.102102, size = 82, normalized size = 0.89

$$\frac{9b^{7/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2a^{11/2}} + \frac{x\left(10a^3x^6 - 28a^2bx^4 - \frac{35b^4}{ax^2+b} + 70ab^2x^2 - 280b^3\right)}{70a^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^6/(a + b/x^2)^2,x]
```

```
[Out] (x*(-280*b^3 + 70*a*b^2*x^2 - 28*a^2*b*x^4 + 10*a^3*x^6 - (35*b^4
)/(b + a*x^2)))/(70*a^5) + (9*b^(7/2)*ArcTan[(Sqrt[a]*x)/Sqrt[b]]
)/(2*a^(11/2))
```

Maple [A] time = 0.007, size = 78, normalized size = 0.9

$$\frac{x^7}{7\,a^2}-\frac{2\,b x^5}{5\,a^3}+\frac{b^2x^3}{a^4}-4\,\frac{b^3x}{a^5}-\frac{b^4x}{2\,a^5\,(ax^2+b)}+\frac{9\,b^4}{2\,a^5}\arctan\left(ax\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(a+b/x^2)^2,x)
```

```
[Out] 1/7*x^7/a^2-2/5*b*x^5/a^3+b^2*x^3/a^4-4*b^3*x/a^5-1/2/a^5*b^4*x/(
a*x^2+b)+9/2/a^5*b^4/(a*b)^(1/2)*arctan(a*x/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(a + b/x^2)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.239665, size = 1, normalized size = 0.01

$$\left[\frac{20\,a^4x^9-36\,a^3bx^7+84\,a^2b^2x^5-420\,ab^3x^3-630\,b^4x+315\,\left(ab^3x^2+b^4\right)\sqrt{-\frac{b}{a}}\log\left(\frac{ax^2+2\,ax\sqrt{-\frac{b}{a}}-b}{ax^2+b}\right)}{140\,(a^6x^2+a^5b)},\ \frac{10\,a^4x^9-18\,a^3bx^7+\cdots}{\cdots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(a + b/x^2)^2,x, algorithm="fricas")
```

```
[Out] [1/140*(20*a^4*x^9 - 36*a^3*b*x^7 + 84*a^2*b^2*x^5 - 420*a*b^3*x^
3 - 630*b^4*x + 315*(a*b^3*x^2 + b^4)*sqrt(-b/a)*log((a*x^2 + 2*a
*x*sqrt(-b/a) - b)/(a*x^2 + b)))/(a^6*x^2 + a^5*b), 1/70*(10*a^4*
x^9 - 18*a^3*b*x^7 + 42*a^2*b^2*x^5 - 210*a*b^3*x^3 - 315*b^4*x +
 315*(a*b^3*x^2 + b^4)*sqrt(b/a)*arctan(x/sqrt(b/a)))/(a^6*x^2 +
a^5*b)]
```

Sympy [A] time = 1.83235, size = 134, normalized size = 1.46

$$-\frac{b^4x}{2a^6x^2+2a^5b}-\frac{9\sqrt{-\frac{b^7}{a^{11}}}\log\left(-\frac{a^5\sqrt{-\frac{b^7}{a^{11}}}}{b^3}+x\right)}{4}+\frac{9\sqrt{-\frac{b^7}{a^{11}}}\log\left(\frac{a^5\sqrt{-\frac{b^7}{a^{11}}}}{b^3}+x\right)}{4}+\frac{x^7}{7a^2}-\frac{2bx^5}{5a^3}+\frac{b^2x^3}{a^4}-\frac{4b^3x}{a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(a+b/x**2)**2,x)
```

```
[Out] -b**4*x/(2*a**6*x**2 + 2*a**5*b) - 9*sqrt(-b**7/a**11)*log(-a**5*
sqrt(-b**7/a**11)/b**3 + x)/4 + 9*sqrt(-b**7/a**11)*log(a**5*sqrt
(-b**7/a**11)/b**3 + x)/4 + x**7/(7*a**2) - 2*b*x**5/(5*a**3) + b
**2*x**3/a**4 - 4*b**3*x/a**5
```

GIAC/XCAS [A] time = 0.226671, size = 113, normalized size = 1.23

$$\frac{9\,b^4\arctan\left(\frac{ax}{\sqrt{ab}}\right)}{2\,\sqrt{ab}a^5}-\frac{b^4x}{2\,(ax^2+b)a^5}+\frac{5\,a^{12}x^7-14\,a^{11}bx^5+35\,a^{10}b^2x^3-140\,a^9b^3x}{35\,a^{14}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(a + b/x^2)^2,x, algorithm="giac")
```

```
[Out] 9/2*b^4*arctan(a*x/sqrt(a*b))/(sqrt(a*b)*a^5) - 1/2*b^4*x/((a*x^2
 + b)*a^5) + 1/35*(5*a^12*x^7 - 14*a^11*b*x^5 + 35*a^10*b^2*x^3 -
 140*a^9*b^3*x)/a^14
```

3.1857 $\int \frac{x^5}{\left(a+\frac{b}{x^2}\right)^2} dx$

Optimal. Leaf size=70

$$-\frac{b^4}{2a^5(ax^2+b)}-\frac{2b^3\log(ax^2+b)}{a^5}+\frac{3b^2x^2}{2a^4}-\frac{bx^4}{2a^3}+\frac{x^6}{6a^2}$$

```
[Out] (3*b^2*x^2)/(2*a^4) - (b*x^4)/(2*a^3) + x^6/(6*a^2) - b^4/(2*a^5*
(b + a*x^2)) - (2*b^3*Log[b + a*x^2])/a^5
```

Rubi [A] time = 0.140501, antiderivative size = 70, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{b^4}{2a^5(ax^2+b)}-\frac{2b^3\log(ax^2+b)}{a^5}+\frac{3b^2x^2}{2a^4}-\frac{bx^4}{2a^3}+\frac{x^6}{6a^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/(a + b/x^2)^2,x]
```

```
[Out] (3*b^2*x^2)/(2*a^4) - (b*x^4)/(2*a^3) + x^6/(6*a^2) - b^4/(2*a^5*
(b + a*x^2)) - (2*b^3*Log[b + a*x^2])/a^5
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{x^6}{6a^2}-\frac{b\int^{x^2} x\,dx}{a^3}+\frac{3b^2x^2}{2a^4}-\frac{b^4}{2a^5(ax^2+b)}-\frac{2b^3\log(ax^2+b)}{a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(a+b/x**2)**2,x)
```

```
[Out] x**6/(6*a**2) - b*Integral(x, (x, x**2))/a**3 + 3*b**2*x**2/(2*a*
*4) - b**4/(2*a**5*(a*x**2 + b)) - 2*b**3*log(a*x**2 + b)/a**5
```

Mathematica [A] time = 0.0382696, size = 60, normalized size = 0.86

$$\frac{a^3x^6-3a^2bx^4-\frac{3b^4}{ax^2+b}-12b^3\log(ax^2+b)+9ab^2x^2}{6a^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/(a + b/x^2)^2,x]
```

```
[Out] (9*a*b^2*x^2 - 3*a^2*b*x^4 + a^3*x^6 - (3*b^4)/(b + a*x^2) - 12*b
^3*Log[b + a*x^2])/(6*a^5)
```

Maple [A] time = 0.014, size = 63, normalized size = 0.9

$$\frac{3\,b^2x^2}{2\,a^4}-\frac{bx^4}{2\,a^3}+\frac{x^6}{6\,a^2}-\frac{b^4}{2\,a^5(ax^2+b)}-2\,\frac{b^3\ln(ax^2+b)}{a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(a+b/x^2)^2,x)
```

```
[Out] 3/2*b^2*x^2/a^4-1/2*b*x^4/a^3+1/6*x^6/a^2-1/2*b^4/a^5/(a*x^2+b)-2
*b^3*ln(a*x^2+b)/a^5
```

Maxima [A] time = 1.44029, size = 88, normalized size = 1.26

$$-\frac{b^4}{2\,(a^6x^2+a^5b)}-\frac{2\,b^3\log\left(ax^2+b\right)}{a^5}+\frac{a^2x^6-3\,abx^4+9\,b^2x^2}{6\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(a + b/x^2)^2,x, algorithm="maxima")
```

```
[Out] -1/2*b^4/(a^6*x^2 + a^5*b) - 2*b^3*log(a*x^2 + b)/a^5 + 1/6*(a^2*
x^6 - 3*a*b*x^4 + 9*b^2*x^2)/a^4
```

Fricas [A] time = 0.223944, size = 109, normalized size = 1.56

$$\frac{a^4x^8-2\,a^3bx^6+6\,a^2b^2x^4+9\,ab^3x^2-3\,b^4-12\,\left(ab^3x^2+b^4\right)\log\left(ax^2+b\right)}{6\,(a^6x^2+a^5b)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(a + b/x^2)^2,x, algorithm="fricas")
```

```
[Out] 1/6*(a^4*x^8 - 2*a^3*b*x^6 + 6*a^2*b^2*x^4 + 9*a*b^3*x^2 - 3*b^4
- 12*(a*b^3*x^2 + b^4)*log(a*x^2 + b))/(a^6*x^2 + a^5*b)
```

Sympy [A] time = 1.6935, size = 66, normalized size = 0.94

$$-\frac{b^4}{2a^6x^2+2a^5b}+\frac{x^6}{6a^2}-\frac{bx^4}{2a^3}+\frac{3b^2x^2}{2a^4}-\frac{2b^3\log\left(ax^2+b\right)}{a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(a+b/x**2)**2,x)
```

```
[Out] -b**4/(2*a**6*x**2 + 2*a**5*b) + x**6/(6*a**2) - b*x**4/(2*a**3)
+ 3*b**2*x**2/(2*a**4) - 2*b**3*log(a*x**2 + b)/a**5
```

GIAC/XCAS [A] time = 0.21858, size = 108, normalized size = 1.54

$$-\frac{2\,b^3\ln\left(\left|ax^2+b\right|\right)}{a^5}+\frac{a^4x^6-3\,a^3bx^4+9\,a^2b^2x^2}{6\,a^6}+\frac{4\,ab^3x^2+3\,b^4}{2\,(ax^2+b)a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(a + b/x^2)^2,x, algorithm="giac")
```

```
[Out] -2*b^3*ln(abs(a*x^2 + b))/a^5 + 1/6*(a^4*x^6 - 3*a^3*b*x^4 + 9*a^
2*b^2*x^2)/a^6 + 1/2*(4*a*b^3*x^2 + 3*b^4)/((a*x^2 + b)*a^5)
```

3.1858 $\int \frac{x^4}{\left(a+\frac{b}{x^2}\right)^2} dx$

Optimal. Leaf size=79

$$-\frac{7b^{5/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2a^{9/2}}+\frac{7b^2x}{2a^4}-\frac{7bx^3}{6a^3}+\frac{7x^5}{10a^2}-\frac{x^7}{2a\left(ax^2+b\right)}$$

```
[Out] (7*b^2*x)/(2*a^4) - (7*b*x^3)/(6*a^3) + (7*x^5)/(10*a^2) - x^7/(2
*a*(b + a*x^2)) - (7*b^(5/2)*ArcTan[(Sqrt[a]*x)/Sqrt[b]])/(2*a^(9
/2))
```

Rubi [A] time = 0.0995307, antiderivative size = 79, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$-\frac{7b^{5/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2a^{9/2}}+\frac{7b^2x}{2a^4}-\frac{7bx^3}{6a^3}+\frac{7x^5}{10a^2}-\frac{x^7}{2a\left(ax^2+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a + b/x^2)^2,x]
```

```
[Out] (7*b^2*x)/(2*a^4) - (7*b*x^3)/(6*a^3) + (7*x^5)/(10*a^2) - x^7/(2
*a*(b + a*x^2)) - (7*b^(5/2)*ArcTan[(Sqrt[a]*x)/Sqrt[b]])/(2*a^(9
/2))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{7b^2\int \frac{1}{a^3}\,dx}{2a}-\frac{x^7}{2a\left(ax^2+b\right)}+\frac{7x^5}{10a^2}-\frac{7bx^3}{6a^3}-\frac{7b^{\frac{5}{2}}\operatorname{atan}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2a^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(a+b/x**2)**2,x)
```

```
[Out] 7*b**2*Integral(a**(-3), x)/(2*a) - x**7/(2*a*(a*x**2 + b)) + 7*x
**5/(10*a**2) - 7*b*x**3/(6*a**3) - 7*b**(5/2)*atan(sqrt(a)*x/sqr
t(b))/(2*a**(9/2))
```

Mathematica [A] time = 0.11083, size = 71, normalized size = 0.9

$$\frac{x\left(6a^2x^4+\frac{15b^3}{ax^2+b}-20abx^2+90b^2\right)}{30a^4}-\frac{7b^{5/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2a^{9/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(a + b/x^2)^2,x]
```

```
[Out] (x*(90*b^2 - 20*a*b*x^2 + 6*a^2*x^4 + (15*b^3)/(b + a*x^2)))/(30*
a^4) - (7*b^(5/2)*ArcTan[(Sqrt[a]*x)/Sqrt[b]])/(2*a^(9/2))
```

Maple [A] time = 0.007, size = 68, normalized size = 0.9

$$\frac{x^5}{5a^2} - \frac{2bx^3}{3a^3} + 3\frac{b^2x}{a^4} + \frac{b^3x}{2a^4(ax^2+b)} - \frac{7b^3}{2a^4}\arctan\left(ax\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(a+b/x^2)^2,x)
```

```
[Out] 1/5*x^5/a^2-2/3*b*x^3/a^3+3*b^2*x/a^4+1/2/a^4*b^3*x/(a*x^2+b)-7/2
/a^4*b^3/(a*b)^(1/2)*arctan(a*x/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(a + b/x^2)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.235178, size = 1, normalized size = 0.01

$$\left[\frac{12a^3x^7 - 28a^2bx^5 + 140ab^2x^3 + 210b^3x + 105(ab^2x^2 + b^3)\sqrt{-\frac{b}{a}}\log\left(\frac{ax^2 - 2ax\sqrt{-\frac{b}{a}} - b}{ax^2+b}\right)}{60(a^5x^2 + a^4b)}, \frac{6a^3x^7 - 14a^2bx^5 + 70ab^2x^3 + 1}{30}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(a + b/x^2)^2,x, algorithm="fricas")
```

```
[Out] [1/60*(12*a^3*x^7 - 28*a^2*b*x^5 + 140*a*b^2*x^3 + 210*b^3*x + 10
5*(a*b^2*x^2 + b^3)*sqrt(-b/a)*log((a*x^2 - 2*a*x*sqrt(-b/a) - b)
/(a*x^2 + b)))/(a^5*x^2 + a^4*b), 1/30*(6*a^3*x^7 - 14*a^2*b*x^5
+ 70*a*b^2*x^3 + 105*b^3*x - 105*(a*b^2*x^2 + b^3)*sqrt(b/a)*arct
an(x/sqrt(b/a)))/(a^5*x^2 + a^4*b)]
```

Sympy [A] time = 1.79283, size = 124, normalized size = 1.57

$$\frac{b^3x}{2a^5x^2 + 2a^4b} + \frac{7\sqrt{-\frac{b^5}{a^9}}\log\left(-\frac{a^4\sqrt{-\frac{b^5}{a^9}}}{b^2} + x\right)}{4} - \frac{7\sqrt{-\frac{b^5}{a^9}}\log\left(\frac{a^4\sqrt{-\frac{b^5}{a^9}}}{b^2} + x\right)}{4} + \frac{x^5}{5a^2} - \frac{2bx^3}{3a^3} + \frac{3b^2x}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(a+b/x**2)**2,x)
```

```
[Out] b**3*x/(2*a**5*x**2 + 2*a**4*b) + 7*sqrt(-b**5/a**9)*log(-a**4*sq
rt(-b**5/a**9)/b**2 + x)/4 - 7*sqrt(-b**5/a**9)*log(a**4*sqrt(-b*
*5/a**9)/b**2 + x)/4 + x**5/(5*a**2) - 2*b*x**3/(3*a**3) + 3*b**2
*x/a**4
```

GIAC/XCAS [A] time = 0.219047, size = 99, normalized size = 1.25

$$-\frac{7\,b^{3}\arctan\left(\frac{ax}{\sqrt{ab}}\right)}{2\,\sqrt{ab}a^{4}}+\frac{b^{3}x}{2\,(ax^{2}+b)a^{4}}+\frac{3\,a^{8}x^{5}-10\,a^{7}bx^{3}+45\,a^{6}b^{2}x}{15\,a^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(a + b/x^2)^2,x, algorithm="giac")
```

```
[Out] -7/2*b^3*arctan(a*x/sqrt(a*b))/(sqrt(a*b)*a^4) + 1/2*b^3*x/((a*x^
2 + b)*a^4) + 1/15*(3*a^8*x^5 - 10*a^7*b*x^3 + 45*a^6*b^2*x)/a^10
```

3.1859 $\int \frac{x^3}{\left(a+\frac{b}{x^2}\right)^2} dx$

Optimal. Leaf size=57

$$\frac{b^3}{2a^4(ax^2+b)}+\frac{3b^2\log(ax^2+b)}{2a^4}-\frac{bx^2}{a^3}+\frac{x^4}{4a^2}$$

```
[Out] -((b*x^2)/a^3) + x^4/(4*a^2) + b^3/(2*a^4*(b + a*x^2)) + (3*b^2*L
og[b + a*x^2])/(2*a^4)
```

Rubi [A] time = 0.115351, antiderivative size = 57, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{b^3}{2a^4(ax^2+b)}+\frac{3b^2\log(ax^2+b)}{2a^4}-\frac{bx^2}{a^3}+\frac{x^4}{4a^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(a + b/x^2)^2,x]
```

```
[Out] -((b*x^2)/a^3) + x^4/(4*a^2) + b^3/(2*a^4*(b + a*x^2)) + (3*b^2*L
og[b + a*x^2])/(2*a^4)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int^{x^2} x\,dx}{2a^2}-\frac{bx^2}{a^3}+\frac{b^3}{2a^4(ax^2+b)}+\frac{3b^2\log(ax^2+b)}{2a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(a+b/x**2)**2,x)
```

```
[Out] Integral(x, (x, x**2))/(2*a**2) - b*x**2/a**3 + b**3/(2*a**4*(a*x
**2 + b)) + 3*b**2*log(a*x**2 + b)/(2*a**4)
```

Mathematica [A] time = 0.0299552, size = 49, normalized size = 0.86

$$\frac{a^2x^4+\frac{2b^3}{ax^2+b}+6b^2\log(ax^2+b)-4abx^2}{4a^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(a + b/x^2)^2,x]
```

```
[Out] (-4*a*b*x^2 + a^2*x^4 + (2*b^3)/(b + a*x^2) + 6*b^2*Log[b + a*x^2
])/(4*a^4)
```

Maple [A] time = 0.013, size = 52, normalized size = 0.9

$$-\frac{bx^2}{a^3}+\frac{x^4}{4a^2}+\frac{b^3}{2a^4(ax^2+b)}+\frac{3b^2\ln(ax^2+b)}{2a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(a+b/x^2)^2,x)
```

```
[Out] -b*x^2/a^3+1/4*x^4/a^2+1/2*b^3/a^4/(a*x^2+b)+3/2*b^2*ln(a*x^2+b)/
a^4
```

Maxima [A] time = 1.44641, size = 73, normalized size = 1.28

$$\frac{b^3}{2\,(a^5x^2 + a^4b)} + \frac{3\,b^2\log\left(ax^2 + b\right)}{2\,a^4} + \frac{ax^4 - 4\,bx^2}{4\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(a + b/x^2)^2,x, algorithm="maxima")
```

```
[Out] 1/2*b^3/(a^5*x^2 + a^4*b) + 3/2*b^2*log(a*x^2 + b)/a^4 + 1/4*(a*x
^4 - 4*b*x^2)/a^3
```

Fricas [A] time = 0.229068, size = 95, normalized size = 1.67

$$\frac{a^3x^6 - 3\,a^2bx^4 - 4\,ab^2x^2 + 2\,b^3 + 6\,\left(ab^2x^2 + b^3\right)\log\left(ax^2 + b\right)}{4\,(a^5x^2 + a^4b)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(a + b/x^2)^2,x, algorithm="fricas")
```

```
[Out] 1/4*(a^3*x^6 - 3*a^2*b*x^4 - 4*a*b^2*x^2 + 2*b^3 + 6*(a*b^2*x^2 +
 b^3)*log(a*x^2 + b))/(a^5*x^2 + a^4*b)
```

Sympy [A] time = 1.65252, size = 53, normalized size = 0.93

$$\frac{b^3}{2a^5x^2 + 2a^4b} + \frac{x^4}{4a^2} - \frac{bx^2}{a^3} + \frac{3b^2\log\left(ax^2 + b\right)}{2a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(a+b/x**2)**2,x)
```

```
[Out] b**3/(2*a**5*x**2 + 2*a**4*b) + x**4/(4*a**2) - b*x**2/a**3 + 3*b
**2*log(a*x**2 + b)/(2*a**4)
```

GIAC/XCAS [A] time = 0.234726, size = 74, normalized size = 1.3

$$\frac{3\,b^2\ln\left(\left|ax^2 + b\right|\right)}{2\,a^4} + \frac{b^3}{2\,(ax^2 + b)a^4} + \frac{a^2x^4 - 4\,abx^2}{4\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(a + b/x^2)^2,x, algorithm="giac")
```

```
[Out] 3/2*b^2*ln(abs(a*x^2 + b))/a^4 + 1/2*b^3/((a*x^2 + b)*a^4) + 1/4*
(a^2*x^4 - 4*a*b*x^2)/a^4
```

3.1860 $\int \frac{x^2}{\left(a+\frac{b}{x^2}\right)^2} dx$

Optimal. Leaf size=66

$$\frac{5b^{3/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2a^{7/2}}-\frac{5bx}{2a^3}+\frac{5x^3}{6a^2}-\frac{x^5}{2a\left(ax^2+b\right)}$$

```
[Out] (-5*b*x)/(2*a^3) + (5*x^3)/(6*a^2) - x^5/(2*a*(b + a*x^2)) + (5*b
^(3/2)*ArcTan[(Sqrt[a]*x)/Sqrt[b]])/(2*a^(7/2))
```

Rubi [A] time = 0.0851529, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$

$$\frac{5b^{3/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2a^{7/2}}-\frac{5bx}{2a^3}+\frac{5x^3}{6a^2}-\frac{x^5}{2a\left(ax^2+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b/x^2)^2,x]
```

```
[Out] (-5*b*x)/(2*a^3) + (5*x^3)/(6*a^2) - x^5/(2*a*(b + a*x^2)) + (5*b
^(3/2)*ArcTan[(Sqrt[a]*x)/Sqrt[b]])/(2*a^(7/2))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{x^5}{2a\left(ax^2+b\right)}+\frac{5x^3}{6a^2}-\frac{5\int b\,dx}{2a^3}+\frac{5b^{\frac{3}{2}}\operatorname{atan}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2a^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b/x**2)**2,x)
```

```
[Out] -x**5/(2*a*(a*x**2 + b)) + 5*x**3/(6*a**2) - 5*Integral(b, x)/(2*
a**3) + 5*b**(3/2)*atan(sqrt(a)*x/sqrt(b))/(2*a**(7/2))
```

Mathematica [A] time = 0.0788073, size = 60, normalized size = 0.91

$$\frac{5b^{3/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2a^{7/2}}+\frac{x\left(-\frac{3b^2}{ax^2+b}+2ax^2-12b\right)}{6a^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a + b/x^2)^2,x]
```

```
[Out] (x*(-12*b + 2*a*x^2 - (3*b^2)/(b + a*x^2)))/(6*a^3) + (5*b^(3/2)*
ArcTan[(Sqrt[a]*x)/Sqrt[b]])/(2*a^(7/2))
```

Maple [A] time = 0.006, size = 57, normalized size = 0.9

$$\frac{x^3}{3\,a^2}-2\,\frac{bx}{a^3}-\frac{b^2x}{2\,a^3\left(ax^2+b\right)}+\frac{5\,b^2}{2\,a^3}\arctan\left(ax\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(a+b/x^2)^2,x)
```

```
[Out] 1/3*x^3/a^2-2*b*x/a^3-1/2/a^3*b^2*x/(a*x^2+b)+5/2/a^3*b^2/(a*b)^(
1/2)*arctan(a*x/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x^2)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.230668, size = 1, normalized size = 0.02

$$\left[\frac{4\,a^2x^5-20\,abx^3-30\,b^2x+15\,\left(abx^2+b^2\right)\sqrt{-\frac{b}{a}}\log\left(\frac{ax^2+2\,ax\sqrt{-\frac{b}{a}}-b}{ax^2+b}\right)}{12\,\left(a^4x^2+a^3b\right)},\ \frac{2\,a^2x^5-10\,abx^3-15\,b^2x+15\,\left(abx^2+b^2\right)\sqrt{\frac{b}{a}}\,\mathrm{arc}}{6\,\left(a^4x^2+a^3b\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x^2)^2,x, algorithm="fricas")
```

```
[Out] [1/12*(4*a^2*x^5 - 20*a*b*x^3 - 30*b^2*x + 15*(a*b*x^2 + b^2)*sqr
t(-b/a)*log((a*x^2 + 2*a*x*sqrt(-b/a) - b)/(a*x^2 + b)))/(a^4*x^2
 + a^3*b), 1/6*(2*a^2*x^5 - 10*a*b*x^3 - 15*b^2*x + 15*(a*b*x^2 +
 b^2)*sqrt(b/a)*arctan(x/sqrt(b/a)))/(a^4*x^2 + a^3*b)]
```

Sympy [A] time = 1.72013, size = 107, normalized size = 1.62

$$-\frac{b^2x}{2a^4x^2+2a^3b}-\frac{5\sqrt{-\frac{b^3}{a^7}}\log\left(-\frac{a^3\sqrt{-\frac{b^3}{a^7}}}{b}+x\right)}{4}+\frac{5\sqrt{-\frac{b^3}{a^7}}\log\left(\frac{a^3\sqrt{-\frac{b^3}{a^7}}}{b}+x\right)}{4}+\frac{x^3}{3a^2}-\frac{2bx}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b/x**2)**2,x)
```

```
[Out] -b**2*x/(2*a**4*x**2 + 2*a**3*b) - 5*sqrt(-b**3/a**7)*log(-a**3*s
qrt(-b**3/a**7)/b + x)/4 + 5*sqrt(-b**3/a**7)*log(a**3*sqrt(-b**3
/a**7)/b + x)/4 + x**3/(3*a**2) - 2*b*x/a**3
```

GIAC/XCAS [A] time = 0.219757, size = 82, normalized size = 1.24

$$\frac{5\,b^2\arctan\left(\frac{ax}{\sqrt{ab}}\right)}{2\,\sqrt{ab}a^3}-\frac{b^2x}{2\,(ax^2+b)a^3}+\frac{a^4x^3-6\,a^3bx}{3\,a^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x^2)^2,x, algorithm="giac")
```

```
[Out] 5/2*b^2*arctan(a*x/sqrt(a*b))/(sqrt(a*b)*a^3) - 1/2*b^2*x/((a*x^2
 + b)*a^3) + 1/3*(a^4*x^3 - 6*a^3*b*x)/a^6
```

3.1861 $\int \frac{x}{\left(a+\frac{b}{x^2}\right)^2} dx$

Optimal. Leaf size=44

$$-\frac{b^2}{2a^3(ax^2+b)}-\frac{b\log(ax^2+b)}{a^3}+\frac{x^2}{2a^2}$$

```
[Out] x^2/(2*a^2) - b^2/(2*a^3*(b + a*x^2)) - (b*Log[b + a*x^2])/a^3
```

Rubi [A] time = 0.0867551, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273

$$-\frac{b^2}{2a^3(ax^2+b)}-\frac{b\log(ax^2+b)}{a^3}+\frac{x^2}{2a^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b/x^2)^2,x]
```

```
[Out] x^2/(2*a^2) - b^2/(2*a^3*(b + a*x^2)) - (b*Log[b + a*x^2])/a^3
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int^{x^2}\frac{1}{a^2}\,dx}{2}-\frac{b^2}{2a^3(ax^2+b)}-\frac{b\log(ax^2+b)}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b/x**2)**2,x)
```

```
[Out] Integral(a**(-2), (x, x**2))/2 - b**2/(2*a**3*(a*x**2 + b)) - b*l
og(a*x**2 + b)/a**3
```

Mathematica [A] time = 0.0289089, size = 38, normalized size = 0.86

$$\frac{-\frac{b^2}{ax^2+b}-2b\log(ax^2+b)+ax^2}{2a^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b/x^2)^2,x]
```

```
[Out] (a*x^2 - b^2/(b + a*x^2) - 2*b*Log[b + a*x^2])/(2*a^3)
```

Maple [A] time = 0.013, size = 41, normalized size = 0.9

$$\frac{x^2}{2\,a^2}-\frac{b^2}{2\,a^3(ax^2+b)}-\frac{b\ln(ax^2+b)}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+b/x^2)^2,x)
```

```
[Out] 1/2*x^2/a^2-1/2*b^2/a^3/(a*x^2+b)-b*ln(a*x^2+b)/a^3
```

Maxima [A] time = 1.43775, size = 58, normalized size = 1.32

$$-\frac{b^2}{2\,(a^4x^2+a^3b)}+\frac{x^2}{2\,a^2}-\frac{b\log\left(ax^2+b\right)}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x^2)^2,x, algorithm="maxima")
```

```
[Out] -1/2*b^2/(a^4*x^2 + a^3*b) + 1/2*x^2/a^2 - b*log(a*x^2 + b)/a^3
```

Fricas [A] time = 0.225497, size = 76, normalized size = 1.73

$$\frac{a^2x^4+abx^2-b^2-2\left(abx^2+b^2\right)\log\left(ax^2+b\right)}{2\,(a^4x^2+a^3b)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x^2)^2,x, algorithm="fricas")
```

```
[Out] 1/2*(a^2*x^4 + a*b*x^2 - b^2 - 2*(a*b*x^2 + b^2)*log(a*x^2 + b))/
(a^4*x^2 + a^3*b)
```

Sympy [A] time = 1.54483, size = 39, normalized size = 0.89

$$-\frac{b^2}{2a^4x^2+2a^3b}+\frac{x^2}{2a^2}-\frac{b\log\left(ax^2+b\right)}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b/x**2)**2,x)
```

```
[Out] -b**2/(2*a**4*x**2 + 2*a**3*b) + x**2/(2*a**2) - b*log(a*x**2 + b
)/a**3
```

GIAC/XCAS [A] time = 0.223274, size = 55, normalized size = 1.25

$$\frac{x^2}{2\,a^2}-\frac{b\ln\left(\left|ax^2+b\right|\right)}{a^3}-\frac{b^2}{2\,(ax^2+b)a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x^2)^2,x, algorithm="giac")
```

```
[Out] 1/2*x^2/a^2 - b*ln(abs(a*x^2 + b))/a^3 - 1/2*b^2/((a*x^2 + b)*a^3
)
```

3.1862 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^2} dx$

Optimal. Leaf size=55

$$-\frac{3\sqrt{b}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2a^{5/2}}+\frac{3x}{2a^2}-\frac{x^3}{2a\left(ax^2+b\right)}$$

```
[Out] (3*x)/(2*a^2) - x^3/(2*a*(b + a*x^2)) - (3*Sqrt[b]*ArcTan[(Sqrt[a
]*x)/Sqrt[b]])/(2*a^(5/2))
```

Rubi [A] time = 0.0608883, antiderivative size = 55, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.444

$$-\frac{3\sqrt{b}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2a^{5/2}}+\frac{3x}{2a^2}-\frac{x^3}{2a\left(ax^2+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^(-2),x]
```

```
[Out] (3*x)/(2*a^2) - x^3/(2*a*(b + a*x^2)) - (3*Sqrt[b]*ArcTan[(Sqrt[a
]*x)/Sqrt[b]])/(2*a^(5/2))
```

Rubi in Sympy [A] time = 10.2996, size = 48, normalized size = 0.87

$$-\frac{x^3}{2a\left(ax^2+b\right)}+\frac{3x}{2a^2}-\frac{3\sqrt{b}\,\mathrm{atan}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**2,x)
```

```
[Out] -x**3/(2*a*(a*x**2 + b)) + 3*x/(2*a**2) - 3*sqrt(b)*atan(sqrt(a)*
x/sqrt(b))/(2*a**(5/2))
```

Mathematica [A] time = 0.0577473, size = 51, normalized size = 0.93

$$-\frac{3\sqrt{b}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2a^{5/2}}+\frac{bx}{2a^2\left(ax^2+b\right)}+\frac{x}{a^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^(-2),x]
```

```
[Out] x/a^2 + (b*x)/(2*a^2*(b + a*x^2)) - (3*Sqrt[b]*ArcTan[(Sqrt[a]*x)
/Sqrt[b]])/(2*a^(5/2))
```

Maple [A] time = 0.01, size = 43, normalized size = 0.8

$$\frac{x}{a^2}+\frac{bx}{2\,a^2\left(ax^2+b\right)}-\frac{3\,b}{2\,a^2}\arctan\left(ax\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^2,x)
```

```
[Out] x/a^2+1/2*b/a^2*x/(a*x^2+b)-3/2*b/a^2/(a*b)^(1/2)*arctan(a*x/(a*b
)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(-2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.233937, size = 1, normalized size = 0.02

$$\left[\frac{4\,ax^3 + 3\left(ax^2 + b\right)\sqrt{-\frac{b}{a}}\log\left(\frac{ax^2 - 2\,ax\sqrt{-\frac{b}{a}} - b}{ax^2 + b}\right) + 6\,bx}{4\left(a^3x^2 + a^2b\right)}, \frac{2\,ax^3 - 3\left(ax^2 + b\right)\sqrt{\frac{b}{a}}\arctan\left(\frac{x}{\sqrt{\frac{b}{a}}}\right) + 3\,bx}{2\left(a^3x^2 + a^2b\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(-2),x, algorithm="fricas")
```

```
[Out] [1/4*(4*a*x^3 + 3*(a*x^2 + b)*sqrt(-b/a)*log((a*x^2 - 2*a*x*sqrt(
-b/a) - b)/(a*x^2 + b)) + 6*b*x)/(a^3*x^2 + a^2*b), 1/2*(2*a*x^3
- 3*(a*x^2 + b)*sqrt(b/a)*arctan(x/sqrt(b/a)) + 3*b*x)/(a^3*x^2 +
 a^2*b)]
```

Sympy [A] time = 1.59491, size = 83, normalized size = 1.51

$$\frac{bx}{2a^3x^2 + 2a^2b} + \frac{3\sqrt{-\frac{b}{a^5}}\log\left(-a^2\sqrt{-\frac{b}{a^5}} + x\right)}{4} - \frac{3\sqrt{-\frac{b}{a^5}}\log\left(a^2\sqrt{-\frac{b}{a^5}} + x\right)}{4} + \frac{x}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**2,x)
```

```
[Out] b*x/(2*a**3*x**2 + 2*a**2*b) + 3*sqrt(-b/a**5)*log(-a**2*sqrt(-b/
a**5) + x)/4 - 3*sqrt(-b/a**5)*log(a**2*sqrt(-b/a**5) + x)/4 + x/
a**2
```

GIAC/XCAS [A] time = 0.221431, size = 57, normalized size = 1.04

$$-\frac{3\,b\arctan\left(\frac{ax}{\sqrt{ab}}\right)}{2\,\sqrt{ab}a^2} + \frac{x}{a^2} + \frac{bx}{2\left(ax^2 + b\right)a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(-2),x, algorithm="giac")
```

```
[Out] -3/2*b*arctan(a*x/sqrt(a*b))/(sqrt(a*b)*a^2) + x/a^2 + 1/2*b*x/((
a*x^2 + b)*a^2)
```

3.1863 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^2 x} \, dx$

Optimal. Leaf size=33

$$\frac{b}{2a^2 (ax^2 + b)} + \frac{\log (ax^2 + b)}{2a^2}$$

```
[Out] b/(2*a^2*(b + a*x^2)) + Log[b + a*x^2]/(2*a^2)
```

Rubi [A] time = 0.0681033, antiderivative size = 33, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{b}{2a^2 (ax^2 + b)} + \frac{\log (ax^2 + b)}{2a^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)^2*x),x]
```

```
[Out] b/(2*a^2*(b + a*x^2)) + Log[b + a*x^2]/(2*a^2)
```

Rubi in Sympy [A] time = 9.30753, size = 26, normalized size = 0.79

$$\frac{b}{2a^2 (ax^2 + b)} + \frac{\log (ax^2 + b)}{2a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**2/x,x)
```

```
[Out] b/(2*a**2*(a*x**2 + b)) + log(a*x**2 + b)/(2*a**2)
```

Mathematica [A] time = 0.0146271, size = 27, normalized size = 0.82

$$\frac{\frac{b}{ax^2+b} + \log (ax^2 + b)}{2a^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)^2*x),x]
```

```
[Out] (b/(b + a*x^2) + Log[b + a*x^2])/(2*a^2)
```

Maple [A] time = 0.01, size = 30, normalized size = 0.9

$$\frac{b}{2\,a^2 (ax^2 + b)} + \frac{\ln (ax^2 + b)}{2\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^2/x,x)
```

```
[Out] 1/2*b/a^2/(a*x^2+b)+1/2*ln(a*x^2+b)/a^2
```

Maxima [A] time = 1.44062, size = 43, normalized size = 1.3

$$\frac{b}{2\,(a^3x^2 + a^2b)} + \frac{\log\left(ax^2 + b\right)}{2\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^2*x),x, algorithm="maxima")

[Out] 1/2*b/(a^3*x^2 + a^2*b) + 1/2*log(a*x^2 + b)/a^2
```

Fricas [A] time = 0.230099, size = 47, normalized size = 1.42

$$\frac{\left(ax^2 + b\right)\log\left(ax^2 + b\right) + b}{2\,(a^3x^2 + a^2b)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^2*x),x, algorithm="fricas")

[Out] 1/2*((a*x^2 + b)*log(a*x^2 + b) + b)/(a^3*x^2 + a^2*b)
```

Sympy [A] time = 1.36042, size = 29, normalized size = 0.88

$$\frac{b}{2a^3x^2 + 2a^2b} + \frac{\log\left(ax^2 + b\right)}{2a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**2/x,x)

[Out] b/(2*a**3*x**2 + 2*a**2*b) + log(a*x**2 + b)/(2*a**2)
```

GIAC/XCAS [A] time = 0.224437, size = 43, normalized size = 1.3

$$-\frac{x^2}{2\,(ax^2 + b)a} + \frac{\ln\left(\left|ax^2 + b\right|\right)}{2\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^2*x),x, algorithm="giac")

[Out] -1/2*x^2/((a*x^2 + b)*a) + 1/2*ln(abs(a*x^2 + b))/a^2
```

3.1864 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^2 x^2} dx$

Optimal. Leaf size=45

$$\frac{\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2a^{3/2}\sqrt{b}} - \frac{x}{2a\,(ax^2+b)}$$

```
[Out] -x/(2*a*(b + a*x^2)) + ArcTan[(Sqrt[a]*x)/Sqrt[b]]/(2*a^(3/2)*Sqr
t[b])
```

Rubi [A] time = 0.0505717, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$

$$\frac{\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2a^{3/2}\sqrt{b}} - \frac{x}{2a\,(ax^2+b)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)^2*x^2),x]
```

```
[Out] -x/(2*a*(b + a*x^2)) + ArcTan[(Sqrt[a]*x)/Sqrt[b]]/(2*a^(3/2)*Sqr
t[b])
```

Rubi in Sympy [A] time = 7.60514, size = 36, normalized size = 0.8

$$-\frac{x}{2a\,(ax^2+b)} + \frac{\operatorname{atan}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2a^{\frac{3}{2}}\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**2/x**2,x)
```

```
[Out] -x/(2*a*(a*x**2 + b)) + atan(sqrt(a)*x/sqrt(b))/(2*a**(3/2)*sqrt(
b))
```

Mathematica [A] time = 0.0377234, size = 45, normalized size = 1.

$$\frac{\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2a^{3/2}\sqrt{b}} - \frac{x}{2a\,(ax^2+b)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)^2*x^2),x]
```

```
[Out] -x/(2*a*(b + a*x^2)) + ArcTan[(Sqrt[a]*x)/Sqrt[b]]/(2*a^(3/2)*Sqr
t[b])
```

Maple [A] time = 0.006, size = 36, normalized size = 0.8

$$-\frac{x}{2\,a\,(ax^2+b)} + \frac{1}{2\,a}\arctan\left(ax\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^2/x^2,x)
```

```
[Out] -1/2*x/a/(a*x^2+b)+1/2/a/(a*b)^(1/2)*arctan(a*x/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^2*x^2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.232293, size = 1, normalized size = 0.02

$$\left[\frac{\left(ax^2+b\right)\log\left(\frac{2\,abx+\left(ax^2-b\right)\sqrt{-ab}}{ax^2+b}\right)-2\,\sqrt{-ab}x}{4\,\left(a^2x^2+ab\right)\sqrt{-ab}}, \frac{\left(ax^2+b\right)\arctan\left(\frac{\sqrt{ab}x}{b}\right)-\sqrt{ab}x}{2\,\left(a^2x^2+ab\right)\sqrt{ab}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^2*x^2),x, algorithm="fricas")
```

```
[Out] [1/4*((a*x^2 + b)*log((2*a*b*x + (a*x^2 - b)*sqrt(-a*b))/(a*x^2 +
 b)) - 2*sqrt(-a*b)*x)/((a^2*x^2 + a*b)*sqrt(-a*b)), 1/2*((a*x^2
+ b)*arctan(sqrt(a*b)*x/b) - sqrt(a*b)*x)/((a^2*x^2 + a*b)*sqrt(a
*b))]
```

Sympy [A] time = 1.40102, size = 78, normalized size = 1.73

$$-\frac{x}{2a^2x^2+2ab}-\frac{\sqrt{-\frac{1}{a^3b}}\log\left(-ab\sqrt{-\frac{1}{a^3b}}+x\right)}{4}+\frac{\sqrt{-\frac{1}{a^3b}}\log\left(ab\sqrt{-\frac{1}{a^3b}}+x\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**2/x**2,x)
```

```
[Out] -x/(2*a**2*x**2 + 2*a*b) - sqrt(-1/(a**3*b))*log(-a*b*sqrt(-1/(a*
*3*b)) + x)/4 + sqrt(-1/(a**3*b))*log(a*b*sqrt(-1/(a**3*b)) + x)/
4
```

GIAC/XCAS [A] time = 0.223468, size = 47, normalized size = 1.04

$$\frac{\arctan\left(\frac{ax}{\sqrt{ab}}\right)}{2\,\sqrt{ab}a}-\frac{x}{2\,\left(ax^2+b\right)a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^2*x^2),x, algorithm="giac")
```

```
[Out] 1/2*arctan(a*x/sqrt(a*b))/(sqrt(a*b)*a) - 1/2*x/((a*x^2 + b)*a)
```

3.1865 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^2 x^3} dx$

Optimal. Leaf size=16

$$\frac{1}{2b\left(a+\frac{b}{x^2}\right)}$$

```
[Out] 1/(2*b*(a + b/x^2))
```

Rubi [A] time = 0.0186636, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$\frac{1}{2b\left(a+\frac{b}{x^2}\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)^2*x^3),x]

[Out] 1/(2*b*(a + b/x^2))
```

Rubi in Sympy [A] time = 2.13541, size = 10, normalized size = 0.62

$$\frac{1}{2b\left(a+\frac{b}{x^2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**2/x**3,x)

[Out] 1/(2*b*(a + b/x**2))
```

Mathematica [A] time = 0.00401547, size = 16, normalized size = 1.

$$-\frac{1}{2a\left(ax^2+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)^2*x^3),x]

[Out] -1/(2*a*(b + a*x^2))
```

Maple [A] time = 0., size = 15, normalized size = 0.9

$$-\frac{1}{\left(2\,ax^2+2\,b\right)a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^2/x^3,x)
```

```
[Out] -1/2/(a*x^2+b)/a
```

Maxima [A] time = 1.44247, size = 19, normalized size = 1.19

$$\frac{1}{2\left(a+\frac{b}{x^2}\right)b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((a + b/x^2)^2*x^3),x, algorithm="maxima")
```

```
[Out] 1/2/((a + b/x^2)*b)
```

Fricas [A] time = 0.214873, size = 20, normalized size = 1.25

$$-\frac{1}{2\left(a^2x^2+ab\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((a + b/x^2)^2*x^3),x, algorithm="fricas")
```

```
[Out] -1/2/(a^2*x^2 + a*b)
```

Sympy [A] time = 1.27337, size = 15, normalized size = 0.94

$$-\frac{1}{2a^2x^2+2ab}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b/x**2)**2/x**3,x)
```

```
[Out] -1/(2*a**2*x**2 + 2*a*b)
```

GIAC/XCAS [A] time = 0.220764, size = 19, normalized size = 1.19

$$-\frac{1}{2\left(ax^2+b\right)a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((a + b/x^2)^2*x^3),x, algorithm="giac")
```

```
[Out] -1/2/((a*x^2 + b)*a)
```

3.1866 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^2 x^4} \, dx$

Optimal. Leaf size=45

$$\frac{\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2\sqrt{a}b^{3/2}}+\frac{x}{2b\left(ax^2+b\right)}$$

```
[Out] x/(2*b*(b + a*x^2)) + ArcTan[(Sqrt[a]*x)/Sqrt[b]]/(2*Sqrt[a]*b^(3
/2))
```

Rubi [A] time = 0.0385874, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2\sqrt{a}b^{3/2}}+\frac{x}{2b\left(ax^2+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)^2*x^4),x]
```

```
[Out] x/(2*b*(b + a*x^2)) + ArcTan[(Sqrt[a]*x)/Sqrt[b]]/(2*Sqrt[a]*b^(3
/2))
```

Rubi in Sympy [A] time = 5.24233, size = 36, normalized size = 0.8

$$\frac{x}{2b\left(ax^2+b\right)}+\frac{\operatorname{atan}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2\sqrt{a}b^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**2/x**4,x)
```

```
[Out] x/(2*b*(a*x**2 + b)) + atan(sqrt(a)*x/sqrt(b))/(2*sqrt(a)*b**(3/2
))
```

Mathematica [A] time = 0.0448949, size = 45, normalized size = 1.

$$\frac{\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2\sqrt{a}b^{3/2}}+\frac{x}{2b\left(ax^2+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)^2*x^4),x]
```

```
[Out] x/(2*b*(b + a*x^2)) + ArcTan[(Sqrt[a]*x)/Sqrt[b]]/(2*Sqrt[a]*b^(3
/2))
```

Maple [A] time = 0.004, size = 36, normalized size = 0.8

$$\frac{x}{2\,b\left(ax^2+b\right)}+\frac{1}{2\,b}\arctan\left(ax\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^2/x^4,x)
```

```
[Out] 1/2*x/b/(a*x^2+b)+1/2/b/(a*b)^(1/2)*arctan(a*x/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^2*x^4),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.232135, size = 1, normalized size = 0.02

$$\left[\frac{\left(ax^2+b\right)\log\left(\frac{2\,abx+\left(ax^2-b\right)\sqrt{-ab}}{ax^2+b}\right)+2\,\sqrt{-ab}x}{4\left(abx^2+b^2\right)\sqrt{-ab}},\ \frac{\left(ax^2+b\right)\arctan\left(\frac{\sqrt{ab}x}{b}\right)+\sqrt{ab}x}{2\left(abx^2+b^2\right)\sqrt{ab}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^2*x^4),x, algorithm="fricas")
```

```
[Out] [1/4*((a*x^2 + b)*log((2*a*b*x + (a*x^2 - b)*sqrt(-a*b))/(a*x^2 +
 b)) + 2*sqrt(-a*b)*x)/((a*b*x^2 + b^2)*sqrt(-a*b)), 1/2*((a*x^2
+ b)*arctan(sqrt(a*b)*x/b) + sqrt(a*b)*x)/((a*b*x^2 + b^2)*sqrt(a
*b))]
```

Sympy [A] time = 1.45556, size = 78, normalized size = 1.73

$$\frac{x}{2abx^2+2b^2}-\frac{\sqrt{-\frac{1}{ab^3}}\log\left(-b^2\sqrt{-\frac{1}{ab^3}}+x\right)}{4}+\frac{\sqrt{-\frac{1}{ab^3}}\log\left(b^2\sqrt{-\frac{1}{ab^3}}+x\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**2/x**4,x)
```

```
[Out] x/(2*a*b*x**2 + 2*b**2) - sqrt(-1/(a*b**3))*log(-b**2*sqrt(-1/(a*
b**3)) + x)/4 + sqrt(-1/(a*b**3))*log(b**2*sqrt(-1/(a*b**3)) + x)
/4
```

GIAC/XCAS [A] time = 0.232761, size = 47, normalized size = 1.04

$$\frac{\arctan\left(\frac{ax}{\sqrt{ab}}\right)}{2\sqrt{ab}b}+\frac{x}{2\left(ax^2+b\right)b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^2*x^4),x, algorithm="giac")
```

```
[Out] 1/2*arctan(a*x/sqrt(a*b))/(sqrt(a*b)*b) + 1/2*x/((a*x^2 + b)*b)
```

3.1867 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^2 x^5} dx$

Optimal. Leaf size=38

$$-\frac{\log(ax^2+b)}{2b^2}+\frac{1}{2b(ax^2+b)}+\frac{\log(x)}{b^2}$$

```
[Out] 1/(2*b*(b + a*x^2)) + Log[x]/b^2 - Log[b + a*x^2]/(2*b^2)
```

Rubi [A] time = 0.0757825, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{\log(ax^2+b)}{2b^2}+\frac{1}{2b(ax^2+b)}+\frac{\log(x)}{b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)^2*x^5),x]

[Out] 1/(2*b*(b + a*x^2)) + Log[x]/b^2 - Log[b + a*x^2]/(2*b^2)
```

Rubi in Sympy [A] time = 10.0786, size = 34, normalized size = 0.89

$$\frac{1}{2b(ax^2+b)}+\frac{\log(x^2)}{2b^2}-\frac{\log(ax^2+b)}{2b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**2/x**5,x)

[Out] 1/(2*b*(a*x**2 + b)) + log(x**2)/(2*b**2) - log(a*x**2 + b)/(2*b*
*2)
```

Mathematica [A] time = 0.023608, size = 33, normalized size = 0.87

$$\frac{\frac{b}{ax^2+b}-\log(ax^2+b)+2\log(x)}{2b^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)^2*x^5),x]

[Out] (b/(b + a*x^2) + 2*Log[x] - Log[b + a*x^2])/(2*b^2)
```

Maple [A] time = 0.015, size = 35, normalized size = 0.9

$$\frac{1}{2\,b(ax^2+b)}+\frac{\ln(x)}{b^2}-\frac{\ln(ax^2+b)}{2\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^2/x^5,x)
```

```
[Out] 1/2/b/(a*x^2+b)+ln(x)/b^2-1/2*ln(a*x^2+b)/b^2
```

Maxima [A] time = 1.43685, size = 50, normalized size = 1.32

$$\frac{1}{2\left(abx^2+b^2\right)}-\frac{\log\left(ax^2+b\right)}{2\,b^2}+\frac{\log\left(x^2\right)}{2\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^2*x^5),x, algorithm="maxima")
```

```
[Out] 1/2/(a*b*x^2 + b^2) - 1/2*log(a*x^2 + b)/b^2 + 1/2*log(x^2)/b^2
```

Fricas [A] time = 0.240162, size = 63, normalized size = 1.66

$$-\frac{\left(ax^2+b\right)\log\left(ax^2+b\right)-2\left(ax^2+b\right)\log\left(x\right)-b}{2\left(ab^2x^2+b^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^2*x^5),x, algorithm="fricas")
```

```
[Out] -1/2*((a*x^2 + b)*log(a*x^2 + b) - 2*(a*x^2 + b)*log(x) - b)/(a*b
^2*x^2 + b^3)
```

Sympy [A] time = 1.69092, size = 34, normalized size = 0.89

$$\frac{1}{2abx^2+2b^2}+\frac{\log\left(x\right)}{b^2}-\frac{\log\left(x^2+\frac{b}{a}\right)}{2b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**2/x**5,x)
```

```
[Out] 1/(2*a*b*x**2 + 2*b**2) + log(x)/b**2 - log(x**2 + b/a)/(2*b**2)
```

GIAC/XCAS [A] time = 0.228627, size = 63, normalized size = 1.66

$$\frac{\ln\left(x^2\right)}{2\,b^2}-\frac{\ln\left(\left|ax^2+b\right|\right)}{2\,b^2}+\frac{ax^2+2\,b}{2\left(ax^2+b\right)b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^2*x^5),x, algorithm="giac")
```

```
[Out] 1/2*ln(x^2)/b^2 - 1/2*ln(abs(a*x^2 + b))/b^2 + 1/2*(a*x^2 + 2*b)/
((a*x^2 + b)*b^2)
```

3.1868 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^2 x^6} \, dx$

Optimal. Leaf size=57

$$-\frac{3\sqrt{a}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2b^{5/2}}+\frac{1}{2bx\left(ax^2+b\right)}-\frac{3}{2b^2x}$$

```
[Out] -3/(2*b^2*x) + 1/(2*b*x*(b + a*x^2)) - (3*Sqrt[a]*ArcTan[(Sqrt[a]
*x)/Sqrt[b]])/(2*b^(5/2))
```

Rubi [A] time = 0.0660439, antiderivative size = 57, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$-\frac{3\sqrt{a}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2b^{5/2}}+\frac{1}{2bx\left(ax^2+b\right)}-\frac{3}{2b^2x}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)^2*x^6),x]
```

```
[Out] -3/(2*b^2*x) + 1/(2*b*x*(b + a*x^2)) - (3*Sqrt[a]*ArcTan[(Sqrt[a]
*x)/Sqrt[b]])/(2*b^(5/2))
```

Rubi in Sympy [A] time = 10.9878, size = 48, normalized size = 0.84

$$-\frac{3\sqrt{a}\,\text{atan}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2b^{\frac{5}{2}}}+\frac{1}{2bx\left(ax^2+b\right)}-\frac{3}{2b^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**2/x**6,x)
```

```
[Out] -3*sqrt(a)*atan(sqrt(a)*x/sqrt(b))/(2*b**(5/2)) + 1/(2*b*x*(a*x**
2 + b)) - 3/(2*b**2*x)
```

Mathematica [A] time = 0.0651415, size = 54, normalized size = 0.95

$$-\frac{3\sqrt{a}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2b^{5/2}}-\frac{ax}{2b^2\left(ax^2+b\right)}-\frac{1}{b^2x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)^2*x^6),x]
```

```
[Out] -(1/(b^2*x)) - (a*x)/(2*b^2*(b + a*x^2)) - (3*Sqrt[a]*ArcTan[(Sqr
t[a]*x)/Sqrt[b]])/(2*b^(5/2))
```

Maple [A] time = 0.01, size = 46, normalized size = 0.8

$$-\frac{1}{b^2x}-\frac{ax}{2\,b^2\left(ax^2+b\right)}-\frac{3\,a}{2\,b^2}\arctan\left(ax\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^2/x^6,x)
```

```
[Out] -1/b^2/x-1/2*a/b^2*x/(a*x^2+b)-3/2*a/b^2/(a*b)^(1/2)*arctan(a*x/(
a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^2*x^6),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.233679, size = 1, normalized size = 0.02

$$\left[-\frac{6\,ax^2 - 3\left(ax^3 + bx\right)\sqrt{-\frac{a}{b}}\log\left(\frac{ax^2 - 2\,bx\sqrt{-\frac{a}{b}} - b}{ax^2 + b}\right) + 4\,b}{4\left(ab^2x^3 + b^3x\right)}, -\frac{3\,ax^2 + 3\left(ax^3 + bx\right)\sqrt{\frac{a}{b}}\arctan\left(\frac{ax}{b\sqrt{\frac{a}{b}}}\right) + 2\,b}{2\left(ab^2x^3 + b^3x\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^2*x^6),x, algorithm="fricas")
```

```
[Out] [-1/4*(6*a*x^2 - 3*(a*x^3 + b*x)*sqrt(-a/b)*log((a*x^2 - 2*b*x*sq
rt(-a/b) - b)/(a*x^2 + b)) + 4*b)/(a*b^2*x^3 + b^3*x), -1/2*(3*a*
x^2 + 3*(a*x^3 + b*x)*sqrt(a/b)*arctan(a*x/(b*sqrt(a/b))) + 2*b)/
(a*b^2*x^3 + b^3*x)]
```

Sympy [A] time = 1.75089, size = 90, normalized size = 1.58

$$\frac{3\sqrt{-\frac{a}{b^5}}\log\left(x - \frac{b^3\sqrt{-\frac{a}{b^5}}}{a}\right)}{4} - \frac{3\sqrt{-\frac{a}{b^5}}\log\left(x + \frac{b^3\sqrt{-\frac{a}{b^5}}}{a}\right)}{4} - \frac{3ax^2 + 2b}{2ab^2x^3 + 2b^3x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**2/x**6,x)
```

```
[Out] 3*sqrt(-a/b**5)*log(x - b**3*sqrt(-a/b**5)/a)/4 - 3*sqrt(-a/b**5)
*log(x + b**3*sqrt(-a/b**5)/a)/4 - (3*a*x**2 + 2*b)/(2*a*b**2*x**
3 + 2*b**3*x)
```

GIAC/XCAS [A] time = 0.224528, size = 63, normalized size = 1.11

$$-\frac{3\,a\arctan\left(\frac{ax}{\sqrt{ab}}\right)}{2\,\sqrt{ab}b^2} - \frac{3\,ax^2 + 2\,b}{2\left(ax^3 + bx\right)b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^2*x^6),x, algorithm="giac")
```

```
[Out] -3/2*a*arctan(a*x/sqrt(a*b))/(sqrt(a*b)*b^2) - 1/2*(3*a*x^2 + 2*b
)/((a*x^3 + b*x)*b^2)
```

3.1869 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^2 x^7} dx$

Optimal. Leaf size=49

$$\frac{a \log \left(ax^2+b\right)}{b^3}-\frac{2 a \log (x)}{b^3}-\frac{a}{2 b^2 \left(ax^2+b\right)}-\frac{1}{2 b^2 x^2}$$

```
[Out] -1/(2*b^2*x^2) - a/(2*b^2*(b + a*x^2)) - (2*a*Log[x])/b^3 + (a*Lo
g[b + a*x^2])/b^3
```

Rubi [A] time = 0.0978796, antiderivative size = 49, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{a \log \left(ax^2+b\right)}{b^3}-\frac{2 a \log (x)}{b^3}-\frac{a}{2 b^2 \left(ax^2+b\right)}-\frac{1}{2 b^2 x^2}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b/x^2)^2*x^7),x]
```

```
[Out] -1/(2*b^2*x^2) - a/(2*b^2*(b + a*x^2)) - (2*a*Log[x])/b^3 + (a*Lo
g[b + a*x^2])/b^3
```

Rubi in Sympy [A] time = 12.1503, size = 46, normalized size = 0.94

$$-\frac{a}{2 b^2 \left(ax^2+b\right)}-\frac{a \log \left(x^2\right)}{b^3}+\frac{a \log \left(ax^2+b\right)}{b^3}-\frac{1}{2 b^2 x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b/x**2)**2/x**7,x)
```

```
[Out] -a/(2*b**2*(a*x**2 + b)) - a*log(x**2)/b**3 + a*log(a*x**2 + b)/b
**3 - 1/(2*b**2*x**2)
```

Mathematica [A] time = 0.0633077, size = 41, normalized size = 0.84

$$-\frac{b \left(\frac{a}{ax^2+b}+\frac{1}{x^2}\right)-2 a \log \left(ax^2+b\right)+4 a \log (x)}{2 b^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b/x^2)^2*x^7),x]
```

```
[Out] -(b*(x^(-2) + a/(b + a*x^2)) + 4*a*Log[x] - 2*a*Log[b + a*x^2])/(
2*b^3)
```

Maple [A] time = 0.019, size = 46, normalized size = 0.9

$$-\frac{1}{2 b^2 x^2}-\frac{a}{2 b^2 \left(ax^2+b\right)}-2 \frac{a \ln (x)}{b^3}+\frac{a \ln \left(ax^2+b\right)}{b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^2/x^7,x)
```

```
[Out] -1/2/b^2/x^2-1/2*a/b^2/(a*x^2+b)-2*a*ln(x)/b^3+a*ln(a*x^2+b)/b^3
```

Maxima [A] time = 1.44481, size = 70, normalized size = 1.43

$$-\frac{2\,ax^2+b}{2\,(ab^2x^4+b^3x^2)}+\frac{a\log\left(ax^2+b\right)}{b^3}-\frac{a\log\left(x^2\right)}{b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^2*x^7),x, algorithm="maxima")
```

```
[Out] -1/2*(2*a*x^2 + b)/(a*b^2*x^4 + b^3*x^2) + a*log(a*x^2 + b)/b^3 -
 a*log(x^2)/b^3
```

Fricas [A] time = 0.224445, size = 99, normalized size = 2.02

$$-\frac{2\,abx^2+b^2-2\left(a^2x^4+abx^2\right)\log\left(ax^2+b\right)+4\left(a^2x^4+abx^2\right)\log\left(x\right)}{2\,(ab^3x^4+b^4x^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^2*x^7),x, algorithm="fricas")
```

```
[Out] -1/2*(2*a*b*x^2 + b^2 - 2*(a^2*x^4 + a*b*x^2)*log(a*x^2 + b) + 4*
(a^2*x^4 + a*b*x^2)*log(x))/(a*b^3*x^4 + b^4*x^2)
```

Sympy [A] time = 2.07918, size = 49, normalized size = 1.

$$-\frac{2a\log\left(x\right)}{b^3}+\frac{a\log\left(x^2+\frac{b}{a}\right)}{b^3}-\frac{2ax^2+b}{2ab^2x^4+2b^3x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**2/x**7,x)
```

```
[Out] -2*a*log(x)/b**3 + a*log(x**2 + b/a)/b**3 - (2*a*x**2 + b)/(2*a*b
**2*x**4 + 2*b**3*x**2)
```

GIAC/XCAS [A] time = 0.226984, size = 69, normalized size = 1.41

$$-\frac{a\ln\left(x^2\right)}{b^3}+\frac{a\ln\left(\left|ax^2+b\right|\right)}{b^3}-\frac{2\,ax^2+b}{2\,(ax^4+bx^2)b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^2*x^7),x, algorithm="giac")
```

```
[Out] -a*ln(x^2)/b^3 + a*ln(abs(a*x^2 + b))/b^3 - 1/2*(2*a*x^2 + b)/((a
*x^4 + b*x^2)*b^2)
```

3.1870 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^2 x^8} dx$

Optimal. Leaf size=68

$$\frac{5a^{3/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2b^{7/2}}+\frac{5a}{2b^3x}+\frac{1}{2bx^3(ax^2+b)}-\frac{5}{6b^2x^3}$$

```
[Out] -5/(6*b^2*x^3) + (5*a)/(2*b^3*x) + 1/(2*b*x^3*(b + a*x^2)) + (5*a
^(3/2)*ArcTan[(Sqrt[a]*x)/Sqrt[b]])/(2*b^(7/2))
```

Rubi [A] time = 0.082769, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{5a^{3/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2b^{7/2}}+\frac{5a}{2b^3x}+\frac{1}{2bx^3(ax^2+b)}-\frac{5}{6b^2x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)^2*x^8),x]
```

```
[Out] -5/(6*b^2*x^3) + (5*a)/(2*b^3*x) + 1/(2*b*x^3*(b + a*x^2)) + (5*a
^(3/2)*ArcTan[(Sqrt[a]*x)/Sqrt[b]])/(2*b^(7/2))
```

Rubi in Sympy [A] time = 14.9566, size = 61, normalized size = 0.9

$$\frac{5a^{\frac{3}{2}}\operatorname{atan}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2b^{\frac{7}{2}}}+\frac{5a}{2b^3x}+\frac{1}{2bx^3(ax^2+b)}-\frac{5}{6b^2x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**2/x**8,x)
```

```
[Out] 5*a**(3/2)*atan(sqrt(a)*x/sqrt(b))/(2*b**(7/2)) + 5*a/(2*b**3*x)
+ 1/(2*b*x**3*(a*x**2 + b)) - 5/(6*b**2*x**3)
```

Mathematica [A] time = 0.0730313, size = 67, normalized size = 0.99

$$\frac{5a^{3/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2b^{7/2}}+\frac{a^2x}{2b^3(ax^2+b)}+\frac{2a}{b^3x}-\frac{1}{3b^2x^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)^2*x^8),x]
```

```
[Out] -1/(3*b^2*x^3) + (2*a)/(b^3*x) + (a^2*x)/(2*b^3*(b + a*x^2)) + (5
*a^(3/2)*ArcTan[(Sqrt[a]*x)/Sqrt[b]])/(2*b^(7/2))
```

Maple [A] time = 0.01, size = 59, normalized size = 0.9

$$-\frac{1}{3b^2x^3}+2\frac{a}{b^3x}+\frac{xa^2}{2b^3(ax^2+b)}+\frac{5a^2}{2b^3}\arctan\left(ax\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^2/x^8,x)
```

```
[Out] -1/3/b^2/x^3+2*a/b^3/x+1/2*a^2/b^3*x/(a*x^2+b)+5/2*a^2/b^3/(a*b)^
(1/2)*arctan(a*x/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^2*x^8),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.240285, size = 1, normalized size = 0.01

$$\left[\frac{30\,a^2x^4 + 20\,abx^2 + 15\left(a^2x^5 + abx^3\right)\sqrt{-\frac{a}{b}}\log\left(\frac{ax^2+2\,bx\sqrt{-\frac{a}{b}}-b}{ax^2+b}\right) - 4\,b^2}{12\left(ab^3x^5 + b^4x^3\right)}, \frac{15\,a^2x^4 + 10\,abx^2 + 15\left(a^2x^5 + abx^3\right)\sqrt{\frac{a}{b}}\arctan\left(\right.}{6\left(ab^3x^5 + b^4x^3\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^2*x^8),x, algorithm="fricas")
```

```
[Out] [1/12*(30*a^2*x^4 + 20*a*b*x^2 + 15*(a^2*x^5 + a*b*x^3)*sqrt(-a/b
)*log((a*x^2 + 2*b*x*sqrt(-a/b) - b)/(a*x^2 + b)) - 4*b^2)/(a*b^3
*x^5 + b^4*x^3), 1/6*(15*a^2*x^4 + 10*a*b*x^2 + 15*(a^2*x^5 + a*b
*x^3)*sqrt(a/b)*arctan(a*x/(b*sqrt(a/b))) - 2*b^2)/(a*b^3*x^5 + b
^4*x^3)]
```

Sympy [A] time = 2.1533, size = 114, normalized size = 1.68

$$-\frac{5\sqrt{-\frac{a^3}{b^7}}\log\left(x - \frac{b^4\sqrt{-\frac{a^3}{b^7}}}{a^2}\right)}{4} + \frac{5\sqrt{-\frac{a^3}{b^7}}\log\left(x + \frac{b^4\sqrt{-\frac{a^3}{b^7}}}{a^2}\right)}{4} + \frac{15a^2x^4 + 10abx^2 - 2b^2}{6ab^3x^5 + 6b^4x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**2/x**8,x)
```

```
[Out] -5*sqrt(-a**3/b**7)*log(x - b**4*sqrt(-a**3/b**7)/a**2)/4 + 5*sqr
t(-a**3/b**7)*log(x + b**4*sqrt(-a**3/b**7)/a**2)/4 + (15*a**2*x*
*4 + 10*a*b*x**2 - 2*b**2)/(6*a*b**3*x**5 + 6*b**4*x**3)
```

GIAC/XCAS [A] time = 0.219144, size = 80, normalized size = 1.18

$$\frac{5\,a^2\arctan\left(\frac{ax}{\sqrt{ab}}\right)}{2\,\sqrt{ab}b^3} + \frac{a^2x}{2\,(ax^2+b)b^3} + \frac{6\,ax^2 - b}{3\,b^3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^2*x^8),x, algorithm="giac")
```

```
[Out] 5/2*a^2*arctan(a*x/sqrt(a*b))/(sqrt(a*b)*b^3) + 1/2*a^2*x/((a*x^2
 + b)*b^3) + 1/3*(6*a*x^2 - b)/(b^3*x^3)
```

3.1871 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^2 x^9} dx$

Optimal. Leaf size=66

$$-\frac{3a^2\log\left(ax^2+b\right)}{2b^4}+\frac{3a^2\log(x)}{b^4}+\frac{a^2}{2b^3\left(ax^2+b\right)}+\frac{a}{b^3x^2}-\frac{1}{4b^2x^4}$$

```
[Out] -1/(4*b^2*x^4) + a/(b^3*x^2) + a^2/(2*b^3*(b + a*x^2)) + (3*a^2*L
og[x])/b^4 - (3*a^2*Log[b + a*x^2])/(2*b^4)
```

Rubi [A] time = 0.118633, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$

$$-\frac{3a^2\log\left(ax^2+b\right)}{2b^4}+\frac{3a^2\log(x)}{b^4}+\frac{a^2}{2b^3\left(ax^2+b\right)}+\frac{a}{b^3x^2}-\frac{1}{4b^2x^4}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)^2*x^9),x]
```

```
[Out] -1/(4*b^2*x^4) + a/(b^3*x^2) + a^2/(2*b^3*(b + a*x^2)) + (3*a^2*L
og[x])/b^4 - (3*a^2*Log[b + a*x^2])/(2*b^4)
```

Rubi in Sympy [A] time = 16.0315, size = 66, normalized size = 1.

$$\frac{a^2}{2b^3\left(ax^2+b\right)}+\frac{3a^2\log\left(x^2\right)}{2b^4}-\frac{3a^2\log\left(ax^2+b\right)}{2b^4}+\frac{a}{b^3x^2}-\frac{1}{4b^2x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**2/x**9,x)
```

```
[Out] a**2/(2*b**3*(a*x**2 + b)) + 3*a**2*log(x**2)/(2*b**4) - 3*a**2*l
og(a*x**2 + b)/(2*b**4) + a/(b**3*x**2) - 1/(4*b**2*x**4)
```

Mathematica [A] time = 0.0959095, size = 57, normalized size = 0.86

$$\frac{-6a^2\log\left(ax^2+b\right)+b\left(\frac{2a^2}{ax^2+b}+\frac{4a}{x^2}-\frac{b}{x^4}\right)+12a^2\log(x)}{4b^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)^2*x^9),x]
```

```
[Out] (b*(-(b/x^4) + (4*a)/x^2 + (2*a^2)/(b + a*x^2)) + 12*a^2*Log[x] -
 6*a^2*Log[b + a*x^2])/(4*b^4)
```

Maple [A] time = 0.019, size = 61, normalized size = 0.9

$$-\frac{1}{4\,b^2x^4}+\frac{a}{b^3x^2}+\frac{a^2}{2\,b^3\left(ax^2+b\right)}+3\,\frac{a^2\ln(x)}{b^4}-\frac{3\,a^2\ln\left(ax^2+b\right)}{2\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/(a+b/x^2)^2/x^9,x)
```

```
[Out] -1/4/b^2/x^4+a/b^3/x^2+1/2*a^2/b^3/(a*x^2+b)+3*a^2*ln(x)/b^4-3/2*
a^2*ln(a*x^2+b)/b^4
```

Maxima [A] time = 1.43896, size = 95, normalized size = 1.44

$$\frac{6\,a^2x^4+3\,abx^2-b^2}{4\,(ab^3x^6+b^4x^4)}-\frac{3\,a^2\log\left(ax^2+b\right)}{2\,b^4}+\frac{3\,a^2\log\left(x^2\right)}{2\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x^2)^2*x^9),x, algorithm="maxima")
```

```
[Out] 1/4*(6*a^2*x^4 + 3*a*b*x^2 - b^2)/(a*b^3*x^6 + b^4*x^4) - 3/2*a^2
*log(a*x^2 + b)/b^4 + 3/2*a^2*log(x^2)/b^4
```

Fricas [A] time = 0.23241, size = 122, normalized size = 1.85

$$\frac{6\,a^2bx^4+3\,ab^2x^2-b^3-6\left(a^3x^6+a^2bx^4\right)\log\left(ax^2+b\right)+12\left(a^3x^6+a^2bx^4\right)\log\left(x\right)}{4\,(ab^4x^6+b^5x^4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x^2)^2*x^9),x, algorithm="fricas")
```

```
[Out] 1/4*(6*a^2*b*x^4 + 3*a*b^2*x^2 - b^3 - 6*(a^3*x^6 + a^2*b*x^4)*lo
g(a*x^2 + b) + 12*(a^3*x^6 + a^2*b*x^4)*log(x))/(a*b^4*x^6 + b^5*
x^4)
```

Sympy [A] time = 2.6295, size = 68, normalized size = 1.03

$$\frac{3a^2\log\left(x\right)}{b^4}-\frac{3a^2\log\left(x^2+\frac{b}{a}\right)}{2b^4}+\frac{6a^2x^4+3abx^2-b^2}{4ab^3x^6+4b^4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(a+b/x**2)**2/x**9,x)
```

```
[Out] 3*a**2*log(x)/b**4 - 3*a**2*log(x**2 + b/a)/(2*b**4) + (6*a**2*x*
*4 + 3*a*b*x**2 - b**2)/(4*a*b**3*x**6 + 4*b**4*x**4)
```

GIAC/XCAS [A] time = 0.235072, size = 116, normalized size = 1.76

$$\frac{3\,a^2\ln\left(x^2\right)}{2\,b^4}-\frac{3\,a^2\ln\left(\left|ax^2+b\right|\right)}{2\,b^4}+\frac{3\,a^3x^2+4\,a^2b}{2\,(ax^2+b)b^4}-\frac{9\,a^2x^4-4\,abx^2+b^2}{4\,b^4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x^2)^2*x^9),x, algorithm="giac")
```

```
[Out] 3/2*a^2*ln(x^2)/b^4 - 3/2*a^2*ln(abs(a*x^2 + b))/b^4 + 1/2*(3*a^3
*x^2 + 4*a^2*b)/((a*x^2 + b)*b^4) - 1/4*(9*a^2*x^4 - 4*a*b*x^2 +
b^2)/(b^4*x^4)
```

3.1872 $\int \frac{x^5}{\left(a+\frac{b}{x^2}\right)^3} dx$

Optimal. Leaf size=87

$$\frac{b^5}{4a^6\left(ax^2+b\right)^2}-\frac{5b^4}{2a^6\left(ax^2+b\right)}-\frac{5b^3\log\left(ax^2+b\right)}{a^6}+\frac{3b^2x^2}{a^5}-\frac{3bx^4}{4a^4}+\frac{x^6}{6a^3}$$

```
[Out] (3*b^2*x^2)/a^5 - (3*b*x^4)/(4*a^4) + x^6/(6*a^3) + b^5/(4*a^6*(b
 + a*x^2)^2) - (5*b^4)/(2*a^6*(b + a*x^2)) - (5*b^3*Log[b + a*x^2
])/a^6
```

Rubi [A] time = 0.180978, antiderivative size = 87, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{b^5}{4a^6\left(ax^2+b\right)^2}-\frac{5b^4}{2a^6\left(ax^2+b\right)}-\frac{5b^3\log\left(ax^2+b\right)}{a^6}+\frac{3b^2x^2}{a^5}-\frac{3bx^4}{4a^4}+\frac{x^6}{6a^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^5/(a + b/x^2)^3,x]
```

```
[Out] (3*b^2*x^2)/a^5 - (3*b*x^4)/(4*a^4) + x^6/(6*a^3) + b^5/(4*a^6*(b
 + a*x^2)^2) - (5*b^4)/(2*a^6*(b + a*x^2)) - (5*b^3*Log[b + a*x^2
])/a^6
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{x^6}{6a^3}-\frac{3b\int^{x^2} x\,dx}{2a^4}+\frac{3b^2x^2}{a^5}+\frac{b^5}{4a^6\left(ax^2+b\right)^2}-\frac{5b^4}{2a^6\left(ax^2+b\right)}-\frac{5b^3\log\left(ax^2+b\right)}{a^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**5/(a+b/x**2)**3,x)
```

```
[Out] x**6/(6*a**3) - 3*b*Integral(x, (x, x**2))/(2*a**4) + 3*b**2*x**2
/a**5 + b**5/(4*a**6*(a*x**2 + b)**2) - 5*b**4/(2*a**6*(a*x**2 +
b)) - 5*b**3*log(a*x**2 + b)/a**6
```

Mathematica [A] time = 0.0907792, size = 71, normalized size = 0.82

$$\frac{2a^3x^6-9a^2bx^4-\frac{3b^4\left(10ax^2+9b\right)}{\left(ax^2+b\right)^2}-60b^3\log\left(ax^2+b\right)+36ab^2x^2}{12a^6}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5/(a + b/x^2)^3,x]
```

```
[Out] (36*a*b^2*x^2 - 9*a^2*b*x^4 + 2*a^3*x^6 - (3*b^4*(9*b + 10*a*x^2)
)/(b + a*x^2)^2 - 60*b^3*Log[b + a*x^2])/(12*a^6)
```

Maple [A] time = 0.016, size = 80, normalized size = 0.9

$$3\,\frac{b^2x^2}{a^5}-\frac{3\,bx^4}{4\,a^4}+\frac{x^6}{6\,a^3}+\frac{b^5}{4\,a^6\left(ax^2+b\right)^2}-\frac{5\,b^4}{2\,a^6\left(ax^2+b\right)}-5\,\frac{b^3\ln\left(ax^2+b\right)}{a^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(a+b/x^2)^3,x)
```

```
[Out] 3*b^2*x^2/a^5-3/4*b*x^4/a^4+1/6*x^6/a^3+1/4*b^5/a^6/(a*x^2+b)^2-5
/2*b^4/a^6/(a*x^2+b)-5*b^3*ln(a*x^2+b)/a^6
```

Maxima [A] time = 1.44732, size = 120, normalized size = 1.38

$$-\frac{10\,ab^4x^2+9\,b^5}{4\,(a^8x^4+2\,a^7bx^2+a^6b^2)}-\frac{5\,b^3\log\left(ax^2+b\right)}{a^6}+\frac{2\,a^2x^6-9\,abx^4+36\,b^2x^2}{12\,a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(a + b/x^2)^3,x, algorithm="maxima")
```

```
[Out] -1/4*(10*a*b^4*x^2 + 9*b^5)/(a^8*x^4 + 2*a^7*b*x^2 + a^6*b^2) - 5
*b^3*log(a*x^2 + b)/a^6 + 1/12*(2*a^2*x^6 - 9*a*b*x^4 + 36*b^2*x^
2)/a^5
```

Fricas [A] time = 0.228388, size = 155, normalized size = 1.78

$$\frac{2\,a^5x^{10}-5\,a^4bx^8+20\,a^3b^2x^6+63\,a^2b^3x^4+6\,ab^4x^2-27\,b^5-60\,\left(a^2b^3x^4+2\,ab^4x^2+b^5\right)\log\left(ax^2+b\right)}{12\,(a^8x^4+2\,a^7bx^2+a^6b^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(a + b/x^2)^3,x, algorithm="fricas")
```

```
[Out] 1/12*(2*a^5*x^10 - 5*a^4*b*x^8 + 20*a^3*b^2*x^6 + 63*a^2*b^3*x^4
+ 6*a*b^4*x^2 - 27*b^5 - 60*(a^2*b^3*x^4 + 2*a*b^4*x^2 + b^5)*log
(a*x^2 + b))/(a^8*x^4 + 2*a^7*b*x^2 + a^6*b^2)
```

Sympy [A] time = 2.3756, size = 90, normalized size = 1.03

$$-\frac{10ab^4x^2+9b^5}{4a^8x^4+8a^7bx^2+4a^6b^2}+\frac{x^6}{6a^3}-\frac{3bx^4}{4a^4}+\frac{3b^2x^2}{a^5}-\frac{5b^3\log\left(ax^2+b\right)}{a^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(a+b/x**2)**3,x)
```

```
[Out] -(10*a*b**4*x**2 + 9*b**5)/(4*a**8*x**4 + 8*a**7*b*x**2 + 4*a**6*
b**2) + x**6/(6*a**3) - 3*b*x**4/(4*a**4) + 3*b**2*x**2/a**5 - 5*
b**3*log(a*x**2 + b)/a**6
```

GIAC/XCAS [A] time = 0.243151, size = 124, normalized size = 1.43

$$-\frac{5\,b^3\ln\left(\left|ax^2+b\right|\right)}{a^6}+\frac{30\,a^2b^3x^4+50\,ab^4x^2+21\,b^5}{4\,(ax^2+b)^2a^6}+\frac{2\,a^6x^6-9\,a^5bx^4+36\,a^4b^2x^2}{12\,a^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(a + b/x^2)^3,x, algorithm="giac")
```

```
[Out] -5*b^3*ln(abs(a*x^2 + b))/a^6 + 1/4*(30*a^2*b^3*x^4 + 50*a*b^4*x^
2 + 21*b^5)/((a*x^2 + b)^2*a^6) + 1/12*(2*a^6*x^6 - 9*a^5*b*x^4 +
 36*a^4*b^2*x^2)/a^9
```

3.1873 $\int \frac{x^4}{\left(a+\frac{b}{x^2}\right)^3} dx$

Optimal. Leaf size=98

$$-\frac{63b^{5/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8a^{11/2}}+\frac{63b^2x}{8a^5}-\frac{21bx^3}{8a^4}+\frac{63x^5}{40a^3}-\frac{9x^7}{8a^2(ax^2+b)}-\frac{x^9}{4a(ax^2+b)^2}$$

```
[Out] (63*b^2*x)/(8*a^5) - (21*b*x^3)/(8*a^4) + (63*x^5)/(40*a^3) - x^9
/(4*a*(b + a*x^2)^2) - (9*x^7)/(8*a^2*(b + a*x^2)) - (63*b^(5/2)*
ArcTan[(Sqrt[a]*x)/Sqrt[b]])/(8*a^(11/2))
```

Rubi [A] time = 0.129064, antiderivative size = 98, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$-\frac{63b^{5/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8a^{11/2}}+\frac{63b^2x}{8a^5}-\frac{21bx^3}{8a^4}+\frac{63x^5}{40a^3}-\frac{9x^7}{8a^2(ax^2+b)}-\frac{x^9}{4a(ax^2+b)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a + b/x^2)^3,x]
```

```
[Out] (63*b^2*x)/(8*a^5) - (21*b*x^3)/(8*a^4) + (63*x^5)/(40*a^3) - x^9
/(4*a*(b + a*x^2)^2) - (9*x^7)/(8*a^2*(b + a*x^2)) - (63*b^(5/2)*
ArcTan[(Sqrt[a]*x)/Sqrt[b]])/(8*a^(11/2))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{x^9}{4a(ax^2+b)^2}+\frac{63b^2\int\frac{1}{a^3}dx}{8a^2}-\frac{9x^7}{8a^2(ax^2+b)}+\frac{63x^5}{40a^3}-\frac{21bx^3}{8a^4}-\frac{63b^{\frac{5}{2}}\operatorname{atan}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8a^{\frac{11}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(a+b/x**2)**3,x)
```

```
[Out] -x**9/(4*a*(a*x**2 + b)**2) + 63*b**2*Integral(a**(-3), x)/(8*a**
2) - 9*x**7/(8*a**2*(a*x**2 + b)) + 63*x**5/(40*a**3) - 21*b*x**3
/(8*a**4) - 63*b**(5/2)*atan(sqrt(a)*x/sqrt(b))/(8*a**(11/2))
```

Mathematica [A] time = 0.114053, size = 88, normalized size = 0.9

$$\frac{8a^4x^9-24a^3bx^7+168a^2b^2x^5+525ab^3x^3+315b^4x}{40a^5(ax^2+b)^2}-\frac{63b^{5/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8a^{11/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(a + b/x^2)^3,x]
```

```
[Out] (315*b^4*x + 525*a*b^3*x^3 + 168*a^2*b^2*x^5 - 24*a^3*b*x^7 + 8*a
^4*x^9)/(40*a^5*(b + a*x^2)^2) - (63*b^(5/2)*ArcTan[(Sqrt[a]*x)/S
qrt[b]])/(8*a^(11/2))
```

Maple [A] time = 0.008, size = 88, normalized size = 0.9

$$\frac{x^5}{5\,a^3}-\frac{bx^3}{a^4}+6\,\frac{b^2x}{a^5}+\frac{17\,b^3x^3}{8\,a^4\,(ax^2+b)^2}+\frac{15\,b^4x}{8\,a^5\,(ax^2+b)^2}-\frac{63\,b^3}{8\,a^5}\arctan\left(ax\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(a+b/x^2)^3,x)
```

```
[Out] 1/5*x^5/a^3-b*x^3/a^4+6*b^2*x/a^5+17/8/a^4*b^3/(a*x^2+b)^2*x^3+15
/8/a^5*b^4/(a*x^2+b)^2*x-63/8/a^5*b^3/(a*b)^(1/2)*arctan(a*x/(a*b
)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(a + b/x^2)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.23055, size = 1, normalized size = 0.01

$$\left[\frac{16\,a^4x^9-48\,a^3bx^7+336\,a^2b^2x^5+1050\,ab^3x^3+630\,b^4x+315\,\left(a^2b^2x^4+2\,ab^3x^2+b^4\right)\sqrt{-\frac{b}{a}}\log\left(\frac{ax^2-2\,ax\sqrt{-\frac{b}{a}}-b}{ax^2+b}\right)}{80\,(a^7x^4+2\,a^6bx^2+a^5b^2)},\frac{8\,a^4x^9\cdots}{\cdots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(a + b/x^2)^3,x, algorithm="fricas")
```

```
[Out] [1/80*(16*a^4*x^9 - 48*a^3*b*x^7 + 336*a^2*b^2*x^5 + 1050*a*b^3*x
^3 + 630*b^4*x + 315*(a^2*b^2*x^4 + 2*a*b^3*x^2 + b^4)*sqrt(-b/a)
*log((a*x^2 - 2*a*x*sqrt(-b/a) - b)/(a*x^2 + b)))/(a^7*x^4 + 2*a^
6*b*x^2 + a^5*b^2), 1/40*(8*a^4*x^9 - 24*a^3*b*x^7 + 168*a^2*b^2*
x^5 + 525*a*b^3*x^3 + 315*b^4*x - 315*(a^2*b^2*x^4 + 2*a*b^3*x^2
+ b^4)*sqrt(b/a)*arctan(x/sqrt(b/a)))/(a^7*x^4 + 2*a^6*b*x^2 + a^
5*b^2)]
```

Sympy [A] time = 2.35364, size = 144, normalized size = 1.47

$$\frac{63\sqrt{-\frac{b^5}{a^{11}}}\log\left(-\frac{a^5\sqrt{-\frac{b^5}{a^{11}}}}{b^2}+x\right)}{16}-\frac{63\sqrt{-\frac{b^5}{a^{11}}}\log\left(\frac{a^5\sqrt{-\frac{b^5}{a^{11}}}}{b^2}+x\right)}{16}+\frac{17ab^3x^3+15b^4x}{8a^7x^4+16a^6bx^2+8a^5b^2}+\frac{x^5}{5a^3}-\frac{bx^3}{a^4}+\frac{6b^2x}{a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(a+b/x**2)**3,x)
```

```
[Out] 63*sqrt(-b**5/a**11)*log(-a**5*sqrt(-b**5/a**11)/b**2 + x)/16 - 6
3*sqrt(-b**5/a**11)*log(a**5*sqrt(-b**5/a**11)/b**2 + x)/16 + (17
```

```
*a*b**3*x**3 + 15*b**4*x)/(8*a**7*x**4 + 16*a**6*b*x**2 + 8*a**5*
b**2) + x**5/(5*a**3) - b*x**3/a**4 + 6*b**2*x/a**5
```

GIAC/XCAS [A] time = 0.23177, size = 113, normalized size = 1.15

$$-\frac{63\,b^3\arctan\left(\frac{ax}{\sqrt{ab}}\right)}{8\,\sqrt{ab}a^5}+\frac{17\,ab^3x^3+15\,b^4x}{8\,(ax^2+b)^2a^5}+\frac{a^{12}x^5-5\,a^{11}bx^3+30\,a^{10}b^2x}{5\,a^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(a + b/x^2)^3,x, algorithm="giac")
```

```
[Out] -63/8*b^3*arctan(a*x/sqrt(a*b))/(sqrt(a*b)*a^5) + 1/8*(17*a*b^3*x
^3 + 15*b^4*x)/((a*x^2 + b)^2*a^5) + 1/5*(a^12*x^5 - 5*a^11*b*x^3
 + 30*a^10*b^2*x)/a^15
```

3.1874 $\int \frac{x^3}{\left(a+\frac{b}{x^2}\right)^3} dx$

Optimal. Leaf size=74

$$-\frac{b^4}{4a^5(ax^2+b)^2}+\frac{2b^3}{a^5(ax^2+b)}+\frac{3b^2\log(ax^2+b)}{a^5}-\frac{3bx^2}{2a^4}+\frac{x^4}{4a^3}$$

```
[Out] (-3*b*x^2)/(2*a^4) + x^4/(4*a^3) - b^4/(4*a^5*(b + a*x^2)^2) + (2
*b^3)/(a^5*(b + a*x^2)) + (3*b^2*Log[b + a*x^2])/a^5
```

Rubi [A] time = 0.14951, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{b^4}{4a^5(ax^2+b)^2}+\frac{2b^3}{a^5(ax^2+b)}+\frac{3b^2\log(ax^2+b)}{a^5}-\frac{3bx^2}{2a^4}+\frac{x^4}{4a^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(a + b/x^2)^3,x]
```

```
[Out] (-3*b*x^2)/(2*a^4) + x^4/(4*a^3) - b^4/(4*a^5*(b + a*x^2)^2) + (2
*b^3)/(a^5*(b + a*x^2)) + (3*b^2*Log[b + a*x^2])/a^5
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int^{x^2} x\,dx}{2a^3}-\frac{3bx^2}{2a^4}-\frac{b^4}{4a^5(ax^2+b)^2}+\frac{2b^3}{a^5(ax^2+b)}+\frac{3b^2\log(ax^2+b)}{a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(a+b/x**2)**3,x)
```

```
[Out] Integral(x, (x, x**2))/(2*a**3) - 3*b*x**2/(2*a**4) - b**4/(4*a**
5*(a*x**2 + b)**2) + 2*b**3/(a**5*(a*x**2 + b)) + 3*b**2*log(a*x*
*2 + b)/a**5
```

Mathematica [A] time = 0.08738, size = 58, normalized size = 0.78

$$\frac{a^2x^4+\frac{b^3(8ax^2+7b)}{(ax^2+b)^2}+12b^2\log(ax^2+b)-6abx^2}{4a^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(a + b/x^2)^3,x]
```

```
[Out] (-6*a*b*x^2 + a^2*x^4 + (b^3*(7*b + 8*a*x^2))/(b + a*x^2)^2 + 12*
b^2*Log[b + a*x^2])/(4*a^5)
```

Maple [A] time = 0.015, size = 69, normalized size = 0.9

$$-\frac{3\,bx^2}{2\,a^4}+\frac{x^4}{4\,a^3}-\frac{b^4}{4\,a^5(ax^2+b)^2}+2\,\frac{b^3}{a^5(ax^2+b)}+3\,\frac{b^2\ln(ax^2+b)}{a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^3/(a+b/x^2)^3,x)
```

```
[Out] -3/2*b*x^2/a^4+1/4*x^4/a^3-1/4*b^4/a^5/(a*x^2+b)^2+2*b^3/a^5/(a*x
^2+b)+3*b^2*ln(a*x^2+b)/a^5
```

Maxima [A] time = 1.4149, size = 104, normalized size = 1.41

$$\frac{8\,ab^3x^2+7\,b^4}{4\,(a^7x^4+2\,a^6bx^2+a^5b^2)}+\frac{3\,b^2\log\left(ax^2+b\right)}{a^5}+\frac{ax^4-6\,bx^2}{4\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^3/(a + b/x^2)^3,x, algorithm="maxima")
```

```
[Out] 1/4*(8*a*b^3*x^2 + 7*b^4)/(a^7*x^4 + 2*a^6*b*x^2 + a^5*b^2) + 3*b
^2*log(a*x^2 + b)/a^5 + 1/4*(a*x^4 - 6*b*x^2)/a^4
```

Fricas [A] time = 0.227276, size = 139, normalized size = 1.88

$$\frac{a^4x^8-4\,a^3bx^6-11\,a^2b^2x^4+2\,ab^3x^2+7\,b^4+12\,\left(a^2b^2x^4+2\,ab^3x^2+b^4\right)\log\left(ax^2+b\right)}{4\,(a^7x^4+2\,a^6bx^2+a^5b^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^3/(a + b/x^2)^3,x, algorithm="fricas")
```

```
[Out] 1/4*(a^4*x^8 - 4*a^3*b*x^6 - 11*a^2*b^2*x^4 + 2*a*b^3*x^2 + 7*b^4
 + 12*(a^2*b^2*x^4 + 2*a*b^3*x^2 + b^4)*log(a*x^2 + b))/(a^7*x^4
+ 2*a^6*b*x^2 + a^5*b^2)
```

Sympy [A] time = 2.18154, size = 78, normalized size = 1.05

$$\frac{8ab^3x^2+7b^4}{4a^7x^4+8a^6bx^2+4a^5b^2}+\frac{x^4}{4a^3}-\frac{3bx^2}{2a^4}+\frac{3b^2\log\left(ax^2+b\right)}{a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**3/(a+b/x**2)**3,x)
```

```
[Out] (8*a*b**3*x**2 + 7*b**4)/(4*a**7*x**4 + 8*a**6*b*x**2 + 4*a**5*b*
*2) + x**4/(4*a**3) - 3*b*x**2/(2*a**4) + 3*b**2*log(a*x**2 + b)/
a**5
```

GIAC/XCAS [A] time = 0.223261, size = 93, normalized size = 1.26

$$\frac{3\,b^2\ln\left(\left|ax^2+b\right|\right)}{a^5}+\frac{a^3x^4-6\,a^2bx^2}{4\,a^6}+\frac{8\,ab^3x^2+7\,b^4}{4\,(ax^2+b)^2a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^3/(a + b/x^2)^3,x, algorithm="giac")
```

```
[Out] 3*b^2*ln(abs(a*x^2 + b))/a^5 + 1/4*(a^3*x^4 - 6*a^2*b*x^2)/a^6 +
1/4*(8*a*b^3*x^2 + 7*b^4)/((a*x^2 + b)^2*a^5)
```

3.1875 $\int \frac{x^2}{\left(a+\frac{b}{x^2}\right)^3} dx$

Optimal. Leaf size=85

$$\frac{35b^{3/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8a^{9/2}}-\frac{35bx}{8a^4}+\frac{35x^3}{24a^3}-\frac{7x^5}{8a^2\left(ax^2+b\right)}-\frac{x^7}{4a\left(ax^2+b\right)^2}$$

```
[Out] (-35*b*x)/(8*a^4) + (35*x^3)/(24*a^3) - x^7/(4*a*(b + a*x^2)^2) -
 (7*x^5)/(8*a^2*(b + a*x^2)) + (35*b^(3/2)*ArcTan[(Sqrt[a]*x)/Sqr
t[b]])/(8*a^(9/2))
```

Rubi [A] time = 0.11347, antiderivative size = 85, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{35b^{3/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8a^{9/2}}-\frac{35bx}{8a^4}+\frac{35x^3}{24a^3}-\frac{7x^5}{8a^2\left(ax^2+b\right)}-\frac{x^7}{4a\left(ax^2+b\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b/x^2)^3,x]
```

```
[Out] (-35*b*x)/(8*a^4) + (35*x^3)/(24*a^3) - x^7/(4*a*(b + a*x^2)^2) -
 (7*x^5)/(8*a^2*(b + a*x^2)) + (35*b^(3/2)*ArcTan[(Sqrt[a]*x)/Sqr
t[b]])/(8*a^(9/2))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{x^7}{4a\left(ax^2+b\right)^2}-\frac{7x^5}{8a^2\left(ax^2+b\right)}+\frac{35x^3}{24a^3}-\frac{35\int b\,dx}{8a^4}+\frac{35b^{\frac{3}{2}}\operatorname{atan}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8a^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b/x**2)**3,x)
```

```
[Out] -x**7/(4*a*(a*x**2 + b)**2) - 7*x**5/(8*a**2*(a*x**2 + b)) + 35*x
**3/(24*a**3) - 35*Integral(b, x)/(8*a**4) + 35*b**(3/2)*atan(sqr
t(a)*x/sqrt(b))/(8*a**(9/2))
```

Mathematica [A] time = 0.102461, size = 77, normalized size = 0.91

$$\frac{35b^{3/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8a^{9/2}}-\frac{-8a^3x^7+56a^2bx^5+175ab^2x^3+105b^3x}{24a^4\left(ax^2+b\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a + b/x^2)^3,x]
```

```
[Out] -(105*b^3*x + 175*a*b^2*x^3 + 56*a^2*b*x^5 - 8*a^3*x^7)/(24*a^4*(
b + a*x^2)^2) + (35*b^(3/2)*ArcTan[(Sqrt[a]*x)/Sqrt[b]])/(8*a^(9/
2))
```

Maple [A] time = 0.007, size = 77, normalized size = 0.9

$$\frac{x^3}{3\,a^3}-3\,\frac{bx}{a^4}-\frac{13\,b^2x^3}{8\,a^3\,(ax^2+b)^2}-\frac{11\,b^3x}{8\,a^4\,(ax^2+b)^2}+\frac{35\,b^2}{8\,a^4}\arctan\left(ax\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(a+b/x^2)^3,x)
```

```
[Out] 1/3*x^3/a^3-3*b*x/a^4-13/8/a^3*b^2/(a*x^2+b)^2*x^3-11/8/a^4*b^3/(
a*x^2+b)^2*x+35/8/a^4*b^2/(a*b)^(1/2)*arctan(a*x/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x^2)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.23467, size = 1, normalized size = 0.01

$$\left[\frac{16\,a^3x^7-112\,a^2bx^5-350\,ab^2x^3-210\,b^3x+105\,\left(a^2bx^4+2\,ab^2x^2+b^3\right)\sqrt{-\frac{b}{a}}\log\left(\frac{ax^2+2\,ax\sqrt{-\frac{b}{a}}-b}{ax^2+b}\right)}{48\,(a^6x^4+2\,a^5bx^2+a^4b^2)},\ \frac{8\,a^3x^7-56\,a^2bx^5-1}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x^2)^3,x, algorithm="fricas")
```

```
[Out] [1/48*(16*a^3*x^7 - 112*a^2*b*x^5 - 350*a*b^2*x^3 - 210*b^3*x + 1
05*(a^2*b*x^4 + 2*a*b^2*x^2 + b^3)*sqrt(-b/a)*log((a*x^2 + 2*a*x*
sqrt(-b/a) - b)/(a*x^2 + b)))/(a^6*x^4 + 2*a^5*b*x^2 + a^4*b^2),
1/24*(8*a^3*x^7 - 56*a^2*b*x^5 - 175*a*b^2*x^3 - 105*b^3*x + 105*
(a^2*b*x^4 + 2*a*b^2*x^2 + b^3)*sqrt(b/a)*arctan(x/sqrt(b/a)))/(a
^6*x^4 + 2*a^5*b*x^2 + a^4*b^2)]
```

Sympy [A] time = 2.25978, size = 131, normalized size = 1.54

$$-\frac{35\sqrt{-\frac{b^3}{a^9}}\log\left(-\frac{a^4\sqrt{-\frac{b^3}{a^9}}}{b}+x\right)}{16}+\frac{35\sqrt{-\frac{b^3}{a^9}}\log\left(\frac{a^4\sqrt{-\frac{b^3}{a^9}}}{b}+x\right)}{16}-\frac{13ab^2x^3+11b^3x}{8a^6x^4+16a^5bx^2+8a^4b^2}+\frac{x^3}{3a^3}-\frac{3bx}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b/x**2)**3,x)
```

```
[Out] -35*sqrt(-b**3/a**9)*log(-a**4*sqrt(-b**3/a**9)/b + x)/16 + 35*sq
rt(-b**3/a**9)*log(a**4*sqrt(-b**3/a**9)/b + x)/16 - (13*a*b**2*x
**3 + 11*b**3*x)/(8*a**6*x**4 + 16*a**5*b*x**2 + 8*a**4*b**2) + x
**3/(3*a**3) - 3*b*x/a**4
```

GIAC/XCAS [A] time = 0.233837, size = 99, normalized size = 1.16

$$\frac{35\,b^2\arctan\left(\frac{ax}{\sqrt{ab}}\right)}{8\,\sqrt{ab}a^4} - \frac{13\,ab^2x^3 + 11\,b^3x}{8\,(ax^2 + b)^2a^4} + \frac{a^6x^3 - 9\,a^5bx}{3\,a^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x^2)^3,x, algorithm="giac")
```

```
[Out] 35/8*b^2*arctan(a*x/sqrt(a*b))/(sqrt(a*b)*a^4) - 1/8*(13*a*b^2*x^
3 + 11*b^3*x)/((a*x^2 + b)^2*a^4) + 1/3*(a^6*x^3 - 9*a^5*b*x)/a^9
```

3.1876 $\int \frac{x}{\left(a+\frac{b}{x^2}\right)^3} \, dx$

Optimal. Leaf size=65

$$\frac{b^3}{4a^4(ax^2+b)^2}-\frac{3b^2}{2a^4(ax^2+b)}-\frac{3b\log(ax^2+b)}{2a^4}+\frac{x^2}{2a^3}$$

```
[Out] x^2/(2*a^3) + b^3/(4*a^4*(b + a*x^2)^2) - (3*b^2)/(2*a^4*(b + a*x
^2)) - (3*b*Log[b + a*x^2])/(2*a^4)
```

Rubi [A] time = 0.118351, antiderivative size = 65, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273

$$\frac{b^3}{4a^4(ax^2+b)^2}-\frac{3b^2}{2a^4(ax^2+b)}-\frac{3b\log(ax^2+b)}{2a^4}+\frac{x^2}{2a^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b/x^2)^3,x]
```

```
[Out] x^2/(2*a^3) + b^3/(4*a^4*(b + a*x^2)^2) - (3*b^2)/(2*a^4*(b + a*x
^2)) - (3*b*Log[b + a*x^2])/(2*a^4)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int^{x^2}\frac{1}{a^3}\,dx}{2}+\frac{b^3}{4a^4(ax^2+b)^2}-\frac{3b^2}{2a^4(ax^2+b)}-\frac{3b\log(ax^2+b)}{2a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b/x**2)**3,x)
```

```
[Out] Integral(a**(-3), (x, x**2))/2 + b**3/(4*a**4*(a*x**2 + b)**2) -
3*b**2/(2*a**4*(a*x**2 + b)) - 3*b*log(a*x**2 + b)/(2*a**4)
```

Mathematica [A] time = 0.0988092, size = 48, normalized size = 0.74

$$-\frac{\frac{b^2(6ax^2+5b)}{(ax^2+b)^2}+6b\log(ax^2+b)-2ax^2}{4a^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b/x^2)^3,x]
```

```
[Out] -(-2*a*x^2 + (b^2*(5*b + 6*a*x^2))/(b + a*x^2)^2 + 6*b*Log[b + a*
x^2])/(4*a^4)
```

Maple [A] time = 0.014, size = 58, normalized size = 0.9

$$\frac{x^2}{2\,a^3}+\frac{b^3}{4\,a^4(ax^2+b)^2}-\frac{3\,b^2}{2\,a^4(ax^2+b)}-\frac{3\,b\ln(ax^2+b)}{2\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+b/x^2)^3,x)
```

```
[Out] 1/2*x^2/a^3+1/4*b^3/a^4/(a*x^2+b)^2-3/2*b^2/a^4/(a*x^2+b)-3/2*b*l
n(a*x^2+b)/a^4
```

Maxima [A] time = 1.44359, size = 89, normalized size = 1.37

$$-\frac{6\,ab^2x^2 + 5\,b^3}{4\,(a^6x^4 + 2\,a^5bx^2 + a^4b^2)} + \frac{x^2}{2\,a^3} - \frac{3\,b\log\left(ax^2 + b\right)}{2\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x^2)^3,x, algorithm="maxima")
```

```
[Out] -1/4*(6*a*b^2*x^2 + 5*b^3)/(a^6*x^4 + 2*a^5*b*x^2 + a^4*b^2) + 1/
2*x^2/a^3 - 3/2*b*log(a*x^2 + b)/a^4
```

Fricas [A] time = 0.221063, size = 123, normalized size = 1.89

$$\frac{2\,a^3x^6 + 4\,a^2bx^4 - 4\,ab^2x^2 - 5\,b^3 - 6\left(a^2bx^4 + 2\,ab^2x^2 + b^3\right)\log\left(ax^2 + b\right)}{4\,(a^6x^4 + 2\,a^5bx^2 + a^4b^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x^2)^3,x, algorithm="fricas")
```

```
[Out] 1/4*(2*a^3*x^6 + 4*a^2*b*x^4 - 4*a*b^2*x^2 - 5*b^3 - 6*(a^2*b*x^4
 + 2*a*b^2*x^2 + b^3)*log(a*x^2 + b))/(a^6*x^4 + 2*a^5*b*x^2 + a^
4*b^2)
```

Sympy [A] time = 2.13986, size = 66, normalized size = 1.02

$$-\frac{6ab^2x^2 + 5b^3}{4a^6x^4 + 8a^5bx^2 + 4a^4b^2} + \frac{x^2}{2a^3} - \frac{3b\log\left(ax^2 + b\right)}{2a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b/x**2)**3,x)
```

```
[Out] -(6*a*b**2*x**2 + 5*b**3)/(4*a**6*x**4 + 8*a**5*b*x**2 + 4*a**4*b
**2) + x**2/(2*a**3) - 3*b*log(a*x**2 + b)/(2*a**4)
```

GIAC/XCAS [A] time = 0.225677, size = 72, normalized size = 1.11

$$\frac{x^2}{2\,a^3} - \frac{3\,b\ln\left(\left|ax^2 + b\right|\right)}{2\,a^4} - \frac{6\,ab^2x^2 + 5\,b^3}{4\,(ax^2 + b)^2a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x^2)^3,x, algorithm="giac")
```

```
[Out] 1/2*x^2/a^3 - 3/2*b*ln(abs(a*x^2 + b))/a^4 - 1/4*(6*a*b^2*x^2 + 5
*b^3)/((a*x^2 + b)^2*a^4)
```

3.1877 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^3} dx$

Optimal. Leaf size=74

$$-\frac{15\sqrt{b}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8a^{7/2}}+\frac{15x}{8a^3}-\frac{5x^3}{8a^2\left(ax^2+b\right)}-\frac{x^5}{4a\left(ax^2+b\right)^2}$$

```
[Out] (15*x)/(8*a^3) - x^5/(4*a*(b + a*x^2)^2) - (5*x^3)/(8*a^2*(b + a*
x^2)) - (15*Sqrt[b]*ArcTan[(Sqrt[a]*x)/Sqrt[b]])/(8*a^(7/2))
```

Rubi [A] time = 0.0865592, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.444

$$-\frac{15\sqrt{b}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8a^{7/2}}+\frac{15x}{8a^3}-\frac{5x^3}{8a^2\left(ax^2+b\right)}-\frac{x^5}{4a\left(ax^2+b\right)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x^2)^(-3),x]
```

```
[Out] (15*x)/(8*a^3) - x^5/(4*a*(b + a*x^2)^2) - (5*x^3)/(8*a^2*(b + a*
x^2)) - (15*Sqrt[b]*ArcTan[(Sqrt[a]*x)/Sqrt[b]])/(8*a^(7/2))
```

Rubi in Sympy [A] time = 14.5185, size = 66, normalized size = 0.89

$$-\frac{x^5}{4a\left(ax^2+b\right)^2}-\frac{5x^3}{8a^2\left(ax^2+b\right)}+\frac{15x}{8a^3}-\frac{15\sqrt{b}\,\mathrm{atan}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8a^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b/x**2)**3,x)
```

```
[Out] -x**5/(4*a*(a*x**2 + b)**2) - 5*x**3/(8*a**2*(a*x**2 + b)) + 15*x
/(8*a**3) - 15*sqrt(b)*atan(sqrt(a)*x/sqrt(b))/(8*a**(7/2))
```

Mathematica [A] time = 0.0928863, size = 66, normalized size = 0.89

$$\frac{8a^2x^5+25abx^3+15b^2x}{8a^3\left(ax^2+b\right)^2}-\frac{15\sqrt{b}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8a^{7/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x^2)^(-3),x]
```

```
[Out] (15*b^2*x + 25*a*b*x^3 + 8*a^2*x^5)/(8*a^3*(b + a*x^2)^2) - (15*S
qrt[b]*ArcTan[(Sqrt[a]*x)/Sqrt[b]])/(8*a^(7/2))
```

Maple [A] time = 0.008, size = 63, normalized size = 0.9

$$\frac{x}{a^3}+\frac{9\,bx^3}{8\,a^2\left(ax^2+b\right)^2}+\frac{7\,b^2x}{8\,a^3\left(ax^2+b\right)^2}-\frac{15\,b}{8\,a^3}\arctan\left(ax\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^3,x)
```

```
[Out] x/a^3+9/8/a^2*b/(a*x^2+b)^2*x^3+7/8/a^3*b^2/(a*x^2+b)^2*x-15/8/a^
3*b/(a*b)^(1/2)*arctan(a*x/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(-3),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.229005, size = 1, normalized size = 0.01

$$\left[\frac{16\,a^{2}x^{5} + 50\,abx^{3} + 30\,b^{2}x + 15\,\left(a^{2}x^{4} + 2\,abx^{2} + b^{2}\right)\sqrt{-\frac{b}{a}}\log\left(\frac{ax^{2} - 2\,ax\sqrt{-\frac{b}{a}} - b}{ax^{2} + b}\right)}{16\,\left(a^{5}x^{4} + 2\,a^{4}bx^{2} + a^{3}b^{2}\right)}, \frac{8\,a^{2}x^{5} + 25\,abx^{3} + 15\,b^{2}x - 15\,\left(a^{2}x^{4} + 2\right.}{8\,\left(a^{5}x^{4} + 2\,a^{4}bx^{2} + \right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(-3),x, algorithm="fricas")
```

```
[Out] [1/16*(16*a^2*x^5 + 50*a*b*x^3 + 30*b^2*x + 15*(a^2*x^4 + 2*a*b*x
^2 + b^2)*sqrt(-b/a)*log((a*x^2 - 2*a*x*sqrt(-b/a) - b)/(a*x^2 +
b)))/(a^5*x^4 + 2*a^4*b*x^2 + a^3*b^2), 1/8*(8*a^2*x^5 + 25*a*b*x
^3 + 15*b^2*x - 15*(a^2*x^4 + 2*a*b*x^2 + b^2)*sqrt(b/a)*arctan(x
/sqrt(b/a)))/(a^5*x^4 + 2*a^4*b*x^2 + a^3*b^2)]
```

Sympy [A] time = 2.20351, size = 107, normalized size = 1.45

$$\frac{15\sqrt{-\frac{b}{a^{7}}}\log\left(-a^{3}\sqrt{-\frac{b}{a^{7}}} + x\right)}{16} - \frac{15\sqrt{-\frac{b}{a^{7}}}\log\left(a^{3}\sqrt{-\frac{b}{a^{7}}} + x\right)}{16} + \frac{9abx^{3} + 7b^{2}x}{8a^{5}x^{4} + 16a^{4}bx^{2} + 8a^{3}b^{2}} + \frac{x}{a^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**3,x)
```

```
[Out] 15*sqrt(-b/a**7)*log(-a**3*sqrt(-b/a**7) + x)/16 - 15*sqrt(-b/a**
7)*log(a**3*sqrt(-b/a**7) + x)/16 + (9*a*b*x**3 + 7*b**2*x)/(8*a*
*5*x**4 + 16*a**4*b*x**2 + 8*a**3*b**2) + x/a**3
```

GIAC/XCAS [A] time = 0.22085, size = 73, normalized size = 0.99

$$-\frac{15\,b\arctan\left(\frac{ax}{\sqrt{ab}}\right)}{8\,\sqrt{ab}a^{3}} + \frac{x}{a^{3}} + \frac{9\,abx^{3} + 7\,b^{2}x}{8\,\left(ax^{2} + b\right)^{2}a^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(-3),x, algorithm="giac")
```

```
[Out] -15/8*b*arctan(a*x/sqrt(a*b))/(sqrt(a*b)*a^3) + x/a^3 + 1/8*(9*a*
b*x^3 + 7*b^2*x)/((a*x^2 + b)^2*a^3)
```

3.1878 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^3 x} \, dx$

Optimal. Leaf size=49

$$-\frac{b^2}{4a^3\left(ax^2+b\right)^2}+\frac{b}{a^3\left(ax^2+b\right)}+\frac{\log\left(ax^2+b\right)}{2a^3}$$

```
[Out] -b^2/(4*a^3*(b + a*x^2)^2) + b/(a^3*(b + a*x^2)) + Log[b + a*x^2]
/(2*a^3)
```

Rubi [A] time = 0.101023, antiderivative size = 49, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{b^2}{4a^3\left(ax^2+b\right)^2}+\frac{b}{a^3\left(ax^2+b\right)}+\frac{\log\left(ax^2+b\right)}{2a^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)^3*x),x]
```

```
[Out] -b^2/(4*a^3*(b + a*x^2)^2) + b/(a^3*(b + a*x^2)) + Log[b + a*x^2]
/(2*a^3)
```

Rubi in Sympy [A] time = 13.211, size = 41, normalized size = 0.84

$$-\frac{b^2}{4a^3\left(ax^2+b\right)^2}+\frac{b}{a^3\left(ax^2+b\right)}+\frac{\log\left(ax^2+b\right)}{2a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**3/x,x)
```

```
[Out] -b**2/(4*a**3*(a*x**2 + b)**2) + b/(a**3*(a*x**2 + b)) + log(a*x*
*2 + b)/(2*a**3)
```

Mathematica [A] time = 0.0275467, size = 39, normalized size = 0.8

$$\frac{\frac{b\left(4ax^2+3b\right)}{\left(ax^2+b\right)^2}+2\log\left(ax^2+b\right)}{4a^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)^3*x),x]
```

```
[Out] ((b*(3*b + 4*a*x^2))/(b + a*x^2)^2 + 2*Log[b + a*x^2])/(4*a^3)
```

Maple [A] time = 0.012, size = 46, normalized size = 0.9

$$-\frac{b^2}{4\,a^3\left(ax^2+b\right)^2}+\frac{b}{a^3\left(ax^2+b\right)}+\frac{\ln\left(ax^2+b\right)}{2\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^3/x,x)
```

```
[Out] -1/4*b^2/a^3/(a*x^2+b)^2+b/a^3/(a*x^2+b)+1/2*ln(a*x^2+b)/a^3
```

Maxima [A] time = 1.42738, size = 74, normalized size = 1.51

$$\frac{4\,abx^2 + 3\,b^2}{4\,(a^5x^4 + 2\,a^4bx^2 + a^3b^2)} + \frac{\log\left(ax^2 + b\right)}{2\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x),x, algorithm="maxima")
```

```
[Out] 1/4*(4*a*b*x^2 + 3*b^2)/(a^5*x^4 + 2*a^4*b*x^2 + a^3*b^2) + 1/2*l
og(a*x^2 + b)/a^3
```

Fricas [A] time = 0.226576, size = 93, normalized size = 1.9

$$\frac{4\,abx^2 + 3\,b^2 + 2\,\left(a^2x^4 + 2\,abx^2 + b^2\right)\log\left(ax^2 + b\right)}{4\,(a^5x^4 + 2\,a^4bx^2 + a^3b^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x),x, algorithm="fricas")
```

```
[Out] 1/4*(4*a*b*x^2 + 3*b^2 + 2*(a^2*x^4 + 2*a*b*x^2 + b^2)*log(a*x^2
+ b))/(a^5*x^4 + 2*a^4*b*x^2 + a^3*b^2)
```

Sympy [A] time = 1.89388, size = 53, normalized size = 1.08

$$\frac{4abx^2 + 3b^2}{4a^5x^4 + 8a^4bx^2 + 4a^3b^2} + \frac{\log\left(ax^2 + b\right)}{2a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**3/x,x)
```

```
[Out] (4*a*b*x**2 + 3*b**2)/(4*a**5*x**4 + 8*a**4*b*x**2 + 4*a**3*b**2)
 + log(a*x**2 + b)/(2*a**3)
```

GIAC/XCAS [A] time = 0.223375, size = 57, normalized size = 1.16

$$\frac{\ln\left(\left|ax^2 + b\right|\right)}{2\,a^3} - \frac{3\,ax^4 + 2\,bx^2}{4\,(ax^2 + b)^2a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x),x, algorithm="giac")
```

```
[Out] 1/2*ln(abs(a*x^2 + b))/a^3 - 1/4*(3*a*x^4 + 2*b*x^2)/((a*x^2 + b)
^2*a^2)
```

3.1879 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^3 x^2} \, dx$

Optimal. Leaf size=64

$$\frac{3\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8a^{5/2}\sqrt{b}}-\frac{3x}{8a^2(ax^2+b)}-\frac{x^3}{4a(ax^2+b)^2}$$

```
[Out] -x^3/(4*a*(b + a*x^2)^2) - (3*x)/(8*a^2*(b + a*x^2)) + (3*ArcTan[
(Sqrt[a]*x)/Sqrt[b]])/(8*a^(5/2)*Sqrt[b])
```

Rubi [A] time = 0.0723402, antiderivative size = 64, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{3\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8a^{5/2}\sqrt{b}}-\frac{3x}{8a^2(ax^2+b)}-\frac{x^3}{4a(ax^2+b)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)^3*x^2),x]
```

```
[Out] -x^3/(4*a*(b + a*x^2)^2) - (3*x)/(8*a^2*(b + a*x^2)) + (3*ArcTan[
(Sqrt[a]*x)/Sqrt[b]])/(8*a^(5/2)*Sqrt[b])
```

Rubi in Sympy [A] time = 11.5358, size = 56, normalized size = 0.88

$$-\frac{x^3}{4a(ax^2+b)^2}-\frac{3x}{8a^2(ax^2+b)}+\frac{3\,\mathrm{atan}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8a^{\frac{5}{2}}\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**3/x**2,x)
```

```
[Out] -x**3/(4*a*(a*x**2 + b)**2) - 3*x/(8*a**2*(a*x**2 + b)) + 3*atan(
sqrt(a)*x/sqrt(b))/(8*a**(5/2)*sqrt(b))
```

Mathematica [A] time = 0.0909158, size = 55, normalized size = 0.86

$$\frac{3\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8a^{5/2}\sqrt{b}}-\frac{5ax^3+3bx}{8a^2(ax^2+b)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)^3*x^2),x]
```

```
[Out] -(3*b*x + 5*a*x^3)/(8*a^2*(b + a*x^2)^2) + (3*ArcTan[(Sqrt[a]*x)/
Sqrt[b]])/(8*a^(5/2)*Sqrt[b])
```

Maple [A] time = 0.011, size = 47, normalized size = 0.7

$$\frac{1}{(ax^2+b)^2}\left(-\frac{5\,x^3}{8\,a}-\frac{3\,bx}{8\,a^2}\right)+\frac{3}{8\,a^2}\arctan\left(ax\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^3/x^2,x)
```

```
[Out] (-5/8*x^3/a-3/8*b*x/a^2)/(a*x^2+b)^2+3/8/a^2/(a*b)^(1/2)*arctan(a
*x/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x^2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.238947, size = 1, normalized size = 0.02

$$\left[\frac{3\left(a^{2}x^{4}+2\,abx^{2}+b^{2}\right)\log\left(\frac{2\,abx+\left(ax^{2}-b\right)\sqrt{-ab}}{ax^{2}+b}\right)-2\left(5\,ax^{3}+3\,bx\right)\sqrt{-ab}}{16\left(a^{4}x^{4}+2\,a^{3}bx^{2}+a^{2}b^{2}\right)\sqrt{-ab}},\ \frac{3\left(a^{2}x^{4}+2\,abx^{2}+b^{2}\right)\arctan\left(\frac{\sqrt{ab}x}{b}\right)-\left(5\,ax^{3}+\right.}{8\left(a^{4}x^{4}+2\,a^{3}bx^{2}+a^{2}b^{2}\right)\sqrt{ab}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x^2),x, algorithm="fricas")
```

```
[Out] [1/16*(3*(a^2*x^4 + 2*a*b*x^2 + b^2)*log((2*a*b*x + (a*x^2 - b)*s
qrt(-a*b))/(a*x^2 + b)) - 2*(5*a*x^3 + 3*b*x)*sqrt(-a*b))/((a^4*x
^4 + 2*a^3*b*x^2 + a^2*b^2)*sqrt(-a*b)), 1/8*(3*(a^2*x^4 + 2*a*b*
x^2 + b^2)*arctan(sqrt(a*b)*x/b) - (5*a*x^3 + 3*b*x)*sqrt(a*b))/(
(a^4*x^4 + 2*a^3*b*x^2 + a^2*b^2)*sqrt(a*b))]
```

Sympy [A] time = 1.93344, size = 109, normalized size = 1.7

$$-\frac{3\sqrt{-\frac{1}{a^{5}b}}\log\left(-a^{2}b\sqrt{-\frac{1}{a^{5}b}}+x\right)}{16}+\frac{3\sqrt{-\frac{1}{a^{5}b}}\log\left(a^{2}b\sqrt{-\frac{1}{a^{5}b}}+x\right)}{16}-\frac{5ax^{3}+3bx}{8a^{4}x^{4}+16a^{3}bx^{2}+8a^{2}b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**3/x**2,x)
```

```
[Out] -3*sqrt(-1/(a**5*b))*log(-a**2*b*sqrt(-1/(a**5*b)) + x)/16 + 3*sq
rt(-1/(a**5*b))*log(a**2*b*sqrt(-1/(a**5*b)) + x)/16 - (5*a*x**3
+ 3*b*x)/(8*a**4*x**4 + 16*a**3*b*x**2 + 8*a**2*b**2)
```

GIAC/XCAS [A] time = 0.231845, size = 61, normalized size = 0.95

$$\frac{3\,\arctan\left(\frac{ax}{\sqrt{ab}}\right)}{8\,\sqrt{ab}a^{2}}-\frac{5\,ax^{3}+3\,bx}{8\left(ax^{2}+b\right)^{2}a^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x^2),x, algorithm="giac")
```

```
[Out] 3/8*arctan(a*x/sqrt(a*b))/(sqrt(a*b)*a^2) - 1/8*(5*a*x^3 + 3*b*x)
/((a*x^2 + b)^2*a^2)
```

3.1880 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^3 x^3} \, dx$

Optimal. Leaf size=16

$$\frac{1}{4b\left(a+\frac{b}{x^2}\right)^2}$$

```
[Out] 1/(4*b*(a + b/x^2)^2)
```

Rubi [A] time = 0.0186982, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{1}{4b\left(a+\frac{b}{x^2}\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)^3*x^3),x]

[Out] 1/(4*b*(a + b/x^2)^2)
```

Rubi in Sympy [A] time = 2.142, size = 12, normalized size = 0.75

$$\frac{1}{4b\left(a+\frac{b}{x^2}\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**3/x**3,x)

[Out] 1/(4*b*(a + b/x**2)**2)
```

Mathematica [A] time = 0.0125049, size = 24, normalized size = 1.5

$$-\frac{2ax^2+b}{4a^2\left(ax^2+b\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)^3*x^3),x]

[Out] -(b + 2*a*x^2)/(4*a^2*(b + a*x^2)^2)
```

Maple [B] time = 0.01, size = 31, normalized size = 1.9

$$-\frac{1}{\left(2\,ax^2+2\,b\right)a^2}+\frac{b}{4\,a^2\left(ax^2+b\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^3/x^3,x)
```

```
[Out] -1/2/(a*x^2+b)/a^2+1/4*b/a^2/(a*x^2+b)^2
```

Maxima [A] time = 1.4225, size = 19, normalized size = 1.19

$$\frac{1}{4\left(a+\frac{b}{x^2}\right)^2 b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x^3),x, algorithm="maxima")

[Out] 1/4/((a + b/x^2)^2*b)
```

Fricas [A] time = 0.218064, size = 49, normalized size = 3.06

$$-\frac{2\,ax^2+b}{4\,(a^4x^4+2\,a^3bx^2+a^2b^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x^3),x, algorithm="fricas")

[Out] -1/4*(2*a*x^2 + b)/(a^4*x^4 + 2*a^3*b*x^2 + a^2*b^2)
```

Sympy [A] time = 1.71308, size = 36, normalized size = 2.25

$$-\frac{2ax^2+b}{4a^4x^4+8a^3bx^2+4a^2b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**3/x**3,x)

[Out] -(2*a*x**2 + b)/(4*a**4*x**4 + 8*a**3*b*x**2 + 4*a**2*b**2)
```

GIAC/XCAS [A] time = 0.225683, size = 30, normalized size = 1.88

$$-\frac{2\,ax^2+b}{4\,(ax^2+b)^2a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x^3),x, algorithm="giac")

[Out] -1/4*(2*a*x^2 + b)/((a*x^2 + b)^2*a^2)
```

3.1881 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^3 x^4}\,dx$

Optimal. Leaf size=65

$$\frac{\tan^{-1}\left(\frac{\sqrt{a}\,x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}}+\frac{x}{8ab\,(ax^2+b)}-\frac{x}{4a\,(ax^2+b)^2}$$

```
[Out] -x/(4*a*(b + a*x^2)^2) + x/(8*a*b*(b + a*x^2)) + ArcTan[(Sqrt[a]*
x)/Sqrt[b]]/(8*a^(3/2)*b^(3/2))
```

Rubi [A] time = 0.0686584, antiderivative size = 65, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{\tan^{-1}\left(\frac{\sqrt{a}\,x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}}+\frac{x}{8ab\,(ax^2+b)}-\frac{x}{4a\,(ax^2+b)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)^3*x^4),x]
```

```
[Out] -x/(4*a*(b + a*x^2)^2) + x/(8*a*b*(b + a*x^2)) + ArcTan[(Sqrt[a]*
x)/Sqrt[b]]/(8*a^(3/2)*b^(3/2))
```

Rubi in Sympy [A] time = 9.62009, size = 51, normalized size = 0.78

$$-\frac{x}{4a\,(ax^2+b)^2}+\frac{x}{8ab\,(ax^2+b)}+\frac{\operatorname{atan}\left(\frac{\sqrt{a}\,x}{\sqrt{b}}\right)}{8a^{\frac{3}{2}}b^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**3/x**4,x)
```

```
[Out] -x/(4*a*(a*x**2 + b)**2) + x/(8*a*b*(a*x**2 + b)) + atan(sqrt(a)*
x/sqrt(b))/(8*a**(3/2)*b**(3/2))
```

Mathematica [A] time = 0.0547117, size = 58, normalized size = 0.89

$$\frac{\frac{\sqrt{a}\sqrt{b}\,x(ax^2-b)}{(ax^2+b)^2}+\tan^{-1}\left(\frac{\sqrt{a}\,x}{\sqrt{b}}\right)}{8a^{3/2}b^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)^3*x^4),x]
```

```
[Out] ((Sqrt[a]*Sqrt[b]*x*(-b + a*x^2))/(b + a*x^2)^2 + ArcTan[(Sqrt[a]
*x)/Sqrt[b]])/(8*a^(3/2)*b^(3/2))
```

Maple [A] time = 0.006, size = 49, normalized size = 0.8

$$\frac{1}{(ax^2+b)^2}\left(\frac{x^3}{8\,b}-\frac{x}{8\,a}\right)+\frac{1}{8\,ab}\arctan\left(ax\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^3/x^4,x)
```

```
[Out] (1/8*x^3/b-1/8*x/a)/(a*x^2+b)^2+1/8/b/a/(a*b)^(1/2)*arctan(a*x/(a
*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x^4),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.234326, size = 1, normalized size = 0.02

$$\left[\frac{\left(a^2x^4 + 2\,abx^2 + b^2\right)\log\left(\frac{2\,abx + \left(ax^2 - b\right)\sqrt{-ab}}{ax^2 + b}\right) + 2\left(ax^3 - bx\right)\sqrt{-ab}}{16\left(a^3bx^4 + 2\,a^2b^2x^2 + ab^3\right)\sqrt{-ab}}, \frac{\left(a^2x^4 + 2\,abx^2 + b^2\right)\arctan\left(\frac{\sqrt{ab}x}{b}\right) + \left(ax^3 - bx\right)\sqrt{ab}}{8\left(a^3bx^4 + 2\,a^2b^2x^2 + ab^3\right)\sqrt{ab}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x^4),x, algorithm="fricas")
```

```
[Out] [1/16*((a^2*x^4 + 2*a*b*x^2 + b^2)*log((2*a*b*x + (a*x^2 - b)*sqr
t(-a*b))/(a*x^2 + b)) + 2*(a*x^3 - b*x)*sqrt(-a*b))/((a^3*b*x^4 +
 2*a^2*b^2*x^2 + a*b^3)*sqrt(-a*b)), 1/8*((a^2*x^4 + 2*a*b*x^2 +
b^2)*arctan(sqrt(a*b)*x/b) + (a*x^3 - b*x)*sqrt(a*b))/((a^3*b*x^4
 + 2*a^2*b^2*x^2 + a*b^3)*sqrt(a*b))]
```

Sympy [A] time = 1.82177, size = 110, normalized size = 1.69

$$-\frac{\sqrt{-\frac{1}{a^3b^3}}\log\left(-ab^2\sqrt{-\frac{1}{a^3b^3}} + x\right)}{16} + \frac{\sqrt{-\frac{1}{a^3b^3}}\log\left(ab^2\sqrt{-\frac{1}{a^3b^3}} + x\right)}{16} + \frac{ax^3 - bx}{8a^3bx^4 + 16a^2b^2x^2 + 8ab^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**3/x**4,x)
```

```
[Out] -sqrt(-1/(a**3*b**3))*log(-a*b**2*sqrt(-1/(a**3*b**3)) + x)/16 +
sqrt(-1/(a**3*b**3))*log(a*b**2*sqrt(-1/(a**3*b**3)) + x)/16 + (a
*x**3 - b*x)/(8*a**3*b*x**4 + 16*a**2*b**2*x**2 + 8*a*b**3)
```

GIAC/XCAS [A] time = 0.224768, size = 68, normalized size = 1.05

$$\frac{\arctan\left(\frac{ax}{\sqrt{ab}}\right)}{8\sqrt{ab}ab} + \frac{ax^3 - bx}{8\left(ax^2 + b\right)^2 ab}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x^4),x, algorithm="giac")
```

```
[Out] 1/8*arctan(a*x/sqrt(a*b))/(sqrt(a*b)*a*b) + 1/8*(a*x^3 - b*x)/((a
*x^2 + b)^2*a*b)
```

3.1882 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^3 x^5} \, dx$

Optimal. Leaf size=16

$$-\frac{1}{4a\left(ax^2+b\right)^2}$$

```
[Out] -1/(4*a*(b + a*x^2)^2)
```

Rubi [A] time = 0.019997, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{1}{4a\left(ax^2+b\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)^3*x^5),x]

[Out] -1/(4*a*(b + a*x^2)^2)
```

Rubi in Sympy [A] time = 3.50583, size = 14, normalized size = 0.88

$$-\frac{1}{4a\left(ax^2+b\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**3/x**5,x)

[Out] -1/(4*a*(a*x**2 + b)**2)
```

Mathematica [A] time = 0.0046052, size = 16, normalized size = 1.

$$-\frac{1}{4a\left(ax^2+b\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)^3*x^5),x]

[Out] -1/(4*a*(b + a*x^2)^2)
```

Maple [A] time = 0.001, size = 15, normalized size = 0.9

$$-\frac{1}{4\,a\left(ax^2+b\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^3/x^5,x)
```

```
[Out] -1/4/a/(a*x^2+b)^2
```

Maxima [A] time = 1.4407, size = 35, normalized size = 2.19

$$-\frac{1}{4\left(a^3x^4+2\,a^2bx^2+ab^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x^5),x, algorithm="maxima")
```

```
[Out] -1/4/(a^3*x^4 + 2*a^2*b*x^2 + a*b^2)
```

Fricas [A] time = 0.216941, size = 35, normalized size = 2.19

$$-\frac{1}{4\left(a^3x^4+2\,a^2bx^2+ab^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x^5),x, algorithm="fricas")
```

```
[Out] -1/4/(a^3*x^4 + 2*a^2*b*x^2 + a*b^2)
```

Sympy [A] time = 1.59476, size = 27, normalized size = 1.69

$$-\frac{1}{4a^3x^4+8a^2bx^2+4ab^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**3/x**5,x)
```

```
[Out] -1/(4*a**3*x**4 + 8*a**2*b*x**2 + 4*a*b**2)
```

GIAC/XCAS [A] time = 0.233716, size = 19, normalized size = 1.19

$$-\frac{1}{4\left(ax^2+b\right)^2a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x^5),x, algorithm="giac")
```

```
[Out] -1/4/((a*x^2 + b)^2*a)
```

3.1883 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^3 x^6} \, dx$

Optimal. Leaf size=62

$$\frac{3 \tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8\sqrt{a}b^{5/2}}+\frac{3x}{8b^2\left(ax^2+b\right)}+\frac{x}{4b\left(ax^2+b\right)^2}$$

```
[Out] x/(4*b*(b + a*x^2)^2) + (3*x)/(8*b^2*(b + a*x^2)) + (3*ArcTan[(Sq
rt[a]*x)/Sqrt[b]])/(8*Sqrt[a]*b^(5/2))
```

Rubi [A] time = 0.0573739, antiderivative size = 62, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{3 \tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8\sqrt{a}b^{5/2}}+\frac{3x}{8b^2\left(ax^2+b\right)}+\frac{x}{4b\left(ax^2+b\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)^3*x^6),x]
```

```
[Out] x/(4*b*(b + a*x^2)^2) + (3*x)/(8*b^2*(b + a*x^2)) + (3*ArcTan[(Sq
rt[a]*x)/Sqrt[b]])/(8*Sqrt[a]*b^(5/2))
```

Rubi in Sympy [A] time = 7.14342, size = 54, normalized size = 0.87

$$\frac{x}{4b\left(ax^2+b\right)^2}+\frac{3x}{8b^2\left(ax^2+b\right)}+\frac{3 \operatorname{atan}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8\sqrt{a}b^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**3/x**6,x)
```

```
[Out] x/(4*b*(a*x**2 + b)**2) + 3*x/(8*b**2*(a*x**2 + b)) + 3*atan(sqrt
(a)*x/sqrt(b))/(8*sqrt(a)*b**(5/2))
```

Mathematica [A] time = 0.0664809, size = 55, normalized size = 0.89

$$\frac{3 \tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8\sqrt{a}b^{5/2}}+\frac{3ax^3+5bx}{8b^2\left(ax^2+b\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)^3*x^6),x]
```

```
[Out] (5*b*x + 3*a*x^3)/(8*b^2*(b + a*x^2)^2) + (3*ArcTan[(Sqrt[a]*x)/S
qrt[b]])/(8*Sqrt[a]*b^(5/2))
```

Maple [A] time = 0.005, size = 51, normalized size = 0.8

$$\frac{x}{4\,b\left(ax^2+b\right)^2}+\frac{3\,x}{8\,b^2\left(ax^2+b\right)}+\frac{3}{8\,b^2}\arctan\left(ax\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^3/x^6,x)
```

```
[Out] 1/4*x/b/(a*x^2+b)^2+3/8*x/b^2/(a*x^2+b)+3/8/b^2/(a*b)^(1/2)*arcta
n(a*x/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x^6),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.237404, size = 1, normalized size = 0.02

$$\left[\frac{3\left(a^2x^4+2\,abx^2+b^2\right)\log\left(\frac{2\,abx+\left(ax^2-b\right)\sqrt{-ab}}{ax^2+b}\right)+2\left(3\,ax^3+5\,bx\right)\sqrt{-ab}}{16\left(a^2b^2x^4+2\,ab^3x^2+b^4\right)\sqrt{-ab}},\ \frac{3\left(a^2x^4+2\,abx^2+b^2\right)\arctan\left(\frac{\sqrt{ab}x}{b}\right)+\left(3\,ax^3+\right.}{8\left(a^2b^2x^4+2\,ab^3x^2+b^4\right)\sqrt{ab}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x^6),x, algorithm="fricas")
```

```
[Out] [1/16*(3*(a^2*x^4 + 2*a*b*x^2 + b^2)*log((2*a*b*x + (a*x^2 - b)*s
qrt(-a*b))/(a*x^2 + b)) + 2*(3*a*x^3 + 5*b*x)*sqrt(-a*b))/((a^2*b
^2*x^4 + 2*a*b^3*x^2 + b^4)*sqrt(-a*b)), 1/8*(3*(a^2*x^4 + 2*a*b*
x^2 + b^2)*arctan(sqrt(a*b)*x/b) + (3*a*x^3 + 5*b*x)*sqrt(a*b))/(
(a^2*b^2*x^4 + 2*a*b^3*x^2 + b^4)*sqrt(a*b))]
```

Sympy [A] time = 1.89881, size = 105, normalized size = 1.69

$$-\frac{3\sqrt{-\frac{1}{ab^5}}\log\left(-b^3\sqrt{-\frac{1}{ab^5}}+x\right)}{16}+\frac{3\sqrt{-\frac{1}{ab^5}}\log\left(b^3\sqrt{-\frac{1}{ab^5}}+x\right)}{16}+\frac{3ax^3+5bx}{8a^2b^2x^4+16ab^3x^2+8b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**3/x**6,x)
```

```
[Out] -3*sqrt(-1/(a*b**5))*log(-b**3*sqrt(-1/(a*b**5)) + x)/16 + 3*sqrt
(-1/(a*b**5))*log(b**3*sqrt(-1/(a*b**5)) + x)/16 + (3*a*x**3 + 5*
b*x)/(8*a**2*b**2*x**4 + 16*a*b**3*x**2 + 8*b**4)
```

GIAC/XCAS [A] time = 0.228677, size = 61, normalized size = 0.98

$$\frac{3\arctan\left(\frac{ax}{\sqrt{ab}}\right)}{8\sqrt{ab}b^2}+\frac{3\,ax^3+5\,bx}{8\left(ax^2+b\right)^2b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x^6),x, algorithm="giac")
```

```
[Out] 3/8*arctan(a*x/sqrt(a*b))/(sqrt(a*b)*b^2) + 1/8*(3*a*x^3 + 5*b*x)
/((a*x^2 + b)^2*b^2)
```

3.1884 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^3 x^7} dx$

Optimal. Leaf size=54

$$-\frac{\log(ax^2+b)}{2b^3}+\frac{1}{2b^2(ax^2+b)}+\frac{1}{4b(ax^2+b)^2}+\frac{\log(x)}{b^3}$$

```
[Out] 1/(4*b*(b + a*x^2)^2) + 1/(2*b^2*(b + a*x^2)) + Log[x]/b^3 - Log[
b + a*x^2]/(2*b^3)
```

Rubi [A] time = 0.100204, antiderivative size = 54, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{\log(ax^2+b)}{2b^3}+\frac{1}{2b^2(ax^2+b)}+\frac{1}{4b(ax^2+b)^2}+\frac{\log(x)}{b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)^3*x^7),x]
```

```
[Out] 1/(4*b*(b + a*x^2)^2) + 1/(2*b^2*(b + a*x^2)) + Log[x]/b^3 - Log[
b + a*x^2]/(2*b^3)
```

Rubi in Sympy [A] time = 12.7582, size = 49, normalized size = 0.91

$$\frac{1}{4b(ax^2+b)^2}+\frac{1}{2b^2(ax^2+b)}+\frac{\log(x^2)}{2b^3}-\frac{\log(ax^2+b)}{2b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**3/x**7,x)
```

```
[Out] 1/(4*b*(a*x**2 + b)**2) + 1/(2*b**2*(a*x**2 + b)) + log(x**2)/(2*
b**3) - log(a*x**2 + b)/(2*b**3)
```

Mathematica [A] time = 0.0530109, size = 43, normalized size = 0.8

$$\frac{\frac{b(2ax^2+3b)}{(ax^2+b)^2}-2\log(ax^2+b)+4\log(x)}{4b^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)^3*x^7),x]
```

```
[Out] ((b*(3*b + 2*a*x^2))/(b + a*x^2)^2 + 4*Log[x] - 2*Log[b + a*x^2])
/(4*b^3)
```

Maple [A] time = 0.016, size = 49, normalized size = 0.9

$$\frac{1}{4\,b(ax^2+b)^2}+\frac{1}{2\,b^2(ax^2+b)}+\frac{\ln(x)}{b^3}-\frac{\ln(ax^2+b)}{2\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^3/x^7,x)
```

```
[Out] 1/4/b/(a*x^2+b)^2+1/2/b^2/(a*x^2+b)+ln(x)/b^3-1/2*ln(a*x^2+b)/b^3
```

Maxima [A] time = 1.42213, size = 81, normalized size = 1.5

$$\frac{2\,ax^2+3\,b}{4\,(a^2b^2x^4+2\,ab^3x^2+b^4)}-\frac{\log\left(ax^2+b\right)}{2\,b^3}+\frac{\log\left(x^2\right)}{2\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x^7),x, algorithm="maxima")
```

```
[Out] 1/4*(2*a*x^2 + 3*b)/(a^2*b^2*x^4 + 2*a*b^3*x^2 + b^4) - 1/2*log(a
*x^2 + b)/b^3 + 1/2*log(x^2)/b^3
```

Fricas [A] time = 0.226441, size = 122, normalized size = 2.26

$$\frac{2\,abx^2+3\,b^2-2\,\left(a^2x^4+2\,abx^2+b^2\right)\log\left(ax^2+b\right)+4\,\left(a^2x^4+2\,abx^2+b^2\right)\log\left(x\right)}{4\,(a^2b^3x^4+2\,ab^4x^2+b^5)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x^7),x, algorithm="fricas")
```

```
[Out] 1/4*(2*a*b*x^2 + 3*b^2 - 2*(a^2*x^4 + 2*a*b*x^2 + b^2)*log(a*x^2
+ b) + 4*(a^2*x^4 + 2*a*b*x^2 + b^2)*log(x))/(a^2*b^3*x^4 + 2*a*b
^4*x^2 + b^5)
```

Sympy [A] time = 2.25035, size = 56, normalized size = 1.04

$$\frac{2ax^2+3b}{4a^2b^2x^4+8ab^3x^2+4b^4}+\frac{\log\left(x\right)}{b^3}-\frac{\log\left(x^2+\frac{b}{a}\right)}{2b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**3/x**7,x)
```

```
[Out] (2*a*x**2 + 3*b)/(4*a**2*b**2*x**4 + 8*a*b**3*x**2 + 4*b**4) + lo
g(x)/b**3 - log(x**2 + b/a)/(2*b**3)
```

GIAC/XCAS [A] time = 0.226274, size = 80, normalized size = 1.48

$$\frac{\ln\left(x^2\right)}{2\,b^3}-\frac{\ln\left(\left|ax^2+b\right|\right)}{2\,b^3}+\frac{3\,a^2x^4+8\,abx^2+6\,b^2}{4\,(ax^2+b)^2b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x^7),x, algorithm="giac")
```

```
[Out] 1/2*ln(x^2)/b^3 - 1/2*ln(abs(a*x^2 + b))/b^3 + 1/4*(3*a^2*x^4 + 8
*a*b*x^2 + 6*b^2)/((a*x^2 + b)^2*b^3)
```

3.1885 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^3 x^8} \, dx$

Optimal. Leaf size=76

$$-\frac{15\sqrt{a}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8b^{7/2}}+\frac{5}{8b^2x\left(ax^2+b\right)}+\frac{1}{4bx\left(ax^2+b\right)^2}-\frac{15}{8b^3x}$$

```
[Out] -15/(8*b^3*x) + 1/(4*b*x*(b + a*x^2)^2) + 5/(8*b^2*x*(b + a*x^2))
 - (15*Sqrt[a]*ArcTan[(Sqrt[a]*x)/Sqrt[b]])/(8*b^(7/2))
```

Rubi [A] time = 0.0885268, antiderivative size = 76, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$-\frac{15\sqrt{a}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8b^{7/2}}+\frac{5}{8b^2x\left(ax^2+b\right)}+\frac{1}{4bx\left(ax^2+b\right)^2}-\frac{15}{8b^3x}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b/x^2)^3*x^8),x]
```

```
[Out] -15/(8*b^3*x) + 1/(4*b*x*(b + a*x^2)^2) + 5/(8*b^2*x*(b + a*x^2))
 - (15*Sqrt[a]*ArcTan[(Sqrt[a]*x)/Sqrt[b]])/(8*b^(7/2))
```

Rubi in Sympy [A] time = 14.834, size = 65, normalized size = 0.86

$$-\frac{15\sqrt{a}\,\text{atan}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8b^{\frac{7}{2}}}+\frac{1}{4bx\left(ax^2+b\right)^2}+\frac{5}{8b^2x\left(ax^2+b\right)}-\frac{15}{8b^3x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b/x**2)**3/x**8,x)
```

```
[Out] -15*sqrt(a)*atan(sqrt(a)*x/sqrt(b))/(8*b**(7/2)) + 1/(4*b*x*(a*x*
*2 + b)**2) + 5/(8*b**2*x*(a*x**2 + b)) - 15/(8*b**3*x)
```

Mathematica [A] time = 0.0822347, size = 68, normalized size = 0.89

$$-\frac{15a^2x^4+25abx^2+8b^2}{8b^3x\left(ax^2+b\right)^2}-\frac{15\sqrt{a}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8b^{7/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b/x^2)^3*x^8),x]
```

```
[Out] -(8*b^2 + 25*a*b*x^2 + 15*a^2*x^4)/(8*b^3*x*(b + a*x^2)^2) - (15*
Sqrt[a]*ArcTan[(Sqrt[a]*x)/Sqrt[b]])/(8*b^(7/2))
```

Maple [A] time = 0.01, size = 66, normalized size = 0.9

$$-\frac{1}{b^3x}-\frac{7\,x^3a^2}{8\,b^3\left(ax^2+b\right)^2}-\frac{9\,ax}{8\,b^2\left(ax^2+b\right)^2}-\frac{15\,a}{8\,b^3}\arctan\left(ax\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^3/x^8,x)
```

```
[Out] -1/b^3/x-7/8/b^3*a^2/(a*x^2+b)^2*x^3-9/8/b^2*a/(a*x^2+b)^2*x-15/8
/b^3*a/(a*b)^(1/2)*arctan(a*x/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x^8),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.244151, size = 1, normalized size = 0.01

$$\left[-\frac{30\,a^2x^4+50\,abx^2-15\left(a^2x^5+2\,abx^3+b^2x\right)\sqrt{-\frac{a}{b}}\log\left(\frac{ax^2-2\,bx\sqrt{-\frac{a}{b}}-b}{ax^2+b}\right)+16\,b^2}{16\left(a^2b^3x^5+2\,ab^4x^3+b^5x\right)},\right.$$
$$\left.-\frac{15\,a^2x^4+25\,abx^2+15\left(a^2x^5+2\,abx^3+b^2x\right)\sqrt{\frac{a}{b}}\arctan\left(\frac{ax}{b\sqrt{\frac{a}{b}}}\right)+8\,b^2}{8\left(a^2b^3x^5+2\,ab^4x^3+b^5x\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x^8),x, algorithm="fricas")
```

```
[Out] [-1/16*(30*a^2*x^4 + 50*a*b*x^2 - 15*(a^2*x^5 + 2*a*b*x^3 + b^2*x
)*sqrt(-a/b)*log((a*x^2 - 2*b*x*sqrt(-a/b) - b)/(a*x^2 + b)) + 16
*b^2)/(a^2*b^3*x^5 + 2*a*b^4*x^3 + b^5*x), -1/8*(15*a^2*x^4 + 25*
a*b*x^2 + 15*(a^2*x^5 + 2*a*b*x^3 + b^2*x)*sqrt(a/b)*arctan(a*x/(
b*sqrt(a/b))) + 8*b^2)/(a^2*b^3*x^5 + 2*a*b^4*x^3 + b^5*x)]
```

Sympy [A] time = 2.50179, size = 114, normalized size = 1.5

$$\frac{15\sqrt{-\frac{a}{b^7}}\log\left(x-\frac{b^4\sqrt{-\frac{a}{b^7}}}{a}\right)}{16}-\frac{15\sqrt{-\frac{a}{b^7}}\log\left(x+\frac{b^4\sqrt{-\frac{a}{b^7}}}{a}\right)}{16}-\frac{15a^2x^4+25abx^2+8b^2}{8a^2b^3x^5+16ab^4x^3+8b^5x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**3/x**8,x)
```

```
[Out] 15*sqrt(-a/b**7)*log(x - b**4*sqrt(-a/b**7)/a)/16 - 15*sqrt(-a/b*
*7)*log(x + b**4*sqrt(-a/b**7)/a)/16 - (15*a**2*x**4 + 25*a*b*x**
2 + 8*b**2)/(8*a**2*b**3*x**5 + 16*a*b**4*x**3 + 8*b**5*x)
```

GIAC/XCAS [A] time = 0.231957, size = 77, normalized size = 1.01

$$-\frac{15\, a \arctan\left(\frac{ax}{\sqrt{ab}}\right)}{8\, \sqrt{ab} b^{3}} - \frac{7\, a^{2} x^{3} + 9\, abx}{8\, {\left(ax^{2} + b\right)}^{2} b^{3}} - \frac{1}{b^{3} x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x^8),x, algorithm="giac")
```

```
[Out] -15/8*a*arctan(a*x/sqrt(a*b))/(sqrt(a*b)*b^3) - 1/8*(7*a^2*x^3 +
9*a*b*x)/((a*x^2 + b)^2*b^3) - 1/(b^3*x)
```

3.1886 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^3 x^9} \, dx$

Optimal. Leaf size=67

$$\frac{3a\log\left(ax^2+b\right)}{2b^4}-\frac{3a\log(x)}{b^4}-\frac{a}{b^3\left(ax^2+b\right)}-\frac{a}{4b^2\left(ax^2+b\right)^2}-\frac{1}{2b^3x^2}$$

```
[Out] -1/(2*b^3*x^2) - a/(4*b^2*(b + a*x^2)^2) - a/(b^3*(b + a*x^2)) -
(3*a*Log[x])/b^4 + (3*a*Log[b + a*x^2])/(2*b^4)
```

Rubi [A] time = 0.126714, antiderivative size = 67, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{3a\log\left(ax^2+b\right)}{2b^4}-\frac{3a\log(x)}{b^4}-\frac{a}{b^3\left(ax^2+b\right)}-\frac{a}{4b^2\left(ax^2+b\right)^2}-\frac{1}{2b^3x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)^3*x^9),x]
```

```
[Out] -1/(2*b^3*x^2) - a/(4*b^2*(b + a*x^2)^2) - a/(b^3*(b + a*x^2)) -
(3*a*Log[x])/b^4 + (3*a*Log[b + a*x^2])/(2*b^4)
```

Rubi in Sympy [A] time = 15.3823, size = 66, normalized size = 0.99

$$-\frac{a}{4b^2\left(ax^2+b\right)^2}-\frac{a}{b^3\left(ax^2+b\right)}-\frac{3a\log\left(x^2\right)}{2b^4}+\frac{3a\log\left(ax^2+b\right)}{2b^4}-\frac{1}{2b^3x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**3/x**9,x)
```

```
[Out] -a/(4*b**2*(a*x**2 + b)**2) - a/(b**3*(a*x**2 + b)) - 3*a*log(x**
2)/(2*b**4) + 3*a*log(a*x**2 + b)/(2*b**4) - 1/(2*b**3*x**2)
```

Mathematica [A] time = 0.101068, size = 59, normalized size = 0.88

$$-\frac{\frac{b\left(6a^2x^4+9abx^2+2b^2\right)}{x^2\left(ax^2+b\right)^2}-6a\log\left(ax^2+b\right)+12a\log(x)}{4b^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)^3*x^9),x]
```

```
[Out] -((b*(2*b^2 + 9*a*b*x^2 + 6*a^2*x^4))/(x^2*(b + a*x^2)^2) + 12*a*
Log[x] - 6*a*Log[b + a*x^2])/(4*b^4)
```

Maple [A] time = 0.018, size = 62, normalized size = 0.9

$$-\frac{1}{2\,b^3x^2}-\frac{a}{4\,b^2\left(ax^2+b\right)^2}-\frac{a}{b^3\left(ax^2+b\right)}-3\,\frac{a\ln(x)}{b^4}+\frac{3\,a\ln\left(ax^2+b\right)}{2\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^3/x^9,x)
```

```
[Out] -1/2/b^3/x^2-1/4*a/b^2/(a*x^2+b)^2-a/b^3/(a*x^2+b)-3*a*ln(x)/b^4+
3/2*a*ln(a*x^2+b)/b^4
```

Maxima [A] time = 1.43765, size = 104, normalized size = 1.55

$$-\frac{6\,a^{2}x^{4}+9\,abx^{2}+2\,b^{2}}{4\,(a^{2}b^{3}x^{6}+2\,ab^{4}x^{4}+b^{5}x^{2})}+\frac{3\,a\log\left(ax^{2}+b\right)}{2\,b^{4}}-\frac{3\,a\log\left(x^{2}\right)}{2\,b^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x^9),x, algorithm="maxima")
```

```
[Out] -1/4*(6*a^2*x^4 + 9*a*b*x^2 + 2*b^2)/(a^2*b^3*x^6 + 2*a*b^4*x^4 +
 b^5*x^2) + 3/2*a*log(a*x^2 + b)/b^4 - 3/2*a*log(x^2)/b^4
```

Fricas [A] time = 0.233763, size = 161, normalized size = 2.4

$$-\frac{6\,a^{2}bx^{4}+9\,ab^{2}x^{2}+2\,b^{3}-6\left(a^{3}x^{6}+2\,a^{2}bx^{4}+ab^{2}x^{2}\right)\log\left(ax^{2}+b\right)+12\left(a^{3}x^{6}+2\,a^{2}bx^{4}+ab^{2}x^{2}\right)\log\left(x\right)}{4\,(a^{2}b^{4}x^{6}+2\,ab^{5}x^{4}+b^{6}x^{2})}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x^9),x, algorithm="fricas")
```

```
[Out] -1/4*(6*a^2*b*x^4 + 9*a*b^2*x^2 + 2*b^3 - 6*(a^3*x^6 + 2*a^2*b*x^
4 + a*b^2*x^2)*log(a*x^2 + b) + 12*(a^3*x^6 + 2*a^2*b*x^4 + a*b^2
*x^2)*log(x))/(a^2*b^4*x^6 + 2*a*b^5*x^4 + b^6*x^2)
```

Sympy [A] time = 3.01482, size = 78, normalized size = 1.16

$$-\frac{3a\log\left(x\right)}{b^{4}}+\frac{3a\log\left(x^{2}+\frac{b}{a}\right)}{2b^{4}}-\frac{6a^{2}x^{4}+9abx^{2}+2b^{2}}{4a^{2}b^{3}x^{6}+8ab^{4}x^{4}+4b^{5}x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**3/x**9,x)
```

```
[Out] -3*a*log(x)/b**4 + 3*a*log(x**2 + b/a)/(2*b**4) - (6*a**2*x**4 +
9*a*b*x**2 + 2*b**2)/(4*a**2*b**3*x**6 + 8*a*b**4*x**4 + 4*b**5*x
**2)
```

GIAC/XCAS [A] time = 0.235527, size = 111, normalized size = 1.66

$$-\frac{3\,a\ln\left(x^{2}\right)}{2\,b^{4}}+\frac{3\,a\ln\left(\left|ax^{2}+b\right|\right)}{2\,b^{4}}-\frac{9\,a^{3}x^{4}+22\,a^{2}bx^{2}+14\,ab^{2}}{4\,(ax^{2}+b)^{2}b^{4}}+\frac{3\,ax^{2}-b}{2\,b^{4}x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x^9),x, algorithm="giac")
```

```
[Out] -3/2*a*ln(x^2)/b^4 + 3/2*a*ln(abs(a*x^2 + b))/b^4 - 1/4*(9*a^3*x^
4 + 22*a^2*b*x^2 + 14*a*b^2)/((a*x^2 + b)^2*b^4) + 1/2*(3*a*x^2 -
 b)/(b^4*x^2)
```

3.1887 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^3 x^{10}}\,dx$

Optimal. Leaf size=87

$$\frac{35a^{3/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8b^{9/2}}+\frac{35a}{8b^4x}+\frac{7}{8b^2x^3\left(ax^2+b\right)}+\frac{1}{4bx^3\left(ax^2+b\right)^2}-\frac{35}{24b^3x^3}$$

```
[Out] -35/(24*b^3*x^3) + (35*a)/(8*b^4*x) + 1/(4*b*x^3*(b + a*x^2)^2) +
 7/(8*b^2*x^3*(b + a*x^2)) + (35*a^(3/2)*ArcTan[(Sqrt[a]*x)/Sqrt[
b]])/(8*b^(9/2))
```

Rubi [A] time = 0.116545, antiderivative size = 87, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{35a^{3/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8b^{9/2}}+\frac{35a}{8b^4x}+\frac{7}{8b^2x^3\left(ax^2+b\right)}+\frac{1}{4bx^3\left(ax^2+b\right)^2}-\frac{35}{24b^3x^3}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b/x^2)^3*x^10),x]
```

```
[Out] -35/(24*b^3*x^3) + (35*a)/(8*b^4*x) + 1/(4*b*x^3*(b + a*x^2)^2) +
 7/(8*b^2*x^3*(b + a*x^2)) + (35*a^(3/2)*ArcTan[(Sqrt[a]*x)/Sqrt[
b]])/(8*b^(9/2))
```

Rubi in Sympy [A] time = 19.084, size = 80, normalized size = 0.92

$$\frac{35a^{\frac{3}{2}}\operatorname{atan}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8b^{\frac{9}{2}}}+\frac{35a}{8b^4x}+\frac{1}{4bx^3\left(ax^2+b\right)^2}+\frac{7}{8b^2x^3\left(ax^2+b\right)}-\frac{35}{24b^3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b/x**2)**3/x**10,x)
```

```
[Out] 35*a**(3/2)*atan(sqrt(a)*x/sqrt(b))/(8*b**(9/2)) + 35*a/(8*b**4*x
) + 1/(4*b*x**3*(a*x**2 + b)**2) + 7/(8*b**2*x**3*(a*x**2 + b)) -
 35/(24*b**3*x**3)
```

Mathematica [A] time = 0.0827297, size = 79, normalized size = 0.91

$$\frac{35a^{3/2}\tan^{-1}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8b^{9/2}}+\frac{105a^3x^6+175a^2bx^4+56ab^2x^2-8b^3}{24b^4x^3\left(ax^2+b\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b/x^2)^3*x^10),x]
```

```
[Out] (-8*b^3 + 56*a*b^2*x^2 + 175*a^2*b*x^4 + 105*a^3*x^6)/(24*b^4*x^3
*(b + a*x^2)^2) + (35*a^(3/2)*ArcTan[(Sqrt[a]*x)/Sqrt[b]])/(8*b^(
9/2))
```

Maple [A] time = 0.01, size = 79, normalized size = 0.9

$$-\frac{1}{3\,b^3x^3}+3\,\frac{a}{b^4x}+\frac{11\,a^3x^3}{8\,b^4\,(ax^2+b)^2}+\frac{13\,xa^2}{8\,b^3\,(ax^2+b)^2}+\frac{35\,a^2}{8\,b^4}\arctan\left(ax\frac{1}{\sqrt{ab}}\right)\frac{1}{\sqrt{ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^3/x^10,x)
```

```
[Out] -1/3/b^3/x^3+3*a/b^4/x+11/8/b^4*a^3/(a*x^2+b)^2*x^3+13/8/b^3*a^2/
(a*x^2+b)^2*x+35/8/b^4*a^2/(a*b)^(1/2)*arctan(a*x/(a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x^10),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.238387, size = 1, normalized size = 0.01

$$\left[\frac{210\,a^3x^6+350\,a^2bx^4+112\,ab^2x^2-16\,b^3+105\,\left(a^3x^7+2\,a^2bx^5+ab^2x^3\right)\sqrt{-\frac{a}{b}}\log\left(\frac{ax^2+2\,bx\sqrt{-\frac{a}{b}}-b}{ax^2+b}\right)}{48\,(a^2b^4x^7+2\,ab^5x^5+b^6x^3)},\ \frac{105\,a^3x^6+175\,a^2bx^4}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x^10),x, algorithm="fricas")
```

```
[Out] [1/48*(210*a^3*x^6 + 350*a^2*b*x^4 + 112*a*b^2*x^2 - 16*b^3 + 105
*(a^3*x^7 + 2*a^2*b*x^5 + a*b^2*x^3)*sqrt(-a/b)*log((a*x^2 + 2*b*
x*sqrt(-a/b) - b)/(a*x^2 + b)))/(a^2*b^4*x^7 + 2*a*b^5*x^5 + b^6*
x^3), 1/24*(105*a^3*x^6 + 175*a^2*b*x^4 + 56*a*b^2*x^2 - 8*b^3 +
105*(a^3*x^7 + 2*a^2*b*x^5 + a*b^2*x^3)*sqrt(a/b)*arctan(a*x/(b*s
qrt(a/b))))/(a^2*b^4*x^7 + 2*a*b^5*x^5 + b^6*x^3)]
```

Sympy [A] time = 3.43085, size = 138, normalized size = 1.59

$$-\frac{35\sqrt{-\frac{a^3}{b^9}}\log\left(x-\frac{b^5\sqrt{-\frac{a^3}{b^9}}}{a^2}\right)}{16}+\frac{35\sqrt{-\frac{a^3}{b^9}}\log\left(x+\frac{b^5\sqrt{-\frac{a^3}{b^9}}}{a^2}\right)}{16}+\frac{105a^3x^6+175a^2bx^4+56ab^2x^2-8b^3}{24a^2b^4x^7+48ab^5x^5+24b^6x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**3/x**10,x)
```

```
[Out] -35*sqrt(-a**3/b**9)*log(x - b**5*sqrt(-a**3/b**9)/a**2)/16 + 35*
sqrt(-a**3/b**9)*log(x + b**5*sqrt(-a**3/b**9)/a**2)/16 + (105*a*
*3*x**6 + 175*a**2*b*x**4 + 56*a*b**2*x**2 - 8*b**3)/(24*a**2*b**
4*x**7 + 48*a*b**5*x**5 + 24*b**6*x**3)
```

GIAC/XCAS [A] time = 0.225292, size = 96, normalized size = 1.1

$$\frac{35\,a^2\arctan\left(\frac{ax}{\sqrt{ab}}\right)}{8\,\sqrt{ab}b^4}+\frac{11\,a^3x^3+13\,a^2bx}{8\,(ax^2+b)^2b^4}+\frac{9\,ax^2-b}{3\,b^4x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x^10),x, algorithm="giac")
```

```
[Out] 35/8*a^2*arctan(a*x/sqrt(a*b))/(sqrt(a*b)*b^4) + 1/8*(11*a^3*x^3
+ 13*a^2*b*x)/((a*x^2 + b)^2*b^4) + 1/3*(9*a*x^2 - b)/(b^4*x^3)
```

3.1888 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^3 x^{11}} \, dx$

Optimal. Leaf size=86

$$-\frac{3a^2\log\left(ax^2+b\right)}{b^5}+\frac{6a^2\log(x)}{b^5}+\frac{3a^2}{2b^4\left(ax^2+b\right)}+\frac{a^2}{4b^3\left(ax^2+b\right)^2}+\frac{3a}{2b^4x^2}-\frac{1}{4b^3x^4}$$

```
[Out] -1/(4*b^3*x^4) + (3*a)/(2*b^4*x^2) + a^2/(4*b^3*(b + a*x^2)^2) +
(3*a^2)/(2*b^4*(b + a*x^2)) + (6*a^2*Log[x])/b^5 - (3*a^2*Log[b +
 a*x^2])/b^5
```

Rubi [A] time = 0.157385, antiderivative size = 86, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{3a^2\log\left(ax^2+b\right)}{b^5}+\frac{6a^2\log(x)}{b^5}+\frac{3a^2}{2b^4\left(ax^2+b\right)}+\frac{a^2}{4b^3\left(ax^2+b\right)^2}+\frac{3a}{2b^4x^2}-\frac{1}{4b^3x^4}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)^3*x^11),x]
```

```
[Out] -1/(4*b^3*x^4) + (3*a)/(2*b^4*x^2) + a^2/(4*b^3*(b + a*x^2)^2) +
(3*a^2)/(2*b^4*(b + a*x^2)) + (6*a^2*Log[x])/b^5 - (3*a^2*Log[b +
 a*x^2])/b^5
```

Rubi in Sympy [A] time = 19.7589, size = 85, normalized size = 0.99

$$\frac{a^2}{4b^3\left(ax^2+b\right)^2}+\frac{3a^2}{2b^4\left(ax^2+b\right)}+\frac{3a^2\log\left(x^2\right)}{b^5}-\frac{3a^2\log\left(ax^2+b\right)}{b^5}+\frac{3a}{2b^4x^2}-\frac{1}{4b^3x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**3/x**11,x)
```

```
[Out] a**2/(4*b**3*(a*x**2 + b)**2) + 3*a**2/(2*b**4*(a*x**2 + b)) + 3*
a**2*log(x**2)/b**5 - 3*a**2*log(a*x**2 + b)/b**5 + 3*a/(2*b**4*x
**2) - 1/(4*b**3*x**4)
```

Mathematica [A] time = 0.0870056, size = 74, normalized size = 0.86

$$\frac{-12a^2\log\left(ax^2+b\right)+24a^2\log(x)+\frac{b\left(12a^3x^6+18a^2bx^4+4ab^2x^2-b^3\right)}{x^4\left(ax^2+b\right)^2}}{4b^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)^3*x^11),x]
```

```
[Out] ((b*(-b^3 + 4*a*b^2*x^2 + 18*a^2*b*x^4 + 12*a^3*x^6))/(x^4*(b + a
*x^2)^2) + 24*a^2*Log[x] - 12*a^2*Log[b + a*x^2])/(4*b^5)
```

Maple [A] time = 0.018, size = 79, normalized size = 0.9

$$-\frac{1}{4\,b^3x^4}+\frac{3\,a}{2\,b^4x^2}+\frac{a^2}{4\,b^3\left(ax^2+b\right)^2}+\frac{3\,a^2}{2\,b^4\left(ax^2+b\right)}+6\,\frac{a^2\ln(x)}{b^5}-3\,\frac{a^2\ln\left(ax^2+b\right)}{b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^3/x^11,x)
```

```
[Out] -1/4/b^3/x^4+3/2*a/b^4/x^2+1/4*a^2/b^3/(a*x^2+b)^2+3/2*a^2/b^4/(a
*x^2+b)+6*a^2*ln(x)/b^5-3*a^2*ln(a*x^2+b)/b^5
```

Maxima [A] time = 1.43148, size = 124, normalized size = 1.44

$$\frac{12\,a^3x^6 + 18\,a^2bx^4 + 4\,ab^2x^2 - b^3}{4\,(a^2b^4x^8 + 2\,ab^5x^6 + b^6x^4)} - \frac{3\,a^2\log\left(ax^2 + b\right)}{b^5} + \frac{3\,a^2\log\left(x^2\right)}{b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x^11),x, algorithm="maxima")
```

```
[Out] 1/4*(12*a^3*x^6 + 18*a^2*b*x^4 + 4*a*b^2*x^2 - b^3)/(a^2*b^4*x^8
+ 2*a*b^5*x^6 + b^6*x^4) - 3*a^2*log(a*x^2 + b)/b^5 + 3*a^2*log(x
^2)/b^5
```

Fricas [A] time = 0.228568, size = 181, normalized size = 2.1

$$\frac{12\,a^3bx^6 + 18\,a^2b^2x^4 + 4\,ab^3x^2 - b^4 - 12\,\left(a^4x^8 + 2\,a^3bx^6 + a^2b^2x^4\right)\log\left(ax^2 + b\right) + 24\,\left(a^4x^8 + 2\,a^3bx^6 + a^2b^2x^4\right)\log\left(x\right)}{4\,(a^2b^5x^8 + 2\,ab^6x^6 + b^7x^4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x^11),x, algorithm="fricas")
```

```
[Out] 1/4*(12*a^3*b*x^6 + 18*a^2*b^2*x^4 + 4*a*b^3*x^2 - b^4 - 12*(a^4*
x^8 + 2*a^3*b*x^6 + a^2*b^2*x^4)*log(a*x^2 + b) + 24*(a^4*x^8 + 2
*a^3*b*x^6 + a^2*b^2*x^4)*log(x))/(a^2*b^5*x^8 + 2*a*b^6*x^6 + b^
7*x^4)
```

Sympy [A] time = 4.45709, size = 90, normalized size = 1.05

$$\frac{6a^2\log\left(x\right)}{b^5} - \frac{3a^2\log\left(x^2 + \frac{b}{a}\right)}{b^5} + \frac{12a^3x^6 + 18a^2bx^4 + 4ab^2x^2 - b^3}{4a^2b^4x^8 + 8ab^5x^6 + 4b^6x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**3/x**11,x)
```

```
[Out] 6*a**2*log(x)/b**5 - 3*a**2*log(x**2 + b/a)/b**5 + (12*a**3*x**6
+ 18*a**2*b*x**4 + 4*a*b**2*x**2 - b**3)/(4*a**2*b**4*x**8 + 8*a*
b**5*x**6 + 4*b**6*x**4)
```

GIAC/XCAS [A] time = 0.224282, size = 108, normalized size = 1.26

$$\frac{3\,a^2\ln\left(x^2\right)}{b^5} - \frac{3\,a^2\ln\left(\left|ax^2 + b\right|\right)}{b^5} + \frac{12\,a^3x^6 + 18\,a^2bx^4 + 4\,ab^2x^2 - b^3}{4\,(ax^4 + bx^2)^2b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^3*x^11),x, algorithm="giac")
```

```
[Out] 3*a^2*ln(x^2)/b^5 - 3*a^2*ln(abs(a*x^2 + b))/b^5 + 1/4*(12*a^3*x^
6 + 18*a^2*b*x^4 + 4*a*b^2*x^2 - b^3)/((a*x^4 + b*x^2)^2*b^4)
```

3.1889 $\int \sqrt{a+\frac{b}{x^2}}x^3\,dx$

Optimal. Leaf size=71

$$-\frac{b^2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{8a^{3/2}}+\frac{bx^2\sqrt{a+\frac{b}{x^2}}}{8a}+\frac{1}{4}x^4\sqrt{a+\frac{b}{x^2}}$$

```
[Out] (b*Sqrt[a + b/x^2]*x^2)/(8*a) + (Sqrt[a + b/x^2]*x^4)/4 - (b^2*Ar
cTanh[Sqrt[a + b/x^2]/Sqrt[a]])/(8*a^(3/2))
```

Rubi [A] time = 0.115383, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{b^2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{8a^{3/2}}+\frac{bx^2\sqrt{a+\frac{b}{x^2}}}{8a}+\frac{1}{4}x^4\sqrt{a+\frac{b}{x^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x^2]*x^3,x]
```

```
[Out] (b*Sqrt[a + b/x^2]*x^2)/(8*a) + (Sqrt[a + b/x^2]*x^4)/4 - (b^2*Ar
cTanh[Sqrt[a + b/x^2]/Sqrt[a]])/(8*a^(3/2))
```

Rubi in Sympy [A] time = 9.55543, size = 60, normalized size = 0.85

$$\frac{x^4\sqrt{a+\frac{b}{x^2}}}{4}+\frac{bx^2\sqrt{a+\frac{b}{x^2}}}{8a}-\frac{b^2\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{8a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**(1/2)*x**3,x)
```

```
[Out] x**4*sqrt(a + b/x**2)/4 + b*x**2*sqrt(a + b/x**2)/(8*a) - b**2*at
anh(sqrt(a + b/x**2)/sqrt(a))/(8*a**(3/2))
```

Mathematica [A] time = 0.0734636, size = 88, normalized size = 1.24

$$x\sqrt{a+\frac{b}{x^2}}\left(\frac{bx}{8a}+\frac{x^3}{4}\right)-\frac{b^2x\sqrt{a+\frac{b}{x^2}}\log\left(\sqrt{a}\sqrt{ax^2+b}+ax\right)}{8a^{3/2}\sqrt{ax^2+b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x^2]*x^3,x]
```

```
[Out] Sqrt[a + b/x^2]*x*((b*x)/(8*a) + x^3/4) - (b^2*Sqrt[a + b/x^2]*x*
Log[a*x + Sqrt[a]*Sqrt[b + a*x^2]])/(8*a^(3/2)*Sqrt[b + a*x^2])
```

Maple [A] time = 0.017, size = 82, normalized size = 1.2

$$\frac{x}{8}\sqrt{\frac{ax^2+b}{x^2}}\left(2x\left(ax^2+b\right)^{3/2}\sqrt{a}-\sqrt{a}\sqrt{ax^2+b}\,xb-\ln\left(\sqrt{a}x+\sqrt{ax^2+b}\right)b^2\right)\frac{1}{\sqrt{ax^2+b}}a^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^(1/2)*x^3,x)
```

```
[Out] 1/8*((a*x^2+b)/x^2)^(1/2)*x*(2*x*(a*x^2+b)^(3/2)*a^(1/2)-a^(1/2)*
(a*x^2+b)^(1/2)*x*b-ln(a^(1/2)*x+(a*x^2+b)^(1/2))*b^2)/(a*x^2+b)^
(1/2)/a^(3/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^2)*x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.253864, size = 1, normalized size = 0.01

$$\left[\frac{\sqrt{a}b^2\log\left(2\,ax^2\sqrt{\frac{ax^2+b}{x^2}}-\left(2\,ax^2+b\right)\sqrt{a}\right)+2\left(2\,a^2x^4+abx^2\right)\sqrt{\frac{ax^2+b}{x^2}}}{16\,a^2},\ \frac{\sqrt{-a}b^2\arctan\left(\frac{\sqrt{-a}}{\sqrt{\frac{ax^2+b}{x^2}}}\right)+\left(2\,a^2x^4+abx^2\right)\sqrt{\frac{ax^2+b}{x^2}}}{8\,a^2}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^2)*x^3,x, algorithm="fricas")
```

```
[Out] [1/16*(sqrt(a)*b^2*log(2*a*x^2*sqrt((a*x^2 + b)/x^2) - (2*a*x^2 +
 b)*sqrt(a)) + 2*(2*a^2*x^4 + a*b*x^2)*sqrt((a*x^2 + b)/x^2))/a^2
, 1/8*(sqrt(-a)*b^2*arctan(sqrt(-a)/sqrt((a*x^2 + b)/x^2)) + (2*a
^2*x^4 + a*b*x^2)*sqrt((a*x^2 + b)/x^2))/a^2]
```

Sympy [A] time = 13.0924, size = 92, normalized size = 1.3

$$\frac{ax^5}{4\sqrt{b}\sqrt{\frac{ax^2}{b}+1}}+\frac{3\sqrt{b}x^3}{8\sqrt{\frac{ax^2}{b}+1}}+\frac{b^{\frac{3}{2}}x}{8a\sqrt{\frac{ax^2}{b}+1}}-\frac{b^2\operatorname{asinh}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**(1/2)*x**3,x)
```

```
[Out] a*x**5/(4*sqrt(b)*sqrt(a*x**2/b + 1)) + 3*sqrt(b)*x**3/(8*sqrt(a*
x**2/b + 1)) + b**(3/2)*x/(8*a*sqrt(a*x**2/b + 1)) - b**2*asinh(s
qrt(a)*x/sqrt(b))/(8*a**(3/2))
```

GIAC/XCAS [A] time = 0.231018, size = 95, normalized size = 1.34

$$\frac{1}{8}\sqrt{ax^2+b}\left(2\,x^2\mathrm{sign}\left(x\right)+\frac{b\mathrm{sign}\left(x\right)}{a}\right)x-\frac{b^2\ln\left(\sqrt{b}\right)\mathrm{sign}\left(x\right)}{8\,a^{\frac{3}{2}}}+\frac{b^2\ln\left(\left|-\sqrt{a}x+\sqrt{ax^2+b}\right|\right)\mathrm{sign}\left(x\right)}{8\,a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^2)*x^3,x, algorithm="giac")
```

```
[Out] 1/8*sqrt(a*x^2 + b)*(2*x^2*sign(x) + b*sign(x)/a)*x - 1/8*b^2*ln(
sqrt(b))*sign(x)/a^(3/2) + 1/8*b^2*ln(abs(-sqrt(a)*x + sqrt(a*x^2
 + b)))*sign(x)/a^(3/2)
```

3.1890 $\int \sqrt{a+\frac{b}{x^2}}x^2\,dx$

Optimal. Leaf size=21

$$\frac{x^3\left(a+\frac{b}{x^2}\right)^{3/2}}{3a}$$

```
[Out] ((a + b/x^2)^(3/2)*x^3)/(3*a)
```

Rubi [A] time = 0.0317097, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{x^3\left(a+\frac{b}{x^2}\right)^{3/2}}{3a}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[a + b/x^2]*x^2,x]

[Out] ((a + b/x^2)^(3/2)*x^3)/(3*a)
```

Rubi in Sympy [A] time = 2.69885, size = 15, normalized size = 0.71

$$\frac{x^3\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}{3a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x**2)**(1/2)*x**2,x)

[Out] x**3*(a + b/x**2)**(3/2)/(3*a)
```

Mathematica [A] time = 0.0103431, size = 26, normalized size = 1.24

$$\frac{x\sqrt{a+\frac{b}{x^2}}\left(ax^2+b\right)}{3a}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[a + b/x^2]*x^2,x]

[Out] (Sqrt[a + b/x^2]*x*(b + a*x^2))/(3*a)
```

Maple [A] time = 0.006, size = 27, normalized size = 1.3

$$\frac{\left(ax^2+b\right)x}{3\,a}\sqrt{\frac{ax^2+b}{x^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x^2)^(1/2)*x^2,x)
```

```
[Out] 1/3*(a*x^2+b)/a*x*((a*x^2+b)/x^2)^(1/2)
```

Maxima [A] time = 1.42735, size = 23, normalized size = 1.1

$$\frac{\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}x^3}{3\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^2)*x^2,x, algorithm="maxima")
```

```
[Out] 1/3*(a + b/x^2)^(3/2)*x^3/a
```

Fricas [A] time = 0.237737, size = 36, normalized size = 1.71

$$\frac{\left(ax^3+bx\right)\sqrt{\frac{ax^2+b}{x^2}}}{3\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^2)*x^2,x, algorithm="fricas")
```

```
[Out] 1/3*(a*x^3 + b*x)*sqrt((a*x^2 + b)/x^2)/a
```

Sympy [A] time = 2.62626, size = 41, normalized size = 1.95

$$\frac{\sqrt{b}x^2\sqrt{\frac{ax^2}{b}+1}}{3}+\frac{b^{\frac{3}{2}}\sqrt{\frac{ax^2}{b}+1}}{3a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**(1/2)*x**2,x)
```

```
[Out] sqrt(b)*x**2*sqrt(a*x**2/b + 1)/3 + b**(3/2)*sqrt(a*x**2/b + 1)/(
3*a)
```

GIAC/XCAS [A] time = 0.226259, size = 36, normalized size = 1.71

$$\frac{\left(ax^2+b\right)^{\frac{3}{2}}\operatorname{sign}\left(x\right)}{3\,a}-\frac{b^{\frac{3}{2}}\operatorname{sign}\left(x\right)}{3\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^2)*x^2,x, algorithm="giac")
```

```
[Out] 1/3*(a*x^2 + b)^(3/2)*sign(x)/a - 1/3*b^(3/2)*sign(x)/a
```

3.1891 $\int \sqrt{a+\frac{b}{x^2}} x \, dx$

Optimal. Leaf size=47

$$\frac{1}{2}x^2\sqrt{a+\frac{b}{x^2}}+\frac{b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{2\sqrt{a}}$$

```
[Out] (Sqrt[a + b/x^2]*x^2)/2 + (b*ArcTanh[Sqrt[a + b/x^2]/Sqrt[a]])/(2
*Sqrt[a])
```

Rubi [A] time = 0.0746072, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{1}{2}x^2\sqrt{a+\frac{b}{x^2}}+\frac{b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{2\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x^2]*x,x]
```

```
[Out] (Sqrt[a + b/x^2]*x^2)/2 + (b*ArcTanh[Sqrt[a + b/x^2]/Sqrt[a]])/(2
*Sqrt[a])
```

Rubi in Sympy [A] time = 6.80272, size = 39, normalized size = 0.83

$$\frac{x^2\sqrt{a+\frac{b}{x^2}}}{2}+\frac{b\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{2\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**(1/2)*x,x)
```

```
[Out] x**2*sqrt(a + b/x**2)/2 + b*atanh(sqrt(a + b/x**2)/sqrt(a))/(2*sq
rt(a))
```

Mathematica [A] time = 0.0508789, size = 58, normalized size = 1.23

$$\frac{1}{2}x\sqrt{a+\frac{b}{x^2}}\left(\frac{b\log\left(\sqrt{a}\sqrt{ax^2+b}+ax\right)}{\sqrt{a}\sqrt{ax^2+b}}+x\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x^2]*x,x]
```

```
[Out] (Sqrt[a + b/x^2]*x*(x + (b*Log[a*x + Sqrt[a]*Sqrt[b + a*x^2]])/(S
qrt[a]*Sqrt[b + a*x^2])))/2
```

Maple [A] time = 0.007, size = 62, normalized size = 1.3

$$\frac{x}{2}\sqrt{\frac{ax^2+b}{x^2}}\left(x\sqrt{ax^2+b}\sqrt{a}+b\ln\left(\sqrt{a}x+\sqrt{ax^2+b}\right)\right)\frac{1}{\sqrt{ax^2+b}}\frac{1}{\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^(1/2)*x,x)
```

```
[Out] 1/2*((a*x^2+b)/x^2)^(1/2)*x*(x*(a*x^2+b)^(1/2)*a^(1/2)+b*ln(a^(1/
2)*x+(a*x^2+b)^(1/2)))/(a*x^2+b)^(1/2)/a^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^2)*x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.253134, size = 1, normalized size = 0.02

$$\left[\frac{2\,ax^2\sqrt{\frac{ax^2+b}{x^2}}+\sqrt{a}b\log\left(-2\,ax^2\sqrt{\frac{ax^2+b}{x^2}}-\left(2\,ax^2+b\right)\sqrt{a}\right)}{4\,a},\ \frac{ax^2\sqrt{\frac{ax^2+b}{x^2}}-\sqrt{-a}b\arctan\left(\frac{\sqrt{-a}}{\sqrt{\frac{ax^2+b}{x^2}}}\right)}{2\,a}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^2)*x,x, algorithm="fricas")
```

```
[Out] [1/4*(2*a*x^2*sqrt((a*x^2 + b)/x^2) + sqrt(a)*b*log(-2*a*x^2*sqrt
((a*x^2 + b)/x^2) - (2*a*x^2 + b)*sqrt(a)))/a, 1/2*(a*x^2*sqrt((a
*x^2 + b)/x^2) - sqrt(-a)*b*arctan(sqrt(-a)/sqrt((a*x^2 + b)/x^2)
))/a]
```

Sympy [A] time = 6.99278, size = 41, normalized size = 0.87

$$\frac{\sqrt{b}x\sqrt{\frac{ax^2}{b}+1}}{2}+\frac{b\,\mathrm{asinh}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**(1/2)*x,x)
```

```
[Out] sqrt(b)*x*sqrt(a*x**2/b + 1)/2 + b*asinh(sqrt(a)*x/sqrt(b))/(2*sq
rt(a))
```

GIAC/XCAS [A] time = 0.23426, size = 72, normalized size = 1.53

$$\frac{b\ln\left(\sqrt{b}\right)\operatorname{sign}(x)}{2\sqrt{a}}+\frac{1}{2}\left(\sqrt{ax^2+b}x-\frac{b\ln\left(\left|-\sqrt{a}x+\sqrt{ax^2+b}\right|\right)}{\sqrt{a}}\right)\operatorname{sign}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^2)*x,x, algorithm="giac")
```

```
[Out] 1/2*b*ln(sqrt(b))*sign(x)/sqrt(a) + 1/2*(sqrt(a*x^2 + b)*x - b*ln
(abs(-sqrt(a)*x + sqrt(a*x^2 + b)))/sqrt(a))*sign(x)
```

3.1892 $\int \sqrt{a+\frac{b}{x^2}}\,dx$

Optimal. Leaf size=42

$$x\sqrt{a+\frac{b}{x^2}}-\sqrt{b}\tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)$$

```
[Out] Sqrt[a + b/x^2]*x - Sqrt[b]*ArcTanh[Sqrt[b]/(Sqrt[a + b/x^2]*x)]
```

Rubi [A] time = 0.0617865, antiderivative size = 42, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364

$$x\sqrt{a+\frac{b}{x^2}}-\sqrt{b}\tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x^2],x]
```

```
[Out] Sqrt[a + b/x^2]*x - Sqrt[b]*ArcTanh[Sqrt[b]/(Sqrt[a + b/x^2]*x)]
```

Rubi in Sympy [A] time = 5.38026, size = 34, normalized size = 0.81

$$-\sqrt{b}\,\mathrm{atanh}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)+x\sqrt{a+\frac{b}{x^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**(1/2),x)
```

```
[Out] -sqrt(b)*atanh(sqrt(b)/(x*sqrt(a + b/x**2))) + x*sqrt(a + b/x**2)
```

Mathematica [A] time = 0.0504626, size = 71, normalized size = 1.69

$$\frac{x\sqrt{a+\frac{b}{x^2}}\left(\sqrt{ax^2+b}-\sqrt{b}\log\left(\sqrt{b}\sqrt{ax^2+b}+b\right)+\sqrt{b}\log(x)\right)}{\sqrt{ax^2+b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x^2],x]
```

```
[Out] (Sqrt[a + b/x^2]*x*(Sqrt[b + a*x^2] + Sqrt[b]*Log[x] - Sqrt[b]*Lo
g[b + Sqrt[b]*Sqrt[b + a*x^2]]))/Sqrt[b + a*x^2]
```

Maple [A] time = 0.008, size = 63, normalized size = 1.5

$$-x\sqrt{\frac{ax^2+b}{x^2}}\left(\sqrt{b}\ln\left(2\,\frac{\sqrt{b}\sqrt{ax^2+b}+b}{x}\right)-\sqrt{ax^2+b}\right)\frac{1}{\sqrt{ax^2+b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^(1/2),x)
```

```
[Out] -((a*x^2+b)/x^2)^(1/2)*x*(b^(1/2)*ln(2*(b^(1/2)*(a*x^2+b)^(1/2)+b
)/x)-(a*x^2+b)^(1/2))/(a*x^2+b)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.251483, size = 1, normalized size = 0.02

$$\left[x\sqrt{\frac{ax^2+b}{x^2}} + \frac{1}{2}\sqrt{b}\log\left(-\frac{ax^2 - 2\sqrt{b}x\sqrt{\frac{ax^2+b}{x^2}} + 2b}{x^2}\right), x\sqrt{\frac{ax^2+b}{x^2}} - \sqrt{-b}\arctan\left(\frac{b}{\sqrt{-b}x\sqrt{\frac{ax^2+b}{x^2}}}\right)\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^2),x, algorithm="fricas")
```

```
[Out] [x*sqrt((a*x^2 + b)/x^2) + 1/2*sqrt(b)*log(-(a*x^2 - 2*sqrt(b)*x*
sqrt((a*x^2 + b)/x^2) + 2*b)/x^2), x*sqrt((a*x^2 + b)/x^2) - sqrt
(-b)*arctan(b/(sqrt(-b)*x*sqrt((a*x^2 + b)/x^2)))]
```

Sympy [A] time = 5.27006, size = 56, normalized size = 1.33

$$\frac{\sqrt{a}x}{\sqrt{1+\frac{b}{ax^2}}} - \sqrt{b}\operatorname{asinh}\left(\frac{\sqrt{b}}{\sqrt{a}x}\right) + \frac{b}{\sqrt{a}x\sqrt{1+\frac{b}{ax^2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**(1/2),x)
```

```
[Out] sqrt(a)*x/sqrt(1 + b/(a*x**2)) - sqrt(b)*asinh(sqrt(b)/(sqrt(a)*x
)) + b/(sqrt(a)*x*sqrt(1 + b/(a*x**2)))
```

GIAC/XCAS [A] time = 0.233782, size = 92, normalized size = 2.19

$$\left(\frac{b\arctan\left(\frac{\sqrt{ax^2+b}}{\sqrt{-b}}\right)}{\sqrt{-b}} + \sqrt{ax^2+b}\right)\operatorname{sign}(x) - \frac{\left(b\arctan\left(\frac{\sqrt{b}}{\sqrt{-b}}\right) + \sqrt{-b}\sqrt{b}\right)\operatorname{sign}(x)}{\sqrt{-b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^2),x, algorithm="giac")
```

```
[Out] (b*arctan(sqrt(a*x^2 + b)/sqrt(-b))/sqrt(-b) + sqrt(a*x^2 + b))*s
ign(x) - (b*arctan(sqrt(b)/sqrt(-b)) + sqrt(-b)*sqrt(b))*sign(x)/
sqrt(-b)
```

3.1893 $\int \frac{\sqrt{a+\frac{b}{x^2}}}{x} dx$

Optimal. Leaf size=38

$$\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)-\sqrt{a+\frac{b}{x^2}}$$

```
[Out] -Sqrt[a + b/x^2] + Sqrt[a]*ArcTanh[Sqrt[a + b/x^2]/Sqrt[a]]
```

Rubi [A] time = 0.0765745, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)-\sqrt{a+\frac{b}{x^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x^2]/x,x]
```

```
[Out] -Sqrt[a + b/x^2] + Sqrt[a]*ArcTanh[Sqrt[a + b/x^2]/Sqrt[a]]
```

Rubi in Sympy [A] time = 6.66849, size = 31, normalized size = 0.82

$$\sqrt{a}\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)-\sqrt{a+\frac{b}{x^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**(1/2)/x,x)
```

```
[Out] sqrt(a)*atanh(sqrt(a + b/x**2)/sqrt(a)) - sqrt(a + b/x**2)
```

Mathematica [A] time = 0.0406865, size = 54, normalized size = 1.42

$$\sqrt{a+\frac{b}{x^2}}\left(\frac{\sqrt{a}x\log\left(\sqrt{a}\sqrt{ax^2+b}+ax\right)}{\sqrt{ax^2+b}}-1\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x^2]/x,x]
```

```
[Out] Sqrt[a + b/x^2]*(-1 + (Sqrt[a]*x*Log[a*x + Sqrt[a]*Sqrt[b + a*x^2
]])/Sqrt[b + a*x^2])
```

Maple [B] time = 0.01, size = 81, normalized size = 2.1

$$\frac{1}{b}\sqrt{\frac{ax^2+b}{x^2}}\left(a^{\frac{3}{2}}\sqrt{ax^2+b}x^2-\left(ax^2+b\right)^{\frac{3}{2}}\sqrt{a}+\ln\left(\sqrt{a}x+\sqrt{ax^2+b}\right)xab\right)\frac{1}{\sqrt{ax^2+b}}\frac{1}{\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^(1/2)/x,x)
```

```
[Out] ((a*x^2+b)/x^2)^(1/2)*(a^(3/2)*(a*x^2+b)^(1/2)*x^2-(a*x^2+b)^(3/2
)*a^(1/2)+ln(a^(1/2)*x+(a*x^2+b)^(1/2))*x*a*b)/(a*x^2+b)^(1/2)/b/
a^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.248816, size = 1, normalized size = 0.03

$$\left[\frac{1}{2}\sqrt{a}\log\left(-2\,ax^2-2\,\sqrt{a}x^2\sqrt{\frac{ax^2+b}{x^2}}-b\right)-\sqrt{\frac{ax^2+b}{x^2}},\ \sqrt{-a}\arctan\left(\frac{a}{\sqrt{-a}\sqrt{\frac{ax^2+b}{x^2}}}\right)-\sqrt{\frac{ax^2+b}{x^2}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^2)/x,x, algorithm="fricas")
```

```
[Out] [1/2*sqrt(a)*log(-2*a*x^2 - 2*sqrt(a)*x^2*sqrt((a*x^2 + b)/x^2) -
 b) - sqrt((a*x^2 + b)/x^2), sqrt(-a)*arctan(a/(sqrt(-a)*sqrt((a*
x^2 + b)/x^2))) - sqrt((a*x^2 + b)/x^2)]
```

Sympy [A] time = 5.23451, size = 56, normalized size = 1.47

$$\sqrt{a}\operatorname{asinh}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)-\frac{ax}{\sqrt{b}\sqrt{\frac{ax^2}{b}+1}}-\frac{\sqrt{b}}{x\sqrt{\frac{ax^2}{b}+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**(1/2)/x,x)
```

```
[Out] sqrt(a)*asinh(sqrt(a)*x/sqrt(b)) - a*x/(sqrt(b)*sqrt(a*x**2/b + 1
)) - sqrt(b)/(x*sqrt(a*x**2/b + 1))
```

GIAC/XCAS [A] time = 0.247001, size = 82, normalized size = 2.16

$$-\frac{1}{2}\sqrt{a}\ln\left(\left(\sqrt{a}x-\sqrt{ax^2+b}\right)^2\right)\operatorname{sign}(x)+\frac{2\sqrt{a}b\operatorname{sign}(x)}{\left(\sqrt{a}x-\sqrt{ax^2+b}\right)^2-b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^2)/x,x, algorithm="giac")
```

```
[Out] -1/2*sqrt(a)*ln((sqrt(a)*x - sqrt(a*x^2 + b))^2)*sign(x) + 2*sqrt
(a)*b*sign(x)/((sqrt(a)*x - sqrt(a*x^2 + b))^2 - b)
```

3.1894 $\int \frac{\sqrt{a+\frac{b}{x^2}}}{x^2}\,dx$

Optimal. Leaf size=50

$$-\frac{\sqrt{a+\frac{b}{x^2}}}{2x}-\frac{a\tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{2\sqrt{b}}$$

```
[Out] -Sqrt[a + b/x^2]/(2*x) - (a*ArcTanh[Sqrt[b]/(Sqrt[a + b/x^2]*x)])
/(2*Sqrt[b])
```

Rubi [A] time = 0.0626728, antiderivative size = 50, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{\sqrt{a+\frac{b}{x^2}}}{2x}-\frac{a\tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{2\sqrt{b}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x^2]/x^2,x]
```

```
[Out] -Sqrt[a + b/x^2]/(2*x) - (a*ArcTanh[Sqrt[b]/(Sqrt[a + b/x^2]*x)])
/(2*Sqrt[b])
```

Rubi in Sympy [A] time = 5.01322, size = 41, normalized size = 0.82

$$-\frac{a\,\text{atanh}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{2\sqrt{b}}-\frac{\sqrt{a+\frac{b}{x^2}}}{2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**(1/2)/x**2,x)
```

```
[Out] -a*atanh(sqrt(b)/(x*sqrt(a + b/x**2)))/(2*sqrt(b)) - sqrt(a + b/x
**2)/(2*x)
```

Mathematica [A] time = 0.0560553, size = 86, normalized size = 1.72

$$\frac{\sqrt{a+\frac{b}{x^2}}\left(-\sqrt{b}\sqrt{ax^2+b}-ax^2\log\left(\sqrt{b}\sqrt{ax^2+b}+b\right)+ax^2\log(x)\right)}{2\sqrt{b}x\sqrt{ax^2+b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x^2]/x^2,x]
```

```
[Out] (Sqrt[a + b/x^2]*(-(Sqrt[b]*Sqrt[b + a*x^2]) + a*x^2*Log[x] - a*x
^2*Log[b + Sqrt[b]*Sqrt[b + a*x^2]]))/(2*Sqrt[b]*x*Sqrt[b + a*x^2
])
```

Maple [B] time = 0.01, size = 85, normalized size = 1.7

$$-\frac{1}{2\,bx}\sqrt{\frac{ax^{2}+b}{x^{2}}}\left(\sqrt{b}\ln\left(2\,\frac{\sqrt{b}\sqrt{ax^{2}+b}+b}{x}\right)x^{2}a-\sqrt{ax^{2}+b}x^{2}a+\left(ax^{2}+b\right)^{\frac{3}{2}}\right)\frac{1}{\sqrt{ax^{2}+b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((a+b/x^2)^(1/2)/x^2,x)
```

```
[Out] -1/2*((a*x^2+b)/x^2)^(1/2)/x*(b^(1/2)*ln(2*(b^(1/2)*(a*x^2+b)^(1/
2)+b)/x)*x^2*a-(a*x^2+b)^(1/2)*x^2*a+(a*x^2+b)^(3/2))/(a*x^2+b)^(
1/2)/b
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(a + b/x^2)/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.24781, size = 1, normalized size = 0.02

$$\left[\frac{a\sqrt{b}x\log\left(\frac{2\,bx\sqrt{\frac{ax^{2}+b}{x^{2}}}-(ax^{2}+2\,b)\sqrt{b}}{x^{2}}\right)-2\,b\sqrt{\frac{ax^{2}+b}{x^{2}}}}{4\,bx},\ \frac{a\sqrt{-b}x\arctan\left(\frac{\sqrt{-b}}{x\sqrt{\frac{ax^{2}+b}{x^{2}}}}\right)-b\sqrt{\frac{ax^{2}+b}{x^{2}}}}{2\,bx}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(a + b/x^2)/x^2,x, algorithm="fricas")
```

```
[Out] [1/4*(a*sqrt(b)*x*log((2*b*x*sqrt((a*x^2 + b)/x^2) - (a*x^2 + 2*b
)*sqrt(b))/x^2) - 2*b*sqrt((a*x^2 + b)/x^2))/(b*x), 1/2*(a*sqrt(-
b)*x*arctan(sqrt(-b)/(x*sqrt((a*x^2 + b)/x^2))) - b*sqrt((a*x^2 +
 b)/x^2))/(b*x)]
```

Sympy [A] time = 6.92504, size = 42, normalized size = 0.84

$$-\frac{\sqrt{a}\sqrt{1+\frac{b}{ax^{2}}}}{2x}-\frac{a\operatorname{asinh}\left(\frac{\sqrt{b}}{\sqrt{a}x}\right)}{2\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a+b/x**2)**(1/2)/x**2,x)
```

```
[Out] -sqrt(a)*sqrt(1 + b/(a*x**2))/(2*x) - a*asinh(sqrt(b)/(sqrt(a)*x)
)/(2*sqrt(b))
```

GIAC/XCAS [A] time = 0.248393, size = 61, normalized size = 1.22

$$\frac{1}{2}\,a\left(\frac{\arctan\left(\frac{\sqrt{ax^2+b}}{\sqrt{-b}}\right)}{\sqrt{-b}}-\frac{\sqrt{ax^2+b}}{ax^2}\right)\mathrm{sign}\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^2)/x^2,x, algorithm="giac")
```

```
[Out] 1/2*a*(arctan(sqrt(a*x^2 + b)/sqrt(-b))/sqrt(-b) - sqrt(a*x^2 + b
)/(a*x^2))*sign(x)
```

3.1895 $\int \frac{\sqrt{a+\frac{b}{x^2}}}{x^3} dx$

Optimal. Leaf size=18

$$-\frac{\left(a+\frac{b}{x^2}\right)^{3/2}}{3b}$$

[Out] -(a + b/x^2)^(3/2)/(3*b)

Rubi [A] time = 0.029328, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{\left(a+\frac{b}{x^2}\right)^{3/2}}{3b}$$

Antiderivative was successfully verified.

[In] Int[Sqrt[a + b/x^2]/x^3,x]

[Out] -(a + b/x^2)^(3/2)/(3*b)

Rubi in Sympy [A] time = 2.12348, size = 14, normalized size = 0.78

$$-\frac{\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((a+b/x**2)**(1/2)/x**3,x)

[Out] -(a + b/x**2)**(3/2)/(3*b)

Mathematica [A] time = 0.03088, size = 18, normalized size = 1.

$$-\frac{\left(a+\frac{b}{x^2}\right)^{3/2}}{3b}$$

Antiderivative was successfully verified.

[In] Integrate[Sqrt[a + b/x^2]/x^3,x]

[Out] -(a + b/x^2)^(3/2)/(3*b)

Maple [A] time = 0.007, size = 29, normalized size = 1.6

$$-\frac{ax^2+b}{3\,bx^2}\sqrt{\frac{ax^2+b}{x^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^(1/2)/x^3,x)

[Out] -1/3*(a*x^2+b)/x^2/b*((a*x^2+b)/x^2)^(1/2)
```

Maxima [A] time = 1.57656, size = 19, normalized size = 1.06

$$-\frac{\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^2)/x^3,x, algorithm="maxima")

[Out] -1/3*(a + b/x^2)^(3/2)/b
```

Fricas [A] time = 0.233625, size = 38, normalized size = 2.11

$$-\frac{\left(ax^2+b\right)\sqrt{\frac{ax^2+b}{x^2}}}{3\,bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^2)/x^3,x, algorithm="fricas")

[Out] -1/3*(a*x^2 + b)*sqrt((a*x^2 + b)/x^2)/(b*x^2)
```

Sympy [A] time = 3.49636, size = 42, normalized size = 2.33

$$-\frac{a^{\frac{3}{2}}\sqrt{1+\frac{b}{ax^2}}}{3b}-\frac{\sqrt{a}\sqrt{1+\frac{b}{ax^2}}}{3x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**(1/2)/x**3,x)

[Out] -a**(3/2)*sqrt(1 + b/(a*x**2))/(3*b) - sqrt(a)*sqrt(1 + b/(a*x**2
))/(3*x**2)
```

GIAC/XCAS [A] time = 0.243901, size = 85, normalized size = 4.72

$$\frac{2\left(3\left(\sqrt{a}x-\sqrt{ax^2+b}\right)^4 a^{\frac{3}{2}}\operatorname{sign}(x)+a^{\frac{3}{2}}b^2\operatorname{sign}(x)\right)}{3\left(\left(\sqrt{a}x-\sqrt{ax^2+b}\right)^2-b\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^2)/x^3,x, algorithm="giac")

[Out] 2/3*(3*(sqrt(a)*x - sqrt(a*x^2 + b))^4*a^(3/2)*sign(x) + a^(3/2)*
b^2*sign(x))/((sqrt(a)*x - sqrt(a*x^2 + b))^2 - b)^3
```

3.1896 $\int \frac{\sqrt{a+\frac{b}{x^2}}}{x^4} dx$

Optimal. Leaf size=74

$$\frac{a^2 \tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{8b^{3/2}} - \frac{a\sqrt{a+\frac{b}{x^2}}}{8bx} - \frac{\sqrt{a+\frac{b}{x^2}}}{4x^3}$$

```
[Out] -Sqrt[a + b/x^2]/(4*x^3) - (a*Sqrt[a + b/x^2])/(8*b*x) + (a^2*Arc
Tanh[Sqrt[b]/(Sqrt[a + b/x^2]*x)])/(8*b^(3/2))
```

Rubi [A] time = 0.109531, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$

$$\frac{a^2 \tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{8b^{3/2}} - \frac{a\sqrt{a+\frac{b}{x^2}}}{8bx} - \frac{\sqrt{a+\frac{b}{x^2}}}{4x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x^2]/x^4,x]
```

```
[Out] -Sqrt[a + b/x^2]/(4*x^3) - (a*Sqrt[a + b/x^2])/(8*b*x) + (a^2*Arc
Tanh[Sqrt[b]/(Sqrt[a + b/x^2]*x)])/(8*b^(3/2))
```

Rubi in Sympy [A] time = 10.5902, size = 60, normalized size = 0.81

$$\frac{a^2 \operatorname{atanh}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{8b^{\frac{3}{2}}} - \frac{a\sqrt{a+\frac{b}{x^2}}}{8bx} - \frac{\sqrt{a+\frac{b}{x^2}}}{4x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**(1/2)/x**4,x)
```

```
[Out] a**2*atanh(sqrt(b)/(x*sqrt(a + b/x**2)))/(8*b**(3/2)) - a*sqrt(a
+ b/x**2)/(8*b*x) - sqrt(a + b/x**2)/(4*x**3)
```

Mathematica [A] time = 0.0958387, size = 98, normalized size = 1.32

$$-\frac{\sqrt{a+\frac{b}{x^2}}\left(-a^2x^4\log\left(\sqrt{b}\sqrt{ax^2+b}+b\right)+a^2x^4\log(x)+\sqrt{b}\sqrt{ax^2+b}\left(ax^2+2b\right)\right)}{8b^{3/2}x^3\sqrt{ax^2+b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x^2]/x^4,x]
```

```
[Out] -(Sqrt[a + b/x^2]*(Sqrt[b]*Sqrt[b + a*x^2]*(2*b + a*x^2) + a^2*x^
4*Log[x] - a^2*x^4*Log[b + Sqrt[b]*Sqrt[b + a*x^2]]))/(8*b^(3/2)*
x^3*Sqrt[b + a*x^2])
```

Maple [A] time = 0.012, size = 106, normalized size = 1.4

$$\frac{1}{8 b^2 x^3}\sqrt{\frac{a x^2+b}{x^2}}\left(\sqrt{b}\,\ln\left(2\,\frac{\sqrt{b}\sqrt{a x^2+b}+b}{x}\right)x^4a^2-\sqrt{a x^2+b}\,x^4a^2+\left(a x^2+b\right)^{\frac{3}{2}}x^2a-2\left(a x^2+b\right)^{3/2}b\right)\frac{1}{\sqrt{a x^2+b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^(1/2)/x^4,x)
```

```
[Out] 1/8*((a*x^2+b)/x^2)^(1/2)/x^3*(b^(1/2)*ln(2*(b^(1/2)*(a*x^2+b)^(1
/2)+b)/x)*x^4*a^2-(a*x^2+b)^(1/2)*x^4*a^2+(a*x^2+b)^(3/2)*x^2*a-2
*(a*x^2+b)^(3/2)*b)/(a*x^2+b)^(1/2)/b^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^2)/x^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.261494, size = 1, normalized size = 0.01

$$\left[\frac{a^2\sqrt{b}x^3\log\left(-\frac{2\,bx\sqrt{\frac{ax^2+b}{x^2}}+\left(ax^2+2\,b\right)\sqrt{b}}{x^2}\right)-2\left(abx^2+2\,b^2\right)\sqrt{\frac{ax^2+b}{x^2}}}{16\,b^2x^3},\right.$$
$$\left.-\frac{a^2\sqrt{-b}x^3\arctan\left(\frac{\sqrt{-b}}{x\sqrt{\frac{ax^2+b}{x^2}}}\right)+\left(abx^2+2\,b^2\right)\sqrt{\frac{ax^2+b}{x^2}}}{8\,b^2x^3}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^2)/x^4,x, algorithm="fricas")
```

```
[Out] [1/16*(a^2*sqrt(b)*x^3*log(-(2*b*x*sqrt((a*x^2 + b)/x^2) + (a*x^2
 + 2*b)*sqrt(b))/x^2) - 2*(a*b*x^2 + 2*b^2)*sqrt((a*x^2 + b)/x^2)
)/(b^2*x^3), -1/8*(a^2*sqrt(-b)*x^3*arctan(sqrt(-b)/(x*sqrt((a*x^
2 + b)/x^2))) + (a*b*x^2 + 2*b^2)*sqrt((a*x^2 + b)/x^2))/(b^2*x^3
)]
```

Sympy [A] time = 12.8142, size = 92, normalized size = 1.24

$$-\frac{a^{\frac{3}{2}}}{8bx\sqrt{1+\frac{b}{ax^2}}}-\frac{3\sqrt{a}}{8x^3\sqrt{1+\frac{b}{ax^2}}}+\frac{a^2\operatorname{asinh}\left(\frac{\sqrt{b}}{\sqrt{a}x}\right)}{8b^{\frac{3}{2}}}-\frac{b}{4\sqrt{a}x^5\sqrt{1+\frac{b}{ax^2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**(1/2)/x**4,x)
```

```
[Out] -a**(3/2)/(8*b*x*sqrt(1 + b/(a*x**2))) - 3*sqrt(a)/(8*x**3*sqrt(1
 + b/(a*x**2))) + a**2*asinh(sqrt(b)/(sqrt(a)*x))/(8*b**(3/2)) -
b/(4*sqrt(a)*x**5*sqrt(1 + b/(a*x**2)))
```

GIAC/XCAS [A] time = 0.24671, size = 86, normalized size = 1.16

$$-\frac{1}{8}\,a^2\left(\frac{\arctan\left(\frac{\sqrt{ax^2+b}}{\sqrt{-b}}\right)}{\sqrt{-b}b}+\frac{\left(ax^2+b\right)^{\frac{3}{2}}+\sqrt{ax^2+b}b}{a^2bx^4}\right)\mathrm{sign}\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^2)/x^4,x, algorithm="giac")
```

```
[Out] -1/8*a^2*(arctan(sqrt(a*x^2 + b)/sqrt(-b))/(sqrt(-b)*b) + ((a*x^2
 + b)^(3/2) + sqrt(a*x^2 + b)*b)/(a^2*b*x^4))*sign(x)
```

3.1897 $\int \left(a+\frac{b}{x^2}\right)^{3/2} x^3\,dx$

Optimal. Leaf size=68

$$\frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{8\sqrt{a}}+\frac{3}{8}bx^2\sqrt{a+\frac{b}{x^2}}+\frac{1}{4}x^4\left(a+\frac{b}{x^2}\right)^{3/2}$$

```
[Out] (3*b*Sqrt[a + b/x^2]*x^2)/8 + ((a + b/x^2)^(3/2)*x^4)/4 + (3*b^2*
ArcTanh[Sqrt[a + b/x^2]/Sqrt[a]])/(8*Sqrt[a])
```

Rubi [A] time = 0.104661, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{8\sqrt{a}}+\frac{3}{8}bx^2\sqrt{a+\frac{b}{x^2}}+\frac{1}{4}x^4\left(a+\frac{b}{x^2}\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^(3/2)*x^3,x]
```

```
[Out] (3*b*Sqrt[a + b/x^2]*x^2)/8 + ((a + b/x^2)^(3/2)*x^4)/4 + (3*b^2*
ArcTanh[Sqrt[a + b/x^2]/Sqrt[a]])/(8*Sqrt[a])
```

Rubi in Sympy [A] time = 9.52387, size = 61, normalized size = 0.9

$$\frac{3bx^2\sqrt{a+\frac{b}{x^2}}}{8}+\frac{x^4\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}{4}+\frac{3b^2\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{8\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**(3/2)*x**3,x)
```

```
[Out] 3*b*x**2*sqrt(a + b/x**2)/8 + x**4*(a + b/x**2)**(3/2)/4 + 3*b**2
*atanh(sqrt(a + b/x**2)/sqrt(a))/(8*sqrt(a))
```

Mathematica [A] time = 0.101756, size = 70, normalized size = 1.03

$$\frac{1}{8}x\sqrt{a+\frac{b}{x^2}}\left(\frac{3b^2\log\left(\sqrt{a}\sqrt{ax^2+b}+ax\right)}{\sqrt{a}\sqrt{ax^2+b}}+2ax^3+5bx\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^(3/2)*x^3,x]
```

```
[Out] (Sqrt[a + b/x^2]*x*(5*b*x + 2*a*x^3 + (3*b^2*Log[a*x + Sqrt[a]*Sq
rt[b + a*x^2]])/(Sqrt[a]*Sqrt[b + a*x^2])))/8
```

Maple [A] time = 0.008, size = 84, normalized size = 1.2

$$\frac{x^3}{8}\left(\frac{ax^2+b}{x^2}\right)^{\frac{3}{2}}\left(2x\left(ax^2+b\right)^{3/2}\sqrt{a}+3\sqrt{a}\sqrt{ax^2+b}\,xb+3\ln\left(\sqrt{a}x+\sqrt{ax^2+b}\right)b^2\right)\left(ax^2+b\right)^{-\frac{3}{2}}\frac{1}{\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^(3/2)*x^3,x)
```

```
[Out] 1/8*((a*x^2+b)/x^2)^(3/2)*x^3*(2*x*(a*x^2+b)^(3/2)*a^(1/2)+3*a^(1
/2)*(a*x^2+b)^(1/2)*x*b+3*ln(a^(1/2)*x+(a*x^2+b)^(1/2))*b^2)/(a*x
^2+b)^(3/2)/a^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(3/2)*x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.249188, size = 1, normalized size = 0.01

$$\left[\frac{3\sqrt{a}b^2\log\left(-2\,ax^2\sqrt{\frac{ax^2+b}{x^2}}-\left(2\,ax^2+b\right)\sqrt{a}\right)+2\left(2\,a^2x^4+5\,abx^2\right)\sqrt{\frac{ax^2+b}{x^2}}}{16\,a},\right.$$
$$\left.-\frac{3\sqrt{-a}b^2\arctan\left(\frac{\sqrt{-a}}{\sqrt{\frac{ax^2+b}{x^2}}}\right)-\left(2\,a^2x^4+5\,abx^2\right)\sqrt{\frac{ax^2+b}{x^2}}}{8\,a}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(3/2)*x^3,x, algorithm="fricas")
```

```
[Out] [1/16*(3*sqrt(a)*b^2*log(-2*a*x^2*sqrt((a*x^2 + b)/x^2) - (2*a*x^
2 + b)*sqrt(a)) + 2*(2*a^2*x^4 + 5*a*b*x^2)*sqrt((a*x^2 + b)/x^2)
)/a, -1/8*(3*sqrt(-a)*b^2*arctan(sqrt(-a)/sqrt((a*x^2 + b)/x^2))
- (2*a^2*x^4 + 5*a*b*x^2)*sqrt((a*x^2 + b)/x^2))/a]
```

Sympy [A] time = 13.75, size = 70, normalized size = 1.03

$$\frac{a\sqrt{b}x^3\sqrt{\frac{ax^2}{b}+1}}{4}+\frac{5b^{\frac{3}{2}}x\sqrt{\frac{ax^2}{b}+1}}{8}+\frac{3b^2\operatorname{asinh}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**(3/2)*x**3,x)
```

```
[Out] a*sqrt(b)*x**3*sqrt(a*x**2/b + 1)/4 + 5*b**(3/2)*x*sqrt(a*x**2/b
+ 1)/8 + 3*b**2*asinh(sqrt(a)*x/sqrt(b))/(8*sqrt(a))
```

GIAC/XCAS [A] time = 0.236494, size = 93, normalized size = 1.37

$$\frac{3\, b^2 \ln\left(\sqrt{b}\right) \operatorname{sign}\left(x\right)}{8\, \sqrt{a}} - \frac{3\, b^2 \ln\left(\left|-\sqrt{a}x + \sqrt{ax^2 + b}\right|\right) \operatorname{sign}\left(x\right)}{8\, \sqrt{a}} + \frac{1}{8}\, \left(2\, ax^2 \operatorname{sign}\left(x\right) + 5\, b \operatorname{sign}\left(x\right)\right) \sqrt{ax^2 + b}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(3/2)*x^3,x, algorithm="giac")
```

```
[Out] 3/8*b^2*ln(sqrt(b))*sign(x)/sqrt(a) - 3/8*b^2*ln(abs(-sqrt(a)*x +
 sqrt(a*x^2 + b)))*sign(x)/sqrt(a) + 1/8*(2*a*x^2*sign(x) + 5*b*s
ign(x))*sqrt(a*x^2 + b)*x
```

3.1898 $\int \left(a+\frac{b}{x^2}\right)^{3/2} x^2\,dx$

Optimal. Leaf size=61

$$-b^{3/2}\tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)+bx\sqrt{a+\frac{b}{x^2}}+\frac{1}{3}x^3\left(a+\frac{b}{x^2}\right)^{3/2}$$

```
[Out] b*Sqrt[a + b/x^2]*x + ((a + b/x^2)^(3/2)*x^3)/3 - b^(3/2)*ArcTanh
[Sqrt[b]/(Sqrt[a + b/x^2]*x)]
```

Rubi [A] time = 0.101419, antiderivative size = 61, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-b^{3/2}\tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)+bx\sqrt{a+\frac{b}{x^2}}+\frac{1}{3}x^3\left(a+\frac{b}{x^2}\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^(3/2)*x^2,x]
```

```
[Out] b*Sqrt[a + b/x^2]*x + ((a + b/x^2)^(3/2)*x^3)/3 - b^(3/2)*ArcTanh
[Sqrt[b]/(Sqrt[a + b/x^2]*x)]
```

Rubi in Sympy [A] time = 9.29897, size = 51, normalized size = 0.84

$$-b^{\frac{3}{2}}\operatorname{atanh}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)+bx\sqrt{a+\frac{b}{x^2}}+\frac{x^3\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**(3/2)*x**2,x)
```

```
[Out] -b**(3/2)*atanh(sqrt(b)/(x*sqrt(a + b/x**2))) + b*x*sqrt(a + b/x*
*2) + x**3*(a + b/x**2)**(3/2)/3
```

Mathematica [A] time = 0.102408, size = 85, normalized size = 1.39

$$\frac{x\sqrt{a+\frac{b}{x^2}}\left(-3b^{3/2}\log\left(\sqrt{b}\sqrt{ax^2+b}+b\right)+\sqrt{ax^2+b}\left(ax^2+4b\right)+3b^{3/2}\log(x)\right)}{3\sqrt{ax^2+b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^(3/2)*x^2,x]
```

```
[Out] (Sqrt[a + b/x^2]*x*(Sqrt[b + a*x^2]*(4*b + a*x^2) + 3*b^(3/2)*Log
[x] - 3*b^(3/2)*Log[b + Sqrt[b]*Sqrt[b + a*x^2]]))/(3*Sqrt[b + a*
x^2])
```

Maple [A] time = 0.01, size = 78, normalized size = 1.3

$$-\frac{x^3}{3}\left(\frac{ax^2+b}{x^2}\right)^{\frac{3}{2}}\left(3\,b^{3/2}\ln\left(2\,\frac{\sqrt{b}\sqrt{ax^2+b}+b}{x}\right)-\left(ax^2+b\right)^{\frac{3}{2}}-3\,\sqrt{ax^2+b}b\right)\left(ax^2+b\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^(3/2)*x^2,x)
```

```
[Out] -1/3*((a*x^2+b)/x^2)^(3/2)*x^3*(3*b^(3/2)*ln(2*(b^(1/2)*(a*x^2+b)
^(1/2)+b)/x)-(a*x^2+b)^(3/2)-3*(a*x^2+b)^(1/2)*b)/(a*x^2+b)^(3/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(3/2)*x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.250717, size = 1, normalized size = 0.02

$$\left[\frac{1}{2}\,b^{\frac{3}{2}}\log\left(-\frac{ax^2-2\,\sqrt{b}x\sqrt{\frac{ax^2+b}{x^2}}+2\,b}{x^2}\right)+\frac{1}{3}\left(ax^3+4\,bx\right)\sqrt{\frac{ax^2+b}{x^2}},\ -\sqrt{-b}b\arctan\left(\frac{b}{\sqrt{-b}x\sqrt{\frac{ax^2+b}{x^2}}}\right)+\frac{1}{3}\left(ax^3+4\,bx\right)\sqrt{\frac{ax^2+b}{x^2}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(3/2)*x^2,x, algorithm="fricas")
```

```
[Out] [1/2*b^(3/2)*log(-(a*x^2 - 2*sqrt(b)*x*sqrt((a*x^2 + b)/x^2) + 2*
b)/x^2) + 1/3*(a*x^3 + 4*b*x)*sqrt((a*x^2 + b)/x^2), -sqrt(-b)*b*
arctan(b/(sqrt(-b)*x*sqrt((a*x^2 + b)/x^2))) + 1/3*(a*x^3 + 4*b*x
)*sqrt((a*x^2 + b)/x^2)]
```

Sympy [A] time = 9.73216, size = 78, normalized size = 1.28

$$\frac{a\sqrt{b}x^2\sqrt{\frac{ax^2}{b}+1}}{3}+\frac{4b^{\frac{3}{2}}\sqrt{\frac{ax^2}{b}+1}}{3}+\frac{b^{\frac{3}{2}}\log\left(\frac{ax^2}{b}\right)}{2}-b^{\frac{3}{2}}\log\left(\sqrt{\frac{ax^2}{b}+1}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**(3/2)*x**2,x)
```

```
[Out] a*sqrt(b)*x**2*sqrt(a*x**2/b + 1)/3 + 4*b**(3/2)*sqrt(a*x**2/b +
1)/3 + b**(3/2)*log(a*x**2/b)/2 - b**(3/2)*log(sqrt(a*x**2/b + 1)
 + 1)
```

GIAC/XCAS [A] time = 0.238492, size = 119, normalized size = 1.95

$$\frac{1}{3}\left(\frac{3\,b^{2}\arctan\left(\frac{\sqrt{ax^{2}+b}}{\sqrt{-b}}\right)}{\sqrt{-b}}+\left(ax^{2}+b\right)^{\frac{3}{2}}+3\,\sqrt{ax^{2}+b}b\right)\mathrm{sign}\left(x\right)-\frac{\left(3\,b^{2}\arctan\left(\frac{\sqrt{b}}{\sqrt{-b}}\right)+4\,\sqrt{-b}b^{\frac{3}{2}}\right)\mathrm{sign}\left(x\right)}{3\,\sqrt{-b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(3/2)*x^2,x, algorithm="giac")
```

```
[Out] 1/3*(3*b^2*arctan(sqrt(a*x^2 + b)/sqrt(-b))/sqrt(-b) + (a*x^2 + b
)^(3/2) + 3*sqrt(a*x^2 + b)*b)*sign(x) - 1/3*(3*b^2*arctan(sqrt(b
)/sqrt(-b)) + 4*sqrt(-b)*b^(3/2))*sign(x)/sqrt(-b)
```

3.1899 $\int \left(a+\frac{b}{x^2}\right)^{3/2} x\,dx$

Optimal. Leaf size=63

$$\frac{1}{2}x^2\left(a+\frac{b}{x^2}\right)^{3/2}-\frac{3}{2}b\sqrt{a+\frac{b}{x^2}}+\frac{3}{2}\sqrt{a}b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)$$

```
[Out] (-3*b*Sqrt[a + b/x^2])/2 + ((a + b/x^2)^(3/2)*x^2)/2 + (3*Sqrt[a]
*b*ArcTanh[Sqrt[a + b/x^2]/Sqrt[a]])/2
```

Rubi [A] time = 0.0906803, antiderivative size = 63, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385

$$\frac{1}{2}x^2\left(a+\frac{b}{x^2}\right)^{3/2}-\frac{3}{2}b\sqrt{a+\frac{b}{x^2}}+\frac{3}{2}\sqrt{a}b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^(3/2)*x,x]
```

```
[Out] (-3*b*Sqrt[a + b/x^2])/2 + ((a + b/x^2)^(3/2)*x^2)/2 + (3*Sqrt[a]
*b*ArcTanh[Sqrt[a + b/x^2]/Sqrt[a]])/2
```

Rubi in Sympy [A] time = 8.682, size = 56, normalized size = 0.89

$$\frac{3\sqrt{a}b\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{2}-\frac{3b\sqrt{a+\frac{b}{x^2}}}{2}+\frac{x^2\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**(3/2)*x,x)
```

```
[Out] 3*sqrt(a)*b*atanh(sqrt(a + b/x**2)/sqrt(a))/2 - 3*b*sqrt(a + b/x*
*2)/2 + x**2*(a + b/x**2)**(3/2)/2
```

Mathematica [A] time = 0.0623314, size = 79, normalized size = 1.25

$$\frac{\sqrt{a+\frac{b}{x^2}}\left(\sqrt{ax^2+b}\left(ax^2-2b\right)+3\sqrt{a}bx\log\left(\sqrt{a}\sqrt{ax^2+b}+ax\right)\right)}{2\sqrt{ax^2+b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^(3/2)*x,x]
```

```
[Out] (Sqrt[a + b/x^2]*((-2*b + a*x^2)*Sqrt[b + a*x^2] + 3*Sqrt[a]*b*x*
Log[a*x + Sqrt[a]*Sqrt[b + a*x^2]]))/(2*Sqrt[b + a*x^2])
```

Maple [B] time = 0.011, size = 107, normalized size = 1.7

$$\frac{x^2}{2b}\left(\frac{ax^2+b}{x^2}\right)^{\frac{3}{2}}\left(2a^{3/2}\left(ax^2+b\right)^{3/2}x^2+3a^{3/2}\sqrt{ax^2+b}\,x^2b-2\left(ax^2+b\right)^{5/2}\sqrt{a}+3\ln\left(\sqrt{a}x+\sqrt{ax^2+b}\right)xab^2\right)\left(ax^2+b\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^(3/2)*x,x)
```

```
[Out] 1/2*((a*x^2+b)/x^2)^(3/2)*x^2*(2*a^(3/2)*(a*x^2+b)^(3/2)*x^2+3*a^
(3/2)*(a*x^2+b)^(1/2)*x^2*b-2*(a*x^2+b)^(5/2)*a^(1/2)+3*ln(a^(1/2
)*x+(a*x^2+b)^(1/2))*x*a*b^2)/(a*x^2+b)^(3/2)/b/a^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(3/2)*x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.252853, size = 1, normalized size = 0.02

$$\left[\frac{3}{4}\sqrt{a}b\log\left(-2\,ax^2-2\,\sqrt{a}x^2\sqrt{\frac{ax^2+b}{x^2}}-b\right)+\frac{1}{2}\left(ax^2-2\,b\right)\sqrt{\frac{ax^2+b}{x^2}},\ \frac{3}{2}\sqrt{-a}b\arctan\left(\frac{a}{\sqrt{-a}\sqrt{\frac{ax^2+b}{x^2}}}\right)+\frac{1}{2}\left(ax^2-2\,b\right)\sqrt{\frac{ax^2+b}{x^2}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(3/2)*x,x, algorithm="fricas")
```

```
[Out] [3/4*sqrt(a)*b*log(-2*a*x^2 - 2*sqrt(a)*x^2*sqrt((a*x^2 + b)/x^2)
 - b) + 1/2*(a*x^2 - 2*b)*sqrt((a*x^2 + b)/x^2), 3/2*sqrt(-a)*b*a
rctan(a/(sqrt(-a)*sqrt((a*x^2 + b)/x^2))) + 1/2*(a*x^2 - 2*b)*sqr
t((a*x^2 + b)/x^2)]
```

Sympy [A] time = 10.0842, size = 88, normalized size = 1.4

$$\frac{3\sqrt{a}b\operatorname{asinh}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2}+\frac{a^2x^3}{2\sqrt{b}\sqrt{\frac{ax^2}{b}+1}}-\frac{a\sqrt{b}x}{2\sqrt{\frac{ax^2}{b}+1}}-\frac{b^{\frac{3}{2}}}{x\sqrt{\frac{ax^2}{b}+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**(3/2)*x,x)
```

```
[Out] 3*sqrt(a)*b*asinh(sqrt(a)*x/sqrt(b))/2 + a**2*x**3/(2*sqrt(b)*sqr
t(a*x**2/b + 1)) - a*sqrt(b)*x/(2*sqrt(a*x**2/b + 1)) - b**(3/2)/
(x*sqrt(a*x**2/b + 1))
```

GIAC/XCAS [A] time = 0.274803, size = 107, normalized size = 1.7

$$\frac{1}{2}\sqrt{ax^2+b}ax\operatorname{sign}(x)-\frac{3}{4}\sqrt{a}b\ln\left(\left(\sqrt{a}x-\sqrt{ax^2+b}\right)^2\right)\operatorname{sign}(x)+\frac{2\sqrt{a}b^2\operatorname{sign}(x)}{\left(\sqrt{a}x-\sqrt{ax^2+b}\right)^2-b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(3/2)*x,x, algorithm="giac")
```

```
[Out] 1/2*sqrt(a*x^2 + b)*a*x*sign(x) - 3/4*sqrt(a)*b*ln((sqrt(a)*x - s
qrt(a*x^2 + b))^2)*sign(x) + 2*sqrt(a)*b^2*sign(x)/((sqrt(a)*x -
sqrt(a*x^2 + b))^2 - b)
```

3.1900 $\int \left(a+\frac{b}{x^2}\right)^{3/2} dx$

Optimal. Leaf size=64

$$x\left(a+\frac{b}{x^2}\right)^{3/2}-\frac{3b\sqrt{a+\frac{b}{x^2}}}{2x}-\frac{3}{2}a\sqrt{b}\tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)$$

```
[Out] (-3*b*Sqrt[a + b/x^2])/(2*x) + (a + b/x^2)^(3/2)*x - (3*a*Sqrt[b]
*ArcTanh[Sqrt[b]/(Sqrt[a + b/x^2]*x)])/2
```

Rubi [A] time = 0.0864575, antiderivative size = 64, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.454

$$x\left(a+\frac{b}{x^2}\right)^{3/2}-\frac{3b\sqrt{a+\frac{b}{x^2}}}{2x}-\frac{3}{2}a\sqrt{b}\tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^(3/2),x]
```

```
[Out] (-3*b*Sqrt[a + b/x^2])/(2*x) + (a + b/x^2)^(3/2)*x - (3*a*Sqrt[b]
*ArcTanh[Sqrt[b]/(Sqrt[a + b/x^2]*x)])/2
```

Rubi in Sympy [A] time = 6.27497, size = 56, normalized size = 0.88

$$-\frac{3a\sqrt{b}\operatorname{atanh}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{2}-\frac{3b\sqrt{a+\frac{b}{x^2}}}{2x}+x\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**(3/2),x)
```

```
[Out] -3*a*sqrt(b)*atanh(sqrt(b)/(x*sqrt(a + b/x**2)))/2 - 3*b*sqrt(a +
 b/x**2)/(2*x) + x*(a + b/x**2)**(3/2)
```

Mathematica [A] time = 0.0810075, size = 95, normalized size = 1.48

$$\frac{\sqrt{a+\frac{b}{x^2}}\left(-\left(b-2ax^2\right)\sqrt{ax^2+b}+3a\sqrt{b}x^2\log(x)-3a\sqrt{b}x^2\log\left(\sqrt{b}\sqrt{ax^2+b}+b\right)\right)}{2x\sqrt{ax^2+b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^(3/2),x]
```

```
[Out] (Sqrt[a + b/x^2]*(-((b - 2*a*x^2)*Sqrt[b + a*x^2]) + 3*a*Sqrt[b]*
x^2*Log[x] - 3*a*Sqrt[b]*x^2*Log[b + Sqrt[b]*Sqrt[b + a*x^2]]))/(
2*x*Sqrt[b + a*x^2])
```

Maple [A] time = 0.01, size = 100, normalized size = 1.6

$$-\frac{x}{2b}\left(\frac{ax^2+b}{x^2}\right)^{\frac{3}{2}}\left(3b^{3/2}\ln\left(2\frac{\sqrt{b}\sqrt{ax^2+b}+b}{x}\right)x^2a-\left(ax^2+b\right)^{\frac{3}{2}}x^2a+\left(ax^2+b\right)^{\frac{5}{2}}-3\sqrt{ax^2+b}x^2ab\right)\left(ax^2+b\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^(3/2),x)
```

```
[Out] -1/2*((a*x^2+b)/x^2)^(3/2)*x*(3*b^(3/2)*ln(2*(b^(1/2)*(a*x^2+b)^(
1/2)+b)/x)*x^2*a-(a*x^2+b)^(3/2)*x^2*a+(a*x^2+b)^(5/2)-3*(a*x^2+b
)^(1/2)*x^2*a*b)/(a*x^2+b)^(3/2)/b
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.253555, size = 1, normalized size = 0.02

$$\left[\frac{3\,a\sqrt{b}x\log\left(-\frac{ax^2-2\,\sqrt{b}x\sqrt{\frac{ax^2+b}{x^2}}+2\,b}{x^2}\right)+2\,\left(2\,ax^2-b\right)\sqrt{\frac{ax^2+b}{x^2}}}{4\,x},\right.$$
$$\left.-\frac{3\,a\sqrt{-b}x\arctan\left(\frac{b}{\sqrt{-b}x\sqrt{\frac{ax^2+b}{x^2}}}\right)-\left(2\,ax^2-b\right)\sqrt{\frac{ax^2+b}{x^2}}}{2\,x}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(3/2),x, algorithm="fricas")
```

```
[Out] [1/4*(3*a*sqrt(b)*x*log(-(a*x^2 - 2*sqrt(b)*x*sqrt((a*x^2 + b)/x^
2) + 2*b)/x^2) + 2*(2*a*x^2 - b)*sqrt((a*x^2 + b)/x^2))/x, -1/2*(
3*a*sqrt(-b)*x*arctan(b/(sqrt(-b)*x*sqrt((a*x^2 + b)/x^2))) - (2*
a*x^2 - b)*sqrt((a*x^2 + b)/x^2))/x]
```

Sympy [A] time = 9.64989, size = 88, normalized size = 1.38

$$\frac{a^{\frac{3}{2}}x}{\sqrt{1+\frac{b}{ax^2}}}+\frac{\sqrt{a}b}{2x\sqrt{1+\frac{b}{ax^2}}}-\frac{3a\sqrt{b}\operatorname{asinh}\left(\frac{\sqrt{b}}{\sqrt{a}x}\right)}{2}-\frac{b^2}{2\sqrt{a}x^3\sqrt{1+\frac{b}{ax^2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**(3/2),x)
```

```
[Out] a**(3/2)*x/sqrt(1 + b/(a*x**2)) + sqrt(a)*b/(2*x*sqrt(1 + b/(a*x*
*2))) - 3*a*sqrt(b)*asinh(sqrt(b)/(sqrt(a)*x))/2 - b**2/(2*sqrt(a
)*x**3*sqrt(1 + b/(a*x**2)))
```

GIAC/XCAS [A] time = 0.24969, size = 80, normalized size = 1.25

$$\frac{1}{2}\left(\frac{3\,b\arctan\left(\frac{\sqrt{ax^2+b}}{\sqrt{-b}}\right)}{\sqrt{-b}}+2\,\sqrt{ax^2+b}-\frac{\sqrt{ax^2+b}b}{ax^2}\right)a\mathrm{sign}\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(3/2),x, algorithm="giac")
```

```
[Out] 1/2*(3*b*arctan(sqrt(a*x^2 + b)/sqrt(-b))/sqrt(-b) + 2*sqrt(a*x^2
 + b) - sqrt(a*x^2 + b)*b/(a*x^2))*a*sign(x)
```

3.1901 $\int \frac{\left(a+\frac{b}{x^2}\right)^{3/2}}{x} dx$

Optimal. Leaf size=54

$$a^{3/2}\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)-a\sqrt{a+\frac{b}{x^2}}-\frac{1}{3}\left(a+\frac{b}{x^2}\right)^{3/2}$$

```
[Out] -(a*Sqrt[a + b/x^2]) - (a + b/x^2)^(3/2)/3 + a^(3/2)*ArcTanh[Sqrt
[a + b/x^2]/Sqrt[a]]
```

Rubi [A] time = 0.100163, antiderivative size = 54, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$a^{3/2}\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)-a\sqrt{a+\frac{b}{x^2}}-\frac{1}{3}\left(a+\frac{b}{x^2}\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^(3/2)/x,x]
```

```
[Out] -(a*Sqrt[a + b/x^2]) - (a + b/x^2)^(3/2)/3 + a^(3/2)*ArcTanh[Sqrt
[a + b/x^2]/Sqrt[a]]
```

Rubi in Sympy [A] time = 8.60806, size = 44, normalized size = 0.81

$$a^{\frac{3}{2}}\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)-a\sqrt{a+\frac{b}{x^2}}-\frac{\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**(3/2)/x,x)
```

```
[Out] a**(3/2)*atanh(sqrt(a + b/x**2)/sqrt(a)) - a*sqrt(a + b/x**2) - (
a + b/x**2)**(3/2)/3
```

Mathematica [A] time = 0.0732387, size = 71, normalized size = 1.31

$$\frac{\sqrt{a+\frac{b}{x^2}}\left(\frac{3a^{3/2}x^3\log\left(\sqrt{a}\sqrt{ax^2+b}+ax\right)}{\sqrt{ax^2+b}}-4ax^2-b\right)}{3x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^(3/2)/x,x]
```

```
[Out] (Sqrt[a + b/x^2]*(-b - 4*a*x^2 + (3*a^(3/2)*x^3*Log[a*x + Sqrt[a]
*Sqrt[b + a*x^2]])/Sqrt[b + a*x^2]))/(3*x^2)
```

Maple [B] time = 0.011, size = 126, normalized size = 2.3

$$\frac{1}{3 b^2}\left(\frac{a x^2+b}{x^2}\right)^{\frac{3}{2}}\left(2 a^{5/2}\left(a x^2+b\right)^{3/2} x^4+3 a^{5/2} \sqrt{a x^2+b}\, x^4 b-2 a^{3/2}\left(a x^2+b\right)^{5/2} x^2+3 \ln\left(\sqrt{a} x+\sqrt{a x^2+b}\right) x^3 a^2 b^2-(a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^(3/2)/x,x)
```

```
[Out] 1/3*((a*x^2+b)/x^2)^(3/2)*(2*a^(5/2)*(a*x^2+b)^(3/2)*x^4+3*a^(5/2
)*(a*x^2+b)^(1/2)*x^4*b-2*a^(3/2)*(a*x^2+b)^(5/2)*x^2+3*ln(a^(1/2
)*x+(a*x^2+b)^(1/2))*x^3*a^2*b^2-(a*x^2+b)^(5/2)*b*a^(1/2))/(a*x^
2+b)^(3/2)/b^2/a^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(3/2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.251573, size = 1, normalized size = 0.02

$$\left[\frac{3 a^{\frac{3}{2}} x^2 \log\left(-2 a x^2-2 \sqrt{a} x^2 \sqrt{\frac{a x^2+b}{x^2}}-b\right)-2\left(4 a x^2+b\right)\sqrt{\frac{a x^2+b}{x^2}}}{6 x^2}, \frac{3 \sqrt{-a} a x^2 \arctan\left(\frac{a}{\sqrt{-a}\sqrt{\frac{a x^2+b}{x^2}}}\right)-\left(4 a x^2+b\right)\sqrt{\frac{a x^2+b}{x^2}}}{3 x^2}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(3/2)/x,x, algorithm="fricas")
```

```
[Out] [1/6*(3*a^(3/2)*x^2*log(-2*a*x^2 - 2*sqrt(a)*x^2*sqrt((a*x^2 + b)
/x^2) - b) - 2*(4*a*x^2 + b)*sqrt((a*x^2 + b)/x^2))/x^2, 1/3*(3*s
qrt(-a)*a*x^2*arctan(a/(sqrt(-a)*sqrt((a*x^2 + b)/x^2))) - (4*a*x
^2 + b)*sqrt((a*x^2 + b)/x^2))/x^2]
```

Sympy [A] time = 8.23667, size = 78, normalized size = 1.44

$$-\frac{4a^{\frac{3}{2}}\sqrt{1+\frac{b}{ax^2}}}{3}-\frac{a^{\frac{3}{2}}\log\left(\frac{b}{ax^2}\right)}{2}+a^{\frac{3}{2}}\log\left(\sqrt{1+\frac{b}{ax^2}}+1\right)-\frac{\sqrt{a}b\sqrt{1+\frac{b}{ax^2}}}{3x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**(3/2)/x,x)
```

```
[Out] -4*a**(3/2)*sqrt(1 + b/(a*x**2))/3 - a**(3/2)*log(b/(a*x**2))/2 +
 a**(3/2)*log(sqrt(1 + b/(a*x**2)) + 1) - sqrt(a)*b*sqrt(1 + b/(a
*x**2))/(3*x**2)
```

GIAC/XCAS [A] time = 0.363144, size = 165, normalized size = 3.06

$$-\frac{1}{2}\,a^{\frac{3}{2}}\ln\left(\left(\sqrt{a}x-\sqrt{ax^2+b}\right)^2\right)\operatorname{sign}\left(x\right)+\frac{4\left(3\left(\sqrt{a}x-\sqrt{ax^2+b}\right)^4a^{\frac{3}{2}}b\operatorname{sign}\left(x\right)-3\left(\sqrt{a}x-\sqrt{ax^2+b}\right)^2a^{\frac{3}{2}}b^2\operatorname{sign}\left(x\right)+2\,a^{\frac{3}{2}}b^3\operatorname{sign}\left(x\right)\right)}{3\left(\left(\sqrt{a}x-\sqrt{ax^2+b}\right)^2-b\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(3/2)/x,x, algorithm="giac")
```

```
[Out] -1/2*a^(3/2)*ln((sqrt(a)*x - sqrt(a*x^2 + b))^2)*sign(x) + 4/3*(3
*(sqrt(a)*x - sqrt(a*x^2 + b))^4*a^(3/2)*b*sign(x) - 3*(sqrt(a)*x
 - sqrt(a*x^2 + b))^2*a^(3/2)*b^2*sign(x) + 2*a^(3/2)*b^3*sign(x)
)/((sqrt(a)*x - sqrt(a*x^2 + b))^2 - b)^3
```

3.1902 $\int \frac{\left(a+\frac{b}{x^2}\right)^{3/2}}{x^2}\,dx$

Optimal. Leaf size=71

$$-\frac{3a^2\tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{8\sqrt{b}}-\frac{3a\sqrt{a+\frac{b}{x^2}}}{8x}-\frac{\left(a+\frac{b}{x^2}\right)^{3/2}}{4x}$$

```
[Out] (-3*a*Sqrt[a + b/x^2])/(8*x) - (a + b/x^2)^(3/2)/(4*x) - (3*a^2*A
rcTanh[Sqrt[b]/(Sqrt[a + b/x^2]*x)])/(8*Sqrt[b])
```

Rubi [A] time = 0.0829662, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{3a^2\tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{8\sqrt{b}}-\frac{3a\sqrt{a+\frac{b}{x^2}}}{8x}-\frac{\left(a+\frac{b}{x^2}\right)^{3/2}}{4x}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^(3/2)/x^2,x]
```

```
[Out] (-3*a*Sqrt[a + b/x^2])/(8*x) - (a + b/x^2)^(3/2)/(4*x) - (3*a^2*A
rcTanh[Sqrt[b]/(Sqrt[a + b/x^2]*x)])/(8*Sqrt[b])
```

Rubi in Sympy [A] time = 6.22149, size = 61, normalized size = 0.86

$$-\frac{3a^2\,\mathrm{atanh}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{8\sqrt{b}}-\frac{3a\sqrt{a+\frac{b}{x^2}}}{8x}-\frac{\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}{4x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**(3/2)/x**2,x)
```

```
[Out] -3*a**2*atanh(sqrt(b)/(x*sqrt(a + b/x**2)))/(8*sqrt(b)) - 3*a*sqr
t(a + b/x**2)/(8*x) - (a + b/x**2)**(3/2)/(4*x)
```

Mathematica [A] time = 0.0971036, size = 101, normalized size = 1.42

$$\frac{\sqrt{a+\frac{b}{x^2}}\left(-3a^2x^4\log\left(\sqrt{b}\sqrt{ax^2+b}+b\right)+3a^2x^4\log(x)-\sqrt{b}\sqrt{ax^2+b}\left(5ax^2+2b\right)\right)}{8\sqrt{b}x^3\sqrt{ax^2+b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^(3/2)/x^2,x]
```

```
[Out] (Sqrt[a + b/x^2]*(-(Sqrt[b]*Sqrt[b + a*x^2]*(2*b + 5*a*x^2)) + 3*
a^2*x^4*Log[x] - 3*a^2*x^4*Log[b + Sqrt[b]*Sqrt[b + a*x^2]]))/(8*
Sqrt[b]*x^3*Sqrt[b + a*x^2])
```

Maple [B] time = 0.012, size = 125, normalized size = 1.8

$$-\frac{1}{8\,b^2x}\left(\frac{ax^2+b}{x^2}\right)^{\frac{3}{2}}\left(3\,b^{3/2}\ln\left(2\,\frac{\sqrt{b}\sqrt{ax^2+b}+b}{x}\right)x^4a^2-\left(ax^2+b\right)^{\frac{3}{2}}x^4a^2+\left(ax^2+b\right)^{\frac{5}{2}}x^2a-3\sqrt{ax^2+b}x^4a^2b+2\,\left(ax^2+\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^(3/2)/x^2,x)
```

```
[Out] -1/8*((a*x^2+b)/x^2)^(3/2)/x*(3*b^(3/2)*ln(2*(b^(1/2)*(a*x^2+b)^(
1/2)+b)/x)*x^4*a^2-(a*x^2+b)^(3/2)*x^4*a^2+(a*x^2+b)^(5/2)*x^2*a-
3*(a*x^2+b)^(1/2)*x^4*a^2*b+2*(a*x^2+b)^(5/2)*b)/(a*x^2+b)^(3/2)/
b^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(3/2)/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.257626, size = 1, normalized size = 0.01

$$\left[\frac{3\,a^2\sqrt{b}x^3\log\left(\frac{2\,bx\sqrt{\frac{ax^2+b}{x^2}}-(ax^2+2\,b)\sqrt{b}}{x^2}\right)-2\left(5\,abx^2+2\,b^2\right)\sqrt{\frac{ax^2+b}{x^2}}}{16\,bx^3},\frac{3\,a^2\sqrt{-b}x^3\arctan\left(\frac{\sqrt{-b}}{x\sqrt{\frac{ax^2+b}{x^2}}}\right)-\left(5\,abx^2+2\,b^2\right)\sqrt{\frac{ax^2+b}{x^2}}}{8\,bx^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(3/2)/x^2,x, algorithm="fricas")
```

```
[Out] [1/16*(3*a^2*sqrt(b)*x^3*log((2*b*x*sqrt((a*x^2 + b)/x^2) - (a*x^
2 + 2*b)*sqrt(b))/x^2) - 2*(5*a*b*x^2 + 2*b^2)*sqrt((a*x^2 + b)/x
^2))/(b*x^3), 1/8*(3*a^2*sqrt(-b)*x^3*arctan(sqrt(-b)/(x*sqrt((a*
x^2 + b)/x^2))) - (5*a*b*x^2 + 2*b^2)*sqrt((a*x^2 + b)/x^2))/(b*x
^3)]
```

Sympy [A] time = 11.4192, size = 71, normalized size = 1.

$$-\frac{5a^{\frac{3}{2}}\sqrt{1+\frac{b}{ax^2}}}{8x}-\frac{\sqrt{a}b\sqrt{1+\frac{b}{ax^2}}}{4x^3}-\frac{3a^2\operatorname{asinh}\left(\frac{\sqrt{b}}{\sqrt{a}x}\right)}{8\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**(3/2)/x**2,x)
```

```
[Out] -5*a**(3/2)*sqrt(1 + b/(a*x**2))/(8*x) - sqrt(a)*b*sqrt(1 + b/(a*
x**2))/(4*x**3) - 3*a**2*asinh(sqrt(b)/(sqrt(a)*x))/(8*sqrt(b))
```

GIAC/XCAS [A] time = 0.249742, size = 85, normalized size = 1.2

$$\frac{1}{8}\,a^2\left(\frac{3\,\arctan\left(\frac{\sqrt{ax^2+b}}{\sqrt{-b}}\right)}{\sqrt{-b}}-\frac{5\,\left(ax^2+b\right)^{\frac{3}{2}}-3\,\sqrt{ax^2+b}b}{a^2x^4}\right)\mathrm{sign}\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(3/2)/x^2,x, algorithm="giac")
```

```
[Out] 1/8*a^2*(3*arctan(sqrt(a*x^2 + b)/sqrt(-b))/sqrt(-b) - (5*(a*x^2
+ b)^(3/2) - 3*sqrt(a*x^2 + b)*b)/(a^2*x^4))*sign(x)
```

3.1903 $\int \frac{\left(a+\frac{b}{x^2}\right)^{3/2}}{x^3} dx$

Optimal. Leaf size=18

$$-\frac{\left(a+\frac{b}{x^2}\right)^{5/2}}{5b}$$

```
[Out] -(a + b/x^2)^(5/2)/(5*b)
```

Rubi [A] time = 0.0295815, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{\left(a+\frac{b}{x^2}\right)^{5/2}}{5b}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x^2)^(3/2)/x^3,x]

[Out] -(a + b/x^2)^(5/2)/(5*b)
```

Rubi in Sympy [A] time = 2.12385, size = 14, normalized size = 0.78

$$-\frac{\left(a+\frac{b}{x^2}\right)^{\frac{5}{2}}}{5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x**2)**(3/2)/x**3,x)

[Out] -(a + b/x**2)**(5/2)/(5*b)
```

Mathematica [A] time = 0.0260863, size = 30, normalized size = 1.67

$$-\frac{\sqrt{a+\frac{b}{x^2}}\left(ax^2+b\right)^2}{5bx^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x^2)^(3/2)/x^3,x]

[Out] -(Sqrt[a + b/x^2]*(b + a*x^2)^2)/(5*b*x^4)
```

Maple [A] time = 0.008, size = 29, normalized size = 1.6

$$-\frac{ax^2+b}{5\,bx^2}\left(\frac{ax^2+b}{x^2}\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^(3/2)/x^3,x)
```

```
[Out] -1/5*(a*x^2+b)/x^2/b*((a*x^2+b)/x^2)^(3/2)
```

Maxima [A] time = 1.43721, size = 19, normalized size = 1.06

$$-\frac{\left(a+\frac{b}{x^2}\right)^{\frac{5}{2}}}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(3/2)/x^3,x, algorithm="maxima")
```

```
[Out] -1/5*(a + b/x^2)^(5/2)/b
```

Fricas [A] time = 0.247137, size = 53, normalized size = 2.94

$$-\frac{\left(a^2x^4+2\,abx^2+b^2\right)\sqrt{\frac{ax^2+b}{x^2}}}{5\,bx^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(3/2)/x^3,x, algorithm="fricas")
```

```
[Out] -1/5*(a^2*x^4 + 2*a*b*x^2 + b^2)*sqrt((a*x^2 + b)/x^2)/(b*x^4)
```

Sympy [A] time = 4.54414, size = 68, normalized size = 3.78

$$-\frac{a^{\frac{5}{2}}\sqrt{1+\frac{b}{ax^2}}}{5b}-\frac{2a^{\frac{3}{2}}\sqrt{1+\frac{b}{ax^2}}}{5x^2}-\frac{\sqrt{a}b\sqrt{1+\frac{b}{ax^2}}}{5x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**(3/2)/x**3,x)
```

```
[Out] -a**(5/2)*sqrt(1 + b/(a*x**2))/(5*b) - 2*a**(3/2)*sqrt(1 + b/(a*x
**2))/(5*x**2) - sqrt(a)*b*sqrt(1 + b/(a*x**2))/(5*x**4)
```

GIAC/XCAS [A] time = 0.251341, size = 124, normalized size = 6.89

$$\frac{2\left(5\left(\sqrt{a}x-\sqrt{ax^2+b}\right)^8a^{\frac{5}{2}}\mathrm{sign}\left(x\right)+10\left(\sqrt{a}x-\sqrt{ax^2+b}\right)^4a^{\frac{5}{2}}b^2\mathrm{sign}\left(x\right)+a^{\frac{5}{2}}b^4\mathrm{sign}\left(x\right)\right)}{5\left(\left(\sqrt{a}x-\sqrt{ax^2+b}\right)^2-b\right)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(3/2)/x^3,x, algorithm="giac")
```

```
[Out] 2/5*(5*(sqrt(a)*x - sqrt(a*x^2 + b))^8*a^(5/2)*sign(x) + 10*(sqrt
(a)*x - sqrt(a*x^2 + b))^4*a^(5/2)*b^2*sign(x) + a^(5/2)*b^4*sign
(x))/((sqrt(a)*x - sqrt(a*x^2 + b))^2 - b)^5
```

3.1904 $\int \frac{\left(a+\frac{b}{x^2}\right)^{3/2}}{x^4}\,dx$

Optimal. Leaf size=95

$$\frac{a^3\tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{16b^{3/2}}-\frac{a^2\sqrt{a+\frac{b}{x^2}}}{16bx}-\frac{a\sqrt{a+\frac{b}{x^2}}}{8x^3}-\frac{\left(a+\frac{b}{x^2}\right)^{3/2}}{6x^3}$$

```
[Out] -(a*Sqrt[a + b/x^2])/(8*x^3) - (a + b/x^2)^(3/2)/(6*x^3) - (a^2*S
qrt[a + b/x^2])/(16*b*x) + (a^3*ArcTanh[Sqrt[b]/(Sqrt[a + b/x^2]*
x)])/(16*b^(3/2))
```

Rubi [A] time = 0.143646, antiderivative size = 95, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{a^3\tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{16b^{3/2}}-\frac{a^2\sqrt{a+\frac{b}{x^2}}}{16bx}-\frac{a\sqrt{a+\frac{b}{x^2}}}{8x^3}-\frac{\left(a+\frac{b}{x^2}\right)^{3/2}}{6x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^(3/2)/x^4,x]
```

```
[Out] -(a*Sqrt[a + b/x^2])/(8*x^3) - (a + b/x^2)^(3/2)/(6*x^3) - (a^2*S
qrt[a + b/x^2])/(16*b*x) + (a^3*ArcTanh[Sqrt[b]/(Sqrt[a + b/x^2]*
x)])/(16*b^(3/2))
```

Rubi in Sympy [A] time = 14.1463, size = 78, normalized size = 0.82

$$\frac{a^3\operatorname{atanh}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{16b^{\frac{3}{2}}}-\frac{a^2\sqrt{a+\frac{b}{x^2}}}{16bx}-\frac{a\sqrt{a+\frac{b}{x^2}}}{8x^3}-\frac{\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}{6x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**(3/2)/x**4,x)
```

```
[Out] a**3*atanh(sqrt(b)/(x*sqrt(a + b/x**2)))/(16*b**(3/2)) - a**2*sqr
t(a + b/x**2)/(16*b*x) - a*sqrt(a + b/x**2)/(8*x**3) - (a + b/x**
2)**(3/2)/(6*x**3)
```

Mathematica [A] time = 0.1085, size = 111, normalized size = 1.17

$$-\frac{\sqrt{a+\frac{b}{x^2}}\left(-3a^3x^6\log\left(\sqrt{b}\sqrt{ax^2+b}+b\right)+3a^3x^6\log(x)+\sqrt{b}\sqrt{ax^2+b}\left(3a^2x^4+14abx^2+8b^2\right)\right)}{48b^{3/2}x^5\sqrt{ax^2+b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^(3/2)/x^4,x]
```

```
[Out] -(Sqrt[a + b/x^2]*(Sqrt[b]*Sqrt[b + a*x^2]*(8*b^2 + 14*a*b*x^2 +
3*a^2*x^4) + 3*a^3*x^6*Log[x] - 3*a^3*x^6*Log[b + Sqrt[b]*Sqrt[b
+ a*x^2]]))/(48*b^(3/2)*x^5*Sqrt[b + a*x^2])
```

Maple [A] time = 0.016, size = 145, normalized size = 1.5

$$\frac{1}{48\,b^3x^3}\left(\frac{ax^2+b}{x^2}\right)^{\frac{3}{2}}\left(3\,b^{3/2}\ln\left(2\,\frac{\sqrt{b}\sqrt{ax^2+b}+b}{x}\right)x^6a^3-\left(ax^2+b\right)^{\frac{3}{2}}x^6a^3+\left(ax^2+b\right)^{\frac{5}{2}}x^4a^2-3\,\sqrt{ax^2+b}x^6a^3b+2\,\left(ax^2\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^(3/2)/x^4,x)
```

```
[Out] 1/48*((a*x^2+b)/x^2)^(3/2)/x^3*(3*b^(3/2)*ln(2*(b^(1/2)*(a*x^2+b)
^(1/2)+b)/x)*x^6*a^3-(a*x^2+b)^(3/2)*x^6*a^3+(a*x^2+b)^(5/2)*x^4*
a^2-3*(a*x^2+b)^(1/2)*x^6*a^3*b+2*(a*x^2+b)^(5/2)*x^2*a*b-8*(a*x^
2+b)^(5/2)*b^2)/(a*x^2+b)^(3/2)/b^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(3/2)/x^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.258503, size = 1, normalized size = 0.01

$$\left[\frac{3\,a^3\sqrt{b}x^5\log\left(-\frac{2\,bx\sqrt{\frac{ax^2+b}{x^2}}+\left(ax^2+2\,b\right)\sqrt{b}}{x^2}\right)-2\left(3\,a^2bx^4+14\,ab^2x^2+8\,b^3\right)\sqrt{\frac{ax^2+b}{x^2}}}{96\,b^2x^5},\right.$$
$$\left.-\frac{3\,a^3\sqrt{-b}x^5\arctan\left(\frac{\sqrt{-b}}{x\sqrt{\frac{ax^2+b}{x^2}}}\right)+\left(3\,a^2bx^4+14\,ab^2x^2+8\,b^3\right)\sqrt{\frac{ax^2+b}{x^2}}}{48\,b^2x^5}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(3/2)/x^4,x, algorithm="fricas")
```

```
[Out] [1/96*(3*a^3*sqrt(b)*x^5*log(-(2*b*x*sqrt((a*x^2 + b)/x^2) + (a*x
^2 + 2*b)*sqrt(b))/x^2) - 2*(3*a^2*b*x^4 + 14*a*b^2*x^2 + 8*b^3)*
sqrt((a*x^2 + b)/x^2))/(b^2*x^5), -1/48*(3*a^3*sqrt(-b)*x^5*arcta
n(sqrt(-b)/(x*sqrt((a*x^2 + b)/x^2))) + (3*a^2*b*x^4 + 14*a*b^2*x
^2 + 8*b^3)*sqrt((a*x^2 + b)/x^2))/(b^2*x^5)]
```

Sympy [A] time = 18.8757, size = 119, normalized size = 1.25

$$-\frac{a^{\frac{5}{2}}}{16bx\sqrt{1+\frac{b}{ax^2}}}-\frac{17a^{\frac{3}{2}}}{48x^3\sqrt{1+\frac{b}{ax^2}}}-\frac{11\sqrt{a}b}{24x^5\sqrt{1+\frac{b}{ax^2}}}+\frac{a^3\operatorname{asinh}\left(\frac{\sqrt{b}}{\sqrt{a}x}\right)}{16b^{\frac{3}{2}}}-\frac{b^2}{6\sqrt{a}x^7\sqrt{1+\frac{b}{ax^2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**(3/2)/x**4,x)
```

```
[Out] -a**(5/2)/(16*b*x*sqrt(1 + b/(a*x**2))) - 17*a**(3/2)/(48*x**3*sq
rt(1 + b/(a*x**2))) - 11*sqrt(a)*b/(24*x**5*sqrt(1 + b/(a*x**2)))
 + a**3*asinh(sqrt(b)/(sqrt(a)*x))/(16*b**(3/2)) - b**2/(6*sqrt(a
)*x**7*sqrt(1 + b/(a*x**2)))
```

GIAC/XCAS [A] time = 0.264781, size = 111, normalized size = 1.17

$$-\frac{1}{48}a^3\left(\frac{3\arctan\left(\frac{\sqrt{ax^2+b}}{\sqrt{-b}}\right)}{\sqrt{-b}b}+\frac{3\left(ax^2+b\right)^{\frac{5}{2}}+8\left(ax^2+b\right)^{\frac{3}{2}}b-3\sqrt{ax^2+b}b^2}{a^3bx^6}\right)\mathrm{sign}\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(3/2)/x^4,x, algorithm="giac")
```

```
[Out] -1/48*a^3*(3*arctan(sqrt(a*x^2 + b)/sqrt(-b))/(sqrt(-b)*b) + (3*(
a*x^2 + b)^(5/2) + 8*(a*x^2 + b)^(3/2)*b - 3*sqrt(a*x^2 + b)*b^2)
/(a^3*b*x^6))*sign(x)
```

3.1905 $\int \left(a+\frac{b}{x^2}\right)^{5/2} x^3 \, dx$

Optimal. Leaf size=86

$$-\frac{15}{8}b^2\sqrt{a+\frac{b}{x^2}}+\frac{15}{8}\sqrt{a}b^2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)+\frac{5}{8}bx^2\left(a+\frac{b}{x^2}\right)^{3/2}+\frac{1}{4}x^4\left(a+\frac{b}{x^2}\right)^{5/2}$$

```
[Out] (-15*b^2*Sqrt[a + b/x^2])/8 + (5*b*(a + b/x^2)^(3/2)*x^2)/8 + ((a
 + b/x^2)^(5/2)*x^4)/4 + (15*Sqrt[a]*b^2*ArcTanh[Sqrt[a + b/x^2]/
Sqrt[a]])/8
```

Rubi [A] time = 0.136751, antiderivative size = 86, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{15}{8}b^2\sqrt{a+\frac{b}{x^2}}+\frac{15}{8}\sqrt{a}b^2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)+\frac{5}{8}bx^2\left(a+\frac{b}{x^2}\right)^{3/2}+\frac{1}{4}x^4\left(a+\frac{b}{x^2}\right)^{5/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^(5/2)*x^3,x]
```

```
[Out] (-15*b^2*Sqrt[a + b/x^2])/8 + (5*b*(a + b/x^2)^(3/2)*x^2)/8 + ((a
 + b/x^2)^(5/2)*x^4)/4 + (15*Sqrt[a]*b^2*ArcTanh[Sqrt[a + b/x^2]/
Sqrt[a]])/8
```

Rubi in Sympy [A] time = 11.8629, size = 78, normalized size = 0.91

$$\frac{15\sqrt{a}b^2\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{8}-\frac{15b^2\sqrt{a+\frac{b}{x^2}}}{8}+\frac{5bx^2\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}{8}+\frac{x^4\left(a+\frac{b}{x^2}\right)^{\frac{5}{2}}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**(5/2)*x**3,x)
```

```
[Out] 15*sqrt(a)*b**2*atanh(sqrt(a + b/x**2)/sqrt(a))/8 - 15*b**2*sqrt(
a + b/x**2)/8 + 5*b*x**2*(a + b/x**2)**(3/2)/8 + x**4*(a + b/x**2
)**(5/2)/4
```

Mathematica [A] time = 0.0853884, size = 93, normalized size = 1.08

$$\frac{\sqrt{a+\frac{b}{x^2}}\left(\sqrt{ax^2+b}\left(2a^2x^4+9abx^2-8b^2\right)+15\sqrt{a}b^2x\log\left(\sqrt{a}\sqrt{ax^2+b}+ax\right)\right)}{8\sqrt{ax^2+b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^(5/2)*x^3,x]
```

```
[Out] (Sqrt[a + b/x^2]*(Sqrt[b + a*x^2]*(-8*b^2 + 9*a*b*x^2 + 2*a^2*x^4
) + 15*Sqrt[a]*b^2*x*Log[a*x + Sqrt[a]*Sqrt[b + a*x^2]]))/(8*Sqrt
[b + a*x^2])
```

Maple [A] time = 0.011, size = 127, normalized size = 1.5

$$\frac{x^4}{8b}\left(\frac{ax^2+b}{x^2}\right)^{\frac{5}{2}}\left(8a^{3/2}\left(ax^2+b\right)^{5/2}x^2+10a^{3/2}\left(ax^2+b\right)^{3/2}x^2b+15a^{3/2}\sqrt{ax^2+b}x^2b^2-8\left(ax^2+b\right)^{7/2}\sqrt{a}+15\ln\left(\sqrt{a}x\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^(5/2)*x^3,x)
```

```
[Out] 1/8*((a*x^2+b)/x^2)^(5/2)*x^4*(8*a^(3/2)*(a*x^2+b)^(5/2)*x^2+10*a
^(3/2)*(a*x^2+b)^(3/2)*x^2*b+15*a^(3/2)*(a*x^2+b)^(1/2)*x^2*b^2-8
*(a*x^2+b)^(7/2)*a^(1/2)+15*ln(a^(1/2)*x+(a*x^2+b)^(1/2))*x*a*b^3
)/(a*x^2+b)^(5/2)/b/a^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(5/2)*x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.262544, size = 1, normalized size = 0.01

$$\left[\frac{15}{16}\sqrt{a}b^2\log\left(-2\,ax^2-2\,\sqrt{a}x^2\sqrt{\frac{ax^2+b}{x^2}}-b\right)+\frac{1}{8}\left(2\,a^2x^4+9\,abx^2-8\,b^2\right)\sqrt{\frac{ax^2+b}{x^2}},\ \frac{15}{8}\sqrt{-a}b^2\arctan\left(\frac{a}{\sqrt{-a}\sqrt{\frac{ax^2+b}{x^2}}}\right)+\frac{1}{8}\left(2\,a^2x^4+9\,abx^2-8\,b^2\right)\sqrt{\frac{ax^2+b}{x^2}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(5/2)*x^3,x, algorithm="fricas")
```

```
[Out] [15/16*sqrt(a)*b^2*log(-2*a*x^2 - 2*sqrt(a)*x^2*sqrt((a*x^2 + b)/
x^2) - b) + 1/8*(2*a^2*x^4 + 9*a*b*x^2 - 8*b^2)*sqrt((a*x^2 + b)/
x^2), 15/8*sqrt(-a)*b^2*arctan(a/(sqrt(-a)*sqrt((a*x^2 + b)/x^2))
) + 1/8*(2*a^2*x^4 + 9*a*b*x^2 - 8*b^2)*sqrt((a*x^2 + b)/x^2)]
```

Sympy [A] time = 21.6335, size = 117, normalized size = 1.36

$$\frac{15\sqrt{a}b^2\operatorname{asinh}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8}+\frac{a^3x^5}{4\sqrt{b}\sqrt{\frac{ax^2}{b}+1}}+\frac{11a^2\sqrt{b}x^3}{8\sqrt{\frac{ax^2}{b}+1}}+\frac{ab^{\frac{3}{2}}x}{8\sqrt{\frac{ax^2}{b}+1}}-\frac{b^{\frac{5}{2}}}{x\sqrt{\frac{ax^2}{b}+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**(5/2)*x**3,x)
```

```
[Out] 15*sqrt(a)*b**2*asinh(sqrt(a)*x/sqrt(b))/8 + a**3*x**5/(4*sqrt(b)
*sqrt(a*x**2/b + 1)) + 11*a**2*sqrt(b)*x**3/(8*sqrt(a*x**2/b + 1)
) + a*b**(3/2)*x/(8*sqrt(a*x**2/b + 1)) - b**(5/2)/(x*sqrt(a*x**2
/b + 1))
```

GIAC/XCAS [A] time = 0.278371, size = 128, normalized size = 1.49

$$-\frac{15}{16}\,\sqrt{a}b^2\ln\left(\left(\sqrt{a}x-\sqrt{ax^2+b}\right)^2\right)\operatorname{sign}\left(x\right)+\frac{2\,\sqrt{a}b^3\operatorname{sign}\left(x\right)}{\left(\sqrt{a}x-\sqrt{ax^2+b}\right)^2-b}+\frac{1}{8}\,\left(2\,a^2x^2\operatorname{sign}\left(x\right)+9\,ab\operatorname{sign}\left(x\right)\right)\sqrt{ax^2+b}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(5/2)*x^3,x, algorithm="giac")
```

```
[Out] -15/16*sqrt(a)*b^2*ln((sqrt(a)*x - sqrt(a*x^2 + b))^2)*sign(x) +
2*sqrt(a)*b^3*sign(x)/((sqrt(a)*x - sqrt(a*x^2 + b))^2 - b) + 1/8
*(2*a^2*x^2*sign(x) + 9*a*b*sign(x))*sqrt(a*x^2 + b)*x
```

3.1906 $\int \left(a+\frac{b}{x^2}\right)^{5/2} x^2 \, dx$

Optimal. Leaf size=88

$$-\frac{5}{2}ab^{3/2}\tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)-\frac{5b^2\sqrt{a+\frac{b}{x^2}}}{2x}+\frac{5}{3}bx\left(a+\frac{b}{x^2}\right)^{3/2}+\frac{1}{3}x^3\left(a+\frac{b}{x^2}\right)^{5/2}$$

```
[Out] (-5*b^2*Sqrt[a + b/x^2])/(2*x) + (5*b*(a + b/x^2)^(3/2)*x)/3 + ((
a + b/x^2)^(5/2)*x^3)/3 - (5*a*b^(3/2)*ArcTanh[Sqrt[b]/(Sqrt[a +
b/x^2]*x)])/2
```

Rubi [A] time = 0.124649, antiderivative size = 88, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{5}{2}ab^{3/2}\tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)-\frac{5b^2\sqrt{a+\frac{b}{x^2}}}{2x}+\frac{5}{3}bx\left(a+\frac{b}{x^2}\right)^{3/2}+\frac{1}{3}x^3\left(a+\frac{b}{x^2}\right)^{5/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^(5/2)*x^2,x]
```

```
[Out] (-5*b^2*Sqrt[a + b/x^2])/(2*x) + (5*b*(a + b/x^2)^(3/2)*x)/3 + ((
a + b/x^2)^(5/2)*x^3)/3 - (5*a*b^(3/2)*ArcTanh[Sqrt[b]/(Sqrt[a +
b/x^2]*x)])/2
```

Rubi in Sympy [A] time = 10.6446, size = 78, normalized size = 0.89

$$-\frac{5ab^{\frac{3}{2}}\operatorname{atanh}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{2}-\frac{5b^2\sqrt{a+\frac{b}{x^2}}}{2x}+\frac{5bx\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}{3}+\frac{x^3\left(a+\frac{b}{x^2}\right)^{\frac{5}{2}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**(5/2)*x**2,x)
```

```
[Out] -5*a*b**(3/2)*atanh(sqrt(b)/(x*sqrt(a + b/x**2)))/2 - 5*b**2*sqrt
(a + b/x**2)/(2*x) + 5*b*x*(a + b/x**2)**(3/2)/3 + x**3*(a + b/x*
*2)**(5/2)/3
```

Mathematica [A] time = 0.1091, size = 107, normalized size = 1.22

$$\frac{\sqrt{a+\frac{b}{x^2}}\left(\sqrt{ax^2+b}\left(2a^2x^4+14abx^2-3b^2\right)+15ab^{3/2}x^2\log(x)-15ab^{3/2}x^2\log\left(\sqrt{b}\sqrt{ax^2+b}+b\right)\right)}{6x\sqrt{ax^2+b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^(5/2)*x^2,x]
```

```
[Out] (Sqrt[a + b/x^2]*(Sqrt[b + a*x^2]*(-3*b^2 + 14*a*b*x^2 + 2*a^2*x^
4) + 15*a*b^(3/2)*x^2*Log[x] - 15*a*b^(3/2)*x^2*Log[b + Sqrt[b]*S
qrt[b + a*x^2]]))/(6*x*Sqrt[b + a*x^2])
```

Maple [A] time = 0.012, size = 122, normalized size = 1.4

$$-\frac{x^3}{6\,b}\left(\frac{a x^2+b}{x^2}\right)^{\frac{5}{2}}\left(-3\,\left(a x^2+b\right)^{5/2} x^2 a+15\,b^{5/2}\ln\left(2\,\frac{\sqrt{b}\sqrt{a x^2+b}+b}{x}\right) x^2 a+3\,\left(a x^2+b\right)^{7/2}-5\,\left(a x^2+b\right)^{3/2} x^2 a b-15\,\sqrt{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^(5/2)*x^2,x)
```

```
[Out] -1/6*((a*x^2+b)/x^2)^(5/2)*x^3*(-3*(a*x^2+b)^(5/2)*x^2*a+15*b^(5/
2)*ln(2*(b^(1/2)*(a*x^2+b)^(1/2)+b)/x)*x^2*a+3*(a*x^2+b)^(7/2)-5*
(a*x^2+b)^(3/2)*x^2*a*b-15*(a*x^2+b)^(1/2)*x^2*a*b^2)/(a*x^2+b)^(
5/2)/b
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(5/2)*x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.259164, size = 1, normalized size = 0.01

$$\left[\frac{15\,a b^{\frac{3}{2}} x \log\left(-\frac{a x^2-2\,\sqrt{b} x\sqrt{\frac{a x^2+b}{x^2}}+2\,b}{x^2}\right)+2\,\left(2\,a^2 x^4+14\,a b x^2-3\,b^2\right)\sqrt{\frac{a x^2+b}{x^2}}}{12\,x},\right.$$
$$\left.-\frac{15\,a\sqrt{-b} b x \arctan\left(\frac{b}{\sqrt{-b} x\sqrt{\frac{a x^2+b}{x^2}}}\right)-\left(2\,a^2 x^4+14\,a b x^2-3\,b^2\right)\sqrt{\frac{a x^2+b}{x^2}}}{6\,x}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(5/2)*x^2,x, algorithm="fricas")
```

```
[Out] [1/12*(15*a*b^(3/2)*x*log(-(a*x^2 - 2*sqrt(b)*x*sqrt((a*x^2 + b)/
x^2) + 2*b)/x^2) + 2*(2*a^2*x^4 + 14*a*b*x^2 - 3*b^2)*sqrt((a*x^2
 + b)/x^2))/x, -1/6*(15*a*sqrt(-b)*b*x*arctan(b/(sqrt(-b)*x*sqrt(
(a*x^2 + b)/x^2))) - (2*a^2*x^4 + 14*a*b*x^2 - 3*b^2)*sqrt((a*x^2
 + b)/x^2))/x]
```

Sympy [A] time = 17.9147, size = 112, normalized size = 1.27

$$\frac{a^2\sqrt{b} x^2\sqrt{\frac{a x^2}{b}+1}}{3}+\frac{7 a b^{\frac{3}{2}}\sqrt{\frac{a x^2}{b}+1}}{3}+\frac{5 a b^{\frac{3}{2}}\log\left(\frac{a x^2}{b}\right)}{4}-\frac{5 a b^{\frac{3}{2}}\log\left(\sqrt{\frac{a x^2}{b}+1}+1\right)}{2}-\frac{b^{\frac{5}{2}}\sqrt{\frac{a x^2}{b}+1}}{2 x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**(5/2)*x**2,x)
```

```
[Out] a**2*sqrt(b)*x**2*sqrt(a*x**2/b + 1)/3 + 7*a*b**(3/2)*sqrt(a*x**2
/b + 1)/3 + 5*a*b**(3/2)*log(a*x**2/b)/4 - 5*a*b**(3/2)*log(sqrt(
a*x**2/b + 1) + 1)/2 - b**(5/2)*sqrt(a*x**2/b + 1)/(2*x**2)
```

GIAC/XCAS [A] time = 0.262812, size = 101, normalized size = 1.15

$$\frac{1}{6}\left(\frac{15\,b^2\arctan\left(\frac{\sqrt{ax^2+b}}{\sqrt{-b}}\right)}{\sqrt{-b}}+2\left(ax^2+b\right)^{\frac{3}{2}}+12\sqrt{ax^2+b}b-\frac{3\sqrt{ax^2+b}b^2}{ax^2}\right)a\mathrm{sign}\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(5/2)*x^2,x, algorithm="giac")
```

```
[Out] 1/6*(15*b^2*arctan(sqrt(a*x^2 + b)/sqrt(-b))/sqrt(-b) + 2*(a*x^2
+ b)^(3/2) + 12*sqrt(a*x^2 + b)*b - 3*sqrt(a*x^2 + b)*b^2/(a*x^2)
)*a*sign(x)
```

3.1907 $\int \left(a+\frac{b}{x^2}\right)^{5/2} x\,dx$

Optimal. Leaf size=80

$$\frac{5}{2}a^{3/2}b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)+\frac{1}{2}x^2\left(a+\frac{b}{x^2}\right)^{5/2}-\frac{5}{6}b\left(a+\frac{b}{x^2}\right)^{3/2}-\frac{5}{2}ab\sqrt{a+\frac{b}{x^2}}$$

```
[Out] (-5*a*b*Sqrt[a + b/x^2])/2 - (5*b*(a + b/x^2)^(3/2))/6 + ((a + b/
x^2)^(5/2)*x^2)/2 + (5*a^(3/2)*b*ArcTanh[Sqrt[a + b/x^2]/Sqrt[a]]
)/2
```

Rubi [A] time = 0.125316, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.385$

$$\frac{5}{2}a^{3/2}b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)+\frac{1}{2}x^2\left(a+\frac{b}{x^2}\right)^{5/2}-\frac{5}{6}b\left(a+\frac{b}{x^2}\right)^{3/2}-\frac{5}{2}ab\sqrt{a+\frac{b}{x^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^(5/2)*x,x]
```

```
[Out] (-5*a*b*Sqrt[a + b/x^2])/2 - (5*b*(a + b/x^2)^(3/2))/6 + ((a + b/
x^2)^(5/2)*x^2)/2 + (5*a^(3/2)*b*ArcTanh[Sqrt[a + b/x^2]/Sqrt[a]]
)/2
```

Rubi in Sympy [A] time = 10.8488, size = 73, normalized size = 0.91

$$\frac{5a^{\frac{3}{2}}b\,\mathrm{atanh}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{2}-\frac{5ab\sqrt{a+\frac{b}{x^2}}}{2}-\frac{5b\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}{6}+\frac{x^2\left(a+\frac{b}{x^2}\right)^{\frac{5}{2}}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**(5/2)*x,x)
```

```
[Out] 5*a**(3/2)*b*atanh(sqrt(a + b/x**2)/sqrt(a))/2 - 5*a*b*sqrt(a + b
/x**2)/2 - 5*b*(a + b/x**2)**(3/2)/6 + x**2*(a + b/x**2)**(5/2)/2
```

Mathematica [A] time = 0.0930837, size = 83, normalized size = 1.04

$$\frac{\sqrt{a+\frac{b}{x^2}}\left(\frac{15a^{3/2}bx^3\log\left(\sqrt{a}\sqrt{ax^2+b}+ax\right)}{\sqrt{ax^2+b}}+3a^2x^4-14abx^2-2b^2\right)}{6x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^(5/2)*x,x]
```

```
[Out] (Sqrt[a + b/x^2]*(-2*b^2 - 14*a*b*x^2 + 3*a^2*x^4 + (15*a^(3/2)*b
*x^3*Log[a*x + Sqrt[a]*Sqrt[b + a*x^2]])/Sqrt[b + a*x^2]))/(6*x^2
)
```

Maple [B] time = 0.012, size = 149, normalized size = 1.9

$$\frac{x^{2}}{6 b^{2}} \left(\frac{a x^{2}+b}{x^{2}}\right)^{\frac{5}{2}} \left(8 a^{5/2} \left(a x^{2}+b\right)^{5/2} x^{4}+10 a^{5/2} \left(a x^{2}+b\right)^{3/2} x^{4} b+15 a^{5/2} \sqrt{a x^{2}+b}\, x^{4} b^{2}-8 a^{3/2} \left(a x^{2}+b\right)^{7/2} x^{2}-2 \left(a x^{2}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^(5/2)*x,x)
```

```
[Out] 1/6*((a*x^2+b)/x^2)^(5/2)*x^2*(8*a^(5/2)*(a*x^2+b)^(5/2)*x^4+10*a
^(5/2)*(a*x^2+b)^(3/2)*x^4*b+15*a^(5/2)*(a*x^2+b)^(1/2)*x^4*b^2-8
*a^(3/2)*(a*x^2+b)^(7/2)*x^2-2*(a*x^2+b)^(7/2)*b*a^(1/2)+15*ln(a^
(1/2)*x+(a*x^2+b)^(1/2))*x^3*a^2*b^3)/(a*x^2+b)^(5/2)/b^2/a^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(5/2)*x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.251322, size = 1, normalized size = 0.01

$$\left[\frac{15 a^{\frac{3}{2}} b x^{2} \log\left(-2 a x^{2}-2 \sqrt{a} x^{2} \sqrt{\frac{a x^{2}+b}{x^{2}}}-b\right)+2 \left(3 a^{2} x^{4}-14 a b x^{2}-2 b^{2}\right) \sqrt{\frac{a x^{2}+b}{x^{2}}}}{12 x^{2}}, \frac{15 \sqrt{-a} a b x^{2} \arctan\left(\frac{a}{\sqrt{-a} \sqrt{\frac{a x^{2}+b}{x^{2}}}}\right)+\left(3\right.}{6 x^{2}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(5/2)*x,x, algorithm="fricas")
```

```
[Out] [1/12*(15*a^(3/2)*b*x^2*log(-2*a*x^2 - 2*sqrt(a)*x^2*sqrt((a*x^2
+ b)/x^2) - b) + 2*(3*a^2*x^4 - 14*a*b*x^2 - 2*b^2)*sqrt((a*x^2 +
 b)/x^2))/x^2, 1/6*(15*sqrt(-a)*a*b*x^2*arctan(a/(sqrt(-a)*sqrt((
a*x^2 + b)/x^2))) + (3*a^2*x^4 - 14*a*b*x^2 - 2*b^2)*sqrt((a*x^2
+ b)/x^2))/x^2]
```

Sympy [A] time = 15.901, size = 112, normalized size = 1.4

$$\frac{a^{\frac{5}{2}} x^{2} \sqrt{1+\frac{b}{a x^{2}}}}{2}-\frac{7 a^{\frac{3}{2}} b \sqrt{1+\frac{b}{a x^{2}}}}{3}-\frac{5 a^{\frac{3}{2}} b \log\left(\frac{b}{a x^{2}}\right)}{4}+\frac{5 a^{\frac{3}{2}} b \log\left(\sqrt{1+\frac{b}{a x^{2}}}+1\right)}{2}-\frac{\sqrt{a} b^{2} \sqrt{1+\frac{b}{a x^{2}}}}{3 x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**(5/2)*x,x)
```

```
[Out] a**(5/2)*x**2*sqrt(1 + b/(a*x**2))/2 - 7*a**(3/2)*b*sqrt(1 + b/(a
*x**2))/3 - 5*a**(3/2)*b*log(b/(a*x**2))/4 + 5*a**(3/2)*b*log(sqr
t(1 + b/(a*x**2)) + 1)/2 - sqrt(a)*b**2*sqrt(1 + b/(a*x**2))/(3*x
```

```
**2)
```

GIAC/XCAS [A] time = 0.376626, size = 192, normalized size = 2.4

$$\frac{1}{2}\sqrt{ax^2+b}a^2x\mathrm{sign}(x)-\frac{5}{4}a^{\frac{3}{2}}b\ln\left(\left(\sqrt{a}x-\sqrt{ax^2+b}\right)^2\right)\mathrm{sign}(x)+\frac{2\left(9\left(\sqrt{a}x-\sqrt{ax^2+b}\right)^4a^{\frac{3}{2}}b^2\mathrm{sign}(x)-12\left(\sqrt{a}x-\sqrt{ax^2+b}\right)^2a^{\frac{3}{2}}b^3\mathrm{sign}(x)+7a^{\frac{3}{2}}b^4\mathrm{sign}(x)\right)}{3\left(\left(\sqrt{a}x-\sqrt{ax^2+b}\right)^2-b\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(5/2)*x,x, algorithm="giac")
```

```
[Out] 1/2*sqrt(a*x^2 + b)*a^2*x*sign(x) - 5/4*a^(3/2)*b*ln((sqrt(a)*x -
 sqrt(a*x^2 + b))^2)*sign(x) + 2/3*(9*(sqrt(a)*x - sqrt(a*x^2 + b
))^4*a^(3/2)*b^2*sign(x) - 12*(sqrt(a)*x - sqrt(a*x^2 + b))^2*a^(
3/2)*b^3*sign(x) + 7*a^(3/2)*b^4*sign(x))/((sqrt(a)*x - sqrt(a*x^
2 + b))^2 - b)^3
```

3.1908 $\int \left(a+\frac{b}{x^2}\right)^{5/2} dx$

Optimal. Leaf size=86

$$-\frac{15}{8}a^2\sqrt{b}\tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)+x\left(a+\frac{b}{x^2}\right)^{5/2}-\frac{5b\left(a+\frac{b}{x^2}\right)^{3/2}}{4x}-\frac{15ab\sqrt{a+\frac{b}{x^2}}}{8x}$$

```
[Out] (-15*a*b*Sqrt[a + b/x^2])/(8*x) - (5*b*(a + b/x^2)^(3/2))/(4*x) +
 (a + b/x^2)^(5/2)*x - (15*a^2*Sqrt[b]*ArcTanh[Sqrt[b]/(Sqrt[a +
b/x^2]*x)])/8
```

Rubi [A] time = 0.122049, antiderivative size = 86, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.454

$$-\frac{15}{8}a^2\sqrt{b}\tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)+x\left(a+\frac{b}{x^2}\right)^{5/2}-\frac{5b\left(a+\frac{b}{x^2}\right)^{3/2}}{4x}-\frac{15ab\sqrt{a+\frac{b}{x^2}}}{8x}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^(5/2),x]
```

```
[Out] (-15*a*b*Sqrt[a + b/x^2])/(8*x) - (5*b*(a + b/x^2)^(3/2))/(4*x) +
 (a + b/x^2)^(5/2)*x - (15*a^2*Sqrt[b]*ArcTanh[Sqrt[b]/(Sqrt[a +
b/x^2]*x)])/8
```

Rubi in Sympy [A] time = 7.87058, size = 76, normalized size = 0.88

$$-\frac{15a^2\sqrt{b}\,\text{atanh}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{8}-\frac{15ab\sqrt{a+\frac{b}{x^2}}}{8x}-\frac{5b\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}{4x}+x\left(a+\frac{b}{x^2}\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**(5/2),x)
```

```
[Out] -15*a**2*sqrt(b)*atanh(sqrt(b)/(x*sqrt(a + b/x**2)))/8 - 15*a*b*s
qrt(a + b/x**2)/(8*x) - 5*b*(a + b/x**2)**(3/2)/(4*x) + x*(a + b/
x**2)**(5/2)
```

Mathematica [A] time = 0.106025, size = 111, normalized size = 1.29

$$\frac{\sqrt{a+\frac{b}{x^2}}\left(\sqrt{ax^2+b}\left(8a^2x^4-9abx^2-2b^2\right)+15a^2\sqrt{b}x^4\log(x)-15a^2\sqrt{b}x^4\log\left(\sqrt{b}\sqrt{ax^2+b}+b\right)\right)}{8x^3\sqrt{ax^2+b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^(5/2),x]
```

```
[Out] (Sqrt[a + b/x^2]*(Sqrt[b + a*x^2]*(-2*b^2 - 9*a*b*x^2 + 8*a^2*x^4
) + 15*a^2*Sqrt[b]*x^4*Log[x] - 15*a^2*Sqrt[b]*x^4*Log[b + Sqrt[b
]*Sqrt[b + a*x^2]]))/(8*x^3*Sqrt[b + a*x^2])
```

Maple [B] time = 0.011, size = 144, normalized size = 1.7

$$-\frac{x}{8\,b^2}\left(\frac{ax^2+b}{x^2}\right)^{\frac{5}{2}}\left(-3\,\left(ax^2+b\right)^{5/2}x^4a^2+15\,b^{5/2}\ln\left(2\,\frac{\sqrt{b}\sqrt{ax^2+b}+b}{x}\right)x^4a^2+3\,\left(ax^2+b\right)^{7/2}x^2a-5\,\left(ax^2+b\right)^{3/2}x^4a^2b$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^(5/2),x)
```

```
[Out] -1/8*((a*x^2+b)/x^2)^(5/2)*x*(-3*(a*x^2+b)^(5/2)*x^4*a^2+15*b^(5/
2)*ln(2*(b^(1/2)*(a*x^2+b)^(1/2)+b)/x)*x^4*a^2+3*(a*x^2+b)^(7/2)*
x^2*a-5*(a*x^2+b)^(3/2)*x^4*a^2*b-15*(a*x^2+b)^(1/2)*x^4*a^2*b^2+
2*(a*x^2+b)^(7/2)*b)/(a*x^2+b)^(5/2)/b^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.255689, size = 1, normalized size = 0.01

$$\left[\frac{15\,a^2\sqrt{b}x^3\log\left(-\frac{ax^2-2\,\sqrt{b}x\sqrt{\frac{ax^2+b}{x^2}}+2\,b}{x^2}\right)+2\,\left(8\,a^2x^4-9\,abx^2-2\,b^2\right)\sqrt{\frac{ax^2+b}{x^2}}}{16\,x^3},\right.$$
$$\left.-\frac{15\,a^2\sqrt{-b}x^3\arctan\left(\frac{b}{\sqrt{-b}x\sqrt{\frac{ax^2+b}{x^2}}}\right)-\left(8\,a^2x^4-9\,abx^2-2\,b^2\right)\sqrt{\frac{ax^2+b}{x^2}}}{8\,x^3}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(5/2),x, algorithm="fricas")
```

```
[Out] [1/16*(15*a^2*sqrt(b)*x^3*log(-(a*x^2 - 2*sqrt(b)*x*sqrt((a*x^2 +
 b)/x^2) + 2*b)/x^2) + 2*(8*a^2*x^4 - 9*a*b*x^2 - 2*b^2)*sqrt((a*
x^2 + b)/x^2))/x^3, -1/8*(15*a^2*sqrt(-b)*x^3*arctan(b/(sqrt(-b)*
x*sqrt((a*x^2 + b)/x^2))) - (8*a^2*x^4 - 9*a*b*x^2 - 2*b^2)*sqrt(
(a*x^2 + b)/x^2))/x^3]
```

Sympy [A] time = 16.474, size = 117, normalized size = 1.36

$$\frac{a^{\frac{5}{2}}x}{\sqrt{1+\frac{b}{ax^2}}}-\frac{a^{\frac{3}{2}}b}{8x\sqrt{1+\frac{b}{ax^2}}}-\frac{11\sqrt{a}b^2}{8x^3\sqrt{1+\frac{b}{ax^2}}}-\frac{15a^2\sqrt{b}\operatorname{asinh}\left(\frac{\sqrt{b}}{\sqrt{a}x}\right)}{8}-\frac{b^3}{4\sqrt{a}x^5\sqrt{1+\frac{b}{ax^2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**(5/2),x)
```

```
[Out] a**(5/2)*x/sqrt(1 + b/(a*x**2)) - a**(3/2)*b/(8*x*sqrt(1 + b/(a*x
**2))) - 11*sqrt(a)*b**2/(8*x**3*sqrt(1 + b/(a*x**2))) - 15*a**2*
sqrt(b)*asinh(sqrt(b)/(sqrt(a)*x))/8 - b**3/(4*sqrt(a)*x**5*sqrt(
1 + b/(a*x**2)))
```

GIAC/XCAS [A] time = 0.263365, size = 105, normalized size = 1.22

$$\frac{1}{8}\left(\frac{15\,b\arctan\left(\frac{\sqrt{ax^2+b}}{\sqrt{-b}}\right)}{\sqrt{-b}}+8\,\sqrt{ax^2+b}-\frac{9\left(ax^2+b\right)^{\frac{3}{2}}b-7\,\sqrt{ax^2+b}b^2}{a^2x^4}\right)a^2\operatorname{sign}\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(5/2),x, algorithm="giac")
```

```
[Out] 1/8*(15*b*arctan(sqrt(a*x^2 + b)/sqrt(-b))/sqrt(-b) + 8*sqrt(a*x^
2 + b) - (9*(a*x^2 + b)^(3/2)*b - 7*sqrt(a*x^2 + b)*b^2)/(a^2*x^4
))*a^2*sign(x)
```

3.1909 $\int \frac{\left(a+\frac{b}{x^2}\right)^{5/2}}{x} \, dx$

Optimal. Leaf size=72

$$a^{5/2}\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)-a^2\sqrt{a+\frac{b}{x^2}}-\frac{1}{3}a\left(a+\frac{b}{x^2}\right)^{3/2}-\frac{1}{5}\left(a+\frac{b}{x^2}\right)^{5/2}$$

```
[Out] -(a^2*Sqrt[a + b/x^2]) - (a*(a + b/x^2)^(3/2))/3 - (a + b/x^2)^(5
/2)/5 + a^(5/2)*ArcTanh[Sqrt[a + b/x^2]/Sqrt[a]]
```

Rubi [A] time = 0.125726, antiderivative size = 72, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$a^{5/2}\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)-a^2\sqrt{a+\frac{b}{x^2}}-\frac{1}{3}a\left(a+\frac{b}{x^2}\right)^{3/2}-\frac{1}{5}\left(a+\frac{b}{x^2}\right)^{5/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^(5/2)/x,x]
```

```
[Out] -(a^2*Sqrt[a + b/x^2]) - (a*(a + b/x^2)^(3/2))/3 - (a + b/x^2)^(5
/2)/5 + a^(5/2)*ArcTanh[Sqrt[a + b/x^2]/Sqrt[a]]
```

Rubi in Sympy [A] time = 10.9748, size = 60, normalized size = 0.83

$$a^{\frac{5}{2}}\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)-a^2\sqrt{a+\frac{b}{x^2}}-\frac{a\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}{3}-\frac{\left(a+\frac{b}{x^2}\right)^{\frac{5}{2}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**(5/2)/x,x)
```

```
[Out] a**(5/2)*atanh(sqrt(a + b/x**2)/sqrt(a)) - a**2*sqrt(a + b/x**2)
- a*(a + b/x**2)**(3/2)/3 - (a + b/x**2)**(5/2)/5
```

Mathematica [A] time = 0.0940606, size = 82, normalized size = 1.14

$$\frac{\sqrt{a+\frac{b}{x^2}}\left(\frac{15a^{5/2}x^5\log\left(\sqrt{a}\sqrt{ax^2+b}+ax\right)}{\sqrt{ax^2+b}}-23a^2x^4-11abx^2-3b^2\right)}{15x^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^(5/2)/x,x]
```

```
[Out] (Sqrt[a + b/x^2]*(-3*b^2 - 11*a*b*x^2 - 23*a^2*x^4 + (15*a^(5/2)*
x^5*Log[a*x + Sqrt[a]*Sqrt[b + a*x^2]])/Sqrt[b + a*x^2]))/(15*x^4
)
```

Maple [B] time = 0.015, size = 166, normalized size = 2.3

$$\frac{1}{15\,b^3}\left(\frac{ax^2+b}{x^2}\right)^{\frac{5}{2}}\left(8\,a^{7/2}\left(ax^2+b\right)^{5/2}x^6+10\,a^{7/2}\left(ax^2+b\right)^{3/2}x^6b+15\,a^{7/2}\sqrt{ax^2+b}x^6b^2-8\,a^{5/2}\left(ax^2+b\right)^{7/2}x^4-2\,a^{3/2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^(5/2)/x,x)
```

```
[Out] 1/15*((a*x^2+b)/x^2)^(5/2)*(8*a^(7/2)*(a*x^2+b)^(5/2)*x^6+10*a^(7
/2)*(a*x^2+b)^(3/2)*x^6*b+15*a^(7/2)*(a*x^2+b)^(1/2)*x^6*b^2-8*a^
(5/2)*(a*x^2+b)^(7/2)*x^4-2*a^(3/2)*(a*x^2+b)^(7/2)*x^2*b+15*ln(a
^(1/2)*x+(a*x^2+b)^(1/2))*x^5*a^3*b^3-3*(a*x^2+b)^(7/2)*b^2*a^(1/
2))/(a*x^2+b)^(5/2)/b^3/a^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(5/2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.252471, size = 1, normalized size = 0.01

$$\left[\frac{15\,a^{\frac{5}{2}}x^4\log\left(-2\,ax^2-2\,\sqrt{a}x^2\sqrt{\frac{ax^2+b}{x^2}}-b\right)-2\left(23\,a^2x^4+11\,abx^2+3\,b^2\right)\sqrt{\frac{ax^2+b}{x^2}}}{30\,x^4},\ \frac{15\,\sqrt{-a}a^2x^4\arctan\left(\frac{a}{\sqrt{-a}\sqrt{\frac{ax^2+b}{x^2}}}\right)-(23\right.}{15\,x^4}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(5/2)/x,x, algorithm="fricas")
```

```
[Out] [1/30*(15*a^(5/2)*x^4*log(-2*a*x^2 - 2*sqrt(a)*x^2*sqrt((a*x^2 +
b)/x^2) - b) - 2*(23*a^2*x^4 + 11*a*b*x^2 + 3*b^2)*sqrt((a*x^2 +
b)/x^2))/x^4, 1/15*(15*sqrt(-a)*a^2*x^4*arctan(a/(sqrt(-a)*sqrt((
a*x^2 + b)/x^2))) - (23*a^2*x^4 + 11*a*b*x^2 + 3*b^2)*sqrt((a*x^2
 + b)/x^2))/x^4]
```

Sympy [A] time = 15.6275, size = 105, normalized size = 1.46

$$-\frac{23a^{\frac{5}{2}}\sqrt{1+\frac{b}{ax^2}}}{15}-\frac{a^{\frac{5}{2}}\log\left(\frac{b}{ax^2}\right)}{2}+a^{\frac{5}{2}}\log\left(\sqrt{1+\frac{b}{ax^2}}+1\right)-\frac{11a^{\frac{3}{2}}b\sqrt{1+\frac{b}{ax^2}}}{15x^2}-\frac{\sqrt{a}b^2\sqrt{1+\frac{b}{ax^2}}}{5x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**(5/2)/x,x)
```

```
[Out] -23*a**(5/2)*sqrt(1 + b/(a*x**2))/15 - a**(5/2)*log(b/(a*x**2))/2
 + a**(5/2)*log(sqrt(1 + b/(a*x**2)) + 1) - 11*a**(3/2)*b*sqrt(1
+ b/(a*x**2))/(15*x**2) - sqrt(a)*b**2*sqrt(1 + b/(a*x**2))/(5*x*
```

```
*4)
```

GIAC/XCAS [A] time = 0.605609, size = 243, normalized size = 3.38

$$-\frac{1}{2}\,a^{\frac{5}{2}}\ln\left(\left(\sqrt{a}x-\sqrt{ax^2+b}\right)^2\right)\operatorname{sign}(x)+\frac{2\left(45\left(\sqrt{a}x-\sqrt{ax^2+b}\right)^8a^{\frac{5}{2}}b\operatorname{sign}(x)-90\left(\sqrt{a}x-\sqrt{ax^2+b}\right)^6a^{\frac{5}{2}}b^2\operatorname{sign}(x)+140\left(\sqrt{a}x-\sqrt{ax^2+b}\right)^4a^{\frac{5}{2}}b^3\operatorname{sign}(x)-70\left(\sqrt{a}x-\sqrt{ax^2+b}\right)^2a^{\frac{5}{2}}b^4\operatorname{sign}(x)+23a^{\frac{5}{2}}b^5\operatorname{sign}(x)\right)}{15\left(\left(\sqrt{a}x-\sqrt{ax^2+b}\right)^2-b\right)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(5/2)/x,x, algorithm="giac")
```

```
[Out] -1/2*a^(5/2)*ln((sqrt(a)*x - sqrt(a*x^2 + b))^2)*sign(x) + 2/15*(
45*(sqrt(a)*x - sqrt(a*x^2 + b))^8*a^(5/2)*b*sign(x) - 90*(sqrt(a
)*x - sqrt(a*x^2 + b))^6*a^(5/2)*b^2*sign(x) + 140*(sqrt(a)*x - s
qrt(a*x^2 + b))^4*a^(5/2)*b^3*sign(x) - 70*(sqrt(a)*x - sqrt(a*x^
2 + b))^2*a^(5/2)*b^4*sign(x) + 23*a^(5/2)*b^5*sign(x))/((sqrt(a)
*x - sqrt(a*x^2 + b))^2 - b)^5
```

3.1910 $\int \frac{\left(a+\frac{b}{x^2}\right)^{5/2}}{x^2} dx$

Optimal. Leaf size=92

$$-\frac{5a^3\tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{16\sqrt{b}}-\frac{5a^2\sqrt{a+\frac{b}{x^2}}}{16x}-\frac{5a\left(a+\frac{b}{x^2}\right)^{3/2}}{24x}-\frac{\left(a+\frac{b}{x^2}\right)^{5/2}}{6x}$$

```
[Out] (-5*a^2*Sqrt[a + b/x^2])/(16*x) - (5*a*(a + b/x^2)^(3/2))/(24*x)
- (a + b/x^2)^(5/2)/(6*x) - (5*a^3*ArcTanh[Sqrt[b]/(Sqrt[a + b/x^
2]*x)])/(16*Sqrt[b])
```

Rubi [A] time = 0.103693, antiderivative size = 92, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{5a^3\tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{16\sqrt{b}}-\frac{5a^2\sqrt{a+\frac{b}{x^2}}}{16x}-\frac{5a\left(a+\frac{b}{x^2}\right)^{3/2}}{24x}-\frac{\left(a+\frac{b}{x^2}\right)^{5/2}}{6x}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^(5/2)/x^2,x]
```

```
[Out] (-5*a^2*Sqrt[a + b/x^2])/(16*x) - (5*a*(a + b/x^2)^(3/2))/(24*x)
- (a + b/x^2)^(5/2)/(6*x) - (5*a^3*ArcTanh[Sqrt[b]/(Sqrt[a + b/x^
2]*x)])/(16*Sqrt[b])
```

Rubi in Sympy [A] time = 7.67312, size = 80, normalized size = 0.87

$$-\frac{5a^3\operatorname{atanh}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{16\sqrt{b}}-\frac{5a^2\sqrt{a+\frac{b}{x^2}}}{16x}-\frac{5a\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}{24x}-\frac{\left(a+\frac{b}{x^2}\right)^{\frac{5}{2}}}{6x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**(5/2)/x**2,x)
```

```
[Out] -5*a**3*atanh(sqrt(b)/(x*sqrt(a + b/x**2)))/(16*sqrt(b)) - 5*a**2
*sqrt(a + b/x**2)/(16*x) - 5*a*(a + b/x**2)**(3/2)/(24*x) - (a +
b/x**2)**(5/2)/(6*x)
```

Mathematica [A] time = 0.119784, size = 112, normalized size = 1.22

$$\frac{\sqrt{a+\frac{b}{x^2}}\left(-15a^3x^6\log\left(\sqrt{b}\sqrt{ax^2+b}+b\right)+15a^3x^6\log(x)-\sqrt{b}\sqrt{ax^2+b}\left(33a^2x^4+26abx^2+8b^2\right)\right)}{48\sqrt{b}x^5\sqrt{ax^2+b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^(5/2)/x^2,x]
```

```
[Out] (Sqrt[a + b/x^2]*(-(Sqrt[b]*Sqrt[b + a*x^2]*(8*b^2 + 26*a*b*x^2 +
 33*a^2*x^4)) + 15*a^3*x^6*Log[x] - 15*a^3*x^6*Log[b + Sqrt[b]*Sq
```

```
rt[b + a*x^2]]))/(48*Sqrt[b]*x^5*Sqrt[b + a*x^2])
```

Maple [B] time = 0.018, size = 166, normalized size = 1.8

$$-\frac{1}{48\,b^3x}\left(\frac{ax^2+b}{x^2}\right)^{\frac{5}{2}}\left(-3\,\left(ax^2+b\right)^{5/2}x^6a^3+15\,b^{5/2}\ln\left(2\,\frac{\sqrt{b}\sqrt{ax^2+b}+b}{x}\right)x^6a^3+3\,\left(ax^2+b\right)^{7/2}x^4a^2-5\,\left(ax^2+b\right)^{3/2}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^(5/2)/x^2,x)
```

```
[Out] -1/48*((a*x^2+b)/x^2)^(5/2)/x*(-3*(a*x^2+b)^(5/2)*x^6*a^3+15*b^(5
/2)*ln(2*(b^(1/2)*(a*x^2+b)^(1/2)+b)/x)*x^6*a^3+3*(a*x^2+b)^(7/2)
*x^4*a^2-5*(a*x^2+b)^(3/2)*x^6*a^3*b-15*(a*x^2+b)^(1/2)*x^6*a^3*b
^2+2*(a*x^2+b)^(7/2)*x^2*a*b+8*(a*x^2+b)^(7/2)*b^2)/(a*x^2+b)^(5/
2)/b^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(5/2)/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.263277, size = 1, normalized size = 0.01

$$\left[\frac{15\,a^3\sqrt{b}x^5\log\left(\frac{2\,bx\sqrt{\frac{ax^2+b}{x^2}}-\left(ax^2+2\,b\right)\sqrt{b}}{x^2}\right)-2\left(33\,a^2bx^4+26\,ab^2x^2+8\,b^3\right)\sqrt{\frac{ax^2+b}{x^2}}}{96\,bx^5},\ \frac{15\,a^3\sqrt{-b}x^5\arctan\left(\frac{\sqrt{-b}}{x\sqrt{\frac{ax^2+b}{x^2}}}\right)-\left(33\,a^2b\right.}{48\,bx^5}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(5/2)/x^2,x, algorithm="fricas")
```

```
[Out] [1/96*(15*a^3*sqrt(b)*x^5*log((2*b*x*sqrt((a*x^2 + b)/x^2) - (a*x
^2 + 2*b)*sqrt(b))/x^2) - 2*(33*a^2*b*x^4 + 26*a*b^2*x^2 + 8*b^3)
*sqrt((a*x^2 + b)/x^2))/(b*x^5), 1/48*(15*a^3*sqrt(-b)*x^5*arctan
(sqrt(-b)/(x*sqrt((a*x^2 + b)/x^2))) - (33*a^2*b*x^4 + 26*a*b^2*x
^2 + 8*b^3)*sqrt((a*x^2 + b)/x^2))/(b*x^5)]
```

Sympy [A] time = 18.1762, size = 99, normalized size = 1.08

$$-\frac{11a^{\frac{5}{2}}\sqrt{1+\frac{b}{ax^2}}}{16x}-\frac{13a^{\frac{3}{2}}b\sqrt{1+\frac{b}{ax^2}}}{24x^3}-\frac{\sqrt{a}b^2\sqrt{1+\frac{b}{ax^2}}}{6x^5}-\frac{5a^3\operatorname{asinh}\left(\frac{\sqrt{b}}{\sqrt{a}x}\right)}{16\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**(5/2)/x**2,x)
```

```
[Out] -11*a**(5/2)*sqrt(1 + b/(a*x**2))/(16*x) - 13*a**(3/2)*b*sqrt(1 +
 b/(a*x**2))/(24*x**3) - sqrt(a)*b**2*sqrt(1 + b/(a*x**2))/(6*x**
5) - 5*a**3*asinh(sqrt(b)/(sqrt(a)*x))/(16*sqrt(b))
```

GIAC/XCAS [A] time = 0.283501, size = 104, normalized size = 1.13

$$\frac{1}{48}\, a^3\left(\frac{15\, \arctan\left(\frac{\sqrt{ax^2+b}}{\sqrt{-b}}\right)}{\sqrt{-b}} - \frac{33\, \left(ax^2+b\right)^{\frac{5}{2}} - 40\, \left(ax^2+b\right)^{\frac{3}{2}} b + 15\, \sqrt{ax^2+b}\, b^2}{a^3 x^6}\right)\mathrm{sign}\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(5/2)/x^2,x, algorithm="giac")
```

```
[Out] 1/48*a^3*(15*arctan(sqrt(a*x^2 + b)/sqrt(-b))/sqrt(-b) - (33*(a*x
^2 + b)^(5/2) - 40*(a*x^2 + b)^(3/2)*b + 15*sqrt(a*x^2 + b)*b^2)/
(a^3*x^6))*sign(x)
```

3.1911 $\int \frac{\left(a+\frac{b}{x^2}\right)^{5/2}}{x^3}\,dx$

Optimal. Leaf size=18

$$-\frac{\left(a+\frac{b}{x^2}\right)^{7/2}}{7b}$$

```
[Out] -(a + b/x^2)^(7/2)/(7*b)
```

Rubi [A] time = 0.0272453, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{\left(a+\frac{b}{x^2}\right)^{7/2}}{7b}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^(5/2)/x^3,x]

[Out] -(a + b/x^2)^(7/2)/(7*b)
```

Rubi in Sympy [A] time = 2.13972, size = 14, normalized size = 0.78

$$-\frac{\left(a+\frac{b}{x^2}\right)^{\frac{7}{2}}}{7b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**(5/2)/x**3,x)

[Out] -(a + b/x**2)**(7/2)/(7*b)
```

Mathematica [A] time = 0.0329176, size = 30, normalized size = 1.67

$$-\frac{\sqrt{a+\frac{b}{x^2}}\left(ax^2+b\right)^3}{7bx^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^(5/2)/x^3,x]

[Out] -(Sqrt[a + b/x^2]*(b + a*x^2)^3)/(7*b*x^6)
```

Maple [A] time = 0.008, size = 29, normalized size = 1.6

$$-\frac{ax^2+b}{7\,bx^2}\left(\frac{ax^2+b}{x^2}\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^(5/2)/x^3,x)

[Out] -1/7*(a*x^2+b)/x^2/b*((a*x^2+b)/x^2)^(5/2)
```

Maxima [A] time = 1.44165, size = 19, normalized size = 1.06

$$-\frac{\left(a+\frac{b}{x^2}\right)^{\frac{7}{2}}}{7\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(5/2)/x^3,x, algorithm="maxima")

[Out] -1/7*(a + b/x^2)^(7/2)/b
```

Fricas [A] time = 0.251446, size = 68, normalized size = 3.78

$$-\frac{\left(a^3x^6+3\,a^2bx^4+3\,ab^2x^2+b^3\right)\sqrt{\frac{ax^2+b}{x^2}}}{7\,bx^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(5/2)/x^3,x, algorithm="fricas")

[Out] -1/7*(a^3*x^6 + 3*a^2*b*x^4 + 3*a*b^2*x^2 + b^3)*sqrt((a*x^2 + b)
/x^2)/(b*x^6)
```

Sympy [A] time = 12.6234, size = 88, normalized size = 4.89

$$\begin{cases} -\frac{a^3\sqrt{a+\frac{b}{x^2}}}{7b} - \frac{3a^2\sqrt{a+\frac{b}{x^2}}}{7x^2} - \frac{3ab\sqrt{a+\frac{b}{x^2}}}{7x^4} - \frac{b^2\sqrt{a+\frac{b}{x^2}}}{7x^6} & \text{for } b \neq 0 \\ -\frac{a^{\frac{5}{2}}}{2x^2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**(5/2)/x**3,x)

[Out] Piecewise((-a**3*sqrt(a + b/x**2)/(7*b) - 3*a**2*sqrt(a + b/x**2)
/(7*x**2) - 3*a*b*sqrt(a + b/x**2)/(7*x**4) - b**2*sqrt(a + b/x**
2)/(7*x**6), Ne(b, 0)), (-a**(5/2)/(2*x**2), True))
```

GIAC/XCAS [A] time = 0.253855, size = 163, normalized size = 9.06

$$\frac{2\left(7\left(\sqrt{a}x-\sqrt{ax^2+b}\right)^{12}a^{\frac{7}{2}}\mathrm{sign}(x)+35\left(\sqrt{a}x-\sqrt{ax^2+b}\right)^{8}a^{\frac{7}{2}}b^2\mathrm{sign}(x)+21\left(\sqrt{a}x-\sqrt{ax^2+b}\right)^{4}a^{\frac{7}{2}}b^4\mathrm{sign}(x)+a^{\frac{7}{2}}b^6\mathrm{sign}}{7\left(\left(\sqrt{a}x-\sqrt{ax^2+b}\right)^2-b\right)^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(5/2)/x^3,x, algorithm="giac")
```

```
[Out] 2/7*(7*(sqrt(a)*x - sqrt(a*x^2 + b))^12*a^(7/2)*sign(x) + 35*(sqr
t(a)*x - sqrt(a*x^2 + b))^8*a^(7/2)*b^2*sign(x) + 21*(sqrt(a)*x -
 sqrt(a*x^2 + b))^4*a^(7/2)*b^4*sign(x) + a^(7/2)*b^6*sign(x))/((
sqrt(a)*x - sqrt(a*x^2 + b))^2 - b)^7
```

3.1912 $\int \frac{\left(a+\frac{b}{x^2}\right)^{5/2}}{x^4}\,dx$

Optimal. Leaf size=116

$$\frac{5a^4\tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{128b^{3/2}}-\frac{5a^3\sqrt{a+\frac{b}{x^2}}}{128bx}-\frac{5a^2\sqrt{a+\frac{b}{x^2}}}{64x^3}-\frac{5a\left(a+\frac{b}{x^2}\right)^{3/2}}{48x^3}-\frac{\left(a+\frac{b}{x^2}\right)^{5/2}}{8x^3}$$

```
[Out] (-5*a^2*Sqrt[a + b/x^2])/(64*x^3) - (5*a*(a + b/x^2)^(3/2))/(48*x
^3) - (a + b/x^2)^(5/2)/(8*x^3) - (5*a^3*Sqrt[a + b/x^2])/(128*b*
x) + (5*a^4*ArcTanh[Sqrt[b]/(Sqrt[a + b/x^2]*x)])/(128*b^(3/2))
```

Rubi [A] time = 0.18245, antiderivative size = 116, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{5a^4\tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{128b^{3/2}}-\frac{5a^3\sqrt{a+\frac{b}{x^2}}}{128bx}-\frac{5a^2\sqrt{a+\frac{b}{x^2}}}{64x^3}-\frac{5a\left(a+\frac{b}{x^2}\right)^{3/2}}{48x^3}-\frac{\left(a+\frac{b}{x^2}\right)^{5/2}}{8x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^(5/2)/x^4,x]
```

```
[Out] (-5*a^2*Sqrt[a + b/x^2])/(64*x^3) - (5*a*(a + b/x^2)^(3/2))/(48*x
^3) - (a + b/x^2)^(5/2)/(8*x^3) - (5*a^3*Sqrt[a + b/x^2])/(128*b*
x) + (5*a^4*ArcTanh[Sqrt[b]/(Sqrt[a + b/x^2]*x)])/(128*b^(3/2))
```

Rubi in Sympy [A] time = 17.9041, size = 104, normalized size = 0.9

$$\frac{5a^4\operatorname{atanh}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{128b^{\frac{3}{2}}}-\frac{5a^3\sqrt{a+\frac{b}{x^2}}}{128bx}-\frac{5a^2\sqrt{a+\frac{b}{x^2}}}{64x^3}-\frac{5a\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}{48x^3}-\frac{\left(a+\frac{b}{x^2}\right)^{\frac{5}{2}}}{8x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**(5/2)/x**4,x)
```

```
[Out] 5*a**4*atanh(sqrt(b)/(x*sqrt(a + b/x**2)))/(128*b**(3/2)) - 5*a**
3*sqrt(a + b/x**2)/(128*b*x) - 5*a**2*sqrt(a + b/x**2)/(64*x**3)
- 5*a*(a + b/x**2)**(3/2)/(48*x**3) - (a + b/x**2)**(5/2)/(8*x**3
)
```

Mathematica [A] time = 0.139184, size = 122, normalized size = 1.05

$$-\frac{\sqrt{a+\frac{b}{x^2}}\left(-15a^4x^8\log\left(\sqrt{b}\sqrt{ax^2+b}+b\right)+15a^4x^8\log(x)+\sqrt{b}\sqrt{ax^2+b}\left(15a^3x^6+118a^2bx^4+136ab^2x^2+48b^3\right)\right)}{384b^{3/2}x^7\sqrt{ax^2+b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^(5/2)/x^4,x]
```

```
[Out] -(Sqrt[a + b/x^2]*(Sqrt[b]*Sqrt[b + a*x^2]*(48*b^3 + 136*a*b^2*x^
2 + 118*a^2*b*x^4 + 15*a^3*x^6) + 15*a^4*x^8*Log[x] - 15*a^4*x^8*
```

```
Log[b + Sqrt[b]*Sqrt[b + a*x^2]]))/(384*b^(3/2)*x^7*Sqrt[b + a*x^
2])
```

Maple [B] time = 0.026, size = 186, normalized size = 1.6

$$\frac{1}{384\,x^3b^4}\left(\frac{ax^2+b}{x^2}\right)^{\frac{5}{2}}\left(-3\,\left(ax^2+b\right)^{5/2}x^8a^4+15\,b^{5/2}\ln\left(2\,\frac{\sqrt{b}\sqrt{ax^2+b}+b}{x}\right)x^8a^4+3\,\left(ax^2+b\right)^{7/2}x^6a^3-5\,\left(ax^2+b\right)^{3/2}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^(5/2)/x^4,x)
```

```
[Out] 1/384*((a*x^2+b)/x^2)^(5/2)/x^3*(-3*(a*x^2+b)^(5/2)*x^8*a^4+15*b^
(5/2)*ln(2*(b^(1/2)*(a*x^2+b)^(1/2)+b)/x)*x^8*a^4+3*(a*x^2+b)^(7/
2)*x^6*a^3-5*(a*x^2+b)^(3/2)*x^8*a^4*b-15*(a*x^2+b)^(1/2)*x^8*a^4
*b^2+2*(a*x^2+b)^(7/2)*x^4*a^2*b+8*(a*x^2+b)^(7/2)*x^2*a*b^2-48*(
a*x^2+b)^(7/2)*b^3)/(a*x^2+b)^(5/2)/b^4
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(5/2)/x^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.270034, size = 1, normalized size = 0.01

$$\left[\frac{15\,a^4\sqrt{b}x^7\log\left(-\frac{2\,bx\sqrt{\frac{ax^2+b}{x^2}}+\left(ax^2+2\,b\right)\sqrt{b}}{x^2}\right)-2\,\left(15\,a^3bx^6+118\,a^2b^2x^4+136\,ab^3x^2+48\,b^4\right)\sqrt{\frac{ax^2+b}{x^2}}}{768\,b^2x^7},\right.$$
$$\left.-\frac{15\,a^4\sqrt{-b}x^7\arctan\left(\frac{\sqrt{-b}}{x\sqrt{\frac{ax^2+b}{x^2}}}\right)+\left(15\,a^3bx^6+118\,a^2b^2x^4+136\,ab^3x^2+48\,b^4\right)\sqrt{\frac{ax^2+b}{x^2}}}{384\,b^2x^7}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(5/2)/x^4,x, algorithm="fricas")
```

```
[Out] [1/768*(15*a^4*sqrt(b)*x^7*log(-(2*b*x*sqrt((a*x^2 + b)/x^2) + (a
*x^2 + 2*b)*sqrt(b))/x^2) - 2*(15*a^3*b*x^6 + 118*a^2*b^2*x^4 + 1
36*a*b^3*x^2 + 48*b^4)*sqrt((a*x^2 + b)/x^2))/(b^2*x^7), -1/384*(
15*a^4*sqrt(-b)*x^7*arctan(sqrt(-b)/(x*sqrt((a*x^2 + b)/x^2))) +
(15*a^3*b*x^6 + 118*a^2*b^2*x^4 + 136*a*b^3*x^2 + 48*b^4)*sqrt((a
*x^2 + b)/x^2))/(b^2*x^7)]
```

Sympy [A] time = 27.3699, size = 150, normalized size = 1.29

$$-\frac{5a^{\frac{7}{2}}}{128bx\sqrt{1+\frac{b}{ax^2}}}-\frac{133a^{\frac{5}{2}}}{384x^3\sqrt{1+\frac{b}{ax^2}}}-\frac{127a^{\frac{3}{2}}b}{192x^5\sqrt{1+\frac{b}{ax^2}}}-\frac{23\sqrt{a}b^2}{48x^7\sqrt{1+\frac{b}{ax^2}}}+\frac{5a^4\operatorname{asinh}\left(\frac{\sqrt{b}}{\sqrt{a}x}\right)}{128b^{\frac{3}{2}}}-\frac{b^3}{8\sqrt{a}x^9\sqrt{1+\frac{b}{ax^2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**(5/2)/x**4,x)
```

```
[Out] -5*a**(7/2)/(128*b*x*sqrt(1 + b/(a*x**2))) - 133*a**(5/2)/(384*x*
*3*sqrt(1 + b/(a*x**2))) - 127*a**(3/2)*b/(192*x**5*sqrt(1 + b/(a
*x**2))) - 23*sqrt(a)*b**2/(48*x**7*sqrt(1 + b/(a*x**2))) + 5*a**
4*asinh(sqrt(b)/(sqrt(a)*x))/(128*b**(3/2)) - b**3/(8*sqrt(a)*x**
9*sqrt(1 + b/(a*x**2)))
```

GIAC/XCAS [A] time = 0.275334, size = 130, normalized size = 1.12

$$-\frac{1}{384}a^4\left(\frac{15\arctan\left(\frac{\sqrt{ax^2+b}}{\sqrt{-b}}\right)}{\sqrt{-b}b}+\frac{15\left(ax^2+b\right)^{\frac{7}{2}}+73\left(ax^2+b\right)^{\frac{5}{2}}b-55\left(ax^2+b\right)^{\frac{3}{2}}b^2+15\sqrt{ax^2+b}b^3}{a^4bx^8}\right)\operatorname{sign}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(5/2)/x^4,x, algorithm="giac")
```

```
[Out] -1/384*a^4*(15*arctan(sqrt(a*x^2 + b)/sqrt(-b))/(sqrt(-b)*b) + (1
5*(a*x^2 + b)^(7/2) + 73*(a*x^2 + b)^(5/2)*b - 55*(a*x^2 + b)^(3/
2)*b^2 + 15*sqrt(a*x^2 + b)*b^3)/(a^4*b*x^8))*sign(x)
```

3.1913 $\int \frac{x^3}{\sqrt{a+\frac{b}{x^2}}} dx$

Optimal. Leaf size=74

$$\frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{8a^{5/2}}-\frac{3bx^2\sqrt{a+\frac{b}{x^2}}}{8a^2}+\frac{x^4\sqrt{a+\frac{b}{x^2}}}{4a}$$

```
[Out] (-3*b*Sqrt[a + b/x^2]*x^2)/(8*a^2) + (Sqrt[a + b/x^2]*x^4)/(4*a)
+ (3*b^2*ArcTanh[Sqrt[a + b/x^2]/Sqrt[a]])/(8*a^(5/2))
```

Rubi [A] time = 0.112116, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{8a^{5/2}}-\frac{3bx^2\sqrt{a+\frac{b}{x^2}}}{8a^2}+\frac{x^4\sqrt{a+\frac{b}{x^2}}}{4a}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/Sqrt[a + b/x^2],x]
```

```
[Out] (-3*b*Sqrt[a + b/x^2]*x^2)/(8*a^2) + (Sqrt[a + b/x^2]*x^4)/(4*a)
+ (3*b^2*ArcTanh[Sqrt[a + b/x^2]/Sqrt[a]])/(8*a^(5/2))
```

Rubi in Sympy [A] time = 9.88857, size = 66, normalized size = 0.89

$$\frac{x^4\sqrt{a+\frac{b}{x^2}}}{4a}-\frac{3bx^2\sqrt{a+\frac{b}{x^2}}}{8a^2}+\frac{3b^2\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{8a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(a+b/x**2)**(1/2),x)
```

```
[Out] x**4*sqrt(a + b/x**2)/(4*a) - 3*b*x**2*sqrt(a + b/x**2)/(8*a**2)
+ 3*b**2*atanh(sqrt(a + b/x**2)/sqrt(a))/(8*a**(5/2))
```

Mathematica [A] time = 0.0684053, size = 90, normalized size = 1.22

$$\frac{\sqrt{a}x\left(2a^2x^4-abx^2-3b^2\right)+3b^2\sqrt{ax^2+b}\log\left(\sqrt{a}\sqrt{ax^2+b}+ax\right)}{8a^{5/2}x\sqrt{a+\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/Sqrt[a + b/x^2],x]
```

```
[Out] (Sqrt[a]*x*(-3*b^2 - a*b*x^2 + 2*a^2*x^4) + 3*b^2*Sqrt[b + a*x^2]
*Log[a*x + Sqrt[a]*Sqrt[b + a*x^2]])/(8*a^(5/2)*Sqrt[a + b/x^2]*x
)
```

Maple [A] time = 0.013, size = 87, normalized size = 1.2

$$\frac{1}{8x}\sqrt{ax^2+b}\left(2x^3\sqrt{ax^2+b}a^{5/2}-3a^{3/2}\sqrt{ax^2+b}xb+3\ln\left(\sqrt{a}x+\sqrt{ax^2+b}\right)ab^2\right)\frac{1}{\sqrt{\frac{ax^2+b}{x^2}}}a^{-\frac{7}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(a+b/x^2)^(1/2),x)
```

```
[Out] 1/8*(a*x^2+b)^(1/2)*(2*x^3*(a*x^2+b)^(1/2)*a^(5/2)-3*a^(3/2)*(a*x
^2+b)^(1/2)*x*b+3*ln(a^(1/2)*x+(a*x^2+b)^(1/2))*a*b^2)/((a*x^2+b)
/x^2)^(1/2)/x/a^(7/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(a + b/x^2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.258802, size = 1, normalized size = 0.01

$$\left[\frac{3\sqrt{a}b^2\log\left(-2ax^2\sqrt{\frac{ax^2+b}{x^2}}-\left(2ax^2+b\right)\sqrt{a}\right)+2\left(2a^2x^4-3abx^2\right)\sqrt{\frac{ax^2+b}{x^2}}}{16a^3},\right.$$
$$\left.-\frac{3\sqrt{-a}b^2\arctan\left(\frac{\sqrt{-a}}{\sqrt{\frac{ax^2+b}{x^2}}}\right)-\left(2a^2x^4-3abx^2\right)\sqrt{\frac{ax^2+b}{x^2}}}{8a^3}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(a + b/x^2),x, algorithm="fricas")
```

```
[Out] [1/16*(3*sqrt(a)*b^2*log(-2*a*x^2*sqrt((a*x^2 + b)/x^2) - (2*a*x^
2 + b)*sqrt(a)) + 2*(2*a^2*x^4 - 3*a*b*x^2)*sqrt((a*x^2 + b)/x^2)
)/a^3, -1/8*(3*sqrt(-a)*b^2*arctan(sqrt(-a)/sqrt((a*x^2 + b)/x^2)
) - (2*a^2*x^4 - 3*a*b*x^2)*sqrt((a*x^2 + b)/x^2))/a^3]
```

Sympy [A] time = 13.7763, size = 95, normalized size = 1.28

$$\frac{x^5}{4\sqrt{b}\sqrt{\frac{ax^2}{b}+1}}-\frac{\sqrt{b}x^3}{8a\sqrt{\frac{ax^2}{b}+1}}-\frac{3b^{\frac{3}{2}}x}{8a^2\sqrt{\frac{ax^2}{b}+1}}+\frac{3b^2\operatorname{asinh}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(a+b/x**2)**(1/2),x)
```

```
[Out] x**5/(4*sqrt(b)*sqrt(a*x**2/b + 1)) - sqrt(b)*x**3/(8*a*sqrt(a*x*
*2/b + 1)) - 3*b**(3/2)*x/(8*a**2*sqrt(a*x**2/b + 1)) + 3*b**2*as
inh(sqrt(a)*x/sqrt(b))/(8*a**(5/2))
```

GIAC/XCAS [A] time = 0.24801, size = 134, normalized size = 1.81

$$-\frac{1}{8}\,b^2\left(\frac{3\,\arctan\left(\frac{\sqrt{\frac{ax^2+b}{x^2}}}{\sqrt{-a}}\right)}{\sqrt{-a}a^2}-\frac{5\,a\sqrt{\frac{ax^2+b}{x^2}}-\frac{3\,(ax^2+b)\sqrt{\frac{ax^2+b}{x^2}}}{x^2}}{\left(a-\frac{ax^2+b}{x^2}\right)^2a^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(a + b/x^2),x, algorithm="giac")
```

```
[Out] -1/8*b^2*(3*arctan(sqrt((a*x^2 + b)/x^2)/sqrt(-a))/(sqrt(-a)*a^2)
 - (5*a*sqrt((a*x^2 + b)/x^2) - 3*(a*x^2 + b)*sqrt((a*x^2 + b)/x^
2)/x^2)/((a - (a*x^2 + b)/x^2)^2*a^2))
```

3.1914 $\int \frac{x}{\sqrt{a+\frac{b}{x^2}}} \, dx$

Optimal. Leaf size=50

$$\frac{x^2\sqrt{a+\frac{b}{x^2}}}{2a}-\frac{b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{2a^{3/2}}$$

```
[Out] (Sqrt[a + b/x^2]*x^2)/(2*a) - (b*ArcTanh[Sqrt[a + b/x^2]/Sqrt[a]]
)/(2*a^(3/2))
```

Rubi [A] time = 0.0764839, antiderivative size = 50, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{x^2\sqrt{a+\frac{b}{x^2}}}{2a}-\frac{b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{2a^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/Sqrt[a + b/x^2],x]
```

```
[Out] (Sqrt[a + b/x^2]*x^2)/(2*a) - (b*ArcTanh[Sqrt[a + b/x^2]/Sqrt[a]]
)/(2*a^(3/2))
```

Rubi in Sympy [A] time = 6.87324, size = 41, normalized size = 0.82

$$\frac{x^2\sqrt{a+\frac{b}{x^2}}}{2a}-\frac{b\,\text{atanh}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{2a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b/x**2)**(1/2),x)
```

```
[Out] x**2*sqrt(a + b/x**2)/(2*a) - b*atanh(sqrt(a + b/x**2)/sqrt(a))/(
2*a**(3/2))
```

Mathematica [A] time = 0.0445525, size = 74, normalized size = 1.48

$$\frac{\sqrt{a}x\left(ax^2+b\right)-b\sqrt{ax^2+b}\log\left(\sqrt{a}\sqrt{ax^2+b}+ax\right)}{2a^{3/2}x\sqrt{a+\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/Sqrt[a + b/x^2],x]
```

```
[Out] (Sqrt[a]*x*(b + a*x^2) - b*Sqrt[b + a*x^2]*Log[a*x + Sqrt[a]*Sqrt
[b + a*x^2]])/(2*a^(3/2)*Sqrt[a + b/x^2]*x)
```

Maple [A] time = 0.013, size = 66, normalized size = 1.3

$$\frac{1}{2x}\sqrt{ax^2+b}\left(x\sqrt{ax^2+b}\,a^{\frac{3}{2}}-b\ln\left(\sqrt{a}\,x+\sqrt{ax^2+b}\right)a\right)\frac{1}{\sqrt{\frac{ax^2+b}{x^2}}}a^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+b/x^2)^(1/2),x)
```

```
[Out] 1/2*(a*x^2+b)^(1/2)*(x*(a*x^2+b)^(1/2)*a^(3/2)-b*ln(a^(1/2)*x+(a*
x^2+b)^(1/2))*a)/((a*x^2+b)/x^2)^(1/2)/x/a^(5/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(a + b/x^2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.257976, size = 1, normalized size = 0.02

$$\left[\frac{2\,ax^2\sqrt{\frac{ax^2+b}{x^2}}+\sqrt{a}b\log\left(2\,ax^2\sqrt{\frac{ax^2+b}{x^2}}-\left(2\,ax^2+b\right)\sqrt{a}\right)}{4\,a^2},\ \frac{ax^2\sqrt{\frac{ax^2+b}{x^2}}+\sqrt{-a}b\arctan\left(\frac{\sqrt{-a}}{\sqrt{\frac{ax^2+b}{x^2}}}\right)}{2\,a^2}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(a + b/x^2),x, algorithm="fricas")
```

```
[Out] [1/4*(2*a*x^2*sqrt((a*x^2 + b)/x^2) + sqrt(a)*b*log(2*a*x^2*sqrt(
(a*x^2 + b)/x^2) - (2*a*x^2 + b)*sqrt(a)))/a^2, 1/2*(a*x^2*sqrt((
a*x^2 + b)/x^2) + sqrt(-a)*b*arctan(sqrt(-a)/sqrt((a*x^2 + b)/x^2
)))/a^2]
```

Sympy [A] time = 7.91433, size = 42, normalized size = 0.84

$$\frac{\sqrt{b}x\sqrt{\frac{ax^2}{b}+1}}{2a}-\frac{b\,\mathrm{asinh}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b/x**2)**(1/2),x)
```

```
[Out] sqrt(b)*x*sqrt(a*x**2/b + 1)/(2*a) - b*asinh(sqrt(a)*x/sqrt(b))/(
2*a**(3/2))
```

GIAC/XCAS [A] time = 0.240789, size = 90, normalized size = 1.8

$$\frac{1}{2}\,b\left(\frac{\arctan\left(\frac{\sqrt{\frac{ax^2+b}{x^2}}}{\sqrt{-a}}\right)}{\sqrt{-a}a}-\frac{\sqrt{\frac{ax^2+b}{x^2}}}{\left(a-\frac{ax^2+b}{x^2}\right)a}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(a + b/x^2),x, algorithm="giac")
```

```
[Out] 1/2*b*(arctan(sqrt((a*x^2 + b)/x^2)/sqrt(-a))/(sqrt(-a)*a) - sqrt
((a*x^2 + b)/x^2)/((a - (a*x^2 + b)/x^2)*a))
```

3.1915 $\int \frac{1}{\sqrt{a+\frac{b}{x^2}}x} dx$

Optimal. Leaf size=24

$$\frac{\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{\sqrt{a}}$$

```
[Out] ArcTanh[Sqrt[a + b/x^2]/Sqrt[a]]/Sqrt[a]
```

Rubi [A] time = 0.057053, antiderivative size = 24, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b/x^2]*x),x]
```

```
[Out] ArcTanh[Sqrt[a + b/x^2]/Sqrt[a]]/Sqrt[a]
```

Rubi in Sympy [A] time = 5.13101, size = 20, normalized size = 0.83

$$\frac{\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**(1/2)/x,x)
```

```
[Out] atanh(sqrt(a + b/x**2)/sqrt(a))/sqrt(a)
```

Mathematica [B] time = 0.0293485, size = 50, normalized size = 2.08

$$\frac{\sqrt{ax^2+b}\tanh^{-1}\left(\frac{\sqrt{a}x}{\sqrt{ax^2+b}}\right)}{\sqrt{a}x\sqrt{a+\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b/x^2]*x),x]
```

```
[Out] (Sqrt[b + a*x^2]*ArcTanh[(Sqrt[a]*x)/Sqrt[b + a*x^2]])/(Sqrt[a]*S
qrt[a + b/x^2]*x)
```

Maple [B] time = 0.008, size = 46, normalized size = 1.9

$$\frac{1}{x}\sqrt{ax^2+b}\ln\left(\sqrt{a}x+\sqrt{ax^2+b}\right)\frac{1}{\sqrt{\frac{ax^2+b}{x^2}}}\frac{1}{\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^(1/2)/x,x)
```

```
[Out] 1/((a*x^2+b)/x^2)^(1/2)/x*(a*x^2+b)^(1/2)*ln(a^(1/2)*x+(a*x^2+b)^
(1/2))/a^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^2)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.241666, size = 1, normalized size = 0.04

$$\left[\frac{\log\left(-2\,ax^2\sqrt{\frac{ax^2+b}{x^2}}-\left(2\,ax^2+b\right)\sqrt{a}\right)}{2\,\sqrt{a}},\,-\frac{\sqrt{-a}\arctan\left(\frac{\sqrt{-a}}{\sqrt{\frac{ax^2+b}{x^2}}}\right)}{a}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^2)*x),x, algorithm="fricas")
```

```
[Out] [1/2*log(-2*a*x^2*sqrt((a*x^2 + b)/x^2) - (2*a*x^2 + b)*sqrt(a))/
sqrt(a), -sqrt(-a)*arctan(sqrt(-a)/sqrt((a*x^2 + b)/x^2))/a]
```

Sympy [A] time = 4.25846, size = 17, normalized size = 0.71

$$\frac{\operatorname{asinh}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**(1/2)/x,x)
```

```
[Out] asinh(sqrt(a)*x/sqrt(b))/sqrt(a)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a+\frac{b}{x^2}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^2)*x),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(a + b/x^2)*x), x)
```

3.1916 $\int \frac{1}{\sqrt{a+\frac{b}{x^2}}x^3} dx$

Optimal. Leaf size=16

$$-\frac{\sqrt{a+\frac{b}{x^2}}}{b}$$

```
[Out] -(Sqrt[a + b/x^2]/b)
```

Rubi [A] time = 0.0289002, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{\sqrt{a+\frac{b}{x^2}}}{b}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b/x^2]*x^3),x]

[Out] -(Sqrt[a + b/x^2]/b)
```

Rubi in Sympy [A] time = 2.11404, size = 12, normalized size = 0.75

$$-\frac{\sqrt{a+\frac{b}{x^2}}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**(1/2)/x**3,x)

[Out] -sqrt(a + b/x**2)/b
```

Mathematica [A] time = 0.0259794, size = 16, normalized size = 1.

$$-\frac{\sqrt{a+\frac{b}{x^2}}}{b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b/x^2]*x^3),x]

[Out] -(Sqrt[a + b/x^2]/b)
```

Maple [A] time = 0.007, size = 29, normalized size = 1.8

$$-\frac{ax^2+b}{bx^2}\frac{1}{\sqrt{\frac{ax^2+b}{x^2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^(1/2)/x^3,x)
```

```
[Out] -(a*x^2+b)/x^2/b/((a*x^2+b)/x^2)^(1/2)
```

Maxima [A] time = 1.43617, size = 19, normalized size = 1.19

$$-\frac{\sqrt{a+\frac{b}{x^2}}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^2)*x^3),x, algorithm="maxima")
```

```
[Out] -sqrt(a + b/x^2)/b
```

Fricas [A] time = 0.226257, size = 24, normalized size = 1.5

$$-\frac{\sqrt{\frac{ax^2+b}{x^2}}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^2)*x^3),x, algorithm="fricas")
```

```
[Out] -sqrt((a*x^2 + b)/x^2)/b
```

Sympy [A] time = 4.08182, size = 26, normalized size = 1.62

$$\begin{cases} -\frac{\sqrt{a+\frac{b}{x^2}}}{b} & \text{for } b \neq 0 \\ -\frac{1}{2\sqrt{a}x^2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**(1/2)/x**3,x)
```

```
[Out] Piecewise((-sqrt(a + b/x**2)/b, Ne(b, 0)), (-1/(2*sqrt(a)*x**2),
True))
```

GIAC/XCAS [A] time = 0.221484, size = 19, normalized size = 1.19

$$-\frac{\sqrt{a+\frac{b}{x^2}}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^2)*x^3),x, algorithm="giac")
```

```
[Out] -sqrt(a + b/x^2)/b
```

3.1917 $\int \frac{1}{\sqrt{a+\frac{b}{x^2}}x^5} dx$

Optimal. Leaf size=35

$$\frac{a\sqrt{a+\frac{b}{x^2}}}{b^2}-\frac{\left(a+\frac{b}{x^2}\right)^{3/2}}{3b^2}$$

```
[Out] (a*Sqrt[a + b/x^2])/b^2 - (a + b/x^2)^(3/2)/(3*b^2)
```

Rubi [A] time = 0.065121, antiderivative size = 35, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a\sqrt{a+\frac{b}{x^2}}}{b^2}-\frac{\left(a+\frac{b}{x^2}\right)^{3/2}}{3b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b/x^2]*x^5),x]

[Out] (a*Sqrt[a + b/x^2])/b^2 - (a + b/x^2)^(3/2)/(3*b^2)
```

Rubi in Sympy [A] time = 6.99349, size = 29, normalized size = 0.83

$$\frac{a\sqrt{a+\frac{b}{x^2}}}{b^2}-\frac{\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}{3b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**(1/2)/x**5,x)

[Out] a*sqrt(a + b/x**2)/b**2 - (a + b/x**2)**(3/2)/(3*b**2)
```

Mathematica [A] time = 0.037926, size = 31, normalized size = 0.89

$$\frac{\sqrt{a+\frac{b}{x^2}}\left(2ax^2-b\right)}{3b^2x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b/x^2]*x^5),x]

[Out] (Sqrt[a + b/x^2]*(-b + 2*a*x^2))/(3*b^2*x^2)
```

Maple [A] time = 0.008, size = 39, normalized size = 1.1

$$\frac{\left(ax^2+b\right)\left(2\,ax^2-b\right)}{3\,b^2x^4}\frac{1}{\sqrt{\frac{ax^2+b}{x^2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^(1/2)/x^5,x)
```

```
[Out] 1/3*(a*x^2+b)*(2*a*x^2-b)/x^4/b^2/((a*x^2+b)/x^2)^(1/2)
```

Maxima [A] time = 1.43742, size = 39, normalized size = 1.11

$$-\frac{\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}{3\,b^2}+\frac{\sqrt{a+\frac{b}{x^2}}\,a}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^2)*x^5),x, algorithm="maxima")
```

```
[Out] -1/3*(a + b/x^2)^(3/2)/b^2 + sqrt(a + b/x^2)*a/b^2
```

Fricas [A] time = 0.234269, size = 42, normalized size = 1.2

$$\frac{\left(2\,ax^2-b\right)\sqrt{\frac{ax^2+b}{x^2}}}{3\,b^2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^2)*x^5),x, algorithm="fricas")
```

```
[Out] 1/3*(2*a*x^2 - b)*sqrt((a*x^2 + b)/x^2)/(b^2*x^2)
```

Sympy [A] time = 5.97929, size = 231, normalized size = 6.6

$$\frac{2a^{\frac{7}{2}}b^{\frac{3}{2}}x^4\sqrt{\frac{ax^2}{b}+1}}{3a^{\frac{5}{2}}b^3x^5+3a^{\frac{3}{2}}b^4x^3}+\frac{a^{\frac{5}{2}}b^{\frac{5}{2}}x^2\sqrt{\frac{ax^2}{b}+1}}{3a^{\frac{5}{2}}b^3x^5+3a^{\frac{3}{2}}b^4x^3}-\frac{a^{\frac{3}{2}}b^{\frac{7}{2}}\sqrt{\frac{ax^2}{b}+1}}{3a^{\frac{5}{2}}b^3x^5+3a^{\frac{3}{2}}b^4x^3}-\frac{2a^4bx^5}{3a^{\frac{5}{2}}b^3x^5+3a^{\frac{3}{2}}b^4x^3}-\frac{2a^3b^2x^3}{3a^{\frac{5}{2}}b^3x^5+3a^{\frac{3}{2}}b^4x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**(1/2)/x**5,x)
```

```
[Out] 2*a**(7/2)*b**(3/2)*x**4*sqrt(a*x**2/b + 1)/(3*a**(5/2)*b**3*x**5
 + 3*a**(3/2)*b**4*x**3) + a**(5/2)*b**(5/2)*x**2*sqrt(a*x**2/b +
 1)/(3*a**(5/2)*b**3*x**5 + 3*a**(3/2)*b**4*x**3) - a**(3/2)*b**(
7/2)*sqrt(a*x**2/b + 1)/(3*a**(5/2)*b**3*x**5 + 3*a**(3/2)*b**4*x
**3) - 2*a**4*b*x**5/(3*a**(5/2)*b**3*x**5 + 3*a**(3/2)*b**4*x**3
) - 2*a**3*b**2*x**3/(3*a**(5/2)*b**3*x**5 + 3*a**(3/2)*b**4*x**3
)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a+\frac{b}{x^2}}\,x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^2)*x^5),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(a + b/x^2)*x^5), x)
```

3.1918 $\int \frac{1}{\sqrt{a+\frac{b}{x^2}}x^7}\,dx$

Optimal. Leaf size=57

$$-\frac{a^2\sqrt{a+\frac{b}{x^2}}}{b^3}-\frac{\left(a+\frac{b}{x^2}\right)^{5/2}}{5b^3}+\frac{2a\left(a+\frac{b}{x^2}\right)^{3/2}}{3b^3}$$

```
[Out] -((a^2*Sqrt[a + b/x^2])/b^3) + (2*a*(a + b/x^2)^(3/2))/(3*b^3) -
(a + b/x^2)^(5/2)/(5*b^3)
```

Rubi [A] time = 0.088691, antiderivative size = 57, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^2\sqrt{a+\frac{b}{x^2}}}{b^3}-\frac{\left(a+\frac{b}{x^2}\right)^{5/2}}{5b^3}+\frac{2a\left(a+\frac{b}{x^2}\right)^{3/2}}{3b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b/x^2]*x^7),x]
```

```
[Out] -((a^2*Sqrt[a + b/x^2])/b^3) + (2*a*(a + b/x^2)^(3/2))/(3*b^3) -
(a + b/x^2)^(5/2)/(5*b^3)
```

Rubi in Sympy [A] time = 10.5054, size = 49, normalized size = 0.86

$$-\frac{a^2\sqrt{a+\frac{b}{x^2}}}{b^3}+\frac{2a\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}{3b^3}-\frac{\left(a+\frac{b}{x^2}\right)^{\frac{5}{2}}}{5b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**(1/2)/x**7,x)
```

```
[Out] -a**2*sqrt(a + b/x**2)/b**3 + 2*a*(a + b/x**2)**(3/2)/(3*b**3) -
(a + b/x**2)**(5/2)/(5*b**3)
```

Mathematica [A] time = 0.0444389, size = 42, normalized size = 0.74

$$-\frac{\sqrt{a+\frac{b}{x^2}}\left(8a^2x^4-4abx^2+3b^2\right)}{15b^3x^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b/x^2]*x^7),x]
```

```
[Out] -(Sqrt[a + b/x^2]*(3*b^2 - 4*a*b*x^2 + 8*a^2*x^4))/(15*b^3*x^4)
```

Maple [A] time = 0.01, size = 50, normalized size = 0.9

$$-\frac{\left(ax^2+b\right)\left(8\,x^4a^2-4\,abx^2+3\,b^2\right)}{15\,b^3x^6}\frac{1}{\sqrt{\frac{ax^2+b}{x^2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/(a+b/x^2)^(1/2)/x^7,x)
```

```
[Out] -1/15*(a*x^2+b)*(8*a^2*x^4-4*a*b*x^2+3*b^2)/x^6/b^3/((a*x^2+b)/x^
2)^(1/2)
```

Maxima [A]   time = 1.43598, size = 63, normalized size = 1.11

$$-\frac{\left(a+\frac{b}{x^2}\right)^{\frac{5}{2}}}{5\,b^3}+\frac{2\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}a}{3\,b^3}-\frac{\sqrt{a+\frac{b}{x^2}}\,a^2}{b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(a + b/x^2)*x^7),x, algorithm="maxima")
```

```
[Out] -1/5*(a + b/x^2)^(5/2)/b^3 + 2/3*(a + b/x^2)^(3/2)*a/b^3 - sqrt(a
 + b/x^2)*a^2/b^3
```

Fricas [A]   time = 0.238032, size = 57, normalized size = 1.

$$-\frac{\left(8\,a^2x^4-4\,abx^2+3\,b^2\right)\sqrt{\frac{ax^2+b}{x^2}}}{15\,b^3x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(a + b/x^2)*x^7),x, algorithm="fricas")
```

```
[Out] -1/15*(8*a^2*x^4 - 4*a*b*x^2 + 3*b^2)*sqrt((a*x^2 + b)/x^2)/(b^3*
x^4)
```

Sympy [A] time = 9.62606, size = 750, normalized size = 13.16

$$-\frac{8a^{\frac{15}{2}}b^{\frac{9}{2}}x^{10}\sqrt{\frac{ax^2}{b}+1}}{15a^{\frac{11}{2}}b^7x^{11}+45a^{\frac{9}{2}}b^8x^9+45a^{\frac{7}{2}}b^9x^7+15a^{\frac{5}{2}}b^{10}x^5} - \frac{20a^{\frac{13}{2}}b^{\frac{11}{2}}x^8\sqrt{\frac{ax^2}{b}+1}}{15a^{\frac{11}{2}}b^7x^{11}+45a^{\frac{9}{2}}b^8x^9+45a^{\frac{7}{2}}b^9x^7+15a^{\frac{5}{2}}b^{10}x^5} - \frac{15a^{\frac{11}{2}}b^{\frac{13}{2}}x^6\sqrt{\frac{ax^2}{b}+1}}{15a^{\frac{11}{2}}b^7x^{11}+45a^{\frac{9}{2}}b^8x^9+45a^{\frac{7}{2}}b^9x^7+15a^{\frac{5}{2}}b^{10}x^5} - \frac{5a^{\frac{9}{2}}b^{\frac{15}{2}}x^4\sqrt{\frac{ax^2}{b}+1}}{15a^{\frac{11}{2}}b^7x^{11}+45a^{\frac{9}{2}}b^8x^9+45a^{\frac{7}{2}}b^9x^7+15a^{\frac{5}{2}}b^{10}x^5} - \frac{5a^{\frac{7}{2}}b^{\frac{17}{2}}x^2\sqrt{\frac{ax^2}{b}+1}}{15a^{\frac{11}{2}}b^7x^{11}+45a^{\frac{9}{2}}b^8x^9+45a^{\frac{7}{2}}b^9x^7+15a^{\frac{5}{2}}b^{10}x^5} - \frac{3a^{\frac{5}{2}}b^{\frac{19}{2}}\sqrt{\frac{ax^2}{b}+1}}{15a^{\frac{11}{2}}b^7x^{11}+45a^{\frac{9}{2}}b^8x^9+45a^{\frac{7}{2}}b^9x^7+15a^{\frac{5}{2}}b^{10}x^5} + \frac{8a^8b^4x^{11}}{15a^{\frac{11}{2}}b^7x^{11}+45a^{\frac{9}{2}}b^8x^9+45a^{\frac{7}{2}}b^9x^7+15a^{\frac{5}{2}}b^{10}x^5} + \frac{24a^7b^5x^9}{15a^{\frac{11}{2}}b^7x^{11}+45a^{\frac{9}{2}}b^8x^9+45a^{\frac{7}{2}}b^9x^7+15a^{\frac{5}{2}}b^{10}x^5} + \frac{24a^6b^6x^7}{15a^{\frac{11}{2}}b^7x^{11}+45a^{\frac{9}{2}}b^8x^9+45a^{\frac{7}{2}}b^9x^7+15a^{\frac{5}{2}}b^{10}x^5} + \frac{8a^5b^7x^5}{15a^{\frac{11}{2}}b^7x^{11}+45a^{\frac{9}{2}}b^8x^9+45a^{\frac{7}{2}}b^9x^7+15a^{\frac{5}{2}}b^{10}x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(a+b/x**2)**(1/2)/x**7,x)
```

```
[Out] -8*a**(15/2)*b**(9/2)*x**10*sqrt(a*x**2/b + 1)/(15*a**(11/2)*b**7
*x**11 + 45*a**(9/2)*b**8*x**9 + 45*a**(7/2)*b**9*x**7 + 15*a**(5
/2)*b**10*x**5) - 20*a**(13/2)*b**(11/2)*x**8*sqrt(a*x**2/b + 1)/
(15*a**(11/2)*b**7*x**11 + 45*a**(9/2)*b**8*x**9 + 45*a**(7/2)*b*
*9*x**7 + 15*a**(5/2)*b**10*x**5) - 15*a**(11/2)*b**(13/2)*x**6*s
qrt(a*x**2/b + 1)/(15*a**(11/2)*b**7*x**11 + 45*a**(9/2)*b**8*x**
9 + 45*a**(7/2)*b**9*x**7 + 15*a**(5/2)*b**10*x**5) - 5*a**(9/2)*
b**(15/2)*x**4*sqrt(a*x**2/b + 1)/(15*a**(11/2)*b**7*x**11 + 45*a
**(9/2)*b**8*x**9 + 45*a**(7/2)*b**9*x**7 + 15*a**(5/2)*b**10*x**
5) - 5*a**(7/2)*b**(17/2)*x**2*sqrt(a*x**2/b + 1)/(15*a**(11/2)*b
**7*x**11 + 45*a**(9/2)*b**8*x**9 + 45*a**(7/2)*b**9*x**7 + 15*a*
*(5/2)*b**10*x**5) - 3*a**(5/2)*b**(19/2)*sqrt(a*x**2/b + 1)/(15*
a**(11/2)*b**7*x**11 + 45*a**(9/2)*b**8*x**9 + 45*a**(7/2)*b**9*x
**7 + 15*a**(5/2)*b**10*x**5) + 8*a**8*b**4*x**11/(15*a**(11/2)*b
**7*x**11 + 45*a**(9/2)*b**8*x**9 + 45*a**(7/2)*b**9*x**7 + 15*a*
*(5/2)*b**10*x**5) + 24*a**7*b**5*x**9/(15*a**(11/2)*b**7*x**11 +
 45*a**(9/2)*b**8*x**9 + 45*a**(7/2)*b**9*x**7 + 15*a**(5/2)*b**1
0*x**5) + 24*a**6*b**6*x**7/(15*a**(11/2)*b**7*x**11 + 45*a**(9/2
)*b**8*x**9 + 45*a**(7/2)*b**9*x**7 + 15*a**(5/2)*b**10*x**5) + 8
*a**5*b**7*x**5/(15*a**(11/2)*b**7*x**11 + 45*a**(9/2)*b**8*x**9
+ 45*a**(7/2)*b**9*x**7 + 15*a**(5/2)*b**10*x**5)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a + \frac{b}{x^2}}x^7}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(a + b/x^2)*x^7),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(a + b/x^2)*x^7), x)
```

3.1919 $\int \frac{1}{\sqrt{a+\frac{b}{x^2}}x^9} dx$

Optimal. Leaf size=75

$$\frac{a^3\sqrt{a+\frac{b}{x^2}}}{b^4}-\frac{a^2\left(a+\frac{b}{x^2}\right)^{3/2}}{b^4}-\frac{\left(a+\frac{b}{x^2}\right)^{7/2}}{7b^4}+\frac{3a\left(a+\frac{b}{x^2}\right)^{5/2}}{5b^4}$$

```
[Out] (a^3*Sqrt[a + b/x^2])/b^4 - (a^2*(a + b/x^2)^(3/2))/b^4 + (3*a*(a
 + b/x^2)^(5/2))/(5*b^4) - (a + b/x^2)^(7/2)/(7*b^4)
```

Rubi [A] time = 0.116408, antiderivative size = 75, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^3\sqrt{a+\frac{b}{x^2}}}{b^4}-\frac{a^2\left(a+\frac{b}{x^2}\right)^{3/2}}{b^4}-\frac{\left(a+\frac{b}{x^2}\right)^{7/2}}{7b^4}+\frac{3a\left(a+\frac{b}{x^2}\right)^{5/2}}{5b^4}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b/x^2]*x^9),x]
```

```
[Out] (a^3*Sqrt[a + b/x^2])/b^4 - (a^2*(a + b/x^2)^(3/2))/b^4 + (3*a*(a
 + b/x^2)^(5/2))/(5*b^4) - (a + b/x^2)^(7/2)/(7*b^4)
```

Rubi in Sympy [A] time = 14.1043, size = 66, normalized size = 0.88

$$\frac{a^3\sqrt{a+\frac{b}{x^2}}}{b^4}-\frac{a^2\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}{b^4}+\frac{3a\left(a+\frac{b}{x^2}\right)^{\frac{5}{2}}}{5b^4}-\frac{\left(a+\frac{b}{x^2}\right)^{\frac{7}{2}}}{7b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**(1/2)/x**9,x)
```

```
[Out] a**3*sqrt(a + b/x**2)/b**4 - a**2*(a + b/x**2)**(3/2)/b**4 + 3*a*
(a + b/x**2)**(5/2)/(5*b**4) - (a + b/x**2)**(7/2)/(7*b**4)
```

Mathematica [A] time = 0.046307, size = 53, normalized size = 0.71

$$\frac{\sqrt{a+\frac{b}{x^2}}\left(16a^3x^6-8a^2bx^4+6ab^2x^2-5b^3\right)}{35b^4x^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b/x^2]*x^9),x]
```

```
[Out] (Sqrt[a + b/x^2]*(-5*b^3 + 6*a*b^2*x^2 - 8*a^2*b*x^4 + 16*a^3*x^6
))/(35*b^4*x^6)
```

Maple [A] time = 0.009, size = 61, normalized size = 0.8

$$\frac{\left(ax^2+b\right)\left(16\,a^3x^6-8\,a^2bx^4+6\,ab^2x^2-5\,b^3\right)}{35\,x^8b^4}\frac{1}{\sqrt{\frac{ax^2+b}{x^2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^(1/2)/x^9,x)
```

```
[Out] 1/35*(a*x^2+b)*(16*a^3*x^6-8*a^2*b*x^4+6*a*b^2*x^2-5*b^3)/x^8/b^4
/((a*x^2+b)/x^2)^(1/2)
```

Maxima [A] time = 1.43946, size = 85, normalized size = 1.13

$$-\frac{\left(a+\frac{b}{x^2}\right)^{\frac{7}{2}}}{7\,b^4}+\frac{3\left(a+\frac{b}{x^2}\right)^{\frac{5}{2}}a}{5\,b^4}-\frac{\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}a^2}{b^4}+\frac{\sqrt{a+\frac{b}{x^2}}\,a^3}{b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^2)*x^9),x, algorithm="maxima")
```

```
[Out] -1/7*(a + b/x^2)^(7/2)/b^4 + 3/5*(a + b/x^2)^(5/2)*a/b^4 - (a + b
/x^2)^(3/2)*a^2/b^4 + sqrt(a + b/x^2)*a^3/b^4
```

Fricas [A] time = 0.246694, size = 72, normalized size = 0.96

$$\frac{\left(16\,a^3x^6-8\,a^2bx^4+6\,ab^2x^2-5\,b^3\right)\sqrt{\frac{ax^2+b}{x^2}}}{35\,b^4x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^2)*x^9),x, algorithm="fricas")
```

```
[Out] 1/35*(16*a^3*x^6 - 8*a^2*b*x^4 + 6*a*b^2*x^2 - 5*b^3)*sqrt((a*x^2
 + b)/x^2)/(b^4*x^6)
```

Sympy [A] time = 15.298, size = 1969, normalized size = 26.25

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**(1/2)/x**9,x)
```

```
[Out] 16*a**(25/2)*b**(23/2)*x**18*sqrt(a*x**2/b + 1)/(35*a**(19/2)*b**
15*x**19 + 210*a**(17/2)*b**16*x**17 + 525*a**(15/2)*b**17*x**15
+ 700*a**(13/2)*b**18*x**13 + 525*a**(11/2)*b**19*x**11 + 210*a**
(9/2)*b**20*x**9 + 35*a**(7/2)*b**21*x**7) + 88*a**(23/2)*b**(25/
2)*x**16*sqrt(a*x**2/b + 1)/(35*a**(19/2)*b**15*x**19 + 210*a**(1
7/2)*b**16*x**17 + 525*a**(15/2)*b**17*x**15 + 700*a**(13/2)*b**1
8*x**13 + 525*a**(11/2)*b**19*x**11 + 210*a**(9/2)*b**20*x**9 + 3
5*a**(7/2)*b**21*x**7) + 198*a**(21/2)*b**(27/2)*x**14*sqrt(a*x**
2/b + 1)/(35*a**(19/2)*b**15*x**19 + 210*a**(17/2)*b**16*x**17 +
525*a**(15/2)*b**17*x**15 + 700*a**(13/2)*b**18*x**13 + 525*a**(1
1/2)*b**19*x**11 + 210*a**(9/2)*b**20*x**9 + 35*a**(7/2)*b**21*x*
*7) + 231*a**(19/2)*b**(29/2)*x**12*sqrt(a*x**2/b + 1)/(35*a**(19
/2)*b**15*x**19 + 210*a**(17/2)*b**16*x**17 + 525*a**(15/2)*b**17
*x**15 + 700*a**(13/2)*b**18*x**13 + 525*a**(11/2)*b**19*x**11 +
210*a**(9/2)*b**20*x**9 + 35*a**(7/2)*b**21*x**7) + 140*a**(17/2)
*b**(31/2)*x**10*sqrt(a*x**2/b + 1)/(35*a**(19/2)*b**15*x**19 + 2
10*a**(17/2)*b**16*x**17 + 525*a**(15/2)*b**17*x**15 + 700*a**(13
/2)*b**18*x**13 + 525*a**(11/2)*b**19*x**11 + 210*a**(9/2)*b**20*
x**9 + 35*a**(7/2)*b**21*x**7) + 21*a**(15/2)*b**(33/2)*x**8*sqrt
```

```
(a*x**2/b + 1)/(35*a**(19/2)*b**15*x**19 + 210*a**(17/2)*b**16*x*
*17 + 525*a**(15/2)*b**17*x**15 + 700*a**(13/2)*b**18*x**13 + 525
*a**(11/2)*b**19*x**11 + 210*a**(9/2)*b**20*x**9 + 35*a**(7/2)*b*
*21*x**7) - 42*a**(13/2)*b**(35/2)*x**6*sqrt(a*x**2/b + 1)/(35*a*
*(19/2)*b**15*x**19 + 210*a**(17/2)*b**16*x**17 + 525*a**(15/2)*b
**17*x**15 + 700*a**(13/2)*b**18*x**13 + 525*a**(11/2)*b**19*x**1
1 + 210*a**(9/2)*b**20*x**9 + 35*a**(7/2)*b**21*x**7) - 47*a**(11
/2)*b**(37/2)*x**4*sqrt(a*x**2/b + 1)/(35*a**(19/2)*b**15*x**19 +
 210*a**(17/2)*b**16*x**17 + 525*a**(15/2)*b**17*x**15 + 700*a**(
13/2)*b**18*x**13 + 525*a**(11/2)*b**19*x**11 + 210*a**(9/2)*b**2
0*x**9 + 35*a**(7/2)*b**21*x**7) - 24*a**(9/2)*b**(39/2)*x**2*sqr
t(a*x**2/b + 1)/(35*a**(19/2)*b**15*x**19 + 210*a**(17/2)*b**16*x
**17 + 525*a**(15/2)*b**17*x**15 + 700*a**(13/2)*b**18*x**13 + 52
5*a**(11/2)*b**19*x**11 + 210*a**(9/2)*b**20*x**9 + 35*a**(7/2)*b
**21*x**7) - 5*a**(7/2)*b**(41/2)*sqrt(a*x**2/b + 1)/(35*a**(19/2
)*b**15*x**19 + 210*a**(17/2)*b**16*x**17 + 525*a**(15/2)*b**17*x
**15 + 700*a**(13/2)*b**18*x**13 + 525*a**(11/2)*b**19*x**11 + 21
0*a**(9/2)*b**20*x**9 + 35*a**(7/2)*b**21*x**7) - 16*a**13*b**11*
x**19/(35*a**(19/2)*b**15*x**19 + 210*a**(17/2)*b**16*x**17 + 525
*a**(15/2)*b**17*x**15 + 700*a**(13/2)*b**18*x**13 + 525*a**(11/2
)*b**19*x**11 + 210*a**(9/2)*b**20*x**9 + 35*a**(7/2)*b**21*x**7)
 - 96*a**12*b**12*x**17/(35*a**(19/2)*b**15*x**19 + 210*a**(17/2)
*b**16*x**17 + 525*a**(15/2)*b**17*x**15 + 700*a**(13/2)*b**18*x*
*13 + 525*a**(11/2)*b**19*x**11 + 210*a**(9/2)*b**20*x**9 + 35*a*
*(7/2)*b**21*x**7) - 240*a**11*b**13*x**15/(35*a**(19/2)*b**15*x*
*19 + 210*a**(17/2)*b**16*x**17 + 525*a**(15/2)*b**17*x**15 + 700
*a**(13/2)*b**18*x**13 + 525*a**(11/2)*b**19*x**11 + 210*a**(9/2)
*b**20*x**9 + 35*a**(7/2)*b**21*x**7) - 320*a**10*b**14*x**13/(35
*a**(19/2)*b**15*x**19 + 210*a**(17/2)*b**16*x**17 + 525*a**(15/2
)*b**17*x**15 + 700*a**(13/2)*b**18*x**13 + 525*a**(11/2)*b**19*x
**11 + 210*a**(9/2)*b**20*x**9 + 35*a**(7/2)*b**21*x**7) - 240*a*
*9*b**15*x**11/(35*a**(19/2)*b**15*x**19 + 210*a**(17/2)*b**16*x*
*17 + 525*a**(15/2)*b**17*x**15 + 700*a**(13/2)*b**18*x**13 + 525
*a**(11/2)*b**19*x**11 + 210*a**(9/2)*b**20*x**9 + 35*a**(7/2)*b*
*21*x**7) - 96*a**8*b**16*x**9/(35*a**(19/2)*b**15*x**19 + 210*a*
*(17/2)*b**16*x**17 + 525*a**(15/2)*b**17*x**15 + 700*a**(13/2)*b
**18*x**13 + 525*a**(11/2)*b**19*x**11 + 210*a**(9/2)*b**20*x**9
+ 35*a**(7/2)*b**21*x**7) - 16*a**7*b**17*x**7/(35*a**(19/2)*b**1
5*x**19 + 210*a**(17/2)*b**16*x**17 + 525*a**(15/2)*b**17*x**15 +
 700*a**(13/2)*b**18*x**13 + 525*a**(11/2)*b**19*x**11 + 210*a**(
9/2)*b**20*x**9 + 35*a**(7/2)*b**21*x**7)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a+\frac{b}{x^2}}x^9}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^2)*x^9),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(a + b/x^2)*x^9), x)
```

3.1920 $\int \frac{x^4}{\sqrt{a+\frac{b}{x^2}}} dx$

Optimal. Leaf size=66

$$\frac{8b^2x\sqrt{a+\frac{b}{x^2}}}{15a^3}-\frac{4bx^3\sqrt{a+\frac{b}{x^2}}}{15a^2}+\frac{x^5\sqrt{a+\frac{b}{x^2}}}{5a}$$

```
[Out] (8*b^2*Sqrt[a + b/x^2]*x)/(15*a^3) - (4*b*Sqrt[a + b/x^2]*x^3)/(1
5*a^2) + (Sqrt[a + b/x^2]*x^5)/(5*a)
```

Rubi [A] time = 0.0777975, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{8b^2x\sqrt{a+\frac{b}{x^2}}}{15a^3}-\frac{4bx^3\sqrt{a+\frac{b}{x^2}}}{15a^2}+\frac{x^5\sqrt{a+\frac{b}{x^2}}}{5a}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/Sqrt[a + b/x^2],x]
```

```
[Out] (8*b^2*Sqrt[a + b/x^2]*x)/(15*a^3) - (4*b*Sqrt[a + b/x^2]*x^3)/(1
5*a^2) + (Sqrt[a + b/x^2]*x^5)/(5*a)
```

Rubi in Sympy [A] time = 6.09426, size = 60, normalized size = 0.91

$$\frac{x^5\sqrt{a+\frac{b}{x^2}}}{5a}-\frac{4bx^3\sqrt{a+\frac{b}{x^2}}}{15a^2}+\frac{8b^2x\sqrt{a+\frac{b}{x^2}}}{15a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(a+b/x**2)**(1/2),x)
```

```
[Out] x**5*sqrt(a + b/x**2)/(5*a) - 4*b*x**3*sqrt(a + b/x**2)/(15*a**2)
 + 8*b**2*x*sqrt(a + b/x**2)/(15*a**3)
```

Mathematica [A] time = 0.0378687, size = 40, normalized size = 0.61

$$\frac{x\sqrt{a+\frac{b}{x^2}}\left(3a^2x^4-4abx^2+8b^2\right)}{15a^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/Sqrt[a + b/x^2],x]
```

```
[Out] (Sqrt[a + b/x^2]*x*(8*b^2 - 4*a*b*x^2 + 3*a^2*x^4))/(15*a^3)
```

Maple [A] time = 0.008, size = 50, normalized size = 0.8

$$\frac{\left(ax^2+b\right)\left(3\,x^4a^2-4\,abx^2+8\,b^2\right)}{15\,a^3x}\frac{1}{\sqrt{\frac{ax^2+b}{x^2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^4/(a+b/x^2)^(1/2),x)
```

```
[Out] 1/15*(a*x^2+b)*(3*a^2*x^4-4*a*b*x^2+8*b^2)/a^3/x/((a*x^2+b)/x^2)^
(1/2)
```

Maxima [A] time = 1.45435, size = 68, normalized size = 1.03

$$\frac{3\left(a+\frac{b}{x^2}\right)^{\frac{5}{2}}x^5-10\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}bx^3+15\sqrt{a+\frac{b}{x^2}}\,b^2x}{15\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^4/sqrt(a + b/x^2),x, algorithm="maxima")
```

```
[Out] 1/15*(3*(a + b/x^2)^(5/2)*x^5 - 10*(a + b/x^2)^(3/2)*b*x^3 + 15*s
qrt(a + b/x^2)*b^2*x)/a^3
```

Fricas [A] time = 0.232059, size = 54, normalized size = 0.82

$$\frac{\left(3\,a^2x^5-4\,abx^3+8\,b^2x\right)\sqrt{\frac{ax^2+b}{x^2}}}{15\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^4/sqrt(a + b/x^2),x, algorithm="fricas")
```

```
[Out] 1/15*(3*a^2*x^5 - 4*a*b*x^3 + 8*b^2*x)*sqrt((a*x^2 + b)/x^2)/a^3
```

Sympy [A] time = 4.02473, size = 279, normalized size = 4.23

$$\frac{3a^4b^{\frac{9}{2}}x^8\sqrt{\frac{ax^2}{b}+1}}{15a^5b^4x^4+30a^4b^5x^2+15a^3b^6}+\frac{2a^3b^{\frac{11}{2}}x^6\sqrt{\frac{ax^2}{b}+1}}{15a^5b^4x^4+30a^4b^5x^2+15a^3b^6}+\frac{3a^2b^{\frac{13}{2}}x^4\sqrt{\frac{ax^2}{b}+1}}{15a^5b^4x^4+30a^4b^5x^2+15a^3b^6}+\frac{12ab^{\frac{15}{2}}x^2\sqrt{\frac{ax^2}{b}+1}}{15a^5b^4x^4+30a^4b^5x^2+15a^3b^6}+\frac{8b^{\frac{17}{2}}\sqrt{\frac{ax^2}{b}+1}}{15a^5b^4x^4+30a^4b^5x^2+15a^3b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**4/(a+b/x**2)**(1/2),x)
```

```
[Out] 3*a**4*b**(9/2)*x**8*sqrt(a*x**2/b + 1)/(15*a**5*b**4*x**4 + 30*a
**4*b**5*x**2 + 15*a**3*b**6) + 2*a**3*b**(11/2)*x**6*sqrt(a*x**2
/b + 1)/(15*a**5*b**4*x**4 + 30*a**4*b**5*x**2 + 15*a**3*b**6) +
3*a**2*b**(13/2)*x**4*sqrt(a*x**2/b + 1)/(15*a**5*b**4*x**4 + 30*
a**4*b**5*x**2 + 15*a**3*b**6) + 12*a*b**(15/2)*x**2*sqrt(a*x**2/
b + 1)/(15*a**5*b**4*x**4 + 30*a**4*b**5*x**2 + 15*a**3*b**6) + 8
*b**(17/2)*sqrt(a*x**2/b + 1)/(15*a**5*b**4*x**4 + 30*a**4*b**5*x
**2 + 15*a**3*b**6)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^4}{\sqrt{a+\frac{b}{x^2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(a + b/x^2),x, algorithm="giac")

[Out] integrate(x^4/sqrt(a + b/x^2), x)
```

3.1921 $\int \frac{x^2}{\sqrt{a+\frac{b}{x^2}}}\,dx$

Optimal. Leaf size=42

$$\frac{x^3\sqrt{a+\frac{b}{x^2}}}{3a}-\frac{2bx\sqrt{a+\frac{b}{x^2}}}{3a^2}$$

```
[Out] (-2*b*Sqrt[a + b/x^2]*x)/(3*a^2) + (Sqrt[a + b/x^2]*x^3)/(3*a)
```

Rubi [A] time = 0.0442501, antiderivative size = 42, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{x^3\sqrt{a+\frac{b}{x^2}}}{3a}-\frac{2bx\sqrt{a+\frac{b}{x^2}}}{3a^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/Sqrt[a + b/x^2],x]

[Out] (-2*b*Sqrt[a + b/x^2]*x)/(3*a^2) + (Sqrt[a + b/x^2]*x^3)/(3*a)
```

Rubi in Sympy [A] time = 3.56717, size = 36, normalized size = 0.86

$$\frac{x^3\sqrt{a+\frac{b}{x^2}}}{3a}-\frac{2bx\sqrt{a+\frac{b}{x^2}}}{3a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b/x**2)**(1/2),x)

[Out] x**3*sqrt(a + b/x**2)/(3*a) - 2*b*x*sqrt(a + b/x**2)/(3*a**2)
```

Mathematica [A] time = 0.0314566, size = 28, normalized size = 0.67

$$\frac{x\sqrt{a+\frac{b}{x^2}}\left(ax^2-2b\right)}{3a^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/Sqrt[a + b/x^2],x]

[Out] (Sqrt[a + b/x^2]*x*(-2*b + a*x^2))/(3*a^2)
```

Maple [A] time = 0.008, size = 38, normalized size = 0.9

$$\frac{\left(ax^2+b\right)\left(ax^2-2\,b\right)}{3\,xa^2}\frac{1}{\sqrt{\frac{ax^2+b}{x^2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(a+b/x^2)^(1/2),x)
```

```
[Out] 1/3*(a*x^2+b)*(a*x^2-2*b)/a^2/x/((a*x^2+b)/x^2)^(1/2)
```

Maxima [A] time = 1.42913, size = 43, normalized size = 1.02

$$\frac{\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}x^3-3\sqrt{a+\frac{b}{x^2}}bx}{3\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(a + b/x^2),x, algorithm="maxima")
```

```
[Out] 1/3*((a + b/x^2)^(3/2)*x^3 - 3*sqrt(a + b/x^2)*b*x)/a^2
```

Fricas [A] time = 0.233731, size = 38, normalized size = 0.9

$$\frac{\left(ax^3-2\,bx\right)\sqrt{\frac{ax^2+b}{x^2}}}{3\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(a + b/x^2),x, algorithm="fricas")
```

```
[Out] 1/3*(a*x^3 - 2*b*x)*sqrt((a*x^2 + b)/x^2)/a^2
```

Sympy [A] time = 2.59534, size = 46, normalized size = 1.1

$$\frac{\sqrt{b}x^2\sqrt{\frac{ax^2}{b}+1}}{3a}-\frac{2b^{\frac{3}{2}}\sqrt{\frac{ax^2}{b}+1}}{3a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b/x**2)**(1/2),x)
```

```
[Out] sqrt(b)*x**2*sqrt(a*x**2/b + 1)/(3*a) - 2*b**(3/2)*sqrt(a*x**2/b
+ 1)/(3*a**2)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\sqrt{a+\frac{b}{x^2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(a + b/x^2),x, algorithm="giac")
```

```
[Out] integrate(x^2/sqrt(a + b/x^2), x)
```

3.1922 $\int \frac{1}{\sqrt{a+\frac{b}{x^2}}}\,dx$

Optimal. Leaf size=16

$$\frac{x\sqrt{a+\frac{b}{x^2}}}{a}$$

```
[Out] (Sqrt[a + b/x^2]*x)/a
```

Rubi [A] time = 0.0108583, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{x\sqrt{a+\frac{b}{x^2}}}{a}$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[a + b/x^2],x]

[Out] (Sqrt[a + b/x^2]*x)/a
```

Rubi in Sympy [A] time = 1.24666, size = 12, normalized size = 0.75

$$\frac{x\sqrt{a+\frac{b}{x^2}}}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**(1/2),x)

[Out] x*sqrt(a + b/x**2)/a
```

Mathematica [A] time = 0.0112631, size = 16, normalized size = 1.

$$\frac{x\sqrt{a+\frac{b}{x^2}}}{a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/Sqrt[a + b/x^2],x]

[Out] (Sqrt[a + b/x^2]*x)/a
```

Maple [A] time = 0.003, size = 28, normalized size = 1.8

$$\frac{ax^2+b}{ax}\frac{1}{\sqrt{\frac{ax^2+b}{x^2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^(1/2),x)

[Out] (a*x^2+b)/a/x/((a*x^2+b)/x^2)^(1/2)
```

Maxima [A] time = 1.44192, size = 19, normalized size = 1.19

$$\frac{\sqrt{a+\frac{b}{x^2}}\,x}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(a + b/x^2),x, algorithm="maxima")

[Out] sqrt(a + b/x^2)*x/a
```

Fricas [A] time = 0.229905, size = 24, normalized size = 1.5

$$\frac{x\sqrt{\frac{ax^2+b}{x^2}}}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(a + b/x^2),x, algorithm="fricas")

[Out] x*sqrt((a*x^2 + b)/x^2)/a
```

Sympy [A] time = 2.07586, size = 17, normalized size = 1.06

$$\frac{\sqrt{b}\sqrt{\frac{ax^2}{b}+1}}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**(1/2),x)

[Out] sqrt(b)*sqrt(a*x**2/b + 1)/a
```

GIAC/XCAS [A] time = 0.224326, size = 38, normalized size = 2.38

$$-\frac{\sqrt{b}\operatorname{sign}(x)}{a}+\frac{\sqrt{ax^2+b}}{a\operatorname{sign}(x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(a + b/x^2),x, algorithm="giac")

[Out] -sqrt(b)*sign(x)/a + sqrt(a*x^2 + b)/(a*sign(x))
```

3.1923 $\int \frac{1}{\sqrt{a+\frac{b}{x^2}}x^2}\,dx$

Optimal. Leaf size=28

$$-\frac{\tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{\sqrt{b}}$$

```
[Out] -(ArcTanh[Sqrt[b]/(Sqrt[a + b/x^2]*x)]/Sqrt[b])
```

Rubi [A] time = 0.0472439, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{\tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{\sqrt{b}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b/x^2]*x^2),x]
```

```
[Out] -(ArcTanh[Sqrt[b]/(Sqrt[a + b/x^2]*x)]/Sqrt[b])
```

Rubi in Sympy [A] time = 4.34709, size = 24, normalized size = 0.86

$$-\frac{\operatorname{atanh}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**(1/2)/x**2,x)
```

```
[Out] -atanh(sqrt(b)/(x*sqrt(a + b/x**2)))/sqrt(b)
```

Mathematica [A] time = 0.0449711, size = 56, normalized size = 2.

$$\frac{\sqrt{ax^2+b}\left(\log(x)-\log\left(\sqrt{b}\sqrt{ax^2+b}+b\right)\right)}{\sqrt{b}x\sqrt{a+\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b/x^2]*x^2),x]
```

```
[Out] (Sqrt[b + a*x^2]*(Log[x] - Log[b + Sqrt[b]*Sqrt[b + a*x^2]]))/(Sq
rt[b]*Sqrt[a + b/x^2]*x)
```

Maple [B] time = 0.011, size = 52, normalized size = 1.9

$$-\frac{1}{x}\sqrt{ax^2+b}\ln\left(2\,\frac{\sqrt{b}\sqrt{ax^2+b}+b}{x}\right)\frac{1}{\sqrt{\frac{ax^2+b}{x^2}}}\frac{1}{\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^(1/2)/x^2,x)
```

```
[Out] -1/((a*x^2+b)/x^2)^(1/2)/x*(a*x^2+b)^(1/2)/b^(1/2)*ln(2*(b^(1/2)*
(a*x^2+b)^(1/2)+b)/x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^2)*x^2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.241416, size = 1, normalized size = 0.04

$$\left[\frac{\log\left(\frac{2\,bx\sqrt{\frac{ax^2+b}{x^2}}-(ax^2+2\,b)\sqrt{b}}{x^2}\right)}{2\,\sqrt{b}}, \frac{\sqrt{-b}\arctan\left(\frac{\sqrt{-b}}{x\sqrt{\frac{ax^2+b}{x^2}}}\right)}{b}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^2)*x^2),x, algorithm="fricas")
```

```
[Out] [1/2*log((2*b*x*sqrt((a*x^2 + b)/x^2) - (a*x^2 + 2*b)*sqrt(b))/x^
2)/sqrt(b), sqrt(-b)*arctan(sqrt(-b)/(x*sqrt((a*x^2 + b)/x^2)))/b
]
```

Sympy [A] time = 4.50102, size = 19, normalized size = 0.68

$$-\frac{\operatorname{asinh}\left(\frac{\sqrt{b}}{\sqrt{a}x}\right)}{\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**(1/2)/x**2,x)
```

```
[Out] -asinh(sqrt(b)/(sqrt(a)*x))/sqrt(b)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a+\frac{b}{x^2}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^2)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(a + b/x^2)*x^2), x)
```

3.1924 $\int \frac{1}{\sqrt{a+\frac{b}{x^2}}x^4} dx$

Optimal. Leaf size=53

$$\frac{a\tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{2b^{3/2}}-\frac{\sqrt{a+\frac{b}{x^2}}}{2bx}$$

```
[Out] -Sqrt[a + b/x^2]/(2*b*x) + (a*ArcTanh[Sqrt[b]/(Sqrt[a + b/x^2]*x)
])/(2*b^(3/2))
```

Rubi [A] time = 0.0777898, antiderivative size = 53, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{a\tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{2b^{3/2}}-\frac{\sqrt{a+\frac{b}{x^2}}}{2bx}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b/x^2]*x^4),x]
```

```
[Out] -Sqrt[a + b/x^2]/(2*b*x) + (a*ArcTanh[Sqrt[b]/(Sqrt[a + b/x^2]*x)
])/(2*b^(3/2))
```

Rubi in Sympy [A] time = 7.40605, size = 41, normalized size = 0.77

$$\frac{a\operatorname{atanh}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{2b^{\frac{3}{2}}}-\frac{\sqrt{a+\frac{b}{x^2}}}{2bx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**(1/2)/x**4,x)
```

```
[Out] a*atanh(sqrt(b)/(x*sqrt(a + b/x**2)))/(2*b**(3/2)) - sqrt(a + b/x
**2)/(2*b*x)
```

Mathematica [A] time = 0.0749784, size = 93, normalized size = 1.75

$$\frac{-\sqrt{b}\left(ax^2+b\right)-ax^2\log(x)\sqrt{ax^2+b}+ax^2\sqrt{ax^2+b}\log\left(\sqrt{b}\sqrt{ax^2+b}+b\right)}{2b^{3/2}x^3\sqrt{a+\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b/x^2]*x^4),x]
```

```
[Out] (-(Sqrt[b]*(b + a*x^2)) - a*x^2*Sqrt[b + a*x^2]*Log[x] + a*x^2*Sq
rt[b + a*x^2]*Log[b + Sqrt[b]*Sqrt[b + a*x^2]])/(2*b^(3/2)*Sqrt[a
 + b/x^2]*x^3)
```

Maple [A] time = 0.01, size = 73, normalized size = 1.4

$$-\frac{1}{2x^3}\sqrt{ax^2+b}\left(-a\ln\left(2\frac{\sqrt{b}\sqrt{ax^2+b}+b}{x}\right)x^2b+\sqrt{ax^2+b}\,b^{\frac{3}{2}}\right)\frac{1}{\sqrt{\frac{ax^2+b}{x^2}}}b^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^(1/2)/x^4,x)
```

```
[Out] -1/2*(a*x^2+b)^(1/2)*(-a*ln(2*(b^(1/2)*(a*x^2+b)^(1/2)+b)/x)*x^2*
b+(a*x^2+b)^(1/2)*b^(3/2))/((a*x^2+b)/x^2)^(1/2)/x^3/b^(5/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^2)*x^4),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.251512, size = 1, normalized size = 0.02

$$\left[\frac{a\sqrt{b}x\log\left(-\frac{2\,bx\sqrt{\frac{ax^2+b}{x^2}}+\left(ax^2+2\,b\right)\sqrt{b}}{x^2}\right)-2\,b\sqrt{\frac{ax^2+b}{x^2}}}{4\,b^2x},\ -\frac{a\sqrt{-b}x\arctan\left(\frac{\sqrt{-b}}{x\sqrt{\frac{ax^2+b}{x^2}}}\right)+b\sqrt{\frac{ax^2+b}{x^2}}}{2\,b^2x}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^2)*x^4),x, algorithm="fricas")
```

```
[Out] [1/4*(a*sqrt(b)*x*log(-(2*b*x*sqrt((a*x^2 + b)/x^2) + (a*x^2 + 2*
b)*sqrt(b))/x^2) - 2*b*sqrt((a*x^2 + b)/x^2))/(b^2*x), -1/2*(a*sq
rt(-b)*x*arctan(sqrt(-b)/(x*sqrt((a*x^2 + b)/x^2))) + b*sqrt((a*x
^2 + b)/x^2))/(b^2*x)]
```

Sympy [A] time = 9.00321, size = 42, normalized size = 0.79

$$-\frac{\sqrt{a}\sqrt{1+\frac{b}{ax^2}}}{2bx}+\frac{a\operatorname{asinh}\left(\frac{\sqrt{b}}{\sqrt{a}x}\right)}{2b^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**(1/2)/x**4,x)
```

```
[Out] -sqrt(a)*sqrt(1 + b/(a*x**2))/(2*b*x) + a*asinh(sqrt(b)/(sqrt(a)*
x))/(2*b**(3/2))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a+\frac{b}{x^2}}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^2)*x^4),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(a + b/x^2)*x^4), x)
```

3.1925 $\int \frac{1}{\sqrt{-a+\frac{b}{x^2}}x}\,dx$

Optimal. Leaf size=27

$$-\frac{\tan^{-1}\left(\frac{\sqrt{\frac{b}{x^2}-a}}{\sqrt{a}}\right)}{\sqrt{a}}$$

```
[Out] -(ArcTan[Sqrt[-a + b/x^2]/Sqrt[a]]/Sqrt[a])
```

Rubi [A] time = 0.0567394, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176

$$-\frac{\tan^{-1}\left(\frac{\sqrt{\frac{b}{x^2}-a}}{\sqrt{a}}\right)}{\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[-a + b/x^2]*x),x]
```

```
[Out] -(ArcTan[Sqrt[-a + b/x^2]/Sqrt[a]]/Sqrt[a])
```

Rubi in Sympy [A] time = 5.5592, size = 22, normalized size = 0.81

$$-\frac{\operatorname{atan}\left(\frac{\sqrt{-a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(-a+b/x**2)**(1/2),x)
```

```
[Out] -atan(sqrt(-a + b/x**2)/sqrt(a))/sqrt(a)
```

Mathematica [B] time = 0.0605379, size = 56, normalized size = 2.07

$$\frac{\sqrt{ax^2-b}\tanh^{-1}\left(\frac{\sqrt{a}x}{\sqrt{ax^2-b}}\right)}{\sqrt{a}x\sqrt{\frac{b}{x^2}-a}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[-a + b/x^2]*x),x]
```

```
[Out] (Sqrt[-b + a*x^2]*ArcTanh[(Sqrt[a]*x)/Sqrt[-b + a*x^2]])/(Sqrt[a]
*Sqrt[-a + b/x^2]*x)
```

Maple [B] time = 0.013, size = 50, normalized size = 1.9

$$\frac{1}{x}\sqrt{-ax^2+b}\arctan\left(x\sqrt{a}\frac{1}{\sqrt{-ax^2+b}}\right)\frac{1}{\sqrt{-\frac{ax^2-b}{x^2}}}\frac{1}{\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(-a+b/x^2)^(1/2),x)
```

```
[Out] 1/(-(a*x^2-b)/x^2)^(1/2)/x*(-a*x^2+b)^(1/2)/a^(1/2)*arctan(a^(1/2
)*x/(-a*x^2+b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-a + b/x^2)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.247084, size = 1, normalized size = 0.04

$$\left[-\frac{\sqrt{-a}\log\left(2\,ax^{2}\sqrt{-\frac{ax^{2}-b}{x^{2}}}+\left(2\,ax^{2}-b\right)\sqrt{-a}\right)}{2\,a},\ \frac{\arctan\left(\frac{\sqrt{a}}{\sqrt{-\frac{ax^{2}-b}{x^{2}}}}\right)}{\sqrt{a}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-a + b/x^2)*x),x, algorithm="fricas")
```

```
[Out] [-1/2*sqrt(-a)*log(2*a*x^2*sqrt(-(a*x^2 - b)/x^2) + (2*a*x^2 - b)
*sqrt(-a))/a, arctan(sqrt(a)/sqrt(-(a*x^2 - b)/x^2))/sqrt(a)]
```

Sympy [A] time = 4.48985, size = 46, normalized size = 1.7

$$\begin{cases} -\frac{i\operatorname{acosh}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{\sqrt{a}} & \text{for}\ \left|\frac{ax^{2}}{b}\right| > 1 \\ \frac{\operatorname{asin}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{\sqrt{a}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(-a+b/x**2)**(1/2),x)
```

```
[Out] Piecewise((-I*acosh(sqrt(a)*x/sqrt(b))/sqrt(a), Abs(a*x**2/b) > 1
), (asin(sqrt(a)*x/sqrt(b))/sqrt(a), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-a+\frac{b}{x^{2}}}\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-a + b/x^2)*x),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(-a + b/x^2)*x), x)
```

3.1926 $\int \frac{1}{\sqrt{2+\frac{b}{x^2}}x^2} dx$

Optimal. Leaf size=20

$$-\frac{\operatorname{csch}^{-1}\left(\frac{\sqrt{2}x}{\sqrt{b}}\right)}{\sqrt{b}}$$

```
[Out] -(ArcCsch[(Sqrt[2]*x)/Sqrt[b]]/Sqrt[b])
```

Rubi [A] time = 0.0344475, antiderivative size = 20, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{\operatorname{csch}^{-1}\left(\frac{\sqrt{2}x}{\sqrt{b}}\right)}{\sqrt{b}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[2 + b/x^2]*x^2),x]

[Out] -(ArcCsch[(Sqrt[2]*x)/Sqrt[b]]/Sqrt[b])
```

Rubi in Sympy [A] time = 3.74194, size = 20, normalized size = 1.

$$-\frac{\operatorname{asinh}\left(\frac{\sqrt{2}\sqrt{b}}{2x}\right)}{\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(2+b/x**2)**(1/2),x)

[Out] -asinh(sqrt(2)*sqrt(b)/(2*x))/sqrt(b)
```

Mathematica [B] time = 0.0469895, size = 56, normalized size = 2.8

$$\frac{\sqrt{b+2x^2}\left(\log(x)-\log\left(\sqrt{b}\sqrt{b+2x^2}+b\right)\right)}{\sqrt{b}x\sqrt{\frac{b}{x^2}+2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[2 + b/x^2]*x^2),x]

[Out] (Sqrt[b + 2*x^2]*(Log[x] - Log[b + Sqrt[b]*Sqrt[b + 2*x^2]]))/(Sq
rt[b]*Sqrt[2 + b/x^2]*x)
```

Maple [B] time = 0.013, size = 52, normalized size = 2.6

$$-\frac{1}{x}\sqrt{2\,x^2+b}\ln\left(2\,\frac{\sqrt{b}\sqrt{2\,x^2+b}+b}{x}\right)\frac{1}{\sqrt{\frac{2\,x^2+b}{x^2}}}\frac{1}{\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(2+b/x^2)^(1/2),x)
```

```
[Out] -1/((2*x^2+b)/x^2)^(1/2)/x*(2*x^2+b)^(1/2)/b^(1/2)*ln(2*(b^(1/2)*
(2*x^2+b)^(1/2)+b)/x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^2*sqrt(b/x^2 + 2)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.246944, size = 1, normalized size = 0.05

$$\left[\frac{\log\left(\frac{bx\sqrt{\frac{2x^2+b}{x^2}}-(x^2+b)\sqrt{b}}{x^2}\right)}{2\sqrt{b}}, \frac{\sqrt{-b}\arctan\left(\frac{\sqrt{-b}}{x\sqrt{\frac{2x^2+b}{x^2}}}\right)}{b}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^2*sqrt(b/x^2 + 2)),x, algorithm="fricas")
```

```
[Out] [1/2*log((b*x*sqrt((2*x^2 + b)/x^2) - (x^2 + b)*sqrt(b))/x^2)/sqr
t(b), sqrt(-b)*arctan(sqrt(-b)/(x*sqrt((2*x^2 + b)/x^2)))/b]
```

Sympy [A] time = 4.33151, size = 20, normalized size = 1.

$$-\frac{\operatorname{asinh}\left(\frac{\sqrt{2}\sqrt{b}}{2x}\right)}{\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(2+b/x**2)**(1/2),x)
```

```
[Out] -asinh(sqrt(2)*sqrt(b)/(2*x))/sqrt(b)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{x^2\sqrt{\frac{b}{x^2}+2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^2*sqrt(b/x^2 + 2)),x, algorithm="giac")
```

```
[Out] integrate(1/(x^2*sqrt(b/x^2 + 2)), x)
```

3.1927 $\int \frac{1}{\sqrt{2-\frac{b}{x^2}}x^2}\,dx$

Optimal. Leaf size=20

$$-\frac{\csc^{-1}\left(\frac{\sqrt{2}x}{\sqrt{b}}\right)}{\sqrt{b}}$$

```
[Out] -(ArcCsc[(Sqrt[2]*x)/Sqrt[b]]/Sqrt[b])
```

Rubi [A] time = 0.0343111, antiderivative size = 20, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125

$$-\frac{\csc^{-1}\left(\frac{\sqrt{2}x}{\sqrt{b}}\right)}{\sqrt{b}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[2 - b/x^2]*x^2),x]

[Out] -(ArcCsc[(Sqrt[2]*x)/Sqrt[b]]/Sqrt[b])
```

Rubi in Sympy [A] time = 4.13383, size = 20, normalized size = 1.

$$-\frac{\operatorname{asin}\left(\frac{\sqrt{2}\sqrt{b}}{2x}\right)}{\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(2-b/x**2)**(1/2),x)

[Out] -asin(sqrt(2)*sqrt(b)/(2*x))/sqrt(b)
```

Mathematica [C] time = 0.054696, size = 64, normalized size = 3.2

$$-\frac{ix\sqrt{2-\frac{b}{x^2}}\log\left(\frac{2\left(\sqrt{2x^2-b}-i\sqrt{b}\right)}{x}\right)}{\sqrt{b}\sqrt{2x^2-b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[2 - b/x^2]*x^2),x]

[Out] ((-I)*Sqrt[2 - b/x^2]*x*Log[(2*((-I)*Sqrt[b] + Sqrt[-b + 2*x^2]))
/x])/(Sqrt[b]*Sqrt[-b + 2*x^2])
```

Maple [B] time = 0.015, size = 64, normalized size = 3.2

$$-\frac{1}{x}\sqrt{2\,x^2-b}\ln\left(2\,\frac{\sqrt{-b}\sqrt{2\,x^2-b}-b}{x}\right)\frac{1}{\sqrt{\frac{2\,x^2-b}{x^2}}}\frac{1}{\sqrt{-b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(2-b/x^2)^(1/2),x)
```

```
[Out] -1/((2*x^2-b)/x^2)^(1/2)/x*(2*x^2-b)^(1/2)/(-b)^(1/2)*ln(2*((-b)^
(1/2)*(2*x^2-b)^(1/2)-b)/x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^2*sqrt(-b/x^2 + 2)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.251337, size = 1, normalized size = 0.05

$$\left[-\frac{\sqrt{-b}\log\left(-\frac{bx\sqrt{\frac{2x^2-b}{x^2}}+(x^2-b)\sqrt{-b}}{x^2}\right)}{2b}, -\frac{\arctan\left(\frac{\sqrt{b}}{x\sqrt{\frac{2x^2-b}{x^2}}}\right)}{\sqrt{b}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^2*sqrt(-b/x^2 + 2)),x, algorithm="fricas")
```

```
[Out] [-1/2*sqrt(-b)*log(-(b*x*sqrt((2*x^2 - b)/x^2) + (x^2 - b)*sqrt(-
b))/x^2)/b, -arctan(sqrt(b)/(x*sqrt((2*x^2 - b)/x^2)))/sqrt(b)]
```

Sympy [A] time = 4.6291, size = 49, normalized size = 2.45

$$\begin{cases} \frac{i\,\mathrm{acosh}\left(\frac{\sqrt{2}\sqrt{b}}{2x}\right)}{\sqrt{b}} & \text{for}\ \frac{\left|\frac{b}{x^2}\right|}{2} > 1 \\ -\frac{\mathrm{asin}\left(\frac{\sqrt{2}\sqrt{b}}{2x}\right)}{\sqrt{b}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(2-b/x**2)**(1/2),x)
```

```
[Out] Piecewise((I*acosh(sqrt(2)*sqrt(b)/(2*x))/sqrt(b), Abs(b/x**2)/2
> 1), (-asin(sqrt(2)*sqrt(b)/(2*x))/sqrt(b), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{x^2\sqrt{-\frac{b}{x^2}+2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^2*sqrt(-b/x^2 + 2)),x, algorithm="giac")
```

```
[Out] integrate(1/(x^2*sqrt(-b/x^2 + 2)), x)
```

3.1928 $\int \frac{x^3}{\left(a+\frac{b}{x^2}\right)^{3/2}}\,dx$

Optimal. Leaf size=93

$$\frac{15b^2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{8a^{7/2}}-\frac{15bx^2\sqrt{a+\frac{b}{x^2}}}{8a^3}+\frac{5x^4\sqrt{a+\frac{b}{x^2}}}{4a^2}-\frac{x^4}{a\sqrt{a+\frac{b}{x^2}}}$$

```
[Out] (-15*b*Sqrt[a + b/x^2]*x^2)/(8*a^3) - x^4/(a*Sqrt[a + b/x^2]) + (
5*Sqrt[a + b/x^2]*x^4)/(4*a^2) + (15*b^2*ArcTanh[Sqrt[a + b/x^2]/
Sqrt[a]])/(8*a^(7/2))
```

Rubi [A] time = 0.148227, antiderivative size = 93, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{15b^2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{8a^{7/2}}-\frac{15bx^2\sqrt{a+\frac{b}{x^2}}}{8a^3}+\frac{5x^4\sqrt{a+\frac{b}{x^2}}}{4a^2}-\frac{x^4}{a\sqrt{a+\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(a + b/x^2)^(3/2),x]
```

```
[Out] (-15*b*Sqrt[a + b/x^2]*x^2)/(8*a^3) - x^4/(a*Sqrt[a + b/x^2]) + (
5*Sqrt[a + b/x^2]*x^4)/(4*a^2) + (15*b^2*ArcTanh[Sqrt[a + b/x^2]/
Sqrt[a]])/(8*a^(7/2))
```

Rubi in Sympy [A] time = 13.3396, size = 85, normalized size = 0.91

$$-\frac{x^4}{a\sqrt{a+\frac{b}{x^2}}}+\frac{5x^4\sqrt{a+\frac{b}{x^2}}}{4a^2}-\frac{15bx^2\sqrt{a+\frac{b}{x^2}}}{8a^3}+\frac{15b^2\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{8a^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(a+b/x**2)**(3/2),x)
```

```
[Out] -x**4/(a*sqrt(a + b/x**2)) + 5*x**4*sqrt(a + b/x**2)/(4*a**2) - 1
5*b*x**2*sqrt(a + b/x**2)/(8*a**3) + 15*b**2*atanh(sqrt(a + b/x**
2)/sqrt(a))/(8*a**(7/2))
```

Mathematica [A] time = 0.0749547, size = 90, normalized size = 0.97

$$\frac{\sqrt{a}x\left(2a^2x^4-5abx^2-15b^2\right)+15b^2\sqrt{ax^2+b}\log\left(\sqrt{a}\sqrt{ax^2+b}+ax\right)}{8a^{7/2}x\sqrt{a+\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(a + b/x^2)^(3/2),x]
```

```
[Out] (Sqrt[a]*x*(-15*b^2 - 5*a*b*x^2 + 2*a^2*x^4) + 15*b^2*Sqrt[b + a*
x^2]*Log[a*x + Sqrt[a]*Sqrt[b + a*x^2]])/(8*a^(7/2)*Sqrt[a + b/x^
2]*x)
```

Maple [A] time = 0.015, size = 87, normalized size = 0.9

$$\frac{ax^2+b}{8\,x^3}\left(2\,x^5a^{7/2}-5\,a^{5/2}x^3b-15\,a^{3/2}xb^2+15\,\ln\left(\sqrt{a}x+\sqrt{ax^2+b}\right)\sqrt{ax^2+b}ab^2\right)\left(\frac{ax^2+b}{x^2}\right)^{-\frac{3}{2}}a^{-\frac{9}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(a+b/x^2)^(3/2),x)
```

```
[Out] 1/8*(a*x^2+b)*(2*x^5*a^(7/2)-5*a^(5/2)*x^3*b-15*a^(3/2)*x*b^2+15*
ln(a^(1/2)*x+(a*x^2+b)^(1/2))*(a*x^2+b)^(1/2)*a*b^2)/((a*x^2+b)/x
^2)^(3/2)/x^3/a^(9/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(a + b/x^2)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.256666, size = 1, normalized size = 0.01

$$\left[\frac{15\left(ab^2x^2+b^3\right)\sqrt{a}\log\left(-2\,ax^2\sqrt{\frac{ax^2+b}{x^2}}-\left(2\,ax^2+b\right)\sqrt{a}\right)+2\left(2\,a^3x^6-5\,a^2bx^4-15\,ab^2x^2\right)\sqrt{\frac{ax^2+b}{x^2}}}{16\left(a^5x^2+a^4b\right)},\right.$$
$$\left.-\frac{15\left(ab^2x^2+b^3\right)\sqrt{-a}\arctan\left(\frac{\sqrt{-a}}{\sqrt{\frac{ax^2+b}{x^2}}}\right)-\left(2\,a^3x^6-5\,a^2bx^4-15\,ab^2x^2\right)\sqrt{\frac{ax^2+b}{x^2}}}{8\left(a^5x^2+a^4b\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(a + b/x^2)^(3/2),x, algorithm="fricas")
```

```
[Out] [1/16*(15*(a*b^2*x^2 + b^3)*sqrt(a)*log(-2*a*x^2*sqrt((a*x^2 + b)
/x^2) - (2*a*x^2 + b)*sqrt(a)) + 2*(2*a^3*x^6 - 5*a^2*b*x^4 - 15*
a*b^2*x^2)*sqrt((a*x^2 + b)/x^2))/(a^5*x^2 + a^4*b), -1/8*(15*(a*
b^2*x^2 + b^3)*sqrt(-a)*arctan(sqrt(-a)/sqrt((a*x^2 + b)/x^2)) -
(2*a^3*x^6 - 5*a^2*b*x^4 - 15*a*b^2*x^2)*sqrt((a*x^2 + b)/x^2))/(
a^5*x^2 + a^4*b)]
```

Sympy [A] time = 19.0428, size = 100, normalized size = 1.08

$$\frac{x^5}{4a\sqrt{b}\sqrt{\frac{ax^2}{b}+1}}-\frac{5\sqrt{b}x^3}{8a^2\sqrt{\frac{ax^2}{b}+1}}-\frac{15b^{\frac{3}{2}}x}{8a^3\sqrt{\frac{ax^2}{b}+1}}+\frac{15b^2\operatorname{asinh}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{8a^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**3/(a+b/x**2)**(3/2),x)
```

```
[Out] x**5/(4*a*sqrt(b)*sqrt(a*x**2/b + 1)) - 5*sqrt(b)*x**3/(8*a**2*sq
rt(a*x**2/b + 1)) - 15*b**(3/2)*x/(8*a**3*sqrt(a*x**2/b + 1)) + 1
5*b**2*asinh(sqrt(a)*x/sqrt(b))/(8*a**(7/2))
```

GIAC/XCAS [A] time = 0.263866, size = 158, normalized size = 1.7

$$-\frac{1}{8}\,b^{2}\left(\frac{15\,\arctan\left(\frac{\sqrt{\frac{ax^{2}+b}{x^{2}}}}{\sqrt{-a}}\right)}{\sqrt{-a}a^{3}}+\frac{8}{a^{3}\sqrt{\frac{ax^{2}+b}{x^{2}}}}-\frac{9\,a\sqrt{\frac{ax^{2}+b}{x^{2}}}-\frac{7\,(ax^{2}+b)\sqrt{\frac{ax^{2}+b}{x^{2}}}}{x^{2}}}{\left(a-\frac{ax^{2}+b}{x^{2}}\right)^{2}a^{3}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^3/(a + b/x^2)^(3/2),x, algorithm="giac")
```

```
[Out] -1/8*b^2*(15*arctan(sqrt((a*x^2 + b)/x^2)/sqrt(-a))/(sqrt(-a)*a^3
) + 8/(a^3*sqrt((a*x^2 + b)/x^2)) - (9*a*sqrt((a*x^2 + b)/x^2) -
7*(a*x^2 + b)*sqrt((a*x^2 + b)/x^2)/x^2)/((a - (a*x^2 + b)/x^2)^2
*a^3))
```

3.1929 $\int \frac{x}{\left(a+\frac{b}{x^2}\right)^{3/2}}\,dx$

Optimal. Leaf size=69

$$-\frac{3b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{2a^{5/2}}+\frac{3x^2\sqrt{a+\frac{b}{x^2}}}{2a^2}-\frac{x^2}{a\sqrt{a+\frac{b}{x^2}}}$$

```
[Out] -(x^2/(a*Sqrt[a + b/x^2])) + (3*Sqrt[a + b/x^2]*x^2)/(2*a^2) - (3
*b*ArcTanh[Sqrt[a + b/x^2]/Sqrt[a]])/(2*a^(5/2))
```

Rubi [A] time = 0.103591, antiderivative size = 69, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$-\frac{3b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{2a^{5/2}}+\frac{3x^2\sqrt{a+\frac{b}{x^2}}}{2a^2}-\frac{x^2}{a\sqrt{a+\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In] Int[x/(a + b/x^2)^(3/2),x]
```

```
[Out] -(x^2/(a*Sqrt[a + b/x^2])) + (3*Sqrt[a + b/x^2]*x^2)/(2*a^2) - (3
*b*ArcTanh[Sqrt[a + b/x^2]/Sqrt[a]])/(2*a^(5/2))
```

Rubi in Sympy [A] time = 9.61652, size = 61, normalized size = 0.88

$$-\frac{x^2}{a\sqrt{a+\frac{b}{x^2}}}+\frac{3x^2\sqrt{a+\frac{b}{x^2}}}{2a^2}-\frac{3b\,\mathrm{atanh}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{2a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x/(a+b/x**2)**(3/2),x)
```

```
[Out] -x**2/(a*sqrt(a + b/x**2)) + 3*x**2*sqrt(a + b/x**2)/(2*a**2) - 3
*b*atanh(sqrt(a + b/x**2)/sqrt(a))/(2*a**(5/2))
```

Mathematica [A] time = 0.0513118, size = 76, normalized size = 1.1

$$\frac{\sqrt{a}x\left(ax^2+3b\right)-3b\sqrt{ax^2+b}\log\left(\sqrt{a}\sqrt{ax^2+b}+ax\right)}{2a^{5/2}x\sqrt{a+\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(a + b/x^2)^(3/2),x]
```

```
[Out] (Sqrt[a]*x*(3*b + a*x^2) - 3*b*Sqrt[b + a*x^2]*Log[a*x + Sqrt[a]*
Sqrt[b + a*x^2]])/(2*a^(5/2)*Sqrt[a + b/x^2]*x)
```

Maple [A] time = 0.013, size = 73, normalized size = 1.1

$$\frac{ax^2+b}{2x^3}\left(x^3a^{\frac{5}{2}}+3a^{3/2}xb-3\ln\left(\sqrt{a}x+\sqrt{ax^2+b}\right)\sqrt{ax^2+b}ab\right)\left(\frac{ax^2+b}{x^2}\right)^{-\frac{3}{2}}a^{-\frac{7}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+b/x^2)^(3/2),x)
```

```
[Out] 1/2*(a*x^2+b)*(x^3*a^(5/2)+3*a^(3/2)*x*b-3*ln(a^(1/2)*x+(a*x^2+b)
^(1/2))*(a*x^2+b)^(1/2)*a*b)/((a*x^2+b)/x^2)^(3/2)/x^3/a^(7/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x^2)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.245536, size = 1, normalized size = 0.01

$$\left[\frac{3\left(abx^2+b^2\right)\sqrt{a}\log\left(2ax^2\sqrt{\frac{ax^2+b}{x^2}}-\left(2ax^2+b\right)\sqrt{a}\right)+2\left(a^2x^4+3abx^2\right)\sqrt{\frac{ax^2+b}{x^2}}}{4\left(a^4x^2+a^3b\right)}, \frac{3\left(abx^2+b^2\right)\sqrt{-a}\arctan\left(\frac{\sqrt{-a}}{\sqrt{\frac{ax^2+b}{x^2}}}\right)+(}{2\left(a^4x^2+a^3b\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x^2)^(3/2),x, algorithm="fricas")
```

```
[Out] [1/4*(3*(a*b*x^2 + b^2)*sqrt(a)*log(2*a*x^2*sqrt((a*x^2 + b)/x^2)
 - (2*a*x^2 + b)*sqrt(a)) + 2*(a^2*x^4 + 3*a*b*x^2)*sqrt((a*x^2 +
 b)/x^2))/(a^4*x^2 + a^3*b), 1/2*(3*(a*b*x^2 + b^2)*sqrt(-a)*arct
an(sqrt(-a)/sqrt((a*x^2 + b)/x^2)) + (a^2*x^4 + 3*a*b*x^2)*sqrt((
a*x^2 + b)/x^2))/(a^4*x^2 + a^3*b)]
```

Sympy [A] time = 11.6551, size = 71, normalized size = 1.03

$$\frac{x^3}{2a\sqrt{b}\sqrt{\frac{ax^2}{b}+1}}+\frac{3\sqrt{b}x}{2a^2\sqrt{\frac{ax^2}{b}+1}}-\frac{3b\operatorname{asinh}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{2a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b/x**2)**(3/2),x)
```

```
[Out] x**3/(2*a*sqrt(b)*sqrt(a*x**2/b + 1)) + 3*sqrt(b)*x/(2*a**2*sqrt(
a*x**2/b + 1)) - 3*b*asinh(sqrt(a)*x/sqrt(b))/(2*a**(5/2))
```

GIAC/XCAS [A] time = 0.268809, size = 131, normalized size = 1.9

$$\frac{1}{2}\,b\left(\frac{3\,\arctan\left(\frac{\sqrt{\frac{ax^2+b}{x^2}}}{\sqrt{-a}}\right)}{\sqrt{-a}a^2}+\frac{2\,a-\frac{3\,(ax^2+b)}{x^2}}{\left(a\sqrt{\frac{ax^2+b}{x^2}}-\frac{(ax^2+b)\sqrt{\frac{ax^2+b}{x^2}}}{x^2}\right)a^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x^2)^(3/2),x, algorithm="giac")
```

```
[Out] 1/2*b*(3*arctan(sqrt((a*x^2 + b)/x^2)/sqrt(-a))/(sqrt(-a)*a^2) +
(2*a - 3*(a*x^2 + b)/x^2)/((a*sqrt((a*x^2 + b)/x^2) - (a*x^2 + b)
*sqrt((a*x^2 + b)/x^2)/x^2)*a^2))
```

3.1930 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{3/2} x}\,dx$

Optimal. Leaf size=41

$$\frac{\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{a^{3/2}}-\frac{1}{a\sqrt{a+\frac{b}{x^2}}}$$

```
[Out] -(1/(a*Sqrt[a + b/x^2])) + ArcTanh[Sqrt[a + b/x^2]/Sqrt[a]]/a^(3/
2)
```

Rubi [A] time = 0.0808789, antiderivative size = 41, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{a^{3/2}}-\frac{1}{a\sqrt{a+\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)^(3/2)*x),x]
```

```
[Out] -(1/(a*Sqrt[a + b/x^2])) + ArcTanh[Sqrt[a + b/x^2]/Sqrt[a]]/a^(3/
2)
```

Rubi in Sympy [A] time = 7.22218, size = 34, normalized size = 0.83

$$-\frac{1}{a\sqrt{a+\frac{b}{x^2}}}+\frac{\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**(3/2)/x,x)
```

```
[Out] -1/(a*sqrt(a + b/x**2)) + atanh(sqrt(a + b/x**2)/sqrt(a))/a**(3/2
)
```

Mathematica [A] time = 0.0398808, size = 63, normalized size = 1.54

$$\frac{\sqrt{ax^2+b}\log\left(\sqrt{a}\sqrt{ax^2+b}+ax\right)-\sqrt{a}x}{a^{3/2}x\sqrt{a+\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)^(3/2)*x),x]
```

```
[Out] (-(Sqrt[a]*x) + Sqrt[b + a*x^2]*Log[a*x + Sqrt[a]*Sqrt[b + a*x^2]
])/(a^(3/2)*Sqrt[a + b/x^2]*x)
```

Maple [A] time = 0.012, size = 63, normalized size = 1.5

$$-\frac{ax^2+b}{x^3}\left(xa^{\frac{3}{2}}-\ln\left(\sqrt{a}x+\sqrt{ax^2+b}\right)a\sqrt{ax^2+b}\right)\left(\frac{ax^2+b}{x^2}\right)^{-\frac{3}{2}}a^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^(3/2)/x,x)
```

```
[Out] -(a*x^2+b)*(x*a^(3/2)-ln(a^(1/2)*x+(a*x^2+b)^(1/2))*a*(a*x^2+b)^(
1/2))/((a*x^2+b)/x^2)^(3/2)/x^3/a^(5/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(3/2)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.244282, size = 1, normalized size = 0.02

$$\left[-\frac{2\,ax^2\sqrt{\frac{ax^2+b}{x^2}}-\left(ax^2+b\right)\sqrt{a}\log\left(-2\,ax^2\sqrt{\frac{ax^2+b}{x^2}}-\left(2\,ax^2+b\right)\sqrt{a}\right)}{2\left(a^3x^2+a^2b\right)},\ -\frac{ax^2\sqrt{\frac{ax^2+b}{x^2}}+\left(ax^2+b\right)\sqrt{-a}\arctan\left(\frac{\sqrt{-a}}{\sqrt{\frac{ax^2+b}{x^2}}}\right)}{a^3x^2+a^2b}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(3/2)*x),x, algorithm="fricas")
```

```
[Out] [-1/2*(2*a*x^2*sqrt((a*x^2 + b)/x^2) - (a*x^2 + b)*sqrt(a)*log(-2
*a*x^2*sqrt((a*x^2 + b)/x^2) - (2*a*x^2 + b)*sqrt(a)))/(a^3*x^2 +
 a^2*b), -(a*x^2*sqrt((a*x^2 + b)/x^2) + (a*x^2 + b)*sqrt(-a)*arc
tan(sqrt(-a)/sqrt((a*x^2 + b)/x^2)))/(a^3*x^2 + a^2*b)]
```

Sympy [A] time = 6.9315, size = 187, normalized size = 4.56

$$-\frac{2a^3x^2\sqrt{1+\frac{b}{ax^2}}}{2a^{\frac{9}{2}}x^2+2a^{\frac{7}{2}}b}-\frac{a^3x^2\log\left(\frac{b}{ax^2}\right)}{2a^{\frac{9}{2}}x^2+2a^{\frac{7}{2}}b}+\frac{2a^3x^2\log\left(\sqrt{1+\frac{b}{ax^2}}+1\right)}{2a^{\frac{9}{2}}x^2+2a^{\frac{7}{2}}b}-\frac{a^2b\log\left(\frac{b}{ax^2}\right)}{2a^{\frac{9}{2}}x^2+2a^{\frac{7}{2}}b}+\frac{2a^2b\log\left(\sqrt{1+\frac{b}{ax^2}}+1\right)}{2a^{\frac{9}{2}}x^2+2a^{\frac{7}{2}}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**(3/2)/x,x)
```

```
[Out] -2*a**3*x**2*sqrt(1 + b/(a*x**2))/(2*a**(9/2)*x**2 + 2*a**(7/2)*b
) - a**3*x**2*log(b/(a*x**2))/(2*a**(9/2)*x**2 + 2*a**(7/2)*b) +
2*a**3*x**2*log(sqrt(1 + b/(a*x**2)) + 1)/(2*a**(9/2)*x**2 + 2*a*
*(7/2)*b) - a**2*b*log(b/(a*x**2))/(2*a**(9/2)*x**2 + 2*a**(7/2)*
b) + 2*a**2*b*log(sqrt(1 + b/(a*x**2)) + 1)/(2*a**(9/2)*x**2 + 2*
a**(7/2)*b)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a + \frac{b}{x^2}\right)^{\frac{3}{2}} x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(3/2)*x),x, algorithm="giac")
```

```
[Out] integrate(1/((a + b/x^2)^(3/2)*x), x)
```

3.1931 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{3/2} x^3} \, dx$

Optimal. Leaf size=15

$$\frac{1}{b\sqrt{a+\frac{b}{x^2}}}$$

```
[Out] 1/(b*Sqrt[a + b/x^2])
```

Rubi [A] time = 0.0291111, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{1}{b\sqrt{a+\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)^(3/2)*x^3),x]

[Out] 1/(b*Sqrt[a + b/x^2])
```

Rubi in Sympy [A] time = 2.13514, size = 12, normalized size = 0.8

$$\frac{1}{b\sqrt{a+\frac{b}{x^2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**(3/2)/x**3,x)

[Out] 1/(b*sqrt(a + b/x**2))
```

Mathematica [A] time = 0.0166078, size = 15, normalized size = 1.

$$\frac{1}{b\sqrt{a+\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)^(3/2)*x^3),x]

[Out] 1/(b*Sqrt[a + b/x^2])
```

Maple [B] time = 0.006, size = 28, normalized size = 1.9

$$\frac{ax^2+b}{bx^2}\left(\frac{ax^2+b}{x^2}\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^(3/2)/x^3,x)

[Out] (a*x^2+b)/x^2/b/((a*x^2+b)/x^2)^(3/2)
```

Maxima [A] time = 1.43849, size = 18, normalized size = 1.2

$$\frac{1}{\sqrt{a+\frac{b}{x^2}}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(3/2)*x^3),x, algorithm="maxima")

[Out] 1/(sqrt(a + b/x^2)*b)
```

Fricas [A] time = 0.237408, size = 39, normalized size = 2.6

$$\frac{x^2\sqrt{\frac{ax^2+b}{x^2}}}{abx^2+b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(3/2)*x^3),x, algorithm="fricas")

[Out] x^2*sqrt((a*x^2 + b)/x^2)/(a*b*x^2 + b^2)
```

Sympy [A] time = 6.96624, size = 26, normalized size = 1.73

$$\begin{cases} \frac{1}{b\sqrt{a+\frac{b}{x^2}}} & \text{for } b \neq 0 \\ -\frac{1}{2a^{\frac{3}{2}}x^2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**(3/2)/x**3,x)

[Out] Piecewise((1/(b*sqrt(a + b/x**2)), Ne(b, 0)), (-1/(2*a**(3/2)*x**
2), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(3/2)*x^3),x, algorithm="giac")

[Out] integrate(1/((a + b/x^2)^(3/2)*x^3), x)
```

3.1932 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{3/2} x^5} dx$

Optimal. Leaf size=34

$$-\frac{a}{b^2\sqrt{a+\frac{b}{x^2}}}-\frac{\sqrt{a+\frac{b}{x^2}}}{b^2}$$

```
[Out] -(a/(b^2*Sqrt[a + b/x^2])) - Sqrt[a + b/x^2]/b^2
```

Rubi [A] time = 0.0646196, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a}{b^2\sqrt{a+\frac{b}{x^2}}}-\frac{\sqrt{a+\frac{b}{x^2}}}{b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)^(3/2)*x^5),x]

[Out] -(a/(b^2*Sqrt[a + b/x^2])) - Sqrt[a + b/x^2]/b^2
```

Rubi in Sympy [A] time = 6.94936, size = 29, normalized size = 0.85

$$-\frac{a}{b^2\sqrt{a+\frac{b}{x^2}}}-\frac{\sqrt{a+\frac{b}{x^2}}}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**(3/2)/x**5,x)

[Out] -a/(b**2*sqrt(a + b/x**2)) - sqrt(a + b/x**2)/b**2
```

Mathematica [A] time = 0.0276238, size = 28, normalized size = 0.82

$$\frac{-2ax^2-b}{b^2x^2\sqrt{a+\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)^(3/2)*x^5),x]

[Out] (-b - 2*a*x^2)/(b^2*Sqrt[a + b/x^2]*x^2)
```

Maple [A] time = 0.008, size = 37, normalized size = 1.1

$$-\frac{(ax^2+b)(2ax^2+b)}{b^2x^4}\left(\frac{ax^2+b}{x^2}\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^(3/2)/x^5,x)
```

```
[Out] -(a*x^2+b)*(2*a*x^2+b)/x^4/b^2/((a*x^2+b)/x^2)^(3/2)
```

Maxima [A] time = 1.42762, size = 41, normalized size = 1.21

$$-\frac{\sqrt{a+\frac{b}{x^2}}}{b^2}-\frac{a}{\sqrt{a+\frac{b}{x^2}}\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(3/2)*x^5),x, algorithm="maxima")
```

```
[Out] -sqrt(a + b/x^2)/b^2 - a/(sqrt(a + b/x^2)*b^2)
```

Fricas [A] time = 0.235011, size = 50, normalized size = 1.47

$$-\frac{\left(2\,ax^2+b\right)\sqrt{\frac{ax^2+b}{x^2}}}{ab^2x^2+b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(3/2)*x^5),x, algorithm="fricas")
```

```
[Out] -(2*a*x^2 + b)*sqrt((a*x^2 + b)/x^2)/(a*b^2*x^2 + b^3)
```

Sympy [A] time = 11.1242, size = 48, normalized size = 1.41

$$\begin{cases} -\frac{2a}{b^2\sqrt{a+\frac{b}{x^2}}}-\frac{1}{bx^2\sqrt{a+\frac{b}{x^2}}} & \text{for } b\neq 0 \\ -\frac{1}{4a^{\frac{3}{2}}x^4} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**(3/2)/x**5,x)
```

```
[Out] Piecewise((-2*a/(b**2*sqrt(a + b/x**2)) - 1/(b*x**2*sqrt(a + b/x*
*2)), Ne(b, 0)), (-1/(4*a**(3/2)*x**4), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(3/2)*x^5),x, algorithm="giac")
```

```
[Out] integrate(1/((a + b/x^2)^(3/2)*x^5), x)
```

3.1933 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{3/2} x^7} dx$

Optimal. Leaf size=54

$$\frac{a^2}{b^3\sqrt{a+\frac{b}{x^2}}}+\frac{2a\sqrt{a+\frac{b}{x^2}}}{b^3}-\frac{\left(a+\frac{b}{x^2}\right)^{3/2}}{3b^3}$$

```
[Out] a^2/(b^3*Sqrt[a + b/x^2]) + (2*a*Sqrt[a + b/x^2])/b^3 - (a + b/x^
2)^(3/2)/(3*b^3)
```

Rubi [A] time = 0.0905849, antiderivative size = 54, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^2}{b^3\sqrt{a+\frac{b}{x^2}}}+\frac{2a\sqrt{a+\frac{b}{x^2}}}{b^3}-\frac{\left(a+\frac{b}{x^2}\right)^{3/2}}{3b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)^(3/2)*x^7),x]
```

```
[Out] a^2/(b^3*Sqrt[a + b/x^2]) + (2*a*Sqrt[a + b/x^2])/b^3 - (a + b/x^
2)^(3/2)/(3*b^3)
```

Rubi in Sympy [A] time = 10.4471, size = 48, normalized size = 0.89

$$\frac{a^2}{b^3\sqrt{a+\frac{b}{x^2}}}+\frac{2a\sqrt{a+\frac{b}{x^2}}}{b^3}-\frac{\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}{3b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**(3/2)/x**7,x)
```

```
[Out] a**2/(b**3*sqrt(a + b/x**2)) + 2*a*sqrt(a + b/x**2)/b**3 - (a + b
/x**2)**(3/2)/(3*b**3)
```

Mathematica [A] time = 0.033243, size = 42, normalized size = 0.78

$$\frac{8a^2x^4+4abx^2-b^2}{3b^3x^4\sqrt{a+\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)^(3/2)*x^7),x]
```

```
[Out] (-b^2 + 4*a*b*x^2 + 8*a^2*x^4)/(3*b^3*Sqrt[a + b/x^2]*x^4)
```

Maple [A] time = 0.008, size = 50, normalized size = 0.9

$$\frac{(ax^2+b)\left(8x^4a^2+4abx^2-b^2\right)}{3b^3x^6}\left(\frac{ax^2+b}{x^2}\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^(3/2)/x^7,x)
```

```
[Out] 1/3*(a*x^2+b)*(8*a^2*x^4+4*a*b*x^2-b^2)/x^6/b^3/((a*x^2+b)/x^2)^(
3/2)
```

Maxima [A] time = 1.43702, size = 62, normalized size = 1.15

$$-\frac{\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}{3\,b^3}+\frac{2\,\sqrt{a+\frac{b}{x^2}}a}{b^3}+\frac{a^2}{\sqrt{a+\frac{b}{x^2}}b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(3/2)*x^7),x, algorithm="maxima")
```

```
[Out] -1/3*(a + b/x^2)^(3/2)/b^3 + 2*sqrt(a + b/x^2)*a/b^3 + a^2/(sqrt(
a + b/x^2)*b^3)
```

Fricas [A] time = 0.237157, size = 73, normalized size = 1.35

$$\frac{\left(8\,a^2x^4+4\,abx^2-b^2\right)\sqrt{\frac{ax^2+b}{x^2}}}{3\,(ab^3x^4+b^4x^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(3/2)*x^7),x, algorithm="fricas")
```

```
[Out] 1/3*(8*a^2*x^4 + 4*a*b*x^2 - b^2)*sqrt((a*x^2 + b)/x^2)/(a*b^3*x^
4 + b^4*x^2)
```

Sympy [A] time = 12.939, size = 423, normalized size = 7.83

$$\frac{8a^{\frac{9}{2}}b^{\frac{7}{2}}x^6\sqrt{\frac{ax^2}{b}+1}}{3a^{\frac{7}{2}}b^6x^7+6a^{\frac{5}{2}}b^7x^5+3a^{\frac{3}{2}}b^8x^3}+\frac{12a^{\frac{7}{2}}b^{\frac{9}{2}}x^4\sqrt{\frac{ax^2}{b}+1}}{3a^{\frac{7}{2}}b^6x^7+6a^{\frac{5}{2}}b^7x^5+3a^{\frac{3}{2}}b^8x^3}+\frac{3a^{\frac{5}{2}}b^{\frac{11}{2}}x^2\sqrt{\frac{ax^2}{b}+1}}{3a^{\frac{7}{2}}b^6x^7+6a^{\frac{5}{2}}b^7x^5+3a^{\frac{3}{2}}b^8x^3}$$
$$-\frac{a^{\frac{3}{2}}b^{\frac{13}{2}}\sqrt{\frac{ax^2}{b}+1}}{3a^{\frac{7}{2}}b^6x^7+6a^{\frac{5}{2}}b^7x^5+3a^{\frac{3}{2}}b^8x^3}-\frac{8a^5b^3x^7}{3a^{\frac{7}{2}}b^6x^7+6a^{\frac{5}{2}}b^7x^5+3a^{\frac{3}{2}}b^8x^3}$$
$$-\frac{16a^4b^4x^5}{3a^{\frac{7}{2}}b^6x^7+6a^{\frac{5}{2}}b^7x^5+3a^{\frac{3}{2}}b^8x^3}-\frac{8a^3b^5x^3}{3a^{\frac{7}{2}}b^6x^7+6a^{\frac{5}{2}}b^7x^5+3a^{\frac{3}{2}}b^8x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**(3/2)/x**7,x)
```

```
[Out] 8*a**(9/2)*b**(7/2)*x**6*sqrt(a*x**2/b + 1)/(3*a**(7/2)*b**6*x**7
 + 6*a**(5/2)*b**7*x**5 + 3*a**(3/2)*b**8*x**3) + 12*a**(7/2)*b**
(9/2)*x**4*sqrt(a*x**2/b + 1)/(3*a**(7/2)*b**6*x**7 + 6*a**(5/2)*
b**7*x**5 + 3*a**(3/2)*b**8*x**3) + 3*a**(5/2)*b**(11/2)*x**2*sqr
t(a*x**2/b + 1)/(3*a**(7/2)*b**6*x**7 + 6*a**(5/2)*b**7*x**5 + 3*
a**(3/2)*b**8*x**3) - a**(3/2)*b**(13/2)*sqrt(a*x**2/b + 1)/(3*a*
*(7/2)*b**6*x**7 + 6*a**(5/2)*b**7*x**5 + 3*a**(3/2)*b**8*x**3) -
 8*a**5*b**3*x**7/(3*a**(7/2)*b**6*x**7 + 6*a**(5/2)*b**7*x**5 +
3*a**(3/2)*b**8*x**3) - 16*a**4*b**4*x**5/(3*a**(7/2)*b**6*x**7 +
 6*a**(5/2)*b**7*x**5 + 3*a**(3/2)*b**8*x**3) - 8*a**3*b**5*x**3/
```

```
(3*a**(7/2)*b**6*x**7 + 6*a**(5/2)*b**7*x**5 + 3*a**(3/2)*b**8*x*
*3)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}} x^7} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(3/2)*x^7),x, algorithm="giac")
```

```
[Out] integrate(1/((a + b/x^2)^(3/2)*x^7), x)
```

3.1934 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{3/2} x^9}\,dx$

Optimal. Leaf size=73

$$-\frac{a^3}{b^4\sqrt{a+\frac{b}{x^2}}}-\frac{3a^2\sqrt{a+\frac{b}{x^2}}}{b^4}+\frac{a\left(a+\frac{b}{x^2}\right)^{3/2}}{b^4}-\frac{\left(a+\frac{b}{x^2}\right)^{5/2}}{5b^4}$$

```
[Out] -(a^3/(b^4*Sqrt[a + b/x^2])) - (3*a^2*Sqrt[a + b/x^2])/b^4 + (a*(
a + b/x^2)^(3/2))/b^4 - (a + b/x^2)^(5/2)/(5*b^4)
```

Rubi [A] time = 0.115064, antiderivative size = 73, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^3}{b^4\sqrt{a+\frac{b}{x^2}}}-\frac{3a^2\sqrt{a+\frac{b}{x^2}}}{b^4}+\frac{a\left(a+\frac{b}{x^2}\right)^{3/2}}{b^4}-\frac{\left(a+\frac{b}{x^2}\right)^{5/2}}{5b^4}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)^(3/2)*x^9),x]
```

```
[Out] -(a^3/(b^4*Sqrt[a + b/x^2])) - (3*a^2*Sqrt[a + b/x^2])/b^4 + (a*(
a + b/x^2)^(3/2))/b^4 - (a + b/x^2)^(5/2)/(5*b^4)
```

Rubi in Sympy [A] time = 14.0021, size = 65, normalized size = 0.89

$$-\frac{a^3}{b^4\sqrt{a+\frac{b}{x^2}}}-\frac{3a^2\sqrt{a+\frac{b}{x^2}}}{b^4}+\frac{a\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}{b^4}-\frac{\left(a+\frac{b}{x^2}\right)^{\frac{5}{2}}}{5b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**(3/2)/x**9,x)
```

```
[Out] -a**3/(b**4*sqrt(a + b/x**2)) - 3*a**2*sqrt(a + b/x**2)/b**4 + a*
(a + b/x**2)**(3/2)/b**4 - (a + b/x**2)**(5/2)/(5*b**4)
```

Mathematica [A] time = 0.0402443, size = 53, normalized size = 0.73

$$\frac{-16a^3x^6-8a^2bx^4+2ab^2x^2-b^3}{5b^4x^6\sqrt{a+\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)^(3/2)*x^9),x]
```

```
[Out] (-b^3 + 2*a*b^2*x^2 - 8*a^2*b*x^4 - 16*a^3*x^6)/(5*b^4*Sqrt[a + b
/x^2]*x^6)
```

Maple [A] time = 0.009, size = 59, normalized size = 0.8

$$-\frac{\left(a x^{2}+b\right)\left(16 a^{3} x^{6}+8 a^{2} b x^{4}-2 a b^{2} x^{2}+b^{3}\right)}{5 x^{8} b^{4}}\left(\frac{a x^{2}+b}{x^{2}}\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^(3/2)/x^9,x)
```

```
[Out] -1/5*(a*x^2+b)*(16*a^3*x^6+8*a^2*b*x^4-2*a*b^2*x^2+b^3)/x^8/b^4/(
(a*x^2+b)/x^2)^(3/2)
```

Maxima [A] time = 1.42275, size = 85, normalized size = 1.16

$$-\frac{\left(a+\frac{b}{x^{2}}\right)^{\frac{5}{2}}}{5 b^{4}}+\frac{\left(a+\frac{b}{x^{2}}\right)^{\frac{3}{2}} a}{b^{4}}-\frac{3 \sqrt{a+\frac{b}{x^{2}}} a^{2}}{b^{4}}-\frac{a^{3}}{\sqrt{a+\frac{b}{x^{2}}} b^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(3/2)*x^9),x, algorithm="maxima")
```

```
[Out] -1/5*(a + b/x^2)^(5/2)/b^4 + (a + b/x^2)^(3/2)*a/b^4 - 3*sqrt(a +
 b/x^2)*a^2/b^4 - a^3/(sqrt(a + b/x^2)*b^4)
```

Fricas [A] time = 0.243883, size = 85, normalized size = 1.16

$$-\frac{\left(16 a^{3} x^{6}+8 a^{2} b x^{4}-2 a b^{2} x^{2}+b^{3}\right) \sqrt{\frac{a x^{2}+b}{x^{2}}}}{5\left(a b^{4} x^{6}+b^{5} x^{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(3/2)*x^9),x, algorithm="fricas")
```

```
[Out] -1/5*(16*a^3*x^6 + 8*a^2*b*x^4 - 2*a*b^2*x^2 + b^3)*sqrt((a*x^2 +
 b)/x^2)/(a*b^4*x^6 + b^5*x^4)
```

Sympy [A] time = 21.3459, size = 1844, normalized size = 25.26

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**(3/2)/x**9,x)
```

```
[Out] -16*a**(21/2)*b**(23/2)*x**16*sqrt(a*x**2/b + 1)/(5*a**(17/2)*b**
15*x**17 + 30*a**(15/2)*b**16*x**15 + 75*a**(13/2)*b**17*x**13 +
100*a**(11/2)*b**18*x**11 + 75*a**(9/2)*b**19*x**9 + 30*a**(7/2)*
b**20*x**7 + 5*a**(5/2)*b**21*x**5) - 88*a**(19/2)*b**(25/2)*x**1
4*sqrt(a*x**2/b + 1)/(5*a**(17/2)*b**15*x**17 + 30*a**(15/2)*b**1
6*x**15 + 75*a**(13/2)*b**17*x**13 + 100*a**(11/2)*b**18*x**11 +
75*a**(9/2)*b**19*x**9 + 30*a**(7/2)*b**20*x**7 + 5*a**(5/2)*b**2
1*x**5) - 198*a**(17/2)*b**(27/2)*x**12*sqrt(a*x**2/b + 1)/(5*a**
(17/2)*b**15*x**17 + 30*a**(15/2)*b**16*x**15 + 75*a**(13/2)*b**1
7*x**13 + 100*a**(11/2)*b**18*x**11 + 75*a**(9/2)*b**19*x**9 + 30
```

```
*a**(7/2)*b**20*x**7 + 5*a**(5/2)*b**21*x**5) - 231*a**(15/2)*b**
(29/2)*x**10*sqrt(a*x**2/b + 1)/(5*a**(17/2)*b**15*x**17 + 30*a**
(15/2)*b**16*x**15 + 75*a**(13/2)*b**17*x**13 + 100*a**(11/2)*b**
18*x**11 + 75*a**(9/2)*b**19*x**9 + 30*a**(7/2)*b**20*x**7 + 5*a*
*(5/2)*b**21*x**5) - 145*a**(13/2)*b**(31/2)*x**8*sqrt(a*x**2/b +
 1)/(5*a**(17/2)*b**15*x**17 + 30*a**(15/2)*b**16*x**15 + 75*a**(
13/2)*b**17*x**13 + 100*a**(11/2)*b**18*x**11 + 75*a**(9/2)*b**19
*x**9 + 30*a**(7/2)*b**20*x**7 + 5*a**(5/2)*b**21*x**5) - 46*a**(
11/2)*b**(33/2)*x**6*sqrt(a*x**2/b + 1)/(5*a**(17/2)*b**15*x**17
+ 30*a**(15/2)*b**16*x**15 + 75*a**(13/2)*b**17*x**13 + 100*a**(1
1/2)*b**18*x**11 + 75*a**(9/2)*b**19*x**9 + 30*a**(7/2)*b**20*x**
7 + 5*a**(5/2)*b**21*x**5) - 8*a**(9/2)*b**(35/2)*x**4*sqrt(a*x**
2/b + 1)/(5*a**(17/2)*b**15*x**17 + 30*a**(15/2)*b**16*x**15 + 75
*a**(13/2)*b**17*x**13 + 100*a**(11/2)*b**18*x**11 + 75*a**(9/2)*
b**19*x**9 + 30*a**(7/2)*b**20*x**7 + 5*a**(5/2)*b**21*x**5) - 3*
a**(7/2)*b**(37/2)*x**2*sqrt(a*x**2/b + 1)/(5*a**(17/2)*b**15*x**
17 + 30*a**(15/2)*b**16*x**15 + 75*a**(13/2)*b**17*x**13 + 100*a*
*(11/2)*b**18*x**11 + 75*a**(9/2)*b**19*x**9 + 30*a**(7/2)*b**20*
x**7 + 5*a**(5/2)*b**21*x**5) - a**(5/2)*b**(39/2)*sqrt(a*x**2/b
+ 1)/(5*a**(17/2)*b**15*x**17 + 30*a**(15/2)*b**16*x**15 + 75*a**
(13/2)*b**17*x**13 + 100*a**(11/2)*b**18*x**11 + 75*a**(9/2)*b**1
9*x**9 + 30*a**(7/2)*b**20*x**7 + 5*a**(5/2)*b**21*x**5) + 16*a**
11*b**11*x**17/(5*a**(17/2)*b**15*x**17 + 30*a**(15/2)*b**16*x**1
5 + 75*a**(13/2)*b**17*x**13 + 100*a**(11/2)*b**18*x**11 + 75*a**
(9/2)*b**19*x**9 + 30*a**(7/2)*b**20*x**7 + 5*a**(5/2)*b**21*x**5
) + 96*a**10*b**12*x**15/(5*a**(17/2)*b**15*x**17 + 30*a**(15/2)*
b**16*x**15 + 75*a**(13/2)*b**17*x**13 + 100*a**(11/2)*b**18*x**1
1 + 75*a**(9/2)*b**19*x**9 + 30*a**(7/2)*b**20*x**7 + 5*a**(5/2)*
b**21*x**5) + 240*a**9*b**13*x**13/(5*a**(17/2)*b**15*x**17 + 30*
a**(15/2)*b**16*x**15 + 75*a**(13/2)*b**17*x**13 + 100*a**(11/2)*
b**18*x**11 + 75*a**(9/2)*b**19*x**9 + 30*a**(7/2)*b**20*x**7 + 5
*a**(5/2)*b**21*x**5) + 320*a**8*b**14*x**11/(5*a**(17/2)*b**15*x
**17 + 30*a**(15/2)*b**16*x**15 + 75*a**(13/2)*b**17*x**13 + 100*
a**(11/2)*b**18*x**11 + 75*a**(9/2)*b**19*x**9 + 30*a**(7/2)*b**2
0*x**7 + 5*a**(5/2)*b**21*x**5) + 240*a**7*b**15*x**9/(5*a**(17/2
)*b**15*x**17 + 30*a**(15/2)*b**16*x**15 + 75*a**(13/2)*b**17*x**
13 + 100*a**(11/2)*b**18*x**11 + 75*a**(9/2)*b**19*x**9 + 30*a**(
7/2)*b**20*x**7 + 5*a**(5/2)*b**21*x**5) + 96*a**6*b**16*x**7/(5*
a**(17/2)*b**15*x**17 + 30*a**(15/2)*b**16*x**15 + 75*a**(13/2)*b
**17*x**13 + 100*a**(11/2)*b**18*x**11 + 75*a**(9/2)*b**19*x**9 +
 30*a**(7/2)*b**20*x**7 + 5*a**(5/2)*b**21*x**5) + 16*a**5*b**17*
x**5/(5*a**(17/2)*b**15*x**17 + 30*a**(15/2)*b**16*x**15 + 75*a**
(13/2)*b**17*x**13 + 100*a**(11/2)*b**18*x**11 + 75*a**(9/2)*b**1
9*x**9 + 30*a**(7/2)*b**20*x**7 + 5*a**(5/2)*b**21*x**5)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a + \frac{b}{x^2}\right)^{\frac{3}{2}} x^9}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(3/2)*x^9),x, algorithm="giac")
```

```
[Out] integrate(1/((a + b/x^2)^(3/2)*x^9), x)
```

3.1935 $\int \frac{x^4}{\left(a+\frac{b}{x^2}\right)^{3/2}}\,dx$

Optimal. Leaf size=88

$$\frac{16b^2x\sqrt{a+\frac{b}{x^2}}}{5a^4}-\frac{8b^2x}{5a^3\sqrt{a+\frac{b}{x^2}}}-\frac{2bx^3}{5a^2\sqrt{a+\frac{b}{x^2}}}+\frac{x^5}{5a\sqrt{a+\frac{b}{x^2}}}$$

```
[Out] (-8*b^2*x)/(5*a^3*Sqrt[a + b/x^2]) + (16*b^2*Sqrt[a + b/x^2]*x)/(
5*a^4) - (2*b*x^3)/(5*a^2*Sqrt[a + b/x^2]) + x^5/(5*a*Sqrt[a + b/
x^2])
```

Rubi [A] time = 0.100294, antiderivative size = 88, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{16b^2x\sqrt{a+\frac{b}{x^2}}}{5a^4}-\frac{8b^2x}{5a^3\sqrt{a+\frac{b}{x^2}}}-\frac{2bx^3}{5a^2\sqrt{a+\frac{b}{x^2}}}+\frac{x^5}{5a\sqrt{a+\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a + b/x^2)^(3/2),x]
```

```
[Out] (-8*b^2*x)/(5*a^3*Sqrt[a + b/x^2]) + (16*b^2*Sqrt[a + b/x^2]*x)/(
5*a^4) - (2*b*x^3)/(5*a^2*Sqrt[a + b/x^2]) + x^5/(5*a*Sqrt[a + b/
x^2])
```

Rubi in Sympy [A] time = 7.9117, size = 82, normalized size = 0.93

$$\frac{x^5}{5a\sqrt{a+\frac{b}{x^2}}}-\frac{2bx^3}{5a^2\sqrt{a+\frac{b}{x^2}}}-\frac{8b^2x}{5a^3\sqrt{a+\frac{b}{x^2}}}+\frac{16b^2x\sqrt{a+\frac{b}{x^2}}}{5a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(a+b/x**2)**(3/2),x)
```

```
[Out] x**5/(5*a*sqrt(a + b/x**2)) - 2*b*x**3/(5*a**2*sqrt(a + b/x**2))
- 8*b**2*x/(5*a**3*sqrt(a + b/x**2)) + 16*b**2*x*sqrt(a + b/x**2)
/(5*a**4)
```

Mathematica [A] time = 0.0338398, size = 52, normalized size = 0.59

$$\frac{a^3x^6-2a^2bx^4+8ab^2x^2+16b^3}{5a^4x\sqrt{a+\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(a + b/x^2)^(3/2),x]
```

```
[Out] (16*b^3 + 8*a*b^2*x^2 - 2*a^2*b*x^4 + a^3*x^6)/(5*a^4*Sqrt[a + b/
x^2]*x)
```

Maple [A] time = 0.009, size = 60, normalized size = 0.7

$$\frac{\left(ax^{2}+b\right)\left(a^{3}x^{6}-2\,a^{2}bx^{4}+8\,ab^{2}x^{2}+16\,b^{3}\right)}{5\,a^{4}x^{3}}\left(\frac{ax^{2}+b}{x^{2}}\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(a+b/x^2)^(3/2),x)
```

```
[Out] 1/5*(a*x^2+b)*(a^3*x^6-2*a^2*b*x^4+8*a*b^2*x^2+16*b^3)/a^4/x^3/((
a*x^2+b)/x^2)^(3/2)
```

Maxima [A] time = 1.44566, size = 93, normalized size = 1.06

$$\frac{b^{3}}{\sqrt{a+\frac{b}{x^{2}}}a^{4}x}+\frac{\left(a+\frac{b}{x^{2}}\right)^{\frac{5}{2}}x^{5}-5\left(a+\frac{b}{x^{2}}\right)^{\frac{3}{2}}bx^{3}+15\sqrt{a+\frac{b}{x^{2}}}b^{2}x}{5\,a^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(a + b/x^2)^(3/2),x, algorithm="maxima")
```

```
[Out] b^3/(sqrt(a + b/x^2)*a^4*x) + 1/5*((a + b/x^2)^(5/2)*x^5 - 5*(a +
 b/x^2)^(3/2)*b*x^3 + 15*sqrt(a + b/x^2)*b^2*x)/a^4
```

Fricas [A] time = 0.239347, size = 84, normalized size = 0.95

$$\frac{\left(a^{3}x^{7}-2\,a^{2}bx^{5}+8\,ab^{2}x^{3}+16\,b^{3}x\right)\sqrt{\frac{ax^{2}+b}{x^{2}}}}{5\left(a^{5}x^{2}+a^{4}b\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(a + b/x^2)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/5*(a^3*x^7 - 2*a^2*b*x^5 + 8*a*b^2*x^3 + 16*b^3*x)*sqrt((a*x^2
+ b)/x^2)/(a^5*x^2 + a^4*b)
```

Sympy [A] time = 5.09096, size = 337, normalized size = 3.83

$$\frac{a^{5}b^{\frac{19}{2}}x^{10}\sqrt{\frac{ax^{2}}{b}+1}}{5a^{7}b^{9}x^{6}+15a^{6}b^{10}x^{4}+15a^{5}b^{11}x^{2}+5a^{4}b^{12}}+\frac{5a^{3}b^{\frac{23}{2}}x^{6}\sqrt{\frac{ax^{2}}{b}+1}}{5a^{7}b^{9}x^{6}+15a^{6}b^{10}x^{4}+15a^{5}b^{11}x^{2}+5a^{4}b^{12}}+\frac{30a^{2}b^{\frac{25}{2}}x^{4}\sqrt{\frac{ax^{2}}{b}+1}}{5a^{7}b^{9}x^{6}+15a^{6}b^{10}x^{4}+15a^{5}b^{11}x^{2}+5a^{4}b^{12}}+\frac{40ab^{\frac{27}{2}}x^{2}\sqrt{\frac{ax^{2}}{b}+1}}{5a^{7}b^{9}x^{6}+15a^{6}b^{10}x^{4}+15a^{5}b^{11}x^{2}+5a^{4}b^{12}}+\frac{16b^{\frac{29}{2}}\sqrt{\frac{ax^{2}}{b}+1}}{5a^{7}b^{9}x^{6}+15a^{6}b^{10}x^{4}+15a^{5}b^{11}x^{2}+5a^{4}b^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(a+b/x**2)**(3/2),x)
```

```
[Out] a**5*b**(19/2)*x**10*sqrt(a*x**2/b + 1)/(5*a**7*b**9*x**6 + 15*a*
*6*b**10*x**4 + 15*a**5*b**11*x**2 + 5*a**4*b**12) + 5*a**3*b**(2
```

```
3/2)*x**6*sqrt(a*x**2/b + 1)/(5*a**7*b**9*x**6 + 15*a**6*b**10*x*
*4 + 15*a**5*b**11*x**2 + 5*a**4*b**12) + 30*a**2*b**(25/2)*x**4*
sqrt(a*x**2/b + 1)/(5*a**7*b**9*x**6 + 15*a**6*b**10*x**4 + 15*a*
*5*b**11*x**2 + 5*a**4*b**12) + 40*a*b**(27/2)*x**2*sqrt(a*x**2/b
 + 1)/(5*a**7*b**9*x**6 + 15*a**6*b**10*x**4 + 15*a**5*b**11*x**2
 + 5*a**4*b**12) + 16*b**(29/2)*sqrt(a*x**2/b + 1)/(5*a**7*b**9*x
**6 + 15*a**6*b**10*x**4 + 15*a**5*b**11*x**2 + 5*a**4*b**12)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(a + b/x^2)^(3/2),x, algorithm="giac")

[Out] integrate(x^4/(a + b/x^2)^(3/2), x)
```

3.1936 $\int \frac{x^2}{\left(a+\frac{b}{x^2}\right)^{3/2}}\,dx$

Optimal. Leaf size=62

$$-\frac{8bx\sqrt{a+\frac{b}{x^2}}}{3a^3}+\frac{4bx}{3a^2\sqrt{a+\frac{b}{x^2}}}+\frac{x^3}{3a\sqrt{a+\frac{b}{x^2}}}$$

```
[Out] (4*b*x)/(3*a^2*Sqrt[a + b/x^2]) - (8*b*Sqrt[a + b/x^2]*x)/(3*a^3)
 + x^3/(3*a*Sqrt[a + b/x^2])
```

Rubi [A] time = 0.0597885, antiderivative size = 62, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{8bx\sqrt{a+\frac{b}{x^2}}}{3a^3}+\frac{4bx}{3a^2\sqrt{a+\frac{b}{x^2}}}+\frac{x^3}{3a\sqrt{a+\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(a + b/x^2)^(3/2),x]
```

```
[Out] (4*b*x)/(3*a^2*Sqrt[a + b/x^2]) - (8*b*Sqrt[a + b/x^2]*x)/(3*a^3)
 + x^3/(3*a*Sqrt[a + b/x^2])
```

Rubi in Sympy [A] time = 4.89335, size = 56, normalized size = 0.9

$$\frac{x^3}{3a\sqrt{a+\frac{b}{x^2}}}+\frac{4bx}{3a^2\sqrt{a+\frac{b}{x^2}}}-\frac{8bx\sqrt{a+\frac{b}{x^2}}}{3a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**2/(a+b/x**2)**(3/2),x)
```

```
[Out] x**3/(3*a*sqrt(a + b/x**2)) + 4*b*x/(3*a**2*sqrt(a + b/x**2)) - 8
*b*x*sqrt(a + b/x**2)/(3*a**3)
```

Mathematica [A] time = 0.031294, size = 41, normalized size = 0.66

$$\frac{a^2x^4-4abx^2-8b^2}{3a^3x\sqrt{a+\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(a + b/x^2)^(3/2),x]
```

```
[Out] (-8*b^2 - 4*a*b*x^2 + a^2*x^4)/(3*a^3*Sqrt[a + b/x^2]*x)
```

Maple [A] time = 0.008, size = 49, normalized size = 0.8

$$\frac{(ax^2+b)\left(x^4a^2-4\,abx^2-8\,b^2\right)}{3\,a^3x^3}\left(\frac{ax^2+b}{x^2}\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^2/(a+b/x^2)^(3/2),x)
```

```
[Out] 1/3*(a*x^2+b)*(a^2*x^4-4*a*b*x^2-8*b^2)/a^3/x^3/((a*x^2+b)/x^2)^(
3/2)
```

Maxima [A] time = 1.42231, size = 72, normalized size = 1.16

$$\frac{\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}x^3-6\sqrt{a+\frac{b}{x^2}}bx}{3\,a^3}-\frac{b^2}{\sqrt{a+\frac{b}{x^2}}a^3x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^2/(a + b/x^2)^(3/2),x, algorithm="maxima")
```

```
[Out] 1/3*((a + b/x^2)^(3/2)*x^3 - 6*sqrt(a + b/x^2)*b*x)/a^3 - b^2/(sq
rt(a + b/x^2)*a^3*x)
```

Fricas [A] time = 0.237976, size = 69, normalized size = 1.11

$$\frac{\left(a^2x^5-4\,abx^3-8\,b^2x\right)\sqrt{\frac{ax^2+b}{x^2}}}{3\left(a^4x^2+a^3b\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^2/(a + b/x^2)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/3*(a^2*x^5 - 4*a*b*x^3 - 8*b^2*x)*sqrt((a*x^2 + b)/x^2)/(a^4*x^
2 + a^3*b)
```

Sympy [A] time = 3.77531, size = 219, normalized size = 3.53

$$\frac{a^3b^{\frac{9}{2}}x^6\sqrt{\frac{ax^2}{b}+1}}{3a^5b^4x^4+6a^4b^5x^2+3a^3b^6}-\frac{3a^2b^{\frac{11}{2}}x^4\sqrt{\frac{ax^2}{b}+1}}{3a^5b^4x^4+6a^4b^5x^2+3a^3b^6}-\frac{12ab^{\frac{13}{2}}x^2\sqrt{\frac{ax^2}{b}+1}}{3a^5b^4x^4+6a^4b^5x^2+3a^3b^6}-\frac{8b^{\frac{15}{2}}\sqrt{\frac{ax^2}{b}+1}}{3a^5b^4x^4+6a^4b^5x^2+3a^3b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**2/(a+b/x**2)**(3/2),x)
```

```
[Out] a**3*b**(9/2)*x**6*sqrt(a*x**2/b + 1)/(3*a**5*b**4*x**4 + 6*a**4*
b**5*x**2 + 3*a**3*b**6) - 3*a**2*b**(11/2)*x**4*sqrt(a*x**2/b +
1)/(3*a**5*b**4*x**4 + 6*a**4*b**5*x**2 + 3*a**3*b**6) - 12*a*b**
(13/2)*x**2*sqrt(a*x**2/b + 1)/(3*a**5*b**4*x**4 + 6*a**4*b**5*x*
*2 + 3*a**3*b**6) - 8*b**(15/2)*sqrt(a*x**2/b + 1)/(3*a**5*b**4*x
**4 + 6*a**4*b**5*x**2 + 3*a**3*b**6)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x^2)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^2/(a + b/x^2)^(3/2), x)
```

3.1937 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{3/2}}\,dx$

Optimal. Leaf size=35

$$\frac{2x\sqrt{a+\frac{b}{x^2}}}{a^2}-\frac{x}{a\sqrt{a+\frac{b}{x^2}}}$$

```
[Out] -(x/(a*Sqrt[a + b/x^2])) + (2*Sqrt[a + b/x^2]*x)/a^2
```

Rubi [A] time = 0.0241494, antiderivative size = 35, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{2x\sqrt{a+\frac{b}{x^2}}}{a^2}-\frac{x}{a\sqrt{a+\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^(-3/2),x]

[Out] -(x/(a*Sqrt[a + b/x^2])) + (2*Sqrt[a + b/x^2]*x)/a^2
```

Rubi in Sympy [A] time = 1.96324, size = 29, normalized size = 0.83

$$-\frac{x}{a\sqrt{a+\frac{b}{x^2}}}+\frac{2x\sqrt{a+\frac{b}{x^2}}}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**(3/2),x)

[Out] -x/(a*sqrt(a + b/x**2)) + 2*x*sqrt(a + b/x**2)/a**2
```

Mathematica [A] time = 0.0218164, size = 27, normalized size = 0.77

$$\frac{ax^2+2b}{a^2x\sqrt{a+\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^(-3/2),x]

[Out] (2*b + a*x^2)/(a^2*Sqrt[a + b/x^2]*x)
```

Maple [A] time = 0.006, size = 37, normalized size = 1.1

$$\frac{\left(ax^2+b\right)\left(ax^2+2\,b\right)}{x^3a^2}\left(\frac{ax^2+b}{x^2}\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/(a+b/x^2)^(3/2),x)
```

```
[Out] (a*x^2+b)*(a*x^2+2*b)/a^2/x^3/((a*x^2+b)/x^2)^(3/2)
```

Maxima [A] time = 1.43021, size = 43, normalized size = 1.23

$$\frac{\sqrt{a+\frac{b}{x^2}}\,x}{a^2}+\frac{b}{\sqrt{a+\frac{b}{x^2}}\,a^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a + b/x^2)^(-3/2),x, algorithm="maxima")
```

```
[Out] sqrt(a + b/x^2)*x/a^2 + b/(sqrt(a + b/x^2)*a^2*x)
```

Fricas [A] time = 0.23137, size = 53, normalized size = 1.51

$$\frac{\left(ax^3+2\,bx\right)\sqrt{\frac{ax^2+b}{x^2}}}{a^3x^2+a^2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a + b/x^2)^(-3/2),x, algorithm="fricas")
```

```
[Out] (a*x^3 + 2*b*x)*sqrt((a*x^2 + b)/x^2)/(a^3*x^2 + a^2*b)
```

Sympy [A] time = 2.94914, size = 42, normalized size = 1.2

$$\frac{x^2}{a\sqrt{b}\sqrt{\frac{ax^2}{b}+1}}+\frac{2\sqrt{b}}{a^2\sqrt{\frac{ax^2}{b}+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(a+b/x**2)**(3/2),x)
```

```
[Out] x**2/(a*sqrt(b)*sqrt(a*x**2/b + 1)) + 2*sqrt(b)/(a**2*sqrt(a*x**2
/b + 1))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a + b/x^2)^(-3/2),x, algorithm="giac")
```

```
[Out] integrate((a + b/x^2)^(-3/2), x)
```

3.1938 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{3/2} x^2} \, dx$

Optimal. Leaf size=19

$$-\frac{1}{ax\sqrt{a+\frac{b}{x^2}}}$$

```
[Out] -(1/(a*Sqrt[a + b/x^2]*x))
```

Rubi [A] time = 0.0298115, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{1}{ax\sqrt{a+\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b/x^2)^(3/2)*x^2),x]

[Out] -(1/(a*Sqrt[a + b/x^2]*x))
```

Rubi in Sympy [A] time = 2.79089, size = 15, normalized size = 0.79

$$-\frac{1}{ax\sqrt{a+\frac{b}{x^2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b/x**2)**(3/2)/x**2,x)

[Out] -1/(a*x*sqrt(a + b/x**2))
```

Mathematica [A] time = 0.010665, size = 19, normalized size = 1.

$$-\frac{1}{ax\sqrt{a+\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b/x^2)^(3/2)*x^2),x]

[Out] -(1/(a*Sqrt[a + b/x^2]*x))
```

Maple [A] time = 0.006, size = 29, normalized size = 1.5

$$-\frac{ax^2+b}{ax^3}\left(\frac{ax^2+b}{x^2}\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^(3/2)/x^2,x)

[Out] -(a*x^2+b)/a/x^3/((a*x^2+b)/x^2)^(3/2)
```

Maxima [A] time = 1.4321, size = 23, normalized size = 1.21

$$-\frac{1}{\sqrt{a+\frac{b}{x^2}}ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(3/2)*x^2),x, algorithm="maxima")

[Out] -1/(sqrt(a + b/x^2)*a*x)
```

Fricas [A] time = 0.230548, size = 39, normalized size = 2.05

$$-\frac{x\sqrt{\frac{ax^2+b}{x^2}}}{a^2x^2+ab}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(3/2)*x^2),x, algorithm="fricas")

[Out] -x*sqrt((a*x^2 + b)/x^2)/(a^2*x^2 + a*b)
```

Sympy [A] time = 3.57052, size = 20, normalized size = 1.05

$$-\frac{1}{a\sqrt{b}\sqrt{\frac{ax^2}{b}+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**(3/2)/x**2,x)

[Out] -1/(a*sqrt(b)*sqrt(a*x**2/b + 1))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(3/2)*x^2),x, algorithm="giac")

[Out] integrate(1/((a + b/x^2)^(3/2)*x^2), x)
```

3.1939 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{3/2} x^4} \, dx$

Optimal. Leaf size=47

$$\frac{1}{bx\sqrt{a+\frac{b}{x^2}}}-\frac{\tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{b^{3/2}}$$

```
[Out] 1/(b*Sqrt[a + b/x^2]*x) - ArcTanh[Sqrt[b]/(Sqrt[a + b/x^2]*x)]/b^
(3/2)
```

Rubi [A] time = 0.0761371, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{1}{bx\sqrt{a+\frac{b}{x^2}}}-\frac{\tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{b^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)^(3/2)*x^4),x]
```

```
[Out] 1/(b*Sqrt[a + b/x^2]*x) - ArcTanh[Sqrt[b]/(Sqrt[a + b/x^2]*x)]/b^
(3/2)
```

Rubi in Sympy [A] time = 7.37041, size = 37, normalized size = 0.79

$$\frac{1}{bx\sqrt{a+\frac{b}{x^2}}}-\frac{\operatorname{atanh}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{b^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**(3/2)/x**4,x)
```

```
[Out] 1/(b*x*sqrt(a + b/x**2)) - atanh(sqrt(b)/(x*sqrt(a + b/x**2)))/b*
*(3/2)
```

Mathematica [A] time = 0.0604653, size = 73, normalized size = 1.55

$$\frac{\log(x)\sqrt{ax^2+b}-\sqrt{ax^2+b}\log\left(\sqrt{b}\sqrt{ax^2+b}+b\right)+\sqrt{b}}{b^{3/2}x\sqrt{a+\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)^(3/2)*x^4),x]
```

```
[Out] (Sqrt[b] + Sqrt[b + a*x^2]*Log[x] - Sqrt[b + a*x^2]*Log[b + Sqrt[
b]*Sqrt[b + a*x^2]])/(b^(3/2)*Sqrt[a + b/x^2]*x)
```

Maple [A] time = 0.012, size = 65, normalized size = 1.4

$$\frac{ax^{2}+b}{x^{3}}\left(b^{\frac{3}{2}}-\ln\left(2\,\frac{\sqrt{b}\sqrt{ax^{2}+b}+b}{x}\right)b\sqrt{ax^{2}+b}\right)\left(\frac{ax^{2}+b}{x^{2}}\right)^{-\frac{3}{2}}b^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^(3/2)/x^4,x)
```

```
[Out] (a*x^2+b)*(b^(3/2)-ln(2*(b^(1/2)*(a*x^2+b)^(1/2)+b)/x)*b*(a*x^2+b
)^(1/2))/((a*x^2+b)/x^2)^(3/2)/x^3/b^(5/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(3/2)*x^4),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.2487, size = 1, normalized size = 0.02

$$\left[\frac{2\,bx\sqrt{\frac{ax^{2}+b}{x^{2}}}+\left(ax^{2}+b\right)\sqrt{b}\log\left(\frac{2\,bx\sqrt{\frac{ax^{2}+b}{x^{2}}}-\left(ax^{2}+2\,b\right)\sqrt{b}}{x^{2}}\right)}{2\left(ab^{2}x^{2}+b^{3}\right)},\ \frac{bx\sqrt{\frac{ax^{2}+b}{x^{2}}}+\left(ax^{2}+b\right)\sqrt{-b}\arctan\left(\frac{\sqrt{-b}}{x\sqrt{\frac{ax^{2}+b}{x^{2}}}}\right)}{ab^{2}x^{2}+b^{3}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(3/2)*x^4),x, algorithm="fricas")
```

```
[Out] [1/2*(2*b*x*sqrt((a*x^2 + b)/x^2) + (a*x^2 + b)*sqrt(b)*log((2*b*
x*sqrt((a*x^2 + b)/x^2) - (a*x^2 + 2*b)*sqrt(b))/x^2))/(a*b^2*x^2
 + b^3), (b*x*sqrt((a*x^2 + b)/x^2) + (a*x^2 + b)*sqrt(-b)*arctan
(sqrt(-b)/(x*sqrt((a*x^2 + b)/x^2))))/(a*b^2*x^2 + b^3)]
```

Sympy [A] time = 9.50262, size = 184, normalized size = 3.91

$$\frac{ab^{2}x^{2}\log\left(\frac{ax^{2}}{b}\right)}{2ab^{\frac{7}{2}}x^{2}+2b^{\frac{9}{2}}}-\frac{2ab^{2}x^{2}\log\left(\sqrt{\frac{ax^{2}}{b}+1}+1\right)}{2ab^{\frac{7}{2}}x^{2}+2b^{\frac{9}{2}}}+\frac{2b^{3}\sqrt{\frac{ax^{2}}{b}+1}}{2ab^{\frac{7}{2}}x^{2}+2b^{\frac{9}{2}}}+\frac{b^{3}\log\left(\frac{ax^{2}}{b}\right)}{2ab^{\frac{7}{2}}x^{2}+2b^{\frac{9}{2}}}-\frac{2b^{3}\log\left(\sqrt{\frac{ax^{2}}{b}+1}+1\right)}{2ab^{\frac{7}{2}}x^{2}+2b^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**(3/2)/x**4,x)
```

```
[Out] a*b**2*x**2*log(a*x**2/b)/(2*a*b**(7/2)*x**2 + 2*b**(9/2)) - 2*a*
b**2*x**2*log(sqrt(a*x**2/b + 1) + 1)/(2*a*b**(7/2)*x**2 + 2*b**(
9/2)) + 2*b**3*sqrt(a*x**2/b + 1)/(2*a*b**(7/2)*x**2 + 2*b**(9/2)
) + b**3*log(a*x**2/b)/(2*a*b**(7/2)*x**2 + 2*b**(9/2)) - 2*b**3*
log(sqrt(a*x**2/b + 1) + 1)/(2*a*b**(7/2)*x**2 + 2*b**(9/2))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(3/2)*x^4),x, algorithm="giac")
```

```
[Out] integrate(1/((a + b/x^2)^(3/2)*x^4), x)
```

3.1940 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{3/2} x^6} \, dx$

Optimal. Leaf size=71

$$\frac{3a\tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{2b^{5/2}}-\frac{3\sqrt{a+\frac{b}{x^2}}}{2b^2x}+\frac{1}{bx^3\sqrt{a+\frac{b}{x^2}}}$$

```
[Out] 1/(b*Sqrt[a + b/x^2]*x^3) - (3*Sqrt[a + b/x^2])/(2*b^2*x) + (3*a*
ArcTanh[Sqrt[b]/(Sqrt[a + b/x^2]*x)])/(2*b^(5/2))
```

Rubi [A] time = 0.110937, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{3a\tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{2b^{5/2}}-\frac{3\sqrt{a+\frac{b}{x^2}}}{2b^2x}+\frac{1}{bx^3\sqrt{a+\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b/x^2)^(3/2)*x^6),x]
```

```
[Out] 1/(b*Sqrt[a + b/x^2]*x^3) - (3*Sqrt[a + b/x^2])/(2*b^2*x) + (3*a*
ArcTanh[Sqrt[b]/(Sqrt[a + b/x^2]*x)])/(2*b^(5/2))
```

Rubi in Sympy [A] time = 10.8548, size = 63, normalized size = 0.89

$$\frac{3a\,\mathrm{atanh}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{2b^{\frac{5}{2}}}+\frac{1}{bx^3\sqrt{a+\frac{b}{x^2}}}-\frac{3\sqrt{a+\frac{b}{x^2}}}{2b^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b/x**2)**(3/2)/x**6,x)
```

```
[Out] 3*a*atanh(sqrt(b)/(x*sqrt(a + b/x**2)))/(2*b**(5/2)) + 1/(b*x**3*
sqrt(a + b/x**2)) - 3*sqrt(a + b/x**2)/(2*b**2*x)
```

Mathematica [A] time = 0.0753506, size = 95, normalized size = 1.34

$$\frac{-\sqrt{b}\left(3ax^2+b\right)-3ax^2\log(x)\sqrt{ax^2+b}+3ax^2\sqrt{ax^2+b}\log\left(\sqrt{b}\sqrt{ax^2+b}+b\right)}{2b^{5/2}x^3\sqrt{a+\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b/x^2)^(3/2)*x^6),x]
```

```
[Out] (-(Sqrt[b]*(b + 3*a*x^2)) - 3*a*x^2*Sqrt[b + a*x^2]*Log[x] + 3*a*
x^2*Sqrt[b + a*x^2]*Log[b + Sqrt[b]*Sqrt[b + a*x^2]])/(2*b^(5/2)*
```

```
Sqrt[a + b/x^2]*x^3)
```

Maple [A] time = 0.012, size = 79, normalized size = 1.1

$$-\frac{ax^{2}+b}{2\,x^{5}}\left(3\,b^{3/2}x^{2}a-3\,\ln\left(2\,\frac{\sqrt{b}\sqrt{ax^{2}+b}+b}{x}\right)\sqrt{ax^{2}+b}x^{2}ab+b^{\frac{5}{2}}\right)\left(\frac{ax^{2}+b}{x^{2}}\right)^{-\frac{3}{2}}b^{-\frac{7}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^(3/2)/x^6,x)
```

```
[Out] -1/2*(a*x^2+b)*(3*b^(3/2)*x^2*a-3*ln(2*(b^(1/2)*(a*x^2+b)^(1/2)+b
)/x)*(a*x^2+b)^(1/2)*x^2*a*b+b^(5/2))/((a*x^2+b)/x^2)^(3/2)/x^5/b
^(7/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(3/2)*x^6),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.249167, size = 1, normalized size = 0.01

$$\left[\frac{3\left(a^{2}x^{3}+abx\right)\sqrt{b}\log\left(-\frac{2\,bx\sqrt{\frac{ax^{2}+b}{x^{2}}}+\left(ax^{2}+2\,b\right)\sqrt{b}}{x^{2}}\right)-2\left(3\,abx^{2}+b^{2}\right)\sqrt{\frac{ax^{2}+b}{x^{2}}}}{4\left(ab^{3}x^{3}+b^{4}x\right)},\ -\frac{3\left(a^{2}x^{3}+abx\right)\sqrt{-b}\arctan\left(\frac{\sqrt{-b}}{x\sqrt{\frac{ax^{2}+b}{x^{2}}}}\right)+\left(3\,abx^{2}+b^{2}\right)\sqrt{\frac{ax^{2}+b}{x^{2}}}}{2\left(ab^{3}x^{3}+b^{4}x\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(3/2)*x^6),x, algorithm="fricas")
```

```
[Out] [1/4*(3*(a^2*x^3 + a*b*x)*sqrt(b)*log(-(2*b*x*sqrt((a*x^2 + b)/x^
2) + (a*x^2 + 2*b)*sqrt(b))/x^2) - 2*(3*a*b*x^2 + b^2)*sqrt((a*x^
2 + b)/x^2))/(a*b^3*x^3 + b^4*x), -1/2*(3*(a^2*x^3 + a*b*x)*sqrt(
-b)*arctan(sqrt(-b)/(x*sqrt((a*x^2 + b)/x^2))) + (3*a*b*x^2 + b^2
)*sqrt((a*x^2 + b)/x^2))/(a*b^3*x^3 + b^4*x)]
```

Sympy [A] time = 16.6653, size = 73, normalized size = 1.03

$$-\frac{3\sqrt{a}}{2b^{2}x\sqrt{1+\frac{b}{ax^{2}}}}+\frac{3a\operatorname{asinh}\left(\frac{\sqrt{b}}{\sqrt{a}x}\right)}{2b^{\frac{5}{2}}}-\frac{1}{2\sqrt{a}bx^{3}\sqrt{1+\frac{b}{ax^{2}}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**(3/2)/x**6,x)
```

```
[Out] -3*sqrt(a)/(2*b**2*x*sqrt(1 + b/(a*x**2))) + 3*a*asinh(sqrt(b)/(s
qrt(a)*x))/(2*b**(5/2)) - 1/(2*sqrt(a)*b*x**3*sqrt(1 + b/(a*x**2)
))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(3/2)*x^6),x, algorithm="giac")
```

```
[Out] integrate(1/((a + b/x^2)^(3/2)*x^6), x)
```

3.1941 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{3/2} x^8} \, dx$

Optimal. Leaf size=95

$$-\frac{15a^2 \tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{8b^{7/2}}+\frac{15a\sqrt{a+\frac{b}{x^2}}}{8b^3x}-\frac{5\sqrt{a+\frac{b}{x^2}}}{4b^2x^3}+\frac{1}{bx^5\sqrt{a+\frac{b}{x^2}}}$$

```
[Out] 1/(b*Sqrt[a + b/x^2]*x^5) - (5*Sqrt[a + b/x^2])/(4*b^2*x^3) + (15
*a*Sqrt[a + b/x^2])/(8*b^3*x) - (15*a^2*ArcTanh[Sqrt[b]/(Sqrt[a +
 b/x^2]*x)])/(8*b^(7/2))
```

Rubi [A] time = 0.15285, antiderivative size = 95, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$

$$-\frac{15a^2 \tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{8b^{7/2}}+\frac{15a\sqrt{a+\frac{b}{x^2}}}{8b^3x}-\frac{5\sqrt{a+\frac{b}{x^2}}}{4b^2x^3}+\frac{1}{bx^5\sqrt{a+\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)^(3/2)*x^8),x]
```

```
[Out] 1/(b*Sqrt[a + b/x^2]*x^5) - (5*Sqrt[a + b/x^2])/(4*b^2*x^3) + (15
*a*Sqrt[a + b/x^2])/(8*b^3*x) - (15*a^2*ArcTanh[Sqrt[b]/(Sqrt[a +
 b/x^2]*x)])/(8*b^(7/2))
```

Rubi in Sympy [A] time = 14.7964, size = 87, normalized size = 0.92

$$-\frac{15a^2 \operatorname{atanh}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{8b^{\frac{7}{2}}}+\frac{15a\sqrt{a+\frac{b}{x^2}}}{8b^3x}+\frac{1}{bx^5\sqrt{a+\frac{b}{x^2}}}-\frac{5\sqrt{a+\frac{b}{x^2}}}{4b^2x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**(3/2)/x**8,x)
```

```
[Out] -15*a**2*atanh(sqrt(b)/(x*sqrt(a + b/x**2)))/(8*b**(7/2)) + 15*a*
sqrt(a + b/x**2)/(8*b**3*x) + 1/(b*x**5*sqrt(a + b/x**2)) - 5*sqr
t(a + b/x**2)/(4*b**2*x**3)
```

Mathematica [A] time = 0.0927381, size = 111, normalized size = 1.17

$$\frac{\sqrt{b}\left(15a^2x^4+5abx^2-2b^2\right)+15a^2x^4\log(x)\sqrt{ax^2+b}-15a^2x^4\sqrt{ax^2+b}\log\left(\sqrt{b}\sqrt{ax^2+b}+b\right)}{8b^{7/2}x^5\sqrt{a+\frac{b}{x^2}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)^(3/2)*x^8),x]
```

```
[Out] (Sqrt[b]*(-2*b^2 + 5*a*b*x^2 + 15*a^2*x^4) + 15*a^2*x^4*Sqrt[b +
a*x^2]*Log[x] - 15*a^2*x^4*Sqrt[b + a*x^2]*Log[b + Sqrt[b]*Sqrt[b
 + a*x^2]])/(8*b^(7/2)*Sqrt[a + b/x^2]*x^5)
```

Maple [A] time = 0.013, size = 94, normalized size = 1.

$$-\frac{ax^2+b}{8\,x^7}\left(-15\,b^{3/2}x^4a^2+15\,\ln\left(2\,\frac{\sqrt{b}\sqrt{ax^2+b}+b}{x}\right)\sqrt{ax^2+b}x^4a^2b-5\,b^{5/2}x^2a+2\,b^{7/2}\right)\left(\frac{ax^2+b}{x^2}\right)^{-\frac{3}{2}}b^{-\frac{9}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^(3/2)/x^8,x)
```

```
[Out] -1/8*(a*x^2+b)*(-15*b^(3/2)*x^4*a^2+15*ln(2*(b^(1/2)*(a*x^2+b)^(1
/2)+b)/x)*(a*x^2+b)^(1/2)*x^4*a^2*b-5*b^(5/2)*x^2*a+2*b^(7/2))/((
a*x^2+b)/x^2)^(3/2)/x^7/b^(9/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(3/2)*x^8),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.258085, size = 1, normalized size = 0.01

$$\left[\frac{15\left(a^3x^5+a^2bx^3\right)\sqrt{b}\log\left(\frac{2\,bx\sqrt{\frac{ax^2+b}{x^2}}-\left(ax^2+2\,b\right)\sqrt{b}}{x^2}\right)+2\left(15\,a^2bx^4+5\,ab^2x^2-2\,b^3\right)\sqrt{\frac{ax^2+b}{x^2}}}{16\left(ab^4x^5+b^5x^3\right)},\ \frac{15\left(a^3x^5+a^2bx^3\right)\sqrt{-b}\arctan\left(\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(3/2)*x^8),x, algorithm="fricas")
```

```
[Out] [1/16*(15*(a^3*x^5 + a^2*b*x^3)*sqrt(b)*log((2*b*x*sqrt((a*x^2 +
b)/x^2) - (a*x^2 + 2*b)*sqrt(b))/x^2) + 2*(15*a^2*b*x^4 + 5*a*b^2
*x^2 - 2*b^3)*sqrt((a*x^2 + b)/x^2))/(a*b^4*x^5 + b^5*x^3), 1/8*(
15*(a^3*x^5 + a^2*b*x^3)*sqrt(-b)*arctan(sqrt(-b)/(x*sqrt((a*x^2
+ b)/x^2))) + (15*a^2*b*x^4 + 5*a*b^2*x^2 - 2*b^3)*sqrt((a*x^2 +
b)/x^2))/(a*b^4*x^5 + b^5*x^3)]
```

Sympy [A] time = 27.7637, size = 102, normalized size = 1.07

$$\frac{15a^{\frac{3}{2}}}{8b^3x\sqrt{1+\frac{b}{ax^2}}}+\frac{5\sqrt{a}}{8b^2x^3\sqrt{1+\frac{b}{ax^2}}}-\frac{15a^2\operatorname{asinh}\left(\frac{\sqrt{b}}{\sqrt{a}x}\right)}{8b^{\frac{7}{2}}}-\frac{1}{4\sqrt{a}bx^5\sqrt{1+\frac{b}{ax^2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**(3/2)/x**8,x)
```

```
[Out] 15*a**(3/2)/(8*b**3*x*sqrt(1 + b/(a*x**2))) + 5*sqrt(a)/(8*b**2*x
**3*sqrt(1 + b/(a*x**2))) - 15*a**2*asinh(sqrt(b)/(sqrt(a)*x))/(8
*b**(7/2)) - 1/(4*sqrt(a)*b*x**5*sqrt(1 + b/(a*x**2)))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}} x^8} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(3/2)*x^8),x, algorithm="giac")
```

```
[Out] integrate(1/((a + b/x^2)^(3/2)*x^8), x)
```

3.1942 $\int \frac{x^3}{\left(a+\frac{b}{x^2}\right)^{5/2}}\,dx$

Optimal. Leaf size=116

$$\frac{35b^2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{8a^{9/2}}-\frac{35bx^2\sqrt{a+\frac{b}{x^2}}}{8a^4}+\frac{35x^4\sqrt{a+\frac{b}{x^2}}}{12a^3}-\frac{7x^4}{3a^2\sqrt{a+\frac{b}{x^2}}}-\frac{x^4}{3a\left(a+\frac{b}{x^2}\right)^{3/2}}$$

```
[Out] (-35*b*Sqrt[a + b/x^2]*x^2)/(8*a^4) - x^4/(3*a*(a + b/x^2)^(3/2))
 - (7*x^4)/(3*a^2*Sqrt[a + b/x^2]) + (35*Sqrt[a + b/x^2]*x^4)/(12
*a^3) + (35*b^2*ArcTanh[Sqrt[a + b/x^2]/Sqrt[a]])/(8*a^(9/2))
```

Rubi [A] time = 0.183621, antiderivative size = 116, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{35b^2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{8a^{9/2}}-\frac{35bx^2\sqrt{a+\frac{b}{x^2}}}{8a^4}+\frac{35x^4\sqrt{a+\frac{b}{x^2}}}{12a^3}-\frac{7x^4}{3a^2\sqrt{a+\frac{b}{x^2}}}-\frac{x^4}{3a\left(a+\frac{b}{x^2}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(a + b/x^2)^(5/2),x]
```

```
[Out] (-35*b*Sqrt[a + b/x^2]*x^2)/(8*a^4) - x^4/(3*a*(a + b/x^2)^(3/2))
 - (7*x^4)/(3*a^2*Sqrt[a + b/x^2]) + (35*Sqrt[a + b/x^2]*x^4)/(12
*a^3) + (35*b^2*ArcTanh[Sqrt[a + b/x^2]/Sqrt[a]])/(8*a^(9/2))
```

Rubi in Sympy [A] time = 17.2595, size = 107, normalized size = 0.92

$$-\frac{x^4}{3a\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}-\frac{7x^4}{3a^2\sqrt{a+\frac{b}{x^2}}}+\frac{35x^4\sqrt{a+\frac{b}{x^2}}}{12a^3}-\frac{35bx^2\sqrt{a+\frac{b}{x^2}}}{8a^4}+\frac{35b^2\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{8a^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(a+b/x**2)**(5/2),x)
```

```
[Out] -x**4/(3*a*(a + b/x**2)**(3/2)) - 7*x**4/(3*a**2*sqrt(a + b/x**2)
) + 35*x**4*sqrt(a + b/x**2)/(12*a**3) - 35*b*x**2*sqrt(a + b/x**
2)/(8*a**4) + 35*b**2*atanh(sqrt(a + b/x**2)/sqrt(a))/(8*a**(9/2)
)
```

Mathematica [A] time = 0.106279, size = 110, normalized size = 0.95

$$\frac{\sqrt{a}x\left(6a^3x^6-21a^2bx^4-140ab^2x^2-105b^3\right)+105b^2\left(ax^2+b\right)^{3/2}\log\left(\sqrt{a}\sqrt{ax^2+b}+ax\right)}{24a^{9/2}x\sqrt{a+\frac{b}{x^2}}\left(ax^2+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(a + b/x^2)^(5/2),x]
```

```
[Out] (Sqrt[a]*x*(-105*b^3 - 140*a*b^2*x^2 - 21*a^2*b*x^4 + 6*a^3*x^6)
+ 105*b^2*(b + a*x^2)^(3/2)*Log[a*x + Sqrt[a]*Sqrt[b + a*x^2]])/(
24*a^(9/2)*Sqrt[a + b/x^2]*x*(b + a*x^2))
```

Maple [A] time = 0.02, size = 98, normalized size = 0.8

$$\frac{ax^2+b}{24\,x^5}\left(6\,x^7a^{9/2}-21\,a^{7/2}x^5b-140\,a^{5/2}x^3b^2-105\,a^{3/2}xb^3+105\,\ln\left(\sqrt{a}x+\sqrt{ax^2+b}\right)\left(ax^2+b\right)^{3/2}ab^2\right)\left(\frac{ax^2+b}{x^2}\right)^{-\frac{5}{2}}a^{-}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(a+b/x^2)^(5/2),x)
```

```
[Out] 1/24*(a*x^2+b)*(6*x^7*a^(9/2)-21*a^(7/2)*x^5*b-140*a^(5/2)*x^3*b^
2-105*a^(3/2)*x*b^3+105*ln(a^(1/2)*x+(a*x^2+b)^(1/2))*(a*x^2+b)^(
3/2)*a*b^2)/((a*x^2+b)/x^2)^(5/2)/x^5/a^(11/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(a + b/x^2)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.277646, size = 1, normalized size = 0.01

$$\left[\frac{105\left(a^2b^2x^4+2\,ab^3x^2+b^4\right)\sqrt{a}\log\left(-2\,ax^2\sqrt{\frac{ax^2+b}{x^2}}-\left(2\,ax^2+b\right)\sqrt{a}\right)+2\left(6\,a^4x^8-21\,a^3bx^6-140\,a^2b^2x^4-105\,ab^3x^2\right)\sqrt{}}{48\left(a^7x^4+2\,a^6bx^2+a^5b^2\right)},\right.$$
$$\left.-\frac{105\left(a^2b^2x^4+2\,ab^3x^2+b^4\right)\sqrt{-a}\arctan\left(\frac{\sqrt{-a}}{\sqrt{\frac{ax^2+b}{x^2}}}\right)-\left(6\,a^4x^8-21\,a^3bx^6-140\,a^2b^2x^4-105\,ab^3x^2\right)\sqrt{\frac{ax^2+b}{x^2}}}{24\left(a^7x^4+2\,a^6bx^2+a^5b^2\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(a + b/x^2)^(5/2),x, algorithm="fricas")
```

```
[Out] [1/48*(105*(a^2*b^2*x^4 + 2*a*b^3*x^2 + b^4)*sqrt(a)*log(-2*a*x^2
*sqrt((a*x^2 + b)/x^2) - (2*a*x^2 + b)*sqrt(a)) + 2*(6*a^4*x^8 -
21*a^3*b*x^6 - 140*a^2*b^2*x^4 - 105*a*b^3*x^2)*sqrt((a*x^2 + b)/
x^2))/(a^7*x^4 + 2*a^6*b*x^2 + a^5*b^2), -1/24*(105*(a^2*b^2*x^4
+ 2*a*b^3*x^2 + b^4)*sqrt(-a)*arctan(sqrt(-a)/sqrt((a*x^2 + b)/x^
2)) - (6*a^4*x^8 - 21*a^3*b*x^6 - 140*a^2*b^2*x^4 - 105*a*b^3*x^2
)*sqrt((a*x^2 + b)/x^2))/(a^7*x^4 + 2*a^6*b*x^2 + a^5*b^2)]
```

Sympy [A] time = 26.95, size = 432, normalized size = 3.72

$$\frac{6a^{\frac{89}{2}}b^{75}x^7}{24a^{\frac{93}{2}}b^{\frac{151}{2}}x^2\sqrt{\frac{ax^2}{b}+1}+24a^{\frac{91}{2}}b^{\frac{153}{2}}\sqrt{\frac{ax^2}{b}+1}} - \frac{21a^{\frac{87}{2}}b^{76}x^5}{24a^{\frac{93}{2}}b^{\frac{151}{2}}x^2\sqrt{\frac{ax^2}{b}+1}+24a^{\frac{91}{2}}b^{\frac{153}{2}}\sqrt{\frac{ax^2}{b}+1}} - \frac{140a^{\frac{85}{2}}b^{77}x^3}{24a^{\frac{93}{2}}b^{\frac{151}{2}}x^2\sqrt{\frac{ax^2}{b}+1}+24a^{\frac{91}{2}}b^{\frac{153}{2}}\sqrt{\frac{ax^2}{b}+1}} - \frac{105a^{\frac{83}{2}}b^{78}x}{24a^{\frac{93}{2}}b^{\frac{151}{2}}x^2\sqrt{\frac{ax^2}{b}+1}+24a^{\frac{91}{2}}b^{\frac{153}{2}}\sqrt{\frac{ax^2}{b}+1}} + \frac{105a^{42}b^{\frac{155}{2}}x^2\sqrt{\frac{ax^2}{b}+1}\operatorname{asinh}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{24a^{\frac{93}{2}}b^{\frac{151}{2}}x^2\sqrt{\frac{ax^2}{b}+1}+24a^{\frac{91}{2}}b^{\frac{153}{2}}\sqrt{\frac{ax^2}{b}+1}} + \frac{105a^{41}b^{\frac{157}{2}}\sqrt{\frac{ax^2}{b}+1}\operatorname{asinh}\left(\frac{\sqrt{a}x}{\sqrt{b}}\right)}{24a^{\frac{93}{2}}b^{\frac{151}{2}}x^2\sqrt{\frac{ax^2}{b}+1}+24a^{\frac{91}{2}}b^{\frac{153}{2}}\sqrt{\frac{ax^2}{b}+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**3/(a+b/x**2)**(5/2),x)
```

```
[Out] 6*a**(89/2)*b**75*x**7/(24*a**(93/2)*b**(151/2)*x**2*sqrt(a*x**2/
b + 1) + 24*a**(91/2)*b**(153/2)*sqrt(a*x**2/b + 1)) - 21*a**(87/
2)*b**76*x**5/(24*a**(93/2)*b**(151/2)*x**2*sqrt(a*x**2/b + 1) +
24*a**(91/2)*b**(153/2)*sqrt(a*x**2/b + 1)) - 140*a**(85/2)*b**77
*x**3/(24*a**(93/2)*b**(151/2)*x**2*sqrt(a*x**2/b + 1) + 24*a**(9
1/2)*b**(153/2)*sqrt(a*x**2/b + 1)) - 105*a**(83/2)*b**78*x/(24*a
**(93/2)*b**(151/2)*x**2*sqrt(a*x**2/b + 1) + 24*a**(91/2)*b**(15
3/2)*sqrt(a*x**2/b + 1)) + 105*a**42*b**(155/2)*x**2*sqrt(a*x**2/
b + 1)*asinh(sqrt(a)*x/sqrt(b))/(24*a**(93/2)*b**(151/2)*x**2*sqr
t(a*x**2/b + 1) + 24*a**(91/2)*b**(153/2)*sqrt(a*x**2/b + 1)) + 1
05*a**41*b**(157/2)*sqrt(a*x**2/b + 1)*asinh(sqrt(a)*x/sqrt(b))/(
24*a**(93/2)*b**(151/2)*x**2*sqrt(a*x**2/b + 1) + 24*a**(91/2)*b*
*(153/2)*sqrt(a*x**2/b + 1))
```

GIAC/XCAS [A] time = 0.272943, size = 193, normalized size = 1.66

$$-\frac{1}{24}\,b^2\left(\frac{8\left(a+\frac{9\,(ax^2+b)}{x^2}\right)x^2}{(ax^2+b)a^4\sqrt{\frac{ax^2+b}{x^2}}} + \frac{105\ \arctan\left(\frac{\sqrt{\frac{ax^2+b}{x^2}}}{\sqrt{-a}}\right)}{\sqrt{-a}a^4} - \frac{3\left(13\,a\sqrt{\frac{ax^2+b}{x^2}} - \frac{11\,(ax^2+b)\sqrt{\frac{ax^2+b}{x^2}}}{x^2}\right)}{\left(a-\frac{ax^2+b}{x^2}\right)^2a^4}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^3/(a + b/x^2)^(5/2),x, algorithm="giac")
```

```
[Out] -1/24*b^2*(8*(a + 9*(a*x^2 + b)/x^2)*x^2/((a*x^2 + b)*a^4*sqrt((a
*x^2 + b)/x^2)) + 105*arctan(sqrt((a*x^2 + b)/x^2)/sqrt(-a))/(sqr
t(-a)*a^4) - 3*(13*a*sqrt((a*x^2 + b)/x^2) - 11*(a*x^2 + b)*sqrt(
(a*x^2 + b)/x^2)/x^2)/((a - (a*x^2 + b)/x^2)^2*a^4))
```

3.1943 $\int \frac{x}{\left(a+\frac{b}{x^2}\right)^{5/2}}\,dx$

Optimal. Leaf size=92

$$-\frac{5b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{2a^{7/2}}+\frac{5x^2\sqrt{a+\frac{b}{x^2}}}{2a^3}-\frac{5x^2}{3a^2\sqrt{a+\frac{b}{x^2}}}-\frac{x^2}{3a\left(a+\frac{b}{x^2}\right)^{3/2}}$$

```
[Out] -x^2/(3*a*(a + b/x^2)^(3/2)) - (5*x^2)/(3*a^2*Sqrt[a + b/x^2]) +
(5*Sqrt[a + b/x^2]*x^2)/(2*a^3) - (5*b*ArcTanh[Sqrt[a + b/x^2]/Sq
rt[a]])/(2*a^(7/2))
```

Rubi [A] time = 0.136101, antiderivative size = 92, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$-\frac{5b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{2a^{7/2}}+\frac{5x^2\sqrt{a+\frac{b}{x^2}}}{2a^3}-\frac{5x^2}{3a^2\sqrt{a+\frac{b}{x^2}}}-\frac{x^2}{3a\left(a+\frac{b}{x^2}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b/x^2)^(5/2),x]
```

```
[Out] -x^2/(3*a*(a + b/x^2)^(3/2)) - (5*x^2)/(3*a^2*Sqrt[a + b/x^2]) +
(5*Sqrt[a + b/x^2]*x^2)/(2*a^3) - (5*b*ArcTanh[Sqrt[a + b/x^2]/Sq
rt[a]])/(2*a^(7/2))
```

Rubi in Sympy [A] time = 12.8146, size = 83, normalized size = 0.9

$$-\frac{x^2}{3a\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}-\frac{5x^2}{3a^2\sqrt{a+\frac{b}{x^2}}}+\frac{5x^2\sqrt{a+\frac{b}{x^2}}}{2a^3}-\frac{5b\,\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{2a^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b/x**2)**(5/2),x)
```

```
[Out] -x**2/(3*a*(a + b/x**2)**(3/2)) - 5*x**2/(3*a**2*sqrt(a + b/x**2)
) + 5*x**2*sqrt(a + b/x**2)/(2*a**3) - 5*b*atanh(sqrt(a + b/x**2)
/sqrt(a))/(2*a**(7/2))
```

Mathematica [A] time = 0.0807643, size = 97, normalized size = 1.05

$$\frac{\sqrt{a}x\left(3a^2x^4+20abx^2+15b^2\right)-15b\left(ax^2+b\right)^{3/2}\log\left(\sqrt{a}\sqrt{ax^2+b}+ax\right)}{6a^{7/2}x\sqrt{a+\frac{b}{x^2}}\left(ax^2+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b/x^2)^(5/2),x]
```

```
[Out] (Sqrt[a]*x*(15*b^2 + 20*a*b*x^2 + 3*a^2*x^4) - 15*b*(b + a*x^2)^(
3/2)*Log[a*x + Sqrt[a]*Sqrt[b + a*x^2]])/(6*a^(7/2)*Sqrt[a + b/x^
2]*x*(b + a*x^2))
```

Maple [A] time = 0.015, size = 85, normalized size = 0.9

$$\frac{ax^2+b}{6\,x^5}\left(3\,x^5a^{7/2}+20\,a^{5/2}x^3b+15\,a^{3/2}xb^2-15\,\ln\left(\sqrt{a}x+\sqrt{ax^2+b}\right)\left(ax^2+b\right)^{3/2}ab\right)\left(\frac{ax^2+b}{x^2}\right)^{-\frac{5}{2}}a^{-\frac{9}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+b/x^2)^(5/2),x)
```

```
[Out] 1/6*(a*x^2+b)*(3*x^5*a^(7/2)+20*a^(5/2)*x^3*b+15*a^(3/2)*x*b^2-15
*ln(a^(1/2)*x+(a*x^2+b)^(1/2))*(a*x^2+b)^(3/2)*a*b)/((a*x^2+b)/x^
2)^(5/2)/x^5/a^(9/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x^2)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.271512, size = 1, normalized size = 0.01

$$\left[\frac{15\left(a^2bx^4+2\,ab^2x^2+b^3\right)\sqrt{a}\log\left(2\,ax^2\sqrt{\frac{ax^2+b}{x^2}}-\left(2\,ax^2+b\right)\sqrt{a}\right)+2\left(3\,a^3x^6+20\,a^2bx^4+15\,ab^2x^2\right)\sqrt{\frac{ax^2+b}{x^2}}}{12\left(a^6x^4+2\,a^5bx^2+a^4b^2\right)},\frac{15\left(a^2bx^4+\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x^2)^(5/2),x, algorithm="fricas")
```

```
[Out] [1/12*(15*(a^2*b*x^4 + 2*a*b^2*x^2 + b^3)*sqrt(a)*log(2*a*x^2*sqr
t((a*x^2 + b)/x^2) - (2*a*x^2 + b)*sqrt(a)) + 2*(3*a^3*x^6 + 20*a
^2*b*x^4 + 15*a*b^2*x^2)*sqrt((a*x^2 + b)/x^2))/(a^6*x^4 + 2*a^5*
b*x^2 + a^4*b^2), 1/6*(15*(a^2*b*x^4 + 2*a*b^2*x^2 + b^3)*sqrt(-a
)*arctan(sqrt(-a)/sqrt((a*x^2 + b)/x^2)) + (3*a^3*x^6 + 20*a^2*b*
x^4 + 15*a*b^2*x^2)*sqrt((a*x^2 + b)/x^2))/(a^6*x^4 + 2*a^5*b*x^2
 + a^4*b^2)]
```

Sympy [A] time = 18.7551, size = 819, normalized size = 8.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b/x**2)**(5/2),x)
```

```
[Out] 6*a**17*x**8*sqrt(1 + b/(a*x**2))/(12*a**(39/2)*x**6 + 36*a**(37/
2)*b*x**4 + 36*a**(35/2)*b**2*x**2 + 12*a**(33/2)*b**3) + 46*a**1
6*b*x**6*sqrt(1 + b/(a*x**2))/(12*a**(39/2)*x**6 + 36*a**(37/2)*b
*x**4 + 36*a**(35/2)*b**2*x**2 + 12*a**(33/2)*b**3) + 15*a**16*b*
x**6*log(b/(a*x**2))/(12*a**(39/2)*x**6 + 36*a**(37/2)*b*x**4 + 3
6*a**(35/2)*b**2*x**2 + 12*a**(33/2)*b**3) - 30*a**16*b*x**6*log(
sqrt(1 + b/(a*x**2)) + 1)/(12*a**(39/2)*x**6 + 36*a**(37/2)*b*x**
4 + 36*a**(35/2)*b**2*x**2 + 12*a**(33/2)*b**3) + 70*a**15*b**2*x
**4*sqrt(1 + b/(a*x**2))/(12*a**(39/2)*x**6 + 36*a**(37/2)*b*x**4
 + 36*a**(35/2)*b**2*x**2 + 12*a**(33/2)*b**3) + 45*a**15*b**2*x*
*4*log(b/(a*x**2))/(12*a**(39/2)*x**6 + 36*a**(37/2)*b*x**4 + 36*
a**(35/2)*b**2*x**2 + 12*a**(33/2)*b**3) - 90*a**15*b**2*x**4*log
(sqrt(1 + b/(a*x**2)) + 1)/(12*a**(39/2)*x**6 + 36*a**(37/2)*b*x*
*4 + 36*a**(35/2)*b**2*x**2 + 12*a**(33/2)*b**3) + 30*a**14*b**3*
x**2*sqrt(1 + b/(a*x**2))/(12*a**(39/2)*x**6 + 36*a**(37/2)*b*x**
4 + 36*a**(35/2)*b**2*x**2 + 12*a**(33/2)*b**3) + 45*a**14*b**3*x
**2*log(b/(a*x**2))/(12*a**(39/2)*x**6 + 36*a**(37/2)*b*x**4 + 36
*a**(35/2)*b**2*x**2 + 12*a**(33/2)*b**3) - 90*a**14*b**3*x**2*lo
g(sqrt(1 + b/(a*x**2)) + 1)/(12*a**(39/2)*x**6 + 36*a**(37/2)*b*x
**4 + 36*a**(35/2)*b**2*x**2 + 12*a**(33/2)*b**3) + 15*a**13*b**4
*log(b/(a*x**2))/(12*a**(39/2)*x**6 + 36*a**(37/2)*b*x**4 + 36*a*
*(35/2)*b**2*x**2 + 12*a**(33/2)*b**3) - 30*a**13*b**4*log(sqrt(1
 + b/(a*x**2)) + 1)/(12*a**(39/2)*x**6 + 36*a**(37/2)*b*x**4 + 36
*a**(35/2)*b**2*x**2 + 12*a**(33/2)*b**3)
```

GIAC/XCAS [A] time = 0.272632, size = 151, normalized size = 1.64

$$\frac{1}{6}\,b\left(\frac{2\left(a+\frac{6\,(ax^2+b)}{x^2}\right)x^2}{(ax^2+b)a^3\sqrt{\frac{ax^2+b}{x^2}}}+\frac{15\,\arctan\left(\frac{\sqrt{\frac{ax^2+b}{x^2}}}{\sqrt{-a}}\right)}{\sqrt{-a}a^3}-\frac{3\,\sqrt{\frac{ax^2+b}{x^2}}}{\left(a-\frac{ax^2+b}{x^2}\right)a^3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x^2)^(5/2),x, algorithm="giac")
```

```
[Out] 1/6*b*(2*(a + 6*(a*x^2 + b)/x^2)*x^2/((a*x^2 + b)*a^3*sqrt((a*x^2
 + b)/x^2)) + 15*arctan(sqrt((a*x^2 + b)/x^2)/sqrt(-a))/(sqrt(-a)
*a^3) - 3*sqrt((a*x^2 + b)/x^2)/((a - (a*x^2 + b)/x^2)*a^3))
```

3.1944 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{5/2} x} \, dx$

Optimal. Leaf size=59

$$\frac{\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{a^{5/2}}-\frac{1}{a^2\sqrt{a+\frac{b}{x^2}}}-\frac{1}{3a\left(a+\frac{b}{x^2}\right)^{3/2}}$$

```
[Out] -1/(3*a*(a + b/x^2)^(3/2)) - 1/(a^2*Sqrt[a + b/x^2]) + ArcTanh[Sq
rt[a + b/x^2]/Sqrt[a]]/a^(5/2)
```

Rubi [A] time = 0.106175, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{a^{5/2}}-\frac{1}{a^2\sqrt{a+\frac{b}{x^2}}}-\frac{1}{3a\left(a+\frac{b}{x^2}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)^(5/2)*x),x]
```

```
[Out] -1/(3*a*(a + b/x^2)^(3/2)) - 1/(a^2*Sqrt[a + b/x^2]) + ArcTanh[Sq
rt[a + b/x^2]/Sqrt[a]]/a^(5/2)
```

Rubi in Sympy [A] time = 9.64342, size = 51, normalized size = 0.86

$$-\frac{1}{3a\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}-\frac{1}{a^2\sqrt{a+\frac{b}{x^2}}}+\frac{\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x^2}}}{\sqrt{a}}\right)}{a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**(5/2)/x,x)
```

```
[Out] -1/(3*a*(a + b/x**2)**(3/2)) - 1/(a**2*sqrt(a + b/x**2)) + atanh(
sqrt(a + b/x**2)/sqrt(a))/a**(5/2)
```

Mathematica [A] time = 0.0687765, size = 86, normalized size = 1.46

$$\frac{3\left(ax^2+b\right)^{3/2}\log\left(\sqrt{a}\sqrt{ax^2+b}+ax\right)-\sqrt{a}x\left(4ax^2+3b\right)}{3a^{5/2}x\sqrt{a+\frac{b}{x^2}}\left(ax^2+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)^(5/2)*x),x]
```

```
[Out] (-(Sqrt[a]*x*(3*b + 4*a*x^2)) + 3*(b + a*x^2)^(3/2)*Log[a*x + Sqr
t[a]*Sqrt[b + a*x^2]])/(3*a^(5/2)*Sqrt[a + b/x^2]*x*(b + a*x^2))
```

Maple [A] time = 0.013, size = 73, normalized size = 1.2

$$-\frac{ax^2+b}{3\,x^5}\left(4\,x^3a^{5/2}+3\,a^{3/2}xb-3\,\ln\left(\sqrt{a}x+\sqrt{ax^2+b}\right)\left(ax^2+b\right)^{3/2}a\right)\left(\frac{ax^2+b}{x^2}\right)^{-\frac{5}{2}}a^{-\frac{7}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^(5/2)/x,x)
```

```
[Out] -1/3*(a*x^2+b)*(4*x^3*a^(5/2)+3*a^(3/2)*x*b-3*ln(a^(1/2)*x+(a*x^2
+b)^(1/2))*(a*x^2+b)^(3/2)*a)/((a*x^2+b)/x^2)^(5/2)/x^5/a^(7/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(5/2)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.258358, size = 1, normalized size = 0.02

$$\left[\frac{3\left(a^2x^4+2\,abx^2+b^2\right)\sqrt{a}\log\left(-2\,ax^2\sqrt{\frac{ax^2+b}{x^2}}-\left(2\,ax^2+b\right)\sqrt{a}\right)-2\left(4\,a^2x^4+3\,abx^2\right)\sqrt{\frac{ax^2+b}{x^2}}}{6\left(a^5x^4+2\,a^4bx^2+a^3b^2\right)},\ -\frac{3\left(a^2x^4+2\,abx^2+b^2\right)\sqrt{-a}\arctan\left(\frac{\sqrt{-a}}{\sqrt{\frac{ax^2+b}{x^2}}}\right)+\left(4\,a^2x^4+3\,abx^2\right)\sqrt{\frac{ax^2+b}{x^2}}}{3\left(a^5x^4+2\,a^4bx^2+a^3b^2\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(5/2)*x),x, algorithm="fricas")
```

```
[Out] [1/6*(3*(a^2*x^4 + 2*a*b*x^2 + b^2)*sqrt(a)*log(-2*a*x^2*sqrt((a*
x^2 + b)/x^2) - (2*a*x^2 + b)*sqrt(a)) - 2*(4*a^2*x^4 + 3*a*b*x^2
)*sqrt((a*x^2 + b)/x^2))/(a^5*x^4 + 2*a^4*b*x^2 + a^3*b^2), -1/3*
(3*(a^2*x^4 + 2*a*b*x^2 + b^2)*sqrt(-a)*arctan(sqrt(-a)/sqrt((a*x
^2 + b)/x^2)) + (4*a^2*x^4 + 3*a*b*x^2)*sqrt((a*x^2 + b)/x^2))/(a
^5*x^4 + 2*a^4*b*x^2 + a^3*b^2)]
```

Sympy [A] time = 12.4281, size = 743, normalized size = 12.59

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**(5/2)/x,x)
```

```
[Out] -8*a**7*x**6*sqrt(1 + b/(a*x**2))/(6*a**(19/2)*x**6 + 18*a**(17/2
)*b*x**4 + 18*a**(15/2)*b**2*x**2 + 6*a**(13/2)*b**3) - 3*a**7*x*
*6*log(b/(a*x**2))/(6*a**(19/2)*x**6 + 18*a**(17/2)*b*x**4 + 18*a
**(15/2)*b**2*x**2 + 6*a**(13/2)*b**3) + 6*a**7*x**6*log(sqrt(1 +
 b/(a*x**2)) + 1)/(6*a**(19/2)*x**6 + 18*a**(17/2)*b*x**4 + 18*a*
*(15/2)*b**2*x**2 + 6*a**(13/2)*b**3) - 14*a**6*b*x**4*sqrt(1 + b
/(a*x**2))/(6*a**(19/2)*x**6 + 18*a**(17/2)*b*x**4 + 18*a**(15/2)
*b**2*x**2 + 6*a**(13/2)*b**3) - 9*a**6*b*x**4*log(b/(a*x**2))/(6
*a**(19/2)*x**6 + 18*a**(17/2)*b*x**4 + 18*a**(15/2)*b**2*x**2 +
6*a**(13/2)*b**3) + 18*a**6*b*x**4*log(sqrt(1 + b/(a*x**2)) + 1)/
(6*a**(19/2)*x**6 + 18*a**(17/2)*b*x**4 + 18*a**(15/2)*b**2*x**2
+ 6*a**(13/2)*b**3) - 6*a**5*b**2*x**2*sqrt(1 + b/(a*x**2))/(6*a*
*(19/2)*x**6 + 18*a**(17/2)*b*x**4 + 18*a**(15/2)*b**2*x**2 + 6*a
**(13/2)*b**3) - 9*a**5*b**2*x**2*log(b/(a*x**2))/(6*a**(19/2)*x*
*6 + 18*a**(17/2)*b*x**4 + 18*a**(15/2)*b**2*x**2 + 6*a**(13/2)*b
**3) + 18*a**5*b**2*x**2*log(sqrt(1 + b/(a*x**2)) + 1)/(6*a**(19/
2)*x**6 + 18*a**(17/2)*b*x**4 + 18*a**(15/2)*b**2*x**2 + 6*a**(13
/2)*b**3) - 3*a**4*b**3*log(b/(a*x**2))/(6*a**(19/2)*x**6 + 18*a*
*(17/2)*b*x**4 + 18*a**(15/2)*b**2*x**2 + 6*a**(13/2)*b**3) + 6*a
**4*b**3*log(sqrt(1 + b/(a*x**2)) + 1)/(6*a**(19/2)*x**6 + 18*a**
(17/2)*b*x**4 + 18*a**(15/2)*b**2*x**2 + 6*a**(13/2)*b**3)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{\frac{5}{2}} x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(5/2)*x),x, algorithm="giac")
```

```
[Out] integrate(1/((a + b/x^2)^(5/2)*x), x)
```

3.1945 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{5/2} x^3} \, dx$

Optimal. Leaf size=18

$$\frac{1}{3b\left(a+\frac{b}{x^2}\right)^{3/2}}$$

```
[Out] 1/(3*b*(a + b/x^2)^(3/2))
```

Rubi [A] time = 0.0288461, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{1}{3b\left(a+\frac{b}{x^2}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b/x^2)^(5/2)*x^3),x]

[Out] 1/(3*b*(a + b/x^2)^(3/2))
```

Rubi in Sympy [A] time = 2.11519, size = 14, normalized size = 0.78

$$\frac{1}{3b\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b/x**2)**(5/2)/x**3,x)

[Out] 1/(3*b*(a + b/x**2)**(3/2))
```

Mathematica [A] time = 0.0310515, size = 30, normalized size = 1.67

$$\frac{x^4\sqrt{a+\frac{b}{x^2}}}{3b\left(ax^2+b\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b/x^2)^(5/2)*x^3),x]

[Out] (Sqrt[a + b/x^2]*x^4)/(3*b*(b + a*x^2)^2)
```

Maple [A] time = 0.008, size = 29, normalized size = 1.6

$$\frac{ax^2+b}{3\,bx^2}\left(\frac{ax^2+b}{x^2}\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^(5/2)/x^3,x)
```

```
[Out] 1/3*(a*x^2+b)/x^2/b/((a*x^2+b)/x^2)^(5/2)
```

Maxima [A] time = 1.44066, size = 19, normalized size = 1.06

$$\frac{1}{3\left(a + \frac{b}{x^2}\right)^{\frac{3}{2}} b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(5/2)*x^3),x, algorithm="maxima")
```

```
[Out] 1/3/((a + b/x^2)^(3/2)*b)
```

Fricas [A] time = 0.241376, size = 55, normalized size = 3.06

$$\frac{x^4\sqrt{\frac{ax^2+b}{x^2}}}{3\left(a^2bx^4 + 2\,ab^2x^2 + b^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(5/2)*x^3),x, algorithm="fricas")
```

```
[Out] 1/3*x^4*sqrt((a*x^2 + b)/x^2)/(a^2*b*x^4 + 2*a*b^2*x^2 + b^3)
```

Sympy [A] time = 13.2867, size = 48, normalized size = 2.67

$$\begin{cases} \frac{1}{3ab\sqrt{a+\frac{b}{x^2}} + \frac{3b^2\sqrt{a+\frac{b}{x^2}}}{x^2}} & \text{for } b \neq 0 \\ -\frac{1}{2a^{\frac{5}{2}}x^2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**(5/2)/x**3,x)
```

```
[Out] Piecewise((1/(3*a*b*sqrt(a + b/x**2) + 3*b**2*sqrt(a + b/x**2)/x*
*2), Ne(b, 0)), (-1/(2*a**(5/2)*x**2), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a + \frac{b}{x^2}\right)^{\frac{5}{2}} x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(5/2)*x^3),x, algorithm="giac")
```

```
[Out] integrate(1/((a + b/x^2)^(5/2)*x^3), x)
```

3.1946 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{5/2} x^5} \, dx$

Optimal. Leaf size=35

$$\frac{1}{b^2\sqrt{a+\frac{b}{x^2}}}-\frac{a}{3b^2\left(a+\frac{b}{x^2}\right)^{3/2}}$$

```
[Out] -a/(3*b^2*(a + b/x^2)^(3/2)) + 1/(b^2*Sqrt[a + b/x^2])
```

Rubi [A] time = 0.0656304, antiderivative size = 35, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{1}{b^2\sqrt{a+\frac{b}{x^2}}}-\frac{a}{3b^2\left(a+\frac{b}{x^2}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)^(5/2)*x^5),x]
```

```
[Out] -a/(3*b^2*(a + b/x^2)^(3/2)) + 1/(b^2*Sqrt[a + b/x^2])
```

Rubi in Sympy [A] time = 7.008, size = 31, normalized size = 0.89

$$-\frac{a}{3b^2\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}+\frac{1}{b^2\sqrt{a+\frac{b}{x^2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**(5/2)/x**5,x)
```

```
[Out] -a/(3*b**2*(a + b/x**2)**(3/2)) + 1/(b**2*sqrt(a + b/x**2))
```

Mathematica [A] time = 0.0260047, size = 37, normalized size = 1.06

$$\frac{2ax^2+3b}{3b^2\sqrt{a+\frac{b}{x^2}}\left(ax^2+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)^(5/2)*x^5),x]
```

```
[Out] (3*b + 2*a*x^2)/(3*b^2*Sqrt[a + b/x^2]*(b + a*x^2))
```

Maple [A] time = 0.005, size = 39, normalized size = 1.1

$$\frac{\left(ax^2+b\right)\left(2\,ax^2+3\,b\right)}{3\,b^2x^4}\left(\frac{ax^2+b}{x^2}\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^(5/2)/x^5,x)
```

```
[Out] 1/3*(a*x^2+b)/x^4*(2*a*x^2+3*b)/b^2/((a*x^2+b)/x^2)^(5/2)
```

Maxima [A] time = 1.44786, size = 39, normalized size = 1.11

$$\frac{1}{\sqrt{a+\frac{b}{x^2}}\,b^2}-\frac{a}{3\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(5/2)*x^5),x, algorithm="maxima")
```

```
[Out] 1/(sqrt(a + b/x^2)*b^2) - 1/3*a/((a + b/x^2)^(3/2)*b^2)
```

Fricas [A] time = 0.245109, size = 72, normalized size = 2.06

$$\frac{\left(2\,ax^4+3\,bx^2\right)\sqrt{\frac{ax^2+b}{x^2}}}{3\left(a^2b^2x^4+2\,ab^3x^2+b^4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(5/2)*x^5),x, algorithm="fricas")
```

```
[Out] 1/3*(2*a*x^4 + 3*b*x^2)*sqrt((a*x^2 + b)/x^2)/(a^2*b^2*x^4 + 2*a*
b^3*x^2 + b^4)
```

Sympy [A] time = 21.0675, size = 94, normalized size = 2.69

$$\begin{cases}\frac{2ax^2}{3ab^2x^2\sqrt{a+\frac{b}{x^2}}+3b^3\sqrt{a+\frac{b}{x^2}}}+\frac{3b}{3ab^2x^2\sqrt{a+\frac{b}{x^2}}+3b^3\sqrt{a+\frac{b}{x^2}}} & \text{for } b\neq 0\\ -\frac{1}{4a^{\frac{5}{2}}x^4} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**(5/2)/x**5,x)
```

```
[Out] Piecewise((2*a*x**2/(3*a*b**2*x**2*sqrt(a + b/x**2) + 3*b**3*sqrt
(a + b/x**2)) + 3*b/(3*a*b**2*x**2*sqrt(a + b/x**2) + 3*b**3*sqrt
(a + b/x**2)), Ne(b, 0)), (-1/(4*a**(5/2)*x**4), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{\frac{5}{2}}x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(5/2)*x^5),x, algorithm="giac")
```

```
[Out] integrate(1/((a + b/x^2)^(5/2)*x^5), x)
```

3.1947 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{5/2} x^7} \, dx$

Optimal. Leaf size=55

$$\frac{a^2}{3b^3\left(a+\frac{b}{x^2}\right)^{3/2}}-\frac{2a}{b^3\sqrt{a+\frac{b}{x^2}}}-\frac{\sqrt{a+\frac{b}{x^2}}}{b^3}$$

```
[Out] a^2/(3*b^3*(a + b/x^2)^(3/2)) - (2*a)/(b^3*Sqrt[a + b/x^2]) - Sqr
t[a + b/x^2]/b^3
```

Rubi [A] time = 0.0925196, antiderivative size = 55, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{a^2}{3b^3\left(a+\frac{b}{x^2}\right)^{3/2}}-\frac{2a}{b^3\sqrt{a+\frac{b}{x^2}}}-\frac{\sqrt{a+\frac{b}{x^2}}}{b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)^(5/2)*x^7),x]
```

```
[Out] a^2/(3*b^3*(a + b/x^2)^(3/2)) - (2*a)/(b^3*Sqrt[a + b/x^2]) - Sqr
t[a + b/x^2]/b^3
```

Rubi in Sympy [A] time = 10.4993, size = 48, normalized size = 0.87

$$\frac{a^2}{3b^3\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}-\frac{2a}{b^3\sqrt{a+\frac{b}{x^2}}}-\frac{\sqrt{a+\frac{b}{x^2}}}{b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**(5/2)/x**7,x)
```

```
[Out] a**2/(3*b**3*(a + b/x**2)**(3/2)) - 2*a/(b**3*sqrt(a + b/x**2)) -
 sqrt(a + b/x**2)/b**3
```

Mathematica [A] time = 0.0491817, size = 48, normalized size = 0.87

$$-\frac{\sqrt{a+\frac{b}{x^2}}\left(8a^2x^4+12abx^2+3b^2\right)}{3b^3\left(ax^2+b\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)^(5/2)*x^7),x]
```

```
[Out] -(Sqrt[a + b/x^2]*(3*b^2 + 12*a*b*x^2 + 8*a^2*x^4))/(3*b^3*(b + a
*x^2)^2)
```

Maple [A] time = 0.008, size = 50, normalized size = 0.9

$$-\frac{\left(ax^{2}+b\right)\left(8\,x^{4}a^{2}+12\,abx^{2}+3\,b^{2}\right)}{3\,b^{3}x^{6}}\left(\frac{ax^{2}+b}{x^{2}}\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^(5/2)/x^7,x)
```

```
[Out] -1/3*(a*x^2+b)*(8*a^2*x^4+12*a*b*x^2+3*b^2)/x^6/b^3/((a*x^2+b)/x^
2)^(5/2)
```

Maxima [A] time = 1.44959, size = 63, normalized size = 1.15

$$-\frac{\sqrt{a+\frac{b}{x^{2}}}}{b^{3}}-\frac{2\,a}{\sqrt{a+\frac{b}{x^{2}}}\,b^{3}}+\frac{a^{2}}{3\left(a+\frac{b}{x^{2}}\right)^{\frac{3}{2}}b^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(5/2)*x^7),x, algorithm="maxima")
```

```
[Out] -sqrt(a + b/x^2)/b^3 - 2*a/(sqrt(a + b/x^2)*b^3) + 1/3*a^2/((a +
b/x^2)^(3/2)*b^3)
```

Fricas [A] time = 0.242698, size = 82, normalized size = 1.49

$$-\frac{\left(8\,a^{2}x^{4}+12\,abx^{2}+3\,b^{2}\right)\sqrt{\frac{ax^{2}+b}{x^{2}}}}{3\left(a^{2}b^{3}x^{4}+2\,ab^{4}x^{2}+b^{5}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(5/2)*x^7),x, algorithm="fricas")
```

```
[Out] -1/3*(8*a^2*x^4 + 12*a*b*x^2 + 3*b^2)*sqrt((a*x^2 + b)/x^2)/(a^2*
b^3*x^4 + 2*a*b^4*x^2 + b^5)
```

Sympy [A] time = 31.2106, size = 153, normalized size = 2.78

$$\begin{cases}-\frac{8a^{2}x^{4}}{3ab^{3}x^{4}\sqrt{a+\frac{b}{x^{2}}}+3b^{4}x^{2}\sqrt{a+\frac{b}{x^{2}}}}-\frac{12abx^{2}}{3ab^{3}x^{4}\sqrt{a+\frac{b}{x^{2}}}+3b^{4}x^{2}\sqrt{a+\frac{b}{x^{2}}}}-\frac{3b^{2}}{3ab^{3}x^{4}\sqrt{a+\frac{b}{x^{2}}}+3b^{4}x^{2}\sqrt{a+\frac{b}{x^{2}}}} & \text{for}\ b\neq 0\\ -\frac{1}{6a^{\frac{5}{2}}x^{6}} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**(5/2)/x**7,x)
```

```
[Out] Piecewise((-8*a**2*x**4/(3*a*b**3*x**4*sqrt(a + b/x**2) + 3*b**4*
x**2*sqrt(a + b/x**2)) - 12*a*b*x**2/(3*a*b**3*x**4*sqrt(a + b/x*
*2) + 3*b**4*x**2*sqrt(a + b/x**2)) - 3*b**2/(3*a*b**3*x**4*sqrt(
a + b/x**2) + 3*b**4*x**2*sqrt(a + b/x**2)), Ne(b, 0)), (-1/(6*a*
*(5/2)*x**6), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a + \frac{b}{x^2}\right)^{\frac{5}{2}} x^7} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(5/2)*x^7),x, algorithm="giac")
```

```
[Out] integrate(1/((a + b/x^2)^(5/2)*x^7), x)
```

3.1948 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{5/2} x^9} \, dx$

Optimal. Leaf size=76

$$-\frac{a^3}{3b^4\left(a+\frac{b}{x^2}\right)^{3/2}}+\frac{3a^2}{b^4\sqrt{a+\frac{b}{x^2}}}+\frac{3a\sqrt{a+\frac{b}{x^2}}}{b^4}-\frac{\left(a+\frac{b}{x^2}\right)^{3/2}}{3b^4}$$

```
[Out] -a^3/(3*b^4*(a + b/x^2)^(3/2)) + (3*a^2)/(b^4*Sqrt[a + b/x^2]) +
(3*a*Sqrt[a + b/x^2])/b^4 - (a + b/x^2)^(3/2)/(3*b^4)
```

Rubi [A] time = 0.114627, antiderivative size = 76, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^3}{3b^4\left(a+\frac{b}{x^2}\right)^{3/2}}+\frac{3a^2}{b^4\sqrt{a+\frac{b}{x^2}}}+\frac{3a\sqrt{a+\frac{b}{x^2}}}{b^4}-\frac{\left(a+\frac{b}{x^2}\right)^{3/2}}{3b^4}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)^(5/2)*x^9),x]
```

```
[Out] -a^3/(3*b^4*(a + b/x^2)^(3/2)) + (3*a^2)/(b^4*Sqrt[a + b/x^2]) +
(3*a*Sqrt[a + b/x^2])/b^4 - (a + b/x^2)^(3/2)/(3*b^4)
```

Rubi in Sympy [A] time = 13.9999, size = 68, normalized size = 0.89

$$-\frac{a^3}{3b^4\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}+\frac{3a^2}{b^4\sqrt{a+\frac{b}{x^2}}}+\frac{3a\sqrt{a+\frac{b}{x^2}}}{b^4}-\frac{\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}{3b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**(5/2)/x**9,x)
```

```
[Out] -a**3/(3*b**4*(a + b/x**2)**(3/2)) + 3*a**2/(b**4*sqrt(a + b/x**2
)) + 3*a*sqrt(a + b/x**2)/b**4 - (a + b/x**2)**(3/2)/(3*b**4)
```

Mathematica [A] time = 0.0440437, size = 62, normalized size = 0.82

$$\frac{16a^3x^6+24a^2bx^4+6ab^2x^2-b^3}{3b^4x^4\sqrt{a+\frac{b}{x^2}}\left(ax^2+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)^(5/2)*x^9),x]
```

```
[Out] (-b^3 + 6*a*b^2*x^2 + 24*a^2*b*x^4 + 16*a^3*x^6)/(3*b^4*Sqrt[a +
b/x^2]*x^4*(b + a*x^2))
```

Maple [A] time = 0.01, size = 61, normalized size = 0.8

$$\frac{(ax^2+b)\,(16\,a^3x^6+24\,a^2bx^4+6\,ab^2x^2-b^3)}{3\,x^8b^4}\left(\frac{ax^2+b}{x^2}\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/(a+b/x^2)^(5/2)/x^9,x)
```

```
[Out] 1/3*(a*x^2+b)*(16*a^3*x^6+24*a^2*b*x^4+6*a*b^2*x^2-b^3)/x^8/b^4/(
(a*x^2+b)/x^2)^(5/2)
```

Maxima [A] time = 1.44432, size = 86, normalized size = 1.13

$$-\frac{\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}{3\,b^4}+\frac{3\,\sqrt{a+\frac{b}{x^2}}\,a}{b^4}+\frac{3\,a^2}{\sqrt{a+\frac{b}{x^2}}\,b^4}-\frac{a^3}{3\,\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x^2)^(5/2)*x^9),x, algorithm="maxima")
```

```
[Out] -1/3*(a + b/x^2)^(3/2)/b^4 + 3*sqrt(a + b/x^2)*a/b^4 + 3*a^2/(sqr
t(a + b/x^2)*b^4) - 1/3*a^3/((a + b/x^2)^(3/2)*b^4)
```

Fricas [A] time = 0.256102, size = 103, normalized size = 1.36

$$\frac{(16\,a^3x^6+24\,a^2bx^4+6\,ab^2x^2-b^3)\sqrt{\frac{ax^2+b}{x^2}}}{3\,(a^2b^4x^6+2\,ab^5x^4+b^6x^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x^2)^(5/2)*x^9),x, algorithm="fricas")
```

```
[Out] 1/3*(16*a^3*x^6 + 24*a^2*b*x^4 + 6*a*b^2*x^2 - b^3)*sqrt((a*x^2 +
 b)/x^2)/(a^2*b^4*x^6 + 2*a*b^5*x^4 + b^6*x^2)
```

Sympy [A] time = 55.0614, size = 201, normalized size = 2.64

$$\begin{cases} \frac{16a^3x^6}{3ab^4x^6\sqrt{a+\frac{b}{x^2}}+3b^5x^4\sqrt{a+\frac{b}{x^2}}}+\frac{24a^2bx^4}{3ab^4x^6\sqrt{a+\frac{b}{x^2}}+3b^5x^4\sqrt{a+\frac{b}{x^2}}}+\frac{6ab^2x^2}{3ab^4x^6\sqrt{a+\frac{b}{x^2}}+3b^5x^4\sqrt{a+\frac{b}{x^2}}}-\frac{b^3}{3ab^4x^6\sqrt{a+\frac{b}{x^2}}+3b^5x^4\sqrt{a+\frac{b}{x^2}}} & \text{for}\ b\neq 0 \\ -\frac{1}{8a^{\frac{5}{2}}x^8} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(a+b/x**2)**(5/2)/x**9,x)
```

```
[Out] Piecewise((16*a**3*x**6/(3*a*b**4*x**6*sqrt(a + b/x**2) + 3*b**5*
x**4*sqrt(a + b/x**2)) + 24*a**2*b*x**4/(3*a*b**4*x**6*sqrt(a + b
/x**2) + 3*b**5*x**4*sqrt(a + b/x**2)) + 6*a*b**2*x**2/(3*a*b**4*
x**6*sqrt(a + b/x**2) + 3*b**5*x**4*sqrt(a + b/x**2)) - b**3/(3*a
*b**4*x**6*sqrt(a + b/x**2) + 3*b**5*x**4*sqrt(a + b/x**2)), Ne(b
, 0)), (-1/(8*a**(5/2)*x**8), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a + \frac{b}{x^2}\right)^{\frac{5}{2}} x^9}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(5/2)*x^9),x, algorithm="giac")
```

```
[Out] integrate(1/((a + b/x^2)^(5/2)*x^9), x)
```

3.1949 $\int \frac{x^2}{\left(a+\frac{b}{x^2}\right)^{5/2}}\,dx$

Optimal. Leaf size=82

$$-\frac{16bx\sqrt{a+\frac{b}{x^2}}}{3a^4}+\frac{8bx}{3a^3\sqrt{a+\frac{b}{x^2}}}+\frac{2bx}{3a^2\left(a+\frac{b}{x^2}\right)^{3/2}}+\frac{x^3}{3a\left(a+\frac{b}{x^2}\right)^{3/2}}$$

```
[Out] (2*b*x)/(3*a^2*(a + b/x^2)^(3/2)) + (8*b*x)/(3*a^3*Sqrt[a + b/x^2
]) - (16*b*Sqrt[a + b/x^2]*x)/(3*a^4) + x^3/(3*a*(a + b/x^2)^(3/2
))
```

Rubi [A] time = 0.0787366, antiderivative size = 82, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{16bx\sqrt{a+\frac{b}{x^2}}}{3a^4}+\frac{8bx}{3a^3\sqrt{a+\frac{b}{x^2}}}+\frac{2bx}{3a^2\left(a+\frac{b}{x^2}\right)^{3/2}}+\frac{x^3}{3a\left(a+\frac{b}{x^2}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b/x^2)^(5/2),x]
```

```
[Out] (2*b*x)/(3*a^2*(a + b/x^2)^(3/2)) + (8*b*x)/(3*a^3*Sqrt[a + b/x^2
]) - (16*b*Sqrt[a + b/x^2]*x)/(3*a^4) + x^3/(3*a*(a + b/x^2)^(3/2
))
```

Rubi in Sympy [A] time = 6.54573, size = 76, normalized size = 0.93

$$\frac{x^3}{3a\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}+\frac{2bx}{3a^2\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}+\frac{8bx}{3a^3\sqrt{a+\frac{b}{x^2}}}-\frac{16bx\sqrt{a+\frac{b}{x^2}}}{3a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b/x**2)**(5/2),x)
```

```
[Out] x**3/(3*a*(a + b/x**2)**(3/2)) + 2*b*x/(3*a**2*(a + b/x**2)**(3/2
)) + 8*b*x/(3*a**3*sqrt(a + b/x**2)) - 16*b*x*sqrt(a + b/x**2)/(3
*a**4)
```

Mathematica [A] time = 0.0377686, size = 61, normalized size = 0.74

$$\frac{a^3x^6-6a^2bx^4-24ab^2x^2-16b^3}{3a^4x\sqrt{a+\frac{b}{x^2}}\left(ax^2+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a + b/x^2)^(5/2),x]
```

```
[Out] (-16*b^3 - 24*a*b^2*x^2 - 6*a^2*b*x^4 + a^3*x^6)/(3*a^4*Sqrt[a +
b/x^2]*x*(b + a*x^2))
```

Maple [A] time = 0.01, size = 60, normalized size = 0.7

$$\frac{(ax^2+b)\,(a^3x^6-6\,a^2bx^4-24\,ab^2x^2-16\,b^3)}{3\,a^4x^5}\left(\frac{ax^2+b}{x^2}\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(a+b/x^2)^(5/2),x)
```

```
[Out] 1/3*(a*x^2+b)*(a^3*x^6-6*a^2*b*x^4-24*a*b^2*x^2-16*b^3)/a^4/x^5/(
(a*x^2+b)/x^2)^(5/2)
```

Maxima [A] time = 1.43746, size = 96, normalized size = 1.17

$$\frac{\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}x^3-9\,\sqrt{a+\frac{b}{x^2}}bx}{3\,a^4}-\frac{9\left(a+\frac{b}{x^2}\right)b^2x^2-b^3}{3\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}a^4x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x^2)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/3*((a + b/x^2)^(3/2)*x^3 - 9*sqrt(a + b/x^2)*b*x)/a^4 - 1/3*(9*
(a + b/x^2)*b^2*x^2 - b^3)/((a + b/x^2)^(3/2)*a^4*x^3)
```

Fricas [A] time = 0.24695, size = 99, normalized size = 1.21

$$\frac{(a^3x^7-6\,a^2bx^5-24\,ab^2x^3-16\,b^3x)\sqrt{\frac{ax^2+b}{x^2}}}{3\,(a^6x^4+2\,a^5bx^2+a^4b^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x^2)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/3*(a^3*x^7 - 6*a^2*b*x^5 - 24*a*b^2*x^3 - 16*b^3*x)*sqrt((a*x^2
 + b)/x^2)/(a^6*x^4 + 2*a^5*b*x^2 + a^4*b^2)
```

Sympy [A] time = 6.56565, size = 337, normalized size = 4.11

$$\frac{a^4b^{\frac{19}{2}}x^8\sqrt{\frac{ax^2}{b}+1}}{3a^7b^9x^6+9a^6b^{10}x^4+9a^5b^{11}x^2+3a^4b^{12}}-\frac{5a^3b^{\frac{21}{2}}x^6\sqrt{\frac{ax^2}{b}+1}}{3a^7b^9x^6+9a^6b^{10}x^4+9a^5b^{11}x^2+3a^4b^{12}}-\frac{30a^2b^{\frac{23}{2}}x^4\sqrt{\frac{ax^2}{b}+1}}{3a^7b^9x^6+9a^6b^{10}x^4+9a^5b^{11}x^2+3a^4b^{12}}-\frac{40ab^{\frac{25}{2}}x^2\sqrt{\frac{ax^2}{b}+1}}{3a^7b^9x^6+9a^6b^{10}x^4+9a^5b^{11}x^2+3a^4b^{12}}-\frac{16b^{\frac{27}{2}}\sqrt{\frac{ax^2}{b}+1}}{3a^7b^9x^6+9a^6b^{10}x^4+9a^5b^{11}x^2+3a^4b^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b/x**2)**(5/2),x)
```

```
[Out] a**4*b**(19/2)*x**8*sqrt(a*x**2/b + 1)/(3*a**7*b**9*x**6 + 9*a**6
*b**10*x**4 + 9*a**5*b**11*x**2 + 3*a**4*b**12) - 5*a**3*b**(21/2
```

```
)*x**6*sqrt(a*x**2/b + 1)/(3*a**7*b**9*x**6 + 9*a**6*b**10*x**4 +
 9*a**5*b**11*x**2 + 3*a**4*b**12) - 30*a**2*b**(23/2)*x**4*sqrt(
a*x**2/b + 1)/(3*a**7*b**9*x**6 + 9*a**6*b**10*x**4 + 9*a**5*b**1
1*x**2 + 3*a**4*b**12) - 40*a*b**(25/2)*x**2*sqrt(a*x**2/b + 1)/(
3*a**7*b**9*x**6 + 9*a**6*b**10*x**4 + 9*a**5*b**11*x**2 + 3*a**4
*b**12) - 16*b**(27/2)*sqrt(a*x**2/b + 1)/(3*a**7*b**9*x**6 + 9*a
**6*b**10*x**4 + 9*a**5*b**11*x**2 + 3*a**4*b**12)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\left(a+\frac{b}{x^2}\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x^2)^(5/2),x, algorithm="giac")
```

```
[Out] integrate(x^2/(a + b/x^2)^(5/2), x)
```

3.1950 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{5/2}} dx$

Optimal. Leaf size=58

$$\frac{8x\sqrt{a+\frac{b}{x^2}}}{3a^3} - \frac{4x}{3a^2\sqrt{a+\frac{b}{x^2}}} - \frac{x}{3a\left(a+\frac{b}{x^2}\right)^{3/2}}$$

```
[Out] -x/(3*a*(a + b/x^2)^(3/2)) - (4*x)/(3*a^2*Sqrt[a + b/x^2]) + (8*S
qrt[a + b/x^2]*x)/(3*a^3)
```

Rubi [A] time = 0.0386351, antiderivative size = 58, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{8x\sqrt{a+\frac{b}{x^2}}}{3a^3} - \frac{4x}{3a^2\sqrt{a+\frac{b}{x^2}}} - \frac{x}{3a\left(a+\frac{b}{x^2}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^(-5/2),x]
```

```
[Out] -x/(3*a*(a + b/x^2)^(3/2)) - (4*x)/(3*a^2*Sqrt[a + b/x^2]) + (8*S
qrt[a + b/x^2]*x)/(3*a^3)
```

Rubi in Sympy [A] time = 3.21847, size = 51, normalized size = 0.88

$$-\frac{x}{3a\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}} - \frac{4x}{3a^2\sqrt{a+\frac{b}{x^2}}} + \frac{8x\sqrt{a+\frac{b}{x^2}}}{3a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**(5/2),x)
```

```
[Out] -x/(3*a*(a + b/x**2)**(3/2)) - 4*x/(3*a**2*sqrt(a + b/x**2)) + 8*
x*sqrt(a + b/x**2)/(3*a**3)
```

Mathematica [A] time = 0.0341844, size = 51, normalized size = 0.88

$$\frac{3a^2x^4 + 12abx^2 + 8b^2}{3a^3x\sqrt{a+\frac{b}{x^2}}\left(ax^2+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^(-5/2),x]
```

```
[Out] (8*b^2 + 12*a*b*x^2 + 3*a^2*x^4)/(3*a^3*Sqrt[a + b/x^2]*x*(b + a*
x^2))
```

Maple [A] time = 0.007, size = 50, normalized size = 0.9

$$\frac{(ax^2+b)\,(3\,x^4a^2+12\,abx^2+8\,b^2)}{3\,a^3x^5}\left(\frac{ax^2+b}{x^2}\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^(5/2),x)
```

```
[Out] 1/3*(a*x^2+b)*(3*a^2*x^4+12*a*b*x^2+8*b^2)/a^3/x^5/((a*x^2+b)/x^2
)^(5/2)
```

Maxima [A] time = 1.44322, size = 69, normalized size = 1.19

$$\frac{\sqrt{a+\frac{b}{x^2}}\,x}{a^3}+\frac{6\left(a+\frac{b}{x^2}\right)bx^2-b^2}{3\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}a^3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(-5/2),x, algorithm="maxima")
```

```
[Out] sqrt(a + b/x^2)*x/a^3 + 1/3*(6*(a + b/x^2)*b*x^2 - b^2)/((a + b/x
^2)^(3/2)*a^3*x^3)
```

Fricas [A] time = 0.233599, size = 85, normalized size = 1.47

$$\frac{(3\,a^2x^5+12\,abx^3+8\,b^2x)\sqrt{\frac{ax^2+b}{x^2}}}{3\,(a^5x^4+2\,a^4bx^2+a^3b^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(-5/2),x, algorithm="fricas")
```

```
[Out] 1/3*(3*a^2*x^5 + 12*a*b*x^3 + 8*b^2*x)*sqrt((a*x^2 + b)/x^2)/(a^5
*x^4 + 2*a^4*b*x^2 + a^3*b^2)
```

Sympy [A] time = 5.47467, size = 163, normalized size = 2.81

$$\frac{3a^2b^{\frac{9}{2}}x^4\sqrt{\frac{ax^2}{b}+1}}{3a^5b^4x^4+6a^4b^5x^2+3a^3b^6}+\frac{12ab^{\frac{11}{2}}x^2\sqrt{\frac{ax^2}{b}+1}}{3a^5b^4x^4+6a^4b^5x^2+3a^3b^6}+\frac{8b^{\frac{13}{2}}\sqrt{\frac{ax^2}{b}+1}}{3a^5b^4x^4+6a^4b^5x^2+3a^3b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**(5/2),x)
```

```
[Out] 3*a**2*b**(9/2)*x**4*sqrt(a*x**2/b + 1)/(3*a**5*b**4*x**4 + 6*a**
4*b**5*x**2 + 3*a**3*b**6) + 12*a*b**(11/2)*x**2*sqrt(a*x**2/b +
1)/(3*a**5*b**4*x**4 + 6*a**4*b**5*x**2 + 3*a**3*b**6) + 8*b**(13
/2)*sqrt(a*x**2/b + 1)/(3*a**5*b**4*x**4 + 6*a**4*b**5*x**2 + 3*a
**3*b**6)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a + \frac{b}{x^2}\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^2)^(-5/2),x, algorithm="giac")
```

```
[Out] integrate((a + b/x^2)^(-5/2), x)
```

3.1951 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{5/2} x^2} \, dx$

Optimal. Leaf size=42

$$-\frac{2b}{3a^2x^3\left(a+\frac{b}{x^2}\right)^{3/2}}-\frac{1}{ax\left(a+\frac{b}{x^2}\right)^{3/2}}$$

```
[Out] (-2*b)/(3*a^2*(a + b/x^2)^(3/2)*x^3) - 1/(a*(a + b/x^2)^(3/2)*x)
```

Rubi [A] time = 0.0616614, antiderivative size = 42, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$-\frac{2b}{3a^2x^3\left(a+\frac{b}{x^2}\right)^{3/2}}-\frac{1}{ax\left(a+\frac{b}{x^2}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)^(5/2)*x^2),x]

[Out] (-2*b)/(3*a^2*(a + b/x^2)^(3/2)*x^3) - 1/(a*(a + b/x^2)^(3/2)*x)
```

Rubi in Sympy [A] time = 4.58083, size = 37, normalized size = 0.88

$$-\frac{1}{ax\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}-\frac{2b}{3a^2x^3\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**(5/2)/x**2,x)

[Out] -1/(a*x*(a + b/x**2)**(3/2)) - 2*b/(3*a**2*x**3*(a + b/x**2)**(3/
2))
```

Mathematica [A] time = 0.041058, size = 38, normalized size = 0.9

$$-\frac{x\sqrt{a+\frac{b}{x^2}}\left(3ax^2+2b\right)}{3a^2\left(ax^2+b\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)^(5/2)*x^2),x]

[Out] -(Sqrt[a + b/x^2]*x*(2*b + 3*a*x^2))/(3*a^2*(b + a*x^2)^2)
```

Maple [A] time = 0.01, size = 39, normalized size = 0.9

$$-\frac{\left(ax^2+b\right)\left(3\,ax^2+2\,b\right)}{3\,x^5a^2}\left(\frac{ax^2+b}{x^2}\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^(5/2)/x^2,x)
```

```
[Out] -1/3*(a*x^2+b)*(3*a*x^2+2*b)/a^2/x^5/((a*x^2+b)/x^2)^(5/2)
```

Maxima [A] time = 1.44415, size = 45, normalized size = 1.07

$$-\frac{3\left(a+\frac{b}{x^2}\right)x^2-b}{3\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}a^2x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(5/2)*x^2),x, algorithm="maxima")
```

```
[Out] -1/3*(3*(a + b/x^2)*x^2 - b)/((a + b/x^2)^(3/2)*a^2*x^3)
```

Fricas [A] time = 0.254659, size = 70, normalized size = 1.67

$$-\frac{\left(3\,ax^3+2\,bx\right)\sqrt{\frac{ax^2+b}{x^2}}}{3\left(a^4x^4+2\,a^3bx^2+a^2b^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(5/2)*x^2),x, algorithm="fricas")
```

```
[Out] -1/3*(3*a*x^3 + 2*b*x)*sqrt((a*x^2 + b)/x^2)/(a^4*x^4 + 2*a^3*b*x
^2 + a^2*b^2)
```

Sympy [A] time = 6.98056, size = 105, normalized size = 2.5

$$-\frac{3ax^2}{3a^3\sqrt{b}x^2\sqrt{\frac{ax^2}{b}+1}+3a^2b^{\frac{3}{2}}\sqrt{\frac{ax^2}{b}+1}}-\frac{2b}{3a^3\sqrt{b}x^2\sqrt{\frac{ax^2}{b}+1}+3a^2b^{\frac{3}{2}}\sqrt{\frac{ax^2}{b}+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**(5/2)/x**2,x)
```

```
[Out] -3*a*x**2/(3*a**3*sqrt(b)*x**2*sqrt(a*x**2/b + 1) + 3*a**2*b**(3/
2)*sqrt(a*x**2/b + 1)) - 2*b/(3*a**3*sqrt(b)*x**2*sqrt(a*x**2/b +
 1) + 3*a**2*b**(3/2)*sqrt(a*x**2/b + 1))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{\frac{5}{2}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(5/2)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/((a + b/x^2)^(5/2)*x^2), x)
```

3.1952 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{5/2} x^4} \, dx$

Optimal. Leaf size=21

$$-\frac{1}{3ax^3\left(a+\frac{b}{x^2}\right)^{3/2}}$$

```
[Out] -1/(3*a*(a + b/x^2)^(3/2)*x^3)
```

Rubi [A] time = 0.0299818, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{1}{3ax^3\left(a+\frac{b}{x^2}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)^(5/2)*x^4),x]

[Out] -1/(3*a*(a + b/x^2)^(3/2)*x^3)
```

Rubi in Sympy [A] time = 2.67316, size = 19, normalized size = 0.9

$$-\frac{1}{3ax^3\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**(5/2)/x**4,x)

[Out] -1/(3*a*x**3*(a + b/x**2)**(3/2))
```

Mathematica [A] time = 0.0141356, size = 28, normalized size = 1.33

$$-\frac{ax^2+b}{3ax^5\left(a+\frac{b}{x^2}\right)^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)^(5/2)*x^4),x]

[Out] -(b + a*x^2)/(3*a*(a + b/x^2)^(5/2)*x^5)
```

Maple [A] time = 0.004, size = 29, normalized size = 1.4

$$-\frac{ax^2+b}{3\,ax^5}\left(\frac{ax^2+b}{x^2}\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^(5/2)/x^4,x)

[Out] -1/3*(a*x^2+b)/a/x^5/((a*x^2+b)/x^2)^(5/2)
```

Maxima [A] time = 1.43884, size = 23, normalized size = 1.1

$$-\frac{1}{3\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}ax^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(5/2)*x^4),x, algorithm="maxima")

[Out] -1/3/((a + b/x^2)^(3/2)*a*x^3)
```

Fricas [A] time = 0.24439, size = 54, normalized size = 2.57

$$-\frac{x\sqrt{\frac{ax^2+b}{x^2}}}{3\left(a^3x^4+2\,a^2bx^2+ab^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(5/2)*x^4),x, algorithm="fricas")

[Out] -1/3*x*sqrt((a*x^2 + b)/x^2)/(a^3*x^4 + 2*a^2*b*x^2 + a*b^2)
```

Sympy [A] time = 9.49625, size = 48, normalized size = 2.29

$$-\frac{1}{3a^2\sqrt{b}x^2\sqrt{\frac{ax^2}{b}+1}+3ab^{\frac{3}{2}}\sqrt{\frac{ax^2}{b}+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**(5/2)/x**4,x)

[Out] -1/(3*a**2*sqrt(b)*x**2*sqrt(a*x**2/b + 1) + 3*a*b**(3/2)*sqrt(a*
x**2/b + 1))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\left(a+\frac{b}{x^2}\right)^{\frac{5}{2}}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(5/2)*x^4),x, algorithm="giac")

[Out] integrate(1/((a + b/x^2)^(5/2)*x^4), x)
```

3.1953 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{5/2} x^6} \, dx$

Optimal. Leaf size=68

$$-\frac{\tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{b^{5/2}}+\frac{1}{b^2x\sqrt{a+\frac{b}{x^2}}}+\frac{1}{3bx^3\left(a+\frac{b}{x^2}\right)^{3/2}}$$

```
[Out] 1/(3*b*(a + b/x^2)^(3/2)*x^3) + 1/(b^2*Sqrt[a + b/x^2]*x) - ArcTa
nh[Sqrt[b]/(Sqrt[a + b/x^2]*x)]/b^(5/2)
```

Rubi [A] time = 0.10844, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{\tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{b^{5/2}}+\frac{1}{b^2x\sqrt{a+\frac{b}{x^2}}}+\frac{1}{3bx^3\left(a+\frac{b}{x^2}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)^(5/2)*x^6),x]
```

```
[Out] 1/(3*b*(a + b/x^2)^(3/2)*x^3) + 1/(b^2*Sqrt[a + b/x^2]*x) - ArcTa
nh[Sqrt[b]/(Sqrt[a + b/x^2]*x)]/b^(5/2)
```

Rubi in Sympy [A] time = 10.7652, size = 58, normalized size = 0.85

$$\frac{1}{3bx^3\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}+\frac{1}{b^2x\sqrt{a+\frac{b}{x^2}}}-\frac{\operatorname{atanh}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{b^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**(5/2)/x**6,x)
```

```
[Out] 1/(3*b*x**3*(a + b/x**2)**(3/2)) + 1/(b**2*x*sqrt(a + b/x**2)) -
atanh(sqrt(b)/(x*sqrt(a + b/x**2)))/b**(5/2)
```

Mathematica [A] time = 0.12355, size = 97, normalized size = 1.43

$$\frac{\sqrt{b}\left(3ax^2+4b\right)+3\log(x)\left(ax^2+b\right)^{3/2}-3\left(ax^2+b\right)^{3/2}\log\left(\sqrt{b}\sqrt{ax^2+b}+b\right)}{3b^{5/2}x\sqrt{a+\frac{b}{x^2}}\left(ax^2+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)^(5/2)*x^6),x]
```

```
[Out] (Sqrt[b]*(4*b + 3*a*x^2) + 3*(b + a*x^2)^(3/2)*Log[x] - 3*(b + a*
x^2)^(3/2)*Log[b + Sqrt[b]*Sqrt[b + a*x^2]])/(3*b^(5/2)*Sqrt[a +
```

```
b/x^2]*x*(b + a*x^2))
```

Maple [A] time = 0.01, size = 77, normalized size = 1.1

$$\frac{ax^2+b}{3x^5}\left(3b^{3/2}x^2a+4b^{5/2}-3\ln\left(2\frac{\sqrt{b}\sqrt{ax^2+b}+b}{x}\right)\left(ax^2+b\right)^{3/2}b\right)\left(\frac{ax^2+b}{x^2}\right)^{-\frac{5}{2}}b^{-\frac{7}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^(5/2)/x^6,x)
```

```
[Out] 1/3*(a*x^2+b)*(3*b^(3/2)*x^2*a+4*b^(5/2)-3*ln(2*(b^(1/2)*(a*x^2+b
)^(1/2)+b)/x)*(a*x^2+b)^(3/2)*b)/((a*x^2+b)/x^2)^(5/2)/x^5/b^(7/2
)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(5/2)*x^6),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.258944, size = 1, normalized size = 0.01

$$\left[\frac{3\left(a^2x^4+2abx^2+b^2\right)\sqrt{b}\log\left(\frac{2bx\sqrt{\frac{ax^2+b}{x^2}}-\left(ax^2+2b\right)\sqrt{b}}{x^2}\right)+2\left(3abx^3+4b^2x\right)\sqrt{\frac{ax^2+b}{x^2}}}{6\left(a^2b^3x^4+2ab^4x^2+b^5\right)}, \frac{3\left(a^2x^4+2abx^2+b^2\right)\sqrt{-b}\arctan\left(\frac{\ldots}{x\ldots}\right.}{3\left(a^2b^3x^4+2\ldots\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(5/2)*x^6),x, algorithm="fricas")
```

```
[Out] [1/6*(3*(a^2*x^4 + 2*a*b*x^2 + b^2)*sqrt(b)*log((2*b*x*sqrt((a*x^
2 + b)/x^2) - (a*x^2 + 2*b)*sqrt(b))/x^2) + 2*(3*a*b*x^3 + 4*b^2*
x)*sqrt((a*x^2 + b)/x^2))/(a^2*b^3*x^4 + 2*a*b^4*x^2 + b^5), 1/3*
(3*(a^2*x^4 + 2*a*b*x^2 + b^2)*sqrt(-b)*arctan(sqrt(-b)/(x*sqrt((
a*x^2 + b)/x^2))) + (3*a*b*x^3 + 4*b^2*x)*sqrt((a*x^2 + b)/x^2))/
(a^2*b^3*x^4 + 2*a*b^4*x^2 + b^5)]
```

Sympy [A] time = 21.7834, size = 740, normalized size = 10.88

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**(5/2)/x**6,x)
```

```
[Out] 3*a**3*b**4*x**6*log(a*x**2/b)/(6*a**3*b**(13/2)*x**6 + 18*a**2*b
**(15/2)*x**4 + 18*a*b**(17/2)*x**2 + 6*b**(19/2)) - 6*a**3*b**4*
```

```
x**6*log(sqrt(a*x**2/b + 1) + 1)/(6*a**3*b**(13/2)*x**6 + 18*a**2
*b**(15/2)*x**4 + 18*a*b**(17/2)*x**2 + 6*b**(19/2)) + 6*a**2*b**
5*x**4*sqrt(a*x**2/b + 1)/(6*a**3*b**(13/2)*x**6 + 18*a**2*b**(15
/2)*x**4 + 18*a*b**(17/2)*x**2 + 6*b**(19/2)) + 9*a**2*b**5*x**4*
log(a*x**2/b)/(6*a**3*b**(13/2)*x**6 + 18*a**2*b**(15/2)*x**4 + 1
8*a*b**(17/2)*x**2 + 6*b**(19/2)) - 18*a**2*b**5*x**4*log(sqrt(a*
x**2/b + 1) + 1)/(6*a**3*b**(13/2)*x**6 + 18*a**2*b**(15/2)*x**4
+ 18*a*b**(17/2)*x**2 + 6*b**(19/2)) + 14*a*b**6*x**2*sqrt(a*x**2
/b + 1)/(6*a**3*b**(13/2)*x**6 + 18*a**2*b**(15/2)*x**4 + 18*a*b*
*(17/2)*x**2 + 6*b**(19/2)) + 9*a*b**6*x**2*log(a*x**2/b)/(6*a**3
*b**(13/2)*x**6 + 18*a**2*b**(15/2)*x**4 + 18*a*b**(17/2)*x**2 +
6*b**(19/2)) - 18*a*b**6*x**2*log(sqrt(a*x**2/b + 1) + 1)/(6*a**3
*b**(13/2)*x**6 + 18*a**2*b**(15/2)*x**4 + 18*a*b**(17/2)*x**2 +
6*b**(19/2)) + 8*b**7*sqrt(a*x**2/b + 1)/(6*a**3*b**(13/2)*x**6 +
 18*a**2*b**(15/2)*x**4 + 18*a*b**(17/2)*x**2 + 6*b**(19/2)) + 3*
b**7*log(a*x**2/b)/(6*a**3*b**(13/2)*x**6 + 18*a**2*b**(15/2)*x**
4 + 18*a*b**(17/2)*x**2 + 6*b**(19/2)) - 6*b**7*log(sqrt(a*x**2/b
 + 1) + 1)/(6*a**3*b**(13/2)*x**6 + 18*a**2*b**(15/2)*x**4 + 18*a
*b**(17/2)*x**2 + 6*b**(19/2))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{\frac{5}{2}}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(5/2)*x^6),x, algorithm="giac")
```

```
[Out] integrate(1/((a + b/x^2)^(5/2)*x^6), x)
```

3.1954 $\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{5/2} x^8} \, dx$

Optimal. Leaf size=95

$$\frac{5a\tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{2b^{7/2}}-\frac{5\sqrt{a+\frac{b}{x^2}}}{2b^3x}+\frac{5}{3b^2x^3\sqrt{a+\frac{b}{x^2}}}+\frac{1}{3bx^5\left(a+\frac{b}{x^2}\right)^{3/2}}$$

```
[Out] 1/(3*b*(a + b/x^2)^(3/2)*x^5) + 5/(3*b^2*Sqrt[a + b/x^2]*x^3) - (
5*Sqrt[a + b/x^2])/(2*b^3*x) + (5*a*ArcTanh[Sqrt[b]/(Sqrt[a + b/x
^2]*x)])/(2*b^(7/2))
```

Rubi [A] time = 0.148155, antiderivative size = 95, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{5a\tanh^{-1}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{2b^{7/2}}-\frac{5\sqrt{a+\frac{b}{x^2}}}{2b^3x}+\frac{5}{3b^2x^3\sqrt{a+\frac{b}{x^2}}}+\frac{1}{3bx^5\left(a+\frac{b}{x^2}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^2)^(5/2)*x^8),x]
```

```
[Out] 1/(3*b*(a + b/x^2)^(3/2)*x^5) + 5/(3*b^2*Sqrt[a + b/x^2]*x^3) - (
5*Sqrt[a + b/x^2])/(2*b^3*x) + (5*a*ArcTanh[Sqrt[b]/(Sqrt[a + b/x
^2]*x)])/(2*b^(7/2))
```

Rubi in Sympy [A] time = 14.7528, size = 85, normalized size = 0.89

$$\frac{5a\,\mathrm{atanh}\left(\frac{\sqrt{b}}{x\sqrt{a+\frac{b}{x^2}}}\right)}{2b^{\frac{7}{2}}}+\frac{1}{3bx^5\left(a+\frac{b}{x^2}\right)^{\frac{3}{2}}}+\frac{5}{3b^2x^3\sqrt{a+\frac{b}{x^2}}}-\frac{5\sqrt{a+\frac{b}{x^2}}}{2b^3x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**2)**(5/2)/x**8,x)
```

```
[Out] 5*a*atanh(sqrt(b)/(x*sqrt(a + b/x**2)))/(2*b**(7/2)) + 1/(3*b*x**
5*(a + b/x**2)**(3/2)) + 5/(3*b**2*x**3*sqrt(a + b/x**2)) - 5*sqr
t(a + b/x**2)/(2*b**3*x)
```

Mathematica [A] time = 0.130607, size = 117, normalized size = 1.23

$$\frac{-\sqrt{b}\left(15a^2x^4+20abx^2+3b^2\right)-15ax^2\log(x)\left(ax^2+b\right)^{3/2}+15ax^2\left(ax^2+b\right)^{3/2}\log\left(\sqrt{b}\sqrt{ax^2+b}+b\right)}{6b^{7/2}x^3\sqrt{a+\frac{b}{x^2}}\left(ax^2+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^2)^(5/2)*x^8),x]
```

```
[Out] (-(Sqrt[b]*(3*b^2 + 20*a*b*x^2 + 15*a^2*x^4)) - 15*a*x^2*(b + a*x
^2)^(3/2)*Log[x] + 15*a*x^2*(b + a*x^2)^(3/2)*Log[b + Sqrt[b]*Sqr
t[b + a*x^2]])/(6*b^(7/2)*Sqrt[a + b/x^2]*x^3*(b + a*x^2))
```

Maple [A] time = 0.012, size = 92, normalized size = 1.

$$-\frac{ax^{2}+b}{6\,x^{7}}\left(15\,b^{3/2}x^{4}a^{2}+20\,b^{5/2}x^{2}a-15\,\ln\left(2\,\frac{\sqrt{b}\sqrt{ax^{2}+b}+b}{x}\right)\left(ax^{2}+b\right)^{3/2}x^{2}ab+3\,b^{7/2}\right)\left(\frac{ax^{2}+b}{x^{2}}\right)^{-\frac{5}{2}}b^{-\frac{9}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^2)^(5/2)/x^8,x)
```

```
[Out] -1/6*(a*x^2+b)*(15*b^(3/2)*x^4*a^2+20*b^(5/2)*x^2*a-15*ln(2*(b^(1
/2)*(a*x^2+b)^(1/2)+b)/x)*(a*x^2+b)^(3/2)*x^2*a*b+3*b^(7/2))/((a*
x^2+b)/x^2)^(5/2)/x^7/b^(9/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(5/2)*x^8),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.261959, size = 1, normalized size = 0.01

$$\left[\frac{15\left(a^{3}x^{5}+2\,a^{2}bx^{3}+ab^{2}x\right)\sqrt{b}\log\left(-\frac{2\,bx\sqrt{\frac{ax^{2}+b}{x^{2}}}+\left(ax^{2}+2\,b\right)\sqrt{b}}{x^{2}}\right)-2\left(15\,a^{2}bx^{4}+20\,ab^{2}x^{2}+3\,b^{3}\right)\sqrt{\frac{ax^{2}+b}{x^{2}}}}{12\left(a^{2}b^{4}x^{5}+2\,ab^{5}x^{3}+b^{6}x\right)},\ -\frac{15\left(a^{3}x^{5}+2\,a^{2}bx^{3}+ab^{2}x\right)\sqrt{-b}\arctan\left(\frac{\sqrt{-b}}{x\sqrt{\frac{ax^{2}+b}{x^{2}}}}\right)+\left(15\,a^{2}bx^{4}+20\,ab^{2}x^{2}+3\,b^{3}\right)\sqrt{\frac{ax^{2}+b}{x^{2}}}}{6\left(a^{2}b^{4}x^{5}+2\,ab^{5}x^{3}+b^{6}x\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(5/2)*x^8),x, algorithm="fricas")
```

```
[Out] [1/12*(15*(a^3*x^5 + 2*a^2*b*x^3 + a*b^2*x)*sqrt(b)*log(-(2*b*x*s
qrt((a*x^2 + b)/x^2) + (a*x^2 + 2*b)*sqrt(b))/x^2) - 2*(15*a^2*b*
x^4 + 20*a*b^2*x^2 + 3*b^3)*sqrt((a*x^2 + b)/x^2))/(a^2*b^4*x^5 +
 2*a*b^5*x^3 + b^6*x), -1/6*(15*(a^3*x^5 + 2*a^2*b*x^3 + a*b^2*x)
*sqrt(-b)*arctan(sqrt(-b)/(x*sqrt((a*x^2 + b)/x^2))) + (15*a^2*b*
x^4 + 20*a*b^2*x^2 + 3*b^3)*sqrt((a*x^2 + b)/x^2))/(a^2*b^4*x^5 +
 2*a*b^5*x^3 + b^6*x)]
```

Sympy [A] time = 35.2349, size = 864, normalized size = 9.09

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**2)**(5/2)/x**8,x)
```

```
[Out] -15*a**4*b**13*x**8*log(a*x**2/b)/(12*a**3*b**(33/2)*x**8 + 36*a*
*2*b**(35/2)*x**6 + 36*a*b**(37/2)*x**4 + 12*b**(39/2)*x**2) + 30
*a**4*b**13*x**8*log(sqrt(a*x**2/b + 1) + 1)/(12*a**3*b**(33/2)*x
**8 + 36*a**2*b**(35/2)*x**6 + 36*a*b**(37/2)*x**4 + 12*b**(39/2)
*x**2) - 30*a**3*b**14*x**6*sqrt(a*x**2/b + 1)/(12*a**3*b**(33/2)
*x**8 + 36*a**2*b**(35/2)*x**6 + 36*a*b**(37/2)*x**4 + 12*b**(39/
2)*x**2) - 45*a**3*b**14*x**6*log(a*x**2/b)/(12*a**3*b**(33/2)*x*
*8 + 36*a**2*b**(35/2)*x**6 + 36*a*b**(37/2)*x**4 + 12*b**(39/2)*
x**2) + 90*a**3*b**14*x**6*log(sqrt(a*x**2/b + 1) + 1)/(12*a**3*b
**(33/2)*x**8 + 36*a**2*b**(35/2)*x**6 + 36*a*b**(37/2)*x**4 + 12
*b**(39/2)*x**2) - 70*a**2*b**15*x**4*sqrt(a*x**2/b + 1)/(12*a**3
*b**(33/2)*x**8 + 36*a**2*b**(35/2)*x**6 + 36*a*b**(37/2)*x**4 +
12*b**(39/2)*x**2) - 45*a**2*b**15*x**4*log(a*x**2/b)/(12*a**3*b*
*(33/2)*x**8 + 36*a**2*b**(35/2)*x**6 + 36*a*b**(37/2)*x**4 + 12*
b**(39/2)*x**2) + 90*a**2*b**15*x**4*log(sqrt(a*x**2/b + 1) + 1)/
(12*a**3*b**(33/2)*x**8 + 36*a**2*b**(35/2)*x**6 + 36*a*b**(37/2)
*x**4 + 12*b**(39/2)*x**2) - 46*a*b**16*x**2*sqrt(a*x**2/b + 1)/(
12*a**3*b**(33/2)*x**8 + 36*a**2*b**(35/2)*x**6 + 36*a*b**(37/2)*
x**4 + 12*b**(39/2)*x**2) - 15*a*b**16*x**2*log(a*x**2/b)/(12*a**
3*b**(33/2)*x**8 + 36*a**2*b**(35/2)*x**6 + 36*a*b**(37/2)*x**4 +
 12*b**(39/2)*x**2) + 30*a*b**16*x**2*log(sqrt(a*x**2/b + 1) + 1)
/(12*a**3*b**(33/2)*x**8 + 36*a**2*b**(35/2)*x**6 + 36*a*b**(37/2
)*x**4 + 12*b**(39/2)*x**2) - 6*b**17*sqrt(a*x**2/b + 1)/(12*a**3
*b**(33/2)*x**8 + 36*a**2*b**(35/2)*x**6 + 36*a*b**(37/2)*x**4 +
12*b**(39/2)*x**2)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^2}\right)^{\frac{5}{2}}x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^2)^(5/2)*x^8),x, algorithm="giac")
```

```
[Out] integrate(1/((a + b/x^2)^(5/2)*x^8), x)
```

3.1955 $\int \frac{\sqrt[3]{1+\frac{1}{x^2}}}{x^3}\,dx$

Optimal. Leaf size=13

$$-\frac{3}{8}\left(\frac{1}{x^2}+1\right)^{4/3}$$

```
[Out] (-3*(1 + x^(-2))^(4/3))/8
```

Rubi [A] time = 0.0161473, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{3}{8}\left(\frac{1}{x^2}+1\right)^{4/3}$$

Antiderivative was successfully verified.

```
[In]  Int[(1 + x^(-2))^(1/3)/x^3,x]

[Out] (-3*(1 + x^(-2))^(4/3))/8
```

Rubi in Sympy [A] time = 1.63378, size = 14, normalized size = 1.08

$$-\frac{3\left(1+\frac{1}{x^2}\right)^{\frac{4}{3}}}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((1+1/x**2)**(1/3)/x**3,x)

[Out] -3*(1 + x**(-2))**(4/3)/8
```

Mathematica [A] time = 0.0194114, size = 13, normalized size = 1.

$$-\frac{3}{8}\left(\frac{1}{x^2}+1\right)^{4/3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(1 + x^(-2))^(1/3)/x^3,x]

[Out] (-3*(1 + x^(-2))^(4/3))/8
```

Maple [B] time = 0.005, size = 22, normalized size = 1.7

$$-\frac{3x^2+3}{8x^2}\sqrt[3]{\frac{x^2+1}{x^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((1+1/x^2)^(1/3)/x^3,x)
```

```
[Out] -3/8/x^2*(x^2+1)*((x^2+1)/x^2)^(1/3)
```

Maxima [A] time = 1.43535, size = 12, normalized size = 0.92

$$-\frac{3}{8}\left(\frac{1}{x^2}+1\right)^{\frac{4}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1/x^2 + 1)^(1/3)/x^3,x, algorithm="maxima")
```

```
[Out] -3/8*(1/x^2 + 1)^(4/3)
```

Fricas [A] time = 0.233103, size = 28, normalized size = 2.15

$$-\frac{3\left(x^2+1\right)\left(\frac{x^2+1}{x^2}\right)^{\frac{1}{3}}}{8\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1/x^2 + 1)^(1/3)/x^3,x, algorithm="fricas")
```

```
[Out] -3/8*(x^2 + 1)*((x^2 + 1)/x^2)^(1/3)/x^2
```

Sympy [A] time = 3.36043, size = 31, normalized size = 2.38

$$-\frac{3\sqrt[3]{1+\frac{1}{x^2}}}{8}-\frac{3\sqrt[3]{1+\frac{1}{x^2}}}{8x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+1/x**2)**(1/3)/x**3,x)
```

```
[Out] -3*(1 + x**(-2))**(1/3)/8 - 3*(1 + x**(-2))**(1/3)/(8*x**2)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(\frac{1}{x^2}+1\right)^{\frac{1}{3}}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1/x^2 + 1)^(1/3)/x^3,x, algorithm="giac")
```

```
[Out] integrate((1/x^2 + 1)^(1/3)/x^3, x)
```

3.1956 $\int \frac{\left(1+\frac{1}{x^2}\right)^{5/3}}{x^3} dx$

Optimal. Leaf size=13

$$-\frac{3}{16}\left(\frac{1}{x^2}+1\right)^{8/3}$$

```
[Out] (-3*(1 + x^(-2))^(8/3))/16
```

Rubi [A] time = 0.0168628, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{3}{16}\left(\frac{1}{x^2}+1\right)^{8/3}$$

Antiderivative was successfully verified.

```
[In]  Int[(1 + x^(-2))^(5/3)/x^3,x]
```

```
[Out] (-3*(1 + x^(-2))^(8/3))/16
```

Rubi in Sympy [A] time = 1.67006, size = 14, normalized size = 1.08

$$-\frac{3\left(1+\frac{1}{x^2}\right)^{\frac{8}{3}}}{16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((1+1/x**2)**(5/3)/x**3,x)
```

```
[Out] -3*(1 + x**(-2))**(8/3)/16
```

Mathematica [A] time = 0.0200953, size = 23, normalized size = 1.77

$$-\frac{3\left(\frac{1}{x^2}+1\right)^{2/3}\left(x^2+1\right)^2}{16x^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(1 + x^(-2))^(5/3)/x^3,x]
```

```
[Out] (-3*(1 + x^(-2))^(2/3)*(1 + x^2)^2)/(16*x^4)
```

Maple [B] time = 0.004, size = 22, normalized size = 1.7

$$-\frac{3\,x^2+3}{16\,x^2}\left(\frac{x^2+1}{x^2}\right)^{\frac{5}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((1+1/x^2)^(5/3)/x^3,x)
```

```
[Out] -3/16/x^2*(x^2+1)*((x^2+1)/x^2)^(5/3)
```

Maxima [A] time = 1.43499, size = 12, normalized size = 0.92

$$-\frac{3}{16}\left(\frac{1}{x^2}+1\right)^{\frac{8}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1/x^2 + 1)^(5/3)/x^3,x, algorithm="maxima")
```

```
[Out] -3/16*(1/x^2 + 1)^(8/3)
```

Fricas [A] time = 0.242366, size = 35, normalized size = 2.69

$$-\frac{3\left(x^4+2x^2+1\right)\left(\frac{x^2+1}{x^2}\right)^{\frac{2}{3}}}{16x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1/x^2 + 1)^(5/3)/x^3,x, algorithm="fricas")
```

```
[Out] -3/16*(x^4 + 2*x^2 + 1)*((x^2 + 1)/x^2)^(2/3)/x^4
```

Sympy [A] time = 8.54398, size = 48, normalized size = 3.69

$$-\frac{3\left(1+\frac{1}{x^2}\right)^{\frac{2}{3}}}{16}-\frac{3\left(1+\frac{1}{x^2}\right)^{\frac{2}{3}}}{8x^2}-\frac{3\left(1+\frac{1}{x^2}\right)^{\frac{2}{3}}}{16x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+1/x**2)**(5/3)/x**3,x)
```

```
[Out] -3*(1 + x**(-2))**(2/3)/16 - 3*(1 + x**(-2))**(2/3)/(8*x**2) - 3*
(1 + x**(-2))**(2/3)/(16*x**4)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(\frac{1}{x^2}+1\right)^{\frac{5}{3}}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1/x^2 + 1)^(5/3)/x^3,x, algorithm="giac")
```

```
[Out] integrate((1/x^2 + 1)^(5/3)/x^3, x)
```

3.1957 $\int \left(1+\frac{b}{x^2}\right)^{3/2} (cx)^m \, dx$

Optimal. Leaf size=44

$$\frac{(cx)^{m+1} {}_2F_1\left(-\frac{3}{2},\frac{1}{2}(-m-1);\frac{1-m}{2};-\frac{b}{x^2}\right)}{c(m+1)}$$

```
[Out] ((c*x)^(1 + m)*Hypergeometric2F1[-3/2, (-1 - m)/2, (1 - m)/2, -(b
/x^2)])/(c*(1 + m))
```

Rubi [A] time = 0.0704241, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{(cx)^{m+1} {}_2F_1\left(-\frac{3}{2},\frac{1}{2}(-m-1);\frac{1-m}{2};-\frac{b}{x^2}\right)}{c(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(1 + b/x^2)^(3/2)*(c*x)^m,x]
```

```
[Out] ((c*x)^(1 + m)*Hypergeometric2F1[-3/2, (-1 - m)/2, (1 - m)/2, -(b
/x^2)])/(c*(1 + m))
```

Rubi in Sympy [A] time = 6.58781, size = 44, normalized size = 1.

$$\frac{(cx)^m \left(\frac{1}{x}\right)^m \left(\frac{1}{x}\right)^{-m-1} {}_2F_1\left(\begin{matrix} -\frac{3}{2}, -\frac{m}{2}-\frac{1}{2} \\ -\frac{m}{2}+\frac{1}{2} \end{matrix}\middle| -\frac{b}{x^2}\right)}{m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((1+b/x**2)**(3/2)*(c*x)**m,x)
```

```
[Out] (c*x)**m*(1/x)**m*(1/x)**(-m - 1)*hyper((-3/2, -m/2 - 1/2), (-m/2
 + 1/2,), -b/x**2)/(m + 1)
```

Mathematica [B] time = 0.111911, size = 100, normalized size = 2.27

$$\frac{\sqrt{\frac{b}{x^2}+1}(cx)^m \left((m-2)x^2 {}_2F_1\left(-\frac{1}{2},\frac{m}{2};\frac{m}{2}+1;-\frac{x^2}{b}\right)+bm\, {}_2F_1\left(-\frac{1}{2},\frac{m}{2}-1;\frac{m}{2};-\frac{x^2}{b}\right)\right)}{(m-2)mx\sqrt{\frac{b+x^2}{b}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(1 + b/x^2)^(3/2)*(c*x)^m,x]
```

```
[Out] (Sqrt[1 + b/x^2]*(c*x)^m*(b*m*Hypergeometric2F1[-1/2, -1 + m/2, m
/2, -(x^2/b)] + (-2 + m)*x^2*Hypergeometric2F1[-1/2, m/2, 1 + m/2
, -(x^2/b)]))/((-2 + m)*m*x*Sqrt[(b + x^2)/b])
```

Maple [F] time = 0.024, size = 0, normalized size = 0.

$$\int \left(1+\frac{b}{x^2}\right)^{\frac{3}{2}} (cx)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((1+b/x^2)^(3/2)*(c*x)^m,x)
```

```
[Out] int((1+b/x^2)^(3/2)*(c*x)^m,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (cx)^m \left(\frac{b}{x^2}+1\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m*(b/x^2 + 1)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((c*x)^m*(b/x^2 + 1)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\left(x^2+b\right)(cx)^m\sqrt{\frac{x^2+b}{x^2}}}{x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m*(b/x^2 + 1)^(3/2),x, algorithm="fricas")
```

```
[Out] integral((x^2 + b)*(c*x)^m*sqrt((x^2 + b)/x^2)/x^2, x)
```

Sympy [A] time = 76.2196, size = 56, normalized size = 1.27

$$-\frac{c^m x x^m \left(-\frac{m}{2}-\frac{1}{2}\right) {}_2F_1\left(\begin{matrix} -\frac{3}{2},-\frac{m}{2}-\frac{1}{2} \\ -\frac{m}{2}+\frac{1}{2} \end{matrix}\middle|\frac{be^{i\pi}}{x^2}\right)}{2\left(-\frac{m}{2}+\frac{1}{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((1+b/x**2)**(3/2)*(c*x)**m,x)
```

```
[Out] -c**m*x*x**m*gamma(-m/2 - 1/2)*hyper((-3/2, -m/2 - 1/2), (-m/2 +
1/2,), b*exp_polar(I*pi)/x**2)/(2*gamma(-m/2 + 1/2))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (cx)^m \left(\frac{b}{x^2}+1\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m*(b/x^2 + 1)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((c*x)^m*(b/x^2 + 1)^(3/2), x)
```

3.1958 $\int \sqrt{1+\frac{b}{x^2}}(cx)^m\,dx$

Optimal. Leaf size=44

$$\frac{(cx)^{m+1}\,{}_2F_1\left(-\frac{1}{2},\frac{1}{2}(-m-1);\frac{1-m}{2};-\frac{b}{x^2}\right)}{c(m+1)}$$

```
[Out] ((c*x)^(1 + m)*Hypergeometric2F1[-1/2, (-1 - m)/2, (1 - m)/2, -(b
/x^2)])/(c*(1 + m))
```

Rubi [A] time = 0.0569861, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{(cx)^{m+1}\,{}_2F_1\left(-\frac{1}{2},\frac{1}{2}(-m-1);\frac{1-m}{2};-\frac{b}{x^2}\right)}{c(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[1 + b/x^2]*(c*x)^m,x]
```

```
[Out] ((c*x)^(1 + m)*Hypergeometric2F1[-1/2, (-1 - m)/2, (1 - m)/2, -(b
/x^2)])/(c*(1 + m))
```

Rubi in Sympy [A] time = 6.30985, size = 44, normalized size = 1.

$$\frac{(cx)^m\left(\frac{1}{x}\right)^m\left(\frac{1}{x}\right)^{-m-1}{}_2F_1\left(\begin{matrix}-\frac{1}{2},-\frac{m}{2}-\frac{1}{2}\\-\frac{m}{2}+\frac{1}{2}\end{matrix}\middle|-\frac{b}{x^2}\right)}{m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((1+b/x**2)**(1/2)*(c*x)**m,x)
```

```
[Out] (c*x)**m*(1/x)**m*(1/x)**(-m - 1)*hyper((-1/2, -m/2 - 1/2), (-m/2
 + 1/2,), -b/x**2)/(m + 1)
```

Mathematica [A] time = 0.0245206, size = 58, normalized size = 1.32

$$\frac{x\sqrt{\frac{b}{x^2}+1}(cx)^m\,{}_2F_1\left(-\frac{1}{2},\frac{m}{2};\frac{m}{2}+1;-\frac{x^2}{b}\right)}{m\sqrt{\frac{b+x^2}{b}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[1 + b/x^2]*(c*x)^m,x]
```

```
[Out] (Sqrt[1 + b/x^2]*x*(c*x)^m*Hypergeometric2F1[-1/2, m/2, 1 + m/2,
-(x^2/b)])/(m*Sqrt[(b + x^2)/b])
```

Maple [F] time = 0.017, size = 0, normalized size = 0.

$$\int \sqrt{1+\frac{b}{x^2}}\,(cx)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((1+b/x^2)^(1/2)*(c*x)^m,x)
```

```
[Out] int((1+b/x^2)^(1/2)*(c*x)^m,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (cx)^m \sqrt{\frac{b}{x^2} + 1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m*sqrt(b/x^2 + 1),x, algorithm="maxima")
```

```
[Out] integrate((c*x)^m*sqrt(b/x^2 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left((cx)^m \sqrt{\frac{x^2 + b}{x^2}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m*sqrt(b/x^2 + 1),x, algorithm="fricas")
```

```
[Out] integral((c*x)^m*sqrt((x^2 + b)/x^2), x)
```

Sympy [A] time = 7.90338, size = 48, normalized size = 1.09

$$-\frac{\sqrt{b}c^m x^m \Gamma\left(-\frac{m}{2}\right) {}_2F_1\left(\left.\begin{matrix} -\frac{1}{2}, \frac{m}{2} \\ \frac{m}{2} + 1 \end{matrix}\right| \frac{x^2 e^{i\pi}}{b}\right)}{2\Gamma\left(-\frac{m}{2} + 1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((1+b/x**2)**(1/2)*(c*x)**m,x)
```

```
[Out] -sqrt(b)*c**m*x**m*gamma(-m/2)*hyper((-1/2, m/2), (m/2 + 1,), x**
2*exp_polar(I*pi)/b)/(2*gamma(-m/2 + 1))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (cx)^m \sqrt{\frac{b}{x^2} + 1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m*sqrt(b/x^2 + 1),x, algorithm="giac")
```

```
[Out] integrate((c*x)^m*sqrt(b/x^2 + 1), x)
```

3.1959 $\int \frac{(cx)^m}{\sqrt{1+\frac{b}{x^2}}}\,dx$

Optimal. Leaf size=44

$$\frac{(cx)^{m+1}\,{}_2F_1\left(\frac{1}{2},\frac{1}{2}(-m-1);\frac{1-m}{2};-\frac{b}{x^2}\right)}{c(m+1)}$$

```
[Out] ((c*x)^(1 + m)*Hypergeometric2F1[1/2, (-1 - m)/2, (1 - m)/2, -(b/
x^2)])/(c*(1 + m))
```

Rubi [A] time = 0.0615539, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{(cx)^{m+1}\,{}_2F_1\left(\frac{1}{2},\frac{1}{2}(-m-1);\frac{1-m}{2};-\frac{b}{x^2}\right)}{c(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^m/Sqrt[1 + b/x^2],x]
```

```
[Out] ((c*x)^(1 + m)*Hypergeometric2F1[1/2, (-1 - m)/2, (1 - m)/2, -(b/
x^2)])/(c*(1 + m))
```

Rubi in Sympy [A] time = 6.41463, size = 42, normalized size = 0.95

$$\frac{(cx)^m\left(\frac{1}{x}\right)^m\left(\frac{1}{x}\right)^{-m-1}{}_2F_1\left(\begin{matrix}\frac{1}{2},-\frac{m}{2}-\frac{1}{2}\\-\frac{m}{2}+\frac{1}{2}\end{matrix}\middle|-\frac{b}{x^2}\right)}{m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**m/(1+b/x**2)**(1/2),x)
```

```
[Out] (c*x)**m*(1/x)**m*(1/x)**(-m - 1)*hyper((1/2, -m/2 - 1/2), (-m/2
+ 1/2,), -b/x**2)/(m + 1)
```

Mathematica [A] time = 0.050518, size = 64, normalized size = 1.45

$$\frac{x\sqrt{\frac{b+x^2}{b}}(cx)^m\,{}_2F_1\left(\frac{1}{2},\frac{m+2}{2};\frac{m+2}{2}+1;-\frac{x^2}{b}\right)}{(m+2)\sqrt{\frac{b}{x^2}+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^m/Sqrt[1 + b/x^2],x]
```

```
[Out] (x*(c*x)^m*Sqrt[(b + x^2)/b]*Hypergeometric2F1[1/2, (2 + m)/2, 1
+ (2 + m)/2, -(x^2/b)])/((2 + m)*Sqrt[1 + b/x^2])
```

Maple [F] time = 0.02, size = 0, normalized size = 0.

$$\int (cx)^m\frac{1}{\sqrt{1+\frac{b}{x^2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^m/(1+b/x^2)^(1/2),x)
```

```
[Out] int((c*x)^m/(1+b/x^2)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx)^m}{\sqrt{\frac{b}{x^2}+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m/sqrt(b/x^2 + 1),x, algorithm="maxima")
```

```
[Out] integrate((c*x)^m/sqrt(b/x^2 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(cx)^m}{\sqrt{\frac{x^2+b}{x^2}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m/sqrt(b/x^2 + 1),x, algorithm="fricas")
```

```
[Out] integral((c*x)^m/sqrt((x^2 + b)/x^2), x)
```

Sympy [A] time = 4.97134, size = 54, normalized size = 1.23

$$-\frac{c^m x x^m \left(-\frac{m}{2}-\frac{1}{2}\right) {}_2F_1\left(\begin{matrix}\frac{1}{2}, -\frac{m}{2}-\frac{1}{2}\\ -\frac{m}{2}+\frac{1}{2}\end{matrix}\middle|\frac{be^{i\pi}}{x^2}\right)}{2\left(-\frac{m}{2}+\frac{1}{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**m/(1+b/x**2)**(1/2),x)
```

```
[Out] -c**m*x*x**m*gamma(-m/2 - 1/2)*hyper((1/2, -m/2 - 1/2), (-m/2 + 1
/2,), b*exp_polar(I*pi)/x**2)/(2*gamma(-m/2 + 1/2))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx)^m}{\sqrt{\frac{b}{x^2}+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m/sqrt(b/x^2 + 1),x, algorithm="giac")
```

```
[Out] integrate((c*x)^m/sqrt(b/x^2 + 1), x)
```

3.1960 $\int \frac{(cx)^m}{\left(1+\frac{b}{x^2}\right)^{3/2}} dx$

Optimal. Leaf size=44

$$\frac{(cx)^{m+1} {}_2F_1\left(\frac{3}{2},\frac{1}{2}(-m-1);\frac{1-m}{2};-\frac{b}{x^2}\right)}{c(m+1)}$$

```
[Out] ((c*x)^(1 + m)*Hypergeometric2F1[3/2, (-1 - m)/2, (1 - m)/2, -(b/
x^2)])/(c*(1 + m))
```

Rubi [A] time = 0.0611903, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{(cx)^{m+1} {}_2F_1\left(\frac{3}{2},\frac{1}{2}(-m-1);\frac{1-m}{2};-\frac{b}{x^2}\right)}{c(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^m/(1 + b/x^2)^(3/2),x]
```

```
[Out] ((c*x)^(1 + m)*Hypergeometric2F1[3/2, (-1 - m)/2, (1 - m)/2, -(b/
x^2)])/(c*(1 + m))
```

Rubi in Sympy [A] time = 6.28187, size = 42, normalized size = 0.95

$$\frac{(cx)^m \left(\frac{1}{x}\right)^m \left(\frac{1}{x}\right)^{-m-1} {}_2F_1\left(\begin{matrix} \frac{3}{2}, -\frac{m}{2}-\frac{1}{2} \\ -\frac{m}{2}+\frac{1}{2} \end{matrix}\middle| -\frac{b}{x^2}\right)}{m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**m/(1+b/x**2)**(3/2),x)
```

```
[Out] (c*x)**m*(1/x)**m*(1/x)**(-m - 1)*hyper((3/2, -m/2 - 1/2), (-m/2
+ 1/2,), -b/x**2)/(m + 1)
```

Mathematica [B] time = 0.0863817, size = 91, normalized size = 2.07

$$\frac{x\sqrt{\frac{b+x^2}{b}}(cx)^m \left({}_2F_1\left(\frac{1}{2},\frac{m}{2}+1;\frac{m}{2}+2;-\frac{x^2}{b}\right) - {}_2F_1\left(\frac{3}{2},\frac{m}{2}+1;\frac{m}{2}+2;-\frac{x^2}{b}\right)\right)}{(m+2)\sqrt{\frac{b}{x^2}+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^m/(1 + b/x^2)^(3/2),x]
```

```
[Out] (x*(c*x)^m*Sqrt[(b + x^2)/b]*(Hypergeometric2F1[1/2, 1 + m/2, 2 +
 m/2, -(x^2/b)] - Hypergeometric2F1[3/2, 1 + m/2, 2 + m/2, -(x^2/
b)]))/((2 + m)*Sqrt[1 + b/x^2])
```

Maple [F] time = 0.02, size = 0, normalized size = 0.

$$\int (cx)^m \left(1+\frac{b}{x^2}\right)^{-\frac{3}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^m/(1+b/x^2)^(3/2),x)
```

```
[Out] int((c*x)^m/(1+b/x^2)^(3/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx)^m}{\left(\frac{b}{x^2}+1\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m/(b/x^2 + 1)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((c*x)^m/(b/x^2 + 1)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(cx)^m x^2}{(x^2+b)\sqrt{\frac{x^2+b}{x^2}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m/(b/x^2 + 1)^(3/2),x, algorithm="fricas")
```

```
[Out] integral((c*x)^m*x^2/((x^2 + b)*sqrt((x^2 + b)/x^2)), x)
```

Sympy [A] time = 15.085, size = 54, normalized size = 1.23

$$-\frac{c^m x x^m \left(-\frac{m}{2}-\frac{1}{2}\right) {}_2F_1\left(\begin{matrix} \frac{3}{2}, -\frac{m}{2}-\frac{1}{2} \\ -\frac{m}{2}+\frac{1}{2} \end{matrix}\middle| \frac{be^{i\pi}}{x^2}\right)}{2\left(-\frac{m}{2}+\frac{1}{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**m/(1+b/x**2)**(3/2),x)
```

```
[Out] -c**m*x*x**m*gamma(-m/2 - 1/2)*hyper((3/2, -m/2 - 1/2), (-m/2 + 1
/2,), b*exp_polar(I*pi)/x**2)/(2*gamma(-m/2 + 1/2))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx)^m}{\left(\frac{b}{x^2}+1\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m/(b/x^2 + 1)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((c*x)^m/(b/x^2 + 1)^(3/2), x)
```

3.1961 $\int \left(1+\frac{b}{x^2}\right)^p (cx)^m \, dx$

Optimal. Leaf size=44

$$\frac{(cx)^{m+1} {}_2F_1\left(\frac{1}{2}(-m-1),-p;\frac{1-m}{2};-\frac{b}{x^2}\right)}{c(m+1)}$$

```
[Out] ((c*x)^(1 + m)*Hypergeometric2F1[(-1 - m)/2, -p, (1 - m)/2, -(b/x
^2)])/(c*(1 + m))
```

Rubi [A] time = 0.0531316, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{(cx)^{m+1} {}_2F_1\left(\frac{1}{2}(-m-1),-p;\frac{1-m}{2};-\frac{b}{x^2}\right)}{c(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(1 + b/x^2)^p*(c*x)^m,x]
```

```
[Out] ((c*x)^(1 + m)*Hypergeometric2F1[(-1 - m)/2, -p, (1 - m)/2, -(b/x
^2)])/(c*(1 + m))
```

Rubi in Sympy [A] time = 6.77472, size = 42, normalized size = 0.95

$$\frac{(cx)^m \left(\frac{1}{x}\right)^m \left(\frac{1}{x}\right)^{-m-1} {}_2F_1\left(\begin{matrix} -p,-\frac{m}{2}-\frac{1}{2} \\ -\frac{m}{2}+\frac{1}{2} \end{matrix}\middle| -\frac{b}{x^2}\right)}{m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((1+b/x**2)**p*(c*x)**m,x)
```

```
[Out] (c*x)**m*(1/x)**m*(1/x)**(-m - 1)*hyper((-p, -m/2 - 1/2), (-m/2 +
 1/2,), -b/x**2)/(m + 1)
```

Mathematica [A] time = 0.0555734, size = 71, normalized size = 1.61

$$\frac{x\left(\frac{b}{x^2}+1\right)^p\left(\frac{x^2}{b}+1\right)^{-p}(cx)^m {}_2F_1\left(\frac{1}{2}(m-2p+1),-p;\frac{1}{2}(m-2p+1)+1;-\frac{x^2}{b}\right)}{m-2p+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(1 + b/x^2)^p*(c*x)^m,x]
```

```
[Out] ((1 + b/x^2)^p*x*(c*x)^m*Hypergeometric2F1[(1 + m - 2*p)/2, -p, 1
 + (1 + m - 2*p)/2, -(x^2/b)])/((1 + m - 2*p)*(1 + x^2/b)^p)
```

Maple [F] time = 0.152, size = 0, normalized size = 0.

$$\int \left(1+\frac{b}{x^2}\right)^p (cx)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((1+b/x^2)^p*(c*x)^m,x)
```

```
[Out] int((1+b/x^2)^p*(c*x)^m,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (cx)^m \left(\frac{b}{x^2}+1\right)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m*(b/x^2 + 1)^p,x, algorithm="maxima")
```

```
[Out] integrate((c*x)^m*(b/x^2 + 1)^p, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left((cx)^m \left(\frac{x^2+b}{x^2}\right)^p, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m*(b/x^2 + 1)^p,x, algorithm="fricas")
```

```
[Out] integral((c*x)^m*((x^2 + b)/x^2)^p, x)
```

Sympy [A] time = 83.708, size = 54, normalized size = 1.23

$$-\frac{c^m x x^m \left(-\frac{m}{2}-\frac{1}{2}\right) {}_2F_1\left(\begin{matrix} -p, -\frac{m}{2}-\frac{1}{2} \\ -\frac{m}{2}+\frac{1}{2} \end{matrix}\middle| \frac{be^{i\pi}}{x^2}\right)}{2\left(-\frac{m}{2}+\frac{1}{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((1+b/x**2)**p*(c*x)**m,x)
```

```
[Out] -c**m*x*x**m*gamma(-m/2 - 1/2)*hyper((-p, -m/2 - 1/2), (-m/2 + 1/
2,), b*exp_polar(I*pi)/x**2)/(2*gamma(-m/2 + 1/2))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (cx)^m \left(\frac{b}{x^2}+1\right)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m*(b/x^2 + 1)^p,x, algorithm="giac")
```

```
[Out] integrate((c*x)^m*(b/x^2 + 1)^p, x)
```

3.1962 $\int \left(a+\frac{b}{x^2}\right)^p (cx)^m\,dx$

Optimal. Leaf size=70

$$\frac{(cx)^{m+1}\left(a+\frac{b}{x^2}\right)^p\left(\frac{b}{ax^2}+1\right)^{-p}{}_2F_1\left(\frac{1}{2}(-m-1),-p;\frac{1-m}{2};-\frac{b}{ax^2}\right)}{c(m+1)}$$

```
[Out] ((a + b/x^2)^p*(c*x)^(1 + m)*Hypergeometric2F1[(-1 - m)/2, -p, (1
 - m)/2, -(b/(a*x^2))])/(c*(1 + m)*(1 + b/(a*x^2))^p)
```

Rubi [A] time = 0.0866844, antiderivative size = 70, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{(cx)^{m+1}\left(a+\frac{b}{x^2}\right)^p\left(\frac{b}{ax^2}+1\right)^{-p}{}_2F_1\left(\frac{1}{2}(-m-1),-p;\frac{1-m}{2};-\frac{b}{ax^2}\right)}{c(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^p*(c*x)^m,x]
```

```
[Out] ((a + b/x^2)^p*(c*x)^(1 + m)*Hypergeometric2F1[(-1 - m)/2, -p, (1
 - m)/2, -(b/(a*x^2))])/(c*(1 + m)*(1 + b/(a*x^2))^p)
```

Rubi in Sympy [A] time = 11.658, size = 63, normalized size = 0.9

$$\frac{(cx)^m\left(1+\frac{b}{ax^2}\right)^{-p}\left(a+\frac{b}{x^2}\right)^p\left(\frac{1}{x}\right)^m\left(\frac{1}{x}\right)^{-m-1}{}_2F_1\left(\begin{matrix}-p,-\frac{m}{2}-\frac{1}{2}\\-\frac{m}{2}+\frac{1}{2}\end{matrix}\middle|-\frac{b}{ax^2}\right)}{m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**p*(c*x)**m,x)
```

```
[Out] (c*x)**m*(1 + b/(a*x**2))**(-p)*(a + b/x**2)**p*(1/x)**m*(1/x)**(
-m - 1)*hyper((-p, -m/2 - 1/2), (-m/2 + 1/2,), -b/(a*x**2))/(m +
1)
```

Mathematica [A] time = 0.0628882, size = 73, normalized size = 1.04

$$\frac{x(cx)^m\left(a+\frac{b}{x^2}\right)^p\left(\frac{ax^2}{b}+1\right)^{-p}{}_2F_1\left(\frac{1}{2}(m-2p+1),-p;\frac{1}{2}(m-2p+1)+1;-\frac{ax^2}{b}\right)}{m-2p+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^p*(c*x)^m,x]
```

```
[Out] ((a + b/x^2)^p*x*(c*x)^m*Hypergeometric2F1[(1 + m - 2*p)/2, -p, 1
 + (1 + m - 2*p)/2, -((a*x^2)/b)])/((1 + m - 2*p)*(1 + (a*x^2)/b)
^p)
```

Maple [F] time = 0.11, size = 0, normalized size = 0.

$$\int \left(a+\frac{b}{x^{2}}\right)^{p} (c x)^{m}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^p*(c*x)^m,x)

[Out] int((a+b/x^2)^p*(c*x)^m,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (cx)^{m} \left(a+\frac{b}{x^{2}}\right)^{p}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m*(a + b/x^2)^p,x, algorithm="maxima")

[Out] integrate((c*x)^m*(a + b/x^2)^p, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left((cx)^{m} \left(\frac{ax^{2}+b}{x^{2}}\right)^{p}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m*(a + b/x^2)^p,x, algorithm="fricas")

[Out] integral((c*x)^m*((a*x^2 + b)/x^2)^p, x)
```

Sympy [A] time = 106.656, size = 60, normalized size = 0.86

$$-\frac{a^{p} c^{m} x x^{m} \left(-\frac{m}{2}-\frac{1}{2}\right) {}_{2}F_{1}\left(\begin{matrix} -p, -\frac{m}{2}-\frac{1}{2} \\ -\frac{m}{2}+\frac{1}{2} \end{matrix}\middle| \frac{b e^{i\pi}}{a x^{2}}\right)}{2\left(-\frac{m}{2}+\frac{1}{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**p*(c*x)**m,x)

[Out] -a**p*c**m*x*x**m*gamma(-m/2 - 1/2)*hyper((-p, -m/2 - 1/2), (-m/2
 + 1/2,), b*exp_polar(I*pi)/(a*x**2))/(2*gamma(-m/2 + 1/2))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (cx)^{m} \left(a+\frac{b}{x^{2}}\right)^{p}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m*(a + b/x^2)^p,x, algorithm="giac")

[Out] integrate((c*x)^m*(a + b/x^2)^p, x)
```

3.1963 $\int \frac{x^5}{a+\frac{b}{x^3}} dx$

Optimal. Leaf size=40

$$\frac{b^2 \log(ax^3+b)}{3a^3} - \frac{bx^3}{3a^2} + \frac{x^6}{6a}$$

```
[Out] -(b*x^3)/(3*a^2) + x^6/(6*a) + (b^2*Log[b + a*x^3])/(3*a^3)
```

Rubi [A] time = 0.0814482, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{b^2 \log(ax^3+b)}{3a^3} - \frac{bx^3}{3a^2} + \frac{x^6}{6a}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/(a + b/x^3),x]
```

```
[Out] -(b*x^3)/(3*a^2) + x^6/(6*a) + (b^2*Log[b + a*x^3])/(3*a^3)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int^{x^3} x\,dx}{3a} - \frac{\int^{x^3} b\,dx}{3a^2} + \frac{b^2 \log(ax^3+b)}{3a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(a+b/x**3),x)
```

```
[Out] Integral(x, (x, x**3))/(3*a) - Integral(b, (x, x**3))/(3*a**2) +
b**2*log(a*x**3 + b)/(3*a**3)
```

Mathematica [A] time = 0.0112327, size = 40, normalized size = 1.

$$\frac{b^2 \log(ax^3+b)}{3a^3} - \frac{bx^3}{3a^2} + \frac{x^6}{6a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/(a + b/x^3),x]
```

```
[Out] -(b*x^3)/(3*a^2) + x^6/(6*a) + (b^2*Log[b + a*x^3])/(3*a^3)
```

Maple [A] time = 0.004, size = 35, normalized size = 0.9

$$-\frac{bx^3}{3\,a^2} + \frac{x^6}{6\,a} + \frac{b^2 \ln(ax^3+b)}{3\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(a+b/x^3),x)
```

```
[Out] -1/3*b*x^3/a^2+1/6*x^6/a+1/3*b^2*ln(a*x^3+b)/a^3
```

Maxima [A] time = 1.42467, size = 46, normalized size = 1.15

$$\frac{b^2 \log\left(ax^3+b\right)}{3\,a^3}+\frac{ax^6-2\,bx^3}{6\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(a + b/x^3),x, algorithm="maxima")
```

```
[Out] 1/3*b^2*log(a*x^3 + b)/a^3 + 1/6*(a*x^6 - 2*b*x^3)/a^2
```

Fricas [A] time = 0.22924, size = 45, normalized size = 1.12

$$\frac{a^2x^6-2\,abx^3+2\,b^2\log\left(ax^3+b\right)}{6\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(a + b/x^3),x, algorithm="fricas")
```

```
[Out] 1/6*(a^2*x^6 - 2*a*b*x^3 + 2*b^2*log(a*x^3 + b))/a^3
```

Sympy [A] time = 1.37638, size = 32, normalized size = 0.8

$$\frac{x^6}{6a}-\frac{bx^3}{3a^2}+\frac{b^2\log\left(ax^3+b\right)}{3a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(a+b/x**3),x)
```

```
[Out] x**6/(6*a) - b*x**3/(3*a**2) + b**2*log(a*x**3 + b)/(3*a**3)
```

GIAC/XCAS [A] time = 0.225942, size = 47, normalized size = 1.18

$$\frac{b^2\ln\left(\left|ax^3+b\right|\right)}{3\,a^3}+\frac{ax^6-2\,bx^3}{6\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(a + b/x^3),x, algorithm="giac")
```

```
[Out] 1/3*b^2*ln(abs(a*x^3 + b))/a^3 + 1/6*(a*x^6 - 2*b*x^3)/a^2
```

3.1964 $\int \frac{x^4}{a+\frac{b}{x^3}}\,dx$

Optimal. Leaf size=136

$$\frac{b^{5/3}\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{6a^{8/3}}-\frac{b^{5/3}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{3a^{8/3}}-\frac{b^{5/3}\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x}{\sqrt{3}\sqrt[3]{b}}\right)}{\sqrt{3}a^{8/3}}-\frac{bx^2}{2a^2}+\frac{x^5}{5a}$$

```
[Out] -(b*x^2)/(2*a^2) + x^5/(5*a) - (b^(5/3)*ArcTan[(b^(1/3) - 2*a^(1/
3)*x)/(Sqrt[3]*b^(1/3))])/(Sqrt[3]*a^(8/3)) - (b^(5/3)*Log[b^(1/3
) + a^(1/3)*x])/(3*a^(8/3)) + (b^(5/3)*Log[b^(2/3) - a^(1/3)*b^(1
/3)*x + a^(2/3)*x^2])/(6*a^(8/3))
```

Rubi [A] time = 0.234764, antiderivative size = 136, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615

$$\frac{b^{5/3}\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{6a^{8/3}}-\frac{b^{5/3}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{3a^{8/3}}-\frac{b^{5/3}\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x}{\sqrt{3}\sqrt[3]{b}}\right)}{\sqrt{3}a^{8/3}}-\frac{bx^2}{2a^2}+\frac{x^5}{5a}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a + b/x^3),x]
```

```
[Out] -(b*x^2)/(2*a^2) + x^5/(5*a) - (b^(5/3)*ArcTan[(b^(1/3) - 2*a^(1/
3)*x)/(Sqrt[3]*b^(1/3))])/(Sqrt[3]*a^(8/3)) - (b^(5/3)*Log[b^(1/3
) + a^(1/3)*x])/(3*a^(8/3)) + (b^(5/3)*Log[b^(2/3) - a^(1/3)*b^(1
/3)*x + a^(2/3)*x^2])/(6*a^(8/3))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{x^5}{5a}-\frac{b\int x\,dx}{a^2}-\frac{b^{\frac{5}{3}}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{3a^{\frac{8}{3}}}+\frac{b^{\frac{5}{3}}\log\left(a^{\frac{2}{3}}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}\right)}{6a^{\frac{8}{3}}}-\frac{\sqrt{3}b^{\frac{5}{3}}\operatorname{atan}\left(\frac{\sqrt{3}\left(-\frac{2\sqrt[3]{a}x}{3}+\frac{\sqrt[3]{b}}{3}\right)}{\sqrt[3]{b}}\right)}{3a^{\frac{8}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(a+b/x**3),x)
```

```
[Out] x**5/(5*a) - b*Integral(x, x)/a**2 - b**(5/3)*log(a**(1/3)*x + b*
*(1/3))/(3*a**(8/3)) + b**(5/3)*log(a**(2/3)*x**2 - a**(1/3)*b**(
1/3)*x + b**(2/3))/(6*a**(8/3)) - sqrt(3)*b**(5/3)*atan(sqrt(3)*(
-2*a**(1/3)*x/3 + b**(1/3)/3)/b**(1/3))/(3*a**(8/3))
```

Mathematica [A] time = 0.0685256, size = 122, normalized size = 0.9

$$\frac{5b^{5/3}\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)-15a^{2/3}bx^2+6a^{5/3}x^5-10b^{5/3}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)-10\sqrt{3}b^{5/3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{a}x}{\sqrt[3]{b}}}{\sqrt{3}}\right)}{30a^{8/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(a + b/x^3),x]
```

```
[Out] (-15*a^(2/3)*b*x^2 + 6*a^(5/3)*x^5 - 10*Sqrt[3]*b^(5/3)*ArcTan[(1
 - (2*a^(1/3)*x)/b^(1/3))/Sqrt[3]] - 10*b^(5/3)*Log[b^(1/3) + a^(
1/3)*x] + 5*b^(5/3)*Log[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2
])/(30*a^(8/3))
```

Maple [A] time = 0.008, size = 117, normalized size = 0.9

$$\frac{x^5}{5\,a}-\frac{bx^2}{2\,a^2}-\frac{b^2}{3\,a^3}\ln\left(x+\sqrt[3]{\frac{b}{a}}\right)\frac{1}{\sqrt[3]{\frac{b}{a}}}+\frac{b^2}{6\,a^3}\ln\left(x^2-x\sqrt[3]{\frac{b}{a}}+\left(\frac{b}{a}\right)^{\frac{2}{3}}\right)\frac{1}{\sqrt[3]{\frac{b}{a}}}+\frac{b^2\sqrt{3}}{3\,a^3}\arctan\left(\frac{\sqrt{3}}{3}\left(2\,x\frac{1}{\sqrt[3]{\frac{b}{a}}}-1\right)\right)\frac{1}{\sqrt[3]{\frac{b}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(a+b/x^3),x)
```

```
[Out] 1/5*x^5/a-1/2*b*x^2/a^2-1/3/a^3*b^2/(b/a)^(1/3)*ln(x+(b/a)^(1/3))
+1/6/a^3*b^2/(b/a)^(1/3)*ln(x^2-x*(b/a)^(1/3)+(b/a)^(2/3))+1/3/a^
3*b^2*3^(1/2)/(b/a)^(1/3)*arctan(1/3*3^(1/2)*(2/(b/a)^(1/3)*x-1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(a + b/x^3),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.23887, size = 220, normalized size = 1.62

$$-\frac{\sqrt{3}\left(5\sqrt{3}b\left(-\frac{b^2}{a^2}\right)^{\frac{1}{3}}\log\left(bx^2-ax\left(-\frac{b^2}{a^2}\right)^{\frac{2}{3}}-b\left(-\frac{b^2}{a^2}\right)^{\frac{1}{3}}\right)-10\sqrt{3}b\left(-\frac{b^2}{a^2}\right)^{\frac{1}{3}}\log\left(bx+a\left(-\frac{b^2}{a^2}\right)^{\frac{2}{3}}\right)-30\,b\left(-\frac{b^2}{a^2}\right)^{\frac{1}{3}}\arctan\left(-\frac{2}{\cdots}\right.\right.}{90\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(a + b/x^3),x, algorithm="fricas")
```

```
[Out] -1/90*sqrt(3)*(5*sqrt(3)*b*(-b^2/a^2)^(1/3)*log(b*x^2 - a*x*(-b^2
/a^2)^(2/3) - b*(-b^2/a^2)^(1/3)) - 10*sqrt(3)*b*(-b^2/a^2)^(1/3)
*log(b*x + a*(-b^2/a^2)^(2/3)) - 30*b*(-b^2/a^2)^(1/3)*arctan(-1/
3*(2*sqrt(3)*b*x - sqrt(3)*a*(-b^2/a^2)^(2/3))/(a*(-b^2/a^2)^(2/3
))) - 3*sqrt(3)*(2*a*x^5 - 5*b*x^2))/a^2
```

Sympy [A] time = 1.35074, size = 44, normalized size = 0.32

$$\operatorname{RootSum}\left(27t^3a^8+b^5,\left(t\mapsto t\log\left(\frac{9t^2a^5}{b^3}+x\right)\right)\right)+\frac{x^5}{5a}-\frac{bx^2}{2a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(a+b/x**3),x)
```

```
[Out] RootSum(27*_t**3*a**8 + b**5, Lambda(_t, _t*log(9*_t**2*a**5/b**3
 + x))) + x**5/(5*a) - b*x**2/(2*a**2)
```

GIAC/XCAS [A] time = 0.230588, size = 178, normalized size = 1.31

$$-\frac{b\left(-\frac{b}{a}\right)^{\frac{2}{3}}\ln\left(\left|x-\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right|\right)}{3\,a^{2}}-\frac{\sqrt{3}\left(-a^{2}b\right)^{\frac{2}{3}}b\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{b}{a}\right)^{\frac{1}{3}}}\right)}{3\,a^{4}}+\frac{\left(-a^{2}b\right)^{\frac{2}{3}}b\ln\left(x^{2}+x\left(-\frac{b}{a}\right)^{\frac{1}{3}}+\left(-\frac{b}{a}\right)^{\frac{2}{3}}\right)}{6\,a^{4}}+\frac{2\,a^{4}x^{5}-5\,a^{3}bx^{2}}{10\,a^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(a + b/x^3),x, algorithm="giac")
```

```
[Out] -1/3*b*(-b/a)^(2/3)*ln(abs(x - (-b/a)^(1/3)))/a^2 - 1/3*sqrt(3)*(
-a^2*b)^(2/3)*b*arctan(1/3*sqrt(3)*(2*x + (-b/a)^(1/3))/(-b/a)^(1
/3))/a^4 + 1/6*(-a^2*b)^(2/3)*b*ln(x^2 + x*(-b/a)^(1/3) + (-b/a)^
(2/3))/a^4 + 1/10*(2*a^4*x^5 - 5*a^3*b*x^2)/a^5
```

3.1965 $\int \frac{x^3}{a+\frac{b}{x^3}}\,dx$

Optimal. Leaf size=132

$$-\frac{b^{4/3}\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{6a^{7/3}}+\frac{b^{4/3}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{3a^{7/3}}-\frac{b^{4/3}\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x}{\sqrt{3}\sqrt[3]{b}}\right)}{\sqrt{3}a^{7/3}}-\frac{bx}{a^2}+\frac{x^4}{4a}$$

```
[Out] -((b*x)/a^2) + x^4/(4*a) - (b^(4/3)*ArcTan[(b^(1/3) - 2*a^(1/3)*x
)/(Sqrt[3]*b^(1/3))])/(Sqrt[3]*a^(7/3)) + (b^(4/3)*Log[b^(1/3) +
a^(1/3)*x])/(3*a^(7/3)) - (b^(4/3)*Log[b^(2/3) - a^(1/3)*b^(1/3)*
x + a^(2/3)*x^2])/(6*a^(7/3))
```

Rubi [A] time = 0.202148, antiderivative size = 132, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615

$$-\frac{b^{4/3}\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{6a^{7/3}}+\frac{b^{4/3}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{3a^{7/3}}-\frac{b^{4/3}\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x}{\sqrt{3}\sqrt[3]{b}}\right)}{\sqrt{3}a^{7/3}}-\frac{bx}{a^2}+\frac{x^4}{4a}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(a + b/x^3),x]
```

```
[Out] -((b*x)/a^2) + x^4/(4*a) - (b^(4/3)*ArcTan[(b^(1/3) - 2*a^(1/3)*x
)/(Sqrt[3]*b^(1/3))])/(Sqrt[3]*a^(7/3)) + (b^(4/3)*Log[b^(1/3) +
a^(1/3)*x])/(3*a^(7/3)) - (b^(4/3)*Log[b^(2/3) - a^(1/3)*b^(1/3)*
x + a^(2/3)*x^2])/(6*a^(7/3))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{x^4}{4a}-\frac{\int b\,dx}{a^2}+\frac{b^{\frac{4}{3}}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{3a^{\frac{7}{3}}}-\frac{b^{\frac{4}{3}}\log\left(a^{\frac{2}{3}}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}\right)}{6a^{\frac{7}{3}}}-\frac{\sqrt{3}b^{\frac{4}{3}}\operatorname{atan}\left(\frac{\sqrt{3}\left(-\frac{2\sqrt[3]{a}x}{3}+\frac{\sqrt[3]{b}}{3}\right)}{\sqrt[3]{b}}\right)}{3a^{\frac{7}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(a+b/x**3),x)
```

```
[Out] x**4/(4*a) - Integral(b, x)/a**2 + b**(4/3)*log(a**(1/3)*x + b**(
1/3))/(3*a**(7/3)) - b**(4/3)*log(a**(2/3)*x**2 - a**(1/3)*b**(1/
3)*x + b**(2/3))/(6*a**(7/3)) - sqrt(3)*b**(4/3)*atan(sqrt(3)*(-2
*a**(1/3)*x/3 + b**(1/3)/3)/b**(1/3))/(3*a**(7/3))
```

Mathematica [A] time = 0.0400798, size = 120, normalized size = 0.91

$$\frac{-2b^{4/3}\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)+3a^{4/3}x^4+4b^{4/3}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)-4\sqrt{3}b^{4/3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{a}x}{\sqrt[3]{b}}}{\sqrt{3}}\right)-12\sqrt[3]{a}bx}{12a^{7/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(a + b/x^3),x]

[Out] (-12*a^(1/3)*b*x + 3*a^(4/3)*x^4 - 4*Sqrt[3]*b^(4/3)*ArcTan[(1 -
(2*a^(1/3)*x)/b^(1/3))/Sqrt[3]] + 4*b^(4/3)*Log[b^(1/3) + a^(1/3)
*x] - 2*b^(4/3)*Log[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2])/(
12*a^(7/3))
```

Maple [A] time = 0.004, size = 115, normalized size = 0.9

$$\frac{x^4}{4\,a}-\frac{bx}{a^2}+\frac{b^2}{3\,a^3}\ln\left(x+\sqrt[3]{\frac{b}{a}}\right)\left(\frac{b}{a}\right)^{-\frac{2}{3}}-\frac{b^2}{6\,a^3}\ln\left(x^2-x\sqrt[3]{\frac{b}{a}}+\left(\frac{b}{a}\right)^{\frac{2}{3}}\right)\left(\frac{b}{a}\right)^{-\frac{2}{3}}+\frac{b^2\sqrt{3}}{3\,a^3}\arctan\left(\frac{\sqrt{3}}{3}\left(2\,x\frac{1}{\sqrt[3]{\frac{b}{a}}}-1\right)\right)\left(\frac{b}{a}\right)^{-\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(a+b/x^3),x)

[Out] 1/4*x^4/a-b*x/a^2+1/3/a^3*b^2/(b/a)^(2/3)*ln(x+(b/a)^(1/3))-1/6/a
^3*b^2/(b/a)^(2/3)*ln(x^2-x*(b/a)^(1/3)+(b/a)^(2/3))+1/3/a^3*b^2/
(b/a)^(2/3)*3^(1/2)*arctan(1/3*3^(1/2)*(2/(b/a)^(1/3)*x-1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(a + b/x^3),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [A] time = 0.242816, size = 163, normalized size = 1.23

$$-\frac{\sqrt{3}\left(2\,\sqrt{3}b\left(\frac{b}{a}\right)^{\frac{1}{3}}\log\left(x^2-x\left(\frac{b}{a}\right)^{\frac{1}{3}}+\left(\frac{b}{a}\right)^{\frac{2}{3}}\right)-4\,\sqrt{3}b\left(\frac{b}{a}\right)^{\frac{1}{3}}\log\left(x+\left(\frac{b}{a}\right)^{\frac{1}{3}}\right)+12\,b\left(\frac{b}{a}\right)^{\frac{1}{3}}\arctan\left(-\frac{2\,\sqrt{3}x-\sqrt{3}\left(\frac{b}{a}\right)^{\frac{1}{3}}}{3\left(\frac{b}{a}\right)^{\frac{1}{3}}}\right)-3\,\sqrt{3}(a\ldots}{36\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(a + b/x^3),x, algorithm="fricas")

[Out] -1/36*sqrt(3)*(2*sqrt(3)*b*(b/a)^(1/3)*log(x^2 - x*(b/a)^(1/3) +
(b/a)^(2/3)) - 4*sqrt(3)*b*(b/a)^(1/3)*log(x + (b/a)^(1/3)) + 12*
b*(b/a)^(1/3)*arctan(-1/3*(2*sqrt(3)*x - sqrt(3)*(b/a)^(1/3))/(b/
a)^(1/3)) - 3*sqrt(3)*(a*x^4 - 4*b*x))/a^2
```

Sympy [A] time = 1.35894, size = 37, normalized size = 0.28

$$\operatorname{RootSum}\left(27t^3a^7-b^4,\left(t\mapsto t\log\left(\frac{3ta^2}{b}+x\right)\right)\right)+\frac{x^4}{4a}-\frac{bx}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(a+b/x**3),x)
```

```
[Out] RootSum(27*_t**3*a**7 - b**4, Lambda(_t, _t*log(3*_t*a**2/b + x))
) + x**4/(4*a) - b*x/a**2
```

GIAC/XCAS [A] time = 0.229689, size = 174, normalized size = 1.32

$$-\frac{b\left(-\frac{b}{a}\right)^{\frac{1}{3}}\ln\left(\left|x-\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right|\right)}{3\,a^2}+\frac{\sqrt{3}\left(-a^2 b\right)^{\frac{1}{3}} b\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{b}{a}\right)^{\frac{1}{3}}}\right)}{3\,a^3}+\frac{\left(-a^2 b\right)^{\frac{1}{3}} b\ln\left(x^2+x\left(-\frac{b}{a}\right)^{\frac{1}{3}}+\left(-\frac{b}{a}\right)^{\frac{2}{3}}\right)}{6\,a^3}+\frac{a^3x^4-4\,a^2bx}{4\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(a + b/x^3),x, algorithm="giac")
```

```
[Out] -1/3*b*(-b/a)^(1/3)*ln(abs(x - (-b/a)^(1/3)))/a^2 + 1/3*sqrt(3)*(
-a^2*b)^(1/3)*b*arctan(1/3*sqrt(3)*(2*x + (-b/a)^(1/3))/(-b/a)^(1
/3))/a^3 + 1/6*(-a^2*b)^(1/3)*b*ln(x^2 + x*(-b/a)^(1/3) + (-b/a)^
(2/3))/a^3 + 1/4*(a^3*x^4 - 4*a^2*b*x)/a^4
```

3.1966 $\int \frac{x^2}{a+\frac{b}{x^3}} dx$

Optimal. Leaf size=27

$$\frac{x^3}{3a} - \frac{b \log(ax^3 + b)}{3a^2}$$

```
[Out] x^3/(3*a) - (b*Log[b + a*x^3])/(3*a^2)
```

Rubi [A] time = 0.062126, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$

$$\frac{x^3}{3a} - \frac{b \log(ax^3 + b)}{3a^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(a + b/x^3),x]
```

```
[Out] x^3/(3*a) - (b*Log[b + a*x^3])/(3*a^2)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int^{x^3} \frac{1}{a}\, dx}{3} - \frac{b \log(ax^3 + b)}{3a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**2/(a+b/x**3),x)
```

```
[Out] Integral(1/a, (x, x**3))/3 - b*log(a*x**3 + b)/(3*a**2)
```

Mathematica [A] time = 0.00769591, size = 27, normalized size = 1.

$$\frac{x^3}{3a} - \frac{b \log(ax^3 + b)}{3a^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(a + b/x^3),x]
```

```
[Out] x^3/(3*a) - (b*Log[b + a*x^3])/(3*a^2)
```

Maple [A] time = 0.003, size = 24, normalized size = 0.9

$$\frac{x^3}{3\,a} - \frac{b \ln(ax^3 + b)}{3\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a+b/x^3),x)
```

```
[Out] 1/3*x^3/a-1/3*b*ln(a*x^3+b)/a^2
```

Maxima [A] time = 1.41605, size = 31, normalized size = 1.15

$$\frac{x^3}{3\,a} - \frac{b\log\left(ax^3 + b\right)}{3\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x^3),x, algorithm="maxima")
```

```
[Out] 1/3*x^3/a - 1/3*b*log(a*x^3 + b)/a^2
```

Fricas [A] time = 0.233483, size = 30, normalized size = 1.11

$$\frac{ax^3 - b\log\left(ax^3 + b\right)}{3\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x^3),x, algorithm="fricas")
```

```
[Out] 1/3*(a*x^3 - b*log(a*x^3 + b))/a^2
```

Sympy [A] time = 1.27087, size = 20, normalized size = 0.74

$$\frac{x^3}{3a} - \frac{b\log\left(ax^3 + b\right)}{3a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b/x**3),x)
```

```
[Out] x**3/(3*a) - b*log(a*x**3 + b)/(3*a**2)
```

GIAC/XCAS [A] time = 0.227272, size = 32, normalized size = 1.19

$$\frac{x^3}{3\,a} - \frac{b\ln\left(\left|ax^3 + b\right|\right)}{3\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x^3),x, algorithm="giac")
```

```
[Out] 1/3*x^3/a - 1/3*b*ln(abs(a*x^3 + b))/a^2
```

3.1967 $\int \frac{x}{a+\frac{b}{x^3}}\,dx$

Optimal. Leaf size=124

$$-\frac{b^{2/3}\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{6a^{5/3}}+\frac{b^{2/3}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{3a^{5/3}}+\frac{b^{2/3}\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x}{\sqrt{3}\sqrt[3]{b}}\right)}{\sqrt{3}a^{5/3}}+\frac{x^2}{2a}$$

```
[Out] x^2/(2*a) + (b^(2/3)*ArcTan[(b^(1/3) - 2*a^(1/3)*x)/(Sqrt[3]*b^(1
/3))])/(Sqrt[3]*a^(5/3)) + (b^(2/3)*Log[b^(1/3) + a^(1/3)*x])/(3*
a^(5/3)) - (b^(2/3)*Log[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2
])/(6*a^(5/3))
```

Rubi [A] time = 0.165952, antiderivative size = 124, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.727$

$$-\frac{b^{2/3}\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{6a^{5/3}}+\frac{b^{2/3}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{3a^{5/3}}+\frac{b^{2/3}\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x}{\sqrt{3}\sqrt[3]{b}}\right)}{\sqrt{3}a^{5/3}}+\frac{x^2}{2a}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b/x^3),x]
```

```
[Out] x^2/(2*a) + (b^(2/3)*ArcTan[(b^(1/3) - 2*a^(1/3)*x)/(Sqrt[3]*b^(1
/3))])/(Sqrt[3]*a^(5/3)) + (b^(2/3)*Log[b^(1/3) + a^(1/3)*x])/(3*
a^(5/3)) - (b^(2/3)*Log[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2
])/(6*a^(5/3))
```

Rubi in Sympy [A] time = 29.6992, size = 116, normalized size = 0.94

$$\frac{x^2}{2a}+\frac{b^{\frac{2}{3}}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{3a^{\frac{5}{3}}}-\frac{b^{\frac{2}{3}}\log\left(a^{\frac{2}{3}}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}\right)}{6a^{\frac{5}{3}}}+\frac{\sqrt{3}b^{\frac{2}{3}}\operatorname{atan}\left(\frac{\sqrt{3}\left(-\frac{2\sqrt[3]{a}x}{3}+\frac{\sqrt[3]{b}}{3}\right)}{\sqrt[3]{b}}\right)}{3a^{\frac{5}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b/x**3),x)
```

```
[Out] x**2/(2*a) + b**(2/3)*log(a**(1/3)*x + b**(1/3))/(3*a**(5/3)) - b
**(2/3)*log(a**(2/3)*x**2 - a**(1/3)*b**(1/3)*x + b**(2/3))/(6*a*
*(5/3)) + sqrt(3)*b**(2/3)*atan(sqrt(3)*(-2*a**(1/3)*x/3 + b**(1/
3)/3)/b**(1/3))/(3*a**(5/3))
```

Mathematica [A] time = 0.0340609, size = 111, normalized size = 0.9

$$\frac{-b^{2/3}\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)+3a^{2/3}x^2+2b^{2/3}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)+2\sqrt{3}b^{2/3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{a}x}{\sqrt[3]{b}}}{\sqrt{3}}\right)}{6a^{5/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b/x^3),x]
```

```
[Out] (3*a^(2/3)*x^2 + 2*Sqrt[3]*b^(2/3)*ArcTan[(1 - (2*a^(1/3)*x)/b^(1
/3))/Sqrt[3]] + 2*b^(2/3)*Log[b^(1/3) + a^(1/3)*x] - b^(2/3)*Log[
b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2])/(6*a^(5/3))
```

Maple [A] time = 0.004, size = 102, normalized size = 0.8

$$\frac{x^2}{2a}+\frac{b}{3a^2}\ln\left(x+\sqrt[3]{\frac{b}{a}}\right)\frac{1}{\sqrt[3]{\frac{b}{a}}}-\frac{b}{6a^2}\ln\left(x^2-x\sqrt[3]{\frac{b}{a}}+\left(\frac{b}{a}\right)^{\frac{2}{3}}\right)\frac{1}{\sqrt[3]{\frac{b}{a}}}-\frac{b\sqrt{3}}{3a^2}\arctan\left(\frac{\sqrt{3}}{3}\left(2x\frac{1}{\sqrt[3]{\frac{b}{a}}}-1\right)\right)\frac{1}{\sqrt[3]{\frac{b}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a+b/x^3),x)
```

```
[Out] 1/2*x^2/a+1/3*b/a^2/(b/a)^(1/3)*ln(x+(b/a)^(1/3))-1/6*b/a^2/(b/a)
^(1/3)*ln(x^2-x*(b/a)^(1/3)+(b/a)^(2/3))-1/3*b/a^2*3^(1/2)/(b/a)^
(1/3)*arctan(1/3*3^(1/2)*(2/(b/a)^(1/3)*x-1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a + b/x^3),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.231009, size = 190, normalized size = 1.53

$$\frac{\sqrt{3}\left(3\sqrt{3}x^2-\sqrt{3}\left(\frac{b^2}{a^2}\right)^{\frac{1}{3}}\log\left(bx^2-ax\left(\frac{b^2}{a^2}\right)^{\frac{2}{3}}+b\left(\frac{b^2}{a^2}\right)^{\frac{1}{3}}\right)+2\sqrt{3}\left(\frac{b^2}{a^2}\right)^{\frac{1}{3}}\log\left(bx+a\left(\frac{b^2}{a^2}\right)^{\frac{2}{3}}\right)+6\left(\frac{b^2}{a^2}\right)^{\frac{1}{3}}\arctan\left(-\frac{2\sqrt{3}bx-\sqrt{3}a\left(\cdots\right.}{3a\left(\frac{b^2}{a^2}\right)^{\cdots}}\right.\right.}{18a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a + b/x^3),x, algorithm="fricas")
```

```
[Out] 1/18*sqrt(3)*(3*sqrt(3)*x^2 - sqrt(3)*(b^2/a^2)^(1/3)*log(b*x^2 -
 a*x*(b^2/a^2)^(2/3) + b*(b^2/a^2)^(1/3)) + 2*sqrt(3)*(b^2/a^2)^(
1/3)*log(b*x + a*(b^2/a^2)^(2/3)) + 6*(b^2/a^2)^(1/3)*arctan(-1/3
*(2*sqrt(3)*b*x - sqrt(3)*a*(b^2/a^2)^(2/3))/(a*(b^2/a^2)^(2/3)))
)/a
```

Sympy [A] time = 1.27921, size = 32, normalized size = 0.26

$$\operatorname{RootSum}\left(27t^3a^5-b^2,\left(t\mapsto t\log\left(\frac{9t^2a^3}{b}+x\right)\right)\right)+\frac{x^2}{2a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b/x**3),x)
```

```
[Out] RootSum(27*_t**3*a**5 - b**2, Lambda(_t, _t*log(9*_t**2*a**3/b +
x))) + x**2/(2*a)
```

GIAC/XCAS [A] time = 0.229102, size = 154, normalized size = 1.24

$$\frac{x^2}{2\,a} + \frac{\left(-\frac{b}{a}\right)^{\frac{2}{3}}\ln\left(\left|x-\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right|\right)}{3\,a} + \frac{\sqrt{3}\left(-a^2b\right)^{\frac{2}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{b}{a}\right)^{\frac{1}{3}}}\right)}{3\,a^3} - \frac{\left(-a^2b\right)^{\frac{2}{3}}\ln\left(x^2+x\left(-\frac{b}{a}\right)^{\frac{1}{3}}+\left(-\frac{b}{a}\right)^{\frac{2}{3}}\right)}{6\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x^3),x, algorithm="giac")
```

```
[Out] 1/2*x^2/a + 1/3*(-b/a)^(2/3)*ln(abs(x - (-b/a)^(1/3)))/a + 1/3*sq
rt(3)*(-a^2*b)^(2/3)*arctan(1/3*sqrt(3)*(2*x + (-b/a)^(1/3))/(-b/
a)^(1/3))/a^3 - 1/6*(-a^2*b)^(2/3)*ln(x^2 + x*(-b/a)^(1/3) + (-b/
a)^(2/3))/a^3
```

3.1968 $\int \frac{1}{a+\frac{b}{x^3}}\,dx$

Optimal. Leaf size=119

$$\frac{\sqrt[3]{b}\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{6a^{4/3}}-\frac{\sqrt[3]{b}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{3a^{4/3}}+\frac{\sqrt[3]{b}\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x}{\sqrt{3}\sqrt[3]{b}}\right)}{\sqrt{3}a^{4/3}}+\frac{x}{a}$$

```
[Out] x/a + (b^(1/3)*ArcTan[(b^(1/3) - 2*a^(1/3)*x)/(Sqrt[3]*b^(1/3))])
/(Sqrt[3]*a^(4/3)) - (b^(1/3)*Log[b^(1/3) + a^(1/3)*x])/(3*a^(4/3
)) + (b^(1/3)*Log[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2])/(6*
a^(4/3))
```

Rubi [A] time = 0.155705, antiderivative size = 119, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.889

$$\frac{\sqrt[3]{b}\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{6a^{4/3}}-\frac{\sqrt[3]{b}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{3a^{4/3}}+\frac{\sqrt[3]{b}\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x}{\sqrt{3}\sqrt[3]{b}}\right)}{\sqrt{3}a^{4/3}}+\frac{x}{a}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^3)^(-1),x]
```

```
[Out] x/a + (b^(1/3)*ArcTan[(b^(1/3) - 2*a^(1/3)*x)/(Sqrt[3]*b^(1/3))])
/(Sqrt[3]*a^(4/3)) - (b^(1/3)*Log[b^(1/3) + a^(1/3)*x])/(3*a^(4/3
)) + (b^(1/3)*Log[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2])/(6*
a^(4/3))
```

Rubi in Sympy [A] time = 29.5204, size = 112, normalized size = 0.94

$$\frac{x}{a}-\frac{\sqrt[3]{b}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{3a^{\frac{4}{3}}}+\frac{\sqrt[3]{b}\log\left(a^{\frac{2}{3}}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}\right)}{6a^{\frac{4}{3}}}+\frac{\sqrt{3}\sqrt[3]{b}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(-\frac{2\sqrt[3]{a}x}{3}+\frac{\sqrt[3]{b}}{3}\right)}{\sqrt[3]{b}}\right)}{3a^{\frac{4}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**3),x)
```

```
[Out] x/a - b**(1/3)*log(a**(1/3)*x + b**(1/3))/(3*a**(4/3)) + b**(1/3)
*log(a**(2/3)*x**2 - a**(1/3)*b**(1/3)*x + b**(2/3))/(6*a**(4/3))
 + sqrt(3)*b**(1/3)*atan(sqrt(3)*(-2*a**(1/3)*x/3 + b**(1/3)/3)/b
**(1/3))/(3*a**(4/3))
```

Mathematica [A] time = 0.0291277, size = 108, normalized size = 0.91

$$\frac{\sqrt[3]{b}\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)-2\sqrt[3]{b}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)+2\sqrt{3}\sqrt[3]{b}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{a}x}{\sqrt[3]{b}}}{\sqrt{3}}\right)+6\sqrt[3]{a}x}{6a^{4/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^3)^(-1),x]
```

```
[Out] (6*a^(1/3)*x + 2*Sqrt[3]*b^(1/3)*ArcTan[(1 - (2*a^(1/3)*x)/b^(1/3
))/Sqrt[3]] - 2*b^(1/3)*Log[b^(1/3) + a^(1/3)*x] + b^(1/3)*Log[b^
(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2])/(6*a^(4/3))
```

Maple [A] time = 0.003, size = 99, normalized size = 0.8

$$\frac{x}{a}-\frac{b}{3\,a^{2}}\ln\left(x+\sqrt[3]{\frac{b}{a}}\right)\left(\frac{b}{a}\right)^{-\frac{2}{3}}+\frac{b}{6\,a^{2}}\ln\left(x^{2}-x\sqrt[3]{\frac{b}{a}}+\left(\frac{b}{a}\right)^{\frac{2}{3}}\right)\left(\frac{b}{a}\right)^{-\frac{2}{3}}-\frac{b\sqrt{3}}{3\,a^{2}}\arctan\left(\frac{\sqrt{3}}{3}\left(2\,x\frac{1}{\sqrt[3]{\frac{b}{a}}}-1\right)\right)\left(\frac{b}{a}\right)^{-\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^3),x)
```

```
[Out] x/a-1/3*b/a^2/(b/a)^(2/3)*ln(x+(b/a)^(1/3))+1/6*b/a^2/(b/a)^(2/3)
*ln(x^2-x*(b/a)^(1/3)+(b/a)^(2/3))-1/3*b/a^2/(b/a)^(2/3)*3^(1/2)*
arctan(1/3*3^(1/2)*(2/(b/a)^(1/3)*x-1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a + b/x^3),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.232219, size = 157, normalized size = 1.32

$$-\frac{\sqrt{3}\left(\sqrt{3}\left(-\frac{b}{a}\right)^{\frac{1}{3}}\log\left(x^{2}+x\left(-\frac{b}{a}\right)^{\frac{1}{3}}+\left(-\frac{b}{a}\right)^{\frac{2}{3}}\right)-2\sqrt{3}\left(-\frac{b}{a}\right)^{\frac{1}{3}}\log\left(x-\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right)-6\sqrt{3}x+6\left(-\frac{b}{a}\right)^{\frac{1}{3}}\arctan\left(\frac{2\sqrt{3}x+\sqrt{3}\left(-\frac{b}{a}\right)^{\frac{1}{3}}}{3\left(-\frac{b}{a}\right)^{\frac{1}{3}}}\right)\right)}{18\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a + b/x^3),x, algorithm="fricas")
```

```
[Out] -1/18*sqrt(3)*(sqrt(3)*(-b/a)^(1/3)*log(x^2 + x*(-b/a)^(1/3) + (-
b/a)^(2/3)) - 2*sqrt(3)*(-b/a)^(1/3)*log(x - (-b/a)^(1/3)) - 6*sq
rt(3)*x + 6*(-b/a)^(1/3)*arctan(1/3*(2*sqrt(3)*x + sqrt(3)*(-b/a)
^(1/3))/(-b/a)^(1/3)))/a
```

Sympy [A] time = 1.27161, size = 22, normalized size = 0.18

$$\operatorname{RootSum}\left(27t^{3}a^{4}+b,\left(t\mapsto t\log\left(-3ta+x\right)\right)\right)+\frac{x}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**3),x)
```

```
[Out] RootSum(27*_t**3*a**4 + b, Lambda(_t, _t*log(-3*_t*a + x))) + x/a
```

GIAC/XCAS [A] time = 0.223646, size = 150, normalized size = 1.26

$$\frac{\left(-\frac{b}{a}\right)^{\frac{1}{3}}\ln\left(\left|x-\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right|\right)}{3\,a}+\frac{x}{a}-\frac{\sqrt{3}\left(-a^{2}b\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{b}{a}\right)^{\frac{1}{3}}}\right)}{3\,a^{2}}-\frac{\left(-a^{2}b\right)^{\frac{1}{3}}\ln\left(x^{2}+x\left(-\frac{b}{a}\right)^{\frac{1}{3}}+\left(-\frac{b}{a}\right)^{\frac{2}{3}}\right)}{6\,a^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a + b/x^3),x, algorithm="giac")
```

```
[Out] 1/3*(-b/a)^(1/3)*ln(abs(x - (-b/a)^(1/3)))/a + x/a - 1/3*sqrt(3)*
(-a^2*b)^(1/3)*arctan(1/3*sqrt(3)*(2*x + (-b/a)^(1/3))/(-b/a)^(1/
3))/a^2 - 1/6*(-a^2*b)^(1/3)*ln(x^2 + x*(-b/a)^(1/3) + (-b/a)^(2/
3))/a^2
```

3.1969 $\int \frac{1}{\left(a+\frac{b}{x^3}\right)x}\,dx$

Optimal. Leaf size=15

$$\frac{\log(ax^3+b)}{3a}$$

```
[Out] Log[b + a*x^3]/(3*a)
```

Rubi [A] time = 0.0200524, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{\log(ax^3+b)}{3a}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^3)*x),x]
```

```
[Out] Log[b + a*x^3]/(3*a)
```

Rubi in Sympy [A] time = 3.6875, size = 10, normalized size = 0.67

$$\frac{\log(ax^3+b)}{3a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**3)/x,x)
```

```
[Out] log(a*x**3 + b)/(3*a)
```

Mathematica [A] time = 0.00526372, size = 15, normalized size = 1.

$$\frac{\log(ax^3+b)}{3a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^3)*x),x]
```

```
[Out] Log[b + a*x^3]/(3*a)
```

Maple [A] time = 0.003, size = 14, normalized size = 0.9

$$\frac{\ln(ax^3+b)}{3\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^3)/x,x)
```

```
[Out] 1/3*ln(a*x^3+b)/a
```

Maxima [A] time = 1.4243, size = 18, normalized size = 1.2

$$\frac{\log\left(ax^3+b\right)}{3\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)*x),x, algorithm="maxima")
```

```
[Out] 1/3*log(a*x^3 + b)/a
```

Fricas [A] time = 0.22054, size = 18, normalized size = 1.2

$$\frac{\log\left(ax^3+b\right)}{3\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)*x),x, algorithm="fricas")
```

```
[Out] 1/3*log(a*x^3 + b)/a
```

Sympy [A] time = 0.322607, size = 10, normalized size = 0.67

$$\frac{\log\left(ax^3+b\right)}{3a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**3)/x,x)
```

```
[Out] log(a*x**3 + b)/(3*a)
```

GIAC/XCAS [A] time = 0.232385, size = 19, normalized size = 1.27

$$\frac{\ln\left(\left|ax^3+b\right|\right)}{3\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)*x),x, algorithm="giac")
```

```
[Out] 1/3*ln(abs(a*x^3 + b))/a
```

3.1970 $\int \frac{1}{\left(a+\frac{b}{x^3}\right)x^2}\,dx$

Optimal. Leaf size=115

$$\frac{\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{6a^{2/3}\sqrt[3]{b}}-\frac{\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{3a^{2/3}\sqrt[3]{b}}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x}{\sqrt{3}\sqrt[3]{b}}\right)}{\sqrt{3}a^{2/3}\sqrt[3]{b}}$$

```
[Out] -(ArcTan[(b^(1/3) - 2*a^(1/3)*x)/(Sqrt[3]*b^(1/3))]/(Sqrt[3]*a^(2
/3)*b^(1/3))) - Log[b^(1/3) + a^(1/3)*x]/(3*a^(2/3)*b^(1/3)) + Lo
g[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2]/(6*a^(2/3)*b^(1/3))
```

Rubi [A] time = 0.131077, antiderivative size = 115, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538

$$\frac{\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{6a^{2/3}\sqrt[3]{b}}-\frac{\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{3a^{2/3}\sqrt[3]{b}}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x}{\sqrt{3}\sqrt[3]{b}}\right)}{\sqrt{3}a^{2/3}\sqrt[3]{b}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^3)*x^2),x]
```

```
[Out] -(ArcTan[(b^(1/3) - 2*a^(1/3)*x)/(Sqrt[3]*b^(1/3))]/(Sqrt[3]*a^(2
/3)*b^(1/3))) - Log[b^(1/3) + a^(1/3)*x]/(3*a^(2/3)*b^(1/3)) + Lo
g[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2]/(6*a^(2/3)*b^(1/3))
```

Rubi in Sympy [A] time = 25.1888, size = 109, normalized size = 0.95

$$-\frac{\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{3a^{\frac{2}{3}}\sqrt[3]{b}}+\frac{\log\left(a^{\frac{2}{3}}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}\right)}{6a^{\frac{2}{3}}\sqrt[3]{b}}-\frac{\sqrt{3}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(-\frac{2\sqrt[3]{a}x}{3}+\frac{\sqrt[3]{b}}{3}\right)}{\sqrt[3]{b}}\right)}{3a^{\frac{2}{3}}\sqrt[3]{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**3)/x**2,x)
```

```
[Out] -log(a**(1/3)*x + b**(1/3))/(3*a**(2/3)*b**(1/3)) + log(a**(2/3)*
x**2 - a**(1/3)*b**(1/3)*x + b**(2/3))/(6*a**(2/3)*b**(1/3)) - sq
rt(3)*atan(sqrt(3)*(-2*a**(1/3)*x/3 + b**(1/3)/3)/b**(1/3))/(3*a*
*(2/3)*b**(1/3))
```

Mathematica [A] time = 0.0222158, size = 89, normalized size = 0.77

$$\frac{\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)-2\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)-2\sqrt{3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{a}x}{\sqrt[3]{b}}}{\sqrt{3}}\right)}{6a^{2/3}\sqrt[3]{b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^3)*x^2),x]
```

```
[Out] (-2*Sqrt[3]*ArcTan[(1 - (2*a^(1/3)*x)/b^(1/3))/Sqrt[3]] - 2*Log[b
^(1/3) + a^(1/3)*x] + Log[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x
^2])/(6*a^(2/3)*b^(1/3))
```

Maple [A] time = 0.004, size = 91, normalized size = 0.8

$$-\frac{1}{3a}\ln\left(x+\sqrt[3]{\frac{b}{a}}\right)\frac{1}{\sqrt[3]{\frac{b}{a}}}+\frac{1}{6a}\ln\left(x^2-x\sqrt[3]{\frac{b}{a}}+\left(\frac{b}{a}\right)^{\frac{2}{3}}\right)\frac{1}{\sqrt[3]{\frac{b}{a}}}+\frac{\sqrt{3}}{3a}\arctan\left(\frac{\sqrt{3}}{3}\left(2x\frac{1}{\sqrt[3]{\frac{b}{a}}}-1\right)\right)\frac{1}{\sqrt[3]{\frac{b}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^3)/x^2,x)
```

```
[Out] -1/3/a/(b/a)^(1/3)*ln(x+(b/a)^(1/3))+1/6/a/(b/a)^(1/3)*ln(x^2-x*(
b/a)^(1/3)+(b/a)^(2/3))+1/3*3^(1/2)/a/(b/a)^(1/3)*arctan(1/3*3^(1
/2)*(2/(b/a)^(1/3)*x-1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)*x^2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.23409, size = 134, normalized size = 1.17

$$-\frac{\sqrt{3}\left(\sqrt{3}\log\left(\left(-a^2b\right)^{\frac{1}{3}}ax^2-ab+\left(-a^2b\right)^{\frac{2}{3}}x\right)-2\sqrt{3}\log\left(ab+\left(-a^2b\right)^{\frac{2}{3}}x\right)+6\arctan\left(-\frac{\sqrt{3}ab-2\sqrt{3}\left(-a^2b\right)^{\frac{2}{3}}x}{3ab}\right)\right)}{18\left(-a^2b\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)*x^2),x, algorithm="fricas")
```

```
[Out] -1/18*sqrt(3)*(sqrt(3)*log((-a^2*b)^(1/3)*a*x^2 - a*b + (-a^2*b)^
(2/3)*x) - 2*sqrt(3)*log(a*b + (-a^2*b)^(2/3)*x) + 6*arctan(-1/3*
(sqrt(3)*a*b - 2*sqrt(3)*(-a^2*b)^(2/3)*x)/(a*b)))/(-a^2*b)^(1/3)
```

Sympy [A] time = 0.338662, size = 24, normalized size = 0.21

$$\operatorname{RootSum}\left(27t^3a^2b+1,\left(t\mapsto t\log\left(9t^2ab+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**3)/x**2,x)
```

```
[Out] RootSum(27*_t**3*a**2*b + 1, Lambda(_t, _t*log(9*_t**2*a*b + x)))
```

GIAC/XCAS [A] time = 0.242769, size = 151, normalized size = 1.31

$$-\frac{\left(-\frac{b}{a}\right)^{\frac{2}{3}}\ln\left(\left|x-\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right|\right)}{3\,b}-\frac{\sqrt{3}\left(-a^{2}b\right)^{\frac{2}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{b}{a}\right)^{\frac{1}{3}}}\right)}{3\,a^{2}b}+\frac{\left(-a^{2}b\right)^{\frac{2}{3}}\ln\left(x^{2}+x\left(-\frac{b}{a}\right)^{\frac{1}{3}}+\left(-\frac{b}{a}\right)^{\frac{2}{3}}\right)}{6\,a^{2}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)*x^2),x, algorithm="giac")
```

```
[Out] -1/3*(-b/a)^(2/3)*ln(abs(x - (-b/a)^(1/3)))/b - 1/3*sqrt(3)*(-a^2
*b)^(2/3)*arctan(1/3*sqrt(3)*(2*x + (-b/a)^(1/3))/(-b/a)^(1/3))/(
a^2*b) + 1/6*(-a^2*b)^(2/3)*ln(x^2 + x*(-b/a)^(1/3) + (-b/a)^(2/3
))/(a^2*b)
```

3.1971 $\int \frac{1}{\left(a+\frac{b}{x^3}\right)x^3}\,dx$

Optimal. Leaf size=115

$$-\frac{\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{6\sqrt[3]{a}b^{2/3}}+\frac{\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{3\sqrt[3]{a}b^{2/3}}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x}{\sqrt{3}\sqrt[3]{b}}\right)}{\sqrt{3}\sqrt[3]{a}b^{2/3}}$$

```
[Out] -(ArcTan[(b^(1/3) - 2*a^(1/3)*x)/(Sqrt[3]*b^(1/3))]/(Sqrt[3]*a^(1
/3)*b^(2/3))) + Log[b^(1/3) + a^(1/3)*x]/(3*a^(1/3)*b^(2/3)) - Lo
g[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2]/(6*a^(1/3)*b^(2/3))
```

Rubi [A] time = 0.125703, antiderivative size = 115, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538

$$-\frac{\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{6\sqrt[3]{a}b^{2/3}}+\frac{\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{3\sqrt[3]{a}b^{2/3}}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x}{\sqrt{3}\sqrt[3]{b}}\right)}{\sqrt{3}\sqrt[3]{a}b^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^3)*x^3),x]
```

```
[Out] -(ArcTan[(b^(1/3) - 2*a^(1/3)*x)/(Sqrt[3]*b^(1/3))]/(Sqrt[3]*a^(1
/3)*b^(2/3))) + Log[b^(1/3) + a^(1/3)*x]/(3*a^(1/3)*b^(2/3)) - Lo
g[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2]/(6*a^(1/3)*b^(2/3))
```

Rubi in Sympy [A] time = 25.6103, size = 109, normalized size = 0.95

$$\frac{\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{3\sqrt[3]{a}b^{\frac{2}{3}}}-\frac{\log\left(a^{\frac{2}{3}}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}\right)}{6\sqrt[3]{a}b^{\frac{2}{3}}}-\frac{\sqrt{3}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(-\frac{2\sqrt[3]{a}x}{3}+\frac{\sqrt[3]{b}}{3}\right)}{\sqrt[3]{b}}\right)}{3\sqrt[3]{a}b^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**3)/x**3,x)
```

```
[Out] log(a**(1/3)*x + b**(1/3))/(3*a**(1/3)*b**(2/3)) - log(a**(2/3)*x
**2 - a**(1/3)*b**(1/3)*x + b**(2/3))/(6*a**(1/3)*b**(2/3)) - sqr
t(3)*atan(sqrt(3)*(-2*a**(1/3)*x/3 + b**(1/3)/3)/b**(1/3))/(3*a**
(1/3)*b**(2/3))
```

Mathematica [A] time = 0.0268715, size = 89, normalized size = 0.77

$$-\frac{\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)-2\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)+2\sqrt{3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{a}x}{\sqrt[3]{b}}}{\sqrt{3}}\right)}{6\sqrt[3]{a}b^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^3)*x^3),x]
```

```
[Out] -(2*Sqrt[3]*ArcTan[(1 - (2*a^(1/3)*x)/b^(1/3))/Sqrt[3]] - 2*Log[b
^(1/3) + a^(1/3)*x] + Log[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x
^2])/(6*a^(1/3)*b^(2/3))
```

Maple [A] time = 0.002, size = 91, normalized size = 0.8

$$\frac{1}{3a}\ln\left(x+\sqrt[3]{\frac{b}{a}}\right)\left(\frac{b}{a}\right)^{-\frac{2}{3}}-\frac{1}{6a}\ln\left(x^2-x\sqrt[3]{\frac{b}{a}}+\left(\frac{b}{a}\right)^{\frac{2}{3}}\right)\left(\frac{b}{a}\right)^{-\frac{2}{3}}+\frac{\sqrt{3}}{3a}\arctan\left(\frac{\sqrt{3}}{3}\left(2x\frac{1}{\sqrt[3]{\frac{b}{a}}}-1\right)\right)\left(\frac{b}{a}\right)^{-\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^3)/x^3,x)
```

```
[Out] 1/3/a/(b/a)^(2/3)*ln(x+(b/a)^(1/3))-1/6/a/(b/a)^(2/3)*ln(x^2-x*(b
/a)^(1/3)+(b/a)^(2/3))+1/3/a/(b/a)^(2/3)*3^(1/2)*arctan(1/3*3^(1/
2)*(2/(b/a)^(1/3)*x-1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)*x^3),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.231186, size = 120, normalized size = 1.04

$$-\frac{\sqrt{3}\left(\sqrt{3}\log\left(\left(ab^2\right)^{\frac{2}{3}}x^2-\left(ab^2\right)^{\frac{1}{3}}bx+b^2\right)-2\sqrt{3}\log\left(\left(ab^2\right)^{\frac{1}{3}}x+b\right)-6\arctan\left(\frac{2\sqrt{3}\left(ab^2\right)^{\frac{1}{3}}x-\sqrt{3}b}{3b}\right)\right)}{18\left(ab^2\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)*x^3),x, algorithm="fricas")
```

```
[Out] -1/18*sqrt(3)*(sqrt(3)*log((a*b^2)^(2/3)*x^2 - (a*b^2)^(1/3)*b*x
+ b^2) - 2*sqrt(3)*log((a*b^2)^(1/3)*x + b) - 6*arctan(1/3*(2*sqr
t(3)*(a*b^2)^(1/3)*x - sqrt(3)*b)/b))/(a*b^2)^(1/3)
```

Sympy [A] time = 0.366084, size = 20, normalized size = 0.17

$$\operatorname{RootSum}\left(27t^3ab^2-1,\left(t\mapsto t\log\left(3tb+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**3)/x**3,x)
```

```
[Out] RootSum(27*_t**3*a*b**2 - 1, Lambda(_t, _t*log(3*_t*b + x)))
```

GIAC/XCAS [A] time = 0.225733, size = 151, normalized size = 1.31

$$-\frac{\left(-\frac{b}{a}\right)^{\frac{1}{3}}\ln\left(\left|x-\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right|\right)}{3\,b}+\frac{\sqrt{3}\left(-a^{2}b\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{b}{a}\right)^{\frac{1}{3}}}\right)}{3\,ab}+\frac{\left(-a^{2}b\right)^{\frac{1}{3}}\ln\left(x^{2}+x\left(-\frac{b}{a}\right)^{\frac{1}{3}}+\left(-\frac{b}{a}\right)^{\frac{2}{3}}\right)}{6\,ab}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)*x^3),x, algorithm="giac")
```

```
[Out] -1/3*(-b/a)^(1/3)*ln(abs(x - (-b/a)^(1/3)))/b + 1/3*sqrt(3)*(-a^2
*b)^(1/3)*arctan(1/3*sqrt(3)*(2*x + (-b/a)^(1/3))/(-b/a)^(1/3))/(
a*b) + 1/6*(-a^2*b)^(1/3)*ln(x^2 + x*(-b/a)^(1/3) + (-b/a)^(2/3))
/(a*b)
```

3.1972 $\int \frac{1}{\left(a+\frac{b}{x^3}\right)x^4}\,dx$

Optimal. Leaf size=15

$$-\frac{\log\left(a+\frac{b}{x^3}\right)}{3b}$$

[Out] -Log[a + b/x^3]/(3*b)

Rubi [A] time = 0.0181738, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{\log\left(a+\frac{b}{x^3}\right)}{3b}$$

Antiderivative was successfully verified.

[In] Int[1/((a + b/x^3)*x^4),x]

[Out] -Log[a + b/x^3]/(3*b)

Rubi in Sympy [A] time = 2.13884, size = 12, normalized size = 0.8

$$-\frac{\log\left(a+\frac{b}{x^3}\right)}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(1/(a+b/x**3)/x**4,x)

[Out] -log(a + b/x**3)/(3*b)

Mathematica [A] time = 0.00958125, size = 22, normalized size = 1.47

$$\frac{\log(x)}{b}-\frac{\log\left(ax^3+b\right)}{3b}$$

Antiderivative was successfully verified.

[In] Integrate[1/((a + b/x^3)*x^4),x]

[Out] Log[x]/b - Log[b + a*x^3]/(3*b)

Maple [A] time = 0.007, size = 21, normalized size = 1.4

$$\frac{\ln(x)}{b}-\frac{\ln\left(ax^3+b\right)}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(a+b/x^3)/x^4,x)

```
[Out] ln(x)/b-1/3/b*ln(a*x^3+b)
```

Maxima [A] time = 1.42677, size = 18, normalized size = 1.2

$$-\frac{\log\left(a+\frac{b}{x^3}\right)}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)*x^4),x, algorithm="maxima")
```

```
[Out] -1/3*log(a + b/x^3)/b
```

Fricas [A] time = 0.235955, size = 24, normalized size = 1.6

$$-\frac{\log\left(ax^3+b\right)-3\,\log\left(x\right)}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)*x^4),x, algorithm="fricas")
```

```
[Out] -1/3*(log(a*x^3 + b) - 3*log(x))/b
```

Sympy [A] time = 0.60819, size = 15, normalized size = 1.

$$\frac{\log\left(x\right)}{b}-\frac{\log\left(x^3+\frac{b}{a}\right)}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**3)/x**4,x)
```

```
[Out] log(x)/b - log(x**3 + b/a)/(3*b)
```

GIAC/XCAS [A] time = 0.225933, size = 30, normalized size = 2.

$$-\frac{\ln\left(\left|ax^3+b\right|\right)}{3\,b}+\frac{\ln\left(\left|x\right|\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)*x^4),x, algorithm="giac")
```

```
[Out] -1/3*ln(abs(a*x^3 + b))/b + ln(abs(x))/b
```

3.1973 $\int \frac{1}{\left(a+\frac{b}{x^3}\right)x^5}\,dx$

Optimal. Leaf size=122

$$-\frac{\sqrt[3]{a}\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{6b^{4/3}}+\frac{\sqrt[3]{a}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{3b^{4/3}}+\frac{\sqrt[3]{a}\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x}{\sqrt{3}\sqrt[3]{b}}\right)}{\sqrt{3}b^{4/3}}-\frac{1}{bx}$$

```
[Out] -(1/(b*x)) + (a^(1/3)*ArcTan[(b^(1/3) - 2*a^(1/3)*x)/(Sqrt[3]*b^(
1/3))])/(Sqrt[3]*b^(4/3)) + (a^(1/3)*Log[b^(1/3) + a^(1/3)*x])/(3
*b^(4/3)) - (a^(1/3)*Log[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^
2])/(6*b^(4/3))
```

Rubi [A] time = 0.162251, antiderivative size = 122, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615

$$-\frac{\sqrt[3]{a}\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{6b^{4/3}}+\frac{\sqrt[3]{a}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{3b^{4/3}}+\frac{\sqrt[3]{a}\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x}{\sqrt{3}\sqrt[3]{b}}\right)}{\sqrt{3}b^{4/3}}-\frac{1}{bx}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^3)*x^5),x]
```

```
[Out] -(1/(b*x)) + (a^(1/3)*ArcTan[(b^(1/3) - 2*a^(1/3)*x)/(Sqrt[3]*b^(
1/3))])/(Sqrt[3]*b^(4/3)) + (a^(1/3)*Log[b^(1/3) + a^(1/3)*x])/(3
*b^(4/3)) - (a^(1/3)*Log[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^
2])/(6*b^(4/3))
```

Rubi in Sympy [A] time = 29.7755, size = 114, normalized size = 0.93

$$\frac{\sqrt[3]{a}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{3b^{\frac{4}{3}}}-\frac{\sqrt[3]{a}\log\left(a^{\frac{2}{3}}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}\right)}{6b^{\frac{4}{3}}}+\frac{\sqrt{3}\sqrt[3]{a}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(-\frac{2\sqrt[3]{a}x}{3}+\frac{\sqrt[3]{b}}{3}\right)}{\sqrt[3]{b}}\right)}{3b^{\frac{4}{3}}}-\frac{1}{bx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**3)/x**5,x)
```

```
[Out] a**(1/3)*log(a**(1/3)*x + b**(1/3))/(3*b**(4/3)) - a**(1/3)*log(a
**(2/3)*x**2 - a**(1/3)*b**(1/3)*x + b**(2/3))/(6*b**(4/3)) + sqr
t(3)*a**(1/3)*atan(sqrt(3)*(-2*a**(1/3)*x/3 + b**(1/3)/3)/b**(1/3
))/(3*b**(4/3)) - 1/(b*x)
```

Mathematica [A] time = 0.0418416, size = 114, normalized size = 0.93

$$\frac{-\sqrt[3]{a}x\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)+2\sqrt[3]{a}x\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)+2\sqrt{3}\sqrt[3]{a}x\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{a}x}{\sqrt[3]{b}}}{\sqrt{3}}\right)-6\sqrt[3]{b}}{6b^{4/3}x}$$

Antiderivative was successfully verified.

```
[In]   Integrate[1/((a + b/x^3)*x^5),x]
```

```
[Out] (-6*b^(1/3) + 2*Sqrt[3]*a^(1/3)*x*ArcTan[(1 - (2*a^(1/3)*x)/b^(1/
3))/Sqrt[3]] + 2*a^(1/3)*x*Log[b^(1/3) + a^(1/3)*x] - a^(1/3)*x*L
og[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2])/(6*b^(4/3)*x)
```

Maple [A] time = 0.006, size = 99, normalized size = 0.8

$$\frac{1}{3b}\ln\left(x+\sqrt[3]{\frac{b}{a}}\right)\frac{1}{\sqrt[3]{\frac{b}{a}}}-\frac{1}{6b}\ln\left(x^2-x\sqrt[3]{\frac{b}{a}}+\left(\frac{b}{a}\right)^{\frac{2}{3}}\right)\frac{1}{\sqrt[3]{\frac{b}{a}}}-\frac{\sqrt{3}}{3b}\arctan\left(\frac{\sqrt{3}}{3}\left(2x\frac{1}{\sqrt[3]{\frac{b}{a}}}-1\right)\right)\frac{1}{\sqrt[3]{\frac{b}{a}}}-\frac{1}{bx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/(a+b/x^3)/x^5,x)
```

```
[Out] 1/3/b/(b/a)^(1/3)*ln(x+(b/a)^(1/3))-1/6/b/(b/a)^(1/3)*ln(x^2-x*(b
/a)^(1/3)+(b/a)^(2/3))-1/3/b*3^(1/2)/(b/a)^(1/3)*arctan(1/3*3^(1/
2)*(2/(b/a)^(1/3)*x-1))-1/b/x
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x^3)*x^5),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.229223, size = 171, normalized size = 1.4

$$-\frac{\sqrt{3}\left(\sqrt{3}x\left(\frac{a}{b}\right)^{\frac{1}{3}}\log\left(ax^2-bx\left(\frac{a}{b}\right)^{\frac{2}{3}}+b\left(\frac{a}{b}\right)^{\frac{1}{3}}\right)-2\sqrt{3}x\left(\frac{a}{b}\right)^{\frac{1}{3}}\log\left(ax+b\left(\frac{a}{b}\right)^{\frac{2}{3}}\right)-6x\left(\frac{a}{b}\right)^{\frac{1}{3}}\arctan\left(-\frac{2\sqrt{3}ax-\sqrt{3}b\left(\frac{a}{b}\right)^{\frac{2}{3}}}{3b\left(\frac{a}{b}\right)^{\frac{2}{3}}}\right)+6\right.}{18bx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x^3)*x^5),x, algorithm="fricas")
```

```
[Out] -1/18*sqrt(3)*(sqrt(3)*x*(a/b)^(1/3)*log(a*x^2 - b*x*(a/b)^(2/3)
+ b*(a/b)^(1/3)) - 2*sqrt(3)*x*(a/b)^(1/3)*log(a*x + b*(a/b)^(2/3
)) - 6*x*(a/b)^(1/3)*arctan(-1/3*(2*sqrt(3)*a*x - sqrt(3)*b*(a/b)
^(2/3))/(b*(a/b)^(2/3))) + 6*sqrt(3))/(b*x)
```

Sympy [A] time = 1.34028, size = 29, normalized size = 0.24

$$\operatorname{RootSum}\left(27t^3b^4-a,\left(t\mapsto t\log\left(\frac{9t^2b^3}{a}+x\right)\right)\right)-\frac{1}{bx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(a+b/x**3)/x**5,x)
```

```
[Out] RootSum(27*_t**3*b**4 - a, Lambda(_t, _t*log(9*_t**2*b**3/a + x))
) - 1/(b*x)
```

GIAC/XCAS [A] time = 0.226631, size = 163, normalized size = 1.34

$$\frac{a\left(-\frac{b}{a}\right)^{\frac{2}{3}}\ln\left(\left|x-\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right|\right)}{3\,b^2}+\frac{\sqrt{3}\left(-a^2b\right)^{\frac{2}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{b}{a}\right)^{\frac{1}{3}}}\right)}{3\,ab^2}-\frac{\left(-a^2b\right)^{\frac{2}{3}}\ln\left(x^2+x\left(-\frac{b}{a}\right)^{\frac{1}{3}}+\left(-\frac{b}{a}\right)^{\frac{2}{3}}\right)}{6\,ab^2}-\frac{1}{bx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)*x^5),x, algorithm="giac")
```

```
[Out] 1/3*a*(-b/a)^(2/3)*ln(abs(x - (-b/a)^(1/3)))/b^2 + 1/3*sqrt(3)*(-
a^2*b)^(2/3)*arctan(1/3*sqrt(3)*(2*x + (-b/a)^(1/3))/(-b/a)^(1/3)
)/(a*b^2) - 1/6*(-a^2*b)^(2/3)*ln(x^2 + x*(-b/a)^(1/3) + (-b/a)^(
2/3))/(a*b^2) - 1/(b*x)
```

3.1974 $\int \frac{1}{\left(a+\frac{b}{x^3}\right)x^6}\,dx$

Optimal. Leaf size=124

$$\frac{a^{2/3}\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{6b^{5/3}}-\frac{a^{2/3}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{3b^{5/3}}+\frac{a^{2/3}\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x}{\sqrt{3}\sqrt[3]{b}}\right)}{\sqrt{3}b^{5/3}}-\frac{1}{2bx^2}$$

```
[Out] -1/(2*b*x^2) + (a^(2/3)*ArcTan[(b^(1/3) - 2*a^(1/3)*x)/(Sqrt[3]*b
^(1/3))])/(Sqrt[3]*b^(5/3)) - (a^(2/3)*Log[b^(1/3) + a^(1/3)*x])/
(3*b^(5/3)) + (a^(2/3)*Log[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*
x^2])/(6*b^(5/3))
```

Rubi [A] time = 0.158557, antiderivative size = 124, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615

$$\frac{a^{2/3}\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{6b^{5/3}}-\frac{a^{2/3}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{3b^{5/3}}+\frac{a^{2/3}\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x}{\sqrt{3}\sqrt[3]{b}}\right)}{\sqrt{3}b^{5/3}}-\frac{1}{2bx^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^3)*x^6),x]
```

```
[Out] -1/(2*b*x^2) + (a^(2/3)*ArcTan[(b^(1/3) - 2*a^(1/3)*x)/(Sqrt[3]*b
^(1/3))])/(Sqrt[3]*b^(5/3)) - (a^(2/3)*Log[b^(1/3) + a^(1/3)*x])/
(3*b^(5/3)) + (a^(2/3)*Log[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*
x^2])/(6*b^(5/3))
```

Rubi in Sympy [A] time = 30.8434, size = 117, normalized size = 0.94

$$-\frac{a^{\frac{2}{3}}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{3b^{\frac{5}{3}}}+\frac{a^{\frac{2}{3}}\log\left(a^{\frac{2}{3}}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}\right)}{6b^{\frac{5}{3}}}+\frac{\sqrt{3}a^{\frac{2}{3}}\operatorname{atan}\left(\frac{\sqrt{3}\left(-\frac{2\sqrt[3]{a}x}{3}+\frac{\sqrt[3]{b}}{3}\right)}{\sqrt[3]{b}}\right)}{3b^{\frac{5}{3}}}-\frac{1}{2bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**3)/x**6,x)
```

```
[Out] -a**(2/3)*log(a**(1/3)*x + b**(1/3))/(3*b**(5/3)) + a**(2/3)*log(
a**(2/3)*x**2 - a**(1/3)*b**(1/3)*x + b**(2/3))/(6*b**(5/3)) + sq
rt(3)*a**(2/3)*atan(sqrt(3)*(-2*a**(1/3)*x/3 + b**(1/3)/3)/b**(1/
3))/(3*b**(5/3)) - 1/(2*b*x**2)
```

Mathematica [A] time = 0.0380149, size = 119, normalized size = 0.96

$$\frac{a^{2/3}x^2\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)-2a^{2/3}x^2\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)+2\sqrt{3}a^{2/3}x^2\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{a}x}{\sqrt[3]{b}}}{\sqrt{3}}\right)-3b^{2/3}}{6b^{5/3}x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^3)*x^6),x]
```

```
[Out] (-3*b^(2/3) + 2*Sqrt[3]*a^(2/3)*x^2*ArcTan[(1 - (2*a^(1/3)*x)/b^(
1/3))/Sqrt[3]] - 2*a^(2/3)*x^2*Log[b^(1/3) + a^(1/3)*x] + a^(2/3)
*x^2*Log[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2])/(6*b^(5/3)*x
^2)
```

Maple [A] time = 0.005, size = 99, normalized size = 0.8

$$-\frac{1}{3\,b}\ln\left(x+\sqrt[3]{\frac{b}{a}}\right)\left(\frac{b}{a}\right)^{-\frac{2}{3}}+\frac{1}{6\,b}\ln\left(x^{2}-x\sqrt[3]{\frac{b}{a}}+\left(\frac{b}{a}\right)^{\frac{2}{3}}\right)\left(\frac{b}{a}\right)^{-\frac{2}{3}}-\frac{\sqrt{3}}{3\,b}\arctan\left(\frac{\sqrt{3}}{3}\left(2\,x\frac{1}{\sqrt[3]{\frac{b}{a}}}-1\right)\right)\left(\frac{b}{a}\right)^{-\frac{2}{3}}-\frac{1}{2\,bx^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^3)/x^6,x)
```

```
[Out] -1/3/b/(b/a)^(2/3)*ln(x+(b/a)^(1/3))+1/6/b/(b/a)^(2/3)*ln(x^2-x*(
b/a)^(1/3)+(b/a)^(2/3))-1/3/b/(b/a)^(2/3)*3^(1/2)*arctan(1/3*3^(1
/2)*(2/(b/a)^(1/3)*x-1))-1/2/b/x^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)*x^6),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.224277, size = 217, normalized size = 1.75

$$-\frac{\sqrt{3}\left(\sqrt{3}x^{2}\left(-\frac{a^{2}}{b^{2}}\right)^{\frac{1}{3}}\log\left(a^{2}x^{2}+abx\left(-\frac{a^{2}}{b^{2}}\right)^{\frac{1}{3}}+b^{2}\left(-\frac{a^{2}}{b^{2}}\right)^{\frac{2}{3}}\right)-2\sqrt{3}x^{2}\left(-\frac{a^{2}}{b^{2}}\right)^{\frac{1}{3}}\log\left(ax-b\left(-\frac{a^{2}}{b^{2}}\right)^{\frac{1}{3}}\right)+6\,x^{2}\left(-\frac{a^{2}}{b^{2}}\right)^{\frac{1}{3}}\arctan\left(\dots\right.\right.}{18\,bx^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)*x^6),x, algorithm="fricas")
```

```
[Out] -1/18*sqrt(3)*(sqrt(3)*x^2*(-a^2/b^2)^(1/3)*log(a^2*x^2 + a*b*x*(
-a^2/b^2)^(1/3) + b^2*(-a^2/b^2)^(2/3)) - 2*sqrt(3)*x^2*(-a^2/b^2
)^(1/3)*log(a*x - b*(-a^2/b^2)^(1/3)) + 6*x^2*(-a^2/b^2)^(1/3)*ar
ctan(1/3*(2*sqrt(3)*a*x + sqrt(3)*b*(-a^2/b^2)^(1/3))/(b*(-a^2/b^
2)^(1/3))) + 3*sqrt(3))/(b*x^2)
```

Sympy [A] time = 1.45458, size = 32, normalized size = 0.26

$$\operatorname{RootSum}\left(27t^{3}b^{5}+a^{2},\left(t\mapsto t\log\left(-\frac{3tb^{2}}{a}+x\right)\right)\right)-\frac{1}{2bx^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**3)/x**6,x)
```

```
[Out] RootSum(27*_t**3*b**5 + a**2, Lambda(_t, _t*log(-3*_t*b**2/a + x)
)) - 1/(2*b*x**2)
```

GIAC/XCAS [A] time = 0.244405, size = 155, normalized size = 1.25

$$\frac{a\left(-\frac{b}{a}\right)^{\frac{1}{3}}\ln\left(\left|x-\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right|\right)}{3\,b^2}-\frac{\sqrt{3}\left(-a^2b\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{b}{a}\right)^{\frac{1}{3}}}\right)}{3\,b^2}-\frac{\left(-a^2b\right)^{\frac{1}{3}}\ln\left(x^2+x\left(-\frac{b}{a}\right)^{\frac{1}{3}}+\left(-\frac{b}{a}\right)^{\frac{2}{3}}\right)}{6\,b^2}-\frac{1}{2\,bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)*x^6),x, algorithm="giac")
```

```
[Out] 1/3*a*(-b/a)^(1/3)*ln(abs(x - (-b/a)^(1/3)))/b^2 - 1/3*sqrt(3)*(-
a^2*b)^(1/3)*arctan(1/3*sqrt(3)*(2*x + (-b/a)^(1/3))/(-b/a)^(1/3)
)/b^2 - 1/6*(-a^2*b)^(1/3)*ln(x^2 + x*(-b/a)^(1/3) + (-b/a)^(2/3)
)/b^2 - 1/2/(b*x^2)
```

3.1975 $\int \frac{1}{\left(a+\frac{b}{x^3}\right)x^7}\,dx$

Optimal. Leaf size=35

$$\frac{a\log\left(ax^3+b\right)}{3b^2}-\frac{a\log(x)}{b^2}-\frac{1}{3bx^3}$$

```
[Out] -1/(3*b*x^3) - (a*Log[x])/b^2 + (a*Log[b + a*x^3])/(3*b^2)
```

Rubi [A] time = 0.0661373, antiderivative size = 35, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{a\log\left(ax^3+b\right)}{3b^2}-\frac{a\log(x)}{b^2}-\frac{1}{3bx^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^3)*x^7),x]

[Out] -1/(3*b*x^3) - (a*Log[x])/b^2 + (a*Log[b + a*x^3])/(3*b^2)
```

Rubi in Sympy [A] time = 9.21433, size = 34, normalized size = 0.97

$$-\frac{a\log\left(x^3\right)}{3b^2}+\frac{a\log\left(ax^3+b\right)}{3b^2}-\frac{1}{3bx^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**3)/x**7,x)

[Out] -a*log(x**3)/(3*b**2) + a*log(a*x**3 + b)/(3*b**2) - 1/(3*b*x**3)
```

Mathematica [A] time = 0.0127865, size = 35, normalized size = 1.

$$\frac{a\log\left(ax^3+b\right)}{3b^2}-\frac{a\log(x)}{b^2}-\frac{1}{3bx^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^3)*x^7),x]

[Out] -1/(3*b*x^3) - (a*Log[x])/b^2 + (a*Log[b + a*x^3])/(3*b^2)
```

Maple [A] time = 0.008, size = 32, normalized size = 0.9

$$-\frac{1}{3\,bx^3}-\frac{a\ln(x)}{b^2}+\frac{a\ln\left(ax^3+b\right)}{3\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^3)/x^7,x)

[Out] -1/3/b/x^3-a*ln(x)/b^2+1/3*a*ln(a*x^3+b)/b^2
```

Maxima [A] time = 1.42775, size = 45, normalized size = 1.29

$$\frac{a\log\left(ax^3+b\right)}{3\,b^2}-\frac{a\log\left(x^3\right)}{3\,b^2}-\frac{1}{3\,bx^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)*x^7),x, algorithm="maxima")
```

```
[Out] 1/3*a*log(a*x^3 + b)/b^2 - 1/3*a*log(x^3)/b^2 - 1/3/(b*x^3)
```

Fricas [A] time = 0.225132, size = 45, normalized size = 1.29

$$\frac{ax^3\log\left(ax^3+b\right)-3\,ax^3\log\left(x\right)-b}{3\,b^2x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)*x^7),x, algorithm="fricas")
```

```
[Out] 1/3*(a*x^3*log(a*x^3 + b) - 3*a*x^3*log(x) - b)/(b^2*x^3)
```

Sympy [A] time = 1.86828, size = 31, normalized size = 0.89

$$-\frac{a\log\left(x\right)}{b^2}+\frac{a\log\left(x^3+\frac{b}{a}\right)}{3b^2}-\frac{1}{3bx^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**3)/x**7,x)
```

```
[Out] -a*log(x)/b**2 + a*log(x**3 + b/a)/(3*b**2) - 1/(3*b*x**3)
```

GIAC/XCAS [A] time = 0.222301, size = 57, normalized size = 1.63

$$\frac{a\ln\left(\left|ax^3+b\right|\right)}{3\,b^2}-\frac{a\ln\left(\left|x\right|\right)}{b^2}+\frac{ax^3-b}{3\,b^2x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)*x^7),x, algorithm="giac")
```

```
[Out] 1/3*a*ln(abs(a*x^3 + b))/b^2 - a*ln(abs(x))/b^2 + 1/3*(a*x^3 - b)
/(b^2*x^3)
```

3.1976 $\int \frac{x^5}{\left(a+\frac{b}{x^3}\right)^2} dx$

Optimal. Leaf size=56

$$\frac{b^3}{3a^4(ax^3+b)} + \frac{b^2\log(ax^3+b)}{a^4} - \frac{2bx^3}{3a^3} + \frac{x^6}{6a^2}$$

```
[Out] (-2*b*x^3)/(3*a^3) + x^6/(6*a^2) + b^3/(3*a^4*(b + a*x^3)) + (b^2
*Log[b + a*x^3])/a^4
```

Rubi [A] time = 0.114911, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{b^3}{3a^4(ax^3+b)} + \frac{b^2\log(ax^3+b)}{a^4} - \frac{2bx^3}{3a^3} + \frac{x^6}{6a^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/(a + b/x^3)^2,x]
```

```
[Out] (-2*b*x^3)/(3*a^3) + x^6/(6*a^2) + b^3/(3*a^4*(b + a*x^3)) + (b^2
*Log[b + a*x^3])/a^4
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int^{x^3} x\,dx}{3a^2} - \frac{2bx^3}{3a^3} + \frac{b^3}{3a^4(ax^3+b)} + \frac{b^2\log(ax^3+b)}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(a+b/x**3)**2,x)
```

```
[Out] Integral(x, (x, x**3))/(3*a**2) - 2*b*x**3/(3*a**3) + b**3/(3*a**
4*(a*x**3 + b)) + b**2*log(a*x**3 + b)/a**4
```

Mathematica [A] time = 0.0317439, size = 49, normalized size = 0.88

$$\frac{a^2x^6 + \frac{2b^3}{ax^3+b} + 6b^2\log(ax^3+b) - 4abx^3}{6a^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/(a + b/x^3)^2,x]
```

```
[Out] (-4*a*b*x^3 + a^2*x^6 + (2*b^3)/(b + a*x^3) + 6*b^2*Log[b + a*x^3
])/(6*a^4)
```

Maple [A] time = 0.008, size = 51, normalized size = 0.9

$$-\frac{2\,bx^3}{3\,a^3} + \frac{x^6}{6\,a^2} + \frac{b^3}{3\,a^4(ax^3+b)} + \frac{b^2\ln(ax^3+b)}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(a+b/x^3)^2,x)
```

```
[Out] -2/3*b*x^3/a^3+1/6*x^6/a^2+1/3*b^3/a^4/(a*x^3+b)+b^2*ln(a*x^3+b)/
a^4
```

Maxima [A] time = 1.43814, size = 72, normalized size = 1.29

$$\frac{b^3}{3\,(a^5x^3 + a^4b)} + \frac{b^2\log\left(ax^3 + b\right)}{a^4} + \frac{ax^6 - 4\,bx^3}{6\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(a + b/x^3)^2,x, algorithm="maxima")
```

```
[Out] 1/3*b^3/(a^5*x^3 + a^4*b) + b^2*log(a*x^3 + b)/a^4 + 1/6*(a*x^6 -
 4*b*x^3)/a^3
```

Fricas [A] time = 0.22113, size = 95, normalized size = 1.7

$$\frac{a^3x^9 - 3\,a^2bx^6 - 4\,ab^2x^3 + 2\,b^3 + 6\,\left(ab^2x^3 + b^3\right)\log\left(ax^3 + b\right)}{6\,(a^5x^3 + a^4b)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(a + b/x^3)^2,x, algorithm="fricas")
```

```
[Out] 1/6*(a^3*x^9 - 3*a^2*b*x^6 - 4*a*b^2*x^3 + 2*b^3 + 6*(a*b^2*x^3 +
 b^3)*log(a*x^3 + b))/(a^5*x^3 + a^4*b)
```

Sympy [A] time = 1.84176, size = 53, normalized size = 0.95

$$\frac{b^3}{3a^5x^3 + 3a^4b} + \frac{x^6}{6a^2} - \frac{2bx^3}{3a^3} + \frac{b^2\log\left(ax^3 + b\right)}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(a+b/x**3)**2,x)
```

```
[Out] b**3/(3*a**5*x**3 + 3*a**4*b) + x**6/(6*a**2) - 2*b*x**3/(3*a**3)
 + b**2*log(a*x**3 + b)/a**4
```

GIAC/XCAS [A] time = 0.236479, size = 73, normalized size = 1.3

$$\frac{b^2\ln\left(\left|ax^3 + b\right|\right)}{a^4} + \frac{b^3}{3\,(ax^3 + b)a^4} + \frac{a^2x^6 - 4\,abx^3}{6\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(a + b/x^3)^2,x, algorithm="giac")
```

```
[Out] b^2*ln(abs(a*x^3 + b))/a^4 + 1/3*b^3/((a*x^3 + b)*a^4) + 1/6*(a^2
*x^6 - 4*a*b*x^3)/a^4
```

3.1977 $\int \frac{x^4}{\left(a+\frac{b}{x^3}\right)^2}\,dx$

Optimal. Leaf size=157

$$\frac{4b^{5/3}\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{9a^{11/3}}-\frac{8b^{5/3}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{9a^{11/3}}-\frac{8b^{5/3}\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x}{\sqrt{3}\sqrt[3]{b}}\right)}{3\sqrt{3}a^{11/3}}-\frac{4bx^2}{3a^3}+\frac{8x^5}{15a^2}-\frac{x^8}{3a\left(ax^3+b\right)}$$

```
[Out] (-4*b*x^2)/(3*a^3) + (8*x^5)/(15*a^2) - x^8/(3*a*(b + a*x^3)) - (
8*b^(5/3)*ArcTan[(b^(1/3) - 2*a^(1/3)*x)/(Sqrt[3]*b^(1/3))])/(3*S
qrt[3]*a^(11/3)) - (8*b^(5/3)*Log[b^(1/3) + a^(1/3)*x])/(9*a^(11/
3)) + (4*b^(5/3)*Log[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2])/
(9*a^(11/3))
```

Rubi [A] time = 0.239825, antiderivative size = 157, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 9, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.692

$$\frac{4b^{5/3}\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{9a^{11/3}}-\frac{8b^{5/3}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{9a^{11/3}}-\frac{8b^{5/3}\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x}{\sqrt{3}\sqrt[3]{b}}\right)}{3\sqrt{3}a^{11/3}}-\frac{4bx^2}{3a^3}+\frac{8x^5}{15a^2}-\frac{x^8}{3a\left(ax^3+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a + b/x^3)^2,x]
```

```
[Out] (-4*b*x^2)/(3*a^3) + (8*x^5)/(15*a^2) - x^8/(3*a*(b + a*x^3)) - (
8*b^(5/3)*ArcTan[(b^(1/3) - 2*a^(1/3)*x)/(Sqrt[3]*b^(1/3))])/(3*S
qrt[3]*a^(11/3)) - (8*b^(5/3)*Log[b^(1/3) + a^(1/3)*x])/(9*a^(11/
3)) + (4*b^(5/3)*Log[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2])/
(9*a^(11/3))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{x^8}{3a\left(ax^3+b\right)}+\frac{8x^5}{15a^2}-\frac{8b\int x\,dx}{3a^3}-\frac{8b^{\frac{5}{3}}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{9a^{\frac{11}{3}}}+\frac{4b^{\frac{5}{3}}\log\left(a^{\frac{2}{3}}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}\right)}{9a^{\frac{11}{3}}}-\frac{8\sqrt{3}b^{\frac{5}{3}}\operatorname{atan}\left(\frac{\sqrt{3}\left(-\frac{2\sqrt[3]{a}x}{3}+\frac{\sqrt[3]{b}}{3}\right)}{\sqrt[3]{b}}\right)}{9a^{\frac{11}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(a+b/x**3)**2,x)
```

```
[Out] -x**8/(3*a*(a*x**3 + b)) + 8*x**5/(15*a**2) - 8*b*Integral(x, x)/
(3*a**3) - 8*b**(5/3)*log(a**(1/3)*x + b**(1/3))/(9*a**(11/3)) +
4*b**(5/3)*log(a**(2/3)*x**2 - a**(1/3)*b**(1/3)*x + b**(2/3))/(9
*a**(11/3)) - 8*sqrt(3)*b**(5/3)*atan(sqrt(3)*(-2*a**(1/3)*x/3 +
b**(1/3)/3)/b**(1/3))/(9*a**(11/3))
```

Mathematica [A] time = 0.187062, size = 144, normalized size = 0.92

$$\frac{20b^{5/3}\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)-\frac{15a^{2/3}b^2x^2}{ax^3+b}-45a^{2/3}bx^2+9a^{5/3}x^5-40b^{5/3}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)-40\sqrt{3}b^{5/3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{a}x}{\sqrt[3]{b}}}{\sqrt{3}}\right)}{45a^{11/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(a + b/x^3)^2,x]
```

```
[Out] (-45*a^(2/3)*b*x^2 + 9*a^(5/3)*x^5 - (15*a^(2/3)*b^2*x^2)/(b + a*
x^3) - 40*Sqrt[3]*b^(5/3)*ArcTan[(1 - (2*a^(1/3)*x)/b^(1/3))/Sqrt
[3]] - 40*b^(5/3)*Log[b^(1/3) + a^(1/3)*x] + 20*b^(5/3)*Log[b^(2/
3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2])/(45*a^(11/3))
```

Maple [A] time = 0.012, size = 137, normalized size = 0.9

$$\frac{x^5}{5a^2}-\frac{bx^2}{a^3}-\frac{b^2x^2}{3a^3(ax^3+b)}-\frac{8b^2}{9a^4}\ln\left(x+\sqrt[3]{\frac{b}{a}}\right)\frac{1}{\sqrt[3]{\frac{b}{a}}}+\frac{4b^2}{9a^4}\ln\left(x^2-x\sqrt[3]{\frac{b}{a}}+\left(\frac{b}{a}\right)^{\frac{2}{3}}\right)\frac{1}{\sqrt[3]{\frac{b}{a}}}+\frac{8b^2\sqrt{3}}{9a^4}\arctan\left(\frac{\sqrt{3}}{3}\left(2x\frac{1}{\sqrt[3]{\frac{b}{a}}}-1\right)\right)\frac{1}{\sqrt[3]{\frac{b}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(a+b/x^3)^2,x)
```

```
[Out] 1/5*x^5/a^2-b*x^2/a^3-1/3/a^3*b^2*x^2/(a*x^3+b)-8/9/a^4*b^2/(b/a)
^(1/3)*ln(x+(b/a)^(1/3))+4/9/a^4*b^2/(b/a)^(1/3)*ln(x^2-x*(b/a)^(
1/3)+(b/a)^(2/3))+8/9/a^4*b^2*3^(1/2)/(b/a)^(1/3)*arctan(1/3*3^(1
/2)*(2/(b/a)^(1/3)*x-1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(a + b/x^3)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.228273, size = 288, normalized size = 1.83

$$-\frac{\sqrt{3}\left(20\sqrt{3}(abx^3+b^2)\left(-\frac{b^2}{a^2}\right)^{\frac{1}{3}}\log\left(bx^2-ax\left(-\frac{b^2}{a^2}\right)^{\frac{2}{3}}-b\left(-\frac{b^2}{a^2}\right)^{\frac{1}{3}}\right)-40\sqrt{3}(abx^3+b^2)\left(-\frac{b^2}{a^2}\right)^{\frac{1}{3}}\log\left(bx+a\left(-\frac{b^2}{a^2}\right)^{\frac{2}{3}}\right)-1\right.}{135\left(a^4x^3+a^3b\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(a + b/x^3)^2,x, algorithm="fricas")
```

```
[Out] -1/135*sqrt(3)*(20*sqrt(3)*(a*b*x^3 + b^2)*(-b^2/a^2)^(1/3)*log(b
*x^2 - a*x*(-b^2/a^2)^(2/3) - b*(-b^2/a^2)^(1/3)) - 40*sqrt(3)*(a
*b*x^3 + b^2)*(-b^2/a^2)^(1/3)*log(b*x + a*(-b^2/a^2)^(2/3)) - 12
0*(a*b*x^3 + b^2)*(-b^2/a^2)^(1/3)*arctan(-1/3*(2*sqrt(3)*b*x - s
qrt(3)*a*(-b^2/a^2)^(2/3))/(a*(-b^2/a^2)^(2/3))) - 3*sqrt(3)*(3*a
^2*x^8 - 12*a*b*x^5 - 20*b^2*x^2))/(a^4*x^3 + a^3*b)
```

Sympy [A] time = 1.92913, size = 70, normalized size = 0.45

$$-\frac{b^2x^2}{3a^4x^3+3a^3b}+\operatorname{RootSum}\left(729t^3a^{11}+512b^5,\left(t\mapsto t\log\left(\frac{81t^2a^7}{64b^3}+x\right)\right)\right)+\frac{x^5}{5a^2}-\frac{bx^2}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(a+b/x**3)**2,x)
```

```
[Out] -b**2*x**2/(3*a**4*x**3 + 3*a**3*b) + RootSum(729*_t**3*a**11 + 5
12*b**5, Lambda(_t, _t*log(81*_t**2*a**7/(64*b**3) + x))) + x**5/
(5*a**2) - b*x**2/a**3
```

GIAC/XCAS [A] time = 0.244994, size = 204, normalized size = 1.3

$$-\frac{b^2x^2}{3\,(ax^3+b)a^3}-\frac{8\,b\left(-\frac{b}{a}\right)^{\frac{2}{3}}\ln\left(\left|x-\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right|\right)}{9\,a^3}-\frac{8\,\sqrt{3}\left(-a^2b\right)^{\frac{2}{3}}b\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{b}{a}\right)^{\frac{1}{3}}}\right)}{9\,a^5}+\frac{4\left(-a^2b\right)^{\frac{2}{3}}b\ln\left(x^2+x\left(-\frac{b}{a}\right)^{\frac{1}{3}}+\left(-\frac{b}{a}\right)^{\frac{2}{3}}\right)}{9\,a^5}+\frac{a^8x^5-5\,a^7bx^2}{5\,a^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(a + b/x^3)^2,x, algorithm="giac")
```

```
[Out] -1/3*b^2*x^2/((a*x^3 + b)*a^3) - 8/9*b*(-b/a)^(2/3)*ln(abs(x - (-
b/a)^(1/3)))/a^3 - 8/9*sqrt(3)*(-a^2*b)^(2/3)*b*arctan(1/3*sqrt(3
)*(2*x + (-b/a)^(1/3))/(-b/a)^(1/3))/a^5 + 4/9*(-a^2*b)^(2/3)*b*l
n(x^2 + x*(-b/a)^(1/3) + (-b/a)^(2/3))/a^5 + 1/5*(a^8*x^5 - 5*a^7
*b*x^2)/a^10
```

3.1978 $\int \frac{x^3}{\left(a+\frac{b}{x^3}\right)^2} dx$

Optimal. Leaf size=155

$$-\frac{7b^{4/3}\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{18a^{10/3}}+\frac{7b^{4/3}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{9a^{10/3}}-\frac{7b^{4/3}\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x}{\sqrt{3}\sqrt[3]{b}}\right)}{3\sqrt{3}a^{10/3}}-\frac{7bx}{3a^3}+\frac{7x^4}{12a^2}-\frac{x^7}{3a\left(ax^3+b\right)}$$

```
[Out] (-7*b*x)/(3*a^3) + (7*x^4)/(12*a^2) - x^7/(3*a*(b + a*x^3)) - (7*
b^(4/3)*ArcTan[(b^(1/3) - 2*a^(1/3)*x)/(Sqrt[3]*b^(1/3))])/(3*Sqr
t[3]*a^(10/3)) + (7*b^(4/3)*Log[b^(1/3) + a^(1/3)*x])/(9*a^(10/3)
) - (7*b^(4/3)*Log[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2])/(1
8*a^(10/3))
```

Rubi [A] time = 0.225125, antiderivative size = 155, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 9, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.692

$$-\frac{7b^{4/3}\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{18a^{10/3}}+\frac{7b^{4/3}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{9a^{10/3}}-\frac{7b^{4/3}\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x}{\sqrt{3}\sqrt[3]{b}}\right)}{3\sqrt{3}a^{10/3}}-\frac{7bx}{3a^3}+\frac{7x^4}{12a^2}-\frac{x^7}{3a\left(ax^3+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(a + b/x^3)^2,x]
```

```
[Out] (-7*b*x)/(3*a^3) + (7*x^4)/(12*a^2) - x^7/(3*a*(b + a*x^3)) - (7*
b^(4/3)*ArcTan[(b^(1/3) - 2*a^(1/3)*x)/(Sqrt[3]*b^(1/3))])/(3*Sqr
t[3]*a^(10/3)) + (7*b^(4/3)*Log[b^(1/3) + a^(1/3)*x])/(9*a^(10/3)
) - (7*b^(4/3)*Log[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2])/(1
8*a^(10/3))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{x^7}{3a\left(ax^3+b\right)}+\frac{7x^4}{12a^2}-\frac{7\int b\,dx}{3a^3}+\frac{7b^{\frac{4}{3}}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{9a^{\frac{10}{3}}}-\frac{7b^{\frac{4}{3}}\log\left(a^{\frac{2}{3}}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}\right)}{18a^{\frac{10}{3}}}-\frac{7\sqrt{3}b^{\frac{4}{3}}\operatorname{atan}\left(\frac{\sqrt{3}\left(-\frac{2\sqrt[3]{a}x}{3}+\frac{\sqrt[3]{b}}{3}\right)}{\sqrt[3]{b}}\right)}{9a^{\frac{10}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(a+b/x**3)**2,x)
```

```
[Out] -x**7/(3*a*(a*x**3 + b)) + 7*x**4/(12*a**2) - 7*Integral(b, x)/(3
*a**3) + 7*b**(4/3)*log(a**(1/3)*x + b**(1/3))/(9*a**(10/3)) - 7*
b**(4/3)*log(a**(2/3)*x**2 - a**(1/3)*b**(1/3)*x + b**(2/3))/(18*
a**(10/3)) - 7*sqrt(3)*b**(4/3)*atan(sqrt(3)*(-2*a**(1/3)*x/3 + b
**(1/3)/3)/b**(1/3))/(9*a**(10/3))
```

Mathematica [A] time = 0.170798, size = 140, normalized size = 0.9

$$\frac{-14b^{4/3}\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)+9a^{4/3}x^4+28b^{4/3}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)-28\sqrt{3}b^{4/3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{a}x}{\sqrt[3]{b}}}{\sqrt{3}}\right)-\frac{12\sqrt[3]{a}b^2x}{ax^3+b}-72\sqrt[3]{a}b\ldots}{36a^{10/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(a + b/x^3)^2,x]
```

```
[Out] (-72*a^(1/3)*b*x + 9*a^(4/3)*x^4 - (12*a^(1/3)*b^2*x)/(b + a*x^3)
 - 28*Sqrt[3]*b^(4/3)*ArcTan[(1 - (2*a^(1/3)*x)/b^(1/3))/Sqrt[3]]
 + 28*b^(4/3)*Log[b^(1/3) + a^(1/3)*x] - 14*b^(4/3)*Log[b^(2/3) -
 a^(1/3)*b^(1/3)*x + a^(2/3)*x^2])/(36*a^(10/3))
```

Maple [A] time = 0.011, size = 133, normalized size = 0.9

$$\frac{x^4}{4a^2}-2\frac{bx}{a^3}-\frac{b^2x}{3a^3(ax^3+b)}+\frac{7b^2}{9a^4}\ln\left(x+\sqrt[3]{\frac{b}{a}}\right)\left(\frac{b}{a}\right)^{-\frac{2}{3}}-\frac{7b^2}{18a^4}\ln\left(x^2-x\sqrt[3]{\frac{b}{a}}+\left(\frac{b}{a}\right)^{\frac{2}{3}}\right)\left(\frac{b}{a}\right)^{-\frac{2}{3}}+\frac{7b^2\sqrt{3}}{9a^4}\arctan\left(\frac{\sqrt{3}}{3}\left(2x\frac{1}{\sqrt[3]{\frac{b}{a}}}-1\right)\right)\left(\frac{b}{a}\right)^{-\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(a+b/x^3)^2,x)
```

```
[Out] 1/4*x^4/a^2-2*b*x/a^3-1/3/a^3*b^2*x/(a*x^3+b)+7/9/a^4*b^2/(b/a)^(
2/3)*ln(x+(b/a)^(1/3))-7/18/a^4*b^2/(b/a)^(2/3)*ln(x^2-x*(b/a)^(1
/3)+(b/a)^(2/3))+7/9/a^4*b^2/(b/a)^(2/3)*3^(1/2)*arctan(1/3*3^(1/
2)*(2/(b/a)^(1/3)*x-1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(a + b/x^3)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.225632, size = 232, normalized size = 1.5

$$-\frac{\sqrt{3}\left(14\sqrt{3}(abx^3+b^2)\left(\frac{b}{a}\right)^{\frac{1}{3}}\log\left(x^2-x\left(\frac{b}{a}\right)^{\frac{1}{3}}+\left(\frac{b}{a}\right)^{\frac{2}{3}}\right)-28\sqrt{3}(abx^3+b^2)\left(\frac{b}{a}\right)^{\frac{1}{3}}\log\left(x+\left(\frac{b}{a}\right)^{\frac{1}{3}}\right)+84\left(abx^3+b^2\right)\left(\frac{b}{a}\right)^{\frac{1}{3}}\ldots}{108\left(a^4x^3+a^3b\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(a + b/x^3)^2,x, algorithm="fricas")
```

```
[Out] -1/108*sqrt(3)*(14*sqrt(3)*(a*b*x^3 + b^2)*(b/a)^(1/3)*log(x^2 -
x*(b/a)^(1/3) + (b/a)^(2/3)) - 28*sqrt(3)*(a*b*x^3 + b^2)*(b/a)^(
1/3)*log(x + (b/a)^(1/3)) + 84*(a*b*x^3 + b^2)*(b/a)^(1/3)*arctan
(-1/3*(2*sqrt(3)*x - sqrt(3)*(b/a)^(1/3))/(b/a)^(1/3)) - 3*sqrt(3
)*(3*a^2*x^7 - 21*a*b*x^4 - 28*b^2*x))/(a^4*x^3 + a^3*b)
```

Sympy [A] time = 1.92968, size = 65, normalized size = 0.42

$$-\frac{b^2x}{3a^4x^3+3a^3b}+\operatorname{RootSum}\left(729t^3a^{10}-343b^4,\left(t\mapsto t\log\left(\frac{9ta^3}{7b}+x\right)\right)\right)+\frac{x^4}{4a^2}-\frac{2bx}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(a+b/x**3)**2,x)
```

```
[Out] -b**2*x/(3*a**4*x**3 + 3*a**3*b) + RootSum(729*_t**3*a**10 - 343*
b**4, Lambda(_t, _t*log(9*_t*a**3/(7*b) + x))) + x**4/(4*a**2) -
2*b*x/a**3
```

GIAC/XCAS [A] time = 0.228954, size = 198, normalized size = 1.28

$$-\frac{7\,b\left(-\frac{b}{a}\right)^{\frac{1}{3}}\ln\left(\left|x-\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right|\right)}{9\,a^3}-\frac{b^2x}{3\,(ax^3+b)a^3}+\frac{7\,\sqrt{3}\left(-a^2b\right)^{\frac{1}{3}}b\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{b}{a}\right)^{\frac{1}{3}}}\right)}{9\,a^4}+\frac{7\left(-a^2b\right)^{\frac{1}{3}}b\ln\left(x^2+x\left(-\frac{b}{a}\right)^{\frac{1}{3}}+\left(-\frac{b}{a}\right)^{\frac{2}{3}}\right)}{18\,a^4}+\frac{a^6x^4-8\,a^5bx}{4\,a^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(a + b/x^3)^2,x, algorithm="giac")
```

```
[Out] -7/9*b*(-b/a)^(1/3)*ln(abs(x - (-b/a)^(1/3)))/a^3 - 1/3*b^2*x/((a
*x^3 + b)*a^3) + 7/9*sqrt(3)*(-a^2*b)^(1/3)*b*arctan(1/3*sqrt(3)*
(2*x + (-b/a)^(1/3))/(-b/a)^(1/3))/a^4 + 7/18*(-a^2*b)^(1/3)*b*ln
(x^2 + x*(-b/a)^(1/3) + (-b/a)^(2/3))/a^4 + 1/4*(a^6*x^4 - 8*a^5*
b*x)/a^8
```

3.1979 $\int \frac{x^2}{\left(a+\frac{b}{x^3}\right)^2} dx$

Optimal. Leaf size=46

$$-\frac{b^2}{3a^3(ax^3+b)}-\frac{2b\log(ax^3+b)}{3a^3}+\frac{x^3}{3a^2}$$

```
[Out] x^3/(3*a^2) - b^2/(3*a^3*(b + a*x^3)) - (2*b*Log[b + a*x^3])/(3*a
^3)
```

Rubi [A] time = 0.0934779, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{b^2}{3a^3(ax^3+b)}-\frac{2b\log(ax^3+b)}{3a^3}+\frac{x^3}{3a^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(a + b/x^3)^2,x]
```

```
[Out] x^3/(3*a^2) - b^2/(3*a^3*(b + a*x^3)) - (2*b*Log[b + a*x^3])/(3*a
^3)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int^{x^3}\frac{1}{a^2}\,dx}{3}-\frac{b^2}{3a^3(ax^3+b)}-\frac{2b\log(ax^3+b)}{3a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**2/(a+b/x**3)**2,x)
```

```
[Out] Integral(a**(-2), (x, x**3))/3 - b**2/(3*a**3*(a*x**3 + b)) - 2*b
*log(a*x**3 + b)/(3*a**3)
```

Mathematica [A] time = 0.0281812, size = 38, normalized size = 0.83

$$\frac{-\frac{b^2}{ax^3+b}-2b\log(ax^3+b)+ax^3}{3a^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(a + b/x^3)^2,x]
```

```
[Out] (a*x^3 - b^2/(b + a*x^3) - 2*b*Log[b + a*x^3])/(3*a^3)
```

Maple [A] time = 0.008, size = 41, normalized size = 0.9

$$\frac{x^3}{3\,a^2}-\frac{b^2}{3\,a^3(ax^3+b)}-\frac{2\,b\ln(ax^3+b)}{3\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(a+b/x^3)^2,x)
```

```
[Out] 1/3*x^3/a^2-1/3*b^2/a^3/(a*x^3+b)-2/3*b*ln(a*x^3+b)/a^3
```

Maxima [A] time = 1.4272, size = 58, normalized size = 1.26

$$-\frac{b^2}{3\left(a^4x^3 + a^3b\right)} + \frac{x^3}{3\,a^2} - \frac{2\,b\log\left(ax^3 + b\right)}{3\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x^3)^2,x, algorithm="maxima")
```

```
[Out] -1/3*b^2/(a^4*x^3 + a^3*b) + 1/3*x^3/a^2 - 2/3*b*log(a*x^3 + b)/a
^3
```

Fricas [A] time = 0.232567, size = 76, normalized size = 1.65

$$\frac{a^2x^6 + abx^3 - b^2 - 2\left(abx^3 + b^2\right)\log\left(ax^3 + b\right)}{3\left(a^4x^3 + a^3b\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x^3)^2,x, algorithm="fricas")
```

```
[Out] 1/3*(a^2*x^6 + a*b*x^3 - b^2 - 2*(a*b*x^3 + b^2)*log(a*x^3 + b))/
(a^4*x^3 + a^3*b)
```

Sympy [A] time = 1.74545, size = 42, normalized size = 0.91

$$-\frac{b^2}{3a^4x^3 + 3a^3b} + \frac{x^3}{3a^2} - \frac{2b\log\left(ax^3 + b\right)}{3a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b/x**3)**2,x)
```

```
[Out] -b**2/(3*a**4*x**3 + 3*a**3*b) + x**3/(3*a**2) - 2*b*log(a*x**3 +
 b)/(3*a**3)
```

GIAC/XCAS [A] time = 0.22986, size = 55, normalized size = 1.2

$$\frac{x^3}{3\,a^2} - \frac{2\,b\ln\left(\left|ax^3 + b\right|\right)}{3\,a^3} - \frac{b^2}{3\left(ax^3 + b\right)a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x^3)^2,x, algorithm="giac")
```

```
[Out] 1/3*x^3/a^2 - 2/3*b*ln(abs(a*x^3 + b))/a^3 - 1/3*b^2/((a*x^3 + b)
*a^3)
```

3.1980 $\int \frac{x}{\left(a+\frac{b}{x^3}\right)^2} \, dx$

Optimal. Leaf size=146

$$-\frac{5b^{2/3}\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{18a^{8/3}}+\frac{5b^{2/3}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{9a^{8/3}}+\frac{5b^{2/3}\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x}{\sqrt{3}\sqrt[3]{b}}\right)}{3\sqrt{3}a^{8/3}}+\frac{5x^2}{6a^2}-\frac{x^5}{3a\left(ax^3+b\right)}$$

```
[Out] (5*x^2)/(6*a^2) - x^5/(3*a*(b + a*x^3)) + (5*b^(2/3)*ArcTan[(b^(1
/3) - 2*a^(1/3)*x)/(Sqrt[3]*b^(1/3))])/(3*Sqrt[3]*a^(8/3)) + (5*b
^(2/3)*Log[b^(1/3) + a^(1/3)*x])/(9*a^(8/3)) - (5*b^(2/3)*Log[b^(
2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2])/(18*a^(8/3))
```

Rubi [A] time = 0.195709, antiderivative size = 146, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 9, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.818

$$-\frac{5b^{2/3}\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{18a^{8/3}}+\frac{5b^{2/3}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{9a^{8/3}}+\frac{5b^{2/3}\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x}{\sqrt{3}\sqrt[3]{b}}\right)}{3\sqrt{3}a^{8/3}}+\frac{5x^2}{6a^2}-\frac{x^5}{3a\left(ax^3+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b/x^3)^2,x]
```

```
[Out] (5*x^2)/(6*a^2) - x^5/(3*a*(b + a*x^3)) + (5*b^(2/3)*ArcTan[(b^(1
/3) - 2*a^(1/3)*x)/(Sqrt[3]*b^(1/3))])/(3*Sqrt[3]*a^(8/3)) + (5*b
^(2/3)*Log[b^(1/3) + a^(1/3)*x])/(9*a^(8/3)) - (5*b^(2/3)*Log[b^(
2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2])/(18*a^(8/3))
```

Rubi in Sympy [A] time = 35.2461, size = 138, normalized size = 0.95

$$-\frac{x^5}{3a\left(ax^3+b\right)}+\frac{5x^2}{6a^2}+\frac{5b^{\frac{2}{3}}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{9a^{\frac{8}{3}}}-\frac{5b^{\frac{2}{3}}\log\left(a^{\frac{2}{3}}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}\right)}{18a^{\frac{8}{3}}}+\frac{5\sqrt{3}b^{\frac{2}{3}}\operatorname{atan}\left(\frac{\sqrt{3}\left(-\frac{2\sqrt[3]{a}x}{3}+\frac{\sqrt[3]{b}}{3}\right)}{\sqrt[3]{b}}\right)}{9a^{\frac{8}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b/x**3)**2,x)
```

```
[Out] -x**5/(3*a*(a*x**3 + b)) + 5*x**2/(6*a**2) + 5*b**(2/3)*log(a**(1
/3)*x + b**(1/3))/(9*a**(8/3)) - 5*b**(2/3)*log(a**(2/3)*x**2 - a
**(1/3)*b**(1/3)*x + b**(2/3))/(18*a**(8/3)) + 5*sqrt(3)*b**(2/3)
*atan(sqrt(3)*(-2*a**(1/3)*x/3 + b**(1/3)/3)/b**(1/3))/(9*a**(8/3
))
```

Mathematica [A] time = 0.150089, size = 131, normalized size = 0.9

$$\frac{-5b^{2/3}\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)+\frac{6a^{2/3}bx^2}{ax^3+b}+9a^{2/3}x^2+10b^{2/3}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)+10\sqrt{3}b^{2/3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{a}x}{\sqrt[3]{b}}}{\sqrt{3}}\right)}{18a^{8/3}}$$

Antiderivative was successfully verified.

```
[In]   Integrate[x/(a + b/x^3)^2,x]
```

```
[Out] (9*a^(2/3)*x^2 + (6*a^(2/3)*b*x^2)/(b + a*x^3) + 10*Sqrt[3]*b^(2/
3)*ArcTan[(1 - (2*a^(1/3)*x)/b^(1/3))/Sqrt[3]] + 10*b^(2/3)*Log[b
^(1/3) + a^(1/3)*x] - 5*b^(2/3)*Log[b^(2/3) - a^(1/3)*b^(1/3)*x +
 a^(2/3)*x^2])/(18*a^(8/3))
```

Maple [A] time = 0.012, size = 120, normalized size = 0.8

$$\frac{x^2}{2a^2}+\frac{bx^2}{3a^2(ax^3+b)}+\frac{5b}{9a^3}\ln\left(x+\sqrt[3]{\frac{b}{a}}\right)\frac{1}{\sqrt[3]{\frac{b}{a}}}-\frac{5b}{18a^3}\ln\left(x^2-x\sqrt[3]{\frac{b}{a}}+\left(\frac{b}{a}\right)^{\frac{2}{3}}\right)\frac{1}{\sqrt[3]{\frac{b}{a}}}-\frac{5b\sqrt{3}}{9a^3}\arctan\left(\frac{\sqrt{3}}{3}\left(2x\frac{1}{\sqrt[3]{\frac{b}{a}}}-1\right)\right)\frac{1}{\sqrt[3]{\frac{b}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x/(a+b/x^3)^2,x)
```

```
[Out] 1/2*x^2/a^2+1/3*b/a^2*x^2/(a*x^3+b)+5/9*b/a^3/(b/a)^(1/3)*ln(x+(b
/a)^(1/3))-5/18*b/a^3/(b/a)^(1/3)*ln(x^2-x*(b/a)^(1/3)+(b/a)^(2/3
))-5/9*b/a^3*3^(1/2)/(b/a)^(1/3)*arctan(1/3*3^(1/2)*(2/(b/a)^(1/3
)*x-1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(a + b/x^3)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.233698, size = 248, normalized size = 1.7

$$-\frac{\sqrt{3}\left(5\sqrt{3}(ax^3+b)\left(\frac{b^2}{a^2}\right)^{\frac{1}{3}}\log\left(bx^2-ax\left(\frac{b^2}{a^2}\right)^{\frac{2}{3}}+b\left(\frac{b^2}{a^2}\right)^{\frac{1}{3}}\right)-10\sqrt{3}(ax^3+b)\left(\frac{b^2}{a^2}\right)^{\frac{1}{3}}\log\left(bx+a\left(\frac{b^2}{a^2}\right)^{\frac{2}{3}}\right)-30(ax^3+b)\left(\frac{b}{a}\right.\right.}{54(a^3x^3+a^2b)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(a + b/x^3)^2,x, algorithm="fricas")
```

```
[Out] -1/54*sqrt(3)*(5*sqrt(3)*(a*x^3 + b)*(b^2/a^2)^(1/3)*log(b*x^2 -
a*x*(b^2/a^2)^(2/3) + b*(b^2/a^2)^(1/3)) - 10*sqrt(3)*(a*x^3 + b)
*(b^2/a^2)^(1/3)*log(b*x + a*(b^2/a^2)^(2/3)) - 30*(a*x^3 + b)*(b
^2/a^2)^(1/3)*arctan(-1/3*(2*sqrt(3)*b*x - sqrt(3)*a*(b^2/a^2)^(2
/3))/(a*(b^2/a^2)^(2/3))) - 3*sqrt(3)*(3*a*x^5 + 5*b*x^2))/(a^3*x
^3 + a^2*b)
```

Sympy [A] time = 1.82811, size = 58, normalized size = 0.4

$$\frac{bx^2}{3a^3x^3 + 3a^2b} + \operatorname{RootSum}\left(729t^3a^8 - 125b^2, \left(t \mapsto t\log\left(\frac{81t^2a^5}{25b} + x\right)\right)\right) + \frac{x^2}{2a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(a+b/x**3)**2,x)
```

```
[Out] b*x**2/(3*a**3*x**3 + 3*a**2*b) + RootSum(729*_t**3*a**8 - 125*b*
*2, Lambda(_t, _t*log(81*_t**2*a**5/(25*b) + x))) + x**2/(2*a**2)
```

GIAC/XCAS [A] time = 0.229015, size = 178, normalized size = 1.22

$$\frac{x^2}{2\,a^2} + \frac{bx^2}{3\,(ax^3+b)a^2} + \frac{5\left(-\frac{b}{a}\right)^{\frac{2}{3}}\ln\left(\left|x-\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right|\right)}{9\,a^2} + \frac{5\,\sqrt{3}\left(-a^2b\right)^{\frac{2}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{b}{a}\right)^{\frac{1}{3}}}\right)}{9\,a^4} - \frac{5\left(-a^2b\right)^{\frac{2}{3}}\ln\left(x^2+x\left(-\frac{b}{a}\right)^{\frac{1}{3}}+\left(-\frac{b}{a}\right)^{\frac{2}{3}}\right)}{18\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(a + b/x^3)^2,x, algorithm="giac")
```

```
[Out] 1/2*x^2/a^2 + 1/3*b*x^2/((a*x^3 + b)*a^2) + 5/9*(-b/a)^(2/3)*ln(a
bs(x - (-b/a)^(1/3)))/a^2 + 5/9*sqrt(3)*(-a^2*b)^(2/3)*arctan(1/3
*sqrt(3)*(2*x + (-b/a)^(1/3))/(-b/a)^(1/3))/a^4 - 5/18*(-a^2*b)^(
2/3)*ln(x^2 + x*(-b/a)^(1/3) + (-b/a)^(2/3))/a^4
```

3.1981 $\int \frac{1}{\left(a+\frac{b}{x^3}\right)^2} dx$

Optimal. Leaf size=144

$$\frac{2\sqrt[3]{b}\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{9a^{7/3}}-\frac{4\sqrt[3]{b}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{9a^{7/3}}+\frac{4\sqrt[3]{b}\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x}{\sqrt{3}\sqrt[3]{b}}\right)}{3\sqrt{3}a^{7/3}}+\frac{4x}{3a^2}-\frac{x^4}{3a\left(ax^3+b\right)}$$

```
[Out] (4*x)/(3*a^2) - x^4/(3*a*(b + a*x^3)) + (4*b^(1/3)*ArcTan[(b^(1/3
) - 2*a^(1/3)*x)/(Sqrt[3]*b^(1/3))])/(3*Sqrt[3]*a^(7/3)) - (4*b^(
1/3)*Log[b^(1/3) + a^(1/3)*x])/(9*a^(7/3)) + (2*b^(1/3)*Log[b^(2/
3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2])/(9*a^(7/3))
```

Rubi [A] time = 0.185682, antiderivative size = 144, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 9, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 1.$

$$\frac{2\sqrt[3]{b}\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{9a^{7/3}}-\frac{4\sqrt[3]{b}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{9a^{7/3}}+\frac{4\sqrt[3]{b}\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x}{\sqrt{3}\sqrt[3]{b}}\right)}{3\sqrt{3}a^{7/3}}+\frac{4x}{3a^2}-\frac{x^4}{3a\left(ax^3+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^3)^(-2),x]
```

```
[Out] (4*x)/(3*a^2) - x^4/(3*a*(b + a*x^3)) + (4*b^(1/3)*ArcTan[(b^(1/3
) - 2*a^(1/3)*x)/(Sqrt[3]*b^(1/3))])/(3*Sqrt[3]*a^(7/3)) - (4*b^(
1/3)*Log[b^(1/3) + a^(1/3)*x])/(9*a^(7/3)) + (2*b^(1/3)*Log[b^(2/
3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2])/(9*a^(7/3))
```

Rubi in Sympy [A] time = 35.0174, size = 136, normalized size = 0.94

$$-\frac{x^4}{3a\left(ax^3+b\right)}+\frac{4x}{3a^2}-\frac{4\sqrt[3]{b}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{9a^{\frac{7}{3}}}+\frac{2\sqrt[3]{b}\log\left(a^{\frac{2}{3}}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}\right)}{9a^{\frac{7}{3}}}+\frac{4\sqrt{3}\sqrt[3]{b}\,\text{atan}\left(\frac{\sqrt{3}\left(-\frac{2\sqrt[3]{a}x}{3}+\frac{\sqrt[3]{b}}{3}\right)}{\sqrt[3]{b}}\right)}{9a^{\frac{7}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**3)**2,x)
```

```
[Out] -x**4/(3*a*(a*x**3 + b)) + 4*x/(3*a**2) - 4*b**(1/3)*log(a**(1/3)
*x + b**(1/3))/(9*a**(7/3)) + 2*b**(1/3)*log(a**(2/3)*x**2 - a**(
1/3)*b**(1/3)*x + b**(2/3))/(9*a**(7/3)) + 4*sqrt(3)*b**(1/3)*ata
n(sqrt(3)*(-2*a**(1/3)*x/3 + b**(1/3)/3)/b**(1/3))/(9*a**(7/3))
```

Mathematica [A] time = 0.147449, size = 127, normalized size = 0.88

$$\frac{2\sqrt[3]{b}\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)+\frac{3\sqrt[3]{a}bx}{ax^3+b}-4\sqrt[3]{b}\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)+4\sqrt{3}\sqrt[3]{b}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{a}x}{\sqrt[3]{b}}}{\sqrt{3}}\right)+9\sqrt[3]{a}x}{9a^{7/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^3)^(-2),x]
```

```
[Out] (9*a^(1/3)*x + (3*a^(1/3)*b*x)/(b + a*x^3) + 4*Sqrt[3]*b^(1/3)*Ar
cTan[(1 - (2*a^(1/3)*x)/b^(1/3))/Sqrt[3]] - 4*b^(1/3)*Log[b^(1/3)
 + a^(1/3)*x] + 2*b^(1/3)*Log[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/
3)*x^2])/(9*a^(7/3))
```

Maple [A] time = 0.013, size = 115, normalized size = 0.8

$$\frac{x}{a^2}+\frac{bx}{3\,a^2\,(ax^3+b)}-\frac{4\,b}{9\,a^3}\ln\left(x+\sqrt[3]{\frac{b}{a}}\right)\left(\frac{b}{a}\right)^{-\frac{2}{3}}+\frac{2\,b}{9\,a^3}\ln\left(x^2-x\sqrt[3]{\frac{b}{a}}+\left(\frac{b}{a}\right)^{\frac{2}{3}}\right)\left(\frac{b}{a}\right)^{-\frac{2}{3}}-\frac{4\,b\sqrt{3}}{9\,a^3}\arctan\left(\frac{\sqrt{3}}{3}\left(2\,x\frac{1}{\sqrt[3]{\frac{b}{a}}}-1\right)\right)\left(\frac{b}{a}\right)^{-\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^3)^2,x)
```

```
[Out] x/a^2+1/3*b/a^2*x/(a*x^3+b)-4/9*b/a^3/(b/a)^(2/3)*ln(x+(b/a)^(1/3
))+2/9*b/a^3/(b/a)^(2/3)*ln(x^2-x*(b/a)^(1/3)+(b/a)^(2/3))-4/9*b/
a^3/(b/a)^(2/3)*3^(1/2)*arctan(1/3*3^(1/2)*(2/(b/a)^(1/3)*x-1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^3)^(-2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.231813, size = 216, normalized size = 1.5

$$-\frac{\sqrt{3}\left(2\,\sqrt{3}(ax^3+b)\left(-\frac{b}{a}\right)^{\frac{1}{3}}\log\left(x^2+x\left(-\frac{b}{a}\right)^{\frac{1}{3}}+\left(-\frac{b}{a}\right)^{\frac{2}{3}}\right)-4\,\sqrt{3}(ax^3+b)\left(-\frac{b}{a}\right)^{\frac{1}{3}}\log\left(x-\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right)+12\left(ax^3+b\right)\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right.}{27\,(a^3x^3+a^2b)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^3)^(-2),x, algorithm="fricas")
```

```
[Out] -1/27*sqrt(3)*(2*sqrt(3)*(a*x^3 + b)*(-b/a)^(1/3)*log(x^2 + x*(-b
/a)^(1/3) + (-b/a)^(2/3)) - 4*sqrt(3)*(a*x^3 + b)*(-b/a)^(1/3)*lo
g(x - (-b/a)^(1/3)) + 12*(a*x^3 + b)*(-b/a)^(1/3)*arctan(1/3*(2*s
qrt(3)*x + sqrt(3)*(-b/a)^(1/3))/(-b/a)^(1/3)) - 3*sqrt(3)*(3*a*x
^4 + 4*b*x))/(a^3*x^3 + a^2*b)
```

Sympy [A] time = 1.77671, size = 48, normalized size = 0.33

$$\frac{bx}{3a^3x^3+3a^2b}+\operatorname{RootSum}\left(729t^3a^7+64b,\left(t\mapsto t\log\left(-\frac{9ta^2}{4}+x\right)\right)\right)+\frac{x}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**3)**2,x)
```

```
[Out] b*x/(3*a**3*x**3 + 3*a**2*b) + RootSum(729*_t**3*a**7 + 64*b, Lam
bda(_t, _t*log(-9*_t*a**2/4 + x))) + x/a**2
```

GIAC/XCAS [A] time = 0.227399, size = 171, normalized size = 1.19

$$\frac{4\left(-\frac{b}{a}\right)^{\frac{1}{3}}\ln\left(\left|x-\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right|\right)}{9\,a^2}+\frac{x}{a^2}+\frac{bx}{3\,(ax^3+b)a^2}-\frac{4\sqrt{3}\left(-a^2b\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{b}{a}\right)^{\frac{1}{3}}}\right)}{9\,a^3}-\frac{2\left(-a^2b\right)^{\frac{1}{3}}\ln\left(x^2+x\left(-\frac{b}{a}\right)^{\frac{1}{3}}+\left(-\frac{b}{a}\right)^{\frac{2}{3}}\right)}{9\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^3)^(-2),x, algorithm="giac")
```

```
[Out] 4/9*(-b/a)^(1/3)*ln(abs(x - (-b/a)^(1/3)))/a^2 + x/a^2 + 1/3*b*x/
((a*x^3 + b)*a^2) - 4/9*sqrt(3)*(-a^2*b)^(1/3)*arctan(1/3*sqrt(3)
*(2*x + (-b/a)^(1/3))/(-b/a)^(1/3))/a^3 - 2/9*(-a^2*b)^(1/3)*ln(x
^2 + x*(-b/a)^(1/3) + (-b/a)^(2/3))/a^3
```

3.1982 $\int \frac{1}{\left(a+\frac{b}{x^3}\right)^2 x}\,dx$

Optimal. Leaf size=33

$$\frac{b}{3a^2(ax^3+b)}+\frac{\log(ax^3+b)}{3a^2}$$

```
[Out] b/(3*a^2*(b + a*x^3)) + Log[b + a*x^3]/(3*a^2)
```

Rubi [A] time = 0.0721187, antiderivative size = 33, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{b}{3a^2(ax^3+b)}+\frac{\log(ax^3+b)}{3a^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^3)^2*x),x]
```

```
[Out] b/(3*a^2*(b + a*x^3)) + Log[b + a*x^3]/(3*a^2)
```

Rubi in Sympy [A] time = 10.0713, size = 26, normalized size = 0.79

$$\frac{b}{3a^2(ax^3+b)}+\frac{\log(ax^3+b)}{3a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**3)**2/x,x)
```

```
[Out] b/(3*a**2*(a*x**3 + b)) + log(a*x**3 + b)/(3*a**2)
```

Mathematica [A] time = 0.0159038, size = 27, normalized size = 0.82

$$\frac{\frac{b}{ax^3+b}+\log(ax^3+b)}{3a^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^3)^2*x),x]
```

```
[Out] (b/(b + a*x^3) + Log[b + a*x^3])/(3*a^2)
```

Maple [A] time = 0.007, size = 30, normalized size = 0.9

$$\frac{b}{3\,a^2(ax^3+b)}+\frac{\ln(ax^3+b)}{3\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^3)^2/x,x)
```

```
[Out] 1/3*b/a^2/(a*x^3+b)+1/3*ln(a*x^3+b)/a^2
```

Maxima [A] time = 1.43606, size = 43, normalized size = 1.3

$$\frac{b}{3\,(a^3x^3 + a^2b)} + \frac{\log\left(ax^3 + b\right)}{3\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^2*x),x, algorithm="maxima")
```

```
[Out] 1/3*b/(a^3*x^3 + a^2*b) + 1/3*log(a*x^3 + b)/a^2
```

Fricas [A] time = 0.220558, size = 47, normalized size = 1.42

$$\frac{\left(ax^3 + b\right)\log\left(ax^3 + b\right) + b}{3\,(a^3x^3 + a^2b)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^2*x),x, algorithm="fricas")
```

```
[Out] 1/3*((a*x^3 + b)*log(a*x^3 + b) + b)/(a^3*x^3 + a^2*b)
```

Sympy [A] time = 1.56545, size = 29, normalized size = 0.88

$$\frac{b}{3a^3x^3 + 3a^2b} + \frac{\log\left(ax^3 + b\right)}{3a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**3)**2/x,x)
```

```
[Out] b/(3*a**3*x**3 + 3*a**2*b) + log(a*x**3 + b)/(3*a**2)
```

GIAC/XCAS [A] time = 0.231363, size = 43, normalized size = 1.3

$$-\frac{x^3}{3\,(ax^3 + b)a} + \frac{\ln\left(\left|ax^3 + b\right|\right)}{3\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^2*x),x, algorithm="giac")
```

```
[Out] -1/3*x^3/((a*x^3 + b)*a) + 1/3*ln(abs(a*x^3 + b))/a^2
```

3.1983 $\int \frac{1}{\left(a+\frac{b}{x^3}\right)^2 x^2} \, dx$

Optimal. Leaf size=136

$$\frac{\log \left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{9a^{5/3}\sqrt[3]{b}}-\frac{2\log \left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{9a^{5/3}\sqrt[3]{b}}-\frac{2\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x}{\sqrt{3}\sqrt[3]{b}}\right)}{3\sqrt{3}a^{5/3}\sqrt[3]{b}}-\frac{x^2}{3a\left(ax^3+b\right)}$$

```
[Out] -x^2/(3*a*(b + a*x^3)) - (2*ArcTan[(b^(1/3) - 2*a^(1/3)*x)/(Sqrt[
3]*b^(1/3))])/(3*Sqrt[3]*a^(5/3)*b^(1/3)) - (2*Log[b^(1/3) + a^(1
/3)*x])/(9*a^(5/3)*b^(1/3)) + Log[b^(2/3) - a^(1/3)*b^(1/3)*x + a
^(2/3)*x^2]/(9*a^(5/3)*b^(1/3))
```

Rubi [A] time = 0.166996, antiderivative size = 136, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615

$$\frac{\log \left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{9a^{5/3}\sqrt[3]{b}}-\frac{2\log \left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{9a^{5/3}\sqrt[3]{b}}-\frac{2\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x}{\sqrt{3}\sqrt[3]{b}}\right)}{3\sqrt{3}a^{5/3}\sqrt[3]{b}}-\frac{x^2}{3a\left(ax^3+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^3)^2*x^2),x]
```

```
[Out] -x^2/(3*a*(b + a*x^3)) - (2*ArcTan[(b^(1/3) - 2*a^(1/3)*x)/(Sqrt[
3]*b^(1/3))])/(3*Sqrt[3]*a^(5/3)*b^(1/3)) - (2*Log[b^(1/3) + a^(1
/3)*x])/(9*a^(5/3)*b^(1/3)) + Log[b^(2/3) - a^(1/3)*b^(1/3)*x + a
^(2/3)*x^2]/(9*a^(5/3)*b^(1/3))
```

Rubi in Sympy [A] time = 30.2787, size = 126, normalized size = 0.93

$$-\frac{x^2}{3a\left(ax^3+b\right)}-\frac{2\log \left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{9a^{\frac{5}{3}}\sqrt[3]{b}}+\frac{\log \left(a^{\frac{2}{3}}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}\right)}{9a^{\frac{5}{3}}\sqrt[3]{b}}-\frac{2\sqrt{3}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(-\frac{2\sqrt[3]{a}x}{3}+\frac{\sqrt[3]{b}}{3}\right)}{\sqrt[3]{b}}\right)}{9a^{\frac{5}{3}}\sqrt[3]{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**3)**2/x**2,x)
```

```
[Out] -x**2/(3*a*(a*x**3 + b)) - 2*log(a**(1/3)*x + b**(1/3))/(9*a**(5/
3)*b**(1/3)) + log(a**(2/3)*x**2 - a**(1/3)*b**(1/3)*x + b**(2/3)
)/(9*a**(5/3)*b**(1/3)) - 2*sqrt(3)*atan(sqrt(3)*(-2*a**(1/3)*x/3
 + b**(1/3)/3)/b**(1/3))/(9*a**(5/3)*b**(1/3))
```

Mathematica [A] time = 0.152733, size = 119, normalized size = 0.88

$$\frac{\frac{\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{\sqrt[3]{b}}-\frac{3a^{2/3}x^2}{ax^3+b}-\frac{2\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{\sqrt[3]{b}}-\frac{2\sqrt{3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{a}x}{\sqrt[3]{b}}}{\sqrt{3}}\right)}{\sqrt[3]{b}}}{9a^{5/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^3)^2*x^2),x]
```

```
[Out] ((-3*a^(2/3)*x^2)/(b + a*x^3) - (2*Sqrt[3]*ArcTan[(1 - (2*a^(1/3)
*x)/b^(1/3))/Sqrt[3]])/b^(1/3) - (2*Log[b^(1/3) + a^(1/3)*x])/b^(
1/3) + Log[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2]/b^(1/3))/(9
*a^(5/3))
```

Maple [A] time = 0.01, size = 108, normalized size = 0.8

$$-\frac{x^2}{3\,a\,(ax^3+b)}-\frac{2}{9\,a^2}\ln\left(x+\sqrt[3]{\frac{b}{a}}\right)\frac{1}{\sqrt[3]{\frac{b}{a}}}+\frac{1}{9\,a^2}\ln\left(x^2-x\sqrt[3]{\frac{b}{a}}+\left(\frac{b}{a}\right)^{\frac{2}{3}}\right)\frac{1}{\sqrt[3]{\frac{b}{a}}}+\frac{2\,\sqrt{3}}{9\,a^2}\arctan\left(\frac{\sqrt{3}}{3}\left(2\,x\frac{1}{\sqrt[3]{\frac{b}{a}}}-1\right)\right)\frac{1}{\sqrt[3]{\frac{b}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^3)^2/x^2,x)
```

```
[Out] -1/3*x^2/a/(a*x^3+b)-2/9/a^2/(b/a)^(1/3)*ln(x+(b/a)^(1/3))+1/9/a^
2/(b/a)^(1/3)*ln(x^2-x*(b/a)^(1/3)+(b/a)^(2/3))+2/9/a^2*3^(1/2)/(
b/a)^(1/3)*arctan(1/3*3^(1/2)*(2/(b/a)^(1/3)*x-1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^2*x^2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.236721, size = 201, normalized size = 1.48

$$-\frac{\sqrt{3}\left(3\,\sqrt{3}\,\left(-a^2b\right)^{\frac{1}{3}}x^2+\sqrt{3}\left(ax^3+b\right)\log\left(\left(-a^2b\right)^{\frac{1}{3}}ax^2-ab+\left(-a^2b\right)^{\frac{2}{3}}x\right)-2\,\sqrt{3}\left(ax^3+b\right)\log\left(ab+\left(-a^2b\right)^{\frac{2}{3}}x\right)+6\,(ax^3$$
$$27\left(a^2x^3+ab\right)\left(-a^2b\right)^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^2*x^2),x, algorithm="fricas")
```

```
[Out] -1/27*sqrt(3)*(3*sqrt(3)*(-a^2*b)^(1/3)*x^2 + sqrt(3)*(a*x^3 + b)
*log((-a^2*b)^(1/3)*a*x^2 - a*b + (-a^2*b)^(2/3)*x) - 2*sqrt(3)*(
a*x^3 + b)*log(a*b + (-a^2*b)^(2/3)*x) + 6*(a*x^3 + b)*arctan(-1/
3*(sqrt(3)*a*b - 2*sqrt(3)*(-a^2*b)^(2/3)*x)/(a*b)))/((a^2*x^3 +
a*b)*(-a^2*b)^(1/3))
```

Sympy [A] time = 1.58137, size = 44, normalized size = 0.32

$$-\frac{x^2}{3a^2x^3+3ab}+\operatorname{RootSum}\left(729t^3a^5b+8,\left(t\mapsto t\log\left(\frac{81t^2a^3b}{4}+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**3)**2/x**2,x)
```

```
[Out] -x**2/(3*a**2*x**3 + 3*a*b) + RootSum(729*_t**3*a**5*b + 8, Lambd
a(_t, _t*log(81*_t**2*a**3*b/4 + x)))
```

GIAC/XCAS [A] time = 0.233271, size = 178, normalized size = 1.31

$$-\frac{x^{2}}{3\,(ax^{3}+b)a}-\frac{2\left(-\frac{b}{a}\right)^{\frac{2}{3}}\ln\left(\left|x-\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right|\right)}{9\,ab}-\frac{2\sqrt{3}\left(-a^{2}b\right)^{\frac{2}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{b}{a}\right)^{\frac{1}{3}}}\right)}{9\,a^{3}b}+\frac{\left(-a^{2}b\right)^{\frac{2}{3}}\ln\left(x^{2}+x\left(-\frac{b}{a}\right)^{\frac{1}{3}}+\left(-\frac{b}{a}\right)^{\frac{2}{3}}\right)}{9\,a^{3}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^2*x^2),x, algorithm="giac")
```

```
[Out] -1/3*x^2/((a*x^3 + b)*a) - 2/9*(-b/a)^(2/3)*ln(abs(x - (-b/a)^(1/
3)))/(a*b) - 2/9*sqrt(3)*(-a^2*b)^(2/3)*arctan(1/3*sqrt(3)*(2*x +
 (-b/a)^(1/3))/(-b/a)^(1/3))/(a^3*b) + 1/9*(-a^2*b)^(2/3)*ln(x^2
+ x*(-b/a)^(1/3) + (-b/a)^(2/3))/(a^3*b)
```

3.1984 $\int \frac{1}{\left(a+\frac{b}{x^3}\right)^2 x^3}\,dx$

Optimal. Leaf size=134

$$-\frac{\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{18a^{4/3}b^{2/3}}+\frac{\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{9a^{4/3}b^{2/3}}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x}{\sqrt{3}\sqrt[3]{b}}\right)}{3\sqrt{3}a^{4/3}b^{2/3}}-\frac{x}{3a\left(ax^3+b\right)}$$

```
[Out] -x/(3*a*(b + a*x^3)) - ArcTan[(b^(1/3) - 2*a^(1/3)*x)/(Sqrt[3]*b^
(1/3))]/(3*Sqrt[3]*a^(4/3)*b^(2/3)) + Log[b^(1/3) + a^(1/3)*x]/(9
*a^(4/3)*b^(2/3)) - Log[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2
]/(18*a^(4/3)*b^(2/3))
```

Rubi [A] time = 0.164658, antiderivative size = 134, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615

$$-\frac{\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{18a^{4/3}b^{2/3}}+\frac{\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{9a^{4/3}b^{2/3}}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x}{\sqrt{3}\sqrt[3]{b}}\right)}{3\sqrt{3}a^{4/3}b^{2/3}}-\frac{x}{3a\left(ax^3+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^3)^2*x^3),x]
```

```
[Out] -x/(3*a*(b + a*x^3)) - ArcTan[(b^(1/3) - 2*a^(1/3)*x)/(Sqrt[3]*b^
(1/3))]/(3*Sqrt[3]*a^(4/3)*b^(2/3)) + Log[b^(1/3) + a^(1/3)*x]/(9
*a^(4/3)*b^(2/3)) - Log[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2
]/(18*a^(4/3)*b^(2/3))
```

Rubi in Sympy [A] time = 30.7387, size = 121, normalized size = 0.9

$$-\frac{x}{3a\left(ax^3+b\right)}+\frac{\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{9a^{\frac{4}{3}}b^{\frac{2}{3}}}-\frac{\log\left(a^{\frac{2}{3}}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}\right)}{18a^{\frac{4}{3}}b^{\frac{2}{3}}}-\frac{\sqrt{3}\,\operatorname{atan}\left(\frac{\sqrt{3}\left(-\frac{2\sqrt[3]{a}x}{3}+\frac{\sqrt[3]{b}}{3}\right)}{\sqrt[3]{b}}\right)}{9a^{\frac{4}{3}}b^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**3)**2/x**3,x)
```

```
[Out] -x/(3*a*(a*x**3 + b)) + log(a**(1/3)*x + b**(1/3))/(9*a**(4/3)*b*
*(2/3)) - log(a**(2/3)*x**2 - a**(1/3)*b**(1/3)*x + b**(2/3))/(18
*a**(4/3)*b**(2/3)) - sqrt(3)*atan(sqrt(3)*(-2*a**(1/3)*x/3 + b**
(1/3)/3)/b**(1/3))/(9*a**(4/3)*b**(2/3))
```

Mathematica [A] time = 0.123012, size = 118, normalized size = 0.88

$$\frac{-\frac{\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{b^{2/3}}+\frac{2\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{b^{2/3}}-\frac{2\sqrt{3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{a}x}{\sqrt[3]{b}}}{\sqrt{3}}\right)}{b^{2/3}}-\frac{6\sqrt[3]{a}x}{ax^3+b}}{18a^{4/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^3)^2*x^3),x]
```

```
[Out] ((-6*a^(1/3)*x)/(b + a*x^3) - (2*Sqrt[3]*ArcTan[(1 - (2*a^(1/3)*x
)/b^(1/3))/Sqrt[3]])/b^(2/3) + (2*Log[b^(1/3) + a^(1/3)*x])/b^(2/
3) - Log[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2]/b^(2/3))/(18*
a^(4/3))
```

Maple [A] time = 0.01, size = 106, normalized size = 0.8

$$-\frac{x}{3\,a\,(ax^{3}+b)}+\frac{1}{9\,a^{2}}\ln\left(x+\sqrt[3]{\frac{b}{a}}\right)\left(\frac{b}{a}\right)^{-\frac{2}{3}}-\frac{1}{18\,a^{2}}\ln\left(x^{2}-x\sqrt[3]{\frac{b}{a}}+\left(\frac{b}{a}\right)^{\frac{2}{3}}\right)\left(\frac{b}{a}\right)^{-\frac{2}{3}}+\frac{\sqrt{3}}{9\,a^{2}}\arctan\left(\frac{\sqrt{3}}{3}\left(2\,x\frac{1}{\sqrt[3]{\frac{b}{a}}}-1\right)\right)\left(\frac{b}{a}\right)^{-\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^3)^2/x^3,x)
```

```
[Out] -1/3*x/a/(a*x^3+b)+1/9/a^2/(b/a)^(2/3)*ln(x+(b/a)^(1/3))-1/18/a^2
/(b/a)^(2/3)*ln(x^2-x*(b/a)^(1/3)+(b/a)^(2/3))+1/9/a^2/(b/a)^(2/3
)*3^(1/2)*arctan(1/3*3^(1/2)*(2/(b/a)^(1/3)*x-1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^2*x^3),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.230606, size = 184, normalized size = 1.37

$$-\frac{\sqrt{3}\left(\sqrt{3}\left(ax^{3}+b\right)\log\left(\left(ab^{2}\right)^{\frac{2}{3}}x^{2}-\left(ab^{2}\right)^{\frac{1}{3}}bx+b^{2}\right)-2\sqrt{3}\left(ax^{3}+b\right)\log\left(\left(ab^{2}\right)^{\frac{1}{3}}x+b\right)-6\left(ax^{3}+b\right)\arctan\left(\frac{2\sqrt{3}\left(ab^{2}\right)^{\frac{1}{3}}x-}{3b}\right.\right.}{54\left(a^{2}x^{3}+ab\right)\left(ab^{2}\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^2*x^3),x, algorithm="fricas")
```

```
[Out] -1/54*sqrt(3)*(sqrt(3)*(a*x^3 + b)*log((a*b^2)^(2/3)*x^2 - (a*b^2
)^(1/3)*b*x + b^2) - 2*sqrt(3)*(a*x^3 + b)*log((a*b^2)^(1/3)*x +
b) - 6*(a*x^3 + b)*arctan(1/3*(2*sqrt(3)*(a*b^2)^(1/3)*x - sqrt(3
)*b)/b) + 6*sqrt(3)*(a*b^2)^(1/3)*x)/((a^2*x^3 + a*b)*(a*b^2)^(1/
3))
```

Sympy [A] time = 1.55435, size = 39, normalized size = 0.29

$$-\frac{x}{3a^{2}x^{3}+3ab}+\operatorname{RootSum}\left(729t^{3}a^{4}b^{2}-1,\left(t\mapsto t\log\left(9tab+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**3)**2/x**3,x)
```

```
[Out] -x/(3*a**2*x**3 + 3*a*b) + RootSum(729*_t**3*a**4*b**2 - 1, Lambd
a(_t, _t*log(9*_t*a*b + x)))
```

GIAC/XCAS [A] time = 0.232874, size = 176, normalized size = 1.31

$$-\frac{\left(-\frac{b}{a}\right)^{\frac{1}{3}}\ln\left(\left|x-\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right|\right)}{9\,ab}-\frac{x}{3\,(ax^3+b)a}+\frac{\sqrt{3}\left(-a^2b\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{b}{a}\right)^{\frac{1}{3}}}\right)}{9\,a^2b}+\frac{\left(-a^2b\right)^{\frac{1}{3}}\ln\left(x^2+x\left(-\frac{b}{a}\right)^{\frac{1}{3}}+\left(-\frac{b}{a}\right)^{\frac{2}{3}}\right)}{18\,a^2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^2*x^3),x, algorithm="giac")
```

```
[Out] -1/9*(-b/a)^(1/3)*ln(abs(x - (-b/a)^(1/3)))/(a*b) - 1/3*x/((a*x^3
 + b)*a) + 1/9*sqrt(3)*(-a^2*b)^(1/3)*arctan(1/3*sqrt(3)*(2*x + (
-b/a)^(1/3))/(-b/a)^(1/3))/(a^2*b) + 1/18*(-a^2*b)^(1/3)*ln(x^2 +
 x*(-b/a)^(1/3) + (-b/a)^(2/3))/(a^2*b)
```

3.1985 $\int \frac{1}{\left(a+\frac{b}{x^3}\right)^2 x^4} \, dx$

Optimal. Leaf size=16

$$\frac{1}{3b\left(a+\frac{b}{x^3}\right)}$$

```
[Out] 1/(3*b*(a + b/x^3))
```

Rubi [A] time = 0.018871, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{1}{3b\left(a+\frac{b}{x^3}\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^3)^2*x^4),x]
```

```
[Out] 1/(3*b*(a + b/x^3))
```

Rubi in Sympy [A] time = 2.1281, size = 10, normalized size = 0.62

$$\frac{1}{3b\left(a+\frac{b}{x^3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**3)**2/x**4,x)
```

```
[Out] 1/(3*b*(a + b/x**3))
```

Mathematica [A] time = 0.0087141, size = 16, normalized size = 1.

$$-\frac{1}{3a\left(ax^3+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^3)^2*x^4),x]
```

```
[Out] -1/(3*a*(b + a*x^3))
```

Maple [A] time = 0.002, size = 15, normalized size = 0.9

$$-\frac{1}{\left(3\,ax^3+3\,b\right)a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^3)^2/x^4,x)
```

```
[Out] -1/3/(a*x^3+b)/a
```

Maxima [A] time = 1.43496, size = 19, normalized size = 1.19

$$\frac{1}{3\left(a+\frac{b}{x^3}\right)b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^2*x^4),x, algorithm="maxima")

[Out] 1/3/((a + b/x^3)*b)
```

Fricas [A] time = 0.221356, size = 20, normalized size = 1.25

$$-\frac{1}{3\left(a^2x^3+ab\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^2*x^4),x, algorithm="fricas")

[Out] -1/3/(a^2*x^3 + a*b)
```

Sympy [A] time = 1.38853, size = 15, normalized size = 0.94

$$-\frac{1}{3a^2x^3+3ab}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**3)**2/x**4,x)

[Out] -1/(3*a**2*x**3 + 3*a*b)
```

GIAC/XCAS [A] time = 0.233998, size = 19, normalized size = 1.19

$$-\frac{1}{3\left(ax^3+b\right)a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^2*x^4),x, algorithm="giac")

[Out] -1/3/((a*x^3 + b)*a)
```

3.1986 $\int \frac{1}{\left(a+\frac{b}{x^3}\right)^2 x^5} \, dx$

Optimal. Leaf size=136

$$\frac{\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{18a^{2/3}b^{4/3}}-\frac{\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{9a^{2/3}b^{4/3}}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x}{\sqrt{3}\sqrt[3]{b}}\right)}{3\sqrt{3}a^{2/3}b^{4/3}}+\frac{x^2}{3b\left(ax^3+b\right)}$$

```
[Out] x^2/(3*b*(b + a*x^3)) - ArcTan[(b^(1/3) - 2*a^(1/3)*x)/(Sqrt[3]*b
^(1/3))]/(3*Sqrt[3]*a^(2/3)*b^(4/3)) - Log[b^(1/3) + a^(1/3)*x]/(
9*a^(2/3)*b^(4/3)) + Log[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^
2]/(18*a^(2/3)*b^(4/3))
```

Rubi [A] time = 0.168202, antiderivative size = 136, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615

$$\frac{\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{18a^{2/3}b^{4/3}}-\frac{\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{9a^{2/3}b^{4/3}}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x}{\sqrt{3}\sqrt[3]{b}}\right)}{3\sqrt{3}a^{2/3}b^{4/3}}+\frac{x^2}{3b\left(ax^3+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^3)^2*x^5),x]
```

```
[Out] x^2/(3*b*(b + a*x^3)) - ArcTan[(b^(1/3) - 2*a^(1/3)*x)/(Sqrt[3]*b
^(1/3))]/(3*Sqrt[3]*a^(2/3)*b^(4/3)) - Log[b^(1/3) + a^(1/3)*x]/(
9*a^(2/3)*b^(4/3)) + Log[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^
2]/(18*a^(2/3)*b^(4/3))
```

Rubi in Sympy [A] time = 29.6453, size = 122, normalized size = 0.9

$$\frac{x^2}{3b\left(ax^3+b\right)}-\frac{\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{9a^{\frac{2}{3}}b^{\frac{4}{3}}}+\frac{\log\left(a^{\frac{2}{3}}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}\right)}{18a^{\frac{2}{3}}b^{\frac{4}{3}}}-\frac{\sqrt{3}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(-\frac{2\sqrt[3]{a}x}{3}+\frac{\sqrt[3]{b}}{3}\right)}{\sqrt[3]{b}}\right)}{9a^{\frac{2}{3}}b^{\frac{4}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**3)**2/x**5,x)
```

```
[Out] x**2/(3*b*(a*x**3 + b)) - log(a**(1/3)*x + b**(1/3))/(9*a**(2/3)*
b**(4/3)) + log(a**(2/3)*x**2 - a**(1/3)*b**(1/3)*x + b**(2/3))/(
18*a**(2/3)*b**(4/3)) - sqrt(3)*atan(sqrt(3)*(-2*a**(1/3)*x/3 + b
**(1/3)/3)/b**(1/3))/(9*a**(2/3)*b**(4/3))
```

Mathematica [A] time = 0.124967, size = 119, normalized size = 0.88

$$\frac{\frac{\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{a^{2/3}}-\frac{2\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{a^{2/3}}-\frac{2\sqrt{3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{a}x}{\sqrt[3]{b}}}{\sqrt{3}}\right)}{a^{2/3}}+\frac{6\sqrt[3]{b}x^2}{ax^3+b}}{18b^{4/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^3)^2*x^5),x]
```

```
[Out] ((6*b^(1/3)*x^2)/(b + a*x^3) - (2*Sqrt[3]*ArcTan[(1 - (2*a^(1/3)*
x)/b^(1/3))/Sqrt[3]])/a^(2/3) - (2*Log[b^(1/3) + a^(1/3)*x])/a^(2
/3) + Log[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2]/a^(2/3))/(18
*b^(4/3))
```

Maple [A] time = 0.005, size = 117, normalized size = 0.9

$$\frac{x^2}{3\,b\,(ax^3+b)}-\frac{1}{9\,ab}\ln\left(x+\sqrt[3]{\frac{b}{a}}\right)\frac{1}{\sqrt[3]{\frac{b}{a}}}+\frac{1}{18\,ab}\ln\left(x^2-x\sqrt[3]{\frac{b}{a}}+\left(\frac{b}{a}\right)^{\frac{2}{3}}\right)\frac{1}{\sqrt[3]{\frac{b}{a}}}+\frac{\sqrt{3}}{9\,ab}\arctan\left(\frac{\sqrt{3}}{3}\left(2\,x\frac{1}{\sqrt[3]{\frac{b}{a}}}-1\right)\right)\frac{1}{\sqrt[3]{\frac{b}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^3)^2/x^5,x)
```

```
[Out] 1/3*x^2/b/(a*x^3+b)-1/9/b/a/(b/a)^(1/3)*ln(x+(b/a)^(1/3))+1/18/b/
a/(b/a)^(1/3)*ln(x^2-x*(b/a)^(1/3)+(b/a)^(2/3))+1/9/b*3^(1/2)/a/(
b/a)^(1/3)*arctan(1/3*3^(1/2)*(2/(b/a)^(1/3)*x-1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^2*x^5),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.236041, size = 201, normalized size = 1.48

$$\frac{\sqrt{3}\left(6\,\sqrt{3}\left(-a^2b\right)^{\frac{1}{3}}x^2-\sqrt{3}\left(ax^3+b\right)\log\left(\left(-a^2b\right)^{\frac{1}{3}}ax^2-ab+\left(-a^2b\right)^{\frac{2}{3}}x\right)+2\,\sqrt{3}\left(ax^3+b\right)\log\left(ab+\left(-a^2b\right)^{\frac{2}{3}}x\right)-6\left(ax^3\right.\right.}{54\left(abx^3+b^2\right)\left(-a^2b\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^2*x^5),x, algorithm="fricas")
```

```
[Out] 1/54*sqrt(3)*(6*sqrt(3)*(-a^2*b)^(1/3)*x^2 - sqrt(3)*(a*x^3 + b)*
log((-a^2*b)^(1/3)*a*x^2 - a*b + (-a^2*b)^(2/3)*x) + 2*sqrt(3)*(a
*x^3 + b)*log(a*b + (-a^2*b)^(2/3)*x) - 6*(a*x^3 + b)*arctan(-1/3
*(sqrt(3)*a*b - 2*sqrt(3)*(-a^2*b)^(2/3)*x)/(a*b)))/((a*b*x^3 + b
^2)*(-a^2*b)^(1/3))
```

Sympy [A] time = 1.59224, size = 44, normalized size = 0.32

$$\frac{x^2}{3abx^3+3b^2}+\operatorname{RootSum}\left(729t^3a^2b^4+1,\left(t\mapsto t\log\left(81t^2ab^3+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**3)**2/x**5,x)
```

```
[Out] x**2/(3*a*b*x**3 + 3*b**2) + RootSum(729*_t**3*a**2*b**4 + 1, Lam
bda(_t, _t*log(81*_t**2*a*b**3 + x)))
```

GIAC/XCAS [A] time = 0.232131, size = 174, normalized size = 1.28

$$\frac{x^2}{3\,(ax^3+b)b} - \frac{\left(-\frac{b}{a}\right)^{\frac{2}{3}}\ln\left(\left|x-\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right|\right)}{9\,b^2} - \frac{\sqrt{3}\left(-a^2b\right)^{\frac{2}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{b}{a}\right)^{\frac{1}{3}}}\right)}{9\,a^2b^2} + \frac{\left(-a^2b\right)^{\frac{2}{3}}\ln\left(x^2+x\left(-\frac{b}{a}\right)^{\frac{1}{3}}+\left(-\frac{b}{a}\right)^{\frac{2}{3}}\right)}{18\,a^2b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^2*x^5),x, algorithm="giac")
```

```
[Out] 1/3*x^2/((a*x^3 + b)*b) - 1/9*(-b/a)^(2/3)*ln(abs(x - (-b/a)^(1/3
)))/b^2 - 1/9*sqrt(3)*(-a^2*b)^(2/3)*arctan(1/3*sqrt(3)*(2*x + (-
b/a)^(1/3))/(-b/a)^(1/3))/(a^2*b^2) + 1/18*(-a^2*b)^(2/3)*ln(x^2
+ x*(-b/a)^(1/3) + (-b/a)^(2/3))/(a^2*b^2)
```

3.1987 $\int \frac{1}{\left(a+\frac{b}{x^3}\right)^2 x^6} dx$

Optimal. Leaf size=134

$$-\frac{\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{9\sqrt[3]{a}b^{5/3}}+\frac{2\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{9\sqrt[3]{a}b^{5/3}}-\frac{2\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x}{\sqrt{3}\sqrt[3]{b}}\right)}{3\sqrt{3}\sqrt[3]{a}b^{5/3}}+\frac{x}{3b\left(ax^3+b\right)}$$

```
[Out] x/(3*b*(b + a*x^3)) - (2*ArcTan[(b^(1/3) - 2*a^(1/3)*x)/(Sqrt[3]*
b^(1/3))])/(3*Sqrt[3]*a^(1/3)*b^(5/3)) + (2*Log[b^(1/3) + a^(1/3)
*x])/(9*a^(1/3)*b^(5/3)) - Log[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2
/3)*x^2]/(9*a^(1/3)*b^(5/3))
```

Rubi [A] time = 0.160351, antiderivative size = 134, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615

$$-\frac{\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{9\sqrt[3]{a}b^{5/3}}+\frac{2\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{9\sqrt[3]{a}b^{5/3}}-\frac{2\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x}{\sqrt{3}\sqrt[3]{b}}\right)}{3\sqrt{3}\sqrt[3]{a}b^{5/3}}+\frac{x}{3b\left(ax^3+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^3)^2*x^6),x]
```

```
[Out] x/(3*b*(b + a*x^3)) - (2*ArcTan[(b^(1/3) - 2*a^(1/3)*x)/(Sqrt[3]*
b^(1/3))])/(3*Sqrt[3]*a^(1/3)*b^(5/3)) + (2*Log[b^(1/3) + a^(1/3)
*x])/(9*a^(1/3)*b^(5/3)) - Log[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2
/3)*x^2]/(9*a^(1/3)*b^(5/3))
```

Rubi in Sympy [A] time = 28.6642, size = 124, normalized size = 0.93

$$\frac{x}{3b\left(ax^3+b\right)}+\frac{2\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{9\sqrt[3]{a}b^{\frac{5}{3}}}-\frac{\log\left(a^{\frac{2}{3}}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{\frac{2}{3}}\right)}{9\sqrt[3]{a}b^{\frac{5}{3}}}-\frac{2\sqrt{3}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(-\frac{2\sqrt[3]{a}x}{3}+\frac{\sqrt[3]{b}}{3}\right)}{\sqrt[3]{b}}\right)}{9\sqrt[3]{a}b^{\frac{5}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**3)**2/x**6,x)
```

```
[Out] x/(3*b*(a*x**3 + b)) + 2*log(a**(1/3)*x + b**(1/3))/(9*a**(1/3)*b
**(5/3)) - log(a**(2/3)*x**2 - a**(1/3)*b**(1/3)*x + b**(2/3))/(9
*a**(1/3)*b**(5/3)) - 2*sqrt(3)*atan(sqrt(3)*(-2*a**(1/3)*x/3 + b
**(1/3)/3)/b**(1/3))/(9*a**(1/3)*b**(5/3))
```

Mathematica [A] time = 0.117481, size = 118, normalized size = 0.88

$$\frac{-\frac{\log\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}{\sqrt[3]{a}}+\frac{3b^{2/3}x}{ax^3+b}+\frac{2\log\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)}{\sqrt[3]{a}}-\frac{2\sqrt{3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{a}x}{\sqrt[3]{b}}}{\sqrt{3}}\right)}{\sqrt[3]{a}}}{9b^{5/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^3)^2*x^6),x]
```

```
[Out] ((3*b^(2/3)*x)/(b + a*x^3) - (2*Sqrt[3]*ArcTan[(1 - (2*a^(1/3)*x)
/b^(1/3))/Sqrt[3]])/a^(1/3) + (2*Log[b^(1/3) + a^(1/3)*x])/a^(1/3
) - Log[b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2]/a^(1/3))/(9*b^
(5/3))
```

Maple [A] time = 0.007, size = 115, normalized size = 0.9

$$\frac{x}{3\,b\,(ax^3+b)}+\frac{2}{9\,ab}\ln\left(x+\sqrt[3]{\frac{b}{a}}\right)\left(\frac{b}{a}\right)^{-\frac{2}{3}}-\frac{1}{9\,ab}\ln\left(x^2-x\sqrt[3]{\frac{b}{a}}+\left(\frac{b}{a}\right)^{\frac{2}{3}}\right)\left(\frac{b}{a}\right)^{-\frac{2}{3}}+\frac{2\sqrt{3}}{9\,ab}\arctan\left(\frac{\sqrt{3}}{3}\left(2\,x\frac{1}{\sqrt[3]{\frac{b}{a}}}-1\right)\right)\left(\frac{b}{a}\right)^{-\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^3)^2/x^6,x)
```

```
[Out] 1/3*x/b/(a*x^3+b)+2/9/b/a/(b/a)^(2/3)*ln(x+(b/a)^(1/3))-1/9/b/a/(
b/a)^(2/3)*ln(x^2-x*(b/a)^(1/3)+(b/a)^(2/3))+2/9/b/a/(b/a)^(2/3)*
3^(1/2)*arctan(1/3*3^(1/2)*(2/(b/a)^(1/3)*x-1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^2*x^6),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.238254, size = 182, normalized size = 1.36

$$-\frac{\sqrt{3}\left(\sqrt{3}(ax^3+b)\log\left(\left(ab^2\right)^{\frac{2}{3}}x^2-\left(ab^2\right)^{\frac{1}{3}}bx+b^2\right)-2\sqrt{3}(ax^3+b)\log\left(\left(ab^2\right)^{\frac{1}{3}}x+b\right)-6\left(ax^3+b\right)\arctan\left(\frac{2\sqrt{3}(ab^2)^{\frac{1}{3}}x-}{3\,b}\right.\right.}{27\left(abx^3+b^2\right)\left(ab^2\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^2*x^6),x, algorithm="fricas")
```

```
[Out] -1/27*sqrt(3)*(sqrt(3)*(a*x^3 + b)*log((a*b^2)^(2/3)*x^2 - (a*b^2
)^(1/3)*b*x + b^2) - 2*sqrt(3)*(a*x^3 + b)*log((a*b^2)^(1/3)*x +
b) - 6*(a*x^3 + b)*arctan(1/3*(2*sqrt(3)*(a*b^2)^(1/3)*x - sqrt(3
)*b)/b) - 3*sqrt(3)*(a*b^2)^(1/3)*x)/((a*b*x^3 + b^2)*(a*b^2)^(1/
3))
```

Sympy [A] time = 1.64388, size = 39, normalized size = 0.29

$$\frac{x}{3abx^3+3b^2}+\operatorname{RootSum}\left(729t^3ab^5-8,\left(t\mapsto t\log\left(\frac{9tb^2}{2}+x\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**3)**2/x**6,x)
```

```
[Out] x/(3*a*b*x**3 + 3*b**2) + RootSum(729*_t**3*a*b**5 - 8, Lambda(_t
, _t*log(9*_t*b**2/2 + x)))
```

GIAC/XCAS [A] time = 0.233769, size = 171, normalized size = 1.28

$$-\frac{2\left(-\frac{b}{a}\right)^{\frac{1}{3}}\ln\left(\left|x-\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right|\right)}{9\,b^2}+\frac{x}{3\,(ax^3+b)b}+\frac{2\,\sqrt{3}\left(-a^2b\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x+\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{b}{a}\right)^{\frac{1}{3}}}\right)}{9\,ab^2}+\frac{\left(-a^2b\right)^{\frac{1}{3}}\ln\left(x^2+x\left(-\frac{b}{a}\right)^{\frac{1}{3}}+\left(-\frac{b}{a}\right)^{\frac{2}{3}}\right)}{9\,ab^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^2*x^6),x, algorithm="giac")
```

```
[Out] -2/9*(-b/a)^(1/3)*ln(abs(x - (-b/a)^(1/3)))/b^2 + 1/3*x/((a*x^3 +
 b)*b) + 2/9*sqrt(3)*(-a^2*b)^(1/3)*arctan(1/3*sqrt(3)*(2*x + (-b
/a)^(1/3))/(-b/a)^(1/3))/(a*b^2) + 1/9*(-a^2*b)^(1/3)*ln(x^2 + x*
(-b/a)^(1/3) + (-b/a)^(2/3))/(a*b^2)
```

3.1988 $\int \frac{1}{\left(a+\frac{b}{x^3}\right)^2 x^7} dx$

Optimal. Leaf size=38

$$-\frac{\log(ax^3+b)}{3b^2}+\frac{1}{3b(ax^3+b)}+\frac{\log(x)}{b^2}$$

```
[Out] 1/(3*b*(b + a*x^3)) + Log[x]/b^2 - Log[b + a*x^3]/(3*b^2)
```

Rubi [A] time = 0.0764279, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{\log(ax^3+b)}{3b^2}+\frac{1}{3b(ax^3+b)}+\frac{\log(x)}{b^2}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b/x^3)^2*x^7),x]

[Out] 1/(3*b*(b + a*x^3)) + Log[x]/b^2 - Log[b + a*x^3]/(3*b^2)
```

Rubi in Sympy [A] time = 9.6625, size = 34, normalized size = 0.89

$$\frac{1}{3b(ax^3+b)}+\frac{\log(x^3)}{3b^2}-\frac{\log(ax^3+b)}{3b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b/x**3)**2/x**7,x)

[Out] 1/(3*b*(a*x**3 + b)) + log(x**3)/(3*b**2) - log(a*x**3 + b)/(3*b*
*2)
```

Mathematica [A] time = 0.0216033, size = 33, normalized size = 0.87

$$\frac{\frac{b}{ax^3+b}-\log(ax^3+b)+3\log(x)}{3b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b/x^3)^2*x^7),x]

[Out] (b/(b + a*x^3) + 3*Log[x] - Log[b + a*x^3])/(3*b^2)
```

Maple [A] time = 0.011, size = 35, normalized size = 0.9

$$\frac{1}{3\,b(ax^3+b)}+\frac{\ln(x)}{b^2}-\frac{\ln(ax^3+b)}{3\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b/x^3)^2/x^7,x)
```

```
[Out] 1/3/b/(a*x^3+b)+ln(x)/b^2-1/3*ln(a*x^3+b)/b^2
```

Maxima [A] time = 1.4412, size = 50, normalized size = 1.32

$$\frac{1}{3\,(abx^3+b^2)}-\frac{\log\left(ax^3+b\right)}{3\,b^2}+\frac{\log\left(x^3\right)}{3\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^2*x^7),x, algorithm="maxima")
```

```
[Out] 1/3/(a*b*x^3 + b^2) - 1/3*log(a*x^3 + b)/b^2 + 1/3*log(x^3)/b^2
```

Fricas [A] time = 0.235612, size = 63, normalized size = 1.66

$$-\frac{\left(ax^3+b\right)\log\left(ax^3+b\right)-3\left(ax^3+b\right)\log\left(x\right)-b}{3\,(ab^2x^3+b^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^2*x^7),x, algorithm="fricas")
```

```
[Out] -1/3*((a*x^3 + b)*log(a*x^3 + b) - 3*(a*x^3 + b)*log(x) - b)/(a*b
^2*x^3 + b^3)
```

Sympy [A] time = 1.9393, size = 34, normalized size = 0.89

$$\frac{1}{3abx^3+3b^2}+\frac{\log\left(x\right)}{b^2}-\frac{\log\left(x^3+\frac{b}{a}\right)}{3b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**3)**2/x**7,x)
```

```
[Out] 1/(3*a*b*x**3 + 3*b**2) + log(x)/b**2 - log(x**3 + b/a)/(3*b**2)
```

GIAC/XCAS [A] time = 0.226547, size = 61, normalized size = 1.61

$$-\frac{\ln\left(\left|ax^3+b\right|\right)}{3\,b^2}+\frac{\ln\left(|x|\right)}{b^2}+\frac{ax^3+2\,b}{3\,(ax^3+b)b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^2*x^7),x, algorithm="giac")
```

```
[Out] -1/3*ln(abs(a*x^3 + b))/b^2 + ln(abs(x))/b^2 + 1/3*(a*x^3 + 2*b)/
((a*x^3 + b)*b^2)
```

3.1989 $\int \sqrt{a+\frac{b}{x^3}}x^5\,dx$

Optimal. Leaf size=71

$$-\frac{b^2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)}{12a^{3/2}}+\frac{bx^3\sqrt{a+\frac{b}{x^3}}}{12a}+\frac{1}{6}x^6\sqrt{a+\frac{b}{x^3}}$$

```
[Out] (b*Sqrt[a + b/x^3]*x^3)/(12*a) + (Sqrt[a + b/x^3]*x^6)/6 - (b^2*A
rcTanh[Sqrt[a + b/x^3]/Sqrt[a]])/(12*a^(3/2))
```

Rubi [A] time = 0.116961, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{b^2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)}{12a^{3/2}}+\frac{bx^3\sqrt{a+\frac{b}{x^3}}}{12a}+\frac{1}{6}x^6\sqrt{a+\frac{b}{x^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x^3]*x^5,x]
```

```
[Out] (b*Sqrt[a + b/x^3]*x^3)/(12*a) + (Sqrt[a + b/x^3]*x^6)/6 - (b^2*A
rcTanh[Sqrt[a + b/x^3]/Sqrt[a]])/(12*a^(3/2))
```

Rubi in Sympy [A] time = 9.57759, size = 60, normalized size = 0.85

$$\frac{x^6\sqrt{a+\frac{b}{x^3}}}{6}+\frac{bx^3\sqrt{a+\frac{b}{x^3}}}{12a}-\frac{b^2\,\text{atanh}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)}{12a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5*(a+b/x**3)**(1/2),x)
```

```
[Out] x**6*sqrt(a + b/x**3)/6 + b*x**3*sqrt(a + b/x**3)/(12*a) - b**2*a
tanh(sqrt(a + b/x**3)/sqrt(a))/(12*a**(3/2))
```

Mathematica [A] time = 0.110671, size = 95, normalized size = 1.34

$$\frac{x^{3/2}\sqrt{a+\frac{b}{x^3}}\left(\sqrt{a}x^{3/2}\sqrt{ax^3+b}\left(2ax^3+b\right)-b^2\tanh^{-1}\left(\frac{\sqrt{a}x^{3/2}}{\sqrt{ax^3+b}}\right)\right)}{12a^{3/2}\sqrt{ax^3+b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x^3]*x^5,x]
```

```
[Out] (Sqrt[a + b/x^3]*x^(3/2)*(Sqrt[a]*x^(3/2)*Sqrt[b + a*x^3]*(b + 2*
a*x^3) - b^2*ArcTanh[(Sqrt[a]*x^(3/2))/Sqrt[b + a*x^3]]))/(12*a^(
3/2)*Sqrt[b + a*x^3])
```

Maple [C] time = 0.362, size = 3560, normalized size = 50.1

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5*(a+b/x^3)^(1/2),x)
```

```
[Out] 1/12*((a*x^3+b)/x^3)^(1/2)*x^2/a^3*(-6*I*(-(I*3^(1/2)-3)*x*a/(I*3
^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)
+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)
*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(
-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(
1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),
((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*
3^(1/2)*x^2*a^2*b^2+12*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+
(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^
(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a
^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1
/3)))^(1/2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-
a^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(
I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(1/3)*3
^(1/2)*x*a*b^2+6*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*
b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))
/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^
(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^
(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^
(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/
2)-3))^(1/2))*(-a^2*b)^(2/3)*3^(1/2)*b^2-12*I*(-(I*3^(1/2)-3)*x*a
/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^
(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^
(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)
-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I
*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2
)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(1/3)*3^(1/2)*x
*a*b^2+I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)
+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(
1/3)))^(1/2)*(a*x^4+b*x)^(1/2)*3^(1/2)*x*a^2*b+2*I*(1/a^2*x*(-a*x
+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*
(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(a*x^4+b*x
)^(1/2)*3^(1/2)*x^4*a^3-6*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x
+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)
^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-
a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(
1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-
a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(
I*3^(1/2)-3))^(1/2))*x^2*a^2*b^2+6*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/
2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a
*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I
*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x
+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-
1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3
^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*x^2*a^2*b^2+6*(-(I*3^(1/2
)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(
-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^
(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I
*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticPi((-(I*3^(1/2)-
3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(
I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2
)-3))^(1/2))*x^2*a^2*b^2+12*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a
*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*
b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*
(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)
^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+
(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)
/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(1/3)*x*a*b^2-12*(-(I*3^(1/2)-3)*
x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*
b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)
))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1
/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticPi((-(I*3^(1/2)-3)*x*
a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(
1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))
```

```
^(1/2))*(-a^2*b)^(1/3)*x*a*b^2-6*x^4*(a*x^4+b*x)^(1/2)*a^3*(1/a^2
*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)
^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)-6*
(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((
I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*
x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b
)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(
I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3
^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2
*b)^(2/3)*b^2+6*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^
(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I
*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/
3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/
2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1
/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2)
-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(2/3)*b^2-6*I*(-
(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*
3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+
(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^
(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticPi((-(I
*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),(I*3^(
1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/
(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(2/3)*3^(1/2)*b^2-3*b*x*(a*x^4+b*x
)^(1/2)*a^2*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1
/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b
)^(1/3)))^(1/2))/(x*(a*x^3+b))^(1/2)/(I*3^(1/2)-3)/(1/a^2*x*(-a*x
+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*
(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)*x^5,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.366716, size = 1, normalized size = 0.01

$$\left[\frac{\sqrt{a}b^2\log\left(-\left(8\,a^2x^6+8\,abx^3+b^2\right)\sqrt{a}+4\left(2\,a^2x^6+abx^3\right)\sqrt{\frac{ax^3+b}{x^3}}\right)+4\left(2\,a^2x^6+abx^3\right)\sqrt{\frac{ax^3+b}{x^3}}}{48\,a^2}, \frac{\sqrt{-a}b^2\arctan\left(\frac{2\sqrt{-a}x^3\sqrt{a\cdots}}{2\,ax^3+b\cdots}\right.}{\cdots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)*x^5,x, algorithm="fricas")
```

```
[Out] [1/48*(sqrt(a)*b^2*log(-(8*a^2*x^6 + 8*a*b*x^3 + b^2)*sqrt(a) + 4
*(2*a^2*x^6 + a*b*x^3)*sqrt((a*x^3 + b)/x^3)) + 4*(2*a^2*x^6 + a*
b*x^3)*sqrt((a*x^3 + b)/x^3))/a^2, 1/24*(sqrt(-a)*b^2*arctan(2*sq
rt(-a)*x^3*sqrt((a*x^3 + b)/x^3)/(2*a*x^3 + b)) + 2*(2*a^2*x^6 +
a*b*x^3)*sqrt((a*x^3 + b)/x^3))/a^2]
```

Sympy [A] time = 14.6212, size = 100, normalized size = 1.41

$$\frac{ax^{\frac{15}{2}}}{6\sqrt{b}\sqrt{\frac{ax^3}{b}+1}}+\frac{\sqrt{b}x^{\frac{9}{2}}}{4\sqrt{\frac{ax^3}{b}+1}}+\frac{b^{\frac{3}{2}}x^{\frac{3}{2}}}{12a\sqrt{\frac{ax^3}{b}+1}}-\frac{b^2\operatorname{asinh}\left(\frac{\sqrt{a}x^{\frac{3}{2}}}{\sqrt{b}}\right)}{12a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5*(a+b/x**3)**(1/2),x)
```

```
[Out] a*x**(15/2)/(6*sqrt(b)*sqrt(a*x**3/b + 1)) + sqrt(b)*x**(9/2)/(4*
sqrt(a*x**3/b + 1)) + b**(3/2)*x**(3/2)/(12*a*sqrt(a*x**3/b + 1))
 - b**2*asinh(sqrt(a)*x**(3/2)/sqrt(b))/(12*a**(3/2))
```

GIAC/XCAS [A] time = 0.250734, size = 74, normalized size = 1.04

$$\frac{1}{12}\sqrt{ax^4+bx}\left(2x^3+\frac{b}{a}\right)x+\frac{b^2\arctan\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{-a}}\right)}{12\sqrt{-a}a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)*x^5,x, algorithm="giac")
```

```
[Out] 1/12*sqrt(a*x^4 + b*x)*(2*x^3 + b/a)*x + 1/12*b^2*arctan(sqrt(a +
 b/x^3)/sqrt(-a))/(sqrt(-a)*a)
```

3.1990 $\int \sqrt{a+\frac{b}{x^3}}x^2\,dx$

Optimal. Leaf size=47

$$\frac{1}{3}x^3\sqrt{a+\frac{b}{x^3}}+\frac{b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)}{3\sqrt{a}}$$

```
[Out] (Sqrt[a + b/x^3]*x^3)/3 + (b*ArcTanh[Sqrt[a + b/x^3]/Sqrt[a]])/(3
*Sqrt[a])
```

Rubi [A] time = 0.0828673, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{1}{3}x^3\sqrt{a+\frac{b}{x^3}}+\frac{b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)}{3\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x^3]*x^2,x]
```

```
[Out] (Sqrt[a + b/x^3]*x^3)/3 + (b*ArcTanh[Sqrt[a + b/x^3]/Sqrt[a]])/(3
*Sqrt[a])
```

Rubi in Sympy [A] time = 6.97374, size = 39, normalized size = 0.83

$$\frac{x^3\sqrt{a+\frac{b}{x^3}}}{3}+\frac{b\,\mathrm{atanh}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)}{3\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(a+b/x**3)**(1/2),x)
```

```
[Out] x**3*sqrt(a + b/x**3)/3 + b*atanh(sqrt(a + b/x**3)/sqrt(a))/(3*sq
rt(a))
```

Mathematica [A] time = 0.0722618, size = 67, normalized size = 1.43

$$\frac{1}{3}x^{3/2}\sqrt{a+\frac{b}{x^3}}\left(\frac{b\tanh^{-1}\left(\frac{\sqrt{a}x^{3/2}}{\sqrt{ax^3+b}}\right)}{\sqrt{a}\sqrt{ax^3+b}}+x^{3/2}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x^3]*x^2,x]
```

```
[Out] (Sqrt[a + b/x^3]*x^(3/2)*(x^(3/2) + (b*ArcTanh[(Sqrt[a]*x^(3/2))/
Sqrt[b + a*x^3]])/(Sqrt[a]*Sqrt[b + a*x^3])))/3
```

Maple [C] time = 0.037, size = 3340, normalized size = 71.1

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(a+b/x^3)^(1/2),x)
```

```
[Out] -1/3*((a*x^3+b)/x^3)^(1/2)*x^2/a^2*(6*I*(-(I*3^(1/2)-3)*x*a/(I*3^
(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+
2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*
((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-
a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/
2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(
I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*x^2*a^2*b-6*I*(-(I*3^(
1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2
)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*
b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))
/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticPi((-(I*3^(1/
2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1
)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(
1/2)-3))^(1/2))*3^(1/2)*x^2*a^2*b-12*I*(-a^2*b)^(1/3)*(-(I*3^(1/2
)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(
-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^
(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I
*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3
)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(
I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*x*a*b+12
*I*(-a^2*b)^(1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b
)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/
(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(
1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(
1/2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^
(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/
2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*x*a*b+6*I*(-a^2
*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3))
)^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/
2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a
*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Ell
ipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(
1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1
/2))*3^(1/2)*b-6*I*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-
1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+
(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^
(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-
a^2*b)^(1/3)))^(1/2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)
/(-a*x+(-a^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(
1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)
*b-6*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/
2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)
/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-
a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Elliptic
F((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),
((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*
x^2*a^2*b+6*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3
)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(
1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2
*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*E
llipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3))
)^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2)-1)/
(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^2*a^2*b+12*(-a^2*b)^(1/3)*(
-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I
*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x
+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)
^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I
*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^
(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x*a*b-
12*(-a^2*b)^(1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b
)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/
(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(
1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(
1/2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^
```

```
(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/
2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x*a*b-6*(-a^2*b)^(2/3)*
(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((
I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*
x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b
)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(
I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3
^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*b+6*(
-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1
/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3
^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)
-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)
*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3
)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2)-1
)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*b-I*(a*x^4+b*x)^(1/2)*(1/a^
2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b
)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3
^(1/2)*x*a^2+3*x*(a*x^4+b*x)^(1/2)*a^2*(1/a^2*x*(-a*x+(-a^2*b)^(1
/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(
-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2))/(x*(a*x^3+b))^(1/2)/(
I*3^(1/2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(
1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*
b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)*x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.367058, size = 1, normalized size = 0.02

$$\left[\frac{4\,ax^{3}\sqrt{\frac{ax^{3}+b}{x^{3}}}+\sqrt{a}b\log\left(-\left(8\,a^{2}x^{6}+8\,abx^{3}+b^{2}\right)\sqrt{a}-4\,\left(2\,a^{2}x^{6}+abx^{3}\right)\sqrt{\frac{ax^{3}+b}{x^{3}}}\right)}{12\,a},\ \frac{2\,ax^{3}\sqrt{\frac{ax^{3}+b}{x^{3}}}-\sqrt{-a}b\arctan\left(\frac{2\,\sqrt{-a}x^{3}\sqrt{\cdots}}{2\,ax^{3}\cdots}\right.}{6\,a}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)*x^2,x, algorithm="fricas")
```

```
[Out] [1/12*(4*a*x^3*sqrt((a*x^3 + b)/x^3) + sqrt(a)*b*log(-(8*a^2*x^6
+ 8*a*b*x^3 + b^2)*sqrt(a) - 4*(2*a^2*x^6 + a*b*x^3)*sqrt((a*x^3
+ b)/x^3)))/a, 1/6*(2*a*x^3*sqrt((a*x^3 + b)/x^3) - sqrt(-a)*b*ar
ctan(2*sqrt(-a)*x^3*sqrt((a*x^3 + b)/x^3)/(2*a*x^3 + b)))/a]
```

Sympy [A] time = 7.51932, size = 48, normalized size = 1.02

$$\frac{\sqrt{b}x^{\frac{3}{2}}\sqrt{\frac{ax^{3}}{b}+1}}{3}+\frac{b\operatorname{asinh}\left(\frac{\sqrt{a}x^{\frac{3}{2}}}{\sqrt{b}}\right)}{3\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(a+b/x**3)**(1/2),x)
```

```
[Out] sqrt(b)*x**(3/2)*sqrt(a*x**3/b + 1)/3 + b*asinh(sqrt(a)*x**(3/2)/
sqrt(b))/(3*sqrt(a))
```

GIAC/XCAS [A] time = 0.252727, size = 53, normalized size = 1.13

$$\frac{1}{3}\sqrt{ax^4+bx}x-\frac{b\arctan\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{-a}}\right)}{3\sqrt{-a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)*x^2,x, algorithm="giac")
```

```
[Out] 1/3*sqrt(a*x^4 + b*x)*x - 1/3*b*arctan(sqrt(a + b/x^3)/sqrt(-a))/
sqrt(-a)
```

3.1991 $\int \frac{\sqrt{a+\frac{b}{x^3}}}{x} \, dx$

Optimal. Leaf size=43

$$\frac{2}{3}\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)-\frac{2}{3}\sqrt{a+\frac{b}{x^3}}$$

```
[Out] (-2*Sqrt[a + b/x^3])/3 + (2*Sqrt[a]*ArcTanh[Sqrt[a + b/x^3]/Sqrt[
a]])/3
```

Rubi [A] time = 0.0765857, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{2}{3}\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)-\frac{2}{3}\sqrt{a+\frac{b}{x^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x^3]/x,x]
```

```
[Out] (-2*Sqrt[a + b/x^3])/3 + (2*Sqrt[a]*ArcTanh[Sqrt[a + b/x^3]/Sqrt[
a]])/3
```

Rubi in Sympy [A] time = 6.64285, size = 37, normalized size = 0.86

$$\frac{2\sqrt{a}\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)}{3}-\frac{2\sqrt{a+\frac{b}{x^3}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**3)**(1/2)/x,x)
```

```
[Out] 2*sqrt(a)*atanh(sqrt(a + b/x**3)/sqrt(a))/3 - 2*sqrt(a + b/x**3)/
3
```

Mathematica [A] time = 0.047376, size = 75, normalized size = 1.74

$$\frac{2\sqrt{a}x^{3/2}\sqrt{a+\frac{b}{x^3}}\tanh^{-1}\left(\frac{\sqrt{a}x^{3/2}}{\sqrt{ax^3+b}}\right)}{3\sqrt{ax^3+b}}-\frac{2}{3}\sqrt{a+\frac{b}{x^3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x^3]/x,x]
```

```
[Out] (-2*Sqrt[a + b/x^3])/3 + (2*Sqrt[a]*Sqrt[a + b/x^3]*x^(3/2)*ArcTa
nh[(Sqrt[a]*x^(3/2))/Sqrt[b + a*x^3]])/(3*Sqrt[b + a*x^3])
```

Maple [C] time = 0.042, size = 3339, normalized size = 77.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^3)^(1/2)/x,x)
```

```
[Out] -2/3*((a*x^3+b)/x^3)^(1/2)/a*(6*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-
1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+
(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^
(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-
a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/
(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1
/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*x^4*a^2-6*I*(-(I*3^(1/2)-3)*
x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*
b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)
))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1
/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticPi((-(I*3^(1/2)-3)*x*
a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(
1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))
^(1/2))*3^(1/2)*x^4*a^2-12*I*(-a^2*b)^(1/3)*(-(I*3^(1/2)-3)*x*a/(
I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1
/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1
)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3
^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-
1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*x^3*a+12*I*(-a^2*b
)^(1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^
(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)
+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x
-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Ellip
ticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3
^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*x^3*a+6*I*(-a^2*b)^(2/3)*
(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((
I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*
x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b
)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(
I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3
^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/
2)*x^2-6*I*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x
+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)
^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-
a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(
1/3)))^(1/2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(
-a^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*
(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*x^2-6*(
-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I
*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x
+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)
^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I
*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^
(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^4*a^
2+6*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2
)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/
(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a
^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticP
i((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),
(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/
2)+1)/(I*3^(1/2)-3))^(1/2))*x^4*a^2+12*(-a^2*b)^(1/3)*(-(I*3^(1/2
)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(
-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^
(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I
*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3
)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(
I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^3*a-12*(-a^2*b
)^(1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^
(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)
+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x
-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Ellip
ticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3
^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^3*a-6*(-a^2*b)^(2/3)*(-(I*3^(1/
2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*
(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)
^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(
```

```
I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-
3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*
(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^2+6*(-a^2*b)^
(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1
)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(
-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Ellipti
cPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2
),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(
1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^2+I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3)
)*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^
2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*(a*x^4+b*x)^(1/2)
*a-3*(a*x^4+b*x)^(1/2)*a*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2
)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-
2*a*x-(-a^2*b)^(1/3)))^(1/2))/(x*(a*x^3+b))^(1/2)/(I*3^(1/2)-3)/(
1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a
^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/
2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.363743, size = 1, normalized size = 0.02

$$\left[\frac{1}{6}\sqrt{a}\log\left(-8\,a^2x^6-8\,abx^3-b^2-4\left(2\,ax^6+bx^3\right)\sqrt{a}\sqrt{\frac{ax^3+b}{x^3}}\right)-\frac{2}{3}\sqrt{\frac{ax^3+b}{x^3}}, \frac{1}{3}\sqrt{-a}\arctan\left(\frac{2\,ax^3\sqrt{\frac{ax^3+b}{x^3}}}{\left(2\,ax^3+b\right)\sqrt{-a}}\right)-\frac{2}{3}\sqrt{\frac{ax^3+b}{x^3}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)/x,x, algorithm="fricas")
```

```
[Out] [1/6*sqrt(a)*log(-8*a^2*x^6 - 8*a*b*x^3 - b^2 - 4*(2*a*x^6 + b*x^
3)*sqrt(a)*sqrt((a*x^3 + b)/x^3)) - 2/3*sqrt((a*x^3 + b)/x^3), 1/
3*sqrt(-a)*arctan(2*a*x^3*sqrt((a*x^3 + b)/x^3)/((2*a*x^3 + b)*sq
rt(-a))) - 2/3*sqrt((a*x^3 + b)/x^3)]
```

Sympy [A] time = 5.53078, size = 76, normalized size = 1.77

$$\frac{2\sqrt{a}\operatorname{asinh}\left(\frac{\sqrt{a}x^{\frac{3}{2}}}{\sqrt{b}}\right)}{3}-\frac{2ax^{\frac{3}{2}}}{3\sqrt{b}\sqrt{\frac{ax^3}{b}+1}}-\frac{2\sqrt{b}}{3x^{\frac{3}{2}}\sqrt{\frac{ax^3}{b}+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**3)**(1/2)/x,x)
```

```
[Out] 2*sqrt(a)*asinh(sqrt(a)*x**(3/2)/sqrt(b))/3 - 2*a*x**(3/2)/(3*sqr
t(b)*sqrt(a*x**3/b + 1)) - 2*sqrt(b)/(3*x**(3/2)*sqrt(a*x**3/b +
1))
```

GIAC/XCAS [A] time = 0.321774, size = 49, normalized size = 1.14

$$-\frac{2\,a\arctan\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{-a}}\right)}{3\,\sqrt{-a}}-\frac{2}{3}\,\sqrt{a+\frac{b}{x^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)/x,x, algorithm="giac")
```

```
[Out] -2/3*a*arctan(sqrt(a + b/x^3)/sqrt(-a))/sqrt(-a) - 2/3*sqrt(a + b
/x^3)
```

3.1992 $\int \frac{\sqrt{a+\frac{b}{x^3}}}{x^4} dx$

Optimal. Leaf size=18

$$-\frac{2\left(a+\frac{b}{x^3}\right)^{3/2}}{9b}$$

```
[Out] (-2*(a + b/x^3)^(3/2))/(9*b)
```

Rubi [A] time = 0.029736, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{2\left(a+\frac{b}{x^3}\right)^{3/2}}{9b}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x^3]/x^4,x]

[Out] (-2*(a + b/x^3)^(3/2))/(9*b)
```

Rubi in Sympy [A] time = 2.1002, size = 15, normalized size = 0.83

$$-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}}{9b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**3)**(1/2)/x**4,x)

[Out] -2*(a + b/x**3)**(3/2)/(9*b)
```

Mathematica [A] time = 0.033716, size = 18, normalized size = 1.

$$-\frac{2\left(a+\frac{b}{x^3}\right)^{3/2}}{9b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x^3]/x^4,x]

[Out] (-2*(a + b/x^3)^(3/2))/(9*b)
```

Maple [A] time = 0.008, size = 29, normalized size = 1.6

$$-\frac{2\,a x^3+2\,b}{9\,b x^3}\sqrt{\frac{a x^3+b}{x^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^3)^(1/2)/x^4,x)

[Out] -2/9/x^3*(a*x^3+b)/b*((a*x^3+b)/x^3)^(1/2)
```

Maxima [A] time = 1.44299, size = 19, normalized size = 1.06

$$-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}}{9\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)/x^4,x, algorithm="maxima")

[Out] -2/9*(a + b/x^3)^(3/2)/b
```

Fricas [A] time = 0.243108, size = 38, normalized size = 2.11

$$-\frac{2\left(ax^3+b\right)\sqrt{\frac{ax^3+b}{x^3}}}{9\,bx^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)/x^4,x, algorithm="fricas")

[Out] -2/9*(a*x^3 + b)*sqrt((a*x^3 + b)/x^3)/(b*x^3)
```

Sympy [A] time = 4.29441, size = 46, normalized size = 2.56

$$-\frac{2a^{\frac{3}{2}}\sqrt{1+\frac{b}{ax^3}}}{9b}-\frac{2\sqrt{a}\sqrt{1+\frac{b}{ax^3}}}{9x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**3)**(1/2)/x**4,x)

[Out] -2*a**(3/2)*sqrt(1 + b/(a*x**3))/(9*b) - 2*sqrt(a)*sqrt(1 + b/(a*
x**3))/(9*x**3)
```

GIAC/XCAS [A] time = 0.237493, size = 19, normalized size = 1.06

$$-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}}{9\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)/x^4,x, algorithm="giac")

[Out] -2/9*(a + b/x^3)^(3/2)/b
```

3.1993 $\int \frac{\sqrt{a+\frac{b}{x^3}}}{x^7} dx$

Optimal. Leaf size=38

$$\frac{2a\left(a+\frac{b}{x^3}\right)^{3/2}}{9b^2}-\frac{2\left(a+\frac{b}{x^3}\right)^{5/2}}{15b^2}$$

```
[Out] (2*a*(a + b/x^3)^(3/2))/(9*b^2) - (2*(a + b/x^3)^(5/2))/(15*b^2)
```

Rubi [A] time = 0.067862, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2a\left(a+\frac{b}{x^3}\right)^{3/2}}{9b^2}-\frac{2\left(a+\frac{b}{x^3}\right)^{5/2}}{15b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x^3]/x^7,x]

[Out] (2*a*(a + b/x^3)^(3/2))/(9*b^2) - (2*(a + b/x^3)^(5/2))/(15*b^2)
```

Rubi in Sympy [A] time = 6.96968, size = 34, normalized size = 0.89

$$\frac{2a\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}}{9b^2}-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{5}{2}}}{15b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**3)**(1/2)/x**7,x)

[Out] 2*a*(a + b/x**3)**(3/2)/(9*b**2) - 2*(a + b/x**3)**(5/2)/(15*b**2
)
```

Mathematica [A] time = 0.0300582, size = 42, normalized size = 1.11

$$\frac{2\sqrt{a+\frac{b}{x^3}}\left(2a^2x^6-abx^3-3b^2\right)}{45b^2x^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x^3]/x^7,x]

[Out] (2*Sqrt[a + b/x^3]*(-3*b^2 - a*b*x^3 + 2*a^2*x^6))/(45*b^2*x^6)
```

Maple [A] time = 0.009, size = 39, normalized size = 1.

$$\frac{\left(2\,a{x}^{3}+2\,b\right)\left(2\,a{x}^{3}-3\,b\right)}{45\,{b}^{2}{x}^{6}}\sqrt{\frac{a{x}^{3}+b}{{x}^{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^3)^(1/2)/x^7,x)

[Out] 2/45*(a*x^3+b)*(2*a*x^3-3*b)*((a*x^3+b)/x^3)^(1/2)/b^2/x^6
```

Maxima [A] time = 1.44038, size = 41, normalized size = 1.08

$$-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{5}{2}}}{15\,b^2}+\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}a}{9\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)/x^7,x, algorithm="maxima")

[Out] -2/15*(a + b/x^3)^(5/2)/b^2 + 2/9*(a + b/x^3)^(3/2)*a/b^2
```

Fricas [A] time = 0.236311, size = 57, normalized size = 1.5

$$\frac{2\left(2\,a^2x^6-abx^3-3\,b^2\right)\sqrt{\frac{ax^3+b}{x^3}}}{45\,b^2x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)/x^7,x, algorithm="fricas")

[Out] 2/45*(2*a^2*x^6 - a*b*x^3 - 3*b^2)*sqrt((a*x^3 + b)/x^3)/(b^2*x^6
)
```

Sympy [A] time = 7.91368, size = 313, normalized size = 8.24

$$\frac{4a^{\frac{11}{2}}b^{\frac{3}{2}}x^9\sqrt{\frac{ax^3}{b}+1}}{45a^{\frac{7}{2}}b^3x^{\frac{21}{2}}+45a^{\frac{5}{2}}b^4x^{\frac{15}{2}}}+\frac{2a^{\frac{9}{2}}b^{\frac{5}{2}}x^6\sqrt{\frac{ax^3}{b}+1}}{45a^{\frac{7}{2}}b^3x^{\frac{21}{2}}+45a^{\frac{5}{2}}b^4x^{\frac{15}{2}}}-\frac{8a^{\frac{7}{2}}b^{\frac{7}{2}}x^3\sqrt{\frac{ax^3}{b}+1}}{45a^{\frac{7}{2}}b^3x^{\frac{21}{2}}+45a^{\frac{5}{2}}b^4x^{\frac{15}{2}}}-\frac{6a^{\frac{5}{2}}b^{\frac{9}{2}}\sqrt{\frac{ax^3}{b}+1}}{45a^{\frac{7}{2}}b^3x^{\frac{21}{2}}+45a^{\frac{5}{2}}b^4x^{\frac{15}{2}}}-\frac{4a^6bx^{\frac{21}{2}}}{45a^{\frac{7}{2}}b^3x^{\frac{21}{2}}+45a^{\frac{5}{2}}b^4x^{\frac{15}{2}}}-\frac{4a^5b^2x^{\frac{15}{2}}}{45a^{\frac{7}{2}}b^3x^{\frac{21}{2}}+45a^{\frac{5}{2}}b^4x^{\frac{15}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**3)**(1/2)/x**7,x)

[Out] 4*a**(11/2)*b**(3/2)*x**9*sqrt(a*x**3/b + 1)/(45*a**(7/2)*b**3*x*
*(21/2) + 45*a**(5/2)*b**4*x**(15/2)) + 2*a**(9/2)*b**(5/2)*x**6*
sqrt(a*x**3/b + 1)/(45*a**(7/2)*b**3*x**(21/2) + 45*a**(5/2)*b**4
*x**(15/2)) - 8*a**(7/2)*b**(7/2)*x**3*sqrt(a*x**3/b + 1)/(45*a**
(7/2)*b**3*x**(21/2) + 45*a**(5/2)*b**4*x**(15/2)) - 6*a**(5/2)*b
**(9/2)*sqrt(a*x**3/b + 1)/(45*a**(7/2)*b**3*x**(21/2) + 45*a**(5
/2)*b**4*x**(15/2)) - 4*a**6*b*x**(21/2)/(45*a**(7/2)*b**3*x**(21
/2) + 45*a**(5/2)*b**4*x**(15/2)) - 4*a**5*b**2*x**(15/2)/(45*a**
(7/2)*b**3*x**(21/2) + 45*a**(5/2)*b**4*x**(15/2))
```

GIAC/XCAS [A] time = 0.236696, size = 39, normalized size = 1.03

$$-\frac{2\left(3\left(a+\frac{b}{x^3}\right)^{\frac{5}{2}}-5\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}a\right)}{45\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)/x^7,x, algorithm="giac")
```

```
[Out] -2/45*(3*(a + b/x^3)^(5/2) - 5*(a + b/x^3)^(3/2)*a)/b^2
```

3.1994 $\int \frac{\sqrt{a+\frac{b}{x^3}}}{x^{10}}\,dx$

Optimal. Leaf size=59

$$-\frac{2a^2\left(a+\frac{b}{x^3}\right)^{3/2}}{9b^3}-\frac{2\left(a+\frac{b}{x^3}\right)^{7/2}}{21b^3}+\frac{4a\left(a+\frac{b}{x^3}\right)^{5/2}}{15b^3}$$

```
[Out] (-2*a^2*(a + b/x^3)^(3/2))/(9*b^3) + (4*a*(a + b/x^3)^(5/2))/(15*
b^3) - (2*(a + b/x^3)^(7/2))/(21*b^3)
```

Rubi [A] time = 0.0868706, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2a^2\left(a+\frac{b}{x^3}\right)^{3/2}}{9b^3}-\frac{2\left(a+\frac{b}{x^3}\right)^{7/2}}{21b^3}+\frac{4a\left(a+\frac{b}{x^3}\right)^{5/2}}{15b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x^3]/x^10,x]
```

```
[Out] (-2*a^2*(a + b/x^3)^(3/2))/(9*b^3) + (4*a*(a + b/x^3)^(5/2))/(15*
b^3) - (2*(a + b/x^3)^(7/2))/(21*b^3)
```

Rubi in Sympy [A] time = 10.5137, size = 54, normalized size = 0.92

$$-\frac{2a^2\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}}{9b^3}+\frac{4a\left(a+\frac{b}{x^3}\right)^{\frac{5}{2}}}{15b^3}-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{7}{2}}}{21b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**3)**(1/2)/x**10,x)
```

```
[Out] -2*a**2*(a + b/x**3)**(3/2)/(9*b**3) + 4*a*(a + b/x**3)**(5/2)/(1
5*b**3) - 2*(a + b/x**3)**(7/2)/(21*b**3)
```

Mathematica [A] time = 0.0379596, size = 53, normalized size = 0.9

$$-\frac{2\sqrt{a+\frac{b}{x^3}}\left(8a^3x^9-4a^2bx^6+3ab^2x^3+15b^3\right)}{315b^3x^9}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x^3]/x^10,x]
```

```
[Out] (-2*Sqrt[a + b/x^3]*(15*b^3 + 3*a*b^2*x^3 - 4*a^2*b*x^6 + 8*a^3*x
^9))/(315*b^3*x^9)
```

Maple [A] time = 0.01, size = 50, normalized size = 0.9

$$-\frac{\left(2\,ax^3+2\,b\right)\left(8\,a^2x^6-12\,abx^3+15\,b^2\right)}{315\,b^3x^9}\sqrt{\frac{ax^3+b}{x^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((a+b/x^3)^(1/2)/x^10,x)
```

```
[Out] -2/315*(a*x^3+b)*(8*a^2*x^6-12*a*b*x^3+15*b^2)*((a*x^3+b)/x^3)^(1
/2)/b^3/x^9
```

Maxima [A] time = 1.43889, size = 63, normalized size = 1.07

$$-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{7}{2}}}{21\,b^3}+\frac{4\left(a+\frac{b}{x^3}\right)^{\frac{5}{2}}a}{15\,b^3}-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}a^2}{9\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(a + b/x^3)/x^10,x, algorithm="maxima")
```

```
[Out] -2/21*(a + b/x^3)^(7/2)/b^3 + 4/15*(a + b/x^3)^(5/2)*a/b^3 - 2/9*
(a + b/x^3)^(3/2)*a^2/b^3
```

Fricas [A] time = 0.230625, size = 72, normalized size = 1.22

$$-\frac{2\left(8\,a^3x^9-4\,a^2bx^6+3\,ab^2x^3+15\,b^3\right)\sqrt{\frac{ax^3+b}{x^3}}}{315\,b^3x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(a + b/x^3)/x^10,x, algorithm="fricas")
```

```
[Out] -2/315*(8*a^3*x^9 - 4*a^2*b*x^6 + 3*a*b^2*x^3 + 15*b^3)*sqrt((a*x
^3 + b)/x^3)/(b^3*x^9)
```

Sympy [A] time = 14.4666, size = 913, normalized size = 15.47

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a+b/x**3)**(1/2)/x**10,x)
```

```
[Out] -16*a**(19/2)*b**(9/2)*x**18*sqrt(a*x**3/b + 1)/(315*a**(13/2)*b*
*7*x**(39/2) + 945*a**(11/2)*b**8*x**(33/2) + 945*a**(9/2)*b**9*x
**(27/2) + 315*a**(7/2)*b**10*x**(21/2)) - 40*a**(17/2)*b**(11/2)
*x**15*sqrt(a*x**3/b + 1)/(315*a**(13/2)*b**7*x**(39/2) + 945*a**
(11/2)*b**8*x**(33/2) + 945*a**(9/2)*b**9*x**(27/2) + 315*a**(7/2
)*b**10*x**(21/2)) - 30*a**(15/2)*b**(13/2)*x**12*sqrt(a*x**3/b +
 1)/(315*a**(13/2)*b**7*x**(39/2) + 945*a**(11/2)*b**8*x**(33/2)
 + 945*a**(9/2)*b**9*x**(27/2) + 315*a**(7/2)*b**10*x**(21/2)) - 4
0*a**(13/2)*b**(15/2)*x**9*sqrt(a*x**3/b + 1)/(315*a**(13/2)*b**7
*x**(39/2) + 945*a**(11/2)*b**8*x**(33/2) + 945*a**(9/2)*b**9*x**
(27/2) + 315*a**(7/2)*b**10*x**(21/2)) - 100*a**(11/2)*b**(17/2)*
x**6*sqrt(a*x**3/b + 1)/(315*a**(13/2)*b**7*x**(39/2) + 945*a**(1
1/2)*b**8*x**(33/2) + 945*a**(9/2)*b**9*x**(27/2) + 315*a**(7/2)*
b**10*x**(21/2)) - 96*a**(9/2)*b**(19/2)*x**3*sqrt(a*x**3/b + 1)/
(315*a**(13/2)*b**7*x**(39/2) + 945*a**(11/2)*b**8*x**(33/2) + 94
5*a**(9/2)*b**9*x**(27/2) + 315*a**(7/2)*b**10*x**(21/2)) - 30*a*
*(7/2)*b**(21/2)*sqrt(a*x**3/b + 1)/(315*a**(13/2)*b**7*x**(39/2)
 + 945*a**(11/2)*b**8*x**(33/2) + 945*a**(9/2)*b**9*x**(27/2) + 3
15*a**(7/2)*b**10*x**(21/2)) + 16*a**10*b**4*x**(39/2)/(315*a**(1
```

```
3/2)*b**7*x**(39/2) + 945*a**(11/2)*b**8*x**(33/2) + 945*a**(9/2)
*b**9*x**(27/2) + 315*a**(7/2)*b**10*x**(21/2)) + 48*a**9*b**5*x*
*(33/2)/(315*a**(13/2)*b**7*x**(39/2) + 945*a**(11/2)*b**8*x**(33
/2) + 945*a**(9/2)*b**9*x**(27/2) + 315*a**(7/2)*b**10*x**(21/2))
 + 48*a**8*b**6*x**(27/2)/(315*a**(13/2)*b**7*x**(39/2) + 945*a**
(11/2)*b**8*x**(33/2) + 945*a**(9/2)*b**9*x**(27/2) + 315*a**(7/2
)*b**10*x**(21/2)) + 16*a**7*b**7*x**(21/2)/(315*a**(13/2)*b**7*x
**(39/2) + 945*a**(11/2)*b**8*x**(33/2) + 945*a**(9/2)*b**9*x**(2
7/2) + 315*a**(7/2)*b**10*x**(21/2))
```

GIAC/XCAS [A] time = 0.232854, size = 58, normalized size = 0.98

$$-\frac{2\left(15\left(a+\frac{b}{x^3}\right)^{\frac{7}{2}}-42\left(a+\frac{b}{x^3}\right)^{\frac{5}{2}}a+35\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}a^2\right)}{315\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)/x^10,x, algorithm="giac")
```

```
[Out] -2/315*(15*(a + b/x^3)^(7/2) - 42*(a + b/x^3)^(5/2)*a + 35*(a + b
/x^3)^(3/2)*a^2)/b^3
```

3.1995 $\int \frac{\sqrt{a+\frac{b}{x^3}}}{x^{13}}\,dx$

Optimal. Leaf size=80

$$\frac{2a^3\left(a+\frac{b}{x^3}\right)^{3/2}}{9b^4}-\frac{2a^2\left(a+\frac{b}{x^3}\right)^{5/2}}{5b^4}-\frac{2\left(a+\frac{b}{x^3}\right)^{9/2}}{27b^4}+\frac{2a\left(a+\frac{b}{x^3}\right)^{7/2}}{7b^4}$$

```
[Out] (2*a^3*(a + b/x^3)^(3/2))/(9*b^4) - (2*a^2*(a + b/x^3)^(5/2))/(5*
b^4) + (2*a*(a + b/x^3)^(7/2))/(7*b^4) - (2*(a + b/x^3)^(9/2))/(2
7*b^4)
```

Rubi [A] time = 0.113603, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{2a^3\left(a+\frac{b}{x^3}\right)^{3/2}}{9b^4}-\frac{2a^2\left(a+\frac{b}{x^3}\right)^{5/2}}{5b^4}-\frac{2\left(a+\frac{b}{x^3}\right)^{9/2}}{27b^4}+\frac{2a\left(a+\frac{b}{x^3}\right)^{7/2}}{7b^4}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x^3]/x^13,x]
```

```
[Out] (2*a^3*(a + b/x^3)^(3/2))/(9*b^4) - (2*a^2*(a + b/x^3)^(5/2))/(5*
b^4) + (2*a*(a + b/x^3)^(7/2))/(7*b^4) - (2*(a + b/x^3)^(9/2))/(2
7*b^4)
```

Rubi in Sympy [A] time = 14.1343, size = 75, normalized size = 0.94

$$\frac{2a^3\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}}{9b^4}-\frac{2a^2\left(a+\frac{b}{x^3}\right)^{\frac{5}{2}}}{5b^4}+\frac{2a\left(a+\frac{b}{x^3}\right)^{\frac{7}{2}}}{7b^4}-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{9}{2}}}{27b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**3)**(1/2)/x**13,x)
```

```
[Out] 2*a**3*(a + b/x**3)**(3/2)/(9*b**4) - 2*a**2*(a + b/x**3)**(5/2)/
(5*b**4) + 2*a*(a + b/x**3)**(7/2)/(7*b**4) - 2*(a + b/x**3)**(9/
2)/(27*b**4)
```

Mathematica [A] time = 0.0460779, size = 64, normalized size = 0.8

$$\frac{2\sqrt{a+\frac{b}{x^3}}\left(16a^4x^{12}-8a^3bx^9+6a^2b^2x^6-5ab^3x^3-35b^4\right)}{945b^4x^{12}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x^3]/x^13,x]
```

```
[Out] (2*Sqrt[a + b/x^3]*(-35*b^4 - 5*a*b^3*x^3 + 6*a^2*b^2*x^6 - 8*a^3
*b*x^9 + 16*a^4*x^12))/(945*b^4*x^12)
```

Maple [A] time = 0.011, size = 61, normalized size = 0.8

$$\frac{(2\,ax^3+2\,b)\,(16\,a^3x^9-24\,a^2bx^6+30\,ab^2x^3-35\,b^3)}{945\,x^{12}b^4}\sqrt{\frac{ax^3+b}{x^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^3)^(1/2)/x^13,x)
```

```
[Out] 2/945*(a*x^3+b)*(16*a^3*x^9-24*a^2*b*x^6+30*a*b^2*x^3-35*b^3)*((a
*x^3+b)/x^3)^(1/2)/x^12/b^4
```

Maxima [A] time = 1.43603, size = 86, normalized size = 1.08

$$-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{9}{2}}}{27\,b^4}+\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{7}{2}}a}{7\,b^4}-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{5}{2}}a^2}{5\,b^4}+\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}a^3}{9\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)/x^13,x, algorithm="maxima")
```

```
[Out] -2/27*(a + b/x^3)^(9/2)/b^4 + 2/7*(a + b/x^3)^(7/2)*a/b^4 - 2/5*(
a + b/x^3)^(5/2)*a^2/b^4 + 2/9*(a + b/x^3)^(3/2)*a^3/b^4
```

Fricas [A] time = 0.230959, size = 86, normalized size = 1.08

$$\frac{2\,(16\,a^4x^{12}-8\,a^3bx^9+6\,a^2b^2x^6-5\,ab^3x^3-35\,b^4)\sqrt{\frac{ax^3+b}{x^3}}}{945\,b^4x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)/x^13,x, algorithm="fricas")
```

```
[Out] 2/945*(16*a^4*x^12 - 8*a^3*b*x^9 + 6*a^2*b^2*x^6 - 5*a*b^3*x^3 -
35*b^4)*sqrt((a*x^3 + b)/x^3)/(b^4*x^12)
```

Sympy [A] time = 25.0441, size = 2317, normalized size = 28.96

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**3)**(1/2)/x**13,x)
```

```
[Out] 32*a**(29/2)*b**(23/2)*x**30*sqrt(a*x**3/b + 1)/(945*a**(21/2)*b*
*15*x**(63/2) + 5670*a**(19/2)*b**16*x**(57/2) + 14175*a**(17/2)*
b**17*x**(51/2) + 18900*a**(15/2)*b**18*x**(45/2) + 14175*a**(13/
2)*b**19*x**(39/2) + 5670*a**(11/2)*b**20*x**(33/2) + 945*a**(9/2
)*b**21*x**(27/2)) + 176*a**(27/2)*b**(25/2)*x**27*sqrt(a*x**3/b
+ 1)/(945*a**(21/2)*b**15*x**(63/2) + 5670*a**(19/2)*b**16*x**(57
/2) + 14175*a**(17/2)*b**17*x**(51/2) + 18900*a**(15/2)*b**18*x**
(45/2) + 14175*a**(13/2)*b**19*x**(39/2) + 5670*a**(11/2)*b**20*x
**(33/2) + 945*a**(9/2)*b**21*x**(27/2)) + 396*a**(25/2)*b**(27/2
)*x**24*sqrt(a*x**3/b + 1)/(945*a**(21/2)*b**15*x**(63/2) + 5670*
a**(19/2)*b**16*x**(57/2) + 14175*a**(17/2)*b**17*x**(51/2) + 189
00*a**(15/2)*b**18*x**(45/2) + 14175*a**(13/2)*b**19*x**(39/2) +
```

```
5670*a**(11/2)*b**20*x**(33/2) + 945*a**(9/2)*b**21*x**(27/2)) +
462*a**(23/2)*b**(29/2)*x**21*sqrt(a*x**3/b + 1)/(945*a**(21/2)*b
**15*x**(63/2) + 5670*a**(19/2)*b**16*x**(57/2) + 14175*a**(17/2)
*b**17*x**(51/2) + 18900*a**(15/2)*b**18*x**(45/2) + 14175*a**(13
/2)*b**19*x**(39/2) + 5670*a**(11/2)*b**20*x**(33/2) + 945*a**(9/
2)*b**21*x**(27/2)) + 210*a**(21/2)*b**(31/2)*x**18*sqrt(a*x**3/b
 + 1)/(945*a**(21/2)*b**15*x**(63/2) + 5670*a**(19/2)*b**16*x**(5
7/2) + 14175*a**(17/2)*b**17*x**(51/2) + 18900*a**(15/2)*b**18*x*
*(45/2) + 14175*a**(13/2)*b**19*x**(39/2) + 5670*a**(11/2)*b**20*
x**(33/2) + 945*a**(9/2)*b**21*x**(27/2)) - 378*a**(19/2)*b**(33/
2)*x**15*sqrt(a*x**3/b + 1)/(945*a**(21/2)*b**15*x**(63/2) + 5670
*a**(19/2)*b**16*x**(57/2) + 14175*a**(17/2)*b**17*x**(51/2) + 18
900*a**(15/2)*b**18*x**(45/2) + 14175*a**(13/2)*b**19*x**(39/2) +
 5670*a**(11/2)*b**20*x**(33/2) + 945*a**(9/2)*b**21*x**(27/2)) -
 1134*a**(17/2)*b**(35/2)*x**12*sqrt(a*x**3/b + 1)/(945*a**(21/2)
*b**15*x**(63/2) + 5670*a**(19/2)*b**16*x**(57/2) + 14175*a**(17/
2)*b**17*x**(51/2) + 18900*a**(15/2)*b**18*x**(45/2) + 14175*a**(
13/2)*b**19*x**(39/2) + 5670*a**(11/2)*b**20*x**(33/2) + 945*a**(
9/2)*b**21*x**(27/2)) - 1494*a**(15/2)*b**(37/2)*x**9*sqrt(a*x**3
/b + 1)/(945*a**(21/2)*b**15*x**(63/2) + 5670*a**(19/2)*b**16*x**
(57/2) + 14175*a**(17/2)*b**17*x**(51/2) + 18900*a**(15/2)*b**18*
x**(45/2) + 14175*a**(13/2)*b**19*x**(39/2) + 5670*a**(11/2)*b**2
0*x**(33/2) + 945*a**(9/2)*b**21*x**(27/2)) - 1098*a**(13/2)*b**(
39/2)*x**6*sqrt(a*x**3/b + 1)/(945*a**(21/2)*b**15*x**(63/2) + 56
70*a**(19/2)*b**16*x**(57/2) + 14175*a**(17/2)*b**17*x**(51/2) +
18900*a**(15/2)*b**18*x**(45/2) + 14175*a**(13/2)*b**19*x**(39/2)
 + 5670*a**(11/2)*b**20*x**(33/2) + 945*a**(9/2)*b**21*x**(27/2))
 - 430*a**(11/2)*b**(41/2)*x**3*sqrt(a*x**3/b + 1)/(945*a**(21/2)
*b**15*x**(63/2) + 5670*a**(19/2)*b**16*x**(57/2) + 14175*a**(17/
2)*b**17*x**(51/2) + 18900*a**(15/2)*b**18*x**(45/2) + 14175*a**(
13/2)*b**19*x**(39/2) + 5670*a**(11/2)*b**20*x**(33/2) + 945*a**(
9/2)*b**21*x**(27/2)) - 70*a**(9/2)*b**(43/2)*sqrt(a*x**3/b + 1)/
(945*a**(21/2)*b**15*x**(63/2) + 5670*a**(19/2)*b**16*x**(57/2) +
 14175*a**(17/2)*b**17*x**(51/2) + 18900*a**(15/2)*b**18*x**(45/2
) + 14175*a**(13/2)*b**19*x**(39/2) + 5670*a**(11/2)*b**20*x**(33
/2) + 945*a**(9/2)*b**21*x**(27/2)) - 32*a**15*b**11*x**(63/2)/(9
45*a**(21/2)*b**15*x**(63/2) + 5670*a**(19/2)*b**16*x**(57/2) + 1
4175*a**(17/2)*b**17*x**(51/2) + 18900*a**(15/2)*b**18*x**(45/2)
+ 14175*a**(13/2)*b**19*x**(39/2) + 5670*a**(11/2)*b**20*x**(33/2
) + 945*a**(9/2)*b**21*x**(27/2)) - 192*a**14*b**12*x**(57/2)/(94
5*a**(21/2)*b**15*x**(63/2) + 5670*a**(19/2)*b**16*x**(57/2) + 14
175*a**(17/2)*b**17*x**(51/2) + 18900*a**(15/2)*b**18*x**(45/2) +
 14175*a**(13/2)*b**19*x**(39/2) + 5670*a**(11/2)*b**20*x**(33/2)
 + 945*a**(9/2)*b**21*x**(27/2)) - 480*a**13*b**13*x**(51/2)/(945
*a**(21/2)*b**15*x**(63/2) + 5670*a**(19/2)*b**16*x**(57/2) + 141
75*a**(17/2)*b**17*x**(51/2) + 18900*a**(15/2)*b**18*x**(45/2) +
14175*a**(13/2)*b**19*x**(39/2) + 5670*a**(11/2)*b**20*x**(33/2)
+ 945*a**(9/2)*b**21*x**(27/2)) - 640*a**12*b**14*x**(45/2)/(945*
a**(21/2)*b**15*x**(63/2) + 5670*a**(19/2)*b**16*x**(57/2) + 1417
5*a**(17/2)*b**17*x**(51/2) + 18900*a**(15/2)*b**18*x**(45/2) + 1
4175*a**(13/2)*b**19*x**(39/2) + 5670*a**(11/2)*b**20*x**(33/2) +
 945*a**(9/2)*b**21*x**(27/2)) - 480*a**11*b**15*x**(39/2)/(945*a
**(21/2)*b**15*x**(63/2) + 5670*a**(19/2)*b**16*x**(57/2) + 14175
*a**(17/2)*b**17*x**(51/2) + 18900*a**(15/2)*b**18*x**(45/2) + 14
175*a**(13/2)*b**19*x**(39/2) + 5670*a**(11/2)*b**20*x**(33/2) +
945*a**(9/2)*b**21*x**(27/2)) - 192*a**10*b**16*x**(33/2)/(945*a*
*(21/2)*b**15*x**(63/2) + 5670*a**(19/2)*b**16*x**(57/2) + 14175*
a**(17/2)*b**17*x**(51/2) + 18900*a**(15/2)*b**18*x**(45/2) + 141
75*a**(13/2)*b**19*x**(39/2) + 5670*a**(11/2)*b**20*x**(33/2) + 9
45*a**(9/2)*b**21*x**(27/2)) - 32*a**9*b**17*x**(27/2)/(945*a**(2
1/2)*b**15*x**(63/2) + 5670*a**(19/2)*b**16*x**(57/2) + 14175*a**
(17/2)*b**17*x**(51/2) + 18900*a**(15/2)*b**18*x**(45/2) + 14175*
a**(13/2)*b**19*x**(39/2) + 5670*a**(11/2)*b**20*x**(33/2) + 945*
a**(9/2)*b**21*x**(27/2))
```

GIAC/XCAS [A] time = 0.232382, size = 77, normalized size = 0.96

$$-\frac{2\left(35\left(a+\frac{b}{x^3}\right)^{\frac{9}{2}}-135\left(a+\frac{b}{x^3}\right)^{\frac{7}{2}}a+189\left(a+\frac{b}{x^3}\right)^{\frac{5}{2}}a^2-105\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}a^3\right)}{945\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)/x^13,x, algorithm="giac")
```

```
[Out] -2/945*(35*(a + b/x^3)^(9/2) - 135*(a + b/x^3)^(7/2)*a + 189*(a +
 b/x^3)^(5/2)*a^2 - 105*(a + b/x^3)^(3/2)*a^3)/b^4
```

3.1996 $\int \sqrt{a+\frac{b}{x^3}}x^7\,dx$

Optimal. Leaf size=291

$$-\frac{21b^2x^2\sqrt{a+\frac{b}{x^3}}}{320a^2}-\frac{7\,3^{3/4}\sqrt{2+\sqrt{3}}b^{8/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{320a^2\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{1}{8}x^8\sqrt{a+\frac{b}{x^3}}+\frac{3bx^5\sqrt{a+\frac{b}{x^3}}}{80a}$$

```
[Out] (-21*b^2*Sqrt[a + b/x^3]*x^2)/(320*a^2) + (3*b*Sqrt[a + b/x^3]*x^
5)/(80*a) + (Sqrt[a + b/x^3]*x^8)/8 - (7*3^(3/4)*Sqrt[2 + Sqrt[3]
]*b^(8/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^
(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*Elliptic
F[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/
3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(320*a^2*Sqrt[a + b/x^3]*Sqrt[
(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/
x)^2])
```

Rubi [A] time = 0.468096, antiderivative size = 291, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{21b^2x^2\sqrt{a+\frac{b}{x^3}}}{320a^2}-\frac{7\,3^{3/4}\sqrt{2+\sqrt{3}}b^{8/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{320a^2\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{1}{8}x^8\sqrt{a+\frac{b}{x^3}}+\frac{3bx^5\sqrt{a+\frac{b}{x^3}}}{80a}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x^3]*x^7,x]
```


```
[Out] (-21*b^2*Sqrt[a + b/x^3]*x^2)/(320*a^2) + (3*b*Sqrt[a + b/x^3]*x^
5)/(80*a) + (Sqrt[a + b/x^3]*x^8)/8 - (7*3^(3/4)*Sqrt[2 + Sqrt[3]
]*b^(8/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^
(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*Elliptic
F[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/
3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(320*a^2*Sqrt[a + b/x^3]*Sqrt[
(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/
x)^2])
```

Rubi in Sympy [A] time = 23.8937, size = 246, normalized size = 0.85

$$\frac{x^8\sqrt{a+\frac{b}{x^3}}}{8}+\frac{3bx^5\sqrt{a+\frac{b}{x^3}}}{80a} - \frac{7\cdot 3^{\frac{3}{4}} b^{\frac{8}{3}} \sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{320a^2\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}} - \frac{21b^2x^2\sqrt{a+\frac{b}{x^3}}}{320a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7*(a+b/x**3)**(1/2),x)
```

```
[Out] x**8*sqrt(a + b/x**3)/8 + 3*b*x**5*sqrt(a + b/x**3)/(80*a) - 7*3*
*(3/4)*b**(8/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**(2/3)/x
**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(sqrt(3) + 2)*
(a**(1/3) + b**(1/3)/x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3))
 + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*sqr
t(3))/(320*a**2*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(1/3)*(
1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) - 21*b**2*x**2*s
qrt(a + b/x**3)/(320*a**2)
```

Mathematica [C] time = 0.723023, size = 207, normalized size = 0.71

$$\frac{x^2\sqrt{a+\frac{b}{x^3}}\left(\sqrt[3]{-b}\left(40a^3x^9+52a^2bx^6-9ab^2x^3-21b^3\right)-7i3^{3/4}\sqrt[3]{a}b^3x\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}}{\sqrt[3]{a}x}-1\right)}\sqrt{\frac{\frac{(-b)^{2/3}}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+x^2}{x^2}}F\left(\sin^{-1}\left(\cdots\right.\right.\right.}{320a^2\sqrt[3]{-b}\left(ax^3+b\right)}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[Sqrt[a + b/x^3]*x^7,x]
```

```
[Out] (Sqrt[a + b/x^3]*x^2*((-b)^(1/3)*(-21*b^3 - 9*a*b^2*x^3 + 52*a^2*
b*x^6 + 40*a^3*x^9) - (7*I)*3^(3/4)*a^(1/3)*b^3*Sqrt[(-1)^(5/6)*(
-1 + (-b)^(1/3)/(a^(1/3)*x))]*x*Sqrt[((-b)^(2/3)/a^(2/3) + ((-b)^
(1/3)*x)/a^(1/3) + x^2)/x^2]*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) -
(I*(-b)^(1/3))/(a^(1/3)*x)]/3^(1/4)], (-1)^(1/3)]))/(320*a^2*(-b)
^(1/3)*(b + a*x^3))
```

Maple [B] time = 0.039, size = 2226, normalized size = 7.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7*(a+b/x^3)^(1/2),x)
```

```
[Out] -1/320*((a*x^3+b)/x^3)^(1/2)*x^2/a^3/(-a^2*b)^(1/3)*(-40*I*(-a^2*
b)^(1/3)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)
+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(
1/3)))^(1/2)*3^(1/2)*(a*x^4+b*x)^(1/2)*x^6*a^3+42*I*(-(I*3^(1/2)-
```

```
3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a
^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1
/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3
^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*
x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*
3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*x^2*a^2*b^
3-84*I*(-a^2*b)^(1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a
^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/
3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*
b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)
))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*
b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^
(1/2)-3))^(1/2))*3^(1/2)*x*a*b^3+120*x^6*(a*x^4+b*x)^(1/2)*a^3*(-
a^2*b)^(1/3)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(
1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*
b)^(1/3)))^(1/2)+42*I*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/
2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a
*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I
*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x
+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-
1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3
^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*b^3-12*I*(-a^2*b)^(1/3)*(
1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a
^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/
2)*3^(1/2)*(a*x^4+b*x)^(1/2)*x^3*a^2*b-42*(-(I*3^(1/2)-3)*x*a/(I*
3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3
)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2
)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/
(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(
1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)
/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^2*a^2*b^3+84*(-a^2*b)^(1/3
)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*
((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-
a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2
*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((
-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I
*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x*a
*b^3-42*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-
a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1
/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2
*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3
)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2
*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3
^(1/2)-3))^(1/2))*b^3+36*b*x^3*(a*x^4+b*x)^(1/2)*a^2*(-a^2*b)^(1/
3)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x
+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))
^(1/2)+21*I*(-a^2*b)^(1/3)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1
/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3
)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*(a*x^4+b*x)^(1/2)*a*b^2-63
*b^2*(a*x^4+b*x)^(1/2)*a*(-a^2*b)^(1/3)*(1/a^2*x*(-a*x+(-a^2*b)^(
1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*
(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2))/(x*(a*x^3+b))^(1/2)/
(I*3^(1/2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^
(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2
*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{a+\frac{b}{x^3}}\,x^7\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)*x^7,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a + b/x^3)*x^7, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(x^7\sqrt{\frac{ax^3+b}{x^3}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)*x^7,x, algorithm="fricas")
```

```
[Out] integral(x^7*sqrt((a*x^3 + b)/x^3), x)
```

Sympy [A] time = 7.31257, size = 48, normalized size = 0.16

$$-\frac{\sqrt{a}x^8\,\Gamma\left(-\frac{8}{3}\right)\,{}_2F_1\left(\begin{matrix}-\frac{8}{3},-\frac{1}{2}\\-\frac{5}{3}\end{matrix}\middle|\frac{be^{i\pi}}{ax^3}\right)}{3\,\Gamma\left(-\frac{5}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7*(a+b/x**3)**(1/2),x)
```

```
[Out] -sqrt(a)*x**8*gamma(-8/3)*hyper((-8/3, -1/2), (-5/3,), b*exp_pola
r(I*pi)/(a*x**3))/(3*gamma(-5/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\sqrt{a+\frac{b}{x^3}}x^7\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)*x^7,x, algorithm="giac")
```

```
[Out] integrate(sqrt(a + b/x^3)*x^7, x)
```

3.1997 $\int \sqrt{a+\frac{b}{x^3}}x^4\,dx$

Optimal. Leaf size=267

$$\frac{3^{3/4}\sqrt{2+\sqrt{3}}\,b^{5/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}\,F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{20a\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{1}{5}x^5\sqrt{a+\frac{b}{x^3}}+\frac{3bx^2\sqrt{a+\frac{b}{x^3}}}{20a}$$

```
[Out] (3*b*Sqrt[a + b/x^3]*x^2)/(20*a) + (Sqrt[a + b/x^3]*x^5)/5 + (3^(
3/4)*Sqrt[2 + Sqrt[3]]*b^(5/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3
) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b
^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)
/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(20*a*Sqr
t[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*
a^(1/3) + b^(1/3)/x)^2])
```

Rubi [A] time = 0.371643, antiderivative size = 267, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{3^{3/4}\sqrt{2+\sqrt{3}}\,b^{5/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}\,F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{20a\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{1}{5}x^5\sqrt{a+\frac{b}{x^3}}+\frac{3bx^2\sqrt{a+\frac{b}{x^3}}}{20a}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x^3]*x^4,x]
```


```
[Out] (3*b*Sqrt[a + b/x^3]*x^2)/(20*a) + (Sqrt[a + b/x^3]*x^5)/5 + (3^(
3/4)*Sqrt[2 + Sqrt[3]]*b^(5/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3
) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b
^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)
/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(20*a*Sqr
t[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*
a^(1/3) + b^(1/3)/x)^2])
```

Rubi in Sympy [A] time = 17.6453, size = 219, normalized size = 0.82

$$\frac{x^5\sqrt{a+\frac{b}{x^3}}}{5}+\frac{3^{\frac{3}{4}}b^{\frac{5}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}(1+\sqrt{3})+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}(-1+\sqrt{3})+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}(1+\sqrt{3})+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{20a\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}(1+\sqrt{3})+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}+\frac{3bx^2\sqrt{a+\frac{b}{x^3}}}{20a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4*(a+b/x**3)**(1/2),x)
```

```
[Out] x**5*sqrt(a + b/x**3)/5 + 3**(3/4)*b**(5/3)*sqrt((a**(2/3) - a**(
1/3)*b**(1/3)/x + b**(2/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/
3)/x)**2)*sqrt(sqrt(3) + 2)*(a**(1/3) + b**(1/3)/x)*elliptic_f(as
in((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)
) + b**(1/3)/x)), -7 - 4*sqrt(3))/(20*a*sqrt(a**(1/3)*(a**(1/3) +
 b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b
/x**3)) + 3*b*x**2*sqrt(a + b/x**3)/(20*a)
```

Mathematica [C] time = 0.655893, size = 196, normalized size = 0.73

$$\frac{x^2\sqrt{a+\frac{b}{x^3}}\left(\sqrt[3]{-b}\left(4a^2x^6+7abx^3+3b^2\right)+i3^{3/4}\sqrt[3]{a}b^2x\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}}{\sqrt[3]{a}x}-1\right)}\sqrt{\frac{\frac{(-b)^{2/3}}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+x^2}{x^2}}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}}{\sqrt[3]{a}x}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\right.\right.}{20a\sqrt[3]{-b}\left(ax^3+b\right)}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[Sqrt[a + b/x^3]*x^4,x]
```

```
[Out] (Sqrt[a + b/x^3]*x^2*((-b)^(1/3)*(3*b^2 + 7*a*b*x^3 + 4*a^2*x^6)
+ I*3^(3/4)*a^(1/3)*b^2*Sqrt[(-1)^(5/6)*(-1 + (-b)^(1/3)/(a^(1/3)
*x))]*x*Sqrt[((-b)^(2/3)/a^(2/3) + ((-b)^(1/3)*x)/a^(1/3) + x^2)/
x^2]*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3))/(a^(1/3)*
x)]/3^(1/4)], (-1)^(1/3)]))/(20*a*(-b)^(1/3)*(b + a*x^3))
```

Maple [B] time = 0.036, size = 2010, normalized size = 7.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4*(a+b/x^3)^(1/2),x)
```

```
[Out] 1/20*((a*x^3+b)/x^3)^(1/2)*x^2/a^2/(-a^2*b)^(1/3)*(6*I*(-(I*3^(1/
2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*
(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)
^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(
I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-
3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*
(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*x^2*a^2
*b^2-12*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3))
)^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/
```

```
2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a
*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Ell
ipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(
1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1
/2))*(-a^2*b)^(1/3)*3^(1/2)*x*a*b^2+6*I*(-(I*3^(1/2)-3)*x*a/(I*3^
(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+
2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*
((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-
a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/
2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(
I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(2/3)*3^(1/2)*b^2+4*I
*(-a^2*b)^(1/3)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b
)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a
^2*b)^(1/3)))^(1/2)*3^(1/2)*(a*x^4+b*x)^(1/2)*x^3*a^2-6*(-(I*3^(1
/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)
*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b
)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/
(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)
-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)
*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^2*a^2*b^2+12
*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(
(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a
*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*
b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-
(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*
3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^
2*b)^(1/3)*x*a*b^2-6*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^
2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3
))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b
)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3))
)^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b
)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(
1/2)-3))^(1/2))*(-a^2*b)^(2/3)*b^2-12*x^3*(a*x^4+b*x)^(1/2)*a^2*(
-a^2*b)^(1/3)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^
(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2
*b)^(1/3)))^(1/2)+3*I*(-a^2*b)^(1/3)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3
))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a
^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*(a*x^4+b*x)^(1/2
)*a*b-9*b*(a*x^4+b*x)^(1/2)*a*(-a^2*b)^(1/3)*(1/a^2*x*(-a*x+(-a^2
*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(
1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2))/(x*(a*x^3+b))^(
1/2)/(I*3^(1/2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^
2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-
(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{a+\frac{b}{x^3}}\,x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)*x^4,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a + b/x^3)*x^4, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(x^4\sqrt{\frac{ax^3+b}{x^3}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)*x^4,x, algorithm="fricas")
```

```
[Out] integral(x^4*sqrt((a*x^3 + b)/x^3), x)
```

Sympy [A] time = 4.48962, size = 48, normalized size = 0.18

$$-\frac{\sqrt{a}x^5\,\Gamma\left(-\frac{5}{3}\right)\,{}_2F_1\left(\begin{matrix}-\frac{5}{3},-\frac{1}{2}\\-\frac{2}{3}\end{matrix}\middle|\frac{be^{i\pi}}{ax^3}\right)}{3\,\Gamma\left(-\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4*(a+b/x**3)**(1/2),x)
```

```
[Out] -sqrt(a)*x**5*gamma(-5/3)*hyper((-5/3, -1/2), (-2/3,), b*exp_pola
r(I*pi)/(a*x**3))/(3*gamma(-2/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{a + \frac{b}{x^3}}x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)*x^4,x, algorithm="giac")
```

```
[Out] integrate(sqrt(a + b/x^3)*x^4, x)
```

3.1998 $\int \sqrt{a+\frac{b}{x^3}}x\,dx$

Optimal. Leaf size=242

$$\frac{1}{2}x^2\sqrt{a+\frac{b}{x^3}}-\frac{3^{3/4}\sqrt{2+\sqrt{3}}b^{2/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{2\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}$$

```
[Out] (Sqrt[a + b/x^3]*x^2)/2 - (3^(3/4)*Sqrt[2 + Sqrt[3]]*b^(2/3)*(a^(
1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))
/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((1 -
 Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x
)], -7 - 4*Sqrt[3]])/(2*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) +
b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi [A] time = 0.257778, antiderivative size = 242, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{1}{2}x^2\sqrt{a+\frac{b}{x^3}}-\frac{3^{3/4}\sqrt{2+\sqrt{3}}b^{2/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{2\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x^3]*x,x]
```

```
[Out] (Sqrt[a + b/x^3]*x^2)/2 - (3^(3/4)*Sqrt[2 + Sqrt[3]]*b^(2/3)*(a^(
1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))
/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((1 -
 Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x
)], -7 - 4*Sqrt[3]])/(2*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) +
b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi in Sympy [A] time = 11.2936, size = 197, normalized size = 0.81

$$-\frac{3^{\frac{3}{4}}b^{\frac{2}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{2\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}+\frac{x^2\sqrt{a+\frac{b}{x^3}}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(a+b/x**3)**(1/2),x)
```

```
[Out] -3**(3/4)*b**(2/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**(2/3
)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(sqrt(3) +
2)*(a**(1/3) + b**(1/3)/x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(
3)) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*
sqrt(3))/(2*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(1/3)*(1 +
sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) + x**2*sqrt(a + b/x*
*3)/2
```

Mathematica [C] time = 0.955599, size = 162, normalized size = 0.67

$$\frac{1}{2}x^2\sqrt{a+\frac{b}{x^3}}\left(1+\frac{i3^{3/4}\sqrt[3]{a}(-b)^{2/3}x\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}}{\sqrt[3]{a}x}-1\right)}\sqrt{\frac{\frac{(-b)^{2/3}}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+x^2}{x^2}}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}}{\sqrt[3]{a}x}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)}{ax^3+b}\right)$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[Sqrt[a + b/x^3]*x,x]
```

```
[Out] (Sqrt[a + b/x^3]*x^2*(1 + (I*3^(3/4)*a^(1/3)*(-b)^(2/3)*Sqrt[(-1)
^(5/6)*(-1 + (-b)^(1/3)/(a^(1/3)*x))]*x*Sqrt[((-b)^(2/3)/a^(2/3)
+ ((-b)^(1/3)*x)/a^(1/3) + x^2)/x^2]*EllipticF[ArcSin[Sqrt[-(-1)^
(5/6) - (I*(-b)^(1/3))/(a^(1/3)*x)]/3^(1/4)], (-1)^(1/3)])/(b + a
*x^3)))/2
```

Maple [B] time = 0.037, size = 1786, normalized size = 7.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(a+b/x^3)^(1/2),x)
```

```
[Out] -1/2*((a*x^3+b)/x^3)^(1/2)*x^2/(-a^2*b)^(1/3)/a*(6*I*(-(I*3^(1/2)
-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-
a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(
1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*
3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)
*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I
*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*x^2*a^2*b
-12*I*(-a^2*b)^(1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^
2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3
))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b
)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3))
)^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b
)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(
1/2)-3))^(1/2))*3^(1/2)*x*a*b+6*I*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*
x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*
b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)
))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1
```

```
/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a
/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(
1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*b-6*(-(I*3^(1
/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)
*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b
)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/
(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)
-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)
*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^2*a^2*b+12*(
-a^2*b)^(1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1
/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3
^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)
-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)
*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)
))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3)
)^(1/2))*x*a*b-6*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)
/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-
a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1
/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^
2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-
a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2
)+1)/(I*3^(1/2)-3))^(1/2))*b-I*(-a^2*b)^(1/3)*(1/a^2*x*(-a*x+(-a^
2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^
(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*(a*x^4+
b*x)^(1/2)*a+3*(a*x^4+b*x)^(1/2)*a*(-a^2*b)^(1/3)*(1/a^2*x*(-a*x+
(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(
I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2))/(x*(a*x^3+
b))^(1/2)/(I*3^(1/2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)
*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2
*a*x-(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{a + \frac{b}{x^3}}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)*x,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a + b/x^3)*x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(x\sqrt{\frac{ax^3+b}{x^3}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)*x,x, algorithm="fricas")
```

```
[Out] integral(x*sqrt((a*x^3 + b)/x^3), x)
```

Sympy [A] time = 2.99159, size = 44, normalized size = 0.18

$$-\frac{\sqrt{a}x^2\,\Gamma\left(-\frac{2}{3}\right)\,{}_2F_1\left(\begin{matrix}-\frac{2}{3},-\frac{1}{2}\\ \frac{1}{3}\end{matrix}\middle|\frac{be^{i\pi}}{ax^3}\right)}{3\,\Gamma\left(\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(a+b/x**3)**(1/2),x)
```

```
[Out] -sqrt(a)*x**2*gamma(-2/3)*hyper((-2/3, -1/2), (1/3,), b*exp_polar
(I*pi)/(a*x**3))/(3*gamma(1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{a + \frac{b}{x^3}}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)*x,x, algorithm="giac")
```

```
[Out] integrate(sqrt(a + b/x^3)*x, x)
```

3.1999 $\int \frac{\sqrt{a+\frac{b}{x^3}}}{x^2}\,dx$

Optimal. Leaf size=243

$$-\frac{2\,3^{3/4}\sqrt{2+\sqrt{3}}a\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{5\sqrt[3]{b}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{2\sqrt{a+\frac{b}{x^3}}}{5x}$$

```
[Out] (-2*Sqrt[a + b/x^3])/(5*x) - (2*3^(3/4)*Sqrt[2 + Sqrt[3]]*a*(a^(1
/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/
x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((1 -
Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)
], -7 - 4*Sqrt[3]])/(5*b^(1/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(
1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi [A] time = 0.253887, antiderivative size = 243, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{2\,3^{3/4}\sqrt{2+\sqrt{3}}a\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{5\sqrt[3]{b}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{2\sqrt{a+\frac{b}{x^3}}}{5x}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x^3]/x^2,x]
```

```
[Out] (-2*Sqrt[a + b/x^3])/(5*x) - (2*3^(3/4)*Sqrt[2 + Sqrt[3]]*a*(a^(1
/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/
x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((1 -
Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)
], -7 - 4*Sqrt[3]])/(5*b^(1/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(
1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi in Sympy [A] time = 10.2292, size = 202, normalized size = 0.83

$$-\frac{2\cdot 3^{\frac{3}{4}}a\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{5\sqrt[3]{b}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}-\frac{2\sqrt{a+\frac{b}{x^3}}}{5x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**3)**(1/2)/x**2,x)
```

```
[Out] -2*3**(3/4)*a*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**(2/3)/x**
2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(sqrt(3) + 2)*(a
**(1/3) + b**(1/3)/x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) +
 b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*sqrt(
3))/(5*b**(1/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(1/3)*(
1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) - 2*sqrt(a + b/x
**3)/(5*x)
```

Mathematica [C] time = 1.4386, size = 164, normalized size = 0.67

$$\frac{2\sqrt{a+\frac{b}{x^3}}\left(-1-\frac{i3^{3/4}a^{4/3}x^4\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}}{\sqrt[3]{a}x}-1\right)}\sqrt{\frac{\frac{(-b)^{2/3}}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+x^2}{x^2}}\,F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}}{\sqrt[3]{a}x}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)}{\sqrt[3]{-b}(ax^3+b)}\right)}{5x}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[Sqrt[a + b/x^3]/x^2,x]
```

```
[Out] (2*Sqrt[a + b/x^3]*(-1 - (I*3^(3/4)*a^(4/3)*Sqrt[(-1)^(5/6)*(-1 +
 (-b)^(1/3)/(a^(1/3)*x))]*x^4*Sqrt[((-b)^(2/3)/a^(2/3) + ((-b)^(1
/3)*x)/a^(1/3) + x^2)/x^2]*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - (I
*(-b)^(1/3))/(a^(1/3)*x)]/3^(1/4)], (-1)^(1/3)])/((-b)^(1/3)*(b +
 a*x^3))))/(5*x)
```

Maple [B] time = 0.041, size = 1785, normalized size = 7.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^3)^(1/2)/x^2,x)
```

```
[Out] -2/5*((a*x^3+b)/x^3)^(1/2)/x/(-a^2*b)^(1/3)*(6*I*(-(I*3^(1/2)-3)*
x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*
b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)
))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1
/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a
/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(
1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*x^5*a^2-12*I*
(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((
I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*
x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b
)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(
I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3
^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2
*b)^(1/3)*3^(1/2)*x^4*a+6*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a
*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*
b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*
(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)
^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+
(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)
/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(2/3)*3^(1/2)*x^3-6*(-(I*3^(1/2)-
3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a
^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1
/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3
^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*
x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*
3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^5*a^2+12*(-(I*3^
```

```
(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/
2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2
*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)
)/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/
2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+
3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(1/
3)*x^4*a-6*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)
))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1
/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*
a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*El
lipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^
(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(
1/2))*(-a^2*b)^(2/3)*x^3+I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1
/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3
)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(-a^2*b)^(1/3)*3^(1/2)*(a*x^4+b*x)
^(1/2)-3*(a*x^4+b*x)^(1/2)*(-a^2*b)^(1/3)*(1/a^2*x*(-a*x+(-a^2*b)
^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2
)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2))/(x*(a*x^3+b))^(1/2
)/(I*3^(1/2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b
)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a
^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + \frac{b}{x^3}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)/x^2,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a + b/x^3)/x^2, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{\frac{ax^3+b}{x^3}}}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)/x^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt((a*x^3 + b)/x^3)/x^2, x)
```

Sympy [A] time = 3.09399, size = 39, normalized size = 0.16

$$-\frac{\sqrt{a}\,\Gamma\left(\frac{1}{3}\right)\,{}_2F_1\left(\begin{matrix}-\frac{1}{2},\frac{1}{3}\\ \frac{4}{3}\end{matrix}\middle|\frac{be^{i\pi}}{ax^3}\right)}{3x\,\Gamma\left(\frac{4}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**3)**(1/2)/x**2,x)
```

```
[Out] -sqrt(a)*gamma(1/3)*hyper((-1/2, 1/3), (4/3,), b*exp_polar(I*pi)/
(a*x**3))/(3*x*gamma(4/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + \frac{b}{x^3}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)/x^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(a + b/x^3)/x^2, x)
```

3.2000 $\int \frac{\sqrt{a+\frac{b}{x^3}}}{x^5} \, dx$

Optimal. Leaf size=267

$$\frac{4\,3^{3/4}\sqrt{2+\sqrt{3}}\,a^2\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}\,F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{55b^{4/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}} - \frac{6a\sqrt{a+\frac{b}{x^3}}}{55bx} - \frac{2\sqrt{a+\frac{b}{x^3}}}{11x^4}$$

```
[Out] (-2*Sqrt[a + b/x^3])/(11*x^4) - (6*a*Sqrt[a + b/x^3])/(55*b*x) +
(4*3^(3/4)*Sqrt[2 + Sqrt[3]]*a^2*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2
/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) +
 b^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/
x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(55*b^(
4/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + S
qrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi [A] time = 0.358858, antiderivative size = 267, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{4\,3^{3/4}\sqrt{2+\sqrt{3}}\,a^2\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}\,F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{55b^{4/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}} - \frac{6a\sqrt{a+\frac{b}{x^3}}}{55bx} - \frac{2\sqrt{a+\frac{b}{x^3}}}{11x^4}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x^3]/x^5,x]
```


```
[Out] (-2*Sqrt[a + b/x^3])/(11*x^4) - (6*a*Sqrt[a + b/x^3])/(55*b*x) +
(4*3^(3/4)*Sqrt[2 + Sqrt[3]]*a^2*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2
/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) +
 b^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/
x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(55*b^(
4/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + S
qrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi in Sympy [A] time = 17.833, size = 223, normalized size = 0.84

$$\frac{4\cdot 3^{\frac{3}{4}}a^{2}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^{2}}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^{2}}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{55b^{\frac{4}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^{2}}}\sqrt{a+\frac{b}{x^{3}}}} - \frac{6a\sqrt{a+\frac{b}{x^{3}}}}{55bx} - \frac{2\sqrt{a+\frac{b}{x^{3}}}}{11x^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate((a+b/x**3)**(1/2)/x**5,x)
```

```
[Out] 4*3**(3/4)*a**2*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**(2/3)/x
**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(sqrt(3) + 2)*
(a**(1/3) + b**(1/3)/x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3))
 + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*sqr
t(3))/(55*b**(4/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(1/3
)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) - 6*a*sqrt(a
+ b/x**3)/(55*b*x) - 2*sqrt(a + b/x**3)/(11*x**4)
```

Mathematica [C] time = 0.789853, size = 192, normalized size = 0.72

$$\frac{2\sqrt{a+\frac{b}{x^{3}}}\left(\sqrt[3]{-b}\left(3a^{2}x^{6}+8abx^{3}+5b^{2}\right)-2i3^{3/4}a^{7/3}x^{7}\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}}{\sqrt[3]{a}x}-1\right)}\sqrt{\frac{\frac{(-b)^{2/3}}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+x^{2}}{x^{2}}}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}}{\sqrt[3]{a}x}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\right.\right.}{55(-b)^{4/3}x^{4}\left(ax^{3}+b\right)}$$

Warning: Unable to verify antiderivative.

```
[In]   Integrate[Sqrt[a + b/x^3]/x^5,x]
```

```
[Out] (2*Sqrt[a + b/x^3]*((-b)^(1/3)*(5*b^2 + 8*a*b*x^3 + 3*a^2*x^6) -
(2*I)*3^(3/4)*a^(7/3)*Sqrt[(-1)^(5/6)*(-1 + (-b)^(1/3)/(a^(1/3)*x
))]*x^7*Sqrt[((-b)^(2/3)/a^(2/3) + ((-b)^(1/3)*x)/a^(1/3) + x^2)/
x^2]*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3))/(a^(1/3)*
x)]/3^(1/4)], (-1)^(1/3)]))/(55*(-b)^(4/3)*x^4*(b + a*x^3))
```

Maple [B] time = 0.045, size = 2002, normalized size = 7.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((a+b/x^3)^(1/2)/x^5,x)
```

```
[Out] 2/55*((a*x^3+b)/x^3)^(1/2)/x^4/(-a^2*b)^(1/3)*(12*I*(-(I*3^(1/2)-
3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a
^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1
/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3
^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*
x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*
3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*x^8*a^3-24
*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)
*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(
```

```
-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^
2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF(
(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((
I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-
a^2*b)^(1/3)*3^(1/2)*x^7*a^2+12*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-
1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+
(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^
(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-
a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/
(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1
/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(2/3)*3^(1/2)*x^6*a-12*(-(I
*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^
(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-
a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1
/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^
(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/
2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^8*a^3+2
4*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*
((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-
a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2
*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((
-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I
*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a
^2*b)^(1/3)*x^7*a^2-12*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-
a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1
/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2
*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3
)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2
*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3
^(1/2)-3))^(1/2))*(-a^2*b)^(2/3)*x^6*a-3*I*(1/a^2*x*(-a*x+(-a^2*b
)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/
2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(-a^2*b)^(1/3)*3^(
1/2)*(a*x^4+b*x)^(1/2)*x^3*a+9*a*(a*x^4+b*x)^(1/2)*x^3*(-a^2*b)^(
1/3)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a
*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)
))^(1/2)-5*I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(
1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*
b)^(1/3)))^(1/2)*(-a^2*b)^(1/3)*3^(1/2)*(a*x^4+b*x)^(1/2)*b+15*(a
*x^4+b*x)^(1/2)*b*(-a^2*b)^(1/3)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(
I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b
)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2))/(x*(a*x^3+b))^(1/2)/b/(I*3^
(1/2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)
+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(
1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + \frac{b}{x^3}}}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)/x^5,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a + b/x^3)/x^5, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\sqrt{\frac{ax^3+b}{x^3}}}{x^5}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)/x^5,x, algorithm="fricas")
```

```
[Out] integral(sqrt((a*x^3 + b)/x^3)/x^5, x)
```

Sympy [A] time = 4.62088, size = 41, normalized size = 0.15

$$-\frac{\sqrt{a}\,\Gamma\left(\frac{4}{3}\right)\,{}_2F_1\left(\begin{matrix}-\frac{1}{2},\frac{4}{3}\\ \frac{7}{3}\end{matrix}\middle|\frac{be^{i\pi}}{ax^3}\right)}{3x^4\,\Gamma\left(\frac{7}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**3)**(1/2)/x**5,x)
```

```
[Out] -sqrt(a)*gamma(4/3)*hyper((-1/2, 4/3), (7/3,), b*exp_polar(I*pi)/
(a*x**3))/(3*x**4*gamma(7/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+\frac{b}{x^3}}}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)/x^5,x, algorithm="giac")
```

```
[Out] integrate(sqrt(a + b/x^3)/x^5, x)
```

3.2001 $\int \frac{\sqrt{a+\frac{b}{x^3}}}{x^8} dx$

Optimal. Leaf size=291

$$\frac{48a^2\sqrt{a+\frac{b}{x^3}}}{935b^2x} - \frac{32\ 3^{3/4}\sqrt{2+\sqrt{3}}a^3\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{935b^{7/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}} - \frac{2\sqrt{a+\frac{b}{x^3}}}{17x^7} - \frac{6a\sqrt{a+\frac{b}{x^3}}}{187bx^4}$$

```
[Out] (-2*Sqrt[a + b/x^3])/(17*x^7) - (6*a*Sqrt[a + b/x^3])/(187*b*x^4)
 + (48*a^2*Sqrt[a + b/x^3])/(935*b^2*x) - (32*3^(3/4)*Sqrt[2 + Sq
rt[3]]*a^3*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a
^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*Ellipti
cF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1
/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(935*b^(7/3)*Sqrt[a + b/x^3]*
Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(
1/3)/x)^2])
```

Rubi [A] time = 0.437878, antiderivative size = 291, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$

$$\frac{48a^2\sqrt{a+\frac{b}{x^3}}}{935b^2x} - \frac{32\ 3^{3/4}\sqrt{2+\sqrt{3}}a^3\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{935b^{7/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}} - \frac{2\sqrt{a+\frac{b}{x^3}}}{17x^7} - \frac{6a\sqrt{a+\frac{b}{x^3}}}{187bx^4}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x^3]/x^8,x]
```


```
[Out] (-2*Sqrt[a + b/x^3])/(17*x^7) - (6*a*Sqrt[a + b/x^3])/(187*b*x^4)
 + (48*a^2*Sqrt[a + b/x^3])/(935*b^2*x) - (32*3^(3/4)*Sqrt[2 + Sq
rt[3]]*a^3*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a
^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*Ellipti
cF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1
/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(935*b^(7/3)*Sqrt[a + b/x^3]*
Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(
1/3)/x)^2])
```

Rubi in Sympy [A] time = 23.955, size = 246, normalized size = 0.85

$$-\frac{32\cdot 3^{\frac{3}{4}}a^{3}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^{2}}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^{2}}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{935b^{\frac{7}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^{2}}}\sqrt{a+\frac{b}{x^{3}}}}+\frac{48a^{2}\sqrt{a+\frac{b}{x^{3}}}}{935b^{2}x}-\frac{6a\sqrt{a+\frac{b}{x^{3}}}}{187bx^{4}}-\frac{2\sqrt{a+\frac{b}{x^{3}}}}{17x^{7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate((a+b/x**3)**(1/2)/x**8,x)
```

```
[Out] -32*3**(3/4)*a**3*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**(2/3)
/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(sqrt(3) + 2
)*(a**(1/3) + b**(1/3)/x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3
)) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*s
qrt(3))/(935*b**(7/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(
1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) + 48*a**2*
sqrt(a + b/x**3)/(935*b**2*x) - 6*a*sqrt(a + b/x**3)/(187*b*x**4)
 - 2*sqrt(a + b/x**3)/(17*x**7)
```

Mathematica [C] time = 0.575011, size = 203, normalized size = 0.7

$$\frac{2\sqrt{a+\frac{b}{x^{3}}}\left(\sqrt[3]{-b}\left(24a^{3}x^{9}+9a^{2}bx^{6}-70ab^{2}x^{3}-55b^{3}\right)-16i3^{3/4}a^{10/3}x^{10}\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}}{\sqrt[3]{a}x}-1\right)}\sqrt{\frac{\frac{(-b)^{2/3}}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+x^{2}}{x^{2}}}F\left(\sin^{-1}\left(\ldots\right.\right.\right.}{935(-b)^{7/3}x^{7}\left(ax^{3}+b\right)}$$

Warning: Unable to verify antiderivative.

```
[In]   Integrate[Sqrt[a + b/x^3]/x^8,x]
```

```
[Out] (2*Sqrt[a + b/x^3]*((-b)^(1/3)*(-55*b^3 - 70*a*b^2*x^3 + 9*a^2*b*
x^6 + 24*a^3*x^9) - (16*I)*3^(3/4)*a^(10/3)*Sqrt[(-1)^(5/6)*(-1 +
 (-b)^(1/3)/(a^(1/3)*x))]*x^10*Sqrt[((-b)^(2/3)/a^(2/3) + ((-b)^(
1/3)*x)/a^(1/3) + x^2)/x^2]*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - (
I*(-b)^(1/3))/(a^(1/3)*x)]/3^(1/4)], (-1)^(1/3)]))/(935*(-b)^(7/3
)*x^7*(b + a*x^3))
```

Maple [B] time = 0.053, size = 2222, normalized size = 7.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((a+b/x^3)^(1/2)/x^8,x)
```

```
[Out] -2/935*((a*x^3+b)/x^3)^(1/2)/x^7/(-a^2*b)^(1/3)*(96*I*(-(I*3^(1/2
)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(
-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^
(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I
*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3
)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(
I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*x^11*a^4
```

```
-192*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(
1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+
1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-
(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Ellipt
icF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2
),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2)
)*(-a^2*b)^(1/3)*3^(1/2)*x^10*a^3+96*I*(-(I*3^(1/2)-3)*x*a/(I*3^(
1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2
*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(
(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a
*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2
)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I
*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(2/3)*3^(1/2)*x^9*a^2-
96*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)
*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(
-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^
2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF(
(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((
I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^
11*a^4+192*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)
))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1
/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*
a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*El
lipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^
(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(
1/2))*(-a^2*b)^(1/3)*x^10*a^3-96*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1
)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(
-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(
1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a
^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(
-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/
2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(2/3)*x^9*a^2-24*I*(1/a^2*x*
(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1
/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(-a^2
*b)^(1/3)*3^(1/2)*(a*x^4+b*x)^(1/2)*x^6*a^2+72*a^2*(a*x^4+b*x)^(1
/2)*x^6*(-a^2*b)^(1/3)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*
(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*
a*x-(-a^2*b)^(1/3)))^(1/2)+15*I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I
*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)
^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(-a^2*b)^(1/3)*3^(1/2)*(a*x^4
+b*x)^(1/2)*x^3*a*b-45*a*(a*x^4+b*x)^(1/2)*x^3*b*(-a^2*b)^(1/3)*(
1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a
^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/
2)+55*I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+
2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1
/3)))^(1/2)*(-a^2*b)^(1/3)*3^(1/2)*(a*x^4+b*x)^(1/2)*b^2-165*(a*x
^4+b*x)^(1/2)*b^2*(-a^2*b)^(1/3)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(
I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b
)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2))/(x*(a*x^3+b))^(1/2)/b^2/(I*
3^(1/2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/
3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)
^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + \frac{b}{x^3}}}{x^8} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)/x^8,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a + b/x^3)/x^8, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{\frac{ax^3+b}{x^3}}}{x^8}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)/x^8,x, algorithm="fricas")
```

```
[Out] integral(sqrt((a*x^3 + b)/x^3)/x^8, x)
```

Sympy [A] time = 7.47414, size = 41, normalized size = 0.14

$$-\frac{\sqrt{a}\,\Gamma\left(\frac{7}{3}\right){}_2F_1\left(\begin{matrix}-\frac{1}{2},\frac{7}{3}\\ \frac{10}{3}\end{matrix}\middle|\frac{be^{i\pi}}{ax^3}\right)}{3x^7\,\Gamma\left(\frac{10}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**3)**(1/2)/x**8,x)
```

```
[Out] -sqrt(a)*gamma(7/3)*hyper((-1/2, 7/3), (10/3,), b*exp_polar(I*pi)
/(a*x**3))/(3*x**7*gamma(10/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+\frac{b}{x^3}}}{x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)/x^8,x, algorithm="giac")
```

```
[Out] integrate(sqrt(a + b/x^3)/x^8, x)
```

3.2002 $\int \sqrt{a+\frac{b}{x^3}}x^6\,dx$

Optimal. Leaf size=563

$$\frac{5\,3^{3/4}b^{7/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{56\sqrt{2}a^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}} - \frac{15\sqrt[4]{3}\sqrt{2-\sqrt{3}}b^{7/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{224a^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}} + \frac{15b^{7/3}\sqrt{a+\frac{b}{x^3}}}{112a^2\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)} - \frac{15b^2x\sqrt{a+\frac{b}{x^3}}}{112a^2} + \frac{1}{7}x^7\sqrt{a+\frac{b}{x^3}} + \frac{3bx^4\sqrt{a+\frac{b}{x^3}}}{56a}$$

```
[Out] (15*b^(7/3)*Sqrt[a + b/x^3])/(112*a^2*((1 + Sqrt[3])*a^(1/3) + b^
(1/3)/x)) - (15*b^2*Sqrt[a + b/x^3]*x)/(112*a^2) + (3*b*Sqrt[a +
b/x^3]*x^4)/(56*a) + (Sqrt[a + b/x^3]*x^7)/7 - (15*3^(1/4)*Sqrt[2
 - Sqrt[3]]*b^(7/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)
/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2
]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt
[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(224*a^(5/3)*Sqrt[a
+ b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1
/3) + b^(1/3)/x)^2]) + (5*3^(3/4)*b^(7/3)*(a^(1/3) + b^(1/3)/x)*S
qrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*
a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) +
 b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]]
)/(56*Sqrt[2]*a^(5/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^
(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi [A] time = 0.903674, antiderivative size = 563, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$\frac{5\,3^{3/4}b^{7/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{56\sqrt{2}a^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}} - \frac{15\sqrt[4]{3}\sqrt{2-\sqrt{3}}b^{7/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{224a^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}} + \frac{15b^{7/3}\sqrt{a+\frac{b}{x^3}}}{112a^2\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)} - \frac{15b^2x\sqrt{a+\frac{b}{x^3}}}{112a^2} + \frac{1}{7}x^7\sqrt{a+\frac{b}{x^3}} + \frac{3bx^4\sqrt{a+\frac{b}{x^3}}}{56a}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x^3]*x^6,x]
```

```
[Out] (15*b^(7/3)*Sqrt[a + b/x^3])/(112*a^2*((1 + Sqrt[3])*a^(1/3) + b^
(1/3)/x)) - (15*b^2*Sqrt[a + b/x^3]*x)/(112*a^2) + (3*b*Sqrt[a +
b/x^3]*x^4)/(56*a) + (Sqrt[a + b/x^3]*x^7)/7 - (15*3^(1/4)*Sqrt[2
 - Sqrt[3]]*b^(7/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)
/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2
]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt
[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(224*a^(5/3)*Sqrt[a
+ b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1
/3) + b^(1/3)/x)^2]) + (5*3^(3/4)*b^(7/3)*(a^(1/3) + b^(1/3)/x)*S
qrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*
a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) +
 b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]]
)/(56*Sqrt[2]*a^(5/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^
(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi in Sympy [A] time = 56.5895, size = 473, normalized size = 0.84

$$\frac{x^7\sqrt{a+\frac{b}{x^3}}}{7}+\frac{3bx^4\sqrt{a+\frac{b}{x^3}}}{56a}+\frac{15b^{\frac{7}{3}}\sqrt{a+\frac{b}{x^3}}}{112a^2\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)}-\frac{15b^2x\sqrt{a+\frac{b}{x^3}}}{112a^2}-\frac{15\sqrt[4]{3}b^{\frac{7}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{224a^{\frac{5}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}+\frac{5\sqrt{2}\cdot 3^{\frac{3}{4}}b^{\frac{7}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{112a^{\frac{5}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6*(a+b/x**3)**(1/2),x)
```

```
[Out] x**7*sqrt(a + b/x**3)/7 + 3*b*x**4*sqrt(a + b/x**3)/(56*a) + 15*b
**(7/3)*sqrt(a + b/x**3)/(112*a**2*(a**(1/3)*(1 + sqrt(3)) + b**(
1/3)/x)) - 15*b**2*x*sqrt(a + b/x**3)/(112*a**2) - 15*3**(1/4)*b*
*(7/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**(2/3)/x**2)/(a**
(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(-sqrt(3) + 2)*(a**(1/3
) + b**(1/3)/x)*elliptic_e(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1
/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*sqrt(3))/(2
24*a**(5/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(1/3)*(1 +
sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) + 5*sqrt(2)*3**(3/4)
*b**(7/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**(2/3)/x**2)/(
a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*(a**(1/3) + b**(1/3)/x)*
elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)/x)/(a**(1/3)
*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*sqrt(3))/(112*a**(5/3)*sqrt
(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1
/3)/x)**2)*sqrt(a + b/x**3))
```

Mathematica [C] time = 1.879, size = 375, normalized size = 0.67

$$\frac{x\sqrt{a+\frac{b}{x^3}}\left(-\frac{15(-1)^{2/3}b^{7/3}\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)\sqrt{\frac{\left(1+\sqrt[3]{-1}\right)\sqrt[3]{a}x\left(\sqrt[3]{b}-\sqrt[3]{-1}\sqrt[3]{a}x\right)}{\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)^2}}\sqrt{\frac{(-1)^{2/3}\sqrt[3]{a}x+\sqrt[3]{b}}{\sqrt[3]{a}x+\sqrt[3]{b}}}\left(\left(1+i\sqrt{3}\right)F\left(\sin^{-1}\left(\frac{\sqrt{\frac{\left(3+i\sqrt{3}\right)\sqrt[3]{a}x}{\sqrt[3]{a}x+\sqrt[3]{b}}}}{\sqrt{2}}\right)\middle|\frac{-i+\sqrt{3}}{i+\sqrt{3}}\right)+\left(-3-i\sqrt{3}\right)E\cdots\right)}{2\left((-1)^{2/3}-1\right)\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}\cdots\right)}{112a^2}$$

Warning: Unable to verify antiderivative.

```
[In]   Integrate[Sqrt[a + b/x^3]*x^6,x]
```

```
[Out] (Sqrt[a + b/x^3]*x*((-15*a^(1/3)*b^2*x)/(b^(1/3) + a^(1/3)*x) + 2
*a*x^3*(3*b + 8*a*x^3) - (15*(-1)^(2/3)*b^(7/3)*(b^(1/3) + a^(1/3
)*x)*Sqrt[((1 + (-1)^(1/3))*a^(1/3)*x*(b^(1/3) - (-1)^(1/3)*a^(1/
3)*x))/(b^(1/3) + a^(1/3)*x)^2]*Sqrt[(b^(1/3) + (-1)^(2/3)*a^(1/3
)*x)/(b^(1/3) + a^(1/3)*x)]*((-3 - I*Sqrt[3])*EllipticE[ArcSin[Sq
rt[((3 + I*Sqrt[3])*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]/Sqrt[2]], (
-I + Sqrt[3])/(I + Sqrt[3])] + (1 + I*Sqrt[3])*EllipticF[ArcSin[S
qrt[((3 + I*Sqrt[3])*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]/Sqrt[2]],
(-I + Sqrt[3])/(I + Sqrt[3])]))/(2*(-1 + (-1)^(2/3))*(b^(2/3) - a
^(1/3)*b^(1/3)*x + a^(2/3)*x^2))))/(112*a^2)
```

Maple [B] time = 0.037, size = 2799, normalized size = 5.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^6*(a+b/x^3)^(1/2),x)
```

```
[Out] 1/56*((a*x^3+b)/x^3)^(1/2)*x^2/a^3*(-15*I*(-a^2*b)^(1/3)*3^(1/2)*
x^2*a*b^2+3*I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^
(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2
*b)^(1/3)))^(1/2)*3^(1/2)*(a*x^4+b*x)^(1/2)*x^2*a^2*b+8*I*(1/a^2*
x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^
(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(
1/2)*(a*x^4+b*x)^(1/2)*x^5*a^3-30*(-a^2*b)^(1/3)*(-(I*3^(1/2)-3)*
x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*
b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)
))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1
/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a
/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(
1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^2*a*b^2+45*(-a^2*b)
^(1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(
1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+
1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-
(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Ellipt
icE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2
),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2)
)*x^2*a*b^2-15*I*3^(1/2)*x^3*a^2*b^2-24*(1/a^2*x*(-a*x+(-a^2*b)^(
1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*
(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(a*x^4+b*x)^(1/2)*x^5
*a^3+60*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-
a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1
/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2
*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3
)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2
*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3
^(1/2)-3))^(1/2))*x*b^2-90*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*
3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3
)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2
```

```
)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/
(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(
1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)
/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x*b^2-15*I*(-a^2*b)^(2/3)*3^
(1/2)*x*b^2-15*I*(-a^2*b)^(1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)
/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-
a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1
/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^
2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-
a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2
)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*x^2*a*b^2+30*I*(-a^2*b)^(2/3)*
(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((
I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*
x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b
)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(
I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3
^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/
2)*x*b^2+30*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3
)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(
1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2
*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*E
llipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))
^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^
(1/2))*a*b^3-45*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^
(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I
*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/
3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/
2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/
3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-
3))^(1/2))*a*b^3+15*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a
^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/
3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*
b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)
))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*
b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^
(1/2)-3))^(1/2))*3^(1/2)*a*b^3-9*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(
I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b
)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(a*x^4+b*x)^(1/2)*x^2*a^2*b+
45*x^3*a^2*b^2+45*(-a^2*b)^(1/3)*x^2*a*b^2+45*(-a^2*b)^(2/3)*x*b^
2)/(x*(a*x^3+b))^(1/2)/(I*3^(1/2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3
))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a
^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{a + \frac{b}{x^3}}x^6\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)*x^6,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a + b/x^3)*x^6, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(x^6\sqrt{\frac{ax^3+b}{x^3}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)*x^6,x, algorithm="fricas")
```

```
[Out] integral(x^6*sqrt((a*x^3 + b)/x^3), x)
```

Sympy [A] time = 6.28929, size = 48, normalized size = 0.09

$$-\frac{\sqrt{a}x^7\Gamma\left(-\frac{7}{3}\right){}_2F_1\left(\begin{matrix}-\frac{7}{3},-\frac{1}{2}\\-\frac{4}{3}\end{matrix}\middle|\frac{be^{i\pi}}{ax^3}\right)}{3\Gamma\left(-\frac{4}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6*(a+b/x**3)**(1/2),x)
```

```
[Out] -sqrt(a)*x**7*gamma(-7/3)*hyper((-7/3, -1/2), (-4/3,), b*exp_pola
r(I*pi)/(a*x**3))/(3*gamma(-4/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{a+\frac{b}{x^3}}x^6\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)*x^6,x, algorithm="giac")
```

```
[Out] integrate(sqrt(a + b/x^3)*x^6, x)
```

3.2003 $\int \sqrt{a+\frac{b}{x^3}}x^3\,dx$

Optimal. Leaf size=539

$$-\frac{3^{3/4}b^{4/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{4\sqrt{2}a^{2/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{3\sqrt[4]{3}\sqrt{2-\sqrt{3}}b^{4/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{16a^{2/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{3b^{4/3}\sqrt{a+\frac{b}{x^3}}}{8a\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}+\frac{3bx\sqrt{a+\frac{b}{x^3}}}{8a}+\frac{1}{4}x^4\sqrt{a+\frac{b}{x^3}}$$

```
[Out] (-3*b^(4/3)*Sqrt[a + b/x^3])/(8*a*((1 + Sqrt[3])*a^(1/3) + b^(1/3
)/x)) + (3*b*Sqrt[a + b/x^3]*x)/(8*a) + (Sqrt[a + b/x^3]*x^4)/4 +
 (3*3^(1/4)*Sqrt[2 - Sqrt[3]]*b^(4/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[
(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1
/3) + b^(1/3)/x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(
1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(1
6*a^(2/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((
1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]) - (3^(3/4)*b^(4/3)*(a^(1/3)
 + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/
((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqr
t[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)],
-7 - 4*Sqrt[3]])/(4*Sqrt[2]*a^(2/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)
*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi [A] time = 0.772621, antiderivative size = 539, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.4$

$$-\frac{3^{3/4}b^{4/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{4\sqrt{2}a^{2/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{3\sqrt[4]{3}\sqrt{2-\sqrt{3}}b^{4/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{16a^{2/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{3b^{4/3}\sqrt{a+\frac{b}{x^3}}}{8a\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}+\frac{3bx\sqrt{a+\frac{b}{x^3}}}{8a}+\frac{1}{4}x^4\sqrt{a+\frac{b}{x^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x^3]*x^3,x]
```

```
[Out] (-3*b^(4/3)*Sqrt[a + b/x^3])/(8*a*((1 + Sqrt[3])*a^(1/3) + b^(1/3
)/x)) + (3*b*Sqrt[a + b/x^3]*x)/(8*a) + (Sqrt[a + b/x^3]*x^4)/4 +
 (3*3^(1/4)*Sqrt[2 - Sqrt[3]]*b^(4/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[
(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1
/3) + b^(1/3)/x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(
1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(1
6*a^(2/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((
1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]) - (3^(3/4)*b^(4/3)*(a^(1/3)
 + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/
((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqr
t[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)],
-7 - 4*Sqrt[3]])/(4*Sqrt[2]*a^(2/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)
*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi in Sympy [A] time = 46.2108, size = 445, normalized size = 0.83

$$\frac{x^4\sqrt{a+\frac{b}{x^3}}}{4}-\frac{3b^{\frac{4}{3}}\sqrt{a+\frac{b}{x^3}}}{8a\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)}+\frac{3bx\sqrt{a+\frac{b}{x^3}}}{8a}+\frac{3\sqrt[4]{3}b^{\frac{4}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{16a^{\frac{2}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}-\frac{\sqrt{2}\cdot 3^{\frac{3}{4}}b^{\frac{4}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{8a^{\frac{2}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3*(a+b/x**3)**(1/2),x)
```

```
[Out] x**4*sqrt(a + b/x**3)/4 - 3*b**(4/3)*sqrt(a + b/x**3)/(8*a*(a**(1
/3)*(1 + sqrt(3)) + b**(1/3)/x)) + 3*b*x*sqrt(a + b/x**3)/(8*a) +
 3*3**(1/4)*b**(4/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**(2
/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(-sqrt(3)
 + 2)*(a**(1/3) + b**(1/3)/x)*elliptic_e(asin((-a**(1/3)*(-1 + sq
rt(3)) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 -
 4*sqrt(3))/(16*a**(2/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a
**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) - sqrt(
2)*3**(3/4)*b**(4/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**(2
/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*(a**(1/3) + b
**(1/3)/x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)/x
)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*sqrt(3))/(8*a**(
2/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)
) + b**(1/3)/x)**2)*sqrt(a + b/x**3))
```

Mathematica [C] time = 1.4081, size = 359, normalized size = 0.67

$$\frac{1}{8}x\sqrt{a+\frac{b}{x^3}}\left(\frac{3(-1)^{2/3}b^{4/3}\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)\sqrt{\frac{\left(1+\sqrt[3]{-1}\right)\sqrt[3]{a}x\left(\sqrt[3]{b}-\sqrt[3]{-1}\sqrt[3]{a}x\right)}{\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)^2}}\sqrt{\frac{(-1)^{2/3}\sqrt[3]{a}x+\sqrt[3]{b}}{\sqrt[3]{a}x+\sqrt[3]{b}}}\left(\left(1+i\sqrt{3}\right)F\left(\sin^{-1}\left(\frac{\sqrt{\frac{\left(3+i\sqrt{3}\right)\sqrt[3]{a}x}{\sqrt[3]{a}x+\sqrt[3]{b}}}}{\sqrt{2}}\right)\right)\right)}{2\left((-1)^{2/3}-1\right)a\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}+\frac{3bx}{a^{2/3}\sqrt[3]{b}+ax}+2x^3\right)$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[Sqrt[a + b/x^3]*x^3,x]
```

```
[Out] (Sqrt[a + b/x^3]*x*(2*x^3 + (3*b*x)/(a^(2/3)*b^(1/3) + a*x) + (3*
(-1)^(2/3)*b^(4/3)*(b^(1/3) + a^(1/3)*x)*Sqrt[((1 + (-1)^(1/3))*a
^(1/3)*x*(b^(1/3) - (-1)^(1/3)*a^(1/3)*x))/(b^(1/3) + a^(1/3)*x)^
2]*Sqrt[(b^(1/3) + (-1)^(2/3)*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]*(
(-3 - I*Sqrt[3])*EllipticE[ArcSin[Sqrt[((3 + I*Sqrt[3])*a^(1/3)*x
)/(b^(1/3) + a^(1/3)*x)]/Sqrt[2]], (-I + Sqrt[3])/(I + Sqrt[3])]
+ (1 + I*Sqrt[3])*EllipticF[ArcSin[Sqrt[((3 + I*Sqrt[3])*a^(1/3)*
x)/(b^(1/3) + a^(1/3)*x)]/Sqrt[2]], (-I + Sqrt[3])/(I + Sqrt[3])]
))/(2*(-1 + (-1)^(2/3))*a*(b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*
x^2))))/8
```

Maple [B] time = 0.037, size = 2579, normalized size = 4.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3*(a+b/x^3)^(1/2),x)
```

```
[Out] -1/4*((a*x^3+b)/x^3)^(1/2)*x^2/a^2*(-3*I*(-a^2*b)^(1/3)*(-(I*3^(1
/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)
*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b
)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/
(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)
-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)
*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*x^2*a*
b-3*I*(-a^2*b)^(1/3)*3^(1/2)*x^2*a*b-6*(-a^2*b)^(1/3)*(-(I*3^(1/2
)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(
-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^
(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I
*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3
)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(
I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^2*a*b+9*(-a^2*
b)^(1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))
^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2
)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*
x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Elli
pticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/
```

```
2))*x^2*a*b+6*I*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/
(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a
^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/
2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2
*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a
*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)
+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*x*b+12*(-a^2*b)^(2/3)*(-(I*3^(1
/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)
*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b
)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/
(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)
-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)
*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x*b-18*(-a^2*b
)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^
(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)
+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x
-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Ellip
ticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/
2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2
))*x*b-3*I*3^(1/2)*x^3*a^2*b-I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*
3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^
(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*(a*x^4+b*x)^(1/2)*x^2*
a^2+3*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^
(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)
+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x
-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Ellip
ticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/
2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2
))*3^(1/2)*a*b^2+6*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*
b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))
/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^
(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^
(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^
(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/
2)-3))^(1/2))*a*b^2-9*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a
^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/
3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*
b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)
))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*
b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^
(1/2)-3))^(1/2))*a*b^2-3*I*(-a^2*b)^(2/3)*3^(1/2)*x*b+3*(1/a^2*x*
(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1
/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(a*x^
4+b*x)^(1/2)*x^2*a^2+9*a^2*b*x^3+9*(-a^2*b)^(1/3)*x^2*a*b+9*(-a^2
*b)^(2/3)*x*b)/(x*(a*x^3+b))^(1/2)/(I*3^(1/2)-3)/(1/a^2*x*(-a*x+(
-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I
*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{a + \frac{b}{x^3}}x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)*x^3,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a + b/x^3)*x^3, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(x^3\sqrt{\frac{ax^3+b}{x^3}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)*x^3,x, algorithm="fricas")
```

```
[Out] integral(x^3*sqrt((a*x^3 + b)/x^3), x)
```

Sympy [A] time = 3.68997, size = 48, normalized size = 0.09

$$-\frac{\sqrt{a}x^4\,\Gamma\left(-\frac{4}{3}\right)\,{}_2F_1\left(\begin{matrix}-\frac{4}{3},-\frac{1}{2}\\ -\frac{1}{3}\end{matrix}\middle|\frac{be^{i\pi}}{ax^3}\right)}{3\,\Gamma\left(-\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(a+b/x**3)**(1/2),x)
```

```
[Out] -sqrt(a)*x**4*gamma(-4/3)*hyper((-4/3, -1/2), (-1/3,), b*exp_pola
r(I*pi)/(a*x**3))/(3*gamma(-1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{a + \frac{b}{x^3}}x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)*x^3,x, algorithm="giac")
```

```
[Out] integrate(sqrt(a + b/x^3)*x^3, x)
```

3.2004 $\int \sqrt{a+\frac{b}{x^3}}\,dx$

Optimal. Leaf size=507

$$-\frac{\sqrt{2}3^{3/4}\sqrt[3]{a}\sqrt[3]{b}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{3\sqrt[4]{3}\sqrt{2-\sqrt{3}}\sqrt[3]{a}\sqrt[3]{b}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{2\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+x\sqrt{a+\frac{b}{x^3}}-\frac{3\sqrt[3]{b}\sqrt{a+\frac{b}{x^3}}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}$$

```
[Out] (-3*b^(1/3)*Sqrt[a + b/x^3])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)
+ Sqrt[a + b/x^3]*x + (3*3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(1/3)*b^(1/3
)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^
(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticE[ArcSin
[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(
1/3)/x)], -7 - 4*Sqrt[3]])/(2*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1
/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]) - (Sqrt
[2]*3^(3/4)*a^(1/3)*b^(1/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) +
 b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1
/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((
1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(Sqrt[a + b/
x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3)
+ b^(1/3)/x)^2])
```

Rubi [A] time = 0.648055, antiderivative size = 507, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.454

$$-\frac{\sqrt{2}3^{3/4}\sqrt[3]{a}\sqrt[3]{b}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{3\sqrt[4]{3}\sqrt{2-\sqrt{3}}\sqrt[3]{a}\sqrt[3]{b}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{2\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+x\sqrt{a+\frac{b}{x^3}}-\frac{3\sqrt[3]{b}\sqrt{a+\frac{b}{x^3}}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}$$

Antiderivative was successfully verified.

```
[In]   Int[Sqrt[a + b/x^3],x]
```

```
[Out] (-3*b^(1/3)*Sqrt[a + b/x^3])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)
+ Sqrt[a + b/x^3]*x + (3*3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(1/3)*b^(1/3
)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^
(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticE[ArcSin
[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(
1/3)/x)], -7 - 4*Sqrt[3]])/(2*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1
/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]) - (Sqrt
[2]*3^(3/4)*a^(1/3)*b^(1/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) +
 b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1
/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((
1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(Sqrt[a + b/
x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3)
+ b^(1/3)/x)^2])
```

Rubi in Sympy [A] time = 34.3546, size = 418, normalized size = 0.82

$$\frac{3\sqrt[4]{3}\sqrt[3]{a}\sqrt[3]{b}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^{2}}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^{2}}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{2\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^{2}}}\sqrt{a+\frac{b}{x^{3}}}} - \frac{\sqrt{2}\cdot 3^{\frac{3}{4}}\sqrt[3]{a}\sqrt[3]{b}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^{2}}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^{2}}}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^{2}}}\sqrt{a+\frac{b}{x^{3}}}} - \frac{3\sqrt[3]{b}\sqrt{a+\frac{b}{x^{3}}}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}} + x\sqrt{a+\frac{b}{x^{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate((a+b/x**3)**(1/2),x)
```

```
[Out] 3*3**(1/4)*a**(1/3)*b**(1/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x
 + b**(2/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(
-sqrt(3) + 2)*(a**(1/3) + b**(1/3)/x)*elliptic_e(asin((-a**(1/3)*
(-1 + sqrt(3)) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x
)), -7 - 4*sqrt(3))/(2*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**
(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) - sqrt(2)
*3**(3/4)*a**(1/3)*b**(1/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x
+ b**(2/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*(a**(1
/3) + b**(1/3)/x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**
(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*sqrt(3))/
(sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) +
b**(1/3)/x)**2)*sqrt(a + b/x**3)) - 3*b**(1/3)*sqrt(a + b/x**3)/(
a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x) + x*sqrt(a + b/x**3)
```

Mathematica [C] time = 1.3442, size = 351, normalized size = 0.69

$$x\sqrt{a+\frac{b}{x^3}}\left(\frac{3(-1)^{2/3}\sqrt[3]{b}\left(\sqrt[3]{ax}+\sqrt[3]{b}\right)\sqrt{\frac{\left(1+\sqrt[3]{-1}\right)\sqrt[3]{a}x\left(\sqrt[3]{b}-\sqrt[3]{-1}\sqrt[3]{a}x\right)}{\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)^2}}\sqrt{\frac{(-1)^{2/3}\sqrt[3]{a}x+\sqrt[3]{b}}{\sqrt[3]{a}x+\sqrt[3]{b}}}\left(\left(1+i\sqrt{3}\right)F\left(\sin^{-1}\left(\frac{\sqrt{\frac{\left(3+i\sqrt{3}\right)\sqrt[3]{a}x}{\sqrt[3]{a}x+\sqrt[3]{b}}}}{\sqrt{2}}\right)\middle|\cdots\right.\right.}{2\left((-1)^{2/3}-1\right)\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}+\frac{3\sqrt[3]{a}x}{\sqrt[3]{a}x+\sqrt[3]{b}}-2\right)$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[Sqrt[a + b/x^3],x]
```

```
[Out] Sqrt[a + b/x^3]*x*(-2 + (3*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x) + (3*
(-1)^(2/3)*b^(1/3)*(b^(1/3) + a^(1/3)*x)*Sqrt[((1 + (-1)^(1/3))*a
^(1/3)*x*(b^(1/3) - (-1)^(1/3)*a^(1/3)*x))/(b^(1/3) + a^(1/3)*x)^
2]*Sqrt[(b^(1/3) + (-1)^(2/3)*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]*(
(-3 - I*Sqrt[3])*EllipticE[ArcSin[Sqrt[((3 + I*Sqrt[3])*a^(1/3)*x
)/(b^(1/3) + a^(1/3)*x)]/Sqrt[2]], (-I + Sqrt[3])/(I + Sqrt[3])]
+ (1 + I*Sqrt[3])*EllipticF[ArcSin[Sqrt[((3 + I*Sqrt[3])*a^(1/3)*
x)/(b^(1/3) + a^(1/3)*x)]/Sqrt[2]], (-I + Sqrt[3])/(I + Sqrt[3])]
))/(2*(-1 + (-1)^(2/3))*(b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^
2)))
```

Maple [B] time = 0.037, size = 2864, normalized size = 5.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^3)^(1/2),x)
```

```
[Out] -2*((a*x^3+b)/x^3)^(1/2)*x/a*(3*I*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*
x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*
3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+
(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1
)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^
(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/
(-a*x+(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*(x*(a*x^3+b))^(1/2)*a*b-3*I*
(-a^2*b)^(1/3)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^2*a-6*(-a^2*b)^(1/3)
*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(
-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^
2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF(
(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((
I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-
(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(x*(
a*x^3+b))^(1/2)*x^2*a+9*(-a^2*b)^(1/3)*((I*3^(1/2)*(-a^2*b)^(1/3)
+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)
*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(
-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1
/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/
(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2
```

```
)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(x*(a*x^3+b))^(1/2)*x^2*a-3*I*(
-a^2*b)^(2/3)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x+12*(-a^2*b)^(2/3)*((I
*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x
+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)
^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I
*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^
(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-(I*3
^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(x*(a*x^
3+b))^(1/2)*x-18*(-a^2*b)^(2/3)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+
(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^
(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-
a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/
(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1
/2)+1)/(I*3^(1/2)-3))^(1/2))*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-
a*x+(-a^2*b)^(1/3)))^(1/2)*(x*(a*x^3+b))^(1/2)*x+I*(1/a^2*x*(-a*x
+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*
(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*a*
b-3*I*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^3*a^2+I*(1/a^2*x*(-a*x+(-a^2*
b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1
/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*x^3*a^2+6
*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(
-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^
2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF(
(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((
I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-
(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(x*(
a*x^3+b))^(1/2)*a*b-9*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(
1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^
2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/
3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^
2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*
3^(1/2)-3))^(1/2))*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*
b)^(1/3)))^(1/2)*(x*(a*x^3+b))^(1/2)*a*b-3*I*(-a^2*b)^(1/3)*((I*3
^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(
-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(
1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3
^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1
/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-(I*3^(
1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*(x
*(a*x^3+b))^(1/2)*x^2*a-3*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/
2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)
-2*a*x-(-a^2*b)^(1/3)))^(1/2)*x^3*a^2+9*(x*(a*x^3+b))^(1/2)*x^3*a
^2+9*(-a^2*b)^(1/3)*(x*(a*x^3+b))^(1/2)*x^2*a+6*I*(-a^2*b)^(2/3)*
((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-
a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2
*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((
-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I
*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-(
I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*3^(1/
2)*(x*(a*x^3+b))^(1/2)*x+9*(-a^2*b)^(2/3)*(x*(a*x^3+b))^(1/2)*x-3
*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(
-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(
1/2)*a*b)/(a*x^3+b)/(I*3^(1/2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*
(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*
b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{a + \frac{b}{x^3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a + b/x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{\frac{ax^3+b}{x^3}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3),x, algorithm="fricas")
```

```
[Out] integral(sqrt((a*x^3 + b)/x^3), x)
```

Sympy [A] time = 2.7907, size = 42, normalized size = 0.08

$$-\frac{\sqrt{a}x\Gamma\left(-\frac{1}{3}\right){}_2F_1\left(\begin{matrix}-\frac{1}{2},-\frac{1}{3}\\ \frac{2}{3}\end{matrix}\middle|\frac{be^{i\pi}}{ax^3}\right)}{3\Gamma\left(\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**3)**(1/2),x)
```

```
[Out] -sqrt(a)*x*gamma(-1/3)*hyper((-1/2, -1/3), (2/3,), b*exp_polar(I*
pi)/(a*x**3))/(3*gamma(2/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\sqrt{a+\frac{b}{x^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3),x, algorithm="giac")
```

```
[Out] integrate(sqrt(a + b/x^3), x)
```

3.2005 $\int \frac{\sqrt{a+\frac{b}{x^3}}}{x^3} dx$

Optimal. Leaf size=517

$$-\frac{2\sqrt{2}3^{3/4}a^{4/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{7b^{2/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{3\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{4/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{7b^{2/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{6a\sqrt{a+\frac{b}{x^3}}}{7b^{2/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}-\frac{2\sqrt{a+\frac{b}{x^3}}}{7x^2}$$

```
[Out] (-6*a*Sqrt[a + b/x^3])/(7*b^(2/3)*((1 + Sqrt[3])*a^(1/3) + b^(1/3
)/x)) - (2*Sqrt[a + b/x^3])/(7*x^2) + (3*3^(1/4)*Sqrt[2 - Sqrt[3]
]*a^(4/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^
(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*Elliptic
E[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/
3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(7*b^(2/3)*Sqrt[a + b/x^3]*Sqr
t[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3
)/x)^2]) - (2*Sqrt[2]*3^(3/4)*a^(4/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[
(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1
/3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(
1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(7
*b^(2/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1
 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi [A] time = 0.660057, antiderivative size = 517, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$

$$-\frac{2\sqrt{2}3^{3/4}a^{4/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{7b^{2/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{3\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{4/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{7b^{2/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{6a\sqrt{a+\frac{b}{x^3}}}{7b^{2/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}-\frac{2\sqrt{a+\frac{b}{x^3}}}{7x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x^3]/x^3,x]
```

```
[Out] (-6*a*Sqrt[a + b/x^3])/(7*b^(2/3)*((1 + Sqrt[3])*a^(1/3) + b^(1/3
)/x)) - (2*Sqrt[a + b/x^3])/(7*x^2) + (3*3^(1/4)*Sqrt[2 - Sqrt[3]
]*a^(4/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^
(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*Elliptic
E[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/
3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(7*b^(2/3)*Sqrt[a + b/x^3]*Sqr
t[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3
)/x)^2]) - (2*Sqrt[2]*3^(3/4)*a^(4/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[
(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1
/3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(
1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(7
*b^(2/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1
 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi in Sympy [A] time = 35.4717, size = 430, normalized size = 0.83

$$\frac{3\sqrt[4]{3}a^{\frac{4}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^{2}}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^{2}}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{7b^{\frac{2}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^{2}}}\sqrt{a+\frac{b}{x^{3}}}} - \frac{2\sqrt{2}\cdot 3^{\frac{3}{4}}a^{\frac{4}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^{2}}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^{2}}}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{7b^{\frac{2}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^{2}}}\sqrt{a+\frac{b}{x^{3}}}} - \frac{6a\sqrt{a+\frac{b}{x^{3}}}}{7b^{\frac{2}{3}}\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)} - \frac{2\sqrt{a+\frac{b}{x^{3}}}}{7x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**3)**(1/2)/x**3,x)
```

```
[Out] 3*3**(1/4)*a**(4/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**(2/
3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(-sqrt(3)
+ 2)*(a**(1/3) + b**(1/3)/x)*elliptic_e(asin((-a**(1/3)*(-1 + sqr
t(3)) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 -
4*sqrt(3))/(7*b**(2/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**
(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) - 2*sqrt(
2)*3**(3/4)*a**(4/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**(2
/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*(a**(1/3) + b
**(1/3)/x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)/x
)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*sqrt(3))/(7*b**(
2/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)
) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) - 6*a*sqrt(a + b/x**3)/(7*b
**(2/3)*(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)) - 2*sqrt(a + b/x**
3)/(7*x**2)
```

Mathematica [C] time = 1.95208, size = 366, normalized size = 0.71

$$\frac{2x\sqrt{a+\frac{b}{x^3}}\left(\frac{3(-1)^{2/3}a\sqrt[3]{b}\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)\sqrt{\frac{\left(1+\sqrt[3]{-1}\right)\sqrt[3]{a}x\left(\sqrt[3]{b}-\sqrt[3]{-1}\sqrt[3]{a}x\right)}{\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)^2}}\sqrt{\frac{(-1)^{2/3}\sqrt[3]{a}x+\sqrt[3]{b}}{\sqrt[3]{a}x+\sqrt[3]{b}}}\left(\left(1+i\sqrt{3}\right)F\left(\sin^{-1}\left(\frac{\sqrt{\frac{\left(3+i\sqrt{3}\right)\sqrt[3]{a}x}{\sqrt[3]{a}x+\sqrt[3]{b}}}}{\sqrt{2}}\right)|\frac{-i+\sqrt{3}}{i+\sqrt{3}}\right)+\left(-3-i\sqrt{3}\right)E\right.}{2\left((-1)^{2/3}-1\right)\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}\right.}{7b}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[Sqrt[a + b/x^3]/x^3,x]
```

```
[Out] (2*Sqrt[a + b/x^3]*x*(-3*a - b/x^3 + (3*a^(4/3)*x)/(b^(1/3) + a^(
1/3)*x) + (3*(-1)^(2/3)*a*b^(1/3)*(b^(1/3) + a^(1/3)*x)*Sqrt[((1
+ (-1)^(1/3))*a^(1/3)*x*(b^(1/3) - (-1)^(1/3)*a^(1/3)*x))/(b^(1/3
) + a^(1/3)*x)^2]*Sqrt[(b^(1/3) + (-1)^(2/3)*a^(1/3)*x)/(b^(1/3)
+ a^(1/3)*x)]*((-3 - I*Sqrt[3])*EllipticE[ArcSin[Sqrt[((3 + I*Sqr
t[3])*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]/Sqrt[2]], (-I + Sqrt[3])/
(I + Sqrt[3])] + (1 + I*Sqrt[3])*EllipticF[ArcSin[Sqrt[((3 + I*Sq
rt[3])*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]/Sqrt[2]], (-I + Sqrt[3])
/(I + Sqrt[3])]))/(2*(-1 + (-1)^(2/3))*(b^(2/3) - a^(1/3)*b^(1/3)
*x + a^(2/3)*x^2))))/(7*b)
```

Maple [B] time = 0.049, size = 3309, normalized size = 6.4

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^3)^(1/2)/x^3,x)
```

```
[Out] -2/21*((a*x^3+b)/x^3)^(1/2)/x^3*(-18*I*3^(1/2)*(x*(a*x^3+b))^(1/2
)*x^7*a^2-4*I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^
(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2
*b)^(1/3)))^(1/2)*3^(1/2)*(a*x^4+b*x)^(1/2)*(x*(a*x^3+b))^(1/2)*x
^3*a-36*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^
(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)
+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x
-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Ellip
ticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/
2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2
))*(-a^2*b)^(1/3)*(x*(a*x^3+b))^(1/2)*x^6*a+54*(-(I*3^(1/2)-3)*x*
a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)
^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))
^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2
)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(
I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/
2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(1/3)*(x*(a*x^
3+b))^(1/2)*x^6*a-18*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-
a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1
/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2
*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3
)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2
*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3
^(1/2)-3))^(1/2))*(-a^2*b)^(1/3)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^6*
a+72*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/
2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)
/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-
a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Elliptic
F((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),
((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*
(-a^2*b)^(2/3)*(x*(a*x^3+b))^(1/2)*x^5-108*(-(I*3^(1/2)-3)*x*a/(I
```

```
*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/
3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/
2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)
/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^
(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1
)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(2/3)*(x*(a*x^3+b)
)^(1/2)*x^5+18*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)
^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(
I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1
/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1
/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)
-3))^(1/2))*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^4*a*b+36*I*(-(I*3^(1/2)
-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-
a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(
1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*
3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)
*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I
*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(2/3)*3^
(1/2)*(x*(a*x^3+b))^(1/2)*x^5+36*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1
)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(
-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(
1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a
^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(
-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/
2)+1)/(I*3^(1/2)-3))^(1/2))*(x*(a*x^3+b))^(1/2)*x^4*a*b-54*(-(I*3
^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1
/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^
2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3
))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1
/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)
+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(x*(a*x^3+b
))^(1/2)*x^4*a*b+13*I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(
-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a
*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*x^4*a*b-39*(1/a^2*x*(-a*x+(-a^2
*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(
1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*x^7*a^2-18*I*(-a
^2*b)^(2/3)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^5+54*(x*(a*x^3+b))^(1/2
)*x^7*a^2+13*I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)
^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^
2*b)^(1/3)))^(1/2)*3^(1/2)*x^7*a^2-18*I*(-a^2*b)^(1/3)*3^(1/2)*(x
*(a*x^3+b))^(1/2)*x^6*a+54*(-a^2*b)^(1/3)*(x*(a*x^3+b))^(1/2)*x^6
*a+54*(-a^2*b)^(2/3)*(x*(a*x^3+b))^(1/2)*x^5+12*(1/a^2*x*(-a*x+(-
a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*
3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(a*x^4+b*x)^(
1/2)*(x*(a*x^3+b))^(1/2)*x^3*a-39*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*
(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*
b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*x^4*a*b+3*I*(1/a^2*x*(-a*x+
(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(
I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*(a*
x^4+b*x)^(1/2)*(x*(a*x^3+b))^(1/2)*b-9*(1/a^2*x*(-a*x+(-a^2*b)^(1
/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(
-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(a*x^4+b*x)^(1/2)*(x*(
a*x^3+b))^(1/2)*b)/(a*x^3+b)/b/(I*3^(1/2)-3)/(1/a^2*x*(-a*x+(-a^2
*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(
1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + \frac{b}{x^3}}}{x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)/x^3,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a + b/x^3)/x^3, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{\frac{ax^3+b}{x^3}}}{x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)/x^3,x, algorithm="fricas")
```

```
[Out] integral(sqrt((a*x^3 + b)/x^3)/x^3, x)
```

Sympy [A] time = 3.41565, size = 41, normalized size = 0.08

$$-\frac{\sqrt{a}\,\Gamma\left(\frac{2}{3}\right)\,{}_2F_1\left(\begin{matrix}-\frac{1}{2},\frac{2}{3}\\ \frac{5}{3}\end{matrix}\middle|\frac{be^{i\pi}}{ax^3}\right)}{3x^2\,\Gamma\left(\frac{5}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**3)**(1/2)/x**3,x)
```

```
[Out] -sqrt(a)*gamma(2/3)*hyper((-1/2, 2/3), (5/3,), b*exp_polar(I*pi)/
(a*x**3))/(3*x**2*gamma(5/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + \frac{b}{x^3}}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)/x^3,x, algorithm="giac")
```

```
[Out] integrate(sqrt(a + b/x^3)/x^3, x)
```

3.2006 $\int \frac{\sqrt{a+\frac{b}{x^3}}}{x^6} \, dx$

Optimal. Leaf size=541

$$\frac{8\sqrt{2}3^{3/4}a^{7/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{91b^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}} - \frac{12\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{7/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{91b^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}} + \frac{24a^2\sqrt{a+\frac{b}{x^3}}}{91b^{5/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)} - \frac{2\sqrt{a+\frac{b}{x^3}}}{13x^5} - \frac{6a\sqrt{a+\frac{b}{x^3}}}{91bx^2}$$

```
[Out] (24*a^2*Sqrt[a + b/x^3])/(91*b^(5/3)*((1 + Sqrt[3])*a^(1/3) + b^(
1/3)/x)) - (2*Sqrt[a + b/x^3])/(13*x^5) - (6*a*Sqrt[a + b/x^3])/(
91*b*x^2) - (12*3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(7/3)*(a^(1/3) + b^(1
/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + S
qrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a
^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*
Sqrt[3]])/(91*b^(5/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^
(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]) + (8*Sqrt[2]*3^
(3/4)*a^(7/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 -
 (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*Elli
pticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a
^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(91*b^(5/3)*Sqrt[a + b/x^3
]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b
^(1/3)/x)^2])
```

Rubi [A] time = 0.797297, antiderivative size = 541, normalized size of antiderivative = 1., number

of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.4$

$$\frac{8\sqrt{2}3^{3/4}a^{7/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{91b^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}$$

$$-\frac{12\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{7/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{91b^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}$$

$$+\frac{24a^2\sqrt{a+\frac{b}{x^3}}}{91b^{5/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}-\frac{2\sqrt{a+\frac{b}{x^3}}}{13x^5}-\frac{6a\sqrt{a+\frac{b}{x^3}}}{91bx^2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x^3]/x^6,x]
```

```
[Out] (24*a^2*Sqrt[a + b/x^3])/(91*b^(5/3)*((1 + Sqrt[3])*a^(1/3) + b^(
1/3)/x)) - (2*Sqrt[a + b/x^3])/(13*x^5) - (6*a*Sqrt[a + b/x^3])/(
91*b*x^2) - (12*3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(7/3)*(a^(1/3) + b^(1
/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + S
qrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a
^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*
Sqrt[3]])/(91*b^(5/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^
(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]) + (8*Sqrt[2]*3^
(3/4)*a^(7/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 -
 (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*Elli
pticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a
^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(91*b^(5/3)*Sqrt[a + b/x^3
]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b
^(1/3)/x)^2])
```

Rubi in Sympy [A] time = 45.748, size = 452, normalized size = 0.84

$$-\frac{12\sqrt[4]{3}a^{\frac{7}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{91b^{\frac{5}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}$$

$$+\frac{8\sqrt{2}\cdot3^{\frac{3}{4}}a^{\frac{7}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{91b^{\frac{5}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}$$

$$+\frac{24a^2\sqrt{a+\frac{b}{x^3}}}{91b^{\frac{5}{3}}\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)}-\frac{6a\sqrt{a+\frac{b}{x^3}}}{91bx^2}-\frac{2\sqrt{a+\frac{b}{x^3}}}{13x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**3)**(1/2)/x**6,x)
```

```
[Out] -12*3**(1/4)*a**(7/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**(
2/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(-sqrt(3
) + 2)*(a**(1/3) + b**(1/3)/x)*elliptic_e(asin((-a**(1/3)*(-1 + s
qrt(3)) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7
- 4*sqrt(3))/(91*b**(5/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(
a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) + 8*sq
rt(2)*3**(3/4)*a**(7/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b*
*(2/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*(a**(1/3)
+ b**(1/3)/x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3
)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*sqrt(3))/(91*
b**(5/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(1/3)*(1 + sqr
t(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) + 24*a**2*sqrt(a + b/x*
*3)/(91*b**(5/3)*(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)) - 6*a*sqr
t(a + b/x**3)/(91*b*x**2) - 2*sqrt(a + b/x**3)/(13*x**5)
```

Mathematica [C] time = 1.78134, size = 377, normalized size = 0.7

$$\frac{2x\sqrt{a+\frac{b}{x^3}}\left(-\frac{12a^{7/3}x}{\sqrt[3]{a}x+\sqrt[3]{b}}+12a^2-\frac{6(-1)^{2/3}a^2\sqrt[3]{b}\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)\sqrt{\frac{\left(1+\sqrt[3]{-1}\right)\sqrt[3]{a}x\left(\sqrt[3]{b}-\sqrt[3]{-1}\sqrt[3]{a}x\right)}{\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)^2}}\sqrt{\frac{(-1)^{2/3}\sqrt[3]{a}x+\sqrt[3]{b}}{\sqrt[3]{a}x+\sqrt[3]{b}}}\left(\left(1+i\sqrt{3}\right)F\left(\sin^{-1}\left(\frac{\sqrt{\frac{\left(3+i\sqrt{3}\right)\sqrt[3]{\cdots}}{\sqrt[3]{a}x+\sqrt[3]{\cdots}}}}{\sqrt{2}}\right.\right.\right.\cdots}{\left((-1)^{2/3}-1\right)\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)}\right)}{91b^2}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[Sqrt[a + b/x^3]/x^6,x]
```

```
[Out] (2*Sqrt[a + b/x^3]*x*(12*a^2 - (7*b^2)/x^6 - (3*a*b)/x^3 - (12*a^
(7/3)*x)/(b^(1/3) + a^(1/3)*x) - (6*(-1)^(2/3)*a^2*b^(1/3)*(b^(1/
3) + a^(1/3)*x)*Sqrt[((1 + (-1)^(1/3))*a^(1/3)*x*(b^(1/3) - (-1)^
(1/3)*a^(1/3)*x))/(b^(1/3) + a^(1/3)*x)^2]*Sqrt[(b^(1/3) + (-1)^(
2/3)*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]*((-3 - I*Sqrt[3])*Elliptic
E[ArcSin[Sqrt[((3 + I*Sqrt[3])*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]/
Sqrt[2]], (-I + Sqrt[3])/(I + Sqrt[3])] + (1 + I*Sqrt[3])*Ellipti
cF[ArcSin[Sqrt[((3 + I*Sqrt[3])*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]
/Sqrt[2]], (-I + Sqrt[3])/(I + Sqrt[3])]))/((-1 + (-1)^(2/3))*(b^
(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2))))/(91*b^2)
```

Maple [B] time = 0.049, size = 3556, normalized size = 6.6

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^3)^(1/2)/x^6,x)
```

```
[Out] 2/91*((a*x^3+b)/x^3)^(1/2)/x^6*(72*(-a^2*b)^(2/3)*(x*(a*x^3+b))^(
1/2)*x^8*a+72*(-a^2*b)^(1/3)*(x*(a*x^3+b))^(1/2)*x^9*a^2-24*(1/a^
2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b
)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*x
^7*a^2*b+21*(a*x^4+b*x)^(1/2)*b^2*(x*(a*x^3+b))^(1/2)*(1/a^2*x*(-
a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3
))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)+9*a*(a*
x^4+b*x)^(1/2)*x^3*b*(x*(a*x^3+b))^(1/2)*(1/a^2*x*(-a*x+(-a^2*b)^
```

```
(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)
*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)-3*I*(1/a^2*x*(-a*x+(
-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I
*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*(a*x
^4+b*x)^(1/2)*(x*(a*x^3+b))^(1/2)*x^3*a*b-24*I*(-a^2*b)^(1/3)*3^(
1/2)*(x*(a*x^3+b))^(1/2)*x^9*a^2+8*I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3
))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a
^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*x^7*a^2*b-7*I*(1
/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^
2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2
)*3^(1/2)*(a*x^4+b*x)^(1/2)*(x*(a*x^3+b))^(1/2)*b^2-24*I*(-a^2*b)
^(2/3)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^8*a-12*a^2*(a*x^4+b*x)^(1/2)
*x^6*(x*(a*x^3+b))^(1/2)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2
)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-
2*a*x-(-a^2*b)^(1/3)))^(1/2)+8*I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(
I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b
)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*x^10*a^3-24*I*3^(1/2
)*(x*(a*x^3+b))^(1/2)*x^10*a^3-24*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*
(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*
b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*x^10*a^3+72*(x*(a*x^3+b))^(
1/2)*x^10*a^3-48*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)
^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(
I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1
/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1
/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)
-3))^(1/2))*(-a^2*b)^(1/3)*(x*(a*x^3+b))^(1/2)*x^9*a^2+72*(-(I*3^
(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/
2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2
*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)
)/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/
2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+
3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(1/
3)*(x*(a*x^3+b))^(1/2)*x^9*a^2+96*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-
1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+
(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^
(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-
a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/
(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1
/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(2/3)*(x*(a*x^3+b))^(1/2)*x
^8*a-144*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))
^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2
)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*
x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Elli
pticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/
2))*(-a^2*b)^(2/3)*(x*(a*x^3+b))^(1/2)*x^8*a+48*(-(I*3^(1/2)-3)*x
*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b
)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3))
)^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/
2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/
(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1
/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*a^2*b*(x*(a*x^3+b))^(1
/2)*x^7-72*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)
))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1
/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*
a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*El
lipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^
(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(
1/2))*a^2*b*(x*(a*x^3+b))^(1/2)*x^7+4*I*(1/a^2*x*(-a*x+(-a^2*b)^(
1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*
(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*(a*x^4+b*x)^(
1/2)*(x*(a*x^3+b))^(1/2)*x^6*a^2+48*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1
/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*
a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((
I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*
x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)
-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*
3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(2/3)*3^(1/2)*(x*(a*x^3
+b))^(1/2)*x^8*a-24*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a
^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/
3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*
b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)
))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*
```

```
b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^
(1/2)-3))^(1/2))*(-a^2*b)^(1/3)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^9*a
^2+24*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^
(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)
+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x
-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Ellip
ticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/
2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2
))*a^2*b*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^7)/(a*x^3+b)/b^2/(I*3^(1/2
)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a
*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)
))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+\frac{b}{x^3}}}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)/x^6,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a + b/x^3)/x^6, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{\sqrt{\frac{ax^3+b}{x^3}}}{x^6}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)/x^6,x, algorithm="fricas")
```

```
[Out] integral(sqrt((a*x^3 + b)/x^3)/x^6, x)
```

Sympy [A] time = 5.36253, size = 41, normalized size = 0.08

$$-\frac{\sqrt{a}\,\Gamma\left(\frac{5}{3}\right){}_2F_1\left(\begin{matrix}-\frac{1}{2},\frac{5}{3}\\ \frac{8}{3}\end{matrix}\middle|\frac{be^{i\pi}}{ax^3}\right)}{3x^5\,\Gamma\left(\frac{8}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**3)**(1/2)/x**6,x)
```

```
[Out] -sqrt(a)*gamma(5/3)*hyper((-1/2, 5/3), (8/3,), b*exp_polar(I*pi)/
(a*x**3))/(3*x**5*gamma(8/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+\frac{b}{x^3}}}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)/x^6,x, algorithm="giac")
```

```
[Out] integrate(sqrt(a + b/x^3)/x^6, x)
```

3.2007 $\int \frac{\sqrt{a+\frac{b}{x^3}}}{x^9}\,dx$

Optimal. Leaf size=565

$$-\frac{80\sqrt{2}3^{3/4}a^{10/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{1729b^{8/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{120\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{10/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{1729b^{8/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{240a^3\sqrt{a+\frac{b}{x^3}}}{1729b^{8/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}+\frac{60a^2\sqrt{a+\frac{b}{x^3}}}{1729b^2x^2}-\frac{2\sqrt{a+\frac{b}{x^3}}}{19x^8}-\frac{6a\sqrt{a+\frac{b}{x^3}}}{247bx^5}$$

```
[Out] (-240*a^3*Sqrt[a + b/x^3])/(1729*b^(8/3)*((1 + Sqrt[3])*a^(1/3) +
 b^(1/3)/x)) - (2*Sqrt[a + b/x^3])/(19*x^8) - (6*a*Sqrt[a + b/x^3
])/(247*b*x^5) + (60*a^2*Sqrt[a + b/x^3])/(1729*b^2*x^2) + (120*3
^(1/4)*Sqrt[2 - Sqrt[3]]*a^(10/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(
2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3)
+ b^(1/3)/x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)
/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(1729*
b^(8/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1
+ Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]) - (80*Sqrt[2]*3^(3/4)*a^(10/3
)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^
(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcSin
[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(
1/3)/x)], -7 - 4*Sqrt[3]])/(1729*b^(8/3)*Sqrt[a + b/x^3]*Sqrt[(a^
(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^
2])
```

Rubi [A] time = 0.938093, antiderivative size = 565, normalized size of antiderivative = 1., number

of steps used = 7, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.4$

$$-\frac{80\sqrt{2}3^{3/4}a^{10/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{1729b^{8/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}$$

$$+\frac{120\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{10/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{1729b^{8/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}$$

$$-\frac{240a^3\sqrt{a+\frac{b}{x^3}}}{1729b^{8/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}+\frac{60a^2\sqrt{a+\frac{b}{x^3}}}{1729b^2x^2}-\frac{2\sqrt{a+\frac{b}{x^3}}}{19x^8}-\frac{6a\sqrt{a+\frac{b}{x^3}}}{247bx^5}$$

Antiderivative was successfully verified.

```
[In]   Int[Sqrt[a + b/x^3]/x^9,x]
```

```
[Out] (-240*a^3*Sqrt[a + b/x^3])/(1729*b^(8/3)*((1 + Sqrt[3])*a^(1/3) +
 b^(1/3)/x)) - (2*Sqrt[a + b/x^3])/(19*x^8) - (6*a*Sqrt[a + b/x^3
])/(247*b*x^5) + (60*a^2*Sqrt[a + b/x^3])/(1729*b^2*x^2) + (120*3
^(1/4)*Sqrt[2 - Sqrt[3]]*a^(10/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(
2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3)
+ b^(1/3)/x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)
/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(1729*
b^(8/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1
+ Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]) - (80*Sqrt[2]*3^(3/4)*a^(10/3
)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^
(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcSin
[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(
1/3)/x)], -7 - 4*Sqrt[3]])/(1729*b^(8/3)*Sqrt[a + b/x^3]*Sqrt[(a^
(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^
2])
```

Rubi in Sympy [A] time = 56.8182, size = 476, normalized size = 0.84

$$\frac{120\sqrt[4]{3}a^{\frac{10}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{1729b^{\frac{8}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}} - \frac{80\sqrt{2}\cdot 3^{\frac{3}{4}}a^{\frac{10}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{1729b^{\frac{8}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}} - \frac{240a^3\sqrt{a+\frac{b}{x^3}}}{1729b^{\frac{8}{3}}\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)} + \frac{60a^2\sqrt{a+\frac{b}{x^3}}}{1729b^2x^2} - \frac{6a\sqrt{a+\frac{b}{x^3}}}{247bx^5} - \frac{2\sqrt{a+\frac{b}{x^3}}}{19x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**3)**(1/2)/x**9,x)
```

```
[Out] 120*3**(1/4)*a**(10/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**
(2/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(-sqrt(
3) + 2)*(a**(1/3) + b**(1/3)/x)*elliptic_e(asin((-a**(1/3)*(-1 +
sqrt(3)) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7
 - 4*sqrt(3))/(1729*b**(8/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x
)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) - 8
0*sqrt(2)*3**(3/4)*a**(10/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x
 + b**(2/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*(a**(
1/3) + b**(1/3)/x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b*
*(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*sqrt(3))
/(1729*b**(8/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(1/3)*(
1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) - 240*a**3*sqrt(
a + b/x**3)/(1729*b**(8/3)*(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x))
 + 60*a**2*sqrt(a + b/x**3)/(1729*b**2*x**2) - 6*a*sqrt(a + b/x**
3)/(247*b*x**5) - 2*sqrt(a + b/x**3)/(19*x**8)
```

Mathematica [C] time = 1.82704, size = 388, normalized size = 0.69

$$\frac{2x\sqrt{a+\frac{b}{x^3}}\left(\frac{120a^{10/3}x}{\sqrt[3]{a}x+\sqrt[3]{b}}-120a^3+\frac{30a^2b}{x^3}+\frac{60(-1)^{2/3}a^3\sqrt[3]{b}\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)\sqrt{\frac{\left(1+\sqrt[3]{-1}\right)\sqrt[3]{a}x\left(\sqrt[3]{b}-\sqrt[3]{-1}\sqrt[3]{a}x\right)}{\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)^2}}\sqrt{\frac{(-1)^{2/3}\sqrt[3]{a}x+\sqrt[3]{b}}{\sqrt[3]{a}x+\sqrt[3]{b}}}\left(\left(1+i\sqrt{3}\right)F\left(\sin^{-1}\ldots\right.\right.}{\left((-1)^{2/3}-1\right)\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\ldots\right.}\right.}{1729b^3}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[Sqrt[a + b/x^3]/x^9,x]
```

```
[Out] (2*Sqrt[a + b/x^3]*x*(-120*a^3 - (91*b^3)/x^9 - (21*a*b^2)/x^6 +
(30*a^2*b)/x^3 + (120*a^(10/3)*x)/(b^(1/3) + a^(1/3)*x) + (60*(-1
)^(2/3)*a^3*b^(1/3)*(b^(1/3) + a^(1/3)*x)*Sqrt[((1 + (-1)^(1/3))*
a^(1/3)*x*(b^(1/3) - (-1)^(1/3)*a^(1/3)*x))/(b^(1/3) + a^(1/3)*x)
```

```
^2]*Sqrt[(b^(1/3) + (-1)^(2/3)*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]*
((-3 - I*Sqrt[3])*EllipticE[ArcSin[Sqrt[((3 + I*Sqrt[3])*a^(1/3)*
x)/(b^(1/3) + a^(1/3)*x)]/Sqrt[2]], (-I + Sqrt[3])/(I + Sqrt[3])]
 + (1 + I*Sqrt[3])*EllipticF[ArcSin[Sqrt[((3 + I*Sqrt[3])*a^(1/3)
*x)/(b^(1/3) + a^(1/3)*x)]/Sqrt[2]], (-I + Sqrt[3])/(I + Sqrt[3])
]))/((-1 + (-1)^(2/3))*(b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2
))))/(1729*b^3)
```

Maple [B] time = 0.05, size = 3788, normalized size = 6.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^3)^(1/2)/x^9,x)
```

```
[Out] -2/1729*((a*x^3+b)/x^3)^(1/2)/x^9*(720*(-a^2*b)^(2/3)*(x*(a*x^3+b
))^(1/2)*x^11*a^2+720*(-a^2*b)^(1/3)*(x*(a*x^3+b))^(1/2)*x^12*a^3
-240*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a
*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)
))^(1/2)*x^10*a^3*b-273*(a*x^4+b*x)^(1/2)*b^3*(x*(a*x^3+b))^(1/2)
*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(
-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(
1/2)-240*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)
))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1
/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*
a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*El
lipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^
(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(
1/2))*(-a^2*b)^(1/3)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^12*a^3+480*I*(
-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I
*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x
+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)
^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I
*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^
(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*
b)^(2/3)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^11*a^2+240*I*(-(I*3^(1/2)-
3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a
^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1
/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3
^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*
x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*
3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*a^3*b*3^(1/2)*(x*(
a*x^3+b))^(1/2)*x^10+90*a^2*(a*x^4+b*x)^(1/2)*x^6*b*(x*(a*x^3+b))
^(1/2)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2
*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/
3)))^(1/2)+40*I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b
)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a
^2*b)^(1/3)))^(1/2)*3^(1/2)*(a*x^4+b*x)^(1/2)*(x*(a*x^3+b))^(1/2)
*x^9*a^3-240*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(
1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*
b)^(1/3)))^(1/2)*x^13*a^4+720*(x*(a*x^3+b))^(1/2)*x^13*a^4-120*a^
3*(a*x^4+b*x)^(1/2)*x^9*(x*(a*x^3+b))^(1/2)*(1/a^2*x*(-a*x+(-a^2*
b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1
/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)+80*I*(1/a^2*x*(-a
*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3)
)*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*
x^13*a^4-240*I*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^13*a^4-63*a*(a*x^4+b
*x)^(1/2)*x^3*b^2*(x*(a*x^3+b))^(1/2)*(1/a^2*x*(-a*x+(-a^2*b)^(1/
3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-
a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)-240*I*(-a^2*b)^(1/3)*3^
(1/2)*(x*(a*x^3+b))^(1/2)*x^12*a^3+80*I*(1/a^2*x*(-a*x+(-a^2*b)^(
1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*
(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*x^10*a^3*b+91
*I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x
+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))
^(1/2)*3^(1/2)*(a*x^4+b*x)^(1/2)*(x*(a*x^3+b))^(1/2)*b^3-240*I*(-
a^2*b)^(2/3)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^11*a^2+21*I*(1/a^2*x*(
-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/
3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2
```

```
)*(a*x^4+b*x)^(1/2)*(x*(a*x^3+b))^(1/2)*x^3*a*b^2-1440*(-(I*3^(1/
2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*
(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)
^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(
I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-
3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*
(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(2/3)*
(x*(a*x^3+b))^(1/2)*x^11*a^2-480*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1
)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(
-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(
1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a
^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(
-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/
2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(1/3)*(x*(a*x^3+b))^(1/2)*x^
12*a^3+480*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)
))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1
/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*
a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*El
lipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^
(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(
1/2))*a^3*b*(x*(a*x^3+b))^(1/2)*x^10-720*(-(I*3^(1/2)-3)*x*a/(I*3
^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)
+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)
*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(
-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1
/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/
(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*a^3*b*(x*(a*x^3+b))^(1/2)*x^1
0+720*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1
)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(
-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Ellipti
cE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)
,((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))
*(-a^2*b)^(1/3)*(x*(a*x^3+b))^(1/2)*x^12*a^3+960*(-(I*3^(1/2)-3)*
x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*
b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)
))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1
/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a
/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(
1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(2/3)*(x*(a*
x^3+b))^(1/2)*x^11*a^2-30*I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(
1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/
3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*(a*x^4+b*x)^(1/2)*(x*(a*x
^3+b))^(1/2)*x^6*a^2*b)/(a*x^3+b)/b^3/(I*3^(1/2)-3)/(1/a^2*x*(-a*
x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))
*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + \frac{b}{x^3}}}{x^9}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)/x^9,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a + b/x^3)/x^9, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{\frac{ax^3+b}{x^3}}}{x^9}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)/x^9,x, algorithm="fricas")
```

```
[Out] integral(sqrt((a*x^3 + b)/x^3)/x^9, x)
```

Sympy [A] time = 9.06312, size = 41, normalized size = 0.07

$$-\frac{\sqrt{a}\,\Gamma\left(\frac{8}{3}\right)\,{}_{2}F_{1}\left(\begin{matrix}-\frac{1}{2},\frac{8}{3}\\\frac{11}{3}\end{matrix}\middle|\frac{be^{i\pi}}{ax^{3}}\right)}{3x^{8}\,\Gamma\left(\frac{11}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**3)**(1/2)/x**9,x)
```

```
[Out] -sqrt(a)*gamma(8/3)*hyper((-1/2, 8/3), (11/3,), b*exp_polar(I*pi)
/(a*x**3))/(3*x**8*gamma(11/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + \frac{b}{x^{3}}}}{x^{9}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^3)/x^9,x, algorithm="giac")
```

```
[Out] integrate(sqrt(a + b/x^3)/x^9, x)
```

3.2008 $\int \left(a+\frac{b}{x^3}\right)^{3/2} x^5 \, dx$

Optimal. Leaf size=68

$$\frac{b^2 \tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)}{4\sqrt{a}}+\frac{1}{4}bx^3\sqrt{a+\frac{b}{x^3}}+\frac{1}{6}x^6\left(a+\frac{b}{x^3}\right)^{3/2}$$

```
[Out] (b*Sqrt[a + b/x^3]*x^3)/4 + ((a + b/x^3)^(3/2)*x^6)/6 + (b^2*ArcT
anh[Sqrt[a + b/x^3]/Sqrt[a]])/(4*Sqrt[a])
```

Rubi [A] time = 0.112587, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{b^2 \tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)}{4\sqrt{a}}+\frac{1}{4}bx^3\sqrt{a+\frac{b}{x^3}}+\frac{1}{6}x^6\left(a+\frac{b}{x^3}\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^3)^(3/2)*x^5,x]
```

```
[Out] (b*Sqrt[a + b/x^3]*x^3)/4 + ((a + b/x^3)^(3/2)*x^6)/6 + (b^2*ArcT
anh[Sqrt[a + b/x^3]/Sqrt[a]])/(4*Sqrt[a])
```

Rubi in Sympy [A] time = 9.61194, size = 58, normalized size = 0.85

$$\frac{bx^3\sqrt{a+\frac{b}{x^3}}}{4}+\frac{x^6\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}}{6}+\frac{b^2 \operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)}{4\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**3)**(3/2)*x**5,x)
```

```
[Out] b*x**3*sqrt(a + b/x**3)/4 + x**6*(a + b/x**3)**(3/2)/6 + b**2*ata
nh(sqrt(a + b/x**3)/sqrt(a))/(4*sqrt(a))
```

Mathematica [A] time = 0.146723, size = 81, normalized size = 1.19

$$\frac{1}{12}x^{3/2}\sqrt{a+\frac{b}{x^3}}\left(\frac{3b^2 \tanh^{-1}\left(\frac{\sqrt{a}x^{3/2}}{\sqrt{ax^3+b}}\right)}{\sqrt{a}\sqrt{ax^3+b}}+x^{3/2}\left(2ax^3+5b\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^3)^(3/2)*x^5,x]
```

```
[Out] (Sqrt[a + b/x^3]*x^(3/2)*(x^(3/2)*(5*b + 2*a*x^3) + (3*b^2*ArcTan
h[(Sqrt[a]*x^(3/2))/Sqrt[b + a*x^3]])/(Sqrt[a]*Sqrt[b + a*x^3])))
/12
```

Maple [C] time = 0.019, size = 3569, normalized size = 52.5

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^3)^(3/2)*x^5,x)
```

```
[Out] -1/12*((a*x^3+b)/x^3)^(3/2)*x^5/a^2*(36*I*(-a^2*b)^(1/3)*3^(1/2)*
(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((
I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*
x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b
)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticPi((-
(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),(I*3
^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1
)/(I*3^(1/2)-3))^(1/2))*x*a*b^2-36*I*(-a^2*b)^(1/3)*3^(1/2)*(-(I*
3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(
1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a
^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/
3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(
1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2
)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x*a*b^2-18
*I*(-a^2*b)^(2/3)*3^(1/2)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x
+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)
^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-
a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(
1/3)))^(1/2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(
-a^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*
(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*b^2-5*I*(1/a^2*
x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^
(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(a*
x^4+b*x)^(1/2)*3^(1/2)*x*a^2*b-18*I*3^(1/2)*(-(I*3^(1/2)-3)*x*a/(
I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1
/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1
)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*
3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-
3),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2
))*x^2*a^2*b^2+18*I*(-a^2*b)^(2/3)*3^(1/2)*(-(I*3^(1/2)-3)*x*a/(I
*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/
3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/
2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)
/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^
(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1
)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*b^2-2*I*3^(1/2)*(1/a^2*x*(-
a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3
))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(a*x^4+
b*x)^(1/2)*x^4*a^3-18*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a
^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/
3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*
b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)
))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*
b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^
(1/2)-3))^(1/2))*x^2*a^2*b^2+18*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)
/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-
a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1
/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^
2*b)^(1/3)))^(1/2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(
-a*x+(-a^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/
2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^2*a^2*b
^2+36*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1
)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(
-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Ellipti
cF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)
,((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))
*(-a^2*b)^(1/3)*x*a*b^2-36*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*
x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b
)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(
-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^
(1/3)))^(1/2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+
(-a^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)
```

```
*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(1/3)
*x*a*b^2+6*x^4*(a*x^4+b*x)^(1/2)*a^3*(1/a^2*x*(-a*x+(-a^2*b)^(1/3
))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a
^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)-18*(-(I*3^(1/2)-3)*x*a/(
I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1
/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1
)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3
^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-
1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(2/3)*b^2+18*(-(I
*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^
(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-
a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1
/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticPi((-(I*3
^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),(I*3^(1/
2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I
*3^(1/2)-3))^(1/2))*(-a^2*b)^(2/3)*b^2+18*I*3^(1/2)*(-(I*3^(1/2)-
3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a
^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1
/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3
^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*
x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*
3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^2*a^2*b^2+15*b*x
*(a*x^4+b*x)^(1/2)*a^2*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*
(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*
a*x-(-a^2*b)^(1/3)))^(1/2))/(a*x^3+b)/(x*(a*x^3+b))^(1/2)/(I*3^(1
/2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2
*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/
3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^3)^(3/2)*x^5,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.372458, size = 1, normalized size = 0.01

$$\left[\frac{3\,\sqrt{a}b^2\log\left(-\left(8\,a^2x^6+8\,abx^3+b^2\right)\sqrt{a}-4\left(2\,a^2x^6+abx^3\right)\sqrt{\frac{ax^3+b}{x^3}}\right)+4\left(2\,a^2x^6+5\,abx^3\right)\sqrt{\frac{ax^3+b}{x^3}}}{48\,a},\; -\frac{3\,\sqrt{-a}b^2\arctan\left(\frac{2\,\sqrt{-a}x^3\sqrt{\frac{ax^3+b}{x^3}}}{2\,ax^3+b}\right)-2\left(2\,a^2x^6+5\,abx^3\right)\sqrt{\frac{ax^3+b}{x^3}}}{24\,a}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^3)^(3/2)*x^5,x, algorithm="fricas")
```

```
[Out] [1/48*(3*sqrt(a)*b^2*log(-(8*a^2*x^6 + 8*a*b*x^3 + b^2)*sqrt(a) -
 4*(2*a^2*x^6 + a*b*x^3)*sqrt((a*x^3 + b)/x^3)) + 4*(2*a^2*x^6 +
5*a*b*x^3)*sqrt((a*x^3 + b)/x^3))/a, -1/24*(3*sqrt(-a)*b^2*arctan
(2*sqrt(-a)*x^3*sqrt((a*x^3 + b)/x^3)/(2*a*x^3 + b)) - 2*(2*a^2*x
^6 + 5*a*b*x^3)*sqrt((a*x^3 + b)/x^3))/a]
```

Sympy [A] time = 18.6384, size = 76, normalized size = 1.12

$$\frac{a\sqrt{b}x^{\frac{9}{2}}\sqrt{\frac{ax^3}{b}+1}}{6}+\frac{5b^{\frac{3}{2}}x^{\frac{3}{2}}\sqrt{\frac{ax^3}{b}+1}}{12}+\frac{b^2\operatorname{asinh}\left(\frac{\sqrt{a}x^{\frac{3}{2}}}{\sqrt{b}}\right)}{4\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**3)**(3/2)*x**5,x)
```

```
[Out] a*sqrt(b)*x**(9/2)*sqrt(a*x**3/b + 1)/6 + 5*b**(3/2)*x**(3/2)*sqr
t(a*x**3/b + 1)/12 + b**2*asinh(sqrt(a)*x**(3/2)/sqrt(b))/(4*sqrt
(a))
```

GIAC/XCAS [A] time = 0.250621, size = 69, normalized size = 1.01

$$\frac{1}{12}\sqrt{ax^4+bx}\left(2\,ax^3+5\,b\right)x-\frac{b^2\arctan\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{-a}}\right)}{4\sqrt{-a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^3)^(3/2)*x^5,x, algorithm="giac")
```

```
[Out] 1/12*sqrt(a*x^4 + b*x)*(2*a*x^3 + 5*b)*x - 1/4*b^2*arctan(sqrt(a
+ b/x^3)/sqrt(-a))/sqrt(-a)
```

3.2009 $\int \left(a+\frac{b}{x^3}\right)^{3/2} x^2 \, dx$

Optimal. Leaf size=58

$$\frac{1}{3}x^3\left(a+\frac{b}{x^3}\right)^{3/2}-b\sqrt{a+\frac{b}{x^3}}+\sqrt{a}b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)$$

```
[Out] -(b*Sqrt[a + b/x^3]) + ((a + b/x^3)^(3/2)*x^3)/3 + Sqrt[a]*b*ArcT
anh[Sqrt[a + b/x^3]/Sqrt[a]]
```

Rubi [A] time = 0.105789, antiderivative size = 58, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$

$$\frac{1}{3}x^3\left(a+\frac{b}{x^3}\right)^{3/2}-b\sqrt{a+\frac{b}{x^3}}+\sqrt{a}b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^3)^(3/2)*x^2,x]
```

```
[Out] -(b*Sqrt[a + b/x^3]) + ((a + b/x^3)^(3/2)*x^3)/3 + Sqrt[a]*b*ArcT
anh[Sqrt[a + b/x^3]/Sqrt[a]]
```

Rubi in Sympy [A] time = 8.87008, size = 49, normalized size = 0.84

$$\sqrt{a}b\,\text{atanh}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)-b\sqrt{a+\frac{b}{x^3}}+\frac{x^3\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**3)**(3/2)*x**2,x)
```

```
[Out] sqrt(a)*b*atanh(sqrt(a + b/x**3)/sqrt(a)) - b*sqrt(a + b/x**3) +
x**3*(a + b/x**3)**(3/2)/3
```

Mathematica [A] time = 0.094162, size = 71, normalized size = 1.22

$$\frac{1}{3}\sqrt{a+\frac{b}{x^3}}\left(\frac{3\sqrt{a}bx^{3/2}\tanh^{-1}\left(\frac{\sqrt{a}x^{3/2}}{\sqrt{ax^3+b}}\right)}{\sqrt{ax^3+b}}+ax^3-2b\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^3)^(3/2)*x^2,x]
```

```
[Out] (Sqrt[a + b/x^3]*(-2*b + a*x^3 + (3*Sqrt[a]*b*x^(3/2)*ArcTanh[(Sq
rt[a]*x^(3/2))/Sqrt[b + a*x^3]])/Sqrt[b + a*x^3]))/3
```

Maple [C] time = 0.025, size = 3559, normalized size = 61.4

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^3)^(3/2)*x^2,x)
```

```
[Out] -1/3*((a*x^3+b)/x^3)^(3/2)*x^3/a*(18*I*(-a^2*b)^(2/3)*(-(I*3^(1/2
)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(
-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^
(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I
*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3
)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(
I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*x^2*b-I*
(a*x^4+b*x)^(1/2)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2
*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(
-a^2*b)^(1/3)))^(1/2)*3^(1/2)*x^3*a^2-36*I*(-a^2*b)^(1/3)*(-(I*3^
(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/
2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2
*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)
)/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/
2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+
3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*x^3*
a*b+18*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))
^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2
)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*
x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Elli
pticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/
2))*3^(1/2)*x^4*a^2*b-18*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*
x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b
)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(
-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^
(1/3)))^(1/2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+
(-a^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)
*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*x^4*a^
2*b-18*I*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(
-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(
1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^
2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/
3)))^(1/2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a
^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I
*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*x^2*b-18*
(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((
I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*
x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b
)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(
I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3
^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^4*a
^2*b+18*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^
(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)
+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x
-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Ellip
ticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3
^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^4*a^2*b+36*(-a^2*b)^(1/3)*(-(I*
3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(
1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a
^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/
3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(
1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2
)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^3*a*b-36
*(-a^2*b)^(1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^
(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I
*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/
3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/
2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1
/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2)
-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^3*a*b-18*(-a^2*b)^(2/3)
*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(
(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a
```

```
*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*
b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-
(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*
3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^2*
b+18*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2
*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3)
)/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)
^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))
^(1/2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b
)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(
1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^2*b+36*I*(-a^2*b)^(
1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/
2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)
/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-
a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Elliptic
Pi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)
,(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1
/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*x^3*a*b+3*(a*x^4+b*x)^(1/2)*
(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-
a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1
/2)*x^3*a^2+2*I*(a*x^4+b*x)^(1/2)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*
(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*
b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*a*b-6*(a*x^4+b*x)^(
1/2)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a
*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)
))^(1/2)*a*b)/(a*x^3+b)/(x*(a*x^3+b))^(1/2)/(I*3^(1/2)-3)/(1/a^2*
x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^
(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^3)^(3/2)*x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.377153, size = 1, normalized size = 0.02

$$\left[\frac{1}{4}\sqrt{a}b\log\left(-8\,a^2x^6-8\,abx^3-b^2-4\left(2\,ax^6+bx^3\right)\sqrt{a}\sqrt{\frac{ax^3+b}{x^3}}\right)+\frac{1}{3}\left(ax^3-2\,b\right)\sqrt{\frac{ax^3+b}{x^3}},\frac{1}{2}\sqrt{-a}b\arctan\left(\frac{2\,ax^3\sqrt{\frac{ax^3+b}{x^3}}}{(2\,ax^3+b)\sqrt{-a}}\right)+\frac{1}{3}\left(ax^3-2\,b\right)\sqrt{\frac{ax^3+b}{x^3}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^3)^(3/2)*x^2,x, algorithm="fricas")
```

```
[Out] [1/4*sqrt(a)*b*log(-8*a^2*x^6 - 8*a*b*x^3 - b^2 - 4*(2*a*x^6 + b*
x^3)*sqrt(a)*sqrt((a*x^3 + b)/x^3)) + 1/3*(a*x^3 - 2*b)*sqrt((a*x
^3 + b)/x^3), 1/2*sqrt(-a)*b*arctan(2*a*x^3*sqrt((a*x^3 + b)/x^3)
/((2*a*x^3 + b)*sqrt(-a))) + 1/3*(a*x^3 - 2*b)*sqrt((a*x^3 + b)/x
^3)]
```

Sympy [A] time = 12.0979, size = 100, normalized size = 1.72

$$\sqrt{a}b\operatorname{asinh}\left(\frac{\sqrt{a}x^{\frac{3}{2}}}{\sqrt{b}}\right)+\frac{a^2x^{\frac{9}{2}}}{3\sqrt{b}\sqrt{\frac{ax^3}{b}+1}}-\frac{a\sqrt{b}x^{\frac{3}{2}}}{3\sqrt{\frac{ax^3}{b}+1}}-\frac{2b^{\frac{3}{2}}}{3x^{\frac{3}{2}}\sqrt{\frac{ax^3}{b}+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**3)**(3/2)*x**2,x)
```

```
[Out] sqrt(a)*b*asinh(sqrt(a)*x**(3/2)/sqrt(b)) + a**2*x**(9/2)/(3*sqrt
(b)*sqrt(a*x**3/b + 1)) - a*sqrt(b)*x**(3/2)/(3*sqrt(a*x**3/b + 1
)) - 2*b**(3/2)/(3*x**(3/2)*sqrt(a*x**3/b + 1))
```

GIAC/XCAS [A] time = 0.261813, size = 72, normalized size = 1.24

$$\frac{1}{3}\sqrt{ax^4+bx}ax-\frac{ab\arctan\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{-a}}\right)}{\sqrt{-a}}-\frac{2}{3}\sqrt{a+\frac{b}{x^3}}b$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^3)^(3/2)*x^2,x, algorithm="giac")
```

```
[Out] 1/3*sqrt(a*x^4 + b*x)*a*x - a*b*arctan(sqrt(a + b/x^3)/sqrt(-a))/
sqrt(-a) - 2/3*sqrt(a + b/x^3)*b
```

3.2010 $\int \frac{\left(a+\frac{b}{x^3}\right)^{3/2}}{x} dx$

Optimal. Leaf size=59

$$\frac{2}{3}a^{3/2}\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)-\frac{2}{3}a\sqrt{a+\frac{b}{x^3}}-\frac{2}{9}\left(a+\frac{b}{x^3}\right)^{3/2}$$

```
[Out] (-2*a*Sqrt[a + b/x^3])/3 - (2*(a + b/x^3)^(3/2))/9 + (2*a^(3/2)*A
rcTanh[Sqrt[a + b/x^3]/Sqrt[a]])/3
```

Rubi [A] time = 0.103361, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{2}{3}a^{3/2}\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)-\frac{2}{3}a\sqrt{a+\frac{b}{x^3}}-\frac{2}{9}\left(a+\frac{b}{x^3}\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^3)^(3/2)/x,x]
```

```
[Out] (-2*a*Sqrt[a + b/x^3])/3 - (2*(a + b/x^3)^(3/2))/9 + (2*a^(3/2)*A
rcTanh[Sqrt[a + b/x^3]/Sqrt[a]])/3
```

Rubi in Sympy [A] time = 8.55991, size = 53, normalized size = 0.9

$$\frac{2a^{\frac{3}{2}}\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)}{3}-\frac{2a\sqrt{a+\frac{b}{x^3}}}{3}-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**3)**(3/2)/x,x)
```

```
[Out] 2*a**(3/2)*atanh(sqrt(a + b/x**3)/sqrt(a))/3 - 2*a*sqrt(a + b/x**
3)/3 - 2*(a + b/x**3)**(3/2)/9
```

Mathematica [A] time = 0.0822024, size = 86, normalized size = 1.46

$$\frac{2\sqrt{a+\frac{b}{x^3}}\left(3a^{3/2}x^{9/2}\tanh^{-1}\left(\frac{\sqrt{a}x^{3/2}}{\sqrt{ax^3+b}}\right)-\sqrt{ax^3+b}\left(4ax^3+b\right)\right)}{9x^3\sqrt{ax^3+b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^3)^(3/2)/x,x]
```

```
[Out] (2*Sqrt[a + b/x^3]*(-(Sqrt[b + a*x^3]*(b + 4*a*x^3)) + 3*a^(3/2)*
x^(9/2)*ArcTanh[(Sqrt[a]*x^(3/2))/Sqrt[b + a*x^3]]))/(9*x^3*Sqrt[
b + a*x^3])
```

Maple [C] time = 0.049, size = 3535, normalized size = 59.9

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^3)^(3/2)/x,x)
```

```
[Out] -2/9*((a*x^3+b)/x^3)^(3/2)*(36*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1
)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(
-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(
1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a
^2*b)^(1/3)))^(1/2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/
(-a*x+(-a^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1
/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)
^(1/3)*3^(1/2)*x^6*a+18*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x
+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)
^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-
a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(
1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-
a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(
I*3^(1/2)-3))^(1/2))*3^(1/2)*x^7*a^2-18*I*(-(I*3^(1/2)-3)*x*a/(I*
3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3
)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2
)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/
(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^
(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3)
,((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))
*(-a^2*b)^(2/3)*3^(1/2)*x^5-36*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1
)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(
-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(
1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a
^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(
-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/
2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(1/3)*3^(1/2)*x^6*a+18*I*(-(
I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3
^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(
-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(
1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3
^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1
/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)
^(2/3)*3^(1/2)*x^5-18*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a
^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/
3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*
b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)
))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*
b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^
(1/2)-3))^(1/2))*x^7*a^2+I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1
/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3
)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(a*x^4+b*x)^(1/2)*3^(1/2)*b+18*(-(
I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3
^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(
-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(
1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticPi((-(I*
3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),(I*3^(1
/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(
I*3^(1/2)-3))^(1/2))*x^7*a^2+36*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)
/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-
a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1
/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^
2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-
a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2
)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(1/3)*x^6*a-36*(-(I*3^(1/2)-3
)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^
2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/
3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^
(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticPi((-(I*3^(1/2)-3)*
x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3
^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3
))^(1/2))*(-a^2*b)^(1/3)*x^6*a-18*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-
1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+
(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^
```

```
(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-
a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/
(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1
/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(2/3)*x^5+18*(-(I*3^(1/2)-3
)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^
2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/
3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^
(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticPi((-(I*3^(1/2)-3)*
x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3
^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3
))^(1/2))*(-a^2*b)^(2/3)*x^5-18*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-
1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+
(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^
(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-
a^2*b)^(1/3)))^(1/2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)
/(-a*x+(-a^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(
1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)
*x^7*a^2-12*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1
/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b
)^(1/3)))^(1/2)*(a*x^4+b*x)^(1/2)*x^3*a+4*I*(1/a^2*x*(-a*x+(-a^2*
b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1
/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(a*x^4+b*x)^(1/2)
*3^(1/2)*x^3*a-3*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*
b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-
a^2*b)^(1/3)))^(1/2)*(a*x^4+b*x)^(1/2)*b)/(a*x^3+b)/(x*(a*x^3+b))
^(1/2)/(I*3^(1/2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-
a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*
x-(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^3)^(3/2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.364618, size = 1, normalized size = 0.02

$$\left[\frac{3\,a^{\frac{3}{2}}x^{3}\log\left(-8\,a^{2}x^{6}-8\,abx^{3}-b^{2}-4\left(2\,ax^{6}+bx^{3}\right)\sqrt{a}\sqrt{\frac{ax^{3}+b}{x^{3}}}\right)-4\left(4\,ax^{3}+b\right)\sqrt{\frac{ax^{3}+b}{x^{3}}}}{18\,x^{3}},\ \frac{3\sqrt{-a}ax^{3}\arctan\left(\frac{2\,ax^{3}\sqrt{\frac{ax^{3}+b}{x^{3}}}}{\left(2\,ax^{3}+b\right)\sqrt{-a}}\right)\cdot}{9\,x^{3}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^3)^(3/2)/x,x, algorithm="fricas")
```

```
[Out] [1/18*(3*a^(3/2)*x^3*log(-8*a^2*x^6 - 8*a*b*x^3 - b^2 - 4*(2*a*x^
6 + b*x^3)*sqrt(a)*sqrt((a*x^3 + b)/x^3)) - 4*(4*a*x^3 + b)*sqrt(
(a*x^3 + b)/x^3))/x^3, 1/9*(3*sqrt(-a)*a*x^3*arctan(2*a*x^3*sqrt(
(a*x^3 + b)/x^3)/((2*a*x^3 + b)*sqrt(-a))) - 2*(4*a*x^3 + b)*sqrt
((a*x^3 + b)/x^3))/x^3]
```

Sympy [A] time = 8.92202, size = 83, normalized size = 1.41

$$-\frac{8a^{\frac{3}{2}}\sqrt{1+\frac{b}{ax^{3}}}}{9}-\frac{a^{\frac{3}{2}}\log\left(\frac{b}{ax^{3}}\right)}{3}+\frac{2a^{\frac{3}{2}}\log\left(\sqrt{1+\frac{b}{ax^{3}}}+1\right)}{3}-\frac{2\sqrt{a}b\sqrt{1+\frac{b}{ax^{3}}}}{9x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**3)**(3/2)/x,x)
```

```
[Out] -8*a**(3/2)*sqrt(1 + b/(a*x**3))/9 - a**(3/2)*log(b/(a*x**3))/3 +
 2*a**(3/2)*log(sqrt(1 + b/(a*x**3)) + 1)/3 - 2*sqrt(a)*b*sqrt(1
+ b/(a*x**3))/(9*x**3)
```

GIAC/XCAS [A] time = 0.321246, size = 68, normalized size = 1.15

$$-\frac{2\,a^{2}\arctan\left(\frac{\sqrt{a+\frac{b}{x^{3}}}}{\sqrt{-a}}\right)}{3\,\sqrt{-a}}-\frac{2}{9}\left(a+\frac{b}{x^{3}}\right)^{\frac{3}{2}}-\frac{2}{3}\,\sqrt{a+\frac{b}{x^{3}}}a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^3)^(3/2)/x,x, algorithm="giac")
```

```
[Out] -2/3*a^2*arctan(sqrt(a + b/x^3)/sqrt(-a))/sqrt(-a) - 2/9*(a + b/x
^3)^(3/2) - 2/3*sqrt(a + b/x^3)*a
```

3.2011 $\int \frac{\left(a+\frac{b}{x^3}\right)^{3/2}}{x^4}\,dx$

Optimal. Leaf size=18

$$-\frac{2\left(a+\frac{b}{x^3}\right)^{5/2}}{15b}$$

```
[Out] (-2*(a + b/x^3)^(5/2))/(15*b)
```

Rubi [A] time = 0.0291361, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{2\left(a+\frac{b}{x^3}\right)^{5/2}}{15b}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^3)^(3/2)/x^4,x]

[Out] (-2*(a + b/x^3)^(5/2))/(15*b)
```

Rubi in Sympy [A] time = 2.10001, size = 15, normalized size = 0.83

$$-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{5}{2}}}{15b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**3)**(3/2)/x**4,x)

[Out] -2*(a + b/x**3)**(5/2)/(15*b)
```

Mathematica [A] time = 0.029953, size = 30, normalized size = 1.67

$$-\frac{2\sqrt{a+\frac{b}{x^3}}\left(ax^3+b\right)^2}{15bx^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^3)^(3/2)/x^4,x]

[Out] (-2*Sqrt[a + b/x^3]*(b + a*x^3)^2)/(15*b*x^6)
```

Maple [A] time = 0.008, size = 29, normalized size = 1.6

$$-\frac{2\,ax^3+2\,b}{15\,bx^3}\left(\frac{ax^3+b}{x^3}\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^3)^(3/2)/x^4,x)

[Out] -2/15/x^3*(a*x^3+b)/b*((a*x^3+b)/x^3)^(3/2)
```

Maxima [A] time = 1.49112, size = 19, normalized size = 1.06

$$-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{5}{2}}}{15\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^3)^(3/2)/x^4,x, algorithm="maxima")

[Out] -2/15*(a + b/x^3)^(5/2)/b
```

Fricas [A] time = 0.236259, size = 53, normalized size = 2.94

$$-\frac{2\left(a^2x^6+2\,abx^3+b^2\right)\sqrt{\frac{ax^3+b}{x^3}}}{15\,bx^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^3)^(3/2)/x^4,x, algorithm="fricas")

[Out] -2/15*(a^2*x^6 + 2*a*b*x^3 + b^2)*sqrt((a*x^3 + b)/x^3)/(b*x^6)
```

Sympy [A] time = 6.10294, size = 71, normalized size = 3.94

$$-\frac{2a^{\frac{5}{2}}\sqrt{1+\frac{b}{ax^3}}}{15b}-\frac{4a^{\frac{3}{2}}\sqrt{1+\frac{b}{ax^3}}}{15x^3}-\frac{2\sqrt{a}b\sqrt{1+\frac{b}{ax^3}}}{15x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**3)**(3/2)/x**4,x)

[Out] -2*a**(5/2)*sqrt(1 + b/(a*x**3))/(15*b) - 4*a**(3/2)*sqrt(1 + b/(
a*x**3))/(15*x**3) - 2*sqrt(a)*b*sqrt(1 + b/(a*x**3))/(15*x**6)
```

GIAC/XCAS [A] time = 0.233162, size = 19, normalized size = 1.06

$$-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{5}{2}}}{15\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^3)^(3/2)/x^4,x, algorithm="giac")

[Out] -2/15*(a + b/x^3)^(5/2)/b
```

3.2012 $\int \frac{\left(a+\frac{b}{x^3}\right)^{3/2}}{x^7}\,dx$

Optimal. Leaf size=38

$$\frac{2a\left(a+\frac{b}{x^3}\right)^{5/2}}{15b^2}-\frac{2\left(a+\frac{b}{x^3}\right)^{7/2}}{21b^2}$$

```
[Out] (2*a*(a + b/x^3)^(5/2))/(15*b^2) - (2*(a + b/x^3)^(7/2))/(21*b^2)
```

Rubi [A] time = 0.0680981, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2a\left(a+\frac{b}{x^3}\right)^{5/2}}{15b^2}-\frac{2\left(a+\frac{b}{x^3}\right)^{7/2}}{21b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^3)^(3/2)/x^7,x]

[Out] (2*a*(a + b/x^3)^(5/2))/(15*b^2) - (2*(a + b/x^3)^(7/2))/(21*b^2)
```

Rubi in Sympy [A] time = 7.02074, size = 34, normalized size = 0.89

$$\frac{2a\left(a+\frac{b}{x^3}\right)^{\frac{5}{2}}}{15b^2}-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{7}{2}}}{21b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**3)**(3/2)/x**7,x)

[Out] 2*a*(a + b/x**3)**(5/2)/(15*b**2) - 2*(a + b/x**3)**(7/2)/(21*b**
2)
```

Mathematica [A] time = 0.0394491, size = 40, normalized size = 1.05

$$\frac{2\sqrt{a+\frac{b}{x^3}}\left(ax^3+b\right)^2\left(2ax^3-5b\right)}{105b^2x^9}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^3)^(3/2)/x^7,x]

[Out] (2*Sqrt[a + b/x^3]*(b + a*x^3)^2*(-5*b + 2*a*x^3))/(105*b^2*x^9)
```

Maple [A] time = 0.007, size = 39, normalized size = 1.

$$\frac{\left(2\,ax^3+2\,b\right)\left(2\,ax^3-5\,b\right)}{105\,b^2x^6}\left(\frac{ax^3+b}{x^3}\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^3)^(3/2)/x^7,x)
```

```
[Out] 2/105*(a*x^3+b)*(2*a*x^3-5*b)*((a*x^3+b)/x^3)^(3/2)/b^2/x^6
```

Maxima [A] time = 1.44498, size = 41, normalized size = 1.08

$$-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{7}{2}}}{21\,b^2}+\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{5}{2}}a}{15\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^3)^(3/2)/x^7,x, algorithm="maxima")
```

```
[Out] -2/21*(a + b/x^3)^(7/2)/b^2 + 2/15*(a + b/x^3)^(5/2)*a/b^2
```

Fricas [A] time = 0.235736, size = 72, normalized size = 1.89

$$\frac{2\left(2\,a^3x^9-a^2bx^6-8\,ab^2x^3-5\,b^3\right)\sqrt{\frac{ax^3+b}{x^3}}}{105\,b^2x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^3)^(3/2)/x^7,x, algorithm="fricas")
```

```
[Out] 2/105*(2*a^3*x^9 - a^2*b*x^6 - 8*a*b^2*x^3 - 5*b^3)*sqrt((a*x^3 +
 b)/x^3)/(b^2*x^9)
```

Sympy [A] time = 10.7871, size = 371, normalized size = 9.76

$$\frac{4a^{\frac{15}{2}}b^{\frac{3}{2}}x^{12}\sqrt{\frac{ax^3}{b}+1}}{105a^{\frac{9}{2}}b^3x^{\frac{27}{2}}+105a^{\frac{7}{2}}b^4x^{\frac{21}{2}}}+\frac{2a^{\frac{13}{2}}b^{\frac{5}{2}}x^9\sqrt{\frac{ax^3}{b}+1}}{105a^{\frac{9}{2}}b^3x^{\frac{27}{2}}+105a^{\frac{7}{2}}b^4x^{\frac{21}{2}}}-\frac{18a^{\frac{11}{2}}b^{\frac{7}{2}}x^6\sqrt{\frac{ax^3}{b}+1}}{105a^{\frac{9}{2}}b^3x^{\frac{27}{2}}+105a^{\frac{7}{2}}b^4x^{\frac{21}{2}}}-\frac{26a^{\frac{9}{2}}b^{\frac{9}{2}}x^3\sqrt{\frac{ax^3}{b}+1}}{105a^{\frac{9}{2}}b^3x^{\frac{27}{2}}+105a^{\frac{7}{2}}b^4x^{\frac{21}{2}}}-\frac{10a^{\frac{7}{2}}b^{\frac{11}{2}}\sqrt{\frac{ax^3}{b}+1}}{105a^{\frac{9}{2}}b^3x^{\frac{27}{2}}+105a^{\frac{7}{2}}b^4x^{\frac{21}{2}}}-\frac{4a^8bx^{\frac{27}{2}}}{105a^{\frac{9}{2}}b^3x^{\frac{27}{2}}+105a^{\frac{7}{2}}b^4x^{\frac{21}{2}}}-\frac{4a^7b^2x^{\frac{21}{2}}}{105a^{\frac{9}{2}}b^3x^{\frac{27}{2}}+105a^{\frac{7}{2}}b^4x^{\frac{21}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**3)**(3/2)/x**7,x)
```

```
[Out] 4*a**(15/2)*b**(3/2)*x**12*sqrt(a*x**3/b + 1)/(105*a**(9/2)*b**3*
x**(27/2) + 105*a**(7/2)*b**4*x**(21/2)) + 2*a**(13/2)*b**(5/2)*x
**9*sqrt(a*x**3/b + 1)/(105*a**(9/2)*b**3*x**(27/2) + 105*a**(7/2
)*b**4*x**(21/2)) - 18*a**(11/2)*b**(7/2)*x**6*sqrt(a*x**3/b + 1)
/(105*a**(9/2)*b**3*x**(27/2) + 105*a**(7/2)*b**4*x**(21/2)) - 26
*a**(9/2)*b**(9/2)*x**3*sqrt(a*x**3/b + 1)/(105*a**(9/2)*b**3*x**
(27/2) + 105*a**(7/2)*b**4*x**(21/2)) - 10*a**(7/2)*b**(11/2)*sqr
t(a*x**3/b + 1)/(105*a**(9/2)*b**3*x**(27/2) + 105*a**(7/2)*b**4*
x**(21/2)) - 4*a**8*b*x**(27/2)/(105*a**(9/2)*b**3*x**(27/2) + 10
5*a**(7/2)*b**4*x**(21/2)) - 4*a**7*b**2*x**(21/2)/(105*a**(9/2)*
b**3*x**(27/2) + 105*a**(7/2)*b**4*x**(21/2))
```

GIAC/XCAS [A] time = 0.241607, size = 105, normalized size = 2.76

$$-\frac{2\left(\frac{7\left(3\left(a+\frac{b}{x^3}\right)^{\frac{5}{2}}-5\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}a\right)a}{b}+\frac{15\left(a+\frac{b}{x^3}\right)^{\frac{7}{2}}-42\left(a+\frac{b}{x^3}\right)^{\frac{5}{2}}a+35\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}a^2}{b}\right)}{315\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^3)^(3/2)/x^7,x, algorithm="giac")
```

```
[Out] -2/315*(7*(3*(a + b/x^3)^(5/2) - 5*(a + b/x^3)^(3/2)*a)*a/b + (15
*(a + b/x^3)^(7/2) - 42*(a + b/x^3)^(5/2)*a + 35*(a + b/x^3)^(3/2
)*a^2)/b)/b
```

3.2013 $\int \frac{\left(a+\frac{b}{x^3}\right)^{3/2}}{x^{10}} dx$

Optimal. Leaf size=59

$$-\frac{2a^2\left(a+\frac{b}{x^3}\right)^{5/2}}{15b^3}-\frac{2\left(a+\frac{b}{x^3}\right)^{9/2}}{27b^3}+\frac{4a\left(a+\frac{b}{x^3}\right)^{7/2}}{21b^3}$$

```
[Out] (-2*a^2*(a + b/x^3)^(5/2))/(15*b^3) + (4*a*(a + b/x^3)^(7/2))/(21
*b^3) - (2*(a + b/x^3)^(9/2))/(27*b^3)
```

Rubi [A] time = 0.0954765, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2a^2\left(a+\frac{b}{x^3}\right)^{5/2}}{15b^3}-\frac{2\left(a+\frac{b}{x^3}\right)^{9/2}}{27b^3}+\frac{4a\left(a+\frac{b}{x^3}\right)^{7/2}}{21b^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x^3)^(3/2)/x^10,x]
```

```
[Out] (-2*a^2*(a + b/x^3)^(5/2))/(15*b^3) + (4*a*(a + b/x^3)^(7/2))/(21
*b^3) - (2*(a + b/x^3)^(9/2))/(27*b^3)
```

Rubi in Sympy [A] time = 10.574, size = 54, normalized size = 0.92

$$-\frac{2a^2\left(a+\frac{b}{x^3}\right)^{\frac{5}{2}}}{15b^3}+\frac{4a\left(a+\frac{b}{x^3}\right)^{\frac{7}{2}}}{21b^3}-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{9}{2}}}{27b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x**3)**(3/2)/x**10,x)
```

```
[Out] -2*a**2*(a + b/x**3)**(5/2)/(15*b**3) + 4*a*(a + b/x**3)**(7/2)/(
21*b**3) - 2*(a + b/x**3)**(9/2)/(27*b**3)
```

Mathematica [A] time = 0.0462347, size = 51, normalized size = 0.86

$$-\frac{2\sqrt{a+\frac{b}{x^3}}\left(ax^3+b\right)^2\left(8a^2x^6-20abx^3+35b^2\right)}{945b^3x^{12}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x^3)^(3/2)/x^10,x]
```

```
[Out] (-2*Sqrt[a + b/x^3]*(b + a*x^3)^2*(35*b^2 - 20*a*b*x^3 + 8*a^2*x^
6))/(945*b^3*x^12)
```

Maple [A] time = 0.009, size = 50, normalized size = 0.9

$$-\frac{\left(2\,ax^3+2\,b\right)\left(8\,a^2x^6-20\,abx^3+35\,b^2\right)}{945\,b^3x^9}\left(\frac{ax^3+b}{x^3}\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^3)^(3/2)/x^10,x)
```

```
[Out] -2/945*(a*x^3+b)*(8*a^2*x^6-20*a*b*x^3+35*b^2)*((a*x^3+b)/x^3)^(3
/2)/b^3/x^9
```

Maxima [A] time = 1.42616, size = 63, normalized size = 1.07

$$-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{9}{2}}}{27\,b^3}+\frac{4\left(a+\frac{b}{x^3}\right)^{\frac{7}{2}}a}{21\,b^3}-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{5}{2}}a^2}{15\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^3)^(3/2)/x^10,x, algorithm="maxima")
```

```
[Out] -2/27*(a + b/x^3)^(9/2)/b^3 + 4/21*(a + b/x^3)^(7/2)*a/b^3 - 2/15
*(a + b/x^3)^(5/2)*a^2/b^3
```

Fricas [A] time = 0.239493, size = 86, normalized size = 1.46

$$-\frac{2\left(8\,a^4x^{12}-4\,a^3bx^9+3\,a^2b^2x^6+50\,ab^3x^3+35\,b^4\right)\sqrt{\frac{ax^3+b}{x^3}}}{945\,b^3x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^3)^(3/2)/x^10,x, algorithm="fricas")
```

```
[Out] -2/945*(8*a^4*x^12 - 4*a^3*b*x^9 + 3*a^2*b^2*x^6 + 50*a*b^3*x^3 +
 35*b^4)*sqrt((a*x^3 + b)/x^3)/(b^3*x^12)
```

Sympy [A] time = 19.3299, size = 1001, normalized size = 16.97

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**3)**(3/2)/x**10,x)
```

```
[Out] -16*a**(23/2)*b**(9/2)*x**21*sqrt(a*x**3/b + 1)/(945*a**(15/2)*b*
*7*x**(45/2) + 2835*a**(13/2)*b**8*x**(39/2) + 2835*a**(11/2)*b**
9*x**(33/2) + 945*a**(9/2)*b**10*x**(27/2)) - 40*a**(21/2)*b**(11
/2)*x**18*sqrt(a*x**3/b + 1)/(945*a**(15/2)*b**7*x**(45/2) + 2835
*a**(13/2)*b**8*x**(39/2) + 2835*a**(11/2)*b**9*x**(33/2) + 945*a
**(9/2)*b**10*x**(27/2)) - 30*a**(19/2)*b**(13/2)*x**15*sqrt(a*x*
*3/b + 1)/(945*a**(15/2)*b**7*x**(45/2) + 2835*a**(13/2)*b**8*x**
(39/2) + 2835*a**(11/2)*b**9*x**(33/2) + 945*a**(9/2)*b**10*x**(2
7/2)) - 110*a**(17/2)*b**(15/2)*x**12*sqrt(a*x**3/b + 1)/(945*a**
(15/2)*b**7*x**(45/2) + 2835*a**(13/2)*b**8*x**(39/2) + 2835*a**(
11/2)*b**9*x**(33/2) + 945*a**(9/2)*b**10*x**(27/2)) - 380*a**(15
/2)*b**(17/2)*x**9*sqrt(a*x**3/b + 1)/(945*a**(15/2)*b**7*x**(45/
2) + 2835*a**(13/2)*b**8*x**(39/2) + 2835*a**(11/2)*b**9*x**(33/2
) + 945*a**(9/2)*b**10*x**(27/2)) - 516*a**(13/2)*b**(19/2)*x**6*
sqrt(a*x**3/b + 1)/(945*a**(15/2)*b**7*x**(45/2) + 2835*a**(13/2)
*b**8*x**(39/2) + 2835*a**(11/2)*b**9*x**(33/2) + 945*a**(9/2)*b*
*10*x**(27/2)) - 310*a**(11/2)*b**(21/2)*x**3*sqrt(a*x**3/b + 1)/
(945*a**(15/2)*b**7*x**(45/2) + 2835*a**(13/2)*b**8*x**(39/2) + 2
835*a**(11/2)*b**9*x**(33/2) + 945*a**(9/2)*b**10*x**(27/2)) - 70
```

```
*a**(9/2)*b**(23/2)*sqrt(a*x**3/b + 1)/(945*a**(15/2)*b**7*x**(45
/2) + 2835*a**(13/2)*b**8*x**(39/2) + 2835*a**(11/2)*b**9*x**(33/
2) + 945*a**(9/2)*b**10*x**(27/2)) + 16*a**12*b**4*x**(45/2)/(945
*a**(15/2)*b**7*x**(45/2) + 2835*a**(13/2)*b**8*x**(39/2) + 2835*
a**(11/2)*b**9*x**(33/2) + 945*a**(9/2)*b**10*x**(27/2)) + 48*a**
11*b**5*x**(39/2)/(945*a**(15/2)*b**7*x**(45/2) + 2835*a**(13/2)*
b**8*x**(39/2) + 2835*a**(11/2)*b**9*x**(33/2) + 945*a**(9/2)*b**
10*x**(27/2)) + 48*a**10*b**6*x**(33/2)/(945*a**(15/2)*b**7*x**(4
5/2) + 2835*a**(13/2)*b**8*x**(39/2) + 2835*a**(11/2)*b**9*x**(33
/2) + 945*a**(9/2)*b**10*x**(27/2)) + 16*a**9*b**7*x**(27/2)/(945
*a**(15/2)*b**7*x**(45/2) + 2835*a**(13/2)*b**8*x**(39/2) + 2835*
a**(11/2)*b**9*x**(33/2) + 945*a**(9/2)*b**10*x**(27/2))
```

GIAC/XCAS [A] time = 0.246158, size = 143, normalized size = 2.42

$$-\frac{2\left(\frac{3\left(15\left(a+\frac{b}{x^3}\right)^{\frac{7}{2}}-42\left(a+\frac{b}{x^3}\right)^{\frac{5}{2}}a+35\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}a^2\right)a}{b^2}+\frac{35\left(a+\frac{b}{x^3}\right)^{\frac{9}{2}}-135\left(a+\frac{b}{x^3}\right)^{\frac{7}{2}}a+189\left(a+\frac{b}{x^3}\right)^{\frac{5}{2}}a^2-105\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}a^3}{b^2}\right)}{945\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^3)^(3/2)/x^10,x, algorithm="giac")
```

```
[Out] -2/945*(3*(15*(a + b/x^3)^(7/2) - 42*(a + b/x^3)^(5/2)*a + 35*(a
+ b/x^3)^(3/2)*a^2)*a/b^2 + (35*(a + b/x^3)^(9/2) - 135*(a + b/x^
3)^(7/2)*a + 189*(a + b/x^3)^(5/2)*a^2 - 105*(a + b/x^3)^(3/2)*a^
3)/b^2)/b
```

3.2014 $\int \frac{\left(a+\frac{b}{x^3}\right)^{3/2}}{x^{13}}\,dx$

Optimal. Leaf size=80

$$\frac{2a^3\left(a+\frac{b}{x^3}\right)^{5/2}}{15b^4}-\frac{2a^2\left(a+\frac{b}{x^3}\right)^{7/2}}{7b^4}-\frac{2\left(a+\frac{b}{x^3}\right)^{11/2}}{33b^4}+\frac{2a\left(a+\frac{b}{x^3}\right)^{9/2}}{9b^4}$$

```
[Out] (2*a^3*(a + b/x^3)^(5/2))/(15*b^4) - (2*a^2*(a + b/x^3)^(7/2))/(7
*b^4) + (2*a*(a + b/x^3)^(9/2))/(9*b^4) - (2*(a + b/x^3)^(11/2))/
(33*b^4)
```

Rubi [A] time = 0.119652, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2a^3\left(a+\frac{b}{x^3}\right)^{5/2}}{15b^4}-\frac{2a^2\left(a+\frac{b}{x^3}\right)^{7/2}}{7b^4}-\frac{2\left(a+\frac{b}{x^3}\right)^{11/2}}{33b^4}+\frac{2a\left(a+\frac{b}{x^3}\right)^{9/2}}{9b^4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^3)^(3/2)/x^13,x]
```

```
[Out] (2*a^3*(a + b/x^3)^(5/2))/(15*b^4) - (2*a^2*(a + b/x^3)^(7/2))/(7
*b^4) + (2*a*(a + b/x^3)^(9/2))/(9*b^4) - (2*(a + b/x^3)^(11/2))/
(33*b^4)
```

Rubi in Sympy [A] time = 14.2659, size = 75, normalized size = 0.94

$$\frac{2a^3\left(a+\frac{b}{x^3}\right)^{\frac{5}{2}}}{15b^4}-\frac{2a^2\left(a+\frac{b}{x^3}\right)^{\frac{7}{2}}}{7b^4}+\frac{2a\left(a+\frac{b}{x^3}\right)^{\frac{9}{2}}}{9b^4}-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{11}{2}}}{33b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**3)**(3/2)/x**13,x)
```

```
[Out] 2*a**3*(a + b/x**3)**(5/2)/(15*b**4) - 2*a**2*(a + b/x**3)**(7/2)
/(7*b**4) + 2*a*(a + b/x**3)**(9/2)/(9*b**4) - 2*(a + b/x**3)**(1
1/2)/(33*b**4)
```

Mathematica [A] time = 0.0543504, size = 62, normalized size = 0.78

$$\frac{2\sqrt{a+\frac{b}{x^3}}\left(ax^3+b\right)^2\left(16a^3x^9-40a^2bx^6+70ab^2x^3-105b^3\right)}{3465b^4x^{15}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^3)^(3/2)/x^13,x]
```

```
[Out] (2*Sqrt[a + b/x^3]*(b + a*x^3)^2*(-105*b^3 + 70*a*b^2*x^3 - 40*a^
2*b*x^6 + 16*a^3*x^9))/(3465*b^4*x^15)
```

Maple [A] time = 0.01, size = 61, normalized size = 0.8

$$\frac{(2\,ax^3+2\,b)\,(16\,a^3x^9-40\,a^2bx^6+70\,ab^2x^3-105\,b^3)}{3465\,x^{12}b^4}\left(\frac{ax^3+b}{x^3}\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^3)^(3/2)/x^13,x)
```

```
[Out] 2/3465*(a*x^3+b)*(16*a^3*x^9-40*a^2*b*x^6+70*a*b^2*x^3-105*b^3)*(
(a*x^3+b)/x^3)^(3/2)/x^12/b^4
```

Maxima [A] time = 1.4179, size = 86, normalized size = 1.08

$$-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{11}{2}}}{33\,b^4}+\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{9}{2}}a}{9\,b^4}-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{7}{2}}a^2}{7\,b^4}+\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{5}{2}}a^3}{15\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^3)^(3/2)/x^13,x, algorithm="maxima")
```

```
[Out] -2/33*(a + b/x^3)^(11/2)/b^4 + 2/9*(a + b/x^3)^(9/2)*a/b^4 - 2/7*
(a + b/x^3)^(7/2)*a^2/b^4 + 2/15*(a + b/x^3)^(5/2)*a^3/b^4
```

Fricas [A] time = 0.240963, size = 101, normalized size = 1.26

$$\frac{2\,(16\,a^5x^{15}-8\,a^4bx^{12}+6\,a^3b^2x^9-5\,a^2b^3x^6-140\,ab^4x^3-105\,b^5)\sqrt{\frac{ax^3+b}{x^3}}}{3465\,b^4x^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^3)^(3/2)/x^13,x, algorithm="fricas")
```

```
[Out] 2/3465*(16*a^5*x^15 - 8*a^4*b*x^12 + 6*a^3*b^2*x^9 - 5*a^2*b^3*x^
6 - 140*a*b^4*x^3 - 105*b^5)*sqrt((a*x^3 + b)/x^3)/(b^4*x^15)
```

Sympy [A] time = 33.0716, size = 2317, normalized size = 28.96

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**3)**(3/2)/x**13,x)
```

```
[Out] 32*a**(33/2)*b**(23/2)*x**33*sqrt(a*x**3/b + 1)/(3465*a**(23/2)*b
**15*x**(69/2) + 20790*a**(21/2)*b**16*x**(63/2) + 51975*a**(19/2
)*b**17*x**(57/2) + 69300*a**(17/2)*b**18*x**(51/2) + 51975*a**(1
5/2)*b**19*x**(45/2) + 20790*a**(13/2)*b**20*x**(39/2) + 3465*a**
(11/2)*b**21*x**(33/2)) + 176*a**(31/2)*b**(25/2)*x**30*sqrt(a*x*
*3/b + 1)/(3465*a**(23/2)*b**15*x**(69/2) + 20790*a**(21/2)*b**16
*x**(63/2) + 51975*a**(19/2)*b**17*x**(57/2) + 69300*a**(17/2)*b*
*18*x**(51/2) + 51975*a**(15/2)*b**19*x**(45/2) + 20790*a**(13/2)
*b**20*x**(39/2) + 3465*a**(11/2)*b**21*x**(33/2)) + 396*a**(29/2
)*b**(27/2)*x**27*sqrt(a*x**3/b + 1)/(3465*a**(23/2)*b**15*x**(69
/2) + 20790*a**(21/2)*b**16*x**(63/2) + 51975*a**(19/2)*b**17*x**
(57/2) + 69300*a**(17/2)*b**18*x**(51/2) + 51975*a**(15/2)*b**19*
```

```
x**(45/2) + 20790*a**(13/2)*b**20*x**(39/2) + 3465*a**(11/2)*b**2
1*x**(33/2)) + 462*a**(27/2)*b**(29/2)*x**24*sqrt(a*x**3/b + 1)/(
3465*a**(23/2)*b**15*x**(69/2) + 20790*a**(21/2)*b**16*x**(63/2)
 + 51975*a**(19/2)*b**17*x**(57/2) + 69300*a**(17/2)*b**18*x**(51/
2) + 51975*a**(15/2)*b**19*x**(45/2) + 20790*a**(13/2)*b**20*x**(
39/2) + 3465*a**(11/2)*b**21*x**(33/2)) - 1848*a**(23/2)*b**(33/2
)*x**18*sqrt(a*x**3/b + 1)/(3465*a**(23/2)*b**15*x**(69/2) + 2079
0*a**(21/2)*b**16*x**(63/2) + 51975*a**(19/2)*b**17*x**(57/2) + 6
9300*a**(17/2)*b**18*x**(51/2) + 51975*a**(15/2)*b**19*x**(45/2)
 + 20790*a**(13/2)*b**20*x**(39/2) + 3465*a**(11/2)*b**21*x**(33/2
)) - 5544*a**(21/2)*b**(35/2)*x**15*sqrt(a*x**3/b + 1)/(3465*a**(
23/2)*b**15*x**(69/2) + 20790*a**(21/2)*b**16*x**(63/2) + 51975*a
**(19/2)*b**17*x**(57/2) + 69300*a**(17/2)*b**18*x**(51/2) + 5197
5*a**(15/2)*b**19*x**(45/2) + 20790*a**(13/2)*b**20*x**(39/2) + 3
465*a**(11/2)*b**21*x**(33/2)) - 8844*a**(19/2)*b**(37/2)*x**12*s
qrt(a*x**3/b + 1)/(3465*a**(23/2)*b**15*x**(69/2) + 20790*a**(21/
2)*b**16*x**(63/2) + 51975*a**(19/2)*b**17*x**(57/2) + 69300*a**(
17/2)*b**18*x**(51/2) + 51975*a**(15/2)*b**19*x**(45/2) + 20790*a
**(13/2)*b**20*x**(39/2) + 3465*a**(11/2)*b**21*x**(33/2)) - 8448
*a**(17/2)*b**(39/2)*x**9*sqrt(a*x**3/b + 1)/(3465*a**(23/2)*b**1
5*x**(69/2) + 20790*a**(21/2)*b**16*x**(63/2) + 51975*a**(19/2)*b
**17*x**(57/2) + 69300*a**(17/2)*b**18*x**(51/2) + 51975*a**(15/2
)*b**19*x**(45/2) + 20790*a**(13/2)*b**20*x**(39/2) + 3465*a**(11
/2)*b**21*x**(33/2)) - 4840*a**(15/2)*b**(41/2)*x**6*sqrt(a*x**3/
b + 1)/(3465*a**(23/2)*b**15*x**(69/2) + 20790*a**(21/2)*b**16*x*
*(63/2) + 51975*a**(19/2)*b**17*x**(57/2) + 69300*a**(17/2)*b**18
*x**(51/2) + 51975*a**(15/2)*b**19*x**(45/2) + 20790*a**(13/2)*b*
*20*x**(39/2) + 3465*a**(11/2)*b**21*x**(33/2)) - 1540*a**(13/2)*
b**(43/2)*x**3*sqrt(a*x**3/b + 1)/(3465*a**(23/2)*b**15*x**(69/2)
 + 20790*a**(21/2)*b**16*x**(63/2) + 51975*a**(19/2)*b**17*x**(57
/2) + 69300*a**(17/2)*b**18*x**(51/2) + 51975*a**(15/2)*b**19*x**
(45/2) + 20790*a**(13/2)*b**20*x**(39/2) + 3465*a**(11/2)*b**21*x
**(33/2)) - 210*a**(11/2)*b**(45/2)*sqrt(a*x**3/b + 1)/(3465*a**(
23/2)*b**15*x**(69/2) + 20790*a**(21/2)*b**16*x**(63/2) + 51975*a
**(19/2)*b**17*x**(57/2) + 69300*a**(17/2)*b**18*x**(51/2) + 5197
5*a**(15/2)*b**19*x**(45/2) + 20790*a**(13/2)*b**20*x**(39/2) + 3
465*a**(11/2)*b**21*x**(33/2)) - 32*a**17*b**11*x**(69/2)/(3465*a
**(23/2)*b**15*x**(69/2) + 20790*a**(21/2)*b**16*x**(63/2) + 5197
5*a**(19/2)*b**17*x**(57/2) + 69300*a**(17/2)*b**18*x**(51/2) + 5
1975*a**(15/2)*b**19*x**(45/2) + 20790*a**(13/2)*b**20*x**(39/2)
 + 3465*a**(11/2)*b**21*x**(33/2)) - 192*a**16*b**12*x**(63/2)/(34
65*a**(23/2)*b**15*x**(69/2) + 20790*a**(21/2)*b**16*x**(63/2) +
51975*a**(19/2)*b**17*x**(57/2) + 69300*a**(17/2)*b**18*x**(51/2)
 + 51975*a**(15/2)*b**19*x**(45/2) + 20790*a**(13/2)*b**20*x**(39
/2) + 3465*a**(11/2)*b**21*x**(33/2)) - 480*a**15*b**13*x**(57/2)
/(3465*a**(23/2)*b**15*x**(69/2) + 20790*a**(21/2)*b**16*x**(63/2
) + 51975*a**(19/2)*b**17*x**(57/2) + 69300*a**(17/2)*b**18*x**(5
1/2) + 51975*a**(15/2)*b**19*x**(45/2) + 20790*a**(13/2)*b**20*x*
*(39/2) + 3465*a**(11/2)*b**21*x**(33/2)) - 640*a**14*b**14*x**(5
1/2)/(3465*a**(23/2)*b**15*x**(69/2) + 20790*a**(21/2)*b**16*x**(
63/2) + 51975*a**(19/2)*b**17*x**(57/2) + 69300*a**(17/2)*b**18*x
**(51/2) + 51975*a**(15/2)*b**19*x**(45/2) + 20790*a**(13/2)*b**2
0*x**(39/2) + 3465*a**(11/2)*b**21*x**(33/2)) - 480*a**13*b**15*x
**(45/2)/(3465*a**(23/2)*b**15*x**(69/2) + 20790*a**(21/2)*b**16*
x**(63/2) + 51975*a**(19/2)*b**17*x**(57/2) + 69300*a**(17/2)*b**
18*x**(51/2) + 51975*a**(15/2)*b**19*x**(45/2) + 20790*a**(13/2)*
b**20*x**(39/2) + 3465*a**(11/2)*b**21*x**(33/2)) - 192*a**12*b**
16*x**(39/2)/(3465*a**(23/2)*b**15*x**(69/2) + 20790*a**(21/2)*b*
*16*x**(63/2) + 51975*a**(19/2)*b**17*x**(57/2) + 69300*a**(17/2)
*b**18*x**(51/2) + 51975*a**(15/2)*b**19*x**(45/2) + 20790*a**(13
/2)*b**20*x**(39/2) + 3465*a**(11/2)*b**21*x**(33/2)) - 32*a**11*
b**17*x**(33/2)/(3465*a**(23/2)*b**15*x**(69/2) + 20790*a**(21/2)
*b**16*x**(63/2) + 51975*a**(19/2)*b**17*x**(57/2) + 69300*a**(17
/2)*b**18*x**(51/2) + 51975*a**(15/2)*b**19*x**(45/2) + 20790*a**
(13/2)*b**20*x**(39/2) + 3465*a**(11/2)*b**21*x**(33/2))
```

GIAC/XCAS [A] time = 0.24161, size = 181, normalized size = 2.26

$$-\frac{2\left(\frac{11\left(35\left(a+\frac{b}{x^3}\right)^{\frac{9}{2}}-135\left(a+\frac{b}{x^3}\right)^{\frac{7}{2}}a+189\left(a+\frac{b}{x^3}\right)^{\frac{5}{2}}a^2-105\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}a^3\right)a}{b^3}+\frac{315\left(a+\frac{b}{x^3}\right)^{\frac{11}{2}}-1540\left(a+\frac{b}{x^3}\right)^{\frac{9}{2}}a+2970\left(a+\frac{b}{x^3}\right)^{\frac{7}{2}}a^2-2772\left(a+\frac{b}{x^3}\right)^{\frac{5}{2}}a^3+1155\left(\cdots\right.}{b^3}\right.}{10395\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^3)^(3/2)/x^13,x, algorithm="giac")
```

```
[Out] -2/10395*(11*(35*(a + b/x^3)^(9/2) - 135*(a + b/x^3)^(7/2)*a + 18
9*(a + b/x^3)^(5/2)*a^2 - 105*(a + b/x^3)^(3/2)*a^3)*a/b^3 + (315
*(a + b/x^3)^(11/2) - 1540*(a + b/x^3)^(9/2)*a + 2970*(a + b/x^3)
^(7/2)*a^2 - 2772*(a + b/x^3)^(5/2)*a^3 + 1155*(a + b/x^3)^(3/2)*
a^4)/b^3)/b
```

3.2015 $\int \frac{x^5}{\sqrt{a+\frac{b}{x^3}}}\,dx$

Optimal. Leaf size=74

$$\frac{b^2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)}{4a^{5/2}}-\frac{bx^3\sqrt{a+\frac{b}{x^3}}}{4a^2}+\frac{x^6\sqrt{a+\frac{b}{x^3}}}{6a}$$

```
[Out] -(b*Sqrt[a + b/x^3]*x^3)/(4*a^2) + (Sqrt[a + b/x^3]*x^6)/(6*a) +
(b^2*ArcTanh[Sqrt[a + b/x^3]/Sqrt[a]])/(4*a^(5/2))
```

Rubi [A] time = 0.11931, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{b^2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)}{4a^{5/2}}-\frac{bx^3\sqrt{a+\frac{b}{x^3}}}{4a^2}+\frac{x^6\sqrt{a+\frac{b}{x^3}}}{6a}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/Sqrt[a + b/x^3],x]
```

```
[Out] -(b*Sqrt[a + b/x^3]*x^3)/(4*a^2) + (Sqrt[a + b/x^3]*x^6)/(6*a) +
(b^2*ArcTanh[Sqrt[a + b/x^3]/Sqrt[a]])/(4*a^(5/2))
```

Rubi in Sympy [A] time = 9.8833, size = 63, normalized size = 0.85

$$\frac{x^6\sqrt{a+\frac{b}{x^3}}}{6a}-\frac{bx^3\sqrt{a+\frac{b}{x^3}}}{4a^2}+\frac{b^2\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)}{4a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(a+b/x**3)**(1/2),x)
```

```
[Out] x**6*sqrt(a + b/x**3)/(6*a) - b*x**3*sqrt(a + b/x**3)/(4*a**2) +
b**2*atanh(sqrt(a + b/x**3)/sqrt(a))/(4*a**(5/2))
```

Mathematica [A] time = 0.0721158, size = 97, normalized size = 1.31

$$\frac{\sqrt{a}x^{3/2}\left(2a^2x^6-abx^3-3b^2\right)+3b^2\sqrt{ax^3+b}\tanh^{-1}\left(\frac{\sqrt{a}x^{3/2}}{\sqrt{ax^3+b}}\right)}{12a^{5/2}x^{3/2}\sqrt{a+\frac{b}{x^3}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/Sqrt[a + b/x^3],x]
```

```
[Out] (Sqrt[a]*x^(3/2)*(-3*b^2 - a*b*x^3 + 2*a^2*x^6) + 3*b^2*Sqrt[b +
a*x^3]*ArcTanh[(Sqrt[a]*x^(3/2))/Sqrt[b + a*x^3]])/(12*a^(5/2)*Sq
rt[a + b/x^3]*x^(3/2))
```

Maple [C] time = 0.043, size = 3567, normalized size = 48.2

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(a+b/x^3)^(1/2),x)
```

```
[Out] -1/12/((a*x^3+b)/x^3)^(1/2)/x*(a*x^3+b)/a^4*(3*I*(1/a^2*x*(-a*x+(
-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I
*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(a*x^4+b*x)^
(1/2)*3^(1/2)*x*a^2*b+18*I*(-a^2*b)^(2/3)*3^(1/2)*(-(I*3^(1/2)-3)
*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2
*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3
)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(
1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*
a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^
(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*b^2-18*I*(-a^2*b)^(2
/3)*3^(1/2)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3
)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(
1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2
*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*E
llipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3))
)^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2)-1)/
(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*b^2-2*I*3^(1/2)*(1/a^2*x*(-a*
x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))
*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(a*x^4+b*
x)^(1/2)*x^4*a^3+36*I*(-a^2*b)^(1/3)*3^(1/2)*(-(I*3^(1/2)-3)*x*a/
(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(
1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(
1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-
1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(I
*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)
-3),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/
2))*x*a*b^2-18*I*3^(1/2)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+
(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^
(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a
^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1
/3)))^(1/2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-
a^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(
I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^2*a^2*b^2-18*(
-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I
*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x
+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)
^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I
*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^
(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^2*a^
2*b^2+18*I*3^(1/2)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*
b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))
/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^
(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^
(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^
(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/
2)-3))^(1/2))*x^2*a^2*b^2+18*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-
a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2
*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)
*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b
)^(1/3)))^(1/2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*
x+(-a^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+
3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^2*a^2*b^2+
36*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)
*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(
-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^
2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF(
(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((
I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-
a^2*b)^(1/3)*x*a*b^2-36*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(
-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(
1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^
2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/
3)))^(1/2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a
^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I
```

```
*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(1/3)*x*
a*b^2+6*x^4*(a*x^4+b*x)^(1/2)*a^3*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*
(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*
b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)-18*(-(I*3^(1/2)-3)*x*a/(I*3
^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)
+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)
*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(
-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1
/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/
(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(2/3)*b^2+18*(-(I*3^
(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/
2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2
*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)
)/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticPi((-(I*3^(1
/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),(I*3^(1/2)-
1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^
(1/2)-3))^(1/2))*(-a^2*b)^(2/3)*b^2-36*I*(-a^2*b)^(1/3)*3^(1/2)*(
-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I
*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x
+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)
^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I
*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^
(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x*a*b^
2-9*b*x*(a*x^4+b*x)^(1/2)*a^2*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3
^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(
1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2))/(x*(a*x^3+b))^(1/2)/(I*3^(1/2)
-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*
x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))
)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(a + b/x^3),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.369017, size = 1, normalized size = 0.01

$$\left[\frac{3\,\sqrt{a}b^2\log\left(-\left(8\,a^2x^6+8\,abx^3+b^2\right)\sqrt{a}-4\left(2\,a^2x^6+abx^3\right)\sqrt{\frac{ax^3+b}{x^3}}\right)+4\left(2\,a^2x^6-3\,abx^3\right)\sqrt{\frac{ax^3+b}{x^3}}}{48\,a^3},\right.$$
$$\left.-\frac{3\,\sqrt{-a}b^2\arctan\left(\frac{2\,\sqrt{-a}x^3\sqrt{\frac{ax^3+b}{x^3}}}{2\,ax^3+b}\right)-2\left(2\,a^2x^6-3\,abx^3\right)\sqrt{\frac{ax^3+b}{x^3}}}{24\,a^3}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(a + b/x^3),x, algorithm="fricas")
```

```
[Out] [1/48*(3*sqrt(a)*b^2*log(-(8*a^2*x^6 + 8*a*b*x^3 + b^2)*sqrt(a) -
 4*(2*a^2*x^6 + a*b*x^3)*sqrt((a*x^3 + b)/x^3)) + 4*(2*a^2*x^6 -
3*a*b*x^3)*sqrt((a*x^3 + b)/x^3))/a^3, -1/24*(3*sqrt(-a)*b^2*arct
an(2*sqrt(-a)*x^3*sqrt((a*x^3 + b)/x^3)/(2*a*x^3 + b)) - 2*(2*a^2
*x^6 - 3*a*b*x^3)*sqrt((a*x^3 + b)/x^3))/a^3]
```

Sympy [A] time = 15.3022, size = 102, normalized size = 1.38

$$\frac{x^{\frac{15}{2}}}{6\sqrt{b}\sqrt{\frac{ax^3}{b}+1}}-\frac{\sqrt{b}x^{\frac{9}{2}}}{12a\sqrt{\frac{ax^3}{b}+1}}-\frac{b^{\frac{3}{2}}x^{\frac{3}{2}}}{4a^2\sqrt{\frac{ax^3}{b}+1}}+\frac{b^2\operatorname{asinh}\left(\frac{\sqrt{a}x^{\frac{3}{2}}}{\sqrt{b}}\right)}{4a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(a+b/x**3)**(1/2),x)
```

```
[Out] x**(15/2)/(6*sqrt(b)*sqrt(a*x**3/b + 1)) - sqrt(b)*x**(9/2)/(12*a
*sqrt(a*x**3/b + 1)) - b**(3/2)*x**(3/2)/(4*a**2*sqrt(a*x**3/b +
1)) + b**2*asinh(sqrt(a)*x**(3/2)/sqrt(b))/(4*a**(5/2))
```

GIAC/XCAS [A] time = 0.255942, size = 134, normalized size = 1.81

$$-\frac{1}{12}b^2\left(\frac{3\arctan\left(\frac{\sqrt{\frac{ax^3+b}{x^3}}}{\sqrt{-a}}\right)}{\sqrt{-a}a^2}-\frac{5a\sqrt{\frac{ax^3+b}{x^3}}-\frac{3(ax^3+b)\sqrt{\frac{ax^3+b}{x^3}}}{x^3}}{\left(a-\frac{ax^3+b}{x^3}\right)^2a^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/sqrt(a + b/x^3),x, algorithm="giac")
```

```
[Out] -1/12*b^2*(3*arctan(sqrt((a*x^3 + b)/x^3)/sqrt(-a))/(sqrt(-a)*a^2
) - (5*a*sqrt((a*x^3 + b)/x^3) - 3*(a*x^3 + b)*sqrt((a*x^3 + b)/x
^3)/x^3)/((a - (a*x^3 + b)/x^3)^2*a^2))
```

3.2016 $\int \frac{x^2}{\sqrt{a+\frac{b}{x^3}}} \, dx$

Optimal. Leaf size=50

$$\frac{x^3\sqrt{a+\frac{b}{x^3}}}{3a}-\frac{b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)}{3a^{3/2}}$$

```
[Out] (Sqrt[a + b/x^3]*x^3)/(3*a) - (b*ArcTanh[Sqrt[a + b/x^3]/Sqrt[a]]
)/(3*a^(3/2))
```

Rubi [A] time = 0.0835028, antiderivative size = 50, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$

$$\frac{x^3\sqrt{a+\frac{b}{x^3}}}{3a}-\frac{b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)}{3a^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/Sqrt[a + b/x^3],x]
```

```
[Out] (Sqrt[a + b/x^3]*x^3)/(3*a) - (b*ArcTanh[Sqrt[a + b/x^3]/Sqrt[a]]
)/(3*a^(3/2))
```

Rubi in Sympy [A] time = 7.04594, size = 41, normalized size = 0.82

$$\frac{x^3\sqrt{a+\frac{b}{x^3}}}{3a}-\frac{b\,\mathrm{atanh}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)}{3a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b/x**3)**(1/2),x)
```

```
[Out] x**3*sqrt(a + b/x**3)/(3*a) - b*atanh(sqrt(a + b/x**3)/sqrt(a))/(
3*a**(3/2))
```

Mathematica [A] time = 0.0555209, size = 81, normalized size = 1.62

$$\frac{\sqrt{a}x^{3/2}\left(ax^3+b\right)-b\sqrt{ax^3+b}\tanh^{-1}\left(\frac{\sqrt{a}x^{3/2}}{\sqrt{ax^3+b}}\right)}{3a^{3/2}x^{3/2}\sqrt{a+\frac{b}{x^3}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/Sqrt[a + b/x^3],x]
```

```
[Out] (Sqrt[a]*x^(3/2)*(b + a*x^3) - b*Sqrt[b + a*x^3]*ArcTanh[(Sqrt[a]
*x^(3/2))/Sqrt[b + a*x^3]])/(3*a^(3/2)*Sqrt[a + b/x^3]*x^(3/2))
```

Maple [C] time = 0.018, size = 3347, normalized size = 66.9

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(a+b/x^3)^(1/2),x)
```

```
[Out] 1/3/((a*x^3+b)/x^3)^(1/2)/x*(a*x^3+b)/a^3*(6*I*(-(I*3^(1/2)-3)*x*
a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)
^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))
^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2
)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(
I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/
2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*x^2*a^2*b-6*I*(
-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I
*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x
+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)
^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticPi((-(
I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),(I*3^
(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)
/(I*3^(1/2)-3))^(1/2))*3^(1/2)*x^2*a^2*b-12*I*(-a^2*b)^(1/3)*(-(I
*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^
(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-
a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1
/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^
(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/
2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*x
*a*b+12*I*(-a^2*b)^(1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+
(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^
(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a
^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1
/3)))^(1/2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-
a^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(
I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*x*a*b+6*
I*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)
^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(
I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1
/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1
/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)
-3))^(1/2))*3^(1/2)*b-6*I*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3
^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)
+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)
*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(
-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(
1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),
((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*
3^(1/2)*b-6*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3
)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(
1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2
*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*E
llipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))
^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^
(1/2))*x^2*a^2*b+6*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*
b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))
/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^
(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^
(1/2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)
^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1
/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^2*a^2*b+12*(-a^2*b)^
(1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1
)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(
-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Ellipti
cF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)
,((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))
*x*a*b-12*(-a^2*b)^(1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+
(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^
(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a
^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1
/3)))^(1/2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-
```

```
a^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(
I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x*a*b-6*(-a^2*b)
^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(
1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+
1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-
(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Ellipt
icF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2
),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2)
)*b+6*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^
2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3
))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b
)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3))
)^(1/2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*
b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^
(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*b+I*3^(1/2)*(a*x^4+b
*x)^(1/2)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3
)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^
(1/3)))^(1/2)*x*a^2-3*x*(a*x^4+b*x)^(1/2)*a^2*(1/a^2*x*(-a*x+(-a^
2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^
(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2))/(x*(a*x^3+b))^
(1/2)/(I*3^(1/2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a
^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x
-(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(a + b/x^3),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.372176, size = 1, normalized size = 0.02

$$\left[\frac{4\,ax^3\sqrt{\frac{ax^3+b}{x^3}} + \sqrt{a}b\log\left(-\left(8\,a^2x^6 + 8\,abx^3 + b^2\right)\sqrt{a} + 4\left(2\,a^2x^6 + abx^3\right)\sqrt{\frac{ax^3+b}{x^3}}\right)}{12\,a^2}, \frac{2\,ax^3\sqrt{\frac{ax^3+b}{x^3}} + \sqrt{-a}b\arctan\left(\frac{2\sqrt{-a}x^3\sqrt{\ldots}}{2\,ax^3+\ldots}\right.}{6\,a^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(a + b/x^3),x, algorithm="fricas")
```

```
[Out] [1/12*(4*a*x^3*sqrt((a*x^3 + b)/x^3) + sqrt(a)*b*log(-(8*a^2*x^6
+ 8*a*b*x^3 + b^2)*sqrt(a) + 4*(2*a^2*x^6 + a*b*x^3)*sqrt((a*x^3
+ b)/x^3)))/a^2, 1/6*(2*a*x^3*sqrt((a*x^3 + b)/x^3) + sqrt(-a)*b*
arctan(2*sqrt(-a)*x^3*sqrt((a*x^3 + b)/x^3)/(2*a*x^3 + b)))/a^2]
```

Sympy [A] time = 8.2166, size = 49, normalized size = 0.98

$$\frac{\sqrt{b}x^{\frac{3}{2}}\sqrt{\frac{ax^3}{b}+1}}{3a} - \frac{b\operatorname{asinh}\left(\frac{\sqrt{a}x^{\frac{3}{2}}}{\sqrt{b}}\right)}{3a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b/x**3)**(1/2),x)
```

```
[Out] sqrt(b)*x**(3/2)*sqrt(a*x**3/b + 1)/(3*a) - b*asinh(sqrt(a)*x**(3
/2)/sqrt(b))/(3*a**(3/2))
```

GIAC/XCAS [A] time = 0.246222, size = 90, normalized size = 1.8

$$\frac{1}{3}\,b\left(\frac{\arctan\left(\frac{\sqrt{\frac{ax^3+b}{x^3}}}{\sqrt{-a}}\right)}{\sqrt{-a}a}-\frac{\sqrt{\frac{ax^3+b}{x^3}}}{\left(a-\frac{ax^3+b}{x^3}\right)a}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(a + b/x^3),x, algorithm="giac")
```

```
[Out] 1/3*b*(arctan(sqrt((a*x^3 + b)/x^3)/sqrt(-a))/(sqrt(-a)*a) - sqrt
((a*x^3 + b)/x^3)/((a - (a*x^3 + b)/x^3)*a))
```

3.2017 $\int \frac{1}{\sqrt{a+\frac{b}{x^3}}x} dx$

Optimal. Leaf size=27

$$\frac{2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)}{3\sqrt{a}}$$

```
[Out] (2*ArcTanh[Sqrt[a + b/x^3]/Sqrt[a]])/(3*Sqrt[a])
```

Rubi [A] time = 0.0578388, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)}{3\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b/x^3]*x),x]

[Out] (2*ArcTanh[Sqrt[a + b/x^3]/Sqrt[a]])/(3*Sqrt[a])
```

Rubi in Sympy [A] time = 5.14286, size = 24, normalized size = 0.89

$$\frac{2\,\mathrm{atanh}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)}{3\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(a+b/x**3)**(1/2),x)

[Out] 2*atanh(sqrt(a + b/x**3)/sqrt(a))/(3*sqrt(a))
```

Mathematica [B] time = 0.0398385, size = 59, normalized size = 2.19

$$\frac{2\sqrt{ax^3+b}\tanh^{-1}\left(\frac{\sqrt{a}x^{3/2}}{\sqrt{ax^3+b}}\right)}{3\sqrt{a}x^{3/2}\sqrt{a+\frac{b}{x^3}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b/x^3]*x),x]

[Out] (2*Sqrt[b + a*x^3]*ArcTanh[(Sqrt[a]*x^(3/2))/Sqrt[b + a*x^3]])/(3
*Sqrt[a]*Sqrt[a + b/x^3]*x^(3/2))
```

Maple [C] time = 0.016, size = 480, normalized size = 17.8

$$-4\frac{\left(ax^{3}+b\right)\left(i\sqrt{3}-1\right)\left(-ax+\sqrt[3]{-a^{2}b}\right)^{2}}{xa^{2}\sqrt{x\left(ax^{3}+b\right)}\left(i\sqrt{3}-3\right)}\sqrt{-\frac{\left(i\sqrt{3}-3\right)xa}{\left(i\sqrt{3}-1\right)\left(-ax+\sqrt[3]{-a^{2}b}\right)}}\sqrt{\frac{i\sqrt{3}\sqrt[3]{-a^{2}b}+2\,ax+\sqrt[3]{-a^{2}b}}{\left(i\sqrt{3}+1\right)\left(-ax+\sqrt[3]{-a^{2}b}\right)}}\sqrt{\frac{i\sqrt{3}\sqrt[3]{-a^{2}b}-2\,ax}{\left(i\sqrt{3}-1\right)\left(-ax\right.}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(a+b/x^3)^(1/2),x)
```

```
[Out] -4/((a*x^3+b)/x^3)^(1/2)/x*(a*x^3+b)*(I*3^(1/2)-1)*(-(I*3^(1/2)-3
)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(-a*x+(-a^2*b)^(
1/3))^2*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/
2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a
*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)/a^2
*(EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3
)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3
))^(1/2))-EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^
2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*
3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2)))/(x*(a*x^3+b))^(1/
2)/(I*3^(1/2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*
b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-
a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^3)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.369302, size = 1, normalized size = 0.04

$$\left[\frac{\log\left(-\left(8\,a^{2}x^{6}+8\,abx^{3}+b^{2}\right)\sqrt{a}-4\left(2\,a^{2}x^{6}+abx^{3}\right)\sqrt{\frac{ax^{3}+b}{x^{3}}}\right)}{6\sqrt{a}}, -\frac{\sqrt{-a}\arctan\left(\frac{2\sqrt{-a}x^{3}\sqrt{\frac{ax^{3}+b}{x^{3}}}}{2\,ax^{3}+b}\right)}{3\,a}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^3)*x),x, algorithm="fricas")
```

```
[Out] [1/6*log(-(8*a^2*x^6 + 8*a*b*x^3 + b^2)*sqrt(a) - 4*(2*a^2*x^6 +
a*b*x^3)*sqrt((a*x^3 + b)/x^3))/sqrt(a), -1/3*sqrt(-a)*arctan(2*s
qrt(-a)*x^3*sqrt((a*x^3 + b)/x^3)/(2*a*x^3 + b))/a]
```

Sympy [A] time = 4.49235, size = 24, normalized size = 0.89

$$\frac{2\operatorname{asinh}\left(\frac{\sqrt{a}x^{\frac{3}{2}}}{\sqrt{b}}\right)}{3\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(a+b/x**3)**(1/2),x)
```

```
[Out] 2*asinh(sqrt(a)*x**(3/2)/sqrt(b))/(3*sqrt(a))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a + \frac{b}{x^3}}\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^3)*x),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(a + b/x^3)*x), x)
```

3.2018 $\int \frac{1}{\sqrt{a+\frac{b}{x^3}}x^4} dx$

Optimal. Leaf size=18

$$-\frac{2\sqrt{a+\frac{b}{x^3}}}{3b}$$

```
[Out] (-2*Sqrt[a + b/x^3])/(3*b)
```

Rubi [A] time = 0.0295821, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{2\sqrt{a+\frac{b}{x^3}}}{3b}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[a + b/x^3]*x^4),x]
```

```
[Out] (-2*Sqrt[a + b/x^3])/(3*b)
```

Rubi in Sympy [A] time = 2.11858, size = 15, normalized size = 0.83

$$-\frac{2\sqrt{a+\frac{b}{x^3}}}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**4/(a+b/x**3)**(1/2),x)
```

```
[Out] -2*sqrt(a + b/x**3)/(3*b)
```

Mathematica [A] time = 0.0210587, size = 18, normalized size = 1.

$$-\frac{2\sqrt{a+\frac{b}{x^3}}}{3b}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(Sqrt[a + b/x^3]*x^4),x]
```

```
[Out] (-2*Sqrt[a + b/x^3])/(3*b)
```

Maple [A] time = 0.007, size = 29, normalized size = 1.6

$$-\frac{2\,ax^3+2\,b}{3\,bx^3}\frac{1}{\sqrt{\frac{ax^3+b}{x^3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(a+b/x^3)^(1/2),x)

[Out] -2/3/x^3*(a*x^3+b)/b/((a*x^3+b)/x^3)^(1/2)
```

Maxima [A] time = 1.42252, size = 19, normalized size = 1.06

$$-\frac{2\sqrt{a+\frac{b}{x^3}}}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^3)*x^4),x, algorithm="maxima")

[Out] -2/3*sqrt(a + b/x^3)/b
```

Fricas [A] time = 0.241184, size = 24, normalized size = 1.33

$$-\frac{2\sqrt{\frac{ax^3+b}{x^3}}}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^3)*x^4),x, algorithm="fricas")

[Out] -2/3*sqrt((a*x^3 + b)/x^3)/b
```

Sympy [A] time = 6.28361, size = 29, normalized size = 1.61

$$\begin{cases} -\frac{2\sqrt{a+\frac{b}{x^3}}}{3b} & \text{for } b \neq 0 \\ -\frac{1}{3\sqrt{a}x^3} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(a+b/x**3)**(1/2),x)

[Out] Piecewise((-2*sqrt(a + b/x**3)/(3*b), Ne(b, 0)), (-1/(3*sqrt(a)*x
**3), True))
```

GIAC/XCAS [A] time = 0.224881, size = 19, normalized size = 1.06

$$-\frac{2\sqrt{a+\frac{b}{x^3}}}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^3)*x^4),x, algorithm="giac")

[Out] -2/3*sqrt(a + b/x^3)/b
```

3.2019 $\int \frac{1}{\sqrt{a+\frac{b}{x^3}}x^7}\,dx$

Optimal. Leaf size=38

$$\frac{2a\sqrt{a+\frac{b}{x^3}}}{3b^2}-\frac{2\left(a+\frac{b}{x^3}\right)^{3/2}}{9b^2}$$

```
[Out] (2*a*Sqrt[a + b/x^3])/(3*b^2) - (2*(a + b/x^3)^(3/2))/(9*b^2)
```

Rubi [A] time = 0.0662499, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2a\sqrt{a+\frac{b}{x^3}}}{3b^2}-\frac{2\left(a+\frac{b}{x^3}\right)^{3/2}}{9b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b/x^3]*x^7),x]

[Out] (2*a*Sqrt[a + b/x^3])/(3*b^2) - (2*(a + b/x^3)^(3/2))/(9*b^2)
```

Rubi in Sympy [A] time = 6.99005, size = 34, normalized size = 0.89

$$\frac{2a\sqrt{a+\frac{b}{x^3}}}{3b^2}-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}}{9b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**7/(a+b/x**3)**(1/2),x)

[Out] 2*a*sqrt(a + b/x**3)/(3*b**2) - 2*(a + b/x**3)**(3/2)/(9*b**2)
```

Mathematica [A] time = 0.0382642, size = 31, normalized size = 0.82

$$\frac{2\sqrt{a+\frac{b}{x^3}}\left(2ax^3-b\right)}{9b^2x^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b/x^3]*x^7),x]

[Out] (2*Sqrt[a + b/x^3]*(-b + 2*a*x^3))/(9*b^2*x^3)
```

Maple [A] time = 0.009, size = 39, normalized size = 1.

$$\frac{\left(2\,ax^3+2\,b\right)\left(2\,ax^3-b\right)}{9\,b^2x^6}\frac{1}{\sqrt{\frac{ax^3+b}{x^3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^7/(a+b/x^3)^(1/2),x)

[Out] 2/9*(a*x^3+b)*(2*a*x^3-b)/x^6/b^2/((a*x^3+b)/x^3)^(1/2)
```

Maxima [A] time = 1.41509, size = 41, normalized size = 1.08

$$-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}}{9\,b^2}+\frac{2\,\sqrt{a+\frac{b}{x^3}}\,a}{3\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^3)*x^7),x, algorithm="maxima")

[Out] -2/9*(a + b/x^3)^(3/2)/b^2 + 2/3*sqrt(a + b/x^3)*a/b^2
```

Fricas [A] time = 0.241734, size = 42, normalized size = 1.11

$$\frac{2\left(2\,ax^3-b\right)\sqrt{\frac{ax^3+b}{x^3}}}{9\,b^2x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^3)*x^7),x, algorithm="fricas")

[Out] 2/9*(2*a*x^3 - b)*sqrt((a*x^3 + b)/x^3)/(b^2*x^3)
```

Sympy [A] time = 9.11585, size = 255, normalized size = 6.71

$$\frac{4a^{\frac{7}{2}}b^{\frac{3}{2}}x^6\sqrt{\frac{ax^3}{b}+1}}{9a^{\frac{5}{2}}b^3x^{\frac{15}{2}}+9a^{\frac{3}{2}}b^4x^{\frac{9}{2}}}+\frac{2a^{\frac{5}{2}}b^{\frac{5}{2}}x^3\sqrt{\frac{ax^3}{b}+1}}{9a^{\frac{5}{2}}b^3x^{\frac{15}{2}}+9a^{\frac{3}{2}}b^4x^{\frac{9}{2}}}-\frac{2a^{\frac{3}{2}}b^{\frac{7}{2}}\sqrt{\frac{ax^3}{b}+1}}{9a^{\frac{5}{2}}b^3x^{\frac{15}{2}}+9a^{\frac{3}{2}}b^4x^{\frac{9}{2}}}-\frac{4a^4bx^{\frac{15}{2}}}{9a^{\frac{5}{2}}b^3x^{\frac{15}{2}}+9a^{\frac{3}{2}}b^4x^{\frac{9}{2}}}-\frac{4a^3b^2x^{\frac{9}{2}}}{9a^{\frac{5}{2}}b^3x^{\frac{15}{2}}+9a^{\frac{3}{2}}b^4x^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**7/(a+b/x**3)**(1/2),x)

[Out] 4*a**(7/2)*b**(3/2)*x**6*sqrt(a*x**3/b + 1)/(9*a**(5/2)*b**3*x**(
15/2) + 9*a**(3/2)*b**4*x**(9/2)) + 2*a**(5/2)*b**(5/2)*x**3*sqrt
(a*x**3/b + 1)/(9*a**(5/2)*b**3*x**(15/2) + 9*a**(3/2)*b**4*x**(9
/2)) - 2*a**(3/2)*b**(7/2)*sqrt(a*x**3/b + 1)/(9*a**(5/2)*b**3*x*
*(15/2) + 9*a**(3/2)*b**4*x**(9/2)) - 4*a**4*b*x**(15/2)/(9*a**(5
/2)*b**3*x**(15/2) + 9*a**(3/2)*b**4*x**(9/2)) - 4*a**3*b**2*x**(
9/2)/(9*a**(5/2)*b**3*x**(15/2) + 9*a**(3/2)*b**4*x**(9/2))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a+\frac{b}{x^3}}x^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^3)*x^7),x, algorithm="giac")

[Out] integrate(1/(sqrt(a + b/x^3)*x^7), x)
```

3.2020 $\int \frac{1}{\sqrt{a+\frac{b}{x^3}}\,x^{10}}\,dx$

Optimal. Leaf size=59

$$-\frac{2a^2\sqrt{a+\frac{b}{x^3}}}{3b^3}-\frac{2\left(a+\frac{b}{x^3}\right)^{5/2}}{15b^3}+\frac{4a\left(a+\frac{b}{x^3}\right)^{3/2}}{9b^3}$$

```
[Out] (-2*a^2*Sqrt[a + b/x^3])/(3*b^3) + (4*a*(a + b/x^3)^(3/2))/(9*b^3
) - (2*(a + b/x^3)^(5/2))/(15*b^3)
```

Rubi [A] time = 0.084263, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2a^2\sqrt{a+\frac{b}{x^3}}}{3b^3}-\frac{2\left(a+\frac{b}{x^3}\right)^{5/2}}{15b^3}+\frac{4a\left(a+\frac{b}{x^3}\right)^{3/2}}{9b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b/x^3]*x^10),x]
```

```
[Out] (-2*a^2*Sqrt[a + b/x^3])/(3*b^3) + (4*a*(a + b/x^3)^(3/2))/(9*b^3
) - (2*(a + b/x^3)^(5/2))/(15*b^3)
```

Rubi in Sympy [A] time = 10.5086, size = 54, normalized size = 0.92

$$-\frac{2a^2\sqrt{a+\frac{b}{x^3}}}{3b^3}+\frac{4a\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}}{9b^3}-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{5}{2}}}{15b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**10/(a+b/x**3)**(1/2),x)
```

```
[Out] -2*a**2*sqrt(a + b/x**3)/(3*b**3) + 4*a*(a + b/x**3)**(3/2)/(9*b*
*3) - 2*(a + b/x**3)**(5/2)/(15*b**3)
```

Mathematica [A] time = 0.0458116, size = 42, normalized size = 0.71

$$-\frac{2\sqrt{a+\frac{b}{x^3}}\left(8a^2x^6-4abx^3+3b^2\right)}{45b^3x^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b/x^3]*x^10),x]
```

```
[Out] (-2*Sqrt[a + b/x^3]*(3*b^2 - 4*a*b*x^3 + 8*a^2*x^6))/(45*b^3*x^6)
```

Maple [A] time = 0.01, size = 50, normalized size = 0.9

$$-\frac{(2\,ax^3+2\,b)\left(8\,a^2x^6-4\,abx^3+3\,b^2\right)}{45\,b^3x^9}\frac{1}{\sqrt{\frac{ax^3+b}{x^3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^10/(a+b/x^3)^(1/2),x)
```

```
[Out] -2/45*(a*x^3+b)*(8*a^2*x^6-4*a*b*x^3+3*b^2)/x^9/b^3/((a*x^3+b)/x^
3)^(1/2)
```

Maxima [A] time = 1.46211, size = 63, normalized size = 1.07

$$-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{5}{2}}}{15\,b^3}+\frac{4\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}a}{9\,b^3}-\frac{2\,\sqrt{a+\frac{b}{x^3}}a^2}{3\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(a + b/x^3)*x^10),x, algorithm="maxima")
```

```
[Out] -2/15*(a + b/x^3)^(5/2)/b^3 + 4/9*(a + b/x^3)^(3/2)*a/b^3 - 2/3*s
qrt(a + b/x^3)*a^2/b^3
```

Fricas [A] time = 0.24519, size = 57, normalized size = 0.97

$$-\frac{2\left(8\,a^2x^6-4\,abx^3+3\,b^2\right)\sqrt{\frac{ax^3+b}{x^3}}}{45\,b^3x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(a + b/x^3)*x^10),x, algorithm="fricas")
```

```
[Out] -2/45*(8*a^2*x^6 - 4*a*b*x^3 + 3*b^2)*sqrt((a*x^3 + b)/x^3)/(b^3*
x^6)
```

Sympy [A] time = 16.5594, size = 824, normalized size = 13.97

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/x**10/(a+b/x**3)**(1/2),x)
```

```
[Out] -16*a**(15/2)*b**(9/2)*x**15*sqrt(a*x**3/b + 1)/(45*a**(11/2)*b**
7*x**(33/2) + 135*a**(9/2)*b**8*x**(27/2) + 135*a**(7/2)*b**9*x**
(21/2) + 45*a**(5/2)*b**10*x**(15/2)) - 40*a**(13/2)*b**(11/2)*x*
*12*sqrt(a*x**3/b + 1)/(45*a**(11/2)*b**7*x**(33/2) + 135*a**(9/2
)*b**8*x**(27/2) + 135*a**(7/2)*b**9*x**(21/2) + 45*a**(5/2)*b**1
0*x**(15/2)) - 30*a**(11/2)*b**(13/2)*x**9*sqrt(a*x**3/b + 1)/(45
*a**(11/2)*b**7*x**(33/2) + 135*a**(9/2)*b**8*x**(27/2) + 135*a**
(7/2)*b**9*x**(21/2) + 45*a**(5/2)*b**10*x**(15/2)) - 10*a**(9/2)
*b**(15/2)*x**6*sqrt(a*x**3/b + 1)/(45*a**(11/2)*b**7*x**(33/2) +
 135*a**(9/2)*b**8*x**(27/2) + 135*a**(7/2)*b**9*x**(21/2) + 45*a
**(5/2)*b**10*x**(15/2)) - 10*a**(7/2)*b**(17/2)*x**3*sqrt(a*x**3
/b + 1)/(45*a**(11/2)*b**7*x**(33/2) + 135*a**(9/2)*b**8*x**(27/2
) + 135*a**(7/2)*b**9*x**(21/2) + 45*a**(5/2)*b**10*x**(15/2)) -
6*a**(5/2)*b**(19/2)*sqrt(a*x**3/b + 1)/(45*a**(11/2)*b**7*x**(33
/2) + 135*a**(9/2)*b**8*x**(27/2) + 135*a**(7/2)*b**9*x**(21/2) +
 45*a**(5/2)*b**10*x**(15/2)) + 16*a**8*b**4*x**(33/2)/(45*a**(11
/2)*b**7*x**(33/2) + 135*a**(9/2)*b**8*x**(27/2) + 135*a**(7/2)*b
**9*x**(21/2) + 45*a**(5/2)*b**10*x**(15/2)) + 48*a**7*b**5*x**(2
7/2)/(45*a**(11/2)*b**7*x**(33/2) + 135*a**(9/2)*b**8*x**(27/2) +
```

```
 135*a**(7/2)*b**9*x**(21/2) + 45*a**(5/2)*b**10*x**(15/2)) + 48*
a**6*b**6*x**(21/2)/(45*a**(11/2)*b**7*x**(33/2) + 135*a**(9/2)*b
**8*x**(27/2) + 135*a**(7/2)*b**9*x**(21/2) + 45*a**(5/2)*b**10*x
**(15/2)) + 16*a**5*b**7*x**(15/2)/(45*a**(11/2)*b**7*x**(33/2) +
 135*a**(9/2)*b**8*x**(27/2) + 135*a**(7/2)*b**9*x**(21/2) + 45*a
**(5/2)*b**10*x**(15/2))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a + \frac{b}{x^3}}x^{10}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^3)*x^10),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(a + b/x^3)*x^10), x)
```

3.2021 $\int \frac{1}{\sqrt{a+\frac{b}{x^3}}\, x^{13}}\, dx$

Optimal. Leaf size=80

$$\frac{2a^3\sqrt{a+\frac{b}{x^3}}}{3b^4}-\frac{2a^2\left(a+\frac{b}{x^3}\right)^{3/2}}{3b^4}-\frac{2\left(a+\frac{b}{x^3}\right)^{7/2}}{21b^4}+\frac{2a\left(a+\frac{b}{x^3}\right)^{5/2}}{5b^4}$$

```
[Out] (2*a^3*Sqrt[a + b/x^3])/(3*b^4) - (2*a^2*(a + b/x^3)^(3/2))/(3*b^
4) + (2*a*(a + b/x^3)^(5/2))/(5*b^4) - (2*(a + b/x^3)^(7/2))/(21*
b^4)
```

Rubi [A] time = 0.114078, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2a^3\sqrt{a+\frac{b}{x^3}}}{3b^4}-\frac{2a^2\left(a+\frac{b}{x^3}\right)^{3/2}}{3b^4}-\frac{2\left(a+\frac{b}{x^3}\right)^{7/2}}{21b^4}+\frac{2a\left(a+\frac{b}{x^3}\right)^{5/2}}{5b^4}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b/x^3]*x^13),x]
```

```
[Out] (2*a^3*Sqrt[a + b/x^3])/(3*b^4) - (2*a^2*(a + b/x^3)^(3/2))/(3*b^
4) + (2*a*(a + b/x^3)^(5/2))/(5*b^4) - (2*(a + b/x^3)^(7/2))/(21*
b^4)
```

Rubi in Sympy [A] time = 14.1965, size = 75, normalized size = 0.94

$$\frac{2a^3\sqrt{a+\frac{b}{x^3}}}{3b^4}-\frac{2a^2\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}}{3b^4}+\frac{2a\left(a+\frac{b}{x^3}\right)^{\frac{5}{2}}}{5b^4}-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{7}{2}}}{21b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**13/(a+b/x**3)**(1/2),x)
```

```
[Out] 2*a**3*sqrt(a + b/x**3)/(3*b**4) - 2*a**2*(a + b/x**3)**(3/2)/(3*
b**4) + 2*a*(a + b/x**3)**(5/2)/(5*b**4) - 2*(a + b/x**3)**(7/2)/
(21*b**4)
```

Mathematica [A] time = 0.0558844, size = 53, normalized size = 0.66

$$\frac{2\sqrt{a+\frac{b}{x^3}}\left(16a^3x^9-8a^2bx^6+6ab^2x^3-5b^3\right)}{105b^4x^9}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b/x^3]*x^13),x]
```

```
[Out] (2*Sqrt[a + b/x^3]*(-5*b^3 + 6*a*b^2*x^3 - 8*a^2*b*x^6 + 16*a^3*x
^9))/(105*b^4*x^9)
```

Maple [A] time = 0.009, size = 61, normalized size = 0.8

$$\frac{(2\,ax^3+2\,b)\,(16\,a^3x^9-8\,a^2bx^6+6\,ab^2x^3-5\,b^3)}{105\,x^{12}b^4}\frac{1}{\sqrt{\frac{ax^3+b}{x^3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^13/(a+b/x^3)^(1/2),x)
```

```
[Out] 2/105*(a*x^3+b)*(16*a^3*x^9-8*a^2*b*x^6+6*a*b^2*x^3-5*b^3)/x^12/b
^4/((a*x^3+b)/x^3)^(1/2)
```

Maxima [A] time = 1.43814, size = 86, normalized size = 1.08

$$-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{7}{2}}}{21\,b^4}+\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{5}{2}}a}{5\,b^4}-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}a^2}{3\,b^4}+\frac{2\sqrt{a+\frac{b}{x^3}}\,a^3}{3\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^3)*x^13),x, algorithm="maxima")
```

```
[Out] -2/21*(a + b/x^3)^(7/2)/b^4 + 2/5*(a + b/x^3)^(5/2)*a/b^4 - 2/3*(
a + b/x^3)^(3/2)*a^2/b^4 + 2/3*sqrt(a + b/x^3)*a^3/b^4
```

Fricas [A] time = 0.244643, size = 72, normalized size = 0.9

$$\frac{2\,(16\,a^3x^9-8\,a^2bx^6+6\,ab^2x^3-5\,b^3)\sqrt{\frac{ax^3+b}{x^3}}}{105\,b^4x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^3)*x^13),x, algorithm="fricas")
```

```
[Out] 2/105*(16*a^3*x^9 - 8*a^2*b*x^6 + 6*a*b^2*x^3 - 5*b^3)*sqrt((a*x^
3 + b)/x^3)/(b^4*x^9)
```

Sympy [A] time = 28.733, size = 2183, normalized size = 27.29

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**13/(a+b/x**3)**(1/2),x)
```

```
[Out] 32*a**(25/2)*b**(23/2)*x**27*sqrt(a*x**3/b + 1)/(105*a**(19/2)*b*
*15*x**(57/2) + 630*a**(17/2)*b**16*x**(51/2) + 1575*a**(15/2)*b*
*17*x**(45/2) + 2100*a**(13/2)*b**18*x**(39/2) + 1575*a**(11/2)*b
**19*x**(33/2) + 630*a**(9/2)*b**20*x**(27/2) + 105*a**(7/2)*b**2
1*x**(21/2)) + 176*a**(23/2)*b**(25/2)*x**24*sqrt(a*x**3/b + 1)/(
105*a**(19/2)*b**15*x**(57/2) + 630*a**(17/2)*b**16*x**(51/2) + 1
575*a**(15/2)*b**17*x**(45/2) + 2100*a**(13/2)*b**18*x**(39/2) +
1575*a**(11/2)*b**19*x**(33/2) + 630*a**(9/2)*b**20*x**(27/2) + 1
05*a**(7/2)*b**21*x**(21/2)) + 396*a**(21/2)*b**(27/2)*x**21*sqrt
(a*x**3/b + 1)/(105*a**(19/2)*b**15*x**(57/2) + 630*a**(17/2)*b**
16*x**(51/2) + 1575*a**(15/2)*b**17*x**(45/2) + 2100*a**(13/2)*b*
```

```
*18*x**(39/2) + 1575*a**(11/2)*b**19*x**(33/2) + 630*a**(9/2)*b**
20*x**(27/2) + 105*a**(7/2)*b**21*x**(21/2)) + 462*a**(19/2)*b**(
29/2)*x**18*sqrt(a*x**3/b + 1)/(105*a**(19/2)*b**15*x**(57/2) + 6
30*a**(17/2)*b**16*x**(51/2) + 1575*a**(15/2)*b**17*x**(45/2) + 2
100*a**(13/2)*b**18*x**(39/2) + 1575*a**(11/2)*b**19*x**(33/2) +
630*a**(9/2)*b**20*x**(27/2) + 105*a**(7/2)*b**21*x**(21/2)) + 28
0*a**(17/2)*b**(31/2)*x**15*sqrt(a*x**3/b + 1)/(105*a**(19/2)*b**
15*x**(57/2) + 630*a**(17/2)*b**16*x**(51/2) + 1575*a**(15/2)*b**
17*x**(45/2) + 2100*a**(13/2)*b**18*x**(39/2) + 1575*a**(11/2)*b*
*19*x**(33/2) + 630*a**(9/2)*b**20*x**(27/2) + 105*a**(7/2)*b**21
*x**(21/2)) + 42*a**(15/2)*b**(33/2)*x**12*sqrt(a*x**3/b + 1)/(10
5*a**(19/2)*b**15*x**(57/2) + 630*a**(17/2)*b**16*x**(51/2) + 157
5*a**(15/2)*b**17*x**(45/2) + 2100*a**(13/2)*b**18*x**(39/2) + 15
75*a**(11/2)*b**19*x**(33/2) + 630*a**(9/2)*b**20*x**(27/2) + 105
*a**(7/2)*b**21*x**(21/2)) - 84*a**(13/2)*b**(35/2)*x**9*sqrt(a*x
**3/b + 1)/(105*a**(19/2)*b**15*x**(57/2) + 630*a**(17/2)*b**16*x
**(51/2) + 1575*a**(15/2)*b**17*x**(45/2) + 2100*a**(13/2)*b**18*
x**(39/2) + 1575*a**(11/2)*b**19*x**(33/2) + 630*a**(9/2)*b**20*x
**(27/2) + 105*a**(7/2)*b**21*x**(21/2)) - 94*a**(11/2)*b**(37/2)
*x**6*sqrt(a*x**3/b + 1)/(105*a**(19/2)*b**15*x**(57/2) + 630*a**
(17/2)*b**16*x**(51/2) + 1575*a**(15/2)*b**17*x**(45/2) + 2100*a*
*(13/2)*b**18*x**(39/2) + 1575*a**(11/2)*b**19*x**(33/2) + 630*a*
*(9/2)*b**20*x**(27/2) + 105*a**(7/2)*b**21*x**(21/2)) - 48*a**(9
/2)*b**(39/2)*x**3*sqrt(a*x**3/b + 1)/(105*a**(19/2)*b**15*x**(57
/2) + 630*a**(17/2)*b**16*x**(51/2) + 1575*a**(15/2)*b**17*x**(45
/2) + 2100*a**(13/2)*b**18*x**(39/2) + 1575*a**(11/2)*b**19*x**(3
3/2) + 630*a**(9/2)*b**20*x**(27/2) + 105*a**(7/2)*b**21*x**(21/2
)) - 10*a**(7/2)*b**(41/2)*sqrt(a*x**3/b + 1)/(105*a**(19/2)*b**1
5*x**(57/2) + 630*a**(17/2)*b**16*x**(51/2) + 1575*a**(15/2)*b**1
7*x**(45/2) + 2100*a**(13/2)*b**18*x**(39/2) + 1575*a**(11/2)*b**
19*x**(33/2) + 630*a**(9/2)*b**20*x**(27/2) + 105*a**(7/2)*b**21*
x**(21/2)) - 32*a**13*b**11*x**(57/2)/(105*a**(19/2)*b**15*x**(57
/2) + 630*a**(17/2)*b**16*x**(51/2) + 1575*a**(15/2)*b**17*x**(45
/2) + 2100*a**(13/2)*b**18*x**(39/2) + 1575*a**(11/2)*b**19*x**(3
3/2) + 630*a**(9/2)*b**20*x**(27/2) + 105*a**(7/2)*b**21*x**(21/2
)) - 192*a**12*b**12*x**(51/2)/(105*a**(19/2)*b**15*x**(57/2) + 6
30*a**(17/2)*b**16*x**(51/2) + 1575*a**(15/2)*b**17*x**(45/2) + 2
100*a**(13/2)*b**18*x**(39/2) + 1575*a**(11/2)*b**19*x**(33/2) +
630*a**(9/2)*b**20*x**(27/2) + 105*a**(7/2)*b**21*x**(21/2)) - 48
0*a**11*b**13*x**(45/2)/(105*a**(19/2)*b**15*x**(57/2) + 630*a**(
17/2)*b**16*x**(51/2) + 1575*a**(15/2)*b**17*x**(45/2) + 2100*a**
(13/2)*b**18*x**(39/2) + 1575*a**(11/2)*b**19*x**(33/2) + 630*a**
(9/2)*b**20*x**(27/2) + 105*a**(7/2)*b**21*x**(21/2)) - 640*a**10
*b**14*x**(39/2)/(105*a**(19/2)*b**15*x**(57/2) + 630*a**(17/2)*b
**16*x**(51/2) + 1575*a**(15/2)*b**17*x**(45/2) + 2100*a**(13/2)*
b**18*x**(39/2) + 1575*a**(11/2)*b**19*x**(33/2) + 630*a**(9/2)*b
**20*x**(27/2) + 105*a**(7/2)*b**21*x**(21/2)) - 480*a**9*b**15*x
**(33/2)/(105*a**(19/2)*b**15*x**(57/2) + 630*a**(17/2)*b**16*x**
(51/2) + 1575*a**(15/2)*b**17*x**(45/2) + 2100*a**(13/2)*b**18*x*
*(39/2) + 1575*a**(11/2)*b**19*x**(33/2) + 630*a**(9/2)*b**20*x**
(27/2) + 105*a**(7/2)*b**21*x**(21/2)) - 192*a**8*b**16*x**(27/2)
/(105*a**(19/2)*b**15*x**(57/2) + 630*a**(17/2)*b**16*x**(51/2) +
 1575*a**(15/2)*b**17*x**(45/2) + 2100*a**(13/2)*b**18*x**(39/2)
+ 1575*a**(11/2)*b**19*x**(33/2) + 630*a**(9/2)*b**20*x**(27/2) +
 105*a**(7/2)*b**21*x**(21/2)) - 32*a**7*b**17*x**(21/2)/(105*a**
(19/2)*b**15*x**(57/2) + 630*a**(17/2)*b**16*x**(51/2) + 1575*a**
(15/2)*b**17*x**(45/2) + 2100*a**(13/2)*b**18*x**(39/2) + 1575*a*
*(11/2)*b**19*x**(33/2) + 630*a**(9/2)*b**20*x**(27/2) + 105*a**(
7/2)*b**21*x**(21/2))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a + \frac{b}{x^3}}x^{13}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^3)*x^13),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(a + b/x^3)*x^13), x)
```

3.2022 $\int \frac{x^7}{\sqrt{a+\frac{b}{x^3}}}\,dx$

Optimal. Leaf size=294

$$\frac{91b^2x^2\sqrt{a+\frac{b}{x^3}}}{320a^3}-\frac{13bx^5\sqrt{a+\frac{b}{x^3}}}{80a^2}+\frac{91\sqrt{2+\sqrt{3}}\,b^{8/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}\,F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{320\sqrt[4]{3}a^3\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{x^8\sqrt{a+\frac{b}{x^3}}}{8a}$$

```
[Out] (91*b^2*Sqrt[a + b/x^3]*x^2)/(320*a^3) - (13*b*Sqrt[a + b/x^3]*x^
5)/(80*a^2) + (Sqrt[a + b/x^3]*x^8)/(8*a) + (91*Sqrt[2 + Sqrt[3]]
*b^(8/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(
1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF
[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3
) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(320*3^(1/4)*a^3*Sqrt[a + b/x^3
]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b
^(1/3)/x)^2])
```

Rubi [A] time = 0.457128, antiderivative size = 294, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$\frac{91b^2x^2\sqrt{a+\frac{b}{x^3}}}{320a^3}-\frac{13bx^5\sqrt{a+\frac{b}{x^3}}}{80a^2}+\frac{91\sqrt{2+\sqrt{3}}\,b^{8/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}\,F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{320\sqrt[4]{3}a^3\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{x^8\sqrt{a+\frac{b}{x^3}}}{8a}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7/Sqrt[a + b/x^3],x]
```


```
[Out] (91*b^2*Sqrt[a + b/x^3]*x^2)/(320*a^3) - (13*b*Sqrt[a + b/x^3]*x^
5)/(80*a^2) + (Sqrt[a + b/x^3]*x^8)/(8*a) + (91*Sqrt[2 + Sqrt[3]]
*b^(8/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(
1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF
[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3
) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(320*3^(1/4)*a^3*Sqrt[a + b/x^3
]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b
^(1/3)/x)^2])
```

Rubi in Sympy [A] time = 24.0791, size = 250, normalized size = 0.85

$$\frac{x^8\sqrt{a+\frac{b}{x^3}}}{8a} - \frac{13bx^5\sqrt{a+\frac{b}{x^3}}}{80a^2} + \frac{91\cdot 3^{\frac{3}{4}} b^{\frac{8}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{960a^3\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}} + \frac{91b^2x^2\sqrt{a+\frac{b}{x^3}}}{320a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7/(a+b/x**3)**(1/2),x)
```

```
[Out] x**8*sqrt(a + b/x**3)/(8*a) - 13*b*x**5*sqrt(a + b/x**3)/(80*a**2
) + 91*3**(3/4)*b**(8/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b
**(2/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(sqrt
(3) + 2)*(a**(1/3) + b**(1/3)/x)*elliptic_f(asin((-a**(1/3)*(-1 +
 sqrt(3)) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -
7 - 4*sqrt(3))/(960*a**3*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a
**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) + 91*b*
*2*x**2*sqrt(a + b/x**3)/(320*a**3)
```

Mathematica [C] time = 0.578193, size = 199, normalized size = 0.68

$$\frac{3\sqrt[3]{-b}\left(40a^3x^9-12a^2bx^6+39ab^2x^3+91b^3\right)+91i3^{3/4}\sqrt[3]{a}b^3x\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}}{\sqrt[3]{a}x}-1\right)}\sqrt{\frac{\frac{(-b)^{2/3}}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+x^2}{x^2}}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}}{\sqrt[3]{a}x}-(\cdots}}{\sqrt[4]{3}}\cdots\right.\right.}{960a^3\sqrt[3]{-b}x\sqrt{a+\frac{b}{x^3}}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^7/Sqrt[a + b/x^3],x]
```

```
[Out] (3*(-b)^(1/3)*(91*b^3 + 39*a*b^2*x^3 - 12*a^2*b*x^6 + 40*a^3*x^9)
 + (91*I)*3^(3/4)*a^(1/3)*b^3*Sqrt[(-1)^(5/6)*(-1 + (-b)^(1/3)/(a
^(1/3)*x))]*x*Sqrt[((-b)^(2/3)/a^(2/3) + ((-b)^(1/3)*x)/a^(1/3) +
 x^2)/x^2]*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3))/(a^
(1/3)*x)]/3^(1/4)], (-1)^(1/3)])/(960*a^3*(-b)^(1/3)*Sqrt[a + b/x
^3]*x)
```

Maple [B] time = 0.042, size = 2233, normalized size = 7.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7/(a+b/x^3)^(1/2),x)
```

```
[Out] 1/320/((a*x^3+b)/x^3)^(1/2)/x*(a*x^3+b)/(-a^2*b)^(1/3)/a^4*(40*I*
(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-
a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1
```

```
/2)*(-a^2*b)^(1/3)*(a*x^4+b*x)^(1/2)*3^(1/2)*x^6*a^3+182*I*(-(I*3
^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1
/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^
2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3
))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1
/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)
+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*x^2
*a^2*b^3-364*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(
1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*
3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3
)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2
)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3
)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3
))^(1/2))*(-a^2*b)^(1/3)*3^(1/2)*x*a*b^3-120*x^6*(a*x^4+b*x)^(1/2
)*a^3*(-a^2*b)^(1/3)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-
a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*
x-(-a^2*b)^(1/3)))^(1/2)+182*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/
(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a
^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/
2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2
*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a
*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)
+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(2/3)*3^(1/2)*b^3-182*(-(I*3^(
1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2
)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*
b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))
/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2
)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3
)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^2*a^2*b^3-5
2*I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*
x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))
)^(1/2)*(-a^2*b)^(1/3)*(a*x^4+b*x)^(1/2)*3^(1/2)*x^3*a^2*b+364*(-
a^2*b)^(1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/
3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^
(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-
2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*
EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3))
)^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))
^(1/2))*x*a*b^3-182*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)
-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x
+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3
^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(
-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)
/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(
1/2)+1)/(I*3^(1/2)-3))^(1/2))*b^3+156*b*x^3*(a*x^4+b*x)^(1/2)*a^2
*(-a^2*b)^(1/3)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b
)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a
^2*b)^(1/3)))^(1/2)+91*I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2
)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-
2*a*x-(-a^2*b)^(1/3)))^(1/2)*(-a^2*b)^(1/3)*(a*x^4+b*x)^(1/2)*3^(
1/2)*a*b^2-273*b^2*(a*x^4+b*x)^(1/2)*a*(-a^2*b)^(1/3)*(1/a^2*x*(-
a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3
))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2))/(x*(a*
x^3+b))^(1/2)/(I*3^(1/2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(
1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/
3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^7}{\sqrt{a+\frac{b}{x^3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(a + b/x^3),x, algorithm="maxima")
```

```
[Out] integrate(x^7/sqrt(a + b/x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^7}{\sqrt{\frac{ax^3+b}{x^3}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(a + b/x^3),x, algorithm="fricas")
```

```
[Out] integral(x^7/sqrt((a*x^3 + b)/x^3), x)
```

Sympy [A] time = 6.3758, size = 46, normalized size = 0.16

$$-\frac{x^8 \left(-\frac{8}{3}\right) {}_2F_1\left(\begin{matrix} -\frac{8}{3}, \frac{1}{2} \\ -\frac{5}{3} \end{matrix}\middle| \frac{be^{i\pi}}{ax^3}\right)}{3\sqrt{a}\left(-\frac{5}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(a+b/x**3)**(1/2),x)
```

```
[Out] -x**8*gamma(-8/3)*hyper((-8/3, 1/2), (-5/3,), b*exp_polar(I*pi)/(
a*x**3))/(3*sqrt(a)*gamma(-5/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^7}{\sqrt{a + \frac{b}{x^3}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/sqrt(a + b/x^3),x, algorithm="giac")
```

```
[Out] integrate(x^7/sqrt(a + b/x^3), x)
```

3.2023 $\int \frac{x^4}{\sqrt{a+\frac{b}{x^3}}}\,dx$

Optimal. Leaf size=270

$$-\frac{7bx^2\sqrt{a+\frac{b}{x^3}}}{20a^2}-\frac{7\sqrt{2+\sqrt{3}}\,b^{5/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}\,F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{20\sqrt[4]{3}a^2\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{x^5\sqrt{a+\frac{b}{x^3}}}{5a}$$

```
[Out] (-7*b*Sqrt[a + b/x^3]*x^2)/(20*a^2) + (Sqrt[a + b/x^3]*x^5)/(5*a)
 - (7*Sqrt[2 + Sqrt[3]]*b^(5/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/
3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) +
b^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x
)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(20*3^(1
/4)*a^2*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1
+ Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi [A] time = 0.36841, antiderivative size = 270, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{7bx^2\sqrt{a+\frac{b}{x^3}}}{20a^2}-\frac{7\sqrt{2+\sqrt{3}}\,b^{5/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}\,F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{20\sqrt[4]{3}a^2\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{x^5\sqrt{a+\frac{b}{x^3}}}{5a}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/Sqrt[a + b/x^3],x]
```

```
[Out] (-7*b*Sqrt[a + b/x^3]*x^2)/(20*a^2) + (Sqrt[a + b/x^3]*x^5)/(5*a)
 - (7*Sqrt[2 + Sqrt[3]]*b^(5/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/
3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) +
b^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x
)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(20*3^(1
/4)*a^2*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1
+ Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi in Sympy [A] time = 17.904, size = 226, normalized size = 0.84

$$\frac{x^5\sqrt{a+\frac{b}{x^3}}}{5a} - \frac{7\cdot 3^{\frac{3}{4}}b^{\frac{5}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{60a^2\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}} - \frac{7bx^2\sqrt{a+\frac{b}{x^3}}}{20a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(a+b/x**3)**(1/2),x)
```

```
[Out] x**5*sqrt(a + b/x**3)/(5*a) - 7*3**(3/4)*b**(5/3)*sqrt((a**(2/3)
- a**(1/3)*b**(1/3)/x + b**(2/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) +
b**(1/3)/x)**2)*sqrt(sqrt(3) + 2)*(a**(1/3) + b**(1/3)/x)*ellipti
c_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)/x)/(a**(1/3)*(1 + s
qrt(3)) + b**(1/3)/x)), -7 - 4*sqrt(3))/(60*a**2*sqrt(a**(1/3)*(a
**(1/3) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*s
qrt(a + b/x**3)) - 7*b*x**2*sqrt(a + b/x**3)/(20*a**2)
```

Mathematica [C] time = 0.380012, size = 188, normalized size = 0.7

$$\frac{-3\sqrt[3]{-b}\left(-4a^2x^6+3abx^3+7b^2\right)-7i3^{3/4}\sqrt[3]{a}b^2x\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}}{\sqrt[3]{a}x}-1\right)}\sqrt{\frac{\frac{(-b)^{2/3}}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+x^2}{x^2}}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}}{\sqrt[3]{a}x}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)}{60a^2\sqrt[3]{-b}x\sqrt{a+\frac{b}{x^3}}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^4/Sqrt[a + b/x^3],x]
```

```
[Out] (-3*(-b)^(1/3)*(7*b^2 + 3*a*b*x^3 - 4*a^2*x^6) - (7*I)*3^(3/4)*a^
(1/3)*b^2*Sqrt[(-1)^(5/6)*(-1 + (-b)^(1/3)/(a^(1/3)*x))]*x*Sqrt[(
(-b)^(2/3)/a^(2/3) + ((-b)^(1/3)*x)/a^(1/3) + x^2)/x^2]*EllipticF
[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3))/(a^(1/3)*x)]/3^(1/4)],
(-1)^(1/3)])/(60*a^2*(-b)^(1/3)*Sqrt[a + b/x^3]*x)
```

Maple [B] time = 0.018, size = 2017, normalized size = 7.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(a+b/x^3)^(1/2),x)
```

```
[Out] -1/20/((a*x^3+b)/x^3)^(1/2)/x*(a*x^3+b)/a^3/(-a^2*b)^(1/3)*(14*I*
3^(1/2)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^
(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)
+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x
-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Ellip
```

```
ticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/
2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2
))*x^2*a^2*b^2-28*I*(-a^2*b)^(1/3)*3^(1/2)*(-(I*3^(1/2)-3)*x*a/(I
*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/
3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/
2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)
/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^
(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1
)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x*a*b^2+14*I*(-a^2*b)^(2/3)
*3^(1/2)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))
^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2
)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*
x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Elli
pticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/
2))*b^2-4*I*(-a^2*b)^(1/3)*3^(1/2)*(a*x^4+b*x)^(1/2)*(1/a^2*x*(-a
*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3)
)*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*x^3*a^2-
14*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)
*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(
-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^
2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF(
(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((
I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^
2*a^2*b^2+28*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/
3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^
(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-
2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*
EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3))
)^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))
^(1/2))*(-a^2*b)^(1/3)*x*a*b^2-14*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-
1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+
(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^
(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-
a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/
(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1
/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(2/3)*b^2+12*x^3*(a*x^4+b*x
)^(1/2)*a^2*(-a^2*b)^(1/3)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1
/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3
)-2*a*x-(-a^2*b)^(1/3)))^(1/2)+7*I*(-a^2*b)^(1/3)*3^(1/2)*(a*x^4+
b*x)^(1/2)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/
3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)
^(1/3)))^(1/2)*a*b-21*b*(a*x^4+b*x)^(1/2)*a*(-a^2*b)^(1/3)*(1/a^2
*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)
^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2))/(
x*(a*x^3+b))^(1/2)/(I*3^(1/2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(
I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b
)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\sqrt{a + \frac{b}{x^3}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(a + b/x^3),x, algorithm="maxima")

[Out] integrate(x^4/sqrt(a + b/x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^4}{\sqrt{\frac{ax^3+b}{x^3}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(a + b/x^3),x, algorithm="fricas")
```

```
[Out] integral(x^4/sqrt((a*x^3 + b)/x^3), x)
```

Sympy [A] time = 3.73112, size = 46, normalized size = 0.17

$$-\frac{x^5\Gamma\left(-\frac{5}{3}\right)\,{}_2F_1\left(\begin{matrix}-\frac{5}{3},\frac{1}{2}\\-\frac{2}{3}\end{matrix}\middle|\frac{be^{i\pi}}{ax^3}\right)}{3\sqrt{a}\,\Gamma\left(-\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(a+b/x**3)**(1/2),x)
```

```
[Out] -x**5*gamma(-5/3)*hyper((-5/3, 1/2), (-2/3,), b*exp_polar(I*pi)/(
a*x**3))/(3*sqrt(a)*gamma(-2/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\sqrt{a+\frac{b}{x^3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/sqrt(a + b/x^3),x, algorithm="giac")
```

```
[Out] integrate(x^4/sqrt(a + b/x^3), x)
```

3.2024 $\int \frac{x}{\sqrt{a+\frac{b}{x^3}}}\,dx$

Optimal. Leaf size=248

$$\frac{\sqrt{2+\sqrt{3}}b^{2/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{2\sqrt[4]{3}a\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{x^2\sqrt{a+\frac{b}{x^3}}}{2a}$$

```
[Out] (Sqrt[a + b/x^3]*x^2)/(2*a) + (Sqrt[2 + Sqrt[3]]*b^(2/3)*(a^(1/3)
 + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/
((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqr
t[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)],
-7 - 4*Sqrt[3]])/(2*3^(1/4)*a*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1
/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi [A] time = 0.264369, antiderivative size = 248, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{\sqrt{2+\sqrt{3}}b^{2/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{2\sqrt[4]{3}a\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{x^2\sqrt{a+\frac{b}{x^3}}}{2a}$$

Antiderivative was successfully verified.

```
[In]  Int[x/Sqrt[a + b/x^3],x]
```

```
[Out] (Sqrt[a + b/x^3]*x^2)/(2*a) + (Sqrt[2 + Sqrt[3]]*b^(2/3)*(a^(1/3)
 + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/
((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqr
t[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)],
-7 - 4*Sqrt[3]])/(2*3^(1/4)*a*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1
/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi in Sympy [A] time = 12.0511, size = 201, normalized size = 0.81

$$\frac{3^{\frac{3}{4}}b^{\frac{2}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{6a\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}+\frac{x^2\sqrt{a+\frac{b}{x^3}}}{2a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b/x**3)**(1/2),x)
```

```
[Out] 3**(3/4)*b**(2/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**(2/3)
/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(sqrt(3) + 2
)*(a**(1/3) + b**(1/3)/x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3
)) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*s
qrt(3))/(6*a*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(1/3)*(1 +
 sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) + x**2*sqrt(a + b/x
**3)/(2*a)
```

Mathematica [C] time = 0.39224, size = 174, normalized size = 0.7

$$\frac{ax^3+b}{2ax\sqrt{a+\frac{b}{x^3}}}+\frac{ib\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}}{\sqrt[3]{a}x}-1\right)}\sqrt{\frac{(-b)^{2/3}}{a^{2/3}x^2}+\frac{\sqrt[3]{-b}}{\sqrt[3]{a}x}+1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}}{\sqrt[3]{a}x}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)}{2\sqrt[4]{3}a^{2/3}\sqrt[3]{-b}\sqrt{a+\frac{b}{x^3}}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x/Sqrt[a + b/x^3],x]
```

```
[Out] (b + a*x^3)/(2*a*Sqrt[a + b/x^3]*x) + ((I/2)*b*Sqrt[(-1)^(5/6)*(-
1 + (-b)^(1/3)/(a^(1/3)*x))]*Sqrt[1 + (-b)^(2/3)/(a^(2/3)*x^2) +
(-b)^(1/3)/(a^(1/3)*x)]*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-
b)^(1/3))/(a^(1/3)*x)]/3^(1/4)], (-1)^(1/3)])/(3^(1/4)*a^(2/3)*(-
b)^(1/3)*Sqrt[a + b/x^3])
```

Maple [B] time = 0.015, size = 1793, normalized size = 7.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+b/x^3)^(1/2),x)
```

```
[Out] 1/2/((a*x^3+b)/x^3)^(1/2)/x*(a*x^3+b)/a^2/(-a^2*b)^(1/3)*(2*I*3^(
1/2)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/
2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)
/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-
a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Elliptic
F((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),
((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*
x^2*a^2*b-4*I*(-a^2*b)^(1/3)*3^(1/2)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/
2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a
*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I
*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x
+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-
1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3
^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x*a*b+2*I*(-a^2*b)^(2/3)*3^(1/2)*
(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((
I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*
x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b
)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(
I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3
^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*b-2*(
-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I
*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x
+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)
^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I
*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^
(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^2*a^
2*b+4*(-a^2*b)^(1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^
2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3
))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b
)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3))
```

```
)^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b
)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(
1/2)-3))^(1/2))*x*a*b-2*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(
1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2
*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(
(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a
*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2
)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I
*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*b+I*(-a^2*b)^(1/3)*3^(1/2)*(a*x
^4+b*x)^(1/2)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^
(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2
*b)^(1/3)))^(1/2)*a-3*(a*x^4+b*x)^(1/2)*a*(-a^2*b)^(1/3)*(1/a^2*x
*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(
1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2))/(x*
(a*x^3+b))^(1/2)/(I*3^(1/2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*
3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^
(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt{a+\frac{b}{x^3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(a + b/x^3),x, algorithm="maxima")
```

```
[Out] integrate(x/sqrt(a + b/x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{x}{\sqrt{\frac{ax^3+b}{x^3}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(a + b/x^3),x, algorithm="fricas")
```

```
[Out] integral(x/sqrt((a*x^3 + b)/x^3), x)
```

Sympy [A] time = 2.81385, size = 42, normalized size = 0.17

$$-\frac{x^2\,\Gamma\left(-\frac{2}{3}\right)\,{}_2F_1\left(\begin{matrix}-\frac{2}{3},\frac{1}{2}\\ \frac{1}{3}\end{matrix}\middle|\frac{be^{i\pi}}{ax^3}\right)}{3\sqrt{a}\,\Gamma\left(\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b/x**3)**(1/2),x)
```

```
[Out] -x**2*gamma(-2/3)*hyper((-2/3, 1/2), (1/3,), b*exp_polar(I*pi)/(a
*x**3))/(3*sqrt(a)*gamma(1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt{a+\frac{b}{x^3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(a + b/x^3),x, algorithm="giac")

[Out] integrate(x/sqrt(a + b/x^3), x)
```

3.2025 $\int \frac{1}{\sqrt{a+\frac{b}{x^3}}x^2}\,dx$

Optimal. Leaf size=221

$$-\frac{2\sqrt{2+\sqrt{3}}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{\sqrt[4]{3}\sqrt[3]{b}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}$$

```
[Out] (-2*Sqrt[2 + Sqrt[3]]*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/
3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)
^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sq
rt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(3^(1/4)*b^(1/3)*S
qrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3]
)*a^(1/3) + b^(1/3)/x)^2])
```

Rubi [A] time = 0.192498, antiderivative size = 221, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2\sqrt{2+\sqrt{3}}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{\sqrt[4]{3}\sqrt[3]{b}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b/x^3]*x^2),x]
```

```
[Out] (-2*Sqrt[2 + Sqrt[3]]*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/
3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)
^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sq
rt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(3^(1/4)*b^(1/3)*S
qrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3]
)*a^(1/3) + b^(1/3)/x)^2])
```

Rubi in Sympy [A] time = 6.86967, size = 185, normalized size = 0.84

$$-\frac{2\cdot 3^{\frac{3}{4}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{3\sqrt[3]{b}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(a+b/x**3)**(1/2),x)
```

```
[Out] -2*3**(3/4)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**(2/3)/x**2)
/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(sqrt(3) + 2)*(a**
(1/3) + b**(1/3)/x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b
**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*sqrt(3)
)/(3*b**(1/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(1/3)*(1
+ sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3))
```

Mathematica [C] time = 0.209595, size = 142, normalized size = 0.64

$$-\frac{2i\sqrt[3]{a}\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}}{\sqrt[3]{a}x}-1\right)}\sqrt{\frac{(-b)^{2/3}}{a^{2/3}x^2}+\frac{\sqrt[3]{-b}}{\sqrt[3]{a}x}+1}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}}{\sqrt[3]{a}x}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)}{\sqrt[4]{3}\sqrt[3]{-b}\sqrt{a+\frac{b}{x^3}}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/(Sqrt[a + b/x^3]*x^2),x]
```

```
[Out] ((-2*I)*a^(1/3)*Sqrt[(-1)^(5/6)*(-1 + (-b)^(1/3)/(a^(1/3)*x))]*Sq
rt[1 + (-b)^(2/3)/(a^(2/3)*x^2) + (-b)^(1/3)/(a^(1/3)*x)]*Ellipti
cF[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3))/(a^(1/3)*x)]/3^(1/4)]
, (-1)^(1/3)])/(3^(1/4)*(-b)^(1/3)*Sqrt[a + b/x^3])
```

Maple [B] time = 0.021, size = 437, normalized size = 2.

$$-4\frac{\left(ax^3+b\right)\left(i\sqrt{3}x^2a^2-2i\sqrt[3]{-a^2b}\sqrt{3}xa+i\left(-a^2b\right)^{2/3}\sqrt{3}-a^2x^2+2\sqrt[3]{-a^2b}xa-\left(-a^2b\right)^{2/3}\right)}{\sqrt[3]{-a^2b}xa\sqrt{x\left(ax^3+b\right)}\left(i\sqrt{3}-3\right)}\sqrt{-\frac{\left(i\sqrt{3}-3\right)xa}{\left(i\sqrt{3}-1\right)\left(-ax+\sqrt[3]{-a^2b}\right.}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(a+b/x^3)^(1/2),x)
```

```
[Out] -4/((a*x^3+b)/x^3)^(1/2)/x*(a*x^3+b)/(-a^2*b)^(1/3)/a*(-(I*3^(1/2
)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(
-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^
(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I
*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3
)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(
I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(I*3^(1/2)*x^2*a
^2-2*I*(-a^2*b)^(1/3)*3^(1/2)*x*a+I*(-a^2*b)^(2/3)*3^(1/2)-a^2*x^
2+2*(-a^2*b)^(1/3)*x*a-(-a^2*b)^(2/3))/(x*(a*x^3+b))^(1/2)/(I*3^(
1/2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+
2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1
/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a+\frac{b}{x^3}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^3)*x^2),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(a + b/x^3)*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{x^2\sqrt{\frac{ax^3+b}{x^3}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(a + b/x^3)*x^2),x, algorithm="fricas")
```

```
[Out] integral(1/(x^2*sqrt((a*x^3 + b)/x^3)), x)
```

Sympy [A] time = 3.32182, size = 37, normalized size = 0.17

$$-\frac{\Gamma\left(\frac{1}{3}\right) {}_2F_1\left(\begin{matrix}\frac{1}{3}, \frac{1}{2} \\ \frac{4}{3}\end{matrix}\middle| \frac{be^{i\pi}}{ax^3}\right)}{3\sqrt{a}x\Gamma\left(\frac{4}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(a+b/x**3)**(1/2),x)
```

```
[Out] -gamma(1/3)*hyper((1/3, 1/2), (4/3,), b*exp_polar(I*pi)/(a*x**3))
/(3*sqrt(a)*x*gamma(4/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a + \frac{b}{x^3}}x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(a + b/x^3)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(a + b/x^3)*x^2), x)
```

3.2026 $\int \frac{1}{\sqrt{a+\frac{b}{x^3}}x^5}\,dx$

Optimal. Leaf size=246

$$\frac{4\sqrt{2+\sqrt{3}}a\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{5\sqrt[4]{3}b^{4/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{2\sqrt{a+\frac{b}{x^3}}}{5bx}$$

```
[Out] (-2*Sqrt[a + b/x^3])/(5*b*x) + (4*Sqrt[2 + Sqrt[3]]*a*(a^(1/3) +
b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1
 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3
])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7
- 4*Sqrt[3]])/(5*3^(1/4)*b^(4/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a
^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi [A] time = 0.281845, antiderivative size = 246, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{4\sqrt{2+\sqrt{3}}a\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{5\sqrt[4]{3}b^{4/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{2\sqrt{a+\frac{b}{x^3}}}{5bx}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b/x^3]*x^5),x]
```

```
[Out] (-2*Sqrt[a + b/x^3])/(5*b*x) + (4*Sqrt[2 + Sqrt[3]]*a*(a^(1/3) +
b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1
 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3
])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7
- 4*Sqrt[3]])/(5*3^(1/4)*b^(4/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a
^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi in Sympy [A] time = 12.2928, size = 202, normalized size = 0.82

$$\frac{4\cdot 3^{\frac{3}{4}}a\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{15b^{\frac{4}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}-\frac{2\sqrt{a+\frac{b}{x^3}}}{5bx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**5/(a+b/x**3)**(1/2),x)
```

```
[Out] 4*3**(3/4)*a*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**(2/3)/x**2
)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(sqrt(3) + 2)*(a*
*(1/3) + b**(1/3)/x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) +
b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*sqrt(3
))/(15*b**(4/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(1/3)*(
1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) - 2*sqrt(a + b/x
**3)/(5*b*x)
```

Mathematica [C] time = 0.491727, size = 170, normalized size = 0.69

$$-\frac{-6\sqrt[3]{-b}\left(ax^3+b\right)+4i3^{3/4}a^{4/3}x^4\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}}{\sqrt[3]{a}x}-1\right)}\sqrt{\frac{\frac{(-b)^{2/3}}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+x^2}{x^2}}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}}{\sqrt[3]{a}x}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)}{15(-b)^{4/3}x^4\sqrt{a+\frac{b}{x^3}}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/(Sqrt[a + b/x^3]*x^5),x]
```

```
[Out] -(-6*(-b)^(1/3)*(b + a*x^3) + (4*I)*3^(3/4)*a^(4/3)*Sqrt[(-1)^(5/
6)*(-1 + (-b)^(1/3)/(a^(1/3)*x))]*x^4*Sqrt[((-b)^(2/3)/a^(2/3) +
((-b)^(1/3)*x)/a^(1/3) + x^2)/x^2]*EllipticF[ArcSin[Sqrt[-(-1)^(5
/6) - (I*(-b)^(1/3))/(a^(1/3)*x)]/3^(1/4)], (-1)^(1/3)])/(15*(-b)
^(4/3)*Sqrt[a + b/x^3]*x^4)
```

Maple [B] time = 0.02, size = 1795, normalized size = 7.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^5/(a+b/x^3)^(1/2),x)
```

```
[Out] 2/5/((a*x^3+b)/x^3)^(1/2)/x^4*(a*x^3+b)/(-a^2*b)^(1/3)/b*(4*I*(-(
I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3
^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(
-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(
1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3
^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1
/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*
x^5*a^2-8*I*(-a^2*b)^(1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*
x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b
)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(
-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^
(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(
-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/
(I*3^(1/2)-3))^(1/2))*3^(1/2)*x^4*a+4*I*(-a^2*b)^(2/3)*(-(I*3^(1/
2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*
(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)
^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(
I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-
3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*
(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*x^3-4*(
-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I
*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x
+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)
^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I
*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^
(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^5*a^
2+8*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2
)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/
(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a
^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF
```

```
((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),(
(I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(
-a^2*b)^(1/3)*x^4*a-4*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a
^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/
3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*
b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)
))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*
b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^
(1/2)-3))^(1/2))*(-a^2*b)^(2/3)*x^3-I*(1/a^2*x*(-a*x+(-a^2*b)^(1/
3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-
a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(-a^2*b)^(1/3)*3^(1/2)*
(a*x^4+b*x)^(1/2)+3*(a*x^4+b*x)^(1/2)*(-a^2*b)^(1/3)*(1/a^2*x*(-a
*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3)
)*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2))/(x*(a*x
^3+b))^(1/2)/(I*3^(1/2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1
/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3
)-2*a*x-(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a + \frac{b}{x^3}}x^5}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^3)*x^5),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(a + b/x^3)*x^5), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{x^5\sqrt{\frac{ax^3+b}{x^3}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^3)*x^5),x, algorithm="fricas")
```

```
[Out] integral(1/(x^5*sqrt((a*x^3 + b)/x^3)), x)
```

Sympy [A] time = 5.42816, size = 39, normalized size = 0.16

$$-\frac{\Gamma\left(\frac{4}{3}\right)\, {}_2F_1\left(\begin{matrix}\frac{1}{2}, \frac{4}{3}\\ \frac{7}{3}\end{matrix}\middle| \frac{be^{i\pi}}{ax^3}\right)}{3\sqrt{a}x^4\,\Gamma\left(\frac{7}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**5/(a+b/x**3)**(1/2),x)
```

```
[Out] -gamma(4/3)*hyper((1/2, 4/3), (7/3,), b*exp_polar(I*pi)/(a*x**3))
/(3*sqrt(a)*x**4*gamma(7/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a + \frac{b}{x^3}}x^5}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^3)*x^5),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(a + b/x^3)*x^5), x)
```

3.2027 $\int \frac{1}{\sqrt{a+\frac{b}{x^3}}x^8}\,dx$

Optimal. Leaf size=270

$$-\frac{32\sqrt{2+\sqrt{3}}a^2\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{55\sqrt[4]{3}b^{7/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{16a\sqrt{a+\frac{b}{x^3}}}{55b^2x}-\frac{2\sqrt{a+\frac{b}{x^3}}}{11bx^4}$$

```
[Out] (-2*Sqrt[a + b/x^3])/(11*b*x^4) + (16*a*Sqrt[a + b/x^3])/(55*b^2*
x) - (32*Sqrt[2 + Sqrt[3]]*a^2*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3
) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b
^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)
/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(55*3^(1/
4)*b^(7/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/(
(1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi [A] time = 0.354781, antiderivative size = 270, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{32\sqrt{2+\sqrt{3}}a^2\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{55\sqrt[4]{3}b^{7/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{16a\sqrt{a+\frac{b}{x^3}}}{55b^2x}-\frac{2\sqrt{a+\frac{b}{x^3}}}{11bx^4}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b/x^3]*x^8),x]
```


```
[Out] (-2*Sqrt[a + b/x^3])/(11*b*x^4) + (16*a*Sqrt[a + b/x^3])/(55*b^2*
x) - (32*Sqrt[2 + Sqrt[3]]*a^2*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3
) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b
^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)
/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(55*3^(1/
4)*b^(7/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/(
(1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi in Sympy [A] time = 18.2012, size = 226, normalized size = 0.84

$$-\frac{32\cdot 3^{\frac{3}{4}}a^2\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{165b^{\frac{7}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}+\frac{16a\sqrt{a+\frac{b}{x^3}}}{55b^2x}-\frac{2\sqrt{a+\frac{b}{x^3}}}{11bx^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate(1/x**8/(a+b/x**3)**(1/2),x)
```

```
[Out] -32*3**(3/4)*a**2*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**(2/3)
/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(sqrt(3) + 2
)*(a**(1/3) + b**(1/3)/x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3
)) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*s
qrt(3))/(165*b**(7/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(
1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) + 16*a*sqr
t(a + b/x**3)/(55*b**2*x) - 2*sqrt(a + b/x**3)/(11*b*x**4)
```

Mathematica [C] time = 0.560924, size = 184, normalized size = 0.68

$$\frac{6\sqrt[3]{-b}\left(8a^2x^6+3abx^3-5b^2\right)-32i3^{3/4}a^{7/3}x^7\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}}{\sqrt[3]{a}x}-1\right)}\sqrt{\frac{\frac{(-b)^{2/3}}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+x^2}{x^2}}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}}{\sqrt[3]{a}x}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)}{165(-b)^{7/3}x^7\sqrt{a+\frac{b}{x^3}}}$$

Warning: Unable to verify antiderivative.

```
[In]   Integrate[1/(Sqrt[a + b/x^3]*x^8),x]
```

```
[Out] (6*(-b)^(1/3)*(-5*b^2 + 3*a*b*x^3 + 8*a^2*x^6) - (32*I)*3^(3/4)*a
^(7/3)*Sqrt[(-1)^(5/6)*(-1 + (-b)^(1/3)/(a^(1/3)*x))]*x^7*Sqrt[((
-b)^(2/3)/a^(2/3) + ((-b)^(1/3)*x)/a^(1/3) + x^2)/x^2]*EllipticF[
ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3))/(a^(1/3)*x)]/3^(1/4)], (
-1)^(1/3)])/(165*(-b)^(7/3)*Sqrt[a + b/x^3]*x^7)
```

Maple [B] time = 0.025, size = 2009, normalized size = 7.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^8/(a+b/x^3)^(1/2),x)
```

```
[Out] -2/55/((a*x^3+b)/x^3)^(1/2)/x^7*(a*x^3+b)/(-a^2*b)^(1/3)/b^2*(32*
I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*
((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-
a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2
*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((
-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I
*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(
1/2)*x^8*a^3-64*I*(-a^2*b)^(1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1
```

```
)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(
-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(
1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a
^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(
-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/
2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*x^7*a^2+32*I*(-a^2*b)^(2/3)*(
-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I
*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x
+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)
^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I
*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^
(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2
)*x^6*a-32*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)
))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1
/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*
a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*El
lipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^
(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(
1/2))*x^8*a^3+64*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)
^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(
I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1
/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1
/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)
-3))^(1/2))*(-a^2*b)^(1/3)*x^7*a^2-32*(-(I*3^(1/2)-3)*x*a/(I*3^(1
/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*
a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((
I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*
x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)
-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*
3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(2/3)*x^6*a-8*I*(-a^2*b
)^(1/3)*(a*x^4+b*x)^(1/2)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/
2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)
-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*x^3*a+24*a*(a*x^4+b*x)^(1/2
)*x^3*(-a^2*b)^(1/3)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-
a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*
x-(-a^2*b)^(1/3)))^(1/2)+5*I*(-a^2*b)^(1/3)*(a*x^4+b*x)^(1/2)*(1/
a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2
*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)
*3^(1/2)*b-15*(a*x^4+b*x)^(1/2)*b*(-a^2*b)^(1/3)*(1/a^2*x*(-a*x+(
-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I
*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2))/(x*(a*x^3+b
))^(1/2)/(I*3^(1/2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*
(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*
a*x-(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a+\frac{b}{x^3}}\,x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^3)*x^8),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(a + b/x^3)*x^8), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{x^8\sqrt{\frac{ax^3+b}{x^3}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^3)*x^8),x, algorithm="fricas")
```

```
[Out] integral(1/(x^8*sqrt((a*x^3 + b)/x^3)), x)
```

Sympy [A] time = 9.09314, size = 39, normalized size = 0.14

$$-\frac{\Gamma\left(\frac{7}{3}\right)\,{}_{2}F_{1}\left(\begin{matrix}\frac{1}{2},\frac{7}{3}\\ \frac{10}{3}\end{matrix}\middle|\frac{be^{i\pi}}{ax^{3}}\right)}{3\sqrt{a}x^{7}\,\Gamma\left(\frac{10}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**8/(a+b/x**3)**(1/2),x)
```

```
[Out] -gamma(7/3)*hyper((1/2, 7/3), (10/3,), b*exp_polar(I*pi)/(a*x**3)
)/(3*sqrt(a)*x**7*gamma(10/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a + \frac{b}{x^{3}}}x^{8}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^3)*x^8),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(a + b/x^3)*x^8), x)
```

3.2028 $\int \frac{x^6}{\sqrt{a+\frac{b}{x^3}}}\,dx$

Optimal. Leaf size=566

$$-\frac{55b^{7/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{56\sqrt{2}\sqrt[4]{3}a^{8/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{55\sqrt[4]{3}\sqrt{2-\sqrt{3}}b^{7/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{224a^{8/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{55b^{7/3}\sqrt{a+\frac{b}{x^3}}}{112a^3\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}+\frac{55b^2x\sqrt{a+\frac{b}{x^3}}}{112a^3}-\frac{11bx^4\sqrt{a+\frac{b}{x^3}}}{56a^2}+\frac{x^7\sqrt{a+\frac{b}{x^3}}}{7a}$$

```
[Out] (-55*b^(7/3)*Sqrt[a + b/x^3])/(112*a^3*((1 + Sqrt[3])*a^(1/3) + b
^(1/3)/x)) + (55*b^2*Sqrt[a + b/x^3]*x)/(112*a^3) - (11*b*Sqrt[a
+ b/x^3]*x^4)/(56*a^2) + (Sqrt[a + b/x^3]*x^7)/(7*a) + (55*3^(1/4
)*Sqrt[2 - Sqrt[3]]*b^(7/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) +
 b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1
/3)/x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((
1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(224*a^(8/3)
*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[
3])*a^(1/3) + b^(1/3)/x)^2]) - (55*b^(7/3)*(a^(1/3) + b^(1/3)/x)*
Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])
*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3)
+ b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]
])/(56*Sqrt[2]*3^(1/4)*a^(8/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(
1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi [A] time = 0.896134, antiderivative size = 566, normalized size of antiderivative = 1., number

of steps used = 7, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{55b^{7/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{56\sqrt{2}\sqrt[4]{3}a^{8/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{55\sqrt[4]{3}\sqrt{2-\sqrt{3}}b^{7/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{224a^{8/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{55b^{7/3}\sqrt{a+\frac{b}{x^3}}}{112a^3\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}+\frac{55b^2x\sqrt{a+\frac{b}{x^3}}}{112a^3}-\frac{11bx^4\sqrt{a+\frac{b}{x^3}}}{56a^2}+\frac{x^7\sqrt{a+\frac{b}{x^3}}}{7a}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/Sqrt[a + b/x^3],x]
```

```
[Out] (-55*b^(7/3)*Sqrt[a + b/x^3])/(112*a^3*((1 + Sqrt[3])*a^(1/3) + b
^(1/3)/x)) + (55*b^2*Sqrt[a + b/x^3]*x)/(112*a^3) - (11*b*Sqrt[a
+ b/x^3]*x^4)/(56*a^2) + (Sqrt[a + b/x^3]*x^7)/(7*a) + (55*3^(1/4
)*Sqrt[2 - Sqrt[3]]*b^(7/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) +
 b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1
/3)/x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((
1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(224*a^(8/3)
*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[
3])*a^(1/3) + b^(1/3)/x)^2]) - (55*b^(7/3)*(a^(1/3) + b^(1/3)/x)*
Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])
*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3)
+ b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]
])/(56*Sqrt[2]*3^(1/4)*a^(8/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(
1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi in Sympy [A] time = 57.6193, size = 476, normalized size = 0.84

$$\frac{x^7\sqrt{a+\frac{b}{x^3}}}{7a}-\frac{11bx^4\sqrt{a+\frac{b}{x^3}}}{56a^2}-\frac{55b^{\frac{7}{3}}\sqrt{a+\frac{b}{x^3}}}{112a^3\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)}+\frac{55b^2x\sqrt{a+\frac{b}{x^3}}}{112a^3}+\frac{55\sqrt[4]{3}b^{\frac{7}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{224a^{\frac{8}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}-\frac{55\sqrt{2}\cdot 3^{\frac{3}{4}}b^{\frac{7}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{336a^{\frac{8}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(a+b/x**3)**(1/2),x)
```

```
[Out] x**7*sqrt(a + b/x**3)/(7*a) - 11*b*x**4*sqrt(a + b/x**3)/(56*a**2
) - 55*b**(7/3)*sqrt(a + b/x**3)/(112*a**3*(a**(1/3)*(1 + sqrt(3)
) + b**(1/3)/x)) + 55*b**2*x*sqrt(a + b/x**3)/(112*a**3) + 55*3**
(1/4)*b**(7/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**(2/3)/x*
*2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(-sqrt(3) + 2)*
(a**(1/3) + b**(1/3)/x)*elliptic_e(asin((-a**(1/3)*(-1 + sqrt(3))
 + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*sqr
t(3))/(224*a**(8/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(1/
3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) - 55*sqrt(2)
*3**(3/4)*b**(7/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**(2/3
)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*(a**(1/3) + b**
(1/3)/x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)/x)/
(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*sqrt(3))/(336*a**(
8/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)
) + b**(1/3)/x)**2)*sqrt(a + b/x**3))
```

Mathematica [C] time = 1.71593, size = 372, normalized size = 0.66

$$\frac{55\left(-a^{2/3}b^{7/3}x^2+\sqrt[3]{a}b^{8/3}x+ab^2x^3\right)+2ax^3\left(8a^2x^6-3abx^3-11b^2\right)+\frac{55(-1)^{2/3}b^{7/3}\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)^2\sqrt{\frac{\left(1+\sqrt[3]{-1}\right)\sqrt[3]{a}x\left(\sqrt[3]{b}-\sqrt[3]{-1}\sqrt[3]{a}x\right)}{\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)^2}}\cdots}{\cdots}}{112a^3x^2\sqrt{a+\frac{b}{x^3}}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^6/Sqrt[a + b/x^3],x]
```

```
[Out] (55*(a^(1/3)*b^(8/3)*x - a^(2/3)*b^(7/3)*x^2 + a*b^2*x^3) + 2*a*x
^3*(-11*b^2 - 3*a*b*x^3 + 8*a^2*x^6) + (55*(-1)^(2/3)*b^(7/3)*(b^
(1/3) + a^(1/3)*x)^2*Sqrt[((1 + (-1)^(1/3))*a^(1/3)*x*(b^(1/3) -
(-1)^(1/3)*a^(1/3)*x))/(b^(1/3) + a^(1/3)*x)^2]*Sqrt[(b^(1/3) + (
-1)^(2/3)*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]*((-3 - I*Sqrt[3])*Ell
ipticE[ArcSin[Sqrt[((3 + I*Sqrt[3])*a^(1/3)*x)/(b^(1/3) + a^(1/3)
*x)]/Sqrt[2]], (-I + Sqrt[3])/(I + Sqrt[3])] + (1 + I*Sqrt[3])*El
lipticF[ArcSin[Sqrt[((3 + I*Sqrt[3])*a^(1/3)*x)/(b^(1/3) + a^(1/3
)*x)]/Sqrt[2]], (-I + Sqrt[3])/(I + Sqrt[3])]))/(2*(-1 + (-1)^(2/
3))))/(112*a^3*Sqrt[a + b/x^3]*x^2)
```

Maple [B] time = 0.043, size = 2806, normalized size = 5.

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(a+b/x^3)^(1/2),x)
```

```
[Out] -1/56/((a*x^3+b)/x^3)^(1/2)/x*(a*x^3+b)/a^4*(-55*I*(-a^2*b)^(1/3)
*3^(1/2)*x^2*a*b^2-55*I*(-a^2*b)^(2/3)*3^(1/2)*x*b^2+110*I*(-(I*3
^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1
/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^
2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3
))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1
/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)
+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(2
/3)*3^(1/2)*x*b^2-110*(-a^2*b)^(1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/
2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a
```

```
*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I
*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x
+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-
1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3
^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^2*a*b^2+165*(-a^2*b)^(1/3)*(-(I
*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^
(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-
a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1
/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^
(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/
2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^2*a*b^2
+55*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1
)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(
-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Ellipti
cE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)
,((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))
*3^(1/2)*a*b^3+24*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2
*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(
-a^2*b)^(1/3)))^(1/2)*(a*x^4+b*x)^(1/2)*x^5*a^3+220*(-a^2*b)^(2/3
)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*
((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-
a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2
*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((
-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I
*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x*b
^2-330*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a
^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/
3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*
b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)
))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*
b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^
(1/2)-3))^(1/2))*x*b^2-55*I*3^(1/2)*x^3*a^2*b^2-8*I*(1/a^2*x*(-a*
x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))
*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(a*x^4+b*
x)^(1/2)*3^(1/2)*x^5*a^3+110*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-
a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2
*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)
*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b
)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x
+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1
)/(I*3^(1/2)-3))^(1/2))*a*b^3-165*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-
1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+
(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^
(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-
a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/
(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1
/2)+1)/(I*3^(1/2)-3))^(1/2))*a*b^3+11*I*(1/a^2*x*(-a*x+(-a^2*b)^(
1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*
(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(a*x^4+b*x)^(1/2)*3^(
1/2)*x^2*a^2*b-33*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2
*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(
-a^2*b)^(1/3)))^(1/2)*(a*x^4+b*x)^(1/2)*x^2*a^2*b-55*I*(-(I*3^(1/
2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*
(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)
^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(
I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-
3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*
(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(1/3)*
3^(1/2)*x^2*a*b^2+165*x^3*a^2*b^2+165*(-a^2*b)^(1/3)*x^2*a*b^2+16
5*(-a^2*b)^(2/3)*x*b^2)/(x*(a*x^3+b))^(1/2)/(I*3^(1/2)-3)/(1/a^2*
x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^
(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{\sqrt{a+\frac{b}{x^3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(a + b/x^3),x, algorithm="maxima")

[Out] integrate(x^6/sqrt(a + b/x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{x^6}{\sqrt{\frac{ax^3+b}{x^3}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(a + b/x^3),x, algorithm="fricas")

[Out] integral(x^6/sqrt((a*x^3 + b)/x^3), x)
```

Sympy [A] time = 5.46012, size = 46, normalized size = 0.08

$$-\frac{x^7\Gamma\left(-\frac{7}{3}\right){}_2F_1\left(\begin{matrix}-\frac{7}{3},\frac{1}{2}\\-\frac{4}{3}\end{matrix}\middle|\frac{be^{i\pi}}{ax^3}\right)}{3\sqrt{a}\,\Gamma\left(-\frac{4}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(a+b/x**3)**(1/2),x)

[Out] -x**7*gamma(-7/3)*hyper((-7/3, 1/2), (-4/3,), b*exp_polar(I*pi)/(
a*x**3))/(3*sqrt(a)*gamma(-4/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{\sqrt{a+\frac{b}{x^3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/sqrt(a + b/x^3),x, algorithm="giac")

[Out] integrate(x^6/sqrt(a + b/x^3), x)
```

3.2029 $\int \frac{x^3}{\sqrt{a+\frac{b}{x^3}}} dx$

Optimal. Leaf size=542

$$\frac{5b^{4/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{4\sqrt{2}\sqrt[4]{3}a^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{5\sqrt[4]{3}\sqrt{2-\sqrt{3}}b^{4/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{16a^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{5b^{4/3}\sqrt{a+\frac{b}{x^3}}}{8a^2\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}-\frac{5bx\sqrt{a+\frac{b}{x^3}}}{8a^2}+\frac{x^4\sqrt{a+\frac{b}{x^3}}}{4a}$$

```
[Out] (5*b^(4/3)*Sqrt[a + b/x^3])/(8*a^2*((1 + Sqrt[3])*a^(1/3) + b^(1/
3)/x)) - (5*b*Sqrt[a + b/x^3]*x)/(8*a^2) + (Sqrt[a + b/x^3]*x^4)/
(4*a) - (5*3^(1/4)*Sqrt[2 - Sqrt[3]]*b^(4/3)*(a^(1/3) + b^(1/3)/x
)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3
])*a^(1/3) + b^(1/3)/x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3
) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[
3]])/(16*a^(5/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)
/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]) + (5*b^(4/3)*(a^(1/3
) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)
/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sq
rt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)],
 -7 - 4*Sqrt[3]])/(4*Sqrt[2]*3^(1/4)*a^(5/3)*Sqrt[a + b/x^3]*Sqrt
[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)
/x)^2])
```

Rubi [A] time = 0.80934, antiderivative size = 542, normalized size of antiderivative = 1., number of

steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{5b^{4/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{4\sqrt{2}\sqrt[4]{3}a^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{5\sqrt[4]{3}\sqrt{2-\sqrt{3}}b^{4/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{16a^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{5b^{4/3}\sqrt{a+\frac{b}{x^3}}}{8a^2\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}-\frac{5bx\sqrt{a+\frac{b}{x^3}}}{8a^2}+\frac{x^4\sqrt{a+\frac{b}{x^3}}}{4a}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/Sqrt[a + b/x^3],x]
```

```
[Out] (5*b^(4/3)*Sqrt[a + b/x^3])/(8*a^2*((1 + Sqrt[3])*a^(1/3) + b^(1/
3)/x)) - (5*b*Sqrt[a + b/x^3]*x)/(8*a^2) + (Sqrt[a + b/x^3]*x^4)/
(4*a) - (5*3^(1/4)*Sqrt[2 - Sqrt[3]]*b^(4/3)*(a^(1/3) + b^(1/3)/x
)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3
])*a^(1/3) + b^(1/3)/x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3
) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[
3]])/(16*a^(5/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)
/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]) + (5*b^(4/3)*(a^(1/3
) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)
/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sq
rt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)],
 -7 - 4*Sqrt[3]])/(4*Sqrt[2]*3^(1/4)*a^(5/3)*Sqrt[a + b/x^3]*Sqrt
[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)
/x)^2])
```

Rubi in Sympy [A] time = 46.3919, size = 452, normalized size = 0.83

$$\frac{x^4\sqrt{a+\frac{b}{x^3}}}{4a}+\frac{5b^{\frac{4}{3}}\sqrt{a+\frac{b}{x^3}}}{8a^2\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)}-\frac{5bx\sqrt{a+\frac{b}{x^3}}}{8a^2}-\frac{5\sqrt[4]{3}b^{\frac{4}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{16a^{\frac{5}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}+\frac{5\sqrt{2}\cdot3^{\frac{3}{4}}b^{\frac{4}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{24a^{\frac{5}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(a+b/x**3)**(1/2),x)
```

```
[Out] x**4*sqrt(a + b/x**3)/(4*a) + 5*b**(4/3)*sqrt(a + b/x**3)/(8*a**2
*(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)) - 5*b*x*sqrt(a + b/x**3)/
(8*a**2) - 5*3**(1/4)*b**(4/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)
/x + b**(2/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqr
t(-sqrt(3) + 2)*(a**(1/3) + b**(1/3)/x)*elliptic_e(asin((-a**(1/3
)*(-1 + sqrt(3)) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)
/x)), -7 - 4*sqrt(3))/(16*a**(5/3)*sqrt(a**(1/3)*(a**(1/3) + b**(
1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3
)) + 5*sqrt(2)*3**(3/4)*b**(4/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/
3)/x + b**(2/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*(
a**(1/3) + b**(1/3)/x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3))
+ b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*sqrt
(3))/(24*a**(5/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(1/3)
*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3))
```

Mathematica [C] time = 1.43155, size = 356, normalized size = 0.66

$$\frac{5bx\left(-\frac{b^{2/3}}{a^{2/3}}+\frac{\sqrt[3]{b}x}{\sqrt[3]{a}}-x^2\right)-\frac{5(-1)^{2/3}b^{4/3}\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)^2\sqrt{\frac{\left(1+\sqrt[3]{-1}\right)\sqrt[3]{a}x\left(\sqrt[3]{b}-\sqrt[3]{-1}\sqrt[3]{a}x\right)}{\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)^2}}\sqrt{\frac{(-1)^{2/3}\sqrt[3]{a}x+\sqrt[3]{b}}{\sqrt[3]{a}x+\sqrt[3]{b}}}\left(\left(1+i\sqrt{3}\right)F\left(\sin^{-1}\left(\frac{\sqrt{\frac{\left(3+i\sqrt{3}\right)\sqrt[3]{a}x}{\sqrt[3]{a}x+\sqrt[3]{b}}}}{\sqrt{2}}\right)|\frac{-}{i}\right.\right.}{2\left((-1)^{2/3}-1\right)a}}{8ax^2\sqrt{a+\frac{b}{x^3}}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^3/Sqrt[a + b/x^3],x]
```

```
[Out] (5*b*x*(-(b^(2/3)/a^(2/3)) + (b^(1/3)*x)/a^(1/3) - x^2) + 2*x^3*(
b + a*x^3) - (5*(-1)^(2/3)*b^(4/3)*(b^(1/3) + a^(1/3)*x)^2*Sqrt[(
(1 + (-1)^(1/3))*a^(1/3)*x*(b^(1/3) - (-1)^(1/3)*a^(1/3)*x))/(b^(
1/3) + a^(1/3)*x)^2]*Sqrt[(b^(1/3) + (-1)^(2/3)*a^(1/3)*x)/(b^(1/
3) + a^(1/3)*x)]*((-3 - I*Sqrt[3])*EllipticE[ArcSin[Sqrt[((3 + I*
Sqrt[3])*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]/Sqrt[2]], (-I + Sqrt[3
])/(I + Sqrt[3])] + (1 + I*Sqrt[3])*EllipticF[ArcSin[Sqrt[((3 + I
*Sqrt[3])*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]/Sqrt[2]], (-I + Sqrt[
3])/(I + Sqrt[3])]))/(2*(-1 + (-1)^(2/3))*a))/(8*a*Sqrt[a + b/x^3
]*x^2)
```

Maple [B] time = 0.019, size = 2586, normalized size = 4.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(a+b/x^3)^(1/2),x)
```

```
[Out] 1/4/((a*x^3+b)/x^3)^(1/2)/x*(a*x^3+b)/a^3*(5*I*(-(I*3^(1/2)-3)*x*
a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)
^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))
^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2
)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(
I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/
2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*a*b^2-5*I*(-a^2
*b)^(1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3))
)^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/
2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a
*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Ell
```

```
ipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(
1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1
/2))*3^(1/2)*x^2*a*b-10*(-a^2*b)^(1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(
1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2
*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(
(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a
*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2
)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I
*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^2*a*b+15*(-a^2*b)^(1/3)*(-(I*
3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(
1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a
^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/
3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(
1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2
)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^2*a*b-5*
I*(-a^2*b)^(1/3)*3^(1/2)*x^2*a*b+20*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3
)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^
2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/
3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^
(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x
*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3
^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x*b-30*(-a^2*b)^(2/
3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)
*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(
-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^
2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE(
(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((
I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x*
b+I*(a*x^4+b*x)^(1/2)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(
-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a
*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*x^2*a^2-5*I*(-a^2*b)^(2/3)*3^(1
/2)*x*b-5*I*3^(1/2)*x^3*a^2*b+10*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1
)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(
-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(
1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a
^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(
-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/
2)+1)/(I*3^(1/2)-3))^(1/2))*a*b^2-15*(-(I*3^(1/2)-3)*x*a/(I*3^(1/
2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a
*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I
*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x
+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-
1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3
^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*a*b^2+10*I*(-a^2*b)^(2/3)*(-(I*3^
(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/
2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2
*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)
)/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/
2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+
3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*x*b-
3*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+
(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^
(1/2)*(a*x^4+b*x)^(1/2)*x^2*a^2+15*a^2*b*x^3+15*(-a^2*b)^(1/3)*x^
2*a*b+15*(-a^2*b)^(2/3)*x*b)/(x*(a*x^3+b))^(1/2)/(I*3^(1/2)-3)/(1
/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^
2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2
)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{\sqrt{a+\frac{b}{x^3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(a + b/x^3),x, algorithm="maxima")
```

```
[Out] integrate(x^3/sqrt(a + b/x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^3}{\sqrt{\frac{ax^3+b}{x^3}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(a + b/x^3),x, algorithm="fricas")
```

```
[Out] integral(x^3/sqrt((a*x^3 + b)/x^3), x)
```

Sympy [A] time = 3.36918, size = 46, normalized size = 0.08

$$-\frac{x^4\Gamma\left(-\frac{4}{3}\right){}_2F_1\left(\begin{matrix}-\frac{4}{3},\frac{1}{2}\\-\frac{1}{3}\end{matrix}\middle|\frac{be^{i\pi}}{ax^3}\right)}{3\sqrt{a}\,\Gamma\left(-\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(a+b/x**3)**(1/2),x)
```

```
[Out] -x**4*gamma(-4/3)*hyper((-4/3, 1/2), (-1/3,), b*exp_polar(I*pi)/(
a*x**3))/(3*sqrt(a)*gamma(-1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{\sqrt{a+\frac{b}{x^3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(a + b/x^3),x, algorithm="giac")
```

```
[Out] integrate(x^3/sqrt(a + b/x^3), x)
```

3.2030 $\int \frac{1}{\sqrt{a+\frac{b}{x^3}}}\,dx$

Optimal. Leaf size=513

$$-\frac{\sqrt{2}\sqrt[3]{b}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{\sqrt[4]{3}a^{2/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{\sqrt[4]{3}\sqrt{2-\sqrt{3}}\sqrt[3]{b}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{2a^{2/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{x\sqrt{a+\frac{b}{x^3}}}{a}-\frac{\sqrt[3]{b}\sqrt{a+\frac{b}{x^3}}}{a\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}$$

```
[Out] -((b^(1/3)*Sqrt[a + b/x^3])/(a*((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x
))) + (Sqrt[a + b/x^3]*x)/a + (3^(1/4)*Sqrt[2 - Sqrt[3]]*b^(1/3)*
(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1
/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticE[ArcSin[(
(1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/
3)/x)], -7 - 4*Sqrt[3]])/(2*a^(2/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)
*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]) -
 (Sqrt[2]*b^(1/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x
^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*
EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3
])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(3^(1/4)*a^(2/3)*Sqrt[
a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^
(1/3) + b^(1/3)/x)^2])
```

Rubi [A] time = 0.643341, antiderivative size = 513, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.454

$$-\frac{\sqrt{2}\sqrt[3]{b}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{\sqrt[4]{3}a^{2/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{\sqrt[4]{3}\sqrt{2-\sqrt{3}}\sqrt[3]{b}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{2a^{2/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{x\sqrt{a+\frac{b}{x^3}}}{a}-\frac{\sqrt[3]{b}\sqrt{a+\frac{b}{x^3}}}{a\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}$$

Antiderivative was successfully verified.

```
[In]   Int[1/Sqrt[a + b/x^3],x]
```

```
[Out] -((b^(1/3)*Sqrt[a + b/x^3])/(a*((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x
))) + (Sqrt[a + b/x^3]*x)/a + (3^(1/4)*Sqrt[2 - Sqrt[3]]*b^(1/3)*
(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1
/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticE[ArcSin[(
(1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/
3)/x)], -7 - 4*Sqrt[3]])/(2*a^(2/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)
*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]) -
 (Sqrt[2]*b^(1/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x
^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*
EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3
])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(3^(1/4)*a^(2/3)*Sqrt[
a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^
(1/3) + b^(1/3)/x)^2])
```

Rubi in Sympy [A] time = 34.7639, size = 420, normalized size = 0.82

$$-\frac{\sqrt[3]{b}\sqrt{a+\frac{b}{x^3}}}{a\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)}+\frac{x\sqrt{a+\frac{b}{x^3}}}{a}+\frac{\sqrt[4]{3}\sqrt[3]{b}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{2a^{\frac{2}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}-\frac{\sqrt{2}\cdot 3^{\frac{3}{4}}\sqrt[3]{b}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{3a^{\frac{2}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate(1/(a+b/x**3)**(1/2),x)
```

```
[Out] -b**(1/3)*sqrt(a + b/x**3)/(a*(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/
x)) + x*sqrt(a + b/x**3)/a + 3**(1/4)*b**(1/3)*sqrt((a**(2/3) - a
**(1/3)*b**(1/3)/x + b**(2/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**
(1/3)/x)**2)*sqrt(-sqrt(3) + 2)*(a**(1/3) + b**(1/3)/x)*elliptic_
e(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)/x)/(a**(1/3)*(1 + sqr
t(3)) + b**(1/3)/x)), -7 - 4*sqrt(3))/(2*a**(2/3)*sqrt(a**(1/3)*(
a**(1/3) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*
sqrt(a + b/x**3)) - sqrt(2)*3**(3/4)*b**(1/3)*sqrt((a**(2/3) - a*
*(1/3)*b**(1/3)/x + b**(2/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(
1/3)/x)**2)*(a**(1/3) + b**(1/3)/x)*elliptic_f(asin((-a**(1/3)*(-
1 + sqrt(3)) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x))
, -7 - 4*sqrt(3))/(3*a**(2/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/
x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3))
```

Mathematica [C] time = 1.41485, size = 334, normalized size = 0.65

$$\frac{x\left(\frac{b^{2/3}}{a^{2/3}}-\frac{\sqrt[3]{b}x}{\sqrt[3]{a}}+x^2\right)+\frac{(-1)^{2/3}\sqrt[3]{b}\sqrt{\frac{\left(1+\sqrt[3]{-1}\right)\sqrt[3]{a}x\left(\sqrt[3]{b}-\sqrt[3]{-1}\sqrt[3]{a}x\right)}{\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)^2}}\sqrt{\frac{(-1)^{2/3}\sqrt[3]{a}x+\sqrt[3]{b}}{\sqrt[3]{a}x+\sqrt[3]{b}}}\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)^2\left(\left(1+i\sqrt{3}\right)F\left(\sin^{-1}\left(\frac{\sqrt{\frac{\left(3+i\sqrt{3}\right)\sqrt[3]{a}x}{\sqrt[3]{a}x+\sqrt[3]{b}}}}{\sqrt{2}}\right)\middle|\frac{-i+\sqrt{3}}{i+\sqrt{3}}\right)+\cdots\right)}{2\left((-1)^{2/3}-1\right)a}}{x^2\sqrt{a+\frac{b}{x^3}}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/Sqrt[a + b/x^3],x]
```

```
[Out] (x*(b^(2/3)/a^(2/3) - (b^(1/3)*x)/a^(1/3) + x^2) + ((-1)^(2/3)*b^
(1/3)*(b^(1/3) + a^(1/3)*x)^2*Sqrt[((1 + (-1)^(1/3))*a^(1/3)*x*(b
^(1/3) - (-1)^(1/3)*a^(1/3)*x))/(b^(1/3) + a^(1/3)*x)^2]*Sqrt[(b^
(1/3) + (-1)^(2/3)*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]*((-3 - I*Sqr
t[3])*EllipticE[ArcSin[Sqrt[((3 + I*Sqrt[3])*a^(1/3)*x)/(b^(1/3)
+ a^(1/3)*x)]/Sqrt[2]], (-I + Sqrt[3])/(I + Sqrt[3])] + (1 + I*Sq
rt[3])*EllipticF[ArcSin[Sqrt[((3 + I*Sqrt[3])*a^(1/3)*x)/(b^(1/3)
 + a^(1/3)*x)]/Sqrt[2]], (-I + Sqrt[3])/(I + Sqrt[3])]))/(2*(-1 +
 (-1)^(2/3))*a))/(Sqrt[a + b/x^3]*x^2)
```

Maple [B] time = 0.014, size = 2374, normalized size = 4.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^3)^(1/2),x)
```

```
[Out] -2/((a*x^3+b)/x^3)^(1/2)/x*(a*x^3+b)/a^2*(-I*(-a^2*b)^(1/3)*3^(1/
2)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)
*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(
-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^
2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE(
(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((
I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^
2*a+2*I*(-a^2*b)^(2/3)*3^(1/2)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/
(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a
^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/
2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2
*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a
*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)
+1)/(I*3^(1/2)-3))^(1/2))*x-2*(-a^2*b)^(1/3)*(-(I*3^(1/2)-3)*x*a/
(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(
1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(
1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-
1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*
3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)
-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^2*a+3*(-a^2*b)^(1/3)*(-
(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*
3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+
(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^
(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*
3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(
1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x^2*a+I
*3^(1/2)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))
^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2
)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*
x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Elli
pticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/
2))*a*b+4*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+
(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^
(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a
```

```
^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1
/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a
^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I
*3^(1/2)-3))^(1/2))*x-6*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(
1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2
*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(
(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a
*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2
)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I
*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*x-I*3^(1/2)*x^3*a^2-I*(-a^2*b)^
(1/3)*3^(1/2)*x^2*a+2*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a
^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/
3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*
b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)
))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*
b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^
(1/2)-3))^(1/2))*a*b-3*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-
a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1
/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2
*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3
)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2
*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3
^(1/2)-3))^(1/2))*a*b-I*(-a^2*b)^(2/3)*3^(1/2)*x+3*x^3*a^2+3*(-a^
2*b)^(1/3)*x^2*a+3*(-a^2*b)^(2/3)*x)/(x*(a*x^3+b))^(1/2)/(I*3^(1/
2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*
a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3
)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a + \frac{b}{x^3}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(a + b/x^3),x, algorithm="maxima")
```

```
[Out] integrate(1/sqrt(a + b/x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{\frac{ax^3+b}{x^3}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(a + b/x^3),x, algorithm="fricas")
```

```
[Out] integral(1/sqrt((a*x^3 + b)/x^3), x)
```

Sympy [A] time = 2.79392, size = 41, normalized size = 0.08

$$-\frac{x\,\Gamma\left(-\frac{1}{3}\right) {}_2F_1\left(\begin{matrix} -\frac{1}{3}, \frac{1}{2} \\ \frac{2}{3} \end{matrix}\middle| \frac{be^{i\pi}}{ax^3}\right)}{3\sqrt{a}\,\Gamma\left(\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**3)**(1/2),x)
```

```
[Out] -x*gamma(-1/3)*hyper((-1/3, 1/2), (2/3,), b*exp_polar(I*pi)/(a*x*
*3))/(3*sqrt(a)*gamma(2/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a + \frac{b}{x^3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(a + b/x^3),x, algorithm="giac")
```

```
[Out] integrate(1/sqrt(a + b/x^3), x)
```

3.2031 $\int \frac{1}{\sqrt{a+\frac{b}{x^3}}x^3}\,dx$

Optimal. Leaf size=491

$$-\frac{2\sqrt{2}\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{\sqrt[4]{3}b^{2/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{\sqrt[4]{3}\sqrt{2-\sqrt{3}}\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{b^{2/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{2\sqrt{a+\frac{b}{x^3}}}{b^{2/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}$$

```
[Out] (-2*Sqrt[a + b/x^3])/(b^(2/3)*((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)
) + (3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(1/3)*(a^(1/3) + b^(1/3)/x)*Sqrt
[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(
1/3) + b^(1/3)/x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^
(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(
b^(2/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1
+ Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]) - (2*Sqrt[2]*a^(1/3)*(a^(1/3)
 + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/
((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqr
t[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)],
-7 - 4*Sqrt[3]])/(3^(1/4)*b^(2/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(
a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi [A] time = 0.557545, antiderivative size = 491, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{2\sqrt{2}\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{\sqrt[4]{3}b^{2/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{\sqrt[4]{3}\sqrt{2-\sqrt{3}}\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{b^{2/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{2\sqrt{a+\frac{b}{x^3}}}{b^{2/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b/x^3]*x^3),x]
```

```
[Out] (-2*Sqrt[a + b/x^3])/(b^(2/3)*((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)
) + (3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(1/3)*(a^(1/3) + b^(1/3)/x)*Sqrt
[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(
1/3) + b^(1/3)/x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^
(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(
b^(2/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1
+ Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]) - (2*Sqrt[2]*a^(1/3)*(a^(1/3)
 + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/
((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqr
t[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)],
-7 - 4*Sqrt[3]])/(3^(1/4)*b^(2/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(
a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi in Sympy [A] time = 26.8365, size = 406, normalized size = 0.83

$$\frac{\sqrt[4]{3}\sqrt[3]{a}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^{2}}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^{2}}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{b^{\frac{2}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^{2}}}\sqrt{a+\frac{b}{x^{3}}}} - \frac{2\sqrt{2}\cdot 3^{\frac{3}{4}}\sqrt[3]{a}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^{2}}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^{2}}}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{3b^{\frac{2}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^{2}}}\sqrt{a+\frac{b}{x^{3}}}} - \frac{2\sqrt{a+\frac{b}{x^{3}}}}{b^{\frac{2}{3}}\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(a+b/x**3)**(1/2),x)
```

```
[Out] 3**(1/4)*a**(1/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**(2/3)
/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(-sqrt(3) +
2)*(a**(1/3) + b**(1/3)/x)*elliptic_e(asin((-a**(1/3)*(-1 + sqrt(
3)) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*
sqrt(3))/(b**(2/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(1/3
)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) - 2*sqrt(2)*3
**(3/4)*a**(1/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**(2/3)/
x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*(a**(1/3) + b**(1
/3)/x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)/x)/(a
**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*sqrt(3))/(3*b**(2/3)
*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) +
b**(1/3)/x)**2)*sqrt(a + b/x**3)) - 2*sqrt(a + b/x**3)/(b**(2/3)*
(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x))
```

Mathematica [C] time = 1.26513, size = 335, normalized size = 0.68

$$\frac{2\left(-a^{2/3}\sqrt[3]{b}x^2+\sqrt[3]{a}b^{2/3}x+\frac{(-1)^{2/3}\sqrt[3]{b}\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)^2\sqrt{\frac{\left(1+\sqrt[3]{-1}\right)\sqrt[3]{a}x\left(\sqrt[3]{b}-\sqrt[3]{-1}\sqrt[3]{a}x\right)}{\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)^2}}\sqrt{\frac{(-1)^{2/3}\sqrt[3]{a}x+\sqrt[3]{b}}{\sqrt[3]{a}x+\sqrt[3]{b}}}\left(\left(1+i\sqrt{3}\right)F\left(\sin^{-1}\left(\frac{\sqrt{\frac{\left(3+i\sqrt{3}\right)\sqrt[3]{a}x}{\sqrt[3]{a}x+\sqrt[3]{b}}}}{\sqrt{2}}\right)|\frac{-i+}{i+}\right.\right.}{2\left((-1)^{2/3}-1\right)}\right.}{bx^2\sqrt{a+\frac{b}{x^3}}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/(Sqrt[a + b/x^3]*x^3),x]
```

```
[Out] (2*(-b + a^(1/3)*b^(2/3)*x - a^(2/3)*b^(1/3)*x^2 + ((-1)^(2/3)*b^
(1/3)*(b^(1/3) + a^(1/3)*x)^2*Sqrt[((1 + (-1)^(1/3))*a^(1/3)*x*(b
^(1/3) - (-1)^(1/3)*a^(1/3)*x))/(b^(1/3) + a^(1/3)*x)^2]*Sqrt[(b^
(1/3) + (-1)^(2/3)*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]*((-3 - I*Sqr
t[3])*EllipticE[ArcSin[Sqrt[((3 + I*Sqrt[3])*a^(1/3)*x)/(b^(1/3)
+ a^(1/3)*x)]/Sqrt[2]], (-I + Sqrt[3])/(I + Sqrt[3])] + (1 + I*Sq
rt[3])*EllipticF[ArcSin[Sqrt[((3 + I*Sqrt[3])*a^(1/3)*x)/(b^(1/3)
 + a^(1/3)*x)]/Sqrt[2]], (-I + Sqrt[3])/(I + Sqrt[3])]))/(2*(-1 +
 (-1)^(2/3)))))/(b*Sqrt[a + b/x^3]*x^2)
```

Maple [B] time = 0.022, size = 2860, normalized size = 5.8

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(a+b/x^3)^(1/2),x)
```

```
[Out] -2/((a*x^3+b)/x^3)^(1/2)/x^2/a*(4*I*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3
)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^
2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/
3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^
(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x
*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3
^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3+b
))^(1/2)*x+2*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(
1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*
3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3
)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2
)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3
)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3
))^(1/2))*3^(1/2)*(x*(a*x^3+b))^(1/2)*a*b-4*(-a^2*b)^(1/3)*((I*3^
(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-
a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1
/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^
(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/
2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-(I*3^(1
/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(x*(a*x^3+b
))^(1/2)*x^2*a+6*(-a^2*b)^(1/3)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+
(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^
(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-
a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/
(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1
/2)+1)/(I*3^(1/2)-3))^(1/2))*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-
a*x+(-a^2*b)^(1/3)))^(1/2)*(x*(a*x^3+b))^(1/2)*x^2*a-2*I*3^(1/2)*
(x*(a*x^3+b))^(1/2)*x^3*a^2+8*(-a^2*b)^(2/3)*((I*3^(1/2)*(-a^2*b)
^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))
^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2
)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(
```

```
I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/
2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-(I*3^(1/2)-3)*x*a/(I*
3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(x*(a*x^3+b))^(1/2)*x-12*
(-a^2*b)^(2/3)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(
I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1
/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1
/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)
-3))^(1/2))*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3
)))^(1/2)*(x*(a*x^3+b))^(1/2)*x+I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*
(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*
b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*a*b-2*I*(-a^2*b)^(1
/3)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^2*a+I*(1/a^2*x*(-a*x+(-a^2*b)^(
1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*
(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*x^3*a^2+4*((I
*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x
+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)
^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I
*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^
(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-(I*3
^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(x*(a*x^
3+b))^(1/2)*a*b-6*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3)
)/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)
^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))
^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)
^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1
/2)-3))^(1/2))*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(
1/3)))^(1/2)*(x*(a*x^3+b))^(1/2)*a*b-2*I*(-a^2*b)^(1/3)*(-(I*3^(1
/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)
*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b
)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/
(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)
-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)
*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*
x^3+b))^(1/2)*x^2*a-3*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(
-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a
*x-(-a^2*b)^(1/3)))^(1/2)*x^3*a^2+6*(x*(a*x^3+b))^(1/2)*x^3*a^2+6
*(-a^2*b)^(1/3)*(x*(a*x^3+b))^(1/2)*x^2*a-2*I*(-a^2*b)^(2/3)*3^(1
/2)*(x*(a*x^3+b))^(1/2)*x+6*(-a^2*b)^(2/3)*(x*(a*x^3+b))^(1/2)*x-
3*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+
(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^
(1/2)*a*b)/b/(I*3^(1/2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1
/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3
)-2*a*x-(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a + \frac{b}{x^3}}x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^3)*x^3),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(a + b/x^3)*x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{x^3\sqrt{\frac{ax^3+b}{x^3}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^3)*x^3),x, algorithm="fricas")
```

```
[Out] integral(1/(x^3*sqrt((a*x^3 + b)/x^3)), x)
```

Sympy [A] time = 3.75423, size = 39, normalized size = 0.08

$$-\frac{\Gamma\left(\frac{2}{3}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{2}{3}\\ \frac{5}{3}\end{matrix}\middle|\frac{be^{i\pi}}{ax^3}\right)}{3\sqrt{a}x^2\,\Gamma\left(\frac{5}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(a+b/x**3)**(1/2),x)
```

```
[Out] -gamma(2/3)*hyper((1/2, 2/3), (5/3,), b*exp_polar(I*pi)/(a*x**3))
/(3*sqrt(a)*x**2*gamma(5/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a+\frac{b}{x^3}}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^3)*x^3),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(a + b/x^3)*x^3), x)
```

3.2032 $\int \frac{1}{\sqrt{a+\frac{b}{x^3}}x^6}\,dx$

Optimal. Leaf size=520

$$\frac{8\sqrt{2}a^{4/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{7\sqrt[4]{3}b^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{4\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{4/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{7b^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{8a\sqrt{a+\frac{b}{x^3}}}{7b^{5/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}-\frac{2\sqrt{a+\frac{b}{x^3}}}{7bx^2}$$

```
[Out] (8*a*Sqrt[a + b/x^3])/(7*b^(5/3)*((1 + Sqrt[3])*a^(1/3) + b^(1/3)
/x)) - (2*Sqrt[a + b/x^3])/(7*b*x^2) - (4*3^(1/4)*Sqrt[2 - Sqrt[3
]]*a^(4/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a
^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*Ellipti
cE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1
/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(7*b^(5/3)*Sqrt[a + b/x^3]*Sq
rt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/
3)/x)^2]) + (8*Sqrt[2]*a^(4/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3
) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b
^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)
/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(7*3^(1/4
)*b^(5/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((
1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi [A] time = 0.673454, antiderivative size = 520, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{8\sqrt{2}a^{4/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{7\sqrt[4]{3}b^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{4\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{4/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{7b^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{8a\sqrt{a+\frac{b}{x^3}}}{7b^{5/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}-\frac{2\sqrt{a+\frac{b}{x^3}}}{7bx^2}$$

Antiderivative was successfully verified.

```
[In]   Int[1/(Sqrt[a + b/x^3]*x^6),x]
```

```
[Out] (8*a*Sqrt[a + b/x^3])/(7*b^(5/3)*((1 + Sqrt[3])*a^(1/3) + b^(1/3)
/x)) - (2*Sqrt[a + b/x^3])/(7*b*x^2) - (4*3^(1/4)*Sqrt[2 - Sqrt[3
]]*a^(4/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a
^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*Ellipti
cE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1
/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(7*b^(5/3)*Sqrt[a + b/x^3]*Sq
rt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/
3)/x)^2]) + (8*Sqrt[2]*a^(4/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3
) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b
^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)
/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(7*3^(1/4
)*b^(5/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((
1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi in Sympy [A] time = 36.4348, size = 432, normalized size = 0.83

$$-\frac{4\sqrt[4]{3}a^{\frac{4}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^{2}}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^{2}}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{7b^{\frac{5}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^{2}}}\sqrt{a+\frac{b}{x^{3}}}}+\frac{8\sqrt{2}\cdot 3^{\frac{3}{4}}a^{\frac{4}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^{2}}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^{2}}}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{21b^{\frac{5}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^{2}}}\sqrt{a+\frac{b}{x^{3}}}}+\frac{8a\sqrt{a+\frac{b}{x^{3}}}}{7b^{\frac{5}{3}}\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)}-\frac{2\sqrt{a+\frac{b}{x^{3}}}}{7bx^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate(1/x**6/(a+b/x**3)**(1/2),x)
```

```
[Out] -4*3**(1/4)*a**(4/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**(2
/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(-sqrt(3)
 + 2)*(a**(1/3) + b**(1/3)/x)*elliptic_e(asin((-a**(1/3)*(-1 + sq
rt(3)) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 -
 4*sqrt(3))/(7*b**(5/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a*
*(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) + 8*sqrt
(2)*3**(3/4)*a**(4/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**(
2/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*(a**(1/3) +
b**(1/3)/x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)/
x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*sqrt(3))/(21*b*
*(5/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(
3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) + 8*a*sqrt(a + b/x**3)/(7
*b**(5/3)*(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)) - 2*sqrt(a + b/x
**3)/(7*b*x**2)
```

Mathematica [C] time = 1.72959, size = 363, normalized size = 0.7

$$\frac{2\left(-4a^{4/3}x\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)+\frac{(ax^3+b)(4ax^3-b)}{x^3}-\frac{2(-1)^{2/3}a\sqrt[3]{b}\sqrt{\frac{\left(1+\sqrt[3]{-1}\right)\sqrt[3]{a}x\left(\sqrt[3]{b}-\sqrt[3]{-1}\sqrt[3]{a}x\right)}{\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)^2}}\sqrt{\frac{(-1)^{2/3}\sqrt[3]{a}x+\sqrt[3]{b}}{\sqrt[3]{a}x+\sqrt[3]{b}}}\left(\sqrt[3]{a}x+\sqrt[3]{b}\right.}{\cdots}\right.}{7b^2x^2\sqrt{a+\frac{b}{x^3}}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/(Sqrt[a + b/x^3]*x^6),x]
```

```
[Out] (2*(-4*a^(4/3)*x*(b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2) + ((
b + a*x^3)*(-b + 4*a*x^3))/x^3 - (2*(-1)^(2/3)*a*b^(1/3)*(b^(1/3)
 + a^(1/3)*x)^2*Sqrt[((1 + (-1)^(1/3))*a^(1/3)*x*(b^(1/3) - (-1)^
(1/3)*a^(1/3)*x))/(b^(1/3) + a^(1/3)*x)^2]*Sqrt[(b^(1/3) + (-1)^(
2/3)*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]*((-3 - I*Sqrt[3])*Elliptic
E[ArcSin[Sqrt[((3 + I*Sqrt[3])*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]/
Sqrt[2]], (-I + Sqrt[3])/(I + Sqrt[3])] + (1 + I*Sqrt[3])*Ellipti
cF[ArcSin[Sqrt[((3 + I*Sqrt[3])*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]
/Sqrt[2]], (-I + Sqrt[3])/(I + Sqrt[3])]))/(-1 + (-1)^(2/3))))/(7
*b^2*Sqrt[a + b/x^3]*x^2)
```

Maple [B] time = 0.027, size = 3300, normalized size = 6.4

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^6/(a+b/x^3)^(1/2),x)
```

```
[Out] 2/21/((a*x^3+b)/x^3)^(1/2)/x^6*(-24*I*(-a^2*b)^(1/3)*(-(I*3^(1/2)
-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-
a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(
1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*
3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)
*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I
*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3
+b))^(1/2)*x^6*a-24*I*(-a^2*b)^(2/3)*3^(1/2)*(x*(a*x^3+b))^(1/2)*
x^5-48*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(
1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+
1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-
(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Ellipt
icF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2
),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2)
)*(-a^2*b)^(1/3)*(x*(a*x^3+b))^(1/2)*x^6*a+72*(-(I*3^(1/2)-3)*x*a
/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^
(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^
(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)
-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I
*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2
)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(1/3)*(x*(a*x^3
+b))^(1/2)*x^6*a+24*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a
^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/
3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*
b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)
))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*
b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^
(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^4*a*b+96*(-(I*3^(1
/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)
*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b
```

```
)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/
(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)
-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)
*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(2/3)
*(x*(a*x^3+b))^(1/2)*x^5-144*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-
a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2
*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)
*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b
)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x
+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1
)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(2/3)*(x*(a*x^3+b))^(1/2)*x^5-24
*I*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^7*a^2-3*I*(a*x^4+b*x)^(1/2)*(1/a
^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*
b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*
3^(1/2)*(x*(a*x^3+b))^(1/2)*b+4*I*(a*x^4+b*x)^(1/2)*(1/a^2*x*(-a*
x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))
*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*(
x*(a*x^3+b))^(1/2)*x^3*a+48*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a
*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*
b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*
(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)
^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+
(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)
/(I*3^(1/2)-3))^(1/2))*(x*(a*x^3+b))^(1/2)*x^4*a*b-72*(-(I*3^(1/2
)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(
-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^
(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I
*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3
)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(
I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(x*(a*x^3+b))^(1
/2)*x^4*a*b+48*I*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)
/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-
a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1
/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^
2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-
a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2
)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^5-24*(1/
a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2
*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)
*x^7*a^2+72*(x*(a*x^3+b))^(1/2)*x^7*a^2+72*(-a^2*b)^(1/3)*(x*(a*x
^3+b))^(1/2)*x^6*a+8*I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*
(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*
a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*x^4*a*b+8*I*(1/a^2*x*(-a*x+(-a
^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3
^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*x^7*a^
2+72*(-a^2*b)^(2/3)*(x*(a*x^3+b))^(1/2)*x^5-12*(1/a^2*x*(-a*x+(-a
^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3
^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(a*x^4+b*x)^(1
/2)*(x*(a*x^3+b))^(1/2)*x^3*a-24*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(
I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b
)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*x^4*a*b-24*I*(-a^2*b)^(1/3)*
3^(1/2)*(x*(a*x^3+b))^(1/2)*x^6*a+9*(1/a^2*x*(-a*x+(-a^2*b)^(1/3)
)*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^
2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(a*x^4+b*x)^(1/2)*(x*(a*x
^3+b))^(1/2)*b)/b^2/(I*3^(1/2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*
(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*
b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a+\frac{b}{x^3}}\,x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^3)*x^6),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(a + b/x^3)*x^6), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{x^6\sqrt{\frac{ax^3+b}{x^3}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^3)*x^6),x, algorithm="fricas")
```

```
[Out] integral(1/(x^6*sqrt((a*x^3 + b)/x^3)), x)
```

Sympy [A] time = 6.39499, size = 39, normalized size = 0.08

$$-\frac{\Gamma\left(\frac{5}{3}\right) {}_2F_1\left(\begin{matrix} \frac{1}{2}, \frac{5}{3} \\ \frac{8}{3} \end{matrix}\middle| \frac{be^{i\pi}}{ax^3}\right)}{3\sqrt{a}x^5\,\Gamma\left(\frac{8}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**6/(a+b/x**3)**(1/2),x)
```

```
[Out] -gamma(5/3)*hyper((1/2, 5/3), (8/3,), b*exp_polar(I*pi)/(a*x**3))
/(3*sqrt(a)*x**5*gamma(8/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a + \frac{b}{x^3}}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^3)*x^6),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(a + b/x^3)*x^6), x)
```

3.2033 $\int \frac{1}{\sqrt{a+\frac{b}{x^3}}x^9}\,dx$

Optimal. Leaf size=544

$$-\frac{80\sqrt{2}a^{7/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{91\sqrt[4]{3}b^{8/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{40\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{7/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{91b^{8/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{80a^2\sqrt{a+\frac{b}{x^3}}}{91b^{8/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}+\frac{20a\sqrt{a+\frac{b}{x^3}}}{91b^2x^2}-\frac{2\sqrt{a+\frac{b}{x^3}}}{13bx^5}$$

```
[Out] (-80*a^2*Sqrt[a + b/x^3])/(91*b^(8/3)*((1 + Sqrt[3])*a^(1/3) + b^
(1/3)/x)) - (2*Sqrt[a + b/x^3])/(13*b*x^5) + (20*a*Sqrt[a + b/x^3
])/(91*b^2*x^2) + (40*3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(7/3)*(a^(1/3)
+ b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/(
(1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticE[ArcSin[((1 - Sqrt
[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -
7 - 4*Sqrt[3]])/(91*b^(8/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3
) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]) - (80*Sqr
t[2]*a^(7/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 -
(a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*Ellip
ticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^
(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(91*3^(1/4)*b^(8/3)*Sqrt[a
+ b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1
/3) + b^(1/3)/x)^2])
```

Rubi [A] time = 0.81237, antiderivative size = 544, normalized size of antiderivative = 1., number of

steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$

$$-\frac{80\sqrt{2}a^{7/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{91\sqrt[4]{3}b^{8/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{40\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{7/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{91b^{8/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{80a^2\sqrt{a+\frac{b}{x^3}}}{91b^{8/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}+\frac{20a\sqrt{a+\frac{b}{x^3}}}{91b^2x^2}-\frac{2\sqrt{a+\frac{b}{x^3}}}{13bx^5}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b/x^3]*x^9),x]
```

```
[Out] (-80*a^2*Sqrt[a + b/x^3])/(91*b^(8/3)*((1 + Sqrt[3])*a^(1/3) + b^
(1/3)/x)) - (2*Sqrt[a + b/x^3])/(13*b*x^5) + (20*a*Sqrt[a + b/x^3
])/(91*b^2*x^2) + (40*3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(7/3)*(a^(1/3)
+ b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/(
(1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticE[ArcSin[((1 - Sqrt
[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -
7 - 4*Sqrt[3]])/(91*b^(8/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3
) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]) - (80*Sqr
t[2]*a^(7/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 -
(a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*Ellip
ticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^
(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(91*3^(1/4)*b^(8/3)*Sqrt[a
+ b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1
/3) + b^(1/3)/x)^2])
```

Rubi in Sympy [A] time = 46.3401, size = 456, normalized size = 0.84

$$\frac{40\sqrt[4]{3}a^{\frac{7}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{91b^{\frac{8}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}-\frac{80\sqrt{2}\cdot 3^{\frac{3}{4}}a^{\frac{7}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{273b^{\frac{8}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}-\frac{80a^2\sqrt{a+\frac{b}{x^3}}}{91b^{\frac{8}{3}}\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)}+\frac{20a\sqrt{a+\frac{b}{x^3}}}{91b^2x^2}-\frac{2\sqrt{a+\frac{b}{x^3}}}{13bx^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**9/(a+b/x**3)**(1/2),x)
```

```
[Out] 40*3**(1/4)*a**(7/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**(2
/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(-sqrt(3)
 + 2)*(a**(1/3) + b**(1/3)/x)*elliptic_e(asin((-a**(1/3)*(-1 + sq
rt(3)) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 -
 4*sqrt(3))/(91*b**(8/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a
**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) - 80*sq
rt(2)*3**(3/4)*a**(7/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b*
*(2/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*(a**(1/3)
+ b**(1/3)/x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3
)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*sqrt(3))/(273
*b**(8/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(1/3)*(1 + sq
rt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) - 80*a**2*sqrt(a + b/x
**3)/(91*b**(8/3)*(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)) + 20*a*s
qrt(a + b/x**3)/(91*b**2*x**2) - 2*sqrt(a + b/x**3)/(13*b*x**5)
```

Mathematica [C] time = 1.7731, size = 377, normalized size = 0.69

$$\frac{2\left(40a^{7/3}x\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)-\frac{(ax^3+b)\left(40a^2x^6-10abx^3+7b^2\right)}{x^6}+\frac{20(-1)^{2/3}a^2\sqrt[3]{b}\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)^2\sqrt{\frac{\left(1+\sqrt[3]{-1}\right)\sqrt[3]{a}x\left(\sqrt[3]{b}-\sqrt[3]{-1}\sqrt[3]{a}x\right)}{\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)^2}}\sqrt{\cdots}}{\cdots}\right)}{91b^3x^2\sqrt{a+\frac{b}{x^3}}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/(Sqrt[a + b/x^3]*x^9),x]
```

```
[Out] (2*(40*a^(7/3)*x*(b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2) - ((
b + a*x^3)*(7*b^2 - 10*a*b*x^3 + 40*a^2*x^6))/x^6 + (20*(-1)^(2/3
)*a^2*b^(1/3)*(b^(1/3) + a^(1/3)*x)^2*Sqrt[((1 + (-1)^(1/3))*a^(1
/3)*x*(b^(1/3) - (-1)^(1/3)*a^(1/3)*x))/(b^(1/3) + a^(1/3)*x)^2]*
Sqrt[(b^(1/3) + (-1)^(2/3)*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]*((-3
 - I*Sqrt[3])*EllipticE[ArcSin[Sqrt[((3 + I*Sqrt[3])*a^(1/3)*x)/(
b^(1/3) + a^(1/3)*x)]/Sqrt[2]], (-I + Sqrt[3])/(I + Sqrt[3])] + (
1 + I*Sqrt[3])*EllipticF[ArcSin[Sqrt[((3 + I*Sqrt[3])*a^(1/3)*x)/
(b^(1/3) + a^(1/3)*x)]/Sqrt[2]], (-I + Sqrt[3])/(I + Sqrt[3])]))/
(-1 + (-1)^(2/3))))/(91*b^3*Sqrt[a + b/x^3]*x^2)
```

Maple [B] time = 0.028, size = 3547, normalized size = 6.5

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^9/(a+b/x^3)^(1/2),x)
```

```
[Out] -2/273/((a*x^3+b)/x^3)^(1/2)/x^9*(720*(-a^2*b)^(2/3)*(x*(a*x^3+b)
)^(1/2)*x^8*a+720*(-a^2*b)^(1/3)*(x*(a*x^3+b))^(1/2)*x^9*a^2-240*
(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-
a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1
/2)*x^7*a^2*b-63*(a*x^4+b*x)^(1/2)*b^2*(x*(a*x^3+b))^(1/2)*(1/a^2
*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)
^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)+80
```

```
*I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x
+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))
^(1/2)*3^(1/2)*x^10*a^3+90*a*(a*x^4+b*x)^(1/2)*x^3*b*(x*(a*x^3+b)
)^(1/2)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+
2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1
/3)))^(1/2)-240*I*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^10*a^3-120*a^2*(a
*x^4+b*x)^(1/2)*x^6*(x*(a*x^3+b))^(1/2)*(1/a^2*x*(-a*x+(-a^2*b)^(
1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*
(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)-240*(1/a^2*x*(-a*x+(-
a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*
3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*x^10*a^3+720*
(x*(a*x^3+b))^(1/2)*x^10*a^3-240*I*(-a^2*b)^(1/3)*3^(1/2)*(x*(a*x
^3+b))^(1/2)*x^9*a^2+80*I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/
2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)
-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*x^7*a^2*b+21*I*(a*x^4+b*x)^
(1/2)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*
a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3
)))^(1/2)*3^(1/2)*(x*(a*x^3+b))^(1/2)*b^2-240*I*(-a^2*b)^(2/3)*3^
(1/2)*(x*(a*x^3+b))^(1/2)*x^8*a+240*I*a^2*b*(-(I*3^(1/2)-3)*x*a/(
I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1
/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1
)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3
^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-
1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3+b))^(1/2
)*x^7-240*I*(-a^2*b)^(1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*
x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b
)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(
-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^
(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(
-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/
(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^9*a^2+480*I*(
-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1
/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3
^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)
-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)
*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)
))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3)
)^(1/2))*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^8*a-480*(-(I*3^(1/2)-3)*x*
a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)
^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))
^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2
)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(
I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/
2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(1/3)*(x*(a*x^
3+b))^(1/2)*x^9*a^2+720*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(
-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(
1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^
2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/
3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^
2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*
3^(1/2)-3))^(1/2))*(-a^2*b)^(1/3)*(x*(a*x^3+b))^(1/2)*x^9*a^2+960
*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(
(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a
*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*
b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-
(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*
3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^
2*b)^(2/3)*(x*(a*x^3+b))^(1/2)*x^8*a-1440*(-(I*3^(1/2)-3)*x*a/(I*
3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3
)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2
)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/
(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(
1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)
/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(2/3)*(x*(a*x^3+b))
^(1/2)*x^8*a+480*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)
^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(
I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1
/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1
/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)
-3))^(1/2))*a^2*b*(x*(a*x^3+b))^(1/2)*x^7-720*(-(I*3^(1/2)-3)*x*a
/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^
(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^
```

```
(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)
-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I
*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2
)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*a^2*b*(x*(a*x^3+b))^(1/2
)*x^7-30*I*(a*x^4+b*x)^(1/2)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^
(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1
/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^3*
a*b+40*I*(a*x^4+b*x)^(1/2)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1
/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3
)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^6*a^
2)/b^3/(I*3^(1/2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-
a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*
x-(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a+\frac{b}{x^3}}\,x^9}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^3)*x^9),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(a + b/x^3)*x^9), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{x^9\sqrt{\frac{ax^3+b}{x^3}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^3)*x^9),x, algorithm="fricas")
```

```
[Out] integral(1/(x^9*sqrt((a*x^3 + b)/x^3)), x)
```

Sympy [A] time = 10.9618, size = 39, normalized size = 0.07

$$-\frac{\Gamma\left(\frac{8}{3}\right)\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{8}{3}\\ \frac{11}{3}\end{matrix}\middle|\frac{be^{i\pi}}{ax^3}\right)}{3\sqrt{a}x^8\,\Gamma\left(\frac{11}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**9/(a+b/x**3)**(1/2),x)
```

```
[Out] -gamma(8/3)*hyper((1/2, 8/3), (11/3,), b*exp_polar(I*pi)/(a*x**3)
)/(3*sqrt(a)*x**8*gamma(11/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a+\frac{b}{x^3}}\,x^9}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^3)*x^9),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(a + b/x^3)*x^9), x)
```

3.2034 $\int \frac{1}{\sqrt{a+\frac{b}{x^3}}x^{12}}\,dx$

Optimal. Leaf size=568

$$\frac{1280\sqrt{2}a^{10/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{1729\sqrt[4]{3}b^{11/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}$$

$$-\frac{640\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{10/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{1729b^{11/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}$$

$$+\frac{1280a^3\sqrt{a+\frac{b}{x^3}}}{1729b^{11/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}-\frac{320a^2\sqrt{a+\frac{b}{x^3}}}{1729b^3x^2}+\frac{32a\sqrt{a+\frac{b}{x^3}}}{247b^2x^5}-\frac{2\sqrt{a+\frac{b}{x^3}}}{19bx^8}$$

```
[Out] (1280*a^3*Sqrt[a + b/x^3])/(1729*b^(11/3)*((1 + Sqrt[3])*a^(1/3)
+ b^(1/3)/x)) - (2*Sqrt[a + b/x^3])/(19*b*x^8) + (32*a*Sqrt[a + b
/x^3])/(247*b^2*x^5) - (320*a^2*Sqrt[a + b/x^3])/(1729*b^3*x^2) -
 (640*3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(10/3)*(a^(1/3) + b^(1/3)/x)*Sq
rt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a
^(1/3) + b^(1/3)/x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) +
b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])
/(1729*b^(11/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/
x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]) + (1280*Sqrt[2]*a^(10
/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*
b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcS
in[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b
^(1/3)/x)], -7 - 4*Sqrt[3]])/(1729*3^(1/4)*b^(11/3)*Sqrt[a + b/x^
3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) +
b^(1/3)/x)^2])
```

Rubi [A] time = 0.945351, antiderivative size = 568, normalized size of antiderivative = 1., number

of steps used = 7, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$

$$\frac{1280\sqrt{2}a^{10/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{1729\sqrt[4]{3}b^{11/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}$$
$$-\frac{640\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{10/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{1729b^{11/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}$$
$$+\frac{1280a^3\sqrt{a+\frac{b}{x^3}}}{1729b^{11/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}-\frac{320a^2\sqrt{a+\frac{b}{x^3}}}{1729b^3x^2}+\frac{32a\sqrt{a+\frac{b}{x^3}}}{247b^2x^5}-\frac{2\sqrt{a+\frac{b}{x^3}}}{19bx^8}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b/x^3]*x^12),x]
```

```
[Out] (1280*a^3*Sqrt[a + b/x^3])/(1729*b^(11/3)*((1 + Sqrt[3])*a^(1/3)
+ b^(1/3)/x)) - (2*Sqrt[a + b/x^3])/(19*b*x^8) + (32*a*Sqrt[a + b
/x^3])/(247*b^2*x^5) - (320*a^2*Sqrt[a + b/x^3])/(1729*b^3*x^2) -
 (640*3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(10/3)*(a^(1/3) + b^(1/3)/x)*Sq
rt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a
^(1/3) + b^(1/3)/x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) +
b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])
/(1729*b^(11/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/
x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]) + (1280*Sqrt[2]*a^(10
/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*
b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcS
in[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b
^(1/3)/x)], -7 - 4*Sqrt[3]])/(1729*3^(1/4)*b^(11/3)*Sqrt[a + b/x^
3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) +
b^(1/3)/x)^2])
```

Rubi in Sympy [A] time = 57.74, size = 479, normalized size = 0.84

$$-\frac{640\sqrt[4]{3}a^{\frac{10}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{1729b^{\frac{11}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}+\frac{1280\sqrt{2}\cdot 3^{\frac{3}{4}}a^{\frac{10}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{5187b^{\frac{11}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}+\frac{1280a^3\sqrt{a+\frac{b}{x^3}}}{1729b^{\frac{11}{3}}\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)}-\frac{320a^2\sqrt{a+\frac{b}{x^3}}}{1729b^3x^2}+\frac{32a\sqrt{a+\frac{b}{x^3}}}{247b^2x^5}-\frac{2\sqrt{a+\frac{b}{x^3}}}{19bx^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**12/(a+b/x**3)**(1/2),x)
```

```
[Out] -640*3**(1/4)*a**(10/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b*
*(2/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(-sqrt
(3) + 2)*(a**(1/3) + b**(1/3)/x)*elliptic_e(asin((-a**(1/3)*(-1 +
 sqrt(3)) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -
7 - 4*sqrt(3))/(1729*b**(11/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)
/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) +
 1280*sqrt(2)*3**(3/4)*a**(10/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/
3)/x + b**(2/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*(
a**(1/3) + b**(1/3)/x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3))
+ b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*sqrt
(3))/(5187*b**(11/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(1
/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) + 1280*a**3
*sqrt(a + b/x**3)/(1729*b**(11/3)*(a**(1/3)*(1 + sqrt(3)) + b**(1
/3)/x)) - 320*a**2*sqrt(a + b/x**3)/(1729*b**3*x**2) + 32*a*sqrt(
a + b/x**3)/(247*b**2*x**5) - 2*sqrt(a + b/x**3)/(19*b*x**8)
```

Mathematica [C] time = 1.8892, size = 387, normalized size = 0.68

$$\frac{2\left(-640a^{10/3}x\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)-\frac{320(-1)^{2/3}a^3\sqrt[3]{b}\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)^2\sqrt{\frac{\left(1+\sqrt[3]{-1}\right)\sqrt[3]{a}x\left(\sqrt[3]{b}-\sqrt[3]{-1}\sqrt[3]{a}x\right)}{\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)^2}}\sqrt{\frac{(-1)^{2/3}\sqrt[3]{a}x+\sqrt[3]{b}}{\sqrt[3]{a}x+\sqrt[3]{b}}}\left(\left(1+i\sqrt{3}\right)F\right|s\ldots}{(-1)^{2/3}-1}\right.}{1729b^4x^2\sqrt{a+\frac{b}{x^3}}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/(Sqrt[a + b/x^3]*x^12),x]
```

```
[Out] (2*(-640*a^(10/3)*x*(b^(2/3) - a^(1/3)*b^(1/3)*x + a^(2/3)*x^2) +
 ((b + a*x^3)*(-91*b^3 + 112*a*b^2*x^3 - 160*a^2*b*x^6 + 640*a^3*
x^9))/x^9 - (320*(-1)^(2/3)*a^3*b^(1/3)*(b^(1/3) + a^(1/3)*x)^2*S
```

```
qrt[((1 + (-1)^(1/3))*a^(1/3)*x*(b^(1/3) - (-1)^(1/3)*a^(1/3)*x))
/(b^(1/3) + a^(1/3)*x)^2]*Sqrt[(b^(1/3) + (-1)^(2/3)*a^(1/3)*x)/(
b^(1/3) + a^(1/3)*x)]*((-3 - I*Sqrt[3])*EllipticE[ArcSin[Sqrt[((3
 + I*Sqrt[3])*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]/Sqrt[2]], (-I + S
qrt[3])/(I + Sqrt[3])] + (1 + I*Sqrt[3])*EllipticF[ArcSin[Sqrt[((
3 + I*Sqrt[3])*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]/Sqrt[2]], (-I +
Sqrt[3])/(I + Sqrt[3])]))/(-1 + (-1)^(2/3))))/(1729*b^4*Sqrt[a +
b/x^3]*x^2)
```

Maple [B] time = 0.029, size = 3779, normalized size = 6.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^12/(a+b/x^3)^(1/2),x)
```

```
[Out] 2/5187/((a*x^3+b)/x^3)^(1/2)/x^12*(-3840*I*(-a^2*b)^(1/3)*(-(I*3^
(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/
2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2
*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)
)/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/
2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+
3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(
a*x^3+b))^(1/2)*x^12*a^3+7680*I*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*
a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)
^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))
^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2
)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(
I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/
2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3+b))^(
1/2)*x^11*a^2+3840*I*a^3*b*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*
x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b
)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(
-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^
(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(
-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/
(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^10-3840*I*(-a
^2*b)^(1/3)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^12*a^3+1280*I*(1/a^2*x*
(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1
/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/
2)*x^10*a^3*b-273*I*(a*x^4+b*x)^(1/2)*(1/a^2*x*(-a*x+(-a^2*b)^(1/
3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-
a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*(x*(a*x^3+b))^(
1/2)*b^3-3840*I*(-a^2*b)^(2/3)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^11*a
^2+11520*(-a^2*b)^(2/3)*(x*(a*x^3+b))^(1/2)*x^11*a^2+11520*(-a^2*
b)^(1/3)*(x*(a*x^3+b))^(1/2)*x^12*a^3-3840*(1/a^2*x*(-a*x+(-a^2*b
)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/
2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*x^10*a^3*b+819*(a*
x^4+b*x)^(1/2)*b^3*(x*(a*x^3+b))^(1/2)*(1/a^2*x*(-a*x+(-a^2*b)^(1
/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(
-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)+1440*a^2*(a*x^4+b*x)^(
1/2)*x^6*b*(x*(a*x^3+b))^(1/2)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*
3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^
(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)-3840*(1/a^2*x*(-a*x+(-a^2*b)^(
1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*
(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*x^13*a^4+11520*(x*(a*
x^3+b))^(1/2)*x^13*a^4-1920*a^3*(a*x^4+b*x)^(1/2)*x^9*(x*(a*x^3+b
))^(1/2)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)
+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(
1/3)))^(1/2)-1008*a*(a*x^4+b*x)^(1/2)*x^3*b^2*(x*(a*x^3+b))^(1/2)
*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(
-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(
1/2)+640*I*(a*x^4+b*x)^(1/2)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^
(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1
/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^9*
a^3+336*I*(a*x^4+b*x)^(1/2)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(
1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/
3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^3*a
*b^2+1280*I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1
```

```
/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b
)^(1/3)))^(1/2)*3^(1/2)*x^13*a^4-3840*I*3^(1/2)*(x*(a*x^3+b))^(1/
2)*x^13*a^4-23040*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b
)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/
(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(
1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(
1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(
1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2
)-3))^(1/2))*(-a^2*b)^(2/3)*(x*(a*x^3+b))^(1/2)*x^11*a^2-7680*(-(
I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3
^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(
-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(
1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3
^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1
/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)
^(1/3)*(x*(a*x^3+b))^(1/2)*x^12*a^3+7680*(-(I*3^(1/2)-3)*x*a/(I*3
^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)
+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)
*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(
-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1
/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/
(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*a^3*b*(x*(a*x^3+b))^(1/2)*x^1
0-11520*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^
(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)
+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x
-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Ellip
ticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/
2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2
))*a^3*b*(x*(a*x^3+b))^(1/2)*x^10+11520*(-(I*3^(1/2)-3)*x*a/(I*3^
(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+
2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*
((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-
a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/
2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(
I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(1/3)*(x*(a*x^3+b))^(
1/2)*x^12*a^3+15360*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2
*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3)
)/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)
^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))
^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)
^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1
/2)-3))^(1/2))*(-a^2*b)^(2/3)*(x*(a*x^3+b))^(1/2)*x^11*a^2-480*I*
(a*x^4+b*x)^(1/2)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2
*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(
-a^2*b)^(1/3)))^(1/2)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^6*a^2*b)/b^4/
(I*3^(1/2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^
(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2
*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a + \frac{b}{x^3}}x^{12}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^3)*x^12),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(a + b/x^3)*x^12), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{x^{12}\sqrt{\frac{ax^3+b}{x^3}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(a + b/x^3)*x^12),x, algorithm="fricas")
```

```
[Out] integral(1/(x^12*sqrt((a*x^3 + b)/x^3)), x)
```

Sympy [A] time = 18.8263, size = 39, normalized size = 0.07

$$-\frac{\Gamma\left(\frac{11}{3}\right)\,{}_{2}F_{1}\left(\begin{matrix}\frac{1}{2},\frac{11}{3}\\ \frac{14}{3}\end{matrix}\middle|\frac{be^{i\pi}}{ax^{3}}\right)}{3\sqrt{a}x^{11}\,\Gamma\left(\frac{14}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/x**12/(a+b/x**3)**(1/2),x)
```

```
[Out] -gamma(11/3)*hyper((1/2, 11/3), (14/3,), b*exp_polar(I*pi)/(a*x**
3))/(3*sqrt(a)*x**11*gamma(14/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a+\frac{b}{x^{3}}}x^{12}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(a + b/x^3)*x^12),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(a + b/x^3)*x^12), x)
```

3.2035 $\int \frac{x^5}{\left(a+\frac{b}{x^3}\right)^{3/2}} dx$

Optimal. Leaf size=95

$$\frac{5b^2 \tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)}{4a^{7/2}} - \frac{5bx^3\sqrt{a+\frac{b}{x^3}}}{4a^3} + \frac{5x^6\sqrt{a+\frac{b}{x^3}}}{6a^2} - \frac{2x^6}{3a\sqrt{a+\frac{b}{x^3}}}$$

```
[Out] (-5*b*Sqrt[a + b/x^3]*x^3)/(4*a^3) - (2*x^6)/(3*a*Sqrt[a + b/x^3]
) + (5*Sqrt[a + b/x^3]*x^6)/(6*a^2) + (5*b^2*ArcTanh[Sqrt[a + b/x
^3]/Sqrt[a]])/(4*a^(7/2))
```

Rubi [A] time = 0.158867, antiderivative size = 95, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{5b^2 \tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)}{4a^{7/2}} - \frac{5bx^3\sqrt{a+\frac{b}{x^3}}}{4a^3} + \frac{5x^6\sqrt{a+\frac{b}{x^3}}}{6a^2} - \frac{2x^6}{3a\sqrt{a+\frac{b}{x^3}}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/(a + b/x^3)^(3/2),x]
```

```
[Out] (-5*b*Sqrt[a + b/x^3]*x^3)/(4*a^3) - (2*x^6)/(3*a*Sqrt[a + b/x^3]
) + (5*Sqrt[a + b/x^3]*x^6)/(6*a^2) + (5*b^2*ArcTanh[Sqrt[a + b/x
^3]/Sqrt[a]])/(4*a^(7/2))
```

Rubi in Sympy [A] time = 13.2507, size = 88, normalized size = 0.93

$$-\frac{2x^6}{3a\sqrt{a+\frac{b}{x^3}}} + \frac{5x^6\sqrt{a+\frac{b}{x^3}}}{6a^2} - \frac{5bx^3\sqrt{a+\frac{b}{x^3}}}{4a^3} + \frac{5b^2 \operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)}{4a^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(a+b/x**3)**(3/2),x)
```

```
[Out] -2*x**6/(3*a*sqrt(a + b/x**3)) + 5*x**6*sqrt(a + b/x**3)/(6*a**2)
 - 5*b*x**3*sqrt(a + b/x**3)/(4*a**3) + 5*b**2*atanh(sqrt(a + b/x
**3)/sqrt(a))/(4*a**(7/2))
```

Mathematica [A] time = 0.0924824, size = 97, normalized size = 1.02

$$\frac{\sqrt{a}x^{3/2}\left(2a^2x^6 - 5abx^3 - 15b^2\right) + 15b^2\sqrt{ax^3+b}\tanh^{-1}\left(\frac{\sqrt{a}x^{3/2}}{\sqrt{ax^3+b}}\right)}{12a^{7/2}x^{3/2}\sqrt{a+\frac{b}{x^3}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/(a + b/x^3)^(3/2),x]
```

```
[Out] (Sqrt[a]*x^(3/2)*(-15*b^2 - 5*a*b*x^3 + 2*a^2*x^6) + 15*b^2*Sqrt[
b + a*x^3]*ArcTanh[(Sqrt[a]*x^(3/2))/Sqrt[b + a*x^3]])/(12*a^(7/2
)*Sqrt[a + b/x^3]*x^(3/2))
```

Maple [C] time = 0.058, size = 3910, normalized size = 41.2

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(a+b/x^3)^(3/2),x)
```

```
[Out] -1/12/((a*x^3+b)/x^3)^(3/2)/x^5*(a*x^3+b)/a^5*(-180*I*EllipticF((
-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I
*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-(
I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3
^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(
-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(
1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(-a^2*b)^(1/3)*3
^(1/2)*(x*(a*x^3+b))^(1/2)*x*a*b^2+180*I*EllipticPi((-(I*3^(1/2)-
3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(
I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2
)-3))^(1/2))*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/
3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^
(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-
2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*
(-a^2*b)^(1/3)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x*a*b^2-90*I*EllipticP
i((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),
(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/
2)+1)/(I*3^(1/2)-3))^(1/2))*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a
*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*
b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*
(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)
^(1/3)))^(1/2)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^2*a^2*b^2-2*I*(1/a^2
*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)
^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(a
*x^4+b*x)^(1/2)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^4*a^3+8*I*(1/a^2*x*
(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1
/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/
2)*x^2*a^2*b^2+7*I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^
2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-
(-a^2*b)^(1/3)))^(1/2)*(a*x^4+b*x)^(1/2)*3^(1/2)*(x*(a*x^3+b))^(1
/2)*x*a^2*b-90*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+
(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)
/(I*3^(1/2)-3))^(1/2))*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-
a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1
/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2
*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3
)))^(1/2)*(x*(a*x^3+b))^(1/2)*x^2*a^2*b^2+90*I*EllipticF((-(I*3^(
1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2
)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-(I*3^(1/
2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*
(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)
^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(
I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(-a^2*b)^(2/3)*3^(1/2)*
(x*(a*x^3+b))^(1/2)*b^2+90*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1
/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),(
(I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(
-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I
*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x
+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)
^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(x*(a*x^3+b))^
(1/2)*x^2*a^2*b^2+180*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)
/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(
1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(
-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^
2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2
)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*
b)^(1/3)))^(1/2)*(-a^2*b)^(1/3)*(x*(a*x^3+b))^(1/2)*x*a*b^2-180*E
llipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3))
```

```
)^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2)-1)/
(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2
)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*
x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*
3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+
(-a^2*b)^(1/3)))^(1/2)*(-a^2*b)^(1/3)*(x*(a*x^3+b))^(1/2)*x*a*b^2
+6*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x
+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))
^(1/2)*(a*x^4+b*x)^(1/2)*(x*(a*x^3+b))^(1/2)*x^4*a^3-90*EllipticF
((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),(
(I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(
-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I
*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x
+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)
^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(-a^2*b)^(2/3)
*(x*(a*x^3+b))^(1/2)*b^2+90*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(
1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),
((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*
(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((
I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*
x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b
)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(-a^2*b)^(2/3
)*(x*(a*x^3+b))^(1/2)*b^2-90*I*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*
3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-
3),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2
))*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)
*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(
-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^
2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(-a^2*b)^(
2/3)*3^(1/2)*(x*(a*x^3+b))^(1/2)*b^2+90*I*EllipticF((-(I*3^(1/2)-
3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*
(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-(I*3^(1/2)-3)
*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2
*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3
)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(
1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*(x*(a*x^3+b))^(1/2)*
x^2*a^2*b^2-21*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)
^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^
2*b)^(1/3)))^(1/2)*(a*x^4+b*x)^(1/2)*(x*(a*x^3+b))^(1/2)*x*a^2*b-
24*x^2*b^2*a^2*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)
^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^
2*b)^(1/3)))^(1/2))/(I*3^(1/2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*
(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*
b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(a + b/x^3)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.401958, size = 1, normalized size = 0.01

$$\left[\frac{15\left(ab^{2}x^{3}+b^{3}\right)\sqrt{a}\log\left(-\left(8\,a^{2}x^{6}+8\,abx^{3}+b^{2}\right)\sqrt{a}-4\left(2\,a^{2}x^{6}+abx^{3}\right)\sqrt{\frac{ax^{3}+b}{x^{3}}}\right)+4\left(2\,a^{3}x^{9}-5\,a^{2}bx^{6}-15\,ab^{2}x^{3}\right)\sqrt{\frac{ax^{3}+b}{x^{3}}}}{48\left(a^{5}x^{3}+a^{4}b\right)}\right.$$

$$\left.-\frac{15\left(ab^{2}x^{3}+b^{3}\right)\sqrt{-a}\arctan\left(\frac{2\sqrt{-a}x^{3}\sqrt{\frac{ax^{3}+b}{x^{3}}}}{2\,ax^{3}+b}\right)-2\left(2\,a^{3}x^{9}-5\,a^{2}bx^{6}-15\,ab^{2}x^{3}\right)\sqrt{\frac{ax^{3}+b}{x^{3}}}}{24\left(a^{5}x^{3}+a^{4}b\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(a + b/x^3)^(3/2),x, algorithm="fricas")
```

```
[Out] [1/48*(15*(a*b^2*x^3 + b^3)*sqrt(a)*log(-(8*a^2*x^6 + 8*a*b*x^3 +
 b^2)*sqrt(a) - 4*(2*a^2*x^6 + a*b*x^3)*sqrt((a*x^3 + b)/x^3)) +
4*(2*a^3*x^9 - 5*a^2*b*x^6 - 15*a*b^2*x^3)*sqrt((a*x^3 + b)/x^3))
/(a^5*x^3 + a^4*b), -1/24*(15*(a*b^2*x^3 + b^3)*sqrt(-a)*arctan(2
*sqrt(-a)*x^3*sqrt((a*x^3 + b)/x^3)/(2*a*x^3 + b)) - 2*(2*a^3*x^9
 - 5*a^2*b*x^6 - 15*a*b^2*x^3)*sqrt((a*x^3 + b)/x^3))/(a^5*x^3 +
a^4*b)]
```

Sympy [A] time = 20.4017, size = 110, normalized size = 1.16

$$\frac{x^{\frac{15}{2}}}{6a\sqrt{b}\sqrt{\frac{ax^3}{b}+1}} - \frac{5\sqrt{b}x^{\frac{9}{2}}}{12a^2\sqrt{\frac{ax^3}{b}+1}} - \frac{5b^{\frac{3}{2}}x^{\frac{3}{2}}}{4a^3\sqrt{\frac{ax^3}{b}+1}} + \frac{5b^2\operatorname{asinh}\left(\frac{\sqrt{a}x^{\frac{3}{2}}}{\sqrt{b}}\right)}{4a^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(a+b/x**3)**(3/2),x)
```

```
[Out] x**(15/2)/(6*a*sqrt(b)*sqrt(a*x**3/b + 1)) - 5*sqrt(b)*x**(9/2)/(
12*a**2*sqrt(a*x**3/b + 1)) - 5*b**(3/2)*x**(3/2)/(4*a**3*sqrt(a*
x**3/b + 1)) + 5*b**2*asinh(sqrt(a)*x**(3/2)/sqrt(b))/(4*a**(7/2)
)
```

GIAC/XCAS [A] time = 0.282544, size = 158, normalized size = 1.66

$$-\frac{1}{12}b^2\left(\frac{15\arctan\left(\frac{\sqrt{\frac{ax^3+b}{x^3}}}{\sqrt{-a}}\right)}{\sqrt{-a}a^3} + \frac{8}{a^3\sqrt{\frac{ax^3+b}{x^3}}} - \frac{9a\sqrt{\frac{ax^3+b}{x^3}} - \frac{7(ax^3+b)\sqrt{\frac{ax^3+b}{x^3}}}{x^3}}{\left(a - \frac{ax^3+b}{x^3}\right)^2 a^3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(a + b/x^3)^(3/2),x, algorithm="giac")
```

```
[Out] -1/12*b^2*(15*arctan(sqrt((a*x^3 + b)/x^3)/sqrt(-a))/(sqrt(-a)*a^
3) + 8/(a^3*sqrt((a*x^3 + b)/x^3)) - (9*a*sqrt((a*x^3 + b)/x^3) -
 7*(a*x^3 + b)*sqrt((a*x^3 + b)/x^3)/x^3)/((a - (a*x^3 + b)/x^3)^
2*a^3))
```

3.2036 $\int \frac{x^2}{\left(a+\frac{b}{x^3}\right)^{3/2}}\,dx$

Optimal. Leaf size=66

$$-\frac{b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)}{a^{5/2}}+\frac{x^3\sqrt{a+\frac{b}{x^3}}}{a^2}-\frac{2x^3}{3a\sqrt{a+\frac{b}{x^3}}}$$

```
[Out] (-2*x^3)/(3*a*Sqrt[a + b/x^3]) + (Sqrt[a + b/x^3]*x^3)/a^2 - (b*A
rcTanh[Sqrt[a + b/x^3]/Sqrt[a]])/a^(5/2)
```

Rubi [A] time = 0.115427, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)}{a^{5/2}}+\frac{x^3\sqrt{a+\frac{b}{x^3}}}{a^2}-\frac{2x^3}{3a\sqrt{a+\frac{b}{x^3}}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b/x^3)^(3/2),x]
```

```
[Out] (-2*x^3)/(3*a*Sqrt[a + b/x^3]) + (Sqrt[a + b/x^3]*x^3)/a^2 - (b*A
rcTanh[Sqrt[a + b/x^3]/Sqrt[a]])/a^(5/2)
```

Rubi in Sympy [A] time = 9.71708, size = 58, normalized size = 0.88

$$-\frac{2x^3}{3a\sqrt{a+\frac{b}{x^3}}}+\frac{x^3\sqrt{a+\frac{b}{x^3}}}{a^2}-\frac{b\,\mathrm{atanh}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)}{a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b/x**3)**(3/2),x)
```

```
[Out] -2*x**3/(3*a*sqrt(a + b/x**3)) + x**3*sqrt(a + b/x**3)/a**2 - b*a
tanh(sqrt(a + b/x**3)/sqrt(a))/a**(5/2)
```

Mathematica [A] time = 0.0612655, size = 83, normalized size = 1.26

$$\frac{\sqrt{a}x^{3/2}\left(ax^3+3b\right)-3b\sqrt{ax^3+b}\tanh^{-1}\left(\frac{\sqrt{a}x^{3/2}}{\sqrt{ax^3+b}}\right)}{3a^{5/2}x^{3/2}\sqrt{a+\frac{b}{x^3}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a + b/x^3)^(3/2),x]
```

```
[Out] (Sqrt[a]*x^(3/2)*(3*b + a*x^3) - 3*b*Sqrt[b + a*x^3]*ArcTanh[(Sqr
t[a]*x^(3/2))/Sqrt[b + a*x^3]])/(3*a^(5/2)*Sqrt[a + b/x^3]*x^(3/2
))
```

Maple [C] time = 0.024, size = 3664, normalized size = 55.5

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^2/(a+b/x^3)^(3/2),x)
```

```
[Out] 1/3/((a*x^3+b)/x^3)^(3/2)/x^5*(a*x^3+b)/a^4*(36*I*(-a^2*b)^(1/3)*
(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((
I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*
x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b
)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticPi((-
(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),(I*3
^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1
)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3+b))^(1/2)*x*a*b-18*I*(-
a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/
3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^
(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-
2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*
EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)
))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2)-1)
/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3+b))^(1/2)*
b+I*(a*x^4+b*x)^(1/2)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(
-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a
*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x*a^2-18*I*
(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((
I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*
x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b
)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticPi((-
(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),(I*3
^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1
)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^2*a^2*b+18*
I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*
((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-
a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2
*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((
-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I
*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(
1/2)*(x*(a*x^3+b))^(1/2)*x^2*a^2*b+18*I*(-a^2*b)^(2/3)*(-(I*3^(1/
2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*
(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)
^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(
I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-
3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*
(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x
^3+b))^(1/2)*b-18*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b
)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/
(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(
1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(
1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(
1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2
)-3))^(1/2))*(x*(a*x^3+b))^(1/2)*x^2*a^2*b+18*(-(I*3^(1/2)-3)*x*a
/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^
(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^
(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)
-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(
I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2
)-3),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1
/2))*(x*(a*x^3+b))^(1/2)*x^2*a^2*b+36*(-a^2*b)^(1/3)*(-(I*3^(1/2)
-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-
a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(
1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*
3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)
*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I
*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(x*(a*x^3+b))^(1/
2)*x*a*b-36*(-a^2*b)^(1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*
x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b
)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(
-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^
(1/3)))^(1/2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+
```

```
(-a^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)
*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(x*(a*x^3+b))^
(1/2)*x*a*b-18*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(
-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^
2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2
)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*
b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*
x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+
1)/(I*3^(1/2)-3))^(1/2))*(x*(a*x^3+b))^(1/2)*b+18*(-a^2*b)^(2/3)*
(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((
I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*
x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b
)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticPi((-
(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),(I*3
^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1
)/(I*3^(1/2)-3))^(1/2))*(x*(a*x^3+b))^(1/2)*b-36*I*(-a^2*b)^(1/3)
*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(
(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a
*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*
b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-
(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*
3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1
/2)*(x*(a*x^3+b))^(1/2)*x*a*b+2*I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*
(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*
b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*x^2*a^2*b-3*(a*x^4+
b*x)^(1/2)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/
3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)
^(1/3)))^(1/2)*(x*(a*x^3+b))^(1/2)*x*a^2-6*x^2*b*a^2*(1/a^2*x*(-a
*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3)
)*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2))/(I*3^(1
/2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2
*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/
3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x^3)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.382606, size = 1, normalized size = 0.02

$$\left[\frac{3\left(abx^3+b^2\right)\sqrt{a}\log\left(-\left(8\,a^2x^6+8\,abx^3+b^2\right)\sqrt{a}+4\left(2\,a^2x^6+abx^3\right)\sqrt{\frac{ax^3+b}{x^3}}\right)+4\left(a^2x^6+3\,abx^3\right)\sqrt{\frac{ax^3+b}{x^3}}}{12\left(a^4x^3+a^3b\right)},\ \frac{3\left(abx^3+b^2\right)\sqrt{\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x^3)^(3/2),x, algorithm="fricas")
```

```
[Out] [1/12*(3*(a*b*x^3 + b^2)*sqrt(a)*log(-(8*a^2*x^6 + 8*a*b*x^3 + b^
2)*sqrt(a) + 4*(2*a^2*x^6 + a*b*x^3)*sqrt((a*x^3 + b)/x^3)) + 4*(
a^2*x^6 + 3*a*b*x^3)*sqrt((a*x^3 + b)/x^3))/(a^4*x^3 + a^3*b), 1/
6*(3*(a*b*x^3 + b^2)*sqrt(-a)*arctan(2*sqrt(-a)*x^3*sqrt((a*x^3 +
 b)/x^3)/(2*a*x^3 + b)) + 2*(a^2*x^6 + 3*a*b*x^3)*sqrt((a*x^3 + b
)/x^3))/(a^4*x^3 + a^3*b)]
```

Sympy [A] time = 11.9413, size = 73, normalized size = 1.11

$$\frac{x^{\frac{9}{2}}}{3a\sqrt{b}\sqrt{\frac{ax^3}{b}+1}}+\frac{\sqrt{b}x^{\frac{3}{2}}}{a^2\sqrt{\frac{ax^3}{b}+1}}-\frac{b\operatorname{asinh}\left(\frac{\sqrt{a}x^{\frac{3}{2}}}{\sqrt{b}}\right)}{a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b/x**3)**(3/2),x)
```

```
[Out] x**(9/2)/(3*a*sqrt(b)*sqrt(a*x**3/b + 1)) + sqrt(b)*x**(3/2)/(a**
2*sqrt(a*x**3/b + 1)) - b*asinh(sqrt(a)*x**(3/2)/sqrt(b))/a**(5/2
)
```

GIAC/XCAS [A] time = 0.280548, size = 131, normalized size = 1.98

$$\frac{1}{3}\,b\left(\frac{3\,\arctan\left(\frac{\sqrt{\frac{ax^3+b}{x^3}}}{\sqrt{-a}}\right)}{\sqrt{-a}a^2}+\frac{2\,a-\frac{3\,(ax^3+b)}{x^3}}{\left(a\sqrt{\frac{ax^3+b}{x^3}}-\frac{(ax^3+b)\sqrt{\frac{ax^3+b}{x^3}}}{x^3}\right)a^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x^3)^(3/2),x, algorithm="giac")
```

```
[Out] 1/3*b*(3*arctan(sqrt((a*x^3 + b)/x^3)/sqrt(-a))/(sqrt(-a)*a^2) +
(2*a - 3*(a*x^3 + b)/x^3)/((a*sqrt((a*x^3 + b)/x^3) - (a*x^3 + b)
*sqrt((a*x^3 + b)/x^3)/x^3)*a^2))
```

3.2037 $\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{3/2} x} \, dx$

Optimal. Leaf size=46

$$\frac{2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)}{3a^{3/2}}-\frac{2}{3a\sqrt{a+\frac{b}{x^3}}}$$

```
[Out] -2/(3*a*Sqrt[a + b/x^3]) + (2*ArcTanh[Sqrt[a + b/x^3]/Sqrt[a]])/(
3*a^(3/2))
```

Rubi [A] time = 0.0831117, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)}{3a^{3/2}}-\frac{2}{3a\sqrt{a+\frac{b}{x^3}}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^3)^(3/2)*x),x]
```

```
[Out] -2/(3*a*Sqrt[a + b/x^3]) + (2*ArcTanh[Sqrt[a + b/x^3]/Sqrt[a]])/(
3*a^(3/2))
```

Rubi in Sympy [A] time = 7.10508, size = 39, normalized size = 0.85

$$-\frac{2}{3a\sqrt{a+\frac{b}{x^3}}}+\frac{2\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x^3}}}{\sqrt{a}}\right)}{3a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**3)**(3/2)/x,x)
```

```
[Out] -2/(3*a*sqrt(a + b/x**3)) + 2*atanh(sqrt(a + b/x**3)/sqrt(a))/(3*
a**(3/2))
```

Mathematica [A] time = 0.0503692, size = 73, normalized size = 1.59

$$-\frac{2\left(\sqrt{a}x^{3/2}-\sqrt{ax^3+b}\tanh^{-1}\left(\frac{\sqrt{a}x^{3/2}}{\sqrt{ax^3+b}}\right)\right)}{3a^{3/2}x^{3/2}\sqrt{a+\frac{b}{x^3}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^3)^(3/2)*x),x]
```

```
[Out] (-2*(Sqrt[a]*x^(3/2) - Sqrt[b + a*x^3]*ArcTanh[(Sqrt[a]*x^(3/2))/
Sqrt[b + a*x^3]]))/(3*a^(3/2)*Sqrt[a + b/x^3]*x^(3/2))
```

Maple [C] time = 0.023, size = 3438, normalized size = 74.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^3)^(3/2)/x,x)
```

```
[Out] -2/3/((a*x^3+b)/x^3)^(3/2)/x^5*(a*x^3+b)/a^3*(6*I*(-(I*3^(1/2)-3)
*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2
*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3
)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(
1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*
a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^
(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3+b)
)^(1/2)*x^2*a^2-6*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2
*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3)
)/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)
^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))
^(1/2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b
)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(
1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3+b))
^(1/2)*x^2*a^2-12*I*(-a^2*b)^(1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)
-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x
+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3
^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(
-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)
/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(
1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3+b))^(1/2)*x*a+12*
I*(-a^2*b)^(1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)
^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(
I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1
/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(
1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2
)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3+b))^(1
/2)*x*a+6*I*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*
x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b
)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(
-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^
(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(
-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/
(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3+b))^(1/2)-6*I*(-a^2*b)^(2
/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2
)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/
(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a
^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticP
i((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),
(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/
2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3+b))^(1/2)-6*(-(I*3^
(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/
2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2
*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)
)/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/
2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+
3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(x*(a*x^3+b)
)^(1/2)*x^2*a^2+6*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b
)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/
(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(
1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(
1/2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^
(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/
2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(x*(a*x^3+b))^(1/2)*x^2
*a^2+12*(-a^2*b)^(1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-
a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1
/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2
*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3
)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2
*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3
^(1/2)-3))^(1/2))*(x*(a*x^3+b))^(1/2)*x*a-12*(-a^2*b)^(1/3)*(-(I*
3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(
```

```
1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a
^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/
3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticPi((-(I*3^
(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),(I*3^(1/2
)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*
3^(1/2)-3))^(1/2))*(x*(a*x^3+b))^(1/2)*x*a-6*(-a^2*b)^(2/3)*(-(I*
3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(
1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a
^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/
3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(
1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2
)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(x*(a*x^3+
b))^(1/2)+6*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*
x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b
)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(
-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^
(1/3)))^(1/2)*EllipticPi((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+
(-a^2*b)^(1/3)))^(1/2),(I*3^(1/2)-1)/(I*3^(1/2)-3),((I*3^(1/2)+3)
*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(x*(a*x^3+b))^
(1/2)+I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+
2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1
/3)))^(1/2)*3^(1/2)*x^2*a^2-3*x^2*a^2*(1/a^2*x*(-a*x+(-a^2*b)^(1/
3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-
a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2))/(I*3^(1/2)-3)/(1/a^2*x
*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(
1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^(3/2)*x),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [A] time = 0.375085, size = 1, normalized size = 0.02

$$\left[-\frac{4\,ax^3\sqrt{\frac{ax^3+b}{x^3}} - \left(ax^3+b\right)\sqrt{a}\log\left(-\left(8\,a^2x^6 + 8\,abx^3 + b^2\right)\sqrt{a} - 4\left(2\,a^2x^6 + abx^3\right)\sqrt{\frac{ax^3+b}{x^3}}\right)}{6\left(a^3x^3 + a^2b\right)}, -\frac{2\,ax^3\sqrt{\frac{ax^3+b}{x^3}} + \left(ax^3+b\right)\sqrt{-a}\arctan\left(\frac{2\sqrt{-a}x^3\sqrt{\frac{ax^3+b}{x^3}}}{2\,ax^3+b}\right)}{3\left(a^3x^3 + a^2b\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^(3/2)*x),x, algorithm="fricas")

[Out] [-1/6*(4*a*x^3*sqrt((a*x^3 + b)/x^3) - (a*x^3 + b)*sqrt(a)*log(-(
8*a^2*x^6 + 8*a*b*x^3 + b^2)*sqrt(a) - 4*(2*a^2*x^6 + a*b*x^3)*sq
rt((a*x^3 + b)/x^3)))/(a^3*x^3 + a^2*b), -1/3*(2*a*x^3*sqrt((a*x^
3 + b)/x^3) + (a*x^3 + b)*sqrt(-a)*arctan(2*sqrt(-a)*x^3*sqrt((a*
x^3 + b)/x^3)/(2*a*x^3 + b)))/(a^3*x^3 + a^2*b)]
```

Sympy [A] time = 7.44187, size = 187, normalized size = 4.07

$$-\frac{2a^3x^3\sqrt{1+\frac{b}{ax^3}}}{3a^{\frac{9}{2}}x^3+3a^{\frac{7}{2}}b}-\frac{a^3x^3\log\left(\frac{b}{ax^3}\right)}{3a^{\frac{9}{2}}x^3+3a^{\frac{7}{2}}b}+\frac{2a^3x^3\log\left(\sqrt{1+\frac{b}{ax^3}}+1\right)}{3a^{\frac{9}{2}}x^3+3a^{\frac{7}{2}}b}-\frac{a^2b\log\left(\frac{b}{ax^3}\right)}{3a^{\frac{9}{2}}x^3+3a^{\frac{7}{2}}b}+\frac{2a^2b\log\left(\sqrt{1+\frac{b}{ax^3}}+1\right)}{3a^{\frac{9}{2}}x^3+3a^{\frac{7}{2}}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**3)**(3/2)/x,x)
```

```
[Out] -2*a**3*x**3*sqrt(1 + b/(a*x**3))/(3*a**(9/2)*x**3 + 3*a**(7/2)*b
) - a**3*x**3*log(b/(a*x**3))/(3*a**(9/2)*x**3 + 3*a**(7/2)*b) +
2*a**3*x**3*log(sqrt(1 + b/(a*x**3)) + 1)/(3*a**(9/2)*x**3 + 3*a*
*(7/2)*b) - a**2*b*log(b/(a*x**3))/(3*a**(9/2)*x**3 + 3*a**(7/2)*
b) + 2*a**2*b*log(sqrt(1 + b/(a*x**3)) + 1)/(3*a**(9/2)*x**3 + 3*
a**(7/2)*b)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^(3/2)*x),x, algorithm="giac")
```

```
[Out] integrate(1/((a + b/x^3)^(3/2)*x), x)
```

3.2038 $\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{3/2} x^4} \, dx$

Optimal. Leaf size=18

$$\frac{2}{3b\sqrt{a+\frac{b}{x^3}}}$$

```
[Out] 2/(3*b*Sqrt[a + b/x^3])
```

Rubi [A] time = 0.0302301, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$\frac{2}{3b\sqrt{a+\frac{b}{x^3}}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^3)^(3/2)*x^4),x]

[Out] 2/(3*b*Sqrt[a + b/x^3])
```

Rubi in Sympy [A] time = 2.12479, size = 14, normalized size = 0.78

$$\frac{2}{3b\sqrt{a+\frac{b}{x^3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**3)**(3/2)/x**4,x)

[Out] 2/(3*b*sqrt(a + b/x**3))
```

Mathematica [A] time = 0.0202149, size = 18, normalized size = 1.

$$\frac{2}{3b\sqrt{a+\frac{b}{x^3}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^3)^(3/2)*x^4),x]

[Out] 2/(3*b*Sqrt[a + b/x^3])
```

Maple [A] time = 0.01, size = 29, normalized size = 1.6

$$\frac{2\,a{x}^{3}+2\,b}{3\,b{x}^{3}}\left({\frac{a{x}^{3}+b}{{x}^{3}}}\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^3)^(3/2)/x^4,x)

[Out] 2/3/x^3*(a*x^3+b)/b/((a*x^3+b)/x^3)^(3/2)
```

Maxima [A] time = 1.43742, size = 19, normalized size = 1.06

$$\frac{2}{3\sqrt{a+\frac{b}{x^3}}\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^(3/2)*x^4),x, algorithm="maxima")

[Out] 2/3/(sqrt(a + b/x^3)*b)
```

Fricas [A] time = 0.252417, size = 41, normalized size = 2.28

$$\frac{2\,x^3\sqrt{\frac{ax^3+b}{x^3}}}{3\,(abx^3+b^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^(3/2)*x^4),x, algorithm="fricas")

[Out] 2/3*x^3*sqrt((a*x^3 + b)/x^3)/(a*b*x^3 + b^2)
```

Sympy [A] time = 10.9752, size = 27, normalized size = 1.5

$$\begin{cases} \frac{2}{3b\sqrt{a+\frac{b}{x^3}}} & \text{for } b \neq 0 \\ -\frac{1}{3a^{\frac{3}{2}}x^3} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**3)**(3/2)/x**4,x)

[Out] Piecewise((2/(3*b*sqrt(a + b/x**3)), Ne(b, 0)), (-1/(3*a**(3/2)*x
**3), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}} x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^(3/2)*x^4),x, algorithm="giac")

[Out] integrate(1/((a + b/x^3)^(3/2)*x^4), x)
```

3.2039 $\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{3/2} x^7} \, dx$

Optimal. Leaf size=38

$$-\frac{2a}{3b^2\sqrt{a+\frac{b}{x^3}}}-\frac{2\sqrt{a+\frac{b}{x^3}}}{3b^2}$$

```
[Out] (-2*a)/(3*b^2*Sqrt[a + b/x^3]) - (2*Sqrt[a + b/x^3])/(3*b^2)
```

Rubi [A] time = 0.0699912, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2a}{3b^2\sqrt{a+\frac{b}{x^3}}}-\frac{2\sqrt{a+\frac{b}{x^3}}}{3b^2}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b/x^3)^(3/2)*x^7),x]
```

```
[Out] (-2*a)/(3*b^2*Sqrt[a + b/x^3]) - (2*Sqrt[a + b/x^3])/(3*b^2)
```

Rubi in Sympy [A] time = 7.00207, size = 36, normalized size = 0.95

$$-\frac{2a}{3b^2\sqrt{a+\frac{b}{x^3}}}-\frac{2\sqrt{a+\frac{b}{x^3}}}{3b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b/x**3)**(3/2)/x**7,x)
```

```
[Out] -2*a/(3*b**2*sqrt(a + b/x**3)) - 2*sqrt(a + b/x**3)/(3*b**2)
```

Mathematica [A] time = 0.0275304, size = 29, normalized size = 0.76

$$-\frac{2\left(2ax^3+b\right)}{3b^2x^3\sqrt{a+\frac{b}{x^3}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b/x^3)^(3/2)*x^7),x]
```

```
[Out] (-2*(b + 2*a*x^3))/(3*b^2*Sqrt[a + b/x^3]*x^3)
```

Maple [A] time = 0.007, size = 37, normalized size = 1.

$$-\frac{\left(2\,a{x}^{3}+2\,b\right)\left(2\,a{x}^{3}+b\right)}{3\,{b}^{2}{x}^{6}}\left({\frac{a{x}^{3}+b}{{x}^{3}}}\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/(a+b/x^3)^(3/2)/x^7,x)
```

```
[Out] -2/3*(a*x^3+b)*(2*a*x^3+b)/x^6/b^2/((a*x^3+b)/x^3)^(3/2)
```

Maxima [A] time = 1.44626, size = 41, normalized size = 1.08

$$-\frac{2\sqrt{a+\frac{b}{x^3}}}{3\,b^2}-\frac{2\,a}{3\,\sqrt{a+\frac{b}{x^3}}b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x^3)^(3/2)*x^7),x, algorithm="maxima")
```

```
[Out] -2/3*sqrt(a + b/x^3)/b^2 - 2/3*a/(sqrt(a + b/x^3)*b^2)
```

Fricas [A] time = 0.241147, size = 50, normalized size = 1.32

$$-\frac{2\left(2\,ax^3+b\right)\sqrt{\frac{ax^3+b}{x^3}}}{3\,(ab^2x^3+b^3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x^3)^(3/2)*x^7),x, algorithm="fricas")
```

```
[Out] -2/3*(2*a*x^3 + b)*sqrt((a*x^3 + b)/x^3)/(a*b^2*x^3 + b^3)
```

Sympy [A] time = 21.1159, size = 51, normalized size = 1.34

$$\begin{cases} -\frac{4a}{3b^2\sqrt{a+\frac{b}{x^3}}}-\frac{2}{3bx^3\sqrt{a+\frac{b}{x^3}}} & \text{for } b\neq 0 \\ -\frac{1}{6a^{\frac{3}{2}}x^6} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(a+b/x**3)**(3/2)/x**7,x)
```

```
[Out] Piecewise((-4*a/(3*b**2*sqrt(a + b/x**3)) - 2/(3*b*x**3*sqrt(a +
b/x**3)), Ne(b, 0)), (-1/(6*a**(3/2)*x**6), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}x^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x^3)^(3/2)*x^7),x, algorithm="giac")
```

```
[Out] integrate(1/((a + b/x^3)^(3/2)*x^7), x)
```

3.2040 $\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{3/2} x^{10}} \, dx$

Optimal. Leaf size=59

$$\frac{2a^2}{3b^3\sqrt{a+\frac{b}{x^3}}}+\frac{4a\sqrt{a+\frac{b}{x^3}}}{3b^3}-\frac{2\left(a+\frac{b}{x^3}\right)^{3/2}}{9b^3}$$

```
[Out] (2*a^2)/(3*b^3*Sqrt[a + b/x^3]) + (4*a*Sqrt[a + b/x^3])/(3*b^3) -
 (2*(a + b/x^3)^(3/2))/(9*b^3)
```

Rubi [A] time = 0.096048, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2a^2}{3b^3\sqrt{a+\frac{b}{x^3}}}+\frac{4a\sqrt{a+\frac{b}{x^3}}}{3b^3}-\frac{2\left(a+\frac{b}{x^3}\right)^{3/2}}{9b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^3)^(3/2)*x^10),x]
```

```
[Out] (2*a^2)/(3*b^3*Sqrt[a + b/x^3]) + (4*a*Sqrt[a + b/x^3])/(3*b^3) -
 (2*(a + b/x^3)^(3/2))/(9*b^3)
```

Rubi in Sympy [A] time = 10.478, size = 54, normalized size = 0.92

$$\frac{2a^2}{3b^3\sqrt{a+\frac{b}{x^3}}}+\frac{4a\sqrt{a+\frac{b}{x^3}}}{3b^3}-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}}{9b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**3)**(3/2)/x**10,x)
```

```
[Out] 2*a**2/(3*b**3*sqrt(a + b/x**3)) + 4*a*sqrt(a + b/x**3)/(3*b**3)
- 2*(a + b/x**3)**(3/2)/(9*b**3)
```

Mathematica [A] time = 0.0418938, size = 42, normalized size = 0.71

$$\frac{2\left(8a^2x^6+4abx^3-b^2\right)}{9b^3x^6\sqrt{a+\frac{b}{x^3}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^3)^(3/2)*x^10),x]
```

```
[Out] (2*(-b^2 + 4*a*b*x^3 + 8*a^2*x^6))/(9*b^3*Sqrt[a + b/x^3]*x^6)
```

Maple [A] time = 0.009, size = 50, normalized size = 0.9

$$\frac{\left(2\,ax^3+2\,b\right)\left(8\,a^2x^6+4\,abx^3-b^2\right)}{9\,b^3x^9}\left(\frac{ax^3+b}{x^3}\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/(a+b/x^3)^(3/2)/x^10,x)
```

```
[Out] 2/9*(a*x^3+b)*(8*a^2*x^6+4*a*b*x^3-b^2)/x^9/b^3/((a*x^3+b)/x^3)^(
3/2)
```

Maxima [A] time = 1.44189, size = 63, normalized size = 1.07

$$-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}}{9\,b^3}+\frac{4\,\sqrt{a+\frac{b}{x^3}}a}{3\,b^3}+\frac{2\,a^2}{3\,\sqrt{a+\frac{b}{x^3}}b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x^3)^(3/2)*x^10),x, algorithm="maxima")
```

```
[Out] -2/9*(a + b/x^3)^(3/2)/b^3 + 4/3*sqrt(a + b/x^3)*a/b^3 + 2/3*a^2/
(sqrt(a + b/x^3)*b^3)
```

Fricas [A] time = 0.240775, size = 73, normalized size = 1.24

$$\frac{2\left(8\,a^2x^6+4\,abx^3-b^2\right)\sqrt{\frac{ax^3+b}{x^3}}}{9\left(ab^3x^6+b^4x^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x^3)^(3/2)*x^10),x, algorithm="fricas")
```

```
[Out] 2/9*(8*a^2*x^6 + 4*a*b*x^3 - b^2)*sqrt((a*x^3 + b)/x^3)/(a*b^3*x^
6 + b^4*x^3)
```

Sympy [A] time = 25.0152, size = 466, normalized size = 7.9

$$\frac{16a^{\frac{9}{2}}b^{\frac{7}{2}}x^9\sqrt{\frac{ax^3}{b}+1}}{9a^{\frac{7}{2}}b^6x^{\frac{21}{2}}+18a^{\frac{5}{2}}b^7x^{\frac{15}{2}}+9a^{\frac{3}{2}}b^8x^{\frac{9}{2}}}+\frac{24a^{\frac{7}{2}}b^{\frac{9}{2}}x^6\sqrt{\frac{ax^3}{b}+1}}{9a^{\frac{7}{2}}b^6x^{\frac{21}{2}}+18a^{\frac{5}{2}}b^7x^{\frac{15}{2}}+9a^{\frac{3}{2}}b^8x^{\frac{9}{2}}}+\frac{6a^{\frac{5}{2}}b^{\frac{11}{2}}x^3\sqrt{\frac{ax^3}{b}+1}}{9a^{\frac{7}{2}}b^6x^{\frac{21}{2}}+18a^{\frac{5}{2}}b^7x^{\frac{15}{2}}+9a^{\frac{3}{2}}b^8x^{\frac{9}{2}}}-\frac{2a^{\frac{3}{2}}b^{\frac{13}{2}}\sqrt{\frac{ax^3}{b}+1}}{9a^{\frac{7}{2}}b^6x^{\frac{21}{2}}+18a^{\frac{5}{2}}b^7x^{\frac{15}{2}}+9a^{\frac{3}{2}}b^8x^{\frac{9}{2}}}-\frac{16a^5b^3x^{\frac{21}{2}}}{9a^{\frac{7}{2}}b^6x^{\frac{21}{2}}+18a^{\frac{5}{2}}b^7x^{\frac{15}{2}}+9a^{\frac{3}{2}}b^8x^{\frac{9}{2}}}-\frac{32a^4b^4x^{\frac{15}{2}}}{9a^{\frac{7}{2}}b^6x^{\frac{21}{2}}+18a^{\frac{5}{2}}b^7x^{\frac{15}{2}}+9a^{\frac{3}{2}}b^8x^{\frac{9}{2}}}-\frac{16a^3b^5x^{\frac{9}{2}}}{9a^{\frac{7}{2}}b^6x^{\frac{21}{2}}+18a^{\frac{5}{2}}b^7x^{\frac{15}{2}}+9a^{\frac{3}{2}}b^8x^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(a+b/x**3)**(3/2)/x**10,x)
```

```
[Out] 16*a**(9/2)*b**(7/2)*x**9*sqrt(a*x**3/b + 1)/(9*a**(7/2)*b**6*x**
(21/2) + 18*a**(5/2)*b**7*x**(15/2) + 9*a**(3/2)*b**8*x**(9/2)) +
 24*a**(7/2)*b**(9/2)*x**6*sqrt(a*x**3/b + 1)/(9*a**(7/2)*b**6*x*
*(21/2) + 18*a**(5/2)*b**7*x**(15/2) + 9*a**(3/2)*b**8*x**(9/2))
+ 6*a**(5/2)*b**(11/2)*x**3*sqrt(a*x**3/b + 1)/(9*a**(7/2)*b**6*x
**(21/2) + 18*a**(5/2)*b**7*x**(15/2) + 9*a**(3/2)*b**8*x**(9/2))
 - 2*a**(3/2)*b**(13/2)*sqrt(a*x**3/b + 1)/(9*a**(7/2)*b**6*x**(2
```

```
1/2) + 18*a**(5/2)*b**7*x**(15/2) + 9*a**(3/2)*b**8*x**(9/2)) - 1
6*a**5*b**3*x**(21/2)/(9*a**(7/2)*b**6*x**(21/2) + 18*a**(5/2)*b*
*7*x**(15/2) + 9*a**(3/2)*b**8*x**(9/2)) - 32*a**4*b**4*x**(15/2)
/(9*a**(7/2)*b**6*x**(21/2) + 18*a**(5/2)*b**7*x**(15/2) + 9*a**(
3/2)*b**8*x**(9/2)) - 16*a**3*b**5*x**(9/2)/(9*a**(7/2)*b**6*x**(
21/2) + 18*a**(5/2)*b**7*x**(15/2) + 9*a**(3/2)*b**8*x**(9/2))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}x^{10}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^(3/2)*x^10),x, algorithm="giac")
```

```
[Out] integrate(1/((a + b/x^3)^(3/2)*x^10), x)
```

3.2041 $\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{3/2} x^{13}} \, dx$

Optimal. Leaf size=78

$$-\frac{2a^3}{3b^4\sqrt{a+\frac{b}{x^3}}}-\frac{2a^2\sqrt{a+\frac{b}{x^3}}}{b^4}+\frac{2a\left(a+\frac{b}{x^3}\right)^{3/2}}{3b^4}-\frac{2\left(a+\frac{b}{x^3}\right)^{5/2}}{15b^4}$$

```
[Out] (-2*a^3)/(3*b^4*Sqrt[a + b/x^3]) - (2*a^2*Sqrt[a + b/x^3])/b^4 +
(2*a*(a + b/x^3)^(3/2))/(3*b^4) - (2*(a + b/x^3)^(5/2))/(15*b^4)
```

Rubi [A] time = 0.118436, antiderivative size = 78, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2a^3}{3b^4\sqrt{a+\frac{b}{x^3}}}-\frac{2a^2\sqrt{a+\frac{b}{x^3}}}{b^4}+\frac{2a\left(a+\frac{b}{x^3}\right)^{3/2}}{3b^4}-\frac{2\left(a+\frac{b}{x^3}\right)^{5/2}}{15b^4}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^3)^(3/2)*x^13),x]
```

```
[Out] (-2*a^3)/(3*b^4*Sqrt[a + b/x^3]) - (2*a^2*Sqrt[a + b/x^3])/b^4 +
(2*a*(a + b/x^3)^(3/2))/(3*b^4) - (2*(a + b/x^3)^(5/2))/(15*b^4)
```

Rubi in Sympy [A] time = 14.0165, size = 73, normalized size = 0.94

$$-\frac{2a^3}{3b^4\sqrt{a+\frac{b}{x^3}}}-\frac{2a^2\sqrt{a+\frac{b}{x^3}}}{b^4}+\frac{2a\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}}{3b^4}-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{5}{2}}}{15b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**3)**(3/2)/x**13,x)
```

```
[Out] -2*a**3/(3*b**4*sqrt(a + b/x**3)) - 2*a**2*sqrt(a + b/x**3)/b**4
+ 2*a*(a + b/x**3)**(3/2)/(3*b**4) - 2*(a + b/x**3)**(5/2)/(15*b*
*4)
```

Mathematica [A] time = 0.0542749, size = 51, normalized size = 0.65

$$-\frac{2\left(16a^3x^9+8a^2bx^6-2ab^2x^3+b^3\right)}{15b^4x^9\sqrt{a+\frac{b}{x^3}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^3)^(3/2)*x^13),x]
```

```
[Out] (-2*(b^3 - 2*a*b^2*x^3 + 8*a^2*b*x^6 + 16*a^3*x^9))/(15*b^4*Sqrt[
a + b/x^3]*x^9)
```

Maple [A] time = 0.01, size = 59, normalized size = 0.8

$$-\frac{(2ax^3+2b)\left(16a^3x^9+8a^2bx^6-2ab^2x^3+b^3\right)}{15x^{12}b^4}\left(\frac{ax^3+b}{x^3}\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^3)^(3/2)/x^13,x)
```

```
[Out] -2/15*(a*x^3+b)*(16*a^3*x^9+8*a^2*b*x^6-2*a*b^2*x^3+b^3)/x^12/b^4
/((a*x^3+b)/x^3)^(3/2)
```

Maxima [A] time = 1.43794, size = 86, normalized size = 1.1

$$-\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{5}{2}}}{15b^4}+\frac{2\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}a}{3b^4}-\frac{2\sqrt{a+\frac{b}{x^3}}a^2}{b^4}-\frac{2a^3}{3\sqrt{a+\frac{b}{x^3}}b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^(3/2)*x^13),x, algorithm="maxima")
```

```
[Out] -2/15*(a + b/x^3)^(5/2)/b^4 + 2/3*(a + b/x^3)^(3/2)*a/b^4 - 2*sqr
t(a + b/x^3)*a^2/b^4 - 2/3*a^3/(sqrt(a + b/x^3)*b^4)
```

Fricas [A] time = 0.24679, size = 85, normalized size = 1.09

$$-\frac{2\left(16a^3x^9+8a^2bx^6-2ab^2x^3+b^3\right)\sqrt{\frac{ax^3+b}{x^3}}}{15\left(ab^4x^9+b^5x^6\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^(3/2)*x^13),x, algorithm="fricas")
```

```
[Out] -2/15*(16*a^3*x^9 + 8*a^2*b*x^6 - 2*a*b^2*x^3 + b^3)*sqrt((a*x^3
+ b)/x^3)/(a*b^4*x^9 + b^5*x^6)
```

Sympy [A] time = 57.3701, size = 2048, normalized size = 26.26

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**3)**(3/2)/x**13,x)
```

```
[Out] -32*a**(21/2)*b**(23/2)*x**24*sqrt(a*x**3/b + 1)/(15*a**(17/2)*b*
*15*x**(51/2) + 90*a**(15/2)*b**16*x**(45/2) + 225*a**(13/2)*b**1
7*x**(39/2) + 300*a**(11/2)*b**18*x**(33/2) + 225*a**(9/2)*b**19*
x**(27/2) + 90*a**(7/2)*b**20*x**(21/2) + 15*a**(5/2)*b**21*x**(1
5/2)) - 176*a**(19/2)*b**(25/2)*x**21*sqrt(a*x**3/b + 1)/(15*a**(
17/2)*b**15*x**(51/2) + 90*a**(15/2)*b**16*x**(45/2) + 225*a**(13
/2)*b**17*x**(39/2) + 300*a**(11/2)*b**18*x**(33/2) + 225*a**(9/2
)*b**19*x**(27/2) + 90*a**(7/2)*b**20*x**(21/2) + 15*a**(5/2)*b**
21*x**(15/2)) - 396*a**(17/2)*b**(27/2)*x**18*sqrt(a*x**3/b + 1)/
(15*a**(17/2)*b**15*x**(51/2) + 90*a**(15/2)*b**16*x**(45/2) + 22
```

```
5*a**(13/2)*b**17*x**(39/2) + 300*a**(11/2)*b**18*x**(33/2) + 225
*a**(9/2)*b**19*x**(27/2) + 90*a**(7/2)*b**20*x**(21/2) + 15*a**(
5/2)*b**21*x**(15/2)) - 462*a**(15/2)*b**(29/2)*x**15*sqrt(a*x**3
/b + 1)/(15*a**(17/2)*b**15*x**(51/2) + 90*a**(15/2)*b**16*x**(45
/2) + 225*a**(13/2)*b**17*x**(39/2) + 300*a**(11/2)*b**18*x**(33/
2) + 225*a**(9/2)*b**19*x**(27/2) + 90*a**(7/2)*b**20*x**(21/2) +
 15*a**(5/2)*b**21*x**(15/2)) - 290*a**(13/2)*b**(31/2)*x**12*sqr
t(a*x**3/b + 1)/(15*a**(17/2)*b**15*x**(51/2) + 90*a**(15/2)*b**1
6*x**(45/2) + 225*a**(13/2)*b**17*x**(39/2) + 300*a**(11/2)*b**18
*x**(33/2) + 225*a**(9/2)*b**19*x**(27/2) + 90*a**(7/2)*b**20*x**
(21/2) + 15*a**(5/2)*b**21*x**(15/2)) - 92*a**(11/2)*b**(33/2)*x*
*9*sqrt(a*x**3/b + 1)/(15*a**(17/2)*b**15*x**(51/2) + 90*a**(15/2
)*b**16*x**(45/2) + 225*a**(13/2)*b**17*x**(39/2) + 300*a**(11/2)
*b**18*x**(33/2) + 225*a**(9/2)*b**19*x**(27/2) + 90*a**(7/2)*b**
20*x**(21/2) + 15*a**(5/2)*b**21*x**(15/2)) - 16*a**(9/2)*b**(35/
2)*x**6*sqrt(a*x**3/b + 1)/(15*a**(17/2)*b**15*x**(51/2) + 90*a**
(15/2)*b**16*x**(45/2) + 225*a**(13/2)*b**17*x**(39/2) + 300*a**(
11/2)*b**18*x**(33/2) + 225*a**(9/2)*b**19*x**(27/2) + 90*a**(7/2
)*b**20*x**(21/2) + 15*a**(5/2)*b**21*x**(15/2)) - 6*a**(7/2)*b**
(37/2)*x**3*sqrt(a*x**3/b + 1)/(15*a**(17/2)*b**15*x**(51/2) + 90
*a**(15/2)*b**16*x**(45/2) + 225*a**(13/2)*b**17*x**(39/2) + 300*
a**(11/2)*b**18*x**(33/2) + 225*a**(9/2)*b**19*x**(27/2) + 90*a**
(7/2)*b**20*x**(21/2) + 15*a**(5/2)*b**21*x**(15/2)) - 2*a**(5/2)
*b**(39/2)*sqrt(a*x**3/b + 1)/(15*a**(17/2)*b**15*x**(51/2) + 90*
a**(15/2)*b**16*x**(45/2) + 225*a**(13/2)*b**17*x**(39/2) + 300*a
**(11/2)*b**18*x**(33/2) + 225*a**(9/2)*b**19*x**(27/2) + 90*a**(
7/2)*b**20*x**(21/2) + 15*a**(5/2)*b**21*x**(15/2)) + 32*a**11*b*
*11*x**(51/2)/(15*a**(17/2)*b**15*x**(51/2) + 90*a**(15/2)*b**16*
x**(45/2) + 225*a**(13/2)*b**17*x**(39/2) + 300*a**(11/2)*b**18*x
**(33/2) + 225*a**(9/2)*b**19*x**(27/2) + 90*a**(7/2)*b**20*x**(2
1/2) + 15*a**(5/2)*b**21*x**(15/2)) + 192*a**10*b**12*x**(45/2)/(
15*a**(17/2)*b**15*x**(51/2) + 90*a**(15/2)*b**16*x**(45/2) + 225
*a**(13/2)*b**17*x**(39/2) + 300*a**(11/2)*b**18*x**(33/2) + 225*
a**(9/2)*b**19*x**(27/2) + 90*a**(7/2)*b**20*x**(21/2) + 15*a**(5
/2)*b**21*x**(15/2)) + 480*a**9*b**13*x**(39/2)/(15*a**(17/2)*b**
15*x**(51/2) + 90*a**(15/2)*b**16*x**(45/2) + 225*a**(13/2)*b**17
*x**(39/2) + 300*a**(11/2)*b**18*x**(33/2) + 225*a**(9/2)*b**19*x
**(27/2) + 90*a**(7/2)*b**20*x**(21/2) + 15*a**(5/2)*b**21*x**(15
/2)) + 640*a**8*b**14*x**(33/2)/(15*a**(17/2)*b**15*x**(51/2) + 9
0*a**(15/2)*b**16*x**(45/2) + 225*a**(13/2)*b**17*x**(39/2) + 300
*a**(11/2)*b**18*x**(33/2) + 225*a**(9/2)*b**19*x**(27/2) + 90*a*
*(7/2)*b**20*x**(21/2) + 15*a**(5/2)*b**21*x**(15/2)) + 480*a**7*
b**15*x**(27/2)/(15*a**(17/2)*b**15*x**(51/2) + 90*a**(15/2)*b**1
6*x**(45/2) + 225*a**(13/2)*b**17*x**(39/2) + 300*a**(11/2)*b**18
*x**(33/2) + 225*a**(9/2)*b**19*x**(27/2) + 90*a**(7/2)*b**20*x**
(21/2) + 15*a**(5/2)*b**21*x**(15/2)) + 192*a**6*b**16*x**(21/2)/
(15*a**(17/2)*b**15*x**(51/2) + 90*a**(15/2)*b**16*x**(45/2) + 22
5*a**(13/2)*b**17*x**(39/2) + 300*a**(11/2)*b**18*x**(33/2) + 225
*a**(9/2)*b**19*x**(27/2) + 90*a**(7/2)*b**20*x**(21/2) + 15*a**(
5/2)*b**21*x**(15/2)) + 32*a**5*b**17*x**(15/2)/(15*a**(17/2)*b**
15*x**(51/2) + 90*a**(15/2)*b**16*x**(45/2) + 225*a**(13/2)*b**17
*x**(39/2) + 300*a**(11/2)*b**18*x**(33/2) + 225*a**(9/2)*b**19*x
**(27/2) + 90*a**(7/2)*b**20*x**(21/2) + 15*a**(5/2)*b**21*x**(15
/2))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}} x^{13}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^(3/2)*x^13),x, algorithm="giac")

[Out] integrate(1/((a + b/x^3)^(3/2)*x^13), x)
```

3.2042 $\int \frac{x^7}{\left(a+\frac{b}{x^3}\right)^{3/2}}\,dx$

Optimal. Leaf size=315

$$\frac{1729b^2x^2\sqrt{a+\frac{b}{x^3}}}{960a^4}-\frac{247bx^5\sqrt{a+\frac{b}{x^3}}}{240a^3}+\frac{19x^8\sqrt{a+\frac{b}{x^3}}}{24a^2}+\frac{1729\sqrt{2+\sqrt{3}}\,b^{8/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}\,F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{960\sqrt[4]{3}\,a^4\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{2x^8}{3a\sqrt{a+\frac{b}{x^3}}}$$

```
[Out] (1729*b^2*Sqrt[a + b/x^3]*x^2)/(960*a^4) - (247*b*Sqrt[a + b/x^3]
*x^5)/(240*a^3) - (2*x^8)/(3*a*Sqrt[a + b/x^3]) + (19*Sqrt[a + b/
x^3]*x^8)/(24*a^2) + (1729*Sqrt[2 + Sqrt[3]]*b^(8/3)*(a^(1/3) + b
^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1
+ Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3]
)*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 -
 4*Sqrt[3]])/(960*3^(1/4)*a^4*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1
/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi [A] time = 0.538178, antiderivative size = 315, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{1729b^2x^2\sqrt{a+\frac{b}{x^3}}}{960a^4}-\frac{247bx^5\sqrt{a+\frac{b}{x^3}}}{240a^3}+\frac{19x^8\sqrt{a+\frac{b}{x^3}}}{24a^2}+\frac{1729\sqrt{2+\sqrt{3}}\,b^{8/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}\,F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{960\sqrt[4]{3}\,a^4\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{2x^8}{3a\sqrt{a+\frac{b}{x^3}}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^7/(a + b/x^3)^(3/2),x]
```



```
[Out] (1729*b^2*Sqrt[a + b/x^3]*x^2)/(960*a^4) - (247*b*Sqrt[a + b/x^3]
*x^5)/(240*a^3) - (2*x^8)/(3*a*Sqrt[a + b/x^3]) + (19*Sqrt[a + b/
x^3]*x^8)/(24*a^2) + (1729*Sqrt[2 + Sqrt[3]]*b^(8/3)*(a^(1/3) + b
^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1
+ Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3]
)*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 -
 4*Sqrt[3]])/(960*3^(1/4)*a^4*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1
/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi in Sympy [A] time = 31.0789, size = 272, normalized size = 0.86

$$-\frac{2x^8}{3a\sqrt{a+\frac{b}{x^3}}}+\frac{19x^8\sqrt{a+\frac{b}{x^3}}}{24a^2}-\frac{247bx^5\sqrt{a+\frac{b}{x^3}}}{240a^3}+\frac{1729\cdot 3^{\frac{3}{4}}b^{\frac{8}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{2880a^4\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}+\frac{1729b^2x^2\sqrt{a+\frac{b}{x^3}}}{960a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**7/(a+b/x**3)**(3/2),x)
```

```
[Out] -2*x**8/(3*a*sqrt(a + b/x**3)) + 19*x**8*sqrt(a + b/x**3)/(24*a**
2) - 247*b*x**5*sqrt(a + b/x**3)/(240*a**3) + 1729*3**(3/4)*b**(8
/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**(2/3)/x**2)/(a**(1/
3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(sqrt(3) + 2)*(a**(1/3) +
b**(1/3)/x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)/
x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*sqrt(3))/(2880*
a**4*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)
) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) + 1729*b**2*x**2*sqrt(a + b
/x**3)/(960*a**4)
```

Mathematica [C] time = 0.589697, size = 199, normalized size = 0.63

$$\frac{3\sqrt[3]{-b}\left(120a^3x^9-228a^2bx^6+741ab^2x^3+1729b^3\right)+1729i3^{3/4}\sqrt[3]{a}b^3x\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}}{\sqrt[3]{a}x}-1\right)}\sqrt{\frac{\frac{(-b)^{2/3}}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+x^2}{x^2}}F\left(\sin^{-1}\left(\sqrt{-\cdots}\right.\right.}{2880a^4\sqrt[3]{-b}x\sqrt{a+\frac{b}{x^3}}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^7/(a + b/x^3)^(3/2),x]
```

```
[Out] (3*(-b)^(1/3)*(1729*b^3 + 741*a*b^2*x^3 - 228*a^2*b*x^6 + 120*a^3
*x^9) + (1729*I)*3^(3/4)*a^(1/3)*b^3*Sqrt[(-1)^(5/6)*(-1 + (-b)^(
1/3)/(a^(1/3)*x))]*x*Sqrt[((-b)^(2/3)/a^(2/3) + ((-b)^(1/3)*x)/a^
(1/3) + x^2)/x^2]*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/
3))/(a^(1/3)*x)]/3^(1/4)], (-1)^(1/3)])/(2880*a^4*(-b)^(1/3)*Sqrt
[a + b/x^3]*x)
```

Maple [B] time = 0.053, size = 2540, normalized size = 8.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^7/(a+b/x^3)^(3/2),x)
```

```
[Out] 1/960/((a*x^3+b)/x^3)^(3/2)/x^5*(a*x^3+b)/(-a^2*b)^(1/3)/a^5*(120
*I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x
```

```
+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))
^(1/2)*(-a^2*b)^(1/3)*(a*x^4+b*x)^(1/2)*3^(1/2)*(x*(a*x^3+b))^(1/
2)*x^6*a^3+3458*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b
)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/
(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(
1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(
1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(
1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2
)-3))^(1/2))*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^2*a^2*b^3-6916*I*(-(I*
3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(
1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a
^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/
3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(
1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2
)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(
1/3)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x*a*b^3-360*(1/a^2*x*(-a*x+(-a^2
*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(
1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(-a^2*b)^(1/3)*(
a*x^4+b*x)^(1/2)*(x*(a*x^3+b))^(1/2)*x^6*a^3+3458*I*(-(I*3^(1/2)-
3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a
^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1
/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3
^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*
x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*
3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(2/3)*3^(
1/2)*(x*(a*x^3+b))^(1/2)*b^3-3458*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-
1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+
(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^
(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-
a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/
(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1
/2)+1)/(I*3^(1/2)-3))^(1/2))*(x*(a*x^3+b))^(1/2)*x^2*a^2*b^3-348*
I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+
(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^
(1/2)*(-a^2*b)^(1/3)*(a*x^4+b*x)^(1/2)*3^(1/2)*(x*(a*x^3+b))^(1/2
)*x^3*a^2*b+6916*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)
^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(
I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1
/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1
/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)
-3))^(1/2))*(-a^2*b)^(1/3)*(x*(a*x^3+b))^(1/2)*x*a*b^3-3458*(-(I*
3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(
1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a
^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/
3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(
1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2
)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(
2/3)*(x*(a*x^3+b))^(1/2)*b^3+1044*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*
(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*
b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(-a^2*b)^(1/3)*(a*x^4+b*x)^
(1/2)*(x*(a*x^3+b))^(1/2)*x^3*a^2*b+1089*I*(1/a^2*x*(-a*x+(-a^2*b
)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/
2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(-a^2*b)^(1/3)*(a*
x^4+b*x)^(1/2)*3^(1/2)*(x*(a*x^3+b))^(1/2)*a*b^2+640*I*(1/a^2*x*(
-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/
3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(-a^2*
b)^(1/3)*3^(1/2)*x*a*b^3-3267*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3
^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(
1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(-a^2*b)^(1/3)*(a*x^4+b*x)^(1/2
)*(x*(a*x^3+b))^(1/2)*a*b^2-1920*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(
I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b
)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(-a^2*b)^(1/3)*x*a*b^3)/(I*3
^(1/2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3
)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^
(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^7}{\left(a + \frac{b}{x^3}\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(a + b/x^3)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^7/(a + b/x^3)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{10}}{(ax^3+b)\sqrt{\frac{ax^3+b}{x^3}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(a + b/x^3)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^10/((a*x^3 + b)*sqrt((a*x^3 + b)/x^3)), x)
```

Sympy [A] time = 7.15815, size = 46, normalized size = 0.15

$$-\frac{x^8\,\Gamma\left(-\frac{8}{3}\right)\,{}_2F_1\left(\begin{matrix}-\frac{8}{3}, \frac{3}{2}\\ -\frac{5}{3}\end{matrix}\middle|\frac{be^{i\pi}}{ax^3}\right)}{3a^{\frac{3}{2}}\,\Gamma\left(-\frac{5}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**7/(a+b/x**3)**(3/2),x)
```

```
[Out] -x**8*gamma(-8/3)*hyper((-8/3, 3/2), (-5/3,), b*exp_polar(I*pi)/(
a*x**3))/(3*a**(3/2)*gamma(-5/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^7}{\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^7/(a + b/x^3)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^7/(a + b/x^3)^(3/2), x)
```

3.2043 $\int \frac{x^4}{\left(a+\frac{b}{x^3}\right)^{3/2}}\,dx$

Optimal. Leaf size=291

$$-\frac{91bx^2\sqrt{a+\frac{b}{x^3}}}{60a^3}+\frac{13x^5\sqrt{a+\frac{b}{x^3}}}{15a^2}-\frac{91\sqrt{2+\sqrt{3}}b^{5/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{60\sqrt[4]{3}a^3\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{2x^5}{3a\sqrt{a+\frac{b}{x^3}}}$$

```
[Out] (-91*b*Sqrt[a + b/x^3]*x^2)/(60*a^3) - (2*x^5)/(3*a*Sqrt[a + b/x^3]) + (13*Sqrt[a + b/x^3]*x^5)/(15*a^2) - (91*Sqrt[2 + Sqrt[3]]*b^(5/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(60*3^(1/4)*a^3*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi [A] time = 0.456815, antiderivative size = 291, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$

$$-\frac{91bx^2\sqrt{a+\frac{b}{x^3}}}{60a^3}+\frac{13x^5\sqrt{a+\frac{b}{x^3}}}{15a^2}-\frac{91\sqrt{2+\sqrt{3}}b^{5/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{60\sqrt[4]{3}a^3\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{2x^5}{3a\sqrt{a+\frac{b}{x^3}}}$$

Antiderivative was successfully verified.

```
[In] Int[x^4/(a + b/x^3)^(3/2),x]
```



```
[Out] (-91*b*Sqrt[a + b/x^3]*x^2)/(60*a^3) - (2*x^5)/(3*a*Sqrt[a + b/x^3]) + (13*Sqrt[a + b/x^3]*x^5)/(15*a^2) - (91*Sqrt[2 + Sqrt[3]]*b^(5/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(60*3^(1/4)*a^3*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi in Sympy [A] time = 23.9799, size = 248, normalized size = 0.85

$$-\frac{2x^5}{3a\sqrt{a+\frac{b}{x^3}}}+\frac{13x^5\sqrt{a+\frac{b}{x^3}}}{15a^2}-\frac{91\cdot 3^{\frac{3}{4}}b^{\frac{5}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{180a^3\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}-\frac{91bx^2\sqrt{a+\frac{b}{x^3}}}{60a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(a+b/x**3)**(3/2),x)
```

```
[Out] -2*x**5/(3*a*sqrt(a + b/x**3)) + 13*x**5*sqrt(a + b/x**3)/(15*a**
2) - 91*3**(3/4)*b**(5/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x +
b**(2/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(sqr
t(3) + 2)*(a**(1/3) + b**(1/3)/x)*elliptic_f(asin((-a**(1/3)*(-1
+ sqrt(3)) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)),
-7 - 4*sqrt(3))/(180*a**3*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(
a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) - 91*b
*x**2*sqrt(a + b/x**3)/(60*a**3)
```

Mathematica [C] time = 0.447876, size = 188, normalized size = 0.65

$$\frac{-3\sqrt[3]{-b}\left(-12a^2x^6+39abx^3+91b^2\right)-91i3^{3/4}\sqrt[3]{a}b^2x\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}}{\sqrt[3]{a}x}-1\right)}\sqrt{\frac{\frac{(-b)^{2/3}}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+x^2}{x^2}}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}}{\sqrt[3]{a}x}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\right.}{180a^3\sqrt[3]{-b}x\sqrt{a+\frac{b}{x^3}}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^4/(a + b/x^3)^(3/2),x]
```

```
[Out] (-3*(-b)^(1/3)*(91*b^2 + 39*a*b*x^3 - 12*a^2*x^6) - (91*I)*3^(3/4
)*a^(1/3)*b^2*Sqrt[(-1)^(5/6)*(-1 + (-b)^(1/3)/(a^(1/3)*x))]*x*Sq
rt[((-b)^(2/3)/a^(2/3) + ((-b)^(1/3)*x)/a^(1/3) + x^2)/x^2]*Ellip
ticF[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(1/3))/(a^(1/3)*x)]/3^(1/4
)], (-1)^(1/3)])/(180*a^3*(-b)^(1/3)*Sqrt[a + b/x^3]*x)
```

Maple [B] time = 0.023, size = 2302, normalized size = 7.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(a+b/x^3)^(3/2),x)
```

```
[Out] -1/60/((a*x^3+b)/x^3)^(3/2)/x^5*(a*x^3+b)/a^4/(-a^2*b)^(1/3)*(182
*I*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/
3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-
```

```
3))^(1/2))*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)
))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1
/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*
a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*3^
(1/2)*(x*(a*x^3+b))^(1/2)*x^2*a^2*b^2-364*I*(-a^2*b)^(1/3)*Ellipt
icF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2
),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2)
)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*
((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-
a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2
*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*(x*
(a*x^3+b))^(1/2)*x*a*b^2+182*I*(-a^2*b)^(2/3)*EllipticF((-(I*3^(1
/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)
+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-(I*3^(1/2
)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(
-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^
(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I
*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*(x*(a*x^3+b))^(1
/2)*b^2-12*I*(-a^2*b)^(1/3)*(a*x^4+b*x)^(1/2)*(1/a^2*x*(-a*x+(-a^
2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^
(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*(x*(a*x
^3+b))^(1/2)*x^3*a^2-182*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)
-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*
3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1
)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(
-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(
1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a
^2*b)^(1/3)))^(1/2)*(x*(a*x^3+b))^(1/2)*x^2*a^2*b^2+364*EllipticF
((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),(
(I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(
-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I
*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x
+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)
^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(-a^2*b)^(1/3)
*(x*(a*x^3+b))^(1/2)*x*a*b^2-182*EllipticF((-(I*3^(1/2)-3)*x*a/(I
*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2
)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-(I*3^(1/2)-3)*x*a/(I*3
^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)
+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)
*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(
-a*x+(-a^2*b)^(1/3)))^(1/2)*(-a^2*b)^(2/3)*(x*(a*x^3+b))^(1/2)*b^
2+36*(-a^2*b)^(1/3)*(a*x^4+b*x)^(1/2)*(1/a^2*x*(-a*x+(-a^2*b)^(1/
3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-
a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(x*(a*x^3+b))^(1/2)*x^3
*a^2+51*I*(-a^2*b)^(1/3)*(a*x^4+b*x)^(1/2)*(1/a^2*x*(-a*x+(-a^2*b
)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/
2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*(x*(a*x^3+
b))^(1/2)*a*b+40*I*(-a^2*b)^(1/3)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*
(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*
b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*x*a*b^2-153*(-a^2*b
)^(1/3)*(a*x^4+b*x)^(1/2)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/
2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)
-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(x*(a*x^3+b))^(1/2)*a*b-120*(-a^2*b
)^(1/3)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+
2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1
/3)))^(1/2)*x*a*b^2)/(I*3^(1/2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))
*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2
*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\left(a + \frac{b}{x^3}\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(a + b/x^3)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^4/(a + b/x^3)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^7}{(ax^3+b)\sqrt{\frac{ax^3+b}{x^3}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(a + b/x^3)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^7/((a*x^3 + b)*sqrt((a*x^3 + b)/x^3)), x)
```

Sympy [A] time = 4.08182, size = 46, normalized size = 0.16

$$-\frac{x^5\Gamma\left(-\frac{5}{3}\right){}_2F_1\left(\begin{matrix}-\frac{5}{3},\frac{3}{2}\\-\frac{2}{3}\end{matrix}\middle|\frac{be^{i\pi}}{ax^3}\right)}{3a^{\frac{3}{2}}\Gamma\left(-\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(a+b/x**3)**(3/2),x)
```

```
[Out] -x**5*gamma(-5/3)*hyper((-5/3, 3/2), (-2/3,), b*exp_polar(I*pi)/(
a*x**3))/(3*a**(3/2)*gamma(-2/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^4}{\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(a + b/x^3)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^4/(a + b/x^3)^(3/2), x)
```

3.2044 $\int \frac{x}{\left(a+\frac{b}{x^3}\right)^{3/2}}\,dx$

Optimal. Leaf size=269

$$\frac{7x^2\sqrt{a+\frac{b}{x^3}}}{6a^2}+\frac{7\sqrt{2+\sqrt{3}}\,b^{2/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}\,F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{6\sqrt[4]{3}\,a^2\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{2x^2}{3a\sqrt{a+\frac{b}{x^3}}}$$

```
[Out] (-2*x^2)/(3*a*Sqrt[a + b/x^3]) + (7*Sqrt[a + b/x^3]*x^2)/(6*a^2)
+ (7*Sqrt[2 + Sqrt[3]]*b^(2/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3
) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b
^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)
/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(6*3^(1/4
)*a^2*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 +
Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi [A] time = 0.347441, antiderivative size = 269, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$

$$\frac{7x^2\sqrt{a+\frac{b}{x^3}}}{6a^2}+\frac{7\sqrt{2+\sqrt{3}}\,b^{2/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}\,F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{6\sqrt[4]{3}\,a^2\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{2x^2}{3a\sqrt{a+\frac{b}{x^3}}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b/x^3)^(3/2),x]
```


```
[Out] (-2*x^2)/(3*a*Sqrt[a + b/x^3]) + (7*Sqrt[a + b/x^3]*x^2)/(6*a^2)
+ (7*Sqrt[2 + Sqrt[3]]*b^(2/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3
) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b
^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)
/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(6*3^(1/4
)*a^2*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 +
Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi in Sympy [A] time = 17.6542, size = 226, normalized size = 0.84

$$-\frac{2x^2}{3a\sqrt{a+\frac{b}{x^3}}}+\frac{7\cdot 3^{\frac{3}{4}}b^{\frac{2}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{18a^2\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}+\frac{7x^2\sqrt{a+\frac{b}{x^3}}}{6a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b/x**3)**(3/2),x)
```

```
[Out] -2*x**2/(3*a*sqrt(a + b/x**3)) + 7*3**(3/4)*b**(2/3)*sqrt((a**(2/
3) - a**(1/3)*b**(1/3)/x + b**(2/3)/x**2)/(a**(1/3)*(1 + sqrt(3))
 + b**(1/3)/x)**2)*sqrt(sqrt(3) + 2)*(a**(1/3) + b**(1/3)/x)*elli
ptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)/x)/(a**(1/3)*(1
+ sqrt(3)) + b**(1/3)/x)), -7 - 4*sqrt(3))/(18*a**2*sqrt(a**(1/3)
*(a**(1/3) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2
)*sqrt(a + b/x**3)) + 7*x**2*sqrt(a + b/x**3)/(6*a**2)
```

Mathematica [C] time = 0.48721, size = 175, normalized size = 0.65

$$\frac{3\sqrt[3]{-b}\left(3ax^3+7b\right)+7i3^{3/4}\sqrt[3]{a}bx\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}}{\sqrt[3]{a}x}-1\right)}\sqrt{\frac{\frac{(-b)^{2/3}}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+x^2}{x^2}}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}}{\sqrt[3]{a}x}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)}{18a^2\sqrt[3]{-b}x\sqrt{a+\frac{b}{x^3}}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x/(a + b/x^3)^(3/2),x]
```

```
[Out] (3*(-b)^(1/3)*(7*b + 3*a*x^3) + (7*I)*3^(3/4)*a^(1/3)*b*Sqrt[(-1)
^(5/6)*(-1 + (-b)^(1/3)/(a^(1/3)*x))]*x*Sqrt[((-b)^(2/3)/a^(2/3)
+ ((-b)^(1/3)*x)/a^(1/3) + x^2)/x^2]*EllipticF[ArcSin[Sqrt[-(-1)^
(5/6) - (I*(-b)^(1/3))/(a^(1/3)*x)]/3^(1/4)], (-1)^(1/3)])/(18*a^
2*(-b)^(1/3)*Sqrt[a + b/x^3]*x)
```

Maple [B] time = 0.022, size = 2052, normalized size = 7.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+b/x^3)^(3/2),x)
```

```
[Out] 1/6/((a*x^3+b)/x^3)^(3/2)/x^5*(a*x^3+b)/a^3/(-a^2*b)^(1/3)*(14*I*
(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((
I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*
x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b
)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(
```

```
I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3
^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/
2)*(x*(a*x^3+b))^(1/2)*x^2*a^2*b-28*I*(-a^2*b)^(1/3)*(-(I*3^(1/2)
-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-
a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(
1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*
3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)
*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I
*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3
+b))^(1/2)*x*a*b+14*I*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/
2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a
*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I
*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x
+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-
1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3
^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3+b))^(1/2)*b-14*
(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((
I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*
x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b
)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(
I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3
^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(x*(a
*x^3+b))^(1/2)*x^2*a^2*b+28*(-a^2*b)^(1/3)*(-(I*3^(1/2)-3)*x*a/(I
*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/
3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/
2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)
/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^
(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1
)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(x*(a*x^3+b))^(1/2)*x*a*b-1
4*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)
^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(
I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1
/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1
/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)
-3))^(1/2))*(x*(a*x^3+b))^(1/2)*b+3*I*(-a^2*b)^(1/3)*(a*x^4+b*x)^
(1/2)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*
a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3
)))^(1/2)*3^(1/2)*(x*(a*x^3+b))^(1/2)*a+4*I*(-a^2*b)^(1/3)*(1/a^2
*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)
^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^
(1/2)*x*a*b-9*(-a^2*b)^(1/3)*(a*x^4+b*x)^(1/2)*(1/a^2*x*(-a*x+(-a
^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3
^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(x*(a*x^3+b))^
(1/2)*a-12*(-a^2*b)^(1/3)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/
2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)
-2*a*x-(-a^2*b)^(1/3)))^(1/2)*x*a*b)/(I*3^(1/2)-3)/(1/a^2*x*(-a*x
+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*
(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\left(a + \frac{b}{x^3}\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x^3)^(3/2),x, algorithm="maxima")

[Out] integrate(x/(a + b/x^3)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^4}{(ax^3 + b)\sqrt{\frac{ax^3+b}{x^3}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x^3)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^4/((a*x^3 + b)*sqrt((a*x^3 + b)/x^3)), x)
```

Sympy [A] time = 3.67218, size = 42, normalized size = 0.16

$$-\frac{x^{2}\Gamma\left(-\frac{2}{3}\right){}_{2}F_{1}\left(\begin{matrix}-\frac{2}{3},\frac{3}{2}\\ \frac{1}{3}\end{matrix}\middle|\frac{be^{i\pi}}{ax^{3}}\right)}{3a^{\frac{3}{2}}\Gamma\left(\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b/x**3)**(3/2),x)
```

```
[Out] -x**2*gamma(-2/3)*hyper((-2/3, 3/2), (1/3,), b*exp_polar(I*pi)/(a
*x**3))/(3*a**(3/2)*gamma(1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\left(a+\frac{b}{x^{3}}\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x^3)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x/(a + b/x^3)^(3/2), x)
```

3.2045 $\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{3/2} x^2}\, dx$

Optimal. Leaf size=248

$$-\frac{2\sqrt{2+\sqrt{3}}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{3\sqrt[4]{3}a\sqrt[3]{b}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{2}{3ax\sqrt{a+\frac{b}{x^3}}}$$

```
[Out] -2/(3*a*Sqrt[a + b/x^3]*x) - (2*Sqrt[2 + Sqrt[3]]*(a^(1/3) + b^(1
/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + S
qrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a
^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*
Sqrt[3]])/(3*3^(1/4)*a*b^(1/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(
1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi [A] time = 0.281943, antiderivative size = 248, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{2\sqrt{2+\sqrt{3}}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{3\sqrt[4]{3}a\sqrt[3]{b}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{2}{3ax\sqrt{a+\frac{b}{x^3}}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^3)^(3/2)*x^2),x]
```

```
[Out] -2/(3*a*Sqrt[a + b/x^3]*x) - (2*Sqrt[2 + Sqrt[3]]*(a^(1/3) + b^(1
/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + S
qrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a
^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*
Sqrt[3]])/(3*3^(1/4)*a*b^(1/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(
1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi in Sympy [A] time = 10.7027, size = 204, normalized size = 0.82

$$-\frac{2}{3ax\sqrt{a+\frac{b}{x^3}}}-\frac{2\cdot 3^{\frac{3}{4}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{9a\sqrt[3]{b}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**3)**(3/2)/x**2,x)
```

```
[Out] -2/(3*a*x*sqrt(a + b/x**3)) - 2*3**(3/4)*sqrt((a**(2/3) - a**(1/3
)*b**(1/3)/x + b**(2/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/
x)**2)*sqrt(sqrt(3) + 2)*(a**(1/3) + b**(1/3)/x)*elliptic_f(asin(
(-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) +
 b**(1/3)/x)), -7 - 4*sqrt(3))/(9*a*b**(1/3)*sqrt(a**(1/3)*(a**(1
/3) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(
a + b/x**3))
```

Mathematica [C] time = 0.345824, size = 164, normalized size = 0.66

$$\frac{-6\sqrt[3]{-b}-2i3^{3/4}\sqrt[3]{a}x\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}}{\sqrt[3]{a}x}-1\right)}\sqrt{\frac{\frac{(-b)^{2/3}}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+x^2}{x^2}}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}}{\sqrt[3]{a}x}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)}{9a\sqrt[3]{-b}x\sqrt{a+\frac{b}{x^3}}}$$

Warning: Unable to verify antiderivative.

```
[In]   Integrate[1/((a + b/x^3)^(3/2)*x^2),x]
```

```
[Out] (-6*(-b)^(1/3) - (2*I)*3^(3/4)*a^(1/3)*Sqrt[(-1)^(5/6)*(-1 + (-b)
^(1/3)/(a^(1/3)*x))]*x*Sqrt[((-b)^(2/3)/a^(2/3) + ((-b)^(1/3)*x)/
a^(1/3) + x^2)/x^2]*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(
1/3))/(a^(1/3)*x)]/3^(1/4)], (-1)^(1/3)])/(9*a*(-b)^(1/3)*Sqrt[a
+ b/x^3]*x)
```

Maple [B] time = 0.016, size = 1822, normalized size = 7.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/(a+b/x^3)^(3/2)/x^2,x)
```

```
[Out] -2/3/((a*x^3+b)/x^3)^(3/2)/x^5*(a*x^3+b)/a^2/(-a^2*b)^(1/3)*(2*I*
3^(1/2)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^
(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)
+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x
-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Ellip
ticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/
2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2
))*(x*(a*x^3+b))^(1/2)*x^2*a^2-4*I*(-a^2*b)^(1/3)*3^(1/2)*(-(I*3^
(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/
2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2
*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)
)/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/
2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+
3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(x*(a*x^3+b)
)^(1/2)*x*a+2*I*(-a^2*b)^(2/3)*3^(1/2)*(-(I*3^(1/2)-3)*x*a/(I*3^(
1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2
*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(
(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a
*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2
)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I
*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(x*(a*x^3+b))^(1/2)-2*(-(I*3^(1
/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)
*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b
)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/
(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)
-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)
*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(x*(a*x^3+b))^
(1/2)*x^2*a^2+4*(-a^2*b)^(1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/
(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a
^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/
```

```
2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2
*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a
*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)
+1)/(I*3^(1/2)-3))^(1/2))*(x*(a*x^3+b))^(1/2)*x*a-2*(-a^2*b)^(2/3
)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*
((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-
a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2
*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((
-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I
*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(x*
(a*x^3+b))^(1/2)+I*(-a^2*b)^(1/3)*3^(1/2)*(1/a^2*x*(-a*x+(-a^2*b)
^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2
)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*x*a-3*x*a*(-a^2*b)^
(1/3)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*
a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3
)))^(1/2))/(I*3^(1/2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2
)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-
2*a*x-(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^(3/2)*x^2),x, algorithm="maxima")
```

```
[Out] integrate(1/((a + b/x^3)^(3/2)*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x}{(ax^3+b)\sqrt{\frac{ax^3+b}{x^3}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^(3/2)*x^2),x, algorithm="fricas")
```

```
[Out] integral(x/((a*x^3 + b)*sqrt((a*x^3 + b)/x^3)), x)
```

Sympy [A] time = 5.03995, size = 37, normalized size = 0.15

$$-\frac{\Gamma\left(\frac{1}{3}\right) {}_2F_1\left(\begin{matrix}\frac{1}{3}, \frac{3}{2} \\ \frac{4}{3}\end{matrix}\middle| \frac{be^{i\pi}}{ax^3}\right)}{3a^{\frac{3}{2}}x\,\Gamma\left(\frac{4}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**3)**(3/2)/x**2,x)
```

```
[Out] -gamma(1/3)*hyper((1/3, 3/2), (4/3,), b*exp_polar(I*pi)/(a*x**3))
/(3*a**(3/2)*x*gamma(4/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a + \frac{b}{x^3}\right)^{\frac{3}{2}} x^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^(3/2)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/((a + b/x^3)^(3/2)*x^2), x)
```

3.2046 $\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{3/2} x^5}\,dx$

Optimal. Leaf size=245

$$\frac{2}{3bx\sqrt{a+\frac{b}{x^3}}}-\frac{4\sqrt{2+\sqrt{3}}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{3\sqrt[4]{3}b^{4/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}$$

```
[Out] 2/(3*b*Sqrt[a + b/x^3]*x) - (4*Sqrt[2 + Sqrt[3]]*(a^(1/3) + b^(1/
3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sq
rt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^
(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*S
qrt[3]])/(3*3^(1/4)*b^(4/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3
) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi [A] time = 0.276321, antiderivative size = 245, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{2}{3bx\sqrt{a+\frac{b}{x^3}}}-\frac{4\sqrt{2+\sqrt{3}}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{3\sqrt[4]{3}b^{4/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^3)^(3/2)*x^5),x]
```

```
[Out] 2/(3*b*Sqrt[a + b/x^3]*x) - (4*Sqrt[2 + Sqrt[3]]*(a^(1/3) + b^(1/
3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sq
rt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^
(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*S
qrt[3]])/(3*3^(1/4)*b^(4/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3
) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi in Sympy [A] time = 12.2133, size = 201, normalized size = 0.82

$$\frac{2}{3bx\sqrt{a+\frac{b}{x^3}}}-\frac{4\cdot 3^{\frac{3}{4}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{9b^{\frac{4}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**3)**(3/2)/x**5,x)
```

```
[Out] 2/(3*b*x*sqrt(a + b/x**3)) - 4*3**(3/4)*sqrt((a**(2/3) - a**(1/3)
*b**(1/3)/x + b**(2/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x
)**2)*sqrt(sqrt(3) + 2)*(a**(1/3) + b**(1/3)/x)*elliptic_f(asin((
-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) +
b**(1/3)/x)), -7 - 4*sqrt(3))/(9*b**(4/3)*sqrt(a**(1/3)*(a**(1/3)
 + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(a +
 b/x**3))
```

Mathematica [C] time = 0.351871, size = 161, normalized size = 0.66

$$-\frac{6\sqrt[3]{-b}-4i3^{3/4}\sqrt[3]{a}x\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}}{\sqrt[3]{a}x}-1\right)}\sqrt{\frac{\frac{(-b)^{2/3}}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+x^2}{x^2}}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}}{\sqrt[3]{a}x}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)|\sqrt[3]{-1}\right)}{9(-b)^{4/3}x\sqrt{a+\frac{b}{x^3}}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/((a + b/x^3)^(3/2)*x^5),x]
```

```
[Out] -(6*(-b)^(1/3) - (4*I)*3^(3/4)*a^(1/3)*Sqrt[(-1)^(5/6)*(-1 + (-b)
^(1/3)/(a^(1/3)*x))]*x*Sqrt[((-b)^(2/3)/a^(2/3) + ((-b)^(1/3)*x)/
a^(1/3) + x^2)/x^2]*EllipticF[ArcSin[Sqrt[-(-1)^(5/6) - (I*(-b)^(
1/3))/(a^(1/3)*x)]/3^(1/4)], (-1)^(1/3)])/(9*(-b)^(4/3)*Sqrt[a +
b/x^3]*x)
```

Maple [B] time = 0.025, size = 1825, normalized size = 7.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^3)^(3/2)/x^5,x)
```

```
[Out] -2/3/((a*x^3+b)/x^3)^(3/2)/x^5*(a*x^3+b)/(-a^2*b)^(1/3)/a/b*(4*I*
(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((
I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*
x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b
)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(
I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3
^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/
2)*(x*(a*x^3+b))^(1/2)*x^2*a^2-8*I*(-a^2*b)^(1/3)*(-(I*3^(1/2)-3)
*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2
*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3
)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(
1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*
a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^
(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3+b)
)^(1/2)*x*a+4*I*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/
(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a
^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/
2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2
*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a
*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)
+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3+b))^(1/2)-4*(-(I*3^(1
/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)
*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b
)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/
(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)
-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)
*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(x*(a*x^3+b))^
(1/2)*x^2*a^2+8*(-a^2*b)^(1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/
(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a
^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/
```

```
2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2
*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a
*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)
+1)/(I*3^(1/2)-3))^(1/2))*(x*(a*x^3+b))^(1/2)*x*a-4*(-a^2*b)^(2/3
)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*
((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-
a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2
*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((
-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I
*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(x*
(a*x^3+b))^(1/2)-I*(-a^2*b)^(1/3)*3^(1/2)*(1/a^2*x*(-a*x+(-a^2*b)
^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2
)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*x*a+3*x*a*(-a^2*b)^
(1/3)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*
a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3
)))^(1/2))/(I*3^(1/2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2
)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-
2*a*x-(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}} x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^(3/2)*x^5),x, algorithm="maxima")
```

```
[Out] integrate(1/((a + b/x^3)^(3/2)*x^5), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(ax^5+bx^2)\sqrt{\frac{ax^3+b}{x^3}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^(3/2)*x^5),x, algorithm="fricas")
```

```
[Out] integral(1/((a*x^5 + b*x^2)*sqrt((a*x^3 + b)/x^3)), x)
```

Sympy [A] time = 8.56006, size = 39, normalized size = 0.16

$$-\frac{\Gamma\left(\frac{4}{3}\right) {}_{2}F_{1}\left(\begin{matrix}\frac{4}{3}, \frac{3}{2} \\ \frac{7}{3}\end{matrix}\middle| \frac{be^{i\pi}}{ax^3}\right)}{3a^{\frac{3}{2}}x^4\,\Gamma\left(\frac{7}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**3)**(3/2)/x**5,x)
```

```
[Out] -gamma(4/3)*hyper((4/3, 3/2), (7/3,), b*exp_polar(I*pi)/(a*x**3))
/(3*a**(3/2)*x**4*gamma(7/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a + \frac{b}{x^3}\right)^{\frac{3}{2}} x^5} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^(3/2)*x^5),x, algorithm="giac")
```

```
[Out] integrate(1/((a + b/x^3)^(3/2)*x^5), x)
```

3.2047 $\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{3/2} x^8}\,dx$

Optimal. Leaf size=267

$$\frac{32\sqrt{2+\sqrt{3}}\,a\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}\,F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{15\sqrt[4]{3}\,b^{7/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}} - \frac{16\sqrt{a+\frac{b}{x^3}}}{15b^2x} + \frac{2}{3bx^4\sqrt{a+\frac{b}{x^3}}}$$

```
[Out] 2/(3*b*Sqrt[a + b/x^3]*x^4) - (16*Sqrt[a + b/x^3])/(15*b^2*x) + (
32*Sqrt[2 + Sqrt[3]]*a*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2
/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x
)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + S
qrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(15*3^(1/4)*b^(7/
3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqr
t[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi [A] time = 0.355649, antiderivative size = 267, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$

$$\frac{32\sqrt{2+\sqrt{3}}\,a\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}\,F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{15\sqrt[4]{3}\,b^{7/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}} - \frac{16\sqrt{a+\frac{b}{x^3}}}{15b^2x} + \frac{2}{3bx^4\sqrt{a+\frac{b}{x^3}}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^3)^(3/2)*x^8),x]
```


```
[Out] 2/(3*b*Sqrt[a + b/x^3]*x^4) - (16*Sqrt[a + b/x^3])/(15*b^2*x) + (
32*Sqrt[2 + Sqrt[3]]*a*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2
/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x
)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + S
qrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(15*3^(1/4)*b^(7/
3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqr
t[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi in Sympy [A] time = 18.0657, size = 223, normalized size = 0.84

$$\frac{32\cdot 3^{\frac{3}{4}}a\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{45b^{\frac{7}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}} + \frac{2}{3bx^4\sqrt{a+\frac{b}{x^3}}} - \frac{16\sqrt{a+\frac{b}{x^3}}}{15b^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate(1/(a+b/x**3)**(3/2)/x**8,x)
```

```
[Out] 32*3**(3/4)*a*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**(2/3)/x**
2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(sqrt(3) + 2)*(a
**(1/3) + b**(1/3)/x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) +
 b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*sqrt(
3))/(45*b**(7/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(1/3)*
(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) + 2/(3*b*x**4*s
qrt(a + b/x**3)) - 16*sqrt(a + b/x**3)/(15*b**2*x)
```

Mathematica [C] time = 0.401144, size = 173, normalized size = 0.65

$$\frac{-6\sqrt[3]{-b}\left(8ax^3+3b\right)+32i3^{3/4}a^{4/3}x^4\sqrt{(-1)^{5/6}\left(\frac{\sqrt[3]{-b}}{\sqrt[3]{a}x}-1\right)}\sqrt{\frac{\frac{(-b)^{2/3}}{a^{2/3}}+\frac{\sqrt[3]{-b}x}{\sqrt[3]{a}}+x^2}{x^2}}F\left(\sin^{-1}\left(\frac{\sqrt{-\frac{i\sqrt[3]{-b}}{\sqrt[3]{a}x}-(-1)^{5/6}}}{\sqrt[4]{3}}\right)\middle|\sqrt[3]{-1}\right)}{45(-b)^{7/3}x^4\sqrt{a+\frac{b}{x^3}}}$$

Warning: Unable to verify antiderivative.

```
[In]   Integrate[1/((a + b/x^3)^(3/2)*x^8),x]
```

```
[Out] (-6*(-b)^(1/3)*(3*b + 8*a*x^3) + (32*I)*3^(3/4)*a^(4/3)*Sqrt[(-1)
^(5/6)*(-1 + (-b)^(1/3)/(a^(1/3)*x))]*x^4*Sqrt[((-b)^(2/3)/a^(2/3
) + ((-b)^(1/3)*x)/a^(1/3) + x^2)/x^2]*EllipticF[ArcSin[Sqrt[-(-1
)^(5/6) - (I*(-b)^(1/3))/(a^(1/3)*x)]/3^(1/4)], (-1)^(1/3)])/(45*
(-b)^(7/3)*Sqrt[a + b/x^3]*x^4)
```

Maple [B] time = 0.028, size = 2056, normalized size = 7.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/(a+b/x^3)^(3/2)/x^8,x)
```

```
[Out] 2/15/((a*x^3+b)/x^3)^(3/2)/x^8*(a*x^3+b)/(-a^2*b)^(1/3)/b^2*(32*I
*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(
(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a
*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*
b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-
(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*
3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1
```

```
/2)*(x*(a*x^3+b))^(1/2)*x^5*a^2-64*I*(-a^2*b)^(1/3)*(-(I*3^(1/2)-
3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a
^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1
/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3
^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*
x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*
3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3+
b))^(1/2)*x^4*a+32*I*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2
)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*
x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*
3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+
(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1
)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^
(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^3-32
*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(
(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a
*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*
b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-
(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*
3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(x*(
a*x^3+b))^(1/2)*x^5*a^2+64*(-a^2*b)^(1/3)*(-(I*3^(1/2)-3)*x*a/(I*
3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3
)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2
)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/
(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(
1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)
/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(x*(a*x^3+b))^(1/2)*x^4*a-32
*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^
(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I
*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/
3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/
2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/
3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-
3))^(1/2))*(x*(a*x^3+b))^(1/2)*x^3-5*I*(-a^2*b)^(1/3)*(1/a^2*x*(-
a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3
))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)
*x^4*a+15*(-a^2*b)^(1/3)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2
)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-
2*a*x-(-a^2*b)^(1/3)))^(1/2)*x^4*a-3*I*(-a^2*b)^(1/3)*(1/a^2*x*(-
a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3
))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(a*x^4+
b*x)^(1/2)*3^(1/2)*(x*(a*x^3+b))^(1/2)+9*(-a^2*b)^(1/3)*(1/a^2*x*
(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1
/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(a*x^
4+b*x)^(1/2)*(x*(a*x^3+b))^(1/2))/(I*3^(1/2)-3)/(1/a^2*x*(-a*x+(-
a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*
3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}} x^8}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^(3/2)*x^8),x, algorithm="maxima")
```

```
[Out] integrate(1/((a + b/x^3)^(3/2)*x^8), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(ax^8+bx^5)\sqrt{\frac{ax^3+b}{x^3}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^(3/2)*x^8),x, algorithm="fricas")
```

```
[Out] integral(1/((a*x^8 + b*x^5)*sqrt((a*x^3 + b)/x^3)), x)
```

Sympy [A] time = 15.1985, size = 39, normalized size = 0.15

$$-\frac{\Gamma\left(\frac{7}{3}\right) {}_2F_1\left(\begin{matrix}\frac{3}{2},\frac{7}{3}\\ \frac{10}{3}\end{matrix}\middle|\frac{be^{i\pi}}{ax^3}\right)}{3a^{\frac{3}{2}}x^7\Gamma\left(\frac{10}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**3)**(3/2)/x**8,x)
```

```
[Out] -gamma(7/3)*hyper((3/2, 7/3), (10/3,), b*exp_polar(I*pi)/(a*x**3)
)/(3*a**(3/2)*x**7*gamma(10/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^(3/2)*x^8),x, algorithm="giac")
```

```
[Out] integrate(1/((a + b/x^3)^(3/2)*x^8), x)
```

3.2048 $\int \frac{x^6}{\left(a+\frac{b}{x^3}\right)^{3/2}}\,dx$

Optimal. Leaf size=587

$$-\frac{935b^{7/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{168\sqrt{2}\sqrt[4]{3}a^{11/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{935\sqrt{2-\sqrt{3}}b^{7/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{224\,3^{3/4}a^{11/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{935b^{7/3}\sqrt{a+\frac{b}{x^3}}}{336a^4\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}+\frac{935b^2x\sqrt{a+\frac{b}{x^3}}}{336a^4}-\frac{187bx^4\sqrt{a+\frac{b}{x^3}}}{168a^3}+\frac{17x^7\sqrt{a+\frac{b}{x^3}}}{21a^2}-\frac{2x^7}{3a\sqrt{a+\frac{b}{x^3}}}$$

```
[Out] (-935*b^(7/3)*Sqrt[a + b/x^3])/(336*a^4*((1 + Sqrt[3])*a^(1/3) +
b^(1/3)/x)) + (935*b^2*Sqrt[a + b/x^3]*x)/(336*a^4) - (187*b*Sqrt
[a + b/x^3]*x^4)/(168*a^3) - (2*x^7)/(3*a*Sqrt[a + b/x^3]) + (17*
Sqrt[a + b/x^3]*x^7)/(21*a^2) + (935*Sqrt[2 - Sqrt[3]]*b^(7/3)*(a
^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3
))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticE[ArcSin[((1
 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)
/x)], -7 - 4*Sqrt[3]])/(224*3^(3/4)*a^(11/3)*Sqrt[a + b/x^3]*Sqrt
[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)
/x)^2]) - (935*b^(7/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2
/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x
)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + S
qrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(168*Sqrt[2]*3^(1
/4)*a^(11/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))
/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi [A] time = 1.05605, antiderivative size = 587, normalized size of antiderivative = 1., number of

steps used = 8, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.4$

$$-\frac{935b^{7/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{168\sqrt{2}\sqrt[4]{3}a^{11/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{935\sqrt{2-\sqrt{3}}b^{7/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{224\ 3^{3/4}a^{11/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{935b^{7/3}\sqrt{a+\frac{b}{x^3}}}{336a^4\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}+\frac{935b^2x\sqrt{a+\frac{b}{x^3}}}{336a^4}-\frac{187bx^4\sqrt{a+\frac{b}{x^3}}}{168a^3}+\frac{17x^7\sqrt{a+\frac{b}{x^3}}}{21a^2}-\frac{2x^7}{3a\sqrt{a+\frac{b}{x^3}}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^6/(a + b/x^3)^(3/2),x]
```

```
[Out] (-935*b^(7/3)*Sqrt[a + b/x^3])/(336*a^4*((1 + Sqrt[3])*a^(1/3) +
b^(1/3)/x)) + (935*b^2*Sqrt[a + b/x^3]*x)/(336*a^4) - (187*b*Sqrt
[a + b/x^3]*x^4)/(168*a^3) - (2*x^7)/(3*a*Sqrt[a + b/x^3]) + (17*
Sqrt[a + b/x^3]*x^7)/(21*a^2) + (935*Sqrt[2 - Sqrt[3]]*b^(7/3)*(a
^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3
))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticE[ArcSin[((1
 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)
/x)], -7 - 4*Sqrt[3]])/(224*3^(3/4)*a^(11/3)*Sqrt[a + b/x^3]*Sqrt
[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)
/x)^2]) - (935*b^(7/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2
/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x
)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + S
qrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(168*Sqrt[2]*3^(1
/4)*a^(11/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))
/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi in Sympy [A] time = 69.0947, size = 498, normalized size = 0.85

$$-\frac{2x^7}{3a\sqrt{a+\frac{b}{x^3}}}+\frac{17x^7\sqrt{a+\frac{b}{x^3}}}{21a^2}-\frac{187bx^4\sqrt{a+\frac{b}{x^3}}}{168a^3}-\frac{935b^{\frac{7}{3}}\sqrt{a+\frac{b}{x^3}}}{336a^4\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)}+\frac{935b^2x\sqrt{a+\frac{b}{x^3}}}{336a^4}$$
$$+\frac{935\sqrt[4]{3}b^{\frac{7}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{672a^{\frac{11}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}$$
$$-\frac{935\sqrt{2}\cdot3^{\frac{3}{4}}b^{\frac{7}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{1008a^{\frac{11}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**6/(a+b/x**3)**(3/2),x)
```

```
[Out] -2*x**7/(3*a*sqrt(a + b/x**3)) + 17*x**7*sqrt(a + b/x**3)/(21*a**
2) - 187*b*x**4*sqrt(a + b/x**3)/(168*a**3) - 935*b**(7/3)*sqrt(a
 + b/x**3)/(336*a**4*(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)) + 935
*b**2*x*sqrt(a + b/x**3)/(336*a**4) + 935*3**(1/4)*b**(7/3)*sqrt(
(a**(2/3) - a**(1/3)*b**(1/3)/x + b**(2/3)/x**2)/(a**(1/3)*(1 + s
qrt(3)) + b**(1/3)/x)**2)*sqrt(-sqrt(3) + 2)*(a**(1/3) + b**(1/3)
/x)*elliptic_e(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)/x)/(a**(
1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*sqrt(3))/(672*a**(11/3)
*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) +
b**(1/3)/x)**2)*sqrt(a + b/x**3)) - 935*sqrt(2)*3**(3/4)*b**(7/3)
*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**(2/3)/x**2)/(a**(1/3)*
(1 + sqrt(3)) + b**(1/3)/x)**2)*(a**(1/3) + b**(1/3)/x)*elliptic_
f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)/x)/(a**(1/3)*(1 + sqr
t(3)) + b**(1/3)/x)), -7 - 4*sqrt(3))/(1008*a**(11/3)*sqrt(a**(1/
3)*(a**(1/3) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)*
*2)*sqrt(a + b/x**3))
```

Mathematica [C] time = 1.84847, size = 390, normalized size = 0.66

$$\frac{\left(ax^3+b\right)\left(935\left(-a^{2/3}b^{7/3}x^2+\sqrt[3]{a}b^{8/3}x+ab^2x^3\right)+48a^2x^6\left(ax^3+b\right)+\frac{935(-1)^{2/3}b^{7/3}\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)^2\sqrt{\frac{\left(1+\sqrt[3]{-1}\right)\sqrt[3]{a}x\left(\sqrt[3]{b}-\sqrt[3]{-1}\sqrt[3]{a}x\right)}{\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)^2}}\cdots}{\cdots}\right)}{336a^4x^5\left(a\cdots\right.}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^6/(a + b/x^3)^(3/2),x]
```

```
[Out] ((b + a*x^3)*(-224*a*b^2*x^3 - 150*a*b*x^3*(b + a*x^3) + 48*a^2*x
^6*(b + a*x^3) + 935*(a^(1/3)*b^(8/3)*x - a^(2/3)*b^(7/3)*x^2 + a
```

```
*b^2*x^3) + (935*(-1)^(2/3)*b^(7/3)*(b^(1/3) + a^(1/3)*x)^2*Sqrt[
((1 + (-1)^(1/3))*a^(1/3)*x*(b^(1/3) - (-1)^(1/3)*a^(1/3)*x))/(b^
(1/3) + a^(1/3)*x)^2]*Sqrt[(b^(1/3) + (-1)^(2/3)*a^(1/3)*x)/(b^(1
/3) + a^(1/3)*x)]*((-3 - I*Sqrt[3])*EllipticE[ArcSin[Sqrt[((3 + I
*Sqrt[3])*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]/Sqrt[2]], (-I + Sqrt[
3])/(I + Sqrt[3])] + (1 + I*Sqrt[3])*EllipticF[ArcSin[Sqrt[((3 +
I*Sqrt[3])*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]/Sqrt[2]], (-I + Sqrt
[3])/(I + Sqrt[3])]))/(2*(-1 + (-1)^(2/3)))))/(336*a^4*(a + b/x^3
)^(3/2)*x^5)
```

Maple [B] time = 0.055, size = 3182, normalized size = 5.4

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^6/(a+b/x^3)^(3/2),x)
```

```
[Out] -1/168/((a*x^3+b)/x^3)^(3/2)/x^5*(a*x^3+b)/a^5*(112*I*(1/a^2*x*(-
a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3
))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)
*x^3*a^2*b^2-24*I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2
*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(
-a^2*b)^(1/3)))^(1/2)*(a*x^4+b*x)^(1/2)*3^(1/2)*(x*(a*x^3+b))^(1/
2)*x^5*a^3-935*I*(-a^2*b)^(2/3)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x*b^2
-1870*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1
)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(
-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Ellipti
cF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)
,((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))
*(-a^2*b)^(1/3)*(x*(a*x^3+b))^(1/2)*x^2*a*b^2+2805*(-(I*3^(1/2)-3
)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^
2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/
3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^
(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x
*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3
^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(1/3)*(x*(
a*x^3+b))^(1/2)*x^2*a*b^2+935*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)
/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-
a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1
/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^
2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-
a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2
)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3+b))^(1/2)*a*b^3+72*(
1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a
^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/
2)*(a*x^4+b*x)^(1/2)*(x*(a*x^3+b))^(1/2)*x^5*a^3+3740*(-(I*3^(1/2
)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(
-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^
(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I
*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3
)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(
I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(2/3)*(
x*(a*x^3+b))^(1/2)*x*b^2-5610*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(
-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^
2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2
)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*
b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*
x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+
1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(2/3)*(x*(a*x^3+b))^(1/2)*x*b^2
-935*I*(-a^2*b)^(1/3)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^2*a*b^2+1870*
I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*
((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-
a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2
*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((
-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I
*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a
^2*b)^(2/3)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x*b^2-935*I*3^(1/2)*(x*(a
*x^3+b))^(1/2)*x^3*a^2*b^2+1870*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)
```

```
/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-
a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1
/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^
2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-
a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2
)+1)/(I*3^(1/2)-3))^(1/2))*(x*(a*x^3+b))^(1/2)*a*b^3-2805*(-(I*3^
(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/
2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2
*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)
)/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/
2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+
3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(x*(a*x^3+b)
)^(1/2)*a*b^3-935*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2
*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3)
)/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)
^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))
^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)
^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1
/2)-3))^(1/2))*(-a^2*b)^(1/3)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^2*a*b
^2-225*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2
*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/
3)))^(1/2)*(a*x^4+b*x)^(1/2)*(x*(a*x^3+b))^(1/2)*x^2*a^2*b-336*(1
/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^
2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2
)*x^3*a^2*b^2+75*I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^
2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-
(-a^2*b)^(1/3)))^(1/2)*(a*x^4+b*x)^(1/2)*3^(1/2)*(x*(a*x^3+b))^(1
/2)*x^2*a^2*b+2805*(x*(a*x^3+b))^(1/2)*x^3*a^2*b^2+2805*(-a^2*b)^
(1/3)*(x*(a*x^3+b))^(1/2)*x^2*a*b^2+2805*(-a^2*b)^(2/3)*(x*(a*x^3
+b))^(1/2)*x*b^2)/(I*3^(1/2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I
*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)
^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(a + b/x^3)^(3/2),x, algorithm="maxima")

[Out] integrate(x^6/(a + b/x^3)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^9}{(ax^3+b)\sqrt{\frac{ax^3+b}{x^3}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(a + b/x^3)^(3/2),x, algorithm="fricas")

[Out] integral(x^9/((a*x^3 + b)*sqrt((a*x^3 + b)/x^3)), x)
```

Sympy [A] time = 6.00334, size = 46, normalized size = 0.08

$$-\frac{x^7\,\Gamma\left(-\frac{7}{3}\right)\,{}_2F_1\left(\begin{matrix}-\frac{7}{3},\frac{3}{2}\\-\frac{4}{3}\end{matrix}\middle|\frac{be^{i\pi}}{ax^3}\right)}{3a^{\frac{3}{2}}\,\Gamma\left(-\frac{4}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**6/(a+b/x**3)**(3/2),x)
```

```
[Out] -x**7*gamma(-7/3)*hyper((-7/3, 3/2), (-4/3,), b*exp_polar(I*pi)/(
a*x**3))/(3*a**(3/2)*gamma(-4/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^6}{\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^6/(a + b/x^3)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^6/(a + b/x^3)^(3/2), x)
```

3.2049 $\int \frac{x^3}{\left(a+\frac{b}{x^3}\right)^{3/2}}\,dx$

Optimal. Leaf size=563

$$\frac{55b^{4/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{12\sqrt{2}\sqrt[4]{3}a^{8/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{55\sqrt{2-\sqrt{3}}b^{4/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{16\ 3^{3/4}a^{8/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{55b^{4/3}\sqrt{a+\frac{b}{x^3}}}{24a^3\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}-\frac{55bx\sqrt{a+\frac{b}{x^3}}}{24a^3}+\frac{11x^4\sqrt{a+\frac{b}{x^3}}}{12a^2}-\frac{2x^4}{3a\sqrt{a+\frac{b}{x^3}}}$$

```
[Out] (55*b^(4/3)*Sqrt[a + b/x^3])/(24*a^3*((1 + Sqrt[3])*a^(1/3) + b^(
1/3)/x)) - (55*b*Sqrt[a + b/x^3]*x)/(24*a^3) - (2*x^4)/(3*a*Sqrt[
a + b/x^3]) + (11*Sqrt[a + b/x^3]*x^4)/(12*a^2) - (55*Sqrt[2 - Sq
rt[3]]*b^(4/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2
- (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*Ell
ipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*
a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(16*3^(3/4)*a^(8/3)*Sqrt[
a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^
(1/3) + b^(1/3)/x)^2]) + (55*b^(4/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(
a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/
3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1
/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(12
*Sqrt[2]*3^(1/4)*a^(8/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) +
 b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi [A] time = 0.943052, antiderivative size = 563, normalized size of antiderivative = 1., number

of steps used = 7, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$\frac{55b^{4/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{12\sqrt{2}\sqrt[4]{3}a^{8/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}$$
$$-\frac{55\sqrt{2-\sqrt{3}}b^{4/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{16\ 3^{3/4}a^{8/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}$$
$$+\frac{55b^{4/3}\sqrt{a+\frac{b}{x^3}}}{24a^3\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}-\frac{55bx\sqrt{a+\frac{b}{x^3}}}{24a^3}+\frac{11x^4\sqrt{a+\frac{b}{x^3}}}{12a^2}-\frac{2x^4}{3a\sqrt{a+\frac{b}{x^3}}}$$

Antiderivative was successfully verified.

```
[In]   Int[x^3/(a + b/x^3)^(3/2),x]
```

```
[Out] (55*b^(4/3)*Sqrt[a + b/x^3])/(24*a^3*((1 + Sqrt[3])*a^(1/3) + b^(
1/3)/x)) - (55*b*Sqrt[a + b/x^3]*x)/(24*a^3) - (2*x^4)/(3*a*Sqrt[
a + b/x^3]) + (11*Sqrt[a + b/x^3]*x^4)/(12*a^2) - (55*Sqrt[2 - Sq
rt[3]]*b^(4/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2
- (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*Ell
ipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*
a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(16*3^(3/4)*a^(8/3)*Sqrt[
a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^
(1/3) + b^(1/3)/x)^2]) + (55*b^(4/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(
a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/
3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1
/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(12
*Sqrt[2]*3^(1/4)*a^(8/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) +
 b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi in Sympy [A] time = 57.3059, size = 474, normalized size = 0.84

$$-\frac{2x^4}{3a\sqrt{a+\frac{b}{x^3}}}+\frac{11x^4\sqrt{a+\frac{b}{x^3}}}{12a^2}+\frac{55b^{\frac{4}{3}}\sqrt{a+\frac{b}{x^3}}}{24a^3\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)}-\frac{55bx\sqrt{a+\frac{b}{x^3}}}{24a^3}$$
$$-\frac{55\sqrt[4]{3}b^{\frac{4}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{48a^{\frac{8}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}$$
$$+\frac{55\sqrt{2}\cdot 3^{\frac{3}{4}}b^{\frac{4}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{72a^{\frac{8}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(a+b/x**3)**(3/2),x)
```

```
[Out] -2*x**4/(3*a*sqrt(a + b/x**3)) + 11*x**4*sqrt(a + b/x**3)/(12*a**
2) + 55*b**(4/3)*sqrt(a + b/x**3)/(24*a**3*(a**(1/3)*(1 + sqrt(3)
) + b**(1/3)/x)) - 55*b*x*sqrt(a + b/x**3)/(24*a**3) - 55*3**(1/4
)*b**(4/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**(2/3)/x**2)/
(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(-sqrt(3) + 2)*(a**
(1/3) + b**(1/3)/x)*elliptic_e(asin((-a**(1/3)*(-1 + sqrt(3)) + b
**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*sqrt(3)
)/(48*a**(8/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(1/3)*(1
 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) + 55*sqrt(2)*3**(
3/4)*b**(4/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**(2/3)/x**
2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*(a**(1/3) + b**(1/3)
/x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)/x)/(a**(
1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*sqrt(3))/(72*a**(8/3)*s
qrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b*
*(1/3)/x)**2)*sqrt(a + b/x**3))
```

Mathematica [C] time = 1.76578, size = 370, normalized size = 0.66

$$\frac{(ax^3+b)\left(-55\left(-a^{2/3}b^{4/3}x^2+\sqrt[3]{a}b^{5/3}x+abx^3\right)-\frac{55(-1)^{2/3}b^{4/3}\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)^2\sqrt{\frac{\left(1+\sqrt[3]{-1}\right)\sqrt[3]{a}x\left(\sqrt[3]{b}-\sqrt[3]{-1}\sqrt[3]{a}x\right)}{\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)^2}}\sqrt{\frac{(-1)^{2/3}\sqrt[3]{a}x+\sqrt[3]{b}}{\sqrt[3]{a}x+\sqrt[3]{b}}}\left(1+i\cdots\right.}{2\left((-1)^{2/3}-1\cdots\right.}\right.}{24a^3x^5\left(a+\frac{b}{x^3}\right)^{3/2}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[x^3/(a + b/x^3)^(3/2),x]
```

```
[Out] ((b + a*x^3)*(16*a*b*x^3 + 6*a*x^3*(b + a*x^3) - 55*(a^(1/3)*b^(5
/3)*x - a^(2/3)*b^(4/3)*x^2 + a*b*x^3) - (55*(-1)^(2/3)*b^(4/3)*(
b^(1/3) + a^(1/3)*x)^2*Sqrt[((1 + (-1)^(1/3))*a^(1/3)*x*(b^(1/3)
- (-1)^(1/3)*a^(1/3)*x))/(b^(1/3) + a^(1/3)*x)^2]*Sqrt[(b^(1/3) +
 (-1)^(2/3)*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]*((-3 - I*Sqrt[3])*E
llipticE[ArcSin[Sqrt[((3 + I*Sqrt[3])*a^(1/3)*x)/(b^(1/3) + a^(1/
3)*x)]/Sqrt[2]], (-I + Sqrt[3])/(I + Sqrt[3])] + (1 + I*Sqrt[3])*
EllipticF[ArcSin[Sqrt[((3 + I*Sqrt[3])*a^(1/3)*x)/(b^(1/3) + a^(1
/3)*x)]/Sqrt[2]], (-I + Sqrt[3])/(I + Sqrt[3])]))/(2*(-1 + (-1)^(
2/3)))))/(24*a^3*(a + b/x^3)^(3/2)*x^5)
```

Maple [B] time = 0.025, size = 2936, normalized size = 5.2

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(a+b/x^3)^(3/2),x)
```

```
[Out] 1/12/((a*x^3+b)/x^3)^(3/2)/x^5*(a*x^3+b)/a^4*(110*I*(-a^2*b)^(2/3
)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*
((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-
a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2
*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((
-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I
```

```
*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(
1/2)*(x*(a*x^3+b))^(1/2)*x*b+8*I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(
I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b
)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*x^3*a^2*b-110*(-a^2*
b)^(1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))
^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2
)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*
x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Elli
pticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/
2))*(x*(a*x^3+b))^(1/2)*x^2*a*b+165*(-a^2*b)^(1/3)*(-(I*3^(1/2)-3
)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^
2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/
3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^
(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x
*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3
^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(x*(a*x^3+b))^(1/2)
*x^2*a*b-55*I*(-a^2*b)^(1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-
a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2
*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)
*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b
)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x
+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1
)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^2*a*b+220*(
-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1
/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3
^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)
-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)
*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)
))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3)
)^(1/2))*(x*(a*x^3+b))^(1/2)*x*b-330*(-a^2*b)^(2/3)*(-(I*3^(1/2)-
3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a
^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1
/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3
^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*
x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*
3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(x*(a*x^3+b))^(1/2
)*x*b+55*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)
))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1
/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*
a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*El
lipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^
(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(
1/2))*3^(1/2)*(x*(a*x^3+b))^(1/2)*a*b^2-55*I*(-a^2*b)^(2/3)*3^(1/
2)*(x*(a*x^3+b))^(1/2)*x*b+3*I*(a*x^4+b*x)^(1/2)*(1/a^2*x*(-a*x+(
-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I
*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*(x*(
a*x^3+b))^(1/2)*x^2*a^2-55*I*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^3*a^2*
b+110*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1
)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(
-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Ellipti
cF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)
,((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))
*(x*(a*x^3+b))^(1/2)*a*b^2-165*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/
(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a
^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/
2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2
*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a
*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)
+1)/(I*3^(1/2)-3))^(1/2))*(x*(a*x^3+b))^(1/2)*a*b^2-55*I*(-a^2*b)
^(1/3)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^2*a*b-9*(a*x^4+b*x)^(1/2)*(1
/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^
2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2
)*(x*(a*x^3+b))^(1/2)*x^2*a^2-24*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(
I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b
)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*x^3*a^2*b+165*(x*(a*x^3+b))^
(1/2)*x^3*a^2*b+165*(-a^2*b)^(1/3)*(x*(a*x^3+b))^(1/2)*x^2*a*b+16
5*(-a^2*b)^(2/3)*(x*(a*x^3+b))^(1/2)*x*b)/(I*3^(1/2)-3)/(1/a^2*x*
(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1
/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{\left(a + \frac{b}{x^3}\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(a + b/x^3)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^3/(a + b/x^3)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^6}{(ax^3 + b)\sqrt{\frac{ax^3+b}{x^3}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(a + b/x^3)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^6/((a*x^3 + b)*sqrt((a*x^3 + b)/x^3)), x)
```

Sympy [A] time = 3.63922, size = 46, normalized size = 0.08

$$-\frac{x^4 \Gamma\left(-\frac{4}{3}\right) {}_2F_1\left(\begin{matrix} -\frac{4}{3}, \frac{3}{2} \\ -\frac{1}{3} \end{matrix}\middle| \frac{be^{i\pi}}{ax^3}\right)}{3a^{\frac{3}{2}} \Gamma\left(-\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(a+b/x**3)**(3/2),x)
```

```
[Out] -x**4*gamma(-4/3)*hyper((-4/3, 3/2), (-1/3,), b*exp_polar(I*pi)/(
a*x**3))/(3*a**(3/2)*gamma(-1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{\left(a + \frac{b}{x^3}\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(a + b/x^3)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^3/(a + b/x^3)^(3/2), x)
```

3.2050 $\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{3/2}}\,dx$

Optimal. Leaf size=539

$$-\frac{5\sqrt{2}\sqrt[3]{b}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{3\sqrt[4]{3}a^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}$$
$$+\frac{5\sqrt{2-\sqrt{3}}\sqrt[3]{b}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{2\,3^{3/4}a^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}$$
$$+\frac{5x\sqrt{a+\frac{b}{x^3}}}{3a^2}-\frac{5\sqrt[3]{b}\sqrt{a+\frac{b}{x^3}}}{3a^2\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}-\frac{2x}{3a\sqrt{a+\frac{b}{x^3}}}$$

```
[Out] (-5*b^(1/3)*Sqrt[a + b/x^3])/(3*a^2*((1 + Sqrt[3])*a^(1/3) + b^(1
/3)/x)) - (2*x)/(3*a*Sqrt[a + b/x^3]) + (5*Sqrt[a + b/x^3]*x)/(3*
a^2) + (5*Sqrt[2 - Sqrt[3]]*b^(1/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a
^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3
) + b^(1/3)/x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/
3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(2*3
^(3/4)*a^(5/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x
))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]) - (5*Sqrt[2]*b^(1/3)*(
a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/
3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((
1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3
)/x)], -7 - 4*Sqrt[3]])/(3*3^(1/4)*a^(5/3)*Sqrt[a + b/x^3]*Sqrt[(
a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x
)^2])
```

Rubi [A] time = 0.770146, antiderivative size = 539, normalized size of antiderivative = 1., number

of steps used = 6, number of rules used = 6, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.546$

$$-\frac{5\sqrt{2}\sqrt[3]{b}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{3\sqrt[4]{3}a^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}$$
$$+\frac{5\sqrt{2-\sqrt{3}}\sqrt[3]{b}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{2\ 3^{3/4}a^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}$$
$$+\frac{5x\sqrt{a+\frac{b}{x^3}}}{3a^2}-\frac{5\sqrt[3]{b}\sqrt{a+\frac{b}{x^3}}}{3a^2\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}-\frac{2x}{3a\sqrt{a+\frac{b}{x^3}}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^3)^(-3/2),x]
```

```
[Out] (-5*b^(1/3)*Sqrt[a + b/x^3])/(3*a^2*((1 + Sqrt[3])*a^(1/3) + b^(1
/3)/x)) - (2*x)/(3*a*Sqrt[a + b/x^3]) + (5*Sqrt[a + b/x^3]*x)/(3*
a^2) + (5*Sqrt[2 - Sqrt[3]]*b^(1/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a
^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3
) + b^(1/3)/x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/
3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(2*3
^(3/4)*a^(5/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x
))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]) - (5*Sqrt[2]*b^(1/3)*(
a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/
3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((
1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3
)/x)], -7 - 4*Sqrt[3]])/(3*3^(1/4)*a^(5/3)*Sqrt[a + b/x^3]*Sqrt[(
a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x
)^2])
```

Rubi in Sympy [A] time = 45.3773, size = 450, normalized size = 0.83

$$-\frac{2x}{3a\sqrt{a+\frac{b}{x^3}}}-\frac{5\sqrt[3]{b}\sqrt{a+\frac{b}{x^3}}}{3a^2\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)}+\frac{5x\sqrt{a+\frac{b}{x^3}}}{3a^2}$$
$$+\frac{5\sqrt[4]{3}\sqrt[3]{b}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{6a^{\frac{5}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}$$
$$-\frac{5\sqrt{2}\cdot 3^{\frac{3}{4}}\sqrt[3]{b}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{9a^{\frac{5}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**3)**(3/2),x)
```

```
[Out] -2*x/(3*a*sqrt(a + b/x**3)) - 5*b**(1/3)*sqrt(a + b/x**3)/(3*a**2
*(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)) + 5*x*sqrt(a + b/x**3)/(3
*a**2) + 5*3**(1/4)*b**(1/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x
 + b**(2/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(
-sqrt(3) + 2)*(a**(1/3) + b**(1/3)/x)*elliptic_e(asin((-a**(1/3)*
(-1 + sqrt(3)) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x
)), -7 - 4*sqrt(3))/(6*a**(5/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3
)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3))
- 5*sqrt(2)*3**(3/4)*b**(1/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/
x + b**(2/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*(a**
(1/3) + b**(1/3)/x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b
**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*sqrt(3)
)/(9*a**(5/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(1/3)*(1
+ sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3))
```

Mathematica [C] time = 1.47933, size = 353, normalized size = 0.65

$$\frac{(ax^3+b)\left(5x\left(\frac{b^{2/3}}{a^{2/3}}-\frac{\sqrt[3]{b}x}{\sqrt[3]{a}}+x^2\right)+\frac{5(-1)^{2/3}\sqrt[3]{b}\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)^2\sqrt{\frac{\left(1+\sqrt[3]{-1}\right)\sqrt[3]{a}x\left(\sqrt[3]{b}-\sqrt[3]{-1}\sqrt[3]{a}x\right)}{\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)^2}}\sqrt{\frac{(-1)^{2/3}\sqrt[3]{a}x+\sqrt[3]{b}}{\sqrt[3]{a}x+\sqrt[3]{b}}}\left(\left(1+i\sqrt{3}\right)F\left(\sin^{-1}\left(\frac{\sqrt{\frac{\left(3+i\sqrt{3}\right)\sqrt[3]{a}x}{\cdots}}}{\sqrt{2}}\right)\cdots\right)\cdots\right)}{2\left((-1)^{2/3}-1\right)a}\cdots\right)}{3ax^5\left(a+\frac{b}{x^3}\right)^{3/2}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[(a + b/x^3)^(-3/2),x]
```

```
[Out] ((b + a*x^3)*(-2*x^3 + 5*x*(b^(2/3)/a^(2/3) - (b^(1/3)*x)/a^(1/3)
 + x^2) + (5*(-1)^(2/3)*b^(1/3)*(b^(1/3) + a^(1/3)*x)^2*Sqrt[((1
+ (-1)^(1/3))*a^(1/3)*x*(b^(1/3) - (-1)^(1/3)*a^(1/3)*x))/(b^(1/3
) + a^(1/3)*x)^2]*Sqrt[(b^(1/3) + (-1)^(2/3)*a^(1/3)*x)/(b^(1/3)
+ a^(1/3)*x)]*((-3 - I*Sqrt[3])*EllipticE[ArcSin[Sqrt[((3 + I*Sqr
t[3])*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]/Sqrt[2]], (-I + Sqrt[3])/
(I + Sqrt[3])] + (1 + I*Sqrt[3])*EllipticF[ArcSin[Sqrt[((3 + I*Sq
rt[3])*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]/Sqrt[2]], (-I + Sqrt[3])
/(I + Sqrt[3])]))/(2*(-1 + (-1)^(2/3))*a)))/(3*a*(a + b/x^3)^(3/2
)*x^5)
```

Maple [B] time = 0.021, size = 2700, normalized size = 5.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^3)^(3/2),x)
```

```
[Out] -2/3/((a*x^3+b)/x^3)^(3/2)/x^5*(a*x^3+b)/a^3*(5*I*(-(I*3^(1/2)-3)
*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2
*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3
)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(
1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*
a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^
(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3+b)
```

```
)^(1/2)*a*b+I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^
(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2
*b)^(1/3)))^(1/2)*3^(1/2)*x^3*a^2-10*(-a^2*b)^(1/3)*((I*3^(1/2)*(
-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^
(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I
*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3
)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(
I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-(I*3^(1/2)-3)*
x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(x*(a*x^3+b))^(1/2
)*x^2*a+15*(-a^2*b)^(1/3)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*
b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*
(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)
^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+
(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)
/(I*3^(1/2)-3))^(1/2))*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-
a^2*b)^(1/3)))^(1/2)*(x*(a*x^3+b))^(1/2)*x^2*a-5*I*(-a^2*b)^(2/3)
*3^(1/2)*(x*(a*x^3+b))^(1/2)*x+20*(-a^2*b)^(2/3)*((I*3^(1/2)*(-a^
2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/
3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^
(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x
*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3
^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-(I*3^(1/2)-3)*x*a
/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(x*(a*x^3+b))^(1/2)*x
-30*(-a^2*b)^(2/3)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3
))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b
)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3))
)^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b
)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(
1/2)-3))^(1/2))*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^
(1/3)))^(1/2)*(x*(a*x^3+b))^(1/2)*x-5*I*(-a^2*b)^(1/3)*(-(I*3^(1/
2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*
(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)
^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(
I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-
3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*
(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x
^3+b))^(1/2)*x^2*a+10*I*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(
1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2
*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(
(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a
*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2
)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I
*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3+b))^(1/2)*x-5
*I*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^3*a^2+10*((I*3^(1/2)*(-a^2*b)^(1
/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1
)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3
^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-
1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-(I*3^(1/2)-3)*x*a/(I*3^(
1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(x*(a*x^3+b))^(1/2)*a*b-15*(
(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a
*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*
b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-
(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*
3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-(I
*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(x*(a*
x^3+b))^(1/2)*a*b-5*I*(-a^2*b)^(1/3)*3^(1/2)*(x*(a*x^3+b))^(1/2)*
x^2*a-3*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+
2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1
/3)))^(1/2)*x^3*a^2+15*(x*(a*x^3+b))^(1/2)*x^3*a^2+15*(-a^2*b)^(1
/3)*(x*(a*x^3+b))^(1/2)*x^2*a+15*(-a^2*b)^(2/3)*(x*(a*x^3+b))^(1/
2)*x)/(I*3^(1/2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a
^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x
-(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^3)^(-3/2),x, algorithm="maxima")
```

```
[Out] integrate((a + b/x^3)^(-3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^3}{(ax^3+b)\sqrt{\frac{ax^3+b}{x^3}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^3)^(-3/2),x, algorithm="fricas")
```

```
[Out] integral(x^3/((a*x^3 + b)*sqrt((a*x^3 + b)/x^3)), x)
```

Sympy [A] time = 3.5815, size = 41, normalized size = 0.08

$$-\frac{x\Gamma\left(-\frac{1}{3}\right){}_2F_1\left(\begin{matrix}-\frac{1}{3},\frac{3}{2}\\ \frac{2}{3}\end{matrix}\middle|\frac{be^{i\pi}}{ax^3}\right)}{3a^{\frac{3}{2}}\Gamma\left(\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**3)**(3/2),x)
```

```
[Out] -x*gamma(-1/3)*hyper((-1/3, 3/2), (2/3,), b*exp_polar(I*pi)/(a*x*
*3))/(3*a**(3/2)*gamma(2/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^3)^(-3/2),x, algorithm="giac")
```

```
[Out] integrate((a + b/x^3)^(-3/2), x)
```

3.2051 $\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{3/2} x^3}\,dx$

Optimal. Leaf size=520

$$\frac{2\sqrt{2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}\,F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{3\sqrt[4]{3}a^{2/3}b^{2/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}} - \frac{\sqrt{2-\sqrt{3}}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}\,E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{3^{3/4}a^{2/3}b^{2/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}} + \frac{2\sqrt{a+\frac{b}{x^3}}}{3ab^{2/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)} - \frac{2}{3ax^2\sqrt{a+\frac{b}{x^3}}}$$

```
[Out] (2*Sqrt[a + b/x^3])/(3*a*b^(2/3)*((1 + Sqrt[3])*a^(1/3) + b^(1/3)
/x)) - 2/(3*a*Sqrt[a + b/x^3]*x^2) - (Sqrt[2 - Sqrt[3]]*(a^(1/3)
+ b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/(
(1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticE[ArcSin[((1 - Sqrt
[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -
7 - 4*Sqrt[3]])/(3^(3/4)*a^(2/3)*b^(2/3)*Sqrt[a + b/x^3]*Sqrt[(a^
(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^
2]) + (2*Sqrt[2]*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^
2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*E
llipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3]
)*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(3*3^(1/4)*a^(2/3)*b^(2
/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sq
rt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi [A] time = 0.661598, antiderivative size = 520, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$

$$\frac{2\sqrt{2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}\,F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{3\sqrt[4]{3}a^{2/3}b^{2/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}} - \frac{\sqrt{2-\sqrt{3}}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}\,E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{3^{3/4}a^{2/3}b^{2/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}} + \frac{2\sqrt{a+\frac{b}{x^3}}}{3ab^{2/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)} - \frac{2}{3ax^2\sqrt{a+\frac{b}{x^3}}}$$

Antiderivative was successfully verified.

```
[In]   Int[1/((a + b/x^3)^(3/2)*x^3),x]
```

```
[Out] (2*Sqrt[a + b/x^3])/(3*a*b^(2/3)*((1 + Sqrt[3])*a^(1/3) + b^(1/3)
/x)) - 2/(3*a*Sqrt[a + b/x^3]*x^2) - (Sqrt[2 - Sqrt[3]]*(a^(1/3)
+ b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/(
(1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticE[ArcSin[((1 - Sqrt
[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -
7 - 4*Sqrt[3]])/(3^(3/4)*a^(2/3)*b^(2/3)*Sqrt[a + b/x^3]*Sqrt[(a^
(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^
2]) + (2*Sqrt[2]*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^
2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*E
llipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3]
)*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(3*3^(1/4)*a^(2/3)*b^(2
/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sq
rt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi in Sympy [A] time = 36.4624, size = 430, normalized size = 0.83

$$-\frac{2}{3ax^2\sqrt{a+\frac{b}{x^3}}}+\frac{2\sqrt{a+\frac{b}{x^3}}}{3ab^{\frac{2}{3}}\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)}-\frac{\sqrt[4]{3}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{3a^{\frac{2}{3}}b^{\frac{2}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}+\frac{2\sqrt{2}\cdot 3^{\frac{3}{4}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{9a^{\frac{2}{3}}b^{\frac{2}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate(1/(a+b/x**3)**(3/2)/x**3,x)
```

```
[Out] -2/(3*a*x**2*sqrt(a + b/x**3)) + 2*sqrt(a + b/x**3)/(3*a*b**(2/3)
*(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)) - 3**(1/4)*sqrt((a**(2/3)
 - a**(1/3)*b**(1/3)/x + b**(2/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) +
 b**(1/3)/x)**2)*sqrt(-sqrt(3) + 2)*(a**(1/3) + b**(1/3)/x)*ellip
tic_e(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)/x)/(a**(1/3)*(1 +
 sqrt(3)) + b**(1/3)/x)), -7 - 4*sqrt(3))/(3*a**(2/3)*b**(2/3)*sq
rt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**
(1/3)/x)**2)*sqrt(a + b/x**3)) + 2*sqrt(2)*3**(3/4)*sqrt((a**(2/3
) - a**(1/3)*b**(1/3)/x + b**(2/3)/x**2)/(a**(1/3)*(1 + sqrt(3))
+ b**(1/3)/x)**2)*(a**(1/3) + b**(1/3)/x)*elliptic_f(asin((-a**(1
/3)*(-1 + sqrt(3)) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/
3)/x)), -7 - 4*sqrt(3))/(9*a**(2/3)*b**(2/3)*sqrt(a**(1/3)*(a**(1
/3) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(
a + b/x**3))
```

Mathematica [C] time = 1.44111, size = 352, normalized size = 0.68

$$\frac{2\left(ax^3+b\right)\left(x\left(-\frac{b^{2/3}}{a^{2/3}}+\frac{\sqrt[3]{b}x}{\sqrt[3]{a}}-x^2\right)-\frac{(-1)^{2/3}\sqrt[3]{b}\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)^2\sqrt{\frac{\left(1+\sqrt[3]{-1}\right)\sqrt[3]{a}x\left(\sqrt[3]{b}-\sqrt[3]{-1}\sqrt[3]{a}x\right)}{\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)^2}}\sqrt{\frac{(-1)^{2/3}\sqrt[3]{a}x+\sqrt[3]{b}}{\sqrt[3]{a}x+\sqrt[3]{b}}}\left(\left(1+i\sqrt{3}\right)F\left(\sin^{-1}\left(\sqrt{\frac{(3+i\ldots}{\sqrt[3]{a}\ldots}}\right.\right.\right.}{2\left((-1)^{2/3}-1\right)a}}{3bx^5\left(a+\frac{b}{x^3}\right)^{3/2}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/((a + b/x^3)^(3/2)*x^3),x]
```

```
[Out] (2*(b + a*x^3)*(x^3 + x*(-(b^(2/3)/a^(2/3)) + (b^(1/3)*x)/a^(1/3)
 - x^2) - ((-1)^(2/3)*b^(1/3)*(b^(1/3) + a^(1/3)*x)^2*Sqrt[((1 +
(-1)^(1/3))*a^(1/3)*x*(b^(1/3) - (-1)^(1/3)*a^(1/3)*x))/(b^(1/3)
+ a^(1/3)*x)^2]*Sqrt[(b^(1/3) + (-1)^(2/3)*a^(1/3)*x)/(b^(1/3) +
a^(1/3)*x)]*((-3 - I*Sqrt[3])*EllipticE[ArcSin[Sqrt[((3 + I*Sqrt[
3])*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]/Sqrt[2]], (-I + Sqrt[3])/(I
 + Sqrt[3])] + (1 + I*Sqrt[3])*EllipticF[ArcSin[Sqrt[((3 + I*Sqrt
[3])*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]/Sqrt[2]], (-I + Sqrt[3])/(
I + Sqrt[3])]))/(2*(-1 + (-1)^(2/3))*a)))/(3*b*(a + b/x^3)^(3/2)*
x^5)
```

Maple [B] time = 0.017, size = 2703, normalized size = 5.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^3)^(3/2)/x^3,x)
```

```
[Out] 2/3/((a*x^3+b)/x^3)^(3/2)/x^5*(a*x^3+b)/a^2*(-2*I*(-a^2*b)^(1/3)*
3^(1/2)*(x*(a*x^3+b))^(1/2)*x^2*a-2*I*(-a^2*b)^(1/3)*(-(I*3^(1/2)
-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-
a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(
1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*
3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)
*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I
*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3
+b))^(1/2)*x^2*a-4*(-a^2*b)^(1/3)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*
x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*
3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+
(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1
)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^
(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/
(-a*x+(-a^2*b)^(1/3)))^(1/2)*(x*(a*x^3+b))^(1/2)*x^2*a+6*(-a^2*b)
^(1/3)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2
)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*
x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Elli
pticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/
2))*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2
)*(x*(a*x^3+b))^(1/2)*x^2*a+2*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)
/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-
a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1
/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^
2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-
a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2
)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3+b))^(1/2)*a*b+8*(-a^
2*b)^(2/3)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^
(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-
```

```
2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*
EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3))
)^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))
^(1/2))*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^
(1/2)*(x*(a*x^3+b))^(1/2)*x-12*(-a^2*b)^(2/3)*((I*3^(1/2)*(-a^2*b
)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3))
)^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/
2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/
(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1
/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-(I*3^(1/2)-3)*x*a/(I
*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(x*(a*x^3+b))^(1/2)*x+I*
(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-
a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1
/2)*3^(1/2)*x^3*a^2-2*I*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^3*a^2-2*I*(
-a^2*b)^(2/3)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x+4*((I*3^(1/2)*(-a^2*b
)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3))
)^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/
2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/
(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1
/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-(I*3^(1/2)-3)*x*a/(I
*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(x*(a*x^3+b))^(1/2)*a*b-
6*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/
(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a
^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE
((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),(
(I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(
-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(x*
(a*x^3+b))^(1/2)*a*b+4*I*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^
(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+
2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*
((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-
a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/
2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(
I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3+b))^(1/2)*x+
6*(x*(a*x^3+b))^(1/2)*x^3*a^2-3*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I
*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)
^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*x^3*a^2+6*(-a^2*b)^(1/3)*(x*(
a*x^3+b))^(1/2)*x^2*a+6*(-a^2*b)^(2/3)*(x*(a*x^3+b))^(1/2)*x)/b/(
I*3^(1/2)-3)/(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(
1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*
b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^(3/2)*x^3),x, algorithm="maxima")
```

```
[Out] integrate(1/((a + b/x^3)^(3/2)*x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(ax^3+b)\sqrt{\frac{ax^3+b}{x^3}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^(3/2)*x^3),x, algorithm="fricas")
```

```
[Out] integral(1/((a*x^3 + b)*sqrt((a*x^3 + b)/x^3)), x)
```

Sympy [A] time = 6.031, size = 39, normalized size = 0.08

$$-\frac{\Gamma\left(\frac{2}{3}\right)\,{}_2F_1\left(\begin{matrix}\frac{2}{3},\frac{3}{2}\\ \frac{5}{3}\end{matrix}\middle|\frac{be^{i\pi}}{ax^3}\right)}{3a^{\frac{3}{2}}x^2\,\Gamma\left(\frac{5}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**3)**(3/2)/x**3,x)
```

```
[Out] -gamma(2/3)*hyper((2/3, 3/2), (5/3,), b*exp_polar(I*pi)/(a*x**3))
/(3*a**(3/2)*x**2*gamma(5/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^(3/2)*x^3),x, algorithm="giac")
```

```
[Out] integrate(1/((a + b/x^3)^(3/2)*x^3), x)
```

3.2052 $\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{3/2} x^6} \, dx$

Optimal. Leaf size=517

$$-\frac{8\sqrt{2}\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{3\sqrt[4]{3}b^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{4\sqrt{2-\sqrt{3}}\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{3^{3/4}b^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{8\sqrt{a+\frac{b}{x^3}}}{3b^{5/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}+\frac{2}{3bx^2\sqrt{a+\frac{b}{x^3}}}$$

```
[Out] (-8*Sqrt[a + b/x^3])/(3*b^(5/3)*((1 + Sqrt[3])*a^(1/3) + b^(1/3)/
x)) + 2/(3*b*Sqrt[a + b/x^3]*x^2) + (4*Sqrt[2 - Sqrt[3]]*a^(1/3)*
(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1
/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticE[ArcSin[(
(1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/
3)/x)], -7 - 4*Sqrt[3]])/(3^(3/4)*b^(5/3)*Sqrt[a + b/x^3]*Sqrt[(a
^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)
^2]) - (8*Sqrt[2]*a^(1/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b
^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3
)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1
+ Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(3*3^(1/4)*b^(
5/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + S
qrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi [A] time = 0.68406, antiderivative size = 517, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$

$$-\frac{8\sqrt{2}\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{3\sqrt[4]{3}b^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{4\sqrt{2-\sqrt{3}}\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{3^{3/4}b^{5/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{8\sqrt{a+\frac{b}{x^3}}}{3b^{5/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}+\frac{2}{3bx^2\sqrt{a+\frac{b}{x^3}}}$$

Antiderivative was successfully verified.

```
[In]   Int[1/((a + b/x^3)^(3/2)*x^6),x]
```

```
[Out] (-8*Sqrt[a + b/x^3])/(3*b^(5/3)*((1 + Sqrt[3])*a^(1/3) + b^(1/3)/
x)) + 2/(3*b*Sqrt[a + b/x^3]*x^2) + (4*Sqrt[2 - Sqrt[3]]*a^(1/3)*
(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1
/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticE[ArcSin[(
(1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/
3)/x)], -7 - 4*Sqrt[3]])/(3^(3/4)*b^(5/3)*Sqrt[a + b/x^3]*Sqrt[(a
^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)
^2]) - (8*Sqrt[2]*a^(1/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b
^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3
)/x)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1
+ Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(3*3^(1/4)*b^(
5/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + S
qrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi in Sympy [A] time = 36.2326, size = 430, normalized size = 0.83

$$\frac{4\sqrt[4]{3}\sqrt[3]{a}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^{2}}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^{2}}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{3b^{\frac{5}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^{2}}}\sqrt{a+\frac{b}{x^{3}}}} - \frac{8\sqrt{2}\cdot 3^{\frac{3}{4}}\sqrt[3]{a}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^{2}}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^{2}}}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{9b^{\frac{5}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^{2}}}\sqrt{a+\frac{b}{x^{3}}}} + \frac{2}{3bx^{2}\sqrt{a+\frac{b}{x^{3}}}} - \frac{8\sqrt{a+\frac{b}{x^{3}}}}{3b^{\frac{5}{3}}\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate(1/(a+b/x**3)**(3/2)/x**6,x)
```

```
[Out] 4*3**(1/4)*a**(1/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**(2/
3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(-sqrt(3)
+ 2)*(a**(1/3) + b**(1/3)/x)*elliptic_e(asin((-a**(1/3)*(-1 + sqr
t(3)) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 -
4*sqrt(3))/(3*b**(5/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**
(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) - 8*sqrt(
2)*3**(3/4)*a**(1/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**(2
/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*(a**(1/3) + b
**(1/3)/x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)/x
)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*sqrt(3))/(9*b**(
5/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)
) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) + 2/(3*b*x**2*sqrt(a + b/x*
*3)) - 8*sqrt(a + b/x**3)/(3*b**(5/3)*(a**(1/3)*(1 + sqrt(3)) + b
**(1/3)/x))
```

Mathematica [C] time = 1.70702, size = 362, normalized size = 0.7

$$\frac{2\left(ax^3+b\right)\left(4\left(-a^{2/3}\sqrt[3]{b}x^2+\sqrt[3]{a}b^{2/3}x+ax^3\right)-3\left(ax^3+b\right)+\frac{2(-1)^{2/3}\sqrt[3]{b}\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)^2\sqrt{\frac{\left(1+\sqrt[3]{-1}\right)\sqrt[3]{a}x\left(\sqrt[3]{b}-\sqrt[3]{-1}\sqrt[3]{a}x\right)}{\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)^2}}\sqrt{\frac{(-1)^{2/3}\sqrt[3]{a}x}{\sqrt[3]{a}x+\sqrt[3]{}}}}{}\right)}{3b^2x^5\left(a+\frac{b}{x^3}\right)^{3/2}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/((a + b/x^3)^(3/2)*x^6),x]
```

```
[Out] (2*(b + a*x^3)*(-(a*x^3) - 3*(b + a*x^3) + 4*(a^(1/3)*b^(2/3)*x -
 a^(2/3)*b^(1/3)*x^2 + a*x^3) + (2*(-1)^(2/3)*b^(1/3)*(b^(1/3) +
a^(1/3)*x)^2*Sqrt[((1 + (-1)^(1/3))*a^(1/3)*x*(b^(1/3) - (-1)^(1/
3)*a^(1/3)*x))/(b^(1/3) + a^(1/3)*x)^2]*Sqrt[(b^(1/3) + (-1)^(2/3
)*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]*((-3 - I*Sqrt[3])*EllipticE[A
rcSin[Sqrt[((3 + I*Sqrt[3])*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]/Sqr
t[2]], (-I + Sqrt[3])/(I + Sqrt[3])] + (1 + I*Sqrt[3])*EllipticF[
ArcSin[Sqrt[((3 + I*Sqrt[3])*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]/Sq
rt[2]], (-I + Sqrt[3])/(I + Sqrt[3])]))/(-1 + (-1)^(2/3))))/(3*b^
2*(a + b/x^3)^(3/2)*x^5)
```

Maple [B] time = 0.026, size = 2867, normalized size = 5.6

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^3)^(3/2)/x^6,x)
```

```
[Out] -2/3/((a*x^3+b)/x^3)^(3/2)/x^5*(a*x^3+b)/a*(4*I*(1/a^2*x*(-a*x+(-
a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*
3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*x^3*a
^2-8*I*(-a^2*b)^(1/3)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^2*a-16*(-a^2*
b)^(1/3)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1
/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*
a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*El
lipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^
(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(
1/2))*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2)*(x*(a*x^3+b))^(1/2)*x^2*a+24*(-a^2*b)^(1/3)*((I*3^(1/2)*(-a^2
*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3
)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(
1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*
a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^
(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-(I*3^(1/2)-3)*x*a/
(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(x*(a*x^3+b))^(1/2)*x^
2*a+8*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^
(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)
+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x
-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Ellip
ticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/
2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2
))*3^(1/2)*(x*(a*x^3+b))^(1/2)*a*b+32*(-a^2*b)^(2/3)*((I*3^(1/2)*
(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)
^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(
I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-
3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*
(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-(I*3^(1/2)-3)
*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(x*(a*x^3+b))^(1/
```

```
2)*x-48*(-a^2*b)^(2/3)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^
(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a
^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1
/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a
^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I
*3^(1/2)-3))^(1/2))*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2
*b)^(1/3)))^(1/2)*(x*(a*x^3+b))^(1/2)*x-8*I*(-a^2*b)^(1/3)*(-(I*3
^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1
/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^
2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3
))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1
/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)
+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*
(a*x^3+b))^(1/2)*x^2*a-8*I*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^3*a^2+3*
I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+
(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^
(1/2)*3^(1/2)*a*b+16*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1
/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2
*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3
)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2
*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3
^(1/2)-3))^(1/2))*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b
)^(1/3)))^(1/2)*(x*(a*x^3+b))^(1/2)*a*b-24*((I*3^(1/2)*(-a^2*b)^(
1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(
1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-
1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*
3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)
-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-(I*3^(1/2)-3)*x*a/(I*3^
(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*(x*(a*x^3+b))^(1/2)*a*b-8*I
*(-a^2*b)^(2/3)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x-12*(1/a^2*x*(-a*x+(
-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I
*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*x^3*a^2+24*(
x*(a*x^3+b))^(1/2)*x^3*a^2+24*(-a^2*b)^(1/3)*(x*(a*x^3+b))^(1/2)*
x^2*a+16*I*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x
+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)
^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-
a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(
1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-
a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(
I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3+b))^(1/2)*x+24*(-a^2*b)^(2
/3)*(x*(a*x^3+b))^(1/2)*x-9*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(
1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/
3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*a*b)/b^2/(I*3^(1/2)-3)/(1/a^2*x*(
-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/
3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a + \frac{b}{x^3}\right)^{\frac{3}{2}} x^6}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^(3/2)*x^6),x, algorithm="maxima")
```

```
[Out] integrate(1/((a + b/x^3)^(3/2)*x^6), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{(ax^6 + bx^3)\sqrt{\frac{ax^3+b}{x^3}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^(3/2)*x^6),x, algorithm="fricas")

[Out] integral(1/((a*x^6 + b*x^3)*sqrt((a*x^3 + b)/x^3)), x)
```

Sympy [A] time = 10.2149, size = 39, normalized size = 0.08

$$-\frac{\Gamma\left(\frac{5}{3}\right) {}_2F_1\left(\begin{matrix}\frac{3}{2}, \frac{5}{3}\\ \frac{8}{3}\end{matrix}\middle| \frac{be^{i\pi}}{ax^3}\right)}{3a^{\frac{3}{2}}x^5\Gamma\left(\frac{8}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**3)**(3/2)/x**6,x)

[Out] -gamma(5/3)*hyper((3/2, 5/3), (8/3,), b*exp_polar(I*pi)/(a*x**3))
/(3*a**(3/2)*x**5*gamma(8/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a + \frac{b}{x^3}\right)^{\frac{3}{2}} x^6}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^(3/2)*x^6),x, algorithm="giac")

[Out] integrate(1/((a + b/x^3)^(3/2)*x^6), x)
```

3.2053 $\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{3/2} x^9}\,dx$

Optimal. Leaf size=541

$$\frac{80\sqrt{2}a^{4/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{21\sqrt[4]{3}b^{8/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}$$
$$-\frac{40\sqrt{2-\sqrt{3}}a^{4/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{7\ 3^{3/4}b^{8/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}$$
$$+\frac{80a\sqrt{a+\frac{b}{x^3}}}{21b^{8/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}-\frac{20\sqrt{a+\frac{b}{x^3}}}{21b^2x^2}+\frac{2}{3bx^5\sqrt{a+\frac{b}{x^3}}}$$

```
[Out] (80*a*Sqrt[a + b/x^3])/(21*b^(8/3)*((1 + Sqrt[3])*a^(1/3) + b^(1/
3)/x)) + 2/(3*b*Sqrt[a + b/x^3]*x^5) - (20*Sqrt[a + b/x^3])/(21*b
^2*x^2) - (40*Sqrt[2 - Sqrt[3]]*a^(4/3)*(a^(1/3) + b^(1/3)/x)*Sqr
t[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^
(1/3) + b^(1/3)/x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b
^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/
(7*3^(3/4)*b^(8/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/
3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]) + (80*Sqrt[2]*a^(4
/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*
b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcS
in[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b
^(1/3)/x)], -7 - 4*Sqrt[3]])/(21*3^(1/4)*b^(8/3)*Sqrt[a + b/x^3]*
Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(
1/3)/x)^2])
```

Rubi [A] time = 0.805199, antiderivative size = 541, normalized size of antiderivative = 1., number

of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.4$

$$\frac{80\sqrt{2}a^{4/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{21\sqrt[4]{3}b^{8/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}$$
$$-\frac{40\sqrt{2-\sqrt{3}}a^{4/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{7\ 3^{3/4}b^{8/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}$$
$$+\frac{80a\sqrt{a+\frac{b}{x^3}}}{21b^{8/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}-\frac{20\sqrt{a+\frac{b}{x^3}}}{21b^2x^2}+\frac{2}{3bx^5\sqrt{a+\frac{b}{x^3}}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^3)^(3/2)*x^9),x]
```

```
[Out] (80*a*Sqrt[a + b/x^3])/(21*b^(8/3)*((1 + Sqrt[3])*a^(1/3) + b^(1/
3)/x)) + 2/(3*b*Sqrt[a + b/x^3]*x^5) - (20*Sqrt[a + b/x^3])/(21*b
^2*x^2) - (40*Sqrt[2 - Sqrt[3]]*a^(4/3)*(a^(1/3) + b^(1/3)/x)*Sqr
t[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^
(1/3) + b^(1/3)/x)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b
^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/
(7*3^(3/4)*b^(8/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/
3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]) + (80*Sqrt[2]*a^(4
/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*
b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcS
in[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b
^(1/3)/x)], -7 - 4*Sqrt[3]])/(21*3^(1/4)*b^(8/3)*Sqrt[a + b/x^3]*
Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(
1/3)/x)^2])
```

Rubi in Sympy [A] time = 47.0798, size = 452, normalized size = 0.84

$$-\frac{40\sqrt[4]{3}a^{\frac{4}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{21b^{\frac{8}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}$$
$$+\frac{80\sqrt{2}\cdot 3^{\frac{3}{4}}a^{\frac{4}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{63b^{\frac{8}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}$$
$$+\frac{80a\sqrt{a+\frac{b}{x^3}}}{21b^{\frac{8}{3}}\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)}+\frac{2}{3bx^5\sqrt{a+\frac{b}{x^3}}}-\frac{20\sqrt{a+\frac{b}{x^3}}}{21b^2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**3)**(3/2)/x**9,x)
```

```
[Out] -40*3**(1/4)*a**(4/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**(
2/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(-sqrt(3
) + 2)*(a**(1/3) + b**(1/3)/x)*elliptic_e(asin((-a**(1/3)*(-1 + s
qrt(3)) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7
- 4*sqrt(3))/(21*b**(8/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(
a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) + 80*s
qrt(2)*3**(3/4)*a**(4/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b
**(2/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*(a**(1/3)
 + b**(1/3)/x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/
3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*sqrt(3))/(63
*b**(8/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(1/3)*(1 + sq
rt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) + 80*a*sqrt(a + b/x**3
)/(21*b**(8/3)*(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)) + 2/(3*b*x*
*5*sqrt(a + b/x**3)) - 20*sqrt(a + b/x**3)/(21*b**2*x**2)
```

Mathematica [C] time = 1.8969, size = 380, normalized size = 0.7

$$\frac{2\left(ax^3+b\right)\left(-40a^{4/3}x\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)+7a^2x^3+33a\left(ax^3+b\right)-\frac{3b\left(ax^3+b\right)}{x^3}-\frac{20(-1)^{2/3}a\sqrt[3]{b}\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)^2\sqrt{\frac{\left(1+\sqrt[3]{-1}\right)\sqrt[3]{\cdots}}{\left(\sqrt[3]{\cdots}\right.}}\cdots}{\cdots}\right)}{21b^3x^5\left(a+\frac{b}{x^3}\right)^{3/2}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/((a + b/x^3)^(3/2)*x^9),x]
```

```
[Out] (2*(b + a*x^3)*(7*a^2*x^3 - 40*a^(4/3)*x*(b^(2/3) - a^(1/3)*b^(1/
3)*x + a^(2/3)*x^2) + 33*a*(b + a*x^3) - (3*b*(b + a*x^3))/x^3 -
(20*(-1)^(2/3)*a*b^(1/3)*(b^(1/3) + a^(1/3)*x)^2*Sqrt[((1 + (-1)^
(1/3))*a^(1/3)*x*(b^(1/3) - (-1)^(1/3)*a^(1/3)*x))/(b^(1/3) + a^(
1/3)*x)^2]*Sqrt[(b^(1/3) + (-1)^(2/3)*a^(1/3)*x)/(b^(1/3) + a^(1/
3)*x)]*((-3 - I*Sqrt[3])*EllipticE[ArcSin[Sqrt[((3 + I*Sqrt[3])*a
^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]/Sqrt[2]], (-I + Sqrt[3])/(I + Sq
rt[3])] + (1 + I*Sqrt[3])*EllipticF[ArcSin[Sqrt[((3 + I*Sqrt[3])*
a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]/Sqrt[2]], (-I + Sqrt[3])/(I + S
qrt[3])]))/(-1 + (-1)^(2/3))))/(21*b^3*(a + b/x^3)^(3/2)*x^5)
```

Maple [B] time = 0.029, size = 3307, normalized size = 6.1

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^3)^(3/2)/x^9,x)
```

```
[Out] 2/21/((a*x^3+b)/x^3)^(3/2)/x^9*(a*x^3+b)*(-80*I*(-a^2*b)^(2/3)*3^
(1/2)*(x*(a*x^3+b))^(1/2)*x^5-80*I*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^
7*a^2-160*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3))
)^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/
2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a
*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Ell
ipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(
```

```
1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1
/2))*(-a^2*b)^(1/3)*(x*(a*x^3+b))^(1/2)*x^6*a+240*(-(I*3^(1/2)-3)
*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2
*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3
)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(
1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*
a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^
(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(1/3)*(x*(a
*x^3+b))^(1/2)*x^6*a-3*I*(a*x^4+b*x)^(1/2)*(1/a^2*x*(-a*x+(-a^2*b
)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/
2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*(x*(a*x^3+
b))^(1/2)*b+320*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^
(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I
*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/
3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/
2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/
3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-
3))^(1/2))*(-a^2*b)^(2/3)*(x*(a*x^3+b))^(1/2)*x^5-480*(-(I*3^(1/2
)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(
-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^
(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I
*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3
)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(
I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(2/3)*(
x*(a*x^3+b))^(1/2)*x^5+160*I*(-a^2*b)^(2/3)*(-(I*3^(1/2)-3)*x*a/(
I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1
/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1
/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1
)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3
^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-
1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3+b))^(1/2
)*x^5-80*I*(-a^2*b)^(1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x
+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)
^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-
a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(
1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-
a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(
I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^6*a+36*I*(1/a^
2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b
)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3
^(1/2)*x^7*a^2+160*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*
b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))
/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^
(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^
(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^
(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/
2)-3))^(1/2))*(x*(a*x^3+b))^(1/2)*x^4*a*b-240*(-(I*3^(1/2)-3)*x*a
/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^
(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^
(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)
-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I
*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2
)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(x*(a*x^3+b))^(1/2)*x^4*
a*b-80*I*(-a^2*b)^(1/3)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^6*a-108*(1/
a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2
*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)
*x^7*a^2+240*(x*(a*x^3+b))^(1/2)*x^7*a^2+240*(-a^2*b)^(1/3)*(x*(a
*x^3+b))^(1/2)*x^6*a+80*I*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x
+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)
^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-
a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(
1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-
a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(
I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^4*a*b+29*I*(1/
a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2
*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)
*3^(1/2)*x^4*a*b+240*(-a^2*b)^(2/3)*(x*(a*x^3+b))^(1/2)*x^5-12*(1
/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^
2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2
)*(a*x^4+b*x)^(1/2)*(x*(a*x^3+b))^(1/2)*x^3*a-87*(1/a^2*x*(-a*x+(
-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I
*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*x^4*a*b+4*I*
(a*x^4+b*x)^(1/2)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2
*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(
```

```
-a^2*b)^(1/3)))^(1/2)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^3*a+9*(1/a^2*
x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^
(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*(a*
x^4+b*x)^(1/2)*(x*(a*x^3+b))^(1/2)*b)/b^3/(I*3^(1/2)-3)/(1/a^2*x*
(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1
/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}x^9}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^(3/2)*x^9),x, algorithm="maxima")
```

```
[Out] integrate(1/((a + b/x^3)^(3/2)*x^9), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{(ax^9+bx^6)\sqrt{\frac{ax^3+b}{x^3}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^(3/2)*x^9),x, algorithm="fricas")
```

```
[Out] integral(1/((a*x^9 + b*x^6)*sqrt((a*x^3 + b)/x^3)), x)
```

Sympy [A] time = 18.2164, size = 39, normalized size = 0.07

$$-\frac{\Gamma\left(\frac{8}{3}\right){}_2F_1\left(\begin{matrix}\frac{3}{2},\frac{8}{3}\\ \frac{11}{3}\end{matrix}\middle|\frac{be^{i\pi}}{ax^3}\right)}{3a^{\frac{3}{2}}x^8\,\Gamma\left(\frac{11}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**3)**(3/2)/x**9,x)
```

```
[Out] -gamma(8/3)*hyper((3/2, 8/3), (11/3,), b*exp_polar(I*pi)/(a*x**3)
)/(3*a**(3/2)*x**8*gamma(11/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}}x^9}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^(3/2)*x^9),x, algorithm="giac")
```

```
[Out] integrate(1/((a + b/x^3)^(3/2)*x^9), x)
```

3.2054 $\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{3/2}x^{12}}\,dx$

Optimal. Leaf size=565

$$-\frac{1280\sqrt{2}a^{7/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{273\sqrt[4]{3}b^{11/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{640\sqrt{2-\sqrt{3}}a^{7/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{91\,3^{3/4}b^{11/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{1280a^2\sqrt{a+\frac{b}{x^3}}}{273b^{11/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}+\frac{320a\sqrt{a+\frac{b}{x^3}}}{273b^3x^2}-\frac{32\sqrt{a+\frac{b}{x^3}}}{39b^2x^5}+\frac{2}{3bx^8\sqrt{a+\frac{b}{x^3}}}$$

```
[Out] (-1280*a^2*Sqrt[a + b/x^3])/(273*b^(11/3)*((1 + Sqrt[3])*a^(1/3)
+ b^(1/3)/x)) + 2/(3*b*Sqrt[a + b/x^3]*x^8) - (32*Sqrt[a + b/x^3]
)/(39*b^2*x^5) + (320*a*Sqrt[a + b/x^3])/(273*b^3*x^2) + (640*Sqr
t[2 - Sqrt[3]]*a^(7/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2
/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x
)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + S
qrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(91*3^(3/4)*b^(11
/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sq
rt[3])*a^(1/3) + b^(1/3)/x)^2]) - (1280*Sqrt[2]*a^(7/3)*(a^(1/3)
+ b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/(
(1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt
[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -
7 - 4*Sqrt[3]])/(273*3^(1/4)*b^(11/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/
3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi [A] time = 0.950395, antiderivative size = 565, normalized size of antiderivative = 1., number

of steps used = 7, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.4$

$$-\frac{1280\sqrt{2}a^{7/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}F\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{273\sqrt[4]{3}b^{11/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}+\frac{640\sqrt{2-\sqrt{3}}a^{7/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{2/3}}{x^2}}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}E\left(\sin^{-1}\left(\frac{\left(1-\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}{\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}}\right)|-7-4\sqrt{3}\right)}{91\ 3^{3/4}b^{11/3}\sqrt{a+\frac{b}{x^3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)^2}}}-\frac{1280a^2\sqrt{a+\frac{b}{x^3}}}{273b^{11/3}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}+\frac{320a\sqrt{a+\frac{b}{x^3}}}{273b^3x^2}-\frac{32\sqrt{a+\frac{b}{x^3}}}{39b^2x^5}+\frac{2}{3bx^8\sqrt{a+\frac{b}{x^3}}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^3)^(3/2)*x^12),x]
```

```
[Out] (-1280*a^2*Sqrt[a + b/x^3])/(273*b^(11/3)*((1 + Sqrt[3])*a^(1/3)
+ b^(1/3)/x)) + 2/(3*b*Sqrt[a + b/x^3]*x^8) - (32*Sqrt[a + b/x^3]
)/(39*b^2*x^5) + (320*a*Sqrt[a + b/x^3])/(273*b^3*x^2) + (640*Sqr
t[2 - Sqrt[3]]*a^(7/3)*(a^(1/3) + b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2
/3)/x^2 - (a^(1/3)*b^(1/3))/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x
)^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)/x)/((1 + S
qrt[3])*a^(1/3) + b^(1/3)/x)], -7 - 4*Sqrt[3]])/(91*3^(3/4)*b^(11
/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)/x))/((1 + Sq
rt[3])*a^(1/3) + b^(1/3)/x)^2]) - (1280*Sqrt[2]*a^(7/3)*(a^(1/3)
+ b^(1/3)/x)*Sqrt[(a^(2/3) + b^(2/3)/x^2 - (a^(1/3)*b^(1/3))/x)/(
(1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2]*EllipticF[ArcSin[((1 - Sqrt
[3])*a^(1/3) + b^(1/3)/x)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)], -
7 - 4*Sqrt[3]])/(273*3^(1/4)*b^(11/3)*Sqrt[a + b/x^3]*Sqrt[(a^(1/
3)*(a^(1/3) + b^(1/3)/x))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)/x)^2])
```

Rubi in Sympy [A] time = 57.6374, size = 476, normalized size = 0.84

$$\frac{640\sqrt[4]{3}a^{\frac{7}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{273b^{\frac{11}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}-\frac{1280\sqrt{2}\cdot 3^{\frac{3}{4}}a^{\frac{7}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\frac{\sqrt[3]{a}\sqrt[3]{b}}{x}+\frac{b^{\frac{2}{3}}}{x^2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}}\right)\middle|-7-4\sqrt{3}\right)}{819b^{\frac{11}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}}{x}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)^2}}\sqrt{a+\frac{b}{x^3}}}-\frac{1280a^2\sqrt{a+\frac{b}{x^3}}}{273b^{\frac{11}{3}}\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\frac{\sqrt[3]{b}}{x}\right)}+\frac{320a\sqrt{a+\frac{b}{x^3}}}{273b^3x^2}+\frac{2}{3bx^8\sqrt{a+\frac{b}{x^3}}}-\frac{32\sqrt{a+\frac{b}{x^3}}}{39b^2x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**3)**(3/2)/x**12,x)
```

```
[Out] 640*3**(1/4)*a**(7/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x + b**(
2/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(-sqrt(3
) + 2)*(a**(1/3) + b**(1/3)/x)*elliptic_e(asin((-a**(1/3)*(-1 + s
qrt(3)) + b**(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7
- 4*sqrt(3))/(273*b**(11/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)
/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) - 12
80*sqrt(2)*3**(3/4)*a**(7/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)/x
 + b**(2/3)/x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)**2)*(a**(
1/3) + b**(1/3)/x)*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b*
*(1/3)/x)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)), -7 - 4*sqrt(3))
/(819*b**(11/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)/x)/(a**(1/3)*(
1 + sqrt(3)) + b**(1/3)/x)**2)*sqrt(a + b/x**3)) - 1280*a**2*sqrt
(a + b/x**3)/(273*b**(11/3)*(a**(1/3)*(1 + sqrt(3)) + b**(1/3)/x)
) + 320*a*sqrt(a + b/x**3)/(273*b**3*x**2) + 2/(3*b*x**8*sqrt(a +
 b/x**3)) - 32*sqrt(a + b/x**3)/(39*b**2*x**5)
```

Mathematica [C] time = 1.92368, size = 400, normalized size = 0.71

$$\frac{2\left(ax^3+b\right)\left(640a^{7/3}x\left(a^{2/3}x^2-\sqrt[3]{a}\sqrt[3]{b}x+b^{2/3}\right)-91a^3x^3-549a^2\left(ax^3+b\right)+\frac{320(-1)^{2/3}a^2\sqrt[3]{b}\left(\sqrt[3]{a}x+\sqrt[3]{b}\right)^2\sqrt{\frac{\left(1+\sqrt[3]{-1}\right)\sqrt[3]{a}x\left(\sqrt[3]{b}-\cdots\right.}{\left(\sqrt[3]{a}x+\sqrt[3]{b}\cdots\right.}}\cdots}{\cdots}\right.}{273b^4x^5\left(\cdots\right.}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/((a + b/x^3)^(3/2)*x^12),x]
```

```
[Out] (2*(b + a*x^3)*(-91*a^3*x^3 + 640*a^(7/3)*x*(b^(2/3) - a^(1/3)*b^
(1/3)*x + a^(2/3)*x^2) - 549*a^2*(b + a*x^3) - (21*b^2*(b + a*x^3
))/x^6 + (69*a*b*(b + a*x^3))/x^3 + (320*(-1)^(2/3)*a^2*b^(1/3)*(
b^(1/3) + a^(1/3)*x)^2*Sqrt[((1 + (-1)^(1/3))*a^(1/3)*x*(b^(1/3)
- (-1)^(1/3)*a^(1/3)*x))/(b^(1/3) + a^(1/3)*x)^2]*Sqrt[(b^(1/3) +
 (-1)^(2/3)*a^(1/3)*x)/(b^(1/3) + a^(1/3)*x)]*((-3 - I*Sqrt[3])*E
llipticE[ArcSin[Sqrt[((3 + I*Sqrt[3])*a^(1/3)*x)/(b^(1/3) + a^(1/
3)*x)]/Sqrt[2]], (-I + Sqrt[3])/(I + Sqrt[3])] + (1 + I*Sqrt[3])*
EllipticF[ArcSin[Sqrt[((3 + I*Sqrt[3])*a^(1/3)*x)/(b^(1/3) + a^(1
/3)*x)]/Sqrt[2]], (-I + Sqrt[3])/(I + Sqrt[3])]))/(-1 + (-1)^(2/3
))))/(273*b^4*(a + b/x^3)^(3/2)*x^5)
```

Maple [B] time = 0.032, size = 3554, normalized size = 6.3

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^3)^(3/2)/x^12,x)
```

```
[Out] -2/273/((a*x^3+b)/x^3)^(3/2)/x^12*(a*x^3+b)*(-1280*I*(-a^2*b)^(1/
3)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^9*a^2+457*I*(1/a^2*x*(-a*x+(-a^2
*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(
1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*x^7*a^2*
b-1280*I*(-a^2*b)^(2/3)*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^8*a+3840*(-
```

```
a^2*b)^(2/3)*(x*(a*x^3+b))^(1/2)*x^8*a+3840*(-a^2*b)^(1/3)*(x*(a*
x^3+b))^(1/2)*x^9*a^2-1371*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1
/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3
)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*x^7*a^2*b-63*(a*x^4+b*x)^(1/2)*b^2
*(x*(a*x^3+b))^(1/2)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-
a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*
x-(-a^2*b)^(1/3)))^(1/2)+548*I*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*
3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^
(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*x^10*a^3-1280*I*3^(1/2
)*(x*(a*x^3+b))^(1/2)*x^10*a^3+207*a*(a*x^4+b*x)^(1/2)*x^3*b*(x*(
a*x^3+b))^(1/2)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b
)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a
^2*b)^(1/3)))^(1/2)+92*I*(a*x^4+b*x)^(1/2)*(1/a^2*x*(-a*x+(-a^2*b
)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/
2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(1/2)*(x*(a*x^3+
b))^(1/2)*x^6*a^2-276*a^2*(a*x^4+b*x)^(1/2)*x^6*(x*(a*x^3+b))^(1/
2)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x
+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))
^(1/2)-1644*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1
/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b
)^(1/3)))^(1/2)*x^10*a^3+3840*(x*(a*x^3+b))^(1/2)*x^10*a^3+21*I*(
a*x^4+b*x)^(1/2)*(1/a^2*x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*
b)^(1/3)+2*a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-
a^2*b)^(1/3)))^(1/2)*3^(1/2)*(x*(a*x^3+b))^(1/2)*b^2-1280*I*(-a^2
*b)^(1/3)*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3))
)^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/
2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a
*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Ell
ipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(
1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1
/2))*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^9*a^2+2560*I*(-a^2*b)^(2/3)*(-
(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*
3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+
(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^
(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*
3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(
1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)
*(x*(a*x^3+b))^(1/2)*x^8*a+1280*I*a^2*b*(-(I*3^(1/2)-3)*x*a/(I*3^
(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+
2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*
((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-
a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/
2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(
I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*(x*(a*x^3+b))^(1/2)*x^
7-2560*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(
1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+
1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-
(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Ellipt
icF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2
),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2)
)*(-a^2*b)^(1/3)*(x*(a*x^3+b))^(1/2)*x^9*a^2+3840*(-(I*3^(1/2)-3)
*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2
*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3
)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(
1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE((-(I*3^(1/2)-3)*x*
a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^
(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(1/3)*(x*(a
*x^3+b))^(1/2)*x^9*a^2+5120*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a
*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*
b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*
(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)
^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+
(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)
/(I*3^(1/2)-3))^(1/2))*(-a^2*b)^(2/3)*(x*(a*x^3+b))^(1/2)*x^8*a-7
680*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2
)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/
(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a
^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticE
((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),(
(I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*(
-a^2*b)^(2/3)*(x*(a*x^3+b))^(1/2)*x^8*a+2560*(-(I*3^(1/2)-3)*x*a/
(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(
1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/2)+1)/(-a*x+(-a^2*b)^(1/3)))^(
1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3))/(I*3^(1/2)-
```

```
1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*EllipticF((-(I*3^(1/2)-3)*x*a/(I*
3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2),((I*3^(1/2)+3)*(I*3^(1/2)
-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1/2))*a^2*b*(x*(a*x^3+b))^(1/2)
*x^7-3840*(-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3))
)^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))/(I*3^(1/
2)+1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*((I*3^(1/2)*(-a^2*b)^(1/3)-2*a
*x-(-a^2*b)^(1/3))/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(1/2)*Ell
ipticE((-(I*3^(1/2)-3)*x*a/(I*3^(1/2)-1)/(-a*x+(-a^2*b)^(1/3)))^(
1/2),((I*3^(1/2)+3)*(I*3^(1/2)-1)/(I*3^(1/2)+1)/(I*3^(1/2)-3))^(1
/2))*a^2*b*(x*(a*x^3+b))^(1/2)*x^7-69*I*(a*x^4+b*x)^(1/2)*(1/a^2*
x*(-a*x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^
(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)*3^(
1/2)*(x*(a*x^3+b))^(1/2)*x^3*a*b)/b^4/(I*3^(1/2)-3)/(1/a^2*x*(-a*
x+(-a^2*b)^(1/3))*(I*3^(1/2)*(-a^2*b)^(1/3)+2*a*x+(-a^2*b)^(1/3))
*(I*3^(1/2)*(-a^2*b)^(1/3)-2*a*x-(-a^2*b)^(1/3)))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}} x^{12}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^(3/2)*x^12),x, algorithm="maxima")
```

```
[Out] integrate(1/((a + b/x^3)^(3/2)*x^12), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{(ax^{12}+bx^9)\sqrt{\frac{ax^3+b}{x^3}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^(3/2)*x^12),x, algorithm="fricas")
```

```
[Out] integral(1/((a*x^12 + b*x^9)*sqrt((a*x^3 + b)/x^3)), x)
```

Sympy [A] time = 31.6769, size = 39, normalized size = 0.07

$$-\frac{\Gamma\left(\frac{11}{3}\right) {}_2F_1\left(\begin{matrix}\frac{3}{2}, \frac{11}{3} \\ \frac{14}{3}\end{matrix}\middle| \frac{be^{i\pi}}{ax^3}\right)}{3a^{\frac{3}{2}}x^{11}\,\Gamma\left(\frac{14}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**3)**(3/2)/x**12,x)
```

```
[Out] -gamma(11/3)*hyper((3/2, 11/3), (14/3,), b*exp_polar(I*pi)/(a*x**
3))/(3*a**(3/2)*x**11*gamma(14/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^3}\right)^{\frac{3}{2}} x^{12}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^3)^(3/2)*x^12),x, algorithm="giac")
```

```
[Out] integrate(1/((a + b/x^3)^(3/2)*x^12), x)
```

3.2055 $\int \frac{1}{a+\frac{b}{x^4}}\,dx$

Optimal. Leaf size=190

$$\frac{\sqrt[4]{b}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x+\sqrt{a}x^2+\sqrt{b}\right)}{4\sqrt{2}a^{5/4}}-\frac{\sqrt[4]{b}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x+\sqrt{a}x^2+\sqrt{b}\right)}{4\sqrt{2}a^{5/4}}+\frac{\sqrt[4]{b}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{a}x}{\sqrt[4]{b}}\right)}{2\sqrt{2}a^{5/4}}-\frac{\sqrt[4]{b}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{a}x}{\sqrt[4]{b}}+1\right)}{2\sqrt{2}a^{5/4}}+\frac{x}{a}$$

```
[Out] x/a + (b^(1/4)*ArcTan[1 - (Sqrt[2]*a^(1/4)*x)/b^(1/4)])/(2*Sqrt[2
]*a^(5/4)) - (b^(1/4)*ArcTan[1 + (Sqrt[2]*a^(1/4)*x)/b^(1/4)])/(2
*Sqrt[2]*a^(5/4)) + (b^(1/4)*Log[Sqrt[b] - Sqrt[2]*a^(1/4)*b^(1/4
)*x + Sqrt[a]*x^2])/(4*Sqrt[2]*a^(5/4)) - (b^(1/4)*Log[Sqrt[b] +
Sqrt[2]*a^(1/4)*b^(1/4)*x + Sqrt[a]*x^2])/(4*Sqrt[2]*a^(5/4))
```

Rubi [A] time = 0.317155, antiderivative size = 190, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 8, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.889

$$\frac{\sqrt[4]{b}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x+\sqrt{a}x^2+\sqrt{b}\right)}{4\sqrt{2}a^{5/4}}-\frac{\sqrt[4]{b}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x+\sqrt{a}x^2+\sqrt{b}\right)}{4\sqrt{2}a^{5/4}}+\frac{\sqrt[4]{b}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{a}x}{\sqrt[4]{b}}\right)}{2\sqrt{2}a^{5/4}}-\frac{\sqrt[4]{b}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{a}x}{\sqrt[4]{b}}+1\right)}{2\sqrt{2}a^{5/4}}+\frac{x}{a}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^4)^(-1),x]
```

```
[Out] x/a + (b^(1/4)*ArcTan[1 - (Sqrt[2]*a^(1/4)*x)/b^(1/4)])/(2*Sqrt[2
]*a^(5/4)) - (b^(1/4)*ArcTan[1 + (Sqrt[2]*a^(1/4)*x)/b^(1/4)])/(2
*Sqrt[2]*a^(5/4)) + (b^(1/4)*Log[Sqrt[b] - Sqrt[2]*a^(1/4)*b^(1/4
)*x + Sqrt[a]*x^2])/(4*Sqrt[2]*a^(5/4)) - (b^(1/4)*Log[Sqrt[b] +
Sqrt[2]*a^(1/4)*b^(1/4)*x + Sqrt[a]*x^2])/(4*Sqrt[2]*a^(5/4))
```

Rubi in Sympy [A] time = 52.8618, size = 175, normalized size = 0.92

$$\frac{x}{a}+\frac{\sqrt{2}\sqrt[4]{b}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x+\sqrt{a}x^2+\sqrt{b}\right)}{8a^{\frac{5}{4}}}-\frac{\sqrt{2}\sqrt[4]{b}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x+\sqrt{a}x^2+\sqrt{b}\right)}{8a^{\frac{5}{4}}}-\frac{\sqrt{2}\sqrt[4]{b}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[4]{a}x}{\sqrt[4]{b}}-1\right)}{4a^{\frac{5}{4}}}-\frac{\sqrt{2}\sqrt[4]{b}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[4]{a}x}{\sqrt[4]{b}}+1\right)}{4a^{\frac{5}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**4),x)
```

```
[Out] x/a + sqrt(2)*b**(1/4)*log(-sqrt(2)*a**(1/4)*b**(1/4)*x + sqrt(a)
*x**2 + sqrt(b))/(8*a**(5/4)) - sqrt(2)*b**(1/4)*log(sqrt(2)*a**(
1/4)*b**(1/4)*x + sqrt(a)*x**2 + sqrt(b))/(8*a**(5/4)) - sqrt(2)*
b**(1/4)*atan(sqrt(2)*a**(1/4)*x/b**(1/4) - 1)/(4*a**(5/4)) - sqr
t(2)*b**(1/4)*atan(sqrt(2)*a**(1/4)*x/b**(1/4) + 1)/(4*a**(5/4))
```

Mathematica [A] time = 0.0848368, size = 173, normalized size = 0.91

$$\frac{\sqrt{2}\sqrt[4]{b}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x+\sqrt{a}x^2+\sqrt{b}\right)-\sqrt{2}\sqrt[4]{b}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x+\sqrt{a}x^2+\sqrt{b}\right)+2\sqrt{2}\sqrt[4]{b}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{a}x}{\sqrt[4]{b}}\right)-2\sqrt{2}\sqrt[4]{b}\tan^{-1}}{8a^{5/4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^4)^(-1),x]
```

```
[Out] (8*a^(1/4)*x + 2*Sqrt[2]*b^(1/4)*ArcTan[1 - (Sqrt[2]*a^(1/4)*x)/b
^(1/4)] - 2*Sqrt[2]*b^(1/4)*ArcTan[1 + (Sqrt[2]*a^(1/4)*x)/b^(1/4
)] + Sqrt[2]*b^(1/4)*Log[Sqrt[b] - Sqrt[2]*a^(1/4)*b^(1/4)*x + Sq
rt[a]*x^2] - Sqrt[2]*b^(1/4)*Log[Sqrt[b] + Sqrt[2]*a^(1/4)*b^(1/4
)*x + Sqrt[a]*x^2])/(8*a^(5/4))
```

Maple [A] time = 0.011, size = 133, normalized size = 0.7

$$\frac{x}{a}-\frac{\sqrt{2}}{8\,a}\sqrt[4]{\frac{b}{a}}\ln\left(1\left(x^2+\sqrt[4]{\frac{b}{a}}x\sqrt{2}+\sqrt{\frac{b}{a}}\right)\left(x^2-\sqrt[4]{\frac{b}{a}}x\sqrt{2}+\sqrt{\frac{b}{a}}\right)^{-1}\right)-\frac{\sqrt{2}}{4\,a}\sqrt[4]{\frac{b}{a}}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{b}{a}}}+1\right)-\frac{\sqrt{2}}{4\,a}\sqrt[4]{\frac{b}{a}}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{\frac{b}{a}}}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^4),x)
```

```
[Out] x/a-1/8/a*(b/a)^(1/4)*2^(1/2)*ln((x^2+(b/a)^(1/4)*x*2^(1/2)+(b/a)
^(1/2))/(x^2-(b/a)^(1/4)*x*2^(1/2)+(b/a)^(1/2)))-1/4/a*(b/a)^(1/4
)*2^(1/2)*arctan(2^(1/2)/(b/a)^(1/4)*x+1)-1/4/a*(b/a)^(1/4)*2^(1/
2)*arctan(2^(1/2)/(b/a)^(1/4)*x-1)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a + b/x^4),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.246337, size = 136, normalized size = 0.72

$$\frac{4\,a\left(-\frac{b}{a^5}\right)^{\frac{1}{4}}\arctan\left(\frac{a\left(-\frac{b}{a^5}\right)^{\frac{1}{4}}}{x+\sqrt{a^2\sqrt{-\frac{b}{a^5}}+x^2}}\right)-a\left(-\frac{b}{a^5}\right)^{\frac{1}{4}}\log\left(a\left(-\frac{b}{a^5}\right)^{\frac{1}{4}}+x\right)+a\left(-\frac{b}{a^5}\right)^{\frac{1}{4}}\log\left(-a\left(-\frac{b}{a^5}\right)^{\frac{1}{4}}+x\right)+4\,x}{4\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a + b/x^4),x, algorithm="fricas")
```

```
[Out] 1/4*(4*a*(-b/a^5)^(1/4)*arctan(a*(-b/a^5)^(1/4)/(x + sqrt(a^2*sqr
t(-b/a^5) + x^2))) - a*(-b/a^5)^(1/4)*log(a*(-b/a^5)^(1/4) + x) +
 a*(-b/a^5)^(1/4)*log(-a*(-b/a^5)^(1/4) + x) + 4*x)/a
```

Sympy [A] time = 1.31298, size = 22, normalized size = 0.12

$$\operatorname{RootSum}\left(256t^4a^5 + b, \left(t \mapsto t\log\left(-4ta + x\right)\right)\right) + \frac{x}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**4),x)
```

```
[Out] RootSum(256*_t**4*a**5 + b, Lambda(_t, _t*log(-4*_t*a + x))) + x/
a
```

GIAC/XCAS [A] time = 0.235881, size = 232, normalized size = 1.22

$$\frac{x}{a} - \frac{\sqrt{2}\left(a^3b\right)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(2x+\sqrt{2}\left(\frac{b}{a}\right)^{\frac{1}{4}}\right)}{2\left(\frac{b}{a}\right)^{\frac{1}{4}}}\right)}{4a^2} - \frac{\sqrt{2}\left(a^3b\right)^{\frac{1}{4}}\arctan\left(\frac{\sqrt{2}\left(2x-\sqrt{2}\left(\frac{b}{a}\right)^{\frac{1}{4}}\right)}{2\left(\frac{b}{a}\right)^{\frac{1}{4}}}\right)}{4a^2} - \frac{\sqrt{2}\left(a^3b\right)^{\frac{1}{4}}\ln\left(x^2+\sqrt{2}x\left(\frac{b}{a}\right)^{\frac{1}{4}}+\sqrt{\frac{b}{a}}\right)}{8a^2} + \frac{\sqrt{2}\left(a^3b\right)^{\frac{1}{4}}\ln\left(x^2-\sqrt{2}x\left(\frac{b}{a}\right)^{\frac{1}{4}}+\sqrt{\frac{b}{a}}\right)}{8a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a + b/x^4),x, algorithm="giac")
```

```
[Out] x/a - 1/4*sqrt(2)*(a^3*b)^(1/4)*arctan(1/2*sqrt(2)*(2*x + sqrt(2)
*(b/a)^(1/4))/(b/a)^(1/4))/a^2 - 1/4*sqrt(2)*(a^3*b)^(1/4)*arctan
(1/2*sqrt(2)*(2*x - sqrt(2)*(b/a)^(1/4))/(b/a)^(1/4))/a^2 - 1/8*s
qrt(2)*(a^3*b)^(1/4)*ln(x^2 + sqrt(2)*x*(b/a)^(1/4) + sqrt(b/a))/
a^2 + 1/8*sqrt(2)*(a^3*b)^(1/4)*ln(x^2 - sqrt(2)*x*(b/a)^(1/4) +
sqrt(b/a))/a^2
```

3.2056 $\int \sqrt{a+\frac{b}{x^4}}x^3\,dx$

Optimal. Leaf size=47

$$\frac{1}{4}x^4\sqrt{a+\frac{b}{x^4}}+\frac{b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)}{4\sqrt{a}}$$

```
[Out] (Sqrt[a + b/x^4]*x^4)/4 + (b*ArcTanh[Sqrt[a + b/x^4]/Sqrt[a]])/(4
*Sqrt[a])
```

Rubi [A] time = 0.0869045, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{1}{4}x^4\sqrt{a+\frac{b}{x^4}}+\frac{b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)}{4\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[a + b/x^4]*x^3,x]
```

```
[Out] (Sqrt[a + b/x^4]*x^4)/4 + (b*ArcTanh[Sqrt[a + b/x^4]/Sqrt[a]])/(4
*Sqrt[a])
```

Rubi in Sympy [A] time = 6.9488, size = 39, normalized size = 0.83

$$\frac{x^4\sqrt{a+\frac{b}{x^4}}}{4}+\frac{b\,\mathrm{atanh}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)}{4\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**3*(a+b/x**4)**(1/2),x)
```

```
[Out] x**4*sqrt(a + b/x**4)/4 + b*atanh(sqrt(a + b/x**4)/sqrt(a))/(4*sq
rt(a))
```

Mathematica [A] time = 0.0676393, size = 64, normalized size = 1.36

$$\frac{1}{4}x^2\sqrt{a+\frac{b}{x^4}}\left(\frac{b\log\left(\sqrt{a}\sqrt{ax^4+b}+ax^2\right)}{\sqrt{a}\sqrt{ax^4+b}}+x^2\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[a + b/x^4]*x^3,x]
```

```
[Out] (Sqrt[a + b/x^4]*x^2*(x^2 + (b*Log[a*x^2 + Sqrt[a]*Sqrt[b + a*x^4
]]))/(Sqrt[a]*Sqrt[b + a*x^4])))/4
```

Maple [A] time = 0.024, size = 68, normalized size = 1.5

$$\frac{x^2}{4}\sqrt{\frac{ax^4+b}{x^4}}\left(x^2\sqrt{ax^4+b}\sqrt{a}+b\ln\left(x^2\sqrt{a}+\sqrt{ax^4+b}\right)\right)\frac{1}{\sqrt{ax^4+b}}\frac{1}{\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3*(a+b/x^4)^(1/2),x)
```

```
[Out] 1/4*((a*x^4+b)/x^4)^(1/2)*x^2*(x^2*(a*x^4+b)^(1/2)*a^(1/2)+b*ln(x
^2*a^(1/2)+(a*x^4+b)^(1/2)))/(a*x^4+b)^(1/2)/a^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^4)*x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.254519, size = 1, normalized size = 0.02

$$\left[\frac{2\,ax^4\sqrt{\frac{ax^4+b}{x^4}}+\sqrt{a}b\log\left(-2\,ax^4\sqrt{\frac{ax^4+b}{x^4}}-\left(2\,ax^4+b\right)\sqrt{a}\right)}{8\,a},\frac{ax^4\sqrt{\frac{ax^4+b}{x^4}}-\sqrt{-a}b\arctan\left(\frac{\sqrt{-a}}{\sqrt{\frac{ax^4+b}{x^4}}}\right)}{4\,a}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^4)*x^3,x, algorithm="fricas")
```

```
[Out] [1/8*(2*a*x^4*sqrt((a*x^4 + b)/x^4) + sqrt(a)*b*log(-2*a*x^4*sqrt
((a*x^4 + b)/x^4) - (2*a*x^4 + b)*sqrt(a)))/a, 1/4*(a*x^4*sqrt((a
*x^4 + b)/x^4) - sqrt(-a)*b*arctan(sqrt(-a)/sqrt((a*x^4 + b)/x^4)
))/a]
```

Sympy [A] time = 8.70102, size = 44, normalized size = 0.94

$$\frac{\sqrt{b}x^2\sqrt{\frac{ax^4}{b}+1}}{4}+\frac{b\operatorname{asinh}\left(\frac{\sqrt{a}x^2}{\sqrt{b}}\right)}{4\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(a+b/x**4)**(1/2),x)
```

```
[Out] sqrt(b)*x**2*sqrt(a*x**4/b + 1)/4 + b*asinh(sqrt(a)*x**2/sqrt(b))
/(4*sqrt(a))
```

GIAC/XCAS [A] time = 0.232942, size = 55, normalized size = 1.17

$$\frac{1}{4}\sqrt{ax^4+b}x^2-\frac{b\ln\left(\left|-\sqrt{a}x^2+\sqrt{ax^4+b}\right|\right)}{4\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^4)*x^3,x, algorithm="giac")
```

```
[Out] 1/4*sqrt(a*x^4 + b)*x^2 - 1/4*b*ln(abs(-sqrt(a)*x^2 + sqrt(a*x^4
+ b)))/sqrt(a)
```

3.2057 $\int \sqrt{a+\frac{b}{x^4}}x\,dx$

Optimal. Leaf size=49

$$\frac{1}{2}x^2\sqrt{a+\frac{b}{x^4}}-\frac{1}{2}\sqrt{b}\tanh^{-1}\left(\frac{\sqrt{b}}{x^2\sqrt{a+\frac{b}{x^4}}}\right)$$

```
[Out] (Sqrt[a + b/x^4]*x^2)/2 - (Sqrt[b]*ArcTanh[Sqrt[b]/(Sqrt[a + b/x^
4]*x^2)])/2
```

Rubi [A] time = 0.106822, antiderivative size = 49, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385

$$\frac{1}{2}x^2\sqrt{a+\frac{b}{x^4}}-\frac{1}{2}\sqrt{b}\tanh^{-1}\left(\frac{\sqrt{b}}{x^2\sqrt{a+\frac{b}{x^4}}}\right)$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[a + b/x^4]*x,x]
```

```
[Out] (Sqrt[a + b/x^4]*x^2)/2 - (Sqrt[b]*ArcTanh[Sqrt[b]/(Sqrt[a + b/x^
4]*x^2)])/2
```

Rubi in Sympy [A] time = 8.44782, size = 41, normalized size = 0.84

$$-\frac{\sqrt{b}\operatorname{atanh}\left(\frac{\sqrt{b}}{x^2\sqrt{a+\frac{b}{x^4}}}\right)}{2}+\frac{x^2\sqrt{a+\frac{b}{x^4}}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x*(a+b/x**4)**(1/2),x)
```

```
[Out] -sqrt(b)*atanh(sqrt(b)/(x**2*sqrt(a + b/x**4)))/2 + x**2*sqrt(a +
 b/x**4)/2
```

Mathematica [A] time = 0.0908435, size = 66, normalized size = 1.35

$$\frac{x^2\sqrt{a+\frac{b}{x^4}}\left(\sqrt{ax^4+b}-\sqrt{b}\tanh^{-1}\left(\frac{\sqrt{ax^4+b}}{\sqrt{b}}\right)\right)}{2\sqrt{ax^4+b}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[a + b/x^4]*x,x]
```

```
[Out] (Sqrt[a + b/x^4]*x^2*(Sqrt[b + a*x^4] - Sqrt[b]*ArcTanh[Sqrt[b +
a*x^4]/Sqrt[b]]))/(2*Sqrt[b + a*x^4])
```

Maple [A] time = 0.017, size = 65, normalized size = 1.3

$$-\frac{x^2}{2}\sqrt{\frac{ax^4+b}{x^4}}\left(\sqrt{b}\ln\left(2\,\frac{\sqrt{b}\sqrt{ax^4+b}+b}{x^2}\right)-\sqrt{ax^4+b}\right)\frac{1}{\sqrt{ax^4+b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x*(a+b/x^4)^(1/2),x)
```

```
[Out] -1/2*((a*x^4+b)/x^4)^(1/2)*x^2*(b^(1/2)*ln(2*(b^(1/2)*(a*x^4+b)^(
1/2)+b)/x^2)-(a*x^4+b)^(1/2))/(a*x^4+b)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(a + b/x^4)*x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.247167, size = 1, normalized size = 0.02

$$\left[\frac{1}{2}\,x^{2}\sqrt{\frac{ax^{4}+b}{x^{4}}}+\frac{1}{4}\,\sqrt{b}\log\left(\frac{ax^{4}-2\,\sqrt{b}x^{2}\sqrt{\frac{ax^{4}+b}{x^{4}}}+2\,b}{x^{4}}\right),\ \frac{1}{2}\,x^{2}\sqrt{\frac{ax^{4}+b}{x^{4}}}-\frac{1}{2}\,\sqrt{-b}\arctan\left(\frac{x^{2}\sqrt{\frac{ax^{4}+b}{x^{4}}}}{\sqrt{-b}}\right)\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(a + b/x^4)*x,x, algorithm="fricas")
```

```
[Out] [1/2*x^2*sqrt((a*x^4 + b)/x^4) + 1/4*sqrt(b)*log((a*x^4 - 2*sqrt(
b)*x^2*sqrt((a*x^4 + b)/x^4) + 2*b)/x^4), 1/2*x^2*sqrt((a*x^4 + b
)/x^4) - 1/2*sqrt(-b)*arctan(x^2*sqrt((a*x^4 + b)/x^4)/sqrt(-b))]
```

Sympy [A] time = 6.19021, size = 66, normalized size = 1.35

$$\frac{\sqrt{a}x^{2}}{2\sqrt{1+\frac{b}{ax^{4}}}}-\frac{\sqrt{b}\operatorname{asinh}\left(\frac{\sqrt{b}}{\sqrt{a}x^{2}}\right)}{2}+\frac{b}{2\sqrt{a}x^{2}\sqrt{1+\frac{b}{ax^{4}}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x*(a+b/x**4)**(1/2),x)
```

```
[Out] sqrt(a)*x**2/(2*sqrt(1 + b/(a*x**4))) - sqrt(b)*asinh(sqrt(b)/(sq
rt(a)*x**2))/2 + b/(2*sqrt(a)*x**2*sqrt(1 + b/(a*x**4)))
```

GIAC/XCAS [A] time = 0.226718, size = 49, normalized size = 1.

$$\frac{b\arctan\left(\frac{\sqrt{ax^{4}+b}}{\sqrt{-b}}\right)}{2\,\sqrt{-b}}+\frac{1}{2}\,\sqrt{ax^{4}+b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(a + b/x^4)*x,x, algorithm="giac")
```

```
[Out] 1/2*b*arctan(sqrt(a*x^4 + b)/sqrt(-b))/sqrt(-b) + 1/2*sqrt(a*x^4
+ b)
```

3.2058 $\int \frac{\sqrt{a+\frac{b}{x^4}}}{x}\,dx$

Optimal. Leaf size=43

$$\frac{1}{2}\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)-\frac{1}{2}\sqrt{a+\frac{b}{x^4}}$$

```
[Out] -Sqrt[a + b/x^4]/2 + (Sqrt[a]*ArcTanh[Sqrt[a + b/x^4]/Sqrt[a]])/2
```

Rubi [A] time = 0.0814702, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{1}{2}\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)-\frac{1}{2}\sqrt{a+\frac{b}{x^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x^4]/x,x]
```

```
[Out] -Sqrt[a + b/x^4]/2 + (Sqrt[a]*ArcTanh[Sqrt[a + b/x^4]/Sqrt[a]])/2
```

Rubi in Sympy [A] time = 6.69369, size = 34, normalized size = 0.79

$$\frac{\sqrt{a}\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)}{2}-\frac{\sqrt{a+\frac{b}{x^4}}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**4)**(1/2)/x,x)
```

```
[Out] sqrt(a)*atanh(sqrt(a + b/x**4)/sqrt(a))/2 - sqrt(a + b/x**4)/2
```

Mathematica [A] time = 0.0563084, size = 71, normalized size = 1.65

$$\frac{\sqrt{a}x^2\sqrt{a+\frac{b}{x^4}}\tanh^{-1}\left(\frac{\sqrt{a}x^2}{\sqrt{ax^4+b}}\right)}{2\sqrt{ax^4+b}}-\frac{1}{2}\sqrt{a+\frac{b}{x^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x^4]/x,x]
```

```
[Out] -Sqrt[a + b/x^4]/2 + (Sqrt[a]*Sqrt[a + b/x^4]*x^2*ArcTanh[(Sqrt[a
]*x^2)/Sqrt[b + a*x^4]])/(2*Sqrt[b + a*x^4])
```

Maple [B] time = 0.017, size = 80, normalized size = 1.9

$$\frac{1}{2b}\sqrt{\frac{ax^4+b}{x^4}}\left(ax^4\sqrt{ax^4+b}+\sqrt{a}\ln\left(x^2\sqrt{a}+\sqrt{ax^4+b}\right)x^2b-\left(ax^4+b\right)^{\frac{3}{2}}\right)\frac{1}{\sqrt{ax^4+b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^4)^(1/2)/x,x)
```

```
[Out] 1/2*((a*x^4+b)/x^4)^(1/2)*(a*x^4*(a*x^4+b)^(1/2)+a^(1/2)*ln(x^2*a
^(1/2)+(a*x^4+b)^(1/2))*x^2*b-(a*x^4+b)^(3/2))/(a*x^4+b)^(1/2)/b
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^4)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.255495, size = 1, normalized size = 0.02

$$\left[\frac{1}{4}\sqrt{a}\log\left(-2\,ax^4-2\,\sqrt{a}x^4\sqrt{\frac{ax^4+b}{x^4}}-b\right)-\frac{1}{2}\sqrt{\frac{ax^4+b}{x^4}},\ \frac{1}{2}\sqrt{-a}\arctan\left(\frac{a}{\sqrt{-a}\sqrt{\frac{ax^4+b}{x^4}}}\right)-\frac{1}{2}\sqrt{\frac{ax^4+b}{x^4}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^4)/x,x, algorithm="fricas")
```

```
[Out] [1/4*sqrt(a)*log(-2*a*x^4 - 2*sqrt(a)*x^4*sqrt((a*x^4 + b)/x^4) -
 b) - 1/2*sqrt((a*x^4 + b)/x^4), 1/2*sqrt(-a)*arctan(a/(sqrt(-a)*
sqrt((a*x^4 + b)/x^4))) - 1/2*sqrt((a*x^4 + b)/x^4)]
```

Sympy [A] time = 5.84477, size = 66, normalized size = 1.53

$$\frac{\sqrt{a}\operatorname{asinh}\left(\frac{\sqrt{a}x^2}{\sqrt{b}}\right)}{2}-\frac{ax^2}{2\sqrt{b}\sqrt{\frac{ax^4}{b}+1}}-\frac{\sqrt{b}}{2x^2\sqrt{\frac{ax^4}{b}+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**4)**(1/2)/x,x)
```

```
[Out] sqrt(a)*asinh(sqrt(a)*x**2/sqrt(b))/2 - a*x**2/(2*sqrt(b)*sqrt(a*
x**4/b + 1)) - sqrt(b)/(2*x**2*sqrt(a*x**4/b + 1))
```

GIAC/XCAS [A] time = 0.231832, size = 49, normalized size = 1.14

$$-\frac{a\arctan\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{-a}}\right)}{2\sqrt{-a}}-\frac{1}{2}\sqrt{a+\frac{b}{x^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^4)/x,x, algorithm="giac")
```

```
[Out] -1/2*a*arctan(sqrt(a + b/x^4)/sqrt(-a))/sqrt(-a) - 1/2*sqrt(a + b
/x^4)
```

3.2059 $\int \frac{\sqrt{a+\frac{b}{x^4}}}{x^3} \, dx$

Optimal. Leaf size=50

$$-\frac{\sqrt{a+\frac{b}{x^4}}}{4x^2}-\frac{a\tanh^{-1}\left(\frac{\sqrt{b}}{x^2\sqrt{a+\frac{b}{x^4}}}\right)}{4\sqrt{b}}$$

```
[Out] -Sqrt[a + b/x^4]/(4*x^2) - (a*ArcTanh[Sqrt[b]/(Sqrt[a + b/x^4]*x^
2)])/(4*Sqrt[b])
```

Rubi [A] time = 0.0992981, antiderivative size = 50, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{\sqrt{a+\frac{b}{x^4}}}{4x^2}-\frac{a\tanh^{-1}\left(\frac{\sqrt{b}}{x^2\sqrt{a+\frac{b}{x^4}}}\right)}{4\sqrt{b}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x^4]/x^3,x]
```

```
[Out] -Sqrt[a + b/x^4]/(4*x^2) - (a*ArcTanh[Sqrt[b]/(Sqrt[a + b/x^4]*x^
2)])/(4*Sqrt[b])
```

Rubi in Sympy [A] time = 6.81476, size = 44, normalized size = 0.88

$$-\frac{a\operatorname{atanh}\left(\frac{\sqrt{b}}{x^2\sqrt{a+\frac{b}{x^4}}}\right)}{4\sqrt{b}}-\frac{\sqrt{a+\frac{b}{x^4}}}{4x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**4)**(1/2)/x**3,x)
```

```
[Out] -a*atanh(sqrt(b)/(x**2*sqrt(a + b/x**4)))/(4*sqrt(b)) - sqrt(a +
b/x**4)/(4*x**2)
```

Mathematica [A] time = 0.0838733, size = 60, normalized size = 1.2

$$\frac{\sqrt{a+\frac{b}{x^4}}\left(-\frac{ax^4\tanh^{-1}\left(\frac{\sqrt{ax^4+b}}{\sqrt{b}}\right)}{\sqrt{b}\sqrt{ax^4+b}}-1\right)}{4x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x^4]/x^3,x]
```

```
[Out] (Sqrt[a + b/x^4]*(-1 - (a*x^4*ArcTanh[Sqrt[b + a*x^4]/Sqrt[b]])/(
Sqrt[b]*Sqrt[b + a*x^4])))/(4*x^2)
```

Maple [B] time = 0.018, size = 90, normalized size = 1.8

$$-\frac{1}{4x^{2}}\sqrt{\frac{ax^{4}+b}{x^{4}}}\left(a\ln\left(2\,\frac{\sqrt{b}\sqrt{ax^{4}+b}+b}{x^{2}}\right)x^{4}b-a\sqrt{ax^{4}+b}x^{4}\sqrt{b}+\left(ax^{4}+b\right)^{\frac{3}{2}}\sqrt{b}\right)\frac{1}{\sqrt{ax^{4}+b}}b^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^4)^(1/2)/x^3,x)
```

```
[Out] -1/4*((a*x^4+b)/x^4)^(1/2)/x^2*(a*ln(2*(b^(1/2)*(a*x^4+b)^(1/2)+b
)/x^2)*x^4*b-a*(a*x^4+b)^(1/2)*x^4*b^(1/2)+(a*x^4+b)^(3/2)*b^(1/2
))/(a*x^4+b)^(1/2)/b^(3/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^4)/x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.257514, size = 1, normalized size = 0.02

$$\left[\frac{a\sqrt{b}x^{2}\log\left(-\frac{2\,bx^{2}\sqrt{\frac{ax^{4}+b}{x^{4}}}-(ax^{4}+2\,b)\sqrt{b}}{x^{4}}\right)-2\,b\sqrt{\frac{ax^{4}+b}{x^{4}}}}{8\,bx^{2}},-\frac{a\sqrt{-b}x^{2}\arctan\left(\frac{b}{\sqrt{-b}x^{2}\sqrt{\frac{ax^{4}+b}{x^{4}}}}\right)+b\sqrt{\frac{ax^{4}+b}{x^{4}}}}{4\,bx^{2}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^4)/x^3,x, algorithm="fricas")
```

```
[Out] [1/8*(a*sqrt(b)*x^2*log(-(2*b*x^2*sqrt((a*x^4 + b)/x^4) - (a*x^4
+ 2*b)*sqrt(b))/x^4) - 2*b*sqrt((a*x^4 + b)/x^4))/(b*x^2), -1/4*(
a*sqrt(-b)*x^2*arctan(b/(sqrt(-b)*x^2*sqrt((a*x^4 + b)/x^4))) + b
*sqrt((a*x^4 + b)/x^4))/(b*x^2)]
```

Sympy [A] time = 8.01696, size = 46, normalized size = 0.92

$$-\frac{\sqrt{a}\sqrt{1+\frac{b}{ax^{4}}}}{4x^{2}}-\frac{a\operatorname{asinh}\left(\frac{\sqrt{b}}{\sqrt{a}x^{2}}\right)}{4\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**4)**(1/2)/x**3,x)
```

```
[Out] -sqrt(a)*sqrt(1 + b/(a*x**4))/(4*x**2) - a*asinh(sqrt(b)/(sqrt(a)
*x**2))/(4*sqrt(b))
```

GIAC/XCAS [A] time = 0.231559, size = 58, normalized size = 1.16

$$\frac{1}{4}\,a\left(\frac{\arctan\left(\frac{\sqrt{ax^4+b}}{\sqrt{-b}}\right)}{\sqrt{-b}}-\frac{\sqrt{ax^4+b}}{ax^4}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^4)/x^3,x, algorithm="giac")
```

```
[Out] 1/4*a*(arctan(sqrt(a*x^4 + b)/sqrt(-b))/sqrt(-b) - sqrt(a*x^4 + b
)/(a*x^4))
```

3.2060 $\int \sqrt{a+\frac{b}{x^4}}x^2\,dx$

Optimal. Leaf size=107

$$\frac{1}{3}x^3\sqrt{a+\frac{b}{x^4}}-\frac{b^{3/4}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{3\sqrt[4]{a}\sqrt{a+\frac{b}{x^4}}}$$

```
[Out] (Sqrt[a + b/x^4]*x^3)/3 - (b^(3/4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sq
rt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticF[2*ArcCot[(a^(1/4)
*x)/b^(1/4)], 1/2])/(3*a^(1/4)*Sqrt[a + b/x^4])
```

Rubi [A] time = 0.137301, antiderivative size = 107, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{1}{3}x^3\sqrt{a+\frac{b}{x^4}}-\frac{b^{3/4}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{3\sqrt[4]{a}\sqrt{a+\frac{b}{x^4}}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x^4]*x^2,x]
```

```
[Out] (Sqrt[a + b/x^4]*x^3)/3 - (b^(3/4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sq
rt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticF[2*ArcCot[(a^(1/4)
*x)/b^(1/4)], 1/2])/(3*a^(1/4)*Sqrt[a + b/x^4])
```

Rubi in Sympy [A] time = 8.71533, size = 94, normalized size = 0.88

$$\frac{x^3\sqrt{a+\frac{b}{x^4}}}{3}-\frac{b^{\frac{3}{4}}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{3\sqrt[4]{a}\sqrt{a+\frac{b}{x^4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(a+b/x**4)**(1/2),x)
```

```
[Out] x**3*sqrt(a + b/x**4)/3 - b**(3/4)*sqrt((a + b/x**4)/(sqrt(a) + s
qrt(b)/x**2)**2)*(sqrt(a) + sqrt(b)/x**2)*elliptic_f(2*atan(b**(1
/4)/(a**(1/4)*x)), 1/2)/(3*a**(1/4)*sqrt(a + b/x**4))
```

Mathematica [C] time = 0.303075, size = 93, normalized size = 0.87

$$\frac{1}{3}x^2\sqrt{a+\frac{b}{x^4}}\left(x-\frac{2ib\sqrt{\frac{ax^4}{b}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)}{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\left(ax^4+b\right)}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x^4]*x^2,x]
```

```
[Out] (Sqrt[a + b/x^4]*x^2*(x - ((2*I)*b*Sqrt[1 + (a*x^4)/b]*EllipticF[
I*ArcSinh[Sqrt[(I*Sqrt[a])/Sqrt[b]]*x], -1])/(Sqrt[(I*Sqrt[a])/Sq
rt[b]]*(b + a*x^4))))/3
```

Maple [C] time = 0.052, size = 130, normalized size = 1.2

$$\frac{x^2}{3\,ax^4+3\,b}\sqrt{\frac{ax^4+b}{x^4}}\left(\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}}x^5a+2\,b\sqrt{-\frac{i\sqrt{a}x^2-\sqrt{b}}{\sqrt{b}}}\sqrt{\frac{i\sqrt{a}x^2+\sqrt{b}}{\sqrt{b}}}EllipticF\left(x\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}},i\right)+\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}}xb\right)\frac{1}{\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(a+b/x^4)^(1/2),x)
```

```
[Out] 1/3*((a*x^4+b)/x^4)^(1/2)*x^2*((I*a^(1/2)/b^(1/2))^(1/2)*x^5*a+2*
b*(-(I*a^(1/2)*x^2-b^(1/2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1/2
))/b^(1/2))^(1/2)*EllipticF(x*(I*a^(1/2)/b^(1/2))^(1/2),I)+(I*a^(
1/2)/b^(1/2))^(1/2)*x*b)/(a*x^4+b)/(I*a^(1/2)/b^(1/2))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{a+\frac{b}{x^4}}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^4)*x^2,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a + b/x^4)*x^2, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(x^2\sqrt{\frac{ax^4+b}{x^4}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^4)*x^2,x, algorithm="fricas")
```

```
[Out] integral(x^2*sqrt((a*x^4 + b)/x^4), x)
```

Sympy [A] time = 3.79714, size = 44, normalized size = 0.41

$$-\frac{\sqrt{a}x^3\,\Gamma\left(-\frac{3}{4}\right)\,{}_2F_1\left(\begin{matrix}-\frac{3}{4},-\frac{1}{2}\\ \frac{1}{4}\end{matrix}\middle|\frac{be^{i\pi}}{ax^4}\right)}{4\,\Gamma\left(\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(a+b/x**4)**(1/2),x)
```

```
[Out] -sqrt(a)*x**3*gamma(-3/4)*hyper((-3/4, -1/2), (1/4,), b*exp_polar
(I*pi)/(a*x**4))/(4*gamma(1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{a + \frac{b}{x^4}} x^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^4)*x^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(a + b/x^4)*x^2, x)
```

3.2061 $\int \sqrt{a+\frac{b}{x^4}}\,dx$

Optimal. Leaf size=224

$$x\sqrt{a+\frac{b}{x^4}}-\frac{2\sqrt{b}\sqrt{a+\frac{b}{x^4}}}{x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}-\frac{\sqrt[4]{a}\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{\sqrt{a+\frac{b}{x^4}}}+\frac{2\sqrt[4]{a}\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{\sqrt{a+\frac{b}{x^4}}}$$

```
[Out] (-2*Sqrt[b]*Sqrt[a + b/x^4])/((Sqrt[a] + Sqrt[b]/x^2)*x) + Sqrt[a
 + b/x^4]*x + (2*a^(1/4)*b^(1/4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt
[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticE[2*ArcCot[(a^(1/4)*x
)/b^(1/4)], 1/2])/Sqrt[a + b/x^4] - (a^(1/4)*b^(1/4)*Sqrt[(a + b/
x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticF
[2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/Sqrt[a + b/x^4]
```

Rubi [A] time = 0.28856, antiderivative size = 224, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.454

$$x\sqrt{a+\frac{b}{x^4}}-\frac{2\sqrt{b}\sqrt{a+\frac{b}{x^4}}}{x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}-\frac{\sqrt[4]{a}\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{\sqrt{a+\frac{b}{x^4}}}+\frac{2\sqrt[4]{a}\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{\sqrt{a+\frac{b}{x^4}}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x^4],x]
```


```
[Out] (-2*Sqrt[b]*Sqrt[a + b/x^4])/((Sqrt[a] + Sqrt[b]/x^2)*x) + Sqrt[a
 + b/x^4]*x + (2*a^(1/4)*b^(1/4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt
[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticE[2*ArcCot[(a^(1/4)*x
)/b^(1/4)], 1/2])/Sqrt[a + b/x^4] - (a^(1/4)*b^(1/4)*Sqrt[(a + b/
x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticF
[2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/Sqrt[a + b/x^4]
```

Rubi in Sympy [A] time = 23.1021, size = 201, normalized size = 0.9

$$\frac{2\sqrt[4]{a}\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{\sqrt{a+\frac{b}{x^4}}}-\frac{\sqrt[4]{a}\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{\sqrt{a+\frac{b}{x^4}}}-\frac{2\sqrt{b}\sqrt{a+\frac{b}{x^4}}}{x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}+x\sqrt{a+\frac{b}{x^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**4)**(1/2),x)
```

```
[Out] 2*a**(1/4)*b**(1/4)*sqrt((a + b/x**4)/(sqrt(a) + sqrt(b)/x**2)**2
)*(sqrt(a) + sqrt(b)/x**2)*elliptic_e(2*atan(b**(1/4)/(a**(1/4)*x
)), 1/2)/sqrt(a + b/x**4) - a**(1/4)*b**(1/4)*sqrt((a + b/x**4)/(
sqrt(a) + sqrt(b)/x**2)**2)*(sqrt(a) + sqrt(b)/x**2)*elliptic_f(2
*atan(b**(1/4)/(a**(1/4)*x)), 1/2)/sqrt(a + b/x**4) - 2*sqrt(b)*s
qrt(a + b/x**4)/(x*(sqrt(a) + sqrt(b)/x**2)) + x*sqrt(a + b/x**4)
```

Mathematica [C] time = 0.730353, size = 119, normalized size = 0.53

$$x\sqrt{a+\frac{b}{x^4}}\left(-1+\frac{2iax\sqrt{\frac{ax^4}{b}+1}\left(E\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)-F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)\right)}{\left(\frac{i\sqrt{a}}{\sqrt{b}}\right)^{3/2}(ax^4+b)}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x^4],x]
```

```
[Out] Sqrt[a + b/x^4]*x*(-1 + ((2*I)*a*x*Sqrt[1 + (a*x^4)/b]*(EllipticE
[I*ArcSinh[Sqrt[(I*Sqrt[a])/Sqrt[b]]*x], -1] - EllipticF[I*ArcSin
h[Sqrt[(I*Sqrt[a])/Sqrt[b]]*x], -1]))/(((I*Sqrt[a])/Sqrt[b])^(3/2
)*(b + a*x^4)))
```

Maple [C] time = 0.021, size = 201, normalized size = 0.9

$$-\frac{x}{ax^4+b}\sqrt{\frac{ax^4+b}{x^4}}\left(-2\,i\sqrt{a}\sqrt{b}\sqrt{-1\left(i\sqrt{a}x^2-\sqrt{b}\right)\frac{1}{\sqrt{b}}}\sqrt{1\left(i\sqrt{a}x^2+\sqrt{b}\right)\frac{1}{\sqrt{b}}}xEllipticF\left(x\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}},i\right)+2\,i\sqrt{a}\sqrt{b}\sqrt{-1\left(i\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^4)^(1/2),x)
```

```
[Out] -((a*x^4+b)/x^4)^(1/2)*x*(-2*I*a^(1/2)*b^(1/2)*(-(I*a^(1/2)*x^2-b
^(1/2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1/2))/b^(1/2))^(1/2)*x*
EllipticF(x*(I*a^(1/2)/b^(1/2))^(1/2),I)+2*I*a^(1/2)*b^(1/2)*(-(I
*a^(1/2)*x^2-b^(1/2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1/2))/b^(
1/2))^(1/2)*x*EllipticE(x*(I*a^(1/2)/b^(1/2))^(1/2),I)+(I*a^(1/2)
/b^(1/2))^(1/2)*x^4*a+(I*a^(1/2)/b^(1/2))^(1/2)*b)/(a*x^4+b)/(I*a
^(1/2)/b^(1/2))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\sqrt{a+\frac{b}{x^4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^4),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a + b/x^4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{\frac{ax^4+b}{x^4}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^4),x, algorithm="fricas")
```

```
[Out] integral(sqrt((a*x^4 + b)/x^4), x)
```

Sympy [A] time = 3.06519, size = 42, normalized size = 0.19

$$-\frac{\sqrt{a}x\Gamma\left(-\frac{1}{4}\right){}_2F_1\left(\begin{matrix}-\frac{1}{2},-\frac{1}{4}\\ \frac{3}{4}\end{matrix}\middle|\frac{be^{i\pi}}{ax^4}\right)}{4\Gamma\left(\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**4)**(1/2),x)
```

```
[Out] -sqrt(a)*x*gamma(-1/4)*hyper((-1/2, -1/4), (3/4,), b*exp_polar(I*
pi)/(a*x**4))/(4*gamma(3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{a + \frac{b}{x^4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^4),x, algorithm="giac")
```

```
[Out] integrate(sqrt(a + b/x^4), x)
```

3.2062 $\int \frac{\sqrt{a+\frac{b}{x^4}}}{x^2} dx$

Optimal. Leaf size=107

$$-\frac{a^{3/4}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{3\sqrt[4]{b}\sqrt{a+\frac{b}{x^4}}}-\frac{\sqrt{a+\frac{b}{x^4}}}{3x}$$

```
[Out] -Sqrt[a + b/x^4]/(3*x) - (a^(3/4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sqr
t[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticF[2*ArcCot[(a^(1/4)*
x)/b^(1/4)], 1/2])/(3*b^(1/4)*Sqrt[a + b/x^4])
```

Rubi [A] time = 0.12151, antiderivative size = 107, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$-\frac{a^{3/4}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{3\sqrt[4]{b}\sqrt{a+\frac{b}{x^4}}}-\frac{\sqrt{a+\frac{b}{x^4}}}{3x}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x^4]/x^2,x]
```

```
[Out] -Sqrt[a + b/x^4]/(3*x) - (a^(3/4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sqr
t[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticF[2*ArcCot[(a^(1/4)*
x)/b^(1/4)], 1/2])/(3*b^(1/4)*Sqrt[a + b/x^4])
```

Rubi in Sympy [A] time = 7.21882, size = 94, normalized size = 0.88

$$-\frac{a^{\frac{3}{4}}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{3\sqrt[4]{b}\sqrt{a+\frac{b}{x^4}}}-\frac{\sqrt{a+\frac{b}{x^4}}}{3x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**4)**(1/2)/x**2,x)
```

```
[Out] -a**(3/4)*sqrt((a + b/x**4)/(sqrt(a) + sqrt(b)/x**2)**2)*(sqrt(a)
 + sqrt(b)/x**2)*elliptic_f(2*atan(b**(1/4)/(a**(1/4)*x)), 1/2)/(
3*b**(1/4)*sqrt(a + b/x**4)) - sqrt(a + b/x**4)/(3*x)
```

Mathematica [C] time = 0.291115, size = 96, normalized size = 0.9

$$\frac{\sqrt{a+\frac{b}{x^4}}\left(-1-\frac{2iax^3\sqrt{\frac{ax^4}{b}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)}{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}(ax^4+b)}\right)}{3x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x^4]/x^2,x]
```

```
[Out] (Sqrt[a + b/x^4]*(-1 - ((2*I)*a*x^3*Sqrt[1 + (a*x^4)/b]*EllipticF
[I*ArcSinh[Sqrt[(I*Sqrt[a])/Sqrt[b]]*x], -1])/(Sqrt[(I*Sqrt[a])/S
qrt[b]]*(b + a*x^4))))/(3*x)
```

Maple [C] time = 0.023, size = 132, normalized size = 1.2

$$-\frac{1}{3x(ax^4+b)}\sqrt{\frac{ax^4+b}{x^4}}\left(-2a\sqrt{-\frac{i\sqrt{a}x^2-\sqrt{b}}{\sqrt{b}}}\sqrt{\frac{i\sqrt{a}x^2+\sqrt{b}}{\sqrt{b}}}EllipticF\left(x\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}},i\right)x^3+\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}}x^4a+\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}}b\right)\frac{1}{\sqrt{i\sqrt{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^4)^(1/2)/x^2,x)
```

```
[Out] -1/3*((a*x^4+b)/x^4)^(1/2)*(-2*a*(-(I*a^(1/2)*x^2-b^(1/2))/b^(1/2
))^(1/2)*((I*a^(1/2)*x^2+b^(1/2))/b^(1/2))^(1/2)*EllipticF(x*(I*a
^(1/2)/b^(1/2))^(1/2),I)*x^3+(I*a^(1/2)/b^(1/2))^(1/2)*x^4*a+(I*a
^(1/2)/b^(1/2))^(1/2)*b)/x/(a*x^4+b)/(I*a^(1/2)/b^(1/2))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+\frac{b}{x^4}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^4)/x^2,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a + b/x^4)/x^2, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{\frac{ax^4+b}{x^4}}}{x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^4)/x^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt((a*x^4 + b)/x^4)/x^2, x)
```

Sympy [A] time = 3.42677, size = 39, normalized size = 0.36

$$-\frac{\sqrt{a}\,\Gamma\left(\frac{1}{4}\right){}_2F_1\left(\begin{matrix}-\frac{1}{2},\frac{1}{4}\\\frac{5}{4}\end{matrix}\middle|\frac{be^{i\pi}}{ax^4}\right)}{4x\,\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**4)**(1/2)/x**2,x)
```

```
[Out] -sqrt(a)*gamma(1/4)*hyper((-1/2, 1/4), (5/4,), b*exp_polar(I*pi)/
(a*x**4))/(4*x*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + \frac{b}{x^4}}}{x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^4)/x^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(a + b/x^4)/x^2, x)
```

3.2063 $\int \frac{\sqrt{a+\frac{b}{x^4}}}{x^4}\,dx$

Optimal. Leaf size=236

$$-\frac{a^{5/4}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{5b^{3/4}\sqrt{a+\frac{b}{x^4}}}+\frac{2a^{5/4}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{5b^{3/4}\sqrt{a+\frac{b}{x^4}}}-\frac{\sqrt{a+\frac{b}{x^4}}}{5x^3}-\frac{2a\sqrt{a+\frac{b}{x^4}}}{5\sqrt{b}x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}$$

```
[Out] -Sqrt[a + b/x^4]/(5*x^3) - (2*a*Sqrt[a + b/x^4])/(5*Sqrt[b]*(Sqrt
[a] + Sqrt[b]/x^2)*x) + (2*a^(5/4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sq
rt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticE[2*ArcCot[(a^(1/4)
*x)/b^(1/4)], 1/2])/(5*b^(3/4)*Sqrt[a + b/x^4]) - (a^(5/4)*Sqrt[(
a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*Ell
ipticF[2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(5*b^(3/4)*Sqrt[a + b
/x^4])
```

Rubi [A] time = 0.30885, antiderivative size = 236, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{a^{5/4}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{5b^{3/4}\sqrt{a+\frac{b}{x^4}}}+\frac{2a^{5/4}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{5b^{3/4}\sqrt{a+\frac{b}{x^4}}}-\frac{\sqrt{a+\frac{b}{x^4}}}{5x^3}-\frac{2a\sqrt{a+\frac{b}{x^4}}}{5\sqrt{b}x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/x^4]/x^4,x]
```

```
[Out] -Sqrt[a + b/x^4]/(5*x^3) - (2*a*Sqrt[a + b/x^4])/(5*Sqrt[b]*(Sqrt
[a] + Sqrt[b]/x^2)*x) + (2*a^(5/4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sq
rt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticE[2*ArcCot[(a^(1/4)
*x)/b^(1/4)], 1/2])/(5*b^(3/4)*Sqrt[a + b/x^4]) - (a^(5/4)*Sqrt[(
a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*Ell
ipticF[2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(5*b^(3/4)*Sqrt[a + b
/x^4])
```

Rubi in Sympy [A] time = 24.3141, size = 211, normalized size = 0.89

$$\frac{2a^{\frac{5}{4}}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{5b^{\frac{3}{4}}\sqrt{a+\frac{b}{x^4}}}-\frac{a^{\frac{5}{4}}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{5b^{\frac{3}{4}}\sqrt{a+\frac{b}{x^4}}}-\frac{2a\sqrt{a+\frac{b}{x^4}}}{5\sqrt{b}x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}-\frac{\sqrt{a+\frac{b}{x^4}}}{5x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**4)**(1/2)/x**4,x)
```

```
[Out] 2*a**(5/4)*sqrt((a + b/x**4)/(sqrt(a) + sqrt(b)/x**2)**2)*(sqrt(a
) + sqrt(b)/x**2)*elliptic_e(2*atan(b**(1/4)/(a**(1/4)*x)), 1/2)/
(5*b**(3/4)*sqrt(a + b/x**4)) - a**(5/4)*sqrt((a + b/x**4)/(sqrt(
a) + sqrt(b)/x**2)**2)*(sqrt(a) + sqrt(b)/x**2)*elliptic_f(2*atan
(b**(1/4)/(a**(1/4)*x)), 1/2)/(5*b**(3/4)*sqrt(a + b/x**4)) - 2*a
*sqrt(a + b/x**4)/(5*sqrt(b)*x*(sqrt(a) + sqrt(b)/x**2)) - sqrt(a
 + b/x**4)/(5*x**3)
```

Mathematica [C] time = 0.829784, size = 138, normalized size = 0.58

$$\frac{1}{5}x^2\sqrt{a+\frac{b}{x^4}}\left(-\frac{2ax^4+b}{bx^5}-\frac{2ia\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\sqrt{\frac{ax^4}{b}+1}\left(E\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)-F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)\right)}{ax^4+b}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/x^4]/x^4,x]
```

```
[Out] (Sqrt[a + b/x^4]*x^2*(-((b + 2*a*x^4)/(b*x^5)) - ((2*I)*a*Sqrt[(I
*Sqrt[a])/Sqrt[b]]*Sqrt[1 + (a*x^4)/b]*(EllipticE[I*ArcSinh[Sqrt[
(I*Sqrt[a])/Sqrt[b]]*x], -1] - EllipticF[I*ArcSinh[Sqrt[(I*Sqrt[a
])/Sqrt[b]]*x], -1]))/(b + a*x^4)))/5
```

Maple [C] time = 0.026, size = 234, normalized size = 1.

$$-\frac{1}{5x^3\left(ax^4+b\right)}\sqrt{\frac{ax^4+b}{x^4}}\left(-2\,ia^{\frac{3}{2}}\sqrt{-1\left(i\sqrt{a}x^2-\sqrt{b}\right)\frac{1}{\sqrt{b}}}\sqrt{1\left(i\sqrt{a}x^2+\sqrt{b}\right)\frac{1}{\sqrt{b}}}x^5 b EllipticF\left(x\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}},i\right)+2\,ia^{\frac{3}{2}}\sqrt{-1\left(\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^4)^(1/2)/x^4,x)
```

```
[Out] -1/5*((a*x^4+b)/x^4)^(1/2)*(-2*I*a^(3/2)*(-(I*a^(1/2)*x^2-b^(1/2)
)/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1/2))/b^(1/2))^(1/2)*x^5*b*El
lipticF(x*(I*a^(1/2)/b^(1/2))^(1/2),I)+2*I*a^(3/2)*(-(I*a^(1/2)*x
^2-b^(1/2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1/2))/b^(1/2))^(1/2
)*x^5*b*EllipticE(x*(I*a^(1/2)/b^(1/2))^(1/2),I)+2*(I*a^(1/2)/b^(
1/2))^(1/2)*b^(1/2)*x^8*a^2+3*(I*a^(1/2)/b^(1/2))^(1/2)*b^(3/2)*x
^4*a+(I*a^(1/2)/b^(1/2))^(1/2)*b^(5/2))/x^3/(a*x^4+b)/b^(3/2)/(I*
a^(1/2)/b^(1/2))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+\frac{b}{x^4}}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^4)/x^4,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a + b/x^4)/x^4, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{\frac{ax^4+b}{x^4}}}{x^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^4)/x^4,x, algorithm="fricas")
```

```
[Out] integral(sqrt((a*x^4 + b)/x^4)/x^4, x)
```

Sympy [A] time = 4.69721, size = 41, normalized size = 0.17

$$-\frac{\sqrt{a}\,\Gamma\left(\frac{3}{4}\right)\,{}_2F_1\left(\begin{matrix}-\frac{1}{2}, \frac{3}{4}\\ \frac{7}{4}\end{matrix}\middle|\frac{be^{i\pi}}{ax^4}\right)}{4x^3\,\Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**4)**(1/2)/x**4,x)
```

```
[Out] -sqrt(a)*gamma(3/4)*hyper((-1/2, 3/4), (7/4,), b*exp_polar(I*pi)/
(a*x**4))/(4*x**3*gamma(7/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + \frac{b}{x^4}}}{x^4}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a + b/x^4)/x^4,x, algorithm="giac")
```

```
[Out] integrate(sqrt(a + b/x^4)/x^4, x)
```

3.2064 $\int \left(a+\frac{b}{x^4}\right)^{3/2} x^3 \, dx$

Optimal. Leaf size=63

$$\frac{1}{4}x^4\left(a+\frac{b}{x^4}\right)^{3/2}-\frac{3}{4}b\sqrt{a+\frac{b}{x^4}}+\frac{3}{4}\sqrt{a}b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)$$

```
[Out] (-3*b*Sqrt[a + b/x^4])/4 + ((a + b/x^4)^(3/2)*x^4)/4 + (3*Sqrt[a]
*b*ArcTanh[Sqrt[a + b/x^4]/Sqrt[a]])/4
```

Rubi [A] time = 0.110076, antiderivative size = 63, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{1}{4}x^4\left(a+\frac{b}{x^4}\right)^{3/2}-\frac{3}{4}b\sqrt{a+\frac{b}{x^4}}+\frac{3}{4}\sqrt{a}b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^4)^(3/2)*x^3,x]
```

```
[Out] (-3*b*Sqrt[a + b/x^4])/4 + ((a + b/x^4)^(3/2)*x^4)/4 + (3*Sqrt[a]
*b*ArcTanh[Sqrt[a + b/x^4]/Sqrt[a]])/4
```

Rubi in Sympy [A] time = 8.87135, size = 56, normalized size = 0.89

$$\frac{3\sqrt{a}b\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)}{4}-\frac{3b\sqrt{a+\frac{b}{x^4}}}{4}+\frac{x^4\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**4)**(3/2)*x**3,x)
```

```
[Out] 3*sqrt(a)*b*atanh(sqrt(a + b/x**4)/sqrt(a))/4 - 3*b*sqrt(a + b/x*
*4)/4 + x**4*(a + b/x**4)**(3/2)/4
```

Mathematica [A] time = 0.0977778, size = 80, normalized size = 1.27

$$\frac{\sqrt{a+\frac{b}{x^4}}\left(\left(ax^4-2b\right)\sqrt{ax^4+b}+3\sqrt{a}bx^2\tanh^{-1}\left(\frac{\sqrt{a}x^2}{\sqrt{ax^4+b}}\right)\right)}{4\sqrt{ax^4+b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^4)^(3/2)*x^3,x]
```

```
[Out] (Sqrt[a + b/x^4]*((-2*b + a*x^4)*Sqrt[b + a*x^4] + 3*Sqrt[a]*b*x^
2*ArcTanh[(Sqrt[a]*x^2)/Sqrt[b + a*x^4]]))/(4*Sqrt[b + a*x^4])
```

Maple [A] time = 0.028, size = 82, normalized size = 1.3

$$\frac{x^4}{4}\left(\frac{ax^4+b}{x^4}\right)^{\frac{3}{2}}\left(ax^4\sqrt{ax^4+b}+3\sqrt{a}\ln\left(x^2\sqrt{a}+\sqrt{ax^4+b}\right)x^2b-2b\sqrt{ax^4+b}\right)\left(ax^4+b\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^4)^(3/2)*x^3,x)
```

```
[Out] 1/4*((a*x^4+b)/x^4)^(3/2)*x^4*(a*x^4*(a*x^4+b)^(1/2)+3*a^(1/2)*ln
(x^2*a^(1/2)+(a*x^4+b)^(1/2))*x^2*b-2*b*(a*x^4+b)^(1/2))/(a*x^4+b
)^(3/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(3/2)*x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.255415, size = 1, normalized size = 0.02

$$\left[\frac{3}{8}\sqrt{a}b\log\left(-2\,ax^4-2\,\sqrt{a}x^4\sqrt{\frac{ax^4+b}{x^4}}-b\right)+\frac{1}{4}\left(ax^4-2\,b\right)\sqrt{\frac{ax^4+b}{x^4}},\ \frac{3}{4}\sqrt{-a}b\arctan\left(\frac{a}{\sqrt{-a}\sqrt{\frac{ax^4+b}{x^4}}}\right)+\frac{1}{4}\left(ax^4-2\,b\right)\sqrt{\frac{ax^4+b}{x^4}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(3/2)*x^3,x, algorithm="fricas")
```

```
[Out] [3/8*sqrt(a)*b*log(-2*a*x^4 - 2*sqrt(a)*x^4*sqrt((a*x^4 + b)/x^4)
 - b) + 1/4*(a*x^4 - 2*b)*sqrt((a*x^4 + b)/x^4), 3/4*sqrt(-a)*b*a
rctan(a/(sqrt(-a)*sqrt((a*x^4 + b)/x^4))) + 1/4*(a*x^4 - 2*b)*sqr
t((a*x^4 + b)/x^4)]
```

Sympy [A] time = 14.6168, size = 95, normalized size = 1.51

$$\frac{3\sqrt{a}b\operatorname{asinh}\left(\frac{\sqrt{a}x^2}{\sqrt{b}}\right)}{4}+\frac{a^2x^6}{4\sqrt{b}\sqrt{\frac{ax^4}{b}+1}}-\frac{a\sqrt{b}x^2}{4\sqrt{\frac{ax^4}{b}+1}}-\frac{b^{\frac{3}{2}}}{2x^2\sqrt{\frac{ax^4}{b}+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**4)**(3/2)*x**3,x)
```

```
[Out] 3*sqrt(a)*b*asinh(sqrt(a)*x**2/sqrt(b))/4 + a**2*x**6/(4*sqrt(b)*
sqrt(a*x**4/b + 1)) - a*sqrt(b)*x**2/(4*sqrt(a*x**4/b + 1)) - b**
(3/2)/(2*x**2*sqrt(a*x**4/b + 1))
```

GIAC/XCAS [A] time = 0.246456, size = 105, normalized size = 1.67

$$\frac{1}{4}\sqrt{ax^4+b}ax^2-\frac{3}{8}\sqrt{a}b\ln\left(\left(\sqrt{a}x^2-\sqrt{ax^4+b}\right)^2\right)+\frac{\sqrt{a}b^2}{\left(\sqrt{a}x^2-\sqrt{ax^4+b}\right)^2-b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(3/2)*x^3,x, algorithm="giac")
```

```
[Out] 1/4*sqrt(a*x^4 + b)*a*x^2 - 3/8*sqrt(a)*b*ln((sqrt(a)*x^2 - sqrt(
a*x^4 + b))^2) + sqrt(a)*b^2/((sqrt(a)*x^2 - sqrt(a*x^4 + b))^2 -
 b)
```

3.2065 $\int \left(a+\frac{b}{x^4}\right)^{3/2} x\,dx$

Optimal. Leaf size=69

$$\frac{1}{2}x^2\left(a+\frac{b}{x^4}\right)^{3/2}-\frac{3b\sqrt{a+\frac{b}{x^4}}}{4x^2}-\frac{3}{4}a\sqrt{b}\tanh^{-1}\left(\frac{\sqrt{b}}{x^2\sqrt{a+\frac{b}{x^4}}}\right)$$

```
[Out] (-3*b*Sqrt[a + b/x^4])/(4*x^2) + ((a + b/x^4)^(3/2)*x^2)/2 - (3*a
*Sqrt[b]*ArcTanh[Sqrt[b]/(Sqrt[a + b/x^4]*x^2)])/4
```

Rubi [A] time = 0.139001, antiderivative size = 69, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.462

$$\frac{1}{2}x^2\left(a+\frac{b}{x^4}\right)^{3/2}-\frac{3b\sqrt{a+\frac{b}{x^4}}}{4x^2}-\frac{3}{4}a\sqrt{b}\tanh^{-1}\left(\frac{\sqrt{b}}{x^2\sqrt{a+\frac{b}{x^4}}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^4)^(3/2)*x,x]
```

```
[Out] (-3*b*Sqrt[a + b/x^4])/(4*x^2) + ((a + b/x^4)^(3/2)*x^2)/2 - (3*a
*Sqrt[b]*ArcTanh[Sqrt[b]/(Sqrt[a + b/x^4]*x^2)])/4
```

Rubi in Sympy [A] time = 9.63545, size = 63, normalized size = 0.91

$$-\frac{3a\sqrt{b}\,\mathrm{atanh}\left(\frac{\sqrt{b}}{x^2\sqrt{a+\frac{b}{x^4}}}\right)}{4}-\frac{3b\sqrt{a+\frac{b}{x^4}}}{4x^2}+\frac{x^2\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**4)**(3/2)*x,x)
```

```
[Out] -3*a*sqrt(b)*atanh(sqrt(b)/(x**2*sqrt(a + b/x**4)))/4 - 3*b*sqrt(
a + b/x**4)/(4*x**2) + x**2*(a + b/x**4)**(3/2)/2
```

Mathematica [A] time = 0.113487, size = 79, normalized size = 1.14

$$-\frac{\sqrt{a+\frac{b}{x^4}}\left(\left(b-2ax^4\right)\sqrt{ax^4+b}+3a\sqrt{b}x^4\tanh^{-1}\left(\frac{\sqrt{ax^4+b}}{\sqrt{b}}\right)\right)}{4x^2\sqrt{ax^4+b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^4)^(3/2)*x,x]
```

```
[Out] -(Sqrt[a + b/x^4]*((b - 2*a*x^4)*Sqrt[b + a*x^4] + 3*a*Sqrt[b]*x^
4*ArcTanh[Sqrt[b + a*x^4]/Sqrt[b]]))/(4*x^2*Sqrt[b + a*x^4])
```

Maple [A] time = 0.026, size = 85, normalized size = 1.2

$$-\frac{x^2}{4}\left(\frac{ax^4+b}{x^4}\right)^{\frac{3}{2}}\left(3\sqrt{b}a\ln\left(2\frac{\sqrt{b}\sqrt{ax^4+b}+b}{x^2}\right)x^4-2ax^4\sqrt{ax^4+b}+b\sqrt{ax^4+b}\right)\left(ax^4+b\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^4)^(3/2)*x,x)
```

```
[Out] -1/4*((a*x^4+b)/x^4)^(3/2)*x^2*(3*b^(1/2)*a*ln(2*(b^(1/2)*(a*x^4+
b)^(1/2)+b)/x^2)*x^4-2*a*x^4*(a*x^4+b)^(1/2)+b*(a*x^4+b)^(1/2))/(
a*x^4+b)^(3/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(3/2)*x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.250062, size = 1, normalized size = 0.01

$$\left[\frac{3a\sqrt{b}x^2\log\left(\frac{ax^4-2\sqrt{b}x^2\sqrt{\frac{ax^4+b}{x^4}}+2b}{x^4}\right)+2\left(2ax^4-b\right)\sqrt{\frac{ax^4+b}{x^4}}}{8x^2},\right.$$
$$\left.-\frac{3a\sqrt{-b}x^2\arctan\left(\frac{x^2\sqrt{\frac{ax^4+b}{x^4}}}{\sqrt{-b}}\right)-\left(2ax^4-b\right)\sqrt{\frac{ax^4+b}{x^4}}}{4x^2}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(3/2)*x,x, algorithm="fricas")
```

```
[Out] [1/8*(3*a*sqrt(b)*x^2*log((a*x^4 - 2*sqrt(b)*x^2*sqrt((a*x^4 + b)
/x^4) + 2*b)/x^4) + 2*(2*a*x^4 - b)*sqrt((a*x^4 + b)/x^4))/x^2, -
1/4*(3*a*sqrt(-b)*x^2*arctan(x^2*sqrt((a*x^4 + b)/x^4)/sqrt(-b))
- (2*a*x^4 - b)*sqrt((a*x^4 + b)/x^4))/x^2]
```

Sympy [A] time = 12.2408, size = 95, normalized size = 1.38

$$\frac{a^{\frac{3}{2}}x^2}{2\sqrt{1+\frac{b}{ax^4}}}+\frac{\sqrt{a}b}{4x^2\sqrt{1+\frac{b}{ax^4}}}-\frac{3a\sqrt{b}\operatorname{asinh}\left(\frac{\sqrt{b}}{\sqrt{a}x^2}\right)}{4}-\frac{b^2}{4\sqrt{a}x^6\sqrt{1+\frac{b}{ax^4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**4)**(3/2)*x,x)
```

```
[Out] a**(3/2)*x**2/(2*sqrt(1 + b/(a*x**4))) + sqrt(a)*b/(4*x**2*sqrt(1
 + b/(a*x**4))) - 3*a*sqrt(b)*asinh(sqrt(b)/(sqrt(a)*x**2))/4 - b
**2/(4*sqrt(a)*x**6*sqrt(1 + b/(a*x**4)))
```

GIAC/XCAS [A] time = 0.224268, size = 77, normalized size = 1.12

$$\frac{1}{4}\left(\frac{3\,b\arctan\left(\frac{\sqrt{ax^4+b}}{\sqrt{-b}}\right)}{\sqrt{-b}}+2\,\sqrt{ax^4+b}-\frac{\sqrt{ax^4+b}b}{ax^4}\right)a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(3/2)*x,x, algorithm="giac")
```

```
[Out] 1/4*(3*b*arctan(sqrt(a*x^4 + b)/sqrt(-b))/sqrt(-b) + 2*sqrt(a*x^4
 + b) - sqrt(a*x^4 + b)*b/(a*x^4))*a
```

3.2066 $\int \frac{\left(a+\frac{b}{x^4}\right)^{3/2}}{x} dx$

Optimal. Leaf size=59

$$\frac{1}{2}a^{3/2}\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)-\frac{1}{2}a\sqrt{a+\frac{b}{x^4}}-\frac{1}{6}\left(a+\frac{b}{x^4}\right)^{3/2}$$

```
[Out] -(a*Sqrt[a + b/x^4])/2 - (a + b/x^4)^(3/2)/6 + (a^(3/2)*ArcTanh[S
qrt[a + b/x^4]/Sqrt[a]])/2
```

Rubi [A] time = 0.103374, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{1}{2}a^{3/2}\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)-\frac{1}{2}a\sqrt{a+\frac{b}{x^4}}-\frac{1}{6}\left(a+\frac{b}{x^4}\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^4)^(3/2)/x,x]
```

```
[Out] -(a*Sqrt[a + b/x^4])/2 - (a + b/x^4)^(3/2)/6 + (a^(3/2)*ArcTanh[S
qrt[a + b/x^4]/Sqrt[a]])/2
```

Rubi in Sympy [A] time = 8.63705, size = 48, normalized size = 0.81

$$\frac{a^{\frac{3}{2}}\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)}{2}-\frac{a\sqrt{a+\frac{b}{x^4}}}{2}-\frac{\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**4)**(3/2)/x,x)
```

```
[Out] a**(3/2)*atanh(sqrt(a + b/x**4)/sqrt(a))/2 - a*sqrt(a + b/x**4)/2
 - (a + b/x**4)**(3/2)/6
```

Mathematica [A] time = 0.0881435, size = 82, normalized size = 1.39

$$\frac{\sqrt{a+\frac{b}{x^4}}\left(3a^{3/2}x^6\tanh^{-1}\left(\frac{\sqrt{a}x^2}{\sqrt{ax^4+b}}\right)-\sqrt{ax^4+b}\left(4ax^4+b\right)\right)}{6x^4\sqrt{ax^4+b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^4)^(3/2)/x,x]
```

```
[Out] (Sqrt[a + b/x^4]*(-(Sqrt[b + a*x^4]*(b + 4*a*x^4)) + 3*a^(3/2)*x^
6*ArcTanh[(Sqrt[a]*x^2)/Sqrt[b + a*x^4]]))/(6*x^4*Sqrt[b + a*x^4]
)
```

Maple [A] time = 0.028, size = 79, normalized size = 1.3

$$\frac{1}{6}\left(\frac{ax^4+b}{x^4}\right)^{\frac{3}{2}}\left(3\,a^{3/2}\ln\left(x^2\sqrt{a}+\sqrt{ax^4+b}\right)x^6-4\,ax^4\sqrt{ax^4+b}-b\sqrt{ax^4+b}\right)\left(ax^4+b\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^4)^(3/2)/x,x)
```

```
[Out] 1/6*((a*x^4+b)/x^4)^(3/2)*(3*a^(3/2)*ln(x^2*a^(1/2)+(a*x^4+b)^(1/
2))*x^6-4*a*x^4*(a*x^4+b)^(1/2)-b*(a*x^4+b)^(1/2))/(a*x^4+b)^(3/2
)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(3/2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.255385, size = 1, normalized size = 0.02

$$\left[\frac{3\,a^{\frac{3}{2}}x^4\log\left(-2\,ax^4-2\,\sqrt{a}x^4\sqrt{\frac{ax^4+b}{x^4}}-b\right)-2\left(4\,ax^4+b\right)\sqrt{\frac{ax^4+b}{x^4}}}{12\,x^4},\ \frac{3\,\sqrt{-a}ax^4\arctan\left(\frac{a}{\sqrt{-a}\sqrt{\frac{ax^4+b}{x^4}}}\right)-\left(4\,ax^4+b\right)\sqrt{\frac{ax^4+b}{x^4}}}{6\,x^4}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(3/2)/x,x, algorithm="fricas")
```

```
[Out] [1/12*(3*a^(3/2)*x^4*log(-2*a*x^4 - 2*sqrt(a)*x^4*sqrt((a*x^4 + b
)/x^4) - b) - 2*(4*a*x^4 + b)*sqrt((a*x^4 + b)/x^4))/x^4, 1/6*(3*
sqrt(-a)*a*x^4*arctan(a/(sqrt(-a)*sqrt((a*x^4 + b)/x^4))) - (4*a*
x^4 + b)*sqrt((a*x^4 + b)/x^4))/x^4]
```

Sympy [A] time = 9.8054, size = 80, normalized size = 1.36

$$-\frac{2a^{\frac{3}{2}}\sqrt{1+\frac{b}{ax^4}}}{3}-\frac{a^{\frac{3}{2}}\log\left(\frac{b}{ax^4}\right)}{4}+\frac{a^{\frac{3}{2}}\log\left(\sqrt{1+\frac{b}{ax^4}}+1\right)}{2}-\frac{\sqrt{a}b\sqrt{1+\frac{b}{ax^4}}}{6x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**4)**(3/2)/x,x)
```

```
[Out] -2*a**(3/2)*sqrt(1 + b/(a*x**4))/3 - a**(3/2)*log(b/(a*x**4))/4 +
 a**(3/2)*log(sqrt(1 + b/(a*x**4)) + 1)/2 - sqrt(a)*b*sqrt(1 + b/
(a*x**4))/(6*x**4)
```

GIAC/XCAS [A] time = 0.238974, size = 68, normalized size = 1.15

$$-\frac{a^{2} \arctan\left(\frac{\sqrt{a+\frac{b}{x^{4}}}}{\sqrt{-a}}\right)}{2 \sqrt{-a}} - \frac{1}{6} \left(a + \frac{b}{x^{4}}\right)^{\frac{3}{2}} - \frac{1}{2} \sqrt{a + \frac{b}{x^{4}}} a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(3/2)/x,x, algorithm="giac")
```

```
[Out] -1/2*a^2*arctan(sqrt(a + b/x^4)/sqrt(-a))/sqrt(-a) - 1/6*(a + b/x
^4)^(3/2) - 1/2*sqrt(a + b/x^4)*a
```

3.2067 $\int \frac{\left(a+\frac{b}{x^4}\right)^{3/2}}{x^3}\,dx$

Optimal. Leaf size=71

$$-\frac{3a^2\tanh^{-1}\left(\frac{\sqrt{b}}{x^2\sqrt{a+\frac{b}{x^4}}}\right)}{16\sqrt{b}}-\frac{3a\sqrt{a+\frac{b}{x^4}}}{16x^2}-\frac{\left(a+\frac{b}{x^4}\right)^{3/2}}{8x^2}$$

```
[Out] (-3*a*Sqrt[a + b/x^4])/(16*x^2) - (a + b/x^4)^(3/2)/(8*x^2) - (3*
a^2*ArcTanh[Sqrt[b]/(Sqrt[a + b/x^4]*x^2)])/(16*Sqrt[b])
```

Rubi [A] time = 0.131929, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{3a^2\tanh^{-1}\left(\frac{\sqrt{b}}{x^2\sqrt{a+\frac{b}{x^4}}}\right)}{16\sqrt{b}}-\frac{3a\sqrt{a+\frac{b}{x^4}}}{16x^2}-\frac{\left(a+\frac{b}{x^4}\right)^{3/2}}{8x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^4)^(3/2)/x^3,x]
```

```
[Out] (-3*a*Sqrt[a + b/x^4])/(16*x^2) - (a + b/x^4)^(3/2)/(8*x^2) - (3*
a^2*ArcTanh[Sqrt[b]/(Sqrt[a + b/x^4]*x^2)])/(16*Sqrt[b])
```

Rubi in Sympy [A] time = 8.35633, size = 66, normalized size = 0.93

$$-\frac{3a^2\operatorname{atanh}\left(\frac{\sqrt{b}}{x^2\sqrt{a+\frac{b}{x^4}}}\right)}{16\sqrt{b}}-\frac{3a\sqrt{a+\frac{b}{x^4}}}{16x^2}-\frac{\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}}{8x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**4)**(3/2)/x**3,x)
```

```
[Out] -3*a**2*atanh(sqrt(b)/(x**2*sqrt(a + b/x**4)))/(16*sqrt(b)) - 3*a
*sqrt(a + b/x**4)/(16*x**2) - (a + b/x**4)**(3/2)/(8*x**2)
```

Mathematica [A] time = 0.141109, size = 70, normalized size = 0.99

$$\frac{\sqrt{a+\frac{b}{x^4}}\left(-\frac{3a^2x^8\tanh^{-1}\left(\frac{\sqrt{ax^4+b}}{\sqrt{b}}\right)}{\sqrt{b}\sqrt{ax^4+b}}-5ax^4-2b\right)}{16x^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^4)^(3/2)/x^3,x]
```

```
[Out] (Sqrt[a + b/x^4]*(-2*b - 5*a*x^4 - (3*a^2*x^8*ArcTanh[Sqrt[b + a*
x^4]/Sqrt[b]])/(Sqrt[b]*Sqrt[b + a*x^4])))/(16*x^6)
```

Maple [A] time = 0.028, size = 93, normalized size = 1.3

$$-\frac{1}{16\,x^{2}}\left(\frac{ax^{4}+b}{x^{4}}\right)^{\frac{3}{2}}\left(3\,a^{2}\ln\left(2\,\frac{\sqrt{b}\sqrt{ax^{4}+b}+b}{x^{2}}\right)x^{8}+5\,a\sqrt{ax^{4}+b}x^{4}\sqrt{b}+2\,b^{3/2}\sqrt{ax^{4}+b}\right)\left(ax^{4}+b\right)^{-\frac{3}{2}}\frac{1}{\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^4)^(3/2)/x^3,x)
```

```
[Out] -1/16*((a*x^4+b)/x^4)^(3/2)/x^2*(3*a^2*ln(2*(b^(1/2)*(a*x^4+b)^(1
/2)+b)/x^2)*x^8+5*a*(a*x^4+b)^(1/2)*x^4*b^(1/2)+2*b^(3/2)*(a*x^4+
b)^(1/2))/(a*x^4+b)^(3/2)/b^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(3/2)/x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.25221, size = 1, normalized size = 0.01

$$\left[\frac{3\,a^{2}\sqrt{b}x^{6}\log\left(-\frac{2\,bx^{2}\sqrt{\frac{ax^{4}+b}{x^{4}}}-(ax^{4}+2\,b)\sqrt{b}}{x^{4}}\right)-2\left(5\,abx^{4}+2\,b^{2}\right)\sqrt{\frac{ax^{4}+b}{x^{4}}}}{32\,bx^{6}},\ -\frac{3\,a^{2}\sqrt{-b}x^{6}\arctan\left(\frac{b}{\sqrt{-b}x^{2}\sqrt{\frac{ax^{4}+b}{x^{4}}}}\right)+\left(5\,abx^{4}+2\,b^{2}\right)\sqrt{\frac{ax^{4}+b}{x^{4}}}}{16\,bx^{6}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(3/2)/x^3,x, algorithm="fricas")
```

```
[Out] [1/32*(3*a^2*sqrt(b)*x^6*log(-(2*b*x^2*sqrt((a*x^4 + b)/x^4) - (a
*x^4 + 2*b)*sqrt(b))/x^4) - 2*(5*a*b*x^4 + 2*b^2)*sqrt((a*x^4 + b
)/x^4))/(b*x^6), -1/16*(3*a^2*sqrt(-b)*x^6*arctan(b/(sqrt(-b)*x^2
*sqrt((a*x^4 + b)/x^4))) + (5*a*b*x^4 + 2*b^2)*sqrt((a*x^4 + b)/x
^4))/(b*x^6)]
```

Sympy [A] time = 13.076, size = 75, normalized size = 1.06

$$-\frac{5a^{\frac{3}{2}}\sqrt{1+\frac{b}{ax^{4}}}}{16x^{2}}-\frac{\sqrt{a}b\sqrt{1+\frac{b}{ax^{4}}}}{8x^{6}}-\frac{3a^{2}\operatorname{asinh}\left(\frac{\sqrt{b}}{\sqrt{a}x^{2}}\right)}{16\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**4)**(3/2)/x**3,x)
```

```
[Out] -5*a**(3/2)*sqrt(1 + b/(a*x**4))/(16*x**2) - sqrt(a)*b*sqrt(1 + b
/(a*x**4))/(8*x**6) - 3*a**2*asinh(sqrt(b)/(sqrt(a)*x**2))/(16*sq
rt(b))
```

GIAC/XCAS [A] time = 0.23397, size = 82, normalized size = 1.15

$$\frac{1}{16}\,a^2\left(\frac{3\,\arctan\left(\frac{\sqrt{ax^4+b}}{\sqrt{-b}}\right)}{\sqrt{-b}}-\frac{5\,\left(ax^4+b\right)^{\frac{3}{2}}-3\,\sqrt{ax^4+b}b}{a^2x^8}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(3/2)/x^3,x, algorithm="giac")
```

```
[Out] 1/16*a^2*(3*arctan(sqrt(a*x^4 + b)/sqrt(-b))/sqrt(-b) - (5*(a*x^4
 + b)^(3/2) - 3*sqrt(a*x^4 + b)*b)/(a^2*x^8))
```

3.2068 $\int \left(a+\frac{b}{x^4}\right)^{3/2} x^2\,dx$

Optimal. Leaf size=126

$$-\frac{2a^{3/4}b^{3/4}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{3\sqrt{a+\frac{b}{x^4}}}-\frac{2b\sqrt{a+\frac{b}{x^4}}}{3x}+\frac{1}{3}x^3\left(a+\frac{b}{x^4}\right)^{3/2}$$

```
[Out] (-2*b*Sqrt[a + b/x^4])/(3*x) + ((a + b/x^4)^(3/2)*x^3)/3 - (2*a^(
3/4)*b^(3/4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a]
 + Sqrt[b]/x^2)*EllipticF[2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(3
*Sqrt[a + b/x^4])
```

Rubi [A] time = 0.164566, antiderivative size = 126, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{2a^{3/4}b^{3/4}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{3\sqrt{a+\frac{b}{x^4}}}-\frac{2b\sqrt{a+\frac{b}{x^4}}}{3x}+\frac{1}{3}x^3\left(a+\frac{b}{x^4}\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^4)^(3/2)*x^2,x]
```

```
[Out] (-2*b*Sqrt[a + b/x^4])/(3*x) + ((a + b/x^4)^(3/2)*x^3)/3 - (2*a^(
3/4)*b^(3/4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a]
 + Sqrt[b]/x^2)*EllipticF[2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(3
*Sqrt[a + b/x^4])
```

Rubi in Sympy [A] time = 10.6396, size = 112, normalized size = 0.89

$$-\frac{2a^{\frac{3}{4}}b^{\frac{3}{4}}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{3\sqrt{a+\frac{b}{x^4}}}-\frac{2b\sqrt{a+\frac{b}{x^4}}}{3x}+\frac{x^3\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**4)**(3/2)*x**2,x)
```

```
[Out] -2*a**(3/4)*b**(3/4)*sqrt((a + b/x**4)/(sqrt(a) + sqrt(b)/x**2)**
2)*(sqrt(a) + sqrt(b)/x**2)*elliptic_f(2*atan(b**(1/4)/(a**(1/4)*
x)), 1/2)/(3*sqrt(a + b/x**4)) - 2*b*sqrt(a + b/x**4)/(3*x) + x**
3*(a + b/x**4)**(3/2)/3
```

Mathematica [C] time = 0.172501, size = 128, normalized size = 1.02

$$\frac{\sqrt{a+\frac{b}{x^4}}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\left(a^2x^8-b^2\right)-4iabx^3\sqrt{\frac{ax^4}{b}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)\right)}{3x\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\left(ax^4+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^4)^(3/2)*x^2,x]
```

```
[Out] (Sqrt[a + b/x^4]*(Sqrt[(I*Sqrt[a])/Sqrt[b]]*(-b^2 + a^2*x^8) - (4
*I)*a*b*x^3*Sqrt[1 + (a*x^4)/b]*EllipticF[I*ArcSinh[Sqrt[(I*Sqrt[
a])/Sqrt[b]]*x], -1]))/(3*Sqrt[(I*Sqrt[a])/Sqrt[b]]*x*(b + a*x^4)
)
```

Maple [C] time = 0.024, size = 138, normalized size = 1.1

$$\frac{x^{3}}{3\left(ax^{4}+b\right)^{2}}\left(\frac{ax^{4}+b}{x^{4}}\right)^{\frac{3}{2}}\left(\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}}x^{8}a^{2}+4\,ab\sqrt{-\frac{i\sqrt{a}x^{2}-\sqrt{b}}{\sqrt{b}}}\sqrt{\frac{i\sqrt{a}x^{2}+\sqrt{b}}{\sqrt{b}}}EllipticF\left(x\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}},i\right)x^{3}-\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}}b^{2}\right)\frac{1}{\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^4)^(3/2)*x^2,x)
```

```
[Out] 1/3*((a*x^4+b)/x^4)^(3/2)*x^3*((I*a^(1/2)/b^(1/2))^(1/2)*x^8*a^2+
4*a*b*(-(I*a^(1/2)*x^2-b^(1/2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^
(1/2))/b^(1/2))^(1/2)*EllipticF(x*(I*a^(1/2)/b^(1/2))^(1/2),I)*x^
3-(I*a^(1/2)/b^(1/2))^(1/2)*b^2)/(a*x^4+b)^2/(I*a^(1/2)/b^(1/2))^
(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\left(a+\frac{b}{x^{4}}\right)^{\frac{3}{2}}x^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(3/2)*x^2,x, algorithm="maxima")
```

```
[Out] integrate((a + b/x^4)^(3/2)*x^2, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\left(ax^{4}+b\right)\sqrt{\frac{ax^{4}+b}{x^{4}}}}{x^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(3/2)*x^2,x, algorithm="fricas")
```

```
[Out] integral((a*x^4 + b)*sqrt((a*x^4 + b)/x^4)/x^2, x)
```

Sympy [A] time = 7.78336, size = 44, normalized size = 0.35

$$-\frac{a^{\frac{3}{2}}x^{3}\,\Gamma\left(-\frac{3}{4}\right){}_{2}F_{1}\left(\left.\begin{matrix}-\frac{3}{2},-\frac{3}{4}\\\frac{1}{4}\end{matrix}\right|\frac{be^{i\pi}}{ax^{4}}\right)}{4\,\Gamma\left(\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**4)**(3/2)*x**2,x)
```

```
[Out] -a**(3/2)*x**3*gamma(-3/4)*hyper((-3/2, -3/4), (1/4,), b*exp_pola
r(I*pi)/(a*x**4))/(4*gamma(1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(a + \frac{b}{x^4}\right)^{\frac{3}{2}} x^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(3/2)*x^2,x, algorithm="giac")
```

```
[Out] integrate((a + b/x^4)^(3/2)*x^2, x)
```

3.2069 $\int \left(a+\frac{b}{x^4}\right)^{3/2} dx$

Optimal. Leaf size=250

$$-\frac{6a^{5/4}\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{5\sqrt{a+\frac{b}{x^4}}}+\frac{12a^{5/4}\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{5\sqrt{a+\frac{b}{x^4}}}+x\left(a+\frac{b}{x^4}\right)^{3/2}-\frac{6b\sqrt{a+\frac{b}{x^4}}}{5x^3}-\frac{12a\sqrt{b}\sqrt{a+\frac{b}{x^4}}}{5x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}$$

```
[Out] (-6*b*Sqrt[a + b/x^4])/(5*x^3) - (12*a*Sqrt[b]*Sqrt[a + b/x^4])/(
5*(Sqrt[a] + Sqrt[b]/x^2)*x) + (a + b/x^4)^(3/2)*x + (12*a^(5/4)*
b^(1/4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sq
rt[b]/x^2)*EllipticE[2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(5*Sqrt
[a + b/x^4]) - (6*a^(5/4)*b^(1/4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sqr
t[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticF[2*ArcCot[(a^(1/4)*
x)/b^(1/4)], 1/2])/(5*Sqrt[a + b/x^4])
```

Rubi [A] time = 0.358019, antiderivative size = 250, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.546

$$-\frac{6a^{5/4}\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{5\sqrt{a+\frac{b}{x^4}}}+\frac{12a^{5/4}\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{5\sqrt{a+\frac{b}{x^4}}}+x\left(a+\frac{b}{x^4}\right)^{3/2}-\frac{6b\sqrt{a+\frac{b}{x^4}}}{5x^3}-\frac{12a\sqrt{b}\sqrt{a+\frac{b}{x^4}}}{5x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^4)^(3/2),x]
```


```
[Out] (-6*b*Sqrt[a + b/x^4])/(5*x^3) - (12*a*Sqrt[b]*Sqrt[a + b/x^4])/(
5*(Sqrt[a] + Sqrt[b]/x^2)*x) + (a + b/x^4)^(3/2)*x + (12*a^(5/4)*
b^(1/4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sq
rt[b]/x^2)*EllipticE[2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(5*Sqrt
[a + b/x^4]) - (6*a^(5/4)*b^(1/4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sqr
t[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticF[2*ArcCot[(a^(1/4)*
x)/b^(1/4)], 1/2])/(5*Sqrt[a + b/x^4])
```

Rubi in Sympy [A] time = 28.2384, size = 228, normalized size = 0.91

$$\frac{12a^{\frac{5}{4}}\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{5\sqrt{a+\frac{b}{x^4}}} - \frac{6a^{\frac{5}{4}}\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{5\sqrt{a+\frac{b}{x^4}}} - \frac{12a\sqrt{b}\sqrt{a+\frac{b}{x^4}}}{5x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)} - \frac{6b\sqrt{a+\frac{b}{x^4}}}{5x^3} + x\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**4)**(3/2),x)
```

```
[Out] 12*a**(5/4)*b**(1/4)*sqrt((a + b/x**4)/(sqrt(a) + sqrt(b)/x**2)**
2)*(sqrt(a) + sqrt(b)/x**2)*elliptic_e(2*atan(b**(1/4)/(a**(1/4)*
x)), 1/2)/(5*sqrt(a + b/x**4)) - 6*a**(5/4)*b**(1/4)*sqrt((a + b/
x**4)/(sqrt(a) + sqrt(b)/x**2)**2)*(sqrt(a) + sqrt(b)/x**2)*ellip
tic_f(2*atan(b**(1/4)/(a**(1/4)*x)), 1/2)/(5*sqrt(a + b/x**4)) -
12*a*sqrt(b)*sqrt(a + b/x**4)/(5*x*(sqrt(a) + sqrt(b)/x**2)) - 6*
b*sqrt(a + b/x**4)/(5*x**3) + x*(a + b/x**4)**(3/2)
```

Mathematica [C] time = 0.307057, size = 196, normalized size = 0.78

$$-\frac{\sqrt{a+\frac{b}{x^4}}\left(12a^{3/2}\sqrt{b}x^5\sqrt{\frac{ax^4}{b}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right) - 12a^{3/2}\sqrt{b}x^5\sqrt{\frac{ax^4}{b}+1}E\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right) + \sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\,(\cdots}{5x^3\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\left(ax^4+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^4)^(3/2),x]
```

```
[Out] -(Sqrt[a + b/x^4]*(Sqrt[(I*Sqrt[a])/Sqrt[b]]*(b^2 + 8*a*b*x^4 + 7
*a^2*x^8) - 12*a^(3/2)*Sqrt[b]*x^5*Sqrt[1 + (a*x^4)/b]*EllipticE[
I*ArcSinh[Sqrt[(I*Sqrt[a])/Sqrt[b]]*x], -1] + 12*a^(3/2)*Sqrt[b]*
x^5*Sqrt[1 + (a*x^4)/b]*EllipticF[I*ArcSinh[Sqrt[(I*Sqrt[a])/Sqrt
[b]]*x], -1]))/(5*Sqrt[(I*Sqrt[a])/Sqrt[b]]*x^3*(b + a*x^4))
```

Maple [C] time = 0.023, size = 228, normalized size = 0.9

$$-\frac{x}{5\left(ax^4+b\right)^2}\left(\frac{ax^4+b}{x^4}\right)^{\frac{3}{2}}\left(-12\,ia^{\frac{3}{2}}\sqrt{b}\sqrt{-1\left(i\sqrt{a}x^2-\sqrt{b}\right)\frac{1}{\sqrt{b}}}\sqrt{1\left(i\sqrt{a}x^2+\sqrt{b}\right)\frac{1}{\sqrt{b}}}x^5 EllipticF\left(x\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}},i\right) + 12\,ia^{\frac{3}{2}}\sqrt{b}\cdots\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^4)^(3/2),x)
```

```
[Out] -1/5*((a*x^4+b)/x^4)^(3/2)*x*(-12*I*a^(3/2)*b^(1/2)*(-(I*a^(1/2)*
x^2-b^(1/2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1/2))/b^(1/2))^(1/
2)*x^5*EllipticF(x*(I*a^(1/2)/b^(1/2))^(1/2),I)+12*I*a^(3/2)*b^(1
/2)*(-(I*a^(1/2)*x^2-b^(1/2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1
/2))/b^(1/2))^(1/2)*x^5*EllipticE(x*(I*a^(1/2)/b^(1/2))^(1/2),I)+
7*(I*a^(1/2)/b^(1/2))^(1/2)*x^8*a^2+8*(I*a^(1/2)/b^(1/2))^(1/2)*x
^4*a*b+(I*a^(1/2)/b^(1/2))^(1/2)*b^2)/(a*x^4+b)^2/(I*a^(1/2)/b^(1
/2))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(a + \frac{b}{x^4}\right)^{\frac{3}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((a + b/x^4)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(ax^4 + b)\sqrt{\frac{ax^4+b}{x^4}}}{x^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(3/2),x, algorithm="fricas")
```

```
[Out] integral((a*x^4 + b)*sqrt((a*x^4 + b)/x^4)/x^4, x)
```

Sympy [A] time = 5.68254, size = 42, normalized size = 0.17

$$-\frac{a^{\frac{3}{2}} x \Gamma\left(-\frac{1}{4}\right) {}_{2}F_{1}\left(\begin{matrix} -\frac{3}{2}, -\frac{1}{4} \\ \frac{3}{4} \end{matrix}\middle| \frac{be^{i\pi}}{ax^4}\right)}{4\Gamma\left(\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**4)**(3/2),x)
```

```
[Out] -a**(3/2)*x*gamma(-1/4)*hyper((-3/2, -1/4), (3/4,), b*exp_polar(I
*pi)/(a*x**4))/(4*gamma(3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(a + \frac{b}{x^4}\right)^{\frac{3}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((a + b/x^4)^(3/2), x)
```

3.2070 $\int \frac{\left(a+\frac{b}{x^4}\right)^{3/2}}{x^2}\,dx$

Optimal. Leaf size=126

$$-\frac{2a^{7/4}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{7\sqrt[4]{b}\sqrt{a+\frac{b}{x^4}}}-\frac{2a\sqrt{a+\frac{b}{x^4}}}{7x}-\frac{\left(a+\frac{b}{x^4}\right)^{3/2}}{7x}$$

```
[Out] (-2*a*Sqrt[a + b/x^4])/(7*x) - (a + b/x^4)^(3/2)/(7*x) - (2*a^(7/
4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]
/x^2)*EllipticF[2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(7*b^(1/4)*S
qrt[a + b/x^4])
```

Rubi [A] time = 0.152631, antiderivative size = 126, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{2a^{7/4}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{7\sqrt[4]{b}\sqrt{a+\frac{b}{x^4}}}-\frac{2a\sqrt{a+\frac{b}{x^4}}}{7x}-\frac{\left(a+\frac{b}{x^4}\right)^{3/2}}{7x}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^4)^(3/2)/x^2,x]
```

```
[Out] (-2*a*Sqrt[a + b/x^4])/(7*x) - (a + b/x^4)^(3/2)/(7*x) - (2*a^(7/
4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]
/x^2)*EllipticF[2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(7*b^(1/4)*S
qrt[a + b/x^4])
```

Rubi in Sympy [A] time = 9.15675, size = 112, normalized size = 0.89

$$-\frac{2a^{\frac{7}{4}}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{7\sqrt[4]{b}\sqrt{a+\frac{b}{x^4}}}-\frac{2a\sqrt{a+\frac{b}{x^4}}}{7x}-\frac{\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}}{7x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**4)**(3/2)/x**2,x)
```

```
[Out] -2*a**(7/4)*sqrt((a + b/x**4)/(sqrt(a) + sqrt(b)/x**2)**2)*(sqrt(
a) + sqrt(b)/x**2)*elliptic_f(2*atan(b**(1/4)/(a**(1/4)*x)), 1/2)
/(7*b**(1/4)*sqrt(a + b/x**4)) - 2*a*sqrt(a + b/x**4)/(7*x) - (a
+ b/x**4)**(3/2)/(7*x)
```

Mathematica [C] time = 0.193086, size = 135, normalized size = 1.07

$$-\frac{\sqrt{a+\frac{b}{x^4}}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\left(3a^2x^8+4abx^4+b^2\right)+4ia^2x^7\sqrt{\frac{ax^4}{b}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)\right)}{7x^5\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\left(ax^4+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^4)^(3/2)/x^2,x]
```

```
[Out] -(Sqrt[a + b/x^4]*(Sqrt[(I*Sqrt[a])/Sqrt[b]]*(b^2 + 4*a*b*x^4 + 3
*a^2*x^8) + (4*I)*a^2*x^7*Sqrt[1 + (a*x^4)/b]*EllipticF[I*ArcSinh
[Sqrt[(I*Sqrt[a])/Sqrt[b]]*x], -1]))/(7*Sqrt[(I*Sqrt[a])/Sqrt[b]]
*x^5*(b + a*x^4))
```

Maple [C] time = 0.028, size = 157, normalized size = 1.3

$$-\frac{1}{7\,x\,(ax^4+b)^2}\left(\frac{ax^4+b}{x^4}\right)^{\frac{3}{2}}\left(-4\,a^2\sqrt{-\frac{i\sqrt{a}x^2-\sqrt{b}}{\sqrt{b}}}\sqrt{\frac{i\sqrt{a}x^2+\sqrt{b}}{\sqrt{b}}}\,EllipticF\left(x\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}},i\right)x^7+3\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x^8a^2+4\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x^4ab+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^4)^(3/2)/x^2,x)
```

```
[Out] -1/7*((a*x^4+b)/x^4)^(3/2)*(-4*a^2*(-(I*a^(1/2)*x^2-b^(1/2))/b^(1
/2))^(1/2)*((I*a^(1/2)*x^2+b^(1/2))/b^(1/2))^(1/2)*EllipticF(x*(I
*a^(1/2)/b^(1/2))^(1/2),I)*x^7+3*(I*a^(1/2)/b^(1/2))^(1/2)*x^8*a^
2+4*(I*a^(1/2)/b^(1/2))^(1/2)*x^4*a*b+(I*a^(1/2)/b^(1/2))^(1/2)*b
^2)/x/(a*x^4+b)^2/(I*a^(1/2)/b^(1/2))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(3/2)/x^2,x, algorithm="maxima")
```

```
[Out] integrate((a + b/x^4)^(3/2)/x^2, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{(ax^4+b)\sqrt{\frac{ax^4+b}{x^4}}}{x^6},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(3/2)/x^2,x, algorithm="fricas")
```

```
[Out] integral((a*x^4 + b)*sqrt((a*x^4 + b)/x^4)/x^6, x)
```

Sympy [A] time = 5.59632, size = 39, normalized size = 0.31

$$-\frac{a^{\frac{3}{2}}\,\Gamma\left(\frac{1}{4}\right)\,{}_2F_1\left(\begin{matrix}-\frac{3}{2},\frac{1}{4}\\ \frac{5}{4}\end{matrix}\middle|\frac{be^{i\pi}}{ax^4}\right)}{4x\,\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**4)**(3/2)/x**2,x)
```

```
[Out] -a**(3/2)*gamma(1/4)*hyper((-3/2, 1/4), (5/4,), b*exp_polar(I*pi)
/(a*x**4))/(4*x*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(a + \frac{b}{x^4}\right)^{\frac{3}{2}}}{x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(3/2)/x^2,x, algorithm="giac")
```

```
[Out] integrate((a + b/x^4)^(3/2)/x^2, x)
```

3.2071 $\int \frac{\left(a+\frac{b}{x^4}\right)^{3/2}}{x^4}\,dx$

Optimal. Leaf size=257

$$-\frac{2a^{9/4}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{15b^{3/4}\sqrt{a+\frac{b}{x^4}}}+\frac{4a^{9/4}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{15b^{3/4}\sqrt{a+\frac{b}{x^4}}}-\frac{4a^2\sqrt{a+\frac{b}{x^4}}}{15\sqrt{b}x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}-\frac{2a\sqrt{a+\frac{b}{x^4}}}{15x^3}-\frac{\left(a+\frac{b}{x^4}\right)^{3/2}}{9x^3}$$

```
[Out] (-2*a*Sqrt[a + b/x^4])/(15*x^3) - (a + b/x^4)^(3/2)/(9*x^3) - (4*
a^2*Sqrt[a + b/x^4])/(15*Sqrt[b]*(Sqrt[a] + Sqrt[b]/x^2)*x) + (4*
a^(9/4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sq
rt[b]/x^2)*EllipticE[2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(15*b^(
3/4)*Sqrt[a + b/x^4]) - (2*a^(9/4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sq
rt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticF[2*ArcCot[(a^(1/4)
*x)/b^(1/4)], 1/2])/(15*b^(3/4)*Sqrt[a + b/x^4])
```

Rubi [A] time = 0.374442, antiderivative size = 257, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{2a^{9/4}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{15b^{3/4}\sqrt{a+\frac{b}{x^4}}}+\frac{4a^{9/4}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{15b^{3/4}\sqrt{a+\frac{b}{x^4}}}-\frac{4a^2\sqrt{a+\frac{b}{x^4}}}{15\sqrt{b}x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}-\frac{2a\sqrt{a+\frac{b}{x^4}}}{15x^3}-\frac{\left(a+\frac{b}{x^4}\right)^{3/2}}{9x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^4)^(3/2)/x^4,x]
```

```
[Out] (-2*a*Sqrt[a + b/x^4])/(15*x^3) - (a + b/x^4)^(3/2)/(9*x^3) - (4*
a^2*Sqrt[a + b/x^4])/(15*Sqrt[b]*(Sqrt[a] + Sqrt[b]/x^2)*x) + (4*
a^(9/4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sq
rt[b]/x^2)*EllipticE[2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(15*b^(
3/4)*Sqrt[a + b/x^4]) - (2*a^(9/4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sq
rt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticF[2*ArcCot[(a^(1/4)
*x)/b^(1/4)], 1/2])/(15*b^(3/4)*Sqrt[a + b/x^4])
```

Rubi in Sympy [A] time = 29.8456, size = 233, normalized size = 0.91

$$\frac{4a^{\frac{9}{4}}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{15b^{\frac{3}{4}}\sqrt{a+\frac{b}{x^4}}}-\frac{2a^{\frac{9}{4}}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{15b^{\frac{3}{4}}\sqrt{a+\frac{b}{x^4}}}-\frac{4a^2\sqrt{a+\frac{b}{x^4}}}{15\sqrt{b}x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}-\frac{2a\sqrt{a+\frac{b}{x^4}}}{15x^3}-\frac{\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}}{9x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**4)**(3/2)/x**4,x)
```

```
[Out] 4*a**(9/4)*sqrt((a + b/x**4)/(sqrt(a) + sqrt(b)/x**2)**2)*(sqrt(a
) + sqrt(b)/x**2)*elliptic_e(2*atan(b**(1/4)/(a**(1/4)*x)), 1/2)/
(15*b**(3/4)*sqrt(a + b/x**4)) - 2*a**(9/4)*sqrt((a + b/x**4)/(sq
rt(a) + sqrt(b)/x**2)**2)*(sqrt(a) + sqrt(b)/x**2)*elliptic_f(2*a
tan(b**(1/4)/(a**(1/4)*x)), 1/2)/(15*b**(3/4)*sqrt(a + b/x**4)) -
 4*a**2*sqrt(a + b/x**4)/(15*sqrt(b)*x*(sqrt(a) + sqrt(b)/x**2))
- 2*a*sqrt(a + b/x**4)/(15*x**3) - (a + b/x**4)**(3/2)/(9*x**3)
```

Mathematica [C] time = 0.339974, size = 213, normalized size = 0.83

$$\frac{x^6\left(a+\frac{b}{x^4}\right)^{3/2}\left(-\frac{4a^2}{15bx}-\frac{11a}{45x^5}-\frac{b}{9x^9}\right)}{ax^4+b}+\frac{4a^{5/2}x^6\left(a+\frac{b}{x^4}\right)^{3/2}\sqrt{1-\frac{i\sqrt{a}x^2}{\sqrt{b}}}\sqrt{1+\frac{i\sqrt{a}x^2}{\sqrt{b}}}\left(E\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)-F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)\right)}{15\sqrt{b}\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\left(ax^4+b\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^4)^(3/2)/x^4,x]
```

```
[Out] ((a + b/x^4)^(3/2)*(-b/(9*x^9) - (11*a)/(45*x^5) - (4*a^2)/(15*b*
x))*x^6)/(b + a*x^4) + (4*a^(5/2)*(a + b/x^4)^(3/2)*x^6*Sqrt[1 -
(I*Sqrt[a]*x^2)/Sqrt[b]]*Sqrt[1 + (I*Sqrt[a]*x^2)/Sqrt[b]]*(Ellip
ticE[I*ArcSinh[Sqrt[(I*Sqrt[a])/Sqrt[b]]*x], -1] - EllipticF[I*Ar
cSinh[Sqrt[(I*Sqrt[a])/Sqrt[b]]*x], -1]))/(15*Sqrt[(I*Sqrt[a])/Sq
rt[b]]*Sqrt[b]*(b + a*x^4)^2)
```

Maple [C] time = 0.031, size = 257, normalized size = 1.

$$-\frac{1}{45x^3\left(ax^4+b\right)^2}\left(\frac{ax^4+b}{x^4}\right)^{\frac{3}{2}}\left(-12\,ia^{\frac{5}{2}}\sqrt{-1\left(i\sqrt{a}x^2-\sqrt{b}\right)\frac{1}{\sqrt{b}}}\sqrt{1\left(i\sqrt{a}x^2+\sqrt{b}\right)\frac{1}{\sqrt{b}}}x^9 b\mathit{EllipticF}\left(x\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}},i\right)+12\,ia^{\frac{5}{2}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^4)^(3/2)/x^4,x)
```

```
[Out] -1/45*((a*x^4+b)/x^4)^(3/2)*(-12*I*a^(5/2)*(-(I*a^(1/2)*x^2-b^(1/
2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1/2))/b^(1/2))^(1/2)*x^9*b*
EllipticF(x*(I*a^(1/2)/b^(1/2))^(1/2),I)+12*I*a^(5/2)*(-(I*a^(1/2
)*x^2-b^(1/2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1/2))/b^(1/2))^(
1/2)*x^9*b*EllipticE(x*(I*a^(1/2)/b^(1/2))^(1/2),I)+12*(I*a^(1/2)
/b^(1/2))^(1/2)*b^(1/2)*x^12*a^3+23*(I*a^(1/2)/b^(1/2))^(1/2)*b^(
3/2)*x^8*a^2+16*(I*a^(1/2)/b^(1/2))^(1/2)*b^(5/2)*x^4*a+5*(I*a^(1
/2)/b^(1/2))^(1/2)*b^(7/2))/x^3/(a*x^4+b)^2/b^(3/2)/(I*a^(1/2)/b^
(1/2))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(3/2)/x^4,x, algorithm="maxima")
```

```
[Out] integrate((a + b/x^4)^(3/2)/x^4, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(ax^4+b)\sqrt{\frac{ax^4+b}{x^4}}}{x^8}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(3/2)/x^4,x, algorithm="fricas")
```

```
[Out] integral((a*x^4 + b)*sqrt((a*x^4 + b)/x^4)/x^8, x)
```

Sympy [A] time = 6.92694, size = 41, normalized size = 0.16

$$-\frac{a^{\frac{3}{2}}\Gamma\left(\frac{3}{4}\right){}_2F_1\left(\begin{matrix}-\frac{3}{2},\frac{3}{4}\\ \frac{7}{4}\end{matrix}\middle|\frac{be^{i\pi}}{ax^4}\right)}{4x^3\Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**4)**(3/2)/x**4,x)
```

```
[Out] -a**(3/2)*gamma(3/4)*hyper((-3/2, 3/4), (7/4,), b*exp_polar(I*pi)
/(a*x**4))/(4*x**3*gamma(7/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(3/2)/x^4,x, algorithm="giac")
```

```
[Out] integrate((a + b/x^4)^(3/2)/x^4, x)
```

3.2072 $\int \left(a+\frac{b}{x^4}\right)^{5/2} x^3\,dx$

Optimal. Leaf size=80

$$\frac{5}{4}a^{3/2}b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)+\frac{1}{4}x^4\left(a+\frac{b}{x^4}\right)^{5/2}-\frac{5}{12}b\left(a+\frac{b}{x^4}\right)^{3/2}-\frac{5}{4}ab\sqrt{a+\frac{b}{x^4}}$$

```
[Out] (-5*a*b*Sqrt[a + b/x^4])/4 - (5*b*(a + b/x^4)^(3/2))/12 + ((a + b
/x^4)^(5/2)*x^4)/4 + (5*a^(3/2)*b*ArcTanh[Sqrt[a + b/x^4]/Sqrt[a]
])/4
```

Rubi [A] time = 0.137096, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{5}{4}a^{3/2}b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)+\frac{1}{4}x^4\left(a+\frac{b}{x^4}\right)^{5/2}-\frac{5}{12}b\left(a+\frac{b}{x^4}\right)^{3/2}-\frac{5}{4}ab\sqrt{a+\frac{b}{x^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^4)^(5/2)*x^3,x]
```

```
[Out] (-5*a*b*Sqrt[a + b/x^4])/4 - (5*b*(a + b/x^4)^(3/2))/12 + ((a + b
/x^4)^(5/2)*x^4)/4 + (5*a^(3/2)*b*ArcTanh[Sqrt[a + b/x^4]/Sqrt[a]
])/4
```

Rubi in Sympy [A] time = 10.9803, size = 73, normalized size = 0.91

$$\frac{5a^{\frac{3}{2}}b\,\mathrm{atanh}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)}{4}-\frac{5ab\sqrt{a+\frac{b}{x^4}}}{4}-\frac{5b\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}}{12}+\frac{x^4\left(a+\frac{b}{x^4}\right)^{\frac{5}{2}}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**4)**(5/2)*x**3,x)
```

```
[Out] 5*a**(3/2)*b*atanh(sqrt(a + b/x**4)/sqrt(a))/4 - 5*a*b*sqrt(a + b
/x**4)/4 - 5*b*(a + b/x**4)**(3/2)/12 + x**4*(a + b/x**4)**(5/2)/
4
```

Mathematica [A] time = 0.118249, size = 95, normalized size = 1.19

$$\frac{\sqrt{a+\frac{b}{x^4}}\left(15a^{3/2}bx^6\tanh^{-1}\left(\frac{\sqrt{a}x^2}{\sqrt{ax^4+b}}\right)+\sqrt{ax^4+b}\left(3a^2x^8-14abx^4-2b^2\right)\right)}{12x^4\sqrt{ax^4+b}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^4)^(5/2)*x^3,x]
```

```
[Out] (Sqrt[a + b/x^4]*(Sqrt[b + a*x^4]*(-2*b^2 - 14*a*b*x^4 + 3*a^2*x^
8) + 15*a^(3/2)*b*x^6*ArcTanh[(Sqrt[a]*x^2)/Sqrt[b + a*x^4]]))/(1
2*x^4*Sqrt[b + a*x^4])
```

Maple [A] time = 0.029, size = 103, normalized size = 1.3

$$\frac{x^4}{12}\left(\frac{ax^4+b}{x^4}\right)^{\frac{5}{2}}\left(15\,a^{3/2}b\ln\left(x^2\sqrt{a}+\sqrt{ax^4+b}\right)x^6+3\,a^2x^8\sqrt{ax^4+b}-14\,ab\sqrt{ax^4+b}x^4-2\,b^2\sqrt{ax^4+b}\right)\left(ax^4+b\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^4)^(5/2)*x^3,x)
```

```
[Out] 1/12*((a*x^4+b)/x^4)^(5/2)*x^4*(15*a^(3/2)*b*ln(x^2*a^(1/2)+(a*x^
4+b)^(1/2))*x^6+3*a^2*x^8*(a*x^4+b)^(1/2)-14*a*b*(a*x^4+b)^(1/2)*
x^4-2*b^2*(a*x^4+b)^(1/2))/(a*x^4+b)^(5/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(5/2)*x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.261971, size = 1, normalized size = 0.01

$$\left[\frac{15\,a^{\frac{3}{2}}bx^4\log\left(-2\,ax^4-2\,\sqrt{a}x^4\sqrt{\frac{ax^4+b}{x^4}}-b\right)+2\left(3\,a^2x^8-14\,abx^4-2\,b^2\right)\sqrt{\frac{ax^4+b}{x^4}}}{24\,x^4},\ \frac{15\,\sqrt{-a}abx^4\arctan\left(\frac{a}{\sqrt{-a}\sqrt{\frac{ax^4+b}{x^4}}}\right)+(3}{12\,x^4}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(5/2)*x^3,x, algorithm="fricas")
```

```
[Out] [1/24*(15*a^(3/2)*b*x^4*log(-2*a*x^4 - 2*sqrt(a)*x^4*sqrt((a*x^4
+ b)/x^4) - b) + 2*(3*a^2*x^8 - 14*a*b*x^4 - 2*b^2)*sqrt((a*x^4 +
 b)/x^4))/x^4, 1/12*(15*sqrt(-a)*a*b*x^4*arctan(a/(sqrt(-a)*sqrt(
(a*x^4 + b)/x^4))) + (3*a^2*x^8 - 14*a*b*x^4 - 2*b^2)*sqrt((a*x^4
 + b)/x^4))/x^4]
```

Sympy [A] time = 26.1637, size = 112, normalized size = 1.4

$$\frac{a^{\frac{5}{2}}x^4\sqrt{1+\frac{b}{ax^4}}}{4}-\frac{7a^{\frac{3}{2}}b\sqrt{1+\frac{b}{ax^4}}}{6}-\frac{5a^{\frac{3}{2}}b\log\left(\frac{b}{ax^4}\right)}{8}+\frac{5a^{\frac{3}{2}}b\log\left(\sqrt{1+\frac{b}{ax^4}}+1\right)}{4}-\frac{\sqrt{a}b^2\sqrt{1+\frac{b}{ax^4}}}{6x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**4)**(5/2)*x**3,x)
```

```
[Out] a**(5/2)*x**4*sqrt(1 + b/(a*x**4))/4 - 7*a**(3/2)*b*sqrt(1 + b/(a
*x**4))/6 - 5*a**(3/2)*b*log(b/(a*x**4))/8 + 5*a**(3/2)*b*log(sqr
t(1 + b/(a*x**4)) + 1)/4 - sqrt(a)*b**2*sqrt(1 + b/(a*x**4))/(6*x
```

```
**4)
```

GIAC/XCAS [A] time = 0.243232, size = 192, normalized size = 2.4

$$\frac{1}{4}\sqrt{ax^4+b}a^2x^2 - \frac{5}{8}a^{\frac{3}{2}}b\ln\left(\left(\sqrt{a}x^2-\sqrt{ax^4+b}\right)^2\right) + \frac{9\left(\sqrt{a}x^2-\sqrt{ax^4+b}\right)^4a^{\frac{3}{2}}b^2 - 12\left(\sqrt{a}x^2-\sqrt{ax^4+b}\right)^2a^{\frac{3}{2}}b^3 + 7a^{\frac{3}{2}}b^4}{3\left(\left(\sqrt{a}x^2-\sqrt{ax^4+b}\right)^2-b\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(5/2)*x^3,x, algorithm="giac")
```

```
[Out] 1/4*sqrt(a*x^4 + b)*a^2*x^2 - 5/8*a^(3/2)*b*ln((sqrt(a)*x^2 - sqr
t(a*x^4 + b))^2) + 1/3*(9*(sqrt(a)*x^2 - sqrt(a*x^4 + b))^4*a^(3/
2)*b^2 - 12*(sqrt(a)*x^2 - sqrt(a*x^4 + b))^2*a^(3/2)*b^3 + 7*a^(
3/2)*b^4)/((sqrt(a)*x^2 - sqrt(a*x^4 + b))^2 - b)^3
```

3.2073 $\int \left(a+\frac{b}{x^4}\right)^{5/2} x\,dx$

Optimal. Leaf size=91

$$-\frac{15}{16}a^2\sqrt{b}\tanh^{-1}\left(\frac{\sqrt{b}}{x^2\sqrt{a+\frac{b}{x^4}}}\right)+\frac{1}{2}x^2\left(a+\frac{b}{x^4}\right)^{5/2}-\frac{5b\left(a+\frac{b}{x^4}\right)^{3/2}}{8x^2}-\frac{15ab\sqrt{a+\frac{b}{x^4}}}{16x^2}$$

```
[Out] (-15*a*b*Sqrt[a + b/x^4])/(16*x^2) - (5*b*(a + b/x^4)^(3/2))/(8*x
^2) + ((a + b/x^4)^(5/2)*x^2)/2 - (15*a^2*Sqrt[b]*ArcTanh[Sqrt[b]
/(Sqrt[a + b/x^4]*x^2)])/16
```

Rubi [A] time = 0.179598, antiderivative size = 91, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.462

$$-\frac{15}{16}a^2\sqrt{b}\tanh^{-1}\left(\frac{\sqrt{b}}{x^2\sqrt{a+\frac{b}{x^4}}}\right)+\frac{1}{2}x^2\left(a+\frac{b}{x^4}\right)^{5/2}-\frac{5b\left(a+\frac{b}{x^4}\right)^{3/2}}{8x^2}-\frac{15ab\sqrt{a+\frac{b}{x^4}}}{16x^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x^4)^(5/2)*x,x]
```

```
[Out] (-15*a*b*Sqrt[a + b/x^4])/(16*x^2) - (5*b*(a + b/x^4)^(3/2))/(8*x
^2) + ((a + b/x^4)^(5/2)*x^2)/2 - (15*a^2*Sqrt[b]*ArcTanh[Sqrt[b]
/(Sqrt[a + b/x^4]*x^2)])/16
```

Rubi in Sympy [A] time = 11.5405, size = 85, normalized size = 0.93

$$-\frac{15a^2\sqrt{b}\,\text{atanh}\left(\frac{\sqrt{b}}{x^2\sqrt{a+\frac{b}{x^4}}}\right)}{16}-\frac{15ab\sqrt{a+\frac{b}{x^4}}}{16x^2}-\frac{5b\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}}{8x^2}+\frac{x^2\left(a+\frac{b}{x^4}\right)^{\frac{5}{2}}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x**4)**(5/2)*x,x)
```

```
[Out] -15*a**2*sqrt(b)*atanh(sqrt(b)/(x**2*sqrt(a + b/x**4)))/16 - 15*a
*b*sqrt(a + b/x**4)/(16*x**2) - 5*b*(a + b/x**4)**(3/2)/(8*x**2)
+ x**2*(a + b/x**4)**(5/2)/2
```

Mathematica [A] time = 0.131894, size = 94, normalized size = 1.03

$$-\frac{\sqrt{a+\frac{b}{x^4}}\left(\sqrt{ax^4+b}\left(-8a^2x^8+9abx^4+2b^2\right)+15a^2\sqrt{b}x^8\tanh^{-1}\left(\frac{\sqrt{ax^4+b}}{\sqrt{b}}\right)\right)}{16x^6\sqrt{ax^4+b}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x^4)^(5/2)*x,x]
```

```
[Out] -(Sqrt[a + b/x^4]*(Sqrt[b + a*x^4]*(2*b^2 + 9*a*b*x^4 - 8*a^2*x^8
) + 15*a^2*Sqrt[b]*x^8*ArcTanh[Sqrt[b + a*x^4]/Sqrt[b]]))/(16*x^6
*Sqrt[b + a*x^4])
```

Maple [A] time = 0.027, size = 108, normalized size = 1.2

$$-\frac{x^2}{16}\left(\frac{ax^4+b}{x^4}\right)^{\frac{5}{2}}\left(15\sqrt{b}a^2\ln\left(2\frac{\sqrt{b}\sqrt{ax^4+b}+b}{x^2}\right)x^8-8a^2x^8\sqrt{ax^4+b}+9ab\sqrt{ax^4+b}x^4+2b^2\sqrt{ax^4+b}\right)\left(ax^4+b\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^4)^(5/2)*x,x)
```

```
[Out] -1/16*((a*x^4+b)/x^4)^(5/2)*x^2*(15*b^(1/2)*a^2*ln(2*(b^(1/2)*(a*
x^4+b)^(1/2)+b)/x^2)*x^8-8*a^2*x^8*(a*x^4+b)^(1/2)+9*a*b*(a*x^4+b
)^(1/2)*x^4+2*b^2*(a*x^4+b)^(1/2))/(a*x^4+b)^(5/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(5/2)*x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.253666, size = 1, normalized size = 0.01

$$\left[\frac{15\,a^2\sqrt{b}x^6\log\left(\frac{ax^4-2\sqrt{b}x^2\sqrt{\frac{ax^4+b}{x^4}}+2\,b}{x^4}\right)+2\left(8\,a^2x^8-9\,abx^4-2\,b^2\right)\sqrt{\frac{ax^4+b}{x^4}}}{32\,x^6},\right.$$
$$\left.-\frac{15\,a^2\sqrt{-b}x^6\arctan\left(\frac{x^2\sqrt{\frac{ax^4+b}{x^4}}}{\sqrt{-b}}\right)-\left(8\,a^2x^8-9\,abx^4-2\,b^2\right)\sqrt{\frac{ax^4+b}{x^4}}}{16\,x^6}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(5/2)*x,x, algorithm="fricas")
```

```
[Out] [1/32*(15*a^2*sqrt(b)*x^6*log((a*x^4 - 2*sqrt(b)*x^2*sqrt((a*x^4
+ b)/x^4) + 2*b)/x^4) + 2*(8*a^2*x^8 - 9*a*b*x^4 - 2*b^2)*sqrt((a
*x^4 + b)/x^4))/x^6, -1/16*(15*a^2*sqrt(-b)*x^6*arctan(x^2*sqrt((
a*x^4 + b)/x^4)/sqrt(-b)) - (8*a^2*x^8 - 9*a*b*x^4 - 2*b^2)*sqrt(
(a*x^4 + b)/x^4))/x^6]
```

Sympy [A] time = 22.2637, size = 124, normalized size = 1.36

$$\frac{a^{\frac{5}{2}}x^2}{2\sqrt{1+\frac{b}{ax^4}}}-\frac{a^{\frac{3}{2}}b}{16x^2\sqrt{1+\frac{b}{ax^4}}}-\frac{11\sqrt{a}b^2}{16x^6\sqrt{1+\frac{b}{ax^4}}}-\frac{15a^2\sqrt{b}\operatorname{asinh}\left(\frac{\sqrt{b}}{\sqrt{a}x^2}\right)}{16}-\frac{b^3}{8\sqrt{a}x^{10}\sqrt{1+\frac{b}{ax^4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**4)**(5/2)*x,x)
```

```
[Out] a**(5/2)*x**2/(2*sqrt(1 + b/(a*x**4))) - a**(3/2)*b/(16*x**2*sqrt
(1 + b/(a*x**4))) - 11*sqrt(a)*b**2/(16*x**6*sqrt(1 + b/(a*x**4))
) - 15*a**2*sqrt(b)*asinh(sqrt(b)/(sqrt(a)*x**2))/16 - b**3/(8*sq
rt(a)*x**10*sqrt(1 + b/(a*x**4)))
```

GIAC/XCAS [A] time = 0.232008, size = 103, normalized size = 1.13

$$\frac{1}{16}\left(\frac{15\,b\arctan\left(\frac{\sqrt{ax^4+b}}{\sqrt{-b}}\right)}{\sqrt{-b}}+8\,\sqrt{ax^4+b}-\frac{9\,\left(ax^4+b\right)^{\frac{3}{2}}b-7\,\sqrt{ax^4+b}b^2}{a^2x^8}\right)a^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(5/2)*x,x, algorithm="giac")
```

```
[Out] 1/16*(15*b*arctan(sqrt(a*x^4 + b)/sqrt(-b))/sqrt(-b) + 8*sqrt(a*x
^4 + b) - (9*(a*x^4 + b)^(3/2)*b - 7*sqrt(a*x^4 + b)*b^2)/(a^2*x^
8))*a^2
```

3.2074 $\int \frac{\left(a+\frac{b}{x^4}\right)^{5/2}}{x} \, dx$

Optimal. Leaf size=77

$$\frac{1}{2}a^{5/2}\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)-\frac{1}{2}a^2\sqrt{a+\frac{b}{x^4}}-\frac{1}{6}a\left(a+\frac{b}{x^4}\right)^{3/2}-\frac{1}{10}\left(a+\frac{b}{x^4}\right)^{5/2}$$

```
[Out] -(a^2*Sqrt[a + b/x^4])/2 - (a*(a + b/x^4)^(3/2))/6 - (a + b/x^4)^
(5/2)/10 + (a^(5/2)*ArcTanh[Sqrt[a + b/x^4]/Sqrt[a]])/2
```

Rubi [A] time = 0.133058, antiderivative size = 77, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{1}{2}a^{5/2}\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)-\frac{1}{2}a^2\sqrt{a+\frac{b}{x^4}}-\frac{1}{6}a\left(a+\frac{b}{x^4}\right)^{3/2}-\frac{1}{10}\left(a+\frac{b}{x^4}\right)^{5/2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x^4)^(5/2)/x,x]
```

```
[Out] -(a^2*Sqrt[a + b/x^4])/2 - (a*(a + b/x^4)^(3/2))/6 - (a + b/x^4)^
(5/2)/10 + (a^(5/2)*ArcTanh[Sqrt[a + b/x^4]/Sqrt[a]])/2
```

Rubi in Sympy [A] time = 10.9971, size = 63, normalized size = 0.82

$$\frac{a^{\frac{5}{2}}\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)}{2}-\frac{a^2\sqrt{a+\frac{b}{x^4}}}{2}-\frac{a\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}}{6}-\frac{\left(a+\frac{b}{x^4}\right)^{\frac{5}{2}}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x**4)**(5/2)/x,x)
```

```
[Out] a**(5/2)*atanh(sqrt(a + b/x**4)/sqrt(a))/2 - a**2*sqrt(a + b/x**4
)/2 - a*(a + b/x**4)**(3/2)/6 - (a + b/x**4)**(5/2)/10
```

Mathematica [A] time = 0.137116, size = 81, normalized size = 1.05

$$\frac{\sqrt{a+\frac{b}{x^4}}\left(\frac{15a^{5/2}x^{10}\tanh^{-1}\left(\frac{\sqrt{a}x^2}{\sqrt{ax^4+b}}\right)}{\sqrt{ax^4+b}}-23a^2x^8-11abx^4-3b^2\right)}{30x^8}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x^4)^(5/2)/x,x]
```

```
[Out] (Sqrt[a + b/x^4]*(-3*b^2 - 11*a*b*x^4 - 23*a^2*x^8 + (15*a^(5/2)*
x^10*ArcTanh[(Sqrt[a]*x^2)/Sqrt[b + a*x^4]])/Sqrt[b + a*x^4]))/(3
0*x^8)
```

Maple [A] time = 0.028, size = 99, normalized size = 1.3

$$\frac{1}{30}\left(\frac{ax^4+b}{x^4}\right)^{\frac{5}{2}}\left(15\,a^{5/2}\ln\left(x^2\sqrt{a}+\sqrt{ax^4+b}\right)x^{10}-23\,a^2x^8\sqrt{ax^4+b}-11\,ab\sqrt{ax^4+b}x^4-3\,b^2\sqrt{ax^4+b}\right)\left(ax^4+b\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^4)^(5/2)/x,x)
```

```
[Out] 1/30*((a*x^4+b)/x^4)^(5/2)*(15*a^(5/2)*ln(x^2*a^(1/2)+(a*x^4+b)^(
1/2))*x^10-23*a^2*x^8*(a*x^4+b)^(1/2)-11*a*b*(a*x^4+b)^(1/2)*x^4-
3*b^2*(a*x^4+b)^(1/2))/(a*x^4+b)^(5/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(5/2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.264653, size = 1, normalized size = 0.01

$$\left[\frac{15\,a^{\frac{5}{2}}x^8\log\left(-2\,ax^4-2\,\sqrt{a}x^4\sqrt{\frac{ax^4+b}{x^4}}-b\right)-2\left(23\,a^2x^8+11\,abx^4+3\,b^2\right)\sqrt{\frac{ax^4+b}{x^4}}}{60\,x^8},\ \frac{15\,\sqrt{-a}a^2x^8\arctan\left(\frac{a}{\sqrt{-a}\sqrt{\frac{ax^4+b}{x^4}}}\right)-(23}{30\,x^8}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(5/2)/x,x, algorithm="fricas")
```

```
[Out] [1/60*(15*a^(5/2)*x^8*log(-2*a*x^4 - 2*sqrt(a)*x^4*sqrt((a*x^4 +
b)/x^4) - b) - 2*(23*a^2*x^8 + 11*a*b*x^4 + 3*b^2)*sqrt((a*x^4 +
b)/x^4))/x^8, 1/30*(15*sqrt(-a)*a^2*x^8*arctan(a/(sqrt(-a)*sqrt((
a*x^4 + b)/x^4))) - (23*a^2*x^8 + 11*a*b*x^4 + 3*b^2)*sqrt((a*x^4
 + b)/x^4))/x^8]
```

Sympy [A] time = 19.1706, size = 107, normalized size = 1.39

$$-\frac{23a^{\frac{5}{2}}\sqrt{1+\frac{b}{ax^4}}}{30}-\frac{a^{\frac{5}{2}}\log\left(\frac{b}{ax^4}\right)}{4}+\frac{a^{\frac{5}{2}}\log\left(\sqrt{1+\frac{b}{ax^4}}+1\right)}{2}-\frac{11a^{\frac{3}{2}}b\sqrt{1+\frac{b}{ax^4}}}{30x^4}-\frac{\sqrt{a}b^2\sqrt{1+\frac{b}{ax^4}}}{10x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**4)**(5/2)/x,x)
```

```
[Out] -23*a**(5/2)*sqrt(1 + b/(a*x**4))/30 - a**(5/2)*log(b/(a*x**4))/4
 + a**(5/2)*log(sqrt(1 + b/(a*x**4)) + 1)/2 - 11*a**(3/2)*b*sqrt(
1 + b/(a*x**4))/(30*x**4) - sqrt(a)*b**2*sqrt(1 + b/(a*x**4))/(10
*x**8)
```

GIAC/XCAS [A] time = 0.23573, size = 86, normalized size = 1.12

$$-\frac{a^{3}\arctan\left(\frac{\sqrt{a+\frac{b}{x^{4}}}}{\sqrt{-a}}\right)}{2\sqrt{-a}}-\frac{1}{10}\left(a+\frac{b}{x^{4}}\right)^{\frac{5}{2}}-\frac{1}{6}\left(a+\frac{b}{x^{4}}\right)^{\frac{3}{2}}a-\frac{1}{2}\sqrt{a+\frac{b}{x^{4}}}a^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(5/2)/x,x, algorithm="giac")
```

```
[Out] -1/2*a^3*arctan(sqrt(a + b/x^4)/sqrt(-a))/sqrt(-a) - 1/10*(a + b/
x^4)^(5/2) - 1/6*(a + b/x^4)^(3/2)*a - 1/2*sqrt(a + b/x^4)*a^2
```

3.2075 $\int \frac{\left(a+\frac{b}{x^4}\right)^{5/2}}{x^3} \, dx$

Optimal. Leaf size=92

$$-\frac{5a^3\tanh^{-1}\left(\frac{\sqrt{b}}{x^2\sqrt{a+\frac{b}{x^4}}}\right)}{32\sqrt{b}}-\frac{5a^2\sqrt{a+\frac{b}{x^4}}}{32x^2}-\frac{5a\left(a+\frac{b}{x^4}\right)^{3/2}}{48x^2}-\frac{\left(a+\frac{b}{x^4}\right)^{5/2}}{12x^2}$$

```
[Out] (-5*a^2*Sqrt[a + b/x^4])/(32*x^2) - (5*a*(a + b/x^4)^(3/2))/(48*x
^2) - (a + b/x^4)^(5/2)/(12*x^2) - (5*a^3*ArcTanh[Sqrt[b]/(Sqrt[a
 + b/x^4]*x^2)])/(32*Sqrt[b])
```

Rubi [A] time = 0.165975, antiderivative size = 92, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{5a^3\tanh^{-1}\left(\frac{\sqrt{b}}{x^2\sqrt{a+\frac{b}{x^4}}}\right)}{32\sqrt{b}}-\frac{5a^2\sqrt{a+\frac{b}{x^4}}}{32x^2}-\frac{5a\left(a+\frac{b}{x^4}\right)^{3/2}}{48x^2}-\frac{\left(a+\frac{b}{x^4}\right)^{5/2}}{12x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^4)^(5/2)/x^3,x]
```

```
[Out] (-5*a^2*Sqrt[a + b/x^4])/(32*x^2) - (5*a*(a + b/x^4)^(3/2))/(48*x
^2) - (a + b/x^4)^(5/2)/(12*x^2) - (5*a^3*ArcTanh[Sqrt[b]/(Sqrt[a
 + b/x^4]*x^2)])/(32*Sqrt[b])
```

Rubi in Sympy [A] time = 10.0874, size = 87, normalized size = 0.95

$$-\frac{5a^3\operatorname{atanh}\left(\frac{\sqrt{b}}{x^2\sqrt{a+\frac{b}{x^4}}}\right)}{32\sqrt{b}}-\frac{5a^2\sqrt{a+\frac{b}{x^4}}}{32x^2}-\frac{5a\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}}{48x^2}-\frac{\left(a+\frac{b}{x^4}\right)^{\frac{5}{2}}}{12x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**4)**(5/2)/x**3,x)
```

```
[Out] -5*a**3*atanh(sqrt(b)/(x**2*sqrt(a + b/x**4)))/(32*sqrt(b)) - 5*a
**2*sqrt(a + b/x**4)/(32*x**2) - 5*a*(a + b/x**4)**(3/2)/(48*x**2
) - (a + b/x**4)**(5/2)/(12*x**2)
```

Mathematica [A] time = 0.170989, size = 81, normalized size = 0.88

$$\frac{\sqrt{a+\frac{b}{x^4}}\left(-\frac{15a^3x^{12}\tanh^{-1}\left(\frac{\sqrt{ax^4+b}}{\sqrt{b}}\right)}{\sqrt{b}\sqrt{ax^4+b}}-33a^2x^8-26abx^4-8b^2\right)}{96x^{10}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^4)^(5/2)/x^3,x]
```

```
[Out] (Sqrt[a + b/x^4]*(-8*b^2 - 26*a*b*x^4 - 33*a^2*x^8 - (15*a^3*x^12
*ArcTanh[Sqrt[b + a*x^4]/Sqrt[b]])/(Sqrt[b]*Sqrt[b + a*x^4])))/(9
```

```
6*x^10)
```

Maple [A] time = 0.031, size = 113, normalized size = 1.2

$$-\frac{1}{96\,x^2}\left(\frac{ax^4+b}{x^4}\right)^{\frac{5}{2}}\left(15\,a^3\ln\left(2\,\frac{\sqrt{b}\sqrt{ax^4+b}+b}{x^2}\right)x^{12}+33\,a^2\sqrt{ax^4+b}\sqrt{b}x^8+26\,b^{3/2}a\sqrt{ax^4+b}x^4+8\,b^{5/2}\sqrt{ax^4+b}\right)(ax^4\cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^4)^(5/2)/x^3,x)
```

```
[Out] -1/96*((a*x^4+b)/x^4)^(5/2)/x^2*(15*a^3*ln(2*(b^(1/2)*(a*x^4+b)^(
1/2)+b)/x^2)*x^12+33*a^2*(a*x^4+b)^(1/2)*b^(1/2)*x^8+26*b^(3/2)*a
*(a*x^4+b)^(1/2)*x^4+8*b^(5/2)*(a*x^4+b)^(1/2))/(a*x^4+b)^(5/2)/b
^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(5/2)/x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.252581, size = 1, normalized size = 0.01

$$\left[\frac{15\,a^3\sqrt{b}x^{10}\log\left(-\frac{2\,bx^2\sqrt{\frac{ax^4+b}{x^4}}-(ax^4+2\,b)\sqrt{b}}{x^4}\right)-2\left(33\,a^2bx^8+26\,ab^2x^4+8\,b^3\right)\sqrt{\frac{ax^4+b}{x^4}}}{192\,bx^{10}},\ -\frac{15\,a^3\sqrt{-b}x^{10}\arctan\left(\frac{b}{\sqrt{-b}x^2\sqrt{\frac{ax^4+b}{x^4}}}\right)+\left(33\,a^2bx^8+26\,ab^2x^4+8\,b^3\right)\sqrt{\frac{ax^4+b}{x^4}}}{96\,bx^{10}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(5/2)/x^3,x, algorithm="fricas")
```

```
[Out] [1/192*(15*a^3*sqrt(b)*x^10*log(-(2*b*x^2*sqrt((a*x^4 + b)/x^4) -
 (a*x^4 + 2*b)*sqrt(b))/x^4) - 2*(33*a^2*b*x^8 + 26*a*b^2*x^4 + 8
*b^3)*sqrt((a*x^4 + b)/x^4))/(b*x^10), -1/96*(15*a^3*sqrt(-b)*x^1
0*arctan(b/(sqrt(-b)*x^2*sqrt((a*x^4 + b)/x^4))) + (33*a^2*b*x^8
+ 26*a*b^2*x^4 + 8*b^3)*sqrt((a*x^4 + b)/x^4))/(b*x^10)]
```

Sympy [A] time = 22.0288, size = 102, normalized size = 1.11

$$-\frac{11a^{\frac{5}{2}}\sqrt{1+\frac{b}{ax^4}}}{32x^2}-\frac{13a^{\frac{3}{2}}b\sqrt{1+\frac{b}{ax^4}}}{48x^6}-\frac{\sqrt{a}b^2\sqrt{1+\frac{b}{ax^4}}}{12x^{10}}-\frac{5a^3\operatorname{asinh}\left(\frac{\sqrt{b}}{\sqrt{a}x^2}\right)}{32\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a+b/x**4)**(5/2)/x**3,x)
```

```
[Out] -11*a**(5/2)*sqrt(1 + b/(a*x**4))/(32*x**2) - 13*a**(3/2)*b*sqrt(
1 + b/(a*x**4))/(48*x**6) - sqrt(a)*b**2*sqrt(1 + b/(a*x**4))/(12
*x**10) - 5*a**3*asinh(sqrt(b)/(sqrt(a)*x**2))/(32*sqrt(b))
```

GIAC/XCAS [A] time = 0.23276, size = 101, normalized size = 1.1

$$\frac{1}{96}\,a^3\left(\frac{15\,\arctan\left(\frac{\sqrt{ax^4+b}}{\sqrt{-b}}\right)}{\sqrt{-b}}-\frac{33\,\left(ax^4+b\right)^{\frac{5}{2}}-40\,\left(ax^4+b\right)^{\frac{3}{2}}b+15\,\sqrt{ax^4+b}b^2}{a^3x^{12}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a + b/x^4)^(5/2)/x^3,x, algorithm="giac")
```

```
[Out] 1/96*a^3*(15*arctan(sqrt(a*x^4 + b)/sqrt(-b))/sqrt(-b) - (33*(a*x
^4 + b)^(5/2) - 40*(a*x^4 + b)^(3/2)*b + 15*sqrt(a*x^4 + b)*b^2)/
(a^3*x^12))
```

3.2076 $\int \left(a+\frac{b}{x^4}\right)^{5/2} x^2\,dx$

Optimal. Leaf size=146

$$-\frac{20a^{7/4}b^{3/4}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{21\sqrt{a+\frac{b}{x^4}}}-\frac{10b\left(a+\frac{b}{x^4}\right)^{3/2}}{21x}-\frac{20ab\sqrt{a+\frac{b}{x^4}}}{21x}+\frac{1}{3}x^3\left(a+\frac{b}{x^4}\right)^{5/2}$$

```
[Out] (-20*a*b*Sqrt[a + b/x^4])/(21*x) - (10*b*(a + b/x^4)^(3/2))/(21*x
) + ((a + b/x^4)^(5/2)*x^3)/3 - (20*a^(7/4)*b^(3/4)*Sqrt[(a + b/x
^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticF[
2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(21*Sqrt[a + b/x^4])
```

Rubi [A] time = 0.198572, antiderivative size = 146, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{20a^{7/4}b^{3/4}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{21\sqrt{a+\frac{b}{x^4}}}-\frac{10b\left(a+\frac{b}{x^4}\right)^{3/2}}{21x}-\frac{20ab\sqrt{a+\frac{b}{x^4}}}{21x}+\frac{1}{3}x^3\left(a+\frac{b}{x^4}\right)^{5/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^4)^(5/2)*x^2,x]
```


```
[Out] (-20*a*b*Sqrt[a + b/x^4])/(21*x) - (10*b*(a + b/x^4)^(3/2))/(21*x
) + ((a + b/x^4)^(5/2)*x^3)/3 - (20*a^(7/4)*b^(3/4)*Sqrt[(a + b/x
^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticF[
2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(21*Sqrt[a + b/x^4])
```

Rubi in Sympy [A] time = 12.6947, size = 131, normalized size = 0.9

$$-\frac{20a^{\frac{7}{4}}b^{\frac{3}{4}}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{21\sqrt{a+\frac{b}{x^4}}}-\frac{20ab\sqrt{a+\frac{b}{x^4}}}{21x}-\frac{10b\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}}{21x}+\frac{x^3\left(a+\frac{b}{x^4}\right)^{\frac{5}{2}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**4)**(5/2)*x**2,x)
```

```
[Out] -20*a**(7/4)*b**(3/4)*sqrt((a + b/x**4)/(sqrt(a) + sqrt(b)/x**2)*
*2)*(sqrt(a) + sqrt(b)/x**2)*elliptic_f(2*atan(b**(1/4)/(a**(1/4)
*x)), 1/2)/(21*sqrt(a + b/x**4)) - 20*a*b*sqrt(a + b/x**4)/(21*x)
 - 10*b*(a + b/x**4)**(3/2)/(21*x) + x**3*(a + b/x**4)**(5/2)/3
```

Mathematica [C] time = 0.238476, size = 149, normalized size = 1.02

$$\frac{\sqrt{a+\frac{b}{x^4}}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\left(7a^3x^{12}-9a^2bx^8-19ab^2x^4-3b^3\right)-40ia^2bx^7\sqrt{\frac{ax^4}{b}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)\right)}{21x^5\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\left(ax^4+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^4)^(5/2)*x^2,x]
```

```
[Out] (Sqrt[a + b/x^4]*(Sqrt[(I*Sqrt[a])/Sqrt[b]]*(-3*b^3 - 19*a*b^2*x^
4 - 9*a^2*b*x^8 + 7*a^3*x^12) - (40*I)*a^2*b*x^7*Sqrt[1 + (a*x^4)
/b]*EllipticF[I*ArcSinh[Sqrt[(I*Sqrt[a])/Sqrt[b]]*x], -1]))/(21*S
qrt[(I*Sqrt[a])/Sqrt[b]]*x^5*(b + a*x^4))
```

Maple [C] time = 0.027, size = 181, normalized size = 1.2

$$\frac{x^3}{21\left(ax^4+b\right)^3}\left(\frac{ax^4+b}{x^4}\right)^{\frac{5}{2}}\left(7\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x^{12}a^3+40\,a^2b\sqrt{-\frac{i\sqrt{a}x^2-\sqrt{b}}{\sqrt{b}}}\sqrt{\frac{i\sqrt{a}x^2+\sqrt{b}}{\sqrt{b}}}\mathit{EllipticF}\left(x\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}},i\right)x^7-9\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x^8a^2b-\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^4)^(5/2)*x^2,x)
```

```
[Out] 1/21*((a*x^4+b)/x^4)^(5/2)*x^3*(7*(I*a^(1/2)/b^(1/2))^(1/2)*x^12*
a^3+40*a^2*b*(-(I*a^(1/2)*x^2-b^(1/2))/b^(1/2))^(1/2)*((I*a^(1/2)
*x^2+b^(1/2))/b^(1/2))^(1/2)*EllipticF(x*(I*a^(1/2)/b^(1/2))^(1/2
),I)*x^7-9*(I*a^(1/2)/b^(1/2))^(1/2)*x^8*a^2*b-19*(I*a^(1/2)/b^(1
/2))^(1/2)*x^4*a*b^2-3*(I*a^(1/2)/b^(1/2))^(1/2)*b^3)/(a*x^4+b)^3
/(I*a^(1/2)/b^(1/2))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\left(a+\frac{b}{x^4}\right)^{\frac{5}{2}}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(5/2)*x^2,x, algorithm="maxima")
```

```
[Out] integrate((a + b/x^4)^(5/2)*x^2, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$${\rm integral}\left(\frac{\left(a^2x^8+2\,abx^4+b^2\right)\sqrt{\frac{ax^4+b}{x^4}}}{x^6},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(5/2)*x^2,x, algorithm="fricas")
```

```
[Out] integral((a^2*x^8 + 2*a*b*x^4 + b^2)*sqrt((a*x^4 + b)/x^4)/x^6, x
)
```

Sympy [A] time = 15.6653, size = 44, normalized size = 0.3

$$-\frac{a^{\frac{5}{2}}x^3\Gamma\left(-\frac{3}{4}\right){}_2F_1\left(\begin{matrix}-\frac{5}{2},-\frac{3}{4}\\ \frac{1}{4}\end{matrix}\middle|\frac{be^{i\pi}}{ax^4}\right)}{4\Gamma\left(\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**4)**(5/2)*x**2,x)
```

```
[Out] -a**(5/2)*x**3*gamma(-3/4)*hyper((-5/2, -3/4), (1/4,), b*exp_pola
r(I*pi)/(a*x**4))/(4*gamma(1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\left(a+\frac{b}{x^4}\right)^{\frac{5}{2}}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(5/2)*x^2,x, algorithm="giac")
```

```
[Out] integrate((a + b/x^4)^(5/2)*x^2, x)
```

3.2077 $\int \left(a+\frac{b}{x^4}\right)^{5/2} dx$

Optimal. Leaf size=272

$$-\frac{4a^{9/4}\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{3\sqrt{a+\frac{b}{x^4}}}+\frac{8a^{9/4}\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{3\sqrt{a+\frac{b}{x^4}}}-\frac{8a^2\sqrt{b}\sqrt{a+\frac{b}{x^4}}}{3x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}+x\left(a+\frac{b}{x^4}\right)^{5/2}-\frac{10b\left(a+\frac{b}{x^4}\right)^{3/2}}{9x^3}-\frac{4ab\sqrt{a+\frac{b}{x^4}}}{3x^3}$$

```
[Out] (-4*a*b*Sqrt[a + b/x^4])/(3*x^3) - (10*b*(a + b/x^4)^(3/2))/(9*x^
3) - (8*a^2*Sqrt[b]*Sqrt[a + b/x^4])/(3*(Sqrt[a] + Sqrt[b]/x^2)*x
) + (a + b/x^4)^(5/2)*x + (8*a^(9/4)*b^(1/4)*Sqrt[(a + b/x^4)/(Sq
rt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticE[2*ArcCo
t[(a^(1/4)*x)/b^(1/4)], 1/2])/(3*Sqrt[a + b/x^4]) - (4*a^(9/4)*b^
(1/4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt
[b]/x^2)*EllipticF[2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(3*Sqrt[a
 + b/x^4])
```

Rubi [A] time = 0.447423, antiderivative size = 272, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.546

$$-\frac{4a^{9/4}\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{3\sqrt{a+\frac{b}{x^4}}}+\frac{8a^{9/4}\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{3\sqrt{a+\frac{b}{x^4}}}-\frac{8a^2\sqrt{b}\sqrt{a+\frac{b}{x^4}}}{3x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}+x\left(a+\frac{b}{x^4}\right)^{5/2}-\frac{10b\left(a+\frac{b}{x^4}\right)^{3/2}}{9x^3}-\frac{4ab\sqrt{a+\frac{b}{x^4}}}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^4)^(5/2),x]
```


```
[Out] (-4*a*b*Sqrt[a + b/x^4])/(3*x^3) - (10*b*(a + b/x^4)^(3/2))/(9*x^
3) - (8*a^2*Sqrt[b]*Sqrt[a + b/x^4])/(3*(Sqrt[a] + Sqrt[b]/x^2)*x
) + (a + b/x^4)^(5/2)*x + (8*a^(9/4)*b^(1/4)*Sqrt[(a + b/x^4)/(Sq
rt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticE[2*ArcCo
t[(a^(1/4)*x)/b^(1/4)], 1/2])/(3*Sqrt[a + b/x^4]) - (4*a^(9/4)*b^
(1/4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt
[b]/x^2)*EllipticF[2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(3*Sqrt[a
 + b/x^4])
```

Rubi in Sympy [A] time = 33.9662, size = 250, normalized size = 0.92

$$\frac{8a^{\frac{9}{4}}\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{3\sqrt{a+\frac{b}{x^4}}} - \frac{4a^{\frac{9}{4}}\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{3\sqrt{a+\frac{b}{x^4}}} - \frac{8a^2\sqrt{b}\sqrt{a+\frac{b}{x^4}}}{3x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)} - \frac{4ab\sqrt{a+\frac{b}{x^4}}}{3x^3} - \frac{10b\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}}{9x^3} + x\left(a+\frac{b}{x^4}\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**4)**(5/2),x)
```

```
[Out] 8*a**(9/4)*b**(1/4)*sqrt((a + b/x**4)/(sqrt(a) + sqrt(b)/x**2)**2
)*(sqrt(a) + sqrt(b)/x**2)*elliptic_e(2*atan(b**(1/4)/(a**(1/4)*x
)), 1/2)/(3*sqrt(a + b/x**4)) - 4*a**(9/4)*b**(1/4)*sqrt((a + b/x
**4)/(sqrt(a) + sqrt(b)/x**2)**2)*(sqrt(a) + sqrt(b)/x**2)*ellipt
ic_f(2*atan(b**(1/4)/(a**(1/4)*x)), 1/2)/(3*sqrt(a + b/x**4)) - 8
*a**2*sqrt(b)*sqrt(a + b/x**4)/(3*x*(sqrt(a) + sqrt(b)/x**2)) - 4
*a*b*sqrt(a + b/x**4)/(3*x**3) - 10*b*(a + b/x**4)**(3/2)/(9*x**3
) + x*(a + b/x**4)**(5/2)
```

Mathematica [C] time = 0.333811, size = 207, normalized size = 0.76

$$-\frac{\sqrt{a+\frac{b}{x^4}}\left(24a^{5/2}\sqrt{b}x^9\sqrt{\frac{ax^4}{b}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)-24a^{5/2}\sqrt{b}x^9\sqrt{\frac{ax^4}{b}+1}E\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)+\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\left(\right.}{9x^7\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\left(ax^4+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^4)^(5/2),x]
```

```
[Out] -(Sqrt[a + b/x^4]*(Sqrt[(I*Sqrt[a])/Sqrt[b]]*(b^3 + 5*a*b^2*x^4 +
 19*a^2*b*x^8 + 15*a^3*x^12) - 24*a^(5/2)*Sqrt[b]*x^9*Sqrt[1 + (a
*x^4)/b]*EllipticE[I*ArcSinh[Sqrt[(I*Sqrt[a])/Sqrt[b]]*x], -1] +
24*a^(5/2)*Sqrt[b]*x^9*Sqrt[1 + (a*x^4)/b]*EllipticF[I*ArcSinh[Sq
rt[(I*Sqrt[a])/Sqrt[b]]*x], -1]))/(9*Sqrt[(I*Sqrt[a])/Sqrt[b]]*x^
7*(b + a*x^4))
```

Maple [C] time = 0.028, size = 250, normalized size = 0.9

$$-\frac{x}{9\left(ax^4+b\right)^3}\left(\frac{ax^4+b}{x^4}\right)^{\frac{5}{2}}\left(24\,ia^{\frac{5}{2}}\sqrt{b}\sqrt{-1\left(i\sqrt{a}x^2-\sqrt{b}\right)\frac{1}{\sqrt{b}}}\sqrt{1\left(i\sqrt{a}x^2+\sqrt{b}\right)\frac{1}{\sqrt{b}}}x^9 EllipticE\left(x\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}},i\right)-24\,ia^{\frac{5}{2}}\sqrt{b}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^4)^(5/2),x)
```

```
[Out] -1/9*((a*x^4+b)/x^4)^(5/2)*x*(24*I*a^(5/2)*b^(1/2)*(-(I*a^(1/2)*x
^2-b^(1/2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1/2))/b^(1/2))^(1/2
)*x^9*EllipticE(x*(I*a^(1/2)/b^(1/2))^(1/2),I)-24*I*a^(5/2)*b^(1/
```

```
2)*(-(I*a^(1/2)*x^2-b^(1/2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1/
2))/b^(1/2))^(1/2)*x^9*EllipticF(x*(I*a^(1/2)/b^(1/2))^(1/2),I)+1
5*(I*a^(1/2)/b^(1/2))^(1/2)*x^12*a^3+19*(I*a^(1/2)/b^(1/2))^(1/2)
*x^8*a^2*b+5*(I*a^(1/2)/b^(1/2))^(1/2)*x^4*a*b^2+(I*a^(1/2)/b^(1/
2))^(1/2)*b^3)/(a*x^4+b)^3/(I*a^(1/2)/b^(1/2))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(a+\frac{b}{x^4}\right)^{\frac{5}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate((a + b/x^4)^(5/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(a^2x^8+2\,abx^4+b^2\right)\sqrt{\frac{ax^4+b}{x^4}}}{x^8},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(5/2),x, algorithm="fricas")
```

```
[Out] integral((a^2*x^8 + 2*a*b*x^4 + b^2)*sqrt((a*x^4 + b)/x^4)/x^8, x
)
```

Sympy [A] time = 10.8476, size = 42, normalized size = 0.15

$$-\frac{a^{\frac{5}{2}}x\,\Gamma\left(-\frac{1}{4}\right)\,{}_2F_1\left(\left.\begin{matrix}-\frac{5}{2},-\frac{1}{4}\\ \frac{3}{4}\end{matrix}\right|\frac{be^{i\pi}}{ax^4}\right)}{4\,\Gamma\left(\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**4)**(5/2),x)
```

```
[Out] -a**(5/2)*x*gamma(-1/4)*hyper((-5/2, -1/4), (3/4,), b*exp_polar(I
*pi)/(a*x**4))/(4*gamma(3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(a+\frac{b}{x^4}\right)^{\frac{5}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((a + b/x^4)^(5/2), x)
```

3.2078 $\int \frac{\left(a+\frac{b}{x^4}\right)^{5/2}}{x^2}\,dx$

Optimal. Leaf size=147

$$-\frac{20a^{11/4}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{77\sqrt[4]{b}\sqrt{a+\frac{b}{x^4}}}-\frac{20a^2\sqrt{a+\frac{b}{x^4}}}{77x}-\frac{10a\left(a+\frac{b}{x^4}\right)^{3/2}}{77x}-\frac{\left(a+\frac{b}{x^4}\right)^{5/2}}{11x}$$

```
[Out] (-20*a^2*Sqrt[a + b/x^4])/(77*x) - (10*a*(a + b/x^4)^(3/2))/(77*x
) - (a + b/x^4)^(5/2)/(11*x) - (20*a^(11/4)*Sqrt[(a + b/x^4)/(Sqr
t[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticF[2*ArcCot
[(a^(1/4)*x)/b^(1/4)], 1/2])/(77*b^(1/4)*Sqrt[a + b/x^4])
```

Rubi [A] time = 0.18914, antiderivative size = 147, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$-\frac{20a^{11/4}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{77\sqrt[4]{b}\sqrt{a+\frac{b}{x^4}}}-\frac{20a^2\sqrt{a+\frac{b}{x^4}}}{77x}-\frac{10a\left(a+\frac{b}{x^4}\right)^{3/2}}{77x}-\frac{\left(a+\frac{b}{x^4}\right)^{5/2}}{11x}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^4)^(5/2)/x^2,x]
```

```
[Out] (-20*a^2*Sqrt[a + b/x^4])/(77*x) - (10*a*(a + b/x^4)^(3/2))/(77*x
) - (a + b/x^4)^(5/2)/(11*x) - (20*a^(11/4)*Sqrt[(a + b/x^4)/(Sqr
t[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticF[2*ArcCot
[(a^(1/4)*x)/b^(1/4)], 1/2])/(77*b^(1/4)*Sqrt[a + b/x^4])
```

Rubi in Sympy [A] time = 11.4276, size = 131, normalized size = 0.89

$$-\frac{20a^{\frac{11}{4}}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{77\sqrt[4]{b}\sqrt{a+\frac{b}{x^4}}}-\frac{20a^2\sqrt{a+\frac{b}{x^4}}}{77x}-\frac{10a\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}}{77x}-\frac{\left(a+\frac{b}{x^4}\right)^{\frac{5}{2}}}{11x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**4)**(5/2)/x**2,x)
```

```
[Out] -20*a**(11/4)*sqrt((a + b/x**4)/(sqrt(a) + sqrt(b)/x**2)**2)*(sqr
t(a) + sqrt(b)/x**2)*elliptic_f(2*atan(b**(1/4)/(a**(1/4)*x)), 1/
2)/(77*b**(1/4)*sqrt(a + b/x**4)) - 20*a**2*sqrt(a + b/x**4)/(77*
x) - 10*a*(a + b/x**4)**(3/2)/(77*x) - (a + b/x**4)**(5/2)/(11*x)
```

Mathematica [C] time = 0.24143, size = 148, normalized size = 1.01

$$-\frac{\sqrt{a+\frac{b}{x^4}}\left(40ia^3x^{11}\sqrt{\frac{ax^4}{b}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)+\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\left(37a^3x^{12}+61a^2bx^8+31ab^2x^4+7b^3\right)\right)}{77x^9\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\left(ax^4+b\right)}$$

Antiderivative was successfully verified.

```
[In]   Integrate[(a + b/x^4)^(5/2)/x^2,x]
```

```
[Out] -(Sqrt[a + b/x^4]*(Sqrt[(I*Sqrt[a])/Sqrt[b]]*(7*b^3 + 31*a*b^2*x^
4 + 61*a^2*b*x^8 + 37*a^3*x^12) + (40*I)*a^3*x^11*Sqrt[1 + (a*x^4
)/b]*EllipticF[I*ArcSinh[Sqrt[(I*Sqrt[a])/Sqrt[b]]*x], -1]))/(77*
Sqrt[(I*Sqrt[a])/Sqrt[b]]*x^9*(b + a*x^4))
```

Maple [C] time = 0.031, size = 180, normalized size = 1.2

$$-\frac{1}{77\,x\left(ax^4+b\right)^3}\left(\frac{ax^4+b}{x^4}\right)^{\frac{5}{2}}\left(-40\,a^3\sqrt{-\frac{i\sqrt{a}x^2-\sqrt{b}}{\sqrt{b}}}\sqrt{\frac{i\sqrt{a}x^2+\sqrt{b}}{\sqrt{b}}}\mathit{EllipticF}\left(x\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}},i\right)x^{11}+37\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x^{12}a^3+61\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((a+b/x^4)^(5/2)/x^2,x)
```

```
[Out] -1/77*((a*x^4+b)/x^4)^(5/2)*(-40*a^3*(-(I*a^(1/2)*x^2-b^(1/2))/b^
(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1/2))/b^(1/2))^(1/2)*EllipticF(x*
(I*a^(1/2)/b^(1/2))^(1/2),I)*x^11+37*(I*a^(1/2)/b^(1/2))^(1/2)*x^
12*a^3+61*(I*a^(1/2)/b^(1/2))^(1/2)*x^8*a^2*b+31*(I*a^(1/2)/b^(1/
2))^(1/2)*x^4*a*b^2+7*(I*a^(1/2)/b^(1/2))^(1/2)*b^3)/x/(a*x^4+b)^
3/(I*a^(1/2)/b^(1/2))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(a+\frac{b}{x^4}\right)^{\frac{5}{2}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a + b/x^4)^(5/2)/x^2,x, algorithm="maxima")
```

```
[Out] integrate((a + b/x^4)^(5/2)/x^2, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\left(a^2x^8+2\,abx^4+b^2\right)\sqrt{\frac{ax^4+b}{x^4}}}{x^{10}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a + b/x^4)^(5/2)/x^2,x, algorithm="fricas")
```

```
[Out] integral((a^2*x^8 + 2*a*b*x^4 + b^2)*sqrt((a*x^4 + b)/x^4)/x^10,
x)
```

Sympy [A] time = 10.9865, size = 39, normalized size = 0.27

$$-\frac{a^{\frac{5}{2}}\,\Gamma\left(\frac{1}{4}\right)\,{}_2F_1\left(\left.\begin{matrix}-\frac{5}{2},\frac{1}{4}\\ \frac{5}{4}\end{matrix}\right|\frac{be^{i\pi}}{ax^4}\right)}{4x\,\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**4)**(5/2)/x**2,x)
```

```
[Out] -a**(5/2)*gamma(1/4)*hyper((-5/2, 1/4), (5/4,), b*exp_polar(I*pi)
/(a*x**4))/(4*x*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(a + \frac{b}{x^4}\right)^{\frac{5}{2}}}{x^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(5/2)/x^2,x, algorithm="giac")
```

```
[Out] integrate((a + b/x^4)^(5/2)/x^2, x)
```

3.2079 $\int \frac{\left(a+\frac{b}{x^4}\right)^{5/2}}{x^4} dx$

Optimal. Leaf size=278

$$-\frac{4a^{13/4}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{39b^{3/4}\sqrt{a+\frac{b}{x^4}}}+\frac{8a^{13/4}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{39b^{3/4}\sqrt{a+\frac{b}{x^4}}}-\frac{8a^3\sqrt{a+\frac{b}{x^4}}}{39\sqrt{b}x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}-\frac{4a^2\sqrt{a+\frac{b}{x^4}}}{39x^3}-\frac{10a\left(a+\frac{b}{x^4}\right)^{3/2}}{117x^3}-\frac{\left(a+\frac{b}{x^4}\right)^{5/2}}{13x^3}$$

```
[Out] (-4*a^2*Sqrt[a + b/x^4])/(39*x^3) - (10*a*(a + b/x^4)^(3/2))/(117
*x^3) - (a + b/x^4)^(5/2)/(13*x^3) - (8*a^3*Sqrt[a + b/x^4])/(39*
Sqrt[b]*(Sqrt[a] + Sqrt[b]/x^2)*x) + (8*a^(13/4)*Sqrt[(a + b/x^4)
/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticE[2*A
rcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(39*b^(3/4)*Sqrt[a + b/x^4]) -
(4*a^(13/4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a]
+ Sqrt[b]/x^2)*EllipticF[2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(39
*b^(3/4)*Sqrt[a + b/x^4])
```

Rubi [A] time = 0.445405, antiderivative size = 278, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$

$$-\frac{4a^{13/4}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{39b^{3/4}\sqrt{a+\frac{b}{x^4}}}+\frac{8a^{13/4}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{39b^{3/4}\sqrt{a+\frac{b}{x^4}}}-\frac{8a^3\sqrt{a+\frac{b}{x^4}}}{39\sqrt{b}x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}-\frac{4a^2\sqrt{a+\frac{b}{x^4}}}{39x^3}-\frac{10a\left(a+\frac{b}{x^4}\right)^{3/2}}{117x^3}-\frac{\left(a+\frac{b}{x^4}\right)^{5/2}}{13x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^4)^(5/2)/x^4,x]
```


```
[Out] (-4*a^2*Sqrt[a + b/x^4])/(39*x^3) - (10*a*(a + b/x^4)^(3/2))/(117
*x^3) - (a + b/x^4)^(5/2)/(13*x^3) - (8*a^3*Sqrt[a + b/x^4])/(39*
Sqrt[b]*(Sqrt[a] + Sqrt[b]/x^2)*x) + (8*a^(13/4)*Sqrt[(a + b/x^4)
/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticE[2*A
rcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(39*b^(3/4)*Sqrt[a + b/x^4]) -
(4*a^(13/4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a]
+ Sqrt[b]/x^2)*EllipticF[2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(39
*b^(3/4)*Sqrt[a + b/x^4])
```

Rubi in Sympy [A] time = 35.9919, size = 253, normalized size = 0.91

$$\frac{8a^{\frac{13}{4}}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{39b^{\frac{3}{4}}\sqrt{a+\frac{b}{x^4}}}-\frac{4a^{\frac{13}{4}}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{39b^{\frac{3}{4}}\sqrt{a+\frac{b}{x^4}}}-\frac{8a^3\sqrt{a+\frac{b}{x^4}}}{39\sqrt{b}x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}-\frac{4a^2\sqrt{a+\frac{b}{x^4}}}{39x^3}-\frac{10a\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}}{117x^3}-\frac{\left(a+\frac{b}{x^4}\right)^{\frac{5}{2}}}{13x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate((a+b/x**4)**(5/2)/x**4,x)
```

```
[Out] 8*a**(13/4)*sqrt((a + b/x**4)/(sqrt(a) + sqrt(b)/x**2)**2)*(sqrt(
a) + sqrt(b)/x**2)*elliptic_e(2*atan(b**(1/4)/(a**(1/4)*x)), 1/2)
/(39*b**(3/4)*sqrt(a + b/x**4)) - 4*a**(13/4)*sqrt((a + b/x**4)/(
sqrt(a) + sqrt(b)/x**2)**2)*(sqrt(a) + sqrt(b)/x**2)*elliptic_f(2
*atan(b**(1/4)/(a**(1/4)*x)), 1/2)/(39*b**(3/4)*sqrt(a + b/x**4))
 - 8*a**3*sqrt(a + b/x**4)/(39*sqrt(b)*x*(sqrt(a) + sqrt(b)/x**2)
) - 4*a**2*sqrt(a + b/x**4)/(39*x**3) - 10*a*(a + b/x**4)**(3/2)/
(117*x**3) - (a + b/x**4)**(5/2)/(13*x**3)
```

Mathematica [C] time = 0.420107, size = 223, normalized size = 0.8

$$-\frac{\sqrt{a+\frac{b}{x^4}}\left(24a^{7/2}\sqrt{b}x^{13}\sqrt{\frac{ax^4}{b}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)-24a^{7/2}\sqrt{b}x^{13}\sqrt{\frac{ax^4}{b}+1}E\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)+\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\right.}{117bx^{11}\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\left(ax^4+b\right)}$$

Antiderivative was successfully verified.

```
[In]   Integrate[(a + b/x^4)^(5/2)/x^4,x]
```

```
[Out] -(Sqrt[a + b/x^4]*(Sqrt[(I*Sqrt[a])/Sqrt[b]]*(9*b^4 + 37*a*b^3*x^
4 + 59*a^2*b^2*x^8 + 55*a^3*b*x^12 + 24*a^4*x^16) - 24*a^(7/2)*Sq
rt[b]*x^13*Sqrt[1 + (a*x^4)/b]*EllipticE[I*ArcSinh[Sqrt[(I*Sqrt[a
])/Sqrt[b]]*x], -1] + 24*a^(7/2)*Sqrt[b]*x^13*Sqrt[1 + (a*x^4)/b]
*EllipticF[I*ArcSinh[Sqrt[(I*Sqrt[a])/Sqrt[b]]*x], -1]))/(117*Sqr
t[(I*Sqrt[a])/Sqrt[b]]*b*x^11*(b + a*x^4))
```

Maple [C] time = 0.034, size = 279, normalized size = 1.

$$-\frac{1}{117\,x^3\left(ax^4+b\right)^3}\left(\frac{ax^4+b}{x^4}\right)^{\frac{5}{2}}\left(-24\,ia^{\frac{7}{2}}\sqrt{-1\left(i\sqrt{a}x^2-\sqrt{b}\right)\frac{1}{\sqrt{b}}}\sqrt{1\left(i\sqrt{a}x^2+\sqrt{b}\right)\frac{1}{\sqrt{b}}}x^{13}b\mathit{EllipticF}\left(x\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}},i\right)+24\,ia\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((a+b/x^4)^(5/2)/x^4,x)
```

```
[Out] -1/117*((a*x^4+b)/x^4)^(5/2)*(-24*I*a^(7/2)*(-(I*a^(1/2)*x^2-b^(1
/2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1/2))/b^(1/2))^(1/2)*x^13*
b*EllipticF(x*(I*a^(1/2)/b^(1/2))^(1/2),I)+24*I*a^(7/2)*(-(I*a^(1
/2)*x^2-b^(1/2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1/2))/b^(1/2))
^(1/2)*x^13*b*EllipticE(x*(I*a^(1/2)/b^(1/2))^(1/2),I)+24*(I*a^(1
/2)/b^(1/2))^(1/2)*b^(1/2)*x^16*a^4+55*(I*a^(1/2)/b^(1/2))^(1/2)*
b^(3/2)*x^12*a^3+59*(I*a^(1/2)/b^(1/2))^(1/2)*b^(5/2)*x^8*a^2+37*
(I*a^(1/2)/b^(1/2))^(1/2)*b^(7/2)*x^4*a+9*(I*a^(1/2)/b^(1/2))^(1/
```

```
2)*b^(9/2))/x^3/(a*x^4+b)^3/b^(3/2)/(I*a^(1/2)/b^(1/2))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(a+\frac{b}{x^4}\right)^{\frac{5}{2}}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(5/2)/x^4,x, algorithm="maxima")
```

```
[Out] integrate((a + b/x^4)^(5/2)/x^4, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(a^2x^8+2\,abx^4+b^2\right)\sqrt{\frac{ax^4+b}{x^4}}}{x^{12}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(5/2)/x^4,x, algorithm="fricas")
```

```
[Out] integral((a^2*x^8 + 2*a*b*x^4 + b^2)*sqrt((a*x^4 + b)/x^4)/x^12,
x)
```

Sympy [A] time = 11.081, size = 41, normalized size = 0.15

$$-\frac{a^{\frac{5}{2}}\,\Gamma\left(\frac{3}{4}\right)\,{}_2F_1\left(\begin{matrix}-\frac{5}{2},\frac{3}{4}\\\frac{7}{4}\end{matrix}\middle|\frac{be^{i\pi}}{ax^4}\right)}{4x^3\,\Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**4)**(5/2)/x**4,x)
```

```
[Out] -a**(5/2)*gamma(3/4)*hyper((-5/2, 3/4), (7/4,), b*exp_polar(I*pi)
/(a*x**4))/(4*x**3*gamma(7/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(a+\frac{b}{x^4}\right)^{\frac{5}{2}}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(5/2)/x^4,x, algorithm="giac")
```

```
[Out] integrate((a + b/x^4)^(5/2)/x^4, x)
```

3.2080 $\int \frac{x^3}{\sqrt{a+\frac{b}{x^4}}} \, dx$

Optimal. Leaf size=50

$$\frac{x^4\sqrt{a+\frac{b}{x^4}}}{4a}-\frac{b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)}{4a^{3/2}}$$

```
[Out] (Sqrt[a + b/x^4]*x^4)/(4*a) - (b*ArcTanh[Sqrt[a + b/x^4]/Sqrt[a]]
)/(4*a^(3/2))
```

Rubi [A] time = 0.0938088, antiderivative size = 50, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{x^4\sqrt{a+\frac{b}{x^4}}}{4a}-\frac{b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)}{4a^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/Sqrt[a + b/x^4],x]
```

```
[Out] (Sqrt[a + b/x^4]*x^4)/(4*a) - (b*ArcTanh[Sqrt[a + b/x^4]/Sqrt[a]]
)/(4*a^(3/2))
```

Rubi in Sympy [A] time = 6.99084, size = 41, normalized size = 0.82

$$\frac{x^4\sqrt{a+\frac{b}{x^4}}}{4a}-\frac{b\,\mathrm{atanh}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)}{4a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(a+b/x**4)**(1/2),x)
```

```
[Out] x**4*sqrt(a + b/x**4)/(4*a) - b*atanh(sqrt(a + b/x**4)/sqrt(a))/(
4*a**(3/2))
```

Mathematica [A] time = 0.0616594, size = 78, normalized size = 1.56

$$\frac{\sqrt{a}x^2\left(ax^4+b\right)-b\sqrt{ax^4+b}\log\left(\sqrt{a}\sqrt{ax^4+b}+ax^2\right)}{4a^{3/2}x^2\sqrt{a+\frac{b}{x^4}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/Sqrt[a + b/x^4],x]
```

```
[Out] (Sqrt[a]*x^2*(b + a*x^4) - b*Sqrt[b + a*x^4]*Log[a*x^2 + Sqrt[a]*
Sqrt[b + a*x^4]])/(4*a^(3/2)*Sqrt[a + b/x^4]*x^2)
```

Maple [A] time = 0.02, size = 70, normalized size = 1.4

$$-\frac{1}{4x^{2}}\sqrt{ax^{4}+b}\left(-x^{2}\sqrt{ax^{4}+b}\,a^{\frac{3}{2}}+b\ln\left(x^{2}\sqrt{a}+\sqrt{ax^{4}+b}\right)a\right)\frac{1}{\sqrt{\frac{ax^{4}+b}{x^{4}}}}a^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(a+b/x^4)^(1/2),x)
```

```
[Out] -1/4*(a*x^4+b)^(1/2)*(-x^2*(a*x^4+b)^(1/2)*a^(3/2)+b*ln(x^2*a^(1/
2)+(a*x^4+b)^(1/2))*a)/((a*x^4+b)/x^4)^(1/2)/x^2/a^(5/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(a + b/x^4),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.253831, size = 1, normalized size = 0.02

$$\left[\frac{2\,ax^{4}\sqrt{\frac{ax^{4}+b}{x^{4}}}+\sqrt{a}b\log\left(2\,ax^{4}\sqrt{\frac{ax^{4}+b}{x^{4}}}-\left(2\,ax^{4}+b\right)\sqrt{a}\right)}{8\,a^{2}},\ \frac{ax^{4}\sqrt{\frac{ax^{4}+b}{x^{4}}}+\sqrt{-a}b\arctan\left(\frac{\sqrt{-a}}{\sqrt{\frac{ax^{4}+b}{x^{4}}}}\right)}{4\,a^{2}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(a + b/x^4),x, algorithm="fricas")
```

```
[Out] [1/8*(2*a*x^4*sqrt((a*x^4 + b)/x^4) + sqrt(a)*b*log(2*a*x^4*sqrt(
(a*x^4 + b)/x^4) - (2*a*x^4 + b)*sqrt(a)))/a^2, 1/4*(a*x^4*sqrt((
a*x^4 + b)/x^4) + sqrt(-a)*b*arctan(sqrt(-a)/sqrt((a*x^4 + b)/x^4
)))/a^2]
```

Sympy [A] time = 9.0067, size = 46, normalized size = 0.92

$$\frac{\sqrt{b}x^{2}\sqrt{\frac{ax^{4}}{b}+1}}{4a}-\frac{b\,\mathrm{asinh}\left(\frac{\sqrt{a}x^{2}}{\sqrt{b}}\right)}{4a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(a+b/x**4)**(1/2),x)
```

```
[Out] sqrt(b)*x**2*sqrt(a*x**4/b + 1)/(4*a) - b*asinh(sqrt(a)*x**2/sqrt
(b))/(4*a**(3/2))
```

GIAC/XCAS [A] time = 0.256846, size = 90, normalized size = 1.8

$$\frac{1}{4}\,b\left(\frac{\arctan\left(\frac{\sqrt{\frac{ax^4+b}{x^4}}}{\sqrt{-a}}\right)}{\sqrt{-a}a}-\frac{\sqrt{\frac{ax^4+b}{x^4}}}{\left(a-\frac{ax^4+b}{x^4}\right)a}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/sqrt(a + b/x^4),x, algorithm="giac")
```

```
[Out] 1/4*b*(arctan(sqrt((a*x^4 + b)/x^4)/sqrt(-a))/(sqrt(-a)*a) - sqrt
((a*x^4 + b)/x^4)/((a - (a*x^4 + b)/x^4)*a))
```

3.2081 $\int \frac{x}{\sqrt{a+\frac{b}{x^4}}}\,dx$

Optimal. Leaf size=21

$$\frac{x^2\sqrt{a+\frac{b}{x^4}}}{2a}$$

```
[Out] (Sqrt[a + b/x^4]*x^2)/(2*a)
```

Rubi [A] time = 0.0254802, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{x^2\sqrt{a+\frac{b}{x^4}}}{2a}$$

Antiderivative was successfully verified.

```
[In]  Int[x/Sqrt[a + b/x^4],x]

[Out] (Sqrt[a + b/x^4]*x^2)/(2*a)
```

Rubi in Sympy [A] time = 2.54613, size = 15, normalized size = 0.71

$$\frac{x^2\sqrt{a+\frac{b}{x^4}}}{2a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b/x**4)**(1/2),x)

[Out] x**2*sqrt(a + b/x**4)/(2*a)
```

Mathematica [A] time = 0.018982, size = 21, normalized size = 1.

$$\frac{x^2\sqrt{a+\frac{b}{x^4}}}{2a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/Sqrt[a + b/x^4],x]

[Out] (Sqrt[a + b/x^4]*x^2)/(2*a)
```

Maple [A] time = 0.01, size = 29, normalized size = 1.4

$$\frac{ax^4+b}{2\,ax^2}\frac{1}{\sqrt{\frac{ax^4+b}{x^4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+b/x^4)^(1/2),x)

[Out] 1/2*(a*x^4+b)/a/x^2/((a*x^4+b)/x^4)^(1/2)
```

Maxima [A] time = 1.43566, size = 23, normalized size = 1.1

$$\frac{\sqrt{a+\frac{b}{x^4}}\,x^2}{2\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(a + b/x^4),x, algorithm="maxima")

[Out] 1/2*sqrt(a + b/x^4)*x^2/a
```

Fricas [A] time = 0.237415, size = 28, normalized size = 1.33

$$\frac{x^2\sqrt{\frac{ax^4+b}{x^4}}}{2\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(a + b/x^4),x, algorithm="fricas")

[Out] 1/2*x^2*sqrt((a*x^4 + b)/x^4)/a
```

Sympy [A] time = 2.55025, size = 19, normalized size = 0.9

$$\frac{\sqrt{b}\sqrt{\frac{ax^4}{b}+1}}{2a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b/x**4)**(1/2),x)

[Out] sqrt(b)*sqrt(a*x**4/b + 1)/(2*a)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt{a+\frac{b}{x^4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(a + b/x^4),x, algorithm="giac")

[Out] integrate(x/sqrt(a + b/x^4), x)
```

3.2082 $\int \frac{1}{\sqrt{a+\frac{b}{x^4}}\,x}\,dx$

Optimal. Leaf size=27

$$\frac{\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)}{2\sqrt{a}}$$

```
[Out] ArcTanh[Sqrt[a + b/x^4]/Sqrt[a]]/(2*Sqrt[a])
```

Rubi [A] time = 0.0612681, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)}{2\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[a + b/x^4]*x),x]

[Out] ArcTanh[Sqrt[a + b/x^4]/Sqrt[a]]/(2*Sqrt[a])
```

Rubi in Sympy [A] time = 5.15627, size = 22, normalized size = 0.81

$$\frac{\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)}{2\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x/(a+b/x**4)**(1/2),x)

[Out] atanh(sqrt(a + b/x**4)/sqrt(a))/(2*sqrt(a))
```

Mathematica [B] time = 0.0305597, size = 55, normalized size = 2.04

$$\frac{\sqrt{ax^4+b}\tanh^{-1}\left(\frac{\sqrt{a}x^2}{\sqrt{ax^4+b}}\right)}{2\sqrt{a}x^2\sqrt{a+\frac{b}{x^4}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(Sqrt[a + b/x^4]*x),x]

[Out] (Sqrt[b + a*x^4]*ArcTanh[(Sqrt[a]*x^2)/Sqrt[b + a*x^4]])/(2*Sqrt[
a]*Sqrt[a + b/x^4]*x^2)
```

Maple [B] time = 0.013, size = 49, normalized size = 1.8

$$\frac{1}{2\,x^2}\sqrt{ax^4+b}\ln\left(x^2\sqrt{a}+\sqrt{ax^4+b}\right)\frac{1}{\sqrt{\frac{ax^4+b}{x^4}}}\frac{1}{\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(a+b/x^4)^(1/2),x)
```

```
[Out] 1/2/((a*x^4+b)/x^4)^(1/2)/x^2*(a*x^4+b)^(1/2)*ln(x^2*a^(1/2)+(a*x
^4+b)^(1/2))/a^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^4)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.251544, size = 1, normalized size = 0.04

$$\left[\frac{\log\left(-2\,ax^4\sqrt{\frac{ax^4+b}{x^4}} - \left(2\,ax^4 + b\right)\sqrt{a}\right)}{4\,\sqrt{a}}, -\frac{\sqrt{-a}\arctan\left(\frac{\sqrt{-a}}{\sqrt{\frac{ax^4+b}{x^4}}}\right)}{2\,a}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^4)*x),x, algorithm="fricas")
```

```
[Out] [1/4*log(-2*a*x^4*sqrt((a*x^4 + b)/x^4) - (2*a*x^4 + b)*sqrt(a))/
sqrt(a), -1/2*sqrt(-a)*arctan(sqrt(-a)/sqrt((a*x^4 + b)/x^4))/a]
```

Sympy [A] time = 4.95612, size = 20, normalized size = 0.74

$$\frac{\operatorname{asinh}\left(\frac{\sqrt{a}x^2}{\sqrt{b}}\right)}{2\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(a+b/x**4)**(1/2),x)
```

```
[Out] asinh(sqrt(a)*x**2/sqrt(b))/(2*sqrt(a))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a + \frac{b}{x^4}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^4)*x),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(a + b/x^4)*x), x)
```

3.2083 $\int \frac{1}{\sqrt{a+\frac{b}{x^4}}\,x^3}\,dx$

Optimal. Leaf size=30

$$-\frac{\tanh^{-1}\left(\frac{\sqrt{b}}{x^2\sqrt{a+\frac{b}{x^4}}}\right)}{2\sqrt{b}}$$

```
[Out] -ArcTanh[Sqrt[b]/(Sqrt[a + b/x^4]*x^2)]/(2*Sqrt[b])
```

Rubi [A] time = 0.0748344, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{\tanh^{-1}\left(\frac{\sqrt{b}}{x^2\sqrt{a+\frac{b}{x^4}}}\right)}{2\sqrt{b}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b/x^4]*x^3),x]
```

```
[Out] -ArcTanh[Sqrt[b]/(Sqrt[a + b/x^4]*x^2)]/(2*Sqrt[b])
```

Rubi in Sympy [A] time = 5.99799, size = 27, normalized size = 0.9

$$-\frac{\operatorname{atanh}\left(\frac{\sqrt{b}}{x^2\sqrt{a+\frac{b}{x^4}}}\right)}{2\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(a+b/x**4)**(1/2),x)
```

```
[Out] -atanh(sqrt(b)/(x**2*sqrt(a + b/x**4)))/(2*sqrt(b))
```

Mathematica [A] time = 0.0767322, size = 52, normalized size = 1.73

$$-\frac{\sqrt{ax^4+b}\tanh^{-1}\left(\frac{\sqrt{ax^4+b}}{\sqrt{b}}\right)}{2\sqrt{b}x^2\sqrt{a+\frac{b}{x^4}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b/x^4]*x^3),x]
```

```
[Out] -(Sqrt[b + a*x^4]*ArcTanh[Sqrt[b + a*x^4]/Sqrt[b]])/(2*Sqrt[b]*Sq
rt[a + b/x^4]*x^2)
```

Maple [B] time = 0.017, size = 52, normalized size = 1.7

$$-\frac{1}{2x^2}\sqrt{ax^4+b}\ln\left(2\frac{\sqrt{b}\sqrt{ax^4+b}+b}{x^2}\right)\frac{1}{\sqrt{\frac{ax^4+b}{x^4}}}\frac{1}{\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(a+b/x^4)^(1/2),x)
```

```
[Out] -1/2/((a*x^4+b)/x^4)^(1/2)/x^2*(a*x^4+b)^(1/2)/b^(1/2)*ln(2*(b^(1
/2)*(a*x^4+b)^(1/2)+b)/x^2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^4)*x^3),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.255224, size = 1, normalized size = 0.03

$$\left[\frac{\log\left(-\frac{2\,bx^{2}\sqrt{\frac{ax^{4}+b}{x^{4}}}-\left(ax^{4}+2\,b\right)\sqrt{b}}{x^{4}}\right)}{4\,\sqrt{b}},\,-\frac{\sqrt{-b}\arctan\left(\frac{b}{\sqrt{-b}x^{2}\sqrt{\frac{ax^{4}+b}{x^{4}}}}\right)}{2\,b}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^4)*x^3),x, algorithm="fricas")
```

```
[Out] [1/4*log(-(2*b*x^2*sqrt((a*x^4 + b)/x^4) - (a*x^4 + 2*b)*sqrt(b))
/x^4)/sqrt(b), -1/2*sqrt(-b)*arctan(b/(sqrt(-b)*x^2*sqrt((a*x^4 +
 b)/x^4)))/b]
```

Sympy [A] time = 6.20858, size = 22, normalized size = 0.73

$$-\frac{\operatorname{asinh}\left(\frac{\sqrt{b}}{\sqrt{a}x^{2}}\right)}{2\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(a+b/x**4)**(1/2),x)
```

```
[Out] -asinh(sqrt(b)/(sqrt(a)*x**2))/(2*sqrt(b))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a+\frac{b}{x^{4}}}x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^4)*x^3),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(a + b/x^4)*x^3), x)
```

3.2084 $\int \frac{x^2}{\sqrt{a+\frac{b}{x^4}}}\,dx$

Optimal. Leaf size=110

$$\frac{b^{3/4}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{6a^{5/4}\sqrt{a+\frac{b}{x^4}}}+\frac{x^3\sqrt{a+\frac{b}{x^4}}}{3a}$$

```
[Out] (Sqrt[a + b/x^4]*x^3)/(3*a) + (b^(3/4)*Sqrt[(a + b/x^4)/(Sqrt[a]
+ Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticF[2*ArcCot[(a^(
1/4)*x)/b^(1/4)], 1/2])/(6*a^(5/4)*Sqrt[a + b/x^4])
```

Rubi [A] time = 0.140947, antiderivative size = 110, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{b^{3/4}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{6a^{5/4}\sqrt{a+\frac{b}{x^4}}}+\frac{x^3\sqrt{a+\frac{b}{x^4}}}{3a}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/Sqrt[a + b/x^4],x]
```

```
[Out] (Sqrt[a + b/x^4]*x^3)/(3*a) + (b^(3/4)*Sqrt[(a + b/x^4)/(Sqrt[a]
+ Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticF[2*ArcCot[(a^(
1/4)*x)/b^(1/4)], 1/2])/(6*a^(5/4)*Sqrt[a + b/x^4])
```

Rubi in Sympy [A] time = 9.18552, size = 95, normalized size = 0.86

$$\frac{x^3\sqrt{a+\frac{b}{x^4}}}{3a}+\frac{b^{\frac{3}{4}}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{6a^{\frac{5}{4}}\sqrt{a+\frac{b}{x^4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b/x**4)**(1/2),x)
```

```
[Out] x**3*sqrt(a + b/x**4)/(3*a) + b**(3/4)*sqrt((a + b/x**4)/(sqrt(a)
 + sqrt(b)/x**2)**2)*(sqrt(a) + sqrt(b)/x**2)*elliptic_f(2*atan(b
**(1/4)/(a**(1/4)*x)), 1/2)/(6*a**(5/4)*sqrt(a + b/x**4))
```

Mathematica [C] time = 0.129054, size = 113, normalized size = 1.03

$$\frac{x\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\left(ax^4+b\right)+ib\sqrt{\frac{ax^4}{b}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)}{3ax^2\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\sqrt{a+\frac{b}{x^4}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/Sqrt[a + b/x^4],x]
```

```
[Out] (Sqrt[(I*Sqrt[a])/Sqrt[b]]*x*(b + a*x^4) + I*b*Sqrt[1 + (a*x^4)/b
]*EllipticF[I*ArcSinh[Sqrt[(I*Sqrt[a])/Sqrt[b]]*x], -1])/(3*a*Sqr
t[(I*Sqrt[a])/Sqrt[b]]*Sqrt[a + b/x^4]*x^2)
```

Maple [C] time = 0.016, size = 124, normalized size = 1.1

$$\frac{1}{3\,ax^2}\left(\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}}x^5a-b\sqrt{-1\left(i\sqrt{a}x^2-\sqrt{b}\right)\frac{1}{\sqrt{b}}}\sqrt{1\left(i\sqrt{a}x^2+\sqrt{b}\right)\frac{1}{\sqrt{b}}}EllipticF\left(x\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}},i\right)+\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}}xb\right)\frac{1}{\sqrt{\frac{ax^4+b}{x^4}}}\frac{1}{\sqrt{\ldots}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(a+b/x^4)^(1/2),x)
```

```
[Out] 1/3*((I*a^(1/2)/b^(1/2))^(1/2)*x^5*a-b*(-(I*a^(1/2)*x^2-b^(1/2))/
b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1/2))/b^(1/2))^(1/2)*EllipticF(
x*(I*a^(1/2)/b^(1/2))^(1/2),I)+(I*a^(1/2)/b^(1/2))^(1/2)*x*b)/((a
*x^4+b)/x^4)^(1/2)/x^2/a/(I*a^(1/2)/b^(1/2))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\sqrt{a+\frac{b}{x^4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(a + b/x^4),x, algorithm="maxima")
```

```
[Out] integrate(x^2/sqrt(a + b/x^4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x^2}{\sqrt{\frac{ax^4+b}{x^4}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(a + b/x^4),x, algorithm="fricas")
```

```
[Out] integral(x^2/sqrt((a*x^4 + b)/x^4), x)
```

Sympy [A] time = 3.4267, size = 42, normalized size = 0.38

$$-\frac{x^3\,\Gamma\left(-\frac{3}{4}\right)\,{}_2F_1\left(\begin{matrix}-\frac{3}{4},\frac{1}{2}\\ \frac{1}{4}\end{matrix}\middle|\frac{be^{i\pi}}{ax^4}\right)}{4\sqrt{a}\,\Gamma\left(\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b/x**4)**(1/2),x)
```

```
[Out] -x**3*gamma(-3/4)*hyper((-3/4, 1/2), (1/4,), b*exp_polar(I*pi)/(a
*x**4))/(4*sqrt(a)*gamma(1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\sqrt{a+\frac{b}{x^4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(a + b/x^4),x, algorithm="giac")
```

```
[Out] integrate(x^2/sqrt(a + b/x^4), x)
```

3.2085 $\int \frac{1}{\sqrt{a+\frac{b}{x^4}}}\,dx$

Optimal. Leaf size=231

$$-\frac{\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{2a^{3/4}\sqrt{a+\frac{b}{x^4}}}+\frac{\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{a^{3/4}\sqrt{a+\frac{b}{x^4}}}+\frac{x\sqrt{a+\frac{b}{x^4}}}{a}-\frac{\sqrt{b}\sqrt{a+\frac{b}{x^4}}}{ax\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}$$

```
[Out] -((Sqrt[b]*Sqrt[a + b/x^4])/(a*(Sqrt[a] + Sqrt[b]/x^2)*x)) + (Sqr
t[a + b/x^4]*x)/a + (b^(1/4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/
x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticE[2*ArcCot[(a^(1/4)*x)/b^
(1/4)], 1/2])/(a^(3/4)*Sqrt[a + b/x^4]) - (b^(1/4)*Sqrt[(a + b/x^
4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticF[2
*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(2*a^(3/4)*Sqrt[a + b/x^4])
```

Rubi [A] time = 0.296741, antiderivative size = 231, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.454

$$-\frac{\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{2a^{3/4}\sqrt{a+\frac{b}{x^4}}}+\frac{\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{a^{3/4}\sqrt{a+\frac{b}{x^4}}}+\frac{x\sqrt{a+\frac{b}{x^4}}}{a}-\frac{\sqrt{b}\sqrt{a+\frac{b}{x^4}}}{ax\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[a + b/x^4],x]
```

```
[Out] -((Sqrt[b]*Sqrt[a + b/x^4])/(a*(Sqrt[a] + Sqrt[b]/x^2)*x)) + (Sqr
t[a + b/x^4]*x)/a + (b^(1/4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/
x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticE[2*ArcCot[(a^(1/4)*x)/b^
(1/4)], 1/2])/(a^(3/4)*Sqrt[a + b/x^4]) - (b^(1/4)*Sqrt[(a + b/x^
4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticF[2
*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(2*a^(3/4)*Sqrt[a + b/x^4])
```

Rubi in Sympy [A] time = 23.5094, size = 202, normalized size = 0.87

$$-\frac{\sqrt{b}\sqrt{a+\frac{b}{x^4}}}{ax\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}+\frac{x\sqrt{a+\frac{b}{x^4}}}{a}+\frac{\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\,\text{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{a^{\frac{3}{4}}\sqrt{a+\frac{b}{x^4}}}-\frac{\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\,\text{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{2a^{\frac{3}{4}}\sqrt{a+\frac{b}{x^4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**4)**(1/2),x)
```

```
[Out] -sqrt(b)*sqrt(a + b/x**4)/(a*x*(sqrt(a) + sqrt(b)/x**2)) + x*sqrt
(a + b/x**4)/a + b**(1/4)*sqrt((a + b/x**4)/(sqrt(a) + sqrt(b)/x*
*2)**2)*(sqrt(a) + sqrt(b)/x**2)*elliptic_e(2*atan(b**(1/4)/(a**(
1/4)*x)), 1/2)/(a**(3/4)*sqrt(a + b/x**4)) - b**(1/4)*sqrt((a + b
/x**4)/(sqrt(a) + sqrt(b)/x**2)**2)*(sqrt(a) + sqrt(b)/x**2)*elli
ptic_f(2*atan(b**(1/4)/(a**(1/4)*x)), 1/2)/(2*a**(3/4)*sqrt(a + b
/x**4))
```

Mathematica [C] time = 0.0945284, size = 107, normalized size = 0.46

$$\frac{i\sqrt{\frac{ax^4}{b}+1}\left(E\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)-F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)\right)}{x^2\left(\frac{i\sqrt{a}}{\sqrt{b}}\right)^{3/2}\sqrt{a+\frac{b}{x^4}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/Sqrt[a + b/x^4],x]
```

```
[Out] (I*Sqrt[1 + (a*x^4)/b]*(EllipticE[I*ArcSinh[Sqrt[(I*Sqrt[a])/Sqrt
[b]]*x], -1] - EllipticF[I*ArcSinh[Sqrt[(I*Sqrt[a])/Sqrt[b]]*x],
-1]))/(((I*Sqrt[a])/Sqrt[b])^(3/2)*Sqrt[a + b/x^4]*x^2)
```

Maple [C] time = 0.014, size = 113, normalized size = 0.5

$$\frac{i}{x^2}\sqrt{b}\sqrt{-1\left(i\sqrt{a}x^2-\sqrt{b}\right)\frac{1}{\sqrt{b}}}\sqrt{1\left(i\sqrt{a}x^2+\sqrt{b}\right)\frac{1}{\sqrt{b}}}\left(\mathit{EllipticF}\left(x\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}},i\right)-\mathit{EllipticE}\left(x\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}},i\right)\right)\frac{1}{\sqrt{\frac{ax^4+b}{x^4}}}\frac{1}{\sqrt{i\sqrt{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^4)^(1/2),x)
```

```
[Out] I/((a*x^4+b)/x^4)^(1/2)/x^2*b^(1/2)/(I*a^(1/2)/b^(1/2))^(1/2)*(-(
I*a^(1/2)*x^2-b^(1/2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1/2))/b^
(1/2))^(1/2)/a^(1/2)*(EllipticF(x*(I*a^(1/2)/b^(1/2))^(1/2),I)-El
lipticE(x*(I*a^(1/2)/b^(1/2))^(1/2),I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\sqrt{a+\frac{b}{x^4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(a + b/x^4),x, algorithm="maxima")
```

```
[Out] integrate(1/sqrt(a + b/x^4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{\frac{ax^4+b}{x^4}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(a + b/x^4),x, algorithm="fricas")
```

```
[Out] integral(1/sqrt((a*x^4 + b)/x^4), x)
```

Sympy [A] time = 3.05644, size = 41, normalized size = 0.18

$$-\frac{x\Gamma\left(-\frac{1}{4}\right){}_{2}F_{1}\left(\begin{matrix}-\frac{1}{4},\frac{1}{2}\\ \frac{3}{4}\end{matrix}\middle|\frac{be^{i\pi}}{ax^{4}}\right)}{4\sqrt{a}\,\Gamma\left(\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**4)**(1/2),x)
```

```
[Out] -x*gamma(-1/4)*hyper((-1/4, 1/2), (3/4,), b*exp_polar(I*pi)/(a*x*
*4))/(4*sqrt(a)*gamma(3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a+\frac{b}{x^4}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(a + b/x^4),x, algorithm="giac")
```

```
[Out] integrate(1/sqrt(a + b/x^4), x)
```

3.2086 $\int \frac{1}{\sqrt{a+\frac{b}{x^4}}x^2}\,dx$

Optimal. Leaf size=88

$$-\frac{\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{2\sqrt[4]{a}\sqrt[4]{b}\sqrt{a+\frac{b}{x^4}}}$$

```
[Out] -(Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/
x^2)*EllipticF[2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(2*a^(1/4)*b^
(1/4)*Sqrt[a + b/x^4])
```

Rubi [A] time = 0.0922831, antiderivative size = 88, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{2\sqrt[4]{a}\sqrt[4]{b}\sqrt{a+\frac{b}{x^4}}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b/x^4]*x^2),x]
```

```
[Out] -(Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/
x^2)*EllipticF[2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(2*a^(1/4)*b^
(1/4)*Sqrt[a + b/x^4])
```

Rubi in Sympy [A] time = 5.61417, size = 80, normalized size = 0.91

$$-\frac{\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{2\sqrt[4]{a}\sqrt[4]{b}\sqrt{a+\frac{b}{x^4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(a+b/x**4)**(1/2),x)
```

```
[Out] -sqrt((a + b/x**4)/(sqrt(a) + sqrt(b)/x**2)**2)*(sqrt(a) + sqrt(b
)/x**2)*elliptic_f(2*atan(b**(1/4)/(a**(1/4)*x)), 1/2)/(2*a**(1/4
)*b**(1/4)*sqrt(a + b/x**4))
```

Mathematica [C] time = 0.0581153, size = 77, normalized size = 0.88

$$-\frac{i\sqrt{\frac{ax^4}{b}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)}{x^2\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\sqrt{a+\frac{b}{x^4}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b/x^4]*x^2),x]
```

```
[Out] ((-I)*Sqrt[1 + (a*x^4)/b]*EllipticF[I*ArcSinh[Sqrt[(I*Sqrt[a])/Sq
rt[b]]*x], -1])/(Sqrt[(I*Sqrt[a])/Sqrt[b]]*Sqrt[a + b/x^4]*x^2)
```

Maple [C] time = 0.012, size = 86, normalized size = 1.

$$\frac{1}{x^2}\sqrt{-1\left(i\sqrt{a}x^2-\sqrt{b}\right)\frac{1}{\sqrt{b}}}\sqrt{1\left(i\sqrt{a}x^2+\sqrt{b}\right)\frac{1}{\sqrt{b}}}EllipticF\left(x\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}},i\right)\frac{1}{\sqrt{\frac{ax^4+b}{x^4}}}\frac{1}{\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(a+b/x^4)^(1/2),x)
```

```
[Out] 1/((a*x^4+b)/x^4)^(1/2)/x^2/(I*a^(1/2)/b^(1/2))^(1/2)*(-(I*a^(1/2
)*x^2-b^(1/2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1/2))/b^(1/2))^(
1/2)*EllipticF(x*(I*a^(1/2)/b^(1/2))^(1/2),I)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\sqrt{a+\frac{b}{x^4}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^4)*x^2),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(a + b/x^4)*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{x^2\sqrt{\frac{ax^4+b}{x^4}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^4)*x^2),x, algorithm="fricas")
```

```
[Out] integral(1/(x^2*sqrt((a*x^4 + b)/x^4)), x)
```

Sympy [A] time = 3.7578, size = 37, normalized size = 0.42

$$-\frac{\Gamma\left(\frac{1}{4}\right){}_2F_1\left(\begin{matrix}\frac{1}{4},\frac{1}{2}\\\frac{5}{4}\end{matrix}\middle|\frac{be^{i\pi}}{ax^4}\right)}{4\sqrt{a}x\,\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(a+b/x**4)**(1/2),x)
```

```
[Out] -gamma(1/4)*hyper((1/4, 1/2), (5/4,), b*exp_polar(I*pi)/(a*x**4))
/(4*sqrt(a)*x*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a+\frac{b}{x^4}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^4)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(a + b/x^4)*x^2), x)
```

3.2087 $\int \frac{1}{\sqrt{a+\frac{b}{x^4}}x^4}\,dx$

Optimal. Leaf size=212

$$-\frac{\sqrt[4]{a}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{2b^{3/4}\sqrt{a+\frac{b}{x^4}}}+\frac{\sqrt[4]{a}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{b^{3/4}\sqrt{a+\frac{b}{x^4}}}-\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{b}x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}$$

```
[Out] -(Sqrt[a + b/x^4]/(Sqrt[b]*(Sqrt[a] + Sqrt[b]/x^2)*x)) + (a^(1/4)
*Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x
^2)*EllipticE[2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(b^(3/4)*Sqrt[
a + b/x^4]) - (a^(1/4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2
]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticF[2*ArcCot[(a^(1/4)*x)/b^(1/4)]
, 1/2])/(2*b^(3/4)*Sqrt[a + b/x^4])
```

Rubi [A] time = 0.254998, antiderivative size = 212, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{\sqrt[4]{a}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{2b^{3/4}\sqrt{a+\frac{b}{x^4}}}+\frac{\sqrt[4]{a}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{b^{3/4}\sqrt{a+\frac{b}{x^4}}}-\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{b}x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b/x^4]*x^4),x]
```

```
[Out] -(Sqrt[a + b/x^4]/(Sqrt[b]*(Sqrt[a] + Sqrt[b]/x^2)*x)) + (a^(1/4)
*Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x
^2)*EllipticE[2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(b^(3/4)*Sqrt[
a + b/x^4]) - (a^(1/4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2
]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticF[2*ArcCot[(a^(1/4)*x)/b^(1/4)]
, 1/2])/(2*b^(3/4)*Sqrt[a + b/x^4])
```

Rubi in Sympy [A] time = 19.4923, size = 187, normalized size = 0.88

$$\frac{\sqrt[4]{a}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{b^{\frac{3}{4}}\sqrt{a+\frac{b}{x^4}}}-\frac{\sqrt[4]{a}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{2b^{\frac{3}{4}}\sqrt{a+\frac{b}{x^4}}}-\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{b}x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(a+b/x**4)**(1/2),x)
```

```
[Out] a**(1/4)*sqrt((a + b/x**4)/(sqrt(a) + sqrt(b)/x**2)**2)*(sqrt(a)
+ sqrt(b)/x**2)*elliptic_e(2*atan(b**(1/4)/(a**(1/4)*x)), 1/2)/(b
**(3/4)*sqrt(a + b/x**4)) - a**(1/4)*sqrt((a + b/x**4)/(sqrt(a) +
 sqrt(b)/x**2)**2)*(sqrt(a) + sqrt(b)/x**2)*elliptic_f(2*atan(b**
(1/4)/(a**(1/4)*x)), 1/2)/(2*b**(3/4)*sqrt(a + b/x**4)) - sqrt(a
+ b/x**4)/(sqrt(b)*x*(sqrt(a) + sqrt(b)/x**2))
```

Mathematica [C] time = 0.222969, size = 173, normalized size = 0.82

$$-\frac{ax^4+b}{bx^3\sqrt{a+\frac{b}{x^4}}}+\frac{\sqrt{a}\sqrt{1-\frac{i\sqrt{a}x^2}{\sqrt{b}}}\sqrt{1+\frac{i\sqrt{a}x^2}{\sqrt{b}}}\left(E\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)-F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)\right)}{\sqrt{b}x^2\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\sqrt{a+\frac{b}{x^4}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b/x^4]*x^4),x]
```

```
[Out] -((b + a*x^4)/(b*Sqrt[a + b/x^4]*x^3)) + (Sqrt[a]*Sqrt[1 - (I*Sqr
t[a]*x^2)/Sqrt[b]]*Sqrt[1 + (I*Sqrt[a]*x^2)/Sqrt[b]]*(EllipticE[I
*ArcSinh[Sqrt[(I*Sqrt[a])/Sqrt[b]]*x], -1] - EllipticF[I*ArcSinh[
Sqrt[(I*Sqrt[a])/Sqrt[b]]*x], -1]))/(Sqrt[(I*Sqrt[a])/Sqrt[b]]*Sq
rt[b]*Sqrt[a + b/x^4]*x^2)
```

Maple [C] time = 0.02, size = 198, normalized size = 0.9

$$-\frac{1}{x^3}\left(\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}}\sqrt{b}x^4a-i\sqrt{a}\sqrt{-1\left(i\sqrt{a}x^2-\sqrt{b}\right)\frac{1}{\sqrt{b}}}\sqrt{1\left(i\sqrt{a}x^2+\sqrt{b}\right)\frac{1}{\sqrt{b}}}xbEllipticF\left(x\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}},i\right)+i\sqrt{a}\sqrt{-1\left(i\sqrt{a}x^2\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(a+b/x^4)^(1/2),x)
```

```
[Out] -((I*a^(1/2)/b^(1/2))^(1/2)*b^(1/2)*x^4*a-I*a^(1/2)*(-(I*a^(1/2)*
x^2-b^(1/2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1/2))/b^(1/2))^(1/
2)*x*b*EllipticF(x*(I*a^(1/2)/b^(1/2))^(1/2),I)+I*a^(1/2)*(-(I*a^
(1/2)*x^2-b^(1/2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1/2))/b^(1/2
))^(1/2)*x*b*EllipticE(x*(I*a^(1/2)/b^(1/2))^(1/2),I)+(I*a^(1/2)/
b^(1/2))^(1/2)*b^(3/2))/((a*x^4+b)/x^4)^(1/2)/x^3/b^(3/2)/(I*a^(1
/2)/b^(1/2))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\sqrt{a+\frac{b}{x^4}}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^4)*x^4),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(a + b/x^4)*x^4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{x^4\sqrt{\frac{ax^4+b}{x^4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^4)*x^4),x, algorithm="fricas")
```

```
[Out] integral(1/(x^4*sqrt((a*x^4 + b)/x^4)), x)
```

Sympy [A] time = 5.47512, size = 39, normalized size = 0.18

$$-\frac{\Gamma\left(\frac{3}{4}\right) {}_2F_1\left(\begin{matrix} \frac{1}{2}, \frac{3}{4} \\ \frac{7}{4} \end{matrix}\middle| \frac{be^{i\pi}}{ax^4}\right)}{4\sqrt{a}x^3\Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(a+b/x**4)**(1/2),x)
```

```
[Out] -gamma(3/4)*hyper((1/2, 3/4), (7/4,), b*exp_polar(I*pi)/(a*x**4))
/(4*sqrt(a)*x**3*gamma(7/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a + \frac{b}{x^4}}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(a + b/x^4)*x^4),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(a + b/x^4)*x^4), x)
```

3.2088 $\int \frac{x^3}{\left(a+\frac{b}{x^4}\right)^{3/2}} dx$

Optimal. Leaf size=71

$$-\frac{3b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)}{4a^{5/2}}+\frac{3x^4\sqrt{a+\frac{b}{x^4}}}{4a^2}-\frac{x^4}{2a\sqrt{a+\frac{b}{x^4}}}$$

```
[Out] -x^4/(2*a*Sqrt[a + b/x^4]) + (3*Sqrt[a + b/x^4]*x^4)/(4*a^2) - (3
*b*ArcTanh[Sqrt[a + b/x^4]/Sqrt[a]])/(4*a^(5/2))
```

Rubi [A] time = 0.121718, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{3b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)}{4a^{5/2}}+\frac{3x^4\sqrt{a+\frac{b}{x^4}}}{4a^2}-\frac{x^4}{2a\sqrt{a+\frac{b}{x^4}}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(a + b/x^4)^(3/2),x]
```

```
[Out] -x^4/(2*a*Sqrt[a + b/x^4]) + (3*Sqrt[a + b/x^4]*x^4)/(4*a^2) - (3
*b*ArcTanh[Sqrt[a + b/x^4]/Sqrt[a]])/(4*a^(5/2))
```

Rubi in Sympy [A] time = 9.79503, size = 63, normalized size = 0.89

$$-\frac{x^4}{2a\sqrt{a+\frac{b}{x^4}}}+\frac{3x^4\sqrt{a+\frac{b}{x^4}}}{4a^2}-\frac{3b\,\text{atanh}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)}{4a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(a+b/x**4)**(3/2),x)
```

```
[Out] -x**4/(2*a*sqrt(a + b/x**4)) + 3*x**4*sqrt(a + b/x**4)/(4*a**2) -
 3*b*atanh(sqrt(a + b/x**4)/sqrt(a))/(4*a**(5/2))
```

Mathematica [A] time = 0.0579726, size = 80, normalized size = 1.13

$$\frac{\sqrt{a}x^2\left(ax^4+3b\right)-3b\sqrt{ax^4+b}\log\left(\sqrt{a}\sqrt{ax^4+b}+ax^2\right)}{4a^{5/2}x^2\sqrt{a+\frac{b}{x^4}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(a + b/x^4)^(3/2),x]
```

```
[Out] (Sqrt[a]*x^2*(3*b + a*x^4) - 3*b*Sqrt[b + a*x^4]*Log[a*x^2 + Sqrt
[a]*Sqrt[b + a*x^4]])/(4*a^(5/2)*Sqrt[a + b/x^4]*x^2)
```

Maple [A] time = 0.022, size = 80, normalized size = 1.1

$$-\frac{ax^4+b}{4\,x^6}\left(-x^6a^{\frac{7}{2}}-3\,x^2ba^{5/2}+3\,b\ln\left(x^2\sqrt{a}+\sqrt{ax^4+b}\right)a^2\sqrt{ax^4+b}\right)\left(\frac{ax^4+b}{x^4}\right)^{-\frac{3}{2}}a^{-\frac{9}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(a+b/x^4)^(3/2),x)
```

```
[Out] -1/4*(a*x^4+b)*(-x^6*a^(7/2)-3*x^2*b*a^(5/2)+3*b*ln(x^2*a^(1/2)+(
a*x^4+b)^(1/2))*a^2*(a*x^4+b)^(1/2))/((a*x^4+b)/x^4)^(3/2)/x^6/a^
(9/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(a + b/x^4)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.255975, size = 1, normalized size = 0.01

$$\left[\frac{3\left(abx^4+b^2\right)\sqrt{a}\log\left(2\,ax^4\sqrt{\frac{ax^4+b}{x^4}}-\left(2\,ax^4+b\right)\sqrt{a}\right)+2\left(a^2x^8+3\,abx^4\right)\sqrt{\frac{ax^4+b}{x^4}}}{8\left(a^4x^4+a^3b\right)},\frac{3\left(abx^4+b^2\right)\sqrt{-a}\arctan\left(\frac{\sqrt{-a}}{\sqrt{\frac{ax^4+b}{x^4}}}\right)+\left(\right.}{4\left(a^4x^4+a^3b\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(a + b/x^4)^(3/2),x, algorithm="fricas")
```

```
[Out] [1/8*(3*(a*b*x^4 + b^2)*sqrt(a)*log(2*a*x^4*sqrt((a*x^4 + b)/x^4)
 - (2*a*x^4 + b)*sqrt(a)) + 2*(a^2*x^8 + 3*a*b*x^4)*sqrt((a*x^4 +
 b)/x^4))/(a^4*x^4 + a^3*b), 1/4*(3*(a*b*x^4 + b^2)*sqrt(-a)*arct
an(sqrt(-a)/sqrt((a*x^4 + b)/x^4)) + (a^2*x^8 + 3*a*b*x^4)*sqrt((
a*x^4 + b)/x^4))/(a^4*x^4 + a^3*b)]
```

Sympy [A] time = 12.4341, size = 75, normalized size = 1.06

$$\frac{x^6}{4a\sqrt{b}\sqrt{\frac{ax^4}{b}+1}}+\frac{3\sqrt{b}x^2}{4a^2\sqrt{\frac{ax^4}{b}+1}}-\frac{3b\operatorname{asinh}\left(\frac{\sqrt{a}x^2}{\sqrt{b}}\right)}{4a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(a+b/x**4)**(3/2),x)
```

```
[Out] x**6/(4*a*sqrt(b)*sqrt(a*x**4/b + 1)) + 3*sqrt(b)*x**2/(4*a**2*sq
rt(a*x**4/b + 1)) - 3*b*asinh(sqrt(a)*x**2/sqrt(b))/(4*a**(5/2))
```

GIAC/XCAS [A] time = 0.31306, size = 131, normalized size = 1.85

$$\frac{1}{4}\,b\left(\frac{3\,\arctan\left(\frac{\sqrt{\frac{ax^4+b}{x^4}}}{\sqrt{-a}}\right)}{\sqrt{-a}a^2}+\frac{2\,a-\frac{3\,(ax^4+b)}{x^4}}{\left(a\sqrt{\frac{ax^4+b}{x^4}}-\frac{(ax^4+b)\sqrt{\frac{ax^4+b}{x^4}}}{x^4}\right)a^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(a + b/x^4)^(3/2),x, algorithm="giac")
```

```
[Out] 1/4*b*(3*arctan(sqrt((a*x^4 + b)/x^4)/sqrt(-a))/(sqrt(-a)*a^2) +
(2*a - 3*(a*x^4 + b)/x^4)/((a*sqrt((a*x^4 + b)/x^4) - (a*x^4 + b)
*sqrt((a*x^4 + b)/x^4)/x^4)*a^2))
```

3.2089 $\int \frac{x}{\left(a+\frac{b}{x^4}\right)^{3/2}}\,dx$

Optimal. Leaf size=40

$$\frac{x^2\sqrt{a+\frac{b}{x^4}}}{a^2}-\frac{x^2}{2a\sqrt{a+\frac{b}{x^4}}}$$

```
[Out] -x^2/(2*a*Sqrt[a + b/x^4]) + (Sqrt[a + b/x^4]*x^2)/a^2
```

Rubi [A] time = 0.0508975, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{x^2\sqrt{a+\frac{b}{x^4}}}{a^2}-\frac{x^2}{2a\sqrt{a+\frac{b}{x^4}}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b/x^4)^(3/2),x]

[Out] -x^2/(2*a*Sqrt[a + b/x^4]) + (Sqrt[a + b/x^4]*x^2)/a^2
```

Rubi in Sympy [A] time = 4.34434, size = 32, normalized size = 0.8

$$-\frac{x^2}{2a\sqrt{a+\frac{b}{x^4}}}+\frac{x^2\sqrt{a+\frac{b}{x^4}}}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b/x**4)**(3/2),x)

[Out] -x**2/(2*a*sqrt(a + b/x**4)) + x**2*sqrt(a + b/x**4)/a**2
```

Mathematica [A] time = 0.0278523, size = 30, normalized size = 0.75

$$\frac{ax^4+2b}{2a^2x^2\sqrt{a+\frac{b}{x^4}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b/x^4)^(3/2),x]

[Out] (2*b + a*x^4)/(2*a^2*Sqrt[a + b/x^4]*x^2)
```

Maple [A] time = 0.01, size = 38, normalized size = 1.

$$\frac{(ax^4+b)\,(ax^4+2\,b)}{2\,a^2x^6}\left(\frac{ax^4+b}{x^4}\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+b/x^4)^(3/2),x)
```

```
[Out] 1/2*(a*x^4+b)*(a*x^4+2*b)/a^2/x^6/((a*x^4+b)/x^4)^(3/2)
```

Maxima [A] time = 1.41906, size = 49, normalized size = 1.22

$$\frac{\sqrt{a+\frac{b}{x^4}}\,x^2}{2\,a^2}+\frac{b}{2\,\sqrt{a+\frac{b}{x^4}}\,a^2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x^4)^(3/2),x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(a + b/x^4)*x^2/a^2 + 1/2*b/(sqrt(a + b/x^4)*a^2*x^2)
```

Fricas [A] time = 0.239978, size = 57, normalized size = 1.42

$$\frac{\left(ax^6+2\,bx^2\right)\sqrt{\frac{ax^4+b}{x^4}}}{2\,(a^3x^4+a^2b)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x^4)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/2*(a*x^6 + 2*b*x^2)*sqrt((a*x^4 + b)/x^4)/(a^3*x^4 + a^2*b)
```

Sympy [A] time = 3.87987, size = 42, normalized size = 1.05

$$\frac{x^4}{2a\sqrt{b}\sqrt{\frac{ax^4}{b}+1}}+\frac{\sqrt{b}}{a^2\sqrt{\frac{ax^4}{b}+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b/x**4)**(3/2),x)
```

```
[Out] x**4/(2*a*sqrt(b)*sqrt(a*x**4/b + 1)) + sqrt(b)/(a**2*sqrt(a*x**4
/b + 1))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x^4)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x/(a + b/x^4)^(3/2), x)
```

3.2090 $\int \frac{1}{\left(a+\frac{b}{x^4}\right)^{3/2} x} \, dx$

Optimal. Leaf size=46

$$\frac{\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)}{2a^{3/2}}-\frac{1}{2a\sqrt{a+\frac{b}{x^4}}}$$

```
[Out] -1/(2*a*Sqrt[a + b/x^4]) + ArcTanh[Sqrt[a + b/x^4]/Sqrt[a]]/(2*a^
(3/2))
```

Rubi [A] time = 0.0879748, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)}{2a^{3/2}}-\frac{1}{2a\sqrt{a+\frac{b}{x^4}}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b/x^4)^(3/2)*x),x]
```

```
[Out] -1/(2*a*Sqrt[a + b/x^4]) + ArcTanh[Sqrt[a + b/x^4]/Sqrt[a]]/(2*a^
(3/2))
```

Rubi in Sympy [A] time = 7.12803, size = 37, normalized size = 0.8

$$-\frac{1}{2a\sqrt{a+\frac{b}{x^4}}}+\frac{\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)}{2a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b/x**4)**(3/2)/x,x)
```

```
[Out] -1/(2*a*sqrt(a + b/x**4)) + atanh(sqrt(a + b/x**4)/sqrt(a))/(2*a*
*(3/2))
```

Mathematica [A] time = 0.0398852, size = 70, normalized size = 1.52

$$\frac{\sqrt{ax^4+b}\log\left(\sqrt{a}\sqrt{ax^4+b}+ax^2\right)-\sqrt{a}x^2}{2a^{3/2}x^2\sqrt{a+\frac{b}{x^4}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b/x^4)^(3/2)*x),x]
```

```
[Out] (-(Sqrt[a]*x^2) + Sqrt[b + a*x^4]*Log[a*x^2 + Sqrt[a]*Sqrt[b + a*
x^4]])/(2*a^(3/2)*Sqrt[a + b/x^4]*x^2)
```

Maple [A] time = 0.02, size = 67, normalized size = 1.5

$$\frac{ax^4+b}{2\,x^6}\left(-x^2a^{\frac{3}{2}}+\ln\left(x^2\sqrt{a}+\sqrt{ax^4+b}\right)a\sqrt{ax^4+b}\right)\left(\frac{ax^4+b}{x^4}\right)^{-\frac{3}{2}}a^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^4)^(3/2)/x,x)
```

```
[Out] 1/2*(a*x^4+b)*(-x^2*a^(3/2)+ln(x^2*a^(1/2)+(a*x^4+b)^(1/2))*a*(a*
x^4+b)^(1/2))/((a*x^4+b)/x^4)^(3/2)/x^6/a^(5/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^4)^(3/2)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.260137, size = 1, normalized size = 0.02

$$\left[-\frac{2\,ax^4\sqrt{\frac{ax^4+b}{x^4}}-\left(ax^4+b\right)\sqrt{a}\log\left(-2\,ax^4\sqrt{\frac{ax^4+b}{x^4}}-\left(2\,ax^4+b\right)\sqrt{a}\right)}{4\,(a^3x^4+a^2b)},\right.$$
$$\left.-\frac{ax^4\sqrt{\frac{ax^4+b}{x^4}}+\left(ax^4+b\right)\sqrt{-a}\arctan\left(\frac{\sqrt{-a}}{\sqrt{\frac{ax^4+b}{x^4}}}\right)}{2\,(a^3x^4+a^2b)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^4)^(3/2)*x),x, algorithm="fricas")
```

```
[Out] [-1/4*(2*a*x^4*sqrt((a*x^4 + b)/x^4) - (a*x^4 + b)*sqrt(a)*log(-2
*a*x^4*sqrt((a*x^4 + b)/x^4) - (2*a*x^4 + b)*sqrt(a)))/(a^3*x^4 +
 a^2*b), -1/2*(a*x^4*sqrt((a*x^4 + b)/x^4) + (a*x^4 + b)*sqrt(-a)
*arctan(sqrt(-a)/sqrt((a*x^4 + b)/x^4)))/(a^3*x^4 + a^2*b)]
```

Sympy [A] time = 8.51045, size = 187, normalized size = 4.07

$$-\frac{2a^3x^4\sqrt{1+\frac{b}{ax^4}}}{4a^{\frac{9}{2}}x^4+4a^{\frac{7}{2}}b}-\frac{a^3x^4\log\left(\frac{b}{ax^4}\right)}{4a^{\frac{9}{2}}x^4+4a^{\frac{7}{2}}b}+\frac{2a^3x^4\log\left(\sqrt{1+\frac{b}{ax^4}}+1\right)}{4a^{\frac{9}{2}}x^4+4a^{\frac{7}{2}}b}-\frac{a^2b\log\left(\frac{b}{ax^4}\right)}{4a^{\frac{9}{2}}x^4+4a^{\frac{7}{2}}b}+\frac{2a^2b\log\left(\sqrt{1+\frac{b}{ax^4}}+1\right)}{4a^{\frac{9}{2}}x^4+4a^{\frac{7}{2}}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**4)**(3/2)/x,x)
```

```
[Out] -2*a**3*x**4*sqrt(1 + b/(a*x**4))/(4*a**(9/2)*x**4 + 4*a**(7/2)*b
) - a**3*x**4*log(b/(a*x**4))/(4*a**(9/2)*x**4 + 4*a**(7/2)*b) +
2*a**3*x**4*log(sqrt(1 + b/(a*x**4)) + 1)/(4*a**(9/2)*x**4 + 4*a*
*(7/2)*b) - a**2*b*log(b/(a*x**4))/(4*a**(9/2)*x**4 + 4*a**(7/2)*
b) + 2*a**2*b*log(sqrt(1 + b/(a*x**4)) + 1)/(4*a**(9/2)*x**4 + 4*
a**(7/2)*b)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^4)^(3/2)*x),x, algorithm="giac")
```

```
[Out] integrate(1/((a + b/x^4)^(3/2)*x), x)
```

3.2091 $\int \frac{1}{\left(a+\frac{b}{x^4}\right)^{3/2} x^3} \, dx$

Optimal. Leaf size=21

$$-\frac{1}{2ax^2\sqrt{a+\frac{b}{x^4}}}$$

```
[Out] -1/(2*a*Sqrt[a + b/x^4]*x^2)
```

Rubi [A] time = 0.0317186, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{1}{2ax^2\sqrt{a+\frac{b}{x^4}}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b/x^4)^(3/2)*x^3),x]

[Out] -1/(2*a*Sqrt[a + b/x^4]*x^2)
```

Rubi in Sympy [A] time = 2.67723, size = 19, normalized size = 0.9

$$-\frac{1}{2ax^2\sqrt{a+\frac{b}{x^4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b/x**4)**(3/2)/x**3,x)

[Out] -1/(2*a*x**2*sqrt(a + b/x**4))
```

Mathematica [A] time = 0.00980364, size = 21, normalized size = 1.

$$-\frac{1}{2ax^2\sqrt{a+\frac{b}{x^4}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b/x^4)^(3/2)*x^3),x]

[Out] -1/(2*a*Sqrt[a + b/x^4]*x^2)
```

Maple [A] time = 0.007, size = 29, normalized size = 1.4

$$-\frac{ax^4+b}{2\,x^6a}\left(\frac{ax^4+b}{x^4}\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^4)^(3/2)/x^3,x)

[Out] -1/2*(a*x^4+b)/a/x^6/((a*x^4+b)/x^4)^(3/2)
```

Maxima [A] time = 1.42855, size = 23, normalized size = 1.1

$$-\frac{1}{2\sqrt{a+\frac{b}{x^4}}ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^4)^(3/2)*x^3),x, algorithm="maxima")

[Out] -1/2/(sqrt(a + b/x^4)*a*x^2)
```

Fricas [A] time = 0.235513, size = 42, normalized size = 2.

$$-\frac{x^2\sqrt{\frac{ax^4+b}{x^4}}}{2\,(a^2x^4+ab)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^4)^(3/2)*x^3),x, algorithm="fricas")

[Out] -1/2*x^2*sqrt((a*x^4 + b)/x^4)/(a^2*x^4 + a*b)
```

Sympy [A] time = 6.77622, size = 22, normalized size = 1.05

$$-\frac{1}{2a\sqrt{b}\sqrt{\frac{ax^4}{b}+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**4)**(3/2)/x**3,x)

[Out] -1/(2*a*sqrt(b)*sqrt(a*x**4/b + 1))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^4)^(3/2)*x^3),x, algorithm="giac")

[Out] integrate(1/((a + b/x^4)^(3/2)*x^3), x)
```

3.2092 $\int \frac{x^2}{\left(a+\frac{b}{x^4}\right)^{3/2}} dx$

Optimal. Leaf size=131

$$\frac{5b^{3/4}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{12a^{9/4}\sqrt{a+\frac{b}{x^4}}}+\frac{5x^3\sqrt{a+\frac{b}{x^4}}}{6a^2}-\frac{x^3}{2a\sqrt{a+\frac{b}{x^4}}}$$

```
[Out] -x^3/(2*a*Sqrt[a + b/x^4]) + (5*Sqrt[a + b/x^4]*x^3)/(6*a^2) + (5
*b^(3/4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + S
qrt[b]/x^2)*EllipticF[2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(12*a^
(9/4)*Sqrt[a + b/x^4])
```

Rubi [A] time = 0.186721, antiderivative size = 131, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{5b^{3/4}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{12a^{9/4}\sqrt{a+\frac{b}{x^4}}}+\frac{5x^3\sqrt{a+\frac{b}{x^4}}}{6a^2}-\frac{x^3}{2a\sqrt{a+\frac{b}{x^4}}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b/x^4)^(3/2),x]
```

```
[Out] -x^3/(2*a*Sqrt[a + b/x^4]) + (5*Sqrt[a + b/x^4]*x^3)/(6*a^2) + (5
*b^(3/4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + S
qrt[b]/x^2)*EllipticF[2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(12*a^
(9/4)*Sqrt[a + b/x^4])
```

Rubi in Sympy [A] time = 12.8762, size = 117, normalized size = 0.89

$$-\frac{x^3}{2a\sqrt{a+\frac{b}{x^4}}}+\frac{5x^3\sqrt{a+\frac{b}{x^4}}}{6a^2}+\frac{5b^{\frac{3}{4}}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{12a^{\frac{9}{4}}\sqrt{a+\frac{b}{x^4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b/x**4)**(3/2),x)
```

```
[Out] -x**3/(2*a*sqrt(a + b/x**4)) + 5*x**3*sqrt(a + b/x**4)/(6*a**2) +
 5*b**(3/4)*sqrt((a + b/x**4)/(sqrt(a) + sqrt(b)/x**2)**2)*(sqrt(
a) + sqrt(b)/x**2)*elliptic_f(2*atan(b**(1/4)/(a**(1/4)*x)), 1/2)
/(12*a**(9/4)*sqrt(a + b/x**4))
```

Mathematica [C] time = 0.13519, size = 116, normalized size = 0.89

$$\frac{x\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\left(2ax^4+5b\right)+5ib\sqrt{\frac{ax^4}{b}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)}{6a^2x^2\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\sqrt{a+\frac{b}{x^4}}}$$

Antiderivative was successfully verified.

```
[In]   Integrate[x^2/(a + b/x^4)^(3/2),x]
```

```
[Out] (Sqrt[(I*Sqrt[a])/Sqrt[b]]*x*(5*b + 2*a*x^4) + (5*I)*b*Sqrt[1 + (
a*x^4)/b]*EllipticF[I*ArcSinh[Sqrt[(I*Sqrt[a])/Sqrt[b]]*x], -1])/
(6*a^2*Sqrt[(I*Sqrt[a])/Sqrt[b]]*Sqrt[a + b/x^4]*x^2)
```

Maple [C] time = 0.027, size = 133, normalized size = 1.

$$\frac{ax^4+b}{6\,a^2x^6}\left(2\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x^5a-5\,b\sqrt{-\frac{i\sqrt{a}x^2-\sqrt{b}}{\sqrt{b}}}\sqrt{\frac{i\sqrt{a}x^2+\sqrt{b}}{\sqrt{b}}}EllipticF\left(x\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}},i\right)+5\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}xb\right)\left(\frac{ax^4+b}{x^4}\right)^{-\frac{3}{2}}\frac{1}{\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^2/(a+b/x^4)^(3/2),x)
```

```
[Out] 1/6*(a*x^4+b)*(2*(I*a^(1/2)/b^(1/2))^(1/2)*x^5*a-5*b*(-(I*a^(1/2)
*x^2-b^(1/2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1/2))/b^(1/2))^(1
/2)*EllipticF(x*(I*a^(1/2)/b^(1/2))^(1/2),I)+5*(I*a^(1/2)/b^(1/2)
)^(1/2)*x*b)/((a*x^4+b)/x^4)^(3/2)/x^6/a^2/(I*a^(1/2)/b^(1/2))^(1
/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^2/(a + b/x^4)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^2/(a + b/x^4)^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x^6}{(ax^4+b)\sqrt{\frac{ax^4+b}{x^4}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^2/(a + b/x^4)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^6/((a*x^4 + b)*sqrt((a*x^4 + b)/x^4)), x)
```

Sympy [A] time = 4.11349, size = 42, normalized size = 0.32

$$-\frac{x^3\,\Gamma\left(-\frac{3}{4}\right)\,{}_2F_1\left(\begin{matrix}-\frac{3}{4},\frac{3}{2}\\ \frac{1}{4}\end{matrix}\middle|\frac{be^{i\pi}}{ax^4}\right)}{4a^{\frac{3}{2}}\,\Gamma\left(\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b/x**4)**(3/2),x)
```

```
[Out] -x**3*gamma(-3/4)*hyper((-3/4, 3/2), (1/4,), b*exp_polar(I*pi)/(a
*x**4))/(4*a**(3/2)*gamma(1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x^4)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^2/(a + b/x^4)^(3/2), x)
```

3.2093 $\int \frac{1}{\left(a+\frac{b}{x^4}\right)^{3/2}}\,dx$

Optimal. Leaf size=258

$$-\frac{3\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{4a^{7/4}\sqrt{a+\frac{b}{x^4}}}+\frac{3\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{2a^{7/4}\sqrt{a+\frac{b}{x^4}}}+\frac{3x\sqrt{a+\frac{b}{x^4}}}{2a^2}-\frac{3\sqrt{b}\sqrt{a+\frac{b}{x^4}}}{2a^2x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}-\frac{x}{2a\sqrt{a+\frac{b}{x^4}}}$$

```
[Out] (-3*Sqrt[b]*Sqrt[a + b/x^4])/(2*a^2*(Sqrt[a] + Sqrt[b]/x^2)*x) -
x/(2*a*Sqrt[a + b/x^4]) + (3*Sqrt[a + b/x^4]*x)/(2*a^2) + (3*b^(1
/4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b
]/x^2)*EllipticE[2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(2*a^(7/4)*
Sqrt[a + b/x^4]) - (3*b^(1/4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]
/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticF[2*ArcCot[(a^(1/4)*x)/b
^(1/4)], 1/2])/(4*a^(7/4)*Sqrt[a + b/x^4])
```

Rubi [A] time = 0.366454, antiderivative size = 258, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.546

$$-\frac{3\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{4a^{7/4}\sqrt{a+\frac{b}{x^4}}}+\frac{3\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{2a^{7/4}\sqrt{a+\frac{b}{x^4}}}+\frac{3x\sqrt{a+\frac{b}{x^4}}}{2a^2}-\frac{3\sqrt{b}\sqrt{a+\frac{b}{x^4}}}{2a^2x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}-\frac{x}{2a\sqrt{a+\frac{b}{x^4}}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^4)^(-3/2),x]
```

```
[Out] (-3*Sqrt[b]*Sqrt[a + b/x^4])/(2*a^2*(Sqrt[a] + Sqrt[b]/x^2)*x) -
x/(2*a*Sqrt[a + b/x^4]) + (3*Sqrt[a + b/x^4]*x)/(2*a^2) + (3*b^(1
/4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b
]/x^2)*EllipticE[2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(2*a^(7/4)*
Sqrt[a + b/x^4]) - (3*b^(1/4)*Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]
/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticF[2*ArcCot[(a^(1/4)*x)/b
^(1/4)], 1/2])/(4*a^(7/4)*Sqrt[a + b/x^4])
```

Rubi in Sympy [A] time = 29.9066, size = 233, normalized size = 0.9

$$-\frac{x}{2a\sqrt{a+\frac{b}{x^4}}}-\frac{3\sqrt{b}\sqrt{a+\frac{b}{x^4}}}{2a^2x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}+\frac{3x\sqrt{a+\frac{b}{x^4}}}{2a^2}+\frac{3\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{2a^{\frac{7}{4}}\sqrt{a+\frac{b}{x^4}}}-\frac{3\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{4a^{\frac{7}{4}}\sqrt{a+\frac{b}{x^4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**4)**(3/2),x)
```

```
[Out] -x/(2*a*sqrt(a + b/x**4)) - 3*sqrt(b)*sqrt(a + b/x**4)/(2*a**2*x*
(sqrt(a) + sqrt(b)/x**2)) + 3*x*sqrt(a + b/x**4)/(2*a**2) + 3*b**
(1/4)*sqrt((a + b/x**4)/(sqrt(a) + sqrt(b)/x**2)**2)*(sqrt(a) + s
qrt(b)/x**2)*elliptic_e(2*atan(b**(1/4)/(a**(1/4)*x)), 1/2)/(2*a*
*(7/4)*sqrt(a + b/x**4)) - 3*b**(1/4)*sqrt((a + b/x**4)/(sqrt(a)
+ sqrt(b)/x**2)**2)*(sqrt(a) + sqrt(b)/x**2)*elliptic_f(2*atan(b*
*(1/4)/(a**(1/4)*x)), 1/2)/(4*a**(7/4)*sqrt(a + b/x**4))
```

Mathematica [C] time = 0.171908, size = 166, normalized size = 0.64

$$\frac{-3\sqrt{b}\sqrt{\frac{ax^4}{b}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)+3\sqrt{b}\sqrt{\frac{ax^4}{b}+1}E\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)-\sqrt{a}x^3\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}{2a^{3/2}x^2\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\sqrt{a+\frac{b}{x^4}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^4)^(-3/2),x]
```

```
[Out] (-(Sqrt[a]*Sqrt[(I*Sqrt[a])/Sqrt[b]]*x^3) + 3*Sqrt[b]*Sqrt[1 + (a
*x^4)/b]*EllipticE[I*ArcSinh[Sqrt[(I*Sqrt[a])/Sqrt[b]]*x], -1] -
3*Sqrt[b]*Sqrt[1 + (a*x^4)/b]*EllipticF[I*ArcSinh[Sqrt[(I*Sqrt[a]
)/Sqrt[b]]*x], -1])/(2*a^(3/2)*Sqrt[(I*Sqrt[a])/Sqrt[b]]*Sqrt[a +
 b/x^4]*x^2)
```

Maple [C] time = 0.018, size = 187, normalized size = 0.7

$$-\frac{ax^4+b}{2x^6}\left(x^3a^{\frac{3}{2}}\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}}-3i\sqrt{b}\sqrt{-1\left(i\sqrt{a}x^2-\sqrt{b}\right)\frac{1}{\sqrt{b}}}\sqrt{1\left(i\sqrt{a}x^2+\sqrt{b}\right)\frac{1}{\sqrt{b}}}aEllipticF\left(x\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}},i\right)+3i\sqrt{b}\sqrt{-1\left(i\sqrt{\right.}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^4)^(3/2),x)
```

```
[Out] -1/2*(a*x^4+b)*(x^3*a^(3/2)*(I*a^(1/2)/b^(1/2))^(1/2)-3*I*b^(1/2)
*(-(I*a^(1/2)*x^2-b^(1/2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1/2)
)/b^(1/2))^(1/2)*a*EllipticF(x*(I*a^(1/2)/b^(1/2))^(1/2),I)+3*I*b
^(1/2)*(-(I*a^(1/2)*x^2-b^(1/2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b
^(1/2))/b^(1/2))^(1/2)*a*EllipticE(x*(I*a^(1/2)/b^(1/2))^(1/2),I)
)/((a*x^4+b)/x^4)^(3/2)/x^6/a^(5/2)/(I*a^(1/2)/b^(1/2))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(-3/2),x, algorithm="maxima")
```

```
[Out] integrate((a + b/x^4)^(-3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^4}{(ax^4+b)\sqrt{\frac{ax^4+b}{x^4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(-3/2),x, algorithm="fricas")
```

```
[Out] integral(x^4/((a*x^4 + b)*sqrt((a*x^4 + b)/x^4)), x)
```

Sympy [A] time = 4.1885, size = 41, normalized size = 0.16

$$-\frac{x\,\Gamma\left(-\frac{1}{4}\right)\,{}_2F_1\left(\begin{matrix}-\frac{1}{4},\frac{3}{2}\\ \frac{3}{4}\end{matrix}\middle|\frac{be^{i\pi}}{ax^4}\right)}{4a^{\frac{3}{2}}\,\Gamma\left(\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**4)**(3/2),x)
```

```
[Out] -x*gamma(-1/4)*hyper((-1/4, 3/2), (3/4,), b*exp_polar(I*pi)/(a*x*
*4))/(4*a**(3/2)*gamma(3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(-3/2),x, algorithm="giac")
```

```
[Out] integrate((a + b/x^4)^(-3/2), x)
```

3.2094 $\int \frac{1}{\left(a+\frac{b}{x^4}\right)^{3/2} x^2} \, dx$

Optimal. Leaf size=110

$$-\frac{\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{4a^{5/4}\sqrt[4]{b}\sqrt{a+\frac{b}{x^4}}}-\frac{1}{2ax\sqrt{a+\frac{b}{x^4}}}$$

```
[Out] -1/(2*a*Sqrt[a + b/x^4]*x) - (Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]
/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticF[2*ArcCot[(a^(1/4)*x)/b
^(1/4)], 1/2])/(4*a^(5/4)*b^(1/4)*Sqrt[a + b/x^4])
```

Rubi [A] time = 0.127289, antiderivative size = 110, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{4a^{5/4}\sqrt[4]{b}\sqrt{a+\frac{b}{x^4}}}-\frac{1}{2ax\sqrt{a+\frac{b}{x^4}}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^4)^(3/2)*x^2),x]
```

```
[Out] -1/(2*a*Sqrt[a + b/x^4]*x) - (Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]
/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticF[2*ArcCot[(a^(1/4)*x)/b
^(1/4)], 1/2])/(4*a^(5/4)*b^(1/4)*Sqrt[a + b/x^4])
```

Rubi in Sympy [A] time = 7.4791, size = 97, normalized size = 0.88

$$-\frac{1}{2ax\sqrt{a+\frac{b}{x^4}}}-\frac{\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{4a^{\frac{5}{4}}\sqrt[4]{b}\sqrt{a+\frac{b}{x^4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**4)**(3/2)/x**2,x)
```

```
[Out] -1/(2*a*x*sqrt(a + b/x**4)) - sqrt((a + b/x**4)/(sqrt(a) + sqrt(b
)/x**2)**2)*(sqrt(a) + sqrt(b)/x**2)*elliptic_f(2*atan(b**(1/4)/(
a**(1/4)*x)), 1/2)/(4*a**(5/4)*b**(1/4)*sqrt(a + b/x**4))
```

Mathematica [C] time = 0.138541, size = 105, normalized size = 0.95

$$-\frac{i\sqrt{\frac{ax^4}{b}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)+x\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}{2ax^2\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\sqrt{a+\frac{b}{x^4}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^4)^(3/2)*x^2),x]
```

```
[Out] -(Sqrt[(I*Sqrt[a])/Sqrt[b]]*x + I*Sqrt[1 + (a*x^4)/b]*EllipticF[I
*ArcSinh[Sqrt[(I*Sqrt[a])/Sqrt[b]]*x], -1])/(2*a*Sqrt[(I*Sqrt[a])
/Sqrt[b]]*Sqrt[a + b/x^4]*x^2)
```

Maple [C] time = 0.02, size = 113, normalized size = 1.

$$-\frac{ax^4+b}{2x^6a}\left(-\sqrt{-1\left(i\sqrt{a}x^2-\sqrt{b}\right)\frac{1}{\sqrt{b}}}\sqrt{1\left(i\sqrt{a}x^2+\sqrt{b}\right)\frac{1}{\sqrt{b}}}\mathit{EllipticF}\left(x\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}},i\right)+x\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}}\right)\left(\frac{ax^4+b}{x^4}\right)^{-\frac{3}{2}}\frac{1}{\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^4)^(3/2)/x^2,x)
```

```
[Out] -1/2*(a*x^4+b)*(-(-(I*a^(1/2)*x^2-b^(1/2))/b^(1/2))^(1/2)*((I*a^(
1/2)*x^2+b^(1/2))/b^(1/2))^(1/2)*EllipticF(x*(I*a^(1/2)/b^(1/2))^
(1/2),I)+x*(I*a^(1/2)/b^(1/2))^(1/2))/((a*x^4+b)/x^4)^(3/2)/x^6/a
/(I*a^(1/2)/b^(1/2))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^4)^(3/2)*x^2),x, algorithm="maxima")
```

```
[Out] integrate(1/((a + b/x^4)^(3/2)*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^2}{(ax^4+b)\sqrt{\frac{ax^4+b}{x^4}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^4)^(3/2)*x^2),x, algorithm="fricas")
```

```
[Out] integral(x^2/((a*x^4 + b)*sqrt((a*x^4 + b)/x^4)), x)
```

Sympy [A] time = 6.00984, size = 37, normalized size = 0.34

$$-\frac{\Gamma\left(\frac{1}{4}\right){}_2F_1\left(\begin{matrix}\frac{1}{4},\frac{3}{2}\\ \frac{5}{4}\end{matrix}\middle|\frac{be^{i\pi}}{ax^4}\right)}{4a^{\frac{3}{2}}x\,\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**4)**(3/2)/x**2,x)
```

```
[Out] -gamma(1/4)*hyper((1/4, 3/2), (5/4,), b*exp_polar(I*pi)/(a*x**4))
/(4*a**(3/2)*x*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^4)^(3/2)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/((a + b/x^4)^(3/2)*x^2), x)
```

3.2095 $\int \frac{1}{\left(a+\frac{b}{x^4}\right)^{3/2} x^4} \, dx$

Optimal. Leaf size=241

$$\frac{\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{4a^{3/4}b^{3/4}\sqrt{a+\frac{b}{x^4}}}-\frac{\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{2a^{3/4}b^{3/4}\sqrt{a+\frac{b}{x^4}}}-\frac{1}{2ax^3\sqrt{a+\frac{b}{x^4}}}+\frac{\sqrt{a+\frac{b}{x^4}}}{2a\sqrt{b}x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}$$

```
[Out] -1/(2*a*Sqrt[a + b/x^4]*x^3) + Sqrt[a + b/x^4]/(2*a*Sqrt[b]*(Sqrt
[a] + Sqrt[b]/x^2)*x) - (Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)
^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticE[2*ArcCot[(a^(1/4)*x)/b^(1/4
)], 1/2])/(2*a^(3/4)*b^(3/4)*Sqrt[a + b/x^4]) + (Sqrt[(a + b/x^4)
/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticF[2*A
rcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(4*a^(3/4)*b^(3/4)*Sqrt[a + b/x
^4])
```

Rubi [A] time = 0.320025, antiderivative size = 241, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{4a^{3/4}b^{3/4}\sqrt{a+\frac{b}{x^4}}}-\frac{\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{2a^{3/4}b^{3/4}\sqrt{a+\frac{b}{x^4}}}-\frac{1}{2ax^3\sqrt{a+\frac{b}{x^4}}}+\frac{\sqrt{a+\frac{b}{x^4}}}{2a\sqrt{b}x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^4)^(3/2)*x^4),x]
```

```
[Out] -1/(2*a*Sqrt[a + b/x^4]*x^3) + Sqrt[a + b/x^4]/(2*a*Sqrt[b]*(Sqrt
[a] + Sqrt[b]/x^2)*x) - (Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)
^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticE[2*ArcCot[(a^(1/4)*x)/b^(1/4
)], 1/2])/(2*a^(3/4)*b^(3/4)*Sqrt[a + b/x^4]) + (Sqrt[(a + b/x^4)
/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticF[2*A
rcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(4*a^(3/4)*b^(3/4)*Sqrt[a + b/x
^4])
```

Rubi in Sympy [A] time = 25.2176, size = 211, normalized size = 0.88

$$-\frac{1}{2ax^3\sqrt{a+\frac{b}{x^4}}}+\frac{\sqrt{a+\frac{b}{x^4}}}{2a\sqrt{b}x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}-\frac{\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{2a^{\frac{3}{4}}b^{\frac{3}{4}}\sqrt{a+\frac{b}{x^4}}}+\frac{\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{4a^{\frac{3}{4}}b^{\frac{3}{4}}\sqrt{a+\frac{b}{x^4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**4)**(3/2)/x**4,x)
```

```
[Out] -1/(2*a*x**3*sqrt(a + b/x**4)) + sqrt(a + b/x**4)/(2*a*sqrt(b)*x*
(sqrt(a) + sqrt(b)/x**2)) - sqrt((a + b/x**4)/(sqrt(a) + sqrt(b)/
x**2)**2)*(sqrt(a) + sqrt(b)/x**2)*elliptic_e(2*atan(b**(1/4)/(a*
*(1/4)*x)), 1/2)/(2*a**(3/4)*b**(3/4)*sqrt(a + b/x**4)) + sqrt((a
 + b/x**4)/(sqrt(a) + sqrt(b)/x**2)**2)*(sqrt(a) + sqrt(b)/x**2)*
elliptic_f(2*atan(b**(1/4)/(a**(1/4)*x)), 1/2)/(4*a**(3/4)*b**(3/
4)*sqrt(a + b/x**4))
```

Mathematica [C] time = 0.177907, size = 166, normalized size = 0.69

$$\frac{i\left(\sqrt{b}\sqrt{\frac{ax^4}{b}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)-\sqrt{b}\sqrt{\frac{ax^4}{b}+1}E\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)+\sqrt{a}x^3\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\right)}{2b^{3/2}x^2\left(\frac{i\sqrt{a}}{\sqrt{b}}\right)^{3/2}\sqrt{a+\frac{b}{x^4}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^4)^(3/2)*x^4),x]
```

```
[Out] ((I/2)*(Sqrt[a]*Sqrt[(I*Sqrt[a])/Sqrt[b]]*x^3 - Sqrt[b]*Sqrt[1 +
(a*x^4)/b]*EllipticE[I*ArcSinh[Sqrt[(I*Sqrt[a])/Sqrt[b]]*x], -1]
+ Sqrt[b]*Sqrt[1 + (a*x^4)/b]*EllipticF[I*ArcSinh[Sqrt[(I*Sqrt[a]
)/Sqrt[b]]*x], -1]))/(((I*Sqrt[a])/Sqrt[b])^(3/2)*b^(3/2)*Sqrt[a
+ b/x^4]*x^2)
```

Maple [C] time = 0.021, size = 187, normalized size = 0.8

$$\frac{ax^4+b}{2\,x^6}\left(x^3\sqrt{b}\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}}\sqrt{a}-i\sqrt{-1\left(i\sqrt{a}x^2-\sqrt{b}\right)\frac{1}{\sqrt{b}}}\sqrt{1\left(i\sqrt{a}x^2+\sqrt{b}\right)\frac{1}{\sqrt{b}}}b\mathit{EllipticF}\left(x\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}},i\right)+i\sqrt{-1\left(i\sqrt{a}x^2-\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^4)^(3/2)/x^4,x)
```

```
[Out] 1/2*(a*x^4+b)*(x^3*b^(1/2)*(I*a^(1/2)/b^(1/2))^(1/2)*a^(1/2)-I*(-
(I*a^(1/2)*x^2-b^(1/2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1/2))/b
^(1/2))^(1/2)*b*EllipticF(x*(I*a^(1/2)/b^(1/2))^(1/2),I)+I*(-(I*a
^(1/2)*x^2-b^(1/2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1/2))/b^(1/
2))^(1/2)*b*EllipticE(x*(I*a^(1/2)/b^(1/2))^(1/2),I))/((a*x^4+b)/
x^4)^(3/2)/x^6/b^(3/2)/(I*a^(1/2)/b^(1/2))^(1/2)/a^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^4)^(3/2)*x^4),x, algorithm="maxima")
```

```
[Out] integrate(1/((a + b/x^4)^(3/2)*x^4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(ax^4+b)\sqrt{\frac{ax^4+b}{x^4}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^4)^(3/2)*x^4),x, algorithm="fricas")
```

```
[Out] integral(1/((a*x^4 + b)*sqrt((a*x^4 + b)/x^4)), x)
```

Sympy [A] time = 8.59647, size = 39, normalized size = 0.16

$$-\frac{\Gamma\left(\frac{3}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{3}{4},\frac{3}{2}\\ \frac{7}{4}\end{matrix}\middle|\frac{be^{i\pi}}{ax^4}\right)}{4a^{\frac{3}{2}}x^3\,\Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**4)**(3/2)/x**4,x)
```

```
[Out] -gamma(3/4)*hyper((3/4, 3/2), (7/4,), b*exp_polar(I*pi)/(a*x**4))
/(4*a**(3/2)*x**3*gamma(7/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^4)^(3/2)*x^4),x, algorithm="giac")
```

```
[Out] integrate(1/((a + b/x^4)^(3/2)*x^4), x)
```

3.2096 $\int \frac{x^3}{\left(a+\frac{b}{x^4}\right)^{5/2}}\,dx$

Optimal. Leaf size=92

$$-\frac{5b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)}{4a^{7/2}}+\frac{5x^4\sqrt{a+\frac{b}{x^4}}}{4a^3}-\frac{5x^4}{6a^2\sqrt{a+\frac{b}{x^4}}}-\frac{x^4}{6a\left(a+\frac{b}{x^4}\right)^{3/2}}$$

```
[Out] -x^4/(6*a*(a + b/x^4)^(3/2)) - (5*x^4)/(6*a^2*Sqrt[a + b/x^4]) +
(5*Sqrt[a + b/x^4]*x^4)/(4*a^3) - (5*b*ArcTanh[Sqrt[a + b/x^4]/Sq
rt[a]])/(4*a^(7/2))
```

Rubi [A] time = 0.153784, antiderivative size = 92, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{5b\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)}{4a^{7/2}}+\frac{5x^4\sqrt{a+\frac{b}{x^4}}}{4a^3}-\frac{5x^4}{6a^2\sqrt{a+\frac{b}{x^4}}}-\frac{x^4}{6a\left(a+\frac{b}{x^4}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(a + b/x^4)^(5/2),x]
```

```
[Out] -x^4/(6*a*(a + b/x^4)^(3/2)) - (5*x^4)/(6*a^2*Sqrt[a + b/x^4]) +
(5*Sqrt[a + b/x^4]*x^4)/(4*a^3) - (5*b*ArcTanh[Sqrt[a + b/x^4]/Sq
rt[a]])/(4*a^(7/2))
```

Rubi in Sympy [A] time = 12.9809, size = 83, normalized size = 0.9

$$-\frac{x^4}{6a\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}}-\frac{5x^4}{6a^2\sqrt{a+\frac{b}{x^4}}}+\frac{5x^4\sqrt{a+\frac{b}{x^4}}}{4a^3}-\frac{5b\,\mathrm{atanh}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)}{4a^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(a+b/x**4)**(5/2),x)
```

```
[Out] -x**4/(6*a*(a + b/x**4)**(3/2)) - 5*x**4/(6*a**2*sqrt(a + b/x**4)
) + 5*x**4*sqrt(a + b/x**4)/(4*a**3) - 5*b*atanh(sqrt(a + b/x**4)
/sqrt(a))/(4*a**(7/2))
```

Mathematica [A] time = 0.0869119, size = 101, normalized size = 1.1

$$\frac{\sqrt{a}x^2\left(3a^2x^8+20abx^4+15b^2\right)-15b\left(ax^4+b\right)^{3/2}\log\left(\sqrt{a}\sqrt{ax^4+b}+ax^2\right)}{12a^{7/2}x^2\sqrt{a+\frac{b}{x^4}}\left(ax^4+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(a + b/x^4)^(5/2),x]
```

```
[Out] (Sqrt[a]*x^2*(15*b^2 + 20*a*b*x^4 + 3*a^2*x^8) - 15*b*(b + a*x^4)
^(3/2)*Log[a*x^2 + Sqrt[a]*Sqrt[b + a*x^4]])/(12*a^(7/2)*Sqrt[a +
 b/x^4]*x^2*(b + a*x^4))
```

Maple [B] time = 0.08, size = 282, normalized size = 3.1

$$\frac{1}{12\,x^{10}}\left(ax^4+b\right)^{\frac{5}{2}}\left(3\sqrt{ax^4+b}a^{15/2}x^{10}+6\,a^{13/2}b\sqrt{ax^4+b}x^6+14\,a^{13/2}\sqrt{-\frac{\left(ax^2+\sqrt{-ab}\right)\left(-ax^2+\sqrt{-ab}\right)}{a}}x^6b-15\ln\left(x^2\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(a+b/x^4)^(5/2),x)
```

```
[Out] 1/12*(a*x^4+b)^(5/2)/a^(13/2)*(3*(a*x^4+b)^(1/2)*a^(15/2)*x^10+6*
a^(13/2)*b*(a*x^4+b)^(1/2)*x^6+14*a^(13/2)*(-1/a*(a*x^2+(-a*b)^(1
/2))*(-a*x^2+(-a*b)^(1/2)))^(1/2)*x^6*b-15*ln(x^2*a^(1/2)+(a*x^4+
b)^(1/2))*x^8*a^7*b+3*a^(11/2)*b^2*(a*x^4+b)^(1/2)*x^2+12*a^(11/2
)*b^2*(-1/a*(a*x^2+(-a*b)^(1/2))*(-a*x^2+(-a*b)^(1/2)))^(1/2)*x^2
-30*a^6*b^2*ln(x^2*a^(1/2)+(a*x^4+b)^(1/2))*x^4-15*a^5*b^3*ln(x^2
*a^(1/2)+(a*x^4+b)^(1/2)))/((a*x^4+b)/x^4)^(5/2)/x^10/(-a*x^2+(-a
*b)^(1/2))^2/(a*x^2+(-a*b)^(1/2))^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(a + b/x^4)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.261846, size = 1, normalized size = 0.01

$$\left[\frac{15\left(a^2bx^8+2\,ab^2x^4+b^3\right)\sqrt{a}\log\left(2\,ax^4\sqrt{\frac{ax^4+b}{x^4}}-\left(2\,ax^4+b\right)\sqrt{a}\right)+2\left(3\,a^3x^{12}+20\,a^2bx^8+15\,ab^2x^4\right)\sqrt{\frac{ax^4+b}{x^4}}}{24\left(a^6x^8+2\,a^5bx^4+a^4b^2\right)},\frac{15\left(a^2bx^8\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(a + b/x^4)^(5/2),x, algorithm="fricas")
```

```
[Out] [1/24*(15*(a^2*b*x^8 + 2*a*b^2*x^4 + b^3)*sqrt(a)*log(2*a*x^4*sqr
t((a*x^4 + b)/x^4) - (2*a*x^4 + b)*sqrt(a)) + 2*(3*a^3*x^12 + 20*
a^2*b*x^8 + 15*a*b^2*x^4)*sqrt((a*x^4 + b)/x^4))/(a^6*x^8 + 2*a^5
*b*x^4 + a^4*b^2), 1/12*(15*(a^2*b*x^8 + 2*a*b^2*x^4 + b^3)*sqrt(
-a)*arctan(sqrt(-a)/sqrt((a*x^4 + b)/x^4)) + (3*a^3*x^12 + 20*a^2
*b*x^8 + 15*a*b^2*x^4)*sqrt((a*x^4 + b)/x^4))/(a^6*x^8 + 2*a^5*b*
x^4 + a^4*b^2)]
```

Sympy [A] time = 20.9482, size = 819, normalized size = 8.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(a+b/x**4)**(5/2),x)
```

```
[Out] 6*a**17*x**16*sqrt(1 + b/(a*x**4))/(24*a**(39/2)*x**12 + 72*a**(3
7/2)*b*x**8 + 72*a**(35/2)*b**2*x**4 + 24*a**(33/2)*b**3) + 46*a*
*16*b*x**12*sqrt(1 + b/(a*x**4))/(24*a**(39/2)*x**12 + 72*a**(37/
2)*b*x**8 + 72*a**(35/2)*b**2*x**4 + 24*a**(33/2)*b**3) + 15*a**1
6*b*x**12*log(b/(a*x**4))/(24*a**(39/2)*x**12 + 72*a**(37/2)*b*x*
*8 + 72*a**(35/2)*b**2*x**4 + 24*a**(33/2)*b**3) - 30*a**16*b*x**
12*log(sqrt(1 + b/(a*x**4)) + 1)/(24*a**(39/2)*x**12 + 72*a**(37/
2)*b*x**8 + 72*a**(35/2)*b**2*x**4 + 24*a**(33/2)*b**3) + 70*a**1
5*b**2*x**8*sqrt(1 + b/(a*x**4))/(24*a**(39/2)*x**12 + 72*a**(37/
2)*b*x**8 + 72*a**(35/2)*b**2*x**4 + 24*a**(33/2)*b**3) + 45*a**1
5*b**2*x**8*log(b/(a*x**4))/(24*a**(39/2)*x**12 + 72*a**(37/2)*b*
x**8 + 72*a**(35/2)*b**2*x**4 + 24*a**(33/2)*b**3) - 90*a**15*b**
2*x**8*log(sqrt(1 + b/(a*x**4)) + 1)/(24*a**(39/2)*x**12 + 72*a**
(37/2)*b*x**8 + 72*a**(35/2)*b**2*x**4 + 24*a**(33/2)*b**3) + 30*
a**14*b**3*x**4*sqrt(1 + b/(a*x**4))/(24*a**(39/2)*x**12 + 72*a**
(37/2)*b*x**8 + 72*a**(35/2)*b**2*x**4 + 24*a**(33/2)*b**3) + 45*
a**14*b**3*x**4*log(b/(a*x**4))/(24*a**(39/2)*x**12 + 72*a**(37/2
)*b*x**8 + 72*a**(35/2)*b**2*x**4 + 24*a**(33/2)*b**3) - 90*a**14
*b**3*x**4*log(sqrt(1 + b/(a*x**4)) + 1)/(24*a**(39/2)*x**12 + 72
*a**(37/2)*b*x**8 + 72*a**(35/2)*b**2*x**4 + 24*a**(33/2)*b**3) +
 15*a**13*b**4*log(b/(a*x**4))/(24*a**(39/2)*x**12 + 72*a**(37/2)
*b*x**8 + 72*a**(35/2)*b**2*x**4 + 24*a**(33/2)*b**3) - 30*a**13*
b**4*log(sqrt(1 + b/(a*x**4)) + 1)/(24*a**(39/2)*x**12 + 72*a**(3
7/2)*b*x**8 + 72*a**(35/2)*b**2*x**4 + 24*a**(33/2)*b**3)
```

GIAC/XCAS [A] time = 0.279033, size = 151, normalized size = 1.64

$$\frac{1}{12}\,b\left(\frac{2\left(a+\frac{6\,(ax^4+b)}{x^4}\right)x^4}{(ax^4+b)a^3\sqrt{\frac{ax^4+b}{x^4}}}+\frac{15\,\arctan\left(\frac{\sqrt{\frac{ax^4+b}{x^4}}}{\sqrt{-a}}\right)}{\sqrt{-a}a^3}-\frac{3\,\sqrt{\frac{ax^4+b}{x^4}}}{\left(a-\frac{ax^4+b}{x^4}\right)a^3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(a + b/x^4)^(5/2),x, algorithm="giac")
```

```
[Out] 1/12*b*(2*(a + 6*(a*x^4 + b)/x^4)*x^4/((a*x^4 + b)*a^3*sqrt((a*x^
4 + b)/x^4)) + 15*arctan(sqrt((a*x^4 + b)/x^4)/sqrt(-a))/(sqrt(-a
)*a^3) - 3*sqrt((a*x^4 + b)/x^4)/((a - (a*x^4 + b)/x^4)*a^3))
```

3.2097 $\int \frac{x}{\left(a+\frac{b}{x^4}\right)^{5/2}}\,dx$

Optimal. Leaf size=64

$$\frac{4x^2\sqrt{a+\frac{b}{x^4}}}{3a^3}-\frac{2x^2}{3a^2\sqrt{a+\frac{b}{x^4}}}-\frac{x^2}{6a\left(a+\frac{b}{x^4}\right)^{3/2}}$$

```
[Out] -x^2/(6*a*(a + b/x^4)^(3/2)) - (2*x^2)/(3*a^2*Sqrt[a + b/x^4]) +
(4*Sqrt[a + b/x^4]*x^2)/(3*a^3)
```

Rubi [A] time = 0.0800754, antiderivative size = 64, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{4x^2\sqrt{a+\frac{b}{x^4}}}{3a^3}-\frac{2x^2}{3a^2\sqrt{a+\frac{b}{x^4}}}-\frac{x^2}{6a\left(a+\frac{b}{x^4}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b/x^4)^(5/2),x]
```

```
[Out] -x^2/(6*a*(a + b/x^4)^(3/2)) - (2*x^2)/(3*a^2*Sqrt[a + b/x^4]) +
(4*Sqrt[a + b/x^4]*x^2)/(3*a^3)
```

Rubi in Sympy [A] time = 6.73961, size = 56, normalized size = 0.88

$$-\frac{x^2}{6a\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}}-\frac{2x^2}{3a^2\sqrt{a+\frac{b}{x^4}}}+\frac{4x^2\sqrt{a+\frac{b}{x^4}}}{3a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b/x**4)**(5/2),x)
```

```
[Out] -x**2/(6*a*(a + b/x**4)**(3/2)) - 2*x**2/(3*a**2*sqrt(a + b/x**4)
) + 4*x**2*sqrt(a + b/x**4)/(3*a**3)
```

Mathematica [A] time = 0.0357642, size = 51, normalized size = 0.8

$$\frac{3a^2x^8+12abx^4+8b^2}{6a^3x^2\sqrt{a+\frac{b}{x^4}}\left(ax^4+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b/x^4)^(5/2),x]
```

```
[Out] (8*b^2 + 12*a*b*x^4 + 3*a^2*x^8)/(6*a^3*Sqrt[a + b/x^4]*x^2*(b +
a*x^4))
```

Maple [A] time = 0.012, size = 50, normalized size = 0.8

$$\frac{(ax^4+b)\left(3x^8a^2+12abx^4+8b^2\right)}{6a^3x^{10}}\left(\frac{ax^4+b}{x^4}\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x/(a+b/x^4)^(5/2),x)
```

```
[Out] 1/6*(a*x^4+b)*(3*a^2*x^8+12*a*b*x^4+8*b^2)/a^3/x^10/((a*x^4+b)/x^
4)^(5/2)
```

Maxima [A] time = 1.44388, size = 73, normalized size = 1.14

$$\frac{\sqrt{a+\frac{b}{x^4}}\,x^2}{2a^3}+\frac{6\left(a+\frac{b}{x^4}\right)bx^4-b^2}{6\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}a^3x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(a + b/x^4)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(a + b/x^4)*x^2/a^3 + 1/6*(6*(a + b/x^4)*b*x^4 - b^2)/((a
 + b/x^4)^(3/2)*a^3*x^6)
```

Fricas [A] time = 0.241041, size = 88, normalized size = 1.38

$$\frac{\left(3a^2x^{10}+12abx^6+8b^2x^2\right)\sqrt{\frac{ax^4+b}{x^4}}}{6\left(a^5x^8+2a^4bx^4+a^3b^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(a + b/x^4)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/6*(3*a^2*x^10 + 12*a*b*x^6 + 8*b^2*x^2)*sqrt((a*x^4 + b)/x^4)/(
a^5*x^8 + 2*a^4*b*x^4 + a^3*b^2)
```

Sympy [A] time = 7.8932, size = 163, normalized size = 2.55

$$\frac{3a^2b^{\frac{9}{2}}x^8\sqrt{\frac{ax^4}{b}+1}}{6a^5b^4x^8+12a^4b^5x^4+6a^3b^6}+\frac{12ab^{\frac{11}{2}}x^4\sqrt{\frac{ax^4}{b}+1}}{6a^5b^4x^8+12a^4b^5x^4+6a^3b^6}+\frac{8b^{\frac{13}{2}}\sqrt{\frac{ax^4}{b}+1}}{6a^5b^4x^8+12a^4b^5x^4+6a^3b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(a+b/x**4)**(5/2),x)
```

```
[Out] 3*a**2*b**(9/2)*x**8*sqrt(a*x**4/b + 1)/(6*a**5*b**4*x**8 + 12*a*
*4*b**5*x**4 + 6*a**3*b**6) + 12*a*b**(11/2)*x**4*sqrt(a*x**4/b +
 1)/(6*a**5*b**4*x**8 + 12*a**4*b**5*x**4 + 6*a**3*b**6) + 8*b**(
13/2)*sqrt(a*x**4/b + 1)/(6*a**5*b**4*x**8 + 12*a**4*b**5*x**4 +
6*a**3*b**6)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\left(a + \frac{b}{x^4}\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x^4)^(5/2),x, algorithm="giac")
```

```
[Out] integrate(x/(a + b/x^4)^(5/2), x)
```

3.2098 $\int \frac{1}{\left(a+\frac{b}{x^4}\right)^{5/2} x} \, dx$

Optimal. Leaf size=64

$$\frac{\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)}{2a^{5/2}} - \frac{1}{2a^2\sqrt{a+\frac{b}{x^4}}} - \frac{1}{6a\left(a+\frac{b}{x^4}\right)^{3/2}}$$

```
[Out] -1/(6*a*(a + b/x^4)^(3/2)) - 1/(2*a^2*Sqrt[a + b/x^4]) + ArcTanh[
Sqrt[a + b/x^4]/Sqrt[a]]/(2*a^(5/2))
```

Rubi [A] time = 0.115789, antiderivative size = 64, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$

$$\frac{\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)}{2a^{5/2}} - \frac{1}{2a^2\sqrt{a+\frac{b}{x^4}}} - \frac{1}{6a\left(a+\frac{b}{x^4}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^4)^(5/2)*x),x]
```

```
[Out] -1/(6*a*(a + b/x^4)^(3/2)) - 1/(2*a^2*Sqrt[a + b/x^4]) + ArcTanh[
Sqrt[a + b/x^4]/Sqrt[a]]/(2*a^(5/2))
```

Rubi in Sympy [A] time = 9.73753, size = 54, normalized size = 0.84

$$-\frac{1}{6a\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}} - \frac{1}{2a^2\sqrt{a+\frac{b}{x^4}}} + \frac{\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x^4}}}{\sqrt{a}}\right)}{2a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**4)**(5/2)/x,x)
```

```
[Out] -1/(6*a*(a + b/x**4)**(3/2)) - 1/(2*a**2*sqrt(a + b/x**4)) + atan
h(sqrt(a + b/x**4)/sqrt(a))/(2*a**(5/2))
```

Mathematica [A] time = 0.0675436, size = 90, normalized size = 1.41

$$\frac{3\left(ax^4+b\right)^{3/2}\log\left(\sqrt{a}\sqrt{ax^4+b}+ax^2\right)-\sqrt{a}x^2\left(4ax^4+3b\right)}{6a^{5/2}x^2\sqrt{a+\frac{b}{x^4}}\left(ax^4+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^4)^(5/2)*x),x]
```

```
[Out] (-(Sqrt[a]*x^2*(3*b + 4*a*x^4)) + 3*(b + a*x^4)^(3/2)*Log[a*x^2 +
 Sqrt[a]*Sqrt[b + a*x^4]])/(6*a^(5/2)*Sqrt[a + b/x^4]*x^2*(b + a*
```

```
x^4))
```

Maple [B] time = 0.036, size = 221, normalized size = 3.5

$$\frac{1}{6\,x^{10}}\left(ax^{4}+b\right)^{\frac{5}{2}}\left(3\ln\left(x^{2}\sqrt{a}+\sqrt{ax^{4}+b}\right)x^{8}a^{5}-4\sqrt{-\frac{\left(ax^{2}+\sqrt{-ab}\right)\left(-ax^{2}+\sqrt{-ab}\right)}{a}}a^{9/2}x^{6}+6\ln\left(x^{2}\sqrt{a}+\sqrt{ax^{4}+b}\right)a^{4}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^4)^(5/2)/x,x)
```

```
[Out] 1/6*(a*x^4+b)^(5/2)/a^(7/2)*(3*ln(x^2*a^(1/2)+(a*x^4+b)^(1/2))*x^
8*a^5-4*(-1/a*(a*x^2+(-a*b)^(1/2))*(-a*x^2+(-a*b)^(1/2)))^(1/2)*a
^(9/2)*x^6+6*ln(x^2*a^(1/2)+(a*x^4+b)^(1/2))*a^4*b*x^4-3*(-1/a*(a
*x^2+(-a*b)^(1/2))*(-a*x^2+(-a*b)^(1/2)))^(1/2)*a^(7/2)*b*x^2+3*l
n(x^2*a^(1/2)+(a*x^4+b)^(1/2))*a^3*b^2)/((a*x^4+b)/x^4)^(5/2)/x^1
0/(-a*x^2+(-a*b)^(1/2))^2/(a*x^2+(-a*b)^(1/2))^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^4)^(5/2)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.261122, size = 1, normalized size = 0.02

$$\left[\frac{3\left(a^{2}x^{8}+2\,abx^{4}+b^{2}\right)\sqrt{a}\log\left(-2\,ax^{4}\sqrt{\frac{ax^{4}+b}{x^{4}}}-\left(2\,ax^{4}+b\right)\sqrt{a}\right)-2\left(4\,a^{2}x^{8}+3\,abx^{4}\right)\sqrt{\frac{ax^{4}+b}{x^{4}}}}{12\left(a^{5}x^{8}+2\,a^{4}bx^{4}+a^{3}b^{2}\right)},\right.$$
$$\left.-\frac{3\left(a^{2}x^{8}+2\,abx^{4}+b^{2}\right)\sqrt{-a}\arctan\left(\frac{\sqrt{-a}}{\sqrt{\frac{ax^{4}+b}{x^{4}}}}\right)+\left(4\,a^{2}x^{8}+3\,abx^{4}\right)\sqrt{\frac{ax^{4}+b}{x^{4}}}}{6\left(a^{5}x^{8}+2\,a^{4}bx^{4}+a^{3}b^{2}\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^4)^(5/2)*x),x, algorithm="fricas")
```

```
[Out] [1/12*(3*(a^2*x^8 + 2*a*b*x^4 + b^2)*sqrt(a)*log(-2*a*x^4*sqrt((a
*x^4 + b)/x^4) - (2*a*x^4 + b)*sqrt(a)) - 2*(4*a^2*x^8 + 3*a*b*x^
4)*sqrt((a*x^4 + b)/x^4))/(a^5*x^8 + 2*a^4*b*x^4 + a^3*b^2), -1/6
*(3*(a^2*x^8 + 2*a*b*x^4 + b^2)*sqrt(-a)*arctan(sqrt(-a)/sqrt((a*
x^4 + b)/x^4)) + (4*a^2*x^8 + 3*a*b*x^4)*sqrt((a*x^4 + b)/x^4))/(
a^5*x^8 + 2*a^4*b*x^4 + a^3*b^2)]
```

Sympy [A] time = 15.4389, size = 743, normalized size = 11.61

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**4)**(5/2)/x,x)
```

```
[Out] -8*a**7*x**12*sqrt(1 + b/(a*x**4))/(12*a**(19/2)*x**12 + 36*a**(1
7/2)*b*x**8 + 36*a**(15/2)*b**2*x**4 + 12*a**(13/2)*b**3) - 3*a**
7*x**12*log(b/(a*x**4))/(12*a**(19/2)*x**12 + 36*a**(17/2)*b*x**8
 + 36*a**(15/2)*b**2*x**4 + 12*a**(13/2)*b**3) + 6*a**7*x**12*log
(sqrt(1 + b/(a*x**4)) + 1)/(12*a**(19/2)*x**12 + 36*a**(17/2)*b*x
**8 + 36*a**(15/2)*b**2*x**4 + 12*a**(13/2)*b**3) - 14*a**6*b*x**
8*sqrt(1 + b/(a*x**4))/(12*a**(19/2)*x**12 + 36*a**(17/2)*b*x**8
+ 36*a**(15/2)*b**2*x**4 + 12*a**(13/2)*b**3) - 9*a**6*b*x**8*log
(b/(a*x**4))/(12*a**(19/2)*x**12 + 36*a**(17/2)*b*x**8 + 36*a**(1
5/2)*b**2*x**4 + 12*a**(13/2)*b**3) + 18*a**6*b*x**8*log(sqrt(1 +
 b/(a*x**4)) + 1)/(12*a**(19/2)*x**12 + 36*a**(17/2)*b*x**8 + 36*
a**(15/2)*b**2*x**4 + 12*a**(13/2)*b**3) - 6*a**5*b**2*x**4*sqrt(
1 + b/(a*x**4))/(12*a**(19/2)*x**12 + 36*a**(17/2)*b*x**8 + 36*a*
*(15/2)*b**2*x**4 + 12*a**(13/2)*b**3) - 9*a**5*b**2*x**4*log(b/(
a*x**4))/(12*a**(19/2)*x**12 + 36*a**(17/2)*b*x**8 + 36*a**(15/2)
*b**2*x**4 + 12*a**(13/2)*b**3) + 18*a**5*b**2*x**4*log(sqrt(1 +
b/(a*x**4)) + 1)/(12*a**(19/2)*x**12 + 36*a**(17/2)*b*x**8 + 36*a
**(15/2)*b**2*x**4 + 12*a**(13/2)*b**3) - 3*a**4*b**3*log(b/(a*x*
*4))/(12*a**(19/2)*x**12 + 36*a**(17/2)*b*x**8 + 36*a**(15/2)*b**
2*x**4 + 12*a**(13/2)*b**3) + 6*a**4*b**3*log(sqrt(1 + b/(a*x**4)
) + 1)/(12*a**(19/2)*x**12 + 36*a**(17/2)*b*x**8 + 36*a**(15/2)*b
**2*x**4 + 12*a**(13/2)*b**3)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a + \frac{b}{x^4}\right)^{\frac{5}{2}} x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^4)^(5/2)*x),x, algorithm="giac")
```

```
[Out] integrate(1/((a + b/x^4)^(5/2)*x), x)
```

3.2099 $\int \frac{1}{\left(a+\frac{b}{x^4}\right)^{5/2} x^3} dx$

Optimal. Leaf size=44

$$-\frac{b}{3a^2x^6\left(a+\frac{b}{x^4}\right)^{3/2}}-\frac{1}{2ax^2\left(a+\frac{b}{x^4}\right)^{3/2}}$$

```
[Out] -b/(3*a^2*(a + b/x^4)^(3/2)*x^6) - 1/(2*a*(a + b/x^4)^(3/2)*x^2)
```

Rubi [A] time = 0.0656855, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{b}{3a^2x^6\left(a+\frac{b}{x^4}\right)^{3/2}}-\frac{1}{2ax^2\left(a+\frac{b}{x^4}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^4)^(5/2)*x^3),x]
```

```
[Out] -b/(3*a^2*(a + b/x^4)^(3/2)*x^6) - 1/(2*a*(a + b/x^4)^(3/2)*x^2)
```

Rubi in Sympy [A] time = 4.39542, size = 39, normalized size = 0.89

$$-\frac{1}{2ax^2\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}}-\frac{b}{3a^2x^6\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**4)**(5/2)/x**3,x)
```

```
[Out] -1/(2*a*x**2*(a + b/x**4)**(3/2)) - b/(3*a**2*x**6*(a + b/x**4)**
(3/2))
```

Mathematica [A] time = 0.0299482, size = 40, normalized size = 0.91

$$\frac{-3ax^4-2b}{6a^2x^2\sqrt{a+\frac{b}{x^4}}\left(ax^4+b\right)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^4)^(5/2)*x^3),x]
```

```
[Out] (-2*b - 3*a*x^4)/(6*a^2*Sqrt[a + b/x^4]*x^2*(b + a*x^4))
```

Maple [A] time = 0.01, size = 39, normalized size = 0.9

$$-\frac{\left(ax^4+b\right)\left(3\,ax^4+2\,b\right)}{6\,a^2x^{10}}\left(\frac{ax^4+b}{x^4}\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^4)^(5/2)/x^3,x)
```

```
[Out] -1/6*(a*x^4+b)*(3*a*x^4+2*b)/a^2/x^10/((a*x^4+b)/x^4)^(5/2)
```

Maxima [A] time = 1.46495, size = 45, normalized size = 1.02

$$-\frac{3\left(a+\frac{b}{x^4}\right)x^4-b}{6\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}a^2x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^4)^(5/2)*x^3),x, algorithm="maxima")
```

```
[Out] -1/6*(3*(a + b/x^4)*x^4 - b)/((a + b/x^4)^(3/2)*a^2*x^6)
```

Fricas [A] time = 0.24514, size = 73, normalized size = 1.66

$$-\frac{\left(3\,ax^6+2\,bx^2\right)\sqrt{\frac{ax^4+b}{x^4}}}{6\,(a^4x^8+2\,a^3bx^4+a^2b^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^4)^(5/2)*x^3),x, algorithm="fricas")
```

```
[Out] -1/6*(3*a*x^6 + 2*b*x^2)*sqrt((a*x^4 + b)/x^4)/(a^4*x^8 + 2*a^3*b
*x^4 + a^2*b^2)
```

Sympy [A] time = 12.6066, size = 105, normalized size = 2.39

$$-\frac{3ax^4}{6a^3\sqrt{b}x^4\sqrt{\frac{ax^4}{b}+1}+6a^2b^{\frac{3}{2}}\sqrt{\frac{ax^4}{b}+1}}-\frac{2b}{6a^3\sqrt{b}x^4\sqrt{\frac{ax^4}{b}+1}+6a^2b^{\frac{3}{2}}\sqrt{\frac{ax^4}{b}+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**4)**(5/2)/x**3,x)
```

```
[Out] -3*a*x**4/(6*a**3*sqrt(b)*x**4*sqrt(a*x**4/b + 1) + 6*a**2*b**(3/
2)*sqrt(a*x**4/b + 1)) - 2*b/(6*a**3*sqrt(b)*x**4*sqrt(a*x**4/b +
 1) + 6*a**2*b**(3/2)*sqrt(a*x**4/b + 1))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\left(a+\frac{b}{x^4}\right)^{\frac{5}{2}}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^4)^(5/2)*x^3),x, algorithm="giac")
```

```
[Out] integrate(1/((a + b/x^4)^(5/2)*x^3), x)
```

3.2100 $\int \frac{x^2}{\left(a+\frac{b}{x^4}\right)^{5/2}}\,dx$

Optimal. Leaf size=152

$$\frac{5b^{3/4}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{8a^{13/4}\sqrt{a+\frac{b}{x^4}}}+\frac{5x^3\sqrt{a+\frac{b}{x^4}}}{4a^3}-\frac{3x^3}{4a^2\sqrt{a+\frac{b}{x^4}}}-\frac{x^3}{6a\left(a+\frac{b}{x^4}\right)^{3/2}}$$

```
[Out] -x^3/(6*a*(a + b/x^4)^(3/2)) - (3*x^3)/(4*a^2*Sqrt[a + b/x^4]) +
(5*Sqrt[a + b/x^4]*x^3)/(4*a^3) + (5*b^(3/4)*Sqrt[(a + b/x^4)/(Sq
rt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticF[2*ArcCo
t[(a^(1/4)*x)/b^(1/4)], 1/2])/(8*a^(13/4)*Sqrt[a + b/x^4])
```

Rubi [A] time = 0.23594, antiderivative size = 152, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{5b^{3/4}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{8a^{13/4}\sqrt{a+\frac{b}{x^4}}}+\frac{5x^3\sqrt{a+\frac{b}{x^4}}}{4a^3}-\frac{3x^3}{4a^2\sqrt{a+\frac{b}{x^4}}}-\frac{x^3}{6a\left(a+\frac{b}{x^4}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b/x^4)^(5/2),x]
```



```
[Out] -x^3/(6*a*(a + b/x^4)^(3/2)) - (3*x^3)/(4*a^2*Sqrt[a + b/x^4]) +
(5*Sqrt[a + b/x^4]*x^3)/(4*a^3) + (5*b^(3/4)*Sqrt[(a + b/x^4)/(Sq
rt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticF[2*ArcCo
t[(a^(1/4)*x)/b^(1/4)], 1/2])/(8*a^(13/4)*Sqrt[a + b/x^4])
```

Rubi in Sympy [A] time = 17.0398, size = 138, normalized size = 0.91

$$-\frac{x^3}{6a\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}}-\frac{3x^3}{4a^2\sqrt{a+\frac{b}{x^4}}}+\frac{5x^3\sqrt{a+\frac{b}{x^4}}}{4a^3}+\frac{5b^{\frac{3}{4}}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{8a^{\frac{13}{4}}\sqrt{a+\frac{b}{x^4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b/x**4)**(5/2),x)
```

```
[Out] -x**3/(6*a*(a + b/x**4)**(3/2)) - 3*x**3/(4*a**2*sqrt(a + b/x**4)
) + 5*x**3*sqrt(a + b/x**4)/(4*a**3) + 5*b**(3/4)*sqrt((a + b/x**
4)/(sqrt(a) + sqrt(b)/x**2)**2)*(sqrt(a) + sqrt(b)/x**2)*elliptic
_f(2*atan(b**(1/4)/(a**(1/4)*x)), 1/2)/(8*a**(13/4)*sqrt(a + b/x*
*4))
```

Mathematica [C] time = 0.378637, size = 118, normalized size = 0.78

$$\frac{\frac{4a^2x^9+21abx^5+15b^2x}{ax^4+b}+\frac{15ib\sqrt{\frac{ax^4}{b}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)}{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}}{12a^3x^2\sqrt{a+\frac{b}{x^4}}}$$

Antiderivative was successfully verified.

```
[In]   Integrate[x^2/(a + b/x^4)^(5/2),x]
```

```
[Out] ((15*b^2*x + 21*a*b*x^5 + 4*a^2*x^9)/(b + a*x^4) + ((15*I)*b*Sqrt
[1 + (a*x^4)/b]*EllipticF[I*ArcSinh[Sqrt[(I*Sqrt[a])/Sqrt[b]]*x],
 -1])/Sqrt[(I*Sqrt[a])/Sqrt[b]])/(12*a^3*Sqrt[a + b/x^4]*x^2)
```

Maple [C] time = 0.031, size = 304, normalized size = 2.

$$\frac{1}{12\,a^{3}x^{10}}\left(4\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x^{13}a^{3}-15\sqrt{-\frac{i\sqrt{a}x^{2}-\sqrt{b}}{\sqrt{b}}}\sqrt{\frac{i\sqrt{a}x^{2}+\sqrt{b}}{\sqrt{b}}}\mathit{EllipticF}\left(x\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}},i\right)x^{8}a^{2}b+25\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x^{9}a^{2}b-30\sqrt{-\frac{i\sqrt{a}x^{2}-}{\sqrt{b}}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^2/(a+b/x^4)^(5/2),x)
```

```
[Out] 1/12*(4*(I*a^(1/2)/b^(1/2))^(1/2)*x^13*a^3-15*(-(I*a^(1/2)*x^2-b^
(1/2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1/2))/b^(1/2))^(1/2)*Ell
ipticF(x*(I*a^(1/2)/b^(1/2))^(1/2),I)*x^8*a^2*b+25*(I*a^(1/2)/b^(
1/2))^(1/2)*x^9*a^2*b-30*(-(I*a^(1/2)*x^2-b^(1/2))/b^(1/2))^(1/2)
*((I*a^(1/2)*x^2+b^(1/2))/b^(1/2))^(1/2)*EllipticF(x*(I*a^(1/2)/b
^(1/2))^(1/2),I)*x^4*a*b^2+36*(I*a^(1/2)/b^(1/2))^(1/2)*x^5*a*b^2
-15*(-(I*a^(1/2)*x^2-b^(1/2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1
/2))/b^(1/2))^(1/2)*EllipticF(x*(I*a^(1/2)/b^(1/2))^(1/2),I)*b^3+
15*(I*a^(1/2)/b^(1/2))^(1/2)*x*b^3)/a^3/((a*x^4+b)/x^4)^(5/2)/x^1
0/(I*a^(1/2)/b^(1/2))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{2}}{\left(a+\frac{b}{x^{4}}\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^2/(a + b/x^4)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate(x^2/(a + b/x^4)^(5/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^{10}}{(a^{2}x^{8}+2\,abx^{4}+b^{2})\sqrt{\frac{ax^{4}+b}{x^{4}}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^2/(a + b/x^4)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(x^10/((a^2*x^8 + 2*a*b*x^4 + b^2)*sqrt((a*x^4 + b)/x^4))
, x)
```

Sympy [A] time = 7.39366, size = 42, normalized size = 0.28

$$-\frac{x^{3}\Gamma\left(-\frac{3}{4}\right){}_{2}F_{1}\left(\begin{matrix}-\frac{3}{4},\frac{5}{2}\\\frac{1}{4}\end{matrix}\middle|\frac{be^{i\pi}}{ax^{4}}\right)}{4a^{\frac{5}{2}}\Gamma\left(\frac{1}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b/x**4)**(5/2),x)
```

```
[Out] -x**3*gamma(-3/4)*hyper((-3/4, 5/2), (1/4,), b*exp_polar(I*pi)/(a
*x**4))/(4*a**(5/2)*gamma(1/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{2}}{\left(a+\frac{b}{x^{4}}\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x^4)^(5/2),x, algorithm="giac")
```

```
[Out] integrate(x^2/(a + b/x^4)^(5/2), x)
```

3.2101 $\int \frac{1}{\left(a+\frac{b}{x^4}\right)^{5/2}} dx$

Optimal. Leaf size=277

$$-\frac{7\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{8a^{11/4}\sqrt{a+\frac{b}{x^4}}}+\frac{7\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{4a^{11/4}\sqrt{a+\frac{b}{x^4}}}+\frac{7x\sqrt{a+\frac{b}{x^4}}}{4a^3}-\frac{7\sqrt{b}\sqrt{a+\frac{b}{x^4}}}{4a^3x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}-\frac{7x}{12a^2\sqrt{a+\frac{b}{x^4}}}-\frac{x}{6a\left(a+\frac{b}{x^4}\right)^{3/2}}$$

```
[Out] (-7*Sqrt[b]*Sqrt[a + b/x^4])/(4*a^3*(Sqrt[a] + Sqrt[b]/x^2)*x) -
x/(6*a*(a + b/x^4)^(3/2)) - (7*x)/(12*a^2*Sqrt[a + b/x^4]) + (7*S
qrt[a + b/x^4]*x)/(4*a^3) + (7*b^(1/4)*Sqrt[(a + b/x^4)/(Sqrt[a]
+ Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticE[2*ArcCot[(a^(
1/4)*x)/b^(1/4)], 1/2])/(4*a^(11/4)*Sqrt[a + b/x^4]) - (7*b^(1/4)
*Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x
^2)*EllipticF[2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(8*a^(11/4)*Sq
rt[a + b/x^4])
```

Rubi [A] time = 0.433029, antiderivative size = 277, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.546

$$-\frac{7\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{8a^{11/4}\sqrt{a+\frac{b}{x^4}}}+\frac{7\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{4a^{11/4}\sqrt{a+\frac{b}{x^4}}}+\frac{7x\sqrt{a+\frac{b}{x^4}}}{4a^3}-\frac{7\sqrt{b}\sqrt{a+\frac{b}{x^4}}}{4a^3x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}-\frac{7x}{12a^2\sqrt{a+\frac{b}{x^4}}}-\frac{x}{6a\left(a+\frac{b}{x^4}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^4)^(-5/2),x]
```


```
[Out] (-7*Sqrt[b]*Sqrt[a + b/x^4])/(4*a^3*(Sqrt[a] + Sqrt[b]/x^2)*x) -
x/(6*a*(a + b/x^4)^(3/2)) - (7*x)/(12*a^2*Sqrt[a + b/x^4]) + (7*S
qrt[a + b/x^4]*x)/(4*a^3) + (7*b^(1/4)*Sqrt[(a + b/x^4)/(Sqrt[a]
+ Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*EllipticE[2*ArcCot[(a^(
1/4)*x)/b^(1/4)], 1/2])/(4*a^(11/4)*Sqrt[a + b/x^4]) - (7*b^(1/4)
*Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x
^2)*EllipticF[2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(8*a^(11/4)*Sq
rt[a + b/x^4])
```

Rubi in Sympy [A] time = 36.4579, size = 252, normalized size = 0.91

$$-\frac{x}{6a\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}}-\frac{7x}{12a^2\sqrt{a+\frac{b}{x^4}}}-\frac{7\sqrt{b}\sqrt{a+\frac{b}{x^4}}}{4a^3x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}+\frac{7x\sqrt{a+\frac{b}{x^4}}}{4a^3}+\frac{7\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{4a^{\frac{11}{4}}\sqrt{a+\frac{b}{x^4}}}-\frac{7\sqrt[4]{b}\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{8a^{\frac{11}{4}}\sqrt{a+\frac{b}{x^4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate(1/(a+b/x**4)**(5/2),x)
```

```
[Out] -x/(6*a*(a + b/x**4)**(3/2)) - 7*x/(12*a**2*sqrt(a + b/x**4)) - 7
*sqrt(b)*sqrt(a + b/x**4)/(4*a**3*x*(sqrt(a) + sqrt(b)/x**2)) + 7
*x*sqrt(a + b/x**4)/(4*a**3) + 7*b**(1/4)*sqrt((a + b/x**4)/(sqrt
(a) + sqrt(b)/x**2)**2)*(sqrt(a) + sqrt(b)/x**2)*elliptic_e(2*ata
n(b**(1/4)/(a**(1/4)*x)), 1/2)/(4*a**(11/4)*sqrt(a + b/x**4)) - 7
*b**(1/4)*sqrt((a + b/x**4)/(sqrt(a) + sqrt(b)/x**2)**2)*(sqrt(a)
 + sqrt(b)/x**2)*elliptic_f(2*atan(b**(1/4)/(a**(1/4)*x)), 1/2)/(
8*a**(11/4)*sqrt(a + b/x**4))
```

Mathematica [C] time = 0.407822, size = 153, normalized size = 0.55

$$\frac{\left(ax^4+b\right)^2\left(-\frac{x^3\left(9ax^4+7b\right)}{3a^2\left(ax^4+b\right)}+\frac{7i\sqrt{\frac{ax^4}{b}+1}\left(E\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)-F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)\right)}{a^2\left(\frac{i\sqrt{a}}{\sqrt{b}}\right)^{3/2}}\right)}{4x^{10}\left(a+\frac{b}{x^4}\right)^{5/2}}$$

Antiderivative was successfully verified.

```
[In]   Integrate[(a + b/x^4)^(-5/2),x]
```

```
[Out] ((b + a*x^4)^2*(-(x^3*(7*b + 9*a*x^4))/(3*a^2*(b + a*x^4)) + ((7*
I)*Sqrt[1 + (a*x^4)/b]*(EllipticE[I*ArcSinh[Sqrt[(I*Sqrt[a])/Sqrt
[b]]*x], -1] - EllipticF[I*ArcSinh[Sqrt[(I*Sqrt[a])/Sqrt[b]]*x],
-1]))/(a^2*((I*Sqrt[a])/Sqrt[b])^(3/2))))/(4*(a + b/x^4)^(5/2)*x^
10)
```

Maple [C] time = 0.03, size = 503, normalized size = 1.8

$$-\frac{1}{12x^{10}}\left(9\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}a^{9/2}x^{11}-21i\sqrt{-1\left(i\sqrt{a}x^2-\sqrt{b}\right)\frac{1}{\sqrt{b}}}\sqrt{1\left(i\sqrt{a}x^2+\sqrt{b}\right)\frac{1}{\sqrt{b}}}EllipticF\left(x\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}},i\right)\sqrt{b}x^8a^4+21i\sqrt{-1\left(\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/(a+b/x^4)^(5/2),x)
```

```
[Out] -1/12*(9*(I*a^(1/2)/b^(1/2))^(1/2)*a^(9/2)*x^11-21*I*(-(I*a^(1/2)
*x^2-b^(1/2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1/2))/b^(1/2))^(1
/2)*EllipticF(x*(I*a^(1/2)/b^(1/2))^(1/2),I)*b^(1/2)*x^8*a^4+21*I
```

```
*(-(I*a^(1/2)*x^2-b^(1/2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1/2)
)/b^(1/2))^(1/2)*EllipticE(x*(I*a^(1/2)/b^(1/2))^(1/2),I)*b^(1/2)
*x^8*a^4+16*(I*a^(1/2)/b^(1/2))^(1/2)*a^(7/2)*x^7*b-42*I*(-(I*a^(
1/2)*x^2-b^(1/2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1/2))/b^(1/2)
)^(1/2)*EllipticF(x*(I*a^(1/2)/b^(1/2))^(1/2),I)*b^(3/2)*x^4*a^3+
42*I*(-(I*a^(1/2)*x^2-b^(1/2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(
1/2))/b^(1/2))^(1/2)*EllipticE(x*(I*a^(1/2)/b^(1/2))^(1/2),I)*b^(
3/2)*x^4*a^3+7*(I*a^(1/2)/b^(1/2))^(1/2)*a^(5/2)*x^3*b^2-21*I*(-(
I*a^(1/2)*x^2-b^(1/2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1/2))/b^
(1/2))^(1/2)*EllipticF(x*(I*a^(1/2)/b^(1/2))^(1/2),I)*b^(5/2)*a^2
+21*I*(-(I*a^(1/2)*x^2-b^(1/2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^
(1/2))/b^(1/2))^(1/2)*EllipticE(x*(I*a^(1/2)/b^(1/2))^(1/2),I)*b^
(5/2)*a^2)/a^(9/2)/((a*x^4+b)/x^4)^(5/2)/x^10/(I*a^(1/2)/b^(1/2))
^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^4}\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(-5/2),x, algorithm="maxima")
```

```
[Out] integrate((a + b/x^4)^(-5/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^8}{\left(a^2x^8+2\,abx^4+b^2\right)\sqrt{\frac{ax^4+b}{x^4}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(-5/2),x, algorithm="fricas")
```

```
[Out] integral(x^8/((a^2*x^8 + 2*a*b*x^4 + b^2)*sqrt((a*x^4 + b)/x^4)),
 x)
```

Sympy [A] time = 7.19938, size = 41, normalized size = 0.15

$$-\frac{x\,\Gamma\left(-\frac{1}{4}\right)\,{}_2F_1\left(\begin{matrix}-\frac{1}{4},\frac{5}{2}\\ \frac{3}{4}\end{matrix}\middle|\frac{be^{i\pi}}{ax^4}\right)}{4a^{\frac{5}{2}}\,\Gamma\left(\frac{3}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**4)**(5/2),x)
```

```
[Out] -x*gamma(-1/4)*hyper((-1/4, 5/2), (3/4,), b*exp_polar(I*pi)/(a*x*
*4))/(4*a**(5/2)*gamma(3/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^4}\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^4)^(-5/2),x, algorithm="giac")

[Out] integrate((a + b/x^4)^(-5/2), x)
```

3.2102 $\int \frac{1}{\left(a+\frac{b}{x^4}\right)^{5/2} x^2} \, dx$

Optimal. Leaf size=131

$$-\frac{5\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{24a^{9/4}\sqrt[4]{b}\sqrt{a+\frac{b}{x^4}}}-\frac{5}{12a^2x\sqrt{a+\frac{b}{x^4}}}-\frac{1}{6ax\left(a+\frac{b}{x^4}\right)^{3/2}}$$

```
[Out] -1/(6*a*(a + b/x^4)^(3/2)*x) - 5/(12*a^2*Sqrt[a + b/x^4]*x) - (5*
Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^
2)*EllipticF[2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(24*a^(9/4)*b^(
1/4)*Sqrt[a + b/x^4])
```

Rubi [A] time = 0.162898, antiderivative size = 131, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$-\frac{5\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{24a^{9/4}\sqrt[4]{b}\sqrt{a+\frac{b}{x^4}}}-\frac{5}{12a^2x\sqrt{a+\frac{b}{x^4}}}-\frac{1}{6ax\left(a+\frac{b}{x^4}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^4)^(5/2)*x^2),x]
```

```
[Out] -1/(6*a*(a + b/x^4)^(3/2)*x) - 5/(12*a^2*Sqrt[a + b/x^4]*x) - (5*
Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^
2)*EllipticF[2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(24*a^(9/4)*b^(
1/4)*Sqrt[a + b/x^4])
```

Rubi in Sympy [A] time = 10.0075, size = 117, normalized size = 0.89

$$-\frac{1}{6ax\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}}-\frac{5}{12a^2x\sqrt{a+\frac{b}{x^4}}}-\frac{5\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{24a^{\frac{9}{4}}\sqrt[4]{b}\sqrt{a+\frac{b}{x^4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**4)**(5/2)/x**2,x)
```

```
[Out] -1/(6*a*x*(a + b/x**4)**(3/2)) - 5/(12*a**2*x*sqrt(a + b/x**4)) -
 5*sqrt((a + b/x**4)/(sqrt(a) + sqrt(b)/x**2)**2)*(sqrt(a) + sqrt
(b)/x**2)*elliptic_f(2*atan(b**(1/4)/(a**(1/4)*x)), 1/2)/(24*a**(
9/4)*b**(1/4)*sqrt(a + b/x**4))
```

Mathematica [C] time = 0.307096, size = 107, normalized size = 0.82

$$\frac{-\frac{7ax^5+5bx}{ax^4+b}-\frac{5i\sqrt{\frac{ax^4}{b}+1}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)}{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}}{12a^2x^2\sqrt{a+\frac{b}{x^4}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^4)^(5/2)*x^2),x]
```

```
[Out] (-((5*b*x + 7*a*x^5)/(b + a*x^4)) - ((5*I)*Sqrt[1 + (a*x^4)/b]*El
lipticF[I*ArcSinh[Sqrt[(I*Sqrt[a])/Sqrt[b]]*x], -1])/Sqrt[(I*Sqrt
[a])/Sqrt[b]])/(12*a^2*Sqrt[a + b/x^4]*x^2)
```

Maple [C] time = 0.031, size = 279, normalized size = 2.1

$$-\frac{1}{12\,a^2x^{10}}\left(-5\sqrt{-\frac{i\sqrt{a}x^2-\sqrt{b}}{\sqrt{b}}}\sqrt{\frac{i\sqrt{a}x^2+\sqrt{b}}{\sqrt{b}}}\,EllipticF\left(x\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}},i\right)x^8a^2+7\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x^9a^2-10\sqrt{-\frac{i\sqrt{a}x^2-\sqrt{b}}{\sqrt{b}}}\sqrt{\frac{i\sqrt{a}x^2+\sqrt{b}}{\sqrt{b}}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^4)^(5/2)/x^2,x)
```

```
[Out] -1/12*(-5*(-(I*a^(1/2)*x^2-b^(1/2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^
2+b^(1/2))/b^(1/2))^(1/2)*EllipticF(x*(I*a^(1/2)/b^(1/2))^(1/2),I
)*x^8*a^2+7*(I*a^(1/2)/b^(1/2))^(1/2)*x^9*a^2-10*(-(I*a^(1/2)*x^2
-b^(1/2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1/2))/b^(1/2))^(1/2)*
EllipticF(x*(I*a^(1/2)/b^(1/2))^(1/2),I)*x^4*a*b+12*(I*a^(1/2)/b^
(1/2))^(1/2)*x^5*a*b-5*(-(I*a^(1/2)*x^2-b^(1/2))/b^(1/2))^(1/2)*(
(I*a^(1/2)*x^2+b^(1/2))/b^(1/2))^(1/2)*EllipticF(x*(I*a^(1/2)/b^(
1/2))^(1/2),I)*b^2+5*(I*a^(1/2)/b^(1/2))^(1/2)*x*b^2)/a^2/((a*x^4
+b)/x^4)^(5/2)/x^10/(I*a^(1/2)/b^(1/2))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^4}\right)^{\frac{5}{2}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^4)^(5/2)*x^2),x, algorithm="maxima")
```

```
[Out] integrate(1/((a + b/x^4)^(5/2)*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^6}{(a^2x^8+2\,abx^4+b^2)\sqrt{\frac{ax^4+b}{x^4}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^4)^(5/2)*x^2),x, algorithm="fricas")
```

```
[Out] integral(x^6/((a^2*x^8 + 2*a*b*x^4 + b^2)*sqrt((a*x^4 + b)/x^4)),
 x)
```

Sympy [A] time = 10.299, size = 37, normalized size = 0.28

$$-\frac{\Gamma\left(\frac{1}{4}\right)\ {}_2F_1\left(\begin{matrix}\frac{1}{4},\frac{5}{2}\\\frac{5}{4}\end{matrix}\middle|\frac{be^{i\pi}}{ax^4}\right)}{4a^{\frac{5}{2}}x\,\Gamma\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**4)**(5/2)/x**2,x)
```

```
[Out] -gamma(1/4)*hyper((1/4, 5/2), (5/4,), b*exp_polar(I*pi)/(a*x**4))
/(4*a**(5/2)*x*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^4}\right)^{\frac{5}{2}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^4)^(5/2)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/((a + b/x^4)^(5/2)*x^2), x)
```

3.2103 $\int \frac{1}{\left(a+\frac{b}{x^4}\right)^{5/2} x^4} \, dx$

Optimal. Leaf size=262

$$\frac{\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{8a^{7/4}b^{3/4}\sqrt{a+\frac{b}{x^4}}}-\frac{\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{4a^{7/4}b^{3/4}\sqrt{a+\frac{b}{x^4}}}-\frac{1}{4a^2x^3\sqrt{a+\frac{b}{x^4}}}+\frac{\sqrt{a+\frac{b}{x^4}}}{4a^2\sqrt{b}x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}-\frac{1}{6ax^3\left(a+\frac{b}{x^4}\right)^{3/2}}$$

```
[Out] -1/(6*a*(a + b/x^4)^(3/2)*x^3) - 1/(4*a^2*Sqrt[a + b/x^4]*x^3) +
Sqrt[a + b/x^4]/(4*a^2*Sqrt[b]*(Sqrt[a] + Sqrt[b]/x^2)*x) - (Sqrt
[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*E
llipticE[2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(4*a^(7/4)*b^(3/4)*
Sqrt[a + b/x^4]) + (Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(
Sqrt[a] + Sqrt[b]/x^2)*EllipticF[2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1
/2])/(8*a^(7/4)*b^(3/4)*Sqrt[a + b/x^4])
```

Rubi [A] time = 0.390801, antiderivative size = 262, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{8a^{7/4}b^{3/4}\sqrt{a+\frac{b}{x^4}}}-\frac{\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\cot^{-1}\left(\frac{\sqrt[4]{a}x}{\sqrt[4]{b}}\right)|\frac{1}{2}\right)}{4a^{7/4}b^{3/4}\sqrt{a+\frac{b}{x^4}}}-\frac{1}{4a^2x^3\sqrt{a+\frac{b}{x^4}}}+\frac{\sqrt{a+\frac{b}{x^4}}}{4a^2\sqrt{b}x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}-\frac{1}{6ax^3\left(a+\frac{b}{x^4}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^4)^(5/2)*x^4),x]
```


```
[Out] -1/(6*a*(a + b/x^4)^(3/2)*x^3) - 1/(4*a^2*Sqrt[a + b/x^4]*x^3) +
Sqrt[a + b/x^4]/(4*a^2*Sqrt[b]*(Sqrt[a] + Sqrt[b]/x^2)*x) - (Sqrt
[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(Sqrt[a] + Sqrt[b]/x^2)*E
llipticE[2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1/2])/(4*a^(7/4)*b^(3/4)*
Sqrt[a + b/x^4]) + (Sqrt[(a + b/x^4)/(Sqrt[a] + Sqrt[b]/x^2)^2]*(
Sqrt[a] + Sqrt[b]/x^2)*EllipticF[2*ArcCot[(a^(1/4)*x)/b^(1/4)], 1
/2])/(8*a^(7/4)*b^(3/4)*Sqrt[a + b/x^4])
```

Rubi in Sympy [A] time = 31.4734, size = 233, normalized size = 0.89

$$-\frac{1}{6ax^3\left(a+\frac{b}{x^4}\right)^{\frac{3}{2}}}-\frac{1}{4a^2x^3\sqrt{a+\frac{b}{x^4}}}+\frac{\sqrt{a+\frac{b}{x^4}}}{4a^2\sqrt{b}x\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)}-\frac{\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)E\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{4a^{\frac{7}{4}}b^{\frac{3}{4}}\sqrt{a+\frac{b}{x^4}}}+\frac{\sqrt{\frac{a+\frac{b}{x^4}}{\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)^2}}\left(\sqrt{a}+\frac{\sqrt{b}}{x^2}\right)F\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}}{\sqrt[4]{a}x}\right)\middle|\frac{1}{2}\right)}{8a^{\frac{7}{4}}b^{\frac{3}{4}}\sqrt{a+\frac{b}{x^4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**4)**(5/2)/x**4,x)
```

```
[Out] -1/(6*a*x**3*(a + b/x**4)**(3/2)) - 1/(4*a**2*x**3*sqrt(a + b/x**
4)) + sqrt(a + b/x**4)/(4*a**2*sqrt(b)*x*(sqrt(a) + sqrt(b)/x**2)
) - sqrt((a + b/x**4)/(sqrt(a) + sqrt(b)/x**2)**2)*(sqrt(a) + sqr
t(b)/x**2)*elliptic_e(2*atan(b**(1/4)/(a**(1/4)*x)), 1/2)/(4*a**(
7/4)*b**(3/4)*sqrt(a + b/x**4)) + sqrt((a + b/x**4)/(sqrt(a) + sq
rt(b)/x**2)**2)*(sqrt(a) + sqrt(b)/x**2)*elliptic_f(2*atan(b**(1/
4)/(a**(1/4)*x)), 1/2)/(8*a**(7/4)*b**(3/4)*sqrt(a + b/x**4))
```

Mathematica [C] time = 0.415921, size = 155, normalized size = 0.59

$$\frac{(ax^4+b)^2\left(\frac{3ax^7+bx^3}{3a^2bx^4+3ab^2}+\frac{i\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\sqrt{\frac{ax^4}{b}+1}\left(E\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)-F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}x\right)\middle|-1\right)\right)}{a^2}\right)}{4x^{10}\left(a+\frac{b}{x^4}\right)^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^4)^(5/2)*x^4),x]
```

```
[Out] ((b + a*x^4)^2*((b*x^3 + 3*a*x^7)/(3*a*b^2 + 3*a^2*b*x^4) + (I*Sq
rt[(I*Sqrt[a])/Sqrt[b]]*Sqrt[1 + (a*x^4)/b]*(EllipticE[I*ArcSinh[
Sqrt[(I*Sqrt[a])/Sqrt[b]]*x], -1] - EllipticF[I*ArcSinh[Sqrt[(I*S
qrt[a])/Sqrt[b]]*x], -1]))/a^2))/(4*(a + b/x^4)^(5/2)*x^10)
```

Maple [C] time = 0.03, size = 503, normalized size = 1.9

$$-\frac{1}{12\,x^{10}}\left(-3\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}a^{7/2}\sqrt{b}x^{11}+3\,iEllipticF\left(x\sqrt{i\sqrt{a}\frac{1}{\sqrt{b}}},i\right)\sqrt{-1\left(i\sqrt{a}x^2-\sqrt{b}\right)\frac{1}{\sqrt{b}}}\sqrt{1\left(i\sqrt{a}x^2+\sqrt{b}\right)\frac{1}{\sqrt{b}}}x^8a^3b-3\,iEllipt\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^4)^(5/2)/x^4,x)
```

```
[Out] -1/12*(-3*(I*a^(1/2)/b^(1/2))^(1/2)*a^(7/2)*b^(1/2)*x^11+3*I*Elli
pticF(x*(I*a^(1/2)/b^(1/2))^(1/2),I)*(-(I*a^(1/2)*x^2-b^(1/2))/b^
(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1/2))/b^(1/2))^(1/2)*x^8*a^3*b-3*
I*EllipticE(x*(I*a^(1/2)/b^(1/2))^(1/2),I)*(-(I*a^(1/2)*x^2-b^(1/
2))/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1/2))/b^(1/2))^(1/2)*x^8*a^
3*b-4*(I*a^(1/2)/b^(1/2))^(1/2)*a^(5/2)*b^(3/2)*x^7+6*I*EllipticF
(x*(I*a^(1/2)/b^(1/2))^(1/2),I)*(-(I*a^(1/2)*x^2-b^(1/2))/b^(1/2)
)^(1/2)*((I*a^(1/2)*x^2+b^(1/2))/b^(1/2))^(1/2)*x^4*a^2*b^2-6*I*E
llipticE(x*(I*a^(1/2)/b^(1/2))^(1/2),I)*(-(I*a^(1/2)*x^2-b^(1/2))
/b^(1/2))^(1/2)*((I*a^(1/2)*x^2+b^(1/2))/b^(1/2))^(1/2)*x^4*a^2*b
^2-(I*a^(1/2)/b^(1/2))^(1/2)*a^(3/2)*b^(5/2)*x^3+3*I*EllipticF(x*
(I*a^(1/2)/b^(1/2))^(1/2),I)*(-(I*a^(1/2)*x^2-b^(1/2))/b^(1/2))^(
1/2)*((I*a^(1/2)*x^2+b^(1/2))/b^(1/2))^(1/2)*a*b^3-3*I*EllipticE(
x*(I*a^(1/2)/b^(1/2))^(1/2),I)*(-(I*a^(1/2)*x^2-b^(1/2))/b^(1/2))
^(1/2)*((I*a^(1/2)*x^2+b^(1/2))/b^(1/2))^(1/2)*a*b^3)/a^(5/2)/((a
*x^4+b)/x^4)^(5/2)/x^10/b^(3/2)/(I*a^(1/2)/b^(1/2))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\left(a+\frac{b}{x^4}\right)^{\frac{5}{2}}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^4)^(5/2)*x^4),x, algorithm="maxima")

[Out] integrate(1/((a + b/x^4)^(5/2)*x^4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^4}{\left(a^2x^8+2\,abx^4+b^2\right)\sqrt{\frac{ax^4+b}{x^4}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^4)^(5/2)*x^4),x, algorithm="fricas")

[Out] integral(x^4/((a^2*x^8 + 2*a*b*x^4 + b^2)*sqrt((a*x^4 + b)/x^4)),
 x)
```

Sympy [A] time = 15.4528, size = 39, normalized size = 0.15

$$-\frac{\Gamma\left(\frac{3}{4}\right)\,{}_2F_1\left(\begin{matrix}\frac{3}{4},\frac{5}{2}\\ \frac{7}{4}\end{matrix}\middle|\frac{be^{i\pi}}{ax^4}\right)}{4a^{\frac{5}{2}}x^3\,\Gamma\left(\frac{7}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**4)**(5/2)/x**4,x)

[Out] -gamma(3/4)*hyper((3/4, 5/2), (7/4,), b*exp_polar(I*pi)/(a*x**4))
/(4*a**(5/2)*x**3*gamma(7/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^4}\right)^{\frac{5}{2}}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^4)^(5/2)*x^4),x, algorithm="giac")

[Out] integrate(1/((a + b/x^4)^(5/2)*x^4), x)
```

3.2104 $\int \frac{1}{a+\frac{b}{x^5}}\,dx$

Optimal. Leaf size=310

$$\frac{\left(1-\sqrt{5}\right)\sqrt[5]{b}\log\left(a^{2/5}x^2-\frac{1}{2}\left(1-\sqrt{5}\right)\sqrt[5]{a}\sqrt[5]{b}x+b^{2/5}\right)}{20a^{6/5}}+\frac{\left(1+\sqrt{5}\right)\sqrt[5]{b}\log\left(a^{2/5}x^2-\frac{1}{2}\left(1+\sqrt{5}\right)\sqrt[5]{a}\sqrt[5]{b}x+b^{2/5}\right)}{20a^{6/5}}-\frac{\sqrt[5]{b}\log\left(\sqrt[5]{a}x+\sqrt[5]{b}\right)}{5a^{6/5}}-\frac{\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\sqrt[5]{b}\tan^{-1}\left(\frac{2\sqrt{\frac{2}{5+\sqrt{5}}}\sqrt[5]{a}x}{\sqrt[5]{b}}+\sqrt{\frac{1}{5}\left(5-2\sqrt{5}\right)}\right)}{5a^{6/5}}+\frac{\sqrt{\frac{1}{2}\left(5-\sqrt{5}\right)}\sqrt[5]{b}\tan^{-1}\left(\sqrt{\frac{1}{5}\left(5+2\sqrt{5}\right)}-\frac{\sqrt{\frac{2}{5}\left(5+\sqrt{5}\right)}\sqrt[5]{a}x}{\sqrt[5]{b}}\right)}{5a^{6/5}}+\frac{x}{a}$$

```
[Out] x/a - (Sqrt[(5 + Sqrt[5])/2]*b^(1/5)*ArcTan[Sqrt[(5 - 2*Sqrt[5])/
5] + (2*Sqrt[2/(5 + Sqrt[5])]*a^(1/5)*x)/b^(1/5)])/(5*a^(6/5)) +
(Sqrt[(5 - Sqrt[5])/2]*b^(1/5)*ArcTan[Sqrt[(5 + 2*Sqrt[5])/5] - (
Sqrt[(2*(5 + Sqrt[5]))/5]*a^(1/5)*x)/b^(1/5)])/(5*a^(6/5)) - (b^(
1/5)*Log[b^(1/5) + a^(1/5)*x])/(5*a^(6/5)) + ((1 - Sqrt[5])*b^(1/
5)*Log[b^(2/5) - ((1 - Sqrt[5])*a^(1/5)*b^(1/5)*x)/2 + a^(2/5)*x^
2])/(20*a^(6/5)) + ((1 + Sqrt[5])*b^(1/5)*Log[b^(2/5) - ((1 + Sqr
t[5])*a^(1/5)*b^(1/5)*x)/2 + a^(2/5)*x^2])/(20*a^(6/5))
```

Rubi [A] time = 1.42243, antiderivative size = 310, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.889

$$\frac{\left(1-\sqrt{5}\right)\sqrt[5]{b}\log\left(a^{2/5}x^2-\frac{1}{2}\left(1-\sqrt{5}\right)\sqrt[5]{a}\sqrt[5]{b}x+b^{2/5}\right)}{20a^{6/5}}+\frac{\left(1+\sqrt{5}\right)\sqrt[5]{b}\log\left(a^{2/5}x^2-\frac{1}{2}\left(1+\sqrt{5}\right)\sqrt[5]{a}\sqrt[5]{b}x+b^{2/5}\right)}{20a^{6/5}}-\frac{\sqrt[5]{b}\log\left(\sqrt[5]{a}x+\sqrt[5]{b}\right)}{5a^{6/5}}-\frac{\sqrt{\frac{1}{2}\left(5+\sqrt{5}\right)}\sqrt[5]{b}\tan^{-1}\left(\frac{2\sqrt{\frac{2}{5+\sqrt{5}}}\sqrt[5]{a}x}{\sqrt[5]{b}}+\sqrt{\frac{1}{5}\left(5-2\sqrt{5}\right)}\right)}{5a^{6/5}}+\frac{\sqrt{\frac{1}{2}\left(5-\sqrt{5}\right)}\sqrt[5]{b}\tan^{-1}\left(\sqrt{\frac{1}{5}\left(5+2\sqrt{5}\right)}-\frac{\sqrt{\frac{2}{5}\left(5+\sqrt{5}\right)}\sqrt[5]{a}x}{\sqrt[5]{b}}\right)}{5a^{6/5}}+\frac{x}{a}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^5)^(-1),x]
```


```
[Out] x/a - (Sqrt[(5 + Sqrt[5])/2]*b^(1/5)*ArcTan[Sqrt[(5 - 2*Sqrt[5])/
5] + (2*Sqrt[2/(5 + Sqrt[5])]*a^(1/5)*x)/b^(1/5)])/(5*a^(6/5)) +
(Sqrt[(5 - Sqrt[5])/2]*b^(1/5)*ArcTan[Sqrt[(5 + 2*Sqrt[5])/5] - (
Sqrt[(2*(5 + Sqrt[5]))/5]*a^(1/5)*x)/b^(1/5)])/(5*a^(6/5)) - (b^(
1/5)*Log[b^(1/5) + a^(1/5)*x])/(5*a^(6/5)) + ((1 - Sqrt[5])*b^(1/
5)*Log[b^(2/5) - ((1 - Sqrt[5])*a^(1/5)*b^(1/5)*x)/2 + a^(2/5)*x^
2])/(20*a^(6/5)) + ((1 + Sqrt[5])*b^(1/5)*Log[b^(2/5) - ((1 + Sqr
t[5])*a^(1/5)*b^(1/5)*x)/2 + a^(2/5)*x^2])/(20*a^(6/5))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**5),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.370442, size = 267, normalized size = 0.86

$$\frac{-\left(\sqrt{5}-1\right)\sqrt[5]{b}\log\left(a^{2/5}x^2+\frac{1}{2}\left(\sqrt{5}-1\right)\sqrt[5]{a}\sqrt[5]{b}x+b^{2/5}\right)+\left(1+\sqrt{5}\right)\sqrt[5]{b}\log\left(a^{2/5}x^2-\frac{1}{2}\left(1+\sqrt{5}\right)\sqrt[5]{a}\sqrt[5]{b}x+b^{2/5}\right)-4\sqrt[5]{b}\log}{20a^{6/5}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^5)^(-1),x]
```

```
[Out] (20*a^(1/5)*x - 2*Sqrt[2*(5 + Sqrt[5])]*b^(1/5)*ArcTan[((-1 + Sqr
t[5])*b^(1/5) + 4*a^(1/5)*x)/(Sqrt[2*(5 + Sqrt[5])]*b^(1/5))] - 2
*Sqrt[10 - 2*Sqrt[5]]*b^(1/5)*ArcTan[(-((1 + Sqrt[5])*b^(1/5)) +
4*a^(1/5)*x)/(Sqrt[10 - 2*Sqrt[5]]*b^(1/5))] - 4*b^(1/5)*Log[b^(1
/5) + a^(1/5)*x] - (-1 + Sqrt[5])*b^(1/5)*Log[b^(2/5) + ((-1 + Sq
rt[5])*a^(1/5)*b^(1/5)*x)/2 + a^(2/5)*x^2] + (1 + Sqrt[5])*b^(1/5
)*Log[b^(2/5) - ((1 + Sqrt[5])*a^(1/5)*b^(1/5)*x)/2 + a^(2/5)*x^2
])/(20*a^(6/5))
```

Maple [B] time = 0.089, size = 911, normalized size = 2.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^5),x)
```

```
[Out] x/a-b/a^2/(b/a)^(4/5)/(5^(1/2)-5)/(5+5^(1/2))*ln(-(b/a)^(1/5)*x*5
^(1/2)+2*(b/a)^(2/5)-(b/a)^(1/5)*x+2*x^2)*5^(1/2)-b/a^2/(b/a)^(4/
5)/(5^(1/2)-5)/(5+5^(1/2))*ln(-(b/a)^(1/5)*x*5^(1/2)+2*(b/a)^(2/5
)-(b/a)^(1/5)*x+2*x^2)+20*b/a^2/(b/a)^(3/5)/(5^(1/2)-5)/(5+5^(1/2
))/(10*(b/a)^(2/5)-2*(b/a)^(2/5)*5^(1/2))^(1/2)*arctan(-1/(10*(b/
a)^(2/5)-2*(b/a)^(2/5)*5^(1/2))^(1/2)*(b/a)^(1/5)*5^(1/2)-1/(10*(
b/a)^(2/5)-2*(b/a)^(2/5)*5^(1/2))^(1/2)*(b/a)^(1/5)+4/(10*(b/a)^(
2/5)-2*(b/a)^(2/5)*5^(1/2))^(1/2)*x)-4*b/a^2/(b/a)^(3/5)/(5^(1/2)
-5)/(5+5^(1/2))/(10*(b/a)^(2/5)-2*(b/a)^(2/5)*5^(1/2))^(1/2)*arct
an(-1/(10*(b/a)^(2/5)-2*(b/a)^(2/5)*5^(1/2))^(1/2)*(b/a)^(1/5)*5^
(1/2)-1/(10*(b/a)^(2/5)-2*(b/a)^(2/5)*5^(1/2))^(1/2)*(b/a)^(1/5)+
4/(10*(b/a)^(2/5)-2*(b/a)^(2/5)*5^(1/2))^(1/2)*x)*5^(1/2)+4*b/a^2
/(b/a)^(4/5)/(5^(1/2)-5)/(5+5^(1/2))*ln(x+(b/a)^(1/5))+b/a^2/(b/a
)^(4/5)/(5^(1/2)-5)/(5+5^(1/2))*ln((b/a)^(1/5)*x*5^(1/2)+2*(b/a)^
(2/5)-(b/a)^(1/5)*x+2*x^2)*5^(1/2)-b/a^2/(b/a)^(4/5)/(5^(1/2)-5)/
(5+5^(1/2))*ln((b/a)^(1/5)*x*5^(1/2)+2*(b/a)^(2/5)-(b/a)^(1/5)*x+
2*x^2)+20*b/a^2/(b/a)^(3/5)/(5^(1/2)-5)/(5+5^(1/2))/(10*(b/a)^(2/
5)+2*(b/a)^(2/5)*5^(1/2))^(1/2)*arctan(1/(10*(b/a)^(2/5)+2*(b/a)^
(2/5)*5^(1/2))^(1/2)*(b/a)^(1/5)*5^(1/2)-1/(10*(b/a)^(2/5)+2*(b/a
)^(2/5)*5^(1/2))^(1/2)*(b/a)^(1/5)+4/(10*(b/a)^(2/5)+2*(b/a)^(2/5
)*5^(1/2))^(1/2)*x)+4*b/a^2/(b/a)^(3/5)/(5^(1/2)-5)/(5+5^(1/2))/(
10*(b/a)^(2/5)+2*(b/a)^(2/5)*5^(1/2))^(1/2)*arctan(1/(10*(b/a)^(2
/5)+2*(b/a)^(2/5)*5^(1/2))^(1/2)*(b/a)^(1/5)*5^(1/2)-1/(10*(b/a)^
(2/5)+2*(b/a)^(2/5)*5^(1/2))^(1/2)*(b/a)^(1/5)+4/(10*(b/a)^(2/5)+
2*(b/a)^(2/5)*5^(1/2))^(1/2)*x)*5^(1/2)
```

Maxima [A] time = 1.59824, size = 441, normalized size = 1.42

$$-\frac{\frac{\sqrt{5}b^{\frac{1}{5}}\left(\sqrt{5}-1\right)\log\left(\frac{4\,a^{\frac{2}{5}}x-a^{\frac{1}{5}}b^{\frac{1}{5}}\left(\sqrt{5}+1\right)-a^{\frac{1}{5}}b^{\frac{1}{5}}\sqrt{2\sqrt{5}-10}}{4\,a^{\frac{2}{5}}x-a^{\frac{1}{5}}b^{\frac{1}{5}}\left(\sqrt{5}+1\right)+a^{\frac{1}{5}}b^{\frac{1}{5}}\sqrt{2\sqrt{5}-10}}\right)}{a^{\frac{1}{5}}\sqrt{2\sqrt{5}-10}}+\frac{\sqrt{5}b^{\frac{1}{5}}\left(\sqrt{5}+1\right)\log\left(\frac{4\,a^{\frac{2}{5}}x+a^{\frac{1}{5}}b^{\frac{1}{5}}\left(\sqrt{5}-1\right)-a^{\frac{1}{5}}b^{\frac{1}{5}}\sqrt{-2\sqrt{5}-10}}{4\,a^{\frac{2}{5}}x+a^{\frac{1}{5}}b^{\frac{1}{5}}\left(\sqrt{5}-1\right)+a^{\frac{1}{5}}b^{\frac{1}{5}}\sqrt{-2\sqrt{5}-10}}\right)}{a^{\frac{1}{5}}\sqrt{-2\sqrt{5}-10}}-\frac{b^{\frac{1}{5}}\left(\sqrt{5}+3\right)\log\left(2\,a^{\frac{2}{5}}x^{2}-a^{\frac{1}{5}}b^{\frac{1}{5}}x\left(\sqrt{5}+1\right)\cdots\right.}{a^{\frac{1}{5}}\left(\sqrt{5}+1\right)}\cdots}{10\,a}$$

$$+\frac{x}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a + b/x^5),x, algorithm="maxima")
```

```
[Out] -1/10*(sqrt(5)*b^(1/5)*(sqrt(5) - 1)*log((4*a^(2/5)*x - a^(1/5)*b
^(1/5)*(sqrt(5) + 1) - a^(1/5)*b^(1/5)*sqrt(2*sqrt(5) - 10))/(4*a
^(2/5)*x - a^(1/5)*b^(1/5)*(sqrt(5) + 1) + a^(1/5)*b^(1/5)*sqrt(2
*sqrt(5) - 10)))/(a^(1/5)*sqrt(2*sqrt(5) - 10)) + sqrt(5)*b^(1/5)
*(sqrt(5) + 1)*log((4*a^(2/5)*x + a^(1/5)*b^(1/5)*(sqrt(5) - 1) -
 a^(1/5)*b^(1/5)*sqrt(-2*sqrt(5) - 10))/(4*a^(2/5)*x + a^(1/5)*b^
(1/5)*(sqrt(5) - 1) + a^(1/5)*b^(1/5)*sqrt(-2*sqrt(5) - 10)))/(a^
(1/5)*sqrt(-2*sqrt(5) - 10)) - b^(1/5)*(sqrt(5) + 3)*log(2*a^(2/5
)*x^2 - a^(1/5)*b^(1/5)*x*(sqrt(5) + 1) + 2*b^(2/5))/(a^(1/5)*(sq
rt(5) + 1)) - b^(1/5)*(sqrt(5) - 3)*log(2*a^(2/5)*x^2 + a^(1/5)*b
^(1/5)*x*(sqrt(5) - 1) + 2*b^(2/5))/(a^(1/5)*(sqrt(5) - 1)) + 2*b
^(1/5)*log(a^(1/5)*x + b^(1/5))/a^(1/5))/a + x/a
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a + b/x^5),x, algorithm="fricas")
```

```
[Out] Exception raised: NotImplementedError
```

Sympy [A] time = 1.3344, size = 22, normalized size = 0.07

$$\operatorname{RootSum}\left(3125t^{5}a^{6}+b,\left(t\mapsto t\log\left(-5ta+x\right)\right)\right)+\frac{x}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**5),x)
```

```
[Out] RootSum(3125*_t**5*a**6 + b, Lambda(_t, _t*log(-5*_t*a + x))) + x
/a
```

GIAC/XCAS [A] time = 0.226639, size = 362, normalized size = 1.17

$$\frac{\left(-\frac{b}{a}\right)^{\frac{1}{5}}\ln\left(\left|x-\left(-\frac{b}{a}\right)^{\frac{1}{5}}\right|\right)}{5\,a}+\frac{x}{a}-\frac{\left(-a^4b\right)^{\frac{1}{5}}\sqrt{2\sqrt{5}+10}\arctan\left(-\frac{\left(\sqrt{5}-1\right)\left(-\frac{b}{a}\right)^{\frac{1}{5}}-4\,x}{\sqrt{2\sqrt{5}+10}\left(-\frac{b}{a}\right)^{\frac{1}{5}}}\right)}{10\,a^2}-\frac{\left(-a^4b\right)^{\frac{1}{5}}\sqrt{-2\sqrt{5}+10}\arctan\left(\frac{\left(\sqrt{5}+1\right)\left(-\frac{b}{a}\right)^{\frac{1}{5}}+4\,x}{\sqrt{-2\sqrt{5}+10}\left(-\frac{b}{a}\right)^{\frac{1}{5}}}\right)}{10\,a^2}-\frac{\left(-a^4b\right)^{\frac{1}{5}}\ln\left(x^2+\frac{1}{2}\,x\left(\sqrt{5}\left(-\frac{b}{a}\right)^{\frac{1}{5}}+\left(-\frac{b}{a}\right)^{\frac{1}{5}}\right)+\left(-\frac{b}{a}\right)^{\frac{2}{5}}\right)}{5\,a^2\left(\sqrt{5}-1\right)}+\frac{\left(-a^4b\right)^{\frac{1}{5}}\ln\left(x^2-\frac{1}{2}\,x\left(\sqrt{5}\left(-\frac{b}{a}\right)^{\frac{1}{5}}-\left(-\frac{b}{a}\right)^{\frac{1}{5}}\right)+\left(-\frac{b}{a}\right)^{\frac{2}{5}}\right)}{5\,a^2\left(\sqrt{5}+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a + b/x^5),x, algorithm="giac")
```

```
[Out] 1/5*(-b/a)^(1/5)*ln(abs(x - (-b/a)^(1/5)))/a + x/a - 1/10*(-a^4*b
)^(1/5)*sqrt(2*sqrt(5) + 10)*arctan(-((sqrt(5) - 1)*(-b/a)^(1/5)
- 4*x)/(sqrt(2*sqrt(5) + 10)*(-b/a)^(1/5)))/a^2 - 1/10*(-a^4*b)^(
1/5)*sqrt(-2*sqrt(5) + 10)*arctan(((sqrt(5) + 1)*(-b/a)^(1/5) + 4
*x)/(sqrt(-2*sqrt(5) + 10)*(-b/a)^(1/5)))/a^2 - 1/5*(-a^4*b)^(1/5
)*ln(x^2 + 1/2*x*(sqrt(5)*(-b/a)^(1/5) + (-b/a)^(1/5)) + (-b/a)^(
2/5))/(a^2*(sqrt(5) - 1)) + 1/5*(-a^4*b)^(1/5)*ln(x^2 - 1/2*x*(sq
rt(5)*(-b/a)^(1/5) - (-b/a)^(1/5)) + (-b/a)^(2/5))/(a^2*(sqrt(5)
+ 1))
```

3.2105 $\int \frac{1}{\sqrt{a+\frac{b}{x^5}}\,x}\,dx$

Optimal. Leaf size=27

$$\frac{2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^5}}}{\sqrt{a}}\right)}{5\sqrt{a}}$$

```
[Out] (2*ArcTanh[Sqrt[a + b/x^5]/Sqrt[a]])/(5*Sqrt[a])
```

Rubi [A] time = 0.0624642, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{2\tanh^{-1}\left(\frac{\sqrt{a+\frac{b}{x^5}}}{\sqrt{a}}\right)}{5\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b/x^5]*x),x]

[Out] (2*ArcTanh[Sqrt[a + b/x^5]/Sqrt[a]])/(5*Sqrt[a])
```

Rubi in Sympy [A] time = 5.12292, size = 24, normalized size = 0.89

$$\frac{2\,\operatorname{atanh}\left(\frac{\sqrt{a+\frac{b}{x^5}}}{\sqrt{a}}\right)}{5\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(a+b/x**5)**(1/2),x)

[Out] 2*atanh(sqrt(a + b/x**5)/sqrt(a))/(5*sqrt(a))
```

Mathematica [A] time = 0.0519659, size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a+\frac{b}{x^5}}\,x}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[1/(Sqrt[a + b/x^5]*x),x]

[Out] Integrate[1/(Sqrt[a + b/x^5]*x), x]
```

Maple [F] time = 0.053, size = 0, normalized size = 0.

$$\int \frac{1}{x}\frac{1}{\sqrt{a+\frac{b}{x^5}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x/(a+b/x^5)^(1/2),x)
```

```
[Out] int(1/x/(a+b/x^5)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(a + b/x^5)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.725371, size = 1, normalized size = 0.04

$$\left[\frac{\log\left(-\left(8\,a^{2}x^{10}+8\,abx^{5}+b^{2}\right)\sqrt{a}-4\left(2\,a^{2}x^{10}+abx^{5}\right)\sqrt{\frac{ax^{5}+b}{x^{5}}}\right)}{10\,\sqrt{a}},\,-\frac{\sqrt{-a}\arctan\left(\frac{2\,\sqrt{-a}x^{5}\sqrt{\frac{ax^{5}+b}{x^{5}}}}{2\,ax^{5}+b}\right)}{5\,a}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(a + b/x^5)*x),x, algorithm="fricas")
```

```
[Out] [1/10*log(-(8*a^2*x^10 + 8*a*b*x^5 + b^2)*sqrt(a) - 4*(2*a^2*x^10
 + a*b*x^5)*sqrt((a*x^5 + b)/x^5))/sqrt(a), -1/5*sqrt(-a)*arctan(
2*sqrt(-a)*x^5*sqrt((a*x^5 + b)/x^5)/(2*a*x^5 + b))/a]
```

Sympy [A] time = 5.4739, size = 24, normalized size = 0.89

$$\frac{2\operatorname{asinh}\left(\frac{\sqrt{a}x^{\frac{5}{2}}}{\sqrt{b}}\right)}{5\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/x/(a+b/x**5)**(1/2),x)
```

```
[Out] 2*asinh(sqrt(a)*x**(5/2)/sqrt(b))/(5*sqrt(a))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a+\frac{b}{x^{5}}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(a + b/x^5)*x),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(a + b/x^5)*x), x)
```

3.2106 $\int \frac{1}{\sqrt{-a+\frac{b}{x^5}}\,x}\,dx$

Optimal. Leaf size=29

$$-\frac{2\tan^{-1}\left(\frac{\sqrt{\frac{b}{x^5}-a}}{\sqrt{a}}\right)}{5\sqrt{a}}$$

```
[Out] (-2*ArcTan[Sqrt[-a + b/x^5]/Sqrt[a]])/(5*Sqrt[a])
```

Rubi [A] time = 0.0666003, antiderivative size = 29, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176

$$-\frac{2\tan^{-1}\left(\frac{\sqrt{\frac{b}{x^5}-a}}{\sqrt{a}}\right)}{5\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[-a + b/x^5]*x),x]

[Out] (-2*ArcTan[Sqrt[-a + b/x^5]/Sqrt[a]])/(5*Sqrt[a])
```

Rubi in Sympy [A] time = 5.58164, size = 26, normalized size = 0.9

$$-\frac{2\,\mathrm{atan}\left(\frac{\sqrt{-a+\frac{b}{x^5}}}{\sqrt{a}}\right)}{5\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(-a+b/x**5)**(1/2),x)

[Out] -2*atan(sqrt(-a + b/x**5)/sqrt(a))/(5*sqrt(a))
```

Mathematica [A] time = 0.0658279, size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-a+\frac{b}{x^5}}\,x}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[1/(Sqrt[-a + b/x^5]*x),x]

[Out] Integrate[1/(Sqrt[-a + b/x^5]*x), x]
```

Maple [F] time = 0.052, size = 0, normalized size = 0.

$$\int \frac{1}{x}\frac{1}{\sqrt{-a+\frac{b}{x^5}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x/(-a+b/x^5)^(1/2),x)
```

```
[Out] int(1/x/(-a+b/x^5)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(-a + b/x^5)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.736699, size = 1, normalized size = 0.03

$$\left[-\frac{\sqrt{-a}\log\left(-\left(8\,a^{2}x^{10}-8\,abx^{5}+b^{2}\right)\sqrt{-a}-4\,\left(2\,a^{2}x^{10}-abx^{5}\right)\sqrt{-\frac{ax^{5}-b}{x^{5}}}\right)}{10\,a},-\frac{\arctan\left(\frac{2\,\sqrt{a}x^{5}\sqrt{-\frac{ax^{5}-b}{x^{5}}}}{2\,ax^{5}-b}\right)}{5\,\sqrt{a}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(sqrt(-a + b/x^5)*x),x, algorithm="fricas")
```

```
[Out] [-1/10*sqrt(-a)*log(-(8*a^2*x^10 - 8*a*b*x^5 + b^2)*sqrt(-a) - 4*
(2*a^2*x^10 - a*b*x^5)*sqrt(-(a*x^5 - b)/x^5))/a, -1/5*arctan(2*s
qrt(a)*x^5*sqrt(-(a*x^5 - b)/x^5)/(2*a*x^5 - b))/sqrt(a)]
```

Sympy [A] time = 5.71677, size = 60, normalized size = 2.07

$$\begin{cases} -\frac{2i\operatorname{acosh}\left(\frac{\sqrt{a}x^{\frac{5}{2}}}{\sqrt{b}}\right)}{5\sqrt{a}} & \text{for}\ \left|\frac{ax^{5}}{b}\right| > 1 \\ \frac{2\operatorname{asin}\left(\frac{\sqrt{a}x^{\frac{5}{2}}}{\sqrt{b}}\right)}{5\sqrt{a}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/x/(-a+b/x**5)**(1/2),x)
```

```
[Out] Piecewise((-2*I*acosh(sqrt(a)*x**(5/2)/sqrt(b))/(5*sqrt(a)), Abs(
a*x**5/b) > 1), (2*asin(sqrt(a)*x**(5/2)/sqrt(b))/(5*sqrt(a)), Tr
ue))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{-a+\frac{b}{x^{5}}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(-a + b/x^5)*x),x, algorithm="giac")

[Out] integrate(1/(sqrt(-a + b/x^5)*x), x)
```

3.2107 $\int \frac{1}{a+\frac{b}{x^6}}\,dx$

Optimal. Leaf size=220

$$\frac{\sqrt[6]{b}\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}x^2+\sqrt[3]{b}\right)}{4\sqrt{3}a^{7/6}}-\frac{\sqrt[6]{b}\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}x^2+\sqrt[3]{b}\right)}{4\sqrt{3}a^{7/6}}-\frac{\sqrt[6]{b}\tan^{-1}\left(\frac{\sqrt[6]{a}x}{\sqrt[6]{b}}\right)}{3a^{7/6}}+\frac{\sqrt[6]{b}\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{b}-2\sqrt[6]{a}x}{\sqrt[6]{b}}\right)}{6a^{7/6}}-\frac{\sqrt[6]{b}\tan^{-1}\left(\frac{2\sqrt[6]{a}x+\sqrt{3}\sqrt[6]{b}}{\sqrt[6]{b}}\right)}{6a^{7/6}}+\frac{x}{a}$$

```
[Out] x/a - (b^(1/6)*ArcTan[(a^(1/6)*x)/b^(1/6)])/(3*a^(7/6)) + (b^(1/6
)*ArcTan[(Sqrt[3]*b^(1/6) - 2*a^(1/6)*x)/b^(1/6)])/(6*a^(7/6)) -
(b^(1/6)*ArcTan[(Sqrt[3]*b^(1/6) + 2*a^(1/6)*x)/b^(1/6)])/(6*a^(7
/6)) + (b^(1/6)*Log[b^(1/3) - Sqrt[3]*a^(1/6)*b^(1/6)*x + a^(1/3)
*x^2])/(4*Sqrt[3]*a^(7/6)) - (b^(1/6)*Log[b^(1/3) + Sqrt[3]*a^(1/
6)*b^(1/6)*x + a^(1/3)*x^2])/(4*Sqrt[3]*a^(7/6))
```

Rubi [A] time = 0.988402, antiderivative size = 220, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 8, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.889

$$\frac{\sqrt[6]{b}\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}x^2+\sqrt[3]{b}\right)}{4\sqrt{3}a^{7/6}}-\frac{\sqrt[6]{b}\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}x^2+\sqrt[3]{b}\right)}{4\sqrt{3}a^{7/6}}-\frac{\sqrt[6]{b}\tan^{-1}\left(\frac{\sqrt[6]{a}x}{\sqrt[6]{b}}\right)}{3a^{7/6}}+\frac{\sqrt[6]{b}\tan^{-1}\left(\frac{\sqrt{3}\sqrt[6]{b}-2\sqrt[6]{a}x}{\sqrt[6]{b}}\right)}{6a^{7/6}}-\frac{\sqrt[6]{b}\tan^{-1}\left(\frac{2\sqrt[6]{a}x+\sqrt{3}\sqrt[6]{b}}{\sqrt[6]{b}}\right)}{6a^{7/6}}+\frac{x}{a}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^6)^(-1),x]
```

```
[Out] x/a - (b^(1/6)*ArcTan[(a^(1/6)*x)/b^(1/6)])/(3*a^(7/6)) + (b^(1/6
)*ArcTan[(Sqrt[3]*b^(1/6) - 2*a^(1/6)*x)/b^(1/6)])/(6*a^(7/6)) -
(b^(1/6)*ArcTan[(Sqrt[3]*b^(1/6) + 2*a^(1/6)*x)/b^(1/6)])/(6*a^(7
/6)) + (b^(1/6)*Log[b^(1/3) - Sqrt[3]*a^(1/6)*b^(1/6)*x + a^(1/3)
*x^2])/(4*Sqrt[3]*a^(7/6)) - (b^(1/6)*Log[b^(1/3) + Sqrt[3]*a^(1/
6)*b^(1/6)*x + a^(1/3)*x^2])/(4*Sqrt[3]*a^(7/6))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**6),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.0924812, size = 182, normalized size = 0.83

$$\frac{\sqrt{3}\sqrt[6]{b}\log\left(-\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}x^2+\sqrt[3]{b}\right)-\sqrt{3}\sqrt[6]{b}\log\left(\sqrt{3}\sqrt[6]{a}\sqrt[6]{b}x+\sqrt[3]{a}x^2+\sqrt[3]{b}\right)-4\sqrt[6]{b}\tan^{-1}\left(\frac{\sqrt[6]{a}x}{\sqrt[6]{b}}\right)+2\sqrt[6]{b}\tan^{-1}\left(\sqrt{3}-\frac{2\sqrt[6]{a}}{\sqrt[6]{b}}\right.}{12a^{7/6}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^6)^(-1),x]
```

```
[Out] (12*a^(1/6)*x - 4*b^(1/6)*ArcTan[(a^(1/6)*x)/b^(1/6)] + 2*b^(1/6)
*ArcTan[Sqrt[3] - (2*a^(1/6)*x)/b^(1/6)] - 2*b^(1/6)*ArcTan[Sqrt[
3] + (2*a^(1/6)*x)/b^(1/6)] + Sqrt[3]*b^(1/6)*Log[b^(1/3) - Sqrt[
3]*a^(1/6)*b^(1/6)*x + a^(1/3)*x^2] - Sqrt[3]*b^(1/6)*Log[b^(1/3)
 + Sqrt[3]*a^(1/6)*b^(1/6)*x + a^(1/3)*x^2])/(12*a^(7/6))
```

Maple [A] time = 0.089, size = 167, normalized size = 0.8

$$\frac{x}{a}-\frac{\sqrt{3}}{12\,a}\sqrt[6]{\frac{b}{a}}\ln\left(x^2+\sqrt{3}\sqrt[6]{\frac{b}{a}}x+\sqrt[3]{\frac{b}{a}}\right)-\frac{1}{6\,a}\sqrt[6]{\frac{b}{a}}\arctan\left(2\,x\frac{1}{\sqrt[6]{\frac{b}{a}}}+\sqrt{3}\right)+\frac{\sqrt{3}}{12\,a}\sqrt[6]{\frac{b}{a}}\ln\left(\sqrt{3}\sqrt[6]{\frac{b}{a}}x-x^2-\sqrt[3]{\frac{b}{a}}\right)-\frac{1}{6\,a}\sqrt[6]{\frac{b}{a}}\arctan\left(-\sqrt{3}+2\,x\frac{1}{\sqrt[6]{\frac{b}{a}}}\right)-\frac{1}{3\,a}\sqrt[6]{\frac{b}{a}}\arctan\left(x\frac{1}{\sqrt[6]{\frac{b}{a}}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^6),x)
```

```
[Out] x/a-1/12/a*3^(1/2)*(b/a)^(1/6)*ln(x^2+3^(1/2)*(b/a)^(1/6)*x+(b/a)
^(1/3))-1/6/a*(b/a)^(1/6)*arctan(2*x/(b/a)^(1/6)+3^(1/2))+1/12/a*
3^(1/2)*(b/a)^(1/6)*ln(3^(1/2)*(b/a)^(1/6)*x-x^2-(b/a)^(1/3))-1/6
/a*(b/a)^(1/6)*arctan(-3^(1/2)+2*x/(b/a)^(1/6))-1/3/a*(b/a)^(1/6)
*arctan(x/(b/a)^(1/6))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a + b/x^6),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.253097, size = 389, normalized size = 1.77

$$4\sqrt{3}a\left(-\frac{b}{a^7}\right)^{\frac{1}{6}}\arctan\left(\frac{\sqrt{3}a\left(-\frac{b}{a^7}\right)^{\frac{1}{6}}}{a\left(-\frac{b}{a^7}\right)^{\frac{1}{6}}+2\,x+2\sqrt{a^2\left(-\frac{b}{a^7}\right)^{\frac{1}{3}}+ax\left(-\frac{b}{a^7}\right)^{\frac{1}{6}}+x^2}}\right)+4\sqrt{3}a\left(-\frac{b}{a^7}\right)^{\frac{1}{6}}\arctan\left(-\frac{\sqrt{3}a\left(-\frac{b}{a^7}\right)^{\frac{1}{6}}}{a\left(-\frac{b}{a^7}\right)^{\frac{1}{6}}-2\,x-2\sqrt{a^2\left(-\frac{b}{a^7}\right)^{\frac{1}{3}}-ax\left(-\frac{b}{a^7}\right)^{\frac{1}{6}}}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a + b/x^6),x, algorithm="fricas")
```

```
[Out] 1/12*(4*sqrt(3)*a*(-b/a^7)^(1/6)*arctan(sqrt(3)*a*(-b/a^7)^(1/6)/
(a*(-b/a^7)^(1/6) + 2*x + 2*sqrt(a^2*(-b/a^7)^(1/3) + a*x*(-b/a^7
)^(1/6) + x^2))) + 4*sqrt(3)*a*(-b/a^7)^(1/6)*arctan(-sqrt(3)*a*(
-b/a^7)^(1/6)/(a*(-b/a^7)^(1/6) - 2*x - 2*sqrt(a^2*(-b/a^7)^(1/3)
 - a*x*(-b/a^7)^(1/6) + x^2))) - a*(-b/a^7)^(1/6)*log(a^2*(-b/a^7
)^(1/3) + a*x*(-b/a^7)^(1/6) + x^2) + a*(-b/a^7)^(1/6)*log(a^2*(-
b/a^7)^(1/3) - a*x*(-b/a^7)^(1/6) + x^2) - 2*a*(-b/a^7)^(1/6)*log
```

```
(a*(-b/a^7)^(1/6) + x) + 2*a*(-b/a^7)^(1/6)*log(-a*(-b/a^7)^(1/6)
 + x) + 12*x)/a
```

Sympy [A] time = 1.34074, size = 22, normalized size = 0.1

$$\operatorname{RootSum}\left(46656t^6a^7 + b, \left(t \mapsto t\log\left(-6ta + x\right)\right)\right) + \frac{x}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**6),x)
```

```
[Out] RootSum(46656*_t**6*a**7 + b, Lambda(_t, _t*log(-6*_t*a + x))) +
x/a
```

GIAC/XCAS [A] time = 0.217526, size = 243, normalized size = 1.1

$$\frac{x}{a} - \frac{\sqrt{3}\left(a^5b\right)^{\frac{1}{6}}\ln\left(x^2 + \sqrt{3}x\left(\frac{b}{a}\right)^{\frac{1}{6}} + \left(\frac{b}{a}\right)^{\frac{1}{3}}\right)}{12\,a^2} + \frac{\sqrt{3}\left(a^5b\right)^{\frac{1}{6}}\ln\left(x^2 - \sqrt{3}x\left(\frac{b}{a}\right)^{\frac{1}{6}} + \left(\frac{b}{a}\right)^{\frac{1}{3}}\right)}{12\,a^2} - \frac{\left(a^5b\right)^{\frac{1}{6}}\arctan\left(\frac{2\,x+\sqrt{3}\left(\frac{b}{a}\right)^{\frac{1}{6}}}{\left(\frac{b}{a}\right)^{\frac{1}{6}}}\right)}{6\,a^2} - \frac{\left(a^5b\right)^{\frac{1}{6}}\arctan\left(\frac{2\,x-\sqrt{3}\left(\frac{b}{a}\right)^{\frac{1}{6}}}{\left(\frac{b}{a}\right)^{\frac{1}{6}}}\right)}{6\,a^2} - \frac{\left(a^5b\right)^{\frac{1}{6}}\arctan\left(\frac{x}{\left(\frac{b}{a}\right)^{\frac{1}{6}}}\right)}{3\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a + b/x^6),x, algorithm="giac")
```

```
[Out] x/a - 1/12*sqrt(3)*(a^5*b)^(1/6)*ln(x^2 + sqrt(3)*x*(b/a)^(1/6) +
 (b/a)^(1/3))/a^2 + 1/12*sqrt(3)*(a^5*b)^(1/6)*ln(x^2 - sqrt(3)*x
*(b/a)^(1/6) + (b/a)^(1/3))/a^2 - 1/6*(a^5*b)^(1/6)*arctan((2*x +
 sqrt(3)*(b/a)^(1/6))/(b/a)^(1/6))/a^2 - 1/6*(a^5*b)^(1/6)*arctan
((2*x - sqrt(3)*(b/a)^(1/6))/(b/a)^(1/6))/a^2 - 1/3*(a^5*b)^(1/6)
*arctan(x/(b/a)^(1/6))/a^2
```

3.2108 $\int \frac{1}{a+\frac{b}{x^8}}\,dx$

Optimal. Leaf size=272

$$-\frac{\sqrt[8]{b}\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}x^2+\sqrt[4]{b}\right)}{8\sqrt{2}(-a)^{9/8}}+\frac{\sqrt[8]{b}\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}x^2+\sqrt[4]{b}\right)}{8\sqrt{2}(-a)^{9/8}}+\frac{\sqrt[8]{b}\tan^{-1}\left(\frac{\sqrt[8]{-a}x}{\sqrt[8]{b}}\right)}{4(-a)^{9/8}}-\frac{\sqrt[8]{b}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{-a}x}{\sqrt[8]{b}}\right)}{4\sqrt{2}(-a)^{9/8}}+\frac{\sqrt[8]{b}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{-a}x}{\sqrt[8]{b}}+1\right)}{4\sqrt{2}(-a)^{9/8}}+\frac{\sqrt[8]{b}\tanh^{-1}\left(\frac{\sqrt[8]{-a}x}{\sqrt[8]{b}}\right)}{4(-a)^{9/8}}+\frac{x}{a}$$

```
[Out] x/a + (b^(1/8)*ArcTan[((-a)^(1/8)*x)/b^(1/8)])/(4*(-a)^(9/8)) - (
b^(1/8)*ArcTan[1 - (Sqrt[2]*(-a)^(1/8)*x)/b^(1/8)])/(4*Sqrt[2]*(-
a)^(9/8)) + (b^(1/8)*ArcTan[1 + (Sqrt[2]*(-a)^(1/8)*x)/b^(1/8)])/
(4*Sqrt[2]*(-a)^(9/8)) + (b^(1/8)*ArcTanh[((-a)^(1/8)*x)/b^(1/8)]
)/(4*(-a)^(9/8)) - (b^(1/8)*Log[b^(1/4) - Sqrt[2]*(-a)^(1/8)*b^(1
/8)*x + (-a)^(1/4)*x^2])/(8*Sqrt[2]*(-a)^(9/8)) + (b^(1/8)*Log[b^
(1/4) + Sqrt[2]*(-a)^(1/8)*b^(1/8)*x + (-a)^(1/4)*x^2])/(8*Sqrt[2
]*(-a)^(9/8))
```

Rubi [A] time = 0.609334, antiderivative size = 272, normalized size of antiderivative = 1., number of steps used = 15, number of rules used = 12, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.333

$$-\frac{\sqrt[8]{b}\log\left(-\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}x^2+\sqrt[4]{b}\right)}{8\sqrt{2}(-a)^{9/8}}+\frac{\sqrt[8]{b}\log\left(\sqrt{2}\sqrt[8]{-a}\sqrt[8]{b}x+\sqrt[4]{-a}x^2+\sqrt[4]{b}\right)}{8\sqrt{2}(-a)^{9/8}}+\frac{\sqrt[8]{b}\tan^{-1}\left(\frac{\sqrt[8]{-a}x}{\sqrt[8]{b}}\right)}{4(-a)^{9/8}}-\frac{\sqrt[8]{b}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[8]{-a}x}{\sqrt[8]{b}}\right)}{4\sqrt{2}(-a)^{9/8}}+\frac{\sqrt[8]{b}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[8]{-a}x}{\sqrt[8]{b}}+1\right)}{4\sqrt{2}(-a)^{9/8}}+\frac{\sqrt[8]{b}\tanh^{-1}\left(\frac{\sqrt[8]{-a}x}{\sqrt[8]{b}}\right)}{4(-a)^{9/8}}+\frac{x}{a}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^8)^(-1),x]
```

```
[Out] x/a + (b^(1/8)*ArcTan[((-a)^(1/8)*x)/b^(1/8)])/(4*(-a)^(9/8)) - (
b^(1/8)*ArcTan[1 - (Sqrt[2]*(-a)^(1/8)*x)/b^(1/8)])/(4*Sqrt[2]*(-
a)^(9/8)) + (b^(1/8)*ArcTan[1 + (Sqrt[2]*(-a)^(1/8)*x)/b^(1/8)])/
(4*Sqrt[2]*(-a)^(9/8)) + (b^(1/8)*ArcTanh[((-a)^(1/8)*x)/b^(1/8)]
)/(4*(-a)^(9/8)) - (b^(1/8)*Log[b^(1/4) - Sqrt[2]*(-a)^(1/8)*b^(1
/8)*x + (-a)^(1/4)*x^2])/(8*Sqrt[2]*(-a)^(9/8)) + (b^(1/8)*Log[b^
(1/4) + Sqrt[2]*(-a)^(1/8)*b^(1/8)*x + (-a)^(1/4)*x^2])/(8*Sqrt[2
]*(-a)^(9/8))
```

Rubi in Sympy [A] time = 102.358, size = 250, normalized size = 0.92

$$-\frac{\sqrt{2}\sqrt[8]{b}\log\left(-\sqrt{2}\sqrt[8]{b}x\sqrt[8]{-a}+\sqrt[4]{b}+x^2\sqrt[4]{-a}\right)}{16\left(-a\right)^{\frac{9}{8}}}+\frac{\sqrt{2}\sqrt[8]{b}\log\left(\sqrt{2}\sqrt[8]{b}x\sqrt[8]{-a}+\sqrt[4]{b}+x^2\sqrt[4]{-a}\right)}{16\left(-a\right)^{\frac{9}{8}}}+\frac{\sqrt[8]{b}\operatorname{atan}\left(\frac{x\sqrt[8]{-a}}{\sqrt[8]{b}}\right)}{4\left(-a\right)^{\frac{9}{8}}}-\frac{\sqrt{2}\sqrt[8]{b}\operatorname{atan}\left(1-\frac{\sqrt{2}x\sqrt[8]{-a}}{\sqrt[8]{b}}\right)}{8\left(-a\right)^{\frac{9}{8}}}+\frac{\sqrt{2}\sqrt[8]{b}\operatorname{atan}\left(1+\frac{\sqrt{2}x\sqrt[8]{-a}}{\sqrt[8]{b}}\right)}{8\left(-a\right)^{\frac{9}{8}}}+\frac{\sqrt[8]{b}\operatorname{atanh}\left(\frac{x\sqrt[8]{-a}}{\sqrt[8]{b}}\right)}{4\left(-a\right)^{\frac{9}{8}}}+\frac{x}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**8),x)
```

```
[Out] -sqrt(2)*b**(1/8)*log(-sqrt(2)*b**(1/8)*x*(-a)**(1/8) + b**(1/4)
+ x**2*(-a)**(1/4))/(16*(-a)**(9/8)) + sqrt(2)*b**(1/8)*log(sqrt(
2)*b**(1/8)*x*(-a)**(1/8) + b**(1/4) + x**2*(-a)**(1/4))/(16*(-a)
**(9/8)) + b**(1/8)*atan(x*(-a)**(1/8)/b**(1/8))/(4*(-a)**(9/8))
- sqrt(2)*b**(1/8)*atan(1 - sqrt(2)*x*(-a)**(1/8)/b**(1/8))/(8*(-
a)**(9/8)) + sqrt(2)*b**(1/8)*atan(1 + sqrt(2)*x*(-a)**(1/8)/b**(
1/8))/(8*(-a)**(9/8)) + b**(1/8)*atanh(x*(-a)**(1/8)/b**(1/8))/(4
*(-a)**(9/8)) + x/a
```

Mathematica [A] time = 0.407333, size = 367, normalized size = 1.35

$$\sqrt[8]{b}\sin\left(\frac{\pi}{8}\right)\log\left(-2\sqrt[8]{a}\sqrt[8]{b}x\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}x^2+\sqrt[4]{b}\right)-\sqrt[8]{b}\sin\left(\frac{\pi}{8}\right)\log\left(2\sqrt[8]{a}\sqrt[8]{b}x\sin\left(\frac{\pi}{8}\right)+\sqrt[4]{a}x^2+\sqrt[4]{b}\right)+\sqrt[8]{b}\cos\left(\frac{\pi}{8}\right)\log\left(-2\right.$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^8)^(-1),x]
```

```
[Out] (8*a^(1/8)*x - 2*b^(1/8)*ArcTan[(a^(1/8)*x*Sec[Pi/8])/b^(1/8) - T
an[Pi/8]]*Cos[Pi/8] - 2*b^(1/8)*ArcTan[(a^(1/8)*x*Sec[Pi/8])/b^(1
/8) + Tan[Pi/8]]*Cos[Pi/8] + b^(1/8)*Cos[Pi/8]*Log[b^(1/4) + a^(1
/4)*x^2 - 2*a^(1/8)*b^(1/8)*x*Cos[Pi/8]] - b^(1/8)*Cos[Pi/8]*Log[
b^(1/4) + a^(1/4)*x^2 + 2*a^(1/8)*b^(1/8)*x*Cos[Pi/8]] + 2*b^(1/8
)*ArcTan[Cot[Pi/8] - (a^(1/8)*x*Csc[Pi/8])/b^(1/8)]*Sin[Pi/8] - 2
*b^(1/8)*ArcTan[Cot[Pi/8] + (a^(1/8)*x*Csc[Pi/8])/b^(1/8)]*Sin[Pi
/8] + b^(1/8)*Log[b^(1/4) + a^(1/4)*x^2 - 2*a^(1/8)*b^(1/8)*x*Sin
[Pi/8]]*Sin[Pi/8] - b^(1/8)*Log[b^(1/4) + a^(1/4)*x^2 + 2*a^(1/8)
*b^(1/8)*x*Sin[Pi/8]]*Sin[Pi/8])/(8*a^(9/8))
```

Maple [C] time = 0.023, size = 34, normalized size = 0.1

$$\frac{x}{a}-\frac{b}{8\,a^2}\sum_{\_R=RootOf\left(a\_Z^8+b\right)}\frac{\ln\left(x-\_R\right)}{\_R^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^8),x)
```

```
[Out] x/a-1/8*b/a^2*sum(1/_R^7*ln(x-_R),_R=RootOf(_Z^8*a+b))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{b\int\frac{1}{ax^8+b}\,dx}{a}+\frac{x}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a + b/x^8),x, algorithm="maxima")
```

```
[Out] -b*integrate(1/(a*x^8 + b), x)/a + x/a
```

Fricas [A] time = 0.252853, size = 478, normalized size = 1.76

$$\sqrt{2}\left(4\sqrt{2}a\left(-\frac{b}{a^9}\right)^{\frac{1}{8}}\arctan\left(\frac{a\left(-\frac{b}{a^9}\right)^{\frac{1}{8}}}{x+\sqrt{a^2\left(-\frac{b}{a^9}\right)^{\frac{1}{4}}+x^2}}\right)-\sqrt{2}a\left(-\frac{b}{a^9}\right)^{\frac{1}{8}}\log\left(a\left(-\frac{b}{a^9}\right)^{\frac{1}{8}}+x\right)+\sqrt{2}a\left(-\frac{b}{a^9}\right)^{\frac{1}{8}}\log\left(-a\left(-\frac{b}{a^9}\right)^{\frac{1}{8}}+x\right)+4a\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a + b/x^8),x, algorithm="fricas")
```

```
[Out] 1/16*sqrt(2)*(4*sqrt(2)*a*(-b/a^9)^(1/8)*arctan(a*(-b/a^9)^(1/8)/
(x + sqrt(a^2*(-b/a^9)^(1/4) + x^2))) - sqrt(2)*a*(-b/a^9)^(1/8)*
log(a*(-b/a^9)^(1/8) + x) + sqrt(2)*a*(-b/a^9)^(1/8)*log(-a*(-b/a
^9)^(1/8) + x) + 4*a*(-b/a^9)^(1/8)*arctan(a*(-b/a^9)^(1/8)/(sqrt
(2)*x + a*(-b/a^9)^(1/8) + sqrt(2)*sqrt(sqrt(2)*a*x*(-b/a^9)^(1/8
) + a^2*(-b/a^9)^(1/4) + x^2))) + 4*a*(-b/a^9)^(1/8)*arctan(a*(-b
/a^9)^(1/8)/(sqrt(2)*x - a*(-b/a^9)^(1/8) + sqrt(2)*sqrt(-sqrt(2)
*a*x*(-b/a^9)^(1/8) + a^2*(-b/a^9)^(1/4) + x^2))) - a*(-b/a^9)^(1
/8)*log(sqrt(2)*a*x*(-b/a^9)^(1/8) + a^2*(-b/a^9)^(1/4) + x^2) +
a*(-b/a^9)^(1/8)*log(-sqrt(2)*a*x*(-b/a^9)^(1/8) + a^2*(-b/a^9)^(
1/4) + x^2) + 8*sqrt(2)*x)/a
```

Sympy [A] time = 1.4569, size = 22, normalized size = 0.08

$$\operatorname{RootSum}\left(16777216t^8a^9 + b, \left(t \mapsto t\log\left(-8ta + x\right)\right)\right) + \frac{x}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**8),x)
```

```
[Out] RootSum(16777216*_t**8*a**9 + b, Lambda(_t, _t*log(-8*_t*a + x)))
 + x/a
```

GIAC/XCAS [A] time = 0.226716, size = 586, normalized size = 2.15

$$-\frac{\sqrt{\sqrt{2}+2}\left(\frac{b}{a}\right)^{\frac{1}{8}}\arctan\left(\frac{2x+\sqrt{-\sqrt{2}+2}\left(\frac{b}{a}\right)^{\frac{1}{8}}}{\sqrt{\sqrt{2}+2}\left(\frac{b}{a}\right)^{\frac{1}{8}}}\right)}{8a} - \frac{\sqrt{\sqrt{2}+2}\left(\frac{b}{a}\right)^{\frac{1}{8}}\arctan\left(\frac{2x-\sqrt{-\sqrt{2}+2}\left(\frac{b}{a}\right)^{\frac{1}{8}}}{\sqrt{\sqrt{2}+2}\left(\frac{b}{a}\right)^{\frac{1}{8}}}\right)}{8a}$$
$$-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{b}{a}\right)^{\frac{1}{8}}\arctan\left(\frac{2x+\sqrt{\sqrt{2}+2}\left(\frac{b}{a}\right)^{\frac{1}{8}}}{\sqrt{-\sqrt{2}+2}\left(\frac{b}{a}\right)^{\frac{1}{8}}}\right)}{8a} - \frac{\sqrt{-\sqrt{2}+2}\left(\frac{b}{a}\right)^{\frac{1}{8}}\arctan\left(\frac{2x-\sqrt{\sqrt{2}+2}\left(\frac{b}{a}\right)^{\frac{1}{8}}}{\sqrt{-\sqrt{2}+2}\left(\frac{b}{a}\right)^{\frac{1}{8}}}\right)}{8a}$$
$$-\frac{\sqrt{\sqrt{2}+2}\left(\frac{b}{a}\right)^{\frac{1}{8}}\ln\left(x^2 + x\sqrt{\sqrt{2}+2}\left(\frac{b}{a}\right)^{\frac{1}{8}} + \left(\frac{b}{a}\right)^{\frac{1}{4}}\right)}{16a}$$
$$+\frac{\sqrt{\sqrt{2}+2}\left(\frac{b}{a}\right)^{\frac{1}{8}}\ln\left(x^2 - x\sqrt{\sqrt{2}+2}\left(\frac{b}{a}\right)^{\frac{1}{8}} + \left(\frac{b}{a}\right)^{\frac{1}{4}}\right)}{16a}$$
$$-\frac{\sqrt{-\sqrt{2}+2}\left(\frac{b}{a}\right)^{\frac{1}{8}}\ln\left(x^2 + x\sqrt{-\sqrt{2}+2}\left(\frac{b}{a}\right)^{\frac{1}{8}} + \left(\frac{b}{a}\right)^{\frac{1}{4}}\right)}{16a}$$
$$+\frac{\sqrt{-\sqrt{2}+2}\left(\frac{b}{a}\right)^{\frac{1}{8}}\ln\left(x^2 - x\sqrt{-\sqrt{2}+2}\left(\frac{b}{a}\right)^{\frac{1}{8}} + \left(\frac{b}{a}\right)^{\frac{1}{4}}\right)}{16a} + \frac{x}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a + b/x^8),x, algorithm="giac")
```

```
[Out] -1/8*sqrt(sqrt(2) + 2)*(b/a)^(1/8)*arctan((2*x + sqrt(-sqrt(2) +
2)*(b/a)^(1/8))/(sqrt(sqrt(2) + 2)*(b/a)^(1/8)))/a - 1/8*sqrt(sqr
t(2) + 2)*(b/a)^(1/8)*arctan((2*x - sqrt(-sqrt(2) + 2)*(b/a)^(1/8
))/(sqrt(sqrt(2) + 2)*(b/a)^(1/8)))/a - 1/8*sqrt(-sqrt(2) + 2)*(b
/a)^(1/8)*arctan((2*x + sqrt(sqrt(2) + 2)*(b/a)^(1/8))/(sqrt(-sqr
t(2) + 2)*(b/a)^(1/8)))/a - 1/8*sqrt(-sqrt(2) + 2)*(b/a)^(1/8)*ar
```

```
ctan((2*x - sqrt(sqrt(2) + 2)*(b/a)^(1/8))/(sqrt(-sqrt(2) + 2)*(b
/a)^(1/8)))/a - 1/16*sqrt(sqrt(2) + 2)*(b/a)^(1/8)*ln(x^2 + x*sqr
t(sqrt(2) + 2)*(b/a)^(1/8) + (b/a)^(1/4))/a + 1/16*sqrt(sqrt(2) +
 2)*(b/a)^(1/8)*ln(x^2 - x*sqrt(sqrt(2) + 2)*(b/a)^(1/8) + (b/a)^
(1/4))/a - 1/16*sqrt(-sqrt(2) + 2)*(b/a)^(1/8)*ln(x^2 + x*sqrt(-s
qrt(2) + 2)*(b/a)^(1/8) + (b/a)^(1/4))/a + 1/16*sqrt(-sqrt(2) + 2
)*(b/a)^(1/8)*ln(x^2 - x*sqrt(-sqrt(2) + 2)*(b/a)^(1/8) + (b/a)^(
1/4))/a + x/a
```

3.2109 $\int \left(a + b\sqrt{x}\right) x^4 \, dx$

Optimal. Leaf size=19

$$\frac{ax^5}{5} + \frac{2}{11}bx^{11/2}$$

```
[Out] (a*x^5)/5 + (2*b*x^(11/2))/11
```

Rubi [A] time = 0.0171207, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{ax^5}{5} + \frac{2}{11}bx^{11/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])*x^4,x]

[Out] (a*x^5)/5 + (2*b*x^(11/2))/11
```

Rubi in Sympy [A] time = 2.77989, size = 15, normalized size = 0.79

$$\frac{ax^5}{5} + \frac{2bx^{\frac{11}{2}}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4*(a+b*x**(1/2)),x)

[Out] a*x**5/5 + 2*b*x**(11/2)/11
```

Mathematica [A] time = 0.00619455, size = 19, normalized size = 1.

$$\frac{ax^5}{5} + \frac{2}{11}bx^{11/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])*x^4,x]

[Out] (a*x^5)/5 + (2*b*x^(11/2))/11
```

Maple [A] time = 0.001, size = 14, normalized size = 0.7

$$\frac{ax^5}{5} + \frac{2\,b}{11}x^{\frac{11}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4*(a+b*x^(1/2)),x)

[Out] 1/5*a*x^5+2/11*b*x^(11/2)
```

Maxima [A] time = 1.44035, size = 224, normalized size = 11.79

$$\frac{2\left(b\sqrt{x}+a\right)^{11}}{11\,b^{10}}-\frac{9\left(b\sqrt{x}+a\right)^{10}a}{5\,b^{10}}+\frac{8\left(b\sqrt{x}+a\right)^{9}a^{2}}{b^{10}}-\frac{21\left(b\sqrt{x}+a\right)^{8}a^{3}}{b^{10}}+\frac{36\left(b\sqrt{x}+a\right)^{7}a^{4}}{b^{10}}-\frac{42\left(b\sqrt{x}+a\right)^{6}a^{5}}{b^{10}}+\frac{168\left(b\sqrt{x}+a\right)^{5}a^{6}}{5\,b^{10}}-\frac{18\left(b\sqrt{x}+a\right)^{4}a^{7}}{b^{10}}+\frac{6\left(b\sqrt{x}+a\right)^{3}a^{8}}{b^{10}}-\frac{\left(b\sqrt{x}+a\right)^{2}a^{9}}{b^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)*x^4,x, algorithm="maxima")
```

```
[Out] 2/11*(b*sqrt(x) + a)^11/b^10 - 9/5*(b*sqrt(x) + a)^10*a/b^10 + 8*
(b*sqrt(x) + a)^9*a^2/b^10 - 21*(b*sqrt(x) + a)^8*a^3/b^10 + 36*(
b*sqrt(x) + a)^7*a^4/b^10 - 42*(b*sqrt(x) + a)^6*a^5/b^10 + 168/5
*(b*sqrt(x) + a)^5*a^6/b^10 - 18*(b*sqrt(x) + a)^4*a^7/b^10 + 6*(
b*sqrt(x) + a)^3*a^8/b^10 - (b*sqrt(x) + a)^2*a^9/b^10
```

Fricas [A] time = 0.22863, size = 18, normalized size = 0.95

$$\frac{2}{11}\,bx^{\frac{11}{2}}+\frac{1}{5}\,ax^{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)*x^4,x, algorithm="fricas")
```

```
[Out] 2/11*b*x^(11/2) + 1/5*a*x^5
```

Sympy [A] time = 2.27967, size = 15, normalized size = 0.79

$$\frac{ax^{5}}{5}+\frac{2bx^{\frac{11}{2}}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4*(a+b*x**(1/2)),x)
```

```
[Out] a*x**5/5 + 2*b*x**(11/2)/11
```

GIAC/XCAS [A] time = 0.213481, size = 18, normalized size = 0.95

$$\frac{2}{11}\,bx^{\frac{11}{2}}+\frac{1}{5}\,ax^{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)*x^4,x, algorithm="giac")
```

```
[Out] 2/11*b*x^(11/2) + 1/5*a*x^5
```

3.2110 $\int \left(a+b\sqrt{x}\right) x^3 \, dx$

Optimal. Leaf size=19

$$\frac{ax^4}{4}+\frac{2}{9}bx^{9/2}$$

```
[Out] (a*x^4)/4 + (2*b*x^(9/2))/9
```

Rubi [A] time = 0.0159518, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{ax^4}{4}+\frac{2}{9}bx^{9/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])*x^3,x]

[Out] (a*x^4)/4 + (2*b*x^(9/2))/9
```

Rubi in Sympy [A] time = 2.81126, size = 15, normalized size = 0.79

$$\frac{ax^4}{4}+\frac{2bx^{\frac{9}{2}}}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3*(a+b*x**(1/2)),x)

[Out] a*x**4/4 + 2*b*x**(9/2)/9
```

Mathematica [A] time = 0.00556642, size = 19, normalized size = 1.

$$\frac{ax^4}{4}+\frac{2}{9}bx^{9/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])*x^3,x]

[Out] (a*x^4)/4 + (2*b*x^(9/2))/9
```

Maple [A] time = 0.002, size = 14, normalized size = 0.7

$$\frac{ax^4}{4}+\frac{2\,b}{9}x^{\frac{9}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3*(a+b*x^(1/2)),x)

[Out] 1/4*a*x^4+2/9*b*x^(9/2)
```

Maxima [A] time = 1.44506, size = 178, normalized size = 9.37

$$\frac{2\left(b\sqrt{x}+a\right)^{9}}{9\,b^{8}}-\frac{7\left(b\sqrt{x}+a\right)^{8}a}{4\,b^{8}}+\frac{6\left(b\sqrt{x}+a\right)^{7}a^{2}}{b^{8}}-\frac{35\left(b\sqrt{x}+a\right)^{6}a^{3}}{3\,b^{8}}+\frac{14\left(b\sqrt{x}+a\right)^{5}a^{4}}{b^{8}}-\frac{21\left(b\sqrt{x}+a\right)^{4}a^{5}}{2\,b^{8}}+\frac{14\left(b\sqrt{x}+a\right)^{3}a^{6}}{3\,b^{8}}-\frac{\left(b\sqrt{x}+a\right)^{2}a^{7}}{b^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)*x^3,x, algorithm="maxima")
```

```
[Out] 2/9*(b*sqrt(x) + a)^9/b^8 - 7/4*(b*sqrt(x) + a)^8*a/b^8 + 6*(b*sq
rt(x) + a)^7*a^2/b^8 - 35/3*(b*sqrt(x) + a)^6*a^3/b^8 + 14*(b*sqr
t(x) + a)^5*a^4/b^8 - 21/2*(b*sqrt(x) + a)^4*a^5/b^8 + 14/3*(b*sq
rt(x) + a)^3*a^6/b^8 - (b*sqrt(x) + a)^2*a^7/b^8
```

Fricas [A] time = 0.23296, size = 18, normalized size = 0.95

$$\frac{2}{9}\,bx^{\frac{9}{2}}+\frac{1}{4}\,ax^{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)*x^3,x, algorithm="fricas")
```

```
[Out] 2/9*b*x^(9/2) + 1/4*a*x^4
```

Sympy [A] time = 1.68469, size = 15, normalized size = 0.79

$$\frac{ax^{4}}{4}+\frac{2bx^{\frac{9}{2}}}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(a+b*x**(1/2)),x)
```

```
[Out] a*x**4/4 + 2*b*x**(9/2)/9
```

GIAC/XCAS [A] time = 0.215945, size = 18, normalized size = 0.95

$$\frac{2}{9}\,bx^{\frac{9}{2}}+\frac{1}{4}\,ax^{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)*x^3,x, algorithm="giac")
```

```
[Out] 2/9*b*x^(9/2) + 1/4*a*x^4
```

3.2111 $\int \left(a+b\sqrt{x}\right) x^2 \, dx$

Optimal. Leaf size=19

$$\frac{ax^3}{3}+\frac{2}{7}bx^{7/2}$$

```
[Out] (a*x^3)/3 + (2*b*x^(7/2))/7
```

Rubi [A] time = 0.0158827, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$\frac{ax^3}{3}+\frac{2}{7}bx^{7/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])*x^2,x]

[Out] (a*x^3)/3 + (2*b*x^(7/2))/7
```

Rubi in Sympy [A] time = 2.78548, size = 15, normalized size = 0.79

$$\frac{ax^3}{3}+\frac{2bx^{\frac{7}{2}}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(a+b*x**(1/2)),x)

[Out] a*x**3/3 + 2*b*x**(7/2)/7
```

Mathematica [A] time = 0.00542435, size = 19, normalized size = 1.

$$\frac{ax^3}{3}+\frac{2}{7}bx^{7/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])*x^2,x]

[Out] (a*x^3)/3 + (2*b*x^(7/2))/7
```

Maple [A] time = 0.002, size = 14, normalized size = 0.7

$$\frac{ax^3}{3}+\frac{2b}{7}x^{\frac{7}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(a+b*x^(1/2)),x)

[Out] 1/3*a*x^3+2/7*b*x^(7/2)
```

Maxima [A] time = 1.44746, size = 132, normalized size = 6.95

$$\frac{2\left(b\sqrt{x}+a\right)^{7}}{7\,b^{6}}-\frac{5\left(b\sqrt{x}+a\right)^{6}a}{3\,b^{6}}+\frac{4\left(b\sqrt{x}+a\right)^{5}a^{2}}{b^{6}}-\frac{5\left(b\sqrt{x}+a\right)^{4}a^{3}}{b^{6}}+\frac{10\left(b\sqrt{x}+a\right)^{3}a^{4}}{3\,b^{6}}-\frac{\left(b\sqrt{x}+a\right)^{2}a^{5}}{b^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)*x^2,x, algorithm="maxima")
```

```
[Out] 2/7*(b*sqrt(x) + a)^7/b^6 - 5/3*(b*sqrt(x) + a)^6*a/b^6 + 4*(b*sq
rt(x) + a)^5*a^2/b^6 - 5*(b*sqrt(x) + a)^4*a^3/b^6 + 10/3*(b*sqrt
(x) + a)^3*a^4/b^6 - (b*sqrt(x) + a)^2*a^5/b^6
```

Fricas [A] time = 0.236269, size = 18, normalized size = 0.95

$$\frac{2}{7}\,bx^{\frac{7}{2}}+\frac{1}{3}\,ax^{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)*x^2,x, algorithm="fricas")
```

```
[Out] 2/7*b*x^(7/2) + 1/3*a*x^3
```

Sympy [A] time = 1.46637, size = 15, normalized size = 0.79

$$\frac{ax^{3}}{3}+\frac{2bx^{\frac{7}{2}}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(a+b*x**(1/2)),x)
```

```
[Out] a*x**3/3 + 2*b*x**(7/2)/7
```

GIAC/XCAS [A] time = 0.216112, size = 18, normalized size = 0.95

$$\frac{2}{7}\,bx^{\frac{7}{2}}+\frac{1}{3}\,ax^{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)*x^2,x, algorithm="giac")
```

```
[Out] 2/7*b*x^(7/2) + 1/3*a*x^3
```

3.2112 $\int \left(a+b\sqrt{x}\right) x \, dx$

Optimal. Leaf size=19

$$\frac{ax^2}{2}+\frac{2}{5}bx^{5/2}$$

```
[Out] (a*x^2)/2 + (2*b*x^(5/2))/5
```

Rubi [A] time = 0.0156251, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{ax^2}{2}+\frac{2}{5}bx^{5/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])*x,x]

[Out] (a*x^2)/2 + (2*b*x^(5/2))/5
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$a\int x \, dx+\frac{2bx^{\frac{5}{2}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(a+b*x**(1/2)),x)

[Out] a*Integral(x, x) + 2*b*x**(5/2)/5
```

Mathematica [A] time = 0.00517189, size = 19, normalized size = 1.

$$\frac{ax^2}{2}+\frac{2}{5}bx^{5/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])*x,x]

[Out] (a*x^2)/2 + (2*b*x^(5/2))/5
```

Maple [A] time = 0.002, size = 14, normalized size = 0.7

$$\frac{ax^2}{2}+\frac{2\,b}{5}x^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(a+b*x^(1/2)),x)

[Out] 1/2*a*x^2+2/5*b*x^(5/2)
```

Maxima [A] time = 1.43598, size = 86, normalized size = 4.53

$$\frac{2\left(b\sqrt{x}+a\right)^{5}}{5\,b^{4}}-\frac{3\left(b\sqrt{x}+a\right)^{4}a}{2\,b^{4}}+\frac{2\left(b\sqrt{x}+a\right)^{3}a^{2}}{b^{4}}-\frac{\left(b\sqrt{x}+a\right)^{2}a^{3}}{b^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)*x,x, algorithm="maxima")
```

```
[Out] 2/5*(b*sqrt(x) + a)^5/b^4 - 3/2*(b*sqrt(x) + a)^4*a/b^4 + 2*(b*sq
rt(x) + a)^3*a^2/b^4 - (b*sqrt(x) + a)^2*a^3/b^4
```

Fricas [A] time = 0.23097, size = 18, normalized size = 0.95

$$\frac{2}{5}\,bx^{\frac{5}{2}}+\frac{1}{2}\,ax^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)*x,x, algorithm="fricas")
```

```
[Out] 2/5*b*x^(5/2) + 1/2*a*x^2
```

Sympy [A] time = 1.18036, size = 15, normalized size = 0.79

$$\frac{ax^{2}}{2}+\frac{2bx^{\frac{5}{2}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(a+b*x**(1/2)),x)
```

```
[Out] a*x**2/2 + 2*b*x**(5/2)/5
```

GIAC/XCAS [A] time = 0.213773, size = 18, normalized size = 0.95

$$\frac{2}{5}\,bx^{\frac{5}{2}}+\frac{1}{2}\,ax^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)*x,x, algorithm="giac")
```

```
[Out] 2/5*b*x^(5/2) + 1/2*a*x^2
```

3.2113 $\int \left(a+b\sqrt{x}\right)\,dx$

Optimal. Leaf size=14

$$ax+\frac{2}{3}bx^{3/2}$$

```
[Out] a*x + (2*b*x^(3/2))/3
```

Rubi [A] time = 0.0109322, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 0, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.

$$ax+\frac{2}{3}bx^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Int[a + b*Sqrt[x],x]

[Out] a*x + (2*b*x^(3/2))/3
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{2bx^{\frac{3}{2}}}{3}+\int a\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(a+b*x**(1/2),x)

[Out] 2*b*x**(3/2)/3 + Integral(a, x)
```

Mathematica [A] time = 0.00305744, size = 14, normalized size = 1.

$$ax+\frac{2}{3}bx^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[a + b*Sqrt[x],x]

[Out] a*x + (2*b*x^(3/2))/3
```

Maple [A] time = 0.002, size = 11, normalized size = 0.8

$$ax+\frac{2\,b}{3}x^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(a+b*x^(1/2),x)

[Out] a*x+2/3*b*x^(3/2)
```

Maxima [A] time = 1.42894, size = 14, normalized size = 1.

$$\frac{2}{3}\,bx^{\frac{3}{2}} + ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(b*sqrt(x) + a,x, algorithm="maxima")
```

```
[Out] 2/3*b*x^(3/2) + a*x
```

Fricas [A] time = 0.241529, size = 14, normalized size = 1.

$$\frac{2}{3}\,bx^{\frac{3}{2}} + ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(b*sqrt(x) + a,x, algorithm="fricas")
```

```
[Out] 2/3*b*x^(3/2) + a*x
```

Sympy [A] time = 0.063559, size = 12, normalized size = 0.86

$$ax + \frac{2bx^{\frac{3}{2}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(a+b*x**(1/2),x)
```

```
[Out] a*x + 2*b*x**(3/2)/3
```

GIAC/XCAS [A] time = 0.214009, size = 14, normalized size = 1.

$$\frac{2}{3}\,bx^{\frac{3}{2}} + ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(b*sqrt(x) + a,x, algorithm="giac")
```

```
[Out] 2/3*b*x^(3/2) + a*x
```

3.2114 $\int \frac{a+b\sqrt{x}}{x}\,dx$

Optimal. Leaf size=13

$$a\log(x) + 2b\sqrt{x}$$

```
[Out] 2*b*Sqrt[x] + a*Log[x]
```

Rubi [A] time = 0.0143519, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$a\log(x) + 2b\sqrt{x}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Sqrt[x])/x,x]

[Out] 2*b*Sqrt[x] + a*Log[x]
```

Rubi in Sympy [A] time = 2.76122, size = 12, normalized size = 0.92

$$a\log(x) + 2b\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b*x**(1/2))/x,x)

[Out] a*log(x) + 2*b*sqrt(x)
```

Mathematica [A] time = 0.00750456, size = 13, normalized size = 1.

$$a\log(x) + 2b\sqrt{x}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Sqrt[x])/x,x]

[Out] 2*b*Sqrt[x] + a*Log[x]
```

Maple [A] time = 0.004, size = 12, normalized size = 0.9

$$a\ln(x) + 2b\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*x^(1/2))/x,x)

[Out] a*ln(x)+2*b*x^(1/2)
```

Maxima [A] time = 1.44106, size = 15, normalized size = 1.15

$$a\log(x) + 2b\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)/x,x, algorithm="maxima")
```

```
[Out] a*log(x) + 2*b*sqrt(x)
```

Fricas [A] time = 0.236997, size = 19, normalized size = 1.46

$$2\,a\log\left(\sqrt{x}\right) + 2\,b\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)/x,x, algorithm="fricas")
```

```
[Out] 2*a*log(sqrt(x)) + 2*b*sqrt(x)
```

Sympy [A] time = 0.452686, size = 12, normalized size = 0.92

$$a\log\left(x\right) + 2b\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))/x,x)
```

```
[Out] a*log(x) + 2*b*sqrt(x)
```

GIAC/XCAS [A] time = 0.214973, size = 16, normalized size = 1.23

$$a\ln\left(|x|\right) + 2\,b\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)/x,x, algorithm="giac")
```

```
[Out] a*ln(abs(x)) + 2*b*sqrt(x)
```

3.2115 $\int \frac{a+b\sqrt{x}}{x^2}\,dx$

Optimal. Leaf size=15

$$-\frac{a}{x}-\frac{2b}{\sqrt{x}}$$

```
[Out] -(a/x) - (2*b)/Sqrt[x]
```

Rubi [A] time = 0.0164164, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a}{x}-\frac{2b}{\sqrt{x}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])/x^2,x]

[Out] -(a/x) - (2*b)/Sqrt[x]
```

Rubi in Sympy [A] time = 2.81284, size = 12, normalized size = 0.8

$$-\frac{a}{x}-\frac{2b}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))/x**2,x)

[Out] -a/x - 2*b/sqrt(x)
```

Mathematica [A] time = 0.00598624, size = 15, normalized size = 1.

$$-\frac{a}{x}-\frac{2b}{\sqrt{x}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])/x^2,x]

[Out] -(a/x) - (2*b)/Sqrt[x]
```

Maple [A] time = 0.002, size = 14, normalized size = 0.9

$$-\frac{a}{x}-2\,\frac{b}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))/x^2,x)

[Out] -a/x-2*b/x^(1/2)
```

Maxima [A] time = 1.43654, size = 18, normalized size = 1.2

$$-\frac{2\,b\sqrt{x}+a}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)/x^2,x, algorithm="maxima")
```

```
[Out] -(2*b*sqrt(x) + a)/x
```

Fricas [A] time = 0.232864, size = 18, normalized size = 1.2

$$-\frac{2\,b\sqrt{x}+a}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)/x^2,x, algorithm="fricas")
```

```
[Out] -(2*b*sqrt(x) + a)/x
```

Sympy [A] time = 1.55826, size = 12, normalized size = 0.8

$$-\frac{a}{x}-\frac{2b}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))/x**2,x)
```

```
[Out] -a/x - 2*b/sqrt(x)
```

GIAC/XCAS [A] time = 0.216703, size = 18, normalized size = 1.2

$$-\frac{2\,b\sqrt{x}+a}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)/x^2,x, algorithm="giac")
```

```
[Out] -(2*b*sqrt(x) + a)/x
```

3.2116 $\int \frac{a+b\sqrt{x}}{x^3} \, dx$

Optimal. Leaf size=19

$$-\frac{a}{2x^2}-\frac{2b}{3x^{3/2}}$$

[Out] -a/(2*x^2) - (2*b)/(3*x^(3/2))

Rubi [A] time = 0.0163598, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a}{2x^2}-\frac{2b}{3x^{3/2}}$$

Antiderivative was successfully verified.

[In] Int[(a + b*Sqrt[x])/x^3,x]

[Out] -a/(2*x^2) - (2*b)/(3*x^(3/2))

Rubi in Sympy [A] time = 2.83381, size = 17, normalized size = 0.89

$$-\frac{a}{2x^2}-\frac{2b}{3x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((a+b*x**(1/2))/x**3,x)

[Out] -a/(2*x**2) - 2*b/(3*x**(3/2))

Mathematica [A] time = 0.00728313, size = 19, normalized size = 1.

$$-\frac{a}{2x^2}-\frac{2b}{3x^{3/2}}$$

Antiderivative was successfully verified.

[In] Integrate[(a + b*Sqrt[x])/x^3,x]

[Out] -a/(2*x^2) - (2*b)/(3*x^(3/2))

Maple [A] time = 0.003, size = 14, normalized size = 0.7

$$-\frac{a}{2\,x^2}-\frac{2\,b}{3}x^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a+b*x^(1/2))/x^3,x)

[Out] -1/2*a/x^2-2/3*b/x^(3/2)

Maxima [A] time = 1.44051, size = 20, normalized size = 1.05

$$-\frac{4\,b\sqrt{x}+3\,a}{6\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)/x^3,x, algorithm="maxima")
```

```
[Out] -1/6*(4*b*sqrt(x) + 3*a)/x^2
```

Fricas [A] time = 0.23698, size = 20, normalized size = 1.05

$$-\frac{4\,b\sqrt{x}+3\,a}{6\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)/x^3,x, algorithm="fricas")
```

```
[Out] -1/6*(4*b*sqrt(x) + 3*a)/x^2
```

Sympy [A] time = 2.10536, size = 17, normalized size = 0.89

$$-\frac{a}{2x^2}-\frac{2b}{3x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))/x**3,x)
```

```
[Out] -a/(2*x**2) - 2*b/(3*x**(3/2))
```

GIAC/XCAS [A] time = 0.213635, size = 20, normalized size = 1.05

$$-\frac{4\,b\sqrt{x}+3\,a}{6\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)/x^3,x, algorithm="giac")
```

```
[Out] -1/6*(4*b*sqrt(x) + 3*a)/x^2
```

3.2117 $\int \frac{a+b\sqrt{x}}{x^4} dx$

Optimal. Leaf size=19

$$-\frac{a}{3x^3}-\frac{2b}{5x^{5/2}}$$

```
[Out] -a/(3*x^3) - (2*b)/(5*x^(5/2))
```

Rubi [A] time = 0.0169034, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a}{3x^3}-\frac{2b}{5x^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Sqrt[x])/x^4,x]

[Out] -a/(3*x^3) - (2*b)/(5*x^(5/2))
```

Rubi in Sympy [A] time = 2.81814, size = 17, normalized size = 0.89

$$-\frac{a}{3x^3}-\frac{2b}{5x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b*x**(1/2))/x**4,x)

[Out] -a/(3*x**3) - 2*b/(5*x**(5/2))
```

Mathematica [A] time = 0.00680828, size = 19, normalized size = 1.

$$-\frac{a}{3x^3}-\frac{2b}{5x^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Sqrt[x])/x^4,x]

[Out] -a/(3*x^3) - (2*b)/(5*x^(5/2))
```

Maple [A] time = 0.003, size = 14, normalized size = 0.7

$$-\frac{a}{3\,x^3}-\frac{2\,b}{5}x^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*x^(1/2))/x^4,x)

[Out] -1/3*a/x^3-2/5*b/x^(5/2)
```

Maxima [A] time = 1.43548, size = 20, normalized size = 1.05

$$-\frac{6\,b\sqrt{x}+5\,a}{15\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)/x^4,x, algorithm="maxima")
```

```
[Out] -1/15*(6*b*sqrt(x) + 5*a)/x^3
```

Fricas [A] time = 0.238555, size = 20, normalized size = 1.05

$$-\frac{6\,b\sqrt{x}+5\,a}{15\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)/x^4,x, algorithm="fricas")
```

```
[Out] -1/15*(6*b*sqrt(x) + 5*a)/x^3
```

Sympy [A] time = 3.07678, size = 17, normalized size = 0.89

$$-\frac{a}{3x^3}-\frac{2b}{5x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))/x**4,x)
```

```
[Out] -a/(3*x**3) - 2*b/(5*x**(5/2))
```

GIAC/XCAS [A] time = 0.215236, size = 20, normalized size = 1.05

$$-\frac{6\,b\sqrt{x}+5\,a}{15\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)/x^4,x, algorithm="giac")
```

```
[Out] -1/15*(6*b*sqrt(x) + 5*a)/x^3
```

3.2118 $\int \left(a+b\sqrt{x}\right)^2 x^4 \, dx$

Optimal. Leaf size=32

$$\frac{a^2x^5}{5}+\frac{4}{11}abx^{11/2}+\frac{b^2x^6}{6}$$

```
[Out] (a^2*x^5)/5 + (4*a*b*x^(11/2))/11 + (b^2*x^6)/6
```

Rubi [A] time = 0.0716848, antiderivative size = 32, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^2x^5}{5}+\frac{4}{11}abx^{11/2}+\frac{b^2x^6}{6}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Sqrt[x])^2*x^4,x]
```

```
[Out] (a^2*x^5)/5 + (4*a*b*x^(11/2))/11 + (b^2*x^6)/6
```

Rubi in Sympy [A] time = 9.49705, size = 27, normalized size = 0.84

$$\frac{a^2x^5}{5}+\frac{4abx^{\frac{11}{2}}}{11}+\frac{b^2x^6}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**4*(a+b*x**(1/2))**2,x)
```

```
[Out] a**2*x**5/5 + 4*a*b*x**(11/2)/11 + b**2*x**6/6
```

Mathematica [A] time = 0.0130854, size = 28, normalized size = 0.88

$$\frac{1}{330}x^5\left(66a^2+120ab\sqrt{x}+55b^2x\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Sqrt[x])^2*x^4,x]
```

```
[Out] (x^5*(66*a^2 + 120*a*b*Sqrt[x] + 55*b^2*x))/330
```

Maple [A] time = 0.002, size = 25, normalized size = 0.8

$$\frac{x^5a^2}{5}+\frac{4\,ab}{11}x^{\frac{11}{2}}+\frac{b^2x^6}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*x^(1/2))^2,x)
```

```
[Out] 1/5*x^5*a^2+4/11*a*b*x^(11/2)+1/6*b^2*x^6
```

Maxima [A] time = 1.45135, size = 224, normalized size = 7.

$$\frac{\left(b\sqrt{x}+a\right)^{12}}{6\,b^{10}}-\frac{18\left(b\sqrt{x}+a\right)^{11}a}{11\,b^{10}}+\frac{36\left(b\sqrt{x}+a\right)^{10}a^{2}}{5\,b^{10}}-\frac{56\left(b\sqrt{x}+a\right)^{9}a^{3}}{3\,b^{10}}+\frac{63\left(b\sqrt{x}+a\right)^{8}a^{4}}{2\,b^{10}}-\frac{36\left(b\sqrt{x}+a\right)^{7}a^{5}}{b^{10}}+\frac{28\left(b\sqrt{x}+a\right)^{6}a^{6}}{b^{10}}-\frac{72\left(b\sqrt{x}+a\right)^{5}a^{7}}{5\,b^{10}}+\frac{9\left(b\sqrt{x}+a\right)^{4}a^{8}}{2\,b^{10}}-\frac{2\left(b\sqrt{x}+a\right)^{3}a^{9}}{3\,b^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2*x^4,x, algorithm="maxima")
```

```
[Out] 1/6*(b*sqrt(x) + a)^12/b^10 - 18/11*(b*sqrt(x) + a)^11*a/b^10 + 3
6/5*(b*sqrt(x) + a)^10*a^2/b^10 - 56/3*(b*sqrt(x) + a)^9*a^3/b^10
 + 63/2*(b*sqrt(x) + a)^8*a^4/b^10 - 36*(b*sqrt(x) + a)^7*a^5/b^1
0 + 28*(b*sqrt(x) + a)^6*a^6/b^10 - 72/5*(b*sqrt(x) + a)^5*a^7/b^
10 + 9/2*(b*sqrt(x) + a)^4*a^8/b^10 - 2/3*(b*sqrt(x) + a)^3*a^9/b
^10
```

Fricas [A] time = 0.232691, size = 32, normalized size = 1.

$$\frac{1}{6}\,b^{2}x^{6}+\frac{4}{11}\,abx^{\frac{11}{2}}+\frac{1}{5}\,a^{2}x^{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2*x^4,x, algorithm="fricas")
```

```
[Out] 1/6*b^2*x^6 + 4/11*a*b*x^(11/2) + 1/5*a^2*x^5
```

Sympy [A] time = 4.02337, size = 27, normalized size = 0.84

$$\frac{a^{2}x^{5}}{5}+\frac{4abx^{\frac{11}{2}}}{11}+\frac{b^{2}x^{6}}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4*(a+b*x**(1/2))**2,x)
```

```
[Out] a**2*x**5/5 + 4*a*b*x**(11/2)/11 + b**2*x**6/6
```

GIAC/XCAS [A] time = 0.216225, size = 32, normalized size = 1.

$$\frac{1}{6}\,b^{2}x^{6}+\frac{4}{11}\,abx^{\frac{11}{2}}+\frac{1}{5}\,a^{2}x^{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2*x^4,x, algorithm="giac")
```

```
[Out] 1/6*b^2*x^6 + 4/11*a*b*x^(11/2) + 1/5*a^2*x^5
```

3.2119 $\int \left(a+b\sqrt{x}\right)^2 x^3\,dx$

Optimal. Leaf size=32

$$\frac{a^2x^4}{4}+\frac{4}{9}abx^{9/2}+\frac{b^2x^5}{5}$$

```
[Out] (a^2*x^4)/4 + (4*a*b*x^(9/2))/9 + (b^2*x^5)/5
```

Rubi [A] time = 0.0672598, antiderivative size = 32, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^2x^4}{4}+\frac{4}{9}abx^{9/2}+\frac{b^2x^5}{5}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^2*x^3,x]

[Out] (a^2*x^4)/4 + (4*a*b*x^(9/2))/9 + (b^2*x^5)/5
```

Rubi in Sympy [A] time = 8.67306, size = 27, normalized size = 0.84

$$\frac{a^2x^4}{4}+\frac{4abx^{\frac{9}{2}}}{9}+\frac{b^2x^5}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3*(a+b*x**(1/2))**2,x)

[Out] a**2*x**4/4 + 4*a*b*x**(9/2)/9 + b**2*x**5/5
```

Mathematica [A] time = 0.00815925, size = 32, normalized size = 1.

$$\frac{a^2x^4}{4}+\frac{4}{9}abx^{9/2}+\frac{b^2x^5}{5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^2*x^3,x]

[Out] (a^2*x^4)/4 + (4*a*b*x^(9/2))/9 + (b^2*x^5)/5
```

Maple [A] time = 0.004, size = 25, normalized size = 0.8

$$\frac{x^4a^2}{4}+\frac{4\,ab}{9}x^{\frac{9}{2}}+\frac{b^2x^5}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3*(a+b*x^(1/2))^2,x)

[Out] 1/4*x^4*a^2+4/9*a*b*x^(9/2)+1/5*b^2*x^5
```

Maxima [A] time = 1.44538, size = 178, normalized size = 5.56

$$\frac{\left(b\sqrt{x}+a\right)^{10}}{5\,b^8}-\frac{14\,\left(b\sqrt{x}+a\right)^{9}a}{9\,b^8}+\frac{21\,\left(b\sqrt{x}+a\right)^{8}a^2}{4\,b^8}-\frac{10\,\left(b\sqrt{x}+a\right)^{7}a^3}{b^8}+\frac{35\,\left(b\sqrt{x}+a\right)^{6}a^4}{3\,b^8}-\frac{42\,\left(b\sqrt{x}+a\right)^{5}a^5}{5\,b^8}+\frac{7\,\left(b\sqrt{x}+a\right)^{4}a^6}{2\,b^8}-\frac{2\,\left(b\sqrt{x}+a\right)^{3}a^7}{3\,b^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2*x^3,x, algorithm="maxima")
```

```
[Out] 1/5*(b*sqrt(x) + a)^10/b^8 - 14/9*(b*sqrt(x) + a)^9*a/b^8 + 21/4*
(b*sqrt(x) + a)^8*a^2/b^8 - 10*(b*sqrt(x) + a)^7*a^3/b^8 + 35/3*(
b*sqrt(x) + a)^6*a^4/b^8 - 42/5*(b*sqrt(x) + a)^5*a^5/b^8 + 7/2*(
b*sqrt(x) + a)^4*a^6/b^8 - 2/3*(b*sqrt(x) + a)^3*a^7/b^8
```

Fricas [A] time = 0.230737, size = 32, normalized size = 1.

$$\frac{1}{5}\,b^2x^5+\frac{4}{9}\,abx^{\frac{9}{2}}+\frac{1}{4}\,a^2x^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2*x^3,x, algorithm="fricas")
```

```
[Out] 1/5*b^2*x^5 + 4/9*a*b*x^(9/2) + 1/4*a^2*x^4
```

Sympy [A] time = 2.17268, size = 27, normalized size = 0.84

$$\frac{a^2x^4}{4}+\frac{4abx^{\frac{9}{2}}}{9}+\frac{b^2x^5}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(a+b*x**(1/2))**2,x)
```

```
[Out] a**2*x**4/4 + 4*a*b*x**(9/2)/9 + b**2*x**5/5
```

GIAC/XCAS [A] time = 0.216202, size = 32, normalized size = 1.

$$\frac{1}{5}\,b^2x^5+\frac{4}{9}\,abx^{\frac{9}{2}}+\frac{1}{4}\,a^2x^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2*x^3,x, algorithm="giac")
```

```
[Out] 1/5*b^2*x^5 + 4/9*a*b*x^(9/2) + 1/4*a^2*x^4
```

3.2120 $\int \left(a+b\sqrt{x}\right)^2 x^2 \, dx$

Optimal. Leaf size=32

$$\frac{a^2x^3}{3}+\frac{4}{7}abx^{7/2}+\frac{b^2x^4}{4}$$

```
[Out] (a^2*x^3)/3 + (4*a*b*x^(7/2))/7 + (b^2*x^4)/4
```

Rubi [A] time = 0.059401, antiderivative size = 32, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^2x^3}{3}+\frac{4}{7}abx^{7/2}+\frac{b^2x^4}{4}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Sqrt[x])^2*x^2,x]

[Out] (a^2*x^3)/3 + (4*a*b*x^(7/2))/7 + (b^2*x^4)/4
```

Rubi in Sympy [A] time = 7.91433, size = 27, normalized size = 0.84

$$\frac{a^2x^3}{3}+\frac{4abx^{\frac{7}{2}}}{7}+\frac{b^2x^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**2*(a+b*x**(1/2))**2,x)

[Out] a**2*x**3/3 + 4*a*b*x**(7/2)/7 + b**2*x**4/4
```

Mathematica [A] time = 0.0132716, size = 28, normalized size = 0.88

$$\frac{1}{84}x^3\left(28a^2+48ab\sqrt{x}+21b^2x\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Sqrt[x])^2*x^2,x]

[Out] (x^3*(28*a^2 + 48*a*b*Sqrt[x] + 21*b^2*x))/84
```

Maple [A] time = 0.001, size = 25, normalized size = 0.8

$$\frac{x^3a^2}{3}+\frac{4\,ab}{7}x^{\frac{7}{2}}+\frac{b^2x^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*x^(1/2))^2,x)

[Out] 1/3*x^3*a^2+4/7*a*b*x^(7/2)+1/4*b^2*x^4
```

Maxima [A] time = 1.44081, size = 132, normalized size = 4.12

$$\frac{\left(b\sqrt{x}+a\right)^{8}}{4\,b^{6}}-\frac{10\,\left(b\sqrt{x}+a\right)^{7}a}{7\,b^{6}}+\frac{10\,\left(b\sqrt{x}+a\right)^{6}a^{2}}{3\,b^{6}}-\frac{4\,\left(b\sqrt{x}+a\right)^{5}a^{3}}{b^{6}}+\frac{5\,\left(b\sqrt{x}+a\right)^{4}a^{4}}{2\,b^{6}}-\frac{2\,\left(b\sqrt{x}+a\right)^{3}a^{5}}{3\,b^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2*x^2,x, algorithm="maxima")
```

```
[Out] 1/4*(b*sqrt(x) + a)^8/b^6 - 10/7*(b*sqrt(x) + a)^7*a/b^6 + 10/3*(
b*sqrt(x) + a)^6*a^2/b^6 - 4*(b*sqrt(x) + a)^5*a^3/b^6 + 5/2*(b*s
qrt(x) + a)^4*a^4/b^6 - 2/3*(b*sqrt(x) + a)^3*a^5/b^6
```

Fricas [A] time = 0.235687, size = 32, normalized size = 1.

$$\frac{1}{4}\,b^{2}x^{4}+\frac{4}{7}\,abx^{\frac{7}{2}}+\frac{1}{3}\,a^{2}x^{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2*x^2,x, algorithm="fricas")
```

```
[Out] 1/4*b^2*x^4 + 4/7*a*b*x^(7/2) + 1/3*a^2*x^3
```

Sympy [A] time = 1.1507, size = 27, normalized size = 0.84

$$\frac{a^{2}x^{3}}{3}+\frac{4abx^{\frac{7}{2}}}{7}+\frac{b^{2}x^{4}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(a+b*x**(1/2))**2,x)
```

```
[Out] a**2*x**3/3 + 4*a*b*x**(7/2)/7 + b**2*x**4/4
```

GIAC/XCAS [A] time = 0.215748, size = 32, normalized size = 1.

$$\frac{1}{4}\,b^{2}x^{4}+\frac{4}{7}\,abx^{\frac{7}{2}}+\frac{1}{3}\,a^{2}x^{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2*x^2,x, algorithm="giac")
```

```
[Out] 1/4*b^2*x^4 + 4/7*a*b*x^(7/2) + 1/3*a^2*x^3
```

3.2121 $\int \left(a+b\sqrt{x}\right)^2 x \, dx$

Optimal. Leaf size=32

$$\frac{a^2x^2}{2}+\frac{4}{5}abx^{5/2}+\frac{b^2x^3}{3}$$

```
[Out] (a^2*x^2)/2 + (4*a*b*x^(5/2))/5 + (b^2*x^3)/3
```

Rubi [A] time = 0.055199, antiderivative size = 32, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^2x^2}{2}+\frac{4}{5}abx^{5/2}+\frac{b^2x^3}{3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^2*x,x]

[Out] (a^2*x^2)/2 + (4*a*b*x^(5/2))/5 + (b^2*x^3)/3
```

Rubi in Sympy [A] time = 7.14808, size = 27, normalized size = 0.84

$$\frac{a^2x^2}{2}+\frac{4abx^{\frac{5}{2}}}{5}+\frac{b^2x^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(a+b*x**(1/2))**2,x)

[Out] a**2*x**2/2 + 4*a*b*x**(5/2)/5 + b**2*x**3/3
```

Mathematica [A] time = 0.0119123, size = 28, normalized size = 0.88

$$\frac{1}{30}x^2\left(15a^2+24ab\sqrt{x}+10b^2x\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^2*x,x]

[Out] (x^2*(15*a^2 + 24*a*b*Sqrt[x] + 10*b^2*x))/30
```

Maple [A] time = 0.002, size = 25, normalized size = 0.8

$$\frac{a^2x^2}{2}+\frac{4\,ab}{5}x^{\frac{5}{2}}+\frac{b^2x^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(a+b*x^(1/2))^2,x)

[Out] 1/2*a^2*x^2+4/5*a*b*x^(5/2)+1/3*b^2*x^3
```

Maxima [A] time = 1.44159, size = 86, normalized size = 2.69

$$\frac{\left(b\sqrt{x}+a\right)^6}{3\,b^4}-\frac{6\,\left(b\sqrt{x}+a\right)^5a}{5\,b^4}+\frac{3\,\left(b\sqrt{x}+a\right)^4a^2}{2\,b^4}-\frac{2\,\left(b\sqrt{x}+a\right)^3a^3}{3\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2*x,x, algorithm="maxima")
```

```
[Out] 1/3*(b*sqrt(x) + a)^6/b^4 - 6/5*(b*sqrt(x) + a)^5*a/b^4 + 3/2*(b*
sqrt(x) + a)^4*a^2/b^4 - 2/3*(b*sqrt(x) + a)^3*a^3/b^4
```

Fricas [A] time = 0.230921, size = 32, normalized size = 1.

$$\frac{1}{3}\,b^2x^3+\frac{4}{5}\,abx^{\frac{5}{2}}+\frac{1}{2}\,a^2x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2*x,x, algorithm="fricas")
```

```
[Out] 1/3*b^2*x^3 + 4/5*a*b*x^(5/2) + 1/2*a^2*x^2
```

Sympy [A] time = 1.27143, size = 27, normalized size = 0.84

$$\frac{a^2x^2}{2}+\frac{4abx^{\frac{5}{2}}}{5}+\frac{b^2x^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(a+b*x**(1/2))**2,x)
```

```
[Out] a**2*x**2/2 + 4*a*b*x**(5/2)/5 + b**2*x**3/3
```

GIAC/XCAS [A] time = 0.215989, size = 32, normalized size = 1.

$$\frac{1}{3}\,b^2x^3+\frac{4}{5}\,abx^{\frac{5}{2}}+\frac{1}{2}\,a^2x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2*x,x, algorithm="giac")
```

```
[Out] 1/3*b^2*x^3 + 4/5*a*b*x^(5/2) + 1/2*a^2*x^2
```

3.2122 $\int \left(a+b\sqrt{x}\right)^2\,dx$

Optimal. Leaf size=27

$$a^2x+\frac{4}{3}abx^{3/2}+\frac{b^2x^2}{2}$$

```
[Out] a^2*x + (4*a*b*x^(3/2))/3 + (b^2*x^2)/2
```

Rubi [A] time = 0.0438566, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$a^2x+\frac{4}{3}abx^{3/2}+\frac{b^2x^2}{2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^2,x]
```

```
[Out] a^2*x + (4*a*b*x^(3/2))/3 + (b^2*x^2)/2
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{4abx^{\frac{3}{2}}}{3}+b^2\int x\,dx+\int a^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**2,x)
```

```
[Out] 4*a*b*x**(3/2)/3 + b**2*Integral(x, x) + Integral(a**2, x)
```

Mathematica [A] time = 0.00780663, size = 27, normalized size = 1.

$$a^2x+\frac{4}{3}abx^{3/2}+\frac{b^2x^2}{2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^2,x]
```

```
[Out] a^2*x + (4*a*b*x^(3/2))/3 + (b^2*x^2)/2
```

Maple [A] time = 0.002, size = 22, normalized size = 0.8

$$xa^2+\frac{4\,ab}{3}x^{\frac{3}{2}}+\frac{b^2x^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^2,x)
```

```
[Out] x*a^2+4/3*a*b*x^(3/2)+1/2*b^2*x^2
```

Maxima [A] time = 1.43792, size = 28, normalized size = 1.04

$$\frac{1}{2}\,b^2x^2+\frac{4}{3}\,abx^{\frac{3}{2}}+a^2x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2,x, algorithm="maxima")

[Out] 1/2*b^2*x^2 + 4/3*a*b*x^(3/2) + a^2*x
```

Fricas [A] time = 0.230621, size = 28, normalized size = 1.04

$$\frac{1}{2}\,b^2x^2+\frac{4}{3}\,abx^{\frac{3}{2}}+a^2x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2,x, algorithm="fricas")

[Out] 1/2*b^2*x^2 + 4/3*a*b*x^(3/2) + a^2*x
```

Sympy [A] time = 0.353698, size = 24, normalized size = 0.89

$$a^2x+\frac{4abx^{\frac{3}{2}}}{3}+\frac{b^2x^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**2,x)

[Out] a**2*x + 4*a*b*x**(3/2)/3 + b**2*x**2/2
```

GIAC/XCAS [A] time = 0.216161, size = 28, normalized size = 1.04

$$\frac{1}{2}\,b^2x^2+\frac{4}{3}\,abx^{\frac{3}{2}}+a^2x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2,x, algorithm="giac")

[Out] 1/2*b^2*x^2 + 4/3*a*b*x^(3/2) + a^2*x
```

3.2123 $\int \frac{(a+b\sqrt{x})^2}{x}\,dx$

Optimal. Leaf size=21

$$a^2\log(x) + 4ab\sqrt{x} + b^2x$$

```
[Out] 4*a*b*Sqrt[x] + b^2*x + a^2*Log[x]
```

Rubi [A] time = 0.0380703, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$a^2\log(x) + 4ab\sqrt{x} + b^2x$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^2/x,x]

[Out] 4*a*b*Sqrt[x] + b^2*x + a^2*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$2a^2\log\left(\sqrt{x}\right) + 4ab\sqrt{x} + 2b^2\int^{\sqrt{x}} x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**2/x,x)

[Out] 2*a**2*log(sqrt(x)) + 4*a*b*sqrt(x) + 2*b**2*Integral(x, (x, sqrt
(x)))
```

Mathematica [A] time = 0.0102791, size = 21, normalized size = 1.

$$a^2\log(x) + 4ab\sqrt{x} + b^2x$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^2/x,x]

[Out] 4*a*b*Sqrt[x] + b^2*x + a^2*Log[x]
```

Maple [A] time = 0.002, size = 20, normalized size = 1.

$$b^2x + a^2\ln(x) + 4\,ab\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^2/x,x)

[Out] b^2*x+a^2*ln(x)+4*a*b*x^(1/2)
```

Maxima [A] time = 1.45189, size = 26, normalized size = 1.24

$$b^2x + a^2\log(x) + 4\,ab\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2/x,x, algorithm="maxima")
```

```
[Out] b^2*x + a^2*log(x) + 4*a*b*sqrt(x)
```

Fricas [A] time = 0.235815, size = 30, normalized size = 1.43

$$b^2x + 2\,a^2\log\left(\sqrt{x}\right) + 4\,ab\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2/x,x, algorithm="fricas")
```

```
[Out] b^2*x + 2*a^2*log(sqrt(x)) + 4*a*b*sqrt(x)
```

Sympy [A] time = 0.473696, size = 20, normalized size = 0.95

$$a^2\log(x) + 4ab\sqrt{x} + b^2x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**2/x,x)
```

```
[Out] a**2*log(x) + 4*a*b*sqrt(x) + b**2*x
```

GIAC/XCAS [A] time = 0.218265, size = 27, normalized size = 1.29

$$b^2x + a^2\ln(|x|) + 4\,ab\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2/x,x, algorithm="giac")
```

```
[Out] b^2*x + a^2*ln(abs(x)) + 4*a*b*sqrt(x)
```

3.2124 $\int \frac{(a+b\sqrt{x})^2}{x^2}\,dx$

Optimal. Leaf size=24

$$-\frac{a^2}{x}-\frac{4ab}{\sqrt{x}}+b^2\log(x)$$

```
[Out] -(a^2/x) - (4*a*b)/Sqrt[x] + b^2*Log[x]
```

Rubi [A] time = 0.0411095, antiderivative size = 24, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^2}{x}-\frac{4ab}{\sqrt{x}}+b^2\log(x)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^2/x^2,x]
```

```
[Out] -(a^2/x) - (4*a*b)/Sqrt[x] + b^2*Log[x]
```

Rubi in Sympy [A] time = 6.14257, size = 26, normalized size = 1.08

$$-\frac{a^2}{x}-\frac{4ab}{\sqrt{x}}+2b^2\log\left(\sqrt{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**2/x**2,x)
```

```
[Out] -a**2/x - 4*a*b/sqrt(x) + 2*b**2*log(sqrt(x))
```

Mathematica [A] time = 0.0216814, size = 23, normalized size = 0.96

$$b^2\log(x)-\frac{a\left(a+4b\sqrt{x}\right)}{x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^2/x^2,x]
```

```
[Out] -((a*(a + 4*b*Sqrt[x]))/x) + b^2*Log[x]
```

Maple [A] time = 0.003, size = 23, normalized size = 1.

$$-\frac{a^2}{x}+b^2\ln(x)-4\,\frac{ab}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^2/x^2,x)
```

```
[Out] -a^2/x+b^2*ln(x)-4*a*b/x^(1/2)
```

Maxima [A] time = 1.44026, size = 31, normalized size = 1.29

$$b^2 \log(x) - \frac{4\,ab\sqrt{x} + a^2}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2/x^2,x, algorithm="maxima")

[Out] b^2*log(x) - (4*a*b*sqrt(x) + a^2)/x
```

Fricas [A] time = 0.234225, size = 36, normalized size = 1.5

$$\frac{2\,b^2x\log\left(\sqrt{x}\right) - 4\,ab\sqrt{x} - a^2}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2/x^2,x, algorithm="fricas")

[Out] (2*b^2*x*log(sqrt(x)) - 4*a*b*sqrt(x) - a^2)/x
```

Sympy [A] time = 1.60933, size = 20, normalized size = 0.83

$$-\frac{a^2}{x} - \frac{4ab}{\sqrt{x}} + b^2\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**2/x**2,x)

[Out] -a**2/x - 4*a*b/sqrt(x) + b**2*log(x)
```

GIAC/XCAS [A] time = 0.216487, size = 32, normalized size = 1.33

$$b^2\ln(|x|) - \frac{4\,ab\sqrt{x} + a^2}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2/x^2,x, algorithm="giac")

[Out] b^2*ln(abs(x)) - (4*a*b*sqrt(x) + a^2)/x
```

3.2125 $\int \frac{(a+b\sqrt{x})^2}{x^3} dx$

Optimal. Leaf size=30

$$-\frac{a^2}{2x^2}-\frac{4ab}{3x^{3/2}}-\frac{b^2}{x}$$

```
[Out] -a^2/(2*x^2) - (4*a*b)/(3*x^(3/2)) - b^2/x
```

Rubi [A] time = 0.0433599, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^2}{2x^2}-\frac{4ab}{3x^{3/2}}-\frac{b^2}{x}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^2/x^3,x]
```

```
[Out] -a^2/(2*x^2) - (4*a*b)/(3*x^(3/2)) - b^2/x
```

Rubi in Sympy [A] time = 6.33381, size = 26, normalized size = 0.87

$$-\frac{a^2}{2x^2}-\frac{4ab}{3x^{\frac{3}{2}}}-\frac{b^2}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**2/x**3,x)
```

```
[Out] -a**2/(2*x**2) - 4*a*b/(3*x**(3/2)) - b**2/x
```

Mathematica [A] time = 0.0108397, size = 30, normalized size = 1.

$$-\frac{a^2}{2x^2}-\frac{4ab}{3x^{3/2}}-\frac{b^2}{x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^2/x^3,x]
```

```
[Out] -a^2/(2*x^2) - (4*a*b)/(3*x^(3/2)) - b^2/x
```

Maple [A] time = 0.003, size = 25, normalized size = 0.8

$$-\frac{a^2}{2\,x^2}-\frac{4\,ab}{3}x^{-\frac{3}{2}}-\frac{b^2}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^2/x^3,x)
```

```
[Out] -1/2*a^2/x^2-4/3*a*b/x^(3/2)-b^2/x
```

Maxima [A] time = 1.41526, size = 32, normalized size = 1.07

$$-\frac{6\,b^2x + 8\,ab\sqrt{x} + 3\,a^2}{6\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2/x^3,x, algorithm="maxima")
```

```
[Out] -1/6*(6*b^2*x + 8*a*b*sqrt(x) + 3*a^2)/x^2
```

Fricas [A] time = 0.232276, size = 32, normalized size = 1.07

$$-\frac{6\,b^2x + 8\,ab\sqrt{x} + 3\,a^2}{6\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2/x^3,x, algorithm="fricas")
```

```
[Out] -1/6*(6*b^2*x + 8*a*b*sqrt(x) + 3*a^2)/x^2
```

Sympy [A] time = 2.16354, size = 26, normalized size = 0.87

$$-\frac{a^2}{2x^2} - \frac{4ab}{3x^{\frac{3}{2}}} - \frac{b^2}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**2/x**3,x)
```

```
[Out] -a**2/(2*x**2) - 4*a*b/(3*x**(3/2)) - b**2/x
```

GIAC/XCAS [A] time = 0.220636, size = 32, normalized size = 1.07

$$-\frac{6\,b^2x + 8\,ab\sqrt{x} + 3\,a^2}{6\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2/x^3,x, algorithm="giac")
```

```
[Out] -1/6*(6*b^2*x + 8*a*b*sqrt(x) + 3*a^2)/x^2
```

3.2126 $\int \frac{(a+b\sqrt{x})^2}{x^4} \, dx$

Optimal. Leaf size=32

$$-\frac{a^2}{3x^3}-\frac{4ab}{5x^{5/2}}-\frac{b^2}{2x^2}$$

```
[Out] -a^2/(3*x^3) - (4*a*b)/(5*x^(5/2)) - b^2/(2*x^2)
```

Rubi [A] time = 0.0433862, antiderivative size = 32, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^2}{3x^3}-\frac{4ab}{5x^{5/2}}-\frac{b^2}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^2/x^4,x]

[Out] -a^2/(3*x^3) - (4*a*b)/(5*x^(5/2)) - b^2/(2*x^2)
```

Rubi in Sympy [A] time = 6.48894, size = 29, normalized size = 0.91

$$-\frac{a^2}{3x^3}-\frac{4ab}{5x^{\frac{5}{2}}}-\frac{b^2}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**2/x**4,x)

[Out] -a**2/(3*x**3) - 4*a*b/(5*x**(5/2)) - b**2/(2*x**2)
```

Mathematica [A] time = 0.0129686, size = 28, normalized size = 0.88

$$-\frac{10a^2+24ab\sqrt{x}+15b^2x}{30x^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^2/x^4,x]

[Out] -(10*a^2 + 24*a*b*Sqrt[x] + 15*b^2*x)/(30*x^3)
```

Maple [A] time = 0.001, size = 25, normalized size = 0.8

$$-\frac{a^2}{3\,x^3}-\frac{4\,ab}{5}x^{-\frac{5}{2}}-\frac{b^2}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^2/x^4,x)

[Out] -1/3*a^2/x^3-4/5*a*b/x^(5/2)-1/2*b^2/x^2
```

Maxima [A] time = 1.42593, size = 32, normalized size = 1.

$$-\frac{15\,b^2x + 24\,ab\sqrt{x} + 10\,a^2}{30\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2/x^4,x, algorithm="maxima")
```

```
[Out] -1/30*(15*b^2*x + 24*a*b*sqrt(x) + 10*a^2)/x^3
```

Fricas [A] time = 0.233807, size = 32, normalized size = 1.

$$-\frac{15\,b^2x + 24\,ab\sqrt{x} + 10\,a^2}{30\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2/x^4,x, algorithm="fricas")
```

```
[Out] -1/30*(15*b^2*x + 24*a*b*sqrt(x) + 10*a^2)/x^3
```

Sympy [A] time = 3.24662, size = 29, normalized size = 0.91

$$-\frac{a^2}{3x^3} - \frac{4ab}{5x^{\frac{5}{2}}} - \frac{b^2}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**2/x**4,x)
```

```
[Out] -a**2/(3*x**3) - 4*a*b/(5*x**(5/2)) - b**2/(2*x**2)
```

GIAC/XCAS [A] time = 0.218457, size = 32, normalized size = 1.

$$-\frac{15\,b^2x + 24\,ab\sqrt{x} + 10\,a^2}{30\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2/x^4,x, algorithm="giac")
```

```
[Out] -1/30*(15*b^2*x + 24*a*b*sqrt(x) + 10*a^2)/x^3
```

3.2127 $\int \frac{(a+b\sqrt{x})^2}{x^5}\,dx$

Optimal. Leaf size=32

$$-\frac{a^2}{4x^4}-\frac{4ab}{7x^{7/2}}-\frac{b^2}{3x^3}$$

```
[Out] -a^2/(4*x^4) - (4*a*b)/(7*x^(7/2)) - b^2/(3*x^3)
```

Rubi [A] time = 0.0432035, antiderivative size = 32, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^2}{4x^4}-\frac{4ab}{7x^{7/2}}-\frac{b^2}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^2/x^5,x]
```

```
[Out] -a^2/(4*x^4) - (4*a*b)/(7*x^(7/2)) - b^2/(3*x^3)
```

Rubi in Sympy [A] time = 6.49635, size = 29, normalized size = 0.91

$$-\frac{a^2}{4x^4}-\frac{4ab}{7x^{\frac{7}{2}}}-\frac{b^2}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**2/x**5,x)
```

```
[Out] -a**2/(4*x**4) - 4*a*b/(7*x**(7/2)) - b**2/(3*x**3)
```

Mathematica [A] time = 0.0110346, size = 28, normalized size = 0.88

$$-\frac{21a^2+48ab\sqrt{x}+28b^2x}{84x^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^2/x^5,x]
```

```
[Out] -(21*a^2 + 48*a*b*Sqrt[x] + 28*b^2*x)/(84*x^4)
```

Maple [A] time = 0.002, size = 25, normalized size = 0.8

$$-\frac{a^2}{4\,x^4}-\frac{4\,ab}{7}x^{-\frac{7}{2}}-\frac{b^2}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^2/x^5,x)
```

```
[Out] -1/4*a^2/x^4-4/7*a*b/x^(7/2)-1/3*b^2/x^3
```

Maxima [A] time = 1.41836, size = 32, normalized size = 1.

$$-\frac{28\,b^2x+48\,ab\sqrt{x}+21\,a^2}{84\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2/x^5,x, algorithm="maxima")

[Out] -1/84*(28*b^2*x + 48*a*b*sqrt(x) + 21*a^2)/x^4
```

Fricas [A] time = 0.237111, size = 32, normalized size = 1.

$$-\frac{28\,b^2x+48\,ab\sqrt{x}+21\,a^2}{84\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2/x^5,x, algorithm="fricas")

[Out] -1/84*(28*b^2*x + 48*a*b*sqrt(x) + 21*a^2)/x^4
```

Sympy [A] time = 4.88277, size = 29, normalized size = 0.91

$$-\frac{a^2}{4x^4}-\frac{4ab}{7x^{\frac{7}{2}}}-\frac{b^2}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**2/x**5,x)

[Out] -a**2/(4*x**4) - 4*a*b/(7*x**(7/2)) - b**2/(3*x**3)
```

GIAC/XCAS [A] time = 0.214902, size = 32, normalized size = 1.

$$-\frac{28\,b^2x+48\,ab\sqrt{x}+21\,a^2}{84\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2/x^5,x, algorithm="giac")

[Out] -1/84*(28*b^2*x + 48*a*b*sqrt(x) + 21*a^2)/x^4
```

3.2128 $\int \left(a+b\sqrt{x}\right)^3 x^4 \, dx$

Optimal. Leaf size=47

$$\frac{a^3x^5}{5}+\frac{6}{11}a^2bx^{11/2}+\frac{1}{2}ab^2x^6+\frac{2}{13}b^3x^{13/2}$$

```
[Out] (a^3*x^5)/5 + (6*a^2*b*x^(11/2))/11 + (a*b^2*x^6)/2 + (2*b^3*x^(1
3/2))/13
```

Rubi [A] time = 0.0803938, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^3x^5}{5}+\frac{6}{11}a^2bx^{11/2}+\frac{1}{2}ab^2x^6+\frac{2}{13}b^3x^{13/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^3*x^4,x]
```

```
[Out] (a^3*x^5)/5 + (6*a^2*b*x^(11/2))/11 + (a*b^2*x^6)/2 + (2*b^3*x^(1
3/2))/13
```

Rubi in Sympy [A] time = 11.7229, size = 42, normalized size = 0.89

$$\frac{a^3x^5}{5}+\frac{6a^2bx^{\frac{11}{2}}}{11}+\frac{ab^2x^6}{2}+\frac{2b^3x^{\frac{13}{2}}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4*(a+b*x**(1/2))**3,x)
```

```
[Out] a**3*x**5/5 + 6*a**2*b*x**(11/2)/11 + a*b**2*x**6/2 + 2*b**3*x**(
13/2)/13
```

Mathematica [A] time = 0.010498, size = 47, normalized size = 1.

$$\frac{a^3x^5}{5}+\frac{6}{11}a^2bx^{11/2}+\frac{1}{2}ab^2x^6+\frac{2}{13}b^3x^{13/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^3*x^4,x]
```

```
[Out] (a^3*x^5)/5 + (6*a^2*b*x^(11/2))/11 + (a*b^2*x^6)/2 + (2*b^3*x^(1
3/2))/13
```

Maple [A] time = 0.002, size = 36, normalized size = 0.8

$$\frac{a^3x^5}{5}+\frac{6\,a^2b}{11}x^{\frac{11}{2}}+\frac{ab^2x^6}{2}+\frac{2\,b^3}{13}x^{\frac{13}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4*(a+b*x^(1/2))^3,x)
```

```
[Out] 1/5*a^3*x^5+6/11*a^2*b*x^(11/2)+1/2*a*b^2*x^6+2/13*b^3*x^(13/2)
```

Maxima [A] time = 1.44087, size = 224, normalized size = 4.77

$$\frac{2\left(b\sqrt{x}+a\right)^{13}}{13\,b^{10}}-\frac{3\left(b\sqrt{x}+a\right)^{12}a}{2\,b^{10}}+\frac{72\left(b\sqrt{x}+a\right)^{11}a^2}{11\,b^{10}}-\frac{84\left(b\sqrt{x}+a\right)^{10}a^3}{5\,b^{10}}+\frac{28\left(b\sqrt{x}+a\right)^{9}a^4}{b^{10}}-\frac{63\left(b\sqrt{x}+a\right)^{8}a^5}{2\,b^{10}}+\frac{24\left(b\sqrt{x}+a\right)^{7}a^6}{b^{10}}-\frac{12\left(b\sqrt{x}+a\right)^{6}a^7}{b^{10}}+\frac{18\left(b\sqrt{x}+a\right)^{5}a^8}{5\,b^{10}}-\frac{\left(b\sqrt{x}+a\right)^{4}a^9}{2\,b^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3*x^4,x, algorithm="maxima")
```

```
[Out] 2/13*(b*sqrt(x) + a)^13/b^10 - 3/2*(b*sqrt(x) + a)^12*a/b^10 + 72
/11*(b*sqrt(x) + a)^11*a^2/b^10 - 84/5*(b*sqrt(x) + a)^10*a^3/b^1
0 + 28*(b*sqrt(x) + a)^9*a^4/b^10 - 63/2*(b*sqrt(x) + a)^8*a^5/b^
10 + 24*(b*sqrt(x) + a)^7*a^6/b^10 - 12*(b*sqrt(x) + a)^6*a^7/b^1
0 + 18/5*(b*sqrt(x) + a)^5*a^8/b^10 - 1/2*(b*sqrt(x) + a)^4*a^9/b
^10
```

Fricas [A] time = 0.231663, size = 55, normalized size = 1.17

$$\frac{1}{2}\,ab^2x^6+\frac{1}{5}\,a^3x^5+\frac{2}{143}\left(11\,b^3x^6+39\,a^2bx^5\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3*x^4,x, algorithm="fricas")
```

```
[Out] 1/2*a*b^2*x^6 + 1/5*a^3*x^5 + 2/143*(11*b^3*x^6 + 39*a^2*b*x^5)*s
qrt(x)
```

Sympy [A] time = 3.34569, size = 42, normalized size = 0.89

$$\frac{a^3x^5}{5}+\frac{6a^2bx^{\frac{11}{2}}}{11}+\frac{ab^2x^6}{2}+\frac{2b^3x^{\frac{13}{2}}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4*(a+b*x**(1/2))**3,x)
```

```
[Out] a**3*x**5/5 + 6*a**2*b*x**(11/2)/11 + a*b**2*x**6/2 + 2*b**3*x**(
13/2)/13
```

GIAC/XCAS [A] time = 0.214855, size = 47, normalized size = 1.

$$\frac{2}{13}\,b^3x^{\frac{13}{2}}+\frac{1}{2}\,ab^2x^6+\frac{6}{11}\,a^2bx^{\frac{11}{2}}+\frac{1}{5}\,a^3x^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3*x^4,x, algorithm="giac")
```

```
[Out] 2/13*b^3*x^(13/2) + 1/2*a*b^2*x^6 + 6/11*a^2*b*x^(11/2) + 1/5*a^3
*x^5
```

3.2129 $\int \left(a+b\sqrt{x}\right)^3 x^3 \, dx$

Optimal. Leaf size=47

$$\frac{a^3x^4}{4}+\frac{2}{3}a^2bx^{9/2}+\frac{3}{5}ab^2x^5+\frac{2}{11}b^3x^{11/2}$$

```
[Out] (a^3*x^4)/4 + (2*a^2*b*x^(9/2))/3 + (3*a*b^2*x^5)/5 + (2*b^3*x^(1
1/2))/11
```

Rubi [A] time = 0.0739327, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^3x^4}{4}+\frac{2}{3}a^2bx^{9/2}+\frac{3}{5}ab^2x^5+\frac{2}{11}b^3x^{11/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^3*x^3,x]
```

```
[Out] (a^3*x^4)/4 + (2*a^2*b*x^(9/2))/3 + (3*a*b^2*x^5)/5 + (2*b^3*x^(1
1/2))/11
```

Rubi in Sympy [A] time = 10.7863, size = 44, normalized size = 0.94

$$\frac{a^3x^4}{4}+\frac{2a^2bx^{\frac{9}{2}}}{3}+\frac{3ab^2x^5}{5}+\frac{2b^3x^{\frac{11}{2}}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3*(a+b*x**(1/2))**3,x)
```

```
[Out] a**3*x**4/4 + 2*a**2*b*x**(9/2)/3 + 3*a*b**2*x**5/5 + 2*b**3*x**(
11/2)/11
```

Mathematica [A] time = 0.0110557, size = 47, normalized size = 1.

$$\frac{a^3x^4}{4}+\frac{2}{3}a^2bx^{9/2}+\frac{3}{5}ab^2x^5+\frac{2}{11}b^3x^{11/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^3*x^3,x]
```

```
[Out] (a^3*x^4)/4 + (2*a^2*b*x^(9/2))/3 + (3*a*b^2*x^5)/5 + (2*b^3*x^(1
1/2))/11
```

Maple [A] time = 0.002, size = 36, normalized size = 0.8

$$\frac{a^3x^4}{4}+\frac{2\,a^2b}{3}x^{\frac{9}{2}}+\frac{3\,ab^2x^5}{5}+\frac{2\,b^3}{11}x^{\frac{11}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3*(a+b*x^(1/2))^3,x)
```

```
[Out] 1/4*a^3*x^4+2/3*a^2*b*x^(9/2)+3/5*a*b^2*x^5+2/11*b^3*x^(11/2)
```

Maxima [A] time = 1.44976, size = 178, normalized size = 3.79

$$\frac{2\left(b\sqrt{x}+a\right)^{11}}{11\,b^8}-\frac{7\left(b\sqrt{x}+a\right)^{10}a}{5\,b^8}+\frac{14\left(b\sqrt{x}+a\right)^{9}a^2}{3\,b^8}-\frac{35\left(b\sqrt{x}+a\right)^{8}a^3}{4\,b^8}+\frac{10\left(b\sqrt{x}+a\right)^{7}a^4}{b^8}-\frac{7\left(b\sqrt{x}+a\right)^{6}a^5}{b^8}+\frac{14\left(b\sqrt{x}+a\right)^{5}a^6}{5\,b^8}-\frac{\left(b\sqrt{x}+a\right)^{4}a^7}{2\,b^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3*x^3,x, algorithm="maxima")
```

```
[Out] 2/11*(b*sqrt(x) + a)^11/b^8 - 7/5*(b*sqrt(x) + a)^10*a/b^8 + 14/3
*(b*sqrt(x) + a)^9*a^2/b^8 - 35/4*(b*sqrt(x) + a)^8*a^3/b^8 + 10*
(b*sqrt(x) + a)^7*a^4/b^8 - 7*(b*sqrt(x) + a)^6*a^5/b^8 + 14/5*(b
*sqrt(x) + a)^5*a^6/b^8 - 1/2*(b*sqrt(x) + a)^4*a^7/b^8
```

Fricas [A] time = 0.244725, size = 55, normalized size = 1.17

$$\frac{3}{5}\,ab^2x^5+\frac{1}{4}\,a^3x^4+\frac{2}{33}\left(3\,b^3x^5+11\,a^2bx^4\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3*x^3,x, algorithm="fricas")
```

```
[Out] 3/5*a*b^2*x^5 + 1/4*a^3*x^4 + 2/33*(3*b^3*x^5 + 11*a^2*b*x^4)*sqr
t(x)
```

Sympy [A] time = 2.42545, size = 44, normalized size = 0.94

$$\frac{a^3x^4}{4}+\frac{2a^2bx^{\frac{9}{2}}}{3}+\frac{3ab^2x^5}{5}+\frac{2b^3x^{\frac{11}{2}}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(a+b*x**(1/2))**3,x)
```

```
[Out] a**3*x**4/4 + 2*a**2*b*x**(9/2)/3 + 3*a*b**2*x**5/5 + 2*b**3*x**(
11/2)/11
```

GIAC/XCAS [A] time = 0.212665, size = 47, normalized size = 1.

$$\frac{2}{11}\,b^3x^{\frac{11}{2}}+\frac{3}{5}\,ab^2x^5+\frac{2}{3}\,a^2bx^{\frac{9}{2}}+\frac{1}{4}\,a^3x^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3*x^3,x, algorithm="giac")
```

```
[Out] 2/11*b^3*x^(11/2) + 3/5*a*b^2*x^5 + 2/3*a^2*b*x^(9/2) + 1/4*a^3*x
^4
```

3.2130 $\int \left(a+b\sqrt{x}\right)^3 x^2 \, dx$

Optimal. Leaf size=47

$$\frac{a^3x^3}{3}+\frac{6}{7}a^2bx^{7/2}+\frac{3}{4}ab^2x^4+\frac{2}{9}b^3x^{9/2}$$

```
[Out] (a^3*x^3)/3 + (6*a^2*b*x^(7/2))/7 + (3*a*b^2*x^4)/4 + (2*b^3*x^(9
/2))/9
```

Rubi [A] time = 0.0702033, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^3x^3}{3}+\frac{6}{7}a^2bx^{7/2}+\frac{3}{4}ab^2x^4+\frac{2}{9}b^3x^{9/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^3*x^2,x]
```

```
[Out] (a^3*x^3)/3 + (6*a^2*b*x^(7/2))/7 + (3*a*b^2*x^4)/4 + (2*b^3*x^(9
/2))/9
```

Rubi in Sympy [A] time = 10.005, size = 44, normalized size = 0.94

$$\frac{a^3x^3}{3}+\frac{6a^2bx^{\frac{7}{2}}}{7}+\frac{3ab^2x^4}{4}+\frac{2b^3x^{\frac{9}{2}}}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(a+b*x**(1/2))**3,x)
```

```
[Out] a**3*x**3/3 + 6*a**2*b*x**(7/2)/7 + 3*a*b**2*x**4/4 + 2*b**3*x**(
9/2)/9
```

Mathematica [A] time = 0.0111514, size = 47, normalized size = 1.

$$\frac{a^3x^3}{3}+\frac{6}{7}a^2bx^{7/2}+\frac{3}{4}ab^2x^4+\frac{2}{9}b^3x^{9/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^3*x^2,x]
```

```
[Out] (a^3*x^3)/3 + (6*a^2*b*x^(7/2))/7 + (3*a*b^2*x^4)/4 + (2*b^3*x^(9
/2))/9
```

Maple [A] time = 0.003, size = 36, normalized size = 0.8

$$\frac{a^3x^3}{3}+\frac{6\,a^2b}{7}x^{\frac{7}{2}}+\frac{3\,ab^2x^4}{4}+\frac{2\,b^3}{9}x^{\frac{9}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(a+b*x^(1/2))^3,x)
```

```
[Out] 1/3*a^3*x^3+6/7*a^2*b*x^(7/2)+3/4*a*b^2*x^4+2/9*b^3*x^(9/2)
```

Maxima [A] time = 1.42609, size = 132, normalized size = 2.81

$$\frac{2\left(b\sqrt{x}+a\right)^{9}}{9\,b^{6}}-\frac{5\left(b\sqrt{x}+a\right)^{8}a}{4\,b^{6}}+\frac{20\left(b\sqrt{x}+a\right)^{7}a^{2}}{7\,b^{6}}-\frac{10\left(b\sqrt{x}+a\right)^{6}a^{3}}{3\,b^{6}}+\frac{2\left(b\sqrt{x}+a\right)^{5}a^{4}}{b^{6}}-\frac{\left(b\sqrt{x}+a\right)^{4}a^{5}}{2\,b^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3*x^2,x, algorithm="maxima")
```

```
[Out] 2/9*(b*sqrt(x) + a)^9/b^6 - 5/4*(b*sqrt(x) + a)^8*a/b^6 + 20/7*(b
*sqrt(x) + a)^7*a^2/b^6 - 10/3*(b*sqrt(x) + a)^6*a^3/b^6 + 2*(b*s
qrt(x) + a)^5*a^4/b^6 - 1/2*(b*sqrt(x) + a)^4*a^5/b^6
```

Fricas [A] time = 0.233188, size = 55, normalized size = 1.17

$$\frac{3}{4}\,ab^{2}x^{4}+\frac{1}{3}\,a^{3}x^{3}+\frac{2}{63}\left(7\,b^{3}x^{4}+27\,a^{2}bx^{3}\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3*x^2,x, algorithm="fricas")
```

```
[Out] 3/4*a*b^2*x^4 + 1/3*a^3*x^3 + 2/63*(7*b^3*x^4 + 27*a^2*b*x^3)*sqr
t(x)
```

Sympy [A] time = 1.83807, size = 44, normalized size = 0.94

$$\frac{a^{3}x^{3}}{3}+\frac{6a^{2}bx^{\frac{7}{2}}}{7}+\frac{3ab^{2}x^{4}}{4}+\frac{2b^{3}x^{\frac{9}{2}}}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(a+b*x**(1/2))**3,x)
```

```
[Out] a**3*x**3/3 + 6*a**2*b*x**(7/2)/7 + 3*a*b**2*x**4/4 + 2*b**3*x**(
9/2)/9
```

GIAC/XCAS [A] time = 0.214679, size = 47, normalized size = 1.

$$\frac{2}{9}\,b^{3}x^{\frac{9}{2}}+\frac{3}{4}\,ab^{2}x^{4}+\frac{6}{7}\,a^{2}bx^{\frac{7}{2}}+\frac{1}{3}\,a^{3}x^{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3*x^2,x, algorithm="giac")
```

```
[Out] 2/9*b^3*x^(9/2) + 3/4*a*b^2*x^4 + 6/7*a^2*b*x^(7/2) + 1/3*a^3*x^3
```

3.2131 $\int \left(a+b\sqrt{x}\right)^3 x\,dx$

Optimal. Leaf size=44

$$\frac{a^3x^2}{2}+\frac{6}{5}a^2bx^{5/2}+ab^2x^3+\frac{2}{7}b^3x^{7/2}$$

```
[Out] (a^3*x^2)/2 + (6*a^2*b*x^(5/2))/5 + a*b^2*x^3 + (2*b^3*x^(7/2))/7
```

Rubi [A] time = 0.0640526, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^3x^2}{2}+\frac{6}{5}a^2bx^{5/2}+ab^2x^3+\frac{2}{7}b^3x^{7/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^3*x,x]
```

```
[Out] (a^3*x^2)/2 + (6*a^2*b*x^(5/2))/5 + a*b^2*x^3 + (2*b^3*x^(7/2))/7
```

Rubi in Sympy [A] time = 9.17054, size = 41, normalized size = 0.93

$$\frac{a^3x^2}{2}+\frac{6a^2bx^{\frac{5}{2}}}{5}+ab^2x^3+\frac{2b^3x^{\frac{7}{2}}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(a+b*x**(1/2))**3,x)
```

```
[Out] a**3*x**2/2 + 6*a**2*b*x**(5/2)/5 + a*b**2*x**3 + 2*b**3*x**(7/2)
/7
```

Mathematica [A] time = 0.0109396, size = 44, normalized size = 1.

$$\frac{a^3x^2}{2}+\frac{6}{5}a^2bx^{5/2}+ab^2x^3+\frac{2}{7}b^3x^{7/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^3*x,x]
```

```
[Out] (a^3*x^2)/2 + (6*a^2*b*x^(5/2))/5 + a*b^2*x^3 + (2*b^3*x^(7/2))/7
```

Maple [A] time = 0.002, size = 35, normalized size = 0.8

$$\frac{x^2a^3}{2}+\frac{6\,a^2b}{5}x^{\frac{5}{2}}+ab^2x^3+\frac{2\,b^3}{7}x^{\frac{7}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(a+b*x^(1/2))^3,x)
```

```
[Out] 1/2*x^2*a^3+6/5*a^2*b*x^(5/2)+a*b^2*x^3+2/7*b^3*x^(7/2)
```

Maxima [A] time = 1.42754, size = 86, normalized size = 1.95

$$\frac{2\left(b\sqrt{x}+a\right)^{7}}{7\,b^{4}}-\frac{\left(b\sqrt{x}+a\right)^{6}a}{b^{4}}+\frac{6\left(b\sqrt{x}+a\right)^{5}a^{2}}{5\,b^{4}}-\frac{\left(b\sqrt{x}+a\right)^{4}a^{3}}{2\,b^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3*x,x, algorithm="maxima")
```

```
[Out] 2/7*(b*sqrt(x) + a)^7/b^4 - (b*sqrt(x) + a)^6*a/b^4 + 6/5*(b*sqrt
(x) + a)^5*a^2/b^4 - 1/2*(b*sqrt(x) + a)^4*a^3/b^4
```

Fricas [A] time = 0.232691, size = 54, normalized size = 1.23

$$ab^{2}x^{3}+\frac{1}{2}\,a^{3}x^{2}+\frac{2}{35}\left(5\,b^{3}x^{3}+21\,a^{2}bx^{2}\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3*x,x, algorithm="fricas")
```

```
[Out] a*b^2*x^3 + 1/2*a^3*x^2 + 2/35*(5*b^3*x^3 + 21*a^2*b*x^2)*sqrt(x)
```

Sympy [A] time = 1.43852, size = 41, normalized size = 0.93

$$\frac{a^{3}x^{2}}{2}+\frac{6a^{2}bx^{\frac{5}{2}}}{5}+ab^{2}x^{3}+\frac{2b^{3}x^{\frac{7}{2}}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(a+b*x**(1/2))**3,x)
```

```
[Out] a**3*x**2/2 + 6*a**2*b*x**(5/2)/5 + a*b**2*x**3 + 2*b**3*x**(7/2)
/7
```

GIAC/XCAS [A] time = 0.217415, size = 46, normalized size = 1.05

$$\frac{2}{7}\,b^{3}x^{\frac{7}{2}}+ab^{2}x^{3}+\frac{6}{5}\,a^{2}bx^{\frac{5}{2}}+\frac{1}{2}\,a^{3}x^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3*x,x, algorithm="giac")
```

```
[Out] 2/7*b^3*x^(7/2) + a*b^2*x^3 + 6/5*a^2*b*x^(5/2) + 1/2*a^3*x^2
```

3.2132 $\int \left(a+b\sqrt{x}\right)^3 \, dx$

Optimal. Leaf size=38

$$\frac{2\left(a+b\sqrt{x}\right)^5}{5b^2}-\frac{a\left(a+b\sqrt{x}\right)^4}{2b^2}$$

```
[Out] -(a*(a + b*Sqrt[x])^4)/(2*b^2) + (2*(a + b*Sqrt[x])^5)/(5*b^2)
```

Rubi [A] time = 0.0451122, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{2\left(a+b\sqrt{x}\right)^5}{5b^2}-\frac{a\left(a+b\sqrt{x}\right)^4}{2b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^3,x]

[Out] -(a*(a + b*Sqrt[x])^4)/(2*b^2) + (2*(a + b*Sqrt[x])^5)/(5*b^2)
```

Rubi in Sympy [A] time = 6.77902, size = 32, normalized size = 0.84

$$-\frac{a\left(a+b\sqrt{x}\right)^4}{2b^2}+\frac{2\left(a+b\sqrt{x}\right)^5}{5b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**3,x)

[Out] -a*(a + b*sqrt(x))**4/(2*b**2) + 2*(a + b*sqrt(x))**5/(5*b**2)
```

Mathematica [A] time = 0.00854131, size = 40, normalized size = 1.05

$$a^3x+2a^2bx^{3/2}+\frac{3}{2}ab^2x^2+\frac{2}{5}b^3x^{5/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^3,x]

[Out] a^3*x + 2*a^2*b*x^(3/2) + (3*a*b^2*x^2)/2 + (2*b^3*x^(5/2))/5
```

Maple [A] time = 0.002, size = 33, normalized size = 0.9

$$\frac{2\,b^3}{5}x^{\frac{5}{2}}+\frac{3\,ab^2x^2}{2}+2\,a^2bx^{3/2}+a^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^3,x)

[Out] 2/5*x^(5/2)*b^3+3/2*a*b^2*x^2+2*a^2*b*x^(3/2)+a^3*x
```

Maxima [A] time = 1.42096, size = 43, normalized size = 1.13

$$\frac{2}{5}\,b^3x^{\frac{5}{2}} + \frac{3}{2}\,ab^2x^2 + 2\,a^2bx^{\frac{3}{2}} + a^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3,x, algorithm="maxima")
```

```
[Out] 2/5*b^3*x^(5/2) + 3/2*a*b^2*x^2 + 2*a^2*b*x^(3/2) + a^3*x
```

Fricas [A] time = 0.232683, size = 47, normalized size = 1.24

$$\frac{3}{2}\,ab^2x^2 + a^3x + \frac{2}{5}\,\left(b^3x^2 + 5\,a^2bx\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3,x, algorithm="fricas")
```

```
[Out] 3/2*a*b^2*x^2 + a^3*x + 2/5*(b^3*x^2 + 5*a^2*b*x)*sqrt(x)
```

Sympy [A] time = 1.21469, size = 39, normalized size = 1.03

$$a^3x + 2a^2bx^{\frac{3}{2}} + \frac{3ab^2x^2}{2} + \frac{2b^3x^{\frac{5}{2}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**3,x)
```

```
[Out] a**3*x + 2*a**2*b*x**(3/2) + 3*a*b**2*x**2/2 + 2*b**3*x**(5/2)/5
```

GIAC/XCAS [A] time = 0.215377, size = 43, normalized size = 1.13

$$\frac{2}{5}\,b^3x^{\frac{5}{2}} + \frac{3}{2}\,ab^2x^2 + 2\,a^2bx^{\frac{3}{2}} + a^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3,x, algorithm="giac")
```

```
[Out] 2/5*b^3*x^(5/2) + 3/2*a*b^2*x^2 + 2*a^2*b*x^(3/2) + a^3*x
```

3.2133 $\int \frac{(a+b\sqrt{x})^3}{x}\,dx$

Optimal. Leaf size=37

$$a^3\log(x)+6a^2b\sqrt{x}+3ab^2x+\frac{2}{3}b^3x^{3/2}$$

```
[Out] 6*a^2*b*Sqrt[x] + 3*a*b^2*x + (2*b^3*x^(3/2))/3 + a^3*Log[x]
```

Rubi [A] time = 0.049088, antiderivative size = 37, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$a^3\log(x)+6a^2b\sqrt{x}+3ab^2x+\frac{2}{3}b^3x^{3/2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Sqrt[x])^3/x,x]
```

```
[Out] 6*a^2*b*Sqrt[x] + 3*a*b^2*x + (2*b^3*x^(3/2))/3 + a^3*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$2a^3\log\left(\sqrt{x}\right)+6a^2b\sqrt{x}+6ab^2\int^{\sqrt{x}}x\,dx+\frac{2b^3x^{\frac{3}{2}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b*x**(1/2))**3/x,x)
```

```
[Out] 2*a**3*log(sqrt(x)) + 6*a**2*b*sqrt(x) + 6*a*b**2*Integral(x, (x,
 sqrt(x))) + 2*b**3*x**(3/2)/3
```

Mathematica [A] time = 0.0152542, size = 37, normalized size = 1.

$$a^3\log(x)+6a^2b\sqrt{x}+3ab^2x+\frac{2}{3}b^3x^{3/2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Sqrt[x])^3/x,x]
```

```
[Out] 6*a^2*b*Sqrt[x] + 3*a*b^2*x + (2*b^3*x^(3/2))/3 + a^3*Log[x]
```

Maple [A] time = 0.003, size = 32, normalized size = 0.9

$$3\,ab^2x+\frac{2\,b^3}{3}x^{\frac{3}{2}}+a^3\ln(x)+6\,a^2b\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*x^(1/2))^3/x,x)
```

```
[Out] 3*a*b^2*x+2/3*b^3*x^(3/2)+a^3*ln(x)+6*a^2*b*x^(1/2)
```

Maxima [A] time = 1.42985, size = 42, normalized size = 1.14

$$\frac{2}{3}\,b^3x^{\frac{3}{2}} + 3\,ab^2x + a^3\log\left(x\right) + 6\,a^2b\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3/x,x, algorithm="maxima")
```

```
[Out] 2/3*b^3*x^(3/2) + 3*a*b^2*x + a^3*log(x) + 6*a^2*b*sqrt(x)
```

Fricas [A] time = 0.235659, size = 46, normalized size = 1.24

$$3\,ab^2x + 2\,a^3\log\left(\sqrt{x}\right) + \frac{2}{3}\,\left(b^3x + 9\,a^2b\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3/x,x, algorithm="fricas")
```

```
[Out] 3*a*b^2*x + 2*a^3*log(sqrt(x)) + 2/3*(b^3*x + 9*a^2*b)*sqrt(x)
```

Sympy [A] time = 0.665255, size = 37, normalized size = 1.

$$a^3\log\left(x\right) + 6a^2b\sqrt{x} + 3ab^2x + \frac{2b^3x^{\frac{3}{2}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**3/x,x)
```

```
[Out] a**3*log(x) + 6*a**2*b*sqrt(x) + 3*a*b**2*x + 2*b**3*x**(3/2)/3
```

GIAC/XCAS [A] time = 0.217069, size = 43, normalized size = 1.16

$$\frac{2}{3}\,b^3x^{\frac{3}{2}} + 3\,ab^2x + a^3\ln\left(|x|\right) + 6\,a^2b\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3/x,x, algorithm="giac")
```

```
[Out] 2/3*b^3*x^(3/2) + 3*a*b^2*x + a^3*ln(abs(x)) + 6*a^2*b*sqrt(x)
```

3.2134 $\int \frac{\left(a+b\sqrt{x}\right)^3}{x^2}\,dx$

Optimal. Leaf size=38

$$-\frac{a^3}{x}-\frac{6a^2b}{\sqrt{x}}+3ab^2\log(x)+2b^3\sqrt{x}$$

```
[Out] -(a^3/x) - (6*a^2*b)/Sqrt[x] + 2*b^3*Sqrt[x] + 3*a*b^2*Log[x]
```

Rubi [A] time = 0.0527943, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^3}{x}-\frac{6a^2b}{\sqrt{x}}+3ab^2\log(x)+2b^3\sqrt{x}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^3/x^2,x]
```

```
[Out] -(a^3/x) - (6*a^2*b)/Sqrt[x] + 2*b^3*Sqrt[x] + 3*a*b^2*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^3}{x}-\frac{6a^2b}{\sqrt{x}}+6ab^2\log\left(\sqrt{x}\right)+2\int^{\sqrt{x}}b^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**3/x**2,x)
```

```
[Out] -a**3/x - 6*a**2*b/sqrt(x) + 6*a*b**2*log(sqrt(x)) + 2*Integral(b
**3, (x, sqrt(x)))
```

Mathematica [A] time = 0.0296743, size = 39, normalized size = 1.03

$$3ab^2\log(x)-\frac{a^3+6a^2b\sqrt{x}-2b^3x^{3/2}}{x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^3/x^2,x]
```

```
[Out] -((a^3 + 6*a^2*b*Sqrt[x] - 2*b^3*x^(3/2))/x) + 3*a*b^2*Log[x]
```

Maple [A] time = 0.003, size = 35, normalized size = 0.9

$$-\frac{a^3}{x}+3\,ab^2\ln(x)-6\,\frac{a^2b}{\sqrt{x}}+2\,b^3\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^3/x^2,x)
```

```
[Out] -a^3/x+3*a*b^2*ln(x)-6*a^2*b/x^(1/2)+2*b^3*x^(1/2)
```

Maxima [A] time = 1.43208, size = 47, normalized size = 1.24

$$3\,ab^2\log\left(x\right) + 2\,b^3\sqrt{x} - \frac{6\,a^2b\sqrt{x} + a^3}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3/x^2,x, algorithm="maxima")
```

```
[Out] 3*a*b^2*log(x) + 2*b^3*sqrt(x) - (6*a^2*b*sqrt(x) + a^3)/x
```

Fricas [A] time = 0.234188, size = 51, normalized size = 1.34

$$\frac{6\,ab^2x\log\left(\sqrt{x}\right) - a^3 + 2\,\left(b^3x - 3\,a^2b\right)\sqrt{x}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3/x^2,x, algorithm="fricas")
```

```
[Out] (6*a*b^2*x*log(sqrt(x)) - a^3 + 2*(b^3*x - 3*a^2*b)*sqrt(x))/x
```

Sympy [A] time = 1.68588, size = 36, normalized size = 0.95

$$-\frac{a^3}{x} - \frac{6a^2b}{\sqrt{x}} + 3ab^2\log\left(x\right) + 2b^3\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**3/x**2,x)
```

```
[Out] -a**3/x - 6*a**2*b/sqrt(x) + 3*a*b**2*log(x) + 2*b**3*sqrt(x)
```

GIAC/XCAS [A] time = 0.221688, size = 49, normalized size = 1.29

$$3\,ab^2\ln\left(|x|\right) + 2\,b^3\sqrt{x} - \frac{6\,a^2b\sqrt{x} + a^3}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3/x^2,x, algorithm="giac")
```

```
[Out] 3*a*b^2*ln(abs(x)) + 2*b^3*sqrt(x) - (6*a^2*b*sqrt(x) + a^3)/x
```

3.2135 $\int \frac{\left(a+b\sqrt{x}\right)^3}{x^3}\,dx$

Optimal. Leaf size=21

$$-\frac{\left(a+b\sqrt{x}\right)^4}{2ax^2}$$

```
[Out] -(a + b*Sqrt[x])^4/(2*a*x^2)
```

Rubi [A] time = 0.0156728, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{\left(a+b\sqrt{x}\right)^4}{2ax^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^3/x^3,x]

[Out] -(a + b*Sqrt[x])^4/(2*a*x^2)
```

Rubi in Sympy [A] time = 2.70663, size = 17, normalized size = 0.81

$$-\frac{\left(a+b\sqrt{x}\right)^4}{2ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**3/x**3,x)

[Out] -(a + b*sqrt(x))**4/(2*a*x**2)
```

Mathematica [A] time = 0.015595, size = 41, normalized size = 1.95

$$-\frac{a^3}{2x^2}-\frac{2a^2b}{x^{3/2}}-\frac{3ab^2}{x}-\frac{2b^3}{\sqrt{x}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^3/x^3,x]

[Out] -a^3/(2*x^2) - (2*a^2*b)/x^(3/2) - (3*a*b^2)/x - (2*b^3)/Sqrt[x]
```

Maple [B] time = 0.003, size = 36, normalized size = 1.7

$$-2\,{\frac{{b}^{3}}{\sqrt{x}}}-3\,{\frac{a{b}^{2}}{x}}-2\,{\frac{{a}^{2}b}{{x}^{3/2}}}-{\frac{{a}^{3}}{2\,{x}^{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^3/x^3,x)
```

```
[Out] -2*b^3/x^(1/2)-3*a*b^2/x-2*a^2*b/x^(3/2)-1/2*a^3/x^2
```

Maxima [A] time = 1.48042, size = 45, normalized size = 2.14

$$-\frac{4\,b^3x^{\frac{3}{2}} + 6\,ab^2x + 4\,a^2b\sqrt{x} + a^3}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3/x^3,x, algorithm="maxima")
```

```
[Out] -1/2*(4*b^3*x^(3/2) + 6*a*b^2*x + 4*a^2*b*sqrt(x) + a^3)/x^2
```

Fricas [A] time = 0.238723, size = 43, normalized size = 2.05

$$-\frac{6\,ab^2x + a^3 + 4\left(b^3x + a^2b\right)\sqrt{x}}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3/x^3,x, algorithm="fricas")
```

```
[Out] -1/2*(6*a*b^2*x + a^3 + 4*(b^3*x + a^2*b)*sqrt(x))/x^2
```

Sympy [A] time = 2.2877, size = 39, normalized size = 1.86

$$-\frac{a^3}{2x^2} - \frac{2a^2b}{x^{\frac{3}{2}}} - \frac{3ab^2}{x} - \frac{2b^3}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**3/x**3,x)
```

```
[Out] -a**3/(2*x**2) - 2*a**2*b/x**(3/2) - 3*a*b**2/x - 2*b**3/sqrt(x)
```

GIAC/XCAS [A] time = 0.21961, size = 45, normalized size = 2.14

$$-\frac{4\,b^3x^{\frac{3}{2}} + 6\,ab^2x + 4\,a^2b\sqrt{x} + a^3}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3/x^3,x, algorithm="giac")
```

```
[Out] -1/2*(4*b^3*x^(3/2) + 6*a*b^2*x + 4*a^2*b*sqrt(x) + a^3)/x^2
```

3.2136 $\int \frac{(a+b\sqrt{x})^3}{x^4}\,dx$

Optimal. Leaf size=47

$$-\frac{a^3}{3x^3}-\frac{6a^2b}{5x^{5/2}}-\frac{3ab^2}{2x^2}-\frac{2b^3}{3x^{3/2}}$$

```
[Out] -a^3/(3*x^3) - (6*a^2*b)/(5*x^(5/2)) - (3*a*b^2)/(2*x^2) - (2*b^3
)/(3*x^(3/2))
```

Rubi [A] time = 0.0562952, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^3}{3x^3}-\frac{6a^2b}{5x^{5/2}}-\frac{3ab^2}{2x^2}-\frac{2b^3}{3x^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^3/x^4,x]
```

```
[Out] -a^3/(3*x^3) - (6*a^2*b)/(5*x^(5/2)) - (3*a*b^2)/(2*x^2) - (2*b^3
)/(3*x^(3/2))
```

Rubi in Sympy [A] time = 8.44625, size = 46, normalized size = 0.98

$$-\frac{a^3}{3x^3}-\frac{6a^2b}{5x^{\frac{5}{2}}}-\frac{3ab^2}{2x^2}-\frac{2b^3}{3x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**3/x**4,x)
```

```
[Out] -a**3/(3*x**3) - 6*a**2*b/(5*x**(5/2)) - 3*a*b**2/(2*x**2) - 2*b*
*3/(3*x**(3/2))
```

Mathematica [A] time = 0.0150027, size = 41, normalized size = 0.87

$$-\frac{10a^3+36a^2b\sqrt{x}+45ab^2x+20b^3x^{3/2}}{30x^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^3/x^4,x]
```

```
[Out] -(10*a^3 + 36*a^2*b*Sqrt[x] + 45*a*b^2*x + 20*b^3*x^(3/2))/(30*x^
3)
```

Maple [A] time = 0.001, size = 36, normalized size = 0.8

$$-\frac{a^3}{3\,x^3}-\frac{6\,a^2b}{5}x^{-\frac{5}{2}}-\frac{3\,ab^2}{2\,x^2}-\frac{2\,b^3}{3}x^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^3/x^4,x)

[Out] -1/3*a^3/x^3-6/5*a^2*b/x^(5/2)-3/2*a*b^2/x^2-2/3*b^3/x^(3/2)
```

Maxima [A] time = 1.42119, size = 47, normalized size = 1.

$$-\frac{20\,b^3x^{\frac{3}{2}} + 45\,ab^2x + 36\,a^2b\sqrt{x} + 10\,a^3}{30\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3/x^4,x, algorithm="maxima")

[Out] -1/30*(20*b^3*x^(3/2) + 45*a*b^2*x + 36*a^2*b*sqrt(x) + 10*a^3)/x
^3
```

Fricas [A] time = 0.234252, size = 49, normalized size = 1.04

$$-\frac{45\,ab^2x + 10\,a^3 + 4\,\left(5\,b^3x + 9\,a^2b\right)\sqrt{x}}{30\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3/x^4,x, algorithm="fricas")

[Out] -1/30*(45*a*b^2*x + 10*a^3 + 4*(5*b^3*x + 9*a^2*b)*sqrt(x))/x^3
```

Sympy [A] time = 3.35331, size = 46, normalized size = 0.98

$$-\frac{a^3}{3x^3} - \frac{6a^2b}{5x^{\frac{5}{2}}} - \frac{3ab^2}{2x^2} - \frac{2b^3}{3x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**3/x**4,x)

[Out] -a**3/(3*x**3) - 6*a**2*b/(5*x**(5/2)) - 3*a*b**2/(2*x**2) - 2*b*
*3/(3*x**(3/2))
```

GIAC/XCAS [A] time = 0.214027, size = 47, normalized size = 1.

$$-\frac{20\,b^3x^{\frac{3}{2}} + 45\,ab^2x + 36\,a^2b\sqrt{x} + 10\,a^3}{30\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3/x^4,x, algorithm="giac")

[Out] -1/30*(20*b^3*x^(3/2) + 45*a*b^2*x + 36*a^2*b*sqrt(x) + 10*a^3)/x
^3
```

3.2137 $\int \frac{(a+b\sqrt{x})^3}{x^5} dx$

Optimal. Leaf size=45

$$-\frac{a^3}{4x^4}-\frac{6a^2b}{7x^{7/2}}-\frac{ab^2}{x^3}-\frac{2b^3}{5x^{5/2}}$$

```
[Out] -a^3/(4*x^4) - (6*a^2*b)/(7*x^(7/2)) - (a*b^2)/x^3 - (2*b^3)/(5*x
^(5/2))
```

Rubi [A] time = 0.0550816, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^3}{4x^4}-\frac{6a^2b}{7x^{7/2}}-\frac{ab^2}{x^3}-\frac{2b^3}{5x^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^3/x^5,x]
```

```
[Out] -a^3/(4*x^4) - (6*a^2*b)/(7*x^(7/2)) - (a*b^2)/x^3 - (2*b^3)/(5*x
^(5/2))
```

Rubi in Sympy [A] time = 8.58788, size = 42, normalized size = 0.93

$$-\frac{a^3}{4x^4}-\frac{6a^2b}{7x^{\frac{7}{2}}}-\frac{ab^2}{x^3}-\frac{2b^3}{5x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**3/x**5,x)
```

```
[Out] -a**3/(4*x**4) - 6*a**2*b/(7*x**(7/2)) - a*b**2/x**3 - 2*b**3/(5*
x**(5/2))
```

Mathematica [A] time = 0.0160295, size = 41, normalized size = 0.91

$$-\frac{35a^3+120a^2b\sqrt{x}+140ab^2x+56b^3x^{3/2}}{140x^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^3/x^5,x]
```

```
[Out] -(35*a^3 + 120*a^2*b*Sqrt[x] + 140*a*b^2*x + 56*b^3*x^(3/2))/(140
*x^4)
```

Maple [A] time = 0.003, size = 36, normalized size = 0.8

$$-\frac{a^3}{4\,x^4}-\frac{6\,a^2b}{7}x^{-\frac{7}{2}}-\frac{ab^2}{x^3}-\frac{2\,b^3}{5}x^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^3/x^5,x)
```

```
[Out] -1/4*a^3/x^4-6/7*a^2*b/x^(7/2)-a*b^2/x^3-2/5*b^3/x^(5/2)
```

Maxima [A] time = 1.43958, size = 47, normalized size = 1.04

$$-\frac{56\,b^3x^{\frac{3}{2}} + 140\,ab^2x + 120\,a^2b\sqrt{x} + 35\,a^3}{140\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3/x^5,x, algorithm="maxima")
```

```
[Out] -1/140*(56*b^3*x^(3/2) + 140*a*b^2*x + 120*a^2*b*sqrt(x) + 35*a^3
)/x^4
```

Fricas [A] time = 0.241591, size = 49, normalized size = 1.09

$$-\frac{140\,ab^2x + 35\,a^3 + 8\,\left(7\,b^3x + 15\,a^2b\right)\sqrt{x}}{140\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3/x^5,x, algorithm="fricas")
```

```
[Out] -1/140*(140*a*b^2*x + 35*a^3 + 8*(7*b^3*x + 15*a^2*b)*sqrt(x))/x^
4
```

Sympy [A] time = 5.04537, size = 42, normalized size = 0.93

$$-\frac{a^3}{4x^4} - \frac{6a^2b}{7x^{\frac{7}{2}}} - \frac{ab^2}{x^3} - \frac{2b^3}{5x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**3/x**5,x)
```

```
[Out] -a**3/(4*x**4) - 6*a**2*b/(7*x**(7/2)) - a*b**2/x**3 - 2*b**3/(5*
x**(5/2))
```

GIAC/XCAS [A] time = 0.215818, size = 47, normalized size = 1.04

$$-\frac{56\,b^3x^{\frac{3}{2}} + 140\,ab^2x + 120\,a^2b\sqrt{x} + 35\,a^3}{140\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3/x^5,x, algorithm="giac")
```

```
[Out] -1/140*(56*b^3*x^(3/2) + 140*a*b^2*x + 120*a^2*b*sqrt(x) + 35*a^3
)/x^4
```

3.2138 $\int \frac{(a+b\sqrt{x})^3}{x^6}\,dx$

Optimal. Leaf size=47

$$-\frac{a^3}{5x^5}-\frac{2a^2b}{3x^{9/2}}-\frac{3ab^2}{4x^4}-\frac{2b^3}{7x^{7/2}}$$

```
[Out] -a^3/(5*x^5) - (2*a^2*b)/(3*x^(9/2)) - (3*a*b^2)/(4*x^4) - (2*b^3
)/(7*x^(7/2))
```

Rubi [A] time = 0.0554863, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^3}{5x^5}-\frac{2a^2b}{3x^{9/2}}-\frac{3ab^2}{4x^4}-\frac{2b^3}{7x^{7/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^3/x^6,x]
```

```
[Out] -a^3/(5*x^5) - (2*a^2*b)/(3*x^(9/2)) - (3*a*b^2)/(4*x^4) - (2*b^3
)/(7*x^(7/2))
```

Rubi in Sympy [A] time = 8.57145, size = 46, normalized size = 0.98

$$-\frac{a^3}{5x^5}-\frac{2a^2b}{3x^{\frac{9}{2}}}-\frac{3ab^2}{4x^4}-\frac{2b^3}{7x^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**3/x**6,x)
```

```
[Out] -a**3/(5*x**5) - 2*a**2*b/(3*x**(9/2)) - 3*a*b**2/(4*x**4) - 2*b*
*3/(7*x**(7/2))
```

Mathematica [A] time = 0.0161598, size = 41, normalized size = 0.87

$$-\frac{84a^3+280a^2b\sqrt{x}+315ab^2x+120b^3x^{3/2}}{420x^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^3/x^6,x]
```

```
[Out] -(84*a^3 + 280*a^2*b*Sqrt[x] + 315*a*b^2*x + 120*b^3*x^(3/2))/(42
0*x^5)
```

Maple [A] time = 0.003, size = 36, normalized size = 0.8

$$-\frac{a^3}{5\,x^5}-\frac{2\,a^2b}{3}x^{-\frac{9}{2}}-\frac{3\,ab^2}{4\,x^4}-\frac{2\,b^3}{7}x^{-\frac{7}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^3/x^6,x)

[Out] -1/5*a^3/x^5-2/3*a^2*b/x^(9/2)-3/4*a*b^2/x^4-2/7*b^3/x^(7/2)
```

Maxima [A] time = 1.53289, size = 47, normalized size = 1.

$$-\frac{120\,b^3x^{\frac{3}{2}} + 315\,ab^2x + 280\,a^2b\sqrt{x} + 84\,a^3}{420\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3/x^6,x, algorithm="maxima")

[Out] -1/420*(120*b^3*x^(3/2) + 315*a*b^2*x + 280*a^2*b*sqrt(x) + 84*a^
3)/x^5
```

Fricas [A] time = 0.233722, size = 49, normalized size = 1.04

$$-\frac{315\,ab^2x + 84\,a^3 + 40\left(3\,b^3x + 7\,a^2b\right)\sqrt{x}}{420\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3/x^6,x, algorithm="fricas")

[Out] -1/420*(315*a*b^2*x + 84*a^3 + 40*(3*b^3*x + 7*a^2*b)*sqrt(x))/x^
5
```

Sympy [A] time = 7.58204, size = 46, normalized size = 0.98

$$-\frac{a^3}{5x^5} - \frac{2a^2b}{3x^{\frac{9}{2}}} - \frac{3ab^2}{4x^4} - \frac{2b^3}{7x^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**3/x**6,x)

[Out] -a**3/(5*x**5) - 2*a**2*b/(3*x**(9/2)) - 3*a*b**2/(4*x**4) - 2*b*
*3/(7*x**(7/2))
```

GIAC/XCAS [A] time = 0.21653, size = 47, normalized size = 1.

$$-\frac{120\,b^3x^{\frac{3}{2}} + 315\,ab^2x + 280\,a^2b\sqrt{x} + 84\,a^3}{420\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3/x^6,x, algorithm="giac")

[Out] -1/420*(120*b^3*x^(3/2) + 315*a*b^2*x + 280*a^2*b*sqrt(x) + 84*a^
3)/x^5
```

3.2139 $\int \left(a+b\sqrt{x}\right)^5 x^4\,dx$

Optimal. Leaf size=75

$$\frac{a^5x^5}{5}+\frac{10}{11}a^4bx^{11/2}+\frac{5}{3}a^3b^2x^6+\frac{20}{13}a^2b^3x^{13/2}+\frac{5}{7}ab^4x^7+\frac{2}{15}b^5x^{15/2}$$

```
[Out] (a^5*x^5)/5 + (10*a^4*b*x^(11/2))/11 + (5*a^3*b^2*x^6)/3 + (20*a^
2*b^3*x^(13/2))/13 + (5*a*b^4*x^7)/7 + (2*b^5*x^(15/2))/15
```

Rubi [A] time = 0.113782, antiderivative size = 75, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^5x^5}{5}+\frac{10}{11}a^4bx^{11/2}+\frac{5}{3}a^3b^2x^6+\frac{20}{13}a^2b^3x^{13/2}+\frac{5}{7}ab^4x^7+\frac{2}{15}b^5x^{15/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^5*x^4,x]
```

```
[Out] (a^5*x^5)/5 + (10*a^4*b*x^(11/2))/11 + (5*a^3*b^2*x^6)/3 + (20*a^
2*b^3*x^(13/2))/13 + (5*a*b^4*x^7)/7 + (2*b^5*x^(15/2))/15
```

Rubi in Sympy [A] time = 17.1535, size = 73, normalized size = 0.97

$$\frac{a^5x^5}{5}+\frac{10a^4bx^{\frac{11}{2}}}{11}+\frac{5a^3b^2x^6}{3}+\frac{20a^2b^3x^{\frac{13}{2}}}{13}+\frac{5ab^4x^7}{7}+\frac{2b^5x^{\frac{15}{2}}}{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4*(a+b*x**(1/2))**5,x)
```

```
[Out] a**5*x**5/5 + 10*a**4*b*x**(11/2)/11 + 5*a**3*b**2*x**6/3 + 20*a*
*2*b**3*x**(13/2)/13 + 5*a*b**4*x**7/7 + 2*b**5*x**(15/2)/15
```

Mathematica [A] time = 0.0147819, size = 75, normalized size = 1.

$$\frac{a^5x^5}{5}+\frac{10}{11}a^4bx^{11/2}+\frac{5}{3}a^3b^2x^6+\frac{20}{13}a^2b^3x^{13/2}+\frac{5}{7}ab^4x^7+\frac{2}{15}b^5x^{15/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^5*x^4,x]
```

```
[Out] (a^5*x^5)/5 + (10*a^4*b*x^(11/2))/11 + (5*a^3*b^2*x^6)/3 + (20*a^
2*b^3*x^(13/2))/13 + (5*a*b^4*x^7)/7 + (2*b^5*x^(15/2))/15
```

Maple [A] time = 0.004, size = 58, normalized size = 0.8

$$\frac{a^5x^5}{5}+\frac{10\,a^4b}{11}x^{\frac{11}{2}}+\frac{5\,a^3b^2x^6}{3}+\frac{20\,a^2b^3}{13}x^{\frac{13}{2}}+\frac{5\,ab^4x^7}{7}+\frac{2\,b^5}{15}x^{\frac{15}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4*(a+b*x^(1/2))^5,x)
```

```
[Out] 1/5*a^5*x^5+10/11*a^4*b*x^(11/2)+5/3*a^3*b^2*x^6+20/13*a^2*b^3*x^
(13/2)+5/7*a*b^4*x^7+2/15*b^5*x^(15/2)
```

Maxima [A] time = 1.42954, size = 224, normalized size = 2.99

$$\frac{2\left(b\sqrt{x}+a\right)^{15}}{15\,b^{10}}-\frac{9\left(b\sqrt{x}+a\right)^{14}a}{7\,b^{10}}+\frac{72\left(b\sqrt{x}+a\right)^{13}a^{2}}{13\,b^{10}}-\frac{14\left(b\sqrt{x}+a\right)^{12}a^{3}}{b^{10}}+\frac{252\left(b\sqrt{x}+a\right)^{11}a^{4}}{11\,b^{10}}-\frac{126\left(b\sqrt{x}+a\right)^{10}a^{5}}{5\,b^{10}}+\frac{56\left(b\sqrt{x}+a\right)^{9}a^{6}}{3\,b^{10}}-\frac{9\left(b\sqrt{x}+a\right)^{8}a^{7}}{b^{10}}+\frac{18\left(b\sqrt{x}+a\right)^{7}a^{8}}{7\,b^{10}}-\frac{\left(b\sqrt{x}+a\right)^{6}a^{9}}{3\,b^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5*x^4,x, algorithm="maxima")
```

```
[Out] 2/15*(b*sqrt(x) + a)^15/b^10 - 9/7*(b*sqrt(x) + a)^14*a/b^10 + 72
/13*(b*sqrt(x) + a)^13*a^2/b^10 - 14*(b*sqrt(x) + a)^12*a^3/b^10
+ 252/11*(b*sqrt(x) + a)^11*a^4/b^10 - 126/5*(b*sqrt(x) + a)^10*a
^5/b^10 + 56/3*(b*sqrt(x) + a)^9*a^6/b^10 - 9*(b*sqrt(x) + a)^8*a
^7/b^10 + 18/7*(b*sqrt(x) + a)^7*a^8/b^10 - 1/3*(b*sqrt(x) + a)^6
*a^9/b^10
```

Fricas [A] time = 0.229815, size = 85, normalized size = 1.13

$$\frac{5}{7}\,ab^{4}x^{7}+\frac{5}{3}\,a^{3}b^{2}x^{6}+\frac{1}{5}\,a^{5}x^{5}+\frac{2}{2145}\left(143\,b^{5}x^{7}+1650\,a^{2}b^{3}x^{6}+975\,a^{4}bx^{5}\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5*x^4,x, algorithm="fricas")
```

```
[Out] 5/7*a*b^4*x^7 + 5/3*a^3*b^2*x^6 + 1/5*a^5*x^5 + 2/2145*(143*b^5*x
^7 + 1650*a^2*b^3*x^6 + 975*a^4*b*x^5)*sqrt(x)
```

Sympy [A] time = 4.7352, size = 73, normalized size = 0.97

$$\frac{a^{5}x^{5}}{5}+\frac{10a^{4}bx^{\frac{11}{2}}}{11}+\frac{5a^{3}b^{2}x^{6}}{3}+\frac{20a^{2}b^{3}x^{\frac{13}{2}}}{13}+\frac{5ab^{4}x^{7}}{7}+\frac{2b^{5}x^{\frac{15}{2}}}{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4*(a+b*x**(1/2))**5,x)
```

```
[Out] a**5*x**5/5 + 10*a**4*b*x**(11/2)/11 + 5*a**3*b**2*x**6/3 + 20*a*
*2*b**3*x**(13/2)/13 + 5*a*b**4*x**7/7 + 2*b**5*x**(15/2)/15
```

GIAC/XCAS [A] time = 0.214355, size = 77, normalized size = 1.03

$$\frac{2}{15}\,b^{5}x^{\frac{15}{2}}+\frac{5}{7}\,ab^{4}x^{7}+\frac{20}{13}\,a^{2}b^{3}x^{\frac{13}{2}}+\frac{5}{3}\,a^{3}b^{2}x^{6}+\frac{10}{11}\,a^{4}bx^{\frac{11}{2}}+\frac{1}{5}\,a^{5}x^{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5*x^4,x, algorithm="giac")
```

```
[Out] 2/15*b^5*x^(15/2) + 5/7*a*b^4*x^7 + 20/13*a^2*b^3*x^(13/2) + 5/3*
a^3*b^2*x^6 + 10/11*a^4*b*x^(11/2) + 1/5*a^5*x^5
```

3.2140 $\int \left(a+b\sqrt{x}\right)^5 x^3\,dx$

Optimal. Leaf size=73

$$\frac{a^5x^4}{4}+\frac{10}{9}a^4bx^{9/2}+2a^3b^2x^5+\frac{20}{11}a^2b^3x^{11/2}+\frac{5}{6}ab^4x^6+\frac{2}{13}b^5x^{13/2}$$

```
[Out] (a^5*x^4)/4 + (10*a^4*b*x^(9/2))/9 + 2*a^3*b^2*x^5 + (20*a^2*b^3*
x^(11/2))/11 + (5*a*b^4*x^6)/6 + (2*b^5*x^(13/2))/13
```

Rubi [A] time = 0.103858, antiderivative size = 73, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^5x^4}{4}+\frac{10}{9}a^4bx^{9/2}+2a^3b^2x^5+\frac{20}{11}a^2b^3x^{11/2}+\frac{5}{6}ab^4x^6+\frac{2}{13}b^5x^{13/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^5*x^3,x]
```

```
[Out] (a^5*x^4)/4 + (10*a^4*b*x^(9/2))/9 + 2*a^3*b^2*x^5 + (20*a^2*b^3*
x^(11/2))/11 + (5*a*b^4*x^6)/6 + (2*b^5*x^(13/2))/13
```

Rubi in Sympy [A] time = 16.011, size = 71, normalized size = 0.97

$$\frac{a^5x^4}{4}+\frac{10a^4bx^{\frac{9}{2}}}{9}+2a^3b^2x^5+\frac{20a^2b^3x^{\frac{11}{2}}}{11}+\frac{5ab^4x^6}{6}+\frac{2b^5x^{\frac{13}{2}}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3*(a+b*x**(1/2))**5,x)
```

```
[Out] a**5*x**4/4 + 10*a**4*b*x**(9/2)/9 + 2*a**3*b**2*x**5 + 20*a**2*b
**3*x**(11/2)/11 + 5*a*b**4*x**6/6 + 2*b**5*x**(13/2)/13
```

Mathematica [A] time = 0.013598, size = 73, normalized size = 1.

$$\frac{a^5x^4}{4}+\frac{10}{9}a^4bx^{9/2}+2a^3b^2x^5+\frac{20}{11}a^2b^3x^{11/2}+\frac{5}{6}ab^4x^6+\frac{2}{13}b^5x^{13/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^5*x^3,x]
```

```
[Out] (a^5*x^4)/4 + (10*a^4*b*x^(9/2))/9 + 2*a^3*b^2*x^5 + (20*a^2*b^3*
x^(11/2))/11 + (5*a*b^4*x^6)/6 + (2*b^5*x^(13/2))/13
```

Maple [A] time = 0.003, size = 58, normalized size = 0.8

$$\frac{a^5x^4}{4}+\frac{10\,a^4b}{9}x^{\frac{9}{2}}+2\,a^3b^2x^5+\frac{20\,a^2b^3}{11}x^{\frac{11}{2}}+\frac{5\,ab^4x^6}{6}+\frac{2\,b^5}{13}x^{\frac{13}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3*(a+b*x^(1/2))^5,x)
```

```
[Out] 1/4*a^5*x^4+10/9*a^4*b*x^(9/2)+2*a^3*b^2*x^5+20/11*a^2*b^3*x^(11/
2)+5/6*a*b^4*x^6+2/13*b^5*x^(13/2)
```

Maxima [A] time = 1.44719, size = 178, normalized size = 2.44

$$\frac{2\left(b\sqrt{x}+a\right)^{13}}{13\,b^8}-\frac{7\left(b\sqrt{x}+a\right)^{12}a}{6\,b^8}+\frac{42\left(b\sqrt{x}+a\right)^{11}a^2}{11\,b^8}-\frac{7\left(b\sqrt{x}+a\right)^{10}a^3}{b^8}+\frac{70\left(b\sqrt{x}+a\right)^{9}a^4}{9\,b^8}-\frac{21\left(b\sqrt{x}+a\right)^{8}a^5}{4\,b^8}+\frac{2\left(b\sqrt{x}+a\right)^{7}a^6}{b^8}-\frac{\left(b\sqrt{x}+a\right)^{6}a^7}{3\,b^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5*x^3,x, algorithm="maxima")
```

```
[Out] 2/13*(b*sqrt(x) + a)^13/b^8 - 7/6*(b*sqrt(x) + a)^12*a/b^8 + 42/1
1*(b*sqrt(x) + a)^11*a^2/b^8 - 7*(b*sqrt(x) + a)^10*a^3/b^8 + 70/
9*(b*sqrt(x) + a)^9*a^4/b^8 - 21/4*(b*sqrt(x) + a)^8*a^5/b^8 + 2*
(b*sqrt(x) + a)^7*a^6/b^8 - 1/3*(b*sqrt(x) + a)^6*a^7/b^8
```

Fricas [A] time = 0.232221, size = 85, normalized size = 1.16

$$\frac{5}{6}\,ab^4x^6+2\,a^3b^2x^5+\frac{1}{4}\,a^5x^4+\frac{2}{1287}\left(99\,b^5x^6+1170\,a^2b^3x^5+715\,a^4bx^4\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5*x^3,x, algorithm="fricas")
```

```
[Out] 5/6*a*b^4*x^6 + 2*a^3*b^2*x^5 + 1/4*a^5*x^4 + 2/1287*(99*b^5*x^6
+ 1170*a^2*b^3*x^5 + 715*a^4*b*x^4)*sqrt(x)
```

Sympy [A] time = 3.41764, size = 71, normalized size = 0.97

$$\frac{a^5x^4}{4}+\frac{10a^4bx^{\frac{9}{2}}}{9}+2a^3b^2x^5+\frac{20a^2b^3x^{\frac{11}{2}}}{11}+\frac{5ab^4x^6}{6}+\frac{2b^5x^{\frac{13}{2}}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(a+b*x**(1/2))**5,x)
```

```
[Out] a**5*x**4/4 + 10*a**4*b*x**(9/2)/9 + 2*a**3*b**2*x**5 + 20*a**2*b
**3*x**(11/2)/11 + 5*a*b**4*x**6/6 + 2*b**5*x**(13/2)/13
```

GIAC/XCAS [A] time = 0.215554, size = 77, normalized size = 1.05

$$\frac{2}{13}\,b^5x^{\frac{13}{2}}+\frac{5}{6}\,ab^4x^6+\frac{20}{11}\,a^2b^3x^{\frac{11}{2}}+2\,a^3b^2x^5+\frac{10}{9}\,a^4bx^{\frac{9}{2}}+\frac{1}{4}\,a^5x^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5*x^3,x, algorithm="giac")
```

```
[Out] 2/13*b^5*x^(13/2) + 5/6*a*b^4*x^6 + 20/11*a^2*b^3*x^(11/2) + 2*a^
3*b^2*x^5 + 10/9*a^4*b*x^(9/2) + 1/4*a^5*x^4
```

3.2141 $\int \left(a+b\sqrt{x}\right)^5 x^2\,dx$

Optimal. Leaf size=72

$$\frac{a^5x^3}{3}+\frac{10}{7}a^4bx^{7/2}+\frac{5}{2}a^3b^2x^4+\frac{20}{9}a^2b^3x^{9/2}+ab^4x^5+\frac{2}{11}b^5x^{11/2}$$

```
[Out] (a^5*x^3)/3 + (10*a^4*b*x^(7/2))/7 + (5*a^3*b^2*x^4)/2 + (20*a^2*
b^3*x^(9/2))/9 + a*b^4*x^5 + (2*b^5*x^(11/2))/11
```

Rubi [A] time = 0.100692, antiderivative size = 72, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^5x^3}{3}+\frac{10}{7}a^4bx^{7/2}+\frac{5}{2}a^3b^2x^4+\frac{20}{9}a^2b^3x^{9/2}+ab^4x^5+\frac{2}{11}b^5x^{11/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^5*x^2,x]
```

```
[Out] (a^5*x^3)/3 + (10*a^4*b*x^(7/2))/7 + (5*a^3*b^2*x^4)/2 + (20*a^2*
b^3*x^(9/2))/9 + a*b^4*x^5 + (2*b^5*x^(11/2))/11
```

Rubi in Sympy [A] time = 15.1954, size = 70, normalized size = 0.97

$$\frac{a^5x^3}{3}+\frac{10a^4bx^{\frac{7}{2}}}{7}+\frac{5a^3b^2x^4}{2}+\frac{20a^2b^3x^{\frac{9}{2}}}{9}+ab^4x^5+\frac{2b^5x^{\frac{11}{2}}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(a+b*x**(1/2))**5,x)
```

```
[Out] a**5*x**3/3 + 10*a**4*b*x**(7/2)/7 + 5*a**3*b**2*x**4/2 + 20*a**2
*b**3*x**(9/2)/9 + a*b**4*x**5 + 2*b**5*x**(11/2)/11
```

Mathematica [A] time = 0.0135334, size = 72, normalized size = 1.

$$\frac{a^5x^3}{3}+\frac{10}{7}a^4bx^{7/2}+\frac{5}{2}a^3b^2x^4+\frac{20}{9}a^2b^3x^{9/2}+ab^4x^5+\frac{2}{11}b^5x^{11/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^5*x^2,x]
```

```
[Out] (a^5*x^3)/3 + (10*a^4*b*x^(7/2))/7 + (5*a^3*b^2*x^4)/2 + (20*a^2*
b^3*x^(9/2))/9 + a*b^4*x^5 + (2*b^5*x^(11/2))/11
```

Maple [A] time = 0.003, size = 57, normalized size = 0.8

$$\frac{a^5x^3}{3}+\frac{10\,a^4b}{7}x^{\frac{7}{2}}+\frac{5\,a^3b^2x^4}{2}+\frac{20\,a^2b^3}{9}x^{\frac{9}{2}}+ab^4x^5+\frac{2\,b^5}{11}x^{\frac{11}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(a+b*x^(1/2))^5,x)
```

```
[Out] 1/3*a^5*x^3+10/7*a^4*b*x^(7/2)+5/2*a^3*b^2*x^4+20/9*a^2*b^3*x^(9/
2)+a*b^4*x^5+2/11*b^5*x^(11/2)
```

Maxima [A] time = 1.43546, size = 132, normalized size = 1.83

$$\frac{2\left(b\sqrt{x}+a\right)^{11}}{11\,b^6}-\frac{\left(b\sqrt{x}+a\right)^{10}a}{b^6}+\frac{20\left(b\sqrt{x}+a\right)^{9}a^2}{9\,b^6}-\frac{5\left(b\sqrt{x}+a\right)^{8}a^3}{2\,b^6}+\frac{10\left(b\sqrt{x}+a\right)^{7}a^4}{7\,b^6}-\frac{\left(b\sqrt{x}+a\right)^{6}a^5}{3\,b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5*x^2,x, algorithm="maxima")
```

```
[Out] 2/11*(b*sqrt(x) + a)^11/b^6 - (b*sqrt(x) + a)^10*a/b^6 + 20/9*(b*
sqrt(x) + a)^9*a^2/b^6 - 5/2*(b*sqrt(x) + a)^8*a^3/b^6 + 10/7*(b*
sqrt(x) + a)^7*a^4/b^6 - 1/3*(b*sqrt(x) + a)^6*a^5/b^6
```

Fricas [A] time = 0.235365, size = 84, normalized size = 1.17

$$ab^4x^5+\frac{5}{2}\,a^3b^2x^4+\frac{1}{3}\,a^5x^3+\frac{2}{693}\left(63\,b^5x^5+770\,a^2b^3x^4+495\,a^4bx^3\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5*x^2,x, algorithm="fricas")
```

```
[Out] a*b^4*x^5 + 5/2*a^3*b^2*x^4 + 1/3*a^5*x^3 + 2/693*(63*b^5*x^5 + 7
70*a^2*b^3*x^4 + 495*a^4*b*x^3)*sqrt(x)
```

Sympy [A] time = 2.48461, size = 70, normalized size = 0.97

$$\frac{a^5x^3}{3}+\frac{10a^4bx^{\frac{7}{2}}}{7}+\frac{5a^3b^2x^4}{2}+\frac{20a^2b^3x^{\frac{9}{2}}}{9}+ab^4x^5+\frac{2b^5x^{\frac{11}{2}}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(a+b*x**(1/2))**5,x)
```

```
[Out] a**5*x**3/3 + 10*a**4*b*x**(7/2)/7 + 5*a**3*b**2*x**4/2 + 20*a**2
*b**3*x**(9/2)/9 + a*b**4*x**5 + 2*b**5*x**(11/2)/11
```

GIAC/XCAS [A] time = 0.222323, size = 76, normalized size = 1.06

$$\frac{2}{11}\,b^5x^{\frac{11}{2}}+ab^4x^5+\frac{20}{9}\,a^2b^3x^{\frac{9}{2}}+\frac{5}{2}\,a^3b^2x^4+\frac{10}{7}\,a^4bx^{\frac{7}{2}}+\frac{1}{3}\,a^5x^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5*x^2,x, algorithm="giac")
```

```
[Out] 2/11*b^5*x^(11/2) + a*b^4*x^5 + 20/9*a^2*b^3*x^(9/2) + 5/2*a^3*b^
2*x^4 + 10/7*a^4*b*x^(7/2) + 1/3*a^5*x^3
```

3.2142 $\int \left(a+b\sqrt{x}\right)^5 x\,dx$

Optimal. Leaf size=80

$$-\frac{a^3\left(a+b\sqrt{x}\right)^6}{3b^4}+\frac{6a^2\left(a+b\sqrt{x}\right)^7}{7b^4}+\frac{2\left(a+b\sqrt{x}\right)^9}{9b^4}-\frac{3a\left(a+b\sqrt{x}\right)^8}{4b^4}$$

```
[Out] -(a^3*(a + b*Sqrt[x])^6)/(3*b^4) + (6*a^2*(a + b*Sqrt[x])^7)/(7*b
^4) - (3*a*(a + b*Sqrt[x])^8)/(4*b^4) + (2*(a + b*Sqrt[x])^9)/(9*
b^4)
```

Rubi [A] time = 0.100685, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^3\left(a+b\sqrt{x}\right)^6}{3b^4}+\frac{6a^2\left(a+b\sqrt{x}\right)^7}{7b^4}+\frac{2\left(a+b\sqrt{x}\right)^9}{9b^4}-\frac{3a\left(a+b\sqrt{x}\right)^8}{4b^4}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Sqrt[x])^5*x,x]
```

```
[Out] -(a^3*(a + b*Sqrt[x])^6)/(3*b^4) + (6*a^2*(a + b*Sqrt[x])^7)/(7*b
^4) - (3*a*(a + b*Sqrt[x])^8)/(4*b^4) + (2*(a + b*Sqrt[x])^9)/(9*
b^4)
```

Rubi in Sympy [A] time = 14.2312, size = 71, normalized size = 0.89

$$\frac{a^5x^2}{2}+2a^4bx^{\frac{5}{2}}+\frac{10a^3b^2x^3}{3}+\frac{20a^2b^3x^{\frac{7}{2}}}{7}+\frac{5ab^4x^4}{4}+\frac{2b^5x^{\frac{9}{2}}}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x*(a+b*x**(1/2))**5,x)
```

```
[Out] a**5*x**2/2 + 2*a**4*b*x**(5/2) + 10*a**3*b**2*x**3/3 + 20*a**2*b
**3*x**(7/2)/7 + 5*a*b**4*x**4/4 + 2*b**5*x**(9/2)/9
```

Mathematica [A] time = 0.0137161, size = 73, normalized size = 0.91

$$\frac{a^5x^2}{2}+2a^4bx^{5/2}+\frac{10}{3}a^3b^2x^3+\frac{20}{7}a^2b^3x^{7/2}+\frac{5}{4}ab^4x^4+\frac{2}{9}b^5x^{9/2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Sqrt[x])^5*x,x]
```

```
[Out] (a^5*x^2)/2 + 2*a^4*b*x^(5/2) + (10*a^3*b^2*x^3)/3 + (20*a^2*b^3*
x^(7/2))/7 + (5*a*b^4*x^4)/4 + (2*b^5*x^(9/2))/9
```

Maple [A] time = 0.003, size = 58, normalized size = 0.7

$$\frac{2\,b^5}{9}x^{\frac{9}{2}}+\frac{5\,ab^4x^4}{4}+\frac{20\,a^2b^3}{7}x^{\frac{7}{2}}+\frac{10\,a^3b^2x^3}{3}+2\,a^4bx^{5/2}+\frac{a^5x^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(a+b*x^(1/2))^5,x)
```

```
[Out] 2/9*x^(9/2)*b^5+5/4*a*b^4*x^4+20/7*a^2*b^3*x^(7/2)+10/3*a^3*b^2*x
^3+2*a^4*b*x^(5/2)+1/2*a^5*x^2
```

Maxima [A] time = 1.54697, size = 86, normalized size = 1.08

$$\frac{2\left(b\sqrt{x}+a\right)^9}{9\,b^4}-\frac{3\left(b\sqrt{x}+a\right)^8 a}{4\,b^4}+\frac{6\left(b\sqrt{x}+a\right)^7 a^2}{7\,b^4}-\frac{\left(b\sqrt{x}+a\right)^6 a^3}{3\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5*x,x, algorithm="maxima")
```

```
[Out] 2/9*(b*sqrt(x) + a)^9/b^4 - 3/4*(b*sqrt(x) + a)^8*a/b^4 + 6/7*(b*
sqrt(x) + a)^7*a^2/b^4 - 1/3*(b*sqrt(x) + a)^6*a^3/b^4
```

Fricas [A] time = 0.237205, size = 85, normalized size = 1.06

$$\frac{5}{4}\,ab^4x^4+\frac{10}{3}\,a^3b^2x^3+\frac{1}{2}\,a^5x^2+\frac{2}{63}\left(7\,b^5x^4+90\,a^2b^3x^3+63\,a^4bx^2\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5*x,x, algorithm="fricas")
```

```
[Out] 5/4*a*b^4*x^4 + 10/3*a^3*b^2*x^3 + 1/2*a^5*x^2 + 2/63*(7*b^5*x^4
+ 90*a^2*b^3*x^3 + 63*a^4*b*x^2)*sqrt(x)
```

Sympy [A] time = 1.65347, size = 71, normalized size = 0.89

$$\frac{a^5x^2}{2}+2a^4bx^{\frac{5}{2}}+\frac{10a^3b^2x^3}{3}+\frac{20a^2b^3x^{\frac{7}{2}}}{7}+\frac{5ab^4x^4}{4}+\frac{2b^5x^{\frac{9}{2}}}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(a+b*x**(1/2))**5,x)
```

```
[Out] a**5*x**2/2 + 2*a**4*b*x**(5/2) + 10*a**3*b**2*x**3/3 + 20*a**2*b
**3*x**(7/2)/7 + 5*a*b**4*x**4/4 + 2*b**5*x**(9/2)/9
```

GIAC/XCAS [A] time = 0.219895, size = 77, normalized size = 0.96

$$\frac{2}{9}\,b^5x^{\frac{9}{2}}+\frac{5}{4}\,ab^4x^4+\frac{20}{7}\,a^2b^3x^{\frac{7}{2}}+\frac{10}{3}\,a^3b^2x^3+2\,a^4bx^{\frac{5}{2}}+\frac{1}{2}\,a^5x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5*x,x, algorithm="giac")
```

```
[Out] 2/9*b^5*x^(9/2) + 5/4*a*b^4*x^4 + 20/7*a^2*b^3*x^(7/2) + 10/3*a^3
*b^2*x^3 + 2*a^4*b*x^(5/2) + 1/2*a^5*x^2
```

3.2143 $\int \left(a+b\sqrt{x}\right)^5\,dx$

Optimal. Leaf size=38

$$\frac{2\left(a+b\sqrt{x}\right)^7}{7b^2}-\frac{a\left(a+b\sqrt{x}\right)^6}{3b^2}$$

```
[Out] -(a*(a + b*Sqrt[x])^6)/(3*b^2) + (2*(a + b*Sqrt[x])^7)/(7*b^2)
```

Rubi [A] time = 0.0450174, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{2\left(a+b\sqrt{x}\right)^7}{7b^2}-\frac{a\left(a+b\sqrt{x}\right)^6}{3b^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Sqrt[x])^5,x]
```

```
[Out] -(a*(a + b*Sqrt[x])^6)/(3*b^2) + (2*(a + b*Sqrt[x])^7)/(7*b^2)
```

Rubi in Sympy [A] time = 8.07235, size = 32, normalized size = 0.84

$$-\frac{a\left(a+b\sqrt{x}\right)^6}{3b^2}+\frac{2\left(a+b\sqrt{x}\right)^7}{7b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b*x**(1/2))**5,x)
```

```
[Out] -a*(a + b*sqrt(x))**6/(3*b**2) + 2*(a + b*sqrt(x))**7/(7*b**2)
```

Mathematica [A] time = 0.0127571, size = 66, normalized size = 1.74

$$a^5x+\frac{10}{3}a^4bx^{3/2}+5a^3b^2x^2+4a^2b^3x^{5/2}+\frac{5}{3}ab^4x^3+\frac{2}{7}b^5x^{7/2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Sqrt[x])^5,x]
```

```
[Out] a^5*x + (10*a^4*b*x^(3/2))/3 + 5*a^3*b^2*x^2 + 4*a^2*b^3*x^(5/2)
+ (5*a*b^4*x^3)/3 + (2*b^5*x^(7/2))/7
```

Maple [A] time = 0.003, size = 55, normalized size = 1.5

$$\frac{2\,b^5}{7}x^{\frac{7}{2}}+\frac{5\,ab^4x^3}{3}+4\,a^2b^3x^{5/2}+5\,a^3b^2x^2+\frac{10\,a^4b}{3}x^{\frac{3}{2}}+xa^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*x^(1/2))^5,x)
```

```
[Out] 2/7*x^(7/2)*b^5+5/3*a*b^4*x^3+4*a^2*b^3*x^(5/2)+5*a^3*b^2*x^2+10/
3*a^4*b*x^(3/2)+x*a^5
```

Maxima [A] time = 1.43983, size = 73, normalized size = 1.92

$$\frac{2}{7}\,b^5x^{\frac{7}{2}} + \frac{5}{3}\,ab^4x^3 + 4\,a^2b^3x^{\frac{5}{2}} + 5\,a^3b^2x^2 + \frac{10}{3}\,a^4bx^{\frac{3}{2}} + a^5x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5,x, algorithm="maxima")
```

```
[Out] 2/7*b^5*x^(7/2) + 5/3*a*b^4*x^3 + 4*a^2*b^3*x^(5/2) + 5*a^3*b^2*x
^2 + 10/3*a^4*b*x^(3/2) + a^5*x
```

Fricas [A] time = 0.229263, size = 78, normalized size = 2.05

$$\frac{5}{3}\,ab^4x^3 + 5\,a^3b^2x^2 + a^5x + \frac{2}{21}\left(3\,b^5x^3 + 42\,a^2b^3x^2 + 35\,a^4bx\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5,x, algorithm="fricas")
```

```
[Out] 5/3*a*b^4*x^3 + 5*a^3*b^2*x^2 + a^5*x + 2/21*(3*b^5*x^3 + 42*a^2*
b^3*x^2 + 35*a^4*b*x)*sqrt(x)
```

Sympy [A] time = 1.43243, size = 66, normalized size = 1.74

$$a^5x + \frac{10a^4bx^{\frac{3}{2}}}{3} + 5a^3b^2x^2 + 4a^2b^3x^{\frac{5}{2}} + \frac{5ab^4x^3}{3} + \frac{2b^5x^{\frac{7}{2}}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**5,x)
```

```
[Out] a**5*x + 10*a**4*b*x**(3/2)/3 + 5*a**3*b**2*x**2 + 4*a**2*b**3*x*
*(5/2) + 5*a*b**4*x**3/3 + 2*b**5*x**(7/2)/7
```

GIAC/XCAS [A] time = 0.213633, size = 73, normalized size = 1.92

$$\frac{2}{7}\,b^5x^{\frac{7}{2}} + \frac{5}{3}\,ab^4x^3 + 4\,a^2b^3x^{\frac{5}{2}} + 5\,a^3b^2x^2 + \frac{10}{3}\,a^4bx^{\frac{3}{2}} + a^5x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5,x, algorithm="giac")
```

```
[Out] 2/7*b^5*x^(7/2) + 5/3*a*b^4*x^3 + 4*a^2*b^3*x^(5/2) + 5*a^3*b^2*x
^2 + 10/3*a^4*b*x^(3/2) + a^5*x
```

3.2144 $\int \frac{(a+b\sqrt{x})^5}{x}\,dx$

Optimal. Leaf size=65

$$a^5\log(x)+10a^4b\sqrt{x}+10a^3b^2x+\frac{20}{3}a^2b^3x^{3/2}+\frac{5}{2}ab^4x^2+\frac{2}{5}b^5x^{5/2}$$

```
[Out] 10*a^4*b*Sqrt[x] + 10*a^3*b^2*x + (20*a^2*b^3*x^(3/2))/3 + (5*a*b
^4*x^2)/2 + (2*b^5*x^(5/2))/5 + a^5*Log[x]
```

Rubi [A] time = 0.0780266, antiderivative size = 65, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$a^5\log(x)+10a^4b\sqrt{x}+10a^3b^2x+\frac{20}{3}a^2b^3x^{3/2}+\frac{5}{2}ab^4x^2+\frac{2}{5}b^5x^{5/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^5/x,x]
```

```
[Out] 10*a^4*b*Sqrt[x] + 10*a^3*b^2*x + (20*a^2*b^3*x^(3/2))/3 + (5*a*b
^4*x^2)/2 + (2*b^5*x^(5/2))/5 + a^5*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$2a^5\log\left(\sqrt{x}\right)+10a^4b\sqrt{x}+20a^3b^2\int^{\sqrt{x}}x\,dx+\frac{20a^2b^3x^{\frac{3}{2}}}{3}+\frac{5ab^4x^2}{2}+\frac{2b^5x^{\frac{5}{2}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**5/x,x)
```

```
[Out] 2*a**5*log(sqrt(x)) + 10*a**4*b*sqrt(x) + 20*a**3*b**2*Integral(x
, (x, sqrt(x))) + 20*a**2*b**3*x**(3/2)/3 + 5*a*b**4*x**2/2 + 2*b
**5*x**(5/2)/5
```

Mathematica [A] time = 0.0191907, size = 65, normalized size = 1.

$$a^5\log(x)+10a^4b\sqrt{x}+10a^3b^2x+\frac{20}{3}a^2b^3x^{3/2}+\frac{5}{2}ab^4x^2+\frac{2}{5}b^5x^{5/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^5/x,x]
```

```
[Out] 10*a^4*b*Sqrt[x] + 10*a^3*b^2*x + (20*a^2*b^3*x^(3/2))/3 + (5*a*b
^4*x^2)/2 + (2*b^5*x^(5/2))/5 + a^5*Log[x]
```

Maple [A] time = 0.003, size = 54, normalized size = 0.8

$$10\,a^3b^2x+\frac{20\,a^2b^3}{3}x^{\frac{3}{2}}+\frac{5\,ab^4x^2}{2}+\frac{2\,b^5}{5}x^{\frac{5}{2}}+a^5\ln(x)+10\,a^4b\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^5/x,x)
```

```
[Out] 10*a^3*b^2*x+20/3*a^2*b^3*x^(3/2)+5/2*a*b^4*x^2+2/5*b^5*x^(5/2)+a
^5*ln(x)+10*a^4*b*x^(1/2)
```

Maxima [A] time = 1.4508, size = 72, normalized size = 1.11

$$\frac{2}{5}\,b^5x^{\frac{5}{2}} + \frac{5}{2}\,ab^4x^2 + \frac{20}{3}\,a^2b^3x^{\frac{3}{2}} + 10\,a^3b^2x + a^5\log\left(x\right) + 10\,a^4b\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5/x,x, algorithm="maxima")
```

```
[Out] 2/5*b^5*x^(5/2) + 5/2*a*b^4*x^2 + 20/3*a^2*b^3*x^(3/2) + 10*a^3*b
^2*x + a^5*log(x) + 10*a^4*b*sqrt(x)
```

Fricas [A] time = 0.236069, size = 77, normalized size = 1.18

$$\frac{5}{2}\,ab^4x^2 + 10\,a^3b^2x + 2\,a^5\log\left(\sqrt{x}\right) + \frac{2}{15}\left(3\,b^5x^2 + 50\,a^2b^3x + 75\,a^4b\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5/x,x, algorithm="fricas")
```

```
[Out] 5/2*a*b^4*x^2 + 10*a^3*b^2*x + 2*a^5*log(sqrt(x)) + 2/15*(3*b^5*x
^2 + 50*a^2*b^3*x + 75*a^4*b)*sqrt(x)
```

Sympy [A] time = 1.31507, size = 66, normalized size = 1.02

$$a^5\log\left(x\right) + 10a^4b\sqrt{x} + 10a^3b^2x + \frac{20a^2b^3x^{\frac{3}{2}}}{3} + \frac{5ab^4x^2}{2} + \frac{2b^5x^{\frac{5}{2}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**5/x,x)
```

```
[Out] a**5*log(x) + 10*a**4*b*sqrt(x) + 10*a**3*b**2*x + 20*a**2*b**3*x
**(3/2)/3 + 5*a*b**4*x**2/2 + 2*b**5*x**(5/2)/5
```

GIAC/XCAS [A] time = 0.215347, size = 73, normalized size = 1.12

$$\frac{2}{5}\,b^5x^{\frac{5}{2}} + \frac{5}{2}\,ab^4x^2 + \frac{20}{3}\,a^2b^3x^{\frac{3}{2}} + 10\,a^3b^2x + a^5\ln\left(|x|\right) + 10\,a^4b\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5/x,x, algorithm="giac")
```

```
[Out] 2/5*b^5*x^(5/2) + 5/2*a*b^4*x^2 + 20/3*a^2*b^3*x^(3/2) + 10*a^3*b
^2*x + a^5*ln(abs(x)) + 10*a^4*b*sqrt(x)
```

3.2145 $\int \frac{(a+b\sqrt{x})^5}{x^2} dx$

Optimal. Leaf size=62

$$-\frac{a^5}{x}-\frac{10a^4b}{\sqrt{x}}+10a^3b^2\log(x)+20a^2b^3\sqrt{x}+5ab^4x+\frac{2}{3}b^5x^{3/2}$$

```
[Out] -(a^5/x) - (10*a^4*b)/Sqrt[x] + 20*a^2*b^3*Sqrt[x] + 5*a*b^4*x +
(2*b^5*x^(3/2))/3 + 10*a^3*b^2*Log[x]
```

Rubi [A] time = 0.0878741, antiderivative size = 62, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^5}{x}-\frac{10a^4b}{\sqrt{x}}+10a^3b^2\log(x)+20a^2b^3\sqrt{x}+5ab^4x+\frac{2}{3}b^5x^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^5/x^2,x]
```

```
[Out] -(a^5/x) - (10*a^4*b)/Sqrt[x] + 20*a^2*b^3*Sqrt[x] + 5*a*b^4*x +
(2*b^5*x^(3/2))/3 + 10*a^3*b^2*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^5}{x}-\frac{10a^4b}{\sqrt{x}}+20a^3b^2\log\left(\sqrt{x}\right)+20a^2b^3\sqrt{x}+10ab^4\int^{\sqrt{x}}x\,dx+\frac{2b^5x^{\frac{3}{2}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**5/x**2,x)
```

```
[Out] -a**5/x - 10*a**4*b/sqrt(x) + 20*a**3*b**2*log(sqrt(x)) + 20*a**2
*b**3*sqrt(x) + 10*a*b**4*Integral(x, (x, sqrt(x))) + 2*b**5*x**(
3/2)/3
```

Mathematica [A] time = 0.0386639, size = 62, normalized size = 1.

$$-\frac{a^5}{x}-\frac{10a^4b}{\sqrt{x}}+10a^3b^2\log(x)+20a^2b^3\sqrt{x}+5ab^4x+\frac{2}{3}b^5x^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^5/x^2,x]
```

```
[Out] -(a^5/x) - (10*a^4*b)/Sqrt[x] + 20*a^2*b^3*Sqrt[x] + 5*a*b^4*x +
(2*b^5*x^(3/2))/3 + 10*a^3*b^2*Log[x]
```

Maple [A] time = 0.003, size = 55, normalized size = 0.9

$$-\frac{a^5}{x}+5\,ab^4x+\frac{2\,b^5}{3}x^{\frac{3}{2}}+10\,a^3b^2\ln(x)-10\,\frac{a^4b}{\sqrt{x}}+20\,a^2b^3\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((a+b*x^(1/2))^5/x^2,x)
```

```
[Out] -a^5/x+5*a*b^4*x+2/3*b^5*x^(3/2)+10*a^3*b^2*ln(x)-10*a^4*b/x^(1/2
)+20*a^2*b^3*x^(1/2)
```

Maxima [A] time = 1.44531, size = 74, normalized size = 1.19

$$\frac{2}{3}\,b^5x^{\frac{3}{2}}+5\,ab^4x+10\,a^3b^2\log\left(x\right)+20\,a^2b^3\sqrt{x}-\frac{10\,a^4b\sqrt{x}+a^5}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*sqrt(x) + a)^5/x^2,x, algorithm="maxima")
```

```
[Out] 2/3*b^5*x^(3/2) + 5*a*b^4*x + 10*a^3*b^2*log(x) + 20*a^2*b^3*sqrt
(x) - (10*a^4*b*sqrt(x) + a^5)/x
```

Fricas [A] time = 0.235766, size = 82, normalized size = 1.32

$$\frac{15\,ab^4x^2+60\,a^3b^2x\log\left(\sqrt{x}\right)-3\,a^5+2\,\left(b^5x^2+30\,a^2b^3x-15\,a^4b\right)\sqrt{x}}{3\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*sqrt(x) + a)^5/x^2,x, algorithm="fricas")
```

```
[Out] 1/3*(15*a*b^4*x^2 + 60*a^3*b^2*x*log(sqrt(x)) - 3*a^5 + 2*(b^5*x^
2 + 30*a^2*b^3*x - 15*a^4*b)*sqrt(x))/x
```

Sympy [A] time = 2.0691, size = 61, normalized size = 0.98

$$-\frac{a^5}{x}-\frac{10a^4b}{\sqrt{x}}+10a^3b^2\log\left(x\right)+20a^2b^3\sqrt{x}+5ab^4x+\frac{2b^5x^{\frac{3}{2}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a+b*x**(1/2))**5/x**2,x)
```

```
[Out] -a**5/x - 10*a**4*b/sqrt(x) + 10*a**3*b**2*log(x) + 20*a**2*b**3*
sqrt(x) + 5*a*b**4*x + 2*b**5*x**(3/2)/3
```

GIAC/XCAS [A] time = 0.219055, size = 76, normalized size = 1.23

$$\frac{2}{3}\,b^5x^{\frac{3}{2}}+5\,ab^4x+10\,a^3b^2\ln\left(|x|\right)+20\,a^2b^3\sqrt{x}-\frac{10\,a^4b\sqrt{x}+a^5}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*sqrt(x) + a)^5/x^2,x, algorithm="giac")
```

```
[Out] 2/3*b^5*x^(3/2) + 5*a*b^4*x + 10*a^3*b^2*ln(abs(x)) + 20*a^2*b^3*
sqrt(x) - (10*a^4*b*sqrt(x) + a^5)/x
```

3.2146 $\int \frac{(a+b\sqrt{x})^5}{x^3} dx$

Optimal. Leaf size=66

$$-\frac{a^5}{2x^2}-\frac{10a^4b}{3x^{3/2}}-\frac{10a^3b^2}{x}-\frac{20a^2b^3}{\sqrt{x}}+5ab^4\log(x)+2b^5\sqrt{x}$$

```
[Out] -a^5/(2*x^2) - (10*a^4*b)/(3*x^(3/2)) - (10*a^3*b^2)/x - (20*a^2*
b^3)/Sqrt[x] + 2*b^5*Sqrt[x] + 5*a*b^4*Log[x]
```

Rubi [A] time = 0.0843245, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^5}{2x^2}-\frac{10a^4b}{3x^{3/2}}-\frac{10a^3b^2}{x}-\frac{20a^2b^3}{\sqrt{x}}+5ab^4\log(x)+2b^5\sqrt{x}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^5/x^3,x]
```

```
[Out] -a^5/(2*x^2) - (10*a^4*b)/(3*x^(3/2)) - (10*a^3*b^2)/x - (20*a^2*
b^3)/Sqrt[x] + 2*b^5*Sqrt[x] + 5*a*b^4*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^5}{2x^2}-\frac{10a^4b}{3x^{\frac{3}{2}}}-\frac{10a^3b^2}{x}-\frac{20a^2b^3}{\sqrt{x}}+10ab^4\log\left(\sqrt{x}\right)+2\int^{\sqrt{x}}b^5\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**5/x**3,x)
```

```
[Out] -a**5/(2*x**2) - 10*a**4*b/(3*x**(3/2)) - 10*a**3*b**2/x - 20*a**
2*b**3/sqrt(x) + 10*a*b**4*log(sqrt(x)) + 2*Integral(b**5, (x, sq
rt(x)))
```

Mathematica [A] time = 0.0386744, size = 67, normalized size = 1.02

$$-\frac{3a^5+20a^4b\sqrt{x}+60a^3b^2x+120a^2b^3x^{3/2}-30ab^4x^2\log(x)-12b^5x^{5/2}}{6x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^5/x^3,x]
```

```
[Out] -(3*a^5 + 20*a^4*b*Sqrt[x] + 60*a^3*b^2*x + 120*a^2*b^3*x^(3/2) -
 12*b^5*x^(5/2) - 30*a*b^4*x^2*Log[x])/(6*x^2)
```

Maple [A] time = 0.005, size = 57, normalized size = 0.9

$$-\frac{a^5}{2x^2}-\frac{10a^4b}{3}x^{-\frac{3}{2}}-10\frac{a^3b^2}{x}+5ab^4\ln(x)-20\frac{a^2b^3}{\sqrt{x}}+2b^5\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^5/x^3,x)
```

```
[Out] -1/2*a^5/x^2-10/3*a^4*b/x^(3/2)-10*a^3*b^2/x+5*a*b^4*ln(x)-20*a^2
*b^3/x^(1/2)+2*b^5*x^(1/2)
```

Maxima [A] time = 1.43993, size = 77, normalized size = 1.17

$$5\,ab^4\log(x) + 2\,b^5\sqrt{x} - \frac{120\,a^2b^3x^{\frac{3}{2}} + 60\,a^3b^2x + 20\,a^4b\sqrt{x} + 3\,a^5}{6\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5/x^3,x, algorithm="maxima")
```

```
[Out] 5*a*b^4*log(x) + 2*b^5*sqrt(x) - 1/6*(120*a^2*b^3*x^(3/2) + 60*a^
3*b^2*x + 20*a^4*b*sqrt(x) + 3*a^5)/x^2
```

Fricas [A] time = 0.231575, size = 84, normalized size = 1.27

$$\frac{60\,ab^4x^2\log\left(\sqrt{x}\right) - 60\,a^3b^2x - 3\,a^5 + 4\left(3\,b^5x^2 - 30\,a^2b^3x - 5\,a^4b\right)\sqrt{x}}{6\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5/x^3,x, algorithm="fricas")
```

```
[Out] 1/6*(60*a*b^4*x^2*log(sqrt(x)) - 60*a^3*b^2*x - 3*a^5 + 4*(3*b^5*
x^2 - 30*a^2*b^3*x - 5*a^4*b)*sqrt(x))/x^2
```

Sympy [A] time = 2.43716, size = 65, normalized size = 0.98

$$-\frac{a^5}{2x^2} - \frac{10a^4b}{3x^{\frac{3}{2}}} - \frac{10a^3b^2}{x} - \frac{20a^2b^3}{\sqrt{x}} + 5ab^4\log(x) + 2b^5\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**5/x**3,x)
```

```
[Out] -a**5/(2*x**2) - 10*a**4*b/(3*x**(3/2)) - 10*a**3*b**2/x - 20*a**
2*b**3/sqrt(x) + 5*a*b**4*log(x) + 2*b**5*sqrt(x)
```

GIAC/XCAS [A] time = 0.218907, size = 78, normalized size = 1.18

$$5\,ab^4\ln(|x|) + 2\,b^5\sqrt{x} - \frac{120\,a^2b^3x^{\frac{3}{2}} + 60\,a^3b^2x + 20\,a^4b\sqrt{x} + 3\,a^5}{6\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5/x^3,x, algorithm="giac")
```

```
[Out] 5*a*b^4*ln(abs(x)) + 2*b^5*sqrt(x) - 1/6*(120*a^2*b^3*x^(3/2) + 6
0*a^3*b^2*x + 20*a^4*b*sqrt(x) + 3*a^5)/x^2
```

3.2147 $\int \frac{(a+b\sqrt{x})^5}{x^4}\,dx$

Optimal. Leaf size=21

$$-\frac{(a+b\sqrt{x})^6}{3ax^3}$$

```
[Out] -(a + b*Sqrt[x])^6/(3*a*x^3)
```

Rubi [A] time = 0.0165892, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{(a+b\sqrt{x})^6}{3ax^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Sqrt[x])^5/x^4,x]
```

```
[Out] -(a + b*Sqrt[x])^6/(3*a*x^3)
```

Rubi in Sympy [A] time = 2.66709, size = 17, normalized size = 0.81

$$-\frac{(a+b\sqrt{x})^6}{3ax^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b*x**(1/2))**5/x**4,x)
```

```
[Out] -(a + b*sqrt(x))**6/(3*a*x**3)
```

Mathematica [B] time = 0.0200988, size = 63, normalized size = 3.

$$-\frac{a^5+6a^4b\sqrt{x}+15a^3b^2x+20a^2b^3x^{3/2}+15ab^4x^2+6b^5x^{5/2}}{3x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Sqrt[x])^5/x^4,x]
```

```
[Out] -(a^5 + 6*a^4*b*Sqrt[x] + 15*a^3*b^2*x + 20*a^2*b^3*x^(3/2) + 15*
a*b^4*x^2 + 6*b^5*x^(5/2))/(3*x^3)
```

Maple [B] time = 0.004, size = 58, normalized size = 2.8

$$-2\,\frac{b^5}{\sqrt{x}}-5\,\frac{ab^4}{x}-\frac{20\,a^2b^3}{3}x^{-\frac{3}{2}}-5\,\frac{a^3b^2}{x^2}-2\,\frac{a^4b}{x^{5/2}}-\frac{a^5}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*x^(1/2))^5/x^4,x)
```

```
[Out] -2*b^5/x^(1/2)-5*a*b^4/x-20/3*a^2*b^3/x^(3/2)-5*a^3*b^2/x^2-2*a^4
*b/x^(5/2)-1/3*a^5/x^3
```

Maxima [A] time = 1.43724, size = 74, normalized size = 3.52

$$-\frac{6\,b^5x^{\frac{5}{2}} + 15\,ab^4x^2 + 20\,a^2b^3x^{\frac{3}{2}} + 15\,a^3b^2x + 6\,a^4b\sqrt{x} + a^5}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5/x^4,x, algorithm="maxima")
```

```
[Out] -1/3*(6*b^5*x^(5/2) + 15*a*b^4*x^2 + 20*a^2*b^3*x^(3/2) + 15*a^3*
b^2*x + 6*a^4*b*sqrt(x) + a^5)/x^3
```

Fricas [A] time = 0.235842, size = 76, normalized size = 3.62

$$-\frac{15\,ab^4x^2 + 15\,a^3b^2x + a^5 + 2\left(3\,b^5x^2 + 10\,a^2b^3x + 3\,a^4b\right)\sqrt{x}}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5/x^4,x, algorithm="fricas")
```

```
[Out] -1/3*(15*a*b^4*x^2 + 15*a^3*b^2*x + a^5 + 2*(3*b^5*x^2 + 10*a^2*b
^3*x + 3*a^4*b)*sqrt(x))/x^3
```

Sympy [A] time = 3.42757, size = 66, normalized size = 3.14

$$-\frac{a^5}{3x^3} - \frac{2a^4b}{x^{\frac{5}{2}}} - \frac{5a^3b^2}{x^2} - \frac{20a^2b^3}{3x^{\frac{3}{2}}} - \frac{5ab^4}{x} - \frac{2b^5}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**5/x**4,x)
```

```
[Out] -a**5/(3*x**3) - 2*a**4*b/x**(5/2) - 5*a**3*b**2/x**2 - 20*a**2*b
**3/(3*x**(3/2)) - 5*a*b**4/x - 2*b**5/sqrt(x)
```

GIAC/XCAS [A] time = 0.213272, size = 74, normalized size = 3.52

$$-\frac{6\,b^5x^{\frac{5}{2}} + 15\,ab^4x^2 + 20\,a^2b^3x^{\frac{3}{2}} + 15\,a^3b^2x + 6\,a^4b\sqrt{x} + a^5}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5/x^4,x, algorithm="giac")
```

```
[Out] -1/3*(6*b^5*x^(5/2) + 15*a*b^4*x^2 + 20*a^2*b^3*x^(3/2) + 15*a^3*
b^2*x + 6*a^4*b*sqrt(x) + a^5)/x^3
```

3.2148 $\int \frac{\left(a+b\sqrt{x}\right)^5}{x^5}\,dx$

Optimal. Leaf size=70

$$-\frac{b^2\left(a+b\sqrt{x}\right)^6}{84a^3x^3}+\frac{b\left(a+b\sqrt{x}\right)^6}{14a^2x^{7/2}}-\frac{\left(a+b\sqrt{x}\right)^6}{4ax^4}$$

```
[Out] -(a + b*Sqrt[x])^6/(4*a*x^4) + (b*(a + b*Sqrt[x])^6)/(14*a^2*x^(7
/2)) - (b^2*(a + b*Sqrt[x])^6)/(84*a^3*x^3)
```

Rubi [A] time = 0.0757441, antiderivative size = 70, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{b^2\left(a+b\sqrt{x}\right)^6}{84a^3x^3}+\frac{b\left(a+b\sqrt{x}\right)^6}{14a^2x^{7/2}}-\frac{\left(a+b\sqrt{x}\right)^6}{4ax^4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^5/x^5,x]
```

```
[Out] -(a + b*Sqrt[x])^6/(4*a*x^4) + (b*(a + b*Sqrt[x])^6)/(14*a^2*x^(7
/2)) - (b^2*(a + b*Sqrt[x])^6)/(84*a^3*x^3)
```

Rubi in Sympy [A] time = 13.5928, size = 73, normalized size = 1.04

$$-\frac{a^5}{4x^4}-\frac{10a^4b}{7x^{\frac{7}{2}}}-\frac{10a^3b^2}{3x^3}-\frac{4a^2b^3}{x^{\frac{5}{2}}}-\frac{5ab^4}{2x^2}-\frac{2b^5}{3x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**5/x**5,x)
```

```
[Out] -a**5/(4*x**4) - 10*a**4*b/(7*x**(7/2)) - 10*a**3*b**2/(3*x**3) -
 4*a**2*b**3/x**(5/2) - 5*a*b**4/(2*x**2) - 2*b**5/(3*x**(3/2))
```

Mathematica [A] time = 0.0218385, size = 65, normalized size = 0.93

$$-\frac{21a^5+120a^4b\sqrt{x}+280a^3b^2x+336a^2b^3x^{3/2}+210ab^4x^2+56b^5x^{5/2}}{84x^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^5/x^5,x]
```

```
[Out] -(21*a^5 + 120*a^4*b*Sqrt[x] + 280*a^3*b^2*x + 336*a^2*b^3*x^(3/2
) + 210*a*b^4*x^2 + 56*b^5*x^(5/2))/(84*x^4)
```

Maple [A] time = 0.003, size = 58, normalized size = 0.8

$$-\frac{2\,b^5}{3}x^{-\frac{3}{2}}-\frac{5\,ab^4}{2\,x^2}-4\,\frac{a^2b^3}{x^{5/2}}-\frac{10\,a^3b^2}{3\,x^3}-\frac{10\,a^4b}{7}x^{-\frac{7}{2}}-\frac{a^5}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^5/x^5,x)
```

```
[Out] -2/3*b^5/x^(3/2)-5/2*a*b^4/x^2-4*a^2*b^3/x^(5/2)-10/3*a^3*b^2/x^3
-10/7*a^4*b/x^(7/2)-1/4*a^5/x^4
```

Maxima [A] time = 1.44165, size = 77, normalized size = 1.1

$$-\frac{56\,b^{5}x^{\frac{5}{2}}+210\,ab^{4}x^{2}+336\,a^{2}b^{3}x^{\frac{3}{2}}+280\,a^{3}b^{2}x+120\,a^{4}b\sqrt{x}+21\,a^{5}}{84\,x^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5/x^5,x, algorithm="maxima")
```

```
[Out] -1/84*(56*b^5*x^(5/2) + 210*a*b^4*x^2 + 336*a^2*b^3*x^(3/2) + 280
*a^3*b^2*x + 120*a^4*b*sqrt(x) + 21*a^5)/x^4
```

Fricas [A] time = 0.233861, size = 78, normalized size = 1.11

$$-\frac{210\,ab^{4}x^{2}+280\,a^{3}b^{2}x+21\,a^{5}+8\left(7\,b^{5}x^{2}+42\,a^{2}b^{3}x+15\,a^{4}b\right)\sqrt{x}}{84\,x^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5/x^5,x, algorithm="fricas")
```

```
[Out] -1/84*(210*a*b^4*x^2 + 280*a^3*b^2*x + 21*a^5 + 8*(7*b^5*x^2 + 42
*a^2*b^3*x + 15*a^4*b)*sqrt(x))/x^4
```

Sympy [A] time = 5.32048, size = 73, normalized size = 1.04

$$-\frac{a^{5}}{4x^{4}}-\frac{10a^{4}b}{7x^{\frac{7}{2}}}-\frac{10a^{3}b^{2}}{3x^{3}}-\frac{4a^{2}b^{3}}{x^{\frac{5}{2}}}-\frac{5ab^{4}}{2x^{2}}-\frac{2b^{5}}{3x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**5/x**5,x)
```

```
[Out] -a**5/(4*x**4) - 10*a**4*b/(7*x**(7/2)) - 10*a**3*b**2/(3*x**3) -
 4*a**2*b**3/x**(5/2) - 5*a*b**4/(2*x**2) - 2*b**5/(3*x**(3/2))
```

GIAC/XCAS [A] time = 0.214445, size = 77, normalized size = 1.1

$$-\frac{56\,b^{5}x^{\frac{5}{2}}+210\,ab^{4}x^{2}+336\,a^{2}b^{3}x^{\frac{3}{2}}+280\,a^{3}b^{2}x+120\,a^{4}b\sqrt{x}+21\,a^{5}}{84\,x^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5/x^5,x, algorithm="giac")
```

```
[Out] -1/84*(56*b^5*x^(5/2) + 210*a*b^4*x^2 + 336*a^2*b^3*x^(3/2) + 280
*a^3*b^2*x + 120*a^4*b*sqrt(x) + 21*a^5)/x^4
```

3.2149 $\int \frac{(a+b\sqrt{x})^5}{x^6}\,dx$

Optimal. Leaf size=75

$$-\frac{a^5}{5x^5}-\frac{10a^4b}{9x^{9/2}}-\frac{5a^3b^2}{2x^4}-\frac{20a^2b^3}{7x^{7/2}}-\frac{5ab^4}{3x^3}-\frac{2b^5}{5x^{5/2}}$$

```
[Out] -a^5/(5*x^5) - (10*a^4*b)/(9*x^(9/2)) - (5*a^3*b^2)/(2*x^4) - (20
*a^2*b^3)/(7*x^(7/2)) - (5*a*b^4)/(3*x^3) - (2*b^5)/(5*x^(5/2))
```

Rubi [A] time = 0.0864623, antiderivative size = 75, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^5}{5x^5}-\frac{10a^4b}{9x^{9/2}}-\frac{5a^3b^2}{2x^4}-\frac{20a^2b^3}{7x^{7/2}}-\frac{5ab^4}{3x^3}-\frac{2b^5}{5x^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^5/x^6,x]
```

```
[Out] -a^5/(5*x^5) - (10*a^4*b)/(9*x^(9/2)) - (5*a^3*b^2)/(2*x^4) - (20
*a^2*b^3)/(7*x^(7/2)) - (5*a*b^4)/(3*x^3) - (2*b^5)/(5*x^(5/2))
```

Rubi in Sympy [A] time = 13.6197, size = 75, normalized size = 1.

$$-\frac{a^5}{5x^5}-\frac{10a^4b}{9x^{\frac{9}{2}}}-\frac{5a^3b^2}{2x^4}-\frac{20a^2b^3}{7x^{\frac{7}{2}}}-\frac{5ab^4}{3x^3}-\frac{2b^5}{5x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**5/x**6,x)
```

```
[Out] -a**5/(5*x**5) - 10*a**4*b/(9*x**(9/2)) - 5*a**3*b**2/(2*x**4) -
20*a**2*b**3/(7*x**(7/2)) - 5*a*b**4/(3*x**3) - 2*b**5/(5*x**(5/2
))
```

Mathematica [A] time = 0.0218488, size = 65, normalized size = 0.87

$$-\frac{126a^5+700a^4b\sqrt{x}+1575a^3b^2x+1800a^2b^3x^{3/2}+1050ab^4x^2+252b^5x^{5/2}}{630x^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^5/x^6,x]
```

```
[Out] -(126*a^5 + 700*a^4*b*Sqrt[x] + 1575*a^3*b^2*x + 1800*a^2*b^3*x^(
3/2) + 1050*a*b^4*x^2 + 252*b^5*x^(5/2))/(630*x^5)
```

Maple [A] time = 0.004, size = 58, normalized size = 0.8

$$-\frac{a^5}{5\,x^5}-\frac{10\,a^4b}{9}x^{-\frac{9}{2}}-\frac{5\,a^3b^2}{2\,x^4}-\frac{20\,a^2b^3}{7}x^{-\frac{7}{2}}-\frac{5\,ab^4}{3\,x^3}-\frac{2\,b^5}{5}x^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^5/x^6,x)
```

```
[Out] -1/5*a^5/x^5-10/9*a^4*b/x^(9/2)-5/2*a^3*b^2/x^4-20/7*a^2*b^3/x^(7
/2)-5/3*a*b^4/x^3-2/5*b^5/x^(5/2)
```

Maxima [A] time = 1.44488, size = 77, normalized size = 1.03

$$-\frac{252\,b^{5}x^{\frac{5}{2}}+1050\,ab^{4}x^{2}+1800\,a^{2}b^{3}x^{\frac{3}{2}}+1575\,a^{3}b^{2}x+700\,a^{4}b\sqrt{x}+126\,a^{5}}{630\,x^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5/x^6,x, algorithm="maxima")
```

```
[Out] -1/630*(252*b^5*x^(5/2) + 1050*a*b^4*x^2 + 1800*a^2*b^3*x^(3/2) +
 1575*a^3*b^2*x + 700*a^4*b*sqrt(x) + 126*a^5)/x^5
```

Fricas [A] time = 0.236644, size = 78, normalized size = 1.04

$$-\frac{1050\,ab^{4}x^{2}+1575\,a^{3}b^{2}x+126\,a^{5}+4\left(63\,b^{5}x^{2}+450\,a^{2}b^{3}x+175\,a^{4}b\right)\sqrt{x}}{630\,x^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5/x^6,x, algorithm="fricas")
```

```
[Out] -1/630*(1050*a*b^4*x^2 + 1575*a^3*b^2*x + 126*a^5 + 4*(63*b^5*x^2
 + 450*a^2*b^3*x + 175*a^4*b)*sqrt(x))/x^5
```

Sympy [A] time = 7.82712, size = 75, normalized size = 1.

$$-\frac{a^{5}}{5x^{5}}-\frac{10a^{4}b}{9x^{\frac{9}{2}}}-\frac{5a^{3}b^{2}}{2x^{4}}-\frac{20a^{2}b^{3}}{7x^{\frac{7}{2}}}-\frac{5ab^{4}}{3x^{3}}-\frac{2b^{5}}{5x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**5/x**6,x)
```

```
[Out] -a**5/(5*x**5) - 10*a**4*b/(9*x**(9/2)) - 5*a**3*b**2/(2*x**4) -
20*a**2*b**3/(7*x**(7/2)) - 5*a*b**4/(3*x**3) - 2*b**5/(5*x**(5/2
))
```

GIAC/XCAS [A] time = 0.215457, size = 77, normalized size = 1.03

$$-\frac{252\,b^{5}x^{\frac{5}{2}}+1050\,ab^{4}x^{2}+1800\,a^{2}b^{3}x^{\frac{3}{2}}+1575\,a^{3}b^{2}x+700\,a^{4}b\sqrt{x}+126\,a^{5}}{630\,x^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5/x^6,x, algorithm="giac")
```

```
[Out] -1/630*(252*b^5*x^(5/2) + 1050*a*b^4*x^2 + 1800*a^2*b^3*x^(3/2) +
 1575*a^3*b^2*x + 700*a^4*b*sqrt(x) + 126*a^5)/x^5
```

3.2150 $\int \frac{(a+b\sqrt{x})^5}{x^7}\,dx$

Optimal. Leaf size=73

$$-\frac{a^5}{6x^6}-\frac{10a^4b}{11x^{11/2}}-\frac{2a^3b^2}{x^5}-\frac{20a^2b^3}{9x^{9/2}}-\frac{5ab^4}{4x^4}-\frac{2b^5}{7x^{7/2}}$$

```
[Out] -a^5/(6*x^6) - (10*a^4*b)/(11*x^(11/2)) - (2*a^3*b^2)/x^5 - (20*a
^2*b^3)/(9*x^(9/2)) - (5*a*b^4)/(4*x^4) - (2*b^5)/(7*x^(7/2))
```

Rubi [A] time = 0.0865189, antiderivative size = 73, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^5}{6x^6}-\frac{10a^4b}{11x^{11/2}}-\frac{2a^3b^2}{x^5}-\frac{20a^2b^3}{9x^{9/2}}-\frac{5ab^4}{4x^4}-\frac{2b^5}{7x^{7/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^5/x^7,x]
```

```
[Out] -a^5/(6*x^6) - (10*a^4*b)/(11*x^(11/2)) - (2*a^3*b^2)/x^5 - (20*a
^2*b^3)/(9*x^(9/2)) - (5*a*b^4)/(4*x^4) - (2*b^5)/(7*x^(7/2))
```

Rubi in Sympy [A] time = 14.0091, size = 73, normalized size = 1.

$$-\frac{a^5}{6x^6}-\frac{10a^4b}{11x^{\frac{11}{2}}}-\frac{2a^3b^2}{x^5}-\frac{20a^2b^3}{9x^{\frac{9}{2}}}-\frac{5ab^4}{4x^4}-\frac{2b^5}{7x^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**5/x**7,x)
```

```
[Out] -a**5/(6*x**6) - 10*a**4*b/(11*x**(11/2)) - 2*a**3*b**2/x**5 - 20
*a**2*b**3/(9*x**(9/2)) - 5*a*b**4/(4*x**4) - 2*b**5/(7*x**(7/2))
```

Mathematica [A] time = 0.022953, size = 65, normalized size = 0.89

$$-\frac{462a^5+2520a^4b\sqrt{x}+5544a^3b^2x+6160a^2b^3x^{3/2}+3465ab^4x^2+792b^5x^{5/2}}{2772x^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^5/x^7,x]
```

```
[Out] -(462*a^5 + 2520*a^4*b*Sqrt[x] + 5544*a^3*b^2*x + 6160*a^2*b^3*x^
(3/2) + 3465*a*b^4*x^2 + 792*b^5*x^(5/2))/(2772*x^6)
```

Maple [A] time = 0.003, size = 58, normalized size = 0.8

$$-\frac{a^5}{6\,x^6}-\frac{10\,a^4b}{11}x^{-\frac{11}{2}}-2\,\frac{a^3b^2}{x^5}-\frac{20\,a^2b^3}{9}x^{-\frac{9}{2}}-\frac{5\,ab^4}{4\,x^4}-\frac{2\,b^5}{7}x^{-\frac{7}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^5/x^7,x)
```

```
[Out] -1/6*a^5/x^6-10/11*a^4*b/x^(11/2)-2*a^3*b^2/x^5-20/9*a^2*b^3/x^(9
/2)-5/4*a*b^4/x^4-2/7*b^5/x^(7/2)
```

Maxima [A] time = 1.43625, size = 77, normalized size = 1.05

$$-\frac{792\, b^5 x^{\frac{5}{2}} + 3465\, ab^4 x^2 + 6160\, a^2 b^3 x^{\frac{3}{2}} + 5544\, a^3 b^2 x + 2520\, a^4 b\sqrt{x} + 462\, a^5}{2772\, x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5/x^7,x, algorithm="maxima")
```

```
[Out] -1/2772*(792*b^5*x^(5/2) + 3465*a*b^4*x^2 + 6160*a^2*b^3*x^(3/2)
+ 5544*a^3*b^2*x + 2520*a^4*b*sqrt(x) + 462*a^5)/x^6
```

Fricas [A] time = 0.232348, size = 78, normalized size = 1.07

$$-\frac{3465\, ab^4 x^2 + 5544\, a^3 b^2 x + 462\, a^5 + 8\left(99\, b^5 x^2 + 770\, a^2 b^3 x + 315\, a^4 b\right)\sqrt{x}}{2772\, x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5/x^7,x, algorithm="fricas")
```

```
[Out] -1/2772*(3465*a*b^4*x^2 + 5544*a^3*b^2*x + 462*a^5 + 8*(99*b^5*x^
2 + 770*a^2*b^3*x + 315*a^4*b)*sqrt(x))/x^6
```

Sympy [A] time = 12.0781, size = 73, normalized size = 1.

$$-\frac{a^5}{6x^6} - \frac{10a^4b}{11x^{\frac{11}{2}}} - \frac{2a^3b^2}{x^5} - \frac{20a^2b^3}{9x^{\frac{9}{2}}} - \frac{5ab^4}{4x^4} - \frac{2b^5}{7x^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**5/x**7,x)
```

```
[Out] -a**5/(6*x**6) - 10*a**4*b/(11*x**(11/2)) - 2*a**3*b**2/x**5 - 20
*a**2*b**3/(9*x**(9/2)) - 5*a*b**4/(4*x**4) - 2*b**5/(7*x**(7/2))
```

GIAC/XCAS [A] time = 0.217632, size = 77, normalized size = 1.05

$$-\frac{792\, b^5 x^{\frac{5}{2}} + 3465\, ab^4 x^2 + 6160\, a^2 b^3 x^{\frac{3}{2}} + 5544\, a^3 b^2 x + 2520\, a^4 b\sqrt{x} + 462\, a^5}{2772\, x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^5/x^7,x, algorithm="giac")
```

```
[Out] -1/2772*(792*b^5*x^(5/2) + 3465*a*b^4*x^2 + 6160*a^2*b^3*x^(3/2)
+ 5544*a^3*b^2*x + 2520*a^4*b*sqrt(x) + 462*a^5)/x^6
```

3.2151 $\int \left(a+b\sqrt{x}\right)^{10} x^4 \, dx$

Optimal. Leaf size=140

$$\frac{a^{10}x^5}{5}+\frac{20}{11}a^9bx^{11/2}+\frac{15}{2}a^8b^2x^6+\frac{240}{13}a^7b^3x^{13/2}+30a^6b^4x^7+\frac{168}{5}a^5b^5x^{15/2}+\frac{105}{4}a^4b^6x^8+\frac{240}{17}a^3b^7x^{17/2}+5a^2b^8x^9+\frac{20}{19}ab^9x^{19/2}+\frac{b^{10}x^{10}}{10}$$

```
[Out] (a^10*x^5)/5 + (20*a^9*b*x^(11/2))/11 + (15*a^8*b^2*x^6)/2 + (240
*a^7*b^3*x^(13/2))/13 + 30*a^6*b^4*x^7 + (168*a^5*b^5*x^(15/2))/5
 + (105*a^4*b^6*x^8)/4 + (240*a^3*b^7*x^(17/2))/17 + 5*a^2*b^8*x^
9 + (20*a*b^9*x^(19/2))/19 + (b^10*x^10)/10
```

Rubi [A] time = 0.230878, antiderivative size = 140, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^{10}x^5}{5}+\frac{20}{11}a^9bx^{11/2}+\frac{15}{2}a^8b^2x^6+\frac{240}{13}a^7b^3x^{13/2}+30a^6b^4x^7+\frac{168}{5}a^5b^5x^{15/2}+\frac{105}{4}a^4b^6x^8+\frac{240}{17}a^3b^7x^{17/2}+5a^2b^8x^9+\frac{20}{19}ab^9x^{19/2}+\frac{b^{10}x^{10}}{10}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^10*x^4,x]
```

```
[Out] (a^10*x^5)/5 + (20*a^9*b*x^(11/2))/11 + (15*a^8*b^2*x^6)/2 + (240
*a^7*b^3*x^(13/2))/13 + 30*a^6*b^4*x^7 + (168*a^5*b^5*x^(15/2))/5
 + (105*a^4*b^6*x^8)/4 + (240*a^3*b^7*x^(17/2))/17 + 5*a^2*b^8*x^
9 + (20*a*b^9*x^(19/2))/19 + (b^10*x^10)/10
```

Rubi in Sympy [A] time = 34.2978, size = 139, normalized size = 0.99

$$\frac{a^{10}x^5}{5}+\frac{20a^9bx^{\frac{11}{2}}}{11}+\frac{15a^8b^2x^6}{2}+\frac{240a^7b^3x^{\frac{13}{2}}}{13}+30a^6b^4x^7+\frac{168a^5b^5x^{\frac{15}{2}}}{5}+\frac{105a^4b^6x^8}{4}+\frac{240a^3b^7x^{\frac{17}{2}}}{17}+5a^2b^8x^9+\frac{20ab^9x^{\frac{19}{2}}}{19}+\frac{b^{10}x^{10}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4*(a+b*x**(1/2))**10,x)
```

```
[Out] a**10*x**5/5 + 20*a**9*b*x**(11/2)/11 + 15*a**8*b**2*x**6/2 + 240
*a**7*b**3*x**(13/2)/13 + 30*a**6*b**4*x**7 + 168*a**5*b**5*x**(1
5/2)/5 + 105*a**4*b**6*x**8/4 + 240*a**3*b**7*x**(17/2)/17 + 5*a*
*2*b**8*x**9 + 20*a*b**9*x**(19/2)/19 + b**10*x**10/10
```

Mathematica [A] time = 0.0285623, size = 140, normalized size = 1.

$$\frac{a^{10}x^5}{5}+\frac{20}{11}a^9bx^{11/2}+\frac{15}{2}a^8b^2x^6+\frac{240}{13}a^7b^3x^{13/2}+30a^6b^4x^7+\frac{168}{5}a^5b^5x^{15/2}+\frac{105}{4}a^4b^6x^8+\frac{240}{17}a^3b^7x^{17/2}+5a^2b^8x^9+\frac{20}{19}ab^9x^{19/2}+\frac{b^{10}x^{10}}{10}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^10*x^4,x]
```

```
[Out] (a^10*x^5)/5 + (20*a^9*b*x^(11/2))/11 + (15*a^8*b^2*x^6)/2 + (240
*a^7*b^3*x^(13/2))/13 + 30*a^6*b^4*x^7 + (168*a^5*b^5*x^(15/2))/5
 + (105*a^4*b^6*x^8)/4 + (240*a^3*b^7*x^(17/2))/17 + 5*a^2*b^8*x^
9 + (20*a*b^9*x^(19/2))/19 + (b^10*x^10)/10
```

Maple [A] time = 0.004, size = 113, normalized size = 0.8

$$\frac{a^{10}x^5}{5}+\frac{20\,a^9b}{11}x^{\frac{11}{2}}+\frac{15\,a^8b^2x^6}{2}+\frac{240\,a^7b^3}{13}x^{\frac{13}{2}}+30\,a^6b^4x^7+\frac{168\,a^5b^5}{5}x^{\frac{15}{2}}+\frac{105\,a^4b^6x^8}{4}+\frac{240\,a^3b^7}{17}x^{\frac{17}{2}}+5\,a^2b^8x^9+\frac{20\,ab^9}{19}x^{\frac{19}{2}}+\frac{b^{10}x^{10}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4*(a+b*x^(1/2))^10,x)
```

```
[Out] 1/5*a^10*x^5+20/11*a^9*b*x^(11/2)+15/2*a^8*b^2*x^6+240/13*a^7*b^3
*x^(13/2)+30*a^6*b^4*x^7+168/5*a^5*b^5*x^(15/2)+105/4*a^4*b^6*x^8
+240/17*a^3*b^7*x^(17/2)+5*a^2*b^8*x^9+20/19*a*b^9*x^(19/2)+1/10*
b^10*x^10
```

Maxima [A] time = 1.43596, size = 224, normalized size = 1.6

$$\frac{\left(b\sqrt{x}+a\right)^{20}}{10\,b^{10}}-\frac{18\left(b\sqrt{x}+a\right)^{19}a}{19\,b^{10}}+\frac{4\left(b\sqrt{x}+a\right)^{18}a^2}{b^{10}}-\frac{168\left(b\sqrt{x}+a\right)^{17}a^3}{17\,b^{10}}+\frac{63\left(b\sqrt{x}+a\right)^{16}a^4}{4\,b^{10}}-\frac{84\left(b\sqrt{x}+a\right)^{15}a^5}{5\,b^{10}}+\frac{12\left(b\sqrt{x}+a\right)^{14}a^6}{b^{10}}-\frac{72\left(b\sqrt{x}+a\right)^{13}a^7}{13\,b^{10}}+\frac{3\left(b\sqrt{x}+a\right)^{12}a^8}{2\,b^{10}}-\frac{2\left(b\sqrt{x}+a\right)^{11}a^9}{11\,b^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10*x^4,x, algorithm="maxima")
```

```
[Out] 1/10*(b*sqrt(x) + a)^20/b^10 - 18/19*(b*sqrt(x) + a)^19*a/b^10 +
4*(b*sqrt(x) + a)^18*a^2/b^10 - 168/17*(b*sqrt(x) + a)^17*a^3/b^1
0 + 63/4*(b*sqrt(x) + a)^16*a^4/b^10 - 84/5*(b*sqrt(x) + a)^15*a^
5/b^10 + 12*(b*sqrt(x) + a)^14*a^6/b^10 - 72/13*(b*sqrt(x) + a)^1
3*a^7/b^10 + 3/2*(b*sqrt(x) + a)^12*a^8/b^10 - 2/11*(b*sqrt(x) +
a)^11*a^9/b^10
```

Fricas [A] time = 0.23178, size = 159, normalized size = 1.14

$$\frac{1}{10}\,b^{10}x^{10}+5\,a^2b^8x^9+\frac{105}{4}\,a^4b^6x^8+30\,a^6b^4x^7+\frac{15}{2}\,a^8b^2x^6+\frac{1}{5}\,a^{10}x^5+\frac{4}{230945}\left(60775\,ab^9x^9+815100\,a^3b^7x^8+1939938\,a^5b^5x^7+1065900\,a^7b^3x^6+104975\,a^9bx^5\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10*x^4,x, algorithm="fricas")
```

```
[Out] 1/10*b^10*x^10 + 5*a^2*b^8*x^9 + 105/4*a^4*b^6*x^8 + 30*a^6*b^4*x
^7 + 15/2*a^8*b^2*x^6 + 1/5*a^10*x^5 + 4/230945*(60775*a*b^9*x^9
+ 815100*a^3*b^7*x^8 + 1939938*a^5*b^5*x^7 + 1065900*a^7*b^3*x^6
+ 104975*a^9*b*x^5)*sqrt(x)
```

Sympy [A] time = 26.6781, size = 139, normalized size = 0.99

$$\frac{a^{10}x^5}{5} + \frac{20a^9bx^{\frac{11}{2}}}{11} + \frac{15a^8b^2x^6}{2} + \frac{240a^7b^3x^{\frac{13}{2}}}{13} + 30a^6b^4x^7 + \frac{168a^5b^5x^{\frac{15}{2}}}{5} + \frac{105a^4b^6x^8}{4} + \frac{240a^3b^7x^{\frac{17}{2}}}{17} + 5a^2b^8x^9 + \frac{20ab^9x^{\frac{19}{2}}}{19} + \frac{b^{10}x^{10}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4*(a+b*x**(1/2))**10,x)
```

```
[Out] a**10*x**5/5 + 20*a**9*b*x**(11/2)/11 + 15*a**8*b**2*x**6/2 + 240
*a**7*b**3*x**(13/2)/13 + 30*a**6*b**4*x**7 + 168*a**5*b**5*x**(1
5/2)/5 + 105*a**4*b**6*x**8/4 + 240*a**3*b**7*x**(17/2)/17 + 5*a*
*2*b**8*x**9 + 20*a*b**9*x**(19/2)/19 + b**10*x**10/10
```

GIAC/XCAS [A] time = 0.219279, size = 151, normalized size = 1.08

$$\frac{1}{10}\,b^{10}x^{10} + \frac{20}{19}\,ab^9x^{\frac{19}{2}} + 5\,a^2b^8x^9 + \frac{240}{17}\,a^3b^7x^{\frac{17}{2}} + \frac{105}{4}\,a^4b^6x^8 + \frac{168}{5}\,a^5b^5x^{\frac{15}{2}} + 30\,a^6b^4x^7 + \frac{240}{13}\,a^7b^3x^{\frac{13}{2}} + \frac{15}{2}\,a^8b^2x^6 + \frac{20}{11}\,a^9bx^{\frac{11}{2}} + \frac{1}{5}\,a^{10}x^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10*x^4,x, algorithm="giac")
```

```
[Out] 1/10*b^10*x^10 + 20/19*a*b^9*x^(19/2) + 5*a^2*b^8*x^9 + 240/17*a^
3*b^7*x^(17/2) + 105/4*a^4*b^6*x^8 + 168/5*a^5*b^5*x^(15/2) + 30*
a^6*b^4*x^7 + 240/13*a^7*b^3*x^(13/2) + 15/2*a^8*b^2*x^6 + 20/11*
a^9*b*x^(11/2) + 1/5*a^10*x^5
```

3.2152 $\int \left(a+b\sqrt{x}\right)^{10} x^3\,dx$

Optimal. Leaf size=162

$$-\frac{2a^7\left(a+b\sqrt{x}\right)^{11}}{11b^8}+\frac{7a^6\left(a+b\sqrt{x}\right)^{12}}{6b^8}-\frac{42a^5\left(a+b\sqrt{x}\right)^{13}}{13b^8}+\frac{5a^4\left(a+b\sqrt{x}\right)^{14}}{b^8}-\frac{14a^3\left(a+b\sqrt{x}\right)^{15}}{3b^8}+\frac{21a^2\left(a+b\sqrt{x}\right)^{16}}{8b^8}+\frac{\left(a+b\sqrt{x}\right)^{18}}{9b^8}-\frac{14a\left(a+b\sqrt{x}\right)^{17}}{17b^8}$$

```
[Out] (-2*a^7*(a + b*Sqrt[x])^11)/(11*b^8) + (7*a^6*(a + b*Sqrt[x])^12)
/(6*b^8) - (42*a^5*(a + b*Sqrt[x])^13)/(13*b^8) + (5*a^4*(a + b*S
qrt[x])^14)/b^8 - (14*a^3*(a + b*Sqrt[x])^15)/(3*b^8) + (21*a^2*(
a + b*Sqrt[x])^16)/(8*b^8) - (14*a*(a + b*Sqrt[x])^17)/(17*b^8) +
 (a + b*Sqrt[x])^18/(9*b^8)
```

Rubi [A] time = 0.217695, antiderivative size = 162, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2a^7\left(a+b\sqrt{x}\right)^{11}}{11b^8}+\frac{7a^6\left(a+b\sqrt{x}\right)^{12}}{6b^8}-\frac{42a^5\left(a+b\sqrt{x}\right)^{13}}{13b^8}+\frac{5a^4\left(a+b\sqrt{x}\right)^{14}}{b^8}-\frac{14a^3\left(a+b\sqrt{x}\right)^{15}}{3b^8}+\frac{21a^2\left(a+b\sqrt{x}\right)^{16}}{8b^8}+\frac{\left(a+b\sqrt{x}\right)^{18}}{9b^8}-\frac{14a\left(a+b\sqrt{x}\right)^{17}}{17b^8}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^10*x^3,x]
```

```
[Out] (-2*a^7*(a + b*Sqrt[x])^11)/(11*b^8) + (7*a^6*(a + b*Sqrt[x])^12)
/(6*b^8) - (42*a^5*(a + b*Sqrt[x])^13)/(13*b^8) + (5*a^4*(a + b*S
qrt[x])^14)/b^8 - (14*a^3*(a + b*Sqrt[x])^15)/(3*b^8) + (21*a^2*(
a + b*Sqrt[x])^16)/(8*b^8) - (14*a*(a + b*Sqrt[x])^17)/(17*b^8) +
 (a + b*Sqrt[x])^18/(9*b^8)
```

Rubi in Sympy [A] time = 32.8326, size = 136, normalized size = 0.84

$$\frac{a^{10}x^4}{4}+\frac{20a^9bx^{\frac{9}{2}}}{9}+9a^8b^2x^5+\frac{240a^7b^3x^{\frac{11}{2}}}{11}+35a^6b^4x^6+\frac{504a^5b^5x^{\frac{13}{2}}}{13}+30a^4b^6x^7+16a^3b^7x^{\frac{15}{2}}+\frac{45a^2b^8x^8}{8}+\frac{20ab^9x^{\frac{17}{2}}}{17}+\frac{b^{10}x^9}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3*(a+b*x**(1/2))**10,x)
```

```
[Out] a**10*x**4/4 + 20*a**9*b*x**(9/2)/9 + 9*a**8*b**2*x**5 + 240*a**7
*b**3*x**(11/2)/11 + 35*a**6*b**4*x**6 + 504*a**5*b**5*x**(13/2)/
13 + 30*a**4*b**6*x**7 + 16*a**3*b**7*x**(15/2) + 45*a**2*b**8*x*
*8/8 + 20*a*b**9*x**(17/2)/17 + b**10*x**9/9
```

Mathematica [A] time = 0.0207013, size = 136, normalized size = 0.84

$$\frac{a^{10}x^4}{4}+\frac{20}{9}a^9bx^{9/2}+9a^8b^2x^5+\frac{240}{11}a^7b^3x^{11/2}+35a^6b^4x^6+\frac{504}{13}a^5b^5x^{13/2}+30a^4b^6x^7+16a^3b^7x^{15/2}+\frac{45}{8}a^2b^8x^8+\frac{20}{17}ab^9x^{17/2}+\frac{b^{10}x^9}{9}$$

Antiderivative was successfully verified.

```
[In]   Integrate[(a + b*Sqrt[x])^10*x^3,x]
```

```
[Out] (a^10*x^4)/4 + (20*a^9*b*x^(9/2))/9 + 9*a^8*b^2*x^5 + (240*a^7*b^
3*x^(11/2))/11 + 35*a^6*b^4*x^6 + (504*a^5*b^5*x^(13/2))/13 + 30*
a^4*b^6*x^7 + 16*a^3*b^7*x^(15/2) + (45*a^2*b^8*x^8)/8 + (20*a*b^
9*x^(17/2))/17 + (b^10*x^9)/9
```

Maple [A]   time = 0.004, size = 113, normalized size = 0.7

$$\frac{x^9b^{10}}{9}+\frac{20\,ab^9}{17}x^{\frac{17}{2}}+\frac{45\,x^8a^2b^8}{8}+16\,x^{15/2}a^3b^7+30\,a^4b^6x^7+\frac{504\,a^5b^5}{13}x^{\frac{13}{2}}+35\,x^6a^6b^4+\frac{240\,a^7b^3}{11}x^{\frac{11}{2}}+9\,x^5a^8b^2+\frac{20\,a^9b}{9}x^{\frac{9}{2}}+\frac{a^{10}x^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^3*(a+b*x^(1/2))^10,x)
```

```
[Out] 1/9*x^9*b^10+20/17*x^(17/2)*a*b^9+45/8*x^8*a^2*b^8+16*x^(15/2)*a^
3*b^7+30*a^4*b^6*x^7+504/13*x^(13/2)*a^5*b^5+35*x^6*a^6*b^4+240/1
1*x^(11/2)*a^7*b^3+9*x^5*a^8*b^2+20/9*x^(9/2)*a^9*b+1/4*a^10*x^4
```

Maxima [A]   time = 1.43828, size = 178, normalized size = 1.1

$$\frac{\left(b\sqrt{x}+a\right)^{18}}{9\,b^8}-\frac{14\left(b\sqrt{x}+a\right)^{17}a}{17\,b^8}+\frac{21\left(b\sqrt{x}+a\right)^{16}a^2}{8\,b^8}-\frac{14\left(b\sqrt{x}+a\right)^{15}a^3}{3\,b^8}+\frac{5\left(b\sqrt{x}+a\right)^{14}a^4}{b^8}-\frac{42\left(b\sqrt{x}+a\right)^{13}a^5}{13\,b^8}+\frac{7\left(b\sqrt{x}+a\right)^{12}a^6}{6\,b^8}-\frac{2\left(b\sqrt{x}+a\right)^{11}a^7}{11\,b^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*sqrt(x) + a)^10*x^3,x, algorithm="maxima")
```

```
[Out] 1/9*(b*sqrt(x) + a)^18/b^8 - 14/17*(b*sqrt(x) + a)^17*a/b^8 + 21/
8*(b*sqrt(x) + a)^16*a^2/b^8 - 14/3*(b*sqrt(x) + a)^15*a^3/b^8 +
5*(b*sqrt(x) + a)^14*a^4/b^8 - 42/13*(b*sqrt(x) + a)^13*a^5/b^8 +
 7/6*(b*sqrt(x) + a)^12*a^6/b^8 - 2/11*(b*sqrt(x) + a)^11*a^7/b^8
```

Fricas [A]   time = 0.235762, size = 159, normalized size = 0.98

$$\frac{1}{9}\,b^{10}x^9+\frac{45}{8}\,a^2b^8x^8+30\,a^4b^6x^7+35\,a^6b^4x^6+9\,a^8b^2x^5+\frac{1}{4}\,a^{10}x^4+\frac{4}{21879}\left(6435\,ab^9x^8+87516\,a^3b^7x^7+212058\,a^5b^5x^6+119340\,a^7b^3x^5+12155\,a^9bx^4\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*sqrt(x) + a)^10*x^3,x, algorithm="fricas")
```

```
[Out] 1/9*b^10*x^9 + 45/8*a^2*b^8*x^8 + 30*a^4*b^6*x^7 + 35*a^6*b^4*x^6
 + 9*a^8*b^2*x^5 + 1/4*a^10*x^4 + 4/21879*(6435*a*b^9*x^8 + 87516
*a^3*b^7*x^7 + 212058*a^5*b^5*x^6 + 119340*a^7*b^3*x^5 + 12155*a^
9*b*x^4)*sqrt(x)
```

Sympy [A] time = 17.7314, size = 136, normalized size = 0.84

$$\frac{a^{10}x^4}{4} + \frac{20a^9bx^{\frac{9}{2}}}{9} + 9a^8b^2x^5 + \frac{240a^7b^3x^{\frac{11}{2}}}{11} + 35a^6b^4x^6 + \frac{504a^5b^5x^{\frac{13}{2}}}{13} + 30a^4b^6x^7 + 16a^3b^7x^{\frac{15}{2}} + \frac{45a^2b^8x^8}{8} + \frac{20ab^9x^{\frac{17}{2}}}{17} + \frac{b^{10}x^9}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(a+b*x**(1/2))**10,x)
```

```
[Out] a**10*x**4/4 + 20*a**9*b*x**(9/2)/9 + 9*a**8*b**2*x**5 + 240*a**7
*b**3*x**(11/2)/11 + 35*a**6*b**4*x**6 + 504*a**5*b**5*x**(13/2)/
13 + 30*a**4*b**6*x**7 + 16*a**3*b**7*x**(15/2) + 45*a**2*b**8*x*
*8/8 + 20*a*b**9*x**(17/2)/17 + b**10*x**9/9
```

GIAC/XCAS [A] time = 0.218264, size = 151, normalized size = 0.93

$$\frac{1}{9}\,b^{10}x^9 + \frac{20}{17}\,ab^9x^{\frac{17}{2}} + \frac{45}{8}\,a^2b^8x^8 + 16\,a^3b^7x^{\frac{15}{2}} + 30\,a^4b^6x^7 + \frac{504}{13}\,a^5b^5x^{\frac{13}{2}} + 35\,a^6b^4x^6 + \frac{240}{11}\,a^7b^3x^{\frac{11}{2}} + 9\,a^8b^2x^5 + \frac{20}{9}\,a^9bx^{\frac{9}{2}} + \frac{1}{4}\,a^{10}x^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10*x^3,x, algorithm="giac")
```

```
[Out] 1/9*b^10*x^9 + 20/17*a*b^9*x^(17/2) + 45/8*a^2*b^8*x^8 + 16*a^3*b
^7*x^(15/2) + 30*a^4*b^6*x^7 + 504/13*a^5*b^5*x^(13/2) + 35*a^6*b
^4*x^6 + 240/11*a^7*b^3*x^(11/2) + 9*a^8*b^2*x^5 + 20/9*a^9*b*x^(
9/2) + 1/4*a^10*x^4
```

3.2153 $\int \left(a+b\sqrt{x}\right)^{10} x^2\,dx$

Optimal. Leaf size=122

$$-\frac{2a^5\left(a+b\sqrt{x}\right)^{11}}{11b^6}+\frac{5a^4\left(a+b\sqrt{x}\right)^{12}}{6b^6}-\frac{20a^3\left(a+b\sqrt{x}\right)^{13}}{13b^6}+\frac{10a^2\left(a+b\sqrt{x}\right)^{14}}{7b^6}+\frac{\left(a+b\sqrt{x}\right)^{16}}{8b^6}-\frac{2a\left(a+b\sqrt{x}\right)^{15}}{3b^6}$$

```
[Out] (-2*a^5*(a + b*Sqrt[x])^11)/(11*b^6) + (5*a^4*(a + b*Sqrt[x])^12)
/(6*b^6) - (20*a^3*(a + b*Sqrt[x])^13)/(13*b^6) + (10*a^2*(a + b*
Sqrt[x])^14)/(7*b^6) - (2*a*(a + b*Sqrt[x])^15)/(3*b^6) + (a + b*
Sqrt[x])^16/(8*b^6)
```

Rubi [A] time = 0.171704, antiderivative size = 122, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2a^5\left(a+b\sqrt{x}\right)^{11}}{11b^6}+\frac{5a^4\left(a+b\sqrt{x}\right)^{12}}{6b^6}-\frac{20a^3\left(a+b\sqrt{x}\right)^{13}}{13b^6}+\frac{10a^2\left(a+b\sqrt{x}\right)^{14}}{7b^6}+\frac{\left(a+b\sqrt{x}\right)^{16}}{8b^6}-\frac{2a\left(a+b\sqrt{x}\right)^{15}}{3b^6}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^10*x^2,x]
```

```
[Out] (-2*a^5*(a + b*Sqrt[x])^11)/(11*b^6) + (5*a^4*(a + b*Sqrt[x])^12)
/(6*b^6) - (20*a^3*(a + b*Sqrt[x])^13)/(13*b^6) + (10*a^2*(a + b*
Sqrt[x])^14)/(7*b^6) - (2*a*(a + b*Sqrt[x])^15)/(3*b^6) + (a + b*
Sqrt[x])^16/(8*b^6)
```

Rubi in Sympy [A] time = 29.3514, size = 114, normalized size = 0.93

$$-\frac{2a^5\left(a+b\sqrt{x}\right)^{11}}{11b^6}+\frac{5a^4\left(a+b\sqrt{x}\right)^{12}}{6b^6}-\frac{20a^3\left(a+b\sqrt{x}\right)^{13}}{13b^6}+\frac{10a^2\left(a+b\sqrt{x}\right)^{14}}{7b^6}-\frac{2a\left(a+b\sqrt{x}\right)^{15}}{3b^6}+\frac{\left(a+b\sqrt{x}\right)^{16}}{8b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(a+b*x**(1/2))**10,x)
```

```
[Out] -2*a**5*(a + b*sqrt(x))**11/(11*b**6) + 5*a**4*(a + b*sqrt(x))**1
2/(6*b**6) - 20*a**3*(a + b*sqrt(x))**13/(13*b**6) + 10*a**2*(a +
 b*sqrt(x))**14/(7*b**6) - 2*a*(a + b*sqrt(x))**15/(3*b**6) + (a
+ b*sqrt(x))**16/(8*b**6)
```

Mathematica [A] time = 0.0288036, size = 140, normalized size = 1.15

$$\frac{a^{10}x^3}{3}+\frac{20}{7}a^9bx^{7/2}+\frac{45}{4}a^8b^2x^4+\frac{80}{3}a^7b^3x^{9/2}+42a^6b^4x^5+\frac{504}{11}a^5b^5x^{11/2}+35a^4b^6x^6+\frac{240}{13}a^3b^7x^{13/2}+\frac{45}{7}a^2b^8x^7+\frac{4}{3}ab^9x^{15/2}+\frac{b^{10}x^8}{8}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^10*x^2,x]
```

```
[Out] (a^10*x^3)/3 + (20*a^9*b*x^(7/2))/7 + (45*a^8*b^2*x^4)/4 + (80*a^
7*b^3*x^(9/2))/3 + 42*a^6*b^4*x^5 + (504*a^5*b^5*x^(11/2))/11 + 3
5*a^4*b^6*x^6 + (240*a^3*b^7*x^(13/2))/13 + (45*a^2*b^8*x^7)/7 +
(4*a*b^9*x^(15/2))/3 + (b^10*x^8)/8
```

Maple [A] time = 0.004, size = 113, normalized size = 0.9

$$\frac{x^8b^{10}}{8}+\frac{4\,ab^9}{3}x^{\frac{15}{2}}+\frac{45\,x^7a^2b^8}{7}+\frac{240\,a^3b^7}{13}x^{\frac{13}{2}}+35\,a^4b^6x^6+\frac{504\,a^5b^5}{11}x^{\frac{11}{2}}+42\,x^5a^6b^4+\frac{80\,a^7b^3}{3}x^{\frac{9}{2}}+\frac{45\,x^4a^8b^2}{4}+\frac{20\,a^9b}{7}x^{\frac{7}{2}}+\frac{x^3a^{10}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(a+b*x^(1/2))^10,x)
```

```
[Out] 1/8*x^8*b^10+4/3*x^(15/2)*a*b^9+45/7*x^7*a^2*b^8+240/13*x^(13/2)*
a^3*b^7+35*a^4*b^6*x^6+504/11*x^(11/2)*a^5*b^5+42*x^5*a^6*b^4+80/
3*x^(9/2)*a^7*b^3+45/4*x^4*a^8*b^2+20/7*x^(7/2)*a^9*b+1/3*x^3*a^1
0
```

Maxima [A] time = 1.43524, size = 132, normalized size = 1.08

$$\frac{\left(b\sqrt{x}+a\right)^{16}}{8\,b^6}-\frac{2\left(b\sqrt{x}+a\right)^{15}a}{3\,b^6}+\frac{10\left(b\sqrt{x}+a\right)^{14}a^2}{7\,b^6}-\frac{20\left(b\sqrt{x}+a\right)^{13}a^3}{13\,b^6}+\frac{5\left(b\sqrt{x}+a\right)^{12}a^4}{6\,b^6}-\frac{2\left(b\sqrt{x}+a\right)^{11}a^5}{11\,b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10*x^2,x, algorithm="maxima")
```

```
[Out] 1/8*(b*sqrt(x) + a)^16/b^6 - 2/3*(b*sqrt(x) + a)^15*a/b^6 + 10/7*
(b*sqrt(x) + a)^14*a^2/b^6 - 20/13*(b*sqrt(x) + a)^13*a^3/b^6 + 5
/6*(b*sqrt(x) + a)^12*a^4/b^6 - 2/11*(b*sqrt(x) + a)^11*a^5/b^6
```

Fricas [A] time = 0.23733, size = 159, normalized size = 1.3

$$\frac{1}{8}\,b^{10}x^8+\frac{45}{7}\,a^2b^8x^7+35\,a^4b^6x^6+42\,a^6b^4x^5+\frac{45}{4}\,a^8b^2x^4+\frac{1}{3}\,a^{10}x^3+\frac{4}{3003}\left(1001\,ab^9x^7+13860\,a^3b^7x^6+34398\,a^5b^5x^5+20020\,a^7b^3x^4+2145\,a^9bx^3\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10*x^2,x, algorithm="fricas")
```

```
[Out] 1/8*b^10*x^8 + 45/7*a^2*b^8*x^7 + 35*a^4*b^6*x^6 + 42*a^6*b^4*x^5
 + 45/4*a^8*b^2*x^4 + 1/3*a^10*x^3 + 4/3003*(1001*a*b^9*x^7 + 138
60*a^3*b^7*x^6 + 34398*a^5*b^5*x^5 + 20020*a^7*b^3*x^4 + 2145*a^9
*b*x^3)*sqrt(x)
```

Sympy [A] time = 11.9221, size = 139, normalized size = 1.14

$$\frac{a^{10}x^3}{3}+\frac{20a^9bx^{\frac{7}{2}}}{7}+\frac{45a^8b^2x^4}{4}+\frac{80a^7b^3x^{\frac{9}{2}}}{3}+42a^6b^4x^5+\frac{504a^5b^5x^{\frac{11}{2}}}{11}+35a^4b^6x^6+\frac{240a^3b^7x^{\frac{13}{2}}}{13}+\frac{45a^2b^8x^7}{7}+\frac{4ab^9x^{\frac{15}{2}}}{3}+\frac{b^{10}x^8}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(a+b*x**(1/2))**10,x)
```

```
[Out] a**10*x**3/3 + 20*a**9*b*x**(7/2)/7 + 45*a**8*b**2*x**4/4 + 80*a*
*7*b**3*x**(9/2)/3 + 42*a**6*b**4*x**5 + 504*a**5*b**5*x**(11/2)/
11 + 35*a**4*b**6*x**6 + 240*a**3*b**7*x**(13/2)/13 + 45*a**2*b**
8*x**7/7 + 4*a*b**9*x**(15/2)/3 + b**10*x**8/8
```

GIAC/XCAS [A] time = 0.21438, size = 151, normalized size = 1.24

$$\frac{1}{8}\,b^{10}x^{8} + \frac{4}{3}\,ab^{9}x^{\frac{15}{2}} + \frac{45}{7}\,a^{2}b^{8}x^{7} + \frac{240}{13}\,a^{3}b^{7}x^{\frac{13}{2}} + 35\,a^{4}b^{6}x^{6} + \frac{504}{11}\,a^{5}b^{5}x^{\frac{11}{2}} + 42\,a^{6}b^{4}x^{5} + \frac{80}{3}\,a^{7}b^{3}x^{\frac{9}{2}} + \frac{45}{4}\,a^{8}b^{2}x^{4} + \frac{20}{7}\,a^{9}bx^{\frac{7}{2}} + \frac{1}{3}\,a^{10}x^{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10*x^2,x, algorithm="giac")
```

```
[Out] 1/8*b^10*x^8 + 4/3*a*b^9*x^(15/2) + 45/7*a^2*b^8*x^7 + 240/13*a^3
*b^7*x^(13/2) + 35*a^4*b^6*x^6 + 504/11*a^5*b^5*x^(11/2) + 42*a^6
*b^4*x^5 + 80/3*a^7*b^3*x^(9/2) + 45/4*a^8*b^2*x^4 + 20/7*a^9*b*x
^(7/2) + 1/3*a^10*x^3
```

3.2154 $\int \left(a+b\sqrt{x}\right)^{10} x \, dx$

Optimal. Leaf size=80

$$-\frac{2a^3\left(a+b\sqrt{x}\right)^{11}}{11b^4}+\frac{a^2\left(a+b\sqrt{x}\right)^{12}}{2b^4}+\frac{\left(a+b\sqrt{x}\right)^{14}}{7b^4}-\frac{6a\left(a+b\sqrt{x}\right)^{13}}{13b^4}$$

```
[Out] (-2*a^3*(a + b*Sqrt[x])^11)/(11*b^4) + (a^2*(a + b*Sqrt[x])^12)/(
2*b^4) - (6*a*(a + b*Sqrt[x])^13)/(13*b^4) + (a + b*Sqrt[x])^14/(
7*b^4)
```

Rubi [A] time = 0.132747, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$-\frac{2a^3\left(a+b\sqrt{x}\right)^{11}}{11b^4}+\frac{a^2\left(a+b\sqrt{x}\right)^{12}}{2b^4}+\frac{\left(a+b\sqrt{x}\right)^{14}}{7b^4}-\frac{6a\left(a+b\sqrt{x}\right)^{13}}{13b^4}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Sqrt[x])^10*x,x]
```

```
[Out] (-2*a^3*(a + b*Sqrt[x])^11)/(11*b^4) + (a^2*(a + b*Sqrt[x])^12)/(
2*b^4) - (6*a*(a + b*Sqrt[x])^13)/(13*b^4) + (a + b*Sqrt[x])^14/(
7*b^4)
```

Rubi in Sympy [A] time = 21.7596, size = 71, normalized size = 0.89

$$-\frac{2a^3\left(a+b\sqrt{x}\right)^{11}}{11b^4}+\frac{a^2\left(a+b\sqrt{x}\right)^{12}}{2b^4}-\frac{6a\left(a+b\sqrt{x}\right)^{13}}{13b^4}+\frac{\left(a+b\sqrt{x}\right)^{14}}{7b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x*(a+b*x**(1/2))**10,x)
```

```
[Out] -2*a**3*(a + b*sqrt(x))**11/(11*b**4) + a**2*(a + b*sqrt(x))**12/
(2*b**4) - 6*a*(a + b*sqrt(x))**13/(13*b**4) + (a + b*sqrt(x))**1
4/(7*b**4)
```

Mathematica [A] time = 0.0217947, size = 136, normalized size = 1.7

$$\frac{a^{10}x^2}{2}+4a^9bx^{5/2}+15a^8b^2x^3+\frac{240}{7}a^7b^3x^{7/2}+\frac{105}{2}a^6b^4x^4+56a^5b^5x^{9/2}+42a^4b^6x^5+\frac{240}{11}a^3b^7x^{11/2}+\frac{15}{2}a^2b^8x^6+\frac{20}{13}ab^9x^{13/2}+\frac{b^{10}x^7}{7}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Sqrt[x])^10*x,x]
```

```
[Out] (a^10*x^2)/2 + 4*a^9*b*x^(5/2) + 15*a^8*b^2*x^3 + (240*a^7*b^3*x^
(7/2))/7 + (105*a^6*b^4*x^4)/2 + 56*a^5*b^5*x^(9/2) + 42*a^4*b^6*
x^5 + (240*a^3*b^7*x^(11/2))/11 + (15*a^2*b^8*x^6)/2 + (20*a*b^9*
x^(13/2))/13 + (b^10*x^7)/7
```

Maple [A] time = 0.004, size = 113, normalized size = 1.4

$$\frac{x^7b^{10}}{7}+\frac{20\,ab^9}{13}x^{\frac{13}{2}}+\frac{15\,x^6a^2b^8}{2}+\frac{240\,a^3b^7}{11}x^{\frac{11}{2}}+42\,x^5a^4b^6+56\,x^{9/2}a^5b^5+\frac{105\,x^4a^6b^4}{2}+\frac{240\,a^7b^3}{7}x^{\frac{7}{2}}+15\,x^3a^8b^2+4\,x^{5/2}a^9b+\frac{x^2a^{10}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(a+b*x^(1/2))^10,x)
```

```
[Out] 1/7*x^7*b^10+20/13*x^(13/2)*a*b^9+15/2*x^6*a^2*b^8+240/11*x^(11/2
)*a^3*b^7+42*x^5*a^4*b^6+56*x^(9/2)*a^5*b^5+105/2*x^4*a^6*b^4+240
/7*x^(7/2)*a^7*b^3+15*x^3*a^8*b^2+4*x^(5/2)*a^9*b+1/2*x^2*a^10
```

Maxima [A] time = 1.44178, size = 86, normalized size = 1.08

$$\frac{\left(b\sqrt{x}+a\right)^{14}}{7\,b^4}-\frac{6\left(b\sqrt{x}+a\right)^{13}a}{13\,b^4}+\frac{\left(b\sqrt{x}+a\right)^{12}a^2}{2\,b^4}-\frac{2\left(b\sqrt{x}+a\right)^{11}a^3}{11\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10*x,x, algorithm="maxima")
```

```
[Out] 1/7*(b*sqrt(x) + a)^14/b^4 - 6/13*(b*sqrt(x) + a)^13*a/b^4 + 1/2*
(b*sqrt(x) + a)^12*a^2/b^4 - 2/11*(b*sqrt(x) + a)^11*a^3/b^4
```

Fricas [A] time = 0.233335, size = 159, normalized size = 1.99

$$\frac{1}{7}\,b^{10}x^7+\frac{15}{2}\,a^2b^8x^6+42\,a^4b^6x^5+\frac{105}{2}\,a^6b^4x^4+15\,a^8b^2x^3+\frac{1}{2}\,a^{10}x^2+\frac{4}{1001}\left(385\,ab^9x^6+5460\,a^3b^7x^5+14014\,a^5b^5x^4+8580\,a^7b^3x^3+1001\,a^9bx^2\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10*x,x, algorithm="fricas")
```

```
[Out] 1/7*b^10*x^7 + 15/2*a^2*b^8*x^6 + 42*a^4*b^6*x^5 + 105/2*a^6*b^4*
x^4 + 15*a^8*b^2*x^3 + 1/2*a^10*x^2 + 4/1001*(385*a*b^9*x^6 + 546
0*a^3*b^7*x^5 + 14014*a^5*b^5*x^4 + 8580*a^7*b^3*x^3 + 1001*a^9*b
*x^2)*sqrt(x)
```

Sympy [A] time = 3.49441, size = 136, normalized size = 1.7

$$\frac{a^{10}x^2}{2}+4a^9bx^{\frac{5}{2}}+15a^8b^2x^3+\frac{240a^7b^3x^{\frac{7}{2}}}{7}+\frac{105a^6b^4x^4}{2}+56a^5b^5x^{\frac{9}{2}}+42a^4b^6x^5+\frac{240a^3b^7x^{\frac{11}{2}}}{11}+\frac{15a^2b^8x^6}{2}+\frac{20ab^9x^{\frac{13}{2}}}{13}+\frac{b^{10}x^7}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(a+b*x**(1/2))**10,x)
```

```
[Out] a**10*x**2/2 + 4*a**9*b*x**(5/2) + 15*a**8*b**2*x**3 + 240*a**7*b
**3*x**(7/2)/7 + 105*a**6*b**4*x**4/2 + 56*a**5*b**5*x**(9/2) + 4
2*a**4*b**6*x**5 + 240*a**3*b**7*x**(11/2)/11 + 15*a**2*b**8*x**6
```

```
/2 + 20*a*b**9*x**(13/2)/13 + b**10*x**7/7
```

GIAC/XCAS [A] time = 0.216736, size = 151, normalized size = 1.89

$$\frac{1}{7}\,b^{10}x^{7} + \frac{20}{13}\,ab^{9}x^{\frac{13}{2}} + \frac{15}{2}\,a^{2}b^{8}x^{6} + \frac{240}{11}\,a^{3}b^{7}x^{\frac{11}{2}} + 42\,a^{4}b^{6}x^{5} + 56\,a^{5}b^{5}x^{\frac{9}{2}} + \frac{105}{2}\,a^{6}b^{4}x^{4} + \frac{240}{7}\,a^{7}b^{3}x^{\frac{7}{2}} + 15\,a^{8}b^{2}x^{3} + 4\,a^{9}bx^{\frac{5}{2}} + \frac{1}{2}\,a^{10}x^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10*x,x, algorithm="giac")
```

```
[Out] 1/7*b^10*x^7 + 20/13*a*b^9*x^(13/2) + 15/2*a^2*b^8*x^6 + 240/11*a
^3*b^7*x^(11/2) + 42*a^4*b^6*x^5 + 56*a^5*b^5*x^(9/2) + 105/2*a^6
*b^4*x^4 + 240/7*a^7*b^3*x^(7/2) + 15*a^8*b^2*x^3 + 4*a^9*b*x^(5/
2) + 1/2*a^10*x^2
```

3.2155 $\int \left(a+b\sqrt{x}\right)^{10}\,dx$

Optimal. Leaf size=38

$$\frac{\left(a+b\sqrt{x}\right)^{12}}{6b^2}-\frac{2a\left(a+b\sqrt{x}\right)^{11}}{11b^2}$$

```
[Out] (-2*a*(a + b*Sqrt[x])^11)/(11*b^2) + (a + b*Sqrt[x])^12/(6*b^2)
```

Rubi [A] time = 0.0508927, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{\left(a+b\sqrt{x}\right)^{12}}{6b^2}-\frac{2a\left(a+b\sqrt{x}\right)^{11}}{11b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^10,x]

[Out] (-2*a*(a + b*Sqrt[x])^11)/(11*b^2) + (a + b*Sqrt[x])^12/(6*b^2)
```

Rubi in Sympy [A] time = 13.3855, size = 32, normalized size = 0.84

$$-\frac{2a\left(a+b\sqrt{x}\right)^{11}}{11b^2}+\frac{\left(a+b\sqrt{x}\right)^{12}}{6b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**10,x)

[Out] -2*a*(a + b*sqrt(x))**11/(11*b**2) + (a + b*sqrt(x))**12/(6*b**2)
```

Mathematica [B] time = 0.0191046, size = 131, normalized size = 3.45

$$a^{10}x+\frac{20}{3}a^9bx^{3/2}+\frac{45}{2}a^8b^2x^2+48a^7b^3x^{5/2}+70a^6b^4x^3+72a^5b^5x^{7/2}+\frac{105}{2}a^4b^6x^4+\frac{80}{3}a^3b^7x^{9/2}+9a^2b^8x^5+\frac{20}{11}ab^9x^{11/2}+\frac{b^{10}x^6}{6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^10,x]

[Out] a^10*x + (20*a^9*b*x^(3/2))/3 + (45*a^8*b^2*x^2)/2 + 48*a^7*b^3*x
^(5/2) + 70*a^6*b^4*x^3 + 72*a^5*b^5*x^(7/2) + (105*a^4*b^6*x^4)/
2 + (80*a^3*b^7*x^(9/2))/3 + 9*a^2*b^8*x^5 + (20*a*b^9*x^(11/2))/
11 + (b^10*x^6)/6
```

Maple [B] time = 0.003, size = 110, normalized size = 2.9

$$\frac{x^6b^{10}}{6}+\frac{20\,ab^9}{11}x^{\frac{11}{2}}+9\,x^5a^2b^8+\frac{80\,a^3b^7}{3}x^{\frac{9}{2}}+\frac{105\,x^4a^4b^6}{2}+72\,x^{7/2}a^5b^5+70\,x^3a^6b^4+48\,x^{5/2}a^7b^3+\frac{45\,x^2a^8b^2}{2}+\frac{20\,a^9b}{3}x^{\frac{3}{2}}+xa^{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^10,x)
```

```
[Out] 1/6*x^6*b^10+20/11*x^(11/2)*a*b^9+9*x^5*a^2*b^8+80/3*x^(9/2)*a^3*
b^7+105/2*x^4*a^4*b^6+72*x^(7/2)*a^5*b^5+70*x^3*a^6*b^4+48*x^(5/2
)*a^7*b^3+45/2*x^2*a^8*b^2+20/3*x^(3/2)*a^9*b+x*a^10
```

Maxima [A] time = 1.43887, size = 41, normalized size = 1.08

$$\frac{\left(b\sqrt{x}+a\right)^{12}}{6\,b^2}-\frac{2\left(b\sqrt{x}+a\right)^{11}a}{11\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10,x, algorithm="maxima")
```

```
[Out] 1/6*(b*sqrt(x) + a)^12/b^2 - 2/11*(b*sqrt(x) + a)^11*a/b^2
```

Fricas [A] time = 0.230588, size = 153, normalized size = 4.03

$$\frac{1}{6}\,b^{10}x^6+9\,a^2b^8x^5+\frac{105}{2}\,a^4b^6x^4+70\,a^6b^4x^3+\frac{45}{2}\,a^8b^2x^2+a^{10}x+\frac{4}{33}\left(15\,ab^9x^5+220\,a^3b^7x^4+594\,a^5b^5x^3+396\,a^7b^3x^2+55\,a^9bx\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10,x, algorithm="fricas")
```

```
[Out] 1/6*b^10*x^6 + 9*a^2*b^8*x^5 + 105/2*a^4*b^6*x^4 + 70*a^6*b^4*x^3
 + 45/2*a^8*b^2*x^2 + a^10*x + 4/33*(15*a*b^9*x^5 + 220*a^3*b^7*x
^4 + 594*a^5*b^5*x^3 + 396*a^7*b^3*x^2 + 55*a^9*b*x)*sqrt(x)
```

Sympy [A] time = 4.78175, size = 133, normalized size = 3.5

$$a^{10}x+\frac{20a^9bx^{\frac{3}{2}}}{3}+\frac{45a^8b^2x^2}{2}+48a^7b^3x^{\frac{5}{2}}+70a^6b^4x^3+72a^5b^5x^{\frac{7}{2}}+\frac{105a^4b^6x^4}{2}+\frac{80a^3b^7x^{\frac{9}{2}}}{3}+9a^2b^8x^5+\frac{20ab^9x^{\frac{11}{2}}}{11}+\frac{b^{10}x^6}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**10,x)
```

```
[Out] a**10*x + 20*a**9*b*x**(3/2)/3 + 45*a**8*b**2*x**2/2 + 48*a**7*b*
*3*x**(5/2) + 70*a**6*b**4*x**3 + 72*a**5*b**5*x**(7/2) + 105*a**
4*b**6*x**4/2 + 80*a**3*b**7*x**(9/2)/3 + 9*a**2*b**8*x**5 + 20*a
*b**9*x**(11/2)/11 + b**10*x**6/6
```

GIAC/XCAS [A] time = 0.21836, size = 147, normalized size = 3.87

$$\frac{1}{6}\,b^{10}x^6+\frac{20}{11}\,ab^9x^{\frac{11}{2}}+9\,a^2b^8x^5+\frac{80}{3}\,a^3b^7x^{\frac{9}{2}}+\frac{105}{2}\,a^4b^6x^4+72\,a^5b^5x^{\frac{7}{2}}+70\,a^6b^4x^3+48\,a^7b^3x^{\frac{5}{2}}+\frac{45}{2}\,a^8b^2x^2+\frac{20}{3}\,a^9bx^{\frac{3}{2}}+a^{10}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10,x, algorithm="giac")
```

```
[Out] 1/6*b^10*x^6 + 20/11*a*b^9*x^(11/2) + 9*a^2*b^8*x^5 + 80/3*a^3*b^
7*x^(9/2) + 105/2*a^4*b^6*x^4 + 72*a^5*b^5*x^(7/2) + 70*a^6*b^4*x
^3 + 48*a^7*b^3*x^(5/2) + 45/2*a^8*b^2*x^2 + 20/3*a^9*b*x^(3/2) +
 a^10*x
```

3.2156 $\int \frac{(a+b\sqrt{x})^{10}}{x}\,dx$

Optimal. Leaf size=128

$$a^{10}\log(x)+20a^9b\sqrt{x}+45a^8b^2x+80a^7b^3x^{3/2}+105a^6b^4x^2+\frac{504}{5}a^5b^5x^{5/2}+70a^4b^6x^3+\frac{240}{7}a^3b^7x^{7/2}+\frac{45}{4}a^2b^8x^4+\frac{20}{9}ab^9x^{9/2}+\frac{b^{10}x^5}{5}$$

```
[Out] 20*a^9*b*Sqrt[x] + 45*a^8*b^2*x + 80*a^7*b^3*x^(3/2) + 105*a^6*b^
4*x^2 + (504*a^5*b^5*x^(5/2))/5 + 70*a^4*b^6*x^3 + (240*a^3*b^7*x
^(7/2))/7 + (45*a^2*b^8*x^4)/4 + (20*a*b^9*x^(9/2))/9 + (b^10*x^5
)/5 + a^10*Log[x]
```

Rubi [A] time = 0.162366, antiderivative size = 128, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$a^{10}\log(x)+20a^9b\sqrt{x}+45a^8b^2x+80a^7b^3x^{3/2}+105a^6b^4x^2+\frac{504}{5}a^5b^5x^{5/2}+70a^4b^6x^3+\frac{240}{7}a^3b^7x^{7/2}+\frac{45}{4}a^2b^8x^4+\frac{20}{9}ab^9x^{9/2}+\frac{b^{10}x^5}{5}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^10/x,x]
```

```
[Out] 20*a^9*b*Sqrt[x] + 45*a^8*b^2*x + 80*a^7*b^3*x^(3/2) + 105*a^6*b^
4*x^2 + (504*a^5*b^5*x^(5/2))/5 + 70*a^4*b^6*x^3 + (240*a^3*b^7*x
^(7/2))/7 + (45*a^2*b^8*x^4)/4 + (20*a*b^9*x^(9/2))/9 + (b^10*x^5
)/5 + a^10*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$2a^{10}\log\left(\sqrt{x}\right)+20a^9b\sqrt{x}+90a^8b^2\int^{\sqrt{x}}x\,dx+80a^7b^3x^{\frac{3}{2}}+105a^6b^4x^2+\frac{504a^5b^5x^{\frac{5}{2}}}{5}+70a^4b^6x^3+\frac{240a^3b^7x^{\frac{7}{2}}}{7}+\frac{45a^2b^8x^4}{4}+\frac{20ab^9x^{\frac{9}{2}}}{9}+\frac{b^{10}x^5}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**10/x,x)
```

```
[Out] 2*a**10*log(sqrt(x)) + 20*a**9*b*sqrt(x) + 90*a**8*b**2*Integral(
x, (x, sqrt(x))) + 80*a**7*b**3*x**(3/2) + 105*a**6*b**4*x**2 + 5
04*a**5*b**5*x**(5/2)/5 + 70*a**4*b**6*x**3 + 240*a**3*b**7*x**(7
/2)/7 + 45*a**2*b**8*x**4/4 + 20*a*b**9*x**(9/2)/9 + b**10*x**5/5
```

Mathematica [A] time = 0.0301907, size = 128, normalized size = 1.

$$a^{10}\log(x)+20a^9b\sqrt{x}+45a^8b^2x+80a^7b^3x^{3/2}+105a^6b^4x^2+\frac{504}{5}a^5b^5x^{5/2}+70a^4b^6x^3+\frac{240}{7}a^3b^7x^{7/2}+\frac{45}{4}a^2b^8x^4+\frac{20}{9}ab^9x^{9/2}+\frac{b^{10}x^5}{5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^10/x,x]
```

```
[Out] 20*a^9*b*Sqrt[x] + 45*a^8*b^2*x + 80*a^7*b^3*x^(3/2) + 105*a^6*b^
4*x^2 + (504*a^5*b^5*x^(5/2))/5 + 70*a^4*b^6*x^3 + (240*a^3*b^7*x
^(7/2))/7 + (45*a^2*b^8*x^4)/4 + (20*a*b^9*x^(9/2))/9 + (b^10*x^5
)/5 + a^10*Log[x]
```

Maple [A] time = 0.005, size = 109, normalized size = 0.9

$$45\,a^{8}b^{2}x+80\,a^{7}b^{3}x^{3/2}+105\,a^{6}b^{4}x^{2}+{\frac{504\,a^{5}b^{5}}{5}{x}^{{\frac{5}{2}}}}+70\,a^{4}b^{6}x^{3}+{\frac{240\,a^{3}b^{7}}{7}{x}^{{\frac{7}{2}}}}+{\frac{45\,a^{2}b^{8}x^{4}}{4}}+{\frac{20\,ab^{9}}{9}{x}^{{\frac{9}{2}}}}+{\frac{b^{10}x^{5}}{5}}+a^{10}\ln\left(x\right)+20\,a^{9}b\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^10/x,x)
```

```
[Out] 45*a^8*b^2*x+80*a^7*b^3*x^(3/2)+105*a^6*b^4*x^2+504/5*a^5*b^5*x^(
5/2)+70*a^4*b^6*x^3+240/7*a^3*b^7*x^(7/2)+45/4*a^2*b^8*x^4+20/9*a
*b^9*x^(9/2)+1/5*b^10*x^5+a^10*ln(x)+20*a^9*b*x^(1/2)
```

Maxima [A] time = 1.44199, size = 146, normalized size = 1.14

$$\frac{1}{5}\,b^{10}x^{5}+\frac{20}{9}\,ab^{9}x^{\frac{9}{2}}+\frac{45}{4}\,a^{2}b^{8}x^{4}+\frac{240}{7}\,a^{3}b^{7}x^{\frac{7}{2}}+70\,a^{4}b^{6}x^{3}+\frac{504}{5}\,a^{5}b^{5}x^{\frac{5}{2}}+105\,a^{6}b^{4}x^{2}+80\,a^{7}b^{3}x^{\frac{3}{2}}+45\,a^{8}b^{2}x+a^{10}\log\left(x\right)+20\,a^{9}b\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10/x,x, algorithm="maxima")
```

```
[Out] 1/5*b^10*x^5 + 20/9*a*b^9*x^(9/2) + 45/4*a^2*b^8*x^4 + 240/7*a^3*
b^7*x^(7/2) + 70*a^4*b^6*x^3 + 504/5*a^5*b^5*x^(5/2) + 105*a^6*b^
4*x^2 + 80*a^7*b^3*x^(3/2) + 45*a^8*b^2*x + a^10*log(x) + 20*a^9*
b*sqrt(x)
```

Fricas [A] time = 0.237965, size = 151, normalized size = 1.18

$$\frac{1}{5}\,b^{10}x^{5}+\frac{45}{4}\,a^{2}b^{8}x^{4}+70\,a^{4}b^{6}x^{3}+105\,a^{6}b^{4}x^{2}+45\,a^{8}b^{2}x+2\,a^{10}\log\left(\sqrt{x}\right)+\frac{4}{315}\,\left(175\,ab^{9}x^{4}+2700\,a^{3}b^{7}x^{3}+7938\,a^{5}b^{5}x^{2}+6300\,a^{7}b^{3}x+1575\,a^{9}b\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10/x,x, algorithm="fricas")
```

```
[Out] 1/5*b^10*x^5 + 45/4*a^2*b^8*x^4 + 70*a^4*b^6*x^3 + 105*a^6*b^4*x^
2 + 45*a^8*b^2*x + 2*a^10*log(sqrt(x)) + 4/315*(175*a*b^9*x^4 + 2
700*a^3*b^7*x^3 + 7938*a^5*b^5*x^2 + 6300*a^7*b^3*x + 1575*a^9*b)
*sqrt(x)
```

Sympy [A] time = 6.17491, size = 131, normalized size = 1.02

$$a^{10}\log\left(x\right)+20a^{9}b\sqrt{x}+45a^{8}b^{2}x+80a^{7}b^{3}x^{\frac{3}{2}}+105a^{6}b^{4}x^{2}+\frac{504a^{5}b^{5}x^{\frac{5}{2}}}{5}+70a^{4}b^{6}x^{3}+\frac{240a^{3}b^{7}x^{\frac{7}{2}}}{7}+\frac{45a^{2}b^{8}x^{4}}{4}+\frac{20ab^{9}x^{\frac{9}{2}}}{9}+\frac{b^{10}x^{5}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**10/x,x)
```

```
[Out] a**10*log(x) + 20*a**9*b*sqrt(x) + 45*a**8*b**2*x + 80*a**7*b**3*
x**(3/2) + 105*a**6*b**4*x**2 + 504*a**5*b**5*x**(5/2)/5 + 70*a**
4*b**6*x**3 + 240*a**3*b**7*x**(7/2)/7 + 45*a**2*b**8*x**4/4 + 20
*a*b**9*x**(9/2)/9 + b**10*x**5/5
```

GIAC/XCAS [A] time = 0.218431, size = 147, normalized size = 1.15

$$\frac{1}{5}\,b^{10}x^5 + \frac{20}{9}\,ab^9x^{\frac{9}{2}} + \frac{45}{4}\,a^2b^8x^4 + \frac{240}{7}\,a^3b^7x^{\frac{7}{2}} + 70\,a^4b^6x^3 + \frac{504}{5}\,a^5b^5x^{\frac{5}{2}} + 105\,a^6b^4x^2 + 80\,a^7b^3x^{\frac{3}{2}} + 45\,a^8b^2x + a^{10}\ln\left(|x|\right) + 20\,a^9b\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10/x,x, algorithm="giac")
```

```
[Out] 1/5*b^10*x^5 + 20/9*a*b^9*x^(9/2) + 45/4*a^2*b^8*x^4 + 240/7*a^3*
b^7*x^(7/2) + 70*a^4*b^6*x^3 + 504/5*a^5*b^5*x^(5/2) + 105*a^6*b^
4*x^2 + 80*a^7*b^3*x^(3/2) + 45*a^8*b^2*x + a^10*ln(abs(x)) + 20*
a^9*b*sqrt(x)
```

3.2157 $\int \frac{(a+b\sqrt{x})^{10}}{x^2} dx$

Optimal. Leaf size=123

$$-\frac{a^{10}}{x}-\frac{20a^9b}{\sqrt{x}}+45a^8b^2\log(x)+240a^7b^3\sqrt{x}+210a^6b^4x+168a^5b^5x^{3/2}+105a^4b^6x^2+48a^3b^7x^{5/2}+15a^2b^8x^3+\frac{20}{7}ab^9x^{7/2}+\frac{b^{10}x^4}{4}$$

```
[Out] -(a^10/x) - (20*a^9*b)/Sqrt[x] + 240*a^7*b^3*Sqrt[x] + 210*a^6*b^
4*x + 168*a^5*b^5*x^(3/2) + 105*a^4*b^6*x^2 + 48*a^3*b^7*x^(5/2)
+ 15*a^2*b^8*x^3 + (20*a*b^9*x^(7/2))/7 + (b^10*x^4)/4 + 45*a^8*b
^2*Log[x]
```

Rubi [A] time = 0.184149, antiderivative size = 123, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^{10}}{x}-\frac{20a^9b}{\sqrt{x}}+45a^8b^2\log(x)+240a^7b^3\sqrt{x}+210a^6b^4x+168a^5b^5x^{3/2}+105a^4b^6x^2+48a^3b^7x^{5/2}+15a^2b^8x^3+\frac{20}{7}ab^9x^{7/2}+\frac{b^{10}x^4}{4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^10/x^2,x]
```

```
[Out] -(a^10/x) - (20*a^9*b)/Sqrt[x] + 240*a^7*b^3*Sqrt[x] + 210*a^6*b^
4*x + 168*a^5*b^5*x^(3/2) + 105*a^4*b^6*x^2 + 48*a^3*b^7*x^(5/2)
+ 15*a^2*b^8*x^3 + (20*a*b^9*x^(7/2))/7 + (b^10*x^4)/4 + 45*a^8*b
^2*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^{10}}{x}-\frac{20a^9b}{\sqrt{x}}+90a^8b^2\log\left(\sqrt{x}\right)+240a^7b^3\sqrt{x}+420a^6b^4\int^{\sqrt{x}}x\,dx+168a^5b^5x^{\frac{3}{2}}+105a^4b^6x^2+48a^3b^7x^{\frac{5}{2}}+15a^2b^8x^3+\frac{20ab^9x^{\frac{7}{2}}}{7}+\frac{b^{10}x^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**10/x**2,x)
```

```
[Out] -a**10/x - 20*a**9*b/sqrt(x) + 90*a**8*b**2*log(sqrt(x)) + 240*a*
*7*b**3*sqrt(x) + 420*a**6*b**4*Integral(x, (x, sqrt(x))) + 168*a
**5*b**5*x**(3/2) + 105*a**4*b**6*x**2 + 48*a**3*b**7*x**(5/2) +
15*a**2*b**8*x**3 + 20*a*b**9*x**(7/2)/7 + b**10*x**4/4
```

Mathematica [A] time = 0.0649921, size = 123, normalized size = 1.

$$-\frac{a^{10}}{x}-\frac{20a^9b}{\sqrt{x}}+45a^8b^2\log(x)+240a^7b^3\sqrt{x}+210a^6b^4x+168a^5b^5x^{3/2}+105a^4b^6x^2+48a^3b^7x^{5/2}+15a^2b^8x^3+\frac{20}{7}ab^9x^{7/2}+\frac{b^{10}x^4}{4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^10/x^2,x]
```

```
[Out] -(a^10/x) - (20*a^9*b)/Sqrt[x] + 240*a^7*b^3*Sqrt[x] + 210*a^6*b^
4*x + 168*a^5*b^5*x^(3/2) + 105*a^4*b^6*x^2 + 48*a^3*b^7*x^(5/2)
+ 15*a^2*b^8*x^3 + (20*a*b^9*x^(7/2))/7 + (b^10*x^4)/4 + 45*a^8*b
^2*Log[x]
```

Maple [A] time = 0.004, size = 110, normalized size = 0.9

$$-\frac{a^{10}}{x}+210\,a^{6}b^{4}x+168\,a^{5}b^{5}x^{3/2}+105\,a^{4}b^{6}x^{2}+48\,a^{3}b^{7}x^{5/2}+15\,a^{2}b^{8}x^{3}+\frac{20\,ab^{9}}{7}x^{\frac{7}{2}}+\frac{b^{10}x^{4}}{4}+45\,a^{8}b^{2}\ln(x)-20\,\frac{a^{9}b}{\sqrt{x}}+240\,a^{7}b^{3}\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^10/x^2,x)
```

```
[Out] -a^10/x+210*a^6*b^4*x+168*a^5*b^5*x^(3/2)+105*a^4*b^6*x^2+48*a^3*
b^7*x^(5/2)+15*a^2*b^8*x^3+20/7*a*b^9*x^(7/2)+1/4*b^10*x^4+45*a^8
*b^2*ln(x)-20*a^9*b/x^(1/2)+240*a^7*b^3*x^(1/2)
```

Maxima [A] time = 1.43775, size = 149, normalized size = 1.21

$$\frac{1}{4}\,b^{10}x^{4}+\frac{20}{7}\,ab^{9}x^{\frac{7}{2}}+15\,a^{2}b^{8}x^{3}+48\,a^{3}b^{7}x^{\frac{5}{2}}+105\,a^{4}b^{6}x^{2}+168\,a^{5}b^{5}x^{\frac{3}{2}}+210\,a^{6}b^{4}x+45\,a^{8}b^{2}\log(x)+240\,a^{7}b^{3}\sqrt{x}-\frac{20\,a^{9}b\sqrt{x}+a^{10}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10/x^2,x, algorithm="maxima")
```

```
[Out] 1/4*b^10*x^4 + 20/7*a*b^9*x^(7/2) + 15*a^2*b^8*x^3 + 48*a^3*b^7*x
^(5/2) + 105*a^4*b^6*x^2 + 168*a^5*b^5*x^(3/2) + 210*a^6*b^4*x +
45*a^8*b^2*log(x) + 240*a^7*b^3*sqrt(x) - (20*a^9*b*sqrt(x) + a^1
0)/x
```

Fricas [A] time = 0.232829, size = 158, normalized size = 1.28

$$\frac{7\,b^{10}x^{5}+420\,a^{2}b^{8}x^{4}+2940\,a^{4}b^{6}x^{3}+5880\,a^{6}b^{4}x^{2}+2520\,a^{8}b^{2}x\log\left(\sqrt{x}\right)-28\,a^{10}+16\left(5\,ab^{9}x^{4}+84\,a^{3}b^{7}x^{3}+294\,a^{5}b^{5}x^{2}+\right.}{28\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10/x^2,x, algorithm="fricas")
```

```
[Out] 1/28*(7*b^10*x^5 + 420*a^2*b^8*x^4 + 2940*a^4*b^6*x^3 + 5880*a^6*
b^4*x^2 + 2520*a^8*b^2*x*log(sqrt(x)) - 28*a^10 + 16*(5*a*b^9*x^4
 + 84*a^3*b^7*x^3 + 294*a^5*b^5*x^2 + 420*a^7*b^3*x - 35*a^9*b)*s
qrt(x))/x
```

Sympy [A] time = 6.55711, size = 124, normalized size = 1.01

$$-\frac{a^{10}}{x}-\frac{20a^{9}b}{\sqrt{x}}+45a^{8}b^{2}\log(x)+240a^{7}b^{3}\sqrt{x}+210a^{6}b^{4}x+168a^{5}b^{5}x^{\frac{3}{2}}+105a^{4}b^{6}x^{2}+48a^{3}b^{7}x^{\frac{5}{2}}+15a^{2}b^{8}x^{3}+\frac{20ab^{9}x^{\frac{7}{2}}}{7}+\frac{b^{10}x^{4}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**10/x**2,x)
```

```
[Out] -a**10/x - 20*a**9*b/sqrt(x) + 45*a**8*b**2*log(x) + 240*a**7*b**
3*sqrt(x) + 210*a**6*b**4*x + 168*a**5*b**5*x**(3/2) + 105*a**4*b
**6*x**2 + 48*a**3*b**7*x**(5/2) + 15*a**2*b**8*x**3 + 20*a*b**9*
x**(7/2)/7 + b**10*x**4/4
```

GIAC/XCAS [A] time = 0.21679, size = 150, normalized size = 1.22

$$\frac{1}{4}\,b^{10}x^4 + \frac{20}{7}\,ab^9x^{\frac{7}{2}} + 15\,a^2b^8x^3 + 48\,a^3b^7x^{\frac{5}{2}} + 105\,a^4b^6x^2 + 168\,a^5b^5x^{\frac{3}{2}} + 210\,a^6b^4x + 45\,a^8b^2\ln\left(|x|\right) + 240\,a^7b^3\sqrt{x} - \frac{20\,a^9b\sqrt{x} + a^{10}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10/x^2,x, algorithm="giac")
```

```
[Out] 1/4*b^10*x^4 + 20/7*a*b^9*x^(7/2) + 15*a^2*b^8*x^3 + 48*a^3*b^7*x
^(5/2) + 105*a^4*b^6*x^2 + 168*a^5*b^5*x^(3/2) + 210*a^6*b^4*x +
45*a^8*b^2*ln(abs(x)) + 240*a^7*b^3*sqrt(x) - (20*a^9*b*sqrt(x) +
 a^10)/x
```

3.2158 $\int \frac{(a+b\sqrt{x})^{10}}{x^3}\,dx$

Optimal. Leaf size=127

$$-\frac{a^{10}}{2x^2}-\frac{20a^9b}{3x^{3/2}}-\frac{45a^8b^2}{x}-\frac{240a^7b^3}{\sqrt{x}}+210a^6b^4\log(x)+504a^5b^5\sqrt{x}+210a^4b^6x+80a^3b^7x^{3/2}+\frac{45}{2}a^2b^8x^2+4ab^9x^{5/2}+\frac{b^{10}x^3}{3}$$

```
[Out] -a^10/(2*x^2) - (20*a^9*b)/(3*x^(3/2)) - (45*a^8*b^2)/x - (240*a^
7*b^3)/Sqrt[x] + 504*a^5*b^5*Sqrt[x] + 210*a^4*b^6*x + 80*a^3*b^7
*x^(3/2) + (45*a^2*b^8*x^2)/2 + 4*a*b^9*x^(5/2) + (b^10*x^3)/3 +
210*a^6*b^4*Log[x]
```

Rubi [A] time = 0.181695, antiderivative size = 127, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^{10}}{2x^2}-\frac{20a^9b}{3x^{3/2}}-\frac{45a^8b^2}{x}-\frac{240a^7b^3}{\sqrt{x}}+210a^6b^4\log(x)+504a^5b^5\sqrt{x}+210a^4b^6x+80a^3b^7x^{3/2}+\frac{45}{2}a^2b^8x^2+4ab^9x^{5/2}+\frac{b^{10}x^3}{3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^10/x^3,x]
```

```
[Out] -a^10/(2*x^2) - (20*a^9*b)/(3*x^(3/2)) - (45*a^8*b^2)/x - (240*a^
7*b^3)/Sqrt[x] + 504*a^5*b^5*Sqrt[x] + 210*a^4*b^6*x + 80*a^3*b^7
*x^(3/2) + (45*a^2*b^8*x^2)/2 + 4*a*b^9*x^(5/2) + (b^10*x^3)/3 +
210*a^6*b^4*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^{10}}{2x^2}-\frac{20a^9b}{3x^{\frac{3}{2}}}-\frac{45a^8b^2}{x}-\frac{240a^7b^3}{\sqrt{x}}+420a^6b^4\log\left(\sqrt{x}\right)+504a^5b^5\sqrt{x}+420a^4b^6\int^{\sqrt{x}}x\,dx+80a^3b^7x^{\frac{3}{2}}+\frac{45a^2b^8x^2}{2}+4ab^9x^{\frac{5}{2}}+\frac{b^{10}x^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**10/x**3,x)
```

```
[Out] -a**10/(2*x**2) - 20*a**9*b/(3*x**(3/2)) - 45*a**8*b**2/x - 240*a
**7*b**3/sqrt(x) + 420*a**6*b**4*log(sqrt(x)) + 504*a**5*b**5*sqr
t(x) + 420*a**4*b**6*Integral(x, (x, sqrt(x))) + 80*a**3*b**7*x**
(3/2) + 45*a**2*b**8*x**2/2 + 4*a*b**9*x**(5/2) + b**10*x**3/3
```

Mathematica [A] time = 0.0527975, size = 127, normalized size = 1.

$$-\frac{a^{10}}{2x^2}-\frac{20a^9b}{3x^{3/2}}-\frac{45a^8b^2}{x}-\frac{240a^7b^3}{\sqrt{x}}+210a^6b^4\log(x)+504a^5b^5\sqrt{x}+210a^4b^6x+80a^3b^7x^{3/2}+\frac{45}{2}a^2b^8x^2+4ab^9x^{5/2}+\frac{b^{10}x^3}{3}$$

Antiderivative was successfully verified.

```
[In]   Integrate[(a + b*Sqrt[x])^10/x^3,x]
```

```
[Out] -a^10/(2*x^2) - (20*a^9*b)/(3*x^(3/2)) - (45*a^8*b^2)/x - (240*a^
7*b^3)/Sqrt[x] + 504*a^5*b^5*Sqrt[x] + 210*a^4*b^6*x + 80*a^3*b^7
*x^(3/2) + (45*a^2*b^8*x^2)/2 + 4*a*b^9*x^(5/2) + (b^10*x^3)/3 +
210*a^6*b^4*Log[x]
```

Maple [A] time = 0.005, size = 110, normalized size = 0.9

$$-\frac{a^{10}}{2\,x^{2}}-\frac{20\,a^{9}b}{3}x^{-\frac{3}{2}}-45\,\frac{a^{8}b^{2}}{x}+210\,a^{4}b^{6}x+80\,a^{3}b^{7}x^{3/2}+\frac{45\,a^{2}b^{8}x^{2}}{2}+4\,ab^{9}x^{5/2}+\frac{b^{10}x^{3}}{3}+210\,a^{6}b^{4}\ln(x)-240\,\frac{a^{7}b^{3}}{\sqrt{x}}+504\,a^{5}b^{5}\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((a+b*x^(1/2))^10/x^3,x)
```

```
[Out] -1/2*a^10/x^2-20/3*a^9*b/x^(3/2)-45*a^8*b^2/x+210*a^4*b^6*x+80*a^
3*b^7*x^(3/2)+45/2*a^2*b^8*x^2+4*a*b^9*x^(5/2)+1/3*b^10*x^3+210*a
^6*b^4*ln(x)-240*a^7*b^3/x^(1/2)+504*a^5*b^5*x^(1/2)
```

Maxima [A] time = 1.44127, size = 149, normalized size = 1.17

$$\frac{1}{3}\,b^{10}x^{3}+4\,ab^{9}x^{\frac{5}{2}}+\frac{45}{2}\,a^{2}b^{8}x^{2}+80\,a^{3}b^{7}x^{\frac{3}{2}}+210\,a^{4}b^{6}x+210\,a^{6}b^{4}\log(x)+504\,a^{5}b^{5}\sqrt{x}-\frac{1440\,a^{7}b^{3}x^{\frac{3}{2}}+270\,a^{8}b^{2}x+40\,a^{9}b\sqrt{x}+3\,a^{10}}{6\,x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*sqrt(x) + a)^10/x^3,x, algorithm="maxima")
```

```
[Out] 1/3*b^10*x^3 + 4*a*b^9*x^(5/2) + 45/2*a^2*b^8*x^2 + 80*a^3*b^7*x^
(3/2) + 210*a^4*b^6*x + 210*a^6*b^4*log(x) + 504*a^5*b^5*sqrt(x)
- 1/6*(1440*a^7*b^3*x^(3/2) + 270*a^8*b^2*x + 40*a^9*b*sqrt(x) +
3*a^10)/x^2
```

Fricas [A] time = 0.239831, size = 158, normalized size = 1.24

$$\frac{2\,b^{10}x^{5}+135\,a^{2}b^{8}x^{4}+1260\,a^{4}b^{6}x^{3}+2520\,a^{6}b^{4}x^{2}\log\left(\sqrt{x}\right)-270\,a^{8}b^{2}x-3\,a^{10}+8\left(3\,ab^{9}x^{4}+60\,a^{3}b^{7}x^{3}+378\,a^{5}b^{5}x^{2}-18\right.}{6\,x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*sqrt(x) + a)^10/x^3,x, algorithm="fricas")
```

```
[Out] 1/6*(2*b^10*x^5 + 135*a^2*b^8*x^4 + 1260*a^4*b^6*x^3 + 2520*a^6*b
^4*x^2*log(sqrt(x)) - 270*a^8*b^2*x - 3*a^10 + 8*(3*a*b^9*x^4 + 6
0*a^3*b^7*x^3 + 378*a^5*b^5*x^2 - 180*a^7*b^3*x - 5*a^9*b)*sqrt(x
))/x^2
```

Sympy [A] time = 6.24309, size = 128, normalized size = 1.01

$$-\frac{a^{10}}{2x^{2}}-\frac{20a^{9}b}{3x^{\frac{3}{2}}}-\frac{45a^{8}b^{2}}{x}-\frac{240a^{7}b^{3}}{\sqrt{x}}+210a^{6}b^{4}\log(x)+504a^{5}b^{5}\sqrt{x}+210a^{4}b^{6}x+80a^{3}b^{7}x^{\frac{3}{2}}+\frac{45a^{2}b^{8}x^{2}}{2}+4ab^{9}x^{\frac{5}{2}}+\frac{b^{10}x^{3}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**10/x**3,x)
```

```
[Out] -a**10/(2*x**2) - 20*a**9*b/(3*x**(3/2)) - 45*a**8*b**2/x - 240*a
**7*b**3/sqrt(x) + 210*a**6*b**4*log(x) + 504*a**5*b**5*sqrt(x) +
 210*a**4*b**6*x + 80*a**3*b**7*x**(3/2) + 45*a**2*b**8*x**2/2 +
4*a*b**9*x**(5/2) + b**10*x**3/3
```

GIAC/XCAS [A] time = 0.219503, size = 150, normalized size = 1.18

$$\frac{1}{3}\,b^{10}x^{3} + 4\,ab^{9}x^{\frac{5}{2}} + \frac{45}{2}\,a^{2}b^{8}x^{2} + 80\,a^{3}b^{7}x^{\frac{3}{2}} + 210\,a^{4}b^{6}x + 210\,a^{6}b^{4}\ln\left(|x|\right) + 504\,a^{5}b^{5}\sqrt{x} - \frac{1440\,a^{7}b^{3}x^{\frac{3}{2}} + 270\,a^{8}b^{2}x + 40\,a^{9}b\sqrt{x} + 3\,a^{10}}{6\,x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10/x^3,x, algorithm="giac")
```

```
[Out] 1/3*b^10*x^3 + 4*a*b^9*x^(5/2) + 45/2*a^2*b^8*x^2 + 80*a^3*b^7*x^
(3/2) + 210*a^4*b^6*x + 210*a^6*b^4*ln(abs(x)) + 504*a^5*b^5*sqrt
(x) - 1/6*(1440*a^7*b^3*x^(3/2) + 270*a^8*b^2*x + 40*a^9*b*sqrt(x
) + 3*a^10)/x^2
```

3.2159 $\int \frac{\left(a+b\sqrt{x}\right)^{10}}{x^4}\,dx$

Optimal. Leaf size=127

$$-\frac{a^{10}}{3x^3}-\frac{4a^9b}{x^{5/2}}-\frac{45a^8b^2}{2x^2}-\frac{80a^7b^3}{x^{3/2}}-\frac{210a^6b^4}{x}-\frac{504a^5b^5}{\sqrt{x}}+210a^4b^6\log(x)+240a^3b^7\sqrt{x}+45a^2b^8x+\frac{20}{3}ab^9x^{3/2}+\frac{b^{10}x^2}{2}$$

```
[Out] -a^10/(3*x^3) - (4*a^9*b)/x^(5/2) - (45*a^8*b^2)/(2*x^2) - (80*a^
7*b^3)/x^(3/2) - (210*a^6*b^4)/x - (504*a^5*b^5)/Sqrt[x] + 240*a^
3*b^7*Sqrt[x] + 45*a^2*b^8*x + (20*a*b^9*x^(3/2))/3 + (b^10*x^2)/
2 + 210*a^4*b^6*Log[x]
```

Rubi [A] time = 0.180176, antiderivative size = 127, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^{10}}{3x^3}-\frac{4a^9b}{x^{5/2}}-\frac{45a^8b^2}{2x^2}-\frac{80a^7b^3}{x^{3/2}}-\frac{210a^6b^4}{x}-\frac{504a^5b^5}{\sqrt{x}}+210a^4b^6\log(x)+240a^3b^7\sqrt{x}+45a^2b^8x+\frac{20}{3}ab^9x^{3/2}+\frac{b^{10}x^2}{2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^10/x^4,x]
```

```
[Out] -a^10/(3*x^3) - (4*a^9*b)/x^(5/2) - (45*a^8*b^2)/(2*x^2) - (80*a^
7*b^3)/x^(3/2) - (210*a^6*b^4)/x - (504*a^5*b^5)/Sqrt[x] + 240*a^
3*b^7*Sqrt[x] + 45*a^2*b^8*x + (20*a*b^9*x^(3/2))/3 + (b^10*x^2)/
2 + 210*a^4*b^6*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^{10}}{3x^3}-\frac{4a^9b}{x^{\frac{5}{2}}}-\frac{45a^8b^2}{2x^2}-\frac{80a^7b^3}{x^{\frac{3}{2}}}-\frac{210a^6b^4}{x}-\frac{504a^5b^5}{\sqrt{x}}+420a^4b^6\log\left(\sqrt{x}\right)+240a^3b^7\sqrt{x}+90a^2b^8\int^{\sqrt{x}}x\,dx+\frac{20ab^9x^{\frac{3}{2}}}{3}+\frac{b^{10}x^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**10/x**4,x)
```

```
[Out] -a**10/(3*x**3) - 4*a**9*b/x**(5/2) - 45*a**8*b**2/(2*x**2) - 80*
a**7*b**3/x**(3/2) - 210*a**6*b**4/x - 504*a**5*b**5/sqrt(x) + 42
0*a**4*b**6*log(sqrt(x)) + 240*a**3*b**7*sqrt(x) + 90*a**2*b**8*I
ntegral(x, (x, sqrt(x))) + 20*a*b**9*x**(3/2)/3 + b**10*x**2/2
```

Mathematica [A] time = 0.0895978, size = 124, normalized size = 0.98

$$210a^4b^6\log(x)-\frac{2a^{10}+24a^9b\sqrt{x}+135a^8b^2x+480a^7b^3x^{3/2}+1260a^6b^4x^2+3024a^5b^5x^{5/2}-1440a^3b^7x^{7/2}-270a^2b^8x^4-40ab^9x^{9/2}-3b^{1}}{6x^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^10/x^4,x]
```

```
[Out] -(2*a^10 + 24*a^9*b*Sqrt[x] + 135*a^8*b^2*x + 480*a^7*b^3*x^(3/2)
 + 1260*a^6*b^4*x^2 + 3024*a^5*b^5*x^(5/2) - 1440*a^3*b^7*x^(7/2)
 - 270*a^2*b^8*x^4 - 40*a*b^9*x^(9/2) - 3*b^10*x^5)/(6*x^3) + 210
*a^4*b^6*Log[x]
```

Maple [A] time = 0.006, size = 110, normalized size = 0.9

$$-\frac{a^{10}}{3\,x^3}-4\,\frac{a^9b}{x^{5/2}}-\frac{45\,a^8b^2}{2\,x^2}-80\,\frac{a^7b^3}{x^{3/2}}-210\,\frac{a^6b^4}{x}+45\,a^2b^8x+\frac{20\,ab^9}{3}x^{\frac{3}{2}}+\frac{b^{10}x^2}{2}+210\,a^4b^6\ln(x)-504\,\frac{a^5b^5}{\sqrt{x}}+240\,a^3b^7\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^10/x^4,x)
```

```
[Out] -1/3*a^10/x^3-4*a^9*b/x^(5/2)-45/2*a^8*b^2/x^2-80*a^7*b^3/x^(3/2)
-210*a^6*b^4/x+45*a^2*b^8*x+20/3*a*b^9*x^(3/2)+1/2*b^10*x^2+210*a
^4*b^6*ln(x)-504*a^5*b^5/x^(1/2)+240*a^3*b^7*x^(1/2)
```

Maxima [A] time = 1.44064, size = 149, normalized size = 1.17

$$\frac{1}{2}\,b^{10}x^2+\frac{20}{3}\,ab^9x^{\frac{3}{2}}+45\,a^2b^8x+210\,a^4b^6\log(x)+240\,a^3b^7\sqrt{x}-\frac{3024\,a^5b^5x^{\frac{5}{2}}+1260\,a^6b^4x^2+480\,a^7b^3x^{\frac{3}{2}}+135\,a^8b^2x+24\,a^9b\sqrt{x}+2\,a^{10}}{6\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10/x^4,x, algorithm="maxima")
```

```
[Out] 1/2*b^10*x^2 + 20/3*a*b^9*x^(3/2) + 45*a^2*b^8*x + 210*a^4*b^6*lo
g(x) + 240*a^3*b^7*sqrt(x) - 1/6*(3024*a^5*b^5*x^(5/2) + 1260*a^6
*b^4*x^2 + 480*a^7*b^3*x^(3/2) + 135*a^8*b^2*x + 24*a^9*b*sqrt(x)
 + 2*a^10)/x^3
```

Fricas [A] time = 0.240245, size = 158, normalized size = 1.24

$$\frac{3\,b^{10}x^5+270\,a^2b^8x^4+2520\,a^4b^6x^3\log\left(\sqrt{x}\right)-1260\,a^6b^4x^2-135\,a^8b^2x-2\,a^{10}+8\left(5\,ab^9x^4+180\,a^3b^7x^3-378\,a^5b^5x^2-6\right.}{6\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10/x^4,x, algorithm="fricas")
```

```
[Out] 1/6*(3*b^10*x^5 + 270*a^2*b^8*x^4 + 2520*a^4*b^6*x^3*log(sqrt(x))
 - 1260*a^6*b^4*x^2 - 135*a^8*b^2*x - 2*a^10 + 8*(5*a*b^9*x^4 + 1
80*a^3*b^7*x^3 - 378*a^5*b^5*x^2 - 60*a^7*b^3*x - 3*a^9*b)*sqrt(x
))/x^3
```

Sympy [A] time = 6.13967, size = 128, normalized size = 1.01

$$-\frac{a^{10}}{3x^3}-\frac{4a^9b}{x^{\frac{5}{2}}}-\frac{45a^8b^2}{2x^2}-\frac{80a^7b^3}{x^{\frac{3}{2}}}-\frac{210a^6b^4}{x}-\frac{504a^5b^5}{\sqrt{x}}+210a^4b^6\log(x)+240a^3b^7\sqrt{x}+45a^2b^8x+\frac{20ab^9x^{\frac{3}{2}}}{3}+\frac{b^{10}x^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**10/x**4,x)
```

```
[Out] -a**10/(3*x**3) - 4*a**9*b/x**(5/2) - 45*a**8*b**2/(2*x**2) - 80*
a**7*b**3/x**(3/2) - 210*a**6*b**4/x - 504*a**5*b**5/sqrt(x) + 21
0*a**4*b**6*log(x) + 240*a**3*b**7*sqrt(x) + 45*a**2*b**8*x + 20*
a*b**9*x**(3/2)/3 + b**10*x**2/2
```

GIAC/XCAS [A] time = 0.220573, size = 150, normalized size = 1.18

$$\frac{1}{2}\,b^{10}x^2 + \frac{20}{3}\,ab^9x^{\frac{3}{2}} + 45\,a^2b^8x + 210\,a^4b^6\ln\left(|x|\right) + 240\,a^3b^7\sqrt{x} - \frac{3024\,a^5b^5x^{\frac{5}{2}} + 1260\,a^6b^4x^2 + 480\,a^7b^3x^{\frac{3}{2}} + 135\,a^8b^2x + 24\,a^9b\sqrt{x} + 2\,a^{10}}{6\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10/x^4,x, algorithm="giac")
```

```
[Out] 1/2*b^10*x^2 + 20/3*a*b^9*x^(3/2) + 45*a^2*b^8*x + 210*a^4*b^6*ln
(abs(x)) + 240*a^3*b^7*sqrt(x) - 1/6*(3024*a^5*b^5*x^(5/2) + 1260
*a^6*b^4*x^2 + 480*a^7*b^3*x^(3/2) + 135*a^8*b^2*x + 24*a^9*b*sqr
t(x) + 2*a^10)/x^3
```

3.2160 $\int \frac{(a+b\sqrt{x})^{10}}{x^5}\,dx$

Optimal. Leaf size=122

$$-\frac{a^{10}}{4x^4}-\frac{20a^9b}{7x^{7/2}}-\frac{15a^8b^2}{x^3}-\frac{48a^7b^3}{x^{5/2}}-\frac{105a^6b^4}{x^2}-\frac{168a^5b^5}{x^{3/2}}-\frac{210a^4b^6}{x}-\frac{240a^3b^7}{\sqrt{x}}+45a^2b^8\log(x)+20ab^9\sqrt{x}+b^{10}x$$

```
[Out] -a^10/(4*x^4) - (20*a^9*b)/(7*x^(7/2)) - (15*a^8*b^2)/x^3 - (48*a
^7*b^3)/x^(5/2) - (105*a^6*b^4)/x^2 - (168*a^5*b^5)/x^(3/2) - (21
0*a^4*b^6)/x - (240*a^3*b^7)/Sqrt[x] + 20*a*b^9*Sqrt[x] + b^10*x
+ 45*a^2*b^8*Log[x]
```

Rubi [A] time = 0.177279, antiderivative size = 122, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^{10}}{4x^4}-\frac{20a^9b}{7x^{7/2}}-\frac{15a^8b^2}{x^3}-\frac{48a^7b^3}{x^{5/2}}-\frac{105a^6b^4}{x^2}-\frac{168a^5b^5}{x^{3/2}}-\frac{210a^4b^6}{x}-\frac{240a^3b^7}{\sqrt{x}}+45a^2b^8\log(x)+20ab^9\sqrt{x}+b^{10}x$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^10/x^5,x]
```

```
[Out] -a^10/(4*x^4) - (20*a^9*b)/(7*x^(7/2)) - (15*a^8*b^2)/x^3 - (48*a
^7*b^3)/x^(5/2) - (105*a^6*b^4)/x^2 - (168*a^5*b^5)/x^(3/2) - (21
0*a^4*b^6)/x - (240*a^3*b^7)/Sqrt[x] + 20*a*b^9*Sqrt[x] + b^10*x
+ 45*a^2*b^8*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^{10}}{4x^4}-\frac{20a^9b}{7x^{\frac{7}{2}}}-\frac{15a^8b^2}{x^3}-\frac{48a^7b^3}{x^{\frac{5}{2}}}-\frac{105a^6b^4}{x^2}-\frac{168a^5b^5}{x^{\frac{3}{2}}}-\frac{210a^4b^6}{x}-\frac{240a^3b^7}{\sqrt{x}}+90a^2b^8\log\left(\sqrt{x}\right)+20ab^9\sqrt{x}+2b^{10}\int^{\sqrt{x}}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**10/x**5,x)
```

```
[Out] -a**10/(4*x**4) - 20*a**9*b/(7*x**(7/2)) - 15*a**8*b**2/x**3 - 48
*a**7*b**3/x**(5/2) - 105*a**6*b**4/x**2 - 168*a**5*b**5/x**(3/2)
 - 210*a**4*b**6/x - 240*a**3*b**7/sqrt(x) + 90*a**2*b**8*log(sqr
t(x)) + 20*a*b**9*sqrt(x) + 2*b**10*Integral(x, (x, sqrt(x)))
```

Mathematica [A] time = 0.131011, size = 126, normalized size = 1.03

$$-\frac{a^{10}}{4x^4}-\frac{20a^9b}{7x^{7/2}}-\frac{15a^8b^2}{x^3}-\frac{48a^7b^3}{x^{5/2}}-\frac{105a^6b^4}{x^2}-\frac{168a^5b^5}{x^{3/2}}-\frac{210a^4b^6}{x}-\frac{240a^3b^7}{\sqrt{x}}+90a^2b^8\log\left(\sqrt{x}\right)+20ab^9\sqrt{x}+b^{10}x$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^10/x^5,x]
```

```
[Out] -a^10/(4*x^4) - (20*a^9*b)/(7*x^(7/2)) - (15*a^8*b^2)/x^3 - (48*a
^7*b^3)/x^(5/2) - (105*a^6*b^4)/x^2 - (168*a^5*b^5)/x^(3/2) - (21
0*a^4*b^6)/x - (240*a^3*b^7)/Sqrt[x] + 20*a*b^9*Sqrt[x] + b^10*x
+ 90*a^2*b^8*Log[Sqrt[x]]
```

Maple [A] time = 0.006, size = 109, normalized size = 0.9

$$-\frac{a^{10}}{4\,x^4}-\frac{20\,a^9b}{7}x^{-\frac{7}{2}}-15\,\frac{a^8b^2}{x^3}-48\,\frac{a^7b^3}{x^{5/2}}-105\,\frac{a^6b^4}{x^2}-168\,\frac{a^5b^5}{x^{3/2}}-210\,\frac{a^4b^6}{x}+b^{10}x+45\,a^2b^8\ln(x)-240\,\frac{a^3b^7}{\sqrt{x}}+20\,ab^9\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^10/x^5,x)
```

```
[Out] -1/4*a^10/x^4-20/7*a^9*b/x^(7/2)-15*a^8*b^2/x^3-48*a^7*b^3/x^(5/2
)-105*a^6*b^4/x^2-168*a^5*b^5/x^(3/2)-210*a^4*b^6/x+b^10*x+45*a^2
*b^8*ln(x)-240*a^3*b^7/x^(1/2)+20*a*b^9*x^(1/2)
```

Maxima [A] time = 1.44092, size = 147, normalized size = 1.2

$$b^{10}x+45\,a^2b^8\log(x)+20\,ab^9\sqrt{x}-\frac{6720\,a^3b^7x^{\frac{7}{2}}+5880\,a^4b^6x^3+4704\,a^5b^5x^{\frac{5}{2}}+2940\,a^6b^4x^2+1344\,a^7b^3x^{\frac{3}{2}}+420\,a^8b^2x+80\,a^9b\sqrt{x}+7\,a^{10}}{28\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10/x^5,x, algorithm="maxima")
```

```
[Out] b^10*x + 45*a^2*b^8*log(x) + 20*a*b^9*sqrt(x) - 1/28*(6720*a^3*b^
7*x^(7/2) + 5880*a^4*b^6*x^3 + 4704*a^5*b^5*x^(5/2) + 2940*a^6*b^
4*x^2 + 1344*a^7*b^3*x^(3/2) + 420*a^8*b^2*x + 80*a^9*b*sqrt(x) +
 7*a^10)/x^4
```

Fricas [A] time = 0.235328, size = 158, normalized size = 1.3

$$\frac{28\,b^{10}x^5+2520\,a^2b^8x^4\log\left(\sqrt{x}\right)-5880\,a^4b^6x^3-2940\,a^6b^4x^2-420\,a^8b^2x-7\,a^{10}+16\left(35\,ab^9x^4-420\,a^3b^7x^3-294\,a^5b^5x\right.}{28\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10/x^5,x, algorithm="fricas")
```

```
[Out] 1/28*(28*b^10*x^5 + 2520*a^2*b^8*x^4*log(sqrt(x)) - 5880*a^4*b^6*
x^3 - 2940*a^6*b^4*x^2 - 420*a^8*b^2*x - 7*a^10 + 16*(35*a*b^9*x^
4 - 420*a^3*b^7*x^3 - 294*a^5*b^5*x^2 - 84*a^7*b^3*x - 5*a^9*b)*s
qrt(x))/x^4
```

Sympy [A] time = 5.84552, size = 124, normalized size = 1.02

$$-\frac{a^{10}}{4x^4}-\frac{20a^9b}{7x^{\frac{7}{2}}}-\frac{15a^8b^2}{x^3}-\frac{48a^7b^3}{x^{\frac{5}{2}}}-\frac{105a^6b^4}{x^2}-\frac{168a^5b^5}{x^{\frac{3}{2}}}-\frac{210a^4b^6}{x}-\frac{240a^3b^7}{\sqrt{x}}+45a^2b^8\log(x)+20ab^9\sqrt{x}+b^{10}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**10/x**5,x)
```

```
[Out] -a**10/(4*x**4) - 20*a**9*b/(7*x**(7/2)) - 15*a**8*b**2/x**3 - 48
*a**7*b**3/x**(5/2) - 105*a**6*b**4/x**2 - 168*a**5*b**5/x**(3/2)
 - 210*a**4*b**6/x - 240*a**3*b**7/sqrt(x) + 45*a**2*b**8*log(x)
+ 20*a*b**9*sqrt(x) + b**10*x
```

GIAC/XCAS [A] time = 0.221342, size = 149, normalized size = 1.22

$$b^{10}x + 45\,a^2b^8\ln\left(|x|\right) + 20\,ab^9\sqrt{x} - \frac{6720\,a^3b^7x^{\frac{7}{2}} + 5880\,a^4b^6x^3 + 4704\,a^5b^5x^{\frac{5}{2}} + 2940\,a^6b^4x^2 + 1344\,a^7b^3x^{\frac{3}{2}} + 420\,a^8b^2x + 80\,a^9b\sqrt{x} + 7\,a^{10}}{28\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10/x^5,x, algorithm="giac")
```

```
[Out] b^10*x + 45*a^2*b^8*ln(abs(x)) + 20*a*b^9*sqrt(x) - 1/28*(6720*a^
3*b^7*x^(7/2) + 5880*a^4*b^6*x^3 + 4704*a^5*b^5*x^(5/2) + 2940*a^
6*b^4*x^2 + 1344*a^7*b^3*x^(3/2) + 420*a^8*b^2*x + 80*a^9*b*sqrt(
x) + 7*a^10)/x^4
```

3.2161 $\int \frac{\left(a+b\sqrt{x}\right)^{10}}{x^6}\,dx$

Optimal. Leaf size=130

$$-\frac{a^{10}}{5x^5}-\frac{20a^9b}{9x^{9/2}}-\frac{45a^8b^2}{4x^4}-\frac{240a^7b^3}{7x^{7/2}}-\frac{70a^6b^4}{x^3}-\frac{504a^5b^5}{5x^{5/2}}-\frac{105a^4b^6}{x^2}-\frac{80a^3b^7}{x^{3/2}}-\frac{45a^2b^8}{x}-\frac{20ab^9}{\sqrt{x}}+b^{10}\log(x)$$

```
[Out] -a^10/(5*x^5) - (20*a^9*b)/(9*x^(9/2)) - (45*a^8*b^2)/(4*x^4) - (
240*a^7*b^3)/(7*x^(7/2)) - (70*a^6*b^4)/x^3 - (504*a^5*b^5)/(5*x^
(5/2)) - (105*a^4*b^6)/x^2 - (80*a^3*b^7)/x^(3/2) - (45*a^2*b^8)/
x - (20*a*b^9)/Sqrt[x] + b^10*Log[x]
```

Rubi [A] time = 0.176046, antiderivative size = 130, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^{10}}{5x^5}-\frac{20a^9b}{9x^{9/2}}-\frac{45a^8b^2}{4x^4}-\frac{240a^7b^3}{7x^{7/2}}-\frac{70a^6b^4}{x^3}-\frac{504a^5b^5}{5x^{5/2}}-\frac{105a^4b^6}{x^2}-\frac{80a^3b^7}{x^{3/2}}-\frac{45a^2b^8}{x}-\frac{20ab^9}{\sqrt{x}}+b^{10}\log(x)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^10/x^6,x]
```

```
[Out] -a^10/(5*x^5) - (20*a^9*b)/(9*x^(9/2)) - (45*a^8*b^2)/(4*x^4) - (
240*a^7*b^3)/(7*x^(7/2)) - (70*a^6*b^4)/x^3 - (504*a^5*b^5)/(5*x^
(5/2)) - (105*a^4*b^6)/x^2 - (80*a^3*b^7)/x^(3/2) - (45*a^2*b^8)/
x - (20*a*b^9)/Sqrt[x] + b^10*Log[x]
```

Rubi in Sympy [A] time = 29.1839, size = 136, normalized size = 1.05

$$-\frac{a^{10}}{5x^5}-\frac{20a^9b}{9x^{\frac{9}{2}}}-\frac{45a^8b^2}{4x^4}-\frac{240a^7b^3}{7x^{\frac{7}{2}}}-\frac{70a^6b^4}{x^3}-\frac{504a^5b^5}{5x^{\frac{5}{2}}}-\frac{105a^4b^6}{x^2}-\frac{80a^3b^7}{x^{\frac{3}{2}}}-\frac{45a^2b^8}{x}-\frac{20ab^9}{\sqrt{x}}+2b^{10}\log\left(\sqrt{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**10/x**6,x)
```

```
[Out] -a**10/(5*x**5) - 20*a**9*b/(9*x**(9/2)) - 45*a**8*b**2/(4*x**4)
- 240*a**7*b**3/(7*x**(7/2)) - 70*a**6*b**4/x**3 - 504*a**5*b**5/
(5*x**(5/2)) - 105*a**4*b**6/x**2 - 80*a**3*b**7/x**(3/2) - 45*a*
*2*b**8/x - 20*a*b**9/sqrt(x) + 2*b**10*log(sqrt(x))
```

Mathematica [A] time = 0.103131, size = 130, normalized size = 1.

$$-\frac{a^{10}}{5x^5}-\frac{20a^9b}{9x^{9/2}}-\frac{45a^8b^2}{4x^4}-\frac{240a^7b^3}{7x^{7/2}}-\frac{70a^6b^4}{x^3}-\frac{504a^5b^5}{5x^{5/2}}-\frac{105a^4b^6}{x^2}-\frac{80a^3b^7}{x^{3/2}}-\frac{45a^2b^8}{x}-\frac{20ab^9}{\sqrt{x}}+b^{10}\log(x)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^10/x^6,x]
```

```
[Out] -a^10/(5*x^5) - (20*a^9*b)/(9*x^(9/2)) - (45*a^8*b^2)/(4*x^4) - (
240*a^7*b^3)/(7*x^(7/2)) - (70*a^6*b^4)/x^3 - (504*a^5*b^5)/(5*x^
(5/2)) - (105*a^4*b^6)/x^2 - (80*a^3*b^7)/x^(3/2) - (45*a^2*b^8)/
x - (20*a*b^9)/Sqrt[x] + b^10*Log[x]
```

Maple [A] time = 0.005, size = 111, normalized size = 0.9

$$-\frac{a^{10}}{5\,x^{5}}-\frac{20\,a^{9}b}{9}x^{-\frac{9}{2}}-\frac{45\,a^{8}b^{2}}{4\,x^{4}}-\frac{240\,a^{7}b^{3}}{7}x^{-\frac{7}{2}}-70\,\frac{a^{6}b^{4}}{x^{3}}-\frac{504\,a^{5}b^{5}}{5}x^{-\frac{5}{2}}-105\,\frac{a^{4}b^{6}}{x^{2}}-80\,\frac{a^{3}b^{7}}{x^{3/2}}-45\,\frac{a^{2}b^{8}}{x}+b^{10}\ln(x)-20\,\frac{ab^{9}}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^10/x^6,x)
```

```
[Out] -1/5*a^10/x^5-20/9*a^9*b/x^(9/2)-45/4*a^8*b^2/x^4-240/7*a^7*b^3/x
^(7/2)-70*a^6*b^4/x^3-504/5*a^5*b^5/x^(5/2)-105*a^4*b^6/x^2-80*a^
3*b^7/x^(3/2)-45*a^2*b^8/x+b^10*ln(x)-20*a*b^9/x^(1/2)
```

Maxima [A] time = 1.44136, size = 150, normalized size = 1.15

$$b^{10}\log(x)-\frac{25200\,ab^{9}x^{\frac{9}{2}}+56700\,a^{2}b^{8}x^{4}+100800\,a^{3}b^{7}x^{\frac{7}{2}}+132300\,a^{4}b^{6}x^{3}+127008\,a^{5}b^{5}x^{\frac{5}{2}}+88200\,a^{6}b^{4}x^{2}+43200\,a^{7}b^{3}x^{\frac{3}{2}}+14175\,a}{1260\,x^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10/x^6,x, algorithm="maxima")
```

```
[Out] b^10*log(x) - 1/1260*(25200*a*b^9*x^(9/2) + 56700*a^2*b^8*x^4 + 1
00800*a^3*b^7*x^(7/2) + 132300*a^4*b^6*x^3 + 127008*a^5*b^5*x^(5/
2) + 88200*a^6*b^4*x^2 + 43200*a^7*b^3*x^(3/2) + 14175*a^8*b^2*x
+ 2800*a^9*b*sqrt(x) + 252*a^10)/x^5
```

Fricas [A] time = 0.234721, size = 158, normalized size = 1.22

$$\frac{2520\,b^{10}x^{5}\log\left(\sqrt{x}\right)-56700\,a^{2}b^{8}x^{4}-132300\,a^{4}b^{6}x^{3}-88200\,a^{6}b^{4}x^{2}-14175\,a^{8}b^{2}x-252\,a^{10}-16\left(1575\,ab^{9}x^{4}+6300\,a^{3}b\right.}{1260\,x^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10/x^6,x, algorithm="fricas")
```

```
[Out] 1/1260*(2520*b^10*x^5*log(sqrt(x)) - 56700*a^2*b^8*x^4 - 132300*a
^4*b^6*x^3 - 88200*a^6*b^4*x^2 - 14175*a^8*b^2*x - 252*a^10 - 16*
(1575*a*b^9*x^4 + 6300*a^3*b^7*x^3 + 7938*a^5*b^5*x^2 + 2700*a^7*
b^3*x + 175*a^9*b)*sqrt(x))/x^5
```

Sympy [A] time = 8.84916, size = 131, normalized size = 1.01

$$-\frac{a^{10}}{5x^{5}}-\frac{20a^{9}b}{9x^{\frac{9}{2}}}-\frac{45a^{8}b^{2}}{4x^{4}}-\frac{240a^{7}b^{3}}{7x^{\frac{7}{2}}}-\frac{70a^{6}b^{4}}{x^{3}}-\frac{504a^{5}b^{5}}{5x^{\frac{5}{2}}}-\frac{105a^{4}b^{6}}{x^{2}}-\frac{80a^{3}b^{7}}{x^{\frac{3}{2}}}-\frac{45a^{2}b^{8}}{x}-\frac{20ab^{9}}{\sqrt{x}}+b^{10}\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**10/x**6,x)
```

```
[Out] -a**10/(5*x**5) - 20*a**9*b/(9*x**(9/2)) - 45*a**8*b**2/(4*x**4)
- 240*a**7*b**3/(7*x**(7/2)) - 70*a**6*b**4/x**3 - 504*a**5*b**5/
```

```
(5*x**(5/2)) - 105*a**4*b**6/x**2 - 80*a**3*b**7/x**(3/2) - 45*a*
*2*b**8/x - 20*a*b**9/sqrt(x) + b**10*log(x)
```

GIAC/XCAS [A] time = 0.219487, size = 151, normalized size = 1.16

$$b^{10}\ln(|x|) - \frac{25200\,ab^9x^{\frac{9}{2}} + 56700\,a^2b^8x^4 + 100800\,a^3b^7x^{\frac{7}{2}} + 132300\,a^4b^6x^3 + 127008\,a^5b^5x^{\frac{5}{2}} + 88200\,a^6b^4x^2 + 43200\,a^7b^3x^{\frac{3}{2}} + 14175\,a}{1260\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10/x^6,x, algorithm="giac")
```

```
[Out] b^10*ln(abs(x)) - 1/1260*(25200*a*b^9*x^(9/2) + 56700*a^2*b^8*x^4
 + 100800*a^3*b^7*x^(7/2) + 132300*a^4*b^6*x^3 + 127008*a^5*b^5*x
^(5/2) + 88200*a^6*b^4*x^2 + 43200*a^7*b^3*x^(3/2) + 14175*a^8*b^
2*x + 2800*a^9*b*sqrt(x) + 252*a^10)/x^5
```

3.2162 $\int \frac{(a+b\sqrt{x})^{10}}{x^7}\,dx$

Optimal. Leaf size=46

$$\frac{b\left(a+b\sqrt{x}\right)^{11}}{66a^2x^{11/2}}-\frac{\left(a+b\sqrt{x}\right)^{11}}{6ax^6}$$

```
[Out] -(a + b*Sqrt[x])^11/(6*a*x^6) + (b*(a + b*Sqrt[x])^11)/(66*a^2*x^
(11/2))
```

Rubi [A] time = 0.0517067, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{b\left(a+b\sqrt{x}\right)^{11}}{66a^2x^{11/2}}-\frac{\left(a+b\sqrt{x}\right)^{11}}{6ax^6}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^10/x^7,x]
```

```
[Out] -(a + b*Sqrt[x])^11/(6*a*x^6) + (b*(a + b*Sqrt[x])^11)/(66*a^2*x^
(11/2))
```

Rubi in Sympy [A] time = 5.77653, size = 37, normalized size = 0.8

$$-\frac{\left(a+b\sqrt{x}\right)^{11}}{6ax^6}+\frac{b\left(a+b\sqrt{x}\right)^{11}}{66a^2x^{\frac{11}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**10/x**7,x)
```

```
[Out] -(a + b*sqrt(x))**11/(6*a*x**6) + b*(a + b*sqrt(x))**11/(66*a**2*
x**(11/2))
```

Mathematica [B] time = 0.0357603, size = 124, normalized size = 2.7

$$-\frac{11a^{10}+120a^9b\sqrt{x}+594a^8b^2x+1760a^7b^3x^{3/2}+3465a^6b^4x^2+4752a^5b^5x^{5/2}+4620a^4b^6x^3+3168a^3b^7x^{7/2}+1485a^2b^8x^4 -}{66x^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^10/x^7,x]
```

```
[Out] -(11*a^10 + 120*a^9*b*Sqrt[x] + 594*a^8*b^2*x + 1760*a^7*b^3*x^(3
/2) + 3465*a^6*b^4*x^2 + 4752*a^5*b^5*x^(5/2) + 4620*a^4*b^6*x^3
+ 3168*a^3*b^7*x^(7/2) + 1485*a^2*b^8*x^4 + 440*a*b^9*x^(9/2) + 6
6*b^10*x^5)/(66*x^6)
```

Maple [B] time = 0.004, size = 113, normalized size = 2.5

$$-\frac{b^{10}}{x}-\frac{20\,ab^9}{3}x^{-\frac{3}{2}}-\frac{45\,a^2b^8}{2\,x^2}-48\,\frac{a^3b^7}{x^{5/2}}-70\,\frac{a^4b^6}{x^3}-72\,\frac{a^5b^5}{x^{7/2}}-\frac{105\,a^6b^4}{2\,x^4}-\frac{80\,a^7b^3}{3}x^{-\frac{9}{2}}-9\,\frac{a^8b^2}{x^5}-\frac{20\,a^9b}{11}x^{-\frac{11}{2}}-\frac{a^{10}}{6\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((a+b*x^(1/2))^10/x^7,x)
```

```
[Out] -b^10/x-20/3*a*b^9/x^(3/2)-45/2*a^2*b^8/x^2-48*a^3*b^7/x^(5/2)-70
*a^4*b^6/x^3-72*a^5*b^5/x^(7/2)-105/2*a^6*b^4/x^4-80/3*a^7*b^3/x^
(9/2)-9*a^8*b^2/x^5-20/11*a^9*b/x^(11/2)-1/6*a^10/x^6
```

Maxima [A] time = 1.43767, size = 151, normalized size = 3.28

$$-\frac{66\,b^{10}x^5 + 440\,ab^9x^{\frac{9}{2}} + 1485\,a^2b^8x^4 + 3168\,a^3b^7x^{\frac{7}{2}} + 4620\,a^4b^6x^3 + 4752\,a^5b^5x^{\frac{5}{2}} + 3465\,a^6b^4x^2 + 1760\,a^7b^3x^{\frac{3}{2}} + 594\,a^8b^2x}{66\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*sqrt(x) + a)^10/x^7,x, algorithm="maxima")
```

```
[Out] -1/66*(66*b^10*x^5 + 440*a*b^9*x^(9/2) + 1485*a^2*b^8*x^4 + 3168*
a^3*b^7*x^(7/2) + 4620*a^4*b^6*x^3 + 4752*a^5*b^5*x^(5/2) + 3465*
a^6*b^4*x^2 + 1760*a^7*b^3*x^(3/2) + 594*a^8*b^2*x + 120*a^9*b*sq
rt(x) + 11*a^10)/x^6
```

Fricas [A] time = 0.232941, size = 153, normalized size = 3.33

$$-\frac{66\,b^{10}x^5 + 1485\,a^2b^8x^4 + 4620\,a^4b^6x^3 + 3465\,a^6b^4x^2 + 594\,a^8b^2x + 11\,a^{10} + 8\left(55\,ab^9x^4 + 396\,a^3b^7x^3 + 594\,a^5b^5x^2 + 220\,a\right.}{66\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*sqrt(x) + a)^10/x^7,x, algorithm="fricas")
```

```
[Out] -1/66*(66*b^10*x^5 + 1485*a^2*b^8*x^4 + 4620*a^4*b^6*x^3 + 3465*a
^6*b^4*x^2 + 594*a^8*b^2*x + 11*a^10 + 8*(55*a*b^9*x^4 + 396*a^3*
b^7*x^3 + 594*a^5*b^5*x^2 + 220*a^7*b^3*x + 15*a^9*b)*sqrt(x))/x^
6
```

Sympy [A] time = 13.2353, size = 134, normalized size = 2.91

$$-\frac{a^{10}}{6x^6} - \frac{20a^9b}{11x^{\frac{11}{2}}} - \frac{9a^8b^2}{x^5} - \frac{80a^7b^3}{3x^{\frac{9}{2}}} - \frac{105a^6b^4}{2x^4} - \frac{72a^5b^5}{x^{\frac{7}{2}}} - \frac{70a^4b^6}{x^3} - \frac{48a^3b^7}{x^{\frac{5}{2}}} - \frac{45a^2b^8}{2x^2} - \frac{20ab^9}{3x^{\frac{3}{2}}} - \frac{b^{10}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a+b*x**(1/2))**10/x**7,x)
```

```
[Out] -a**10/(6*x**6) - 20*a**9*b/(11*x**(11/2)) - 9*a**8*b**2/x**5 - 8
0*a**7*b**3/(3*x**(9/2)) - 105*a**6*b**4/(2*x**4) - 72*a**5*b**5/
x**(7/2) - 70*a**4*b**6/x**3 - 48*a**3*b**7/x**(5/2) - 45*a**2*b*
*8/(2*x**2) - 20*a*b**9/(3*x**(3/2)) - b**10/x
```

GIAC/XCAS [A] time = 0.21934, size = 151, normalized size = 3.28

$$-\frac{66\,b^{10}x^5 + 440\,ab^9x^{\frac{9}{2}} + 1485\,a^2b^8x^4 + 3168\,a^3b^7x^{\frac{7}{2}} + 4620\,a^4b^6x^3 + 4752\,a^5b^5x^{\frac{5}{2}} + 3465\,a^6b^4x^2 + 1760\,a^7b^3x^{\frac{3}{2}} + 594\,a^8b^2x}{66\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10/x^7,x, algorithm="giac")
```

```
[Out] -1/66*(66*b^10*x^5 + 440*a*b^9*x^(9/2) + 1485*a^2*b^8*x^4 + 3168*
a^3*b^7*x^(7/2) + 4620*a^4*b^6*x^3 + 4752*a^5*b^5*x^(5/2) + 3465*
a^6*b^4*x^2 + 1760*a^7*b^3*x^(3/2) + 594*a^8*b^2*x + 120*a^9*b*sq
rt(x) + 11*a^10)/x^6
```

3.2163 $\int \frac{\left(a+b\sqrt{x}\right)^{10}}{x^8}\,dx$

Optimal. Leaf size=96

$$\frac{b^3\left(a+b\sqrt{x}\right)^{11}}{2002a^4x^{11/2}}-\frac{b^2\left(a+b\sqrt{x}\right)^{11}}{182a^3x^6}+\frac{3b\left(a+b\sqrt{x}\right)^{11}}{91a^2x^{13/2}}-\frac{\left(a+b\sqrt{x}\right)^{11}}{7ax^7}$$

```
[Out] -(a + b*Sqrt[x])^11/(7*a*x^7) + (3*b*(a + b*Sqrt[x])^11)/(91*a^2*
x^(13/2)) - (b^2*(a + b*Sqrt[x])^11)/(182*a^3*x^6) + (b^3*(a + b*
Sqrt[x])^11)/(2002*a^4*x^(11/2))
```

Rubi [A] time = 0.106826, antiderivative size = 96, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{b^3\left(a+b\sqrt{x}\right)^{11}}{2002a^4x^{11/2}}-\frac{b^2\left(a+b\sqrt{x}\right)^{11}}{182a^3x^6}+\frac{3b\left(a+b\sqrt{x}\right)^{11}}{91a^2x^{13/2}}-\frac{\left(a+b\sqrt{x}\right)^{11}}{7ax^7}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^10/x^8,x]
```

```
[Out] -(a + b*Sqrt[x])^11/(7*a*x^7) + (3*b*(a + b*Sqrt[x])^11)/(91*a^2*
x^(13/2)) - (b^2*(a + b*Sqrt[x])^11)/(182*a^3*x^6) + (b^3*(a + b*
Sqrt[x])^11)/(2002*a^4*x^(11/2))
```

Rubi in Sympy [A] time = 12.058, size = 85, normalized size = 0.89

$$-\frac{\left(a+b\sqrt{x}\right)^{11}}{7ax^7}+\frac{3b\left(a+b\sqrt{x}\right)^{11}}{91a^2x^{\frac{13}{2}}}-\frac{b^2\left(a+b\sqrt{x}\right)^{11}}{182a^3x^6}+\frac{b^3\left(a+b\sqrt{x}\right)^{11}}{2002a^4x^{\frac{11}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**10/x**8,x)
```

```
[Out] -(a + b*sqrt(x))**11/(7*a*x**7) + 3*b*(a + b*sqrt(x))**11/(91*a**
2*x**(13/2)) - b**2*(a + b*sqrt(x))**11/(182*a**3*x**6) + b**3*(a
 + b*sqrt(x))**11/(2002*a**4*x**(11/2))
```

Mathematica [A] time = 0.0444066, size = 124, normalized size = 1.29

$$-\frac{286a^{10}+3080a^9b\sqrt{x}+15015a^8b^2x+43680a^7b^3x^{3/2}+84084a^6b^4x^2+112112a^5b^5x^{5/2}+105105a^4b^6x^3+68640a^3b^7x^{7/2}+}{2002x^7}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^10/x^8,x]
```

```
[Out] -(286*a^10 + 3080*a^9*b*Sqrt[x] + 15015*a^8*b^2*x + 43680*a^7*b^3
*x^(3/2) + 84084*a^6*b^4*x^2 + 112112*a^5*b^5*x^(5/2) + 105105*a^
4*b^6*x^3 + 68640*a^3*b^7*x^(7/2) + 30030*a^2*b^8*x^4 + 8008*a*b^
9*x^(9/2) + 1001*b^10*x^5)/(2002*x^7)
```

Maple [A] time = 0.004, size = 113, normalized size = 1.2

$$-\frac{b^{10}}{2\,x^{2}}-4\,\frac{ab^{9}}{x^{5/2}}-15\,\frac{a^{2}b^{8}}{x^{3}}-\frac{240\,a^{3}b^{7}}{7}x^{-\frac{7}{2}}-\frac{105\,a^{4}b^{6}}{2\,x^{4}}-56\,\frac{a^{5}b^{5}}{x^{9/2}}-42\,\frac{a^{6}b^{4}}{x^{5}}-\frac{240\,a^{7}b^{3}}{11}x^{-\frac{11}{2}}-\frac{15\,a^{8}b^{2}}{2\,x^{6}}-\frac{20\,a^{9}b}{13}x^{-\frac{13}{2}}-\frac{a^{10}}{7\,x^{7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^10/x^8,x)
```

```
[Out] -1/2*b^10/x^2-4*a*b^9/x^(5/2)-15*a^2*b^8/x^3-240/7*a^3*b^7/x^(7/2
)-105/2*a^4*b^6/x^4-56*a^5*b^5/x^(9/2)-42*a^6*b^4/x^5-240/11*a^7*
b^3/x^(11/2)-15/2*a^8*b^2/x^6-20/13*a^9*b/x^(13/2)-1/7*a^10/x^7
```

Maxima [A] time = 1.44842, size = 151, normalized size = 1.57

$$-\frac{1001\,b^{10}x^{5}+8008\,ab^{9}x^{\frac{9}{2}}+30030\,a^{2}b^{8}x^{4}+68640\,a^{3}b^{7}x^{\frac{7}{2}}+105105\,a^{4}b^{6}x^{3}+112112\,a^{5}b^{5}x^{\frac{5}{2}}+84084\,a^{6}b^{4}x^{2}+43680\,a^{7}b^{3}x}{2002\,x^{7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10/x^8,x, algorithm="maxima")
```

```
[Out] -1/2002*(1001*b^10*x^5 + 8008*a*b^9*x^(9/2) + 30030*a^2*b^8*x^4 +
 68640*a^3*b^7*x^(7/2) + 105105*a^4*b^6*x^3 + 112112*a^5*b^5*x^(5
/2) + 84084*a^6*b^4*x^2 + 43680*a^7*b^3*x^(3/2) + 15015*a^8*b^2*x
 + 3080*a^9*b*sqrt(x) + 286*a^10)/x^7
```

Fricas [A] time = 0.234056, size = 153, normalized size = 1.59

$$-\frac{1001\,b^{10}x^{5}+30030\,a^{2}b^{8}x^{4}+105105\,a^{4}b^{6}x^{3}+84084\,a^{6}b^{4}x^{2}+15015\,a^{8}b^{2}x+286\,a^{10}+8\left(1001\,ab^{9}x^{4}+8580\,a^{3}b^{7}x^{3}+1401\right.}{2002\,x^{7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10/x^8,x, algorithm="fricas")
```

```
[Out] -1/2002*(1001*b^10*x^5 + 30030*a^2*b^8*x^4 + 105105*a^4*b^6*x^3 +
 84084*a^6*b^4*x^2 + 15015*a^8*b^2*x + 286*a^10 + 8*(1001*a*b^9*x
^4 + 8580*a^3*b^7*x^3 + 14014*a^5*b^5*x^2 + 5460*a^7*b^3*x + 385*
a^9*b)*sqrt(x))/x^7
```

Sympy [A] time = 18.4966, size = 138, normalized size = 1.44

$$-\frac{a^{10}}{7x^{7}}-\frac{20a^{9}b}{13x^{\frac{13}{2}}}-\frac{15a^{8}b^{2}}{2x^{6}}-\frac{240a^{7}b^{3}}{11x^{\frac{11}{2}}}-\frac{42a^{6}b^{4}}{x^{5}}-\frac{56a^{5}b^{5}}{x^{\frac{9}{2}}}-\frac{105a^{4}b^{6}}{2x^{4}}-\frac{240a^{3}b^{7}}{7x^{\frac{7}{2}}}-\frac{15a^{2}b^{8}}{x^{3}}-\frac{4ab^{9}}{x^{\frac{5}{2}}}-\frac{b^{10}}{2x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**10/x**8,x)
```

```
[Out] -a**10/(7*x**7) - 20*a**9*b/(13*x**(13/2)) - 15*a**8*b**2/(2*x**6
) - 240*a**7*b**3/(11*x**(11/2)) - 42*a**6*b**4/x**5 - 56*a**5*b*
*5/x**(9/2) - 105*a**4*b**6/(2*x**4) - 240*a**3*b**7/(7*x**(7/2))
 - 15*a**2*b**8/x**3 - 4*a*b**9/x**(5/2) - b**10/(2*x**2)
```

GIAC/XCAS [A] time = 0.216388, size = 151, normalized size = 1.57

$$-\frac{1001 \, b^{10} x^{5} + 8008 \, a b^{9} x^{\frac{9}{2}} + 30030 \, a^{2} b^{8} x^{4} + 68640 \, a^{3} b^{7} x^{\frac{7}{2}} + 105105 \, a^{4} b^{6} x^{3} + 112112 \, a^{5} b^{5} x^{\frac{5}{2}} + 84084 \, a^{6} b^{4} x^{2} + 43680 \, a^{7} b^{3} x}{2002 \, x^{7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10/x^8,x, algorithm="giac")
```

```
[Out] -1/2002*(1001*b^10*x^5 + 8008*a*b^9*x^(9/2) + 30030*a^2*b^8*x^4 +
 68640*a^3*b^7*x^(7/2) + 105105*a^4*b^6*x^3 + 112112*a^5*b^5*x^(5
/2) + 84084*a^6*b^4*x^2 + 43680*a^7*b^3*x^(3/2) + 15015*a^8*b^2*x
 + 3080*a^9*b*sqrt(x) + 286*a^10)/x^7
```

3.2164 $\int \frac{\left(a+b\sqrt{x}\right)^{10}}{x^9}\,dx$

Optimal. Leaf size=146

$$\frac{b^5\left(a+b\sqrt{x}\right)^{11}}{24024a^6x^{11/2}}-\frac{b^4\left(a+b\sqrt{x}\right)^{11}}{2184a^5x^6}+\frac{b^3\left(a+b\sqrt{x}\right)^{11}}{364a^4x^{13/2}}-\frac{b^2\left(a+b\sqrt{x}\right)^{11}}{84a^3x^7}+\frac{b\left(a+b\sqrt{x}\right)^{11}}{24a^2x^{15/2}}-\frac{\left(a+b\sqrt{x}\right)^{11}}{8ax^8}$$

```
[Out] -(a + b*Sqrt[x])^11/(8*a*x^8) + (b*(a + b*Sqrt[x])^11)/(24*a^2*x^
(15/2)) - (b^2*(a + b*Sqrt[x])^11)/(84*a^3*x^7) + (b^3*(a + b*Sqr
t[x])^11)/(364*a^4*x^(13/2)) - (b^4*(a + b*Sqrt[x])^11)/(2184*a^5
*x^6) + (b^5*(a + b*Sqrt[x])^11)/(24024*a^6*x^(11/2))
```

Rubi [A] time = 0.167422, antiderivative size = 146, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$\frac{b^5\left(a+b\sqrt{x}\right)^{11}}{24024a^6x^{11/2}}-\frac{b^4\left(a+b\sqrt{x}\right)^{11}}{2184a^5x^6}+\frac{b^3\left(a+b\sqrt{x}\right)^{11}}{364a^4x^{13/2}}-\frac{b^2\left(a+b\sqrt{x}\right)^{11}}{84a^3x^7}+\frac{b\left(a+b\sqrt{x}\right)^{11}}{24a^2x^{15/2}}-\frac{\left(a+b\sqrt{x}\right)^{11}}{8ax^8}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^10/x^9,x]
```

```
[Out] -(a + b*Sqrt[x])^11/(8*a*x^8) + (b*(a + b*Sqrt[x])^11)/(24*a^2*x^
(15/2)) - (b^2*(a + b*Sqrt[x])^11)/(84*a^3*x^7) + (b^3*(a + b*Sqr
t[x])^11)/(364*a^4*x^(13/2)) - (b^4*(a + b*Sqrt[x])^11)/(2184*a^5
*x^6) + (b^5*(a + b*Sqrt[x])^11)/(24024*a^6*x^(11/2))
```

Rubi in Sympy [A] time = 21.2961, size = 129, normalized size = 0.88

$$-\frac{\left(a+b\sqrt{x}\right)^{11}}{8ax^8}+\frac{b\left(a+b\sqrt{x}\right)^{11}}{24a^2x^{\frac{15}{2}}}-\frac{b^2\left(a+b\sqrt{x}\right)^{11}}{84a^3x^7}+\frac{b^3\left(a+b\sqrt{x}\right)^{11}}{364a^4x^{\frac{13}{2}}}-\frac{b^4\left(a+b\sqrt{x}\right)^{11}}{2184a^5x^6}+\frac{b^5\left(a+b\sqrt{x}\right)^{11}}{24024a^6x^{\frac{11}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**10/x**9,x)
```

```
[Out] -(a + b*sqrt(x))**11/(8*a*x**8) + b*(a + b*sqrt(x))**11/(24*a**2*
x**(15/2)) - b**2*(a + b*sqrt(x))**11/(84*a**3*x**7) + b**3*(a +
b*sqrt(x))**11/(364*a**4*x**(13/2)) - b**4*(a + b*sqrt(x))**11/(2
184*a**5*x**6) + b**5*(a + b*sqrt(x))**11/(24024*a**6*x**(11/2))
```

Mathematica [A] time = 0.0471329, size = 140, normalized size = 0.96

$$-\frac{a^{10}}{8x^8}-\frac{4a^9b}{3x^{15/2}}-\frac{45a^8b^2}{7x^7}-\frac{240a^7b^3}{13x^{13/2}}-\frac{35a^6b^4}{x^6}-\frac{504a^5b^5}{11x^{11/2}}-\frac{42a^4b^6}{x^5}-\frac{80a^3b^7}{3x^{9/2}}-\frac{45a^2b^8}{4x^4}-\frac{20ab^9}{7x^{7/2}}-\frac{b^{10}}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^10/x^9,x]
```

```
[Out] -a^10/(8*x^8) - (4*a^9*b)/(3*x^(15/2)) - (45*a^8*b^2)/(7*x^7) - (
240*a^7*b^3)/(13*x^(13/2)) - (35*a^6*b^4)/x^6 - (504*a^5*b^5)/(11
*x^(11/2)) - (42*a^4*b^6)/x^5 - (80*a^3*b^7)/(3*x^(9/2)) - (45*a^
2*b^8)/(4*x^4) - (20*a*b^9)/(7*x^(7/2)) - b^10/(3*x^3)
```

Maple [A] time = 0.004, size = 113, normalized size = 0.8

$$-\frac{b^{10}}{3\,x^{3}}-\frac{20\,ab^{9}}{7}x^{-\frac{7}{2}}-\frac{45\,a^{2}b^{8}}{4\,x^{4}}-\frac{80\,a^{3}b^{7}}{3}x^{-\frac{9}{2}}-42\,\frac{a^{4}b^{6}}{x^{5}}-\frac{504\,a^{5}b^{5}}{11}x^{-\frac{11}{2}}-35\,\frac{a^{6}b^{4}}{x^{6}}-\frac{240\,a^{7}b^{3}}{13}x^{-\frac{13}{2}}-\frac{45\,a^{8}b^{2}}{7\,x^{7}}-\frac{4\,a^{9}b}{3}x^{-\frac{15}{2}}-\frac{a^{10}}{8\,x^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^10/x^9,x)
```

```
[Out] -1/3*b^10/x^3-20/7*a*b^9/x^(7/2)-45/4*a^2*b^8/x^4-80/3*a^3*b^7/x^
(9/2)-42*a^4*b^6/x^5-504/11*a^5*b^5/x^(11/2)-35*a^6*b^4/x^6-240/1
3*a^7*b^3/x^(13/2)-45/7*a^8*b^2/x^7-4/3*a^9*b/x^(15/2)-1/8*a^10/x
^8
```

Maxima [A] time = 1.44034, size = 151, normalized size = 1.03

$$-\frac{8008\,b^{10}x^{5}+68640\,ab^{9}x^{\frac{9}{2}}+270270\,a^{2}b^{8}x^{4}+640640\,a^{3}b^{7}x^{\frac{7}{2}}+1009008\,a^{4}b^{6}x^{3}+1100736\,a^{5}b^{5}x^{\frac{5}{2}}+840840\,a^{6}b^{4}x^{2}+44352}{24024\,x^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10/x^9,x, algorithm="maxima")
```

```
[Out] -1/24024*(8008*b^10*x^5 + 68640*a*b^9*x^(9/2) + 270270*a^2*b^8*x^
4 + 640640*a^3*b^7*x^(7/2) + 1009008*a^4*b^6*x^3 + 1100736*a^5*b^
5*x^(5/2) + 840840*a^6*b^4*x^2 + 443520*a^7*b^3*x^(3/2) + 154440*
a^8*b^2*x + 32032*a^9*b*sqrt(x) + 3003*a^10)/x^8
```

Fricas [A] time = 0.239221, size = 153, normalized size = 1.05

$$-\frac{8008\,b^{10}x^{5}+270270\,a^{2}b^{8}x^{4}+1009008\,a^{4}b^{6}x^{3}+840840\,a^{6}b^{4}x^{2}+154440\,a^{8}b^{2}x+3003\,a^{10}+32\left(2145\,ab^{9}x^{4}+20020\,a^{3}b^{7}x\right.}{24024\,x^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10/x^9,x, algorithm="fricas")
```

```
[Out] -1/24024*(8008*b^10*x^5 + 270270*a^2*b^8*x^4 + 1009008*a^4*b^6*x^
3 + 840840*a^6*b^4*x^2 + 154440*a^8*b^2*x + 3003*a^10 + 32*(2145*
a*b^9*x^4 + 20020*a^3*b^7*x^3 + 34398*a^5*b^5*x^2 + 13860*a^7*b^3
*x + 1001*a^9*b)*sqrt(x))/x^8
```

Sympy [A] time = 26.5444, size = 141, normalized size = 0.97

$$-\frac{a^{10}}{8x^{8}}-\frac{4a^{9}b}{3x^{\frac{15}{2}}}-\frac{45a^{8}b^{2}}{7x^{7}}-\frac{240a^{7}b^{3}}{13x^{\frac{13}{2}}}-\frac{35a^{6}b^{4}}{x^{6}}-\frac{504a^{5}b^{5}}{11x^{\frac{11}{2}}}-\frac{42a^{4}b^{6}}{x^{5}}-\frac{80a^{3}b^{7}}{3x^{\frac{9}{2}}}-\frac{45a^{2}b^{8}}{4x^{4}}-\frac{20ab^{9}}{7x^{\frac{7}{2}}}-\frac{b^{10}}{3x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**10/x**9,x)
```

```
[Out] -a**10/(8*x**8) - 4*a**9*b/(3*x**(15/2)) - 45*a**8*b**2/(7*x**7)
- 240*a**7*b**3/(13*x**(13/2)) - 35*a**6*b**4/x**6 - 504*a**5*b**
5/(11*x**(11/2)) - 42*a**4*b**6/x**5 - 80*a**3*b**7/(3*x**(9/2))
- 45*a**2*b**8/(4*x**4) - 20*a*b**9/(7*x**(7/2)) - b**10/(3*x**3)
```

GIAC/XCAS [A] time = 0.221215, size = 151, normalized size = 1.03

$$-\frac{8008\,b^{10}x^5 + 68640\,ab^9x^{\frac{9}{2}} + 270270\,a^2b^8x^4 + 640640\,a^3b^7x^{\frac{7}{2}} + 1009008\,a^4b^6x^3 + 1100736\,a^5b^5x^{\frac{5}{2}} + 840840\,a^6b^4x^2 + 44352}{24024\,x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10/x^9,x, algorithm="giac")
```

```
[Out] -1/24024*(8008*b^10*x^5 + 68640*a*b^9*x^(9/2) + 270270*a^2*b^8*x^
4 + 640640*a^3*b^7*x^(7/2) + 1009008*a^4*b^6*x^3 + 1100736*a^5*b^
5*x^(5/2) + 840840*a^6*b^4*x^2 + 443520*a^7*b^3*x^(3/2) + 154440*
a^8*b^2*x + 32032*a^9*b*sqrt(x) + 3003*a^10)/x^8
```

3.2165 $\int \frac{\left(a+b\sqrt{x}\right)^{10}}{x^{10}}\,dx$

Optimal. Leaf size=136

$$-\frac{a^{10}}{9x^9}-\frac{20a^9b}{17x^{17/2}}-\frac{45a^8b^2}{8x^8}-\frac{16a^7b^3}{x^{15/2}}-\frac{30a^6b^4}{x^7}-\frac{504a^5b^5}{13x^{13/2}}-\frac{35a^4b^6}{x^6}-\frac{240a^3b^7}{11x^{11/2}}-\frac{9a^2b^8}{x^5}-\frac{20ab^9}{9x^{9/2}}-\frac{b^{10}}{4x^4}$$

```
[Out] -a^10/(9*x^9) - (20*a^9*b)/(17*x^(17/2)) - (45*a^8*b^2)/(8*x^8) -
 (16*a^7*b^3)/x^(15/2) - (30*a^6*b^4)/x^7 - (504*a^5*b^5)/(13*x^(
13/2)) - (35*a^4*b^6)/x^6 - (240*a^3*b^7)/(11*x^(11/2)) - (9*a^2*
b^8)/x^5 - (20*a*b^9)/(9*x^(9/2)) - b^10/(4*x^4)
```

Rubi [A] time = 0.183106, antiderivative size = 136, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^{10}}{9x^9}-\frac{20a^9b}{17x^{17/2}}-\frac{45a^8b^2}{8x^8}-\frac{16a^7b^3}{x^{15/2}}-\frac{30a^6b^4}{x^7}-\frac{504a^5b^5}{13x^{13/2}}-\frac{35a^4b^6}{x^6}-\frac{240a^3b^7}{11x^{11/2}}-\frac{9a^2b^8}{x^5}-\frac{20ab^9}{9x^{9/2}}-\frac{b^{10}}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^10/x^10,x]
```

```
[Out] -a^10/(9*x^9) - (20*a^9*b)/(17*x^(17/2)) - (45*a^8*b^2)/(8*x^8) -
 (16*a^7*b^3)/x^(15/2) - (30*a^6*b^4)/x^7 - (504*a^5*b^5)/(13*x^(
13/2)) - (35*a^4*b^6)/x^6 - (240*a^3*b^7)/(11*x^(11/2)) - (9*a^2*
b^8)/x^5 - (20*a*b^9)/(9*x^(9/2)) - b^10/(4*x^4)
```

Rubi in Sympy [A] time = 31.1101, size = 138, normalized size = 1.01

$$-\frac{a^{10}}{9x^9}-\frac{20a^9b}{17x^{\frac{17}{2}}}-\frac{45a^8b^2}{8x^8}-\frac{16a^7b^3}{x^{\frac{15}{2}}}-\frac{30a^6b^4}{x^7}-\frac{504a^5b^5}{13x^{\frac{13}{2}}}-\frac{35a^4b^6}{x^6}-\frac{240a^3b^7}{11x^{\frac{11}{2}}}-\frac{9a^2b^8}{x^5}-\frac{20ab^9}{9x^{\frac{9}{2}}}-\frac{b^{10}}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**10/x**10,x)
```

```
[Out] -a**10/(9*x**9) - 20*a**9*b/(17*x**(17/2)) - 45*a**8*b**2/(8*x**8
) - 16*a**7*b**3/x**(15/2) - 30*a**6*b**4/x**7 - 504*a**5*b**5/(1
3*x**(13/2)) - 35*a**4*b**6/x**6 - 240*a**3*b**7/(11*x**(11/2)) -
 9*a**2*b**8/x**5 - 20*a*b**9/(9*x**(9/2)) - b**10/(4*x**4)
```

Mathematica [A] time = 0.0442389, size = 136, normalized size = 1.

$$-\frac{a^{10}}{9x^9}-\frac{20a^9b}{17x^{17/2}}-\frac{45a^8b^2}{8x^8}-\frac{16a^7b^3}{x^{15/2}}-\frac{30a^6b^4}{x^7}-\frac{504a^5b^5}{13x^{13/2}}-\frac{35a^4b^6}{x^6}-\frac{240a^3b^7}{11x^{11/2}}-\frac{9a^2b^8}{x^5}-\frac{20ab^9}{9x^{9/2}}-\frac{b^{10}}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^10/x^10,x]
```

```
[Out] -a^10/(9*x^9) - (20*a^9*b)/(17*x^(17/2)) - (45*a^8*b^2)/(8*x^8) -
 (16*a^7*b^3)/x^(15/2) - (30*a^6*b^4)/x^7 - (504*a^5*b^5)/(13*x^(
13/2)) - (35*a^4*b^6)/x^6 - (240*a^3*b^7)/(11*x^(11/2)) - (9*a^2*
b^8)/x^5 - (20*a*b^9)/(9*x^(9/2)) - b^10/(4*x^4)
```

Maple [A] time = 0.005, size = 113, normalized size = 0.8

$$-\frac{a^{10}}{9\,x^{9}}-\frac{20\,a^{9}b}{17}x^{-\frac{17}{2}}-\frac{45\,a^{8}b^{2}}{8\,x^{8}}-16\,\frac{a^{7}b^{3}}{x^{15/2}}-30\,\frac{a^{6}b^{4}}{x^{7}}-\frac{504\,a^{5}b^{5}}{13}x^{-\frac{13}{2}}-35\,\frac{a^{4}b^{6}}{x^{6}}-\frac{240\,a^{3}b^{7}}{11}x^{-\frac{11}{2}}-9\,\frac{a^{2}b^{8}}{x^{5}}-\frac{20\,ab^{9}}{9}x^{-\frac{9}{2}}-\frac{b^{10}}{4\,x^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^10/x^10,x)
```

```
[Out] -1/9*a^10/x^9-20/17*a^9*b/x^(17/2)-45/8*a^8*b^2/x^8-16*a^7*b^3/x^
(15/2)-30*a^6*b^4/x^7-504/13*a^5*b^5/x^(13/2)-35*a^4*b^6/x^6-240/
11*a^3*b^7/x^(11/2)-9*a^2*b^8/x^5-20/9*a*b^9/x^(9/2)-1/4*b^10/x^4
```

Maxima [A] time = 1.43757, size = 151, normalized size = 1.11

$$-\frac{43758\,b^{10}x^{5}+388960\,ab^{9}x^{\frac{9}{2}}+1575288\,a^{2}b^{8}x^{4}+3818880\,a^{3}b^{7}x^{\frac{7}{2}}+6126120\,a^{4}b^{6}x^{3}+6785856\,a^{5}b^{5}x^{\frac{5}{2}}+5250960\,a^{6}b^{4}x^{2}+}{175032\,x^{9}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10/x^10,x, algorithm="maxima")
```

```
[Out] -1/175032*(43758*b^10*x^5 + 388960*a*b^9*x^(9/2) + 1575288*a^2*b^
8*x^4 + 3818880*a^3*b^7*x^(7/2) + 6126120*a^4*b^6*x^3 + 6785856*a
^5*b^5*x^(5/2) + 5250960*a^6*b^4*x^2 + 2800512*a^7*b^3*x^(3/2) +
984555*a^8*b^2*x + 205920*a^9*b*sqrt(x) + 19448*a^10)/x^9
```

Fricas [A] time = 0.242507, size = 153, normalized size = 1.12

$$-\frac{43758\,b^{10}x^{5}+1575288\,a^{2}b^{8}x^{4}+6126120\,a^{4}b^{6}x^{3}+5250960\,a^{6}b^{4}x^{2}+984555\,a^{8}b^{2}x+19448\,a^{10}+32\,\left(12155\,ab^{9}x^{4}+11934\right.}{175032\,x^{9}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10/x^10,x, algorithm="fricas")
```

```
[Out] -1/175032*(43758*b^10*x^5 + 1575288*a^2*b^8*x^4 + 6126120*a^4*b^6
*x^3 + 5250960*a^6*b^4*x^2 + 984555*a^8*b^2*x + 19448*a^10 + 32*(
12155*a*b^9*x^4 + 119340*a^3*b^7*x^3 + 212058*a^5*b^5*x^2 + 87516
*a^7*b^3*x + 6435*a^9*b)*sqrt(x))/x^9
```

Sympy [A] time = 36.7752, size = 138, normalized size = 1.01

$$-\frac{a^{10}}{9x^{9}}-\frac{20a^{9}b}{17x^{\frac{17}{2}}}-\frac{45a^{8}b^{2}}{8x^{8}}-\frac{16a^{7}b^{3}}{x^{\frac{15}{2}}}-\frac{30a^{6}b^{4}}{x^{7}}-\frac{504a^{5}b^{5}}{13x^{\frac{13}{2}}}-\frac{35a^{4}b^{6}}{x^{6}}-\frac{240a^{3}b^{7}}{11x^{\frac{11}{2}}}-\frac{9a^{2}b^{8}}{x^{5}}-\frac{20ab^{9}}{9x^{\frac{9}{2}}}-\frac{b^{10}}{4x^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**10/x**10,x)
```

```
[Out] -a**10/(9*x**9) - 20*a**9*b/(17*x**(17/2)) - 45*a**8*b**2/(8*x**8
) - 16*a**7*b**3/x**(15/2) - 30*a**6*b**4/x**7 - 504*a**5*b**5/(1
3*x**(13/2)) - 35*a**4*b**6/x**6 - 240*a**3*b**7/(11*x**(11/2)) -
 9*a**2*b**8/x**5 - 20*a*b**9/(9*x**(9/2)) - b**10/(4*x**4)
```

GIAC/XCAS [A] time = 0.218031, size = 151, normalized size = 1.11

$$-\frac{43758\,b^{10}x^5 + 388960\,ab^9x^{\frac{9}{2}} + 1575288\,a^2b^8x^4 + 3818880\,a^3b^7x^{\frac{7}{2}} + 6126120\,a^4b^6x^3 + 6785856\,a^5b^5x^{\frac{5}{2}} + 5250960\,a^6b^4x^2 + \cdots}{175032\,x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10/x^10,x, algorithm="giac")
```

```
[Out] -1/175032*(43758*b^10*x^5 + 388960*a*b^9*x^(9/2) + 1575288*a^2*b^
8*x^4 + 3818880*a^3*b^7*x^(7/2) + 6126120*a^4*b^6*x^3 + 6785856*a
^5*b^5*x^(5/2) + 5250960*a^6*b^4*x^2 + 2800512*a^7*b^3*x^(3/2) +
984555*a^8*b^2*x + 205920*a^9*b*sqrt(x) + 19448*a^10)/x^9
```

3.2166 $\int \frac{\left(a+b\sqrt{x}\right)^{10}}{x^{11}}\,dx$

Optimal. Leaf size=140

$$-\frac{a^{10}}{10x^{10}}-\frac{20a^9b}{19x^{19/2}}-\frac{5a^8b^2}{x^9}-\frac{240a^7b^3}{17x^{17/2}}-\frac{105a^6b^4}{4x^8}-\frac{168a^5b^5}{5x^{15/2}}-\frac{30a^4b^6}{x^7}-\frac{240a^3b^7}{13x^{13/2}}-\frac{15a^2b^8}{2x^6}-\frac{20ab^9}{11x^{11/2}}-\frac{b^{10}}{5x^5}$$

```
[Out] -a^10/(10*x^10) - (20*a^9*b)/(19*x^(19/2)) - (5*a^8*b^2)/x^9 - (2
40*a^7*b^3)/(17*x^(17/2)) - (105*a^6*b^4)/(4*x^8) - (168*a^5*b^5)
/(5*x^(15/2)) - (30*a^4*b^6)/x^7 - (240*a^3*b^7)/(13*x^(13/2)) -
(15*a^2*b^8)/(2*x^6) - (20*a*b^9)/(11*x^(11/2)) - b^10/(5*x^5)
```

Rubi [A] time = 0.180849, antiderivative size = 140, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^{10}}{10x^{10}}-\frac{20a^9b}{19x^{19/2}}-\frac{5a^8b^2}{x^9}-\frac{240a^7b^3}{17x^{17/2}}-\frac{105a^6b^4}{4x^8}-\frac{168a^5b^5}{5x^{15/2}}-\frac{30a^4b^6}{x^7}-\frac{240a^3b^7}{13x^{13/2}}-\frac{15a^2b^8}{2x^6}-\frac{20ab^9}{11x^{11/2}}-\frac{b^{10}}{5x^5}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^10/x^11,x]
```

```
[Out] -a^10/(10*x^10) - (20*a^9*b)/(19*x^(19/2)) - (5*a^8*b^2)/x^9 - (2
40*a^7*b^3)/(17*x^(17/2)) - (105*a^6*b^4)/(4*x^8) - (168*a^5*b^5)
/(5*x^(15/2)) - (30*a^4*b^6)/x^7 - (240*a^3*b^7)/(13*x^(13/2)) -
(15*a^2*b^8)/(2*x^6) - (20*a*b^9)/(11*x^(11/2)) - b^10/(5*x^5)
```

Rubi in Sympy [A] time = 31.0817, size = 141, normalized size = 1.01

$$-\frac{a^{10}}{10x^{10}}-\frac{20a^9b}{19x^{\frac{19}{2}}}-\frac{5a^8b^2}{x^9}-\frac{240a^7b^3}{17x^{\frac{17}{2}}}-\frac{105a^6b^4}{4x^8}-\frac{168a^5b^5}{5x^{\frac{15}{2}}}-\frac{30a^4b^6}{x^7}-\frac{240a^3b^7}{13x^{\frac{13}{2}}}-\frac{15a^2b^8}{2x^6}-\frac{20ab^9}{11x^{\frac{11}{2}}}-\frac{b^{10}}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**10/x**11,x)
```

```
[Out] -a**10/(10*x**10) - 20*a**9*b/(19*x**(19/2)) - 5*a**8*b**2/x**9 -
 240*a**7*b**3/(17*x**(17/2)) - 105*a**6*b**4/(4*x**8) - 168*a**5
*b**5/(5*x**(15/2)) - 30*a**4*b**6/x**7 - 240*a**3*b**7/(13*x**(1
3/2)) - 15*a**2*b**8/(2*x**6) - 20*a*b**9/(11*x**(11/2)) - b**10/
(5*x**5)
```

Mathematica [A] time = 0.0459384, size = 140, normalized size = 1.

$$-\frac{a^{10}}{10x^{10}}-\frac{20a^9b}{19x^{19/2}}-\frac{5a^8b^2}{x^9}-\frac{240a^7b^3}{17x^{17/2}}-\frac{105a^6b^4}{4x^8}-\frac{168a^5b^5}{5x^{15/2}}-\frac{30a^4b^6}{x^7}-\frac{240a^3b^7}{13x^{13/2}}-\frac{15a^2b^8}{2x^6}-\frac{20ab^9}{11x^{11/2}}-\frac{b^{10}}{5x^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^10/x^11,x]
```

```
[Out] -a^10/(10*x^10) - (20*a^9*b)/(19*x^(19/2)) - (5*a^8*b^2)/x^9 - (2
40*a^7*b^3)/(17*x^(17/2)) - (105*a^6*b^4)/(4*x^8) - (168*a^5*b^5)
/(5*x^(15/2)) - (30*a^4*b^6)/x^7 - (240*a^3*b^7)/(13*x^(13/2)) -
(15*a^2*b^8)/(2*x^6) - (20*a*b^9)/(11*x^(11/2)) - b^10/(5*x^5)
```

Maple [A] time = 0.004, size = 113, normalized size = 0.8

$$-\frac{a^{10}}{10\,x^{10}}-\frac{20\,a^{9}b}{19}x^{-\frac{19}{2}}-5\,\frac{a^{8}b^{2}}{x^{9}}-\frac{240\,a^{7}b^{3}}{17}x^{-\frac{17}{2}}-\frac{105\,a^{6}b^{4}}{4\,x^{8}}-\frac{168\,a^{5}b^{5}}{5}x^{-\frac{15}{2}}-30\,\frac{a^{4}b^{6}}{x^{7}}-\frac{240\,a^{3}b^{7}}{13}x^{-\frac{13}{2}}-\frac{15\,a^{2}b^{8}}{2\,x^{6}}-\frac{20\,ab^{9}}{11}x^{-\frac{11}{2}}-\frac{b^{10}}{5\,x^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^10/x^11,x)
```

```
[Out] -1/10*a^10/x^10-20/19*a^9*b/x^(19/2)-5*a^8*b^2/x^9-240/17*a^7*b^3
/x^(17/2)-105/4*a^6*b^4/x^8-168/5*a^5*b^5/x^(15/2)-30*a^4*b^6/x^7
-240/13*a^3*b^7/x^(13/2)-15/2*a^2*b^8/x^6-20/11*a*b^9/x^(11/2)-1/
5*b^10/x^5
```

Maxima [A] time = 1.44395, size = 151, normalized size = 1.08

$$-\frac{184756\,b^{10}x^{5}+1679600\,ab^{9}x^{\frac{9}{2}}+6928350\,a^{2}b^{8}x^{4}+17054400\,a^{3}b^{7}x^{\frac{7}{2}}+27713400\,a^{4}b^{6}x^{3}+31039008\,a^{5}b^{5}x^{\frac{5}{2}}+24249225\,a^{6}}{923780\,x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10/x^11,x, algorithm="maxima")
```

```
[Out] -1/923780*(184756*b^10*x^5 + 1679600*a*b^9*x^(9/2) + 6928350*a^2*
b^8*x^4 + 17054400*a^3*b^7*x^(7/2) + 27713400*a^4*b^6*x^3 + 31039
008*a^5*b^5*x^(5/2) + 24249225*a^6*b^4*x^2 + 13041600*a^7*b^3*x^(
3/2) + 4618900*a^8*b^2*x + 972400*a^9*b*sqrt(x) + 92378*a^10)/x^1
0
```

Fricas [A] time = 0.240329, size = 153, normalized size = 1.09

$$-\frac{184756\,b^{10}x^{5}+6928350\,a^{2}b^{8}x^{4}+27713400\,a^{4}b^{6}x^{3}+24249225\,a^{6}b^{4}x^{2}+4618900\,a^{8}b^{2}x+92378\,a^{10}+16\left(104975\,ab^{9}x^{4}+\right.}{923780\,x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10/x^11,x, algorithm="fricas")
```

```
[Out] -1/923780*(184756*b^10*x^5 + 6928350*a^2*b^8*x^4 + 27713400*a^4*b
^6*x^3 + 24249225*a^6*b^4*x^2 + 4618900*a^8*b^2*x + 92378*a^10 +
16*(104975*a*b^9*x^4 + 1065900*a^3*b^7*x^3 + 1939938*a^5*b^5*x^2
+ 815100*a^7*b^3*x + 60775*a^9*b)*sqrt(x))/x^10
```

Sympy [A] time = 45.3544, size = 141, normalized size = 1.01

$$-\frac{a^{10}}{10x^{10}}-\frac{20a^{9}b}{19x^{\frac{19}{2}}}-\frac{5a^{8}b^{2}}{x^{9}}-\frac{240a^{7}b^{3}}{17x^{\frac{17}{2}}}-\frac{105a^{6}b^{4}}{4x^{8}}-\frac{168a^{5}b^{5}}{5x^{\frac{15}{2}}}-\frac{30a^{4}b^{6}}{x^{7}}-\frac{240a^{3}b^{7}}{13x^{\frac{13}{2}}}-\frac{15a^{2}b^{8}}{2x^{6}}-\frac{20ab^{9}}{11x^{\frac{11}{2}}}-\frac{b^{10}}{5x^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**10/x**11,x)
```

```
[Out] -a**10/(10*x**10) - 20*a**9*b/(19*x**(19/2)) - 5*a**8*b**2/x**9 -
 240*a**7*b**3/(17*x**(17/2)) - 105*a**6*b**4/(4*x**8) - 168*a**5
*b**5/(5*x**(15/2)) - 30*a**4*b**6/x**7 - 240*a**3*b**7/(13*x**(1
```

```
3/2)) - 15*a**2*b**8/(2*x**6) - 20*a*b**9/(11*x**(11/2)) - b**10/
(5*x**5)
```

GIAC/XCAS [A] time = 0.223112, size = 151, normalized size = 1.08

$$-\frac{184756\,b^{10}x^{5} + 1679600\,ab^{9}x^{\frac{9}{2}} + 6928350\,a^{2}b^{8}x^{4} + 17054400\,a^{3}b^{7}x^{\frac{7}{2}} + 27713400\,a^{4}b^{6}x^{3} + 31039008\,a^{5}b^{5}x^{\frac{5}{2}} + 24249225\,a^{6}}{923780\,x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^10/x^11,x, algorithm="giac")
```

```
[Out] -1/923780*(184756*b^10*x^5 + 1679600*a*b^9*x^(9/2) + 6928350*a^2*
b^8*x^4 + 17054400*a^3*b^7*x^(7/2) + 27713400*a^4*b^6*x^3 + 31039
008*a^5*b^5*x^(5/2) + 24249225*a^6*b^4*x^2 + 13041600*a^7*b^3*x^(
3/2) + 4618900*a^8*b^2*x + 972400*a^9*b*sqrt(x) + 92378*a^10)/x^1
0
```

3.2167 $\int \left(a+b\sqrt{x}\right)^{15} x^5\,dx$

Optimal. Leaf size=242

$$-\frac{a^{11}\left(a+b\sqrt{x}\right)^{16}}{8b^{12}}+\frac{22a^{10}\left(a+b\sqrt{x}\right)^{17}}{17b^{12}}-\frac{55a^9\left(a+b\sqrt{x}\right)^{18}}{9b^{12}}+\frac{330a^8\left(a+b\sqrt{x}\right)^{19}}{19b^{12}}-\frac{33a^7\left(a+b\sqrt{x}\right)^{20}}{b^{12}}+\frac{44a^6\left(a+b\sqrt{x}\right)^{21}}{b^{12}}-\frac{42a^5\left(a+b\sqrt{x}\right)^{22}}{b^{12}}+\frac{660a^4\left(a+b\sqrt{x}\right)^{23}}{23b^{12}}-\frac{55a^3\left(a+b\sqrt{x}\right)^{24}}{4b^{12}}+\frac{22a^2\left(a+b\sqrt{x}\right)^{25}}{5b^{12}}+\frac{2\left(a+b\sqrt{x}\right)^{27}}{27b^{12}}-\frac{11a\left(a+b\sqrt{x}\right)^{26}}{13b^{12}}$$

```
[Out] -(a^11*(a + b*Sqrt[x])^16)/(8*b^12) + (22*a^10*(a + b*Sqrt[x])^17
)/(17*b^12) - (55*a^9*(a + b*Sqrt[x])^18)/(9*b^12) + (330*a^8*(a
+ b*Sqrt[x])^19)/(19*b^12) - (33*a^7*(a + b*Sqrt[x])^20)/b^12 + (
44*a^6*(a + b*Sqrt[x])^21)/b^12 - (42*a^5*(a + b*Sqrt[x])^22)/b^1
2 + (660*a^4*(a + b*Sqrt[x])^23)/(23*b^12) - (55*a^3*(a + b*Sqrt[
x])^24)/(4*b^12) + (22*a^2*(a + b*Sqrt[x])^25)/(5*b^12) - (11*a*(
a + b*Sqrt[x])^26)/(13*b^12) + (2*(a + b*Sqrt[x])^27)/(27*b^12)
```

Rubi [A] time = 0.368772, antiderivative size = 242, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^{11}\left(a+b\sqrt{x}\right)^{16}}{8b^{12}}+\frac{22a^{10}\left(a+b\sqrt{x}\right)^{17}}{17b^{12}}-\frac{55a^9\left(a+b\sqrt{x}\right)^{18}}{9b^{12}}+\frac{330a^8\left(a+b\sqrt{x}\right)^{19}}{19b^{12}}-\frac{33a^7\left(a+b\sqrt{x}\right)^{20}}{b^{12}}+\frac{44a^6\left(a+b\sqrt{x}\right)^{21}}{b^{12}}-\frac{42a^5\left(a+b\sqrt{x}\right)^{22}}{b^{12}}+\frac{660a^4\left(a+b\sqrt{x}\right)^{23}}{23b^{12}}-\frac{55a^3\left(a+b\sqrt{x}\right)^{24}}{4b^{12}}+\frac{22a^2\left(a+b\sqrt{x}\right)^{25}}{5b^{12}}+\frac{2\left(a+b\sqrt{x}\right)^{27}}{27b^{12}}-\frac{11a\left(a+b\sqrt{x}\right)^{26}}{13b^{12}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^15*x^5,x]
```

```
[Out] -(a^11*(a + b*Sqrt[x])^16)/(8*b^12) + (22*a^10*(a + b*Sqrt[x])^17
)/(17*b^12) - (55*a^9*(a + b*Sqrt[x])^18)/(9*b^12) + (330*a^8*(a
+ b*Sqrt[x])^19)/(19*b^12) - (33*a^7*(a + b*Sqrt[x])^20)/b^12 + (
44*a^6*(a + b*Sqrt[x])^21)/b^12 - (42*a^5*(a + b*Sqrt[x])^22)/b^1
2 + (660*a^4*(a + b*Sqrt[x])^23)/(23*b^12) - (55*a^3*(a + b*Sqrt[
x])^24)/(4*b^12) + (22*a^2*(a + b*Sqrt[x])^25)/(5*b^12) - (11*a*(
a + b*Sqrt[x])^26)/(13*b^12) + (2*(a + b*Sqrt[x])^27)/(27*b^12)
```

Rubi in Sympy [A] time = 59.0177, size = 214, normalized size = 0.88

$$\frac{a^{15}x^6}{6}+\frac{30a^{14}bx^{\frac{13}{2}}}{13}+15a^{13}b^2x^7+\frac{182a^{12}b^3x^{\frac{15}{2}}}{3}+\frac{1365a^{11}b^4x^8}{8}+\frac{6006a^{10}b^5x^{\frac{17}{2}}}{17}+\frac{5005a^9b^6x^9}{9}+\frac{12870a^8b^7x^{\frac{19}{2}}}{19}+\frac{1287a^7b^8x^{10}}{2}+\frac{1430a^6b^9x^{\frac{21}{2}}}{3}+273a^5b^{10}x^{11}+\frac{2730a^4b^{11}x^{\frac{23}{2}}}{23}+\frac{455a^3b^{12}x^{12}}{12}+\frac{42a^2b^{13}x^{\frac{25}{2}}}{5}+\frac{15ab^{14}x^{13}}{13}+\frac{2b^{15}x^{\frac{27}{2}}}{27}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5*(a+b*x**(1/2))**15,x)
```

```
[Out] a**15*x**6/6 + 30*a**14*b*x**(13/2)/13 + 15*a**13*b**2*x**7 + 182
*a**12*b**3*x**(15/2)/3 + 1365*a**11*b**4*x**8/8 + 6006*a**10*b**
5*x**(17/2)/17 + 5005*a**9*b**6*x**9/9 + 12870*a**8*b**7*x**(19/2
)/19 + 1287*a**7*b**8*x**10/2 + 1430*a**6*b**9*x**(21/2)/3 + 273*
a**5*b**10*x**11 + 2730*a**4*b**11*x**(23/2)/23 + 455*a**3*b**12*
```

```
x**12/12 + 42*a**2*b**13*x**(25/2)/5 + 15*a*b**14*x**13/13 + 2*b*
*15*x**(27/2)/27
```

Mathematica [A] time = 0.0391214, size = 211, normalized size = 0.87

$$\frac{a^{15}x^6}{6}+\frac{30}{13}a^{14}bx^{13/2}+15a^{13}b^2x^7+\frac{182}{3}a^{12}b^3x^{15/2}+\frac{1365}{8}a^{11}b^4x^8+\frac{6006}{17}a^{10}b^5x^{17/2}+\frac{5005}{9}a^9b^6x^9+\frac{12870}{19}a^8b^7x^{19/2}+\frac{1287}{2}a^7b^8x^{10}+\frac{1430}{3}a^6b^9x^{21/2}+273a^5b^{10}x^{11}+\frac{2730}{23}a^4b^{11}x^{23/2}+\frac{455}{12}a^3b^{12}x^{12}+\frac{42}{5}a^2b^{13}x^{25/2}+\frac{15}{13}ab^{14}x^{13}+\frac{2}{27}b^{15}x^{27/2}$$

Antiderivative was successfully verified.

```
[In]   Integrate[(a + b*Sqrt[x])^15*x^5,x]
```

```
[Out] (a^15*x^6)/6 + (30*a^14*b*x^(13/2))/13 + 15*a^13*b^2*x^7 + (182*a
^12*b^3*x^(15/2))/3 + (1365*a^11*b^4*x^8)/8 + (6006*a^10*b^5*x^(1
7/2))/17 + (5005*a^9*b^6*x^9)/9 + (12870*a^8*b^7*x^(19/2))/19 + (
1287*a^7*b^8*x^10)/2 + (1430*a^6*b^9*x^(21/2))/3 + 273*a^5*b^10*x
^11 + (2730*a^4*b^11*x^(23/2))/23 + (455*a^3*b^12*x^12)/12 + (42*
a^2*b^13*x^(25/2))/5 + (15*a*b^14*x^13)/13 + (2*b^15*x^(27/2))/27
```

Maple [A] time = 0.004, size = 168, normalized size = 0.7

$$\frac{2\,b^{15}}{27}x^{\frac{27}{2}}+\frac{15\,x^{13}ab^{14}}{13}+\frac{42\,a^2b^{13}}{5}x^{\frac{25}{2}}+\frac{455\,x^{12}a^3b^{12}}{12}+\frac{2730\,a^4b^{11}}{23}x^{\frac{23}{2}}+273\,x^{11}a^5b^{10}+\frac{1430\,a^6b^9}{3}x^{\frac{21}{2}}+\frac{1287\,x^{10}a^7b^8}{2}+\frac{12870\,a^8b^7}{19}x^{\frac{19}{2}}+\frac{5005\,x^9a^9b^6}{9}+\frac{6006\,a^{10}b^5}{17}x^{\frac{17}{2}}+\frac{1365\,x^8a^{11}b^4}{8}+\frac{182\,a^{12}b^3}{3}x^{\frac{15}{2}}+15\,x^7a^{13}b^2+\frac{30\,a^{14}b}{13}x^{\frac{13}{2}}+\frac{a^{15}x^6}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^5*(a+b*x^(1/2))^15,x)
```

```
[Out] 2/27*b^15*x^(27/2)+15/13*x^13*a*b^14+42/5*a^2*b^13*x^(25/2)+455/1
2*x^12*a^3*b^12+2730/23*a^4*b^11*x^(23/2)+273*x^11*a^5*b^10+1430/
3*a^6*b^9*x^(21/2)+1287/2*x^10*a^7*b^8+12870/19*a^8*b^7*x^(19/2)+
5005/9*x^9*a^9*b^6+6006/17*a^10*b^5*x^(17/2)+1365/8*x^8*a^11*b^4+
182/3*a^12*b^3*x^(15/2)+15*x^7*a^13*b^2+30/13*a^14*b*x^(13/2)+1/6
*a^15*x^6
```

Maxima [A] time = 1.45605, size = 270, normalized size = 1.12

$$\frac{2\left(b\sqrt{x}+a\right)^{27}}{27\,b^{12}}-\frac{11\left(b\sqrt{x}+a\right)^{26}a}{13\,b^{12}}+\frac{22\left(b\sqrt{x}+a\right)^{25}a^2}{5\,b^{12}}-\frac{55\left(b\sqrt{x}+a\right)^{24}a^3}{4\,b^{12}}+\frac{660\left(b\sqrt{x}+a\right)^{23}a^4}{23\,b^{12}}-\frac{42\left(b\sqrt{x}+a\right)^{22}a^5}{b^{12}}+\frac{44\left(b\sqrt{x}+a\right)^{21}a^6}{b^{12}}-\frac{33\left(b\sqrt{x}+a\right)^{20}a^7}{b^{12}}+\frac{330\left(b\sqrt{x}+a\right)^{19}a^8}{19\,b^{12}}-\frac{55\left(b\sqrt{x}+a\right)^{18}a^9}{9\,b^{12}}+\frac{22\left(b\sqrt{x}+a\right)^{17}a^{10}}{17\,b^{12}}-\frac{\left(b\sqrt{x}+a\right)^{16}a^{11}}{8\,b^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*sqrt(x) + a)^15*x^5,x, algorithm="maxima")
```

```
[Out] 2/27*(b*sqrt(x) + a)^27/b^12 - 11/13*(b*sqrt(x) + a)^26*a/b^12 +
22/5*(b*sqrt(x) + a)^25*a^2/b^12 - 55/4*(b*sqrt(x) + a)^24*a^3/b^
```

```
12 + 660/23*(b*sqrt(x) + a)^23*a^4/b^12 - 42*(b*sqrt(x) + a)^22*a
^5/b^12 + 44*(b*sqrt(x) + a)^21*a^6/b^12 - 33*(b*sqrt(x) + a)^20*
a^7/b^12 + 330/19*(b*sqrt(x) + a)^19*a^8/b^12 - 55/9*(b*sqrt(x) +
 a)^18*a^9/b^12 + 22/17*(b*sqrt(x) + a)^17*a^10/b^12 - 1/8*(b*sqr
t(x) + a)^16*a^11/b^12
```

Fricas [A] time = 0.235198, size = 234, normalized size = 0.97

$$\frac{15}{13}ab^{14}x^{13}+\frac{455}{12}a^3b^{12}x^{12}+273a^5b^{10}x^{11}+\frac{1287}{2}a^7b^8x^{10}+\frac{5005}{9}a^9b^6x^9+\frac{1365}{8}a^{11}b^4x^8+15a^{13}b^2x^7+\frac{1}{6}a^{15}x^6+\frac{2}{13037895}\left(482885b^{15}x^{13}+54759159a^2b^{13}x^{12}+773770725a^4b^{11}x^{11}+3107364975a^6b^9x^{10}+4415729175a^8b^7x^9+230310\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15*x^5,x, algorithm="fricas")
```

```
[Out] 15/13*a*b^14*x^13 + 455/12*a^3*b^12*x^12 + 273*a^5*b^10*x^11 + 12
87/2*a^7*b^8*x^10 + 5005/9*a^9*b^6*x^9 + 1365/8*a^11*b^4*x^8 + 15
*a^13*b^2*x^7 + 1/6*a^15*x^6 + 2/13037895*(482885*b^15*x^13 + 547
59159*a^2*b^13*x^12 + 773770725*a^4*b^11*x^11 + 3107364975*a^6*b^
9*x^10 + 4415729175*a^8*b^7*x^9 + 2303105805*a^10*b^5*x^8 + 39548
2815*a^12*b^3*x^7 + 15043725*a^14*b*x^6)*sqrt(x)
```

Sympy [A] time = 29.9602, size = 214, normalized size = 0.88

$$\frac{a^{15}x^6}{6}+\frac{30a^{14}bx^{\frac{13}{2}}}{13}+15a^{13}b^2x^7+\frac{182a^{12}b^3x^{\frac{15}{2}}}{3}+\frac{1365a^{11}b^4x^8}{8}+\frac{6006a^{10}b^5x^{\frac{17}{2}}}{17}+\frac{5005a^9b^6x^9}{9}+\frac{12870a^8b^7x^{\frac{19}{2}}}{19}+\frac{1287a^7b^8x^{10}}{2}+\frac{1430a^6b^9x^{\frac{21}{2}}}{3}+273a^5b^{10}x^{11}+\frac{2730a^4b^{11}x^{\frac{23}{2}}}{23}+\frac{455a^3b^{12}x^{12}}{12}+\frac{42a^2b^{13}x^{\frac{25}{2}}}{5}+\frac{15ab^{14}x^{13}}{13}+\frac{2b^{15}x^{\frac{27}{2}}}{27}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5*(a+b*x**(1/2))**15,x)
```

```
[Out] a**15*x**6/6 + 30*a**14*b*x**(13/2)/13 + 15*a**13*b**2*x**7 + 182
*a**12*b**3*x**(15/2)/3 + 1365*a**11*b**4*x**8/8 + 6006*a**10*b**
5*x**(17/2)/17 + 5005*a**9*b**6*x**9/9 + 12870*a**8*b**7*x**(19/2
)/19 + 1287*a**7*b**8*x**10/2 + 1430*a**6*b**9*x**(21/2)/3 + 273*
a**5*b**10*x**11 + 2730*a**4*b**11*x**(23/2)/23 + 455*a**3*b**12*
x**12/12 + 42*a**2*b**13*x**(25/2)/5 + 15*a*b**14*x**13/13 + 2*b*
*15*x**(27/2)/27
```

GIAC/XCAS [A] time = 0.221415, size = 225, normalized size = 0.93

$$\frac{2}{27}b^{15}x^{\frac{27}{2}}+\frac{15}{13}ab^{14}x^{13}+\frac{42}{5}a^2b^{13}x^{\frac{25}{2}}+\frac{455}{12}a^3b^{12}x^{12}+\frac{2730}{23}a^4b^{11}x^{\frac{23}{2}}+273a^5b^{10}x^{11}+\frac{1430}{3}a^6b^9x^{\frac{21}{2}}+\frac{1287}{2}a^7b^8x^{10}+\frac{12870}{19}a^8b^7x^{\frac{19}{2}}+\frac{5005}{9}a^9b^6x^9+\frac{6006}{17}a^{10}b^5x^{\frac{17}{2}}+\frac{1365}{8}a^{11}b^4x^8+\frac{182}{3}a^{12}b^3x^{\frac{15}{2}}+15a^{13}b^2x^7+\frac{30}{13}a^{14}bx^{\frac{13}{2}}+\frac{1}{6}a^{15}x^6$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15*x^5,x, algorithm="giac")
```

```
[Out] 2/27*b^15*x^(27/2) + 15/13*a*b^14*x^13 + 42/5*a^2*b^13*x^(25/2) +
 455/12*a^3*b^12*x^12 + 2730/23*a^4*b^11*x^(23/2) + 273*a^5*b^10*
```

```
x^11 + 1430/3*a^6*b^9*x^(21/2) + 1287/2*a^7*b^8*x^10 + 12870/19*a
^8*b^7*x^(19/2) + 5005/9*a^9*b^6*x^9 + 6006/17*a^10*b^5*x^(17/2)
+ 1365/8*a^11*b^4*x^8 + 182/3*a^12*b^3*x^(15/2) + 15*a^13*b^2*x^7
 + 30/13*a^14*b*x^(13/2) + 1/6*a^15*x^6
```

3.2168 $\int \left(a+b\sqrt{x}\right)^{15} x^4 \, dx$

Optimal. Leaf size=202

$$-\frac{a^9\left(a+b\sqrt{x}\right)^{16}}{8b^{10}}+\frac{18a^8\left(a+b\sqrt{x}\right)^{17}}{17b^{10}}-\frac{4a^7\left(a+b\sqrt{x}\right)^{18}}{b^{10}}+\frac{168a^6\left(a+b\sqrt{x}\right)^{19}}{19b^{10}}-\frac{63a^5\left(a+b\sqrt{x}\right)^{20}}{5b^{10}}+\frac{12a^4\left(a+b\sqrt{x}\right)^{21}}{b^{10}}-\frac{84a^3\left(a+b\sqrt{x}\right)^{22}}{11b^{10}}+\frac{72a^2\left(a+b\sqrt{x}\right)^{23}}{23b^{10}}+\frac{2\left(a+b\sqrt{x}\right)^{25}}{25b^{10}}-\frac{3a\left(a+b\sqrt{x}\right)^{24}}{4b^{10}}$$

```
[Out] -(a^9*(a + b*Sqrt[x])^16)/(8*b^10) + (18*a^8*(a + b*Sqrt[x])^17)/
(17*b^10) - (4*a^7*(a + b*Sqrt[x])^18)/b^10 + (168*a^6*(a + b*Sqr
t[x])^19)/(19*b^10) - (63*a^5*(a + b*Sqrt[x])^20)/(5*b^10) + (12*
a^4*(a + b*Sqrt[x])^21)/b^10 - (84*a^3*(a + b*Sqrt[x])^22)/(11*b^
10) + (72*a^2*(a + b*Sqrt[x])^23)/(23*b^10) - (3*a*(a + b*Sqrt[x]
)^24)/(4*b^10) + (2*(a + b*Sqrt[x])^25)/(25*b^10)
```

Rubi [A] time = 0.313142, antiderivative size = 202, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$-\frac{a^9\left(a+b\sqrt{x}\right)^{16}}{8b^{10}}+\frac{18a^8\left(a+b\sqrt{x}\right)^{17}}{17b^{10}}-\frac{4a^7\left(a+b\sqrt{x}\right)^{18}}{b^{10}}+\frac{168a^6\left(a+b\sqrt{x}\right)^{19}}{19b^{10}}-\frac{63a^5\left(a+b\sqrt{x}\right)^{20}}{5b^{10}}+\frac{12a^4\left(a+b\sqrt{x}\right)^{21}}{b^{10}}-\frac{84a^3\left(a+b\sqrt{x}\right)^{22}}{11b^{10}}+\frac{72a^2\left(a+b\sqrt{x}\right)^{23}}{23b^{10}}+\frac{2\left(a+b\sqrt{x}\right)^{25}}{25b^{10}}-\frac{3a\left(a+b\sqrt{x}\right)^{24}}{4b^{10}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^15*x^4,x]
```

```
[Out] -(a^9*(a + b*Sqrt[x])^16)/(8*b^10) + (18*a^8*(a + b*Sqrt[x])^17)/
(17*b^10) - (4*a^7*(a + b*Sqrt[x])^18)/b^10 + (168*a^6*(a + b*Sqr
t[x])^19)/(19*b^10) - (63*a^5*(a + b*Sqrt[x])^20)/(5*b^10) + (12*
a^4*(a + b*Sqrt[x])^21)/b^10 - (84*a^3*(a + b*Sqrt[x])^22)/(11*b^
10) + (72*a^2*(a + b*Sqrt[x])^23)/(23*b^10) - (3*a*(a + b*Sqrt[x]
)^24)/(4*b^10) + (2*(a + b*Sqrt[x])^25)/(25*b^10)
```

Rubi in Sympy [A] time = 58.7262, size = 192, normalized size = 0.95

$$-\frac{a^9\left(a+b\sqrt{x}\right)^{16}}{8b^{10}}+\frac{18a^8\left(a+b\sqrt{x}\right)^{17}}{17b^{10}}-\frac{4a^7\left(a+b\sqrt{x}\right)^{18}}{b^{10}}+\frac{168a^6\left(a+b\sqrt{x}\right)^{19}}{19b^{10}}-\frac{63a^5\left(a+b\sqrt{x}\right)^{20}}{5b^{10}}+\frac{12a^4\left(a+b\sqrt{x}\right)^{21}}{b^{10}}-\frac{84a^3\left(a+b\sqrt{x}\right)^{22}}{11b^{10}}+\frac{72a^2\left(a+b\sqrt{x}\right)^{23}}{23b^{10}}-\frac{3a\left(a+b\sqrt{x}\right)^{24}}{4b^{10}}+\frac{2\left(a+b\sqrt{x}\right)^{25}}{25b^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4*(a+b*x**(1/2))**15,x)
```

```
[Out] -a**9*(a + b*sqrt(x))**16/(8*b**10) + 18*a**8*(a + b*sqrt(x))**17
/(17*b**10) - 4*a**7*(a + b*sqrt(x))**18/b**10 + 168*a**6*(a + b*
sqrt(x))**19/(19*b**10) - 63*a**5*(a + b*sqrt(x))**20/(5*b**10) +
 12*a**4*(a + b*sqrt(x))**21/b**10 - 84*a**3*(a + b*sqrt(x))**22/
(11*b**10) + 72*a**2*(a + b*sqrt(x))**23/(23*b**10) - 3*a*(a + b*
sqrt(x))**24/(4*b**10) + 2*(a + b*sqrt(x))**25/(25*b**10)
```

Mathematica [A] time = 0.0310905, size = 207, normalized size = 1.02

$$\frac{a^{15}x^5}{5}+\frac{30}{11}a^{14}bx^{11/2}+\frac{35}{2}a^{13}b^2x^6+70a^{12}b^3x^{13/2}+195a^{11}b^4x^7+\frac{2002}{5}a^{10}b^5x^{15/2}+\frac{5005}{8}a^9b^6x^8+\frac{12870}{17}a^8b^7x^{17/2}+715a^7b^8x^9+\frac{10010}{19}a^6b^9x^{19/2}+\frac{3003}{10}a^5b^{10}x^{10}+130a^4b^{11}x^{21/2}+\frac{455}{11}a^3b^{12}x^{11}+\frac{210}{23}a^2b^{13}x^{23/2}+\frac{5}{4}ab^{14}x^{12}+\frac{2}{25}b^{15}x^{25/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^15*x^4,x]
```

```
[Out] (a^15*x^5)/5 + (30*a^14*b*x^(11/2))/11 + (35*a^13*b^2*x^6)/2 + 70
*a^12*b^3*x^(13/2) + 195*a^11*b^4*x^7 + (2002*a^10*b^5*x^(15/2))/
5 + (5005*a^9*b^6*x^8)/8 + (12870*a^8*b^7*x^(17/2))/17 + 715*a^7*
b^8*x^9 + (10010*a^6*b^9*x^(19/2))/19 + (3003*a^5*b^10*x^10)/10 +
 130*a^4*b^11*x^(21/2) + (455*a^3*b^12*x^11)/11 + (210*a^2*b^13*x
^(23/2))/23 + (5*a*b^14*x^12)/4 + (2*b^15*x^(25/2))/25
```

Maple [A] time = 0.006, size = 168, normalized size = 0.8

$$\frac{2\,b^{15}}{25}x^{\frac{25}{2}}+\frac{5\,x^{12}ab^{14}}{4}+\frac{210\,a^2b^{13}}{23}x^{\frac{23}{2}}+\frac{455\,x^{11}a^3b^{12}}{11}+130\,x^{21/2}a^4b^{11}+\frac{3003\,x^{10}a^5b^{10}}{10}+\frac{10010\,a^6b^9}{19}x^{\frac{19}{2}}+715\,x^9a^7b^8+\frac{12870\,a^8b^7}{17}x^{\frac{17}{2}}+\frac{5005\,a^9b^6x^8}{8}+\frac{2002\,a^{10}b^5}{5}x^{\frac{15}{2}}+195\,x^7a^{11}b^4+70\,x^{13/2}a^{12}b^3+\frac{35\,x^6a^{13}b^2}{2}+\frac{30\,a^{14}b}{11}x^{\frac{11}{2}}+\frac{a^{15}x^5}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4*(a+b*x^(1/2))^15,x)
```

```
[Out] 2/25*x^(25/2)*b^15+5/4*x^12*a*b^14+210/23*x^(23/2)*a^2*b^13+455/1
1*x^11*a^3*b^12+130*x^(21/2)*a^4*b^11+3003/10*x^10*a^5*b^10+10010
/19*x^(19/2)*a^6*b^9+715*x^9*a^7*b^8+12870/17*x^(17/2)*a^8*b^7+50
05/8*a^9*b^6*x^8+2002/5*x^(15/2)*a^10*b^5+195*x^7*a^11*b^4+70*x^(
13/2)*a^12*b^3+35/2*x^6*a^13*b^2+30/11*x^(11/2)*a^14*b+1/5*a^15*x
^5
```

Maxima [A] time = 1.44038, size = 224, normalized size = 1.11

$$\frac{2\left(b\sqrt{x}+a\right)^{25}}{25\,b^{10}}-\frac{3\left(b\sqrt{x}+a\right)^{24}a}{4\,b^{10}}+\frac{72\left(b\sqrt{x}+a\right)^{23}a^2}{23\,b^{10}}-\frac{84\left(b\sqrt{x}+a\right)^{22}a^3}{11\,b^{10}}+\frac{12\left(b\sqrt{x}+a\right)^{21}a^4}{b^{10}}-\frac{63\left(b\sqrt{x}+a\right)^{20}a^5}{5\,b^{10}}+\frac{168\left(b\sqrt{x}+a\right)^{19}a^6}{19\,b^{10}}-\frac{4\left(b\sqrt{x}+a\right)^{18}a^7}{b^{10}}+\frac{18\left(b\sqrt{x}+a\right)^{17}a^8}{17\,b^{10}}-\frac{\left(b\sqrt{x}+a\right)^{16}a^9}{8\,b^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15*x^4,x, algorithm="maxima")
```

```
[Out] 2/25*(b*sqrt(x) + a)^25/b^10 - 3/4*(b*sqrt(x) + a)^24*a/b^10 + 72
/23*(b*sqrt(x) + a)^23*a^2/b^10 - 84/11*(b*sqrt(x) + a)^22*a^3/b^
10 + 12*(b*sqrt(x) + a)^21*a^4/b^10 - 63/5*(b*sqrt(x) + a)^20*a^5
/b^10 + 168/19*(b*sqrt(x) + a)^19*a^6/b^10 - 4*(b*sqrt(x) + a)^18
*a^7/b^10 + 18/17*(b*sqrt(x) + a)^17*a^8/b^10 - 1/8*(b*sqrt(x) +
a)^16*a^9/b^10
```

Fricas [A] time = 0.242884, size = 234, normalized size = 1.16

$$\frac{5}{4}\,ab^{14}x^{12}+\frac{455}{11}\,a^3b^{12}x^{11}+\frac{3003}{10}\,a^5b^{10}x^{10}+715\,a^7b^8x^9+\frac{5005}{8}\,a^9b^6x^8+195\,a^{11}b^4x^7+\frac{35}{2}\,a^{13}b^2x^6+\frac{1}{5}\,a^{15}x^5+\frac{2}{2042975}\,\left(81719\,b^{15}x^{12}+9326625\,a^2b^{13}x^{11}+132793375\,a^4b^{11}x^{10}+538162625\,a^6b^9x^9+773326125\,a^8b^7x^8+409003595\,a^{1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15*x^4,x, algorithm="fricas")
```

```
[Out] 5/4*a*b^14*x^12 + 455/11*a^3*b^12*x^11 + 3003/10*a^5*b^10*x^10 +
715*a^7*b^8*x^9 + 5005/8*a^9*b^6*x^8 + 195*a^11*b^4*x^7 + 35/2*a^
13*b^2*x^6 + 1/5*a^15*x^5 + 2/2042975*(81719*b^15*x^12 + 9326625*
a^2*b^13*x^11 + 132793375*a^4*b^11*x^10 + 538162625*a^6*b^9*x^9 +
 773326125*a^8*b^7*x^8 + 409003595*a^10*b^5*x^7 + 71504125*a^12*b
^3*x^6 + 2785875*a^14*b*x^5)*sqrt(x)
```

Sympy [A] time = 22.7052, size = 211, normalized size = 1.04

$$\frac{a^{15}x^5}{5}+\frac{30a^{14}bx^{\frac{11}{2}}}{11}+\frac{35a^{13}b^2x^6}{2}+70a^{12}b^3x^{\frac{13}{2}}+195a^{11}b^4x^7+\frac{2002a^{10}b^5x^{\frac{15}{2}}}{5}+\frac{5005a^9b^6x^8}{8}+\frac{12870a^8b^7x^{\frac{17}{2}}}{17}+715a^7b^8x^9+\frac{10010a^6b^9x^{\frac{19}{2}}}{19}+\frac{3003a^5b^{10}x^{10}}{10}+130a^4b^{11}x^{\frac{21}{2}}+\frac{455a^3b^{12}x^{11}}{11}+\frac{210a^2b^{13}x^{\frac{23}{2}}}{23}+\frac{5ab^{14}x^{12}}{4}+\frac{2b^{15}x^{\frac{25}{2}}}{25}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4*(a+b*x**(1/2))**15,x)
```

```
[Out] a**15*x**5/5 + 30*a**14*b*x**(11/2)/11 + 35*a**13*b**2*x**6/2 + 7
0*a**12*b**3*x**(13/2) + 195*a**11*b**4*x**7 + 2002*a**10*b**5*x*
*(15/2)/5 + 5005*a**9*b**6*x**8/8 + 12870*a**8*b**7*x**(17/2)/17
+ 715*a**7*b**8*x**9 + 10010*a**6*b**9*x**(19/2)/19 + 3003*a**5*b
**10*x**10/10 + 130*a**4*b**11*x**(21/2) + 455*a**3*b**12*x**11/1
1 + 210*a**2*b**13*x**(23/2)/23 + 5*a*b**14*x**12/4 + 2*b**15*x**
(25/2)/25
```

GIAC/XCAS [A] time = 0.217513, size = 225, normalized size = 1.11

$$\frac{2}{25}\,b^{15}x^{\frac{25}{2}}+\frac{5}{4}\,ab^{14}x^{12}+\frac{210}{23}\,a^2b^{13}x^{\frac{23}{2}}+\frac{455}{11}\,a^3b^{12}x^{11}+130\,a^4b^{11}x^{\frac{21}{2}}+\frac{3003}{10}\,a^5b^{10}x^{10}+\frac{10010}{19}\,a^6b^9x^{\frac{19}{2}}+715\,a^7b^8x^9+\frac{12870}{17}\,a^8b^7x^{\frac{17}{2}}+\frac{5005}{8}\,a^9b^6x^8+\frac{2002}{5}\,a^{10}b^5x^{\frac{15}{2}}+195\,a^{11}b^4x^7+70\,a^{12}b^3x^{\frac{13}{2}}+\frac{35}{2}\,a^{13}b^2x^6+\frac{30}{11}\,a^{14}bx^{\frac{11}{2}}+\frac{1}{5}\,a^{15}x^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15*x^4,x, algorithm="giac")
```

```
[Out] 2/25*b^15*x^(25/2) + 5/4*a*b^14*x^12 + 210/23*a^2*b^13*x^(23/2) +
 455/11*a^3*b^12*x^11 + 130*a^4*b^11*x^(21/2) + 3003/10*a^5*b^10*
x^10 + 10010/19*a^6*b^9*x^(19/2) + 715*a^7*b^8*x^9 + 12870/17*a^8
*b^7*x^(17/2) + 5005/8*a^9*b^6*x^8 + 2002/5*a^10*b^5*x^(15/2) + 1
95*a^11*b^4*x^7 + 70*a^12*b^3*x^(13/2) + 35/2*a^13*b^2*x^6 + 30/1
1*a^14*b*x^(11/2) + 1/5*a^15*x^5
```

3.2169 $\int \left(a+b\sqrt{x}\right)^{15} x^3\,dx$

Optimal. Leaf size=162

$$-\frac{a^7\left(a+b\sqrt{x}\right)^{16}}{8b^8}+\frac{14a^6\left(a+b\sqrt{x}\right)^{17}}{17b^8}-\frac{7a^5\left(a+b\sqrt{x}\right)^{18}}{3b^8}+\frac{70a^4\left(a+b\sqrt{x}\right)^{19}}{19b^8}-\frac{7a^3\left(a+b\sqrt{x}\right)^{20}}{2b^8}+\frac{2a^2\left(a+b\sqrt{x}\right)^{21}}{b^8}+\frac{2\left(a+b\sqrt{x}\right)^{23}}{23b^8}-\frac{7a\left(a+b\sqrt{x}\right)^{22}}{11b^8}$$

```
[Out] -(a^7*(a + b*Sqrt[x])^16)/(8*b^8) + (14*a^6*(a + b*Sqrt[x])^17)/(
17*b^8) - (7*a^5*(a + b*Sqrt[x])^18)/(3*b^8) + (70*a^4*(a + b*Sqr
t[x])^19)/(19*b^8) - (7*a^3*(a + b*Sqrt[x])^20)/(2*b^8) + (2*a^2*
(a + b*Sqrt[x])^21)/b^8 - (7*a*(a + b*Sqrt[x])^22)/(11*b^8) + (2*
(a + b*Sqrt[x])^23)/(23*b^8)
```

Rubi [A] time = 0.265874, antiderivative size = 162, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^7\left(a+b\sqrt{x}\right)^{16}}{8b^8}+\frac{14a^6\left(a+b\sqrt{x}\right)^{17}}{17b^8}-\frac{7a^5\left(a+b\sqrt{x}\right)^{18}}{3b^8}+\frac{70a^4\left(a+b\sqrt{x}\right)^{19}}{19b^8}-\frac{7a^3\left(a+b\sqrt{x}\right)^{20}}{2b^8}+\frac{2a^2\left(a+b\sqrt{x}\right)^{21}}{b^8}+\frac{2\left(a+b\sqrt{x}\right)^{23}}{23b^8}-\frac{7a\left(a+b\sqrt{x}\right)^{22}}{11b^8}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^15*x^3,x]
```

```
[Out] -(a^7*(a + b*Sqrt[x])^16)/(8*b^8) + (14*a^6*(a + b*Sqrt[x])^17)/(
17*b^8) - (7*a^5*(a + b*Sqrt[x])^18)/(3*b^8) + (70*a^4*(a + b*Sqr
t[x])^19)/(19*b^8) - (7*a^3*(a + b*Sqrt[x])^20)/(2*b^8) + (2*a^2*
(a + b*Sqrt[x])^21)/b^8 - (7*a*(a + b*Sqrt[x])^22)/(11*b^8) + (2*
(a + b*Sqrt[x])^23)/(23*b^8)
```

Rubi in Sympy [A] time = 50.9727, size = 153, normalized size = 0.94

$$-\frac{a^7\left(a+b\sqrt{x}\right)^{16}}{8b^8}+\frac{14a^6\left(a+b\sqrt{x}\right)^{17}}{17b^8}-\frac{7a^5\left(a+b\sqrt{x}\right)^{18}}{3b^8}+\frac{70a^4\left(a+b\sqrt{x}\right)^{19}}{19b^8}-\frac{7a^3\left(a+b\sqrt{x}\right)^{20}}{2b^8}+\frac{2a^2\left(a+b\sqrt{x}\right)^{21}}{b^8}-\frac{7a\left(a+b\sqrt{x}\right)^{22}}{11b^8}+\frac{2\left(a+b\sqrt{x}\right)^{23}}{23b^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3*(a+b*x**(1/2))**15,x)
```

```
[Out] -a**7*(a + b*sqrt(x))**16/(8*b**8) + 14*a**6*(a + b*sqrt(x))**17/
(17*b**8) - 7*a**5*(a + b*sqrt(x))**18/(3*b**8) + 70*a**4*(a + b*
sqrt(x))**19/(19*b**8) - 7*a**3*(a + b*sqrt(x))**20/(2*b**8) + 2*
a**2*(a + b*sqrt(x))**21/b**8 - 7*a*(a + b*sqrt(x))**22/(11*b**8)
 + 2*(a + b*sqrt(x))**23/(23*b**8)
```

Mathematica [A] time = 0.0329563, size = 205, normalized size = 1.27

$$\frac{a^{15}x^4}{4}+\frac{10}{3}a^{14}bx^{9/2}+21a^{13}b^2x^5+\frac{910}{11}a^{12}b^3x^{11/2}+\frac{455}{2}a^{11}b^4x^6+462a^{10}b^5x^{13/2}+715a^9b^6x^7+858a^8b^7x^{15/2}+\frac{6435}{8}a^7b^8x^8+\frac{10010}{17}a^6b^9x^{17/2}+\frac{1001}{3}a^5b^{10}x^9+\frac{2730}{19}a^4b^{11}x^{19/2}+\frac{91}{2}a^3b^{12}x^{10}+10a^2b^{13}x^{21/2}+\frac{15}{11}ab^{14}x^{11}+\frac{2}{23}b^{15}x^{23/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^15*x^3,x]
```

```
[Out] (a^15*x^4)/4 + (10*a^14*b*x^(9/2))/3 + 21*a^13*b^2*x^5 + (910*a^1
2*b^3*x^(11/2))/11 + (455*a^11*b^4*x^6)/2 + 462*a^10*b^5*x^(13/2)
 + 715*a^9*b^6*x^7 + 858*a^8*b^7*x^(15/2) + (6435*a^7*b^8*x^8)/8
+ (10010*a^6*b^9*x^(17/2))/17 + (1001*a^5*b^10*x^9)/3 + (2730*a^4
*b^11*x^(19/2))/19 + (91*a^3*b^12*x^10)/2 + 10*a^2*b^13*x^(21/2)
+ (15*a*b^14*x^11)/11 + (2*b^15*x^(23/2))/23
```

Maple [A] time = 0.006, size = 168, normalized size = 1.

$$\frac{2\,b^{15}}{23}x^{\frac{23}{2}}+\frac{15\,x^{11}ab^{14}}{11}+10\,x^{21/2}a^{2}b^{13}+\frac{91\,a^{3}b^{12}x^{10}}{2}+\frac{2730\,a^{4}b^{11}}{19}x^{\frac{19}{2}}+\frac{1001\,x^{9}a^{5}b^{10}}{3}+\frac{10010\,a^{6}b^{9}}{17}x^{\frac{17}{2}}+\frac{6435\,x^{8}a^{7}b^{8}}{8}+858\,x^{15/2}a^{8}b^{7}+715\,a^{9}b^{6}x^{7}+462\,x^{13/2}a^{10}b^{5}+\frac{455\,x^{6}a^{11}b^{4}}{2}+\frac{910\,a^{12}b^{3}}{11}x^{\frac{11}{2}}+21\,x^{5}a^{13}b^{2}+\frac{10\,a^{14}b}{3}x^{\frac{9}{2}}+\frac{x^{4}a^{15}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3*(a+b*x^(1/2))^15,x)
```

```
[Out] 2/23*x^(23/2)*b^15+15/11*x^11*a*b^14+10*x^(21/2)*a^2*b^13+91/2*a^
3*b^12*x^10+2730/19*x^(19/2)*a^4*b^11+1001/3*x^9*a^5*b^10+10010/1
7*x^(17/2)*a^6*b^9+6435/8*x^8*a^7*b^8+858*x^(15/2)*a^8*b^7+715*a^
9*b^6*x^7+462*x^(13/2)*a^10*b^5+455/2*x^6*a^11*b^4+910/11*x^(11/2
)*a^12*b^3+21*x^5*a^13*b^2+10/3*x^(9/2)*a^14*b+1/4*x^4*a^15
```

Maxima [A] time = 1.45703, size = 178, normalized size = 1.1

$$\frac{2\,\left(b\sqrt{x}+a\right)^{23}}{23\,b^{8}}-\frac{7\,\left(b\sqrt{x}+a\right)^{22}a}{11\,b^{8}}+\frac{2\,\left(b\sqrt{x}+a\right)^{21}a^{2}}{b^{8}}-\frac{7\,\left(b\sqrt{x}+a\right)^{20}a^{3}}{2\,b^{8}}+\frac{70\,\left(b\sqrt{x}+a\right)^{19}a^{4}}{19\,b^{8}}-\frac{7\,\left(b\sqrt{x}+a\right)^{18}a^{5}}{3\,b^{8}}+\frac{14\,\left(b\sqrt{x}+a\right)^{17}a^{6}}{17\,b^{8}}-\frac{\left(b\sqrt{x}+a\right)^{16}a^{7}}{8\,b^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15*x^3,x, algorithm="maxima")
```

```
[Out] 2/23*(b*sqrt(x) + a)^23/b^8 - 7/11*(b*sqrt(x) + a)^22*a/b^8 + 2*(
b*sqrt(x) + a)^21*a^2/b^8 - 7/2*(b*sqrt(x) + a)^20*a^3/b^8 + 70/1
9*(b*sqrt(x) + a)^19*a^4/b^8 - 7/3*(b*sqrt(x) + a)^18*a^5/b^8 + 1
4/17*(b*sqrt(x) + a)^17*a^6/b^8 - 1/8*(b*sqrt(x) + a)^16*a^7/b^8
```

Fricas [A] time = 0.232224, size = 234, normalized size = 1.44

$$\frac{15}{11}\,ab^{14}x^{11}+\frac{91}{2}\,a^{3}b^{12}x^{10}+\frac{1001}{3}\,a^{5}b^{10}x^{9}+\frac{6435}{8}\,a^{7}b^{8}x^{8}+715\,a^{9}b^{6}x^{7}+\frac{455}{2}\,a^{11}b^{4}x^{6}+21\,a^{13}b^{2}x^{5}+\frac{1}{4}\,a^{15}x^{4}+\frac{2}{245157}\left(10659\,b^{15}x^{11}+1225785\,a^{2}b^{13}x^{10}+17612595\,a^{4}b^{11}x^{9}+72177105\,a^{6}b^{9}x^{8}+105172353\,a^{8}b^{7}x^{7}+56631267\,a^{10}b^{5}x^{6}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15*x^3,x, algorithm="fricas")
```

```
[Out] 15/11*a*b^14*x^11 + 91/2*a^3*b^12*x^10 + 1001/3*a^5*b^10*x^9 + 64
35/8*a^7*b^8*x^8 + 715*a^9*b^6*x^7 + 455/2*a^11*b^4*x^6 + 21*a^13
```

```
*b^2*x^5 + 1/4*a^15*x^4 + 2/245157*(10659*b^15*x^11 + 1225785*a^2
*b^13*x^10 + 17612595*a^4*b^11*x^9 + 72177105*a^6*b^9*x^8 + 10517
2353*a^8*b^7*x^7 + 56631267*a^10*b^5*x^6 + 10140585*a^12*b^3*x^5
+ 408595*a^14*b*x^4)*sqrt(x)
```

Sympy [A] time = 17.0156, size = 209, normalized size = 1.29

$$\frac{a^{15}x^4}{4} + \frac{10a^{14}bx^{\frac{9}{2}}}{3} + 21a^{13}b^2x^5 + \frac{910a^{12}b^3x^{\frac{11}{2}}}{11} + \frac{455a^{11}b^4x^6}{2} + 462a^{10}b^5x^{\frac{13}{2}} + 715a^9b^6x^7 + 858a^8b^7x^{\frac{15}{2}} + \frac{6435a^7b^8x^8}{8} + \frac{10010a^6b^9x^{\frac{17}{2}}}{17} + \frac{1001a^5b^{10}x^9}{3} + \frac{2730a^4b^{11}x^{\frac{19}{2}}}{19} + \frac{91a^3b^{12}x^{10}}{2} + 10a^2b^{13}x^{\frac{21}{2}} + \frac{15ab^{14}x^{11}}{11} + \frac{2b^{15}x^{\frac{23}{2}}}{23}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(a+b*x**(1/2))**15,x)
```

```
[Out] a**15*x**4/4 + 10*a**14*b*x**(9/2)/3 + 21*a**13*b**2*x**5 + 910*a
**12*b**3*x**(11/2)/11 + 455*a**11*b**4*x**6/2 + 462*a**10*b**5*x
**(13/2) + 715*a**9*b**6*x**7 + 858*a**8*b**7*x**(15/2) + 6435*a*
*7*b**8*x**8/8 + 10010*a**6*b**9*x**(17/2)/17 + 1001*a**5*b**10*x
**9/3 + 2730*a**4*b**11*x**(19/2)/19 + 91*a**3*b**12*x**10/2 + 10
*a**2*b**13*x**(21/2) + 15*a*b**14*x**11/11 + 2*b**15*x**(23/2)/2
3
```

GIAC/XCAS [A] time = 0.220722, size = 225, normalized size = 1.39

$$\frac{2}{23}\,b^{15}x^{\frac{23}{2}} + \frac{15}{11}\,ab^{14}x^{11} + 10\,a^2b^{13}x^{\frac{21}{2}} + \frac{91}{2}\,a^3b^{12}x^{10} + \frac{2730}{19}\,a^4b^{11}x^{\frac{19}{2}} + \frac{1001}{3}\,a^5b^{10}x^9 + \frac{10010}{17}\,a^6b^9x^{\frac{17}{2}} + \frac{6435}{8}\,a^7b^8x^8 + 858\,a^8b^7x^{\frac{15}{2}} + 715\,a^9b^6x^7 + 462\,a^{10}b^5x^{\frac{13}{2}} + \frac{455}{2}\,a^{11}b^4x^6 + \frac{910}{11}\,a^{12}b^3x^{\frac{11}{2}} + 21\,a^{13}b^2x^5 + \frac{10}{3}\,a^{14}bx^{\frac{9}{2}} + \frac{1}{4}\,a^{15}x^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15*x^3,x, algorithm="giac")
```

```
[Out] 2/23*b^15*x^(23/2) + 15/11*a*b^14*x^11 + 10*a^2*b^13*x^(21/2) + 9
1/2*a^3*b^12*x^10 + 2730/19*a^4*b^11*x^(19/2) + 1001/3*a^5*b^10*x
^9 + 10010/17*a^6*b^9*x^(17/2) + 6435/8*a^7*b^8*x^8 + 858*a^8*b^7
*x^(15/2) + 715*a^9*b^6*x^7 + 462*a^10*b^5*x^(13/2) + 455/2*a^11*
b^4*x^6 + 910/11*a^12*b^3*x^(11/2) + 21*a^13*b^2*x^5 + 10/3*a^14*
b*x^(9/2) + 1/4*a^15*x^4
```

3.2170 $\int \left(a+b\sqrt{x}\right)^{15} x^2\,dx$

Optimal. Leaf size=122

$$-\frac{a^5\left(a+b\sqrt{x}\right)^{16}}{8b^6}+\frac{10a^4\left(a+b\sqrt{x}\right)^{17}}{17b^6}-\frac{10a^3\left(a+b\sqrt{x}\right)^{18}}{9b^6}+\frac{20a^2\left(a+b\sqrt{x}\right)^{19}}{19b^6}+\frac{2\left(a+b\sqrt{x}\right)^{21}}{21b^6}-\frac{a\left(a+b\sqrt{x}\right)^{20}}{2b^6}$$

```
[Out] -(a^5*(a + b*Sqrt[x])^16)/(8*b^6) + (10*a^4*(a + b*Sqrt[x])^17)/(
17*b^6) - (10*a^3*(a + b*Sqrt[x])^18)/(9*b^6) + (20*a^2*(a + b*Sq
rt[x])^19)/(19*b^6) - (a*(a + b*Sqrt[x])^20)/(2*b^6) + (2*(a + b*
Sqrt[x])^21)/(21*b^6)
```

Rubi [A] time = 0.226807, antiderivative size = 122, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^5\left(a+b\sqrt{x}\right)^{16}}{8b^6}+\frac{10a^4\left(a+b\sqrt{x}\right)^{17}}{17b^6}-\frac{10a^3\left(a+b\sqrt{x}\right)^{18}}{9b^6}+\frac{20a^2\left(a+b\sqrt{x}\right)^{19}}{19b^6}+\frac{2\left(a+b\sqrt{x}\right)^{21}}{21b^6}-\frac{a\left(a+b\sqrt{x}\right)^{20}}{2b^6}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^15*x^2,x]
```

```
[Out] -(a^5*(a + b*Sqrt[x])^16)/(8*b^6) + (10*a^4*(a + b*Sqrt[x])^17)/(
17*b^6) - (10*a^3*(a + b*Sqrt[x])^18)/(9*b^6) + (20*a^2*(a + b*Sq
rt[x])^19)/(19*b^6) - (a*(a + b*Sqrt[x])^20)/(2*b^6) + (2*(a + b*
Sqrt[x])^21)/(21*b^6)
```

Rubi in Sympy [A] time = 41.822, size = 112, normalized size = 0.92

$$-\frac{a^5\left(a+b\sqrt{x}\right)^{16}}{8b^6}+\frac{10a^4\left(a+b\sqrt{x}\right)^{17}}{17b^6}-\frac{10a^3\left(a+b\sqrt{x}\right)^{18}}{9b^6}+\frac{20a^2\left(a+b\sqrt{x}\right)^{19}}{19b^6}-\frac{a\left(a+b\sqrt{x}\right)^{20}}{2b^6}+\frac{2\left(a+b\sqrt{x}\right)^{21}}{21b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(a+b*x**(1/2))**15,x)
```

```
[Out] -a**5*(a + b*sqrt(x))**16/(8*b**6) + 10*a**4*(a + b*sqrt(x))**17/
(17*b**6) - 10*a**3*(a + b*sqrt(x))**18/(9*b**6) + 20*a**2*(a + b
*sqrt(x))**19/(19*b**6) - a*(a + b*sqrt(x))**20/(2*b**6) + 2*(a +
 b*sqrt(x))**21/(21*b**6)
```

Mathematica [A] time = 0.0307612, size = 209, normalized size = 1.71

$$\frac{a^{15}x^3}{3}+\frac{30}{7}a^{14}bx^{7/2}+\frac{105}{4}a^{13}b^2x^4+\frac{910}{9}a^{12}b^3x^{9/2}+273a^{11}b^4x^5+546a^{10}b^5x^{11/2}+\frac{5005}{6}a^9b^6x^6+990a^8b^7x^{13/2}+\frac{6435}{7}a^7b^8x^7+\frac{2002}{3}a^6b^9x^{15/2}+\frac{3003}{8}a^5b^{10}x^8+\frac{2730}{17}a^4b^{11}x^{17/2}+\frac{455}{9}a^3b^{12}x^9+\frac{210}{19}a^2b^{13}x^{19/2}+\frac{3}{2}ab^{14}x^{10}+\frac{2}{21}b^{15}x^{21/2}$$

Antiderivative was successfully verified.

```
[In]   Integrate[(a + b*Sqrt[x])^15*x^2,x]
```

```
[Out] (a^15*x^3)/3 + (30*a^14*b*x^(7/2))/7 + (105*a^13*b^2*x^4)/4 + (91
0*a^12*b^3*x^(9/2))/9 + 273*a^11*b^4*x^5 + 546*a^10*b^5*x^(11/2)
+ (5005*a^9*b^6*x^6)/6 + 990*a^8*b^7*x^(13/2) + (6435*a^7*b^8*x^7
)/7 + (2002*a^6*b^9*x^(15/2))/3 + (3003*a^5*b^10*x^8)/8 + (2730*a
^4*b^11*x^(17/2))/17 + (455*a^3*b^12*x^9)/9 + (210*a^2*b^13*x^(19
/2))/19 + (3*a*b^14*x^10)/2 + (2*b^15*x^(21/2))/21
```

Maple [A] time = 0.004, size = 168, normalized size = 1.4

$$\frac{2\,b^{15}}{21}x^{\frac{21}{2}}+\frac{3\,x^{10}ab^{14}}{2}+\frac{210\,a^{2}b^{13}}{19}x^{\frac{19}{2}}+\frac{455\,a^{3}b^{12}x^{9}}{9}+\frac{2730\,a^{4}b^{11}}{17}x^{\frac{17}{2}}+\frac{3003\,x^{8}a^{5}b^{10}}{8}+\frac{2002\,a^{6}b^{9}}{3}x^{\frac{15}{2}}+\frac{6435\,x^{7}a^{7}b^{8}}{7}+990\,x^{13/2}a^{8}b^{7}+\frac{5005\,x^{6}a^{9}b^{6}}{6}+546\,x^{11/2}a^{10}b^{5}+273\,x^{5}a^{11}b^{4}+\frac{910\,a^{12}b^{3}}{9}x^{\frac{9}{2}}+\frac{105\,x^{4}a^{13}b^{2}}{4}+\frac{30\,a^{14}b}{7}x^{\frac{7}{2}}+\frac{x^{3}a^{15}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^2*(a+b*x^(1/2))^15,x)
```

```
[Out] 2/21*x^(21/2)*b^15+3/2*x^10*a*b^14+210/19*x^(19/2)*a^2*b^13+455/9
*a^3*b^12*x^9+2730/17*x^(17/2)*a^4*b^11+3003/8*x^8*a^5*b^10+2002/
3*x^(15/2)*a^6*b^9+6435/7*x^7*a^7*b^8+990*x^(13/2)*a^8*b^7+5005/6
*x^6*a^9*b^6+546*x^(11/2)*a^10*b^5+273*x^5*a^11*b^4+910/9*x^(9/2)
*a^12*b^3+105/4*x^4*a^13*b^2+30/7*x^(7/2)*a^14*b+1/3*x^3*a^15
```

Maxima [A] time = 1.42034, size = 132, normalized size = 1.08

$$\frac{2\left(b\sqrt{x}+a\right)^{21}}{21\,b^{6}}-\frac{\left(b\sqrt{x}+a\right)^{20}a}{2\,b^{6}}+\frac{20\left(b\sqrt{x}+a\right)^{19}a^{2}}{19\,b^{6}}-\frac{10\left(b\sqrt{x}+a\right)^{18}a^{3}}{9\,b^{6}}+\frac{10\left(b\sqrt{x}+a\right)^{17}a^{4}}{17\,b^{6}}-\frac{\left(b\sqrt{x}+a\right)^{16}a^{5}}{8\,b^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*sqrt(x) + a)^15*x^2,x, algorithm="maxima")
```

```
[Out] 2/21*(b*sqrt(x) + a)^21/b^6 - 1/2*(b*sqrt(x) + a)^20*a/b^6 + 20/1
9*(b*sqrt(x) + a)^19*a^2/b^6 - 10/9*(b*sqrt(x) + a)^18*a^3/b^6 +
10/17*(b*sqrt(x) + a)^17*a^4/b^6 - 1/8*(b*sqrt(x) + a)^16*a^5/b^6
```

Fricas [A] time = 0.232144, size = 234, normalized size = 1.92

$$\frac{3}{2}\,ab^{14}x^{10}+\frac{455}{9}\,a^{3}b^{12}x^{9}+\frac{3003}{8}\,a^{5}b^{10}x^{8}+\frac{6435}{7}\,a^{7}b^{8}x^{7}+\frac{5005}{6}\,a^{9}b^{6}x^{6}+273\,a^{11}b^{4}x^{5}+\frac{105}{4}\,a^{13}b^{2}x^{4}+\frac{1}{3}\,a^{15}x^{3}+\frac{2}{20349}\left(969\,b^{15}x^{10}+112455\,a^{2}b^{13}x^{9}+1633905\,a^{4}b^{11}x^{8}+6789783\,a^{6}b^{9}x^{7}+10072755\,a^{8}b^{7}x^{6}+5555277\,a^{10}b^{5}x^{5}+1028755\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*sqrt(x) + a)^15*x^2,x, algorithm="fricas")
```

```
[Out] 3/2*a*b^14*x^10 + 455/9*a^3*b^12*x^9 + 3003/8*a^5*b^10*x^8 + 6435
/7*a^7*b^8*x^7 + 5005/6*a^9*b^6*x^6 + 273*a^11*b^4*x^5 + 105/4*a^
13*b^2*x^4 + 1/3*a^15*x^3 + 2/20349*(969*b^15*x^10 + 112455*a^2*b
^13*x^9 + 1633905*a^4*b^11*x^8 + 6789783*a^6*b^9*x^7 + 10072755*a
^8*b^7*x^6 + 5555277*a^10*b^5*x^5 + 1028755*a^12*b^3*x^4 + 43605*
a^14*b*x^3)*sqrt(x)
```

Sympy [A] time = 14.1527, size = 212, normalized size = 1.74

$$\frac{a^{15}x^3}{3} + \frac{30a^{14}bx^{\frac{7}{2}}}{7} + \frac{105a^{13}b^2x^4}{4} + \frac{910a^{12}b^3x^{\frac{9}{2}}}{9} + 273a^{11}b^4x^5 + 546a^{10}b^5x^{\frac{11}{2}} + \frac{5005a^9b^6x^6}{6} + 990a^8b^7x^{\frac{13}{2}} + \frac{6435a^7b^8x^7}{7} + \frac{2002a^6b^9x^{\frac{15}{2}}}{3} + \frac{3003a^5b^{10}x^8}{8} + \frac{2730a^4b^{11}x^{\frac{17}{2}}}{17} + \frac{455a^3b^{12}x^9}{9} + \frac{210a^2b^{13}x^{\frac{19}{2}}}{19} + \frac{3ab^{14}x^{10}}{2} + \frac{2b^{15}x^{\frac{21}{2}}}{21}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(a+b*x**(1/2))**15,x)
```

```
[Out] a**15*x**3/3 + 30*a**14*b*x**(7/2)/7 + 105*a**13*b**2*x**4/4 + 91
0*a**12*b**3*x**(9/2)/9 + 273*a**11*b**4*x**5 + 546*a**10*b**5*x*
*(11/2) + 5005*a**9*b**6*x**6/6 + 990*a**8*b**7*x**(13/2) + 6435*
a**7*b**8*x**7/7 + 2002*a**6*b**9*x**(15/2)/3 + 3003*a**5*b**10*x
**8/8 + 2730*a**4*b**11*x**(17/2)/17 + 455*a**3*b**12*x**9/9 + 21
0*a**2*b**13*x**(19/2)/19 + 3*a*b**14*x**10/2 + 2*b**15*x**(21/2)
/21
```

GIAC/XCAS [A] time = 0.217238, size = 225, normalized size = 1.84

$$\frac{2}{21}\,b^{15}x^{\frac{21}{2}} + \frac{3}{2}\,ab^{14}x^{10} + \frac{210}{19}\,a^2b^{13}x^{\frac{19}{2}} + \frac{455}{9}\,a^3b^{12}x^9 + \frac{2730}{17}\,a^4b^{11}x^{\frac{17}{2}} + \frac{3003}{8}\,a^5b^{10}x^8 + \frac{2002}{3}\,a^6b^9x^{\frac{15}{2}} + \frac{6435}{7}\,a^7b^8x^7 + 990\,a^8b^7x^{\frac{13}{2}} + \frac{5005}{6}\,a^9b^6x^6 + 546\,a^{10}b^5x^{\frac{11}{2}} + 273\,a^{11}b^4x^5 + \frac{910}{9}\,a^{12}b^3x^{\frac{9}{2}} + \frac{105}{4}\,a^{13}b^2x^4 + \frac{30}{7}\,a^{14}bx^{\frac{7}{2}} + \frac{1}{3}\,a^{15}x^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15*x^2,x, algorithm="giac")
```

```
[Out] 2/21*b^15*x^(21/2) + 3/2*a*b^14*x^10 + 210/19*a^2*b^13*x^(19/2) +
 455/9*a^3*b^12*x^9 + 2730/17*a^4*b^11*x^(17/2) + 3003/8*a^5*b^10
*x^8 + 2002/3*a^6*b^9*x^(15/2) + 6435/7*a^7*b^8*x^7 + 990*a^8*b^7
*x^(13/2) + 5005/6*a^9*b^6*x^6 + 546*a^10*b^5*x^(11/2) + 273*a^11
*b^4*x^5 + 910/9*a^12*b^3*x^(9/2) + 105/4*a^13*b^2*x^4 + 30/7*a^1
4*b*x^(7/2) + 1/3*a^15*x^3
```

3.2171 $\int \left(a+b\sqrt{x}\right)^{15} x \, dx$

Optimal. Leaf size=80

$$-\frac{a^3\left(a+b\sqrt{x}\right)^{16}}{8b^4}+\frac{6a^2\left(a+b\sqrt{x}\right)^{17}}{17b^4}+\frac{2\left(a+b\sqrt{x}\right)^{19}}{19b^4}-\frac{a\left(a+b\sqrt{x}\right)^{18}}{3b^4}$$

```
[Out] -(a^3*(a + b*Sqrt[x])^16)/(8*b^4) + (6*a^2*(a + b*Sqrt[x])^17)/(1
7*b^4) - (a*(a + b*Sqrt[x])^18)/(3*b^4) + (2*(a + b*Sqrt[x])^19)/
(19*b^4)
```

Rubi [A] time = 0.185615, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{a^3\left(a+b\sqrt{x}\right)^{16}}{8b^4}+\frac{6a^2\left(a+b\sqrt{x}\right)^{17}}{17b^4}+\frac{2\left(a+b\sqrt{x}\right)^{19}}{19b^4}-\frac{a\left(a+b\sqrt{x}\right)^{18}}{3b^4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^15*x,x]
```

```
[Out] -(a^3*(a + b*Sqrt[x])^16)/(8*b^4) + (6*a^2*(a + b*Sqrt[x])^17)/(1
7*b^4) - (a*(a + b*Sqrt[x])^18)/(3*b^4) + (2*(a + b*Sqrt[x])^19)/
(19*b^4)
```

Rubi in Sympy [A] time = 33.4942, size = 71, normalized size = 0.89

$$-\frac{a^3\left(a+b\sqrt{x}\right)^{16}}{8b^4}+\frac{6a^2\left(a+b\sqrt{x}\right)^{17}}{17b^4}-\frac{a\left(a+b\sqrt{x}\right)^{18}}{3b^4}+\frac{2\left(a+b\sqrt{x}\right)^{19}}{19b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(a+b*x**(1/2))**15,x)
```

```
[Out] -a**3*(a + b*sqrt(x))**16/(8*b**4) + 6*a**2*(a + b*sqrt(x))**17/(
17*b**4) - a*(a + b*sqrt(x))**18/(3*b**4) + 2*(a + b*sqrt(x))**19
/(19*b**4)
```

Mathematica [B] time = 0.0315292, size = 199, normalized size = 2.49

$$\frac{a^{15}x^2}{2}+6a^{14}bx^{5/2}+35a^{13}b^2x^3+130a^{12}b^3x^{7/2}+\frac{1365}{4}a^{11}b^4x^4+\frac{2002}{3}a^{10}b^5x^{9/2}$$
$$+1001a^9b^6x^5+1170a^8b^7x^{11/2}+\frac{2145}{2}a^7b^8x^6+770a^6b^9x^{13/2}+429a^5b^{10}x^7$$
$$+182a^4b^{11}x^{15/2}+\frac{455}{8}a^3b^{12}x^8+\frac{210}{17}a^2b^{13}x^{17/2}+\frac{5}{3}ab^{14}x^9+\frac{2}{19}b^{15}x^{19/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^15*x,x]
```

```
[Out] (a^15*x^2)/2 + 6*a^14*b*x^(5/2) + 35*a^13*b^2*x^3 + 130*a^12*b^3*
x^(7/2) + (1365*a^11*b^4*x^4)/4 + (2002*a^10*b^5*x^(9/2))/3 + 100
1*a^9*b^6*x^5 + 1170*a^8*b^7*x^(11/2) + (2145*a^7*b^8*x^6)/2 + 77
0*a^6*b^9*x^(13/2) + 429*a^5*b^10*x^7 + 182*a^4*b^11*x^(15/2) + (
455*a^3*b^12*x^8)/8 + (210*a^2*b^13*x^(17/2))/17 + (5*a*b^14*x^9)
/3 + (2*b^15*x^(19/2))/19
```

Maple [B] time = 0.005, size = 168, normalized size = 2.1

$$\frac{2\,b^{15}}{19}x^{\frac{19}{2}} + \frac{5\,x^{9}ab^{14}}{3} + \frac{210\,a^{2}b^{13}}{17}x^{\frac{17}{2}} + \frac{455\,x^{8}a^{3}b^{12}}{8} + 182\,x^{15/2}a^{4}b^{11} + 429\,x^{7}a^{5}b^{10} + 770\,x^{13/2}a^{6}b^{9} + \frac{2145\,x^{6}a^{7}b^{8}}{2} + 1170\,x^{11/2}a^{8}b^{7} + 1001\,x^{5}a^{9}b^{6} + \frac{2002\,a^{10}b^{5}}{3}x^{\frac{9}{2}} + \frac{1365\,x^{4}a^{11}b^{4}}{4} + 130\,x^{7/2}a^{12}b^{3} + 35\,x^{3}a^{13}b^{2} + 6\,x^{5/2}a^{14}b + \frac{x^{2}a^{15}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x*(a+b*x^(1/2))^15,x)
```

```
[Out] 2/19*x^(19/2)*b^15+5/3*x^9*a*b^14+210/17*x^(17/2)*a^2*b^13+455/8*
x^8*a^3*b^12+182*x^(15/2)*a^4*b^11+429*x^7*a^5*b^10+770*x^(13/2)*
a^6*b^9+2145/2*x^6*a^7*b^8+1170*x^(11/2)*a^8*b^7+1001*x^5*a^9*b^6
+2002/3*x^(9/2)*a^10*b^5+1365/4*x^4*a^11*b^4+130*x^(7/2)*a^12*b^3
+35*x^3*a^13*b^2+6*x^(5/2)*a^14*b+1/2*x^2*a^15
```

Maxima [A] time = 1.43665, size = 86, normalized size = 1.08

$$\frac{2\left(b\sqrt{x}+a\right)^{19}}{19\,b^{4}} - \frac{\left(b\sqrt{x}+a\right)^{18}a}{3\,b^{4}} + \frac{6\left(b\sqrt{x}+a\right)^{17}a^{2}}{17\,b^{4}} - \frac{\left(b\sqrt{x}+a\right)^{16}a^{3}}{8\,b^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*sqrt(x) + a)^15*x,x, algorithm="maxima")
```

```
[Out] 2/19*(b*sqrt(x) + a)^19/b^4 - 1/3*(b*sqrt(x) + a)^18*a/b^4 + 6/17
*(b*sqrt(x) + a)^17*a^2/b^4 - 1/8*(b*sqrt(x) + a)^16*a^3/b^4
```

Fricas [A] time = 0.234355, size = 234, normalized size = 2.92

$$\frac{5}{3}\,ab^{14}x^{9} + \frac{455}{8}\,a^{3}b^{12}x^{8} + 429\,a^{5}b^{10}x^{7} + \frac{2145}{2}\,a^{7}b^{8}x^{6} + 1001\,a^{9}b^{6}x^{5} + \frac{1365}{4}\,a^{11}b^{4}x^{4} + 35\,a^{13}b^{2}x^{3} + \frac{1}{2}\,a^{15}x^{2} + \frac{2}{969}\left(51\,b^{15}x^{9} + 5985\,a^{2}b^{13}x^{8} + 88179\,a^{4}b^{11}x^{7} + 373065\,a^{6}b^{9}x^{6} + 566865\,a^{8}b^{7}x^{5} + 323323\,a^{10}b^{5}x^{4} + 62985\,a^{12}b^{3}x^{3} + 2907\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*sqrt(x) + a)^15*x,x, algorithm="fricas")
```

```
[Out] 5/3*a*b^14*x^9 + 455/8*a^3*b^12*x^8 + 429*a^5*b^10*x^7 + 2145/2*a
^7*b^8*x^6 + 1001*a^9*b^6*x^5 + 1365/4*a^11*b^4*x^4 + 35*a^13*b^2
*x^3 + 1/2*a^15*x^2 + 2/969*(51*b^15*x^9 + 5985*a^2*b^13*x^8 + 88
179*a^4*b^11*x^7 + 373065*a^6*b^9*x^6 + 566865*a^8*b^7*x^5 + 3233
23*a^10*b^5*x^4 + 62985*a^12*b^3*x^3 + 2907*a^14*b*x^2)*sqrt(x)
```

Sympy [A] time = 8.44242, size = 204, normalized size = 2.55

$$\frac{a^{15}x^{2}}{2} + 6a^{14}bx^{\frac{5}{2}} + 35a^{13}b^{2}x^{3} + 130a^{12}b^{3}x^{\frac{7}{2}} + \frac{1365a^{11}b^{4}x^{4}}{4} + \frac{2002a^{10}b^{5}x^{\frac{9}{2}}}{3} + 1001a^{9}b^{6}x^{5} + 1170a^{8}b^{7}x^{\frac{11}{2}} + \frac{2145a^{7}b^{8}x^{6}}{2} + 770a^{6}b^{9}x^{\frac{13}{2}} + 429a^{5}b^{10}x^{7} + 182a^{4}b^{11}x^{\frac{15}{2}} + \frac{455a^{3}b^{12}x^{8}}{8} + \frac{210a^{2}b^{13}x^{\frac{17}{2}}}{17} + \frac{5ab^{14}x^{9}}{3} + \frac{2b^{15}x^{\frac{19}{2}}}{19}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(a+b*x**(1/2))**15,x)
```

```
[Out] a**15*x**2/2 + 6*a**14*b*x**(5/2) + 35*a**13*b**2*x**3 + 130*a**1
2*b**3*x**(7/2) + 1365*a**11*b**4*x**4/4 + 2002*a**10*b**5*x**(9/
2)/3 + 1001*a**9*b**6*x**5 + 1170*a**8*b**7*x**(11/2) + 2145*a**7
*b**8*x**6/2 + 770*a**6*b**9*x**(13/2) + 429*a**5*b**10*x**7 + 18
2*a**4*b**11*x**(15/2) + 455*a**3*b**12*x**8/8 + 210*a**2*b**13*x
**(17/2)/17 + 5*a*b**14*x**9/3 + 2*b**15*x**(19/2)/19
```

GIAC/XCAS [A] time = 0.218277, size = 225, normalized size = 2.81

$$\frac{2}{19}\,b^{15}x^{\frac{19}{2}} + \frac{5}{3}\,ab^{14}x^{9} + \frac{210}{17}\,a^{2}b^{13}x^{\frac{17}{2}} + \frac{455}{8}\,a^{3}b^{12}x^{8} + 182\,a^{4}b^{11}x^{\frac{15}{2}} + 429\,a^{5}b^{10}x^{7} + 770\,a^{6}b^{9}x^{\frac{13}{2}} + \frac{2145}{2}\,a^{7}b^{8}x^{6} + 1170\,a^{8}b^{7}x^{\frac{11}{2}} + 1001\,a^{9}b^{6}x^{5} + \frac{2002}{3}\,a^{10}b^{5}x^{\frac{9}{2}} + \frac{1365}{4}\,a^{11}b^{4}x^{4} + 130\,a^{12}b^{3}x^{\frac{7}{2}} + 35\,a^{13}b^{2}x^{3} + 6\,a^{14}bx^{\frac{5}{2}} + \frac{1}{2}\,a^{15}x^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15*x,x, algorithm="giac")
```

```
[Out] 2/19*b^15*x^(19/2) + 5/3*a*b^14*x^9 + 210/17*a^2*b^13*x^(17/2) +
455/8*a^3*b^12*x^8 + 182*a^4*b^11*x^(15/2) + 429*a^5*b^10*x^7 + 7
70*a^6*b^9*x^(13/2) + 2145/2*a^7*b^8*x^6 + 1170*a^8*b^7*x^(11/2)
+ 1001*a^9*b^6*x^5 + 2002/3*a^10*b^5*x^(9/2) + 1365/4*a^11*b^4*x^
4 + 130*a^12*b^3*x^(7/2) + 35*a^13*b^2*x^3 + 6*a^14*b*x^(5/2) + 1
/2*a^15*x^2
```

3.2172 $\int \left(a+b\sqrt{x}\right)^{15}\,dx$

Optimal. Leaf size=38

$$\frac{2\left(a+b\sqrt{x}\right)^{17}}{17b^2}-\frac{a\left(a+b\sqrt{x}\right)^{16}}{8b^2}$$

```
[Out] -(a*(a + b*Sqrt[x])^16)/(8*b^2) + (2*(a + b*Sqrt[x])^17)/(17*b^2)
```

Rubi [A] time = 0.0523329, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{2\left(a+b\sqrt{x}\right)^{17}}{17b^2}-\frac{a\left(a+b\sqrt{x}\right)^{16}}{8b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^15,x]

[Out] -(a*(a + b*Sqrt[x])^16)/(8*b^2) + (2*(a + b*Sqrt[x])^17)/(17*b^2)
```

Rubi in Sympy [A] time = 24.6897, size = 32, normalized size = 0.84

$$-\frac{a\left(a+b\sqrt{x}\right)^{16}}{8b^2}+\frac{2\left(a+b\sqrt{x}\right)^{17}}{17b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**15,x)

[Out] -a*(a + b*sqrt(x))**16/(8*b**2) + 2*(a + b*sqrt(x))**17/(17*b**2)
```

Mathematica [B] time = 0.0267295, size = 190, normalized size = 5.

$$a^{15}x+10a^{14}bx^{3/2}+\frac{105}{2}a^{13}b^2x^2+182a^{12}b^3x^{5/2}+455a^{11}b^4x^3+858a^{10}b^5x^{7/2}+\frac{5005}{4}a^9b^6x^4+1430a^8b^7x^{9/2}+1287a^7b^8x^5+910a^6b^9x^{11/2}+\frac{1001}{2}a^5b^{10}x^6+210a^4b^{11}x^{13/2}+65a^3b^{12}x^7+14a^2b^{13}x^{15/2}+\frac{15}{8}ab^{14}x^8+\frac{2}{17}b^{15}x^{17/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^15,x]

[Out] a^15*x + 10*a^14*b*x^(3/2) + (105*a^13*b^2*x^2)/2 + 182*a^12*b^3*
x^(5/2) + 455*a^11*b^4*x^3 + 858*a^10*b^5*x^(7/2) + (5005*a^9*b^6
*x^4)/4 + 1430*a^8*b^7*x^(9/2) + 1287*a^7*b^8*x^5 + 910*a^6*b^9*x
^(11/2) + (1001*a^5*b^10*x^6)/2 + 210*a^4*b^11*x^(13/2) + 65*a^3*
b^12*x^7 + 14*a^2*b^13*x^(15/2) + (15*a*b^14*x^8)/8 + (2*b^15*x^(
17/2))/17
```

Maple [B] time = 0.005, size = 165, normalized size = 4.3

$$\frac{2b^{15}x^{\frac{17}{2}}}{17}+\frac{15x^{8}ab^{14}}{8}+14x^{15/2}a^{2}b^{13}+65x^{7}a^{3}b^{12}+210x^{13/2}a^{4}b^{11}+\frac{1001x^{6}a^{5}b^{10}}{2}+910x^{11/2}a^{6}b^{9}+1287x^{5}a^{7}b^{8}+1430x^{9/2}a^{8}b^{7}+\frac{5005x^{4}a^{9}b^{6}}{4}+858x^{7/2}a^{10}b^{5}+455x^{3}a^{11}b^{4}+182x^{5/2}a^{12}b^{3}+\frac{105x^{2}a^{13}b^{2}}{2}+10x^{3/2}a^{14}b+xa^{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^15,x)
```

```
[Out] 2/17*x^(17/2)*b^15+15/8*x^8*a*b^14+14*x^(15/2)*a^2*b^13+65*x^7*a^
3*b^12+210*x^(13/2)*a^4*b^11+1001/2*x^6*a^5*b^10+910*x^(11/2)*a^6
*b^9+1287*x^5*a^7*b^8+1430*x^(9/2)*a^8*b^7+5005/4*x^4*a^9*b^6+858
*x^(7/2)*a^10*b^5+455*x^3*a^11*b^4+182*x^(5/2)*a^12*b^3+105/2*x^2
*a^13*b^2+10*x^(3/2)*a^14*b+x*a^15
```

Maxima [A] time = 1.41542, size = 41, normalized size = 1.08

$$\frac{2\left(b\sqrt{x}+a\right)^{17}}{17b^{2}}-\frac{\left(b\sqrt{x}+a\right)^{16}a}{8b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15,x, algorithm="maxima")
```

```
[Out] 2/17*(b*sqrt(x) + a)^17/b^2 - 1/8*(b*sqrt(x) + a)^16*a/b^2
```

Fricas [A] time = 0.231075, size = 225, normalized size = 5.92

$$\frac{15}{8}ab^{14}x^{8}+65a^{3}b^{12}x^{7}+\frac{1001}{2}a^{5}b^{10}x^{6}+1287a^{7}b^{8}x^{5}+\frac{5005}{4}a^{9}b^{6}x^{4}+455a^{11}b^{4}x^{3}+\frac{105}{2}a^{13}b^{2}x^{2}+a^{15}x+\frac{2}{17}\left(b^{15}x^{8}+119a^{2}b^{13}x^{7}+1785a^{4}b^{11}x^{6}+7735a^{6}b^{9}x^{5}+12155a^{8}b^{7}x^{4}+7293a^{10}b^{5}x^{3}+1547a^{12}b^{3}x^{2}+85a^{14}bx\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15,x, algorithm="fricas")
```

```
[Out] 15/8*a*b^14*x^8 + 65*a^3*b^12*x^7 + 1001/2*a^5*b^10*x^6 + 1287*a^
7*b^8*x^5 + 5005/4*a^9*b^6*x^4 + 455*a^11*b^4*x^3 + 105/2*a^13*b^
2*x^2 + a^15*x + 2/17*(b^15*x^8 + 119*a^2*b^13*x^7 + 1785*a^4*b^1
1*x^6 + 7735*a^6*b^9*x^5 + 12155*a^8*b^7*x^4 + 7293*a^10*b^5*x^3
+ 1547*a^12*b^3*x^2 + 85*a^14*b*x)*sqrt(x)
```

Sympy [A] time = 6.78041, size = 197, normalized size = 5.18

$$a^{15}x+10a^{14}bx^{\frac{3}{2}}+\frac{105a^{13}b^{2}x^{2}}{2}+182a^{12}b^{3}x^{\frac{5}{2}}+455a^{11}b^{4}x^{3}+858a^{10}b^{5}x^{\frac{7}{2}}+\frac{5005a^{9}b^{6}x^{4}}{4}+1430a^{8}b^{7}x^{\frac{9}{2}}+1287a^{7}b^{8}x^{5}+910a^{6}b^{9}x^{\frac{11}{2}}+\frac{1001a^{5}b^{10}x^{6}}{2}+210a^{4}b^{11}x^{\frac{13}{2}}+65a^{3}b^{12}x^{7}+14a^{2}b^{13}x^{\frac{15}{2}}+\frac{15ab^{14}x^{8}}{8}+\frac{2b^{15}x^{\frac{17}{2}}}{17}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**15,x)
```

```
[Out] a**15*x + 10*a**14*b*x**(3/2) + 105*a**13*b**2*x**2/2 + 182*a**12
*b**3*x**(5/2) + 455*a**11*b**4*x**3 + 858*a**10*b**5*x**(7/2) +
5005*a**9*b**6*x**4/4 + 1430*a**8*b**7*x**(9/2) + 1287*a**7*b**8*
x**5 + 910*a**6*b**9*x**(11/2) + 1001*a**5*b**10*x**6/2 + 210*a**
4*b**11*x**(13/2) + 65*a**3*b**12*x**7 + 14*a**2*b**13*x**(15/2)
+ 15*a*b**14*x**8/8 + 2*b**15*x**(17/2)/17
```

GIAC/XCAS [A] time = 0.221683, size = 221, normalized size = 5.82

$$\frac{2}{17}\,b^{15}x^{\frac{17}{2}} + \frac{15}{8}\,ab^{14}x^{8} + 14\,a^{2}b^{13}x^{\frac{15}{2}} + 65\,a^{3}b^{12}x^{7} + 210\,a^{4}b^{11}x^{\frac{13}{2}} + \frac{1001}{2}\,a^{5}b^{10}x^{6} + 910\,a^{6}b^{9}x^{\frac{11}{2}} + 1287\,a^{7}b^{8}x^{5} + 1430\,a^{8}b^{7}x^{\frac{9}{2}} + \frac{5005}{4}\,a^{9}b^{6}x^{4} + 858\,a^{10}b^{5}x^{\frac{7}{2}} + 455\,a^{11}b^{4}x^{3} + 182\,a^{12}b^{3}x^{\frac{5}{2}} + \frac{105}{2}\,a^{13}b^{2}x^{2} + 10\,a^{14}bx^{\frac{3}{2}} + a^{15}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15,x, algorithm="giac")
```

```
[Out] 2/17*b^15*x^(17/2) + 15/8*a*b^14*x^8 + 14*a^2*b^13*x^(15/2) + 65*
a^3*b^12*x^7 + 210*a^4*b^11*x^(13/2) + 1001/2*a^5*b^10*x^6 + 910*
a^6*b^9*x^(11/2) + 1287*a^7*b^8*x^5 + 1430*a^8*b^7*x^(9/2) + 5005
/4*a^9*b^6*x^4 + 858*a^10*b^5*x^(7/2) + 455*a^11*b^4*x^3 + 182*a^
12*b^3*x^(5/2) + 105/2*a^13*b^2*x^2 + 10*a^14*b*x^(3/2) + a^15*x
```

3.2173 $\int \frac{\left(a+b\sqrt{x}\right)^{15}}{x}\,dx$

Optimal. Leaf size=205

$$a^{15}\log(x)+30a^{14}b\sqrt{x}+105a^{13}b^2x+\frac{910}{3}a^{12}b^3x^{3/2}+\frac{1365}{2}a^{11}b^4x^2+\frac{6006}{5}a^{10}b^5x^{5/2}+\frac{5005}{3}a^9b^6x^3+\frac{12870}{7}a^8b^7x^{7/2}+\frac{6435}{4}a^7b^8x^4+\frac{10010}{9}a^6b^9x^{9/2}+\frac{3003}{5}a^5b^{10}x^5+\frac{2730}{11}a^4b^{11}x^{11/2}+\frac{455}{6}a^3b^{12}x^6+\frac{210}{13}a^2b^{13}x^{13/2}+\frac{15}{7}ab^{14}x^7+\frac{2}{15}b^{15}x^{15/2}$$

```
[Out] 30*a^14*b*Sqrt[x] + 105*a^13*b^2*x + (910*a^12*b^3*x^(3/2))/3 + (
1365*a^11*b^4*x^2)/2 + (6006*a^10*b^5*x^(5/2))/5 + (5005*a^9*b^6*
x^3)/3 + (12870*a^8*b^7*x^(7/2))/7 + (6435*a^7*b^8*x^4)/4 + (1001
0*a^6*b^9*x^(9/2))/9 + (3003*a^5*b^10*x^5)/5 + (2730*a^4*b^11*x^(
11/2))/11 + (455*a^3*b^12*x^6)/6 + (210*a^2*b^13*x^(13/2))/13 + (
15*a*b^14*x^7)/7 + (2*b^15*x^(15/2))/15 + a^15*Log[x]
```

Rubi [A] time = 0.255, antiderivative size = 205, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$a^{15}\log(x)+30a^{14}b\sqrt{x}+105a^{13}b^2x+\frac{910}{3}a^{12}b^3x^{3/2}+\frac{1365}{2}a^{11}b^4x^2+\frac{6006}{5}a^{10}b^5x^{5/2}+\frac{5005}{3}a^9b^6x^3+\frac{12870}{7}a^8b^7x^{7/2}+\frac{6435}{4}a^7b^8x^4+\frac{10010}{9}a^6b^9x^{9/2}+\frac{3003}{5}a^5b^{10}x^5+\frac{2730}{11}a^4b^{11}x^{11/2}+\frac{455}{6}a^3b^{12}x^6+\frac{210}{13}a^2b^{13}x^{13/2}+\frac{15}{7}ab^{14}x^7+\frac{2}{15}b^{15}x^{15/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^15/x,x]
```

```
[Out] 30*a^14*b*Sqrt[x] + 105*a^13*b^2*x + (910*a^12*b^3*x^(3/2))/3 + (
1365*a^11*b^4*x^2)/2 + (6006*a^10*b^5*x^(5/2))/5 + (5005*a^9*b^6*
x^3)/3 + (12870*a^8*b^7*x^(7/2))/7 + (6435*a^7*b^8*x^4)/4 + (1001
0*a^6*b^9*x^(9/2))/9 + (3003*a^5*b^10*x^5)/5 + (2730*a^4*b^11*x^(
11/2))/11 + (455*a^3*b^12*x^6)/6 + (210*a^2*b^13*x^(13/2))/13 + (
15*a*b^14*x^7)/7 + (2*b^15*x^(15/2))/15 + a^15*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$2a^{15}\log\left(\sqrt{x}\right)+30a^{14}b\sqrt{x}+210a^{13}b^2\int^{\sqrt{x}}x\,dx+\frac{910a^{12}b^3x^{\frac{3}{2}}}{3}+\frac{1365a^{11}b^4x^2}{2}+\frac{6006a^{10}b^5x^{\frac{5}{2}}}{5}+\frac{5005a^9b^6x^3}{3}+\frac{12870a^8b^7x^{\frac{7}{2}}}{7}+\frac{6435a^7b^8x^4}{4}+\frac{10010a^6b^9x^{\frac{9}{2}}}{9}+\frac{3003a^5b^{10}x^5}{5}+\frac{2730a^4b^{11}x^{\frac{11}{2}}}{11}+\frac{455a^3b^{12}x^6}{6}+\frac{210a^2b^{13}x^{\frac{13}{2}}}{13}+\frac{15ab^{14}x^7}{7}+\frac{2b^{15}x^{\frac{15}{2}}}{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**15/x,x)
```

```
[Out] 2*a**15*log(sqrt(x)) + 30*a**14*b*sqrt(x) + 210*a**13*b**2*Integr
al(x, (x, sqrt(x))) + 910*a**12*b**3*x**(3/2)/3 + 1365*a**11*b**4
*x**2/2 + 6006*a**10*b**5*x**(5/2)/5 + 5005*a**9*b**6*x**3/3 + 12
870*a**8*b**7*x**(7/2)/7 + 6435*a**7*b**8*x**4/4 + 10010*a**6*b**
9*x**(9/2)/9 + 3003*a**5*b**10*x**5/5 + 2730*a**4*b**11*x**(11/2)
/11 + 455*a**3*b**12*x**6/6 + 210*a**2*b**13*x**(13/2)/13 + 15*a*
b**14*x**7/7 + 2*b**15*x**(15/2)/15
```

Mathematica [A] time = 0.044582, size = 205, normalized size = 1.

$$a^{15}\log(x)+30a^{14}b\sqrt{x}+105a^{13}b^2x+\frac{910}{3}a^{12}b^3x^{3/2}+\frac{1365}{2}a^{11}b^4x^2+\frac{6006}{5}a^{10}b^5x^{5/2}+\frac{5005}{3}a^9b^6x^3+\frac{12870}{7}a^8b^7x^{7/2}+\frac{6435}{4}a^7b^8x^4+\frac{10010}{9}a^6b^9x^{9/2}+\frac{3003}{5}a^5b^{10}x^5+\frac{2730}{11}a^4b^{11}x^{11/2}+\frac{455}{6}a^3b^{12}x^6+\frac{210}{13}a^2b^{13}x^{13/2}+\frac{15}{7}ab^{14}x^7+\frac{2}{15}b^{15}x^{15/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^15/x,x]
```

```
[Out] 30*a^14*b*Sqrt[x] + 105*a^13*b^2*x + (910*a^12*b^3*x^(3/2))/3 + (
1365*a^11*b^4*x^2)/2 + (6006*a^10*b^5*x^(5/2))/5 + (5005*a^9*b^6*
x^3)/3 + (12870*a^8*b^7*x^(7/2))/7 + (6435*a^7*b^8*x^4)/4 + (1001
0*a^6*b^9*x^(9/2))/9 + (3003*a^5*b^10*x^5)/5 + (2730*a^4*b^11*x^(
11/2))/11 + (455*a^3*b^12*x^6)/6 + (210*a^2*b^13*x^(13/2))/13 + (
15*a*b^14*x^7)/7 + (2*b^15*x^(15/2))/15 + a^15*Log[x]
```

Maple [A] time = 0.006, size = 164, normalized size = 0.8

$$105\,a^{13}b^2x+\frac{910\,a^{12}b^3}{3}x^{\frac{3}{2}}+\frac{1365\,a^{11}b^4x^2}{2}+\frac{6006\,a^{10}b^5}{5}x^{\frac{5}{2}}+\frac{5005\,a^9b^6x^3}{3}+\frac{12870\,a^8b^7}{7}x^{\frac{7}{2}}+\frac{6435\,a^7b^8x^4}{4}+\frac{10010\,a^6b^9}{9}x^{\frac{9}{2}}+\frac{3003\,a^5b^{10}x^5}{5}+\frac{2730\,a^4b^{11}}{11}x^{\frac{11}{2}}+\frac{455\,a^3b^{12}x^6}{6}+\frac{210\,a^2b^{13}}{13}x^{\frac{13}{2}}+\frac{15\,ab^{14}x^7}{7}+\frac{2\,b^{15}}{15}x^{\frac{15}{2}}+a^{15}\ln(x)+30\,a^{14}b\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^15/x,x)
```

```
[Out] 105*a^13*b^2*x+910/3*a^12*b^3*x^(3/2)+1365/2*a^11*b^4*x^2+6006/5*
a^10*b^5*x^(5/2)+5005/3*a^9*b^6*x^3+12870/7*a^8*b^7*x^(7/2)+6435/
4*a^7*b^8*x^4+10010/9*a^6*b^9*x^(9/2)+3003/5*a^5*b^10*x^5+2730/11
*a^4*b^11*x^(11/2)+455/6*a^3*b^12*x^6+210/13*a^2*b^13*x^(13/2)+15
/7*a*b^14*x^7+2/15*b^15*x^(15/2)+a^15*ln(x)+30*a^14*b*x^(1/2)
```

Maxima [A] time = 1.42025, size = 220, normalized size = 1.07

$$\frac{2}{15}\,b^{15}x^{\frac{15}{2}}+\frac{15}{7}\,ab^{14}x^7+\frac{210}{13}\,a^2b^{13}x^{\frac{13}{2}}+\frac{455}{6}\,a^3b^{12}x^6+\frac{2730}{11}\,a^4b^{11}x^{\frac{11}{2}}+\frac{3003}{5}\,a^5b^{10}x^5+\frac{10010}{9}\,a^6b^9x^{\frac{9}{2}}+\frac{6435}{4}\,a^7b^8x^4+\frac{12870}{7}\,a^8b^7x^{\frac{7}{2}}+\frac{5005}{3}\,a^9b^6x^3+\frac{6006}{5}\,a^{10}b^5x^{\frac{5}{2}}+\frac{1365}{2}\,a^{11}b^4x^2+\frac{910}{3}\,a^{12}b^3x^{\frac{3}{2}}+105\,a^{13}b^2x+a^{15}\log(x)+30\,a^{14}b\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x,x, algorithm="maxima")
```

```
[Out] 2/15*b^15*x^(15/2) + 15/7*a*b^14*x^7 + 210/13*a^2*b^13*x^(13/2) +
 455/6*a^3*b^12*x^6 + 2730/11*a^4*b^11*x^(11/2) + 3003/5*a^5*b^10
*x^5 + 10010/9*a^6*b^9*x^(9/2) + 6435/4*a^7*b^8*x^4 + 12870/7*a^8
*b^7*x^(7/2) + 5005/3*a^9*b^6*x^3 + 6006/5*a^10*b^5*x^(5/2) + 136
5/2*a^11*b^4*x^2 + 910/3*a^12*b^3*x^(3/2) + 105*a^13*b^2*x + a^15
*log(x) + 30*a^14*b*sqrt(x)
```

Fricas [A] time = 0.240013, size = 225, normalized size = 1.1

$$\frac{15}{7}ab^{14}x^7+\frac{455}{6}a^3b^{12}x^6+\frac{3003}{5}a^5b^{10}x^5+\frac{6435}{4}a^7b^8x^4$$
$$+\frac{5005}{3}a^9b^6x^3+\frac{1365}{2}a^{11}b^4x^2+105\,a^{13}b^2x+2\,a^{15}\log\left(\sqrt{x}\right)$$
$$+\frac{2}{45045}\left(3003\,b^{15}x^7+363825\,a^2b^{13}x^6+5589675\,a^4b^{11}x^5+25050025\,a^6b^9x^4+41409225\,a^8b^7x^3+27054027\,a^{10}b^5x^2+68318\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x,x, algorithm="fricas")
```

```
[Out] 15/7*a*b^14*x^7 + 455/6*a^3*b^12*x^6 + 3003/5*a^5*b^10*x^5 + 6435
/4*a^7*b^8*x^4 + 5005/3*a^9*b^6*x^3 + 1365/2*a^11*b^4*x^2 + 105*a
^13*b^2*x + 2*a^15*log(sqrt(x)) + 2/45045*(3003*b^15*x^7 + 363825
*a^2*b^13*x^6 + 5589675*a^4*b^11*x^5 + 25050025*a^6*b^9*x^4 + 414
09225*a^8*b^7*x^3 + 27054027*a^10*b^5*x^2 + 6831825*a^12*b^3*x +
675675*a^14*b)*sqrt(x)
```

Sympy [A] time = 19.0353, size = 211, normalized size = 1.03

$$a^{15}\log(x)+30a^{14}b\sqrt{x}+105a^{13}b^2x+\frac{910a^{12}b^3x^{\frac{3}{2}}}{3}+\frac{1365a^{11}b^4x^2}{2}+\frac{6006a^{10}b^5x^{\frac{5}{2}}}{5}$$
$$+\frac{5005a^9b^6x^3}{3}+\frac{12870a^8b^7x^{\frac{7}{2}}}{7}+\frac{6435a^7b^8x^4}{4}+\frac{10010a^6b^9x^{\frac{9}{2}}}{9}+\frac{3003a^5b^{10}x^5}{5}$$
$$+\frac{2730a^4b^{11}x^{\frac{11}{2}}}{11}+\frac{455a^3b^{12}x^6}{6}+\frac{210a^2b^{13}x^{\frac{13}{2}}}{13}+\frac{15ab^{14}x^7}{7}+\frac{2b^{15}x^{\frac{15}{2}}}{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**15/x,x)
```

```
[Out] a**15*log(x) + 30*a**14*b*sqrt(x) + 105*a**13*b**2*x + 910*a**12*
b**3*x**(3/2)/3 + 1365*a**11*b**4*x**2/2 + 6006*a**10*b**5*x**(5/
2)/5 + 5005*a**9*b**6*x**3/3 + 12870*a**8*b**7*x**(7/2)/7 + 6435*
a**7*b**8*x**4/4 + 10010*a**6*b**9*x**(9/2)/9 + 3003*a**5*b**10*x
**5/5 + 2730*a**4*b**11*x**(11/2)/11 + 455*a**3*b**12*x**6/6 + 21
0*a**2*b**13*x**(13/2)/13 + 15*a*b**14*x**7/7 + 2*b**15*x**(15/2)
/15
```

GIAC/XCAS [A] time = 0.218695, size = 221, normalized size = 1.08

$$\frac{2}{15}b^{15}x^{\frac{15}{2}}+\frac{15}{7}ab^{14}x^7+\frac{210}{13}a^2b^{13}x^{\frac{13}{2}}+\frac{455}{6}a^3b^{12}x^6+\frac{2730}{11}a^4b^{11}x^{\frac{11}{2}}+\frac{3003}{5}a^5b^{10}x^5$$
$$+\frac{10010}{9}a^6b^9x^{\frac{9}{2}}+\frac{6435}{4}a^7b^8x^4+\frac{12870}{7}a^8b^7x^{\frac{7}{2}}+\frac{5005}{3}a^9b^6x^3+\frac{6006}{5}a^{10}b^5x^{\frac{5}{2}}$$
$$+\frac{1365}{2}a^{11}b^4x^2+\frac{910}{3}a^{12}b^3x^{\frac{3}{2}}+105\,a^{13}b^2x+a^{15}\ln\left(|x|\right)+30\,a^{14}b\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x,x, algorithm="giac")
```

```
[Out] 2/15*b^15*x^(15/2) + 15/7*a*b^14*x^7 + 210/13*a^2*b^13*x^(13/2) +
 455/6*a^3*b^12*x^6 + 2730/11*a^4*b^11*x^(11/2) + 3003/5*a^5*b^10
*x^5 + 10010/9*a^6*b^9*x^(9/2) + 6435/4*a^7*b^8*x^4 + 12870/7*a^8
*b^7*x^(7/2) + 5005/3*a^9*b^6*x^3 + 6006/5*a^10*b^5*x^(5/2) + 136
5/2*a^11*b^4*x^2 + 910/3*a^12*b^3*x^(3/2) + 105*a^13*b^2*x + a^15
*ln(abs(x)) + 30*a^14*b*sqrt(x)
```

3.2174 $\int \frac{(a+b\sqrt{x})^{15}}{x^2} dx$

Optimal. Leaf size=192

$$-\frac{a^{15}}{x}-\frac{30a^{14}b}{\sqrt{x}}+105a^{13}b^2\log(x)+910a^{12}b^3\sqrt{x}+1365a^{11}b^4x+2002a^{10}b^5x^{3/2}+\frac{5005}{2}a^9b^6x^2+2574a^8b^7x^{5/2}+2145a^7b^8x^3+1430a^6b^9x^{7/2}+\frac{3003}{4}a^5b^{10}x^4+\frac{910}{3}a^4b^{11}x^{9/2}+91a^3b^{12}x^5+\frac{210}{11}a^2b^{13}x^{11/2}+\frac{5}{2}ab^{14}x^6+\frac{2}{13}b^{15}x^{13/2}$$

```
[Out] -(a^15/x) - (30*a^14*b)/Sqrt[x] + 910*a^12*b^3*Sqrt[x] + 1365*a^1
1*b^4*x + 2002*a^10*b^5*x^(3/2) + (5005*a^9*b^6*x^2)/2 + 2574*a^8
*b^7*x^(5/2) + 2145*a^7*b^8*x^3 + 1430*a^6*b^9*x^(7/2) + (3003*a^
5*b^10*x^4)/4 + (910*a^4*b^11*x^(9/2))/3 + 91*a^3*b^12*x^5 + (210
*a^2*b^13*x^(11/2))/11 + (5*a*b^14*x^6)/2 + (2*b^15*x^(13/2))/13
+ 105*a^13*b^2*Log[x]
```

Rubi [A] time = 0.315878, antiderivative size = 192, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^{15}}{x}-\frac{30a^{14}b}{\sqrt{x}}+105a^{13}b^2\log(x)+910a^{12}b^3\sqrt{x}+1365a^{11}b^4x+2002a^{10}b^5x^{3/2}+\frac{5005}{2}a^9b^6x^2+2574a^8b^7x^{5/2}+2145a^7b^8x^3+1430a^6b^9x^{7/2}+\frac{3003}{4}a^5b^{10}x^4+\frac{910}{3}a^4b^{11}x^{9/2}+91a^3b^{12}x^5+\frac{210}{11}a^2b^{13}x^{11/2}+\frac{5}{2}ab^{14}x^6+\frac{2}{13}b^{15}x^{13/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^15/x^2,x]
```

```
[Out] -(a^15/x) - (30*a^14*b)/Sqrt[x] + 910*a^12*b^3*Sqrt[x] + 1365*a^1
1*b^4*x + 2002*a^10*b^5*x^(3/2) + (5005*a^9*b^6*x^2)/2 + 2574*a^8
*b^7*x^(5/2) + 2145*a^7*b^8*x^3 + 1430*a^6*b^9*x^(7/2) + (3003*a^
5*b^10*x^4)/4 + (910*a^4*b^11*x^(9/2))/3 + 91*a^3*b^12*x^5 + (210
*a^2*b^13*x^(11/2))/11 + (5*a*b^14*x^6)/2 + (2*b^15*x^(13/2))/13
+ 105*a^13*b^2*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^{15}}{x}-\frac{30a^{14}b}{\sqrt{x}}+210a^{13}b^2\log\left(\sqrt{x}\right)+910a^{12}b^3\sqrt{x}+2730a^{11}b^4\int^{\sqrt{x}}x\,dx+2002a^{10}b^5x^{\frac{3}{2}}+\frac{5005a^9b^6x^2}{2}+2574a^8b^7x^{\frac{5}{2}}+2145a^7b^8x^3+1430a^6b^9x^{\frac{7}{2}}+\frac{3003a^5b^{10}x^4}{4}+\frac{910a^4b^{11}x^{\frac{9}{2}}}{3}+91a^3b^{12}x^5+\frac{210a^2b^{13}x^{\frac{11}{2}}}{11}+\frac{5ab^{14}x^6}{2}+\frac{2b^{15}x^{\frac{13}{2}}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**15/x**2,x)
```

```
[Out] -a**15/x - 30*a**14*b/sqrt(x) + 210*a**13*b**2*log(sqrt(x)) + 910
*a**12*b**3*sqrt(x) + 2730*a**11*b**4*Integral(x, (x, sqrt(x))) +
 2002*a**10*b**5*x**(3/2) + 5005*a**9*b**6*x**2/2 + 2574*a**8*b**
7*x**(5/2) + 2145*a**7*b**8*x**3 + 1430*a**6*b**9*x**(7/2) + 3003
*a**5*b**10*x**4/4 + 910*a**4*b**11*x**(9/2)/3 + 91*a**3*b**12*x*
*5 + 210*a**2*b**13*x**(11/2)/11 + 5*a*b**14*x**6/2 + 2*b**15*x**
(13/2)/13
```

Mathematica [A] time = 0.0875781, size = 192, normalized size = 1.

$$-\frac{a^{15}}{x}-\frac{30a^{14}b}{\sqrt{x}}+105a^{13}b^2\log(x)+910a^{12}b^3\sqrt{x}+1365a^{11}b^4x+2002a^{10}b^5x^{3/2}+\frac{5005}{2}a^9b^6x^2+2574a^8b^7x^{5/2}+2145a^7b^8x^3+1430a^6b^9x^{7/2}+\frac{3003}{4}a^5b^{10}x^4+\frac{910}{3}a^4b^{11}x^{9/2}+91a^3b^{12}x^5+\frac{210}{11}a^2b^{13}x^{11/2}+\frac{5}{2}ab^{14}x^6+\frac{2}{13}b^{15}x^{13/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^15/x^2,x]
```

```
[Out] -(a^15/x) - (30*a^14*b)/Sqrt[x] + 910*a^12*b^3*Sqrt[x] + 1365*a^1
1*b^4*x + 2002*a^10*b^5*x^(3/2) + (5005*a^9*b^6*x^2)/2 + 2574*a^8
*b^7*x^(5/2) + 2145*a^7*b^8*x^3 + 1430*a^6*b^9*x^(7/2) + (3003*a^
5*b^10*x^4)/4 + (910*a^4*b^11*x^(9/2))/3 + 91*a^3*b^12*x^5 + (210
*a^2*b^13*x^(11/2))/11 + (5*a*b^14*x^6)/2 + (2*b^15*x^(13/2))/13
+ 105*a^13*b^2*Log[x]
```

Maple [A] time = 0.005, size = 165, normalized size = 0.9

$$-\frac{a^{15}}{x}+1365\,a^{11}b^4x+2002\,a^{10}b^5x^{3/2}+\frac{5005\,a^9b^6x^2}{2}+2574\,a^8b^7x^{5/2}+2145\,a^7b^8x^3+1430\,a^6b^9x^{7/2}+\frac{3003\,a^5b^{10}x^4}{4}+\frac{910\,a^4b^{11}}{3}x^{\frac{9}{2}}+91\,a^3b^{12}x^5+\frac{210\,a^2b^{13}}{11}x^{\frac{11}{2}}+\frac{5\,ab^{14}x^6}{2}+\frac{2\,b^{15}}{13}x^{\frac{13}{2}}+105\,a^{13}b^2\ln(x)-30\,\frac{a^{14}b}{\sqrt{x}}+910\,a^{12}b^3\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^15/x^2,x)
```

```
[Out] -a^15/x+1365*a^11*b^4*x+2002*a^10*b^5*x^(3/2)+5005/2*a^9*b^6*x^2+
2574*a^8*b^7*x^(5/2)+2145*a^7*b^8*x^3+1430*a^6*b^9*x^(7/2)+3003/4
*a^5*b^10*x^4+910/3*a^4*b^11*x^(9/2)+91*a^3*b^12*x^5+210/11*a^2*b
^13*x^(11/2)+5/2*a*b^14*x^6+2/13*b^15*x^(13/2)+105*a^13*b^2*ln(x)
-30*a^14*b/x^(1/2)+910*a^12*b^3*x^(1/2)
```

Maxima [A] time = 1.43246, size = 223, normalized size = 1.16

$$\frac{2}{13}\,b^{15}x^{\frac{13}{2}}+\frac{5}{2}\,ab^{14}x^6+\frac{210}{11}\,a^2b^{13}x^{\frac{11}{2}}+91\,a^3b^{12}x^5+\frac{910}{3}\,a^4b^{11}x^{\frac{9}{2}}+\frac{3003}{4}\,a^5b^{10}x^4+1430\,a^6b^9x^{\frac{7}{2}}+2145\,a^7b^8x^3+2574\,a^8b^7x^{\frac{5}{2}}+\frac{5005}{2}\,a^9b^6x^2+2002\,a^{10}b^5x^{\frac{3}{2}}+1365\,a^{11}b^4x+105\,a^{13}b^2\log(x)+910\,a^{12}b^3\sqrt{x}-\frac{30\,a^{14}b\sqrt{x}+a^{15}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^2,x, algorithm="maxima")
```

```
[Out] 2/13*b^15*x^(13/2) + 5/2*a*b^14*x^6 + 210/11*a^2*b^13*x^(11/2) +
91*a^3*b^12*x^5 + 910/3*a^4*b^11*x^(9/2) + 3003/4*a^5*b^10*x^4 +
1430*a^6*b^9*x^(7/2) + 2145*a^7*b^8*x^3 + 2574*a^8*b^7*x^(5/2) +
5005/2*a^9*b^6*x^2 + 2002*a^10*b^5*x^(3/2) + 1365*a^11*b^4*x + 10
5*a^13*b^2*log(x) + 910*a^12*b^3*sqrt(x) - (30*a^14*b*sqrt(x) + a
^15)/x
```

Fricas [A] time = 0.240229, size = 232, normalized size = 1.21

$$\frac{4290\,ab^{14}x^{7} + 156156\,a^{3}b^{12}x^{6} + 1288287\,a^{5}b^{10}x^{5} + 3680820\,a^{7}b^{8}x^{4} + 4294290\,a^{9}b^{6}x^{3} + 2342340\,a^{11}b^{4}x^{2} + 360360\,a^{13}b^{2}x\,\mathrm{lo}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^2,x, algorithm="fricas")
```

```
[Out] 1/1716*(4290*a*b^14*x^7 + 156156*a^3*b^12*x^6 + 1288287*a^5*b^10*
x^5 + 3680820*a^7*b^8*x^4 + 4294290*a^9*b^6*x^3 + 2342340*a^11*b^
4*x^2 + 360360*a^13*b^2*x*log(sqrt(x)) - 1716*a^15 + 8*(33*b^15*x
^7 + 4095*a^2*b^13*x^6 + 65065*a^4*b^11*x^5 + 306735*a^6*b^9*x^4
+ 552123*a^8*b^7*x^3 + 429429*a^10*b^5*x^2 + 195195*a^12*b^3*x -
6435*a^14*b)*sqrt(x))/x
```

Sympy [A] time = 18.8701, size = 197, normalized size = 1.03

$$-\frac{a^{15}}{x} - \frac{30a^{14}b}{\sqrt{x}} + 105a^{13}b^{2}\log(x) + 910a^{12}b^{3}\sqrt{x} + 1365a^{11}b^{4}x + 2002a^{10}b^{5}x^{\frac{3}{2}} + \frac{5005a^{9}b^{6}x^{2}}{2} + 2574a^{8}b^{7}x^{\frac{5}{2}} + 2145a^{7}b^{8}x^{3} + 1430a^{6}b^{9}x^{\frac{7}{2}} + \frac{3003a^{5}b^{10}x^{4}}{4} + \frac{910a^{4}b^{11}x^{\frac{9}{2}}}{3} + 91a^{3}b^{12}x^{5} + \frac{210a^{2}b^{13}x^{\frac{11}{2}}}{11} + \frac{5ab^{14}x^{6}}{2} + \frac{2b^{15}x^{\frac{13}{2}}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**15/x**2,x)
```

```
[Out] -a**15/x - 30*a**14*b/sqrt(x) + 105*a**13*b**2*log(x) + 910*a**12
*b**3*sqrt(x) + 1365*a**11*b**4*x + 2002*a**10*b**5*x**(3/2) + 50
05*a**9*b**6*x**2/2 + 2574*a**8*b**7*x**(5/2) + 2145*a**7*b**8*x*
*3 + 1430*a**6*b**9*x**(7/2) + 3003*a**5*b**10*x**4/4 + 910*a**4*
b**11*x**(9/2)/3 + 91*a**3*b**12*x**5 + 210*a**2*b**13*x**(11/2)/
11 + 5*a*b**14*x**6/2 + 2*b**15*x**(13/2)/13
```

GIAC/XCAS [A] time = 0.221688, size = 224, normalized size = 1.17

$$\frac{2}{13}\,b^{15}x^{\frac{13}{2}} + \frac{5}{2}\,ab^{14}x^{6} + \frac{210}{11}\,a^{2}b^{13}x^{\frac{11}{2}} + 91\,a^{3}b^{12}x^{5} + \frac{910}{3}\,a^{4}b^{11}x^{\frac{9}{2}} + \frac{3003}{4}\,a^{5}b^{10}x^{4} + 1430\,a^{6}b^{9}x^{\frac{7}{2}} + 2145\,a^{7}b^{8}x^{3} + 2574\,a^{8}b^{7}x^{\frac{5}{2}} + \frac{5005}{2}\,a^{9}b^{6}x^{2} + 2002\,a^{10}b^{5}x^{\frac{3}{2}} + 1365\,a^{11}b^{4}x + 105\,a^{13}b^{2}\ln(|x|) + 910\,a^{12}b^{3}\sqrt{x} - \frac{30\,a^{14}b\sqrt{x} + a^{15}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^2,x, algorithm="giac")
```

```
[Out] 2/13*b^15*x^(13/2) + 5/2*a*b^14*x^6 + 210/11*a^2*b^13*x^(11/2) +
91*a^3*b^12*x^5 + 910/3*a^4*b^11*x^(9/2) + 3003/4*a^5*b^10*x^4 +
1430*a^6*b^9*x^(7/2) + 2145*a^7*b^8*x^3 + 2574*a^8*b^7*x^(5/2) +
5005/2*a^9*b^6*x^2 + 2002*a^10*b^5*x^(3/2) + 1365*a^11*b^4*x + 10
5*a^13*b^2*ln(abs(x)) + 910*a^12*b^3*sqrt(x) - (30*a^14*b*sqrt(x)
 + a^15)/x
```

3.2175 $\int \frac{(a+b\sqrt{x})^{15}}{x^3}\,dx$

Optimal. Leaf size=190

$$-\frac{a^{15}}{2x^2}-\frac{10a^{14}b}{x^{3/2}}-\frac{105a^{13}b^2}{x}-\frac{910a^{12}b^3}{\sqrt{x}}+1365a^{11}b^4\log(x)+6006a^{10}b^5\sqrt{x}+5005a^9b^6x+4290a^8b^7x^{3/2}+\frac{6435}{2}a^7b^8x^2+2002a^6b^9x^{5/2}+1001a^5b^{10}x^3+390a^4b^{11}x^{7/2}+\frac{455}{4}a^3b^{12}x^4+\frac{70}{3}a^2b^{13}x^{9/2}+3ab^{14}x^5+\frac{2}{11}b^{15}x^{11/2}$$

```
[Out] -a^15/(2*x^2) - (10*a^14*b)/x^(3/2) - (105*a^13*b^2)/x - (910*a^1
2*b^3)/Sqrt[x] + 6006*a^10*b^5*Sqrt[x] + 5005*a^9*b^6*x + 4290*a^
8*b^7*x^(3/2) + (6435*a^7*b^8*x^2)/2 + 2002*a^6*b^9*x^(5/2) + 100
1*a^5*b^10*x^3 + 390*a^4*b^11*x^(7/2) + (455*a^3*b^12*x^4)/4 + (7
0*a^2*b^13*x^(9/2))/3 + 3*a*b^14*x^5 + (2*b^15*x^(11/2))/11 + 136
5*a^11*b^4*Log[x]
```

Rubi [A] time = 0.310178, antiderivative size = 190, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^{15}}{2x^2}-\frac{10a^{14}b}{x^{3/2}}-\frac{105a^{13}b^2}{x}-\frac{910a^{12}b^3}{\sqrt{x}}+1365a^{11}b^4\log(x)+6006a^{10}b^5\sqrt{x}+5005a^9b^6x+4290a^8b^7x^{3/2}+\frac{6435}{2}a^7b^8x^2+2002a^6b^9x^{5/2}+1001a^5b^{10}x^3+390a^4b^{11}x^{7/2}+\frac{455}{4}a^3b^{12}x^4+\frac{70}{3}a^2b^{13}x^{9/2}+3ab^{14}x^5+\frac{2}{11}b^{15}x^{11/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^15/x^3,x]
```

```
[Out] -a^15/(2*x^2) - (10*a^14*b)/x^(3/2) - (105*a^13*b^2)/x - (910*a^1
2*b^3)/Sqrt[x] + 6006*a^10*b^5*Sqrt[x] + 5005*a^9*b^6*x + 4290*a^
8*b^7*x^(3/2) + (6435*a^7*b^8*x^2)/2 + 2002*a^6*b^9*x^(5/2) + 100
1*a^5*b^10*x^3 + 390*a^4*b^11*x^(7/2) + (455*a^3*b^12*x^4)/4 + (7
0*a^2*b^13*x^(9/2))/3 + 3*a*b^14*x^5 + (2*b^15*x^(11/2))/11 + 136
5*a^11*b^4*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^{15}}{2x^2}-\frac{10a^{14}b}{x^{\frac{3}{2}}}-\frac{105a^{13}b^2}{x}-\frac{910a^{12}b^3}{\sqrt{x}}+2730a^{11}b^4\log\left(\sqrt{x}\right)+6006a^{10}b^5\sqrt{x}+10010a^9b^6\int^{\sqrt{x}}x\,dx+4290a^8b^7x^{\frac{3}{2}}+\frac{6435a^7b^8x^2}{2}+2002a^6b^9x^{\frac{5}{2}}+1001a^5b^{10}x^3+390a^4b^{11}x^{\frac{7}{2}}+\frac{455a^3b^{12}x^4}{4}+\frac{70a^2b^{13}x^{\frac{9}{2}}}{3}+3ab^{14}x^5+\frac{2b^{15}x^{\frac{11}{2}}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**15/x**3,x)
```

```
[Out] -a**15/(2*x**2) - 10*a**14*b/x**(3/2) - 105*a**13*b**2/x - 910*a*
*12*b**3/sqrt(x) + 2730*a**11*b**4*log(sqrt(x)) + 6006*a**10*b**5
*sqrt(x) + 10010*a**9*b**6*Integral(x, (x, sqrt(x))) + 4290*a**8*
b**7*x**(3/2) + 6435*a**7*b**8*x**2/2 + 2002*a**6*b**9*x**(5/2) +
 1001*a**5*b**10*x**3 + 390*a**4*b**11*x**(7/2) + 455*a**3*b**12*
x**4/4 + 70*a**2*b**13*x**(9/2)/3 + 3*a*b**14*x**5 + 2*b**15*x**(
11/2)/11
```

Mathematica [A] time = 0.107152, size = 190, normalized size = 1.

$$-\frac{a^{15}}{2x^2}-\frac{10a^{14}b}{x^{3/2}}-\frac{105a^{13}b^2}{x}-\frac{910a^{12}b^3}{\sqrt{x}}+1365a^{11}b^4\log(x)+6006a^{10}b^5\sqrt{x}+5005a^9b^6x+4290a^8b^7x^{3/2}+\frac{6435}{2}a^7b^8x^2+2002a^6b^9x^{5/2}+1001a^5b^{10}x^3+390a^4b^{11}x^{7/2}+\frac{455}{4}a^3b^{12}x^4+\frac{70}{3}a^2b^{13}x^{9/2}+3ab^{14}x^5+\frac{2}{11}b^{15}x^{11/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^15/x^3,x]
```

```
[Out] -a^15/(2*x^2) - (10*a^14*b)/x^(3/2) - (105*a^13*b^2)/x - (910*a^1
2*b^3)/Sqrt[x] + 6006*a^10*b^5*Sqrt[x] + 5005*a^9*b^6*x + 4290*a^
8*b^7*x^(3/2) + (6435*a^7*b^8*x^2)/2 + 2002*a^6*b^9*x^(5/2) + 100
1*a^5*b^10*x^3 + 390*a^4*b^11*x^(7/2) + (455*a^3*b^12*x^4)/4 + (7
0*a^2*b^13*x^(9/2))/3 + 3*a*b^14*x^5 + (2*b^15*x^(11/2))/11 + 136
5*a^11*b^4*Log[x]
```

Maple [A] time = 0.008, size = 165, normalized size = 0.9

$$-\frac{a^{15}}{2\,x^2}-10\,\frac{a^{14}b}{x^{3/2}}-105\,\frac{a^{13}b^2}{x}+5005\,a^9b^6x+4290\,a^8b^7x^{3/2}+\frac{6435\,a^7b^8x^2}{2}+2002\,a^6b^9x^{5/2}+1001\,a^5b^{10}x^3+390\,a^4b^{11}x^{7/2}+\frac{455\,a^3b^{12}x^4}{4}+\frac{70\,a^2b^{13}}{3}x^{\frac{9}{2}}+3\,ab^{14}x^5+\frac{2\,b^{15}}{11}x^{\frac{11}{2}}+1365\,a^{11}b^4\ln(x)-910\,\frac{a^{12}b^3}{\sqrt{x}}+6006\,a^{10}b^5\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^15/x^3,x)
```

```
[Out] -1/2*a^15/x^2-10*a^14*b/x^(3/2)-105*a^13*b^2/x+5005*a^9*b^6*x+429
0*a^8*b^7*x^(3/2)+6435/2*a^7*b^8*x^2+2002*a^6*b^9*x^(5/2)+1001*a^
5*b^10*x^3+390*a^4*b^11*x^(7/2)+455/4*a^3*b^12*x^4+70/3*a^2*b^13*
x^(9/2)+3*a*b^14*x^5+2/11*b^15*x^(11/2)+1365*a^11*b^4*ln(x)-910*a
^12*b^3/x^(1/2)+6006*a^10*b^5*x^(1/2)
```

Maxima [A] time = 1.42875, size = 220, normalized size = 1.16

$$\frac{2}{11}\,b^{15}x^{\frac{11}{2}}+3\,ab^{14}x^5+\frac{70}{3}\,a^2b^{13}x^{\frac{9}{2}}+\frac{455}{4}\,a^3b^{12}x^4+390\,a^4b^{11}x^{\frac{7}{2}}+1001\,a^5b^{10}x^3+2002\,a^6b^9x^{\frac{5}{2}}+\frac{6435}{2}\,a^7b^8x^2+4290\,a^8b^7x^{\frac{3}{2}}+5005\,a^9b^6x+1365\,a^{11}b^4\log(x)+6006\,a^{10}b^5\sqrt{x}-\frac{1820\,a^{12}b^3x^{\frac{3}{2}}+210\,a^{13}b^2x+20\,a^{14}b\sqrt{x}+a^{15}}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^3,x, algorithm="maxima")
```

```
[Out] 2/11*b^15*x^(11/2) + 3*a*b^14*x^5 + 70/3*a^2*b^13*x^(9/2) + 455/4
*a^3*b^12*x^4 + 390*a^4*b^11*x^(7/2) + 1001*a^5*b^10*x^3 + 2002*a
^6*b^9*x^(5/2) + 6435/2*a^7*b^8*x^2 + 4290*a^8*b^7*x^(3/2) + 5005
*a^9*b^6*x + 1365*a^11*b^4*log(x) + 6006*a^10*b^5*sqrt(x) - 1/2*(
1820*a^12*b^3*x^(3/2) + 210*a^13*b^2*x + 20*a^14*b*sqrt(x) + a^15
)/x^2
```

Fricas [A] time = 0.234782, size = 232, normalized size = 1.22

$$\frac{396\,ab^{14}x^7 + 15015\,a^3b^{12}x^6 + 132132\,a^5b^{10}x^5 + 424710\,a^7b^8x^4 + 660660\,a^9b^6x^3 + 360360\,a^{11}b^4x^2\log\left(\sqrt{x}\right) - 13860\,a^{13}b^2x \cdots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^3,x, algorithm="fricas")
```

```
[Out] 1/132*(396*a*b^14*x^7 + 15015*a^3*b^12*x^6 + 132132*a^5*b^10*x^5
+ 424710*a^7*b^8*x^4 + 660660*a^9*b^6*x^3 + 360360*a^11*b^4*x^2*l
og(sqrt(x)) - 13860*a^13*b^2*x - 66*a^15 + 8*(3*b^15*x^7 + 385*a^
2*b^13*x^6 + 6435*a^4*b^11*x^5 + 33033*a^6*b^9*x^4 + 70785*a^8*b^
7*x^3 + 99099*a^10*b^5*x^2 - 15015*a^12*b^3*x - 165*a^14*b)*sqrt(
x))/x^2
```

Sympy [A] time = 18.0269, size = 196, normalized size = 1.03

$$-\frac{a^{15}}{2x^2} - \frac{10a^{14}b}{x^{\frac{3}{2}}} - \frac{105a^{13}b^2}{x} - \frac{910a^{12}b^3}{\sqrt{x}} + 1365a^{11}b^4\log(x) + 6006a^{10}b^5\sqrt{x} + 5005a^9b^6x + 4290a^8b^7x^{\frac{3}{2}} + \frac{6435a^7b^8x^2}{2} + 2002a^6b^9x^{\frac{5}{2}} + 1001a^5b^{10}x^3 + 390a^4b^{11}x^{\frac{7}{2}} + \frac{455a^3b^{12}x^4}{4} + \frac{70a^2b^{13}x^{\frac{9}{2}}}{3} + 3ab^{14}x^5 + \frac{2b^{15}x^{\frac{11}{2}}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**15/x**3,x)
```

```
[Out] -a**15/(2*x**2) - 10*a**14*b/x**(3/2) - 105*a**13*b**2/x - 910*a*
*12*b**3/sqrt(x) + 1365*a**11*b**4*log(x) + 6006*a**10*b**5*sqrt(
x) + 5005*a**9*b**6*x + 4290*a**8*b**7*x**(3/2) + 6435*a**7*b**8*
x**2/2 + 2002*a**6*b**9*x**(5/2) + 1001*a**5*b**10*x**3 + 390*a**
4*b**11*x**(7/2) + 455*a**3*b**12*x**4/4 + 70*a**2*b**13*x**(9/2)
/3 + 3*a*b**14*x**5 + 2*b**15*x**(11/2)/11
```

GIAC/XCAS [A] time = 0.2245, size = 221, normalized size = 1.16

$$\frac{2}{11}\,b^{15}x^{\frac{11}{2}} + 3\,ab^{14}x^5 + \frac{70}{3}\,a^2b^{13}x^{\frac{9}{2}} + \frac{455}{4}\,a^3b^{12}x^4 + 390\,a^4b^{11}x^{\frac{7}{2}} + 1001\,a^5b^{10}x^3 + 2002\,a^6b^9x^{\frac{5}{2}} + \frac{6435}{2}\,a^7b^8x^2 + 4290\,a^8b^7x^{\frac{3}{2}} + 5005\,a^9b^6x + 1365\,a^{11}b^4\ln(|x|) + 6006\,a^{10}b^5\sqrt{x} - \frac{1820\,a^{12}b^3x^{\frac{3}{2}} + 210\,a^{13}b^2x + 20\,a^{14}b\sqrt{x} + a^{15}}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^3,x, algorithm="giac")
```

```
[Out] 2/11*b^15*x^(11/2) + 3*a*b^14*x^5 + 70/3*a^2*b^13*x^(9/2) + 455/4
*a^3*b^12*x^4 + 390*a^4*b^11*x^(7/2) + 1001*a^5*b^10*x^3 + 2002*a
^6*b^9*x^(5/2) + 6435/2*a^7*b^8*x^2 + 4290*a^8*b^7*x^(3/2) + 5005
*a^9*b^6*x + 1365*a^11*b^4*ln(abs(x)) + 6006*a^10*b^5*sqrt(x) - 1
/2*(1820*a^12*b^3*x^(3/2) + 210*a^13*b^2*x + 20*a^14*b*sqrt(x) +
a^15)/x^2
```

3.2176 $\int \frac{(a+b\sqrt{x})^{15}}{x^4}\,dx$

Optimal. Leaf size=196

$$-\frac{a^{15}}{3x^3}-\frac{6a^{14}b}{x^{5/2}}-\frac{105a^{13}b^2}{2x^2}-\frac{910a^{12}b^3}{3x^{3/2}}-\frac{1365a^{11}b^4}{x}-\frac{6006a^{10}b^5}{\sqrt{x}}+5005a^9b^6\log(x)+12870a^8b^7\sqrt{x}+6435a^7b^8x+\frac{10010}{3}a^6b^9x^{3/2}+\frac{3003}{2}a^5b^{10}x^2+546a^4b^{11}x^{5/2}+\frac{455}{3}a^3b^{12}x^3+30a^2b^{13}x^{7/2}+\frac{15}{4}ab^{14}x^4+\frac{2}{9}b^{15}x^{9/2}$$

```
[Out] -a^15/(3*x^3) - (6*a^14*b)/x^(5/2) - (105*a^13*b^2)/(2*x^2) - (91
0*a^12*b^3)/(3*x^(3/2)) - (1365*a^11*b^4)/x - (6006*a^10*b^5)/Sqr
t[x] + 12870*a^8*b^7*Sqrt[x] + 6435*a^7*b^8*x + (10010*a^6*b^9*x^
(3/2))/3 + (3003*a^5*b^10*x^2)/2 + 546*a^4*b^11*x^(5/2) + (455*a^
3*b^12*x^3)/3 + 30*a^2*b^13*x^(7/2) + (15*a*b^14*x^4)/4 + (2*b^15
*x^(9/2))/9 + 5005*a^9*b^6*Log[x]
```

Rubi [A] time = 0.310543, antiderivative size = 196, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^{15}}{3x^3}-\frac{6a^{14}b}{x^{5/2}}-\frac{105a^{13}b^2}{2x^2}-\frac{910a^{12}b^3}{3x^{3/2}}-\frac{1365a^{11}b^4}{x}-\frac{6006a^{10}b^5}{\sqrt{x}}+5005a^9b^6\log(x)+12870a^8b^7\sqrt{x}+6435a^7b^8x+\frac{10010}{3}a^6b^9x^{3/2}+\frac{3003}{2}a^5b^{10}x^2+546a^4b^{11}x^{5/2}+\frac{455}{3}a^3b^{12}x^3+30a^2b^{13}x^{7/2}+\frac{15}{4}ab^{14}x^4+\frac{2}{9}b^{15}x^{9/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^15/x^4,x]
```

```
[Out] -a^15/(3*x^3) - (6*a^14*b)/x^(5/2) - (105*a^13*b^2)/(2*x^2) - (91
0*a^12*b^3)/(3*x^(3/2)) - (1365*a^11*b^4)/x - (6006*a^10*b^5)/Sqr
t[x] + 12870*a^8*b^7*Sqrt[x] + 6435*a^7*b^8*x + (10010*a^6*b^9*x^
(3/2))/3 + (3003*a^5*b^10*x^2)/2 + 546*a^4*b^11*x^(5/2) + (455*a^
3*b^12*x^3)/3 + 30*a^2*b^13*x^(7/2) + (15*a*b^14*x^4)/4 + (2*b^15
*x^(9/2))/9 + 5005*a^9*b^6*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^{15}}{3x^3}-\frac{6a^{14}b}{x^{\frac{5}{2}}}-\frac{105a^{13}b^2}{2x^2}-\frac{910a^{12}b^3}{3x^{\frac{3}{2}}}-\frac{1365a^{11}b^4}{x}-\frac{6006a^{10}b^5}{\sqrt{x}}+10010a^9b^6\log\left(\sqrt{x}\right)+12870a^8b^7\sqrt{x}+12870a^7b^8\int^{\sqrt{x}}x\,dx+\frac{10010a^6b^9x^{\frac{3}{2}}}{3}+\frac{3003a^5b^{10}x^2}{2}+546a^4b^{11}x^{\frac{5}{2}}+\frac{455a^3b^{12}x^3}{3}+30a^2b^{13}x^{\frac{7}{2}}+\frac{15ab^{14}x^4}{4}+\frac{2b^{15}x^{\frac{9}{2}}}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**15/x**4,x)
```

```
[Out] -a**15/(3*x**3) - 6*a**14*b/x**(5/2) - 105*a**13*b**2/(2*x**2) -
910*a**12*b**3/(3*x**(3/2)) - 1365*a**11*b**4/x - 6006*a**10*b**5
/sqrt(x) + 10010*a**9*b**6*log(sqrt(x)) + 12870*a**8*b**7*sqrt(x)
 + 12870*a**7*b**8*Integral(x, (x, sqrt(x))) + 10010*a**6*b**9*x*
*(3/2)/3 + 3003*a**5*b**10*x**2/2 + 546*a**4*b**11*x**(5/2) + 455
*a**3*b**12*x**3/3 + 30*a**2*b**13*x**(7/2) + 15*a*b**14*x**4/4 +
 2*b**15*x**(9/2)/9
```

Mathematica [A] time = 0.104421, size = 196, normalized size = 1.

$$-\frac{a^{15}}{3x^3}-\frac{6a^{14}b}{x^{5/2}}-\frac{105a^{13}b^2}{2x^2}-\frac{910a^{12}b^3}{3x^{3/2}}-\frac{1365a^{11}b^4}{x}-\frac{6006a^{10}b^5}{\sqrt{x}}+5005a^9b^6\log(x)+12870a^8b^7\sqrt{x}+6435a^7b^8x+\frac{10010}{3}a^6b^9x^{3/2}+\frac{3003}{2}a^5b^{10}x^2+546a^4b^{11}x^{5/2}+\frac{455}{3}a^3b^{12}x^3+30a^2b^{13}x^{7/2}+\frac{15}{4}ab^{14}x^4+\frac{2}{9}b^{15}x^{9/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^15/x^4,x]
```

```
[Out] -a^15/(3*x^3) - (6*a^14*b)/x^(5/2) - (105*a^13*b^2)/(2*x^2) - (91
0*a^12*b^3)/(3*x^(3/2)) - (1365*a^11*b^4)/x - (6006*a^10*b^5)/Sqr
t[x] + 12870*a^8*b^7*Sqrt[x] + 6435*a^7*b^8*x + (10010*a^6*b^9*x^
(3/2))/3 + (3003*a^5*b^10*x^2)/2 + 546*a^4*b^11*x^(5/2) + (455*a^
3*b^12*x^3)/3 + 30*a^2*b^13*x^(7/2) + (15*a*b^14*x^4)/4 + (2*b^15
*x^(9/2))/9 + 5005*a^9*b^6*Log[x]
```

Maple [A] time = 0.006, size = 165, normalized size = 0.8

$$-\frac{a^{15}}{3\,x^3}-6\,\frac{a^{14}b}{x^{5/2}}-\frac{105\,a^{13}b^2}{2\,x^2}-\frac{910\,a^{12}b^3}{3}x^{-\frac{3}{2}}-1365\,\frac{a^{11}b^4}{x}+6435\,a^7b^8x+\frac{10010\,a^6b^9}{3}x^{\frac{3}{2}}+\frac{3003\,a^5b^{10}x^2}{2}+546\,a^4b^{11}x^{5/2}+\frac{455\,a^3b^{12}x^3}{3}+30\,a^2b^{13}x^{7/2}+\frac{15\,ab^{14}x^4}{4}+\frac{2\,b^{15}}{9}x^{\frac{9}{2}}+5005\,a^9b^6\ln(x)-6006\,\frac{a^{10}b^5}{\sqrt{x}}+12870\,a^8b^7\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^15/x^4,x)
```

```
[Out] -1/3*a^15/x^3-6*a^14*b/x^(5/2)-105/2*a^13*b^2/x^2-910/3*a^12*b^3/
x^(3/2)-1365*a^11*b^4/x+6435*a^7*b^8*x+10010/3*a^6*b^9*x^(3/2)+30
03/2*a^5*b^10*x^2+546*a^4*b^11*x^(5/2)+455/3*a^3*b^12*x^3+30*a^2*
b^13*x^(7/2)+15/4*a*b^14*x^4+2/9*b^15*x^(9/2)+5005*a^9*b^6*ln(x)-
6006*a^10*b^5/x^(1/2)+12870*a^8*b^7*x^(1/2)
```

Maxima [A] time = 1.43043, size = 223, normalized size = 1.14

$$\frac{2}{9}\,b^{15}x^{\frac{9}{2}}+\frac{15}{4}\,ab^{14}x^4+30\,a^2b^{13}x^{\frac{7}{2}}+\frac{455}{3}\,a^3b^{12}x^3+546\,a^4b^{11}x^{\frac{5}{2}}+\frac{3003}{2}\,a^5b^{10}x^2+\frac{10010}{3}\,a^6b^9x^{\frac{3}{2}}+6435\,a^7b^8x+5005\,a^9b^6\log(x)+12870\,a^8b^7\sqrt{x}-\frac{36036\,a^{10}b^5x^{\frac{5}{2}}+8190\,a^{11}b^4x^2+1820\,a^{12}b^3x^{\frac{3}{2}}+315\,a^{13}b^2x+36\,a^{14}b\sqrt{x}+2\,a^{15}}{6\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^4,x, algorithm="maxima")
```

```
[Out] 2/9*b^15*x^(9/2) + 15/4*a*b^14*x^4 + 30*a^2*b^13*x^(7/2) + 455/3*
a^3*b^12*x^3 + 546*a^4*b^11*x^(5/2) + 3003/2*a^5*b^10*x^2 + 10010
/3*a^6*b^9*x^(3/2) + 6435*a^7*b^8*x + 5005*a^9*b^6*log(x) + 12870
*a^8*b^7*sqrt(x) - 1/6*(36036*a^10*b^5*x^(5/2) + 8190*a^11*b^4*x^
2 + 1820*a^12*b^3*x^(3/2) + 315*a^13*b^2*x + 36*a^14*b*sqrt(x) +
2*a^15)/x^3
```

Fricas [A] time = 0.238551, size = 231, normalized size = 1.18

$$\frac{135\,ab^{14}x^{7} + 5460\,a^{3}b^{12}x^{6} + 54054\,a^{5}b^{10}x^{5} + 231660\,a^{7}b^{8}x^{4} + 360360\,a^{9}b^{6}x^{3}\log\left(\sqrt{x}\right) - 49140\,a^{11}b^{4}x^{2} - 1890\,a^{13}b^{2}x - 12}{36\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^4,x, algorithm="fricas")
```

```
[Out] 1/36*(135*a*b^14*x^7 + 5460*a^3*b^12*x^6 + 54054*a^5*b^10*x^5 + 2
31660*a^7*b^8*x^4 + 360360*a^9*b^6*x^3*log(sqrt(x)) - 49140*a^11*
b^4*x^2 - 1890*a^13*b^2*x - 12*a^15 + 8*(b^15*x^7 + 135*a^2*b^13*
x^6 + 2457*a^4*b^11*x^5 + 15015*a^6*b^9*x^4 + 57915*a^8*b^7*x^3 -
 27027*a^10*b^5*x^2 - 1365*a^12*b^3*x - 27*a^14*b)*sqrt(x))/x^3
```

Sympy [A] time = 17.5361, size = 201, normalized size = 1.03

$$-\frac{a^{15}}{3x^{3}} - \frac{6a^{14}b}{x^{\frac{5}{2}}} - \frac{105a^{13}b^{2}}{2x^{2}} - \frac{910a^{12}b^{3}}{3x^{\frac{3}{2}}} - \frac{1365a^{11}b^{4}}{x} - \frac{6006a^{10}b^{5}}{\sqrt{x}} + 5005a^{9}b^{6}\log(x) + 12870a^{8}b^{7}\sqrt{x} + 6435a^{7}b^{8}x + \frac{10010a^{6}b^{9}x^{\frac{3}{2}}}{3} + \frac{3003a^{5}b^{10}x^{2}}{2} + 546a^{4}b^{11}x^{\frac{5}{2}} + \frac{455a^{3}b^{12}x^{3}}{3} + 30a^{2}b^{13}x^{\frac{7}{2}} + \frac{15ab^{14}x^{4}}{4} + \frac{2b^{15}x^{\frac{9}{2}}}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**15/x**4,x)
```

```
[Out] -a**15/(3*x**3) - 6*a**14*b/x**(5/2) - 105*a**13*b**2/(2*x**2) -
910*a**12*b**3/(3*x**(3/2)) - 1365*a**11*b**4/x - 6006*a**10*b**5
/sqrt(x) + 5005*a**9*b**6*log(x) + 12870*a**8*b**7*sqrt(x) + 6435
*a**7*b**8*x + 10010*a**6*b**9*x**(3/2)/3 + 3003*a**5*b**10*x**2/
2 + 546*a**4*b**11*x**(5/2) + 455*a**3*b**12*x**3/3 + 30*a**2*b**
13*x**(7/2) + 15*a*b**14*x**4/4 + 2*b**15*x**(9/2)/9
```

GIAC/XCAS [A] time = 0.219209, size = 224, normalized size = 1.14

$$\frac{2}{9}\,b^{15}x^{\frac{9}{2}} + \frac{15}{4}\,ab^{14}x^{4} + 30\,a^{2}b^{13}x^{\frac{7}{2}} + \frac{455}{3}\,a^{3}b^{12}x^{3} + 546\,a^{4}b^{11}x^{\frac{5}{2}} + \frac{3003}{2}\,a^{5}b^{10}x^{2} + \frac{10010}{3}\,a^{6}b^{9}x^{\frac{3}{2}} + 6435\,a^{7}b^{8}x + 5005\,a^{9}b^{6}\ln(|x|) + 12870\,a^{8}b^{7}\sqrt{x} - \frac{36036\,a^{10}b^{5}x^{\frac{5}{2}} + 8190\,a^{11}b^{4}x^{2} + 1820\,a^{12}b^{3}x^{\frac{3}{2}} + 315\,a^{13}b^{2}x + 36\,a^{14}b\sqrt{x} + 2\,a^{15}}{6\,x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^4,x, algorithm="giac")
```

```
[Out] 2/9*b^15*x^(9/2) + 15/4*a*b^14*x^4 + 30*a^2*b^13*x^(7/2) + 455/3*
a^3*b^12*x^3 + 546*a^4*b^11*x^(5/2) + 3003/2*a^5*b^10*x^2 + 10010
/3*a^6*b^9*x^(3/2) + 6435*a^7*b^8*x + 5005*a^9*b^6*ln(abs(x)) + 1
2870*a^8*b^7*sqrt(x) - 1/6*(36036*a^10*b^5*x^(5/2) + 8190*a^11*b^
4*x^2 + 1820*a^12*b^3*x^(3/2) + 315*a^13*b^2*x + 36*a^14*b*sqrt(x
) + 2*a^15)/x^3
```

3.2177 $\int \frac{\left(a+b\sqrt{x}\right)^{15}}{x^6}\,dx$

Optimal. Leaf size=194

$$-\frac{a^{15}}{5x^5}-\frac{10a^{14}b}{3x^{9/2}}-\frac{105a^{13}b^2}{4x^4}-\frac{130a^{12}b^3}{x^{7/2}}-\frac{455a^{11}b^4}{x^3}-\frac{6006a^{10}b^5}{5x^{5/2}}-\frac{5005a^9b^6}{2x^2}-\frac{4290a^8b^7}{x^{3/2}}-\frac{6435a^7b^8}{x}-\frac{10010a^6b^9}{\sqrt{x}}+3003a^5b^{10}\log(x)+2730a^4b^{11}\sqrt{x}+455a^3b^{12}x+70a^2b^{13}x^{3/2}+\frac{15}{2}ab^{14}x^2+\frac{2}{5}b^{15}x^{5/2}$$

```
[Out] -a^15/(5*x^5) - (10*a^14*b)/(3*x^(9/2)) - (105*a^13*b^2)/(4*x^4)
- (130*a^12*b^3)/x^(7/2) - (455*a^11*b^4)/x^3 - (6006*a^10*b^5)/(
5*x^(5/2)) - (5005*a^9*b^6)/(2*x^2) - (4290*a^8*b^7)/x^(3/2) - (6
435*a^7*b^8)/x - (10010*a^6*b^9)/Sqrt[x] + 2730*a^4*b^11*Sqrt[x]
+ 455*a^3*b^12*x + 70*a^2*b^13*x^(3/2) + (15*a*b^14*x^2)/2 + (2*b
^15*x^(5/2))/5 + 3003*a^5*b^10*Log[x]
```

Rubi [A] time = 0.30717, antiderivative size = 194, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^{15}}{5x^5}-\frac{10a^{14}b}{3x^{9/2}}-\frac{105a^{13}b^2}{4x^4}-\frac{130a^{12}b^3}{x^{7/2}}-\frac{455a^{11}b^4}{x^3}-\frac{6006a^{10}b^5}{5x^{5/2}}-\frac{5005a^9b^6}{2x^2}-\frac{4290a^8b^7}{x^{3/2}}-\frac{6435a^7b^8}{x}-\frac{10010a^6b^9}{\sqrt{x}}+3003a^5b^{10}\log(x)+2730a^4b^{11}\sqrt{x}+455a^3b^{12}x+70a^2b^{13}x^{3/2}+\frac{15}{2}ab^{14}x^2+\frac{2}{5}b^{15}x^{5/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^15/x^6,x]
```

```
[Out] -a^15/(5*x^5) - (10*a^14*b)/(3*x^(9/2)) - (105*a^13*b^2)/(4*x^4)
- (130*a^12*b^3)/x^(7/2) - (455*a^11*b^4)/x^3 - (6006*a^10*b^5)/(
5*x^(5/2)) - (5005*a^9*b^6)/(2*x^2) - (4290*a^8*b^7)/x^(3/2) - (6
435*a^7*b^8)/x - (10010*a^6*b^9)/Sqrt[x] + 2730*a^4*b^11*Sqrt[x]
+ 455*a^3*b^12*x + 70*a^2*b^13*x^(3/2) + (15*a*b^14*x^2)/2 + (2*b
^15*x^(5/2))/5 + 3003*a^5*b^10*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^{15}}{5x^5}-\frac{10a^{14}b}{3x^{\frac{9}{2}}}-\frac{105a^{13}b^2}{4x^4}-\frac{130a^{12}b^3}{x^{\frac{7}{2}}}-\frac{455a^{11}b^4}{x^3}-\frac{6006a^{10}b^5}{5x^{\frac{5}{2}}}-\frac{5005a^9b^6}{2x^2}-\frac{4290a^8b^7}{x^{\frac{3}{2}}}-\frac{6435a^7b^8}{x}-\frac{10010a^6b^9}{\sqrt{x}}+6006a^5b^{10}\log\left(\sqrt{x}\right)+2730a^4b^{11}\sqrt{x}+910a^3b^{12}\int^{\sqrt{x}}x\,dx+70a^2b^{13}x^{\frac{3}{2}}+\frac{15ab^{14}x^2}{2}+\frac{2b^{15}x^{\frac{5}{2}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**15/x**6,x)
```

```
[Out] -a**15/(5*x**5) - 10*a**14*b/(3*x**(9/2)) - 105*a**13*b**2/(4*x**
4) - 130*a**12*b**3/x**(7/2) - 455*a**11*b**4/x**3 - 6006*a**10*b
**5/(5*x**(5/2)) - 5005*a**9*b**6/(2*x**2) - 4290*a**8*b**7/x**(3
/2) - 6435*a**7*b**8/x - 10010*a**6*b**9/sqrt(x) + 6006*a**5*b**1
0*log(sqrt(x)) + 2730*a**4*b**11*sqrt(x) + 910*a**3*b**12*Integra
l(x, (x, sqrt(x))) + 70*a**2*b**13*x**(3/2) + 15*a*b**14*x**2/2 +
 2*b**15*x**(5/2)/5
```

Mathematica [A] time = 0.131071, size = 194, normalized size = 1.

$$-\frac{a^{15}}{5x^5}-\frac{10a^{14}b}{3x^{9/2}}-\frac{105a^{13}b^2}{4x^4}-\frac{130a^{12}b^3}{x^{7/2}}-\frac{455a^{11}b^4}{x^3}-\frac{6006a^{10}b^5}{5x^{5/2}}-\frac{5005a^9b^6}{2x^2}-\frac{4290a^8b^7}{x^{3/2}}-\frac{6435a^7b^8}{x}-\frac{10010a^6b^9}{\sqrt{x}}+3003a^5b^{10}\log(x)+2730a^4b^{11}\sqrt{x}+455a^3b^{12}x+70a^2b^{13}x^{3/2}+\frac{15}{2}ab^{14}x^2+\frac{2}{5}b^{15}x^{5/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^15/x^6,x]
```

```
[Out] -a^15/(5*x^5) - (10*a^14*b)/(3*x^(9/2)) - (105*a^13*b^2)/(4*x^4)
- (130*a^12*b^3)/x^(7/2) - (455*a^11*b^4)/x^3 - (6006*a^10*b^5)/(
5*x^(5/2)) - (5005*a^9*b^6)/(2*x^2) - (4290*a^8*b^7)/x^(3/2) - (6
435*a^7*b^8)/x - (10010*a^6*b^9)/Sqrt[x] + 2730*a^4*b^11*Sqrt[x]
+ 455*a^3*b^12*x + 70*a^2*b^13*x^(3/2) + (15*a*b^14*x^2)/2 + (2*b
^15*x^(5/2))/5 + 3003*a^5*b^10*Log[x]
```

Maple [A] time = 0.006, size = 165, normalized size = 0.9

$$-\frac{a^{15}}{5\,x^5}-\frac{10\,a^{14}b}{3}x^{-\frac{9}{2}}-\frac{105\,a^{13}b^2}{4\,x^4}-130\,\frac{a^{12}b^3}{x^{7/2}}-455\,\frac{a^{11}b^4}{x^3}-\frac{6006\,a^{10}b^5}{5}x^{-\frac{5}{2}}-\frac{5005\,a^9b^6}{2\,x^2}-4290\,\frac{a^8b^7}{x^{3/2}}-6435\,\frac{a^7b^8}{x}+455\,a^3b^{12}x+70\,a^2b^{13}x^{3/2}+\frac{15\,ab^{14}x^2}{2}+\frac{2\,b^{15}}{5}x^{\frac{5}{2}}+3003\,a^5b^{10}\ln(x)-10010\,\frac{a^6b^9}{\sqrt{x}}+2730\,a^4b^{11}\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^15/x^6,x)
```

```
[Out] -1/5*a^15/x^5-10/3*a^14*b/x^(9/2)-105/4*a^13*b^2/x^4-130*a^12*b^3
/x^(7/2)-455*a^11*b^4/x^3-6006/5*a^10*b^5/x^(5/2)-5005/2*a^9*b^6/
x^2-4290*a^8*b^7/x^(3/2)-6435*a^7*b^8/x+455*a^3*b^12*x+70*a^2*b^1
3*x^(3/2)+15/2*a*b^14*x^2+2/5*b^15*x^(5/2)+3003*a^5*b^10*ln(x)-10
010*a^6*b^9/x^(1/2)+2730*a^4*b^11*x^(1/2)
```

Maxima [A] time = 1.42038, size = 223, normalized size = 1.15

$$\frac{2}{5}\,b^{15}x^{\frac{5}{2}}+\frac{15}{2}\,ab^{14}x^2+70\,a^2b^{13}x^{\frac{3}{2}}+455\,a^3b^{12}x+3003\,a^5b^{10}\log(x)+2730\,a^4b^{11}\sqrt{x}-\frac{600600\,a^6b^9x^{\frac{9}{2}}+386100\,a^7b^8x^4+257400\,a^8b^7x^{\frac{7}{2}}+150150\,a^9b^6x^3+72072\,a^{10}b^5x^{\frac{5}{2}}+27300\,a^{11}b^4x^2+7800\,a^{12}b^3x^{\frac{3}{2}}+157}{60\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^6,x, algorithm="maxima")
```

```
[Out] 2/5*b^15*x^(5/2) + 15/2*a*b^14*x^2 + 70*a^2*b^13*x^(3/2) + 455*a^
3*b^12*x + 3003*a^5*b^10*log(x) + 2730*a^4*b^11*sqrt(x) - 1/60*(6
00600*a^6*b^9*x^(9/2) + 386100*a^7*b^8*x^4 + 257400*a^8*b^7*x^(7/
2) + 150150*a^9*b^6*x^3 + 72072*a^10*b^5*x^(5/2) + 27300*a^11*b^4
*x^2 + 7800*a^12*b^3*x^(3/2) + 1575*a^13*b^2*x + 200*a^14*b*sqrt(
x) + 12*a^15)/x^5
```

Fricas [A] time = 0.236478, size = 232, normalized size = 1.2

$$\frac{450\,ab^{14}x^7+27300\,a^3b^{12}x^6+360360\,a^5b^{10}x^5\log\left(\sqrt{x}\right)-386100\,a^7b^8x^4-150150\,a^9b^6x^3-27300\,a^{11}b^4x^2-1575\,a^{13}b^2x-}{6(}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^6,x, algorithm="fricas")
```

```
[Out] 1/60*(450*a*b^14*x^7 + 27300*a^3*b^12*x^6 + 360360*a^5*b^10*x^5*l
og(sqrt(x)) - 386100*a^7*b^8*x^4 - 150150*a^9*b^6*x^3 - 27300*a^1
1*b^4*x^2 - 1575*a^13*b^2*x - 12*a^15 + 8*(3*b^15*x^7 + 525*a^2*b
^13*x^6 + 20475*a^4*b^11*x^5 - 75075*a^6*b^9*x^4 - 32175*a^8*b^7*
x^3 - 9009*a^10*b^5*x^2 - 975*a^12*b^3*x - 25*a^14*b)*sqrt(x))/x^
5
```

Sympy [A] time = 16.8374, size = 199, normalized size = 1.03

$$-\frac{a^{15}}{5x^5}-\frac{10a^{14}b}{3x^{\frac{9}{2}}}-\frac{105a^{13}b^2}{4x^4}-\frac{130a^{12}b^3}{x^{\frac{7}{2}}}-\frac{455a^{11}b^4}{x^3}-\frac{6006a^{10}b^5}{5x^{\frac{5}{2}}}-\frac{5005a^9b^6}{2x^2}-\frac{4290a^8b^7}{x^{\frac{3}{2}}}-\frac{6435a^7b^8}{x}-\frac{10010a^6b^9}{\sqrt{x}}+3003a^5b^{10}\log(x)+2730a^4b^{11}\sqrt{x}+455a^3b^{12}x+70a^2b^{13}x^{\frac{3}{2}}+\frac{15ab^{14}x^2}{2}+\frac{2b^{15}x^{\frac{5}{2}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**15/x**6,x)
```

```
[Out] -a**15/(5*x**5) - 10*a**14*b/(3*x**(9/2)) - 105*a**13*b**2/(4*x**
4) - 130*a**12*b**3/x**(7/2) - 455*a**11*b**4/x**3 - 6006*a**10*b
**5/(5*x**(5/2)) - 5005*a**9*b**6/(2*x**2) - 4290*a**8*b**7/x**(3
/2) - 6435*a**7*b**8/x - 10010*a**6*b**9/sqrt(x) + 3003*a**5*b**1
0*log(x) + 2730*a**4*b**11*sqrt(x) + 455*a**3*b**12*x + 70*a**2*b
**13*x**(3/2) + 15*a*b**14*x**2/2 + 2*b**15*x**(5/2)/5
```

GIAC/XCAS [A] time = 0.225449, size = 224, normalized size = 1.15

$$\frac{2}{5}b^{15}x^{\frac{5}{2}}+\frac{15}{2}ab^{14}x^2+70a^2b^{13}x^{\frac{3}{2}}+455a^3b^{12}x+3003a^5b^{10}\ln(|x|)+2730a^4b^{11}\sqrt{x}-\frac{600600a^6b^9x^{\frac{9}{2}}+386100a^7b^8x^4+257400a^8b^7x^{\frac{7}{2}}+150150a^9b^6x^3+72072a^{10}b^5x^{\frac{5}{2}}+27300a^{11}b^4x^2+7800a^{12}b^3x^{\frac{3}{2}}+157}{60x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^6,x, algorithm="giac")
```

```
[Out] 2/5*b^15*x^(5/2) + 15/2*a*b^14*x^2 + 70*a^2*b^13*x^(3/2) + 455*a^
3*b^12*x + 3003*a^5*b^10*ln(abs(x)) + 2730*a^4*b^11*sqrt(x) - 1/6
0*(600600*a^6*b^9*x^(9/2) + 386100*a^7*b^8*x^4 + 257400*a^8*b^7*x
^(7/2) + 150150*a^9*b^6*x^3 + 72072*a^10*b^5*x^(5/2) + 27300*a^11
*b^4*x^2 + 7800*a^12*b^3*x^(3/2) + 1575*a^13*b^2*x + 200*a^14*b*s
qrt(x) + 12*a^15)/x^5
```

3.2178 $\int \frac{\left(a+b\sqrt{x}\right)^{15}}{x^7}\,dx$

Optimal. Leaf size=196

$$-\frac{a^{15}}{6x^6}-\frac{30a^{14}b}{11x^{11/2}}-\frac{21a^{13}b^2}{x^5}-\frac{910a^{12}b^3}{9x^{9/2}}-\frac{1365a^{11}b^4}{4x^4}-\frac{858a^{10}b^5}{x^{7/2}}-\frac{5005a^9b^6}{3x^3}-\frac{2574a^8b^7}{x^{5/2}}-\frac{6435a^7b^8}{2x^2}-\frac{10010a^6b^9}{3x^{3/2}}-\frac{3003a^5b^{10}}{x}-\frac{2730a^4b^{11}}{\sqrt{x}}+455a^3b^{12}\log(x)+210a^2b^{13}\sqrt{x}+15ab^{14}x+\frac{2}{3}b^{15}x^{3/2}$$

```
[Out] -a^15/(6*x^6) - (30*a^14*b)/(11*x^(11/2)) - (21*a^13*b^2)/x^5 - (
910*a^12*b^3)/(9*x^(9/2)) - (1365*a^11*b^4)/(4*x^4) - (858*a^10*b
^5)/x^(7/2) - (5005*a^9*b^6)/(3*x^3) - (2574*a^8*b^7)/x^(5/2) - (
6435*a^7*b^8)/(2*x^2) - (10010*a^6*b^9)/(3*x^(3/2)) - (3003*a^5*b
^10)/x - (2730*a^4*b^11)/Sqrt[x] + 210*a^2*b^13*Sqrt[x] + 15*a*b^
14*x + (2*b^15*x^(3/2))/3 + 455*a^3*b^12*Log[x]
```

Rubi [A] time = 0.307642, antiderivative size = 196, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^{15}}{6x^6}-\frac{30a^{14}b}{11x^{11/2}}-\frac{21a^{13}b^2}{x^5}-\frac{910a^{12}b^3}{9x^{9/2}}-\frac{1365a^{11}b^4}{4x^4}-\frac{858a^{10}b^5}{x^{7/2}}-\frac{5005a^9b^6}{3x^3}-\frac{2574a^8b^7}{x^{5/2}}-\frac{6435a^7b^8}{2x^2}-\frac{10010a^6b^9}{3x^{3/2}}-\frac{3003a^5b^{10}}{x}-\frac{2730a^4b^{11}}{\sqrt{x}}+455a^3b^{12}\log(x)+210a^2b^{13}\sqrt{x}+15ab^{14}x+\frac{2}{3}b^{15}x^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^15/x^7,x]
```

```
[Out] -a^15/(6*x^6) - (30*a^14*b)/(11*x^(11/2)) - (21*a^13*b^2)/x^5 - (
910*a^12*b^3)/(9*x^(9/2)) - (1365*a^11*b^4)/(4*x^4) - (858*a^10*b
^5)/x^(7/2) - (5005*a^9*b^6)/(3*x^3) - (2574*a^8*b^7)/x^(5/2) - (
6435*a^7*b^8)/(2*x^2) - (10010*a^6*b^9)/(3*x^(3/2)) - (3003*a^5*b
^10)/x - (2730*a^4*b^11)/Sqrt[x] + 210*a^2*b^13*Sqrt[x] + 15*a*b^
14*x + (2*b^15*x^(3/2))/3 + 455*a^3*b^12*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^{15}}{6x^6}-\frac{30a^{14}b}{11x^{\frac{11}{2}}}-\frac{21a^{13}b^2}{x^5}-\frac{910a^{12}b^3}{9x^{\frac{9}{2}}}-\frac{1365a^{11}b^4}{4x^4}-\frac{858a^{10}b^5}{x^{\frac{7}{2}}}-\frac{5005a^9b^6}{3x^3}-\frac{2574a^8b^7}{x^{\frac{5}{2}}}-\frac{6435a^7b^8}{2x^2}-\frac{10010a^6b^9}{3x^{\frac{3}{2}}}-\frac{3003a^5b^{10}}{x}-\frac{2730a^4b^{11}}{\sqrt{x}}+910a^3b^{12}\log\left(\sqrt{x}\right)+210a^2b^{13}\sqrt{x}+30ab^{14}\int^{\sqrt{x}}x\,dx+\frac{2b^{15}x^{\frac{3}{2}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**15/x**7,x)
```

```
[Out] -a**15/(6*x**6) - 30*a**14*b/(11*x**(11/2)) - 21*a**13*b**2/x**5
- 910*a**12*b**3/(9*x**(9/2)) - 1365*a**11*b**4/(4*x**4) - 858*a*
*10*b**5/x**(7/2) - 5005*a**9*b**6/(3*x**3) - 2574*a**8*b**7/x**(
5/2) - 6435*a**7*b**8/(2*x**2) - 10010*a**6*b**9/(3*x**(3/2)) - 3
003*a**5*b**10/x - 2730*a**4*b**11/sqrt(x) + 910*a**3*b**12*log(s
qrt(x)) + 210*a**2*b**13*sqrt(x) + 30*a*b**14*Integral(x, (x, sqr
t(x))) + 2*b**15*x**(3/2)/3
```

Mathematica [A] time = 0.132378, size = 196, normalized size = 1.

$$-\frac{a^{15}}{6x^6}-\frac{30a^{14}b}{11x^{11/2}}-\frac{21a^{13}b^2}{x^5}-\frac{910a^{12}b^3}{9x^{9/2}}-\frac{1365a^{11}b^4}{4x^4}-\frac{858a^{10}b^5}{x^{7/2}}-\frac{5005a^9b^6}{3x^3}-\frac{2574a^8b^7}{x^{5/2}}-\frac{6435a^7b^8}{2x^2}-\frac{10010a^6b^9}{3x^{3/2}}-\frac{3003a^5b^{10}}{x}-\frac{2730a^4b^{11}}{\sqrt{x}}+455a^3b^{12}\log(x)+210a^2b^{13}\sqrt{x}+15ab^{14}x+\frac{2}{3}b^{15}x^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^15/x^7,x]
```

```
[Out] -a^15/(6*x^6) - (30*a^14*b)/(11*x^(11/2)) - (21*a^13*b^2)/x^5 - (
910*a^12*b^3)/(9*x^(9/2)) - (1365*a^11*b^4)/(4*x^4) - (858*a^10*b
^5)/x^(7/2) - (5005*a^9*b^6)/(3*x^3) - (2574*a^8*b^7)/x^(5/2) - (
6435*a^7*b^8)/(2*x^2) - (10010*a^6*b^9)/(3*x^(3/2)) - (3003*a^5*b
^10)/x - (2730*a^4*b^11)/Sqrt[x] + 210*a^2*b^13*Sqrt[x] + 15*a*b^
14*x + (2*b^15*x^(3/2))/3 + 455*a^3*b^12*Log[x]
```

Maple [A] time = 0.006, size = 165, normalized size = 0.8

$$-\frac{a^{15}}{6\,x^6}-\frac{30\,a^{14}b}{11}x^{-\frac{11}{2}}-21\,\frac{a^{13}b^2}{x^5}-\frac{910\,a^{12}b^3}{9}x^{-\frac{9}{2}}-\frac{1365\,a^{11}b^4}{4\,x^4}-858\,\frac{a^{10}b^5}{x^{7/2}}-\frac{5005\,a^9b^6}{3\,x^3}-2574\,\frac{a^8b^7}{x^{5/2}}-\frac{6435\,a^7b^8}{2\,x^2}-\frac{10010\,a^6b^9}{3}x^{-\frac{3}{2}}-3003\,\frac{a^5b^{10}}{x}+15\,ab^{14}x+\frac{2\,b^{15}}{3}x^{\frac{3}{2}}+455\,a^3b^{12}\ln(x)-2730\,\frac{a^4b^{11}}{\sqrt{x}}+210\,a^2b^{13}\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^15/x^7,x)
```

```
[Out] -1/6*a^15/x^6-30/11*a^14*b/x^(11/2)-21*a^13*b^2/x^5-910/9*a^12*b^
3/x^(9/2)-1365/4*a^11*b^4/x^4-858*a^10*b^5/x^(7/2)-5005/3*a^9*b^6
/x^3-2574*a^8*b^7/x^(5/2)-6435/2*a^7*b^8/x^2-10010/3*a^6*b^9/x^(3
/2)-3003*a^5*b^10/x+15*a*b^14*x+2/3*b^15*x^(3/2)+455*a^3*b^12*ln(
x)-2730*a^4*b^11/x^(1/2)+210*a^2*b^13*x^(1/2)
```

Maxima [A] time = 1.4301, size = 223, normalized size = 1.14

$$\frac{2}{3}\,b^{15}x^{\frac{3}{2}}+15\,ab^{14}x+455\,a^3b^{12}\log(x)+210\,a^2b^{13}\sqrt{x}-\frac{1081080\,a^4b^{11}x^{\frac{11}{2}}+1189188\,a^5b^{10}x^5+1321320\,a^6b^9x^{\frac{9}{2}}+1274130\,a^7b^8x^4+1019304\,a^8b^7x^{\frac{7}{2}}+660660\,a^9b^6x^3+339768\,a^{10}}{396\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^7,x, algorithm="maxima")
```

```
[Out] 2/3*b^15*x^(3/2) + 15*a*b^14*x + 455*a^3*b^12*log(x) + 210*a^2*b^
13*sqrt(x) - 1/396*(1081080*a^4*b^11*x^(11/2) + 1189188*a^5*b^10*
x^5 + 1321320*a^6*b^9*x^(9/2) + 1274130*a^7*b^8*x^4 + 1019304*a^8
*b^7*x^(7/2) + 660660*a^9*b^6*x^3 + 339768*a^10*b^5*x^(5/2) + 135
135*a^11*b^4*x^2 + 40040*a^12*b^3*x^(3/2) + 8316*a^13*b^2*x + 108
0*a^14*b*sqrt(x) + 66*a^15)/x^6
```

Fricas [A] time = 0.240696, size = 232, normalized size = 1.18

$$\frac{5940\,ab^{14}x^7+360360\,a^3b^{12}x^6\log\left(\sqrt{x}\right)-1189188\,a^5b^{10}x^5-1274130\,a^7b^8x^4-660660\,a^9b^6x^3-135135\,a^{11}b^4x^2-8316\,a^{13}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^7,x, algorithm="fricas")
```

```
[Out] 1/396*(5940*a*b^14*x^7 + 360360*a^3*b^12*x^6*log(sqrt(x)) - 11891
88*a^5*b^10*x^5 - 1274130*a^7*b^8*x^4 - 660660*a^9*b^6*x^3 - 1351
35*a^11*b^4*x^2 - 8316*a^13*b^2*x - 66*a^15 + 8*(33*b^15*x^7 + 10
395*a^2*b^13*x^6 - 135135*a^4*b^11*x^5 - 165165*a^6*b^9*x^4 - 127
413*a^8*b^7*x^3 - 42471*a^10*b^5*x^2 - 5005*a^12*b^3*x - 135*a^14
*b)*sqrt(x))/x^6
```

Sympy [A] time = 16.6652, size = 201, normalized size = 1.03

$$-\frac{a^{15}}{6x^6}-\frac{30a^{14}b}{11x^{\frac{11}{2}}}-\frac{21a^{13}b^2}{x^5}-\frac{910a^{12}b^3}{9x^{\frac{9}{2}}}-\frac{1365a^{11}b^4}{4x^4}-\frac{858a^{10}b^5}{x^{\frac{7}{2}}}-\frac{5005a^9b^6}{3x^3}-\frac{2574a^8b^7}{x^{\frac{5}{2}}}-\frac{6435a^7b^8}{2x^2}-\frac{10010a^6b^9}{3x^{\frac{3}{2}}}-\frac{3003a^5b^{10}}{x}-\frac{2730a^4b^{11}}{\sqrt{x}}+455a^3b^{12}\log(x)+210a^2b^{13}\sqrt{x}+15ab^{14}x+\frac{2b^{15}x^{\frac{3}{2}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**15/x**7,x)
```

```
[Out] -a**15/(6*x**6) - 30*a**14*b/(11*x**(11/2)) - 21*a**13*b**2/x**5
- 910*a**12*b**3/(9*x**(9/2)) - 1365*a**11*b**4/(4*x**4) - 858*a*
*10*b**5/x**(7/2) - 5005*a**9*b**6/(3*x**3) - 2574*a**8*b**7/x**(
5/2) - 6435*a**7*b**8/(2*x**2) - 10010*a**6*b**9/(3*x**(3/2)) - 3
003*a**5*b**10/x - 2730*a**4*b**11/sqrt(x) + 455*a**3*b**12*log(x
) + 210*a**2*b**13*sqrt(x) + 15*a*b**14*x + 2*b**15*x**(3/2)/3
```

GIAC/XCAS [A] time = 0.227974, size = 224, normalized size = 1.14

$$\frac{2}{3}b^{15}x^{\frac{3}{2}}+15\,ab^{14}x+455\,a^3b^{12}\ln(|x|)+210\,a^2b^{13}\sqrt{x}-\frac{1081080\,a^4b^{11}x^{\frac{11}{2}}+1189188\,a^5b^{10}x^5+1321320\,a^6b^9x^{\frac{9}{2}}+1274130\,a^7b^8x^4+1019304\,a^8b^7x^{\frac{7}{2}}+660660\,a^9b^6x^3+339768\,a^{10}}{396\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^7,x, algorithm="giac")
```

```
[Out] 2/3*b^15*x^(3/2) + 15*a*b^14*x + 455*a^3*b^12*ln(abs(x)) + 210*a^
2*b^13*sqrt(x) - 1/396*(1081080*a^4*b^11*x^(11/2) + 1189188*a^5*b
^10*x^5 + 1321320*a^6*b^9*x^(9/2) + 1274130*a^7*b^8*x^4 + 1019304
*a^8*b^7*x^(7/2) + 660660*a^9*b^6*x^3 + 339768*a^10*b^5*x^(5/2) +
 135135*a^11*b^4*x^2 + 40040*a^12*b^3*x^(3/2) + 8316*a^13*b^2*x +
 1080*a^14*b*sqrt(x) + 66*a^15)/x^6
```

3.2179 $\int \frac{\left(a+b\sqrt{x}\right)^{15}}{x^8} dx$

Optimal. Leaf size=198

$$-\frac{a^{15}}{7x^7}-\frac{30a^{14}b}{13x^{13/2}}-\frac{35a^{13}b^2}{2x^6}-\frac{910a^{12}b^3}{11x^{11/2}}-\frac{273a^{11}b^4}{x^5}-\frac{2002a^{10}b^5}{3x^{9/2}}-\frac{5005a^9b^6}{4x^4}-\frac{12870a^8b^7}{7x^{7/2}}-\frac{2145a^7b^8}{x^3}-\frac{2002a^6b^9}{x^{5/2}}-\frac{3003a^5b^{10}}{2x^2}-\frac{910a^4b^{11}}{x^{3/2}}-\frac{455a^3b^{12}}{x}-\frac{210a^2b^{13}}{\sqrt{x}}+15ab^{14}\log(x)+2b^{15}\sqrt{x}$$

```
[Out] -a^15/(7*x^7) - (30*a^14*b)/(13*x^(13/2)) - (35*a^13*b^2)/(2*x^6)
 - (910*a^12*b^3)/(11*x^(11/2)) - (273*a^11*b^4)/x^5 - (2002*a^10
*b^5)/(3*x^(9/2)) - (5005*a^9*b^6)/(4*x^4) - (12870*a^8*b^7)/(7*x
^(7/2)) - (2145*a^7*b^8)/x^3 - (2002*a^6*b^9)/x^(5/2) - (3003*a^5
*b^10)/(2*x^2) - (910*a^4*b^11)/x^(3/2) - (455*a^3*b^12)/x - (210
*a^2*b^13)/Sqrt[x] + 2*b^15*Sqrt[x] + 15*a*b^14*Log[x]
```

Rubi [A] time = 0.304735, antiderivative size = 198, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$-\frac{a^{15}}{7x^7}-\frac{30a^{14}b}{13x^{13/2}}-\frac{35a^{13}b^2}{2x^6}-\frac{910a^{12}b^3}{11x^{11/2}}-\frac{273a^{11}b^4}{x^5}-\frac{2002a^{10}b^5}{3x^{9/2}}-\frac{5005a^9b^6}{4x^4}-\frac{12870a^8b^7}{7x^{7/2}}-\frac{2145a^7b^8}{x^3}-\frac{2002a^6b^9}{x^{5/2}}-\frac{3003a^5b^{10}}{2x^2}-\frac{910a^4b^{11}}{x^{3/2}}-\frac{455a^3b^{12}}{x}-\frac{210a^2b^{13}}{\sqrt{x}}+15ab^{14}\log(x)+2b^{15}\sqrt{x}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^15/x^8,x]
```

```
[Out] -a^15/(7*x^7) - (30*a^14*b)/(13*x^(13/2)) - (35*a^13*b^2)/(2*x^6)
 - (910*a^12*b^3)/(11*x^(11/2)) - (273*a^11*b^4)/x^5 - (2002*a^10
*b^5)/(3*x^(9/2)) - (5005*a^9*b^6)/(4*x^4) - (12870*a^8*b^7)/(7*x
^(7/2)) - (2145*a^7*b^8)/x^3 - (2002*a^6*b^9)/x^(5/2) - (3003*a^5
*b^10)/(2*x^2) - (910*a^4*b^11)/x^(3/2) - (455*a^3*b^12)/x - (210
*a^2*b^13)/Sqrt[x] + 2*b^15*Sqrt[x] + 15*a*b^14*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^{15}}{7x^7}-\frac{30a^{14}b}{13x^{\frac{13}{2}}}-\frac{35a^{13}b^2}{2x^6}-\frac{910a^{12}b^3}{11x^{\frac{11}{2}}}-\frac{273a^{11}b^4}{x^5}-\frac{2002a^{10}b^5}{3x^{\frac{9}{2}}}-\frac{5005a^9b^6}{4x^4}-\frac{12870a^8b^7}{7x^{\frac{7}{2}}}-\frac{2145a^7b^8}{x^3}-\frac{2002a^6b^9}{x^{\frac{5}{2}}}-\frac{3003a^5b^{10}}{2x^2}-\frac{910a^4b^{11}}{x^{\frac{3}{2}}}-\frac{455a^3b^{12}}{x}-\frac{210a^2b^{13}}{\sqrt{x}}+30ab^{14}\log\left(\sqrt{x}\right)+2\int^{\sqrt{x}}b^{15}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**15/x**8,x)
```

```
[Out] -a**15/(7*x**7) - 30*a**14*b/(13*x**(13/2)) - 35*a**13*b**2/(2*x*
*6) - 910*a**12*b**3/(11*x**(11/2)) - 273*a**11*b**4/x**5 - 2002*
a**10*b**5/(3*x**(9/2)) - 5005*a**9*b**6/(4*x**4) - 12870*a**8*b*
*7/(7*x**(7/2)) - 2145*a**7*b**8/x**3 - 2002*a**6*b**9/x**(5/2) -
 3003*a**5*b**10/(2*x**2) - 910*a**4*b**11/x**(3/2) - 455*a**3*b*
*12/x - 210*a**2*b**13/sqrt(x) + 30*a*b**14*log(sqrt(x)) + 2*Inte
gral(b**15, (x, sqrt(x)))
```

Mathematica [A] time = 0.124439, size = 198, normalized size = 1.

$$-\frac{a^{15}}{7x^7}-\frac{30a^{14}b}{13x^{13/2}}-\frac{35a^{13}b^2}{2x^6}-\frac{910a^{12}b^3}{11x^{11/2}}-\frac{273a^{11}b^4}{x^5}-\frac{2002a^{10}b^5}{3x^{9/2}}-\frac{5005a^9b^6}{4x^4}-\frac{12870a^8b^7}{7x^{7/2}}-\frac{2145a^7b^8}{x^3}-\frac{2002a^6b^9}{x^{5/2}}-\frac{3003a^5b^{10}}{2x^2}-\frac{910a^4b^{11}}{x^{3/2}}-\frac{455a^3b^{12}}{x}-\frac{210a^2b^{13}}{\sqrt{x}}+15ab^{14}\log(x)+2b^{15}\sqrt{x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^15/x^8,x]
```

```
[Out] -a^15/(7*x^7) - (30*a^14*b)/(13*x^(13/2)) - (35*a^13*b^2)/(2*x^6)
 - (910*a^12*b^3)/(11*x^(11/2)) - (273*a^11*b^4)/x^5 - (2002*a^10
*b^5)/(3*x^(9/2)) - (5005*a^9*b^6)/(4*x^4) - (12870*a^8*b^7)/(7*x
^(7/2)) - (2145*a^7*b^8)/x^3 - (2002*a^6*b^9)/x^(5/2) - (3003*a^5
*b^10)/(2*x^2) - (910*a^4*b^11)/x^(3/2) - (455*a^3*b^12)/x - (210
*a^2*b^13)/Sqrt[x] + 2*b^15*Sqrt[x] + 15*a*b^14*Log[x]
```

Maple [A] time = 0.008, size = 167, normalized size = 0.8

$$-\frac{a^{15}}{7\,x^{7}}-\frac{30\,a^{14}b}{13}x^{-\frac{13}{2}}-\frac{35\,a^{13}b^{2}}{2\,x^{6}}-\frac{910\,a^{12}b^{3}}{11}x^{-\frac{11}{2}}-273\,\frac{a^{11}b^{4}}{x^{5}}-\frac{2002\,a^{10}b^{5}}{3}x^{-\frac{9}{2}}-\frac{5005\,a^{9}b^{6}}{4\,x^{4}}-\frac{12870\,a^{8}b^{7}}{7}x^{-\frac{7}{2}}-2145\,\frac{a^{7}b^{8}}{x^{3}}-2002\,\frac{a^{6}b^{9}}{x^{5/2}}-\frac{3003\,a^{5}b^{10}}{2\,x^{2}}-910\,\frac{a^{4}b^{11}}{x^{3/2}}-455\,\frac{a^{3}b^{12}}{x}+15\,ab^{14}\ln(x)-210\,\frac{a^{2}b^{13}}{\sqrt{x}}+2\,b^{15}\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^15/x^8,x)
```

```
[Out] -1/7*a^15/x^7-30/13*a^14*b/x^(13/2)-35/2*a^13*b^2/x^6-910/11*a^12
*b^3/x^(11/2)-273*a^11*b^4/x^5-2002/3*a^10*b^5/x^(9/2)-5005/4*a^9
*b^6/x^4-12870/7*a^8*b^7/x^(7/2)-2145*a^7*b^8/x^3-2002*a^6*b^9/x^
(5/2)-3003/2*a^5*b^10/x^2-910*a^4*b^11/x^(3/2)-455*a^3*b^12/x+15*
a*b^14*ln(x)-210*a^2*b^13/x^(1/2)+2*b^15*x^(1/2)
```

Maxima [A] time = 1.43061, size = 225, normalized size = 1.14

$$15\,ab^{14}\log(x)+2\,b^{15}\sqrt{x}-\frac{2522520\,a^{2}b^{13}x^{\frac{13}{2}}+5465460\,a^{3}b^{12}x^{6}+10930920\,a^{4}b^{11}x^{\frac{11}{2}}+18036018\,a^{5}b^{10}x^{5}+24048024\,a^{6}b^{9}x^{\frac{9}{2}}+25765740\,a^{7}b^{8}x^{4}+22\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^8,x, algorithm="maxima")
```

```
[Out] 15*a*b^14*log(x) + 2*b^15*sqrt(x) - 1/12012*(2522520*a^2*b^13*x^(
13/2) + 5465460*a^3*b^12*x^6 + 10930920*a^4*b^11*x^(11/2) + 18036
018*a^5*b^10*x^5 + 24048024*a^6*b^9*x^(9/2) + 25765740*a^7*b^8*x^
4 + 22084920*a^8*b^7*x^(7/2) + 15030015*a^9*b^6*x^3 + 8016008*a^1
0*b^5*x^(5/2) + 3279276*a^11*b^4*x^2 + 993720*a^12*b^3*x^(3/2) +
210210*a^13*b^2*x + 27720*a^14*b*sqrt(x) + 1716*a^15)/x^7
```

Fricas [A] time = 0.241613, size = 232, normalized size = 1.17

$$\frac{360360\,ab^{14}x^{7}\log\left(\sqrt{x}\right)-5465460\,a^{3}b^{12}x^{6}-18036018\,a^{5}b^{10}x^{5}-25765740\,a^{7}b^{8}x^{4}-15030015\,a^{9}b^{6}x^{3}-3279276\,a^{11}b^{4}x^{2}-\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^8,x, algorithm="fricas")
```

```
[Out] 1/12012*(360360*a*b^14*x^7*log(sqrt(x)) - 5465460*a^3*b^12*x^6 -
18036018*a^5*b^10*x^5 - 25765740*a^7*b^8*x^4 - 15030015*a^9*b^6*x
```

```
^3 - 3279276*a^11*b^4*x^2 - 210210*a^13*b^2*x - 1716*a^15 + 8*(30
03*b^15*x^7 - 315315*a^2*b^13*x^6 - 1366365*a^4*b^11*x^5 - 300600
3*a^6*b^9*x^4 - 2760615*a^8*b^7*x^3 - 1002001*a^10*b^5*x^2 - 1242
15*a^12*b^3*x - 3465*a^14*b)*sqrt(x))/x^7
```

Sympy [A] time = 19.7185, size = 202, normalized size = 1.02

$$-\frac{a^{15}}{7x^7}-\frac{30a^{14}b}{13x^{\frac{13}{2}}}-\frac{35a^{13}b^2}{2x^6}-\frac{910a^{12}b^3}{11x^{\frac{11}{2}}}-\frac{273a^{11}b^4}{x^5}-\frac{2002a^{10}b^5}{3x^{\frac{9}{2}}}-\frac{5005a^9b^6}{4x^4}-\frac{12870a^8b^7}{7x^{\frac{7}{2}}}-\frac{2145a^7b^8}{x^3}-\frac{2002a^6b^9}{x^{\frac{5}{2}}}-\frac{3003a^5b^{10}}{2x^2}-\frac{910a^4b^{11}}{x^{\frac{3}{2}}}-\frac{455a^3b^{12}}{x}-\frac{210a^2b^{13}}{\sqrt{x}}+15ab^{14}\log(x)+2b^{15}\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**15/x**8,x)
```

```
[Out] -a**15/(7*x**7) - 30*a**14*b/(13*x**(13/2)) - 35*a**13*b**2/(2*x*
*6) - 910*a**12*b**3/(11*x**(11/2)) - 273*a**11*b**4/x**5 - 2002*
a**10*b**5/(3*x**(9/2)) - 5005*a**9*b**6/(4*x**4) - 12870*a**8*b*
*7/(7*x**(7/2)) - 2145*a**7*b**8/x**3 - 2002*a**6*b**9/x**(5/2) -
 3003*a**5*b**10/(2*x**2) - 910*a**4*b**11/x**(3/2) - 455*a**3*b*
*12/x - 210*a**2*b**13/sqrt(x) + 15*a*b**14*log(x) + 2*b**15*sqrt
(x)
```

GIAC/XCAS [A] time = 0.219681, size = 227, normalized size = 1.15

$$15\,ab^{14}\ln(|x|)+2\,b^{15}\sqrt{x}-\frac{2522520\,a^2b^{13}x^{\frac{13}{2}}+5465460\,a^3b^{12}x^6+10930920\,a^4b^{11}x^{\frac{11}{2}}+18036018\,a^5b^{10}x^5+24048024\,a^6b^9x^{\frac{9}{2}}+25765740\,a^7b^8x^4+22\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^8,x, algorithm="giac")
```

```
[Out] 15*a*b^14*ln(abs(x)) + 2*b^15*sqrt(x) - 1/12012*(2522520*a^2*b^13
*x^(13/2) + 5465460*a^3*b^12*x^6 + 10930920*a^4*b^11*x^(11/2) + 1
8036018*a^5*b^10*x^5 + 24048024*a^6*b^9*x^(9/2) + 25765740*a^7*b^
8*x^4 + 22084920*a^8*b^7*x^(7/2) + 15030015*a^9*b^6*x^3 + 8016008
*a^10*b^5*x^(5/2) + 3279276*a^11*b^4*x^2 + 993720*a^12*b^3*x^(3/2
) + 210210*a^13*b^2*x + 27720*a^14*b*sqrt(x) + 1716*a^15)/x^7
```

3.2180 $\int \frac{(a+b\sqrt{x})^{15}}{x^9} \, dx$

Optimal. Leaf size=21

$$-\frac{\left(a+b\sqrt{x}\right)^{16}}{8ax^8}$$

```
[Out] -(a + b*Sqrt[x])^16/(8*a*x^8)
```

Rubi [A] time = 0.0164378, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{\left(a+b\sqrt{x}\right)^{16}}{8ax^8}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Sqrt[x])^15/x^9,x]
```

```
[Out] -(a + b*Sqrt[x])^16/(8*a*x^8)
```

Rubi in Sympy [A] time = 2.79467, size = 17, normalized size = 0.81

$$-\frac{\left(a+b\sqrt{x}\right)^{16}}{8ax^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b*x**(1/2))**15/x**9,x)
```

```
[Out] -(a + b*sqrt(x))**16/(8*a*x**8)
```

Mathematica [B] time = 0.0538755, size = 183, normalized size = 8.71

$$-\frac{a^{15}+16a^{14}b\sqrt{x}+120a^{13}b^2x+560a^{12}b^3x^{3/2}+1820a^{11}b^4x^2+4368a^{10}b^5x^{5/2}+8008a^9b^6x^3+11440a^8b^7x^{7/2}+12870a^7b^8x}{8x^8}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Sqrt[x])^15/x^9,x]
```

```
[Out] -(a^15 + 16*a^14*b*Sqrt[x] + 120*a^13*b^2*x + 560*a^12*b^3*x^(3/2
) + 1820*a^11*b^4*x^2 + 4368*a^10*b^5*x^(5/2) + 8008*a^9*b^6*x^3
+ 11440*a^8*b^7*x^(7/2) + 12870*a^7*b^8*x^4 + 11440*a^6*b^9*x^(9/
2) + 8008*a^5*b^10*x^5 + 4368*a^4*b^11*x^(11/2) + 1820*a^3*b^12*x
^6 + 560*a^2*b^13*x^(13/2) + 120*a*b^14*x^7 + 16*b^15*x^(15/2))/(
8*x^8)
```

Maple [B] time = 0.006, size = 168, normalized size = 8.

$$-2\,{\frac{{b}^{15}}{\sqrt{x}}}-15\,{\frac{a{b}^{14}}{x}}-70\,{\frac{{a}^{2}{b}^{13}}{{x}^{3/2}}}-{\frac{455\,{a}^{3}{b}^{12}}{2\,{x}^{2}}}-546\,{\frac{{a}^{4}{b}^{11}}{{x}^{5/2}}}-1001\,{\frac{{a}^{5}{b}^{10}}{{x}^{3}}}-1430\,{\frac{{a}^{6}{b}^{9}}{{x}^{7/2}}}-{\frac{6435\,{a}^{7}{b}^{8}}{4\,{x}^{4}}}-1430\,{\frac{{a}^{8}{b}^{7}}{{x}^{9/2}}}-1001\,{\frac{{a}^{9}{b}^{6}}{{x}^{5}}}-546\,{\frac{{a}^{10}{b}^{5}}{{x}^{11/2}}}-{\frac{455\,{a}^{11}{b}^{4}}{2\,{x}^{6}}}-70\,{\frac{{a}^{12}{b}^{3}}{{x}^{13/2}}}-15\,{\frac{{a}^{13}{b}^{2}}{{x}^{7}}}-2\,{\frac{{a}^{14}b}{{x}^{15/2}}}-{\frac{{a}^{15}}{8\,{x}^{8}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((a+b*x^(1/2))^15/x^9,x)
```

```
[Out] -2*b^15/x^(1/2)-15*a*b^14/x-70*a^2*b^13/x^(3/2)-455/2*a^3*b^12/x^
2-546*a^4*b^11/x^(5/2)-1001*a^5*b^10/x^3-1430*a^6*b^9/x^(7/2)-643
5/4*a^7*b^8/x^4-1430*a^8*b^7/x^(9/2)-1001*a^9*b^6/x^5-546*a^10*b^
5/x^(11/2)-455/2*a^11*b^4/x^6-70*a^12*b^3/x^(13/2)-15*a^13*b^2/x^
7-2*a^14*b/x^(15/2)-1/8*a^15/x^8
```

Maxima [A] time = 1.43426, size = 223, normalized size = 10.62

$$-\frac{16\,b^{15}x^{\frac{15}{2}} + 120\,ab^{14}x^{7} + 560\,a^{2}b^{13}x^{\frac{13}{2}} + 1820\,a^{3}b^{12}x^{6} + 4368\,a^{4}b^{11}x^{\frac{11}{2}} + 8008\,a^{5}b^{10}x^{5} + 11440\,a^{6}b^{9}x^{\frac{9}{2}} + 12870\,a^{7}b^{8}x^{4} + 11}{8\,x^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*sqrt(x) + a)^15/x^9,x, algorithm="maxima")
```

```
[Out] -1/8*(16*b^15*x^(15/2) + 120*a*b^14*x^7 + 560*a^2*b^13*x^(13/2) +
 1820*a^3*b^12*x^6 + 4368*a^4*b^11*x^(11/2) + 8008*a^5*b^10*x^5 +
 11440*a^6*b^9*x^(9/2) + 12870*a^7*b^8*x^4 + 11440*a^8*b^7*x^(7/2
) + 8008*a^9*b^6*x^3 + 4368*a^10*b^5*x^(5/2) + 1820*a^11*b^4*x^2
+ 560*a^12*b^3*x^(3/2) + 120*a^13*b^2*x + 16*a^14*b*sqrt(x) + a^1
5)/x^8
```

Fricas [A] time = 0.239793, size = 221, normalized size = 10.52

$$-\frac{120\,ab^{14}x^{7} + 1820\,a^{3}b^{12}x^{6} + 8008\,a^{5}b^{10}x^{5} + 12870\,a^{7}b^{8}x^{4} + 8008\,a^{9}b^{6}x^{3} + 1820\,a^{11}b^{4}x^{2} + 120\,a^{13}b^{2}x + a^{15} + 16\,\left(b^{15}x^{7} + 3\right.}{8\,x^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*sqrt(x) + a)^15/x^9,x, algorithm="fricas")
```

```
[Out] -1/8*(120*a*b^14*x^7 + 1820*a^3*b^12*x^6 + 8008*a^5*b^10*x^5 + 12
870*a^7*b^8*x^4 + 8008*a^9*b^6*x^3 + 1820*a^11*b^4*x^2 + 120*a^13
*b^2*x + a^15 + 16*(b^15*x^7 + 35*a^2*b^13*x^6 + 273*a^4*b^11*x^5
 + 715*a^6*b^9*x^4 + 715*a^8*b^7*x^3 + 273*a^10*b^5*x^2 + 35*a^12
*b^3*x + a^14*b)*sqrt(x))/x^8
```

Sympy [A] time = 27.7204, size = 197, normalized size = 9.38

$$-\frac{a^{15}}{8x^{8}} - \frac{2a^{14}b}{x^{\frac{15}{2}}} - \frac{15a^{13}b^{2}}{x^{7}} - \frac{70a^{12}b^{3}}{x^{\frac{13}{2}}} - \frac{455a^{11}b^{4}}{2x^{6}} - \frac{546a^{10}b^{5}}{x^{\frac{11}{2}}} - \frac{1001a^{9}b^{6}}{x^{5}} - \frac{1430a^{8}b^{7}}{x^{\frac{9}{2}}} - \frac{6435a^{7}b^{8}}{4x^{4}} - \frac{1430a^{6}b^{9}}{x^{\frac{7}{2}}} - \frac{1001a^{5}b^{10}}{x^{3}} - \frac{546a^{4}b^{11}}{x^{\frac{5}{2}}} - \frac{455a^{3}b^{12}}{2x^{2}} - \frac{70a^{2}b^{13}}{x^{\frac{3}{2}}} - \frac{15ab^{14}}{x} - \frac{2b^{15}}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a+b*x**(1/2))**15/x**9,x)
```

```
[Out] -a**15/(8*x**8) - 2*a**14*b/x**(15/2) - 15*a**13*b**2/x**7 - 70*a
**12*b**3/x**(13/2) - 455*a**11*b**4/(2*x**6) - 546*a**10*b**5/x*
*(11/2) - 1001*a**9*b**6/x**5 - 1430*a**8*b**7/x**(9/2) - 6435*a*
*7*b**8/(4*x**4) - 1430*a**6*b**9/x**(7/2) - 1001*a**5*b**10/x**3
 - 546*a**4*b**11/x**(5/2) - 455*a**3*b**12/(2*x**2) - 70*a**2*b*
*13/x**(3/2) - 15*a*b**14/x - 2*b**15/sqrt(x)
```

GIAC/XCAS [A] time = 0.22247, size = 223, normalized size = 10.62

$$-\frac{16\,b^{15}x^{\frac{15}{2}} + 120\,ab^{14}x^{7} + 560\,a^{2}b^{13}x^{\frac{13}{2}} + 1820\,a^{3}b^{12}x^{6} + 4368\,a^{4}b^{11}x^{\frac{11}{2}} + 8008\,a^{5}b^{10}x^{5} + 11440\,a^{6}b^{9}x^{\frac{9}{2}} + 12870\,a^{7}b^{8}x^{4} + 11}{8\,x^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^9,x, algorithm="giac")
```

```
[Out] -1/8*(16*b^15*x^(15/2) + 120*a*b^14*x^7 + 560*a^2*b^13*x^(13/2) +
 1820*a^3*b^12*x^6 + 4368*a^4*b^11*x^(11/2) + 8008*a^5*b^10*x^5 +
 11440*a^6*b^9*x^(9/2) + 12870*a^7*b^8*x^4 + 11440*a^8*b^7*x^(7/2
) + 8008*a^9*b^6*x^3 + 4368*a^10*b^5*x^(5/2) + 1820*a^11*b^4*x^2
+ 560*a^12*b^3*x^(3/2) + 120*a^13*b^2*x + 16*a^14*b*sqrt(x) + a^1
5)/x^8
```

3.2181 $\int \frac{(a+b\sqrt{x})^{15}}{x^{10}}\,dx$

Optimal. Leaf size=70

$$-\frac{b^2\left(a+b\sqrt{x}\right)^{16}}{1224a^3x^8}+\frac{2b\left(a+b\sqrt{x}\right)^{16}}{153a^2x^{17/2}}-\frac{\left(a+b\sqrt{x}\right)^{16}}{9ax^9}$$

```
[Out] -(a + b*Sqrt[x])^16/(9*a*x^9) + (2*b*(a + b*Sqrt[x])^16)/(153*a^2
*x^(17/2)) - (b^2*(a + b*Sqrt[x])^16)/(1224*a^3*x^8)
```

Rubi [A] time = 0.0809359, antiderivative size = 70, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$-\frac{b^2\left(a+b\sqrt{x}\right)^{16}}{1224a^3x^8}+\frac{2b\left(a+b\sqrt{x}\right)^{16}}{153a^2x^{17/2}}-\frac{\left(a+b\sqrt{x}\right)^{16}}{9ax^9}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^15/x^10,x]
```

```
[Out] -(a + b*Sqrt[x])^16/(9*a*x^9) + (2*b*(a + b*Sqrt[x])^16)/(153*a^2
*x^(17/2)) - (b^2*(a + b*Sqrt[x])^16)/(1224*a^3*x^8)
```

Rubi in Sympy [A] time = 8.72606, size = 61, normalized size = 0.87

$$-\frac{\left(a+b\sqrt{x}\right)^{16}}{9ax^9}+\frac{2b\left(a+b\sqrt{x}\right)^{16}}{153a^2x^{\frac{17}{2}}}-\frac{b^2\left(a+b\sqrt{x}\right)^{16}}{1224a^3x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**15/x**10,x)
```

```
[Out] -(a + b*sqrt(x))**16/(9*a*x**9) + 2*b*(a + b*sqrt(x))**16/(153*a*
*2*x**(17/2)) - b**2*(a + b*sqrt(x))**16/(1224*a**3*x**8)
```

Mathematica [B] time = 0.0588206, size = 185, normalized size = 2.64

$$-\frac{136a^{15}+2160a^{14}b\sqrt{x}+16065a^{13}b^2x+74256a^{12}b^3x^{3/2}+238680a^{11}b^4x^2+565488a^{10}b^5x^{5/2}+1021020a^9b^6x^3+1432080a^8\cdots}{\cdots}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^15/x^10,x]
```

```
[Out] -(136*a^15 + 2160*a^14*b*Sqrt[x] + 16065*a^13*b^2*x + 74256*a^12*
b^3*x^(3/2) + 238680*a^11*b^4*x^2 + 565488*a^10*b^5*x^(5/2) + 102
1020*a^9*b^6*x^3 + 1432080*a^8*b^7*x^(7/2) + 1575288*a^7*b^8*x^4
+ 1361360*a^6*b^9*x^(9/2) + 918918*a^5*b^10*x^5 + 477360*a^4*b^11
*x^(11/2) + 185640*a^3*b^12*x^6 + 51408*a^2*b^13*x^(13/2) + 9180*
a*b^14*x^7 + 816*b^15*x^(15/2))/(1224*x^9)
```

Maple [B] time = 0.006, size = 168, normalized size = 2.4

$$-\frac{2\,b^{15}}{3}x^{-\frac{3}{2}}-\frac{15\,ab^{14}}{2\,x^2}-42\,\frac{a^2b^{13}}{x^{5/2}}-\frac{455\,a^3b^{12}}{3\,x^3}-390\,\frac{a^4b^{11}}{x^{7/2}}-\frac{3003\,a^5b^{10}}{4\,x^4}-\frac{10010\,a^6b^9}{9}x^{-\frac{9}{2}}-1287\,\frac{a^7b^8}{x^5}$$
$$-1170\,\frac{a^8b^7}{x^{11/2}}-\frac{5005\,a^9b^6}{6\,x^6}-462\,\frac{a^{10}b^5}{x^{13/2}}-195\,\frac{a^{11}b^4}{x^7}-\frac{182\,a^{12}b^3}{3}x^{-\frac{15}{2}}-\frac{105\,a^{13}b^2}{8\,x^8}-\frac{30\,a^{14}b}{17}x^{-\frac{17}{2}}-\frac{a^{15}}{9\,x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^15/x^10,x)
```

```
[Out] -2/3*b^15/x^(3/2)-15/2*a*b^14/x^2-42*a^2*b^13/x^(5/2)-455/3*a^3*b
^12/x^3-390*a^4*b^11/x^(7/2)-3003/4*a^5*b^10/x^4-10010/9*a^6*b^9/
x^(9/2)-1287*a^7*b^8/x^5-1170*a^8*b^7/x^(11/2)-5005/6*a^9*b^6/x^6
-462*a^10*b^5/x^(13/2)-195*a^11*b^4/x^7-182/3*a^12*b^3/x^(15/2)-1
05/8*a^13*b^2/x^8-30/17*a^14*b/x^(17/2)-1/9*a^15/x^9
```

Maxima [A] time = 1.42806, size = 225, normalized size = 3.21

$$-\frac{816\,b^{15}x^{\frac{15}{2}} + 9180\,ab^{14}x^{7} + 51408\,a^{2}b^{13}x^{\frac{13}{2}} + 185640\,a^{3}b^{12}x^{6} + 477360\,a^{4}b^{11}x^{\frac{11}{2}} + 918918\,a^{5}b^{10}x^{5} + 1361360\,a^{6}b^{9}x^{\frac{9}{2}} + 157}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^10,x, algorithm="maxima")
```

```
[Out] -1/1224*(816*b^15*x^(15/2) + 9180*a*b^14*x^7 + 51408*a^2*b^13*x^(
13/2) + 185640*a^3*b^12*x^6 + 477360*a^4*b^11*x^(11/2) + 918918*a
^5*b^10*x^5 + 1361360*a^6*b^9*x^(9/2) + 1575288*a^7*b^8*x^4 + 143
2080*a^8*b^7*x^(7/2) + 1021020*a^9*b^6*x^3 + 565488*a^10*b^5*x^(5
/2) + 238680*a^11*b^4*x^2 + 74256*a^12*b^3*x^(3/2) + 16065*a^13*b
^2*x + 2160*a^14*b*sqrt(x) + 136*a^15)/x^9
```

Fricas [A] time = 0.237585, size = 227, normalized size = 3.24

$$-\frac{9180\,ab^{14}x^{7} + 185640\,a^{3}b^{12}x^{6} + 918918\,a^{5}b^{10}x^{5} + 1575288\,a^{7}b^{8}x^{4} + 1021020\,a^{9}b^{6}x^{3} + 238680\,a^{11}b^{4}x^{2} + 16065\,a^{13}b^{2}x + 1}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^10,x, algorithm="fricas")
```

```
[Out] -1/1224*(9180*a*b^14*x^7 + 185640*a^3*b^12*x^6 + 918918*a^5*b^10*
x^5 + 1575288*a^7*b^8*x^4 + 1021020*a^9*b^6*x^3 + 238680*a^11*b^4
*x^2 + 16065*a^13*b^2*x + 136*a^15 + 16*(51*b^15*x^7 + 3213*a^2*b
^13*x^6 + 29835*a^4*b^11*x^5 + 85085*a^6*b^9*x^4 + 89505*a^8*b^7*
x^3 + 35343*a^10*b^5*x^2 + 4641*a^12*b^3*x + 135*a^14*b)*sqrt(x))
/x^9
```

Sympy [A] time = 38.6774, size = 209, normalized size = 2.99

$$-\frac{a^{15}}{9x^{9}} - \frac{30a^{14}b}{17x^{\frac{17}{2}}} - \frac{105a^{13}b^{2}}{8x^{8}} - \frac{182a^{12}b^{3}}{3x^{\frac{15}{2}}} - \frac{195a^{11}b^{4}}{x^{7}} - \frac{462a^{10}b^{5}}{x^{\frac{13}{2}}} - \frac{5005a^{9}b^{6}}{6x^{6}} - \frac{1170a^{8}b^{7}}{x^{\frac{11}{2}}} - \frac{1287a^{7}b^{8}}{x^{5}} - \frac{10010a^{6}b^{9}}{9x^{\frac{9}{2}}} - \frac{3003a^{5}b^{10}}{4x^{4}} - \frac{390a^{4}b^{11}}{x^{\frac{7}{2}}} - \frac{455a^{3}b^{12}}{3x^{3}} - \frac{42a^{2}b^{13}}{x^{\frac{5}{2}}} - \frac{15ab^{14}}{2x^{2}} - \frac{2b^{15}}{3x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**15/x**10,x)
```

```
[Out] -a**15/(9*x**9) - 30*a**14*b/(17*x**(17/2)) - 105*a**13*b**2/(8*x
**8) - 182*a**12*b**3/(3*x**(15/2)) - 195*a**11*b**4/x**7 - 462*a
**10*b**5/x**(13/2) - 5005*a**9*b**6/(6*x**6) - 1170*a**8*b**7/x*
*(11/2) - 1287*a**7*b**8/x**5 - 10010*a**6*b**9/(9*x**(9/2)) - 30
03*a**5*b**10/(4*x**4) - 390*a**4*b**11/x**(7/2) - 455*a**3*b**12
```

```
/(3*x**3) - 42*a**2*b**13/x**(5/2) - 15*a*b**14/(2*x**2) - 2*b**1
5/(3*x**(3/2))
```

GIAC/XCAS [A] time = 0.22218, size = 225, normalized size = 3.21

$$-\frac{816\,b^{15}x^{\frac{15}{2}} + 9180\,ab^{14}x^{7} + 51408\,a^{2}b^{13}x^{\frac{13}{2}} + 185640\,a^{3}b^{12}x^{6} + 477360\,a^{4}b^{11}x^{\frac{11}{2}} + 918918\,a^{5}b^{10}x^{5} + 1361360\,a^{6}b^{9}x^{\frac{9}{2}} + 157}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^10,x, algorithm="giac")
```

```
[Out] -1/1224*(816*b^15*x^(15/2) + 9180*a*b^14*x^7 + 51408*a^2*b^13*x^(
13/2) + 185640*a^3*b^12*x^6 + 477360*a^4*b^11*x^(11/2) + 918918*a
^5*b^10*x^5 + 1361360*a^6*b^9*x^(9/2) + 1575288*a^7*b^8*x^4 + 143
2080*a^8*b^7*x^(7/2) + 1021020*a^9*b^6*x^3 + 565488*a^10*b^5*x^(5
/2) + 238680*a^11*b^4*x^2 + 74256*a^12*b^3*x^(3/2) + 16065*a^13*b
^2*x + 2160*a^14*b*sqrt(x) + 136*a^15)/x^9
```

3.2182 $\int \frac{(a+b\sqrt{x})^{15}}{x^{11}}\,dx$

Optimal. Leaf size=120

$$-\frac{b^4\left(a+b\sqrt{x}\right)^{16}}{38760a^5x^8}+\frac{2b^3\left(a+b\sqrt{x}\right)^{16}}{4845a^4x^{17/2}}-\frac{b^2\left(a+b\sqrt{x}\right)^{16}}{285a^3x^9}+\frac{2b\left(a+b\sqrt{x}\right)^{16}}{95a^2x^{19/2}}-\frac{\left(a+b\sqrt{x}\right)^{16}}{10ax^{10}}$$

```
[Out] -(a + b*Sqrt[x])^16/(10*a*x^10) + (2*b*(a + b*Sqrt[x])^16)/(95*a^
2*x^(19/2)) - (b^2*(a + b*Sqrt[x])^16)/(285*a^3*x^9) + (2*b^3*(a
+ b*Sqrt[x])^16)/(4845*a^4*x^(17/2)) - (b^4*(a + b*Sqrt[x])^16)/(
38760*a^5*x^8)
```

Rubi [A] time = 0.138512, antiderivative size = 120, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{b^4\left(a+b\sqrt{x}\right)^{16}}{38760a^5x^8}+\frac{2b^3\left(a+b\sqrt{x}\right)^{16}}{4845a^4x^{17/2}}-\frac{b^2\left(a+b\sqrt{x}\right)^{16}}{285a^3x^9}+\frac{2b\left(a+b\sqrt{x}\right)^{16}}{95a^2x^{19/2}}-\frac{\left(a+b\sqrt{x}\right)^{16}}{10ax^{10}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^15/x^11,x]
```

```
[Out] -(a + b*Sqrt[x])^16/(10*a*x^10) + (2*b*(a + b*Sqrt[x])^16)/(95*a^
2*x^(19/2)) - (b^2*(a + b*Sqrt[x])^16)/(285*a^3*x^9) + (2*b^3*(a
+ b*Sqrt[x])^16)/(4845*a^4*x^(17/2)) - (b^4*(a + b*Sqrt[x])^16)/(
38760*a^5*x^8)
```

Rubi in Sympy [A] time = 16.5069, size = 109, normalized size = 0.91

$$-\frac{\left(a+b\sqrt{x}\right)^{16}}{10ax^{10}}+\frac{2b\left(a+b\sqrt{x}\right)^{16}}{95a^2x^{\frac{19}{2}}}-\frac{b^2\left(a+b\sqrt{x}\right)^{16}}{285a^3x^9}+\frac{2b^3\left(a+b\sqrt{x}\right)^{16}}{4845a^4x^{\frac{17}{2}}}-\frac{b^4\left(a+b\sqrt{x}\right)^{16}}{38760a^5x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**15/x**11,x)
```

```
[Out] -(a + b*sqrt(x))**16/(10*a*x**10) + 2*b*(a + b*sqrt(x))**16/(95*a
**2*x**(19/2)) - b**2*(a + b*sqrt(x))**16/(285*a**3*x**9) + 2*b**
3*(a + b*sqrt(x))**16/(4845*a**4*x**(17/2)) - b**4*(a + b*sqrt(x)
)**16/(38760*a**5*x**8)
```

Mathematica [A] time = 0.069915, size = 205, normalized size = 1.71

$$-\frac{a^{15}}{10x^{10}}-\frac{30a^{14}b}{19x^{19/2}}-\frac{35a^{13}b^2}{3x^9}-\frac{910a^{12}b^3}{17x^{17/2}}-\frac{1365a^{11}b^4}{8x^8}-\frac{2002a^{10}b^5}{5x^{15/2}}-\frac{715a^9b^6}{x^7}-\frac{990a^8b^7}{x^{13/2}}-\frac{2145a^7b^8}{2x^6}-\frac{910a^6b^9}{x^{11/2}}-\frac{3003a^5b^{10}}{5x^5}-\frac{910a^4b^{11}}{3x^{9/2}}-\frac{455a^3b^{12}}{4x^4}-\frac{30a^2b^{13}}{x^{7/2}}-\frac{5ab^{14}}{x^3}-\frac{2b^{15}}{5x^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^15/x^11,x]
```

```
[Out] -a^15/(10*x^10) - (30*a^14*b)/(19*x^(19/2)) - (35*a^13*b^2)/(3*x^
9) - (910*a^12*b^3)/(17*x^(17/2)) - (1365*a^11*b^4)/(8*x^8) - (20
02*a^10*b^5)/(5*x^(15/2)) - (715*a^9*b^6)/x^7 - (990*a^8*b^7)/x^(
13/2) - (2145*a^7*b^8)/(2*x^6) - (910*a^6*b^9)/x^(11/2) - (3003*a
```

```
^5*b^10)/(5*x^5) - (910*a^4*b^11)/(3*x^(9/2)) - (455*a^3*b^12)/(4
*x^4) - (30*a^2*b^13)/x^(7/2) - (5*a*b^14)/x^3 - (2*b^15)/(5*x^(5
/2))
```

Maple [A] time = 0.005, size = 168, normalized size = 1.4

$$-\frac{2\,b^{15}}{5}x^{-\frac{5}{2}}-5\,\frac{ab^{14}}{x^{3}}-30\,\frac{a^{2}b^{13}}{x^{7/2}}-\frac{455\,a^{3}b^{12}}{4\,x^{4}}-\frac{910\,a^{4}b^{11}}{3}x^{-\frac{9}{2}}-\frac{3003\,a^{5}b^{10}}{5\,x^{5}}-910\,\frac{a^{6}b^{9}}{x^{11/2}}-\frac{2145\,a^{7}b^{8}}{2\,x^{6}}-990\,\frac{a^{8}b^{7}}{x^{13/2}}-715\,\frac{a^{9}b^{6}}{x^{7}}-\frac{2002\,a^{10}b^{5}}{5}x^{-\frac{15}{2}}-\frac{1365\,a^{11}b^{4}}{8\,x^{8}}-\frac{910\,a^{12}b^{3}}{17}x^{-\frac{17}{2}}-\frac{35\,a^{13}b^{2}}{3\,x^{9}}-\frac{30\,a^{14}b}{19}x^{-\frac{19}{2}}-\frac{a^{15}}{10\,x^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((a+b*x^(1/2))^15/x^11,x)
```

```
[Out] -2/5*b^15/x^(5/2)-5*a*b^14/x^3-30*a^2*b^13/x^(7/2)-455/4*a^3*b^12
/x^4-910/3*a^4*b^11/x^(9/2)-3003/5*a^5*b^10/x^5-910*a^6*b^9/x^(11
/2)-2145/2*a^7*b^8/x^6-990*a^8*b^7/x^(13/2)-715*a^9*b^6/x^7-2002/
5*a^10*b^5/x^(15/2)-1365/8*a^11*b^4/x^8-910/17*a^12*b^3/x^(17/2)-
35/3*a^13*b^2/x^9-30/19*a^14*b/x^(19/2)-1/10*a^15/x^10
```

Maxima [A] time = 1.43838, size = 225, normalized size = 1.88

$$-\frac{15504\,b^{15}x^{\frac{15}{2}}+193800\,ab^{14}x^{7}+1162800\,a^{2}b^{13}x^{\frac{13}{2}}+4408950\,a^{3}b^{12}x^{6}+11757200\,a^{4}b^{11}x^{\frac{11}{2}}+23279256\,a^{5}b^{10}x^{5}+3527160\ldots}{\ldots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*sqrt(x) + a)^15/x^11,x, algorithm="maxima")
```

```
[Out] -1/38760*(15504*b^15*x^(15/2) + 193800*a*b^14*x^7 + 1162800*a^2*b
^13*x^(13/2) + 4408950*a^3*b^12*x^6 + 11757200*a^4*b^11*x^(11/2)
+ 23279256*a^5*b^10*x^5 + 35271600*a^6*b^9*x^(9/2) + 41570100*a^7
*b^8*x^4 + 38372400*a^8*b^7*x^(7/2) + 27713400*a^9*b^6*x^3 + 1551
9504*a^10*b^5*x^(5/2) + 6613425*a^11*b^4*x^2 + 2074800*a^12*b^3*x
^(3/2) + 452200*a^13*b^2*x + 61200*a^14*b*sqrt(x) + 3876*a^15)/x^
10
```

Fricas [A] time = 0.240303, size = 227, normalized size = 1.89

$$-\frac{193800\,ab^{14}x^{7}+4408950\,a^{3}b^{12}x^{6}+23279256\,a^{5}b^{10}x^{5}+41570100\,a^{7}b^{8}x^{4}+27713400\,a^{9}b^{6}x^{3}+6613425\,a^{11}b^{4}x^{2}+452200\ldots}{\ldots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*sqrt(x) + a)^15/x^11,x, algorithm="fricas")
```

```
[Out] -1/38760*(193800*a*b^14*x^7 + 4408950*a^3*b^12*x^6 + 23279256*a^5
*b^10*x^5 + 41570100*a^7*b^8*x^4 + 27713400*a^9*b^6*x^3 + 6613425
*a^11*b^4*x^2 + 452200*a^13*b^2*x + 3876*a^15 + 16*(969*b^15*x^7
+ 72675*a^2*b^13*x^6 + 734825*a^4*b^11*x^5 + 2204475*a^6*b^9*x^4
+ 2398275*a^8*b^7*x^3 + 969969*a^10*b^5*x^2 + 129675*a^12*b^3*x +
 3825*a^14*b)*sqrt(x))/x^10
```

Sympy [A] time = 47.3222, size = 211, normalized size = 1.76

$$-\frac{a^{15}}{10x^{10}}-\frac{30a^{14}b}{19x^{\frac{19}{2}}}-\frac{35a^{13}b^2}{3x^9}-\frac{910a^{12}b^3}{17x^{\frac{17}{2}}}-\frac{1365a^{11}b^4}{8x^8}-\frac{2002a^{10}b^5}{5x^{\frac{15}{2}}}-\frac{715a^9b^6}{x^7}-\frac{990a^8b^7}{x^{\frac{13}{2}}}-\frac{2145a^7b^8}{2x^6}-\frac{910a^6b^9}{x^{\frac{11}{2}}}-\frac{3003a^5b^{10}}{5x^5}-\frac{910a^4b^{11}}{3x^{\frac{9}{2}}}-\frac{455a^3b^{12}}{4x^4}-\frac{30a^2b^{13}}{x^{\frac{7}{2}}}-\frac{5ab^{14}}{x^3}-\frac{2b^{15}}{5x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**15/x**11,x)
```

```
[Out] -a**15/(10*x**10) - 30*a**14*b/(19*x**(19/2)) - 35*a**13*b**2/(3*
x**9) - 910*a**12*b**3/(17*x**(17/2)) - 1365*a**11*b**4/(8*x**8)
- 2002*a**10*b**5/(5*x**(15/2)) - 715*a**9*b**6/x**7 - 990*a**8*b
**7/x**(13/2) - 2145*a**7*b**8/(2*x**6) - 910*a**6*b**9/x**(11/2)
 - 3003*a**5*b**10/(5*x**5) - 910*a**4*b**11/(3*x**(9/2)) - 455*a
**3*b**12/(4*x**4) - 30*a**2*b**13/x**(7/2) - 5*a*b**14/x**3 - 2*
b**15/(5*x**(5/2))
```

GIAC/XCAS [A] time = 0.222945, size = 225, normalized size = 1.88

$$-\frac{15504\,b^{15}x^{\frac{15}{2}}+193800\,ab^{14}x^7+1162800\,a^2b^{13}x^{\frac{13}{2}}+4408950\,a^3b^{12}x^6+11757200\,a^4b^{11}x^{\frac{11}{2}}+23279256\,a^5b^{10}x^5+3527160}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^11,x, algorithm="giac")
```

```
[Out] -1/38760*(15504*b^15*x^(15/2) + 193800*a*b^14*x^7 + 1162800*a^2*b
^13*x^(13/2) + 4408950*a^3*b^12*x^6 + 11757200*a^4*b^11*x^(11/2)
+ 23279256*a^5*b^10*x^5 + 35271600*a^6*b^9*x^(9/2) + 41570100*a^7
*b^8*x^4 + 38372400*a^8*b^7*x^(7/2) + 27713400*a^9*b^6*x^3 + 1551
9504*a^10*b^5*x^(5/2) + 6613425*a^11*b^4*x^2 + 2074800*a^12*b^3*x
^(3/2) + 452200*a^13*b^2*x + 61200*a^14*b*sqrt(x) + 3876*a^15)/x^
10
```

3.2183 $\int \frac{\left(a+b\sqrt{x}\right)^{15}}{x^{12}}\,dx$

Optimal. Leaf size=170

$$-\frac{b^6\left(a+b\sqrt{x}\right)^{16}}{596904a^7x^8}+\frac{2b^5\left(a+b\sqrt{x}\right)^{16}}{74613a^6x^{17/2}}-\frac{b^4\left(a+b\sqrt{x}\right)^{16}}{4389a^5x^9}+\frac{2b^3\left(a+b\sqrt{x}\right)^{16}}{1463a^4x^{19/2}}-\frac{b^2\left(a+b\sqrt{x}\right)^{16}}{154a^3x^{10}}+\frac{2b\left(a+b\sqrt{x}\right)^{16}}{77a^2x^{21/2}}-\frac{\left(a+b\sqrt{x}\right)^{16}}{11ax^{11}}$$

```
[Out] -(a + b*Sqrt[x])^16/(11*a*x^11) + (2*b*(a + b*Sqrt[x])^16)/(77*a^
2*x^(21/2)) - (b^2*(a + b*Sqrt[x])^16)/(154*a^3*x^10) + (2*b^3*(a
 + b*Sqrt[x])^16)/(1463*a^4*x^(19/2)) - (b^4*(a + b*Sqrt[x])^16)/
(4389*a^5*x^9) + (2*b^5*(a + b*Sqrt[x])^16)/(74613*a^6*x^(17/2))
- (b^6*(a + b*Sqrt[x])^16)/(596904*a^7*x^8)
```

Rubi [A] time = 0.210759, antiderivative size = 170, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{b^6\left(a+b\sqrt{x}\right)^{16}}{596904a^7x^8}+\frac{2b^5\left(a+b\sqrt{x}\right)^{16}}{74613a^6x^{17/2}}-\frac{b^4\left(a+b\sqrt{x}\right)^{16}}{4389a^5x^9}+\frac{2b^3\left(a+b\sqrt{x}\right)^{16}}{1463a^4x^{19/2}}-\frac{b^2\left(a+b\sqrt{x}\right)^{16}}{154a^3x^{10}}+\frac{2b\left(a+b\sqrt{x}\right)^{16}}{77a^2x^{21/2}}-\frac{\left(a+b\sqrt{x}\right)^{16}}{11ax^{11}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^15/x^12,x]
```

```
[Out] -(a + b*Sqrt[x])^16/(11*a*x^11) + (2*b*(a + b*Sqrt[x])^16)/(77*a^
2*x^(21/2)) - (b^2*(a + b*Sqrt[x])^16)/(154*a^3*x^10) + (2*b^3*(a
 + b*Sqrt[x])^16)/(1463*a^4*x^(19/2)) - (b^4*(a + b*Sqrt[x])^16)/
(4389*a^5*x^9) + (2*b^5*(a + b*Sqrt[x])^16)/(74613*a^6*x^(17/2))
- (b^6*(a + b*Sqrt[x])^16)/(596904*a^7*x^8)
```

Rubi in Sympy [A] time = 27.6123, size = 156, normalized size = 0.92

$$-\frac{\left(a+b\sqrt{x}\right)^{16}}{11ax^{11}}+\frac{2b\left(a+b\sqrt{x}\right)^{16}}{77a^2x^{\frac{21}{2}}}-\frac{b^2\left(a+b\sqrt{x}\right)^{16}}{154a^3x^{10}}+\frac{2b^3\left(a+b\sqrt{x}\right)^{16}}{1463a^4x^{\frac{19}{2}}}-\frac{b^4\left(a+b\sqrt{x}\right)^{16}}{4389a^5x^9}+\frac{2b^5\left(a+b\sqrt{x}\right)^{16}}{74613a^6x^{\frac{17}{2}}}-\frac{b^6\left(a+b\sqrt{x}\right)^{16}}{596904a^7x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**15/x**12,x)
```

```
[Out] -(a + b*sqrt(x))**16/(11*a*x**11) + 2*b*(a + b*sqrt(x))**16/(77*a
**2*x**(21/2)) - b**2*(a + b*sqrt(x))**16/(154*a**3*x**10) + 2*b*
*3*(a + b*sqrt(x))**16/(1463*a**4*x**(19/2)) - b**4*(a + b*sqrt(x
))**16/(4389*a**5*x**9) + 2*b**5*(a + b*sqrt(x))**16/(74613*a**6*
x**(17/2)) - b**6*(a + b*sqrt(x))**16/(596904*a**7*x**8)
```

Mathematica [A] time = 0.0711197, size = 209, normalized size = 1.23

$$-\frac{a^{15}}{11x^{11}}-\frac{10a^{14}b}{7x^{21/2}}-\frac{21a^{13}b^2}{2x^{10}}-\frac{910a^{12}b^3}{19x^{19/2}}-\frac{455a^{11}b^4}{3x^9}-\frac{6006a^{10}b^5}{17x^{17/2}}-\frac{5005a^9b^6}{8x^8}-\frac{858a^8b^7}{x^{15/2}}-\frac{6435a^7b^8}{7x^7}-\frac{770a^6b^9}{x^{13/2}}-\frac{1001a^5b^{10}}{2x^6}-\frac{2730a^4b^{11}}{11x^{11/2}}-\frac{91a^3b^{12}}{x^5}-\frac{70a^2b^{13}}{3x^{9/2}}-\frac{15ab^{14}}{4x^4}-\frac{2b^{15}}{7x^{7/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^15/x^12,x]
```

```
[Out] -a^15/(11*x^11) - (10*a^14*b)/(7*x^(21/2)) - (21*a^13*b^2)/(2*x^1
0) - (910*a^12*b^3)/(19*x^(19/2)) - (455*a^11*b^4)/(3*x^9) - (600
6*a^10*b^5)/(17*x^(17/2)) - (5005*a^9*b^6)/(8*x^8) - (858*a^8*b^7
)/x^(15/2) - (6435*a^7*b^8)/(7*x^7) - (770*a^6*b^9)/x^(13/2) - (1
001*a^5*b^10)/(2*x^6) - (2730*a^4*b^11)/(11*x^(11/2)) - (91*a^3*b
^12)/x^5 - (70*a^2*b^13)/(3*x^(9/2)) - (15*a*b^14)/(4*x^4) - (2*b
^15)/(7*x^(7/2))
```

Maple [A] time = 0.005, size = 168, normalized size = 1.

$$-\frac{2\,b^{15}}{7}x^{-\frac{7}{2}}-\frac{15\,ab^{14}}{4\,x^{4}}-\frac{70\,a^{2}b^{13}}{3}x^{-\frac{9}{2}}-91\,\frac{a^{3}b^{12}}{x^{5}}-\frac{2730\,a^{4}b^{11}}{11}x^{-\frac{11}{2}}-\frac{1001\,a^{5}b^{10}}{2\,x^{6}}-770\,\frac{a^{6}b^{9}}{x^{13/2}}-\frac{6435\,a^{7}b^{8}}{7\,x^{7}}-858\,\frac{a^{8}b^{7}}{x^{15/2}}-\frac{5005\,a^{9}b^{6}}{8\,x^{8}}-\frac{6006\,a^{10}b^{5}}{17}x^{-\frac{17}{2}}-\frac{455\,a^{11}b^{4}}{3\,x^{9}}-\frac{910\,a^{12}b^{3}}{19}x^{-\frac{19}{2}}-\frac{21\,a^{13}b^{2}}{2\,x^{10}}-\frac{10\,a^{14}b}{7}x^{-\frac{21}{2}}-\frac{a^{15}}{11\,x^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^15/x^12,x)
```

```
[Out] -2/7*b^15/x^(7/2)-15/4*a*b^14/x^4-70/3*a^2*b^13/x^(9/2)-91*a^3*b^
12/x^5-2730/11*a^4*b^11/x^(11/2)-1001/2*a^5*b^10/x^6-770*a^6*b^9/
x^(13/2)-6435/7*a^7*b^8/x^7-858*a^8*b^7/x^(15/2)-5005/8*a^9*b^6/x
^8-6006/17*a^10*b^5/x^(17/2)-455/3*a^11*b^4/x^9-910/19*a^12*b^3/x
^(19/2)-21/2*a^13*b^2/x^10-10/7*a^14*b/x^(21/2)-1/11*a^15/x^11
```

Maxima [A] time = 1.44253, size = 225, normalized size = 1.32

$$-\frac{170544\,b^{15}x^{\frac{15}{2}}+2238390\,ab^{14}x^{7}+13927760\,a^{2}b^{13}x^{\frac{13}{2}}+54318264\,a^{3}b^{12}x^{6}+148140720\,a^{4}b^{11}x^{\frac{11}{2}}+298750452\,a^{5}b^{10}x^{5}+45}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^12,x, algorithm="maxima")
```

```
[Out] -1/596904*(170544*b^15*x^(15/2) + 2238390*a*b^14*x^7 + 13927760*a
^2*b^13*x^(13/2) + 54318264*a^3*b^12*x^6 + 148140720*a^4*b^11*x^(
11/2) + 298750452*a^5*b^10*x^5 + 459616080*a^6*b^9*x^(9/2) + 5487
25320*a^7*b^8*x^4 + 512143632*a^8*b^7*x^(7/2) + 373438065*a^9*b^6
*x^3 + 210882672*a^10*b^5*x^(5/2) + 90530440*a^11*b^4*x^2 + 28588
560*a^12*b^3*x^(3/2) + 6267492*a^13*b^2*x + 852720*a^14*b*sqrt(x)
 + 54264*a^15)/x^11
```

Fricas [A] time = 0.246128, size = 227, normalized size = 1.34

$$-\frac{2238390\,ab^{14}x^{7}+54318264\,a^{3}b^{12}x^{6}+298750452\,a^{5}b^{10}x^{5}+548725320\,a^{7}b^{8}x^{4}+373438065\,a^{9}b^{6}x^{3}+90530440\,a^{11}b^{4}x^{2}+6}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^12,x, algorithm="fricas")
```

```
[Out] -1/596904*(2238390*a*b^14*x^7 + 54318264*a^3*b^12*x^6 + 298750452
*a^5*b^10*x^5 + 548725320*a^7*b^8*x^4 + 373438065*a^9*b^6*x^3 + 9
```

```
0530440*a^11*b^4*x^2 + 6267492*a^13*b^2*x + 54264*a^15 + 16*(1065
9*b^15*x^7 + 870485*a^2*b^13*x^6 + 9258795*a^4*b^11*x^5 + 2872600
5*a^6*b^9*x^4 + 32008977*a^8*b^7*x^3 + 13180167*a^10*b^5*x^2 + 17
86785*a^12*b^3*x + 53295*a^14*b)*sqrt(x))/x^11
```

Sympy [A] time = 63.0551, size = 214, normalized size = 1.26

$$-\frac{a^{15}}{11x^{11}}-\frac{10a^{14}b}{7x^{\frac{21}{2}}}-\frac{21a^{13}b^2}{2x^{10}}-\frac{910a^{12}b^3}{19x^{\frac{19}{2}}}-\frac{455a^{11}b^4}{3x^9}-\frac{6006a^{10}b^5}{17x^{\frac{17}{2}}}-\frac{5005a^9b^6}{8x^8}-\frac{858a^8b^7}{x^{\frac{15}{2}}}-\frac{6435a^7b^8}{7x^7}-\frac{770a^6b^9}{x^{\frac{13}{2}}}-\frac{1001a^5b^{10}}{2x^6}-\frac{2730a^4b^{11}}{11x^{\frac{11}{2}}}-\frac{91a^3b^{12}}{x^5}-\frac{70a^2b^{13}}{3x^{\frac{9}{2}}}-\frac{15ab^{14}}{4x^4}-\frac{2b^{15}}{7x^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**15/x**12,x)
```

```
[Out] -a**15/(11*x**11) - 10*a**14*b/(7*x**(21/2)) - 21*a**13*b**2/(2*x
**10) - 910*a**12*b**3/(19*x**(19/2)) - 455*a**11*b**4/(3*x**9) -
 6006*a**10*b**5/(17*x**(17/2)) - 5005*a**9*b**6/(8*x**8) - 858*a
**8*b**7/x**(15/2) - 6435*a**7*b**8/(7*x**7) - 770*a**6*b**9/x**(
13/2) - 1001*a**5*b**10/(2*x**6) - 2730*a**4*b**11/(11*x**(11/2))
 - 91*a**3*b**12/x**5 - 70*a**2*b**13/(3*x**(9/2)) - 15*a*b**14/(
4*x**4) - 2*b**15/(7*x**(7/2))
```

GIAC/XCAS [A] time = 0.221534, size = 225, normalized size = 1.32

$$-\frac{170544\,b^{15}x^{\frac{15}{2}}+2238390\,ab^{14}x^7+13927760\,a^2b^{13}x^{\frac{13}{2}}+54318264\,a^3b^{12}x^6+148140720\,a^4b^{11}x^{\frac{11}{2}}+298750452\,a^5b^{10}x^5+4\ldots}{\ldots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^12,x, algorithm="giac")
```

```
[Out] -1/596904*(170544*b^15*x^(15/2) + 2238390*a*b^14*x^7 + 13927760*a
^2*b^13*x^(13/2) + 54318264*a^3*b^12*x^6 + 148140720*a^4*b^11*x^(
11/2) + 298750452*a^5*b^10*x^5 + 459616080*a^6*b^9*x^(9/2) + 5487
25320*a^7*b^8*x^4 + 512143632*a^8*b^7*x^(7/2) + 373438065*a^9*b^6
*x^3 + 210882672*a^10*b^5*x^(5/2) + 90530440*a^11*b^4*x^2 + 28588
560*a^12*b^3*x^(3/2) + 6267492*a^13*b^2*x + 852720*a^14*b*sqrt(x)
 + 54264*a^15)/x^11
```

3.2184 $\int \frac{(a+b\sqrt{x})^{15}}{x^{13}} dx$

Optimal. Leaf size=220

$$-\frac{b^8 (a+b\sqrt{x})^{16}}{5883768a^9x^8}+\frac{2b^7 (a+b\sqrt{x})^{16}}{735471a^8x^{17/2}}-\frac{b^6 (a+b\sqrt{x})^{16}}{43263a^7x^9}+\frac{2b^5 (a+b\sqrt{x})^{16}}{14421a^6x^{19/2}}-\frac{b^4 (a+b\sqrt{x})^{16}}{1518a^5x^{10}}+\frac{2b^3 (a+b\sqrt{x})^{16}}{759a^4x^{21/2}}-\frac{7b^2 (a+b\sqrt{x})^{16}}{759a^3x^{11}}+\frac{2b (a+b\sqrt{x})^{16}}{69a^2x^{23/2}}-\frac{(a+b\sqrt{x})^{16}}{12ax^{12}}$$

```
[Out] -(a + b*Sqrt[x])^16/(12*a*x^12) + (2*b*(a + b*Sqrt[x])^16)/(69*a^
2*x^(23/2)) - (7*b^2*(a + b*Sqrt[x])^16)/(759*a^3*x^11) + (2*b^3*
(a + b*Sqrt[x])^16)/(759*a^4*x^(21/2)) - (b^4*(a + b*Sqrt[x])^16)
/(1518*a^5*x^10) + (2*b^5*(a + b*Sqrt[x])^16)/(14421*a^6*x^(19/2)
) - (b^6*(a + b*Sqrt[x])^16)/(43263*a^7*x^9) + (2*b^7*(a + b*Sqrt
[x])^16)/(735471*a^8*x^(17/2)) - (b^8*(a + b*Sqrt[x])^16)/(588376
8*a^9*x^8)
```

Rubi [A] time = 0.287344, antiderivative size = 220, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{b^8 (a+b\sqrt{x})^{16}}{5883768a^9x^8}+\frac{2b^7 (a+b\sqrt{x})^{16}}{735471a^8x^{17/2}}-\frac{b^6 (a+b\sqrt{x})^{16}}{43263a^7x^9}+\frac{2b^5 (a+b\sqrt{x})^{16}}{14421a^6x^{19/2}}-\frac{b^4 (a+b\sqrt{x})^{16}}{1518a^5x^{10}}+\frac{2b^3 (a+b\sqrt{x})^{16}}{759a^4x^{21/2}}-\frac{7b^2 (a+b\sqrt{x})^{16}}{759a^3x^{11}}+\frac{2b (a+b\sqrt{x})^{16}}{69a^2x^{23/2}}-\frac{(a+b\sqrt{x})^{16}}{12ax^{12}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^15/x^13,x]
```

```
[Out] -(a + b*Sqrt[x])^16/(12*a*x^12) + (2*b*(a + b*Sqrt[x])^16)/(69*a^
2*x^(23/2)) - (7*b^2*(a + b*Sqrt[x])^16)/(759*a^3*x^11) + (2*b^3*
(a + b*Sqrt[x])^16)/(759*a^4*x^(21/2)) - (b^4*(a + b*Sqrt[x])^16)
/(1518*a^5*x^10) + (2*b^5*(a + b*Sqrt[x])^16)/(14421*a^6*x^(19/2)
) - (b^6*(a + b*Sqrt[x])^16)/(43263*a^7*x^9) + (2*b^7*(a + b*Sqrt
[x])^16)/(735471*a^8*x^(17/2)) - (b^8*(a + b*Sqrt[x])^16)/(588376
8*a^9*x^8)
```

Rubi in Sympy [A] time = 41.8581, size = 206, normalized size = 0.94

$$-\frac{(a+b\sqrt{x})^{16}}{12ax^{12}}+\frac{2b (a+b\sqrt{x})^{16}}{69a^2x^{\frac{23}{2}}}-\frac{7b^2 (a+b\sqrt{x})^{16}}{759a^3x^{11}}+\frac{2b^3 (a+b\sqrt{x})^{16}}{759a^4x^{\frac{21}{2}}}-\frac{b^4 (a+b\sqrt{x})^{16}}{1518a^5x^{10}}+\frac{2b^5 (a+b\sqrt{x})^{16}}{14421a^6x^{\frac{19}{2}}}-\frac{b^6 (a+b\sqrt{x})^{16}}{43263a^7x^9}+\frac{2b^7 (a+b\sqrt{x})^{16}}{735471a^8x^{\frac{17}{2}}}-\frac{b^8 (a+b\sqrt{x})^{16}}{5883768a^9x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**15/x**13,x)
```

```
[Out] -(a + b*sqrt(x))**16/(12*a*x**12) + 2*b*(a + b*sqrt(x))**16/(69*a
**2*x**(23/2)) - 7*b**2*(a + b*sqrt(x))**16/(759*a**3*x**11) + 2*
b**3*(a + b*sqrt(x))**16/(759*a**4*x**(21/2)) - b**4*(a + b*sqrt(
x))**16/(1518*a**5*x**10) + 2*b**5*(a + b*sqrt(x))**16/(14421*a**
6*x**(19/2)) - b**6*(a + b*sqrt(x))**16/(43263*a**7*x**9) + 2*b**
7*(a + b*sqrt(x))**16/(735471*a**8*x**(17/2)) - b**8*(a + b*sqrt(
x))**16/(5883768*a**9*x**8)
```

Mathematica [A] time = 0.0698245, size = 209, normalized size = 0.95

$$-\frac{a^{15}}{12x^{12}}-\frac{30a^{14}b}{23x^{23/2}}-\frac{105a^{13}b^2}{11x^{11}}-\frac{130a^{12}b^3}{3x^{21/2}}-\frac{273a^{11}b^4}{2x^{10}}-\frac{6006a^{10}b^5}{19x^{19/2}}-\frac{5005a^9b^6}{9x^9}-\frac{12870a^8b^7}{17x^{17/2}}-\frac{6435a^7b^8}{8x^8}-\frac{2002a^6b^9}{3x^{15/2}}-\frac{429a^5b^{10}}{x^7}-\frac{210a^4b^{11}}{x^{13/2}}-\frac{455a^3b^{12}}{6x^6}-\frac{210a^2b^{13}}{11x^{11/2}}-\frac{3ab^{14}}{x^5}-\frac{2b^{15}}{9x^{9/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^15/x^13,x]
```

```
[Out] -a^15/(12*x^12) - (30*a^14*b)/(23*x^(23/2)) - (105*a^13*b^2)/(11*
x^11) - (130*a^12*b^3)/(3*x^(21/2)) - (273*a^11*b^4)/(2*x^10) - (
6006*a^10*b^5)/(19*x^(19/2)) - (5005*a^9*b^6)/(9*x^9) - (12870*a^
8*b^7)/(17*x^(17/2)) - (6435*a^7*b^8)/(8*x^8) - (2002*a^6*b^9)/(3
*x^(15/2)) - (429*a^5*b^10)/x^7 - (210*a^4*b^11)/x^(13/2) - (455*
a^3*b^12)/(6*x^6) - (210*a^2*b^13)/(11*x^(11/2)) - (3*a*b^14)/x^5
 - (2*b^15)/(9*x^(9/2))
```

Maple [A] time = 0.005, size = 168, normalized size = 0.8

$$-\frac{2\,b^{15}}{9}x^{-\frac{9}{2}}-3\,\frac{ab^{14}}{x^5}-\frac{210\,a^2b^{13}}{11}x^{-\frac{11}{2}}-\frac{455\,a^3b^{12}}{6\,x^6}-210\,\frac{a^4b^{11}}{x^{13/2}}-429\,\frac{a^5b^{10}}{x^7}-\frac{2002\,a^6b^9}{3}x^{-\frac{15}{2}}-\frac{6435\,a^7b^8}{8\,x^8}-\frac{12870\,a^8b^7}{17}x^{-\frac{17}{2}}-\frac{5005\,a^9b^6}{9\,x^9}-\frac{6006\,a^{10}b^5}{19}x^{-\frac{19}{2}}-\frac{273\,a^{11}b^4}{2\,x^{10}}-\frac{130\,a^{12}b^3}{3}x^{-\frac{21}{2}}-\frac{105\,a^{13}b^2}{11\,x^{11}}-\frac{30\,a^{14}b}{23}x^{-\frac{23}{2}}-\frac{a^{15}}{12\,x^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^15/x^13,x)
```

```
[Out] -2/9*b^15/x^(9/2)-3*a*b^14/x^5-210/11*a^2*b^13/x^(11/2)-455/6*a^3
*b^12/x^6-210*a^4*b^11/x^(13/2)-429*a^5*b^10/x^7-2002/3*a^6*b^9/x
^(15/2)-6435/8*a^7*b^8/x^8-12870/17*a^8*b^7/x^(17/2)-5005/9*a^9*b
^6/x^9-6006/19*a^10*b^5/x^(19/2)-273/2*a^11*b^4/x^10-130/3*a^12*b
^3/x^(21/2)-105/11*a^13*b^2/x^11-30/23*a^14*b/x^(23/2)-1/12*a^15/
x^12
```

Maxima [A] time = 1.43073, size = 225, normalized size = 1.02

$$-\frac{1307504\,b^{15}x^{\frac{15}{2}}+17651304\,ab^{14}x^7+112326480\,a^2b^{13}x^{\frac{13}{2}}+446185740\,a^3b^{12}x^6+1235591280\,a^4b^{11}x^{\frac{11}{2}}+2524136472\,a^5b^{1(}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^13,x, algorithm="maxima")
```

```
[Out] -1/5883768*(1307504*b^15*x^(15/2) + 17651304*a*b^14*x^7 + 1123264
80*a^2*b^13*x^(13/2) + 446185740*a^3*b^12*x^6 + 1235591280*a^4*b^
11*x^(11/2) + 2524136472*a^5*b^10*x^5 + 3926434512*a^6*b^9*x^(9/2
) + 4732755885*a^7*b^8*x^4 + 4454358480*a^8*b^7*x^(7/2) + 3272028
760*a^9*b^6*x^3 + 1859890032*a^10*b^5*x^(5/2) + 803134332*a^11*b^
4*x^2 + 254963280*a^12*b^3*x^(3/2) + 56163240*a^13*b^2*x + 767448
0*a^14*b*sqrt(x) + 490314*a^15)/x^12
```

Fricas [A] time = 0.240932, size = 227, normalized size = 1.03

$$-\frac{17651304\,ab^{14}x^7+446185740\,a^3b^{12}x^6+2524136472\,a^5b^{10}x^5+4732755885\,a^7b^8x^4+3272028760\,a^9b^6x^3+803134332\,a^{11}b}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^13,x, algorithm="fricas")
```

```
[Out] -1/5883768*(17651304*a*b^14*x^7 + 446185740*a^3*b^12*x^6 + 252413
6472*a^5*b^10*x^5 + 4732755885*a^7*b^8*x^4 + 3272028760*a^9*b^6*x
^3 + 803134332*a^11*b^4*x^2 + 56163240*a^13*b^2*x + 490314*a^15 +
 16*(81719*b^15*x^7 + 7020405*a^2*b^13*x^6 + 77224455*a^4*b^11*x^
5 + 245402157*a^6*b^9*x^4 + 278397405*a^8*b^7*x^3 + 116243127*a^1
0*b^5*x^2 + 15935205*a^12*b^3*x + 479655*a^14*b)*sqrt(x))/x^12
```

Sympy [A] time = 81.9025, size = 214, normalized size = 0.97

$$-\frac{a^{15}}{12x^{12}} - \frac{30a^{14}b}{23x^{\frac{23}{2}}} - \frac{105a^{13}b^2}{11x^{11}} - \frac{130a^{12}b^3}{3x^{\frac{21}{2}}} - \frac{273a^{11}b^4}{2x^{10}} - \frac{6006a^{10}b^5}{19x^{\frac{19}{2}}} - \frac{5005a^9b^6}{9x^9} - \frac{12870a^8b^7}{17x^{\frac{17}{2}}} - \frac{6435a^7b^8}{8x^8} - \frac{2002a^6b^9}{3x^{\frac{15}{2}}} - \frac{429a^5b^{10}}{x^7} - \frac{210a^4b^{11}}{x^{\frac{13}{2}}} - \frac{455a^3b^{12}}{6x^6} - \frac{210a^2b^{13}}{11x^{\frac{11}{2}}} - \frac{3ab^{14}}{x^5} - \frac{2b^{15}}{9x^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**15/x**13,x)
```

```
[Out] -a**15/(12*x**12) - 30*a**14*b/(23*x**(23/2)) - 105*a**13*b**2/(1
1*x**11) - 130*a**12*b**3/(3*x**(21/2)) - 273*a**11*b**4/(2*x**10
) - 6006*a**10*b**5/(19*x**(19/2)) - 5005*a**9*b**6/(9*x**9) - 12
870*a**8*b**7/(17*x**(17/2)) - 6435*a**7*b**8/(8*x**8) - 2002*a**
6*b**9/(3*x**(15/2)) - 429*a**5*b**10/x**7 - 210*a**4*b**11/x**(1
3/2) - 455*a**3*b**12/(6*x**6) - 210*a**2*b**13/(11*x**(11/2)) -
3*a*b**14/x**5 - 2*b**15/(9*x**(9/2))
```

GIAC/XCAS [A] time = 0.224153, size = 225, normalized size = 1.02

$$-\frac{1307504\,b^{15}x^{\frac{15}{2}} + 17651304\,ab^{14}x^7 + 112326480\,a^2b^{13}x^{\frac{13}{2}} + 446185740\,a^3b^{12}x^6 + 1235591280\,a^4b^{11}x^{\frac{11}{2}} + 2524136472\,a^5b^{10}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^13,x, algorithm="giac")
```

```
[Out] -1/5883768*(1307504*b^15*x^(15/2) + 17651304*a*b^14*x^7 + 1123264
80*a^2*b^13*x^(13/2) + 446185740*a^3*b^12*x^6 + 1235591280*a^4*b^
11*x^(11/2) + 2524136472*a^5*b^10*x^5 + 3926434512*a^6*b^9*x^(9/2
) + 4732755885*a^7*b^8*x^4 + 4454358480*a^8*b^7*x^(7/2) + 3272028
760*a^9*b^6*x^3 + 1859890032*a^10*b^5*x^(5/2) + 803134332*a^11*b^
4*x^2 + 254963280*a^12*b^3*x^(3/2) + 56163240*a^13*b^2*x + 767448
0*a^14*b*sqrt(x) + 490314*a^15)/x^12
```

3.2185 $\int \frac{(a+b\sqrt{x})^{15}}{x^{14}}\,dx$

Optimal. Leaf size=270

$$-\frac{b^{10}(a+b\sqrt{x})^{16}}{42493880a^{11}x^8}+\frac{2b^9(a+b\sqrt{x})^{16}}{5311735a^{10}x^{17/2}}-\frac{b^8(a+b\sqrt{x})^{16}}{312455a^9x^9}+\frac{6b^7(a+b\sqrt{x})^{16}}{312455a^8x^{19/2}}-\frac{3b^6(a+b\sqrt{x})^{16}}{32890a^7x^{10}}+\frac{6b^5(a+b\sqrt{x})^{16}}{16445a^6x^{21/2}}-\frac{21b^4(a+b\sqrt{x})^{16}}{16445a^5x^{11}}+\frac{6b^3(a+b\sqrt{x})^{16}}{1495a^4x^{23/2}}-\frac{3b^2(a+b\sqrt{x})^{16}}{260a^3x^{12}}+\frac{2b(a+b\sqrt{x})^{16}}{65a^2x^{25/2}}-\frac{(a+b\sqrt{x})^{16}}{13ax^{13}}$$

```
[Out] -(a + b*Sqrt[x])^16/(13*a*x^13) + (2*b*(a + b*Sqrt[x])^16)/(65*a^
2*x^(25/2)) - (3*b^2*(a + b*Sqrt[x])^16)/(260*a^3*x^12) + (6*b^3*
(a + b*Sqrt[x])^16)/(1495*a^4*x^(23/2)) - (21*b^4*(a + b*Sqrt[x])
^16)/(16445*a^5*x^11) + (6*b^5*(a + b*Sqrt[x])^16)/(16445*a^6*x^(
21/2)) - (3*b^6*(a + b*Sqrt[x])^16)/(32890*a^7*x^10) + (6*b^7*(a
+ b*Sqrt[x])^16)/(312455*a^8*x^(19/2)) - (b^8*(a + b*Sqrt[x])^16)
/(312455*a^9*x^9) + (2*b^9*(a + b*Sqrt[x])^16)/(5311735*a^10*x^(1
7/2)) - (b^10*(a + b*Sqrt[x])^16)/(42493880*a^11*x^8)
```

Rubi [A] time = 0.399926, antiderivative size = 270, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{b^{10}(a+b\sqrt{x})^{16}}{42493880a^{11}x^8}+\frac{2b^9(a+b\sqrt{x})^{16}}{5311735a^{10}x^{17/2}}-\frac{b^8(a+b\sqrt{x})^{16}}{312455a^9x^9}+\frac{6b^7(a+b\sqrt{x})^{16}}{312455a^8x^{19/2}}-\frac{3b^6(a+b\sqrt{x})^{16}}{32890a^7x^{10}}+\frac{6b^5(a+b\sqrt{x})^{16}}{16445a^6x^{21/2}}-\frac{21b^4(a+b\sqrt{x})^{16}}{16445a^5x^{11}}+\frac{6b^3(a+b\sqrt{x})^{16}}{1495a^4x^{23/2}}-\frac{3b^2(a+b\sqrt{x})^{16}}{260a^3x^{12}}+\frac{2b(a+b\sqrt{x})^{16}}{65a^2x^{25/2}}-\frac{(a+b\sqrt{x})^{16}}{13ax^{13}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^15/x^14,x]
```

```
[Out] -(a + b*Sqrt[x])^16/(13*a*x^13) + (2*b*(a + b*Sqrt[x])^16)/(65*a^
2*x^(25/2)) - (3*b^2*(a + b*Sqrt[x])^16)/(260*a^3*x^12) + (6*b^3*
(a + b*Sqrt[x])^16)/(1495*a^4*x^(23/2)) - (21*b^4*(a + b*Sqrt[x])
^16)/(16445*a^5*x^11) + (6*b^5*(a + b*Sqrt[x])^16)/(16445*a^6*x^(
21/2)) - (3*b^6*(a + b*Sqrt[x])^16)/(32890*a^7*x^10) + (6*b^7*(a
+ b*Sqrt[x])^16)/(312455*a^8*x^(19/2)) - (b^8*(a + b*Sqrt[x])^16)
/(312455*a^9*x^9) + (2*b^9*(a + b*Sqrt[x])^16)/(5311735*a^10*x^(1
7/2)) - (b^10*(a + b*Sqrt[x])^16)/(42493880*a^11*x^8)
```

Rubi in Sympy [A] time = 53.1805, size = 212, normalized size = 0.79

$$-\frac{a^{15}}{13x^{13}}-\frac{6a^{14}b}{5x^{\frac{25}{2}}}-\frac{35a^{13}b^2}{4x^{12}}-\frac{910a^{12}b^3}{23x^{\frac{23}{2}}}-\frac{1365a^{11}b^4}{11x^{11}}-\frac{286a^{10}b^5}{x^{\frac{21}{2}}}-\frac{1001a^9b^6}{2x^{10}}-\frac{12870a^8b^7}{19x^{\frac{19}{2}}}-\frac{715a^7b^8}{x^9}-\frac{10010a^6b^9}{17x^{\frac{17}{2}}}-\frac{3003a^5b^{10}}{8x^8}-\frac{182a^4b^{11}}{x^{\frac{15}{2}}}-\frac{65a^3b^{12}}{x^7}-\frac{210a^2b^{13}}{13x^{\frac{13}{2}}}-\frac{5ab^{14}}{2x^6}-\frac{2b^{15}}{11x^{\frac{11}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**15/x**14,x)
```

```
[Out] -a**15/(13*x**13) - 6*a**14*b/(5*x**(25/2)) - 35*a**13*b**2/(4*x*
*12) - 910*a**12*b**3/(23*x**(23/2)) - 1365*a**11*b**4/(11*x**11)
 - 286*a**10*b**5/x**(21/2) - 1001*a**9*b**6/(2*x**10) - 12870*a*
*8*b**7/(19*x**(19/2)) - 715*a**7*b**8/x**9 - 10010*a**6*b**9/(17
*x**(17/2)) - 3003*a**5*b**10/(8*x**8) - 182*a**4*b**11/x**(15/2)
```

```
 - 65*a**3*b**12/x**7 - 210*a**2*b**13/(13*x**(13/2)) - 5*a*b**14
/(2*x**6) - 2*b**15/(11*x**(11/2))
```

Mathematica [A] time = 0.0675727, size = 207, normalized size = 0.77

$$-\frac{a^{15}}{13x^{13}}-\frac{6a^{14}b}{5x^{25/2}}-\frac{35a^{13}b^2}{4x^{12}}-\frac{910a^{12}b^3}{23x^{23/2}}-\frac{1365a^{11}b^4}{11x^{11}}-\frac{286a^{10}b^5}{x^{21/2}}-\frac{1001a^9b^6}{2x^{10}}-\frac{12870a^8b^7}{19x^{19/2}}-\frac{715a^7b^8}{x^9}-\frac{10010a^6b^9}{17x^{17/2}}-\frac{3003a^5b^{10}}{8x^8}-\frac{182a^4b^{11}}{x^{15/2}}-\frac{65a^3b^{12}}{x^7}-\frac{210a^2b^{13}}{13x^{13/2}}-\frac{5ab^{14}}{2x^6}-\frac{2b^{15}}{11x^{11/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^15/x^14,x]
```

```
[Out] -a^15/(13*x^13) - (6*a^14*b)/(5*x^(25/2)) - (35*a^13*b^2)/(4*x^12
) - (910*a^12*b^3)/(23*x^(23/2)) - (1365*a^11*b^4)/(11*x^11) - (2
86*a^10*b^5)/x^(21/2) - (1001*a^9*b^6)/(2*x^10) - (12870*a^8*b^7)
/(19*x^(19/2)) - (715*a^7*b^8)/x^9 - (10010*a^6*b^9)/(17*x^(17/2)
) - (3003*a^5*b^10)/(8*x^8) - (182*a^4*b^11)/x^(15/2) - (65*a^3*b
^12)/x^7 - (210*a^2*b^13)/(13*x^(13/2)) - (5*a*b^14)/(2*x^6) - (2
*b^15)/(11*x^(11/2))
```

Maple [A] time = 0.007, size = 168, normalized size = 0.6

$$-\frac{2\,b^{15}}{11}x^{-\frac{11}{2}}-\frac{5\,ab^{14}}{2\,x^6}-\frac{210\,a^2b^{13}}{13}x^{-\frac{13}{2}}-65\,\frac{a^3b^{12}}{x^7}-182\,\frac{a^4b^{11}}{x^{15/2}}-\frac{3003\,a^5b^{10}}{8\,x^8}-\frac{10010\,a^6b^9}{17}x^{-\frac{17}{2}}-715\,\frac{a^7b^8}{x^9}-\frac{12870\,a^8b^7}{19}x^{-\frac{19}{2}}-\frac{1001\,a^9b^6}{2\,x^{10}}-286\,\frac{a^{10}b^5}{x^{21/2}}-\frac{1365\,a^{11}b^4}{11\,x^{11}}-\frac{910\,a^{12}b^3}{23}x^{-\frac{23}{2}}-\frac{35\,a^{13}b^2}{4\,x^{12}}-\frac{6\,a^{14}b}{5}x^{-\frac{25}{2}}-\frac{a^{15}}{13\,x^{13}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^15/x^14,x)
```

```
[Out] -2/11*b^15/x^(11/2)-5/2*a*b^14/x^6-210/13*a^2*b^13/x^(13/2)-65*a^
3*b^12/x^7-182*a^4*b^11/x^(15/2)-3003/8*a^5*b^10/x^8-10010/17*a^6
*b^9/x^(17/2)-715*a^7*b^8/x^9-12870/19*a^8*b^7/x^(19/2)-1001/2*a^
9*b^6/x^10-286*a^10*b^5/x^(21/2)-1365/11*a^11*b^4/x^11-910/23*a^1
2*b^3/x^(23/2)-35/4*a^13*b^2/x^12-6/5*a^14*b/x^(25/2)-1/13*a^15/x
^13
```

Maxima [A] time = 1.56516, size = 225, normalized size = 0.83

$$-\frac{7726160\,b^{15}x^{\frac{15}{2}}+106234700\,ab^{14}x^7+686439600\,a^2b^{13}x^{\frac{13}{2}}+2762102200\,a^3b^{12}x^6+7733886160\,a^4b^{11}x^{\frac{11}{2}}+15951140205\,a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^14,x, algorithm="maxima")
```

```
[Out] -1/42493880*(7726160*b^15*x^(15/2) + 106234700*a*b^14*x^7 + 68643
9600*a^2*b^13*x^(13/2) + 2762102200*a^3*b^12*x^6 + 7733886160*a^4
*b^11*x^(11/2) + 15951140205*a^5*b^10*x^5 + 25021396400*a^6*b^9*x
^(9/2) + 30383124200*a^7*b^8*x^4 + 28784012400*a^8*b^7*x^(7/2) +
21268186940*a^9*b^6*x^3 + 12153249680*a^10*b^5*x^(5/2) + 52731042
00*a^11*b^4*x^2 + 1681279600*a^12*b^3*x^(3/2) + 371821450*a^13*b^
2*x + 50992656*a^14*b*sqrt(x) + 3268760*a^15)/x^13
```

Fricas [A] time = 0.240719, size = 227, normalized size = 0.84

$$-\frac{106234700\,ab^{14}x^{7}+2762102200\,a^{3}b^{12}x^{6}+15951140205\,a^{5}b^{10}x^{5}+30383124200\,a^{7}b^{8}x^{4}+21268186940\,a^{9}b^{6}x^{3}+52731042\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^14,x, algorithm="fricas")
```

```
[Out] -1/42493880*(106234700*a*b^14*x^7 + 2762102200*a^3*b^12*x^6 + 159
51140205*a^5*b^10*x^5 + 30383124200*a^7*b^8*x^4 + 21268186940*a^9
*b^6*x^3 + 5273104200*a^11*b^4*x^2 + 371821450*a^13*b^2*x + 32687
60*a^15 + 16*(482885*b^15*x^7 + 42902475*a^2*b^13*x^6 + 483367885
*a^4*b^11*x^5 + 1563837275*a^6*b^9*x^4 + 1799000775*a^8*b^7*x^3 +
 759578105*a^10*b^5*x^2 + 105079975*a^12*b^3*x + 3187041*a^14*b)*
sqrt(x))/x^13
```

Sympy [A] time = 105.758, size = 212, normalized size = 0.79

$$-\frac{a^{15}}{13x^{13}}-\frac{6a^{14}b}{5x^{\frac{25}{2}}}-\frac{35a^{13}b^{2}}{4x^{12}}-\frac{910a^{12}b^{3}}{23x^{\frac{23}{2}}}-\frac{1365a^{11}b^{4}}{11x^{11}}-\frac{286a^{10}b^{5}}{x^{\frac{21}{2}}}-\frac{1001a^{9}b^{6}}{2x^{10}}-\frac{12870a^{8}b^{7}}{19x^{\frac{19}{2}}}-\frac{715a^{7}b^{8}}{x^{9}}-\frac{10010a^{6}b^{9}}{17x^{\frac{17}{2}}}-\frac{3003a^{5}b^{10}}{8x^{8}}-\frac{182a^{4}b^{11}}{x^{\frac{15}{2}}}-\frac{65a^{3}b^{12}}{x^{7}}-\frac{210a^{2}b^{13}}{13x^{\frac{13}{2}}}-\frac{5ab^{14}}{2x^{6}}-\frac{2b^{15}}{11x^{\frac{11}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**15/x**14,x)
```

```
[Out] -a**15/(13*x**13) - 6*a**14*b/(5*x**(25/2)) - 35*a**13*b**2/(4*x*
*12) - 910*a**12*b**3/(23*x**(23/2)) - 1365*a**11*b**4/(11*x**11)
 - 286*a**10*b**5/x**(21/2) - 1001*a**9*b**6/(2*x**10) - 12870*a*
*8*b**7/(19*x**(19/2)) - 715*a**7*b**8/x**9 - 10010*a**6*b**9/(17
*x**(17/2)) - 3003*a**5*b**10/(8*x**8) - 182*a**4*b**11/x**(15/2)
 - 65*a**3*b**12/x**7 - 210*a**2*b**13/(13*x**(13/2)) - 5*a*b**14
/(2*x**6) - 2*b**15/(11*x**(11/2))
```

GIAC/XCAS [A] time = 0.219569, size = 225, normalized size = 0.83

$$-\frac{7726160\,b^{15}x^{\frac{15}{2}}+106234700\,ab^{14}x^{7}+686439600\,a^{2}b^{13}x^{\frac{13}{2}}+2762102200\,a^{3}b^{12}x^{6}+7733886160\,a^{4}b^{11}x^{\frac{11}{2}}+15951140205\,a\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^14,x, algorithm="giac")
```

```
[Out] -1/42493880*(7726160*b^15*x^(15/2) + 106234700*a*b^14*x^7 + 68643
9600*a^2*b^13*x^(13/2) + 2762102200*a^3*b^12*x^6 + 7733886160*a^4
*b^11*x^(11/2) + 15951140205*a^5*b^10*x^5 + 25021396400*a^6*b^9*x
^(9/2) + 30383124200*a^7*b^8*x^4 + 28784012400*a^8*b^7*x^(7/2) +
21268186940*a^9*b^6*x^3 + 12153249680*a^10*b^5*x^(5/2) + 52731042
00*a^11*b^4*x^2 + 1681279600*a^12*b^3*x^(3/2) + 371821450*a^13*b^
2*x + 50992656*a^14*b*sqrt(x) + 3268760*a^15)/x^13
```

3.2186 $\int \frac{(a+b\sqrt{x})^{15}}{x^{15}}\,dx$

Optimal. Leaf size=211

$$-\frac{a^{15}}{14x^{14}}-\frac{10a^{14}b}{9x^{27/2}}-\frac{105a^{13}b^2}{13x^{13}}-\frac{182a^{12}b^3}{5x^{25/2}}-\frac{455a^{11}b^4}{4x^{12}}-\frac{6006a^{10}b^5}{23x^{23/2}}-\frac{455a^9b^6}{x^{11}}-\frac{4290a^8b^7}{7x^{21/2}}-\frac{1287a^7b^8}{2x^{10}}-\frac{10010a^6b^9}{19x^{19/2}}-\frac{1001a^5b^{10}}{3x^9}-\frac{2730a^4b^{11}}{17x^{17/2}}-\frac{455a^3b^{12}}{8x^8}-\frac{14a^2b^{13}}{x^{15/2}}-\frac{15ab^{14}}{7x^7}-\frac{2b^{15}}{13x^{13/2}}$$

```
[Out] -a^15/(14*x^14) - (10*a^14*b)/(9*x^(27/2)) - (105*a^13*b^2)/(13*x
^13) - (182*a^12*b^3)/(5*x^(25/2)) - (455*a^11*b^4)/(4*x^12) - (6
006*a^10*b^5)/(23*x^(23/2)) - (455*a^9*b^6)/x^11 - (4290*a^8*b^7)
/(7*x^(21/2)) - (1287*a^7*b^8)/(2*x^10) - (10010*a^6*b^9)/(19*x^(
19/2)) - (1001*a^5*b^10)/(3*x^9) - (2730*a^4*b^11)/(17*x^(17/2))
- (455*a^3*b^12)/(8*x^8) - (14*a^2*b^13)/x^(15/2) - (15*a*b^14)/(
7*x^7) - (2*b^15)/(13*x^(13/2))
```

Rubi [A] time = 0.320332, antiderivative size = 211, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^{15}}{14x^{14}}-\frac{10a^{14}b}{9x^{27/2}}-\frac{105a^{13}b^2}{13x^{13}}-\frac{182a^{12}b^3}{5x^{25/2}}-\frac{455a^{11}b^4}{4x^{12}}-\frac{6006a^{10}b^5}{23x^{23/2}}-\frac{455a^9b^6}{x^{11}}-\frac{4290a^8b^7}{7x^{21/2}}-\frac{1287a^7b^8}{2x^{10}}-\frac{10010a^6b^9}{19x^{19/2}}-\frac{1001a^5b^{10}}{3x^9}-\frac{2730a^4b^{11}}{17x^{17/2}}-\frac{455a^3b^{12}}{8x^8}-\frac{14a^2b^{13}}{x^{15/2}}-\frac{15ab^{14}}{7x^7}-\frac{2b^{15}}{13x^{13/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^15/x^15,x]
```

```
[Out] -a^15/(14*x^14) - (10*a^14*b)/(9*x^(27/2)) - (105*a^13*b^2)/(13*x
^13) - (182*a^12*b^3)/(5*x^(25/2)) - (455*a^11*b^4)/(4*x^12) - (6
006*a^10*b^5)/(23*x^(23/2)) - (455*a^9*b^6)/x^11 - (4290*a^8*b^7)
/(7*x^(21/2)) - (1287*a^7*b^8)/(2*x^10) - (10010*a^6*b^9)/(19*x^(
19/2)) - (1001*a^5*b^10)/(3*x^9) - (2730*a^4*b^11)/(17*x^(17/2))
- (455*a^3*b^12)/(8*x^8) - (14*a^2*b^13)/x^(15/2) - (15*a*b^14)/(
7*x^7) - (2*b^15)/(13*x^(13/2))
```

Rubi in Sympy [A] time = 51.9865, size = 216, normalized size = 1.02

$$-\frac{a^{15}}{14x^{14}}-\frac{10a^{14}b}{9x^{\frac{27}{2}}}-\frac{105a^{13}b^2}{13x^{13}}-\frac{182a^{12}b^3}{5x^{\frac{25}{2}}}-\frac{455a^{11}b^4}{4x^{12}}-\frac{6006a^{10}b^5}{23x^{\frac{23}{2}}}-\frac{455a^9b^6}{x^{11}}-\frac{4290a^8b^7}{7x^{\frac{21}{2}}}-\frac{1287a^7b^8}{2x^{10}}-\frac{10010a^6b^9}{19x^{\frac{19}{2}}}-\frac{1001a^5b^{10}}{3x^9}-\frac{2730a^4b^{11}}{17x^{\frac{17}{2}}}-\frac{455a^3b^{12}}{8x^8}-\frac{14a^2b^{13}}{x^{\frac{15}{2}}}-\frac{15ab^{14}}{7x^7}-\frac{2b^{15}}{13x^{\frac{13}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**15/x**15,x)
```

```
[Out] -a**15/(14*x**14) - 10*a**14*b/(9*x**(27/2)) - 105*a**13*b**2/(13
*x**13) - 182*a**12*b**3/(5*x**(25/2)) - 455*a**11*b**4/(4*x**12)
 - 6006*a**10*b**5/(23*x**(23/2)) - 455*a**9*b**6/x**11 - 4290*a*
*8*b**7/(7*x**(21/2)) - 1287*a**7*b**8/(2*x**10) - 10010*a**6*b**
9/(19*x**(19/2)) - 1001*a**5*b**10/(3*x**9) - 2730*a**4*b**11/(17
*x**(17/2)) - 455*a**3*b**12/(8*x**8) - 14*a**2*b**13/x**(15/2) -
 15*a*b**14/(7*x**7) - 2*b**15/(13*x**(13/2))
```

Mathematica [A] time = 0.0700299, size = 211, normalized size = 1.

$$-\frac{a^{15}}{14x^{14}}-\frac{10a^{14}b}{9x^{27/2}}-\frac{105a^{13}b^2}{13x^{13}}-\frac{182a^{12}b^3}{5x^{25/2}}-\frac{455a^{11}b^4}{4x^{12}}-\frac{6006a^{10}b^5}{23x^{23/2}}-\frac{455a^9b^6}{x^{11}}-\frac{4290a^8b^7}{7x^{21/2}}-\frac{1287a^7b^8}{2x^{10}}-\frac{10010a^6b^9}{19x^{19/2}}-\frac{1001a^5b^{10}}{3x^9}-\frac{2730a^4b^{11}}{17x^{17/2}}-\frac{455a^3b^{12}}{8x^8}-\frac{14a^2b^{13}}{x^{15/2}}-\frac{15ab^{14}}{7x^7}-\frac{2b^{15}}{13x^{13/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^15/x^15,x]
```

```
[Out] -a^15/(14*x^14) - (10*a^14*b)/(9*x^(27/2)) - (105*a^13*b^2)/(13*x
^13) - (182*a^12*b^3)/(5*x^(25/2)) - (455*a^11*b^4)/(4*x^12) - (6
006*a^10*b^5)/(23*x^(23/2)) - (455*a^9*b^6)/x^11 - (4290*a^8*b^7)
/(7*x^(21/2)) - (1287*a^7*b^8)/(2*x^10) - (10010*a^6*b^9)/(19*x^(
19/2)) - (1001*a^5*b^10)/(3*x^9) - (2730*a^4*b^11)/(17*x^(17/2))
- (455*a^3*b^12)/(8*x^8) - (14*a^2*b^13)/x^(15/2) - (15*a*b^14)/(
7*x^7) - (2*b^15)/(13*x^(13/2))
```

Maple [A] time = 0.006, size = 168, normalized size = 0.8

$$-\frac{a^{15}}{14\,x^{14}}-\frac{10\,a^{14}b}{9}x^{-\frac{27}{2}}-\frac{105\,a^{13}b^2}{13\,x^{13}}-\frac{182\,a^{12}b^3}{5}x^{-\frac{25}{2}}-\frac{455\,a^{11}b^4}{4\,x^{12}}-\frac{6006\,a^{10}b^5}{23}x^{-\frac{23}{2}}-455\,\frac{a^9b^6}{x^{11}}-\frac{4290\,a^8b^7}{7}x^{-\frac{21}{2}}-\frac{1287\,a^7b^8}{2\,x^{10}}-\frac{10010\,a^6b^9}{19}x^{-\frac{19}{2}}-\frac{1001\,a^5b^{10}}{3\,x^9}-\frac{2730\,a^4b^{11}}{17}x^{-\frac{17}{2}}-\frac{455\,a^3b^{12}}{8\,x^8}-14\,\frac{a^2b^{13}}{x^{15/2}}-\frac{15\,ab^{14}}{7\,x^7}-\frac{2\,b^{15}}{13}x^{-\frac{13}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^15/x^15,x)
```

```
[Out] -1/14*a^15/x^14-10/9*a^14*b/x^(27/2)-105/13*a^13*b^2/x^13-182/5*a
^12*b^3/x^(25/2)-455/4*a^11*b^4/x^12-6006/23*a^10*b^5/x^(23/2)-45
5*a^9*b^6/x^11-4290/7*a^8*b^7/x^(21/2)-1287/2*a^7*b^8/x^10-10010/
19*a^6*b^9/x^(19/2)-1001/3*a^5*b^10/x^9-2730/17*a^4*b^11/x^(17/2)
-455/8*a^3*b^12/x^8-14*a^2*b^13/x^(15/2)-15/7*a*b^14/x^7-2/13*b^1
5/x^(13/2)
```

Maxima [A] time = 1.45045, size = 225, normalized size = 1.07

$$-\frac{37442160\,b^{15}x^{\frac{15}{2}}+521515800\,ab^{14}x^7+3407236560\,a^2b^{13}x^{\frac{13}{2}}+13841898525\,a^3b^{12}x^6+39083007600\,a^4b^{11}x^{\frac{11}{2}}+812058046\ldots}{\ldots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^15,x, algorithm="maxima")
```

```
[Out] -1/243374040*(37442160*b^15*x^(15/2) + 521515800*a*b^14*x^7 + 340
7236560*a^2*b^13*x^(13/2) + 13841898525*a^3*b^12*x^6 + 3908300760
0*a^4*b^11*x^(11/2) + 81205804680*a^5*b^10*x^5 + 128219691600*a^6
*b^9*x^(9/2) + 156611194740*a^7*b^8*x^4 + 149153518800*a^8*b^7*x^
(7/2) + 110735188200*a^9*b^6*x^3 + 63552368880*a^10*b^5*x^(5/2) +
 27683797050*a^11*b^4*x^2 + 8858815056*a^12*b^3*x^(3/2) + 1965713
400*a^13*b^2*x + 270415600*a^14*b*sqrt(x) + 17383860*a^15)/x^14
```

Fricas [A] time = 0.243505, size = 227, normalized size = 1.08

$$-\frac{521515800\,ab^{14}x^7+13841898525\,a^3b^{12}x^6+81205804680\,a^5b^{10}x^5+156611194740\,a^7b^8x^4+110735188200\,a^9b^6x^3+27683\ldots}{\ldots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^15,x, algorithm="fricas")
```

```
[Out] -1/243374040*(521515800*a*b^14*x^7 + 13841898525*a^3*b^12*x^6 + 8
1205804680*a^5*b^10*x^5 + 156611194740*a^7*b^8*x^4 + 110735188200
*a^9*b^6*x^3 + 27683797050*a^11*b^4*x^2 + 1965713400*a^13*b^2*x +
 17383860*a^15 + 16*(2340135*b^15*x^7 + 212952285*a^2*b^13*x^6 +
2442687975*a^4*b^11*x^5 + 8013730725*a^6*b^9*x^4 + 9322094925*a^8
*b^7*x^3 + 3972023055*a^10*b^5*x^2 + 553675941*a^12*b^3*x + 16900
975*a^14*b)*sqrt(x))/x^14
```

Sympy [A] time = 146.774, size = 216, normalized size = 1.02

$$-\frac{a^{15}}{14x^{14}}-\frac{10a^{14}b}{9x^{\frac{27}{2}}}-\frac{105a^{13}b^{2}}{13x^{13}}-\frac{182a^{12}b^{3}}{5x^{\frac{25}{2}}}-\frac{455a^{11}b^{4}}{4x^{12}}-\frac{6006a^{10}b^{5}}{23x^{\frac{23}{2}}}-\frac{455a^{9}b^{6}}{x^{11}}-\frac{4290a^{8}b^{7}}{7x^{\frac{21}{2}}}-\frac{1287a^{7}b^{8}}{2x^{10}}-\frac{10010a^{6}b^{9}}{19x^{\frac{19}{2}}}-\frac{1001a^{5}b^{10}}{3x^{9}}-\frac{2730a^{4}b^{11}}{17x^{\frac{17}{2}}}-\frac{455a^{3}b^{12}}{8x^{8}}-\frac{14a^{2}b^{13}}{x^{\frac{15}{2}}}-\frac{15ab^{14}}{7x^{7}}-\frac{2b^{15}}{13x^{\frac{13}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**15/x**15,x)
```

```
[Out] -a**15/(14*x**14) - 10*a**14*b/(9*x**(27/2)) - 105*a**13*b**2/(13
*x**13) - 182*a**12*b**3/(5*x**(25/2)) - 455*a**11*b**4/(4*x**12)
 - 6006*a**10*b**5/(23*x**(23/2)) - 455*a**9*b**6/x**11 - 4290*a*
*8*b**7/(7*x**(21/2)) - 1287*a**7*b**8/(2*x**10) - 10010*a**6*b**
9/(19*x**(19/2)) - 1001*a**5*b**10/(3*x**9) - 2730*a**4*b**11/(17
*x**(17/2)) - 455*a**3*b**12/(8*x**8) - 14*a**2*b**13/x**(15/2) -
 15*a*b**14/(7*x**7) - 2*b**15/(13*x**(13/2))
```

GIAC/XCAS [A] time = 0.22214, size = 225, normalized size = 1.07

$$-\frac{37442160\,b^{15}x^{\frac{15}{2}}+521515800\,ab^{14}x^{7}+3407236560\,a^{2}b^{13}x^{\frac{13}{2}}+13841898525\,a^{3}b^{12}x^{6}+39083007600\,a^{4}b^{11}x^{\frac{11}{2}}+812058046}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^15,x, algorithm="giac")
```

```
[Out] -1/243374040*(37442160*b^15*x^(15/2) + 521515800*a*b^14*x^7 + 340
7236560*a^2*b^13*x^(13/2) + 13841898525*a^3*b^12*x^6 + 3908300760
0*a^4*b^11*x^(11/2) + 81205804680*a^5*b^10*x^5 + 128219691600*a^6
*b^9*x^(9/2) + 156611194740*a^7*b^8*x^4 + 149153518800*a^8*b^7*x^
(7/2) + 110735188200*a^9*b^6*x^3 + 63552368880*a^10*b^5*x^(5/2) +
 27683797050*a^11*b^4*x^2 + 8858815056*a^12*b^3*x^(3/2) + 1965713
400*a^13*b^2*x + 270415600*a^14*b*sqrt(x) + 17383860*a^15)/x^14
```

3.2187 $\int \frac{(a+b\sqrt{x})^{15}}{x^{16}} dx$

Optimal. Leaf size=211

$$-\frac{a^{15}}{15x^{15}}-\frac{30a^{14}b}{29x^{29/2}}-\frac{15a^{13}b^2}{2x^{14}}-\frac{910a^{12}b^3}{27x^{27/2}}-\frac{105a^{11}b^4}{x^{13}}-\frac{6006a^{10}b^5}{25x^{25/2}}-\frac{5005a^9b^6}{12x^{12}}-\frac{12870a^8b^7}{23x^{23/2}}-\frac{585a^7b^8}{x^{11}}-\frac{1430a^6b^9}{3x^{21/2}}-\frac{3003a^5b^{10}}{10x^{10}}-\frac{2730a^4b^{11}}{19x^{19/2}}-\frac{455a^3b^{12}}{9x^9}-\frac{210a^2b^{13}}{17x^{17/2}}-\frac{15ab^{14}}{8x^8}-\frac{2b^{15}}{15x^{15/2}}$$

```
[Out] -a^15/(15*x^15) - (30*a^14*b)/(29*x^(29/2)) - (15*a^13*b^2)/(2*x^
14) - (910*a^12*b^3)/(27*x^(27/2)) - (105*a^11*b^4)/x^13 - (6006*
a^10*b^5)/(25*x^(25/2)) - (5005*a^9*b^6)/(12*x^12) - (12870*a^8*b
^7)/(23*x^(23/2)) - (585*a^7*b^8)/x^11 - (1430*a^6*b^9)/(3*x^(21/
2)) - (3003*a^5*b^10)/(10*x^10) - (2730*a^4*b^11)/(19*x^(19/2)) -
 (455*a^3*b^12)/(9*x^9) - (210*a^2*b^13)/(17*x^(17/2)) - (15*a*b^
14)/(8*x^8) - (2*b^15)/(15*x^(15/2))
```

Rubi [A] time = 0.315884, antiderivative size = 211, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^{15}}{15x^{15}}-\frac{30a^{14}b}{29x^{29/2}}-\frac{15a^{13}b^2}{2x^{14}}-\frac{910a^{12}b^3}{27x^{27/2}}-\frac{105a^{11}b^4}{x^{13}}-\frac{6006a^{10}b^5}{25x^{25/2}}-\frac{5005a^9b^6}{12x^{12}}-\frac{12870a^8b^7}{23x^{23/2}}-\frac{585a^7b^8}{x^{11}}-\frac{1430a^6b^9}{3x^{21/2}}-\frac{3003a^5b^{10}}{10x^{10}}-\frac{2730a^4b^{11}}{19x^{19/2}}-\frac{455a^3b^{12}}{9x^9}-\frac{210a^2b^{13}}{17x^{17/2}}-\frac{15ab^{14}}{8x^8}-\frac{2b^{15}}{15x^{15/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^15/x^16,x]
```

```
[Out] -a^15/(15*x^15) - (30*a^14*b)/(29*x^(29/2)) - (15*a^13*b^2)/(2*x^
14) - (910*a^12*b^3)/(27*x^(27/2)) - (105*a^11*b^4)/x^13 - (6006*
a^10*b^5)/(25*x^(25/2)) - (5005*a^9*b^6)/(12*x^12) - (12870*a^8*b
^7)/(23*x^(23/2)) - (585*a^7*b^8)/x^11 - (1430*a^6*b^9)/(3*x^(21/
2)) - (3003*a^5*b^10)/(10*x^10) - (2730*a^4*b^11)/(19*x^(19/2)) -
 (455*a^3*b^12)/(9*x^9) - (210*a^2*b^13)/(17*x^(17/2)) - (15*a*b^
14)/(8*x^8) - (2*b^15)/(15*x^(15/2))
```

Rubi in Sympy [A] time = 52.8243, size = 216, normalized size = 1.02

$$-\frac{a^{15}}{15x^{15}}-\frac{30a^{14}b}{29x^{\frac{29}{2}}}-\frac{15a^{13}b^2}{2x^{14}}-\frac{910a^{12}b^3}{27x^{\frac{27}{2}}}-\frac{105a^{11}b^4}{x^{13}}-\frac{6006a^{10}b^5}{25x^{\frac{25}{2}}}-\frac{5005a^9b^6}{12x^{12}}-\frac{12870a^8b^7}{23x^{\frac{23}{2}}}-\frac{585a^7b^8}{x^{11}}-\frac{1430a^6b^9}{3x^{\frac{21}{2}}}-\frac{3003a^5b^{10}}{10x^{10}}-\frac{2730a^4b^{11}}{19x^{\frac{19}{2}}}-\frac{455a^3b^{12}}{9x^9}-\frac{210a^2b^{13}}{17x^{\frac{17}{2}}}-\frac{15ab^{14}}{8x^8}-\frac{2b^{15}}{15x^{\frac{15}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**15/x**16,x)
```

```
[Out] -a**15/(15*x**15) - 30*a**14*b/(29*x**(29/2)) - 15*a**13*b**2/(2*
x**14) - 910*a**12*b**3/(27*x**(27/2)) - 105*a**11*b**4/x**13 - 6
006*a**10*b**5/(25*x**(25/2)) - 5005*a**9*b**6/(12*x**12) - 12870
*a**8*b**7/(23*x**(23/2)) - 585*a**7*b**8/x**11 - 1430*a**6*b**9/
(3*x**(21/2)) - 3003*a**5*b**10/(10*x**10) - 2730*a**4*b**11/(19*
x**(19/2)) - 455*a**3*b**12/(9*x**9) - 210*a**2*b**13/(17*x**(17/
2)) - 15*a*b**14/(8*x**8) - 2*b**15/(15*x**(15/2))
```

Mathematica [A] time = 0.0721261, size = 211, normalized size = 1.

$$-\frac{a^{15}}{15x^{15}}-\frac{30a^{14}b}{29x^{29/2}}-\frac{15a^{13}b^2}{2x^{14}}-\frac{910a^{12}b^3}{27x^{27/2}}-\frac{105a^{11}b^4}{x^{13}}-\frac{6006a^{10}b^5}{25x^{25/2}}-\frac{5005a^9b^6}{12x^{12}}-\frac{12870a^8b^7}{23x^{23/2}}-\frac{585a^7b^8}{x^{11}}-\frac{1430a^6b^9}{3x^{21/2}}-\frac{3003a^5b^{10}}{10x^{10}}-\frac{2730a^4b^{11}}{19x^{19/2}}-\frac{455a^3b^{12}}{9x^9}-\frac{210a^2b^{13}}{17x^{17/2}}-\frac{15ab^{14}}{8x^8}-\frac{2b^{15}}{15x^{15/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^15/x^16,x]
```

```
[Out] -a^15/(15*x^15) - (30*a^14*b)/(29*x^(29/2)) - (15*a^13*b^2)/(2*x^
14) - (910*a^12*b^3)/(27*x^(27/2)) - (105*a^11*b^4)/x^13 - (6006*
a^10*b^5)/(25*x^(25/2)) - (5005*a^9*b^6)/(12*x^12) - (12870*a^8*b
^7)/(23*x^(23/2)) - (585*a^7*b^8)/x^11 - (1430*a^6*b^9)/(3*x^(21/
2)) - (3003*a^5*b^10)/(10*x^10) - (2730*a^4*b^11)/(19*x^(19/2)) -
 (455*a^3*b^12)/(9*x^9) - (210*a^2*b^13)/(17*x^(17/2)) - (15*a*b^
14)/(8*x^8) - (2*b^15)/(15*x^(15/2))
```

Maple [A] time = 0.006, size = 168, normalized size = 0.8

$$-\frac{a^{15}}{15\,x^{15}}-\frac{30\,a^{14}b}{29}x^{-\frac{29}{2}}-\frac{15\,a^{13}b^2}{2\,x^{14}}-\frac{910\,a^{12}b^3}{27}x^{-\frac{27}{2}}-105\,\frac{a^{11}b^4}{x^{13}}-\frac{6006\,a^{10}b^5}{25}x^{-\frac{25}{2}}-\frac{5005\,a^9b^6}{12\,x^{12}}-\frac{12870\,a^8b^7}{23}x^{-\frac{23}{2}}-585\,\frac{a^7b^8}{x^{11}}-\frac{1430\,a^6b^9}{3}x^{-\frac{21}{2}}-\frac{3003\,a^5b^{10}}{10\,x^{10}}-\frac{2730\,a^4b^{11}}{19}x^{-\frac{19}{2}}-\frac{455\,a^3b^{12}}{9\,x^9}-\frac{210\,a^2b^{13}}{17}x^{-\frac{17}{2}}-\frac{15\,ab^{14}}{8\,x^8}-\frac{2\,b^{15}}{15}x^{-\frac{15}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^15/x^16,x)
```

```
[Out] -1/15*a^15/x^15-30/29*a^14*b/x^(29/2)-15/2*a^13*b^2/x^14-910/27*a
^12*b^3/x^(27/2)-105*a^11*b^4/x^13-6006/25*a^10*b^5/x^(25/2)-5005
/12*a^9*b^6/x^12-12870/23*a^8*b^7/x^(23/2)-585*a^7*b^8/x^11-1430/
3*a^6*b^9/x^(21/2)-3003/10*a^5*b^10/x^10-2730/19*a^4*b^11/x^(19/2
)-455/9*a^3*b^12/x^9-210/17*a^2*b^13/x^(17/2)-15/8*a*b^14/x^8-2/1
5*b^15/x^(15/2)
```

Maxima [A] time = 1.44992, size = 225, normalized size = 1.07

$$-\frac{155117520\,b^{15}x^{\frac{15}{2}}+2181340125\,ab^{14}x^7+14371182000\,a^2b^{13}x^{\frac{13}{2}}+58815393000\,a^3b^{12}x^6+167159538000\,a^4b^{11}x^{\frac{11}{2}}+3493\cdots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^16,x, algorithm="maxima")
```

```
[Out] -1/1163381400*(155117520*b^15*x^(15/2) + 2181340125*a*b^14*x^7 +
14371182000*a^2*b^13*x^(13/2) + 58815393000*a^3*b^12*x^6 + 167159
538000*a^4*b^11*x^(11/2) + 349363434420*a^5*b^10*x^5 + 5545451340
00*a^6*b^9*x^(9/2) + 680578119000*a^7*b^8*x^4 + 650987766000*a^8*
b^7*x^(7/2) + 485226992250*a^9*b^6*x^3 + 279490747536*a^10*b^5*x^
(5/2) + 122155047000*a^11*b^4*x^2 + 39210262000*a^12*b^3*x^(3/2)
+ 8725360500*a^13*b^2*x + 1203498000*a^14*b*sqrt(x) + 77558760*a^
15)/x^15
```

Fricas [A] time = 0.239263, size = 227, normalized size = 1.08

$$-\frac{2181340125\,ab^{14}x^7+58815393000\,a^3b^{12}x^6+349363434420\,a^5b^{10}x^5+680578119000\,a^7b^8x^4+485226992250\,a^9b^6x^3+122\cdots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^16,x, algorithm="fricas")
```

```
[Out] -1/1163381400*(2181340125*a*b^14*x^7 + 58815393000*a^3*b^12*x^6 +
 349363434420*a^5*b^10*x^5 + 680578119000*a^7*b^8*x^4 + 485226992
250*a^9*b^6*x^3 + 122155047000*a^11*b^4*x^2 + 8725360500*a^13*b^2
*x + 77558760*a^15 + 16*(9694845*b^15*x^7 + 898198875*a^2*b^13*x^
6 + 10447471125*a^4*b^11*x^5 + 34659070875*a^6*b^9*x^4 + 40686735
375*a^8*b^7*x^3 + 17468171721*a^10*b^5*x^2 + 2450641375*a^12*b^3*
x + 75218625*a^14*b)*sqrt(x))/x^15
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**15/x**16,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.221935, size = 225, normalized size = 1.07

$$-\frac{155117520\,b^{15}x^{\frac{15}{2}} + 2181340125\,ab^{14}x^{7} + 14371182000\,a^{2}b^{13}x^{\frac{13}{2}} + 58815393000\,a^{3}b^{12}x^{6} + 167159538000\,a^{4}b^{11}x^{\frac{11}{2}} + 3493}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^16,x, algorithm="giac")
```

```
[Out] -1/1163381400*(155117520*b^15*x^(15/2) + 2181340125*a*b^14*x^7 +
14371182000*a^2*b^13*x^(13/2) + 58815393000*a^3*b^12*x^6 + 167159
538000*a^4*b^11*x^(11/2) + 349363434420*a^5*b^10*x^5 + 5545451340
00*a^6*b^9*x^(9/2) + 680578119000*a^7*b^8*x^4 + 650987766000*a^8*
b^7*x^(7/2) + 485226992250*a^9*b^6*x^3 + 279490747536*a^10*b^5*x^
(5/2) + 122155047000*a^11*b^4*x^2 + 39210262000*a^12*b^3*x^(3/2)
+ 8725360500*a^13*b^2*x + 1203498000*a^14*b*sqrt(x) + 77558760*a^
15)/x^15
```

3.2188 $\int \frac{(a+b\sqrt{x})^{15}}{x^{17}}\,dx$

Optimal. Leaf size=207

$$-\frac{a^{15}}{16x^{16}}-\frac{30a^{14}b}{31x^{31/2}}-\frac{7a^{13}b^2}{x^{15}}-\frac{910a^{12}b^3}{29x^{29/2}}-\frac{195a^{11}b^4}{2x^{14}}-\frac{2002a^{10}b^5}{9x^{27/2}}-\frac{385a^9b^6}{x^{13}}-\frac{2574a^8b^7}{5x^{25/2}}-\frac{2145a^7b^8}{4x^{12}}-\frac{10010a^6b^9}{23x^{23/2}}-\frac{273a^5b^{10}}{x^{11}}-\frac{130a^4b^{11}}{x^{21/2}}-\frac{91a^3b^{12}}{2x^{10}}-\frac{210a^2b^{13}}{19x^{19/2}}-\frac{5ab^{14}}{3x^9}-\frac{2b^{15}}{17x^{17/2}}$$

```
[Out] -a^15/(16*x^16) - (30*a^14*b)/(31*x^(31/2)) - (7*a^13*b^2)/x^15 -
 (910*a^12*b^3)/(29*x^(29/2)) - (195*a^11*b^4)/(2*x^14) - (2002*a
^10*b^5)/(9*x^(27/2)) - (385*a^9*b^6)/x^13 - (2574*a^8*b^7)/(5*x^
(25/2)) - (2145*a^7*b^8)/(4*x^12) - (10010*a^6*b^9)/(23*x^(23/2))
 - (273*a^5*b^10)/x^11 - (130*a^4*b^11)/x^(21/2) - (91*a^3*b^12)/
(2*x^10) - (210*a^2*b^13)/(19*x^(19/2)) - (5*a*b^14)/(3*x^9) - (2
*b^15)/(17*x^(17/2))
```

Rubi [A] time = 0.314122, antiderivative size = 207, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$-\frac{a^{15}}{16x^{16}}-\frac{30a^{14}b}{31x^{31/2}}-\frac{7a^{13}b^2}{x^{15}}-\frac{910a^{12}b^3}{29x^{29/2}}-\frac{195a^{11}b^4}{2x^{14}}-\frac{2002a^{10}b^5}{9x^{27/2}}-\frac{385a^9b^6}{x^{13}}-\frac{2574a^8b^7}{5x^{25/2}}-\frac{2145a^7b^8}{4x^{12}}-\frac{10010a^6b^9}{23x^{23/2}}-\frac{273a^5b^{10}}{x^{11}}-\frac{130a^4b^{11}}{x^{21/2}}-\frac{91a^3b^{12}}{2x^{10}}-\frac{210a^2b^{13}}{19x^{19/2}}-\frac{5ab^{14}}{3x^9}-\frac{2b^{15}}{17x^{17/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^15/x^17,x]
```

```
[Out] -a^15/(16*x^16) - (30*a^14*b)/(31*x^(31/2)) - (7*a^13*b^2)/x^15 -
 (910*a^12*b^3)/(29*x^(29/2)) - (195*a^11*b^4)/(2*x^14) - (2002*a
^10*b^5)/(9*x^(27/2)) - (385*a^9*b^6)/x^13 - (2574*a^8*b^7)/(5*x^
(25/2)) - (2145*a^7*b^8)/(4*x^12) - (10010*a^6*b^9)/(23*x^(23/2))
 - (273*a^5*b^10)/x^11 - (130*a^4*b^11)/x^(21/2) - (91*a^3*b^12)/
(2*x^10) - (210*a^2*b^13)/(19*x^(19/2)) - (5*a*b^14)/(3*x^9) - (2
*b^15)/(17*x^(17/2))
```

Rubi in Sympy [A] time = 53.764, size = 212, normalized size = 1.02

$$-\frac{a^{15}}{16x^{16}}-\frac{30a^{14}b}{31x^{\frac{31}{2}}}-\frac{7a^{13}b^2}{x^{15}}-\frac{910a^{12}b^3}{29x^{\frac{29}{2}}}-\frac{195a^{11}b^4}{2x^{14}}-\frac{2002a^{10}b^5}{9x^{\frac{27}{2}}}-\frac{385a^9b^6}{x^{13}}-\frac{2574a^8b^7}{5x^{\frac{25}{2}}}-\frac{2145a^7b^8}{4x^{12}}-\frac{10010a^6b^9}{23x^{\frac{23}{2}}}-\frac{273a^5b^{10}}{x^{11}}-\frac{130a^4b^{11}}{x^{\frac{21}{2}}}-\frac{91a^3b^{12}}{2x^{10}}-\frac{210a^2b^{13}}{19x^{\frac{19}{2}}}-\frac{5ab^{14}}{3x^9}-\frac{2b^{15}}{17x^{\frac{17}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**15/x**17,x)
```

```
[Out] -a**15/(16*x**16) - 30*a**14*b/(31*x**(31/2)) - 7*a**13*b**2/x**1
5 - 910*a**12*b**3/(29*x**(29/2)) - 195*a**11*b**4/(2*x**14) - 20
02*a**10*b**5/(9*x**(27/2)) - 385*a**9*b**6/x**13 - 2574*a**8*b**
7/(5*x**(25/2)) - 2145*a**7*b**8/(4*x**12) - 10010*a**6*b**9/(23*
x**(23/2)) - 273*a**5*b**10/x**11 - 130*a**4*b**11/x**(21/2) - 91
*a**3*b**12/(2*x**10) - 210*a**2*b**13/(19*x**(19/2)) - 5*a*b**14
/(3*x**9) - 2*b**15/(17*x**(17/2))
```

Mathematica [A] time = 0.0713114, size = 207, normalized size = 1.

$$-\frac{a^{15}}{16x^{16}}-\frac{30a^{14}b}{31x^{31/2}}-\frac{7a^{13}b^2}{x^{15}}-\frac{910a^{12}b^3}{29x^{29/2}}-\frac{195a^{11}b^4}{2x^{14}}-\frac{2002a^{10}b^5}{9x^{27/2}}-\frac{385a^9b^6}{x^{13}}-\frac{2574a^8b^7}{5x^{25/2}}-\frac{2145a^7b^8}{4x^{12}}-\frac{10010a^6b^9}{23x^{23/2}}-\frac{273a^5b^{10}}{x^{11}}-\frac{130a^4b^{11}}{x^{21/2}}-\frac{91a^3b^{12}}{2x^{10}}-\frac{210a^2b^{13}}{19x^{19/2}}-\frac{5ab^{14}}{3x^9}-\frac{2b^{15}}{17x^{17/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^15/x^17,x]
```

```
[Out] -a^15/(16*x^16) - (30*a^14*b)/(31*x^(31/2)) - (7*a^13*b^2)/x^15 -
 (910*a^12*b^3)/(29*x^(29/2)) - (195*a^11*b^4)/(2*x^14) - (2002*a
^10*b^5)/(9*x^(27/2)) - (385*a^9*b^6)/x^13 - (2574*a^8*b^7)/(5*x^
(25/2)) - (2145*a^7*b^8)/(4*x^12) - (10010*a^6*b^9)/(23*x^(23/2))
 - (273*a^5*b^10)/x^11 - (130*a^4*b^11)/x^(21/2) - (91*a^3*b^12)/
(2*x^10) - (210*a^2*b^13)/(19*x^(19/2)) - (5*a*b^14)/(3*x^9) - (2
*b^15)/(17*x^(17/2))
```

Maple [A] time = 0.006, size = 168, normalized size = 0.8

$$-\frac{a^{15}}{16\,x^{16}}-\frac{30\,a^{14}b}{31}x^{-\frac{31}{2}}-7\,\frac{a^{13}b^2}{x^{15}}-\frac{910\,a^{12}b^3}{29}x^{-\frac{29}{2}}-\frac{195\,a^{11}b^4}{2\,x^{14}}-\frac{2002\,a^{10}b^5}{9}x^{-\frac{27}{2}}-385\,\frac{a^9b^6}{x^{13}}-\frac{2574\,a^8b^7}{5}x^{-\frac{25}{2}}-\frac{2145\,a^7b^8}{4\,x^{12}}-\frac{10010\,a^6b^9}{23}x^{-\frac{23}{2}}-273\,\frac{a^5b^{10}}{x^{11}}-130\,\frac{a^4b^{11}}{x^{21/2}}-\frac{91\,a^3b^{12}}{2\,x^{10}}-\frac{210\,a^2b^{13}}{19}x^{-\frac{19}{2}}-\frac{5\,ab^{14}}{3\,x^9}-\frac{2\,b^{15}}{17}x^{-\frac{17}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^15/x^17,x)
```

```
[Out] -1/16*a^15/x^16-30/31*a^14*b/x^(31/2)-7*a^13*b^2/x^15-910/29*a^12
*b^3/x^(29/2)-195/2*a^11*b^4/x^14-2002/9*a^10*b^5/x^(27/2)-385*a^
9*b^6/x^13-2574/5*a^8*b^7/x^(25/2)-2145/4*a^7*b^8/x^12-10010/23*a
^6*b^9/x^(23/2)-273*a^5*b^10/x^11-130*a^4*b^11/x^(21/2)-91/2*a^3*
b^12/x^10-210/19*a^2*b^13/x^(19/2)-5/3*a*b^14/x^9-2/17*b^15/x^(17
/2)
```

Maxima [A] time = 1.44707, size = 225, normalized size = 1.09

$$-\frac{565722720\,b^{15}x^{\frac{15}{2}}+8014405200\,ab^{14}x^7+53148160800\,a^2b^{13}x^{\frac{13}{2}}+218793261960\,a^3b^{12}x^6+625123605600\,a^4b^{11}x^{\frac{11}{2}}+131\ldots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^17,x, algorithm="maxima")
```

```
[Out] -1/4808643120*(565722720*b^15*x^(15/2) + 8014405200*a*b^14*x^7 +
53148160800*a^2*b^13*x^(13/2) + 218793261960*a^3*b^12*x^6 + 62512
3605600*a^4*b^11*x^(11/2) + 1312759571760*a^5*b^10*x^5 + 20928051
14400*a^6*b^9*x^(9/2) + 2578634873100*a^7*b^8*x^4 + 2475489478176
*a^8*b^7*x^(7/2) + 1851327601200*a^9*b^6*x^3 + 1069655947360*a^10
*b^5*x^(5/2) + 468842704200*a^11*b^4*x^2 + 150891904800*a^12*b^3*
x^(3/2) + 33660501840*a^13*b^2*x + 4653525600*a^14*b*sqrt(x) + 30
0540195*a^15)/x^16
```

Fricas [A] time = 0.240377, size = 227, normalized size = 1.1

$$-\frac{8014405200\,ab^{14}x^7+218793261960\,a^3b^{12}x^6+1312759571760\,a^5b^{10}x^5+2578634873100\,a^7b^8x^4+1851327601200\,a^9b^6x^3\ldots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^17,x, algorithm="fricas")
```

```
[Out] -1/4808643120*(8014405200*a*b^14*x^7 + 218793261960*a^3*b^12*x^6
+ 1312759571760*a^5*b^10*x^5 + 2578634873100*a^7*b^8*x^4 + 185132
7601200*a^9*b^6*x^3 + 468842704200*a^11*b^4*x^2 + 33660501840*a^1
3*b^2*x + 300540195*a^15 + 32*(17678835*b^15*x^7 + 1660880025*a^2
*b^13*x^6 + 19535112675*a^4*b^11*x^5 + 65400159825*a^6*b^9*x^4 +
77359046193*a^8*b^7*x^3 + 33426748355*a^10*b^5*x^2 + 4715372025*a
^12*b^3*x + 145422675*a^14*b)*sqrt(x))/x^16
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**15/x**17,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.221718, size = 225, normalized size = 1.09

$$-\frac{565722720\, b^{15} x^{\frac{15}{2}} + 8014405200\, a b^{14} x^{7} + 53148160800\, a^{2} b^{13} x^{\frac{13}{2}} + 218793261960\, a^{3} b^{12} x^{6} + 625123605600\, a^{4} b^{11} x^{\frac{11}{2}} + 1312}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^15/x^17,x, algorithm="giac")
```

```
[Out] -1/4808643120*(565722720*b^15*x^(15/2) + 8014405200*a*b^14*x^7 +
53148160800*a^2*b^13*x^(13/2) + 218793261960*a^3*b^12*x^6 + 62512
3605600*a^4*b^11*x^(11/2) + 1312759571760*a^5*b^10*x^5 + 20928051
14400*a^6*b^9*x^(9/2) + 2578634873100*a^7*b^8*x^4 + 2475489478176
*a^8*b^7*x^(7/2) + 1851327601200*a^9*b^6*x^3 + 1069655947360*a^10
*b^5*x^(5/2) + 468842704200*a^11*b^4*x^2 + 150891904800*a^12*b^3*
x^(3/2) + 33660501840*a^13*b^2*x + 4653525600*a^14*b*sqrt(x) + 30
0540195*a^15)/x^16
```

3.2189 $\int \frac{x^3}{a+b\sqrt{x}}\,dx$

Optimal. Leaf size=107

$$-\frac{2a^7\log\left(a+b\sqrt{x}\right)}{b^8}+\frac{2a^6\sqrt{x}}{b^7}-\frac{a^5x}{b^6}+\frac{2a^4x^{3/2}}{3b^5}-\frac{a^3x^2}{2b^4}+\frac{2a^2x^{5/2}}{5b^3}-\frac{ax^3}{3b^2}+\frac{2x^{7/2}}{7b}$$

```
[Out] (2*a^6*Sqrt[x])/b^7 - (a^5*x)/b^6 + (2*a^4*x^(3/2))/(3*b^5) - (a^
3*x^2)/(2*b^4) + (2*a^2*x^(5/2))/(5*b^3) - (a*x^3)/(3*b^2) + (2*x
^(7/2))/(7*b) - (2*a^7*Log[a + b*Sqrt[x]])/b^8
```

Rubi [A] time = 0.168375, antiderivative size = 107, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2a^7\log\left(a+b\sqrt{x}\right)}{b^8}+\frac{2a^6\sqrt{x}}{b^7}-\frac{a^5x}{b^6}+\frac{2a^4x^{3/2}}{3b^5}-\frac{a^3x^2}{2b^4}+\frac{2a^2x^{5/2}}{5b^3}-\frac{ax^3}{3b^2}+\frac{2x^{7/2}}{7b}$$

Antiderivative was successfully verified.

```
[In] Int[x^3/(a + b*Sqrt[x]),x]
```

```
[Out] (2*a^6*Sqrt[x])/b^7 - (a^5*x)/b^6 + (2*a^4*x^(3/2))/(3*b^5) - (a^
3*x^2)/(2*b^4) + (2*a^2*x^(5/2))/(5*b^3) - (a*x^3)/(3*b^2) + (2*x
^(7/2))/(7*b) - (2*a^7*Log[a + b*Sqrt[x]])/b^8
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{2a^7\log\left(a+b\sqrt{x}\right)}{b^8}-\frac{2a^5\int^{\sqrt{x}}x\,dx}{b^6}+\frac{2a^4x^{\frac{3}{2}}}{3b^5}-\frac{a^3x^2}{2b^4}+\frac{2a^2x^{\frac{5}{2}}}{5b^3}-\frac{ax^3}{3b^2}+\frac{2x^{\frac{7}{2}}}{7b}+\frac{2\int^{\sqrt{x}}a^6\,dx}{b^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**3/(a+b*x**(1/2)),x)
```

```
[Out] -2*a**7*log(a + b*sqrt(x))/b**8 - 2*a**5*Integral(x, (x, sqrt(x))
)/b**6 + 2*a**4*x**(3/2)/(3*b**5) - a**3*x**2/(2*b**4) + 2*a**2*x
**(5/2)/(5*b**3) - a*x**3/(3*b**2) + 2*x**(7/2)/(7*b) + 2*Integra
l(a**6, (x, sqrt(x)))/b**7
```

Mathematica [A] time = 0.0385756, size = 99, normalized size = 0.93

$$\frac{-420a^7\log\left(a+b\sqrt{x}\right)+420a^6b\sqrt{x}-210a^5b^2x+140a^4b^3x^{3/2}-105a^3b^4x^2+84a^2b^5x^{5/2}-70ab^6x^3+60b^7x^{7/2}}{210b^8}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3/(a + b*Sqrt[x]),x]
```

```
[Out] (420*a^6*b*Sqrt[x] - 210*a^5*b^2*x + 140*a^4*b^3*x^(3/2) - 105*a^
3*b^4*x^2 + 84*a^2*b^5*x^(5/2) - 70*a*b^6*x^3 + 60*b^7*x^(7/2) -
420*a^7*Log[a + b*Sqrt[x]])/(210*b^8)
```

Maple [A] time = 0.006, size = 88, normalized size = 0.8

$$-\frac{xa^5}{b^6}+\frac{2\,a^4}{3\,b^5}x^{\frac{3}{2}}-\frac{x^2a^3}{2\,b^4}+\frac{2\,a^2}{5\,b^3}x^{\frac{5}{2}}-\frac{ax^3}{3\,b^2}+\frac{2}{7\,b}x^{\frac{7}{2}}-2\,\frac{a^7\ln\left(a+b\sqrt{x}\right)}{b^8}+2\,\frac{a^6\sqrt{x}}{b^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(a+b*x^(1/2)),x)
```

```
[Out] -a^5*x/b^6+2/3*a^4*x^(3/2)/b^5-1/2*a^3*x^2/b^4+2/5*a^2*x^(5/2)/b^
3-1/3*a*x^3/b^2+2/7*x^(7/2)/b-2*a^7*ln(a+b*x^(1/2))/b^8+2*a^6*x^(
1/2)/b^7
```

Maxima [A] time = 1.44788, size = 174, normalized size = 1.63

$$-\frac{2\,a^{7}\log\left(b\sqrt{x}+a\right)}{b^{8}}+\frac{2\left(b\sqrt{x}+a\right)^{7}}{7\,b^{8}}-\frac{7\left(b\sqrt{x}+a\right)^{6}a}{3\,b^{8}}+\frac{42\left(b\sqrt{x}+a\right)^{5}a^{2}}{5\,b^{8}}-\frac{35\left(b\sqrt{x}+a\right)^{4}a^{3}}{2\,b^{8}}+\frac{70\left(b\sqrt{x}+a\right)^{3}a^{4}}{3\,b^{8}}-\frac{21\left(b\sqrt{x}+a\right)^{2}a^{5}}{b^{8}}+\frac{14\left(b\sqrt{x}+a\right)a^{6}}{b^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*sqrt(x) + a),x, algorithm="maxima")
```

```
[Out] -2*a^7*log(b*sqrt(x) + a)/b^8 + 2/7*(b*sqrt(x) + a)^7/b^8 - 7/3*(
b*sqrt(x) + a)^6*a/b^8 + 42/5*(b*sqrt(x) + a)^5*a^2/b^8 - 35/2*(b
*sqrt(x) + a)^4*a^3/b^8 + 70/3*(b*sqrt(x) + a)^3*a^4/b^8 - 21*(b*
sqrt(x) + a)^2*a^5/b^8 + 14*(b*sqrt(x) + a)*a^6/b^8
```

Fricas [A] time = 0.240558, size = 119, normalized size = 1.11

$$-\frac{70\,ab^{6}x^{3}+105\,a^{3}b^{4}x^{2}+210\,a^{5}b^{2}x+420\,a^{7}\log\left(b\sqrt{x}+a\right)-4\left(15\,b^{7}x^{3}+21\,a^{2}b^{5}x^{2}+35\,a^{4}b^{3}x+105\,a^{6}b\right)\sqrt{x}}{210\,b^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*sqrt(x) + a),x, algorithm="fricas")
```

```
[Out] -1/210*(70*a*b^6*x^3 + 105*a^3*b^4*x^2 + 210*a^5*b^2*x + 420*a^7*
log(b*sqrt(x) + a) - 4*(15*b^7*x^3 + 21*a^2*b^5*x^2 + 35*a^4*b^3*
x + 105*a^6*b)*sqrt(x))/b^8
```

Sympy [A] time = 3.20987, size = 109, normalized size = 1.02

$$\begin{cases} -\frac{2a^{7}\log\left(\frac{a}{b}+\sqrt{x}\right)}{b^{8}}+\frac{2a^{6}\sqrt{x}}{b^{7}}-\frac{a^{5}x}{b^{6}}+\frac{2a^{4}x^{\frac{3}{2}}}{3b^{5}}-\frac{a^{3}x^{2}}{2b^{4}}+\frac{2a^{2}x^{\frac{5}{2}}}{5b^{3}}-\frac{ax^{3}}{3b^{2}}+\frac{2x^{\frac{7}{2}}}{7b} & \text{for}\: b \neq 0 \\ \frac{x^{4}}{4a} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(a+b*x**(1/2)),x)
```

```
[Out] Piecewise((-2*a**7*log(a/b + sqrt(x))/b**8 + 2*a**6*sqrt(x)/b**7
- a**5*x/b**6 + 2*a**4*x**(3/2)/(3*b**5) - a**3*x**2/(2*b**4) + 2
*a**2*x**(5/2)/(5*b**3) - a*x**3/(3*b**2) + 2*x**(7/2)/(7*b), Ne(
b, 0)), (x**4/(4*a), True))
```

GIAC/XCAS [A] time = 0.214183, size = 120, normalized size = 1.12

$$-\frac{2\,a^{7}\ln\left(\left|b\sqrt{x}+a\right|\right)}{b^{8}}+\frac{60\,b^{6}x^{\frac{7}{2}}-70\,ab^{5}x^{3}+84\,a^{2}b^{4}x^{\frac{5}{2}}-105\,a^{3}b^{3}x^{2}+140\,a^{4}b^{2}x^{\frac{3}{2}}-210\,a^{5}bx+420\,a^{6}\sqrt{x}}{210\,b^{7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*sqrt(x) + a),x, algorithm="giac")
```

```
[Out] -2*a^7*ln(abs(b*sqrt(x) + a))/b^8 + 1/210*(60*b^6*x^(7/2) - 70*a*
b^5*x^3 + 84*a^2*b^4*x^(5/2) - 105*a^3*b^3*x^2 + 140*a^4*b^2*x^(3
/2) - 210*a^5*b*x + 420*a^6*sqrt(x))/b^7
```

3.2190 $\int \frac{x^2}{a+b\sqrt{x}}\,dx$

Optimal. Leaf size=79

$$-\frac{2a^5\log\left(a+b\sqrt{x}\right)}{b^6}+\frac{2a^4\sqrt{x}}{b^5}-\frac{a^3x}{b^4}+\frac{2a^2x^{3/2}}{3b^3}-\frac{ax^2}{2b^2}+\frac{2x^{5/2}}{5b}$$

```
[Out] (2*a^4*Sqrt[x])/b^5 - (a^3*x)/b^4 + (2*a^2*x^(3/2))/(3*b^3) - (a*
x^2)/(2*b^2) + (2*x^(5/2))/(5*b) - (2*a^5*Log[a + b*Sqrt[x]])/b^6
```

Rubi [A] time = 0.115811, antiderivative size = 79, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2a^5\log\left(a+b\sqrt{x}\right)}{b^6}+\frac{2a^4\sqrt{x}}{b^5}-\frac{a^3x}{b^4}+\frac{2a^2x^{3/2}}{3b^3}-\frac{ax^2}{2b^2}+\frac{2x^{5/2}}{5b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b*Sqrt[x]),x]
```

```
[Out] (2*a^4*Sqrt[x])/b^5 - (a^3*x)/b^4 + (2*a^2*x^(3/2))/(3*b^3) - (a*
x^2)/(2*b^2) + (2*x^(5/2))/(5*b) - (2*a^5*Log[a + b*Sqrt[x]])/b^6
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{2a^5\log\left(a+b\sqrt{x}\right)}{b^6}-\frac{2a^3\int^{\sqrt{x}}x\,dx}{b^4}+\frac{2a^2x^{\frac{3}{2}}}{3b^3}-\frac{ax^2}{2b^2}+\frac{2x^{\frac{5}{2}}}{5b}+\frac{2\int^{\sqrt{x}}a^4\,dx}{b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b*x**(1/2)),x)
```

```
[Out] -2*a**5*log(a + b*sqrt(x))/b**6 - 2*a**3*Integral(x, (x, sqrt(x))
)/b**4 + 2*a**2*x**(3/2)/(3*b**3) - a*x**2/(2*b**2) + 2*x**(5/2)/
(5*b) + 2*Integral(a**4, (x, sqrt(x)))/b**5
```

Mathematica [A] time = 0.0235146, size = 75, normalized size = 0.95

$$\frac{-60a^5\log\left(a+b\sqrt{x}\right)+60a^4b\sqrt{x}-30a^3b^2x+20a^2b^3x^{3/2}-15ab^4x^2+12b^5x^{5/2}}{30b^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a + b*Sqrt[x]),x]
```

```
[Out] (60*a^4*b*Sqrt[x] - 30*a^3*b^2*x + 20*a^2*b^3*x^(3/2) - 15*a*b^4*
x^2 + 12*b^5*x^(5/2) - 60*a^5*Log[a + b*Sqrt[x]])/(30*b^6)
```

Maple [A] time = 0.005, size = 66, normalized size = 0.8

$$-\frac{a^3x}{b^4}+\frac{2\,a^2}{3\,b^3}x^{\frac{3}{2}}-\frac{ax^2}{2\,b^2}+\frac{2}{5\,b}x^{\frac{5}{2}}-2\,\frac{a^5\ln\left(a+b\sqrt{x}\right)}{b^6}+2\,\frac{a^4\sqrt{x}}{b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(a+b*x^(1/2)),x)
```

```
[Out] -a^3*x/b^4+2/3*a^2*x^(3/2)/b^3-1/2*a*x^2/b^2+2/5*x^(5/2)/b-2*a^5*
ln(a+b*x^(1/2))/b^6+2*a^4*x^(1/2)/b^5
```

Maxima [A] time = 1.44257, size = 128, normalized size = 1.62

$$-\frac{2\,a^5\log\left(b\sqrt{x}+a\right)}{b^6}+\frac{2\,\left(b\sqrt{x}+a\right)^5}{5\,b^6}-\frac{5\,\left(b\sqrt{x}+a\right)^4 a}{2\,b^6}+\frac{20\,\left(b\sqrt{x}+a\right)^3 a^2}{3\,b^6}-\frac{10\,\left(b\sqrt{x}+a\right)^2 a^3}{b^6}+\frac{10\,\left(b\sqrt{x}+a\right)a^4}{b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*sqrt(x) + a),x, algorithm="maxima")
```

```
[Out] -2*a^5*log(b*sqrt(x) + a)/b^6 + 2/5*(b*sqrt(x) + a)^5/b^6 - 5/2*(
b*sqrt(x) + a)^4*a/b^6 + 20/3*(b*sqrt(x) + a)^3*a^2/b^6 - 10*(b*s
qrt(x) + a)^2*a^3/b^6 + 10*(b*sqrt(x) + a)*a^4/b^6
```

Fricas [A] time = 0.240372, size = 89, normalized size = 1.13

$$-\frac{15\,ab^4x^2+30\,a^3b^2x+60\,a^5\log\left(b\sqrt{x}+a\right)-4\,\left(3\,b^5x^2+5\,a^2b^3x+15\,a^4b\right)\sqrt{x}}{30\,b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*sqrt(x) + a),x, algorithm="fricas")
```

```
[Out] -1/30*(15*a*b^4*x^2 + 30*a^3*b^2*x + 60*a^5*log(b*sqrt(x) + a) -
4*(3*b^5*x^2 + 5*a^2*b^3*x + 15*a^4*b)*sqrt(x))/b^6
```

Sympy [A] time = 1.47042, size = 82, normalized size = 1.04

$$\begin{cases} -\frac{2a^5\log\left(\frac{a}{b}+\sqrt{x}\right)}{b^6}+\frac{2a^4\sqrt{x}}{b^5}-\frac{a^3x}{b^4}+\frac{2a^2x^{\frac{3}{2}}}{3b^3}-\frac{ax^2}{2b^2}+\frac{2x^{\frac{5}{2}}}{5b} & \text{for}\ b\neq 0\\ \frac{x^3}{3a} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b*x**(1/2)),x)
```

```
[Out] Piecewise((-2*a**5*log(a/b + sqrt(x))/b**6 + 2*a**4*sqrt(x)/b**5
- a**3*x/b**4 + 2*a**2*x**(3/2)/(3*b**3) - a*x**2/(2*b**2) + 2*x*
*(5/2)/(5*b), Ne(b, 0)), (x**3/(3*a), True))
```

GIAC/XCAS [A] time = 0.220805, size = 90, normalized size = 1.14

$$-\frac{2\,a^5\ln\left(\left|b\sqrt{x}+a\right|\right)}{b^6}+\frac{12\,b^4x^{\frac{5}{2}}-15\,ab^3x^2+20\,a^2b^2x^{\frac{3}{2}}-30\,a^3bx+60\,a^4\sqrt{x}}{30\,b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*sqrt(x) + a),x, algorithm="giac")
```

```
[Out] -2*a^5*ln(abs(b*sqrt(x) + a))/b^6 + 1/30*(12*b^4*x^(5/2) - 15*a*b
^3*x^2 + 20*a^2*b^2*x^(3/2) - 30*a^3*b*x + 60*a^4*sqrt(x))/b^5
```

3.2191 $\int \frac{x}{a+b\sqrt{x}}\,dx$

Optimal. Leaf size=51

$$-\frac{2a^3\log\left(a+b\sqrt{x}\right)}{b^4}+\frac{2a^2\sqrt{x}}{b^3}-\frac{ax}{b^2}+\frac{2x^{3/2}}{3b}$$

```
[Out] (2*a^2*Sqrt[x])/b^3 - (a*x)/b^2 + (2*x^(3/2))/(3*b) - (2*a^3*Log[
a + b*Sqrt[x]])/b^4
```

Rubi [A] time = 0.0762548, antiderivative size = 51, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{2a^3\log\left(a+b\sqrt{x}\right)}{b^4}+\frac{2a^2\sqrt{x}}{b^3}-\frac{ax}{b^2}+\frac{2x^{3/2}}{3b}$$

Antiderivative was successfully verified.

```
[In] Int[x/(a + b*Sqrt[x]),x]
```

```
[Out] (2*a^2*Sqrt[x])/b^3 - (a*x)/b^2 + (2*x^(3/2))/(3*b) - (2*a^3*Log[
a + b*Sqrt[x]])/b^4
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{2a^3\log\left(a+b\sqrt{x}\right)}{b^4}-\frac{2a\int^{\sqrt{x}}x\,dx}{b^2}+\frac{2x^{\frac{3}{2}}}{3b}+\frac{2\int^{\sqrt{x}}a^2\,dx}{b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x/(a+b*x**(1/2)),x)
```

```
[Out] -2*a**3*log(a + b*sqrt(x))/b**4 - 2*a*Integral(x, (x, sqrt(x)))/b
**2 + 2*x**(3/2)/(3*b) + 2*Integral(a**2, (x, sqrt(x)))/b**3
```

Mathematica [A] time = 0.0162078, size = 51, normalized size = 1.

$$-\frac{2a^3\log\left(a+b\sqrt{x}\right)}{b^4}+\frac{2a^2\sqrt{x}}{b^3}-\frac{ax}{b^2}+\frac{2x^{3/2}}{3b}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(a + b*Sqrt[x]),x]
```

```
[Out] (2*a^2*Sqrt[x])/b^3 - (a*x)/b^2 + (2*x^(3/2))/(3*b) - (2*a^3*Log[
a + b*Sqrt[x]])/b^4
```

Maple [A] time = 0.004, size = 44, normalized size = 0.9

$$-\frac{ax}{b^2}+\frac{2}{3\,b}x^{\frac{3}{2}}-2\,\frac{a^3\ln\left(a+b\sqrt{x}\right)}{b^4}+2\,\frac{a^2\sqrt{x}}{b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x/(a+b*x^(1/2)),x)
```

```
[Out] -a*x/b^2+2/3*x^(3/2)/b-2*a^3*ln(a+b*x^(1/2))/b^4+2*a^2*x^(1/2)/b^
3
```

Maxima [A] time = 1.44189, size = 82, normalized size = 1.61

$$-\frac{2\,a^3\log\left(b\sqrt{x}+a\right)}{b^4}+\frac{2\,\left(b\sqrt{x}+a\right)^3}{3\,b^4}-\frac{3\,\left(b\sqrt{x}+a\right)^2a}{b^4}+\frac{6\,\left(b\sqrt{x}+a\right)a^2}{b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(b*sqrt(x) + a),x, algorithm="maxima")
```

```
[Out] -2*a^3*log(b*sqrt(x) + a)/b^4 + 2/3*(b*sqrt(x) + a)^3/b^4 - 3*(b*
sqrt(x) + a)^2*a/b^4 + 6*(b*sqrt(x) + a)*a^2/b^4
```

Fricas [A] time = 0.237705, size = 58, normalized size = 1.14

$$-\frac{3\,ab^2x+6\,a^3\log\left(b\sqrt{x}+a\right)-2\,\left(b^3x+3\,a^2b\right)\sqrt{x}}{3\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(b*sqrt(x) + a),x, algorithm="fricas")
```

```
[Out] -1/3*(3*a*b^2*x + 6*a^3*log(b*sqrt(x) + a) - 2*(b^3*x + 3*a^2*b)*
sqrt(x))/b^4
```

Sympy [A] time = 12.6424, size = 49, normalized size = 0.96

$$-\frac{2a^3\log\left(1+\frac{b\sqrt{x}}{a}\right)}{b^4}+\frac{2a^2\sqrt{x}}{b^3}-\frac{ax}{b^2}+\frac{2x^{\frac{3}{2}}}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(a+b*x**(1/2)),x)
```

```
[Out] -2*a**3*log(1 + b*sqrt(x)/a)/b**4 + 2*a**2*sqrt(x)/b**3 - a*x/b**
2 + 2*x**(3/2)/(3*b)
```

GIAC/XCAS [A] time = 0.220052, size = 61, normalized size = 1.2

$$-\frac{2\,a^3\ln\left(\left|b\sqrt{x}+a\right|\right)}{b^4}+\frac{2\,b^2x^{\frac{3}{2}}-3\,abx+6\,a^2\sqrt{x}}{3\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(b*sqrt(x) + a),x, algorithm="giac")
```

```
[Out] -2*a^3*ln(abs(b*sqrt(x) + a))/b^4 + 1/3*(2*b^2*x^(3/2) - 3*a*b*x
+ 6*a^2*sqrt(x))/b^3
```

3.2192 $\int \frac{1}{a+b\sqrt{x}} \, dx$

Optimal. Leaf size=27

$$\frac{2\sqrt{x}}{b} - \frac{2a\log\left(a + b\sqrt{x}\right)}{b^2}$$

```
[Out] (2*Sqrt[x])/b - (2*a*Log[a + b*Sqrt[x]])/b^2
```

Rubi [A] time = 0.0393953, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{2\sqrt{x}}{b} - \frac{2a\log\left(a + b\sqrt{x}\right)}{b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^(-1),x]
```

```
[Out] (2*Sqrt[x])/b - (2*a*Log[a + b*Sqrt[x]])/b^2
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{2a\log\left(a + b\sqrt{x}\right)}{b^2} + 2\int^{\sqrt{x}} \frac{1}{b} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*x**(1/2)),x)
```

```
[Out] -2*a*log(a + b*sqrt(x))/b**2 + 2*Integral(1/b, (x, sqrt(x)))
```

Mathematica [A] time = 0.0108455, size = 27, normalized size = 1.

$$\frac{2\sqrt{x}}{b} - \frac{2a\log\left(a + b\sqrt{x}\right)}{b^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^(-1),x]
```

```
[Out] (2*Sqrt[x])/b - (2*a*Log[a + b*Sqrt[x]])/b^2
```

Maple [B] time = 0.013, size = 57, normalized size = 2.1

$$2\,\frac{\sqrt{x}}{b} + \frac{a}{b^2}\ln\left(b\sqrt{x} - a\right) - \frac{a}{b^2}\ln\left(a + b\sqrt{x}\right) - \frac{a\ln\left(b^2x - a^2\right)}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*x^(1/2)),x)
```

```
[Out] 2*x^(1/2)/b+a/b^2*ln(b*x^(1/2)-a)-a*ln(a+b*x^(1/2))/b^2-a*ln(b^2*
x-a^2)/b^2
```

Maxima [A] time = 1.44789, size = 36, normalized size = 1.33

$$-\frac{2\,a\log\left(b\sqrt{x}+a\right)}{b^2}+\frac{2\,\left(b\sqrt{x}+a\right)}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*sqrt(x) + a),x, algorithm="maxima")
```

```
[Out] -2*a*log(b*sqrt(x) + a)/b^2 + 2*(b*sqrt(x) + a)/b^2
```

Fricas [A] time = 0.234246, size = 30, normalized size = 1.11

$$-\frac{2\,\left(a\log\left(b\sqrt{x}+a\right)-b\sqrt{x}\right)}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*sqrt(x) + a),x, algorithm="fricas")
```

```
[Out] -2*(a*log(b*sqrt(x) + a) - b*sqrt(x))/b^2
```

Sympy [A] time = 0.424704, size = 27, normalized size = 1.

$$\begin{cases} -\frac{2a\log\left(\frac{a}{b}+\sqrt{x}\right)}{b^2}+\frac{2\sqrt{x}}{b} & \text{for } b\neq 0 \\ \frac{x}{a} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*x**(1/2)),x)
```

```
[Out] Piecewise((-2*a*log(a/b + sqrt(x))/b**2 + 2*sqrt(x)/b, Ne(b, 0)),
 (x/a, True))
```

GIAC/XCAS [A] time = 0.215655, size = 32, normalized size = 1.19

$$-\frac{2\,a\ln\left(\left|b\sqrt{x}+a\right|\right)}{b^2}+\frac{2\,\sqrt{x}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*sqrt(x) + a),x, algorithm="giac")
```

```
[Out] -2*a*ln(abs(b*sqrt(x) + a))/b^2 + 2*sqrt(x)/b
```

3.2193 $\int \frac{1}{(a+b\sqrt{x})x}\,dx$

Optimal. Leaf size=22

$$\frac{\log(x)}{a}-\frac{2\log\left(a+b\sqrt{x}\right)}{a}$$

```
[Out] (-2*Log[a + b*Sqrt[x]])/a + Log[x]/a
```

Rubi [A] time = 0.0300269, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{\log(x)}{a}-\frac{2\log\left(a+b\sqrt{x}\right)}{a}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b*Sqrt[x])*x),x]

[Out] (-2*Log[a + b*Sqrt[x]])/a + Log[x]/a
```

Rubi in Sympy [A] time = 5.63783, size = 22, normalized size = 1.

$$\frac{2\log\left(\sqrt{x}\right)}{a}-\frac{2\log\left(a+b\sqrt{x}\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(a+b*x**(1/2)),x)

[Out] 2*log(sqrt(x))/a - 2*log(a + b*sqrt(x))/a
```

Mathematica [A] time = 0.00803701, size = 27, normalized size = 1.23

$$\frac{2\log\left(\sqrt{x}\right)}{a}-\frac{2\log\left(a+b\sqrt{x}\right)}{a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b*Sqrt[x])*x),x]

[Out] (-2*Log[a + b*Sqrt[x]])/a + (2*Log[Sqrt[x]])/a
```

Maple [A] time = 0.008, size = 21, normalized size = 1.

$$\frac{\ln(x)}{a}-2\,\frac{\ln\left(a+b\sqrt{x}\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(a+b*x^(1/2)),x)

[Out] ln(x)/a-2*ln(a+b*x^(1/2))/a
```

Maxima [A] time = 1.43953, size = 27, normalized size = 1.23

$$-\frac{2 \log \left(b\sqrt{x}+a\right)}{a}+\frac{\log \left(x\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)*x),x, algorithm="maxima")
```

```
[Out] -2*log(b*sqrt(x) + a)/a + log(x)/a
```

Fricas [A] time = 0.23689, size = 27, normalized size = 1.23

$$-\frac{2 \left(\log \left(b\sqrt{x}+a\right)-\log \left(\sqrt{x}\right)\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)*x),x, algorithm="fricas")
```

```
[Out] -2*(log(b*sqrt(x) + a) - log(sqrt(x)))/a
```

Sympy [A] time = 1.16948, size = 37, normalized size = 1.68

$$\begin{cases} \frac{\tilde{\infty}}{\sqrt{x}} & \text{for}\: a = 0 \wedge b = 0 \\ \frac{\log{\left(x \right)}}{a} & \text{for}\: b = 0 \\ - \frac{2}{b \sqrt{x}} & \text{for}\: a = 0 \\ \frac{\log{\left(x \right)}}{a} - \frac{2 \log{\left(\frac{a}{b} + \sqrt{x} \right)}}{a} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(a+b*x**(1/2)),x)
```

```
[Out] Piecewise((zoo/sqrt(x), Eq(a, 0) & Eq(b, 0)), (log(x)/a, Eq(b, 0)
), (-2/(b*sqrt(x)), Eq(a, 0)), (log(x)/a - 2*log(a/b + sqrt(x))/a
, True))
```

GIAC/XCAS [A] time = 0.217808, size = 30, normalized size = 1.36

$$-\frac{2 \ln \left(\left|b\sqrt{x}+a\right|\right)}{a}+\frac{\ln \left(\left|x\right|\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)*x),x, algorithm="giac")
```

```
[Out] -2*ln(abs(b*sqrt(x) + a))/a + ln(abs(x))/a
```

3.2194 $\int \frac{1}{(a+b\sqrt{x})x^2}\,dx$

Optimal. Leaf size=47

$$-\frac{2b^2\log\left(a+b\sqrt{x}\right)}{a^3}+\frac{b^2\log(x)}{a^3}+\frac{2b}{a^2\sqrt{x}}-\frac{1}{ax}$$

```
[Out] -(1/(a*x)) + (2*b)/(a^2*Sqrt[x]) - (2*b^2*Log[a + b*Sqrt[x]])/a^3
 + (b^2*Log[x])/a^3
```

Rubi [A] time = 0.0736098, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2b^2\log\left(a+b\sqrt{x}\right)}{a^3}+\frac{b^2\log(x)}{a^3}+\frac{2b}{a^2\sqrt{x}}-\frac{1}{ax}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b*Sqrt[x])*x^2),x]
```

```
[Out] -(1/(a*x)) + (2*b)/(a^2*Sqrt[x]) - (2*b^2*Log[a + b*Sqrt[x]])/a^3
 + (b^2*Log[x])/a^3
```

Rubi in Sympy [A] time = 10.7405, size = 49, normalized size = 1.04

$$-\frac{1}{ax}+\frac{2b}{a^2\sqrt{x}}+\frac{2b^2\log\left(\sqrt{x}\right)}{a^3}-\frac{2b^2\log\left(a+b\sqrt{x}\right)}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**2/(a+b*x**(1/2)),x)
```

```
[Out] -1/(a*x) + 2*b/(a**2*sqrt(x)) + 2*b**2*log(sqrt(x))/a**3 - 2*b**2
*log(a + b*sqrt(x))/a**3
```

Mathematica [A] time = 0.025111, size = 44, normalized size = 0.94

$$\frac{-2b^2x\log\left(a+b\sqrt{x}\right)-a\left(a-2b\sqrt{x}\right)+b^2x\log(x)}{a^3x}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b*Sqrt[x])*x^2),x]
```

```
[Out] (-(a*(a - 2*b*Sqrt[x])) - 2*b^2*x*Log[a + b*Sqrt[x]] + b^2*x*Log[
x])/(a^3*x)
```

Maple [A] time = 0.013, size = 44, normalized size = 0.9

$$-\frac{1}{ax}+\frac{b^2\ln(x)}{a^3}-2\,\frac{b^2\ln\left(a+b\sqrt{x}\right)}{a^3}+2\,\frac{b}{a^2\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(a+b*x^(1/2)),x)
```

```
[Out] -1/a/x+b^2*ln(x)/a^3-2*b^2*ln(a+b*x^(1/2))/a^3+2*b/a^2/x^(1/2)
```

Maxima [A] time = 1.43919, size = 58, normalized size = 1.23

$$-\frac{2\,b^2\log\left(b\sqrt{x}+a\right)}{a^3}+\frac{b^2\log\left(x\right)}{a^3}+\frac{2\,b\sqrt{x}-a}{a^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)*x^2),x, algorithm="maxima")
```

```
[Out] -2*b^2*log(b*sqrt(x) + a)/a^3 + b^2*log(x)/a^3 + (2*b*sqrt(x) - a
)/(a^2*x)
```

Fricas [A] time = 0.250961, size = 58, normalized size = 1.23

$$-\frac{2\,b^2x\log\left(b\sqrt{x}+a\right)-2\,b^2x\log\left(\sqrt{x}\right)-2\,ab\sqrt{x}+a^2}{a^3x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)*x^2),x, algorithm="fricas")
```

```
[Out] -(2*b^2*x*log(b*sqrt(x) + a) - 2*b^2*x*log(sqrt(x)) - 2*a*b*sqrt(
x) + a^2)/(a^3*x)
```

Sympy [A] time = 4.61125, size = 68, normalized size = 1.45

$$\begin{cases} \frac{\tilde{\infty}}{x^{\frac{3}{2}}} & \text{for}\: a = 0 \wedge b = 0 \\ -\frac{1}{ax} & \text{for}\: b = 0 \\ -\frac{2}{3bx^{\frac{3}{2}}} & \text{for}\: a = 0 \\ -\frac{1}{ax}+\frac{2b}{a^2\sqrt{x}}+\frac{b^2\log\left(x\right)}{a^3}-\frac{2b^2\log\left(\frac{a}{b}+\sqrt{x}\right)}{a^3} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(a+b*x**(1/2)),x)
```

```
[Out] Piecewise((zoo/x**(3/2), Eq(a, 0) & Eq(b, 0)), (-1/(a*x), Eq(b, 0
)), (-2/(3*b*x**(3/2)), Eq(a, 0)), (-1/(a*x) + 2*b/(a**2*sqrt(x))
 + b**2*log(x)/a**3 - 2*b**2*log(a/b + sqrt(x))/a**3, True))
```

GIAC/XCAS [A] time = 0.223029, size = 65, normalized size = 1.38

$$-\frac{2\,b^2\ln\left(\left|b\sqrt{x}+a\right|\right)}{a^3}+\frac{b^2\ln\left(\left|x\right|\right)}{a^3}+\frac{2\,ab\sqrt{x}-a^2}{a^3x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)*x^2),x, algorithm="giac")
```

```
[Out] -2*b^2*ln(abs(b*sqrt(x) + a))/a^3 + b^2*ln(abs(x))/a^3 + (2*a*b*s
qrt(x) - a^2)/(a^3*x)
```

3.2195 $\int \frac{1}{(a+b\sqrt{x})x^3}\,dx$

Optimal. Leaf size=75

$$-\frac{2b^4\log\left(a+b\sqrt{x}\right)}{a^5}+\frac{b^4\log(x)}{a^5}+\frac{2b^3}{a^4\sqrt{x}}-\frac{b^2}{a^3x}+\frac{2b}{3a^2x^{3/2}}-\frac{1}{2ax^2}$$

```
[Out] -1/(2*a*x^2) + (2*b)/(3*a^2*x^(3/2)) - b^2/(a^3*x) + (2*b^3)/(a^4
*Sqrt[x]) - (2*b^4*Log[a + b*Sqrt[x]])/a^5 + (b^4*Log[x])/a^5
```

Rubi [A] time = 0.0995624, antiderivative size = 75, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2b^4\log\left(a+b\sqrt{x}\right)}{a^5}+\frac{b^4\log(x)}{a^5}+\frac{2b^3}{a^4\sqrt{x}}-\frac{b^2}{a^3x}+\frac{2b}{3a^2x^{3/2}}-\frac{1}{2ax^2}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b*Sqrt[x])*x^3),x]
```

```
[Out] -1/(2*a*x^2) + (2*b)/(3*a^2*x^(3/2)) - b^2/(a^3*x) + (2*b^3)/(a^4
*Sqrt[x]) - (2*b^4*Log[a + b*Sqrt[x]])/a^5 + (b^4*Log[x])/a^5
```

Rubi in Sympy [A] time = 15.153, size = 76, normalized size = 1.01

$$-\frac{1}{2ax^2}+\frac{2b}{3a^2x^{\frac{3}{2}}}-\frac{b^2}{a^3x}+\frac{2b^3}{a^4\sqrt{x}}+\frac{2b^4\log\left(\sqrt{x}\right)}{a^5}-\frac{2b^4\log\left(a+b\sqrt{x}\right)}{a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**3/(a+b*x**(1/2)),x)
```

```
[Out] -1/(2*a*x**2) + 2*b/(3*a**2*x**(3/2)) - b**2/(a**3*x) + 2*b**3/(a
**4*sqrt(x)) + 2*b**4*log(sqrt(x))/a**5 - 2*b**4*log(a + b*sqrt(x
))/a**5
```

Mathematica [A] time = 0.0589921, size = 69, normalized size = 0.92

$$\frac{\frac{a\left(-3a^3+4a^2b\sqrt{x}-6ab^2x+12b^3x^{3/2}\right)}{x^2}-12b^4\log\left(a+b\sqrt{x}\right)+6b^4\log(x)}{6a^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b*Sqrt[x])*x^3),x]
```

```
[Out] ((a*(-3*a^3 + 4*a^2*b*Sqrt[x] - 6*a*b^2*x + 12*b^3*x^(3/2)))/x^2
- 12*b^4*Log[a + b*Sqrt[x]] + 6*b^4*Log[x])/(6*a^5)
```

Maple [A] time = 0.014, size = 66, normalized size = 0.9

$$-\frac{1}{2\,ax^2}+\frac{2\,b}{3\,a^2}x^{-\frac{3}{2}}-\frac{b^2}{a^3x}+\frac{b^4\ln(x)}{a^5}-2\,\frac{b^4\ln\left(a+b\sqrt{x}\right)}{a^5}+2\,\frac{b^3}{a^4\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^3/(a+b*x^(1/2)),x)
```

```
[Out] -1/2/a/x^2+2/3*b/a^2/x^(3/2)-b^2/a^3/x+b^4*ln(x)/a^5-2*b^4*ln(a+b
*x^(1/2))/a^5+2*b^3/a^4/x^(1/2)
```

Maxima [A] time = 1.44192, size = 86, normalized size = 1.15

$$-\frac{2\,b^4\log\left(b\sqrt{x}+a\right)}{a^5}+\frac{b^4\log\left(x\right)}{a^5}+\frac{12\,b^3x^{\frac{3}{2}}-6\,ab^2x+4\,a^2b\sqrt{x}-3\,a^3}{6\,a^4x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((b*sqrt(x) + a)*x^3),x, algorithm="maxima")
```

```
[Out] -2*b^4*log(b*sqrt(x) + a)/a^5 + b^4*log(x)/a^5 + 1/6*(12*b^3*x^(3
/2) - 6*a*b^2*x + 4*a^2*b*sqrt(x) - 3*a^3)/(a^4*x^2)
```

Fricas [A] time = 0.241041, size = 93, normalized size = 1.24

$$-\frac{12\,b^4x^2\log\left(b\sqrt{x}+a\right)-12\,b^4x^2\log\left(\sqrt{x}\right)+6\,a^2b^2x+3\,a^4-4\left(3\,ab^3x+a^3b\right)\sqrt{x}}{6\,a^5x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((b*sqrt(x) + a)*x^3),x, algorithm="fricas")
```

```
[Out] -1/6*(12*b^4*x^2*log(b*sqrt(x) + a) - 12*b^4*x^2*log(sqrt(x)) + 6
*a^2*b^2*x + 3*a^4 - 4*(3*a*b^3*x + a^3*b)*sqrt(x))/(a^5*x^2)
```

Sympy [A] time = 10.3545, size = 99, normalized size = 1.32

$$\begin{cases} \frac{\tilde{\infty}}{x^{\frac{5}{2}}} & \text{for}\: a = 0 \wedge b = 0 \\ -\frac{1}{2ax^2} & \text{for}\: b = 0 \\ -\frac{2}{5bx^{\frac{5}{2}}} & \text{for}\: a = 0 \\ -\frac{1}{2ax^2}+\frac{2b}{3a^2x^{\frac{3}{2}}}-\frac{b^2}{a^3x}+\frac{2b^3}{a^4\sqrt{x}}+\frac{b^4\log\left(x\right)}{a^5}-\frac{2b^4\log\left(\frac{a}{b}+\sqrt{x}\right)}{a^5} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/x**3/(a+b*x**(1/2)),x)
```

```
[Out] Piecewise((zoo/x**(5/2), Eq(a, 0) & Eq(b, 0)), (-1/(2*a*x**2), Eq
(b, 0)), (-2/(5*b*x**(5/2)), Eq(a, 0)), (-1/(2*a*x**2) + 2*b/(3*a
**2*x**(3/2)) - b**2/(a**3*x) + 2*b**3/(a**4*sqrt(x)) + b**4*log(
x)/a**5 - 2*b**4*log(a/b + sqrt(x))/a**5, True))
```

GIAC/XCAS [A] time = 0.255229, size = 93, normalized size = 1.24

$$-\frac{2\,b^4\ln\left(\left|b\sqrt{x}+a\right|\right)}{a^5}+\frac{b^4\ln\left(\left|x\right|\right)}{a^5}+\frac{12\,ab^3x^{\frac{3}{2}}-6\,a^2b^2x+4\,a^3b\sqrt{x}-3\,a^4}{6\,a^5x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)*x^3),x, algorithm="giac")
```

```
[Out] -2*b^4*ln(abs(b*sqrt(x) + a))/a^5 + b^4*ln(abs(x))/a^5 + 1/6*(12*
a*b^3*x^(3/2) - 6*a^2*b^2*x + 4*a^3*b*sqrt(x) - 3*a^4)/(a^5*x^2)
```

3.2196 $\int \frac{1}{(a+b\sqrt{x})x^4} dx$

Optimal. Leaf size=103

$$-\frac{2b^6\log\left(a+b\sqrt{x}\right)}{a^7}+\frac{b^6\log(x)}{a^7}+\frac{2b^5}{a^6\sqrt{x}}-\frac{b^4}{a^5x}+\frac{2b^3}{3a^4x^{3/2}}-\frac{b^2}{2a^3x^2}+\frac{2b}{5a^2x^{5/2}}-\frac{1}{3ax^3}$$

```
[Out] -1/(3*a*x^3) + (2*b)/(5*a^2*x^(5/2)) - b^2/(2*a^3*x^2) + (2*b^3)/
(3*a^4*x^(3/2)) - b^4/(a^5*x) + (2*b^5)/(a^6*Sqrt[x]) - (2*b^6*Lo
g[a + b*Sqrt[x]])/a^7 + (b^6*Log[x])/a^7
```

Rubi [A] time = 0.129377, antiderivative size = 103, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2b^6\log\left(a+b\sqrt{x}\right)}{a^7}+\frac{b^6\log(x)}{a^7}+\frac{2b^5}{a^6\sqrt{x}}-\frac{b^4}{a^5x}+\frac{2b^3}{3a^4x^{3/2}}-\frac{b^2}{2a^3x^2}+\frac{2b}{5a^2x^{5/2}}-\frac{1}{3ax^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b*Sqrt[x])*x^4),x]
```

```
[Out] -1/(3*a*x^3) + (2*b)/(5*a^2*x^(5/2)) - b^2/(2*a^3*x^2) + (2*b^3)/
(3*a^4*x^(3/2)) - b^4/(a^5*x) + (2*b^5)/(a^6*Sqrt[x]) - (2*b^6*Lo
g[a + b*Sqrt[x]])/a^7 + (b^6*Log[x])/a^7
```

Rubi in Sympy [A] time = 19.7222, size = 104, normalized size = 1.01

$$-\frac{1}{3ax^3}+\frac{2b}{5a^2x^{\frac{5}{2}}}-\frac{b^2}{2a^3x^2}+\frac{2b^3}{3a^4x^{\frac{3}{2}}}-\frac{b^4}{a^5x}+\frac{2b^5}{a^6\sqrt{x}}+\frac{2b^6\log\left(\sqrt{x}\right)}{a^7}-\frac{2b^6\log\left(a+b\sqrt{x}\right)}{a^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(a+b*x**(1/2)),x)
```

```
[Out] -1/(3*a*x**3) + 2*b/(5*a**2*x**(5/2)) - b**2/(2*a**3*x**2) + 2*b*
*3/(3*a**4*x**(3/2)) - b**4/(a**5*x) + 2*b**5/(a**6*sqrt(x)) + 2*
b**6*log(sqrt(x))/a**7 - 2*b**6*log(a + b*sqrt(x))/a**7
```

Mathematica [A] time = 0.0687339, size = 93, normalized size = 0.9

$$\frac{\frac{a\left(-10a^5+12a^4b\sqrt{x}-15a^3b^2x+20a^2b^3x^{3/2}-30ab^4x^2+60b^5x^{5/2}\right)}{x^3}-60b^6\log\left(a+b\sqrt{x}\right)+30b^6\log(x)}{30a^7}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b*Sqrt[x])*x^4),x]
```

```
[Out] ((a*(-10*a^5 + 12*a^4*b*Sqrt[x] - 15*a^3*b^2*x + 20*a^2*b^3*x^(3/
2) - 30*a*b^4*x^2 + 60*b^5*x^(5/2)))/x^3 - 60*b^6*Log[a + b*Sqrt[
x]] + 30*b^6*Log[x])/(30*a^7)
```

Maple [A] time = 0.016, size = 88, normalized size = 0.9

$$-\frac{1}{3\,ax^3}+\frac{2\,b}{5\,a^2}x^{-\frac{5}{2}}-\frac{b^2}{2\,x^2a^3}+\frac{2\,b^3}{3\,a^4}x^{-\frac{3}{2}}-\frac{b^4}{xa^5}+\frac{b^6\ln(x)}{a^7}-2\,\frac{b^6\ln\left(a+b\sqrt{x}\right)}{a^7}+2\,\frac{b^5}{a^6\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(a+b*x^(1/2)),x)
```

```
[Out] -1/3/a/x^3+2/5*b/a^2/x^(5/2)-1/2*b^2/x^2/a^3+2/3*b^3/a^4/x^(3/2)-
b^4/x/a^5+b^6*ln(x)/a^7-2*b^6*ln(a+b*x^(1/2))/a^7+2*b^5/a^6/x^(1/
2)
```

Maxima [A] time = 1.44736, size = 116, normalized size = 1.13

$$-\frac{2\,b^6\log\left(b\sqrt{x}+a\right)}{a^7}+\frac{b^6\log\left(x\right)}{a^7}+\frac{60\,b^5x^{\frac{5}{2}}-30\,ab^4x^2+20\,a^2b^3x^{\frac{3}{2}}-15\,a^3b^2x+12\,a^4b\sqrt{x}-10\,a^5}{30\,a^6x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)*x^4),x, algorithm="maxima")
```

```
[Out] -2*b^6*log(b*sqrt(x) + a)/a^7 + b^6*log(x)/a^7 + 1/30*(60*b^5*x^(
5/2) - 30*a*b^4*x^2 + 20*a^2*b^3*x^(3/2) - 15*a^3*b^2*x + 12*a^4*
b*sqrt(x) - 10*a^5)/(a^6*x^3)
```

Fricas [A] time = 0.246158, size = 124, normalized size = 1.2

$$-\frac{60\,b^6x^3\log\left(b\sqrt{x}+a\right)-60\,b^6x^3\log\left(\sqrt{x}\right)+30\,a^2b^4x^2+15\,a^4b^2x+10\,a^6-4\left(15\,ab^5x^2+5\,a^3b^3x+3\,a^5b\right)\sqrt{x}}{30\,a^7x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)*x^4),x, algorithm="fricas")
```

```
[Out] -1/30*(60*b^6*x^3*log(b*sqrt(x) + a) - 60*b^6*x^3*log(sqrt(x)) +
30*a^2*b^4*x^2 + 15*a^4*b^2*x + 10*a^6 - 4*(15*a*b^5*x^2 + 5*a^3*
b^3*x + 3*a^5*b)*sqrt(x))/(a^7*x^3)
```

Sympy [A] time = 25.9195, size = 126, normalized size = 1.22

$$\begin{cases} \frac{\tilde{\infty}}{x^{\frac{7}{2}}} & \text{for}\: a = 0 \wedge b = 0 \\ -\frac{1}{3ax^3} & \text{for}\: b = 0 \\ -\frac{2}{7bx^{\frac{7}{2}}} & \text{for}\: a = 0 \\ -\frac{1}{3ax^3}+\frac{2b}{5a^2x^{\frac{5}{2}}}-\frac{b^2}{2a^3x^2}+\frac{2b^3}{3a^4x^{\frac{3}{2}}}-\frac{b^4}{a^5x}+\frac{2b^5}{a^6\sqrt{x}}+\frac{b^6\log\left(x\right)}{a^7}-\frac{2b^6\log\left(\frac{a}{b}+\sqrt{x}\right)}{a^7} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(a+b*x**(1/2)),x)
```

```
[Out] Piecewise((zoo/x**(7/2), Eq(a, 0) & Eq(b, 0)), (-1/(3*a*x**3), Eq
(b, 0)), (-2/(7*b*x**(7/2)), Eq(a, 0)), (-1/(3*a*x**3) + 2*b/(5*a
**2*x**(5/2)) - b**2/(2*a**3*x**2) + 2*b**3/(3*a**4*x**(3/2)) - b
**4/(a**5*x) + 2*b**5/(a**6*sqrt(x)) + b**6*log(x)/a**7 - 2*b**6*
log(a/b + sqrt(x))/a**7, True))
```

GIAC/XCAS [A] time = 0.260295, size = 123, normalized size = 1.19

$$-\frac{2\,b^6\ln\left(\left|b\sqrt{x}+a\right|\right)}{a^7}+\frac{b^6\ln\left(\left|x\right|\right)}{a^7}+\frac{60\,ab^5x^{\frac{5}{2}}-30\,a^2b^4x^2+20\,a^3b^3x^{\frac{3}{2}}-15\,a^4b^2x+12\,a^5b\sqrt{x}-10\,a^6}{30\,a^7x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)*x^4),x, algorithm="giac")
```

```
[Out] -2*b^6*ln(abs(b*sqrt(x) + a))/a^7 + b^6*ln(abs(x))/a^7 + 1/30*(60
*a*b^5*x^(5/2) - 30*a^2*b^4*x^2 + 20*a^3*b^3*x^(3/2) - 15*a^4*b^2
*x + 12*a^5*b*sqrt(x) - 10*a^6)/(a^7*x^3)
```

3.2197 $\int \frac{x^3}{\left(a+b\sqrt{x}\right)^2}\,dx$

Optimal. Leaf size=111

$$\frac{2a^7}{b^8\left(a+b\sqrt{x}\right)}+\frac{14a^6\log\left(a+b\sqrt{x}\right)}{b^8}-\frac{12a^5\sqrt{x}}{b^7}+\frac{5a^4x}{b^6}-\frac{8a^3x^{3/2}}{3b^5}+\frac{3a^2x^2}{2b^4}-\frac{4ax^{5/2}}{5b^3}+\frac{x^3}{3b^2}$$

```
[Out] (2*a^7)/(b^8*(a + b*Sqrt[x])) - (12*a^5*Sqrt[x])/b^7 + (5*a^4*x)/
b^6 - (8*a^3*x^(3/2))/(3*b^5) + (3*a^2*x^2)/(2*b^4) - (4*a*x^(5/2
))/(5*b^3) + x^3/(3*b^2) + (14*a^6*Log[a + b*Sqrt[x]])/b^8
```

Rubi [A] time = 0.193152, antiderivative size = 111, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2a^7}{b^8\left(a+b\sqrt{x}\right)}+\frac{14a^6\log\left(a+b\sqrt{x}\right)}{b^8}-\frac{12a^5\sqrt{x}}{b^7}+\frac{5a^4x}{b^6}-\frac{8a^3x^{3/2}}{3b^5}+\frac{3a^2x^2}{2b^4}-\frac{4ax^{5/2}}{5b^3}+\frac{x^3}{3b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(a + b*Sqrt[x])^2,x]
```

```
[Out] (2*a^7)/(b^8*(a + b*Sqrt[x])) - (12*a^5*Sqrt[x])/b^7 + (5*a^4*x)/
b^6 - (8*a^3*x^(3/2))/(3*b^5) + (3*a^2*x^2)/(2*b^4) - (4*a*x^(5/2
))/(5*b^3) + x^3/(3*b^2) + (14*a^6*Log[a + b*Sqrt[x]])/b^8
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{2a^7}{b^8\left(a+b\sqrt{x}\right)}+\frac{14a^6\log\left(a+b\sqrt{x}\right)}{b^8}-\frac{12a^5\sqrt{x}}{b^7}+\frac{10a^4\int^{\sqrt{x}}x\,dx}{b^6}-\frac{8a^3x^{\frac{3}{2}}}{3b^5}+\frac{3a^2x^2}{2b^4}-\frac{4ax^{\frac{5}{2}}}{5b^3}+\frac{x^3}{3b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(a+b*x**(1/2))**2,x)
```

```
[Out] 2*a**7/(b**8*(a + b*sqrt(x))) + 14*a**6*log(a + b*sqrt(x))/b**8 -
 12*a**5*sqrt(x)/b**7 + 10*a**4*Integral(x, (x, sqrt(x)))/b**6 -
8*a**3*x**(3/2)/(3*b**5) + 3*a**2*x**2/(2*b**4) - 4*a*x**(5/2)/(5
*b**3) + x**3/(3*b**2)
```

Mathematica [A] time = 0.0544409, size = 102, normalized size = 0.92

$$\frac{\frac{60a^7}{a+b\sqrt{x}}+420a^6\log\left(a+b\sqrt{x}\right)-360a^5b\sqrt{x}+150a^4b^2x-80a^3b^3x^{3/2}+45a^2b^4x^2-24ab^5x^{5/2}+10b^6x^3}{30b^8}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(a + b*Sqrt[x])^2,x]
```

```
[Out] ((60*a^7)/(a + b*Sqrt[x]) - 360*a^5*b*Sqrt[x] + 150*a^4*b^2*x - 8
0*a^3*b^3*x^(3/2) + 45*a^2*b^4*x^2 - 24*a*b^5*x^(5/2) + 10*b^6*x^
3 + 420*a^6*Log[a + b*Sqrt[x]])/(30*b^8)
```

Maple [A] time = 0.011, size = 94, normalized size = 0.9

$$5\frac{a^4x}{b^6}-\frac{8a^3}{3b^5}x^{\frac{3}{2}}+\frac{3a^2x^2}{2b^4}-\frac{4a}{5b^3}x^{\frac{5}{2}}+\frac{x^3}{3b^2}+14\frac{a^6\ln\left(a+b\sqrt{x}\right)}{b^8}-12\frac{a^5\sqrt{x}}{b^7}+2\frac{a^7}{b^8\left(a+b\sqrt{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(a+b*x^(1/2))^2,x)
```

```
[Out] 5*a^4*x/b^6-8/3*a^3*x^(3/2)/b^5+3/2*a^2*x^2/b^4-4/5*a*x^(5/2)/b^3
+1/3*x^3/b^2+14*a^6*ln(a+b*x^(1/2))/b^8-12*a^5*x^(1/2)/b^7+2*a^7/
b^8/(a+b*x^(1/2))
```

Maxima [A] time = 1.4498, size = 174, normalized size = 1.57

$$\frac{14a^6\log\left(b\sqrt{x}+a\right)}{b^8}+\frac{\left(b\sqrt{x}+a\right)^6}{3b^8}-\frac{14\left(b\sqrt{x}+a\right)^5a}{5b^8}+\frac{21\left(b\sqrt{x}+a\right)^4a^2}{2b^8}-\frac{70\left(b\sqrt{x}+a\right)^3a^3}{3b^8}+\frac{35\left(b\sqrt{x}+a\right)^2a^4}{b^8}-\frac{42\left(b\sqrt{x}+a\right)a^5}{b^8}+\frac{2a^7}{\left(b\sqrt{x}+a\right)b^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*sqrt(x) + a)^2,x, algorithm="maxima")
```

```
[Out] 14*a^6*log(b*sqrt(x) + a)/b^8 + 1/3*(b*sqrt(x) + a)^6/b^8 - 14/5*
(b*sqrt(x) + a)^5*a/b^8 + 21/2*(b*sqrt(x) + a)^4*a^2/b^8 - 70/3*(
b*sqrt(x) + a)^3*a^3/b^8 + 35*(b*sqrt(x) + a)^2*a^4/b^8 - 42*(b*s
qrt(x) + a)*a^5/b^8 + 2*a^7/((b*sqrt(x) + a)*b^8)
```

Fricas [A] time = 0.237738, size = 154, normalized size = 1.39

$$-\frac{14ab^6x^3+35a^3b^4x^2+210a^5b^2x-60a^7-420\left(a^6b\sqrt{x}+a^7\right)\log\left(b\sqrt{x}+a\right)-\left(10b^7x^3+21a^2b^5x^2+70a^4b^3x-360a^6b\right)}{30\left(b^9\sqrt{x}+ab^8\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*sqrt(x) + a)^2,x, algorithm="fricas")
```

```
[Out] -1/30*(14*a*b^6*x^3 + 35*a^3*b^4*x^2 + 210*a^5*b^2*x - 60*a^7 - 4
20*(a^6*b*sqrt(x) + a^7)*log(b*sqrt(x) + a) - (10*b^7*x^3 + 21*a^
2*b^5*x^2 + 70*a^4*b^3*x - 360*a^6*b)*sqrt(x))/(b^9*sqrt(x) + a*b
^8)
```

Sympy [A] time = 6.46221, size = 272, normalized size = 2.45

$$\begin{cases}\frac{420a^7\log\left(\frac{a}{b}+\sqrt{x}\right)}{30ab^8+30b^9\sqrt{x}}+\frac{420a^7}{30ab^8+30b^9\sqrt{x}}+\frac{420a^6b\sqrt{x}\log\left(\frac{a}{b}+\sqrt{x}\right)}{30ab^8+30b^9\sqrt{x}}-\frac{210a^5b^2x}{30ab^8+30b^9\sqrt{x}}+\frac{70a^4b^3x^{\frac{3}{2}}}{30ab^8+30b^9\sqrt{x}}-\frac{35a^3b^4x^2}{30ab^8+30b^9\sqrt{x}}+\frac{21a^2b^5x^{\frac{5}{2}}}{30ab^8+30b^9\sqrt{x}}-\frac{14ab^6}{30ab^8+30} \\ \frac{x^4}{4a^2}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(a+b*x**(1/2))**2,x)
```

```
[Out] Piecewise((420*a**7*log(a/b + sqrt(x))/(30*a*b**8 + 30*b**9*sqrt(
x)) + 420*a**7/(30*a*b**8 + 30*b**9*sqrt(x)) + 420*a**6*b*sqrt(x)
*log(a/b + sqrt(x))/(30*a*b**8 + 30*b**9*sqrt(x)) - 210*a**5*b**2
```

```
*x/(30*a*b**8 + 30*b**9*sqrt(x)) + 70*a**4*b**3*x**(3/2)/(30*a*b*
*8 + 30*b**9*sqrt(x)) - 35*a**3*b**4*x**2/(30*a*b**8 + 30*b**9*sq
rt(x)) + 21*a**2*b**5*x**(5/2)/(30*a*b**8 + 30*b**9*sqrt(x)) - 14
*a*b**6*x**3/(30*a*b**8 + 30*b**9*sqrt(x)) + 10*b**7*x**(7/2)/(30
*a*b**8 + 30*b**9*sqrt(x)), Ne(b, 0)), (x**4/(4*a**2), True))
```

GIAC/XCAS [A] time = 0.245738, size = 135, normalized size = 1.22

$$\frac{14\,a^6\ln\left(\left|b\sqrt{x}+a\right|\right)}{b^8}+\frac{2\,a^7}{\left(b\sqrt{x}+a\right)b^8}+\frac{10\,b^{10}x^3-24\,ab^9x^{\frac{5}{2}}+45\,a^2b^8x^2-80\,a^3b^7x^{\frac{3}{2}}+150\,a^4b^6x-360\,a^5b^5\sqrt{x}}{30\,b^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*sqrt(x) + a)^2,x, algorithm="giac")
```

```
[Out] 14*a^6*ln(abs(b*sqrt(x) + a))/b^8 + 2*a^7/((b*sqrt(x) + a)*b^8) +
 1/30*(10*b^10*x^3 - 24*a*b^9*x^(5/2) + 45*a^2*b^8*x^2 - 80*a^3*b
^7*x^(3/2) + 150*a^4*b^6*x - 360*a^5*b^5*sqrt(x))/b^12
```

3.2198 $\int \frac{x^2}{\left(a+b\sqrt{x}\right)^2} dx$

Optimal. Leaf size=83

$$\frac{2a^5}{b^6\left(a+b\sqrt{x}\right)}+\frac{10a^4\log\left(a+b\sqrt{x}\right)}{b^6}-\frac{8a^3\sqrt{x}}{b^5}+\frac{3a^2x}{b^4}-\frac{4ax^{3/2}}{3b^3}+\frac{x^2}{2b^2}$$

```
[Out] (2*a^5)/(b^6*(a + b*Sqrt[x])) - (8*a^3*Sqrt[x])/b^5 + (3*a^2*x)/b
^4 - (4*a*x^(3/2))/(3*b^3) + x^2/(2*b^2) + (10*a^4*Log[a + b*Sqrt
[x]])/b^6
```

Rubi [A] time = 0.137506, antiderivative size = 83, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2a^5}{b^6\left(a+b\sqrt{x}\right)}+\frac{10a^4\log\left(a+b\sqrt{x}\right)}{b^6}-\frac{8a^3\sqrt{x}}{b^5}+\frac{3a^2x}{b^4}-\frac{4ax^{3/2}}{3b^3}+\frac{x^2}{2b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b*Sqrt[x])^2,x]
```

```
[Out] (2*a^5)/(b^6*(a + b*Sqrt[x])) - (8*a^3*Sqrt[x])/b^5 + (3*a^2*x)/b
^4 - (4*a*x^(3/2))/(3*b^3) + x^2/(2*b^2) + (10*a^4*Log[a + b*Sqrt
[x]])/b^6
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{2a^5}{b^6\left(a+b\sqrt{x}\right)}+\frac{10a^4\log\left(a+b\sqrt{x}\right)}{b^6}-\frac{8a^3\sqrt{x}}{b^5}+\frac{6a^2\int^{\sqrt{x}}x\,dx}{b^4}-\frac{4ax^{\frac{3}{2}}}{3b^3}+\frac{x^2}{2b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b*x**(1/2))**2,x)
```

```
[Out] 2*a**5/(b**6*(a + b*sqrt(x))) + 10*a**4*log(a + b*sqrt(x))/b**6 -
 8*a**3*sqrt(x)/b**5 + 6*a**2*Integral(x, (x, sqrt(x)))/b**4 - 4*
a*x**(3/2)/(3*b**3) + x**2/(2*b**2)
```

Mathematica [A] time = 0.0499564, size = 78, normalized size = 0.94

$$\frac{\frac{12a^5}{a+b\sqrt{x}}+60a^4\log\left(a+b\sqrt{x}\right)-48a^3b\sqrt{x}+18a^2b^2x-8ab^3x^{3/2}+3b^4x^2}{6b^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a + b*Sqrt[x])^2,x]
```

```
[Out] ((12*a^5)/(a + b*Sqrt[x]) - 48*a^3*b*Sqrt[x] + 18*a^2*b^2*x - 8*a
*b^3*x^(3/2) + 3*b^4*x^2 + 60*a^4*Log[a + b*Sqrt[x]])/(6*b^6)
```

Maple [A] time = 0.011, size = 72, normalized size = 0.9

$$3\frac{xa^2}{b^4}-\frac{4a}{3b^3}x^{\frac{3}{2}}+\frac{x^2}{2b^2}+10\frac{a^4\ln\left(a+b\sqrt{x}\right)}{b^6}-8\frac{a^3\sqrt{x}}{b^5}+2\frac{a^5}{b^6\left(a+b\sqrt{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(a+b*x^(1/2))^2,x)
```

```
[Out] 3*a^2*x/b^4-4/3*a*x^(3/2)/b^3+1/2*x^2/b^2+10*a^4*ln(a+b*x^(1/2))/
b^6-8*a^3*x^(1/2)/b^5+2*a^5/b^6/(a+b*x^(1/2))
```

Maxima [A] time = 1.44304, size = 128, normalized size = 1.54

$$\frac{10\,a^4\log\left(b\sqrt{x}+a\right)}{b^6}+\frac{\left(b\sqrt{x}+a\right)^4}{2\,b^6}-\frac{10\,\left(b\sqrt{x}+a\right)^3a}{3\,b^6}+\frac{10\,\left(b\sqrt{x}+a\right)^2a^2}{b^6}-\frac{20\,\left(b\sqrt{x}+a\right)a^3}{b^6}+\frac{2\,a^5}{\left(b\sqrt{x}+a\right)b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*sqrt(x) + a)^2,x, algorithm="maxima")
```

```
[Out] 10*a^4*log(b*sqrt(x) + a)/b^6 + 1/2*(b*sqrt(x) + a)^4/b^6 - 10/3*
(b*sqrt(x) + a)^3*a/b^6 + 10*(b*sqrt(x) + a)^2*a^2/b^6 - 20*(b*sq
rt(x) + a)*a^3/b^6 + 2*a^5/((b*sqrt(x) + a)*b^6)
```

Fricas [A] time = 0.245805, size = 124, normalized size = 1.49

$$-\frac{5\,ab^4x^2+30\,a^3b^2x-12\,a^5-60\,\left(a^4b\sqrt{x}+a^5\right)\log\left(b\sqrt{x}+a\right)-\left(3\,b^5x^2+10\,a^2b^3x-48\,a^4b\right)\sqrt{x}}{6\,\left(b^7\sqrt{x}+ab^6\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*sqrt(x) + a)^2,x, algorithm="fricas")
```

```
[Out] -1/6*(5*a*b^4*x^2 + 30*a^3*b^2*x - 12*a^5 - 60*(a^4*b*sqrt(x) + a
^5)*log(b*sqrt(x) + a) - (3*b^5*x^2 + 10*a^2*b^3*x - 48*a^4*b)*sq
rt(x))/(b^7*sqrt(x) + a*b^6)
```

Sympy [A] time = 3.28809, size = 212, normalized size = 2.55

$$\begin{cases}\frac{60a^5\log\left(\frac{a}{b}+\sqrt{x}\right)}{6ab^6+6b^7\sqrt{x}}+\frac{60a^5}{6ab^6+6b^7\sqrt{x}}+\frac{60a^4b\sqrt{x}\log\left(\frac{a}{b}+\sqrt{x}\right)}{6ab^6+6b^7\sqrt{x}}-\frac{30a^3b^2x}{6ab^6+6b^7\sqrt{x}}+\frac{10a^2b^3x^{\frac{3}{2}}}{6ab^6+6b^7\sqrt{x}}-\frac{5ab^4x^2}{6ab^6+6b^7\sqrt{x}}+\frac{3b^5x^{\frac{5}{2}}}{6ab^6+6b^7\sqrt{x}} & \text{for}\ b\neq 0\\ \frac{x^3}{3a^2} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b*x**(1/2))**2,x)
```

```
[Out] Piecewise((60*a**5*log(a/b + sqrt(x))/(6*a*b**6 + 6*b**7*sqrt(x))
 + 60*a**5/(6*a*b**6 + 6*b**7*sqrt(x)) + 60*a**4*b*sqrt(x)*log(a/
b + sqrt(x))/(6*a*b**6 + 6*b**7*sqrt(x)) - 30*a**3*b**2*x/(6*a*b*
*6 + 6*b**7*sqrt(x)) + 10*a**2*b**3*x**(3/2)/(6*a*b**6 + 6*b**7*s
qrt(x)) - 5*a*b**4*x**2/(6*a*b**6 + 6*b**7*sqrt(x)) + 3*b**5*x**(
5/2)/(6*a*b**6 + 6*b**7*sqrt(x)), Ne(b, 0)), (x**3/(3*a**2), True
))
```

GIAC/XCAS [A] time = 0.277892, size = 105, normalized size = 1.27

$$\frac{10\,a^4\ln\left(\left|b\sqrt{x}+a\right|\right)}{b^6}+\frac{2\,a^5}{\left(b\sqrt{x}+a\right)b^6}+\frac{3\,b^6x^2-8\,ab^5x^{\frac{3}{2}}+18\,a^2b^4x-48\,a^3b^3\sqrt{x}}{6\,b^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*sqrt(x) + a)^2,x, algorithm="giac")
```

```
[Out] 10*a^4*ln(abs(b*sqrt(x) + a))/b^6 + 2*a^5/((b*sqrt(x) + a)*b^6) +
 1/6*(3*b^6*x^2 - 8*a*b^5*x^(3/2) + 18*a^2*b^4*x - 48*a^3*b^3*sqr
t(x))/b^8
```

3.2199 $\int \frac{x}{\left(a+b\sqrt{x}\right)^2}\,dx$

Optimal. Leaf size=54

$$\frac{2a^3}{b^4\left(a+b\sqrt{x}\right)}+\frac{6a^2\log\left(a+b\sqrt{x}\right)}{b^4}-\frac{4a\sqrt{x}}{b^3}+\frac{x}{b^2}$$

```
[Out] (2*a^3)/(b^4*(a + b*Sqrt[x])) - (4*a*Sqrt[x])/b^3 + x/b^2 + (6*a^
2*Log[a + b*Sqrt[x]])/b^4
```

Rubi [A] time = 0.0928997, antiderivative size = 54, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{2a^3}{b^4\left(a+b\sqrt{x}\right)}+\frac{6a^2\log\left(a+b\sqrt{x}\right)}{b^4}-\frac{4a\sqrt{x}}{b^3}+\frac{x}{b^2}$$

Antiderivative was successfully verified.

```
[In] Int[x/(a + b*Sqrt[x])^2,x]
```

```
[Out] (2*a^3)/(b^4*(a + b*Sqrt[x])) - (4*a*Sqrt[x])/b^3 + x/b^2 + (6*a^
2*Log[a + b*Sqrt[x]])/b^4
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{2a^3}{b^4\left(a+b\sqrt{x}\right)}+\frac{6a^2\log\left(a+b\sqrt{x}\right)}{b^4}-\frac{4a\sqrt{x}}{b^3}+\frac{2\int^{\sqrt{x}}x\,dx}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x/(a+b*x**(1/2))**2,x)
```

```
[Out] 2*a**3/(b**4*(a + b*sqrt(x))) + 6*a**2*log(a + b*sqrt(x))/b**4 -
4*a*sqrt(x)/b**3 + 2*Integral(x, (x, sqrt(x)))/b**2
```

Mathematica [A] time = 0.0351834, size = 50, normalized size = 0.93

$$\frac{\frac{2a^3}{a+b\sqrt{x}}+6a^2\log\left(a+b\sqrt{x}\right)-4ab\sqrt{x}+b^2x}{b^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(a + b*Sqrt[x])^2,x]
```

```
[Out] ((2*a^3)/(a + b*Sqrt[x]) - 4*a*b*Sqrt[x] + b^2*x + 6*a^2*Log[a +
b*Sqrt[x]])/b^4
```

Maple [A] time = 0.01, size = 49, normalized size = 0.9

$$\frac{x}{b^2}+6\,\frac{a^2\ln\left(a+b\sqrt{x}\right)}{b^4}-4\,\frac{a\sqrt{x}}{b^3}+2\,\frac{a^3}{b^4\left(a+b\sqrt{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+b*x^(1/2))^2,x)
```

```
[Out] x/b^2+6*a^2*ln(a+b*x^(1/2))/b^4-4*a*x^(1/2)/b^3+2*a^3/b^4/(a+b*x^
(1/2))
```

Maxima [A] time = 1.43724, size = 81, normalized size = 1.5

$$\frac{6\,a^2\log\left(b\sqrt{x}+a\right)}{b^4}+\frac{\left(b\sqrt{x}+a\right)^2}{b^4}-\frac{6\left(b\sqrt{x}+a\right)a}{b^4}+\frac{2\,a^3}{\left(b\sqrt{x}+a\right)b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*sqrt(x) + a)^2,x, algorithm="maxima")
```

```
[Out] 6*a^2*log(b*sqrt(x) + a)/b^4 + (b*sqrt(x) + a)^2/b^4 - 6*(b*sqrt(
x) + a)*a/b^4 + 2*a^3/((b*sqrt(x) + a)*b^4)
```

Fricas [A] time = 0.23456, size = 93, normalized size = 1.72

$$-\frac{3\,ab^2x-2\,a^3-6\left(a^2b\sqrt{x}+a^3\right)\log\left(b\sqrt{x}+a\right)-\left(b^3x-4\,a^2b\right)\sqrt{x}}{b^5\sqrt{x}+ab^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*sqrt(x) + a)^2,x, algorithm="fricas")
```

```
[Out] -(3*a*b^2*x - 2*a^3 - 6*(a^2*b*sqrt(x) + a^3)*log(b*sqrt(x) + a)
- (b^3*x - 4*a^2*b)*sqrt(x))/(b^5*sqrt(x) + a*b^4)
```

Sympy [A] time = 12.2803, size = 158, normalized size = 2.93

$$\frac{6a^3x^{18}\log\left(1+\frac{b\sqrt{x}}{a}\right)}{ab^4x^{18}+b^5x^{\frac{37}{2}}}+\frac{6a^2bx^{\frac{37}{2}}\log\left(1+\frac{b\sqrt{x}}{a}\right)}{ab^4x^{18}+b^5x^{\frac{37}{2}}}-\frac{6a^2bx^{\frac{37}{2}}}{ab^4x^{18}+b^5x^{\frac{37}{2}}}-\frac{3ab^2x^{19}}{ab^4x^{18}+b^5x^{\frac{37}{2}}}+\frac{b^3x^{\frac{39}{2}}}{ab^4x^{18}+b^5x^{\frac{37}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b*x**(1/2))**2,x)
```

```
[Out] 6*a**3*x**18*log(1 + b*sqrt(x)/a)/(a*b**4*x**18 + b**5*x**(37/2))
 + 6*a**2*b*x**(37/2)*log(1 + b*sqrt(x)/a)/(a*b**4*x**18 + b**5*x
**(37/2)) - 6*a**2*b*x**(37/2)/(a*b**4*x**18 + b**5*x**(37/2)) -
3*a*b**2*x**19/(a*b**4*x**18 + b**5*x**(37/2)) + b**3*x**(39/2)/(
a*b**4*x**18 + b**5*x**(37/2))
```

GIAC/XCAS [A] time = 0.269079, size = 70, normalized size = 1.3

$$\frac{6\,a^2\ln\left(\left|b\sqrt{x}+a\right|\right)}{b^4}+\frac{2\,a^3}{\left(b\sqrt{x}+a\right)b^4}+\frac{b^2x-4\,ab\sqrt{x}}{b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*sqrt(x) + a)^2,x, algorithm="giac")
```

```
[Out] 6*a^2*ln(abs(b*sqrt(x) + a))/b^4 + 2*a^3/((b*sqrt(x) + a)*b^4) +
(b^2*x - 4*a*b*sqrt(x))/b^4
```

3.2200 $\int \frac{1}{\left(a+b\sqrt{x}\right)^2} dx$

Optimal. Leaf size=33

$$\frac{2a}{b^2\left(a+b\sqrt{x}\right)}+\frac{2\log\left(a+b\sqrt{x}\right)}{b^2}$$

```
[Out] (2*a)/(b^2*(a + b*Sqrt[x])) + (2*Log[a + b*Sqrt[x]])/b^2
```

Rubi [A] time = 0.0498108, antiderivative size = 33, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{2a}{b^2\left(a+b\sqrt{x}\right)}+\frac{2\log\left(a+b\sqrt{x}\right)}{b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^(-2),x]
```

```
[Out] (2*a)/(b^2*(a + b*Sqrt[x])) + (2*Log[a + b*Sqrt[x]])/b^2
```

Rubi in Sympy [A] time = 6.3659, size = 29, normalized size = 0.88

$$\frac{2a}{b^2\left(a+b\sqrt{x}\right)}+\frac{2\log\left(a+b\sqrt{x}\right)}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*x**(1/2))**2,x)
```

```
[Out] 2*a/(b**2*(a + b*sqrt(x))) + 2*log(a + b*sqrt(x))/b**2
```

Mathematica [A] time = 0.020916, size = 29, normalized size = 0.88

$$\frac{2\left(\frac{a}{a+b\sqrt{x}}+\log\left(a+b\sqrt{x}\right)\right)}{b^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^(-2),x]
```

```
[Out] (2*(a/(a + b*Sqrt[x]) + Log[a + b*Sqrt[x]]))/b^2
```

Maple [B] time = 0.027, size = 96, normalized size = 2.9

$$-2\,\frac{a^2}{\left(b^2x-a^2\right)b^2}+\frac{\ln\left(b^2x-a^2\right)}{b^2}+\frac{a}{b^2}\left(b\sqrt{x}-a\right)^{-1}-\frac{1}{b^2}\ln\left(b\sqrt{x}-a\right)+\frac{a}{b^2}\left(a+b\sqrt{x}\right)^{-1}+\frac{1}{b^2}\ln\left(a+b\sqrt{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*x^(1/2))^2,x)
```

```
[Out] -2*a^2/(b^2*x-a^2)/b^2+ln(b^2*x-a^2)/b^2+a/b^2/(b*x^(1/2)-a)-1/b^
2*ln(b*x^(1/2)-a)+a/b^2/(a+b*x^(1/2))+ln(a+b*x^(1/2))/b^2
```

Maxima [A] time = 1.44661, size = 39, normalized size = 1.18

$$\frac{2\,\log\left(b\sqrt{x}+a\right)}{b^2}+\frac{2\,a}{\left(b\sqrt{x}+a\right)b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^(-2),x, algorithm="maxima")
```

```
[Out] 2*log(b*sqrt(x) + a)/b^2 + 2*a/((b*sqrt(x) + a)*b^2)
```

Fricas [A] time = 0.229348, size = 47, normalized size = 1.42

$$\frac{2\left(\left(b\sqrt{x}+a\right)\log\left(b\sqrt{x}+a\right)+a\right)}{b^3\sqrt{x}+ab^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^(-2),x, algorithm="fricas")
```

```
[Out] 2*((b*sqrt(x) + a)*log(b*sqrt(x) + a) + a)/(b^3*sqrt(x) + a*b^2)
```

Sympy [A] time = 1.60955, size = 80, normalized size = 2.42

$$\begin{cases} \frac{2a\log\left(\frac{a}{b}+\sqrt{x}\right)}{ab^2+b^3\sqrt{x}}+\frac{2a}{ab^2+b^3\sqrt{x}}+\frac{2b\sqrt{x}\log\left(\frac{a}{b}+\sqrt{x}\right)}{ab^2+b^3\sqrt{x}} & \text{for}\ b\neq 0 \\ \frac{x}{a^2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*x**(1/2))**2,x)
```

```
[Out] Piecewise((2*a*log(a/b + sqrt(x))/(a*b**2 + b**3*sqrt(x)) + 2*a/(
a*b**2 + b**3*sqrt(x)) + 2*b*sqrt(x)*log(a/b + sqrt(x))/(a*b**2 +
 b**3*sqrt(x)), Ne(b, 0)), (x/a**2, True))
```

GIAC/XCAS [A] time = 0.254054, size = 41, normalized size = 1.24

$$\frac{2\ln\left(\left|b\sqrt{x}+a\right|\right)}{b^2}+\frac{2\,a}{\left(b\sqrt{x}+a\right)b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^(-2),x, algorithm="giac")
```

```
[Out] 2*ln(abs(b*sqrt(x) + a))/b^2 + 2*a/((b*sqrt(x) + a)*b^2)
```

3.2201 $\int \frac{1}{\left(a+b\sqrt{x}\right)^2 x}\,dx$

Optimal. Leaf size=38

$$-\frac{2\log\left(a+b\sqrt{x}\right)}{a^2}+\frac{\log(x)}{a^2}+\frac{2}{a\left(a+b\sqrt{x}\right)}$$

```
[Out] 2/(a*(a + b*Sqrt[x])) - (2*Log[a + b*Sqrt[x]])/a^2 + Log[x]/a^2
```

Rubi [A] time = 0.0586244, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2\log\left(a+b\sqrt{x}\right)}{a^2}+\frac{\log(x)}{a^2}+\frac{2}{a\left(a+b\sqrt{x}\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b*Sqrt[x])^2*x),x]
```

```
[Out] 2/(a*(a + b*Sqrt[x])) - (2*Log[a + b*Sqrt[x]])/a^2 + Log[x]/a^2
```

Rubi in Sympy [A] time = 8.6033, size = 37, normalized size = 0.97

$$\frac{2}{a\left(a+b\sqrt{x}\right)}+\frac{2\log\left(\sqrt{x}\right)}{a^2}-\frac{2\log\left(a+b\sqrt{x}\right)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(a+b*x**(1/2))**2,x)
```

```
[Out] 2/(a*(a + b*sqrt(x))) + 2*log(sqrt(x))/a**2 - 2*log(a + b*sqrt(x)
)/a**2
```

Mathematica [A] time = 0.0487181, size = 37, normalized size = 0.97

$$\frac{2\left(\frac{a}{a+b\sqrt{x}}-\log\left(a+b\sqrt{x}\right)+\frac{\log(x)}{2}\right)}{a^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b*Sqrt[x])^2*x),x]
```

```
[Out] (2*(a/(a + b*Sqrt[x]) - Log[a + b*Sqrt[x]] + Log[x]/2))/a^2
```

Maple [A] time = 0.012, size = 35, normalized size = 0.9

$$\frac{\ln(x)}{a^2}-2\,\frac{\ln\left(a+b\sqrt{x}\right)}{a^2}+2\,\frac{1}{a\left(a+b\sqrt{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(a+b*x^(1/2))^2,x)
```

```
[Out] ln(x)/a^2-2*ln(a+b*x^(1/2))/a^2+2/a/(a+b*x^(1/2))
```

Maxima [A] time = 1.44234, size = 46, normalized size = 1.21

$$\frac{2}{ab\sqrt{x}+a^2}-\frac{2\log\left(b\sqrt{x}+a\right)}{a^2}+\frac{\log\left(x\right)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^2*x),x, algorithm="maxima")
```

```
[Out] 2/(a*b*sqrt(x) + a^2) - 2*log(b*sqrt(x) + a)/a^2 + log(x)/a^2
```

Fricas [A] time = 0.239156, size = 66, normalized size = 1.74

$$-\frac{2\left(\left(b\sqrt{x}+a\right)\log\left(b\sqrt{x}+a\right)-\left(b\sqrt{x}+a\right)\log\left(\sqrt{x}\right)-a\right)}{a^2b\sqrt{x}+a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^2*x),x, algorithm="fricas")
```

```
[Out] -2*((b*sqrt(x) + a)*log(b*sqrt(x) + a) - (b*sqrt(x) + a)*log(sqrt
(x)) - a)/(a^2*b*sqrt(x) + a^3)
```

Sympy [A] time = 3.06032, size = 151, normalized size = 3.97

$$\begin{cases} \frac{\tilde{\infty}}{x} & \text{for}\: a = 0 \wedge b = 0 \\ \frac{\log\left(x\right)}{a^2} & \text{for}\: b = 0 \\ -\frac{1}{b^2x} & \text{for}\: a = 0 \\ \frac{a\sqrt{x}\log\left(x\right)}{a^3\sqrt{x}+a^2bx}-\frac{2a\sqrt{x}\log\left(\frac{a}{b}+\sqrt{x}\right)}{a^3\sqrt{x}+a^2bx}+\frac{2a\sqrt{x}}{a^3\sqrt{x}+a^2bx}+\frac{bx\log\left(x\right)}{a^3\sqrt{x}+a^2bx}-\frac{2bx\log\left(\frac{a}{b}+\sqrt{x}\right)}{a^3\sqrt{x}+a^2bx} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(a+b*x**(1/2))**2,x)
```

```
[Out] Piecewise((zoo/x, Eq(a, 0) & Eq(b, 0)), (log(x)/a**2, Eq(b, 0)),
(-1/(b**2*x), Eq(a, 0)), (a*sqrt(x)*log(x)/(a**3*sqrt(x) + a**2*b
*x) - 2*a*sqrt(x)*log(a/b + sqrt(x))/(a**3*sqrt(x) + a**2*b*x) +
2*a*sqrt(x)/(a**3*sqrt(x) + a**2*b*x) + b*x*log(x)/(a**3*sqrt(x)
+ a**2*b*x) - 2*b*x*log(a/b + sqrt(x))/(a**3*sqrt(x) + a**2*b*x),
 True))
```

GIAC/XCAS [A] time = 0.265108, size = 49, normalized size = 1.29

$$-\frac{2\ln\left(\left|b\sqrt{x}+a\right|\right)}{a^2}+\frac{\ln\left(\left|x\right|\right)}{a^2}+\frac{2}{\left(b\sqrt{x}+a\right)a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^2*x),x, algorithm="giac")
```

```
[Out] -2*ln(abs(b*sqrt(x) + a))/a^2 + ln(abs(x))/a^2 + 2/((b*sqrt(x) +
a)*a)
```

3.2202 $\int \frac{1}{\left(a+b\sqrt{x}\right)^2 x^2}\,dx$

Optimal. Leaf size=67

$$-\frac{6b^2\log\left(a+b\sqrt{x}\right)}{a^4}+\frac{3b^2\log(x)}{a^4}+\frac{2b^2}{a^3\left(a+b\sqrt{x}\right)}+\frac{4b}{a^3\sqrt{x}}-\frac{1}{a^2x}$$

```
[Out] (2*b^2)/(a^3*(a + b*Sqrt[x])) - 1/(a^2*x) + (4*b)/(a^3*Sqrt[x]) -
 (6*b^2*Log[a + b*Sqrt[x]])/a^4 + (3*b^2*Log[x])/a^4
```

Rubi [A] time = 0.103965, antiderivative size = 67, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{6b^2\log\left(a+b\sqrt{x}\right)}{a^4}+\frac{3b^2\log(x)}{a^4}+\frac{2b^2}{a^3\left(a+b\sqrt{x}\right)}+\frac{4b}{a^3\sqrt{x}}-\frac{1}{a^2x}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b*Sqrt[x])^2*x^2),x]
```

```
[Out] (2*b^2)/(a^3*(a + b*Sqrt[x])) - 1/(a^2*x) + (4*b)/(a^3*Sqrt[x]) -
 (6*b^2*Log[a + b*Sqrt[x]])/a^4 + (3*b^2*Log[x])/a^4
```

Rubi in Sympy [A] time = 15.0421, size = 68, normalized size = 1.01

$$-\frac{1}{a^2x}+\frac{2b^2}{a^3\left(a+b\sqrt{x}\right)}+\frac{4b}{a^3\sqrt{x}}+\frac{6b^2\log\left(\sqrt{x}\right)}{a^4}-\frac{6b^2\log\left(a+b\sqrt{x}\right)}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**2/(a+b*x**(1/2))**2,x)
```

```
[Out] -1/(a**2*x) + 2*b**2/(a**3*(a + b*sqrt(x))) + 4*b/(a**3*sqrt(x))
+ 6*b**2*log(sqrt(x))/a**4 - 6*b**2*log(a + b*sqrt(x))/a**4
```

Mathematica [A] time = 0.114687, size = 60, normalized size = 0.9

$$\frac{a\left(\frac{2b^2}{a+b\sqrt{x}}-\frac{a}{x}+\frac{4b}{\sqrt{x}}\right)-6b^2\log\left(a+b\sqrt{x}\right)+3b^2\log(x)}{a^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b*Sqrt[x])^2*x^2),x]
```

```
[Out] (a*((2*b^2)/(a + b*Sqrt[x]) - a/x + (4*b)/Sqrt[x]) - 6*b^2*Log[a
+ b*Sqrt[x]] + 3*b^2*Log[x])/a^4
```

Maple [A] time = 0.017, size = 62, normalized size = 0.9

$$-\frac{1}{xa^2}+3\,\frac{b^2\ln(x)}{a^4}-6\,\frac{b^2\ln\left(a+b\sqrt{x}\right)}{a^4}+4\,\frac{b}{a^3\sqrt{x}}+2\,\frac{b^2}{a^3\left(a+b\sqrt{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(a+b*x^(1/2))^2,x)
```

```
[Out] -1/a^2/x+3*b^2*ln(x)/a^4-6*b^2*ln(a+b*x^(1/2))/a^4+4*b/a^3/x^(1/2
)+2*b^2/a^3/(a+b*x^(1/2))
```

Maxima [A] time = 1.44395, size = 85, normalized size = 1.27

$$\frac{6\,b^2x+3\,ab\sqrt{x}-a^2}{a^3bx^{\frac{3}{2}}+a^4x}-\frac{6\,b^2\log\left(b\sqrt{x}+a\right)}{a^4}+\frac{3\,b^2\log\left(x\right)}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^2*x^2),x, algorithm="maxima")
```

```
[Out] (6*b^2*x + 3*a*b*sqrt(x) - a^2)/(a^3*b*x^(3/2) + a^4*x) - 6*b^2*l
og(b*sqrt(x) + a)/a^4 + 3*b^2*log(x)/a^4
```

Fricas [A] time = 0.247486, size = 112, normalized size = 1.67

$$\frac{6\,ab^2x+3\,a^2b\sqrt{x}-a^3-6\left(b^3x^{\frac{3}{2}}+ab^2x\right)\log\left(b\sqrt{x}+a\right)+6\left(b^3x^{\frac{3}{2}}+ab^2x\right)\log\left(\sqrt{x}\right)}{a^4bx^{\frac{3}{2}}+a^5x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^2*x^2),x, algorithm="fricas")
```

```
[Out] (6*a*b^2*x + 3*a^2*b*sqrt(x) - a^3 - 6*(b^3*x^(3/2) + a*b^2*x)*lo
g(b*sqrt(x) + a) + 6*(b^3*x^(3/2) + a*b^2*x)*log(sqrt(x)))/(a^4*b
*x^(3/2) + a^5*x)
```

Sympy [A] time = 5.6085, size = 238, normalized size = 3.55

$$\begin{cases} \frac{\tilde{\infty}}{x^2} & \text{for}\ a = 0 \wedge b = \\ -\frac{1}{2b^2x^2} & \text{for}\ a = 0 \\ -\frac{1}{a^2x} & \text{for}\ b = 0 \\ -\frac{a^3\sqrt{x}}{a^5x^{\frac{3}{2}}+a^4bx^2}+\frac{3a^2bx}{a^5x^{\frac{3}{2}}+a^4bx^2}+\frac{3ab^2x^{\frac{3}{2}}\log\left(x\right)}{a^5x^{\frac{3}{2}}+a^4bx^2}-\frac{6ab^2x^{\frac{3}{2}}\log\left(\frac{a}{b}+\sqrt{x}\right)}{a^5x^{\frac{3}{2}}+a^4bx^2}+\frac{6ab^2x^{\frac{3}{2}}}{a^5x^{\frac{3}{2}}+a^4bx^2}+\frac{3b^3x^2\log\left(x\right)}{a^5x^{\frac{3}{2}}+a^4bx^2}-\frac{6b^3x^2\log\left(\frac{a}{b}+\sqrt{x}\right)}{a^5x^{\frac{3}{2}}+a^4bx^2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(a+b*x**(1/2))**2,x)
```

```
[Out] Piecewise((zoo/x**2, Eq(a, 0) & Eq(b, 0)), (-1/(2*b**2*x**2), Eq(
a, 0)), (-1/(a**2*x), Eq(b, 0)), (-a**3*sqrt(x)/(a**5*x**(3/2) +
a**4*b*x**2) + 3*a**2*b*x/(a**5*x**(3/2) + a**4*b*x**2) + 3*a*b**
2*x**(3/2)*log(x)/(a**5*x**(3/2) + a**4*b*x**2) - 6*a*b**2*x**(3/
2)*log(a/b + sqrt(x))/(a**5*x**(3/2) + a**4*b*x**2) + 6*a*b**2*x*
*(3/2)/(a**5*x**(3/2) + a**4*b*x**2) + 3*b**3*x**2*log(x)/(a**5*x
**(3/2) + a**4*b*x**2) - 6*b**3*x**2*log(a/b + sqrt(x))/(a**5*x**
(3/2) + a**4*b*x**2), True))
```

GIAC/XCAS [A] time = 0.27408, size = 90, normalized size = 1.34

$$-\frac{6\,b^2\ln\left(\left|b\sqrt{x}+a\right|\right)}{a^4}+\frac{3\,b^2\ln\left(\left|x\right|\right)}{a^4}+\frac{6\,ab^2x+3\,a^2b\sqrt{x}-a^3}{\left(b\sqrt{x}+a\right)a^4x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^2*x^2),x, algorithm="giac")
```

```
[Out] -6*b^2*ln(abs(b*sqrt(x) + a))/a^4 + 3*b^2*ln(abs(x))/a^4 + (6*a*b
^2*x + 3*a^2*b*sqrt(x) - a^3)/((b*sqrt(x) + a)*a^4*x)
```

3.2203 $\int \frac{1}{\left(a+b\sqrt{x}\right)^2 x^3}\,dx$

Optimal. Leaf size=95

$$-\frac{10b^4\log\left(a+b\sqrt{x}\right)}{a^6}+\frac{5b^4\log(x)}{a^6}+\frac{2b^4}{a^5\left(a+b\sqrt{x}\right)}+\frac{8b^3}{a^5\sqrt{x}}-\frac{3b^2}{a^4x}+\frac{4b}{3a^3x^{3/2}}-\frac{1}{2a^2x^2}$$

```
[Out] (2*b^4)/(a^5*(a + b*Sqrt[x])) - 1/(2*a^2*x^2) + (4*b)/(3*a^3*x^(3
/2)) - (3*b^2)/(a^4*x) + (8*b^3)/(a^5*Sqrt[x]) - (10*b^4*Log[a +
b*Sqrt[x]])/a^6 + (5*b^4*Log[x])/a^6
```

Rubi [A] time = 0.143036, antiderivative size = 95, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{10b^4\log\left(a+b\sqrt{x}\right)}{a^6}+\frac{5b^4\log(x)}{a^6}+\frac{2b^4}{a^5\left(a+b\sqrt{x}\right)}+\frac{8b^3}{a^5\sqrt{x}}-\frac{3b^2}{a^4x}+\frac{4b}{3a^3x^{3/2}}-\frac{1}{2a^2x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b*Sqrt[x])^2*x^3),x]
```

```
[Out] (2*b^4)/(a^5*(a + b*Sqrt[x])) - 1/(2*a^2*x^2) + (4*b)/(3*a^3*x^(3
/2)) - (3*b^2)/(a^4*x) + (8*b^3)/(a^5*Sqrt[x]) - (10*b^4*Log[a +
b*Sqrt[x]])/a^6 + (5*b^4*Log[x])/a^6
```

Rubi in Sympy [A] time = 20.3192, size = 97, normalized size = 1.02

$$-\frac{1}{2a^2x^2}+\frac{4b}{3a^3x^{\frac{3}{2}}}-\frac{3b^2}{a^4x}+\frac{2b^4}{a^5\left(a+b\sqrt{x}\right)}+\frac{8b^3}{a^5\sqrt{x}}+\frac{10b^4\log\left(\sqrt{x}\right)}{a^6}-\frac{10b^4\log\left(a+b\sqrt{x}\right)}{a^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(a+b*x**(1/2))**2,x)
```

```
[Out] -1/(2*a**2*x**2) + 4*b/(3*a**3*x**(3/2)) - 3*b**2/(a**4*x) + 2*b*
*4/(a**5*(a + b*sqrt(x))) + 8*b**3/(a**5*sqrt(x)) + 10*b**4*log(s
qrt(x))/a**6 - 10*b**4*log(a + b*sqrt(x))/a**6
```

Mathematica [A] time = 0.13143, size = 91, normalized size = 0.96

$$\frac{\frac{a\left(-3a^4+5a^3b\sqrt{x}-10a^2b^2x+30ab^3x^{3/2}+60b^4x^2\right)}{x^2\left(a+b\sqrt{x}\right)}-60b^4\log\left(a+b\sqrt{x}\right)+30b^4\log(x)}{6a^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b*Sqrt[x])^2*x^3),x]
```

```
[Out] ((a*(-3*a^4 + 5*a^3*b*Sqrt[x] - 10*a^2*b^2*x + 30*a*b^3*x^(3/2) +
 60*b^4*x^2))/((a + b*Sqrt[x])*x^2) - 60*b^4*Log[a + b*Sqrt[x]] +
 30*b^4*Log[x])/(6*a^6)
```

Maple [A] time = 0.016, size = 84, normalized size = 0.9

$$-\frac{1}{2\,a^2x^2}+\frac{4\,b}{3\,a^3}x^{-\frac{3}{2}}-3\,\frac{b^2}{a^4x}+5\,\frac{b^4\ln(x)}{a^6}-10\,\frac{b^4\ln\left(a+b\sqrt{x}\right)}{a^6}+8\,\frac{b^3}{a^5\sqrt{x}}+2\,\frac{b^4}{a^5\left(a+b\sqrt{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(a+b*x^(1/2))^2,x)
```

```
[Out] -1/2/a^2/x^2+4/3*b/a^3/x^(3/2)-3*b^2/a^4/x+5*b^4*ln(x)/a^6-10*b^4
*ln(a+b*x^(1/2))/a^6+8*b^3/a^5/x^(1/2)+2*b^4/a^5/(a+b*x^(1/2))
```

Maxima [A] time = 1.44042, size = 119, normalized size = 1.25

$$\frac{60\,b^4x^2 + 30\,ab^3x^{\frac{3}{2}} - 10\,a^2b^2x + 5\,a^3b\sqrt{x} - 3\,a^4}{6\left(a^5bx^{\frac{5}{2}} + a^6x^2\right)} - \frac{10\,b^4\log\left(b\sqrt{x} + a\right)}{a^6} + \frac{5\,b^4\log\left(x\right)}{a^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^2*x^3),x, algorithm="maxima")
```

```
[Out] 1/6*(60*b^4*x^2 + 30*a*b^3*x^(3/2) - 10*a^2*b^2*x + 5*a^3*b*sqrt(
x) - 3*a^4)/(a^5*b*x^(5/2) + a^6*x^2) - 10*b^4*log(b*sqrt(x) + a)
/a^6 + 5*b^4*log(x)/a^6
```

Fricas [A] time = 0.246651, size = 151, normalized size = 1.59

$$\frac{60\,ab^4x^2 - 10\,a^3b^2x - 3\,a^5 - 60\left(b^5x^{\frac{5}{2}} + ab^4x^2\right)\log\left(b\sqrt{x} + a\right) + 60\left(b^5x^{\frac{5}{2}} + ab^4x^2\right)\log\left(\sqrt{x}\right) + 5\left(6\,a^2b^3x + a^4b\right)\sqrt{x}}{6\left(a^6bx^{\frac{5}{2}} + a^7x^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^2*x^3),x, algorithm="fricas")
```

```
[Out] 1/6*(60*a*b^4*x^2 - 10*a^3*b^2*x - 3*a^5 - 60*(b^5*x^(5/2) + a*b^
4*x^2)*log(b*sqrt(x) + a) + 60*(b^5*x^(5/2) + a*b^4*x^2)*log(sqrt
(x)) + 5*(6*a^2*b^3*x + a^4*b)*sqrt(x))/(a^6*b*x^(5/2) + a^7*x^2)
```

Sympy [A] time = 15.0083, size = 333, normalized size = 3.51

$$\begin{cases} \frac{\tilde{\infty}}{x^3} \\ -\frac{1}{2a^2x^2} \\ -\frac{1}{3b^2x^3} \\ -\frac{3a^5\sqrt{x}}{6a^7x^{\frac{5}{2}}+6a^6bx^3} + \frac{5a^4bx}{6a^7x^{\frac{5}{2}}+6a^6bx^3} - \frac{10a^3b^2x^{\frac{3}{2}}}{6a^7x^{\frac{5}{2}}+6a^6bx^3} + \frac{30a^2b^3x^2}{6a^7x^{\frac{5}{2}}+6a^6bx^3} + \frac{30ab^4x^{\frac{5}{2}}\log(x)}{6a^7x^{\frac{5}{2}}+6a^6bx^3} - \frac{60ab^4x^{\frac{5}{2}}\log\left(\frac{a}{b}+\sqrt{x}\right)}{6a^7x^{\frac{5}{2}}+6a^6bx^3} + \frac{60ab^4x^{\frac{5}{2}}}{6a^7x^{\frac{5}{2}}+6a^6bx^3} + \frac{30b^5x^3\log}{6a^7x^{\frac{5}{2}}+6a^6} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(a+b*x**(1/2))**2,x)
```

```
[Out] Piecewise((zoo/x**3, Eq(a, 0) & Eq(b, 0)), (-1/(2*a**2*x**2), Eq(
b, 0)), (-1/(3*b**2*x**3), Eq(a, 0)), (-3*a**5*sqrt(x)/(6*a**7*x*
*(5/2) + 6*a**6*b*x**3) + 5*a**4*b*x/(6*a**7*x**(5/2) + 6*a**6*b*
x**3) - 10*a**3*b**2*x**(3/2)/(6*a**7*x**(5/2) + 6*a**6*b*x**3) +
 30*a**2*b**3*x**2/(6*a**7*x**(5/2) + 6*a**6*b*x**3) + 30*a*b**4*
x**(5/2)*log(x)/(6*a**7*x**(5/2) + 6*a**6*b*x**3) - 60*a*b**4*x**
(5/2)*log(a/b + sqrt(x))/(6*a**7*x**(5/2) + 6*a**6*b*x**3) + 60*a
*b**4*x**(5/2)/(6*a**7*x**(5/2) + 6*a**6*b*x**3) + 30*b**5*x**3*l
og(x)/(6*a**7*x**(5/2) + 6*a**6*b*x**3) - 60*b**5*x**3*log(a/b +
sqrt(x))/(6*a**7*x**(5/2) + 6*a**6*b*x**3), True))
```

GIAC/XCAS [A] time = 0.272017, size = 122, normalized size = 1.28

$$-\frac{10\,b^4\ln\left(\left|b\sqrt{x}+a\right|\right)}{a^6}+\frac{5\,b^4\ln\left(\left|x\right|\right)}{a^6}+\frac{60\,ab^4x^2+30\,a^2b^3x^{\frac{3}{2}}-10\,a^3b^2x+5\,a^4b\sqrt{x}-3\,a^5}{6\,\left(b\sqrt{x}+a\right)a^6x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^2*x^3),x, algorithm="giac")
```

```
[Out] -10*b^4*ln(abs(b*sqrt(x) + a))/a^6 + 5*b^4*ln(abs(x))/a^6 + 1/6*(
60*a*b^4*x^2 + 30*a^2*b^3*x^(3/2) - 10*a^3*b^2*x + 5*a^4*b*sqrt(x
) - 3*a^5)/((b*sqrt(x) + a)*a^6*x^2)
```

3.2204 $\int \frac{1}{\left(a+b\sqrt{x}\right)^2 x^4}\,dx$

Optimal. Leaf size=123

$$-\frac{14b^6\log\left(a+b\sqrt{x}\right)}{a^8}+\frac{7b^6\log(x)}{a^8}+\frac{2b^6}{a^7\left(a+b\sqrt{x}\right)}+\frac{12b^5}{a^7\sqrt{x}}-\frac{5b^4}{a^6x}+\frac{8b^3}{3a^5x^{3/2}}-\frac{3b^2}{2a^4x^2}+\frac{4b}{5a^3x^{5/2}}-\frac{1}{3a^2x^3}$$

```
[Out] (2*b^6)/(a^7*(a + b*Sqrt[x])) - 1/(3*a^2*x^3) + (4*b)/(5*a^3*x^(5
/2)) - (3*b^2)/(2*a^4*x^2) + (8*b^3)/(3*a^5*x^(3/2)) - (5*b^4)/(a
^6*x) + (12*b^5)/(a^7*Sqrt[x]) - (14*b^6*Log[a + b*Sqrt[x]])/a^8
+ (7*b^6*Log[x])/a^8
```

Rubi [A] time = 0.182053, antiderivative size = 123, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$-\frac{14b^6\log\left(a+b\sqrt{x}\right)}{a^8}+\frac{7b^6\log(x)}{a^8}+\frac{2b^6}{a^7\left(a+b\sqrt{x}\right)}+\frac{12b^5}{a^7\sqrt{x}}-\frac{5b^4}{a^6x}+\frac{8b^3}{3a^5x^{3/2}}-\frac{3b^2}{2a^4x^2}+\frac{4b}{5a^3x^{5/2}}-\frac{1}{3a^2x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b*Sqrt[x])^2*x^4),x]
```

```
[Out] (2*b^6)/(a^7*(a + b*Sqrt[x])) - 1/(3*a^2*x^3) + (4*b)/(5*a^3*x^(5
/2)) - (3*b^2)/(2*a^4*x^2) + (8*b^3)/(3*a^5*x^(3/2)) - (5*b^4)/(a
^6*x) + (12*b^5)/(a^7*Sqrt[x]) - (14*b^6*Log[a + b*Sqrt[x]])/a^8
+ (7*b^6*Log[x])/a^8
```

Rubi in Sympy [A] time = 26.8341, size = 126, normalized size = 1.02

$$-\frac{1}{3a^2x^3}+\frac{4b}{5a^3x^{\frac{5}{2}}}-\frac{3b^2}{2a^4x^2}+\frac{8b^3}{3a^5x^{\frac{3}{2}}}-\frac{5b^4}{a^6x}+\frac{2b^6}{a^7\left(a+b\sqrt{x}\right)}+\frac{12b^5}{a^7\sqrt{x}}+\frac{14b^6\log\left(\sqrt{x}\right)}{a^8}-\frac{14b^6\log\left(a+b\sqrt{x}\right)}{a^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(a+b*x**(1/2))**2,x)
```

```
[Out] -1/(3*a**2*x**3) + 4*b/(5*a**3*x**(5/2)) - 3*b**2/(2*a**4*x**2) +
 8*b**3/(3*a**5*x**(3/2)) - 5*b**4/(a**6*x) + 2*b**6/(a**7*(a + b
*sqrt(x))) + 12*b**5/(a**7*sqrt(x)) + 14*b**6*log(sqrt(x))/a**8 -
 14*b**6*log(a + b*sqrt(x))/a**8
```

Mathematica [A] time = 0.17373, size = 115, normalized size = 0.93

$$\frac{\frac{a\left(-10a^6+14a^5b\sqrt{x}-21a^4b^2x+35a^3b^3x^{3/2}-70a^2b^4x^2+210ab^5x^{5/2}+420b^6x^3\right)}{x^3\left(a+b\sqrt{x}\right)}-420b^6\log\left(a+b\sqrt{x}\right)+210b^6\log(x)}{30a^8}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b*Sqrt[x])^2*x^4),x]
```

```
[Out] ((a*(-10*a^6 + 14*a^5*b*Sqrt[x] - 21*a^4*b^2*x + 35*a^3*b^3*x^(3/
2) - 70*a^2*b^4*x^2 + 210*a*b^5*x^(5/2) + 420*b^6*x^3))/((a + b*S
qrt[x])*x^3) - 420*b^6*Log[a + b*Sqrt[x]] + 210*b^6*Log[x])/(30*a
^8)
```

Maple [A] time = 0.02, size = 106, normalized size = 0.9

$$-\frac{1}{3\,x^{3}a^{2}}+\frac{4\,b}{5\,a^{3}}x^{-\frac{5}{2}}-\frac{3\,b^{2}}{2\,a^{4}x^{2}}+\frac{8\,b^{3}}{3\,a^{5}}x^{-\frac{3}{2}}-5\,\frac{b^{4}}{a^{6}x}+7\,\frac{b^{6}\ln\left(x\right)}{a^{8}}-14\,\frac{b^{6}\ln\left(a+b\sqrt{x}\right)}{a^{8}}+12\,\frac{b^{5}}{a^{7}\sqrt{x}}+2\,\frac{b^{6}}{a^{7}\left(a+b\sqrt{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^4/(a+b*x^(1/2))^2,x)
```

```
[Out] -1/3/x^3/a^2+4/5*b/a^3/x^(5/2)-3/2*b^2/a^4/x^2+8/3*b^3/a^5/x^(3/2
)-5*b^4/a^6/x+7*b^6*ln(x)/a^8-14*b^6*ln(a+b*x^(1/2))/a^8+12*b^5/a
^7/x^(1/2)+2*b^6/a^7/(a+b*x^(1/2))
```

Maxima [A] time = 1.44335, size = 149, normalized size = 1.21

$$\frac{420\,b^{6}x^{3}+210\,ab^{5}x^{\frac{5}{2}}-70\,a^{2}b^{4}x^{2}+35\,a^{3}b^{3}x^{\frac{3}{2}}-21\,a^{4}b^{2}x+14\,a^{5}b\sqrt{x}-10\,a^{6}}{30\left(a^{7}bx^{\frac{7}{2}}+a^{8}x^{3}\right)}-\frac{14\,b^{6}\log\left(b\sqrt{x}+a\right)}{a^{8}}+\frac{7\,b^{6}\log\left(x\right)}{a^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((b*sqrt(x) + a)^2*x^4),x, algorithm="maxima")
```

```
[Out] 1/30*(420*b^6*x^3 + 210*a*b^5*x^(5/2) - 70*a^2*b^4*x^2 + 35*a^3*b
^3*x^(3/2) - 21*a^4*b^2*x + 14*a^5*b*sqrt(x) - 10*a^6)/(a^7*b*x^(
7/2) + a^8*x^3) - 14*b^6*log(b*sqrt(x) + a)/a^8 + 7*b^6*log(x)/a^
8
```

Fricas [A] time = 0.245178, size = 182, normalized size = 1.48

$$\frac{420\,ab^{6}x^{3}-70\,a^{3}b^{4}x^{2}-21\,a^{5}b^{2}x-10\,a^{7}-420\left(b^{7}x^{\frac{7}{2}}+ab^{6}x^{3}\right)\log\left(b\sqrt{x}+a\right)+420\left(b^{7}x^{\frac{7}{2}}+ab^{6}x^{3}\right)\log\left(\sqrt{x}\right)+7\left(30\,a^{2}b^{5}\right.}{30\left(a^{8}bx^{\frac{7}{2}}+a^{9}x^{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((b*sqrt(x) + a)^2*x^4),x, algorithm="fricas")
```

```
[Out] 1/30*(420*a*b^6*x^3 - 70*a^3*b^4*x^2 - 21*a^5*b^2*x - 10*a^7 - 42
0*(b^7*x^(7/2) + a*b^6*x^3)*log(b*sqrt(x) + a) + 420*(b^7*x^(7/2)
 + a*b^6*x^3)*log(sqrt(x)) + 7*(30*a^2*b^5*x^2 + 5*a^4*b^3*x + 2*
a^6*b)*sqrt(x))/(a^8*b*x^(7/2) + a^9*x^3)
```

Sympy [A] time = 19.7215, size = 396, normalized size = 3.22

$$\begin{cases}\frac{\tilde{\infty}}{x^{4}}\\ -\frac{1}{4b^{2}x^{4}}\\ -\frac{1}{3a^{2}x^{3}}\\ -\frac{10a^{7}\sqrt{x}}{30a^{9}x^{\frac{7}{2}}+30a^{8}bx^{4}}+\frac{14a^{6}bx}{30a^{9}x^{\frac{7}{2}}+30a^{8}bx^{4}}-\frac{21a^{5}b^{2}x^{\frac{3}{2}}}{30a^{9}x^{\frac{7}{2}}+30a^{8}bx^{4}}+\frac{35a^{4}b^{3}x^{2}}{30a^{9}x^{\frac{7}{2}}+30a^{8}bx^{4}}-\frac{70a^{3}b^{4}x^{\frac{5}{2}}}{30a^{9}x^{\frac{7}{2}}+30a^{8}bx^{4}}+\frac{210a^{2}b^{5}x^{3}}{30a^{9}x^{\frac{7}{2}}+30a^{8}bx^{4}}+\frac{210ab^{6}x^{\frac{7}{2}}\log\left(x\right)}{30a^{9}x^{\frac{7}{2}}+30a^{8}bx^{4}}-\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(a+b*x**(1/2))**2,x)
```

```
[Out] Piecewise((zoo/x**4, Eq(a, 0) & Eq(b, 0)), (-1/(4*b**2*x**4), Eq(
a, 0)), (-1/(3*a**2*x**3), Eq(b, 0)), (-10*a**7*sqrt(x)/(30*a**9*
x**(7/2) + 30*a**8*b*x**4) + 14*a**6*b*x/(30*a**9*x**(7/2) + 30*a
**8*b*x**4) - 21*a**5*b**2*x**(3/2)/(30*a**9*x**(7/2) + 30*a**8*b
*x**4) + 35*a**4*b**3*x**2/(30*a**9*x**(7/2) + 30*a**8*b*x**4) -
70*a**3*b**4*x**(5/2)/(30*a**9*x**(7/2) + 30*a**8*b*x**4) + 210*a
**2*b**5*x**3/(30*a**9*x**(7/2) + 30*a**8*b*x**4) + 210*a*b**6*x*
*(7/2)*log(x)/(30*a**9*x**(7/2) + 30*a**8*b*x**4) - 420*a*b**6*x*
*(7/2)*log(a/b + sqrt(x))/(30*a**9*x**(7/2) + 30*a**8*b*x**4) + 2
10*b**7*x**4*log(x)/(30*a**9*x**(7/2) + 30*a**8*b*x**4) - 420*b**
7*x**4*log(a/b + sqrt(x))/(30*a**9*x**(7/2) + 30*a**8*b*x**4) - 4
20*b**7*x**4/(30*a**9*x**(7/2) + 30*a**8*b*x**4), True))
```

GIAC/XCAS [A] time = 0.243208, size = 151, normalized size = 1.23

$$-\frac{14\,b^6\ln\left(\left|b\sqrt{x}+a\right|\right)}{a^8}+\frac{7\,b^6\ln\left(\left|x\right|\right)}{a^8}+\frac{420\,ab^6x^3+210\,a^2b^5x^{\frac{5}{2}}-70\,a^3b^4x^2+35\,a^4b^3x^{\frac{3}{2}}-21\,a^5b^2x+14\,a^6b\sqrt{x}-10\,a^7}{30\,\left(b\sqrt{x}+a\right)a^8x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^2*x^4),x, algorithm="giac")
```

```
[Out] -14*b^6*ln(abs(b*sqrt(x) + a))/a^8 + 7*b^6*ln(abs(x))/a^8 + 1/30*
(420*a*b^6*x^3 + 210*a^2*b^5*x^(5/2) - 70*a^3*b^4*x^2 + 35*a^4*b^
3*x^(3/2) - 21*a^5*b^2*x + 14*a^6*b*sqrt(x) - 10*a^7)/((b*sqrt(x)
 + a)*a^8*x^3)
```

3.2205 $\int \frac{x^3}{(a+b\sqrt{x})^3} dx$

Optimal. Leaf size=114

$$\frac{a^7}{b^8(a+b\sqrt{x})^2}-\frac{14a^6}{b^8(a+b\sqrt{x})}-\frac{42a^5\log(a+b\sqrt{x})}{b^8}+\frac{30a^4\sqrt{x}}{b^7}-\frac{10a^3x}{b^6}+\frac{4a^2x^{3/2}}{b^5}-\frac{3ax^2}{2b^4}+\frac{2x^{5/2}}{5b^3}$$

```
[Out] a^7/(b^8*(a + b*Sqrt[x])^2) - (14*a^6)/(b^8*(a + b*Sqrt[x])) + (3
0*a^4*Sqrt[x])/b^7 - (10*a^3*x)/b^6 + (4*a^2*x^(3/2))/b^5 - (3*a*
x^2)/(2*b^4) + (2*x^(5/2))/(5*b^3) - (42*a^5*Log[a + b*Sqrt[x]])/
b^8
```

Rubi [A] time = 0.21138, antiderivative size = 114, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^7}{b^8(a+b\sqrt{x})^2}-\frac{14a^6}{b^8(a+b\sqrt{x})}-\frac{42a^5\log(a+b\sqrt{x})}{b^8}+\frac{30a^4\sqrt{x}}{b^7}-\frac{10a^3x}{b^6}+\frac{4a^2x^{3/2}}{b^5}-\frac{3ax^2}{2b^4}+\frac{2x^{5/2}}{5b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(a + b*Sqrt[x])^3,x]
```

```
[Out] a^7/(b^8*(a + b*Sqrt[x])^2) - (14*a^6)/(b^8*(a + b*Sqrt[x])) + (3
0*a^4*Sqrt[x])/b^7 - (10*a^3*x)/b^6 + (4*a^2*x^(3/2))/b^5 - (3*a*
x^2)/(2*b^4) + (2*x^(5/2))/(5*b^3) - (42*a^5*Log[a + b*Sqrt[x]])/
b^8
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^7}{b^8(a+b\sqrt{x})^2}-\frac{14a^6}{b^8(a+b\sqrt{x})}-\frac{42a^5\log(a+b\sqrt{x})}{b^8}+\frac{30a^4\sqrt{x}}{b^7}-\frac{20a^3\int^{\sqrt{x}} x\,dx}{b^6}+\frac{4a^2x^{\frac{3}{2}}}{b^5}-\frac{3ax^2}{2b^4}+\frac{2x^{\frac{5}{2}}}{5b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(a+b*x**(1/2))**3,x)
```

```
[Out] a**7/(b**8*(a + b*sqrt(x))**2) - 14*a**6/(b**8*(a + b*sqrt(x))) -
 42*a**5*log(a + b*sqrt(x))/b**8 + 30*a**4*sqrt(x)/b**7 - 20*a**3
*Integral(x, (x, sqrt(x)))/b**6 + 4*a**2*x**(3/2)/b**5 - 3*a*x**2
/(2*b**4) + 2*x**(5/2)/(5*b**3)
```

Mathematica [A] time = 0.0769831, size = 107, normalized size = 0.94

$$\frac{\frac{10a^7}{(a+b\sqrt{x})^2}-\frac{140a^6}{a+b\sqrt{x}}-420a^5\log(a+b\sqrt{x})+300a^4b\sqrt{x}-100a^3b^2x+40a^2b^3x^{3/2}-15ab^4x^2+4b^5x^{5/2}}{10b^8}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(a + b*Sqrt[x])^3,x]
```

```
[Out] ((10*a^7)/(a + b*Sqrt[x])^2 - (140*a^6)/(a + b*Sqrt[x]) + 300*a^4
*b*Sqrt[x] - 100*a^3*b^2*x + 40*a^2*b^3*x^(3/2) - 15*a*b^4*x^2 +
4*b^5*x^(5/2) - 420*a^5*Log[a + b*Sqrt[x]])/(10*b^8)
```

Maple [A] time = 0.013, size = 99, normalized size = 0.9

$$-10\,\frac{a^3x}{b^6}+4\,\frac{a^2x^{3/2}}{b^5}-\frac{3\,ax^2}{2\,b^4}+\frac{2}{5\,b^3}x^{\frac{5}{2}}-42\,\frac{a^5\ln\left(a+b\sqrt{x}\right)}{b^8}+30\,\frac{a^4\sqrt{x}}{b^7}+\frac{a^7}{b^8}\left(a+b\sqrt{x}\right)^{-2}-14\,\frac{a^6}{b^8\left(a+b\sqrt{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(a+b*x^(1/2))^3,x)
```

```
[Out] -10*a^3*x/b^6+4*a^2*x^(3/2)/b^5-3/2*a*x^2/b^4+2/5*x^(5/2)/b^3-42*
a^5*ln(a+b*x^(1/2))/b^8+30*a^4*x^(1/2)/b^7+a^7/b^8/(a+b*x^(1/2))^
2-14*a^6/b^8/(a+b*x^(1/2))
```

Maxima [A] time = 1.43945, size = 173, normalized size = 1.52

$$-\frac{42\,a^5\log\left(b\sqrt{x}+a\right)}{b^8}+\frac{2\left(b\sqrt{x}+a\right)^5}{5\,b^8}-\frac{7\left(b\sqrt{x}+a\right)^4a}{2\,b^8}+\frac{14\left(b\sqrt{x}+a\right)^3a^2}{b^8}-\frac{35\left(b\sqrt{x}+a\right)^2a^3}{b^8}+\frac{70\left(b\sqrt{x}+a\right)a^4}{b^8}-\frac{14\,a^6}{\left(b\sqrt{x}+a\right)b^8}+\frac{a^7}{\left(b\sqrt{x}+a\right)^2b^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*sqrt(x) + a)^3,x, algorithm="maxima")
```

```
[Out] -42*a^5*log(b*sqrt(x) + a)/b^8 + 2/5*(b*sqrt(x) + a)^5/b^8 - 7/2*
(b*sqrt(x) + a)^4*a/b^8 + 14*(b*sqrt(x) + a)^3*a^2/b^8 - 35*(b*sq
rt(x) + a)^2*a^3/b^8 + 70*(b*sqrt(x) + a)*a^4/b^8 - 14*a^6/((b*sq
rt(x) + a)*b^8) + a^7/((b*sqrt(x) + a)^2*b^8)
```

Fricas [A] time = 0.237723, size = 178, normalized size = 1.56

$$-\frac{7\,ab^6x^3+35\,a^3b^4x^2-500\,a^5b^2x+130\,a^7+420\left(a^5b^2x+2\,a^6b\sqrt{x}+a^7\right)\log\left(b\sqrt{x}+a\right)-2\left(2\,b^7x^3+7\,a^2b^5x^2+70\,a^4b^3x+\right.}{10\left(b^{10}x+2\,ab^9\sqrt{x}+a^2b^8\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*sqrt(x) + a)^3,x, algorithm="fricas")
```

```
[Out] -1/10*(7*a*b^6*x^3 + 35*a^3*b^4*x^2 - 500*a^5*b^2*x + 130*a^7 + 4
20*(a^5*b^2*x + 2*a^6*b*sqrt(x) + a^7)*log(b*sqrt(x) + a) - 2*(2*
b^7*x^3 + 7*a^2*b^5*x^2 + 70*a^4*b^3*x + 80*a^6*b)*sqrt(x))/(b^10
*x + 2*a*b^9*sqrt(x) + a^2*b^8)
```

Sympy [A] time = 8.28267, size = 450, normalized size = 3.95

$$\begin{cases}-\frac{420a^7\log\left(\frac{a}{b}+\sqrt{x}\right)}{10a^2b^8+20ab^9\sqrt{x}+10b^{10}x}-\frac{665a^7}{10a^2b^8+20ab^9\sqrt{x}+10b^{10}x}-\frac{840a^6b\sqrt{x}\log\left(\frac{a}{b}+\sqrt{x}\right)}{10a^2b^8+20ab^9\sqrt{x}+10b^{10}x}-\frac{910a^6b\sqrt{x}}{10a^2b^8+20ab^9\sqrt{x}+10b^{10}x}-\frac{420a^5b^2x\log\left(\frac{a}{b}+\sqrt{x}\right)}{10a^2b^8+20ab^9\sqrt{x}+10b^{10}x}- \\ \frac{x^4}{4a^3}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(a+b*x**(1/2))**3,x)
```

```
[Out] Piecewise((-420*a**7*log(a/b + sqrt(x))/(10*a**2*b**8 + 20*a*b**9
*sqrt(x) + 10*b**10*x) - 665*a**7/(10*a**2*b**8 + 20*a*b**9*sqrt(
```

```
x) + 10*b**10*x) - 840*a**6*b*sqrt(x)*log(a/b + sqrt(x))/(10*a**2
*b**8 + 20*a*b**9*sqrt(x) + 10*b**10*x) - 910*a**6*b*sqrt(x)/(10*
a**2*b**8 + 20*a*b**9*sqrt(x) + 10*b**10*x) - 420*a**5*b**2*x*log
(a/b + sqrt(x))/(10*a**2*b**8 + 20*a*b**9*sqrt(x) + 10*b**10*x) -
 35*a**5*b**2*x/(10*a**2*b**8 + 20*a*b**9*sqrt(x) + 10*b**10*x) +
 140*a**4*b**3*x**(3/2)/(10*a**2*b**8 + 20*a*b**9*sqrt(x) + 10*b*
*10*x) - 35*a**3*b**4*x**2/(10*a**2*b**8 + 20*a*b**9*sqrt(x) + 10
*b**10*x) + 14*a**2*b**5*x**(5/2)/(10*a**2*b**8 + 20*a*b**9*sqrt(
x) + 10*b**10*x) - 7*a*b**6*x**3/(10*a**2*b**8 + 20*a*b**9*sqrt(x
) + 10*b**10*x) + 4*b**7*x**(7/2)/(10*a**2*b**8 + 20*a*b**9*sqrt(
x) + 10*b**10*x), Ne(b, 0)), (x**4/(4*a**3), True))
```

GIAC/XCAS [A] time = 0.275364, size = 136, normalized size = 1.19

$$-\frac{42\, a^{5} \ln\left(\left|b \sqrt{x} + a\right|\right)}{b^{8}} - \frac{14\, a^{6} b \sqrt{x} + 13\, a^{7}}{{\left(b \sqrt{x} + a\right)}^{2} b^{8}} + \frac{4\, b^{12} x^{\frac{5}{2}} - 15\, a b^{11} x^{2} + 40\, a^{2} b^{10} x^{\frac{3}{2}} - 100\, a^{3} b^{9} x + 300\, a^{4} b^{8} \sqrt{x}}{10\, b^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*sqrt(x) + a)^3,x, algorithm="giac")
```

```
[Out] -42*a^5*ln(abs(b*sqrt(x) + a))/b^8 - (14*a^6*b*sqrt(x) + 13*a^7)/
((b*sqrt(x) + a)^2*b^8) + 1/10*(4*b^12*x^(5/2) - 15*a*b^11*x^2 +
40*a^2*b^10*x^(3/2) - 100*a^3*b^9*x + 300*a^4*b^8*sqrt(x))/b^15
```

3.2206 $\int \frac{x^2}{\left(a+b\sqrt{x}\right)^3}\,dx$

Optimal. Leaf size=88

$$\frac{a^5}{b^6\left(a+b\sqrt{x}\right)^2}-\frac{10a^4}{b^6\left(a+b\sqrt{x}\right)}-\frac{20a^3\log\left(a+b\sqrt{x}\right)}{b^6}+\frac{12a^2\sqrt{x}}{b^5}-\frac{3ax}{b^4}+\frac{2x^{3/2}}{3b^3}$$

```
[Out] a^5/(b^6*(a + b*Sqrt[x])^2) - (10*a^4)/(b^6*(a + b*Sqrt[x])) + (1
2*a^2*Sqrt[x])/b^5 - (3*a*x)/b^4 + (2*x^(3/2))/(3*b^3) - (20*a^3*
Log[a + b*Sqrt[x]])/b^6
```

Rubi [A] time = 0.15116, antiderivative size = 88, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^5}{b^6\left(a+b\sqrt{x}\right)^2}-\frac{10a^4}{b^6\left(a+b\sqrt{x}\right)}-\frac{20a^3\log\left(a+b\sqrt{x}\right)}{b^6}+\frac{12a^2\sqrt{x}}{b^5}-\frac{3ax}{b^4}+\frac{2x^{3/2}}{3b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b*Sqrt[x])^3,x]
```

```
[Out] a^5/(b^6*(a + b*Sqrt[x])^2) - (10*a^4)/(b^6*(a + b*Sqrt[x])) + (1
2*a^2*Sqrt[x])/b^5 - (3*a*x)/b^4 + (2*x^(3/2))/(3*b^3) - (20*a^3*
Log[a + b*Sqrt[x]])/b^6
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^5}{b^6\left(a+b\sqrt{x}\right)^2}-\frac{10a^4}{b^6\left(a+b\sqrt{x}\right)}-\frac{20a^3\log\left(a+b\sqrt{x}\right)}{b^6}+\frac{12a^2\sqrt{x}}{b^5}-\frac{6a\int^{\sqrt{x}}x\,dx}{b^4}+\frac{2x^{\frac{3}{2}}}{3b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b*x**(1/2))**3,x)
```

```
[Out] a**5/(b**6*(a + b*sqrt(x))**2) - 10*a**4/(b**6*(a + b*sqrt(x))) -
 20*a**3*log(a + b*sqrt(x))/b**6 + 12*a**2*sqrt(x)/b**5 - 6*a*Int
egral(x, (x, sqrt(x)))/b**4 + 2*x**(3/2)/(3*b**3)
```

Mathematica [A] time = 0.0558735, size = 83, normalized size = 0.94

$$\frac{\frac{3a^5}{\left(a+b\sqrt{x}\right)^2}-\frac{30a^4}{a+b\sqrt{x}}-60a^3\log\left(a+b\sqrt{x}\right)+36a^2b\sqrt{x}-9ab^2x+2b^3x^{3/2}}{3b^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a + b*Sqrt[x])^3,x]
```

```
[Out] ((3*a^5)/(a + b*Sqrt[x])^2 - (30*a^4)/(a + b*Sqrt[x]) + 36*a^2*b*
Sqrt[x] - 9*a*b^2*x + 2*b^3*x^(3/2) - 60*a^3*Log[a + b*Sqrt[x]])/
(3*b^6)
```

Maple [A] time = 0.011, size = 77, normalized size = 0.9

$$-3\,\frac{ax}{b^{4}}+\frac{2}{3\,b^{3}}x^{\frac{3}{2}}-20\,\frac{a^{3}\ln\left(a+b\sqrt{x}\right)}{b^{6}}+12\,\frac{a^{2}\sqrt{x}}{b^{5}}+\frac{a^{5}}{b^{6}}\left(a+b\sqrt{x}\right)^{-2}-10\,\frac{a^{4}}{b^{6}\left(a+b\sqrt{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(a+b*x^(1/2))^3,x)
```

```
[Out] -3*a*x/b^4+2/3*x^(3/2)/b^3-20*a^3*ln(a+b*x^(1/2))/b^6+12*a^2*x^(1
/2)/b^5+a^5/b^6/(a+b*x^(1/2))^2-10*a^4/b^6/(a+b*x^(1/2))
```

Maxima [A] time = 1.43531, size = 127, normalized size = 1.44

$$-\frac{20\,a^{3}\log\left(b\sqrt{x}+a\right)}{b^{6}}+\frac{2\left(b\sqrt{x}+a\right)^{3}}{3\,b^{6}}-\frac{5\left(b\sqrt{x}+a\right)^{2}a}{b^{6}}+\frac{20\left(b\sqrt{x}+a\right)a^{2}}{b^{6}}-\frac{10\,a^{4}}{\left(b\sqrt{x}+a\right)b^{6}}+\frac{a^{5}}{\left(b\sqrt{x}+a\right)^{2}b^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*sqrt(x) + a)^3,x, algorithm="maxima")
```

```
[Out] -20*a^3*log(b*sqrt(x) + a)/b^6 + 2/3*(b*sqrt(x) + a)^3/b^6 - 5*(b
*sqrt(x) + a)^2*a/b^6 + 20*(b*sqrt(x) + a)*a^2/b^6 - 10*a^4/((b*s
qrt(x) + a)*b^6) + a^5/((b*sqrt(x) + a)^2*b^6)
```

Fricas [A] time = 0.233619, size = 147, normalized size = 1.67

$$-\frac{5\,ab^{4}x^{2}-63\,a^{3}b^{2}x+27\,a^{5}+60\left(a^{3}b^{2}x+2\,a^{4}b\sqrt{x}+a^{5}\right)\log\left(b\sqrt{x}+a\right)-2\left(b^{5}x^{2}+10\,a^{2}b^{3}x+3\,a^{4}b\right)\sqrt{x}}{3\left(b^{8}x+2\,ab^{7}\sqrt{x}+a^{2}b^{6}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*sqrt(x) + a)^3,x, algorithm="fricas")
```

```
[Out] -1/3*(5*a*b^4*x^2 - 63*a^3*b^2*x + 27*a^5 + 60*(a^3*b^2*x + 2*a^4
*b*sqrt(x) + a^5)*log(b*sqrt(x) + a) - 2*(b^5*x^2 + 10*a^2*b^3*x
+ 3*a^4*b)*sqrt(x))/(b^8*x + 2*a*b^7*sqrt(x) + a^2*b^6)
```

Sympy [A] time = 4.1606, size = 371, normalized size = 4.22

$$\begin{cases}-\frac{60a^{5}\log\left(\frac{a}{b}+\sqrt{x}\right)}{3a^{2}b^{6}+6ab^{7}\sqrt{x}+3b^{8}x}-\frac{95a^{5}}{3a^{2}b^{6}+6ab^{7}\sqrt{x}+3b^{8}x}-\frac{120a^{4}b\sqrt{x}\log\left(\frac{a}{b}+\sqrt{x}\right)}{3a^{2}b^{6}+6ab^{7}\sqrt{x}+3b^{8}x}-\frac{130a^{4}b\sqrt{x}}{3a^{2}b^{6}+6ab^{7}\sqrt{x}+3b^{8}x}-\frac{60a^{3}b^{2}x\log\left(\frac{a}{b}+\sqrt{x}\right)}{3a^{2}b^{6}+6ab^{7}\sqrt{x}+3b^{8}x}-\frac{5a^{3}b^{2}x}{3a^{2}b^{6}+6ab^{7}\sqrt{x}+3b^{8}x} \\ \frac{x^{3}}{3a^{3}}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b*x**(1/2))**3,x)
```

```
[Out] Piecewise((-60*a**5*log(a/b + sqrt(x))/(3*a**2*b**6 + 6*a*b**7*sq
rt(x) + 3*b**8*x) - 95*a**5/(3*a**2*b**6 + 6*a*b**7*sqrt(x) + 3*b
**8*x) - 120*a**4*b*sqrt(x)*log(a/b + sqrt(x))/(3*a**2*b**6 + 6*a
*b**7*sqrt(x) + 3*b**8*x) - 130*a**4*b*sqrt(x)/(3*a**2*b**6 + 6*a
*b**7*sqrt(x) + 3*b**8*x) - 60*a**3*b**2*x*log(a/b + sqrt(x))/(3*
a**2*b**6 + 6*a*b**7*sqrt(x) + 3*b**8*x) - 5*a**3*b**2*x/(3*a**2*
b**6 + 6*a*b**7*sqrt(x) + 3*b**8*x) + 20*a**2*b**3*x**(3/2)/(3*a*
*2*b**6 + 6*a*b**7*sqrt(x) + 3*b**8*x) - 5*a*b**4*x**2/(3*a**2*b*
```

```
*6 + 6*a*b**7*sqrt(x) + 3*b**8*x) + 2*b**5*x**(5/2)/(3*a**2*b**6
+ 6*a*b**7*sqrt(x) + 3*b**8*x), Ne(b, 0)), (x**3/(3*a**3), True))
```

GIAC/XCAS [A] time = 0.291323, size = 107, normalized size = 1.22

$$-\frac{20\,a^3\ln\left(\left|b\sqrt{x}+a\right|\right)}{b^6}-\frac{10\,a^4b\sqrt{x}+9\,a^5}{\left(b\sqrt{x}+a\right)^2b^6}+\frac{2\,b^6x^{\frac{3}{2}}-9\,ab^5x+36\,a^2b^4\sqrt{x}}{3\,b^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*sqrt(x) + a)^3,x, algorithm="giac")
```

```
[Out] -20*a^3*ln(abs(b*sqrt(x) + a))/b^6 - (10*a^4*b*sqrt(x) + 9*a^5)/(
(b*sqrt(x) + a)^2*b^6) + 1/3*(2*b^6*x^(3/2) - 9*a*b^5*x + 36*a^2*
b^4*sqrt(x))/b^9
```

3.2207 $\int \frac{x}{\left(a+b\sqrt{x}\right)^3}\,dx$

Optimal. Leaf size=64

$$\frac{a^3}{b^4\left(a+b\sqrt{x}\right)^2}-\frac{6a^2}{b^4\left(a+b\sqrt{x}\right)}-\frac{6a\log\left(a+b\sqrt{x}\right)}{b^4}+\frac{2\sqrt{x}}{b^3}$$

```
[Out] a^3/(b^4*(a + b*Sqrt[x])^2) - (6*a^2)/(b^4*(a + b*Sqrt[x])) + (2*
Sqrt[x])/b^3 - (6*a*Log[a + b*Sqrt[x]])/b^4
```

Rubi [A] time = 0.0981842, antiderivative size = 64, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^3}{b^4\left(a+b\sqrt{x}\right)^2}-\frac{6a^2}{b^4\left(a+b\sqrt{x}\right)}-\frac{6a\log\left(a+b\sqrt{x}\right)}{b^4}+\frac{2\sqrt{x}}{b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b*Sqrt[x])^3,x]
```

```
[Out] a^3/(b^4*(a + b*Sqrt[x])^2) - (6*a^2)/(b^4*(a + b*Sqrt[x])) + (2*
Sqrt[x])/b^3 - (6*a*Log[a + b*Sqrt[x]])/b^4
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^3}{b^4\left(a+b\sqrt{x}\right)^2}-\frac{6a^2}{b^4\left(a+b\sqrt{x}\right)}-\frac{6a\log\left(a+b\sqrt{x}\right)}{b^4}+2\int^{\sqrt{x}}\frac{1}{b^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b*x**(1/2))**3,x)
```

```
[Out] a**3/(b**4*(a + b*sqrt(x))**2) - 6*a**2/(b**4*(a + b*sqrt(x))) -
6*a*log(a + b*sqrt(x))/b**4 + 2*Integral(b**(-3), (x, sqrt(x)))
```

Mathematica [A] time = 0.0424355, size = 57, normalized size = 0.89

$$\frac{\frac{a^3}{\left(a+b\sqrt{x}\right)^2}-\frac{6a^2}{a+b\sqrt{x}}-6a\log\left(a+b\sqrt{x}\right)+2b\sqrt{x}}{b^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b*Sqrt[x])^3,x]
```

```
[Out] (a^3/(a + b*Sqrt[x])^2 - (6*a^2)/(a + b*Sqrt[x]) + 2*b*Sqrt[x] -
6*a*Log[a + b*Sqrt[x]])/b^4
```

Maple [A] time = 0.01, size = 57, normalized size = 0.9

$$-6\,\frac{a\ln\left(a+b\sqrt{x}\right)}{b^4}+2\,\frac{\sqrt{x}}{b^3}+\frac{a^3}{b^4}\left(a+b\sqrt{x}\right)^{-2}-6\,\frac{a^2}{b^4\left(a+b\sqrt{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x/(a+b*x^(1/2))^3,x)
```

```
[Out] -6*a*ln(a+b*x^(1/2))/b^4+2*x^(1/2)/b^3+a^3/b^4/(a+b*x^(1/2))^2-6*
a^2/b^4/(a+b*x^(1/2))
```

Maxima [A] time = 1.44511, size = 81, normalized size = 1.27

$$-\frac{6\,a\log\left(b\sqrt{x}+a\right)}{b^4}+\frac{2\,\left(b\sqrt{x}+a\right)}{b^4}-\frac{6\,a^2}{\left(b\sqrt{x}+a\right)b^4}+\frac{a^3}{\left(b\sqrt{x}+a\right)^2 b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(b*sqrt(x) + a)^3,x, algorithm="maxima")
```

```
[Out] -6*a*log(b*sqrt(x) + a)/b^4 + 2*(b*sqrt(x) + a)/b^4 - 6*a^2/((b*s
qrt(x) + a)*b^4) + a^3/((b*sqrt(x) + a)^2*b^4)
```

Fricas [A] time = 0.239883, size = 113, normalized size = 1.77

$$\frac{4\,ab^2x-5\,a^3-6\,\left(ab^2x+2\,a^2b\sqrt{x}+a^3\right)\log\left(b\sqrt{x}+a\right)+2\,\left(b^3x-2\,a^2b\right)\sqrt{x}}{b^6x+2\,ab^5\sqrt{x}+a^2b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(b*sqrt(x) + a)^3,x, algorithm="fricas")
```

```
[Out] (4*a*b^2*x - 5*a^3 - 6*(a*b^2*x + 2*a^2*b*sqrt(x) + a^3)*log(b*sq
rt(x) + a) + 2*(b^3*x - 2*a^2*b)*sqrt(x))/(b^6*x + 2*a*b^5*sqrt(x
) + a^2*b^4)
```

Sympy [A] time = 2.94404, size = 230, normalized size = 3.59

$$\begin{cases} -\frac{6a^3\log\left(\frac{a}{b}+\sqrt{x}\right)}{a^2b^4+2ab^5\sqrt{x}+b^6x}-\frac{3a^3}{a^2b^4+2ab^5\sqrt{x}+b^6x}-\frac{12a^2b\sqrt{x}\log\left(\frac{a}{b}+\sqrt{x}\right)}{a^2b^4+2ab^5\sqrt{x}+b^6x}-\frac{6ab^2x\log\left(\frac{a}{b}+\sqrt{x}\right)}{a^2b^4+2ab^5\sqrt{x}+b^6x}+\frac{6ab^2x}{a^2b^4+2ab^5\sqrt{x}+b^6x}+\frac{2b^3x^{\frac{3}{2}}}{a^2b^4+2ab^5\sqrt{x}+b^6x} & \text{for } b \neq \\ \frac{x^2}{2a^3} & \text{otherwi} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(a+b*x**(1/2))**3,x)
```

```
[Out] Piecewise((-6*a**3*log(a/b + sqrt(x))/(a**2*b**4 + 2*a*b**5*sqrt(
x) + b**6*x) - 3*a**3/(a**2*b**4 + 2*a*b**5*sqrt(x) + b**6*x) - 1
2*a**2*b*sqrt(x)*log(a/b + sqrt(x))/(a**2*b**4 + 2*a*b**5*sqrt(x)
 + b**6*x) - 6*a*b**2*x*log(a/b + sqrt(x))/(a**2*b**4 + 2*a*b**5*
sqrt(x) + b**6*x) + 6*a*b**2*x/(a**2*b**4 + 2*a*b**5*sqrt(x) + b*
*6*x) + 2*b**3*x**(3/2)/(a**2*b**4 + 2*a*b**5*sqrt(x) + b**6*x),
Ne(b, 0)), (x**2/(2*a**3), True))
```

GIAC/XCAS [A] time = 0.273914, size = 72, normalized size = 1.12

$$-\frac{6\,a\ln\left(\left|b\sqrt{x}+a\right|\right)}{b^4}+\frac{2\,\sqrt{x}}{b^3}-\frac{6\,a^2b\sqrt{x}+5\,a^3}{\left(b\sqrt{x}+a\right)^2b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*sqrt(x) + a)^3,x, algorithm="giac")
```

```
[Out] -6*a*ln(abs(b*sqrt(x) + a))/b^4 + 2*sqrt(x)/b^3 - (6*a^2*b*sqrt(x
) + 5*a^3)/((b*sqrt(x) + a)^2*b^4)
```

3.2208 $\int \frac{1}{\left(a+b\sqrt{x}\right)^3} \, dx$

Optimal. Leaf size=16

$$\frac{x}{a\left(a+b\sqrt{x}\right)^2}$$

```
[Out] x/(a*(a + b*Sqrt[x])^2)
```

Rubi [A] time = 0.019397, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{x}{a\left(a+b\sqrt{x}\right)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Sqrt[x])^(-3),x]

[Out] x/(a*(a + b*Sqrt[x])^2)
```

Rubi in Sympy [A] time = 1.2807, size = 12, normalized size = 0.75

$$\frac{x}{a\left(a+b\sqrt{x}\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b*x**(1/2))**3,x)

[Out] x/(a*(a + b*sqrt(x))**2)
```

Mathematica [A] time = 0.0145343, size = 26, normalized size = 1.62

$$-\frac{a+2b\sqrt{x}}{b^2\left(a+b\sqrt{x}\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Sqrt[x])^(-3),x]

[Out] -((a + 2*b*Sqrt[x])/(b^2*(a + b*Sqrt[x])^2))
```

Maple [B] time = 0.036, size = 131, normalized size = 8.2

$$-\frac{1}{b^2}\left(b\sqrt{x}-a\right)^{-1}-\frac{a}{2\,b^2}\left(b\sqrt{x}-a\right)^{-2}-\frac{1}{b^2}\left(a+b\sqrt{x}\right)^{-1}+\frac{a}{2\,b^2}\left(a+b\sqrt{x}\right)^{-2}$$
$$+\frac{a^3}{2\,\left(b^2x-a^2\right)^2b^2}-3\,ab^2\left(-1/2\,\frac{a^2}{b^4\left(b^2x-a^2\right)^2}-\frac{1}{b^4\left(b^2x-a^2\right)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b*x^(1/2))^3,x)
```

```
[Out] -1/b^2/(b*x^(1/2)-a)-1/2/b^2*a/(b*x^(1/2)-a)^2-1/b^2/(a+b*x^(1/2)
)+1/2/b^2*a/(a+b*x^(1/2))^2+1/2*a^3/(b^2*x-a^2)^2/b^2-3*a*b^2*(-1
/2*a^2/b^4/(b^2*x-a^2)^2-1/b^4/(b^2*x-a^2))
```

Maxima [A] time = 1.43227, size = 39, normalized size = 2.44

$$-\frac{2}{\left(b\sqrt{x}+a\right)b^2}+\frac{a}{\left(b\sqrt{x}+a\right)^2b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^(-3),x, algorithm="maxima")
```

```
[Out] -2/((b*sqrt(x) + a)*b^2) + a/((b*sqrt(x) + a)^2*b^2)
```

Fricas [A] time = 0.22973, size = 46, normalized size = 2.88

$$-\frac{2\,b\sqrt{x}+a}{b^4x+2\,ab^3\sqrt{x}+a^2b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^(-3),x, algorithm="fricas")
```

```
[Out] -(2*b*sqrt(x) + a)/(b^4*x + 2*a*b^3*sqrt(x) + a^2*b^2)
```

Sympy [A] time = 2.55119, size = 34, normalized size = 2.12

$$\begin{cases} \frac{x}{a^3+2a^2b\sqrt{x}+ab^2x} & \text{for}\ a\neq 0 \\ -\frac{2}{b^3\sqrt{x}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*x**(1/2))**3,x)
```

```
[Out] Piecewise((x/(a**3 + 2*a**2*b*sqrt(x) + a*b**2*x), Ne(a, 0)), (-2
/(b**3*sqrt(x)), True))
```

GIAC/XCAS [A] time = 0.216168, size = 30, normalized size = 1.88

$$-\frac{2\,b\sqrt{x}+a}{\left(b\sqrt{x}+a\right)^2b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^(-3),x, algorithm="giac")
```

```
[Out] -(2*b*sqrt(x) + a)/((b*sqrt(x) + a)^2*b^2)
```

3.2209 $\int \frac{1}{\left(a+b\sqrt{x}\right)^3 x}\,dx$

Optimal. Leaf size=53

$$-\frac{2\log\left(a+b\sqrt{x}\right)}{a^3}+\frac{\log(x)}{a^3}+\frac{2}{a^2\left(a+b\sqrt{x}\right)}+\frac{1}{a\left(a+b\sqrt{x}\right)^2}$$

```
[Out] 1/(a*(a + b*Sqrt[x])^2) + 2/(a^2*(a + b*Sqrt[x])) - (2*Log[a + b*
Sqrt[x]])/a^3 + Log[x]/a^3
```

Rubi [A] time = 0.0783251, antiderivative size = 53, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2\log\left(a+b\sqrt{x}\right)}{a^3}+\frac{\log(x)}{a^3}+\frac{2}{a^2\left(a+b\sqrt{x}\right)}+\frac{1}{a\left(a+b\sqrt{x}\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b*Sqrt[x])^3*x),x]
```

```
[Out] 1/(a*(a + b*Sqrt[x])^2) + 2/(a^2*(a + b*Sqrt[x])) - (2*Log[a + b*
Sqrt[x]])/a^3 + Log[x]/a^3
```

Rubi in Sympy [A] time = 11.2828, size = 53, normalized size = 1.

$$\frac{1}{a\left(a+b\sqrt{x}\right)^2}+\frac{2}{a^2\left(a+b\sqrt{x}\right)}+\frac{2\log\left(\sqrt{x}\right)}{a^3}-\frac{2\log\left(a+b\sqrt{x}\right)}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(a+b*x**(1/2))**3,x)
```

```
[Out] 1/(a*(a + b*sqrt(x))**2) + 2/(a**2*(a + b*sqrt(x))) + 2*log(sqrt(
x))/a**3 - 2*log(a + b*sqrt(x))/a**3
```

Mathematica [A] time = 0.0758942, size = 44, normalized size = 0.83

$$\frac{\frac{a\left(3a+2b\sqrt{x}\right)}{\left(a+b\sqrt{x}\right)^2}-2\log\left(a+b\sqrt{x}\right)+\log(x)}{a^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b*Sqrt[x])^3*x),x]
```

```
[Out] ((a*(3*a + 2*b*Sqrt[x]))/(a + b*Sqrt[x])^2 - 2*Log[a + b*Sqrt[x]]
 + Log[x])/a^3
```

Maple [A] time = 0.014, size = 48, normalized size = 0.9

$$\frac{\ln(x)}{a^3}-2\,\frac{\ln\left(a+b\sqrt{x}\right)}{a^3}+\frac{1}{a}\left(a+b\sqrt{x}\right)^{-2}+2\,\frac{1}{a^2\left(a+b\sqrt{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(a+b*x^(1/2))^3,x)
```

```
[Out] ln(x)/a^3-2*ln(a+b*x^(1/2))/a^3+1/a/(a+b*x^(1/2))^2+2/a^2/(a+b*x^
(1/2))
```

Maxima [A] time = 1.44016, size = 73, normalized size = 1.38

$$\frac{2\,b\sqrt{x}+3\,a}{a^{2}b^{2}x+2\,a^{3}b\sqrt{x}+a^{4}}-\frac{2\,\log\left(b\sqrt{x}+a\right)}{a^{3}}+\frac{\log\left(x\right)}{a^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^3*x),x, algorithm="maxima")
```

```
[Out] (2*b*sqrt(x) + 3*a)/(a^2*b^2*x + 2*a^3*b*sqrt(x) + a^4) - 2*log(b
*sqrt(x) + a)/a^3 + log(x)/a^3
```

Fricas [A] time = 0.244708, size = 115, normalized size = 2.17

$$\frac{2\,ab\sqrt{x}+3\,a^{2}-2\,\left(b^{2}x+2\,ab\sqrt{x}+a^{2}\right)\log\left(b\sqrt{x}+a\right)+2\,\left(b^{2}x+2\,ab\sqrt{x}+a^{2}\right)\log\left(\sqrt{x}\right)}{a^{3}b^{2}x+2\,a^{4}b\sqrt{x}+a^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^3*x),x, algorithm="fricas")
```

```
[Out] (2*a*b*sqrt(x) + 3*a^2 - 2*(b^2*x + 2*a*b*sqrt(x) + a^2)*log(b*sq
rt(x) + a) + 2*(b^2*x + 2*a*b*sqrt(x) + a^2)*log(sqrt(x)))/(a^3*b
^2*x + 2*a^4*b*sqrt(x) + a^5)
```

Sympy [A] time = 6.58567, size = 364, normalized size = 6.87

$$\begin{cases}\frac{\tilde{\infty}}{x^{\frac{3}{2}}} \\ -\frac{2}{3b^{3}x^{\frac{3}{2}}} \\ \frac{\log(x)}{a^{3}} \\ \frac{a^{2}\sqrt{x}\log(x)}{a^{5}\sqrt{x}+2a^{4}bx+a^{3}b^{2}x^{\frac{3}{2}}}-\frac{2a^{2}\sqrt{x}\log\left(\frac{a}{b}+\sqrt{x}\right)}{a^{5}\sqrt{x}+2a^{4}bx+a^{3}b^{2}x^{\frac{3}{2}}}+\frac{3a^{2}\sqrt{x}}{a^{5}\sqrt{x}+2a^{4}bx+a^{3}b^{2}x^{\frac{3}{2}}}+\frac{2abx\log(x)}{a^{5}\sqrt{x}+2a^{4}bx+a^{3}b^{2}x^{\frac{3}{2}}}-\frac{4abx\log\left(\frac{a}{b}+\sqrt{x}\right)}{a^{5}\sqrt{x}+2a^{4}bx+a^{3}b^{2}x^{\frac{3}{2}}}+\frac{2abx}{a^{5}\sqrt{x}+2a^{4}bx+a^{3}b^{2}x^{\frac{3}{2}}}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(a+b*x**(1/2))**3,x)
```

```
[Out] Piecewise((zoo/x**(3/2), Eq(a, 0) & Eq(b, 0)), (-2/(3*b**3*x**(3/
2)), Eq(a, 0)), (log(x)/a**3, Eq(b, 0)), (a**2*sqrt(x)*log(x)/(a*
*5*sqrt(x) + 2*a**4*b*x + a**3*b**2*x**(3/2)) - 2*a**2*sqrt(x)*lo
g(a/b + sqrt(x))/(a**5*sqrt(x) + 2*a**4*b*x + a**3*b**2*x**(3/2))
 + 3*a**2*sqrt(x)/(a**5*sqrt(x) + 2*a**4*b*x + a**3*b**2*x**(3/2)
) + 2*a*b*x*log(x)/(a**5*sqrt(x) + 2*a**4*b*x + a**3*b**2*x**(3/2
)) - 4*a*b*x*log(a/b + sqrt(x))/(a**5*sqrt(x) + 2*a**4*b*x + a**3
*b**2*x**(3/2)) + 2*a*b*x/(a**5*sqrt(x) + 2*a**4*b*x + a**3*b**2*
x**(3/2)) + b**2*x**(3/2)*log(x)/(a**5*sqrt(x) + 2*a**4*b*x + a**
3*b**2*x**(3/2)) - 2*b**2*x**(3/2)*log(a/b + sqrt(x))/(a**5*sqrt(
x) + 2*a**4*b*x + a**3*b**2*x**(3/2)), True))
```

GIAC/XCAS [A] time = 0.250254, size = 65, normalized size = 1.23

$$-\frac{2\,\ln\left(\left|b\sqrt{x}+a\right|\right)}{a^3}+\frac{\ln\left(\left|x\right|\right)}{a^3}+\frac{2\,ab\sqrt{x}+3\,a^2}{\left(b\sqrt{x}+a\right)^2a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^3*x),x, algorithm="giac")
```

```
[Out] -2*ln(abs(b*sqrt(x) + a))/a^3 + ln(abs(x))/a^3 + (2*a*b*sqrt(x) +
 3*a^2)/((b*sqrt(x) + a)^2*a^3)
```

3.2210 $\int \frac{1}{\left(a+b\sqrt{x}\right)^3 x^2}\,dx$

Optimal. Leaf size=85

$$-\frac{12b^2\log\left(a+b\sqrt{x}\right)}{a^5}+\frac{6b^2\log(x)}{a^5}+\frac{6b^2}{a^4\left(a+b\sqrt{x}\right)}+\frac{6b}{a^4\sqrt{x}}+\frac{b^2}{a^3\left(a+b\sqrt{x}\right)^2}-\frac{1}{a^3x}$$

```
[Out] b^2/(a^3*(a + b*Sqrt[x])^2) + (6*b^2)/(a^4*(a + b*Sqrt[x])) - 1/(
a^3*x) + (6*b)/(a^4*Sqrt[x]) - (12*b^2*Log[a + b*Sqrt[x]])/a^5 +
(6*b^2*Log[x])/a^5
```

Rubi [A] time = 0.13501, antiderivative size = 85, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{12b^2\log\left(a+b\sqrt{x}\right)}{a^5}+\frac{6b^2\log(x)}{a^5}+\frac{6b^2}{a^4\left(a+b\sqrt{x}\right)}+\frac{6b}{a^4\sqrt{x}}+\frac{b^2}{a^3\left(a+b\sqrt{x}\right)^2}-\frac{1}{a^3x}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b*Sqrt[x])^3*x^2),x]
```

```
[Out] b^2/(a^3*(a + b*Sqrt[x])^2) + (6*b^2)/(a^4*(a + b*Sqrt[x])) - 1/(
a^3*x) + (6*b)/(a^4*Sqrt[x]) - (12*b^2*Log[a + b*Sqrt[x]])/a^5 +
(6*b^2*Log[x])/a^5
```

Rubi in Sympy [A] time = 19.1972, size = 85, normalized size = 1.

$$\frac{b^2}{a^3\left(a+b\sqrt{x}\right)^2}-\frac{1}{a^3x}+\frac{6b^2}{a^4\left(a+b\sqrt{x}\right)}+\frac{6b}{a^4\sqrt{x}}+\frac{12b^2\log\left(\sqrt{x}\right)}{a^5}-\frac{12b^2\log\left(a+b\sqrt{x}\right)}{a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(a+b*x**(1/2))**3,x)
```

```
[Out] b**2/(a**3*(a + b*sqrt(x))**2) - 1/(a**3*x) + 6*b**2/(a**4*(a + b
*sqrt(x))) + 6*b/(a**4*sqrt(x)) + 12*b**2*log(sqrt(x))/a**5 - 12*
b**2*log(a + b*sqrt(x))/a**5
```

Mathematica [A] time = 0.133978, size = 77, normalized size = 0.91

$$\frac{\frac{a\left(-a^3+4a^2b\sqrt{x}+18ab^2x+12b^3x^{3/2}\right)}{x\left(a+b\sqrt{x}\right)^2}-12b^2\log\left(a+b\sqrt{x}\right)+6b^2\log(x)}{a^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b*Sqrt[x])^3*x^2),x]
```

```
[Out] ((a*(-a^3 + 4*a^2*b*Sqrt[x] + 18*a*b^2*x + 12*b^3*x^(3/2)))/((a +
 b*Sqrt[x])^2*x) - 12*b^2*Log[a + b*Sqrt[x]] + 6*b^2*Log[x])/a^5
```

Maple [A] time = 0.017, size = 78, normalized size = 0.9

$$-\frac{1}{a^3x}+6\frac{b^2\ln(x)}{a^5}-12\frac{b^2\ln\left(a+b\sqrt{x}\right)}{a^5}+6\frac{b}{a^4\sqrt{x}}+\frac{b^2}{a^3}\left(a+b\sqrt{x}\right)^{-2}+6\frac{b^2}{a^4\left(a+b\sqrt{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(a+b*x^(1/2))^3,x)
```

```
[Out] -1/a^3/x+6*b^2*ln(x)/a^5-12*b^2*ln(a+b*x^(1/2))/a^5+6*b/a^4/x^(1/
2)+b^2/a^3/(a+b*x^(1/2))^2+6*b^2/a^4/(a+b*x^(1/2))
```

Maxima [A] time = 1.44758, size = 115, normalized size = 1.35

$$\frac{12\,b^3x^{\frac{3}{2}}+18\,ab^2x+4\,a^2b\sqrt{x}-a^3}{a^4b^2x^2+2\,a^5bx^{\frac{3}{2}}+a^6x}-\frac{12\,b^2\log\left(b\sqrt{x}+a\right)}{a^5}+\frac{6\,b^2\log\left(x\right)}{a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^3*x^2),x, algorithm="maxima")
```

```
[Out] (12*b^3*x^(3/2) + 18*a*b^2*x + 4*a^2*b*sqrt(x) - a^3)/(a^4*b^2*x^
2 + 2*a^5*b*x^(3/2) + a^6*x) - 12*b^2*log(b*sqrt(x) + a)/a^5 + 6*
b^2*log(x)/a^5
```

Fricas [A] time = 0.243955, size = 171, normalized size = 2.01

$$\frac{18\,a^2b^2x-a^4-12\left(b^4x^2+2\,ab^3x^{\frac{3}{2}}+a^2b^2x\right)\log\left(b\sqrt{x}+a\right)+12\left(b^4x^2+2\,ab^3x^{\frac{3}{2}}+a^2b^2x\right)\log\left(\sqrt{x}\right)+4\left(3\,ab^3x+a^3b\right)\sqrt{x}}{a^5b^2x^2+2\,a^6bx^{\frac{3}{2}}+a^7x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^3*x^2),x, algorithm="fricas")
```

```
[Out] (18*a^2*b^2*x - a^4 - 12*(b^4*x^2 + 2*a*b^3*x^(3/2) + a^2*b^2*x)*
log(b*sqrt(x) + a) + 12*(b^4*x^2 + 2*a*b^3*x^(3/2) + a^2*b^2*x)*l
og(sqrt(x)) + 4*(3*a*b^3*x + a^3*b)*sqrt(x))/(a^5*b^2*x^2 + 2*a^6
*b*x^(3/2) + a^7*x)
```

Sympy [A] time = 15.3387, size = 481, normalized size = 5.66

$$\begin{cases} \frac{\tilde{\infty}}{x^{\frac{5}{2}}} \\ -\frac{1}{a^3x} \\ -\frac{2}{5b^3x^{\frac{5}{2}}} \\ -\frac{a^4\sqrt{x}}{a^7x^{\frac{3}{2}}+2a^6bx^2+a^5b^2x^{\frac{5}{2}}}+\frac{4a^3bx}{a^7x^{\frac{3}{2}}+2a^6bx^2+a^5b^2x^{\frac{5}{2}}}+\frac{6a^2b^2x^{\frac{3}{2}}\log\left(x\right)}{a^7x^{\frac{3}{2}}+2a^6bx^2+a^5b^2x^{\frac{5}{2}}}-\frac{12a^2b^2x^{\frac{3}{2}}\log\left(\frac{a}{b}+\sqrt{x}\right)}{a^7x^{\frac{3}{2}}+2a^6bx^2+a^5b^2x^{\frac{5}{2}}}+\frac{18a^2b^2x^{\frac{3}{2}}}{a^7x^{\frac{3}{2}}+2a^6bx^2+a^5b^2x^{\frac{5}{2}}}+\frac{12ab^3x^2\log\left(x\right)}{a^7x^{\frac{3}{2}}+2a^6bx^2+\cdots} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(a+b*x**(1/2))**3,x)
```

```
[Out] Piecewise((zoo/x**(5/2), Eq(a, 0) & Eq(b, 0)), (-1/(a**3*x), Eq(b
, 0)), (-2/(5*b**3*x**(5/2)), Eq(a, 0)), (-a**4*sqrt(x)/(a**7*x**
(3/2) + 2*a**6*b*x**2 + a**5*b**2*x**(5/2)) + 4*a**3*b*x/(a**7*x*
*(3/2) + 2*a**6*b*x**2 + a**5*b**2*x**(5/2)) + 6*a**2*b**2*x**(3/
2)*log(x)/(a**7*x**(3/2) + 2*a**6*b*x**2 + a**5*b**2*x**(5/2)) -
12*a**2*b**2*x**(3/2)*log(a/b + sqrt(x))/(a**7*x**(3/2) + 2*a**6*
b*x**2 + a**5*b**2*x**(5/2)) + 18*a**2*b**2*x**(3/2)/(a**7*x**(3/
2) + 2*a**6*b*x**2 + a**5*b**2*x**(5/2)) + 12*a*b**3*x**2*log(x)/
(a**7*x**(3/2) + 2*a**6*b*x**2 + a**5*b**2*x**(5/2)) - 24*a*b**3*
x**2*log(a/b + sqrt(x))/(a**7*x**(3/2) + 2*a**6*b*x**2 + a**5*b**
```

```
2*x**(5/2)) + 12*a*b**3*x**2/(a**7*x**(3/2) + 2*a**6*b*x**2 + a**
5*b**2*x**(5/2)) + 6*b**4*x**(5/2)*log(x)/(a**7*x**(3/2) + 2*a**6
*b*x**2 + a**5*b**2*x**(5/2)) - 12*b**4*x**(5/2)*log(a/b + sqrt(x
))/(a**7*x**(3/2) + 2*a**6*b*x**2 + a**5*b**2*x**(5/2)), True))
```

GIAC/XCAS [A] time = 0.241166, size = 100, normalized size = 1.18

$$-\frac{12\,b^2\ln\left(\left|b\sqrt{x}+a\right|\right)}{a^5}+\frac{6\,b^2\ln\left(\left|x\right|\right)}{a^5}+\frac{12\,b^3x^{\frac{3}{2}}+18\,ab^2x+4\,a^2b\sqrt{x}-a^3}{\left(bx+a\sqrt{x}\right)^2a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^3*x^2),x, algorithm="giac")
```

```
[Out] -12*b^2*ln(abs(b*sqrt(x) + a))/a^5 + 6*b^2*ln(abs(x))/a^5 + (12*b
^3*x^(3/2) + 18*a*b^2*x + 4*a^2*b*sqrt(x) - a^3)/((b*x + a*sqrt(x
))^2*a^4)
```

3.2211 $\int \frac{1}{\left(a+b\sqrt{x}\right)^3 x^3}\,dx$

Optimal. Leaf size=111

$$-\frac{30b^4\log\left(a+b\sqrt{x}\right)}{a^7}+\frac{15b^4\log(x)}{a^7}+\frac{10b^4}{a^6\left(a+b\sqrt{x}\right)}+\frac{20b^3}{a^6\sqrt{x}}+\frac{b^4}{a^5\left(a+b\sqrt{x}\right)^2}-\frac{6b^2}{a^5x}+\frac{2b}{a^4x^{3/2}}-\frac{1}{2a^3x^2}$$

```
[Out] b^4/(a^5*(a + b*Sqrt[x])^2) + (10*b^4)/(a^6*(a + b*Sqrt[x])) - 1/
(2*a^3*x^2) + (2*b)/(a^4*x^(3/2)) - (6*b^2)/(a^5*x) + (20*b^3)/(a
^6*Sqrt[x]) - (30*b^4*Log[a + b*Sqrt[x]])/a^7 + (15*b^4*Log[x])/a
^7
```

Rubi [A] time = 0.179952, antiderivative size = 111, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{30b^4\log\left(a+b\sqrt{x}\right)}{a^7}+\frac{15b^4\log(x)}{a^7}+\frac{10b^4}{a^6\left(a+b\sqrt{x}\right)}+\frac{20b^3}{a^6\sqrt{x}}+\frac{b^4}{a^5\left(a+b\sqrt{x}\right)^2}-\frac{6b^2}{a^5x}+\frac{2b}{a^4x^{3/2}}-\frac{1}{2a^3x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b*Sqrt[x])^3*x^3),x]
```

```
[Out] b^4/(a^5*(a + b*Sqrt[x])^2) + (10*b^4)/(a^6*(a + b*Sqrt[x])) - 1/
(2*a^3*x^2) + (2*b)/(a^4*x^(3/2)) - (6*b^2)/(a^5*x) + (20*b^3)/(a
^6*Sqrt[x]) - (30*b^4*Log[a + b*Sqrt[x]])/a^7 + (15*b^4*Log[x])/a
^7
```

Rubi in Sympy [A] time = 25.8141, size = 112, normalized size = 1.01

$$-\frac{1}{2a^3x^2}+\frac{2b}{a^4x^{\frac{3}{2}}}+\frac{b^4}{a^5\left(a+b\sqrt{x}\right)^2}-\frac{6b^2}{a^5x}+\frac{10b^4}{a^6\left(a+b\sqrt{x}\right)}+\frac{20b^3}{a^6\sqrt{x}}+\frac{30b^4\log\left(\sqrt{x}\right)}{a^7}-\frac{30b^4\log\left(a+b\sqrt{x}\right)}{a^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(a+b*x**(1/2))**3,x)
```

```
[Out] -1/(2*a**3*x**2) + 2*b/(a**4*x**(3/2)) + b**4/(a**5*(a + b*sqrt(x
))**2) - 6*b**2/(a**5*x) + 10*b**4/(a**6*(a + b*sqrt(x))) + 20*b*
*3/(a**6*sqrt(x)) + 30*b**4*log(sqrt(x))/a**7 - 30*b**4*log(a + b
*sqrt(x))/a**7
```

Mathematica [A] time = 0.205424, size = 104, normalized size = 0.94

$$\frac{\frac{a\left(-a^5+2a^4b\sqrt{x}-5a^3b^2x+20a^2b^3x^{3/2}+90ab^4x^2+60b^5x^{5/2}\right)}{x^2\left(a+b\sqrt{x}\right)^2}-60b^4\log\left(a+b\sqrt{x}\right)+30b^4\log(x)}{2a^7}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b*Sqrt[x])^3*x^3),x]
```

```
[Out] ((a*(-a^5 + 2*a^4*b*Sqrt[x] - 5*a^3*b^2*x + 20*a^2*b^3*x^(3/2) +
90*a*b^4*x^2 + 60*b^5*x^(5/2)))/((a + b*Sqrt[x])^2*x^2) - 60*b^4*
Log[a + b*Sqrt[x]] + 30*b^4*Log[x])/(2*a^7)
```

Maple [A] time = 0.018, size = 100, normalized size = 0.9

$$-\frac{1}{2\,x^{2}a^{3}}+2\,\frac{b}{a^{4}x^{3/2}}-6\,\frac{b^{2}}{xa^{5}}+15\,\frac{b^{4}\ln\left(x\right)}{a^{7}}-30\,\frac{b^{4}\ln\left(a+b\sqrt{x}\right)}{a^{7}}+20\,\frac{b^{3}}{a^{6}\sqrt{x}}+\frac{b^{4}}{a^{5}}\left(a+b\sqrt{x}\right)^{-2}+10\,\frac{b^{4}}{a^{6}\left(a+b\sqrt{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(a+b*x^(1/2))^3,x)
```

```
[Out] -1/2/x^2/a^3+2*b/a^4/x^(3/2)-6*b^2/x/a^5+15*b^4*ln(x)/a^7-30*b^4*
ln(a+b*x^(1/2))/a^7+20*b^3/a^6/x^(1/2)+b^4/a^5/(a+b*x^(1/2))^2+10
*b^4/a^6/(a+b*x^(1/2))
```

Maxima [A] time = 1.44644, size = 149, normalized size = 1.34

$$\frac{60\,b^{5}x^{\frac{5}{2}}+90\,ab^{4}x^{2}+20\,a^{2}b^{3}x^{\frac{3}{2}}-5\,a^{3}b^{2}x+2\,a^{4}b\sqrt{x}-a^{5}}{2\left(a^{6}b^{2}x^{3}+2\,a^{7}bx^{\frac{5}{2}}+a^{8}x^{2}\right)}-\frac{30\,b^{4}\log\left(b\sqrt{x}+a\right)}{a^{7}}+\frac{15\,b^{4}\log\left(x\right)}{a^{7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^3*x^3),x, algorithm="maxima")
```

```
[Out] 1/2*(60*b^5*x^(5/2) + 90*a*b^4*x^2 + 20*a^2*b^3*x^(3/2) - 5*a^3*b
^2*x + 2*a^4*b*sqrt(x) - a^5)/(a^6*b^2*x^3 + 2*a^7*b*x^(5/2) + a^
8*x^2) - 30*b^4*log(b*sqrt(x) + a)/a^7 + 15*b^4*log(x)/a^7
```

Fricas [A] time = 0.240411, size = 211, normalized size = 1.9

$$\frac{90\,a^{2}b^{4}x^{2}-5\,a^{4}b^{2}x-a^{6}-60\left(b^{6}x^{3}+2\,ab^{5}x^{\frac{5}{2}}+a^{2}b^{4}x^{2}\right)\log\left(b\sqrt{x}+a\right)+60\left(b^{6}x^{3}+2\,ab^{5}x^{\frac{5}{2}}+a^{2}b^{4}x^{2}\right)\log\left(\sqrt{x}\right)+2\,(30\,a}{2\left(a^{7}b^{2}x^{3}+2\,a^{8}bx^{\frac{5}{2}}+a^{9}x^{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^3*x^3),x, algorithm="fricas")
```

```
[Out] 1/2*(90*a^2*b^4*x^2 - 5*a^4*b^2*x - a^6 - 60*(b^6*x^3 + 2*a*b^5*x
^(5/2) + a^2*b^4*x^2)*log(b*sqrt(x) + a) + 60*(b^6*x^3 + 2*a*b^5*
x^(5/2) + a^2*b^4*x^2)*log(sqrt(x)) + 2*(30*a*b^5*x^2 + 10*a^3*b^
3*x + a^5*b)*sqrt(x))/(a^7*b^2*x^3 + 2*a^8*b*x^(5/2) + a^9*x^2)
```

Sympy [A] time = 38.4782, size = 612, normalized size = 5.51

$$\begin{cases}\frac{\tilde{\infty}}{x^{\frac{7}{2}}}\\ -\frac{2}{7b^{3}x^{\frac{7}{2}}}\\ -\frac{1}{2a^{3}x^{2}}\\ -\frac{a^{6}\sqrt{x}}{2a^{9}x^{\frac{5}{2}}+4a^{8}bx^{3}+2a^{7}b^{2}x^{\frac{7}{2}}}+\frac{2a^{5}bx}{2a^{9}x^{\frac{5}{2}}+4a^{8}bx^{3}+2a^{7}b^{2}x^{\frac{7}{2}}}-\frac{5a^{4}b^{2}x^{\frac{3}{2}}}{2a^{9}x^{\frac{5}{2}}+4a^{8}bx^{3}+2a^{7}b^{2}x^{\frac{7}{2}}}+\frac{20a^{3}b^{3}x^{2}}{2a^{9}x^{\frac{5}{2}}+4a^{8}bx^{3}+2a^{7}b^{2}x^{\frac{7}{2}}}+\frac{30a^{2}b^{4}x^{\frac{5}{2}}\log\left(x\right)}{2a^{9}x^{\frac{5}{2}}+4a^{8}bx^{3}+2a^{7}b^{2}x^{\frac{7}{2}}}-\frac{60}{2a^{9}}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(a+b*x**(1/2))**3,x)
```

```
[Out] Piecewise((zoo/x**(7/2), Eq(a, 0) & Eq(b, 0)), (-2/(7*b**3*x**(7/
2)), Eq(a, 0)), (-1/(2*a**3*x**2), Eq(b, 0)), (-a**6*sqrt(x)/(2*a
**9*x**(5/2) + 4*a**8*b*x**3 + 2*a**7*b**2*x**(7/2)) + 2*a**5*b*x
/(2*a**9*x**(5/2) + 4*a**8*b*x**3 + 2*a**7*b**2*x**(7/2)) - 5*a**
4*b**2*x**(3/2)/(2*a**9*x**(5/2) + 4*a**8*b*x**3 + 2*a**7*b**2*x*
*(7/2)) + 20*a**3*b**3*x**2/(2*a**9*x**(5/2) + 4*a**8*b*x**3 + 2*
a**7*b**2*x**(7/2)) + 30*a**2*b**4*x**(5/2)*log(x)/(2*a**9*x**(5/
2) + 4*a**8*b*x**3 + 2*a**7*b**2*x**(7/2)) - 60*a**2*b**4*x**(5/2
)*log(a/b + sqrt(x))/(2*a**9*x**(5/2) + 4*a**8*b*x**3 + 2*a**7*b*
*2*x**(7/2)) + 90*a**2*b**4*x**(5/2)/(2*a**9*x**(5/2) + 4*a**8*b*
x**3 + 2*a**7*b**2*x**(7/2)) + 60*a*b**5*x**3*log(x)/(2*a**9*x**(
5/2) + 4*a**8*b*x**3 + 2*a**7*b**2*x**(7/2)) - 120*a*b**5*x**3*lo
g(a/b + sqrt(x))/(2*a**9*x**(5/2) + 4*a**8*b*x**3 + 2*a**7*b**2*x
**(7/2)) + 60*a*b**5*x**3/(2*a**9*x**(5/2) + 4*a**8*b*x**3 + 2*a*
*7*b**2*x**(7/2)) + 30*b**6*x**(7/2)*log(x)/(2*a**9*x**(5/2) + 4*
a**8*b*x**3 + 2*a**7*b**2*x**(7/2)) - 60*b**6*x**(7/2)*log(a/b +
sqrt(x))/(2*a**9*x**(5/2) + 4*a**8*b*x**3 + 2*a**7*b**2*x**(7/2))
, True))
```

GIAC/XCAS [A] time = 0.295352, size = 136, normalized size = 1.23

$$-\frac{30\,b^4\ln\left(\left|b\sqrt{x}+a\right|\right)}{a^7}+\frac{15\,b^4\ln\left(\left|x\right|\right)}{a^7}+\frac{60\,ab^5x^{\frac{5}{2}}+90\,a^2b^4x^2+20\,a^3b^3x^{\frac{3}{2}}-5\,a^4b^2x+2\,a^5b\sqrt{x}-a^6}{2\left(b\sqrt{x}+a\right)^2a^7x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^3*x^3),x, algorithm="giac")
```

```
[Out] -30*b^4*ln(abs(b*sqrt(x) + a))/a^7 + 15*b^4*ln(abs(x))/a^7 + 1/2*
(60*a*b^5*x^(5/2) + 90*a^2*b^4*x^2 + 20*a^3*b^3*x^(3/2) - 5*a^4*b
^2*x + 2*a^5*b*sqrt(x) - a^6)/((b*sqrt(x) + a)^2*a^7*x^2)
```

3.2212 $\int \frac{1}{\left(a+b\sqrt{x}\right)^3 x^4}\,dx$

Optimal. Leaf size=139

$$-\frac{56b^6\log\left(a+b\sqrt{x}\right)}{a^9}+\frac{28b^6\log(x)}{a^9}+\frac{14b^6}{a^8\left(a+b\sqrt{x}\right)}+\frac{42b^5}{a^8\sqrt{x}}+\frac{b^6}{a^7\left(a+b\sqrt{x}\right)^2}-\frac{15b^4}{a^7x}+\frac{20b^3}{3a^6x^{3/2}}-\frac{3b^2}{a^5x^2}+\frac{6b}{5a^4x^{5/2}}-\frac{1}{3a^3x^3}$$

```
[Out] b^6/(a^7*(a + b*Sqrt[x])^2) + (14*b^6)/(a^8*(a + b*Sqrt[x])) - 1/
(3*a^3*x^3) + (6*b)/(5*a^4*x^(5/2)) - (3*b^2)/(a^5*x^2) + (20*b^3
)/(3*a^6*x^(3/2)) - (15*b^4)/(a^7*x) + (42*b^5)/(a^8*Sqrt[x]) - (
56*b^6*Log[a + b*Sqrt[x]])/a^9 + (28*b^6*Log[x])/a^9
```

Rubi [A] time = 0.234081, antiderivative size = 139, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{56b^6\log\left(a+b\sqrt{x}\right)}{a^9}+\frac{28b^6\log(x)}{a^9}+\frac{14b^6}{a^8\left(a+b\sqrt{x}\right)}+\frac{42b^5}{a^8\sqrt{x}}+\frac{b^6}{a^7\left(a+b\sqrt{x}\right)^2}-\frac{15b^4}{a^7x}+\frac{20b^3}{3a^6x^{3/2}}-\frac{3b^2}{a^5x^2}+\frac{6b}{5a^4x^{5/2}}-\frac{1}{3a^3x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b*Sqrt[x])^3*x^4),x]
```

```
[Out] b^6/(a^7*(a + b*Sqrt[x])^2) + (14*b^6)/(a^8*(a + b*Sqrt[x])) - 1/
(3*a^3*x^3) + (6*b)/(5*a^4*x^(5/2)) - (3*b^2)/(a^5*x^2) + (20*b^3
)/(3*a^6*x^(3/2)) - (15*b^4)/(a^7*x) + (42*b^5)/(a^8*Sqrt[x]) - (
56*b^6*Log[a + b*Sqrt[x]])/a^9 + (28*b^6*Log[x])/a^9
```

Rubi in Sympy [A] time = 39.7535, size = 141, normalized size = 1.01

$$-\frac{1}{3a^3x^3}+\frac{6b}{5a^4x^{\frac{5}{2}}}-\frac{3b^2}{a^5x^2}+\frac{20b^3}{3a^6x^{\frac{3}{2}}}+\frac{b^6}{a^7\left(a+b\sqrt{x}\right)^2}-\frac{15b^4}{a^7x}+\frac{14b^6}{a^8\left(a+b\sqrt{x}\right)}+\frac{42b^5}{a^8\sqrt{x}}+\frac{56b^6\log\left(\sqrt{x}\right)}{a^9}-\frac{56b^6\log\left(a+b\sqrt{x}\right)}{a^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(a+b*x**(1/2))**3,x)
```

```
[Out] -1/(3*a**3*x**3) + 6*b/(5*a**4*x**(5/2)) - 3*b**2/(a**5*x**2) + 2
0*b**3/(3*a**6*x**(3/2)) + b**6/(a**7*(a + b*sqrt(x))**2) - 15*b*
*4/(a**7*x) + 14*b**6/(a**8*(a + b*sqrt(x))) + 42*b**5/(a**8*sqrt
(x)) + 56*b**6*log(sqrt(x))/a**9 - 56*b**6*log(a + b*sqrt(x))/a**
9
```

Mathematica [A] time = 0.276557, size = 128, normalized size = 0.92

$$\frac{\frac{a\left(-5a^7+8a^6b\sqrt{x}-14a^5b^2x+28a^4b^3x^{3/2}-70a^3b^4x^2+280a^2b^5x^{5/2}+1260ab^6x^3+840b^7x^{7/2}\right)}{x^3\left(a+b\sqrt{x}\right)^2}-840b^6\log\left(a+b\sqrt{x}\right)+420b^6\log(x)}{15a^9}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b*Sqrt[x])^3*x^4),x]
```

```
[Out] ((a*(-5*a^7 + 8*a^6*b*Sqrt[x] - 14*a^5*b^2*x + 28*a^4*b^3*x^(3/2)
 - 70*a^3*b^4*x^2 + 280*a^2*b^5*x^(5/2) + 1260*a*b^6*x^3 + 840*b^
7*x^(7/2)))/((a + b*Sqrt[x])^2*x^3) - 840*b^6*Log[a + b*Sqrt[x]]
+ 420*b^6*Log[x])/(15*a^9)
```

Maple [A] time = 0.019, size = 122, normalized size = 0.9

$$-\frac{1}{3\,a^{3}x^{3}}+\frac{6\,b}{5\,a^{4}}x^{-\frac{5}{2}}-3\,\frac{b^{2}}{a^{5}x^{2}}+\frac{20\,b^{3}}{3\,a^{6}}x^{-\frac{3}{2}}-15\,\frac{b^{4}}{a^{7}x}+28\,\frac{b^{6}\ln(x)}{a^{9}}-56\,\frac{b^{6}\ln\left(a+b\sqrt{x}\right)}{a^{9}}+42\,\frac{b^{5}}{a^{8}\sqrt{x}}+\frac{b^{6}}{a^{7}}\left(a+b\sqrt{x}\right)^{-2}+14\,\frac{b^{6}}{a^{8}\left(a+b\sqrt{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(a+b*x^(1/2))^3,x)
```

```
[Out] -1/3/a^3/x^3+6/5*b/a^4/x^(5/2)-3*b^2/a^5/x^2+20/3*b^3/a^6/x^(3/2)
-15*b^4/a^7/x+28*b^6*ln(x)/a^9-56*b^6*ln(a+b*x^(1/2))/a^9+42*b^5/
a^8/x^(1/2)+b^6/a^7/(a+b*x^(1/2))^2+14*b^6/a^8/(a+b*x^(1/2))
```

Maxima [A] time = 1.44213, size = 178, normalized size = 1.28

$$\frac{840\,b^{7}x^{\frac{7}{2}}+1260\,ab^{6}x^{3}+280\,a^{2}b^{5}x^{\frac{5}{2}}-70\,a^{3}b^{4}x^{2}+28\,a^{4}b^{3}x^{\frac{3}{2}}-14\,a^{5}b^{2}x+8\,a^{6}b\sqrt{x}-5\,a^{7}}{15\left(a^{8}b^{2}x^{4}+2\,a^{9}bx^{\frac{7}{2}}+a^{10}x^{3}\right)}-\frac{56\,b^{6}\log\left(b\sqrt{x}+a\right)}{a^{9}}+\frac{28\,b^{6}\log(x)}{a^{9}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^3*x^4),x, algorithm="maxima")
```

```
[Out] 1/15*(840*b^7*x^(7/2) + 1260*a*b^6*x^3 + 280*a^2*b^5*x^(5/2) - 70
*a^3*b^4*x^2 + 28*a^4*b^3*x^(3/2) - 14*a^5*b^2*x + 8*a^6*b*sqrt(x
) - 5*a^7)/(a^8*b^2*x^4 + 2*a^9*b*x^(7/2) + a^10*x^3) - 56*b^6*lo
g(b*sqrt(x) + a)/a^9 + 28*b^6*log(x)/a^9
```

Fricas [A] time = 0.244592, size = 242, normalized size = 1.74

$$\frac{1260\,a^{2}b^{6}x^{3}-70\,a^{4}b^{4}x^{2}-14\,a^{6}b^{2}x-5\,a^{8}-840\left(b^{8}x^{4}+2\,ab^{7}x^{\frac{7}{2}}+a^{2}b^{6}x^{3}\right)\log\left(b\sqrt{x}+a\right)+840\left(b^{8}x^{4}+2\,ab^{7}x^{\frac{7}{2}}+a^{2}b^{6}x^{3}\right.}{15\left(a^{9}b^{2}x^{4}+2\,a^{10}bx^{\frac{7}{2}}+a^{11}x^{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^3*x^4),x, algorithm="fricas")
```

```
[Out] 1/15*(1260*a^2*b^6*x^3 - 70*a^4*b^4*x^2 - 14*a^6*b^2*x - 5*a^8 -
840*(b^8*x^4 + 2*a*b^7*x^(7/2) + a^2*b^6*x^3)*log(b*sqrt(x) + a)
+ 840*(b^8*x^4 + 2*a*b^7*x^(7/2) + a^2*b^6*x^3)*log(sqrt(x)) + 4*
(210*a*b^7*x^3 + 70*a^3*b^5*x^2 + 7*a^5*b^3*x + 2*a^7*b)*sqrt(x))
/(a^9*b^2*x^4 + 2*a^10*b*x^(7/2) + a^11*x^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(a+b*x**(1/2))**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.278928, size = 166, normalized size = 1.19

$$-\frac{56\,b^6\ln\left(\left|b\sqrt{x}+a\right|\right)}{a^9}+\frac{28\,b^6\ln\left(|x|\right)}{a^9}+\frac{840\,ab^7x^{\frac{7}{2}}+1260\,a^2b^6x^3+280\,a^3b^5x^{\frac{5}{2}}-70\,a^4b^4x^2+28\,a^5b^3x^{\frac{3}{2}}-14\,a^6b^2x+8\,a^7b\sqrt{x}-5\,a^8}{15\left(b\sqrt{x}+a\right)^2a^9x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^3*x^4),x, algorithm="giac")
```

```
[Out] -56*b^6*ln(abs(b*sqrt(x) + a))/a^9 + 28*b^6*ln(abs(x))/a^9 + 1/15
*(840*a*b^7*x^(7/2) + 1260*a^2*b^6*x^3 + 280*a^3*b^5*x^(5/2) - 70
*a^4*b^4*x^2 + 28*a^5*b^3*x^(3/2) - 14*a^6*b^2*x + 8*a^7*b*sqrt(x
) - 5*a^8)/((b*sqrt(x) + a)^2*a^9*x^3)
```

3.2213 $\int \frac{x^4}{\left(a+b\sqrt{x}\right)^5}\,dx$

Optimal. Leaf size=155

$$\frac{a^9}{2b^{10}\left(a+b\sqrt{x}\right)^4}-\frac{6a^8}{b^{10}\left(a+b\sqrt{x}\right)^3}+\frac{36a^7}{b^{10}\left(a+b\sqrt{x}\right)^2}-\frac{168a^6}{b^{10}\left(a+b\sqrt{x}\right)}-\frac{252a^5\log\left(a+b\sqrt{x}\right)}{b^{10}}+\frac{140a^4\sqrt{x}}{b^9}-\frac{35a^3x}{b^8}+\frac{10a^2x^{3/2}}{b^7}-\frac{5ax^2}{2b^6}+\frac{2x^{5/2}}{5b^5}$$

```
[Out] a^9/(2*b^10*(a + b*Sqrt[x])^4) - (6*a^8)/(b^10*(a + b*Sqrt[x])^3)
 + (36*a^7)/(b^10*(a + b*Sqrt[x])^2) - (168*a^6)/(b^10*(a + b*Sqr
t[x])) + (140*a^4*Sqrt[x])/b^9 - (35*a^3*x)/b^8 + (10*a^2*x^(3/2)
)/b^7 - (5*a*x^2)/(2*b^6) + (2*x^(5/2))/(5*b^5) - (252*a^5*Log[a
+ b*Sqrt[x]])/b^10
```

Rubi [A] time = 0.309515, antiderivative size = 155, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^9}{2b^{10}\left(a+b\sqrt{x}\right)^4}-\frac{6a^8}{b^{10}\left(a+b\sqrt{x}\right)^3}+\frac{36a^7}{b^{10}\left(a+b\sqrt{x}\right)^2}-\frac{168a^6}{b^{10}\left(a+b\sqrt{x}\right)}-\frac{252a^5\log\left(a+b\sqrt{x}\right)}{b^{10}}+\frac{140a^4\sqrt{x}}{b^9}-\frac{35a^3x}{b^8}+\frac{10a^2x^{3/2}}{b^7}-\frac{5ax^2}{2b^6}+\frac{2x^{5/2}}{5b^5}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a + b*Sqrt[x])^5,x]
```

```
[Out] a^9/(2*b^10*(a + b*Sqrt[x])^4) - (6*a^8)/(b^10*(a + b*Sqrt[x])^3)
 + (36*a^7)/(b^10*(a + b*Sqrt[x])^2) - (168*a^6)/(b^10*(a + b*Sqr
t[x])) + (140*a^4*Sqrt[x])/b^9 - (35*a^3*x)/b^8 + (10*a^2*x^(3/2)
)/b^7 - (5*a*x^2)/(2*b^6) + (2*x^(5/2))/(5*b^5) - (252*a^5*Log[a
+ b*Sqrt[x]])/b^10
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^9}{2b^{10}\left(a+b\sqrt{x}\right)^4}-\frac{6a^8}{b^{10}\left(a+b\sqrt{x}\right)^3}+\frac{36a^7}{b^{10}\left(a+b\sqrt{x}\right)^2}-\frac{168a^6}{b^{10}\left(a+b\sqrt{x}\right)}-\frac{252a^5\log\left(a+b\sqrt{x}\right)}{b^{10}}+\frac{140a^4\sqrt{x}}{b^9}-\frac{70a^3\int^{\sqrt{x}}x\,dx}{b^8}+\frac{10a^2x^{\frac{3}{2}}}{b^7}-\frac{5ax^2}{2b^6}+\frac{2x^{\frac{5}{2}}}{5b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(a+b*x**(1/2))**5,x)
```

```
[Out] a**9/(2*b**10*(a + b*sqrt(x))**4) - 6*a**8/(b**10*(a + b*sqrt(x))
**3) + 36*a**7/(b**10*(a + b*sqrt(x))**2) - 168*a**6/(b**10*(a +
b*sqrt(x))) - 252*a**5*log(a + b*sqrt(x))/b**10 + 140*a**4*sqrt(x
)/b**9 - 70*a**3*Integral(x, (x, sqrt(x)))/b**8 + 10*a**2*x**(3/2
)/b**7 - 5*a*x**2/(2*b**6) + 2*x**(5/2)/(5*b**5)
```

Mathematica [A] time = 0.064673, size = 150, normalized size = 0.97

$$\frac{-1375a^9-2980a^8b\sqrt{x}+570a^7b^2x+5420a^6b^3x^{3/2}+3875a^5b^4x^2-2520a^5\left(a+b\sqrt{x}\right)^4\log\left(a+b\sqrt{x}\right)+504a^4b^5x^{5/2}-84a^3}{10b^{10}\left(a+b\sqrt{x}\right)^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(a + b*Sqrt[x])^5,x]
```

```
[Out] (-1375*a^9 - 2980*a^8*b*Sqrt[x] + 570*a^7*b^2*x + 5420*a^6*b^3*x^
(3/2) + 3875*a^5*b^4*x^2 + 504*a^4*b^5*x^(5/2) - 84*a^3*b^6*x^3 +
 24*a^2*b^7*x^(7/2) - 9*a*b^8*x^4 + 4*b^9*x^(9/2) - 2520*a^5*(a +
 b*Sqrt[x])^4*Log[a + b*Sqrt[x]])/(10*b^10*(a + b*Sqrt[x])^4)
```

Maple [A] time = 0.015, size = 134, normalized size = 0.9

$$-35\,{\frac{{a}^{3}x}{{b}^{8}}}+10\,{\frac{{a}^{2}{x}^{3/2}}{{b}^{7}}}-{\frac{5\,a{x}^{2}}{2\,{b}^{6}}}+{\frac{2}{5\,{b}^{5}}{x}^{{\frac{5}{2}}}}-252\,{\frac{{a}^{5}\ln \left(a+b\sqrt{x} \right) }{{b}^{10}}}+140\,{\frac{{a}^{4}\sqrt{x}}{{b}^{9}}}+{\frac{{a}^{9}}{2\,{b}^{10}} \left(a+b\sqrt{x} \right) ^{-4}}-6\,{\frac{{a}^{8}}{{b}^{10} \left(a+b\sqrt{x} \right) ^{3}}}+36\,{\frac{{a}^{7}}{{b}^{10} \left(a+b\sqrt{x} \right) ^{2}}}-168\,{\frac{{a}^{6}}{{b}^{10} \left(a+b\sqrt{x} \right) }}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(a+b*x^(1/2))^5,x)
```

```
[Out] -35*a^3*x/b^8+10*a^2*x^(3/2)/b^7-5/2*a*x^2/b^6+2/5*x^(5/2)/b^5-25
2*a^5*ln(a+b*x^(1/2))/b^10+140*a^4*x^(1/2)/b^9+1/2*a^9/b^10/(a+b*
x^(1/2))^4-6*a^8/b^10/(a+b*x^(1/2))^3+36*a^7/b^10/(a+b*x^(1/2))^2
-168*a^6/b^10/(a+b*x^(1/2))
```

Maxima [A] time = 1.42974, size = 220, normalized size = 1.42

$$-\frac{252 \, a^{5} \log\left(b \sqrt{x} + a\right)}{b^{10}} + \frac{2 \, {\left(b \sqrt{x} + a\right)}^{5}}{5 \, b^{10}} - \frac{9 \, {\left(b \sqrt{x} + a\right)}^{4} a}{2 \, b^{10}} + \frac{24 \, {\left(b \sqrt{x} + a\right)}^{3} a^{2}}{b^{10}} - \frac{84 \, {\left(b \sqrt{x} + a\right)}^{2} a^{3}}{b^{10}} + \frac{252 \, {\left(b \sqrt{x} + a\right)} a^{4}}{b^{10}} - \frac{168 \, a^{6}}{{\left(b \sqrt{x} + a\right)} b^{10}} + \frac{36 \, a^{7}}{{\left(b \sqrt{x} + a\right)}^{2} b^{10}} - \frac{6 \, a^{8}}{{\left(b \sqrt{x} + a\right)}^{3} b^{10}} + \frac{a^{9}}{2 \, {\left(b \sqrt{x} + a\right)}^{4} b^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*sqrt(x) + a)^5,x, algorithm="maxima")
```

```
[Out] -252*a^5*log(b*sqrt(x) + a)/b^10 + 2/5*(b*sqrt(x) + a)^5/b^10 - 9
/2*(b*sqrt(x) + a)^4*a/b^10 + 24*(b*sqrt(x) + a)^3*a^2/b^10 - 84*
(b*sqrt(x) + a)^2*a^3/b^10 + 252*(b*sqrt(x) + a)*a^4/b^10 - 168*a
^6/((b*sqrt(x) + a)*b^10) + 36*a^7/((b*sqrt(x) + a)^2*b^10) - 6*a
^8/((b*sqrt(x) + a)^3*b^10) + 1/2*a^9/((b*sqrt(x) + a)^4*b^10)
```

Fricas [A] time = 0.246303, size = 263, normalized size = 1.7

$$-\frac{9 \, a b^{8} x^{4} + 84 \, a^{3} b^{6} x^{3} - 3875 \, a^{5} b^{4} x^{2} - 570 \, a^{7} b^{2} x + 1375 \, a^{9} + 2520 \, {\left(a^{5} b^{4} x^{2} + 6 \, a^{7} b^{2} x + a^{9} + 4 \, {\left(a^{6} b^{3} x + a^{8} b\right)} \sqrt{x}\right)} \log\left(b \sqrt{x} + \right.}{10 \, {\left(b^{14} x^{2} + 6 \, a^{2} b^{12} x + a^{4} b^{10} + 4 \, {\left(a b^{13} x + a^{3} b^{11}\right)} \sqrt{x}\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*sqrt(x) + a)^5,x, algorithm="fricas")
```

```
[Out] -1/10*(9*a*b^8*x^4 + 84*a^3*b^6*x^3 - 3875*a^5*b^4*x^2 - 570*a^7*
b^2*x + 1375*a^9 + 2520*(a^5*b^4*x^2 + 6*a^7*b^2*x + a^9 + 4*(a^6
*b^3*x + a^8*b)*sqrt(x))*log(b*sqrt(x) + a) - 4*(b^9*x^4 + 6*a^2*
b^7*x^3 + 126*a^4*b^5*x^2 + 1355*a^6*b^3*x - 745*a^8*b)*sqrt(x))/
(b^14*x^2 + 6*a^2*b^12*x + a^4*b^10 + 4*(a*b^13*x + a^3*b^11)*sqr
t(x))
```

Sympy [A] time = 26.4734, size = 1013, normalized size = 6.54

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(a+b*x**(1/2))**5,x)
```

```
[Out] Piecewise((-2520*a**9*log(a/b + sqrt(x))/(10*a**4*b**10 + 40*a**3
*b**11*sqrt(x) + 60*a**2*b**12*x + 40*a*b**13*x**(3/2) + 10*b**14
*x**2) - 5439*a**9/(10*a**4*b**10 + 40*a**3*b**11*sqrt(x) + 60*a*
*2*b**12*x + 40*a*b**13*x**(3/2) + 10*b**14*x**2) - 10080*a**8*b*
sqrt(x)*log(a/b + sqrt(x))/(10*a**4*b**10 + 40*a**3*b**11*sqrt(x)
 + 60*a**2*b**12*x + 40*a*b**13*x**(3/2) + 10*b**14*x**2) - 19236
*a**8*b*sqrt(x)/(10*a**4*b**10 + 40*a**3*b**11*sqrt(x) + 60*a**2*
b**12*x + 40*a*b**13*x**(3/2) + 10*b**14*x**2) - 15120*a**7*b**2*
x*log(a/b + sqrt(x))/(10*a**4*b**10 + 40*a**3*b**11*sqrt(x) + 60*
a**2*b**12*x + 40*a*b**13*x**(3/2) + 10*b**14*x**2) - 23814*a**7*
b**2*x/(10*a**4*b**10 + 40*a**3*b**11*sqrt(x) + 60*a**2*b**12*x +
 40*a*b**13*x**(3/2) + 10*b**14*x**2) - 10080*a**6*b**3*x**(3/2)*
log(a/b + sqrt(x))/(10*a**4*b**10 + 40*a**3*b**11*sqrt(x) + 60*a*
*2*b**12*x + 40*a*b**13*x**(3/2) + 10*b**14*x**2) - 10836*a**6*b*
*3*x**(3/2)/(10*a**4*b**10 + 40*a**3*b**11*sqrt(x) + 60*a**2*b**1
2*x + 40*a*b**13*x**(3/2) + 10*b**14*x**2) - 2520*a**5*b**4*x**2*
log(a/b + sqrt(x))/(10*a**4*b**10 + 40*a**3*b**11*sqrt(x) + 60*a*
*2*b**12*x + 40*a*b**13*x**(3/2) + 10*b**14*x**2) - 189*a**5*b**4
*x**2/(10*a**4*b**10 + 40*a**3*b**11*sqrt(x) + 60*a**2*b**12*x +
40*a*b**13*x**(3/2) + 10*b**14*x**2) + 504*a**4*b**5*x**(5/2)/(10
*a**4*b**10 + 40*a**3*b**11*sqrt(x) + 60*a**2*b**12*x + 40*a*b**1
3*x**(3/2) + 10*b**14*x**2) - 84*a**3*b**6*x**3/(10*a**4*b**10 +
40*a**3*b**11*sqrt(x) + 60*a**2*b**12*x + 40*a*b**13*x**(3/2) + 1
0*b**14*x**2) + 24*a**2*b**7*x**(7/2)/(10*a**4*b**10 + 40*a**3*b*
*11*sqrt(x) + 60*a**2*b**12*x + 40*a*b**13*x**(3/2) + 10*b**14*x*
*2) - 9*a*b**8*x**4/(10*a**4*b**10 + 40*a**3*b**11*sqrt(x) + 60*a
**2*b**12*x + 40*a*b**13*x**(3/2) + 10*b**14*x**2) + 4*b**9*x**(9
/2)/(10*a**4*b**10 + 40*a**3*b**11*sqrt(x) + 60*a**2*b**12*x + 40
*a*b**13*x**(3/2) + 10*b**14*x**2), Ne(b, 0)), (x**5/(5*a**5), Tr
ue))
```

GIAC/XCAS [A] time = 0.259332, size = 163, normalized size = 1.05

$$-\frac{252\,a^5\ln\left(\left|b\sqrt{x}+a\right|\right)}{b^{10}}-\frac{336\,a^6b^3x^{\frac{3}{2}}+936\,a^7b^2x+876\,a^8b\sqrt{x}+275\,a^9}{2\,\left(b\sqrt{x}+a\right)^4b^{10}}+\frac{4\,b^{20}x^{\frac{5}{2}}-25\,ab^{19}x^2+100\,a^2b^{18}x^{\frac{3}{2}}-350\,a^3b^{17}x+1400\,a^4b^{16}\sqrt{x}}{10\,b^{25}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*sqrt(x) + a)^5,x, algorithm="giac")
```

```
[Out] -252*a^5*ln(abs(b*sqrt(x) + a))/b^10 - 1/2*(336*a^6*b^3*x^(3/2) +
 936*a^7*b^2*x + 876*a^8*b*sqrt(x) + 275*a^9)/((b*sqrt(x) + a)^4*
b^10) + 1/10*(4*b^20*x^(5/2) - 25*a*b^19*x^2 + 100*a^2*b^18*x^(3/
2) - 350*a^3*b^17*x + 1400*a^4*b^16*sqrt(x))/b^25
```

3.2214 $\int \frac{x^3}{\left(a+b\sqrt{x}\right)^5}\,dx$

Optimal. Leaf size=131

$$\frac{a^7}{2b^8\left(a+b\sqrt{x}\right)^4}-\frac{14a^6}{3b^8\left(a+b\sqrt{x}\right)^3}+\frac{21a^5}{b^8\left(a+b\sqrt{x}\right)^2}-\frac{70a^4}{b^8\left(a+b\sqrt{x}\right)}-\frac{70a^3\log\left(a+b\sqrt{x}\right)}{b^8}+\frac{30a^2\sqrt{x}}{b^7}-\frac{5ax}{b^6}+\frac{2x^{3/2}}{3b^5}$$

```
[Out] a^7/(2*b^8*(a + b*Sqrt[x])^4) - (14*a^6)/(3*b^8*(a + b*Sqrt[x])^3
) + (21*a^5)/(b^8*(a + b*Sqrt[x])^2) - (70*a^4)/(b^8*(a + b*Sqrt[
x])) + (30*a^2*Sqrt[x])/b^7 - (5*a*x)/b^6 + (2*x^(3/2))/(3*b^5) -
 (70*a^3*Log[a + b*Sqrt[x]])/b^8
```

Rubi [A] time = 0.229271, antiderivative size = 131, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^7}{2b^8\left(a+b\sqrt{x}\right)^4}-\frac{14a^6}{3b^8\left(a+b\sqrt{x}\right)^3}+\frac{21a^5}{b^8\left(a+b\sqrt{x}\right)^2}-\frac{70a^4}{b^8\left(a+b\sqrt{x}\right)}-\frac{70a^3\log\left(a+b\sqrt{x}\right)}{b^8}+\frac{30a^2\sqrt{x}}{b^7}-\frac{5ax}{b^6}+\frac{2x^{3/2}}{3b^5}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(a + b*Sqrt[x])^5,x]
```

```
[Out] a^7/(2*b^8*(a + b*Sqrt[x])^4) - (14*a^6)/(3*b^8*(a + b*Sqrt[x])^3
) + (21*a^5)/(b^8*(a + b*Sqrt[x])^2) - (70*a^4)/(b^8*(a + b*Sqrt[
x])) + (30*a^2*Sqrt[x])/b^7 - (5*a*x)/b^6 + (2*x^(3/2))/(3*b^5) -
 (70*a^3*Log[a + b*Sqrt[x]])/b^8
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^7}{2b^8\left(a+b\sqrt{x}\right)^4}-\frac{14a^6}{3b^8\left(a+b\sqrt{x}\right)^3}+\frac{21a^5}{b^8\left(a+b\sqrt{x}\right)^2}-\frac{70a^4}{b^8\left(a+b\sqrt{x}\right)}-\frac{70a^3\log\left(a+b\sqrt{x}\right)}{b^8}+\frac{30a^2\sqrt{x}}{b^7}-\frac{10a\int^{\sqrt{x}}x\,dx}{b^6}+\frac{2x^{\frac{3}{2}}}{3b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(a+b*x**(1/2))**5,x)
```

```
[Out] a**7/(2*b**8*(a + b*sqrt(x))**4) - 14*a**6/(3*b**8*(a + b*sqrt(x)
)**3) + 21*a**5/(b**8*(a + b*sqrt(x))**2) - 70*a**4/(b**8*(a + b*
sqrt(x))) - 70*a**3*log(a + b*sqrt(x))/b**8 + 30*a**2*sqrt(x)/b**
7 - 10*a*Integral(x, (x, sqrt(x)))/b**6 + 2*x**(3/2)/(3*b**5)
```

Mathematica [A] time = 0.0545923, size = 126, normalized size = 0.96

$$\frac{-319a^7-856a^6b\sqrt{x}-444a^5b^2x+544a^4b^3x^{3/2}+556a^3b^4x^2-420a^3\left(a+b\sqrt{x}\right)^4\log\left(a+b\sqrt{x}\right)+84a^2b^5x^{5/2}-14ab^6x^3+4}{6b^8\left(a+b\sqrt{x}\right)^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(a + b*Sqrt[x])^5,x]
```

```
[Out] (-319*a^7 - 856*a^6*b*Sqrt[x] - 444*a^5*b^2*x + 544*a^4*b^3*x^(3/
2) + 556*a^3*b^4*x^2 + 84*a^2*b^5*x^(5/2) - 14*a*b^6*x^3 + 4*b^7*
x^(7/2) - 420*a^3*(a + b*Sqrt[x])^4*Log[a + b*Sqrt[x]])/(6*b^8*(a
 + b*Sqrt[x])^4)
```

Maple [A] time = 0.014, size = 112, normalized size = 0.9

$$-5\,\frac{ax}{b^6}+\frac{2}{3\,b^5}x^{\frac{3}{2}}-70\,\frac{a^3\ln\left(a+b\sqrt{x}\right)}{b^8}+30\,\frac{a^2\sqrt{x}}{b^7}+\frac{a^7}{2\,b^8}\left(a+b\sqrt{x}\right)^{-4}-\frac{14\,a^6}{3\,b^8}\left(a+b\sqrt{x}\right)^{-3}+21\,\frac{a^5}{b^8\left(a+b\sqrt{x}\right)^2}-70\,\frac{a^4}{b^8\left(a+b\sqrt{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(a+b*x^(1/2))^5,x)
```

```
[Out] -5*a*x/b^6+2/3*x^(3/2)/b^5-70*a^3*ln(a+b*x^(1/2))/b^8+30*a^2*x^(1
/2)/b^7+1/2*a^7/b^8/(a+b*x^(1/2))^4-14/3*a^6/b^8/(a+b*x^(1/2))^3+
21*a^5/b^8/(a+b*x^(1/2))^2-70*a^4/b^8/(a+b*x^(1/2))
```

Maxima [A] time = 1.4564, size = 174, normalized size = 1.33

$$-\frac{70\,a^3\log\left(b\sqrt{x}+a\right)}{b^8}+\frac{2\left(b\sqrt{x}+a\right)^3}{3\,b^8}-\frac{7\left(b\sqrt{x}+a\right)^2a}{b^8}+\frac{42\left(b\sqrt{x}+a\right)a^2}{b^8}-\frac{70\,a^4}{\left(b\sqrt{x}+a\right)b^8}+\frac{21\,a^5}{\left(b\sqrt{x}+a\right)^2b^8}-\frac{14\,a^6}{3\left(b\sqrt{x}+a\right)^3b^8}+\frac{a^7}{2\left(b\sqrt{x}+a\right)^4b^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*sqrt(x) + a)^5,x, algorithm="maxima")
```

```
[Out] -70*a^3*log(b*sqrt(x) + a)/b^8 + 2/3*(b*sqrt(x) + a)^3/b^8 - 7*(b
*sqrt(x) + a)^2*a/b^8 + 42*(b*sqrt(x) + a)*a^2/b^8 - 70*a^4/((b*s
qrt(x) + a)*b^8) + 21*a^5/((b*sqrt(x) + a)^2*b^8) - 14/3*a^6/((b*
sqrt(x) + a)^3*b^8) + 1/2*a^7/((b*sqrt(x) + a)^4*b^8)
```

Fricas [A] time = 0.245252, size = 234, normalized size = 1.79

$$-\frac{14\,ab^6x^3-556\,a^3b^4x^2+444\,a^5b^2x+319\,a^7+420\left(a^3b^4x^2+6\,a^5b^2x+a^7+4\left(a^4b^3x+a^6b\right)\sqrt{x}\right)\log\left(b\sqrt{x}+a\right)-4\left(b^7x^3+\right.}{6\left(b^{12}x^2+6\,a^2b^{10}x+a^4b^8+4\left(ab^{11}x+a^3b^9\right)\sqrt{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*sqrt(x) + a)^5,x, algorithm="fricas")
```

```
[Out] -1/6*(14*a*b^6*x^3 - 556*a^3*b^4*x^2 + 444*a^5*b^2*x + 319*a^7 +
420*(a^3*b^4*x^2 + 6*a^5*b^2*x + a^7 + 4*(a^4*b^3*x + a^6*b)*sqrt
(x))*log(b*sqrt(x) + a) - 4*(b^7*x^3 + 21*a^2*b^5*x^2 + 136*a^4*b
^3*x - 214*a^6*b)*sqrt(x))/(b^12*x^2 + 6*a^2*b^10*x + a^4*b^8 + 4
*(a*b^11*x + a^3*b^9)*sqrt(x))
```

Sympy [A] time = 10.2422, size = 882, normalized size = 6.73

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(a+b*x**(1/2))**5,x)
```

```
[Out] Piecewise((-420*a**7*log(a/b + sqrt(x))/(6*a**4*b**8 + 24*a**3*b*
*9*sqrt(x) + 36*a**2*b**10*x + 24*a*b**11*x**(3/2) + 6*b**12*x**2
) - 959*a**7/(6*a**4*b**8 + 24*a**3*b**9*sqrt(x) + 36*a**2*b**10*
x + 24*a*b**11*x**(3/2) + 6*b**12*x**2) - 1680*a**6*b*sqrt(x)*log
(a/b + sqrt(x))/(6*a**4*b**8 + 24*a**3*b**9*sqrt(x) + 36*a**2*b**
10*x + 24*a*b**11*x**(3/2) + 6*b**12*x**2) - 3416*a**6*b*sqrt(x)/
(6*a**4*b**8 + 24*a**3*b**9*sqrt(x) + 36*a**2*b**10*x + 24*a*b**1
1*x**(3/2) + 6*b**12*x**2) - 2520*a**5*b**2*x*log(a/b + sqrt(x))/
(6*a**4*b**8 + 24*a**3*b**9*sqrt(x) + 36*a**2*b**10*x + 24*a*b**1
1*x**(3/2) + 6*b**12*x**2) - 4284*a**5*b**2*x/(6*a**4*b**8 + 24*a
**3*b**9*sqrt(x) + 36*a**2*b**10*x + 24*a*b**11*x**(3/2) + 6*b**1
2*x**2) - 1680*a**4*b**3*x**(3/2)*log(a/b + sqrt(x))/(6*a**4*b**8
 + 24*a**3*b**9*sqrt(x) + 36*a**2*b**10*x + 24*a*b**11*x**(3/2) +
 6*b**12*x**2) - 2016*a**4*b**3*x**(3/2)/(6*a**4*b**8 + 24*a**3*b
**9*sqrt(x) + 36*a**2*b**10*x + 24*a*b**11*x**(3/2) + 6*b**12*x**
2) - 420*a**3*b**4*x**2*log(a/b + sqrt(x))/(6*a**4*b**8 + 24*a**3
*b**9*sqrt(x) + 36*a**2*b**10*x + 24*a*b**11*x**(3/2) + 6*b**12*x
**2) - 84*a**3*b**4*x**2/(6*a**4*b**8 + 24*a**3*b**9*sqrt(x) + 36
*a**2*b**10*x + 24*a*b**11*x**(3/2) + 6*b**12*x**2) + 84*a**2*b**
5*x**(5/2)/(6*a**4*b**8 + 24*a**3*b**9*sqrt(x) + 36*a**2*b**10*x
+ 24*a*b**11*x**(3/2) + 6*b**12*x**2) - 14*a*b**6*x**3/(6*a**4*b*
*8 + 24*a**3*b**9*sqrt(x) + 36*a**2*b**10*x + 24*a*b**11*x**(3/2)
 + 6*b**12*x**2) + 4*b**7*x**(7/2)/(6*a**4*b**8 + 24*a**3*b**9*sq
rt(x) + 36*a**2*b**10*x + 24*a*b**11*x**(3/2) + 6*b**12*x**2), Ne
(b, 0)), (x**4/(4*a**5), True))
```

GIAC/XCAS [A] time = 0.280281, size = 134, normalized size = 1.02

$$-\frac{70\,a^3\ln\left(\left|b\sqrt{x}+a\right|\right)}{b^8}-\frac{420\,a^4b^3x^{\frac{3}{2}}+1134\,a^5b^2x+1036\,a^6b\sqrt{x}+319\,a^7}{6\left(b\sqrt{x}+a\right)^4b^8}+\frac{2\,b^{10}x^{\frac{3}{2}}-15\,ab^9x+90\,a^2b^8\sqrt{x}}{3\,b^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*sqrt(x) + a)^5,x, algorithm="giac")
```

```
[Out] -70*a^3*ln(abs(b*sqrt(x) + a))/b^8 - 1/6*(420*a^4*b^3*x^(3/2) + 1
134*a^5*b^2*x + 1036*a^6*b*sqrt(x) + 319*a^7)/((b*sqrt(x) + a)^4*
b^8) + 1/3*(2*b^10*x^(3/2) - 15*a*b^9*x + 90*a^2*b^8*sqrt(x))/b^1
5
```

3.2215 $\int \frac{x^2}{\left(a+b\sqrt{x}\right)^5}\,dx$

Optimal. Leaf size=107

$$\frac{a^5}{2b^6\left(a+b\sqrt{x}\right)^4}-\frac{10a^4}{3b^6\left(a+b\sqrt{x}\right)^3}+\frac{10a^3}{b^6\left(a+b\sqrt{x}\right)^2}-\frac{20a^2}{b^6\left(a+b\sqrt{x}\right)}-\frac{10a\log\left(a+b\sqrt{x}\right)}{b^6}+\frac{2\sqrt{x}}{b^5}$$

```
[Out] a^5/(2*b^6*(a + b*Sqrt[x])^4) - (10*a^4)/(3*b^6*(a + b*Sqrt[x])^3
) + (10*a^3)/(b^6*(a + b*Sqrt[x])^2) - (20*a^2)/(b^6*(a + b*Sqrt[
x])) + (2*Sqrt[x])/b^5 - (10*a*Log[a + b*Sqrt[x]])/b^6
```

Rubi [A] time = 0.160153, antiderivative size = 107, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^5}{2b^6\left(a+b\sqrt{x}\right)^4}-\frac{10a^4}{3b^6\left(a+b\sqrt{x}\right)^3}+\frac{10a^3}{b^6\left(a+b\sqrt{x}\right)^2}-\frac{20a^2}{b^6\left(a+b\sqrt{x}\right)}-\frac{10a\log\left(a+b\sqrt{x}\right)}{b^6}+\frac{2\sqrt{x}}{b^5}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b*Sqrt[x])^5,x]
```

```
[Out] a^5/(2*b^6*(a + b*Sqrt[x])^4) - (10*a^4)/(3*b^6*(a + b*Sqrt[x])^3
) + (10*a^3)/(b^6*(a + b*Sqrt[x])^2) - (20*a^2)/(b^6*(a + b*Sqrt[
x])) + (2*Sqrt[x])/b^5 - (10*a*Log[a + b*Sqrt[x]])/b^6
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^5}{2b^6\left(a+b\sqrt{x}\right)^4}-\frac{10a^4}{3b^6\left(a+b\sqrt{x}\right)^3}+\frac{10a^3}{b^6\left(a+b\sqrt{x}\right)^2}-\frac{20a^2}{b^6\left(a+b\sqrt{x}\right)}-\frac{10a\log\left(a+b\sqrt{x}\right)}{b^6}+2\int^{\sqrt{x}}\frac{1}{b^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b*x**(1/2))**5,x)
```

```
[Out] a**5/(2*b**6*(a + b*sqrt(x))**4) - 10*a**4/(3*b**6*(a + b*sqrt(x)
)**3) + 10*a**3/(b**6*(a + b*sqrt(x))**2) - 20*a**2/(b**6*(a + b*
sqrt(x))) - 10*a*log(a + b*sqrt(x))/b**6 + 2*Integral(b**(-5), (x
, sqrt(x)))
```

Mathematica [A] time = 0.0696635, size = 100, normalized size = 0.93

$$-\frac{77a^5+248a^4b\sqrt{x}+252a^3b^2x+48a^2b^3x^{3/2}-48ab^4x^2+60a\left(a+b\sqrt{x}\right)^4\log\left(a+b\sqrt{x}\right)-12b^5x^{5/2}}{6b^6\left(a+b\sqrt{x}\right)^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a + b*Sqrt[x])^5,x]
```

```
[Out] -(77*a^5 + 248*a^4*b*Sqrt[x] + 252*a^3*b^2*x + 48*a^2*b^3*x^(3/2)
 - 48*a*b^4*x^2 - 12*b^5*x^(5/2) + 60*a*(a + b*Sqrt[x])^4*Log[a +
 b*Sqrt[x]])/(6*b^6*(a + b*Sqrt[x])^4)
```

Maple [A] time = 0.013, size = 92, normalized size = 0.9

$$-10\,{\frac {a\ln \left(a+b\sqrt {x} \right) }{{b}^{6}}}+2\,{\frac {\sqrt {x}}{{b}^{5}}}+{\frac {{a}^{5}}{2\,{b}^{6}}\left(a+b\sqrt {x} \right) ^{-4}}-{\frac {10\,{a}^{4}}{3\,{b}^{6}}\left(a+b\sqrt {x} \right) ^{-3}}+10\,{\frac {{a}^{3}}{{b}^{6} \left(a+b\sqrt {x} \right) ^{2}}}-20\,{\frac {{a}^{2}}{{b}^{6} \left(a+b\sqrt {x} \right) }}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(a+b*x^(1/2))^5,x)
```

```
[Out] -10*a*ln(a+b*x^(1/2))/b^6+2*x^(1/2)/b^5+1/2*a^5/b^6/(a+b*x^(1/2))
^4-10/3*a^4/b^6/(a+b*x^(1/2))^3+10*a^3/b^6/(a+b*x^(1/2))^2-20*a^2
/b^6/(a+b*x^(1/2))
```

Maxima [A] time = 1.45195, size = 128, normalized size = 1.2

$$-\frac{10 \, a \log\left(b \sqrt{x} + a\right)}{b^{6}} + \frac{2 \, {\left(b \sqrt{x} + a\right)}}{b^{6}} - \frac{20 \, a^{2}}{{\left(b \sqrt{x} + a\right)} b^{6}} + \frac{10 \, a^{3}}{{\left(b \sqrt{x} + a\right)}^{2} b^{6}} - \frac{10 \, a^{4}}{3 \, {\left(b \sqrt{x} + a\right)}^{3} b^{6}} + \frac{a^{5}}{2 \, {\left(b \sqrt{x} + a\right)}^{4} b^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*sqrt(x) + a)^5,x, algorithm="maxima")
```

```
[Out] -10*a*log(b*sqrt(x) + a)/b^6 + 2*(b*sqrt(x) + a)/b^6 - 20*a^2/((b
*sqrt(x) + a)*b^6) + 10*a^3/((b*sqrt(x) + a)^2*b^6) - 10/3*a^4/((
b*sqrt(x) + a)^3*b^6) + 1/2*a^5/((b*sqrt(x) + a)^4*b^6)
```

Fricas [A] time = 0.239876, size = 203, normalized size = 1.9

$$\frac{48 \, a b^{4} x^{2} - 252 \, a^{3} b^{2} x - 77 \, a^{5} - 60 \, {\left(a b^{4} x^{2} + 6 \, a^{3} b^{2} x + a^{5} + 4 \, {\left(a^{2} b^{3} x + a^{4} b\right)} \sqrt{x}\right)} \log\left(b \sqrt{x} + a\right) + 4 \, {\left(3 \, b^{5} x^{2} - 12 \, a^{2} b^{3} x - 62 \, a}{6 \, {\left(b^{10} x^{2} + 6 \, a^{2} b^{8} x + a^{4} b^{6} + 4 \, {\left(a b^{9} x + a^{3} b^{7}\right)} \sqrt{x}\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*sqrt(x) + a)^5,x, algorithm="fricas")
```

```
[Out] 1/6*(48*a*b^4*x^2 - 252*a^3*b^2*x - 77*a^5 - 60*(a*b^4*x^2 + 6*a^
3*b^2*x + a^5 + 4*(a^2*b^3*x + a^4*b)*sqrt(x))*log(b*sqrt(x) + a)
 + 4*(3*b^5*x^2 - 12*a^2*b^3*x - 62*a^4*b)*sqrt(x))/(b^10*x^2 + 6
*a^2*b^8*x + a^4*b^6 + 4*(a*b^9*x + a^3*b^7)*sqrt(x))
```

Sympy [A] time = 7.07111, size = 687, normalized size = 6.42

$$\begin{cases} - \frac{60 a^{5} \log{\left (\frac{a}{b} + \sqrt{x} \right)}}{6 a^{4} b^{6} + 24 a^{3} b^{7} \sqrt{x} + 36 a^{2} b^{8} x + 24 a b^{9} x^{\frac{3}{2}} + 6 b^{10} x^{2}} - \frac{125 a^{5}}{6 a^{4} b^{6} + 24 a^{3} b^{7} \sqrt{x} + 36 a^{2} b^{8} x + 24 a b^{9} x^{\frac{3}{2}} + 6 b^{10} x^{2}} - \frac{240 a^{4} b \sqrt{x} \log{\left (\frac{a}{b} + \sqrt{x} \right)}}{6 a^{4} b^{6} + 24 a^{3} b^{7} \sqrt{x} + 36 a^{2} b^{8} x + 24 a b^{9} x^{\frac{3}{2}} + 6 b^{10} x^{2}} - \frac{}{6a} \\ \frac{x^{3}}{3 a^{5}} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b*x**(1/2))**5,x)
```

```
[Out] Piecewise((-60*a**5*log(a/b + sqrt(x))/(6*a**4*b**6 + 24*a**3*b**
7*sqrt(x) + 36*a**2*b**8*x + 24*a*b**9*x**(3/2) + 6*b**10*x**2) -
 125*a**5/(6*a**4*b**6 + 24*a**3*b**7*sqrt(x) + 36*a**2*b**8*x +
24*a*b**9*x**(3/2) + 6*b**10*x**2) - 240*a**4*b*sqrt(x)*log(a/b +
 sqrt(x))/(6*a**4*b**6 + 24*a**3*b**7*sqrt(x) + 36*a**2*b**8*x +
24*a*b**9*x**(3/2) + 6*b**10*x**2) - 440*a**4*b*sqrt(x)/(6*a**4*b
```

```
**6 + 24*a**3*b**7*sqrt(x) + 36*a**2*b**8*x + 24*a*b**9*x**(3/2)
+ 6*b**10*x**2) - 360*a**3*b**2*x*log(a/b + sqrt(x))/(6*a**4*b**6
 + 24*a**3*b**7*sqrt(x) + 36*a**2*b**8*x + 24*a*b**9*x**(3/2) + 6
*b**10*x**2) - 540*a**3*b**2*x/(6*a**4*b**6 + 24*a**3*b**7*sqrt(x
) + 36*a**2*b**8*x + 24*a*b**9*x**(3/2) + 6*b**10*x**2) - 240*a**
2*b**3*x**(3/2)*log(a/b + sqrt(x))/(6*a**4*b**6 + 24*a**3*b**7*sq
rt(x) + 36*a**2*b**8*x + 24*a*b**9*x**(3/2) + 6*b**10*x**2) - 240
*a**2*b**3*x**(3/2)/(6*a**4*b**6 + 24*a**3*b**7*sqrt(x) + 36*a**2
*b**8*x + 24*a*b**9*x**(3/2) + 6*b**10*x**2) - 60*a*b**4*x**2*log
(a/b + sqrt(x))/(6*a**4*b**6 + 24*a**3*b**7*sqrt(x) + 36*a**2*b**
8*x + 24*a*b**9*x**(3/2) + 6*b**10*x**2) + 12*b**5*x**(5/2)/(6*a*
*4*b**6 + 24*a**3*b**7*sqrt(x) + 36*a**2*b**8*x + 24*a*b**9*x**(3
/2) + 6*b**10*x**2), Ne(b, 0)), (x**3/(3*a**5), True))
```

GIAC/XCAS [A] time = 0.246681, size = 99, normalized size = 0.93

$$-\frac{10\, a \ln\left(\left|b\sqrt{x}+a\right|\right)}{b^{6}}+\frac{2\,\sqrt{x}}{b^{5}}-\frac{120\, a^{2} b^{3} x^{\frac{3}{2}}+300\, a^{3} b^{2} x+260\, a^{4} b \sqrt{x}+77\, a^{5}}{6\,\left(b\sqrt{x}+a\right)^{4} b^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*sqrt(x) + a)^5,x, algorithm="giac")
```

```
[Out] -10*a*ln(abs(b*sqrt(x) + a))/b^6 + 2*sqrt(x)/b^5 - 1/6*(120*a^2*b
^3*x^(3/2) + 300*a^3*b^2*x + 260*a^4*b*sqrt(x) + 77*a^5)/((b*sqrt
(x) + a)^4*b^6)
```

3.2216 $\int \frac{x}{\left(a+b\sqrt{x}\right)^5}\,dx$

Optimal. Leaf size=21

$$\frac{x^2}{2a\left(a+b\sqrt{x}\right)^4}$$

```
[Out] x^2/(2*a*(a + b*Sqrt[x])^4)
```

Rubi [A] time = 0.0149838, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{x^2}{2a\left(a+b\sqrt{x}\right)^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b*Sqrt[x])^5,x]
```

```
[Out] x^2/(2*a*(a + b*Sqrt[x])^4)
```

Rubi in Sympy [A] time = 2.71878, size = 15, normalized size = 0.71

$$\frac{x^2}{2a\left(a+b\sqrt{x}\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b*x**(1/2))**5,x)
```

```
[Out] x**2/(2*a*(a + b*sqrt(x))**4)
```

Mathematica [B] time = 0.024057, size = 50, normalized size = 2.38

$$-\frac{a^3+4a^2b\sqrt{x}+6ab^2x+4b^3x^{3/2}}{2b^4\left(a+b\sqrt{x}\right)^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b*Sqrt[x])^5,x]
```

```
[Out] -(a^3 + 4*a^2*b*Sqrt[x] + 6*a*b^2*x + 4*b^3*x^(3/2))/(2*b^4*(a +
b*Sqrt[x])^4)
```

Maple [B] time = 0.007, size = 65, normalized size = 3.1

$$3\,\frac{a}{b^4\left(a+b\sqrt{x}\right)^2}+\frac{a^3}{2\,b^4}\left(a+b\sqrt{x}\right)^{-4}-2\,\frac{1}{b^4\left(a+b\sqrt{x}\right)}-2\,\frac{a^2}{b^4\left(a+b\sqrt{x}\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+b*x^(1/2))^5,x)
```

```
[Out] 3*a/b^4/(a+b*x^(1/2))^2+1/2*a^3/b^4/(a+b*x^(1/2))^4-2/b^4/(a+b*x^
(1/2))-2*a^2/b^4/(a+b*x^(1/2))^3
```

Maxima [A] time = 1.43184, size = 86, normalized size = 4.1

$$-\frac{2}{\left(b\sqrt{x}+a\right)b^4}+\frac{3\,a}{\left(b\sqrt{x}+a\right)^2b^4}-\frac{2\,a^2}{\left(b\sqrt{x}+a\right)^3b^4}+\frac{a^3}{2\left(b\sqrt{x}+a\right)^4b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*sqrt(x) + a)^5,x, algorithm="maxima")
```

```
[Out] -2/((b*sqrt(x) + a)*b^4) + 3*a/((b*sqrt(x) + a)^2*b^4) - 2*a^2/((
b*sqrt(x) + a)^3*b^4) + 1/2*a^3/((b*sqrt(x) + a)^4*b^4)
```

Fricas [A] time = 0.230519, size = 100, normalized size = 4.76

$$-\frac{6\,ab^2x+a^3+4\left(b^3x+a^2b\right)\sqrt{x}}{2\left(b^8x^2+6\,a^2b^6x+a^4b^4+4\left(ab^7x+a^3b^5\right)\sqrt{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*sqrt(x) + a)^5,x, algorithm="fricas")
```

```
[Out] -1/2*(6*a*b^2*x + a^3 + 4*(b^3*x + a^2*b)*sqrt(x))/(b^8*x^2 + 6*a
^2*b^6*x + a^4*b^4 + 4*(a*b^7*x + a^3*b^5)*sqrt(x))
```

Sympy [A] time = 6.60569, size = 253, normalized size = 12.05

$$\begin{cases}-\frac{a^3}{2a^4b^4+8a^3b^5\sqrt{x}+12a^2b^6x+8ab^7x^{\frac{3}{2}}+2b^8x^2}-\frac{4a^2b\sqrt{x}}{2a^4b^4+8a^3b^5\sqrt{x}+12a^2b^6x+8ab^7x^{\frac{3}{2}}+2b^8x^2}-\frac{6ab^2x}{2a^4b^4+8a^3b^5\sqrt{x}+12a^2b^6x+8ab^7x^{\frac{3}{2}}+2b^8x^2}-\frac{}{2a^4b^4+8a^3b} \\ \frac{x^2}{2a^5}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b*x**(1/2))**5,x)
```

```
[Out] Piecewise((-a**3/(2*a**4*b**4 + 8*a**3*b**5*sqrt(x) + 12*a**2*b**
6*x + 8*a*b**7*x**(3/2) + 2*b**8*x**2) - 4*a**2*b*sqrt(x)/(2*a**4
*b**4 + 8*a**3*b**5*sqrt(x) + 12*a**2*b**6*x + 8*a*b**7*x**(3/2)
+ 2*b**8*x**2) - 6*a*b**2*x/(2*a**4*b**4 + 8*a**3*b**5*sqrt(x) +
12*a**2*b**6*x + 8*a*b**7*x**(3/2) + 2*b**8*x**2) - 4*b**3*x**(3/
2)/(2*a**4*b**4 + 8*a**3*b**5*sqrt(x) + 12*a**2*b**6*x + 8*a*b**7
*x**(3/2) + 2*b**8*x**2), Ne(b, 0)), (x**2/(2*a**5), True))
```

GIAC/XCAS [A] time = 0.258892, size = 57, normalized size = 2.71

$$-\frac{4\,b^3x^{\frac{3}{2}}+6\,ab^2x+4\,a^2b\sqrt{x}+a^3}{2\left(b\sqrt{x}+a\right)^4b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*sqrt(x) + a)^5,x, algorithm="giac")
```

```
[Out] -1/2*(4*b^3*x^(3/2) + 6*a*b^2*x + 4*a^2*b*sqrt(x) + a^3)/((b*sqrt
(x) + a)^4*b^4)
```

3.2217 $\int \frac{1}{\left(a+b\sqrt{x}\right)^5}\,dx$

Optimal. Leaf size=38

$$\frac{a}{2b^2\left(a+b\sqrt{x}\right)^4}-\frac{2}{3b^2\left(a+b\sqrt{x}\right)^3}$$

```
[Out] a/(2*b^2*(a + b*Sqrt[x])^4) - 2/(3*b^2*(a + b*Sqrt[x])^3)
```

Rubi [A] time = 0.0522011, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{a}{2b^2\left(a+b\sqrt{x}\right)^4}-\frac{2}{3b^2\left(a+b\sqrt{x}\right)^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^(-5),x]
```

```
[Out] a/(2*b^2*(a + b*Sqrt[x])^4) - 2/(3*b^2*(a + b*Sqrt[x])^3)
```

Rubi in Sympy [A] time = 3.36315, size = 48, normalized size = 1.26

$$\frac{x}{2a\left(a+b\sqrt{x}\right)^4}+\frac{x}{3a^2\left(a+b\sqrt{x}\right)^3}+\frac{x}{6a^3\left(a+b\sqrt{x}\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*x**(1/2))**5,x)
```

```
[Out] x/(2*a*(a + b*sqrt(x))**4) + x/(3*a**2*(a + b*sqrt(x))**3) + x/(6
*a**3*(a + b*sqrt(x))**2)
```

Mathematica [A] time = 0.0159688, size = 28, normalized size = 0.74

$$-\frac{a+4b\sqrt{x}}{6b^2\left(a+b\sqrt{x}\right)^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^(-5),x]
```

```
[Out] -(a + 4*b*Sqrt[x])/(6*b^2*(a + b*Sqrt[x])^4)
```

Maple [B] time = 0.063, size = 200, normalized size = 5.3

$$-\frac{1}{3\,b^2}\left(b\sqrt{x}-a\right)^{-3}-\frac{a}{4\,b^2}\left(b\sqrt{x}-a\right)^{-4}-\frac{1}{3\,b^2}\left(a+b\sqrt{x}\right)^{-3}+\frac{a}{4\,b^2}\left(a+b\sqrt{x}\right)^{-4}+\frac{a^5}{4\,(b^2x-a^2)^4\,b^2}-5\,ab^4\left(-1/4\,\frac{a^4}{b^6\,(b^2x-a^2)^4}-2/3\,\frac{a^2}{b^6\,(b^2x-a^2)^3}-1/2\,\frac{1}{b^6\,(b^2x-a^2)^2}\right)-10\,a^3b^2\left(-1/4\,\frac{a^2}{b^4\,(b^2x-a^2)^4}-1/3\,\frac{1}{(b^2x-a^2)^3\,b^4}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*x^(1/2))^5,x)
```

```
[Out] -1/3/b^2/(b*x^(1/2)-a)^3-1/4/b^2*a/(b*x^(1/2)-a)^4-1/3/b^2/(a+b*x
^(1/2))^3+1/4*a/b^2/(a+b*x^(1/2))^4+1/4*a^5/(b^2*x-a^2)^4/b^2-5*a
*b^4*(-1/4*a^4/b^6/(b^2*x-a^2)^4-2/3*a^2/b^6/(b^2*x-a^2)^3-1/2/b^
6/(b^2*x-a^2)^2)-10*a^3*b^2*(-1/4*a^2/b^4/(b^2*x-a^2)^4-1/3/(b^2*
x-a^2)^3/b^4)
```

Maxima [A] time = 1.43151, size = 41, normalized size = 1.08

$$-\frac{2}{3\left(b\sqrt{x}+a\right)^{3}b^{2}}+\frac{a}{2\left(b\sqrt{x}+a\right)^{4}b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^(-5),x, algorithm="maxima")
```

```
[Out] -2/3/((b*sqrt(x) + a)^3*b^2) + 1/2*a/((b*sqrt(x) + a)^4*b^2)
```

Fricas [A] time = 0.239021, size = 74, normalized size = 1.95

$$-\frac{4\,b\sqrt{x}+a}{6\left(b^{6}x^{2}+6\,a^{2}b^{4}x+a^{4}b^{2}+4\left(ab^{5}x+a^{3}b^{3}\right)\sqrt{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^(-5),x, algorithm="fricas")
```

```
[Out] -1/6*(4*b*sqrt(x) + a)/(b^6*x^2 + 6*a^2*b^4*x + a^4*b^2 + 4*(a*b^
5*x + a^3*b^3)*sqrt(x))
```

Sympy [A] time = 6.15061, size = 121, normalized size = 3.18

$$\begin{cases} -\frac{a}{6a^{4}b^{2}+24a^{3}b^{3}\sqrt{x}+36a^{2}b^{4}x+24ab^{5}x^{\frac{3}{2}}+6b^{6}x^{2}}-\frac{4b\sqrt{x}}{6a^{4}b^{2}+24a^{3}b^{3}\sqrt{x}+36a^{2}b^{4}x+24ab^{5}x^{\frac{3}{2}}+6b^{6}x^{2}} & \text{for}\ b\neq 0\\ \frac{x}{a^{5}} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*x**(1/2))**5,x)
```

```
[Out] Piecewise((-a/(6*a**4*b**2 + 24*a**3*b**3*sqrt(x) + 36*a**2*b**4*
x + 24*a*b**5*x**(3/2) + 6*b**6*x**2) - 4*b*sqrt(x)/(6*a**4*b**2
+ 24*a**3*b**3*sqrt(x) + 36*a**2*b**4*x + 24*a*b**5*x**(3/2) + 6*
b**6*x**2), Ne(b, 0)), (x/a**5, True))
```

GIAC/XCAS [A] time = 0.263334, size = 30, normalized size = 0.79

$$-\frac{4\,b\sqrt{x}+a}{6\left(b\sqrt{x}+a\right)^{4}b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^(-5),x, algorithm="giac")
```

```
[Out] -1/6*(4*b*sqrt(x) + a)/((b*sqrt(x) + a)^4*b^2)
```

3.2218 $\int \frac{1}{\left(a+b\sqrt{x}\right)^5 x} \, dx$

Optimal. Leaf size=89

$$-\frac{2\log\left(a+b\sqrt{x}\right)}{a^5}+\frac{\log(x)}{a^5}+\frac{2}{a^4\left(a+b\sqrt{x}\right)}+\frac{1}{a^3\left(a+b\sqrt{x}\right)^2}+\frac{2}{3a^2\left(a+b\sqrt{x}\right)^3}+\frac{1}{2a\left(a+b\sqrt{x}\right)^4}$$

```
[Out] 1/(2*a*(a + b*Sqrt[x])^4) + 2/(3*a^2*(a + b*Sqrt[x])^3) + 1/(a^3*
(a + b*Sqrt[x])^2) + 2/(a^4*(a + b*Sqrt[x])) - (2*Log[a + b*Sqrt[
x]])/a^5 + Log[x]/a^5
```

Rubi [A] time = 0.120346, antiderivative size = 89, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2\log\left(a+b\sqrt{x}\right)}{a^5}+\frac{\log(x)}{a^5}+\frac{2}{a^4\left(a+b\sqrt{x}\right)}+\frac{1}{a^3\left(a+b\sqrt{x}\right)^2}+\frac{2}{3a^2\left(a+b\sqrt{x}\right)^3}+\frac{1}{2a\left(a+b\sqrt{x}\right)^4}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b*Sqrt[x])^5*x),x]
```

```
[Out] 1/(2*a*(a + b*Sqrt[x])^4) + 2/(3*a^2*(a + b*Sqrt[x])^3) + 1/(a^3*
(a + b*Sqrt[x])^2) + 2/(a^4*(a + b*Sqrt[x])) - (2*Log[a + b*Sqrt[
x]])/a^5 + Log[x]/a^5
```

Rubi in Sympy [A] time = 17.3848, size = 87, normalized size = 0.98

$$\frac{1}{2a\left(a+b\sqrt{x}\right)^4}+\frac{2}{3a^2\left(a+b\sqrt{x}\right)^3}+\frac{1}{a^3\left(a+b\sqrt{x}\right)^2}+\frac{2}{a^4\left(a+b\sqrt{x}\right)}+\frac{2\log\left(\sqrt{x}\right)}{a^5}-\frac{2\log\left(a+b\sqrt{x}\right)}{a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(a+b*x**(1/2))**5,x)
```

```
[Out] 1/(2*a*(a + b*sqrt(x))**4) + 2/(3*a**2*(a + b*sqrt(x))**3) + 1/(a
**3*(a + b*sqrt(x))**2) + 2/(a**4*(a + b*sqrt(x))) + 2*log(sqrt(x
))/a**5 - 2*log(a + b*sqrt(x))/a**5
```

Mathematica [A] time = 0.10164, size = 71, normalized size = 0.8

$$\frac{\frac{a\left(25a^3+52a^2b\sqrt{x}+42ab^2x+12b^3x^{3/2}\right)}{\left(a+b\sqrt{x}\right)^4}-12\log\left(a+b\sqrt{x}\right)+6\log(x)}{6a^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b*Sqrt[x])^5*x),x]
```

```
[Out] ((a*(25*a^3 + 52*a^2*b*Sqrt[x] + 42*a*b^2*x + 12*b^3*x^(3/2)))/(a
 + b*Sqrt[x])^4 - 12*Log[a + b*Sqrt[x]] + 6*Log[x])/(6*a^5)
```

Maple [A] time = 0.014, size = 76, normalized size = 0.9

$$\frac{\ln(x)}{a^5}-2\frac{\ln\left(a+b\sqrt{x}\right)}{a^5}+\frac{1}{2a}\left(a+b\sqrt{x}\right)^{-4}+\frac{2}{3a^2}\left(a+b\sqrt{x}\right)^{-3}+\frac{1}{a^3}\left(a+b\sqrt{x}\right)^{-2}+2\frac{1}{a^4\left(a+b\sqrt{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(a+b*x^(1/2))^5,x)
```

```
[Out] ln(x)/a^5-2*ln(a+b*x^(1/2))/a^5+1/2/a/(a+b*x^(1/2))^4+2/3/a^2/(a+
b*x^(1/2))^3+1/a^3/(a+b*x^(1/2))^2+2/a^4/(a+b*x^(1/2))
```

Maxima [A] time = 1.44198, size = 131, normalized size = 1.47

$$\frac{12\,b^3x^{\frac{3}{2}} + 42\,ab^2x + 52\,a^2b\sqrt{x} + 25\,a^3}{6\left(a^4b^4x^2 + 4\,a^5b^3x^{\frac{3}{2}} + 6\,a^6b^2x + 4\,a^7b\sqrt{x} + a^8\right)} - \frac{2\,\log\left(b\sqrt{x} + a\right)}{a^5} + \frac{\log\left(x\right)}{a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^5*x),x, algorithm="maxima")
```

```
[Out] 1/6*(12*b^3*x^(3/2) + 42*a*b^2*x + 52*a^2*b*sqrt(x) + 25*a^3)/(a^
4*b^4*x^2 + 4*a^5*b^3*x^(3/2) + 6*a^6*b^2*x + 4*a^7*b*sqrt(x) + a
^8) - 2*log(b*sqrt(x) + a)/a^5 + log(x)/a^5
```

Fricas [A] time = 0.243501, size = 230, normalized size = 2.58

$$\frac{42\,a^2b^2x + 25\,a^4 - 12\left(b^4x^2 + 6\,a^2b^2x + a^4 + 4\left(ab^3x + a^3b\right)\sqrt{x}\right)\log\left(b\sqrt{x} + a\right) + 12\left(b^4x^2 + 6\,a^2b^2x + a^4 + 4\left(ab^3x + a^3b\right)\sqrt{\cdots}\right.}{6\left(a^5b^4x^2 + 6\,a^7b^2x + a^9 + 4\left(a^6b^3x + a^8b\right)\sqrt{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^5*x),x, algorithm="fricas")
```

```
[Out] 1/6*(42*a^2*b^2*x + 25*a^4 - 12*(b^4*x^2 + 6*a^2*b^2*x + a^4 + 4*
(a*b^3*x + a^3*b)*sqrt(x))*log(b*sqrt(x) + a) + 12*(b^4*x^2 + 6*a
^2*b^2*x + a^4 + 4*(a*b^3*x + a^3*b)*sqrt(x))*log(sqrt(x)) + 4*(3
*a*b^3*x + 13*a^3*b)*sqrt(x))/(a^5*b^4*x^2 + 6*a^7*b^2*x + a^9 +
4*(a^6*b^3*x + a^8*b)*sqrt(x))
```

Sympy [A] time = 18.3514, size = 1049, normalized size = 11.79

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(a+b*x**(1/2))**5,x)
```

```
[Out] Piecewise((zoo/x**(5/2), Eq(a, 0) & Eq(b, 0)), (log(x)/a**5, Eq(b
, 0)), (-2/(5*b**5*x**(5/2)), Eq(a, 0)), (6*a**4*sqrt(x)*log(x)/(
6*a**9*sqrt(x) + 24*a**8*b*x + 36*a**7*b**2*x**(3/2) + 24*a**6*b*
*3*x**2 + 6*a**5*b**4*x**(5/2)) - 12*a**4*sqrt(x)*log(a/b + sqrt(
x))/(6*a**9*sqrt(x) + 24*a**8*b*x + 36*a**7*b**2*x**(3/2) + 24*a*
*6*b**3*x**2 + 6*a**5*b**4*x**(5/2)) + 25*a**4*sqrt(x)/(6*a**9*sq
rt(x) + 24*a**8*b*x + 36*a**7*b**2*x**(3/2) + 24*a**6*b**3*x**2 +
 6*a**5*b**4*x**(5/2)) + 24*a**3*b*x*log(x)/(6*a**9*sqrt(x) + 24*
a**8*b*x + 36*a**7*b**2*x**(3/2) + 24*a**6*b**3*x**2 + 6*a**5*b**
4*x**(5/2)) - 48*a**3*b*x*log(a/b + sqrt(x))/(6*a**9*sqrt(x) + 24
*a**8*b*x + 36*a**7*b**2*x**(3/2) + 24*a**6*b**3*x**2 + 6*a**5*b*
*4*x**(5/2)) + 52*a**3*b*x/(6*a**9*sqrt(x) + 24*a**8*b*x + 36*a**
7*b**2*x**(3/2) + 24*a**6*b**3*x**2 + 6*a**5*b**4*x**(5/2)) + 36*
a**2*b**2*x**(3/2)*log(x)/(6*a**9*sqrt(x) + 24*a**8*b*x + 36*a**7
*b**2*x**(3/2) + 24*a**6*b**3*x**2 + 6*a**5*b**4*x**(5/2)) - 72*a
```

```
**2*b**2*x**(3/2)*log(a/b + sqrt(x))/(6*a**9*sqrt(x) + 24*a**8*b*
x + 36*a**7*b**2*x**(3/2) + 24*a**6*b**3*x**2 + 6*a**5*b**4*x**(5
/2)) + 42*a**2*b**2*x**(3/2)/(6*a**9*sqrt(x) + 24*a**8*b*x + 36*a
**7*b**2*x**(3/2) + 24*a**6*b**3*x**2 + 6*a**5*b**4*x**(5/2)) + 2
4*a*b**3*x**2*log(x)/(6*a**9*sqrt(x) + 24*a**8*b*x + 36*a**7*b**2
*x**(3/2) + 24*a**6*b**3*x**2 + 6*a**5*b**4*x**(5/2)) - 48*a*b**3
*x**2*log(a/b + sqrt(x))/(6*a**9*sqrt(x) + 24*a**8*b*x + 36*a**7*
b**2*x**(3/2) + 24*a**6*b**3*x**2 + 6*a**5*b**4*x**(5/2)) + 12*a*
b**3*x**2/(6*a**9*sqrt(x) + 24*a**8*b*x + 36*a**7*b**2*x**(3/2) +
 24*a**6*b**3*x**2 + 6*a**5*b**4*x**(5/2)) + 6*b**4*x**(5/2)*log(
x)/(6*a**9*sqrt(x) + 24*a**8*b*x + 36*a**7*b**2*x**(3/2) + 24*a**
6*b**3*x**2 + 6*a**5*b**4*x**(5/2)) - 12*b**4*x**(5/2)*log(a/b +
sqrt(x))/(6*a**9*sqrt(x) + 24*a**8*b*x + 36*a**7*b**2*x**(3/2) +
24*a**6*b**3*x**2 + 6*a**5*b**4*x**(5/2)), True))
```

GIAC/XCAS [A] time = 0.277833, size = 93, normalized size = 1.04

$$-\frac{2\,\ln\left(\left|b\sqrt{x}+a\right|\right)}{a^5}+\frac{\ln\left(|x|\right)}{a^5}+\frac{12\,ab^3x^{\frac{3}{2}}+42\,a^2b^2x+52\,a^3b\sqrt{x}+25\,a^4}{6\,\left(b\sqrt{x}+a\right)^4a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^5*x),x, algorithm="giac")
```

```
[Out] -2*ln(abs(b*sqrt(x) + a))/a^5 + ln(abs(x))/a^5 + 1/6*(12*a*b^3*x^
(3/2) + 42*a^2*b^2*x + 52*a^3*b*sqrt(x) + 25*a^4)/((b*sqrt(x) + a
)^4*a^5)
```

3.2219 $\int \frac{1}{\left(a+b\sqrt{x}\right)^5 x^2} \, dx$

Optimal. Leaf size=126

$$-\frac{30b^2\log\left(a+b\sqrt{x}\right)}{a^7}+\frac{15b^2\log(x)}{a^7}+\frac{20b^2}{a^6\left(a+b\sqrt{x}\right)}+\frac{10b}{a^6\sqrt{x}}+\frac{6b^2}{a^5\left(a+b\sqrt{x}\right)^2}-\frac{1}{a^5x}+\frac{2b^2}{a^4\left(a+b\sqrt{x}\right)^3}+\frac{b^2}{2a^3\left(a+b\sqrt{x}\right)^4}$$

```
[Out] b^2/(2*a^3*(a + b*Sqrt[x])^4) + (2*b^2)/(a^4*(a + b*Sqrt[x])^3) +
 (6*b^2)/(a^5*(a + b*Sqrt[x])^2) + (20*b^2)/(a^6*(a + b*Sqrt[x]))
 - 1/(a^5*x) + (10*b)/(a^6*Sqrt[x]) - (30*b^2*Log[a + b*Sqrt[x]])
/a^7 + (15*b^2*Log[x])/a^7
```

Rubi [A] time = 0.209466, antiderivative size = 126, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$-\frac{30b^2\log\left(a+b\sqrt{x}\right)}{a^7}+\frac{15b^2\log(x)}{a^7}+\frac{20b^2}{a^6\left(a+b\sqrt{x}\right)}+\frac{10b}{a^6\sqrt{x}}+\frac{6b^2}{a^5\left(a+b\sqrt{x}\right)^2}-\frac{1}{a^5x}+\frac{2b^2}{a^4\left(a+b\sqrt{x}\right)^3}+\frac{b^2}{2a^3\left(a+b\sqrt{x}\right)^4}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b*Sqrt[x])^5*x^2),x]
```

```
[Out] b^2/(2*a^3*(a + b*Sqrt[x])^4) + (2*b^2)/(a^4*(a + b*Sqrt[x])^3) +
 (6*b^2)/(a^5*(a + b*Sqrt[x])^2) + (20*b^2)/(a^6*(a + b*Sqrt[x]))
 - 1/(a^5*x) + (10*b)/(a^6*Sqrt[x]) - (30*b^2*Log[a + b*Sqrt[x]])
/a^7 + (15*b^2*Log[x])/a^7
```

Rubi in Sympy [A] time = 31.4844, size = 124, normalized size = 0.98

$$\frac{b^2}{2a^3\left(a+b\sqrt{x}\right)^4}+\frac{2b^2}{a^4\left(a+b\sqrt{x}\right)^3}+\frac{6b^2}{a^5\left(a+b\sqrt{x}\right)^2}-\frac{1}{a^5x}+\frac{20b^2}{a^6\left(a+b\sqrt{x}\right)}+\frac{10b}{a^6\sqrt{x}}+\frac{30b^2\log\left(\sqrt{x}\right)}{a^7}-\frac{30b^2\log\left(a+b\sqrt{x}\right)}{a^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(a+b*x**(1/2))**5,x)
```

```
[Out] b**2/(2*a**3*(a + b*sqrt(x))**4) + 2*b**2/(a**4*(a + b*sqrt(x))**
3) + 6*b**2/(a**5*(a + b*sqrt(x))**2) - 1/(a**5*x) + 20*b**2/(a**
6*(a + b*sqrt(x))) + 10*b/(a**6*sqrt(x)) + 30*b**2*log(sqrt(x))/a
**7 - 30*b**2*log(a + b*sqrt(x))/a**7
```

Mathematica [A] time = 0.129912, size = 104, normalized size = 0.83

$$\frac{\frac{a\left(-2a^5+12a^4b\sqrt{x}+125a^3b^2x+260a^2b^3x^{3/2}+210ab^4x^2+60b^5x^{5/2}\right)}{x\left(a+b\sqrt{x}\right)^4}-60b^2\log\left(a+b\sqrt{x}\right)+30b^2\log(x)}{2a^7}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b*Sqrt[x])^5*x^2),x]
```

```
[Out] ((a*(-2*a^5 + 12*a^4*b*Sqrt[x] + 125*a^3*b^2*x + 260*a^2*b^3*x^(3
/2) + 210*a*b^4*x^2 + 60*b^5*x^(5/2)))/((a + b*Sqrt[x])^4*x) - 60
*b^2*Log[a + b*Sqrt[x]] + 30*b^2*Log[x])/(2*a^7)
```

Maple [A] time = 0.018, size = 113, normalized size = 0.9

$$-\frac{1}{xa^5}+15\,\frac{b^2\ln(x)}{a^7}-30\,\frac{b^2\ln\left(a+b\sqrt{x}\right)}{a^7}+10\,\frac{b}{a^6\sqrt{x}}+\frac{b^2}{2\,a^3}\left(a+b\sqrt{x}\right)^{-4}+2\,\frac{b^2}{a^4\left(a+b\sqrt{x}\right)^3}+6\,\frac{b^2}{a^5\left(a+b\sqrt{x}\right)^2}+20\,\frac{b^2}{a^6\left(a+b\sqrt{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(a+b*x^(1/2))^5,x)
```

```
[Out] -1/x/a^5+15*b^2*ln(x)/a^7-30*b^2*ln(a+b*x^(1/2))/a^7+10*b/a^6/x^(
1/2)+1/2*b^2/a^3/(a+b*x^(1/2))^4+2*b^2/a^4/(a+b*x^(1/2))^3+6*b^2/
a^5/(a+b*x^(1/2))^2+20*b^2/a^6/(a+b*x^(1/2))
```

Maxima [A] time = 1.44138, size = 176, normalized size = 1.4

$$\frac{60\,b^5x^{\frac{5}{2}}+210\,ab^4x^2+260\,a^2b^3x^{\frac{3}{2}}+125\,a^3b^2x+12\,a^4b\sqrt{x}-2\,a^5}{2\left(a^6b^4x^3+4\,a^7b^3x^{\frac{5}{2}}+6\,a^8b^2x^2+4\,a^9bx^{\frac{3}{2}}+a^{10}x\right)}-\frac{30\,b^2\log\left(b\sqrt{x}+a\right)}{a^7}+\frac{15\,b^2\log(x)}{a^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^5*x^2),x, algorithm="maxima")
```

```
[Out] 1/2*(60*b^5*x^(5/2) + 210*a*b^4*x^2 + 260*a^2*b^3*x^(3/2) + 125*a
^3*b^2*x + 12*a^4*b*sqrt(x) - 2*a^5)/(a^6*b^4*x^3 + 4*a^7*b^3*x^(
5/2) + 6*a^8*b^2*x^2 + 4*a^9*b*x^(3/2) + a^10*x) - 30*b^2*log(b*s
qrt(x) + a)/a^7 + 15*b^2*log(x)/a^7
```

Fricas [A] time = 0.246633, size = 301, normalized size = 2.39

$$\frac{210\,a^2b^4x^2+125\,a^4b^2x-2\,a^6-60\left(b^6x^3+6\,a^2b^4x^2+a^4b^2x+4\left(ab^5x^2+a^3b^3x\right)\sqrt{x}\right)\log\left(b\sqrt{x}+a\right)+60\left(b^6x^3+6\,a^2b^4x^2\right.}{2\left(a^7b^4x^3+6\,a^9b^2x^2+a^{11}x+4\left(a^8b^3x^2+a^{10}bx\right)\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^5*x^2),x, algorithm="fricas")
```

```
[Out] 1/2*(210*a^2*b^4*x^2 + 125*a^4*b^2*x - 2*a^6 - 60*(b^6*x^3 + 6*a^
2*b^4*x^2 + a^4*b^2*x + 4*(a*b^5*x^2 + a^3*b^3*x)*sqrt(x))*log(b*
sqrt(x) + a) + 60*(b^6*x^3 + 6*a^2*b^4*x^2 + a^4*b^2*x + 4*(a*b^5
*x^2 + a^3*b^3*x)*sqrt(x))*log(sqrt(x)) + 4*(15*a*b^5*x^2 + 65*a^
3*b^3*x + 3*a^5*b)*sqrt(x))/(a^7*b^4*x^3 + 6*a^9*b^2*x^2 + a^11*x
 + 4*(a^8*b^3*x^2 + a^10*b*x)*sqrt(x))
```

Sympy [A] time = 55.2021, size = 1232, normalized size = 9.78

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(a+b*x**(1/2))**5,x)
```

```
[Out] Piecewise((zoo/x**(7/2), Eq(a, 0) & Eq(b, 0)), (-2/(7*b**5*x**(7/
2)), Eq(a, 0)), (-1/(a**5*x), Eq(b, 0)), (-2*a**6*sqrt(x)/(2*a**1
1*x**(3/2) + 8*a**10*b*x**2 + 12*a**9*b**2*x**(5/2) + 8*a**8*b**3
*x**3 + 2*a**7*b**4*x**(7/2)) + 12*a**5*b*x/(2*a**11*x**(3/2) + 8
*a**10*b*x**2 + 12*a**9*b**2*x**(5/2) + 8*a**8*b**3*x**3 + 2*a**7
*b**4*x**(7/2)) + 30*a**4*b**2*x**(3/2)*log(x)/(2*a**11*x**(3/2)
+ 8*a**10*b*x**2 + 12*a**9*b**2*x**(5/2) + 8*a**8*b**3*x**3 + 2*a
**7*b**4*x**(7/2)) - 60*a**4*b**2*x**(3/2)*log(a/b + sqrt(x))/(2*
a**11*x**(3/2) + 8*a**10*b*x**2 + 12*a**9*b**2*x**(5/2) + 8*a**8*
b**3*x**3 + 2*a**7*b**4*x**(7/2)) + 125*a**4*b**2*x**(3/2)/(2*a**
11*x**(3/2) + 8*a**10*b*x**2 + 12*a**9*b**2*x**(5/2) + 8*a**8*b**
3*x**3 + 2*a**7*b**4*x**(7/2)) + 120*a**3*b**3*x**2*log(x)/(2*a**
11*x**(3/2) + 8*a**10*b*x**2 + 12*a**9*b**2*x**(5/2) + 8*a**8*b**
3*x**3 + 2*a**7*b**4*x**(7/2)) - 240*a**3*b**3*x**2*log(a/b + sqr
t(x))/(2*a**11*x**(3/2) + 8*a**10*b*x**2 + 12*a**9*b**2*x**(5/2)
+ 8*a**8*b**3*x**3 + 2*a**7*b**4*x**(7/2)) + 260*a**3*b**3*x**2/(
2*a**11*x**(3/2) + 8*a**10*b*x**2 + 12*a**9*b**2*x**(5/2) + 8*a**
8*b**3*x**3 + 2*a**7*b**4*x**(7/2)) + 180*a**2*b**4*x**(5/2)*log(
x)/(2*a**11*x**(3/2) + 8*a**10*b*x**2 + 12*a**9*b**2*x**(5/2) + 8
*a**8*b**3*x**3 + 2*a**7*b**4*x**(7/2)) - 360*a**2*b**4*x**(5/2)*
log(a/b + sqrt(x))/(2*a**11*x**(3/2) + 8*a**10*b*x**2 + 12*a**9*b
**2*x**(5/2) + 8*a**8*b**3*x**3 + 2*a**7*b**4*x**(7/2)) + 210*a**
2*b**4*x**(5/2)/(2*a**11*x**(3/2) + 8*a**10*b*x**2 + 12*a**9*b**2
*x**(5/2) + 8*a**8*b**3*x**3 + 2*a**7*b**4*x**(7/2)) + 120*a*b**5
*x**3*log(x)/(2*a**11*x**(3/2) + 8*a**10*b*x**2 + 12*a**9*b**2*x*
*(5/2) + 8*a**8*b**3*x**3 + 2*a**7*b**4*x**(7/2)) - 240*a*b**5*x*
*3*log(a/b + sqrt(x))/(2*a**11*x**(3/2) + 8*a**10*b*x**2 + 12*a**
9*b**2*x**(5/2) + 8*a**8*b**3*x**3 + 2*a**7*b**4*x**(7/2)) + 60*a
*b**5*x**3/(2*a**11*x**(3/2) + 8*a**10*b*x**2 + 12*a**9*b**2*x**(
5/2) + 8*a**8*b**3*x**3 + 2*a**7*b**4*x**(7/2)) + 30*b**6*x**(7/2
)*log(x)/(2*a**11*x**(3/2) + 8*a**10*b*x**2 + 12*a**9*b**2*x**(5/
2) + 8*a**8*b**3*x**3 + 2*a**7*b**4*x**(7/2)) - 60*b**6*x**(7/2)*
log(a/b + sqrt(x))/(2*a**11*x**(3/2) + 8*a**10*b*x**2 + 12*a**9*b
**2*x**(5/2) + 8*a**8*b**3*x**3 + 2*a**7*b**4*x**(7/2)), True))
```

GIAC/XCAS [A] time = 0.253098, size = 136, normalized size = 1.08

$$-\frac{30\,b^2\ln\left(\left|b\sqrt{x}+a\right|\right)}{a^7}+\frac{15\,b^2\ln\left(\left|x\right|\right)}{a^7}+\frac{60\,ab^5x^{\frac{5}{2}}+210\,a^2b^4x^2+260\,a^3b^3x^{\frac{3}{2}}+125\,a^4b^2x+12\,a^5b\sqrt{x}-2\,a^6}{2\left(b\sqrt{x}+a\right)^4a^7x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^5*x^2),x, algorithm="giac")
```

```
[Out] -30*b^2*ln(abs(b*sqrt(x) + a))/a^7 + 15*b^2*ln(abs(x))/a^7 + 1/2*
(60*a*b^5*x^(5/2) + 210*a^2*b^4*x^2 + 260*a^3*b^3*x^(3/2) + 125*a
^4*b^2*x + 12*a^5*b*sqrt(x) - 2*a^6)/((b*sqrt(x) + a)^4*a^7*x)
```

3.2220 $\int \frac{1}{\left(a+b\sqrt{x}\right)^5 x^3}\,dx$

Optimal. Leaf size=156

$$-\frac{140b^4\log\left(a+b\sqrt{x}\right)}{a^9}+\frac{70b^4\log(x)}{a^9}+\frac{70b^4}{a^8\left(a+b\sqrt{x}\right)}+\frac{70b^3}{a^8\sqrt{x}}+\frac{15b^4}{a^7\left(a+b\sqrt{x}\right)^2}-\frac{15b^2}{a^7x}+\frac{10b^4}{3a^6\left(a+b\sqrt{x}\right)^3}+\frac{10b}{3a^6x^{3/2}}+\frac{b^4}{2a^5\left(a+b\sqrt{x}\right)^4}-\frac{1}{2a^5x^2}$$

```
[Out] b^4/(2*a^5*(a + b*Sqrt[x])^4) + (10*b^4)/(3*a^6*(a + b*Sqrt[x])^3
) + (15*b^4)/(a^7*(a + b*Sqrt[x])^2) + (70*b^4)/(a^8*(a + b*Sqrt[
x])) - 1/(2*a^5*x^2) + (10*b)/(3*a^6*x^(3/2)) - (15*b^2)/(a^7*x)
+ (70*b^3)/(a^8*Sqrt[x]) - (140*b^4*Log[a + b*Sqrt[x]])/a^9 + (70
*b^4*Log[x])/a^9
```

Rubi [A] time = 0.267995, antiderivative size = 156, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{140b^4\log\left(a+b\sqrt{x}\right)}{a^9}+\frac{70b^4\log(x)}{a^9}+\frac{70b^4}{a^8\left(a+b\sqrt{x}\right)}+\frac{70b^3}{a^8\sqrt{x}}+\frac{15b^4}{a^7\left(a+b\sqrt{x}\right)^2}-\frac{15b^2}{a^7x}+\frac{10b^4}{3a^6\left(a+b\sqrt{x}\right)^3}+\frac{10b}{3a^6x^{3/2}}+\frac{b^4}{2a^5\left(a+b\sqrt{x}\right)^4}-\frac{1}{2a^5x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b*Sqrt[x])^5*x^3),x]
```

```
[Out] b^4/(2*a^5*(a + b*Sqrt[x])^4) + (10*b^4)/(3*a^6*(a + b*Sqrt[x])^3
) + (15*b^4)/(a^7*(a + b*Sqrt[x])^2) + (70*b^4)/(a^8*(a + b*Sqrt[
x])) - 1/(2*a^5*x^2) + (10*b)/(3*a^6*x^(3/2)) - (15*b^2)/(a^7*x)
+ (70*b^3)/(a^8*Sqrt[x]) - (140*b^4*Log[a + b*Sqrt[x]])/a^9 + (70
*b^4*Log[x])/a^9
```

Rubi in Sympy [A] time = 67.0575, size = 155, normalized size = 0.99

$$\frac{b^4}{2a^5\left(a+b\sqrt{x}\right)^4}-\frac{1}{2a^5x^2}+\frac{10b^4}{3a^6\left(a+b\sqrt{x}\right)^3}+\frac{10b}{3a^6x^{\frac{3}{2}}}+\frac{15b^4}{a^7\left(a+b\sqrt{x}\right)^2}-\frac{15b^2}{a^7x}+\frac{70b^4}{a^8\left(a+b\sqrt{x}\right)}+\frac{70b^3}{a^8\sqrt{x}}+\frac{140b^4\log\left(\sqrt{x}\right)}{a^9}-\frac{140b^4\log\left(a+b\sqrt{x}\right)}{a^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(a+b*x**(1/2))**5,x)
```

```
[Out] b**4/(2*a**5*(a + b*sqrt(x))**4) - 1/(2*a**5*x**2) + 10*b**4/(3*a
**6*(a + b*sqrt(x))**3) + 10*b/(3*a**6*x**(3/2)) + 15*b**4/(a**7*
(a + b*sqrt(x))**2) - 15*b**2/(a**7*x) + 70*b**4/(a**8*(a + b*sqr
t(x))) + 70*b**3/(a**8*sqrt(x)) + 140*b**4*log(sqrt(x))/a**9 - 14
0*b**4*log(a + b*sqrt(x))/a**9
```

Mathematica [A] time = 0.154801, size = 128, normalized size = 0.82

$$\frac{\frac{a\left(-3a^7+8a^6b\sqrt{x}-28a^5b^2x+168a^4b^3x^{3/2}+1750a^3b^4x^2+3640a^2b^5x^{5/2}+2940ab^6x^3+840b^7x^{7/2}\right)}{x^2\left(a+b\sqrt{x}\right)^4}-840b^4\log\left(a+b\sqrt{x}\right)+420b^4\log(x)}{6a^9}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b*Sqrt[x])^5*x^3),x]
```

```
[Out] ((a*(-3*a^7 + 8*a^6*b*Sqrt[x] - 28*a^5*b^2*x + 168*a^4*b^3*x^(3/2
) + 1750*a^3*b^4*x^2 + 3640*a^2*b^5*x^(5/2) + 2940*a*b^6*x^3 + 84
0*b^7*x^(7/2)))/((a + b*Sqrt[x])^4*x^2) - 840*b^4*Log[a + b*Sqrt[
x]] + 420*b^4*Log[x])/(6*a^9)
```

Maple [A] time = 0.02, size = 135, normalized size = 0.9

$$-\frac{1}{2\,a^{5}x^{2}}+\frac{10\,b}{3\,a^{6}}x^{-\frac{3}{2}}-15\,\frac{b^{2}}{a^{7}x}+70\,\frac{b^{4}\ln\left(x\right)}{a^{9}}-140\,\frac{b^{4}\ln\left(a+b\sqrt{x}\right)}{a^{9}}+70\,\frac{b^{3}}{a^{8}\sqrt{x}}+\frac{b^{4}}{2\,a^{5}}\left(a+b\sqrt{x}\right)^{-4}+\frac{10\,b^{4}}{3\,a^{6}}\left(a+b\sqrt{x}\right)^{-3}+15\,\frac{b^{4}}{a^{7}\left(a+b\sqrt{x}\right)^{2}}+70\,\frac{b^{4}}{a^{8}\left(a+b\sqrt{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(a+b*x^(1/2))^5,x)
```

```
[Out] -1/2/a^5/x^2+10/3*b/a^6/x^(3/2)-15*b^2/a^7/x+70*b^4*ln(x)/a^9-140
*b^4*ln(a+b*x^(1/2))/a^9+70*b^3/a^8/x^(1/2)+1/2*b^4/a^5/(a+b*x^(1
/2))^4+10/3*b^4/a^6/(a+b*x^(1/2))^3+15*b^4/a^7/(a+b*x^(1/2))^2+70
*b^4/a^8/(a+b*x^(1/2))
```

Maxima [A] time = 1.46034, size = 208, normalized size = 1.33

$$\frac{840\,b^{7}x^{\frac{7}{2}}+2940\,ab^{6}x^{3}+3640\,a^{2}b^{5}x^{\frac{5}{2}}+1750\,a^{3}b^{4}x^{2}+168\,a^{4}b^{3}x^{\frac{3}{2}}-28\,a^{5}b^{2}x+8\,a^{6}b\sqrt{x}-3\,a^{7}}{6\left(a^{8}b^{4}x^{4}+4\,a^{9}b^{3}x^{\frac{7}{2}}+6\,a^{10}b^{2}x^{3}+4\,a^{11}bx^{\frac{5}{2}}+a^{12}x^{2}\right)}-\frac{140\,b^{4}\log\left(b\sqrt{x}+a\right)}{a^{9}}+\frac{70\,b^{4}\log\left(x\right)}{a^{9}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^5*x^3),x, algorithm="maxima")
```

```
[Out] 1/6*(840*b^7*x^(7/2) + 2940*a*b^6*x^3 + 3640*a^2*b^5*x^(5/2) + 17
50*a^3*b^4*x^2 + 168*a^4*b^3*x^(3/2) - 28*a^5*b^2*x + 8*a^6*b*sqr
t(x) - 3*a^7)/(a^8*b^4*x^4 + 4*a^9*b^3*x^(7/2) + 6*a^10*b^2*x^3 +
 4*a^11*b*x^(5/2) + a^12*x^2) - 140*b^4*log(b*sqrt(x) + a)/a^9 +
70*b^4*log(x)/a^9
```

Fricas [A] time = 0.255213, size = 346, normalized size = 2.22

$$\frac{2940\,a^{2}b^{6}x^{3}+1750\,a^{4}b^{4}x^{2}-28\,a^{6}b^{2}x-3\,a^{8}-840\left(b^{8}x^{4}+6\,a^{2}b^{6}x^{3}+a^{4}b^{4}x^{2}+4\left(ab^{7}x^{3}+a^{3}b^{5}x^{2}\right)\sqrt{x}\right)\log\left(b\sqrt{x}+a\right)+84}{6\left(a^{9}b^{4}x^{4}+6\,a^{11}b^{2}x^{3}+a^{13}x^{2}+4\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^5*x^3),x, algorithm="fricas")
```

```
[Out] 1/6*(2940*a^2*b^6*x^3 + 1750*a^4*b^4*x^2 - 28*a^6*b^2*x - 3*a^8 -
 840*(b^8*x^4 + 6*a^2*b^6*x^3 + a^4*b^4*x^2 + 4*(a*b^7*x^3 + a^3*
b^5*x^2)*sqrt(x))*log(b*sqrt(x) + a) + 840*(b^8*x^4 + 6*a^2*b^6*x
^3 + a^4*b^4*x^2 + 4*(a*b^7*x^3 + a^3*b^5*x^2)*sqrt(x))*log(sqrt(
x)) + 8*(105*a*b^7*x^3 + 455*a^3*b^5*x^2 + 21*a^5*b^3*x + a^7*b)*
```

```
sqrt(x))/(a^9*b^4*x^4 + 6*a^11*b^2*x^3 + a^13*x^2 + 4*(a^10*b^3*x
^3 + a^12*b*x^2)*sqrt(x))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(a+b*x**(1/2))**5,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.252481, size = 161, normalized size = 1.03

$$-\frac{140\,b^4\ln\left(\left|b\sqrt{x}+a\right|\right)}{a^9}+\frac{70\,b^4\ln\left(\left|x\right|\right)}{a^9}+\frac{840\,b^7x^{\frac{7}{2}}+2940\,ab^6x^3+3640\,a^2b^5x^{\frac{5}{2}}+1750\,a^3b^4x^2+168\,a^4b^3x^{\frac{3}{2}}-28\,a^5b^2x+8\,a^6b\sqrt{x}-3\,a^7}{6\,\left(bx+a\sqrt{x}\right)^4a^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^5*x^3),x, algorithm="giac")
```

```
[Out] -140*b^4*ln(abs(b*sqrt(x) + a))/a^9 + 70*b^4*ln(abs(x))/a^9 + 1/6
*(840*b^7*x^(7/2) + 2940*a*b^6*x^3 + 3640*a^2*b^5*x^(5/2) + 1750*
a^3*b^4*x^2 + 168*a^4*b^3*x^(3/2) - 28*a^5*b^2*x + 8*a^6*b*sqrt(x
) - 3*a^7)/((b*x + a*sqrt(x))^4*a^8)
```

3.2221 $\int \frac{x^5}{\left(a+b\sqrt{x}\right)^8}\,dx$

Optimal. Leaf size=203

$$\frac{2a^{11}}{7b^{12}\left(a+b\sqrt{x}\right)^7}-\frac{11a^{10}}{3b^{12}\left(a+b\sqrt{x}\right)^6}+\frac{22a^9}{b^{12}\left(a+b\sqrt{x}\right)^5}-\frac{165a^8}{2b^{12}\left(a+b\sqrt{x}\right)^4}+\frac{220a^7}{b^{12}\left(a+b\sqrt{x}\right)^3}-\frac{462a^6}{b^{12}\left(a+b\sqrt{x}\right)^2}+\frac{924a^5}{b^{12}\left(a+b\sqrt{x}\right)}+\frac{660a^4\log\left(a+b\sqrt{x}\right)}{b^{12}}-\frac{240a^3\sqrt{x}}{b^{11}}+\frac{36a^2x}{b^{10}}-\frac{16ax^{3/2}}{3b^9}+\frac{x^2}{2b^8}$$

```
[Out] (2*a^11)/(7*b^12*(a + b*Sqrt[x])^7) - (11*a^10)/(3*b^12*(a + b*Sq
rt[x])^6) + (22*a^9)/(b^12*(a + b*Sqrt[x])^5) - (165*a^8)/(2*b^12
*(a + b*Sqrt[x])^4) + (220*a^7)/(b^12*(a + b*Sqrt[x])^3) - (462*a
^6)/(b^12*(a + b*Sqrt[x])^2) + (924*a^5)/(b^12*(a + b*Sqrt[x])) -
 (240*a^3*Sqrt[x])/b^11 + (36*a^2*x)/b^10 - (16*a*x^(3/2))/(3*b^9
) + x^2/(2*b^8) + (660*a^4*Log[a + b*Sqrt[x]])/b^12
```

Rubi [A] time = 0.432792, antiderivative size = 203, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2a^{11}}{7b^{12}\left(a+b\sqrt{x}\right)^7}-\frac{11a^{10}}{3b^{12}\left(a+b\sqrt{x}\right)^6}+\frac{22a^9}{b^{12}\left(a+b\sqrt{x}\right)^5}-\frac{165a^8}{2b^{12}\left(a+b\sqrt{x}\right)^4}+\frac{220a^7}{b^{12}\left(a+b\sqrt{x}\right)^3}-\frac{462a^6}{b^{12}\left(a+b\sqrt{x}\right)^2}+\frac{924a^5}{b^{12}\left(a+b\sqrt{x}\right)}+\frac{660a^4\log\left(a+b\sqrt{x}\right)}{b^{12}}-\frac{240a^3\sqrt{x}}{b^{11}}+\frac{36a^2x}{b^{10}}-\frac{16ax^{3/2}}{3b^9}+\frac{x^2}{2b^8}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5/(a + b*Sqrt[x])^8,x]
```

```
[Out] (2*a^11)/(7*b^12*(a + b*Sqrt[x])^7) - (11*a^10)/(3*b^12*(a + b*Sq
rt[x])^6) + (22*a^9)/(b^12*(a + b*Sqrt[x])^5) - (165*a^8)/(2*b^12
*(a + b*Sqrt[x])^4) + (220*a^7)/(b^12*(a + b*Sqrt[x])^3) - (462*a
^6)/(b^12*(a + b*Sqrt[x])^2) + (924*a^5)/(b^12*(a + b*Sqrt[x])) -
 (240*a^3*Sqrt[x])/b^11 + (36*a^2*x)/b^10 - (16*a*x^(3/2))/(3*b^9
) + x^2/(2*b^8) + (660*a^4*Log[a + b*Sqrt[x]])/b^12
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{2a^{11}}{7b^{12}\left(a+b\sqrt{x}\right)^7}-\frac{11a^{10}}{3b^{12}\left(a+b\sqrt{x}\right)^6}+\frac{22a^9}{b^{12}\left(a+b\sqrt{x}\right)^5}-\frac{165a^8}{2b^{12}\left(a+b\sqrt{x}\right)^4}+\frac{220a^7}{b^{12}\left(a+b\sqrt{x}\right)^3}-\frac{462a^6}{b^{12}\left(a+b\sqrt{x}\right)^2}+\frac{924a^5}{b^{12}\left(a+b\sqrt{x}\right)}+\frac{660a^4\log\left(a+b\sqrt{x}\right)}{b^{12}}-\frac{240a^3\sqrt{x}}{b^{11}}+\frac{72a^2\int^{\sqrt{x}}x\,dx}{b^{10}}-\frac{16ax^{\frac{3}{2}}}{3b^9}+\frac{x^2}{2b^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5/(a+b*x**(1/2))**8,x)
```

```
[Out] 2*a**11/(7*b**12*(a + b*sqrt(x))**7) - 11*a**10/(3*b**12*(a + b*s
qrt(x))**6) + 22*a**9/(b**12*(a + b*sqrt(x))**5) - 165*a**8/(2*b*
*12*(a + b*sqrt(x))**4) + 220*a**7/(b**12*(a + b*sqrt(x))**3) - 4
62*a**6/(b**12*(a + b*sqrt(x))**2) + 924*a**5/(b**12*(a + b*sqrt(
x))) + 660*a**4*log(a + b*sqrt(x))/b**12 - 240*a**3*sqrt(x)/b**11
 + 72*a**2*Integral(x, (x, sqrt(x)))/b**10 - 16*a*x**(3/2)/(3*b**
9) + x**2/(2*b**8)
```

Mathematica [A] time = 0.075844, size = 174, normalized size = 0.86

$$\frac{25961a^{11} + 154007a^{10}b\sqrt{x} + 365001a^9b^2x + 414295a^8b^3x^{3/2} + 171745a^7b^4x^2 - 90993a^6b^5x^{5/2} - 127351a^5b^6x^3 - 45913a^4b}{42b^{12}\left(a + b\sqrt{x}\right)^7}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5/(a + b*Sqrt[x])^8,x]
```

```
[Out] (25961*a^11 + 154007*a^10*b*Sqrt[x] + 365001*a^9*b^2*x + 414295*a
^8*b^3*x^(3/2) + 171745*a^7*b^4*x^2 - 90993*a^6*b^5*x^(5/2) - 127
351*a^5*b^6*x^3 - 45913*a^4*b^7*x^(7/2) - 3465*a^3*b^8*x^4 + 385*
a^2*b^9*x^(9/2) - 77*a*b^10*x^5 + 21*b^11*x^(11/2) + 27720*a^4*(a
 + b*Sqrt[x])^7*Log[a + b*Sqrt[x]])/(42*b^12*(a + b*Sqrt[x])^7)
```

Maple [A] time = 0.018, size = 174, normalized size = 0.9

$$36\,\frac{xa^2}{b^{10}} - \frac{16\,a}{3\,b^9}x^{\frac{3}{2}} + \frac{x^2}{2\,b^8} + 660\,\frac{a^4\ln\left(a + b\sqrt{x}\right)}{b^{12}} - 240\,\frac{a^3\sqrt{x}}{b^{11}} + \frac{2\,a^{11}}{7\,b^{12}}\left(a + b\sqrt{x}\right)^{-7} - \frac{11\,a^{10}}{3\,b^{12}}\left(a + b\sqrt{x}\right)^{-6} + 22\,\frac{a^9}{b^{12}\left(a + b\sqrt{x}\right)^5} - \frac{165\,a^8}{2\,b^{12}}\left(a + b\sqrt{x}\right)^{-4} + 220\,\frac{a^7}{b^{12}\left(a + b\sqrt{x}\right)^3} - 462\,\frac{a^6}{b^{12}\left(a + b\sqrt{x}\right)^2} + 924\,\frac{a^5}{b^{12}\left(a + b\sqrt{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5/(a+b*x^(1/2))^8,x)
```

```
[Out] 36*a^2*x/b^10-16/3*a*x^(3/2)/b^9+1/2*x^2/b^8+660*a^4*ln(a+b*x^(1/
2))/b^12-240*a^3*x^(1/2)/b^11+2/7*a^11/b^12/(a+b*x^(1/2))^7-11/3*
a^10/b^12/(a+b*x^(1/2))^6+22*a^9/b^12/(a+b*x^(1/2))^5-165/2*a^8/b
^12/(a+b*x^(1/2))^4+220*a^7/b^12/(a+b*x^(1/2))^3-462*a^6/b^12/(a+
b*x^(1/2))^2+924*a^5/b^12/(a+b*x^(1/2))
```

Maxima [A] time = 1.46113, size = 266, normalized size = 1.31

$$\frac{660\,a^4\log\left(b\sqrt{x} + a\right)}{b^{12}} + \frac{\left(b\sqrt{x} + a\right)^4}{2\,b^{12}} - \frac{22\left(b\sqrt{x} + a\right)^3 a}{3\,b^{12}} + \frac{55\left(b\sqrt{x} + a\right)^2 a^2}{b^{12}} - \frac{330\left(b\sqrt{x} + a\right)a^3}{b^{12}} + \frac{924\,a^5}{\left(b\sqrt{x} + a\right)b^{12}} - \frac{462\,a^6}{\left(b\sqrt{x} + a\right)^2 b^{12}} + \frac{220\,a^7}{\left(b\sqrt{x} + a\right)^3 b^{12}} - \frac{165\,a^8}{2\left(b\sqrt{x} + a\right)^4 b^{12}} + \frac{22\,a^9}{\left(b\sqrt{x} + a\right)^5 b^{12}} - \frac{11\,a^{10}}{3\left(b\sqrt{x} + a\right)^6 b^{12}} + \frac{2\,a^{11}}{7\left(b\sqrt{x} + a\right)^7 b^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*sqrt(x) + a)^8,x, algorithm="maxima")
```

```
[Out] 660*a^4*log(b*sqrt(x) + a)/b^12 + 1/2*(b*sqrt(x) + a)^4/b^12 - 22
/3*(b*sqrt(x) + a)^3*a/b^12 + 55*(b*sqrt(x) + a)^2*a^2/b^12 - 330
*(b*sqrt(x) + a)*a^3/b^12 + 924*a^5/((b*sqrt(x) + a)*b^12) - 462*
a^6/((b*sqrt(x) + a)^2*b^12) + 220*a^7/((b*sqrt(x) + a)^3*b^12) -
 165/2*a^8/((b*sqrt(x) + a)^4*b^12) + 22*a^9/((b*sqrt(x) + a)^5*b
^12) - 11/3*a^10/((b*sqrt(x) + a)^6*b^12) + 2/7*a^11/((b*sqrt(x)
+ a)^7*b^12)
```

Fricas [A] time = 0.241692, size = 386, normalized size = 1.9

$$-\frac{77\,ab^{10}x^5+3465\,a^3b^8x^4+127351\,a^5b^6x^3-171745\,a^7b^4x^2-365001\,a^9b^2x-25961\,a^{11}-27720\,\left(7\,a^5b^6x^3+35\,a^7b^4x^2+2\right.}{42\,\left(7\,ab^{18}x^3+35\,a^3b^{16}x^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*sqrt(x) + a)^8,x, algorithm="fricas")
```

```
[Out] -1/42*(77*a*b^10*x^5 + 3465*a^3*b^8*x^4 + 127351*a^5*b^6*x^3 - 17
1745*a^7*b^4*x^2 - 365001*a^9*b^2*x - 25961*a^11 - 27720*(7*a^5*b
^6*x^3 + 35*a^7*b^4*x^2 + 21*a^9*b^2*x + a^11 + (a^4*b^7*x^3 + 21
*a^6*b^5*x^2 + 35*a^8*b^3*x + 7*a^10*b)*sqrt(x))*log(b*sqrt(x) +
a) - 7*(3*b^11*x^5 + 55*a^2*b^9*x^4 - 6559*a^4*b^7*x^3 - 12999*a^
6*b^5*x^2 + 59185*a^8*b^3*x + 22001*a^10*b)*sqrt(x))/(7*a*b^18*x^
3 + 35*a^3*b^16*x^2 + 21*a^5*b^14*x + a^7*b^12 + (b^19*x^3 + 21*a
^2*b^17*x^2 + 35*a^4*b^15*x + 7*a^6*b^13)*sqrt(x))
```

Sympy [A] time = 156.991, size = 2154, normalized size = 10.61

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5/(a+b*x**(1/2))**8,x)
```

```
[Out] Piecewise((803880*a**11*log(a/b + sqrt(x))/(1218*a**7*b**12 + 852
6*a**6*b**13*sqrt(x) + 25578*a**5*b**14*x + 42630*a**4*b**15*x**(
3/2) + 42630*a**3*b**16*x**2 + 25578*a**2*b**17*x**(5/2) + 8526*a
*b**18*x**3 + 1218*b**19*x**(7/2)) + 774576*a**11/(1218*a**7*b**1
2 + 8526*a**6*b**13*sqrt(x) + 25578*a**5*b**14*x + 42630*a**4*b**
15*x**(3/2) + 42630*a**3*b**16*x**2 + 25578*a**2*b**17*x**(5/2) +
 8526*a*b**18*x**3 + 1218*b**19*x**(7/2)) + 5627160*a**10*b*sqrt(
x)*log(a/b + sqrt(x))/(1218*a**7*b**12 + 8526*a**6*b**13*sqrt(x)
+ 25578*a**5*b**14*x + 42630*a**4*b**15*x**(3/2) + 42630*a**3*b**
16*x**2 + 25578*a**2*b**17*x**(5/2) + 8526*a*b**18*x**3 + 1218*b*
*19*x**(7/2)) + 4618152*a**10*b*sqrt(x)/(1218*a**7*b**12 + 8526*a
**6*b**13*sqrt(x) + 25578*a**5*b**14*x + 42630*a**4*b**15*x**(3/2
) + 42630*a**3*b**16*x**2 + 25578*a**2*b**17*x**(5/2) + 8526*a*b*
*18*x**3 + 1218*b**19*x**(7/2)) + 16881480*a**9*b**2*x*log(a/b +
sqrt(x))/(1218*a**7*b**12 + 8526*a**6*b**13*sqrt(x) + 25578*a**5*
b**14*x + 42630*a**4*b**15*x**(3/2) + 42630*a**3*b**16*x**2 + 255
78*a**2*b**17*x**(5/2) + 8526*a*b**18*x**3 + 1218*b**19*x**(7/2))
 + 11040876*a**9*b**2*x/(1218*a**7*b**12 + 8526*a**6*b**13*sqrt(x
) + 25578*a**5*b**14*x + 42630*a**4*b**15*x**(3/2) + 42630*a**3*b
**16*x**2 + 25578*a**2*b**17*x**(5/2) + 8526*a*b**18*x**3 + 1218*
b**19*x**(7/2)) + 28135800*a**8*b**3*x**(3/2)*log(a/b + sqrt(x))/
(1218*a**7*b**12 + 8526*a**6*b**13*sqrt(x) + 25578*a**5*b**14*x +
 42630*a**4*b**15*x**(3/2) + 42630*a**3*b**16*x**2 + 25578*a**2*b
**17*x**(5/2) + 8526*a*b**18*x**3 + 1218*b**19*x**(7/2)) + 127743
00*a**8*b**3*x**(3/2)/(1218*a**7*b**12 + 8526*a**6*b**13*sqrt(x)
+ 25578*a**5*b**14*x + 42630*a**4*b**15*x**(3/2) + 42630*a**3*b**
16*x**2 + 25578*a**2*b**17*x**(5/2) + 8526*a*b**18*x**3 + 1218*b*
*19*x**(7/2)) + 28135800*a**7*b**4*x**2*log(a/b + sqrt(x))/(1218*
a**7*b**12 + 8526*a**6*b**13*sqrt(x) + 25578*a**5*b**14*x + 42630
*a**4*b**15*x**(3/2) + 42630*a**3*b**16*x**2 + 25578*a**2*b**17*x
**(5/2) + 8526*a*b**18*x**3 + 1218*b**19*x**(7/2)) + 5740350*a**7
*b**4*x**2/(1218*a**7*b**12 + 8526*a**6*b**13*sqrt(x) + 25578*a**
5*b**14*x + 42630*a**4*b**15*x**(3/2) + 42630*a**3*b**16*x**2 + 2
5578*a**2*b**17*x**(5/2) + 8526*a*b**18*x**3 + 1218*b**19*x**(7/2
)) + 16881480*a**6*b**5*x**(5/2)*log(a/b + sqrt(x))/(1218*a**7*b*
*12 + 8526*a**6*b**13*sqrt(x) + 25578*a**5*b**14*x + 42630*a**4*b
**15*x**(3/2) + 42630*a**3*b**16*x**2 + 25578*a**2*b**17*x**(5/2)
 + 8526*a*b**18*x**3 + 1218*b**19*x**(7/2)) - 2182950*a**6*b**5*x
**(5/2)/(1218*a**7*b**12 + 8526*a**6*b**13*sqrt(x) + 25578*a**5*b
**14*x + 42630*a**4*b**15*x**(3/2) + 42630*a**3*b**16*x**2 + 2557
8*a**2*b**17*x**(5/2) + 8526*a*b**18*x**3 + 1218*b**19*x**(7/2))
```

```
+ 5627160*a**5*b**6*x**3*log(a/b + sqrt(x))/(1218*a**7*b**12 + 85
26*a**6*b**13*sqrt(x) + 25578*a**5*b**14*x + 42630*a**4*b**15*x**
(3/2) + 42630*a**3*b**16*x**2 + 25578*a**2*b**17*x**(5/2) + 8526*
a*b**18*x**3 + 1218*b**19*x**(7/2)) - 3541230*a**5*b**6*x**3/(121
8*a**7*b**12 + 8526*a**6*b**13*sqrt(x) + 25578*a**5*b**14*x + 426
30*a**4*b**15*x**(3/2) + 42630*a**3*b**16*x**2 + 25578*a**2*b**17
*x**(5/2) + 8526*a*b**18*x**3 + 1218*b**19*x**(7/2)) + 803880*a**
4*b**7*x**(7/2)*log(a/b + sqrt(x))/(1218*a**7*b**12 + 8526*a**6*b
**13*sqrt(x) + 25578*a**5*b**14*x + 42630*a**4*b**15*x**(3/2) + 4
2630*a**3*b**16*x**2 + 25578*a**2*b**17*x**(5/2) + 8526*a*b**18*x
**3 + 1218*b**19*x**(7/2)) - 1309770*a**4*b**7*x**(7/2)/(1218*a**
7*b**12 + 8526*a**6*b**13*sqrt(x) + 25578*a**5*b**14*x + 42630*a*
*4*b**15*x**(3/2) + 42630*a**3*b**16*x**2 + 25578*a**2*b**17*x**(
5/2) + 8526*a*b**18*x**3 + 1218*b**19*x**(7/2)) - 100485*a**3*b**
8*x**4/(1218*a**7*b**12 + 8526*a**6*b**13*sqrt(x) + 25578*a**5*b*
*14*x + 42630*a**4*b**15*x**(3/2) + 42630*a**3*b**16*x**2 + 25578
*a**2*b**17*x**(5/2) + 8526*a*b**18*x**3 + 1218*b**19*x**(7/2)) +
 11165*a**2*b**9*x**(9/2)/(1218*a**7*b**12 + 8526*a**6*b**13*sqrt
(x) + 25578*a**5*b**14*x + 42630*a**4*b**15*x**(3/2) + 42630*a**3
*b**16*x**2 + 25578*a**2*b**17*x**(5/2) + 8526*a*b**18*x**3 + 121
8*b**19*x**(7/2)) - 2233*a*b**10*x**5/(1218*a**7*b**12 + 8526*a**
6*b**13*sqrt(x) + 25578*a**5*b**14*x + 42630*a**4*b**15*x**(3/2)
+ 42630*a**3*b**16*x**2 + 25578*a**2*b**17*x**(5/2) + 8526*a*b**1
8*x**3 + 1218*b**19*x**(7/2)) + 609*b**11*x**(11/2)/(1218*a**7*b*
*12 + 8526*a**6*b**13*sqrt(x) + 25578*a**5*b**14*x + 42630*a**4*b
**15*x**(3/2) + 42630*a**3*b**16*x**2 + 25578*a**2*b**17*x**(5/2)
 + 8526*a*b**18*x**3 + 1218*b**19*x**(7/2)), Ne(b, 0)), (x**6/(6*
a**8), True))
```

GIAC/XCAS [A] time = 0.235223, size = 193, normalized size = 0.95

$$\frac{660\,a^4\ln\left(\left|b\sqrt{x}+a\right|\right)}{b^{12}} + \frac{38808\,a^5b^6x^3 + 213444\,a^6b^5x^{\frac{5}{2}} + 494340\,a^7b^4x^2 + 615615\,a^8b^3x^{\frac{3}{2}} + 434049\,a^9b^2x + 164087\,a^{10}b\sqrt{x} + 25961\,a^{11}}{42\left(b\sqrt{x}+a\right)^7b^{12}} + \frac{3\,b^{24}x^2 - 32\,ab^{23}x^{\frac{3}{2}} + 216\,a^2b^{22}x - 1440\,a^3b^{21}\sqrt{x}}{6\,b^{32}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^5/(b*sqrt(x) + a)^8,x, algorithm="giac")
```

```
[Out] 660*a^4*ln(abs(b*sqrt(x) + a))/b^12 + 1/42*(38808*a^5*b^6*x^3 + 2
13444*a^6*b^5*x^(5/2) + 494340*a^7*b^4*x^2 + 615615*a^8*b^3*x^(3/
2) + 434049*a^9*b^2*x + 164087*a^10*b*sqrt(x) + 25961*a^11)/((b*s
qrt(x) + a)^7*b^12) + 1/6*(3*b^24*x^2 - 32*a*b^23*x^(3/2) + 216*a
^2*b^22*x - 1440*a^3*b^21*sqrt(x))/b^32
```

3.2222 $\int \frac{x^4}{\left(a+b\sqrt{x}\right)^8}\,dx$

Optimal. Leaf size=172

$$\frac{2a^9}{7b^{10}\left(a+b\sqrt{x}\right)^7}-\frac{3a^8}{b^{10}\left(a+b\sqrt{x}\right)^6}+\frac{72a^7}{5b^{10}\left(a+b\sqrt{x}\right)^5}-\frac{42a^6}{b^{10}\left(a+b\sqrt{x}\right)^4}+\frac{84a^5}{b^{10}\left(a+b\sqrt{x}\right)^3}-\frac{126a^4}{b^{10}\left(a+b\sqrt{x}\right)^2}+\frac{168a^3}{b^{10}\left(a+b\sqrt{x}\right)}+\frac{72a^2\log\left(a+b\sqrt{x}\right)}{b^{10}}-\frac{16a\sqrt{x}}{b^9}+\frac{x}{b^8}$$

```
[Out] (2*a^9)/(7*b^10*(a + b*Sqrt[x])^7) - (3*a^8)/(b^10*(a + b*Sqrt[x]
)^6) + (72*a^7)/(5*b^10*(a + b*Sqrt[x])^5) - (42*a^6)/(b^10*(a +
b*Sqrt[x])^4) + (84*a^5)/(b^10*(a + b*Sqrt[x])^3) - (126*a^4)/(b^
10*(a + b*Sqrt[x])^2) + (168*a^3)/(b^10*(a + b*Sqrt[x])) - (16*a*
Sqrt[x])/b^9 + x/b^8 + (72*a^2*Log[a + b*Sqrt[x]])/b^10
```

Rubi [A] time = 0.330569, antiderivative size = 172, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2a^9}{7b^{10}\left(a+b\sqrt{x}\right)^7}-\frac{3a^8}{b^{10}\left(a+b\sqrt{x}\right)^6}+\frac{72a^7}{5b^{10}\left(a+b\sqrt{x}\right)^5}-\frac{42a^6}{b^{10}\left(a+b\sqrt{x}\right)^4}+\frac{84a^5}{b^{10}\left(a+b\sqrt{x}\right)^3}-\frac{126a^4}{b^{10}\left(a+b\sqrt{x}\right)^2}+\frac{168a^3}{b^{10}\left(a+b\sqrt{x}\right)}+\frac{72a^2\log\left(a+b\sqrt{x}\right)}{b^{10}}-\frac{16a\sqrt{x}}{b^9}+\frac{x}{b^8}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a + b*Sqrt[x])^8,x]
```

```
[Out] (2*a^9)/(7*b^10*(a + b*Sqrt[x])^7) - (3*a^8)/(b^10*(a + b*Sqrt[x]
)^6) + (72*a^7)/(5*b^10*(a + b*Sqrt[x])^5) - (42*a^6)/(b^10*(a +
b*Sqrt[x])^4) + (84*a^5)/(b^10*(a + b*Sqrt[x])^3) - (126*a^4)/(b^
10*(a + b*Sqrt[x])^2) + (168*a^3)/(b^10*(a + b*Sqrt[x])) - (16*a*
Sqrt[x])/b^9 + x/b^8 + (72*a^2*Log[a + b*Sqrt[x]])/b^10
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{2a^9}{7b^{10}\left(a+b\sqrt{x}\right)^7}-\frac{3a^8}{b^{10}\left(a+b\sqrt{x}\right)^6}+\frac{72a^7}{5b^{10}\left(a+b\sqrt{x}\right)^5}-\frac{42a^6}{b^{10}\left(a+b\sqrt{x}\right)^4}+\frac{84a^5}{b^{10}\left(a+b\sqrt{x}\right)^3}-\frac{126a^4}{b^{10}\left(a+b\sqrt{x}\right)^2}+\frac{168a^3}{b^{10}\left(a+b\sqrt{x}\right)}+\frac{72a^2\log\left(a+b\sqrt{x}\right)}{b^{10}}-\frac{16a\sqrt{x}}{b^9}+\frac{2\int^{\sqrt{x}} x\,dx}{b^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(a+b*x**(1/2))**8,x)
```

```
[Out] 2*a**9/(7*b**10*(a + b*sqrt(x))**7) - 3*a**8/(b**10*(a + b*sqrt(x
))**6) + 72*a**7/(5*b**10*(a + b*sqrt(x))**5) - 42*a**6/(b**10*(a
 + b*sqrt(x))**4) + 84*a**5/(b**10*(a + b*sqrt(x))**3) - 126*a**4
/(b**10*(a + b*sqrt(x))**2) + 168*a**3/(b**10*(a + b*sqrt(x))) +
72*a**2*log(a + b*sqrt(x))/b**10 - 16*a*sqrt(x)/b**9 + 2*Integral
(x, (x, sqrt(x)))/b**8
```

Mathematica [A] time = 0.0693656, size = 150, normalized size = 0.87

$$\frac{3349a^9+20923a^8b\sqrt{x}+53949a^7b^2x+72275a^6b^3x^{3/2}+50225a^5b^4x^2+12495a^4b^5x^{5/2}-4655a^3b^6x^3-3185a^2b^7x^{7/2}+252\ldots}{35b^{10}\left(a+b\sqrt{x}\right)^7}$$

Antiderivative was successfully verified.

```
[In]   Integrate[x^4/(a + b*Sqrt[x])^8,x]
```

```
[Out] (3349*a^9 + 20923*a^8*b*Sqrt[x] + 53949*a^7*b^2*x + 72275*a^6*b^3
*x^(3/2) + 50225*a^5*b^4*x^2 + 12495*a^4*b^5*x^(5/2) - 4655*a^3*b
^6*x^3 - 3185*a^2*b^7*x^(7/2) - 315*a*b^8*x^4 + 35*b^9*x^(9/2) +
2520*a^2*(a + b*Sqrt[x])^7*Log[a + b*Sqrt[x]])/(35*b^10*(a + b*Sq
rt[x])^7)
```

Maple [A] time = 0.016, size = 151, normalized size = 0.9

$$\frac{x}{b^8}+72\,\frac{a^2\ln\left(a+b\sqrt{x}\right)}{b^{10}}-16\,\frac{a\sqrt{x}}{b^9}+\frac{2\,a^9}{7\,b^{10}}\left(a+b\sqrt{x}\right)^{-7}-3\,\frac{a^8}{b^{10}\left(a+b\sqrt{x}\right)^6}+\frac{72\,a^7}{5\,b^{10}}\left(a+b\sqrt{x}\right)^{-5}-42\,\frac{a^6}{b^{10}\left(a+b\sqrt{x}\right)^4}+84\,\frac{a^5}{b^{10}\left(a+b\sqrt{x}\right)^3}-126\,\frac{a^4}{b^{10}\left(a+b\sqrt{x}\right)^2}+168\,\frac{a^3}{b^{10}\left(a+b\sqrt{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^4/(a+b*x^(1/2))^8,x)
```

```
[Out] x/b^8+72*a^2*ln(a+b*x^(1/2))/b^10-16*a*x^(1/2)/b^9+2/7*a^9/b^10/(
a+b*x^(1/2))^7-3*a^8/b^10/(a+b*x^(1/2))^6+72/5*a^7/b^10/(a+b*x^(1
/2))^5-42*a^6/b^10/(a+b*x^(1/2))^4+84*a^5/b^10/(a+b*x^(1/2))^3-12
6*a^4/b^10/(a+b*x^(1/2))^2+168*a^3/b^10/(a+b*x^(1/2))
```

Maxima [A] time = 1.44218, size = 219, normalized size = 1.27

$$\frac{72\,a^2\log\left(b\sqrt{x}+a\right)}{b^{10}}+\frac{\left(b\sqrt{x}+a\right)^2}{b^{10}}-\frac{18\,\left(b\sqrt{x}+a\right)a}{b^{10}}+\frac{168\,a^3}{\left(b\sqrt{x}+a\right)b^{10}}-\frac{126\,a^4}{\left(b\sqrt{x}+a\right)^2b^{10}}+\frac{84\,a^5}{\left(b\sqrt{x}+a\right)^3b^{10}}-\frac{42\,a^6}{\left(b\sqrt{x}+a\right)^4b^{10}}+\frac{72\,a^7}{5\,\left(b\sqrt{x}+a\right)^5b^{10}}-\frac{3\,a^8}{\left(b\sqrt{x}+a\right)^6b^{10}}+\frac{2\,a^9}{7\,\left(b\sqrt{x}+a\right)^7b^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^4/(b*sqrt(x) + a)^8,x, algorithm="maxima")
```

```
[Out] 72*a^2*log(b*sqrt(x) + a)/b^10 + (b*sqrt(x) + a)^2/b^10 - 18*(b*s
qrt(x) + a)*a/b^10 + 168*a^3/((b*sqrt(x) + a)*b^10) - 126*a^4/((b
*sqrt(x) + a)^2*b^10) + 84*a^5/((b*sqrt(x) + a)^3*b^10) - 42*a^6/
((b*sqrt(x) + a)^4*b^10) + 72/5*a^7/((b*sqrt(x) + a)^5*b^10) - 3*
a^8/((b*sqrt(x) + a)^6*b^10) + 2/7*a^9/((b*sqrt(x) + a)^7*b^10)
```

Fricas [A] time = 0.244276, size = 356, normalized size = 2.07

$$-\frac{315\,ab^8x^4+4655\,a^3b^6x^3-50225\,a^5b^4x^2-53949\,a^7b^2x-3349\,a^9-2520\,(7\,a^3b^6x^3+35\,a^5b^4x^2+21\,a^7b^2x+a^9+(a^2b^7x^3}{35\,(7\,ab^{16}x^3+35\,a^3b^{14}x^2+21\,a^5b^{12}x+a^7b^{10}+}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^4/(b*sqrt(x) + a)^8,x, algorithm="fricas")
```

```
[Out] -1/35*(315*a*b^8*x^4 + 4655*a^3*b^6*x^3 - 50225*a^5*b^4*x^2 - 539
49*a^7*b^2*x - 3349*a^9 - 2520*(7*a^3*b^6*x^3 + 35*a^5*b^4*x^2 +
21*a^7*b^2*x + a^9 + (a^2*b^7*x^3 + 21*a^4*b^5*x^2 + 35*a^6*b^3*x
 + 7*a^8*b)*sqrt(x))*log(b*sqrt(x) + a) - 7*(5*b^9*x^4 - 455*a^2*
```

```
b^7*x^3 + 1785*a^4*b^5*x^2 + 10325*a^6*b^3*x + 2989*a^8*b)*sqrt(x
))/(7*a*b^16*x^3 + 35*a^3*b^14*x^2 + 21*a^5*b^12*x + a^7*b^10 + (
b^17*x^3 + 21*a^2*b^15*x^2 + 35*a^4*b^13*x + 7*a^6*b^11)*sqrt(x))
```

Sympy [A] time = 34.9145, size = 1945, normalized size = 11.31

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(a+b*x**(1/2))**8,x)
```

```
[Out] Piecewise((2520*a**9*log(a/b + sqrt(x))/(35*a**7*b**10 + 245*a**6
*b**11*sqrt(x) + 735*a**5*b**12*x + 1225*a**4*b**13*x**(3/2) + 12
25*a**3*b**14*x**2 + 735*a**2*b**15*x**(5/2) + 245*a*b**16*x**3 +
 35*b**17*x**(7/2)) + 5589*a**9/(35*a**7*b**10 + 245*a**6*b**11*s
qrt(x) + 735*a**5*b**12*x + 1225*a**4*b**13*x**(3/2) + 1225*a**3*
b**14*x**2 + 735*a**2*b**15*x**(5/2) + 245*a*b**16*x**3 + 35*b**1
7*x**(7/2)) + 17640*a**8*b*sqrt(x)*log(a/b + sqrt(x))/(35*a**7*b*
*10 + 245*a**6*b**11*sqrt(x) + 735*a**5*b**12*x + 1225*a**4*b**13
*x**(3/2) + 1225*a**3*b**14*x**2 + 735*a**2*b**15*x**(5/2) + 245*
a*b**16*x**3 + 35*b**17*x**(7/2)) + 36603*a**8*b*sqrt(x)/(35*a**7
*b**10 + 245*a**6*b**11*sqrt(x) + 735*a**5*b**12*x + 1225*a**4*b*
*13*x**(3/2) + 1225*a**3*b**14*x**2 + 735*a**2*b**15*x**(5/2) + 2
45*a*b**16*x**3 + 35*b**17*x**(7/2)) + 52920*a**7*b**2*x*log(a/b
+ sqrt(x))/(35*a**7*b**10 + 245*a**6*b**11*sqrt(x) + 735*a**5*b**
12*x + 1225*a**4*b**13*x**(3/2) + 1225*a**3*b**14*x**2 + 735*a**2
*b**15*x**(5/2) + 245*a*b**16*x**3 + 35*b**17*x**(7/2)) + 100989*
a**7*b**2*x/(35*a**7*b**10 + 245*a**6*b**11*sqrt(x) + 735*a**5*b*
*12*x + 1225*a**4*b**13*x**(3/2) + 1225*a**3*b**14*x**2 + 735*a**
2*b**15*x**(5/2) + 245*a*b**16*x**3 + 35*b**17*x**(7/2)) + 88200*
a**6*b**3*x**(3/2)*log(a/b + sqrt(x))/(35*a**7*b**10 + 245*a**6*b
**11*sqrt(x) + 735*a**5*b**12*x + 1225*a**4*b**13*x**(3/2) + 1225
*a**3*b**14*x**2 + 735*a**2*b**15*x**(5/2) + 245*a*b**16*x**3 + 3
5*b**17*x**(7/2)) + 150675*a**6*b**3*x**(3/2)/(35*a**7*b**10 + 24
5*a**6*b**11*sqrt(x) + 735*a**5*b**12*x + 1225*a**4*b**13*x**(3/2
) + 1225*a**3*b**14*x**2 + 735*a**2*b**15*x**(5/2) + 245*a*b**16*
x**3 + 35*b**17*x**(7/2)) + 88200*a**5*b**4*x**2*log(a/b + sqrt(x
))/(35*a**7*b**10 + 245*a**6*b**11*sqrt(x) + 735*a**5*b**12*x + 1
225*a**4*b**13*x**(3/2) + 1225*a**3*b**14*x**2 + 735*a**2*b**15*x
**(5/2) + 245*a*b**16*x**3 + 35*b**17*x**(7/2)) + 128625*a**5*b**
4*x**2/(35*a**7*b**10 + 245*a**6*b**11*sqrt(x) + 735*a**5*b**12*x
 + 1225*a**4*b**13*x**(3/2) + 1225*a**3*b**14*x**2 + 735*a**2*b**
15*x**(5/2) + 245*a*b**16*x**3 + 35*b**17*x**(7/2)) + 52920*a**4*
b**5*x**(5/2)*log(a/b + sqrt(x))/(35*a**7*b**10 + 245*a**6*b**11*
sqrt(x) + 735*a**5*b**12*x + 1225*a**4*b**13*x**(3/2) + 1225*a**3
*b**14*x**2 + 735*a**2*b**15*x**(5/2) + 245*a*b**16*x**3 + 35*b**
17*x**(7/2)) + 59535*a**4*b**5*x**(5/2)/(35*a**7*b**10 + 245*a**6
*b**11*sqrt(x) + 735*a**5*b**12*x + 1225*a**4*b**13*x**(3/2) + 12
25*a**3*b**14*x**2 + 735*a**2*b**15*x**(5/2) + 245*a*b**16*x**3 +
 35*b**17*x**(7/2)) + 17640*a**3*b**6*x**3*log(a/b + sqrt(x))/(35
*a**7*b**10 + 245*a**6*b**11*sqrt(x) + 735*a**5*b**12*x + 1225*a*
*4*b**13*x**(3/2) + 1225*a**3*b**14*x**2 + 735*a**2*b**15*x**(5/2
) + 245*a*b**16*x**3 + 35*b**17*x**(7/2)) + 11025*a**3*b**6*x**3/
(35*a**7*b**10 + 245*a**6*b**11*sqrt(x) + 735*a**5*b**12*x + 1225
*a**4*b**13*x**(3/2) + 1225*a**3*b**14*x**2 + 735*a**2*b**15*x**(
5/2) + 245*a*b**16*x**3 + 35*b**17*x**(7/2)) + 2520*a**2*b**7*x**
(7/2)*log(a/b + sqrt(x))/(35*a**7*b**10 + 245*a**6*b**11*sqrt(x)
+ 735*a**5*b**12*x + 1225*a**4*b**13*x**(3/2) + 1225*a**3*b**14*x
**2 + 735*a**2*b**15*x**(5/2) + 245*a*b**16*x**3 + 35*b**17*x**(7
/2)) - 945*a**2*b**7*x**(7/2)/(35*a**7*b**10 + 245*a**6*b**11*sqr
t(x) + 735*a**5*b**12*x + 1225*a**4*b**13*x**(3/2) + 1225*a**3*b*
*14*x**2 + 735*a**2*b**15*x**(5/2) + 245*a*b**16*x**3 + 35*b**17*
x**(7/2)) - 315*a*b**8*x**4/(35*a**7*b**10 + 245*a**6*b**11*sqrt(
x) + 735*a**5*b**12*x + 1225*a**4*b**13*x**(3/2) + 1225*a**3*b**1
4*x**2 + 735*a**2*b**15*x**(5/2) + 245*a*b**16*x**3 + 35*b**17*x*
*(7/2)) + 35*b**9*x**(9/2)/(35*a**7*b**10 + 245*a**6*b**11*sqrt(x
) + 735*a**5*b**12*x + 1225*a**4*b**13*x**(3/2) + 1225*a**3*b**14
*x**2 + 735*a**2*b**15*x**(5/2) + 245*a*b**16*x**3 + 35*b**17*x**
(7/2)), Ne(b, 0)), (x**5/(5*a**8), True))
```

GIAC/XCAS [A] time = 0.219014, size = 161, normalized size = 0.94

$$\frac{72\,a^2\ln\left(\left|b\sqrt{x}+a\right|\right)}{b^{10}}+\frac{b^8x-16\,ab^7\sqrt{x}}{b^{16}}+\frac{5880\,a^3b^6x^3+30870\,a^4b^5x^{\frac{5}{2}}+69090\,a^5b^4x^2+83790\,a^6b^3x^{\frac{3}{2}}+57834\,a^7b^2x+21483\,a^8b\sqrt{x}+3349\,a^9}{35\left(b\sqrt{x}+a\right)^7b^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*sqrt(x) + a)^8,x, algorithm="giac")
```

```
[Out] 72*a^2*ln(abs(b*sqrt(x) + a))/b^10 + (b^8*x - 16*a*b^7*sqrt(x))/b
^16 + 1/35*(5880*a^3*b^6*x^3 + 30870*a^4*b^5*x^(5/2) + 69090*a^5*
b^4*x^2 + 83790*a^6*b^3*x^(3/2) + 57834*a^7*b^2*x + 21483*a^8*b*s
qrt(x) + 3349*a^9)/((b*sqrt(x) + a)^7*b^10)
```

3.2223 $\int \frac{x^3}{\left(a+b\sqrt{x}\right)^8}\,dx$

Optimal. Leaf size=157

$$\frac{2a^7}{7b^8\left(a+b\sqrt{x}\right)^7}-\frac{7a^6}{3b^8\left(a+b\sqrt{x}\right)^6}+\frac{42a^5}{5b^8\left(a+b\sqrt{x}\right)^5}-\frac{35a^4}{2b^8\left(a+b\sqrt{x}\right)^4}+\frac{70a^3}{3b^8\left(a+b\sqrt{x}\right)^3}-\frac{21a^2}{b^8\left(a+b\sqrt{x}\right)^2}+\frac{14a}{b^8\left(a+b\sqrt{x}\right)}+\frac{2\log\left(a+b\sqrt{x}\right)}{b^8}$$

```
[Out] (2*a^7)/(7*b^8*(a + b*Sqrt[x])^7) - (7*a^6)/(3*b^8*(a + b*Sqrt[x]
)^6) + (42*a^5)/(5*b^8*(a + b*Sqrt[x])^5) - (35*a^4)/(2*b^8*(a +
b*Sqrt[x])^4) + (70*a^3)/(3*b^8*(a + b*Sqrt[x])^3) - (21*a^2)/(b^
8*(a + b*Sqrt[x])^2) + (14*a)/(b^8*(a + b*Sqrt[x])) + (2*Log[a +
b*Sqrt[x]])/b^8
```

Rubi [A] time = 0.244912, antiderivative size = 157, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2a^7}{7b^8\left(a+b\sqrt{x}\right)^7}-\frac{7a^6}{3b^8\left(a+b\sqrt{x}\right)^6}+\frac{42a^5}{5b^8\left(a+b\sqrt{x}\right)^5}-\frac{35a^4}{2b^8\left(a+b\sqrt{x}\right)^4}+\frac{70a^3}{3b^8\left(a+b\sqrt{x}\right)^3}-\frac{21a^2}{b^8\left(a+b\sqrt{x}\right)^2}+\frac{14a}{b^8\left(a+b\sqrt{x}\right)}+\frac{2\log\left(a+b\sqrt{x}\right)}{b^8}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(a + b*Sqrt[x])^8,x]
```

```
[Out] (2*a^7)/(7*b^8*(a + b*Sqrt[x])^7) - (7*a^6)/(3*b^8*(a + b*Sqrt[x]
)^6) + (42*a^5)/(5*b^8*(a + b*Sqrt[x])^5) - (35*a^4)/(2*b^8*(a +
b*Sqrt[x])^4) + (70*a^3)/(3*b^8*(a + b*Sqrt[x])^3) - (21*a^2)/(b^
8*(a + b*Sqrt[x])^2) + (14*a)/(b^8*(a + b*Sqrt[x])) + (2*Log[a +
b*Sqrt[x]])/b^8
```

Rubi in Sympy [A] time = 37.6382, size = 150, normalized size = 0.96

$$\frac{2a^7}{7b^8\left(a+b\sqrt{x}\right)^7}-\frac{7a^6}{3b^8\left(a+b\sqrt{x}\right)^6}+\frac{42a^5}{5b^8\left(a+b\sqrt{x}\right)^5}-\frac{35a^4}{2b^8\left(a+b\sqrt{x}\right)^4}+\frac{70a^3}{3b^8\left(a+b\sqrt{x}\right)^3}-\frac{21a^2}{b^8\left(a+b\sqrt{x}\right)^2}+\frac{14a}{b^8\left(a+b\sqrt{x}\right)}+\frac{2\log\left(a+b\sqrt{x}\right)}{b^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(a+b*x**(1/2))**8,x)
```

```
[Out] 2*a**7/(7*b**8*(a + b*sqrt(x))**7) - 7*a**6/(3*b**8*(a + b*sqrt(x
))**6) + 42*a**5/(5*b**8*(a + b*sqrt(x))**5) - 35*a**4/(2*b**8*(a
 + b*sqrt(x))**4) + 70*a**3/(3*b**8*(a + b*sqrt(x))**3) - 21*a**2
/(b**8*(a + b*sqrt(x))**2) + 14*a/(b**8*(a + b*sqrt(x))) + 2*log(
a + b*sqrt(x))/b**8
```

Mathematica [A] time = 0.0662979, size = 102, normalized size = 0.65

$$\frac{\frac{a\left(1089a^6+7203a^5b\sqrt{x}+20139a^4b^2x+30625a^3b^3x^{3/2}+26950a^2b^4x^2+13230ab^5x^{5/2}+2940b^6x^3\right)}{\left(a+b\sqrt{x}\right)^7}+420\log\left(a+b\sqrt{x}\right)}{210b^8}$$

Antiderivative was successfully verified.

```
[In]   Integrate[x^3/(a + b*Sqrt[x])^8,x]
```

```
[Out] ((a*(1089*a^6 + 7203*a^5*b*Sqrt[x] + 20139*a^4*b^2*x + 30625*a^3*
b^3*x^(3/2) + 26950*a^2*b^4*x^2 + 13230*a*b^5*x^(5/2) + 2940*b^6*
x^3))/(a + b*Sqrt[x])^7 + 420*Log[a + b*Sqrt[x]])/(210*b^8)
```

Maple [A] time = 0.013, size = 132, normalized size = 0.8

$$2\,\frac{\ln\left(a+b\sqrt{x}\right)}{b^8}+\frac{2\,a^7}{7\,b^8}\left(a+b\sqrt{x}\right)^{-7}-\frac{7\,a^6}{3\,b^8}\left(a+b\sqrt{x}\right)^{-6}+\frac{42\,a^5}{5\,b^8}\left(a+b\sqrt{x}\right)^{-5}-\frac{35\,a^4}{2\,b^8}\left(a+b\sqrt{x}\right)^{-4}+\frac{70\,a^3}{3\,b^8}\left(a+b\sqrt{x}\right)^{-3}-21\,\frac{a^2}{b^8\left(a+b\sqrt{x}\right)^2}+14\,\frac{a}{b^8\left(a+b\sqrt{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^3/(a+b*x^(1/2))^8,x)
```

```
[Out] 2*ln(a+b*x^(1/2))/b^8+2/7*a^7/b^8/(a+b*x^(1/2))^7-7/3*a^6/b^8/(a+
b*x^(1/2))^6+42/5*a^5/b^8/(a+b*x^(1/2))^5-35/2*a^4/b^8/(a+b*x^(1/
2))^4+70/3*a^3/b^8/(a+b*x^(1/2))^3-21*a^2/b^8/(a+b*x^(1/2))^2+14*
a/b^8/(a+b*x^(1/2))
```

Maxima [A] time = 1.45616, size = 177, normalized size = 1.13

$$\frac{2\,\log\left(b\sqrt{x}+a\right)}{b^8}+\frac{14\,a}{\left(b\sqrt{x}+a\right)b^8}-\frac{21\,a^2}{\left(b\sqrt{x}+a\right)^2b^8}+\frac{70\,a^3}{3\left(b\sqrt{x}+a\right)^3b^8}-\frac{35\,a^4}{2\left(b\sqrt{x}+a\right)^4b^8}+\frac{42\,a^5}{5\left(b\sqrt{x}+a\right)^5b^8}-\frac{7\,a^6}{3\left(b\sqrt{x}+a\right)^6b^8}+\frac{2\,a^7}{7\left(b\sqrt{x}+a\right)^7b^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^3/(b*sqrt(x) + a)^8,x, algorithm="maxima")
```

```
[Out] 2*log(b*sqrt(x) + a)/b^8 + 14*a/((b*sqrt(x) + a)*b^8) - 21*a^2/((
b*sqrt(x) + a)^2*b^8) + 70/3*a^3/((b*sqrt(x) + a)^3*b^8) - 35/2*a
^4/((b*sqrt(x) + a)^4*b^8) + 42/5*a^5/((b*sqrt(x) + a)^5*b^8) - 7
/3*a^6/((b*sqrt(x) + a)^6*b^8) + 2/7*a^7/((b*sqrt(x) + a)^7*b^8)
```

Fricas [A] time = 0.237058, size = 309, normalized size = 1.97

$$\frac{2940\,ab^6x^3+26950\,a^3b^4x^2+20139\,a^5b^2x+1089\,a^7+420\left(7\,ab^6x^3+35\,a^3b^4x^2+21\,a^5b^2x+a^7+\left(b^7x^3+21\,a^2b^5x^2+35\,a^4b\right.\right.}{210\left(7\,ab^{14}x^3+35\,a^3b^{12}x^2+21\,a^5b^{10}x+a^7b^8+\left(b^{15}x^3+21\,a^2b^{13}x^2+3\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^3/(b*sqrt(x) + a)^8,x, algorithm="fricas")
```

```
[Out] 1/210*(2940*a*b^6*x^3 + 26950*a^3*b^4*x^2 + 20139*a^5*b^2*x + 108
9*a^7 + 420*(7*a*b^6*x^3 + 35*a^3*b^4*x^2 + 21*a^5*b^2*x + a^7 +
(b^7*x^3 + 21*a^2*b^5*x^2 + 35*a^4*b^3*x + 7*a^6*b)*sqrt(x))*log(
b*sqrt(x) + a) + 49*(270*a^2*b^5*x^2 + 625*a^4*b^3*x + 147*a^6*b)
*sqrt(x))/(7*a*b^14*x^3 + 35*a^3*b^12*x^2 + 21*a^5*b^10*x + a^7*b
^8 + (b^15*x^3 + 21*a^2*b^13*x^2 + 35*a^4*b^11*x + 7*a^6*b^9)*sqr
t(x))
```

Sympy [A] time = 32.6686, size = 1629, normalized size = 10.38

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(a+b*x**(1/2))**8,x)
```

```
[Out] Piecewise((420*a**7*log(a/b + sqrt(x))/(210*a**7*b**8 + 1470*a**6
*b**9*sqrt(x) + 4410*a**5*b**10*x + 7350*a**4*b**11*x**(3/2) + 73
50*a**3*b**12*x**2 + 4410*a**2*b**13*x**(5/2) + 1470*a*b**14*x**3
 + 210*b**15*x**(7/2)) + 1089*a**7/(210*a**7*b**8 + 1470*a**6*b**
9*sqrt(x) + 4410*a**5*b**10*x + 7350*a**4*b**11*x**(3/2) + 7350*a
**3*b**12*x**2 + 4410*a**2*b**13*x**(5/2) + 1470*a*b**14*x**3 + 2
10*b**15*x**(7/2)) + 2940*a**6*b*sqrt(x)*log(a/b + sqrt(x))/(210*
a**7*b**8 + 1470*a**6*b**9*sqrt(x) + 4410*a**5*b**10*x + 7350*a**
4*b**11*x**(3/2) + 7350*a**3*b**12*x**2 + 4410*a**2*b**13*x**(5/2
) + 1470*a*b**14*x**3 + 210*b**15*x**(7/2)) + 7203*a**6*b*sqrt(x)
/(210*a**7*b**8 + 1470*a**6*b**9*sqrt(x) + 4410*a**5*b**10*x + 73
50*a**4*b**11*x**(3/2) + 7350*a**3*b**12*x**2 + 4410*a**2*b**13*x
**(5/2) + 1470*a*b**14*x**3 + 210*b**15*x**(7/2)) + 8820*a**5*b**
2*x*log(a/b + sqrt(x))/(210*a**7*b**8 + 1470*a**6*b**9*sqrt(x) +
4410*a**5*b**10*x + 7350*a**4*b**11*x**(3/2) + 7350*a**3*b**12*x*
*2 + 4410*a**2*b**13*x**(5/2) + 1470*a*b**14*x**3 + 210*b**15*x**
(7/2)) + 20139*a**5*b**2*x/(210*a**7*b**8 + 1470*a**6*b**9*sqrt(x
) + 4410*a**5*b**10*x + 7350*a**4*b**11*x**(3/2) + 7350*a**3*b**1
2*x**2 + 4410*a**2*b**13*x**(5/2) + 1470*a*b**14*x**3 + 210*b**15
*x**(7/2)) + 14700*a**4*b**3*x**(3/2)*log(a/b + sqrt(x))/(210*a**
7*b**8 + 1470*a**6*b**9*sqrt(x) + 4410*a**5*b**10*x + 7350*a**4*b
**11*x**(3/2) + 7350*a**3*b**12*x**2 + 4410*a**2*b**13*x**(5/2) +
 1470*a*b**14*x**3 + 210*b**15*x**(7/2)) + 30625*a**4*b**3*x**(3/
2)/(210*a**7*b**8 + 1470*a**6*b**9*sqrt(x) + 4410*a**5*b**10*x +
7350*a**4*b**11*x**(3/2) + 7350*a**3*b**12*x**2 + 4410*a**2*b**13
*x**(5/2) + 1470*a*b**14*x**3 + 210*b**15*x**(7/2)) + 14700*a**3*
b**4*x**2*log(a/b + sqrt(x))/(210*a**7*b**8 + 1470*a**6*b**9*sqrt
(x) + 4410*a**5*b**10*x + 7350*a**4*b**11*x**(3/2) + 7350*a**3*b*
*12*x**2 + 4410*a**2*b**13*x**(5/2) + 1470*a*b**14*x**3 + 210*b**
15*x**(7/2)) + 26950*a**3*b**4*x**2/(210*a**7*b**8 + 1470*a**6*b*
*9*sqrt(x) + 4410*a**5*b**10*x + 7350*a**4*b**11*x**(3/2) + 7350*
a**3*b**12*x**2 + 4410*a**2*b**13*x**(5/2) + 1470*a*b**14*x**3 +
210*b**15*x**(7/2)) + 8820*a**2*b**5*x**(5/2)*log(a/b + sqrt(x))/
(210*a**7*b**8 + 1470*a**6*b**9*sqrt(x) + 4410*a**5*b**10*x + 735
0*a**4*b**11*x**(3/2) + 7350*a**3*b**12*x**2 + 4410*a**2*b**13*x*
*(5/2) + 1470*a*b**14*x**3 + 210*b**15*x**(7/2)) + 13230*a**2*b**
5*x**(5/2)/(210*a**7*b**8 + 1470*a**6*b**9*sqrt(x) + 4410*a**5*b*
*10*x + 7350*a**4*b**11*x**(3/2) + 7350*a**3*b**12*x**2 + 4410*a*
*2*b**13*x**(5/2) + 1470*a*b**14*x**3 + 210*b**15*x**(7/2)) + 294
0*a*b**6*x**3*log(a/b + sqrt(x))/(210*a**7*b**8 + 1470*a**6*b**9*
sqrt(x) + 4410*a**5*b**10*x + 7350*a**4*b**11*x**(3/2) + 7350*a**
3*b**12*x**2 + 4410*a**2*b**13*x**(5/2) + 1470*a*b**14*x**3 + 210
*b**15*x**(7/2)) + 2940*a*b**6*x**3/(210*a**7*b**8 + 1470*a**6*b*
*9*sqrt(x) + 4410*a**5*b**10*x + 7350*a**4*b**11*x**(3/2) + 7350*
a**3*b**12*x**2 + 4410*a**2*b**13*x**(5/2) + 1470*a*b**14*x**3 +
210*b**15*x**(7/2)) + 420*b**7*x**(7/2)*log(a/b + sqrt(x))/(210*a
**7*b**8 + 1470*a**6*b**9*sqrt(x) + 4410*a**5*b**10*x + 7350*a**4
*b**11*x**(3/2) + 7350*a**3*b**12*x**2 + 4410*a**2*b**13*x**(5/2)
 + 1470*a*b**14*x**3 + 210*b**15*x**(7/2)), Ne(b, 0)), (x**4/(4*a
**8), True))
```

GIAC/XCAS [A] time = 0.242489, size = 128, normalized size = 0.82

$$\frac{2\,\ln\left(\left|b\sqrt{x}+a\right|\right)}{b^8}+\frac{2940\,ab^5x^3+13230\,a^2b^4x^{\frac{5}{2}}+26950\,a^3b^3x^2+30625\,a^4b^2x^{\frac{3}{2}}+20139\,a^5bx+7203\,a^6\sqrt{x}+\frac{1089\,a^7}{b}}{210\,\left(b\sqrt{x}+a\right)^7b^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*sqrt(x) + a)^8,x, algorithm="giac")
```

```
[Out] 2*ln(abs(b*sqrt(x) + a))/b^8 + 1/210*(2940*a*b^5*x^3 + 13230*a^2*
b^4*x^(5/2) + 26950*a^3*b^3*x^2 + 30625*a^4*b^2*x^(3/2) + 20139*a
^5*b*x + 7203*a^6*sqrt(x) + 1089*a^7/b)/((b*sqrt(x) + a)^7*b^7)
```

3.2224 $\int \frac{x^2}{\left(a+b\sqrt{x}\right)^8}\,dx$

Optimal. Leaf size=43

$$\frac{x^3}{21a^2\left(a+b\sqrt{x}\right)^6}+\frac{2x^3}{7a\left(a+b\sqrt{x}\right)^7}$$

```
[Out] (2*x^3)/(7*a*(a + b*Sqrt[x])^7) + x^3/(21*a^2*(a + b*Sqrt[x])^6)
```

Rubi [A] time = 0.0479277, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{x^3}{21a^2\left(a+b\sqrt{x}\right)^6}+\frac{2x^3}{7a\left(a+b\sqrt{x}\right)^7}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/(a + b*Sqrt[x])^8,x]
```

```
[Out] (2*x^3)/(7*a*(a + b*Sqrt[x])^7) + x^3/(21*a^2*(a + b*Sqrt[x])^6)
```

Rubi in Sympy [A] time = 6.58194, size = 36, normalized size = 0.84

$$\frac{2x^3}{7a\left(a+b\sqrt{x}\right)^7}+\frac{x^3}{21a^2\left(a+b\sqrt{x}\right)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**2/(a+b*x**(1/2))**8,x)
```

```
[Out] 2*x**3/(7*a*(a + b*sqrt(x))**7) + x**3/(21*a**2*(a + b*sqrt(x))**
6)
```

Mathematica [A] time = 0.0353904, size = 74, normalized size = 1.72

$$-\frac{a^5+7a^4b\sqrt{x}+21a^3b^2x+35a^2b^3x^{3/2}+35ab^4x^2+21b^5x^{5/2}}{21b^6\left(a+b\sqrt{x}\right)^7}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/(a + b*Sqrt[x])^8,x]
```

```
[Out] -(a^5 + 7*a^4*b*Sqrt[x] + 21*a^3*b^2*x + 35*a^2*b^3*x^(3/2) + 35*
a*b^4*x^2 + 21*b^5*x^(5/2))/(21*b^6*(a + b*Sqrt[x])^7)
```

Maple [B] time = 0.01, size = 99, normalized size = 2.3

$$\frac{10\,a}{3\,b^6}\left(a+b\sqrt{x}\right)^{-3}+4\,\frac{a^3}{b^6\left(a+b\sqrt{x}\right)^5}-\frac{1}{b^6}\left(a+b\sqrt{x}\right)^{-2}-\frac{5\,a^4}{3\,b^6}\left(a+b\sqrt{x}\right)^{-6}-5\,\frac{a^2}{b^6\left(a+b\sqrt{x}\right)^4}+\frac{2\,a^5}{7\,b^6}\left(a+b\sqrt{x}\right)^{-7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(a+b*x^(1/2))^8,x)
```

```
[Out] 10/3*a/b^6/(a+b*x^(1/2))^3+4*a^3/b^6/(a+b*x^(1/2))^5-1/b^6/(a+b*x
^(1/2))^2-5/3*a^4/b^6/(a+b*x^(1/2))^6-5*a^2/b^6/(a+b*x^(1/2))^4+2
/7*a^5/b^6/(a+b*x^(1/2))^7
```

Maxima [A] time = 1.4415, size = 132, normalized size = 3.07

$$-\frac{1}{\left(b\sqrt{x}+a\right)^{2}b^{6}}+\frac{10\,a}{3\,\left(b\sqrt{x}+a\right)^{3}b^{6}}-\frac{5\,a^{2}}{\left(b\sqrt{x}+a\right)^{4}b^{6}}+\frac{4\,a^{3}}{\left(b\sqrt{x}+a\right)^{5}b^{6}}-\frac{5\,a^{4}}{3\,\left(b\sqrt{x}+a\right)^{6}b^{6}}+\frac{2\,a^{5}}{7\,\left(b\sqrt{x}+a\right)^{7}b^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*sqrt(x) + a)^8,x, algorithm="maxima")
```

```
[Out] -1/((b*sqrt(x) + a)^2*b^6) + 10/3*a/((b*sqrt(x) + a)^3*b^6) - 5*a
^2/((b*sqrt(x) + a)^4*b^6) + 4*a^3/((b*sqrt(x) + a)^5*b^6) - 5/3*
a^4/((b*sqrt(x) + a)^6*b^6) + 2/7*a^5/((b*sqrt(x) + a)^7*b^6)
```

Fricas [A] time = 0.238638, size = 177, normalized size = 4.12

$$-\frac{35\,ab^{4}x^{2}+21\,a^{3}b^{2}x+a^{5}+7\,\left(3\,b^{5}x^{2}+5\,a^{2}b^{3}x+a^{4}b\right)\sqrt{x}}{21\,\left(7\,ab^{12}x^{3}+35\,a^{3}b^{10}x^{2}+21\,a^{5}b^{8}x+a^{7}b^{6}+\left(b^{13}x^{3}+21\,a^{2}b^{11}x^{2}+35\,a^{4}b^{9}x+7\,a^{6}b^{7}\right)\sqrt{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*sqrt(x) + a)^8,x, algorithm="fricas")
```

```
[Out] -1/21*(35*a*b^4*x^2 + 21*a^3*b^2*x + a^5 + 7*(3*b^5*x^2 + 5*a^2*b
^3*x + a^4*b)*sqrt(x))/(7*a*b^12*x^3 + 35*a^3*b^10*x^2 + 21*a^5*b
^8*x + a^7*b^6 + (b^13*x^3 + 21*a^2*b^11*x^2 + 35*a^4*b^9*x + 7*a
^6*b^7)*sqrt(x))
```

Sympy [A] time = 30.2126, size = 619, normalized size = 14.4

$$\begin{cases} -\frac{a^{5}}{21a^{7}b^{6}+147a^{6}b^{7}\sqrt{x}+441a^{5}b^{8}x+735a^{4}b^{9}x^{\frac{3}{2}}+735a^{3}b^{10}x^{2}+441a^{2}b^{11}x^{\frac{5}{2}}+147ab^{12}x^{3}+21b^{13}x^{\frac{7}{2}}}-\frac{7a^{4}b\sqrt{x}}{21a^{7}b^{6}+147a^{6}b^{7}\sqrt{x}+441a^{5}b^{8}x+735a^{4}b^{9}x^{\frac{3}{2}}+735a^{3}b^{10}x^{2}+\cdots} \\ \frac{x^{3}}{3a^{8}} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b*x**(1/2))**8,x)
```

```
[Out] Piecewise((-a**5/(21*a**7*b**6 + 147*a**6*b**7*sqrt(x) + 441*a**5
*b**8*x + 735*a**4*b**9*x**(3/2) + 735*a**3*b**10*x**2 + 441*a**2
*b**11*x**(5/2) + 147*a*b**12*x**3 + 21*b**13*x**(7/2)) - 7*a**4*
b*sqrt(x)/(21*a**7*b**6 + 147*a**6*b**7*sqrt(x) + 441*a**5*b**8*x
 + 735*a**4*b**9*x**(3/2) + 735*a**3*b**10*x**2 + 441*a**2*b**11*
x**(5/2) + 147*a*b**12*x**3 + 21*b**13*x**(7/2)) - 21*a**3*b**2*x
/(21*a**7*b**6 + 147*a**6*b**7*sqrt(x) + 441*a**5*b**8*x + 735*a*
*4*b**9*x**(3/2) + 735*a**3*b**10*x**2 + 441*a**2*b**11*x**(5/2)
+ 147*a*b**12*x**3 + 21*b**13*x**(7/2)) - 35*a**2*b**3*x**(3/2)/(
21*a**7*b**6 + 147*a**6*b**7*sqrt(x) + 441*a**5*b**8*x + 735*a**4
*b**9*x**(3/2) + 735*a**3*b**10*x**2 + 441*a**2*b**11*x**(5/2) +
147*a*b**12*x**3 + 21*b**13*x**(7/2)) - 35*a*b**4*x**2/(21*a**7*b
**6 + 147*a**6*b**7*sqrt(x) + 441*a**5*b**8*x + 735*a**4*b**9*x**
```

```
(3/2) + 735*a**3*b**10*x**2 + 441*a**2*b**11*x**(5/2) + 147*a*b**
12*x**3 + 21*b**13*x**(7/2)) - 21*b**5*x**(5/2)/(21*a**7*b**6 + 1
47*a**6*b**7*sqrt(x) + 441*a**5*b**8*x + 735*a**4*b**9*x**(3/2) +
 735*a**3*b**10*x**2 + 441*a**2*b**11*x**(5/2) + 147*a*b**12*x**3
 + 21*b**13*x**(7/2)), Ne(b, 0)), (x**3/(3*a**8), True))
```

GIAC/XCAS [A] time = 0.260071, size = 86, normalized size = 2.

$$-\frac{21\,b^5x^{\frac{5}{2}} + 35\,ab^4x^2 + 35\,a^2b^3x^{\frac{3}{2}} + 21\,a^3b^2x + 7\,a^4b\sqrt{x} + a^5}{21\,\left(b\sqrt{x} + a\right)^7b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*sqrt(x) + a)^8,x, algorithm="giac")
```

```
[Out] -1/21*(21*b^5*x^(5/2) + 35*a*b^4*x^2 + 35*a^2*b^3*x^(3/2) + 21*a^
3*b^2*x + 7*a^4*b*sqrt(x) + a^5)/((b*sqrt(x) + a)^7*b^6)
```

3.2225 $\int \frac{x}{\left(a+b\sqrt{x}\right)^8}\,dx$

Optimal. Leaf size=78

$$\frac{2a^3}{7b^4\left(a+b\sqrt{x}\right)^7}-\frac{a^2}{b^4\left(a+b\sqrt{x}\right)^6}+\frac{6a}{5b^4\left(a+b\sqrt{x}\right)^5}-\frac{1}{2b^4\left(a+b\sqrt{x}\right)^4}$$

```
[Out] (2*a^3)/(7*b^4*(a + b*Sqrt[x])^7) - a^2/(b^4*(a + b*Sqrt[x])^6) +
 (6*a)/(5*b^4*(a + b*Sqrt[x])^5) - 1/(2*b^4*(a + b*Sqrt[x])^4)
```

Rubi [A] time = 0.10931, antiderivative size = 78, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{2a^3}{7b^4\left(a+b\sqrt{x}\right)^7}-\frac{a^2}{b^4\left(a+b\sqrt{x}\right)^6}+\frac{6a}{5b^4\left(a+b\sqrt{x}\right)^5}-\frac{1}{2b^4\left(a+b\sqrt{x}\right)^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b*Sqrt[x])^8,x]
```

```
[Out] (2*a^3)/(7*b^4*(a + b*Sqrt[x])^7) - a^2/(b^4*(a + b*Sqrt[x])^6) +
 (6*a)/(5*b^4*(a + b*Sqrt[x])^5) - 1/(2*b^4*(a + b*Sqrt[x])^4)
```

Rubi in Sympy [A] time = 17.1514, size = 71, normalized size = 0.91

$$\frac{2a^3}{7b^4\left(a+b\sqrt{x}\right)^7}-\frac{a^2}{b^4\left(a+b\sqrt{x}\right)^6}+\frac{6a}{5b^4\left(a+b\sqrt{x}\right)^5}-\frac{1}{2b^4\left(a+b\sqrt{x}\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b*x**(1/2))**8,x)
```

```
[Out] 2*a**3/(7*b**4*(a + b*sqrt(x))**7) - a**2/(b**4*(a + b*sqrt(x))**
6) + 6*a/(5*b**4*(a + b*sqrt(x))**5) - 1/(2*b**4*(a + b*sqrt(x))*
*4)
```

Mathematica [A] time = 0.0208027, size = 50, normalized size = 0.64

$$-\frac{a^3+7a^2b\sqrt{x}+21ab^2x+35b^3x^{3/2}}{70b^4\left(a+b\sqrt{x}\right)^7}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b*Sqrt[x])^8,x]
```

```
[Out] -(a^3 + 7*a^2*b*Sqrt[x] + 21*a*b^2*x + 35*b^3*x^(3/2))/(70*b^4*(a
 + b*Sqrt[x])^7)
```

Maple [A] time = 0.009, size = 65, normalized size = 0.8

$$\frac{2\,a^3}{7\,b^4}\left(a+b\sqrt{x}\right)^{-7}-\frac{a^2}{b^4}\left(a+b\sqrt{x}\right)^{-6}+\frac{6\,a}{5\,b^4}\left(a+b\sqrt{x}\right)^{-5}-\frac{1}{2\,b^4}\left(a+b\sqrt{x}\right)^{-4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+b*x^(1/2))^8,x)
```

```
[Out] 2/7*a^3/b^4/(a+b*x^(1/2))^7-a^2/b^4/(a+b*x^(1/2))^6+6/5*a/b^4/(a+
b*x^(1/2))^5-1/2/b^4/(a+b*x^(1/2))^4
```

Maxima [A] time = 1.44373, size = 86, normalized size = 1.1

$$-\frac{1}{2\left(b\sqrt{x}+a\right)^{4}b^{4}}+\frac{6\,a}{5\left(b\sqrt{x}+a\right)^{5}b^{4}}-\frac{a^{2}}{\left(b\sqrt{x}+a\right)^{6}b^{4}}+\frac{2\,a^{3}}{7\left(b\sqrt{x}+a\right)^{7}b^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*sqrt(x) + a)^8,x, algorithm="maxima")
```

```
[Out] -1/2/((b*sqrt(x) + a)^4*b^4) + 6/5*a/((b*sqrt(x) + a)^5*b^4) - a^
2/((b*sqrt(x) + a)^6*b^4) + 2/7*a^3/((b*sqrt(x) + a)^7*b^4)
```

Fricas [A] time = 0.227216, size = 147, normalized size = 1.88

$$-\frac{21\,ab^{2}x+a^{3}+7\left(5\,b^{3}x+a^{2}b\right)\sqrt{x}}{70\left(7\,ab^{10}x^{3}+35\,a^{3}b^{8}x^{2}+21\,a^{5}b^{6}x+a^{7}b^{4}+\left(b^{11}x^{3}+21\,a^{2}b^{9}x^{2}+35\,a^{4}b^{7}x+7\,a^{6}b^{5}\right)\sqrt{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*sqrt(x) + a)^8,x, algorithm="fricas")
```

```
[Out] -1/70*(21*a*b^2*x + a^3 + 7*(5*b^3*x + a^2*b)*sqrt(x))/(7*a*b^10*
x^3 + 35*a^3*b^8*x^2 + 21*a^5*b^6*x + a^7*b^4 + (b^11*x^3 + 21*a^
2*b^9*x^2 + 35*a^4*b^7*x + 7*a^6*b^5)*sqrt(x))
```

Sympy [A] time = 30.2573, size = 410, normalized size = 5.26

$$\begin{cases} -\frac{a^{3}}{70a^{7}b^{4}+490a^{6}b^{5}\sqrt{x}+1470a^{5}b^{6}x+2450a^{4}b^{7}x^{\frac{3}{2}}+2450a^{3}b^{8}x^{2}+1470a^{2}b^{9}x^{\frac{5}{2}}+490ab^{10}x^{3}+70b^{11}x^{\frac{7}{2}}}-\frac{7a^{2}b\sqrt{x}}{70a^{7}b^{4}+490a^{6}b^{5}\sqrt{x}+1470a^{5}b^{6}x+2450a^{4}b^{7}x^{\frac{3}{2}}+2450a^{3}b \\ \frac{x^{2}}{2a^{8}} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b*x**(1/2))**8,x)
```

```
[Out] Piecewise((-a**3/(70*a**7*b**4 + 490*a**6*b**5*sqrt(x) + 1470*a**
5*b**6*x + 2450*a**4*b**7*x**(3/2) + 2450*a**3*b**8*x**2 + 1470*a
**2*b**9*x**(5/2) + 490*a*b**10*x**3 + 70*b**11*x**(7/2)) - 7*a**
2*b*sqrt(x)/(70*a**7*b**4 + 490*a**6*b**5*sqrt(x) + 1470*a**5*b**
6*x + 2450*a**4*b**7*x**(3/2) + 2450*a**3*b**8*x**2 + 1470*a**2*b
**9*x**(5/2) + 490*a*b**10*x**3 + 70*b**11*x**(7/2)) - 21*a*b**2*
x/(70*a**7*b**4 + 490*a**6*b**5*sqrt(x) + 1470*a**5*b**6*x + 2450
*a**4*b**7*x**(3/2) + 2450*a**3*b**8*x**2 + 1470*a**2*b**9*x**(5/
2) + 490*a*b**10*x**3 + 70*b**11*x**(7/2)) - 35*b**3*x**(3/2)/(70
*a**7*b**4 + 490*a**6*b**5*sqrt(x) + 1470*a**5*b**6*x + 2450*a**4
*b**7*x**(3/2) + 2450*a**3*b**8*x**2 + 1470*a**2*b**9*x**(5/2) +
490*a*b**10*x**3 + 70*b**11*x**(7/2)), Ne(b, 0)), (x**2/(2*a**8),
 True))
```

GIAC/XCAS [A] time = 0.224605, size = 57, normalized size = 0.73

$$-\frac{35\,b^3x^{\frac{3}{2}} + 21\,ab^2x + 7\,a^2b\sqrt{x} + a^3}{70\,\left(b\sqrt{x} + a\right)^7 b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*sqrt(x) + a)^8,x, algorithm="giac")
```

```
[Out] -1/70*(35*b^3*x^(3/2) + 21*a*b^2*x + 7*a^2*b*sqrt(x) + a^3)/((b*s
qrt(x) + a)^7*b^4)
```

3.2226 $\int \frac{1}{\left(a+b\sqrt{x}\right)^8} dx$

Optimal. Leaf size=38

$$\frac{2a}{7b^2\left(a+b\sqrt{x}\right)^7}-\frac{1}{3b^2\left(a+b\sqrt{x}\right)^6}$$

```
[Out] (2*a)/(7*b^2*(a + b*Sqrt[x])^7) - 1/(3*b^2*(a + b*Sqrt[x])^6)
```

Rubi [A] time = 0.0512334, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{2a}{7b^2\left(a+b\sqrt{x}\right)^7}-\frac{1}{3b^2\left(a+b\sqrt{x}\right)^6}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^(-8),x]
```

```
[Out] (2*a)/(7*b^2*(a + b*Sqrt[x])^7) - 1/(3*b^2*(a + b*Sqrt[x])^6)
```

Rubi in Sympy [A] time = 9.79497, size = 105, normalized size = 2.76

$$\frac{2x}{7a\left(a+b\sqrt{x}\right)^7}+\frac{5x}{21a^2\left(a+b\sqrt{x}\right)^6}+\frac{4x}{21a^3\left(a+b\sqrt{x}\right)^5}+\frac{x}{7a^4\left(a+b\sqrt{x}\right)^4}+\frac{2x}{21a^5\left(a+b\sqrt{x}\right)^3}+\frac{x}{21a^6\left(a+b\sqrt{x}\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*x**(1/2))**8,x)
```

```
[Out] 2*x/(7*a*(a + b*sqrt(x))**7) + 5*x/(21*a**2*(a + b*sqrt(x))**6) +
 4*x/(21*a**3*(a + b*sqrt(x))**5) + x/(7*a**4*(a + b*sqrt(x))**4)
 + 2*x/(21*a**5*(a + b*sqrt(x))**3) + x/(21*a**6*(a + b*sqrt(x))*
*2)
```

Mathematica [A] time = 0.01407, size = 28, normalized size = 0.74

$$-\frac{a+7b\sqrt{x}}{21b^2\left(a+b\sqrt{x}\right)^7}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^(-8),x]
```

```
[Out] -(a + 7*b*Sqrt[x])/(21*b^2*(a + b*Sqrt[x])^7)
```

Maple [B] time = 0.102, size = 399, normalized size = 10.5

$$\frac{1}{6\,b^2}\left(b\sqrt{x}-a\right)^{-6}-\frac{1}{6\,b^2}\left(a+b\sqrt{x}\right)^{-6} + b^8\left(-\frac{a^2}{b^{10}\,(b^2x-a^2)^4}-\frac{2\,a^6}{3\,b^{10}\,(b^2x-a^2)^6}-\frac{6\,a^4}{5\,b^{10}\,(b^2x-a^2)^5}-\frac{a^8}{7\,b^{10}\,(b^2x-a^2)^7}-\frac{1}{3\,b^{10}\,(b^2x-a^2)^3}\right) - \frac{a^8}{7\,(b^2x-a^2)^7\,b^2}+\frac{a}{7\,b^2}\left(b\sqrt{x}-a\right)^{-7}+\frac{a}{7\,b^2}\left(a+b\sqrt{x}\right)^{-7}+28\,a^2b^6\left(-1/4\,\frac{1}{(b^2x-a^2)^4\,b^8} -1/2\,\frac{a^4}{b^8\,(b^2x-a^2)^6}-3/5\,\frac{a^2}{b^8\,(b^2x-a^2)^5}-1/7\,\frac{a^6}{b^8\,(b^2x-a^2)^7}\right)+70\,a^4b^4\left(-1/3\,\frac{a^2}{b^6\,(b^2x-a^2)^6}-1/5\,\frac{1}{(b^2x-a^2)^5\,b^6}-1/7\,\frac{}{b^6\,(b}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*x^(1/2))^8,x)
```

```
[Out] 1/6/b^2/(b*x^(1/2)-a)^6-1/6/b^2/(a+b*x^(1/2))^6+b^8*(-a^2/b^10/(b
^2*x-a^2)^4-2/3*a^6/b^10/(b^2*x-a^2)^6-6/5*a^4/b^10/(b^2*x-a^2)^5
-1/7*a^8/b^10/(b^2*x-a^2)^7-1/3/b^10/(b^2*x-a^2)^3)-1/7*a^8/(b^2*
x-a^2)^7/b^2+1/7/b^2*a/(b*x^(1/2)-a)^7+1/7*a/b^2/(a+b*x^(1/2))^7+
28*a^2*b^6*(-1/4/(b^2*x-a^2)^4/b^8-1/2*a^4/b^8/(b^2*x-a^2)^6-3/5*
a^2/b^8/(b^2*x-a^2)^5-1/7*a^6/b^8/(b^2*x-a^2)^7)+70*a^4*b^4*(-1/3
*a^2/b^6/(b^2*x-a^2)^6-1/5/(b^2*x-a^2)^5/b^6-1/7*a^4/b^6/(b^2*x-a
^2)^7)+28*a^6*b^2*(-1/6/(b^2*x-a^2)^6/b^4-1/7*a^2/b^4/(b^2*x-a^2)
^7)
```

Maxima [A] time = 1.44282, size = 41, normalized size = 1.08

$$-\frac{1}{3\left(b\sqrt{x}+a\right)^6b^2}+\frac{2\,a}{7\left(b\sqrt{x}+a\right)^7b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^(-8),x, algorithm="maxima")
```

```
[Out] -1/3/((b*sqrt(x) + a)^6*b^2) + 2/7*a/((b*sqrt(x) + a)^7*b^2)
```

Fricas [A] time = 0.236788, size = 120, normalized size = 3.16

$$-\frac{7\,b\sqrt{x}+a}{21\left(7\,ab^8x^3+35\,a^3b^6x^2+21\,a^5b^4x+a^7b^2+\left(b^9x^3+21\,a^2b^7x^2+35\,a^4b^5x+7\,a^6b^3\right)\sqrt{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^(-8),x, algorithm="fricas")
```

```
[Out] -1/21*(7*b*sqrt(x) + a)/(7*a*b^8*x^3 + 35*a^3*b^6*x^2 + 21*a^5*b^
4*x + a^7*b^2 + (b^9*x^3 + 21*a^2*b^7*x^2 + 35*a^4*b^5*x + 7*a^6*
b^3)*sqrt(x))
```

Sympy [A] time = 29.2737, size = 199, normalized size = 5.24

$$\begin{cases} -\frac{a}{21a^7b^2+147a^6b^3\sqrt{x}+441a^5b^4x+735a^4b^5x^{\frac{3}{2}}+735a^3b^6x^2+441a^2b^7x^{\frac{5}{2}}+147ab^8x^3+21b^9x^{\frac{7}{2}}}-\frac{7b\sqrt{x}}{21a^7b^2+147a^6b^3\sqrt{x}+441a^5b^4x+735a^4b^5x^{\frac{3}{2}}+735a^3b^6x^2+441a} \\ \frac{x}{a^8} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*x**(1/2))**8,x)
```

```
[Out] Piecewise((-a/(21*a**7*b**2 + 147*a**6*b**3*sqrt(x) + 441*a**5*b*
*4*x + 735*a**4*b**5*x**(3/2) + 735*a**3*b**6*x**2 + 441*a**2*b**
7*x**(5/2) + 147*a*b**8*x**3 + 21*b**9*x**(7/2)) - 7*b*sqrt(x)/(2
1*a**7*b**2 + 147*a**6*b**3*sqrt(x) + 441*a**5*b**4*x + 735*a**4*
b**5*x**(3/2) + 735*a**3*b**6*x**2 + 441*a**2*b**7*x**(5/2) + 147
*a*b**8*x**3 + 21*b**9*x**(7/2)), Ne(b, 0)), (x/a**8, True))
```

GIAC/XCAS [A] time = 0.261001, size = 30, normalized size = 0.79

$$-\frac{7 \, b \sqrt{x} + a}{21 \, {\left(b \sqrt{x} + a\right)}^{7} b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^(-8),x, algorithm="giac")
```

```
[Out] -1/21*(7*b*sqrt(x) + a)/((b*sqrt(x) + a)^7*b^2)
```

3.2227 $\int \frac{1}{\left(a+b\sqrt{x}\right)^8 x}\,dx$

Optimal. Leaf size=143

$$-\frac{2\log\left(a+b\sqrt{x}\right)}{a^8}+\frac{\log(x)}{a^8}+\frac{2}{a^7\left(a+b\sqrt{x}\right)}+\frac{1}{a^6\left(a+b\sqrt{x}\right)^2}+\frac{2}{3a^5\left(a+b\sqrt{x}\right)^3}+\frac{1}{2a^4\left(a+b\sqrt{x}\right)^4}+\frac{2}{5a^3\left(a+b\sqrt{x}\right)^5}+\frac{1}{3a^2\left(a+b\sqrt{x}\right)^6}+\frac{2}{7a\left(a+b\sqrt{x}\right)^7}$$

```
[Out] 2/(7*a*(a + b*Sqrt[x])^7) + 1/(3*a^2*(a + b*Sqrt[x])^6) + 2/(5*a^
3*(a + b*Sqrt[x])^5) + 1/(2*a^4*(a + b*Sqrt[x])^4) + 2/(3*a^5*(a
+ b*Sqrt[x])^3) + 1/(a^6*(a + b*Sqrt[x])^2) + 2/(a^7*(a + b*Sqrt[
x])) - (2*Log[a + b*Sqrt[x]])/a^8 + Log[x]/a^8
```

Rubi [A] time = 0.185326, antiderivative size = 143, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2\log\left(a+b\sqrt{x}\right)}{a^8}+\frac{\log(x)}{a^8}+\frac{2}{a^7\left(a+b\sqrt{x}\right)}+\frac{1}{a^6\left(a+b\sqrt{x}\right)^2}+\frac{2}{3a^5\left(a+b\sqrt{x}\right)^3}+\frac{1}{2a^4\left(a+b\sqrt{x}\right)^4}+\frac{2}{5a^3\left(a+b\sqrt{x}\right)^5}+\frac{1}{3a^2\left(a+b\sqrt{x}\right)^6}+\frac{2}{7a\left(a+b\sqrt{x}\right)^7}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b*Sqrt[x])^8*x),x]
```

```
[Out] 2/(7*a*(a + b*Sqrt[x])^7) + 1/(3*a^2*(a + b*Sqrt[x])^6) + 2/(5*a^
3*(a + b*Sqrt[x])^5) + 1/(2*a^4*(a + b*Sqrt[x])^4) + 2/(3*a^5*(a
+ b*Sqrt[x])^3) + 1/(a^6*(a + b*Sqrt[x])^2) + 2/(a^7*(a + b*Sqrt[
x])) - (2*Log[a + b*Sqrt[x]])/a^8 + Log[x]/a^8
```

Rubi in Sympy [A] time = 29.8079, size = 138, normalized size = 0.97

$$\frac{2}{7a\left(a+b\sqrt{x}\right)^7}+\frac{1}{3a^2\left(a+b\sqrt{x}\right)^6}+\frac{2}{5a^3\left(a+b\sqrt{x}\right)^5}+\frac{1}{2a^4\left(a+b\sqrt{x}\right)^4}+\frac{2}{3a^5\left(a+b\sqrt{x}\right)^3}+\frac{1}{a^6\left(a+b\sqrt{x}\right)^2}+\frac{2}{a^7\left(a+b\sqrt{x}\right)}+\frac{2\log\left(\sqrt{x}\right)}{a^8}-\frac{2\log\left(a+b\sqrt{x}\right)}{a^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(a+b*x**(1/2))**8,x)
```

```
[Out] 2/(7*a*(a + b*sqrt(x))**7) + 1/(3*a**2*(a + b*sqrt(x))**6) + 2/(5
*a**3*(a + b*sqrt(x))**5) + 1/(2*a**4*(a + b*sqrt(x))**4) + 2/(3*
a**5*(a + b*sqrt(x))**3) + 1/(a**6*(a + b*sqrt(x))**2) + 2/(a**7*
(a + b*sqrt(x))) + 2*log(sqrt(x))/a**8 - 2*log(a + b*sqrt(x))/a**
8
```

Mathematica [A] time = 0.147629, size = 106, normalized size = 0.74

$$\frac{\frac{a\left(1089a^6+4683a^5b\sqrt{x}+9639a^4b^2x+11165a^3b^3x^{3/2}+7490a^2b^4x^2+2730ab^5x^{5/2}+420b^6x^3\right)}{\left(a+b\sqrt{x}\right)^7}-420\log\left(a+b\sqrt{x}\right)+210\log(x)}{210a^8}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b*Sqrt[x])^8*x),x]
```

```
[Out] ((a*(1089*a^6 + 4683*a^5*b*Sqrt[x] + 9639*a^4*b^2*x + 11165*a^3*b
^3*x^(3/2) + 7490*a^2*b^4*x^2 + 2730*a*b^5*x^(5/2) + 420*b^6*x^3)
)/(a + b*Sqrt[x])^7 - 420*Log[a + b*Sqrt[x]] + 210*Log[x])/(210*a
^8)
```

Maple [A] time = 0.018, size = 118, normalized size = 0.8

$$\frac{\ln(x)}{a^8} - 2\frac{\ln\left(a+b\sqrt{x}\right)}{a^8} + \frac{2}{7a}\left(a+b\sqrt{x}\right)^{-7} + \frac{1}{3a^2}\left(a+b\sqrt{x}\right)^{-6} + \frac{2}{5a^3}\left(a+b\sqrt{x}\right)^{-5} + \frac{1}{2a^4}\left(a+b\sqrt{x}\right)^{-4} + \frac{2}{3a^5}\left(a+b\sqrt{x}\right)^{-3} + \frac{1}{a^6}\left(a+b\sqrt{x}\right)^{-2} + 2\frac{1}{a^7\left(a+b\sqrt{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(a+b*x^(1/2))^8,x)
```

```
[Out] ln(x)/a^8-2*ln(a+b*x^(1/2))/a^8+2/7/a/(a+b*x^(1/2))^7+1/3/a^2/(a+
b*x^(1/2))^6+2/5/a^3/(a+b*x^(1/2))^5+1/2/a^4/(a+b*x^(1/2))^4+2/3/
a^5/(a+b*x^(1/2))^3+1/a^6/(a+b*x^(1/2))^2+2/a^7/(a+b*x^(1/2))
```

Maxima [A] time = 1.43753, size = 220, normalized size = 1.54

$$\frac{420\,b^6x^3 + 2730\,ab^5x^{\frac{5}{2}} + 7490\,a^2b^4x^2 + 11165\,a^3b^3x^{\frac{3}{2}} + 9639\,a^4b^2x + 4683\,a^5b\sqrt{x} + 1089\,a^6}{210\left(a^7b^7x^{\frac{7}{2}} + 7\,a^8b^6x^3 + 21\,a^9b^5x^{\frac{5}{2}} + 35\,a^{10}b^4x^2 + 35\,a^{11}b^3x^{\frac{3}{2}} + 21\,a^{12}b^2x + 7\,a^{13}b\sqrt{x} + a^{14}\right)} - \frac{2\log\left(b\sqrt{x}+a\right)}{a^8} + \frac{\log(x)}{a^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^8*x),x, algorithm="maxima")
```

```
[Out] 1/210*(420*b^6*x^3 + 2730*a*b^5*x^(5/2) + 7490*a^2*b^4*x^2 + 1116
5*a^3*b^3*x^(3/2) + 9639*a^4*b^2*x + 4683*a^5*b*sqrt(x) + 1089*a^
6)/(a^7*b^7*x^(7/2) + 7*a^8*b^6*x^3 + 21*a^9*b^5*x^(5/2) + 35*a^1
0*b^4*x^2 + 35*a^11*b^3*x^(3/2) + 21*a^12*b^2*x + 7*a^13*b*sqrt(x
) + a^14) - 2*log(b*sqrt(x) + a)/a^8 + log(x)/a^8
```

Fricas [A] time = 0.258582, size = 412, normalized size = 2.88

$$\frac{420\,ab^6x^3 + 7490\,a^3b^4x^2 + 9639\,a^5b^2x + 1089\,a^7 - 420\left(7\,ab^6x^3 + 35\,a^3b^4x^2 + 21\,a^5b^2x + a^7 + \left(b^7x^3 + 21\,a^2b^5x^2 + 35\,a^4b^3x\right.\right.}{210\left(7\,a^9b^6x^3 + 35\,a^{11}b\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^8*x),x, algorithm="fricas")
```

```
[Out] 1/210*(420*a*b^6*x^3 + 7490*a^3*b^4*x^2 + 9639*a^5*b^2*x + 1089*a
^7 - 420*(7*a*b^6*x^3 + 35*a^3*b^4*x^2 + 21*a^5*b^2*x + a^7 + (b^
7*x^3 + 21*a^2*b^5*x^2 + 35*a^4*b^3*x + 7*a^6*b)*sqrt(x))*log(b*s
qrt(x) + a) + 420*(7*a*b^6*x^3 + 35*a^3*b^4*x^2 + 21*a^5*b^2*x +
a^7 + (b^7*x^3 + 21*a^2*b^5*x^2 + 35*a^4*b^3*x + 7*a^6*b)*sqrt(x)
)*log(sqrt(x)) + 7*(390*a^2*b^5*x^2 + 1595*a^4*b^3*x + 669*a^6*b)
*sqrt(x))/(7*a^9*b^6*x^3 + 35*a^11*b^4*x^2 + 21*a^13*b^2*x + a^15
 + (a^8*b^7*x^3 + 21*a^10*b^5*x^2 + 35*a^12*b^3*x + 7*a^14*b)*sqr
t(x))
```

Sympy [A] time = 160.334, size = 2684, normalized size = 18.77

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(a+b*x**(1/2))**8,x)
```

```
[Out] Piecewise((zoo/x**4, Eq(a, 0) & Eq(b, 0)), (log(x)/a**8, Eq(b, 0)
), (-1/(4*b**8*x**4), Eq(a, 0)), (210*a**7*sqrt(x)*log(x)/(210*a*
*15*sqrt(x) + 1470*a**14*b*x + 4410*a**13*b**2*x**(3/2) + 7350*a*
*12*b**3*x**2 + 7350*a**11*b**4*x**(5/2) + 4410*a**10*b**5*x**3 +
 1470*a**9*b**6*x**(7/2) + 210*a**8*b**7*x**4) - 420*a**7*sqrt(x)
*log(a/b + sqrt(x))/(210*a**15*sqrt(x) + 1470*a**14*b*x + 4410*a*
*13*b**2*x**(3/2) + 7350*a**12*b**3*x**2 + 7350*a**11*b**4*x**(5/
2) + 4410*a**10*b**5*x**3 + 1470*a**9*b**6*x**(7/2) + 210*a**8*b*
*7*x**4) + 854*a**7*sqrt(x)/(210*a**15*sqrt(x) + 1470*a**14*b*x +
 4410*a**13*b**2*x**(3/2) + 7350*a**12*b**3*x**2 + 7350*a**11*b**
4*x**(5/2) + 4410*a**10*b**5*x**3 + 1470*a**9*b**6*x**(7/2) + 210
*a**8*b**7*x**4) + 1470*a**6*b*x*log(x)/(210*a**15*sqrt(x) + 1470
*a**14*b*x + 4410*a**13*b**2*x**(3/2) + 7350*a**12*b**3*x**2 + 73
50*a**11*b**4*x**(5/2) + 4410*a**10*b**5*x**3 + 1470*a**9*b**6*x*
*(7/2) + 210*a**8*b**7*x**4) - 2940*a**6*b*x*log(a/b + sqrt(x))/(
210*a**15*sqrt(x) + 1470*a**14*b*x + 4410*a**13*b**2*x**(3/2) + 7
350*a**12*b**3*x**2 + 7350*a**11*b**4*x**(5/2) + 4410*a**10*b**5*
x**3 + 1470*a**9*b**6*x**(7/2) + 210*a**8*b**7*x**4) + 3038*a**6*
b*x/(210*a**15*sqrt(x) + 1470*a**14*b*x + 4410*a**13*b**2*x**(3/2
) + 7350*a**12*b**3*x**2 + 7350*a**11*b**4*x**(5/2) + 4410*a**10*
b**5*x**3 + 1470*a**9*b**6*x**(7/2) + 210*a**8*b**7*x**4) + 4410*
a**5*b**2*x**(3/2)*log(x)/(210*a**15*sqrt(x) + 1470*a**14*b*x + 4
410*a**13*b**2*x**(3/2) + 7350*a**12*b**3*x**2 + 7350*a**11*b**4*
x**(5/2) + 4410*a**10*b**5*x**3 + 1470*a**9*b**6*x**(7/2) + 210*a
**8*b**7*x**4) - 8820*a**5*b**2*x**(3/2)*log(a/b + sqrt(x))/(210*
a**15*sqrt(x) + 1470*a**14*b*x + 4410*a**13*b**2*x**(3/2) + 7350*
a**12*b**3*x**2 + 7350*a**11*b**4*x**(5/2) + 4410*a**10*b**5*x**3
 + 1470*a**9*b**6*x**(7/2) + 210*a**8*b**7*x**4) + 4704*a**5*b**2
*x**(3/2)/(210*a**15*sqrt(x) + 1470*a**14*b*x + 4410*a**13*b**2*x
**(3/2) + 7350*a**12*b**3*x**2 + 7350*a**11*b**4*x**(5/2) + 4410*
a**10*b**5*x**3 + 1470*a**9*b**6*x**(7/2) + 210*a**8*b**7*x**4) +
 7350*a**4*b**3*x**2*log(x)/(210*a**15*sqrt(x) + 1470*a**14*b*x +
 4410*a**13*b**2*x**(3/2) + 7350*a**12*b**3*x**2 + 7350*a**11*b**
4*x**(5/2) + 4410*a**10*b**5*x**3 + 1470*a**9*b**6*x**(7/2) + 210
*a**8*b**7*x**4) - 14700*a**4*b**3*x**2*log(a/b + sqrt(x))/(210*a
**15*sqrt(x) + 1470*a**14*b*x + 4410*a**13*b**2*x**(3/2) + 7350*a
**12*b**3*x**2 + 7350*a**11*b**4*x**(5/2) + 4410*a**10*b**5*x**3
+ 1470*a**9*b**6*x**(7/2) + 210*a**8*b**7*x**4) + 2940*a**4*b**3*
x**2/(210*a**15*sqrt(x) + 1470*a**14*b*x + 4410*a**13*b**2*x**(3/
2) + 7350*a**12*b**3*x**2 + 7350*a**11*b**4*x**(5/2) + 4410*a**10
*b**5*x**3 + 1470*a**9*b**6*x**(7/2) + 210*a**8*b**7*x**4) + 7350
*a**3*b**4*x**(5/2)*log(x)/(210*a**15*sqrt(x) + 1470*a**14*b*x +
4410*a**13*b**2*x**(3/2) + 7350*a**12*b**3*x**2 + 7350*a**11*b**4
*x**(5/2) + 4410*a**10*b**5*x**3 + 1470*a**9*b**6*x**(7/2) + 210*
a**8*b**7*x**4) - 14700*a**3*b**4*x**(5/2)*log(a/b + sqrt(x))/(21
0*a**15*sqrt(x) + 1470*a**14*b*x + 4410*a**13*b**2*x**(3/2) + 735
0*a**12*b**3*x**2 + 7350*a**11*b**4*x**(5/2) + 4410*a**10*b**5*x*
*3 + 1470*a**9*b**6*x**(7/2) + 210*a**8*b**7*x**4) - 735*a**3*b**
4*x**(5/2)/(210*a**15*sqrt(x) + 1470*a**14*b*x + 4410*a**13*b**2*
x**(3/2) + 7350*a**12*b**3*x**2 + 7350*a**11*b**4*x**(5/2) + 4410
*a**10*b**5*x**3 + 1470*a**9*b**6*x**(7/2) + 210*a**8*b**7*x**4)
+ 4410*a**2*b**5*x**3*log(x)/(210*a**15*sqrt(x) + 1470*a**14*b*x
+ 4410*a**13*b**2*x**(3/2) + 7350*a**12*b**3*x**2 + 7350*a**11*b*
*4*x**(5/2) + 4410*a**10*b**5*x**3 + 1470*a**9*b**6*x**(7/2) + 21
0*a**8*b**7*x**4) - 8820*a**2*b**5*x**3*log(a/b + sqrt(x))/(210*a
**15*sqrt(x) + 1470*a**14*b*x + 4410*a**13*b**2*x**(3/2) + 7350*a
**12*b**3*x**2 + 7350*a**11*b**4*x**(5/2) + 4410*a**10*b**5*x**3
+ 1470*a**9*b**6*x**(7/2) + 210*a**8*b**7*x**4) - 2205*a**2*b**5*
x**3/(210*a**15*sqrt(x) + 1470*a**14*b*x + 4410*a**13*b**2*x**(3/
2) + 7350*a**12*b**3*x**2 + 7350*a**11*b**4*x**(5/2) + 4410*a**10
*b**5*x**3 + 1470*a**9*b**6*x**(7/2) + 210*a**8*b**7*x**4) + 1470
*a*b**6*x**(7/2)*log(x)/(210*a**15*sqrt(x) + 1470*a**14*b*x + 441
0*a**13*b**2*x**(3/2) + 7350*a**12*b**3*x**2 + 7350*a**11*b**4*x*
```

```
*(5/2) + 4410*a**10*b**5*x**3 + 1470*a**9*b**6*x**(7/2) + 210*a**
8*b**7*x**4) - 2940*a*b**6*x**(7/2)*log(a/b + sqrt(x))/(210*a**15
*sqrt(x) + 1470*a**14*b*x + 4410*a**13*b**2*x**(3/2) + 7350*a**12
*b**3*x**2 + 7350*a**11*b**4*x**(5/2) + 4410*a**10*b**5*x**3 + 14
70*a**9*b**6*x**(7/2) + 210*a**8*b**7*x**4) - 1225*a*b**6*x**(7/2
)/(210*a**15*sqrt(x) + 1470*a**14*b*x + 4410*a**13*b**2*x**(3/2)
+ 7350*a**12*b**3*x**2 + 7350*a**11*b**4*x**(5/2) + 4410*a**10*b*
*5*x**3 + 1470*a**9*b**6*x**(7/2) + 210*a**8*b**7*x**4) + 210*b**
7*x**4*log(x)/(210*a**15*sqrt(x) + 1470*a**14*b*x + 4410*a**13*b*
*2*x**(3/2) + 7350*a**12*b**3*x**2 + 7350*a**11*b**4*x**(5/2) + 4
410*a**10*b**5*x**3 + 1470*a**9*b**6*x**(7/2) + 210*a**8*b**7*x**
4) - 420*b**7*x**4*log(a/b + sqrt(x))/(210*a**15*sqrt(x) + 1470*a
**14*b*x + 4410*a**13*b**2*x**(3/2) + 7350*a**12*b**3*x**2 + 7350
*a**11*b**4*x**(5/2) + 4410*a**10*b**5*x**3 + 1470*a**9*b**6*x**(
7/2) + 210*a**8*b**7*x**4) - 235*b**7*x**4/(210*a**15*sqrt(x) + 1
470*a**14*b*x + 4410*a**13*b**2*x**(3/2) + 7350*a**12*b**3*x**2 +
 7350*a**11*b**4*x**(5/2) + 4410*a**10*b**5*x**3 + 1470*a**9*b**6
*x**(7/2) + 210*a**8*b**7*x**4), True))
```

GIAC/XCAS [A] time = 0.278327, size = 138, normalized size = 0.97

$$-\frac{2 \ln\left(\left|b\sqrt{x}+a\right|\right)}{a^8}+\frac{\ln\left(|x|\right)}{a^8}+\frac{420\, ab^6x^3+2730\, a^2b^5x^{\frac{5}{2}}+7490\, a^3b^4x^2+11165\, a^4b^3x^{\frac{3}{2}}+9639\, a^5b^2x+4683\, a^6b\sqrt{x}+1089\, a^7}{210\left(b\sqrt{x}+a\right)^7a^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^8*x),x, algorithm="giac")
```

```
[Out] -2*ln(abs(b*sqrt(x) + a))/a^8 + ln(abs(x))/a^8 + 1/210*(420*a*b^6
*x^3 + 2730*a^2*b^5*x^(5/2) + 7490*a^3*b^4*x^2 + 11165*a^4*b^3*x^
(3/2) + 9639*a^5*b^2*x + 4683*a^6*b*sqrt(x) + 1089*a^7)/((b*sqrt(
x) + a)^7*a^8)
```

3.2228 $\int \frac{1}{\left(a+b\sqrt{x}\right)^8 x^2}\,dx$

Optimal. Leaf size=184

$$-\frac{72b^2\log\left(a+b\sqrt{x}\right)}{a^{10}}+\frac{36b^2\log(x)}{a^{10}}+\frac{56b^2}{a^9\left(a+b\sqrt{x}\right)}+\frac{16b}{a^9\sqrt{x}}+\frac{21b^2}{a^8\left(a+b\sqrt{x}\right)^2}-\frac{1}{a^8x}+\frac{10b^2}{a^7\left(a+b\sqrt{x}\right)^3}+\frac{5b^2}{a^6\left(a+b\sqrt{x}\right)^4}+\frac{12b^2}{5a^5\left(a+b\sqrt{x}\right)^5}+\frac{b^2}{a^4\left(a+b\sqrt{x}\right)^6}+\frac{2b^2}{7a^3\left(a+b\sqrt{x}\right)^7}$$

```
[Out] (2*b^2)/(7*a^3*(a + b*Sqrt[x])^7) + b^2/(a^4*(a + b*Sqrt[x])^6) +
 (12*b^2)/(5*a^5*(a + b*Sqrt[x])^5) + (5*b^2)/(a^6*(a + b*Sqrt[x]
)^4) + (10*b^2)/(a^7*(a + b*Sqrt[x])^3) + (21*b^2)/(a^8*(a + b*Sq
rt[x])^2) + (56*b^2)/(a^9*(a + b*Sqrt[x])) - 1/(a^8*x) + (16*b)/(
a^9*Sqrt[x]) - (72*b^2*Log[a + b*Sqrt[x]])/a^10 + (36*b^2*Log[x])
/a^10
```

Rubi [A] time = 0.343844, antiderivative size = 184, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{72b^2\log\left(a+b\sqrt{x}\right)}{a^{10}}+\frac{36b^2\log(x)}{a^{10}}+\frac{56b^2}{a^9\left(a+b\sqrt{x}\right)}+\frac{16b}{a^9\sqrt{x}}+\frac{21b^2}{a^8\left(a+b\sqrt{x}\right)^2}-\frac{1}{a^8x}+\frac{10b^2}{a^7\left(a+b\sqrt{x}\right)^3}+\frac{5b^2}{a^6\left(a+b\sqrt{x}\right)^4}+\frac{12b^2}{5a^5\left(a+b\sqrt{x}\right)^5}+\frac{b^2}{a^4\left(a+b\sqrt{x}\right)^6}+\frac{2b^2}{7a^3\left(a+b\sqrt{x}\right)^7}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b*Sqrt[x])^8*x^2),x]
```


```
[Out] (2*b^2)/(7*a^3*(a + b*Sqrt[x])^7) + b^2/(a^4*(a + b*Sqrt[x])^6) +
 (12*b^2)/(5*a^5*(a + b*Sqrt[x])^5) + (5*b^2)/(a^6*(a + b*Sqrt[x]
)^4) + (10*b^2)/(a^7*(a + b*Sqrt[x])^3) + (21*b^2)/(a^8*(a + b*Sq
rt[x])^2) + (56*b^2)/(a^9*(a + b*Sqrt[x])) - 1/(a^8*x) + (16*b)/(
a^9*Sqrt[x]) - (72*b^2*Log[a + b*Sqrt[x]])/a^10 + (36*b^2*Log[x])
/a^10
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(a+b*x**(1/2))**8,x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.228447, size = 139, normalized size = 0.76

$$\frac{\frac{a\left(-35a^8+315a^7b\sqrt{x}+6534a^6b^2x+28098a^5b^3x^{3/2}+57834a^4b^4x^2+66990a^3b^5x^{5/2}+44940a^2b^6x^3+16380ab^7x^{7/2}+2520b^8x^4\right)}{x\left(a+b\sqrt{x}\right)^7}-2520b^2\log\left(a+b\sqrt{x}\right)+12}{35a^{10}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b*Sqrt[x])^8*x^2),x]
```

```
[Out] ((a*(-35*a^8 + 315*a^7*b*Sqrt[x] + 6534*a^6*b^2*x + 28098*a^5*b^3
*x^(3/2) + 57834*a^4*b^4*x^2 + 66990*a^3*b^5*x^(5/2) + 44940*a^2*
b^6*x^3 + 16380*a*b^7*x^(7/2) + 2520*b^8*x^4))/((a + b*Sqrt[x])^7
*x) - 2520*b^2*Log[a + b*Sqrt[x]] + 1260*b^2*Log[x])/(35*a^10)
```

Maple [A] time = 0.022, size = 163, normalized size = 0.9

$$-\frac{1}{a^8x}+36\,\frac{b^2\ln(x)}{a^{10}}-72\,\frac{b^2\ln\left(a+b\sqrt{x}\right)}{a^{10}}+16\,\frac{b}{a^9\sqrt{x}}+\frac{2\,b^2}{7\,a^3}\left(a+b\sqrt{x}\right)^{-7}+\frac{b^2}{a^4}\left(a+b\sqrt{x}\right)^{-6}+\frac{12\,b^2}{5\,a^5}\left(a+b\sqrt{x}\right)^{-5}+5\,\frac{b^2}{a^6\left(a+b\sqrt{x}\right)^4}+10\,\frac{b^2}{a^7\left(a+b\sqrt{x}\right)^3}+21\,\frac{b^2}{a^8\left(a+b\sqrt{x}\right)^2}+56\,\frac{b^2}{a^9\left(a+b\sqrt{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(a+b*x^(1/2))^8,x)
```

```
[Out] -1/a^8/x+36*b^2*ln(x)/a^10-72*b^2*ln(a+b*x^(1/2))/a^10+16*b/a^9/x
^(1/2)+2/7*b^2/a^3/(a+b*x^(1/2))^7+b^2/a^4/(a+b*x^(1/2))^6+12/5*b
^2/a^5/(a+b*x^(1/2))^5+5*b^2/a^6/(a+b*x^(1/2))^4+10*b^2/a^7/(a+b*
x^(1/2))^3+21*b^2/a^8/(a+b*x^(1/2))^2+56*b^2/a^9/(a+b*x^(1/2))
```

Maxima [A] time = 1.46834, size = 265, normalized size = 1.44

$$\frac{2520\,b^8x^4+16380\,ab^7x^{\frac{7}{2}}+44940\,a^2b^6x^3+66990\,a^3b^5x^{\frac{5}{2}}+57834\,a^4b^4x^2+28098\,a^5b^3x^{\frac{3}{2}}+6534\,a^6b^2x+315\,a^7b\sqrt{x}-35\,a^8}{35\left(a^9b^7x^{\frac{9}{2}}+7\,a^{10}b^6x^4+21\,a^{11}b^5x^{\frac{7}{2}}+35\,a^{12}b^4x^3+35\,a^{13}b^3x^{\frac{5}{2}}+21\,a^{14}b^2x^2+7\,a^{15}bx^{\frac{3}{2}}+a^{16}x\right)}-\frac{72\,b^2\log\left(b\sqrt{x}+a\right)}{a^{10}}+\frac{36\,b^2\log(x)}{a^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((b*sqrt(x) + a)^8*x^2),x, algorithm="maxima")
```

```
[Out] 1/35*(2520*b^8*x^4 + 16380*a*b^7*x^(7/2) + 44940*a^2*b^6*x^3 + 66
990*a^3*b^5*x^(5/2) + 57834*a^4*b^4*x^2 + 28098*a^5*b^3*x^(3/2) +
 6534*a^6*b^2*x + 315*a^7*b*sqrt(x) - 35*a^8)/(a^9*b^7*x^(9/2) +
7*a^10*b^6*x^4 + 21*a^11*b^5*x^(7/2) + 35*a^12*b^4*x^3 + 35*a^13*
b^3*x^(5/2) + 21*a^14*b^2*x^2 + 7*a^15*b*x^(3/2) + a^16*x) - 72*b
^2*log(b*sqrt(x) + a)/a^10 + 36*b^2*log(x)/a^10
```

Fricas [A] time = 0.254873, size = 483, normalized size = 2.62

$$\frac{2520\,ab^8x^4+44940\,a^3b^6x^3+57834\,a^5b^4x^2+6534\,a^7b^2x-35\,a^9-2520\left(7\,ab^8x^4+35\,a^3b^6x^3+21\,a^5b^4x^2+a^7b^2x+\left(b^9x^4+\right.\right.}{35}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((b*sqrt(x) + a)^8*x^2),x, algorithm="fricas")
```

```
[Out] 1/35*(2520*a*b^8*x^4 + 44940*a^3*b^6*x^3 + 57834*a^5*b^4*x^2 + 65
34*a^7*b^2*x - 35*a^9 - 2520*(7*a*b^8*x^4 + 35*a^3*b^6*x^3 + 21*a
^5*b^4*x^2 + a^7*b^2*x + (b^9*x^4 + 21*a^2*b^7*x^3 + 35*a^4*b^5*x
^2 + 7*a^6*b^3*x)*sqrt(x))*log(b*sqrt(x) + a) + 2520*(7*a*b^8*x^4
 + 35*a^3*b^6*x^3 + 21*a^5*b^4*x^2 + a^7*b^2*x + (b^9*x^4 + 21*a^
2*b^7*x^3 + 35*a^4*b^5*x^2 + 7*a^6*b^3*x)*sqrt(x))*log(sqrt(x)) +
 21*(780*a^2*b^7*x^3 + 3190*a^4*b^5*x^2 + 1338*a^6*b^3*x + 15*a^8
*b)*sqrt(x))/(7*a^11*b^6*x^4 + 35*a^13*b^4*x^3 + 21*a^15*b^2*x^2
+ a^17*x + (a^10*b^7*x^4 + 21*a^12*b^5*x^3 + 35*a^14*b^3*x^2 + 7*
```

```
a^16*b*x)*sqrt(x))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(a+b*x**(1/2))**8,x)

[Out] Timed out
```

GIAC/XCAS [A] time = 0.239319, size = 181, normalized size = 0.98

$$-\frac{72\,b^2\ln\left(\left|b\sqrt{x}+a\right|\right)}{a^{10}}+\frac{36\,b^2\ln\left(|x|\right)}{a^{10}}+\frac{2520\,ab^8x^4+16380\,a^2b^7x^{\frac{7}{2}}+44940\,a^3b^6x^3+66990\,a^4b^5x^{\frac{5}{2}}+57834\,a^5b^4x^2+28098\,a^6b^3x^{\frac{3}{2}}+6534\,a^7b^2x+315\,a^8b\sqrt{x}-35}{35\left(b\sqrt{x}+a\right)^7a^{10}x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^8*x^2),x, algorithm="giac")

[Out] -72*b^2*ln(abs(b*sqrt(x) + a))/a^10 + 36*b^2*ln(abs(x))/a^10 + 1/
35*(2520*a*b^8*x^4 + 16380*a^2*b^7*x^(7/2) + 44940*a^3*b^6*x^3 +
66990*a^4*b^5*x^(5/2) + 57834*a^5*b^4*x^2 + 28098*a^6*b^3*x^(3/2)
 + 6534*a^7*b^2*x + 315*a^8*b*sqrt(x) - 35*a^9)/((b*sqrt(x) + a)^
7*a^10*x)
```

3.2229 $\int \frac{1}{\left(a+b\sqrt{x}\right)^8 x^3}\,dx$

Optimal. Leaf size=217

$$-\frac{660b^4\log\left(a+b\sqrt{x}\right)}{a^{12}}+\frac{330b^4\log(x)}{a^{12}}+\frac{420b^4}{a^{11}\left(a+b\sqrt{x}\right)}+\frac{240b^3}{a^{11}\sqrt{x}}+\frac{126b^4}{a^{10}\left(a+b\sqrt{x}\right)^2}-\frac{36b^2}{a^{10}x}+\frac{140b^4}{3a^9\left(a+b\sqrt{x}\right)^3}+\frac{16b}{3a^9x^{3/2}}+\frac{35b^4}{2a^8\left(a+b\sqrt{x}\right)^4}-\frac{1}{2a^8x^2}+\frac{6b^4}{a^7\left(a+b\sqrt{x}\right)^5}+\frac{5b^4}{3a^6\left(a+b\sqrt{x}\right)^6}+\frac{2b^4}{7a^5\left(a+b\sqrt{x}\right)^7}$$

```
[Out] (2*b^4)/(7*a^5*(a + b*Sqrt[x])^7) + (5*b^4)/(3*a^6*(a + b*Sqrt[x]
)^6) + (6*b^4)/(a^7*(a + b*Sqrt[x])^5) + (35*b^4)/(2*a^8*(a + b*S
qrt[x])^4) + (140*b^4)/(3*a^9*(a + b*Sqrt[x])^3) + (126*b^4)/(a^1
0*(a + b*Sqrt[x])^2) + (420*b^4)/(a^11*(a + b*Sqrt[x])) - 1/(2*a^
8*x^2) + (16*b)/(3*a^9*x^(3/2)) - (36*b^2)/(a^10*x) + (240*b^3)/(
a^11*Sqrt[x]) - (660*b^4*Log[a + b*Sqrt[x]])/a^12 + (330*b^4*Log[
x])/a^12
```

Rubi [A] time = 0.435843, antiderivative size = 217, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{660b^4\log\left(a+b\sqrt{x}\right)}{a^{12}}+\frac{330b^4\log(x)}{a^{12}}+\frac{420b^4}{a^{11}\left(a+b\sqrt{x}\right)}+\frac{240b^3}{a^{11}\sqrt{x}}+\frac{126b^4}{a^{10}\left(a+b\sqrt{x}\right)^2}-\frac{36b^2}{a^{10}x}+\frac{140b^4}{3a^9\left(a+b\sqrt{x}\right)^3}+\frac{16b}{3a^9x^{3/2}}+\frac{35b^4}{2a^8\left(a+b\sqrt{x}\right)^4}-\frac{1}{2a^8x^2}+\frac{6b^4}{a^7\left(a+b\sqrt{x}\right)^5}+\frac{5b^4}{3a^6\left(a+b\sqrt{x}\right)^6}+\frac{2b^4}{7a^5\left(a+b\sqrt{x}\right)^7}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b*Sqrt[x])^8*x^3),x]
```

```
[Out] (2*b^4)/(7*a^5*(a + b*Sqrt[x])^7) + (5*b^4)/(3*a^6*(a + b*Sqrt[x]
)^6) + (6*b^4)/(a^7*(a + b*Sqrt[x])^5) + (35*b^4)/(2*a^8*(a + b*S
qrt[x])^4) + (140*b^4)/(3*a^9*(a + b*Sqrt[x])^3) + (126*b^4)/(a^1
0*(a + b*Sqrt[x])^2) + (420*b^4)/(a^11*(a + b*Sqrt[x])) - 1/(2*a^
8*x^2) + (16*b)/(3*a^9*x^(3/2)) - (36*b^2)/(a^10*x) + (240*b^3)/(
a^11*Sqrt[x]) - (660*b^4*Log[a + b*Sqrt[x]])/a^12 + (330*b^4*Log[
x])/a^12
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(a+b*x**(1/2))**8,x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.249116, size = 163, normalized size = 0.75

$$\frac{\frac{a\left(-21a^{10}+77a^9b\sqrt{x}-385a^8b^2x+3465a^7b^3x^{3/2}+71874a^6b^4x^2+309078a^5b^5x^{5/2}+636174a^4b^6x^3+736890a^3b^7x^{7/2}+494340a^2b^8x^4+180180ab^9x^{9/2}+27720b^{10}x^5\right)}{x^2\left(a+b\sqrt{x}\right)^7} -}{42a^{12}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b*Sqrt[x])^8*x^3),x]
```

```
[Out] ((a*(-21*a^10 + 77*a^9*b*Sqrt[x] - 385*a^8*b^2*x + 3465*a^7*b^3*x
^(3/2) + 71874*a^6*b^4*x^2 + 309078*a^5*b^5*x^(5/2) + 636174*a^4*
b^6*x^3 + 736890*a^3*b^7*x^(7/2) + 494340*a^2*b^8*x^4 + 180180*a*
b^9*x^(9/2) + 27720*b^10*x^5))/((a + b*Sqrt[x])^7*x^2) - 27720*b^
4*Log[a + b*Sqrt[x]] + 13860*b^4*Log[x])/(42*a^12)
```

Maple [A] time = 0.022, size = 186, normalized size = 0.9

$$-\frac{1}{2\,a^8x^2}+\frac{16\,b}{3\,a^9}x^{-\frac{3}{2}}-36\,\frac{b^2}{xa^{10}}+330\,\frac{b^4\ln(x)}{a^{12}}-660\,\frac{b^4\ln\left(a+b\sqrt{x}\right)}{a^{12}}+240\,\frac{b^3}{a^{11}\sqrt{x}}+\frac{2\,b^4}{7\,a^5}\left(a+b\sqrt{x}\right)^{-7}+\frac{5\,b^4}{3\,a^6}\left(a+b\sqrt{x}\right)^{-6}+6\,\frac{b^4}{a^7\left(a+b\sqrt{x}\right)^5}+\frac{35\,b^4}{2\,a^8}\left(a+b\sqrt{x}\right)^{-4}+\frac{140\,b^4}{3\,a^9}\left(a+b\sqrt{x}\right)^{-3}+126\,\frac{b^4}{a^{10}\left(a+b\sqrt{x}\right)^2}+420\,\frac{b^4}{a^{11}\left(a+b\sqrt{x}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(a+b*x^(1/2))^8,x)
```

```
[Out] -1/2/a^8/x^2+16/3*b/a^9/x^(3/2)-36*b^2/a^10/x+330*b^4*ln(x)/a^12-
660*b^4*ln(a+b*x^(1/2))/a^12+240*b^3/a^11/x^(1/2)+2/7*b^4/a^5/(a+
b*x^(1/2))^7+5/3*b^4/a^6/(a+b*x^(1/2))^6+6*b^4/a^7/(a+b*x^(1/2))^
5+35/2*b^4/a^8/(a+b*x^(1/2))^4+140/3*b^4/a^9/(a+b*x^(1/2))^3+126*
b^4/a^10/(a+b*x^(1/2))^2+420*b^4/a^11/(a+b*x^(1/2))
```

Maxima [A] time = 1.47591, size = 297, normalized size = 1.37

$$\frac{27720\,b^{10}x^5+180180\,ab^9x^{\frac{9}{2}}+494340\,a^2b^8x^4+736890\,a^3b^7x^{\frac{7}{2}}+636174\,a^4b^6x^3+309078\,a^5b^5x^{\frac{5}{2}}+71874\,a^6b^4x^2+3465\,a^7b}{42\left(a^{11}b^7x^{\frac{11}{2}}+7\,a^{12}b^6x^5+21\,a^{13}b^5x^{\frac{9}{2}}+35\,a^{14}b^4x^4+35\,a^{15}b^3x^{\frac{7}{2}}+21\,a^{16}b^2x^3+7\,a^{17}bx^{\frac{5}{2}}+a\right.}$$
$$-\frac{660\,b^4\log\left(b\sqrt{x}+a\right)}{a^{12}}+\frac{330\,b^4\log(x)}{a^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^8*x^3),x, algorithm="maxima")
```

```
[Out] 1/42*(27720*b^10*x^5 + 180180*a*b^9*x^(9/2) + 494340*a^2*b^8*x^4
+ 736890*a^3*b^7*x^(7/2) + 636174*a^4*b^6*x^3 + 309078*a^5*b^5*x^
(5/2) + 71874*a^6*b^4*x^2 + 3465*a^7*b^3*x^(3/2) - 385*a^8*b^2*x
+ 77*a^9*b*sqrt(x) - 21*a^10)/(a^11*b^7*x^(11/2) + 7*a^12*b^6*x^5
 + 21*a^13*b^5*x^(9/2) + 35*a^14*b^4*x^4 + 35*a^15*b^3*x^(7/2) +
21*a^16*b^2*x^3 + 7*a^17*b*x^(5/2) + a^18*x^2) - 660*b^4*log(b*sq
rt(x) + a)/a^12 + 330*b^4*log(x)/a^12
```

Fricas [A] time = 0.257737, size = 528, normalized size = 2.43

$$\frac{27720\,ab^{10}x^5+494340\,a^3b^8x^4+636174\,a^5b^6x^3+71874\,a^7b^4x^2-385\,a^9b^2x-21\,a^{11}-27720\left(7\,ab^{10}x^5+35\,a^3b^8x^4+21\,a^5b\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^8*x^3),x, algorithm="fricas")
```

```
[Out] 1/42*(27720*a*b^10*x^5 + 494340*a^3*b^8*x^4 + 636174*a^5*b^6*x^3
+ 71874*a^7*b^4*x^2 - 385*a^9*b^2*x - 21*a^11 - 27720*(7*a*b^10*x
^5 + 35*a^3*b^8*x^4 + 21*a^5*b^6*x^3 + a^7*b^4*x^2 + (b^11*x^5 +
21*a^2*b^9*x^4 + 35*a^4*b^7*x^3 + 7*a^6*b^5*x^2)*sqrt(x))*log(b*s
qrt(x) + a) + 27720*(7*a*b^10*x^5 + 35*a^3*b^8*x^4 + 21*a^5*b^6*x
^3 + a^7*b^4*x^2 + (b^11*x^5 + 21*a^2*b^9*x^4 + 35*a^4*b^7*x^3 +
7*a^6*b^5*x^2)*sqrt(x))*log(sqrt(x)) + 77*(2340*a^2*b^9*x^4 + 957
0*a^4*b^7*x^3 + 4014*a^6*b^5*x^2 + 45*a^8*b^3*x + a^10*b)*sqrt(x)
)/(7*a^13*b^6*x^5 + 35*a^15*b^4*x^4 + 21*a^17*b^2*x^3 + a^19*x^2
+ (a^12*b^7*x^5 + 21*a^14*b^5*x^4 + 35*a^16*b^3*x^3 + 7*a^18*b*x^
2)*sqrt(x))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(a+b*x**(1/2))**8,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.221266, size = 211, normalized size = 0.97

$$-\frac{660\, b^{4} \ln \left(\left|b \sqrt{x} + a\right|\right)}{a^{12}} + \frac{330\, b^{4} \ln \left(\left|x\right|\right)}{a^{12}} + \frac{27720\, a b^{10} x^{5} + 180180\, a^{2} b^{9} x^{\frac{9}{2}} + 494340\, a^{3} b^{8} x^{4} + 736890\, a^{4} b^{7} x^{\frac{7}{2}} + 636174\, a^{5} b^{6} x^{3} + 309078\, a^{6} b^{5} x^{\frac{5}{2}} + 71874\, a^{7} b^{4} x^{2} + 3465}{42 \left(b \sqrt{x} + a\right)^{7} a^{12} x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + a)^8*x^3),x, algorithm="giac")
```

```
[Out] -660*b^4*ln(abs(b*sqrt(x) + a))/a^12 + 330*b^4*ln(abs(x))/a^12 +
1/42*(27720*a*b^10*x^5 + 180180*a^2*b^9*x^(9/2) + 494340*a^3*b^8*
x^4 + 736890*a^4*b^7*x^(7/2) + 636174*a^5*b^6*x^3 + 309078*a^6*b^
5*x^(5/2) + 71874*a^7*b^4*x^2 + 3465*a^8*b^3*x^(3/2) - 385*a^9*b^
2*x + 77*a^10*b*sqrt(x) - 21*a^11)/((b*sqrt(x) + a)^7*a^12*x^2)
```

3.2230 $\int \frac{1}{(2+b\sqrt{x})x} dx$

Optimal. Leaf size=19

$$\frac{\log(x)}{2} - \log\left(b\sqrt{x} + 2\right)$$

```
[Out] -Log[2 + b*Sqrt[x]] + Log[x]/2
```

Rubi [A] time = 0.0282215, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{\log(x)}{2} - \log\left(b\sqrt{x} + 2\right)$$

Antiderivative was successfully verified.

```
[In] Int[1/((2 + b*Sqrt[x])*x),x]

[Out] -Log[2 + b*Sqrt[x]] + Log[x]/2
```

Rubi in Sympy [A] time = 4.44836, size = 15, normalized size = 0.79

$$\log\left(\sqrt{x}\right) - \log\left(b\sqrt{x} + 2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x/(2+b*x**(1/2)),x)

[Out] log(sqrt(x)) - log(b*sqrt(x) + 2)
```

Mathematica [A] time = 0.00926639, size = 19, normalized size = 1.

$$\log\left(\sqrt{x}\right) - \log\left(b\sqrt{x} + 2\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((2 + b*Sqrt[x])*x),x]

[Out] -Log[2 + b*Sqrt[x]] + Log[Sqrt[x]]
```

Maple [A] time = 0.01, size = 16, normalized size = 0.8

$$\frac{\ln(x)}{2} - \ln\left(2 + b\sqrt{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(2+b*x^(1/2)),x)

[Out] 1/2*ln(x)-ln(2+b*x^(1/2))
```

Maxima [A] time = 1.43428, size = 20, normalized size = 1.05

$$-\log\left(b\sqrt{x}+2\right)+\frac{1}{2}\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + 2)*x),x, algorithm="maxima")
```

```
[Out] -log(b*sqrt(x) + 2) + 1/2*log(x)
```

Fricas [A] time = 0.242178, size = 20, normalized size = 1.05

$$-\log\left(b\sqrt{x}+2\right)+\log\left(\sqrt{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + 2)*x),x, algorithm="fricas")
```

```
[Out] -log(b*sqrt(x) + 2) + log(sqrt(x))
```

Sympy [A] time = 1.78924, size = 19, normalized size = 1.

$$\begin{cases} \frac{\log\left(x\right)}{2}-\log\left(\sqrt{x}+\frac{2}{b}\right) & \text{for}\: b \neq 0 \\ \frac{\log\left(x\right)}{2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(2+b*x**(1/2)),x)
```

```
[Out] Piecewise((log(x)/2 - log(sqrt(x) + 2/b), Ne(b, 0)), (log(x)/2, T
rue))
```

GIAC/XCAS [A] time = 0.241362, size = 23, normalized size = 1.21

$$-\ln\left(\left|b\sqrt{x}+2\right|\right)+\frac{1}{2}\ln\left(\left|x\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*sqrt(x) + 2)*x),x, algorithm="giac")
```

```
[Out] -ln(abs(b*sqrt(x) + 2)) + 1/2*ln(abs(x))
```

3.2231 $\int \sqrt{a+b\sqrt{x}}x^2\,dx$

Optimal. Leaf size=132

$$-\frac{4a^5\left(a+b\sqrt{x}\right)^{3/2}}{3b^6}+\frac{4a^4\left(a+b\sqrt{x}\right)^{5/2}}{b^6}-\frac{40a^3\left(a+b\sqrt{x}\right)^{7/2}}{7b^6}+\frac{40a^2\left(a+b\sqrt{x}\right)^{9/2}}{9b^6}+\frac{4\left(a+b\sqrt{x}\right)^{13/2}}{13b^6}-\frac{20a\left(a+b\sqrt{x}\right)^{11/2}}{11b^6}$$

```
[Out] (-4*a^5*(a + b*Sqrt[x])^(3/2))/(3*b^6) + (4*a^4*(a + b*Sqrt[x])^(
5/2))/b^6 - (40*a^3*(a + b*Sqrt[x])^(7/2))/(7*b^6) + (40*a^2*(a +
 b*Sqrt[x])^(9/2))/(9*b^6) - (20*a*(a + b*Sqrt[x])^(11/2))/(11*b^
6) + (4*(a + b*Sqrt[x])^(13/2))/(13*b^6)
```

Rubi [A] time = 0.148104, antiderivative size = 132, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{4a^5\left(a+b\sqrt{x}\right)^{3/2}}{3b^6}+\frac{4a^4\left(a+b\sqrt{x}\right)^{5/2}}{b^6}-\frac{40a^3\left(a+b\sqrt{x}\right)^{7/2}}{7b^6}+\frac{40a^2\left(a+b\sqrt{x}\right)^{9/2}}{9b^6}+\frac{4\left(a+b\sqrt{x}\right)^{13/2}}{13b^6}-\frac{20a\left(a+b\sqrt{x}\right)^{11/2}}{11b^6}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[x]]*x^2,x]
```

```
[Out] (-4*a^5*(a + b*Sqrt[x])^(3/2))/(3*b^6) + (4*a^4*(a + b*Sqrt[x])^(
5/2))/b^6 - (40*a^3*(a + b*Sqrt[x])^(7/2))/(7*b^6) + (40*a^2*(a +
 b*Sqrt[x])^(9/2))/(9*b^6) - (20*a*(a + b*Sqrt[x])^(11/2))/(11*b^
6) + (4*(a + b*Sqrt[x])^(13/2))/(13*b^6)
```

Rubi in Sympy [A] time = 22.0667, size = 124, normalized size = 0.94

$$-\frac{4a^5\left(a+b\sqrt{x}\right)^{\frac{3}{2}}}{3b^6}+\frac{4a^4\left(a+b\sqrt{x}\right)^{\frac{5}{2}}}{b^6}-\frac{40a^3\left(a+b\sqrt{x}\right)^{\frac{7}{2}}}{7b^6}+\frac{40a^2\left(a+b\sqrt{x}\right)^{\frac{9}{2}}}{9b^6}-\frac{20a\left(a+b\sqrt{x}\right)^{\frac{11}{2}}}{11b^6}+\frac{4\left(a+b\sqrt{x}\right)^{\frac{13}{2}}}{13b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(a+b*x**(1/2))**(1/2),x)
```

```
[Out] -4*a**5*(a + b*sqrt(x))**(3/2)/(3*b**6) + 4*a**4*(a + b*sqrt(x))*
*(5/2)/b**6 - 40*a**3*(a + b*sqrt(x))**(7/2)/(7*b**6) + 40*a**2*(
a + b*sqrt(x))**(9/2)/(9*b**6) - 20*a*(a + b*sqrt(x))**(11/2)/(11
*b**6) + 4*(a + b*sqrt(x))**(13/2)/(13*b**6)
```

Mathematica [A] time = 0.0329966, size = 89, normalized size = 0.67

$$\frac{4\sqrt{a+b\sqrt{x}}\left(-256a^6+128a^5b\sqrt{x}-96a^4b^2x+80a^3b^3x^{3/2}-70a^2b^4x^2+63ab^5x^{5/2}+693b^6x^3\right)}{9009b^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b*Sqrt[x]]*x^2,x]
```

```
[Out] (4*Sqrt[a + b*Sqrt[x]]*(-256*a^6 + 128*a^5*b*Sqrt[x] - 96*a^4*b^2
*x + 80*a^3*b^3*x^(3/2) - 70*a^2*b^4*x^2 + 63*a*b^5*x^(5/2) + 693
*b^6*x^3))/(9009*b^6)
```

Maple [A] time = 0.008, size = 85, normalized size = 0.6

$$4\,{\frac {1}{{b}^{6}} \left(1/13\, \left(a+b\sqrt {x} \right) ^{13/2}-{\frac {5\,a \left(a+b\sqrt {x} \right) ^{11/2}}{11}}+{\frac {10\,{a}^{2} \left(a+b\sqrt {x} \right) ^{9/2}}{9}}-{\frac {10\,{a}^{3} \left(a+b\sqrt {x} \right) ^{7/2}}{7}}+ \left(a+b\sqrt {x} \right) ^{5/2}{a}^{4}-1/3\, \left(a+b\sqrt{x} \right) ^{3/2}{a}^{5} \right) }$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(a+b*x^(1/2))^(1/2),x)
```

```
[Out] 4/b^6*(1/13*(a+b*x^(1/2))^(13/2)-5/11*a*(a+b*x^(1/2))^(11/2)+10/9
*a^2*(a+b*x^(1/2))^(9/2)-10/7*a^3*(a+b*x^(1/2))^(7/2)+(a+b*x^(1/2
))^(5/2)*a^4-1/3*(a+b*x^(1/2))^(3/2)*a^5)
```

Maxima [A] time = 1.44599, size = 132, normalized size = 1.

$$\frac{4\,{\left(b\sqrt{x}+a\right)}^{\frac{13}{2}}}{13\,b^{6}}-\frac{20\,{\left(b\sqrt{x}+a\right)}^{\frac{11}{2}}a}{11\,b^{6}}+\frac{40\,{\left(b\sqrt{x}+a\right)}^{\frac{9}{2}}a^{2}}{9\,b^{6}}-\frac{40\,{\left(b\sqrt{x}+a\right)}^{\frac{7}{2}}a^{3}}{7\,b^{6}}+\frac{4\,{\left(b\sqrt{x}+a\right)}^{\frac{5}{2}}a^{4}}{b^{6}}-\frac{4\,{\left(b\sqrt{x}+a\right)}^{\frac{3}{2}}a^{5}}{3\,b^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(x) + a)*x^2,x, algorithm="maxima")
```

```
[Out] 4/13*(b*sqrt(x) + a)^(13/2)/b^6 - 20/11*(b*sqrt(x) + a)^(11/2)*a/
b^6 + 40/9*(b*sqrt(x) + a)^(9/2)*a^2/b^6 - 40/7*(b*sqrt(x) + a)^(
7/2)*a^3/b^6 + 4*(b*sqrt(x) + a)^(5/2)*a^4/b^6 - 4/3*(b*sqrt(x) +
 a)^(3/2)*a^5/b^6
```

Fricas [A] time = 0.251863, size = 104, normalized size = 0.79

$$\frac{4\,{\left(693\,b^{6}x^{3}-70\,a^{2}b^{4}x^{2}-96\,a^{4}b^{2}x-256\,a^{6}+{\left(63\,ab^{5}x^{2}+80\,a^{3}b^{3}x+128\,a^{5}b\right)}\sqrt{x}\right)}\sqrt{b\sqrt{x}+a}}{9009\,b^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(x) + a)*x^2,x, algorithm="fricas")
```

```
[Out] 4/9009*(693*b^6*x^3 - 70*a^2*b^4*x^2 - 96*a^4*b^2*x - 256*a^6 + (
63*a*b^5*x^2 + 80*a^3*b^3*x + 128*a^5*b)*sqrt(x))*sqrt(b*sqrt(x)
+ a)/b^6
```

Sympy [A] time = 30.3945, size = 8588, normalized size = 65.06

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(a+b*x**(1/2))**(1/2),x)
```

```
[Out] -1024*a**(153/2)*x**18*sqrt(1 + b*sqrt(x)/a)/(9009*a**70*b**6*x**
18 + 135135*a**69*b**7*x**(37/2) + 945945*a**68*b**8*x**19 + 4099
095*a**67*b**9*x**(39/2) + 12297285*a**66*b**10*x**20 + 27054027*
a**65*b**11*x**(41/2) + 45090045*a**64*b**12*x**21 + 57972915*a**
63*b**13*x**(43/2) + 57972915*a**62*b**14*x**22 + 45090045*a**61*
b**15*x**(45/2) + 27054027*a**60*b**16*x**23 + 12297285*a**59*b**
17*x**(47/2) + 4099095*a**58*b**18*x**24 + 945945*a**57*b**19*x**
(49/2) + 135135*a**56*b**20*x**25 + 9009*a**55*b**21*x**(51/2)) +
 1024*a**(153/2)*x**18/(9009*a**70*b**6*x**18 + 135135*a**69*b**7
*x**(37/2) + 945945*a**68*b**8*x**19 + 4099095*a**67*b**9*x**(39/
2) + 12297285*a**66*b**10*x**20 + 27054027*a**65*b**11*x**(41/2)
+ 45090045*a**64*b**12*x**21 + 57972915*a**63*b**13*x**(43/2) + 5
7972915*a**62*b**14*x**22 + 45090045*a**61*b**15*x**(45/2) + 2705
4027*a**60*b**16*x**23 + 12297285*a**59*b**17*x**(47/2) + 4099095
*a**58*b**18*x**24 + 945945*a**57*b**19*x**(49/2) + 135135*a**56*
b**20*x**25 + 9009*a**55*b**21*x**(51/2)) - 14848*a**(151/2)*b*x*
*(37/2)*sqrt(1 + b*sqrt(x)/a)/(9009*a**70*b**6*x**18 + 135135*a**
69*b**7*x**(37/2) + 945945*a**68*b**8*x**19 + 4099095*a**67*b**9*
x**(39/2) + 12297285*a**66*b**10*x**20 + 27054027*a**65*b**11*x**
(41/2) + 45090045*a**64*b**12*x**21 + 57972915*a**63*b**13*x**(43
/2) + 57972915*a**62*b**14*x**22 + 45090045*a**61*b**15*x**(45/2)
 + 27054027*a**60*b**16*x**23 + 12297285*a**59*b**17*x**(47/2) +
4099095*a**58*b**18*x**24 + 945945*a**57*b**19*x**(49/2) + 135135
*a**56*b**20*x**25 + 9009*a**55*b**21*x**(51/2)) + 15360*a**(151/
2)*b*x**(37/2)/(9009*a**70*b**6*x**18 + 135135*a**69*b**7*x**(37/
2) + 945945*a**68*b**8*x**19 + 4099095*a**67*b**9*x**(39/2) + 122
97285*a**66*b**10*x**20 + 27054027*a**65*b**11*x**(41/2) + 450900
45*a**64*b**12*x**21 + 57972915*a**63*b**13*x**(43/2) + 57972915*
a**62*b**14*x**22 + 45090045*a**61*b**15*x**(45/2) + 27054027*a**
60*b**16*x**23 + 12297285*a**59*b**17*x**(47/2) + 4099095*a**58*b
**18*x**24 + 945945*a**57*b**19*x**(49/2) + 135135*a**56*b**20*x*
*25 + 9009*a**55*b**21*x**(51/2)) - 100224*a**(149/2)*b**2*x**19*
sqrt(1 + b*sqrt(x)/a)/(9009*a**70*b**6*x**18 + 135135*a**69*b**7*
x**(37/2) + 945945*a**68*b**8*x**19 + 4099095*a**67*b**9*x**(39/2
) + 12297285*a**66*b**10*x**20 + 27054027*a**65*b**11*x**(41/2) +
 45090045*a**64*b**12*x**21 + 57972915*a**63*b**13*x**(43/2) + 57
972915*a**62*b**14*x**22 + 45090045*a**61*b**15*x**(45/2) + 27054
027*a**60*b**16*x**23 + 12297285*a**59*b**17*x**(47/2) + 4099095*
a**58*b**18*x**24 + 945945*a**57*b**19*x**(49/2) + 135135*a**56*b
**20*x**25 + 9009*a**55*b**21*x**(51/2)) + 107520*a**(149/2)*b**2
*x**19/(9009*a**70*b**6*x**18 + 135135*a**69*b**7*x**(37/2) + 945
945*a**68*b**8*x**19 + 4099095*a**67*b**9*x**(39/2) + 12297285*a*
*66*b**10*x**20 + 27054027*a**65*b**11*x**(41/2) + 45090045*a**64
*b**12*x**21 + 57972915*a**63*b**13*x**(43/2) + 57972915*a**62*b*
*14*x**22 + 45090045*a**61*b**15*x**(45/2) + 27054027*a**60*b**16
*x**23 + 12297285*a**59*b**17*x**(47/2) + 4099095*a**58*b**18*x**
24 + 945945*a**57*b**19*x**(49/2) + 135135*a**56*b**20*x**25 + 90
09*a**55*b**21*x**(51/2)) - 417600*a**(147/2)*b**3*x**(39/2)*sqrt
(1 + b*sqrt(x)/a)/(9009*a**70*b**6*x**18 + 135135*a**69*b**7*x**(
37/2) + 945945*a**68*b**8*x**19 + 4099095*a**67*b**9*x**(39/2) +
12297285*a**66*b**10*x**20 + 27054027*a**65*b**11*x**(41/2) + 450
90045*a**64*b**12*x**21 + 57972915*a**63*b**13*x**(43/2) + 579729
15*a**62*b**14*x**22 + 45090045*a**61*b**15*x**(45/2) + 27054027*
a**60*b**16*x**23 + 12297285*a**59*b**17*x**(47/2) + 4099095*a**5
8*b**18*x**24 + 945945*a**57*b**19*x**(49/2) + 135135*a**56*b**20
*x**25 + 9009*a**55*b**21*x**(51/2)) + 465920*a**(147/2)*b**3*x**
(39/2)/(9009*a**70*b**6*x**18 + 135135*a**69*b**7*x**(37/2) + 945
945*a**68*b**8*x**19 + 4099095*a**67*b**9*x**(39/2) + 12297285*a*
*66*b**10*x**20 + 27054027*a**65*b**11*x**(41/2) + 45090045*a**64
*b**12*x**21 + 57972915*a**63*b**13*x**(43/2) + 57972915*a**62*b*
*14*x**22 + 45090045*a**61*b**15*x**(45/2) + 27054027*a**60*b**16
*x**23 + 12297285*a**59*b**17*x**(47/2) + 4099095*a**58*b**18*x**
24 + 945945*a**57*b**19*x**(49/2) + 135135*a**56*b**20*x**25 + 90
09*a**55*b**21*x**(51/2)) - 1200600*a**(145/2)*b**4*x**20*sqrt(1
+ b*sqrt(x)/a)/(9009*a**70*b**6*x**18 + 135135*a**69*b**7*x**(37/
2) + 945945*a**68*b**8*x**19 + 4099095*a**67*b**9*x**(39/2) + 122
97285*a**66*b**10*x**20 + 27054027*a**65*b**11*x**(41/2) + 450900
45*a**64*b**12*x**21 + 57972915*a**63*b**13*x**(43/2) + 57972915*
a**62*b**14*x**22 + 45090045*a**61*b**15*x**(45/2) + 27054027*a**
60*b**16*x**23 + 12297285*a**59*b**17*x**(47/2) + 4099095*a**58*b
**18*x**24 + 945945*a**57*b**19*x**(49/2) + 135135*a**56*b**20*x*
*25 + 9009*a**55*b**21*x**(51/2)) + 1397760*a**(145/2)*b**4*x**20
/(9009*a**70*b**6*x**18 + 135135*a**69*b**7*x**(37/2) + 945945*a*
*68*b**8*x**19 + 4099095*a**67*b**9*x**(39/2) + 12297285*a**66*b*
```

*10*x**20 + 27054027*a**65*b**11*x**(41/2) + 45090045*a**64*b**12
*x**21 + 57972915*a**63*b**13*x**(43/2) + 57972915*a**62*b**14*x*
*22 + 45090045*a**61*b**15*x**(45/2) + 27054027*a**60*b**16*x**23
 + 12297285*a**59*b**17*x**(47/2) + 4099095*a**58*b**18*x**24 + 9
45945*a**57*b**19*x**(49/2) + 135135*a**56*b**20*x**25 + 9009*a**
55*b**21*x**(51/2)) - 2521260*a**(143/2)*b**5*x**(41/2)*sqrt(1 +
b*sqrt(x)/a)/(9009*a**70*b**6*x**18 + 135135*a**69*b**7*x**(37/2)
 + 945945*a**68*b**8*x**19 + 4099095*a**67*b**9*x**(39/2) + 12297
285*a**66*b**10*x**20 + 27054027*a**65*b**11*x**(41/2) + 45090045
*a**64*b**12*x**21 + 57972915*a**63*b**13*x**(43/2) + 57972915*a*
*62*b**14*x**22 + 45090045*a**61*b**15*x**(45/2) + 27054027*a**60
*b**16*x**23 + 12297285*a**59*b**17*x**(47/2) + 4099095*a**58*b**
18*x**24 + 945945*a**57*b**19*x**(49/2) + 135135*a**56*b**20*x**2
5 + 9009*a**55*b**21*x**(51/2)) + 3075072*a**(143/2)*b**5*x**(41/
2)/(9009*a**70*b**6*x**18 + 135135*a**69*b**7*x**(37/2) + 945945*
a**68*b**8*x**19 + 4099095*a**67*b**9*x**(39/2) + 12297285*a**66*
b**10*x**20 + 27054027*a**65*b**11*x**(41/2) + 45090045*a**64*b**
12*x**21 + 57972915*a**63*b**13*x**(43/2) + 57972915*a**62*b**14*
x**22 + 45090045*a**61*b**15*x**(45/2) + 27054027*a**60*b**16*x**
23 + 12297285*a**59*b**17*x**(47/2) + 4099095*a**58*b**18*x**24 +
 945945*a**57*b**19*x**(49/2) + 135135*a**56*b**20*x**25 + 9009*a
55*b21*x**(51/2)) - 3988992*a**(141/2)*b**6*x**21*sqrt(1 + b*
sqrt(x)/a)/(9009*a**70*b**6*x**18 + 135135*a**69*b**7*x**(37/2) +
 945945*a**68*b**8*x**19 + 4099095*a**67*b**9*x**(39/2) + 1229728
5*a**66*b**10*x**20 + 27054027*a**65*b**11*x**(41/2) + 45090045*a
64*b12*x**21 + 57972915*a**63*b**13*x**(43/2) + 57972915*a**6
2*b**14*x**22 + 45090045*a**61*b**15*x**(45/2) + 27054027*a**60*b
16*x23 + 12297285*a**59*b**17*x**(47/2) + 4099095*a**58*b**18
*x**24 + 945945*a**57*b**19*x**(49/2) + 135135*a**56*b**20*x**25
+ 9009*a**55*b**21*x**(51/2)) + 5125120*a**(141/2)*b**6*x**21/(90
09*a**70*b**6*x**18 + 135135*a**69*b**7*x**(37/2) + 945945*a**68*
b**8*x**19 + 4099095*a**67*b**9*x**(39/2) + 12297285*a**66*b**10*
x**20 + 27054027*a**65*b**11*x**(41/2) + 45090045*a**64*b**12*x**
21 + 57972915*a**63*b**13*x**(43/2) + 57972915*a**62*b**14*x**22
+ 45090045*a**61*b**15*x**(45/2) + 27054027*a**60*b**16*x**23 + 1
2297285*a**59*b**17*x**(47/2) + 4099095*a**58*b**18*x**24 + 94594
5*a**57*b**19*x**(49/2) + 135135*a**56*b**20*x**25 + 9009*a**55*b
21*x(51/2)) - 4802592*a**(139/2)*b**7*x**(43/2)*sqrt(1 + b*sq
rt(x)/a)/(9009*a**70*b**6*x**18 + 135135*a**69*b**7*x**(37/2) + 9
45945*a**68*b**8*x**19 + 4099095*a**67*b**9*x**(39/2) + 12297285*
a**66*b**10*x**20 + 27054027*a**65*b**11*x**(41/2) + 45090045*a**
64*b**12*x**21 + 57972915*a**63*b**13*x**(43/2) + 57972915*a**62*
b**14*x**22 + 45090045*a**61*b**15*x**(45/2) + 27054027*a**60*b**
16*x**23 + 12297285*a**59*b**17*x**(47/2) + 4099095*a**58*b**18*x
24 + 945945*a57*b**19*x**(49/2) + 135135*a**56*b**20*x**25 +
9009*a**55*b**21*x**(51/2)) + 6589440*a**(139/2)*b**7*x**(43/2)/(
9009*a**70*b**6*x**18 + 135135*a**69*b**7*x**(37/2) + 945945*a**6
8*b**8*x**19 + 4099095*a**67*b**9*x**(39/2) + 12297285*a**66*b**1
0*x**20 + 27054027*a**65*b**11*x**(41/2) + 45090045*a**64*b**12*x
21 + 57972915*a63*b**13*x**(43/2) + 57972915*a**62*b**14*x**2
2 + 45090045*a**61*b**15*x**(45/2) + 27054027*a**60*b**16*x**23 +
 12297285*a**59*b**17*x**(47/2) + 4099095*a**58*b**18*x**24 + 945
945*a**57*b**19*x**(49/2) + 135135*a**56*b**20*x**25 + 9009*a**55
*b**21*x**(51/2)) - 4232160*a**(137/2)*b**8*x**22*sqrt(1 + b*sqrt
(x)/a)/(9009*a**70*b**6*x**18 + 135135*a**69*b**7*x**(37/2) + 945
945*a**68*b**8*x**19 + 4099095*a**67*b**9*x**(39/2) + 12297285*a*
*66*b**10*x**20 + 27054027*a**65*b**11*x**(41/2) + 45090045*a**64
*b**12*x**21 + 57972915*a**63*b**13*x**(43/2) + 57972915*a**62*b*
*14*x**22 + 45090045*a**61*b**15*x**(45/2) + 27054027*a**60*b**16
*x**23 + 12297285*a**59*b**17*x**(47/2) + 4099095*a**58*b**18*x**
24 + 945945*a**57*b**19*x**(49/2) + 135135*a**56*b**20*x**25 + 90
09*a**55*b**21*x**(51/2)) + 6589440*a**(137/2)*b**8*x**22/(9009*a
70*b6*x**18 + 135135*a**69*b**7*x**(37/2) + 945945*a**68*b**8
*x**19 + 4099095*a**67*b**9*x**(39/2) + 12297285*a**66*b**10*x**2
0 + 27054027*a**65*b**11*x**(41/2) + 45090045*a**64*b**12*x**21 +
 57972915*a**63*b**13*x**(43/2) + 57972915*a**62*b**14*x**22 + 45
090045*a**61*b**15*x**(45/2) + 27054027*a**60*b**16*x**23 + 12297
285*a**59*b**17*x**(47/2) + 4099095*a**58*b**18*x**24 + 945945*a*
*57*b**19*x**(49/2) + 135135*a**56*b**20*x**25 + 9009*a**55*b**21
*x**(51/2)) - 1935440*a**(135/2)*b**9*x**(45/2)*sqrt(1 + b*sqrt(x
)/a)/(9009*a**70*b**6*x**18 + 135135*a**69*b**7*x**(37/2) + 94594
5*a**68*b**8*x**19 + 4099095*a**67*b**9*x**(39/2) + 12297285*a**6
6*b**10*x**20 + 27054027*a**65*b**11*x**(41/2) + 45090045*a**64*b
12*x21 + 57972915*a**63*b**13*x**(43/2) + 57972915*a**62*b**1

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4*x**22 + 45090045*a**61*b**15*x**(45/2) + 27054027*a**60*b**16*x
**23 + 12297285*a**59*b**17*x**(47/2) + 4099095*a**58*b**18*x**24
 + 945945*a**57*b**19*x**(49/2) + 135135*a**56*b**20*x**25 + 9009
*a**55*b**21*x**(51/2)) + 5125120*a**(135/2)*b**9*x**(45/2)/(9009
*a**70*b**6*x**18 + 135135*a**69*b**7*x**(37/2) + 945945*a**68*b*
*8*x**19 + 4099095*a**67*b**9*x**(39/2) + 12297285*a**66*b**10*x*
*20 + 27054027*a**65*b**11*x**(41/2) + 45090045*a**64*b**12*x**21
 + 57972915*a**63*b**13*x**(43/2) + 57972915*a**62*b**14*x**22 +
45090045*a**61*b**15*x**(45/2) + 27054027*a**60*b**16*x**23 + 122
97285*a**59*b**17*x**(47/2) + 4099095*a**58*b**18*x**24 + 945945*
a**57*b**19*x**(49/2) + 135135*a**56*b**20*x**25 + 9009*a**55*b**
21*x**(51/2)) + 2214784*a**(133/2)*b**10*x**23*sqrt(1 + b*sqrt(x)
/a)/(9009*a**70*b**6*x**18 + 135135*a**69*b**7*x**(37/2) + 945945
*a**68*b**8*x**19 + 4099095*a**67*b**9*x**(39/2) + 12297285*a**66
*b**10*x**20 + 27054027*a**65*b**11*x**(41/2) + 45090045*a**64*b*
*12*x**21 + 57972915*a**63*b**13*x**(43/2) + 57972915*a**62*b**14
*x**22 + 45090045*a**61*b**15*x**(45/2) + 27054027*a**60*b**16*x*
*23 + 12297285*a**59*b**17*x**(47/2) + 4099095*a**58*b**18*x**24
+ 945945*a**57*b**19*x**(49/2) + 135135*a**56*b**20*x**25 + 9009*
a**55*b**21*x**(51/2)) + 3075072*a**(133/2)*b**10*x**23/(9009*a**
70*b**6*x**18 + 135135*a**69*b**7*x**(37/2) + 945945*a**68*b**8*x
**19 + 4099095*a**67*b**9*x**(39/2) + 12297285*a**66*b**10*x**20
+ 27054027*a**65*b**11*x**(41/2) + 45090045*a**64*b**12*x**21 + 5
7972915*a**63*b**13*x**(43/2) + 57972915*a**62*b**14*x**22 + 4509
0045*a**61*b**15*x**(45/2) + 27054027*a**60*b**16*x**23 + 1229728
5*a**59*b**17*x**(47/2) + 4099095*a**58*b**18*x**24 + 945945*a**5
7*b**19*x**(49/2) + 135135*a**56*b**20*x**25 + 9009*a**55*b**21*x
**(51/2)) + 8060832*a**(131/2)*b**11*x**(47/2)*sqrt(1 + b*sqrt(x)
/a)/(9009*a**70*b**6*x**18 + 135135*a**69*b**7*x**(37/2) + 945945
*a**68*b**8*x**19 + 4099095*a**67*b**9*x**(39/2) + 12297285*a**66
*b**10*x**20 + 27054027*a**65*b**11*x**(41/2) + 45090045*a**64*b*
*12*x**21 + 57972915*a**63*b**13*x**(43/2) + 57972915*a**62*b**14
*x**22 + 45090045*a**61*b**15*x**(45/2) + 27054027*a**60*b**16*x*
*23 + 12297285*a**59*b**17*x**(47/2) + 4099095*a**58*b**18*x**24
+ 945945*a**57*b**19*x**(49/2) + 135135*a**56*b**20*x**25 + 9009*
a**55*b**21*x**(51/2)) + 1397760*a**(131/2)*b**11*x**(47/2)/(9009
*a**70*b**6*x**18 + 135135*a**69*b**7*x**(37/2) + 945945*a**68*b*
*8*x**19 + 4099095*a**67*b**9*x**(39/2) + 12297285*a**66*b**10*x*
*20 + 27054027*a**65*b**11*x**(41/2) + 45090045*a**64*b**12*x**21
 + 57972915*a**63*b**13*x**(43/2) + 57972915*a**62*b**14*x**22 +
45090045*a**61*b**15*x**(45/2) + 27054027*a**60*b**16*x**23 + 122
97285*a**59*b**17*x**(47/2) + 4099095*a**58*b**18*x**24 + 945945*
a**57*b**19*x**(49/2) + 135135*a**56*b**20*x**25 + 9009*a**55*b**
21*x**(51/2)) + 14375088*a**(129/2)*b**12*x**24*sqrt(1 + b*sqrt(x
)/a)/(9009*a**70*b**6*x**18 + 135135*a**69*b**7*x**(37/2) + 94594
5*a**68*b**8*x**19 + 4099095*a**67*b**9*x**(39/2) + 12297285*a**6
6*b**10*x**20 + 27054027*a**65*b**11*x**(41/2) + 45090045*a**64*b
**12*x**21 + 57972915*a**63*b**13*x**(43/2) + 57972915*a**62*b**1
4*x**22 + 45090045*a**61*b**15*x**(45/2) + 27054027*a**60*b**16*x
**23 + 12297285*a**59*b**17*x**(47/2) + 4099095*a**58*b**18*x**24
 + 945945*a**57*b**19*x**(49/2) + 135135*a**56*b**20*x**25 + 9009
*a**55*b**21*x**(51/2)) + 465920*a**(129/2)*b**12*x**24/(9009*a**
70*b**6*x**18 + 135135*a**69*b**7*x**(37/2) + 945945*a**68*b**8*x
**19 + 4099095*a**67*b**9*x**(39/2) + 12297285*a**66*b**10*x**20
+ 27054027*a**65*b**11*x**(41/2) + 45090045*a**64*b**12*x**21 + 5
7972915*a**63*b**13*x**(43/2) + 57972915*a**62*b**14*x**22 + 4509
0045*a**61*b**15*x**(45/2) + 27054027*a**60*b**16*x**23 + 1229728
5*a**59*b**17*x**(47/2) + 4099095*a**58*b**18*x**24 + 945945*a**5
7*b**19*x**(49/2) + 135135*a**56*b**20*x**25 + 9009*a**55*b**21*x
**(51/2)) + 18620280*a**(127/2)*b**13*x**(49/2)*sqrt(1 + b*sqrt(x
)/a)/(9009*a**70*b**6*x**18 + 135135*a**69*b**7*x**(37/2) + 94594
5*a**68*b**8*x**19 + 4099095*a**67*b**9*x**(39/2) + 12297285*a**6
6*b**10*x**20 + 27054027*a**65*b**11*x**(41/2) + 45090045*a**64*b
**12*x**21 + 57972915*a**63*b**13*x**(43/2) + 57972915*a**62*b**1
4*x**22 + 45090045*a**61*b**15*x**(45/2) + 27054027*a**60*b**16*x
**23 + 12297285*a**59*b**17*x**(47/2) + 4099095*a**58*b**18*x**24
 + 945945*a**57*b**19*x**(49/2) + 135135*a**56*b**20*x**25 + 9009
*a**55*b**21*x**(51/2)) + 107520*a**(127/2)*b**13*x**(49/2)/(9009
*a**70*b**6*x**18 + 135135*a**69*b**7*x**(37/2) + 945945*a**68*b*
*8*x**19 + 4099095*a**67*b**9*x**(39/2) + 12297285*a**66*b**10*x*
*20 + 27054027*a**65*b**11*x**(41/2) + 45090045*a**64*b**12*x**21
 + 57972915*a**63*b**13*x**(43/2) + 57972915*a**62*b**14*x**22 +
45090045*a**61*b**15*x**(45/2) + 27054027*a**60*b**16*x**23 + 122
97285*a**59*b**17*x**(47/2) + 4099095*a**58*b**18*x**24 + 945945*
```

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a**57*b**19*x**(49/2) + 135135*a**56*b**20*x**25 + 9009*a**55*b**
21*x**(51/2)) + 18558720*a**(125/2)*b**14*x**25*sqrt(1 + b*sqrt(x
)/a)/(9009*a**70*b**6*x**18 + 135135*a**69*b**7*x**(37/2) + 94594
5*a**68*b**8*x**19 + 4099095*a**67*b**9*x**(39/2) + 12297285*a**6
6*b**10*x**20 + 27054027*a**65*b**11*x**(41/2) + 45090045*a**64*b
**12*x**21 + 57972915*a**63*b**13*x**(43/2) + 57972915*a**62*b**1
4*x**22 + 45090045*a**61*b**15*x**(45/2) + 27054027*a**60*b**16*x
**23 + 12297285*a**59*b**17*x**(47/2) + 4099095*a**58*b**18*x**24
 + 945945*a**57*b**19*x**(49/2) + 135135*a**56*b**20*x**25 + 9009
*a**55*b**21*x**(51/2)) + 15360*a**(125/2)*b**14*x**25/(9009*a**7
0*b**6*x**18 + 135135*a**69*b**7*x**(37/2) + 945945*a**68*b**8*x*
*19 + 4099095*a**67*b**9*x**(39/2) + 12297285*a**66*b**10*x**20 +
 27054027*a**65*b**11*x**(41/2) + 45090045*a**64*b**12*x**21 + 57
972915*a**63*b**13*x**(43/2) + 57972915*a**62*b**14*x**22 + 45090
045*a**61*b**15*x**(45/2) + 27054027*a**60*b**16*x**23 + 12297285
*a**59*b**17*x**(47/2) + 4099095*a**58*b**18*x**24 + 945945*a**57
*b**19*x**(49/2) + 135135*a**56*b**20*x**25 + 9009*a**55*b**21*x*
*(51/2)) + 14360352*a**(123/2)*b**15*x**(51/2)*sqrt(1 + b*sqrt(x)
/a)/(9009*a**70*b**6*x**18 + 135135*a**69*b**7*x**(37/2) + 945945
*a**68*b**8*x**19 + 4099095*a**67*b**9*x**(39/2) + 12297285*a**66
*b**10*x**20 + 27054027*a**65*b**11*x**(41/2) + 45090045*a**64*b*
*12*x**21 + 57972915*a**63*b**13*x**(43/2) + 57972915*a**62*b**14
*x**22 + 45090045*a**61*b**15*x**(45/2) + 27054027*a**60*b**16*x*
*23 + 12297285*a**59*b**17*x**(47/2) + 4099095*a**58*b**18*x**24
+ 945945*a**57*b**19*x**(49/2) + 135135*a**56*b**20*x**25 + 9009*
a**55*b**21*x**(51/2)) + 1024*a**(123/2)*b**15*x**(51/2)/(9009*a*
*70*b**6*x**18 + 135135*a**69*b**7*x**(37/2) + 945945*a**68*b**8*
x**19 + 4099095*a**67*b**9*x**(39/2) + 12297285*a**66*b**10*x**20
 + 27054027*a**65*b**11*x**(41/2) + 45090045*a**64*b**12*x**21 +
57972915*a**63*b**13*x**(43/2) + 57972915*a**62*b**14*x**22 + 450
90045*a**61*b**15*x**(45/2) + 27054027*a**60*b**16*x**23 + 122972
85*a**59*b**17*x**(47/2) + 4099095*a**58*b**18*x**24 + 945945*a**
57*b**19*x**(49/2) + 135135*a**56*b**20*x**25 + 9009*a**55*b**21*
x**(51/2)) + 8569248*a**(121/2)*b**16*x**26*sqrt(1 + b*sqrt(x)/a)
/(9009*a**70*b**6*x**18 + 135135*a**69*b**7*x**(37/2) + 945945*a*
*68*b**8*x**19 + 4099095*a**67*b**9*x**(39/2) + 12297285*a**66*b*
*10*x**20 + 27054027*a**65*b**11*x**(41/2) + 45090045*a**64*b**12
*x**21 + 57972915*a**63*b**13*x**(43/2) + 57972915*a**62*b**14*x*
*22 + 45090045*a**61*b**15*x**(45/2) + 27054027*a**60*b**16*x**23
 + 12297285*a**59*b**17*x**(47/2) + 4099095*a**58*b**18*x**24 + 9
45945*a**57*b**19*x**(49/2) + 135135*a**56*b**20*x**25 + 9009*a**
55*b**21*x**(51/2)) + 3873456*a**(119/2)*b**17*x**(53/2)*sqrt(1 +
 b*sqrt(x)/a)/(9009*a**70*b**6*x**18 + 135135*a**69*b**7*x**(37/2
) + 945945*a**68*b**8*x**19 + 4099095*a**67*b**9*x**(39/2) + 1229
7285*a**66*b**10*x**20 + 27054027*a**65*b**11*x**(41/2) + 4509004
5*a**64*b**12*x**21 + 57972915*a**63*b**13*x**(43/2) + 57972915*a
**62*b**14*x**22 + 45090045*a**61*b**15*x**(45/2) + 27054027*a**6
0*b**16*x**23 + 12297285*a**59*b**17*x**(47/2) + 4099095*a**58*b*
*18*x**24 + 945945*a**57*b**19*x**(49/2) + 135135*a**56*b**20*x**
25 + 9009*a**55*b**21*x**(51/2)) + 1283840*a**(117/2)*b**18*x**27
*sqrt(1 + b*sqrt(x)/a)/(9009*a**70*b**6*x**18 + 135135*a**69*b**7
*x**(37/2) + 945945*a**68*b**8*x**19 + 4099095*a**67*b**9*x**(39/
2) + 12297285*a**66*b**10*x**20 + 27054027*a**65*b**11*x**(41/2)
+ 45090045*a**64*b**12*x**21 + 57972915*a**63*b**13*x**(43/2) + 5
7972915*a**62*b**14*x**22 + 45090045*a**61*b**15*x**(45/2) + 2705
4027*a**60*b**16*x**23 + 12297285*a**59*b**17*x**(47/2) + 4099095
*a**58*b**18*x**24 + 945945*a**57*b**19*x**(49/2) + 135135*a**56*
b**20*x**25 + 9009*a**55*b**21*x**(51/2)) + 294560*a**(115/2)*b**
19*x**(55/2)*sqrt(1 + b*sqrt(x)/a)/(9009*a**70*b**6*x**18 + 13513
5*a**69*b**7*x**(37/2) + 945945*a**68*b**8*x**19 + 4099095*a**67*
b**9*x**(39/2) + 12297285*a**66*b**10*x**20 + 27054027*a**65*b**1
1*x**(41/2) + 45090045*a**64*b**12*x**21 + 57972915*a**63*b**13*x
**(43/2) + 57972915*a**62*b**14*x**22 + 45090045*a**61*b**15*x**(
45/2) + 27054027*a**60*b**16*x**23 + 12297285*a**59*b**17*x**(47/
2) + 4099095*a**58*b**18*x**24 + 945945*a**57*b**19*x**(49/2) + 1
35135*a**56*b**20*x**25 + 9009*a**55*b**21*x**(51/2)) + 41832*a**
(113/2)*b**20*x**28*sqrt(1 + b*sqrt(x)/a)/(9009*a**70*b**6*x**18
+ 135135*a**69*b**7*x**(37/2) + 945945*a**68*b**8*x**19 + 4099095
*a**67*b**9*x**(39/2) + 12297285*a**66*b**10*x**20 + 27054027*a**
65*b**11*x**(41/2) + 45090045*a**64*b**12*x**21 + 57972915*a**63*
b**13*x**(43/2) + 57972915*a**62*b**14*x**22 + 45090045*a**61*b**
15*x**(45/2) + 27054027*a**60*b**16*x**23 + 12297285*a**59*b**17*
x**(47/2) + 4099095*a**58*b**18*x**24 + 945945*a**57*b**19*x**(49
/2) + 135135*a**56*b**20*x**25 + 9009*a**55*b**21*x**(51/2)) + 27
```

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72*a**(111/2)*b**21*x**(57/2)*sqrt(1 + b*sqrt(x)/a)/(9009*a**70*b
**6*x**18 + 135135*a**69*b**7*x**(37/2) + 945945*a**68*b**8*x**19
 + 4099095*a**67*b**9*x**(39/2) + 12297285*a**66*b**10*x**20 + 27
054027*a**65*b**11*x**(41/2) + 45090045*a**64*b**12*x**21 + 57972
915*a**63*b**13*x**(43/2) + 57972915*a**62*b**14*x**22 + 45090045
*a**61*b**15*x**(45/2) + 27054027*a**60*b**16*x**23 + 12297285*a*
*59*b**17*x**(47/2) + 4099095*a**58*b**18*x**24 + 945945*a**57*b*
*19*x**(49/2) + 135135*a**56*b**20*x**25 + 9009*a**55*b**21*x**(5
1/2))
```

GIAC/XCAS [A] time = 0.275925, size = 115, normalized size = 0.87

$$\frac{4\left(693\left(b\sqrt{x}+a\right)^{\frac{13}{2}}-4095\left(b\sqrt{x}+a\right)^{\frac{11}{2}}a+10010\left(b\sqrt{x}+a\right)^{\frac{9}{2}}a^{2}-12870\left(b\sqrt{x}+a\right)^{\frac{7}{2}}a^{3}+9009\left(b\sqrt{x}+a\right)^{\frac{5}{2}}a^{4}-3003\left(b\sqrt{x}\right.\right.}{9009\,b^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(x) + a)*x^2,x, algorithm="giac")
```

```
[Out] 4/9009*(693*(b*sqrt(x) + a)^(13/2) - 4095*(b*sqrt(x) + a)^(11/2)*
a + 10010*(b*sqrt(x) + a)^(9/2)*a^2 - 12870*(b*sqrt(x) + a)^(7/2)
*a^3 + 9009*(b*sqrt(x) + a)^(5/2)*a^4 - 3003*(b*sqrt(x) + a)^(3/2
)*a^5)/b^6
```

3.2232 $\int \sqrt{a+b\sqrt{x}}x\,dx$

Optimal. Leaf size=88

$$-\frac{4a^3\left(a+b\sqrt{x}\right)^{3/2}}{3b^4}+\frac{12a^2\left(a+b\sqrt{x}\right)^{5/2}}{5b^4}+\frac{4\left(a+b\sqrt{x}\right)^{9/2}}{9b^4}-\frac{12a\left(a+b\sqrt{x}\right)^{7/2}}{7b^4}$$

```
[Out] (-4*a^3*(a + b*Sqrt[x])^(3/2))/(3*b^4) + (12*a^2*(a + b*Sqrt[x])^
(5/2))/(5*b^4) - (12*a*(a + b*Sqrt[x])^(7/2))/(7*b^4) + (4*(a + b
*Sqrt[x])^(9/2))/(9*b^4)
```

Rubi [A] time = 0.0989765, antiderivative size = 88, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{4a^3\left(a+b\sqrt{x}\right)^{3/2}}{3b^4}+\frac{12a^2\left(a+b\sqrt{x}\right)^{5/2}}{5b^4}+\frac{4\left(a+b\sqrt{x}\right)^{9/2}}{9b^4}-\frac{12a\left(a+b\sqrt{x}\right)^{7/2}}{7b^4}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[x]]*x,x]
```

```
[Out] (-4*a^3*(a + b*Sqrt[x])^(3/2))/(3*b^4) + (12*a^2*(a + b*Sqrt[x])^
(5/2))/(5*b^4) - (12*a*(a + b*Sqrt[x])^(7/2))/(7*b^4) + (4*(a + b
*Sqrt[x])^(9/2))/(9*b^4)
```

Rubi in Sympy [A] time = 14.387, size = 82, normalized size = 0.93

$$-\frac{4a^3\left(a+b\sqrt{x}\right)^{\frac{3}{2}}}{3b^4}+\frac{12a^2\left(a+b\sqrt{x}\right)^{\frac{5}{2}}}{5b^4}-\frac{12a\left(a+b\sqrt{x}\right)^{\frac{7}{2}}}{7b^4}+\frac{4\left(a+b\sqrt{x}\right)^{\frac{9}{2}}}{9b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(a+b*x**(1/2))**(1/2),x)
```

```
[Out] -4*a**3*(a + b*sqrt(x))**(3/2)/(3*b**4) + 12*a**2*(a + b*sqrt(x))
**(5/2)/(5*b**4) - 12*a*(a + b*sqrt(x))**(7/2)/(7*b**4) + 4*(a +
b*sqrt(x))**(9/2)/(9*b**4)
```

Mathematica [A] time = 0.0280919, size = 65, normalized size = 0.74

$$\frac{4\sqrt{a+b\sqrt{x}}\left(-16a^4+8a^3b\sqrt{x}-6a^2b^2x+5ab^3x^{3/2}+35b^4x^2\right)}{315b^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b*Sqrt[x]]*x,x]
```

```
[Out] (4*Sqrt[a + b*Sqrt[x]]*(-16*a^4 + 8*a^3*b*Sqrt[x] - 6*a^2*b^2*x +
 5*a*b^3*x^(3/2) + 35*b^4*x^2))/(315*b^4)
```

Maple [A] time = 0.003, size = 58, normalized size = 0.7

$$4\,\frac{1/9\,\left(a+b\sqrt{x}\right)^{9/2}-3/7\,a\left(a+b\sqrt{x}\right)^{7/2}+3/5\,\left(a+b\sqrt{x}\right)^{5/2}a^2-1/3\,\left(a+b\sqrt{x}\right)^{3/2}a^3}{b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x*(a+b*x^(1/2))^(1/2),x)
```

```
[Out] 4/b^4*(1/9*(a+b*x^(1/2))^(9/2)-3/7*a*(a+b*x^(1/2))^(7/2)+3/5*(a+b
*x^(1/2))^(5/2)*a^2-1/3*(a+b*x^(1/2))^(3/2)*a^3)
```

Maxima [A] time = 1.44211, size = 86, normalized size = 0.98

$$\frac{4\,\left(b\sqrt{x}+a\right)^{\frac{9}{2}}}{9\,b^{4}}-\frac{12\,\left(b\sqrt{x}+a\right)^{\frac{7}{2}}a}{7\,b^{4}}+\frac{12\,\left(b\sqrt{x}+a\right)^{\frac{5}{2}}a^{2}}{5\,b^{4}}-\frac{4\,\left(b\sqrt{x}+a\right)^{\frac{3}{2}}a^{3}}{3\,b^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(b*sqrt(x) + a)*x,x, algorithm="maxima")
```

```
[Out] 4/9*(b*sqrt(x) + a)^(9/2)/b^4 - 12/7*(b*sqrt(x) + a)^(7/2)*a/b^4
+ 12/5*(b*sqrt(x) + a)^(5/2)*a^2/b^4 - 4/3*(b*sqrt(x) + a)^(3/2)*
a^3/b^4
```

Fricas [A] time = 0.243527, size = 74, normalized size = 0.84

$$\frac{4\,\left(35\,b^{4}x^{2}-6\,a^{2}b^{2}x-16\,a^{4}+\left(5\,ab^{3}x+8\,a^{3}b\right)\sqrt{x}\right)\sqrt{b\sqrt{x}+a}}{315\,b^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(b*sqrt(x) + a)*x,x, algorithm="fricas")
```

```
[Out] 4/315*(35*b^4*x^2 - 6*a^2*b^2*x - 16*a^4 + (5*a*b^3*x + 8*a^3*b)*
sqrt(x))*sqrt(b*sqrt(x) + a)/b^4
```

Sympy [A] time = 8.59073, size = 1987, normalized size = 22.58

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x*(a+b*x**(1/2))**(1/2),x)
```

```
[Out] -64*a**(49/2)*x**8*sqrt(1 + b*sqrt(x)/a)/(315*a**20*b**4*x**8 + 1
890*a**19*b**5*x**(17/2) + 4725*a**18*b**6*x**9 + 6300*a**17*b**7
*x**(19/2) + 4725*a**16*b**8*x**10 + 1890*a**15*b**9*x**(21/2) +
315*a**14*b**10*x**11) + 64*a**(49/2)*x**8/(315*a**20*b**4*x**8 +
 1890*a**19*b**5*x**(17/2) + 4725*a**18*b**6*x**9 + 6300*a**17*b*
*7*x**(19/2) + 4725*a**16*b**8*x**10 + 1890*a**15*b**9*x**(21/2)
+ 315*a**14*b**10*x**11) - 352*a**(47/2)*b*x**(17/2)*sqrt(1 + b*s
qrt(x)/a)/(315*a**20*b**4*x**8 + 1890*a**19*b**5*x**(17/2) + 4725
*a**18*b**6*x**9 + 6300*a**17*b**7*x**(19/2) + 4725*a**16*b**8*x*
*10 + 1890*a**15*b**9*x**(21/2) + 315*a**14*b**10*x**11) + 384*a*
*(47/2)*b*x**(17/2)/(315*a**20*b**4*x**8 + 1890*a**19*b**5*x**(17
/2) + 4725*a**18*b**6*x**9 + 6300*a**17*b**7*x**(19/2) + 4725*a**
16*b**8*x**10 + 1890*a**15*b**9*x**(21/2) + 315*a**14*b**10*x**11
) - 792*a**(45/2)*b**2*x**9*sqrt(1 + b*sqrt(x)/a)/(315*a**20*b**4
*x**8 + 1890*a**19*b**5*x**(17/2) + 4725*a**18*b**6*x**9 + 6300*a
**17*b**7*x**(19/2) + 4725*a**16*b**8*x**10 + 1890*a**15*b**9*x**
(21/2) + 315*a**14*b**10*x**11) + 960*a**(45/2)*b**2*x**9/(315*a*
*20*b**4*x**8 + 1890*a**19*b**5*x**(17/2) + 4725*a**18*b**6*x**9
+ 6300*a**17*b**7*x**(19/2) + 4725*a**16*b**8*x**10 + 1890*a**15*
```

```
b**9*x**(21/2) + 315*a**14*b**10*x**11) - 924*a**(43/2)*b**3*x**(
19/2)*sqrt(1 + b*sqrt(x)/a)/(315*a**20*b**4*x**8 + 1890*a**19*b**
5*x**(17/2) + 4725*a**18*b**6*x**9 + 6300*a**17*b**7*x**(19/2) +
4725*a**16*b**8*x**10 + 1890*a**15*b**9*x**(21/2) + 315*a**14*b**
10*x**11) + 1280*a**(43/2)*b**3*x**(19/2)/(315*a**20*b**4*x**8 +
1890*a**19*b**5*x**(17/2) + 4725*a**18*b**6*x**9 + 6300*a**17*b**
7*x**(19/2) + 4725*a**16*b**8*x**10 + 1890*a**15*b**9*x**(21/2) +
 315*a**14*b**10*x**11) - 420*a**(41/2)*b**4*x**10*sqrt(1 + b*sqr
t(x)/a)/(315*a**20*b**4*x**8 + 1890*a**19*b**5*x**(17/2) + 4725*a
**18*b**6*x**9 + 6300*a**17*b**7*x**(19/2) + 4725*a**16*b**8*x**1
0 + 1890*a**15*b**9*x**(21/2) + 315*a**14*b**10*x**11) + 960*a**(
41/2)*b**4*x**10/(315*a**20*b**4*x**8 + 1890*a**19*b**5*x**(17/2)
 + 4725*a**18*b**6*x**9 + 6300*a**17*b**7*x**(19/2) + 4725*a**16*
b**8*x**10 + 1890*a**15*b**9*x**(21/2) + 315*a**14*b**10*x**11) +
 756*a**(39/2)*b**5*x**(21/2)*sqrt(1 + b*sqrt(x)/a)/(315*a**20*b*
*4*x**8 + 1890*a**19*b**5*x**(17/2) + 4725*a**18*b**6*x**9 + 6300
*a**17*b**7*x**(19/2) + 4725*a**16*b**8*x**10 + 1890*a**15*b**9*x
**(21/2) + 315*a**14*b**10*x**11) + 384*a**(39/2)*b**5*x**(21/2)/
(315*a**20*b**4*x**8 + 1890*a**19*b**5*x**(17/2) + 4725*a**18*b**
6*x**9 + 6300*a**17*b**7*x**(19/2) + 4725*a**16*b**8*x**10 + 1890
*a**15*b**9*x**(21/2) + 315*a**14*b**10*x**11) + 2268*a**(37/2)*b
**6*x**11*sqrt(1 + b*sqrt(x)/a)/(315*a**20*b**4*x**8 + 1890*a**19
*b**5*x**(17/2) + 4725*a**18*b**6*x**9 + 6300*a**17*b**7*x**(19/2
) + 4725*a**16*b**8*x**10 + 1890*a**15*b**9*x**(21/2) + 315*a**14
*b**10*x**11) + 64*a**(37/2)*b**6*x**11/(315*a**20*b**4*x**8 + 18
90*a**19*b**5*x**(17/2) + 4725*a**18*b**6*x**9 + 6300*a**17*b**7*
x**(19/2) + 4725*a**16*b**8*x**10 + 1890*a**15*b**9*x**(21/2) + 3
15*a**14*b**10*x**11) + 2988*a**(35/2)*b**7*x**(23/2)*sqrt(1 + b*
sqrt(x)/a)/(315*a**20*b**4*x**8 + 1890*a**19*b**5*x**(17/2) + 472
5*a**18*b**6*x**9 + 6300*a**17*b**7*x**(19/2) + 4725*a**16*b**8*x
**10 + 1890*a**15*b**9*x**(21/2) + 315*a**14*b**10*x**11) + 2196*
a**(33/2)*b**8*x**12*sqrt(1 + b*sqrt(x)/a)/(315*a**20*b**4*x**8 +
 1890*a**19*b**5*x**(17/2) + 4725*a**18*b**6*x**9 + 6300*a**17*b*
*7*x**(19/2) + 4725*a**16*b**8*x**10 + 1890*a**15*b**9*x**(21/2)
+ 315*a**14*b**10*x**11) + 860*a**(31/2)*b**9*x**(25/2)*sqrt(1 +
b*sqrt(x)/a)/(315*a**20*b**4*x**8 + 1890*a**19*b**5*x**(17/2) + 4
725*a**18*b**6*x**9 + 6300*a**17*b**7*x**(19/2) + 4725*a**16*b**8
*x**10 + 1890*a**15*b**9*x**(21/2) + 315*a**14*b**10*x**11) + 140
*a**(29/2)*b**10*x**13*sqrt(1 + b*sqrt(x)/a)/(315*a**20*b**4*x**8
 + 1890*a**19*b**5*x**(17/2) + 4725*a**18*b**6*x**9 + 6300*a**17*
b**7*x**(19/2) + 4725*a**16*b**8*x**10 + 1890*a**15*b**9*x**(21/2
) + 315*a**14*b**10*x**11)
```

GIAC/XCAS [A] time = 0.259561, size = 77, normalized size = 0.88

$$\frac{4\left(35\left(b\sqrt{x}+a\right)^{\frac{9}{2}}-135\left(b\sqrt{x}+a\right)^{\frac{7}{2}}a+189\left(b\sqrt{x}+a\right)^{\frac{5}{2}}a^{2}-105\left(b\sqrt{x}+a\right)^{\frac{3}{2}}a^{3}\right)}{315\,b^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(x) + a)*x,x, algorithm="giac")
```

```
[Out] 4/315*(35*(b*sqrt(x) + a)^(9/2) - 135*(b*sqrt(x) + a)^(7/2)*a + 1
89*(b*sqrt(x) + a)^(5/2)*a^2 - 105*(b*sqrt(x) + a)^(3/2)*a^3)/b^4
```

3.2233 $\int \sqrt{a+b\sqrt{x}}\,dx$

Optimal. Leaf size=42

$$\frac{4\left(a+b\sqrt{x}\right)^{5/2}}{5b^2}-\frac{4a\left(a+b\sqrt{x}\right)^{3/2}}{3b^2}$$

```
[Out] (-4*a*(a + b*Sqrt[x])^(3/2))/(3*b^2) + (4*(a + b*Sqrt[x])^(5/2))/
(5*b^2)
```

Rubi [A] time = 0.0474007, antiderivative size = 42, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{4\left(a+b\sqrt{x}\right)^{5/2}}{5b^2}-\frac{4a\left(a+b\sqrt{x}\right)^{3/2}}{3b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[x]],x]
```

```
[Out] (-4*a*(a + b*Sqrt[x])^(3/2))/(3*b^2) + (4*(a + b*Sqrt[x])^(5/2))/
(5*b^2)
```

Rubi in Sympy [A] time = 6.04349, size = 37, normalized size = 0.88

$$-\frac{4a\left(a+b\sqrt{x}\right)^{\frac{3}{2}}}{3b^2}+\frac{4\left(a+b\sqrt{x}\right)^{\frac{5}{2}}}{5b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**(1/2),x)
```

```
[Out] -4*a*(a + b*sqrt(x))**(3/2)/(3*b**2) + 4*(a + b*sqrt(x))**(5/2)/(
5*b**2)
```

Mathematica [A] time = 0.0193036, size = 40, normalized size = 0.95

$$\frac{4\sqrt{a+b\sqrt{x}}\left(-2a^2+ab\sqrt{x}+3b^2x\right)}{15b^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b*Sqrt[x]],x]
```

```
[Out] (4*Sqrt[a + b*Sqrt[x]]*(-2*a^2 + a*b*Sqrt[x] + 3*b^2*x))/(15*b^2)
```

Maple [A] time = 0.004, size = 30, normalized size = 0.7

$$4\,\frac{1/5\,\left(a+b\sqrt{x}\right)^{5/2}-1/3\,\left(a+b\sqrt{x}\right)^{3/2}a}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^(1/2),x)
```

[Out] 4/b^2*(1/5*(a+b*x^(1/2))^(5/2)-1/3*(a+b*x^(1/2))^(3/2)*a)

Maxima [A] time = 1.45126, size = 41, normalized size = 0.98

$$\frac{4\left(b\sqrt{x}+a\right)^{\frac{5}{2}}}{5\,b^2}-\frac{4\left(b\sqrt{x}+a\right)^{\frac{3}{2}}a}{3\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sqrt(b*sqrt(x) + a),x, algorithm="maxima")

[Out] 4/5*(b*sqrt(x) + a)^(5/2)/b^2 - 4/3*(b*sqrt(x) + a)^(3/2)*a/b^2

Fricas [A] time = 0.24716, size = 43, normalized size = 1.02

$$\frac{4\left(3\,b^2x+ab\sqrt{x}-2\,a^2\right)\sqrt{b\sqrt{x}+a}}{15\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sqrt(b*sqrt(x) + a),x, algorithm="fricas")

[Out] 4/15*(3*b^2*x + a*b*sqrt(x) - 2*a^2)*sqrt(b*sqrt(x) + a)/b^2

Sympy [A] time = 3.9724, size = 272, normalized size = 6.48

$$-\frac{8a^{\frac{9}{2}}x^2\sqrt{1+\frac{b\sqrt{x}}{a}}}{15a^2b^2x^2+15ab^3x^{\frac{5}{2}}}+\frac{8a^{\frac{9}{2}}x^2}{15a^2b^2x^2+15ab^3x^{\frac{5}{2}}}-\frac{4a^{\frac{7}{2}}bx^{\frac{5}{2}}\sqrt{1+\frac{b\sqrt{x}}{a}}}{15a^2b^2x^2+15ab^3x^{\frac{5}{2}}}+\frac{8a^{\frac{7}{2}}bx^{\frac{5}{2}}}{15a^2b^2x^2+15ab^3x^{\frac{5}{2}}}+\frac{16a^{\frac{5}{2}}b^2x^3\sqrt{1+\frac{b\sqrt{x}}{a}}}{15a^2b^2x^2+15ab^3x^{\frac{5}{2}}}+\frac{12a^{\frac{3}{2}}b^3x^{\frac{7}{2}}\sqrt{1+\frac{b\sqrt{x}}{a}}}{15a^2b^2x^2+15ab^3x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a+b*x**(1/2))**(1/2),x)

[Out] -8*a**(9/2)*x**2*sqrt(1 + b*sqrt(x)/a)/(15*a**2*b**2*x**2 + 15*a*b**3*x**(5/2)) + 8*a**(9/2)*x**2/(15*a**2*b**2*x**2 + 15*a*b**3*x**(5/2)) - 4*a**(7/2)*b*x**(5/2)*sqrt(1 + b*sqrt(x)/a)/(15*a**2*b**2*x**2 + 15*a*b**3*x**(5/2)) + 8*a**(7/2)*b*x**(5/2)/(15*a**2*b**2*x**2 + 15*a*b**3*x**(5/2)) + 16*a**(5/2)*b**2*x**3*sqrt(1 + b*sqrt(x)/a)/(15*a**2*b**2*x**2 + 15*a*b**3*x**(5/2)) + 12*a**(3/2)*b**3*x**(7/2)*sqrt(1 + b*sqrt(x)/a)/(15*a**2*b**2*x**2 + 15*a*b**3*x**(5/2))

GIAC/XCAS [A] time = 0.251155, size = 39, normalized size = 0.93

$$\frac{4\left(3\left(b\sqrt{x}+a\right)^{\frac{5}{2}}-5\left(b\sqrt{x}+a\right)^{\frac{3}{2}}a\right)}{15\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sqrt(b*sqrt(x) + a),x, algorithm="giac")

[Out] 4/15*(3*(b*sqrt(x) + a)^(5/2) - 5*(b*sqrt(x) + a)^(3/2)*a)/b^2

3.2234 $\int \frac{\sqrt{a+b\sqrt{x}}}{x}\,dx$

Optimal. Leaf size=43

$$4\sqrt{a+b\sqrt{x}}-4\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{x}}}{\sqrt{a}}\right)$$

```
[Out] 4*Sqrt[a + b*Sqrt[x]] - 4*Sqrt[a]*ArcTanh[Sqrt[a + b*Sqrt[x]]/Sqr
t[a]]
```

Rubi [A] time = 0.0665888, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.235

$$4\sqrt{a+b\sqrt{x}}-4\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{x}}}{\sqrt{a}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[x]]/x,x]
```

```
[Out] 4*Sqrt[a + b*Sqrt[x]] - 4*Sqrt[a]*ArcTanh[Sqrt[a + b*Sqrt[x]]/Sqr
t[a]]
```

Rubi in Sympy [A] time = 7.03237, size = 37, normalized size = 0.86

$$-4\sqrt{a}\,\mathrm{atanh}\left(\frac{\sqrt{a+b\sqrt{x}}}{\sqrt{a}}\right)+4\sqrt{a+b\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**(1/2)/x,x)
```

```
[Out] -4*sqrt(a)*atanh(sqrt(a + b*sqrt(x))/sqrt(a)) + 4*sqrt(a + b*sqrt
(x))
```

Mathematica [A] time = 0.0251753, size = 43, normalized size = 1.

$$4\sqrt{a+b\sqrt{x}}-4\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{x}}}{\sqrt{a}}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b*Sqrt[x]]/x,x]
```

```
[Out] 4*Sqrt[a + b*Sqrt[x]] - 4*Sqrt[a]*ArcTanh[Sqrt[a + b*Sqrt[x]]/Sqr
t[a]]
```

Maple [A] time = 0.005, size = 32, normalized size = 0.7

$$-4\,\mathit{Artanh}\left(\frac{\sqrt{a+b\sqrt{x}}}{\sqrt{a}}\right)\sqrt{a}+4\sqrt{a+b\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^(1/2)/x,x)
```

```
[Out] -4*arctanh((a+b*x^(1/2))^(1/2)/a^(1/2))*a^(1/2)+4*(a+b*x^(1/2))^(
1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(x) + a)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.257928, size = 1, normalized size = 0.02

$$\left[2\sqrt{a}\log\left(\frac{b\sqrt{x}-2\sqrt{b\sqrt{x}+a}\sqrt{a}+2\,a}{\sqrt{x}}\right)+4\sqrt{b\sqrt{x}+a}, -4\sqrt{-a}\arctan\left(\frac{\sqrt{b\sqrt{x}+a}}{\sqrt{-a}}\right)+4\sqrt{b\sqrt{x}+a}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(x) + a)/x,x, algorithm="fricas")
```

```
[Out] [2*sqrt(a)*log((b*sqrt(x) - 2*sqrt(b*sqrt(x) + a)*sqrt(a) + 2*a)/
sqrt(x)) + 4*sqrt(b*sqrt(x) + a), -4*sqrt(-a)*arctan(sqrt(b*sqrt(
x) + a)/sqrt(-a)) + 4*sqrt(b*sqrt(x) + a)]
```

Sympy [A] time = 5.2011, size = 75, normalized size = 1.74

$$-4\sqrt{a}\operatorname{asinh}\left(\frac{\sqrt{a}}{\sqrt{b}\sqrt[4]{x}}\right)+\frac{4a}{\sqrt{b}\sqrt[4]{x}\sqrt{\frac{a}{b\sqrt{x}}+1}}+\frac{4\sqrt{b}\sqrt[4]{x}}{\sqrt{\frac{a}{b\sqrt{x}}+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**(1/2)/x,x)
```

```
[Out] -4*sqrt(a)*asinh(sqrt(a)/(sqrt(b)*x**(1/4))) + 4*a/(sqrt(b)*x**(1
/4)*sqrt(a/(b*sqrt(x)) + 1)) + 4*sqrt(b)*x**(1/4)/sqrt(a/(b*sqrt(
x)) + 1)
```

GIAC/XCAS [A] time = 0.252703, size = 49, normalized size = 1.14

$$\frac{4\,a\arctan\left(\frac{\sqrt{b\sqrt{x}+a}}{\sqrt{-a}}\right)}{\sqrt{-a}}+4\sqrt{b\sqrt{x}+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(x) + a)/x,x, algorithm="giac")
```

```
[Out] 4*a*arctan(sqrt(b*sqrt(x) + a)/sqrt(-a))/sqrt(-a) + 4*sqrt(b*sqrt
(x) + a)
```

3.2235 $\int \frac{\sqrt{a+b\sqrt{x}}}{x^2}\,dx$

Optimal. Leaf size=77

$$\frac{b^2\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{x}}}{\sqrt{a}}\right)}{2a^{3/2}}-\frac{b\sqrt{a+b\sqrt{x}}}{2a\sqrt{x}}-\frac{\sqrt{a+b\sqrt{x}}}{x}$$

```
[Out] -(Sqrt[a + b*Sqrt[x]]/x) - (b*Sqrt[a + b*Sqrt[x]])/(2*a*Sqrt[x])
+ (b^2*ArcTanh[Sqrt[a + b*Sqrt[x]]/Sqrt[a]])/(2*a^(3/2))
```

Rubi [A] time = 0.101619, antiderivative size = 77, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.294

$$\frac{b^2\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{x}}}{\sqrt{a}}\right)}{2a^{3/2}}-\frac{b\sqrt{a+b\sqrt{x}}}{2a\sqrt{x}}-\frac{\sqrt{a+b\sqrt{x}}}{x}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[x]]/x^2,x]
```

```
[Out] -(Sqrt[a + b*Sqrt[x]]/x) - (b*Sqrt[a + b*Sqrt[x]])/(2*a*Sqrt[x])
+ (b^2*ArcTanh[Sqrt[a + b*Sqrt[x]]/Sqrt[a]])/(2*a^(3/2))
```

Rubi in Sympy [A] time = 10.0583, size = 63, normalized size = 0.82

$$-\frac{\sqrt{a+b\sqrt{x}}}{x}-\frac{b\sqrt{a+b\sqrt{x}}}{2a\sqrt{x}}+\frac{b^2\operatorname{atanh}\left(\frac{\sqrt{a+b\sqrt{x}}}{\sqrt{a}}\right)}{2a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**(1/2)/x**2,x)
```

```
[Out] -sqrt(a + b*sqrt(x))/x - b*sqrt(a + b*sqrt(x))/(2*a*sqrt(x)) + b*
*2*atanh(sqrt(a + b*sqrt(x))/sqrt(a))/(2*a**(3/2))
```

Mathematica [A] time = 0.0608848, size = 66, normalized size = 0.86

$$\frac{b^2\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{x}}}{\sqrt{a}}\right)}{2a^{3/2}}+\left(-\frac{b}{2a\sqrt{x}}-\frac{1}{x}\right)\sqrt{a+b\sqrt{x}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b*Sqrt[x]]/x^2,x]
```

```
[Out] (-x^(-1) - b/(2*a*Sqrt[x]))*Sqrt[a + b*Sqrt[x]] + (b^2*ArcTanh[Sq
rt[a + b*Sqrt[x]]/Sqrt[a]])/(2*a^(3/2))
```

Maple [A] time = 0.011, size = 59, normalized size = 0.8

$$4b^2\left(\frac{1}{b^2x}\left(-1/8\,\frac{\left(a+b\sqrt{x}\right)^{3/2}}{a}-1/8\sqrt{a+b\sqrt{x}}\right)+1/8\,\frac{1}{a^{3/2}}\mathit{Artanh}\left(\frac{\sqrt{a+b\sqrt{x}}}{\sqrt{a}}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((a+b*x^(1/2))^(1/2)/x^2,x)
```

```
[Out] 4*b^2*((-1/8/a*(a+b*x^(1/2))^(3/2)-1/8*(a+b*x^(1/2))^(1/2))/x/b^2
+1/8/a^(3/2)*arctanh((a+b*x^(1/2))^(1/2)/a^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(b*sqrt(x) + a)/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.2685, size = 1, normalized size = 0.01

$$\left[\frac{b^2 x \log\left(\frac{\sqrt{a} b \sqrt{x} + 2 \sqrt{b \sqrt{x} + a}\, a + 2 a^{\frac{3}{2}}}{\sqrt{x}}\right) - 2 \left(\sqrt{a} b \sqrt{x} + 2 a^{\frac{3}{2}}\right) \sqrt{b \sqrt{x} + a}}{4 a^{\frac{3}{2}} x}, -\frac{b^2 x \arctan\left(\frac{a}{\sqrt{b \sqrt{x} + a} \sqrt{-a}}\right) + \left(\sqrt{-a} b \sqrt{x} + 2 \sqrt{-a} a\right) \sqrt{b \sqrt{x} + a}}{2 \sqrt{-a} a x}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(b*sqrt(x) + a)/x^2,x, algorithm="fricas")
```

```
[Out] [1/4*(b^2*x*log((sqrt(a)*b*sqrt(x) + 2*sqrt(b*sqrt(x) + a)*a + 2*
a^(3/2))/sqrt(x)) - 2*(sqrt(a)*b*sqrt(x) + 2*a^(3/2))*sqrt(b*sqrt
(x) + a))/(a^(3/2)*x), -1/2*(b^2*x*arctan(a/(sqrt(b*sqrt(x) + a)*
sqrt(-a))) + (sqrt(-a)*b*sqrt(x) + 2*sqrt(-a)*a)*sqrt(b*sqrt(x) +
 a))/(sqrt(-a)*a*x)]
```

Sympy [A] time = 13.4252, size = 105, normalized size = 1.36

$$-\frac{a}{\sqrt{b} x^{\frac{5}{4}} \sqrt{\frac{a}{b \sqrt{x}} + 1}} - \frac{3 \sqrt{b}}{2 x^{\frac{3}{4}} \sqrt{\frac{a}{b \sqrt{x}} + 1}} - \frac{b^{\frac{3}{2}}}{2 a \sqrt[4]{x} \sqrt{\frac{a}{b \sqrt{x}} + 1}} + \frac{b^2 \operatorname{asinh}\left(\frac{\sqrt{a}}{\sqrt{b} \sqrt[4]{x}}\right)}{2 a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a+b*x**(1/2))**(1/2)/x**2,x)
```

```
[Out] -a/(sqrt(b)*x**(5/4)*sqrt(a/(b*sqrt(x)) + 1)) - 3*sqrt(b)/(2*x**(
3/4)*sqrt(a/(b*sqrt(x)) + 1)) - b**(3/2)/(2*a*x**(1/4)*sqrt(a/(b*
sqrt(x)) + 1)) + b**2*asinh(sqrt(a)/(sqrt(b)*x**(1/4)))/(2*a**(3/
2))
```

GIAC/XCAS [A] time = 0.259851, size = 84, normalized size = 1.09

$$-\frac{1}{2}\,b^2\left(\frac{\arctan\left(\frac{\sqrt{b\sqrt{x}+a}}{\sqrt{-a}}\right)}{\sqrt{-a}a}+\frac{\left(b\sqrt{x}+a\right)^{\frac{3}{2}}+\sqrt{b\sqrt{x}+a}a}{ab^2x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(x) + a)/x^2,x, algorithm="giac")
```

```
[Out] -1/2*b^2*(arctan(sqrt(b*sqrt(x) + a)/sqrt(-a))/(sqrt(-a)*a) + ((b
*sqrt(x) + a)^(3/2) + sqrt(b*sqrt(x) + a)*a)/(a*b^2*x))
```

3.2236 $\int \frac{\sqrt{a+b\sqrt{x}}}{x^3}\,dx$

Optimal. Leaf size=133

$$\frac{5b^4\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{x}}}{\sqrt{a}}\right)}{32a^{7/2}}-\frac{5b^3\sqrt{a+b\sqrt{x}}}{32a^3\sqrt{x}}+\frac{5b^2\sqrt{a+b\sqrt{x}}}{48a^2x}-\frac{b\sqrt{a+b\sqrt{x}}}{12ax^{3/2}}-\frac{\sqrt{a+b\sqrt{x}}}{2x^2}$$

```
[Out] -Sqrt[a + b*Sqrt[x]]/(2*x^2) - (b*Sqrt[a + b*Sqrt[x]])/(12*a*x^(3
/2)) + (5*b^2*Sqrt[a + b*Sqrt[x]])/(48*a^2*x) - (5*b^3*Sqrt[a + b
*Sqrt[x]])/(32*a^3*Sqrt[x]) + (5*b^4*ArcTanh[Sqrt[a + b*Sqrt[x]]/
Sqrt[a]])/(32*a^(7/2))
```

Rubi [A] time = 0.172506, antiderivative size = 133, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.294

$$\frac{5b^4\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{x}}}{\sqrt{a}}\right)}{32a^{7/2}}-\frac{5b^3\sqrt{a+b\sqrt{x}}}{32a^3\sqrt{x}}+\frac{5b^2\sqrt{a+b\sqrt{x}}}{48a^2x}-\frac{b\sqrt{a+b\sqrt{x}}}{12ax^{3/2}}-\frac{\sqrt{a+b\sqrt{x}}}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[x]]/x^3,x]
```

```
[Out] -Sqrt[a + b*Sqrt[x]]/(2*x^2) - (b*Sqrt[a + b*Sqrt[x]])/(12*a*x^(3
/2)) + (5*b^2*Sqrt[a + b*Sqrt[x]])/(48*a^2*x) - (5*b^3*Sqrt[a + b
*Sqrt[x]])/(32*a^3*Sqrt[x]) + (5*b^4*ArcTanh[Sqrt[a + b*Sqrt[x]]/
Sqrt[a]])/(32*a^(7/2))
```

Rubi in Sympy [A] time = 17.9616, size = 119, normalized size = 0.89

$$-\frac{\sqrt{a+b\sqrt{x}}}{2x^2}-\frac{b\sqrt{a+b\sqrt{x}}}{12ax^{\frac{3}{2}}}+\frac{5b^2\sqrt{a+b\sqrt{x}}}{48a^2x}-\frac{5b^3\sqrt{a+b\sqrt{x}}}{32a^3\sqrt{x}}+\frac{5b^4\operatorname{atanh}\left(\frac{\sqrt{a+b\sqrt{x}}}{\sqrt{a}}\right)}{32a^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**(1/2)/x**3,x)
```

```
[Out] -sqrt(a + b*sqrt(x))/(2*x**2) - b*sqrt(a + b*sqrt(x))/(12*a*x**(3
/2)) + 5*b**2*sqrt(a + b*sqrt(x))/(48*a**2*x) - 5*b**3*sqrt(a + b
*sqrt(x))/(32*a**3*sqrt(x)) + 5*b**4*atanh(sqrt(a + b*sqrt(x))/sq
rt(a))/(32*a**(7/2))
```

Mathematica [A] time = 0.0882718, size = 90, normalized size = 0.68

$$\frac{5b^4\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{x}}}{\sqrt{a}}\right)}{32a^{7/2}}-\frac{\sqrt{a+b\sqrt{x}}\left(48a^3+8a^2b\sqrt{x}-10ab^2x+15b^3x^{3/2}\right)}{96a^3x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b*Sqrt[x]]/x^3,x]
```

```
[Out] -(Sqrt[a + b*Sqrt[x]]*(48*a^3 + 8*a^2*b*Sqrt[x] - 10*a*b^2*x + 15
*b^3*x^(3/2)))/(96*a^3*x^2) + (5*b^4*ArcTanh[Sqrt[a + b*Sqrt[x]]/
```

```
Sqrt[a]])/(32*a^(7/2))
```

Maple [A] time = 0.015, size = 87, normalized size = 0.7

$$4\,b^{4}\left(\frac{1}{x^{2}b^{4}}\left(-\frac{5\,\left(a+b\sqrt{x}\right)^{7/2}}{128\,a^{3}}+\frac{55\,\left(a+b\sqrt{x}\right)^{5/2}}{384\,a^{2}}-\frac{73\,\left(a+b\sqrt{x}\right)^{3/2}}{384\,a}-\frac{5\,\sqrt{a+b\sqrt{x}}}{128}\right)+\frac{5}{128\,a^{7/2}}Artanh\left(\frac{\sqrt{a+b\sqrt{x}}}{\sqrt{a}}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^(1/2)/x^3,x)
```

```
[Out] 4*b^4*((-5/128/a^3*(a+b*x^(1/2))^(7/2)+55/384/a^2*(a+b*x^(1/2))^(
5/2)-73/384/a*(a+b*x^(1/2))^(3/2)-5/128*(a+b*x^(1/2))^(1/2))/x^2/
b^4+5/128/a^(7/2)*arctanh((a+b*x^(1/2))^(1/2)/a^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(x) + a)/x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.255883, size = 1, normalized size = 0.01

$$\left[\frac{15\,b^{4}x^{2}\log\left(\frac{\sqrt{a}b\sqrt{x}+2\,\sqrt{b\sqrt{x}+a}a+2\,a^{\frac{3}{2}}}{\sqrt{x}}\right)-2\left(\left(15\,b^{3}x+8\,a^{2}b\right)\sqrt{a}\sqrt{x}-2\left(5\,ab^{2}x-24\,a^{3}\right)\sqrt{a}\right)\sqrt{b\sqrt{x}+a}}{192\,a^{\frac{7}{2}}x^{2}},\right.$$
$$\left.-\frac{15\,b^{4}x^{2}\arctan\left(\frac{a}{\sqrt{b\sqrt{x}+a}\sqrt{-a}}\right)+\left(\left(15\,b^{3}x+8\,a^{2}b\right)\sqrt{-a}\sqrt{x}-2\left(5\,ab^{2}x-24\,a^{3}\right)\sqrt{-a}\right)\sqrt{b\sqrt{x}+a}}{96\,\sqrt{-a}a^{3}x^{2}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(x) + a)/x^3,x, algorithm="fricas")
```

```
[Out] [1/192*(15*b^4*x^2*log((sqrt(a)*b*sqrt(x) + 2*sqrt(b*sqrt(x) + a)
*a + 2*a^(3/2))/sqrt(x)) - 2*((15*b^3*x + 8*a^2*b)*sqrt(a)*sqrt(x
) - 2*(5*a*b^2*x - 24*a^3)*sqrt(a))*sqrt(b*sqrt(x) + a))/(a^(7/2)
*x^2), -1/96*(15*b^4*x^2*arctan(a/(sqrt(b*sqrt(x) + a)*sqrt(-a)))
 + ((15*b^3*x + 8*a^2*b)*sqrt(-a)*sqrt(x) - 2*(5*a*b^2*x - 24*a^3
)*sqrt(-a))*sqrt(b*sqrt(x) + a))/(sqrt(-a)*a^3*x^2)]
```

Sympy [A] time = 35.6483, size = 170, normalized size = 1.28

$$-\frac{a}{2\sqrt{b}x^{\frac{9}{4}}\sqrt{\frac{a}{b\sqrt{x}}+1}}-\frac{7\sqrt{b}}{12x^{\frac{7}{4}}\sqrt{\frac{a}{b\sqrt{x}}+1}}+\frac{b^{\frac{3}{2}}}{48ax^{\frac{5}{4}}\sqrt{\frac{a}{b\sqrt{x}}+1}}-\frac{5b^{\frac{5}{2}}}{96a^2x^{\frac{3}{4}}\sqrt{\frac{a}{b\sqrt{x}}+1}}-\frac{5b^{\frac{7}{2}}}{32a^3\sqrt[4]{x}\sqrt{\frac{a}{b\sqrt{x}}+1}}+\frac{5b^4\operatorname{asinh}\left(\frac{\sqrt{a}}{\sqrt{b}\sqrt[4]{x}}\right)}{32a^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**(1/2)/x**3,x)
```

```
[Out] -a/(2*sqrt(b)*x**(9/4)*sqrt(a/(b*sqrt(x)) + 1)) - 7*sqrt(b)/(12*x
**(7/4)*sqrt(a/(b*sqrt(x)) + 1)) + b**(3/2)/(48*a*x**(5/4)*sqrt(a
/(b*sqrt(x)) + 1)) - 5*b**(5/2)/(96*a**2*x**(3/4)*sqrt(a/(b*sqrt(
x)) + 1)) - 5*b**(7/2)/(32*a**3*x**(1/4)*sqrt(a/(b*sqrt(x)) + 1))
 + 5*b**4*asinh(sqrt(a)/(sqrt(b)*x**(1/4)))/(32*a**(7/2))
```

GIAC/XCAS [A] time = 0.228737, size = 127, normalized size = 0.95

$$-\frac{1}{96}b^4\left(\frac{15\arctan\left(\frac{\sqrt{b\sqrt{x}+a}}{\sqrt{-a}}\right)}{\sqrt{-a}a^3}+\frac{15\left(b\sqrt{x}+a\right)^{\frac{7}{2}}-55\left(b\sqrt{x}+a\right)^{\frac{5}{2}}a+73\left(b\sqrt{x}+a\right)^{\frac{3}{2}}a^2+15\sqrt{b\sqrt{x}+a}a^3}{a^3b^4x^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(x) + a)/x^3,x, algorithm="giac")
```

```
[Out] -1/96*b^4*(15*arctan(sqrt(b*sqrt(x) + a)/sqrt(-a))/(sqrt(-a)*a^3)
 + (15*(b*sqrt(x) + a)^(7/2) - 55*(b*sqrt(x) + a)^(5/2)*a + 73*(b
*sqrt(x) + a)^(3/2)*a^2 + 15*sqrt(b*sqrt(x) + a)*a^3)/(a^3*b^4*x^
2))
```

3.2237 $\int \frac{x^2}{\sqrt{a+b\sqrt{x}}}\,dx$

Optimal. Leaf size=130

$$-\frac{4a^5\sqrt{a+b\sqrt{x}}}{b^6}+\frac{20a^4\left(a+b\sqrt{x}\right)^{3/2}}{3b^6}-\frac{8a^3\left(a+b\sqrt{x}\right)^{5/2}}{b^6}+\frac{40a^2\left(a+b\sqrt{x}\right)^{7/2}}{7b^6}+\frac{4\left(a+b\sqrt{x}\right)^{11/2}}{11b^6}-\frac{20a\left(a+b\sqrt{x}\right)^{9/2}}{9b^6}$$

```
[Out] (-4*a^5*Sqrt[a + b*Sqrt[x]])/b^6 + (20*a^4*(a + b*Sqrt[x])^(3/2))
/(3*b^6) - (8*a^3*(a + b*Sqrt[x])^(5/2))/b^6 + (40*a^2*(a + b*Sqr
t[x])^(7/2))/(7*b^6) - (20*a*(a + b*Sqrt[x])^(9/2))/(9*b^6) + (4*
(a + b*Sqrt[x])^(11/2))/(11*b^6)
```

Rubi [A] time = 0.143758, antiderivative size = 130, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{4a^5\sqrt{a+b\sqrt{x}}}{b^6}+\frac{20a^4\left(a+b\sqrt{x}\right)^{3/2}}{3b^6}-\frac{8a^3\left(a+b\sqrt{x}\right)^{5/2}}{b^6}+\frac{40a^2\left(a+b\sqrt{x}\right)^{7/2}}{7b^6}+\frac{4\left(a+b\sqrt{x}\right)^{11/2}}{11b^6}-\frac{20a\left(a+b\sqrt{x}\right)^{9/2}}{9b^6}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/Sqrt[a + b*Sqrt[x]],x]
```

```
[Out] (-4*a^5*Sqrt[a + b*Sqrt[x]])/b^6 + (20*a^4*(a + b*Sqrt[x])^(3/2))
/(3*b^6) - (8*a^3*(a + b*Sqrt[x])^(5/2))/b^6 + (40*a^2*(a + b*Sqr
t[x])^(7/2))/(7*b^6) - (20*a*(a + b*Sqrt[x])^(9/2))/(9*b^6) + (4*
(a + b*Sqrt[x])^(11/2))/(11*b^6)
```

Rubi in Sympy [A] time = 21.8941, size = 122, normalized size = 0.94

$$-\frac{4a^5\sqrt{a+b\sqrt{x}}}{b^6}+\frac{20a^4\left(a+b\sqrt{x}\right)^{\frac{3}{2}}}{3b^6}-\frac{8a^3\left(a+b\sqrt{x}\right)^{\frac{5}{2}}}{b^6}+\frac{40a^2\left(a+b\sqrt{x}\right)^{\frac{7}{2}}}{7b^6}-\frac{20a\left(a+b\sqrt{x}\right)^{\frac{9}{2}}}{9b^6}+\frac{4\left(a+b\sqrt{x}\right)^{\frac{11}{2}}}{11b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b*x**(1/2))**(1/2),x)
```

```
[Out] -4*a**5*sqrt(a + b*sqrt(x))/b**6 + 20*a**4*(a + b*sqrt(x))**(3/2)
/(3*b**6) - 8*a**3*(a + b*sqrt(x))**(5/2)/b**6 + 40*a**2*(a + b*s
qrt(x))**(7/2)/(7*b**6) - 20*a*(a + b*sqrt(x))**(9/2)/(9*b**6) +
4*(a + b*sqrt(x))**(11/2)/(11*b**6)
```

Mathematica [A] time = 0.0364061, size = 78, normalized size = 0.6

$$\frac{4\sqrt{a+b\sqrt{x}}\left(-256a^5+128a^4b\sqrt{x}-96a^3b^2x+80a^2b^3x^{3/2}-70ab^4x^2+63b^5x^{5/2}\right)}{693b^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/Sqrt[a + b*Sqrt[x]],x]
```

```
[Out] (4*Sqrt[a + b*Sqrt[x]]*(-256*a^5 + 128*a^4*b*Sqrt[x] - 96*a^3*b^2
*x + 80*a^2*b^3*x^(3/2) - 70*a*b^4*x^2 + 63*b^5*x^(5/2)))/(693*b^
```

```
6)
```

Maple [A] time = 0.003, size = 86, normalized size = 0.7

$$4\frac{1}{b^6}\left(1/11\left(a+b\sqrt{x}\right)^{11/2}-5/9\,a\left(a+b\sqrt{x}\right)^{9/2}+\frac{10\left(a+b\sqrt{x}\right)^{7/2}a^2}{7}-2\left(a+b\sqrt{x}\right)^{5/2}a^3+5/3\left(a+b\sqrt{x}\right)^{3/2}a^4-\sqrt{a+b\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(a+b*x^(1/2))^(1/2),x)
```

```
[Out] 4/b^6*(1/11*(a+b*x^(1/2))^(11/2)-5/9*a*(a+b*x^(1/2))^(9/2)+10/7*(
a+b*x^(1/2))^(7/2)*a^2-2*(a+b*x^(1/2))^(5/2)*a^3+5/3*(a+b*x^(1/2)
)^(3/2)*a^4-(a+b*x^(1/2))^(1/2)*a^5)
```

Maxima [A] time = 1.43918, size = 132, normalized size = 1.02

$$\frac{4\left(b\sqrt{x}+a\right)^{\frac{11}{2}}}{11\,b^6}-\frac{20\left(b\sqrt{x}+a\right)^{\frac{9}{2}}a}{9\,b^6}+\frac{40\left(b\sqrt{x}+a\right)^{\frac{7}{2}}a^2}{7\,b^6}-\frac{8\left(b\sqrt{x}+a\right)^{\frac{5}{2}}a^3}{b^6}+\frac{20\left(b\sqrt{x}+a\right)^{\frac{3}{2}}a^4}{3\,b^6}-\frac{4\sqrt{b\sqrt{x}+a}a^5}{b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(b*sqrt(x) + a),x, algorithm="maxima")
```

```
[Out] 4/11*(b*sqrt(x) + a)^(11/2)/b^6 - 20/9*(b*sqrt(x) + a)^(9/2)*a/b^
6 + 40/7*(b*sqrt(x) + a)^(7/2)*a^2/b^6 - 8*(b*sqrt(x) + a)^(5/2)*
a^3/b^6 + 20/3*(b*sqrt(x) + a)^(3/2)*a^4/b^6 - 4*sqrt(b*sqrt(x) +
 a)*a^5/b^6
```

Fricas [A] time = 0.24399, size = 90, normalized size = 0.69

$$-\frac{4\left(70\,ab^4x^2+96\,a^3b^2x+256\,a^5-\left(63\,b^5x^2+80\,a^2b^3x+128\,a^4b\right)\sqrt{x}\right)\sqrt{b\sqrt{x}+a}}{693\,b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(b*sqrt(x) + a),x, algorithm="fricas")
```

```
[Out] -4/693*(70*a*b^4*x^2 + 96*a^3*b^2*x + 256*a^5 - (63*b^5*x^2 + 80*
a^2*b^3*x + 128*a^4*b)*sqrt(x))*sqrt(b*sqrt(x) + a)/b^6
```

Sympy [A] time = 28.6492, size = 8356, normalized size = 64.28

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b*x**(1/2))**(1/2),x)
```

```
[Out] -1024*a**(151/2)*x**18*sqrt(1 + b*sqrt(x)/a)/(693*a**70*b**6*x**1
8 + 10395*a**69*b**7*x**(37/2) + 72765*a**68*b**8*x**19 + 315315*
a**67*b**9*x**(39/2) + 945945*a**66*b**10*x**20 + 2081079*a**65*b
**11*x**(41/2) + 3468465*a**64*b**12*x**21 + 4459455*a**63*b**13*
x**(43/2) + 4459455*a**62*b**14*x**22 + 3468465*a**61*b**15*x**(4
```

5/2) + 2081079*a**60*b**16*x**23 + 945945*a**59*b**17*x**(47/2) + 315315*a**58*b**18*x**24 + 72765*a**57*b**19*x**(49/2) + 10395*a**56*b**20*x**25 + 693*a**55*b**21*x**(51/2)) + 1024*a**(151/2)*x**18/(693*a**70*b**6*x**18 + 10395*a**69*b**7*x**(37/2) + 72765*a**68*b**8*x**19 + 315315*a**67*b**9*x**(39/2) + 945945*a**66*b**10*x**20 + 2081079*a**65*b**11*x**(41/2) + 3468465*a**64*b**12*x**21 + 4459455*a**63*b**13*x**(43/2) + 4459455*a**62*b**14*x**22 + 3468465*a**61*b**15*x**(45/2) + 2081079*a**60*b**16*x**23 + 945945*a**59*b**17*x**(47/2) + 315315*a**58*b**18*x**24 + 72765*a**57*b**19*x**(49/2) + 10395*a**56*b**20*x**25 + 693*a**55*b**21*x**(51/2)) - 14848*a**(149/2)*b*x**(37/2)*sqrt(1 + b*sqrt(x)/a)/(693*a**70*b**6*x**18 + 10395*a**69*b**7*x**(37/2) + 72765*a**68*b**8*x**19 + 315315*a**67*b**9*x**(39/2) + 945945*a**66*b**10*x**20 + 2081079*a**65*b**11*x**(41/2) + 3468465*a**64*b**12*x**21 + 4459455*a**63*b**13*x**(43/2) + 4459455*a**62*b**14*x**22 + 3468465*a**61*b**15*x**(45/2) + 2081079*a**60*b**16*x**23 + 945945*a**59*b**17*x**(47/2) + 315315*a**58*b**18*x**24 + 72765*a**57*b**19*x**(49/2) + 10395*a**56*b**20*x**25 + 693*a**55*b**21*x**(51/2)) + 15360*a**(149/2)*b*x**(37/2)/(693*a**70*b**6*x**18 + 10395*a**69*b**7*x**(37/2) + 72765*a**68*b**8*x**19 + 315315*a**67*b**9*x**(39/2) + 945945*a**66*b**10*x**20 + 2081079*a**65*b**11*x**(41/2) + 3468465*a**64*b**12*x**21 + 4459455*a**63*b**13*x**(43/2) + 4459455*a**62*b**14*x**22 + 3468465*a**61*b**15*x**(45/2) + 2081079*a**60*b**16*x**23 + 945945*a**59*b**17*x**(47/2) + 315315*a**58*b**18*x**24 + 72765*a**57*b**19*x**(49/2) + 10395*a**56*b**20*x**25 + 693*a**55*b**21*x**(51/2)) - 100224*a**(147/2)*b**2*x**19*sqrt(1 + b*sqrt(x)/a)/(693*a**70*b**6*x**18 + 10395*a**69*b**7*x**(37/2) + 72765*a**68*b**8*x**19 + 315315*a**67*b**9*x**(39/2) + 945945*a**66*b**10*x**20 + 2081079*a**65*b**11*x**(41/2) + 3468465*a**64*b**12*x**21 + 4459455*a**63*b**13*x**(43/2) + 4459455*a**62*b**14*x**22 + 3468465*a**61*b**15*x**(45/2) + 2081079*a**60*b**16*x**23 + 945945*a**59*b**17*x**(47/2) + 315315*a**58*b**18*x**24 + 72765*a**57*b**19*x**(49/2) + 10395*a**56*b**20*x**25 + 693*a**55*b**21*x**(51/2)) + 107520*a**(147/2)*b**2*x**19/(693*a**70*b**6*x**18 + 10395*a**69*b**7*x**(37/2) + 72765*a**68*b**8*x**19 + 315315*a**67*b**9*x**(39/2) + 945945*a**66*b**10*x**20 + 2081079*a**65*b**11*x**(41/2) + 3468465*a**64*b**12*x**21 + 4459455*a**63*b**13*x**(43/2) + 4459455*a**62*b**14*x**22 + 3468465*a**61*b**15*x**(45/2) + 2081079*a**60*b**16*x**23 + 945945*a**59*b**17*x**(47/2) + 315315*a**58*b**18*x**24 + 72765*a**57*b**19*x**(49/2) + 10395*a**56*b**20*x**25 + 693*a**55*b**21*x**(51/2)) - 417600*a**(145/2)*b**3*x**(39/2)*sqrt(1 + b*sqrt(x)/a)/(693*a**70*b**6*x**18 + 10395*a**69*b**7*x**(37/2) + 72765*a**68*b**8*x**19 + 315315*a**67*b**9*x**(39/2) + 945945*a**66*b**10*x**20 + 2081079*a**65*b**11*x**(41/2) + 3468465*a**64*b**12*x**21 + 4459455*a**63*b**13*x**(43/2) + 4459455*a**62*b**14*x**22 + 3468465*a**61*b**15*x**(45/2) + 2081079*a**60*b**16*x**23 + 945945*a**59*b**17*x**(47/2) + 315315*a**58*b**18*x**24 + 72765*a**57*b**19*x**(49/2) + 10395*a**56*b**20*x**25 + 693*a**55*b**21*x**(51/2)) + 465920*a**(145/2)*b**3*x**(39/2)/(693*a**70*b**6*x**18 + 10395*a**69*b**7*x**(37/2) + 72765*a**68*b**8*x**19 + 315315*a**67*b**9*x**(39/2) + 945945*a**66*b**10*x**20 + 2081079*a**65*b**11*x**(41/2) + 3468465*a**64*b**12*x**21 + 4459455*a**63*b**13*x**(43/2) + 4459455*a**62*b**14*x**22 + 3468465*a**61*b**15*x**(45/2) + 2081079*a**60*b**16*x**23 + 945945*a**59*b**17*x**(47/2) + 315315*a**58*b**18*x**24 + 72765*a**57*b**19*x**(49/2) + 10395*a**56*b**20*x**25 + 693*a**55*b**21*x**(51/2)) - 1200600*a**(143/2)*b**4*x**20*sqrt(1 + b*sqrt(x)/a)/(693*a**70*b**6*x**18 + 10395*a**69*b**7*x**(37/2) + 72765*a**68*b**8*x**19 + 315315*a**67*b**9*x**(39/2) + 945945*a**66*b**10*x**20 + 2081079*a**65*b**11*x**(41/2) + 3468465*a**64*b**12*x**21 + 4459455*a**63*b**13*x**(43/2) + 4459455*a**62*b**14*x**22 + 3468465*a**61*b**15*x**(45/2) + 2081079*a**60*b**16*x**23 + 945945*a**59*b**17*x**(47/2) + 315315*a**58*b**18*x**24 + 72765*a**57*b**19*x**(49/2) + 10395*a**56*b**20*x**25 + 693*a**55*b**21*x**(51/2)) + 1397760*a**(143/2)*b**4*x**20/(693*a**70*b**6*x**18 + 10395*a**69*b**7*x**(37/2) + 72765*a**68*b**8*x**19 + 315315*a**67*b**9*x**(39/2) + 945945*a**66*b**10*x**20 + 2081079*a**65*b**11*x**(41/2) + 3468465*a**64*b**12*x**21 + 4459455*a**63*b**13*x**(43/2) + 4459455*a**62*b**14*x**22 + 3468465*a**61*b**15*x**(45/2) + 2081079*a**60*b**16*x**23 + 945945*a**59*b**17*x**(47/2) + 315315*a**58*b**18*x**24 + 72765*a**57*b**19*x**(49/2) + 10395*a**56*b**20*x**25 + 693*a**55*b**21*x**(51/2)) - 2521260*a**(141/2)*b**5*x**(41/2)*sqrt(1 + b*sqrt(x)/a)/(693*a**70*b**6*x**18 + 10395*a**69*b**7*x**(37/2) + 72765*a**68*b**8*x**19 + 315315*a**67*b**9*x**(39

/2) + 945945*a**66*b**10*x**20 + 2081079*a**65*b**11*x**(41/2) +
3468465*a**64*b**12*x**21 + 4459455*a**63*b**13*x**(43/2) + 44594
55*a**62*b**14*x**22 + 3468465*a**61*b**15*x**(45/2) + 2081079*a*
*60*b**16*x**23 + 945945*a**59*b**17*x**(47/2) + 315315*a**58*b**
18*x**24 + 72765*a**57*b**19*x**(49/2) + 10395*a**56*b**20*x**25
+ 693*a**55*b**21*x**(51/2)) + 3075072*a**(141/2)*b**5*x**(41/2)/
(693*a**70*b**6*x**18 + 10395*a**69*b**7*x**(37/2) + 72765*a**68*
b**8*x**19 + 315315*a**67*b**9*x**(39/2) + 945945*a**66*b**10*x**
20 + 2081079*a**65*b**11*x**(41/2) + 3468465*a**64*b**12*x**21 +
4459455*a**63*b**13*x**(43/2) + 4459455*a**62*b**14*x**22 + 34684
65*a**61*b**15*x**(45/2) + 2081079*a**60*b**16*x**23 + 945945*a**
59*b**17*x**(47/2) + 315315*a**58*b**18*x**24 + 72765*a**57*b**19
*x**(49/2) + 10395*a**56*b**20*x**25 + 693*a**55*b**21*x**(51/2))
 - 3991764*a**(139/2)*b**6*x**21*sqrt(1 + b*sqrt(x)/a)/(693*a**70
*b**6*x**18 + 10395*a**69*b**7*x**(37/2) + 72765*a**68*b**8*x**19
 + 315315*a**67*b**9*x**(39/2) + 945945*a**66*b**10*x**20 + 20810
79*a**65*b**11*x**(41/2) + 3468465*a**64*b**12*x**21 + 4459455*a*
*63*b**13*x**(43/2) + 4459455*a**62*b**14*x**22 + 3468465*a**61*b
15*x(45/2) + 2081079*a**60*b**16*x**23 + 945945*a**59*b**17*x
(47/2) + 315315*a58*b**18*x**24 + 72765*a**57*b**19*x**(49/2)
 + 10395*a**56*b**20*x**25 + 693*a**55*b**21*x**(51/2)) + 5125120
*a**(139/2)*b**6*x**21/(693*a**70*b**6*x**18 + 10395*a**69*b**7*x
(37/2) + 72765*a68*b**8*x**19 + 315315*a**67*b**9*x**(39/2) +
 945945*a**66*b**10*x**20 + 2081079*a**65*b**11*x**(41/2) + 34684
65*a**64*b**12*x**21 + 4459455*a**63*b**13*x**(43/2) + 4459455*a*
*62*b**14*x**22 + 3468465*a**61*b**15*x**(45/2) + 2081079*a**60*b
16*x23 + 945945*a**59*b**17*x**(47/2) + 315315*a**58*b**18*x*
*24 + 72765*a**57*b**19*x**(49/2) + 10395*a**56*b**20*x**25 + 693
*a**55*b**21*x**(51/2)) - 4844172*a**(137/2)*b**7*x**(43/2)*sqrt(
1 + b*sqrt(x)/a)/(693*a**70*b**6*x**18 + 10395*a**69*b**7*x**(37/
2) + 72765*a**68*b**8*x**19 + 315315*a**67*b**9*x**(39/2) + 94594
5*a**66*b**10*x**20 + 2081079*a**65*b**11*x**(41/2) + 3468465*a**
64*b**12*x**21 + 4459455*a**63*b**13*x**(43/2) + 4459455*a**62*b*
*14*x**22 + 3468465*a**61*b**15*x**(45/2) + 2081079*a**60*b**16*x
23 + 945945*a59*b**17*x**(47/2) + 315315*a**58*b**18*x**24 +
72765*a**57*b**19*x**(49/2) + 10395*a**56*b**20*x**25 + 693*a**55
*b**21*x**(51/2)) + 6589440*a**(137/2)*b**7*x**(43/2)/(693*a**70*
b**6*x**18 + 10395*a**69*b**7*x**(37/2) + 72765*a**68*b**8*x**19
+ 315315*a**67*b**9*x**(39/2) + 945945*a**66*b**10*x**20 + 208107
9*a**65*b**11*x**(41/2) + 3468465*a**64*b**12*x**21 + 4459455*a**
63*b**13*x**(43/2) + 4459455*a**62*b**14*x**22 + 3468465*a**61*b*
*15*x**(45/2) + 2081079*a**60*b**16*x**23 + 945945*a**59*b**17*x*
*(47/2) + 315315*a**58*b**18*x**24 + 72765*a**57*b**19*x**(49/2)
+ 10395*a**56*b**20*x**25 + 693*a**55*b**21*x**(51/2)) - 4523220*
a**(135/2)*b**8*x**22*sqrt(1 + b*sqrt(x)/a)/(693*a**70*b**6*x**18
 + 10395*a**69*b**7*x**(37/2) + 72765*a**68*b**8*x**19 + 315315*a
67*b9*x**(39/2) + 945945*a**66*b**10*x**20 + 2081079*a**65*b*
*11*x**(41/2) + 3468465*a**64*b**12*x**21 + 4459455*a**63*b**13*x
(43/2) + 4459455*a62*b**14*x**22 + 3468465*a**61*b**15*x**(45
/2) + 2081079*a**60*b**16*x**23 + 945945*a**59*b**17*x**(47/2) +
315315*a**58*b**18*x**24 + 72765*a**57*b**19*x**(49/2) + 10395*a*
*56*b**20*x**25 + 693*a**55*b**21*x**(51/2)) + 6589440*a**(135/2)
*b**8*x**22/(693*a**70*b**6*x**18 + 10395*a**69*b**7*x**(37/2) +
72765*a**68*b**8*x**19 + 315315*a**67*b**9*x**(39/2) + 945945*a**
66*b**10*x**20 + 2081079*a**65*b**11*x**(41/2) + 3468465*a**64*b*
*12*x**21 + 4459455*a**63*b**13*x**(43/2) + 4459455*a**62*b**14*x
22 + 3468465*a61*b**15*x**(45/2) + 2081079*a**60*b**16*x**23
+ 945945*a**59*b**17*x**(47/2) + 315315*a**58*b**18*x**24 + 72765
*a**57*b**19*x**(49/2) + 10395*a**56*b**20*x**25 + 693*a**55*b**2
1*x**(51/2)) - 3196700*a**(133/2)*b**9*x**(45/2)*sqrt(1 + b*sqrt(
x)/a)/(693*a**70*b**6*x**18 + 10395*a**69*b**7*x**(37/2) + 72765*
a**68*b**8*x**19 + 315315*a**67*b**9*x**(39/2) + 945945*a**66*b**
10*x**20 + 2081079*a**65*b**11*x**(41/2) + 3468465*a**64*b**12*x*
*21 + 4459455*a**63*b**13*x**(43/2) + 4459455*a**62*b**14*x**22 +
 3468465*a**61*b**15*x**(45/2) + 2081079*a**60*b**16*x**23 + 9459
45*a**59*b**17*x**(47/2) + 315315*a**58*b**18*x**24 + 72765*a**57
*b**19*x**(49/2) + 10395*a**56*b**20*x**25 + 693*a**55*b**21*x**(
51/2)) + 5125120*a**(133/2)*b**9*x**(45/2)/(693*a**70*b**6*x**18
+ 10395*a**69*b**7*x**(37/2) + 72765*a**68*b**8*x**19 + 315315*a*
*67*b**9*x**(39/2) + 945945*a**66*b**10*x**20 + 2081079*a**65*b**
11*x**(41/2) + 3468465*a**64*b**12*x**21 + 4459455*a**63*b**13*x*
*(43/2) + 4459455*a**62*b**14*x**22 + 3468465*a**61*b**15*x**(45/
2) + 2081079*a**60*b**16*x**23 + 945945*a**59*b**17*x**(47/2) + 3
15315*a**58*b**18*x**24 + 72765*a**57*b**19*x**(49/2) + 10395*a**

56*b**20*x**25 + 693*a**55*b**21*x**(51/2)) - 1568996*a**(131/2)*
b**10*x**23*sqrt(1 + b*sqrt(x)/a)/(693*a**70*b**6*x**18 + 10395*a
69*b7*x**(37/2) + 72765*a**68*b**8*x**19 + 315315*a**67*b**9*
x**(39/2) + 945945*a**66*b**10*x**20 + 2081079*a**65*b**11*x**(41
/2) + 3468465*a**64*b**12*x**21 + 4459455*a**63*b**13*x**(43/2) +
 4459455*a**62*b**14*x**22 + 3468465*a**61*b**15*x**(45/2) + 2081
079*a**60*b**16*x**23 + 945945*a**59*b**17*x**(47/2) + 315315*a**
58*b**18*x**24 + 72765*a**57*b**19*x**(49/2) + 10395*a**56*b**20*
x**25 + 693*a**55*b**21*x**(51/2)) + 3075072*a**(131/2)*b**10*x**
23/(693*a**70*b**6*x**18 + 10395*a**69*b**7*x**(37/2) + 72765*a**
68*b**8*x**19 + 315315*a**67*b**9*x**(39/2) + 945945*a**66*b**10*
x**20 + 2081079*a**65*b**11*x**(41/2) + 3468465*a**64*b**12*x**21
 + 4459455*a**63*b**13*x**(43/2) + 4459455*a**62*b**14*x**22 + 34
68465*a**61*b**15*x**(45/2) + 2081079*a**60*b**16*x**23 + 945945*
a**59*b**17*x**(47/2) + 315315*a**58*b**18*x**24 + 72765*a**57*b*
*19*x**(49/2) + 10395*a**56*b**20*x**25 + 693*a**55*b**21*x**(51/
2)) - 263484*a**(129/2)*b**11*x**(47/2)*sqrt(1 + b*sqrt(x)/a)/(69
3*a**70*b**6*x**18 + 10395*a**69*b**7*x**(37/2) + 72765*a**68*b**
8*x**19 + 315315*a**67*b**9*x**(39/2) + 945945*a**66*b**10*x**20
+ 2081079*a**65*b**11*x**(41/2) + 3468465*a**64*b**12*x**21 + 445
9455*a**63*b**13*x**(43/2) + 4459455*a**62*b**14*x**22 + 3468465*
a**61*b**15*x**(45/2) + 2081079*a**60*b**16*x**23 + 945945*a**59*
b**17*x**(47/2) + 315315*a**58*b**18*x**24 + 72765*a**57*b**19*x*
*(49/2) + 10395*a**56*b**20*x**25 + 693*a**55*b**21*x**(51/2)) +
1397760*a**(129/2)*b**11*x**(47/2)/(693*a**70*b**6*x**18 + 10395*
a**69*b**7*x**(37/2) + 72765*a**68*b**8*x**19 + 315315*a**67*b**9
*x**(39/2) + 945945*a**66*b**10*x**20 + 2081079*a**65*b**11*x**(4
1/2) + 3468465*a**64*b**12*x**21 + 4459455*a**63*b**13*x**(43/2)
+ 4459455*a**62*b**14*x**22 + 3468465*a**61*b**15*x**(45/2) + 208
1079*a**60*b**16*x**23 + 945945*a**59*b**17*x**(47/2) + 315315*a*
*58*b**18*x**24 + 72765*a**57*b**19*x**(49/2) + 10395*a**56*b**20
*x**25 + 693*a**55*b**21*x**(51/2)) + 501228*a**(127/2)*b**12*x**
24*sqrt(1 + b*sqrt(x)/a)/(693*a**70*b**6*x**18 + 10395*a**69*b**7
*x**(37/2) + 72765*a**68*b**8*x**19 + 315315*a**67*b**9*x**(39/2)
 + 945945*a**66*b**10*x**20 + 2081079*a**65*b**11*x**(41/2) + 346
8465*a**64*b**12*x**21 + 4459455*a**63*b**13*x**(43/2) + 4459455*
a**62*b**14*x**22 + 3468465*a**61*b**15*x**(45/2) + 2081079*a**60
*b**16*x**23 + 945945*a**59*b**17*x**(47/2) + 315315*a**58*b**18*
x**24 + 72765*a**57*b**19*x**(49/2) + 10395*a**56*b**20*x**25 + 6
93*a**55*b**21*x**(51/2)) + 465920*a**(127/2)*b**12*x**24/(693*a*
*70*b**6*x**18 + 10395*a**69*b**7*x**(37/2) + 72765*a**68*b**8*x*
*19 + 315315*a**67*b**9*x**(39/2) + 945945*a**66*b**10*x**20 + 20
81079*a**65*b**11*x**(41/2) + 3468465*a**64*b**12*x**21 + 4459455
*a**63*b**13*x**(43/2) + 4459455*a**62*b**14*x**22 + 3468465*a**6
1*b**15*x**(45/2) + 2081079*a**60*b**16*x**23 + 945945*a**59*b**1
7*x**(47/2) + 315315*a**58*b**18*x**24 + 72765*a**57*b**19*x**(49
/2) + 10395*a**56*b**20*x**25 + 693*a**55*b**21*x**(51/2)) + 7824
60*a**(125/2)*b**13*x**(49/2)*sqrt(1 + b*sqrt(x)/a)/(693*a**70*b*
*6*x**18 + 10395*a**69*b**7*x**(37/2) + 72765*a**68*b**8*x**19 +
315315*a**67*b**9*x**(39/2) + 945945*a**66*b**10*x**20 + 2081079*
a**65*b**11*x**(41/2) + 3468465*a**64*b**12*x**21 + 4459455*a**63
*b**13*x**(43/2) + 4459455*a**62*b**14*x**22 + 3468465*a**61*b**1
5*x**(45/2) + 2081079*a**60*b**16*x**23 + 945945*a**59*b**17*x**(
47/2) + 315315*a**58*b**18*x**24 + 72765*a**57*b**19*x**(49/2) +
10395*a**56*b**20*x**25 + 693*a**55*b**21*x**(51/2)) + 107520*a**
(125/2)*b**13*x**(49/2)/(693*a**70*b**6*x**18 + 10395*a**69*b**7*
x**(37/2) + 72765*a**68*b**8*x**19 + 315315*a**67*b**9*x**(39/2)
+ 945945*a**66*b**10*x**20 + 2081079*a**65*b**11*x**(41/2) + 3468
465*a**64*b**12*x**21 + 4459455*a**63*b**13*x**(43/2) + 4459455*a
62*b14*x**22 + 3468465*a**61*b**15*x**(45/2) + 2081079*a**60*
b**16*x**23 + 945945*a**59*b**17*x**(47/2) + 315315*a**58*b**18*x
24 + 72765*a57*b**19*x**(49/2) + 10395*a**56*b**20*x**25 + 69
3*a**55*b**21*x**(51/2)) + 720900*a**(123/2)*b**14*x**25*sqrt(1 +
 b*sqrt(x)/a)/(693*a**70*b**6*x**18 + 10395*a**69*b**7*x**(37/2)
+ 72765*a**68*b**8*x**19 + 315315*a**67*b**9*x**(39/2) + 945945*a
66*b10*x**20 + 2081079*a**65*b**11*x**(41/2) + 3468465*a**64*
b**12*x**21 + 4459455*a**63*b**13*x**(43/2) + 4459455*a**62*b**14
*x**22 + 3468465*a**61*b**15*x**(45/2) + 2081079*a**60*b**16*x**2
3 + 945945*a**59*b**17*x**(47/2) + 315315*a**58*b**18*x**24 + 727
65*a**57*b**19*x**(49/2) + 10395*a**56*b**20*x**25 + 693*a**55*b*
*21*x**(51/2)) + 15360*a**(123/2)*b**14*x**25/(693*a**70*b**6*x**
18 + 10395*a**69*b**7*x**(37/2) + 72765*a**68*b**8*x**19 + 315315
*a**67*b**9*x**(39/2) + 945945*a**66*b**10*x**20 + 2081079*a**65*
b**11*x**(41/2) + 3468465*a**64*b**12*x**21 + 4459455*a**63*b**13

```
*x**(43/2) + 4459455*a**62*b**14*x**22 + 3468465*a**61*b**15*x**(
45/2) + 2081079*a**60*b**16*x**23 + 945945*a**59*b**17*x**(47/2)
+ 315315*a**58*b**18*x**24 + 72765*a**57*b**19*x**(49/2) + 10395*
a**56*b**20*x**25 + 693*a**55*b**21*x**(51/2)) + 486492*a**(121/2
)*b**15*x**(51/2)*sqrt(1 + b*sqrt(x)/a)/(693*a**70*b**6*x**18 + 1
0395*a**69*b**7*x**(37/2) + 72765*a**68*b**8*x**19 + 315315*a**67
*b**9*x**(39/2) + 945945*a**66*b**10*x**20 + 2081079*a**65*b**11*
x**(41/2) + 3468465*a**64*b**12*x**21 + 4459455*a**63*b**13*x**(4
3/2) + 4459455*a**62*b**14*x**22 + 3468465*a**61*b**15*x**(45/2)
+ 2081079*a**60*b**16*x**23 + 945945*a**59*b**17*x**(47/2) + 3153
15*a**58*b**18*x**24 + 72765*a**57*b**19*x**(49/2) + 10395*a**56*
b**20*x**25 + 693*a**55*b**21*x**(51/2)) + 1024*a**(121/2)*b**15*
x**(51/2)/(693*a**70*b**6*x**18 + 10395*a**69*b**7*x**(37/2) + 72
765*a**68*b**8*x**19 + 315315*a**67*b**9*x**(39/2) + 945945*a**66
*b**10*x**20 + 2081079*a**65*b**11*x**(41/2) + 3468465*a**64*b**1
2*x**21 + 4459455*a**63*b**13*x**(43/2) + 4459455*a**62*b**14*x**
22 + 3468465*a**61*b**15*x**(45/2) + 2081079*a**60*b**16*x**23 +
945945*a**59*b**17*x**(47/2) + 315315*a**58*b**18*x**24 + 72765*a
**57*b**19*x**(49/2) + 10395*a**56*b**20*x**25 + 693*a**55*b**21*
x**(51/2)) + 244932*a**(119/2)*b**16*x**26*sqrt(1 + b*sqrt(x)/a)/
(693*a**70*b**6*x**18 + 10395*a**69*b**7*x**(37/2) + 72765*a**68*
b**8*x**19 + 315315*a**67*b**9*x**(39/2) + 945945*a**66*b**10*x**
20 + 2081079*a**65*b**11*x**(41/2) + 3468465*a**64*b**12*x**21 +
4459455*a**63*b**13*x**(43/2) + 4459455*a**62*b**14*x**22 + 34684
65*a**61*b**15*x**(45/2) + 2081079*a**60*b**16*x**23 + 945945*a**
59*b**17*x**(47/2) + 315315*a**58*b**18*x**24 + 72765*a**57*b**19
*x**(49/2) + 10395*a**56*b**20*x**25 + 693*a**55*b**21*x**(51/2))
 + 89676*a**(117/2)*b**17*x**(53/2)*sqrt(1 + b*sqrt(x)/a)/(693*a*
*70*b**6*x**18 + 10395*a**69*b**7*x**(37/2) + 72765*a**68*b**8*x*
*19 + 315315*a**67*b**9*x**(39/2) + 945945*a**66*b**10*x**20 + 20
81079*a**65*b**11*x**(41/2) + 3468465*a**64*b**12*x**21 + 4459455
*a**63*b**13*x**(43/2) + 4459455*a**62*b**14*x**22 + 3468465*a**6
1*b**15*x**(45/2) + 2081079*a**60*b**16*x**23 + 945945*a**59*b**1
7*x**(47/2) + 315315*a**58*b**18*x**24 + 72765*a**57*b**19*x**(49
/2) + 10395*a**56*b**20*x**25 + 693*a**55*b**21*x**(51/2)) + 2258
0*a**(115/2)*b**18*x**27*sqrt(1 + b*sqrt(x)/a)/(693*a**70*b**6*x*
*18 + 10395*a**69*b**7*x**(37/2) + 72765*a**68*b**8*x**19 + 31531
5*a**67*b**9*x**(39/2) + 945945*a**66*b**10*x**20 + 2081079*a**65
*b**11*x**(41/2) + 3468465*a**64*b**12*x**21 + 4459455*a**63*b**1
3*x**(43/2) + 4459455*a**62*b**14*x**22 + 3468465*a**61*b**15*x**
(45/2) + 2081079*a**60*b**16*x**23 + 945945*a**59*b**17*x**(47/2)
 + 315315*a**58*b**18*x**24 + 72765*a**57*b**19*x**(49/2) + 10395
*a**56*b**20*x**25 + 693*a**55*b**21*x**(51/2)) + 3500*a**(113/2)
*b**19*x**(55/2)*sqrt(1 + b*sqrt(x)/a)/(693*a**70*b**6*x**18 + 10
395*a**69*b**7*x**(37/2) + 72765*a**68*b**8*x**19 + 315315*a**67*
b**9*x**(39/2) + 945945*a**66*b**10*x**20 + 2081079*a**65*b**11*x
**(41/2) + 3468465*a**64*b**12*x**21 + 4459455*a**63*b**13*x**(43
/2) + 4459455*a**62*b**14*x**22 + 3468465*a**61*b**15*x**(45/2) +
 2081079*a**60*b**16*x**23 + 945945*a**59*b**17*x**(47/2) + 31531
5*a**58*b**18*x**24 + 72765*a**57*b**19*x**(49/2) + 10395*a**56*b
**20*x**25 + 693*a**55*b**21*x**(51/2)) + 252*a**(111/2)*b**20*x*
*28*sqrt(1 + b*sqrt(x)/a)/(693*a**70*b**6*x**18 + 10395*a**69*b**
7*x**(37/2) + 72765*a**68*b**8*x**19 + 315315*a**67*b**9*x**(39/2
) + 945945*a**66*b**10*x**20 + 2081079*a**65*b**11*x**(41/2) + 34
68465*a**64*b**12*x**21 + 4459455*a**63*b**13*x**(43/2) + 4459455
*a**62*b**14*x**22 + 3468465*a**61*b**15*x**(45/2) + 2081079*a**6
0*b**16*x**23 + 945945*a**59*b**17*x**(47/2) + 315315*a**58*b**18
*x**24 + 72765*a**57*b**19*x**(49/2) + 10395*a**56*b**20*x**25 +
693*a**55*b**21*x**(51/2))
```

GIAC/XCAS [A] time = 0.255964, size = 115, normalized size = 0.88

$$\frac{4\left(63\left(b\sqrt{x}+a\right)^{\frac{11}{2}}-385\left(b\sqrt{x}+a\right)^{\frac{9}{2}}a+990\left(b\sqrt{x}+a\right)^{\frac{7}{2}}a^{2}-1386\left(b\sqrt{x}+a\right)^{\frac{5}{2}}a^{3}+1155\left(b\sqrt{x}+a\right)^{\frac{3}{2}}a^{4}-693\sqrt{b\sqrt{x}+a}a^{5}\right)}{693\,b^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(b*sqrt(x) + a),x, algorithm="giac")
```

```
[Out] 4/693*(63*(b*sqrt(x) + a)^(11/2) - 385*(b*sqrt(x) + a)^(9/2)*a +
```

```
990*(b*sqrt(x) + a)^(7/2)*a^2 - 1386*(b*sqrt(x) + a)^(5/2)*a^3 +
1155*(b*sqrt(x) + a)^(3/2)*a^4 - 693*sqrt(b*sqrt(x) + a)*a^5)/b^6
```

3.2238 $\int \frac{x}{\sqrt{a+b\sqrt{x}}}\,dx$

Optimal. Leaf size=84

$$-\frac{4a^3\sqrt{a+b\sqrt{x}}}{b^4}+\frac{4a^2\left(a+b\sqrt{x}\right)^{3/2}}{b^4}+\frac{4\left(a+b\sqrt{x}\right)^{7/2}}{7b^4}-\frac{12a\left(a+b\sqrt{x}\right)^{5/2}}{5b^4}$$

```
[Out] (-4*a^3*Sqrt[a + b*Sqrt[x]])/b^4 + (4*a^2*(a + b*Sqrt[x])^(3/2))/
b^4 - (12*a*(a + b*Sqrt[x])^(5/2))/(5*b^4) + (4*(a + b*Sqrt[x])^(
7/2))/(7*b^4)
```

Rubi [A] time = 0.0978998, antiderivative size = 84, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$-\frac{4a^3\sqrt{a+b\sqrt{x}}}{b^4}+\frac{4a^2\left(a+b\sqrt{x}\right)^{3/2}}{b^4}+\frac{4\left(a+b\sqrt{x}\right)^{7/2}}{7b^4}-\frac{12a\left(a+b\sqrt{x}\right)^{5/2}}{5b^4}$$

Antiderivative was successfully verified.

```
[In]  Int[x/Sqrt[a + b*Sqrt[x]],x]
```

```
[Out] (-4*a^3*Sqrt[a + b*Sqrt[x]])/b^4 + (4*a^2*(a + b*Sqrt[x])^(3/2))/
b^4 - (12*a*(a + b*Sqrt[x])^(5/2))/(5*b^4) + (4*(a + b*Sqrt[x])^(
7/2))/(7*b^4)
```

Rubi in Sympy [A] time = 14.4778, size = 78, normalized size = 0.93

$$-\frac{4a^3\sqrt{a+b\sqrt{x}}}{b^4}+\frac{4a^2\left(a+b\sqrt{x}\right)^{\frac{3}{2}}}{b^4}-\frac{12a\left(a+b\sqrt{x}\right)^{\frac{5}{2}}}{5b^4}+\frac{4\left(a+b\sqrt{x}\right)^{\frac{7}{2}}}{7b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b*x**(1/2))**(1/2),x)
```

```
[Out] -4*a**3*sqrt(a + b*sqrt(x))/b**4 + 4*a**2*(a + b*sqrt(x))**(3/2)/
b**4 - 12*a*(a + b*sqrt(x))**(5/2)/(5*b**4) + 4*(a + b*sqrt(x))**
(7/2)/(7*b**4)
```

Mathematica [A] time = 0.0279793, size = 54, normalized size = 0.64

$$\frac{4\sqrt{a+b\sqrt{x}}\left(-16a^3+8a^2b\sqrt{x}-6ab^2x+5b^3x^{3/2}\right)}{35b^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/Sqrt[a + b*Sqrt[x]],x]
```

```
[Out] (4*Sqrt[a + b*Sqrt[x]]*(-16*a^3 + 8*a^2*b*Sqrt[x] - 6*a*b^2*x + 5
*b^3*x^(3/2)))/(35*b^4)
```

Maple [A] time = 0.003, size = 57, normalized size = 0.7

$$4\,\frac{1/7\,\left(a+b\sqrt{x}\right)^{7/2}-3/5\,a\left(a+b\sqrt{x}\right)^{5/2}+\left(a+b\sqrt{x}\right)^{3/2}a^2-\sqrt{a+b\sqrt{x}}a^3}{b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x/(a+b*x^(1/2))^(1/2),x)
```

```
[Out] 4/b^4*(1/7*(a+b*x^(1/2))^(7/2)-3/5*a*(a+b*x^(1/2))^(5/2)+(a+b*x^(
1/2))^(3/2)*a^2-(a+b*x^(1/2))^(1/2)*a^3)
```

Maxima [A] time = 1.43805, size = 86, normalized size = 1.02

$$\frac{4\left(b\sqrt{x}+a\right)^{\frac{7}{2}}}{7\,b^{4}}-\frac{12\left(b\sqrt{x}+a\right)^{\frac{5}{2}}a}{5\,b^{4}}+\frac{4\left(b\sqrt{x}+a\right)^{\frac{3}{2}}a^{2}}{b^{4}}-\frac{4\sqrt{b\sqrt{x}+a}a^{3}}{b^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/sqrt(b*sqrt(x) + a),x, algorithm="maxima")
```

```
[Out] 4/7*(b*sqrt(x) + a)^(7/2)/b^4 - 12/5*(b*sqrt(x) + a)^(5/2)*a/b^4
+ 4*(b*sqrt(x) + a)^(3/2)*a^2/b^4 - 4*sqrt(b*sqrt(x) + a)*a^3/b^4
```

Fricas [A] time = 0.24437, size = 61, normalized size = 0.73

$$-\frac{4\left(6\,ab^{2}x+16\,a^{3}-\left(5\,b^{3}x+8\,a^{2}b\right)\sqrt{x}\right)\sqrt{b\sqrt{x}+a}}{35\,b^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/sqrt(b*sqrt(x) + a),x, algorithm="fricas")
```

```
[Out] -4/35*(6*a*b^2*x + 16*a^3 - (5*b^3*x + 8*a^2*b)*sqrt(x))*sqrt(b*s
qrt(x) + a)/b^4
```

Sympy [A] time = 8.66146, size = 1872, normalized size = 22.29

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(a+b*x**(1/2))**(1/2),x)
```

```
[Out] -64*a**(47/2)*x**8*sqrt(1 + b*sqrt(x)/a)/(35*a**20*b**4*x**8 + 21
0*a**19*b**5*x**(17/2) + 525*a**18*b**6*x**9 + 700*a**17*b**7*x**
(19/2) + 525*a**16*b**8*x**10 + 210*a**15*b**9*x**(21/2) + 35*a**
14*b**10*x**11) + 64*a**(47/2)*x**8/(35*a**20*b**4*x**8 + 210*a**
19*b**5*x**(17/2) + 525*a**18*b**6*x**9 + 700*a**17*b**7*x**(19/2
) + 525*a**16*b**8*x**10 + 210*a**15*b**9*x**(21/2) + 35*a**14*b*
*10*x**11) - 352*a**(45/2)*b*x**(17/2)*sqrt(1 + b*sqrt(x)/a)/(35*
a**20*b**4*x**8 + 210*a**19*b**5*x**(17/2) + 525*a**18*b**6*x**9
+ 700*a**17*b**7*x**(19/2) + 525*a**16*b**8*x**10 + 210*a**15*b**
9*x**(21/2) + 35*a**14*b**10*x**11) + 384*a**(45/2)*b*x**(17/2)/(
35*a**20*b**4*x**8 + 210*a**19*b**5*x**(17/2) + 525*a**18*b**6*x*
*9 + 700*a**17*b**7*x**(19/2) + 525*a**16*b**8*x**10 + 210*a**15*
b**9*x**(21/2) + 35*a**14*b**10*x**11) - 792*a**(43/2)*b**2*x**9*
sqrt(1 + b*sqrt(x)/a)/(35*a**20*b**4*x**8 + 210*a**19*b**5*x**(17
/2) + 525*a**18*b**6*x**9 + 700*a**17*b**7*x**(19/2) + 525*a**16*
b**8*x**10 + 210*a**15*b**9*x**(21/2) + 35*a**14*b**10*x**11) + 9
60*a**(43/2)*b**2*x**9/(35*a**20*b**4*x**8 + 210*a**19*b**5*x**(1
7/2) + 525*a**18*b**6*x**9 + 700*a**17*b**7*x**(19/2) + 525*a**16
*b**8*x**10 + 210*a**15*b**9*x**(21/2) + 35*a**14*b**10*x**11) -
924*a**(41/2)*b**3*x**(19/2)*sqrt(1 + b*sqrt(x)/a)/(35*a**20*b**4
```

```
*x**8 + 210*a**19*b**5*x**(17/2) + 525*a**18*b**6*x**9 + 700*a**1
7*b**7*x**(19/2) + 525*a**16*b**8*x**10 + 210*a**15*b**9*x**(21/2
) + 35*a**14*b**10*x**11) + 1280*a**(41/2)*b**3*x**(19/2)/(35*a**
20*b**4*x**8 + 210*a**19*b**5*x**(17/2) + 525*a**18*b**6*x**9 + 7
00*a**17*b**7*x**(19/2) + 525*a**16*b**8*x**10 + 210*a**15*b**9*x
**(21/2) + 35*a**14*b**10*x**11) - 560*a**(39/2)*b**4*x**10*sqrt(
1 + b*sqrt(x)/a)/(35*a**20*b**4*x**8 + 210*a**19*b**5*x**(17/2) +
 525*a**18*b**6*x**9 + 700*a**17*b**7*x**(19/2) + 525*a**16*b**8*
x**10 + 210*a**15*b**9*x**(21/2) + 35*a**14*b**10*x**11) + 960*a*
*(39/2)*b**4*x**10/(35*a**20*b**4*x**8 + 210*a**19*b**5*x**(17/2)
 + 525*a**18*b**6*x**9 + 700*a**17*b**7*x**(19/2) + 525*a**16*b**
8*x**10 + 210*a**15*b**9*x**(21/2) + 35*a**14*b**10*x**11) - 84*a
**(37/2)*b**5*x**(21/2)*sqrt(1 + b*sqrt(x)/a)/(35*a**20*b**4*x**8
 + 210*a**19*b**5*x**(17/2) + 525*a**18*b**6*x**9 + 700*a**17*b**
7*x**(19/2) + 525*a**16*b**8*x**10 + 210*a**15*b**9*x**(21/2) + 3
5*a**14*b**10*x**11) + 384*a**(37/2)*b**5*x**(21/2)/(35*a**20*b**
4*x**8 + 210*a**19*b**5*x**(17/2) + 525*a**18*b**6*x**9 + 700*a**
17*b**7*x**(19/2) + 525*a**16*b**8*x**10 + 210*a**15*b**9*x**(21/
2) + 35*a**14*b**10*x**11) + 168*a**(35/2)*b**6*x**11*sqrt(1 + b*
sqrt(x)/a)/(35*a**20*b**4*x**8 + 210*a**19*b**5*x**(17/2) + 525*a
**18*b**6*x**9 + 700*a**17*b**7*x**(19/2) + 525*a**16*b**8*x**10
+ 210*a**15*b**9*x**(21/2) + 35*a**14*b**10*x**11) + 64*a**(35/2)
*b**6*x**11/(35*a**20*b**4*x**8 + 210*a**19*b**5*x**(17/2) + 525*
a**18*b**6*x**9 + 700*a**17*b**7*x**(19/2) + 525*a**16*b**8*x**10
 + 210*a**15*b**9*x**(21/2) + 35*a**14*b**10*x**11) + 188*a**(33/
2)*b**7*x**(23/2)*sqrt(1 + b*sqrt(x)/a)/(35*a**20*b**4*x**8 + 210
*a**19*b**5*x**(17/2) + 525*a**18*b**6*x**9 + 700*a**17*b**7*x**(
19/2) + 525*a**16*b**8*x**10 + 210*a**15*b**9*x**(21/2) + 35*a**1
4*b**10*x**11) + 96*a**(31/2)*b**8*x**12*sqrt(1 + b*sqrt(x)/a)/(3
5*a**20*b**4*x**8 + 210*a**19*b**5*x**(17/2) + 525*a**18*b**6*x**
9 + 700*a**17*b**7*x**(19/2) + 525*a**16*b**8*x**10 + 210*a**15*b
**9*x**(21/2) + 35*a**14*b**10*x**11) + 20*a**(29/2)*b**9*x**(25/
2)*sqrt(1 + b*sqrt(x)/a)/(35*a**20*b**4*x**8 + 210*a**19*b**5*x**
(17/2) + 525*a**18*b**6*x**9 + 700*a**17*b**7*x**(19/2) + 525*a**
16*b**8*x**10 + 210*a**15*b**9*x**(21/2) + 35*a**14*b**10*x**11)
```

GIAC/XCAS [A] time = 0.3005, size = 77, normalized size = 0.92

$$\frac{4\left(5\left(b\sqrt{x}+a\right)^{\frac{7}{2}}-21\left(b\sqrt{x}+a\right)^{\frac{5}{2}}a+35\left(b\sqrt{x}+a\right)^{\frac{3}{2}}a^{2}-35\sqrt{b\sqrt{x}+a}a^{3}\right)}{35\,b^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(b*sqrt(x) + a),x, algorithm="giac")
```

```
[Out] 4/35*(5*(b*sqrt(x) + a)^(7/2) - 21*(b*sqrt(x) + a)^(5/2)*a + 35*(
b*sqrt(x) + a)^(3/2)*a^2 - 35*sqrt(b*sqrt(x) + a)*a^3)/b^4
```

3.2239 $\int \frac{1}{\sqrt{a+b\sqrt{x}}}\,dx$

Optimal. Leaf size=40

$$\frac{4\left(a+b\sqrt{x}\right)^{3/2}}{3b^2}-\frac{4a\sqrt{a+b\sqrt{x}}}{b^2}$$

```
[Out] (-4*a*Sqrt[a + b*Sqrt[x]])/b^2 + (4*(a + b*Sqrt[x])^(3/2))/(3*b^2
)
```

Rubi [A] time = 0.0471729, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{4\left(a+b\sqrt{x}\right)^{3/2}}{3b^2}-\frac{4a\sqrt{a+b\sqrt{x}}}{b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[a + b*Sqrt[x]],x]
```

```
[Out] (-4*a*Sqrt[a + b*Sqrt[x]])/b^2 + (4*(a + b*Sqrt[x])^(3/2))/(3*b^2
)
```

Rubi in Sympy [A] time = 6.03321, size = 36, normalized size = 0.9

$$-\frac{4a\sqrt{a+b\sqrt{x}}}{b^2}+\frac{4\left(a+b\sqrt{x}\right)^{\frac{3}{2}}}{3b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*x**(1/2))**(1/2),x)
```

```
[Out] -4*a*sqrt(a + b*sqrt(x))/b**2 + 4*(a + b*sqrt(x))**(3/2)/(3*b**2)
```

Mathematica [A] time = 0.0187558, size = 31, normalized size = 0.78

$$\frac{4\left(b\sqrt{x}-2a\right)\sqrt{a+b\sqrt{x}}}{3b^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/Sqrt[a + b*Sqrt[x]],x]
```

```
[Out] (4*(-2*a + b*Sqrt[x])*Sqrt[a + b*Sqrt[x]])/(3*b^2)
```

Maple [A] time = 0.006, size = 30, normalized size = 0.8

$$4\,\frac{1/3\,\left(a+b\sqrt{x}\right)^{3/2}-a\sqrt{a+b\sqrt{x}}}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*x^(1/2))^(1/2),x)
```

```
[Out] 4/b^2*(1/3*(a+b*x^(1/2))^(3/2)-a*(a+b*x^(1/2))^(1/2))
```

Maxima [A] time = 1.44255, size = 41, normalized size = 1.02

$$\frac{4\left(b\sqrt{x}+a\right)^{\frac{3}{2}}}{3\,b^2}-\frac{4\,\sqrt{b\sqrt{x}+a}a}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*sqrt(x) + a),x, algorithm="maxima")
```

```
[Out] 4/3*(b*sqrt(x) + a)^(3/2)/b^2 - 4*sqrt(b*sqrt(x) + a)*a/b^2
```

Fricas [A] time = 0.244414, size = 31, normalized size = 0.78

$$\frac{4\,\sqrt{b\sqrt{x}+a}\left(b\sqrt{x}-2\,a\right)}{3\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*sqrt(x) + a),x, algorithm="fricas")
```

```
[Out] 4/3*sqrt(b*sqrt(x) + a)*(b*sqrt(x) - 2*a)/b^2
```

Sympy [A] time = 3.76088, size = 219, normalized size = 5.48

$$-\frac{8a^{\frac{7}{2}}x^2\sqrt{1+\frac{b\sqrt{x}}{a}}}{3a^2b^2x^2+3ab^3x^{\frac{5}{2}}}+\frac{8a^{\frac{7}{2}}x^2}{3a^2b^2x^2+3ab^3x^{\frac{5}{2}}}-\frac{4a^{\frac{5}{2}}bx^{\frac{5}{2}}\sqrt{1+\frac{b\sqrt{x}}{a}}}{3a^2b^2x^2+3ab^3x^{\frac{5}{2}}}+\frac{8a^{\frac{5}{2}}bx^{\frac{5}{2}}}{3a^2b^2x^2+3ab^3x^{\frac{5}{2}}}+\frac{4a^{\frac{3}{2}}b^2x^3\sqrt{1+\frac{b\sqrt{x}}{a}}}{3a^2b^2x^2+3ab^3x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*x**(1/2))**(1/2),x)
```

```
[Out] -8*a**(7/2)*x**2*sqrt(1 + b*sqrt(x)/a)/(3*a**2*b**2*x**2 + 3*a*b*
*3*x**(5/2)) + 8*a**(7/2)*x**2/(3*a**2*b**2*x**2 + 3*a*b**3*x**(5
/2)) - 4*a**(5/2)*b*x**(5/2)*sqrt(1 + b*sqrt(x)/a)/(3*a**2*b**2*x
**2 + 3*a*b**3*x**(5/2)) + 8*a**(5/2)*b*x**(5/2)/(3*a**2*b**2*x**
2 + 3*a*b**3*x**(5/2)) + 4*a**(3/2)*b**2*x**3*sqrt(1 + b*sqrt(x)/
a)/(3*a**2*b**2*x**2 + 3*a*b**3*x**(5/2))
```

GIAC/XCAS [A] time = 0.258369, size = 36, normalized size = 0.9

$$\frac{4\left(\left(b\sqrt{x}+a\right)^{\frac{3}{2}}-3\,\sqrt{b\sqrt{x}+a}a\right)}{3\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*sqrt(x) + a),x, algorithm="giac")
```

```
[Out] 4/3*((b*sqrt(x) + a)^(3/2) - 3*sqrt(b*sqrt(x) + a)*a)/b^2
```

3.2240 $\int \frac{1}{\sqrt{a+b\sqrt{x}}x}\,dx$

Optimal. Leaf size=27

$$-\frac{4\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{x}}}{\sqrt{a}}\right)}{\sqrt{a}}$$

```
[Out] (-4*ArcTanh[Sqrt[a + b*Sqrt[x]]/Sqrt[a]])/Sqrt[a]
```

Rubi [A] time = 0.0515509, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176

$$-\frac{4\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{x}}}{\sqrt{a}}\right)}{\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b*Sqrt[x]]*x),x]

[Out] (-4*ArcTanh[Sqrt[a + b*Sqrt[x]]/Sqrt[a]])/Sqrt[a]
```

Rubi in Sympy [A] time = 5.35677, size = 26, normalized size = 0.96

$$-\frac{4\,\mathrm{atanh}\left(\frac{\sqrt{a+b\sqrt{x}}}{\sqrt{a}}\right)}{\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(a+b*x**(1/2))**(1/2),x)

[Out] -4*atanh(sqrt(a + b*sqrt(x))/sqrt(a))/sqrt(a)
```

Mathematica [A] time = 0.0179539, size = 27, normalized size = 1.

$$-\frac{4\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{x}}}{\sqrt{a}}\right)}{\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b*Sqrt[x]]*x),x]

[Out] (-4*ArcTanh[Sqrt[a + b*Sqrt[x]]/Sqrt[a]])/Sqrt[a]
```

Maple [A] time = 0.005, size = 20, normalized size = 0.7

$$-4\,\frac{1}{\sqrt{a}}\mathit{Artanh}\left(\frac{\sqrt{a+b\sqrt{x}}}{\sqrt{a}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(a+b*x^(1/2))^(1/2),x)

[Out] -4*arctanh((a+b*x^(1/2))^(1/2)/a^(1/2))/a^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*sqrt(x) + a)*x),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [A] time = 0.258527, size = 1, normalized size = 0.04

$$\left[\frac{2\log\left(\frac{\sqrt{a}b\sqrt{x}-2\sqrt{b\sqrt{x}+a}a+2a^{\frac{3}{2}}}{\sqrt{x}}\right)}{\sqrt{a}}, \frac{4\arctan\left(\frac{a}{\sqrt{b\sqrt{x}+a}\sqrt{-a}}\right)}{\sqrt{-a}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*sqrt(x) + a)*x),x, algorithm="fricas")

[Out] [2*log((sqrt(a)*b*sqrt(x) - 2*sqrt(b*sqrt(x) + a)*a + 2*a^(3/2))/
sqrt(x))/sqrt(a), 4*arctan(a/(sqrt(b*sqrt(x) + a)*sqrt(-a)))/sqrt
(-a)]
```

Sympy [A] time = 4.54514, size = 24, normalized size = 0.89

$$-\frac{4\operatorname{asinh}\left(\frac{\sqrt{a}}{\sqrt{b}\sqrt[4]{x}}\right)}{\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(a+b*x**(1/2))**(1/2),x)

[Out] -4*asinh(sqrt(a)/(sqrt(b)*x**(1/4)))/sqrt(a)
```

GIAC/XCAS [A] time = 0.2676, size = 31, normalized size = 1.15

$$\frac{4\arctan\left(\frac{\sqrt{b\sqrt{x}+a}}{\sqrt{-a}}\right)}{\sqrt{-a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*sqrt(x) + a)*x),x, algorithm="giac")

[Out] 4*arctan(sqrt(b*sqrt(x) + a)/sqrt(-a))/sqrt(-a)
```

3.2241 $\int \frac{1}{\sqrt{a+b\sqrt{x}}x^2}\,dx$

Optimal. Leaf size=80

$$-\frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{x}}}{\sqrt{a}}\right)}{2a^{5/2}}+\frac{3b\sqrt{a+b\sqrt{x}}}{2a^2\sqrt{x}}-\frac{\sqrt{a+b\sqrt{x}}}{ax}$$

```
[Out] -(Sqrt[a + b*Sqrt[x]]/(a*x)) + (3*b*Sqrt[a + b*Sqrt[x]])/(2*a^2*S
qrt[x]) - (3*b^2*ArcTanh[Sqrt[a + b*Sqrt[x]]/Sqrt[a]])/(2*a^(5/2)
)
```

Rubi [A] time = 0.104909, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.235

$$-\frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{x}}}{\sqrt{a}}\right)}{2a^{5/2}}+\frac{3b\sqrt{a+b\sqrt{x}}}{2a^2\sqrt{x}}-\frac{\sqrt{a+b\sqrt{x}}}{ax}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b*Sqrt[x]]*x^2),x]
```

```
[Out] -(Sqrt[a + b*Sqrt[x]]/(a*x)) + (3*b*Sqrt[a + b*Sqrt[x]])/(2*a^2*S
qrt[x]) - (3*b^2*ArcTanh[Sqrt[a + b*Sqrt[x]]/Sqrt[a]])/(2*a^(5/2)
)
```

Rubi in Sympy [A] time = 10.3309, size = 70, normalized size = 0.88

$$-\frac{\sqrt{a+b\sqrt{x}}}{ax}+\frac{3b\sqrt{a+b\sqrt{x}}}{2a^2\sqrt{x}}-\frac{3b^2\operatorname{atanh}\left(\frac{\sqrt{a+b\sqrt{x}}}{\sqrt{a}}\right)}{2a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(a+b*x**(1/2))**(1/2),x)
```

```
[Out] -sqrt(a + b*sqrt(x))/(a*x) + 3*b*sqrt(a + b*sqrt(x))/(2*a**2*sqrt
(x)) - 3*b**2*atanh(sqrt(a + b*sqrt(x))/sqrt(a))/(2*a**(5/2))
```

Mathematica [A] time = 0.0653856, size = 69, normalized size = 0.86

$$\left(\frac{3b}{2a^2\sqrt{x}}-\frac{1}{ax}\right)\sqrt{a+b\sqrt{x}}-\frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{x}}}{\sqrt{a}}\right)}{2a^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b*Sqrt[x]]*x^2),x]
```

```
[Out] (-(1/(a*x)) + (3*b)/(2*a^2*Sqrt[x]))*Sqrt[a + b*Sqrt[x]] - (3*b^2
*ArcTanh[Sqrt[a + b*Sqrt[x]]/Sqrt[a]])/(2*a^(5/2))
```

Maple [A] time = 0.007, size = 72, normalized size = 0.9

$$4\,b^{2}\left(-1/4\,\frac{\sqrt{a+b\sqrt{x}}}{ab^{2}x}-3/4\,\frac{1}{a}\left(-1/2\,\frac{\sqrt{a+b\sqrt{x}}}{ab\sqrt{x}}+1/2\,\frac{1}{a^{3/2}}Artanh\left(\frac{\sqrt{a+b\sqrt{x}}}{\sqrt{a}}\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(a+b*x^(1/2))^(1/2),x)
```

```
[Out] 4*b^2*(-1/4*(a+b*x^(1/2))^(1/2)/a/x/b^2-3/4/a*(-1/2*(a+b*x^(1/2))
^(1/2)/a/x^(1/2)/b+1/2/a^(3/2)*arctanh((a+b*x^(1/2))^(1/2)/a^(1/2
))))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*sqrt(x) + a)*x^2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.25914, size = 1, normalized size = 0.01

$$\left[\frac{3\,b^{2}x\log\left(\frac{\sqrt{a}b\sqrt{x}-2\,\sqrt{b\sqrt{x}+a}a+2\,a^{\frac{3}{2}}}{\sqrt{x}}\right)+2\left(3\,\sqrt{a}b\sqrt{x}-2\,a^{\frac{3}{2}}\right)\sqrt{b\sqrt{x}+a}}{4\,a^{\frac{5}{2}}x},\ \frac{3\,b^{2}x\arctan\left(\frac{a}{\sqrt{b\sqrt{x}+a}\sqrt{-a}}\right)+\left(3\,\sqrt{-a}b\sqrt{x}-2\,\sqrt{-a}a\right)\sqrt{\ldots}}{2\,\sqrt{-a}a^{2}x}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*sqrt(x) + a)*x^2),x, algorithm="fricas")
```

```
[Out] [1/4*(3*b^2*x*log((sqrt(a)*b*sqrt(x) - 2*sqrt(b*sqrt(x) + a)*a +
2*a^(3/2))/sqrt(x)) + 2*(3*sqrt(a)*b*sqrt(x) - 2*a^(3/2))*sqrt(b*
sqrt(x) + a))/(a^(5/2)*x), 1/2*(3*b^2*x*arctan(a/(sqrt(b*sqrt(x)
+ a)*sqrt(-a))) + (3*sqrt(-a)*b*sqrt(x) - 2*sqrt(-a)*a)*sqrt(b*sq
rt(x) + a))/(sqrt(-a)*a^2*x)]
```

Sympy [A] time = 16.7029, size = 110, normalized size = 1.38

$$-\frac{1}{\sqrt{b}x^{\frac{5}{4}}\sqrt{\frac{a}{b\sqrt{x}}+1}}+\frac{\sqrt{b}}{2ax^{\frac{3}{4}}\sqrt{\frac{a}{b\sqrt{x}}+1}}+\frac{3b^{\frac{3}{2}}}{2a^{2}\sqrt[4]{x}\sqrt{\frac{a}{b\sqrt{x}}+1}}-\frac{3b^{2}\operatorname{asinh}\left(\frac{\sqrt{a}}{\sqrt{b}\sqrt[4]{x}}\right)}{2a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(a+b*x**(1/2))**(1/2),x)
```

```
[Out] -1/(sqrt(b)*x**(5/4)*sqrt(a/(b*sqrt(x)) + 1)) + sqrt(b)/(2*a*x**(
3/4)*sqrt(a/(b*sqrt(x)) + 1)) + 3*b**(3/2)/(2*a**2*x**(1/4)*sqrt(
a/(b*sqrt(x)) + 1)) - 3*b**2*asinh(sqrt(a)/(sqrt(b)*x**(1/4)))/(2
*a**(5/2))
```

GIAC/XCAS [A] time = 0.256131, size = 89, normalized size = 1.11

$$\frac{1}{2}\,b^2\left(\frac{3\,\arctan\left(\frac{\sqrt{b\sqrt{x}+a}}{\sqrt{-a}}\right)}{\sqrt{-a}a^2}+\frac{3\,\left(b\sqrt{x}+a\right)^{\frac{3}{2}}-5\,\sqrt{b\sqrt{x}+a}a}{a^2b^2x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*sqrt(x) + a)*x^2),x, algorithm="giac")
```

```
[Out] 1/2*b^2*(3*arctan(sqrt(b*sqrt(x) + a)/sqrt(-a))/(sqrt(-a)*a^2) +
(3*(b*sqrt(x) + a)^(3/2) - 5*sqrt(b*sqrt(x) + a)*a)/(a^2*b^2*x))
```

3.2242 $\int \frac{1}{\sqrt{a+b\sqrt{x}}x^3} dx$

Optimal. Leaf size=136

$$-\frac{35b^4\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{x}}}{\sqrt{a}}\right)}{32a^{9/2}}+\frac{35b^3\sqrt{a+b\sqrt{x}}}{32a^4\sqrt{x}}-\frac{35b^2\sqrt{a+b\sqrt{x}}}{48a^3x}+\frac{7b\sqrt{a+b\sqrt{x}}}{12a^2x^{3/2}}-\frac{\sqrt{a+b\sqrt{x}}}{2ax^2}$$

```
[Out] -Sqrt[a + b*Sqrt[x]]/(2*a*x^2) + (7*b*Sqrt[a + b*Sqrt[x]])/(12*a^
2*x^(3/2)) - (35*b^2*Sqrt[a + b*Sqrt[x]])/(48*a^3*x) + (35*b^3*Sq
rt[a + b*Sqrt[x]])/(32*a^4*Sqrt[x]) - (35*b^4*ArcTanh[Sqrt[a + b*
Sqrt[x]]/Sqrt[a]])/(32*a^(9/2))
```

Rubi [A] time = 0.174682, antiderivative size = 136, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 4, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.235

$$-\frac{35b^4\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{x}}}{\sqrt{a}}\right)}{32a^{9/2}}+\frac{35b^3\sqrt{a+b\sqrt{x}}}{32a^4\sqrt{x}}-\frac{35b^2\sqrt{a+b\sqrt{x}}}{48a^3x}+\frac{7b\sqrt{a+b\sqrt{x}}}{12a^2x^{3/2}}-\frac{\sqrt{a+b\sqrt{x}}}{2ax^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b*Sqrt[x]]*x^3),x]
```

```
[Out] -Sqrt[a + b*Sqrt[x]]/(2*a*x^2) + (7*b*Sqrt[a + b*Sqrt[x]])/(12*a^
2*x^(3/2)) - (35*b^2*Sqrt[a + b*Sqrt[x]])/(48*a^3*x) + (35*b^3*Sq
rt[a + b*Sqrt[x]])/(32*a^4*Sqrt[x]) - (35*b^4*ArcTanh[Sqrt[a + b*
Sqrt[x]]/Sqrt[a]])/(32*a^(9/2))
```

Rubi in Sympy [A] time = 18.6339, size = 124, normalized size = 0.91

$$-\frac{\sqrt{a+b\sqrt{x}}}{2ax^2}+\frac{7b\sqrt{a+b\sqrt{x}}}{12a^2x^{\frac{3}{2}}}-\frac{35b^2\sqrt{a+b\sqrt{x}}}{48a^3x}+\frac{35b^3\sqrt{a+b\sqrt{x}}}{32a^4\sqrt{x}}-\frac{35b^4\operatorname{atanh}\left(\frac{\sqrt{a+b\sqrt{x}}}{\sqrt{a}}\right)}{32a^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(a+b*x**(1/2))**(1/2),x)
```

```
[Out] -sqrt(a + b*sqrt(x))/(2*a*x**2) + 7*b*sqrt(a + b*sqrt(x))/(12*a**
2*x**(3/2)) - 35*b**2*sqrt(a + b*sqrt(x))/(48*a**3*x) + 35*b**3*s
qrt(a + b*sqrt(x))/(32*a**4*sqrt(x)) - 35*b**4*atanh(sqrt(a + b*s
qrt(x))/sqrt(a))/(32*a**(9/2))
```

Mathematica [A] time = 0.0978351, size = 90, normalized size = 0.66

$$\frac{\sqrt{a+b\sqrt{x}}\left(-48a^3+56a^2b\sqrt{x}-70ab^2x+105b^3x^{3/2}\right)}{96a^4x^2}-\frac{35b^4\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{x}}}{\sqrt{a}}\right)}{32a^{9/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b*Sqrt[x]]*x^3),x]
```

```
[Out] (Sqrt[a + b*Sqrt[x]]*(-48*a^3 + 56*a^2*b*Sqrt[x] - 70*a*b^2*x + 1
05*b^3*x^(3/2)))/(96*a^4*x^2) - (35*b^4*ArcTanh[Sqrt[a + b*Sqrt[x
```

```
]]/Sqrt[a]])/(32*a^(9/2))
```

Maple [A] time = 0.008, size = 124, normalized size = 0.9

$$4\,b^{4}\left(-1/8\,\frac{\sqrt{a+b\sqrt{x}}}{ab^{4}x^{2}}-\frac{7}{8\,a}\left(-1/6\,\frac{\sqrt{a+b\sqrt{x}}}{ax^{3/2}b^{3}}-5/6\,\frac{1}{a}\left(-1/4\,\frac{\sqrt{a+b\sqrt{x}}}{ab^{2}x}-3/4\,\frac{1}{a}\left(-1/2\,\frac{\sqrt{a+b\sqrt{x}}}{ab\sqrt{x}}+1/2\,\frac{1}{a^{3/2}}Artanh\left(\frac{\sqrt{a+b\sqrt{x}}}{\sqrt{a}}\right)\right)\right)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(a+b*x^(1/2))^(1/2),x)
```

```
[Out] 4*b^4*(-1/8*(a+b*x^(1/2))^(1/2)/a/x^2/b^4-7/8/a*(-1/6*(a+b*x^(1/2
))^(1/2)/a/x^(3/2)/b^3-5/6/a*(-1/4*(a+b*x^(1/2))^(1/2)/a/x/b^2-3/
4/a*(-1/2*(a+b*x^(1/2))^(1/2)/a/x^(1/2)/b+1/2/a^(3/2)*arctanh((a+
b*x^(1/2))^(1/2)/a^(1/2))))))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*sqrt(x) + a)*x^3),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.255696, size = 1, normalized size = 0.01

$$\left[\frac{105\,b^{4}x^{2}\log\left(\frac{\sqrt{a}b\sqrt{x}-2\sqrt{b\sqrt{x}+a}a+2\,a^{\frac{3}{2}}}{\sqrt{x}}\right)+2\left(7\left(15\,b^{3}x+8\,a^{2}b\right)\sqrt{a}\sqrt{x}-2\left(35\,ab^{2}x+24\,a^{3}\right)\sqrt{a}\right)\sqrt{b\sqrt{x}+a}}{192\,a^{\frac{9}{2}}x^{2}},\frac{105\,b^{4}x^{2}\arctan\left(\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*sqrt(x) + a)*x^3),x, algorithm="fricas")
```

```
[Out] [1/192*(105*b^4*x^2*log((sqrt(a)*b*sqrt(x) - 2*sqrt(b*sqrt(x) + a
)*a + 2*a^(3/2))/sqrt(x)) + 2*(7*(15*b^3*x + 8*a^2*b)*sqrt(a)*sqr
t(x) - 2*(35*a*b^2*x + 24*a^3)*sqrt(a))*sqrt(b*sqrt(x) + a))/(a^(
9/2)*x^2), 1/96*(105*b^4*x^2*arctan(a/(sqrt(b*sqrt(x) + a)*sqrt(-
a))) + (7*(15*b^3*x + 8*a^2*b)*sqrt(-a)*sqrt(x) - 2*(35*a*b^2*x +
 24*a^3)*sqrt(-a))*sqrt(b*sqrt(x) + a))/(sqrt(-a)*a^4*x^2)]
```

Sympy [A] time = 43.1338, size = 173, normalized size = 1.27

$$-\frac{1}{2\sqrt{b}x^{\frac{9}{4}}\sqrt{\frac{a}{b\sqrt{x}}+1}}+\frac{\sqrt{b}}{12ax^{\frac{7}{4}}\sqrt{\frac{a}{b\sqrt{x}}+1}}-\frac{7b^{\frac{3}{2}}}{48a^{2}x^{\frac{5}{4}}\sqrt{\frac{a}{b\sqrt{x}}+1}}+\frac{35b^{\frac{5}{2}}}{96a^{3}x^{\frac{3}{4}}\sqrt{\frac{a}{b\sqrt{x}}+1}}+\frac{35b^{\frac{7}{2}}}{32a^{4}\sqrt[4]{x}\sqrt{\frac{a}{b\sqrt{x}}+1}}-\frac{35b^{4}\operatorname{asinh}\left(\frac{\sqrt{a}}{\sqrt{b}\sqrt[4]{x}}\right)}{32a^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(a+b*x**(1/2))**(1/2),x)
```

```
[Out] -1/(2*sqrt(b)*x**(9/4)*sqrt(a/(b*sqrt(x)) + 1)) + sqrt(b)/(12*a*x
**(7/4)*sqrt(a/(b*sqrt(x)) + 1)) - 7*b**(3/2)/(48*a**2*x**(5/4)*s
qrt(a/(b*sqrt(x)) + 1)) + 35*b**(5/2)/(96*a**3*x**(3/4)*sqrt(a/(b
*sqrt(x)) + 1)) + 35*b**(7/2)/(32*a**4*x**(1/4)*sqrt(a/(b*sqrt(x)
) + 1)) - 35*b**4*asinh(sqrt(a)/(sqrt(b)*x**(1/4)))/(32*a**(9/2))
```

GIAC/XCAS [A] time = 0.276574, size = 127, normalized size = 0.93

$$\frac{1}{96}\,b^4\left(\frac{105\,\arctan\left(\frac{\sqrt{b\sqrt{x}+a}}{\sqrt{-a}}\right)}{\sqrt{-a}a^4}+\frac{105\,\left(b\sqrt{x}+a\right)^{\frac{7}{2}}-385\,\left(b\sqrt{x}+a\right)^{\frac{5}{2}}a+511\,\left(b\sqrt{x}+a\right)^{\frac{3}{2}}a^2-279\,\sqrt{b\sqrt{x}+a}a^3}{a^4b^4x^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*sqrt(x) + a)*x^3),x, algorithm="giac")
```

```
[Out] 1/96*b^4*(105*arctan(sqrt(b*sqrt(x) + a)/sqrt(-a))/(sqrt(-a)*a^4)
 + (105*(b*sqrt(x) + a)^(7/2) - 385*(b*sqrt(x) + a)^(5/2)*a + 511
*(b*sqrt(x) + a)^(3/2)*a^2 - 279*sqrt(b*sqrt(x) + a)*a^3)/(a^4*b^
4*x^2))
```

3.2243 $\int \left(a+b\sqrt{x}\right)^n \sqrt{x}\,dx$

Optimal. Leaf size=74

$$\frac{2a^2\left(a+b\sqrt{x}\right)^{n+1}}{b^3(n+1)}-\frac{4a\left(a+b\sqrt{x}\right)^{n+2}}{b^3(n+2)}+\frac{2\left(a+b\sqrt{x}\right)^{n+3}}{b^3(n+3)}$$

```
[Out] (2*a^2*(a + b*Sqrt[x])^(1 + n))/(b^3*(1 + n)) - (4*a*(a + b*Sqrt[
x])^(2 + n))/(b^3*(2 + n)) + (2*(a + b*Sqrt[x])^(3 + n))/(b^3*(3
+ n))
```

Rubi [A] time = 0.0997435, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{2a^2\left(a+b\sqrt{x}\right)^{n+1}}{b^3(n+1)}-\frac{4a\left(a+b\sqrt{x}\right)^{n+2}}{b^3(n+2)}+\frac{2\left(a+b\sqrt{x}\right)^{n+3}}{b^3(n+3)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^n*Sqrt[x],x]
```

```
[Out] (2*a^2*(a + b*Sqrt[x])^(1 + n))/(b^3*(1 + n)) - (4*a*(a + b*Sqrt[
x])^(2 + n))/(b^3*(2 + n)) + (2*(a + b*Sqrt[x])^(3 + n))/(b^3*(3
+ n))
```

Rubi in Sympy [A] time = 17.1912, size = 65, normalized size = 0.88

$$\frac{2a^2\left(a+b\sqrt{x}\right)^{n+1}}{b^3\left(n+1\right)}-\frac{4a\left(a+b\sqrt{x}\right)^{n+2}}{b^3\left(n+2\right)}+\frac{2\left(a+b\sqrt{x}\right)^{n+3}}{b^3\left(n+3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(1/2)*(a+b*x**(1/2))**n,x)
```

```
[Out] 2*a**2*(a + b*sqrt(x))**(n + 1)/(b**3*(n + 1)) - 4*a*(a + b*sqrt(
x))**(n + 2)/(b**3*(n + 2)) + 2*(a + b*sqrt(x))**(n + 3)/(b**3*(n
 + 3))
```

Mathematica [A] time = 0.0542211, size = 64, normalized size = 0.86

$$\frac{2\left(a+b\sqrt{x}\right)^{n+1}\left(2a^2-2ab(n+1)\sqrt{x}+b^2\left(n^2+3n+2\right)x\right)}{b^3(n+1)(n+2)(n+3)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^n*Sqrt[x],x]
```

```
[Out] (2*(a + b*Sqrt[x])^(1 + n)*(2*a^2 - 2*a*b*(1 + n)*Sqrt[x] + b^2*(
2 + 3*n + n^2)*x))/(b^3*(1 + n)*(2 + n)*(3 + n))
```

Maple [F] time = 0.024, size = 0, normalized size = 0.

$$\int \sqrt{x}\left(a+b\sqrt{x}\right)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(1/2)*(a+b*x^(1/2))^n,x)
```

```
[Out] int(x^(1/2)*(a+b*x^(1/2))^n,x)
```

Maxima [A] time = 1.45482, size = 96, normalized size = 1.3

$$\frac{2\left(\left(n^2+3\,n+2\right)b^3x^{\frac{3}{2}}+\left(n^2+n\right)ab^2x-2\,a^2bn\sqrt{x}+2\,a^3\right)\left(b\sqrt{x}+a\right)^n}{(n^3+6\,n^2+11\,n+6)b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^n*sqrt(x),x, algorithm="maxima")
```

```
[Out] 2*((n^2 + 3*n + 2)*b^3*x^(3/2) + (n^2 + n)*a*b^2*x - 2*a^2*b*n*sq
rt(x) + 2*a^3)*(b*sqrt(x) + a)^n/((n^3 + 6*n^2 + 11*n + 6)*b^3)
```

Fricas [A] time = 0.271337, size = 132, normalized size = 1.78

$$\frac{2\left(2\,a^3+\left(ab^2n^2+ab^2n\right)x-\left(2\,a^2bn-\left(b^3n^2+3\,b^3n+2\,b^3\right)x\right)\sqrt{x}\right)\left(b\sqrt{x}+a\right)^n}{b^3n^3+6\,b^3n^2+11\,b^3n+6\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^n*sqrt(x),x, algorithm="fricas")
```

```
[Out] 2*(2*a^3 + (a*b^2*n^2 + a*b^2*n)*x - (2*a^2*b*n - (b^3*n^2 + 3*b^
3*n + 2*b^3)*x)*sqrt(x))*(b*sqrt(x) + a)^n/(b^3*n^3 + 6*b^3*n^2 +
 11*b^3*n + 6*b^3)
```

Sympy [A] time = 12.9236, size = 5039, normalized size = 68.09

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(1/2)*(a+b*x**(1/2))**n,x)
```

```
[Out] 4*a**6*a**n*x**(9/2)*(1 + b*sqrt(x)/a)**n/(a**3*b**3*n**3*x**(9/2
) + 6*a**3*b**3*n**2*x**(9/2) + 11*a**3*b**3*n*x**(9/2) + 6*a**3*
b**3*x**(9/2) + 3*a**2*b**4*n**3*x**5 + 18*a**2*b**4*n**2*x**5 +
33*a**2*b**4*n*x**5 + 18*a**2*b**4*x**5 + 3*a*b**5*n**3*x**(11/2)
 + 18*a*b**5*n**2*x**(11/2) + 33*a*b**5*n*x**(11/2) + 18*a*b**5*x
**(11/2) + b**6*n**3*x**6 + 6*b**6*n**2*x**6 + 11*b**6*n*x**6 + 6
*b**6*x**6) - 4*a**6*a**n*x**(9/2)/(a**3*b**3*n**3*x**(9/2) + 6*a
**3*b**3*n**2*x**(9/2) + 11*a**3*b**3*n*x**(9/2) + 6*a**3*b**3*x*
*(9/2) + 3*a**2*b**4*n**3*x**5 + 18*a**2*b**4*n**2*x**5 + 33*a**2
*b**4*n*x**5 + 18*a**2*b**4*x**5 + 3*a*b**5*n**3*x**(11/2) + 18*a
*b**5*n**2*x**(11/2) + 33*a*b**5*n*x**(11/2) + 18*a*b**5*x**(11/2
) + b**6*n**3*x**6 + 6*b**6*n**2*x**6 + 11*b**6*n*x**6 + 6*b**6*x
**6) - 4*a**5*a**n*b*n*x**5*(1 + b*sqrt(x)/a)**n/(a**3*b**3*n**3*
x**(9/2) + 6*a**3*b**3*n**2*x**(9/2) + 11*a**3*b**3*n*x**(9/2) +
6*a**3*b**3*x**(9/2) + 3*a**2*b**4*n**3*x**5 + 18*a**2*b**4*n**2*
x**5 + 33*a**2*b**4*n*x**5 + 18*a**2*b**4*x**5 + 3*a*b**5*n**3*x*
*(11/2) + 18*a*b**5*n**2*x**(11/2) + 33*a*b**5*n*x**(11/2) + 18*a
*b**5*x**(11/2) + b**6*n**3*x**6 + 6*b**6*n**2*x**6 + 11*b**6*n*x
**6 + 6*b**6*x**6) + 12*a**5*a**n*b*x**5*(1 + b*sqrt(x)/a)**n/(a*
```

*3*b**3*n**3*x**(9/2) + 6*a**3*b**3*n**2*x**(9/2) + 11*a**3*b**3*
n*x**(9/2) + 6*a**3*b**3*x**(9/2) + 3*a**2*b**4*n**3*x**5 + 18*a*
*2*b**4*n**2*x**5 + 33*a**2*b**4*n*x**5 + 18*a**2*b**4*x**5 + 3*a
*b**5*n**3*x**(11/2) + 18*a*b**5*n**2*x**(11/2) + 33*a*b**5*n*x**
(11/2) + 18*a*b**5*x**(11/2) + b**6*n**3*x**6 + 6*b**6*n**2*x**6
+ 11*b**6*n*x**6 + 6*b**6*x**6) - 12*a**5*a**n*b*x**5/(a**3*b**3*
n**3*x**(9/2) + 6*a**3*b**3*n**2*x**(9/2) + 11*a**3*b**3*n*x**(9/
2) + 6*a**3*b**3*x**(9/2) + 3*a**2*b**4*n**3*x**5 + 18*a**2*b**4*
n**2*x**5 + 33*a**2*b**4*n*x**5 + 18*a**2*b**4*x**5 + 3*a*b**5*n*
*3*x**(11/2) + 18*a*b**5*n**2*x**(11/2) + 33*a*b**5*n*x**(11/2) +
18*a*b**5*x**(11/2) + b**6*n**3*x**6 + 6*b**6*n**2*x**6 + 11*b**
6*n*x**6 + 6*b**6*x**6) + 2*a**4*a**n*b**2*n**2*x**(11/2)*(1 + b*
sqrt(x)/a)**n/(a**3*b**3*n**3*x**(9/2) + 6*a**3*b**3*n**2*x**(9/2
) + 11*a**3*b**3*n*x**(9/2) + 6*a**3*b**3*x**(9/2) + 3*a**2*b**4*
n**3*x**5 + 18*a**2*b**4*n**2*x**5 + 33*a**2*b**4*n*x**5 + 18*a**
2*b**4*x**5 + 3*a*b**5*n**3*x**(11/2) + 18*a*b**5*n**2*x**(11/2)
+ 33*a*b**5*n*x**(11/2) + 18*a*b**5*x**(11/2) + b**6*n**3*x**6 +
6*b**6*n**2*x**6 + 11*b**6*n*x**6 + 6*b**6*x**6) - 10*a**4*a**n*b
2*n*x(11/2)*(1 + b*sqrt(x)/a)**n/(a**3*b**3*n**3*x**(9/2) + 6
*a**3*b**3*n**2*x**(9/2) + 11*a**3*b**3*n*x**(9/2) + 6*a**3*b**3*
x**(9/2) + 3*a**2*b**4*n**3*x**5 + 18*a**2*b**4*n**2*x**5 + 33*a*
*2*b**4*n*x**5 + 18*a**2*b**4*x**5 + 3*a*b**5*n**3*x**(11/2) + 18
*a*b**5*n**2*x**(11/2) + 33*a*b**5*n*x**(11/2) + 18*a*b**5*x**(11
/2) + b**6*n**3*x**6 + 6*b**6*n**2*x**6 + 11*b**6*n*x**6 + 6*b**6
*x**6) + 12*a**4*a**n*b**2*x**(11/2)*(1 + b*sqrt(x)/a)**n/(a**3*b
3*n3*x**(9/2) + 6*a**3*b**3*n**2*x**(9/2) + 11*a**3*b**3*n*x*
*(9/2) + 6*a**3*b**3*x**(9/2) + 3*a**2*b**4*n**3*x**5 + 18*a**2*b
4*n2*x**5 + 33*a**2*b**4*n*x**5 + 18*a**2*b**4*x**5 + 3*a*b**
5*n**3*x**(11/2) + 18*a*b**5*n**2*x**(11/2) + 33*a*b**5*n*x**(11/
2) + 18*a*b**5*x**(11/2) + b**6*n**3*x**6 + 6*b**6*n**2*x**6 + 11
*b**6*n*x**6 + 6*b**6*x**6) - 12*a**4*a**n*b**2*x**(11/2)/(a**3*b
3*n3*x**(9/2) + 6*a**3*b**3*n**2*x**(9/2) + 11*a**3*b**3*n*x*
*(9/2) + 6*a**3*b**3*x**(9/2) + 3*a**2*b**4*n**3*x**5 + 18*a**2*b
4*n2*x**5 + 33*a**2*b**4*n*x**5 + 18*a**2*b**4*x**5 + 3*a*b**
5*n**3*x**(11/2) + 18*a*b**5*n**2*x**(11/2) + 33*a*b**5*n*x**(11/
2) + 18*a*b**5*x**(11/2) + b**6*n**3*x**6 + 6*b**6*n**2*x**6 + 11
*b**6*n*x**6 + 6*b**6*x**6) + 8*a**3*a**n*b**3*n**2*x**6*(1 + b*s
qrt(x)/a)**n/(a**3*b**3*n**3*x**(9/2) + 6*a**3*b**3*n**2*x**(9/2)
+ 11*a**3*b**3*n*x**(9/2) + 6*a**3*b**3*x**(9/2) + 3*a**2*b**4*n
3*x5 + 18*a**2*b**4*n**2*x**5 + 33*a**2*b**4*n*x**5 + 18*a**2
*b**4*x**5 + 3*a*b**5*n**3*x**(11/2) + 18*a*b**5*n**2*x**(11/2) +
33*a*b**5*n*x**(11/2) + 18*a*b**5*x**(11/2) + b**6*n**3*x**6 + 6
*b**6*n**2*x**6 + 11*b**6*n*x**6 + 6*b**6*x**6) + 8*a**3*a**n*b**
3*x**6*(1 + b*sqrt(x)/a)**n/(a**3*b**3*n**3*x**(9/2) + 6*a**3*b**
3*n**2*x**(9/2) + 11*a**3*b**3*n*x**(9/2) + 6*a**3*b**3*x**(9/2)
+ 3*a**2*b**4*n**3*x**5 + 18*a**2*b**4*n**2*x**5 + 33*a**2*b**4*n
*x**5 + 18*a**2*b**4*x**5 + 3*a*b**5*n**3*x**(11/2) + 18*a*b**5*n
2*x(11/2) + 33*a*b**5*n*x**(11/2) + 18*a*b**5*x**(11/2) + b**
6*n**3*x**6 + 6*b**6*n**2*x**6 + 11*b**6*n*x**6 + 6*b**6*x**6) -
4*a**3*a**n*b**3*x**6/(a**3*b**3*n**3*x**(9/2) + 6*a**3*b**3*n**2
*x**(9/2) + 11*a**3*b**3*n*x**(9/2) + 6*a**3*b**3*x**(9/2) + 3*a*
*2*b**4*n**3*x**5 + 18*a**2*b**4*n**2*x**5 + 33*a**2*b**4*n*x**5
+ 18*a**2*b**4*x**5 + 3*a*b**5*n**3*x**(11/2) + 18*a*b**5*n**2*x*
*(11/2) + 33*a*b**5*n*x**(11/2) + 18*a*b**5*x**(11/2) + b**6*n**3
*x**6 + 6*b**6*n**2*x**6 + 11*b**6*n*x**6 + 6*b**6*x**6) + 12*a**
2*a**n*b**4*n**2*x**(13/2)*(1 + b*sqrt(x)/a)**n/(a**3*b**3*n**3*x
(9/2) + 6*a3*b**3*n**2*x**(9/2) + 11*a**3*b**3*n*x**(9/2) + 6
*a**3*b**3*x**(9/2) + 3*a**2*b**4*n**3*x**5 + 18*a**2*b**4*n**2*x
5 + 33*a2*b**4*n*x**5 + 18*a**2*b**4*x**5 + 3*a*b**5*n**3*x**
(11/2) + 18*a*b**5*n**2*x**(11/2) + 33*a*b**5*n*x**(11/2) + 18*a*
b**5*x**(11/2) + b**6*n**3*x**6 + 6*b**6*n**2*x**6 + 11*b**6*n*x*
*6 + 6*b**6*x**6) + 20*a**2*a**n*b**4*n*x**(13/2)*(1 + b*sqrt(x)/
a)**n/(a**3*b**3*n**3*x**(9/2) + 6*a**3*b**3*n**2*x**(9/2) + 11*a
3*b3*n*x**(9/2) + 6*a**3*b**3*x**(9/2) + 3*a**2*b**4*n**3*x**
5 + 18*a**2*b**4*n**2*x**5 + 33*a**2*b**4*n*x**5 + 18*a**2*b**4*x
5 + 3*a*b5*n**3*x**(11/2) + 18*a*b**5*n**2*x**(11/2) + 33*a*b
5*n*x(11/2) + 18*a*b**5*x**(11/2) + b**6*n**3*x**6 + 6*b**6*n
2*x6 + 11*b**6*n*x**6 + 6*b**6*x**6) + 12*a**2*a**n*b**4*x**(
13/2)*(1 + b*sqrt(x)/a)**n/(a**3*b**3*n**3*x**(9/2) + 6*a**3*b**3
*n**2*x**(9/2) + 11*a**3*b**3*n*x**(9/2) + 6*a**3*b**3*x**(9/2) +
3*a**2*b**4*n**3*x**5 + 18*a**2*b**4*n**2*x**5 + 33*a**2*b**4*n*
x**5 + 18*a**2*b**4*x**5 + 3*a*b**5*n**3*x**(11/2) + 18*a*b**5*n*
*2*x**(11/2) + 33*a*b**5*n*x**(11/2) + 18*a*b**5*x**(11/2) + b**6
*n**3*x**6 + 6*b**6*n**2*x**6 + 11*b**6*n*x**6 + 6*b**6*x**6) + 8

```
*a*a**n*b**5*n**2*x**7*(1 + b*sqrt(x)/a)**n/(a**3*b**3*n**3*x**(9
/2) + 6*a**3*b**3*n**2*x**(9/2) + 11*a**3*b**3*n*x**(9/2) + 6*a**
3*b**3*x**(9/2) + 3*a**2*b**4*n**3*x**5 + 18*a**2*b**4*n**2*x**5
+ 33*a**2*b**4*n*x**5 + 18*a**2*b**4*x**5 + 3*a*b**5*n**3*x**(11/
2) + 18*a*b**5*n**2*x**(11/2) + 33*a*b**5*n*x**(11/2) + 18*a*b**5
*x**(11/2) + b**6*n**3*x**6 + 6*b**6*n**2*x**6 + 11*b**6*n*x**6 +
 6*b**6*x**6) + 20*a*a**n*b**5*n*x**7*(1 + b*sqrt(x)/a)**n/(a**3*
b**3*n**3*x**(9/2) + 6*a**3*b**3*n**2*x**(9/2) + 11*a**3*b**3*n*x
**(9/2) + 6*a**3*b**3*x**(9/2) + 3*a**2*b**4*n**3*x**5 + 18*a**2*
b**4*n**2*x**5 + 33*a**2*b**4*n*x**5 + 18*a**2*b**4*x**5 + 3*a*b*
*5*n**3*x**(11/2) + 18*a*b**5*n**2*x**(11/2) + 33*a*b**5*n*x**(11
/2) + 18*a*b**5*x**(11/2) + b**6*n**3*x**6 + 6*b**6*n**2*x**6 + 1
1*b**6*n*x**6 + 6*b**6*x**6) + 12*a*a**n*b**5*x**7*(1 + b*sqrt(x)
/a)**n/(a**3*b**3*n**3*x**(9/2) + 6*a**3*b**3*n**2*x**(9/2) + 11*
a**3*b**3*n*x**(9/2) + 6*a**3*b**3*x**(9/2) + 3*a**2*b**4*n**3*x*
*5 + 18*a**2*b**4*n**2*x**5 + 33*a**2*b**4*n*x**5 + 18*a**2*b**4*
x**5 + 3*a*b**5*n**3*x**(11/2) + 18*a*b**5*n**2*x**(11/2) + 33*a*
b**5*n*x**(11/2) + 18*a*b**5*x**(11/2) + b**6*n**3*x**6 + 6*b**6*
n**2*x**6 + 11*b**6*n*x**6 + 6*b**6*x**6) + 2*a**n*b**6*n**2*x**(
15/2)*(1 + b*sqrt(x)/a)**n/(a**3*b**3*n**3*x**(9/2) + 6*a**3*b**3
*n**2*x**(9/2) + 11*a**3*b**3*n*x**(9/2) + 6*a**3*b**3*x**(9/2) +
 3*a**2*b**4*n**3*x**5 + 18*a**2*b**4*n**2*x**5 + 33*a**2*b**4*n*
x**5 + 18*a**2*b**4*x**5 + 3*a*b**5*n**3*x**(11/2) + 18*a*b**5*n*
*2*x**(11/2) + 33*a*b**5*n*x**(11/2) + 18*a*b**5*x**(11/2) + b**6
*n**3*x**6 + 6*b**6*n**2*x**6 + 11*b**6*n*x**6 + 6*b**6*x**6) + 6
*a**n*b**6*n*x**(15/2)*(1 + b*sqrt(x)/a)**n/(a**3*b**3*n**3*x**(9
/2) + 6*a**3*b**3*n**2*x**(9/2) + 11*a**3*b**3*n*x**(9/2) + 6*a**
3*b**3*x**(9/2) + 3*a**2*b**4*n**3*x**5 + 18*a**2*b**4*n**2*x**5
+ 33*a**2*b**4*n*x**5 + 18*a**2*b**4*x**5 + 3*a*b**5*n**3*x**(11/
2) + 18*a*b**5*n**2*x**(11/2) + 33*a*b**5*n*x**(11/2) + 18*a*b**5
*x**(11/2) + b**6*n**3*x**6 + 6*b**6*n**2*x**6 + 11*b**6*n*x**6 +
 6*b**6*x**6) + 4*a**n*b**6*x**(15/2)*(1 + b*sqrt(x)/a)**n/(a**3*
b**3*n**3*x**(9/2) + 6*a**3*b**3*n**2*x**(9/2) + 11*a**3*b**3*n*x
**(9/2) + 6*a**3*b**3*x**(9/2) + 3*a**2*b**4*n**3*x**5 + 18*a**2*
b**4*n**2*x**5 + 33*a**2*b**4*n*x**5 + 18*a**2*b**4*x**5 + 3*a*b*
*5*n**3*x**(11/2) + 18*a*b**5*n**2*x**(11/2) + 33*a*b**5*n*x**(11
/2) + 18*a*b**5*x**(11/2) + b**6*n**3*x**6 + 6*b**6*n**2*x**6 + 1
1*b**6*n*x**6 + 6*b**6*x**6)
```

GIAC/XCAS [A] time = 0.229719, size = 336, normalized size = 4.54

$$\frac{2\left(\left(b\sqrt{x}+a\right)^{3}n^{2}e^{\left(n\ln\left(b\sqrt{x}+a\right)\right)}-2\left(b\sqrt{x}+a\right)^{2}an^{2}e^{\left(n\ln\left(b\sqrt{x}+a\right)\right)}+\left(b\sqrt{x}+a\right)a^{2}n^{2}e^{\left(n\ln\left(b\sqrt{x}+a\right)\right)}+3\left(b\sqrt{x}+a\right)^{3}ne^{\left(n\ln\left(b\sqrt{x}+a\right)\right)} \dots}{(b \dots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^n*sqrt(x),x, algorithm="giac")
```

```
[Out] 2*((b*sqrt(x) + a)^3*n^2*e^(n*ln(b*sqrt(x) + a)) - 2*(b*sqrt(x) +
 a)^2*a*n^2*e^(n*ln(b*sqrt(x) + a)) + (b*sqrt(x) + a)*a^2*n^2*e^(
n*ln(b*sqrt(x) + a)) + 3*(b*sqrt(x) + a)^3*n*e^(n*ln(b*sqrt(x) +
a)) - 8*(b*sqrt(x) + a)^2*a*n*e^(n*ln(b*sqrt(x) + a)) + 5*(b*sqrt
(x) + a)*a^2*n*e^(n*ln(b*sqrt(x) + a)) + 2*(b*sqrt(x) + a)^3*e^(n
*ln(b*sqrt(x) + a)) - 6*(b*sqrt(x) + a)^2*a*e^(n*ln(b*sqrt(x) + a
)) + 6*(b*sqrt(x) + a)*a^2*e^(n*ln(b*sqrt(x) + a)))/((b^2*n^3 + 6
*b^2*n^2 + 11*b^2*n + 6*b^2)*b)
```

3.2244 $\int \frac{\left(a+b\sqrt{x}\right)^n}{\sqrt{x}}\,dx$

Optimal. Leaf size=23

$$\frac{2\left(a+b\sqrt{x}\right)^{n+1}}{b(n+1)}$$

```
[Out] (2*(a + b*Sqrt[x])^(1 + n))/(b*(1 + n))
```

Rubi [A] time = 0.0208757, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.059

$$\frac{2\left(a+b\sqrt{x}\right)^{n+1}}{b(n+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^n/Sqrt[x],x]
```

```
[Out] (2*(a + b*Sqrt[x])^(1 + n))/(b*(1 + n))
```

Rubi in Sympy [A] time = 2.64388, size = 17, normalized size = 0.74

$$\frac{2\left(a+b\sqrt{x}\right)^{n+1}}{b\,(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**n/x**(1/2),x)
```

```
[Out] 2*(a + b*sqrt(x))**(n + 1)/(b*(n + 1))
```

Mathematica [A] time = 0.0139538, size = 23, normalized size = 1.

$$\frac{2\left(a+b\sqrt{x}\right)^{n+1}}{b(n+1)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^n/Sqrt[x],x]
```

```
[Out] (2*(a + b*Sqrt[x])^(1 + n))/(b*(1 + n))
```

Maple [A] time = 0.005, size = 22, normalized size = 1.

$$2\,\frac{\left(a+b\sqrt{x}\right)^{1+n}}{b\,(1+n)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^n/x^(1/2),x)
```

```
[Out] 2*(a+b*x^(1/2))^(1+n)/b/(1+n)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^n/sqrt(x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.276852, size = 34, normalized size = 1.48

$$\frac{2\left(b\sqrt{x}+a\right)\left(b\sqrt{x}+a\right)^{n}}{bn+b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^n/sqrt(x),x, algorithm="fricas")
```

```
[Out] 2*(b*sqrt(x) + a)*(b*sqrt(x) + a)^n/(b*n + b)
```

Sympy [A] time = 4.74355, size = 51, normalized size = 2.22

$$\frac{2aa^{n}\left(1+\frac{b\sqrt{x}}{a}\right)^{n}}{bn+b}+\frac{2a^{n}b\sqrt{x}\left(1+\frac{b\sqrt{x}}{a}\right)^{n}}{bn+b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**n/x**(1/2),x)
```

```
[Out] 2*a*a**n*(1 + b*sqrt(x)/a)**n/(b*n + b) + 2*a**n*b*sqrt(x)*(1 + b
*sqrt(x)/a)**n/(b*n + b)
```

GIAC/XCAS [A] time = 0.217978, size = 28, normalized size = 1.22

$$\frac{2\left(b\sqrt{x}+a\right)^{n+1}}{b(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^n/sqrt(x),x, algorithm="giac")
```

```
[Out] 2*(b*sqrt(x) + a)^(n + 1)/(b*(n + 1))
```

3.2245 $\int \frac{1+\sqrt{x}}{\sqrt{x}}\,dx$

Optimal. Leaf size=9

$$x + 2\sqrt{x}$$

```
[Out] 2*Sqrt[x] + x
```

Rubi [A] time = 0.0093867, antiderivative size = 9, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$x + 2\sqrt{x}$$

Antiderivative was successfully verified.

```
[In]  Int[(1 + Sqrt[x])/Sqrt[x],x]

[Out] 2*Sqrt[x] + x
```

Rubi in Sympy [A] time = 2.06847, size = 7, normalized size = 0.78

$$2\sqrt{x} + x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((1+x**(1/2))/x**(1/2),x)

[Out] 2*sqrt(x) + x
```

Mathematica [A] time = 0.00242195, size = 9, normalized size = 1.

$$x + 2\sqrt{x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(1 + Sqrt[x])/Sqrt[x],x]

[Out] 2*Sqrt[x] + x
```

Maple [A] time = 0.001, size = 8, normalized size = 0.9

$$x + 2\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((1+x^(1/2))/x^(1/2),x)

[Out] x+2*x^(1/2)
```

Maxima [A] time = 1.43398, size = 9, normalized size = 1.

$$\left(\sqrt{x}+1\right)^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((sqrt(x) + 1)/sqrt(x),x, algorithm="maxima")
```

```
[Out] (sqrt(x) + 1)^2
```

Fricas [A] time = 0.237127, size = 9, normalized size = 1.

$$x+2\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((sqrt(x) + 1)/sqrt(x),x, algorithm="fricas")
```

```
[Out] x + 2*sqrt(x)
```

Sympy [A] time = 0.313056, size = 7, normalized size = 0.78

$$2\sqrt{x}+x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((1+x**(1/2))/x**(1/2),x)
```

```
[Out] 2*sqrt(x) + x
```

GIAC/XCAS [A] time = 0.214832, size = 9, normalized size = 1.

$$x+2\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((sqrt(x) + 1)/sqrt(x),x, algorithm="giac")
```

```
[Out] x + 2*sqrt(x)
```

3.2246 $\int \frac{(1+\sqrt{x})^2}{\sqrt{x}}\,dx$

Optimal. Leaf size=13

$$\frac{2}{3}\left(\sqrt{x}+1\right)^3$$

```
[Out] (2*(1 + Sqrt[x])^3)/3
```

Rubi [A] time = 0.0103076, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{2}{3}\left(\sqrt{x}+1\right)^3$$

Antiderivative was successfully verified.

```
[In]  Int[(1 + Sqrt[x])^2/Sqrt[x],x]

[Out] (2*(1 + Sqrt[x])^3)/3
```

Rubi in Sympy [A] time = 1.66702, size = 10, normalized size = 0.77

$$\frac{2\left(\sqrt{x}+1\right)^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((1+x**(1/2))**2/x**(1/2),x)

[Out] 2*(sqrt(x) + 1)**3/3
```

Mathematica [A] time = 0.0037662, size = 20, normalized size = 1.54

$$\frac{2x^{3/2}}{3}+2x+2\sqrt{x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(1 + Sqrt[x])^2/Sqrt[x],x]

[Out] 2*Sqrt[x] + 2*x + (2*x^(3/2))/3
```

Maple [A] time = 0.003, size = 15, normalized size = 1.2

$$\frac{2}{3}x^{\frac{3}{2}}+2\,x+2\,\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((1+x^(1/2))^2/x^(1/2),x)

[Out] 2/3*x^(3/2)+2*x+2*x^(1/2)
```

Maxima [A] time = 1.43368, size = 12, normalized size = 0.92

$$\frac{2}{3}\left(\sqrt{x}+1\right)^{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((sqrt(x) + 1)^2/sqrt(x),x, algorithm="maxima")
```

```
[Out] 2/3*(sqrt(x) + 1)^3
```

Fricas [A] time = 0.235999, size = 16, normalized size = 1.23

$$\frac{2}{3}(x+3)\sqrt{x}+2x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((sqrt(x) + 1)^2/sqrt(x),x, algorithm="fricas")
```

```
[Out] 2/3*(x + 3)*sqrt(x) + 2*x
```

Sympy [A] time = 0.328288, size = 17, normalized size = 1.31

$$\frac{2x^{\frac{3}{2}}}{3}+2\sqrt{x}+2x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((1+x**(1/2))**2/x**(1/2),x)
```

```
[Out] 2*x**(3/2)/3 + 2*sqrt(x) + 2*x
```

GIAC/XCAS [A] time = 0.257539, size = 19, normalized size = 1.46

$$\frac{2}{3}x^{\frac{3}{2}}+2x+2\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((sqrt(x) + 1)^2/sqrt(x),x, algorithm="giac")
```

```
[Out] 2/3*x^(3/2) + 2*x + 2*sqrt(x)
```

3.2247 $\int \frac{(1+\sqrt{x})^3}{\sqrt{x}}\,dx$

Optimal. Leaf size=13

$$\frac{1}{2}\left(\sqrt{x}+1\right)^4$$

```
[Out] (1 + Sqrt[x])^4/2
```

Rubi [A] time = 0.0101607, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{1}{2}\left(\sqrt{x}+1\right)^4$$

Antiderivative was successfully verified.

```
[In] Int[(1 + Sqrt[x])^3/Sqrt[x],x]

[Out] (1 + Sqrt[x])^4/2
```

Rubi in Sympy [A] time = 1.66345, size = 8, normalized size = 0.62

$$\frac{\left(\sqrt{x}+1\right)^4}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((1+x**(1/2))**3/x**(1/2),x)

[Out] (sqrt(x) + 1)**4/2
```

Mathematica [A] time = 0.0068166, size = 25, normalized size = 1.92

$$2x^{3/2}+\frac{x^2}{2}+3x+2\sqrt{x}$$

Antiderivative was successfully verified.

```
[In] Integrate[(1 + Sqrt[x])^3/Sqrt[x],x]

[Out] 2*Sqrt[x] + 3*x + 2*x^(3/2) + x^2/2
```

Maple [B] time = 0.002, size = 20, normalized size = 1.5

$$\frac{x^2}{2}+2\,x^{3/2}+3\,x+2\,\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1+x^(1/2))^3/x^(1/2),x)

[Out] 1/2*x^2+2*x^(3/2)+3*x+2*x^(1/2)
```

Maxima [A] time = 1.4351, size = 12, normalized size = 0.92

$$\frac{1}{2}\left(\sqrt{x}+1\right)^{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((sqrt(x) + 1)^3/sqrt(x),x, algorithm="maxima")
```

```
[Out] 1/2*(sqrt(x) + 1)^4
```

Fricas [A] time = 0.236769, size = 23, normalized size = 1.77

$$\frac{1}{2}x^{2}+2\,(x+1)\sqrt{x}+3\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((sqrt(x) + 1)^3/sqrt(x),x, algorithm="fricas")
```

```
[Out] 1/2*x^2 + 2*(x + 1)*sqrt(x) + 3*x
```

Sympy [A] time = 0.445511, size = 20, normalized size = 1.54

$$2x^{\frac{3}{2}}+2\sqrt{x}+\frac{x^{2}}{2}+3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((1+x**(1/2))**3/x**(1/2),x)
```

```
[Out] 2*x**(3/2) + 2*sqrt(x) + x**2/2 + 3*x
```

GIAC/XCAS [A] time = 0.242263, size = 26, normalized size = 2.

$$\frac{1}{2}x^{2}+2\,x^{\frac{3}{2}}+3\,x+2\,\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((sqrt(x) + 1)^3/sqrt(x),x, algorithm="giac")
```

```
[Out] 1/2*x^2 + 2*x^(3/2) + 3*x + 2*sqrt(x)
```

3.2248 $\int \frac{\sqrt{x}}{1+\sqrt{x}}\,dx$

Optimal. Leaf size=19

$$x-2\sqrt{x}+2\log\left(\sqrt{x}+1\right)$$

```
[Out] -2*Sqrt[x] + x + 2*Log[1 + Sqrt[x]]
```

Rubi [A] time = 0.028977, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$x-2\sqrt{x}+2\log\left(\sqrt{x}+1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[x]/(1 + Sqrt[x]),x]

[Out] -2*Sqrt[x] + x + 2*Log[1 + Sqrt[x]]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-2\sqrt{x}+2\log\left(\sqrt{x}+1\right)+2\int^{\sqrt{x}} x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(1/2)/(1+x**(1/2)),x)

[Out] -2*sqrt(x) + 2*log(sqrt(x) + 1) + 2*Integral(x, (x, sqrt(x)))
```

Mathematica [A] time = 0.00637374, size = 19, normalized size = 1.

$$x-2\sqrt{x}+2\log\left(\sqrt{x}+1\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[x]/(1 + Sqrt[x]),x]

[Out] -2*Sqrt[x] + x + 2*Log[1 + Sqrt[x]]
```

Maple [A] time = 0.003, size = 16, normalized size = 0.8

$$x+2\ln\left(1+\sqrt{x}\right)-2\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(1/2)/(1+x^(1/2)),x)

[Out] x+2*ln(1+x^(1/2))-2*x^(1/2)
```

Maxima [A] time = 1.44349, size = 30, normalized size = 1.58

$$\left(\sqrt{x}+1\right)^{2}-4\sqrt{x}+2\log\left(\sqrt{x}+1\right)-4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(sqrt(x) + 1),x, algorithm="maxima")

[Out] (sqrt(x) + 1)^2 - 4*sqrt(x) + 2*log(sqrt(x) + 1) - 4
```

Fricas [A] time = 0.235673, size = 20, normalized size = 1.05

$$x-2\sqrt{x}+2\log\left(\sqrt{x}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(sqrt(x) + 1),x, algorithm="fricas")

[Out] x - 2*sqrt(x) + 2*log(sqrt(x) + 1)
```

Sympy [A] time = 0.328301, size = 17, normalized size = 0.89

$$-2\sqrt{x}+x+2\log\left(\sqrt{x}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(1/2)/(1+x**(1/2)),x)

[Out] -2*sqrt(x) + x + 2*log(sqrt(x) + 1)
```

GIAC/XCAS [A] time = 0.257443, size = 20, normalized size = 1.05

$$x-2\sqrt{x}+2\ln\left(\sqrt{x}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(sqrt(x) + 1),x, algorithm="giac")

[Out] x - 2*sqrt(x) + 2*ln(sqrt(x) + 1)
```

3.2249 $\int \frac{1}{(1+\sqrt{x})\sqrt{x}}\,dx$

Optimal. Leaf size=10

$$2\log\left(\sqrt{x}+1\right)$$

```
[Out] 2*Log[1 + Sqrt[x]]
```

Rubi [A] time = 0.0107821, antiderivative size = 10, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$2\log\left(\sqrt{x}+1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/((1 + Sqrt[x])*Sqrt[x]),x]

[Out] 2*Log[1 + Sqrt[x]]
```

Rubi in Sympy [A] time = 1.70002, size = 8, normalized size = 0.8

$$2\log\left(\sqrt{x}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**(1/2)/(1+x**(1/2)),x)

[Out] 2*log(sqrt(x) + 1)
```

Mathematica [A] time = 0.00251891, size = 10, normalized size = 1.

$$2\log\left(\sqrt{x}+1\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((1 + Sqrt[x])*Sqrt[x]),x]

[Out] 2*Log[1 + Sqrt[x]]
```

Maple [A] time = 0.003, size = 9, normalized size = 0.9

$$2\ln\left(1+\sqrt{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^(1/2)/(1+x^(1/2)),x)

[Out] 2*ln(1+x^(1/2))
```

Maxima [A] time = 1.4368, size = 11, normalized size = 1.1

$$2\log\left(\sqrt{x}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x)*(sqrt(x) + 1)),x, algorithm="maxima")
```

```
[Out] 2*log(sqrt(x) + 1)
```

Fricas [A] time = 0.238383, size = 11, normalized size = 1.1

$$2 \log \left(\sqrt{x} + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x)*(sqrt(x) + 1)),x, algorithm="fricas")
```

```
[Out] 2*log(sqrt(x) + 1)
```

Sympy [A] time = 0.347851, size = 8, normalized size = 0.8

$$2 \log \left(\sqrt{x} + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**(1/2)/(1+x**(1/2)),x)
```

```
[Out] 2*log(sqrt(x) + 1)
```

GIAC/XCAS [A] time = 0.234345, size = 11, normalized size = 1.1

$$2 \ln \left(\sqrt{x} + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x)*(sqrt(x) + 1)),x, algorithm="giac")
```

```
[Out] 2*ln(sqrt(x) + 1)
```

3.2250 $\int \frac{1}{\left(1+\sqrt{x}\right)^2\sqrt{x}}\,dx$

Optimal. Leaf size=11

$$-\frac{2}{\sqrt{x}+1}$$

```
[Out] -2/(1 + Sqrt[x])
```

Rubi [A] time = 0.0106922, antiderivative size = 11, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$-\frac{2}{\sqrt{x}+1}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((1 + Sqrt[x])^2*Sqrt[x]),x]

[Out] -2/(1 + Sqrt[x])
```

Rubi in Sympy [A] time = 1.72704, size = 8, normalized size = 0.73

$$-\frac{2}{\sqrt{x}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**(1/2)/(1+x**(1/2))**2,x)

[Out] -2/(sqrt(x) + 1)
```

Mathematica [A] time = 0.00338574, size = 11, normalized size = 1.

$$-\frac{2}{\sqrt{x}+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((1 + Sqrt[x])^2*Sqrt[x]),x]

[Out] -2/(1 + Sqrt[x])
```

Maple [A] time = 0.001, size = 10, normalized size = 0.9

$$-2\left(1+\sqrt{x}\right)^{-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^(1/2)/(1+x^(1/2))^2,x)

[Out] -2/(1+x^(1/2))
```

Maxima [A] time = 1.41589, size = 12, normalized size = 1.09

$$-\frac{2}{\sqrt{x}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x)*(sqrt(x) + 1)^2),x, algorithm="maxima")
```

```
[Out] -2/(sqrt(x) + 1)
```

Fricas [A] time = 0.233853, size = 12, normalized size = 1.09

$$-\frac{2}{\sqrt{x}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x)*(sqrt(x) + 1)^2),x, algorithm="fricas")
```

```
[Out] -2/(sqrt(x) + 1)
```

Sympy [A] time = 1.40201, size = 8, normalized size = 0.73

$$-\frac{2}{\sqrt{x}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**(1/2)/(1+x**(1/2))**2,x)
```

```
[Out] -2/(sqrt(x) + 1)
```

GIAC/XCAS [A] time = 0.248497, size = 12, normalized size = 1.09

$$-\frac{2}{\sqrt{x}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x)*(sqrt(x) + 1)^2),x, algorithm="giac")
```

```
[Out] -2/(sqrt(x) + 1)
```

3.2251 $\int \frac{1}{\left(1+\sqrt{x}\right)^3\sqrt{x}}\,dx$

Optimal. Leaf size=11

$$-\frac{1}{\left(\sqrt{x}+1\right)^2}$$

```
[Out] -(1 + Sqrt[x])^(-2)
```

Rubi [A] time = 0.0103994, antiderivative size = 11, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{1}{\left(\sqrt{x}+1\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((1 + Sqrt[x])^3*Sqrt[x]),x]

[Out] -(1 + Sqrt[x])^(-2)
```

Rubi in Sympy [A] time = 1.68544, size = 10, normalized size = 0.91

$$-\frac{1}{\left(\sqrt{x}+1\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**(1/2)/(1+x**(1/2))**3,x)

[Out] -1/(sqrt(x) + 1)**2
```

Mathematica [A] time = 0.00371788, size = 11, normalized size = 1.

$$-\frac{1}{\left(\sqrt{x}+1\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((1 + Sqrt[x])^3*Sqrt[x]),x]

[Out] -(1 + Sqrt[x])^(-2)
```

Maple [A] time = 0.002, size = 10, normalized size = 0.9

$$-\left(1+\sqrt{x}\right)^{-2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^(1/2)/(1+x^(1/2))^3,x)

[Out] -1/(1+x^(1/2))^2
```

Maxima [A] time = 1.44626, size = 12, normalized size = 1.09

$$-\frac{1}{\left(\sqrt{x}+1\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x)*(sqrt(x) + 1)^3),x, algorithm="maxima")
```

```
[Out] -1/(sqrt(x) + 1)^2
```

Fricas [A] time = 0.233711, size = 16, normalized size = 1.45

$$-\frac{1}{x+2\sqrt{x}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x)*(sqrt(x) + 1)^3),x, algorithm="fricas")
```

```
[Out] -1/(x + 2*sqrt(x) + 1)
```

Sympy [A] time = 1.70747, size = 12, normalized size = 1.09

$$-\frac{1}{2\sqrt{x}+x+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**(1/2)/(1+x**(1/2))**3,x)
```

```
[Out] -1/(2*sqrt(x) + x + 1)
```

GIAC/XCAS [A] time = 0.24483, size = 12, normalized size = 1.09

$$-\frac{1}{\left(\sqrt{x}+1\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x)*(sqrt(x) + 1)^3),x, algorithm="giac")
```

```
[Out] -1/(sqrt(x) + 1)^2
```

3.2252 $\int \sqrt{1+\sqrt{x}}\sqrt{x}\,dx$

Optimal. Leaf size=46

$$\frac{4}{7}\left(\sqrt{x}+1\right)^{7/2}-\frac{8}{5}\left(\sqrt{x}+1\right)^{5/2}+\frac{4}{3}\left(\sqrt{x}+1\right)^{3/2}$$

```
[Out] (4*(1 + Sqrt[x])^(3/2))/3 - (8*(1 + Sqrt[x])^(5/2))/5 + (4*(1 + S
qrt[x])^(7/2))/7
```

Rubi [A] time = 0.035224, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{4}{7}\left(\sqrt{x}+1\right)^{7/2}-\frac{8}{5}\left(\sqrt{x}+1\right)^{5/2}+\frac{4}{3}\left(\sqrt{x}+1\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[1 + Sqrt[x]]*Sqrt[x],x]
```

```
[Out] (4*(1 + Sqrt[x])^(3/2))/3 - (8*(1 + Sqrt[x])^(5/2))/5 + (4*(1 + S
qrt[x])^(7/2))/7
```

Rubi in Sympy [A] time = 4.32721, size = 39, normalized size = 0.85

$$\frac{4\left(\sqrt{x}+1\right)^{\frac{7}{2}}}{7}-\frac{8\left(\sqrt{x}+1\right)^{\frac{5}{2}}}{5}+\frac{4\left(\sqrt{x}+1\right)^{\frac{3}{2}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(1/2)*(1+x**(1/2))**(1/2),x)
```

```
[Out] 4*(sqrt(x) + 1)**(7/2)/7 - 8*(sqrt(x) + 1)**(5/2)/5 + 4*(sqrt(x)
+ 1)**(3/2)/3
```

Mathematica [A] time = 0.0134588, size = 34, normalized size = 0.74

$$\frac{4}{105}\sqrt{\sqrt{x}+1}\left(15x^{3/2}+3x-4\sqrt{x}+8\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[1 + Sqrt[x]]*Sqrt[x],x]
```

```
[Out] (4*Sqrt[1 + Sqrt[x]]*(8 - 4*Sqrt[x] + 3*x + 15*x^(3/2)))/105
```

Maple [A] time = 0.007, size = 29, normalized size = 0.6

$$\frac{4}{3}\left(1+\sqrt{x}\right)^{\frac{3}{2}}-\frac{8}{5}\left(1+\sqrt{x}\right)^{\frac{5}{2}}+\frac{4}{7}\left(1+\sqrt{x}\right)^{\frac{7}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(1/2)*(1+x^(1/2))^(1/2),x)
```

```
[Out] 4/3*(1+x^(1/2))^(3/2)-8/5*(1+x^(1/2))^(5/2)+4/7*(1+x^(1/2))^(7/2)
```

Maxima [A] time = 1.46878, size = 38, normalized size = 0.83

$$\frac{4}{7}\left(\sqrt{x}+1\right)^{\frac{7}{2}}-\frac{8}{5}\left(\sqrt{x}+1\right)^{\frac{5}{2}}+\frac{4}{3}\left(\sqrt{x}+1\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)*sqrt(sqrt(x) + 1),x, algorithm="maxima")
```

```
[Out] 4/7*(sqrt(x) + 1)^(7/2) - 8/5*(sqrt(x) + 1)^(5/2) + 4/3*(sqrt(x)
+ 1)^(3/2)
```

Fricas [A] time = 0.241923, size = 31, normalized size = 0.67

$$\frac{4}{105}\left((15\,x-4)\sqrt{x}+3\,x+8\right)\sqrt{\sqrt{x}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)*sqrt(sqrt(x) + 1),x, algorithm="fricas")
```

```
[Out] 4/105*((15*x - 4)*sqrt(x) + 3*x + 8)*sqrt(sqrt(x) + 1)
```

Sympy [A] time = 4.35294, size = 398, normalized size = 8.65

$$\frac{60x^{\frac{15}{2}}\sqrt{\sqrt{x}+1}}{315x^{\frac{11}{2}}+105x^{\frac{9}{2}}+105x^{6}+315x^{5}}+\frac{200x^{\frac{13}{2}}\sqrt{\sqrt{x}+1}}{315x^{\frac{11}{2}}+105x^{\frac{9}{2}}+105x^{6}+315x^{5}}+\frac{60x^{\frac{11}{2}}\sqrt{\sqrt{x}+1}}{315x^{\frac{11}{2}}+105x^{\frac{9}{2}}+105x^{6}+315x^{5}}-\frac{96x^{\frac{11}{2}}}{315x^{\frac{11}{2}}+105x^{\frac{9}{2}}+105x^{6}+315x^{5}}+\frac{32x^{\frac{9}{2}}\sqrt{\sqrt{x}+1}}{315x^{\frac{11}{2}}+105x^{\frac{9}{2}}+105x^{6}+315x^{5}}-\frac{32x^{\frac{9}{2}}}{315x^{\frac{11}{2}}+105x^{\frac{9}{2}}+105x^{6}+315x^{5}}+\frac{192x^{7}\sqrt{\sqrt{x}+1}}{315x^{\frac{11}{2}}+105x^{\frac{9}{2}}+105x^{6}+315x^{5}}+\frac{80x^{6}\sqrt{\sqrt{x}+1}}{315x^{\frac{11}{2}}+105x^{\frac{9}{2}}+105x^{6}+315x^{5}}-\frac{32x^{6}}{315x^{\frac{11}{2}}+105x^{\frac{9}{2}}+105x^{6}+315x^{5}}+\frac{80x^{5}\sqrt{\sqrt{x}+1}}{315x^{\frac{11}{2}}+105x^{\frac{9}{2}}+105x^{6}+315x^{5}}-\frac{96x^{5}}{315x^{\frac{11}{2}}+105x^{\frac{9}{2}}+105x^{6}+315x^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(1/2)*(1+x**(1/2))**(1/2),x)
```

```
[Out] 60*x**(15/2)*sqrt(sqrt(x) + 1)/(315*x**(11/2) + 105*x**(9/2) + 10
5*x**6 + 315*x**5) + 200*x**(13/2)*sqrt(sqrt(x) + 1)/(315*x**(11/
2) + 105*x**(9/2) + 105*x**6 + 315*x**5) + 60*x**(11/2)*sqrt(sqrt
(x) + 1)/(315*x**(11/2) + 105*x**(9/2) + 105*x**6 + 315*x**5) - 9
6*x**(11/2)/(315*x**(11/2) + 105*x**(9/2) + 105*x**6 + 315*x**5)
+ 32*x**(9/2)*sqrt(sqrt(x) + 1)/(315*x**(11/2) + 105*x**(9/2) + 1
05*x**6 + 315*x**5) - 32*x**(9/2)/(315*x**(11/2) + 105*x**(9/2) +
 105*x**6 + 315*x**5) + 192*x**7*sqrt(sqrt(x) + 1)/(315*x**(11/2)
 + 105*x**(9/2) + 105*x**6 + 315*x**5) + 80*x**6*sqrt(sqrt(x) + 1
)/(315*x**(11/2) + 105*x**(9/2) + 105*x**6 + 315*x**5) - 32*x**6/
(315*x**(11/2) + 105*x**(9/2) + 105*x**6 + 315*x**5) + 80*x**5*sq
rt(sqrt(x) + 1)/(315*x**(11/2) + 105*x**(9/2) + 105*x**6 + 315*x*
*5) - 96*x**5/(315*x**(11/2) + 105*x**(9/2) + 105*x**6 + 315*x**5
```

)

GIAC/XCAS [A] time = 0.27152, size = 38, normalized size = 0.83

$$\frac{4}{7}\left(\sqrt{x}+1\right)^{\frac{7}{2}}-\frac{8}{5}\left(\sqrt{x}+1\right)^{\frac{5}{2}}+\frac{4}{3}\left(\sqrt{x}+1\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)*sqrt(sqrt(x) + 1),x, algorithm="giac")
```

```
[Out] 4/7*(sqrt(x) + 1)^(7/2) - 8/5*(sqrt(x) + 1)^(5/2) + 4/3*(sqrt(x)
+ 1)^(3/2)
```

3.2253 $\int \frac{\sqrt{1+\sqrt{x}}}{\sqrt{x}} \, dx$

Optimal. Leaf size=15

$$\frac{4}{3}\left(\sqrt{x}+1\right)^{3/2}$$

```
[Out] (4*(1 + Sqrt[x])^(3/2))/3
```

Rubi [A] time = 0.0115843, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.059

$$\frac{4}{3}\left(\sqrt{x}+1\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[1 + Sqrt[x]]/Sqrt[x],x]

[Out] (4*(1 + Sqrt[x])^(3/2))/3
```

Rubi in Sympy [A] time = 1.68515, size = 12, normalized size = 0.8

$$\frac{4\left(\sqrt{x}+1\right)^{\frac{3}{2}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((1+x**(1/2))**(1/2)/x**(1/2),x)

[Out] 4*(sqrt(x) + 1)**(3/2)/3
```

Mathematica [A] time = 0.00515461, size = 15, normalized size = 1.

$$\frac{4}{3}\left(\sqrt{x}+1\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[1 + Sqrt[x]]/Sqrt[x],x]

[Out] (4*(1 + Sqrt[x])^(3/2))/3
```

Maple [A] time = 0.003, size = 10, normalized size = 0.7

$$\frac{4}{3}\left(1+\sqrt{x}\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((1+x^(1/2))^(1/2)/x^(1/2),x)

[Out] 4/3*(1+x^(1/2))^(3/2)
```

Maxima [A] time = 1.42043, size = 12, normalized size = 0.8

$$\frac{4}{3} \left(\sqrt{x} + 1\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(x) + 1)/sqrt(x),x, algorithm="maxima")

[Out] 4/3*(sqrt(x) + 1)^(3/2)
```

Fricas [A] time = 0.24265, size = 12, normalized size = 0.8

$$\frac{4}{3} \left(\sqrt{x} + 1\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(x) + 1)/sqrt(x),x, algorithm="fricas")

[Out] 4/3*(sqrt(x) + 1)^(3/2)
```

Sympy [A] time = 0.500026, size = 31, normalized size = 2.07

$$\frac{4\sqrt{x}\sqrt{\sqrt{x} + 1}}{3} + \frac{4\sqrt{\sqrt{x} + 1}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((1+x**(1/2))**(1/2)/x**(1/2),x)

[Out] 4*sqrt(x)*sqrt(sqrt(x) + 1)/3 + 4*sqrt(sqrt(x) + 1)/3
```

GIAC/XCAS [A] time = 0.223076, size = 12, normalized size = 0.8

$$\frac{4}{3} \left(\sqrt{x} + 1\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(x) + 1)/sqrt(x),x, algorithm="giac")

[Out] 4/3*(sqrt(x) + 1)^(3/2)
```

3.2254 $\int \frac{\sqrt[3]{x}}{1+\sqrt{x}}\,dx$

Optimal. Leaf size=58

$$\frac{6x^{5/6}}{5}-3\sqrt[3]{x}-3\log\left(\sqrt[6]{x}+1\right)+\log\left(\sqrt{x}+1\right)-2\sqrt{3}\tan^{-1}\left(\frac{1-2\sqrt[6]{x}}{\sqrt{3}}\right)$$

```
[Out] -3*x^(1/3) + (6*x^(5/6))/5 - 2*Sqrt[3]*ArcTan[(1 - 2*x^(1/6))/Sqr
t[3]] - 3*Log[1 + x^(1/6)] + Log[1 + Sqrt[x]]
```

Rubi [A] time = 0.0787792, antiderivative size = 58, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$\frac{6x^{5/6}}{5}-3\sqrt[3]{x}-3\log\left(\sqrt[6]{x}+1\right)+\log\left(\sqrt{x}+1\right)-2\sqrt{3}\tan^{-1}\left(\frac{1-2\sqrt[6]{x}}{\sqrt{3}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^(1/3)/(1 + Sqrt[x]),x]
```

```
[Out] -3*x^(1/3) + (6*x^(5/6))/5 - 2*Sqrt[3]*ArcTan[(1 - 2*x^(1/6))/Sqr
t[3]] - 3*Log[1 + x^(1/6)] + Log[1 + Sqrt[x]]
```

Rubi in Sympy [A] time = 5.89322, size = 58, normalized size = 1.

$$\frac{6x^{\frac{5}{6}}}{5}-3\sqrt[3]{x}-3\log\left(\sqrt[6]{x}+1\right)+\log\left(\sqrt{x}+1\right)+2\sqrt{3}\,\mathrm{atan}\left(\sqrt{3}\left(\frac{2\sqrt[6]{x}}{3}-\frac{1}{3}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(1/3)/(1+x**(1/2)),x)
```

```
[Out] 6*x**(5/6)/5 - 3*x**(1/3) - 3*log(x**(1/6) + 1) + log(sqrt(x) + 1
) + 2*sqrt(3)*atan(sqrt(3)*(2*x**(1/6)/3 - 1/3))
```

Mathematica [A] time = 0.027125, size = 65, normalized size = 1.12

$$\frac{6x^{5/6}}{5}-3\sqrt[3]{x}-2\log\left(\sqrt[6]{x}+1\right)+\log\left(\sqrt[3]{x}-\sqrt[6]{x}+1\right)+2\sqrt{3}\tan^{-1}\left(\frac{2\sqrt[6]{x}-1}{\sqrt{3}}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(1/3)/(1 + Sqrt[x]),x]
```

```
[Out] -3*x^(1/3) + (6*x^(5/6))/5 + 2*Sqrt[3]*ArcTan[(-1 + 2*x^(1/6))/Sq
rt[3]] - 2*Log[1 + x^(1/6)] + Log[1 - x^(1/6) + x^(1/3)]
```

Maple [A] time = 0.007, size = 49, normalized size = 0.8

$$\frac{6}{5}x^{\frac{5}{6}}-3\sqrt[3]{x}+\ln\left(\sqrt[3]{x}-\sqrt[6]{x}+1\right)+2\sqrt{3}\arctan\left(1/3\left(2\sqrt[6]{x}-1\right)\sqrt{3}\right)-2\ln\left(1+\sqrt[6]{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(1/3)/(1+x^(1/2)),x)
```

```
[Out] 6/5*x^(5/6)-3*x^(1/3)+ln(x^(1/3)-x^(1/6)+1)+2*3^(1/2)*arctan(1/3*
(2*x^(1/6)-1)*3^(1/2))-2*ln(1+x^(1/6))
```

Maxima [A] time = 1.57992, size = 65, normalized size = 1.12

$$2\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}\left(2x^{\frac{1}{6}}-1\right)\right)+\frac{6}{5}x^{\frac{5}{6}}-3x^{\frac{1}{3}}+\log\left(x^{\frac{1}{3}}-x^{\frac{1}{6}}+1\right)-2\log\left(x^{\frac{1}{6}}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(1/3)/(sqrt(x) + 1),x, algorithm="maxima")
```

```
[Out] 2*sqrt(3)*arctan(1/3*sqrt(3)*(2*x^(1/6) - 1)) + 6/5*x^(5/6) - 3*x
^(1/3) + log(x^(1/3) - x^(1/6) + 1) - 2*log(x^(1/6) + 1)
```

Fricas [A] time = 0.254115, size = 65, normalized size = 1.12

$$2\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}\left(2x^{\frac{1}{6}}-1\right)\right)+\frac{6}{5}x^{\frac{5}{6}}-3x^{\frac{1}{3}}+\log\left(x^{\frac{1}{3}}-x^{\frac{1}{6}}+1\right)-2\log\left(x^{\frac{1}{6}}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(1/3)/(sqrt(x) + 1),x, algorithm="fricas")
```

```
[Out] 2*sqrt(3)*arctan(1/3*sqrt(3)*(2*x^(1/6) - 1)) + 6/5*x^(5/6) - 3*x
^(1/3) + log(x^(1/3) - x^(1/6) + 1) - 2*log(x^(1/6) + 1)
```

Sympy [A] time = 2.5613, size = 138, normalized size = 2.38

$$\frac{16x^{\frac{5}{6}}\,\Gamma\left(\frac{8}{3}\right)}{5\,\Gamma\left(\frac{11}{3}\right)}-\frac{8\sqrt[3]{x}\,\Gamma\left(\frac{8}{3}\right)}{\Gamma\left(\frac{11}{3}\right)}-\frac{16e^{\frac{10i\pi}{3}}\log\left(-\sqrt[6]{x}e^{\frac{i\pi}{3}}+1\right)\Gamma\left(\frac{8}{3}\right)}{3\,\Gamma\left(\frac{11}{3}\right)}-\frac{16\log\left(-\sqrt[6]{x}e^{i\pi}+1\right)\Gamma\left(\frac{8}{3}\right)}{3\,\Gamma\left(\frac{11}{3}\right)}-\frac{16e^{\frac{2i\pi}{3}}\log\left(-\sqrt[6]{x}e^{\frac{5i\pi}{3}}+1\right)\Gamma\left(\frac{8}{3}\right)}{3\,\Gamma\left(\frac{11}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(1/3)/(1+x**(1/2)),x)
```

```
[Out] 16*x**(5/6)*gamma(8/3)/(5*gamma(11/3)) - 8*x**(1/3)*gamma(8/3)/ga
mma(11/3) - 16*exp(10*I*pi/3)*log(-x**(1/6)*exp_polar(I*pi/3) + 1
)*gamma(8/3)/(3*gamma(11/3)) - 16*log(-x**(1/6)*exp_polar(I*pi) +
 1)*gamma(8/3)/(3*gamma(11/3)) - 16*exp(2*I*pi/3)*log(-x**(1/6)*e
xp_polar(5*I*pi/3) + 1)*gamma(8/3)/(3*gamma(11/3))
```

GIAC/XCAS [A] time = 0.279143, size = 65, normalized size = 1.12

$$2\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}\left(2x^{\frac{1}{6}}-1\right)\right)+\frac{6}{5}x^{\frac{5}{6}}-3x^{\frac{1}{3}}+\ln\left(x^{\frac{1}{3}}-x^{\frac{1}{6}}+1\right)-2\ln\left(x^{\frac{1}{6}}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(1/3)/(sqrt(x) + 1),x, algorithm="giac")
```

```
[Out] 2*sqrt(3)*arctan(1/3*sqrt(3)*(2*x^(1/6) - 1)) + 6/5*x^(5/6) - 3*x
^(1/3) + ln(x^(1/3) - x^(1/6) + 1) - 2*ln(x^(1/6) + 1)
```

3.2255 $\int \left(a+b\sqrt{x}\right)^4 x^m\,dx$

Optimal. Leaf size=87

$$\frac{a^4x^{m+1}}{m+1}+\frac{8a^3bx^{m+\frac{3}{2}}}{2m+3}+\frac{6a^2b^2x^{m+2}}{m+2}+\frac{8ab^3x^{m+\frac{5}{2}}}{2m+5}+\frac{b^4x^{m+3}}{m+3}$$

```
[Out] (a^4*x^(1 + m))/(1 + m) + (8*a^3*b*x^(3/2 + m))/(3 + 2*m) + (6*a^
2*b^2*x^(2 + m))/(2 + m) + (8*a*b^3*x^(5/2 + m))/(5 + 2*m) + (b^4
*x^(3 + m))/(3 + m)
```

Rubi [A] time = 0.107431, antiderivative size = 87, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{a^4x^{m+1}}{m+1}+\frac{8a^3bx^{m+\frac{3}{2}}}{2m+3}+\frac{6a^2b^2x^{m+2}}{m+2}+\frac{8ab^3x^{m+\frac{5}{2}}}{2m+5}+\frac{b^4x^{m+3}}{m+3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Sqrt[x])^4*x^m,x]
```

```
[Out] (a^4*x^(1 + m))/(1 + m) + (8*a^3*b*x^(3/2 + m))/(3 + 2*m) + (6*a^
2*b^2*x^(2 + m))/(2 + m) + (8*a*b^3*x^(5/2 + m))/(5 + 2*m) + (b^4
*x^(3 + m))/(3 + m)
```

Rubi in Sympy [A] time = 15.83, size = 76, normalized size = 0.87

$$\frac{a^4x^{m+1}}{m+1}+\frac{8a^3bx^{m+\frac{3}{2}}}{2m+3}+\frac{6a^2b^2x^{m+2}}{m+2}+\frac{8ab^3x^{m+\frac{5}{2}}}{2m+5}+\frac{b^4x^{m+3}}{m+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**m*(a+b*x**(1/2))**4,x)
```

```
[Out] a**4*x**(m + 1)/(m + 1) + 8*a**3*b*x**(m + 3/2)/(2*m + 3) + 6*a**
2*b**2*x**(m + 2)/(m + 2) + 8*a*b**3*x**(m + 5/2)/(2*m + 5) + b**
4*x**(m + 3)/(m + 3)
```

Mathematica [A] time = 0.0969382, size = 83, normalized size = 0.95

$$2x^{m+1}\left(\frac{a^4}{2m+2}+\frac{4a^3b\sqrt{x}}{2m+3}+\frac{3a^2b^2x}{m+2}+\frac{4ab^3x^{3/2}}{2m+5}+\frac{b^4x^2}{2m+6}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Sqrt[x])^4*x^m,x]
```

```
[Out] 2*x^(1 + m)*(a^4/(2 + 2*m) + (4*a^3*b*Sqrt[x])/(3 + 2*m) + (3*a^2
*b^2*x)/(2 + m) + (4*a*b^3*x^(3/2))/(5 + 2*m) + (b^4*x^2)/(6 + 2*
m))
```

Maple [F] time = 0.028, size = 0, normalized size = 0.

$$\int x^m\left(a+b\sqrt{x}\right)^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(a+b*x^(1/2))^4,x)
```

```
[Out] int(x^m*(a+b*x^(1/2))^4,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^4*x^m,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.255215, size = 351, normalized size = 4.03

$$\frac{\left(\left(4\,b^4m^4+28\,b^4m^3+71\,b^4m^2+77\,b^4m+30\,b^4\right)x^3+6\left(4\,a^2b^2m^4+32\,a^2b^2m^3+91\,a^2b^2m^2+108\,a^2b^2m+45\,a^2b^2\right)x^2+\left(4\,a\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^4*x^m,x, algorithm="fricas")
```

```
[Out] ((4*b^4*m^4 + 28*b^4*m^3 + 71*b^4*m^2 + 77*b^4*m + 30*b^4)*x^3 +
6*(4*a^2*b^2*m^4 + 32*a^2*b^2*m^3 + 91*a^2*b^2*m^2 + 108*a^2*b^2*
m + 45*a^2*b^2)*x^2 + (4*a^4*m^4 + 36*a^4*m^3 + 119*a^4*m^2 + 171
*a^4*m + 90*a^4)*x + 8*((2*a*b^3*m^4 + 15*a*b^3*m^3 + 40*a*b^3*m^
2 + 45*a*b^3*m + 18*a*b^3)*x^2 + (2*a^3*b*m^4 + 17*a^3*b*m^3 + 52
*a^3*b*m^2 + 67*a^3*b*m + 30*a^3*b)*x)*sqrt(x))*x^m/(4*m^5 + 40*m
^4 + 155*m^3 + 290*m^2 + 261*m + 90)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(a+b*x**(1/2))**4,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [A] time = 0.276674, size = 150, normalized size = 1.72

$$\frac{b^4x^3e^{\left(2\,m\ln\left(\sqrt{x}\right)\right)}}{m+3}+\frac{8\,ab^3x^{\frac{5}{2}}e^{\left(2\,m\ln\left(\sqrt{x}\right)\right)}}{2\,m+5}+\frac{6\,a^2b^2x^2e^{\left(2\,m\ln\left(\sqrt{x}\right)\right)}}{m+2}+\frac{8\,a^3bx^{\frac{3}{2}}e^{\left(2\,m\ln\left(\sqrt{x}\right)\right)}}{2\,m+3}+\frac{a^4xe^{\left(2\,m\ln\left(\sqrt{x}\right)\right)}}{m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^4*x^m,x, algorithm="giac")
```

```
[Out] b^4*x^3*e^(2*m*ln(sqrt(x)))/(m + 3) + 8*a*b^3*x^(5/2)*e^(2*m*ln(s
qrt(x)))/(2*m + 5) + 6*a^2*b^2*x^2*e^(2*m*ln(sqrt(x)))/(m + 2) +
8*a^3*b*x^(3/2)*e^(2*m*ln(sqrt(x)))/(2*m + 3) + a^4*x*e^(2*m*ln(s
qrt(x)))/(m + 1)
```

3.2256 $\int \left(a+b\sqrt{x}\right)^3 x^m\,dx$

Optimal. Leaf size=70

$$\frac{a^3x^{m+1}}{m+1}+\frac{6a^2bx^{m+\frac{3}{2}}}{2m+3}+\frac{3ab^2x^{m+2}}{m+2}+\frac{2b^3x^{m+\frac{5}{2}}}{2m+5}$$

```
[Out] (a^3*x^(1 + m))/(1 + m) + (6*a^2*b*x^(3/2 + m))/(3 + 2*m) + (3*a*
b^2*x^(2 + m))/(2 + m) + (2*b^3*x^(5/2 + m))/(5 + 2*m)
```

Rubi [A] time = 0.0720506, antiderivative size = 70, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{a^3x^{m+1}}{m+1}+\frac{6a^2bx^{m+\frac{3}{2}}}{2m+3}+\frac{3ab^2x^{m+2}}{m+2}+\frac{2b^3x^{m+\frac{5}{2}}}{2m+5}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^3*x^m,x]
```

```
[Out] (a^3*x^(1 + m))/(1 + m) + (6*a^2*b*x^(3/2 + m))/(3 + 2*m) + (3*a*
b^2*x^(2 + m))/(2 + m) + (2*b^3*x^(5/2 + m))/(5 + 2*m)
```

Rubi in Sympy [A] time = 12.0738, size = 61, normalized size = 0.87

$$\frac{a^3x^{m+1}}{m+1}+\frac{6a^2bx^{m+\frac{3}{2}}}{2m+3}+\frac{3ab^2x^{m+2}}{m+2}+\frac{2b^3x^{m+\frac{5}{2}}}{2m+5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(a+b*x**(1/2))**3,x)
```

```
[Out] a**3*x**(m + 1)/(m + 1) + 6*a**2*b*x**(m + 3/2)/(2*m + 3) + 3*a*b
**2*x**(m + 2)/(m + 2) + 2*b**3*x**(m + 5/2)/(2*m + 5)
```

Mathematica [A] time = 0.0560137, size = 69, normalized size = 0.99

$$x^m\left(\frac{2a^3x}{2m+2}+\frac{6a^2bx^{3/2}}{2m+3}+\frac{6ab^2x^2}{2m+4}+\frac{2b^3x^{5/2}}{2m+5}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^3*x^m,x]
```

```
[Out] x^m*((2*a^3*x)/(2 + 2*m) + (6*a^2*b*x^(3/2))/(3 + 2*m) + (6*a*b^2
*x^2)/(4 + 2*m) + (2*b^3*x^(5/2))/(5 + 2*m))
```

Maple [F] time = 0.015, size = 0, normalized size = 0.

$$\int x^m\left(a+b\sqrt{x}\right)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(a+b*x^(1/2))^3,x)
```

```
[Out] int(x^m*(a+b*x^(1/2))^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3*x^m,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.259144, size = 225, normalized size = 3.21

$$\frac{\left(3\left(4\,ab^2m^3 + 20\,ab^2m^2 + 31\,ab^2m + 15\,ab^2\right)x^2 + \left(4\,a^3m^3 + 24\,a^3m^2 + 47\,a^3m + 30\,a^3\right)x + 2\left(\left(2\,b^3m^3 + 9\,b^3m^2 + 13\,b^3m + 6\right.\right.}{4\,m^4 + 28\,m^3 + 71\,m^2 + 77\,m + 30}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3*x^m,x, algorithm="fricas")
```

```
[Out] (3*(4*a*b^2*m^3 + 20*a*b^2*m^2 + 31*a*b^2*m + 15*a*b^2)*x^2 + (4*
a^3*m^3 + 24*a^3*m^2 + 47*a^3*m + 30*a^3)*x + 2*((2*b^3*m^3 + 9*b
^3*m^2 + 13*b^3*m + 6*b^3)*x^2 + 3*(2*a^2*b*m^3 + 11*a^2*b*m^2 +
19*a^2*b*m + 10*a^2*b)*x)*sqrt(x))*x^m/(4*m^4 + 28*m^3 + 71*m^2 +
 77*m + 30)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(a+b*x**(1/2))**3,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [A] time = 0.276776, size = 119, normalized size = 1.7

$$\frac{2\,b^3x^{\frac{5}{2}}e^{\left(2\,m\ln\left(\sqrt{x}\right)\right)}}{2\,m + 5} + \frac{3\,ab^2x^2e^{\left(2\,m\ln\left(\sqrt{x}\right)\right)}}{m + 2} + \frac{6\,a^2bx^{\frac{3}{2}}e^{\left(2\,m\ln\left(\sqrt{x}\right)\right)}}{2\,m + 3} + \frac{a^3xe^{\left(2\,m\ln\left(\sqrt{x}\right)\right)}}{m + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^3*x^m,x, algorithm="giac")
```

```
[Out] 2*b^3*x^(5/2)*e^(2*m*ln(sqrt(x)))/(2*m + 5) + 3*a*b^2*x^2*e^(2*m*
ln(sqrt(x)))/(m + 2) + 6*a^2*b*x^(3/2)*e^(2*m*ln(sqrt(x)))/(2*m +
 3) + a^3*x*e^(2*m*ln(sqrt(x)))/(m + 1)
```

3.2257 $\int \left(a+b\sqrt{x}\right)^2 x^m \, dx$

Optimal. Leaf size=47

$$\frac{a^2x^{m+1}}{m+1}+\frac{4abx^{m+\frac{3}{2}}}{2m+3}+\frac{b^2x^{m+2}}{m+2}$$

```
[Out] (a^2*x^(1 + m))/(1 + m) + (4*a*b*x^(3/2 + m))/(3 + 2*m) + (b^2*x^
(2 + m))/(2 + m)
```

Rubi [A] time = 0.0511278, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{a^2x^{m+1}}{m+1}+\frac{4abx^{m+\frac{3}{2}}}{2m+3}+\frac{b^2x^{m+2}}{m+2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^2*x^m,x]
```

```
[Out] (a^2*x^(1 + m))/(1 + m) + (4*a*b*x^(3/2 + m))/(3 + 2*m) + (b^2*x^
(2 + m))/(2 + m)
```

Rubi in Sympy [A] time = 8.32769, size = 39, normalized size = 0.83

$$\frac{a^2x^{m+1}}{m+1}+\frac{4abx^{m+\frac{3}{2}}}{2m+3}+\frac{b^2x^{m+2}}{m+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(a+b*x**(1/2))**2,x)
```

```
[Out] a**2*x**(m + 1)/(m + 1) + 4*a*b*x**(m + 3/2)/(2*m + 3) + b**2*x**
(m + 2)/(m + 2)
```

Mathematica [A] time = 0.0663917, size = 49, normalized size = 1.04

$$x^m\left(\frac{2a^2x}{2m+2}+\frac{4abx^{3/2}}{2m+3}+\frac{2b^2x^2}{2m+4}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^2*x^m,x]
```

```
[Out] x^m*((2*a^2*x)/(2 + 2*m) + (4*a*b*x^(3/2))/(3 + 2*m) + (2*b^2*x^2
)/(4 + 2*m))
```

Maple [F] time = 0.014, size = 0, normalized size = 0.

$$\int x^m\left(a+b\sqrt{x}\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(a+b*x^(1/2))^2,x)

[Out] int(x^m*(a+b*x^(1/2))^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2*x^m,x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [A] time = 0.252343, size = 120, normalized size = 2.55

$$\frac{\left(\left(2\,b^2m^2+5\,b^2m+3\,b^2\right)x^2+4\left(abm^2+3\,abm+2\,ab\right)x^{\frac{3}{2}}+\left(2\,a^2m^2+7\,a^2m+6\,a^2\right)x\right)x^m}{2\,m^3+9\,m^2+13\,m+6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2*x^m,x, algorithm="fricas")

[Out] ((2*b^2*m^2 + 5*b^2*m + 3*b^2)*x^2 + 4*(a*b*m^2 + 3*a*b*m + 2*a*b
)*x^(3/2) + (2*a^2*m^2 + 7*a^2*m + 6*a^2)*x)*x^m/(2*m^3 + 9*m^2 +
 13*m + 6)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(a+b*x**(1/2))**2,x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [A] time = 0.258311, size = 82, normalized size = 1.74

$$\frac{b^2x^2e^{\left(2\,m\ln\left(\sqrt{x}\right)\right)}}{m+2}+\frac{4\,abx^{\frac{3}{2}}e^{\left(2\,m\ln\left(\sqrt{x}\right)\right)}}{2\,m+3}+\frac{a^2xe^{\left(2\,m\ln\left(\sqrt{x}\right)\right)}}{m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^2*x^m,x, algorithm="giac")

[Out] b^2*x^2*e^(2*m*ln(sqrt(x)))/(m + 2) + 4*a*b*x^(3/2)*e^(2*m*ln(sqr
t(x)))/(2*m + 3) + a^2*x*e^(2*m*ln(sqrt(x)))/(m + 1)
```

3.2258 $\int (a+b\sqrt{x}) x^m \, dx$

Optimal. Leaf size=30

$$\frac{ax^{m+1}}{m+1}+\frac{2bx^{m+\frac{3}{2}}}{2m+3}$$

```
[Out] (a*x^(1 + m))/(1 + m) + (2*b*x^(3/2 + m))/(3 + 2*m)
```

Rubi [A] time = 0.0242294, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{ax^{m+1}}{m+1}+\frac{2bx^{m+\frac{3}{2}}}{2m+3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])*x^m,x]

[Out] (a*x^(1 + m))/(1 + m) + (2*b*x^(3/2 + m))/(3 + 2*m)
```

Rubi in Sympy [A] time = 4.46858, size = 24, normalized size = 0.8

$$\frac{ax^{m+1}}{m+1}+\frac{2bx^{m+\frac{3}{2}}}{2m+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(a+b*x**(1/2)),x)

[Out] a*x**(m + 1)/(m + 1) + 2*b*x**(m + 3/2)/(2*m + 3)
```

Mathematica [A] time = 0.0412618, size = 28, normalized size = 0.93

$$x^m\left(\frac{ax}{m+1}+\frac{2bx^{3/2}}{2m+3}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])*x^m,x]

[Out] x^m*((a*x)/(1 + m) + (2*b*x^(3/2))/(3 + 2*m))
```

Maple [F] time = 0.007, size = 0, normalized size = 0.

$$\int x^m \left(a+b\sqrt{x}\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(a+b*x^(1/2)),x)

[Out] int(x^m*(a+b*x^(1/2)),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)*x^m,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.254054, size = 50, normalized size = 1.67

$$\frac{\left(2\,(bm+b)x^{\frac{3}{2}}+(2\,am+3\,a)x\right)x^m}{2\,m^2+5\,m+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)*x^m,x, algorithm="fricas")
```

```
[Out] (2*(b*m + b)*x^(3/2) + (2*a*m + 3*a)*x)*x^m/(2*m^2 + 5*m + 3)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(a+b*x**(1/2)),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [A] time = 0.269757, size = 51, normalized size = 1.7

$$\frac{2\,bx^{\frac{3}{2}}e^{\left(2\,m\ln\left(\sqrt{x}\right)\right)}}{2\,m+3}+\frac{axe^{\left(2\,m\ln\left(\sqrt{x}\right)\right)}}{m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)*x^m,x, algorithm="giac")
```

```
[Out] 2*b*x^(3/2)*e^(2*m*ln(sqrt(x)))/(2*m + 3) + a*x*e^(2*m*ln(sqrt(x)
))/(m + 1)
```

3.2259 $\int \frac{x^m}{a+b\sqrt{x}}\,dx$

Optimal. Leaf size=37

$$\frac{x^{m+1}\,{}_2F_1\left(1,2(m+1);2m+3;-\frac{b\sqrt{x}}{a}\right)}{a(m+1)}$$

```
[Out] (x^(1 + m)*Hypergeometric2F1[1, 2*(1 + m), 3 + 2*m, -((b*Sqrt[x])
/a)])/(a*(1 + m))
```

Rubi [A] time = 0.0499234, antiderivative size = 37, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{x^{m+1}\,{}_2F_1\left(1,2(m+1);2m+3;-\frac{b\sqrt{x}}{a}\right)}{a(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m/(a + b*Sqrt[x]),x]
```

```
[Out] (x^(1 + m)*Hypergeometric2F1[1, 2*(1 + m), 3 + 2*m, -((b*Sqrt[x])
/a)])/(a*(1 + m))
```

Rubi in Sympy [A] time = 6.6144, size = 27, normalized size = 0.73

$$\frac{x^{m+1}{}_2F_1\left(\begin{matrix}1, 2m+2 \\ 2m+3\end{matrix}\middle| -\frac{b\sqrt{x}}{a}\right)}{a\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m/(a+b*x**(1/2)),x)
```

```
[Out] x**(m + 1)*hyper((1, 2*m + 2), (2*m + 3,), -b*sqrt(x)/a)/(a*(m +
1))
```

Mathematica [A] time = 0.0564639, size = 42, normalized size = 1.14

$$-\frac{2x^{m+\frac{1}{2}}\left({}_2F_1\left(1,2m+1;2m+2;-\frac{b\sqrt{x}}{a}\right)-1\right)}{2bm+b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m/(a + b*Sqrt[x]),x]
```

```
[Out] (-2*x^(1/2 + m)*(-1 + Hypergeometric2F1[1, 1 + 2*m, 2 + 2*m, -((b
*Sqrt[x])/a)]))/(b + 2*b*m)
```

Maple [F] time = 0.021, size = 0, normalized size = 0.

$$\int x^m\left(a+b\sqrt{x}\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m/(a+b*x^(1/2)),x)
```

```
[Out] int(x^m/(a+b*x^(1/2)),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{b\sqrt{x}+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*sqrt(x) + a),x, algorithm="maxima")
```

```
[Out] integrate(x^m/(b*sqrt(x) + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^m}{b\sqrt{x}+a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*sqrt(x) + a),x, algorithm="fricas")
```

```
[Out] integral(x^m/(b*sqrt(x) + a), x)
```

Sympy [A] time = 3.49082, size = 82, normalized size = 2.22

$$\frac{4mxx^m\left(\frac{b\sqrt{x}e^{i\pi}}{a}, 1, 2m+2\right)(2m+2)}{a(2m+3)} + \frac{4xx^m\left(\frac{b\sqrt{x}e^{i\pi}}{a}, 1, 2m+2\right)(2m+2)}{a(2m+3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m/(a+b*x**(1/2)),x)
```

```
[Out] 4*m*x*x**m*lerchphi(b*sqrt(x)*exp_polar(I*pi)/a, 1, 2*m + 2)*gamm
a(2*m + 2)/(a*gamma(2*m + 3)) + 4*x*x**m*lerchphi(b*sqrt(x)*exp_p
olar(I*pi)/a, 1, 2*m + 2)*gamma(2*m + 2)/(a*gamma(2*m + 3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{b\sqrt{x}+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*sqrt(x) + a),x, algorithm="giac")
```

```
[Out] integrate(x^m/(b*sqrt(x) + a), x)
```

3.2260 $\int \frac{x^m}{\left(a+b\sqrt{x}\right)^2} \, dx$

Optimal. Leaf size=37

$$\frac{x^{m+1}\,{}_2F_1\left(2,2(m+1);2m+3;-\frac{b\sqrt{x}}{a}\right)}{a^2(m+1)}$$

```
[Out] (x^(1 + m)*Hypergeometric2F1[2, 2*(1 + m), 3 + 2*m, -((b*Sqrt[x])
/a)])/(a^2*(1 + m))
```

Rubi [A] time = 0.0467434, antiderivative size = 37, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{x^{m+1}\,{}_2F_1\left(2,2(m+1);2m+3;-\frac{b\sqrt{x}}{a}\right)}{a^2(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m/(a + b*Sqrt[x])^2,x]
```

```
[Out] (x^(1 + m)*Hypergeometric2F1[2, 2*(1 + m), 3 + 2*m, -((b*Sqrt[x])
/a)])/(a^2*(1 + m))
```

Rubi in Sympy [A] time = 6.06195, size = 29, normalized size = 0.78

$$\frac{x^{m+1}{}_2F_1\left(\begin{matrix} 2, 2m+2 \\ 2m+3 \end{matrix}\middle| -\frac{b\sqrt{x}}{a}\right)}{a^2\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m/(a+b*x**(1/2))**2,x)
```

```
[Out] x**(m + 1)*hyper((2, 2*m + 2), (2*m + 3,), -b*sqrt(x)/a)/(a**2*(m
 + 1))
```

Mathematica [A] time = 0.0645262, size = 71, normalized size = 1.92

$$\frac{2x^{m+\frac{1}{2}}\left({}_2F_1\left(1,2m+1;2m+2;-\frac{b\sqrt{x}}{a}\right)-{}_2F_1\left(2,2m+1;2m+2;-\frac{b\sqrt{x}}{a}\right)\right)}{ab(2m+1)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m/(a + b*Sqrt[x])^2,x]
```

```
[Out] (2*x^(1/2 + m)*(Hypergeometric2F1[1, 1 + 2*m, 2 + 2*m, -((b*Sqrt[
x])/a)] - Hypergeometric2F1[2, 1 + 2*m, 2 + 2*m, -((b*Sqrt[x])/a)
]))/(a*b*(1 + 2*m))
```

Maple [F] time = 0.022, size = 0, normalized size = 0.

$$\int x^m\left(a+b\sqrt{x}\right)^{-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m/(a+b*x^(1/2))^2,x)
```

```
[Out] int(x^m/(a+b*x^(1/2))^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-(2m+1)\int \frac{x^m}{ab\sqrt{x}+a^2}\,dx + \frac{2\,xx^m}{ab\sqrt{x}+a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*sqrt(x) + a)^2,x, algorithm="maxima")
```

```
[Out] -(2*m + 1)*integrate(x^m/(a*b*sqrt(x) + a^2), x) + 2*x*x^m/(a*b*s
qrt(x) + a^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^m}{b^2x+2\,ab\sqrt{x}+a^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*sqrt(x) + a)^2,x, algorithm="fricas")
```

```
[Out] integral(x^m/(b^2*x + 2*a*b*sqrt(x) + a^2), x)
```

Sympy [A] time = 11.0901, size = 473, normalized size = 12.78

$$-\frac{8am^2xx^m\left(\frac{b\sqrt{x}e^{i\pi}}{a},1,2m+2\right)(2m+2)}{a^3(2m+3)+a^2b\sqrt{x}(2m+3)} - \frac{12amxx^m\left(\frac{b\sqrt{x}e^{i\pi}}{a},1,2m+2\right)(2m+2)}{a^3(2m+3)+a^2b\sqrt{x}(2m+3)} + \frac{4amxx^m(2m+2)}{a^3(2m+3)+a^2b\sqrt{x}(2m+3)} - \frac{4axx^m\left(\frac{b\sqrt{x}e^{i\pi}}{a},1,2m+2\right)(2m+2)}{a^3(2m+3)+a^2b\sqrt{x}(2m+3)} + \frac{4axx^m(2m+2)}{a^3(2m+3)+a^2b\sqrt{x}(2m+3)} - \frac{8bm^2x^{\frac{3}{2}}x^m\left(\frac{b\sqrt{x}e^{i\pi}}{a},1,2m+2\right)(2m+2)}{a^3(2m+3)+a^2b\sqrt{x}(2m+3)} - \frac{12bmx^{\frac{3}{2}}x^m\left(\frac{b\sqrt{x}e^{i\pi}}{a},1,2m+2\right)(2m+2)}{a^3(2m+3)+a^2b\sqrt{x}(2m+3)} - \frac{4bx^{\frac{3}{2}}x^m\left(\frac{b\sqrt{x}e^{i\pi}}{a},1,2m+2\right)(2m+2)}{a^3(2m+3)+a^2b\sqrt{x}(2m+3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m/(a+b*x**(1/2))**2,x)
```

```
[Out] -8*a*m**2*x*x**m*lerchphi(b*sqrt(x)*exp_polar(I*pi)/a, 1, 2*m + 2
)*gamma(2*m + 2)/(a**3*gamma(2*m + 3) + a**2*b*sqrt(x)*gamma(2*m
+ 3)) - 12*a*m*x*x**m*lerchphi(b*sqrt(x)*exp_polar(I*pi)/a, 1, 2*
m + 2)*gamma(2*m + 2)/(a**3*gamma(2*m + 3) + a**2*b*sqrt(x)*gamma
(2*m + 3)) + 4*a*m*x*x**m*gamma(2*m + 2)/(a**3*gamma(2*m + 3) + a
**2*b*sqrt(x)*gamma(2*m + 3)) - 4*a*x*x**m*lerchphi(b*sqrt(x)*exp
_polar(I*pi)/a, 1, 2*m + 2)*gamma(2*m + 2)/(a**3*gamma(2*m + 3) +
 a**2*b*sqrt(x)*gamma(2*m + 3)) + 4*a*x*x**m*gamma(2*m + 2)/(a**3
*gamma(2*m + 3) + a**2*b*sqrt(x)*gamma(2*m + 3)) - 8*b*m**2*x**(3
/2)*x**m*lerchphi(b*sqrt(x)*exp_polar(I*pi)/a, 1, 2*m + 2)*gamma(
```

```
2*m + 2)/(a**3*gamma(2*m + 3) + a**2*b*sqrt(x)*gamma(2*m + 3)) -
12*b*m*x**(3/2)*x**m*lerchphi(b*sqrt(x)*exp_polar(I*pi)/a, 1, 2*m
 + 2)*gamma(2*m + 2)/(a**3*gamma(2*m + 3) + a**2*b*sqrt(x)*gamma(
2*m + 3)) - 4*b*x**(3/2)*x**m*lerchphi(b*sqrt(x)*exp_polar(I*pi)/
a, 1, 2*m + 2)*gamma(2*m + 2)/(a**3*gamma(2*m + 3) + a**2*b*sqrt(
x)*gamma(2*m + 3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{\left(b\sqrt{x}+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*sqrt(x) + a)^2,x, algorithm="giac")
```

```
[Out] integrate(x^m/(b*sqrt(x) + a)^2, x)
```

3.2261 $\int \left(a+b\sqrt{x}\right)^p x^m \, dx$

Optimal. Leaf size=52

$$-\frac{2x^{m+1}\left(a+b\sqrt{x}\right)^{p+1} {}_2F_1\left(1,2m+p+3;p+2;\frac{a+b\sqrt{x}}{a}\right)}{a(p+1)}$$

```
[Out] (-2*(a + b*Sqrt[x])^(1 + p)*x^(1 + m)*Hypergeometric2F1[1, 3 + 2*
m + p, 2 + p, (a + b*Sqrt[x])/a])/(a*(1 + p))
```

Rubi [A] time = 0.0714407, antiderivative size = 63, normalized size of antiderivative = 1.21, number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$\frac{x^{m+1}\left(a+b\sqrt{x}\right)^p\left(\frac{b\sqrt{x}}{a}+1\right)^{-p} {}_2F_1\left(2(m+1),-p;2m+3;-\frac{b\sqrt{x}}{a}\right)}{m+1}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^p*x^m,x]
```

```
[Out] ((a + b*Sqrt[x])^p*x^(1 + m)*Hypergeometric2F1[2*(1 + m), -p, 3 +
 2*m, -((b*Sqrt[x])/a)])/((1 + m)*(1 + (b*Sqrt[x])/a)^p)
```

Rubi in Sympy [A] time = 9.57257, size = 49, normalized size = 0.94

$$\frac{x^{m+1}\left(1+\frac{b\sqrt{x}}{a}\right)^{-p}\left(a+b\sqrt{x}\right)^p {}_2F_1\left(\left.\begin{matrix}-p,2m+2\\2m+3\end{matrix}\right|-\frac{b\sqrt{x}}{a}\right)}{m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(a+b*x**(1/2))**p,x)
```

```
[Out] x**(m + 1)*(1 + b*sqrt(x)/a)**(-p)*(a + b*sqrt(x))**p*hyper((-p,
2*m + 2), (2*m + 3,), -b*sqrt(x)/a)/(m + 1)
```

Mathematica [A] time = 0.0742418, size = 65, normalized size = 1.25

$$\frac{x^{m+1}\left(a+b\sqrt{x}\right)^p\left(\frac{b\sqrt{x}}{a}+1\right)^{-p} {}_2F_1\left(2(m+1),-p;2(m+1)+1;-\frac{b\sqrt{x}}{a}\right)}{m+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^p*x^m,x]
```

```
[Out] ((a + b*Sqrt[x])^p*x^(1 + m)*Hypergeometric2F1[2*(1 + m), -p, 1 +
 2*(1 + m), -((b*Sqrt[x])/a)])/((1 + m)*(1 + (b*Sqrt[x])/a)^p)
```

Maple [F] time = 0.024, size = 0, normalized size = 0.

$$\int x^m\left(a+b\sqrt{x}\right)^p\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(a+b*x^(1/2))^p,x)

[Out] int(x^m*(a+b*x^(1/2))^p,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b\sqrt{x} + a\right)^{p} x^{m} \,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^p*x^m,x, algorithm="maxima")

[Out] integrate((b*sqrt(x) + a)^p*x^m, x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^p*x^m,x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(a+b*x**(1/2))**p,x)

[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b\sqrt{x} + a\right)^{p} x^{m} \,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^p*x^m,x, algorithm="giac")

[Out] integrate((b*sqrt(x) + a)^p*x^m, x)
```

3.2262 $\int \left(a+b\sqrt{x}\right)^p x^3 \, dx$

Optimal. Leaf size=204

$$-\frac{2a^7\left(a+b\sqrt{x}\right)^{p+1}}{b^8(p+1)}+\frac{14a^6\left(a+b\sqrt{x}\right)^{p+2}}{b^8(p+2)}-\frac{42a^5\left(a+b\sqrt{x}\right)^{p+3}}{b^8(p+3)}+\frac{70a^4\left(a+b\sqrt{x}\right)^{p+4}}{b^8(p+4)}-\frac{70a^3\left(a+b\sqrt{x}\right)^{p+5}}{b^8(p+5)}+\frac{42a^2\left(a+b\sqrt{x}\right)^{p+6}}{b^8(p+6)}-\frac{14a\left(a+b\sqrt{x}\right)^{p+7}}{b^8(p+7)}+\frac{2\left(a+b\sqrt{x}\right)^{p+8}}{b^8(p+8)}$$

```
[Out] (-2*a^7*(a + b*Sqrt[x])^(1 + p))/(b^8*(1 + p)) + (14*a^6*(a + b*S
qrt[x])^(2 + p))/(b^8*(2 + p)) - (42*a^5*(a + b*Sqrt[x])^(3 + p))
/(b^8*(3 + p)) + (70*a^4*(a + b*Sqrt[x])^(4 + p))/(b^8*(4 + p)) -
 (70*a^3*(a + b*Sqrt[x])^(5 + p))/(b^8*(5 + p)) + (42*a^2*(a + b*
Sqrt[x])^(6 + p))/(b^8*(6 + p)) - (14*a*(a + b*Sqrt[x])^(7 + p))/
(b^8*(7 + p)) + (2*(a + b*Sqrt[x])^(8 + p))/(b^8*(8 + p))
```

Rubi [A] time = 0.273027, antiderivative size = 204, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2a^7\left(a+b\sqrt{x}\right)^{p+1}}{b^8(p+1)}+\frac{14a^6\left(a+b\sqrt{x}\right)^{p+2}}{b^8(p+2)}-\frac{42a^5\left(a+b\sqrt{x}\right)^{p+3}}{b^8(p+3)}+\frac{70a^4\left(a+b\sqrt{x}\right)^{p+4}}{b^8(p+4)}-\frac{70a^3\left(a+b\sqrt{x}\right)^{p+5}}{b^8(p+5)}+\frac{42a^2\left(a+b\sqrt{x}\right)^{p+6}}{b^8(p+6)}-\frac{14a\left(a+b\sqrt{x}\right)^{p+7}}{b^8(p+7)}+\frac{2\left(a+b\sqrt{x}\right)^{p+8}}{b^8(p+8)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^p*x^3,x]
```

```
[Out] (-2*a^7*(a + b*Sqrt[x])^(1 + p))/(b^8*(1 + p)) + (14*a^6*(a + b*S
qrt[x])^(2 + p))/(b^8*(2 + p)) - (42*a^5*(a + b*Sqrt[x])^(3 + p))
/(b^8*(3 + p)) + (70*a^4*(a + b*Sqrt[x])^(4 + p))/(b^8*(4 + p)) -
 (70*a^3*(a + b*Sqrt[x])^(5 + p))/(b^8*(5 + p)) + (42*a^2*(a + b*
Sqrt[x])^(6 + p))/(b^8*(6 + p)) - (14*a*(a + b*Sqrt[x])^(7 + p))/
(b^8*(7 + p)) + (2*(a + b*Sqrt[x])^(8 + p))/(b^8*(8 + p))
```

Rubi in Sympy [A] time = 50.0283, size = 184, normalized size = 0.9

$$-\frac{2a^7\left(a+b\sqrt{x}\right)^{p+1}}{b^8\left(p+1\right)}+\frac{14a^6\left(a+b\sqrt{x}\right)^{p+2}}{b^8\left(p+2\right)}-\frac{42a^5\left(a+b\sqrt{x}\right)^{p+3}}{b^8\left(p+3\right)}+\frac{70a^4\left(a+b\sqrt{x}\right)^{p+4}}{b^8\left(p+4\right)}-\frac{70a^3\left(a+b\sqrt{x}\right)^{p+5}}{b^8\left(p+5\right)}+\frac{42a^2\left(a+b\sqrt{x}\right)^{p+6}}{b^8\left(p+6\right)}-\frac{14a\left(a+b\sqrt{x}\right)^{p+7}}{b^8\left(p+7\right)}+\frac{2\left(a+b\sqrt{x}\right)^{p+8}}{b^8\left(p+8\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3*(a+b*x**(1/2))**p,x)
```

```
[Out] -2*a**7*(a + b*sqrt(x))**(p + 1)/(b**8*(p + 1)) + 14*a**6*(a + b*
sqrt(x))**(p + 2)/(b**8*(p + 2)) - 42*a**5*(a + b*sqrt(x))**(p +
3)/(b**8*(p + 3)) + 70*a**4*(a + b*sqrt(x))**(p + 4)/(b**8*(p + 4
)) - 70*a**3*(a + b*sqrt(x))**(p + 5)/(b**8*(p + 5)) + 42*a**2*(a
 + b*sqrt(x))**(p + 6)/(b**8*(p + 6)) - 14*a*(a + b*sqrt(x))**(p
+ 7)/(b**8*(p + 7)) + 2*(a + b*sqrt(x))**(p + 8)/(b**8*(p + 8))
```

Mathematica [A] time = 0.34184, size = 265, normalized size = 1.3

$$2\left(a+b\sqrt{x}\right)^{p+1}\left(-5040a^7+5040a^6b(p+1)\sqrt{x}-2520a^5b^2\left(p^2+3p+2\right)x+840a^4b^3\left(p^3+6p^2+11p+6\right)x^{3/2}-210a^3b^4\left(p\right.\right.$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^p*x^3,x]
```

```
[Out] (2*(a + b*Sqrt[x])^(1 + p)*(-5040*a^7 + 5040*a^6*b*(1 + p)*Sqrt[x
] - 2520*a^5*b^2*(2 + 3*p + p^2)*x + 840*a^4*b^3*(6 + 11*p + 6*p^
2 + p^3)*x^(3/2) - 210*a^3*b^4*(24 + 50*p + 35*p^2 + 10*p^3 + p^4
)*x^2 + 42*a^2*b^5*(120 + 274*p + 225*p^2 + 85*p^3 + 15*p^4 + p^5
)*x^(5/2) - 7*a*b^6*(720 + 1764*p + 1624*p^2 + 735*p^3 + 175*p^4
+ 21*p^5 + p^6)*x^3 + b^7*(5040 + 13068*p + 13132*p^2 + 6769*p^3
+ 1960*p^4 + 322*p^5 + 28*p^6 + p^7)*x^(7/2)))/(b^8*(1 + p)*(2 +
p)*(3 + p)*(4 + p)*(5 + p)*(6 + p)*(7 + p)*(8 + p))
```

Maple [F] time = 0.022, size = 0, normalized size = 0.

$$\int x^{3} \left(a+b\sqrt{x}\right)^{p}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3*(a+b*x^(1/2))^p,x)
```

```
[Out] int(x^3*(a+b*x^(1/2))^p,x)
```

Maxima [A] time = 1.48508, size = 386, normalized size = 1.89

$$\frac{2\left(\left(p^{7}+28\,p^{6}+322\,p^{5}+1960\,p^{4}+6769\,p^{3}+13132\,p^{2}+13068\,p+5040\right)b^{8}x^{4}+\left(p^{7}+21\,p^{6}+175\,p^{5}+735\,p^{4}+1624\,p^{3}+17\cdots\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^p*x^3,x, algorithm="maxima")
```

```
[Out] 2*((p^7 + 28*p^6 + 322*p^5 + 1960*p^4 + 6769*p^3 + 13132*p^2 + 13
068*p + 5040)*b^8*x^4 + (p^7 + 21*p^6 + 175*p^5 + 735*p^4 + 1624*
p^3 + 1764*p^2 + 720*p)*a*b^7*x^(7/2) - 7*(p^6 + 15*p^5 + 85*p^4
+ 225*p^3 + 274*p^2 + 120*p)*a^2*b^6*x^3 + 42*(p^5 + 10*p^4 + 35*
p^3 + 50*p^2 + 24*p)*a^3*b^5*x^(5/2) - 210*(p^4 + 6*p^3 + 11*p^2
+ 6*p)*a^4*b^4*x^2 + 840*(p^3 + 3*p^2 + 2*p)*a^5*b^3*x^(3/2) - 25
20*(p^2 + p)*a^6*b^2*x + 5040*a^7*b*p*sqrt(x) - 5040*a^8)*(b*sqrt
(x) + a)^p/((p^8 + 36*p^7 + 546*p^6 + 4536*p^5 + 22449*p^4 + 6728
4*p^3 + 118124*p^2 + 109584*p + 40320)*b^8)
```

Fricas [A] time = 0.328416, size = 618, normalized size = 3.03

$$-\frac{2\left(5040\,a^{8}-\left(b^{8}p^{7}+28\,b^{8}p^{6}+322\,b^{8}p^{5}+1960\,b^{8}p^{4}+6769\,b^{8}p^{3}+13132\,b^{8}p^{2}+13068\,b^{8}p+5040\,b^{8}\right)x^{4}+7\left(a^{2}b^{6}p^{6}+15\,a\cdots\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^p*x^3,x, algorithm="fricas")
```

```
[Out] -2*(5040*a^8 - (b^8*p^7 + 28*b^8*p^6 + 322*b^8*p^5 + 1960*b^8*p^4
 + 6769*b^8*p^3 + 13132*b^8*p^2 + 13068*b^8*p + 5040*b^8)*x^4 + 7
*(a^2*b^6*p^6 + 15*a^2*b^6*p^5 + 85*a^2*b^6*p^4 + 225*a^2*b^6*p^3
 + 274*a^2*b^6*p^2 + 120*a^2*b^6*p)*x^3 + 210*(a^4*b^4*p^4 + 6*a^
4*b^4*p^3 + 11*a^4*b^4*p^2 + 6*a^4*b^4*p)*x^2 + 2520*(a^6*b^2*p^2
 + a^6*b^2*p)*x - (5040*a^7*b*p + (a*b^7*p^7 + 21*a*b^7*p^6 + 175
```

```
*a*b^7*p^5 + 735*a*b^7*p^4 + 1624*a*b^7*p^3 + 1764*a*b^7*p^2 + 72
0*a*b^7*p)*x^3 + 42*(a^3*b^5*p^5 + 10*a^3*b^5*p^4 + 35*a^3*b^5*p^
3 + 50*a^3*b^5*p^2 + 24*a^3*b^5*p)*x^2 + 840*(a^5*b^3*p^3 + 3*a^5
*b^3*p^2 + 2*a^5*b^3*p)*x)*sqrt(x))*(b*sqrt(x) + a)^p/(b^8*p^8 +
36*b^8*p^7 + 546*b^8*p^6 + 4536*b^8*p^5 + 22449*b^8*p^4 + 67284*b
^8*p^3 + 118124*b^8*p^2 + 109584*b^8*p + 40320*b^8)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(a+b*x**(1/2))**p,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.267367, size = 1, normalized size = 0.

Done

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^p*x^3,x, algorithm="giac")
```

```
[Out] Done
```

3.2263 $\int \left(a+b\sqrt{x}\right)^p x^2\,dx$

Optimal. Leaf size=152

$$-\frac{2a^5\left(a+b\sqrt{x}\right)^{p+1}}{b^6(p+1)}+\frac{10a^4\left(a+b\sqrt{x}\right)^{p+2}}{b^6(p+2)}-\frac{20a^3\left(a+b\sqrt{x}\right)^{p+3}}{b^6(p+3)}+\frac{20a^2\left(a+b\sqrt{x}\right)^{p+4}}{b^6(p+4)}-\frac{10a\left(a+b\sqrt{x}\right)^{p+5}}{b^6(p+5)}+\frac{2\left(a+b\sqrt{x}\right)^{p+6}}{b^6(p+6)}$$

```
[Out] (-2*a^5*(a + b*Sqrt[x])^(1 + p))/(b^6*(1 + p)) + (10*a^4*(a + b*S
qrt[x])^(2 + p))/(b^6*(2 + p)) - (20*a^3*(a + b*Sqrt[x])^(3 + p))
/(b^6*(3 + p)) + (20*a^2*(a + b*Sqrt[x])^(4 + p))/(b^6*(4 + p)) -
 (10*a*(a + b*Sqrt[x])^(5 + p))/(b^6*(5 + p)) + (2*(a + b*Sqrt[x]
)^(6 + p))/(b^6*(6 + p))
```

Rubi [A] time = 0.184023, antiderivative size = 152, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2a^5\left(a+b\sqrt{x}\right)^{p+1}}{b^6(p+1)}+\frac{10a^4\left(a+b\sqrt{x}\right)^{p+2}}{b^6(p+2)}-\frac{20a^3\left(a+b\sqrt{x}\right)^{p+3}}{b^6(p+3)}+\frac{20a^2\left(a+b\sqrt{x}\right)^{p+4}}{b^6(p+4)}-\frac{10a\left(a+b\sqrt{x}\right)^{p+5}}{b^6(p+5)}+\frac{2\left(a+b\sqrt{x}\right)^{p+6}}{b^6(p+6)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^p*x^2,x]
```

```
[Out] (-2*a^5*(a + b*Sqrt[x])^(1 + p))/(b^6*(1 + p)) + (10*a^4*(a + b*S
qrt[x])^(2 + p))/(b^6*(2 + p)) - (20*a^3*(a + b*Sqrt[x])^(3 + p))
/(b^6*(3 + p)) + (20*a^2*(a + b*Sqrt[x])^(4 + p))/(b^6*(4 + p)) -
 (10*a*(a + b*Sqrt[x])^(5 + p))/(b^6*(5 + p)) + (2*(a + b*Sqrt[x]
)^(6 + p))/(b^6*(6 + p))
```

Rubi in Sympy [A] time = 36.3819, size = 136, normalized size = 0.89

$$-\frac{2a^5\left(a+b\sqrt{x}\right)^{p+1}}{b^6\left(p+1\right)}+\frac{10a^4\left(a+b\sqrt{x}\right)^{p+2}}{b^6\left(p+2\right)}-\frac{20a^3\left(a+b\sqrt{x}\right)^{p+3}}{b^6\left(p+3\right)}+\frac{20a^2\left(a+b\sqrt{x}\right)^{p+4}}{b^6\left(p+4\right)}-\frac{10a\left(a+b\sqrt{x}\right)^{p+5}}{b^6\left(p+5\right)}+\frac{2\left(a+b\sqrt{x}\right)^{p+6}}{b^6\left(p+6\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(a+b*x**(1/2))**p,x)
```

```
[Out] -2*a**5*(a + b*sqrt(x))**(p + 1)/(b**6*(p + 1)) + 10*a**4*(a + b*
sqrt(x))**(p + 2)/(b**6*(p + 2)) - 20*a**3*(a + b*sqrt(x))**(p +
3)/(b**6*(p + 3)) + 20*a**2*(a + b*sqrt(x))**(p + 4)/(b**6*(p + 4
)) - 10*a*(a + b*sqrt(x))**(p + 5)/(b**6*(p + 5)) + 2*(a + b*sqrt
(x))**(p + 6)/(b**6*(p + 6))
```

Mathematica [A] time = 0.198549, size = 170, normalized size = 1.12

$$\frac{2\left(a+b\sqrt{x}\right)^{p+1}\left(-120a^5+120a^4b(p+1)\sqrt{x}-60a^3b^2\left(p^2+3p+2\right)x+20a^2b^3\left(p^3+6p^2+11p+6\right)x^{3/2}-5ab^4\left(p^4+10p^3+\right.\right.}{b^6(p+1)(p+2)(p+3)(p+4)(p+5)(p+6)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^p*x^2,x]
```

```
[Out] (2*(a + b*Sqrt[x])^(1 + p)*(-120*a^5 + 120*a^4*b*(1 + p)*Sqrt[x]
- 60*a^3*b^2*(2 + 3*p + p^2)*x + 20*a^2*b^3*(6 + 11*p + 6*p^2 + p
^3)*x^(3/2) - 5*a*b^4*(24 + 50*p + 35*p^2 + 10*p^3 + p^4)*x^2 + b
^5*(120 + 274*p + 225*p^2 + 85*p^3 + 15*p^4 + p^5)*x^(5/2)))/(b^6
*(1 + p)*(2 + p)*(3 + p)*(4 + p)*(5 + p)*(6 + p))
```

Maple [F] time = 0.022, size = 0, normalized size = 0.

$$\int x^{2} \left(a + b\sqrt{x}\right)^{p} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(a+b*x^(1/2))^p,x)
```

```
[Out] int(x^2*(a+b*x^(1/2))^p,x)
```

Maxima [A] time = 1.43506, size = 250, normalized size = 1.64

$$\frac{2\left(\left(p^{5} + 15\,p^{4} + 85\,p^{3} + 225\,p^{2} + 274\,p + 120\right)b^{6}x^{3} + \left(p^{5} + 10\,p^{4} + 35\,p^{3} + 50\,p^{2} + 24\,p\right)ab^{5}x^{\frac{5}{2}} - 5\left(p^{4} + 6\,p^{3} + 11\,p^{2} + 6\,p\right)a^{2} \cdots}{\left(p^{6} + 21\,p^{5} + 175\,p^{4} + 735\,p^{3} + 1624\,p^{2} + 176 \cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^p*x^2,x, algorithm="maxima")
```

```
[Out] 2*((p^5 + 15*p^4 + 85*p^3 + 225*p^2 + 274*p + 120)*b^6*x^3 + (p^5
 + 10*p^4 + 35*p^3 + 50*p^2 + 24*p)*a*b^5*x^(5/2) - 5*(p^4 + 6*p^
3 + 11*p^2 + 6*p)*a^2*b^4*x^2 + 20*(p^3 + 3*p^2 + 2*p)*a^3*b^3*x^
(3/2) - 60*(p^2 + p)*a^4*b^2*x + 120*a^5*b*p*sqrt(x) - 120*a^6)*(
b*sqrt(x) + a)^p/((p^6 + 21*p^5 + 175*p^4 + 735*p^3 + 1624*p^2 +
1764*p + 720)*b^6)
```

Fricas [A] time = 0.29176, size = 379, normalized size = 2.49

$$-\frac{2\left(120\,a^{6} - \left(b^{6}p^{5} + 15\,b^{6}p^{4} + 85\,b^{6}p^{3} + 225\,b^{6}p^{2} + 274\,b^{6}p + 120\,b^{6}\right)x^{3} + 5\left(a^{2}b^{4}p^{4} + 6\,a^{2}b^{4}p^{3} + 11\,a^{2}b^{4}p^{2} + 6\,a^{2}b^{4}p\right)x^{2} + \cdots}{b^{6}p^{6} + 21\,b^{6}p^{5} + 175\,b^{6} \cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^p*x^2,x, algorithm="fricas")
```

```
[Out] -2*(120*a^6 - (b^6*p^5 + 15*b^6*p^4 + 85*b^6*p^3 + 225*b^6*p^2 +
274*b^6*p + 120*b^6)*x^3 + 5*(a^2*b^4*p^4 + 6*a^2*b^4*p^3 + 11*a^
2*b^4*p^2 + 6*a^2*b^4*p)*x^2 + 60*(a^4*b^2*p^2 + a^4*b^2*p)*x - (
120*a^5*b*p + (a*b^5*p^5 + 10*a*b^5*p^4 + 35*a*b^5*p^3 + 50*a*b^5
*p^2 + 24*a*b^5*p)*x^2 + 20*(a^3*b^3*p^3 + 3*a^3*b^3*p^2 + 2*a^3*
b^3*p)*x)*sqrt(x))*(b*sqrt(x) + a)^p/(b^6*p^6 + 21*b^6*p^5 + 175*
b^6*p^4 + 735*b^6*p^3 + 1624*b^6*p^2 + 1764*b^6*p + 720*b^6)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(a+b*x**(1/2))**p,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.266615, size = 1, normalized size = 0.01

Done

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^p*x^2,x, algorithm="giac")
```

```
[Out] Done
```

3.2264 $\int \left(a+b\sqrt{x}\right)^p x\,dx$

Optimal. Leaf size=100

$$-\frac{2a^3\left(a+b\sqrt{x}\right)^{p+1}}{b^4(p+1)}+\frac{6a^2\left(a+b\sqrt{x}\right)^{p+2}}{b^4(p+2)}-\frac{6a\left(a+b\sqrt{x}\right)^{p+3}}{b^4(p+3)}+\frac{2\left(a+b\sqrt{x}\right)^{p+4}}{b^4(p+4)}$$

```
[Out] (-2*a^3*(a + b*Sqrt[x])^(1 + p))/(b^4*(1 + p)) + (6*a^2*(a + b*Sq
rt[x])^(2 + p))/(b^4*(2 + p)) - (6*a*(a + b*Sqrt[x])^(3 + p))/(b^
4*(3 + p)) + (2*(a + b*Sqrt[x])^(4 + p))/(b^4*(4 + p))
```

Rubi [A] time = 0.120948, antiderivative size = 100, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{2a^3\left(a+b\sqrt{x}\right)^{p+1}}{b^4(p+1)}+\frac{6a^2\left(a+b\sqrt{x}\right)^{p+2}}{b^4(p+2)}-\frac{6a\left(a+b\sqrt{x}\right)^{p+3}}{b^4(p+3)}+\frac{2\left(a+b\sqrt{x}\right)^{p+4}}{b^4(p+4)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^p*x,x]
```

```
[Out] (-2*a^3*(a + b*Sqrt[x])^(1 + p))/(b^4*(1 + p)) + (6*a^2*(a + b*Sq
rt[x])^(2 + p))/(b^4*(2 + p)) - (6*a*(a + b*Sqrt[x])^(3 + p))/(b^
4*(3 + p)) + (2*(a + b*Sqrt[x])^(4 + p))/(b^4*(4 + p))
```

Rubi in Sympy [A] time = 23.2331, size = 88, normalized size = 0.88

$$-\frac{2a^3\left(a+b\sqrt{x}\right)^{p+1}}{b^4\,(p+1)}+\frac{6a^2\left(a+b\sqrt{x}\right)^{p+2}}{b^4\,(p+2)}-\frac{6a\left(a+b\sqrt{x}\right)^{p+3}}{b^4\,(p+3)}+\frac{2\left(a+b\sqrt{x}\right)^{p+4}}{b^4\,(p+4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(a+b*x**(1/2))**p,x)
```

```
[Out] -2*a**3*(a + b*sqrt(x))**(p + 1)/(b**4*(p + 1)) + 6*a**2*(a + b*s
qrt(x))**(p + 2)/(b**4*(p + 2)) - 6*a*(a + b*sqrt(x))**(p + 3)/(b
**4*(p + 3)) + 2*(a + b*sqrt(x))**(p + 4)/(b**4*(p + 4))
```

Mathematica [A] time = 0.0746156, size = 95, normalized size = 0.95

$$\frac{2\left(a+b\sqrt{x}\right)^{p+1}\left(-6a^3+6a^2b(p+1)\sqrt{x}-3ab^2\left(p^2+3p+2\right)x+b^3\left(p^3+6p^2+11p+6\right)x^{3/2}\right)}{b^4(p+1)(p+2)(p+3)(p+4)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^p*x,x]
```

```
[Out] (2*(a + b*Sqrt[x])^(1 + p)*(-6*a^3 + 6*a^2*b*(1 + p)*Sqrt[x] - 3*
a*b^2*(2 + 3*p + p^2)*x + b^3*(6 + 11*p + 6*p^2 + p^3)*x^(3/2)))/
(b^4*(1 + p)*(2 + p)*(3 + p)*(4 + p))
```

Maple [F] time = 0.021, size = 0, normalized size = 0.

$$\int x\left(a+b\sqrt{x}\right)^p\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(a+b*x^(1/2))^p,x)
```

```
[Out] int(x*(a+b*x^(1/2))^p,x)
```

Maxima [A] time = 1.43222, size = 140, normalized size = 1.4

$$\frac{2\left(\left(p^3+6p^2+11p+6\right)b^4x^2+\left(p^3+3p^2+2p\right)ab^3x^{\frac{3}{2}}-3\left(p^2+p\right)a^2b^2x+6a^3bp\sqrt{x}-6a^4\right)\left(b\sqrt{x}+a\right)^p}{(p^4+10p^3+35p^2+50p+24)b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^p*x,x, algorithm="maxima")
```

```
[Out] 2*((p^3 + 6*p^2 + 11*p + 6)*b^4*x^2 + (p^3 + 3*p^2 + 2*p)*a*b^3*x
^(3/2) - 3*(p^2 + p)*a^2*b^2*x + 6*a^3*b*p*sqrt(x) - 6*a^4)*(b*sq
rt(x) + a)^p/((p^4 + 10*p^3 + 35*p^2 + 50*p + 24)*b^4)
```

Fricas [A] time = 0.276088, size = 200, normalized size = 2.

$$-\frac{2\left(6a^4-\left(b^4p^3+6b^4p^2+11b^4p+6b^4\right)x^2+3\left(a^2b^2p^2+a^2b^2p\right)x-\left(6a^3bp+\left(ab^3p^3+3ab^3p^2+2ab^3p\right)x\right)\sqrt{x}\right)\left(b\sqrt{x}+a\right)}{b^4p^4+10b^4p^3+35b^4p^2+50b^4p+24b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^p*x,x, algorithm="fricas")
```

```
[Out] -2*(6*a^4 - (b^4*p^3 + 6*b^4*p^2 + 11*b^4*p + 6*b^4)*x^2 + 3*(a^2
*b^2*p^2 + a^2*b^2*p)*x - (6*a^3*b*p + (a*b^3*p^3 + 3*a*b^3*p^2 +
 2*a*b^3*p)*x)*sqrt(x))*(b*sqrt(x) + a)^p/(b^4*p^4 + 10*b^4*p^3 +
 35*b^4*p^2 + 50*b^4*p + 24*b^4)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(a+b*x**(1/2))**p,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.242723, size = 597, normalized size = 5.97

$$2\left(\left(b\sqrt{x}+a\right)^4p^3e^{\left(p\ln\left(b\sqrt{x}+a\right)\right)}-3\left(b\sqrt{x}+a\right)^3ap^3e^{\left(p\ln\left(b\sqrt{x}+a\right)\right)}+3\left(b\sqrt{x}+a\right)^2a^2p^3e^{\left(p\ln\left(b\sqrt{x}+a\right)\right)}-\left(b\sqrt{x}+a\right)a^3p^3e^{\left(p\ln\left(b\sqrt{x}+a\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^p*x,x, algorithm="giac")
```

```
[Out] 2*((b*sqrt(x) + a)^4*p^3*e^(p*ln(b*sqrt(x) + a)) - 3*(b*sqrt(x) +
 a)^3*a*p^3*e^(p*ln(b*sqrt(x) + a)) + 3*(b*sqrt(x) + a)^2*a^2*p^3
*e^(p*ln(b*sqrt(x) + a)) - (b*sqrt(x) + a)*a^3*p^3*e^(p*ln(b*sqrt
(x) + a)) + 6*(b*sqrt(x) + a)^4*p^2*e^(p*ln(b*sqrt(x) + a)) - 21*
(b*sqrt(x) + a)^3*a*p^2*e^(p*ln(b*sqrt(x) + a)) + 24*(b*sqrt(x) +
 a)^2*a^2*p^2*e^(p*ln(b*sqrt(x) + a)) - 9*(b*sqrt(x) + a)*a^3*p^2
*e^(p*ln(b*sqrt(x) + a)) + 11*(b*sqrt(x) + a)^4*p*e^(p*ln(b*sqrt(
x) + a)) - 42*(b*sqrt(x) + a)^3*a*p*e^(p*ln(b*sqrt(x) + a)) + 57*
(b*sqrt(x) + a)^2*a^2*p*e^(p*ln(b*sqrt(x) + a)) - 26*(b*sqrt(x) +
 a)*a^3*p*e^(p*ln(b*sqrt(x) + a)) + 6*(b*sqrt(x) + a)^4*e^(p*ln(b
*sqrt(x) + a)) - 24*(b*sqrt(x) + a)^3*a*e^(p*ln(b*sqrt(x) + a)) +
 36*(b*sqrt(x) + a)^2*a^2*e^(p*ln(b*sqrt(x) + a)) - 24*(b*sqrt(x)
 + a)*a^3*e^(p*ln(b*sqrt(x) + a)))/((b^2*p^4 + 10*b^2*p^3 + 35*b^
2*p^2 + 50*b^2*p + 24*b^2)*b^2)
```

3.2265 $\int (a+b\sqrt{x})^p\,dx$

Optimal. Leaf size=48

$$\frac{2\left(a+b\sqrt{x}\right)^{p+2}}{b^2(p+2)}-\frac{2a\left(a+b\sqrt{x}\right)^{p+1}}{b^2(p+1)}$$

```
[Out] (-2*a*(a + b*Sqrt[x])^(1 + p))/(b^2*(1 + p)) + (2*(a + b*Sqrt[x])
^(2 + p))/(b^2*(2 + p))
```

Rubi [A] time = 0.0566575, antiderivative size = 48, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{2\left(a+b\sqrt{x}\right)^{p+2}}{b^2(p+2)}-\frac{2a\left(a+b\sqrt{x}\right)^{p+1}}{b^2(p+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^p,x]
```

```
[Out] (-2*a*(a + b*Sqrt[x])^(1 + p))/(b^2*(1 + p)) + (2*(a + b*Sqrt[x])
^(2 + p))/(b^2*(2 + p))
```

Rubi in Sympy [A] time = 9.21465, size = 41, normalized size = 0.85

$$-\frac{2a\left(a+b\sqrt{x}\right)^{p+1}}{b^2\left(p+1\right)}+\frac{2\left(a+b\sqrt{x}\right)^{p+2}}{b^2\left(p+2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**p,x)
```

```
[Out] -2*a*(a + b*sqrt(x))**(p + 1)/(b**2*(p + 1)) + 2*(a + b*sqrt(x))*
*(p + 2)/(b**2*(p + 2))
```

Mathematica [A] time = 0.0286932, size = 42, normalized size = 0.88

$$\frac{2\left(a+b\sqrt{x}\right)^{p+1}\left(b(p+1)\sqrt{x}-a\right)}{b^2(p+1)(p+2)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^p,x]
```

```
[Out] (2*(a + b*Sqrt[x])^(1 + p)*(-a + b*(1 + p)*Sqrt[x]))/(b^2*(1 + p)
*(2 + p))
```

Maple [F] time = 0.021, size = 0, normalized size = 0.

$$\int \left(a+b\sqrt{x}\right)^p\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^p,x)
```

```
[Out] int((a+b*x^(1/2))^p,x)
```

Maxima [A] time = 1.44858, size = 61, normalized size = 1.27

$$\frac{2\left(b^2(p+1)x+abp\sqrt{x}-a^2\right)\left(b\sqrt{x}+a\right)^p}{(p^2+3p+2)b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^p,x, algorithm="maxima")
```

```
[Out] 2*(b^2*(p + 1)*x + a*b*p*sqrt(x) - a^2)*(b*sqrt(x) + a)^p/((p^2 +
 3*p + 2)*b^2)
```

Fricas [A] time = 0.2708, size = 76, normalized size = 1.58

$$\frac{2\left(abp\sqrt{x}-a^2+\left(b^2p+b^2\right)x\right)\left(b\sqrt{x}+a\right)^p}{b^2p^2+3\,b^2p+2\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^p,x, algorithm="fricas")
```

```
[Out] 2*(a*b*p*sqrt(x) - a^2 + (b^2*p + b^2)*x)*(b*sqrt(x) + a)^p/(b^2*
p^2 + 3*b^2*p + 2*b^2)
```

Sympy [A] time = 5.80834, size = 823, normalized size = 17.15

$$\begin{aligned}
&-\frac{2a^3a^px^2\left(1+\frac{b\sqrt{x}}{a}\right)^p}{ab^2p^2x^2+3ab^2px^2+2ab^2x^2+b^3p^2x^{\frac{5}{2}}+3b^3px^{\frac{5}{2}}+2b^3x^{\frac{5}{2}}}\\
&+\frac{2a^3a^px^2}{ab^2p^2x^2+3ab^2px^2+2ab^2x^2+b^3p^2x^{\frac{5}{2}}+3b^3px^{\frac{5}{2}}+2b^3x^{\frac{5}{2}}}\\
&+\frac{2a^2a^pbpx^{\frac{5}{2}}\left(1+\frac{b\sqrt{x}}{a}\right)^p}{ab^2p^2x^2+3ab^2px^2+2ab^2x^2+b^3p^2x^{\frac{5}{2}}+3b^3px^{\frac{5}{2}}+2b^3x^{\frac{5}{2}}}\\
&-\frac{2a^2a^pbx^{\frac{5}{2}}\left(1+\frac{b\sqrt{x}}{a}\right)^p}{ab^2p^2x^2+3ab^2px^2+2ab^2x^2+b^3p^2x^{\frac{5}{2}}+3b^3px^{\frac{5}{2}}+2b^3x^{\frac{5}{2}}}\\
&+\frac{2a^2a^pbx^{\frac{5}{2}}}{ab^2p^2x^2+3ab^2px^2+2ab^2x^2+b^3p^2x^{\frac{5}{2}}+3b^3px^{\frac{5}{2}}+2b^3x^{\frac{5}{2}}}\\
&+\frac{4aa^pb^2px^3\left(1+\frac{b\sqrt{x}}{a}\right)^p}{ab^2p^2x^2+3ab^2px^2+2ab^2x^2+b^3p^2x^{\frac{5}{2}}+3b^3px^{\frac{5}{2}}+2b^3x^{\frac{5}{2}}}\\
&+\frac{2aa^pb^2x^3\left(1+\frac{b\sqrt{x}}{a}\right)^p}{ab^2p^2x^2+3ab^2px^2+2ab^2x^2+b^3p^2x^{\frac{5}{2}}+3b^3px^{\frac{5}{2}}+2b^3x^{\frac{5}{2}}}\\
&+\frac{2a^pb^3px^{\frac{7}{2}}\left(1+\frac{b\sqrt{x}}{a}\right)^p}{ab^2p^2x^2+3ab^2px^2+2ab^2x^2+b^3p^2x^{\frac{5}{2}}+3b^3px^{\frac{5}{2}}+2b^3x^{\frac{5}{2}}}\\
&+\frac{2a^pb^3x^{\frac{7}{2}}\left(1+\frac{b\sqrt{x}}{a}\right)^p}{ab^2p^2x^2+3ab^2px^2+2ab^2x^2+b^3p^2x^{\frac{5}{2}}+3b^3px^{\frac{5}{2}}+2b^3x^{\frac{5}{2}}}
\end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**p,x)
```

```
[Out] -2*a**3*a**p*x**2*(1 + b*sqrt(x)/a)**p/(a*b**2*p**2*x**2 + 3*a*b*
*2*p*x**2 + 2*a*b**2*x**2 + b**3*p**2*x**(5/2) + 3*b**3*p*x**(5/2
) + 2*b**3*x**(5/2)) + 2*a**3*a**p*x**2/(a*b**2*p**2*x**2 + 3*a*b
**2*p*x**2 + 2*a*b**2*x**2 + b**3*p**2*x**(5/2) + 3*b**3*p*x**(5/
2) + 2*b**3*x**(5/2)) + 2*a**2*a**p*b*p*x**(5/2)*(1 + b*sqrt(x)/a
)**p/(a*b**2*p**2*x**2 + 3*a*b**2*p*x**2 + 2*a*b**2*x**2 + b**3*p
**2*x**(5/2) + 3*b**3*p*x**(5/2) + 2*b**3*x**(5/2)) - 2*a**2*a**p
*b*x**(5/2)*(1 + b*sqrt(x)/a)**p/(a*b**2*p**2*x**2 + 3*a*b**2*p*x
**2 + 2*a*b**2*x**2 + b**3*p**2*x**(5/2) + 3*b**3*p*x**(5/2) + 2*
b**3*x**(5/2)) + 2*a**2*a**p*b*x**(5/2)/(a*b**2*p**2*x**2 + 3*a*b
**2*p*x**2 + 2*a*b**2*x**2 + b**3*p**2*x**(5/2) + 3*b**3*p*x**(5/
2) + 2*b**3*x**(5/2)) + 4*a*a**p*b**2*p*x**3*(1 + b*sqrt(x)/a)**p
/(a*b**2*p**2*x**2 + 3*a*b**2*p*x**2 + 2*a*b**2*x**2 + b**3*p**2*
x**(5/2) + 3*b**3*p*x**(5/2) + 2*b**3*x**(5/2)) + 2*a*a**p*b**2*x
**3*(1 + b*sqrt(x)/a)**p/(a*b**2*p**2*x**2 + 3*a*b**2*p*x**2 + 2*
a*b**2*x**2 + b**3*p**2*x**(5/2) + 3*b**3*p*x**(5/2) + 2*b**3*x**
(5/2)) + 2*a**p*b**3*p*x**(7/2)*(1 + b*sqrt(x)/a)**p/(a*b**2*p**2
*x**2 + 3*a*b**2*p*x**2 + 2*a*b**2*x**2 + b**3*p**2*x**(5/2) + 3*
b**3*p*x**(5/2) + 2*b**3*x**(5/2)) + 2*a**p*b**3*x**(7/2)*(1 + b*
sqrt(x)/a)**p/(a*b**2*p**2*x**2 + 3*a*b**2*p*x**2 + 2*a*b**2*x**2
 + b**3*p**2*x**(5/2) + 3*b**3*p*x**(5/2) + 2*b**3*x**(5/2))
```

GIAC/XCAS [A] time = 0.269291, size = 138, normalized size = 2.88

$$\frac{2\left(\left(b\sqrt{x}+a\right)^{2}pe^{\left(p\ln\left(b\sqrt{x}+a\right)\right)}-\left(b\sqrt{x}+a\right)ape^{\left(p\ln\left(b\sqrt{x}+a\right)\right)}+\left(b\sqrt{x}+a\right)^{2}e^{\left(p\ln\left(b\sqrt{x}+a\right)\right)}-2\left(b\sqrt{x}+a\right)ae^{\left(p\ln\left(b\sqrt{x}+a\right)\right)}\right)}{(p^{2}+3p+2)b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^p,x, algorithm="giac")
```

```
[Out] 2*((b*sqrt(x) + a)^2*p*e^(p*ln(b*sqrt(x) + a)) - (b*sqrt(x) + a)*
a*p*e^(p*ln(b*sqrt(x) + a)) + (b*sqrt(x) + a)^2*e^(p*ln(b*sqrt(x)
 + a)) - 2*(b*sqrt(x) + a)*a*e^(p*ln(b*sqrt(x) + a)))/((p^2 + 3*p
 + 2)*b^2)
```

3.2266 $\int \frac{(a+b\sqrt{x})^p}{x}\,dx$

Optimal. Leaf size=43

$$-\frac{2\left(a+b\sqrt{x}\right)^{p+1}{}_2F_1\left(1,p+1;p+2;\frac{\sqrt{x}b}{a}+1\right)}{a(p+1)}$$

```
[Out] (-2*(a + b*Sqrt[x])^(1 + p)*Hypergeometric2F1[1, 1 + p, 2 + p, 1
+ (b*Sqrt[x])/a])/(a*(1 + p))
```

Rubi [A] time = 0.047178, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2\left(a+b\sqrt{x}\right)^{p+1}{}_2F_1\left(1,p+1;p+2;\frac{\sqrt{x}b}{a}+1\right)}{a(p+1)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Sqrt[x])^p/x,x]
```

```
[Out] (-2*(a + b*Sqrt[x])^(1 + p)*Hypergeometric2F1[1, 1 + p, 2 + p, 1
+ (b*Sqrt[x])/a])/(a*(1 + p))
```

Rubi in Sympy [A] time = 5.65795, size = 34, normalized size = 0.79

$$-\frac{2\left(a+b\sqrt{x}\right)^{p+1}{}_2F_1\left(\left.\begin{matrix}1,p+1\\p+2\end{matrix}\right|1+\frac{b\sqrt{x}}{a}\right)}{a\left(p+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b*x**(1/2))**p/x,x)
```

```
[Out] -2*(a + b*sqrt(x))**(p + 1)*hyper((1, p + 1), (p + 2,), 1 + b*sqr
t(x)/a)/(a*(p + 1))
```

Mathematica [A] time = 0.034323, size = 55, normalized size = 1.28

$$\frac{2\left(\frac{a}{b\sqrt{x}}+1\right)^{-p}\left(a+b\sqrt{x}\right)^p{}_2F_1\left(-p,-p;1-p;-\frac{a}{b\sqrt{x}}\right)}{p}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Sqrt[x])^p/x,x]
```

```
[Out] (2*(a + b*Sqrt[x])^p*Hypergeometric2F1[-p, -p, 1 - p, -(a/(b*Sqrt
[x]))])/(p*(1 + a/(b*Sqrt[x]))^p)
```

Maple [F] time = 0.022, size = 0, normalized size = 0.

$$\int \frac{1}{x}\left(a+b\sqrt{x}\right)^p\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^p/x,x)
```

```
[Out] int((a+b*x^(1/2))^p/x,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\sqrt{x}+a)^p}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^p/x,x, algorithm="maxima")
```

```
[Out] integrate((b*sqrt(x) + a)^p/x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(b\sqrt{x}+a)^p}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^p/x,x, algorithm="fricas")
```

```
[Out] integral((b*sqrt(x) + a)^p/x, x)
```

Sympy [A] time = 7.17471, size = 41, normalized size = 0.95

$$-\frac{2b^p x^{\frac{p}{2}}\,\Gamma(-p)\,{}_2F_1\left(\begin{matrix}-p,-p\\-p+1\end{matrix}\middle|\frac{ae^{i\pi}}{b\sqrt{x}}\right)}{\Gamma(-p+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**p/x,x)
```

```
[Out] -2*b**p*x**(p/2)*gamma(-p)*hyper((-p, -p), (-p + 1,), a*exp_polar
(I*pi)/(b*sqrt(x)))/gamma(-p + 1)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\sqrt{x}+a)^p}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^p/x,x, algorithm="giac")
```

```
[Out] integrate((b*sqrt(x) + a)^p/x, x)
```

3.2267 $\int \frac{(a+b\sqrt{x})^p}{x^2}\,dx$

Optimal. Leaf size=46

$$-\frac{2b^2\left(a+b\sqrt{x}\right)^{p+1}{}_2F_1\left(3,p+1;p+2;\frac{\sqrt{x}b}{a}+1\right)}{a^3(p+1)}$$

```
[Out] (-2*b^2*(a + b*Sqrt[x])^(1 + p)*Hypergeometric2F1[3, 1 + p, 2 + p
, 1 + (b*Sqrt[x])/a])/(a^3*(1 + p))
```

Rubi [A] time = 0.053777, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{2b^2\left(a+b\sqrt{x}\right)^{p+1}{}_2F_1\left(3,p+1;p+2;\frac{\sqrt{x}b}{a}+1\right)}{a^3(p+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*Sqrt[x])^p/x^2,x]
```

```
[Out] (-2*b^2*(a + b*Sqrt[x])^(1 + p)*Hypergeometric2F1[3, 1 + p, 2 + p
, 1 + (b*Sqrt[x])/a])/(a^3*(1 + p))
```

Rubi in Sympy [A] time = 6.83301, size = 39, normalized size = 0.85

$$-\frac{2b^2\left(a+b\sqrt{x}\right)^{p+1}{}_2F_1\left(\begin{matrix}3,p+1\\p+2\end{matrix}\middle|1+\frac{b\sqrt{x}}{a}\right)}{a^3\left(p+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/2))**p/x**2,x)
```

```
[Out] -2*b**2*(a + b*sqrt(x))**(p + 1)*hyper((3, p + 1), (p + 2,), 1 +
b*sqrt(x)/a)/(a**3*(p + 1))
```

Mathematica [A] time = 0.0319637, size = 62, normalized size = 1.35

$$\frac{2\left(\frac{a}{b\sqrt{x}}+1\right)^{-p}\left(a+b\sqrt{x}\right)^p{}_2F_1\left(2-p,-p;3-p;-\frac{a}{b\sqrt{x}}\right)}{(p-2)x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*Sqrt[x])^p/x^2,x]
```

```
[Out] (2*(a + b*Sqrt[x])^p*Hypergeometric2F1[2 - p, -p, 3 - p, -(a/(b*S
qrt[x]))])/((-2 + p)*(1 + a/(b*Sqrt[x]))^p*x)
```

Maple [F] time = 0.023, size = 0, normalized size = 0.

$$\int \frac{1}{x^2}\left(a+b\sqrt{x}\right)^p\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/2))^p/x^2,x)
```

```
[Out] int((a+b*x^(1/2))^p/x^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b\sqrt{x}+a\right)^p}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^p/x^2,x, algorithm="maxima")
```

```
[Out] integrate((b*sqrt(x) + a)^p/x^2, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\left(b\sqrt{x}+a\right)^p}{x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^p/x^2,x, algorithm="fricas")
```

```
[Out] integral((b*sqrt(x) + a)^p/x^2, x)
```

Sympy [A] time = 18.198, size = 42, normalized size = 0.91

$$-\frac{2b^p x^{\frac{p}{2}}\left(-p+2\right){}_2F_1\left(\begin{matrix}-p,-p+2\\-p+3\end{matrix}\middle|\frac{ae^{i\pi}}{b\sqrt{x}}\right)}{x\left(-p+3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/2))**p/x**2,x)
```

```
[Out] -2*b**p*x**(p/2)*gamma(-p + 2)*hyper((-p, -p + 2), (-p + 3,), a*e
xp_polar(I*pi)/(b*sqrt(x)))/(x*gamma(-p + 3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b\sqrt{x}+a\right)^p}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*sqrt(x) + a)^p/x^2,x, algorithm="giac")
```

```
[Out] integrate((b*sqrt(x) + a)^p/x^2, x)
```

3.2268 $\int \frac{x^4}{\left(a+bx^{3/2}\right)^{2/3}}\,dx$

Optimal. Leaf size=42

$$\frac{x^5\sqrt[3]{a+bx^{3/2}}\,{}_2F_1\left(1,\frac{11}{3};\frac{13}{3};-\frac{bx^{3/2}}{a}\right)}{5a}$$

```
[Out] (x^5*(a + b*x^(3/2))^(1/3)*Hypergeometric2F1[1, 11/3, 13/3, -((b*
x^(3/2))/a)])/(5*a)
```

Rubi [A] time = 0.098764, antiderivative size = 57, normalized size of antiderivative = 1.36, number of steps used = 3, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.176$

$$\frac{x^5\left(\frac{bx^{3/2}}{a}+1\right)^{2/3}\,{}_2F_1\left(\frac{2}{3},\frac{10}{3};\frac{13}{3};-\frac{bx^{3/2}}{a}\right)}{5\left(a+bx^{3/2}\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4/(a + b*x^(3/2))^(2/3),x]
```

```
[Out] (x^5*(1 + (b*x^(3/2))/a)^(2/3)*Hypergeometric2F1[2/3, 10/3, 13/3,
 -((b*x^(3/2))/a)])/(5*(a + b*x^(3/2))^(2/3))
```

Rubi in Sympy [A] time = 9.0365, size = 48, normalized size = 1.14

$$\frac{x^5\sqrt[3]{a+bx^{\frac{3}{2}}}\,{}_2F_1\left(\begin{matrix}\frac{2}{3},\frac{10}{3}\\\frac{13}{3}\end{matrix}\middle|-\frac{bx^{\frac{3}{2}}}{a}\right)}{5a\sqrt[3]{1+\frac{bx^{\frac{3}{2}}}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4/(a+b*x**(3/2))**(2/3),x)
```

```
[Out] x**5*(a + b*x**(3/2))**(1/3)*hyper((2/3, 10/3), (13/3,), -b*x**(3
/2)/a)/(5*a*(1 + b*x**(3/2)/a)**(1/3))
```

Mathematica [B] time = 0.0824257, size = 103, normalized size = 2.45

$$\frac{\sqrt{x}\left(-14a^3\left(\frac{bx^{3/2}}{a}+1\right)^{2/3}\,{}_2F_1\left(\frac{1}{3},\frac{2}{3};\frac{4}{3};-\frac{bx^{3/2}}{a}\right)+14a^3+7a^2bx^{3/2}-2ab^2x^3+5b^3x^{9/2}\right)}{20b^3\left(a+bx^{3/2}\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^4/(a + b*x^(3/2))^(2/3),x]
```

```
[Out] (Sqrt[x]*(14*a^3 + 7*a^2*b*x^(3/2) - 2*a*b^2*x^3 + 5*b^3*x^(9/2)
- 14*a^3*(1 + (b*x^(3/2))/a)^(2/3)*Hypergeometric2F1[1/3, 2/3, 4/
3, -((b*x^(3/2))/a)]))/(20*b^3*(a + b*x^(3/2))^(2/3))
```

Maple [F] time = 0.023, size = 0, normalized size = 0.

$$\int x^4 \left(a + b x^{\frac{3}{2}}\right)^{-\frac{2}{3}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4/(a+b*x^(3/2))^(2/3),x)

[Out] int(x^4/(a+b*x^(3/2))^(2/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\left(b x^{\frac{3}{2}} + a\right)^{\frac{2}{3}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^(3/2) + a)^(2/3),x, algorithm="maxima")

[Out] integrate(x^4/(b*x^(3/2) + a)^(2/3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^4}{\left(b x^{\frac{3}{2}} + a\right)^{\frac{2}{3}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^(3/2) + a)^(2/3),x, algorithm="fricas")

[Out] integral(x^4/(b*x^(3/2) + a)^(2/3), x)
```

Sympy [A] time = 22.9656, size = 41, normalized size = 0.98

$$\frac{2x^5 \Gamma\left(\frac{10}{3}\right) {}_2F_1\left(\begin{matrix} \frac{2}{3}, \frac{10}{3} \\ \frac{13}{3} \end{matrix}\middle| \frac{b x^{\frac{3}{2}} e^{i\pi}}{a}\right)}{3a^{\frac{2}{3}} \Gamma\left(\frac{13}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4/(a+b*x**(3/2))**(2/3),x)

[Out] 2*x**5*gamma(10/3)*hyper((2/3, 10/3), (13/3,), b*x**(3/2)*exp_pol
ar(I*pi)/a)/(3*a**(2/3)*gamma(13/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4}{\left(b x^{\frac{3}{2}} + a\right)^{\frac{2}{3}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^4/(b*x^(3/2) + a)^(2/3),x, algorithm="giac")
```

```
[Out] integrate(x^4/(b*x^(3/2) + a)^(2/3), x)
```

3.2269 $\int \frac{x^3}{\left(a+bx^{3/2}\right)^{2/3}}\,dx$

Optimal. Leaf size=198

$$-\frac{10a^2\log\left(1-\frac{\sqrt[3]{b}\sqrt{x}}{\sqrt[3]{a+bx^{3/2}}}\right)}{27b^{8/3}}+\frac{5a^2\log\left(\frac{b^{2/3}x}{\left(a+bx^{3/2}\right)^{2/3}}+\frac{\sqrt[3]{b}\sqrt{x}}{\sqrt[3]{a+bx^{3/2}}}+1\right)}{27b^{8/3}}-\frac{10a^2\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}\sqrt{x}}{\sqrt[3]{a+bx^{3/2}}}+1}{\sqrt{3}}\right)}{9\sqrt{3}b^{8/3}}-\frac{5ax\sqrt[3]{a+bx^{3/2}}}{9b^2}+\frac{x^{5/2}\sqrt[3]{a+bx^{3/2}}}{3b}$$

```
[Out] (-5*a*x*(a + b*x^(3/2))^(1/3))/(9*b^2) + (x^(5/2)*(a + b*x^(3/2))
^(1/3))/(3*b) - (10*a^2*ArcTan[(1 + (2*b^(1/3)*Sqrt[x])/(a + b*x^
(3/2))^(1/3))/Sqrt[3]])/(9*Sqrt[3]*b^(8/3)) - (10*a^2*Log[1 - (b^
(1/3)*Sqrt[x])/(a + b*x^(3/2))^(1/3)])/(27*b^(8/3)) + (5*a^2*Log[
1 + (b^(2/3)*x)/(a + b*x^(3/2))^(2/3) + (b^(1/3)*Sqrt[x])/(a + b*
x^(3/2))^(1/3)])/(27*b^(8/3))
```

Rubi [A] time = 0.374353, antiderivative size = 198, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 9, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.529

$$-\frac{10a^2\log\left(1-\frac{\sqrt[3]{b}\sqrt{x}}{\sqrt[3]{a+bx^{3/2}}}\right)}{27b^{8/3}}+\frac{5a^2\log\left(\frac{b^{2/3}x}{\left(a+bx^{3/2}\right)^{2/3}}+\frac{\sqrt[3]{b}\sqrt{x}}{\sqrt[3]{a+bx^{3/2}}}+1\right)}{27b^{8/3}}-\frac{10a^2\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}\sqrt{x}}{\sqrt[3]{a+bx^{3/2}}}+1}{\sqrt{3}}\right)}{9\sqrt{3}b^{8/3}}-\frac{5ax\sqrt[3]{a+bx^{3/2}}}{9b^2}+\frac{x^{5/2}\sqrt[3]{a+bx^{3/2}}}{3b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(a + b*x^(3/2))^(2/3),x]
```

```
[Out] (-5*a*x*(a + b*x^(3/2))^(1/3))/(9*b^2) + (x^(5/2)*(a + b*x^(3/2))
^(1/3))/(3*b) - (10*a^2*ArcTan[(1 + (2*b^(1/3)*Sqrt[x])/(a + b*x^
(3/2))^(1/3))/Sqrt[3]])/(9*Sqrt[3]*b^(8/3)) - (10*a^2*Log[1 - (b^
(1/3)*Sqrt[x])/(a + b*x^(3/2))^(1/3)])/(27*b^(8/3)) + (5*a^2*Log[
1 + (b^(2/3)*x)/(a + b*x^(3/2))^(2/3) + (b^(1/3)*Sqrt[x])/(a + b*
x^(3/2))^(1/3)])/(27*b^(8/3))
```

Rubi in Sympy [A] time = 32.3995, size = 187, normalized size = 0.94

$$-\frac{10a^2\log\left(-\frac{\sqrt[3]{b}\sqrt{x}}{\sqrt[3]{a+bx^{\frac{3}{2}}}}+1\right)}{27b^{\frac{8}{3}}}+\frac{5a^2\log\left(\frac{b^{\frac{2}{3}}x}{\left(a+bx^{\frac{3}{2}}\right)^{\frac{2}{3}}}+\frac{\sqrt[3]{b}\sqrt{x}}{\sqrt[3]{a+bx^{\frac{3}{2}}}}+1\right)}{27b^{\frac{8}{3}}}-\frac{10\sqrt{3}a^2\,\mathrm{atan}\left(\sqrt{3}\left(\frac{2\sqrt[3]{b}\sqrt{x}}{3\sqrt[3]{a+bx^{\frac{3}{2}}}}+\frac{1}{3}\right)\right)}{27b^{\frac{8}{3}}}-\frac{5ax\sqrt[3]{a+bx^{\frac{3}{2}}}}{9b^2}+\frac{x^{\frac{5}{2}}\sqrt[3]{a+bx^{\frac{3}{2}}}}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(a+b*x**(3/2))**(2/3),x)
```

```
[Out] -10*a**2*log(-b**(1/3)*sqrt(x)/(a + b*x**(3/2))**(1/3) + 1)/(27*b
**(8/3)) + 5*a**2*log(b**(2/3)*x/(a + b*x**(3/2))**(2/3) + b**(1/
3)*sqrt(x)/(a + b*x**(3/2))**(1/3) + 1)/(27*b**(8/3)) - 10*sqrt(3
)*a**2*atan(sqrt(3)*(2*b**(1/3)*sqrt(x)/(3*(a + b*x**(3/2))**(1/3
)) + 1/3))/(27*b**(8/3)) - 5*a*x*(a + b*x**(3/2))**(1/3)/(9*b**2)
 + x**(5/2)*(a + b*x**(3/2))**(1/3)/(3*b)
```

Mathematica [C] time = 0.0533722, size = 87, normalized size = 0.44

$$\frac{5a^2x\left(\frac{bx^{3/2}}{a}+1\right)^{2/3}{}_2F_1\left(\frac{2}{3},\frac{2}{3};\frac{5}{3};-\frac{bx^{3/2}}{a}\right)-5a^2x-2abx^{5/2}+3b^2x^4}{9b^2\left(a+bx^{3/2}\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(a + b*x^(3/2))^(2/3),x]
```

```
[Out] (-5*a^2*x - 2*a*b*x^(5/2) + 3*b^2*x^4 + 5*a^2*x*(1 + (b*x^(3/2))/
a)^(2/3)*Hypergeometric2F1[2/3, 2/3, 5/3, -((b*x^(3/2))/a)])/(9*b
^2*(a + b*x^(3/2))^(2/3))
```

Maple [F] time = 0.023, size = 0, normalized size = 0.

$$\int x^3\left(a+bx^{\frac{3}{2}}\right)^{-\frac{2}{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(a+b*x^(3/2))^(2/3),x)
```

```
[Out] int(x^3/(a+b*x^(3/2))^(2/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^(3/2) + a)^(2/3),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^(3/2) + a)^(2/3),x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [A] time = 11.4368, size = 41, normalized size = 0.21

$$\frac{2x^{4}\Gamma\left(\frac{8}{3}\right){}_{2}F_{1}\left(\begin{matrix}\frac{2}{3},\frac{8}{3}\\ \frac{11}{3}\end{matrix}\middle|\frac{bx^{\frac{3}{2}}e^{i\pi}}{a}\right)}{3a^{\frac{2}{3}}\Gamma\left(\frac{11}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(a+b*x**(3/2))**(2/3),x)
```

```
[Out] 2*x**4*gamma(8/3)*hyper((2/3, 8/3), (11/3,), b*x**(3/2)*exp_polar
(I*pi)/a)/(3*a**(2/3)*gamma(11/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{3}}{\left(bx^{\frac{3}{2}}+a\right)^{\frac{2}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^(3/2) + a)^(2/3),x, algorithm="giac")
```

```
[Out] integrate(x^3/(b*x^(3/2) + a)^(2/3), x)
```

3.2270 $\int \frac{x^2}{\left(a+bx^{3/2}\right)^{2/3}}\,dx$

Optimal. Leaf size=40

$$\frac{\left(a+bx^{3/2}\right)^{4/3}}{2b^2}-\frac{2a\sqrt[3]{a+bx^{3/2}}}{b^2}$$

```
[Out] (-2*a*(a + b*x^(3/2))^(1/3))/b^2 + (a + b*x^(3/2))^(4/3)/(2*b^2)
```

Rubi [A] time = 0.0624712, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$

$$\frac{\left(a+bx^{3/2}\right)^{4/3}}{2b^2}-\frac{2a\sqrt[3]{a+bx^{3/2}}}{b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b*x^(3/2))^(2/3),x]
```

```
[Out] (-2*a*(a + b*x^(3/2))^(1/3))/b^2 + (a + b*x^(3/2))^(4/3)/(2*b^2)
```

Rubi in Sympy [A] time = 7.14871, size = 34, normalized size = 0.85

$$-\frac{2a\sqrt[3]{a+bx^{\frac{3}{2}}}}{b^2}+\frac{\left(a+bx^{\frac{3}{2}}\right)^{\frac{4}{3}}}{2b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b*x**(3/2))**(2/3),x)
```

```
[Out] -2*a*(a + b*x**(3/2))**(1/3)/b**2 + (a + b*x**(3/2))**(4/3)/(2*b*
*2)
```

Mathematica [A] time = 0.0222897, size = 31, normalized size = 0.78

$$\frac{\left(bx^{3/2}-3a\right)\sqrt[3]{a+bx^{3/2}}}{2b^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a + b*x^(3/2))^(2/3),x]
```

```
[Out] ((-3*a + b*x^(3/2))*(a + b*x^(3/2))^(1/3))/(2*b^2)
```

Maple [A] time = 0.004, size = 30, normalized size = 0.8

$$2\,\frac{1/4\,\left(a+bx^{3/2}\right)^{4/3}-a\sqrt[3]{a+bx^{3/2}}}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(a+b*x^(3/2))^(2/3),x)
```

```
[Out] 2/b^2*(1/4*(a+b*x^(3/2))^(4/3)-a*(a+b*x^(3/2))^(1/3))
```

Maxima [A] time = 1.44101, size = 41, normalized size = 1.02

$$\frac{\left(bx^{\frac{3}{2}} + a\right)^{\frac{4}{3}}}{2\,b^2} - \frac{2\left(bx^{\frac{3}{2}} + a\right)^{\frac{1}{3}}a}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^(3/2) + a)^(2/3),x, algorithm="maxima")
```

```
[Out] 1/2*(b*x^(3/2) + a)^(4/3)/b^2 - 2*(b*x^(3/2) + a)^(1/3)*a/b^2
```

Fricas [A] time = 0.43604, size = 31, normalized size = 0.78

$$\frac{\left(bx^{\frac{3}{2}} + a\right)^{\frac{1}{3}}\left(bx^{\frac{3}{2}} - 3\,a\right)}{2\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^(3/2) + a)^(2/3),x, algorithm="fricas")
```

```
[Out] 1/2*(b*x^(3/2) + a)^(1/3)*(b*x^(3/2) - 3*a)/b^2
```

Sympy [A] time = 5.14262, size = 49, normalized size = 1.22

$$\begin{cases} -\frac{3a\sqrt[3]{a + bx^{\frac{3}{2}}}}{2b^2} + \frac{x^{\frac{3}{2}}\sqrt[3]{a + bx^{\frac{3}{2}}}}{2b} & \text{for}\: b \neq 0 \\ \frac{x^3}{3a^{\frac{2}{3}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b*x**(3/2))**(2/3),x)
```

```
[Out] Piecewise((-3*a*(a + b*x**(3/2))**(1/3)/(2*b**2) + x**(3/2)*(a +
b*x**(3/2))**(1/3)/(2*b), Ne(b, 0)), (x**3/(3*a**(2/3)), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\left(bx^{\frac{3}{2}} + a\right)^{\frac{2}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^(3/2) + a)^(2/3),x, algorithm="giac")
```

```
[Out] integrate(x^2/(b*x^(3/2) + a)^(2/3), x)
```

3.2271 $\int \frac{x}{\left(a+bx^{3/2}\right)^{2/3}}\,dx$

Optimal. Leaf size=42

$$\frac{x^2\sqrt[3]{a+bx^{3/2}}\,{}_2F_1\left(1,\frac{5}{3};\frac{7}{3};-\frac{bx^{3/2}}{a}\right)}{2a}$$

```
[Out] (x^2*(a + b*x^(3/2))^(1/3)*Hypergeometric2F1[1, 5/3, 7/3, -((b*x^
(3/2))/a)])/(2*a)
```

Rubi [A] time = 0.0950916, antiderivative size = 57, normalized size of antiderivative = 1.36, number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{x^2\left(\frac{bx^{3/2}}{a}+1\right)^{2/3}{}_2F_1\left(\frac{2}{3},\frac{4}{3};\frac{7}{3};-\frac{bx^{3/2}}{a}\right)}{2\left(a+bx^{3/2}\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b*x^(3/2))^(2/3),x]
```

```
[Out] (x^2*(1 + (b*x^(3/2))/a)^(2/3)*Hypergeometric2F1[2/3, 4/3, 7/3, -
((b*x^(3/2))/a)])/(2*(a + b*x^(3/2))^(2/3))
```

Rubi in Sympy [A] time = 9.06406, size = 48, normalized size = 1.14

$$\frac{x^2\sqrt[3]{a+bx^{\frac{3}{2}}}\,{}_2F_1\left(\begin{matrix}\frac{2}{3},\frac{4}{3}\\ \frac{7}{3}\end{matrix}\middle|-\frac{bx^{\frac{3}{2}}}{a}\right)}{2a\sqrt[3]{1+\frac{bx^{\frac{3}{2}}}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b*x**(3/2))**(2/3),x)
```

```
[Out] x**2*(a + b*x**(3/2))**(1/3)*hyper((2/3, 4/3), (7/3,), -b*x**(3/2
)/a)/(2*a*(1 + b*x**(3/2)/a)**(1/3))
```

Mathematica [A] time = 0.0510622, size = 71, normalized size = 1.69

$$\frac{\sqrt{x}\left(-a\left(\frac{bx^{3/2}}{a}+1\right)^{2/3}{}_2F_1\left(\frac{1}{3},\frac{2}{3};\frac{4}{3};-\frac{bx^{3/2}}{a}\right)+a+bx^{3/2}\right)}{b\left(a+bx^{3/2}\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b*x^(3/2))^(2/3),x]
```

```
[Out] (Sqrt[x]*(a + b*x^(3/2) - a*(1 + (b*x^(3/2))/a)^(2/3)*Hypergeomet
ric2F1[1/3, 2/3, 4/3, -((b*x^(3/2))/a)]))/(b*(a + b*x^(3/2))^(2/3
))
```

Maple [F] time = 0.022, size = 0, normalized size = 0.

$$\int x\left(a+bx^{\frac{3}{2}}\right)^{-\frac{2}{3}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x/(a+b*x^(3/2))^(2/3),x)

[Out] int(x/(a+b*x^(3/2))^(2/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\left(bx^{\frac{3}{2}}+a\right)^{\frac{2}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(b*x^(3/2) + a)^(2/3),x, algorithm="maxima")

[Out] integrate(x/(b*x^(3/2) + a)^(2/3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x}{\left(bx^{\frac{3}{2}}+a\right)^{\frac{2}{3}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(b*x^(3/2) + a)^(2/3),x, algorithm="fricas")

[Out] integral(x/(b*x^(3/2) + a)^(2/3), x)
```

Sympy [A] time = 2.48303, size = 41, normalized size = 0.98

$$\frac{2x^2\left(\frac{4}{3}\right)\,{}_2F_1\left(\left.\begin{matrix}\frac{2}{3},\frac{4}{3}\\ \frac{7}{3}\end{matrix}\right|\frac{bx^{\frac{3}{2}}e^{i\pi}}{a}\right)}{3a^{\frac{2}{3}}\left(\frac{7}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(a+b*x**(3/2))**(2/3),x)

[Out] 2*x**2*gamma(4/3)*hyper((2/3, 4/3), (7/3,), b*x**(3/2)*exp_polar(
I*pi)/a)/(3*a**(2/3)*gamma(7/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\left(bx^{\frac{3}{2}}+a\right)^{\frac{2}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^(3/2) + a)^(2/3),x, algorithm="giac")

[Out] integrate(x/(b*x^(3/2) + a)^(2/3), x)
```

3.2272 $\int \frac{1}{\left(a+bx^{3/2}\right)^{2/3}}\,dx$

Optimal. Leaf size=140

$$-\frac{2\log\left(1-\frac{\sqrt[3]{b}\sqrt{x}}{\sqrt[3]{a+bx^{3/2}}}\right)}{3b^{2/3}}+\frac{\log\left(\frac{b^{2/3}x}{\left(a+bx^{3/2}\right)^{2/3}}+\frac{\sqrt[3]{b}\sqrt{x}}{\sqrt[3]{a+bx^{3/2}}}+1\right)}{3b^{2/3}}-\frac{2\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}\sqrt{x}}{\sqrt[3]{a+bx^{3/2}}}+1}{\sqrt{3}}\right)}{\sqrt{3}b^{2/3}}$$

```
[Out] (-2*ArcTan[(1 + (2*b^(1/3)*Sqrt[x])/(a + b*x^(3/2))^(1/3))/Sqrt[3
]])/(Sqrt[3]*b^(2/3)) - (2*Log[1 - (b^(1/3)*Sqrt[x])/(a + b*x^(3/
2))^(1/3)])/(3*b^(2/3)) + Log[1 + (b^(2/3)*x)/(a + b*x^(3/2))^(2/
3) + (b^(1/3)*Sqrt[x])/(a + b*x^(3/2))^(1/3)]/(3*b^(2/3))
```

Rubi [A] time = 0.200703, antiderivative size = 140, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615

$$-\frac{2\log\left(1-\frac{\sqrt[3]{b}\sqrt{x}}{\sqrt[3]{a+bx^{3/2}}}\right)}{3b^{2/3}}+\frac{\log\left(\frac{b^{2/3}x}{\left(a+bx^{3/2}\right)^{2/3}}+\frac{\sqrt[3]{b}\sqrt{x}}{\sqrt[3]{a+bx^{3/2}}}+1\right)}{3b^{2/3}}-\frac{2\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}\sqrt{x}}{\sqrt[3]{a+bx^{3/2}}}+1}{\sqrt{3}}\right)}{\sqrt{3}b^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(3/2))^(-2/3),x]
```

```
[Out] (-2*ArcTan[(1 + (2*b^(1/3)*Sqrt[x])/(a + b*x^(3/2))^(1/3))/Sqrt[3
]])/(Sqrt[3]*b^(2/3)) - (2*Log[1 - (b^(1/3)*Sqrt[x])/(a + b*x^(3/
2))^(1/3)])/(3*b^(2/3)) + Log[1 + (b^(2/3)*x)/(a + b*x^(3/2))^(2/
3) + (b^(1/3)*Sqrt[x])/(a + b*x^(3/2))^(1/3)]/(3*b^(2/3))
```

Rubi in Sympy [A] time = 20.6116, size = 133, normalized size = 0.95

$$-\frac{2\log\left(-\frac{\sqrt[3]{b}\sqrt{x}}{\sqrt[3]{a+bx^{\frac{3}{2}}}}+1\right)}{3b^{\frac{2}{3}}}+\frac{\log\left(\frac{b^{\frac{2}{3}}x}{\left(a+bx^{\frac{3}{2}}\right)^{\frac{2}{3}}}+\frac{\sqrt[3]{b}\sqrt{x}}{\sqrt[3]{a+bx^{\frac{3}{2}}}}+1\right)}{3b^{\frac{2}{3}}}-\frac{2\sqrt{3}\,\mathrm{atan}\left(\sqrt{3}\left(\frac{2\sqrt[3]{b}\sqrt{x}}{3\sqrt[3]{a+bx^{\frac{3}{2}}}}+\frac{1}{3}\right)\right)}{3b^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*x**(3/2))**(2/3),x)
```

```
[Out] -2*log(-b**(1/3)*sqrt(x)/(a + b*x**(3/2))**(1/3) + 1)/(3*b**(2/3)
) + log(b**(2/3)*x/(a + b*x**(3/2))**(2/3) + b**(1/3)*sqrt(x)/(a
+ b*x**(3/2))**(1/3) + 1)/(3*b**(2/3)) - 2*sqrt(3)*atan(sqrt(3)*(
2*b**(1/3)*sqrt(x)/(3*(a + b*x**(3/2))**(1/3)) + 1/3))/(3*b**(2/3
))
```

Mathematica [C] time = 0.0259033, size = 53, normalized size = 0.38

$$\frac{x\left(\frac{a+bx^{3/2}}{a}\right)^{2/3}{}_2F_1\left(\frac{2}{3},\frac{2}{3};\frac{5}{3};-\frac{bx^{3/2}}{a}\right)}{\left(a+bx^{3/2}\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(3/2))^(-2/3),x]
```

```
[Out] (x*((a + b*x^(3/2))/a)^(2/3)*Hypergeometric2F1[2/3, 2/3, 5/3, -((
b*x^(3/2))/a)])/(a + b*x^(3/2))^(2/3)
```

Maple [F] time = 0.021, size = 0, normalized size = 0.

$$\int \left(a + b x^{\frac{3}{2}}\right)^{-\frac{2}{3}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*x^(3/2))^(2/3),x)
```

```
[Out] int(1/(a+b*x^(3/2))^(2/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(3/2) + a)^(-2/3),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(3/2) + a)^(-2/3),x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [A] time = 3.9904, size = 39, normalized size = 0.28

$$\frac{2x\Gamma\left(\frac{2}{3}\right) {}_2F_1\left(\begin{matrix}\frac{2}{3}, \frac{2}{3} \\ \frac{5}{3}\end{matrix}\middle| \frac{bx^{\frac{3}{2}}e^{i\pi}}{a}\right)}{3a^{\frac{2}{3}}\Gamma\left(\frac{5}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*x**(3/2))**(2/3),x)
```

```
[Out] 2*x*gamma(2/3)*hyper((2/3, 2/3), (5/3,), b*x**(3/2)*exp_polar(I*p
i)/a)/(3*a**(2/3)*gamma(5/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bx^{\frac{3}{2}} + a\right)^{\frac{2}{3}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(3/2) + a)^(-2/3),x, algorithm="giac")
```

```
[Out] integrate((b*x^(3/2) + a)^(-2/3), x)
```

3.2273 $\int \frac{1}{x\left(a+bx^{3/2}\right)^{2/3}}\,dx$

Optimal. Leaf size=85

$$\frac{\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^{3/2}}\right)}{a^{2/3}}-\frac{2\tan^{-1}\left(\frac{2\sqrt[3]{a+bx^{3/2}}+\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}a^{2/3}}-\frac{\log(x)}{2a^{2/3}}$$

```
[Out] (-2*ArcTan[(a^(1/3) + 2*(a + b*x^(3/2))^(1/3))/(Sqrt[3]*a^(1/3))]
)/(Sqrt[3]*a^(2/3)) - Log[x]/(2*a^(2/3)) + Log[a^(1/3) - (a + b*x
^(3/2))^(1/3)]/a^(2/3)
```

Rubi [A] time = 0.140263, antiderivative size = 85, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.294

$$\frac{\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^{3/2}}\right)}{a^{2/3}}-\frac{2\tan^{-1}\left(\frac{2\sqrt[3]{a+bx^{3/2}}+\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}a^{2/3}}-\frac{\log(x)}{2a^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a + b*x^(3/2))^(2/3)),x]
```

```
[Out] (-2*ArcTan[(a^(1/3) + 2*(a + b*x^(3/2))^(1/3))/(Sqrt[3]*a^(1/3))]
)/(Sqrt[3]*a^(2/3)) - Log[x]/(2*a^(2/3)) + Log[a^(1/3) - (a + b*x
^(3/2))^(1/3)]/a^(2/3)
```

Rubi in Sympy [A] time = 7.60732, size = 83, normalized size = 0.98

$$-\frac{\log\left(x^{\frac{3}{2}}\right)}{3a^{\frac{2}{3}}}+\frac{\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^{\frac{3}{2}}}\right)}{a^{\frac{2}{3}}}-\frac{2\sqrt{3}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\frac{2\sqrt[3]{a+bx^{\frac{3}{2}}}}{3}\right)}{\sqrt[3]{a}}\right)}{3a^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(a+b*x**(3/2))**(2/3),x)
```

```
[Out] -log(x**(3/2))/(3*a**(2/3)) + log(a**(1/3) - (a + b*x**(3/2))**(1
/3))/a**(2/3) - 2*sqrt(3)*atan(sqrt(3)*(a**(1/3)/3 + 2*(a + b*x**
(3/2))**(1/3)/3)/a**(1/3))/(3*a**(2/3))
```

Mathematica [C] time = 0.0350378, size = 52, normalized size = 0.61

$$-\frac{\left(\frac{a}{bx^{3/2}}+1\right)^{2/3}{}_2F_1\left(\frac{2}{3},\frac{2}{3};\frac{5}{3};-\frac{a}{bx^{3/2}}\right)}{\left(a+bx^{3/2}\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a + b*x^(3/2))^(2/3)),x]
```

```
[Out] -(((1 + a/(b*x^(3/2)))^(2/3)*Hypergeometric2F1[2/3, 2/3, 5/3, -(a
/(b*x^(3/2)))])/(a + b*x^(3/2))^(2/3))
```

Maple [A] time = 0.011, size = 85, normalized size = 1.

$$\frac{2}{3}\ln\left(\sqrt[3]{a+bx^{\frac{3}{2}}}-\sqrt[3]{a}\right)a^{-\frac{2}{3}}-\frac{1}{3}\ln\left(\left(a+bx^{\frac{3}{2}}\right)^{\frac{2}{3}}+\sqrt[3]{a+bx^{\frac{3}{2}}}\sqrt[3]{a}+a^{\frac{2}{3}}\right)a^{-\frac{2}{3}}-\frac{2\sqrt{3}}{3}\arctan\left(\frac{\sqrt{3}}{3}\left(2\frac{\sqrt[3]{a+bx^{3/2}}}{\sqrt[3]{a}}+1\right)\right)a^{-\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(a+b*x^(3/2))^(2/3),x)
```

```
[Out] 2/3/a^(2/3)*ln((a+b*x^(3/2))^(1/3)-a^(1/3))-1/3/a^(2/3)*ln((a+b*x
^(3/2))^(2/3)+(a+b*x^(3/2))^(1/3)*a^(1/3)+a^(2/3))-2/3/a^(2/3)*3^
(1/2)*arctan(1/3*3^(1/2)*(2/a^(1/3)*(a+b*x^(3/2))^(1/3)+1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(3/2) + a)^(2/3)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(3/2) + a)^(2/3)*x),x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [A] time = 5.60182, size = 41, normalized size = 0.48

$$-\frac{2\Gamma\left(\frac{2}{3}\right){}_2F_1\left(\begin{matrix}\frac{2}{3},\frac{2}{3}\\\frac{5}{3}\end{matrix}\middle|\frac{ae^{i\pi}}{bx^{\frac{3}{2}}}\right)}{3b^{\frac{2}{3}}x\Gamma\left(\frac{5}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(a+b*x**(3/2))**(2/3),x)
```

```
[Out] -2*gamma(2/3)*hyper((2/3, 2/3), (5/3,), a*exp_polar(I*pi)/(b*x**(
3/2)))/(3*b**(2/3)*x*gamma(5/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bx^{\frac{3}{2}} + a\right)^{\frac{2}{3}} x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(3/2) + a)^(2/3)*x),x, algorithm="giac")

[Out] integrate(1/((b*x^(3/2) + a)^(2/3)*x), x)
```

3.2274 $\int \frac{1}{x^2\left(a+bx^{3/2}\right)^{2/3}}\,dx$

Optimal. Leaf size=40

$$-\frac{\sqrt[3]{a+bx^{3/2}}\,{}_2F_1\left(-\frac{1}{3},1;\frac{1}{3};-\frac{bx^{3/2}}{a}\right)}{ax}$$

```
[Out] -(((a + b*x^(3/2))^(1/3)*Hypergeometric2F1[-1/3, 1, 1/3, -((b*x^(
3/2))/a)])/(a*x))
```

Rubi [A] time = 0.0931307, antiderivative size = 55, normalized size of antiderivative = 1.38, number of steps used = 3, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176

$$-\frac{\left(\frac{bx^{3/2}}{a}+1\right)^{2/3}{}_2F_1\left(-\frac{2}{3},\frac{2}{3};\frac{1}{3};-\frac{bx^{3/2}}{a}\right)}{x\left(a+bx^{3/2}\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(a + b*x^(3/2))^(2/3)),x]
```

```
[Out] -(((1 + (b*x^(3/2))/a)^(2/3)*Hypergeometric2F1[-2/3, 2/3, 1/3, -(
(b*x^(3/2))/a)])/(x*(a + b*x^(3/2))^(2/3)))
```

Rubi in Sympy [A] time = 8.85697, size = 48, normalized size = 1.2

$$-\frac{\sqrt[3]{a+bx^{\frac{3}{2}}}\,{}_2F_1\left(\begin{matrix}\frac{2}{3},-\frac{2}{3}\\\frac{1}{3}\end{matrix}\middle|-\frac{bx^{\frac{3}{2}}}{a}\right)}{ax\sqrt[3]{1+\frac{bx^{\frac{3}{2}}}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(a+b*x**(3/2))**(2/3),x)
```

```
[Out] -(a + b*x**(3/2))**(1/3)*hyper((2/3, -2/3), (1/3,), -b*x**(3/2)/a
)/(a*x*(1 + b*x**(3/2)/a)**(1/3))
```

Mathematica [A] time = 0.0517278, size = 77, normalized size = 1.92

$$\frac{-bx^{3/2}\left(\frac{bx^{3/2}}{a}+1\right)^{2/3}{}_2F_1\left(\frac{1}{3},\frac{2}{3};\frac{4}{3};-\frac{bx^{3/2}}{a}\right)-a-bx^{3/2}}{ax\left(a+bx^{3/2}\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*(a + b*x^(3/2))^(2/3)),x]
```

```
[Out] (-a - b*x^(3/2) - b*x^(3/2)*(1 + (b*x^(3/2))/a)^(2/3)*Hypergeomet
ric2F1[1/3, 2/3, 4/3, -((b*x^(3/2))/a)])/(a*x*(a + b*x^(3/2))^(2/
3))
```

Maple [F] time = 0.02, size = 0, normalized size = 0.

$$\int \frac{1}{x^2}\left(a+bx^{\frac{3}{2}}\right)^{-\frac{2}{3}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(a+b*x^(3/2))^(2/3),x)
```

```
[Out] int(1/x^2/(a+b*x^(3/2))^(2/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bx^{\frac{3}{2}}+a\right)^{\frac{2}{3}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(3/2) + a)^(2/3)*x^2),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x^(3/2) + a)^(2/3)*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\left(bx^{\frac{3}{2}}+a\right)^{\frac{2}{3}}x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(3/2) + a)^(2/3)*x^2),x, algorithm="fricas")
```

```
[Out] integral(1/((b*x^(3/2) + a)^(2/3)*x^2), x)
```

Sympy [A] time = 10.6342, size = 42, normalized size = 1.05

$$\frac{2\,\Gamma\left(-\frac{2}{3}\right)\,{}_2F_1\left(\begin{matrix}-\frac{2}{3},\frac{2}{3}\\ \frac{1}{3}\end{matrix}\middle|\frac{bx^{\frac{3}{2}}e^{i\pi}}{a}\right)}{3a^{\frac{2}{3}}x\,\Gamma\left(\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(a+b*x**(3/2))**(2/3),x)
```

```
[Out] 2*gamma(-2/3)*hyper((-2/3, 2/3), (1/3,), b*x**(3/2)*exp_polar(I*p
i)/a)/(3*a**(2/3)*x*gamma(1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bx^{\frac{3}{2}}+a\right)^{\frac{2}{3}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(3/2) + a)^(2/3)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^(3/2) + a)^(2/3)*x^2), x)
```

3.2275 $\int \frac{1}{x^3(a+bx^{3/2})^{2/3}}\,dx$

Optimal. Leaf size=50

$$\frac{3b\sqrt[3]{a+bx^{3/2}}}{2a^2\sqrt{x}}-\frac{\sqrt[3]{a+bx^{3/2}}}{2ax^2}$$

```
[Out] -(a + b*x^(3/2))^(1/3)/(2*a*x^2) + (3*b*(a + b*x^(3/2))^(1/3))/(2
*a^2*Sqrt[x])
```

Rubi [A] time = 0.0479379, antiderivative size = 50, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{3b\sqrt[3]{a+bx^{3/2}}}{2a^2\sqrt{x}}-\frac{\sqrt[3]{a+bx^{3/2}}}{2ax^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(a + b*x^(3/2))^(2/3)),x]
```

```
[Out] -(a + b*x^(3/2))^(1/3)/(2*a*x^2) + (3*b*(a + b*x^(3/2))^(1/3))/(2
*a^2*Sqrt[x])
```

Rubi in Sympy [A] time = 4.46244, size = 42, normalized size = 0.84

$$-\frac{\sqrt[3]{a+bx^{\frac{3}{2}}}}{2ax^2}+\frac{3b\sqrt[3]{a+bx^{\frac{3}{2}}}}{2a^2\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(a+b*x**(3/2))**(2/3),x)
```

```
[Out] -(a + b*x**(3/2))**(1/3)/(2*a*x**2) + 3*b*(a + b*x**(3/2))**(1/3)
/(2*a**2*sqrt(x))
```

Mathematica [A] time = 0.0226849, size = 33, normalized size = 0.66

$$-\frac{\left(a-3bx^{3/2}\right)\sqrt[3]{a+bx^{3/2}}}{2a^2x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*(a + b*x^(3/2))^(2/3)),x]
```

```
[Out] -((a - 3*b*x^(3/2))*(a + b*x^(3/2))^(1/3))/(2*a^2*x^2)
```

Maple [F] time = 0.023, size = 0, normalized size = 0.

$$\int \frac{1}{x^3}\left(a+bx^{\frac{3}{2}}\right)^{-\frac{2}{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(a+b*x^(3/2))^(2/3),x)
```

```
[Out] int(1/x^3/(a+b*x^(3/2))^(2/3),x)
```

Maxima [A] time = 1.43183, size = 47, normalized size = 0.94

$$\frac{\frac{4\left(bx^{\frac{3}{2}}+a\right)^{\frac{1}{3}}b}{\sqrt{x}}-\frac{\left(bx^{\frac{3}{2}}+a\right)^{\frac{4}{3}}}{x^2}}{2\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(3/2) + a)^(2/3)*x^3),x, algorithm="maxima")
```

```
[Out] 1/2*(4*(b*x^(3/2) + a)^(1/3)*b/sqrt(x) - (b*x^(3/2) + a)^(4/3)/x^
2)/a^2
```

Fricas [A] time = 0.442881, size = 36, normalized size = 0.72

$$\frac{\left(3\,bx^{\frac{3}{2}}-a\right)\left(bx^{\frac{3}{2}}+a\right)^{\frac{1}{3}}}{2\,a^2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(3/2) + a)^(2/3)*x^3),x, algorithm="fricas")
```

```
[Out] 1/2*(3*b*x^(3/2) - a)*(b*x^(3/2) + a)^(1/3)/(a^2*x^2)
```

Sympy [A] time = 25.7729, size = 76, normalized size = 1.52

$$-\frac{2\sqrt[3]{b}\sqrt[3]{\frac{a}{bx^{\frac{3}{2}}}+1}\,\Gamma\left(-\frac{4}{3}\right)}{9ax^{\frac{3}{2}}\,\Gamma\left(\frac{2}{3}\right)}+\frac{2b^{\frac{4}{3}}\sqrt[3]{\frac{a}{bx^{\frac{3}{2}}}+1}\,\Gamma\left(-\frac{4}{3}\right)}{3a^2\,\Gamma\left(\frac{2}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(a+b*x**(3/2))**(2/3),x)
```

```
[Out] -2*b**(1/3)*(a/(b*x**(3/2)) + 1)**(1/3)*gamma(-4/3)/(9*a*x**(3/2)
*gamma(2/3)) + 2*b**(4/3)*(a/(b*x**(3/2)) + 1)**(1/3)*gamma(-4/3)
/(3*a**2*gamma(2/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bx^{\frac{3}{2}}+a\right)^{\frac{2}{3}}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(3/2) + a)^(2/3)*x^3),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^(3/2) + a)^(2/3)*x^3), x)
```

3.2276 $\int \frac{1}{x^4\left(a+bx^{3/2}\right)^{2/3}}\,dx$

Optimal. Leaf size=148

$$\frac{5b^2\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^{3/2}}\right)}{9a^{8/3}}-\frac{10b^2\tan^{-1}\left(\frac{2\sqrt[3]{a+bx^{3/2}}+\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{8/3}}-\frac{5b^2\log(x)}{18a^{8/3}}+\frac{5b\sqrt[3]{a+bx^{3/2}}}{9a^2x^{3/2}}-\frac{\sqrt[3]{a+bx^{3/2}}}{3ax^3}$$

```
[Out] -(a + b*x^(3/2))^(1/3)/(3*a*x^3) + (5*b*(a + b*x^(3/2))^(1/3))/(9
*a^2*x^(3/2)) - (10*b^2*ArcTan[(a^(1/3) + 2*(a + b*x^(3/2))^(1/3)
)/(Sqrt[3]*a^(1/3))])/(9*Sqrt[3]*a^(8/3)) - (5*b^2*Log[x])/(18*a^
(8/3)) + (5*b^2*Log[a^(1/3) - (a + b*x^(3/2))^(1/3)])/(9*a^(8/3))
```

Rubi [A] time = 0.209792, antiderivative size = 148, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.353

$$\frac{5b^2\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^{3/2}}\right)}{9a^{8/3}}-\frac{10b^2\tan^{-1}\left(\frac{2\sqrt[3]{a+bx^{3/2}}+\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{8/3}}-\frac{5b^2\log(x)}{18a^{8/3}}+\frac{5b\sqrt[3]{a+bx^{3/2}}}{9a^2x^{3/2}}-\frac{\sqrt[3]{a+bx^{3/2}}}{3ax^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^4*(a + b*x^(3/2))^(2/3)),x]
```

```
[Out] -(a + b*x^(3/2))^(1/3)/(3*a*x^3) + (5*b*(a + b*x^(3/2))^(1/3))/(9
*a^2*x^(3/2)) - (10*b^2*ArcTan[(a^(1/3) + 2*(a + b*x^(3/2))^(1/3)
)/(Sqrt[3]*a^(1/3))])/(9*Sqrt[3]*a^(8/3)) - (5*b^2*Log[x])/(18*a^
(8/3)) + (5*b^2*Log[a^(1/3) - (a + b*x^(3/2))^(1/3)])/(9*a^(8/3))
```

Rubi in Sympy [A] time = 16.0176, size = 143, normalized size = 0.97

$$-\frac{\sqrt[3]{a+bx^{\frac{3}{2}}}}{3ax^3}+\frac{5b\sqrt[3]{a+bx^{\frac{3}{2}}}}{9a^2x^{\frac{3}{2}}}-\frac{5b^2\log\left(x^{\frac{3}{2}}\right)}{27a^{\frac{8}{3}}}+\frac{5b^2\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^{\frac{3}{2}}}\right)}{9a^{\frac{8}{3}}}-\frac{10\sqrt{3}b^2\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\frac{2\sqrt[3]{a+bx^{\frac{3}{2}}}}{3}\right)}{\sqrt[3]{a}}\right)}{27a^{\frac{8}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(a+b*x**(3/2))**(2/3),x)
```

```
[Out] -(a + b*x**(3/2))**(1/3)/(3*a*x**3) + 5*b*(a + b*x**(3/2))**(1/3)
/(9*a**2*x**(3/2)) - 5*b**2*log(x**(3/2))/(27*a**(8/3)) + 5*b**2*
log(a**(1/3) - (a + b*x**(3/2))**(1/3))/(9*a**(8/3)) - 10*sqrt(3)
*b**2*atan(sqrt(3)*(a**(1/3)/3 + 2*(a + b*x**(3/2))**(1/3)/3)/a**
(1/3))/(27*a**(8/3))
```

Mathematica [C] time = 0.0589437, size = 91, normalized size = 0.61

$$\frac{-3a^2-5b^2x^3\left(\frac{a}{bx^{3/2}}+1\right)^{2/3}{}_2F_1\left(\frac{2}{3},\frac{2}{3};\frac{5}{3};-\frac{a}{bx^{3/2}}\right)+2abx^{3/2}+5b^2x^3}{9a^2x^3\left(a+bx^{3/2}\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^4*(a + b*x^(3/2))^(2/3)),x]
```

```
[Out] (-3*a^2 + 2*a*b*x^(3/2) + 5*b^2*x^3 - 5*b^2*(1 + a/(b*x^(3/2)))^(
2/3)*x^3*Hypergeometric2F1[2/3, 2/3, 5/3, -(a/(b*x^(3/2)))])/(9*a
^2*x^3*(a + b*x^(3/2))^(2/3))
```

Maple [F] time = 0.023, size = 0, normalized size = 0.

$$\int \frac{1}{x^4}\left(a+bx^{\frac{3}{2}}\right)^{-\frac{2}{3}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(a+b*x^(3/2))^(2/3),x)
```

```
[Out] int(1/x^4/(a+b*x^(3/2))^(2/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(3/2) + a)^(2/3)*x^4),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(3/2) + a)^(2/3)*x^4),x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [A] time = 109.3, size = 42, normalized size = 0.28

$$-\frac{2\Gamma\left(\frac{8}{3}\right){}_2F_1\left(\begin{matrix}\frac{2}{3},\frac{8}{3}\\ \frac{11}{3}\end{matrix}\middle|\frac{ae^{i\pi}}{bx^{\frac{3}{2}}}\right)}{3b^{\frac{2}{3}}x^4\Gamma\left(\frac{11}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(a+b*x**(3/2))**(2/3),x)
```

```
[Out] -2*gamma(8/3)*hyper((2/3, 8/3), (11/3,), a*exp_polar(I*pi)/(b*x**
(3/2)))/(3*b**(2/3)*x**4*gamma(11/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bx^{\frac{3}{2}} + a\right)^{\frac{2}{3}} x^4} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(3/2) + a)^(2/3)*x^4),x, algorithm="giac")

[Out] integrate(1/((b*x^(3/2) + a)^(2/3)*x^4), x)
```

3.2277 $\int \frac{\sqrt{x}}{1+x^{3/2}} \, dx$

Optimal. Leaf size=12

$$\frac{2}{3} \log \left(x^{3/2}+1\right)$$

```
[Out] (2*Log[1 + x^(3/2)])/3
```

Rubi [A] time = 0.0121616, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{2}{3} \log \left(x^{3/2}+1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[x]/(1 + x^(3/2)),x]

[Out] (2*Log[1 + x^(3/2)])/3
```

Rubi in Sympy [A] time = 1.68948, size = 10, normalized size = 0.83

$$\frac{2 \log \left(x^{\frac{3}{2}}+1\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(1/2)/(1+x**(3/2)),x)

[Out] 2*log(x**(3/2) + 1)/3
```

Mathematica [A] time = 0.00328783, size = 12, normalized size = 1.

$$\frac{2}{3} \log \left(x^{3/2}+1\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[x]/(1 + x^(3/2)),x]

[Out] (2*Log[1 + x^(3/2)])/3
```

Maple [A] time = 0.003, size = 9, normalized size = 0.8

$$\frac{2}{3} \ln \left(1+x^{\frac{3}{2}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(1/2)/(1+x^(3/2)),x)

[Out] 2/3*ln(1+x^(3/2))
```

Maxima [A] time = 1.42787, size = 11, normalized size = 0.92

$$\frac{2}{3}\log\left(x^{\frac{3}{2}}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(x^(3/2) + 1),x, algorithm="maxima")
```

```
[Out] 2/3*log(x^(3/2) + 1)
```

Fricas [A] time = 0.226772, size = 11, normalized size = 0.92

$$\frac{2}{3}\log\left(x^{\frac{3}{2}}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(x^(3/2) + 1),x, algorithm="fricas")
```

```
[Out] 2/3*log(x^(3/2) + 1)
```

Sympy [A] time = 0.520411, size = 24, normalized size = 2.

$$\frac{2\log\left(\sqrt{x}+1\right)}{3}+\frac{2\log\left(-\sqrt{x}+x+1\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(1/2)/(1+x**(3/2)),x)
```

```
[Out] 2*log(sqrt(x) + 1)/3 + 2*log(-sqrt(x) + x + 1)/3
```

GIAC/XCAS [A] time = 0.234105, size = 27, normalized size = 2.25

$$\frac{2}{3}\ln\left(x-\sqrt{x}+1\right)+\frac{2}{3}\ln\left(\sqrt{x}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(x^(3/2) + 1),x, algorithm="giac")
```

```
[Out] 2/3*ln(x - sqrt(x) + 1) + 2/3*ln(sqrt(x) + 1)
```

3.2278 $\int \left(a+b\sqrt[3]{x}\right) x^4 \, dx$

Optimal. Leaf size=19

$$\frac{ax^5}{5}+\frac{3}{16}bx^{16/3}$$

```
[Out] (a*x^5)/5 + (3*b*x^(16/3))/16
```

Rubi [A] time = 0.0167725, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{ax^5}{5}+\frac{3}{16}bx^{16/3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))*x^4,x]
```

```
[Out] (a*x^5)/5 + (3*b*x^(16/3))/16
```

Rubi in Sympy [A] time = 2.91699, size = 15, normalized size = 0.79

$$\frac{ax^5}{5}+\frac{3bx^{\frac{16}{3}}}{16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))*x**4,x)
```

```
[Out] a*x**5/5 + 3*b*x**(16/3)/16
```

Mathematica [A] time = 0.00628031, size = 19, normalized size = 1.

$$\frac{ax^5}{5}+\frac{3}{16}bx^{16/3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))*x^4,x]
```

```
[Out] (a*x^5)/5 + (3*b*x^(16/3))/16
```

Maple [A] time = 0.002, size = 14, normalized size = 0.7

$$\frac{ax^5}{5}+\frac{3\,b}{16}x^{\frac{16}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))*x^4,x)
```

```
[Out] 1/5*a*x^5+3/16*b*x^(16/3)
```

Maxima [A] time = 1.44817, size = 339, normalized size = 17.84

$$\frac{3\left(bx^{\frac{1}{3}}+a\right)^{16}}{16\,b^{15}}-\frac{14\left(bx^{\frac{1}{3}}+a\right)^{15}a}{5\,b^{15}}+\frac{39\left(bx^{\frac{1}{3}}+a\right)^{14}a^{2}}{2\,b^{15}}-\frac{84\left(bx^{\frac{1}{3}}+a\right)^{13}a^{3}}{b^{15}}+\frac{1001\left(bx^{\frac{1}{3}}+a\right)^{12}a^{4}}{4\,b^{15}}-\frac{546\left(bx^{\frac{1}{3}}+a\right)^{11}a^{5}}{b^{15}}+\frac{9009\left(bx^{\frac{1}{3}}+a\right)^{10}a^{6}}{10\,b^{15}}-\frac{1144\left(bx^{\frac{1}{3}}+a\right)^{9}a^{7}}{b^{15}}+\frac{9009\left(bx^{\frac{1}{3}}+a\right)^{8}a^{8}}{8\,b^{15}}-\frac{858\left(bx^{\frac{1}{3}}+a\right)^{7}a^{9}}{b^{15}}+\frac{1001\left(bx^{\frac{1}{3}}+a\right)^{6}a^{10}}{2\,b^{15}}-\frac{1092\left(bx^{\frac{1}{3}}+a\right)^{5}a^{11}}{5\,b^{15}}+\frac{273\left(bx^{\frac{1}{3}}+a\right)^{4}a^{12}}{4\,b^{15}}-\frac{14\left(bx^{\frac{1}{3}}+a\right)^{3}a^{13}}{b^{15}}+\frac{3\left(bx^{\frac{1}{3}}+a\right)^{2}a^{14}}{2\,b^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)*x^4,x, algorithm="maxima")
```

```
[Out] 3/16*(b*x^(1/3) + a)^16/b^15 - 14/5*(b*x^(1/3) + a)^15*a/b^15 + 3
9/2*(b*x^(1/3) + a)^14*a^2/b^15 - 84*(b*x^(1/3) + a)^13*a^3/b^15
+ 1001/4*(b*x^(1/3) + a)^12*a^4/b^15 - 546*(b*x^(1/3) + a)^11*a^5
/b^15 + 9009/10*(b*x^(1/3) + a)^10*a^6/b^15 - 1144*(b*x^(1/3) + a
)^9*a^7/b^15 + 9009/8*(b*x^(1/3) + a)^8*a^8/b^15 - 858*(b*x^(1/3)
 + a)^7*a^9/b^15 + 1001/2*(b*x^(1/3) + a)^6*a^10/b^15 - 1092/5*(b
*x^(1/3) + a)^5*a^11/b^15 + 273/4*(b*x^(1/3) + a)^4*a^12/b^15 - 1
4*(b*x^(1/3) + a)^3*a^13/b^15 + 3/2*(b*x^(1/3) + a)^2*a^14/b^15
```

Fricas [A] time = 0.222381, size = 18, normalized size = 0.95

$$\frac{3}{16}\,bx^{\frac{16}{3}}+\frac{1}{5}\,ax^{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)*x^4,x, algorithm="fricas")
```

```
[Out] 3/16*b*x^(16/3) + 1/5*a*x^5
```

Sympy [A] time = 5.63077, size = 15, normalized size = 0.79

$$\frac{ax^{5}}{5}+\frac{3bx^{\frac{16}{3}}}{16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))*x**4,x)
```

```
[Out] a*x**5/5 + 3*b*x**(16/3)/16
```

GIAC/XCAS [A] time = 0.260224, size = 18, normalized size = 0.95

$$\frac{3}{16}\,bx^{\frac{16}{3}}+\frac{1}{5}\,ax^{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)*x^4,x, algorithm="giac")
```

```
[Out] 3/16*b*x^(16/3) + 1/5*a*x^5
```

3.2279 $\int \left(a+b\sqrt[3]{x}\right) x^3 \, dx$

Optimal. Leaf size=19

$$\frac{ax^4}{4}+\frac{3}{13}bx^{13/3}$$

```
[Out] (a*x^4)/4 + (3*b*x^(13/3))/13
```

Rubi [A] time = 0.015651, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{ax^4}{4}+\frac{3}{13}bx^{13/3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))*x^3,x]
```

```
[Out] (a*x^4)/4 + (3*b*x^(13/3))/13
```

Rubi in Sympy [A] time = 2.89515, size = 15, normalized size = 0.79

$$\frac{ax^4}{4}+\frac{3bx^{\frac{13}{3}}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))*x**3,x)
```

```
[Out] a*x**4/4 + 3*b*x**(13/3)/13
```

Mathematica [A] time = 0.00544259, size = 19, normalized size = 1.

$$\frac{ax^4}{4}+\frac{3}{13}bx^{13/3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))*x^3,x]
```

```
[Out] (a*x^4)/4 + (3*b*x^(13/3))/13
```

Maple [A] time = 0.001, size = 14, normalized size = 0.7

$$\frac{ax^4}{4}+\frac{3\,b}{13}x^{\frac{13}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))*x^3,x)
```

```
[Out] 1/4*a*x^4+3/13*b*x^(13/3)
```

Maxima [A] time = 1.44228, size = 270, normalized size = 14.21

$$\frac{3\left(bx^{\frac{1}{3}}+a\right)^{13}}{13\,b^{12}}-\frac{11\left(bx^{\frac{1}{3}}+a\right)^{12}a}{4\,b^{12}}+\frac{15\left(bx^{\frac{1}{3}}+a\right)^{11}a^{2}}{b^{12}}-\frac{99\left(bx^{\frac{1}{3}}+a\right)^{10}a^{3}}{2\,b^{12}}+\frac{110\left(bx^{\frac{1}{3}}+a\right)^{9}a^{4}}{b^{12}}-\frac{693\left(bx^{\frac{1}{3}}+a\right)^{8}a^{5}}{4\,b^{12}}+\frac{198\left(bx^{\frac{1}{3}}+a\right)^{7}a^{6}}{b^{12}}-\frac{165\left(bx^{\frac{1}{3}}+a\right)^{6}a^{7}}{b^{12}}+\frac{99\left(bx^{\frac{1}{3}}+a\right)^{5}a^{8}}{b^{12}}-\frac{165\left(bx^{\frac{1}{3}}+a\right)^{4}a^{9}}{4\,b^{12}}+\frac{11\left(bx^{\frac{1}{3}}+a\right)^{3}a^{10}}{b^{12}}-\frac{3\left(bx^{\frac{1}{3}}+a\right)^{2}a^{11}}{2\,b^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)*x^3,x, algorithm="maxima")
```

```
[Out] 3/13*(b*x^(1/3) + a)^13/b^12 - 11/4*(b*x^(1/3) + a)^12*a/b^12 + 1
5*(b*x^(1/3) + a)^11*a^2/b^12 - 99/2*(b*x^(1/3) + a)^10*a^3/b^12
+ 110*(b*x^(1/3) + a)^9*a^4/b^12 - 693/4*(b*x^(1/3) + a)^8*a^5/b^
12 + 198*(b*x^(1/3) + a)^7*a^6/b^12 - 165*(b*x^(1/3) + a)^6*a^7/b
^12 + 99*(b*x^(1/3) + a)^5*a^8/b^12 - 165/4*(b*x^(1/3) + a)^4*a^9
/b^12 + 11*(b*x^(1/3) + a)^3*a^10/b^12 - 3/2*(b*x^(1/3) + a)^2*a^
11/b^12
```

Fricas [A] time = 0.211205, size = 18, normalized size = 0.95

$$\frac{3}{13}\,bx^{\frac{13}{3}}+\frac{1}{4}\,ax^{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)*x^3,x, algorithm="fricas")
```

```
[Out] 3/13*b*x^(13/3) + 1/4*a*x^4
```

Sympy [A] time = 3.24294, size = 15, normalized size = 0.79

$$\frac{ax^{4}}{4}+\frac{3bx^{\frac{13}{3}}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))*x**3,x)
```

```
[Out] a*x**4/4 + 3*b*x**(13/3)/13
```

GIAC/XCAS [A] time = 0.291398, size = 18, normalized size = 0.95

$$\frac{3}{13}\,bx^{\frac{13}{3}}+\frac{1}{4}\,ax^{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)*x^3,x, algorithm="giac")
```

```
[Out] 3/13*b*x^(13/3) + 1/4*a*x^4
```

3.2280 $\int \left(a + b\sqrt[3]{x}\right) x^2 \, dx$

Optimal. Leaf size=19

$$\frac{ax^3}{3} + \frac{3}{10}bx^{10/3}$$

```
[Out] (a*x^3)/3 + (3*b*x^(10/3))/10
```

Rubi [A] time = 0.0153745, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$\frac{ax^3}{3} + \frac{3}{10}bx^{10/3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))*x^2,x]

[Out] (a*x^3)/3 + (3*b*x^(10/3))/10
```

Rubi in Sympy [A] time = 2.89902, size = 15, normalized size = 0.79

$$\frac{ax^3}{3} + \frac{3bx^{\frac{10}{3}}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))*x**2,x)

[Out] a*x**3/3 + 3*b*x**(10/3)/10
```

Mathematica [A] time = 0.00614047, size = 19, normalized size = 1.

$$\frac{ax^3}{3} + \frac{3}{10}bx^{10/3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))*x^2,x]

[Out] (a*x^3)/3 + (3*b*x^(10/3))/10
```

Maple [A] time = 0.001, size = 14, normalized size = 0.7

$$\frac{ax^3}{3} + \frac{3\,b}{10}x^{\frac{10}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))*x^2,x)

[Out] 1/3*a*x^3+3/10*b*x^(10/3)
```

Maxima [A] time = 1.43704, size = 201, normalized size = 10.58

$$\frac{3\left(bx^{\frac{1}{3}}+a\right)^{10}}{10\,b^9}-\frac{8\left(bx^{\frac{1}{3}}+a\right)^{9}a}{3\,b^9}+\frac{21\left(bx^{\frac{1}{3}}+a\right)^{8}a^2}{2\,b^9}-\frac{24\left(bx^{\frac{1}{3}}+a\right)^{7}a^3}{b^9}+\frac{35\left(bx^{\frac{1}{3}}+a\right)^{6}a^4}{b^9}-\frac{168\left(bx^{\frac{1}{3}}+a\right)^{5}a^5}{5\,b^9}+\frac{21\left(bx^{\frac{1}{3}}+a\right)^{4}a^6}{b^9}-\frac{8\left(bx^{\frac{1}{3}}+a\right)^{3}a^7}{b^9}+\frac{3\left(bx^{\frac{1}{3}}+a\right)^{2}a^8}{2\,b^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)*x^2,x, algorithm="maxima")
```

```
[Out] 3/10*(b*x^(1/3) + a)^10/b^9 - 8/3*(b*x^(1/3) + a)^9*a/b^9 + 21/2*
(b*x^(1/3) + a)^8*a^2/b^9 - 24*(b*x^(1/3) + a)^7*a^3/b^9 + 35*(b*
x^(1/3) + a)^6*a^4/b^9 - 168/5*(b*x^(1/3) + a)^5*a^5/b^9 + 21*(b*
x^(1/3) + a)^4*a^6/b^9 - 8*(b*x^(1/3) + a)^3*a^7/b^9 + 3/2*(b*x^(
1/3) + a)^2*a^8/b^9
```

Fricas [A] time = 0.212913, size = 18, normalized size = 0.95

$$\frac{3}{10}\,bx^{\frac{10}{3}}+\frac{1}{3}\,ax^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)*x^2,x, algorithm="fricas")
```

```
[Out] 3/10*b*x^(10/3) + 1/3*a*x^3
```

Sympy [A] time = 1.89655, size = 15, normalized size = 0.79

$$\frac{ax^3}{3}+\frac{3bx^{\frac{10}{3}}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))*x**2,x)
```

```
[Out] a*x**3/3 + 3*b*x**(10/3)/10
```

GIAC/XCAS [A] time = 0.256131, size = 18, normalized size = 0.95

$$\frac{3}{10}\,bx^{\frac{10}{3}}+\frac{1}{3}\,ax^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)*x^2,x, algorithm="giac")
```

```
[Out] 3/10*b*x^(10/3) + 1/3*a*x^3
```

3.2281 $\int \left(a + b\sqrt[3]{x}\right) x\, dx$

Optimal. Leaf size=19

$$\frac{ax^2}{2} + \frac{3}{7}bx^{7/3}$$

```
[Out] (a*x^2)/2 + (3*b*x^(7/3))/7
```

Rubi [A] time = 0.0161281, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$

$$\frac{ax^2}{2} + \frac{3}{7}bx^{7/3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))*x,x]

[Out] (a*x^2)/2 + (3*b*x^(7/3))/7
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$a \int x\, dx + \frac{3bx^{\frac{7}{3}}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))*x,x)

[Out] a*Integral(x, x) + 3*b*x**(7/3)/7
```

Mathematica [A] time = 0.00493222, size = 19, normalized size = 1.

$$\frac{ax^2}{2} + \frac{3}{7}bx^{7/3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))*x,x]

[Out] (a*x^2)/2 + (3*b*x^(7/3))/7
```

Maple [A] time = 0.002, size = 14, normalized size = 0.7

$$\frac{ax^2}{2} + \frac{3\,b}{7}x^{\frac{7}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))*x,x)

[Out] 1/2*a*x^2+3/7*b*x^(7/3)
```

Maxima [A] time = 1.43855, size = 132, normalized size = 6.95

$$\frac{3\left(bx^{\frac{1}{3}}+a\right)^{7}}{7\,b^{6}}-\frac{5\left(bx^{\frac{1}{3}}+a\right)^{6}a}{2\,b^{6}}+\frac{6\left(bx^{\frac{1}{3}}+a\right)^{5}a^{2}}{b^{6}}-\frac{15\left(bx^{\frac{1}{3}}+a\right)^{4}a^{3}}{2\,b^{6}}+\frac{5\left(bx^{\frac{1}{3}}+a\right)^{3}a^{4}}{b^{6}}-\frac{3\left(bx^{\frac{1}{3}}+a\right)^{2}a^{5}}{2\,b^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)*x,x, algorithm="maxima")
```

```
[Out] 3/7*(b*x^(1/3) + a)^7/b^6 - 5/2*(b*x^(1/3) + a)^6*a/b^6 + 6*(b*x^
(1/3) + a)^5*a^2/b^6 - 15/2*(b*x^(1/3) + a)^4*a^3/b^6 + 5*(b*x^(1
/3) + a)^3*a^4/b^6 - 3/2*(b*x^(1/3) + a)^2*a^5/b^6
```

Fricas [A] time = 0.210685, size = 18, normalized size = 0.95

$$\frac{3}{7}\,bx^{\frac{7}{3}}+\frac{1}{2}\,ax^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)*x,x, algorithm="fricas")
```

```
[Out] 3/7*b*x^(7/3) + 1/2*a*x^2
```

Sympy [A] time = 1.20788, size = 15, normalized size = 0.79

$$\frac{ax^{2}}{2}+\frac{3bx^{\frac{7}{3}}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))*x,x)
```

```
[Out] a*x**2/2 + 3*b*x**(7/3)/7
```

GIAC/XCAS [A] time = 0.248049, size = 18, normalized size = 0.95

$$\frac{3}{7}\,bx^{\frac{7}{3}}+\frac{1}{2}\,ax^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)*x,x, algorithm="giac")
```

```
[Out] 3/7*b*x^(7/3) + 1/2*a*x^2
```

3.2282 $\int \left(a + b\sqrt[3]{x}\right) \, dx$

Optimal. Leaf size=14

$$ax + \frac{3}{4}bx^{4/3}$$

```
[Out] a*x + (3*b*x^(4/3))/4
```

Rubi [A] time = 0.0105716, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 0, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$

$$ax + \frac{3}{4}bx^{4/3}$$

Antiderivative was successfully verified.

```
[In]  Int[a + b*x^(1/3),x]

[Out] a*x + (3*b*x^(4/3))/4
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{3bx^{\frac{4}{3}}}{4} + \int a \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(a+b*x**(1/3),x)

[Out] 3*b*x**(4/3)/4 + Integral(a, x)
```

Mathematica [A] time = 0.00245811, size = 14, normalized size = 1.

$$ax + \frac{3}{4}bx^{4/3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[a + b*x^(1/3),x]

[Out] a*x + (3*b*x^(4/3))/4
```

Maple [A] time = 0.001, size = 11, normalized size = 0.8

$$ax + \frac{3\,b}{4}x^{\frac{4}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(a+b*x^(1/3),x)

[Out] a*x+3/4*b*x^(4/3)
```

Maxima [A] time = 1.44014, size = 14, normalized size = 1.

$$\frac{3}{4}\,bx^{\frac{4}{3}} + ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(b*x^(1/3) + a,x, algorithm="maxima")
```

```
[Out] 3/4*b*x^(4/3) + a*x
```

Fricas [A] time = 0.213039, size = 14, normalized size = 1.

$$\frac{3}{4}\,bx^{\frac{4}{3}} + ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(b*x^(1/3) + a,x, algorithm="fricas")
```

```
[Out] 3/4*b*x^(4/3) + a*x
```

Sympy [A] time = 0.062648, size = 12, normalized size = 0.86

$$ax + \frac{3bx^{\frac{4}{3}}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(a+b*x**(1/3),x)
```

```
[Out] a*x + 3*b*x**(4/3)/4
```

GIAC/XCAS [A] time = 0.281117, size = 14, normalized size = 1.

$$\frac{3}{4}\,bx^{\frac{4}{3}} + ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(b*x^(1/3) + a,x, algorithm="giac")
```

```
[Out] 3/4*b*x^(4/3) + a*x
```

3.2283 $\int \frac{a+b\sqrt[3]{x}}{x}\,dx$

Optimal. Leaf size=13

$$a\log(x) + 3b\sqrt[3]{x}$$

```
[Out] 3*b*x^(1/3) + a*Log[x]
```

Rubi [A] time = 0.015596, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$a\log(x) + 3b\sqrt[3]{x}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))/x,x]

[Out] 3*b*x^(1/3) + a*Log[x]
```

Rubi in Sympy [A] time = 2.81745, size = 12, normalized size = 0.92

$$a\log(x) + 3b\sqrt[3]{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))/x,x)

[Out] a*log(x) + 3*b*x**(1/3)
```

Mathematica [A] time = 0.00759096, size = 13, normalized size = 1.

$$a\log(x) + 3b\sqrt[3]{x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))/x,x]

[Out] 3*b*x^(1/3) + a*Log[x]
```

Maple [A] time = 0.004, size = 12, normalized size = 0.9

$$3\,b\sqrt[3]{x} + a\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))/x,x)

[Out] 3*b*x^(1/3)+a*ln(x)
```

Maxima [A] time = 1.43977, size = 15, normalized size = 1.15

$$a \log (x) + 3 \, b x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)/x,x, algorithm="maxima")
```

```
[Out] a*log(x) + 3*b*x^(1/3)
```

Fricas [A] time = 0.218097, size = 19, normalized size = 1.46

$$3 \, a \log \left(x^{\frac{1}{3}}\right) + 3 \, b x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)/x,x, algorithm="fricas")
```

```
[Out] 3*a*log(x^(1/3)) + 3*b*x^(1/3)
```

Sympy [A] time = 0.710171, size = 12, normalized size = 0.92

$$a \log (x) + 3b\sqrt[3]{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))/x,x)
```

```
[Out] a*log(x) + 3*b*x**(1/3)
```

GIAC/XCAS [A] time = 0.269308, size = 16, normalized size = 1.23

$$a\ln (|x|) + 3 \, b x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)/x,x, algorithm="giac")
```

```
[Out] a*ln(abs(x)) + 3*b*x^(1/3)
```

3.2284 $\int \frac{a+b\sqrt[3]{x}}{x^2} dx$

Optimal. Leaf size=17

$$-\frac{a}{x}-\frac{3b}{2x^{2/3}}$$

```
[Out] -(a/x) - (3*b)/(2*x^(2/3))
```

Rubi [A] time = 0.0164993, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a}{x}-\frac{3b}{2x^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))/x^2,x]

[Out] -(a/x) - (3*b)/(2*x^(2/3))
```

Rubi in Sympy [A] time = 3.0318, size = 14, normalized size = 0.82

$$-\frac{a}{x}-\frac{3b}{2x^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))/x**2,x)

[Out] -a/x - 3*b/(2*x**(2/3))
```

Mathematica [A] time = 0.00750872, size = 17, normalized size = 1.

$$-\frac{a}{x}-\frac{3b}{2x^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))/x^2,x]

[Out] -(a/x) - (3*b)/(2*x^(2/3))
```

Maple [A] time = 0.008, size = 14, normalized size = 0.8

$$-\frac{a}{x}-\frac{3\,b}{2}x^{-\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))/x^2,x)

[Out] -a/x-3/2*b/x^(2/3)
```

Maxima [A] time = 1.44402, size = 20, normalized size = 1.18

$$-\frac{3\,bx^{\frac{1}{3}} + 2\,a}{2\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)/x^2,x, algorithm="maxima")
```

```
[Out] -1/2*(3*b*x^(1/3) + 2*a)/x
```

Fricas [A] time = 0.212827, size = 20, normalized size = 1.18

$$-\frac{3\,bx^{\frac{1}{3}} + 2\,a}{2\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)/x^2,x, algorithm="fricas")
```

```
[Out] -1/2*(3*b*x^(1/3) + 2*a)/x
```

Sympy [A] time = 2.51015, size = 14, normalized size = 0.82

$$-\frac{a}{x} - \frac{3b}{2x^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))/x**2,x)
```

```
[Out] -a/x - 3*b/(2*x**(2/3))
```

GIAC/XCAS [A] time = 0.246131, size = 20, normalized size = 1.18

$$-\frac{3\,bx^{\frac{1}{3}} + 2\,a}{2\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)/x^2,x, algorithm="giac")
```

```
[Out] -1/2*(3*b*x^(1/3) + 2*a)/x
```

3.2285 $\int \frac{a+b\sqrt[3]{x}}{x^3}\,dx$

Optimal. Leaf size=19

$$-\frac{a}{2x^2}-\frac{3b}{5x^{5/3}}$$

```
[Out] -a/(2*x^2) - (3*b)/(5*x^(5/3))
```

Rubi [A] time = 0.0155531, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a}{2x^2}-\frac{3b}{5x^{5/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))/x^3,x]

[Out] -a/(2*x^2) - (3*b)/(5*x^(5/3))
```

Rubi in Sympy [A] time = 2.94582, size = 17, normalized size = 0.89

$$-\frac{a}{2x^2}-\frac{3b}{5x^{\frac{5}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))/x**3,x)

[Out] -a/(2*x**2) - 3*b/(5*x**(5/3))
```

Mathematica [A] time = 0.00757016, size = 19, normalized size = 1.

$$-\frac{a}{2x^2}-\frac{3b}{5x^{5/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))/x^3,x]

[Out] -a/(2*x^2) - (3*b)/(5*x^(5/3))
```

Maple [A] time = 0.008, size = 14, normalized size = 0.7

$$-\frac{a}{2\,x^2}-\frac{3\,b}{5}x^{-\frac{5}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))/x^3,x)

[Out] -1/2*a/x^2-3/5*b/x^(5/3)
```

Maxima [A] time = 1.43992, size = 20, normalized size = 1.05

$$-\frac{6\,bx^{\frac{1}{3}} + 5\,a}{10\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)/x^3,x, algorithm="maxima")
```

```
[Out] -1/10*(6*b*x^(1/3) + 5*a)/x^2
```

Fricas [A] time = 0.215202, size = 20, normalized size = 1.05

$$-\frac{6\,bx^{\frac{1}{3}} + 5\,a}{10\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)/x^3,x, algorithm="fricas")
```

```
[Out] -1/10*(6*b*x^(1/3) + 5*a)/x^2
```

Sympy [A] time = 4.79186, size = 17, normalized size = 0.89

$$-\frac{a}{2x^2} - \frac{3b}{5x^{\frac{5}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))/x**3,x)
```

```
[Out] -a/(2*x**2) - 3*b/(5*x**(5/3))
```

GIAC/XCAS [A] time = 0.237336, size = 20, normalized size = 1.05

$$-\frac{6\,bx^{\frac{1}{3}} + 5\,a}{10\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)/x^3,x, algorithm="giac")
```

```
[Out] -1/10*(6*b*x^(1/3) + 5*a)/x^2
```

3.2286 $\int \frac{a+b\sqrt[3]{x}}{x^4}\,dx$

Optimal. Leaf size=19

$$-\frac{a}{3x^3}-\frac{3b}{8x^{8/3}}$$

```
[Out] -a/(3*x^3) - (3*b)/(8*x^(8/3))
```

Rubi [A] time = 0.0162039, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a}{3x^3}-\frac{3b}{8x^{8/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))/x^4,x]

[Out] -a/(3*x^3) - (3*b)/(8*x^(8/3))
```

Rubi in Sympy [A] time = 2.89295, size = 17, normalized size = 0.89

$$-\frac{a}{3x^3}-\frac{3b}{8x^{\frac{8}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))/x**4,x)

[Out] -a/(3*x**3) - 3*b/(8*x**(8/3))
```

Mathematica [A] time = 0.00626751, size = 19, normalized size = 1.

$$-\frac{a}{3x^3}-\frac{3b}{8x^{8/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))/x^4,x]

[Out] -a/(3*x^3) - (3*b)/(8*x^(8/3))
```

Maple [A] time = 0.008, size = 14, normalized size = 0.7

$$-\frac{a}{3\,x^3}-\frac{3\,b}{8}x^{-\frac{8}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))/x^4,x)

[Out] -1/3*a/x^3-3/8*b/x^(8/3)
```

Maxima [A] time = 1.4458, size = 20, normalized size = 1.05

$$-\frac{9\,bx^{\frac{1}{3}} + 8\,a}{24\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)/x^4,x, algorithm="maxima")
```

```
[Out] -1/24*(9*b*x^(1/3) + 8*a)/x^3
```

Fricas [A] time = 0.213195, size = 20, normalized size = 1.05

$$-\frac{9\,bx^{\frac{1}{3}} + 8\,a}{24\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)/x^4,x, algorithm="fricas")
```

```
[Out] -1/24*(9*b*x^(1/3) + 8*a)/x^3
```

Sympy [A] time = 9.00004, size = 17, normalized size = 0.89

$$-\frac{a}{3x^3} - \frac{3b}{8x^{\frac{8}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))/x**4,x)
```

```
[Out] -a/(3*x**3) - 3*b/(8*x**(8/3))
```

GIAC/XCAS [A] time = 0.248079, size = 20, normalized size = 1.05

$$-\frac{9\,bx^{\frac{1}{3}} + 8\,a}{24\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)/x^4,x, algorithm="giac")
```

```
[Out] -1/24*(9*b*x^(1/3) + 8*a)/x^3
```

3.2287 $\int \left(a+b\sqrt[3]{x}\right)^2 x^4 \, dx$

Optimal. Leaf size=34

$$\frac{a^2x^5}{5}+\frac{3}{8}abx^{16/3}+\frac{3}{17}b^2x^{17/3}$$

```
[Out] (a^2*x^5)/5 + (3*a*b*x^(16/3))/8 + (3*b^2*x^(17/3))/17
```

Rubi [A] time = 0.0758651, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^2x^5}{5}+\frac{3}{8}abx^{16/3}+\frac{3}{17}b^2x^{17/3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^2*x^4,x]

[Out] (a^2*x^5)/5 + (3*a*b*x^(16/3))/8 + (3*b^2*x^(17/3))/17
```

Rubi in Sympy [A] time = 12.7269, size = 31, normalized size = 0.91

$$\frac{a^2x^5}{5}+\frac{3abx^{\frac{16}{3}}}{8}+\frac{3b^2x^{\frac{17}{3}}}{17}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**2*x**4,x)

[Out] a**2*x**5/5 + 3*a*b*x**(16/3)/8 + 3*b**2*x**(17/3)/17
```

Mathematica [A] time = 0.0122557, size = 34, normalized size = 1.

$$\frac{a^2x^5}{5}+\frac{3}{8}abx^{16/3}+\frac{3}{17}b^2x^{17/3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^2*x^4,x]

[Out] (a^2*x^5)/5 + (3*a*b*x^(16/3))/8 + (3*b^2*x^(17/3))/17
```

Maple [A] time = 0.002, size = 25, normalized size = 0.7

$$\frac{x^5a^2}{5}+\frac{3\,ab}{8}x^{\frac{16}{3}}+\frac{3\,b^2}{17}x^{\frac{17}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^2*x^4,x)

[Out] 1/5*x^5*a^2+3/8*a*b*x^(16/3)+3/17*b^2*x^(17/3)
```

Maxima [A] time = 1.4467, size = 338, normalized size = 9.94

$$\frac{3\left(bx^{\frac{1}{3}}+a\right)^{17}}{17\,b^{15}}-\frac{21\left(bx^{\frac{1}{3}}+a\right)^{16}a}{8\,b^{15}}+\frac{91\left(bx^{\frac{1}{3}}+a\right)^{15}a^{2}}{5\,b^{15}}-\frac{78\left(bx^{\frac{1}{3}}+a\right)^{14}a^{3}}{b^{15}}+\frac{231\left(bx^{\frac{1}{3}}+a\right)^{13}a^{4}}{b^{15}}-\frac{1001\left(bx^{\frac{1}{3}}+a\right)^{12}a^{5}}{2\,b^{15}}+\frac{819\left(bx^{\frac{1}{3}}+a\right)^{11}a^{6}}{b^{15}}-\frac{5148\left(bx^{\frac{1}{3}}+a\right)^{10}a^{7}}{5\,b^{15}}+\frac{1001\left(bx^{\frac{1}{3}}+a\right)^{9}a^{8}}{b^{15}}-\frac{3003\left(bx^{\frac{1}{3}}+a\right)^{8}a^{9}}{4\,b^{15}}+\frac{429\left(bx^{\frac{1}{3}}+a\right)^{7}a^{10}}{b^{15}}-\frac{182\left(bx^{\frac{1}{3}}+a\right)^{6}a^{11}}{b^{15}}+\frac{273\left(bx^{\frac{1}{3}}+a\right)^{5}a^{12}}{5\,b^{15}}-\frac{21\left(bx^{\frac{1}{3}}+a\right)^{4}a^{13}}{2\,b^{15}}+\frac{\left(bx^{\frac{1}{3}}+a\right)^{3}a^{14}}{b^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^2*x^4,x, algorithm="maxima")
```

```
[Out] 3/17*(b*x^(1/3) + a)^17/b^15 - 21/8*(b*x^(1/3) + a)^16*a/b^15 + 9
1/5*(b*x^(1/3) + a)^15*a^2/b^15 - 78*(b*x^(1/3) + a)^14*a^3/b^15
+ 231*(b*x^(1/3) + a)^13*a^4/b^15 - 1001/2*(b*x^(1/3) + a)^12*a^5
/b^15 + 819*(b*x^(1/3) + a)^11*a^6/b^15 - 5148/5*(b*x^(1/3) + a)^
10*a^7/b^15 + 1001*(b*x^(1/3) + a)^9*a^8/b^15 - 3003/4*(b*x^(1/3)
 + a)^8*a^9/b^15 + 429*(b*x^(1/3) + a)^7*a^10/b^15 - 182*(b*x^(1/
3) + a)^6*a^11/b^15 + 273/5*(b*x^(1/3) + a)^5*a^12/b^15 - 21/2*(b
*x^(1/3) + a)^4*a^13/b^15 + (b*x^(1/3) + a)^3*a^14/b^15
```

Fricas [A] time = 0.212157, size = 32, normalized size = 0.94

$$\frac{3}{17}\,b^{2}x^{\frac{17}{3}}+\frac{3}{8}\,abx^{\frac{16}{3}}+\frac{1}{5}\,a^{2}x^{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^2*x^4,x, algorithm="fricas")
```

```
[Out] 3/17*b^2*x^(17/3) + 3/8*a*b*x^(16/3) + 1/5*a^2*x^5
```

Sympy [A] time = 5.67345, size = 31, normalized size = 0.91

$$\frac{a^{2}x^{5}}{5}+\frac{3abx^{\frac{16}{3}}}{8}+\frac{3b^{2}x^{\frac{17}{3}}}{17}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**2*x**4,x)
```

```
[Out] a**2*x**5/5 + 3*a*b*x**(16/3)/8 + 3*b**2*x**(17/3)/17
```

GIAC/XCAS [A] time = 0.251296, size = 32, normalized size = 0.94

$$\frac{3}{17}\,b^{2}x^{\frac{17}{3}}+\frac{3}{8}\,abx^{\frac{16}{3}}+\frac{1}{5}\,a^{2}x^{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^2*x^4,x, algorithm="giac")
```

```
[Out] 3/17*b^2*x^(17/3) + 3/8*a*b*x^(16/3) + 1/5*a^2*x^5
```

3.2288 $\int \left(a+b\sqrt[3]{x}\right)^2 x^3\,dx$

Optimal. Leaf size=34

$$\frac{a^2x^4}{4}+\frac{6}{13}abx^{13/3}+\frac{3}{14}b^2x^{14/3}$$

```
[Out] (a^2*x^4)/4 + (6*a*b*x^(13/3))/13 + (3*b^2*x^(14/3))/14
```

Rubi [A] time = 0.070833, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^2x^4}{4}+\frac{6}{13}abx^{13/3}+\frac{3}{14}b^2x^{14/3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^2*x^3,x]

[Out] (a^2*x^4)/4 + (6*a*b*x^(13/3))/13 + (3*b^2*x^(14/3))/14
```

Rubi in Sympy [A] time = 10.8763, size = 31, normalized size = 0.91

$$\frac{a^2x^4}{4}+\frac{6abx^{\frac{13}{3}}}{13}+\frac{3b^2x^{\frac{14}{3}}}{14}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**2*x**3,x)

[Out] a**2*x**4/4 + 6*a*b*x**(13/3)/13 + 3*b**2*x**(14/3)/14
```

Mathematica [A] time = 0.0110125, size = 34, normalized size = 1.

$$\frac{a^2x^4}{4}+\frac{6}{13}abx^{13/3}+\frac{3}{14}b^2x^{14/3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^2*x^3,x]

[Out] (a^2*x^4)/4 + (6*a*b*x^(13/3))/13 + (3*b^2*x^(14/3))/14
```

Maple [A] time = 0.001, size = 25, normalized size = 0.7

$$\frac{x^4a^2}{4}+\frac{6\,ab}{13}x^{\frac{13}{3}}+\frac{3\,b^2}{14}x^{\frac{14}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^2*x^3,x)

[Out] 1/4*x^4*a^2+6/13*a*b*x^(13/3)+3/14*b^2*x^(14/3)
```

Maxima [A] time = 1.44625, size = 270, normalized size = 7.94

$$\frac{3\left(bx^{\frac{1}{3}}+a\right)^{14}}{14\,b^{12}}-\frac{33\left(bx^{\frac{1}{3}}+a\right)^{13}a}{13\,b^{12}}+\frac{55\left(bx^{\frac{1}{3}}+a\right)^{12}a^{2}}{4\,b^{12}}-\frac{45\left(bx^{\frac{1}{3}}+a\right)^{11}a^{3}}{b^{12}}+\frac{99\left(bx^{\frac{1}{3}}+a\right)^{10}a^{4}}{b^{12}}-\frac{154\left(bx^{\frac{1}{3}}+a\right)^{9}a^{5}}{b^{12}}+\frac{693\left(bx^{\frac{1}{3}}+a\right)^{8}a^{6}}{4\,b^{12}}-\frac{990\left(bx^{\frac{1}{3}}+a\right)^{7}a^{7}}{7\,b^{12}}+\frac{165\left(bx^{\frac{1}{3}}+a\right)^{6}a^{8}}{2\,b^{12}}-\frac{33\left(bx^{\frac{1}{3}}+a\right)^{5}a^{9}}{b^{12}}+\frac{33\left(bx^{\frac{1}{3}}+a\right)^{4}a^{10}}{4\,b^{12}}-\frac{\left(bx^{\frac{1}{3}}+a\right)^{3}a^{11}}{b^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^(1/3) + a)^2*x^3,x, algorithm="maxima")
```

```
[Out] 3/14*(b*x^(1/3) + a)^14/b^12 - 33/13*(b*x^(1/3) + a)^13*a/b^12 +
55/4*(b*x^(1/3) + a)^12*a^2/b^12 - 45*(b*x^(1/3) + a)^11*a^3/b^12
 + 99*(b*x^(1/3) + a)^10*a^4/b^12 - 154*(b*x^(1/3) + a)^9*a^5/b^1
2 + 693/4*(b*x^(1/3) + a)^8*a^6/b^12 - 990/7*(b*x^(1/3) + a)^7*a^
7/b^12 + 165/2*(b*x^(1/3) + a)^6*a^8/b^12 - 33*(b*x^(1/3) + a)^5*
a^9/b^12 + 33/4*(b*x^(1/3) + a)^4*a^10/b^12 - (b*x^(1/3) + a)^3*a
^11/b^12
```

Fricas [A] time = 0.212367, size = 32, normalized size = 0.94

$$\frac{3}{14}\,b^{2}x^{\frac{14}{3}}+\frac{6}{13}\,abx^{\frac{13}{3}}+\frac{1}{4}\,a^{2}x^{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^(1/3) + a)^2*x^3,x, algorithm="fricas")
```

```
[Out] 3/14*b^2*x^(14/3) + 6/13*a*b*x^(13/3) + 1/4*a^2*x^4
```

Sympy [A] time = 3.39547, size = 31, normalized size = 0.91

$$\frac{a^{2}x^{4}}{4}+\frac{6abx^{\frac{13}{3}}}{13}+\frac{3b^{2}x^{\frac{14}{3}}}{14}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a+b*x**(1/3))**2*x**3,x)
```

```
[Out] a**2*x**4/4 + 6*a*b*x**(13/3)/13 + 3*b**2*x**(14/3)/14
```

GIAC/XCAS [A] time = 0.254471, size = 32, normalized size = 0.94

$$\frac{3}{14}\,b^{2}x^{\frac{14}{3}}+\frac{6}{13}\,abx^{\frac{13}{3}}+\frac{1}{4}\,a^{2}x^{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^(1/3) + a)^2*x^3,x, algorithm="giac")
```

```
[Out] 3/14*b^2*x^(14/3) + 6/13*a*b*x^(13/3) + 1/4*a^2*x^4
```

3.2289 $\int \left(a+b\sqrt[3]{x}\right)^2 x^2 \, dx$

Optimal. Leaf size=34

$$\frac{a^2x^3}{3}+\frac{3}{5}abx^{10/3}+\frac{3}{11}b^2x^{11/3}$$

```
[Out] (a^2*x^3)/3 + (3*a*b*x^(10/3))/5 + (3*b^2*x^(11/3))/11
```

Rubi [A] time = 0.0625656, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^2x^3}{3}+\frac{3}{5}abx^{10/3}+\frac{3}{11}b^2x^{11/3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^2*x^2,x]

[Out] (a^2*x^3)/3 + (3*a*b*x^(10/3))/5 + (3*b^2*x^(11/3))/11
```

Rubi in Sympy [A] time = 9.29909, size = 31, normalized size = 0.91

$$\frac{a^2x^3}{3}+\frac{3abx^{\frac{10}{3}}}{5}+\frac{3b^2x^{\frac{11}{3}}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**2*x**2,x)

[Out] a**2*x**3/3 + 3*a*b*x**(10/3)/5 + 3*b**2*x**(11/3)/11
```

Mathematica [A] time = 0.012886, size = 34, normalized size = 1.

$$\frac{a^2x^3}{3}+\frac{3}{5}abx^{10/3}+\frac{3}{11}b^2x^{11/3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^2*x^2,x]

[Out] (a^2*x^3)/3 + (3*a*b*x^(10/3))/5 + (3*b^2*x^(11/3))/11
```

Maple [A] time = 0.003, size = 25, normalized size = 0.7

$$\frac{x^3a^2}{3}+\frac{3\,ab}{5}x^{\frac{10}{3}}+\frac{3\,b^2}{11}x^{\frac{11}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^2*x^2,x)

[Out] 1/3*x^3*a^2+3/5*a*b*x^(10/3)+3/11*b^2*x^(11/3)
```

Maxima [A] time = 1.44591, size = 200, normalized size = 5.88

$$\frac{3\left(bx^{\frac{1}{3}}+a\right)^{11}}{11\,b^9}-\frac{12\left(bx^{\frac{1}{3}}+a\right)^{10}a}{5\,b^9}+\frac{28\left(bx^{\frac{1}{3}}+a\right)^{9}a^2}{3\,b^9}-\frac{21\left(bx^{\frac{1}{3}}+a\right)^{8}a^3}{b^9}+\frac{30\left(bx^{\frac{1}{3}}+a\right)^{7}a^4}{b^9}-\frac{28\left(bx^{\frac{1}{3}}+a\right)^{6}a^5}{b^9}+\frac{84\left(bx^{\frac{1}{3}}+a\right)^{5}a^6}{5\,b^9}-\frac{6\left(bx^{\frac{1}{3}}+a\right)^{4}a^7}{b^9}+\frac{\left(bx^{\frac{1}{3}}+a\right)^{3}a^8}{b^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^2*x^2,x, algorithm="maxima")
```

```
[Out] 3/11*(b*x^(1/3) + a)^11/b^9 - 12/5*(b*x^(1/3) + a)^10*a/b^9 + 28/
3*(b*x^(1/3) + a)^9*a^2/b^9 - 21*(b*x^(1/3) + a)^8*a^3/b^9 + 30*(
b*x^(1/3) + a)^7*a^4/b^9 - 28*(b*x^(1/3) + a)^6*a^5/b^9 + 84/5*(b
*x^(1/3) + a)^5*a^6/b^9 - 6*(b*x^(1/3) + a)^4*a^7/b^9 + (b*x^(1/3
) + a)^3*a^8/b^9
```

Fricas [A] time = 0.21574, size = 32, normalized size = 0.94

$$\frac{3}{11}\,b^2x^{\frac{11}{3}}+\frac{3}{5}\,abx^{\frac{10}{3}}+\frac{1}{3}\,a^2x^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^2*x^2,x, algorithm="fricas")
```

```
[Out] 3/11*b^2*x^(11/3) + 3/5*a*b*x^(10/3) + 1/3*a^2*x^3
```

Sympy [A] time = 2.00397, size = 31, normalized size = 0.91

$$\frac{a^2x^3}{3}+\frac{3abx^{\frac{10}{3}}}{5}+\frac{3b^2x^{\frac{11}{3}}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**2*x**2,x)
```

```
[Out] a**2*x**3/3 + 3*a*b*x**(10/3)/5 + 3*b**2*x**(11/3)/11
```

GIAC/XCAS [A] time = 0.263706, size = 32, normalized size = 0.94

$$\frac{3}{11}\,b^2x^{\frac{11}{3}}+\frac{3}{5}\,abx^{\frac{10}{3}}+\frac{1}{3}\,a^2x^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^2*x^2,x, algorithm="giac")
```

```
[Out] 3/11*b^2*x^(11/3) + 3/5*a*b*x^(10/3) + 1/3*a^2*x^3
```

3.2290 $\int \left(a+b\sqrt[3]{x}\right)^2 x \, dx$

Optimal. Leaf size=34

$$\frac{a^2x^2}{2}+\frac{6}{7}abx^{7/3}+\frac{3}{8}b^2x^{8/3}$$

```
[Out] (a^2*x^2)/2 + (6*a*b*x^(7/3))/7 + (3*b^2*x^(8/3))/8
```

Rubi [A] time = 0.0542323, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^2x^2}{2}+\frac{6}{7}abx^{7/3}+\frac{3}{8}b^2x^{8/3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^(1/3))^2*x,x]

[Out] (a^2*x^2)/2 + (6*a*b*x^(7/3))/7 + (3*b^2*x^(8/3))/8
```

Rubi in Sympy [A] time = 8.03824, size = 31, normalized size = 0.91

$$\frac{a^2x^2}{2}+\frac{6abx^{\frac{7}{3}}}{7}+\frac{3b^2x^{\frac{8}{3}}}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b*x**(1/3))**2*x,x)

[Out] a**2*x**2/2 + 6*a*b*x**(7/3)/7 + 3*b**2*x**(8/3)/8
```

Mathematica [A] time = 0.0102203, size = 34, normalized size = 1.

$$\frac{a^2x^2}{2}+\frac{6}{7}abx^{7/3}+\frac{3}{8}b^2x^{8/3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^(1/3))^2*x,x]

[Out] (a^2*x^2)/2 + (6*a*b*x^(7/3))/7 + (3*b^2*x^(8/3))/8
```

Maple [A] time = 0.002, size = 25, normalized size = 0.7

$$\frac{a^2x^2}{2}+\frac{6\,ab}{7}x^{\frac{7}{3}}+\frac{3\,b^2}{8}x^{\frac{8}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*x^(1/3))^2*x,x)

[Out] 1/2*a^2*x^2+6/7*a*b*x^(7/3)+3/8*b^2*x^(8/3)
```

Maxima [A] time = 1.44189, size = 132, normalized size = 3.88

$$\frac{3\left(bx^{\frac{1}{3}}+a\right)^{8}}{8\,b^{6}}-\frac{15\left(bx^{\frac{1}{3}}+a\right)^{7}a}{7\,b^{6}}+\frac{5\left(bx^{\frac{1}{3}}+a\right)^{6}a^{2}}{b^{6}}-\frac{6\left(bx^{\frac{1}{3}}+a\right)^{5}a^{3}}{b^{6}}+\frac{15\left(bx^{\frac{1}{3}}+a\right)^{4}a^{4}}{4\,b^{6}}-\frac{\left(bx^{\frac{1}{3}}+a\right)^{3}a^{5}}{b^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^2*x,x, algorithm="maxima")
```

```
[Out] 3/8*(b*x^(1/3) + a)^8/b^6 - 15/7*(b*x^(1/3) + a)^7*a/b^6 + 5*(b*x
^(1/3) + a)^6*a^2/b^6 - 6*(b*x^(1/3) + a)^5*a^3/b^6 + 15/4*(b*x^(
1/3) + a)^4*a^4/b^6 - (b*x^(1/3) + a)^3*a^5/b^6
```

Fricas [A] time = 0.212494, size = 32, normalized size = 0.94

$$\frac{3}{8}\,b^{2}x^{\frac{8}{3}}+\frac{6}{7}\,abx^{\frac{7}{3}}+\frac{1}{2}\,a^{2}x^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^2*x,x, algorithm="fricas")
```

```
[Out] 3/8*b^2*x^(8/3) + 6/7*a*b*x^(7/3) + 1/2*a^2*x^2
```

Sympy [A] time = 1.30568, size = 31, normalized size = 0.91

$$\frac{a^{2}x^{2}}{2}+\frac{6abx^{\frac{7}{3}}}{7}+\frac{3b^{2}x^{\frac{8}{3}}}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**2*x,x)
```

```
[Out] a**2*x**2/2 + 6*a*b*x**(7/3)/7 + 3*b**2*x**(8/3)/8
```

GIAC/XCAS [A] time = 0.258597, size = 32, normalized size = 0.94

$$\frac{3}{8}\,b^{2}x^{\frac{8}{3}}+\frac{6}{7}\,abx^{\frac{7}{3}}+\frac{1}{2}\,a^{2}x^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^2*x,x, algorithm="giac")
```

```
[Out] 3/8*b^2*x^(8/3) + 6/7*a*b*x^(7/3) + 1/2*a^2*x^2
```

3.2291 $\int \left(a+b\sqrt[3]{x}\right)^2\,dx$

Optimal. Leaf size=29

$$a^2x+\frac{3}{2}abx^{4/3}+\frac{3}{5}b^2x^{5/3}$$

```
[Out] a^2*x + (3*a*b*x^(4/3))/2 + (3*b^2*x^(5/3))/5
```

Rubi [A] time = 0.0435078, antiderivative size = 29, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$a^2x+\frac{3}{2}abx^{4/3}+\frac{3}{5}b^2x^{5/3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^2,x]
```

```
[Out] a^2*x + (3*a*b*x^(4/3))/2 + (3*b^2*x^(5/3))/5
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{3abx^{\frac{4}{3}}}{2}+\frac{3b^2x^{\frac{5}{3}}}{5}+\int a^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**2,x)
```

```
[Out] 3*a*b*x**(4/3)/2 + 3*b**2*x**(5/3)/5 + Integral(a**2, x)
```

Mathematica [A] time = 0.00837939, size = 29, normalized size = 1.

$$a^2x+\frac{3}{2}abx^{4/3}+\frac{3}{5}b^2x^{5/3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^2,x]
```

```
[Out] a^2*x + (3*a*b*x^(4/3))/2 + (3*b^2*x^(5/3))/5
```

Maple [A] time = 0.002, size = 22, normalized size = 0.8

$$xa^2+\frac{3\,ab}{2}x^{\frac{4}{3}}+\frac{3\,b^2}{5}x^{\frac{5}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^2,x)
```

```
[Out] x*a^2+3/2*a*b*x^(4/3)+3/5*b^2*x^(5/3)
```

Maxima [A] time = 1.43597, size = 28, normalized size = 0.97

$$\frac{3}{5} b^2 x^{\frac{5}{3}} + \frac{3}{2} a b x^{\frac{4}{3}} + a^2 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^2,x, algorithm="maxima")
```

```
[Out] 3/5*b^2*x^(5/3) + 3/2*a*b*x^(4/3) + a^2*x
```

Fricas [A] time = 0.21119, size = 28, normalized size = 0.97

$$\frac{3}{5} b^2 x^{\frac{5}{3}} + \frac{3}{2} a b x^{\frac{4}{3}} + a^2 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^2,x, algorithm="fricas")
```

```
[Out] 3/5*b^2*x^(5/3) + 3/2*a*b*x^(4/3) + a^2*x
```

Sympy [A] time = 1.11379, size = 27, normalized size = 0.93

$$a^2 x + \frac{3 a b x^{\frac{4}{3}}}{2} + \frac{3 b^2 x^{\frac{5}{3}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**2,x)
```

```
[Out] a**2*x + 3*a*b*x**(4/3)/2 + 3*b**2*x**(5/3)/5
```

GIAC/XCAS [A] time = 0.285884, size = 28, normalized size = 0.97

$$\frac{3}{5} b^2 x^{\frac{5}{3}} + \frac{3}{2} a b x^{\frac{4}{3}} + a^2 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^2,x, algorithm="giac")
```

```
[Out] 3/5*b^2*x^(5/3) + 3/2*a*b*x^(4/3) + a^2*x
```

3.2292 $\int \frac{\left(a+b\sqrt[3]{x}\right)^2}{x} \, dx$

Optimal. Leaf size=28

$$a^2 \log(x) + 6ab\sqrt[3]{x} + \frac{3}{2}b^2x^{2/3}$$

```
[Out] 6*a*b*x^(1/3) + (3*b^2*x^(2/3))/2 + a^2*Log[x]
```

Rubi [A] time = 0.0345169, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$a^2 \log(x) + 6ab\sqrt[3]{x} + \frac{3}{2}b^2x^{2/3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^2/x,x]

[Out] 6*a*b*x^(1/3) + (3*b^2*x^(2/3))/2 + a^2*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$3a^2 \log\left(\sqrt[3]{x}\right) + 6ab\sqrt[3]{x} + 3b^2 \int^{\sqrt[3]{x}} x \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**2/x,x)

[Out] 3*a**2*log(x**(1/3)) + 6*a*b*x**(1/3) + 3*b**2*Integral(x, (x, x*
*(1/3)))
```

Mathematica [A] time = 0.014204, size = 28, normalized size = 1.

$$a^2 \log(x) + \frac{3}{2}b\sqrt[3]{x}\left(4a + b\sqrt[3]{x}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^2/x,x]

[Out] (3*b*(4*a + b*x^(1/3))*x^(1/3))/2 + a^2*Log[x]
```

Maple [A] time = 0.004, size = 23, normalized size = 0.8

$$6\,ab\sqrt[3]{x} + \frac{3\,b^2}{2}x^{\frac{2}{3}} + a^2\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^2/x,x)
```

```
[Out] 6*a*b*x^(1/3)+3/2*b^2*x^(2/3)+a^2*ln(x)
```

Maxima [A] time = 1.44329, size = 30, normalized size = 1.07

$$a^2 \log(x) + \frac{3}{2}b^2x^{\frac{2}{3}} + 6abx^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^2/x,x, algorithm="maxima")
```

```
[Out] a^2*log(x) + 3/2*b^2*x^(2/3) + 6*a*b*x^(1/3)
```

Fricas [A] time = 0.218895, size = 34, normalized size = 1.21

$$3a^2 \log\left(x^{\frac{1}{3}}\right) + \frac{3}{2}b^2x^{\frac{2}{3}} + 6abx^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^2/x,x, algorithm="fricas")
```

```
[Out] 3*a^2*log(x^(1/3)) + 3/2*b^2*x^(2/3) + 6*a*b*x^(1/3)
```

Sympy [A] time = 0.628671, size = 27, normalized size = 0.96

$$a^2 \log(x) + 6ab\sqrt[3]{x} + \frac{3b^2x^{\frac{2}{3}}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**2/x,x)
```

```
[Out] a**2*log(x) + 6*a*b*x**(1/3) + 3*b**2*x**(2/3)/2
```

GIAC/XCAS [A] time = 0.250871, size = 31, normalized size = 1.11

$$a^2 \ln(|x|) + \frac{3}{2}b^2x^{\frac{2}{3}} + 6abx^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^2/x,x, algorithm="giac")
```

```
[Out] a^2*ln(abs(x)) + 3/2*b^2*x^(2/3) + 6*a*b*x^(1/3)
```

3.2293 $\int \frac{\left(a+b\sqrt[3]{x}\right)^2}{x^2}\,dx$

Optimal. Leaf size=19

$$-\frac{\left(a+b\sqrt[3]{x}\right)^3}{ax}$$

```
[Out] -((a + b*x^(1/3))^3/(a*x))
```

Rubi [A] time = 0.0162551, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{\left(a+b\sqrt[3]{x}\right)^3}{ax}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^2/x^2,x]
```

```
[Out] -((a + b*x^(1/3))^3/(a*x))
```

Rubi in Sympy [A] time = 2.85974, size = 14, normalized size = 0.74

$$-\frac{\left(a+b\sqrt[3]{x}\right)^3}{ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**2/x**2,x)
```

```
[Out] -(a + b*x**(1/3))**3/(a*x)
```

Mathematica [A] time = 0.0149112, size = 28, normalized size = 1.47

$$-\frac{a^2}{x}-\frac{3ab}{x^{2/3}}-\frac{3b^2}{\sqrt[3]{x}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^2/x^2,x]
```

```
[Out] -(a^2/x) - (3*a*b)/x^(2/3) - (3*b^2)/x^(1/3)
```

Maple [A] time = 0.008, size = 25, normalized size = 1.3

$$-\frac{a^2}{x}-3\,\frac{ab}{x^{2/3}}-3\,\frac{b^2}{\sqrt[3]{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^2/x^2,x)
```

```
[Out] -a^2/x-3*a*b/x^(2/3)-3*b^2/x^(1/3)
```

Maxima [A] time = 1.47163, size = 32, normalized size = 1.68

$$-\frac{3\,b^2x^{\frac{2}{3}} + 3\,abx^{\frac{1}{3}} + a^2}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^2/x^2,x, algorithm="maxima")
```

```
[Out] -(3*b^2*x^(2/3) + 3*a*b*x^(1/3) + a^2)/x
```

Fricas [A] time = 0.21334, size = 32, normalized size = 1.68

$$-\frac{3\,b^2x^{\frac{2}{3}} + 3\,abx^{\frac{1}{3}} + a^2}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^2/x^2,x, algorithm="fricas")
```

```
[Out] -(3*b^2*x^(2/3) + 3*a*b*x^(1/3) + a^2)/x
```

Sympy [A] time = 2.14483, size = 26, normalized size = 1.37

$$-\frac{a^2}{x} - \frac{3ab}{x^{\frac{2}{3}}} - \frac{3b^2}{\sqrt[3]{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**2/x**2,x)
```

```
[Out] -a**2/x - 3*a*b/x**(2/3) - 3*b**2/x**(1/3)
```

GIAC/XCAS [A] time = 0.260883, size = 32, normalized size = 1.68

$$-\frac{3\,b^2x^{\frac{2}{3}} + 3\,abx^{\frac{1}{3}} + a^2}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^2/x^2,x, algorithm="giac")
```

```
[Out] -(3*b^2*x^(2/3) + 3*a*b*x^(1/3) + a^2)/x
```

3.2294 $\int \frac{\left(a+b\sqrt[3]{x}\right)^2}{x^3}\,dx$

Optimal. Leaf size=34

$$-\frac{a^2}{2x^2}-\frac{6ab}{5x^{5/3}}-\frac{3b^2}{4x^{4/3}}$$

```
[Out] -a^2/(2*x^2) - (6*a*b)/(5*x^(5/3)) - (3*b^2)/(4*x^(4/3))
```

Rubi [A] time = 0.0433039, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^2}{2x^2}-\frac{6ab}{5x^{5/3}}-\frac{3b^2}{4x^{4/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^2/x^3,x]
```

```
[Out] -a^2/(2*x^2) - (6*a*b)/(5*x^(5/3)) - (3*b^2)/(4*x^(4/3))
```

Rubi in Sympy [A] time = 6.76713, size = 32, normalized size = 0.94

$$-\frac{a^2}{2x^2}-\frac{6ab}{5x^{\frac{5}{3}}}-\frac{3b^2}{4x^{\frac{4}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**2/x**3,x)
```

```
[Out] -a**2/(2*x**2) - 6*a*b/(5*x**(5/3)) - 3*b**2/(4*x**(4/3))
```

Mathematica [A] time = 0.0128438, size = 34, normalized size = 1.

$$-\frac{a^2}{2x^2}-\frac{6ab}{5x^{5/3}}-\frac{3b^2}{4x^{4/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^2/x^3,x]
```

```
[Out] -a^2/(2*x^2) - (6*a*b)/(5*x^(5/3)) - (3*b^2)/(4*x^(4/3))
```

Maple [A] time = 0.008, size = 25, normalized size = 0.7

$$-\frac{a^2}{2\,x^2}-\frac{6\,ab}{5}x^{-\frac{5}{3}}-\frac{3\,b^2}{4}x^{-\frac{4}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^2/x^3,x)
```

```
[Out] -1/2*a^2/x^2-6/5*a*b/x^(5/3)-3/4*b^2/x^(4/3)
```

Maxima [A] time = 1.42443, size = 35, normalized size = 1.03

$$-\frac{15\,b^{2}x^{\frac{2}{3}}+24\,abx^{\frac{1}{3}}+10\,a^{2}}{20\,x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^2/x^3,x, algorithm="maxima")

[Out] -1/20*(15*b^2*x^(2/3) + 24*a*b*x^(1/3) + 10*a^2)/x^2
```

Fricas [A] time = 0.212666, size = 35, normalized size = 1.03

$$-\frac{15\,b^{2}x^{\frac{2}{3}}+24\,abx^{\frac{1}{3}}+10\,a^{2}}{20\,x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^2/x^3,x, algorithm="fricas")

[Out] -1/20*(15*b^2*x^(2/3) + 24*a*b*x^(1/3) + 10*a^2)/x^2
```

Sympy [A] time = 3.99564, size = 32, normalized size = 0.94

$$-\frac{a^{2}}{2x^{2}}-\frac{6ab}{5x^{\frac{5}{3}}}-\frac{3b^{2}}{4x^{\frac{4}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**2/x**3,x)

[Out] -a**2/(2*x**2) - 6*a*b/(5*x**(5/3)) - 3*b**2/(4*x**(4/3))
```

GIAC/XCAS [A] time = 0.25413, size = 35, normalized size = 1.03

$$-\frac{15\,b^{2}x^{\frac{2}{3}}+24\,abx^{\frac{1}{3}}+10\,a^{2}}{20\,x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^2/x^3,x, algorithm="giac")

[Out] -1/20*(15*b^2*x^(2/3) + 24*a*b*x^(1/3) + 10*a^2)/x^2
```

3.2295 $\int \frac{\left(a+b\sqrt[3]{x}\right)^2}{x^4}\,dx$

Optimal. Leaf size=34

$$-\frac{a^2}{3x^3}-\frac{3ab}{4x^{8/3}}-\frac{3b^2}{7x^{7/3}}$$

```
[Out] -a^2/(3*x^3) - (3*a*b)/(4*x^(8/3)) - (3*b^2)/(7*x^(7/3))
```

Rubi [A] time = 0.0436681, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^2}{3x^3}-\frac{3ab}{4x^{8/3}}-\frac{3b^2}{7x^{7/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^2/x^4,x]

[Out] -a^2/(3*x^3) - (3*a*b)/(4*x^(8/3)) - (3*b^2)/(7*x^(7/3))
```

Rubi in Sympy [A] time = 6.90215, size = 32, normalized size = 0.94

$$-\frac{a^2}{3x^3}-\frac{3ab}{4x^{\frac{8}{3}}}-\frac{3b^2}{7x^{\frac{7}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**2/x**4,x)

[Out] -a**2/(3*x**3) - 3*a*b/(4*x**(8/3)) - 3*b**2/(7*x**(7/3))
```

Mathematica [A] time = 0.0150763, size = 34, normalized size = 1.

$$-\frac{a^2}{3x^3}-\frac{3ab}{4x^{8/3}}-\frac{3b^2}{7x^{7/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^2/x^4,x]

[Out] -a^2/(3*x^3) - (3*a*b)/(4*x^(8/3)) - (3*b^2)/(7*x^(7/3))
```

Maple [A] time = 0.008, size = 25, normalized size = 0.7

$$-\frac{a^2}{3\,x^3}-\frac{3\,ab}{4}x^{-\frac{8}{3}}-\frac{3\,b^2}{7}x^{-\frac{7}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^2/x^4,x)
```

```
[Out] -1/3*a^2/x^3-3/4*a*b/x^(8/3)-3/7*b^2/x^(7/3)
```

Maxima [A] time = 1.41781, size = 35, normalized size = 1.03

$$-\frac{36\,b^2x^{\frac{2}{3}}+63\,abx^{\frac{1}{3}}+28\,a^2}{84\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^2/x^4,x, algorithm="maxima")
```

```
[Out] -1/84*(36*b^2*x^(2/3) + 63*a*b*x^(1/3) + 28*a^2)/x^3
```

Fricas [A] time = 0.212264, size = 35, normalized size = 1.03

$$-\frac{36\,b^2x^{\frac{2}{3}}+63\,abx^{\frac{1}{3}}+28\,a^2}{84\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^2/x^4,x, algorithm="fricas")
```

```
[Out] -1/84*(36*b^2*x^(2/3) + 63*a*b*x^(1/3) + 28*a^2)/x^3
```

Sympy [A] time = 7.37126, size = 32, normalized size = 0.94

$$-\frac{a^2}{3x^3}-\frac{3ab}{4x^{\frac{8}{3}}}-\frac{3b^2}{7x^{\frac{7}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**2/x**4,x)
```

```
[Out] -a**2/(3*x**3) - 3*a*b/(4*x**(8/3)) - 3*b**2/(7*x**(7/3))
```

GIAC/XCAS [A] time = 0.22022, size = 35, normalized size = 1.03

$$-\frac{36\,b^2x^{\frac{2}{3}}+63\,abx^{\frac{1}{3}}+28\,a^2}{84\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^2/x^4,x, algorithm="giac")
```

```
[Out] -1/84*(36*b^2*x^(2/3) + 63*a*b*x^(1/3) + 28*a^2)/x^3
```

3.2296 $\int \left(a+b\sqrt[3]{x}\right)^3 x^4\,dx$

Optimal. Leaf size=47

$$\frac{a^3x^5}{5}+\frac{9}{16}a^2bx^{16/3}+\frac{9}{17}ab^2x^{17/3}+\frac{b^3x^6}{6}$$

```
[Out] (a^3*x^5)/5 + (9*a^2*b*x^(16/3))/16 + (9*a*b^2*x^(17/3))/17 + (b^
3*x^6)/6
```

Rubi [A] time = 0.0883463, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^3x^5}{5}+\frac{9}{16}a^2bx^{16/3}+\frac{9}{17}ab^2x^{17/3}+\frac{b^3x^6}{6}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^3*x^4,x]
```

```
[Out] (a^3*x^5)/5 + (9*a^2*b*x^(16/3))/16 + (9*a*b^2*x^(17/3))/17 + (b^
3*x^6)/6
```

Rubi in Sympy [A] time = 15.2758, size = 42, normalized size = 0.89

$$\frac{a^3x^5}{5}+\frac{9a^2bx^{\frac{16}{3}}}{16}+\frac{9ab^2x^{\frac{17}{3}}}{17}+\frac{b^3x^6}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**3*x**4,x)
```

```
[Out] a**3*x**5/5 + 9*a**2*b*x**(16/3)/16 + 9*a*b**2*x**(17/3)/17 + b**
3*x**6/6
```

Mathematica [A] time = 0.010515, size = 47, normalized size = 1.

$$\frac{a^3x^5}{5}+\frac{9}{16}a^2bx^{16/3}+\frac{9}{17}ab^2x^{17/3}+\frac{b^3x^6}{6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^3*x^4,x]
```

```
[Out] (a^3*x^5)/5 + (9*a^2*b*x^(16/3))/16 + (9*a*b^2*x^(17/3))/17 + (b^
3*x^6)/6
```

Maple [A] time = 0.002, size = 36, normalized size = 0.8

$$\frac{a^3x^5}{5}+\frac{9\,a^2b}{16}x^{\frac{16}{3}}+\frac{9\,ab^2}{17}x^{\frac{17}{3}}+\frac{b^3x^6}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^3*x^4,x)
```

```
[Out] 1/5*a^3*x^5+9/16*a^2*b*x^(16/3)+9/17*a*b^2*x^(17/3)+1/6*b^3*x^6
```

Maxima [A] time = 1.432, size = 339, normalized size = 7.21

$$\frac{\left(bx^{\frac{1}{3}}+a\right)^{18}}{6\,b^{15}}-\frac{42\left(bx^{\frac{1}{3}}+a\right)^{17}a}{17\,b^{15}}+\frac{273\left(bx^{\frac{1}{3}}+a\right)^{16}a^{2}}{16\,b^{15}}-\frac{364\left(bx^{\frac{1}{3}}+a\right)^{15}a^{3}}{5\,b^{15}}+\frac{429\left(bx^{\frac{1}{3}}+a\right)^{14}a^{4}}{2\,b^{15}}-\frac{462\left(bx^{\frac{1}{3}}+a\right)^{13}a^{5}}{b^{15}}+\frac{3003\left(bx^{\frac{1}{3}}+a\right)^{12}a^{6}}{4\,b^{15}}-\frac{936\left(bx^{\frac{1}{3}}+a\right)^{11}a^{7}}{b^{15}}+\frac{9009\left(bx^{\frac{1}{3}}+a\right)^{10}a^{8}}{10\,b^{15}}-\frac{2002\left(bx^{\frac{1}{3}}+a\right)^{9}a^{9}}{3\,b^{15}}+\frac{3003\left(bx^{\frac{1}{3}}+a\right)^{8}a^{10}}{8\,b^{15}}-\frac{156\left(bx^{\frac{1}{3}}+a\right)^{7}a^{11}}{b^{15}}+\frac{91\left(bx^{\frac{1}{3}}+a\right)^{6}a^{12}}{2\,b^{15}}-\frac{42\left(bx^{\frac{1}{3}}+a\right)^{5}a^{13}}{5\,b^{15}}+\frac{3\left(bx^{\frac{1}{3}}+a\right)^{4}a^{14}}{4\,b^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^3*x^4,x, algorithm="maxima")
```

```
[Out] 1/6*(b*x^(1/3) + a)^18/b^15 - 42/17*(b*x^(1/3) + a)^17*a/b^15 + 2
73/16*(b*x^(1/3) + a)^16*a^2/b^15 - 364/5*(b*x^(1/3) + a)^15*a^3/
b^15 + 429/2*(b*x^(1/3) + a)^14*a^4/b^15 - 462*(b*x^(1/3) + a)^13
*a^5/b^15 + 3003/4*(b*x^(1/3) + a)^12*a^6/b^15 - 936*(b*x^(1/3) +
 a)^11*a^7/b^15 + 9009/10*(b*x^(1/3) + a)^10*a^8/b^15 - 2002/3*(b
*x^(1/3) + a)^9*a^9/b^15 + 3003/8*(b*x^(1/3) + a)^8*a^10/b^15 - 1
56*(b*x^(1/3) + a)^7*a^11/b^15 + 91/2*(b*x^(1/3) + a)^6*a^12/b^15
 - 42/5*(b*x^(1/3) + a)^5*a^13/b^15 + 3/4*(b*x^(1/3) + a)^4*a^14/
b^15
```

Fricas [A] time = 0.21223, size = 47, normalized size = 1.

$$\frac{1}{6}\,b^{3}x^{6}+\frac{9}{17}\,ab^{2}x^{\frac{17}{3}}+\frac{9}{16}\,a^{2}bx^{\frac{16}{3}}+\frac{1}{5}\,a^{3}x^{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^3*x^4,x, algorithm="fricas")
```

```
[Out] 1/6*b^3*x^6 + 9/17*a*b^2*x^(17/3) + 9/16*a^2*b*x^(16/3) + 1/5*a^3
*x^5
```

Sympy [A] time = 6.88523, size = 42, normalized size = 0.89

$$\frac{a^{3}x^{5}}{5}+\frac{9a^{2}bx^{\frac{16}{3}}}{16}+\frac{9ab^{2}x^{\frac{17}{3}}}{17}+\frac{b^{3}x^{6}}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**3*x**4,x)
```

```
[Out] a**3*x**5/5 + 9*a**2*b*x**(16/3)/16 + 9*a*b**2*x**(17/3)/17 + b**
3*x**6/6
```

GIAC/XCAS [A] time = 0.216526, size = 47, normalized size = 1.

$$\frac{1}{6}\,b^{3}x^{6}+\frac{9}{17}\,ab^{2}x^{\frac{17}{3}}+\frac{9}{16}\,a^{2}bx^{\frac{16}{3}}+\frac{1}{5}\,a^{3}x^{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^3*x^4,x, algorithm="giac")
```

```
[Out] 1/6*b^3*x^6 + 9/17*a*b^2*x^(17/3) + 9/16*a^2*b*x^(16/3) + 1/5*a^3
*x^5
```

3.2297 $\int \left(a+b\sqrt[3]{x}\right)^3 x^3 \, dx$

Optimal. Leaf size=47

$$\frac{a^3x^4}{4}+\frac{9}{13}a^2bx^{13/3}+\frac{9}{14}ab^2x^{14/3}+\frac{b^3x^5}{5}$$

```
[Out] (a^3*x^4)/4 + (9*a^2*b*x^(13/3))/13 + (9*a*b^2*x^(14/3))/14 + (b^
3*x^5)/5
```

Rubi [A] time = 0.0823604, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^3x^4}{4}+\frac{9}{13}a^2bx^{13/3}+\frac{9}{14}ab^2x^{14/3}+\frac{b^3x^5}{5}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^(1/3))^3*x^3,x]
```

```
[Out] (a^3*x^4)/4 + (9*a^2*b*x^(13/3))/13 + (9*a*b^2*x^(14/3))/14 + (b^
3*x^5)/5
```

Rubi in Sympy [A] time = 13.3222, size = 42, normalized size = 0.89

$$\frac{a^3x^4}{4}+\frac{9a^2bx^{\frac{13}{3}}}{13}+\frac{9ab^2x^{\frac{14}{3}}}{14}+\frac{b^3x^5}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b*x**(1/3))**3*x**3,x)
```

```
[Out] a**3*x**4/4 + 9*a**2*b*x**(13/3)/13 + 9*a*b**2*x**(14/3)/14 + b**
3*x**5/5
```

Mathematica [A] time = 0.0112628, size = 47, normalized size = 1.

$$\frac{a^3x^4}{4}+\frac{9}{13}a^2bx^{13/3}+\frac{9}{14}ab^2x^{14/3}+\frac{b^3x^5}{5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^(1/3))^3*x^3,x]
```

```
[Out] (a^3*x^4)/4 + (9*a^2*b*x^(13/3))/13 + (9*a*b^2*x^(14/3))/14 + (b^
3*x^5)/5
```

Maple [A] time = 0.002, size = 36, normalized size = 0.8

$$\frac{a^3x^4}{4}+\frac{9\,a^2b}{13}x^{\frac{13}{3}}+\frac{9\,ab^2}{14}x^{\frac{14}{3}}+\frac{b^3x^5}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*x^(1/3))^3*x^3,x)
```

```
[Out] 1/4*a^3*x^4+9/13*a^2*b*x^(13/3)+9/14*a*b^2*x^(14/3)+1/5*b^3*x^5
```

Maxima [A] time = 1.43211, size = 270, normalized size = 5.74

$$\frac{\left(bx^{\frac{1}{3}}+a\right)^{15}}{5\,b^{12}}-\frac{33\left(bx^{\frac{1}{3}}+a\right)^{14}a}{14\,b^{12}}+\frac{165\left(bx^{\frac{1}{3}}+a\right)^{13}a^{2}}{13\,b^{12}}-\frac{165\left(bx^{\frac{1}{3}}+a\right)^{12}a^{3}}{4\,b^{12}}+\frac{90\left(bx^{\frac{1}{3}}+a\right)^{11}a^{4}}{b^{12}}-\frac{693\left(bx^{\frac{1}{3}}+a\right)^{10}a^{5}}{5\,b^{12}}+\frac{154\left(bx^{\frac{1}{3}}+a\right)^{9}a^{6}}{b^{12}}-\frac{495\left(bx^{\frac{1}{3}}+a\right)^{8}a^{7}}{4\,b^{12}}+\frac{495\left(bx^{\frac{1}{3}}+a\right)^{7}a^{8}}{7\,b^{12}}-\frac{55\left(bx^{\frac{1}{3}}+a\right)^{6}a^{9}}{2\,b^{12}}+\frac{33\left(bx^{\frac{1}{3}}+a\right)^{5}a^{10}}{5\,b^{12}}-\frac{3\left(bx^{\frac{1}{3}}+a\right)^{4}a^{11}}{4\,b^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^3*x^3,x, algorithm="maxima")
```

```
[Out] 1/5*(b*x^(1/3) + a)^15/b^12 - 33/14*(b*x^(1/3) + a)^14*a/b^12 + 1
65/13*(b*x^(1/3) + a)^13*a^2/b^12 - 165/4*(b*x^(1/3) + a)^12*a^3/
b^12 + 90*(b*x^(1/3) + a)^11*a^4/b^12 - 693/5*(b*x^(1/3) + a)^10*
a^5/b^12 + 154*(b*x^(1/3) + a)^9*a^6/b^12 - 495/4*(b*x^(1/3) + a)
^8*a^7/b^12 + 495/7*(b*x^(1/3) + a)^7*a^8/b^12 - 55/2*(b*x^(1/3)
+ a)^6*a^9/b^12 + 33/5*(b*x^(1/3) + a)^5*a^10/b^12 - 3/4*(b*x^(1/
3) + a)^4*a^11/b^12
```

Fricas [A] time = 0.21349, size = 47, normalized size = 1.

$$\frac{1}{5}\,b^{3}x^{5}+\frac{9}{14}\,ab^{2}x^{\frac{14}{3}}+\frac{9}{13}\,a^{2}bx^{\frac{13}{3}}+\frac{1}{4}\,a^{3}x^{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^3*x^3,x, algorithm="fricas")
```

```
[Out] 1/5*b^3*x^5 + 9/14*a*b^2*x^(14/3) + 9/13*a^2*b*x^(13/3) + 1/4*a^3
*x^4
```

Sympy [A] time = 3.90852, size = 42, normalized size = 0.89

$$\frac{a^{3}x^{4}}{4}+\frac{9a^{2}bx^{\frac{13}{3}}}{13}+\frac{9ab^{2}x^{\frac{14}{3}}}{14}+\frac{b^{3}x^{5}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**3*x**3,x)
```

```
[Out] a**3*x**4/4 + 9*a**2*b*x**(13/3)/13 + 9*a*b**2*x**(14/3)/14 + b**
3*x**5/5
```

GIAC/XCAS [A] time = 0.218989, size = 47, normalized size = 1.

$$\frac{1}{5}\,b^{3}x^{5}+\frac{9}{14}\,ab^{2}x^{\frac{14}{3}}+\frac{9}{13}\,a^{2}bx^{\frac{13}{3}}+\frac{1}{4}\,a^{3}x^{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^3*x^3,x, algorithm="giac")

[Out] 1/5*b^3*x^5 + 9/14*a*b^2*x^(14/3) + 9/13*a^2*b*x^(13/3) + 1/4*a^3
*x^4
```

3.2298 $\int \left(a+b\sqrt[3]{x}\right)^3 x^2\,dx$

Optimal. Leaf size=47

$$\frac{a^3x^3}{3}+\frac{9}{10}a^2bx^{10/3}+\frac{9}{11}ab^2x^{11/3}+\frac{b^3x^4}{4}$$

```
[Out] (a^3*x^3)/3 + (9*a^2*b*x^(10/3))/10 + (9*a*b^2*x^(11/3))/11 + (b^
3*x^4)/4
```

Rubi [A] time = 0.074644, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^3x^3}{3}+\frac{9}{10}a^2bx^{10/3}+\frac{9}{11}ab^2x^{11/3}+\frac{b^3x^4}{4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^3*x^2,x]
```

```
[Out] (a^3*x^3)/3 + (9*a^2*b*x^(10/3))/10 + (9*a*b^2*x^(11/3))/11 + (b^
3*x^4)/4
```

Rubi in Sympy [A] time = 11.6034, size = 42, normalized size = 0.89

$$\frac{a^3x^3}{3}+\frac{9a^2bx^{\frac{10}{3}}}{10}+\frac{9ab^2x^{\frac{11}{3}}}{11}+\frac{b^3x^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**3*x**2,x)
```

```
[Out] a**3*x**3/3 + 9*a**2*b*x**(10/3)/10 + 9*a*b**2*x**(11/3)/11 + b**
3*x**4/4
```

Mathematica [A] time = 0.0120432, size = 41, normalized size = 0.87

$$\frac{1}{660}x^3\left(220a^3+594a^2b\sqrt[3]{x}+540ab^2x^{2/3}+165b^3x\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^3*x^2,x]
```

```
[Out] (x^3*(220*a^3 + 594*a^2*b*x^(1/3) + 540*a*b^2*x^(2/3) + 165*b^3*x
))/660
```

Maple [A] time = 0.002, size = 36, normalized size = 0.8

$$\frac{a^3x^3}{3}+\frac{9\,a^2b}{10}x^{\frac{10}{3}}+\frac{9\,ab^2}{11}x^{\frac{11}{3}}+\frac{b^3x^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^3*x^2,x)
```

```
[Out] 1/3*a^3*x^3+9/10*a^2*b*x^(10/3)+9/11*a*b^2*x^(11/3)+1/4*b^3*x^4
```

Maxima [A] time = 1.45569, size = 201, normalized size = 4.28

$$\frac{\left(bx^{\frac{1}{3}}+a\right)^{12}}{4\,b^9}-\frac{24\left(bx^{\frac{1}{3}}+a\right)^{11}a}{11\,b^9}+\frac{42\left(bx^{\frac{1}{3}}+a\right)^{10}a^2}{5\,b^9}-\frac{56\left(bx^{\frac{1}{3}}+a\right)^{9}a^3}{3\,b^9}+\frac{105\left(bx^{\frac{1}{3}}+a\right)^{8}a^4}{4\,b^9}-\frac{24\left(bx^{\frac{1}{3}}+a\right)^{7}a^5}{b^9}+\frac{14\left(bx^{\frac{1}{3}}+a\right)^{6}a^6}{b^9}-\frac{24\left(bx^{\frac{1}{3}}+a\right)^{5}a^7}{5\,b^9}+\frac{3\left(bx^{\frac{1}{3}}+a\right)^{4}a^8}{4\,b^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^3*x^2,x, algorithm="maxima")
```

```
[Out] 1/4*(b*x^(1/3) + a)^12/b^9 - 24/11*(b*x^(1/3) + a)^11*a/b^9 + 42/
5*(b*x^(1/3) + a)^10*a^2/b^9 - 56/3*(b*x^(1/3) + a)^9*a^3/b^9 + 1
05/4*(b*x^(1/3) + a)^8*a^4/b^9 - 24*(b*x^(1/3) + a)^7*a^5/b^9 + 1
4*(b*x^(1/3) + a)^6*a^6/b^9 - 24/5*(b*x^(1/3) + a)^5*a^7/b^9 + 3/
4*(b*x^(1/3) + a)^4*a^8/b^9
```

Fricas [A] time = 0.212257, size = 47, normalized size = 1.

$$\frac{1}{4}\,b^3x^4+\frac{9}{11}\,ab^2x^{\frac{11}{3}}+\frac{9}{10}\,a^2bx^{\frac{10}{3}}+\frac{1}{3}\,a^3x^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^3*x^2,x, algorithm="fricas")
```

```
[Out] 1/4*b^3*x^4 + 9/11*a*b^2*x^(11/3) + 9/10*a^2*b*x^(10/3) + 1/3*a^3
*x^3
```

Sympy [A] time = 2.38298, size = 42, normalized size = 0.89

$$\frac{a^3x^3}{3}+\frac{9a^2bx^{\frac{10}{3}}}{10}+\frac{9ab^2x^{\frac{11}{3}}}{11}+\frac{b^3x^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**3*x**2,x)
```

```
[Out] a**3*x**3/3 + 9*a**2*b*x**(10/3)/10 + 9*a*b**2*x**(11/3)/11 + b**
3*x**4/4
```

GIAC/XCAS [A] time = 0.21941, size = 47, normalized size = 1.

$$\frac{1}{4}\,b^3x^4+\frac{9}{11}\,ab^2x^{\frac{11}{3}}+\frac{9}{10}\,a^2bx^{\frac{10}{3}}+\frac{1}{3}\,a^3x^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^3*x^2,x, algorithm="giac")
```

```
[Out] 1/4*b^3*x^4 + 9/11*a*b^2*x^(11/3) + 9/10*a^2*b*x^(10/3) + 1/3*a^3
*x^3
```

3.2299 $\int \left(a+b\sqrt[3]{x}\right)^3 x\,dx$

Optimal. Leaf size=47

$$\frac{a^3x^2}{2}+\frac{9}{7}a^2bx^{7/3}+\frac{9}{8}ab^2x^{8/3}+\frac{b^3x^3}{3}$$

```
[Out] (a^3*x^2)/2 + (9*a^2*b*x^(7/3))/7 + (9*a*b^2*x^(8/3))/8 + (b^3*x^
3)/3
```

Rubi [A] time = 0.0680476, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^3x^2}{2}+\frac{9}{7}a^2bx^{7/3}+\frac{9}{8}ab^2x^{8/3}+\frac{b^3x^3}{3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^(1/3))^3*x,x]
```

```
[Out] (a^3*x^2)/2 + (9*a^2*b*x^(7/3))/7 + (9*a*b^2*x^(8/3))/8 + (b^3*x^
3)/3
```

Rubi in Sympy [A] time = 10.3657, size = 42, normalized size = 0.89

$$\frac{a^3x^2}{2}+\frac{9a^2bx^{\frac{7}{3}}}{7}+\frac{9ab^2x^{\frac{8}{3}}}{8}+\frac{b^3x^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b*x**(1/3))**3*x,x)
```

```
[Out] a**3*x**2/2 + 9*a**2*b*x**(7/3)/7 + 9*a*b**2*x**(8/3)/8 + b**3*x*
*3/3
```

Mathematica [A] time = 0.0109354, size = 47, normalized size = 1.

$$\frac{a^3x^2}{2}+\frac{9}{7}a^2bx^{7/3}+\frac{9}{8}ab^2x^{8/3}+\frac{b^3x^3}{3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^(1/3))^3*x,x]
```

```
[Out] (a^3*x^2)/2 + (9*a^2*b*x^(7/3))/7 + (9*a*b^2*x^(8/3))/8 + (b^3*x^
3)/3
```

Maple [A] time = 0.001, size = 36, normalized size = 0.8

$$\frac{x^2a^3}{2}+\frac{9\,a^2b}{7}x^{\frac{7}{3}}+\frac{9\,ab^2}{8}x^{\frac{8}{3}}+\frac{b^3x^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*x^(1/3))^3*x,x)
```

```
[Out] 1/2*x^2*a^3+9/7*a^2*b*x^(7/3)+9/8*a*b^2*x^(8/3)+1/3*b^3*x^3
```

Maxima [A] time = 1.42071, size = 132, normalized size = 2.81

$$\frac{\left(bx^{\frac{1}{3}}+a\right)^{9}}{3\,b^{6}}-\frac{15\left(bx^{\frac{1}{3}}+a\right)^{8}a}{8\,b^{6}}+\frac{30\left(bx^{\frac{1}{3}}+a\right)^{7}a^{2}}{7\,b^{6}}-\frac{5\left(bx^{\frac{1}{3}}+a\right)^{6}a^{3}}{b^{6}}+\frac{3\left(bx^{\frac{1}{3}}+a\right)^{5}a^{4}}{b^{6}}-\frac{3\left(bx^{\frac{1}{3}}+a\right)^{4}a^{5}}{4\,b^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^3*x,x, algorithm="maxima")
```

```
[Out] 1/3*(b*x^(1/3) + a)^9/b^6 - 15/8*(b*x^(1/3) + a)^8*a/b^6 + 30/7*(
b*x^(1/3) + a)^7*a^2/b^6 - 5*(b*x^(1/3) + a)^6*a^3/b^6 + 3*(b*x^(
1/3) + a)^5*a^4/b^6 - 3/4*(b*x^(1/3) + a)^4*a^5/b^6
```

Fricas [A] time = 0.210735, size = 47, normalized size = 1.

$$\frac{1}{3}\,b^{3}x^{3}+\frac{9}{8}\,ab^{2}x^{\frac{8}{3}}+\frac{9}{7}\,a^{2}bx^{\frac{7}{3}}+\frac{1}{2}\,a^{3}x^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^3*x,x, algorithm="fricas")
```

```
[Out] 1/3*b^3*x^3 + 9/8*a*b^2*x^(8/3) + 9/7*a^2*b*x^(7/3) + 1/2*a^3*x^2
```

Sympy [A] time = 1.41488, size = 42, normalized size = 0.89

$$\frac{a^{3}x^{2}}{2}+\frac{9a^{2}bx^{\frac{7}{3}}}{7}+\frac{9ab^{2}x^{\frac{8}{3}}}{8}+\frac{b^{3}x^{3}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**3*x,x)
```

```
[Out] a**3*x**2/2 + 9*a**2*b*x**(7/3)/7 + 9*a*b**2*x**(8/3)/8 + b**3*x*
*3/3
```

GIAC/XCAS [A] time = 0.221367, size = 47, normalized size = 1.

$$\frac{1}{3}\,b^{3}x^{3}+\frac{9}{8}\,ab^{2}x^{\frac{8}{3}}+\frac{9}{7}\,a^{2}bx^{\frac{7}{3}}+\frac{1}{2}\,a^{3}x^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^3*x,x, algorithm="giac")
```

```
[Out] 1/3*b^3*x^3 + 9/8*a*b^2*x^(8/3) + 9/7*a^2*b*x^(7/3) + 1/2*a^3*x^2
```

3.2300 $\int \left(a + b\sqrt[3]{x}\right)^3 \, dx$

Optimal. Leaf size=42

$$a^3x + \frac{9}{4}a^2bx^{4/3} + \frac{9}{5}ab^2x^{5/3} + \frac{b^3x^2}{2}$$

```
[Out] a^3*x + (9*a^2*b*x^(4/3))/4 + (9*a*b^2*x^(5/3))/5 + (b^3*x^2)/2
```

Rubi [A] time = 0.0607792, antiderivative size = 42, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$

$$a^3x + \frac{9}{4}a^2bx^{4/3} + \frac{9}{5}ab^2x^{5/3} + \frac{b^3x^2}{2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^3,x]
```

```
[Out] a^3*x + (9*a^2*b*x^(4/3))/4 + (9*a*b^2*x^(5/3))/5 + (b^3*x^2)/2
```

Rubi in Sympy [A] time = 8.2966, size = 39, normalized size = 0.93

$$a^3x + \frac{9a^2bx^{\frac{4}{3}}}{4} + \frac{9ab^2x^{\frac{5}{3}}}{5} + \frac{b^3x^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**3,x)
```

```
[Out] a**3*x + 9*a**2*b*x**(4/3)/4 + 9*a*b**2*x**(5/3)/5 + b**3*x**2/2
```

Mathematica [A] time = 0.00924879, size = 42, normalized size = 1.

$$a^3x + \frac{9}{4}a^2bx^{4/3} + \frac{9}{5}ab^2x^{5/3} + \frac{b^3x^2}{2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^3,x]
```

```
[Out] a^3*x + (9*a^2*b*x^(4/3))/4 + (9*a*b^2*x^(5/3))/5 + (b^3*x^2)/2
```

Maple [A] time = 0.002, size = 33, normalized size = 0.8

$$a^3x + \frac{9\,a^2b}{4}x^{\frac{4}{3}} + \frac{9\,ab^2}{5}x^{\frac{5}{3}} + \frac{b^3x^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^3,x)
```

```
[Out] a^3*x+9/4*a^2*b*x^(4/3)+9/5*a*b^2*x^(5/3)+1/2*b^3*x^2
```

Maxima [A] time = 1.4467, size = 43, normalized size = 1.02

$$\frac{1}{2}\,b^3x^2 + \frac{9}{5}\,ab^2x^{\frac{5}{3}} + \frac{9}{4}\,a^2bx^{\frac{4}{3}} + a^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^3,x, algorithm="maxima")

[Out] 1/2*b^3*x^2 + 9/5*a*b^2*x^(5/3) + 9/4*a^2*b*x^(4/3) + a^3*x
```

Fricas [A] time = 0.214309, size = 43, normalized size = 1.02

$$\frac{1}{2}\,b^3x^2 + \frac{9}{5}\,ab^2x^{\frac{5}{3}} + \frac{9}{4}\,a^2bx^{\frac{4}{3}} + a^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^3,x, algorithm="fricas")

[Out] 1/2*b^3*x^2 + 9/5*a*b^2*x^(5/3) + 9/4*a^2*b*x^(4/3) + a^3*x
```

Sympy [A] time = 1.18059, size = 39, normalized size = 0.93

$$a^3x + \frac{9a^2bx^{\frac{4}{3}}}{4} + \frac{9ab^2x^{\frac{5}{3}}}{5} + \frac{b^3x^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**3,x)

[Out] a**3*x + 9*a**2*b*x**(4/3)/4 + 9*a*b**2*x**(5/3)/5 + b**3*x**2/2
```

GIAC/XCAS [A] time = 0.212922, size = 43, normalized size = 1.02

$$\frac{1}{2}\,b^3x^2 + \frac{9}{5}\,ab^2x^{\frac{5}{3}} + \frac{9}{4}\,a^2bx^{\frac{4}{3}} + a^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^3,x, algorithm="giac")

[Out] 1/2*b^3*x^2 + 9/5*a*b^2*x^(5/3) + 9/4*a^2*b*x^(4/3) + a^3*x
```

3.2301 $\int \frac{\left(a+b\sqrt[3]{x}\right)^3}{x}\,dx$

Optimal. Leaf size=36

$$a^3\log(x)+9a^2b\sqrt[3]{x}+\frac{9}{2}ab^2x^{2/3}+b^3x$$

```
[Out] 9*a^2*b*x^(1/3) + (9*a*b^2*x^(2/3))/2 + b^3*x + a^3*Log[x]
```

Rubi [A] time = 0.049095, antiderivative size = 36, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$a^3\log(x)+9a^2b\sqrt[3]{x}+\frac{9}{2}ab^2x^{2/3}+b^3x$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^3/x,x]
```

```
[Out] 9*a^2*b*x^(1/3) + (9*a*b^2*x^(2/3))/2 + b^3*x + a^3*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$3a^3\log\left(\sqrt[3]{x}\right)+9a^2b\sqrt[3]{x}+9ab^2\int^{\sqrt[3]{x}}x\,dx+b^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**3/x,x)
```

```
[Out] 3*a**3*log(x**(1/3)) + 9*a**2*b*x**(1/3) + 9*a*b**2*Integral(x, (
x, x**(1/3))) + b**3*x
```

Mathematica [A] time = 0.0141602, size = 36, normalized size = 1.

$$a^3\log(x)+9a^2b\sqrt[3]{x}+\frac{9}{2}ab^2x^{2/3}+b^3x$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^3/x,x]
```

```
[Out] 9*a^2*b*x^(1/3) + (9*a*b^2*x^(2/3))/2 + b^3*x + a^3*Log[x]
```

Maple [A] time = 0.004, size = 31, normalized size = 0.9

$$9\,a^2b\sqrt[3]{x}+\frac{9\,ab^2}{2}x^{\frac{2}{3}}+b^3x+a^3\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^3/x,x)
```

```
[Out] 9*a^2*b*x^(1/3)+9/2*a*b^2*x^(2/3)+b^3*x+a^3*ln(x)
```

Maxima [A] time = 1.43571, size = 41, normalized size = 1.14

$$b^3x + a^3 \log(x) + \frac{9}{2} ab^2 x^{\frac{2}{3}} + 9 a^2 b x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^3/x,x, algorithm="maxima")
```

```
[Out] b^3*x + a^3*log(x) + 9/2*a*b^2*x^(2/3) + 9*a^2*b*x^(1/3)
```

Fricas [A] time = 0.218813, size = 45, normalized size = 1.25

$$b^3x + 3 a^3 \log\left(x^{\frac{1}{3}}\right) + \frac{9}{2} ab^2 x^{\frac{2}{3}} + 9 a^2 b x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^3/x,x, algorithm="fricas")
```

```
[Out] b^3*x + 3*a^3*log(x^(1/3)) + 9/2*a*b^2*x^(2/3) + 9*a^2*b*x^(1/3)
```

Sympy [A] time = 0.635514, size = 36, normalized size = 1.

$$a^3 \log(x) + 9a^2 b \sqrt[3]{x} + \frac{9ab^2 x^{\frac{2}{3}}}{2} + b^3 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**3/x,x)
```

```
[Out] a**3*log(x) + 9*a**2*b*x**(1/3) + 9*a*b**2*x**(2/3)/2 + b**3*x
```

GIAC/XCAS [A] time = 0.218421, size = 42, normalized size = 1.17

$$b^3x + a^3 \ln(|x|) + \frac{9}{2} ab^2 x^{\frac{2}{3}} + 9 a^2 b x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^3/x,x, algorithm="giac")
```

```
[Out] b^3*x + a^3*ln(abs(x)) + 9/2*a*b^2*x^(2/3) + 9*a^2*b*x^(1/3)
```

3.2302 $\int \frac{\left(a+b\sqrt[3]{x}\right)^3}{x^2}\,dx$

Optimal. Leaf size=39

$$-\frac{a^3}{x}-\frac{9a^2b}{2x^{2/3}}-\frac{9ab^2}{\sqrt[3]{x}}+b^3\log(x)$$

```
[Out] -(a^3/x) - (9*a^2*b)/(2*x^(2/3)) - (9*a*b^2)/x^(1/3) + b^3*Log[x]
```

Rubi [A] time = 0.0543552, antiderivative size = 39, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^3}{x}-\frac{9a^2b}{2x^{2/3}}-\frac{9ab^2}{\sqrt[3]{x}}+b^3\log(x)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^3/x^2,x]
```

```
[Out] -(a^3/x) - (9*a^2*b)/(2*x^(2/3)) - (9*a*b^2)/x^(1/3) + b^3*Log[x]
```

Rubi in Sympy [A] time = 8.48079, size = 41, normalized size = 1.05

$$-\frac{a^3}{x}-\frac{9a^2b}{2x^{\frac{2}{3}}}-\frac{9ab^2}{\sqrt[3]{x}}+3b^3\log\left(\sqrt[3]{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**3/x**2,x)
```

```
[Out] -a**3/x - 9*a**2*b/(2*x**(2/3)) - 9*a*b**2/x**(1/3) + 3*b**3*log(
x**(1/3))
```

Mathematica [A] time = 0.0318332, size = 40, normalized size = 1.03

$$b^3\log(x)-\frac{a\left(2a^2+9ab\sqrt[3]{x}+18b^2x^{2/3}\right)}{2x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^3/x^2,x]
```

```
[Out] -(a*(2*a^2 + 9*a*b*x^(1/3) + 18*b^2*x^(2/3)))/(2*x) + b^3*Log[x]
```

Maple [A] time = 0.009, size = 34, normalized size = 0.9

$$-\frac{a^3}{x}-\frac{9\,a^2b}{2}x^{-\frac{2}{3}}-9\,\frac{ab^2}{\sqrt[3]{x}}+b^3\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^3/x^2,x)
```

```
[Out] -a^3/x-9/2*a^2*b/x^(2/3)-9*a*b^2/x^(1/3)+b^3*ln(x)
```

Maxima [A] time = 1.4295, size = 49, normalized size = 1.26

$$b^3 \log(x) - \frac{18\,ab^2x^{\frac{2}{3}} + 9\,a^2bx^{\frac{1}{3}} + 2\,a^3}{2\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^3/x^2,x, algorithm="maxima")
```

```
[Out] b^3*log(x) - 1/2*(18*a*b^2*x^(2/3) + 9*a^2*b*x^(1/3) + 2*a^3)/x
```

Fricas [A] time = 0.219189, size = 53, normalized size = 1.36

$$\frac{6\,b^3x\log\left(x^{\frac{1}{3}}\right) - 18\,ab^2x^{\frac{2}{3}} - 9\,a^2bx^{\frac{1}{3}} - 2\,a^3}{2\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^3/x^2,x, algorithm="fricas")
```

```
[Out] 1/2*(6*b^3*x*log(x^(1/3)) - 18*a*b^2*x^(2/3) - 9*a^2*b*x^(1/3) -
2*a^3)/x
```

Sympy [A] time = 2.27901, size = 36, normalized size = 0.92

$$-\frac{a^3}{x} - \frac{9a^2b}{2x^{\frac{2}{3}}} - \frac{9ab^2}{\sqrt[3]{x}} + b^3\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**3/x**2,x)
```

```
[Out] -a**3/x - 9*a**2*b/(2*x**(2/3)) - 9*a*b**2/x**(1/3) + b**3*log(x)
```

GIAC/XCAS [A] time = 0.21915, size = 50, normalized size = 1.28

$$b^3\ln(|x|) - \frac{18\,ab^2x^{\frac{2}{3}} + 9\,a^2bx^{\frac{1}{3}} + 2\,a^3}{2\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^3/x^2,x, algorithm="giac")
```

```
[Out] b^3*ln(abs(x)) - 1/2*(18*a*b^2*x^(2/3) + 9*a^2*b*x^(1/3) + 2*a^3)
/x
```

3.2303 $\int \frac{\left(a+b\sqrt[3]{x}\right)^3}{x^3}\,dx$

Optimal. Leaf size=45

$$-\frac{a^3}{2x^2}-\frac{9a^2b}{5x^{5/3}}-\frac{9ab^2}{4x^{4/3}}-\frac{b^3}{x}$$

```
[Out] -a^3/(2*x^2) - (9*a^2*b)/(5*x^(5/3)) - (9*a*b^2)/(4*x^(4/3)) - b^
3/x
```

Rubi [A] time = 0.0554227, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^3}{2x^2}-\frac{9a^2b}{5x^{5/3}}-\frac{9ab^2}{4x^{4/3}}-\frac{b^3}{x}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^3/x^3,x]
```

```
[Out] -a^3/(2*x^2) - (9*a^2*b)/(5*x^(5/3)) - (9*a*b^2)/(4*x^(4/3)) - b^
3/x
```

Rubi in Sympy [A] time = 8.97845, size = 41, normalized size = 0.91

$$-\frac{a^3}{2x^2}-\frac{9a^2b}{5x^{\frac{5}{3}}}-\frac{9ab^2}{4x^{\frac{4}{3}}}-\frac{b^3}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**3/x**3,x)
```

```
[Out] -a**3/(2*x**2) - 9*a**2*b/(5*x**(5/3)) - 9*a*b**2/(4*x**(4/3)) -
b**3/x
```

Mathematica [A] time = 0.0159044, size = 41, normalized size = 0.91

$$-\frac{10a^3+36a^2b\sqrt[3]{x}+45ab^2x^{2/3}+20b^3x}{20x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^3/x^3,x]
```

```
[Out] -(10*a^3 + 36*a^2*b*x^(1/3) + 45*a*b^2*x^(2/3) + 20*b^3*x)/(20*x^
2)
```

Maple [A] time = 0.008, size = 36, normalized size = 0.8

$$-\frac{a^3}{2\,x^2}-\frac{9\,a^2b}{5}x^{-\frac{5}{3}}-\frac{9\,ab^2}{4}x^{-\frac{4}{3}}-\frac{b^3}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^3/x^3,x)
```

```
[Out] -1/2*a^3/x^2-9/5*a^2*b/x^(5/3)-9/4*a*b^2/x^(4/3)-b^3/x
```

Maxima [A] time = 1.44767, size = 47, normalized size = 1.04

$$-\frac{20\, b^3 x + 45\, a b^2 x^{\frac{2}{3}} + 36\, a^2 b x^{\frac{1}{3}} + 10\, a^3}{20\, x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^3/x^3,x, algorithm="maxima")
```

```
[Out] -1/20*(20*b^3*x + 45*a*b^2*x^(2/3) + 36*a^2*b*x^(1/3) + 10*a^3)/x
^2
```

Fricas [A] time = 0.213877, size = 47, normalized size = 1.04

$$-\frac{20\, b^3 x + 45\, a b^2 x^{\frac{2}{3}} + 36\, a^2 b x^{\frac{1}{3}} + 10\, a^3}{20\, x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^3/x^3,x, algorithm="fricas")
```

```
[Out] -1/20*(20*b^3*x + 45*a*b^2*x^(2/3) + 36*a^2*b*x^(1/3) + 10*a^3)/x
^2
```

Sympy [A] time = 4.10645, size = 41, normalized size = 0.91

$$-\frac{a^3}{2x^2} - \frac{9a^2 b}{5x^{\frac{5}{3}}} - \frac{9ab^2}{4x^{\frac{4}{3}}} - \frac{b^3}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**3/x**3,x)
```

```
[Out] -a**3/(2*x**2) - 9*a**2*b/(5*x**(5/3)) - 9*a*b**2/(4*x**(4/3)) -
b**3/x
```

GIAC/XCAS [A] time = 0.220307, size = 47, normalized size = 1.04

$$-\frac{20\, b^3 x + 45\, a b^2 x^{\frac{2}{3}} + 36\, a^2 b x^{\frac{1}{3}} + 10\, a^3}{20\, x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^3/x^3,x, algorithm="giac")
```

```
[Out] -1/20*(20*b^3*x + 45*a*b^2*x^(2/3) + 36*a^2*b*x^(1/3) + 10*a^3)/x
^2
```

3.2304 $\int \frac{\left(a+b\sqrt[3]{x}\right)^3}{x^4}\,dx$

Optimal. Leaf size=47

$$-\frac{a^3}{3x^3}-\frac{9a^2b}{8x^{8/3}}-\frac{9ab^2}{7x^{7/3}}-\frac{b^3}{2x^2}$$

```
[Out] -a^3/(3*x^3) - (9*a^2*b)/(8*x^(8/3)) - (9*a*b^2)/(7*x^(7/3)) - b^
3/(2*x^2)
```

Rubi [A] time = 0.0555846, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^3}{3x^3}-\frac{9a^2b}{8x^{8/3}}-\frac{9ab^2}{7x^{7/3}}-\frac{b^3}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^3/x^4,x]
```

```
[Out] -a^3/(3*x^3) - (9*a^2*b)/(8*x^(8/3)) - (9*a*b^2)/(7*x^(7/3)) - b^
3/(2*x^2)
```

Rubi in Sympy [A] time = 9.09271, size = 44, normalized size = 0.94

$$-\frac{a^3}{3x^3}-\frac{9a^2b}{8x^{\frac{8}{3}}}-\frac{9ab^2}{7x^{\frac{7}{3}}}-\frac{b^3}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**3/x**4,x)
```

```
[Out] -a**3/(3*x**3) - 9*a**2*b/(8*x**(8/3)) - 9*a*b**2/(7*x**(7/3)) -
b**3/(2*x**2)
```

Mathematica [A] time = 0.0137925, size = 41, normalized size = 0.87

$$-\frac{56a^3+189a^2b\sqrt[3]{x}+216ab^2x^{2/3}+84b^3x}{168x^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^3/x^4,x]
```

```
[Out] -(56*a^3 + 189*a^2*b*x^(1/3) + 216*a*b^2*x^(2/3) + 84*b^3*x)/(168
*x^3)
```

Maple [A] time = 0.008, size = 36, normalized size = 0.8

$$-\frac{a^3}{3\,x^3}-\frac{9\,a^2b}{8}x^{-\frac{8}{3}}-\frac{9\,ab^2}{7}x^{-\frac{7}{3}}-\frac{b^3}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^3/x^4,x)
```

```
[Out] -1/3*a^3/x^3-9/8*a^2*b/x^(8/3)-9/7*a*b^2/x^(7/3)-1/2*b^3/x^2
```

Maxima [A] time = 1.46555, size = 47, normalized size = 1.

$$-\frac{84\,b^3x+216\,ab^2x^{\frac{2}{3}}+189\,a^2bx^{\frac{1}{3}}+56\,a^3}{168\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^3/x^4,x, algorithm="maxima")
```

```
[Out] -1/168*(84*b^3*x + 216*a*b^2*x^(2/3) + 189*a^2*b*x^(1/3) + 56*a^3
)/x^3
```

Fricas [A] time = 0.213939, size = 47, normalized size = 1.

$$-\frac{84\,b^3x+216\,ab^2x^{\frac{2}{3}}+189\,a^2bx^{\frac{1}{3}}+56\,a^3}{168\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^3/x^4,x, algorithm="fricas")
```

```
[Out] -1/168*(84*b^3*x + 216*a*b^2*x^(2/3) + 189*a^2*b*x^(1/3) + 56*a^3
)/x^3
```

Sympy [A] time = 7.54943, size = 44, normalized size = 0.94

$$-\frac{a^3}{3x^3}-\frac{9a^2b}{8x^{\frac{8}{3}}}-\frac{9ab^2}{7x^{\frac{7}{3}}}-\frac{b^3}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**3/x**4,x)
```

```
[Out] -a**3/(3*x**3) - 9*a**2*b/(8*x**(8/3)) - 9*a*b**2/(7*x**(7/3)) -
b**3/(2*x**2)
```

GIAC/XCAS [A] time = 0.218806, size = 47, normalized size = 1.

$$-\frac{84\,b^3x+216\,ab^2x^{\frac{2}{3}}+189\,a^2bx^{\frac{1}{3}}+56\,a^3}{168\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^3/x^4,x, algorithm="giac")
```

```
[Out] -1/168*(84*b^3*x + 216*a*b^2*x^(2/3) + 189*a^2*b*x^(1/3) + 56*a^3
)/x^3
```

3.2305 $\int \left(a+b\sqrt[3]{x}\right)^5 x^4\,dx$

Optimal. Leaf size=77

$$\frac{a^5x^5}{5}+\frac{15}{16}a^4bx^{16/3}+\frac{30}{17}a^3b^2x^{17/3}+\frac{5}{3}a^2b^3x^6+\frac{15}{19}ab^4x^{19/3}+\frac{3}{20}b^5x^{20/3}$$

```
[Out] (a^5*x^5)/5 + (15*a^4*b*x^(16/3))/16 + (30*a^3*b^2*x^(17/3))/17 +
 (5*a^2*b^3*x^6)/3 + (15*a*b^4*x^(19/3))/19 + (3*b^5*x^(20/3))/20
```

Rubi [A] time = 0.120376, antiderivative size = 77, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^5x^5}{5}+\frac{15}{16}a^4bx^{16/3}+\frac{30}{17}a^3b^2x^{17/3}+\frac{5}{3}a^2b^3x^6+\frac{15}{19}ab^4x^{19/3}+\frac{3}{20}b^5x^{20/3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^(1/3))^5*x^4,x]
```

```
[Out] (a^5*x^5)/5 + (15*a^4*b*x^(16/3))/16 + (30*a^3*b^2*x^(17/3))/17 +
 (5*a^2*b^3*x^6)/3 + (15*a*b^4*x^(19/3))/19 + (3*b^5*x^(20/3))/20
```

Rubi in Sympy [A] time = 21.3437, size = 75, normalized size = 0.97

$$\frac{a^5x^5}{5}+\frac{15a^4bx^{\frac{16}{3}}}{16}+\frac{30a^3b^2x^{\frac{17}{3}}}{17}+\frac{5a^2b^3x^6}{3}+\frac{15ab^4x^{\frac{19}{3}}}{19}+\frac{3b^5x^{\frac{20}{3}}}{20}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b*x**(1/3))**5*x**4,x)
```

```
[Out] a**5*x**5/5 + 15*a**4*b*x**(16/3)/16 + 30*a**3*b**2*x**(17/3)/17
+ 5*a**2*b**3*x**6/3 + 15*a*b**4*x**(19/3)/19 + 3*b**5*x**(20/3)/
20
```

Mathematica [A] time = 0.0161966, size = 77, normalized size = 1.

$$\frac{a^5x^5}{5}+\frac{15}{16}a^4bx^{16/3}+\frac{30}{17}a^3b^2x^{17/3}+\frac{5}{3}a^2b^3x^6+\frac{15}{19}ab^4x^{19/3}+\frac{3}{20}b^5x^{20/3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^(1/3))^5*x^4,x]
```

```
[Out] (a^5*x^5)/5 + (15*a^4*b*x^(16/3))/16 + (30*a^3*b^2*x^(17/3))/17 +
 (5*a^2*b^3*x^6)/3 + (15*a*b^4*x^(19/3))/19 + (3*b^5*x^(20/3))/20
```

Maple [A] time = 0.003, size = 58, normalized size = 0.8

$$\frac{a^5x^5}{5}+\frac{15\,a^4b}{16}x^{\frac{16}{3}}+\frac{30\,a^3b^2}{17}x^{\frac{17}{3}}+\frac{5\,a^2b^3x^6}{3}+\frac{15\,ab^4}{19}x^{\frac{19}{3}}+\frac{3\,b^5}{20}x^{\frac{20}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^5*x^4,x)
```

```
[Out] 1/5*a^5*x^5+15/16*a^4*b*x^(16/3)+30/17*a^3*b^2*x^(17/3)+5/3*a^2*b
^3*x^6+15/19*a*b^4*x^(19/3)+3/20*b^5*x^(20/3)
```

Maxima [A] time = 1.43507, size = 339, normalized size = 4.4

$$\frac{3\left(bx^{\frac{1}{3}}+a\right)^{20}}{20\,b^{15}}-\frac{42\left(bx^{\frac{1}{3}}+a\right)^{19}a}{19\,b^{15}}+\frac{91\left(bx^{\frac{1}{3}}+a\right)^{18}a^{2}}{6\,b^{15}}-\frac{1092\left(bx^{\frac{1}{3}}+a\right)^{17}a^{3}}{17\,b^{15}}+\frac{3003\left(bx^{\frac{1}{3}}+a\right)^{16}a^{4}}{16\,b^{15}}-\frac{2002\left(bx^{\frac{1}{3}}+a\right)^{15}a^{5}}{5\,b^{15}}+\frac{1287\left(bx^{\frac{1}{3}}+a\right)^{14}a^{6}}{2\,b^{15}}-\frac{792\left(bx^{\frac{1}{3}}+a\right)^{13}a^{7}}{b^{15}}+\frac{3003\left(bx^{\frac{1}{3}}+a\right)^{12}a^{8}}{4\,b^{15}}-\frac{546\left(bx^{\frac{1}{3}}+a\right)^{11}a^{9}}{b^{15}}+\frac{3003\left(bx^{\frac{1}{3}}+a\right)^{10}a^{10}}{10\,b^{15}}-\frac{364\left(bx^{\frac{1}{3}}+a\right)^{9}a^{11}}{3\,b^{15}}+\frac{273\left(bx^{\frac{1}{3}}+a\right)^{8}a^{12}}{8\,b^{15}}-\frac{6\left(bx^{\frac{1}{3}}+a\right)^{7}a^{13}}{b^{15}}+\frac{\left(bx^{\frac{1}{3}}+a\right)^{6}a^{14}}{2\,b^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5*x^4,x, algorithm="maxima")
```

```
[Out] 3/20*(b*x^(1/3) + a)^20/b^15 - 42/19*(b*x^(1/3) + a)^19*a/b^15 +
91/6*(b*x^(1/3) + a)^18*a^2/b^15 - 1092/17*(b*x^(1/3) + a)^17*a^3
/b^15 + 3003/16*(b*x^(1/3) + a)^16*a^4/b^15 - 2002/5*(b*x^(1/3) +
 a)^15*a^5/b^15 + 1287/2*(b*x^(1/3) + a)^14*a^6/b^15 - 792*(b*x^(
1/3) + a)^13*a^7/b^15 + 3003/4*(b*x^(1/3) + a)^12*a^8/b^15 - 546*
(b*x^(1/3) + a)^11*a^9/b^15 + 3003/10*(b*x^(1/3) + a)^10*a^10/b^1
5 - 364/3*(b*x^(1/3) + a)^9*a^11/b^15 + 273/8*(b*x^(1/3) + a)^8*a
^12/b^15 - 6*(b*x^(1/3) + a)^7*a^13/b^15 + 1/2*(b*x^(1/3) + a)^6*
a^14/b^15
```

Fricas [A] time = 0.212505, size = 93, normalized size = 1.21

$$\frac{5}{3}\,a^{2}b^{3}x^{6}+\frac{1}{5}\,a^{5}x^{5}+\frac{3}{340}\left(17\,b^{5}x^{6}+200\,a^{3}b^{2}x^{5}\right)x^{\frac{2}{3}}+\frac{15}{304}\left(16\,ab^{4}x^{6}+19\,a^{4}bx^{5}\right)x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5*x^4,x, algorithm="fricas")
```

```
[Out] 5/3*a^2*b^3*x^6 + 1/5*a^5*x^5 + 3/340*(17*b^5*x^6 + 200*a^3*b^2*x
^5)*x^(2/3) + 15/304*(16*a*b^4*x^6 + 19*a^4*b*x^5)*x^(1/3)
```

Sympy [A] time = 9.91422, size = 75, normalized size = 0.97

$$\frac{a^{5}x^{5}}{5}+\frac{15a^{4}bx^{\frac{16}{3}}}{16}+\frac{30a^{3}b^{2}x^{\frac{17}{3}}}{17}+\frac{5a^{2}b^{3}x^{6}}{3}+\frac{15ab^{4}x^{\frac{19}{3}}}{19}+\frac{3b^{5}x^{\frac{20}{3}}}{20}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**5*x**4,x)
```

```
[Out] a**5*x**5/5 + 15*a**4*b*x**(16/3)/16 + 30*a**3*b**2*x**(17/3)/17
+ 5*a**2*b**3*x**6/3 + 15*a*b**4*x**(19/3)/19 + 3*b**5*x**(20/3)/
20
```

GIAC/XCAS [A] time = 0.240798, size = 77, normalized size = 1.

$$\frac{3}{20}\,b^{5}x^{\frac{20}{3}}+\frac{15}{19}\,ab^{4}x^{\frac{19}{3}}+\frac{5}{3}\,a^{2}b^{3}x^{6}+\frac{30}{17}\,a^{3}b^{2}x^{\frac{17}{3}}+\frac{15}{16}\,a^{4}bx^{\frac{16}{3}}+\frac{1}{5}\,a^{5}x^{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5*x^4,x, algorithm="giac")
```

```
[Out] 3/20*b^5*x^(20/3) + 15/19*a*b^4*x^(19/3) + 5/3*a^2*b^3*x^6 + 30/1
7*a^3*b^2*x^(17/3) + 15/16*a^4*b*x^(16/3) + 1/5*a^5*x^5
```

3.2306 $\int \left(a+b\sqrt[3]{x}\right)^5 x^3\,dx$

Optimal. Leaf size=75

$$\frac{a^5x^4}{4}+\frac{15}{13}a^4bx^{13/3}+\frac{15}{7}a^3b^2x^{14/3}+2a^2b^3x^5+\frac{15}{16}ab^4x^{16/3}+\frac{3}{17}b^5x^{17/3}$$

```
[Out] (a^5*x^4)/4 + (15*a^4*b*x^(13/3))/13 + (15*a^3*b^2*x^(14/3))/7 +
2*a^2*b^3*x^5 + (15*a*b^4*x^(16/3))/16 + (3*b^5*x^(17/3))/17
```

Rubi [A] time = 0.111378, antiderivative size = 75, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^5x^4}{4}+\frac{15}{13}a^4bx^{13/3}+\frac{15}{7}a^3b^2x^{14/3}+2a^2b^3x^5+\frac{15}{16}ab^4x^{16/3}+\frac{3}{17}b^5x^{17/3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^5*x^3,x]
```

```
[Out] (a^5*x^4)/4 + (15*a^4*b*x^(13/3))/13 + (15*a^3*b^2*x^(14/3))/7 +
2*a^2*b^3*x^5 + (15*a*b^4*x^(16/3))/16 + (3*b^5*x^(17/3))/17
```

Rubi in Sympy [A] time = 18.7879, size = 73, normalized size = 0.97

$$\frac{a^5x^4}{4}+\frac{15a^4bx^{\frac{13}{3}}}{13}+\frac{15a^3b^2x^{\frac{14}{3}}}{7}+2a^2b^3x^5+\frac{15ab^4x^{\frac{16}{3}}}{16}+\frac{3b^5x^{\frac{17}{3}}}{17}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**5*x**3,x)
```

```
[Out] a**5*x**4/4 + 15*a**4*b*x**(13/3)/13 + 15*a**3*b**2*x**(14/3)/7 +
 2*a**2*b**3*x**5 + 15*a*b**4*x**(16/3)/16 + 3*b**5*x**(17/3)/17
```

Mathematica [A] time = 0.0141429, size = 75, normalized size = 1.

$$\frac{a^5x^4}{4}+\frac{15}{13}a^4bx^{13/3}+\frac{15}{7}a^3b^2x^{14/3}+2a^2b^3x^5+\frac{15}{16}ab^4x^{16/3}+\frac{3}{17}b^5x^{17/3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^5*x^3,x]
```

```
[Out] (a^5*x^4)/4 + (15*a^4*b*x^(13/3))/13 + (15*a^3*b^2*x^(14/3))/7 +
2*a^2*b^3*x^5 + (15*a*b^4*x^(16/3))/16 + (3*b^5*x^(17/3))/17
```

Maple [A] time = 0.003, size = 58, normalized size = 0.8

$$\frac{a^5x^4}{4}+\frac{15\,a^4b}{13}x^{\frac{13}{3}}+\frac{15\,a^3b^2}{7}x^{\frac{14}{3}}+2\,a^2b^3x^5+\frac{15\,ab^4}{16}x^{\frac{16}{3}}+\frac{3\,b^5}{17}x^{\frac{17}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^5*x^3,x)
```

```
[Out] 1/4*a^5*x^4+15/13*a^4*b*x^(13/3)+15/7*a^3*b^2*x^(14/3)+2*a^2*b^3*
x^5+15/16*a*b^4*x^(16/3)+3/17*b^5*x^(17/3)
```

Maxima [A] time = 1.44093, size = 270, normalized size = 3.6

$$\frac{3\left(bx^{\frac{1}{3}}+a\right)^{17}}{17\,b^{12}}-\frac{33\left(bx^{\frac{1}{3}}+a\right)^{16}a}{16\,b^{12}}+\frac{11\left(bx^{\frac{1}{3}}+a\right)^{15}a^{2}}{b^{12}}-\frac{495\left(bx^{\frac{1}{3}}+a\right)^{14}a^{3}}{14\,b^{12}}+\frac{990\left(bx^{\frac{1}{3}}+a\right)^{13}a^{4}}{13\,b^{12}}-\frac{231\left(bx^{\frac{1}{3}}+a\right)^{12}a^{5}}{2\,b^{12}}+\frac{126\left(bx^{\frac{1}{3}}+a\right)^{11}a^{6}}{b^{12}}-\frac{99\left(bx^{\frac{1}{3}}+a\right)^{10}a^{7}}{b^{12}}+\frac{55\left(bx^{\frac{1}{3}}+a\right)^{9}a^{8}}{b^{12}}-\frac{165\left(bx^{\frac{1}{3}}+a\right)^{8}a^{9}}{8\,b^{12}}+\frac{33\left(bx^{\frac{1}{3}}+a\right)^{7}a^{10}}{7\,b^{12}}-\frac{\left(bx^{\frac{1}{3}}+a\right)^{6}a^{11}}{2\,b^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5*x^3,x, algorithm="maxima")
```

```
[Out] 3/17*(b*x^(1/3) + a)^17/b^12 - 33/16*(b*x^(1/3) + a)^16*a/b^12 +
11*(b*x^(1/3) + a)^15*a^2/b^12 - 495/14*(b*x^(1/3) + a)^14*a^3/b^
12 + 990/13*(b*x^(1/3) + a)^13*a^4/b^12 - 231/2*(b*x^(1/3) + a)^1
2*a^5/b^12 + 126*(b*x^(1/3) + a)^11*a^6/b^12 - 99*(b*x^(1/3) + a)
^10*a^7/b^12 + 55*(b*x^(1/3) + a)^9*a^8/b^12 - 165/8*(b*x^(1/3) +
 a)^8*a^9/b^12 + 33/7*(b*x^(1/3) + a)^7*a^10/b^12 - 1/2*(b*x^(1/3
) + a)^6*a^11/b^12
```

Fricas [A] time = 0.212473, size = 93, normalized size = 1.24

$$2\,a^{2}b^{3}x^{5}+\frac{1}{4}\,a^{5}x^{4}+\frac{3}{119}\left(7\,b^{5}x^{5}+85\,a^{3}b^{2}x^{4}\right)x^{\frac{2}{3}}+\frac{15}{208}\left(13\,ab^{4}x^{5}+16\,a^{4}bx^{4}\right)x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5*x^3,x, algorithm="fricas")
```

```
[Out] 2*a^2*b^3*x^5 + 1/4*a^5*x^4 + 3/119*(7*b^5*x^5 + 85*a^3*b^2*x^4)*
x^(2/3) + 15/208*(13*a*b^4*x^5 + 16*a^4*b*x^4)*x^(1/3)
```

Sympy [A] time = 5.79276, size = 73, normalized size = 0.97

$$\frac{a^{5}x^{4}}{4}+\frac{15a^{4}bx^{\frac{13}{3}}}{13}+\frac{15a^{3}b^{2}x^{\frac{14}{3}}}{7}+2a^{2}b^{3}x^{5}+\frac{15ab^{4}x^{\frac{16}{3}}}{16}+\frac{3b^{5}x^{\frac{17}{3}}}{17}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**5*x**3,x)
```

```
[Out] a**5*x**4/4 + 15*a**4*b*x**(13/3)/13 + 15*a**3*b**2*x**(14/3)/7 +
 2*a**2*b**3*x**5 + 15*a*b**4*x**(16/3)/16 + 3*b**5*x**(17/3)/17
```

GIAC/XCAS [A] time = 0.250162, size = 77, normalized size = 1.03

$$\frac{3}{17}\,b^{5}x^{\frac{17}{3}}+\frac{15}{16}\,ab^{4}x^{\frac{16}{3}}+2\,a^{2}b^{3}x^{5}+\frac{15}{7}\,a^{3}b^{2}x^{\frac{14}{3}}+\frac{15}{13}\,a^{4}bx^{\frac{13}{3}}+\frac{1}{4}\,a^{5}x^{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5*x^3,x, algorithm="giac")
```

```
[Out] 3/17*b^5*x^(17/3) + 15/16*a*b^4*x^(16/3) + 2*a^2*b^3*x^5 + 15/7*a
^3*b^2*x^(14/3) + 15/13*a^4*b*x^(13/3) + 1/4*a^5*x^4
```

3.2307 $\int \left(a+b\sqrt[3]{x}\right)^5 x^2\,dx$

Optimal. Leaf size=77

$$\frac{a^5x^3}{3}+\frac{3}{2}a^4bx^{10/3}+\frac{30}{11}a^3b^2x^{11/3}+\frac{5}{2}a^2b^3x^4+\frac{15}{13}ab^4x^{13/3}+\frac{3}{14}b^5x^{14/3}$$

```
[Out] (a^5*x^3)/3 + (3*a^4*b*x^(10/3))/2 + (30*a^3*b^2*x^(11/3))/11 + (
5*a^2*b^3*x^4)/2 + (15*a*b^4*x^(13/3))/13 + (3*b^5*x^(14/3))/14
```

Rubi [A] time = 0.105271, antiderivative size = 77, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^5x^3}{3}+\frac{3}{2}a^4bx^{10/3}+\frac{30}{11}a^3b^2x^{11/3}+\frac{5}{2}a^2b^3x^4+\frac{15}{13}ab^4x^{13/3}+\frac{3}{14}b^5x^{14/3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^5*x^2,x]
```

```
[Out] (a^5*x^3)/3 + (3*a^4*b*x^(10/3))/2 + (30*a^3*b^2*x^(11/3))/11 + (
5*a^2*b^3*x^4)/2 + (15*a*b^4*x^(13/3))/13 + (3*b^5*x^(14/3))/14
```

Rubi in Sympy [A] time = 17.111, size = 75, normalized size = 0.97

$$\frac{a^5x^3}{3}+\frac{3a^4bx^{\frac{10}{3}}}{2}+\frac{30a^3b^2x^{\frac{11}{3}}}{11}+\frac{5a^2b^3x^4}{2}+\frac{15ab^4x^{\frac{13}{3}}}{13}+\frac{3b^5x^{\frac{14}{3}}}{14}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**5*x**2,x)
```

```
[Out] a**5*x**3/3 + 3*a**4*b*x**(10/3)/2 + 30*a**3*b**2*x**(11/3)/11 +
5*a**2*b**3*x**4/2 + 15*a*b**4*x**(13/3)/13 + 3*b**5*x**(14/3)/14
```

Mathematica [A] time = 0.0140527, size = 77, normalized size = 1.

$$\frac{a^5x^3}{3}+\frac{3}{2}a^4bx^{10/3}+\frac{30}{11}a^3b^2x^{11/3}+\frac{5}{2}a^2b^3x^4+\frac{15}{13}ab^4x^{13/3}+\frac{3}{14}b^5x^{14/3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^5*x^2,x]
```

```
[Out] (a^5*x^3)/3 + (3*a^4*b*x^(10/3))/2 + (30*a^3*b^2*x^(11/3))/11 + (
5*a^2*b^3*x^4)/2 + (15*a*b^4*x^(13/3))/13 + (3*b^5*x^(14/3))/14
```

Maple [A] time = 0.003, size = 58, normalized size = 0.8

$$\frac{a^5x^3}{3}+\frac{3\,a^4b}{2}x^{\frac{10}{3}}+\frac{30\,a^3b^2}{11}x^{\frac{11}{3}}+\frac{5\,a^2b^3x^4}{2}+\frac{15\,ab^4}{13}x^{\frac{13}{3}}+\frac{3\,b^5}{14}x^{\frac{14}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^5*x^2,x)
```

```
[Out] 1/3*a^5*x^3+3/2*a^4*b*x^(10/3)+30/11*a^3*b^2*x^(11/3)+5/2*a^2*b^3
*x^4+15/13*a*b^4*x^(13/3)+3/14*b^5*x^(14/3)
```

Maxima [A] time = 1.43878, size = 201, normalized size = 2.61

$$\frac{3\left(bx^{\frac{1}{3}}+a\right)^{14}}{14\,b^9}-\frac{24\left(bx^{\frac{1}{3}}+a\right)^{13}a}{13\,b^9}+\frac{7\left(bx^{\frac{1}{3}}+a\right)^{12}a^2}{b^9}-\frac{168\left(bx^{\frac{1}{3}}+a\right)^{11}a^3}{11\,b^9}+\frac{21\left(bx^{\frac{1}{3}}+a\right)^{10}a^4}{b^9}-\frac{56\left(bx^{\frac{1}{3}}+a\right)^{9}a^5}{3\,b^9}+\frac{21\left(bx^{\frac{1}{3}}+a\right)^{8}a^6}{2\,b^9}-\frac{24\left(bx^{\frac{1}{3}}+a\right)^{7}a^7}{7\,b^9}+\frac{\left(bx^{\frac{1}{3}}+a\right)^{6}a^8}{2\,b^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5*x^2,x, algorithm="maxima")
```

```
[Out] 3/14*(b*x^(1/3) + a)^14/b^9 - 24/13*(b*x^(1/3) + a)^13*a/b^9 + 7*
(b*x^(1/3) + a)^12*a^2/b^9 - 168/11*(b*x^(1/3) + a)^11*a^3/b^9 +
21*(b*x^(1/3) + a)^10*a^4/b^9 - 56/3*(b*x^(1/3) + a)^9*a^5/b^9 +
21/2*(b*x^(1/3) + a)^8*a^6/b^9 - 24/7*(b*x^(1/3) + a)^7*a^7/b^9 +
 1/2*(b*x^(1/3) + a)^6*a^8/b^9
```

Fricas [A] time = 0.211879, size = 93, normalized size = 1.21

$$\frac{5}{2}\,a^2b^3x^4+\frac{1}{3}\,a^5x^3+\frac{3}{154}\left(11\,b^5x^4+140\,a^3b^2x^3\right)x^{\frac{2}{3}}+\frac{3}{26}\left(10\,ab^4x^4+13\,a^4bx^3\right)x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5*x^2,x, algorithm="fricas")
```

```
[Out] 5/2*a^2*b^3*x^4 + 1/3*a^5*x^3 + 3/154*(11*b^5*x^4 + 140*a^3*b^2*x
^3)*x^(2/3) + 3/26*(10*a*b^4*x^4 + 13*a^4*b*x^3)*x^(1/3)
```

Sympy [A] time = 3.46132, size = 75, normalized size = 0.97

$$\frac{a^5x^3}{3}+\frac{3a^4bx^{\frac{10}{3}}}{2}+\frac{30a^3b^2x^{\frac{11}{3}}}{11}+\frac{5a^2b^3x^4}{2}+\frac{15ab^4x^{\frac{13}{3}}}{13}+\frac{3b^5x^{\frac{14}{3}}}{14}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**5*x**2,x)
```

```
[Out] a**5*x**3/3 + 3*a**4*b*x**(10/3)/2 + 30*a**3*b**2*x**(11/3)/11 +
5*a**2*b**3*x**4/2 + 15*a*b**4*x**(13/3)/13 + 3*b**5*x**(14/3)/14
```

GIAC/XCAS [A] time = 0.22377, size = 77, normalized size = 1.

$$\frac{3}{14}\,b^5x^{\frac{14}{3}}+\frac{15}{13}\,ab^4x^{\frac{13}{3}}+\frac{5}{2}\,a^2b^3x^4+\frac{30}{11}\,a^3b^2x^{\frac{11}{3}}+\frac{3}{2}\,a^4bx^{\frac{10}{3}}+\frac{1}{3}\,a^5x^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5*x^2,x, algorithm="giac")
```

```
[Out] 3/14*b^5*x^(14/3) + 15/13*a*b^4*x^(13/3) + 5/2*a^2*b^3*x^4 + 30/1
1*a^3*b^2*x^(11/3) + 3/2*a^4*b*x^(10/3) + 1/3*a^5*x^3
```

3.2308 $\int \left(a+b\sqrt[3]{x}\right)^5 x \, dx$

Optimal. Leaf size=77

$$\frac{a^5x^2}{2}+\frac{15}{7}a^4bx^{7/3}+\frac{15}{4}a^3b^2x^{8/3}+\frac{10}{3}a^2b^3x^3+\frac{3}{2}ab^4x^{10/3}+\frac{3}{11}b^5x^{11/3}$$

```
[Out] (a^5*x^2)/2 + (15*a^4*b*x^(7/3))/7 + (15*a^3*b^2*x^(8/3))/4 + (10
*a^2*b^3*x^3)/3 + (3*a*b^4*x^(10/3))/2 + (3*b^5*x^(11/3))/11
```

Rubi [A] time = 0.0961683, antiderivative size = 77, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$\frac{a^5x^2}{2}+\frac{15}{7}a^4bx^{7/3}+\frac{15}{4}a^3b^2x^{8/3}+\frac{10}{3}a^2b^3x^3+\frac{3}{2}ab^4x^{10/3}+\frac{3}{11}b^5x^{11/3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^5*x,x]
```

```
[Out] (a^5*x^2)/2 + (15*a^4*b*x^(7/3))/7 + (15*a^3*b^2*x^(8/3))/4 + (10
*a^2*b^3*x^3)/3 + (3*a*b^4*x^(10/3))/2 + (3*b^5*x^(11/3))/11
```

Rubi in Sympy [A] time = 15.5546, size = 75, normalized size = 0.97

$$\frac{a^5x^2}{2}+\frac{15a^4bx^{\frac{7}{3}}}{7}+\frac{15a^3b^2x^{\frac{8}{3}}}{4}+\frac{10a^2b^3x^3}{3}+\frac{3ab^4x^{\frac{10}{3}}}{2}+\frac{3b^5x^{\frac{11}{3}}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**5*x,x)
```

```
[Out] a**5*x**2/2 + 15*a**4*b*x**(7/3)/7 + 15*a**3*b**2*x**(8/3)/4 + 10
*a**2*b**3*x**3/3 + 3*a*b**4*x**(10/3)/2 + 3*b**5*x**(11/3)/11
```

Mathematica [A] time = 0.0146728, size = 77, normalized size = 1.

$$\frac{a^5x^2}{2}+\frac{15}{7}a^4bx^{7/3}+\frac{15}{4}a^3b^2x^{8/3}+\frac{10}{3}a^2b^3x^3+\frac{3}{2}ab^4x^{10/3}+\frac{3}{11}b^5x^{11/3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^5*x,x]
```

```
[Out] (a^5*x^2)/2 + (15*a^4*b*x^(7/3))/7 + (15*a^3*b^2*x^(8/3))/4 + (10
*a^2*b^3*x^3)/3 + (3*a*b^4*x^(10/3))/2 + (3*b^5*x^(11/3))/11
```

Maple [A] time = 0.003, size = 58, normalized size = 0.8

$$\frac{a^5x^2}{2}+\frac{15\,a^4b}{7}x^{\frac{7}{3}}+\frac{15\,a^3b^2}{4}x^{\frac{8}{3}}+\frac{10\,a^2b^3x^3}{3}+\frac{3\,ab^4}{2}x^{\frac{10}{3}}+\frac{3\,b^5}{11}x^{\frac{11}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^5*x,x)
```

```
[Out] 1/2*a^5*x^2+15/7*a^4*b*x^(7/3)+15/4*a^3*b^2*x^(8/3)+10/3*a^2*b^3*
x^3+3/2*a*b^4*x^(10/3)+3/11*b^5*x^(11/3)
```

Maxima [A] time = 1.44986, size = 132, normalized size = 1.71

$$\frac{3\left(bx^{\frac{1}{3}}+a\right)^{11}}{11\,b^{6}}-\frac{3\left(bx^{\frac{1}{3}}+a\right)^{10}a}{2\,b^{6}}+\frac{10\left(bx^{\frac{1}{3}}+a\right)^{9}a^{2}}{3\,b^{6}}-\frac{15\left(bx^{\frac{1}{3}}+a\right)^{8}a^{3}}{4\,b^{6}}+\frac{15\left(bx^{\frac{1}{3}}+a\right)^{7}a^{4}}{7\,b^{6}}-\frac{\left(bx^{\frac{1}{3}}+a\right)^{6}a^{5}}{2\,b^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5*x,x, algorithm="maxima")
```

```
[Out] 3/11*(b*x^(1/3) + a)^11/b^6 - 3/2*(b*x^(1/3) + a)^10*a/b^6 + 10/3
*(b*x^(1/3) + a)^9*a^2/b^6 - 15/4*(b*x^(1/3) + a)^8*a^3/b^6 + 15/
7*(b*x^(1/3) + a)^7*a^4/b^6 - 1/2*(b*x^(1/3) + a)^6*a^5/b^6
```

Fricas [A] time = 0.211541, size = 93, normalized size = 1.21

$$\frac{10}{3}\,a^{2}b^{3}x^{3}+\frac{1}{2}\,a^{5}x^{2}+\frac{3}{44}\left(4\,b^{5}x^{3}+55\,a^{3}b^{2}x^{2}\right)x^{\frac{2}{3}}+\frac{3}{14}\left(7\,ab^{4}x^{3}+10\,a^{4}bx^{2}\right)x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5*x,x, algorithm="fricas")
```

```
[Out] 10/3*a^2*b^3*x^3 + 1/2*a^5*x^2 + 3/44*(4*b^5*x^3 + 55*a^3*b^2*x^2
)*x^(2/3) + 3/14*(7*a*b^4*x^3 + 10*a^4*b*x^2)*x^(1/3)
```

Sympy [A] time = 1.6643, size = 75, normalized size = 0.97

$$\frac{a^{5}x^{2}}{2}+\frac{15a^{4}bx^{\frac{7}{3}}}{7}+\frac{15a^{3}b^{2}x^{\frac{8}{3}}}{4}+\frac{10a^{2}b^{3}x^{3}}{3}+\frac{3ab^{4}x^{\frac{10}{3}}}{2}+\frac{3b^{5}x^{\frac{11}{3}}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**5*x,x)
```

```
[Out] a**5*x**2/2 + 15*a**4*b*x**(7/3)/7 + 15*a**3*b**2*x**(8/3)/4 + 10
*a**2*b**3*x**3/3 + 3*a*b**4*x**(10/3)/2 + 3*b**5*x**(11/3)/11
```

GIAC/XCAS [A] time = 0.246306, size = 77, normalized size = 1.

$$\frac{3}{11}\,b^{5}x^{\frac{11}{3}}+\frac{3}{2}\,ab^{4}x^{\frac{10}{3}}+\frac{10}{3}\,a^{2}b^{3}x^{3}+\frac{15}{4}\,a^{3}b^{2}x^{\frac{8}{3}}+\frac{15}{7}\,a^{4}bx^{\frac{7}{3}}+\frac{1}{2}\,a^{5}x^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5*x,x, algorithm="giac")
```

```
[Out] 3/11*b^5*x^(11/3) + 3/2*a*b^4*x^(10/3) + 10/3*a^2*b^3*x^3 + 15/4*
a^3*b^2*x^(8/3) + 15/7*a^4*b*x^(7/3) + 1/2*a^5*x^2
```

3.2309 $\int \left(a+b\sqrt[3]{x}\right)^5 \, dx$

Optimal. Leaf size=59

$$\frac{a^2\left(a+b\sqrt[3]{x}\right)^6}{2b^3}+\frac{3\left(a+b\sqrt[3]{x}\right)^8}{8b^3}-\frac{6a\left(a+b\sqrt[3]{x}\right)^7}{7b^3}$$

```
[Out] (a^2*(a + b*x^(1/3))^6)/(2*b^3) - (6*a*(a + b*x^(1/3))^7)/(7*b^3)
 + (3*(a + b*x^(1/3))^8)/(8*b^3)
```

Rubi [A] time = 0.080046, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{a^2\left(a+b\sqrt[3]{x}\right)^6}{2b^3}+\frac{3\left(a+b\sqrt[3]{x}\right)^8}{8b^3}-\frac{6a\left(a+b\sqrt[3]{x}\right)^7}{7b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^5,x]
```

```
[Out] (a^2*(a + b*x^(1/3))^6)/(2*b^3) - (6*a*(a + b*x^(1/3))^7)/(7*b^3)
 + (3*(a + b*x^(1/3))^8)/(8*b^3)
```

Rubi in Sympy [A] time = 12.1733, size = 53, normalized size = 0.9

$$\frac{a^2\left(a+b\sqrt[3]{x}\right)^6}{2b^3}-\frac{6a\left(a+b\sqrt[3]{x}\right)^7}{7b^3}+\frac{3\left(a+b\sqrt[3]{x}\right)^8}{8b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**5,x)
```

```
[Out] a**2*(a + b*x**(1/3))**6/(2*b**3) - 6*a*(a + b*x**(1/3))**7/(7*b*
*3) + 3*(a + b*x**(1/3))**8/(8*b**3)
```

Mathematica [A] time = 0.0126144, size = 68, normalized size = 1.15

$$a^5x+\frac{15}{4}a^4bx^{4/3}+6a^3b^2x^{5/3}+5a^2b^3x^2+\frac{15}{7}ab^4x^{7/3}+\frac{3}{8}b^5x^{8/3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^5,x]
```

```
[Out] a^5*x + (15*a^4*b*x^(4/3))/4 + 6*a^3*b^2*x^(5/3) + 5*a^2*b^3*x^2
+ (15*a*b^4*x^(7/3))/7 + (3*b^5*x^(8/3))/8
```

Maple [A] time = 0.003, size = 55, normalized size = 0.9

$$xa^5+\frac{3\,b^5}{8}x^{\frac{8}{3}}+\frac{15\,ab^4}{7}x^{\frac{7}{3}}+5\,a^2b^3x^2+6\,a^3b^2x^{5/3}+\frac{15\,a^4b}{4}x^{\frac{4}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^5,x)
```

```
[Out] x*a^5+3/8*b^5*x^(8/3)+15/7*a*b^4*x^(7/3)+5*a^2*b^3*x^2+6*a^3*b^2*
x^(5/3)+15/4*a^4*b*x^(4/3)
```

Maxima [A] time = 1.43557, size = 73, normalized size = 1.24

$$\frac{3}{8}\, b^5 x^{\frac{8}{3}} + \frac{15}{7}\, a b^4 x^{\frac{7}{3}} + 5\, a^2 b^3 x^2 + 6\, a^3 b^2 x^{\frac{5}{3}} + \frac{15}{4}\, a^4 b x^{\frac{4}{3}} + a^5 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5,x, algorithm="maxima")
```

```
[Out] 3/8*b^5*x^(8/3) + 15/7*a*b^4*x^(7/3) + 5*a^2*b^3*x^2 + 6*a^3*b^2*
x^(5/3) + 15/4*a^4*b*x^(4/3) + a^5*x
```

Fricas [A] time = 0.208988, size = 82, normalized size = 1.39

$$5\, a^2 b^3 x^2 + a^5 x + \frac{3}{8}\, \left(b^5 x^2 + 16\, a^3 b^2 x\right) x^{\frac{2}{3}} + \frac{15}{28}\, \left(4\, a b^4 x^2 + 7\, a^4 b x\right) x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5,x, algorithm="fricas")
```

```
[Out] 5*a^2*b^3*x^2 + a^5*x + 3/8*(b^5*x^2 + 16*a^3*b^2*x)*x^(2/3) + 15
/28*(4*a*b^4*x^2 + 7*a^4*b*x)*x^(1/3)
```

Sympy [A] time = 1.42529, size = 68, normalized size = 1.15

$$a^5 x + \frac{15 a^4 b x^{\frac{4}{3}}}{4} + 6 a^3 b^2 x^{\frac{5}{3}} + 5 a^2 b^3 x^2 + \frac{15 a b^4 x^{\frac{7}{3}}}{7} + \frac{3 b^5 x^{\frac{8}{3}}}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**5,x)
```

```
[Out] a**5*x + 15*a**4*b*x**(4/3)/4 + 6*a**3*b**2*x**(5/3) + 5*a**2*b**
3*x**2 + 15*a*b**4*x**(7/3)/7 + 3*b**5*x**(8/3)/8
```

GIAC/XCAS [A] time = 0.229454, size = 73, normalized size = 1.24

$$\frac{3}{8}\, b^5 x^{\frac{8}{3}} + \frac{15}{7}\, a b^4 x^{\frac{7}{3}} + 5\, a^2 b^3 x^2 + 6\, a^3 b^2 x^{\frac{5}{3}} + \frac{15}{4}\, a^4 b x^{\frac{4}{3}} + a^5 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5,x, algorithm="giac")
```

```
[Out] 3/8*b^5*x^(8/3) + 15/7*a*b^4*x^(7/3) + 5*a^2*b^3*x^2 + 6*a^3*b^2*
x^(5/3) + 15/4*a^4*b*x^(4/3) + a^5*x
```

3.2310 $\int \frac{\left(a+b\sqrt[3]{x}\right)^5}{x}\,dx$

Optimal. Leaf size=65

$$a^5\log(x)+15a^4b\sqrt[3]{x}+15a^3b^2x^{2/3}+10a^2b^3x+\frac{15}{4}ab^4x^{4/3}+\frac{3}{5}b^5x^{5/3}$$

```
[Out] 15*a^4*b*x^(1/3) + 15*a^3*b^2*x^(2/3) + 10*a^2*b^3*x + (15*a*b^4*
x^(4/3))/4 + (3*b^5*x^(5/3))/5 + a^5*Log[x]
```

Rubi [A] time = 0.0767114, antiderivative size = 65, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$a^5\log(x)+15a^4b\sqrt[3]{x}+15a^3b^2x^{2/3}+10a^2b^3x+\frac{15}{4}ab^4x^{4/3}+\frac{3}{5}b^5x^{5/3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^5/x,x]
```

```
[Out] 15*a^4*b*x^(1/3) + 15*a^3*b^2*x^(2/3) + 10*a^2*b^3*x + (15*a*b^4*
x^(4/3))/4 + (3*b^5*x^(5/3))/5 + a^5*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$3a^5\log\left(\sqrt[3]{x}\right)+15a^4b\sqrt[3]{x}+30a^3b^2\int^{\sqrt[3]{x}}x\,dx+10a^2b^3x+\frac{15ab^4x^{\frac{4}{3}}}{4}+\frac{3b^5x^{\frac{5}{3}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**5/x,x)
```

```
[Out] 3*a**5*log(x**(1/3)) + 15*a**4*b*x**(1/3) + 30*a**3*b**2*Integral
(x, (x, x**(1/3))) + 10*a**2*b**3*x + 15*a*b**4*x**(4/3)/4 + 3*b*
*5*x**(5/3)/5
```

Mathematica [A] time = 0.0202114, size = 65, normalized size = 1.

$$a^5\log(x)+15a^4b\sqrt[3]{x}+15a^3b^2x^{2/3}+10a^2b^3x+\frac{15}{4}ab^4x^{4/3}+\frac{3}{5}b^5x^{5/3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^5/x,x]
```

```
[Out] 15*a^4*b*x^(1/3) + 15*a^3*b^2*x^(2/3) + 10*a^2*b^3*x + (15*a*b^4*
x^(4/3))/4 + (3*b^5*x^(5/3))/5 + a^5*Log[x]
```

Maple [A] time = 0.004, size = 54, normalized size = 0.8

$$15\,a^4b\sqrt[3]{x}+15\,a^3b^2x^{2/3}+10\,a^2b^3x+\frac{15\,ab^4}{4}x^{\frac{4}{3}}+\frac{3\,b^5}{5}x^{\frac{5}{3}}+a^5\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^5/x,x)
```

```
[Out] 15*a^4*b*x^(1/3)+15*a^3*b^2*x^(2/3)+10*a^2*b^3*x+15/4*a*b^4*x^(4/
3)+3/5*b^5*x^(5/3)+a^5*ln(x)
```

Maxima [A] time = 1.52388, size = 72, normalized size = 1.11

$$\frac{3}{5} b^5 x^{\frac{5}{3}} + \frac{15}{4} a b^4 x^{\frac{4}{3}} + 10 a^2 b^3 x + a^5 \log(x) + 15 a^3 b^2 x^{\frac{2}{3}} + 15 a^4 b x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5/x,x, algorithm="maxima")
```

```
[Out] 3/5*b^5*x^(5/3) + 15/4*a*b^4*x^(4/3) + 10*a^2*b^3*x + a^5*log(x)
+ 15*a^3*b^2*x^(2/3) + 15*a^4*b*x^(1/3)
```

Fricas [A] time = 0.218309, size = 76, normalized size = 1.17

$$10 a^2 b^3 x + 3 a^5 \log\left(x^{\frac{1}{3}}\right) + \frac{3}{5} \left(b^5 x + 25 a^3 b^2\right) x^{\frac{2}{3}} + \frac{15}{4} \left(a b^4 x + 4 a^4 b\right) x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5/x,x, algorithm="fricas")
```

```
[Out] 10*a^2*b^3*x + 3*a^5*log(x^(1/3)) + 3/5*(b^5*x + 25*a^3*b^2)*x^(2
/3) + 15/4*(a*b^4*x + 4*a^4*b)*x^(1/3)
```

Sympy [A] time = 3.52726, size = 66, normalized size = 1.02

$$a^5 \log(x) + 15 a^4 b \sqrt[3]{x} + 15 a^3 b^2 x^{\frac{2}{3}} + 10 a^2 b^3 x + \frac{15 a b^4 x^{\frac{4}{3}}}{4} + \frac{3 b^5 x^{\frac{5}{3}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**5/x,x)
```

```
[Out] a**5*log(x) + 15*a**4*b*x**(1/3) + 15*a**3*b**2*x**(2/3) + 10*a**
2*b**3*x + 15*a*b**4*x**(4/3)/4 + 3*b**5*x**(5/3)/5
```

GIAC/XCAS [A] time = 0.239783, size = 73, normalized size = 1.12

$$\frac{3}{5} b^5 x^{\frac{5}{3}} + \frac{15}{4} a b^4 x^{\frac{4}{3}} + 10 a^2 b^3 x + a^5 \ln(|x|) + 15 a^3 b^2 x^{\frac{2}{3}} + 15 a^4 b x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5/x,x, algorithm="giac")
```

```
[Out] 3/5*b^5*x^(5/3) + 15/4*a*b^4*x^(4/3) + 10*a^2*b^3*x + a^5*ln(abs(
x)) + 15*a^3*b^2*x^(2/3) + 15*a^4*b*x^(1/3)
```

3.2311 $\int \frac{\left(a+b\sqrt[3]{x}\right)^5}{x^2}\,dx$

Optimal. Leaf size=68

$$-\frac{a^5}{x}-\frac{15a^4b}{2x^{2/3}}-\frac{30a^3b^2}{\sqrt[3]{x}}+10a^2b^3\log(x)+15ab^4\sqrt[3]{x}+\frac{3}{2}b^5x^{2/3}$$

```
[Out] -(a^5/x) - (15*a^4*b)/(2*x^(2/3)) - (30*a^3*b^2)/x^(1/3) + 15*a*b
^4*x^(1/3) + (3*b^5*x^(2/3))/2 + 10*a^2*b^3*Log[x]
```

Rubi [A] time = 0.0839101, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^5}{x}-\frac{15a^4b}{2x^{2/3}}-\frac{30a^3b^2}{\sqrt[3]{x}}+10a^2b^3\log(x)+15ab^4\sqrt[3]{x}+\frac{3}{2}b^5x^{2/3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^5/x^2,x]
```

```
[Out] -(a^5/x) - (15*a^4*b)/(2*x^(2/3)) - (30*a^3*b^2)/x^(1/3) + 15*a*b
^4*x^(1/3) + (3*b^5*x^(2/3))/2 + 10*a^2*b^3*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^5}{x}-\frac{15a^4b}{2x^{\frac{2}{3}}}-\frac{30a^3b^2}{\sqrt[3]{x}}+30a^2b^3\log\left(\sqrt[3]{x}\right)+15ab^4\sqrt[3]{x}+3b^5\int^{\sqrt[3]{x}}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**5/x**2,x)
```

```
[Out] -a**5/x - 15*a**4*b/(2*x**(2/3)) - 30*a**3*b**2/x**(1/3) + 30*a**
2*b**3*log(x**(1/3)) + 15*a*b**4*x**(1/3) + 3*b**5*Integral(x, (x
, x**(1/3)))
```

Mathematica [A] time = 0.0229316, size = 69, normalized size = 1.01

$$\frac{-2a^5-15a^4b\sqrt[3]{x}-60a^3b^2x^{2/3}+20a^2b^3x\log(x)+30ab^4x^{4/3}+3b^5x^{5/3}}{2x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^5/x^2,x]
```

```
[Out] (-2*a^5 - 15*a^4*b*x^(1/3) - 60*a^3*b^2*x^(2/3) + 30*a*b^4*x^(4/3
) + 3*b^5*x^(5/3) + 20*a^2*b^3*x*Log[x])/(2*x)
```

Maple [A] time = 0.01, size = 57, normalized size = 0.8

$$-\frac{a^5}{x}-\frac{15\,a^4b}{2}x^{-\frac{2}{3}}-30\,\frac{a^3b^2}{\sqrt[3]{x}}+15\,ab^4\sqrt[3]{x}+\frac{3\,b^5}{2}x^{\frac{2}{3}}+10\,a^2b^3\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((a+b*x^(1/3))^5/x^2,x)
```

```
[Out] -a^5/x-15/2*a^4*b/x^(2/3)-30*a^3*b^2/x^(1/3)+15*a*b^4*x^(1/3)+3/2
*b^5*x^(2/3)+10*a^2*b^3*ln(x)
```

Maxima [A] time = 1.43707, size = 80, normalized size = 1.18

$$10\,a^{2}b^{3}\log\left(x\right)+\frac{3}{2}\,b^{5}x^{\frac{2}{3}}+15\,ab^{4}x^{\frac{1}{3}}-\frac{60\,a^{3}b^{2}x^{\frac{2}{3}}+15\,a^{4}bx^{\frac{1}{3}}+2\,a^{5}}{2\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^(1/3) + a)^5/x^2,x, algorithm="maxima")
```

```
[Out] 10*a^2*b^3*log(x) + 3/2*b^5*x^(2/3) + 15*a*b^4*x^(1/3) - 1/2*(60*
a^3*b^2*x^(2/3) + 15*a^4*b*x^(1/3) + 2*a^5)/x
```

Fricas [A] time = 0.218582, size = 84, normalized size = 1.24

$$\frac{60\,a^{2}b^{3}x\log\left(x^{\frac{1}{3}}\right)-2\,a^{5}+3\,\left(b^{5}x-20\,a^{3}b^{2}\right)x^{\frac{2}{3}}+15\,\left(2\,ab^{4}x-a^{4}b\right)x^{\frac{1}{3}}}{2\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^(1/3) + a)^5/x^2,x, algorithm="fricas")
```

```
[Out] 1/2*(60*a^2*b^3*x*log(x^(1/3)) - 2*a^5 + 3*(b^5*x - 20*a^3*b^2)*x
^(2/3) + 15*(2*a*b^4*x - a^4*b)*x^(1/3))/x
```

Sympy [A] time = 2.37137, size = 66, normalized size = 0.97

$$-\frac{a^{5}}{x}-\frac{15a^{4}b}{2x^{\frac{2}{3}}}-\frac{30a^{3}b^{2}}{\sqrt[3]{x}}+10a^{2}b^{3}\log\left(x\right)+15ab^{4}\sqrt[3]{x}+\frac{3b^{5}x^{\frac{2}{3}}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a+b*x**(1/3))**5/x**2,x)
```

```
[Out] -a**5/x - 15*a**4*b/(2*x**(2/3)) - 30*a**3*b**2/x**(1/3) + 10*a**
2*b**3*log(x) + 15*a*b**4*x**(1/3) + 3*b**5*x**(2/3)/2
```

GIAC/XCAS [A] time = 0.242628, size = 81, normalized size = 1.19

$$10\,a^{2}b^{3}\ln\left(|x|\right)+\frac{3}{2}\,b^{5}x^{\frac{2}{3}}+15\,ab^{4}x^{\frac{1}{3}}-\frac{60\,a^{3}b^{2}x^{\frac{2}{3}}+15\,a^{4}bx^{\frac{1}{3}}+2\,a^{5}}{2\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^(1/3) + a)^5/x^2,x, algorithm="giac")
```

```
[Out] 10*a^2*b^3*ln(abs(x)) + 3/2*b^5*x^(2/3) + 15*a*b^4*x^(1/3) - 1/2*
(60*a^3*b^2*x^(2/3) + 15*a^4*b*x^(1/3) + 2*a^5)/x
```

3.2312 $\int \frac{\left(a+b\sqrt[3]{x}\right)^5}{x^3}\,dx$

Optimal. Leaf size=21

$$-\frac{\left(a+b\sqrt[3]{x}\right)^6}{2ax^2}$$

[Out] -(a + b*x^(1/3))^6/(2*a*x^2)

Rubi [A] time = 0.0156913, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$-\frac{\left(a+b\sqrt[3]{x}\right)^6}{2ax^2}$$

Antiderivative was successfully verified.

[In] Int[(a + b*x^(1/3))^5/x^3,x]

[Out] -(a + b*x^(1/3))^6/(2*a*x^2)

Rubi in Sympy [A] time = 2.79034, size = 17, normalized size = 0.81

$$-\frac{\left(a+b\sqrt[3]{x}\right)^6}{2ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((a+b*x**(1/3))**5/x**3,x)

[Out] -(a + b*x**(1/3))**6/(2*a*x**2)

Mathematica [B] time = 0.0203644, size = 65, normalized size = 3.1

$$-\frac{a^5+6a^4b\sqrt[3]{x}+15a^3b^2x^{2/3}+20a^2b^3x+15ab^4x^{4/3}+6b^5x^{5/3}}{2x^2}$$

Antiderivative was successfully verified.

[In] Integrate[(a + b*x^(1/3))^5/x^3,x]

[Out] -(a^5 + 6*a^4*b*x^(1/3) + 15*a^3*b^2*x^(2/3) + 20*a^2*b^3*x + 15*a*b^4*x^(4/3) + 6*b^5*x^(5/3))/(2*x^2)

Maple [B] time = 0.01, size = 58, normalized size = 2.8

$$-\frac{a^5}{2\,x^2}-\frac{15\,a^3b^2}{2}x^{-\frac{4}{3}}-10\,\frac{a^2b^3}{x}-\frac{15\,ab^4}{2}x^{-\frac{2}{3}}-3\,\frac{a^4b}{x^{5/3}}-3\,\frac{b^5}{\sqrt[3]{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a+b*x^(1/3))^5/x^3,x)

```
[Out] -1/2*a^5/x^2-15/2*a^3*b^2/x^(4/3)-10*a^2*b^3/x-15/2*a*b^4/x^(2/3)
-3*a^4*b/x^(5/3)-3*b^5/x^(1/3)
```

Maxima [A] time = 1.44903, size = 74, normalized size = 3.52

$$-\frac{6\,b^5x^{\frac{5}{3}}+15\,ab^4x^{\frac{4}{3}}+20\,a^2b^3x+15\,a^3b^2x^{\frac{2}{3}}+6\,a^4bx^{\frac{1}{3}}+a^5}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5/x^3,x, algorithm="maxima")
```

```
[Out] -1/2*(6*b^5*x^(5/3) + 15*a*b^4*x^(4/3) + 20*a^2*b^3*x + 15*a^3*b^
2*x^(2/3) + 6*a^4*b*x^(1/3) + a^5)/x^2
```

Fricas [A] time = 0.215366, size = 77, normalized size = 3.67

$$-\frac{20\,a^2b^3x+a^5+3\left(2\,b^5x+5\,a^3b^2\right)x^{\frac{2}{3}}+3\left(5\,ab^4x+2\,a^4b\right)x^{\frac{1}{3}}}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5/x^3,x, algorithm="fricas")
```

```
[Out] -1/2*(20*a^2*b^3*x + a^5 + 3*(2*b^5*x + 5*a^3*b^2)*x^(2/3) + 3*(5
*a*b^4*x + 2*a^4*b)*x^(1/3))/x^2
```

Sympy [A] time = 4.22533, size = 70, normalized size = 3.33

$$-\frac{a^5}{2x^2}-\frac{3a^4b}{x^{\frac{5}{3}}}-\frac{15a^3b^2}{2x^{\frac{4}{3}}}-\frac{10a^2b^3}{x}-\frac{15ab^4}{2x^{\frac{2}{3}}}-\frac{3b^5}{\sqrt[3]{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**5/x**3,x)
```

```
[Out] -a**5/(2*x**2) - 3*a**4*b/x**(5/3) - 15*a**3*b**2/(2*x**(4/3)) -
10*a**2*b**3/x - 15*a*b**4/(2*x**(2/3)) - 3*b**5/x**(1/3)
```

GIAC/XCAS [A] time = 0.258683, size = 74, normalized size = 3.52

$$-\frac{6\,b^5x^{\frac{5}{3}}+15\,ab^4x^{\frac{4}{3}}+20\,a^2b^3x+15\,a^3b^2x^{\frac{2}{3}}+6\,a^4bx^{\frac{1}{3}}+a^5}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5/x^3,x, algorithm="giac")
```

```
[Out] -1/2*(6*b^5*x^(5/3) + 15*a*b^4*x^(4/3) + 20*a^2*b^3*x + 15*a^3*b^
2*x^(2/3) + 6*a^4*b*x^(1/3) + a^5)/x^2
```

3.2313 $\int \frac{\left(a+b\sqrt[3]{x}\right)^5}{x^4}\,dx$

Optimal. Leaf size=73

$$-\frac{a^5}{3x^3}-\frac{15a^4b}{8x^{8/3}}-\frac{30a^3b^2}{7x^{7/3}}-\frac{5a^2b^3}{x^2}-\frac{3ab^4}{x^{5/3}}-\frac{3b^5}{4x^{4/3}}$$

```
[Out] -a^5/(3*x^3) - (15*a^4*b)/(8*x^(8/3)) - (30*a^3*b^2)/(7*x^(7/3))
- (5*a^2*b^3)/x^2 - (3*a*b^4)/x^(5/3) - (3*b^5)/(4*x^(4/3))
```

Rubi [A] time = 0.0856076, antiderivative size = 73, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^5}{3x^3}-\frac{15a^4b}{8x^{8/3}}-\frac{30a^3b^2}{7x^{7/3}}-\frac{5a^2b^3}{x^2}-\frac{3ab^4}{x^{5/3}}-\frac{3b^5}{4x^{4/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^5/x^4,x]
```

```
[Out] -a^5/(3*x^3) - (15*a^4*b)/(8*x^(8/3)) - (30*a^3*b^2)/(7*x^(7/3))
- (5*a^2*b^3)/x^2 - (3*a*b^4)/x^(5/3) - (3*b^5)/(4*x^(4/3))
```

Rubi in Sympy [A] time = 14.2815, size = 73, normalized size = 1.

$$-\frac{a^5}{3x^3}-\frac{15a^4b}{8x^{\frac{8}{3}}}-\frac{30a^3b^2}{7x^{\frac{7}{3}}}-\frac{5a^2b^3}{x^2}-\frac{3ab^4}{x^{\frac{5}{3}}}-\frac{3b^5}{4x^{\frac{4}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**5/x**4,x)
```

```
[Out] -a**5/(3*x**3) - 15*a**4*b/(8*x**(8/3)) - 30*a**3*b**2/(7*x**(7/3
)) - 5*a**2*b**3/x**2 - 3*a*b**4/x**(5/3) - 3*b**5/(4*x**(4/3))
```

Mathematica [A] time = 0.022003, size = 67, normalized size = 0.92

$$-\frac{56a^5+315a^4b\sqrt[3]{x}+720a^3b^2x^{2/3}+840a^2b^3x+504ab^4x^{4/3}+126b^5x^{5/3}}{168x^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^5/x^4,x]
```

```
[Out] -(56*a^5 + 315*a^4*b*x^(1/3) + 720*a^3*b^2*x^(2/3) + 840*a^2*b^3*
x + 504*a*b^4*x^(4/3) + 126*b^5*x^(5/3))/(168*x^3)
```

Maple [A] time = 0.01, size = 58, normalized size = 0.8

$$-\frac{a^5}{3\,x^3}-\frac{15\,a^4b}{8}x^{-\frac{8}{3}}-\frac{30\,a^3b^2}{7}x^{-\frac{7}{3}}-5\,\frac{a^2b^3}{x^2}-3\,\frac{ab^4}{x^{5/3}}-\frac{3\,b^5}{4}x^{-\frac{4}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^5/x^4,x)
```

```
[Out] -1/3*a^5/x^3-15/8*a^4*b/x^(8/3)-30/7*a^3*b^2/x^(7/3)-5*a^2*b^3/x^
2-3*a*b^4/x^(5/3)-3/4*b^5/x^(4/3)
```

Maxima [A] time = 1.44079, size = 77, normalized size = 1.05

$$-\frac{126\,b^5x^{\frac{5}{3}}+504\,ab^4x^{\frac{4}{3}}+840\,a^2b^3x+720\,a^3b^2x^{\frac{2}{3}}+315\,a^4bx^{\frac{1}{3}}+56\,a^5}{168\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5/x^4,x, algorithm="maxima")
```

```
[Out] -1/168*(126*b^5*x^(5/3) + 504*a*b^4*x^(4/3) + 840*a^2*b^3*x + 720
*a^3*b^2*x^(2/3) + 315*a^4*b*x^(1/3) + 56*a^5)/x^3
```

Fricas [A] time = 0.217573, size = 80, normalized size = 1.1

$$-\frac{840\,a^2b^3x+56\,a^5+18\left(7\,b^5x+40\,a^3b^2\right)x^{\frac{2}{3}}+63\left(8\,ab^4x+5\,a^4b\right)x^{\frac{1}{3}}}{168\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5/x^4,x, algorithm="fricas")
```

```
[Out] -1/168*(840*a^2*b^3*x + 56*a^5 + 18*(7*b^5*x + 40*a^3*b^2)*x^(2/3
) + 63*(8*a*b^4*x + 5*a^4*b)*x^(1/3))/x^3
```

Sympy [A] time = 7.89439, size = 73, normalized size = 1.

$$-\frac{a^5}{3x^3}-\frac{15a^4b}{8x^{\frac{8}{3}}}-\frac{30a^3b^2}{7x^{\frac{7}{3}}}-\frac{5a^2b^3}{x^2}-\frac{3ab^4}{x^{\frac{5}{3}}}-\frac{3b^5}{4x^{\frac{4}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**5/x**4,x)
```

```
[Out] -a**5/(3*x**3) - 15*a**4*b/(8*x**(8/3)) - 30*a**3*b**2/(7*x**(7/3
)) - 5*a**2*b**3/x**2 - 3*a*b**4/x**(5/3) - 3*b**5/(4*x**(4/3))
```

GIAC/XCAS [A] time = 0.24017, size = 77, normalized size = 1.05

$$-\frac{126\,b^5x^{\frac{5}{3}}+504\,ab^4x^{\frac{4}{3}}+840\,a^2b^3x+720\,a^3b^2x^{\frac{2}{3}}+315\,a^4bx^{\frac{1}{3}}+56\,a^5}{168\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5/x^4,x, algorithm="giac")
```

```
[Out] -1/168*(126*b^5*x^(5/3) + 504*a*b^4*x^(4/3) + 840*a^2*b^3*x + 720
*a^3*b^2*x^(2/3) + 315*a^4*b*x^(1/3) + 56*a^5)/x^3
```

3.2314 $\int \frac{\left(a+b\sqrt[3]{x}\right)^5}{x^5}\,dx$

Optimal. Leaf size=75

$$-\frac{a^5}{4x^4}-\frac{15a^4b}{11x^{11/3}}-\frac{3a^3b^2}{x^{10/3}}-\frac{10a^2b^3}{3x^3}-\frac{15ab^4}{8x^{8/3}}-\frac{3b^5}{7x^{7/3}}$$

```
[Out] -a^5/(4*x^4) - (15*a^4*b)/(11*x^(11/3)) - (3*a^3*b^2)/x^(10/3) -
(10*a^2*b^3)/(3*x^3) - (15*a*b^4)/(8*x^(8/3)) - (3*b^5)/(7*x^(7/3
))
```

Rubi [A] time = 0.0844925, antiderivative size = 75, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^5}{4x^4}-\frac{15a^4b}{11x^{11/3}}-\frac{3a^3b^2}{x^{10/3}}-\frac{10a^2b^3}{3x^3}-\frac{15ab^4}{8x^{8/3}}-\frac{3b^5}{7x^{7/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^5/x^5,x]
```

```
[Out] -a^5/(4*x^4) - (15*a^4*b)/(11*x^(11/3)) - (3*a^3*b^2)/x^(10/3) -
(10*a^2*b^3)/(3*x^3) - (15*a*b^4)/(8*x^(8/3)) - (3*b^5)/(7*x^(7/3
))
```

Rubi in Sympy [A] time = 14.3219, size = 75, normalized size = 1.

$$-\frac{a^5}{4x^4}-\frac{15a^4b}{11x^{\frac{11}{3}}}-\frac{3a^3b^2}{x^{\frac{10}{3}}}-\frac{10a^2b^3}{3x^3}-\frac{15ab^4}{8x^{\frac{8}{3}}}-\frac{3b^5}{7x^{\frac{7}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**5/x**5,x)
```

```
[Out] -a**5/(4*x**4) - 15*a**4*b/(11*x**(11/3)) - 3*a**3*b**2/x**(10/3)
 - 10*a**2*b**3/(3*x**3) - 15*a*b**4/(8*x**(8/3)) - 3*b**5/(7*x**
(7/3))
```

Mathematica [A] time = 0.0242013, size = 67, normalized size = 0.89

$$-\frac{462a^5+2520a^4b\sqrt[3]{x}+5544a^3b^2x^{2/3}+6160a^2b^3x+3465ab^4x^{4/3}+792b^5x^{5/3}}{1848x^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^5/x^5,x]
```

```
[Out] -(462*a^5 + 2520*a^4*b*x^(1/3) + 5544*a^3*b^2*x^(2/3) + 6160*a^2*
b^3*x + 3465*a*b^4*x^(4/3) + 792*b^5*x^(5/3))/(1848*x^4)
```

Maple [A] time = 0.009, size = 58, normalized size = 0.8

$$-\frac{a^5}{4\,x^4}-\frac{15\,a^4b}{11}x^{-\frac{11}{3}}-3\,\frac{a^3b^2}{x^{10/3}}-\frac{10\,a^2b^3}{3\,x^3}-\frac{15\,ab^4}{8}x^{-\frac{8}{3}}-\frac{3\,b^5}{7}x^{-\frac{7}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^5/x^5,x)
```

```
[Out] -1/4*a^5/x^4-15/11*a^4*b/x^(11/3)-3*a^3*b^2/x^(10/3)-10/3*a^2*b^3
/x^3-15/8*a*b^4/x^(8/3)-3/7*b^5/x^(7/3)
```

Maxima [A] time = 1.44568, size = 77, normalized size = 1.03

$$-\frac{792\,b^5x^{\frac{5}{3}} + 3465\,ab^4x^{\frac{4}{3}} + 6160\,a^2b^3x + 5544\,a^3b^2x^{\frac{2}{3}} + 2520\,a^4bx^{\frac{1}{3}} + 462\,a^5}{1848\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5/x^5,x, algorithm="maxima")
```

```
[Out] -1/1848*(792*b^5*x^(5/3) + 3465*a*b^4*x^(4/3) + 6160*a^2*b^3*x +
5544*a^3*b^2*x^(2/3) + 2520*a^4*b*x^(1/3) + 462*a^5)/x^4
```

Fricas [A] time = 0.222502, size = 78, normalized size = 1.04

$$-\frac{6160\,a^2b^3x + 462\,a^5 + 792\,\left(b^5x + 7\,a^3b^2\right)x^{\frac{2}{3}} + 315\,\left(11\,ab^4x + 8\,a^4b\right)x^{\frac{1}{3}}}{1848\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5/x^5,x, algorithm="fricas")
```

```
[Out] -1/1848*(6160*a^2*b^3*x + 462*a^5 + 792*(b^5*x + 7*a^3*b^2)*x^(2/
3) + 315*(11*a*b^4*x + 8*a^4*b)*x^(1/3))/x^4
```

Sympy [A] time = 14.6929, size = 75, normalized size = 1.

$$-\frac{a^5}{4x^4} - \frac{15a^4b}{11x^{\frac{11}{3}}} - \frac{3a^3b^2}{x^{\frac{10}{3}}} - \frac{10a^2b^3}{3x^3} - \frac{15ab^4}{8x^{\frac{8}{3}}} - \frac{3b^5}{7x^{\frac{7}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**5/x**5,x)
```

```
[Out] -a**5/(4*x**4) - 15*a**4*b/(11*x**(11/3)) - 3*a**3*b**2/x**(10/3)
 - 10*a**2*b**3/(3*x**3) - 15*a*b**4/(8*x**(8/3)) - 3*b**5/(7*x**
(7/3))
```

GIAC/XCAS [A] time = 0.242489, size = 77, normalized size = 1.03

$$-\frac{792\,b^5x^{\frac{5}{3}} + 3465\,ab^4x^{\frac{4}{3}} + 6160\,a^2b^3x + 5544\,a^3b^2x^{\frac{2}{3}} + 2520\,a^4bx^{\frac{1}{3}} + 462\,a^5}{1848\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5/x^5,x, algorithm="giac")
```

```
[Out] -1/1848*(792*b^5*x^(5/3) + 3465*a*b^4*x^(4/3) + 6160*a^2*b^3*x +
5544*a^3*b^2*x^(2/3) + 2520*a^4*b*x^(1/3) + 462*a^5)/x^4
```

3.2315 $\int \frac{\left(a+b\sqrt[3]{x}\right)^5}{x^6}\,dx$

Optimal. Leaf size=77

$$-\frac{a^5}{5x^5}-\frac{15a^4b}{14x^{14/3}}-\frac{30a^3b^2}{13x^{13/3}}-\frac{5a^2b^3}{2x^4}-\frac{15ab^4}{11x^{11/3}}-\frac{3b^5}{10x^{10/3}}$$

```
[Out] -a^5/(5*x^5) - (15*a^4*b)/(14*x^(14/3)) - (30*a^3*b^2)/(13*x^(13/
3)) - (5*a^2*b^3)/(2*x^4) - (15*a*b^4)/(11*x^(11/3)) - (3*b^5)/(1
0*x^(10/3))
```

Rubi [A] time = 0.0855027, antiderivative size = 77, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^5}{5x^5}-\frac{15a^4b}{14x^{14/3}}-\frac{30a^3b^2}{13x^{13/3}}-\frac{5a^2b^3}{2x^4}-\frac{15ab^4}{11x^{11/3}}-\frac{3b^5}{10x^{10/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^5/x^6,x]
```

```
[Out] -a^5/(5*x^5) - (15*a^4*b)/(14*x^(14/3)) - (30*a^3*b^2)/(13*x^(13/
3)) - (5*a^2*b^3)/(2*x^4) - (15*a*b^4)/(11*x^(11/3)) - (3*b^5)/(1
0*x^(10/3))
```

Rubi in Sympy [A] time = 14.6988, size = 76, normalized size = 0.99

$$-\frac{a^5}{5x^5}-\frac{15a^4b}{14x^{\frac{14}{3}}}-\frac{30a^3b^2}{13x^{\frac{13}{3}}}-\frac{5a^2b^3}{2x^4}-\frac{15ab^4}{11x^{\frac{11}{3}}}-\frac{3b^5}{10x^{\frac{10}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**5/x**6,x)
```

```
[Out] -a**5/(5*x**5) - 15*a**4*b/(14*x**(14/3)) - 30*a**3*b**2/(13*x**(
13/3)) - 5*a**2*b**3/(2*x**4) - 15*a*b**4/(11*x**(11/3)) - 3*b**5
/(10*x**(10/3))
```

Mathematica [A] time = 0.0233293, size = 67, normalized size = 0.87

$$-\frac{2002a^5+10725a^4b\sqrt[3]{x}+23100a^3b^2x^{2/3}+25025a^2b^3x+13650ab^4x^{4/3}+3003b^5x^{5/3}}{10010x^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^5/x^6,x]
```

```
[Out] -(2002*a^5 + 10725*a^4*b*x^(1/3) + 23100*a^3*b^2*x^(2/3) + 25025*
a^2*b^3*x + 13650*a*b^4*x^(4/3) + 3003*b^5*x^(5/3))/(10010*x^5)
```

Maple [A] time = 0.009, size = 58, normalized size = 0.8

$$-\frac{a^5}{5\,x^5}-\frac{15\,a^4b}{14}x^{-\frac{14}{3}}-\frac{30\,a^3b^2}{13}x^{-\frac{13}{3}}-\frac{5\,a^2b^3}{2\,x^4}-\frac{15\,ab^4}{11}x^{-\frac{11}{3}}-\frac{3\,b^5}{10}x^{-\frac{10}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^5/x^6,x)
```

```
[Out] -1/5*a^5/x^5-15/14*a^4*b/x^(14/3)-30/13*a^3*b^2/x^(13/3)-5/2*a^2*
b^3/x^4-15/11*a*b^4/x^(11/3)-3/10*b^5/x^(10/3)
```

Maxima [A] time = 1.44195, size = 77, normalized size = 1.

$$-\frac{3003\,b^{5}x^{\frac{5}{3}} + 13650\,ab^{4}x^{\frac{4}{3}} + 25025\,a^{2}b^{3}x + 23100\,a^{3}b^{2}x^{\frac{2}{3}} + 10725\,a^{4}bx^{\frac{1}{3}} + 2002\,a^{5}}{10010\,x^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5/x^6,x, algorithm="maxima")
```

```
[Out] -1/10010*(3003*b^5*x^(5/3) + 13650*a*b^4*x^(4/3) + 25025*a^2*b^3*
x + 23100*a^3*b^2*x^(2/3) + 10725*a^4*b*x^(1/3) + 2002*a^5)/x^5
```

Fricas [A] time = 0.233553, size = 80, normalized size = 1.04

$$-\frac{25025\,a^{2}b^{3}x + 2002\,a^{5} + 231\left(13\,b^{5}x + 100\,a^{3}b^{2}\right)x^{\frac{2}{3}} + 975\left(14\,ab^{4}x + 11\,a^{4}b\right)x^{\frac{1}{3}}}{10010\,x^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5/x^6,x, algorithm="fricas")
```

```
[Out] -1/10010*(25025*a^2*b^3*x + 2002*a^5 + 231*(13*b^5*x + 100*a^3*b^
2)*x^(2/3) + 975*(14*a*b^4*x + 11*a^4*b)*x^(1/3))/x^5
```

Sympy [A] time = 25.3799, size = 76, normalized size = 0.99

$$-\frac{a^{5}}{5x^{5}} - \frac{15a^{4}b}{14x^{\frac{14}{3}}} - \frac{30a^{3}b^{2}}{13x^{\frac{13}{3}}} - \frac{5a^{2}b^{3}}{2x^{4}} - \frac{15ab^{4}}{11x^{\frac{11}{3}}} - \frac{3b^{5}}{10x^{\frac{10}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**5/x**6,x)
```

```
[Out] -a**5/(5*x**5) - 15*a**4*b/(14*x**(14/3)) - 30*a**3*b**2/(13*x**(
13/3)) - 5*a**2*b**3/(2*x**4) - 15*a*b**4/(11*x**(11/3)) - 3*b**5
/(10*x**(10/3))
```

GIAC/XCAS [A] time = 0.233085, size = 77, normalized size = 1.

$$-\frac{3003\,b^{5}x^{\frac{5}{3}} + 13650\,ab^{4}x^{\frac{4}{3}} + 25025\,a^{2}b^{3}x + 23100\,a^{3}b^{2}x^{\frac{2}{3}} + 10725\,a^{4}bx^{\frac{1}{3}} + 2002\,a^{5}}{10010\,x^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5/x^6,x, algorithm="giac")
```

```
[Out] -1/10010*(3003*b^5*x^(5/3) + 13650*a*b^4*x^(4/3) + 25025*a^2*b^3*
x + 23100*a^3*b^2*x^(2/3) + 10725*a^4*b*x^(1/3) + 2002*a^5)/x^5
```

3.2316 $\int \frac{\left(a+b\sqrt[3]{x}\right)^5}{x^7}\,dx$

Optimal. Leaf size=75

$$-\frac{a^5}{6x^6}-\frac{15a^4b}{17x^{17/3}}-\frac{15a^3b^2}{8x^{16/3}}-\frac{2a^2b^3}{x^5}-\frac{15ab^4}{14x^{14/3}}-\frac{3b^5}{13x^{13/3}}$$

```
[Out] -a^5/(6*x^6) - (15*a^4*b)/(17*x^(17/3)) - (15*a^3*b^2)/(8*x^(16/3
)) - (2*a^2*b^3)/x^5 - (15*a*b^4)/(14*x^(14/3)) - (3*b^5)/(13*x^(
13/3))
```

Rubi [A] time = 0.0844662, antiderivative size = 75, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^5}{6x^6}-\frac{15a^4b}{17x^{17/3}}-\frac{15a^3b^2}{8x^{16/3}}-\frac{2a^2b^3}{x^5}-\frac{15ab^4}{14x^{14/3}}-\frac{3b^5}{13x^{13/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^5/x^7,x]
```

```
[Out] -a^5/(6*x^6) - (15*a^4*b)/(17*x^(17/3)) - (15*a^3*b^2)/(8*x^(16/3
)) - (2*a^2*b^3)/x^5 - (15*a*b^4)/(14*x^(14/3)) - (3*b^5)/(13*x^(
13/3))
```

Rubi in Sympy [A] time = 14.8727, size = 75, normalized size = 1.

$$-\frac{a^5}{6x^6}-\frac{15a^4b}{17x^{\frac{17}{3}}}-\frac{15a^3b^2}{8x^{\frac{16}{3}}}-\frac{2a^2b^3}{x^5}-\frac{15ab^4}{14x^{\frac{14}{3}}}-\frac{3b^5}{13x^{\frac{13}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**5/x**7,x)
```

```
[Out] -a**5/(6*x**6) - 15*a**4*b/(17*x**(17/3)) - 15*a**3*b**2/(8*x**(1
6/3)) - 2*a**2*b**3/x**5 - 15*a*b**4/(14*x**(14/3)) - 3*b**5/(13*
x**(13/3))
```

Mathematica [A] time = 0.0233588, size = 67, normalized size = 0.89

$$-\frac{6188a^5+32760a^4b\sqrt[3]{x}+69615a^3b^2x^{2/3}+74256a^2b^3x+39780ab^4x^{4/3}+8568b^5x^{5/3}}{37128x^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^5/x^7,x]
```

```
[Out] -(6188*a^5 + 32760*a^4*b*x^(1/3) + 69615*a^3*b^2*x^(2/3) + 74256*
a^2*b^3*x + 39780*a*b^4*x^(4/3) + 8568*b^5*x^(5/3))/(37128*x^6)
```

Maple [A] time = 0.01, size = 58, normalized size = 0.8

$$-\frac{a^5}{6\,x^6}-\frac{15\,a^4b}{17}x^{-\frac{17}{3}}-\frac{15\,a^3b^2}{8}x^{-\frac{16}{3}}-2\,\frac{a^2b^3}{x^5}-\frac{15\,ab^4}{14}x^{-\frac{14}{3}}-\frac{3\,b^5}{13}x^{-\frac{13}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^5/x^7,x)
```

```
[Out] -1/6*a^5/x^6-15/17*a^4*b/x^(17/3)-15/8*a^3*b^2/x^(16/3)-2*a^2*b^3
/x^5-15/14*a*b^4/x^(14/3)-3/13*b^5/x^(13/3)
```

Maxima [A] time = 1.44154, size = 77, normalized size = 1.03

$$-\frac{8568\,b^5x^{\frac{5}{3}} + 39780\,ab^4x^{\frac{4}{3}} + 74256\,a^2b^3x + 69615\,a^3b^2x^{\frac{2}{3}} + 32760\,a^4bx^{\frac{1}{3}} + 6188\,a^5}{37128\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5/x^7,x, algorithm="maxima")
```

```
[Out] -1/37128*(8568*b^5*x^(5/3) + 39780*a*b^4*x^(4/3) + 74256*a^2*b^3*
x + 69615*a^3*b^2*x^(2/3) + 32760*a^4*b*x^(1/3) + 6188*a^5)/x^6
```

Fricas [A] time = 0.219771, size = 80, normalized size = 1.07

$$-\frac{74256\,a^2b^3x + 6188\,a^5 + 1071\left(8\,b^5x + 65\,a^3b^2\right)x^{\frac{2}{3}} + 2340\left(17\,ab^4x + 14\,a^4b\right)x^{\frac{1}{3}}}{37128\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5/x^7,x, algorithm="fricas")
```

```
[Out] -1/37128*(74256*a^2*b^3*x + 6188*a^5 + 1071*(8*b^5*x + 65*a^3*b^2
)*x^(2/3) + 2340*(17*a*b^4*x + 14*a^4*b)*x^(1/3))/x^6
```

Sympy [A] time = 37.616, size = 75, normalized size = 1.

$$-\frac{a^5}{6x^6} - \frac{15a^4b}{17x^{\frac{17}{3}}} - \frac{15a^3b^2}{8x^{\frac{16}{3}}} - \frac{2a^2b^3}{x^5} - \frac{15ab^4}{14x^{\frac{14}{3}}} - \frac{3b^5}{13x^{\frac{13}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**5/x**7,x)
```

```
[Out] -a**5/(6*x**6) - 15*a**4*b/(17*x**(17/3)) - 15*a**3*b**2/(8*x**(1
6/3)) - 2*a**2*b**3/x**5 - 15*a*b**4/(14*x**(14/3)) - 3*b**5/(13*
x**(13/3))
```

GIAC/XCAS [A] time = 0.250235, size = 77, normalized size = 1.03

$$-\frac{8568\,b^5x^{\frac{5}{3}} + 39780\,ab^4x^{\frac{4}{3}} + 74256\,a^2b^3x + 69615\,a^3b^2x^{\frac{2}{3}} + 32760\,a^4bx^{\frac{1}{3}} + 6188\,a^5}{37128\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^5/x^7,x, algorithm="giac")
```

```
[Out] -1/37128*(8568*b^5*x^(5/3) + 39780*a*b^4*x^(4/3) + 74256*a^2*b^3*
x + 69615*a^3*b^2*x^(2/3) + 32760*a^4*b*x^(1/3) + 6188*a^5)/x^6
```

3.2317 $\int \left(a+b\sqrt[3]{x}\right)^{10} x^4\,dx$

Optimal. Leaf size=144

$$\frac{a^{10}x^5}{5}+\frac{15}{8}a^9bx^{16/3}+\frac{135}{17}a^8b^2x^{17/3}+20a^7b^3x^6+\frac{630}{19}a^6b^4x^{19/3}+\frac{189}{5}a^5b^5x^{20/3}+30a^4b^6x^7+\frac{180}{11}a^3b^7x^{22/3}+\frac{135}{23}a^2b^8x^{23/3}+\frac{5}{4}ab^9x^8+\frac{3}{25}b^{10}x^{25/3}$$

```
[Out] (a^10*x^5)/5 + (15*a^9*b*x^(16/3))/8 + (135*a^8*b^2*x^(17/3))/17
+ 20*a^7*b^3*x^6 + (630*a^6*b^4*x^(19/3))/19 + (189*a^5*b^5*x^(20
/3))/5 + 30*a^4*b^6*x^7 + (180*a^3*b^7*x^(22/3))/11 + (135*a^2*b^
8*x^(23/3))/23 + (5*a*b^9*x^8)/4 + (3*b^10*x^(25/3))/25
```

Rubi [A] time = 0.226456, antiderivative size = 144, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^{10}x^5}{5}+\frac{15}{8}a^9bx^{16/3}+\frac{135}{17}a^8b^2x^{17/3}+20a^7b^3x^6+\frac{630}{19}a^6b^4x^{19/3}+\frac{189}{5}a^5b^5x^{20/3}+30a^4b^6x^7+\frac{180}{11}a^3b^7x^{22/3}+\frac{135}{23}a^2b^8x^{23/3}+\frac{5}{4}ab^9x^8+\frac{3}{25}b^{10}x^{25/3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^10*x^4,x]
```

```
[Out] (a^10*x^5)/5 + (15*a^9*b*x^(16/3))/8 + (135*a^8*b^2*x^(17/3))/17
+ 20*a^7*b^3*x^6 + (630*a^6*b^4*x^(19/3))/19 + (189*a^5*b^5*x^(20
/3))/5 + 30*a^4*b^6*x^7 + (180*a^3*b^7*x^(22/3))/11 + (135*a^2*b^
8*x^(23/3))/23 + (5*a*b^9*x^8)/4 + (3*b^10*x^(25/3))/25
```

Rubi in Sympy [A] time = 39.5889, size = 144, normalized size = 1.

$$\frac{a^{10}x^5}{5}+\frac{15a^9bx^{\frac{16}{3}}}{8}+\frac{135a^8b^2x^{\frac{17}{3}}}{17}+20a^7b^3x^6+\frac{630a^6b^4x^{\frac{19}{3}}}{19}+\frac{189a^5b^5x^{\frac{20}{3}}}{5}+30a^4b^6x^7+\frac{180a^3b^7x^{\frac{22}{3}}}{11}+\frac{135a^2b^8x^{\frac{23}{3}}}{23}+\frac{5ab^9x^8}{4}+\frac{3b^{10}x^{\frac{25}{3}}}{25}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**10*x**4,x)
```

```
[Out] a**10*x**5/5 + 15*a**9*b*x**(16/3)/8 + 135*a**8*b**2*x**(17/3)/17
 + 20*a**7*b**3*x**6 + 630*a**6*b**4*x**(19/3)/19 + 189*a**5*b**5
*x**(20/3)/5 + 30*a**4*b**6*x**7 + 180*a**3*b**7*x**(22/3)/11 + 1
35*a**2*b**8*x**(23/3)/23 + 5*a*b**9*x**8/4 + 3*b**10*x**(25/3)/2
5
```

Mathematica [A] time = 0.0311942, size = 144, normalized size = 1.

$$\frac{a^{10}x^5}{5}+\frac{15}{8}a^9bx^{16/3}+\frac{135}{17}a^8b^2x^{17/3}+20a^7b^3x^6+\frac{630}{19}a^6b^4x^{19/3}+\frac{189}{5}a^5b^5x^{20/3}+30a^4b^6x^7+\frac{180}{11}a^3b^7x^{22/3}+\frac{135}{23}a^2b^8x^{23/3}+\frac{5}{4}ab^9x^8+\frac{3}{25}b^{10}x^{25/3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^10*x^4,x]
```

```
[Out] (a^10*x^5)/5 + (15*a^9*b*x^(16/3))/8 + (135*a^8*b^2*x^(17/3))/17
+ 20*a^7*b^3*x^6 + (630*a^6*b^4*x^(19/3))/19 + (189*a^5*b^5*x^(20
/3))/5 + 30*a^4*b^6*x^7 + (180*a^3*b^7*x^(22/3))/11 + (135*a^2*b^
8*x^(23/3))/23 + (5*a*b^9*x^8)/4 + (3*b^10*x^(25/3))/25
```

Maple [A] time = 0.003, size = 113, normalized size = 0.8

$$\frac{a^{10}x^{5}}{5}+\frac{15\,a^{9}b}{8}x^{\frac{16}{3}}+\frac{135\,a^{8}b^{2}}{17}x^{\frac{17}{3}}+20\,a^{7}b^{3}x^{6}+\frac{630\,a^{6}b^{4}}{19}x^{\frac{19}{3}}+\frac{189\,a^{5}b^{5}}{5}x^{\frac{20}{3}}+30\,a^{4}b^{6}x^{7}+\frac{180\,a^{3}b^{7}}{11}x^{\frac{22}{3}}+\frac{135\,a^{2}b^{8}}{23}x^{\frac{23}{3}}+\frac{5\,ab^{9}x^{8}}{4}+\frac{3\,b^{10}}{25}x^{\frac{25}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^10*x^4,x)
```

```
[Out] 1/5*a^10*x^5+15/8*a^9*b*x^(16/3)+135/17*a^8*b^2*x^(17/3)+20*a^7*b
^3*x^6+630/19*a^6*b^4*x^(19/3)+189/5*a^5*b^5*x^(20/3)+30*a^4*b^6*
x^7+180/11*a^3*b^7*x^(22/3)+135/23*a^2*b^8*x^(23/3)+5/4*a*b^9*x^8
+3/25*b^10*x^(25/3)
```

Maxima [A] time = 1.44953, size = 339, normalized size = 2.35

$$\frac{3\left(bx^{\frac{1}{3}}+a\right)^{25}}{25\,b^{15}}-\frac{7\left(bx^{\frac{1}{3}}+a\right)^{24}a}{4\,b^{15}}+\frac{273\left(bx^{\frac{1}{3}}+a\right)^{23}a^{2}}{23\,b^{15}}-\frac{546\left(bx^{\frac{1}{3}}+a\right)^{22}a^{3}}{11\,b^{15}}+\frac{143\left(bx^{\frac{1}{3}}+a\right)^{21}a^{4}}{b^{15}}-\frac{3003\left(bx^{\frac{1}{3}}+a\right)^{20}a^{5}}{10\,b^{15}}+\frac{9009\left(bx^{\frac{1}{3}}+a\right)^{19}a^{6}}{19\,b^{15}}-\frac{572\left(bx^{\frac{1}{3}}+a\right)^{18}a^{7}}{b^{15}}+\frac{9009\left(bx^{\frac{1}{3}}+a\right)^{17}a^{8}}{17\,b^{15}}-\frac{3003\left(bx^{\frac{1}{3}}+a\right)^{16}a^{9}}{8\,b^{15}}+\frac{1001\left(bx^{\frac{1}{3}}+a\right)^{15}a^{10}}{5\,b^{15}}-\frac{78\left(bx^{\frac{1}{3}}+a\right)^{14}a^{11}}{b^{15}}+\frac{21\left(bx^{\frac{1}{3}}+a\right)^{13}a^{12}}{b^{15}}-\frac{7\left(bx^{\frac{1}{3}}+a\right)^{12}a^{13}}{2\,b^{15}}+\frac{3\left(bx^{\frac{1}{3}}+a\right)^{11}a^{14}}{11\,b^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10*x^4,x, algorithm="maxima")
```

```
[Out] 3/25*(b*x^(1/3) + a)^25/b^15 - 7/4*(b*x^(1/3) + a)^24*a/b^15 + 27
3/23*(b*x^(1/3) + a)^23*a^2/b^15 - 546/11*(b*x^(1/3) + a)^22*a^3/
b^15 + 143*(b*x^(1/3) + a)^21*a^4/b^15 - 3003/10*(b*x^(1/3) + a)^
20*a^5/b^15 + 9009/19*(b*x^(1/3) + a)^19*a^6/b^15 - 572*(b*x^(1/3
) + a)^18*a^7/b^15 + 9009/17*(b*x^(1/3) + a)^17*a^8/b^15 - 3003/8
*(b*x^(1/3) + a)^16*a^9/b^15 + 1001/5*(b*x^(1/3) + a)^15*a^10/b^1
5 - 78*(b*x^(1/3) + a)^14*a^11/b^15 + 21*(b*x^(1/3) + a)^13*a^12/
b^15 - 7/2*(b*x^(1/3) + a)^12*a^13/b^15 + 3/11*(b*x^(1/3) + a)^11
*a^14/b^15
```

Fricas [A] time = 0.22394, size = 167, normalized size = 1.16

$$\frac{5}{4}\,ab^{9}x^{8}+30\,a^{4}b^{6}x^{7}+20\,a^{7}b^{3}x^{6}+\frac{1}{5}\,a^{10}x^{5}+\frac{27}{1955}\left(425\,a^{2}b^{8}x^{7}+2737\,a^{5}b^{5}x^{6}+575\,a^{8}b^{2}x^{5}\right)x^{\frac{2}{3}}+\frac{3}{41800}\left(1672\,b^{10}x^{8}+228000\,a^{3}b^{7}x^{7}+462000\,a^{6}b^{4}x^{6}+26125\,a^{9}bx^{5}\right)x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10*x^4,x, algorithm="fricas")
```

```
[Out] 5/4*a*b^9*x^8 + 30*a^4*b^6*x^7 + 20*a^7*b^3*x^6 + 1/5*a^10*x^5 +
27/1955*(425*a^2*b^8*x^7 + 2737*a^5*b^5*x^6 + 575*a^8*b^2*x^5)*x^
(2/3) + 3/41800*(1672*b^10*x^8 + 228000*a^3*b^7*x^7 + 462000*a^6*
b^4*x^6 + 26125*a^9*b*x^5)*x^(1/3)
```

Sympy [A] time = 19.4821, size = 144, normalized size = 1.

$$\frac{a^{10}x^5}{5} + \frac{15a^9bx^{\frac{16}{3}}}{8} + \frac{135a^8b^2x^{\frac{17}{3}}}{17} + 20a^7b^3x^6 + \frac{630a^6b^4x^{\frac{19}{3}}}{19} + \frac{189a^5b^5x^{\frac{20}{3}}}{5} + 30a^4b^6x^7 + \frac{180a^3b^7x^{\frac{22}{3}}}{11} + \frac{135a^2b^8x^{\frac{23}{3}}}{23} + \frac{5ab^9x^8}{4} + \frac{3b^{10}x^{\frac{25}{3}}}{25}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**10*x**4,x)
```

```
[Out] a**10*x**5/5 + 15*a**9*b*x**(16/3)/8 + 135*a**8*b**2*x**(17/3)/17
 + 20*a**7*b**3*x**6 + 630*a**6*b**4*x**(19/3)/19 + 189*a**5*b**5
*x**(20/3)/5 + 30*a**4*b**6*x**7 + 180*a**3*b**7*x**(22/3)/11 + 1
35*a**2*b**8*x**(23/3)/23 + 5*a*b**9*x**8/4 + 3*b**10*x**(25/3)/2
5
```

GIAC/XCAS [A] time = 0.247735, size = 151, normalized size = 1.05

$$\frac{3}{25}\,b^{10}x^{\frac{25}{3}} + \frac{5}{4}\,ab^9x^8 + \frac{135}{23}\,a^2b^8x^{\frac{23}{3}} + \frac{180}{11}\,a^3b^7x^{\frac{22}{3}} + 30\,a^4b^6x^7 + \frac{189}{5}\,a^5b^5x^{\frac{20}{3}} + \frac{630}{19}\,a^6b^4x^{\frac{19}{3}} + 20\,a^7b^3x^6 + \frac{135}{17}\,a^8b^2x^{\frac{17}{3}} + \frac{15}{8}\,a^9bx^{\frac{16}{3}} + \frac{1}{5}\,a^{10}x^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10*x^4,x, algorithm="giac")
```

```
[Out] 3/25*b^10*x^(25/3) + 5/4*a*b^9*x^8 + 135/23*a^2*b^8*x^(23/3) + 18
0/11*a^3*b^7*x^(22/3) + 30*a^4*b^6*x^7 + 189/5*a^5*b^5*x^(20/3) +
 630/19*a^6*b^4*x^(19/3) + 20*a^7*b^3*x^6 + 135/17*a^8*b^2*x^(17/
3) + 15/8*a^9*b*x^(16/3) + 1/5*a^10*x^5
```

3.2318 $\int \left(a+b\sqrt[3]{x}\right)^{10} x^3\,dx$

Optimal. Leaf size=144

$$\frac{a^{10}x^4}{4}+\frac{30}{13}a^9bx^{13/3}+\frac{135}{14}a^8b^2x^{14/3}+24a^7b^3x^5+\frac{315}{8}a^6b^4x^{16/3}+\frac{756}{17}a^5b^5x^{17/3}+35a^4b^6x^6+\frac{360}{19}a^3b^7x^{19/3}+\frac{27}{4}a^2b^8x^{20/3}+\frac{10}{7}ab^9x^7+\frac{3}{22}b^{10}x^{22/3}$$

```
[Out] (a^10*x^4)/4 + (30*a^9*b*x^(13/3))/13 + (135*a^8*b^2*x^(14/3))/14
 + 24*a^7*b^3*x^5 + (315*a^6*b^4*x^(16/3))/8 + (756*a^5*b^5*x^(17
/3))/17 + 35*a^4*b^6*x^6 + (360*a^3*b^7*x^(19/3))/19 + (27*a^2*b^
8*x^(20/3))/4 + (10*a*b^9*x^7)/7 + (3*b^10*x^(22/3))/22
```

Rubi [A] time = 0.212423, antiderivative size = 144, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{a^{10}x^4}{4}+\frac{30}{13}a^9bx^{13/3}+\frac{135}{14}a^8b^2x^{14/3}+24a^7b^3x^5+\frac{315}{8}a^6b^4x^{16/3}+\frac{756}{17}a^5b^5x^{17/3}+35a^4b^6x^6+\frac{360}{19}a^3b^7x^{19/3}+\frac{27}{4}a^2b^8x^{20/3}+\frac{10}{7}ab^9x^7+\frac{3}{22}b^{10}x^{22/3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^10*x^3,x]
```

```
[Out] (a^10*x^4)/4 + (30*a^9*b*x^(13/3))/13 + (135*a^8*b^2*x^(14/3))/14
 + 24*a^7*b^3*x^5 + (315*a^6*b^4*x^(16/3))/8 + (756*a^5*b^5*x^(17
/3))/17 + 35*a^4*b^6*x^6 + (360*a^3*b^7*x^(19/3))/19 + (27*a^2*b^
8*x^(20/3))/4 + (10*a*b^9*x^7)/7 + (3*b^10*x^(22/3))/22
```

Rubi in Sympy [A] time = 36.7699, size = 144, normalized size = 1.

$$\frac{a^{10}x^4}{4}+\frac{30a^9bx^{\frac{13}{3}}}{13}+\frac{135a^8b^2x^{\frac{14}{3}}}{14}+24a^7b^3x^5+\frac{315a^6b^4x^{\frac{16}{3}}}{8}+\frac{756a^5b^5x^{\frac{17}{3}}}{17}+35a^4b^6x^6+\frac{360a^3b^7x^{\frac{19}{3}}}{19}+\frac{27a^2b^8x^{\frac{20}{3}}}{4}+\frac{10ab^9x^7}{7}+\frac{3b^{10}x^{\frac{22}{3}}}{22}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**10*x**3,x)
```

```
[Out] a**10*x**4/4 + 30*a**9*b*x**(13/3)/13 + 135*a**8*b**2*x**(14/3)/1
4 + 24*a**7*b**3*x**5 + 315*a**6*b**4*x**(16/3)/8 + 756*a**5*b**5
*x**(17/3)/17 + 35*a**4*b**6*x**6 + 360*a**3*b**7*x**(19/3)/19 +
27*a**2*b**8*x**(20/3)/4 + 10*a*b**9*x**7/7 + 3*b**10*x**(22/3)/2
2
```

Mathematica [A] time = 0.0240016, size = 144, normalized size = 1.

$$\frac{a^{10}x^4}{4}+\frac{30}{13}a^9bx^{13/3}+\frac{135}{14}a^8b^2x^{14/3}+24a^7b^3x^5+\frac{315}{8}a^6b^4x^{16/3}+\frac{756}{17}a^5b^5x^{17/3}+35a^4b^6x^6+\frac{360}{19}a^3b^7x^{19/3}+\frac{27}{4}a^2b^8x^{20/3}+\frac{10}{7}ab^9x^7+\frac{3}{22}b^{10}x^{22/3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^10*x^3,x]
```

```
[Out] (a^10*x^4)/4 + (30*a^9*b*x^(13/3))/13 + (135*a^8*b^2*x^(14/3))/14
 + 24*a^7*b^3*x^5 + (315*a^6*b^4*x^(16/3))/8 + (756*a^5*b^5*x^(17
/3))/17 + 35*a^4*b^6*x^6 + (360*a^3*b^7*x^(19/3))/19 + (27*a^2*b^
8*x^(20/3))/4 + (10*a*b^9*x^7)/7 + (3*b^10*x^(22/3))/22
```

Maple [A] time = 0.003, size = 113, normalized size = 0.8

$$\frac{a^{10}x^4}{4}+\frac{30\,a^9b}{13}x^{\frac{13}{3}}+\frac{135\,a^8b^2}{14}x^{\frac{14}{3}}+24\,a^7b^3x^5+\frac{315\,a^6b^4}{8}x^{\frac{16}{3}}+\frac{756\,a^5b^5}{17}x^{\frac{17}{3}}+35\,a^4b^6x^6+\frac{360\,a^3b^7}{19}x^{\frac{19}{3}}+\frac{27\,a^2b^8}{4}x^{\frac{20}{3}}+\frac{10\,ab^9x^7}{7}+\frac{3\,b^{10}}{22}x^{\frac{22}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^10*x^3,x)
```

```
[Out] 1/4*a^10*x^4+30/13*a^9*b*x^(13/3)+135/14*a^8*b^2*x^(14/3)+24*a^7*
b^3*x^5+315/8*a^6*b^4*x^(16/3)+756/17*a^5*b^5*x^(17/3)+35*a^4*b^6
*x^6+360/19*a^3*b^7*x^(19/3)+27/4*a^2*b^8*x^(20/3)+10/7*a*b^9*x^7
+3/22*b^10*x^(22/3)
```

Maxima [A] time = 1.42822, size = 270, normalized size = 1.88

$$\frac{3\left(bx^{\frac{1}{3}}+a\right)^{22}}{22\,b^{12}}-\frac{11\left(bx^{\frac{1}{3}}+a\right)^{21}a}{7\,b^{12}}+\frac{33\left(bx^{\frac{1}{3}}+a\right)^{20}a^2}{4\,b^{12}}-\frac{495\left(bx^{\frac{1}{3}}+a\right)^{19}a^3}{19\,b^{12}}+\frac{55\left(bx^{\frac{1}{3}}+a\right)^{18}a^4}{b^{12}}-\frac{1386\left(bx^{\frac{1}{3}}+a\right)^{17}a^5}{17\,b^{12}}+\frac{693\left(bx^{\frac{1}{3}}+a\right)^{16}a^6}{8\,b^{12}}-\frac{66\left(bx^{\frac{1}{3}}+a\right)^{15}a^7}{b^{12}}+\frac{495\left(bx^{\frac{1}{3}}+a\right)^{14}a^8}{14\,b^{12}}-\frac{165\left(bx^{\frac{1}{3}}+a\right)^{13}a^9}{13\,b^{12}}+\frac{11\left(bx^{\frac{1}{3}}+a\right)^{12}a^{10}}{4\,b^{12}}-\frac{3\left(bx^{\frac{1}{3}}+a\right)^{11}a^{11}}{11\,b^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10*x^3,x, algorithm="maxima")
```

```
[Out] 3/22*(b*x^(1/3) + a)^22/b^12 - 11/7*(b*x^(1/3) + a)^21*a/b^12 + 3
3/4*(b*x^(1/3) + a)^20*a^2/b^12 - 495/19*(b*x^(1/3) + a)^19*a^3/b
^12 + 55*(b*x^(1/3) + a)^18*a^4/b^12 - 1386/17*(b*x^(1/3) + a)^17
*a^5/b^12 + 693/8*(b*x^(1/3) + a)^16*a^6/b^12 - 66*(b*x^(1/3) + a
)^15*a^7/b^12 + 495/14*(b*x^(1/3) + a)^14*a^8/b^12 - 165/13*(b*x^
(1/3) + a)^13*a^9/b^12 + 11/4*(b*x^(1/3) + a)^12*a^10/b^12 - 3/11
*(b*x^(1/3) + a)^11*a^11/b^12
```

Fricas [A] time = 0.241902, size = 167, normalized size = 1.16

$$\frac{10}{7}\,ab^9x^7+35\,a^4b^6x^6+24\,a^7b^3x^5+\frac{1}{4}\,a^{10}x^4+\frac{27}{476}\left(119\,a^2b^8x^6+784\,a^5b^5x^5+170\,a^8b^2x^4\right)x^{\frac{2}{3}}+\frac{3}{21736}\left(988\,b^{10}x^7+137280\,a^3b^7x^6+285285\,a^6b^4x^5+16720\,a^9bx^4\right)x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10*x^3,x, algorithm="fricas")
```

```
[Out] 10/7*a*b^9*x^7 + 35*a^4*b^6*x^6 + 24*a^7*b^3*x^5 + 1/4*a^10*x^4 +
 27/476*(119*a^2*b^8*x^6 + 784*a^5*b^5*x^5 + 170*a^8*b^2*x^4)*x^(
2/3) + 3/21736*(988*b^10*x^7 + 137280*a^3*b^7*x^6 + 285285*a^6*b^
4*x^5 + 16720*a^9*b*x^4)*x^(1/3)
```

Sympy [A] time = 14.1248, size = 144, normalized size = 1.

$$\frac{a^{10}x^4}{4} + \frac{30a^9bx^{\frac{13}{3}}}{13} + \frac{135a^8b^2x^{\frac{14}{3}}}{14} + 24a^7b^3x^5 + \frac{315a^6b^4x^{\frac{16}{3}}}{8} + \frac{756a^5b^5x^{\frac{17}{3}}}{17} + 35a^4b^6x^6 + \frac{360a^3b^7x^{\frac{19}{3}}}{19} + \frac{27a^2b^8x^{\frac{20}{3}}}{4} + \frac{10ab^9x^7}{7} + \frac{3b^{10}x^{\frac{22}{3}}}{22}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**10*x**3,x)
```

```
[Out] a**10*x**4/4 + 30*a**9*b*x**(13/3)/13 + 135*a**8*b**2*x**(14/3)/1
4 + 24*a**7*b**3*x**5 + 315*a**6*b**4*x**(16/3)/8 + 756*a**5*b**5
*x**(17/3)/17 + 35*a**4*b**6*x**6 + 360*a**3*b**7*x**(19/3)/19 +
27*a**2*b**8*x**(20/3)/4 + 10*a*b**9*x**7/7 + 3*b**10*x**(22/3)/2
2
```

GIAC/XCAS [A] time = 0.234254, size = 151, normalized size = 1.05

$$\frac{3}{22}\,b^{10}x^{\frac{22}{3}} + \frac{10}{7}\,ab^9x^7 + \frac{27}{4}\,a^2b^8x^{\frac{20}{3}} + \frac{360}{19}\,a^3b^7x^{\frac{19}{3}} + 35\,a^4b^6x^6 + \frac{756}{17}\,a^5b^5x^{\frac{17}{3}} + \frac{315}{8}\,a^6b^4x^{\frac{16}{3}} + 24\,a^7b^3x^5 + \frac{135}{14}\,a^8b^2x^{\frac{14}{3}} + \frac{30}{13}\,a^9bx^{\frac{13}{3}} + \frac{1}{4}\,a^{10}x^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10*x^3,x, algorithm="giac")
```

```
[Out] 3/22*b^10*x^(22/3) + 10/7*a*b^9*x^7 + 27/4*a^2*b^8*x^(20/3) + 360
/19*a^3*b^7*x^(19/3) + 35*a^4*b^6*x^6 + 756/17*a^5*b^5*x^(17/3) +
 315/8*a^6*b^4*x^(16/3) + 24*a^7*b^3*x^5 + 135/14*a^8*b^2*x^(14/3
) + 30/13*a^9*b*x^(13/3) + 1/4*a^10*x^4
```

3.2319 $\int \left(a+b\sqrt[3]{x}\right)^{10} x^2 \, dx$

Optimal. Leaf size=179

$$\frac{3a^8\left(a+b\sqrt[3]{x}\right)^{11}}{11b^9}-\frac{2a^7\left(a+b\sqrt[3]{x}\right)^{12}}{b^9}+\frac{84a^6\left(a+b\sqrt[3]{x}\right)^{13}}{13b^9}-\frac{12a^5\left(a+b\sqrt[3]{x}\right)^{14}}{b^9}+\frac{14a^4\left(a+b\sqrt[3]{x}\right)^{15}}{b^9}-\frac{21a^3\left(a+b\sqrt[3]{x}\right)^{16}}{2b^9}+\frac{84a^2\left(a+b\sqrt[3]{x}\right)^{17}}{17b^9}+\frac{3\left(a+b\sqrt[3]{x}\right)^{19}}{19b^9}-\frac{4a\left(a+b\sqrt[3]{x}\right)^{18}}{3b^9}$$

```
[Out] (3*a^8*(a + b*x^(1/3))^11)/(11*b^9) - (2*a^7*(a + b*x^(1/3))^12)/
b^9 + (84*a^6*(a + b*x^(1/3))^13)/(13*b^9) - (12*a^5*(a + b*x^(1/
3))^14)/b^9 + (14*a^4*(a + b*x^(1/3))^15)/b^9 - (21*a^3*(a + b*x^
(1/3))^16)/(2*b^9) + (84*a^2*(a + b*x^(1/3))^17)/(17*b^9) - (4*a*
(a + b*x^(1/3))^18)/(3*b^9) + (3*(a + b*x^(1/3))^19)/(19*b^9)
```

Rubi [A] time = 0.227793, antiderivative size = 179, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{3a^8\left(a+b\sqrt[3]{x}\right)^{11}}{11b^9}-\frac{2a^7\left(a+b\sqrt[3]{x}\right)^{12}}{b^9}+\frac{84a^6\left(a+b\sqrt[3]{x}\right)^{13}}{13b^9}-\frac{12a^5\left(a+b\sqrt[3]{x}\right)^{14}}{b^9}+\frac{14a^4\left(a+b\sqrt[3]{x}\right)^{15}}{b^9}-\frac{21a^3\left(a+b\sqrt[3]{x}\right)^{16}}{2b^9}+\frac{84a^2\left(a+b\sqrt[3]{x}\right)^{17}}{17b^9}+\frac{3\left(a+b\sqrt[3]{x}\right)^{19}}{19b^9}-\frac{4a\left(a+b\sqrt[3]{x}\right)^{18}}{3b^9}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^10*x^2,x]
```

```
[Out] (3*a^8*(a + b*x^(1/3))^11)/(11*b^9) - (2*a^7*(a + b*x^(1/3))^12)/
b^9 + (84*a^6*(a + b*x^(1/3))^13)/(13*b^9) - (12*a^5*(a + b*x^(1/
3))^14)/b^9 + (14*a^4*(a + b*x^(1/3))^15)/b^9 - (21*a^3*(a + b*x^
(1/3))^16)/(2*b^9) + (84*a^2*(a + b*x^(1/3))^17)/(17*b^9) - (4*a*
(a + b*x^(1/3))^18)/(3*b^9) + (3*(a + b*x^(1/3))^19)/(19*b^9)
```

Rubi in Sympy [A] time = 34.7839, size = 141, normalized size = 0.79

$$\frac{a^{10}x^3}{3}+3a^9bx^{\frac{10}{3}}+\frac{135a^8b^2x^{\frac{11}{3}}}{11}+30a^7b^3x^4+\frac{630a^6b^4x^{\frac{13}{3}}}{13}+54a^5b^5x^{\frac{14}{3}}+42a^4b^6x^5+\frac{45a^3b^7x^{\frac{16}{3}}}{2}+\frac{135a^2b^8x^{\frac{17}{3}}}{17}+\frac{5ab^9x^6}{3}+\frac{3b^{10}x^{\frac{19}{3}}}{19}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**10*x**2,x)
```

```
[Out] a**10*x**3/3 + 3*a**9*b*x**(10/3) + 135*a**8*b**2*x**(11/3)/11 +
30*a**7*b**3*x**4 + 630*a**6*b**4*x**(13/3)/13 + 54*a**5*b**5*x**
(14/3) + 42*a**4*b**6*x**5 + 45*a**3*b**7*x**(16/3)/2 + 135*a**2*
b**8*x**(17/3)/17 + 5*a*b**9*x**6/3 + 3*b**10*x**(19/3)/19
```

Mathematica [A] time = 0.0298755, size = 140, normalized size = 0.78

$$\frac{a^{10}x^3}{3}+3a^9bx^{10/3}+\frac{135}{11}a^8b^2x^{11/3}+30a^7b^3x^4+\frac{630}{13}a^6b^4x^{13/3}+54a^5b^5x^{14/3}+42a^4b^6x^5+\frac{45}{2}a^3b^7x^{16/3}+\frac{135}{17}a^2b^8x^{17/3}+\frac{5}{3}ab^9x^6+\frac{3}{19}b^{10}x^{19/3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^10*x^2,x]
```

```
[Out] (a^10*x^3)/3 + 3*a^9*b*x^(10/3) + (135*a^8*b^2*x^(11/3))/11 + 30*
a^7*b^3*x^4 + (630*a^6*b^4*x^(13/3))/13 + 54*a^5*b^5*x^(14/3) + 4
2*a^4*b^6*x^5 + (45*a^3*b^7*x^(16/3))/2 + (135*a^2*b^8*x^(17/3))/
17 + (5*a*b^9*x^6)/3 + (3*b^10*x^(19/3))/19
```

Maple [A] time = 0.003, size = 113, normalized size = 0.6

$$\frac{3\,b^{10}}{19}x^{\frac{19}{3}}+\frac{5\,ab^{9}x^{6}}{3}+\frac{135\,a^{2}b^{8}}{17}x^{\frac{17}{3}}+\frac{45\,a^{3}b^{7}}{2}x^{\frac{16}{3}}+42\,x^{5}a^{4}b^{6}+54\,a^{5}b^{5}x^{14/3}+\frac{630\,a^{6}b^{4}}{13}x^{\frac{13}{3}}+30\,a^{7}b^{3}x^{4}+\frac{135\,a^{8}b^{2}}{11}x^{\frac{11}{3}}+3\,a^{9}bx^{10/3}+\frac{x^{3}a^{10}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^10*x^2,x)
```

```
[Out] 3/19*b^10*x^(19/3)+5/3*a*b^9*x^6+135/17*a^2*b^8*x^(17/3)+45/2*a^3
*b^7*x^(16/3)+42*x^5*a^4*b^6+54*a^5*b^5*x^(14/3)+630/13*a^6*b^4*x
^(13/3)+30*a^7*b^3*x^4+135/11*a^8*b^2*x^(11/3)+3*a^9*b*x^(10/3)+1
/3*x^3*a^10
```

Maxima [A] time = 1.44399, size = 201, normalized size = 1.12

$$\frac{3\left(bx^{\frac{1}{3}}+a\right)^{19}}{19\,b^{9}}-\frac{4\left(bx^{\frac{1}{3}}+a\right)^{18}a}{3\,b^{9}}+\frac{84\left(bx^{\frac{1}{3}}+a\right)^{17}a^{2}}{17\,b^{9}}-\frac{21\left(bx^{\frac{1}{3}}+a\right)^{16}a^{3}}{2\,b^{9}}+\frac{14\left(bx^{\frac{1}{3}}+a\right)^{15}a^{4}}{b^{9}}-\frac{12\left(bx^{\frac{1}{3}}+a\right)^{14}a^{5}}{b^{9}}+\frac{84\left(bx^{\frac{1}{3}}+a\right)^{13}a^{6}}{13\,b^{9}}-\frac{2\left(bx^{\frac{1}{3}}+a\right)^{12}a^{7}}{b^{9}}+\frac{3\left(bx^{\frac{1}{3}}+a\right)^{11}a^{8}}{11\,b^{9}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10*x^2,x, algorithm="maxima")
```

```
[Out] 3/19*(b*x^(1/3) + a)^19/b^9 - 4/3*(b*x^(1/3) + a)^18*a/b^9 + 84/1
7*(b*x^(1/3) + a)^17*a^2/b^9 - 21/2*(b*x^(1/3) + a)^16*a^3/b^9 +
14*(b*x^(1/3) + a)^15*a^4/b^9 - 12*(b*x^(1/3) + a)^14*a^5/b^9 + 8
4/13*(b*x^(1/3) + a)^13*a^6/b^9 - 2*(b*x^(1/3) + a)^12*a^7/b^9 +
3/11*(b*x^(1/3) + a)^11*a^8/b^9
```

Fricas [A] time = 0.238689, size = 167, normalized size = 0.93

$$\frac{5}{3}\,ab^{9}x^{6}+42\,a^{4}b^{6}x^{5}+30\,a^{7}b^{3}x^{4}+\frac{1}{3}\,a^{10}x^{3}+\frac{27}{187}\left(55\,a^{2}b^{8}x^{5}+374\,a^{5}b^{5}x^{4}+85\,a^{8}b^{2}x^{3}\right)x^{\frac{2}{3}}+\frac{3}{494}\left(26\,b^{10}x^{6}+3705\,a^{3}b^{7}x^{5}+7980\,a^{6}b^{4}x^{4}+494\,a^{9}bx^{3}\right)x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10*x^2,x, algorithm="fricas")
```

```
[Out] 5/3*a*b^9*x^6 + 42*a^4*b^6*x^5 + 30*a^7*b^3*x^4 + 1/3*a^10*x^3 +
27/187*(55*a^2*b^8*x^5 + 374*a^5*b^5*x^4 + 85*a^8*b^2*x^3)*x^(2/3
) + 3/494*(26*b^10*x^6 + 3705*a^3*b^7*x^5 + 7980*a^6*b^4*x^4 + 49
4*a^9*b*x^3)*x^(1/3)
```

Sympy [A] time = 8.56349, size = 141, normalized size = 0.79

$$\frac{a^{10}x^3}{3} + 3a^9bx^{\frac{10}{3}} + \frac{135a^8b^2x^{\frac{11}{3}}}{11} + 30a^7b^3x^4 + \frac{630a^6b^4x^{\frac{13}{3}}}{13} + 54a^5b^5x^{\frac{14}{3}} + 42a^4b^6x^5 + \frac{45a^3b^7x^{\frac{16}{3}}}{2} + \frac{135a^2b^8x^{\frac{17}{3}}}{17} + \frac{5ab^9x^6}{3} + \frac{3b^{10}x^{\frac{19}{3}}}{19}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**10*x**2,x)
```

```
[Out] a**10*x**3/3 + 3*a**9*b*x**(10/3) + 135*a**8*b**2*x**(11/3)/11 +
30*a**7*b**3*x**4 + 630*a**6*b**4*x**(13/3)/13 + 54*a**5*b**5*x**
(14/3) + 42*a**4*b**6*x**5 + 45*a**3*b**7*x**(16/3)/2 + 135*a**2*
b**8*x**(17/3)/17 + 5*a*b**9*x**6/3 + 3*b**10*x**(19/3)/19
```

GIAC/XCAS [A] time = 0.237384, size = 151, normalized size = 0.84

$$\frac{3}{19}\,b^{10}x^{\frac{19}{3}} + \frac{5}{3}\,ab^9x^6 + \frac{135}{17}\,a^2b^8x^{\frac{17}{3}} + \frac{45}{2}\,a^3b^7x^{\frac{16}{3}} + 42\,a^4b^6x^5 + 54\,a^5b^5x^{\frac{14}{3}} + \frac{630}{13}\,a^6b^4x^{\frac{13}{3}} + 30\,a^7b^3x^4 + \frac{135}{11}\,a^8b^2x^{\frac{11}{3}} + 3\,a^9bx^{\frac{10}{3}} + \frac{1}{3}\,a^{10}x^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10*x^2,x, algorithm="giac")
```

```
[Out] 3/19*b^10*x^(19/3) + 5/3*a*b^9*x^6 + 135/17*a^2*b^8*x^(17/3) + 45
/2*a^3*b^7*x^(16/3) + 42*a^4*b^6*x^5 + 54*a^5*b^5*x^(14/3) + 630/
13*a^6*b^4*x^(13/3) + 30*a^7*b^3*x^4 + 135/11*a^8*b^2*x^(11/3) +
3*a^9*b*x^(10/3) + 1/3*a^10*x^3
```

3.2320 $\int \left(a+b\sqrt[3]{x}\right)^{10} x \, dx$

Optimal. Leaf size=120

$$-\frac{3a^5\left(a+b\sqrt[3]{x}\right)^{11}}{11b^6}+\frac{5a^4\left(a+b\sqrt[3]{x}\right)^{12}}{4b^6}-\frac{30a^3\left(a+b\sqrt[3]{x}\right)^{13}}{13b^6}+\frac{15a^2\left(a+b\sqrt[3]{x}\right)^{14}}{7b^6}+\frac{3\left(a+b\sqrt[3]{x}\right)^{16}}{16b^6}-\frac{a\left(a+b\sqrt[3]{x}\right)^{15}}{b^6}$$

```
[Out] (-3*a^5*(a + b*x^(1/3))^11)/(11*b^6) + (5*a^4*(a + b*x^(1/3))^12)
/(4*b^6) - (30*a^3*(a + b*x^(1/3))^13)/(13*b^6) + (15*a^2*(a + b*
x^(1/3))^14)/(7*b^6) - (a*(a + b*x^(1/3))^15)/b^6 + (3*(a + b*x^(
1/3))^16)/(16*b^6)
```

Rubi [A] time = 0.165851, antiderivative size = 120, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{3a^5\left(a+b\sqrt[3]{x}\right)^{11}}{11b^6}+\frac{5a^4\left(a+b\sqrt[3]{x}\right)^{12}}{4b^6}-\frac{30a^3\left(a+b\sqrt[3]{x}\right)^{13}}{13b^6}+\frac{15a^2\left(a+b\sqrt[3]{x}\right)^{14}}{7b^6}+\frac{3\left(a+b\sqrt[3]{x}\right)^{16}}{16b^6}-\frac{a\left(a+b\sqrt[3]{x}\right)^{15}}{b^6}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^10*x,x]
```

```
[Out] (-3*a^5*(a + b*x^(1/3))^11)/(11*b^6) + (5*a^4*(a + b*x^(1/3))^12)
/(4*b^6) - (30*a^3*(a + b*x^(1/3))^13)/(13*b^6) + (15*a^2*(a + b*
x^(1/3))^14)/(7*b^6) - (a*(a + b*x^(1/3))^15)/b^6 + (3*(a + b*x^(
1/3))^16)/(16*b^6)
```

Rubi in Sympy [A] time = 30.0399, size = 112, normalized size = 0.93

$$-\frac{3a^5\left(a+b\sqrt[3]{x}\right)^{11}}{11b^6}+\frac{5a^4\left(a+b\sqrt[3]{x}\right)^{12}}{4b^6}-\frac{30a^3\left(a+b\sqrt[3]{x}\right)^{13}}{13b^6}+\frac{15a^2\left(a+b\sqrt[3]{x}\right)^{14}}{7b^6}-\frac{a\left(a+b\sqrt[3]{x}\right)^{15}}{b^6}+\frac{3\left(a+b\sqrt[3]{x}\right)^{16}}{16b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**10*x,x)
```

```
[Out] -3*a**5*(a + b*x**(1/3))**11/(11*b**6) + 5*a**4*(a + b*x**(1/3))*
*12/(4*b**6) - 30*a**3*(a + b*x**(1/3))**13/(13*b**6) + 15*a**2*(
a + b*x**(1/3))**14/(7*b**6) - a*(a + b*x**(1/3))**15/b**6 + 3*(a
 + b*x**(1/3))**16/(16*b**6)
```

Mathematica [A] time = 0.022489, size = 142, normalized size = 1.18

$$\frac{a^{10}x^2}{2}+\frac{30}{7}a^9bx^{7/3}+\frac{135}{8}a^8b^2x^{8/3}+40a^7b^3x^3+63a^6b^4x^{10/3}+\frac{756}{11}a^5b^5x^{11/3}+\frac{105}{2}a^4b^6x^4+\frac{360}{13}a^3b^7x^{13/3}+\frac{135}{14}a^2b^8x^{14/3}+2ab^9x^5+\frac{3}{16}b^{10}x^{16/3}$$

Antiderivative was successfully verified.

```
[In]   Integrate[(a + b*x^(1/3))^10*x,x]
```

```
[Out] (a^10*x^2)/2 + (30*a^9*b*x^(7/3))/7 + (135*a^8*b^2*x^(8/3))/8 + 4
0*a^7*b^3*x^3 + 63*a^6*b^4*x^(10/3) + (756*a^5*b^5*x^(11/3))/11 +
 (105*a^4*b^6*x^4)/2 + (360*a^3*b^7*x^(13/3))/13 + (135*a^2*b^8*x
^(14/3))/14 + 2*a*b^9*x^5 + (3*b^10*x^(16/3))/16
```

Maple [A]   time = 0.003, size = 113, normalized size = 0.9

$$\frac{3\,b^{10}}{16}x^{\frac{16}{3}}+2\,ab^{9}x^{5}+\frac{135\,a^{2}b^{8}}{14}x^{\frac{14}{3}}+\frac{360\,a^{3}b^{7}}{13}x^{\frac{13}{3}}+\frac{105\,x^{4}a^{4}b^{6}}{2}+\frac{756\,a^{5}b^{5}}{11}x^{\frac{11}{3}}+63\,a^{6}b^{4}x^{10/3}+40\,a^{7}b^{3}x^{3}+\frac{135\,a^{8}b^{2}}{8}x^{\frac{8}{3}}+\frac{30\,a^{9}b}{7}x^{\frac{7}{3}}+\frac{x^{2}a^{10}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((a+b*x^(1/3))^10*x,x)
```

```
[Out] 3/16*b^10*x^(16/3)+2*a*b^9*x^5+135/14*a^2*b^8*x^(14/3)+360/13*a^3
*b^7*x^(13/3)+105/2*x^4*a^4*b^6+756/11*a^5*b^5*x^(11/3)+63*a^6*b^
4*x^(10/3)+40*a^7*b^3*x^3+135/8*a^8*b^2*x^(8/3)+30/7*a^9*b*x^(7/3
)+1/2*x^2*a^10
```

Maxima [A]   time = 1.44269, size = 132, normalized size = 1.1

$$\frac{3\left(bx^{\frac{1}{3}}+a\right)^{16}}{16\,b^{6}}-\frac{\left(bx^{\frac{1}{3}}+a\right)^{15}a}{b^{6}}+\frac{15\left(bx^{\frac{1}{3}}+a\right)^{14}a^{2}}{7\,b^{6}}-\frac{30\left(bx^{\frac{1}{3}}+a\right)^{13}a^{3}}{13\,b^{6}}+\frac{5\left(bx^{\frac{1}{3}}+a\right)^{12}a^{4}}{4\,b^{6}}-\frac{3\left(bx^{\frac{1}{3}}+a\right)^{11}a^{5}}{11\,b^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^(1/3) + a)^10*x,x, algorithm="maxima")
```

```
[Out] 3/16*(b*x^(1/3) + a)^16/b^6 - (b*x^(1/3) + a)^15*a/b^6 + 15/7*(b*
x^(1/3) + a)^14*a^2/b^6 - 30/13*(b*x^(1/3) + a)^13*a^3/b^6 + 5/4*
(b*x^(1/3) + a)^12*a^4/b^6 - 3/11*(b*x^(1/3) + a)^11*a^5/b^6
```

Fricas [A]   time = 0.236912, size = 167, normalized size = 1.39

$$2\,ab^{9}x^{5}+\frac{105}{2}\,a^{4}b^{6}x^{4}+40\,a^{7}b^{3}x^{3}+\frac{1}{2}\,a^{10}x^{2}+\frac{27}{616}\left(220\,a^{2}b^{8}x^{4}+1568\,a^{5}b^{5}x^{3}+385\,a^{8}b^{2}x^{2}\right)x^{\frac{2}{3}}+\frac{3}{1456}\left(91\,b^{10}x^{5}+13440\,a^{3}b^{7}x^{4}+30576\,a^{6}b^{4}x^{3}+2080\,a^{9}bx^{2}\right)x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^(1/3) + a)^10*x,x, algorithm="fricas")
```

```
[Out] 2*a*b^9*x^5 + 105/2*a^4*b^6*x^4 + 40*a^7*b^3*x^3 + 1/2*a^10*x^2 +
 27/616*(220*a^2*b^8*x^4 + 1568*a^5*b^5*x^3 + 385*a^8*b^2*x^2)*x^
(2/3) + 3/1456*(91*b^10*x^5 + 13440*a^3*b^7*x^4 + 30576*a^6*b^4*x
^3 + 2080*a^9*b*x^2)*x^(1/3)
```

Sympy [A]   time = 3.53187, size = 143, normalized size = 1.19

$$\frac{a^{10}x^{2}}{2}+\frac{30a^{9}bx^{\frac{7}{3}}}{7}+\frac{135a^{8}b^{2}x^{\frac{8}{3}}}{8}+40a^{7}b^{3}x^{3}+63a^{6}b^{4}x^{\frac{10}{3}}+\frac{756a^{5}b^{5}x^{\frac{11}{3}}}{11}+\frac{105a^{4}b^{6}x^{4}}{2}+\frac{360a^{3}b^{7}x^{\frac{13}{3}}}{13}+\frac{135a^{2}b^{8}x^{\frac{14}{3}}}{14}+2ab^{9}x^{5}+\frac{3b^{10}x^{\frac{16}{3}}}{16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**10*x,x)
```

```
[Out] a**10*x**2/2 + 30*a**9*b*x**(7/3)/7 + 135*a**8*b**2*x**(8/3)/8 +
40*a**7*b**3*x**3 + 63*a**6*b**4*x**(10/3) + 756*a**5*b**5*x**(11
/3)/11 + 105*a**4*b**6*x**4/2 + 360*a**3*b**7*x**(13/3)/13 + 135*
a**2*b**8*x**(14/3)/14 + 2*a*b**9*x**5 + 3*b**10*x**(16/3)/16
```

GIAC/XCAS [A] time = 0.247145, size = 151, normalized size = 1.26

$$\frac{3}{16}\,b^{10}x^{\frac{16}{3}} + 2\,ab^{9}x^{5} + \frac{135}{14}\,a^{2}b^{8}x^{\frac{14}{3}} + \frac{360}{13}\,a^{3}b^{7}x^{\frac{13}{3}} + \frac{105}{2}\,a^{4}b^{6}x^{4} + \frac{756}{11}\,a^{5}b^{5}x^{\frac{11}{3}} + 63\,a^{6}b^{4}x^{\frac{10}{3}} + 40\,a^{7}b^{3}x^{3} + \frac{135}{8}\,a^{8}b^{2}x^{\frac{8}{3}} + \frac{30}{7}\,a^{9}bx^{\frac{7}{3}} + \frac{1}{2}\,a^{10}x^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10*x,x, algorithm="giac")
```

```
[Out] 3/16*b^10*x^(16/3) + 2*a*b^9*x^5 + 135/14*a^2*b^8*x^(14/3) + 360/
13*a^3*b^7*x^(13/3) + 105/2*a^4*b^6*x^4 + 756/11*a^5*b^5*x^(11/3)
 + 63*a^6*b^4*x^(10/3) + 40*a^7*b^3*x^3 + 135/8*a^8*b^2*x^(8/3) +
 30/7*a^9*b*x^(7/3) + 1/2*a^10*x^2
```

3.2321 $\int \left(a+b\sqrt[3]{x}\right)^{10}\,dx$

Optimal. Leaf size=59

$$\frac{3a^2\left(a+b\sqrt[3]{x}\right)^{11}}{11b^3}+\frac{3\left(a+b\sqrt[3]{x}\right)^{13}}{13b^3}-\frac{a\left(a+b\sqrt[3]{x}\right)^{12}}{2b^3}$$

```
[Out] (3*a^2*(a + b*x^(1/3))^11)/(11*b^3) - (a*(a + b*x^(1/3))^12)/(2*b
^3) + (3*(a + b*x^(1/3))^13)/(13*b^3)
```

Rubi [A] time = 0.107089, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{3a^2\left(a+b\sqrt[3]{x}\right)^{11}}{11b^3}+\frac{3\left(a+b\sqrt[3]{x}\right)^{13}}{13b^3}-\frac{a\left(a+b\sqrt[3]{x}\right)^{12}}{2b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^10,x]
```

```
[Out] (3*a^2*(a + b*x^(1/3))^11)/(11*b^3) - (a*(a + b*x^(1/3))^12)/(2*b
^3) + (3*(a + b*x^(1/3))^13)/(13*b^3)
```

Rubi in Sympy [A] time = 17.6768, size = 53, normalized size = 0.9

$$\frac{3a^2\left(a+b\sqrt[3]{x}\right)^{11}}{11b^3}-\frac{a\left(a+b\sqrt[3]{x}\right)^{12}}{2b^3}+\frac{3\left(a+b\sqrt[3]{x}\right)^{13}}{13b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**10,x)
```

```
[Out] 3*a**2*(a + b*x**(1/3))**11/(11*b**3) - a*(a + b*x**(1/3))**12/(2
*b**3) + 3*(a + b*x**(1/3))**13/(13*b**3)
```

Mathematica [B] time = 0.0195622, size = 133, normalized size = 2.25

$$a^{10}x+\frac{15}{2}a^9bx^{4/3}+27a^8b^2x^{5/3}+60a^7b^3x^2+90a^6b^4x^{7/3}+\frac{189}{2}a^5b^5x^{8/3}+70a^4b^6x^3+36a^3b^7x^{10/3}+\frac{135}{11}a^2b^8x^{11/3}+\frac{5}{2}ab^9x^4+\frac{3}{13}b^{10}x^{13/3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^10,x]
```

```
[Out] a^10*x + (15*a^9*b*x^(4/3))/2 + 27*a^8*b^2*x^(5/3) + 60*a^7*b^3*x
^2 + 90*a^6*b^4*x^(7/3) + (189*a^5*b^5*x^(8/3))/2 + 70*a^4*b^6*x^
3 + 36*a^3*b^7*x^(10/3) + (135*a^2*b^8*x^(11/3))/11 + (5*a*b^9*x^
4)/2 + (3*b^10*x^(13/3))/13
```

Maple [B] time = 0.004, size = 110, normalized size = 1.9

$$xa^{10}+\frac{3\,b^{10}}{13}x^{\frac{13}{3}}+\frac{5\,ab^9x^4}{2}+\frac{135\,a^2b^8}{11}x^{\frac{11}{3}}+36\,a^3b^7x^{10/3}+70\,a^4b^6x^3+\frac{189\,a^5b^5}{2}x^{\frac{8}{3}}+90\,a^6b^4x^{7/3}+60\,a^7b^3x^2+27\,a^8b^2x^{5/3}+\frac{15\,a^9b}{2}x^{\frac{4}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((a+b*x^(1/3))^10,x)
```

```
[Out] x*a^10+3/13*b^10*x^(13/3)+5/2*a*b^9*x^4+135/11*a^2*b^8*x^(11/3)+3
6*a^3*b^7*x^(10/3)+70*a^4*b^6*x^3+189/2*a^5*b^5*x^(8/3)+90*a^6*b^
4*x^(7/3)+60*a^7*b^3*x^2+27*a^8*b^2*x^(5/3)+15/2*a^9*b*x^(4/3)
```

Maxima [A] time = 1.44466, size = 63, normalized size = 1.07

$$\frac{3\left(bx^{\frac{1}{3}}+a\right)^{13}}{13\,b^3}-\frac{\left(bx^{\frac{1}{3}}+a\right)^{12}a}{2\,b^3}+\frac{3\left(bx^{\frac{1}{3}}+a\right)^{11}a^2}{11\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^(1/3) + a)^10,x, algorithm="maxima")
```

```
[Out] 3/13*(b*x^(1/3) + a)^13/b^3 - 1/2*(b*x^(1/3) + a)^12*a/b^3 + 3/11
*(b*x^(1/3) + a)^11*a^2/b^3
```

Fricas [A] time = 0.238159, size = 158, normalized size = 2.68

$$\frac{5}{2}\,ab^9x^4+70\,a^4b^6x^3+60\,a^7b^3x^2+a^{10}x+\frac{27}{22}\left(10\,a^2b^8x^3+77\,a^5b^5x^2+22\,a^8b^2x\right)x^{\frac{2}{3}}+\frac{3}{26}\left(2\,b^{10}x^4+312\,a^3b^7x^3+780\,a^6b^4x^2+65\,a^9bx\right)x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^(1/3) + a)^10,x, algorithm="fricas")
```

```
[Out] 5/2*a*b^9*x^4 + 70*a^4*b^6*x^3 + 60*a^7*b^3*x^2 + a^10*x + 27/22*
(10*a^2*b^8*x^3 + 77*a^5*b^5*x^2 + 22*a^8*b^2*x)*x^(2/3) + 3/26*(
2*b^10*x^4 + 312*a^3*b^7*x^3 + 780*a^6*b^4*x^2 + 65*a^9*b*x)*x^(1
/3)
```

Sympy [A] time = 2.80363, size = 136, normalized size = 2.31

$$a^{10}x+\frac{15a^9bx^{\frac{4}{3}}}{2}+27a^8b^2x^{\frac{5}{3}}+60a^7b^3x^2+90a^6b^4x^{\frac{7}{3}}+\frac{189a^5b^5x^{\frac{8}{3}}}{2}+70a^4b^6x^3+36a^3b^7x^{\frac{10}{3}}+\frac{135a^2b^8x^{\frac{11}{3}}}{11}+\frac{5ab^9x^4}{2}+\frac{3b^{10}x^{\frac{13}{3}}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a+b*x**(1/3))**10,x)
```

```
[Out] a**10*x + 15*a**9*b*x**(4/3)/2 + 27*a**8*b**2*x**(5/3) + 60*a**7*
b**3*x**2 + 90*a**6*b**4*x**(7/3) + 189*a**5*b**5*x**(8/3)/2 + 70
*a**4*b**6*x**3 + 36*a**3*b**7*x**(10/3) + 135*a**2*b**8*x**(11/3
)/11 + 5*a*b**9*x**4/2 + 3*b**10*x**(13/3)/13
```

GIAC/XCAS [A] time = 0.25986, size = 147, normalized size = 2.49

$$\frac{3}{13}\,b^{10}x^{\frac{13}{3}}+\frac{5}{2}\,ab^9x^4+\frac{135}{11}\,a^2b^8x^{\frac{11}{3}}+36\,a^3b^7x^{\frac{10}{3}}+70\,a^4b^6x^3+\frac{189}{2}\,a^5b^5x^{\frac{8}{3}}+90\,a^6b^4x^{\frac{7}{3}}+60\,a^7b^3x^2+27\,a^8b^2x^{\frac{5}{3}}+\frac{15}{2}\,a^9bx^{\frac{4}{3}}+a^{10}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10,x, algorithm="giac")
```

```
[Out] 3/13*b^10*x^(13/3) + 5/2*a*b^9*x^4 + 135/11*a^2*b^8*x^(11/3) + 36
*a^3*b^7*x^(10/3) + 70*a^4*b^6*x^3 + 189/2*a^5*b^5*x^(8/3) + 90*a
^6*b^4*x^(7/3) + 60*a^7*b^3*x^2 + 27*a^8*b^2*x^(5/3) + 15/2*a^9*b
*x^(4/3) + a^10*x
```

3.2322 $\int \frac{\left(a+b\sqrt[3]{x}\right)^{10}}{x}\,dx$

Optimal. Leaf size=136

$$a^{10}\log(x)+30a^9b\sqrt[3]{x}+\frac{135}{2}a^8b^2x^{2/3}+120a^7b^3x+\frac{315}{2}a^6b^4x^{4/3}+\frac{756}{5}a^5b^5x^{5/3}+105a^4b^6x^2+\frac{360}{7}a^3b^7x^{7/3}+\frac{135}{8}a^2b^8x^{8/3}+\frac{10}{3}ab^9x^3+\frac{3}{10}b^{10}x^{10/3}$$

```
[Out] 30*a^9*b*x^(1/3) + (135*a^8*b^2*x^(2/3))/2 + 120*a^7*b^3*x + (315
*a^6*b^4*x^(4/3))/2 + (756*a^5*b^5*x^(5/3))/5 + 105*a^4*b^6*x^2 +
 (360*a^3*b^7*x^(7/3))/7 + (135*a^2*b^8*x^(8/3))/8 + (10*a*b^9*x^
3)/3 + (3*b^10*x^(10/3))/10 + a^10*Log[x]
```

Rubi [A] time = 0.157414, antiderivative size = 136, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$a^{10}\log(x)+30a^9b\sqrt[3]{x}+\frac{135}{2}a^8b^2x^{2/3}+120a^7b^3x+\frac{315}{2}a^6b^4x^{4/3}+\frac{756}{5}a^5b^5x^{5/3}+105a^4b^6x^2+\frac{360}{7}a^3b^7x^{7/3}+\frac{135}{8}a^2b^8x^{8/3}+\frac{10}{3}ab^9x^3+\frac{3}{10}b^{10}x^{10/3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^10/x,x]
```

```
[Out] 30*a^9*b*x^(1/3) + (135*a^8*b^2*x^(2/3))/2 + 120*a^7*b^3*x + (315
*a^6*b^4*x^(4/3))/2 + (756*a^5*b^5*x^(5/3))/5 + 105*a^4*b^6*x^2 +
 (360*a^3*b^7*x^(7/3))/7 + (135*a^2*b^8*x^(8/3))/8 + (10*a*b^9*x^
3)/3 + (3*b^10*x^(10/3))/10 + a^10*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$3a^{10}\log\left(\sqrt[3]{x}\right)+30a^9b\sqrt[3]{x}+135a^8b^2\int^{\sqrt[3]{x}}x\,dx+120a^7b^3x+\frac{315a^6b^4x^{\frac{4}{3}}}{2}+\frac{756a^5b^5x^{\frac{5}{3}}}{5}+105a^4b^6x^2+\frac{360a^3b^7x^{\frac{7}{3}}}{7}+\frac{135a^2b^8x^{\frac{8}{3}}}{8}+\frac{10ab^9x^3}{3}+\frac{3b^{10}x^{\frac{10}{3}}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**10/x,x)
```

```
[Out] 3*a**10*log(x**(1/3)) + 30*a**9*b*x**(1/3) + 135*a**8*b**2*Integr
al(x, (x, x**(1/3))) + 120*a**7*b**3*x + 315*a**6*b**4*x**(4/3)/2
 + 756*a**5*b**5*x**(5/3)/5 + 105*a**4*b**6*x**2 + 360*a**3*b**7*
x**(7/3)/7 + 135*a**2*b**8*x**(8/3)/8 + 10*a*b**9*x**3/3 + 3*b**1
0*x**(10/3)/10
```

Mathematica [A] time = 0.0321525, size = 136, normalized size = 1.

$$a^{10}\log(x)+30a^9b\sqrt[3]{x}+\frac{135}{2}a^8b^2x^{2/3}+120a^7b^3x+\frac{315}{2}a^6b^4x^{4/3}+\frac{756}{5}a^5b^5x^{5/3}+105a^4b^6x^2+\frac{360}{7}a^3b^7x^{7/3}+\frac{135}{8}a^2b^8x^{8/3}+\frac{10}{3}ab^9x^3+\frac{3}{10}b^{10}x^{10/3}$$

Antiderivative was successfully verified.

```
[In]   Integrate[(a + b*x^(1/3))^10/x,x]
```

```
[Out] 30*a^9*b*x^(1/3) + (135*a^8*b^2*x^(2/3))/2 + 120*a^7*b^3*x + (315
*a^6*b^4*x^(4/3))/2 + (756*a^5*b^5*x^(5/3))/5 + 105*a^4*b^6*x^2 +
 (360*a^3*b^7*x^(7/3))/7 + (135*a^2*b^8*x^(8/3))/8 + (10*a*b^9*x^
3)/3 + (3*b^10*x^(10/3))/10 + a^10*Log[x]
```

Maple [A]   time = 0.006, size = 109, normalized size = 0.8

$$30\,a^{9}b\sqrt[3]{x}+\frac{135\,a^{8}b^{2}}{2}x^{\frac{2}{3}}+120\,a^{7}b^{3}x+\frac{315\,a^{6}b^{4}}{2}x^{\frac{4}{3}}+\frac{756\,a^{5}b^{5}}{5}x^{\frac{5}{3}}+105\,a^{4}b^{6}x^{2}+\frac{360\,a^{3}b^{7}}{7}x^{\frac{7}{3}}+\frac{135\,a^{2}b^{8}}{8}x^{\frac{8}{3}}+\frac{10\,ab^{9}x^{3}}{3}+\frac{3\,b^{10}}{10}x^{\frac{10}{3}}+a^{10}\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((a+b*x^(1/3))^10/x,x)
```

```
[Out] 30*a^9*b*x^(1/3)+135/2*a^8*b^2*x^(2/3)+120*a^7*b^3*x+315/2*a^6*b^
4*x^(4/3)+756/5*a^5*b^5*x^(5/3)+105*a^4*b^6*x^2+360/7*a^3*b^7*x^(
7/3)+135/8*a^2*b^8*x^(8/3)+10/3*a*b^9*x^3+3/10*b^10*x^(10/3)+a^10
*ln(x)
```

Maxima [A]   time = 1.44564, size = 146, normalized size = 1.07

$$\frac{3}{10}\,b^{10}x^{\frac{10}{3}}+\frac{10}{3}\,ab^{9}x^{3}+\frac{135}{8}\,a^{2}b^{8}x^{\frac{8}{3}}+\frac{360}{7}\,a^{3}b^{7}x^{\frac{7}{3}}+105\,a^{4}b^{6}x^{2}+\frac{756}{5}\,a^{5}b^{5}x^{\frac{5}{3}}+\frac{315}{2}\,a^{6}b^{4}x^{\frac{4}{3}}+120\,a^{7}b^{3}x+a^{10}\log(x)+\frac{135}{2}\,a^{8}b^{2}x^{\frac{2}{3}}+30\,a^{9}bx^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^(1/3) + a)^10/x,x, algorithm="maxima")
```

```
[Out] 3/10*b^10*x^(10/3) + 10/3*a*b^9*x^3 + 135/8*a^2*b^8*x^(8/3) + 360
/7*a^3*b^7*x^(7/3) + 105*a^4*b^6*x^2 + 756/5*a^5*b^5*x^(5/3) + 31
5/2*a^6*b^4*x^(4/3) + 120*a^7*b^3*x + a^10*log(x) + 135/2*a^8*b^2
*x^(2/3) + 30*a^9*b*x^(1/3)
```

Fricas [A]   time = 0.244942, size = 153, normalized size = 1.12

$$\frac{10}{3}\,ab^{9}x^{3}+105\,a^{4}b^{6}x^{2}+120\,a^{7}b^{3}x+3\,a^{10}\log\left(x^{\frac{1}{3}}\right)+\frac{27}{40}\left(25\,a^{2}b^{8}x^{2}+224\,a^{5}b^{5}x+100\,a^{8}b^{2}\right)x^{\frac{2}{3}}+\frac{3}{70}\left(7\,b^{10}x^{3}+1200\,a^{3}b^{7}x^{2}+3675\,a^{6}b^{4}x+700\,a^{9}b\right)x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^(1/3) + a)^10/x,x, algorithm="fricas")
```

```
[Out] 10/3*a*b^9*x^3 + 105*a^4*b^6*x^2 + 120*a^7*b^3*x + 3*a^10*log(x^(
1/3)) + 27/40*(25*a^2*b^8*x^2 + 224*a^5*b^5*x + 100*a^8*b^2)*x^(2
/3) + 3/70*(7*b^10*x^3 + 1200*a^3*b^7*x^2 + 3675*a^6*b^4*x + 700*
a^9*b)*x^(1/3)
```

Sympy [A] time = 10.1803, size = 139, normalized size = 1.02

$$a^{10}\log(x) + 30a^9b\sqrt[3]{x} + \frac{135a^8b^2x^{\frac{2}{3}}}{2} + 120a^7b^3x + \frac{315a^6b^4x^{\frac{4}{3}}}{2} + \frac{756a^5b^5x^{\frac{5}{3}}}{5} + 105a^4b^6x^2 + \frac{360a^3b^7x^{\frac{7}{3}}}{7} + \frac{135a^2b^8x^{\frac{8}{3}}}{8} + \frac{10ab^9x^3}{3} + \frac{3b^{10}x^{\frac{10}{3}}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**10/x,x)
```

```
[Out] a**10*log(x) + 30*a**9*b*x**(1/3) + 135*a**8*b**2*x**(2/3)/2 + 12
0*a**7*b**3*x + 315*a**6*b**4*x**(4/3)/2 + 756*a**5*b**5*x**(5/3)
/5 + 105*a**4*b**6*x**2 + 360*a**3*b**7*x**(7/3)/7 + 135*a**2*b**
8*x**(8/3)/8 + 10*a*b**9*x**3/3 + 3*b**10*x**(10/3)/10
```

GIAC/XCAS [A] time = 0.22748, size = 147, normalized size = 1.08

$$\frac{3}{10}\,b^{10}x^{\frac{10}{3}} + \frac{10}{3}\,ab^9x^3 + \frac{135}{8}\,a^2b^8x^{\frac{8}{3}} + \frac{360}{7}\,a^3b^7x^{\frac{7}{3}} + 105\,a^4b^6x^2 + \frac{756}{5}\,a^5b^5x^{\frac{5}{3}} + \frac{315}{2}\,a^6b^4x^{\frac{4}{3}} + 120\,a^7b^3x + a^{10}\ln(|x|) + \frac{135}{2}\,a^8b^2x^{\frac{2}{3}} + 30\,a^9bx^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10/x,x, algorithm="giac")
```

```
[Out] 3/10*b^10*x^(10/3) + 10/3*a*b^9*x^3 + 135/8*a^2*b^8*x^(8/3) + 360
/7*a^3*b^7*x^(7/3) + 105*a^4*b^6*x^2 + 756/5*a^5*b^5*x^(5/3) + 31
5/2*a^6*b^4*x^(4/3) + 120*a^7*b^3*x + a^10*ln(abs(x)) + 135/2*a^8
*b^2*x^(2/3) + 30*a^9*b*x^(1/3)
```

3.2323 $\int \frac{\left(a+b\sqrt[3]{x}\right)^{10}}{x^2}\,dx$

Optimal. Leaf size=125

$$-\frac{a^{10}}{x}-\frac{15a^9b}{x^{2/3}}-\frac{135a^8b^2}{\sqrt[3]{x}}+120a^7b^3\log(x)+630a^6b^4\sqrt[3]{x}+378a^5b^5x^{2/3}+210a^4b^6x+90a^3b^7x^{4/3}+27a^2b^8x^{5/3}+5ab^9x^2+\frac{3}{7}b^{10}x^{7/3}$$

```
[Out] -(a^10/x) - (15*a^9*b)/x^(2/3) - (135*a^8*b^2)/x^(1/3) + 630*a^6*
b^4*x^(1/3) + 378*a^5*b^5*x^(2/3) + 210*a^4*b^6*x + 90*a^3*b^7*x^
(4/3) + 27*a^2*b^8*x^(5/3) + 5*a*b^9*x^2 + (3*b^10*x^(7/3))/7 + 1
20*a^7*b^3*Log[x]
```

Rubi [A] time = 0.177705, antiderivative size = 125, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^{10}}{x}-\frac{15a^9b}{x^{2/3}}-\frac{135a^8b^2}{\sqrt[3]{x}}+120a^7b^3\log(x)+630a^6b^4\sqrt[3]{x}+378a^5b^5x^{2/3}+210a^4b^6x+90a^3b^7x^{4/3}+27a^2b^8x^{5/3}+5ab^9x^2+\frac{3}{7}b^{10}x^{7/3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^10/x^2,x]
```

```
[Out] -(a^10/x) - (15*a^9*b)/x^(2/3) - (135*a^8*b^2)/x^(1/3) + 630*a^6*
b^4*x^(1/3) + 378*a^5*b^5*x^(2/3) + 210*a^4*b^6*x + 90*a^3*b^7*x^
(4/3) + 27*a^2*b^8*x^(5/3) + 5*a*b^9*x^2 + (3*b^10*x^(7/3))/7 + 1
20*a^7*b^3*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^{10}}{x}-\frac{15a^9b}{x^{\frac{2}{3}}}-\frac{135a^8b^2}{\sqrt[3]{x}}+360a^7b^3\log\left(\sqrt[3]{x}\right)+630a^6b^4\sqrt[3]{x}+756a^5b^5\int^{\sqrt[3]{x}}x\,dx+210a^4b^6x+90a^3b^7x^{\frac{4}{3}}+27a^2b^8x^{\frac{5}{3}}+5ab^9x^2+\frac{3b^{10}x^{\frac{7}{3}}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**10/x**2,x)
```

```
[Out] -a**10/x - 15*a**9*b/x**(2/3) - 135*a**8*b**2/x**(1/3) + 360*a**7
*b**3*log(x**(1/3)) + 630*a**6*b**4*x**(1/3) + 756*a**5*b**5*Inte
gral(x, (x, x**(1/3))) + 210*a**4*b**6*x + 90*a**3*b**7*x**(4/3)
+ 27*a**2*b**8*x**(5/3) + 5*a*b**9*x**2 + 3*b**10*x**(7/3)/7
```

Mathematica [A] time = 0.0784842, size = 125, normalized size = 1.

$$-\frac{a^{10}}{x}-\frac{15a^9b}{x^{2/3}}-\frac{135a^8b^2}{\sqrt[3]{x}}+120a^7b^3\log(x)+630a^6b^4\sqrt[3]{x}+378a^5b^5x^{2/3}+210a^4b^6x+90a^3b^7x^{4/3}+27a^2b^8x^{5/3}+5ab^9x^2+\frac{3}{7}b^{10}x^{7/3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^10/x^2,x]
```

```
[Out] -(a^10/x) - (15*a^9*b)/x^(2/3) - (135*a^8*b^2)/x^(1/3) + 630*a^6*
b^4*x^(1/3) + 378*a^5*b^5*x^(2/3) + 210*a^4*b^6*x + 90*a^3*b^7*x^
(4/3) + 27*a^2*b^8*x^(5/3) + 5*a*b^9*x^2 + (3*b^10*x^(7/3))/7 + 1
20*a^7*b^3*Log[x]
```

Maple [A] time = 0.01, size = 110, normalized size = 0.9

$$-\frac{a^{10}}{x}-15\,\frac{a^{9}b}{x^{2/3}}-135\,\frac{a^{8}b^{2}}{\sqrt[3]{x}}+630\,a^{6}b^{4}\sqrt[3]{x}+378\,a^{5}b^{5}x^{2/3}+210\,a^{4}b^{6}x+90\,a^{3}b^{7}x^{4/3}+27\,a^{2}b^{8}x^{5/3}+5\,ab^{9}x^{2}+\frac{3\,b^{10}}{7}x^{\frac{7}{3}}+120\,a^{7}b^{3}\ln\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^10/x^2,x)
```

```
[Out] -a^10/x-15*a^9*b/x^(2/3)-135*a^8*b^2/x^(1/3)+630*a^6*b^4*x^(1/3)+
378*a^5*b^5*x^(2/3)+210*a^4*b^6*x+90*a^3*b^7*x^(4/3)+27*a^2*b^8*x
^(5/3)+5*a*b^9*x^2+3/7*b^10*x^(7/3)+120*a^7*b^3*ln(x)
```

Maxima [A] time = 1.44521, size = 149, normalized size = 1.19

$$\frac{3}{7}\,b^{10}x^{\frac{7}{3}}+5\,ab^{9}x^{2}+27\,a^{2}b^{8}x^{\frac{5}{3}}+90\,a^{3}b^{7}x^{\frac{4}{3}}+210\,a^{4}b^{6}x+120\,a^{7}b^{3}\log\left(x\right)+378\,a^{5}b^{5}x^{\frac{2}{3}}+630\,a^{6}b^{4}x^{\frac{1}{3}}-\frac{135\,a^{8}b^{2}x^{\frac{2}{3}}+15\,a^{9}bx^{\frac{1}{3}}+a^{10}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10/x^2,x, algorithm="maxima")
```

```
[Out] 3/7*b^10*x^(7/3) + 5*a*b^9*x^2 + 27*a^2*b^8*x^(5/3) + 90*a^3*b^7*
x^(4/3) + 210*a^4*b^6*x + 120*a^7*b^3*log(x) + 378*a^5*b^5*x^(2/3
) + 630*a^6*b^4*x^(1/3) - (135*a^8*b^2*x^(2/3) + 15*a^9*b*x^(1/3)
 + a^10)/x
```

Fricas [A] time = 0.228604, size = 157, normalized size = 1.26

$$\frac{35\,ab^{9}x^{3}+1470\,a^{4}b^{6}x^{2}+2520\,a^{7}b^{3}x\log\left(x^{\frac{1}{3}}\right)-7\,a^{10}+189\,\left(a^{2}b^{8}x^{2}+14\,a^{5}b^{5}x-5\,a^{8}b^{2}\right)x^{\frac{2}{3}}+3\,\left(b^{10}x^{3}+210\,a^{3}b^{7}x^{2}+1470\right.}{7\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10/x^2,x, algorithm="fricas")
```

```
[Out] 1/7*(35*a*b^9*x^3 + 1470*a^4*b^6*x^2 + 2520*a^7*b^3*x*log(x^(1/3)
) - 7*a^10 + 189*(a^2*b^8*x^2 + 14*a^5*b^5*x - 5*a^8*b^2)*x^(2/3)
 + 3*(b^10*x^3 + 210*a^3*b^7*x^2 + 1470*a^6*b^4*x - 35*a^9*b)*x^(
1/3))/x
```

Sympy [A] time = 10.0192, size = 128, normalized size = 1.02

$$-\frac{a^{10}}{x}-\frac{15a^9b}{x^{\frac{2}{3}}}-\frac{135a^8b^2}{\sqrt[3]{x}}+120a^7b^3\log(x)+630a^6b^4\sqrt[3]{x}+378a^5b^5x^{\frac{2}{3}}+210a^4b^6x+90a^3b^7x^{\frac{4}{3}}+27a^2b^8x^{\frac{5}{3}}+5ab^9x^2+\frac{3b^{10}x^{\frac{7}{3}}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**10/x**2,x)
```

```
[Out] -a**10/x - 15*a**9*b/x**(2/3) - 135*a**8*b**2/x**(1/3) + 120*a**7
*b**3*log(x) + 630*a**6*b**4*x**(1/3) + 378*a**5*b**5*x**(2/3) +
210*a**4*b**6*x + 90*a**3*b**7*x**(4/3) + 27*a**2*b**8*x**(5/3) +
 5*a*b**9*x**2 + 3*b**10*x**(7/3)/7
```

GIAC/XCAS [A] time = 0.256255, size = 150, normalized size = 1.2

$$\frac{3}{7}b^{10}x^{\frac{7}{3}}+5\,ab^9x^2+27\,a^2b^8x^{\frac{5}{3}}+90\,a^3b^7x^{\frac{4}{3}}+210\,a^4b^6x+120\,a^7b^3\ln(|x|)+378\,a^5b^5x^{\frac{2}{3}}+630\,a^6b^4x^{\frac{1}{3}}-\frac{135\,a^8b^2x^{\frac{2}{3}}+15\,a^9bx^{\frac{1}{3}}+a^{10}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10/x^2,x, algorithm="giac")
```

```
[Out] 3/7*b^10*x^(7/3) + 5*a*b^9*x^2 + 27*a^2*b^8*x^(5/3) + 90*a^3*b^7*
x^(4/3) + 210*a^4*b^6*x + 120*a^7*b^3*ln(abs(x)) + 378*a^5*b^5*x^
(2/3) + 630*a^6*b^4*x^(1/3) - (135*a^8*b^2*x^(2/3) + 15*a^9*b*x^(
1/3) + a^10)/x
```

3.2324 $\int \frac{\left(a+b\sqrt[3]{x}\right)^{10}}{x^3}\,dx$

Optimal. Leaf size=131

$$-\frac{a^{10}}{2x^2}-\frac{6a^9b}{x^{5/3}}-\frac{135a^8b^2}{4x^{4/3}}-\frac{120a^7b^3}{x}-\frac{315a^6b^4}{x^{2/3}}-\frac{756a^5b^5}{\sqrt[3]{x}}+210a^4b^6\log(x)+360a^3b^7\sqrt[3]{x}+\frac{135}{2}a^2b^8x^{2/3}+10ab^9x+\frac{3}{4}b^{10}x^{4/3}$$

```
[Out] -a^10/(2*x^2) - (6*a^9*b)/x^(5/3) - (135*a^8*b^2)/(4*x^(4/3)) - (
120*a^7*b^3)/x - (315*a^6*b^4)/x^(2/3) - (756*a^5*b^5)/x^(1/3) +
360*a^3*b^7*x^(1/3) + (135*a^2*b^8*x^(2/3))/2 + 10*a*b^9*x + (3*b
^10*x^(4/3))/4 + 210*a^4*b^6*Log[x]
```

Rubi [A] time = 0.178483, antiderivative size = 131, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^{10}}{2x^2}-\frac{6a^9b}{x^{5/3}}-\frac{135a^8b^2}{4x^{4/3}}-\frac{120a^7b^3}{x}-\frac{315a^6b^4}{x^{2/3}}-\frac{756a^5b^5}{\sqrt[3]{x}}+210a^4b^6\log(x)+360a^3b^7\sqrt[3]{x}+\frac{135}{2}a^2b^8x^{2/3}+10ab^9x+\frac{3}{4}b^{10}x^{4/3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^(1/3))^10/x^3,x]
```

```
[Out] -a^10/(2*x^2) - (6*a^9*b)/x^(5/3) - (135*a^8*b^2)/(4*x^(4/3)) - (
120*a^7*b^3)/x - (315*a^6*b^4)/x^(2/3) - (756*a^5*b^5)/x^(1/3) +
360*a^3*b^7*x^(1/3) + (135*a^2*b^8*x^(2/3))/2 + 10*a*b^9*x + (3*b
^10*x^(4/3))/4 + 210*a^4*b^6*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^{10}}{2x^2}-\frac{6a^9b}{x^{\frac{5}{3}}}-\frac{135a^8b^2}{4x^{\frac{4}{3}}}-\frac{120a^7b^3}{x}-\frac{315a^6b^4}{x^{\frac{2}{3}}}-\frac{756a^5b^5}{\sqrt[3]{x}}+630a^4b^6\log\left(\sqrt[3]{x}\right)+360a^3b^7\sqrt[3]{x}+135a^2b^8\int^{\sqrt[3]{x}}x\,dx+10ab^9x+\frac{3b^{10}x^{\frac{4}{3}}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b*x**(1/3))**10/x**3,x)
```

```
[Out] -a**10/(2*x**2) - 6*a**9*b/x**(5/3) - 135*a**8*b**2/(4*x**(4/3))
- 120*a**7*b**3/x - 315*a**6*b**4/x**(2/3) - 756*a**5*b**5/x**(1/
3) + 630*a**4*b**6*log(x**(1/3)) + 360*a**3*b**7*x**(1/3) + 135*a
**2*b**8*Integral(x, (x, x**(1/3))) + 10*a*b**9*x + 3*b**10*x**(4
/3)/4
```

Mathematica [A] time = 0.0475645, size = 130, normalized size = 0.99

$$-\frac{2a^{10}+24a^9b\sqrt[3]{x}+135a^8b^2x^{2/3}+480a^7b^3x+1260a^6b^4x^{4/3}+3024a^5b^5x^{5/3}-840a^4b^6x^2\log(x)-1440a^3b^7x^{7/3}-270a^2b^8}{4x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^(1/3))^10/x^3,x]
```

```
[Out] -(2*a^10 + 24*a^9*b*x^(1/3) + 135*a^8*b^2*x^(2/3) + 480*a^7*b^3*x
 + 1260*a^6*b^4*x^(4/3) + 3024*a^5*b^5*x^(5/3) - 1440*a^3*b^7*x^(
7/3) - 270*a^2*b^8*x^(8/3) - 40*a*b^9*x^3 - 3*b^10*x^(10/3) - 840
*a^4*b^6*x^2*Log[x])/(4*x^2)
```

Maple [A] time = 0.014, size = 110, normalized size = 0.8

$$-\frac{a^{10}}{2\,x^{2}}-6\,\frac{a^{9}b}{x^{5/3}}-\frac{135\,a^{8}b^{2}}{4}x^{-\frac{4}{3}}-120\,\frac{a^{7}b^{3}}{x}-315\,\frac{a^{6}b^{4}}{x^{2/3}}-756\,\frac{a^{5}b^{5}}{\sqrt[3]{x}}+360\,a^{3}b^{7}\sqrt[3]{x}+\frac{135\,a^{2}b^{8}}{2}x^{\frac{2}{3}}+10\,ab^{9}x+\frac{3\,b^{10}}{4}x^{\frac{4}{3}}+210\,a^{4}b^{6}\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^10/x^3,x)
```

```
[Out] -1/2*a^10/x^2-6*a^9*b/x^(5/3)-135/4*a^8*b^2/x^(4/3)-120*a^7*b^3/x
-315*a^6*b^4/x^(2/3)-756*a^5*b^5/x^(1/3)+360*a^3*b^7*x^(1/3)+135/
2*a^2*b^8*x^(2/3)+10*a*b^9*x+3/4*b^10*x^(4/3)+210*a^4*b^6*ln(x)
```

Maxima [A] time = 1.43768, size = 149, normalized size = 1.14

$$\frac{3}{4}\,b^{10}x^{\frac{4}{3}}+10\,ab^{9}x+210\,a^{4}b^{6}\log(x)+\frac{135}{2}\,a^{2}b^{8}x^{\frac{2}{3}}+360\,a^{3}b^{7}x^{\frac{1}{3}}-\frac{3024\,a^{5}b^{5}x^{\frac{5}{3}}+1260\,a^{6}b^{4}x^{\frac{4}{3}}+480\,a^{7}b^{3}x+135\,a^{8}b^{2}x^{\frac{2}{3}}+24\,a^{9}bx^{\frac{1}{3}}+2\,a^{10}}{4\,x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10/x^3,x, algorithm="maxima")
```

```
[Out] 3/4*b^10*x^(4/3) + 10*a*b^9*x + 210*a^4*b^6*log(x) + 135/2*a^2*b^
8*x^(2/3) + 360*a^3*b^7*x^(1/3) - 1/4*(3024*a^5*b^5*x^(5/3) + 126
0*a^6*b^4*x^(4/3) + 480*a^7*b^3*x + 135*a^8*b^2*x^(2/3) + 24*a^9*
b*x^(1/3) + 2*a^10)/x^2
```

Fricas [A] time = 0.241707, size = 158, normalized size = 1.21

$$\frac{40\,ab^{9}x^{3}+2520\,a^{4}b^{6}x^{2}\log\left(x^{\frac{1}{3}}\right)-480\,a^{7}b^{3}x-2\,a^{10}+27\left(10\,a^{2}b^{8}x^{2}-112\,a^{5}b^{5}x-5\,a^{8}b^{2}\right)x^{\frac{2}{3}}+3\left(b^{10}x^{3}+480\,a^{3}b^{7}x^{2}-42\right.}{4\,x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10/x^3,x, algorithm="fricas")
```

```
[Out] 1/4*(40*a*b^9*x^3 + 2520*a^4*b^6*x^2*log(x^(1/3)) - 480*a^7*b^3*x
 - 2*a^10 + 27*(10*a^2*b^8*x^2 - 112*a^5*b^5*x - 5*a^8*b^2)*x^(2/
3) + 3*(b^10*x^3 + 480*a^3*b^7*x^2 - 420*a^6*b^4*x - 8*a^9*b)*x^(
1/3))/x^2
```

Sympy [A] time = 10.1997, size = 133, normalized size = 1.02

$$-\frac{a^{10}}{2x^{2}}-\frac{6a^{9}b}{x^{\frac{5}{3}}}-\frac{135a^{8}b^{2}}{4x^{\frac{4}{3}}}-\frac{120a^{7}b^{3}}{x}-\frac{315a^{6}b^{4}}{x^{\frac{2}{3}}}-\frac{756a^{5}b^{5}}{\sqrt[3]{x}}+210a^{4}b^{6}\log(x)+360a^{3}b^{7}\sqrt[3]{x}+\frac{135a^{2}b^{8}x^{\frac{2}{3}}}{2}+10ab^{9}x+\frac{3b^{10}x^{\frac{4}{3}}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**10/x**3,x)
```

```
[Out] -a**10/(2*x**2) - 6*a**9*b/x**(5/3) - 135*a**8*b**2/(4*x**(4/3))
- 120*a**7*b**3/x - 315*a**6*b**4/x**(2/3) - 756*a**5*b**5/x**(1/
3) + 210*a**4*b**6*log(x) + 360*a**3*b**7*x**(1/3) + 135*a**2*b**
8*x**(2/3)/2 + 10*a*b**9*x + 3*b**10*x**(4/3)/4
```

GIAC/XCAS [A] time = 0.236443, size = 150, normalized size = 1.15

$$\frac{3}{4}\,b^{10}x^{\frac{4}{3}} + 10\,ab^{9}x + 210\,a^{4}b^{6}\ln\left(|x|\right) + \frac{135}{2}\,a^{2}b^{8}x^{\frac{2}{3}} + 360\,a^{3}b^{7}x^{\frac{1}{3}} - \frac{3024\,a^{5}b^{5}x^{\frac{5}{3}} + 1260\,a^{6}b^{4}x^{\frac{4}{3}} + 480\,a^{7}b^{3}x + 135\,a^{8}b^{2}x^{\frac{2}{3}} + 24\,a^{9}bx^{\frac{1}{3}} + 2\,a^{10}}{4\,x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10/x^3,x, algorithm="giac")
```

```
[Out] 3/4*b^10*x^(4/3) + 10*a*b^9*x + 210*a^4*b^6*ln(abs(x)) + 135/2*a^
2*b^8*x^(2/3) + 360*a^3*b^7*x^(1/3) - 1/4*(3024*a^5*b^5*x^(5/3) +
 1260*a^6*b^4*x^(4/3) + 480*a^7*b^3*x + 135*a^8*b^2*x^(2/3) + 24*
a^9*b*x^(1/3) + 2*a^10)/x^2
```

3.2325 $\int \frac{\left(a+b\sqrt[3]{x}\right)^{10}}{x^4}\,dx$

Optimal. Leaf size=131

$$-\frac{a^{10}}{3x^3}-\frac{15a^9b}{4x^{8/3}}-\frac{135a^8b^2}{7x^{7/3}}-\frac{60a^7b^3}{x^2}-\frac{126a^6b^4}{x^{5/3}}-\frac{189a^5b^5}{x^{4/3}}-\frac{210a^4b^6}{x}-\frac{180a^3b^7}{x^{2/3}}-\frac{135a^2b^8}{\sqrt[3]{x}}+10ab^9\log(x)+3b^{10}\sqrt[3]{x}$$

```
[Out] -a^10/(3*x^3) - (15*a^9*b)/(4*x^(8/3)) - (135*a^8*b^2)/(7*x^(7/3)
) - (60*a^7*b^3)/x^2 - (126*a^6*b^4)/x^(5/3) - (189*a^5*b^5)/x^(4
/3) - (210*a^4*b^6)/x - (180*a^3*b^7)/x^(2/3) - (135*a^2*b^8)/x^(
1/3) + 3*b^10*x^(1/3) + 10*a*b^9*Log[x]
```

Rubi [A] time = 0.175049, antiderivative size = 131, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^{10}}{3x^3}-\frac{15a^9b}{4x^{8/3}}-\frac{135a^8b^2}{7x^{7/3}}-\frac{60a^7b^3}{x^2}-\frac{126a^6b^4}{x^{5/3}}-\frac{189a^5b^5}{x^{4/3}}-\frac{210a^4b^6}{x}-\frac{180a^3b^7}{x^{2/3}}-\frac{135a^2b^8}{\sqrt[3]{x}}+10ab^9\log(x)+3b^{10}\sqrt[3]{x}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^10/x^4,x]
```

```
[Out] -a^10/(3*x^3) - (15*a^9*b)/(4*x^(8/3)) - (135*a^8*b^2)/(7*x^(7/3)
) - (60*a^7*b^3)/x^2 - (126*a^6*b^4)/x^(5/3) - (189*a^5*b^5)/x^(4
/3) - (210*a^4*b^6)/x - (180*a^3*b^7)/x^(2/3) - (135*a^2*b^8)/x^(
1/3) + 3*b^10*x^(1/3) + 10*a*b^9*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^{10}}{3x^3}-\frac{15a^9b}{4x^{\frac{8}{3}}}-\frac{135a^8b^2}{7x^{\frac{7}{3}}}-\frac{60a^7b^3}{x^2}-\frac{126a^6b^4}{x^{\frac{5}{3}}}-\frac{189a^5b^5}{x^{\frac{4}{3}}}-\frac{210a^4b^6}{x}-\frac{180a^3b^7}{x^{\frac{2}{3}}}-\frac{135a^2b^8}{\sqrt[3]{x}}+30ab^9\log\left(\sqrt[3]{x}\right)+3\int^{\sqrt[3]{x}}b^{10}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**10/x**4,x)
```

```
[Out] -a**10/(3*x**3) - 15*a**9*b/(4*x**(8/3)) - 135*a**8*b**2/(7*x**(7
/3)) - 60*a**7*b**3/x**2 - 126*a**6*b**4/x**(5/3) - 189*a**5*b**5
/x**(4/3) - 210*a**4*b**6/x - 180*a**3*b**7/x**(2/3) - 135*a**2*b
**8/x**(1/3) + 30*a*b**9*log(x**(1/3)) + 3*Integral(b**10, (x, x*
*(1/3)))
```

Mathematica [A] time = 0.0941067, size = 131, normalized size = 1.

$$-\frac{a^{10}}{3x^3}-\frac{15a^9b}{4x^{8/3}}-\frac{135a^8b^2}{7x^{7/3}}-\frac{60a^7b^3}{x^2}-\frac{126a^6b^4}{x^{5/3}}-\frac{189a^5b^5}{x^{4/3}}-\frac{210a^4b^6}{x}-\frac{180a^3b^7}{x^{2/3}}-\frac{135a^2b^8}{\sqrt[3]{x}}+10ab^9\log(x)+3b^{10}\sqrt[3]{x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^10/x^4,x]
```

```
[Out] -a^10/(3*x^3) - (15*a^9*b)/(4*x^(8/3)) - (135*a^8*b^2)/(7*x^(7/3)
) - (60*a^7*b^3)/x^2 - (126*a^6*b^4)/x^(5/3) - (189*a^5*b^5)/x^(4
/3) - (210*a^4*b^6)/x - (180*a^3*b^7)/x^(2/3) - (135*a^2*b^8)/x^(
1/3) + 3*b^10*x^(1/3) + 10*a*b^9*Log[x]
```

Maple [A] time = 0.012, size = 112, normalized size = 0.9

$$-\frac{a^{10}}{3\,x^3}-\frac{15\,a^9b}{4}x^{-\frac{8}{3}}-\frac{135\,a^8b^2}{7}x^{-\frac{7}{3}}-60\,\frac{a^7b^3}{x^2}-126\,\frac{a^6b^4}{x^{5/3}}-189\,\frac{a^5b^5}{x^{4/3}}-210\,\frac{a^4b^6}{x}-180\,\frac{a^3b^7}{x^{2/3}}-135\,\frac{a^2b^8}{\sqrt[3]{x}}+3\,b^{10}\sqrt[3]{x}+10\,ab^9\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^10/x^4,x)
```

```
[Out] -1/3*a^10/x^3-15/4*a^9*b/x^(8/3)-135/7*a^8*b^2/x^(7/3)-60*a^7*b^3
/x^2-126*a^6*b^4/x^(5/3)-189*a^5*b^5/x^(4/3)-210*a^4*b^6/x-180*a^
3*b^7/x^(2/3)-135*a^2*b^8/x^(1/3)+3*b^10*x^(1/3)+10*a*b^9*ln(x)
```

Maxima [A] time = 1.45017, size = 151, normalized size = 1.15

$$10\,ab^9\log(x)+3\,b^{10}x^{\frac{1}{3}}-\frac{11340\,a^2b^8x^{\frac{8}{3}}+15120\,a^3b^7x^{\frac{7}{3}}+17640\,a^4b^6x^2+15876\,a^5b^5x^{\frac{5}{3}}+10584\,a^6b^4x^{\frac{4}{3}}+5040\,a^7b^3x+1620\,a^8b^2x^{\frac{2}{3}}+315\,a^9bx^{\frac{1}{3}}+}{84\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10/x^4,x, algorithm="maxima")
```

```
[Out] 10*a*b^9*log(x) + 3*b^10*x^(1/3) - 1/84*(11340*a^2*b^8*x^(8/3) +
15120*a^3*b^7*x^(7/3) + 17640*a^4*b^6*x^2 + 15876*a^5*b^5*x^(5/3)
 + 10584*a^6*b^4*x^(4/3) + 5040*a^7*b^3*x + 1620*a^8*b^2*x^(2/3)
+ 315*a^9*b*x^(1/3) + 28*a^10)/x^3
```

Fricas [A] time = 0.22203, size = 159, normalized size = 1.21

$$\frac{2520\,ab^9x^3\log\left(x^{\frac{1}{3}}\right)-17640\,a^4b^6x^2-5040\,a^7b^3x-28\,a^{10}-324\left(35\,a^2b^8x^2+49\,a^5b^5x+5\,a^8b^2\right)x^{\frac{2}{3}}+63\left(4\,b^{10}x^3-240\,a^3b\right.}{84\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10/x^4,x, algorithm="fricas")
```

```
[Out] 1/84*(2520*a*b^9*x^3*log(x^(1/3)) - 17640*a^4*b^6*x^2 - 5040*a^7*
b^3*x - 28*a^10 - 324*(35*a^2*b^8*x^2 + 49*a^5*b^5*x + 5*a^8*b^2)
*x^(2/3) + 63*(4*b^10*x^3 - 240*a^3*b^7*x^2 - 168*a^6*b^4*x - 5*a
^9*b)*x^(1/3))/x^3
```

Sympy [A] time = 8.70147, size = 133, normalized size = 1.02

$$-\frac{a^{10}}{3x^3}-\frac{15a^9b}{4x^{\frac{8}{3}}}-\frac{135a^8b^2}{7x^{\frac{7}{3}}}-\frac{60a^7b^3}{x^2}-\frac{126a^6b^4}{x^{\frac{5}{3}}}-\frac{189a^5b^5}{x^{\frac{4}{3}}}-\frac{210a^4b^6}{x}-\frac{180a^3b^7}{x^{\frac{2}{3}}}-\frac{135a^2b^8}{\sqrt[3]{x}}+10ab^9\log(x)+3b^{10}\sqrt[3]{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**10/x**4,x)
```

```
[Out] -a**10/(3*x**3) - 15*a**9*b/(4*x**(8/3)) - 135*a**8*b**2/(7*x**(7
/3)) - 60*a**7*b**3/x**2 - 126*a**6*b**4/x**(5/3) - 189*a**5*b**5
/x**(4/3) - 210*a**4*b**6/x - 180*a**3*b**7/x**(2/3) - 135*a**2*b
**8/x**(1/3) + 10*a*b**9*log(x) + 3*b**10*x**(1/3)
```

GIAC/XCAS [A] time = 0.268407, size = 153, normalized size = 1.17

$$10\,ab^9\ln\left(|x|\right) + 3\,b^{10}x^{\frac{1}{3}} - \frac{11340\,a^2b^8x^{\frac{8}{3}} + 15120\,a^3b^7x^{\frac{7}{3}} + 17640\,a^4b^6x^2 + 15876\,a^5b^5x^{\frac{5}{3}} + 10584\,a^6b^4x^{\frac{4}{3}} + 5040\,a^7b^3x + 1620\,a^8b^2x^{\frac{2}{3}} + 315\,a^9bx^{\frac{1}{3}} +}{84\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10/x^4,x, algorithm="giac")
```

```
[Out] 10*a*b^9*ln(abs(x)) + 3*b^10*x^(1/3) - 1/84*(11340*a^2*b^8*x^(8/3
) + 15120*a^3*b^7*x^(7/3) + 17640*a^4*b^6*x^2 + 15876*a^5*b^5*x^(
5/3) + 10584*a^6*b^4*x^(4/3) + 5040*a^7*b^3*x + 1620*a^8*b^2*x^(2
/3) + 315*a^9*b*x^(1/3) + 28*a^10)/x^3
```

3.2326 $\int \frac{\left(a+b\sqrt[3]{x}\right)^{10}}{x^5}\,dx$

Optimal. Leaf size=46

$$\frac{b\left(a+b\sqrt[3]{x}\right)^{11}}{44a^2x^{11/3}}-\frac{\left(a+b\sqrt[3]{x}\right)^{11}}{4ax^4}$$

```
[Out] -(a + b*x^(1/3))^11/(4*a*x^4) + (b*(a + b*x^(1/3))^11)/(44*a^2*x^
(11/3))
```

Rubi [A] time = 0.0497436, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{b\left(a+b\sqrt[3]{x}\right)^{11}}{44a^2x^{11/3}}-\frac{\left(a+b\sqrt[3]{x}\right)^{11}}{4ax^4}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^(1/3))^10/x^5,x]
```

```
[Out] -(a + b*x^(1/3))^11/(4*a*x^4) + (b*(a + b*x^(1/3))^11)/(44*a^2*x^
(11/3))
```

Rubi in Sympy [A] time = 5.7237, size = 37, normalized size = 0.8

$$-\frac{\left(a+b\sqrt[3]{x}\right)^{11}}{4ax^4}+\frac{b\left(a+b\sqrt[3]{x}\right)^{11}}{44a^2x^{\frac{11}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b*x**(1/3))**10/x**5,x)
```

```
[Out] -(a + b*x**(1/3))**11/(4*a*x**4) + b*(a + b*x**(1/3))**11/(44*a**
2*x**(11/3))
```

Mathematica [B] time = 0.0427081, size = 128, normalized size = 2.78

$$-\frac{11a^{10}+120a^9b\sqrt[3]{x}+594a^8b^2x^{2/3}+1760a^7b^3x+3465a^6b^4x^{4/3}+4752a^5b^5x^{5/3}+4620a^4b^6x^2+3168a^3b^7x^{7/3}+1485a^2b^8x^{3}}{44x^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^(1/3))^10/x^5,x]
```

```
[Out] -(11*a^10 + 120*a^9*b*x^(1/3) + 594*a^8*b^2*x^(2/3) + 1760*a^7*b^
3*x + 3465*a^6*b^4*x^(4/3) + 4752*a^5*b^5*x^(5/3) + 4620*a^4*b^6*
x^2 + 3168*a^3*b^7*x^(7/3) + 1485*a^2*b^8*x^(8/3) + 440*a*b^9*x^3
 + 66*b^10*x^(10/3))/(44*x^4)
```

Maple [B] time = 0.011, size = 113, normalized size = 2.5

$$-\frac{a^{10}}{4\,x^4}-105\,\frac{a^4b^6}{x^2}-\frac{135\,a^2b^8}{4}x^{-\frac{4}{3}}-\frac{27\,a^8b^2}{2}x^{-\frac{10}{3}}-\frac{315\,a^6b^4}{4}x^{-\frac{8}{3}}-\frac{30\,a^9b}{11}x^{-\frac{11}{3}}-40\,\frac{a^7b^3}{x^3}-10\,\frac{ab^9}{x}-\frac{3\,b^{10}}{2}x^{-\frac{2}{3}}-72\,\frac{a^3b^7}{x^{5/3}}-108\,\frac{a^5b^5}{x^{7/3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((a+b*x^(1/3))^10/x^5,x)
```

```
[Out] -1/4*a^10/x^4-105*a^4*b^6/x^2-135/4*a^2*b^8/x^(4/3)-27/2*a^8*b^2/
x^(10/3)-315/4*a^6*b^4/x^(8/3)-30/11*a^9*b/x^(11/3)-40*a^7*b^3/x^
3-10*a*b^9/x-3/2*b^10/x^(2/3)-72*a^3*b^7/x^(5/3)-108*a^5*b^5/x^(7
/3)
```

Maxima [A] time = 1.44677, size = 151, normalized size = 3.28

$$-\frac{66\,b^{10}x^{\frac{10}{3}} + 440\,ab^{9}x^{3} + 1485\,a^{2}b^{8}x^{\frac{8}{3}} + 3168\,a^{3}b^{7}x^{\frac{7}{3}} + 4620\,a^{4}b^{6}x^{2} + 4752\,a^{5}b^{5}x^{\frac{5}{3}} + 3465\,a^{6}b^{4}x^{\frac{4}{3}} + 1760\,a^{7}b^{3}x + 594\,a^{8}b^{2}x}{44\,x^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^(1/3) + a)^10/x^5,x, algorithm="maxima")
```

```
[Out] -1/44*(66*b^10*x^(10/3) + 440*a*b^9*x^3 + 1485*a^2*b^8*x^(8/3) +
3168*a^3*b^7*x^(7/3) + 4620*a^4*b^6*x^2 + 4752*a^5*b^5*x^(5/3) +
3465*a^6*b^4*x^(4/3) + 1760*a^7*b^3*x + 594*a^8*b^2*x^(2/3) + 120
*a^9*b*x^(1/3) + 11*a^10)/x^4
```

Fricas [A] time = 0.219338, size = 154, normalized size = 3.35

$$-\frac{440\,ab^{9}x^{3} + 4620\,a^{4}b^{6}x^{2} + 1760\,a^{7}b^{3}x + 11\,a^{10} + 297\left(5\,a^{2}b^{8}x^{2} + 16\,a^{5}b^{5}x + 2\,a^{8}b^{2}\right)x^{\frac{2}{3}} + 3\left(22\,b^{10}x^{3} + 1056\,a^{3}b^{7}x^{2} + 1155\right.}{44\,x^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^(1/3) + a)^10/x^5,x, algorithm="fricas")
```

```
[Out] -1/44*(440*a*b^9*x^3 + 4620*a^4*b^6*x^2 + 1760*a^7*b^3*x + 11*a^1
0 + 297*(5*a^2*b^8*x^2 + 16*a^5*b^5*x + 2*a^8*b^2)*x^(2/3) + 3*(2
2*b^10*x^3 + 1056*a^3*b^7*x^2 + 1155*a^6*b^4*x + 40*a^9*b)*x^(1/3
))/x^4
```

Sympy [A] time = 15.5886, size = 139, normalized size = 3.02

$$-\frac{a^{10}}{4x^{4}} - \frac{30a^{9}b}{11x^{\frac{11}{3}}} - \frac{27a^{8}b^{2}}{2x^{\frac{10}{3}}} - \frac{40a^{7}b^{3}}{x^{3}} - \frac{315a^{6}b^{4}}{4x^{\frac{8}{3}}} - \frac{108a^{5}b^{5}}{x^{\frac{7}{3}}} - \frac{105a^{4}b^{6}}{x^{2}} - \frac{72a^{3}b^{7}}{x^{\frac{5}{3}}} - \frac{135a^{2}b^{8}}{4x^{\frac{4}{3}}} - \frac{10ab^{9}}{x} - \frac{3b^{10}}{2x^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a+b*x**(1/3))**10/x**5,x)
```

```
[Out] -a**10/(4*x**4) - 30*a**9*b/(11*x**(11/3)) - 27*a**8*b**2/(2*x**(
10/3)) - 40*a**7*b**3/x**3 - 315*a**6*b**4/(4*x**(8/3)) - 108*a**
5*b**5/x**(7/3) - 105*a**4*b**6/x**2 - 72*a**3*b**7/x**(5/3) - 13
5*a**2*b**8/(4*x**(4/3)) - 10*a*b**9/x - 3*b**10/(2*x**(2/3))
```

GIAC/XCAS [A] time = 0.256514, size = 151, normalized size = 3.28

$$-\frac{66\,b^{10}x^{\frac{10}{3}} + 440\,ab^{9}x^{3} + 1485\,a^{2}b^{8}x^{\frac{8}{3}} + 3168\,a^{3}b^{7}x^{\frac{7}{3}} + 4620\,a^{4}b^{6}x^{2} + 4752\,a^{5}b^{5}x^{\frac{5}{3}} + 3465\,a^{6}b^{4}x^{\frac{4}{3}} + 1760\,a^{7}b^{3}x + 594\,a^{8}b^{2}x}{44\,x^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10/x^5,x, algorithm="giac")
```

```
[Out] -1/44*(66*b^10*x^(10/3) + 440*a*b^9*x^3 + 1485*a^2*b^8*x^(8/3) +
3168*a^3*b^7*x^(7/3) + 4620*a^4*b^6*x^2 + 4752*a^5*b^5*x^(5/3) +
3465*a^6*b^4*x^(4/3) + 1760*a^7*b^3*x + 594*a^8*b^2*x^(2/3) + 120
*a^9*b*x^(1/3) + 11*a^10)/x^4
```

3.2327 $\int \frac{\left(a+b\sqrt[3]{x}\right)^{10}}{x^6}\,dx$

Optimal. Leaf size=122

$$-\frac{b^4\left(a+b\sqrt[3]{x}\right)^{11}}{5005a^5x^{11/3}}+\frac{b^3\left(a+b\sqrt[3]{x}\right)^{11}}{455a^4x^4}-\frac{6b^2\left(a+b\sqrt[3]{x}\right)^{11}}{455a^3x^{13/3}}+\frac{2b\left(a+b\sqrt[3]{x}\right)^{11}}{35a^2x^{14/3}}-\frac{\left(a+b\sqrt[3]{x}\right)^{11}}{5ax^5}$$

```
[Out] -(a + b*x^(1/3))^11/(5*a*x^5) + (2*b*(a + b*x^(1/3))^11)/(35*a^2*
x^(14/3)) - (6*b^2*(a + b*x^(1/3))^11)/(455*a^3*x^(13/3)) + (b^3*
(a + b*x^(1/3))^11)/(455*a^4*x^4) - (b^4*(a + b*x^(1/3))^11)/(500
5*a^5*x^(11/3))
```

Rubi [A] time = 0.13323, antiderivative size = 122, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$-\frac{b^4\left(a+b\sqrt[3]{x}\right)^{11}}{5005a^5x^{11/3}}+\frac{b^3\left(a+b\sqrt[3]{x}\right)^{11}}{455a^4x^4}-\frac{6b^2\left(a+b\sqrt[3]{x}\right)^{11}}{455a^3x^{13/3}}+\frac{2b\left(a+b\sqrt[3]{x}\right)^{11}}{35a^2x^{14/3}}-\frac{\left(a+b\sqrt[3]{x}\right)^{11}}{5ax^5}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^10/x^6,x]
```

```
[Out] -(a + b*x^(1/3))^11/(5*a*x^5) + (2*b*(a + b*x^(1/3))^11)/(35*a^2*
x^(14/3)) - (6*b^2*(a + b*x^(1/3))^11)/(455*a^3*x^(13/3)) + (b^3*
(a + b*x^(1/3))^11)/(455*a^4*x^4) - (b^4*(a + b*x^(1/3))^11)/(500
5*a^5*x^(11/3))
```

Rubi in Sympy [A] time = 16.1106, size = 110, normalized size = 0.9

$$-\frac{\left(a+b\sqrt[3]{x}\right)^{11}}{5ax^5}+\frac{2b\left(a+b\sqrt[3]{x}\right)^{11}}{35a^2x^{\frac{14}{3}}}-\frac{6b^2\left(a+b\sqrt[3]{x}\right)^{11}}{455a^3x^{\frac{13}{3}}}+\frac{b^3\left(a+b\sqrt[3]{x}\right)^{11}}{455a^4x^4}-\frac{b^4\left(a+b\sqrt[3]{x}\right)^{11}}{5005a^5x^{\frac{11}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**10/x**6,x)
```

```
[Out] -(a + b*x**(1/3))**11/(5*a*x**5) + 2*b*(a + b*x**(1/3))**11/(35*a
**2*x**(14/3)) - 6*b**2*(a + b*x**(1/3))**11/(455*a**3*x**(13/3))
 + b**3*(a + b*x**(1/3))**11/(455*a**4*x**4) - b**4*(a + b*x**(1/
3))**11/(5005*a**5*x**(11/3))
```

Mathematica [A] time = 0.054367, size = 140, normalized size = 1.15

$$-\frac{a^{10}}{5x^5}-\frac{15a^9b}{7x^{14/3}}-\frac{135a^8b^2}{13x^{13/3}}-\frac{30a^7b^3}{x^4}-\frac{630a^6b^4}{11x^{11/3}}-\frac{378a^5b^5}{5x^{10/3}}-\frac{70a^4b^6}{x^3}-\frac{45a^3b^7}{x^{8/3}}-\frac{135a^2b^8}{7x^{7/3}}-\frac{5ab^9}{x^2}-\frac{3b^{10}}{5x^{5/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^10/x^6,x]
```

```
[Out] -a^10/(5*x^5) - (15*a^9*b)/(7*x^(14/3)) - (135*a^8*b^2)/(13*x^(13
/3)) - (30*a^7*b^3)/x^4 - (630*a^6*b^4)/(11*x^(11/3)) - (378*a^5*
b^5)/(5*x^(10/3)) - (70*a^4*b^6)/x^3 - (45*a^3*b^7)/x^(8/3) - (13
5*a^2*b^8)/(7*x^(7/3)) - (5*a*b^9)/x^2 - (3*b^10)/(5*x^(5/3))
```

Maple [A] time = 0.01, size = 113, normalized size = 0.9

$$-30\,\frac{a^7b^3}{x^4}-\frac{a^{10}}{5\,x^5}-\frac{135\,a^8b^2}{13}x^{-\frac{13}{3}}-5\,\frac{ab^9}{x^2}-\frac{378\,a^5b^5}{5}x^{-\frac{10}{3}}-45\,\frac{a^3b^7}{x^{8/3}}-\frac{630\,a^6b^4}{11}x^{-\frac{11}{3}}-\frac{15\,a^9b}{7}x^{-\frac{14}{3}}-70\,\frac{a^4b^6}{x^3}-\frac{3\,b^{10}}{5}x^{-\frac{5}{3}}-\frac{135\,a^2b^8}{7}x^{-\frac{7}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^10/x^6,x)
```

```
[Out] -30*a^7*b^3/x^4-1/5*a^10/x^5-135/13*a^8*b^2/x^(13/3)-5*a*b^9/x^2-
378/5*a^5*b^5/x^(10/3)-45*a^3*b^7/x^(8/3)-630/11*a^6*b^4/x^(11/3)
-15/7*a^9*b/x^(14/3)-70*a^4*b^6/x^3-3/5*b^10/x^(5/3)-135/7*a^2*b^
8/x^(7/3)
```

Maxima [A] time = 1.4443, size = 151, normalized size = 1.24

$$-\frac{3003\,b^{10}x^{\frac{10}{3}}+25025\,ab^9x^3+96525\,a^2b^8x^{\frac{8}{3}}+225225\,a^3b^7x^{\frac{7}{3}}+350350\,a^4b^6x^2+378378\,a^5b^5x^{\frac{5}{3}}+286650\,a^6b^4x^{\frac{4}{3}}+150150}{5005\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10/x^6,x, algorithm="maxima")
```

```
[Out] -1/5005*(3003*b^10*x^(10/3) + 25025*a*b^9*x^3 + 96525*a^2*b^8*x^(
8/3) + 225225*a^3*b^7*x^(7/3) + 350350*a^4*b^6*x^2 + 378378*a^5*b
^5*x^(5/3) + 286650*a^6*b^4*x^(4/3) + 150150*a^7*b^3*x + 51975*a^
8*b^2*x^(2/3) + 10725*a^9*b*x^(1/3) + 1001*a^10)/x^5
```

Fricas [A] time = 0.217515, size = 154, normalized size = 1.26

$$-\frac{25025\,ab^9x^3+350350\,a^4b^6x^2+150150\,a^7b^3x+1001\,a^{10}+297\,(325\,a^2b^8x^2+1274\,a^5b^5x+175\,a^8b^2)\,x^{\frac{2}{3}}+39\,(77\,b^{10}x^3+5}{5005\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10/x^6,x, algorithm="fricas")
```

```
[Out] -1/5005*(25025*a*b^9*x^3 + 350350*a^4*b^6*x^2 + 150150*a^7*b^3*x
+ 1001*a^10 + 297*(325*a^2*b^8*x^2 + 1274*a^5*b^5*x + 175*a^8*b^2
)*x^(2/3) + 39*(77*b^10*x^3 + 5775*a^3*b^7*x^2 + 7350*a^6*b^4*x +
 275*a^9*b)*x^(1/3))/x^5
```

Sympy [A] time = 26.5369, size = 143, normalized size = 1.17

$$-\frac{a^{10}}{5x^5}-\frac{15a^9b}{7x^{\frac{14}{3}}}-\frac{135a^8b^2}{13x^{\frac{13}{3}}}-\frac{30a^7b^3}{x^4}-\frac{630a^6b^4}{11x^{\frac{11}{3}}}-\frac{378a^5b^5}{5x^{\frac{10}{3}}}-\frac{70a^4b^6}{x^3}-\frac{45a^3b^7}{x^{\frac{8}{3}}}-\frac{135a^2b^8}{7x^{\frac{7}{3}}}-\frac{5ab^9}{x^2}-\frac{3b^{10}}{5x^{\frac{5}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**10/x**6,x)
```

```
[Out] -a**10/(5*x**5) - 15*a**9*b/(7*x**(14/3)) - 135*a**8*b**2/(13*x**
(13/3)) - 30*a**7*b**3/x**4 - 630*a**6*b**4/(11*x**(11/3)) - 378*
```

```
a**5*b**5/(5*x**(10/3)) - 70*a**4*b**6/x**3 - 45*a**3*b**7/x**(8/
3) - 135*a**2*b**8/(7*x**(7/3)) - 5*a*b**9/x**2 - 3*b**10/(5*x**(
5/3))
```

GIAC/XCAS [A] time = 0.2618, size = 151, normalized size = 1.24

$$-\frac{3003\,b^{10}x^{\frac{10}{3}} + 25025\,ab^{9}x^{3} + 96525\,a^{2}b^{8}x^{\frac{8}{3}} + 225225\,a^{3}b^{7}x^{\frac{7}{3}} + 350350\,a^{4}b^{6}x^{2} + 378378\,a^{5}b^{5}x^{\frac{5}{3}} + 286650\,a^{6}b^{4}x^{\frac{4}{3}} + 150150}{5005\,x^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10/x^6,x, algorithm="giac")
```

```
[Out] -1/5005*(3003*b^10*x^(10/3) + 25025*a*b^9*x^3 + 96525*a^2*b^8*x^(
8/3) + 225225*a^3*b^7*x^(7/3) + 350350*a^4*b^6*x^2 + 378378*a^5*b
^5*x^(5/3) + 286650*a^6*b^4*x^(4/3) + 150150*a^7*b^3*x + 51975*a^
8*b^2*x^(2/3) + 10725*a^9*b*x^(1/3) + 1001*a^10)/x^5
```

3.2328 $\int \frac{\left(a+b\sqrt[3]{x}\right)^{10}}{x^7}\,dx$

Optimal. Leaf size=144

$$-\frac{a^{10}}{6x^6}-\frac{30a^9b}{17x^{17/3}}-\frac{135a^8b^2}{16x^{16/3}}-\frac{24a^7b^3}{x^5}-\frac{45a^6b^4}{x^{14/3}}-\frac{756a^5b^5}{13x^{13/3}}-\frac{105a^4b^6}{2x^4}-\frac{360a^3b^7}{11x^{11/3}}-\frac{27a^2b^8}{2x^{10/3}}-\frac{10ab^9}{3x^3}-\frac{3b^{10}}{8x^{8/3}}$$

```
[Out] -a^10/(6*x^6) - (30*a^9*b)/(17*x^(17/3)) - (135*a^8*b^2)/(16*x^(1
6/3)) - (24*a^7*b^3)/x^5 - (45*a^6*b^4)/x^(14/3) - (756*a^5*b^5)/
(13*x^(13/3)) - (105*a^4*b^6)/(2*x^4) - (360*a^3*b^7)/(11*x^(11/3
)) - (27*a^2*b^8)/(2*x^(10/3)) - (10*a*b^9)/(3*x^3) - (3*b^10)/(8
*x^(8/3))
```

Rubi [A] time = 0.186925, antiderivative size = 144, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^{10}}{6x^6}-\frac{30a^9b}{17x^{17/3}}-\frac{135a^8b^2}{16x^{16/3}}-\frac{24a^7b^3}{x^5}-\frac{45a^6b^4}{x^{14/3}}-\frac{756a^5b^5}{13x^{13/3}}-\frac{105a^4b^6}{2x^4}-\frac{360a^3b^7}{11x^{11/3}}-\frac{27a^2b^8}{2x^{10/3}}-\frac{10ab^9}{3x^3}-\frac{3b^{10}}{8x^{8/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^10/x^7,x]
```

```
[Out] -a^10/(6*x^6) - (30*a^9*b)/(17*x^(17/3)) - (135*a^8*b^2)/(16*x^(1
6/3)) - (24*a^7*b^3)/x^5 - (45*a^6*b^4)/x^(14/3) - (756*a^5*b^5)/
(13*x^(13/3)) - (105*a^4*b^6)/(2*x^4) - (360*a^3*b^7)/(11*x^(11/3
)) - (27*a^2*b^8)/(2*x^(10/3)) - (10*a*b^9)/(3*x^3) - (3*b^10)/(8
*x^(8/3))
```

Rubi in Sympy [A] time = 31.6085, size = 146, normalized size = 1.01

$$-\frac{a^{10}}{6x^6}-\frac{30a^9b}{17x^{\frac{17}{3}}}-\frac{135a^8b^2}{16x^{\frac{16}{3}}}-\frac{24a^7b^3}{x^5}-\frac{45a^6b^4}{x^{\frac{14}{3}}}-\frac{756a^5b^5}{13x^{\frac{13}{3}}}-\frac{105a^4b^6}{2x^4}-\frac{360a^3b^7}{11x^{\frac{11}{3}}}-\frac{27a^2b^8}{2x^{\frac{10}{3}}}-\frac{10ab^9}{3x^3}-\frac{3b^{10}}{8x^{\frac{8}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**10/x**7,x)
```

```
[Out] -a**10/(6*x**6) - 30*a**9*b/(17*x**(17/3)) - 135*a**8*b**2/(16*x*
*(16/3)) - 24*a**7*b**3/x**5 - 45*a**6*b**4/x**(14/3) - 756*a**5*
b**5/(13*x**(13/3)) - 105*a**4*b**6/(2*x**4) - 360*a**3*b**7/(11*
x**(11/3)) - 27*a**2*b**8/(2*x**(10/3)) - 10*a*b**9/(3*x**3) - 3*
b**10/(8*x**(8/3))
```

Mathematica [A] time = 0.0508242, size = 144, normalized size = 1.

$$-\frac{a^{10}}{6x^6}-\frac{30a^9b}{17x^{17/3}}-\frac{135a^8b^2}{16x^{16/3}}-\frac{24a^7b^3}{x^5}-\frac{45a^6b^4}{x^{14/3}}-\frac{756a^5b^5}{13x^{13/3}}-\frac{105a^4b^6}{2x^4}-\frac{360a^3b^7}{11x^{11/3}}-\frac{27a^2b^8}{2x^{10/3}}-\frac{10ab^9}{3x^3}-\frac{3b^{10}}{8x^{8/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^10/x^7,x]
```

```
[Out] -a^10/(6*x^6) - (30*a^9*b)/(17*x^(17/3)) - (135*a^8*b^2)/(16*x^(1
6/3)) - (24*a^7*b^3)/x^5 - (45*a^6*b^4)/x^(14/3) - (756*a^5*b^5)/
(13*x^(13/3)) - (105*a^4*b^6)/(2*x^4) - (360*a^3*b^7)/(11*x^(11/3
)) - (27*a^2*b^8)/(2*x^(10/3)) - (10*a*b^9)/(3*x^3) - (3*b^10)/(8
```

```
*x^(8/3))
```

Maple [A] time = 0.01, size = 113, normalized size = 0.8

$$-\frac{a^{10}}{6\,x^{6}}-\frac{30\,a^{9}b}{17}x^{-\frac{17}{3}}-\frac{135\,a^{8}b^{2}}{16}x^{-\frac{16}{3}}-24\,\frac{a^{7}b^{3}}{x^{5}}-45\,\frac{a^{6}b^{4}}{x^{14/3}}-\frac{756\,a^{5}b^{5}}{13}x^{-\frac{13}{3}}-\frac{105\,a^{4}b^{6}}{2\,x^{4}}-\frac{360\,a^{3}b^{7}}{11}x^{-\frac{11}{3}}-\frac{27\,a^{2}b^{8}}{2}x^{-\frac{10}{3}}-\frac{10\,ab^{9}}{3\,x^{3}}-\frac{3\,b^{10}}{8}x^{-\frac{8}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^10/x^7,x)
```

```
[Out] -1/6*a^10/x^6-30/17*a^9*b/x^(17/3)-135/16*a^8*b^2/x^(16/3)-24*a^7
*b^3/x^5-45*a^6*b^4/x^(14/3)-756/13*a^5*b^5/x^(13/3)-105/2*a^4*b^
6/x^4-360/11*a^3*b^7/x^(11/3)-27/2*a^2*b^8/x^(10/3)-10/3*a*b^9/x^
3-3/8*b^10/x^(8/3)
```

Maxima [A] time = 1.43973, size = 151, normalized size = 1.05

$$-\frac{43758\,b^{10}x^{\frac{10}{3}}+388960\,ab^{9}x^{3}+1575288\,a^{2}b^{8}x^{\frac{8}{3}}+3818880\,a^{3}b^{7}x^{\frac{7}{3}}+6126120\,a^{4}b^{6}x^{2}+6785856\,a^{5}b^{5}x^{\frac{5}{3}}+5250960\,a^{6}b^{4}x^{\frac{4}{3}}}{116688\,x^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10/x^7,x, algorithm="maxima")
```

```
[Out] -1/116688*(43758*b^10*x^(10/3) + 388960*a*b^9*x^3 + 1575288*a^2*b
^8*x^(8/3) + 3818880*a^3*b^7*x^(7/3) + 6126120*a^4*b^6*x^2 + 6785
856*a^5*b^5*x^(5/3) + 5250960*a^6*b^4*x^(4/3) + 2800512*a^7*b^3*x
 + 984555*a^8*b^2*x^(2/3) + 205920*a^9*b*x^(1/3) + 19448*a^10)/x^
6
```

Fricas [A] time = 0.217837, size = 154, normalized size = 1.07

$$-\frac{388960\,ab^{9}x^{3}+6126120\,a^{4}b^{6}x^{2}+2800512\,a^{7}b^{3}x+19448\,a^{10}+15147\left(104\,a^{2}b^{8}x^{2}+448\,a^{5}b^{5}x+65\,a^{8}b^{2}\right)x^{\frac{2}{3}}+234\left(187\,b^{1}\right.}{116688\,x^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10/x^7,x, algorithm="fricas")
```

```
[Out] -1/116688*(388960*a*b^9*x^3 + 6126120*a^4*b^6*x^2 + 2800512*a^7*b
^3*x + 19448*a^10 + 15147*(104*a^2*b^8*x^2 + 448*a^5*b^5*x + 65*a
^8*b^2)*x^(2/3) + 234*(187*b^10*x^3 + 16320*a^3*b^7*x^2 + 22440*a
^6*b^4*x + 880*a^9*b)*x^(1/3))/x^6
```

Sympy [A] time = 39.7926, size = 146, normalized size = 1.01

$$-\frac{a^{10}}{6x^{6}}-\frac{30a^{9}b}{17x^{\frac{17}{3}}}-\frac{135a^{8}b^{2}}{16x^{\frac{16}{3}}}-\frac{24a^{7}b^{3}}{x^{5}}-\frac{45a^{6}b^{4}}{x^{\frac{14}{3}}}-\frac{756a^{5}b^{5}}{13x^{\frac{13}{3}}}-\frac{105a^{4}b^{6}}{2x^{4}}-\frac{360a^{3}b^{7}}{11x^{\frac{11}{3}}}-\frac{27a^{2}b^{8}}{2x^{\frac{10}{3}}}-\frac{10ab^{9}}{3x^{3}}-\frac{3b^{10}}{8x^{\frac{8}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**10/x**7,x)
```

```
[Out] -a**10/(6*x**6) - 30*a**9*b/(17*x**(17/3)) - 135*a**8*b**2/(16*x*
*(16/3)) - 24*a**7*b**3/x**5 - 45*a**6*b**4/x**(14/3) - 756*a**5*
b**5/(13*x**(13/3)) - 105*a**4*b**6/(2*x**4) - 360*a**3*b**7/(11*
x**(11/3)) - 27*a**2*b**8/(2*x**(10/3)) - 10*a*b**9/(3*x**3) - 3*
b**10/(8*x**(8/3))
```

GIAC/XCAS [A] time = 0.269649, size = 151, normalized size = 1.05

$$-\frac{43758\,b^{10}x^{\frac{10}{3}} + 388960\,ab^{9}x^{3} + 1575288\,a^{2}b^{8}x^{\frac{8}{3}} + 3818880\,a^{3}b^{7}x^{\frac{7}{3}} + 6126120\,a^{4}b^{6}x^{2} + 6785856\,a^{5}b^{5}x^{\frac{5}{3}} + 5250960\,a^{6}b^{4}x^{\frac{4}{3}}}{116688\,x^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10/x^7,x, algorithm="giac")
```

```
[Out] -1/116688*(43758*b^10*x^(10/3) + 388960*a*b^9*x^3 + 1575288*a^2*b
^8*x^(8/3) + 3818880*a^3*b^7*x^(7/3) + 6126120*a^4*b^6*x^2 + 6785
856*a^5*b^5*x^(5/3) + 5250960*a^6*b^4*x^(4/3) + 2800512*a^7*b^3*x
 + 984555*a^8*b^2*x^(2/3) + 205920*a^9*b*x^(1/3) + 19448*a^10)/x^
6
```

3.2329 $\int \frac{\left(a+b\sqrt[3]{x}\right)^{10}}{x^8}\,dx$

Optimal. Leaf size=144

$$-\frac{a^{10}}{7x^7}-\frac{3a^9b}{2x^{20/3}}-\frac{135a^8b^2}{19x^{19/3}}-\frac{20a^7b^3}{x^6}-\frac{630a^6b^4}{17x^{17/3}}-\frac{189a^5b^5}{4x^{16/3}}-\frac{42a^4b^6}{x^5}-\frac{180a^3b^7}{7x^{14/3}}-\frac{135a^2b^8}{13x^{13/3}}-\frac{5ab^9}{2x^4}-\frac{3b^{10}}{11x^{11/3}}$$

```
[Out] -a^10/(7*x^7) - (3*a^9*b)/(2*x^(20/3)) - (135*a^8*b^2)/(19*x^(19/
3)) - (20*a^7*b^3)/x^6 - (630*a^6*b^4)/(17*x^(17/3)) - (189*a^5*b
^5)/(4*x^(16/3)) - (42*a^4*b^6)/x^5 - (180*a^3*b^7)/(7*x^(14/3))
- (135*a^2*b^8)/(13*x^(13/3)) - (5*a*b^9)/(2*x^4) - (3*b^10)/(11*
x^(11/3))
```

Rubi [A] time = 0.179372, antiderivative size = 144, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^{10}}{7x^7}-\frac{3a^9b}{2x^{20/3}}-\frac{135a^8b^2}{19x^{19/3}}-\frac{20a^7b^3}{x^6}-\frac{630a^6b^4}{17x^{17/3}}-\frac{189a^5b^5}{4x^{16/3}}-\frac{42a^4b^6}{x^5}-\frac{180a^3b^7}{7x^{14/3}}-\frac{135a^2b^8}{13x^{13/3}}-\frac{5ab^9}{2x^4}-\frac{3b^{10}}{11x^{11/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^10/x^8,x]
```

```
[Out] -a^10/(7*x^7) - (3*a^9*b)/(2*x^(20/3)) - (135*a^8*b^2)/(19*x^(19/
3)) - (20*a^7*b^3)/x^6 - (630*a^6*b^4)/(17*x^(17/3)) - (189*a^5*b
^5)/(4*x^(16/3)) - (42*a^4*b^6)/x^5 - (180*a^3*b^7)/(7*x^(14/3))
- (135*a^2*b^8)/(13*x^(13/3)) - (5*a*b^9)/(2*x^4) - (3*b^10)/(11*
x^(11/3))
```

Rubi in Sympy [A] time = 31.7783, size = 146, normalized size = 1.01

$$-\frac{a^{10}}{7x^7}-\frac{3a^9b}{2x^{\frac{20}{3}}}-\frac{135a^8b^2}{19x^{\frac{19}{3}}}-\frac{20a^7b^3}{x^6}-\frac{630a^6b^4}{17x^{\frac{17}{3}}}-\frac{189a^5b^5}{4x^{\frac{16}{3}}}-\frac{42a^4b^6}{x^5}-\frac{180a^3b^7}{7x^{\frac{14}{3}}}-\frac{135a^2b^8}{13x^{\frac{13}{3}}}-\frac{5ab^9}{2x^4}-\frac{3b^{10}}{11x^{\frac{11}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**10/x**8,x)
```

```
[Out] -a**10/(7*x**7) - 3*a**9*b/(2*x**(20/3)) - 135*a**8*b**2/(19*x**(
19/3)) - 20*a**7*b**3/x**6 - 630*a**6*b**4/(17*x**(17/3)) - 189*a
**5*b**5/(4*x**(16/3)) - 42*a**4*b**6/x**5 - 180*a**3*b**7/(7*x**
(14/3)) - 135*a**2*b**8/(13*x**(13/3)) - 5*a*b**9/(2*x**4) - 3*b*
*10/(11*x**(11/3))
```

Mathematica [A] time = 0.0567608, size = 144, normalized size = 1.

$$-\frac{a^{10}}{7x^7}-\frac{3a^9b}{2x^{20/3}}-\frac{135a^8b^2}{19x^{19/3}}-\frac{20a^7b^3}{x^6}-\frac{630a^6b^4}{17x^{17/3}}-\frac{189a^5b^5}{4x^{16/3}}-\frac{42a^4b^6}{x^5}-\frac{180a^3b^7}{7x^{14/3}}-\frac{135a^2b^8}{13x^{13/3}}-\frac{5ab^9}{2x^4}-\frac{3b^{10}}{11x^{11/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^10/x^8,x]
```

```
[Out] -a^10/(7*x^7) - (3*a^9*b)/(2*x^(20/3)) - (135*a^8*b^2)/(19*x^(19/
3)) - (20*a^7*b^3)/x^6 - (630*a^6*b^4)/(17*x^(17/3)) - (189*a^5*b
^5)/(4*x^(16/3)) - (42*a^4*b^6)/x^5 - (180*a^3*b^7)/(7*x^(14/3))
- (135*a^2*b^8)/(13*x^(13/3)) - (5*a*b^9)/(2*x^4) - (3*b^10)/(11*
```

```
x^(11/3))
```

Maple [A] time = 0.011, size = 113, normalized size = 0.8

$$-\frac{a^{10}}{7\,x^{7}}-\frac{3\,a^{9}b}{2}x^{-\frac{20}{3}}-\frac{135\,a^{8}b^{2}}{19}x^{-\frac{19}{3}}-20\,\frac{a^{7}b^{3}}{x^{6}}-\frac{630\,a^{6}b^{4}}{17}x^{-\frac{17}{3}}-\frac{189\,a^{5}b^{5}}{4}x^{-\frac{16}{3}}-42\,\frac{a^{4}b^{6}}{x^{5}}-\frac{180\,a^{3}b^{7}}{7}x^{-\frac{14}{3}}-\frac{135\,a^{2}b^{8}}{13}x^{-\frac{13}{3}}-\frac{5\,ab^{9}}{2\,x^{4}}-\frac{3\,b^{10}}{11}x^{-\frac{11}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^10/x^8,x)
```

```
[Out] -1/7*a^10/x^7-3/2*a^9*b/x^(20/3)-135/19*a^8*b^2/x^(19/3)-20*a^7*b
^3/x^6-630/17*a^6*b^4/x^(17/3)-189/4*a^5*b^5/x^(16/3)-42*a^4*b^6/
x^5-180/7*a^3*b^7/x^(14/3)-135/13*a^2*b^8/x^(13/3)-5/2*a*b^9/x^4-
3/11*b^10/x^(11/3)
```

Maxima [A] time = 1.44517, size = 151, normalized size = 1.05

$$-\frac{352716\,b^{10}x^{\frac{10}{3}}+3233230\,ab^{9}x^{3}+13430340\,a^{2}b^{8}x^{\frac{8}{3}}+33256080\,a^{3}b^{7}x^{\frac{7}{3}}+54318264\,a^{4}b^{6}x^{2}+61108047\,a^{5}b^{5}x^{\frac{5}{3}}+47927880}{1293292\,x^{7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10/x^8,x, algorithm="maxima")
```

```
[Out] -1/1293292*(352716*b^10*x^(10/3) + 3233230*a*b^9*x^3 + 13430340*a
^2*b^8*x^(8/3) + 33256080*a^3*b^7*x^(7/3) + 54318264*a^4*b^6*x^2
+ 61108047*a^5*b^5*x^(5/3) + 47927880*a^6*b^4*x^(4/3) + 25865840*
a^7*b^3*x + 9189180*a^8*b^2*x^(2/3) + 1939938*a^9*b*x^(1/3) + 184
756*a^10)/x^7
```

Fricas [A] time = 0.217877, size = 154, normalized size = 1.07

$$-\frac{3233230\,ab^{9}x^{3}+54318264\,a^{4}b^{6}x^{2}+25865840\,a^{7}b^{3}x+184756\,a^{10}+35343\left(380\,a^{2}b^{8}x^{2}+1729\,a^{5}b^{5}x+260\,a^{8}b^{2}\right)x^{\frac{2}{3}}+1482}{1293292\,x^{7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10/x^8,x, algorithm="fricas")
```

```
[Out] -1/1293292*(3233230*a*b^9*x^3 + 54318264*a^4*b^6*x^2 + 25865840*a
^7*b^3*x + 184756*a^10 + 35343*(380*a^2*b^8*x^2 + 1729*a^5*b^5*x
+ 260*a^8*b^2)*x^(2/3) + 1482*(238*b^10*x^3 + 22440*a^3*b^7*x^2 +
 32340*a^6*b^4*x + 1309*a^9*b)*x^(1/3))/x^7
```

Sympy [A] time = 60.1749, size = 146, normalized size = 1.01

$$-\frac{a^{10}}{7x^{7}}-\frac{3a^{9}b}{2x^{\frac{20}{3}}}-\frac{135a^{8}b^{2}}{19x^{\frac{19}{3}}}-\frac{20a^{7}b^{3}}{x^{6}}-\frac{630a^{6}b^{4}}{17x^{\frac{17}{3}}}-\frac{189a^{5}b^{5}}{4x^{\frac{16}{3}}}-\frac{42a^{4}b^{6}}{x^{5}}-\frac{180a^{3}b^{7}}{7x^{\frac{14}{3}}}-\frac{135a^{2}b^{8}}{13x^{\frac{13}{3}}}-\frac{5ab^{9}}{2x^{4}}-\frac{3b^{10}}{11x^{\frac{11}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**10/x**8,x)
```

```
[Out] -a**10/(7*x**7) - 3*a**9*b/(2*x**(20/3)) - 135*a**8*b**2/(19*x**(
19/3)) - 20*a**7*b**3/x**6 - 630*a**6*b**4/(17*x**(17/3)) - 189*a
**5*b**5/(4*x**(16/3)) - 42*a**4*b**6/x**5 - 180*a**3*b**7/(7*x**
(14/3)) - 135*a**2*b**8/(13*x**(13/3)) - 5*a*b**9/(2*x**4) - 3*b*
*10/(11*x**(11/3))
```

GIAC/XCAS [A] time = 0.220233, size = 151, normalized size = 1.05

$$-\frac{352716\, b^{10} x^{\frac{10}{3}} + 3233230\, a b^{9} x^{3} + 13430340\, a^{2} b^{8} x^{\frac{8}{3}} + 33256080\, a^{3} b^{7} x^{\frac{7}{3}} + 54318264\, a^{4} b^{6} x^{2} + 61108047\, a^{5} b^{5} x^{\frac{5}{3}} + 47927880}{1293292\, x^{7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10/x^8,x, algorithm="giac")
```

```
[Out] -1/1293292*(352716*b^10*x^(10/3) + 3233230*a*b^9*x^3 + 13430340*a
^2*b^8*x^(8/3) + 33256080*a^3*b^7*x^(7/3) + 54318264*a^4*b^6*x^2
+ 61108047*a^5*b^5*x^(5/3) + 47927880*a^6*b^4*x^(4/3) + 25865840*
a^7*b^3*x + 9189180*a^8*b^2*x^(2/3) + 1939938*a^9*b*x^(1/3) + 184
756*a^10)/x^7
```

3.2330 $\int \frac{\left(a+b\sqrt[3]{x}\right)^{10}}{x^9}\,dx$

Optimal. Leaf size=144

$$-\frac{a^{10}}{8x^8}-\frac{30a^9b}{23x^{23/3}}-\frac{135a^8b^2}{22x^{22/3}}-\frac{120a^7b^3}{7x^7}-\frac{63a^6b^4}{2x^{20/3}}-\frac{756a^5b^5}{19x^{19/3}}-\frac{35a^4b^6}{x^6}-\frac{360a^3b^7}{17x^{17/3}}-\frac{135a^2b^8}{16x^{16/3}}-\frac{2ab^9}{x^5}-\frac{3b^{10}}{14x^{14/3}}$$

```
[Out] -a^10/(8*x^8) - (30*a^9*b)/(23*x^(23/3)) - (135*a^8*b^2)/(22*x^(2
2/3)) - (120*a^7*b^3)/(7*x^7) - (63*a^6*b^4)/(2*x^(20/3)) - (756*
a^5*b^5)/(19*x^(19/3)) - (35*a^4*b^6)/x^6 - (360*a^3*b^7)/(17*x^(
17/3)) - (135*a^2*b^8)/(16*x^(16/3)) - (2*a*b^9)/x^5 - (3*b^10)/(
14*x^(14/3))
```

Rubi [A] time = 0.182271, antiderivative size = 144, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^{10}}{8x^8}-\frac{30a^9b}{23x^{23/3}}-\frac{135a^8b^2}{22x^{22/3}}-\frac{120a^7b^3}{7x^7}-\frac{63a^6b^4}{2x^{20/3}}-\frac{756a^5b^5}{19x^{19/3}}-\frac{35a^4b^6}{x^6}-\frac{360a^3b^7}{17x^{17/3}}-\frac{135a^2b^8}{16x^{16/3}}-\frac{2ab^9}{x^5}-\frac{3b^{10}}{14x^{14/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^10/x^9,x]
```

```
[Out] -a^10/(8*x^8) - (30*a^9*b)/(23*x^(23/3)) - (135*a^8*b^2)/(22*x^(2
2/3)) - (120*a^7*b^3)/(7*x^7) - (63*a^6*b^4)/(2*x^(20/3)) - (756*
a^5*b^5)/(19*x^(19/3)) - (35*a^4*b^6)/x^6 - (360*a^3*b^7)/(17*x^(
17/3)) - (135*a^2*b^8)/(16*x^(16/3)) - (2*a*b^9)/x^5 - (3*b^10)/(
14*x^(14/3))
```

Rubi in Sympy [A] time = 31.6797, size = 146, normalized size = 1.01

$$-\frac{a^{10}}{8x^8}-\frac{30a^9b}{23x^{\frac{23}{3}}}-\frac{135a^8b^2}{22x^{\frac{22}{3}}}-\frac{120a^7b^3}{7x^7}-\frac{63a^6b^4}{2x^{\frac{20}{3}}}-\frac{756a^5b^5}{19x^{\frac{19}{3}}}-\frac{35a^4b^6}{x^6}-\frac{360a^3b^7}{17x^{\frac{17}{3}}}-\frac{135a^2b^8}{16x^{\frac{16}{3}}}-\frac{2ab^9}{x^5}-\frac{3b^{10}}{14x^{\frac{14}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**10/x**9,x)
```

```
[Out] -a**10/(8*x**8) - 30*a**9*b/(23*x**(23/3)) - 135*a**8*b**2/(22*x*
*(22/3)) - 120*a**7*b**3/(7*x**7) - 63*a**6*b**4/(2*x**(20/3)) -
756*a**5*b**5/(19*x**(19/3)) - 35*a**4*b**6/x**6 - 360*a**3*b**7/
(17*x**(17/3)) - 135*a**2*b**8/(16*x**(16/3)) - 2*a*b**9/x**5 - 3
*b**10/(14*x**(14/3))
```

Mathematica [A] time = 0.0500089, size = 144, normalized size = 1.

$$-\frac{a^{10}}{8x^8}-\frac{30a^9b}{23x^{23/3}}-\frac{135a^8b^2}{22x^{22/3}}-\frac{120a^7b^3}{7x^7}-\frac{63a^6b^4}{2x^{20/3}}-\frac{756a^5b^5}{19x^{19/3}}-\frac{35a^4b^6}{x^6}-\frac{360a^3b^7}{17x^{17/3}}-\frac{135a^2b^8}{16x^{16/3}}-\frac{2ab^9}{x^5}-\frac{3b^{10}}{14x^{14/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^10/x^9,x]
```

```
[Out] -a^10/(8*x^8) - (30*a^9*b)/(23*x^(23/3)) - (135*a^8*b^2)/(22*x^(2
2/3)) - (120*a^7*b^3)/(7*x^7) - (63*a^6*b^4)/(2*x^(20/3)) - (756*
a^5*b^5)/(19*x^(19/3)) - (35*a^4*b^6)/x^6 - (360*a^3*b^7)/(17*x^(
17/3)) - (135*a^2*b^8)/(16*x^(16/3)) - (2*a*b^9)/x^5 - (3*b^10)/(
14*x^(14/3))
```

Maple [A] time = 0.011, size = 113, normalized size = 0.8

$$-\frac{a^{10}}{8\,x^{8}}-\frac{30\,a^{9}b}{23}x^{-\frac{23}{3}}-\frac{135\,a^{8}b^{2}}{22}x^{-\frac{22}{3}}-\frac{120\,a^{7}b^{3}}{7\,x^{7}}-\frac{63\,a^{6}b^{4}}{2}x^{-\frac{20}{3}}-\frac{756\,a^{5}b^{5}}{19}x^{-\frac{19}{3}}-35\,\frac{a^{4}b^{6}}{x^{6}}-\frac{360\,a^{3}b^{7}}{17}x^{-\frac{17}{3}}-\frac{135\,a^{2}b^{8}}{16}x^{-\frac{16}{3}}-2\,\frac{ab^{9}}{x^{5}}-\frac{3\,b^{10}}{14}x^{-\frac{14}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^10/x^9,x)
```

```
[Out] -1/8*a^10/x^8-30/23*a^9*b/x^(23/3)-135/22*a^8*b^2/x^(22/3)-120/7*
a^7*b^3/x^7-63/2*a^6*b^4/x^(20/3)-756/19*a^5*b^5/x^(19/3)-35*a^4*
b^6/x^6-360/17*a^3*b^7/x^(17/3)-135/16*a^2*b^8/x^(16/3)-2*a*b^9/x
^5-3/14*b^10/x^(14/3)
```

Maxima [A] time = 1.44629, size = 151, normalized size = 1.05

$$-\frac{1961256\,b^{10}x^{\frac{10}{3}}+18305056\,ab^{9}x^{3}+77224455\,a^{2}b^{8}x^{\frac{8}{3}}+193818240\,a^{3}b^{7}x^{\frac{7}{3}}+320338480\,a^{4}b^{6}x^{2}+364174272\,a^{5}b^{5}x^{\frac{5}{3}}+288}{9152528\,x^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10/x^9,x, algorithm="maxima")
```

```
[Out] -1/9152528*(1961256*b^10*x^(10/3) + 18305056*a*b^9*x^3 + 77224455
*a^2*b^8*x^(8/3) + 193818240*a^3*b^7*x^(7/3) + 320338480*a^4*b^6*
x^2 + 364174272*a^5*b^5*x^(5/3) + 288304632*a^6*b^4*x^(4/3) + 156
900480*a^7*b^3*x + 56163240*a^8*b^2*x^(2/3) + 11938080*a^9*b*x^(1
/3) + 1144066*a^10)/x^8
```

Fricas [A] time = 0.218366, size = 154, normalized size = 1.07

$$-\frac{18305056\,ab^{9}x^{3}+320338480\,a^{4}b^{6}x^{2}+156900480\,a^{7}b^{3}x+1144066\,a^{10}+73899\left(1045\,a^{2}b^{8}x^{2}+4928\,a^{5}b^{5}x+760\,a^{8}b^{2}\right)x^{\frac{2}{3}}}{9152528\,x^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10/x^9,x, algorithm="fricas")
```

```
[Out] -1/9152528*(18305056*a*b^9*x^3 + 320338480*a^4*b^6*x^2 + 15690048
0*a^7*b^3*x + 1144066*a^10 + 73899*(1045*a^2*b^8*x^2 + 4928*a^5*b
^5*x + 760*a^8*b^2)*x^(2/3) + 5016*(391*b^10*x^3 + 38640*a^3*b^7*
x^2 + 57477*a^6*b^4*x + 2380*a^9*b)*x^(1/3))/x^8
```

Sympy [A] time = 90.58, size = 146, normalized size = 1.01

$$-\frac{a^{10}}{8x^{8}}-\frac{30a^{9}b}{23x^{\frac{23}{3}}}-\frac{135a^{8}b^{2}}{22x^{\frac{22}{3}}}-\frac{120a^{7}b^{3}}{7x^{7}}-\frac{63a^{6}b^{4}}{2x^{\frac{20}{3}}}-\frac{756a^{5}b^{5}}{19x^{\frac{19}{3}}}-\frac{35a^{4}b^{6}}{x^{6}}-\frac{360a^{3}b^{7}}{17x^{\frac{17}{3}}}-\frac{135a^{2}b^{8}}{16x^{\frac{16}{3}}}-\frac{2ab^{9}}{x^{5}}-\frac{3b^{10}}{14x^{\frac{14}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**10/x**9,x)
```

```
[Out] -a**10/(8*x**8) - 30*a**9*b/(23*x**(23/3)) - 135*a**8*b**2/(22*x*
*(22/3)) - 120*a**7*b**3/(7*x**7) - 63*a**6*b**4/(2*x**(20/3)) -
756*a**5*b**5/(19*x**(19/3)) - 35*a**4*b**6/x**6 - 360*a**3*b**7/
(17*x**(17/3)) - 135*a**2*b**8/(16*x**(16/3)) - 2*a*b**9/x**5 - 3
*b**10/(14*x**(14/3))
```

GIAC/XCAS [A] time = 0.221964, size = 151, normalized size = 1.05

$$-\frac{1961256\,b^{10}x^{\frac{10}{3}} + 18305056\,ab^{9}x^{3} + 77224455\,a^{2}b^{8}x^{\frac{8}{3}} + 193818240\,a^{3}b^{7}x^{\frac{7}{3}} + 320338480\,a^{4}b^{6}x^{2} + 364174272\,a^{5}b^{5}x^{\frac{5}{3}} + 288}{9152528\,x^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10/x^9,x, algorithm="giac")
```

```
[Out] -1/9152528*(1961256*b^10*x^(10/3) + 18305056*a*b^9*x^3 + 77224455
*a^2*b^8*x^(8/3) + 193818240*a^3*b^7*x^(7/3) + 320338480*a^4*b^6*
x^2 + 364174272*a^5*b^5*x^(5/3) + 288304632*a^6*b^4*x^(4/3) + 156
900480*a^7*b^3*x + 56163240*a^8*b^2*x^(2/3) + 11938080*a^9*b*x^(1
/3) + 1144066*a^10)/x^8
```

3.2331 $\int \frac{\left(a+b\sqrt[3]{x}\right)^{10}}{x^{10}}\,dx$

Optimal. Leaf size=142

$$-\frac{a^{10}}{9x^9}-\frac{15a^9b}{13x^{26/3}}-\frac{27a^8b^2}{5x^{25/3}}-\frac{15a^7b^3}{x^8}-\frac{630a^6b^4}{23x^{23/3}}-\frac{378a^5b^5}{11x^{22/3}}-\frac{30a^4b^6}{x^7}-\frac{18a^3b^7}{x^{20/3}}-\frac{135a^2b^8}{19x^{19/3}}-\frac{5ab^9}{3x^6}-\frac{3b^{10}}{17x^{17/3}}$$

```
[Out] -a^10/(9*x^9) - (15*a^9*b)/(13*x^(26/3)) - (27*a^8*b^2)/(5*x^(25/
3)) - (15*a^7*b^3)/x^8 - (630*a^6*b^4)/(23*x^(23/3)) - (378*a^5*b
^5)/(11*x^(22/3)) - (30*a^4*b^6)/x^7 - (18*a^3*b^7)/x^(20/3) - (1
35*a^2*b^8)/(19*x^(19/3)) - (5*a*b^9)/(3*x^6) - (3*b^10)/(17*x^(1
7/3))
```

Rubi [A] time = 0.182231, antiderivative size = 142, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^{10}}{9x^9}-\frac{15a^9b}{13x^{26/3}}-\frac{27a^8b^2}{5x^{25/3}}-\frac{15a^7b^3}{x^8}-\frac{630a^6b^4}{23x^{23/3}}-\frac{378a^5b^5}{11x^{22/3}}-\frac{30a^4b^6}{x^7}-\frac{18a^3b^7}{x^{20/3}}-\frac{135a^2b^8}{19x^{19/3}}-\frac{5ab^9}{3x^6}-\frac{3b^{10}}{17x^{17/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^10/x^10,x]
```

```
[Out] -a^10/(9*x^9) - (15*a^9*b)/(13*x^(26/3)) - (27*a^8*b^2)/(5*x^(25/
3)) - (15*a^7*b^3)/x^8 - (630*a^6*b^4)/(23*x^(23/3)) - (378*a^5*b
^5)/(11*x^(22/3)) - (30*a^4*b^6)/x^7 - (18*a^3*b^7)/x^(20/3) - (1
35*a^2*b^8)/(19*x^(19/3)) - (5*a*b^9)/(3*x^6) - (3*b^10)/(17*x^(1
7/3))
```

Rubi in Sympy [A] time = 32.7075, size = 144, normalized size = 1.01

$$-\frac{a^{10}}{9x^9}-\frac{15a^9b}{13x^{\frac{26}{3}}}-\frac{27a^8b^2}{5x^{\frac{25}{3}}}-\frac{15a^7b^3}{x^8}-\frac{630a^6b^4}{23x^{\frac{23}{3}}}-\frac{378a^5b^5}{11x^{\frac{22}{3}}}-\frac{30a^4b^6}{x^7}-\frac{18a^3b^7}{x^{\frac{20}{3}}}-\frac{135a^2b^8}{19x^{\frac{19}{3}}}-\frac{5ab^9}{3x^6}-\frac{3b^{10}}{17x^{\frac{17}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**10/x**10,x)
```

```
[Out] -a**10/(9*x**9) - 15*a**9*b/(13*x**(26/3)) - 27*a**8*b**2/(5*x**(
25/3)) - 15*a**7*b**3/x**8 - 630*a**6*b**4/(23*x**(23/3)) - 378*a
**5*b**5/(11*x**(22/3)) - 30*a**4*b**6/x**7 - 18*a**3*b**7/x**(20
/3) - 135*a**2*b**8/(19*x**(19/3)) - 5*a*b**9/(3*x**6) - 3*b**10/
(17*x**(17/3))
```

Mathematica [A] time = 0.0510856, size = 142, normalized size = 1.

$$-\frac{a^{10}}{9x^9}-\frac{15a^9b}{13x^{26/3}}-\frac{27a^8b^2}{5x^{25/3}}-\frac{15a^7b^3}{x^8}-\frac{630a^6b^4}{23x^{23/3}}-\frac{378a^5b^5}{11x^{22/3}}-\frac{30a^4b^6}{x^7}-\frac{18a^3b^7}{x^{20/3}}-\frac{135a^2b^8}{19x^{19/3}}-\frac{5ab^9}{3x^6}-\frac{3b^{10}}{17x^{17/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^10/x^10,x]
```

```
[Out] -a^10/(9*x^9) - (15*a^9*b)/(13*x^(26/3)) - (27*a^8*b^2)/(5*x^(25/
3)) - (15*a^7*b^3)/x^8 - (630*a^6*b^4)/(23*x^(23/3)) - (378*a^5*b
^5)/(11*x^(22/3)) - (30*a^4*b^6)/x^7 - (18*a^3*b^7)/x^(20/3) - (1
35*a^2*b^8)/(19*x^(19/3)) - (5*a*b^9)/(3*x^6) - (3*b^10)/(17*x^(1
```

```
7/3))
```

Maple [A] time = 0.011, size = 113, normalized size = 0.8

$$-\frac{a^{10}}{9\,x^9}-\frac{15\,a^9b}{13}x^{-\frac{26}{3}}-\frac{27\,a^8b^2}{5}x^{-\frac{25}{3}}-15\,\frac{a^7b^3}{x^8}-\frac{630\,a^6b^4}{23}x^{-\frac{23}{3}}-\frac{378\,a^5b^5}{11}x^{-\frac{22}{3}}-30\,\frac{a^4b^6}{x^7}-18\,a^3b^7x^{-\frac{20}{3}}-\frac{135\,a^2b^8}{19}x^{-\frac{19}{3}}-\frac{5\,ab^9}{3\,x^6}-\frac{3\,b^{10}}{17}x^{-\frac{17}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^10/x^10,x)
```

```
[Out] -1/9*a^10/x^9-15/13*a^9*b/x^(26/3)-27/5*a^8*b^2/x^(25/3)-15*a^7*b
^3/x^8-630/23*a^6*b^4/x^(23/3)-378/11*a^5*b^5/x^(22/3)-30*a^4*b^6
/x^7-18*a^3*b^7/x^(20/3)-135/19*a^2*b^8/x^(19/3)-5/3*a*b^9/x^6-3/
17*b^10/x^(17/3)
```

Maxima [A] time = 1.44608, size = 151, normalized size = 1.06

$$-\frac{8436285\,b^{10}x^{\frac{10}{3}}+79676025\,ab^9x^3+339671475\,a^2b^8x^{\frac{8}{3}}+860501070\,a^3b^7x^{\frac{7}{3}}+1434168450\,a^4b^6x^2+1642774770\,a^5b^5x^{\frac{5}{3}}+}{47805615\,x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10/x^10,x, algorithm="maxima")
```

```
[Out] -1/47805615*(8436285*b^10*x^(10/3) + 79676025*a*b^9*x^3 + 3396714
75*a^2*b^8*x^(8/3) + 860501070*a^3*b^7*x^(7/3) + 1434168450*a^4*b
^6*x^2 + 1642774770*a^5*b^5*x^(5/3) + 1309458150*a^6*b^4*x^(4/3)
+ 717084225*a^7*b^3*x + 258150321*a^8*b^2*x^(2/3) + 55160325*a^9*
b*x^(1/3) + 5311735*a^10)/x^9
```

Fricas [A] time = 0.216495, size = 154, normalized size = 1.08

$$-\frac{79676025\,ab^9x^3+1434168450\,a^4b^6x^2+717084225\,a^7b^3x+5311735\,a^{10}+1235169\left(275\,a^2b^8x^2+1330\,a^5b^5x+209\,a^8b^2\right)x}{47805615\,x^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10/x^10,x, algorithm="fricas")
```

```
[Out] -1/47805615*(79676025*a*b^9*x^3 + 1434168450*a^4*b^6*x^2 + 717084
225*a^7*b^3*x + 5311735*a^10 + 1235169*(275*a^2*b^8*x^2 + 1330*a^
5*b^5*x + 209*a^8*b^2)*x^(2/3) + 28215*(299*b^10*x^3 + 30498*a^3*
b^7*x^2 + 46410*a^6*b^4*x + 1955*a^9*b)*x^(1/3))/x^9
```

Sympy [A] time = 144.63, size = 144, normalized size = 1.01

$$-\frac{a^{10}}{9x^9}-\frac{15a^9b}{13x^{\frac{26}{3}}}-\frac{27a^8b^2}{5x^{\frac{25}{3}}}-\frac{15a^7b^3}{x^8}-\frac{630a^6b^4}{23x^{\frac{23}{3}}}-\frac{378a^5b^5}{11x^{\frac{22}{3}}}-\frac{30a^4b^6}{x^7}-\frac{18a^3b^7}{x^{\frac{20}{3}}}-\frac{135a^2b^8}{19x^{\frac{19}{3}}}-\frac{5ab^9}{3x^6}-\frac{3b^{10}}{17x^{\frac{17}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**10/x**10,x)
```

```
[Out] -a**10/(9*x**9) - 15*a**9*b/(13*x**(26/3)) - 27*a**8*b**2/(5*x**(
25/3)) - 15*a**7*b**3/x**8 - 630*a**6*b**4/(23*x**(23/3)) - 378*a
**5*b**5/(11*x**(22/3)) - 30*a**4*b**6/x**7 - 18*a**3*b**7/x**(20
/3) - 135*a**2*b**8/(19*x**(19/3)) - 5*a*b**9/(3*x**6) - 3*b**10/
(17*x**(17/3))
```

GIAC/XCAS [A] time = 0.220455, size = 151, normalized size = 1.06

$$-\frac{8436285\,b^{10}x^{\frac{10}{3}} + 79676025\,ab^{9}x^{3} + 339671475\,a^{2}b^{8}x^{\frac{8}{3}} + 860501070\,a^{3}b^{7}x^{\frac{7}{3}} + 1434168450\,a^{4}b^{6}x^{2} + 1642774770\,a^{5}b^{5}x^{\frac{5}{3}} + }{47805615\,x^{9}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^10/x^10,x, algorithm="giac")
```

```
[Out] -1/47805615*(8436285*b^10*x^(10/3) + 79676025*a*b^9*x^3 + 3396714
75*a^2*b^8*x^(8/3) + 860501070*a^3*b^7*x^(7/3) + 1434168450*a^4*b
^6*x^2 + 1642774770*a^5*b^5*x^(5/3) + 1309458150*a^6*b^4*x^(4/3)
+ 717084225*a^7*b^3*x + 258150321*a^8*b^2*x^(2/3) + 55160325*a^9*
b*x^(1/3) + 5311735*a^10)/x^9
```

3.2332 $\int \left(a+b\sqrt[3]{x}\right)^{15} x^5 \, dx$

Optimal. Leaf size=217

$$\frac{a^{15}x^6}{6}+\frac{45}{19}a^{14}bx^{19/3}+\frac{63}{4}a^{13}b^2x^{20/3}+65a^{12}b^3x^7+\frac{4095}{22}a^{11}b^4x^{22/3}+\frac{9009}{23}a^{10}b^5x^{23/3}+\frac{5005}{8}a^9b^6x^8+\frac{3861}{5}a^8b^7x^{25/3}+\frac{1485}{2}a^7b^8x^{26/3}+\frac{5005}{9}a^6b^9x^9+\frac{1287}{4}a^5b^{10}x^{28/3}+\frac{4095}{29}a^4b^{11}x^{29/3}+\frac{91}{2}a^3b^{12}x^{10}+\frac{315}{31}a^2b^{13}x^{31/3}+\frac{45}{32}ab^{14}x^{32/3}+\frac{b^{15}x^{11}}{11}$$

```
[Out] (a^15*x^6)/6 + (45*a^14*b*x^(19/3))/19 + (63*a^13*b^2*x^(20/3))/4
 + 65*a^12*b^3*x^7 + (4095*a^11*b^4*x^(22/3))/22 + (9009*a^10*b^5
*x^(23/3))/23 + (5005*a^9*b^6*x^8)/8 + (3861*a^8*b^7*x^(25/3))/5
+ (1485*a^7*b^8*x^(26/3))/2 + (5005*a^6*b^9*x^9)/9 + (1287*a^5*b^
10*x^(28/3))/4 + (4095*a^4*b^11*x^(29/3))/29 + (91*a^3*b^12*x^10)
/2 + (315*a^2*b^13*x^(31/3))/31 + (45*a*b^14*x^(32/3))/32 + (b^15
*x^11)/11
```

Rubi [A] time = 0.361593, antiderivative size = 217, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^{15}x^6}{6}+\frac{45}{19}a^{14}bx^{19/3}+\frac{63}{4}a^{13}b^2x^{20/3}+65a^{12}b^3x^7+\frac{4095}{22}a^{11}b^4x^{22/3}+\frac{9009}{23}a^{10}b^5x^{23/3}+\frac{5005}{8}a^9b^6x^8+\frac{3861}{5}a^8b^7x^{25/3}+\frac{1485}{2}a^7b^8x^{26/3}+\frac{5005}{9}a^6b^9x^9+\frac{1287}{4}a^5b^{10}x^{28/3}+\frac{4095}{29}a^4b^{11}x^{29/3}+\frac{91}{2}a^3b^{12}x^{10}+\frac{315}{31}a^2b^{13}x^{31/3}+\frac{45}{32}ab^{14}x^{32/3}+\frac{b^{15}x^{11}}{11}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^15*x^5,x]
```

```
[Out] (a^15*x^6)/6 + (45*a^14*b*x^(19/3))/19 + (63*a^13*b^2*x^(20/3))/4
 + 65*a^12*b^3*x^7 + (4095*a^11*b^4*x^(22/3))/22 + (9009*a^10*b^5
*x^(23/3))/23 + (5005*a^9*b^6*x^8)/8 + (3861*a^8*b^7*x^(25/3))/5
+ (1485*a^7*b^8*x^(26/3))/2 + (5005*a^6*b^9*x^9)/9 + (1287*a^5*b^
10*x^(28/3))/4 + (4095*a^4*b^11*x^(29/3))/29 + (91*a^3*b^12*x^10)
/2 + (315*a^2*b^13*x^(31/3))/31 + (45*a*b^14*x^(32/3))/32 + (b^15
*x^11)/11
```

Rubi in Sympy [A] time = 68.2499, size = 218, normalized size = 1.

$$\frac{a^{15}x^6}{6}+\frac{45a^{14}bx^{\frac{19}{3}}}{19}+\frac{63a^{13}b^2x^{\frac{20}{3}}}{4}+65a^{12}b^3x^7+\frac{4095a^{11}b^4x^{\frac{22}{3}}}{22}+\frac{9009a^{10}b^5x^{\frac{23}{3}}}{23}+\frac{5005a^9b^6x^8}{8}+\frac{3861a^8b^7x^{\frac{25}{3}}}{5}+\frac{1485a^7b^8x^{\frac{26}{3}}}{2}+\frac{5005a^6b^9x^9}{9}+\frac{1287a^5b^{10}x^{\frac{28}{3}}}{4}+\frac{4095a^4b^{11}x^{\frac{29}{3}}}{29}+\frac{91a^3b^{12}x^{10}}{2}+\frac{315a^2b^{13}x^{\frac{31}{3}}}{31}+\frac{45ab^{14}x^{\frac{32}{3}}}{32}+\frac{b^{15}x^{11}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**15*x**5,x)
```

```
[Out] a**15*x**6/6 + 45*a**14*b*x**(19/3)/19 + 63*a**13*b**2*x**(20/3)/
4 + 65*a**12*b**3*x**7 + 4095*a**11*b**4*x**(22/3)/22 + 9009*a**1
0*b**5*x**(23/3)/23 + 5005*a**9*b**6*x**8/8 + 3861*a**8*b**7*x**(
25/3)/5 + 1485*a**7*b**8*x**(26/3)/2 + 5005*a**6*b**9*x**9/9 + 12
87*a**5*b**10*x**(28/3)/4 + 4095*a**4*b**11*x**(29/3)/29 + 91*a**
3*b**12*x**10/2 + 315*a**2*b**13*x**(31/3)/31 + 45*a*b**14*x**(32
/3)/32 + b**15*x**11/11
```

Mathematica [A] time = 0.0379692, size = 217, normalized size = 1.

$$\frac{a^{15}x^6}{6}+\frac{45}{19}a^{14}bx^{19/3}+\frac{63}{4}a^{13}b^2x^{20/3}+65a^{12}b^3x^7+\frac{4095}{22}a^{11}b^4x^{22/3}+\frac{9009}{23}a^{10}b^5x^{23/3}+\frac{5005}{8}a^9b^6x^8+\frac{3861}{5}a^8b^7x^{25/3}+\frac{1485}{2}a^7b^8x^{26/3}+\frac{5005}{9}a^6b^9x^9+\frac{1287}{4}a^5b^{10}x^{28/3}+\frac{4095}{29}a^4b^{11}x^{29/3}+\frac{91}{2}a^3b^{12}x^{10}+\frac{315}{31}a^2b^{13}x^{31/3}+\frac{45}{32}ab^{14}x^{32/3}+\frac{b^{15}x^{11}}{11}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^15*x^5,x]
```

```
[Out] (a^15*x^6)/6 + (45*a^14*b*x^(19/3))/19 + (63*a^13*b^2*x^(20/3))/4
 + 65*a^12*b^3*x^7 + (4095*a^11*b^4*x^(22/3))/22 + (9009*a^10*b^5
*x^(23/3))/23 + (5005*a^9*b^6*x^8)/8 + (3861*a^8*b^7*x^(25/3))/5
+ (1485*a^7*b^8*x^(26/3))/2 + (5005*a^6*b^9*x^9)/9 + (1287*a^5*b^
10*x^(28/3))/4 + (4095*a^4*b^11*x^(29/3))/29 + (91*a^3*b^12*x^10)
/2 + (315*a^2*b^13*x^(31/3))/31 + (45*a*b^14*x^(32/3))/32 + (b^15
*x^11)/11
```

Maple [A] time = 0.004, size = 168, normalized size = 0.8

$$\frac{a^{15}x^6}{6}+\frac{45\,a^{14}b}{19}x^{\frac{19}{3}}+\frac{63\,a^{13}b^2}{4}x^{\frac{20}{3}}+65\,a^{12}b^3x^7+\frac{4095\,a^{11}b^4}{22}x^{\frac{22}{3}}+\frac{9009\,a^{10}b^5}{23}x^{\frac{23}{3}}+\frac{5005\,a^9b^6x^8}{8}+\frac{3861\,a^8b^7}{5}x^{\frac{25}{3}}+\frac{1485\,a^7b^8}{2}x^{\frac{26}{3}}+\frac{5005\,a^6b^9x^9}{9}+\frac{1287\,a^5b^{10}}{4}x^{\frac{28}{3}}+\frac{4095\,a^4b^{11}}{29}x^{\frac{29}{3}}+\frac{91\,a^3b^{12}x^{10}}{2}+\frac{315\,a^2b^{13}}{31}x^{\frac{31}{3}}+\frac{45\,ab^{14}}{32}x^{\frac{32}{3}}+\frac{b^{15}x^{11}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^15*x^5,x)
```

```
[Out] 1/6*a^15*x^6+45/19*a^14*b*x^(19/3)+63/4*a^13*b^2*x^(20/3)+65*a^12
*b^3*x^7+4095/22*a^11*b^4*x^(22/3)+9009/23*a^10*b^5*x^(23/3)+5005
/8*a^9*b^6*x^8+3861/5*a^8*b^7*x^(25/3)+1485/2*a^7*b^8*x^(26/3)+50
05/9*a^6*b^9*x^9+1287/4*a^5*b^10*x^(28/3)+4095/29*a^4*b^11*x^(29/
3)+91/2*a^3*b^12*x^10+315/31*a^2*b^13*x^(31/3)+45/32*a*b^14*x^(32
/3)+1/11*b^15*x^11
```

Maxima [A] time = 1.46231, size = 408, normalized size = 1.88

$$\frac{\left(bx^{\frac{1}{3}}+a\right)^{33}}{11\,b^{18}}-\frac{51\left(bx^{\frac{1}{3}}+a\right)^{32}a}{32\,b^{18}}+\frac{408\left(bx^{\frac{1}{3}}+a\right)^{31}a^2}{31\,b^{18}}-\frac{68\left(bx^{\frac{1}{3}}+a\right)^{30}a^3}{b^{18}}+\frac{7140\left(bx^{\frac{1}{3}}+a\right)^{29}a^4}{29\,b^{18}}-\frac{663\left(bx^{\frac{1}{3}}+a\right)^{28}a^5}{b^{18}}+\frac{12376\left(bx^{\frac{1}{3}}+a\right)^{27}a^6}{9\,b^{18}}-\frac{2244\left(bx^{\frac{1}{3}}+a\right)^{26}a^7}{b^{18}}+\frac{14586\left(bx^{\frac{1}{3}}+a\right)^{25}a^8}{5\,b^{18}}-\frac{12155\left(bx^{\frac{1}{3}}+a\right)^{24}a^9}{4\,b^{18}}+\frac{58344\left(bx^{\frac{1}{3}}+a\right)^{23}a^{10}}{23\,b^{18}}-\frac{18564\left(bx^{\frac{1}{3}}+a\right)^{22}a^{11}}{11\,b^{18}}+\frac{884\left(bx^{\frac{1}{3}}+a\right)^{21}a^{12}}{b^{18}}-\frac{357\left(bx^{\frac{1}{3}}+a\right)^{20}a^{13}}{b^{18}}+\frac{2040\left(bx^{\frac{1}{3}}+a\right)^{19}a^{14}}{19\,b^{18}}-\frac{68\left(bx^{\frac{1}{3}}+a\right)^{18}a^{15}}{3\,b^{18}}+\frac{3\left(bx^{\frac{1}{3}}+a\right)^{17}a^{16}}{b^{18}}-\frac{3\left(bx^{\frac{1}{3}}+a\right)^{16}a^{17}}{16\,b^{18}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15*x^5,x, algorithm="maxima")
```

```
[Out] 1/11*(b*x^(1/3) + a)^33/b^18 - 51/32*(b*x^(1/3) + a)^32*a/b^18 +
408/31*(b*x^(1/3) + a)^31*a^2/b^18 - 68*(b*x^(1/3) + a)^30*a^3/b^
18 + 7140/29*(b*x^(1/3) + a)^29*a^4/b^18 - 663*(b*x^(1/3) + a)^28
*a^5/b^18 + 12376/9*(b*x^(1/3) + a)^27*a^6/b^18 - 2244*(b*x^(1/3)
 + a)^26*a^7/b^18 + 14586/5*(b*x^(1/3) + a)^25*a^8/b^18 - 12155/4
*(b*x^(1/3) + a)^24*a^9/b^18 + 58344/23*(b*x^(1/3) + a)^23*a^10/b
^18 - 18564/11*(b*x^(1/3) + a)^22*a^11/b^18 + 884*(b*x^(1/3) + a)
^21*a^12/b^18 - 357*(b*x^(1/3) + a)^20*a^13/b^18 + 2040/19*(b*x^(
1/3) + a)^19*a^14/b^18 - 68/3*(b*x^(1/3) + a)^18*a^15/b^18 + 3*(b
*x^(1/3) + a)^17*a^16/b^18 - 3/16*(b*x^(1/3) + a)^16*a^17/b^18
```

Fricas [A] time = 0.215121, size = 242, normalized size = 1.12

$$\frac{1}{11}\,b^{15}x^{11}+\frac{91}{2}\,a^{3}b^{12}x^{10}+\frac{5005}{9}\,a^{6}b^{9}x^{9}+\frac{5005}{8}\,a^{9}b^{6}x^{8}+65\,a^{12}b^{3}x^{7}+\frac{1}{6}\,a^{15}x^{6}+\frac{9}{21344}\left(3335\,ab^{14}x^{10}+334880\,a^{4}b^{11}x^{9}+1760880\,a^{7}b^{8}x^{8}+928928\,a^{10}b^{5}x^{7}+37352\,a^{13}b^{2}x^{6}\right)x^{\frac{2}{3}}+\frac{9}{129580}\left(146300\,a^{2}b^{13}x^{10}+4632485\,a^{5}b^{10}x^{9}+11117964\,a^{8}b^{7}x^{8}+2679950\,a^{11}b^{4}x^{7}+34100\,a^{14}bx^{6}\right)x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15*x^5,x, algorithm="fricas")
```

```
[Out] 1/11*b^15*x^11 + 91/2*a^3*b^12*x^10 + 5005/9*a^6*b^9*x^9 + 5005/8
*a^9*b^6*x^8 + 65*a^12*b^3*x^7 + 1/6*a^15*x^6 + 9/21344*(3335*a*b
^14*x^10 + 334880*a^4*b^11*x^9 + 1760880*a^7*b^8*x^8 + 928928*a^1
0*b^5*x^7 + 37352*a^13*b^2*x^6)*x^(2/3) + 9/129580*(146300*a^2*b^
13*x^10 + 4632485*a^5*b^10*x^9 + 11117964*a^8*b^7*x^8 + 2679950*a
^11*b^4*x^7 + 34100*a^14*b*x^6)*x^(1/3)
```

Sympy [A] time = 68.3461, size = 218, normalized size = 1.

$$\frac{a^{15}x^{6}}{6}+\frac{45a^{14}bx^{\frac{19}{3}}}{19}+\frac{63a^{13}b^{2}x^{\frac{20}{3}}}{4}+65a^{12}b^{3}x^{7}+\frac{4095a^{11}b^{4}x^{\frac{22}{3}}}{22}+\frac{9009a^{10}b^{5}x^{\frac{23}{3}}}{23}+\frac{5005a^{9}b^{6}x^{8}}{8}+\frac{3861a^{8}b^{7}x^{\frac{25}{3}}}{5}+\frac{1485a^{7}b^{8}x^{\frac{26}{3}}}{2}+\frac{5005a^{6}b^{9}x^{9}}{9}+\frac{1287a^{5}b^{10}x^{\frac{28}{3}}}{4}+\frac{4095a^{4}b^{11}x^{\frac{29}{3}}}{29}+\frac{91a^{3}b^{12}x^{10}}{2}+\frac{315a^{2}b^{13}x^{\frac{31}{3}}}{31}+\frac{45ab^{14}x^{\frac{32}{3}}}{32}+\frac{b^{15}x^{11}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**15*x**5,x)
```

```
[Out] a**15*x**6/6 + 45*a**14*b*x**(19/3)/19 + 63*a**13*b**2*x**(20/3)/
4 + 65*a**12*b**3*x**7 + 4095*a**11*b**4*x**(22/3)/22 + 9009*a**1
0*b**5*x**(23/3)/23 + 5005*a**9*b**6*x**8/8 + 3861*a**8*b**7*x**(
25/3)/5 + 1485*a**7*b**8*x**(26/3)/2 + 5005*a**6*b**9*x**9/9 + 12
87*a**5*b**10*x**(28/3)/4 + 4095*a**4*b**11*x**(29/3)/29 + 91*a**
3*b**12*x**10/2 + 315*a**2*b**13*x**(31/3)/31 + 45*a*b**14*x**(32
/3)/32 + b**15*x**11/11
```

GIAC/XCAS [A] time = 0.224153, size = 225, normalized size = 1.04

$$\frac{1}{11}\,b^{15}x^{11}+\frac{45}{32}\,ab^{14}x^{\frac{32}{3}}+\frac{315}{31}\,a^{2}b^{13}x^{\frac{31}{3}}+\frac{91}{2}\,a^{3}b^{12}x^{10}+\frac{4095}{29}\,a^{4}b^{11}x^{\frac{29}{3}}+\frac{1287}{4}\,a^{5}b^{10}x^{\frac{28}{3}}+\frac{5005}{9}\,a^{6}b^{9}x^{9}+\frac{1485}{2}\,a^{7}b^{8}x^{\frac{26}{3}}+\frac{3861}{5}\,a^{8}b^{7}x^{\frac{25}{3}}+\frac{5005}{8}\,a^{9}b^{6}x^{8}+\frac{9009}{23}\,a^{10}b^{5}x^{\frac{23}{3}}+\frac{4095}{22}\,a^{11}b^{4}x^{\frac{22}{3}}+65\,a^{12}b^{3}x^{7}+\frac{63}{4}\,a^{13}b^{2}x^{\frac{20}{3}}+\frac{45}{19}\,a^{14}bx^{\frac{19}{3}}+\frac{1}{6}\,a^{15}x^{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15*x^5,x, algorithm="giac")
```

```
[Out] 1/11*b^15*x^11 + 45/32*a*b^14*x^(32/3) + 315/31*a^2*b^13*x^(31/3)
 + 91/2*a^3*b^12*x^10 + 4095/29*a^4*b^11*x^(29/3) + 1287/4*a^5*b^
10*x^(28/3) + 5005/9*a^6*b^9*x^9 + 1485/2*a^7*b^8*x^(26/3) + 3861
/5*a^8*b^7*x^(25/3) + 5005/8*a^9*b^6*x^8 + 9009/23*a^10*b^5*x^(23
/3) + 4095/22*a^11*b^4*x^(22/3) + 65*a^12*b^3*x^7 + 63/4*a^13*b^2
*x^(20/3) + 45/19*a^14*b*x^(19/3) + 1/6*a^15*x^6
```

3.2333 $\int \left(a+b\sqrt[3]{x}\right)^{15} x^4\,dx$

Optimal. Leaf size=217

$$\frac{a^{15}x^5}{5}+\frac{45}{16}a^{14}bx^{16/3}+\frac{315}{17}a^{13}b^2x^{17/3}+\frac{455}{6}a^{12}b^3x^6+\frac{4095}{19}a^{11}b^4x^{19/3}+\frac{9009}{20}a^{10}b^5x^{20/3}+715a^9b^6x^7+\frac{1755}{2}a^8b^7x^{22/3}+\frac{19305}{23}a^7b^8x^{23/3}+\frac{5005}{8}a^6b^9x^8+\frac{9009}{25}a^5b^{10}x^{25/3}+\frac{315}{2}a^4b^{11}x^{26/3}+\frac{455}{9}a^3b^{12}x^9+\frac{45}{4}a^2b^{13}x^{28/3}+\frac{45}{29}ab^{14}x^{29/3}+\frac{b^{15}x^{10}}{10}$$

```
[Out] (a^15*x^5)/5 + (45*a^14*b*x^(16/3))/16 + (315*a^13*b^2*x^(17/3))/
17 + (455*a^12*b^3*x^6)/6 + (4095*a^11*b^4*x^(19/3))/19 + (9009*a
^10*b^5*x^(20/3))/20 + 715*a^9*b^6*x^7 + (1755*a^8*b^7*x^(22/3))/
2 + (19305*a^7*b^8*x^(23/3))/23 + (5005*a^6*b^9*x^8)/8 + (9009*a^
5*b^10*x^(25/3))/25 + (315*a^4*b^11*x^(26/3))/2 + (455*a^3*b^12*x
^9)/9 + (45*a^2*b^13*x^(28/3))/4 + (45*a*b^14*x^(29/3))/29 + (b^1
5*x^10)/10
```

Rubi [A] time = 0.350772, antiderivative size = 217, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{a^{15}x^5}{5}+\frac{45}{16}a^{14}bx^{16/3}+\frac{315}{17}a^{13}b^2x^{17/3}+\frac{455}{6}a^{12}b^3x^6+\frac{4095}{19}a^{11}b^4x^{19/3}+\frac{9009}{20}a^{10}b^5x^{20/3}+715a^9b^6x^7+\frac{1755}{2}a^8b^7x^{22/3}+\frac{19305}{23}a^7b^8x^{23/3}+\frac{5005}{8}a^6b^9x^8+\frac{9009}{25}a^5b^{10}x^{25/3}+\frac{315}{2}a^4b^{11}x^{26/3}+\frac{455}{9}a^3b^{12}x^9+\frac{45}{4}a^2b^{13}x^{28/3}+\frac{45}{29}ab^{14}x^{29/3}+\frac{b^{15}x^{10}}{10}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^15*x^4,x]
```

```
[Out] (a^15*x^5)/5 + (45*a^14*b*x^(16/3))/16 + (315*a^13*b^2*x^(17/3))/
17 + (455*a^12*b^3*x^6)/6 + (4095*a^11*b^4*x^(19/3))/19 + (9009*a
^10*b^5*x^(20/3))/20 + 715*a^9*b^6*x^7 + (1755*a^8*b^7*x^(22/3))/
2 + (19305*a^7*b^8*x^(23/3))/23 + (5005*a^6*b^9*x^8)/8 + (9009*a^
5*b^10*x^(25/3))/25 + (315*a^4*b^11*x^(26/3))/2 + (455*a^3*b^12*x
^9)/9 + (45*a^2*b^13*x^(28/3))/4 + (45*a*b^14*x^(29/3))/29 + (b^1
5*x^10)/10
```

Rubi in Sympy [A] time = 61.9748, size = 218, normalized size = 1.

$$\frac{a^{15}x^5}{5}+\frac{45a^{14}bx^{\frac{16}{3}}}{16}+\frac{315a^{13}b^2x^{\frac{17}{3}}}{17}+\frac{455a^{12}b^3x^6}{6}+\frac{4095a^{11}b^4x^{\frac{19}{3}}}{19}+\frac{9009a^{10}b^5x^{\frac{20}{3}}}{20}+715a^9b^6x^7+\frac{1755a^8b^7x^{\frac{22}{3}}}{2}+\frac{19305a^7b^8x^{\frac{23}{3}}}{23}+\frac{5005a^6b^9x^8}{8}+\frac{9009a^5b^{10}x^{\frac{25}{3}}}{25}+\frac{315a^4b^{11}x^{\frac{26}{3}}}{2}+\frac{455a^3b^{12}x^9}{9}+\frac{45a^2b^{13}x^{\frac{28}{3}}}{4}+\frac{45ab^{14}x^{\frac{29}{3}}}{29}+\frac{b^{15}x^{10}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**15*x**4,x)
```

```
[Out] a**15*x**5/5 + 45*a**14*b*x**(16/3)/16 + 315*a**13*b**2*x**(17/3)
/17 + 455*a**12*b**3*x**6/6 + 4095*a**11*b**4*x**(19/3)/19 + 9009
*a**10*b**5*x**(20/3)/20 + 715*a**9*b**6*x**7 + 1755*a**8*b**7*x*
*(22/3)/2 + 19305*a**7*b**8*x**(23/3)/23 + 5005*a**6*b**9*x**8/8
+ 9009*a**5*b**10*x**(25/3)/25 + 315*a**4*b**11*x**(26/3)/2 + 455
*a**3*b**12*x**9/9 + 45*a**2*b**13*x**(28/3)/4 + 45*a*b**14*x**(2
9/3)/29 + b**15*x**10/10
```

Mathematica [A] time = 0.030992, size = 217, normalized size = 1.

$$\frac{a^{15}x^5}{5}+\frac{45}{16}a^{14}bx^{16/3}+\frac{315}{17}a^{13}b^2x^{17/3}+\frac{455}{6}a^{12}b^3x^6+\frac{4095}{19}a^{11}b^4x^{19/3}+\frac{9009}{20}a^{10}b^5x^{20/3}+715a^9b^6x^7+\frac{1755}{2}a^8b^7x^{22/3}+\frac{19305}{23}a^7b^8x^{23/3}+\frac{5005}{8}a^6b^9x^8+\frac{9009}{25}a^5b^{10}x^{25/3}+\frac{315}{2}a^4b^{11}x^{26/3}+\frac{455}{9}a^3b^{12}x^9+\frac{45}{4}a^2b^{13}x^{28/3}+\frac{45}{29}ab^{14}x^{29/3}+\frac{b^{15}x^{10}}{10}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^15*x^4,x]
```

```
[Out] (a^15*x^5)/5 + (45*a^14*b*x^(16/3))/16 + (315*a^13*b^2*x^(17/3))/
17 + (455*a^12*b^3*x^6)/6 + (4095*a^11*b^4*x^(19/3))/19 + (9009*a
^10*b^5*x^(20/3))/20 + 715*a^9*b^6*x^7 + (1755*a^8*b^7*x^(22/3))/
2 + (19305*a^7*b^8*x^(23/3))/23 + (5005*a^6*b^9*x^8)/8 + (9009*a^
5*b^10*x^(25/3))/25 + (315*a^4*b^11*x^(26/3))/2 + (455*a^3*b^12*x
^9)/9 + (45*a^2*b^13*x^(28/3))/4 + (45*a*b^14*x^(29/3))/29 + (b^1
5*x^10)/10
```

Maple [A] time = 0.004, size = 168, normalized size = 0.8

$$\frac{a^{15}x^5}{5}+\frac{45\,a^{14}b}{16}x^{\frac{16}{3}}+\frac{315\,a^{13}b^2}{17}x^{\frac{17}{3}}+\frac{455\,a^{12}b^3x^6}{6}+\frac{4095\,a^{11}b^4}{19}x^{\frac{19}{3}}+\frac{9009\,a^{10}b^5}{20}x^{\frac{20}{3}}+715\,a^9b^6x^7+\frac{1755\,a^8b^7}{2}x^{\frac{22}{3}}+\frac{19305\,a^7b^8}{23}x^{\frac{23}{3}}+\frac{5005\,a^6b^9x^8}{8}+\frac{9009\,a^5b^{10}}{25}x^{\frac{25}{3}}+\frac{315\,a^4b^{11}}{2}x^{\frac{26}{3}}+\frac{455\,a^3b^{12}x^9}{9}+\frac{45\,a^2b^{13}}{4}x^{\frac{28}{3}}+\frac{45\,ab^{14}}{29}x^{\frac{29}{3}}+\frac{b^{15}x^{10}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^15*x^4,x)
```

```
[Out] 1/5*a^15*x^5+45/16*a^14*b*x^(16/3)+315/17*a^13*b^2*x^(17/3)+455/6
*a^12*b^3*x^6+4095/19*a^11*b^4*x^(19/3)+9009/20*a^10*b^5*x^(20/3)
+715*a^9*b^6*x^7+1755/2*a^8*b^7*x^(22/3)+19305/23*a^7*b^8*x^(23/3
)+5005/8*a^6*b^9*x^8+9009/25*a^5*b^10*x^(25/3)+315/2*a^4*b^11*x^(
26/3)+455/9*a^3*b^12*x^9+45/4*a^2*b^13*x^(28/3)+45/29*a*b^14*x^(2
9/3)+1/10*b^15*x^10
```

Maxima [A] time = 1.44837, size = 339, normalized size = 1.56

$$\frac{\left(bx^{\frac{1}{3}}+a\right)^{30}}{10\,b^{15}}-\frac{42\left(bx^{\frac{1}{3}}+a\right)^{29}a}{29\,b^{15}}+\frac{39\left(bx^{\frac{1}{3}}+a\right)^{28}a^2}{4\,b^{15}}-\frac{364\left(bx^{\frac{1}{3}}+a\right)^{27}a^3}{9\,b^{15}}+\frac{231\left(bx^{\frac{1}{3}}+a\right)^{26}a^4}{2\,b^{15}}-\frac{6006\left(bx^{\frac{1}{3}}+a\right)^{25}a^5}{25\,b^{15}}+\frac{3003\left(bx^{\frac{1}{3}}+a\right)^{24}a^6}{8\,b^{15}}-\frac{10296\left(bx^{\frac{1}{3}}+a\right)^{23}a^7}{23\,b^{15}}+\frac{819\left(bx^{\frac{1}{3}}+a\right)^{22}a^8}{2\,b^{15}}-\frac{286\left(bx^{\frac{1}{3}}+a\right)^{21}a^9}{b^{15}}+\frac{3003\left(bx^{\frac{1}{3}}+a\right)^{20}a^{10}}{20\,b^{15}}-\frac{1092\left(bx^{\frac{1}{3}}+a\right)^{19}a^{11}}{19\,b^{15}}+\frac{91\left(bx^{\frac{1}{3}}+a\right)^{18}a^{12}}{6\,b^{15}}-\frac{42\left(bx^{\frac{1}{3}}+a\right)^{17}a^{13}}{17\,b^{15}}+\frac{3\left(bx^{\frac{1}{3}}+a\right)^{16}a^{14}}{16\,b^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15*x^4,x, algorithm="maxima")
```

```
[Out] 1/10*(b*x^(1/3) + a)^30/b^15 - 42/29*(b*x^(1/3) + a)^29*a/b^15 +
39/4*(b*x^(1/3) + a)^28*a^2/b^15 - 364/9*(b*x^(1/3) + a)^27*a^3/b
^15 + 231/2*(b*x^(1/3) + a)^26*a^4/b^15 - 6006/25*(b*x^(1/3) + a)
^25*a^5/b^15 + 3003/8*(b*x^(1/3) + a)^24*a^6/b^15 - 10296/23*(b*x
^(1/3) + a)^23*a^7/b^15 + 819/2*(b*x^(1/3) + a)^22*a^8/b^15 - 286
*(b*x^(1/3) + a)^21*a^9/b^15 + 3003/20*(b*x^(1/3) + a)^20*a^10/b^
15 - 1092/19*(b*x^(1/3) + a)^19*a^11/b^15 + 91/6*(b*x^(1/3) + a)^
18*a^12/b^15 - 42/17*(b*x^(1/3) + a)^17*a^13/b^15 + 3/16*(b*x^(1/
3) + a)^16*a^14/b^15
```

Fricas [A] time = 0.215154, size = 242, normalized size = 1.12

$$\frac{1}{10}\,b^{15}x^{10}+\frac{455}{9}\,a^{3}b^{12}x^{9}+\frac{5005}{8}\,a^{6}b^{9}x^{8}+715\,a^{9}b^{6}x^{7}+\frac{455}{6}\,a^{12}b^{3}x^{6}+\frac{1}{5}\,a^{15}x^{5}+\frac{9}{226780}\left(39100\,ab^{14}x^{9}+3968650\,a^{4}b^{11}x^{8}+21149700\,a^{7}b^{8}x^{7}+11350339\,a^{10}b^{5}x^{6}+466900\,a^{13}b^{2}x^{5}\right)x^{\frac{2}{3}}+\frac{9}{7600}\left(9500\,a^{2}b^{13}x^{9}+304304\,a^{5}b^{10}x^{8}+741000\,a^{8}b^{7}x^{7}+182000\,a^{11}b^{4}x^{6}+2375\,a^{14}bx^{5}\right)x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15*x^4,x, algorithm="fricas")
```

```
[Out] 1/10*b^15*x^10 + 455/9*a^3*b^12*x^9 + 5005/8*a^6*b^9*x^8 + 715*a^
9*b^6*x^7 + 455/6*a^12*b^3*x^6 + 1/5*a^15*x^5 + 9/226780*(39100*a
*b^14*x^9 + 3968650*a^4*b^11*x^8 + 21149700*a^7*b^8*x^7 + 1135033
9*a^10*b^5*x^6 + 466900*a^13*b^2*x^5)*x^(2/3) + 9/7600*(9500*a^2*
b^13*x^9 + 304304*a^5*b^10*x^8 + 741000*a^8*b^7*x^7 + 182000*a^11
*b^4*x^6 + 2375*a^14*b*x^5)*x^(1/3)
```

Sympy [A] time = 40.2561, size = 218, normalized size = 1.

$$\frac{a^{15}x^{5}}{5}+\frac{45a^{14}bx^{\frac{16}{3}}}{16}+\frac{315a^{13}b^{2}x^{\frac{17}{3}}}{17}+\frac{455a^{12}b^{3}x^{6}}{6}+\frac{4095a^{11}b^{4}x^{\frac{19}{3}}}{19}+\frac{9009a^{10}b^{5}x^{\frac{20}{3}}}{20}+715a^{9}b^{6}x^{7}+\frac{1755a^{8}b^{7}x^{\frac{22}{3}}}{2}+\frac{19305a^{7}b^{8}x^{\frac{23}{3}}}{23}+\frac{5005a^{6}b^{9}x^{8}}{8}+\frac{9009a^{5}b^{10}x^{\frac{25}{3}}}{25}+\frac{315a^{4}b^{11}x^{\frac{26}{3}}}{2}+\frac{455a^{3}b^{12}x^{9}}{9}+\frac{45a^{2}b^{13}x^{\frac{28}{3}}}{4}+\frac{45ab^{14}x^{\frac{29}{3}}}{29}+\frac{b^{15}x^{10}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**15*x**4,x)
```

```
[Out] a**15*x**5/5 + 45*a**14*b*x**(16/3)/16 + 315*a**13*b**2*x**(17/3)
/17 + 455*a**12*b**3*x**6/6 + 4095*a**11*b**4*x**(19/3)/19 + 9009
*a**10*b**5*x**(20/3)/20 + 715*a**9*b**6*x**7 + 1755*a**8*b**7*x*
*(22/3)/2 + 19305*a**7*b**8*x**(23/3)/23 + 5005*a**6*b**9*x**8/8
+ 9009*a**5*b**10*x**(25/3)/25 + 315*a**4*b**11*x**(26/3)/2 + 455
*a**3*b**12*x**9/9 + 45*a**2*b**13*x**(28/3)/4 + 45*a*b**14*x**(2
9/3)/29 + b**15*x**10/10
```

GIAC/XCAS [A] time = 0.220065, size = 225, normalized size = 1.04

$$\frac{1}{10}\,b^{15}x^{10}+\frac{45}{29}\,ab^{14}x^{\frac{29}{3}}+\frac{45}{4}\,a^{2}b^{13}x^{\frac{28}{3}}+\frac{455}{9}\,a^{3}b^{12}x^{9}+\frac{315}{2}\,a^{4}b^{11}x^{\frac{26}{3}}+\frac{9009}{25}\,a^{5}b^{10}x^{\frac{25}{3}}+\frac{5005}{8}\,a^{6}b^{9}x^{8}+\frac{19305}{23}\,a^{7}b^{8}x^{\frac{23}{3}}+\frac{1755}{2}\,a^{8}b^{7}x^{\frac{22}{3}}+715\,a^{9}b^{6}x^{7}+\frac{9009}{20}\,a^{10}b^{5}x^{\frac{20}{3}}+\frac{4095}{19}\,a^{11}b^{4}x^{\frac{19}{3}}+\frac{455}{6}\,a^{12}b^{3}x^{6}+\frac{315}{17}\,a^{13}b^{2}x^{\frac{17}{3}}+\frac{45}{16}\,a^{14}bx^{\frac{16}{3}}+\frac{1}{5}\,a^{15}x^{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15*x^4,x, algorithm="giac")
```

```
[Out] 1/10*b^15*x^10 + 45/29*a*b^14*x^(29/3) + 45/4*a^2*b^13*x^(28/3) +
 455/9*a^3*b^12*x^9 + 315/2*a^4*b^11*x^(26/3) + 9009/25*a^5*b^10*
x^(25/3) + 5005/8*a^6*b^9*x^8 + 19305/23*a^7*b^8*x^(23/3) + 1755/
2*a^8*b^7*x^(22/3) + 715*a^9*b^6*x^7 + 9009/20*a^10*b^5*x^(20/3)
+ 4095/19*a^11*b^4*x^(19/3) + 455/6*a^12*b^3*x^6 + 315/17*a^13*b^
2*x^(17/3) + 45/16*a^14*b*x^(16/3) + 1/5*a^15*x^5
```

3.2334 $\int \left(a+b\sqrt[3]{x}\right)^{15} x^3\,dx$

Optimal. Leaf size=244

$$-\frac{3a^{11}\left(a+b\sqrt[3]{x}\right)^{16}}{16b^{12}}+\frac{33a^{10}\left(a+b\sqrt[3]{x}\right)^{17}}{17b^{12}}-\frac{55a^{9}\left(a+b\sqrt[3]{x}\right)^{18}}{6b^{12}}+\frac{495a^{8}\left(a+b\sqrt[3]{x}\right)^{19}}{19b^{12}}-\frac{99a^{7}\left(a+b\sqrt[3]{x}\right)^{20}}{2b^{12}}+\frac{66a^{6}\left(a+b\sqrt[3]{x}\right)^{21}}{b^{12}}-\frac{63a^{5}\left(a+b\sqrt[3]{x}\right)^{22}}{b^{12}}+\frac{990a^{4}\left(a+b\sqrt[3]{x}\right)^{23}}{23b^{12}}-\frac{165a^{3}\left(a+b\sqrt[3]{x}\right)^{24}}{8b^{12}}+\frac{33a^{2}\left(a+b\sqrt[3]{x}\right)^{25}}{5b^{12}}+\frac{\left(a+b\sqrt[3]{x}\right)^{27}}{9b^{12}}-\frac{33a\left(a+b\sqrt[3]{x}\right)^{26}}{26b^{12}}$$

```
[Out] (-3*a^11*(a + b*x^(1/3))^16)/(16*b^12) + (33*a^10*(a + b*x^(1/3))
^17)/(17*b^12) - (55*a^9*(a + b*x^(1/3))^18)/(6*b^12) + (495*a^8*
(a + b*x^(1/3))^19)/(19*b^12) - (99*a^7*(a + b*x^(1/3))^20)/(2*b^
12) + (66*a^6*(a + b*x^(1/3))^21)/b^12 - (63*a^5*(a + b*x^(1/3))^
22)/b^12 + (990*a^4*(a + b*x^(1/3))^23)/(23*b^12) - (165*a^3*(a +
 b*x^(1/3))^24)/(8*b^12) + (33*a^2*(a + b*x^(1/3))^25)/(5*b^12) -
 (33*a*(a + b*x^(1/3))^26)/(26*b^12) + (a + b*x^(1/3))^27/(9*b^12
)
```

Rubi [A] time = 0.348297, antiderivative size = 244, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$-\frac{3a^{11}\left(a+b\sqrt[3]{x}\right)^{16}}{16b^{12}}+\frac{33a^{10}\left(a+b\sqrt[3]{x}\right)^{17}}{17b^{12}}-\frac{55a^{9}\left(a+b\sqrt[3]{x}\right)^{18}}{6b^{12}}+\frac{495a^{8}\left(a+b\sqrt[3]{x}\right)^{19}}{19b^{12}}-\frac{99a^{7}\left(a+b\sqrt[3]{x}\right)^{20}}{2b^{12}}+\frac{66a^{6}\left(a+b\sqrt[3]{x}\right)^{21}}{b^{12}}-\frac{63a^{5}\left(a+b\sqrt[3]{x}\right)^{22}}{b^{12}}+\frac{990a^{4}\left(a+b\sqrt[3]{x}\right)^{23}}{23b^{12}}-\frac{165a^{3}\left(a+b\sqrt[3]{x}\right)^{24}}{8b^{12}}+\frac{33a^{2}\left(a+b\sqrt[3]{x}\right)^{25}}{5b^{12}}+\frac{\left(a+b\sqrt[3]{x}\right)^{27}}{9b^{12}}-\frac{33a\left(a+b\sqrt[3]{x}\right)^{26}}{26b^{12}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^15*x^3,x]
```



```
[Out] (-3*a^11*(a + b*x^(1/3))^16)/(16*b^12) + (33*a^10*(a + b*x^(1/3))
^17)/(17*b^12) - (55*a^9*(a + b*x^(1/3))^18)/(6*b^12) + (495*a^8*
(a + b*x^(1/3))^19)/(19*b^12) - (99*a^7*(a + b*x^(1/3))^20)/(2*b^
12) + (66*a^6*(a + b*x^(1/3))^21)/b^12 - (63*a^5*(a + b*x^(1/3))^
22)/b^12 + (990*a^4*(a + b*x^(1/3))^23)/(23*b^12) - (165*a^3*(a +
 b*x^(1/3))^24)/(8*b^12) + (33*a^2*(a + b*x^(1/3))^25)/(5*b^12) -
 (33*a*(a + b*x^(1/3))^26)/(26*b^12) + (a + b*x^(1/3))^27/(9*b^12
)
```

Rubi in Sympy [A] time = 58.2071, size = 216, normalized size = 0.89

$$\frac{a^{15}x^4}{4}+\frac{45a^{14}bx^{\frac{13}{3}}}{13}+\frac{45a^{13}b^2x^{\frac{14}{3}}}{2}+91a^{12}b^3x^5+\frac{4095a^{11}b^4x^{\frac{16}{3}}}{16}+\frac{9009a^{10}b^5x^{\frac{17}{3}}}{17}+\frac{5005a^9b^6x^6}{6}+\frac{19305a^8b^7x^{\frac{19}{3}}}{19}+\frac{3861a^7b^8x^{\frac{20}{3}}}{4}+715a^6b^9x^7+\frac{819a^5b^{10}x^{\frac{22}{3}}}{2}+\frac{4095a^4b^{11}x^{\frac{23}{3}}}{23}+\frac{455a^3b^{12}x^8}{8}+\frac{63a^2b^{13}x^{\frac{25}{3}}}{5}+\frac{45ab^{14}x^{\frac{26}{3}}}{26}+\frac{b^{15}x^9}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**15*x**3,x)
```

```
[Out] a**15*x**4/4 + 45*a**14*b*x**(13/3)/13 + 45*a**13*b**2*x**(14/3)/
2 + 91*a**12*b**3*x**5 + 4095*a**11*b**4*x**(16/3)/16 + 9009*a**1
0*b**5*x**(17/3)/17 + 5005*a**9*b**6*x**6/6 + 19305*a**8*b**7*x**
```

```
(19/3)/19 + 3861*a**7*b**8*x**(20/3)/4 + 715*a**6*b**9*x**7 + 819
*a**5*b**10*x**(22/3)/2 + 4095*a**4*b**11*x**(23/3)/23 + 455*a**3
*b**12*x**8/8 + 63*a**2*b**13*x**(25/3)/5 + 45*a*b**14*x**(26/3)/
26 + b**15*x**9/9
```

Mathematica [A] time = 0.0351181, size = 215, normalized size = 0.88

$$\frac{a^{15}x^4}{4}+\frac{45}{13}a^{14}bx^{13/3}+\frac{45}{2}a^{13}b^2x^{14/3}+91a^{12}b^3x^5+\frac{4095}{16}a^{11}b^4x^{16/3}+\frac{9009}{17}a^{10}b^5x^{17/3}+\frac{5005}{6}a^9b^6x^6+\frac{19305}{19}a^8b^7x^{19/3}+\frac{3861}{4}a^7b^8x^{20/3}+715a^6b^9x^7+\frac{819}{2}a^5b^{10}x^{22/3}+\frac{4095}{23}a^4b^{11}x^{23/3}+\frac{455}{8}a^3b^{12}x^8+\frac{63}{5}a^2b^{13}x^{25/3}+\frac{45}{26}ab^{14}x^{26/3}+\frac{b^{15}x^9}{9}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^15*x^3,x]
```

```
[Out] (a^15*x^4)/4 + (45*a^14*b*x^(13/3))/13 + (45*a^13*b^2*x^(14/3))/2
 + 91*a^12*b^3*x^5 + (4095*a^11*b^4*x^(16/3))/16 + (9009*a^10*b^5
*x^(17/3))/17 + (5005*a^9*b^6*x^6)/6 + (19305*a^8*b^7*x^(19/3))/1
9 + (3861*a^7*b^8*x^(20/3))/4 + 715*a^6*b^9*x^7 + (819*a^5*b^10*x
^(22/3))/2 + (4095*a^4*b^11*x^(23/3))/23 + (455*a^3*b^12*x^8)/8 +
 (63*a^2*b^13*x^(25/3))/5 + (45*a*b^14*x^(26/3))/26 + (b^15*x^9)/
9
```

Maple [A] time = 0.004, size = 168, normalized size = 0.7

$$\frac{b^{15}x^9}{9}+\frac{45\,ab^{14}}{26}x^{\frac{26}{3}}+\frac{63\,a^2b^{13}}{5}x^{\frac{25}{3}}+\frac{455\,x^8a^3b^{12}}{8}+\frac{4095\,a^4b^{11}}{23}x^{\frac{23}{3}}+\frac{819\,a^5b^{10}}{2}x^{\frac{22}{3}}+715\,a^6b^9x^7+\frac{3861\,a^7b^8}{4}x^{\frac{20}{3}}+\frac{19305\,a^8b^7}{19}x^{\frac{19}{3}}+\frac{5005\,x^6a^9b^6}{6}+\frac{9009\,a^{10}b^5}{17}x^{\frac{17}{3}}+\frac{4095\,a^{11}b^4}{16}x^{\frac{16}{3}}+91\,a^{12}b^3x^5+\frac{45\,a^{13}b^2}{2}x^{\frac{14}{3}}+\frac{45\,a^{14}b}{13}x^{\frac{13}{3}}+\frac{x^4a^{15}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^15*x^3,x)
```

```
[Out] 1/9*b^15*x^9+45/26*a*b^14*x^(26/3)+63/5*a^2*b^13*x^(25/3)+455/8*x
^8*a^3*b^12+4095/23*a^4*b^11*x^(23/3)+819/2*a^5*b^10*x^(22/3)+715
*a^6*b^9*x^7+3861/4*a^7*b^8*x^(20/3)+19305/19*a^8*b^7*x^(19/3)+50
05/6*x^6*a^9*b^6+9009/17*a^10*b^5*x^(17/3)+4095/16*a^11*b^4*x^(16
/3)+91*a^12*b^3*x^5+45/2*a^13*b^2*x^(14/3)+45/13*a^14*b*x^(13/3)+
1/4*x^4*a^15
```

Maxima [A] time = 1.44344, size = 270, normalized size = 1.11

$$\frac{\left(bx^{\frac{1}{3}}+a\right)^{27}}{9\,b^{12}}-\frac{33\left(bx^{\frac{1}{3}}+a\right)^{26}a}{26\,b^{12}}+\frac{33\left(bx^{\frac{1}{3}}+a\right)^{25}a^2}{5\,b^{12}}-\frac{165\left(bx^{\frac{1}{3}}+a\right)^{24}a^3}{8\,b^{12}}+\frac{990\left(bx^{\frac{1}{3}}+a\right)^{23}a^4}{23\,b^{12}}-\frac{63\left(bx^{\frac{1}{3}}+a\right)^{22}a^5}{b^{12}}+\frac{66\left(bx^{\frac{1}{3}}+a\right)^{21}a^6}{b^{12}}-\frac{99\left(bx^{\frac{1}{3}}+a\right)^{20}a^7}{2\,b^{12}}+\frac{495\left(bx^{\frac{1}{3}}+a\right)^{19}a^8}{19\,b^{12}}-\frac{55\left(bx^{\frac{1}{3}}+a\right)^{18}a^9}{6\,b^{12}}+\frac{33\left(bx^{\frac{1}{3}}+a\right)^{17}a^{10}}{17\,b^{12}}-\frac{3\left(bx^{\frac{1}{3}}+a\right)^{16}a^{11}}{16\,b^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15*x^3,x, algorithm="maxima")
```

```
[Out] 1/9*(b*x^(1/3) + a)^27/b^12 - 33/26*(b*x^(1/3) + a)^26*a/b^12 + 3
3/5*(b*x^(1/3) + a)^25*a^2/b^12 - 165/8*(b*x^(1/3) + a)^24*a^3/b^
12 + 990/23*(b*x^(1/3) + a)^23*a^4/b^12 - 63*(b*x^(1/3) + a)^22*a
^5/b^12 + 66*(b*x^(1/3) + a)^21*a^6/b^12 - 99/2*(b*x^(1/3) + a)^2
0*a^7/b^12 + 495/19*(b*x^(1/3) + a)^19*a^8/b^12 - 55/6*(b*x^(1/3)
 + a)^18*a^9/b^12 + 33/17*(b*x^(1/3) + a)^17*a^10/b^12 - 3/16*(b*
x^(1/3) + a)^16*a^11/b^12
```

Fricas [A] time = 0.215568, size = 242, normalized size = 0.99

$$\frac{1}{9}\,b^{15}x^{9}+\frac{455}{8}\,a^{3}b^{12}x^{8}+715\,a^{6}b^{9}x^{7}+\frac{5005}{6}\,a^{9}b^{6}x^{6}+91\,a^{12}b^{3}x^{5}+\frac{1}{4}\,a^{15}x^{4}+\frac{9}{20332}\left(3910\,ab^{14}x^{8}+402220\,a^{4}b^{11}x^{7}+2180607\,a^{7}b^{8}x^{6}+1197196\,a^{10}b^{5}x^{5}+50830\,a^{13}b^{2}x^{4}\right)x^{\frac{2}{3}}+\frac{9}{19760}\left(27664\,a^{2}b^{13}x^{8}+899080\,a^{5}b^{10}x^{7}+2230800\,a^{8}b^{7}x^{6}+561925\,a^{11}b^{4}x^{5}+7600\,a^{14}bx^{4}\right)x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15*x^3,x, algorithm="fricas")
```

```
[Out] 1/9*b^15*x^9 + 455/8*a^3*b^12*x^8 + 715*a^6*b^9*x^7 + 5005/6*a^9*
b^6*x^6 + 91*a^12*b^3*x^5 + 1/4*a^15*x^4 + 9/20332*(3910*a*b^14*x
^8 + 402220*a^4*b^11*x^7 + 2180607*a^7*b^8*x^6 + 1197196*a^10*b^5
*x^5 + 50830*a^13*b^2*x^4)*x^(2/3) + 9/19760*(27664*a^2*b^13*x^8
+ 899080*a^5*b^10*x^7 + 2230800*a^8*b^7*x^6 + 561925*a^11*b^4*x^5
 + 7600*a^14*b*x^4)*x^(1/3)
```

Sympy [A] time = 26.3503, size = 216, normalized size = 0.89

$$\frac{a^{15}x^{4}}{4}+\frac{45a^{14}bx^{\frac{13}{3}}}{13}+\frac{45a^{13}b^{2}x^{\frac{14}{3}}}{2}+91a^{12}b^{3}x^{5}+\frac{4095a^{11}b^{4}x^{\frac{16}{3}}}{16}+\frac{9009a^{10}b^{5}x^{\frac{17}{3}}}{17}+\frac{5005a^{9}b^{6}x^{6}}{6}+\frac{19305a^{8}b^{7}x^{\frac{19}{3}}}{19}+\frac{3861a^{7}b^{8}x^{\frac{20}{3}}}{4}+715a^{6}b^{9}x^{7}+\frac{819a^{5}b^{10}x^{\frac{22}{3}}}{2}+\frac{4095a^{4}b^{11}x^{\frac{23}{3}}}{23}+\frac{455a^{3}b^{12}x^{8}}{8}+\frac{63a^{2}b^{13}x^{\frac{25}{3}}}{5}+\frac{45ab^{14}x^{\frac{26}{3}}}{26}+\frac{b^{15}x^{9}}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**15*x**3,x)
```

```
[Out] a**15*x**4/4 + 45*a**14*b*x**(13/3)/13 + 45*a**13*b**2*x**(14/3)/
2 + 91*a**12*b**3*x**5 + 4095*a**11*b**4*x**(16/3)/16 + 9009*a**1
0*b**5*x**(17/3)/17 + 5005*a**9*b**6*x**6/6 + 19305*a**8*b**7*x**
(19/3)/19 + 3861*a**7*b**8*x**(20/3)/4 + 715*a**6*b**9*x**7 + 819
*a**5*b**10*x**(22/3)/2 + 4095*a**4*b**11*x**(23/3)/23 + 455*a**3
*b**12*x**8/8 + 63*a**2*b**13*x**(25/3)/5 + 45*a*b**14*x**(26/3)/
26 + b**15*x**9/9
```

GIAC/XCAS [A] time = 0.220329, size = 225, normalized size = 0.92

$$\frac{1}{9}\,b^{15}x^{9}+\frac{45}{26}\,ab^{14}x^{\frac{26}{3}}+\frac{63}{5}\,a^{2}b^{13}x^{\frac{25}{3}}+\frac{455}{8}\,a^{3}b^{12}x^{8}+\frac{4095}{23}\,a^{4}b^{11}x^{\frac{23}{3}}+\frac{819}{2}\,a^{5}b^{10}x^{\frac{22}{3}}+715\,a^{6}b^{9}x^{7}+\frac{3861}{4}\,a^{7}b^{8}x^{\frac{20}{3}}+\frac{19305}{19}\,a^{8}b^{7}x^{\frac{19}{3}}+\frac{5005}{6}\,a^{9}b^{6}x^{6}+\frac{9009}{17}\,a^{10}b^{5}x^{\frac{17}{3}}+\frac{4095}{16}\,a^{11}b^{4}x^{\frac{16}{3}}+91\,a^{12}b^{3}x^{5}+\frac{45}{2}\,a^{13}b^{2}x^{\frac{14}{3}}+\frac{45}{13}\,a^{14}bx^{\frac{13}{3}}+\frac{1}{4}\,a^{15}x^{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15*x^3,x, algorithm="giac")
```

```
[Out] 1/9*b^15*x^9 + 45/26*a*b^14*x^(26/3) + 63/5*a^2*b^13*x^(25/3) + 4
55/8*a^3*b^12*x^8 + 4095/23*a^4*b^11*x^(23/3) + 819/2*a^5*b^10*x^
(22/3) + 715*a^6*b^9*x^7 + 3861/4*a^7*b^8*x^(20/3) + 19305/19*a^8
*b^7*x^(19/3) + 5005/6*a^9*b^6*x^6 + 9009/17*a^10*b^5*x^(17/3) +
4095/16*a^11*b^4*x^(16/3) + 91*a^12*b^3*x^5 + 45/2*a^13*b^2*x^(14
/3) + 45/13*a^14*b*x^(13/3) + 1/4*a^15*x^4
```

3.2335 $\int \left(a+b\sqrt[3]{x}\right)^{15} x^2\,dx$

Optimal. Leaf size=183

$$\frac{3a^8\left(a+b\sqrt[3]{x}\right)^{16}}{16b^9}-\frac{24a^7\left(a+b\sqrt[3]{x}\right)^{17}}{17b^9}+\frac{14a^6\left(a+b\sqrt[3]{x}\right)^{18}}{3b^9}-\frac{168a^5\left(a+b\sqrt[3]{x}\right)^{19}}{19b^9}+\frac{21a^4\left(a+b\sqrt[3]{x}\right)^{20}}{2b^9}-\frac{8a^3\left(a+b\sqrt[3]{x}\right)^{21}}{b^9}+\frac{42a^2\left(a+b\sqrt[3]{x}\right)^{22}}{11b^9}+\frac{\left(a+b\sqrt[3]{x}\right)^{24}}{8b^9}-\frac{24a\left(a+b\sqrt[3]{x}\right)^{23}}{23b^9}$$

```
[Out] (3*a^8*(a + b*x^(1/3))^16)/(16*b^9) - (24*a^7*(a + b*x^(1/3))^17)
/(17*b^9) + (14*a^6*(a + b*x^(1/3))^18)/(3*b^9) - (168*a^5*(a + b
*x^(1/3))^19)/(19*b^9) + (21*a^4*(a + b*x^(1/3))^20)/(2*b^9) - (8
*a^3*(a + b*x^(1/3))^21)/b^9 + (42*a^2*(a + b*x^(1/3))^22)/(11*b^
9) - (24*a*(a + b*x^(1/3))^23)/(23*b^9) + (a + b*x^(1/3))^24/(8*b
^9)
```

Rubi [A] time = 0.289039, antiderivative size = 183, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{3a^8\left(a+b\sqrt[3]{x}\right)^{16}}{16b^9}-\frac{24a^7\left(a+b\sqrt[3]{x}\right)^{17}}{17b^9}+\frac{14a^6\left(a+b\sqrt[3]{x}\right)^{18}}{3b^9}-\frac{168a^5\left(a+b\sqrt[3]{x}\right)^{19}}{19b^9}+\frac{21a^4\left(a+b\sqrt[3]{x}\right)^{20}}{2b^9}-\frac{8a^3\left(a+b\sqrt[3]{x}\right)^{21}}{b^9}+\frac{42a^2\left(a+b\sqrt[3]{x}\right)^{22}}{11b^9}+\frac{\left(a+b\sqrt[3]{x}\right)^{24}}{8b^9}-\frac{24a\left(a+b\sqrt[3]{x}\right)^{23}}{23b^9}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^15*x^2,x]
```

```
[Out] (3*a^8*(a + b*x^(1/3))^16)/(16*b^9) - (24*a^7*(a + b*x^(1/3))^17)
/(17*b^9) + (14*a^6*(a + b*x^(1/3))^18)/(3*b^9) - (168*a^5*(a + b
*x^(1/3))^19)/(19*b^9) + (21*a^4*(a + b*x^(1/3))^20)/(2*b^9) - (8
*a^3*(a + b*x^(1/3))^21)/b^9 + (42*a^2*(a + b*x^(1/3))^22)/(11*b^
9) - (24*a*(a + b*x^(1/3))^23)/(23*b^9) + (a + b*x^(1/3))^24/(8*b
^9)
```

Rubi in Sympy [A] time = 53.7429, size = 173, normalized size = 0.95

$$\frac{3a^8\left(a+b\sqrt[3]{x}\right)^{16}}{16b^9}-\frac{24a^7\left(a+b\sqrt[3]{x}\right)^{17}}{17b^9}+\frac{14a^6\left(a+b\sqrt[3]{x}\right)^{18}}{3b^9}-\frac{168a^5\left(a+b\sqrt[3]{x}\right)^{19}}{19b^9}+\frac{21a^4\left(a+b\sqrt[3]{x}\right)^{20}}{2b^9}-\frac{8a^3\left(a+b\sqrt[3]{x}\right)^{21}}{b^9}+\frac{42a^2\left(a+b\sqrt[3]{x}\right)^{22}}{11b^9}-\frac{24a\left(a+b\sqrt[3]{x}\right)^{23}}{23b^9}+\frac{\left(a+b\sqrt[3]{x}\right)^{24}}{8b^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**15*x**2,x)
```

```
[Out] 3*a**8*(a + b*x**(1/3))**16/(16*b**9) - 24*a**7*(a + b*x**(1/3))*
*17/(17*b**9) + 14*a**6*(a + b*x**(1/3))**18/(3*b**9) - 168*a**5*
(a + b*x**(1/3))**19/(19*b**9) + 21*a**4*(a + b*x**(1/3))**20/(2*
b**9) - 8*a**3*(a + b*x**(1/3))**21/b**9 + 42*a**2*(a + b*x**(1/3
))**22/(11*b**9) - 24*a*(a + b*x**(1/3))**23/(23*b**9) + (a + b*x
**(1/3))**24/(8*b**9)
```

Mathematica [A] time = 0.0336197, size = 213, normalized size = 1.16

$$\frac{a^{15}x^3}{3}+\frac{9}{2}a^{14}bx^{10/3}+\frac{315}{11}a^{13}b^2x^{11/3}+\frac{455}{4}a^{12}b^3x^4+315a^{11}b^4x^{13/3}+\frac{1287}{2}a^{10}b^5x^{14/3}+1001a^9b^6x^5+\frac{19305}{16}a^8b^7x^{16/3}+\frac{19305}{17}a^7b^8x^{17/3}+\frac{5005}{6}a^6b^9x^6+\frac{9009}{19}a^5b^{10}x^{19/3}+\frac{819}{4}a^4b^{11}x^{20/3}+65a^3b^{12}x^7+\frac{315}{22}a^2b^{13}x^{22/3}+\frac{45}{23}ab^{14}x^{23/3}+\frac{b^{15}x^8}{8}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^15*x^2,x]
```

```
[Out] (a^15*x^3)/3 + (9*a^14*b*x^(10/3))/2 + (315*a^13*b^2*x^(11/3))/11
 + (455*a^12*b^3*x^4)/4 + 315*a^11*b^4*x^(13/3) + (1287*a^10*b^5*
x^(14/3))/2 + 1001*a^9*b^6*x^5 + (19305*a^8*b^7*x^(16/3))/16 + (1
9305*a^7*b^8*x^(17/3))/17 + (5005*a^6*b^9*x^6)/6 + (9009*a^5*b^10
*x^(19/3))/19 + (819*a^4*b^11*x^(20/3))/4 + 65*a^3*b^12*x^7 + (31
5*a^2*b^13*x^(22/3))/22 + (45*a*b^14*x^(23/3))/23 + (b^15*x^8)/8
```

Maple [A] time = 0.004, size = 168, normalized size = 0.9

$$\frac{b^{15}x^8}{8}+\frac{45\,ab^{14}}{23}x^{\frac{23}{3}}+\frac{315\,a^2b^{13}}{22}x^{\frac{22}{3}}+65\,x^7a^3b^{12}+\frac{819\,a^4b^{11}}{4}x^{\frac{20}{3}}+\frac{9009\,a^5b^{10}}{19}x^{\frac{19}{3}}+\frac{5005\,a^6b^9x^6}{6}+\frac{19305\,a^7b^8}{17}x^{\frac{17}{3}}+\frac{19305\,a^8b^7}{16}x^{\frac{16}{3}}+1001\,x^5a^9b^6+\frac{1287\,a^{10}b^5}{2}x^{\frac{14}{3}}+315\,a^{11}b^4x^{13/3}+\frac{455\,a^{12}b^3x^4}{4}+\frac{315\,a^{13}b^2}{11}x^{\frac{11}{3}}+\frac{9\,a^{14}b}{2}x^{\frac{10}{3}}+\frac{x^3a^{15}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^15*x^2,x)
```

```
[Out] 1/8*b^15*x^8+45/23*a*b^14*x^(23/3)+315/22*a^2*b^13*x^(22/3)+65*x^
7*a^3*b^12+819/4*a^4*b^11*x^(20/3)+9009/19*a^5*b^10*x^(19/3)+5005
/6*a^6*b^9*x^6+19305/17*a^7*b^8*x^(17/3)+19305/16*a^8*b^7*x^(16/3
)+1001*x^5*a^9*b^6+1287/2*a^10*b^5*x^(14/3)+315*a^11*b^4*x^(13/3)
+455/4*a^12*b^3*x^4+315/11*a^13*b^2*x^(11/3)+9/2*a^14*b*x^(10/3)+
1/3*x^3*a^15
```

Maxima [A] time = 1.45724, size = 201, normalized size = 1.1

$$\frac{\left(bx^{\frac{1}{3}}+a\right)^{24}}{8\,b^9}-\frac{24\left(bx^{\frac{1}{3}}+a\right)^{23}a}{23\,b^9}+\frac{42\left(bx^{\frac{1}{3}}+a\right)^{22}a^2}{11\,b^9}-\frac{8\left(bx^{\frac{1}{3}}+a\right)^{21}a^3}{b^9}+\frac{21\left(bx^{\frac{1}{3}}+a\right)^{20}a^4}{2\,b^9}-\frac{168\left(bx^{\frac{1}{3}}+a\right)^{19}a^5}{19\,b^9}+\frac{14\left(bx^{\frac{1}{3}}+a\right)^{18}a^6}{3\,b^9}-\frac{24\left(bx^{\frac{1}{3}}+a\right)^{17}a^7}{17\,b^9}+\frac{3\left(bx^{\frac{1}{3}}+a\right)^{16}a^8}{16\,b^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15*x^2,x, algorithm="maxima")
```

```
[Out] 1/8*(b*x^(1/3) + a)^24/b^9 - 24/23*(b*x^(1/3) + a)^23*a/b^9 + 42/
11*(b*x^(1/3) + a)^22*a^2/b^9 - 8*(b*x^(1/3) + a)^21*a^3/b^9 + 21
/2*(b*x^(1/3) + a)^20*a^4/b^9 - 168/19*(b*x^(1/3) + a)^19*a^5/b^9
 + 14/3*(b*x^(1/3) + a)^18*a^6/b^9 - 24/17*(b*x^(1/3) + a)^17*a^7
/b^9 + 3/16*(b*x^(1/3) + a)^16*a^8/b^9
```

Fricas [A] time = 0.214222, size = 242, normalized size = 1.32

$$\frac{1}{8}b^{15}x^8+65a^3b^{12}x^7+\frac{5005}{6}a^6b^9x^6+1001a^9b^6x^5+\frac{455}{4}a^{12}b^3x^4+\frac{1}{3}a^{15}x^3+\frac{9}{17204}\left(3740ab^{14}x^7+391391a^4b^{11}x^6+2170740a^7b^8x^5+1230086a^{10}b^5x^4+54740a^{13}b^2x^3\right)x^{\frac{2}{3}}+\frac{9}{3344}\left(5320a^2b^{13}x^7+176176a^5b^{10}x^6+448305a^8b^7x^5+117040a^{11}b^4x^4+1672a^{14}bx^3\right)x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^(1/3) + a)^15*x^2,x, algorithm="fricas")
```

```
[Out] 1/8*b^15*x^8 + 65*a^3*b^12*x^7 + 5005/6*a^6*b^9*x^6 + 1001*a^9*b^
6*x^5 + 455/4*a^12*b^3*x^4 + 1/3*a^15*x^3 + 9/17204*(3740*a*b^14*
x^7 + 391391*a^4*b^11*x^6 + 2170740*a^7*b^8*x^5 + 1230086*a^10*b^
5*x^4 + 54740*a^13*b^2*x^3)*x^(2/3) + 9/3344*(5320*a^2*b^13*x^7 +
 176176*a^5*b^10*x^6 + 448305*a^8*b^7*x^5 + 117040*a^11*b^4*x^4 +
 1672*a^14*b*x^3)*x^(1/3)
```

Sympy [A] time = 17.3199, size = 214, normalized size = 1.17

$$\frac{a^{15}x^3}{3}+\frac{9a^{14}bx^{\frac{10}{3}}}{2}+\frac{315a^{13}b^2x^{\frac{11}{3}}}{11}+\frac{455a^{12}b^3x^4}{4}+315a^{11}b^4x^{\frac{13}{3}}+\frac{1287a^{10}b^5x^{\frac{14}{3}}}{2}+1001a^9b^6x^5+\frac{19305a^8b^7x^{\frac{16}{3}}}{16}+\frac{19305a^7b^8x^{\frac{17}{3}}}{17}+\frac{5005a^6b^9x^6}{6}+\frac{9009a^5b^{10}x^{\frac{19}{3}}}{19}+\frac{819a^4b^{11}x^{\frac{20}{3}}}{4}+65a^3b^{12}x^7+\frac{315a^2b^{13}x^{\frac{22}{3}}}{22}+\frac{45ab^{14}x^{\frac{23}{3}}}{23}+\frac{b^{15}x^8}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a+b*x**(1/3))**15*x**2,x)
```

```
[Out] a**15*x**3/3 + 9*a**14*b*x**(10/3)/2 + 315*a**13*b**2*x**(11/3)/1
1 + 455*a**12*b**3*x**4/4 + 315*a**11*b**4*x**(13/3) + 1287*a**10
*b**5*x**(14/3)/2 + 1001*a**9*b**6*x**5 + 19305*a**8*b**7*x**(16/
3)/16 + 19305*a**7*b**8*x**(17/3)/17 + 5005*a**6*b**9*x**6/6 + 90
09*a**5*b**10*x**(19/3)/19 + 819*a**4*b**11*x**(20/3)/4 + 65*a**3
*b**12*x**7 + 315*a**2*b**13*x**(22/3)/22 + 45*a*b**14*x**(23/3)/
23 + b**15*x**8/8
```

GIAC/XCAS [A] time = 0.222511, size = 225, normalized size = 1.23

$$\frac{1}{8}b^{15}x^8+\frac{45}{23}ab^{14}x^{\frac{23}{3}}+\frac{315}{22}a^2b^{13}x^{\frac{22}{3}}+65a^3b^{12}x^7+\frac{819}{4}a^4b^{11}x^{\frac{20}{3}}+\frac{9009}{19}a^5b^{10}x^{\frac{19}{3}}+\frac{5005}{6}a^6b^9x^6+\frac{19305}{17}a^7b^8x^{\frac{17}{3}}+\frac{19305}{16}a^8b^7x^{\frac{16}{3}}+1001a^9b^6x^5+\frac{1287}{2}a^{10}b^5x^{\frac{14}{3}}+315a^{11}b^4x^{\frac{13}{3}}+\frac{455}{4}a^{12}b^3x^4+\frac{315}{11}a^{13}b^2x^{\frac{11}{3}}+\frac{9}{2}a^{14}bx^{\frac{10}{3}}+\frac{1}{3}a^{15}x^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^(1/3) + a)^15*x^2,x, algorithm="giac")
```

```
[Out] 1/8*b^15*x^8 + 45/23*a*b^14*x^(23/3) + 315/22*a^2*b^13*x^(22/3) +
 65*a^3*b^12*x^7 + 819/4*a^4*b^11*x^(20/3) + 9009/19*a^5*b^10*x^(
19/3) + 5005/6*a^6*b^9*x^6 + 19305/17*a^7*b^8*x^(17/3) + 19305/16
*a^8*b^7*x^(16/3) + 1001*a^9*b^6*x^5 + 1287/2*a^10*b^5*x^(14/3) +
 315*a^11*b^4*x^(13/3) + 455/4*a^12*b^3*x^4 + 315/11*a^13*b^2*x^(
11/3) + 9/2*a^14*b*x^(10/3) + 1/3*a^15*x^3
```

3.2336 $\int \left(a+b\sqrt[3]{x}\right)^{15} x\,dx$

Optimal. Leaf size=122

$$-\frac{3a^5\left(a+b\sqrt[3]{x}\right)^{16}}{16b^6}+\frac{15a^4\left(a+b\sqrt[3]{x}\right)^{17}}{17b^6}-\frac{5a^3\left(a+b\sqrt[3]{x}\right)^{18}}{3b^6}+\frac{30a^2\left(a+b\sqrt[3]{x}\right)^{19}}{19b^6}+\frac{\left(a+b\sqrt[3]{x}\right)^{21}}{7b^6}-\frac{3a\left(a+b\sqrt[3]{x}\right)^{20}}{4b^6}$$

```
[Out] (-3*a^5*(a + b*x^(1/3))^16)/(16*b^6) + (15*a^4*(a + b*x^(1/3))^17
)/(17*b^6) - (5*a^3*(a + b*x^(1/3))^18)/(3*b^6) + (30*a^2*(a + b*
x^(1/3))^19)/(19*b^6) - (3*a*(a + b*x^(1/3))^20)/(4*b^6) + (a + b
*x^(1/3))^21/(7*b^6)
```

Rubi [A] time = 0.222192, antiderivative size = 122, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{3a^5\left(a+b\sqrt[3]{x}\right)^{16}}{16b^6}+\frac{15a^4\left(a+b\sqrt[3]{x}\right)^{17}}{17b^6}-\frac{5a^3\left(a+b\sqrt[3]{x}\right)^{18}}{3b^6}+\frac{30a^2\left(a+b\sqrt[3]{x}\right)^{19}}{19b^6}+\frac{\left(a+b\sqrt[3]{x}\right)^{21}}{7b^6}-\frac{3a\left(a+b\sqrt[3]{x}\right)^{20}}{4b^6}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^15*x,x]
```

```
[Out] (-3*a^5*(a + b*x^(1/3))^16)/(16*b^6) + (15*a^4*(a + b*x^(1/3))^17
)/(17*b^6) - (5*a^3*(a + b*x^(1/3))^18)/(3*b^6) + (30*a^2*(a + b*
x^(1/3))^19)/(19*b^6) - (3*a*(a + b*x^(1/3))^20)/(4*b^6) + (a + b
*x^(1/3))^21/(7*b^6)
```

Rubi in Sympy [A] time = 41.1548, size = 114, normalized size = 0.93

$$-\frac{3a^5\left(a+b\sqrt[3]{x}\right)^{16}}{16b^6}+\frac{15a^4\left(a+b\sqrt[3]{x}\right)^{17}}{17b^6}-\frac{5a^3\left(a+b\sqrt[3]{x}\right)^{18}}{3b^6}+\frac{30a^2\left(a+b\sqrt[3]{x}\right)^{19}}{19b^6}-\frac{3a\left(a+b\sqrt[3]{x}\right)^{20}}{4b^6}+\frac{\left(a+b\sqrt[3]{x}\right)^{21}}{7b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**15*x,x)
```

```
[Out] -3*a**5*(a + b*x**(1/3))**16/(16*b**6) + 15*a**4*(a + b*x**(1/3))
**17/(17*b**6) - 5*a**3*(a + b*x**(1/3))**18/(3*b**6) + 30*a**2*(
a + b*x**(1/3))**19/(19*b**6) - 3*a*(a + b*x**(1/3))**20/(4*b**6)
 + (a + b*x**(1/3))**21/(7*b**6)
```

Mathematica [A] time = 0.0338411, size = 213, normalized size = 1.75

$$\frac{a^{15}x^2}{2}+\frac{45}{7}a^{14}bx^{7/3}+\frac{315}{8}a^{13}b^2x^{8/3}+\frac{455}{3}a^{12}b^3x^3+\frac{819}{2}a^{11}b^4x^{10/3}+819a^{10}b^5x^{11/3}+\frac{5005}{4}a^9b^6x^4+1485a^8b^7x^{13/3}+\frac{19305}{14}a^7b^8x^{14/3}+1001a^6b^9x^5+\frac{9009}{16}a^5b^{10}x^{16/3}+\frac{4095}{17}a^4b^{11}x^{17/3}+\frac{455}{6}a^3b^{12}x^6+\frac{315}{19}a^2b^{13}x^{19/3}+\frac{9}{4}ab^{14}x^{20/3}+\frac{b^{15}x^7}{7}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^15*x,x]
```

```
[Out] (a^15*x^2)/2 + (45*a^14*b*x^(7/3))/7 + (315*a^13*b^2*x^(8/3))/8 +
 (455*a^12*b^3*x^3)/3 + (819*a^11*b^4*x^(10/3))/2 + 819*a^10*b^5*
x^(11/3) + (5005*a^9*b^6*x^4)/4 + 1485*a^8*b^7*x^(13/3) + (19305*
a^7*b^8*x^(14/3))/14 + 1001*a^6*b^9*x^5 + (9009*a^5*b^10*x^(16/3)
)/16 + (4095*a^4*b^11*x^(17/3))/17 + (455*a^3*b^12*x^6)/6 + (315*
a^2*b^13*x^(19/3))/19 + (9*a*b^14*x^(20/3))/4 + (b^15*x^7)/7
```

Maple [A] time = 0.004, size = 168, normalized size = 1.4

$$\frac{b^{15}x^7}{7}+\frac{9\,ab^{14}}{4}x^{\frac{20}{3}}+\frac{315\,a^2b^{13}}{19}x^{\frac{19}{3}}+\frac{455\,a^3b^{12}x^6}{6}+\frac{4095\,a^4b^{11}}{17}x^{\frac{17}{3}}+\frac{9009\,a^5b^{10}}{16}x^{\frac{16}{3}}+1001\,a^6b^9x^5+\frac{19305\,a^7b^8}{14}x^{\frac{14}{3}}+1485\,a^8b^7x^{13/3}+\frac{5005\,x^4a^9b^6}{4}+819\,a^{10}b^5x^{11/3}+\frac{819\,a^{11}b^4}{2}x^{\frac{10}{3}}+\frac{455\,a^{12}b^3x^3}{3}+\frac{315\,a^{13}b^2}{8}x^{\frac{8}{3}}+\frac{45\,a^{14}b}{7}x^{\frac{7}{3}}+\frac{x^2a^{15}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^15*x,x)
```

```
[Out] 1/7*b^15*x^7+9/4*a*b^14*x^(20/3)+315/19*a^2*b^13*x^(19/3)+455/6*a
^3*b^12*x^6+4095/17*a^4*b^11*x^(17/3)+9009/16*a^5*b^10*x^(16/3)+1
001*a^6*b^9*x^5+19305/14*a^7*b^8*x^(14/3)+1485*a^8*b^7*x^(13/3)+5
005/4*x^4*a^9*b^6+819*a^10*b^5*x^(11/3)+819/2*a^11*b^4*x^(10/3)+4
55/3*a^12*b^3*x^3+315/8*x^(8/3)*a^13*b^2+45/7*a^14*b*x^(7/3)+1/2*
x^2*a^15
```

Maxima [A] time = 1.42363, size = 132, normalized size = 1.08

$$\frac{\left(bx^{\frac{1}{3}}+a\right)^{21}}{7\,b^6}-\frac{3\left(bx^{\frac{1}{3}}+a\right)^{20}a}{4\,b^6}+\frac{30\left(bx^{\frac{1}{3}}+a\right)^{19}a^2}{19\,b^6}-\frac{5\left(bx^{\frac{1}{3}}+a\right)^{18}a^3}{3\,b^6}+\frac{15\left(bx^{\frac{1}{3}}+a\right)^{17}a^4}{17\,b^6}-\frac{3\left(bx^{\frac{1}{3}}+a\right)^{16}a^5}{16\,b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15*x,x, algorithm="maxima")
```

```
[Out] 1/7*(b*x^(1/3) + a)^21/b^6 - 3/4*(b*x^(1/3) + a)^20*a/b^6 + 30/19
*(b*x^(1/3) + a)^19*a^2/b^6 - 5/3*(b*x^(1/3) + a)^18*a^3/b^6 + 15
/17*(b*x^(1/3) + a)^17*a^4/b^6 - 3/16*(b*x^(1/3) + a)^16*a^5/b^6
```

Fricas [A] time = 0.213796, size = 242, normalized size = 1.98

$$\frac{1}{7}b^{15}x^7+\frac{455}{6}a^3b^{12}x^6+1001\,a^6b^9x^5+\frac{5005}{4}a^9b^6x^4+\frac{455}{3}a^{12}b^3x^3+\frac{1}{2}a^{15}x^2+\frac{9}{952}\left(238\,ab^{14}x^6+25480\,a^4b^{11}x^5+145860\,a^7b^8x^4+86632\,a^{10}b^5x^3+4165\,a^{13}b^2x^2\right)x^{\frac{2}{3}}+\frac{9}{2128}\left(3920\,a^2b^{13}x^6+133133\,a^5b^{10}x^5+351120\,a^8b^7x^4+96824\,a^{11}b^4x^3+1520\,a^{14}bx^2\right)x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15*x,x, algorithm="fricas")
```

```
[Out] 1/7*b^15*x^7 + 455/6*a^3*b^12*x^6 + 1001*a^6*b^9*x^5 + 5005/4*a^9
*b^6*x^4 + 455/3*a^12*b^3*x^3 + 1/2*a^15*x^2 + 9/952*(238*a*b^14*
x^6 + 25480*a^4*b^11*x^5 + 145860*a^7*b^8*x^4 + 86632*a^10*b^5*x^
```

```
3 + 4165*a^13*b^2*x^2)*x^(2/3) + 9/2128*(3920*a^2*b^13*x^6 + 1331
33*a^5*b^10*x^5 + 351120*a^8*b^7*x^4 + 96824*a^11*b^4*x^3 + 1520*
a^14*b*x^2)*x^(1/3)
```

Sympy [A] time = 8.66108, size = 214, normalized size = 1.75

$$\frac{a^{15}x^2}{2} + \frac{45a^{14}bx^{\frac{7}{3}}}{7} + \frac{315a^{13}b^2x^{\frac{8}{3}}}{8} + \frac{455a^{12}b^3x^3}{3} + \frac{819a^{11}b^4x^{\frac{10}{3}}}{2} + 819a^{10}b^5x^{\frac{11}{3}} + \frac{5005a^9b^6x^4}{4} + 1485a^8b^7x^{\frac{13}{3}} + \frac{19305a^7b^8x^{\frac{14}{3}}}{14} + 1001a^6b^9x^5 + \frac{9009a^5b^{10}x^{\frac{16}{3}}}{16} + \frac{4095a^4b^{11}x^{\frac{17}{3}}}{17} + \frac{455a^3b^{12}x^6}{6} + \frac{315a^2b^{13}x^{\frac{19}{3}}}{19} + \frac{9ab^{14}x^{\frac{20}{3}}}{4} + \frac{b^{15}x^7}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**15*x,x)
```

```
[Out] a**15*x**2/2 + 45*a**14*b*x**(7/3)/7 + 315*a**13*b**2*x**(8/3)/8
+ 455*a**12*b**3*x**3/3 + 819*a**11*b**4*x**(10/3)/2 + 819*a**10*
b**5*x**(11/3) + 5005*a**9*b**6*x**4/4 + 1485*a**8*b**7*x**(13/3)
 + 19305*a**7*b**8*x**(14/3)/14 + 1001*a**6*b**9*x**5 + 9009*a**5
*b**10*x**(16/3)/16 + 4095*a**4*b**11*x**(17/3)/17 + 455*a**3*b**
12*x**6/6 + 315*a**2*b**13*x**(19/3)/19 + 9*a*b**14*x**(20/3)/4 +
 b**15*x**7/7
```

GIAC/XCAS [A] time = 0.220327, size = 225, normalized size = 1.84

$$\frac{1}{7}\,b^{15}x^7 + \frac{9}{4}\,ab^{14}x^{\frac{20}{3}} + \frac{315}{19}\,a^2b^{13}x^{\frac{19}{3}} + \frac{455}{6}\,a^3b^{12}x^6 + \frac{4095}{17}\,a^4b^{11}x^{\frac{17}{3}} + \frac{9009}{16}\,a^5b^{10}x^{\frac{16}{3}} + 1001\,a^6b^9x^5 + \frac{19305}{14}\,a^7b^8x^{\frac{14}{3}} + 1485\,a^8b^7x^{\frac{13}{3}} + \frac{5005}{4}\,a^9b^6x^4 + 819\,a^{10}b^5x^{\frac{11}{3}} + \frac{819}{2}\,a^{11}b^4x^{\frac{10}{3}} + \frac{455}{3}\,a^{12}b^3x^3 + \frac{315}{8}\,a^{13}b^2x^{\frac{8}{3}} + \frac{45}{7}\,a^{14}bx^{\frac{7}{3}} + \frac{1}{2}\,a^{15}x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15*x,x, algorithm="giac")
```

```
[Out] 1/7*b^15*x^7 + 9/4*a*b^14*x^(20/3) + 315/19*a^2*b^13*x^(19/3) + 4
55/6*a^3*b^12*x^6 + 4095/17*a^4*b^11*x^(17/3) + 9009/16*a^5*b^10*
x^(16/3) + 1001*a^6*b^9*x^5 + 19305/14*a^7*b^8*x^(14/3) + 1485*a^
8*b^7*x^(13/3) + 5005/4*a^9*b^6*x^4 + 819*a^10*b^5*x^(11/3) + 819
/2*a^11*b^4*x^(10/3) + 455/3*a^12*b^3*x^3 + 315/8*a^13*b^2*x^(8/3
) + 45/7*a^14*b*x^(7/3) + 1/2*a^15*x^2
```

3.2337 $\int \left(a+b\sqrt[3]{x}\right)^{15}\,dx$

Optimal. Leaf size=59

$$\frac{3a^2\left(a+b\sqrt[3]{x}\right)^{16}}{16b^3}+\frac{\left(a+b\sqrt[3]{x}\right)^{18}}{6b^3}-\frac{6a\left(a+b\sqrt[3]{x}\right)^{17}}{17b^3}$$

```
[Out] (3*a^2*(a + b*x^(1/3))^16)/(16*b^3) - (6*a*(a + b*x^(1/3))^17)/(1
7*b^3) + (a + b*x^(1/3))^18/(6*b^3)
```

Rubi [A] time = 0.159697, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{3a^2\left(a+b\sqrt[3]{x}\right)^{16}}{16b^3}+\frac{\left(a+b\sqrt[3]{x}\right)^{18}}{6b^3}-\frac{6a\left(a+b\sqrt[3]{x}\right)^{17}}{17b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^15,x]
```

```
[Out] (3*a^2*(a + b*x^(1/3))^16)/(16*b^3) - (6*a*(a + b*x^(1/3))^17)/(1
7*b^3) + (a + b*x^(1/3))^18/(6*b^3)
```

Rubi in Sympy [A] time = 27.8305, size = 53, normalized size = 0.9

$$\frac{3a^2\left(a+b\sqrt[3]{x}\right)^{16}}{16b^3}-\frac{6a\left(a+b\sqrt[3]{x}\right)^{17}}{17b^3}+\frac{\left(a+b\sqrt[3]{x}\right)^{18}}{6b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**15,x)
```

```
[Out] 3*a**2*(a + b*x**(1/3))**16/(16*b**3) - 6*a*(a + b*x**(1/3))**17/
(17*b**3) + (a + b*x**(1/3))**18/(6*b**3)
```

Mathematica [B] time = 0.0296419, size = 204, normalized size = 3.46

$$a^{15}x+\frac{45}{4}a^{14}bx^{4/3}+63a^{13}b^2x^{5/3}+\frac{455}{2}a^{12}b^3x^2+585a^{11}b^4x^{7/3}+\frac{9009}{8}a^{10}b^5x^{8/3}+\frac{5005}{3}a^9b^6x^3+\frac{3861}{2}a^8b^7x^{10/3}+1755a^7b^8x^{11/3}+\frac{5005}{4}a^6b^9x^4+693a^5b^{10}x^{13/3}+\frac{585}{2}a^4b^{11}x^{14/3}+91a^3b^{12}x^5+\frac{315}{16}a^2b^{13}x^{16/3}+\frac{45}{17}ab^{14}x^{17/3}+\frac{b^{15}x^6}{6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^15,x]
```

```
[Out] a^15*x + (45*a^14*b*x^(4/3))/4 + 63*a^13*b^2*x^(5/3) + (455*a^12*
b^3*x^2)/2 + 585*a^11*b^4*x^(7/3) + (9009*a^10*b^5*x^(8/3))/8 + (
5005*a^9*b^6*x^3)/3 + (3861*a^8*b^7*x^(10/3))/2 + 1755*a^7*b^8*x^
(11/3) + (5005*a^6*b^9*x^4)/4 + 693*a^5*b^10*x^(13/3) + (585*a^4*
b^11*x^(14/3))/2 + 91*a^3*b^12*x^5 + (315*a^2*b^13*x^(16/3))/16 +
 (45*a*b^14*x^(17/3))/17 + (b^15*x^6)/6
```

Maple [B] time = 0.033, size = 165, normalized size = 2.8

$$xa^{15}+\frac{b^{15}x^6}{6}+\frac{455\,x^2b^3a^{12}}{2}+91\,a^3b^{12}x^5+\frac{5005\,a^9b^6x^3}{3}+\frac{45\,ba^{14}}{4}x^{\frac{4}{3}}+63\,a^{13}b^2x^{5/3}+585\,a^{11}b^4x^{7/3}+\frac{9009\,b^5a^{10}}{8}x^{\frac{8}{3}}+\frac{3861\,b^7a^8}{2}x^{\frac{10}{3}}+1755\,a^7b^8x^{11/3}+\frac{5005\,b^9x^4a^6}{4}+693\,b^{10}a^5x^{13/3}+\frac{585\,b^{11}a^4}{2}x^{\frac{14}{3}}+\frac{315\,b^{13}a^2}{16}x^{\frac{16}{3}}+\frac{45\,ab^{14}}{17}x^{\frac{17}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^15,x)
```

```
[Out] x*a^15+1/6*b^15*x^6+455/2*x^2*b^3*a^12+91*a^3*b^12*x^5+5005/3*a^9
*b^6*x^3+45/4*b*a^14*x^(4/3)+63*a^13*b^2*x^(5/3)+585*a^11*b^4*x^(
7/3)+9009/8*b^5*a^10*x^(8/3)+3861/2*b^7*a^8*x^(10/3)+1755*a^7*b^8
*x^(11/3)+5005/4*b^9*x^4*a^6+693*b^10*a^5*x^(13/3)+585/2*b^11*a^4
*x^(14/3)+315/16*b^13*a^2*x^(16/3)+45/17*a*b^14*x^(17/3)
```

Maxima [A] time = 1.45593, size = 63, normalized size = 1.07

$$\frac{\left(bx^{\frac{1}{3}}+a\right)^{18}}{6\,b^3}-\frac{6\left(bx^{\frac{1}{3}}+a\right)^{17}a}{17\,b^3}+\frac{3\left(bx^{\frac{1}{3}}+a\right)^{16}a^2}{16\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15,x, algorithm="maxima")
```

```
[Out] 1/6*(b*x^(1/3) + a)^18/b^3 - 6/17*(b*x^(1/3) + a)^17*a/b^3 + 3/16
*(b*x^(1/3) + a)^16*a^2/b^3
```

Fricas [A] time = 0.213717, size = 232, normalized size = 3.93

$$\frac{1}{6}\,b^{15}x^6+91\,a^3b^{12}x^5+\frac{5005}{4}\,a^6b^9x^4+\frac{5005}{3}\,a^9b^6x^3+\frac{455}{2}\,a^{12}b^3x^2+a^{15}x+\frac{9}{136}\left(40\,ab^{14}x^5+4420\,a^4b^{11}x^4+26520\,a^7b^8x^3+17017\,a^{10}b^5x^2+952\,a^{13}b^2x\right)x^{\frac{2}{3}}+\frac{9}{16}\left(35\,a^2b^{13}x^5+1232\,a^5b^{10}x^4+3432\,a^8b^7x^3+1040\,a^{11}b^4x^2+20\,a^{14}bx\right)x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15,x, algorithm="fricas")
```

```
[Out] 1/6*b^15*x^6 + 91*a^3*b^12*x^5 + 5005/4*a^6*b^9*x^4 + 5005/3*a^9*
b^6*x^3 + 455/2*a^12*b^3*x^2 + a^15*x + 9/136*(40*a*b^14*x^5 + 44
20*a^4*b^11*x^4 + 26520*a^7*b^8*x^3 + 17017*a^10*b^5*x^2 + 952*a^
13*b^2*x)*x^(2/3) + 9/16*(35*a^2*b^13*x^5 + 1232*a^5*b^10*x^4 + 3
432*a^8*b^7*x^3 + 1040*a^11*b^4*x^2 + 20*a^14*b*x)*x^(1/3)
```

Sympy [A] time = 7.08213, size = 207, normalized size = 3.51

$$a^{15}x+\frac{45a^{14}bx^{\frac{4}{3}}}{4}+63a^{13}b^2x^{\frac{5}{3}}+\frac{455a^{12}b^3x^2}{2}+585a^{11}b^4x^{\frac{7}{3}}+\frac{9009a^{10}b^5x^{\frac{8}{3}}}{8}+\frac{5005a^9b^6x^3}{3}+\frac{3861a^8b^7x^{\frac{10}{3}}}{2}+1755a^7b^8x^{\frac{11}{3}}+\frac{5005a^6b^9x^4}{4}+693a^5b^{10}x^{\frac{13}{3}}+\frac{585a^4b^{11}x^{\frac{14}{3}}}{2}+91a^3b^{12}x^5+\frac{315a^2b^{13}x^{\frac{16}{3}}}{16}+\frac{45ab^{14}x^{\frac{17}{3}}}{17}+\frac{b^{15}x^6}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**15,x)
```

```
[Out] a**15*x + 45*a**14*b*x**(4/3)/4 + 63*a**13*b**2*x**(5/3) + 455*a*
*12*b**3*x**2/2 + 585*a**11*b**4*x**(7/3) + 9009*a**10*b**5*x**(8
/3)/8 + 5005*a**9*b**6*x**3/3 + 3861*a**8*b**7*x**(10/3)/2 + 1755
*a**7*b**8*x**(11/3) + 5005*a**6*b**9*x**4/4 + 693*a**5*b**10*x**
(13/3) + 585*a**4*b**11*x**(14/3)/2 + 91*a**3*b**12*x**5 + 315*a*
*2*b**13*x**(16/3)/16 + 45*a*b**14*x**(17/3)/17 + b**15*x**6/6
```

GIAC/XCAS [A] time = 0.219076, size = 221, normalized size = 3.75

$$\frac{1}{6}\,b^{15}x^{6} + \frac{45}{17}\,ab^{14}x^{\frac{17}{3}} + \frac{315}{16}\,a^{2}b^{13}x^{\frac{16}{3}} + 91\,a^{3}b^{12}x^{5} + \frac{585}{2}\,a^{4}b^{11}x^{\frac{14}{3}} + 693\,a^{5}b^{10}x^{\frac{13}{3}} + \frac{5005}{4}\,a^{6}b^{9}x^{4} + 1755\,a^{7}b^{8}x^{\frac{11}{3}} + \frac{3861}{2}\,a^{8}b^{7}x^{\frac{10}{3}} + \frac{5005}{3}\,a^{9}b^{6}x^{3} + \frac{9009}{8}\,a^{10}b^{5}x^{\frac{8}{3}} + 585\,a^{11}b^{4}x^{\frac{7}{3}} + \frac{455}{2}\,a^{12}b^{3}x^{2} + 63\,a^{13}b^{2}x^{\frac{5}{3}} + \frac{45}{4}\,a^{14}bx^{\frac{4}{3}} + a^{15}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15,x, algorithm="giac")
```

```
[Out] 1/6*b^15*x^6 + 45/17*a*b^14*x^(17/3) + 315/16*a^2*b^13*x^(16/3) +
 91*a^3*b^12*x^5 + 585/2*a^4*b^11*x^(14/3) + 693*a^5*b^10*x^(13/3
) + 5005/4*a^6*b^9*x^4 + 1755*a^7*b^8*x^(11/3) + 3861/2*a^8*b^7*x
^(10/3) + 5005/3*a^9*b^6*x^3 + 9009/8*a^10*b^5*x^(8/3) + 585*a^11
*b^4*x^(7/3) + 455/2*a^12*b^3*x^2 + 63*a^13*b^2*x^(5/3) + 45/4*a^
14*b*x^(4/3) + a^15*x
```

3.2338 $\int \frac{\left(a+b\sqrt[3]{x}\right)^{15}}{x}\,dx$

Optimal. Leaf size=209

$$a^{15}\log(x)+45a^{14}b\sqrt[3]{x}+\frac{315}{2}a^{13}b^2x^{2/3}+455a^{12}b^3x+\frac{4095}{4}a^{11}b^4x^{4/3}+\frac{9009}{5}a^{10}b^5x^{5/3}+\frac{5005}{2}a^9b^6x^2+\frac{19305}{7}a^8b^7x^{7/3}+\frac{19305}{8}a^7b^8x^{8/3}+\frac{5005}{3}a^6b^9x^3+\frac{9009}{10}a^5b^{10}x^{10/3}+\frac{4095}{11}a^4b^{11}x^{11/3}+\frac{455}{4}a^3b^{12}x^4+\frac{315}{13}a^2b^{13}x^{13/3}+\frac{45}{14}ab^{14}x^{14/3}+\frac{b^{15}x^5}{5}$$

```
[Out] 45*a^14*b*x^(1/3) + (315*a^13*b^2*x^(2/3))/2 + 455*a^12*b^3*x + (
4095*a^11*b^4*x^(4/3))/4 + (9009*a^10*b^5*x^(5/3))/5 + (5005*a^9*
b^6*x^2)/2 + (19305*a^8*b^7*x^(7/3))/7 + (19305*a^7*b^8*x^(8/3))/
8 + (5005*a^6*b^9*x^3)/3 + (9009*a^5*b^10*x^(10/3))/10 + (4095*a^
4*b^11*x^(11/3))/11 + (455*a^3*b^12*x^4)/4 + (315*a^2*b^13*x^(13/
3))/13 + (45*a*b^14*x^(14/3))/14 + (b^15*x^5)/5 + a^15*Log[x]
```

Rubi [A] time = 0.243086, antiderivative size = 209, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$a^{15}\log(x)+45a^{14}b\sqrt[3]{x}+\frac{315}{2}a^{13}b^2x^{2/3}+455a^{12}b^3x+\frac{4095}{4}a^{11}b^4x^{4/3}+\frac{9009}{5}a^{10}b^5x^{5/3}+\frac{5005}{2}a^9b^6x^2+\frac{19305}{7}a^8b^7x^{7/3}+\frac{19305}{8}a^7b^8x^{8/3}+\frac{5005}{3}a^6b^9x^3+\frac{9009}{10}a^5b^{10}x^{10/3}+\frac{4095}{11}a^4b^{11}x^{11/3}+\frac{455}{4}a^3b^{12}x^4+\frac{315}{13}a^2b^{13}x^{13/3}+\frac{45}{14}ab^{14}x^{14/3}+\frac{b^{15}x^5}{5}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^15/x,x]
```

```
[Out] 45*a^14*b*x^(1/3) + (315*a^13*b^2*x^(2/3))/2 + 455*a^12*b^3*x + (
4095*a^11*b^4*x^(4/3))/4 + (9009*a^10*b^5*x^(5/3))/5 + (5005*a^9*
b^6*x^2)/2 + (19305*a^8*b^7*x^(7/3))/7 + (19305*a^7*b^8*x^(8/3))/
8 + (5005*a^6*b^9*x^3)/3 + (9009*a^5*b^10*x^(10/3))/10 + (4095*a^
4*b^11*x^(11/3))/11 + (455*a^3*b^12*x^4)/4 + (315*a^2*b^13*x^(13/
3))/13 + (45*a*b^14*x^(14/3))/14 + (b^15*x^5)/5 + a^15*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$3a^{15}\log\left(\sqrt[3]{x}\right)+45a^{14}b\sqrt[3]{x}+315a^{13}b^2\int^{\sqrt[3]{x}}x\,dx+455a^{12}b^3x+\frac{4095a^{11}b^4x^{\frac{4}{3}}}{4}+\frac{9009a^{10}b^5x^{\frac{5}{3}}}{5}+\frac{5005a^9b^6x^2}{2}+\frac{19305a^8b^7x^{\frac{7}{3}}}{7}+\frac{19305a^7b^8x^{\frac{8}{3}}}{8}+\frac{5005a^6b^9x^3}{3}+\frac{9009a^5b^{10}x^{\frac{10}{3}}}{10}+\frac{4095a^4b^{11}x^{\frac{11}{3}}}{11}+\frac{455a^3b^{12}x^4}{4}+\frac{315a^2b^{13}x^{\frac{13}{3}}}{13}+\frac{45ab^{14}x^{\frac{14}{3}}}{14}+\frac{b^{15}x^5}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**15/x,x)
```

```
[Out] 3*a**15*log(x**(1/3)) + 45*a**14*b*x**(1/3) + 315*a**13*b**2*Inte
gral(x, (x, x**(1/3))) + 455*a**12*b**3*x + 4095*a**11*b**4*x**(4
/3)/4 + 9009*a**10*b**5*x**(5/3)/5 + 5005*a**9*b**6*x**2/2 + 1930
5*a**8*b**7*x**(7/3)/7 + 19305*a**7*b**8*x**(8/3)/8 + 5005*a**6*b
**9*x**3/3 + 9009*a**5*b**10*x**(10/3)/10 + 4095*a**4*b**11*x**(1
1/3)/11 + 455*a**3*b**12*x**4/4 + 315*a**2*b**13*x**(13/3)/13 + 4
5*a*b**14*x**(14/3)/14 + b**15*x**5/5
```

Mathematica [A] time = 0.0471303, size = 209, normalized size = 1.

$$a^{15}\log(x)+45a^{14}b\sqrt[3]{x}+\frac{315}{2}a^{13}b^2x^{2/3}+455a^{12}b^3x+\frac{4095}{4}a^{11}b^4x^{4/3}+\frac{9009}{5}a^{10}b^5x^{5/3}+\frac{5005}{2}a^9b^6x^2+\frac{19305}{7}a^8b^7x^{7/3}+\frac{19305}{8}a^7b^8x^{8/3}+\frac{5005}{3}a^6b^9x^3+\frac{9009}{10}a^5b^{10}x^{10/3}+\frac{4095}{11}a^4b^{11}x^{11/3}+\frac{455}{4}a^3b^{12}x^4+\frac{315}{13}a^2b^{13}x^{13/3}+\frac{45}{14}ab^{14}x^{14/3}+\frac{b^{15}x^5}{5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^15/x,x]
```

```
[Out] 45*a^14*b*x^(1/3) + (315*a^13*b^2*x^(2/3))/2 + 455*a^12*b^3*x + (
4095*a^11*b^4*x^(4/3))/4 + (9009*a^10*b^5*x^(5/3))/5 + (5005*a^9*
b^6*x^2)/2 + (19305*a^8*b^7*x^(7/3))/7 + (19305*a^7*b^8*x^(8/3))/
8 + (5005*a^6*b^9*x^3)/3 + (9009*a^5*b^10*x^(10/3))/10 + (4095*a^
4*b^11*x^(11/3))/11 + (455*a^3*b^12*x^4)/4 + (315*a^2*b^13*x^(13/
3))/13 + (45*a*b^14*x^(14/3))/14 + (b^15*x^5)/5 + a^15*Log[x]
```

Maple [A] time = 0.006, size = 164, normalized size = 0.8

$$45\,a^{14}b\sqrt[3]{x}+\frac{315\,a^{13}b^2}{2}x^{\frac{2}{3}}+455\,a^{12}b^3x+\frac{4095\,a^{11}b^4}{4}x^{\frac{4}{3}}+\frac{9009\,a^{10}b^5}{5}x^{\frac{5}{3}}+\frac{5005\,a^9b^6x^2}{2}+\frac{19305\,a^8b^7}{7}x^{\frac{7}{3}}+\frac{19305\,a^7b^8}{8}x^{\frac{8}{3}}+\frac{5005\,a^6b^9x^3}{3}+\frac{9009\,a^5b^{10}}{10}x^{\frac{10}{3}}+\frac{4095\,a^4b^{11}}{11}x^{\frac{11}{3}}+\frac{455\,a^3b^{12}x^4}{4}+\frac{315\,a^2b^{13}}{13}x^{\frac{13}{3}}+\frac{45\,ab^{14}}{14}x^{\frac{14}{3}}+\frac{b^{15}x^5}{5}+a^{15}\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^15/x,x)
```

```
[Out] 45*a^14*b*x^(1/3)+315/2*a^13*b^2*x^(2/3)+455*a^12*b^3*x+4095/4*a^
11*b^4*x^(4/3)+9009/5*a^10*b^5*x^(5/3)+5005/2*a^9*b^6*x^2+19305/7
*a^8*b^7*x^(7/3)+19305/8*a^7*b^8*x^(8/3)+5005/3*a^6*b^9*x^3+9009/
10*a^5*b^10*x^(10/3)+4095/11*a^4*b^11*x^(11/3)+455/4*a^3*b^12*x^4
+315/13*a^2*b^13*x^(13/3)+45/14*a*b^14*x^(14/3)+1/5*b^15*x^5+a^15
*ln(x)
```

Maxima [A] time = 1.41987, size = 220, normalized size = 1.05

$$\frac{1}{5}\,b^{15}x^5+\frac{45}{14}\,ab^{14}x^{\frac{14}{3}}+\frac{315}{13}\,a^2b^{13}x^{\frac{13}{3}}+\frac{455}{4}\,a^3b^{12}x^4+\frac{4095}{11}\,a^4b^{11}x^{\frac{11}{3}}+\frac{9009}{10}\,a^5b^{10}x^{\frac{10}{3}}+\frac{5005}{3}\,a^6b^9x^3+\frac{19305}{8}\,a^7b^8x^{\frac{8}{3}}+\frac{19305}{7}\,a^8b^7x^{\frac{7}{3}}+\frac{5005}{2}\,a^9b^6x^2+\frac{9009}{5}\,a^{10}b^5x^{\frac{5}{3}}+\frac{4095}{4}\,a^{11}b^4x^{\frac{4}{3}}+455\,a^{12}b^3x+a^{15}\log(x)+\frac{315}{2}\,a^{13}b^2x^{\frac{2}{3}}+45\,a^{14}bx^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15/x,x, algorithm="maxima")
```

```
[Out] 1/5*b^15*x^5 + 45/14*a*b^14*x^(14/3) + 315/13*a^2*b^13*x^(13/3) +
 455/4*a^3*b^12*x^4 + 4095/11*a^4*b^11*x^(11/3) + 9009/10*a^5*b^1
0*x^(10/3) + 5005/3*a^6*b^9*x^3 + 19305/8*a^7*b^8*x^(8/3) + 19305
/7*a^8*b^7*x^(7/3) + 5005/2*a^9*b^6*x^2 + 9009/5*a^10*b^5*x^(5/3)
 + 4095/4*a^11*b^4*x^(4/3) + 455*a^12*b^3*x + a^15*log(x) + 315/2
*a^13*b^2*x^(2/3) + 45*a^14*b*x^(1/3)
```

Fricas [A] time = 0.22125, size = 227, normalized size = 1.09

$$\frac{1}{5}\,b^{15}x^{5}+\frac{455}{4}\,a^{3}b^{12}x^{4}+\frac{5005}{3}\,a^{6}b^{9}x^{3}+\frac{5005}{2}\,a^{9}b^{6}x^{2}+455\,a^{12}b^{3}x+3\,a^{15}\log\left(x^{\frac{1}{3}}\right)+\frac{9}{3080}\left(1100\,ab^{14}x^{4}+127400\,a^{4}b^{11}x^{3}+825825\,a^{7}b^{8}x^{2}+616616\,a^{10}b^{5}x+53900\,a^{13}b^{2}\right)x^{\frac{2}{3}}+\frac{9}{1820}\left(4900\,a^{2}b^{13}x^{4}+182182\,a^{5}b^{10}x^{3}+557700\,a^{8}b^{7}x^{2}+207025\,a^{11}b^{4}x+9100\,a^{14}b\right)x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15/x,x, algorithm="fricas")
```

```
[Out] 1/5*b^15*x^5 + 455/4*a^3*b^12*x^4 + 5005/3*a^6*b^9*x^3 + 5005/2*a
^9*b^6*x^2 + 455*a^12*b^3*x + 3*a^15*log(x^(1/3)) + 9/3080*(1100*
a*b^14*x^4 + 127400*a^4*b^11*x^3 + 825825*a^7*b^8*x^2 + 616616*a^
10*b^5*x + 53900*a^13*b^2)*x^(2/3) + 9/1820*(4900*a^2*b^13*x^4 +
182182*a^5*b^10*x^3 + 557700*a^8*b^7*x^2 + 207025*a^11*b^4*x + 91
00*a^14*b)*x^(1/3)
```

Sympy [A] time = 17.1838, size = 212, normalized size = 1.01

$$a^{15}\log(x)+45a^{14}b\sqrt[3]{x}+\frac{315a^{13}b^{2}x^{\frac{2}{3}}}{2}+455a^{12}b^{3}x+\frac{4095a^{11}b^{4}x^{\frac{4}{3}}}{4}+\frac{9009a^{10}b^{5}x^{\frac{5}{3}}}{5}+\frac{5005a^{9}b^{6}x^{2}}{2}+\frac{19305a^{8}b^{7}x^{\frac{7}{3}}}{7}+\frac{19305a^{7}b^{8}x^{\frac{8}{3}}}{8}+\frac{5005a^{6}b^{9}x^{3}}{3}+\frac{9009a^{5}b^{10}x^{\frac{10}{3}}}{10}+\frac{4095a^{4}b^{11}x^{\frac{11}{3}}}{11}+\frac{455a^{3}b^{12}x^{4}}{4}+\frac{315a^{2}b^{13}x^{\frac{13}{3}}}{13}+\frac{45ab^{14}x^{\frac{14}{3}}}{14}+\frac{b^{15}x^{5}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**15/x,x)
```

```
[Out] a**15*log(x) + 45*a**14*b*x**(1/3) + 315*a**13*b**2*x**(2/3)/2 +
455*a**12*b**3*x + 4095*a**11*b**4*x**(4/3)/4 + 9009*a**10*b**5*x
**(5/3)/5 + 5005*a**9*b**6*x**2/2 + 19305*a**8*b**7*x**(7/3)/7 +
19305*a**7*b**8*x**(8/3)/8 + 5005*a**6*b**9*x**3/3 + 9009*a**5*b*
*10*x**(10/3)/10 + 4095*a**4*b**11*x**(11/3)/11 + 455*a**3*b**12*
x**4/4 + 315*a**2*b**13*x**(13/3)/13 + 45*a*b**14*x**(14/3)/14 +
b**15*x**5/5
```

GIAC/XCAS [A] time = 0.224964, size = 221, normalized size = 1.06

$$\frac{1}{5}\,b^{15}x^{5}+\frac{45}{14}\,ab^{14}x^{\frac{14}{3}}+\frac{315}{13}\,a^{2}b^{13}x^{\frac{13}{3}}+\frac{455}{4}\,a^{3}b^{12}x^{4}+\frac{4095}{11}\,a^{4}b^{11}x^{\frac{11}{3}}+\frac{9009}{10}\,a^{5}b^{10}x^{\frac{10}{3}}+\frac{5005}{3}\,a^{6}b^{9}x^{3}+\frac{19305}{8}\,a^{7}b^{8}x^{\frac{8}{3}}+\frac{19305}{7}\,a^{8}b^{7}x^{\frac{7}{3}}+\frac{5005}{2}\,a^{9}b^{6}x^{2}+\frac{9009}{5}\,a^{10}b^{5}x^{\frac{5}{3}}+\frac{4095}{4}\,a^{11}b^{4}x^{\frac{4}{3}}+455\,a^{12}b^{3}x+a^{15}\ln\left(|x|\right)+\frac{315}{2}\,a^{13}b^{2}x^{\frac{2}{3}}+45\,a^{14}bx^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15/x,x, algorithm="giac")
```

```
[Out] 1/5*b^15*x^5 + 45/14*a*b^14*x^(14/3) + 315/13*a^2*b^13*x^(13/3) +
 455/4*a^3*b^12*x^4 + 4095/11*a^4*b^11*x^(11/3) + 9009/10*a^5*b^1
0*x^(10/3) + 5005/3*a^6*b^9*x^3 + 19305/8*a^7*b^8*x^(8/3) + 19305
/7*a^8*b^7*x^(7/3) + 5005/2*a^9*b^6*x^2 + 9009/5*a^10*b^5*x^(5/3)
 + 4095/4*a^11*b^4*x^(4/3) + 455*a^12*b^3*x + a^15*ln(abs(x)) + 3
15/2*a^13*b^2*x^(2/3) + 45*a^14*b*x^(1/3)
```

3.2339 $\int \frac{\left(a+b\sqrt[3]{x}\right)^{15}}{x^2}\,dx$

Optimal. Leaf size=202

$$-\frac{a^{15}}{x}-\frac{45a^{14}b}{2x^{2/3}}-\frac{315a^{13}b^2}{\sqrt[3]{x}}+455a^{12}b^3\log(x)+4095a^{11}b^4\sqrt[3]{x}+\frac{9009}{2}a^{10}b^5x^{2/3}+5005a^9b^6x+\frac{19305}{4}a^8b^7x^{4/3}+3861a^7b^8x^{5/3}+\frac{5005}{2}a^6b^9x^2+1287a^5b^{10}x^{7/3}+\frac{4095}{8}a^4b^{11}x^{8/3}+\frac{455}{3}a^3b^{12}x^3+\frac{63}{2}a^2b^{13}x^{10/3}+\frac{45}{11}ab^{14}x^{11/3}+\frac{b^{15}x^4}{4}$$

```
[Out] -(a^15/x) - (45*a^14*b)/(2*x^(2/3)) - (315*a^13*b^2)/x^(1/3) + 40
95*a^11*b^4*x^(1/3) + (9009*a^10*b^5*x^(2/3))/2 + 5005*a^9*b^6*x
+ (19305*a^8*b^7*x^(4/3))/4 + 3861*a^7*b^8*x^(5/3) + (5005*a^6*b^
9*x^2)/2 + 1287*a^5*b^10*x^(7/3) + (4095*a^4*b^11*x^(8/3))/8 + (4
55*a^3*b^12*x^3)/3 + (63*a^2*b^13*x^(10/3))/2 + (45*a*b^14*x^(11/
3))/11 + (b^15*x^4)/4 + 455*a^12*b^3*Log[x]
```

Rubi [A] time = 0.30414, antiderivative size = 202, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^{15}}{x}-\frac{45a^{14}b}{2x^{2/3}}-\frac{315a^{13}b^2}{\sqrt[3]{x}}+455a^{12}b^3\log(x)+4095a^{11}b^4\sqrt[3]{x}+\frac{9009}{2}a^{10}b^5x^{2/3}+5005a^9b^6x+\frac{19305}{4}a^8b^7x^{4/3}+3861a^7b^8x^{5/3}+\frac{5005}{2}a^6b^9x^2+1287a^5b^{10}x^{7/3}+\frac{4095}{8}a^4b^{11}x^{8/3}+\frac{455}{3}a^3b^{12}x^3+\frac{63}{2}a^2b^{13}x^{10/3}+\frac{45}{11}ab^{14}x^{11/3}+\frac{b^{15}x^4}{4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^15/x^2,x]
```

```
[Out] -(a^15/x) - (45*a^14*b)/(2*x^(2/3)) - (315*a^13*b^2)/x^(1/3) + 40
95*a^11*b^4*x^(1/3) + (9009*a^10*b^5*x^(2/3))/2 + 5005*a^9*b^6*x
+ (19305*a^8*b^7*x^(4/3))/4 + 3861*a^7*b^8*x^(5/3) + (5005*a^6*b^
9*x^2)/2 + 1287*a^5*b^10*x^(7/3) + (4095*a^4*b^11*x^(8/3))/8 + (4
55*a^3*b^12*x^3)/3 + (63*a^2*b^13*x^(10/3))/2 + (45*a*b^14*x^(11/
3))/11 + (b^15*x^4)/4 + 455*a^12*b^3*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^{15}}{x}-\frac{45a^{14}b}{2x^{\frac{2}{3}}}-\frac{315a^{13}b^2}{\sqrt[3]{x}}+1365a^{12}b^3\log\left(\sqrt[3]{x}\right)+4095a^{11}b^4\sqrt[3]{x}+9009a^{10}b^5\int^{\sqrt[3]{x}}x\,dx+5005a^9b^6x+\frac{19305a^8b^7x^{\frac{4}{3}}}{4}+3861a^7b^8x^{\frac{5}{3}}+\frac{5005a^6b^9x^2}{2}+1287a^5b^{10}x^{\frac{7}{3}}+\frac{4095a^4b^{11}x^{\frac{8}{3}}}{8}+\frac{455a^3b^{12}x^3}{3}+\frac{63a^2b^{13}x^{\frac{10}{3}}}{2}+\frac{45ab^{14}x^{\frac{11}{3}}}{11}+\frac{b^{15}x^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**15/x**2,x)
```

```
[Out] -a**15/x - 45*a**14*b/(2*x**(2/3)) - 315*a**13*b**2/x**(1/3) + 13
65*a**12*b**3*log(x**(1/3)) + 4095*a**11*b**4*x**(1/3) + 9009*a**
10*b**5*Integral(x, (x, x**(1/3))) + 5005*a**9*b**6*x + 19305*a**
8*b**7*x**(4/3)/4 + 3861*a**7*b**8*x**(5/3) + 5005*a**6*b**9*x**2
/2 + 1287*a**5*b**10*x**(7/3) + 4095*a**4*b**11*x**(8/3)/8 + 455*
a**3*b**12*x**3/3 + 63*a**2*b**13*x**(10/3)/2 + 45*a*b**14*x**(11
/3)/11 + b**15*x**4/4
```

Mathematica [A] time = 0.108272, size = 202, normalized size = 1.

$$-\frac{a^{15}}{x}-\frac{45a^{14}b}{2x^{2/3}}-\frac{315a^{13}b^2}{\sqrt[3]{x}}+455a^{12}b^3\log(x)+4095a^{11}b^4\sqrt[3]{x}+\frac{9009}{2}a^{10}b^5x^{2/3}+5005a^9b^6x+\frac{19305}{4}a^8b^7x^{4/3}+3861a^7b^8x^{5/3}+\frac{5005}{2}a^6b^9x^2+1287a^5b^{10}x^{7/3}+\frac{4095}{8}a^4b^{11}x^{8/3}+\frac{455}{3}a^3b^{12}x^3+\frac{63}{2}a^2b^{13}x^{10/3}+\frac{45}{11}ab^{14}x^{11/3}+\frac{b^{15}x^4}{4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^15/x^2,x]
```

```
[Out] -(a^15/x) - (45*a^14*b)/(2*x^(2/3)) - (315*a^13*b^2)/x^(1/3) + 40
95*a^11*b^4*x^(1/3) + (9009*a^10*b^5*x^(2/3))/2 + 5005*a^9*b^6*x
+ (19305*a^8*b^7*x^(4/3))/4 + 3861*a^7*b^8*x^(5/3) + (5005*a^6*b^
9*x^2)/2 + 1287*a^5*b^10*x^(7/3) + (4095*a^4*b^11*x^(8/3))/8 + (4
55*a^3*b^12*x^3)/3 + (63*a^2*b^13*x^(10/3))/2 + (45*a*b^14*x^(11/
3))/11 + (b^15*x^4)/4 + 455*a^12*b^3*Log[x]
```

Maple [A] time = 0.013, size = 165, normalized size = 0.8

$$-\frac{a^{15}}{x}-\frac{45\,a^{14}b}{2}x^{-\frac{2}{3}}-315\,\frac{a^{13}b^2}{\sqrt[3]{x}}+4095\,a^{11}b^4\sqrt[3]{x}+\frac{9009\,a^{10}b^5}{2}x^{\frac{2}{3}}+5005\,a^9b^6x+\frac{19305\,a^8b^7}{4}x^{\frac{4}{3}}+3861\,a^7b^8x^{5/3}+\frac{5005\,a^6b^9x^2}{2}+1287\,a^5b^{10}x^{7/3}+\frac{4095\,a^4b^{11}}{8}x^{\frac{8}{3}}+\frac{455\,a^3b^{12}x^3}{3}+\frac{63\,a^2b^{13}}{2}x^{\frac{10}{3}}+\frac{45\,ab^{14}}{11}x^{\frac{11}{3}}+\frac{b^{15}x^4}{4}+455\,a^{12}b^3\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^15/x^2,x)
```

```
[Out] -a^15/x-45/2*a^14*b/x^(2/3)-315*a^13*b^2/x^(1/3)+4095*a^11*b^4*x^
(1/3)+9009/2*a^10*b^5*x^(2/3)+5005*a^9*b^6*x+19305/4*a^8*b^7*x^(4
/3)+3861*a^7*b^8*x^(5/3)+5005/2*a^6*b^9*x^2+1287*a^5*b^10*x^(7/3)
+4095/8*a^4*b^11*x^(8/3)+455/3*a^3*b^12*x^3+63/2*a^2*b^13*x^(10/3
)+45/11*a*b^14*x^(11/3)+1/4*b^15*x^4+455*a^12*b^3*ln(x)
```

Maxima [A] time = 1.43921, size = 225, normalized size = 1.11

$$\frac{1}{4}\,b^{15}x^4+\frac{45}{11}\,ab^{14}x^{\frac{11}{3}}+\frac{63}{2}\,a^2b^{13}x^{\frac{10}{3}}+\frac{455}{3}\,a^3b^{12}x^3+\frac{4095}{8}\,a^4b^{11}x^{\frac{8}{3}}+1287\,a^5b^{10}x^{\frac{7}{3}}+\frac{5005}{2}\,a^6b^9x^2+3861\,a^7b^8x^{\frac{5}{3}}+\frac{19305}{4}\,a^8b^7x^{\frac{4}{3}}+5005\,a^9b^6x+455\,a^{12}b^3\log(x)+\frac{9009}{2}\,a^{10}b^5x^{\frac{2}{3}}+4095\,a^{11}b^4x^{\frac{1}{3}}-\frac{630\,a^{13}b^2x^{\frac{2}{3}}+45\,a^{14}bx^{\frac{1}{3}}+2\,a^{15}}{2\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15/x^2,x, algorithm="maxima")
```

```
[Out] 1/4*b^15*x^4 + 45/11*a*b^14*x^(11/3) + 63/2*a^2*b^13*x^(10/3) + 4
55/3*a^3*b^12*x^3 + 4095/8*a^4*b^11*x^(8/3) + 1287*a^5*b^10*x^(7/
3) + 5005/2*a^6*b^9*x^2 + 3861*a^7*b^8*x^(5/3) + 19305/4*a^8*b^7*
x^(4/3) + 5005*a^9*b^6*x + 455*a^12*b^3*log(x) + 9009/2*a^10*b^5*
x^(2/3) + 4095*a^11*b^4*x^(1/3) - 1/2*(630*a^13*b^2*x^(2/3) + 45*
a^14*b*x^(1/3) + 2*a^15)/x
```

Fricas [A] time = 0.221727, size = 234, normalized size = 1.16

$$\frac{66\, b^{15} x^{5} + 40040\, a^{3} b^{12} x^{4} + 660660\, a^{6} b^{9} x^{3} + 1321320\, a^{9} b^{6} x^{2} + 360360\, a^{12} b^{3} x \log\left(x^{\frac{1}{3}}\right) - 264\, a^{15} + 27\, \left(40\, a b^{14} x^{4} + 5005\, a^{4} b}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15/x^2,x, algorithm="fricas")
```

```
[Out] 1/264*(66*b^15*x^5 + 40040*a^3*b^12*x^4 + 660660*a^6*b^9*x^3 + 13
21320*a^9*b^6*x^2 + 360360*a^12*b^3*x*log(x^(1/3)) - 264*a^15 + 2
7*(40*a*b^14*x^4 + 5005*a^4*b^11*x^3 + 37752*a^7*b^8*x^2 + 44044*
a^10*b^5*x - 3080*a^13*b^2)*x^(2/3) + 594*(14*a^2*b^13*x^4 + 572*
a^5*b^10*x^3 + 2145*a^8*b^7*x^2 + 1820*a^11*b^4*x - 10*a^14*b)*x^
(1/3))/x
```

Sympy [A] time = 17.6909, size = 204, normalized size = 1.01

$$-\frac{a^{15}}{x} - \frac{45a^{14}b}{2x^{\frac{2}{3}}} - \frac{315a^{13}b^{2}}{\sqrt[3]{x}} + 455a^{12}b^{3}\log(x) + 4095a^{11}b^{4}\sqrt[3]{x} + \frac{9009a^{10}b^{5}x^{\frac{2}{3}}}{2} + 5005a^{9}b^{6}x + \frac{19305a^{8}b^{7}x^{\frac{4}{3}}}{4} + 3861a^{7}b^{8}x^{\frac{5}{3}} + \frac{5005a^{6}b^{9}x^{2}}{2} + 1287a^{5}b^{10}x^{\frac{7}{3}} + \frac{4095a^{4}b^{11}x^{\frac{8}{3}}}{8} + \frac{455a^{3}b^{12}x^{3}}{3} + \frac{63a^{2}b^{13}x^{\frac{10}{3}}}{2} + \frac{45ab^{14}x^{\frac{11}{3}}}{11} + \frac{b^{15}x^{4}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**15/x**2,x)
```

```
[Out] -a**15/x - 45*a**14*b/(2*x**(2/3)) - 315*a**13*b**2/x**(1/3) + 45
5*a**12*b**3*log(x) + 4095*a**11*b**4*x**(1/3) + 9009*a**10*b**5*
x**(2/3)/2 + 5005*a**9*b**6*x + 19305*a**8*b**7*x**(4/3)/4 + 3861
*a**7*b**8*x**(5/3) + 5005*a**6*b**9*x**2/2 + 1287*a**5*b**10*x**
(7/3) + 4095*a**4*b**11*x**(8/3)/8 + 455*a**3*b**12*x**3/3 + 63*a
**2*b**13*x**(10/3)/2 + 45*a*b**14*x**(11/3)/11 + b**15*x**4/4
```

GIAC/XCAS [A] time = 0.225312, size = 227, normalized size = 1.12

$$\frac{1}{4}\, b^{15} x^{4} + \frac{45}{11}\, a b^{14} x^{\frac{11}{3}} + \frac{63}{2}\, a^{2} b^{13} x^{\frac{10}{3}} + \frac{455}{3}\, a^{3} b^{12} x^{3} + \frac{4095}{8}\, a^{4} b^{11} x^{\frac{8}{3}} + 1287\, a^{5} b^{10} x^{\frac{7}{3}} + \frac{5005}{2}\, a^{6} b^{9} x^{2} + 3861\, a^{7} b^{8} x^{\frac{5}{3}} + \frac{19305}{4}\, a^{8} b^{7} x^{\frac{4}{3}} + 5005\, a^{9} b^{6} x + 455\, a^{12} b^{3} \ln\left(|x|\right) + \frac{9009}{2}\, a^{10} b^{5} x^{\frac{2}{3}} + 4095\, a^{11} b^{4} x^{\frac{1}{3}} - \frac{630\, a^{13} b^{2} x^{\frac{2}{3}} + 45\, a^{14} b x^{\frac{1}{3}} + 2\, a^{15}}{2\, x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15/x^2,x, algorithm="giac")
```

```
[Out] 1/4*b^15*x^4 + 45/11*a*b^14*x^(11/3) + 63/2*a^2*b^13*x^(10/3) + 4
55/3*a^3*b^12*x^3 + 4095/8*a^4*b^11*x^(8/3) + 1287*a^5*b^10*x^(7/
3) + 5005/2*a^6*b^9*x^2 + 3861*a^7*b^8*x^(5/3) + 19305/4*a^8*b^7*
x^(4/3) + 5005*a^9*b^6*x + 455*a^12*b^3*ln(abs(x)) + 9009/2*a^10*
b^5*x^(2/3) + 4095*a^11*b^4*x^(1/3) - 1/2*(630*a^13*b^2*x^(2/3) +
 45*a^14*b*x^(1/3) + 2*a^15)/x
```

3.2340 $\int \frac{\left(a+b\sqrt[3]{x}\right)^{15}}{x^3}\,dx$

Optimal. Leaf size=200

$$-\frac{a^{15}}{2x^2}-\frac{9a^{14}b}{x^{5/3}}-\frac{315a^{13}b^2}{4x^{4/3}}-\frac{455a^{12}b^3}{x}-\frac{4095a^{11}b^4}{2x^{2/3}}-\frac{9009a^{10}b^5}{\sqrt[3]{x}}$$
$$+5005a^9b^6\log(x)+19305a^8b^7\sqrt[3]{x}+\frac{19305}{2}a^7b^8x^{2/3}+5005a^6b^9x+\frac{9009}{4}a^5b^{10}x^{4/3}+819a^4b^{11}x^{5/3}+\frac{455}{2}a^3b^{12}x^2+45a^2b^{13}x^{7/3}+\frac{45}{8}$$

```
[Out] -a^15/(2*x^2) - (9*a^14*b)/x^(5/3) - (315*a^13*b^2)/(4*x^(4/3)) -
 (455*a^12*b^3)/x - (4095*a^11*b^4)/(2*x^(2/3)) - (9009*a^10*b^5)
/x^(1/3) + 19305*a^8*b^7*x^(1/3) + (19305*a^7*b^8*x^(2/3))/2 + 50
05*a^6*b^9*x + (9009*a^5*b^10*x^(4/3))/4 + 819*a^4*b^11*x^(5/3) +
 (455*a^3*b^12*x^2)/2 + 45*a^2*b^13*x^(7/3) + (45*a*b^14*x^(8/3))
/8 + (b^15*x^3)/3 + 5005*a^9*b^6*Log[x]
```

Rubi [A] time = 0.30774, antiderivative size = 200, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^{15}}{2x^2}-\frac{9a^{14}b}{x^{5/3}}-\frac{315a^{13}b^2}{4x^{4/3}}-\frac{455a^{12}b^3}{x}-\frac{4095a^{11}b^4}{2x^{2/3}}-\frac{9009a^{10}b^5}{\sqrt[3]{x}}$$
$$+5005a^9b^6\log(x)+19305a^8b^7\sqrt[3]{x}+\frac{19305}{2}a^7b^8x^{2/3}+5005a^6b^9x+\frac{9009}{4}a^5b^{10}x^{4/3}+819a^4b^{11}x^{5/3}+\frac{455}{2}a^3b^{12}x^2+45a^2b^{13}x^{7/3}+\frac{45}{8}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^15/x^3,x]
```

```
[Out] -a^15/(2*x^2) - (9*a^14*b)/x^(5/3) - (315*a^13*b^2)/(4*x^(4/3)) -
 (455*a^12*b^3)/x - (4095*a^11*b^4)/(2*x^(2/3)) - (9009*a^10*b^5)
/x^(1/3) + 19305*a^8*b^7*x^(1/3) + (19305*a^7*b^8*x^(2/3))/2 + 50
05*a^6*b^9*x + (9009*a^5*b^10*x^(4/3))/4 + 819*a^4*b^11*x^(5/3) +
 (455*a^3*b^12*x^2)/2 + 45*a^2*b^13*x^(7/3) + (45*a*b^14*x^(8/3))
/8 + (b^15*x^3)/3 + 5005*a^9*b^6*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^{15}}{2x^2}-\frac{9a^{14}b}{x^{\frac{5}{3}}}-\frac{315a^{13}b^2}{4x^{\frac{4}{3}}}-\frac{455a^{12}b^3}{x}-\frac{4095a^{11}b^4}{2x^{\frac{2}{3}}}-\frac{9009a^{10}b^5}{\sqrt[3]{x}}$$
$$+15015a^9b^6\log\left(\sqrt[3]{x}\right)+19305a^8b^7\sqrt[3]{x}+19305a^7b^8\int^{\sqrt[3]{x}}x\,dx+5005a^6b^9x$$
$$+\frac{9009a^5b^{10}x^{\frac{4}{3}}}{4}+819a^4b^{11}x^{\frac{5}{3}}+\frac{455a^3b^{12}x^2}{2}+45a^2b^{13}x^{\frac{7}{3}}+\frac{45ab^{14}x^{\frac{8}{3}}}{8}+\frac{b^{15}x^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**15/x**3,x)
```

```
[Out] -a**15/(2*x**2) - 9*a**14*b/x**(5/3) - 315*a**13*b**2/(4*x**(4/3)
) - 455*a**12*b**3/x - 4095*a**11*b**4/(2*x**(2/3)) - 9009*a**10*
b**5/x**(1/3) + 15015*a**9*b**6*log(x**(1/3)) + 19305*a**8*b**7*x
**(1/3) + 19305*a**7*b**8*Integral(x, (x, x**(1/3))) + 5005*a**6*
b**9*x + 9009*a**5*b**10*x**(4/3)/4 + 819*a**4*b**11*x**(5/3) + 4
55*a**3*b**12*x**2/2 + 45*a**2*b**13*x**(7/3) + 45*a*b**14*x**(8/
3)/8 + b**15*x**3/3
```

Mathematica [A] time = 0.10807, size = 200, normalized size = 1.

$$-\frac{a^{15}}{2x^2}-\frac{9a^{14}b}{x^{5/3}}-\frac{315a^{13}b^2}{4x^{4/3}}-\frac{455a^{12}b^3}{x}-\frac{4095a^{11}b^4}{2x^{2/3}}-\frac{9009a^{10}b^5}{\sqrt[3]{x}}$$
$$+5005a^9b^6\log(x)+19305a^8b^7\sqrt[3]{x}+\frac{19305}{2}a^7b^8x^{2/3}+5005a^6b^9x+\frac{9009}{4}a^5b^{10}x^{4/3}+819a^4b^{11}x^{5/3}+\frac{455}{2}a^3b^{12}x^2+45a^2b^{13}x^{7/3}+\frac{45}{8}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^15/x^3,x]
```

```
[Out] -a^15/(2*x^2) - (9*a^14*b)/x^(5/3) - (315*a^13*b^2)/(4*x^(4/3)) -
 (455*a^12*b^3)/x - (4095*a^11*b^4)/(2*x^(2/3)) - (9009*a^10*b^5)
/x^(1/3) + 19305*a^8*b^7*x^(1/3) + (19305*a^7*b^8*x^(2/3))/2 + 50
05*a^6*b^9*x + (9009*a^5*b^10*x^(4/3))/4 + 819*a^4*b^11*x^(5/3) +
 (455*a^3*b^12*x^2)/2 + 45*a^2*b^13*x^(7/3) + (45*a*b^14*x^(8/3))
/8 + (b^15*x^3)/3 + 5005*a^9*b^6*Log[x]
```

Maple [A] time = 0.013, size = 165, normalized size = 0.8

$$-\frac{a^{15}}{2\,x^2}-9\,\frac{a^{14}b}{x^{5/3}}-\frac{315\,a^{13}b^2}{4}x^{-\frac{4}{3}}-455\,\frac{a^{12}b^3}{x}-\frac{4095\,a^{11}b^4}{2}x^{-\frac{2}{3}}-9009\,\frac{a^{10}b^5}{\sqrt[3]{x}}$$
$$+19305\,a^8b^7\sqrt[3]{x}+\frac{19305\,a^7b^8}{2}x^{\frac{2}{3}}+5005\,a^6b^9x+\frac{9009\,a^5b^{10}}{4}x^{\frac{4}{3}}+819\,a^4b^{11}x^{5/3}$$
$$+\frac{455\,a^3b^{12}x^2}{2}+45\,a^2b^{13}x^{7/3}+\frac{45\,ab^{14}}{8}x^{\frac{8}{3}}+\frac{b^{15}x^3}{3}+5005\,a^9b^6\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^15/x^3,x)
```

```
[Out] -1/2*a^15/x^2-9*a^14*b/x^(5/3)-315/4*a^13*b^2/x^(4/3)-455*a^12*b^
3/x-4095/2*a^11*b^4/x^(2/3)-9009*a^10*b^5/x^(1/3)+19305*a^8*b^7*x
^(1/3)+19305/2*a^7*b^8*x^(2/3)+5005*a^6*b^9*x+9009/4*a^5*b^10*x^(
4/3)+819*a^4*b^11*x^(5/3)+455/2*a^3*b^12*x^2+45*a^2*b^13*x^(7/3)+
45/8*a*b^14*x^(8/3)+1/3*b^15*x^3+5005*a^9*b^6*ln(x)
```

Maxima [A] time = 1.42232, size = 223, normalized size = 1.12

$$\frac{1}{3}b^{15}x^3+\frac{45}{8}ab^{14}x^{\frac{8}{3}}+45\,a^2b^{13}x^{\frac{7}{3}}+\frac{455}{2}a^3b^{12}x^2+819\,a^4b^{11}x^{\frac{5}{3}}+\frac{9009}{4}a^5b^{10}x^{\frac{4}{3}}$$
$$+5005\,a^6b^9x+5005\,a^9b^6\log(x)+\frac{19305}{2}a^7b^8x^{\frac{2}{3}}+19305\,a^8b^7x^{\frac{1}{3}}$$
$$-\frac{36036\,a^{10}b^5x^{\frac{5}{3}}+8190\,a^{11}b^4x^{\frac{4}{3}}+1820\,a^{12}b^3x+315\,a^{13}b^2x^{\frac{2}{3}}+36\,a^{14}bx^{\frac{1}{3}}+2\,a^{15}}{4\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15/x^3,x, algorithm="maxima")
```

```
[Out] 1/3*b^15*x^3 + 45/8*a*b^14*x^(8/3) + 45*a^2*b^13*x^(7/3) + 455/2*
a^3*b^12*x^2 + 819*a^4*b^11*x^(5/3) + 9009/4*a^5*b^10*x^(4/3) + 5
005*a^6*b^9*x + 5005*a^9*b^6*log(x) + 19305/2*a^7*b^8*x^(2/3) + 1
9305*a^8*b^7*x^(1/3) - 1/4*(36036*a^10*b^5*x^(5/3) + 8190*a^11*b^
4*x^(4/3) + 1820*a^12*b^3*x + 315*a^13*b^2*x^(2/3) + 36*a^14*b*x^
(1/3) + 2*a^15)/x^2
```

Fricas [A] time = 0.221858, size = 234, normalized size = 1.17

$$\frac{8\,b^{15}x^5+5460\,a^3b^{12}x^4+120120\,a^6b^9x^3+360360\,a^9b^6x^2\log\left(x^{\frac{1}{3}}\right)-10920\,a^{12}b^3x-12\,a^{15}+27\left(5\,ab^{14}x^4+728\,a^4b^{11}x^3+8\right.}{24\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15/x^3,x, algorithm="fricas")
```

```
[Out] 1/24*(8*b^15*x^5 + 5460*a^3*b^12*x^4 + 120120*a^6*b^9*x^3 + 36036
0*a^9*b^6*x^2*log(x^(1/3)) - 10920*a^12*b^3*x - 12*a^15 + 27*(5*a
*b^14*x^4 + 728*a^4*b^11*x^3 + 8580*a^7*b^8*x^2 - 8008*a^10*b^5*x
 - 70*a^13*b^2)*x^(2/3) + 54*(20*a^2*b^13*x^4 + 1001*a^5*b^10*x^3
 + 8580*a^8*b^7*x^2 - 910*a^11*b^4*x - 4*a^14*b)*x^(1/3))/x^2
```

Sympy [A] time = 17.2505, size = 202, normalized size = 1.01

$$-\frac{a^{15}}{2x^2}-\frac{9a^{14}b}{x^{\frac{5}{3}}}-\frac{315a^{13}b^2}{4x^{\frac{4}{3}}}-\frac{455a^{12}b^3}{x}-\frac{4095a^{11}b^4}{2x^{\frac{2}{3}}}-\frac{9009a^{10}b^5}{\sqrt[3]{x}}+5005a^9b^6\log(x)+19305a^8b^7\sqrt[3]{x}+\frac{19305a^7b^8x^{\frac{2}{3}}}{2}+5005a^6b^9x+\frac{9009a^5b^{10}x^{\frac{4}{3}}}{4}+819a^4b^{11}x^{\frac{5}{3}}+\frac{455a^3b^{12}x^2}{2}+45a^2b^{13}x^{\frac{7}{3}}+\frac{45ab^{14}x^{\frac{8}{3}}}{8}+\frac{b^{15}x^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**15/x**3,x)
```

```
[Out] -a**15/(2*x**2) - 9*a**14*b/x**(5/3) - 315*a**13*b**2/(4*x**(4/3)
) - 455*a**12*b**3/x - 4095*a**11*b**4/(2*x**(2/3)) - 9009*a**10*
b**5/x**(1/3) + 5005*a**9*b**6*log(x) + 19305*a**8*b**7*x**(1/3)
+ 19305*a**7*b**8*x**(2/3)/2 + 5005*a**6*b**9*x + 9009*a**5*b**10
*x**(4/3)/4 + 819*a**4*b**11*x**(5/3) + 455*a**3*b**12*x**2/2 + 4
5*a**2*b**13*x**(7/3) + 45*a*b**14*x**(8/3)/8 + b**15*x**3/3
```

GIAC/XCAS [A] time = 0.223204, size = 224, normalized size = 1.12

$$\frac{1}{3}\,b^{15}x^3+\frac{45}{8}\,ab^{14}x^{\frac{8}{3}}+45\,a^2b^{13}x^{\frac{7}{3}}+\frac{455}{2}\,a^3b^{12}x^2+819\,a^4b^{11}x^{\frac{5}{3}}+\frac{9009}{4}\,a^5b^{10}x^{\frac{4}{3}}+5005\,a^6b^9x+5005\,a^9b^6\ln(|x|)+\frac{19305}{2}\,a^7b^8x^{\frac{2}{3}}+19305\,a^8b^7x^{\frac{1}{3}}-\frac{36036\,a^{10}b^5x^{\frac{5}{3}}+8190\,a^{11}b^4x^{\frac{4}{3}}+1820\,a^{12}b^3x+315\,a^{13}b^2x^{\frac{2}{3}}+36\,a^{14}bx^{\frac{1}{3}}+2\,a^{15}}{4\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15/x^3,x, algorithm="giac")
```

```
[Out] 1/3*b^15*x^3 + 45/8*a*b^14*x^(8/3) + 45*a^2*b^13*x^(7/3) + 455/2*
a^3*b^12*x^2 + 819*a^4*b^11*x^(5/3) + 9009/4*a^5*b^10*x^(4/3) + 5
005*a^6*b^9*x + 5005*a^9*b^6*ln(abs(x)) + 19305/2*a^7*b^8*x^(2/3)
 + 19305*a^8*b^7*x^(1/3) - 1/4*(36036*a^10*b^5*x^(5/3) + 8190*a^1
1*b^4*x^(4/3) + 1820*a^12*b^3*x + 315*a^13*b^2*x^(2/3) + 36*a^14*
b*x^(1/3) + 2*a^15)/x^2
```

3.2341 $\int \frac{\left(a+b\sqrt[3]{x}\right)^{15}}{x^4}\,dx$

Optimal. Leaf size=200

$$-\frac{a^{15}}{3x^3}-\frac{45a^{14}b}{8x^{8/3}}-\frac{45a^{13}b^2}{x^{7/3}}-\frac{455a^{12}b^3}{2x^2}-\frac{819a^{11}b^4}{x^{5/3}}-\frac{9009a^{10}b^5}{4x^{4/3}}-\frac{5005a^9b^6}{x}-\frac{19305a^8b^7}{2x^{2/3}}-\frac{19305a^7b^8}{\sqrt[3]{x}}+5005a^6b^9\log(x)+9009a^5b^{10}\sqrt[3]{x}+\frac{4095}{2}a^4b^{11}x^{2/3}+455a^3b^{12}x+\frac{315}{4}a^2b^{13}x^{4/3}+9ab^{14}x^{5/3}+\frac{b^{15}x^2}{2}$$

```
[Out] -a^15/(3*x^3) - (45*a^14*b)/(8*x^(8/3)) - (45*a^13*b^2)/x^(7/3) -
 (455*a^12*b^3)/(2*x^2) - (819*a^11*b^4)/x^(5/3) - (9009*a^10*b^5
)/(4*x^(4/3)) - (5005*a^9*b^6)/x - (19305*a^8*b^7)/(2*x^(2/3)) -
(19305*a^7*b^8)/x^(1/3) + 9009*a^5*b^10*x^(1/3) + (4095*a^4*b^11*
x^(2/3))/2 + 455*a^3*b^12*x + (315*a^2*b^13*x^(4/3))/4 + 9*a*b^14
*x^(5/3) + (b^15*x^2)/2 + 5005*a^6*b^9*Log[x]
```

Rubi [A] time = 0.300902, antiderivative size = 200, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^{15}}{3x^3}-\frac{45a^{14}b}{8x^{8/3}}-\frac{45a^{13}b^2}{x^{7/3}}-\frac{455a^{12}b^3}{2x^2}-\frac{819a^{11}b^4}{x^{5/3}}-\frac{9009a^{10}b^5}{4x^{4/3}}-\frac{5005a^9b^6}{x}-\frac{19305a^8b^7}{2x^{2/3}}-\frac{19305a^7b^8}{\sqrt[3]{x}}+5005a^6b^9\log(x)+9009a^5b^{10}\sqrt[3]{x}+\frac{4095}{2}a^4b^{11}x^{2/3}+455a^3b^{12}x+\frac{315}{4}a^2b^{13}x^{4/3}+9ab^{14}x^{5/3}+\frac{b^{15}x^2}{2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^15/x^4,x]
```

```
[Out] -a^15/(3*x^3) - (45*a^14*b)/(8*x^(8/3)) - (45*a^13*b^2)/x^(7/3) -
 (455*a^12*b^3)/(2*x^2) - (819*a^11*b^4)/x^(5/3) - (9009*a^10*b^5
)/(4*x^(4/3)) - (5005*a^9*b^6)/x - (19305*a^8*b^7)/(2*x^(2/3)) -
(19305*a^7*b^8)/x^(1/3) + 9009*a^5*b^10*x^(1/3) + (4095*a^4*b^11*
x^(2/3))/2 + 455*a^3*b^12*x + (315*a^2*b^13*x^(4/3))/4 + 9*a*b^14
*x^(5/3) + (b^15*x^2)/2 + 5005*a^6*b^9*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^{15}}{3x^3}-\frac{45a^{14}b}{8x^{\frac{8}{3}}}-\frac{45a^{13}b^2}{x^{\frac{7}{3}}}-\frac{455a^{12}b^3}{2x^2}-\frac{819a^{11}b^4}{x^{\frac{5}{3}}}-\frac{9009a^{10}b^5}{4x^{\frac{4}{3}}}-\frac{5005a^9b^6}{x}-\frac{19305a^8b^7}{2x^{\frac{2}{3}}}-\frac{19305a^7b^8}{\sqrt[3]{x}}+15015a^6b^9\log\left(\sqrt[3]{x}\right)+9009a^5b^{10}\sqrt[3]{x}+4095a^4b^{11}\int^{\sqrt[3]{x}}x\,dx+455a^3b^{12}x+\frac{315a^2b^{13}x^{\frac{4}{3}}}{4}+9ab^{14}x^{\frac{5}{3}}+\frac{b^{15}x^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**15/x**4,x)
```

```
[Out] -a**15/(3*x**3) - 45*a**14*b/(8*x**(8/3)) - 45*a**13*b**2/x**(7/3
) - 455*a**12*b**3/(2*x**2) - 819*a**11*b**4/x**(5/3) - 9009*a**1
0*b**5/(4*x**(4/3)) - 5005*a**9*b**6/x - 19305*a**8*b**7/(2*x**(2
/3)) - 19305*a**7*b**8/x**(1/3) + 15015*a**6*b**9*log(x**(1/3)) +
 9009*a**5*b**10*x**(1/3) + 4095*a**4*b**11*Integral(x, (x, x**(1
/3))) + 455*a**3*b**12*x + 315*a**2*b**13*x**(4/3)/4 + 9*a*b**14*
x**(5/3) + b**15*x**2/2
```

Mathematica [A] time = 0.111945, size = 200, normalized size = 1.

$$-\frac{a^{15}}{3x^3}-\frac{45a^{14}b}{8x^{8/3}}-\frac{45a^{13}b^2}{x^{7/3}}-\frac{455a^{12}b^3}{2x^2}-\frac{819a^{11}b^4}{x^{5/3}}-\frac{9009a^{10}b^5}{4x^{4/3}}-\frac{5005a^9b^6}{x}-\frac{19305a^8b^7}{2x^{2/3}}-\frac{19305a^7b^8}{\sqrt[3]{x}}+5005a^6b^9\log(x)+9009a^5b^{10}\sqrt[3]{x}+\frac{4095}{2}a^4b^{11}x^{2/3}+455a^3b^{12}x+\frac{315}{4}a^2b^{13}x^{4/3}+9ab^{14}x^{5/3}+\frac{b^{15}x^2}{2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^15/x^4,x]
```

```
[Out] -a^15/(3*x^3) - (45*a^14*b)/(8*x^(8/3)) - (45*a^13*b^2)/x^(7/3) -
 (455*a^12*b^3)/(2*x^2) - (819*a^11*b^4)/x^(5/3) - (9009*a^10*b^5
)/(4*x^(4/3)) - (5005*a^9*b^6)/x - (19305*a^8*b^7)/(2*x^(2/3)) -
(19305*a^7*b^8)/x^(1/3) + 9009*a^5*b^10*x^(1/3) + (4095*a^4*b^11*
x^(2/3))/2 + 455*a^3*b^12*x + (315*a^2*b^13*x^(4/3))/4 + 9*a*b^14
*x^(5/3) + (b^15*x^2)/2 + 5005*a^6*b^9*Log[x]
```

Maple [A] time = 0.014, size = 165, normalized size = 0.8

$$-\frac{a^{15}}{3\,x^3}-\frac{45\,a^{14}b}{8}x^{-\frac{8}{3}}-45\,\frac{a^{13}b^2}{x^{7/3}}-\frac{455\,a^{12}b^3}{2\,x^2}-819\,\frac{a^{11}b^4}{x^{5/3}}-\frac{9009\,a^{10}b^5}{4}x^{-\frac{4}{3}}-5005\,\frac{a^9b^6}{x}-\frac{19305\,a^8b^7}{2}x^{-\frac{2}{3}}-19305\,\frac{a^7b^8}{\sqrt[3]{x}}+9009\,a^5b^{10}\sqrt[3]{x}+\frac{4095\,a^4b^{11}}{2}x^{\frac{2}{3}}+455\,a^3b^{12}x+\frac{315\,a^2b^{13}}{4}x^{\frac{4}{3}}+9\,ab^{14}x^{5/3}+\frac{b^{15}x^2}{2}+5005\,a^6b^9\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^15/x^4,x)
```

```
[Out] -1/3*a^15/x^3-45/8*a^14*b/x^(8/3)-45*a^13*b^2/x^(7/3)-455/2*a^12*
b^3/x^2-819*a^11*b^4/x^(5/3)-9009/4*a^10*b^5/x^(4/3)-5005*a^9*b^6
/x-19305/2*a^8*b^7/x^(2/3)-19305*a^7*b^8/x^(1/3)+9009*a^5*b^10*x^
(1/3)+4095/2*a^4*b^11*x^(2/3)+455*a^3*b^12*x+315/4*a^2*b^13*x^(4/
3)+9*a*b^14*x^(5/3)+1/2*b^15*x^2+5005*a^6*b^9*ln(x)
```

Maxima [A] time = 1.44277, size = 223, normalized size = 1.12

$$\frac{1}{2}\,b^{15}x^2+9\,ab^{14}x^{\frac{5}{3}}+\frac{315}{4}\,a^2b^{13}x^{\frac{4}{3}}+455\,a^3b^{12}x+5005\,a^6b^9\log(x)+\frac{4095}{2}\,a^4b^{11}x^{\frac{2}{3}}+9009\,a^5b^{10}x^{\frac{1}{3}}-\frac{463320\,a^7b^8x^{\frac{8}{3}}+231660\,a^8b^7x^{\frac{7}{3}}+120120\,a^9b^6x^2+54054\,a^{10}b^5x^{\frac{5}{3}}+19656\,a^{11}b^4x^{\frac{4}{3}}+5460\,a^{12}b^3x+1080\,a^{13}b^2x^{\frac{2}{3}}+135\,a}{24\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15/x^4,x, algorithm="maxima")
```

```
[Out] 1/2*b^15*x^2 + 9*a*b^14*x^(5/3) + 315/4*a^2*b^13*x^(4/3) + 455*a^
3*b^12*x + 5005*a^6*b^9*log(x) + 4095/2*a^4*b^11*x^(2/3) + 9009*a
^5*b^10*x^(1/3) - 1/24*(463320*a^7*b^8*x^(8/3) + 231660*a^8*b^7*x
^(7/3) + 120120*a^9*b^6*x^2 + 54054*a^10*b^5*x^(5/3) + 19656*a^11
*b^4*x^(4/3) + 5460*a^12*b^3*x + 1080*a^13*b^2*x^(2/3) + 135*a^14
*b*x^(1/3) + 8*a^15)/x^3
```

Fricas [A] time = 0.222316, size = 234, normalized size = 1.17

$$\frac{12\,b^{15}x^5+10920\,a^3b^{12}x^4+360360\,a^6b^9x^3\log\left(x^{\frac{1}{3}}\right)-120120\,a^9b^6x^2-5460\,a^{12}b^3x-8\,a^{15}+54\,\left(4\,ab^{14}x^4+910\,a^4b^{11}x^3-8\right.}{24\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15/x^4,x, algorithm="fricas")
```

```
[Out] 1/24*(12*b^15*x^5 + 10920*a^3*b^12*x^4 + 360360*a^6*b^9*x^3*log(x
^(1/3)) - 120120*a^9*b^6*x^2 - 5460*a^12*b^3*x - 8*a^15 + 54*(4*a
*b^14*x^4 + 910*a^4*b^11*x^3 - 8580*a^7*b^8*x^2 - 1001*a^10*b^5*x
 - 20*a^13*b^2)*x^(2/3) + 27*(70*a^2*b^13*x^4 + 8008*a^5*b^10*x^3
 - 8580*a^8*b^7*x^2 - 728*a^11*b^4*x - 5*a^14*b)*x^(1/3))/x^3
```

Sympy [A] time = 16.9995, size = 202, normalized size = 1.01

$$-\frac{a^{15}}{3x^3}-\frac{45a^{14}b}{8x^{\frac{8}{3}}}-\frac{45a^{13}b^2}{x^{\frac{7}{3}}}-\frac{455a^{12}b^3}{2x^2}-\frac{819a^{11}b^4}{x^{\frac{5}{3}}}-\frac{9009a^{10}b^5}{4x^{\frac{4}{3}}}-\frac{5005a^9b^6}{x}-\frac{19305a^8b^7}{2x^{\frac{2}{3}}}-\frac{19305a^7b^8}{\sqrt[3]{x}} + 5005a^6b^9\log(x) + 9009a^5b^{10}\sqrt[3]{x}+\frac{4095a^4b^{11}x^{\frac{2}{3}}}{2}+455a^3b^{12}x+\frac{315a^2b^{13}x^{\frac{4}{3}}}{4}+9ab^{14}x^{\frac{5}{3}}+\frac{b^{15}x^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**15/x**4,x)
```

```
[Out] -a**15/(3*x**3) - 45*a**14*b/(8*x**(8/3)) - 45*a**13*b**2/x**(7/3
) - 455*a**12*b**3/(2*x**2) - 819*a**11*b**4/x**(5/3) - 9009*a**1
0*b**5/(4*x**(4/3)) - 5005*a**9*b**6/x - 19305*a**8*b**7/(2*x**(2
/3)) - 19305*a**7*b**8/x**(1/3) + 5005*a**6*b**9*log(x) + 9009*a*
*5*b**10*x**(1/3) + 4095*a**4*b**11*x**(2/3)/2 + 455*a**3*b**12*x
 + 315*a**2*b**13*x**(4/3)/4 + 9*a*b**14*x**(5/3) + b**15*x**2/2
```

GIAC/XCAS [A] time = 0.221574, size = 224, normalized size = 1.12

$$\frac{1}{2}b^{15}x^2+9\,ab^{14}x^{\frac{5}{3}}+\frac{315}{4}\,a^2b^{13}x^{\frac{4}{3}}+455\,a^3b^{12}x+5005\,a^6b^9\ln(|x|)+\frac{4095}{2}\,a^4b^{11}x^{\frac{2}{3}}+9009\,a^5b^{10}x^{\frac{1}{3}} - \frac{463320\,a^7b^8x^{\frac{8}{3}}+231660\,a^8b^7x^{\frac{7}{3}}+120120\,a^9b^6x^2+54054\,a^{10}b^5x^{\frac{5}{3}}+19656\,a^{11}b^4x^{\frac{4}{3}}+5460\,a^{12}b^3x+1080\,a^{13}b^2x^{\frac{2}{3}}+135\,a}{24\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15/x^4,x, algorithm="giac")
```

```
[Out] 1/2*b^15*x^2 + 9*a*b^14*x^(5/3) + 315/4*a^2*b^13*x^(4/3) + 455*a^
3*b^12*x + 5005*a^6*b^9*ln(abs(x)) + 4095/2*a^4*b^11*x^(2/3) + 90
09*a^5*b^10*x^(1/3) - 1/24*(463320*a^7*b^8*x^(8/3) + 231660*a^8*b
^7*x^(7/3) + 120120*a^9*b^6*x^2 + 54054*a^10*b^5*x^(5/3) + 19656*
a^11*b^4*x^(4/3) + 5460*a^12*b^3*x + 1080*a^13*b^2*x^(2/3) + 135*
a^14*b*x^(1/3) + 8*a^15)/x^3
```

3.2342 $\int \frac{\left(a+b\sqrt[3]{x}\right)^{15}}{x^6}\,dx$

Optimal. Leaf size=211

$$-\frac{a^{15}}{5x^5}-\frac{45a^{14}b}{14x^{14/3}}-\frac{315a^{13}b^2}{13x^{13/3}}-\frac{455a^{12}b^3}{4x^4}-\frac{4095a^{11}b^4}{11x^{11/3}}-\frac{9009a^{10}b^5}{10x^{10/3}}-\frac{5005a^9b^6}{3x^3}-\frac{19305a^8b^7}{8x^{8/3}}-\frac{19305a^7b^8}{7x^{7/3}}-\frac{5005a^6b^9}{2x^2}-\frac{9009a^5b^{10}}{5x^{5/3}}-\frac{4095a^4b^{11}}{4x^{4/3}}-\frac{455a^3b^{12}}{x}-\frac{315a^2b^{13}}{2x^{2/3}}-\frac{45ab^{14}}{\sqrt[3]{x}}+b^{15}\log(x)$$

```
[Out] -a^15/(5*x^5) - (45*a^14*b)/(14*x^(14/3)) - (315*a^13*b^2)/(13*x^
(13/3)) - (455*a^12*b^3)/(4*x^4) - (4095*a^11*b^4)/(11*x^(11/3))
- (9009*a^10*b^5)/(10*x^(10/3)) - (5005*a^9*b^6)/(3*x^3) - (19305
*a^8*b^7)/(8*x^(8/3)) - (19305*a^7*b^8)/(7*x^(7/3)) - (5005*a^6*b
^9)/(2*x^2) - (9009*a^5*b^10)/(5*x^(5/3)) - (4095*a^4*b^11)/(4*x^
(4/3)) - (455*a^3*b^12)/x - (315*a^2*b^13)/(2*x^(2/3)) - (45*a*b^
14)/x^(1/3) + b^15*Log[x]
```

Rubi [A] time = 0.300943, antiderivative size = 211, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^{15}}{5x^5}-\frac{45a^{14}b}{14x^{14/3}}-\frac{315a^{13}b^2}{13x^{13/3}}-\frac{455a^{12}b^3}{4x^4}-\frac{4095a^{11}b^4}{11x^{11/3}}-\frac{9009a^{10}b^5}{10x^{10/3}}-\frac{5005a^9b^6}{3x^3}-\frac{19305a^8b^7}{8x^{8/3}}-\frac{19305a^7b^8}{7x^{7/3}}-\frac{5005a^6b^9}{2x^2}-\frac{9009a^5b^{10}}{5x^{5/3}}-\frac{4095a^4b^{11}}{4x^{4/3}}-\frac{455a^3b^{12}}{x}-\frac{315a^2b^{13}}{2x^{2/3}}-\frac{45ab^{14}}{\sqrt[3]{x}}+b^{15}\log(x)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^15/x^6,x]
```

```
[Out] -a^15/(5*x^5) - (45*a^14*b)/(14*x^(14/3)) - (315*a^13*b^2)/(13*x^
(13/3)) - (455*a^12*b^3)/(4*x^4) - (4095*a^11*b^4)/(11*x^(11/3))
- (9009*a^10*b^5)/(10*x^(10/3)) - (5005*a^9*b^6)/(3*x^3) - (19305
*a^8*b^7)/(8*x^(8/3)) - (19305*a^7*b^8)/(7*x^(7/3)) - (5005*a^6*b
^9)/(2*x^2) - (9009*a^5*b^10)/(5*x^(5/3)) - (4095*a^4*b^11)/(4*x^
(4/3)) - (455*a^3*b^12)/x - (315*a^2*b^13)/(2*x^(2/3)) - (45*a*b^
14)/x^(1/3) + b^15*Log[x]
```

Rubi in Sympy [A] time = 51.6058, size = 218, normalized size = 1.03

$$-\frac{a^{15}}{5x^5}-\frac{45a^{14}b}{14x^{\frac{14}{3}}}-\frac{315a^{13}b^2}{13x^{\frac{13}{3}}}-\frac{455a^{12}b^3}{4x^4}-\frac{4095a^{11}b^4}{11x^{\frac{11}{3}}}-\frac{9009a^{10}b^5}{10x^{\frac{10}{3}}}-\frac{5005a^9b^6}{3x^3}-\frac{19305a^8b^7}{8x^{\frac{8}{3}}}-\frac{19305a^7b^8}{7x^{\frac{7}{3}}}-\frac{5005a^6b^9}{2x^2}-\frac{9009a^5b^{10}}{5x^{\frac{5}{3}}}-\frac{4095a^4b^{11}}{4x^{\frac{4}{3}}}-\frac{455a^3b^{12}}{x}-\frac{315a^2b^{13}}{2x^{\frac{2}{3}}}-\frac{45ab^{14}}{\sqrt[3]{x}}+3b^{15}\log\left(\sqrt[3]{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**15/x**6,x)
```

```
[Out] -a**15/(5*x**5) - 45*a**14*b/(14*x**(14/3)) - 315*a**13*b**2/(13*
x**(13/3)) - 455*a**12*b**3/(4*x**4) - 4095*a**11*b**4/(11*x**(11
/3)) - 9009*a**10*b**5/(10*x**(10/3)) - 5005*a**9*b**6/(3*x**3) -
 19305*a**8*b**7/(8*x**(8/3)) - 19305*a**7*b**8/(7*x**(7/3)) - 50
05*a**6*b**9/(2*x**2) - 9009*a**5*b**10/(5*x**(5/3)) - 4095*a**4*
b**11/(4*x**(4/3)) - 455*a**3*b**12/x - 315*a**2*b**13/(2*x**(2/3
)) - 45*a*b**14/x**(1/3) + 3*b**15*log(x**(1/3))
```

Mathematica [A] time = 0.184138, size = 211, normalized size = 1.

$$-\frac{a^{15}}{5x^5}-\frac{45a^{14}b}{14x^{14/3}}-\frac{315a^{13}b^2}{13x^{13/3}}-\frac{455a^{12}b^3}{4x^4}-\frac{4095a^{11}b^4}{11x^{11/3}}-\frac{9009a^{10}b^5}{10x^{10/3}}-\frac{5005a^9b^6}{3x^3}-\frac{19305a^8b^7}{8x^{8/3}}-\frac{19305a^7b^8}{7x^{7/3}}-\frac{5005a^6b^9}{2x^2}-\frac{9009a^5b^{10}}{5x^{5/3}}-\frac{4095a^4b^{11}}{4x^{4/3}}-\frac{455a^3b^{12}}{x}-\frac{315a^2b^{13}}{2x^{2/3}}-\frac{45ab^{14}}{\sqrt[3]{x}}+b^{15}\log(x)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^15/x^6,x]
```

```
[Out] -a^15/(5*x^5) - (45*a^14*b)/(14*x^(14/3)) - (315*a^13*b^2)/(13*x^
(13/3)) - (455*a^12*b^3)/(4*x^4) - (4095*a^11*b^4)/(11*x^(11/3))
- (9009*a^10*b^5)/(10*x^(10/3)) - (5005*a^9*b^6)/(3*x^3) - (19305
*a^8*b^7)/(8*x^(8/3)) - (19305*a^7*b^8)/(7*x^(7/3)) - (5005*a^6*b
^9)/(2*x^2) - (9009*a^5*b^10)/(5*x^(5/3)) - (4095*a^4*b^11)/(4*x^
(4/3)) - (455*a^3*b^12)/x - (315*a^2*b^13)/(2*x^(2/3)) - (45*a*b^
14)/x^(1/3) + b^15*Log[x]
```

Maple [A] time = 0.014, size = 166, normalized size = 0.8

$$-\frac{a^{15}}{5\,x^5}-\frac{45\,a^{14}b}{14}x^{-\frac{14}{3}}-\frac{315\,a^{13}b^2}{13}x^{-\frac{13}{3}}-\frac{455\,a^{12}b^3}{4\,x^4}-\frac{4095\,a^{11}b^4}{11}x^{-\frac{11}{3}}-\frac{9009\,a^{10}b^5}{10}x^{-\frac{10}{3}}-\frac{5005\,a^9b^6}{3\,x^3}-\frac{19305\,a^8b^7}{8}x^{-\frac{8}{3}}-\frac{19305\,a^7b^8}{7}x^{-\frac{7}{3}}-\frac{5005\,a^6b^9}{2\,x^2}-\frac{9009\,a^5b^{10}}{5}x^{-\frac{5}{3}}-\frac{4095\,a^4b^{11}}{4}x^{-\frac{4}{3}}-455\,\frac{a^3b^{12}}{x}-\frac{315\,a^2b^{13}}{2}x^{-\frac{2}{3}}-45\,\frac{ab^{14}}{\sqrt[3]{x}}+b^{15}\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^15/x^6,x)
```

```
[Out] -1/5*a^15/x^5-45/14*a^14*b/x^(14/3)-315/13*a^13*b^2/x^(13/3)-455/
4*a^12*b^3/x^4-4095/11*a^11*b^4/x^(11/3)-9009/10*a^10*b^5/x^(10/3
)-5005/3*a^9*b^6/x^3-19305/8*a^8*b^7/x^(8/3)-19305/7*a^7*b^8/x^(7
/3)-5005/2*a^6*b^9/x^2-9009/5*a^5*b^10/x^(5/3)-4095/4*a^4*b^11/x^
(4/3)-455*a^3*b^12/x-315/2*a^2*b^13/x^(2/3)-45*a*b^14/x^(1/3)+b^1
5*ln(x)
```

Maxima [A] time = 1.44061, size = 224, normalized size = 1.06

$$b^{15}\log(x)-\frac{5405400\,ab^{14}x^{\frac{14}{3}}+18918900\,a^2b^{13}x^{\frac{13}{3}}+54654600\,a^3b^{12}x^4+122972850\,a^4b^{11}x^{\frac{11}{3}}+216432216\,a^5b^{10}x^{\frac{10}{3}}+300600300\,a^6b^9x^{\dots}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15/x^6,x, algorithm="maxima")
```

```
[Out] b^15*log(x) - 1/120120*(5405400*a*b^14*x^(14/3) + 18918900*a^2*b^
13*x^(13/3) + 54654600*a^3*b^12*x^4 + 122972850*a^4*b^11*x^(11/3)
 + 216432216*a^5*b^10*x^(10/3) + 300600300*a^6*b^9*x^3 + 33127380
0*a^7*b^8*x^(8/3) + 289864575*a^8*b^7*x^(7/3) + 200400200*a^9*b^6
*x^2 + 108216108*a^10*b^5*x^(5/3) + 44717400*a^11*b^4*x^(4/3) + 1
3663650*a^12*b^3*x + 2910600*a^13*b^2*x^(2/3) + 386100*a^14*b*x^(
1/3) + 24024*a^15)/x^5
```

Fricas [A] time = 0.221001, size = 234, normalized size = 1.11

$$\frac{360360\, b^{15} x^5 \log\left(x^{\frac{1}{3}}\right) - 54654600\, a^3 b^{12} x^4 - 300600300\, a^6 b^9 x^3 - 200400200\, a^9 b^6 x^2 - 13663650\, a^{12} b^3 x - 24024\, a^{15} - 594 \cdots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15/x^6,x, algorithm="fricas")
```

```
[Out] 1/120120*(360360*b^15*x^5*log(x^(1/3)) - 54654600*a^3*b^12*x^4 -
300600300*a^6*b^9*x^3 - 200400200*a^9*b^6*x^2 - 13663650*a^12*b^3
*x - 24024*a^15 - 594*(9100*a*b^14*x^4 + 207025*a^4*b^11*x^3 + 55
7700*a^7*b^8*x^2 + 182182*a^10*b^5*x + 4900*a^13*b^2)*x^(2/3) - 3
51*(53900*a^2*b^13*x^4 + 616616*a^5*b^10*x^3 + 825825*a^8*b^7*x^2
 + 127400*a^11*b^4*x + 1100*a^14*b)*x^(1/3))/x^5
```

Sympy [A] time = 28.6659, size = 212, normalized size = 1.

$$-\frac{a^{15}}{5x^5} - \frac{45a^{14}b}{14x^{\frac{14}{3}}} - \frac{315a^{13}b^2}{13x^{\frac{13}{3}}} - \frac{455a^{12}b^3}{4x^4} - \frac{4095a^{11}b^4}{11x^{\frac{11}{3}}} - \frac{9009a^{10}b^5}{10x^{\frac{10}{3}}} - \frac{5005a^9b^6}{3x^3} - \frac{19305a^8b^7}{8x^{\frac{8}{3}}} - \frac{19305a^7b^8}{7x^{\frac{7}{3}}} - \frac{5005a^6b^9}{2x^2} - \frac{9009a^5b^{10}}{5x^{\frac{5}{3}}} - \frac{4095a^4b^{11}}{4x^{\frac{4}{3}}} - \frac{455a^3b^{12}}{x} - \frac{315a^2b^{13}}{2x^{\frac{2}{3}}} - \frac{45ab^{14}}{\sqrt[3]{x}} + b^{15}\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**15/x**6,x)
```

```
[Out] -a**15/(5*x**5) - 45*a**14*b/(14*x**(14/3)) - 315*a**13*b**2/(13*
x**(13/3)) - 455*a**12*b**3/(4*x**4) - 4095*a**11*b**4/(11*x**(11
/3)) - 9009*a**10*b**5/(10*x**(10/3)) - 5005*a**9*b**6/(3*x**3) -
 19305*a**8*b**7/(8*x**(8/3)) - 19305*a**7*b**8/(7*x**(7/3)) - 50
05*a**6*b**9/(2*x**2) - 9009*a**5*b**10/(5*x**(5/3)) - 4095*a**4*
b**11/(4*x**(4/3)) - 455*a**3*b**12/x - 315*a**2*b**13/(2*x**(2/3
)) - 45*a*b**14/x**(1/3) + b**15*log(x)
```

GIAC/XCAS [A] time = 0.222597, size = 225, normalized size = 1.07

$$b^{15}\ln(|x|) - \frac{5405400\, ab^{14}x^{\frac{14}{3}} + 18918900\, a^2b^{13}x^{\frac{13}{3}} + 54654600\, a^3b^{12}x^4 + 122972850\, a^4b^{11}x^{\frac{11}{3}} + 216432216\, a^5b^{10}x^{\frac{10}{3}} + 300600300\, a^6b^9 \cdots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15/x^6,x, algorithm="giac")
```

```
[Out] b^15*ln(abs(x)) - 1/120120*(5405400*a*b^14*x^(14/3) + 18918900*a^
2*b^13*x^(13/3) + 54654600*a^3*b^12*x^4 + 122972850*a^4*b^11*x^(1
1/3) + 216432216*a^5*b^10*x^(10/3) + 300600300*a^6*b^9*x^3 + 3312
73800*a^7*b^8*x^(8/3) + 289864575*a^8*b^7*x^(7/3) + 200400200*a^9
*b^6*x^2 + 108216108*a^10*b^5*x^(5/3) + 44717400*a^11*b^4*x^(4/3)
 + 13663650*a^12*b^3*x + 2910600*a^13*b^2*x^(2/3) + 386100*a^14*b
*x^(1/3) + 24024*a^15)/x^5
```

3.2343 $\int \frac{\left(a+b\sqrt[3]{x}\right)^{15}}{x^7}\,dx$

Optimal. Leaf size=72

$$-\frac{b^2\left(a+b\sqrt[3]{x}\right)^{16}}{816a^3x^{16/3}}+\frac{b\left(a+b\sqrt[3]{x}\right)^{16}}{51a^2x^{17/3}}-\frac{\left(a+b\sqrt[3]{x}\right)^{16}}{6ax^6}$$

```
[Out] -(a + b*x^(1/3))^16/(6*a*x^6) + (b*(a + b*x^(1/3))^16)/(51*a^2*x^
(17/3)) - (b^2*(a + b*x^(1/3))^16)/(816*a^3*x^(16/3))
```

Rubi [A] time = 0.0791763, antiderivative size = 72, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{b^2\left(a+b\sqrt[3]{x}\right)^{16}}{816a^3x^{16/3}}+\frac{b\left(a+b\sqrt[3]{x}\right)^{16}}{51a^2x^{17/3}}-\frac{\left(a+b\sqrt[3]{x}\right)^{16}}{6ax^6}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^15/x^7,x]
```

```
[Out] -(a + b*x^(1/3))^16/(6*a*x^6) + (b*(a + b*x^(1/3))^16)/(51*a^2*x^
(17/3)) - (b^2*(a + b*x^(1/3))^16)/(816*a^3*x^(16/3))
```

Rubi in Sympy [A] time = 8.46751, size = 61, normalized size = 0.85

$$-\frac{\left(a+b\sqrt[3]{x}\right)^{16}}{6ax^6}+\frac{b\left(a+b\sqrt[3]{x}\right)^{16}}{51a^2x^{\frac{17}{3}}}-\frac{b^2\left(a+b\sqrt[3]{x}\right)^{16}}{816a^3x^{\frac{16}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**15/x**7,x)
```

```
[Out] -(a + b*x**(1/3))**16/(6*a*x**6) + b*(a + b*x**(1/3))**16/(51*a**
2*x**(17/3)) - b**2*(a + b*x**(1/3))**16/(816*a**3*x**(16/3))
```

Mathematica [B] time = 0.0594525, size = 189, normalized size = 2.62

$$-\frac{136a^{15}+2160a^{14}b\sqrt[3]{x}+16065a^{13}b^2x^{2/3}+74256a^{12}b^3x+238680a^{11}b^4x^{4/3}+565488a^{10}b^5x^{5/3}+1021020a^9b^6x^2+1432080}{}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^15/x^7,x]
```

```
[Out] -(136*a^15 + 2160*a^14*b*x^(1/3) + 16065*a^13*b^2*x^(2/3) + 74256
*a^12*b^3*x + 238680*a^11*b^4*x^(4/3) + 565488*a^10*b^5*x^(5/3) +
 1021020*a^9*b^6*x^2 + 1432080*a^8*b^7*x^(7/3) + 1575288*a^7*b^8*
x^(8/3) + 1361360*a^6*b^9*x^3 + 918918*a^5*b^10*x^(10/3) + 477360
*a^4*b^11*x^(11/3) + 185640*a^3*b^12*x^4 + 51408*a^2*b^13*x^(13/3
) + 9180*a*b^14*x^(14/3) + 816*b^15*x^5)/(816*x^6)
```

Maple [B] time = 0.011, size = 168, normalized size = 2.3

$$-\frac{5005\,a^{9}b^{6}}{4\,x^{4}}-91\,\frac{a^{12}b^{3}}{x^{5}}-\frac{315\,a^{13}b^{2}}{16}x^{-\frac{16}{3}}-693\,\frac{a^{10}b^{5}}{x^{13/3}}-\frac{455\,a^{3}b^{12}}{2\,x^{2}}-\frac{45\,ab^{14}}{4}x^{-\frac{4}{3}}-\frac{3861\,a^{7}b^{8}}{2}x^{-\frac{10}{3}}-\frac{45\,a^{14}b}{17}x^{-\frac{17}{3}}-\frac{9009\,a^{5}b^{10}}{8}x^{-\frac{8}{3}}-1755\,\frac{a^{8}b^{7}}{x^{11/3}}-\frac{585\,a^{11}b^{4}}{2}x^{-\frac{14}{3}}-\frac{5005\,a^{6}b^{9}}{3\,x^{3}}-\frac{b^{15}}{x}-\frac{a^{15}}{6\,x^{6}}-63\,\frac{a^{2}b^{13}}{x^{5/3}}-585\,\frac{a^{4}b^{11}}{x^{7/3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^15/x^7,x)
```

```
[Out] -5005/4*a^9*b^6/x^4-91*a^12*b^3/x^5-315/16*a^13*b^2/x^(16/3)-693*
a^10*b^5/x^(13/3)-455/2*a^3*b^12/x^2-45/4*a*b^14/x^(4/3)-3861/2*a
^7*b^8/x^(10/3)-45/17*a^14*b/x^(17/3)-9009/8*a^5*b^10/x^(8/3)-175
5*a^8*b^7/x^(11/3)-585/2*a^11*b^4/x^(14/3)-5005/3*a^6*b^9/x^3-b^1
5/x-1/6*a^15/x^6-63*a^2*b^13/x^(5/3)-585*a^4*b^11/x^(7/3)
```

Maxima [A] time = 1.44051, size = 225, normalized size = 3.12

$$-\frac{816\,b^{15}x^{5}+9180\,ab^{14}x^{\frac{14}{3}}+51408\,a^{2}b^{13}x^{\frac{13}{3}}+185640\,a^{3}b^{12}x^{4}+477360\,a^{4}b^{11}x^{\frac{11}{3}}+918918\,a^{5}b^{10}x^{\frac{10}{3}}+1361360\,a^{6}b^{9}x^{3}+15\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15/x^7,x, algorithm="maxima")
```

```
[Out] -1/816*(816*b^15*x^5 + 9180*a*b^14*x^(14/3) + 51408*a^2*b^13*x^(1
3/3) + 185640*a^3*b^12*x^4 + 477360*a^4*b^11*x^(11/3) + 918918*a^
5*b^10*x^(10/3) + 1361360*a^6*b^9*x^3 + 1575288*a^7*b^8*x^(8/3) +
 1432080*a^8*b^7*x^(7/3) + 1021020*a^9*b^6*x^2 + 565488*a^10*b^5*
x^(5/3) + 238680*a^11*b^4*x^(4/3) + 74256*a^12*b^3*x + 16065*a^13
*b^2*x^(2/3) + 2160*a^14*b*x^(1/3) + 136*a^15)/x^6
```

Fricas [A] time = 0.216964, size = 228, normalized size = 3.17

$$-\frac{816\,b^{15}x^{5}+185640\,a^{3}b^{12}x^{4}+1361360\,a^{6}b^{9}x^{3}+1021020\,a^{9}b^{6}x^{2}+74256\,a^{12}b^{3}x+136\,a^{15}+459\left(20\,ab^{14}x^{4}+1040\,a^{4}b^{11}x^{3}\cdots\right.}{81\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15/x^7,x, algorithm="fricas")
```

```
[Out] -1/816*(816*b^15*x^5 + 185640*a^3*b^12*x^4 + 1361360*a^6*b^9*x^3
+ 1021020*a^9*b^6*x^2 + 74256*a^12*b^3*x + 136*a^15 + 459*(20*a*b
^14*x^4 + 1040*a^4*b^11*x^3 + 3432*a^7*b^8*x^2 + 1232*a^10*b^5*x
+ 35*a^13*b^2)*x^(2/3) + 54*(952*a^2*b^13*x^4 + 17017*a^5*b^10*x^
3 + 26520*a^8*b^7*x^2 + 4420*a^11*b^4*x + 40*a^14*b)*x^(1/3))/x^6
```

Sympy [A] time = 41.2952, size = 209, normalized size = 2.9

$$-\frac{a^{15}}{6x^{6}}-\frac{45a^{14}b}{17x^{\frac{17}{3}}}-\frac{315a^{13}b^{2}}{16x^{\frac{16}{3}}}-\frac{91a^{12}b^{3}}{x^{5}}-\frac{585a^{11}b^{4}}{2x^{\frac{14}{3}}}-\frac{693a^{10}b^{5}}{x^{\frac{13}{3}}}-\frac{5005a^{9}b^{6}}{4x^{4}}-\frac{1755a^{8}b^{7}}{x^{\frac{11}{3}}}-\frac{3861a^{7}b^{8}}{2x^{\frac{10}{3}}}-\frac{5005a^{6}b^{9}}{3x^{3}}-\frac{9009a^{5}b^{10}}{8x^{\frac{8}{3}}}-\frac{585a^{4}b^{11}}{x^{\frac{7}{3}}}-\frac{455a^{3}b^{12}}{2x^{2}}-\frac{63a^{2}b^{13}}{x^{\frac{5}{3}}}-\frac{45ab^{14}}{4x^{\frac{4}{3}}}-\frac{b^{15}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**15/x**7,x)
```

```
[Out] -a**15/(6*x**6) - 45*a**14*b/(17*x**(17/3)) - 315*a**13*b**2/(16*
x**(16/3)) - 91*a**12*b**3/x**5 - 585*a**11*b**4/(2*x**(14/3)) -
693*a**10*b**5/x**(13/3) - 5005*a**9*b**6/(4*x**4) - 1755*a**8*b*
*7/x**(11/3) - 3861*a**7*b**8/(2*x**(10/3)) - 5005*a**6*b**9/(3*x
**3) - 9009*a**5*b**10/(8*x**(8/3)) - 585*a**4*b**11/x**(7/3) - 4
55*a**3*b**12/(2*x**2) - 63*a**2*b**13/x**(5/3) - 45*a*b**14/(4*x
**(4/3)) - b**15/x
```

GIAC/XCAS [A] time = 0.220504, size = 225, normalized size = 3.12

$$-\frac{816\,b^{15}x^{5} + 9180\,ab^{14}x^{\frac{14}{3}} + 51408\,a^{2}b^{13}x^{\frac{13}{3}} + 185640\,a^{3}b^{12}x^{4} + 477360\,a^{4}b^{11}x^{\frac{11}{3}} + 918918\,a^{5}b^{10}x^{\frac{10}{3}} + 1361360\,a^{6}b^{9}x^{3} + 15\cdots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15/x^7,x, algorithm="giac")
```

```
[Out] -1/816*(816*b^15*x^5 + 9180*a*b^14*x^(14/3) + 51408*a^2*b^13*x^(1
3/3) + 185640*a^3*b^12*x^4 + 477360*a^4*b^11*x^(11/3) + 918918*a^
5*b^10*x^(10/3) + 1361360*a^6*b^9*x^3 + 1575288*a^7*b^8*x^(8/3) +
 1432080*a^8*b^7*x^(7/3) + 1021020*a^9*b^6*x^2 + 565488*a^10*b^5*
x^(5/3) + 238680*a^11*b^4*x^(4/3) + 74256*a^12*b^3*x + 16065*a^13
*b^2*x^(2/3) + 2160*a^14*b*x^(1/3) + 136*a^15)/x^6
```

3.2344 $\int \frac{\left(a+b\sqrt[3]{x}\right)^{15}}{x^8}\,dx$

Optimal. Leaf size=148

$$\frac{b^5\left(a+b\sqrt[3]{x}\right)^{16}}{108528a^6x^{16/3}}-\frac{b^4\left(a+b\sqrt[3]{x}\right)^{16}}{6783a^5x^{17/3}}+\frac{b^3\left(a+b\sqrt[3]{x}\right)^{16}}{798a^4x^6}-\frac{b^2\left(a+b\sqrt[3]{x}\right)^{16}}{133a^3x^{19/3}}+\frac{b\left(a+b\sqrt[3]{x}\right)^{16}}{28a^2x^{20/3}}-\frac{\left(a+b\sqrt[3]{x}\right)^{16}}{7ax^7}$$

```
[Out] -(a + b*x^(1/3))^16/(7*a*x^7) + (b*(a + b*x^(1/3))^16)/(28*a^2*x^
(20/3)) - (b^2*(a + b*x^(1/3))^16)/(133*a^3*x^(19/3)) + (b^3*(a +
 b*x^(1/3))^16)/(798*a^4*x^6) - (b^4*(a + b*x^(1/3))^16)/(6783*a^
5*x^(17/3)) + (b^5*(a + b*x^(1/3))^16)/(108528*a^6*x^(16/3))
```

Rubi [A] time = 0.175147, antiderivative size = 148, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{b^5\left(a+b\sqrt[3]{x}\right)^{16}}{108528a^6x^{16/3}}-\frac{b^4\left(a+b\sqrt[3]{x}\right)^{16}}{6783a^5x^{17/3}}+\frac{b^3\left(a+b\sqrt[3]{x}\right)^{16}}{798a^4x^6}-\frac{b^2\left(a+b\sqrt[3]{x}\right)^{16}}{133a^3x^{19/3}}+\frac{b\left(a+b\sqrt[3]{x}\right)^{16}}{28a^2x^{20/3}}-\frac{\left(a+b\sqrt[3]{x}\right)^{16}}{7ax^7}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^15/x^8,x]
```

```
[Out] -(a + b*x^(1/3))^16/(7*a*x^7) + (b*(a + b*x^(1/3))^16)/(28*a^2*x^
(20/3)) - (b^2*(a + b*x^(1/3))^16)/(133*a^3*x^(19/3)) + (b^3*(a +
 b*x^(1/3))^16)/(798*a^4*x^6) - (b^4*(a + b*x^(1/3))^16)/(6783*a^
5*x^(17/3)) + (b^5*(a + b*x^(1/3))^16)/(108528*a^6*x^(16/3))
```

Rubi in Sympy [A] time = 21.9653, size = 131, normalized size = 0.89

$$-\frac{\left(a+b\sqrt[3]{x}\right)^{16}}{7ax^7}+\frac{b\left(a+b\sqrt[3]{x}\right)^{16}}{28a^2x^{\frac{20}{3}}}-\frac{b^2\left(a+b\sqrt[3]{x}\right)^{16}}{133a^3x^{\frac{19}{3}}}+\frac{b^3\left(a+b\sqrt[3]{x}\right)^{16}}{798a^4x^6}-\frac{b^4\left(a+b\sqrt[3]{x}\right)^{16}}{6783a^5x^{\frac{17}{3}}}+\frac{b^5\left(a+b\sqrt[3]{x}\right)^{16}}{108528a^6x^{\frac{16}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**15/x**8,x)
```

```
[Out] -(a + b*x**(1/3))**16/(7*a*x**7) + b*(a + b*x**(1/3))**16/(28*a**
2*x**(20/3)) - b**2*(a + b*x**(1/3))**16/(133*a**3*x**(19/3)) + b
**3*(a + b*x**(1/3))**16/(798*a**4*x**6) - b**4*(a + b*x**(1/3))*
*16/(6783*a**5*x**(17/3)) + b**5*(a + b*x**(1/3))**16/(108528*a**
6*x**(16/3))
```

Mathematica [A] time = 0.0713744, size = 213, normalized size = 1.44

$$-\frac{a^{15}}{7x^7}-\frac{9a^{14}b}{4x^{20/3}}-\frac{315a^{13}b^2}{19x^{19/3}}-\frac{455a^{12}b^3}{6x^6}-\frac{4095a^{11}b^4}{17x^{17/3}}-\frac{9009a^{10}b^5}{16x^{16/3}}-\frac{1001a^9b^6}{x^5}-\frac{19305a^8b^7}{14x^{14/3}}-\frac{1485a^7b^8}{x^{13/3}}-\frac{5005a^6b^9}{4x^4}-\frac{819a^5b^{10}}{x^{11/3}}-\frac{819a^4b^{11}}{2x^{10/3}}-\frac{455a^3b^{12}}{3x^3}-\frac{315a^2b^{13}}{8x^{8/3}}-\frac{45ab^{14}}{7x^{7/3}}-\frac{b^{15}}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^15/x^8,x]
```

```
[Out] -a^15/(7*x^7) - (9*a^14*b)/(4*x^(20/3)) - (315*a^13*b^2)/(19*x^(1
9/3)) - (455*a^12*b^3)/(6*x^6) - (4095*a^11*b^4)/(17*x^(17/3)) -
```

```
(9009*a^10*b^5)/(16*x^(16/3)) - (1001*a^9*b^6)/x^5 - (19305*a^8*b
^7)/(14*x^(14/3)) - (1485*a^7*b^8)/x^(13/3) - (5005*a^6*b^9)/(4*x
^4) - (819*a^5*b^10)/x^(11/3) - (819*a^4*b^11)/(2*x^(10/3)) - (45
5*a^3*b^12)/(3*x^3) - (315*a^2*b^13)/(8*x^(8/3)) - (45*a*b^14)/(7
*x^(7/3)) - b^15/(2*x^2)
```

Maple [A] time = 0.011, size = 168, normalized size = 1.1

$$-\frac{9\,a^{14}b}{4}x^{-\frac{20}{3}}-\frac{5005\,a^{6}b^{9}}{4\,x^{4}}-1001\,\frac{a^{9}b^{6}}{x^{5}}-\frac{9009\,a^{10}b^{5}}{16}x^{-\frac{16}{3}}-\frac{315\,a^{13}b^{2}}{19}x^{-\frac{19}{3}}-1485\,\frac{a^{7}b^{8}}{x^{13/3}}-\frac{b^{15}}{2\,x^{2}}-\frac{819\,a^{4}b^{11}}{2}x^{-\frac{10}{3}}-\frac{4095\,a^{11}b^{4}}{17}x^{-\frac{17}{3}}-\frac{315\,a^{2}b^{13}}{8}x^{-\frac{8}{3}}-819\,\frac{a^{5}b^{10}}{x^{11/3}}-\frac{19305\,a^{8}b^{7}}{14}x^{-\frac{14}{3}}-\frac{455\,a^{3}b^{12}}{3\,x^{3}}-\frac{455\,a^{12}b^{3}}{6\,x^{6}}-\frac{a^{15}}{7\,x^{7}}-\frac{45\,ab^{14}}{7}x^{-\frac{7}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((a+b*x^(1/3))^15/x^8,x)
```

```
[Out] -9/4*a^14*b/x^(20/3)-5005/4*a^6*b^9/x^4-1001*a^9*b^6/x^5-9009/16*
a^10*b^5/x^(16/3)-315/19*a^13*b^2/x^(19/3)-1485*a^7*b^8/x^(13/3)-
1/2*b^15/x^2-819/2*a^4*b^11/x^(10/3)-4095/17*a^11*b^4/x^(17/3)-31
5/8*a^2*b^13/x^(8/3)-819*a^5*b^10/x^(11/3)-19305/14*a^8*b^7/x^(14
/3)-455/3*a^3*b^12/x^3-455/6*a^12*b^3/x^6-1/7*a^15/x^7-45/7*a*b^1
4/x^(7/3)
```

Maxima [A] time = 1.43709, size = 225, normalized size = 1.52

$$-\frac{54264\,b^{15}x^{5}+697680\,ab^{14}x^{\frac{14}{3}}+4273290\,a^{2}b^{13}x^{\frac{13}{3}}+16460080\,a^{3}b^{12}x^{4}+44442216\,a^{4}b^{11}x^{\frac{11}{3}}+88884432\,a^{5}b^{10}x^{\frac{10}{3}}+135795\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^(1/3) + a)^15/x^8,x, algorithm="maxima")
```

```
[Out] -1/108528*(54264*b^15*x^5 + 697680*a*b^14*x^(14/3) + 4273290*a^2*
b^13*x^(13/3) + 16460080*a^3*b^12*x^4 + 44442216*a^4*b^11*x^(11/3
) + 88884432*a^5*b^10*x^(10/3) + 135795660*a^6*b^9*x^3 + 16116408
0*a^7*b^8*x^(8/3) + 149652360*a^8*b^7*x^(7/3) + 108636528*a^9*b^6
*x^2 + 61108047*a^10*b^5*x^(5/3) + 26142480*a^11*b^4*x^(4/3) + 82
30040*a^12*b^3*x + 1799280*a^13*b^2*x^(2/3) + 244188*a^14*b*x^(1/
3) + 15504*a^15)/x^7
```

Fricas [A] time = 0.217849, size = 228, normalized size = 1.54

$$-\frac{54264\,b^{15}x^{5}+16460080\,a^{3}b^{12}x^{4}+135795660\,a^{6}b^{9}x^{3}+108636528\,a^{9}b^{6}x^{2}+8230040\,a^{12}b^{3}x+15504\,a^{15}+459\,\left(1520\,ab^{14}x\cdots\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^(1/3) + a)^15/x^8,x, algorithm="fricas")
```

```
[Out] -1/108528*(54264*b^15*x^5 + 16460080*a^3*b^12*x^4 + 135795660*a^6
*b^9*x^3 + 108636528*a^9*b^6*x^2 + 8230040*a^12*b^3*x + 15504*a^1
5 + 459*(1520*a*b^14*x^4 + 96824*a^4*b^11*x^3 + 351120*a^7*b^8*x^
2 + 133133*a^10*b^5*x + 3920*a^13*b^2)*x^(2/3) + 1026*(4165*a^2*b
^13*x^4 + 86632*a^5*b^10*x^3 + 145860*a^8*b^7*x^2 + 25480*a^11*b^
4*x + 238*a^14*b)*x^(1/3))/x^7
```

Sympy [A] time = 62.9059, size = 216, normalized size = 1.46

$$-\frac{a^{15}}{7x^7}-\frac{9a^{14}b}{4x^{\frac{20}{3}}}-\frac{315a^{13}b^2}{19x^{\frac{19}{3}}}-\frac{455a^{12}b^3}{6x^6}-\frac{4095a^{11}b^4}{17x^{\frac{17}{3}}}-\frac{9009a^{10}b^5}{16x^{\frac{16}{3}}}-\frac{1001a^9b^6}{x^5}-\frac{19305a^8b^7}{14x^{\frac{14}{3}}}-\frac{1485a^7b^8}{x^{\frac{13}{3}}}-\frac{5005a^6b^9}{4x^4}-\frac{819a^5b^{10}}{x^{\frac{11}{3}}}-\frac{819a^4b^{11}}{2x^{\frac{10}{3}}}-\frac{455a^3b^{12}}{3x^3}-\frac{315a^2b^{13}}{8x^{\frac{8}{3}}}-\frac{45ab^{14}}{7x^{\frac{7}{3}}}-\frac{b^{15}}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**15/x**8,x)
```

```
[Out] -a**15/(7*x**7) - 9*a**14*b/(4*x**(20/3)) - 315*a**13*b**2/(19*x*
*(19/3)) - 455*a**12*b**3/(6*x**6) - 4095*a**11*b**4/(17*x**(17/3
)) - 9009*a**10*b**5/(16*x**(16/3)) - 1001*a**9*b**6/x**5 - 19305
*a**8*b**7/(14*x**(14/3)) - 1485*a**7*b**8/x**(13/3) - 5005*a**6*
b**9/(4*x**4) - 819*a**5*b**10/x**(11/3) - 819*a**4*b**11/(2*x**(
10/3)) - 455*a**3*b**12/(3*x**3) - 315*a**2*b**13/(8*x**(8/3)) -
45*a*b**14/(7*x**(7/3)) - b**15/(2*x**2)
```

GIAC/XCAS [A] time = 0.222169, size = 225, normalized size = 1.52

$$-\frac{54264\,b^{15}x^5+697680\,ab^{14}x^{\frac{14}{3}}+4273290\,a^2b^{13}x^{\frac{13}{3}}+16460080\,a^3b^{12}x^4+44442216\,a^4b^{11}x^{\frac{11}{3}}+88884432\,a^5b^{10}x^{\frac{10}{3}}+135795}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15/x^8,x, algorithm="giac")
```

```
[Out] -1/108528*(54264*b^15*x^5 + 697680*a*b^14*x^(14/3) + 4273290*a^2*
b^13*x^(13/3) + 16460080*a^3*b^12*x^4 + 44442216*a^4*b^11*x^(11/3
) + 88884432*a^5*b^10*x^(10/3) + 135795660*a^6*b^9*x^3 + 16116408
0*a^7*b^8*x^(8/3) + 149652360*a^8*b^7*x^(7/3) + 108636528*a^9*b^6
*x^2 + 61108047*a^10*b^5*x^(5/3) + 26142480*a^11*b^4*x^(4/3) + 82
30040*a^12*b^3*x + 1799280*a^13*b^2*x^(2/3) + 244188*a^14*b*x^(1/
3) + 15504*a^15)/x^7
```

3.2345 $\int \frac{\left(a+b\sqrt[3]{x}\right)^{15}}{x^9}\,dx$

Optimal. Leaf size=224

$$-\frac{b^8\left(a+b\sqrt[3]{x}\right)^{16}}{3922512a^9x^{16/3}}+\frac{b^7\left(a+b\sqrt[3]{x}\right)^{16}}{245157a^8x^{17/3}}-\frac{b^6\left(a+b\sqrt[3]{x}\right)^{16}}{28842a^7x^6}+\frac{b^5\left(a+b\sqrt[3]{x}\right)^{16}}{4807a^6x^{19/3}}-\frac{b^4\left(a+b\sqrt[3]{x}\right)^{16}}{1012a^5x^{20/3}}+\frac{b^3\left(a+b\sqrt[3]{x}\right)^{16}}{253a^4x^7}-\frac{7b^2\left(a+b\sqrt[3]{x}\right)^{16}}{506a^3x^{22/3}}+\frac{b\left(a+b\sqrt[3]{x}\right)^{16}}{23a^2x^{23/3}}-\frac{\left(a+b\sqrt[3]{x}\right)^{16}}{8ax^8}$$

```
[Out] -(a + b*x^(1/3))^16/(8*a*x^8) + (b*(a + b*x^(1/3))^16)/(23*a^2*x^
(23/3)) - (7*b^2*(a + b*x^(1/3))^16)/(506*a^3*x^(22/3)) + (b^3*(a
 + b*x^(1/3))^16)/(253*a^4*x^7) - (b^4*(a + b*x^(1/3))^16)/(1012*
a^5*x^(20/3)) + (b^5*(a + b*x^(1/3))^16)/(4807*a^6*x^(19/3)) - (b
^6*(a + b*x^(1/3))^16)/(28842*a^7*x^6) + (b^7*(a + b*x^(1/3))^16)
/(245157*a^8*x^(17/3)) - (b^8*(a + b*x^(1/3))^16)/(3922512*a^9*x^
(16/3))
```

Rubi [A] time = 0.295676, antiderivative size = 224, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{b^8\left(a+b\sqrt[3]{x}\right)^{16}}{3922512a^9x^{16/3}}+\frac{b^7\left(a+b\sqrt[3]{x}\right)^{16}}{245157a^8x^{17/3}}-\frac{b^6\left(a+b\sqrt[3]{x}\right)^{16}}{28842a^7x^6}+\frac{b^5\left(a+b\sqrt[3]{x}\right)^{16}}{4807a^6x^{19/3}}-\frac{b^4\left(a+b\sqrt[3]{x}\right)^{16}}{1012a^5x^{20/3}}+\frac{b^3\left(a+b\sqrt[3]{x}\right)^{16}}{253a^4x^7}-\frac{7b^2\left(a+b\sqrt[3]{x}\right)^{16}}{506a^3x^{22/3}}+\frac{b\left(a+b\sqrt[3]{x}\right)^{16}}{23a^2x^{23/3}}-\frac{\left(a+b\sqrt[3]{x}\right)^{16}}{8ax^8}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^15/x^9,x]
```


```
[Out] -(a + b*x^(1/3))^16/(8*a*x^8) + (b*(a + b*x^(1/3))^16)/(23*a^2*x^
(23/3)) - (7*b^2*(a + b*x^(1/3))^16)/(506*a^3*x^(22/3)) + (b^3*(a
 + b*x^(1/3))^16)/(253*a^4*x^7) - (b^4*(a + b*x^(1/3))^16)/(1012*
a^5*x^(20/3)) + (b^5*(a + b*x^(1/3))^16)/(4807*a^6*x^(19/3)) - (b
^6*(a + b*x^(1/3))^16)/(28842*a^7*x^6) + (b^7*(a + b*x^(1/3))^16)
/(245157*a^8*x^(17/3)) - (b^8*(a + b*x^(1/3))^16)/(3922512*a^9*x^
(16/3))
```

Rubi in Sympy [A] time = 42.1918, size = 202, normalized size = 0.9

$$-\frac{\left(a+b\sqrt[3]{x}\right)^{16}}{8ax^8}+\frac{b\left(a+b\sqrt[3]{x}\right)^{16}}{23a^2x^{\frac{23}{3}}}-\frac{7b^2\left(a+b\sqrt[3]{x}\right)^{16}}{506a^3x^{\frac{22}{3}}}+\frac{b^3\left(a+b\sqrt[3]{x}\right)^{16}}{253a^4x^7}-\frac{b^4\left(a+b\sqrt[3]{x}\right)^{16}}{1012a^5x^{\frac{20}{3}}}+\frac{b^5\left(a+b\sqrt[3]{x}\right)^{16}}{4807a^6x^{\frac{19}{3}}}-\frac{b^6\left(a+b\sqrt[3]{x}\right)^{16}}{28842a^7x^6}+\frac{b^7\left(a+b\sqrt[3]{x}\right)^{16}}{245157a^8x^{\frac{17}{3}}}-\frac{b^8\left(a+b\sqrt[3]{x}\right)^{16}}{3922512a^9x^{\frac{16}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**15/x**9,x)
```

```
[Out] -(a + b*x**(1/3))**16/(8*a*x**8) + b*(a + b*x**(1/3))**16/(23*a**
2*x**(23/3)) - 7*b**2*(a + b*x**(1/3))**16/(506*a**3*x**(22/3)) +
 b**3*(a + b*x**(1/3))**16/(253*a**4*x**7) - b**4*(a + b*x**(1/3)
)**16/(1012*a**5*x**(20/3)) + b**5*(a + b*x**(1/3))**16/(4807*a**
6*x**(19/3)) - b**6*(a + b*x**(1/3))**16/(28842*a**7*x**6) + b**7
*(a + b*x**(1/3))**16/(245157*a**8*x**(17/3)) - b**8*(a + b*x**(1
/3))**16/(3922512*a**9*x**(16/3))
```

Mathematica [A] time = 0.0744744, size = 213, normalized size = 0.95

$$-\frac{a^{15}}{8x^8}-\frac{45a^{14}b}{23x^{23/3}}-\frac{315a^{13}b^2}{22x^{22/3}}-\frac{65a^{12}b^3}{x^7}-\frac{819a^{11}b^4}{4x^{20/3}}-\frac{9009a^{10}b^5}{19x^{19/3}}-\frac{5005a^9b^6}{6x^6}-\frac{19305a^8b^7}{17x^{17/3}}-\frac{19305a^7b^8}{16x^{16/3}}-\frac{1001a^6b^9}{x^5}-\frac{1287a^5b^{10}}{2x^{14/3}}-\frac{315a^4b^{11}}{x^{13/3}}-\frac{455a^3b^{12}}{4x^4}-\frac{315a^2b^{13}}{11x^{11/3}}-\frac{9ab^{14}}{2x^{10/3}}-\frac{b^{15}}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^15/x^9,x]
```

```
[Out] -a^15/(8*x^8) - (45*a^14*b)/(23*x^(23/3)) - (315*a^13*b^2)/(22*x^
(22/3)) - (65*a^12*b^3)/x^7 - (819*a^11*b^4)/(4*x^(20/3)) - (9009
*a^10*b^5)/(19*x^(19/3)) - (5005*a^9*b^6)/(6*x^6) - (19305*a^8*b^
7)/(17*x^(17/3)) - (19305*a^7*b^8)/(16*x^(16/3)) - (1001*a^6*b^9)
/x^5 - (1287*a^5*b^10)/(2*x^(14/3)) - (315*a^4*b^11)/x^(13/3) - (
455*a^3*b^12)/(4*x^4) - (315*a^2*b^13)/(11*x^(11/3)) - (9*a*b^14)
/(2*x^(10/3)) - b^15/(3*x^3)
```

Maple [A] time = 0.011, size = 168, normalized size = 0.8

$$-\frac{819\,a^{11}b^4}{4}x^{-\frac{20}{3}}-\frac{455\,a^3b^{12}}{4\,x^4}-1001\,\frac{a^6b^9}{x^5}-\frac{19305\,a^7b^8}{16}x^{-\frac{16}{3}}-\frac{9009\,a^{10}b^5}{19}x^{-\frac{19}{3}}-315\,\frac{a^4b^{11}}{x^{13/3}}-\frac{45\,a^{14}b}{23}x^{-\frac{23}{3}}-\frac{9\,ab^{14}}{2}x^{-\frac{10}{3}}-\frac{19305\,a^8b^7}{17}x^{-\frac{17}{3}}-\frac{315\,a^2b^{13}}{11}x^{-\frac{11}{3}}-\frac{1287\,a^5b^{10}}{2}x^{-\frac{14}{3}}-\frac{b^{15}}{3\,x^3}-\frac{315\,a^{13}b^2}{22}x^{-\frac{22}{3}}-\frac{5005\,a^9b^6}{6\,x^6}-\frac{a^{15}}{8\,x^8}-65\,\frac{a^{12}b^3}{x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^15/x^9,x)
```

```
[Out] -819/4*a^11*b^4/x^(20/3)-455/4*a^3*b^12/x^4-1001*a^6*b^9/x^5-1930
5/16*a^7*b^8/x^(16/3)-9009/19*a^10*b^5/x^(19/3)-315*a^4*b^11/x^(1
3/3)-45/23*a^14*b/x^(23/3)-9/2*a*b^14/x^(10/3)-19305/17*a^8*b^7/x
^(17/3)-315/11*a^2*b^13/x^(11/3)-1287/2*a^5*b^10/x^(14/3)-1/3*b^1
5/x^3-315/22*a^13*b^2/x^(22/3)-5005/6*a^9*b^6/x^6-1/8*a^15/x^8-65
*a^12*b^3/x^7
```

Maxima [A] time = 1.44404, size = 225, normalized size = 1.

$$-\frac{1307504\,b^{15}x^5+17651304\,ab^{14}x^{\frac{14}{3}}+112326480\,a^2b^{13}x^{\frac{13}{3}}+446185740\,a^3b^{12}x^4+1235591280\,a^4b^{11}x^{\frac{11}{3}}+2524136472\,a^5b^{10}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15/x^9,x, algorithm="maxima")
```

```
[Out] -1/3922512*(1307504*b^15*x^5 + 17651304*a*b^14*x^(14/3) + 1123264
80*a^2*b^13*x^(13/3) + 446185740*a^3*b^12*x^4 + 1235591280*a^4*b^
11*x^(11/3) + 2524136472*a^5*b^10*x^(10/3) + 3926434512*a^6*b^9*x
^3 + 4732755885*a^7*b^8*x^(8/3) + 4454358480*a^8*b^7*x^(7/3) + 32
72028760*a^9*b^6*x^2 + 1859890032*a^10*b^5*x^(5/3) + 803134332*a^
11*b^4*x^(4/3) + 254963280*a^12*b^3*x + 56163240*a^13*b^2*x^(2/3)
 + 7674480*a^14*b*x^(1/3) + 490314*a^15)/x^8
```

Fricas [A] time = 0.218407, size = 228, normalized size = 1.02

$$-\frac{1307504\,b^{15}x^5+446185740\,a^3b^{12}x^4+3926434512\,a^6b^9x^3+3272028760\,a^9b^6x^2+254963280\,a^{12}b^3x+490314\,a^{15}+10557}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15/x^9,x, algorithm="fricas")
```

```
[Out] -1/3922512*(1307504*b^15*x^5 + 446185740*a^3*b^12*x^4 + 392643451
2*a^6*b^9*x^3 + 3272028760*a^9*b^6*x^2 + 254963280*a^12*b^3*x + 4
90314*a^15 + 10557*(1672*a*b^14*x^4 + 117040*a^4*b^11*x^3 + 44830
5*a^7*b^8*x^2 + 176176*a^10*b^5*x + 5320*a^13*b^2)*x^(2/3) + 2052
*(54740*a^2*b^13*x^4 + 1230086*a^5*b^10*x^3 + 2170740*a^8*b^7*x^2
 + 391391*a^11*b^4*x + 3740*a^14*b)*x^(1/3))/x^8
```

Sympy [A] time = 93.4596, size = 216, normalized size = 0.96

$$-\frac{a^{15}}{8x^{8}}-\frac{45a^{14}b}{23x^{\frac{23}{3}}}-\frac{315a^{13}b^{2}}{22x^{\frac{22}{3}}}-\frac{65a^{12}b^{3}}{x^{7}}-\frac{819a^{11}b^{4}}{4x^{\frac{20}{3}}}-\frac{9009a^{10}b^{5}}{19x^{\frac{19}{3}}}-\frac{5005a^{9}b^{6}}{6x^{6}}-\frac{19305a^{8}b^{7}}{17x^{\frac{17}{3}}}-\frac{19305a^{7}b^{8}}{16x^{\frac{16}{3}}}-\frac{1001a^{6}b^{9}}{x^{5}}-\frac{1287a^{5}b^{10}}{2x^{\frac{14}{3}}}-\frac{315a^{4}b^{11}}{x^{\frac{13}{3}}}-\frac{455a^{3}b^{12}}{4x^{4}}-\frac{315a^{2}b^{13}}{11x^{\frac{11}{3}}}-\frac{9ab^{14}}{2x^{\frac{10}{3}}}-\frac{b^{15}}{3x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**15/x**9,x)
```

```
[Out] -a**15/(8*x**8) - 45*a**14*b/(23*x**(23/3)) - 315*a**13*b**2/(22*
x**(22/3)) - 65*a**12*b**3/x**7 - 819*a**11*b**4/(4*x**(20/3)) -
9009*a**10*b**5/(19*x**(19/3)) - 5005*a**9*b**6/(6*x**6) - 19305*
a**8*b**7/(17*x**(17/3)) - 19305*a**7*b**8/(16*x**(16/3)) - 1001*
a**6*b**9/x**5 - 1287*a**5*b**10/(2*x**(14/3)) - 315*a**4*b**11/x
**(13/3) - 455*a**3*b**12/(4*x**4) - 315*a**2*b**13/(11*x**(11/3)
) - 9*a*b**14/(2*x**(10/3)) - b**15/(3*x**3)
```

GIAC/XCAS [A] time = 0.221664, size = 225, normalized size = 1.

$$-\frac{1307504\,b^{15}x^{5}+17651304\,ab^{14}x^{\frac{14}{3}}+112326480\,a^{2}b^{13}x^{\frac{13}{3}}+446185740\,a^{3}b^{12}x^{4}+1235591280\,a^{4}b^{11}x^{\frac{11}{3}}+2524136472\,a^{5}b^{10}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15/x^9,x, algorithm="giac")
```

```
[Out] -1/3922512*(1307504*b^15*x^5 + 17651304*a*b^14*x^(14/3) + 1123264
80*a^2*b^13*x^(13/3) + 446185740*a^3*b^12*x^4 + 1235591280*a^4*b^
11*x^(11/3) + 2524136472*a^5*b^10*x^(10/3) + 3926434512*a^6*b^9*x
^3 + 4732755885*a^7*b^8*x^(8/3) + 4454358480*a^8*b^7*x^(7/3) + 32
72028760*a^9*b^6*x^2 + 1859890032*a^10*b^5*x^(5/3) + 803134332*a^
11*b^4*x^(4/3) + 254963280*a^12*b^3*x + 56163240*a^13*b^2*x^(2/3)
 + 7674480*a^14*b*x^(1/3) + 490314*a^15)/x^8
```

3.2346 $\int \frac{\left(a+b\sqrt[3]{x}\right)^{15}}{x^{10}}\,dx$

Optimal. Leaf size=215

$$-\frac{a^{15}}{9x^9}-\frac{45a^{14}b}{26x^{26/3}}-\frac{63a^{13}b^2}{5x^{25/3}}-\frac{455a^{12}b^3}{8x^8}-\frac{4095a^{11}b^4}{23x^{23/3}}-\frac{819a^{10}b^5}{2x^{22/3}}-\frac{715a^9b^6}{x^7}-\frac{3861a^8b^7}{4x^{20/3}}-\frac{19305a^7b^8}{19x^{19/3}}-\frac{5005a^6b^9}{6x^6}-\frac{9009a^5b^{10}}{17x^{17/3}}-\frac{4095a^4b^{11}}{16x^{16/3}}-\frac{91a^3b^{12}}{x^5}-\frac{45a^2b^{13}}{2x^{14/3}}-\frac{45ab^{14}}{13x^{13/3}}-\frac{b^{15}}{4x^4}$$

```
[Out] -a^15/(9*x^9) - (45*a^14*b)/(26*x^(26/3)) - (63*a^13*b^2)/(5*x^(2
5/3)) - (455*a^12*b^3)/(8*x^8) - (4095*a^11*b^4)/(23*x^(23/3)) -
(819*a^10*b^5)/(2*x^(22/3)) - (715*a^9*b^6)/x^7 - (3861*a^8*b^7)/
(4*x^(20/3)) - (19305*a^7*b^8)/(19*x^(19/3)) - (5005*a^6*b^9)/(6*
x^6) - (9009*a^5*b^10)/(17*x^(17/3)) - (4095*a^4*b^11)/(16*x^(16/
3)) - (91*a^3*b^12)/x^5 - (45*a^2*b^13)/(2*x^(14/3)) - (45*a*b^14
)/(13*x^(13/3)) - b^15/(4*x^4)
```

Rubi [A] time = 0.313076, antiderivative size = 215, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$-\frac{a^{15}}{9x^9}-\frac{45a^{14}b}{26x^{26/3}}-\frac{63a^{13}b^2}{5x^{25/3}}-\frac{455a^{12}b^3}{8x^8}-\frac{4095a^{11}b^4}{23x^{23/3}}-\frac{819a^{10}b^5}{2x^{22/3}}-\frac{715a^9b^6}{x^7}-\frac{3861a^8b^7}{4x^{20/3}}-\frac{19305a^7b^8}{19x^{19/3}}-\frac{5005a^6b^9}{6x^6}-\frac{9009a^5b^{10}}{17x^{17/3}}-\frac{4095a^4b^{11}}{16x^{16/3}}-\frac{91a^3b^{12}}{x^5}-\frac{45a^2b^{13}}{2x^{14/3}}-\frac{45ab^{14}}{13x^{13/3}}-\frac{b^{15}}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^15/x^10,x]
```

```
[Out] -a^15/(9*x^9) - (45*a^14*b)/(26*x^(26/3)) - (63*a^13*b^2)/(5*x^(2
5/3)) - (455*a^12*b^3)/(8*x^8) - (4095*a^11*b^4)/(23*x^(23/3)) -
(819*a^10*b^5)/(2*x^(22/3)) - (715*a^9*b^6)/x^7 - (3861*a^8*b^7)/
(4*x^(20/3)) - (19305*a^7*b^8)/(19*x^(19/3)) - (5005*a^6*b^9)/(6*
x^6) - (9009*a^5*b^10)/(17*x^(17/3)) - (4095*a^4*b^11)/(16*x^(16/
3)) - (91*a^3*b^12)/x^5 - (45*a^2*b^13)/(2*x^(14/3)) - (45*a*b^14
)/(13*x^(13/3)) - b^15/(4*x^4)
```

Rubi in Sympy [A] time = 52.5369, size = 218, normalized size = 1.01

$$-\frac{a^{15}}{9x^9}-\frac{45a^{14}b}{26x^{\frac{26}{3}}}-\frac{63a^{13}b^2}{5x^{\frac{25}{3}}}-\frac{455a^{12}b^3}{8x^8}-\frac{4095a^{11}b^4}{23x^{\frac{23}{3}}}-\frac{819a^{10}b^5}{2x^{\frac{22}{3}}}-\frac{715a^9b^6}{x^7}-\frac{3861a^8b^7}{4x^{\frac{20}{3}}}-\frac{19305a^7b^8}{19x^{\frac{19}{3}}}-\frac{5005a^6b^9}{6x^6}-\frac{9009a^5b^{10}}{17x^{\frac{17}{3}}}-\frac{4095a^4b^{11}}{16x^{\frac{16}{3}}}-\frac{91a^3b^{12}}{x^5}-\frac{45a^2b^{13}}{2x^{\frac{14}{3}}}-\frac{45ab^{14}}{13x^{\frac{13}{3}}}-\frac{b^{15}}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**15/x**10,x)
```

```
[Out] -a**15/(9*x**9) - 45*a**14*b/(26*x**(26/3)) - 63*a**13*b**2/(5*x*
*(25/3)) - 455*a**12*b**3/(8*x**8) - 4095*a**11*b**4/(23*x**(23/3
)) - 819*a**10*b**5/(2*x**(22/3)) - 715*a**9*b**6/x**7 - 3861*a**
8*b**7/(4*x**(20/3)) - 19305*a**7*b**8/(19*x**(19/3)) - 5005*a**6
*b**9/(6*x**6) - 9009*a**5*b**10/(17*x**(17/3)) - 4095*a**4*b**11
/(16*x**(16/3)) - 91*a**3*b**12/x**5 - 45*a**2*b**13/(2*x**(14/3)
) - 45*a*b**14/(13*x**(13/3)) - b**15/(4*x**4)
```

Mathematica [A] time = 0.0799535, size = 215, normalized size = 1.

$$-\frac{a^{15}}{9x^9}-\frac{45a^{14}b}{26x^{26/3}}-\frac{63a^{13}b^2}{5x^{25/3}}-\frac{455a^{12}b^3}{8x^8}-\frac{4095a^{11}b^4}{23x^{23/3}}-\frac{819a^{10}b^5}{2x^{22/3}}-\frac{715a^9b^6}{x^7}-\frac{3861a^8b^7}{4x^{20/3}}-\frac{19305a^7b^8}{19x^{19/3}}-\frac{5005a^6b^9}{6x^6}-\frac{9009a^5b^{10}}{17x^{17/3}}-\frac{4095a^4b^{11}}{16x^{16/3}}-\frac{91a^3b^{12}}{x^5}-\frac{45a^2b^{13}}{2x^{14/3}}-\frac{45ab^{14}}{13x^{13/3}}-\frac{b^{15}}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^15/x^10,x]
```

```
[Out] -a^15/(9*x^9) - (45*a^14*b)/(26*x^(26/3)) - (63*a^13*b^2)/(5*x^(2
5/3)) - (455*a^12*b^3)/(8*x^8) - (4095*a^11*b^4)/(23*x^(23/3)) -
(819*a^10*b^5)/(2*x^(22/3)) - (715*a^9*b^6)/x^7 - (3861*a^8*b^7)/
(4*x^(20/3)) - (19305*a^7*b^8)/(19*x^(19/3)) - (5005*a^6*b^9)/(6*
x^6) - (9009*a^5*b^10)/(17*x^(17/3)) - (4095*a^4*b^11)/(16*x^(16/
3)) - (91*a^3*b^12)/x^5 - (45*a^2*b^13)/(2*x^(14/3)) - (45*a*b^14
)/(13*x^(13/3)) - b^15/(4*x^4)
```

Maple [A] time = 0.012, size = 168, normalized size = 0.8

$$-\frac{a^{15}}{9\,x^9}-\frac{45\,a^{14}b}{26}x^{-\frac{26}{3}}-\frac{63\,a^{13}b^2}{5}x^{-\frac{25}{3}}-\frac{455\,a^{12}b^3}{8\,x^8}-\frac{4095\,a^{11}b^4}{23}x^{-\frac{23}{3}}-\frac{819\,a^{10}b^5}{2}x^{-\frac{22}{3}}-715\,\frac{a^9b^6}{x^7}-\frac{3861\,a^8b^7}{4}x^{-\frac{20}{3}}-\frac{19305\,a^7b^8}{19}x^{-\frac{19}{3}}-\frac{5005\,a^6b^9}{6\,x^6}-\frac{9009\,a^5b^{10}}{17}x^{-\frac{17}{3}}-\frac{4095\,a^4b^{11}}{16}x^{-\frac{16}{3}}-91\,\frac{a^3b^{12}}{x^5}-\frac{45\,a^2b^{13}}{2}x^{-\frac{14}{3}}-\frac{45\,ab^{14}}{13}x^{-\frac{13}{3}}-\frac{b^{15}}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^15/x^10,x)
```

```
[Out] -1/9*a^15/x^9-45/26*a^14*b/x^(26/3)-63/5*a^13*b^2/x^(25/3)-455/8*
a^12*b^3/x^8-4095/23*a^11*b^4/x^(23/3)-819/2*a^10*b^5/x^(22/3)-71
5*a^9*b^6/x^7-3861/4*a^8*b^7/x^(20/3)-19305/19*a^7*b^8/x^(19/3)-5
005/6*a^6*b^9/x^6-9009/17*a^5*b^10/x^(17/3)-4095/16*a^4*b^11/x^(1
6/3)-91*a^3*b^12/x^5-45/2*a^2*b^13/x^(14/3)-45/13*a*b^14/x^(13/3)
-1/4*b^15/x^4
```

Maxima [A] time = 1.43796, size = 225, normalized size = 1.05

$$-\frac{17383860\,b^{15}x^5+240699600\,ab^{14}x^{\frac{14}{3}}+1564547400\,a^2b^{13}x^{\frac{13}{3}}+6327725040\,a^3b^{12}x^4+17796726675\,a^4b^{11}x^{\frac{11}{3}}+3684969288\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15/x^10,x, algorithm="maxima")
```

```
[Out] -1/69535440*(17383860*b^15*x^5 + 240699600*a*b^14*x^(14/3) + 1564
547400*a^2*b^13*x^(13/3) + 6327725040*a^3*b^12*x^4 + 17796726675*
a^4*b^11*x^(11/3) + 36849692880*a^5*b^10*x^(10/3) + 58004146200*a
^6*b^9*x^3 + 70651666800*a^7*b^8*x^(8/3) + 67119083460*a^8*b^7*x^
(7/3) + 49717839600*a^9*b^6*x^2 + 28474762680*a^10*b^5*x^(5/3) +
12380331600*a^11*b^4*x^(4/3) + 3954828150*a^12*b^3*x + 876146544*
a^13*b^2*x^(2/3) + 120349800*a^14*b*x^(1/3) + 7726160*a^15)/x^9
```

Fricas [A] time = 0.217018, size = 228, normalized size = 1.06

$$-\frac{17383860\,b^{15}x^5+6327725040\,a^3b^{12}x^4+58004146200\,a^6b^9x^3+49717839600\,a^9b^6x^2+3954828150\,a^{12}b^3x+7726160\,a^{15}+\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15/x^10,x, algorithm="fricas")
```

```
[Out] -1/69535440*(17383860*b^15*x^5 + 6327725040*a^3*b^12*x^4 + 580041
46200*a^6*b^9*x^3 + 49717839600*a^9*b^6*x^2 + 3954828150*a^12*b^3
*x + 7726160*a^15 + 31671*(7600*a*b^14*x^4 + 561925*a^4*b^11*x^3
+ 2230800*a^7*b^8*x^2 + 899080*a^10*b^5*x + 27664*a^13*b^2)*x^(2/
3) + 30780*(50830*a^2*b^13*x^4 + 1197196*a^5*b^10*x^3 + 2180607*a
^8*b^7*x^2 + 402220*a^11*b^4*x + 3910*a^14*b)*x^(1/3))/x^9
```

Sympy [A] time = 148.517, size = 218, normalized size = 1.01

$$-\frac{a^{15}}{9x^9}-\frac{45a^{14}b}{26x^{\frac{26}{3}}}-\frac{63a^{13}b^2}{5x^{\frac{25}{3}}}-\frac{455a^{12}b^3}{8x^8}-\frac{4095a^{11}b^4}{23x^{\frac{23}{3}}}-\frac{819a^{10}b^5}{2x^{\frac{22}{3}}}-\frac{715a^9b^6}{x^7}-\frac{3861a^8b^7}{4x^{\frac{20}{3}}}-\frac{19305a^7b^8}{19x^{\frac{19}{3}}}-\frac{5005a^6b^9}{6x^6}-\frac{9009a^5b^{10}}{17x^{\frac{17}{3}}}-\frac{4095a^4b^{11}}{16x^{\frac{16}{3}}}-\frac{91a^3b^{12}}{x^5}-\frac{45a^2b^{13}}{2x^{\frac{14}{3}}}-\frac{45ab^{14}}{13x^{\frac{13}{3}}}-\frac{b^{15}}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**15/x**10,x)
```

```
[Out] -a**15/(9*x**9) - 45*a**14*b/(26*x**(26/3)) - 63*a**13*b**2/(5*x*
*(25/3)) - 455*a**12*b**3/(8*x**8) - 4095*a**11*b**4/(23*x**(23/3
)) - 819*a**10*b**5/(2*x**(22/3)) - 715*a**9*b**6/x**7 - 3861*a**
8*b**7/(4*x**(20/3)) - 19305*a**7*b**8/(19*x**(19/3)) - 5005*a**6
*b**9/(6*x**6) - 9009*a**5*b**10/(17*x**(17/3)) - 4095*a**4*b**11
/(16*x**(16/3)) - 91*a**3*b**12/x**5 - 45*a**2*b**13/(2*x**(14/3)
) - 45*a*b**14/(13*x**(13/3)) - b**15/(4*x**4)
```

GIAC/XCAS [A] time = 0.221408, size = 225, normalized size = 1.05

$$-\frac{17383860\,b^{15}x^5+240699600\,ab^{14}x^{\frac{14}{3}}+1564547400\,a^2b^{13}x^{\frac{13}{3}}+6327725040\,a^3b^{12}x^4+17796726675\,a^4b^{11}x^{\frac{11}{3}}+3684969288}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15/x^10,x, algorithm="giac")
```

```
[Out] -1/69535440*(17383860*b^15*x^5 + 240699600*a*b^14*x^(14/3) + 1564
547400*a^2*b^13*x^(13/3) + 6327725040*a^3*b^12*x^4 + 17796726675*
a^4*b^11*x^(11/3) + 36849692880*a^5*b^10*x^(10/3) + 58004146200*a
^6*b^9*x^3 + 70651666800*a^7*b^8*x^(8/3) + 67119083460*a^8*b^7*x^
(7/3) + 49717839600*a^9*b^6*x^2 + 28474762680*a^10*b^5*x^(5/3) +
12380331600*a^11*b^4*x^(4/3) + 3954828150*a^12*b^3*x + 876146544*
a^13*b^2*x^(2/3) + 120349800*a^14*b*x^(1/3) + 7726160*a^15)/x^9
```

3.2347 $\int \frac{\left(a+b\sqrt[3]{x}\right)^{15}}{x^{11}}\,dx$

Optimal. Leaf size=217

$$-\frac{a^{15}}{10x^{10}}-\frac{45a^{14}b}{29x^{29/3}}-\frac{45a^{13}b^2}{4x^{28/3}}-\frac{455a^{12}b^3}{9x^9}-\frac{315a^{11}b^4}{2x^{26/3}}-\frac{9009a^{10}b^5}{25x^{25/3}}-\frac{5005a^9b^6}{8x^8}-\frac{19305a^8b^7}{23x^{23/3}}-\frac{1755a^7b^8}{2x^{22/3}}-\frac{715a^6b^9}{x^7}-\frac{9009a^5b^{10}}{20x^{20/3}}-\frac{4095a^4b^{11}}{19x^{19/3}}-\frac{455a^3b^{12}}{6x^6}-\frac{315a^2b^{13}}{17x^{17/3}}-\frac{45ab^{14}}{16x^{16/3}}-\frac{b^{15}}{5x^5}$$

```
[Out] -a^15/(10*x^10) - (45*a^14*b)/(29*x^(29/3)) - (45*a^13*b^2)/(4*x^
(28/3)) - (455*a^12*b^3)/(9*x^9) - (315*a^11*b^4)/(2*x^(26/3)) -
(9009*a^10*b^5)/(25*x^(25/3)) - (5005*a^9*b^6)/(8*x^8) - (19305*a
^8*b^7)/(23*x^(23/3)) - (1755*a^7*b^8)/(2*x^(22/3)) - (715*a^6*b^
9)/x^7 - (9009*a^5*b^10)/(20*x^(20/3)) - (4095*a^4*b^11)/(19*x^(1
9/3)) - (455*a^3*b^12)/(6*x^6) - (315*a^2*b^13)/(17*x^(17/3)) - (
45*a*b^14)/(16*x^(16/3)) - b^15/(5*x^5)
```

Rubi [A] time = 0.309772, antiderivative size = 217, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^{15}}{10x^{10}}-\frac{45a^{14}b}{29x^{29/3}}-\frac{45a^{13}b^2}{4x^{28/3}}-\frac{455a^{12}b^3}{9x^9}-\frac{315a^{11}b^4}{2x^{26/3}}-\frac{9009a^{10}b^5}{25x^{25/3}}-\frac{5005a^9b^6}{8x^8}-\frac{19305a^8b^7}{23x^{23/3}}-\frac{1755a^7b^8}{2x^{22/3}}-\frac{715a^6b^9}{x^7}-\frac{9009a^5b^{10}}{20x^{20/3}}-\frac{4095a^4b^{11}}{19x^{19/3}}-\frac{455a^3b^{12}}{6x^6}-\frac{315a^2b^{13}}{17x^{17/3}}-\frac{45ab^{14}}{16x^{16/3}}-\frac{b^{15}}{5x^5}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^15/x^11,x]
```

```
[Out] -a^15/(10*x^10) - (45*a^14*b)/(29*x^(29/3)) - (45*a^13*b^2)/(4*x^
(28/3)) - (455*a^12*b^3)/(9*x^9) - (315*a^11*b^4)/(2*x^(26/3)) -
(9009*a^10*b^5)/(25*x^(25/3)) - (5005*a^9*b^6)/(8*x^8) - (19305*a
^8*b^7)/(23*x^(23/3)) - (1755*a^7*b^8)/(2*x^(22/3)) - (715*a^6*b^
9)/x^7 - (9009*a^5*b^10)/(20*x^(20/3)) - (4095*a^4*b^11)/(19*x^(1
9/3)) - (455*a^3*b^12)/(6*x^6) - (315*a^2*b^13)/(17*x^(17/3)) - (
45*a*b^14)/(16*x^(16/3)) - b^15/(5*x^5)
```

Rubi in Sympy [A] time = 52.5544, size = 219, normalized size = 1.01

$$-\frac{a^{15}}{10x^{10}}-\frac{45a^{14}b}{29x^{\frac{29}{3}}}-\frac{45a^{13}b^2}{4x^{\frac{28}{3}}}-\frac{455a^{12}b^3}{9x^9}-\frac{315a^{11}b^4}{2x^{\frac{26}{3}}}-\frac{9009a^{10}b^5}{25x^{\frac{25}{3}}}-\frac{5005a^9b^6}{8x^8}-\frac{19305a^8b^7}{23x^{\frac{23}{3}}}-\frac{1755a^7b^8}{2x^{\frac{22}{3}}}-\frac{715a^6b^9}{x^7}-\frac{9009a^5b^{10}}{20x^{\frac{20}{3}}}-\frac{4095a^4b^{11}}{19x^{\frac{19}{3}}}-\frac{455a^3b^{12}}{6x^6}-\frac{315a^2b^{13}}{17x^{\frac{17}{3}}}-\frac{45ab^{14}}{16x^{\frac{16}{3}}}-\frac{b^{15}}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**15/x**11,x)
```

```
[Out] -a**15/(10*x**10) - 45*a**14*b/(29*x**(29/3)) - 45*a**13*b**2/(4*
x**(28/3)) - 455*a**12*b**3/(9*x**9) - 315*a**11*b**4/(2*x**(26/3
)) - 9009*a**10*b**5/(25*x**(25/3)) - 5005*a**9*b**6/(8*x**8) - 1
9305*a**8*b**7/(23*x**(23/3)) - 1755*a**7*b**8/(2*x**(22/3)) - 71
5*a**6*b**9/x**7 - 9009*a**5*b**10/(20*x**(20/3)) - 4095*a**4*b**
11/(19*x**(19/3)) - 455*a**3*b**12/(6*x**6) - 315*a**2*b**13/(17*
x**(17/3)) - 45*a*b**14/(16*x**(16/3)) - b**15/(5*x**5)
```

Mathematica [A] time = 0.0759684, size = 217, normalized size = 1.

$$-\frac{a^{15}}{10x^{10}}-\frac{45a^{14}b}{29x^{29/3}}-\frac{45a^{13}b^2}{4x^{28/3}}-\frac{455a^{12}b^3}{9x^9}-\frac{315a^{11}b^4}{2x^{26/3}}-\frac{9009a^{10}b^5}{25x^{25/3}}-\frac{5005a^9b^6}{8x^8}-\frac{19305a^8b^7}{23x^{23/3}}-\frac{1755a^7b^8}{2x^{22/3}}-\frac{715a^6b^9}{x^7}-\frac{9009a^5b^{10}}{20x^{20/3}}-\frac{4095a^4b^{11}}{19x^{19/3}}-\frac{455a^3b^{12}}{6x^6}-\frac{315a^2b^{13}}{17x^{17/3}}-\frac{45ab^{14}}{16x^{16/3}}-\frac{b^{15}}{5x^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^15/x^11,x]
```

```
[Out] -a^15/(10*x^10) - (45*a^14*b)/(29*x^(29/3)) - (45*a^13*b^2)/(4*x^
(28/3)) - (455*a^12*b^3)/(9*x^9) - (315*a^11*b^4)/(2*x^(26/3)) -
(9009*a^10*b^5)/(25*x^(25/3)) - (5005*a^9*b^6)/(8*x^8) - (19305*a
^8*b^7)/(23*x^(23/3)) - (1755*a^7*b^8)/(2*x^(22/3)) - (715*a^6*b^
9)/x^7 - (9009*a^5*b^10)/(20*x^(20/3)) - (4095*a^4*b^11)/(19*x^(1
9/3)) - (455*a^3*b^12)/(6*x^6) - (315*a^2*b^13)/(17*x^(17/3)) - (
45*a*b^14)/(16*x^(16/3)) - b^15/(5*x^5)
```

Maple [A] time = 0.011, size = 168, normalized size = 0.8

$$-\frac{a^{15}}{10\,x^{10}}-\frac{45\,a^{14}b}{29}x^{-\frac{29}{3}}-\frac{45\,a^{13}b^2}{4}x^{-\frac{28}{3}}-\frac{455\,a^{12}b^3}{9\,x^9}-\frac{315\,a^{11}b^4}{2}x^{-\frac{26}{3}}-\frac{9009\,a^{10}b^5}{25}x^{-\frac{25}{3}}-\frac{5005\,a^9b^6}{8\,x^8}-\frac{19305\,a^8b^7}{23}x^{-\frac{23}{3}}-\frac{1755\,a^7b^8}{2}x^{-\frac{22}{3}}-715\,\frac{a^6b^9}{x^7}-\frac{9009\,a^5b^{10}}{20}x^{-\frac{20}{3}}-\frac{4095\,a^4b^{11}}{19}x^{-\frac{19}{3}}-\frac{455\,a^3b^{12}}{6\,x^6}-\frac{315\,a^2b^{13}}{17}x^{-\frac{17}{3}}-\frac{45\,ab^{14}}{16}x^{-\frac{16}{3}}-\frac{b^{15}}{5\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^15/x^11,x)
```

```
[Out] -1/10*a^15/x^10-45/29*a^14*b/x^(29/3)-45/4*a^13*b^2/x^(28/3)-455/
9*a^12*b^3/x^9-315/2*a^11*b^4/x^(26/3)-9009/25*a^10*b^5/x^(25/3)-
5005/8*a^9*b^6/x^8-19305/23*a^8*b^7/x^(23/3)-1755/2*a^7*b^8/x^(22
/3)-715*a^6*b^9/x^7-9009/20*a^5*b^10/x^(20/3)-4095/19*a^4*b^11/x^
(19/3)-455/6*a^3*b^12/x^6-315/17*a^2*b^13/x^(17/3)-45/16*a*b^14/x
^(16/3)-1/5*b^15/x^5
```

Maxima [A] time = 1.42962, size = 225, normalized size = 1.04

$$-\frac{155117520\,b^{15}x^5+2181340125\,ab^{14}x^{\frac{14}{3}}+14371182000\,a^2b^{13}x^{\frac{13}{3}}+58815393000\,a^3b^{12}x^4+167159538000\,a^4b^{11}x^{\frac{11}{3}}+3493\ldots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15/x^11,x, algorithm="maxima")
```

```
[Out] -1/775587600*(155117520*b^15*x^5 + 2181340125*a*b^14*x^(14/3) + 1
4371182000*a^2*b^13*x^(13/3) + 58815393000*a^3*b^12*x^4 + 1671595
38000*a^4*b^11*x^(11/3) + 349363434420*a^5*b^10*x^(10/3) + 554545
134000*a^6*b^9*x^3 + 680578119000*a^7*b^8*x^(8/3) + 650987766000*
a^8*b^7*x^(7/3) + 485226992250*a^9*b^6*x^2 + 279490747536*a^10*b^
5*x^(5/3) + 122155047000*a^11*b^4*x^(4/3) + 39210262000*a^12*b^3*
x + 8725360500*a^13*b^2*x^(2/3) + 1203498000*a^14*b*x^(1/3) + 775
58760*a^15)/x^10
```

Fricas [A] time = 0.216226, size = 228, normalized size = 1.05

$$-\frac{155117520\,b^{15}x^5+58815393000\,a^3b^{12}x^4+554545134000\,a^6b^9x^3+485226992250\,a^9b^6x^2+39210262000\,a^{12}b^3x+775587\ldots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15/x^11,x, algorithm="fricas")
```

```
[Out] -1/775587600*(155117520*b^15*x^5 + 58815393000*a^3*b^12*x^4 + 554
545134000*a^6*b^9*x^3 + 485226992250*a^9*b^6*x^2 + 39210262000*a^
12*b^3*x + 77558760*a^15 + 918459*(2375*a*b^14*x^4 + 182000*a^4*b
^11*x^3 + 741000*a^7*b^8*x^2 + 304304*a^10*b^5*x + 9500*a^13*b^2)
*x^(2/3) + 30780*(466900*a^2*b^13*x^4 + 11350339*a^5*b^10*x^3 + 2
1149700*a^8*b^7*x^2 + 3968650*a^11*b^4*x + 39100*a^14*b)*x^(1/3))
/x^10
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**15/x**11,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.221897, size = 225, normalized size = 1.04

$$-\frac{155117520\, b^{15} x^{5} + 2181340125\, a b^{14} x^{\frac{14}{3}} + 14371182000\, a^{2} b^{13} x^{\frac{13}{3}} + 58815393000\, a^{3} b^{12} x^{4} + 167159538000\, a^{4} b^{11} x^{\frac{11}{3}} + 3493}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15/x^11,x, algorithm="giac")
```

```
[Out] -1/775587600*(155117520*b^15*x^5 + 2181340125*a*b^14*x^(14/3) + 1
4371182000*a^2*b^13*x^(13/3) + 58815393000*a^3*b^12*x^4 + 1671595
38000*a^4*b^11*x^(11/3) + 349363434420*a^5*b^10*x^(10/3) + 554545
134000*a^6*b^9*x^3 + 680578119000*a^7*b^8*x^(8/3) + 650987766000*
a^8*b^7*x^(7/3) + 485226992250*a^9*b^6*x^2 + 279490747536*a^10*b^
5*x^(5/3) + 122155047000*a^11*b^4*x^(4/3) + 39210262000*a^12*b^3*
x + 8725360500*a^13*b^2*x^(2/3) + 1203498000*a^14*b*x^(1/3) + 775
58760*a^15)/x^10
```

3.2348 $\int \frac{\left(a+b\sqrt[3]{x}\right)^{15}}{x^{12}}\,dx$

Optimal. Leaf size=217

$$-\frac{a^{15}}{11x^{11}}-\frac{45a^{14}b}{32x^{32/3}}-\frac{315a^{13}b^2}{31x^{31/3}}-\frac{91a^{12}b^3}{2x^{10}}-\frac{4095a^{11}b^4}{29x^{29/3}}-\frac{1287a^{10}b^5}{4x^{28/3}}-\frac{5005a^9b^6}{9x^9}-\frac{1485a^8b^7}{2x^{26/3}}-\frac{3861a^7b^8}{5x^{25/3}}-\frac{5005a^6b^9}{8x^8}-\frac{9009a^5b^{10}}{23x^{23/3}}-\frac{4095a^4b^{11}}{22x^{22/3}}-\frac{65a^3b^{12}}{x^7}-\frac{63a^2b^{13}}{4x^{20/3}}-\frac{45ab^{14}}{19x^{19/3}}-\frac{b^{15}}{6x^6}$$

```
[Out] -a^15/(11*x^11) - (45*a^14*b)/(32*x^(32/3)) - (315*a^13*b^2)/(31*
x^(31/3)) - (91*a^12*b^3)/(2*x^10) - (4095*a^11*b^4)/(29*x^(29/3)
) - (1287*a^10*b^5)/(4*x^(28/3)) - (5005*a^9*b^6)/(9*x^9) - (1485
*a^8*b^7)/(2*x^(26/3)) - (3861*a^7*b^8)/(5*x^(25/3)) - (5005*a^6*
b^9)/(8*x^8) - (9009*a^5*b^10)/(23*x^(23/3)) - (4095*a^4*b^11)/(2
2*x^(22/3)) - (65*a^3*b^12)/x^7 - (63*a^2*b^13)/(4*x^(20/3)) - (4
5*a*b^14)/(19*x^(19/3)) - b^15/(6*x^6)
```

Rubi [A] time = 0.311952, antiderivative size = 217, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^{15}}{11x^{11}}-\frac{45a^{14}b}{32x^{32/3}}-\frac{315a^{13}b^2}{31x^{31/3}}-\frac{91a^{12}b^3}{2x^{10}}-\frac{4095a^{11}b^4}{29x^{29/3}}-\frac{1287a^{10}b^5}{4x^{28/3}}-\frac{5005a^9b^6}{9x^9}-\frac{1485a^8b^7}{2x^{26/3}}-\frac{3861a^7b^8}{5x^{25/3}}-\frac{5005a^6b^9}{8x^8}-\frac{9009a^5b^{10}}{23x^{23/3}}-\frac{4095a^4b^{11}}{22x^{22/3}}-\frac{65a^3b^{12}}{x^7}-\frac{63a^2b^{13}}{4x^{20/3}}-\frac{45ab^{14}}{19x^{19/3}}-\frac{b^{15}}{6x^6}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^15/x^12,x]
```

```
[Out] -a^15/(11*x^11) - (45*a^14*b)/(32*x^(32/3)) - (315*a^13*b^2)/(31*
x^(31/3)) - (91*a^12*b^3)/(2*x^10) - (4095*a^11*b^4)/(29*x^(29/3)
) - (1287*a^10*b^5)/(4*x^(28/3)) - (5005*a^9*b^6)/(9*x^9) - (1485
*a^8*b^7)/(2*x^(26/3)) - (3861*a^7*b^8)/(5*x^(25/3)) - (5005*a^6*
b^9)/(8*x^8) - (9009*a^5*b^10)/(23*x^(23/3)) - (4095*a^4*b^11)/(2
2*x^(22/3)) - (65*a^3*b^12)/x^7 - (63*a^2*b^13)/(4*x^(20/3)) - (4
5*a*b^14)/(19*x^(19/3)) - b^15/(6*x^6)
```

Rubi in Sympy [A] time = 53.5654, size = 219, normalized size = 1.01

$$-\frac{a^{15}}{11x^{11}}-\frac{45a^{14}b}{32x^{\frac{32}{3}}}-\frac{315a^{13}b^2}{31x^{\frac{31}{3}}}-\frac{91a^{12}b^3}{2x^{10}}-\frac{4095a^{11}b^4}{29x^{\frac{29}{3}}}-\frac{1287a^{10}b^5}{4x^{\frac{28}{3}}}-\frac{5005a^9b^6}{9x^9}-\frac{1485a^8b^7}{2x^{\frac{26}{3}}}-\frac{3861a^7b^8}{5x^{\frac{25}{3}}}-\frac{5005a^6b^9}{8x^8}-\frac{9009a^5b^{10}}{23x^{\frac{23}{3}}}-\frac{4095a^4b^{11}}{22x^{\frac{22}{3}}}-\frac{65a^3b^{12}}{x^7}-\frac{63a^2b^{13}}{4x^{\frac{20}{3}}}-\frac{45ab^{14}}{19x^{\frac{19}{3}}}-\frac{b^{15}}{6x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**(1/3))**15/x**12,x)
```

```
[Out] -a**15/(11*x**11) - 45*a**14*b/(32*x**(32/3)) - 315*a**13*b**2/(3
1*x**(31/3)) - 91*a**12*b**3/(2*x**10) - 4095*a**11*b**4/(29*x**(
29/3)) - 1287*a**10*b**5/(4*x**(28/3)) - 5005*a**9*b**6/(9*x**9)
- 1485*a**8*b**7/(2*x**(26/3)) - 3861*a**7*b**8/(5*x**(25/3)) - 5
005*a**6*b**9/(8*x**8) - 9009*a**5*b**10/(23*x**(23/3)) - 4095*a*
*4*b**11/(22*x**(22/3)) - 65*a**3*b**12/x**7 - 63*a**2*b**13/(4*x
**(20/3)) - 45*a*b**14/(19*x**(19/3)) - b**15/(6*x**6)
```

Mathematica [A] time = 0.0763806, size = 217, normalized size = 1.

$$-\frac{a^{15}}{11x^{11}}-\frac{45a^{14}b}{32x^{32/3}}-\frac{315a^{13}b^2}{31x^{31/3}}-\frac{91a^{12}b^3}{2x^{10}}-\frac{4095a^{11}b^4}{29x^{29/3}}-\frac{1287a^{10}b^5}{4x^{28/3}}-\frac{5005a^9b^6}{9x^9}-\frac{1485a^8b^7}{2x^{26/3}}-\frac{3861a^7b^8}{5x^{25/3}}-\frac{5005a^6b^9}{8x^8}-\frac{9009a^5b^{10}}{23x^{23/3}}-\frac{4095a^4b^{11}}{22x^{22/3}}-\frac{65a^3b^{12}}{x^7}-\frac{63a^2b^{13}}{4x^{20/3}}-\frac{45ab^{14}}{19x^{19/3}}-\frac{b^{15}}{6x^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^15/x^12,x]
```

```
[Out] -a^15/(11*x^11) - (45*a^14*b)/(32*x^(32/3)) - (315*a^13*b^2)/(31*
x^(31/3)) - (91*a^12*b^3)/(2*x^10) - (4095*a^11*b^4)/(29*x^(29/3)
) - (1287*a^10*b^5)/(4*x^(28/3)) - (5005*a^9*b^6)/(9*x^9) - (1485
*a^8*b^7)/(2*x^(26/3)) - (3861*a^7*b^8)/(5*x^(25/3)) - (5005*a^6*
b^9)/(8*x^8) - (9009*a^5*b^10)/(23*x^(23/3)) - (4095*a^4*b^11)/(2
2*x^(22/3)) - (65*a^3*b^12)/x^7 - (63*a^2*b^13)/(4*x^(20/3)) - (4
5*a*b^14)/(19*x^(19/3)) - b^15/(6*x^6)
```

Maple [A] time = 0.012, size = 168, normalized size = 0.8

$$-\frac{a^{15}}{11\,x^{11}}-\frac{45\,a^{14}b}{32}x^{-\frac{32}{3}}-\frac{315\,a^{13}b^2}{31}x^{-\frac{31}{3}}-\frac{91\,a^{12}b^3}{2\,x^{10}}-\frac{4095\,a^{11}b^4}{29}x^{-\frac{29}{3}}-\frac{1287\,a^{10}b^5}{4}x^{-\frac{28}{3}}-\frac{5005\,a^9b^6}{9\,x^9}-\frac{1485\,a^8b^7}{2}x^{-\frac{26}{3}}-\frac{3861\,a^7b^8}{5}x^{-\frac{25}{3}}-\frac{5005\,a^6b^9}{8\,x^8}-\frac{9009\,a^5b^{10}}{23}x^{-\frac{23}{3}}-\frac{4095\,a^4b^{11}}{22}x^{-\frac{22}{3}}-65\,\frac{a^3b^{12}}{x^7}-\frac{63\,a^2b^{13}}{4}x^{-\frac{20}{3}}-\frac{45\,ab^{14}}{19}x^{-\frac{19}{3}}-\frac{b^{15}}{6\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^(1/3))^15/x^12,x)
```

```
[Out] -1/11*a^15/x^11-45/32*a^14*b/x^(32/3)-315/31*a^13*b^2/x^(31/3)-91
/2*a^12*b^3/x^10-4095/29*a^11*b^4/x^(29/3)-1287/4*a^10*b^5/x^(28/
3)-5005/9*a^9*b^6/x^9-1485/2*a^8*b^7/x^(26/3)-3861/5*a^7*b^8/x^(2
5/3)-5005/8*a^6*b^9/x^8-9009/23*a^5*b^10/x^(23/3)-4095/22*a^4*b^1
1/x^(22/3)-65*a^3*b^12/x^7-63/4*a^2*b^13/x^(20/3)-45/19*a*b^14/x^
(19/3)-1/6*b^15/x^6
```

Maxima [A] time = 1.43981, size = 225, normalized size = 1.04

$$-\frac{1037158320\,b^{15}x^5+14738565600\,ab^{14}x^{\frac{14}{3}}+98011461240\,a^2b^{13}x^{\frac{13}{3}}+404491744800\,a^3b^{12}x^4+1158317269200\,a^4b^{11}x^{\frac{11}{3}}+\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15/x^12,x, algorithm="maxima")
```

```
[Out] -1/6222949920*(1037158320*b^15*x^5 + 14738565600*a*b^14*x^(14/3)
+ 98011461240*a^2*b^13*x^(13/3) + 404491744800*a^3*b^12*x^4 + 115
8317269200*a^4*b^11*x^(11/3) + 2437502427360*a^5*b^10*x^(10/3) +
3893233043700*a^6*b^9*x^3 + 4805361928224*a^7*b^8*x^(8/3) + 46205
40315600*a^8*b^7*x^(7/3) + 3460651594400*a^9*b^6*x^2 + 2002234136
760*a^10*b^5*x^(5/3) + 878723445600*a^11*b^4*x^(4/3) + 2831442213
60*a^12*b^3*x + 63233200800*a^13*b^2*x^(2/3) + 8751023325*a^14*b*
x^(1/3) + 565722720*a^15)/x^11
```

Fricas [A] time = 0.215746, size = 228, normalized size = 1.05

$$-\frac{1037158320\,b^{15}x^5+404491744800\,a^3b^{12}x^4+3893233043700\,a^6b^9x^3+3460651594400\,a^9b^6x^2+283144221360\,a^{12}b^3x+\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15/x^12,x, algorithm="fricas")
```

```
[Out] -1/6222949920*(1037158320*b^15*x^5 + 404491744800*a^3*b^12*x^4 +
3893233043700*a^6*b^9*x^3 + 3460651594400*a^9*b^6*x^2 + 283144221
360*a^12*b^3*x + 565722720*a^15 + 432216*(34100*a*b^14*x^4 + 2679
950*a^4*b^11*x^3 + 11117964*a^7*b^8*x^2 + 4632485*a^10*b^5*x + 14
6300*a^13*b^2)*x^(2/3) + 2623995*(37352*a^2*b^13*x^4 + 928928*a^5
*b^10*x^3 + 1760880*a^8*b^7*x^2 + 334880*a^11*b^4*x + 3335*a^14*b
)*x^(1/3))/x^11
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**(1/3))**15/x**12,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.226813, size = 225, normalized size = 1.04

$$-\frac{1037158320\, b^{15} x^5 + 14738565600\, a b^{14} x^{\frac{14}{3}} + 98011461240\, a^2 b^{13} x^{\frac{13}{3}} + 404491744800\, a^3 b^{12} x^4 + 1158317269200\, a^4 b^{11} x^{\frac{11}{3}} + \cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^15/x^12,x, algorithm="giac")
```

```
[Out] -1/6222949920*(1037158320*b^15*x^5 + 14738565600*a*b^14*x^(14/3)
+ 98011461240*a^2*b^13*x^(13/3) + 404491744800*a^3*b^12*x^4 + 115
8317269200*a^4*b^11*x^(11/3) + 2437502427360*a^5*b^10*x^(10/3) +
3893233043700*a^6*b^9*x^3 + 4805361928224*a^7*b^8*x^(8/3) + 46205
40315600*a^8*b^7*x^(7/3) + 3460651594400*a^9*b^6*x^2 + 2002234136
760*a^10*b^5*x^(5/3) + 878723445600*a^11*b^4*x^(4/3) + 2831442213
60*a^12*b^3*x + 63233200800*a^13*b^2*x^(2/3) + 8751023325*a^14*b*
x^(1/3) + 565722720*a^15)/x^11
```

3.2349 $\int \frac{x^3}{a+b\sqrt[3]{x}}\,dx$

Optimal. Leaf size=166

$$-\frac{3a^{11}\log\left(a+b\sqrt[3]{x}\right)}{b^{12}}+\frac{3a^{10}\sqrt[3]{x}}{b^{11}}-\frac{3a^9x^{2/3}}{2b^{10}}+\frac{a^8x}{b^9}-\frac{3a^7x^{4/3}}{4b^8}+\frac{3a^6x^{5/3}}{5b^7}-\frac{a^5x^2}{2b^6}+\frac{3a^4x^{7/3}}{7b^5}-\frac{3a^3x^{8/3}}{8b^4}+\frac{a^2x^3}{3b^3}-\frac{3ax^{10/3}}{10b^2}+\frac{3x^{11/3}}{11b}$$

```
[Out] (3*a^10*x^(1/3))/b^11 - (3*a^9*x^(2/3))/(2*b^10) + (a^8*x)/b^9 -
(3*a^7*x^(4/3))/(4*b^8) + (3*a^6*x^(5/3))/(5*b^7) - (a^5*x^2)/(2*
b^6) + (3*a^4*x^(7/3))/(7*b^5) - (3*a^3*x^(8/3))/(8*b^4) + (a^2*x
^3)/(3*b^3) - (3*a*x^(10/3))/(10*b^2) + (3*x^(11/3))/(11*b) - (3*
a^11*Log[a + b*x^(1/3)])/b^12
```

Rubi [A] time = 0.24773, antiderivative size = 166, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{3a^{11}\log\left(a+b\sqrt[3]{x}\right)}{b^{12}}+\frac{3a^{10}\sqrt[3]{x}}{b^{11}}-\frac{3a^9x^{2/3}}{2b^{10}}+\frac{a^8x}{b^9}-\frac{3a^7x^{4/3}}{4b^8}+\frac{3a^6x^{5/3}}{5b^7}-\frac{a^5x^2}{2b^6}+\frac{3a^4x^{7/3}}{7b^5}-\frac{3a^3x^{8/3}}{8b^4}+\frac{a^2x^3}{3b^3}-\frac{3ax^{10/3}}{10b^2}+\frac{3x^{11/3}}{11b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(a + b*x^(1/3)),x]
```

```
[Out] (3*a^10*x^(1/3))/b^11 - (3*a^9*x^(2/3))/(2*b^10) + (a^8*x)/b^9 -
(3*a^7*x^(4/3))/(4*b^8) + (3*a^6*x^(5/3))/(5*b^7) - (a^5*x^2)/(2*
b^6) + (3*a^4*x^(7/3))/(7*b^5) - (3*a^3*x^(8/3))/(8*b^4) + (a^2*x
^3)/(3*b^3) - (3*a*x^(10/3))/(10*b^2) + (3*x^(11/3))/(11*b) - (3*
a^11*Log[a + b*x^(1/3)])/b^12
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{3a^{11}\log\left(a+b\sqrt[3]{x}\right)}{b^{12}}-\frac{3a^9\int^{\sqrt[3]{x}}x\,dx}{b^{10}}+\frac{a^8x}{b^9}-\frac{3a^7x^{\frac{4}{3}}}{4b^8}+\frac{3a^6x^{\frac{5}{3}}}{5b^7}-\frac{a^5x^2}{2b^6}+\frac{3a^4x^{\frac{7}{3}}}{7b^5}-\frac{3a^3x^{\frac{8}{3}}}{8b^4}+\frac{a^2x^3}{3b^3}-\frac{3ax^{\frac{10}{3}}}{10b^2}+\frac{3x^{\frac{11}{3}}}{11b}+\frac{3\int^{\sqrt[3]{x}}a^{10}\,dx}{b^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(a+b*x**(1/3)),x)
```

```
[Out] -3*a**11*log(a + b*x**(1/3))/b**12 - 3*a**9*Integral(x, (x, x**(1
/3)))/b**10 + a**8*x/b**9 - 3*a**7*x**(4/3)/(4*b**8) + 3*a**6*x**
(5/3)/(5*b**7) - a**5*x**2/(2*b**6) + 3*a**4*x**(7/3)/(7*b**5) -
3*a**3*x**(8/3)/(8*b**4) + a**2*x**3/(3*b**3) - 3*a*x**(10/3)/(10
*b**2) + 3*x**(11/3)/(11*b) + 3*Integral(a**10, (x, x**(1/3)))/b*
*11
```

Mathematica [A] time = 0.11852, size = 166, normalized size = 1.

$$-\frac{3a^{11}\log\left(a+b\sqrt[3]{x}\right)}{b^{12}}+\frac{3a^{10}\sqrt[3]{x}}{b^{11}}-\frac{3a^9x^{2/3}}{2b^{10}}+\frac{a^8x}{b^9}-\frac{3a^7x^{4/3}}{4b^8}+\frac{3a^6x^{5/3}}{5b^7}-\frac{a^5x^2}{2b^6}+\frac{3a^4x^{7/3}}{7b^5}-\frac{3a^3x^{8/3}}{8b^4}+\frac{a^2x^3}{3b^3}-\frac{3ax^{10/3}}{10b^2}+\frac{3x^{11/3}}{11b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3/(a + b*x^(1/3)),x]
```

```
[Out] (3*a^10*x^(1/3))/b^11 - (3*a^9*x^(2/3))/(2*b^10) + (a^8*x)/b^9 -
(3*a^7*x^(4/3))/(4*b^8) + (3*a^6*x^(5/3))/(5*b^7) - (a^5*x^2)/(2*
b^6) + (3*a^4*x^(7/3))/(7*b^5) - (3*a^3*x^(8/3))/(8*b^4) + (a^2*x
^3)/(3*b^3) - (3*a*x^(10/3))/(10*b^2) + (3*x^(11/3))/(11*b) - (3*
a^11*Log[a + b*x^(1/3)])/b^12
```

Maple [A]   time = 0.007, size = 131, normalized size = 0.8

$$3\,{\frac{{a}^{10}\sqrt[3]{x}}{{b}^{11}}}-{\frac{3\,{a}^{9}}{2\,{b}^{10}}{x}^{{\frac{2}{3}}}}+{\frac{{a}^{8}x}{{b}^{9}}}-{\frac{3\,{a}^{7}}{4\,{b}^{8}}{x}^{{\frac{4}{3}}}}+{\frac{3\,{a}^{6}}{5\,{b}^{7}}{x}^{{\frac{5}{3}}}}-{\frac{{a}^{5}{x}^{2}}{2\,{b}^{6}}}+{\frac{3\,{a}^{4}}{7\,{b}^{5}}{x}^{{\frac{7}{3}}}}-{\frac{3\,{a}^{3}}{8\,{b}^{4}}{x}^{{\frac{8}{3}}}}+{\frac{{x}^{3}{a}^{2}}{3\,{b}^{3}}}-{\frac{3\,a}{10\,{b}^{2}}{x}^{{\frac{10}{3}}}}+{\frac{3}{11\,b}{x}^{{\frac{11}{3}}}}-3\,{\frac{{a}^{11}\ln \left(a+b\sqrt[3]{x} \right) }{{b}^{12}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(a+b*x^(1/3)),x)
```

```
[Out] 3*a^10*x^(1/3)/b^11-3/2*a^9*x^(2/3)/b^10+a^8*x/b^9-3/4*a^7*x^(4/3
)/b^8+3/5*a^6*x^(5/3)/b^7-1/2*a^5*x^2/b^6+3/7*a^4*x^(7/3)/b^5-3/8
*a^3*x^(8/3)/b^4+1/3*a^2*x^3/b^3-3/10*a*x^(10/3)/b^2+3/11*x^(11/3
)/b-3*a^11*ln(a+b*x^(1/3))/b^12
```

Maxima [A]   time = 1.42504, size = 266, normalized size = 1.6

$$-\frac{3\,a^{11}\log\left(bx^{\frac{1}{3}}+a\right)}{b^{12}}+\frac{3\,\left(bx^{\frac{1}{3}}+a\right)^{11}}{11\,b^{12}}-\frac{33\,\left(bx^{\frac{1}{3}}+a\right)^{10}a}{10\,b^{12}}+\frac{55\,\left(bx^{\frac{1}{3}}+a\right)^{9}a^{2}}{3\,b^{12}}-\frac{495\,\left(bx^{\frac{1}{3}}+a\right)^{8}a^{3}}{8\,b^{12}}+\frac{990\,\left(bx^{\frac{1}{3}}+a\right)^{7}a^{4}}{7\,b^{12}}-\frac{231\,\left(bx^{\frac{1}{3}}+a\right)^{6}a^{5}}{b^{12}}+\frac{1386\,\left(bx^{\frac{1}{3}}+a\right)^{5}a^{6}}{5\,b^{12}}-\frac{495\,\left(bx^{\frac{1}{3}}+a\right)^{4}a^{7}}{2\,b^{12}}+\frac{165\,\left(bx^{\frac{1}{3}}+a\right)^{3}a^{8}}{b^{12}}-\frac{165\,\left(bx^{\frac{1}{3}}+a\right)^{2}a^{9}}{2\,b^{12}}+\frac{33\,\left(bx^{\frac{1}{3}}+a\right)a^{10}}{b^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^(1/3) + a),x, algorithm="maxima")
```

```
[Out] -3*a^11*log(b*x^(1/3) + a)/b^12 + 3/11*(b*x^(1/3) + a)^11/b^12 -
33/10*(b*x^(1/3) + a)^10*a/b^12 + 55/3*(b*x^(1/3) + a)^9*a^2/b^12
 - 495/8*(b*x^(1/3) + a)^8*a^3/b^12 + 990/7*(b*x^(1/3) + a)^7*a^4
/b^12 - 231*(b*x^(1/3) + a)^6*a^5/b^12 + 1386/5*(b*x^(1/3) + a)^5
*a^6/b^12 - 495/2*(b*x^(1/3) + a)^4*a^7/b^12 + 165*(b*x^(1/3) + a
)^3*a^8/b^12 - 165/2*(b*x^(1/3) + a)^2*a^9/b^12 + 33*(b*x^(1/3) +
 a)*a^10/b^12
```

Fricas [A]   time = 0.219047, size = 180, normalized size = 1.08

$$\frac{3080\,a^{2}b^{9}x^{3}-4620\,a^{5}b^{6}x^{2}+9240\,a^{8}b^{3}x-27720\,a^{11}\log\left(bx^{\frac{1}{3}}+a\right)+63\,\left(40\,b^{11}x^{3}-55\,a^{3}b^{8}x^{2}+88\,a^{6}b^{5}x-220\,a^{9}b^{2}\right)x^{\frac{2}{3}}-}{9240\,b^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^(1/3) + a),x, algorithm="fricas")
```

```
[Out] 1/9240*(3080*a^2*b^9*x^3 - 4620*a^5*b^6*x^2 + 9240*a^8*b^3*x - 27
720*a^11*log(b*x^(1/3) + a) + 63*(40*b^11*x^3 - 55*a^3*b^8*x^2 +
88*a^6*b^5*x - 220*a^9*b^2)*x^(2/3) - 198*(14*a*b^10*x^3 - 20*a^4
*b^7*x^2 + 35*a^7*b^4*x - 140*a^10*b)*x^(1/3))/b^12
```

Sympy [A] time = 129.273, size = 165, normalized size = 0.99

$$-\frac{3a^{11}\log\left(1+\frac{b\sqrt[3]{x}}{a}\right)}{b^{12}}+\frac{3a^{10}\sqrt[3]{x}}{b^{11}}-\frac{3a^9x^{\frac{2}{3}}}{2b^{10}}+\frac{a^8x}{b^9}-\frac{3a^7x^{\frac{4}{3}}}{4b^8}+\frac{3a^6x^{\frac{5}{3}}}{5b^7}-\frac{a^5x^2}{2b^6}+\frac{3a^4x^{\frac{7}{3}}}{7b^5}-\frac{3a^3x^{\frac{8}{3}}}{8b^4}+\frac{a^2x^3}{3b^3}-\frac{3ax^{\frac{10}{3}}}{10b^2}+\frac{3x^{\frac{11}{3}}}{11b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(a+b*x**(1/3)),x)
```

```
[Out] -3*a**11*log(1 + b*x**(1/3)/a)/b**12 + 3*a**10*x**(1/3)/b**11 - 3
*a**9*x**(2/3)/(2*b**10) + a**8*x/b**9 - 3*a**7*x**(4/3)/(4*b**8)
 + 3*a**6*x**(5/3)/(5*b**7) - a**5*x**2/(2*b**6) + 3*a**4*x**(7/3
)/(7*b**5) - 3*a**3*x**(8/3)/(8*b**4) + a**2*x**3/(3*b**3) - 3*a*
x**(10/3)/(10*b**2) + 3*x**(11/3)/(11*b)
```

GIAC/XCAS [A] time = 0.219318, size = 180, normalized size = 1.08

$$-\frac{3\,a^{11}\ln\left(\left|bx^{\frac{1}{3}}+a\right|\right)}{b^{12}}+\frac{2520\,b^{10}x^{\frac{11}{3}}-2772\,ab^9x^{\frac{10}{3}}+3080\,a^2b^8x^3-3465\,a^3b^7x^{\frac{8}{3}}+3960\,a^4b^6x^{\frac{7}{3}}-4620\,a^5b^5x^2+5544\,a^6b^4x^{\frac{5}{3}}-6930\,a^7b^3x^{\frac{4}{3}}+924}{9240\,b^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^(1/3) + a),x, algorithm="giac")
```

```
[Out] -3*a^11*ln(abs(b*x^(1/3) + a))/b^12 + 1/9240*(2520*b^10*x^(11/3)
- 2772*a*b^9*x^(10/3) + 3080*a^2*b^8*x^3 - 3465*a^3*b^7*x^(8/3) +
 3960*a^4*b^6*x^(7/3) - 4620*a^5*b^5*x^2 + 5544*a^6*b^4*x^(5/3) -
 6930*a^7*b^3*x^(4/3) + 9240*a^8*b^2*x - 13860*a^9*b*x^(2/3) + 27
720*a^10*x^(1/3))/b^11
```

3.2350 $\int \frac{x^2}{a+b\sqrt[3]{x}}\,dx$

Optimal. Leaf size=124

$$\frac{3a^8\log\left(a+b\sqrt[3]{x}\right)}{b^9}-\frac{3a^7\sqrt[3]{x}}{b^8}+\frac{3a^6x^{2/3}}{2b^7}-\frac{a^5x}{b^6}+\frac{3a^4x^{4/3}}{4b^5}-\frac{3a^3x^{5/3}}{5b^4}+\frac{a^2x^2}{2b^3}-\frac{3ax^{7/3}}{7b^2}+\frac{3x^{8/3}}{8b}$$

```
[Out] (-3*a^7*x^(1/3))/b^8 + (3*a^6*x^(2/3))/(2*b^7) - (a^5*x)/b^6 + (3
*a^4*x^(4/3))/(4*b^5) - (3*a^3*x^(5/3))/(5*b^4) + (a^2*x^2)/(2*b^
3) - (3*a*x^(7/3))/(7*b^2) + (3*x^(8/3))/(8*b) + (3*a^8*Log[a + b
*x^(1/3)])/b^9
```

Rubi [A] time = 0.163539, antiderivative size = 124, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{3a^8\log\left(a+b\sqrt[3]{x}\right)}{b^9}-\frac{3a^7\sqrt[3]{x}}{b^8}+\frac{3a^6x^{2/3}}{2b^7}-\frac{a^5x}{b^6}+\frac{3a^4x^{4/3}}{4b^5}-\frac{3a^3x^{5/3}}{5b^4}+\frac{a^2x^2}{2b^3}-\frac{3ax^{7/3}}{7b^2}+\frac{3x^{8/3}}{8b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b*x^(1/3)),x]
```

```
[Out] (-3*a^7*x^(1/3))/b^8 + (3*a^6*x^(2/3))/(2*b^7) - (a^5*x)/b^6 + (3
*a^4*x^(4/3))/(4*b^5) - (3*a^3*x^(5/3))/(5*b^4) + (a^2*x^2)/(2*b^
3) - (3*a*x^(7/3))/(7*b^2) + (3*x^(8/3))/(8*b) + (3*a^8*Log[a + b
*x^(1/3)])/b^9
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{3a^8\log\left(a+b\sqrt[3]{x}\right)}{b^9}+\frac{3a^6\int^{\sqrt[3]{x}}x\,dx}{b^7}-\frac{a^5x}{b^6}+\frac{3a^4x^{\frac{4}{3}}}{4b^5}-\frac{3a^3x^{\frac{5}{3}}}{5b^4}+\frac{a^2x^2}{2b^3}-\frac{3ax^{\frac{7}{3}}}{7b^2}+\frac{3x^{\frac{8}{3}}}{8b}-\frac{3\int^{\sqrt[3]{x}}a^7\,dx}{b^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b*x**(1/3)),x)
```

```
[Out] 3*a**8*log(a + b*x**(1/3))/b**9 + 3*a**6*Integral(x, (x, x**(1/3)
))/b**7 - a**5*x/b**6 + 3*a**4*x**(4/3)/(4*b**5) - 3*a**3*x**(5/3
)/(5*b**4) + a**2*x**2/(2*b**3) - 3*a*x**(7/3)/(7*b**2) + 3*x**(8
/3)/(8*b) - 3*Integral(a**7, (x, x**(1/3)))/b**8
```

Mathematica [A] time = 0.0794611, size = 124, normalized size = 1.

$$\frac{3a^8\log\left(a+b\sqrt[3]{x}\right)}{b^9}-\frac{3a^7\sqrt[3]{x}}{b^8}+\frac{3a^6x^{2/3}}{2b^7}-\frac{a^5x}{b^6}+\frac{3a^4x^{4/3}}{4b^5}-\frac{3a^3x^{5/3}}{5b^4}+\frac{a^2x^2}{2b^3}-\frac{3ax^{7/3}}{7b^2}+\frac{3x^{8/3}}{8b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a + b*x^(1/3)),x]
```

```
[Out] (-3*a^7*x^(1/3))/b^8 + (3*a^6*x^(2/3))/(2*b^7) - (a^5*x)/b^6 + (3
*a^4*x^(4/3))/(4*b^5) - (3*a^3*x^(5/3))/(5*b^4) + (a^2*x^2)/(2*b^
3) - (3*a*x^(7/3))/(7*b^2) + (3*x^(8/3))/(8*b) + (3*a^8*Log[a + b
*x^(1/3)])/b^9
```

Maple [A] time = 0.005, size = 99, normalized size = 0.8

$$-3\frac{a^7\sqrt[3]{x}}{b^8}+\frac{3\,a^6}{2\,b^7}x^{\frac{2}{3}}-\frac{xa^5}{b^6}+\frac{3\,a^4}{4\,b^5}x^{\frac{4}{3}}-\frac{3\,a^3}{5\,b^4}x^{\frac{5}{3}}+\frac{a^2x^2}{2\,b^3}-\frac{3\,a}{7\,b^2}x^{\frac{7}{3}}+\frac{3}{8\,b}x^{\frac{8}{3}}+3\,\frac{a^8\ln\left(a+b\sqrt[3]{x}\right)}{b^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(a+b*x^(1/3)),x)
```

```
[Out] -3*a^7*x^(1/3)/b^8+3/2*a^6*x^(2/3)/b^7-a^5*x/b^6+3/4*a^4*x^(4/3)/
b^5-3/5*a^3*x^(5/3)/b^4+1/2*a^2*x^2/b^3-3/7*a*x^(7/3)/b^2+3/8*x^(
8/3)/b+3*a^8*ln(a+b*x^(1/3))/b^9
```

Maxima [A] time = 1.43191, size = 197, normalized size = 1.59

$$\frac{3\,a^8\log\left(bx^{\frac{1}{3}}+a\right)}{b^9}+\frac{3\left(bx^{\frac{1}{3}}+a\right)^8}{8\,b^9}-\frac{24\left(bx^{\frac{1}{3}}+a\right)^7a}{7\,b^9}+\frac{14\left(bx^{\frac{1}{3}}+a\right)^6a^2}{b^9}-\frac{168\left(bx^{\frac{1}{3}}+a\right)^5a^3}{5\,b^9}+\frac{105\left(bx^{\frac{1}{3}}+a\right)^4a^4}{2\,b^9}-\frac{56\left(bx^{\frac{1}{3}}+a\right)^3a^5}{b^9}+\frac{42\left(bx^{\frac{1}{3}}+a\right)^2a^6}{b^9}-\frac{24\left(bx^{\frac{1}{3}}+a\right)a^7}{b^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^(1/3) + a),x, algorithm="maxima")
```

```
[Out] 3*a^8*log(b*x^(1/3) + a)/b^9 + 3/8*(b*x^(1/3) + a)^8/b^9 - 24/7*(
b*x^(1/3) + a)^7*a/b^9 + 14*(b*x^(1/3) + a)^6*a^2/b^9 - 168/5*(b*
x^(1/3) + a)^5*a^3/b^9 + 105/2*(b*x^(1/3) + a)^4*a^4/b^9 - 56*(b*
x^(1/3) + a)^3*a^5/b^9 + 42*(b*x^(1/3) + a)^2*a^6/b^9 - 24*(b*x^(
1/3) + a)*a^7/b^9
```

Fricas [A] time = 0.218475, size = 135, normalized size = 1.09

$$\frac{140\,a^2b^6x^2-280\,a^5b^3x+840\,a^8\log\left(bx^{\frac{1}{3}}+a\right)+21\left(5\,b^8x^2-8\,a^3b^5x+20\,a^6b^2\right)x^{\frac{2}{3}}-30\left(4\,ab^7x^2-7\,a^4b^4x+28\,a^7b\right)x^{\frac{1}{3}}}{280\,b^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^(1/3) + a),x, algorithm="fricas")
```

```
[Out] 1/280*(140*a^2*b^6*x^2 - 280*a^5*b^3*x + 840*a^8*log(b*x^(1/3) +
a) + 21*(5*b^8*x^2 - 8*a^3*b^5*x + 20*a^6*b^2)*x^(2/3) - 30*(4*a*
b^7*x^2 - 7*a^4*b^4*x + 28*a^7*b)*x^(1/3))/b^9
```

Sympy [A] time = 64.3962, size = 122, normalized size = 0.98

$$\frac{3a^8\log\left(1+\frac{b\sqrt[3]{x}}{a}\right)}{b^9}-\frac{3a^7\sqrt[3]{x}}{b^8}+\frac{3a^6x^{\frac{2}{3}}}{2b^7}-\frac{a^5x}{b^6}+\frac{3a^4x^{\frac{4}{3}}}{4b^5}-\frac{3a^3x^{\frac{5}{3}}}{5b^4}+\frac{a^2x^2}{2b^3}-\frac{3ax^{\frac{7}{3}}}{7b^2}+\frac{3x^{\frac{8}{3}}}{8b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b*x**(1/3)),x)
```

```
[Out] 3*a**8*log(1 + b*x**(1/3)/a)/b**9 - 3*a**7*x**(1/3)/b**8 + 3*a**6
*x**(2/3)/(2*b**7) - a**5*x/b**6 + 3*a**4*x**(4/3)/(4*b**5) - 3*a
```

```
**3*x**(5/3)/(5*b**4) + a**2*x**2/(2*b**3) - 3*a*x**(7/3)/(7*b**2
) + 3*x**(8/3)/(8*b)
```

GIAC/XCAS [A] time = 0.227003, size = 135, normalized size = 1.09

$$\frac{3\,a^{8}\ln\left(\left|bx^{\frac{1}{3}}+a\right|\right)}{b^{9}}+\frac{105\,b^{7}x^{\frac{8}{3}}-120\,ab^{6}x^{\frac{7}{3}}+140\,a^{2}b^{5}x^{2}-168\,a^{3}b^{4}x^{\frac{5}{3}}+210\,a^{4}b^{3}x^{\frac{4}{3}}-280\,a^{5}b^{2}x+420\,a^{6}bx^{\frac{2}{3}}-840\,a^{7}x^{\frac{1}{3}}}{280\,b^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^(1/3) + a),x, algorithm="giac")
```

```
[Out] 3*a^8*ln(abs(b*x^(1/3) + a))/b^9 + 1/280*(105*b^7*x^(8/3) - 120*a
*b^6*x^(7/3) + 140*a^2*b^5*x^2 - 168*a^3*b^4*x^(5/3) + 210*a^4*b^
3*x^(4/3) - 280*a^5*b^2*x + 420*a^6*b*x^(2/3) - 840*a^7*x^(1/3))/
b^8
```

3.2351 $\int \frac{x}{a+b\sqrt[3]{x}}\,dx$

Optimal. Leaf size=80

$$-\frac{3a^5\log\left(a+b\sqrt[3]{x}\right)}{b^6}+\frac{3a^4\sqrt[3]{x}}{b^5}-\frac{3a^3x^{2/3}}{2b^4}+\frac{a^2x}{b^3}-\frac{3ax^{4/3}}{4b^2}+\frac{3x^{5/3}}{5b}$$

```
[Out] (3*a^4*x^(1/3))/b^5 - (3*a^3*x^(2/3))/(2*b^4) + (a^2*x)/b^3 - (3*
a*x^(4/3))/(4*b^2) + (3*x^(5/3))/(5*b) - (3*a^5*Log[a + b*x^(1/3)
])/b^6
```

Rubi [A] time = 0.10618, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$-\frac{3a^5\log\left(a+b\sqrt[3]{x}\right)}{b^6}+\frac{3a^4\sqrt[3]{x}}{b^5}-\frac{3a^3x^{2/3}}{2b^4}+\frac{a^2x}{b^3}-\frac{3ax^{4/3}}{4b^2}+\frac{3x^{5/3}}{5b}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b*x^(1/3)),x]
```

```
[Out] (3*a^4*x^(1/3))/b^5 - (3*a^3*x^(2/3))/(2*b^4) + (a^2*x)/b^3 - (3*
a*x^(4/3))/(4*b^2) + (3*x^(5/3))/(5*b) - (3*a^5*Log[a + b*x^(1/3)
])/b^6
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{3a^5\log\left(a+b\sqrt[3]{x}\right)}{b^6}-\frac{3a^3\int^{\sqrt[3]{x}}x\,dx}{b^4}+\frac{a^2x}{b^3}-\frac{3ax^{\frac{4}{3}}}{4b^2}+\frac{3x^{\frac{5}{3}}}{5b}+\frac{3\int^{\sqrt[3]{x}}a^4\,dx}{b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b*x**(1/3)),x)
```

```
[Out] -3*a**5*log(a + b*x**(1/3))/b**6 - 3*a**3*Integral(x, (x, x**(1/3
)))/b**4 + a**2*x/b**3 - 3*a*x**(4/3)/(4*b**2) + 3*x**(5/3)/(5*b)
 + 3*Integral(a**4, (x, x**(1/3)))/b**5
```

Mathematica [A] time = 0.0271454, size = 77, normalized size = 0.96

$$\frac{-60a^5\log\left(a+b\sqrt[3]{x}\right)+60a^4b\sqrt[3]{x}-30a^3b^2x^{2/3}+20a^2b^3x-15ab^4x^{4/3}+12b^5x^{5/3}}{20b^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b*x^(1/3)),x]
```

```
[Out] (60*a^4*b*x^(1/3) - 30*a^3*b^2*x^(2/3) + 20*a^2*b^3*x - 15*a*b^4*
x^(4/3) + 12*b^5*x^(5/3) - 60*a^5*Log[a + b*x^(1/3)])/(20*b^6)
```

Maple [A] time = 0.003, size = 65, normalized size = 0.8

$$3\,\frac{a^4\sqrt[3]{x}}{b^5}-\frac{3\,a^3}{2\,b^4}x^{\frac{2}{3}}+\frac{xa^2}{b^3}-\frac{3\,a}{4\,b^2}x^{\frac{4}{3}}+\frac{3}{5\,b}x^{\frac{5}{3}}-3\,\frac{a^5\ln\left(a+b\sqrt[3]{x}\right)}{b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x/(a+b*x^(1/3)),x)
```

```
[Out] 3*a^4*x^(1/3)/b^5-3/2*a^3*x^(2/3)/b^4+a^2*x/b^3-3/4*a*x^(4/3)/b^2
+3/5*x^(5/3)/b-3*a^5*ln(a+b*x^(1/3))/b^6
```

Maxima [A] time = 1.43283, size = 128, normalized size = 1.6

$$-\frac{3\,a^5\log\left(bx^{\frac{1}{3}}+a\right)}{b^6}+\frac{3\left(bx^{\frac{1}{3}}+a\right)^5}{5\,b^6}-\frac{15\left(bx^{\frac{1}{3}}+a\right)^4 a}{4\,b^6}+\frac{10\left(bx^{\frac{1}{3}}+a\right)^3 a^2}{b^6}-\frac{15\left(bx^{\frac{1}{3}}+a\right)^2 a^3}{b^6}+\frac{15\left(bx^{\frac{1}{3}}+a\right)a^4}{b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(b*x^(1/3) + a),x, algorithm="maxima")
```

```
[Out] -3*a^5*log(b*x^(1/3) + a)/b^6 + 3/5*(b*x^(1/3) + a)^5/b^6 - 15/4*
(b*x^(1/3) + a)^4*a/b^6 + 10*(b*x^(1/3) + a)^3*a^2/b^6 - 15*(b*x^
(1/3) + a)^2*a^3/b^6 + 15*(b*x^(1/3) + a)*a^4/b^6
```

Fricas [A] time = 0.215824, size = 89, normalized size = 1.11

$$\frac{20\,a^2b^3x-60\,a^5\log\left(bx^{\frac{1}{3}}+a\right)+6\left(2\,b^5x-5\,a^3b^2\right)x^{\frac{2}{3}}-15\left(ab^4x-4\,a^4b\right)x^{\frac{1}{3}}}{20\,b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(b*x^(1/3) + a),x, algorithm="fricas")
```

```
[Out] 1/20*(20*a^2*b^3*x - 60*a^5*log(b*x^(1/3) + a) + 6*(2*b^5*x - 5*a
^3*b^2)*x^(2/3) - 15*(a*b^4*x - 4*a^4*b)*x^(1/3))/b^6
```

Sympy [A] time = 24.9221, size = 80, normalized size = 1.

$$-\frac{3a^5\log\left(1+\frac{b\sqrt[3]{x}}{a}\right)}{b^6}+\frac{3a^4\sqrt[3]{x}}{b^5}-\frac{3a^3x^{\frac{2}{3}}}{2b^4}+\frac{a^2x}{b^3}-\frac{3ax^{\frac{4}{3}}}{4b^2}+\frac{3x^{\frac{5}{3}}}{5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(a+b*x**(1/3)),x)
```

```
[Out] -3*a**5*log(1 + b*x**(1/3)/a)/b**6 + 3*a**4*x**(1/3)/b**5 - 3*a**
3*x**(2/3)/(2*b**4) + a**2*x/b**3 - 3*a*x**(4/3)/(4*b**2) + 3*x**
(5/3)/(5*b)
```

GIAC/XCAS [A] time = 0.21996, size = 90, normalized size = 1.12

$$-\frac{3\,a^5\ln\left(\left|bx^{\frac{1}{3}}+a\right|\right)}{b^6}+\frac{12\,b^4x^{\frac{5}{3}}-15\,ab^3x^{\frac{4}{3}}+20\,a^2b^2x-30\,a^3bx^{\frac{2}{3}}+60\,a^4x^{\frac{1}{3}}}{20\,b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^(1/3) + a),x, algorithm="giac")
```

```
[Out] -3*a^5*ln(abs(b*x^(1/3) + a))/b^6 + 1/20*(12*b^4*x^(5/3) - 15*a*b
^3*x^(4/3) + 20*a^2*b^2*x - 30*a^3*b*x^(2/3) + 60*a^4*x^(1/3))/b^
5
```

3.2352 $\int \frac{1}{a+b\sqrt[3]{x}}\,dx$

Optimal. Leaf size=42

$$\frac{3a^2\log\left(a+b\sqrt[3]{x}\right)}{b^3}-\frac{3a\sqrt[3]{x}}{b^2}+\frac{3x^{2/3}}{2b}$$

```
[Out] (-3*a*x^(1/3))/b^2 + (3*x^(2/3))/(2*b) + (3*a^2*Log[a + b*x^(1/3)
])/b^3
```

Rubi [A] time = 0.0533012, antiderivative size = 42, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{3a^2\log\left(a+b\sqrt[3]{x}\right)}{b^3}-\frac{3a\sqrt[3]{x}}{b^2}+\frac{3x^{2/3}}{2b}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^(-1),x]
```

```
[Out] (-3*a*x^(1/3))/b^2 + (3*x^(2/3))/(2*b) + (3*a^2*Log[a + b*x^(1/3)
])/b^3
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{3a^2\log\left(a+b\sqrt[3]{x}\right)}{b^3}+\frac{3\int^{\sqrt[3]{x}}x\,dx}{b}-\frac{3\int^{\sqrt[3]{x}}a\,dx}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*x**(1/3)),x)
```

```
[Out] 3*a**2*log(a + b*x**(1/3))/b**3 + 3*Integral(x, (x, x**(1/3)))/b
- 3*Integral(a, (x, x**(1/3)))/b**2
```

Mathematica [A] time = 0.0195126, size = 42, normalized size = 1.

$$\frac{3a^2\log\left(a+b\sqrt[3]{x}\right)}{b^3}-\frac{3a\sqrt[3]{x}}{b^2}+\frac{3x^{2/3}}{2b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^(-1),x]
```

```
[Out] (-3*a*x^(1/3))/b^2 + (3*x^(2/3))/(2*b) + (3*a^2*Log[a + b*x^(1/3)
])/b^3
```

Maple [B] time = 0.023, size = 79, normalized size = 1.9

$$\frac{a^2\ln\left(b^3x+a^3\right)}{b^3}+\frac{3}{2\,b}x^{\frac{2}{3}}+2\,\frac{a^2\ln\left(a+b\sqrt[3]{x}\right)}{b^3}-\frac{a^2}{b^3}\ln\left(b^2x^{\frac{2}{3}}-ab\sqrt[3]{x}+a^2\right)-3\,\frac{a\sqrt[3]{x}}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*x^(1/3)),x)
```

```
[Out] a^2*ln(b^3*x+a^3)/b^3+3/2*x^(2/3)/b+2*a^2*ln(a+b*x^(1/3))/b^3-1/b
^3*a^2*ln(b^2*x^(2/3)-a*b*x^(1/3)+a^2)-3*a*x^(1/3)/b^2
```

Maxima [A] time = 1.4431, size = 59, normalized size = 1.4

$$\frac{3\,a^2\log\left(bx^{\frac{1}{3}}+a\right)}{b^3}+\frac{3\left(bx^{\frac{1}{3}}+a\right)^2}{2\,b^3}-\frac{6\left(bx^{\frac{1}{3}}+a\right)a}{b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x^(1/3) + a),x, algorithm="maxima")
```

```
[Out] 3*a^2*log(b*x^(1/3) + a)/b^3 + 3/2*(b*x^(1/3) + a)^2/b^3 - 6*(b*x
^(1/3) + a)*a/b^3
```

Fricas [A] time = 0.215, size = 45, normalized size = 1.07

$$\frac{3\left(2\,a^2\log\left(bx^{\frac{1}{3}}+a\right)+b^2x^{\frac{2}{3}}-2\,abx^{\frac{1}{3}}\right)}{2\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x^(1/3) + a),x, algorithm="fricas")
```

```
[Out] 3/2*(2*a^2*log(b*x^(1/3) + a) + b^2*x^(2/3) - 2*a*b*x^(1/3))/b^3
```

Sympy [A] time = 0.463942, size = 42, normalized size = 1.

$$\begin{cases}\frac{3a^2\log\left(\frac{a}{b}+\sqrt[3]{x}\right)}{b^3}-\frac{3a\sqrt[3]{x}}{b^2}+\frac{3x^{\frac{2}{3}}}{2b} & \text{for}\ b\neq 0\\ \frac{x}{a} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*x**(1/3)),x)
```

```
[Out] Piecewise((3*a**2*log(a/b + x**(1/3))/b**3 - 3*a*x**(1/3)/b**2 +
3*x**(2/3)/(2*b), Ne(b, 0)), (x/a, True))
```

GIAC/XCAS [A] time = 0.214726, size = 47, normalized size = 1.12

$$\frac{3\,a^2\ln\left(\left|bx^{\frac{1}{3}}+a\right|\right)}{b^3}+\frac{3\left(bx^{\frac{2}{3}}-2\,ax^{\frac{1}{3}}\right)}{2\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x^(1/3) + a),x, algorithm="giac")
```

```
[Out] 3*a^2*ln(abs(b*x^(1/3) + a))/b^3 + 3/2*(b*x^(2/3) - 2*a*x^(1/3))/
b^2
```

3.2353 $\int \frac{1}{\left(a+b\sqrt[3]{x}\right)x}\,dx$

Optimal. Leaf size=22

$$\frac{\log(x)}{a}-\frac{3\log\left(a+b\sqrt[3]{x}\right)}{a}$$

```
[Out] (-3*Log[a + b*x^(1/3)])/a + Log[x]/a
```

Rubi [A] time = 0.0315545, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{\log(x)}{a}-\frac{3\log\left(a+b\sqrt[3]{x}\right)}{a}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b*x^(1/3))*x),x]

[Out] (-3*Log[a + b*x^(1/3)])/a + Log[x]/a
```

Rubi in Sympy [A] time = 6.58708, size = 22, normalized size = 1.

$$\frac{3\log\left(\sqrt[3]{x}\right)}{a}-\frac{3\log\left(a+b\sqrt[3]{x}\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*x**(1/3))/x,x)

[Out] 3*log(x**(1/3))/a - 3*log(a + b*x**(1/3))/a
```

Mathematica [A] time = 0.00800117, size = 27, normalized size = 1.23

$$\frac{3\log\left(\sqrt[3]{x}\right)}{a}-\frac{3\log\left(a+b\sqrt[3]{x}\right)}{a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b*x^(1/3))*x),x]

[Out] (-3*Log[a + b*x^(1/3)])/a + (3*Log[x^(1/3)])/a
```

Maple [A] time = 0.003, size = 21, normalized size = 1.

$$-3\,\frac{\ln\left(a+b\sqrt[3]{x}\right)}{a}+\frac{\ln(x)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*x^(1/3))/x,x)
```

```
[Out] -3*ln(a+b*x^(1/3))/a+ln(x)/a
```

Maxima [A] time = 1.44184, size = 27, normalized size = 1.23

$$-\frac{3 \log\left(bx^{\frac{1}{3}} + a\right)}{a} + \frac{\log(x)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + a)*x),x, algorithm="maxima")
```

```
[Out] -3*log(b*x^(1/3) + a)/a + log(x)/a
```

Fricas [A] time = 0.22336, size = 27, normalized size = 1.23

$$-\frac{3 \left(\log\left(bx^{\frac{1}{3}} + a\right) - \log\left(x^{\frac{1}{3}}\right)\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + a)*x),x, algorithm="fricas")
```

```
[Out] -3*(log(b*x^(1/3) + a) - log(x^(1/3)))/a
```

Sympy [A] time = 1.60658, size = 37, normalized size = 1.68

$$\begin{cases} \frac{\tilde{\infty}}{\sqrt[3]{x}} & \text{for}\: a = 0 \wedge b = 0 \\ \frac{\log(x)}{a} & \text{for}\: b = 0 \\ -\frac{3}{b \sqrt[3]{x}} & \text{for}\: a = 0 \\ \frac{\log(x)}{a} - \frac{3 \log\left(\frac{a}{b} + \sqrt[3]{x}\right)}{a} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*x**(1/3))/x,x)
```

```
[Out] Piecewise((zoo/x**(1/3), Eq(a, 0) & Eq(b, 0)), (log(x)/a, Eq(b, 0
)), (-3/(b*x**(1/3)), Eq(a, 0)), (log(x)/a - 3*log(a/b + x**(1/3)
)/a, True))
```

GIAC/XCAS [A] time = 0.21826, size = 30, normalized size = 1.36

$$-\frac{3 \ln\left(\left|bx^{\frac{1}{3}} + a\right|\right)}{a} + \frac{\ln(|x|)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + a)*x),x, algorithm="giac")
```

```
[Out] -3*ln(abs(b*x^(1/3) + a))/a + ln(abs(x))/a
```

3.2354 $\int \frac{1}{\left(a+b\sqrt[3]{x}\right)x^2}\,dx$

Optimal. Leaf size=63

$$\frac{3b^3\log\left(a+b\sqrt[3]{x}\right)}{a^4}-\frac{b^3\log(x)}{a^4}-\frac{3b^2}{a^3\sqrt[3]{x}}+\frac{3b}{2a^2x^{2/3}}-\frac{1}{ax}$$

```
[Out] -(1/(a*x)) + (3*b)/(2*a^2*x^(2/3)) - (3*b^2)/(a^3*x^(1/3)) + (3*b
^3*Log[a + b*x^(1/3)])/a^4 - (b^3*Log[x])/a^4
```

Rubi [A] time = 0.0885364, antiderivative size = 63, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{3b^3\log\left(a+b\sqrt[3]{x}\right)}{a^4}-\frac{b^3\log(x)}{a^4}-\frac{3b^2}{a^3\sqrt[3]{x}}+\frac{3b}{2a^2x^{2/3}}-\frac{1}{ax}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b*x^(1/3))*x^2),x]
```

```
[Out] -(1/(a*x)) + (3*b)/(2*a^2*x^(2/3)) - (3*b^2)/(a^3*x^(1/3)) + (3*b
^3*Log[a + b*x^(1/3)])/a^4 - (b^3*Log[x])/a^4
```

Rubi in Sympy [A] time = 12.9982, size = 65, normalized size = 1.03

$$-\frac{1}{ax}+\frac{3b}{2a^2x^{\frac{2}{3}}}-\frac{3b^2}{a^3\sqrt[3]{x}}-\frac{3b^3\log\left(\sqrt[3]{x}\right)}{a^4}+\frac{3b^3\log\left(a+b\sqrt[3]{x}\right)}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b*x**(1/3))/x**2,x)
```

```
[Out] -1/(a*x) + 3*b/(2*a**2*x**(2/3)) - 3*b**2/(a**3*x**(1/3)) - 3*b**
3*log(x**(1/3))/a**4 + 3*b**3*log(a + b*x**(1/3))/a**4
```

Mathematica [A] time = 0.0319644, size = 62, normalized size = 0.98

$$-\frac{2a^3-3a^2b\sqrt[3]{x}-6b^3x\log\left(a+b\sqrt[3]{x}\right)+6ab^2x^{2/3}+2b^3x\log(x)}{2a^4x}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b*x^(1/3))*x^2),x]
```

```
[Out] -(2*a^3 - 3*a^2*b*x^(1/3) + 6*a*b^2*x^(2/3) - 6*b^3*x*Log[a + b*x
^(1/3)] + 2*b^3*x*Log[x])/(2*a^4*x)
```

Maple [A] time = 0.014, size = 56, normalized size = 0.9

$$-\frac{1}{ax}+\frac{3\,b}{2\,a^2}x^{-\frac{2}{3}}-3\,\frac{b^2}{a^3\sqrt[3]{x}}+3\,\frac{b^3\ln\left(a+b\sqrt[3]{x}\right)}{a^4}-\frac{b^3\ln(x)}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*x^(1/3))/x^2,x)
```

```
[Out] -1/a/x+3/2*b/a^2/x^(2/3)-3*b^2/a^3/x^(1/3)+3*b^3*ln(a+b*x^(1/3))/
a^4-b^3*ln(x)/a^4
```

Maxima [A] time = 1.4354, size = 76, normalized size = 1.21

$$\frac{3\,b^3\log\left(bx^{\frac{1}{3}}+a\right)}{a^4}-\frac{b^3\log\left(x\right)}{a^4}-\frac{6\,b^2x^{\frac{2}{3}}-3\,abx^{\frac{1}{3}}+2\,a^2}{2\,a^3x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + a)*x^2),x, algorithm="maxima")
```

```
[Out] 3*b^3*log(b*x^(1/3) + a)/a^4 - b^3*log(x)/a^4 - 1/2*(6*b^2*x^(2/3
) - 3*a*b*x^(1/3) + 2*a^2)/(a^3*x)
```

Fricas [A] time = 0.226166, size = 76, normalized size = 1.21

$$\frac{6\,b^3x\log\left(bx^{\frac{1}{3}}+a\right)-6\,b^3x\log\left(x^{\frac{1}{3}}\right)-6\,ab^2x^{\frac{2}{3}}+3\,a^2bx^{\frac{1}{3}}-2\,a^3}{2\,a^4x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + a)*x^2),x, algorithm="fricas")
```

```
[Out] 1/2*(6*b^3*x*log(b*x^(1/3) + a) - 6*b^3*x*log(x^(1/3)) - 6*a*b^2*
x^(2/3) + 3*a^2*b*x^(1/3) - 2*a^3)/(a^4*x)
```

Sympy [A] time = 8.67268, size = 83, normalized size = 1.32

$$\begin{cases} \frac{\tilde{\infty}}{x^{\frac{4}{3}}} & \text{for}\: a = 0 \wedge b = 0 \\ -\frac{1}{ax} & \text{for}\: b = 0 \\ -\frac{3}{4bx^{\frac{4}{3}}} & \text{for}\: a = 0 \\ -\frac{1}{ax}+\frac{3b}{2a^2x^{\frac{2}{3}}}-\frac{3b^2}{a^3\sqrt[3]{x}}-\frac{b^3\log\left(x\right)}{a^4}+\frac{3b^3\log\left(\frac{a}{b}+\sqrt[3]{x}\right)}{a^4} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*x**(1/3))/x**2,x)
```

```
[Out] Piecewise((zoo/x**(4/3), Eq(a, 0) & Eq(b, 0)), (-1/(a*x), Eq(b, 0
)), (-3/(4*b*x**(4/3)), Eq(a, 0)), (-1/(a*x) + 3*b/(2*a**2*x**(2/
3)) - 3*b**2/(a**3*x**(1/3)) - b**3*log(x)/a**4 + 3*b**3*log(a/b
+ x**(1/3))/a**4, True))
```

GIAC/XCAS [A] time = 0.224452, size = 82, normalized size = 1.3

$$\frac{3\,b^3\ln\left(\left|bx^{\frac{1}{3}}+a\right|\right)}{a^4}-\frac{b^3\ln\left(|x|\right)}{a^4}-\frac{6\,ab^2x^{\frac{2}{3}}-3\,a^2bx^{\frac{1}{3}}+2\,a^3}{2\,a^4x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + a)*x^2),x, algorithm="giac")
```

```
[Out] 3*b^3*ln(abs(b*x^(1/3) + a))/a^4 - b^3*ln(abs(x))/a^4 - 1/2*(6*a*
b^2*x^(2/3) - 3*a^2*b*x^(1/3) + 2*a^3)/(a^4*x)
```

3.2355 $\int \frac{1}{\left(a+b\sqrt[3]{x}\right)x^3}\,dx$

Optimal. Leaf size=104

$$-\frac{3b^6\log\left(a+b\sqrt[3]{x}\right)}{a^7}+\frac{b^6\log(x)}{a^7}+\frac{3b^5}{a^6\sqrt[3]{x}}-\frac{3b^4}{2a^5x^{2/3}}+\frac{b^3}{a^4x}-\frac{3b^2}{4a^3x^{4/3}}+\frac{3b}{5a^2x^{5/3}}-\frac{1}{2ax^2}$$

```
[Out] -1/(2*a*x^2) + (3*b)/(5*a^2*x^(5/3)) - (3*b^2)/(4*a^3*x^(4/3)) +
b^3/(a^4*x) - (3*b^4)/(2*a^5*x^(2/3)) + (3*b^5)/(a^6*x^(1/3)) - (
3*b^6*Log[a + b*x^(1/3)])/a^7 + (b^6*Log[x])/a^7
```

Rubi [A] time = 0.128783, antiderivative size = 104, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{3b^6\log\left(a+b\sqrt[3]{x}\right)}{a^7}+\frac{b^6\log(x)}{a^7}+\frac{3b^5}{a^6\sqrt[3]{x}}-\frac{3b^4}{2a^5x^{2/3}}+\frac{b^3}{a^4x}-\frac{3b^2}{4a^3x^{4/3}}+\frac{3b}{5a^2x^{5/3}}-\frac{1}{2ax^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b*x^(1/3))*x^3),x]
```

```
[Out] -1/(2*a*x^2) + (3*b)/(5*a^2*x^(5/3)) - (3*b^2)/(4*a^3*x^(4/3)) +
b^3/(a^4*x) - (3*b^4)/(2*a^5*x^(2/3)) + (3*b^5)/(a^6*x^(1/3)) - (
3*b^6*Log[a + b*x^(1/3)])/a^7 + (b^6*Log[x])/a^7
```

Rubi in Sympy [A] time = 20.2577, size = 107, normalized size = 1.03

$$-\frac{1}{2ax^2}+\frac{3b}{5a^2x^{\frac{5}{3}}}-\frac{3b^2}{4a^3x^{\frac{4}{3}}}+\frac{b^3}{a^4x}-\frac{3b^4}{2a^5x^{\frac{2}{3}}}+\frac{3b^5}{a^6\sqrt[3]{x}}+\frac{3b^6\log\left(\sqrt[3]{x}\right)}{a^7}-\frac{3b^6\log\left(a+b\sqrt[3]{x}\right)}{a^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*x**(1/3))/x**3,x)
```

```
[Out] -1/(2*a*x**2) + 3*b/(5*a**2*x**(5/3)) - 3*b**2/(4*a**3*x**(4/3))
+ b**3/(a**4*x) - 3*b**4/(2*a**5*x**(2/3)) + 3*b**5/(a**6*x**(1/3
)) + 3*b**6*log(x**(1/3))/a**7 - 3*b**6*log(a + b*x**(1/3))/a**7
```

Mathematica [A] time = 0.0699572, size = 95, normalized size = 0.91

$$\frac{\frac{a\left(-10a^5+12a^4b\sqrt[3]{x}-15a^3b^2x^{2/3}+20a^2b^3x-30ab^4x^{4/3}+60b^5x^{5/3}\right)}{x^2}-60b^6\log\left(a+b\sqrt[3]{x}\right)+20b^6\log(x)}{20a^7}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b*x^(1/3))*x^3),x]
```

```
[Out] ((a*(-10*a^5 + 12*a^4*b*x^(1/3) - 15*a^3*b^2*x^(2/3) + 20*a^2*b^3
*x - 30*a*b^4*x^(4/3) + 60*b^5*x^(5/3)))/x^2 - 60*b^6*Log[a + b*x
^(1/3)] + 20*b^6*Log[x])/(20*a^7)
```

Maple [A] time = 0.003, size = 87, normalized size = 0.8

$$-\frac{1}{2\,ax^2}+\frac{3\,b}{5\,a^2}x^{-\frac{5}{3}}-\frac{3\,b^2}{4\,a^3}x^{-\frac{4}{3}}+\frac{b^3}{a^4x}-\frac{3\,b^4}{2\,a^5}x^{-\frac{2}{3}}+3\,\frac{b^5}{a^6\sqrt[3]{x}}-3\,\frac{b^6\ln\left(a+b\sqrt[3]{x}\right)}{a^7}+\frac{b^6\ln(x)}{a^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*x^(1/3))/x^3,x)
```

```
[Out] -1/2/a/x^2+3/5*b/a^2/x^(5/3)-3/4*b^2/a^3/x^(4/3)+b^3/a^4/x-3/2*b^
4/a^5/x^(2/3)+3*b^5/a^6/x^(1/3)-3*b^6*ln(a+b*x^(1/3))/a^7+b^6*ln(
x)/a^7
```

Maxima [A] time = 1.4387, size = 116, normalized size = 1.12

$$-\frac{3\,b^6\log\left(bx^{\frac{1}{3}}+a\right)}{a^7}+\frac{b^6\log\left(x\right)}{a^7}+\frac{60\,b^5x^{\frac{5}{3}}-30\,ab^4x^{\frac{4}{3}}+20\,a^2b^3x-15\,a^3b^2x^{\frac{2}{3}}+12\,a^4bx^{\frac{1}{3}}-10\,a^5}{20\,a^6x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + a)*x^3),x, algorithm="maxima")
```

```
[Out] -3*b^6*log(b*x^(1/3) + a)/a^7 + b^6*log(x)/a^7 + 1/20*(60*b^5*x^(
5/3) - 30*a*b^4*x^(4/3) + 20*a^2*b^3*x - 15*a^3*b^2*x^(2/3) + 12*
a^4*b*x^(1/3) - 10*a^5)/(a^6*x^2)
```

Fricas [A] time = 0.226224, size = 126, normalized size = 1.21

$$-\frac{60\,b^6x^2\log\left(bx^{\frac{1}{3}}+a\right)-60\,b^6x^2\log\left(x^{\frac{1}{3}}\right)-20\,a^3b^3x+10\,a^6-15\left(4\,ab^5x-a^4b^2\right)x^{\frac{2}{3}}+6\left(5\,a^2b^4x-2\,a^5b\right)x^{\frac{1}{3}}}{20\,a^7x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + a)*x^3),x, algorithm="fricas")
```

```
[Out] -1/20*(60*b^6*x^2*log(b*x^(1/3) + a) - 60*b^6*x^2*log(x^(1/3)) -
20*a^3*b^3*x + 10*a^6 - 15*(4*a*b^5*x - a^4*b^2)*x^(2/3) + 6*(5*a
^2*b^4*x - 2*a^5*b)*x^(1/3))/(a^7*x^2)
```

Sympy [A] time = 30.4538, size = 129, normalized size = 1.24

$$\begin{cases} \frac{\tilde{\infty}}{x^{\frac{7}{3}}} & \text{for}\: a = 0 \wedge b = 0 \\ -\frac{3}{7bx^{\frac{7}{3}}} & \text{for}\: a = 0 \\ -\frac{1}{2ax^2} & \text{for}\: b = 0 \\ -\frac{1}{2ax^2}+\frac{3b}{5a^2x^{\frac{5}{3}}}-\frac{3b^2}{4a^3x^{\frac{4}{3}}}+\frac{b^3}{a^4x}-\frac{3b^4}{2a^5x^{\frac{2}{3}}}+\frac{3b^5}{a^6\sqrt[3]{x}}+\frac{b^6\log\left(x\right)}{a^7}-\frac{3b^6\log\left(\frac{a}{b}+\sqrt[3]{x}\right)}{a^7} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*x**(1/3))/x**3,x)
```

```
[Out] Piecewise((zoo/x**(7/3), Eq(a, 0) & Eq(b, 0)), (-3/(7*b*x**(7/3))
, Eq(a, 0)), (-1/(2*a*x**2), Eq(b, 0)), (-1/(2*a*x**2) + 3*b/(5*a
**2*x**(5/3)) - 3*b**2/(4*a**3*x**(4/3)) + b**3/(a**4*x) - 3*b**4
/(2*a**5*x**(2/3)) + 3*b**5/(a**6*x**(1/3)) + b**6*log(x)/a**7 -
3*b**6*log(a/b + x**(1/3))/a**7, True))
```

GIAC/XCAS [A] time = 0.222569, size = 123, normalized size = 1.18

$$-\frac{3\,b^{6}\ln\left(\left|bx^{\frac{1}{3}}+a\right|\right)}{a^{7}}+\frac{b^{6}\ln\left(|x|\right)}{a^{7}}+\frac{60\,ab^{5}x^{\frac{5}{3}}-30\,a^{2}b^{4}x^{\frac{4}{3}}+20\,a^{3}b^{3}x-15\,a^{4}b^{2}x^{\frac{2}{3}}+12\,a^{5}bx^{\frac{1}{3}}-10\,a^{6}}{20\,a^{7}x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + a)*x^3),x, algorithm="giac")
```

```
[Out] -3*b^6*ln(abs(b*x^(1/3) + a))/a^7 + b^6*ln(abs(x))/a^7 + 1/20*(60
*a*b^5*x^(5/3) - 30*a^2*b^4*x^(4/3) + 20*a^3*b^3*x - 15*a^4*b^2*x
^(2/3) + 12*a^5*b*x^(1/3) - 10*a^6)/(a^7*x^2)
```

3.2356 $\int \frac{1}{\left(a+b\sqrt[3]{x}\right)x^4}\,dx$

Optimal. Leaf size=149

$$\frac{3b^9\log\left(a+b\sqrt[3]{x}\right)}{a^{10}}-\frac{b^9\log(x)}{a^{10}}-\frac{3b^8}{a^9\sqrt[3]{x}}+\frac{3b^7}{2a^8x^{2/3}}-\frac{b^6}{a^7x}+\frac{3b^5}{4a^6x^{4/3}}-\frac{3b^4}{5a^5x^{5/3}}+\frac{b^3}{2a^4x^2}-\frac{3b^2}{7a^3x^{7/3}}+\frac{3b}{8a^2x^{8/3}}-\frac{1}{3ax^3}$$

```
[Out] -1/(3*a*x^3) + (3*b)/(8*a^2*x^(8/3)) - (3*b^2)/(7*a^3*x^(7/3)) +
b^3/(2*a^4*x^2) - (3*b^4)/(5*a^5*x^(5/3)) + (3*b^5)/(4*a^6*x^(4/3
)) - b^6/(a^7*x) + (3*b^7)/(2*a^8*x^(2/3)) - (3*b^8)/(a^9*x^(1/3)
) + (3*b^9*Log[a + b*x^(1/3)])/a^10 - (b^9*Log[x])/a^10
```

Rubi [A] time = 0.181564, antiderivative size = 149, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{3b^9\log\left(a+b\sqrt[3]{x}\right)}{a^{10}}-\frac{b^9\log(x)}{a^{10}}-\frac{3b^8}{a^9\sqrt[3]{x}}+\frac{3b^7}{2a^8x^{2/3}}-\frac{b^6}{a^7x}+\frac{3b^5}{4a^6x^{4/3}}-\frac{3b^4}{5a^5x^{5/3}}+\frac{b^3}{2a^4x^2}-\frac{3b^2}{7a^3x^{7/3}}+\frac{3b}{8a^2x^{8/3}}-\frac{1}{3ax^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b*x^(1/3))*x^4),x]
```

```
[Out] -1/(3*a*x^3) + (3*b)/(8*a^2*x^(8/3)) - (3*b^2)/(7*a^3*x^(7/3)) +
b^3/(2*a^4*x^2) - (3*b^4)/(5*a^5*x^(5/3)) + (3*b^5)/(4*a^6*x^(4/3
)) - b^6/(a^7*x) + (3*b^7)/(2*a^8*x^(2/3)) - (3*b^8)/(a^9*x^(1/3)
) + (3*b^9*Log[a + b*x^(1/3)])/a^10 - (b^9*Log[x])/a^10
```

Rubi in Sympy [A] time = 28.153, size = 150, normalized size = 1.01

$$-\frac{1}{3ax^3}+\frac{3b}{8a^2x^{\frac{8}{3}}}-\frac{3b^2}{7a^3x^{\frac{7}{3}}}+\frac{b^3}{2a^4x^2}-\frac{3b^4}{5a^5x^{\frac{5}{3}}}+\frac{3b^5}{4a^6x^{\frac{4}{3}}}-\frac{b^6}{a^7x}+\frac{3b^7}{2a^8x^{\frac{2}{3}}}-\frac{3b^8}{a^9\sqrt[3]{x}}-\frac{3b^9\log\left(\sqrt[3]{x}\right)}{a^{10}}+\frac{3b^9\log\left(a+b\sqrt[3]{x}\right)}{a^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*x**(1/3))/x**4,x)
```

```
[Out] -1/(3*a*x**3) + 3*b/(8*a**2*x**(8/3)) - 3*b**2/(7*a**3*x**(7/3))
+ b**3/(2*a**4*x**2) - 3*b**4/(5*a**5*x**(5/3)) + 3*b**5/(4*a**6*
x**(4/3)) - b**6/(a**7*x) + 3*b**7/(2*a**8*x**(2/3)) - 3*b**8/(a*
*9*x**(1/3)) - 3*b**9*log(x**(1/3))/a**10 + 3*b**9*log(a + b*x**(
1/3))/a**10
```

Mathematica [A] time = 0.0913375, size = 132, normalized size = 0.89

$$\frac{\frac{a\left(-280a^8+315a^7b\sqrt[3]{x}-360a^6b^2x^{2/3}+420a^5b^3x-504a^4b^4x^{4/3}+630a^3b^5x^{5/3}-840a^2b^6x^2+1260ab^7x^{7/3}-2520b^8x^{8/3}\right)}{x^3}+2520b^9\log\left(a+b\sqrt[3]{x}\right)-840b^9}{840a^{10}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b*x^(1/3))*x^4),x]
```

```
[Out] ((a*(-280*a^8 + 315*a^7*b*x^(1/3) - 360*a^6*b^2*x^(2/3) + 420*a^5
*b^3*x - 504*a^4*b^4*x^(4/3) + 630*a^3*b^5*x^(5/3) - 840*a^2*b^6*
x^2 + 1260*a*b^7*x^(7/3) - 2520*b^8*x^(8/3)))/x^3 + 2520*b^9*Log[
a + b*x^(1/3)] - 840*b^9*Log[x])/(840*a^10)
```

Maple [A] time = 0.017, size = 122, normalized size = 0.8

$$-\frac{1}{3\,ax^{3}}+\frac{3\,b}{8\,a^{2}}x^{-\frac{8}{3}}-\frac{3\,b^{2}}{7\,a^{3}}x^{-\frac{7}{3}}+\frac{b^{3}}{2\,a^{4}x^{2}}-\frac{3\,b^{4}}{5\,a^{5}}x^{-\frac{5}{3}}+\frac{3\,b^{5}}{4\,a^{6}}x^{-\frac{4}{3}}-\frac{b^{6}}{a^{7}x}+\frac{3\,b^{7}}{2\,a^{8}}x^{-\frac{2}{3}}-3\,\frac{b^{8}}{a^{9}\sqrt[3]{x}}+3\,\frac{b^{9}\ln\left(a+b\sqrt[3]{x}\right)}{a^{10}}-\frac{b^{9}\ln\left(x\right)}{a^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*x^(1/3))/x^4,x)
```

```
[Out] -1/3/a/x^3+3/8*b/a^2/x^(8/3)-3/7*b^2/a^3/x^(7/3)+1/2*b^3/a^4/x^2-
3/5*b^4/a^5/x^(5/3)+3/4*b^5/a^6/x^(4/3)-b^6/a^7/x+3/2*b^7/a^8/x^(
2/3)-3*b^8/a^9/x^(1/3)+3*b^9*ln(a+b*x^(1/3))/a^10-b^9*ln(x)/a^10
```

Maxima [A] time = 1.44351, size = 162, normalized size = 1.09

$$\frac{3\,b^{9}\log\left(bx^{\frac{1}{3}}+a\right)}{a^{10}}-\frac{b^{9}\log\left(x\right)}{a^{10}}-\frac{2520\,b^{8}x^{\frac{8}{3}}-1260\,ab^{7}x^{\frac{7}{3}}+840\,a^{2}b^{6}x^{2}-630\,a^{3}b^{5}x^{\frac{5}{3}}+504\,a^{4}b^{4}x^{\frac{4}{3}}-420\,a^{5}b^{3}x+360\,a^{6}b^{2}x^{\frac{2}{3}}-315\,a^{7}bx^{\frac{1}{3}}+280\,a^{8}}{840\,a^{9}x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + a)*x^4),x, algorithm="maxima")
```

```
[Out] 3*b^9*log(b*x^(1/3) + a)/a^10 - b^9*log(x)/a^10 - 1/840*(2520*b^8
*x^(8/3) - 1260*a*b^7*x^(7/3) + 840*a^2*b^6*x^2 - 630*a^3*b^5*x^(
5/3) + 504*a^4*b^4*x^(4/3) - 420*a^5*b^3*x + 360*a^6*b^2*x^(2/3)
- 315*a^7*b*x^(1/3) + 280*a^8)/(a^9*x^3)
```

Fricas [A] time = 0.227347, size = 170, normalized size = 1.14

$$\frac{2520\,b^{9}x^{3}\log\left(bx^{\frac{1}{3}}+a\right)-2520\,b^{9}x^{3}\log\left(x^{\frac{1}{3}}\right)-840\,a^{3}b^{6}x^{2}+420\,a^{6}b^{3}x-280\,a^{9}-90\,\left(28\,ab^{8}x^{2}-7\,a^{4}b^{5}x+4\,a^{7}b^{2}\right)x^{\frac{2}{3}}+6}{840\,a^{10}x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + a)*x^4),x, algorithm="fricas")
```

```
[Out] 1/840*(2520*b^9*x^3*log(b*x^(1/3) + a) - 2520*b^9*x^3*log(x^(1/3)
) - 840*a^3*b^6*x^2 + 420*a^6*b^3*x - 280*a^9 - 90*(28*a*b^8*x^2
- 7*a^4*b^5*x + 4*a^7*b^2)*x^(2/3) + 63*(20*a^2*b^7*x^2 - 8*a^5*b
^4*x + 5*a^8*b)*x^(1/3))/(a^10*x^3)
```

Sympy [A] time = 87.8231, size = 172, normalized size = 1.15

$$\begin{cases} \frac{\tilde{\infty}}{x^{\frac{10}{3}}} & \text{for } a = 0 \wedge b = 0 \\ -\frac{3}{10bx^{\frac{10}{3}}} & \text{for } a = 0 \\ -\frac{1}{3ax^3} & \text{for } b = 0 \\ -\frac{1}{3ax^3} + \frac{3b}{8a^2x^{\frac{8}{3}}} - \frac{3b^2}{7a^3x^{\frac{7}{3}}} + \frac{b^3}{2a^4x^2} - \frac{3b^4}{5a^5x^{\frac{5}{3}}} + \frac{3b^5}{4a^6x^{\frac{4}{3}}} - \frac{b^6}{a^7x} + \frac{3b^7}{2a^8x^{\frac{2}{3}}} - \frac{3b^8}{a^9\sqrt[3]{x}} - \frac{b^9\log(x)}{a^{10}} + \frac{3b^9\log\left(\frac{a}{b} + \sqrt[3]{x}\right)}{a^{10}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*x**(1/3))/x**4,x)
```

```
[Out] Piecewise((zoo/x**(10/3), Eq(a, 0) & Eq(b, 0)), (-3/(10*b*x**(10/
3)), Eq(a, 0)), (-1/(3*a*x**3), Eq(b, 0)), (-1/(3*a*x**3) + 3*b/(
8*a**2*x**(8/3)) - 3*b**2/(7*a**3*x**(7/3)) + b**3/(2*a**4*x**2)
- 3*b**4/(5*a**5*x**(5/3)) + 3*b**5/(4*a**6*x**(4/3)) - b**6/(a**
7*x) + 3*b**7/(2*a**8*x**(2/3)) - 3*b**8/(a**9*x**(1/3)) - b**9*l
og(x)/a**10 + 3*b**9*log(a/b + x**(1/3))/a**10, True))
```

GIAC/XCAS [A] time = 0.218496, size = 169, normalized size = 1.13

$$\frac{3\,b^9\ln\left(\left|bx^{\frac{1}{3}} + a\right|\right)}{a^{10}} - \frac{b^9\ln\left(|x|\right)}{a^{10}} - \frac{2520\,ab^8x^{\frac{8}{3}} - 1260\,a^2b^7x^{\frac{7}{3}} + 840\,a^3b^6x^2 - 630\,a^4b^5x^{\frac{5}{3}} + 504\,a^5b^4x^{\frac{4}{3}} - 420\,a^6b^3x + 360\,a^7b^2x^{\frac{2}{3}} - 315\,a^8bx^{\frac{1}{3}} + 280\,a^9}{840\,a^{10}x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + a)*x^4),x, algorithm="giac")
```

```
[Out] 3*b^9*ln(abs(b*x^(1/3) + a))/a^10 - b^9*ln(abs(x))/a^10 - 1/840*(
2520*a*b^8*x^(8/3) - 1260*a^2*b^7*x^(7/3) + 840*a^3*b^6*x^2 - 630
*a^4*b^5*x^(5/3) + 504*a^5*b^4*x^(4/3) - 420*a^6*b^3*x + 360*a^7*
b^2*x^(2/3) - 315*a^8*b*x^(1/3) + 280*a^9)/(a^10*x^3)
```

3.2357 $\int \frac{1}{\left(2+b\sqrt[3]{x}\right)x}\,dx$

Optimal. Leaf size=21

$$\frac{\log(x)}{2}-\frac{3}{2}\log\left(b\sqrt[3]{x}+2\right)$$

[Out] (-3*Log[2 + b*x^(1/3)])/2 + Log[x]/2

Rubi [A] time = 0.0276904, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{\log(x)}{2}-\frac{3}{2}\log\left(b\sqrt[3]{x}+2\right)$$

Antiderivative was successfully verified.

[In] Int[1/((2 + b*x^(1/3))*x),x]

[Out] (-3*Log[2 + b*x^(1/3)])/2 + Log[x]/2

Rubi in Sympy [A] time = 4.59721, size = 22, normalized size = 1.05

$$\frac{3\log\left(\sqrt[3]{x}\right)}{2}-\frac{3\log\left(b\sqrt[3]{x}+2\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(1/(2+b*x**(1/3))/x,x)

[Out] 3*log(x**(1/3))/2 - 3*log(b*x**(1/3) + 2)/2

Mathematica [A] time = 0.00922767, size = 25, normalized size = 1.19

$$\frac{3}{2}\log\left(\sqrt[3]{x}\right)-\frac{3}{2}\log\left(b\sqrt[3]{x}+2\right)$$

Antiderivative was successfully verified.

[In] Integrate[1/((2 + b*x^(1/3))*x),x]

[Out] (-3*Log[2 + b*x^(1/3)])/2 + (3*Log[x^(1/3)])/2

Maple [A] time = 0.004, size = 16, normalized size = 0.8

$$-\frac{3}{2}\ln\left(2+b\sqrt[3]{x}\right)+\frac{\ln(x)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(2+b*x^(1/3))/x,x)

[Out] -3/2*ln(2+b*x^(1/3))+1/2*ln(x)

Maxima [A] time = 1.4382, size = 20, normalized size = 0.95

$$-\frac{3}{2}\log\left(bx^{\frac{1}{3}}+2\right)+\frac{1}{2}\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + 2)*x),x, algorithm="maxima")
```

```
[Out] -3/2*log(b*x^(1/3) + 2) + 1/2*log(x)
```

Fricas [A] time = 0.219521, size = 23, normalized size = 1.1

$$-\frac{3}{2}\log\left(bx^{\frac{1}{3}}+2\right)+\frac{3}{2}\log\left(x^{\frac{1}{3}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + 2)*x),x, algorithm="fricas")
```

```
[Out] -3/2*log(b*x^(1/3) + 2) + 3/2*log(x^(1/3))
```

Sympy [A] time = 2.265, size = 22, normalized size = 1.05

$$\begin{cases} \frac{\log\left(x\right)}{2}-\frac{3\log\left(\sqrt[3]{x}+\frac{2}{b}\right)}{2} & \text{for}\ b\neq 0\\ \frac{\log\left(x\right)}{2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(2+b*x**(1/3))/x,x)
```

```
[Out] Piecewise((log(x)/2 - 3*log(x**(1/3) + 2/b)/2, Ne(b, 0)), (log(x)
/2, True))
```

GIAC/XCAS [A] time = 0.220211, size = 23, normalized size = 1.1

$$-\frac{3}{2}\ln\left(\left|bx^{\frac{1}{3}}+2\right|\right)+\frac{1}{2}\ln\left(\left|x\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + 2)*x),x, algorithm="giac")
```

```
[Out] -3/2*ln(abs(b*x^(1/3) + 2)) + 1/2*ln(abs(x))
```

3.2358 $\int \frac{x^3}{\left(a+b\sqrt[3]{x}\right)^2}\,dx$

Optimal. Leaf size=171

$$\frac{3a^{11}}{b^{12}\left(a+b\sqrt[3]{x}\right)}+\frac{33a^{10}\log\left(a+b\sqrt[3]{x}\right)}{b^{12}}-\frac{30a^9\sqrt[3]{x}}{b^{11}}+\frac{27a^8x^{2/3}}{2b^{10}}-\frac{8a^7x}{b^9}+\frac{21a^6x^{4/3}}{4b^8}-\frac{18a^5x^{5/3}}{5b^7}+\frac{5a^4x^2}{2b^6}-\frac{12a^3x^{7/3}}{7b^5}+\frac{9a^2x^{8/3}}{8b^4}-\frac{2ax^3}{3b^3}+\frac{3x^{10/3}}{10b^2}$$

```
[Out] (3*a^11)/(b^12*(a + b*x^(1/3))) - (30*a^9*x^(1/3))/b^11 + (27*a^8
*x^(2/3))/(2*b^10) - (8*a^7*x)/b^9 + (21*a^6*x^(4/3))/(4*b^8) - (
18*a^5*x^(5/3))/(5*b^7) + (5*a^4*x^2)/(2*b^6) - (12*a^3*x^(7/3))/
(7*b^5) + (9*a^2*x^(8/3))/(8*b^4) - (2*a*x^3)/(3*b^3) + (3*x^(10/
3))/(10*b^2) + (33*a^10*Log[a + b*x^(1/3)])/b^12
```

Rubi [A] time = 0.297123, antiderivative size = 171, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{3a^{11}}{b^{12}\left(a+b\sqrt[3]{x}\right)}+\frac{33a^{10}\log\left(a+b\sqrt[3]{x}\right)}{b^{12}}-\frac{30a^9\sqrt[3]{x}}{b^{11}}+\frac{27a^8x^{2/3}}{2b^{10}}-\frac{8a^7x}{b^9}+\frac{21a^6x^{4/3}}{4b^8}-\frac{18a^5x^{5/3}}{5b^7}+\frac{5a^4x^2}{2b^6}-\frac{12a^3x^{7/3}}{7b^5}+\frac{9a^2x^{8/3}}{8b^4}-\frac{2ax^3}{3b^3}+\frac{3x^{10/3}}{10b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(a + b*x^(1/3))^2,x]
```

```
[Out] (3*a^11)/(b^12*(a + b*x^(1/3))) - (30*a^9*x^(1/3))/b^11 + (27*a^8
*x^(2/3))/(2*b^10) - (8*a^7*x)/b^9 + (21*a^6*x^(4/3))/(4*b^8) - (
18*a^5*x^(5/3))/(5*b^7) + (5*a^4*x^2)/(2*b^6) - (12*a^3*x^(7/3))/
(7*b^5) + (9*a^2*x^(8/3))/(8*b^4) - (2*a*x^3)/(3*b^3) + (3*x^(10/
3))/(10*b^2) + (33*a^10*Log[a + b*x^(1/3)])/b^12
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{3a^{11}}{b^{12}\left(a+b\sqrt[3]{x}\right)}+\frac{33a^{10}\log\left(a+b\sqrt[3]{x}\right)}{b^{12}}-\frac{30a^9\sqrt[3]{x}}{b^{11}}+\frac{27a^8\int^{\sqrt[3]{x}}x\,dx}{b^{10}}-\frac{8a^7x}{b^9}+\frac{21a^6x^{\frac{4}{3}}}{4b^8}-\frac{18a^5x^{\frac{5}{3}}}{5b^7}+\frac{5a^4x^2}{2b^6}-\frac{12a^3x^{\frac{7}{3}}}{7b^5}+\frac{9a^2x^{\frac{8}{3}}}{8b^4}-\frac{2ax^3}{3b^3}+\frac{3x^{\frac{10}{3}}}{10b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(a+b*x**(1/3))**2,x)
```

```
[Out] 3*a**11/(b**12*(a + b*x**(1/3))) + 33*a**10*log(a + b*x**(1/3))/b
**12 - 30*a**9*x**(1/3)/b**11 + 27*a**8*Integral(x, (x, x**(1/3))
)/b**10 - 8*a**7*x/b**9 + 21*a**6*x**(4/3)/(4*b**8) - 18*a**5*x**
(5/3)/(5*b**7) + 5*a**4*x**2/(2*b**6) - 12*a**3*x**(7/3)/(7*b**5)
 + 9*a**2*x**(8/3)/(8*b**4) - 2*a*x**3/(3*b**3) + 3*x**(10/3)/(10
*b**2)
```

Mathematica [A] time = 0.119952, size = 171, normalized size = 1.

$$\frac{3a^{11}}{b^{12}\left(a+b\sqrt[3]{x}\right)}+\frac{33a^{10}\log\left(a+b\sqrt[3]{x}\right)}{b^{12}}-\frac{30a^9\sqrt[3]{x}}{b^{11}}+\frac{27a^8x^{2/3}}{2b^{10}}-\frac{8a^7x}{b^9}+\frac{21a^6x^{4/3}}{4b^8}-\frac{18a^5x^{5/3}}{5b^7}+\frac{5a^4x^2}{2b^6}-\frac{12a^3x^{7/3}}{7b^5}+\frac{9a^2x^{8/3}}{8b^4}-\frac{2ax^3}{3b^3}+\frac{3x^{10/3}}{10b^2}$$

Antiderivative was successfully verified.

```
[In]   Integrate[x^3/(a + b*x^(1/3))^2,x]
```

```
[Out] (3*a^11)/(b^12*(a + b*x^(1/3))) - (30*a^9*x^(1/3))/b^11 + (27*a^8
*x^(2/3))/(2*b^10) - (8*a^7*x)/b^9 + (21*a^6*x^(4/3))/(4*b^8) - (
18*a^5*x^(5/3))/(5*b^7) + (5*a^4*x^2)/(2*b^6) - (12*a^3*x^(7/3))/
(7*b^5) + (9*a^2*x^(8/3))/(8*b^4) - (2*a*x^3)/(3*b^3) + (3*x^(10/
3))/(10*b^2) + (33*a^10*Log[a + b*x^(1/3)])/b^12
```

Maple [A] time = 0.012, size = 138, normalized size = 0.8

$$3\frac{a^{11}}{b^{12}\left(a+b\sqrt[3]{x}\right)}-30\frac{a^{9}\sqrt[3]{x}}{b^{11}}+\frac{27a^{8}}{2b^{10}}x^{\frac{2}{3}}-8\frac{a^{7}x}{b^{9}}+\frac{21a^{6}}{4b^{8}}x^{\frac{4}{3}}-\frac{18a^{5}}{5b^{7}}x^{\frac{5}{3}}+\frac{5a^{4}x^{2}}{2b^{6}}-\frac{12a^{3}}{7b^{5}}x^{\frac{7}{3}}+\frac{9a^{2}}{8b^{4}}x^{\frac{8}{3}}-\frac{2ax^{3}}{3b^{3}}+\frac{3}{10b^{2}}x^{\frac{10}{3}}+33\frac{a^{10}\ln\left(a+b\sqrt[3]{x}\right)}{b^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^3/(a+b*x^(1/3))^2,x)
```

```
[Out] 3*a^11/b^12/(a+b*x^(1/3))-30*a^9*x^(1/3)/b^11+27/2*a^8*x^(2/3)/b^
10-8*a^7*x/b^9+21/4*a^6*x^(4/3)/b^8-18/5*a^5*x^(5/3)/b^7+5/2*a^4*
x^2/b^6-12/7*a^3*x^(7/3)/b^5+9/8*a^2*x^(8/3)/b^4-2/3*a*x^3/b^3+3/
10*x^(10/3)/b^2+33*a^10*ln(a+b*x^(1/3))/b^12
```

Maxima [A] time = 1.44281, size = 266, normalized size = 1.56

$$\frac{33a^{10}\log\left(bx^{\frac{1}{3}}+a\right)}{b^{12}}+\frac{3\left(bx^{\frac{1}{3}}+a\right)^{10}}{10b^{12}}-\frac{11\left(bx^{\frac{1}{3}}+a\right)^{9}a}{3b^{12}}+\frac{165\left(bx^{\frac{1}{3}}+a\right)^{8}a^{2}}{8b^{12}}-\frac{495\left(bx^{\frac{1}{3}}+a\right)^{7}a^{3}}{7b^{12}}+\frac{165\left(bx^{\frac{1}{3}}+a\right)^{6}a^{4}}{b^{12}}-\frac{1386\left(bx^{\frac{1}{3}}+a\right)^{5}a^{5}}{5b^{12}}+\frac{693\left(bx^{\frac{1}{3}}+a\right)^{4}a^{6}}{2b^{12}}-\frac{330\left(bx^{\frac{1}{3}}+a\right)^{3}a^{7}}{b^{12}}+\frac{495\left(bx^{\frac{1}{3}}+a\right)^{2}a^{8}}{2b^{12}}-\frac{165\left(bx^{\frac{1}{3}}+a\right)a^{9}}{b^{12}}+\frac{3a^{11}}{\left(bx^{\frac{1}{3}}+a\right)b^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^3/(b*x^(1/3) + a)^2,x, algorithm="maxima")
```

```
[Out] 33*a^10*log(b*x^(1/3) + a)/b^12 + 3/10*(b*x^(1/3) + a)^10/b^12 -
11/3*(b*x^(1/3) + a)^9*a/b^12 + 165/8*(b*x^(1/3) + a)^8*a^2/b^12
- 495/7*(b*x^(1/3) + a)^7*a^3/b^12 + 165*(b*x^(1/3) + a)^6*a^4/b^
12 - 1386/5*(b*x^(1/3) + a)^5*a^5/b^12 + 693/2*(b*x^(1/3) + a)^4*
a^6/b^12 - 330*(b*x^(1/3) + a)^3*a^7/b^12 + 495/2*(b*x^(1/3) + a)
^2*a^8/b^12 - 165*(b*x^(1/3) + a)*a^9/b^12 + 3*a^11/((b*x^(1/3) +
 a)*b^12)
```

Fricas [A] time = 0.219541, size = 215, normalized size = 1.26

$$\frac{385a^{2}b^{9}x^{3}-924a^{5}b^{6}x^{2}+4620a^{8}b^{3}x+2520a^{11}+27720\left(a^{10}bx^{\frac{1}{3}}+a^{11}\right)\log\left(bx^{\frac{1}{3}}+a\right)+9\left(28b^{11}x^{3}-55a^{3}b^{8}x^{2}+154a^{6}b\right.}{840\left(b^{13}x^{\frac{1}{3}}+ab^{12}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^(1/3) + a)^2,x, algorithm="fricas")
```

```
[Out] 1/840*(385*a^2*b^9*x^3 - 924*a^5*b^6*x^2 + 4620*a^8*b^3*x + 2520*
a^11 + 27720*(a^10*b*x^(1/3) + a^11)*log(b*x^(1/3) + a) + 9*(28*b
^11*x^3 - 55*a^3*b^8*x^2 + 154*a^6*b^5*x - 1540*a^9*b^2)*x^(2/3)
- 2*(154*a*b^10*x^3 - 330*a^4*b^7*x^2 + 1155*a^7*b^4*x + 12600*a^
10*b)*x^(1/3))/(b^13*x^(1/3) + a*b^12)
```

Sympy [A] time = 138.042, size = 444, normalized size = 2.6

$$\frac{27720a^{11}x^{\frac{308}{3}}\log\left(1+\frac{b\sqrt[3]{x}}{a}\right)}{840ab^{12}x^{\frac{308}{3}}+840b^{13}x^{103}}+\frac{27720a^{10}bx^{103}\log\left(1+\frac{b\sqrt[3]{x}}{a}\right)}{840ab^{12}x^{\frac{308}{3}}+840b^{13}x^{103}}-\frac{27720a^{10}bx^{103}}{840ab^{12}x^{\frac{308}{3}}+840b^{13}x^{103}}-\frac{13860a^{9}b^{2}x^{\frac{310}{3}}}{840ab^{12}x^{\frac{308}{3}}+840b^{13}x^{103}}+\frac{4620a^{8}b^{3}x^{\frac{311}{3}}}{840ab^{12}x^{\frac{308}{3}}+840b^{13}x^{103}}-\frac{2310a^{7}b^{4}x^{104}}{840ab^{12}x^{\frac{308}{3}}+840b^{13}x^{103}}+\frac{1386a^{6}b^{5}x^{\frac{313}{3}}}{840ab^{12}x^{\frac{308}{3}}+840b^{13}x^{103}}-\frac{924a^{5}b^{6}x^{\frac{314}{3}}}{840ab^{12}x^{\frac{308}{3}}+840b^{13}x^{103}}+\frac{660a^{4}b^{7}x^{105}}{840ab^{12}x^{\frac{308}{3}}+840b^{13}x^{103}}-\frac{495a^{3}b^{8}x^{\frac{316}{3}}}{840ab^{12}x^{\frac{308}{3}}+840b^{13}x^{103}}+\frac{385a^{2}b^{9}x^{\frac{317}{3}}}{840ab^{12}x^{\frac{308}{3}}+840b^{13}x^{103}}-\frac{308ab^{10}x^{106}}{840ab^{12}x^{\frac{308}{3}}+840b^{13}x^{103}}+\frac{252b^{11}x^{\frac{319}{3}}}{840ab^{12}x^{\frac{308}{3}}+840b^{13}x^{103}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(a+b*x**(1/3))**2,x)
```

```
[Out] 27720*a**11*x**(308/3)*log(1 + b*x**(1/3)/a)/(840*a*b**12*x**(308
/3) + 840*b**13*x**103) + 27720*a**10*b*x**103*log(1 + b*x**(1/3)
/a)/(840*a*b**12*x**(308/3) + 840*b**13*x**103) - 27720*a**10*b*x
**103/(840*a*b**12*x**(308/3) + 840*b**13*x**103) - 13860*a**9*b*
*2*x**(310/3)/(840*a*b**12*x**(308/3) + 840*b**13*x**103) + 4620*
a**8*b**3*x**(311/3)/(840*a*b**12*x**(308/3) + 840*b**13*x**103)
- 2310*a**7*b**4*x**104/(840*a*b**12*x**(308/3) + 840*b**13*x**10
3) + 1386*a**6*b**5*x**(313/3)/(840*a*b**12*x**(308/3) + 840*b**1
3*x**103) - 924*a**5*b**6*x**(314/3)/(840*a*b**12*x**(308/3) + 84
0*b**13*x**103) + 660*a**4*b**7*x**105/(840*a*b**12*x**(308/3) +
840*b**13*x**103) - 495*a**3*b**8*x**(316/3)/(840*a*b**12*x**(308
/3) + 840*b**13*x**103) + 385*a**2*b**9*x**(317/3)/(840*a*b**12*x
**(308/3) + 840*b**13*x**103) - 308*a*b**10*x**106/(840*a*b**12*x
**(308/3) + 840*b**13*x**103) + 252*b**11*x**(319/3)/(840*a*b**12
*x**(308/3) + 840*b**13*x**103)
```

GIAC/XCAS [A] time = 0.223925, size = 194, normalized size = 1.13

$$\frac{33\,a^{10}\ln\left(\left|bx^{\frac{1}{3}}+a\right|\right)}{b^{12}}+\frac{3\,a^{11}}{\left(bx^{\frac{1}{3}}+a\right)b^{12}}+\frac{252\,b^{18}x^{\frac{10}{3}}-560\,ab^{17}x^{3}+945\,a^{2}b^{16}x^{\frac{8}{3}}-1440\,a^{3}b^{15}x^{\frac{7}{3}}+2100\,a^{4}b^{14}x^{2}-3024\,a^{5}b^{13}x^{\frac{5}{3}}+4410\,a^{6}b^{12}x^{\frac{4}{3}}-6720\,a^{7}b^{11}x+113}{840\,b^{20}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^(1/3) + a)^2,x, algorithm="giac")
```

```
[Out] 33*a^10*ln(abs(b*x^(1/3) + a))/b^12 + 3*a^11/((b*x^(1/3) + a)*b^1
2) + 1/840*(252*b^18*x^(10/3) - 560*a*b^17*x^3 + 945*a^2*b^16*x^(
8/3) - 1440*a^3*b^15*x^(7/3) + 2100*a^4*b^14*x^2 - 3024*a^5*b^13*
x^(5/3) + 4410*a^6*b^12*x^(4/3) - 6720*a^7*b^11*x + 11340*a^8*b^1
0*x^(2/3) - 25200*a^9*b^9*x^(1/3))/b^20
```

3.2359 $\int \frac{x^2}{\left(a+b\sqrt[3]{x}\right)^2}\,dx$

Optimal. Leaf size=122

$$-\frac{3a^8}{b^9\left(a+b\sqrt[3]{x}\right)}-\frac{24a^7\log\left(a+b\sqrt[3]{x}\right)}{b^9}+\frac{21a^6\sqrt[3]{x}}{b^8}-\frac{9a^5x^{2/3}}{b^7}+\frac{5a^4x}{b^6}-\frac{3a^3x^{4/3}}{b^5}+\frac{9a^2x^{5/3}}{5b^4}-\frac{ax^2}{b^3}+\frac{3x^{7/3}}{7b^2}$$

```
[Out] (-3*a^8)/(b^9*(a + b*x^(1/3))) + (21*a^6*x^(1/3))/b^8 - (9*a^5*x^
(2/3))/b^7 + (5*a^4*x)/b^6 - (3*a^3*x^(4/3))/b^5 + (9*a^2*x^(5/3)
)/(5*b^4) - (a*x^2)/b^3 + (3*x^(7/3))/(7*b^2) - (24*a^7*Log[a + b
*x^(1/3)])/b^9
```

Rubi [A] time = 0.209587, antiderivative size = 122, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{3a^8}{b^9\left(a+b\sqrt[3]{x}\right)}-\frac{24a^7\log\left(a+b\sqrt[3]{x}\right)}{b^9}+\frac{21a^6\sqrt[3]{x}}{b^8}-\frac{9a^5x^{2/3}}{b^7}+\frac{5a^4x}{b^6}-\frac{3a^3x^{4/3}}{b^5}+\frac{9a^2x^{5/3}}{5b^4}-\frac{ax^2}{b^3}+\frac{3x^{7/3}}{7b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b*x^(1/3))^2,x]
```

```
[Out] (-3*a^8)/(b^9*(a + b*x^(1/3))) + (21*a^6*x^(1/3))/b^8 - (9*a^5*x^
(2/3))/b^7 + (5*a^4*x)/b^6 - (3*a^3*x^(4/3))/b^5 + (9*a^2*x^(5/3)
)/(5*b^4) - (a*x^2)/b^3 + (3*x^(7/3))/(7*b^2) - (24*a^7*Log[a + b
*x^(1/3)])/b^9
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{3a^8}{b^9\left(a+b\sqrt[3]{x}\right)}-\frac{24a^7\log\left(a+b\sqrt[3]{x}\right)}{b^9}+\frac{21a^6\sqrt[3]{x}}{b^8}-\frac{18a^5\int^{\sqrt[3]{x}}x\,dx}{b^7}+\frac{5a^4x}{b^6}-\frac{3a^3x^{\frac{4}{3}}}{b^5}+\frac{9a^2x^{\frac{5}{3}}}{5b^4}-\frac{ax^2}{b^3}+\frac{3x^{\frac{7}{3}}}{7b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b*x**(1/3))**2,x)
```

```
[Out] -3*a**8/(b**9*(a + b*x**(1/3))) - 24*a**7*log(a + b*x**(1/3))/b**
9 + 21*a**6*x**(1/3)/b**8 - 18*a**5*Integral(x, (x, x**(1/3)))/b*
*7 + 5*a**4*x/b**6 - 3*a**3*x**(4/3)/b**5 + 9*a**2*x**(5/3)/(5*b*
*4) - a*x**2/b**3 + 3*x**(7/3)/(7*b**2)
```

Mathematica [A] time = 0.0868546, size = 122, normalized size = 1.

$$-\frac{3a^8}{b^9\left(a+b\sqrt[3]{x}\right)}-\frac{24a^7\log\left(a+b\sqrt[3]{x}\right)}{b^9}+\frac{21a^6\sqrt[3]{x}}{b^8}-\frac{9a^5x^{2/3}}{b^7}+\frac{5a^4x}{b^6}-\frac{3a^3x^{4/3}}{b^5}+\frac{9a^2x^{5/3}}{5b^4}-\frac{ax^2}{b^3}+\frac{3x^{7/3}}{7b^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a + b*x^(1/3))^2,x]
```

```
[Out] (-3*a^8)/(b^9*(a + b*x^(1/3))) + (21*a^6*x^(1/3))/b^8 - (9*a^5*x^
(2/3))/b^7 + (5*a^4*x)/b^6 - (3*a^3*x^(4/3))/b^5 + (9*a^2*x^(5/3)
)/(5*b^4) - (a*x^2)/b^3 + (3*x^(7/3))/(7*b^2) - (24*a^7*Log[a + b
*x^(1/3)])/b^9
```

Maple [A] time = 0.012, size = 105, normalized size = 0.9

$$-3\,{\frac{{a}^{8}}{{b}^{9} \left(a+b\sqrt[3]{x} \right) }}+21\,{\frac{{a}^{6}\sqrt[3]{x}}{{b}^{8}}}-9\,{\frac{{a}^{5}{x}^{2/3}}{{b}^{7}}}+5\,{\frac{{a}^{4}x}{{b}^{6}}}-3\,{\frac{{a}^{3}{x}^{4/3}}{{b}^{5}}}+{\frac{9\,{a}^{2}}{5\,{b}^{4}}{x}^{{\frac{5}{3}}}}-{\frac{a{x}^{2}}{{b}^{3}}}+{\frac{3}{7\,{b}^{2}}{x}^{{\frac{7}{3}}}}-24\,{\frac{{a}^{7}\ln \left(a+b\sqrt[3]{x} \right) }{{b}^{9}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^2/(a+b*x^(1/3))^2,x)
```

```
[Out] -3*a^8/b^9/(a+b*x^(1/3))+21*a^6*x^(1/3)/b^8-9*a^5*x^(2/3)/b^7+5*a
^4*x/b^6-3*a^3*x^(4/3)/b^5+9/5*a^2*x^(5/3)/b^4-a*x^2/b^3+3/7*x^(7
/3)/b^2-24*a^7*ln(a+b*x^(1/3))/b^9
```

Maxima [A] time = 1.44315, size = 197, normalized size = 1.61

$$-\frac{24\,a^{7}\log\left(bx^{\frac{1}{3}}+a\right)}{b^{9}}+\frac{3\,\left(bx^{\frac{1}{3}}+a\right)^{7}}{7\,b^{9}}-\frac{4\,\left(bx^{\frac{1}{3}}+a\right)^{6}a}{b^{9}}+\frac{84\,\left(bx^{\frac{1}{3}}+a\right)^{5}a^{2}}{5\,b^{9}}-\frac{42\,\left(bx^{\frac{1}{3}}+a\right)^{4}a^{3}}{b^{9}}+\frac{70\,\left(bx^{\frac{1}{3}}+a\right)^{3}a^{4}}{b^{9}}-\frac{84\,\left(bx^{\frac{1}{3}}+a\right)^{2}a^{5}}{b^{9}}+\frac{84\,\left(bx^{\frac{1}{3}}+a\right)a^{6}}{b^{9}}-\frac{3\,a^{8}}{\left(bx^{\frac{1}{3}}+a\right)b^{9}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^2/(b*x^(1/3) + a)^2,x, algorithm="maxima")
```

```
[Out] -24*a^7*log(b*x^(1/3) + a)/b^9 + 3/7*(b*x^(1/3) + a)^7/b^9 - 4*(b
*x^(1/3) + a)^6*a/b^9 + 84/5*(b*x^(1/3) + a)^5*a^2/b^9 - 42*(b*x^
(1/3) + a)^4*a^3/b^9 + 70*(b*x^(1/3) + a)^3*a^4/b^9 - 84*(b*x^(1/
3) + a)^2*a^5/b^9 + 84*(b*x^(1/3) + a)*a^6/b^9 - 3*a^8/((b*x^(1/3
) + a)*b^9)
```

Fricas [A] time = 0.219233, size = 170, normalized size = 1.39

$$\frac{28\,a^{2}b^{6}x^{2}-140\,a^{5}b^{3}x-105\,a^{8}-840\,\left(a^{7}bx^{\frac{1}{3}}+a^{8}\right)\log\left(bx^{\frac{1}{3}}+a\right)+3\,\left(5\,b^{8}x^{2}-14\,a^{3}b^{5}x+140\,a^{6}b^{2}\right)x^{\frac{2}{3}}-5\,\left(4\,ab^{7}x^{2}-14\,a\right.}{35\,\left(b^{10}x^{\frac{1}{3}}+ab^{9}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^2/(b*x^(1/3) + a)^2,x, algorithm="fricas")
```

```
[Out] 1/35*(28*a^2*b^6*x^2 - 140*a^5*b^3*x - 105*a^8 - 840*(a^7*b*x^(1/
3) + a^8)*log(b*x^(1/3) + a) + 3*(5*b^8*x^2 - 14*a^3*b^5*x + 140*
a^6*b^2)*x^(2/3) - 5*(4*a*b^7*x^2 - 14*a^4*b^4*x - 147*a^7*b)*x^(
1/3))/(b^10*x^(1/3) + a*b^9)
```

Sympy [A] time = 63.6099, size = 343, normalized size = 2.81

$$-\frac{840a^{8}x^{\frac{176}{3}}\log\left(1+\frac{b\sqrt[3]{x}}{a}\right)}{35ab^{9}x^{\frac{176}{3}}+35b^{10}x^{59}}-\frac{840a^{7}bx^{59}\log\left(1+\frac{b\sqrt[3]{x}}{a}\right)}{35ab^{9}x^{\frac{176}{3}}+35b^{10}x^{59}}+\frac{840a^{7}bx^{59}}{35ab^{9}x^{\frac{176}{3}}+35b^{10}x^{59}}+\frac{420a^{6}b^{2}x^{\frac{178}{3}}}{35ab^{9}x^{\frac{176}{3}}+35b^{10}x^{59}}-\frac{140a^{5}b^{3}x^{\frac{179}{3}}}{35ab^{9}x^{\frac{176}{3}}+35b^{10}x^{59}}+\frac{70a^{4}b^{4}x^{60}}{35ab^{9}x^{\frac{176}{3}}+35b^{10}x^{59}}-\frac{42a^{3}b^{5}x^{\frac{181}{3}}}{35ab^{9}x^{\frac{176}{3}}+35b^{10}x^{59}}+\frac{28a^{2}b^{6}x^{\frac{182}{3}}}{35ab^{9}x^{\frac{176}{3}}+35b^{10}x^{59}}-\frac{20ab^{7}x^{61}}{35ab^{9}x^{\frac{176}{3}}+35b^{10}x^{59}}+\frac{15b^{8}x^{\frac{184}{3}}}{35ab^{9}x^{\frac{176}{3}}+35b^{10}x^{59}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b*x**(1/3))**2,x)
```

```
[Out] -840*a**8*x**(176/3)*log(1 + b*x**(1/3)/a)/(35*a*b**9*x**(176/3)
+ 35*b**10*x**59) - 840*a**7*b*x**59*log(1 + b*x**(1/3)/a)/(35*a*
b**9*x**(176/3) + 35*b**10*x**59) + 840*a**7*b*x**59/(35*a*b**9*x
**(176/3) + 35*b**10*x**59) + 420*a**6*b**2*x**(178/3)/(35*a*b**9
*x**(176/3) + 35*b**10*x**59) - 140*a**5*b**3*x**(179/3)/(35*a*b*
*9*x**(176/3) + 35*b**10*x**59) + 70*a**4*b**4*x**60/(35*a*b**9*x
**(176/3) + 35*b**10*x**59) - 42*a**3*b**5*x**(181/3)/(35*a*b**9*
x**(176/3) + 35*b**10*x**59) + 28*a**2*b**6*x**(182/3)/(35*a*b**9
*x**(176/3) + 35*b**10*x**59) - 20*a*b**7*x**61/(35*a*b**9*x**(17
6/3) + 35*b**10*x**59) + 15*b**8*x**(184/3)/(35*a*b**9*x**(176/3)
 + 35*b**10*x**59)
```

GIAC/XCAS [A] time = 0.221702, size = 150, normalized size = 1.23

$$-\frac{24\,a^7\ln\left(\left|bx^{\frac{1}{3}}+a\right|\right)}{b^9}-\frac{3\,a^8}{\left(bx^{\frac{1}{3}}+a\right)b^9}+\frac{15\,b^{12}x^{\frac{7}{3}}-35\,ab^{11}x^2+63\,a^2b^{10}x^{\frac{5}{3}}-105\,a^3b^9x^{\frac{4}{3}}+175\,a^4b^8x-315\,a^5b^7x^{\frac{2}{3}}+735\,a^6b^6x^{\frac{1}{3}}}{35\,b^{14}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^(1/3) + a)^2,x, algorithm="giac")
```

```
[Out] -24*a^7*ln(abs(b*x^(1/3) + a))/b^9 - 3*a^8/((b*x^(1/3) + a)*b^9)
+ 1/35*(15*b^12*x^(7/3) - 35*a*b^11*x^2 + 63*a^2*b^10*x^(5/3) - 1
05*a^3*b^9*x^(4/3) + 175*a^4*b^8*x - 315*a^5*b^7*x^(2/3) + 735*a^
6*b^6*x^(1/3))/b^14
```

3.2360 $\int \frac{x}{\left(a+b\sqrt[3]{x}\right)^2}\,dx$

Optimal. Leaf size=85

$$\frac{3a^5}{b^6\left(a+b\sqrt[3]{x}\right)}+\frac{15a^4\log\left(a+b\sqrt[3]{x}\right)}{b^6}-\frac{12a^3\sqrt[3]{x}}{b^5}+\frac{9a^2x^{2/3}}{2b^4}-\frac{2ax}{b^3}+\frac{3x^{4/3}}{4b^2}$$

```
[Out] (3*a^5)/(b^6*(a + b*x^(1/3))) - (12*a^3*x^(1/3))/b^5 + (9*a^2*x^(
2/3))/(2*b^4) - (2*a*x)/b^3 + (3*x^(4/3))/(4*b^2) + (15*a^4*Log[a
 + b*x^(1/3)])/b^6
```

Rubi [A] time = 0.130913, antiderivative size = 85, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{3a^5}{b^6\left(a+b\sqrt[3]{x}\right)}+\frac{15a^4\log\left(a+b\sqrt[3]{x}\right)}{b^6}-\frac{12a^3\sqrt[3]{x}}{b^5}+\frac{9a^2x^{2/3}}{2b^4}-\frac{2ax}{b^3}+\frac{3x^{4/3}}{4b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b*x^(1/3))^2,x]
```

```
[Out] (3*a^5)/(b^6*(a + b*x^(1/3))) - (12*a^3*x^(1/3))/b^5 + (9*a^2*x^(
2/3))/(2*b^4) - (2*a*x)/b^3 + (3*x^(4/3))/(4*b^2) + (15*a^4*Log[a
 + b*x^(1/3)])/b^6
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{3a^5}{b^6\left(a+b\sqrt[3]{x}\right)}+\frac{15a^4\log\left(a+b\sqrt[3]{x}\right)}{b^6}-\frac{12a^3\sqrt[3]{x}}{b^5}+\frac{9a^2\int^{\sqrt[3]{x}}x\,dx}{b^4}-\frac{2ax}{b^3}+\frac{3x^{\frac{4}{3}}}{4b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b*x**(1/3))**2,x)
```

```
[Out] 3*a**5/(b**6*(a + b*x**(1/3))) + 15*a**4*log(a + b*x**(1/3))/b**6
 - 12*a**3*x**(1/3)/b**5 + 9*a**2*Integral(x, (x, x**(1/3)))/b**4
 - 2*a*x/b**3 + 3*x**(4/3)/(4*b**2)
```

Mathematica [A] time = 0.0466647, size = 80, normalized size = 0.94

$$\frac{\frac{12a^5}{a+b\sqrt[3]{x}}+60a^4\log\left(a+b\sqrt[3]{x}\right)-48a^3b\sqrt[3]{x}+18a^2b^2x^{2/3}-8ab^3x+3b^4x^{4/3}}{4b^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b*x^(1/3))^2,x]
```

```
[Out] ((12*a^5)/(a + b*x^(1/3)) - 48*a^3*b*x^(1/3) + 18*a^2*b^2*x^(2/3)
 - 8*a*b^3*x + 3*b^4*x^(4/3) + 60*a^4*Log[a + b*x^(1/3)])/(4*b^6)
```

Maple [A] time = 0.003, size = 72, normalized size = 0.9

$$3\,\frac{a^5}{b^6\left(a+b\sqrt[3]{x}\right)}-12\,\frac{a^3\sqrt[3]{x}}{b^5}+\frac{9\,a^2}{2\,b^4}x^{\frac{2}{3}}-2\,\frac{ax}{b^3}+\frac{3}{4\,b^2}x^{\frac{4}{3}}+15\,\frac{a^4\ln\left(a+b\sqrt[3]{x}\right)}{b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+b*x^(1/3))^2,x)
```

```
[Out] 3*a^5/b^6/(a+b*x^(1/3))-12*a^3*x^(1/3)/b^5+9/2*a^2*x^(2/3)/b^4-2*
a*x/b^3+3/4*x^(4/3)/b^2+15*a^4*ln(a+b*x^(1/3))/b^6
```

Maxima [A] time = 1.44379, size = 128, normalized size = 1.51

$$\frac{15\,a^4\log\left(bx^{\frac{1}{3}}+a\right)}{b^6}+\frac{3\left(bx^{\frac{1}{3}}+a\right)^4}{4\,b^6}-\frac{5\left(bx^{\frac{1}{3}}+a\right)^3a}{b^6}+\frac{15\left(bx^{\frac{1}{3}}+a\right)^2a^2}{b^6}-\frac{30\left(bx^{\frac{1}{3}}+a\right)a^3}{b^6}+\frac{3\,a^5}{\left(bx^{\frac{1}{3}}+a\right)b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^(1/3) + a)^2,x, algorithm="maxima")
```

```
[Out] 15*a^4*log(b*x^(1/3) + a)/b^6 + 3/4*(b*x^(1/3) + a)^4/b^6 - 5*(b*
x^(1/3) + a)^3*a/b^6 + 15*(b*x^(1/3) + a)^2*a^2/b^6 - 30*(b*x^(1/
3) + a)*a^3/b^6 + 3*a^5/((b*x^(1/3) + a)*b^6)
```

Fricas [A] time = 0.218904, size = 124, normalized size = 1.46

$$\frac{10\,a^2b^3x+12\,a^5+60\left(a^4bx^{\frac{1}{3}}+a^5\right)\log\left(bx^{\frac{1}{3}}+a\right)+3\left(b^5x-10\,a^3b^2\right)x^{\frac{2}{3}}-\left(5\,ab^4x+48\,a^4b\right)x^{\frac{1}{3}}}{4\left(b^7x^{\frac{1}{3}}+ab^6\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^(1/3) + a)^2,x, algorithm="fricas")
```

```
[Out] 1/4*(10*a^2*b^3*x + 12*a^5 + 60*(a^4*b*x^(1/3) + a^5)*log(b*x^(1/
3) + a) + 3*(b^5*x - 10*a^3*b^2)*x^(2/3) - (5*a*b^4*x + 48*a^4*b)
*x^(1/3))/(b^7*x^(1/3) + a*b^6)
```

Sympy [A] time = 24.9744, size = 243, normalized size = 2.86

$$\frac{60a^5x^{\frac{80}{3}}\log\left(1+\frac{b\sqrt[3]{x}}{a}\right)}{4ab^6x^{\frac{80}{3}}+4b^7x^{27}}+\frac{60a^4bx^{27}\log\left(1+\frac{b\sqrt[3]{x}}{a}\right)}{4ab^6x^{\frac{80}{3}}+4b^7x^{27}}-\frac{60a^4bx^{27}}{4ab^6x^{\frac{80}{3}}+4b^7x^{27}}-\frac{30a^3b^2x^{\frac{82}{3}}}{4ab^6x^{\frac{80}{3}}+4b^7x^{27}}+\frac{10a^2b^3x^{\frac{83}{3}}}{4ab^6x^{\frac{80}{3}}+4b^7x^{27}}-\frac{5ab^4x^{28}}{4ab^6x^{\frac{80}{3}}+4b^7x^{27}}+\frac{3b^5x^{\frac{85}{3}}}{4ab^6x^{\frac{80}{3}}+4b^7x^{27}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b*x**(1/3))**2,x)
```

```
[Out] 60*a**5*x**(80/3)*log(1 + b*x**(1/3)/a)/(4*a*b**6*x**(80/3) + 4*b
**7*x**27) + 60*a**4*b*x**27*log(1 + b*x**(1/3)/a)/(4*a*b**6*x**(
80/3) + 4*b**7*x**27) - 60*a**4*b*x**27/(4*a*b**6*x**(80/3) + 4*b
**7*x**27) - 30*a**3*b**2*x**(82/3)/(4*a*b**6*x**(80/3) + 4*b**7*
x**27) + 10*a**2*b**3*x**(83/3)/(4*a*b**6*x**(80/3) + 4*b**7*x**2
7) - 5*a*b**4*x**28/(4*a*b**6*x**(80/3) + 4*b**7*x**27) + 3*b**5*
x**(85/3)/(4*a*b**6*x**(80/3) + 4*b**7*x**27)
```

GIAC/XCAS [A] time = 0.21626, size = 105, normalized size = 1.24

$$\frac{15\,a^4 \ln\left(\left|bx^{\frac{1}{3}} + a\right|\right)}{b^6} + \frac{3\,a^5}{\left(bx^{\frac{1}{3}} + a\right)b^6} + \frac{3\,b^6x^{\frac{4}{3}} - 8\,ab^5x + 18\,a^2b^4x^{\frac{2}{3}} - 48\,a^3b^3x^{\frac{1}{3}}}{4\,b^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^(1/3) + a)^2,x, algorithm="giac")
```

```
[Out] 15*a^4*ln(abs(b*x^(1/3) + a))/b^6 + 3*a^5/((b*x^(1/3) + a)*b^6) +
 1/4*(3*b^6*x^(4/3) - 8*a*b^5*x + 18*a^2*b^4*x^(2/3) - 48*a^3*b^3
*x^(1/3))/b^8
```

3.2361 $\int \frac{1}{\left(a+b\sqrt[3]{x}\right)^2}\,dx$

Optimal. Leaf size=46

$$-\frac{3a^2}{b^3\left(a+b\sqrt[3]{x}\right)}-\frac{6a\log\left(a+b\sqrt[3]{x}\right)}{b^3}+\frac{3\sqrt[3]{x}}{b^2}$$

```
[Out] (-3*a^2)/(b^3*(a + b*x^(1/3))) + (3*x^(1/3))/b^2 - (6*a*Log[a + b
*x^(1/3)])/b^3
```

Rubi [A] time = 0.0622783, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$-\frac{3a^2}{b^3\left(a+b\sqrt[3]{x}\right)}-\frac{6a\log\left(a+b\sqrt[3]{x}\right)}{b^3}+\frac{3\sqrt[3]{x}}{b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^(-2),x]
```

```
[Out] (-3*a^2)/(b^3*(a + b*x^(1/3))) + (3*x^(1/3))/b^2 - (6*a*Log[a + b
*x^(1/3)])/b^3
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{3a^2}{b^3\left(a+b\sqrt[3]{x}\right)}-\frac{6a\log\left(a+b\sqrt[3]{x}\right)}{b^3}+3\int^{\sqrt[3]{x}}\frac{1}{b^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*x**(1/3))**2,x)
```

```
[Out] -3*a**2/(b**3*(a + b*x**(1/3))) - 6*a*log(a + b*x**(1/3))/b**3 +
3*Integral(b**(-2), (x, x**(1/3)))
```

Mathematica [A] time = 0.031182, size = 42, normalized size = 0.91

$$\frac{3\left(-\frac{a^2}{a+b\sqrt[3]{x}}-2a\log\left(a+b\sqrt[3]{x}\right)+b\sqrt[3]{x}\right)}{b^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^(-2),x]
```

```
[Out] (3*(-(a^2/(a + b*x^(1/3))) + b*x^(1/3) - 2*a*Log[a + b*x^(1/3)]))
/b^3
```

Maple [B] time = 0.071, size = 257, normalized size = 5.6

$$-3\frac{a^4}{(b^3x+a^3)\,b^3}+3\frac{\sqrt[3]{x}}{b^2}-4\frac{a\ln\left(a+b\sqrt[3]{x}\right)}{b^3}-2\frac{a^2}{b^3\left(a+b\sqrt[3]{x}\right)}-\frac{a^2}{b^2}\sqrt[3]{x}\left(b^2x^{\frac{2}{3}}-ab\sqrt[3]{x}+a^2\right)^{-1}+2\frac{a^3}{b^3\left(b^2x^{2/3}-ab\sqrt[3]{x}+a^2\right)}+\frac{5a}{3b^3}\ln\left(b^2x^{\frac{2}{3}}-ab\sqrt[3]{x}+a^2\right)+\frac{2a\sqrt{3}}{3b^3}\arctan\left(\frac{\sqrt{3}}{3ab}\left(2b^2\sqrt[3]{x}-ab\right)\right)+\frac{a}{3b^3}\ln\left(b\left(b^2x^{\frac{2}{3}}-ab\sqrt[3]{x}+a^2\right)\right)-\frac{2a\sqrt{3}}{3b^3}\arctan\left(\frac{\sqrt{3}}{3ab^2}\left(2\sqrt[3]{x}b^3-ab^2\right)\right)-2\frac{a\ln\left(b^3x+a^3\right)}{b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/(a+b*x^(1/3))^2,x)
```

```
[Out] -3*a^4/(b^3*x+a^3)/b^3+3*x^(1/3)/b^2-4*a*ln(a+b*x^(1/3))/b^3-2*a^
2/b^3/(a+b*x^(1/3))-1/b^2*a^2/(b^2*x^(2/3)-a*b*x^(1/3)+a^2)*x^(1/
3)+2/b^3*a^3/(b^2*x^(2/3)-a*b*x^(1/3)+a^2)+5/3/b^3*a*ln(b^2*x^(2/
3)-a*b*x^(1/3)+a^2)+2/3/b^3*a*3^(1/2)*arctan(1/3*(2*b^2*x^(1/3)-a
*b)*3^(1/2)/a/b)+1/3*a/b^3*ln(b*(b^2*x^(2/3)-a*b*x^(1/3)+a^2))-2/
3*a/b^3*3^(1/2)*arctan(1/3*(2*x^(1/3)*b^3-a*b^2)*3^(1/2)/a/b^2)-2
*a/b^3*ln(b^3*x+a^3)
```

Maxima [A] time = 1.43303, size = 59, normalized size = 1.28

$$-\frac{6\,a\log\left(bx^{\frac{1}{3}}+a\right)}{b^3}+\frac{3\left(bx^{\frac{1}{3}}+a\right)}{b^3}-\frac{3\,a^2}{\left(bx^{\frac{1}{3}}+a\right)b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^(1/3) + a)^(-2),x, algorithm="maxima")
```

```
[Out] -6*a*log(b*x^(1/3) + a)/b^3 + 3*(b*x^(1/3) + a)/b^3 - 3*a^2/((b*x
^(1/3) + a)*b^3)
```

Fricas [A] time = 0.21563, size = 76, normalized size = 1.65

$$\frac{3\left(b^2x^{\frac{2}{3}}+abx^{\frac{1}{3}}-a^2-2\left(abx^{\frac{1}{3}}+a^2\right)\log\left(bx^{\frac{1}{3}}+a\right)\right)}{b^4x^{\frac{1}{3}}+ab^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^(1/3) + a)^(-2),x, algorithm="fricas")
```

```
[Out] 3*(b^2*x^(2/3) + a*b*x^(1/3) - a^2 - 2*(a*b*x^(1/3) + a^2)*log(b*
x^(1/3) + a))/(b^4*x^(1/3) + a*b^3)
```

Sympy [A] time = 1.68711, size = 109, normalized size = 2.37

$$\begin{cases} -\frac{6a^2\log\left(\frac{a}{b}+\sqrt[3]{x}\right)}{ab^3+b^4\sqrt[3]{x}}-\frac{6a^2}{ab^3+b^4\sqrt[3]{x}}-\frac{6ab\sqrt[3]{x}\log\left(\frac{a}{b}+\sqrt[3]{x}\right)}{ab^3+b^4\sqrt[3]{x}}+\frac{3b^2x^{\frac{2}{3}}}{ab^3+b^4\sqrt[3]{x}} & \text{for } b\neq 0\\ \frac{x}{a^2} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(a+b*x**(1/3))**2,x)
```

```
[Out] Piecewise((-6*a**2*log(a/b + x**(1/3))/(a*b**3 + b**4*x**(1/3)) -
 6*a**2/(a*b**3 + b**4*x**(1/3)) - 6*a*b*x**(1/3)*log(a/b + x**(1
/3))/(a*b**3 + b**4*x**(1/3)) + 3*b**2*x**(2/3)/(a*b**3 + b**4*x*
*(1/3)), Ne(b, 0)), (x/a**2, True))
```

GIAC/XCAS [A] time = 0.217199, size = 55, normalized size = 1.2

$$-\frac{6\,a\ln\left(\left|bx^{\frac{1}{3}}+a\right|\right)}{b^3}+\frac{3\,x^{\frac{1}{3}}}{b^2}-\frac{3\,a^2}{\left(bx^{\frac{1}{3}}+a\right)b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^(-2),x, algorithm="giac")
```

```
[Out] -6*a*ln(abs(b*x^(1/3) + a))/b^3 + 3*x^(1/3)/b^2 - 3*a^2/((b*x^(1/
3) + a)*b^3)
```

3.2362 $\int \frac{1}{\left(a+b\sqrt[3]{x}\right)^2 x} \, dx$

Optimal. Leaf size=38

$$-\frac{3\log\left(a+b\sqrt[3]{x}\right)}{a^2}+\frac{\log(x)}{a^2}+\frac{3}{a\left(a+b\sqrt[3]{x}\right)}$$

```
[Out] 3/(a*(a + b*x^(1/3))) - (3*Log[a + b*x^(1/3)])/a^2 + Log[x]/a^2
```

Rubi [A] time = 0.0571982, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$-\frac{3\log\left(a+b\sqrt[3]{x}\right)}{a^2}+\frac{\log(x)}{a^2}+\frac{3}{a\left(a+b\sqrt[3]{x}\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b*x^(1/3))^2*x),x]
```

```
[Out] 3/(a*(a + b*x^(1/3))) - (3*Log[a + b*x^(1/3)])/a^2 + Log[x]/a^2
```

Rubi in Sympy [A] time = 8.6017, size = 37, normalized size = 0.97

$$\frac{3}{a\left(a+b\sqrt[3]{x}\right)}+\frac{3\log\left(\sqrt[3]{x}\right)}{a^2}-\frac{3\log\left(a+b\sqrt[3]{x}\right)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*x**(1/3))**2/x,x)
```

```
[Out] 3/(a*(a + b*x**(1/3))) + 3*log(x**(1/3))/a**2 - 3*log(a + b*x**(1
/3))/a**2
```

Mathematica [A] time = 0.0499961, size = 37, normalized size = 0.97

$$\frac{3\left(\frac{a}{a+b\sqrt[3]{x}}-\log\left(a+b\sqrt[3]{x}\right)+\frac{\log(x)}{3}\right)}{a^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b*x^(1/3))^2*x),x]
```

```
[Out] (3*(a/(a + b*x^(1/3)) - Log[a + b*x^(1/3)] + Log[x]/3))/a^2
```

Maple [A] time = 0.003, size = 35, normalized size = 0.9

$$3\frac{1}{a\left(a+b\sqrt[3]{x}\right)}-3\frac{\ln\left(a+b\sqrt[3]{x}\right)}{a^2}+\frac{\ln(x)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*x^(1/3))^2/x,x)

[Out] 3/a/(a+b*x^(1/3))-3*ln(a+b*x^(1/3))/a^2+ln(x)/a^2
```

Maxima [A] time = 1.44099, size = 46, normalized size = 1.21

$$\frac{3}{abx^{\frac{1}{3}} + a^2} - \frac{3 \log\left(bx^{\frac{1}{3}} + a\right)}{a^2} + \frac{\log(x)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + a)^2*x),x, algorithm="maxima")

[Out] 3/(a*b*x^(1/3) + a^2) - 3*log(b*x^(1/3) + a)/a^2 + log(x)/a^2
```

Fricas [A] time = 0.225277, size = 66, normalized size = 1.74

$$-\frac{3\left(\left(bx^{\frac{1}{3}} + a\right)\log\left(bx^{\frac{1}{3}} + a\right) - \left(bx^{\frac{1}{3}} + a\right)\log\left(x^{\frac{1}{3}}\right) - a\right)}{a^2bx^{\frac{1}{3}} + a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + a)^2*x),x, algorithm="fricas")

[Out] -3*((b*x^(1/3) + a)*log(b*x^(1/3) + a) - (b*x^(1/3) + a)*log(x^(1
/3)) - a)/(a^2*b*x^(1/3) + a^3)
```

Sympy [A] time = 4.596, size = 160, normalized size = 4.21

$$\begin{cases} \frac{\tilde{\infty}}{x^{\frac{2}{3}}} & \text{for}\: a = 0 \wedge b = 0 \\ \frac{\log(x)}{a^2} & \text{for}\: b = 0 \\ -\frac{3}{2b^2x^{\frac{2}{3}}} & \text{for}\: a = 0 \\ \frac{ax^{\frac{2}{3}}\log(x)}{a^3x^{\frac{2}{3}} + a^2bx} - \frac{3ax^{\frac{2}{3}}\log\left(\frac{a}{b} + \sqrt[3]{x}\right)}{a^3x^{\frac{2}{3}} + a^2bx} + \frac{3ax^{\frac{2}{3}}}{a^3x^{\frac{2}{3}} + a^2bx} + \frac{bx\log(x)}{a^3x^{\frac{2}{3}} + a^2bx} - \frac{3bx\log\left(\frac{a}{b} + \sqrt[3]{x}\right)}{a^3x^{\frac{2}{3}} + a^2bx} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*x**(1/3))**2/x,x)

[Out] Piecewise((zoo/x**(2/3), Eq(a, 0) & Eq(b, 0)), (log(x)/a**2, Eq(b
, 0)), (-3/(2*b**2*x**(2/3)), Eq(a, 0)), (a*x**(2/3)*log(x)/(a**3
*x**(2/3) + a**2*b*x) - 3*a*x**(2/3)*log(a/b + x**(1/3))/(a**3*x*
*(2/3) + a**2*b*x) + 3*a*x**(2/3)/(a**3*x**(2/3) + a**2*b*x) + b*
x*log(x)/(a**3*x**(2/3) + a**2*b*x) - 3*b*x*log(a/b + x**(1/3))/(
a**3*x**(2/3) + a**2*b*x), True))
```

GIAC/XCAS [A] time = 0.220957, size = 49, normalized size = 1.29

$$-\frac{3\ln\left(\left|bx^{\frac{1}{3}} + a\right|\right)}{a^2} + \frac{\ln(|x|)}{a^2} + \frac{3}{\left(bx^{\frac{1}{3}} + a\right)a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + a)^2*x),x, algorithm="giac")
```

```
[Out] -3*ln(abs(b*x^(1/3) + a))/a^2 + ln(abs(x))/a^2 + 3/((b*x^(1/3) +
a)*a)
```

3.2363 $\int \frac{1}{\left(a+b\sqrt[3]{x}\right)^2 x^2}\,dx$

Optimal. Leaf size=80

$$\frac{12b^3\log\left(a+b\sqrt[3]{x}\right)}{a^5}-\frac{4b^3\log(x)}{a^5}-\frac{3b^3}{a^4\left(a+b\sqrt[3]{x}\right)}-\frac{9b^2}{a^4\sqrt[3]{x}}+\frac{3b}{a^3x^{2/3}}-\frac{1}{a^2x}$$

```
[Out] (-3*b^3)/(a^4*(a + b*x^(1/3))) - 1/(a^2*x) + (3*b)/(a^3*x^(2/3))
- (9*b^2)/(a^4*x^(1/3)) + (12*b^3*Log[a + b*x^(1/3)])/a^5 - (4*b^
3*Log[x])/a^5
```

Rubi [A] time = 0.120971, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{12b^3\log\left(a+b\sqrt[3]{x}\right)}{a^5}-\frac{4b^3\log(x)}{a^5}-\frac{3b^3}{a^4\left(a+b\sqrt[3]{x}\right)}-\frac{9b^2}{a^4\sqrt[3]{x}}+\frac{3b}{a^3x^{2/3}}-\frac{1}{a^2x}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b*x^(1/3))^2*x^2),x]
```

```
[Out] (-3*b^3)/(a^4*(a + b*x^(1/3))) - 1/(a^2*x) + (3*b)/(a^3*x^(2/3))
- (9*b^2)/(a^4*x^(1/3)) + (12*b^3*Log[a + b*x^(1/3)])/a^5 - (4*b^
3*Log[x])/a^5
```

Rubi in Sympy [A] time = 17.4359, size = 82, normalized size = 1.02

$$-\frac{1}{a^2x}+\frac{3b}{a^3x^{\frac{2}{3}}}-\frac{3b^3}{a^4\left(a+b\sqrt[3]{x}\right)}-\frac{9b^2}{a^4\sqrt[3]{x}}-\frac{12b^3\log\left(\sqrt[3]{x}\right)}{a^5}+\frac{12b^3\log\left(a+b\sqrt[3]{x}\right)}{a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*x**(1/3))**2/x**2,x)
```

```
[Out] -1/(a**2*x) + 3*b/(a**3*x**(2/3)) - 3*b**3/(a**4*(a + b*x**(1/3))
) - 9*b**2/(a**4*x**(1/3)) - 12*b**3*log(x**(1/3))/a**5 + 12*b**3
*log(a + b*x**(1/3))/a**5
```

Mathematica [A] time = 0.154204, size = 77, normalized size = 0.96

$$\frac{-\frac{a^4-2a^3b\sqrt[3]{x}+6a^2b^2x^{2/3}+12ab^3x}{ax+bx^{4/3}}+12b^3\log\left(a+b\sqrt[3]{x}\right)-4b^3\log(x)}{a^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b*x^(1/3))^2*x^2),x]
```

```
[Out] (-((a^4 - 2*a^3*b*x^(1/3) + 6*a^2*b^2*x^(2/3) + 12*a*b^3*x)/(a*x
+ b*x^(4/3))) + 12*b^3*Log[a + b*x^(1/3)] - 4*b^3*Log[x])/a^5
```

Maple [A] time = 0.017, size = 73, normalized size = 0.9

$$-3\,\frac{b^3}{a^4\left(a+b\sqrt[3]{x}\right)}-\frac{1}{xa^2}+3\,\frac{b}{a^3x^{2/3}}-9\,\frac{b^2}{a^4\sqrt[3]{x}}+12\,\frac{b^3\ln\left(a+b\sqrt[3]{x}\right)}{a^5}-4\,\frac{b^3\ln(x)}{a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*x^(1/3))^2/x^2,x)
```

```
[Out] -3*b^3/a^4/(a+b*x^(1/3))-1/a^2/x+3*b/a^3/x^(2/3)-9*b^2/a^4/x^(1/3
)+12*b^3*ln(a+b*x^(1/3))/a^5-4*b^3*ln(x)/a^5
```

Maxima [A] time = 1.43324, size = 99, normalized size = 1.24

$$-\frac{12\,b^3x+6\,ab^2x^{\frac{2}{3}}-2\,a^2bx^{\frac{1}{3}}+a^3}{a^4bx^{\frac{4}{3}}+a^5x}+\frac{12\,b^3\log\left(bx^{\frac{1}{3}}+a\right)}{a^5}-\frac{4\,b^3\log\left(x\right)}{a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + a)^2*x^2),x, algorithm="maxima")
```

```
[Out] -(12*b^3*x + 6*a*b^2*x^(2/3) - 2*a^2*b*x^(1/3) + a^3)/(a^4*b*x^(4
/3) + a^5*x) + 12*b^3*log(b*x^(1/3) + a)/a^5 - 4*b^3*log(x)/a^5
```

Fricas [A] time = 0.226877, size = 126, normalized size = 1.58

$$-\frac{12\,ab^3x+6\,a^2b^2x^{\frac{2}{3}}-2\,a^3bx^{\frac{1}{3}}+a^4-12\left(b^4x^{\frac{4}{3}}+ab^3x\right)\log\left(bx^{\frac{1}{3}}+a\right)+12\left(b^4x^{\frac{4}{3}}+ab^3x\right)\log\left(x^{\frac{1}{3}}\right)}{a^5bx^{\frac{4}{3}}+a^6x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + a)^2*x^2),x, algorithm="fricas")
```

```
[Out] -(12*a*b^3*x + 6*a^2*b^2*x^(2/3) - 2*a^3*b*x^(1/3) + a^4 - 12*(b^
4*x^(4/3) + a*b^3*x)*log(b*x^(1/3) + a) + 12*(b^4*x^(4/3) + a*b^3
*x)*log(x^(1/3)))/(a^5*b*x^(4/3) + a^6*x)
```

Sympy [A] time = 17.2018, size = 272, normalized size = 3.4

$$\begin{cases} \frac{\tilde{\infty}}{x^{\frac{5}{3}}} \\ -\frac{1}{a^2x} \\ -\frac{3}{5b^2x^{\frac{5}{3}}} \\ -\frac{a^4x^{\frac{2}{3}}}{a^6x^{\frac{5}{3}}+a^5bx^2}+\frac{2a^3bx}{a^6x^{\frac{5}{3}}+a^5bx^2}-\frac{6a^2b^2x^{\frac{4}{3}}}{a^6x^{\frac{5}{3}}+a^5bx^2}-\frac{4ab^3x^{\frac{5}{3}}\log\left(x\right)}{a^6x^{\frac{5}{3}}+a^5bx^2}+\frac{12ab^3x^{\frac{5}{3}}\log\left(\frac{a}{b}+\sqrt[3]{x}\right)}{a^6x^{\frac{5}{3}}+a^5bx^2}-\frac{12ab^3x^{\frac{5}{3}}}{a^6x^{\frac{5}{3}}+a^5bx^2}-\frac{4b^4x^2\log\left(x\right)}{a^6x^{\frac{5}{3}}+a^5bx^2}+\frac{12b^4x^2\log\left(\frac{a}{b}+\sqrt[3]{x}\right)}{a^6x^{\frac{5}{3}}+a^5bx^2} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*x**(1/3))**2/x**2,x)
```

```
[Out] Piecewise((zoo/x**(5/3), Eq(a, 0) & Eq(b, 0)), (-1/(a**2*x), Eq(b
, 0)), (-3/(5*b**2*x**(5/3)), Eq(a, 0)), (-a**4*x**(2/3)/(a**6*x*
*(5/3) + a**5*b*x**2) + 2*a**3*b*x/(a**6*x**(5/3) + a**5*b*x**2)
- 6*a**2*b**2*x**(4/3)/(a**6*x**(5/3) + a**5*b*x**2) - 4*a*b**3*x
**(5/3)*log(x)/(a**6*x**(5/3) + a**5*b*x**2) + 12*a*b**3*x**(5/3)
*log(a/b + x**(1/3))/(a**6*x**(5/3) + a**5*b*x**2) - 12*a*b**3*x*
*(5/3)/(a**6*x**(5/3) + a**5*b*x**2) - 4*b**4*x**2*log(x)/(a**6*x
**(5/3) + a**5*b*x**2) + 12*b**4*x**2*log(a/b + x**(1/3))/(a**6*x
**(5/3) + a**5*b*x**2), True))
```

GIAC/XCAS [A] time = 0.220681, size = 104, normalized size = 1.3

$$\frac{12\,b^3\ln\left(\left|bx^{\frac{1}{3}}+a\right|\right)}{a^5}-\frac{4\,b^3\ln\left(|x|\right)}{a^5}-\frac{12\,ab^3x+6\,a^2b^2x^{\frac{2}{3}}-2\,a^3bx^{\frac{1}{3}}+a^4}{\left(bx^{\frac{1}{3}}+a\right)a^5x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + a)^2*x^2),x, algorithm="giac")
```

```
[Out] 12*b^3*ln(abs(b*x^(1/3) + a))/a^5 - 4*b^3*ln(abs(x))/a^5 - (12*a*
b^3*x + 6*a^2*b^2*x^(2/3) - 2*a^3*b*x^(1/3) + a^4)/((b*x^(1/3) +
a)*a^5*x)
```

3.2364 $\int \frac{1}{\left(a+b\sqrt[3]{x}\right)^2 x^3}\,dx$

Optimal. Leaf size=125

$$-\frac{21b^6\log\left(a+b\sqrt[3]{x}\right)}{a^8}+\frac{7b^6\log(x)}{a^8}+\frac{3b^6}{a^7\left(a+b\sqrt[3]{x}\right)}+\frac{18b^5}{a^7\sqrt[3]{x}}-\frac{15b^4}{2a^6x^{2/3}}+\frac{4b^3}{a^5x}-\frac{9b^2}{4a^4x^{4/3}}+\frac{6b}{5a^3x^{5/3}}-\frac{1}{2a^2x^2}$$

```
[Out] (3*b^6)/(a^7*(a + b*x^(1/3))) - 1/(2*a^2*x^2) + (6*b)/(5*a^3*x^(5
/3)) - (9*b^2)/(4*a^4*x^(4/3)) + (4*b^3)/(a^5*x) - (15*b^4)/(2*a^
6*x^(2/3)) + (18*b^5)/(a^7*x^(1/3)) - (21*b^6*Log[a + b*x^(1/3)])
/a^8 + (7*b^6*Log[x])/a^8
```

Rubi [A] time = 0.188413, antiderivative size = 125, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{21b^6\log\left(a+b\sqrt[3]{x}\right)}{a^8}+\frac{7b^6\log(x)}{a^8}+\frac{3b^6}{a^7\left(a+b\sqrt[3]{x}\right)}+\frac{18b^5}{a^7\sqrt[3]{x}}-\frac{15b^4}{2a^6x^{2/3}}+\frac{4b^3}{a^5x}-\frac{9b^2}{4a^4x^{4/3}}+\frac{6b}{5a^3x^{5/3}}-\frac{1}{2a^2x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b*x^(1/3))^2*x^3),x]
```

```
[Out] (3*b^6)/(a^7*(a + b*x^(1/3))) - 1/(2*a^2*x^2) + (6*b)/(5*a^3*x^(5
/3)) - (9*b^2)/(4*a^4*x^(4/3)) + (4*b^3)/(a^5*x) - (15*b^4)/(2*a^
6*x^(2/3)) + (18*b^5)/(a^7*x^(1/3)) - (21*b^6*Log[a + b*x^(1/3)])
/a^8 + (7*b^6*Log[x])/a^8
```

Rubi in Sympy [A] time = 27.422, size = 128, normalized size = 1.02

$$-\frac{1}{2a^2x^2}+\frac{6b}{5a^3x^{\frac{5}{3}}}-\frac{9b^2}{4a^4x^{\frac{4}{3}}}+\frac{4b^3}{a^5x}-\frac{15b^4}{2a^6x^{\frac{2}{3}}}+\frac{3b^6}{a^7\left(a+b\sqrt[3]{x}\right)}+\frac{18b^5}{a^7\sqrt[3]{x}}+\frac{21b^6\log\left(\sqrt[3]{x}\right)}{a^8}-\frac{21b^6\log\left(a+b\sqrt[3]{x}\right)}{a^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*x**(1/3))**2/x**3,x)
```

```
[Out] -1/(2*a**2*x**2) + 6*b/(5*a**3*x**(5/3)) - 9*b**2/(4*a**4*x**(4/3
)) + 4*b**3/(a**5*x) - 15*b**4/(2*a**6*x**(2/3)) + 3*b**6/(a**7*(
a + b*x**(1/3))) + 18*b**5/(a**7*x**(1/3)) + 21*b**6*log(x**(1/3)
)/a**8 - 21*b**6*log(a + b*x**(1/3))/a**8
```

Mathematica [A] time = 0.237039, size = 117, normalized size = 0.94

$$\frac{\frac{a\left(-10a^6+14a^5b\sqrt[3]{x}-21a^4b^2x^{2/3}+35a^3b^3x-70a^2b^4x^{4/3}+210ab^5x^{5/3}+420b^6x^2\right)}{x^2\left(a+b\sqrt[3]{x}\right)}-420b^6\log\left(a+b\sqrt[3]{x}\right)+140b^6\log(x)}{20a^8}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b*x^(1/3))^2*x^3),x]
```

```
[Out] ((a*(-10*a^6 + 14*a^5*b*x^(1/3) - 21*a^4*b^2*x^(2/3) + 35*a^3*b^3
*x - 70*a^2*b^4*x^(4/3) + 210*a*b^5*x^(5/3) + 420*b^6*x^2))/((a +
 b*x^(1/3))*x^2) - 420*b^6*Log[a + b*x^(1/3)] + 140*b^6*Log[x])/(
```

```
20*a^8)
```

Maple [A] time = 0.003, size = 106, normalized size = 0.9

$$3\frac{b^{6}}{a^{7}\left(a+b\sqrt[3]{x}\right)}-\frac{1}{2a^{2}x^{2}}+\frac{6b}{5a^{3}}x^{-\frac{5}{3}}-\frac{9b^{2}}{4a^{4}}x^{-\frac{4}{3}}+4\frac{b^{3}}{xa^{5}}-\frac{15b^{4}}{2a^{6}}x^{-\frac{2}{3}}+18\frac{b^{5}}{a^{7}\sqrt[3]{x}}-21\frac{b^{6}\ln\left(a+b\sqrt[3]{x}\right)}{a^{8}}+7\frac{b^{6}\ln(x)}{a^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/(a+b*x^(1/3))^2/x^3,x)
```

```
[Out] 3*b^6/a^7/(a+b*x^(1/3))-1/2/a^2/x^2+6/5*b/a^3/x^(5/3)-9/4*b^2/a^4
/x^(4/3)+4*b^3/x/a^5-15/2*b^4/a^6/x^(2/3)+18*b^5/a^7/x^(1/3)-21*b
^6*ln(a+b*x^(1/3))/a^8+7*b^6*ln(x)/a^8
```

Maxima [A] time = 1.44637, size = 149, normalized size = 1.19

$$\frac{420\,b^{6}x^{2}+210\,ab^{5}x^{\frac{5}{3}}-70\,a^{2}b^{4}x^{\frac{4}{3}}+35\,a^{3}b^{3}x-21\,a^{4}b^{2}x^{\frac{2}{3}}+14\,a^{5}bx^{\frac{1}{3}}-10\,a^{6}}{20\left(a^{7}bx^{\frac{7}{3}}+a^{8}x^{2}\right)}-\frac{21\,b^{6}\log\left(bx^{\frac{1}{3}}+a\right)}{a^{8}}+\frac{7\,b^{6}\log(x)}{a^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((b*x^(1/3) + a)^2*x^3),x, algorithm="maxima")
```

```
[Out] 1/20*(420*b^6*x^2 + 210*a*b^5*x^(5/3) - 70*a^2*b^4*x^(4/3) + 35*a
^3*b^3*x - 21*a^4*b^2*x^(2/3) + 14*a^5*b*x^(1/3) - 10*a^6)/(a^7*b
*x^(7/3) + a^8*x^2) - 21*b^6*log(b*x^(1/3) + a)/a^8 + 7*b^6*log(x
)/a^8
```

Fricas [A] time = 0.228479, size = 184, normalized size = 1.47

$$\frac{420\,ab^{6}x^{2}+35\,a^{4}b^{3}x-10\,a^{7}-420\left(b^{7}x^{\frac{7}{3}}+ab^{6}x^{2}\right)\log\left(bx^{\frac{1}{3}}+a\right)+420\left(b^{7}x^{\frac{7}{3}}+ab^{6}x^{2}\right)\log\left(x^{\frac{1}{3}}\right)+21\left(10\,a^{2}b^{5}x-a^{5}b^{2}\right)x}{20\left(a^{8}bx^{\frac{7}{3}}+a^{9}x^{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((b*x^(1/3) + a)^2*x^3),x, algorithm="fricas")
```

```
[Out] 1/20*(420*a*b^6*x^2 + 35*a^4*b^3*x - 10*a^7 - 420*(b^7*x^(7/3) +
a*b^6*x^2)*log(b*x^(1/3) + a) + 420*(b^7*x^(7/3) + a*b^6*x^2)*log
(x^(1/3)) + 21*(10*a^2*b^5*x - a^5*b^2)*x^(2/3) - 14*(5*a^3*b^4*x
 - a^6*b)*x^(1/3))/(a^8*b*x^(7/3) + a^9*x^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*x**(1/3))**2/x**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.218207, size = 151, normalized size = 1.21

$$-\frac{21\, b^{6} \ln\left(\left|bx^{\frac{1}{3}} + a\right|\right)}{a^{8}} + \frac{7\, b^{6} \ln\left(|x|\right)}{a^{8}} + \frac{420\, ab^{6} x^{2} + 210\, a^{2} b^{5} x^{\frac{5}{3}} - 70\, a^{3} b^{4} x^{\frac{4}{3}} + 35\, a^{4} b^{3} x - 21\, a^{5} b^{2} x^{\frac{2}{3}} + 14\, a^{6} b x^{\frac{1}{3}} - 10\, a^{7}}{20 \left(bx^{\frac{1}{3}} + a\right) a^{8} x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + a)^2*x^3),x, algorithm="giac")
```

```
[Out] -21*b^6*ln(abs(b*x^(1/3) + a))/a^8 + 7*b^6*ln(abs(x))/a^8 + 1/20*
(420*a*b^6*x^2 + 210*a^2*b^5*x^(5/3) - 70*a^3*b^4*x^(4/3) + 35*a^
4*b^3*x - 21*a^5*b^2*x^(2/3) + 14*a^6*b*x^(1/3) - 10*a^7)/((b*x^(
1/3) + a)*a^8*x^2)
```

3.2365 $\int \frac{1}{\left(a+b\sqrt[3]{x}\right)^2 x^4}\,dx$

Optimal. Leaf size=162

$$\frac{30b^9\log\left(a+b\sqrt[3]{x}\right)}{a^{11}}-\frac{10b^9\log(x)}{a^{11}}-\frac{3b^9}{a^{10}\left(a+b\sqrt[3]{x}\right)}-\frac{27b^8}{a^{10}\sqrt[3]{x}}+\frac{12b^7}{a^9x^{2/3}}-\frac{7b^6}{a^8x}+\frac{9b^5}{2a^7x^{4/3}}-\frac{3b^4}{a^6x^{5/3}}+\frac{2b^3}{a^5x^2}-\frac{9b^2}{7a^4x^{7/3}}+\frac{3b}{4a^3x^{8/3}}-\frac{1}{3a^2x^3}$$

```
[Out] (-3*b^9)/(a^10*(a + b*x^(1/3))) - 1/(3*a^2*x^3) + (3*b)/(4*a^3*x^
(8/3)) - (9*b^2)/(7*a^4*x^(7/3)) + (2*b^3)/(a^5*x^2) - (3*b^4)/(a
^6*x^(5/3)) + (9*b^5)/(2*a^7*x^(4/3)) - (7*b^6)/(a^8*x) + (12*b^7
)/(a^9*x^(2/3)) - (27*b^8)/(a^10*x^(1/3)) + (30*b^9*Log[a + b*x^(
1/3)])/a^11 - (10*b^9*Log[x])/a^11
```

Rubi [A] time = 0.260817, antiderivative size = 162, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{30b^9\log\left(a+b\sqrt[3]{x}\right)}{a^{11}}-\frac{10b^9\log(x)}{a^{11}}-\frac{3b^9}{a^{10}\left(a+b\sqrt[3]{x}\right)}-\frac{27b^8}{a^{10}\sqrt[3]{x}}+\frac{12b^7}{a^9x^{2/3}}-\frac{7b^6}{a^8x}+\frac{9b^5}{2a^7x^{4/3}}-\frac{3b^4}{a^6x^{5/3}}+\frac{2b^3}{a^5x^2}-\frac{9b^2}{7a^4x^{7/3}}+\frac{3b}{4a^3x^{8/3}}-\frac{1}{3a^2x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b*x^(1/3))^2*x^4),x]
```

```
[Out] (-3*b^9)/(a^10*(a + b*x^(1/3))) - 1/(3*a^2*x^3) + (3*b)/(4*a^3*x^
(8/3)) - (9*b^2)/(7*a^4*x^(7/3)) + (2*b^3)/(a^5*x^2) - (3*b^4)/(a
^6*x^(5/3)) + (9*b^5)/(2*a^7*x^(4/3)) - (7*b^6)/(a^8*x) + (12*b^7
)/(a^9*x^(2/3)) - (27*b^8)/(a^10*x^(1/3)) + (30*b^9*Log[a + b*x^(
1/3)])/a^11 - (10*b^9*Log[x])/a^11
```

Rubi in Sympy [A] time = 45.4411, size = 167, normalized size = 1.03

$$-\frac{1}{3a^2x^3}+\frac{3b}{4a^3x^{\frac{8}{3}}}-\frac{9b^2}{7a^4x^{\frac{7}{3}}}+\frac{2b^3}{a^5x^2}-\frac{3b^4}{a^6x^{\frac{5}{3}}}+\frac{9b^5}{2a^7x^{\frac{4}{3}}}-\frac{7b^6}{a^8x}+\frac{12b^7}{a^9x^{\frac{2}{3}}}-\frac{3b^9}{a^{10}\left(a+b\sqrt[3]{x}\right)}-\frac{27b^8}{a^{10}\sqrt[3]{x}}-\frac{30b^9\log\left(\sqrt[3]{x}\right)}{a^{11}}+\frac{30b^9\log\left(a+b\sqrt[3]{x}\right)}{a^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*x**(1/3))**2/x**4,x)
```

```
[Out] -1/(3*a**2*x**3) + 3*b/(4*a**3*x**(8/3)) - 9*b**2/(7*a**4*x**(7/3
)) + 2*b**3/(a**5*x**2) - 3*b**4/(a**6*x**(5/3)) + 9*b**5/(2*a**7
*x**(4/3)) - 7*b**6/(a**8*x) + 12*b**7/(a**9*x**(2/3)) - 3*b**9/(
a**10*(a + b*x**(1/3))) - 27*b**8/(a**10*x**(1/3)) - 30*b**9*log(
x**(1/3))/a**11 + 30*b**9*log(a + b*x**(1/3))/a**11
```

Mathematica [A] time = 0.355602, size = 154, normalized size = 0.95

$$-\frac{\frac{a\left(28a^9-35a^8b\sqrt[3]{x}+45a^7b^2x^{2/3}-60a^6b^3x+84a^5b^4x^{4/3}-126a^4b^5x^{5/3}+210a^3b^6x^2-420a^2b^7x^{7/3}+1260ab^8x^{8/3}+2520b^9x^3\right)}{x^3\left(a+b\sqrt[3]{x}\right)}-2520b^9\log\left(a+b\sqrt[3]{x}\right)+}{84a^{11}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b*x^(1/3))^2*x^4),x]
```

```
[Out] -((a*(28*a^9 - 35*a^8*b*x^(1/3) + 45*a^7*b^2*x^(2/3) - 60*a^6*b^3
*x + 84*a^5*b^4*x^(4/3) - 126*a^4*b^5*x^(5/3) + 210*a^3*b^6*x^2 -
 420*a^2*b^7*x^(7/3) + 1260*a*b^8*x^(8/3) + 2520*b^9*x^3))/((a +
b*x^(1/3))*x^3) - 2520*b^9*Log[a + b*x^(1/3)] + 840*b^9*Log[x])/(
84*a^11)
```

Maple [A] time = 0.022, size = 139, normalized size = 0.9

$$-3\,\frac{b^9}{a^{10}\left(a+b\sqrt[3]{x}\right)}-\frac{1}{3\,x^3a^2}+\frac{3\,b}{4\,a^3}x^{-\frac{8}{3}}-\frac{9\,b^2}{7\,a^4}x^{-\frac{7}{3}}+2\,\frac{b^3}{a^5x^2}-3\,\frac{b^4}{a^6x^{5/3}}+\frac{9\,b^5}{2\,a^7}x^{-\frac{4}{3}}-7\,\frac{b^6}{a^8x}+12\,\frac{b^7}{a^9x^{2/3}}-27\,\frac{b^8}{a^{10}\sqrt[3]{x}}+30\,\frac{b^9\ln\left(a+b\sqrt[3]{x}\right)}{a^{11}}-10\,\frac{b^9\ln(x)}{a^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*x^(1/3))^2/x^4,x)
```

```
[Out] -3*b^9/a^10/(a+b*x^(1/3))-1/3/x^3/a^2+3/4*b/a^3/x^(8/3)-9/7*b^2/a
^4/x^(7/3)+2*b^3/a^5/x^2-3*b^4/a^6/x^(5/3)+9/2*b^5/a^7/x^(4/3)-7*
b^6/a^8/x+12*b^7/a^9/x^(2/3)-27*b^8/a^10/x^(1/3)+30*b^9*ln(a+b*x^
(1/3))/a^11-10*b^9*ln(x)/a^11
```

Maxima [A] time = 1.44067, size = 193, normalized size = 1.19

$$-\frac{2520\,b^9x^3+1260\,ab^8x^{\frac{8}{3}}-420\,a^2b^7x^{\frac{7}{3}}+210\,a^3b^6x^2-126\,a^4b^5x^{\frac{5}{3}}+84\,a^5b^4x^{\frac{4}{3}}-60\,a^6b^3x+45\,a^7b^2x^{\frac{2}{3}}-35\,a^8bx^{\frac{1}{3}}+28\,a^9}{84\left(a^{10}bx^{\frac{10}{3}}+a^{11}x^3\right)}+\frac{30\,b^9\log\left(bx^{\frac{1}{3}}+a\right)}{a^{11}}-\frac{10\,b^9\log(x)}{a^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + a)^2*x^4),x, algorithm="maxima")
```

```
[Out] -1/84*(2520*b^9*x^3 + 1260*a*b^8*x^(8/3) - 420*a^2*b^7*x^(7/3) +
210*a^3*b^6*x^2 - 126*a^4*b^5*x^(5/3) + 84*a^5*b^4*x^(4/3) - 60*a
^6*b^3*x + 45*a^7*b^2*x^(2/3) - 35*a^8*b*x^(1/3) + 28*a^9)/(a^10*
b*x^(10/3) + a^11*x^3) + 30*b^9*log(b*x^(1/3) + a)/a^11 - 10*b^9*
log(x)/a^11
```

Fricas [A] time = 0.228253, size = 228, normalized size = 1.41

$$-\frac{2520\,ab^9x^3+210\,a^4b^6x^2-60\,a^7b^3x+28\,a^{10}-2520\left(b^{10}x^{\frac{10}{3}}+ab^9x^3\right)\log\left(bx^{\frac{1}{3}}+a\right)+2520\left(b^{10}x^{\frac{10}{3}}+ab^9x^3\right)\log\left(x^{\frac{1}{3}}\right)+\cdots}{84\left(a^{11}bx^{\frac{10}{3}}+a^{12}x^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + a)^2*x^4),x, algorithm="fricas")
```

```
[Out] -1/84*(2520*a*b^9*x^3 + 210*a^4*b^6*x^2 - 60*a^7*b^3*x + 28*a^10
- 2520*(b^10*x^(10/3) + a*b^9*x^3)*log(b*x^(1/3) + a) + 2520*(b^1
0*x^(10/3) + a*b^9*x^3)*log(x^(1/3)) + 9*(140*a^2*b^8*x^2 - 14*a^
```

```
5*b^5*x + 5*a^8*b^2)*x^(2/3) - 7*(60*a^3*b^7*x^2 - 12*a^6*b^4*x +
 5*a^9*b)*x^(1/3))/(a^11*b*x^(10/3) + a^12*x^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*x**(1/3))**2/x**4,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.22353, size = 196, normalized size = 1.21

$$\frac{30\,b^9\ln\left(\left|bx^{\frac{1}{3}}+a\right|\right)}{a^{11}}-\frac{10\,b^9\ln\left(|x|\right)}{a^{11}}-\frac{2520\,ab^9x^3+1260\,a^2b^8x^{\frac{8}{3}}-420\,a^3b^7x^{\frac{7}{3}}+210\,a^4b^6x^2-126\,a^5b^5x^{\frac{5}{3}}+84\,a^6b^4x^{\frac{4}{3}}-60\,a^7b^3x+45\,a^8b^2x^{\frac{2}{3}}-35\,a^9bx^{\frac{1}{3}}+28\,a}{84\left(bx^{\frac{1}{3}}+a\right)a^{11}x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + a)^2*x^4),x, algorithm="giac")
```

```
[Out] 30*b^9*ln(abs(b*x^(1/3) + a))/a^11 - 10*b^9*ln(abs(x))/a^11 - 1/8
4*(2520*a*b^9*x^3 + 1260*a^2*b^8*x^(8/3) - 420*a^3*b^7*x^(7/3) +
210*a^4*b^6*x^2 - 126*a^5*b^5*x^(5/3) + 84*a^6*b^4*x^(4/3) - 60*a
^7*b^3*x + 45*a^8*b^2*x^(2/3) - 35*a^9*b*x^(1/3) + 28*a^10)/((b*x
^(1/3) + a)*a^11*x^3)
```

3.2366 $\int \frac{x^3}{\left(a+b\sqrt[3]{x}\right)^3}\,dx$

Optimal. Leaf size=171

$$\frac{3a^{11}}{2b^{12}\left(a+b\sqrt[3]{x}\right)^2}-\frac{33a^{10}}{b^{12}\left(a+b\sqrt[3]{x}\right)}-\frac{165a^9\log\left(a+b\sqrt[3]{x}\right)}{b^{12}}+\frac{135a^8\sqrt[3]{x}}{b^{11}}-\frac{54a^7x^{2/3}}{b^{10}}+\frac{28a^6x}{b^9}-\frac{63a^5x^{4/3}}{4b^8}+\frac{9a^4x^{5/3}}{b^7}-\frac{5a^3x^2}{b^6}+\frac{18a^2x^{7/3}}{7b^5}-\frac{9ax^{8/3}}{8b^4}+\frac{x^3}{3b^3}$$

```
[Out] (3*a^11)/(2*b^12*(a + b*x^(1/3))^2) - (33*a^10)/(b^12*(a + b*x^(1
/3))) + (135*a^8*x^(1/3))/b^11 - (54*a^7*x^(2/3))/b^10 + (28*a^6*
x)/b^9 - (63*a^5*x^(4/3))/(4*b^8) + (9*a^4*x^(5/3))/b^7 - (5*a^3*
x^2)/b^6 + (18*a^2*x^(7/3))/(7*b^5) - (9*a*x^(8/3))/(8*b^4) + x^3
/(3*b^3) - (165*a^9*Log[a + b*x^(1/3)])/b^12
```

Rubi [A] time = 0.325596, antiderivative size = 171, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{3a^{11}}{2b^{12}\left(a+b\sqrt[3]{x}\right)^2}-\frac{33a^{10}}{b^{12}\left(a+b\sqrt[3]{x}\right)}-\frac{165a^9\log\left(a+b\sqrt[3]{x}\right)}{b^{12}}+\frac{135a^8\sqrt[3]{x}}{b^{11}}-\frac{54a^7x^{2/3}}{b^{10}}+\frac{28a^6x}{b^9}-\frac{63a^5x^{4/3}}{4b^8}+\frac{9a^4x^{5/3}}{b^7}-\frac{5a^3x^2}{b^6}+\frac{18a^2x^{7/3}}{7b^5}-\frac{9ax^{8/3}}{8b^4}+\frac{x^3}{3b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(a + b*x^(1/3))^3,x]
```

```
[Out] (3*a^11)/(2*b^12*(a + b*x^(1/3))^2) - (33*a^10)/(b^12*(a + b*x^(1
/3))) + (135*a^8*x^(1/3))/b^11 - (54*a^7*x^(2/3))/b^10 + (28*a^6*
x)/b^9 - (63*a^5*x^(4/3))/(4*b^8) + (9*a^4*x^(5/3))/b^7 - (5*a^3*
x^2)/b^6 + (18*a^2*x^(7/3))/(7*b^5) - (9*a*x^(8/3))/(8*b^4) + x^3
/(3*b^3) - (165*a^9*Log[a + b*x^(1/3)])/b^12
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{3a^{11}}{2b^{12}\left(a+b\sqrt[3]{x}\right)^2}-\frac{33a^{10}}{b^{12}\left(a+b\sqrt[3]{x}\right)}-\frac{165a^9\log\left(a+b\sqrt[3]{x}\right)}{b^{12}}+\frac{135a^8\sqrt[3]{x}}{b^{11}}-\frac{108a^7\int^{\sqrt[3]{x}}x\,dx}{b^{10}}+\frac{28a^6x}{b^9}-\frac{63a^5x^{\frac{4}{3}}}{4b^8}+\frac{9a^4x^{\frac{5}{3}}}{b^7}-\frac{5a^3x^2}{b^6}+\frac{18a^2x^{\frac{7}{3}}}{7b^5}-\frac{9ax^{\frac{8}{3}}}{8b^4}+\frac{x^3}{3b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(a+b*x**(1/3))**3,x)
```

```
[Out] 3*a**11/(2*b**12*(a + b*x**(1/3))**2) - 33*a**10/(b**12*(a + b*x*
*(1/3))) - 165*a**9*log(a + b*x**(1/3))/b**12 + 135*a**8*x**(1/3)
/b**11 - 108*a**7*Integral(x, (x, x**(1/3)))/b**10 + 28*a**6*x/b*
*9 - 63*a**5*x**(4/3)/(4*b**8) + 9*a**4*x**(5/3)/b**7 - 5*a**3*x*
*2/b**6 + 18*a**2*x**(7/3)/(7*b**5) - 9*a*x**(8/3)/(8*b**4) + x**
3/(3*b**3)
```

Mathematica [A] time = 0.102513, size = 157, normalized size = 0.92

$$\frac{\frac{252a^{11}}{\left(a+b\sqrt[3]{x}\right)^2}-\frac{5544a^{10}}{a+b\sqrt[3]{x}}-27720a^9\log\left(a+b\sqrt[3]{x}\right)+22680a^8b\sqrt[3]{x}-9072a^7b^2x^{2/3}+4704a^6b^3x-2646a^5b^4x^{4/3}+1512a^4b^5x^{5/3}-}{168b^{12}}$$

Antiderivative was successfully verified.

```
[In]   Integrate[x^3/(a + b*x^(1/3))^3,x]
```

```
[Out] ((252*a^11)/(a + b*x^(1/3))^2 - (5544*a^10)/(a + b*x^(1/3)) + 226
80*a^8*b*x^(1/3) - 9072*a^7*b^2*x^(2/3) + 4704*a^6*b^3*x - 2646*a
^5*b^4*x^(4/3) + 1512*a^4*b^5*x^(5/3) - 840*a^3*b^6*x^2 + 432*a^2
*b^7*x^(7/3) - 189*a*b^8*x^(8/3) + 56*b^9*x^3 - 27720*a^9*Log[a +
 b*x^(1/3)])/(168*b^12)
```

Maple [A] time = 0.013, size = 144, normalized size = 0.8

$$\frac{3 a^{11}}{2 b^{12}} \left(a + b\sqrt[3]{x}\right)^{-2} - 33 \frac{a^{10}}{b^{12} \left(a + b\sqrt[3]{x}\right)} + 135 \frac{a^8 \sqrt[3]{x}}{b^{11}} - 54 \frac{a^7 x^{2/3}}{b^{10}} + 28 \frac{a^6 x}{b^9} - \frac{63 a^5}{4 b^8} x^{\frac{4}{3}} + 9 \frac{a^4 x^{5/3}}{b^7} - 5 \frac{x^2 a^3}{b^6} + \frac{18 a^2}{7 b^5} x^{\frac{7}{3}} - \frac{9 a}{8 b^4} x^{\frac{8}{3}} + \frac{x^3}{3 b^3} - 165 \frac{a^9 \ln\left(a + b\sqrt[3]{x}\right)}{b^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^3/(a+b*x^(1/3))^3,x)
```

```
[Out] 3/2*a^11/b^12/(a+b*x^(1/3))^2-33*a^10/b^12/(a+b*x^(1/3))+135*a^8*
x^(1/3)/b^11-54*a^7*x^(2/3)/b^10+28*a^6*x/b^9-63/4*a^5*x^(4/3)/b^
8+9*a^4*x^(5/3)/b^7-5*a^3*x^2/b^6+18/7*a^2*x^(7/3)/b^5-9/8*a*x^(8
/3)/b^4+1/3*x^3/b^3-165*a^9*ln(a+b*x^(1/3))/b^12
```

Maxima [A] time = 1.44412, size = 266, normalized size = 1.56

$$-\frac{165 a^9 \log\left(bx^{\frac{1}{3}} + a\right)}{b^{12}} + \frac{\left(bx^{\frac{1}{3}} + a\right)^9}{3 b^{12}} - \frac{33 \left(bx^{\frac{1}{3}} + a\right)^8 a}{8 b^{12}} + \frac{165 \left(bx^{\frac{1}{3}} + a\right)^7 a^2}{7 b^{12}} - \frac{165 \left(bx^{\frac{1}{3}} + a\right)^6 a^3}{2 b^{12}} + \frac{198 \left(bx^{\frac{1}{3}} + a\right)^5 a^4}{b^{12}} - \frac{693 \left(bx^{\frac{1}{3}} + a\right)^4 a^5}{2 b^{12}} + \frac{462 \left(bx^{\frac{1}{3}} + a\right)^3 a^6}{b^{12}} - \frac{495 \left(bx^{\frac{1}{3}} + a\right)^2 a^7}{b^{12}} + \frac{495 \left(bx^{\frac{1}{3}} + a\right) a^8}{b^{12}} - \frac{33 a^{10}}{\left(bx^{\frac{1}{3}} + a\right) b^{12}} + \frac{3 a^{11}}{2 \left(bx^{\frac{1}{3}} + a\right)^2 b^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^3/(b*x^(1/3) + a)^3,x, algorithm="maxima")
```

```
[Out] -165*a^9*log(b*x^(1/3) + a)/b^12 + 1/3*(b*x^(1/3) + a)^9/b^12 - 3
3/8*(b*x^(1/3) + a)^8*a/b^12 + 165/7*(b*x^(1/3) + a)^7*a^2/b^12 -
 165/2*(b*x^(1/3) + a)^6*a^3/b^12 + 198*(b*x^(1/3) + a)^5*a^4/b^1
2 - 693/2*(b*x^(1/3) + a)^4*a^5/b^12 + 462*(b*x^(1/3) + a)^3*a^6/
b^12 - 495*(b*x^(1/3) + a)^2*a^7/b^12 + 495*(b*x^(1/3) + a)*a^8/b
^12 - 33*a^10/((b*x^(1/3) + a)*b^12) + 3/2*a^11/((b*x^(1/3) + a)^
2*b^12)
```

Fricas [A] time = 0.234337, size = 243, normalized size = 1.42

$$\frac{110 a^2 b^9 x^3 - 462 a^5 b^6 x^2 + 9240 a^8 b^3 x - 5292 a^{11} - 27720 \left(a^9 b^2 x^{\frac{2}{3}} + 2 a^{10} b x^{\frac{1}{3}} + a^{11}\right) \log\left(bx^{\frac{1}{3}} + a\right) + \left(56 b^{11} x^3 - 165 a^3 b^8 x\right.}{168 \left(b^{14} x^{\frac{2}{3}} + 2 a b^{13} x^{\frac{1}{3}} + a^2 b^{12}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^(1/3) + a)^3,x, algorithm="fricas")
```

```
[Out] 1/168*(110*a^2*b^9*x^3 - 462*a^5*b^6*x^2 + 9240*a^8*b^3*x - 5292*
a^11 - 27720*(a^9*b^2*x^(2/3) + 2*a^10*b*x^(1/3) + a^11)*log(b*x^
(1/3) + a) + (56*b^11*x^3 - 165*a^3*b^8*x^2 + 924*a^6*b^5*x + 362
88*a^9*b^2)*x^(2/3) - (77*a*b^10*x^3 - 264*a^4*b^7*x^2 + 2310*a^7
*b^4*x - 17136*a^10*b)*x^(1/3))/(b^14*x^(2/3) + 2*a*b^13*x^(1/3)
+ a^2*b^12)
```

Sympy [A] time = 21.6122, size = 624, normalized size = 3.65

$$\begin{cases} -\frac{27720a^{11}\log\left(\frac{a}{b}+\sqrt[3]{x}\right)}{168a^2b^{12}+336ab^{13}\sqrt[3]{x}+168b^{14}x^{\frac{2}{3}}} - \frac{41580a^{11}}{168a^2b^{12}+336ab^{13}\sqrt[3]{x}+168b^{14}x^{\frac{2}{3}}} - \frac{55440a^{10}b\sqrt[3]{x}\log\left(\frac{a}{b}+\sqrt[3]{x}\right)}{168a^2b^{12}+336ab^{13}\sqrt[3]{x}+168b^{14}x^{\frac{2}{3}}} - \frac{55440a^{10}b\sqrt[3]{x}}{168a^2b^{12}+336ab^{13}\sqrt[3]{x}+168b^{14}x^{\frac{2}{3}}} - \ldots \\ \frac{x^4}{4a^3} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(a+b*x**(1/3))**3,x)
```

```
[Out] Piecewise((-27720*a**11*log(a/b + x**(1/3))/(168*a**2*b**12 + 336
*a*b**13*x**(1/3) + 168*b**14*x**(2/3)) - 41580*a**11/(168*a**2*b
**12 + 336*a*b**13*x**(1/3) + 168*b**14*x**(2/3)) - 55440*a**10*b
*x**(1/3)*log(a/b + x**(1/3))/(168*a**2*b**12 + 336*a*b**13*x**(1
/3) + 168*b**14*x**(2/3)) - 55440*a**10*b*x**(1/3)/(168*a**2*b**1
2 + 336*a*b**13*x**(1/3) + 168*b**14*x**(2/3)) - 27720*a**9*b**2*
x**(2/3)*log(a/b + x**(1/3))/(168*a**2*b**12 + 336*a*b**13*x**(1/
3) + 168*b**14*x**(2/3)) + 9240*a**8*b**3*x/(168*a**2*b**12 + 336
*a*b**13*x**(1/3) + 168*b**14*x**(2/3)) - 2310*a**7*b**4*x**(4/3)
/(168*a**2*b**12 + 336*a*b**13*x**(1/3) + 168*b**14*x**(2/3)) + 9
24*a**6*b**5*x**(5/3)/(168*a**2*b**12 + 336*a*b**13*x**(1/3) + 16
8*b**14*x**(2/3)) - 462*a**5*b**6*x**2/(168*a**2*b**12 + 336*a*b*
*13*x**(1/3) + 168*b**14*x**(2/3)) + 264*a**4*b**7*x**(7/3)/(168*
a**2*b**12 + 336*a*b**13*x**(1/3) + 168*b**14*x**(2/3)) - 165*a**
3*b**8*x**(8/3)/(168*a**2*b**12 + 336*a*b**13*x**(1/3) + 168*b**1
4*x**(2/3)) + 110*a**2*b**9*x**3/(168*a**2*b**12 + 336*a*b**13*x*
*(1/3) + 168*b**14*x**(2/3)) - 77*a*b**10*x**(10/3)/(168*a**2*b**
12 + 336*a*b**13*x**(1/3) + 168*b**14*x**(2/3)) + 56*b**11*x**(11
/3)/(168*a**2*b**12 + 336*a*b**13*x**(1/3) + 168*b**14*x**(2/3)),
 Ne(b, 0)), (x**4/(4*a**3), True))
```

GIAC/XCAS [A] time = 0.224032, size = 196, normalized size = 1.15

$$-\frac{165\,a^9\ln\left(\left|bx^{\frac{1}{3}}+a\right|\right)}{b^{12}} - \frac{3\left(22\,a^{10}bx^{\frac{1}{3}}+21\,a^{11}\right)}{2\left(bx^{\frac{1}{3}}+a\right)^2b^{12}} + \frac{56\,b^{24}x^3 - 189\,ab^{23}x^{\frac{8}{3}} + 432\,a^2b^{22}x^{\frac{7}{3}} - 840\,a^3b^{21}x^2 + 1512\,a^4b^{20}x^{\frac{5}{3}} - 2646\,a^5b^{19}x^{\frac{4}{3}} + 4704\,a^6b^{18}x - 9072\,a^7b^{17}x^{\frac{2}{3}} + 22680\ldots}{168\,b^{27}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/(b*x^(1/3) + a)^3,x, algorithm="giac")
```

```
[Out] -165*a^9*ln(abs(b*x^(1/3) + a))/b^12 - 3/2*(22*a^10*b*x^(1/3) + 2
1*a^11)/((b*x^(1/3) + a)^2*b^12) + 1/168*(56*b^24*x^3 - 189*a*b^2
3*x^(8/3) + 432*a^2*b^22*x^(7/3) - 840*a^3*b^21*x^2 + 1512*a^4*b^
20*x^(5/3) - 2646*a^5*b^19*x^(4/3) + 4704*a^6*b^18*x - 9072*a^7*b
^17*x^(2/3) + 22680*a^8*b^16*x^(1/3))/b^27
```

3.2367 $\int \frac{x^2}{\left(a+b\sqrt[3]{x}\right)^3}\,dx$

Optimal. Leaf size=134

$$-\frac{3a^8}{2b^9\left(a+b\sqrt[3]{x}\right)^2}+\frac{24a^7}{b^9\left(a+b\sqrt[3]{x}\right)}+\frac{84a^6\log\left(a+b\sqrt[3]{x}\right)}{b^9}-\frac{63a^5\sqrt[3]{x}}{b^8}+\frac{45a^4x^{2/3}}{2b^7}-\frac{10a^3x}{b^6}+\frac{9a^2x^{4/3}}{2b^5}-\frac{9ax^{5/3}}{5b^4}+\frac{x^2}{2b^3}$$

```
[Out] (-3*a^8)/(2*b^9*(a + b*x^(1/3))^2) + (24*a^7)/(b^9*(a + b*x^(1/3)
)) - (63*a^5*x^(1/3))/b^8 + (45*a^4*x^(2/3))/(2*b^7) - (10*a^3*x)
/b^6 + (9*a^2*x^(4/3))/(2*b^5) - (9*a*x^(5/3))/(5*b^4) + x^2/(2*b
^3) + (84*a^6*Log[a + b*x^(1/3)])/b^9
```

Rubi [A] time = 0.225814, antiderivative size = 134, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{3a^8}{2b^9\left(a+b\sqrt[3]{x}\right)^2}+\frac{24a^7}{b^9\left(a+b\sqrt[3]{x}\right)}+\frac{84a^6\log\left(a+b\sqrt[3]{x}\right)}{b^9}-\frac{63a^5\sqrt[3]{x}}{b^8}+\frac{45a^4x^{2/3}}{2b^7}-\frac{10a^3x}{b^6}+\frac{9a^2x^{4/3}}{2b^5}-\frac{9ax^{5/3}}{5b^4}+\frac{x^2}{2b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b*x^(1/3))^3,x]
```

```
[Out] (-3*a^8)/(2*b^9*(a + b*x^(1/3))^2) + (24*a^7)/(b^9*(a + b*x^(1/3)
)) - (63*a^5*x^(1/3))/b^8 + (45*a^4*x^(2/3))/(2*b^7) - (10*a^3*x)
/b^6 + (9*a^2*x^(4/3))/(2*b^5) - (9*a*x^(5/3))/(5*b^4) + x^2/(2*b
^3) + (84*a^6*Log[a + b*x^(1/3)])/b^9
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{3a^8}{2b^9\left(a+b\sqrt[3]{x}\right)^2}+\frac{24a^7}{b^9\left(a+b\sqrt[3]{x}\right)}+\frac{84a^6\log\left(a+b\sqrt[3]{x}\right)}{b^9}-\frac{63a^5\sqrt[3]{x}}{b^8}+\frac{45a^4\int^{\sqrt[3]{x}}x\,dx}{b^7}-\frac{10a^3x}{b^6}+\frac{9a^2x^{\frac{4}{3}}}{2b^5}-\frac{9ax^{\frac{5}{3}}}{5b^4}+\frac{x^2}{2b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b*x**(1/3))**3,x)
```

```
[Out] -3*a**8/(2*b**9*(a + b*x**(1/3))**2) + 24*a**7/(b**9*(a + b*x**(1
/3))) + 84*a**6*log(a + b*x**(1/3))/b**9 - 63*a**5*x**(1/3)/b**8
+ 45*a**4*Integral(x, (x, x**(1/3)))/b**7 - 10*a**3*x/b**6 + 9*a*
*2*x**(4/3)/(2*b**5) - 9*a*x**(5/3)/(5*b**4) + x**2/(2*b**3)
```

Mathematica [A] time = 0.08003, size = 120, normalized size = 0.9

$$\frac{-\frac{15a^8}{\left(a+b\sqrt[3]{x}\right)^2}+\frac{240a^7}{a+b\sqrt[3]{x}}+840a^6\log\left(a+b\sqrt[3]{x}\right)-630a^5b\sqrt[3]{x}+225a^4b^2x^{2/3}-100a^3b^3x+45a^2b^4x^{4/3}-18ab^5x^{5/3}+5b^6x^2}{10b^9}$$

Antiderivative was successfully verified.

```
[In]   Integrate[x^2/(a + b*x^(1/3))^3,x]
```

```
[Out] ((-15*a^8)/(a + b*x^(1/3))^2 + (240*a^7)/(a + b*x^(1/3)) - 630*a^
5*b*x^(1/3) + 225*a^4*b^2*x^(2/3) - 100*a^3*b^3*x + 45*a^2*b^4*x^
(4/3) - 18*a*b^5*x^(5/3) + 5*b^6*x^2 + 840*a^6*Log[a + b*x^(1/3)]
)/(10*b^9)
```

Maple [A] time = 0.013, size = 111, normalized size = 0.8

$$-\frac{3a^8}{2b^9}\left(a+b\sqrt[3]{x}\right)^{-2}+24\frac{a^7}{b^9\left(a+b\sqrt[3]{x}\right)}-63\frac{a^5\sqrt[3]{x}}{b^8}+\frac{45a^4}{2b^7}x^{\frac{2}{3}}-10\frac{a^3x}{b^6}+\frac{9a^2}{2b^5}x^{\frac{4}{3}}-\frac{9a}{5b^4}x^{\frac{5}{3}}+\frac{x^2}{2b^3}+84\frac{a^6\ln\left(a+b\sqrt[3]{x}\right)}{b^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^2/(a+b*x^(1/3))^3,x)
```

```
[Out] -3/2*a^8/b^9/(a+b*x^(1/3))^2+24*a^7/b^9/(a+b*x^(1/3))-63*a^5*x^(1
/3)/b^8+45/2*a^4*x^(2/3)/b^7-10*a^3*x/b^6+9/2*a^2*x^(4/3)/b^5-9/5
*a*x^(5/3)/b^4+1/2*x^2/b^3+84*a^6*ln(a+b*x^(1/3))/b^9
```

Maxima [A] time = 1.45562, size = 197, normalized size = 1.47

$$\frac{84a^6\log\left(bx^{\frac{1}{3}}+a\right)}{b^9}+\frac{\left(bx^{\frac{1}{3}}+a\right)^6}{2b^9}-\frac{24\left(bx^{\frac{1}{3}}+a\right)^5a}{5b^9}+\frac{21\left(bx^{\frac{1}{3}}+a\right)^4a^2}{b^9}-\frac{56\left(bx^{\frac{1}{3}}+a\right)^3a^3}{b^9}+\frac{105\left(bx^{\frac{1}{3}}+a\right)^2a^4}{b^9}-\frac{168\left(bx^{\frac{1}{3}}+a\right)a^5}{b^9}+\frac{24a^7}{\left(bx^{\frac{1}{3}}+a\right)b^9}-\frac{3a^8}{2\left(bx^{\frac{1}{3}}+a\right)^2b^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^2/(b*x^(1/3) + a)^3,x, algorithm="maxima")
```

```
[Out] 84*a^6*log(b*x^(1/3) + a)/b^9 + 1/2*(b*x^(1/3) + a)^6/b^9 - 24/5*
(b*x^(1/3) + a)^5*a/b^9 + 21*(b*x^(1/3) + a)^4*a^2/b^9 - 56*(b*x^
(1/3) + a)^3*a^3/b^9 + 105*(b*x^(1/3) + a)^2*a^4/b^9 - 168*(b*x^(
1/3) + a)*a^5/b^9 + 24*a^7/((b*x^(1/3) + a)*b^9) - 3/2*a^8/((b*x^
(1/3) + a)^2*b^9)
```

Fricas [A] time = 0.226016, size = 198, normalized size = 1.48

$$\frac{14a^2b^6x^2-280a^5b^3x+225a^8+840\left(a^6b^2x^{\frac{2}{3}}+2a^7bx^{\frac{1}{3}}+a^8\right)\log\left(bx^{\frac{1}{3}}+a\right)+\left(5b^8x^2-28a^3b^5x-1035a^6b^2\right)x^{\frac{2}{3}}-2\left(4a\right.}{10\left(b^{11}x^{\frac{2}{3}}+2ab^{10}x^{\frac{1}{3}}+a^2b^9\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^2/(b*x^(1/3) + a)^3,x, algorithm="fricas")
```

```
[Out] 1/10*(14*a^2*b^6*x^2 - 280*a^5*b^3*x + 225*a^8 + 840*(a^6*b^2*x^(
2/3) + 2*a^7*b*x^(1/3) + a^8)*log(b*x^(1/3) + a) + (5*b^8*x^2 - 2
8*a^3*b^5*x - 1035*a^6*b^2)*x^(2/3) - 2*(4*a*b^7*x^2 - 35*a^4*b^4
*x + 195*a^7*b)*x^(1/3))/(b^11*x^(2/3) + 2*a*b^10*x^(1/3) + a^2*b
^9)
```

Sympy [A] time = 7.33795, size = 493, normalized size = 3.68

$$\begin{cases} \frac{840a^8\log\left(\frac{a}{b}+\sqrt[3]{x}\right)}{10a^2b^9+20ab^{10}\sqrt[3]{x}+10b^{11}x^{\frac{2}{3}}} + \frac{1260a^8}{10a^2b^9+20ab^{10}\sqrt[3]{x}+10b^{11}x^{\frac{2}{3}}} + \frac{1680a^7b\sqrt[3]{x}\log\left(\frac{a}{b}+\sqrt[3]{x}\right)}{10a^2b^9+20ab^{10}\sqrt[3]{x}+10b^{11}x^{\frac{2}{3}}} + \frac{1680a^7b\sqrt[3]{x}}{10a^2b^9+20ab^{10}\sqrt[3]{x}+10b^{11}x^{\frac{2}{3}}} + \frac{840a^6b^2x^{\frac{2}{3}}\log\left(\frac{a}{b}+\right.}{10a^2b^9+20ab^{10}\sqrt[3]{x}+1} \\ \frac{x^3}{3a^3} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b*x**(1/3))**3,x)
```

```
[Out] Piecewise((840*a**8*log(a/b + x**(1/3))/(10*a**2*b**9 + 20*a*b**1
0*x**(1/3) + 10*b**11*x**(2/3)) + 1260*a**8/(10*a**2*b**9 + 20*a*
b**10*x**(1/3) + 10*b**11*x**(2/3)) + 1680*a**7*b*x**(1/3)*log(a/
b + x**(1/3))/(10*a**2*b**9 + 20*a*b**10*x**(1/3) + 10*b**11*x**(
2/3)) + 1680*a**7*b*x**(1/3)/(10*a**2*b**9 + 20*a*b**10*x**(1/3)
+ 10*b**11*x**(2/3)) + 840*a**6*b**2*x**(2/3)*log(a/b + x**(1/3))
/(10*a**2*b**9 + 20*a*b**10*x**(1/3) + 10*b**11*x**(2/3)) - 280*a
**5*b**3*x/(10*a**2*b**9 + 20*a*b**10*x**(1/3) + 10*b**11*x**(2/3
)) + 70*a**4*b**4*x**(4/3)/(10*a**2*b**9 + 20*a*b**10*x**(1/3) +
10*b**11*x**(2/3)) - 28*a**3*b**5*x**(5/3)/(10*a**2*b**9 + 20*a*b
**10*x**(1/3) + 10*b**11*x**(2/3)) + 14*a**2*b**6*x**2/(10*a**2*b
**9 + 20*a*b**10*x**(1/3) + 10*b**11*x**(2/3)) - 8*a*b**7*x**(7/3
)/(10*a**2*b**9 + 20*a*b**10*x**(1/3) + 10*b**11*x**(2/3)) + 5*b*
*8*x**(8/3)/(10*a**2*b**9 + 20*a*b**10*x**(1/3) + 10*b**11*x**(2/
3)), Ne(b, 0)), (x**3/(3*a**3), True))
```

GIAC/XCAS [A] time = 0.223357, size = 151, normalized size = 1.13

$$\frac{84\,a^6\ln\left(\left|bx^{\frac{1}{3}}+a\right|\right)}{b^9} + \frac{3\left(16\,a^7bx^{\frac{1}{3}}+15\,a^8\right)}{2\left(bx^{\frac{1}{3}}+a\right)^2b^9} + \frac{5\,b^{15}x^2 - 18\,ab^{14}x^{\frac{5}{3}} + 45\,a^2b^{13}x^{\frac{4}{3}} - 100\,a^3b^{12}x + 225\,a^4b^{11}x^{\frac{2}{3}} - 630\,a^5b^{10}x^{\frac{1}{3}}}{10\,b^{18}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(b*x^(1/3) + a)^3,x, algorithm="giac")
```

```
[Out] 84*a^6*ln(abs(b*x^(1/3) + a))/b^9 + 3/2*(16*a^7*b*x^(1/3) + 15*a^
8)/((b*x^(1/3) + a)^2*b^9) + 1/10*(5*b^15*x^2 - 18*a*b^14*x^(5/3)
 + 45*a^2*b^13*x^(4/3) - 100*a^3*b^12*x + 225*a^4*b^11*x^(2/3) -
630*a^5*b^10*x^(1/3))/b^18
```

3.2368 $\int \frac{x}{\left(a+b\sqrt[3]{x}\right)^3} dx$

Optimal. Leaf size=90

$$\frac{3a^5}{2b^6\left(a+b\sqrt[3]{x}\right)^2}-\frac{15a^4}{b^6\left(a+b\sqrt[3]{x}\right)}-\frac{30a^3\log\left(a+b\sqrt[3]{x}\right)}{b^6}+\frac{18a^2\sqrt[3]{x}}{b^5}-\frac{9ax^{2/3}}{2b^4}+\frac{x}{b^3}$$

```
[Out] (3*a^5)/(2*b^6*(a + b*x^(1/3))^2) - (15*a^4)/(b^6*(a + b*x^(1/3))
) + (18*a^2*x^(1/3))/b^5 - (9*a*x^(2/3))/(2*b^4) + x/b^3 - (30*a^
3*Log[a + b*x^(1/3)])/b^6
```

Rubi [A] time = 0.147201, antiderivative size = 90, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{3a^5}{2b^6\left(a+b\sqrt[3]{x}\right)^2}-\frac{15a^4}{b^6\left(a+b\sqrt[3]{x}\right)}-\frac{30a^3\log\left(a+b\sqrt[3]{x}\right)}{b^6}+\frac{18a^2\sqrt[3]{x}}{b^5}-\frac{9ax^{2/3}}{2b^4}+\frac{x}{b^3}$$

Antiderivative was successfully verified.

```
[In] Int[x/(a + b*x^(1/3))^3,x]
```

```
[Out] (3*a^5)/(2*b^6*(a + b*x^(1/3))^2) - (15*a^4)/(b^6*(a + b*x^(1/3))
) + (18*a^2*x^(1/3))/b^5 - (9*a*x^(2/3))/(2*b^4) + x/b^3 - (30*a^
3*Log[a + b*x^(1/3)])/b^6
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{3a^5}{2b^6\left(a+b\sqrt[3]{x}\right)^2}-\frac{15a^4}{b^6\left(a+b\sqrt[3]{x}\right)}-\frac{30a^3\log\left(a+b\sqrt[3]{x}\right)}{b^6}+\frac{18a^2\sqrt[3]{x}}{b^5}-\frac{9a\int^{\sqrt[3]{x}} x\,dx}{b^4}+\frac{x}{b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x/(a+b*x**(1/3))**3,x)
```

```
[Out] 3*a**5/(2*b**6*(a + b*x**(1/3))**2) - 15*a**4/(b**6*(a + b*x**(1/
3))) - 30*a**3*log(a + b*x**(1/3))/b**6 + 18*a**2*x**(1/3)/b**5 -
 9*a*Integral(x, (x, x**(1/3)))/b**4 + x/b**3
```

Mathematica [A] time = 0.0606054, size = 83, normalized size = 0.92

$$\frac{\frac{3a^5}{\left(a+b\sqrt[3]{x}\right)^2}-\frac{30a^4}{a+b\sqrt[3]{x}}-60a^3\log\left(a+b\sqrt[3]{x}\right)+36a^2b\sqrt[3]{x}-9ab^2x^{2/3}+2b^3x}{2b^6}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(a + b*x^(1/3))^3,x]
```

```
[Out] ((3*a^5)/(a + b*x^(1/3))^2 - (30*a^4)/(a + b*x^(1/3)) + 36*a^2*b*
x^(1/3) - 9*a*b^2*x^(2/3) + 2*b^3*x - 60*a^3*Log[a + b*x^(1/3)])/
(2*b^6)
```

Maple [A] time = 0.004, size = 77, normalized size = 0.9

$$\frac{3 a^5}{2 b^6}\left(a+b\sqrt[3]{x}\right)^{-2}-15\frac{a^4}{b^6\left(a+b\sqrt[3]{x}\right)}+18\frac{a^2\sqrt[3]{x}}{b^5}-\frac{9 a}{2 b^4}x^{\frac{2}{3}}+\frac{x}{b^3}-30\frac{a^3\ln\left(a+b\sqrt[3]{x}\right)}{b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x/(a+b*x^(1/3))^3,x)
```

```
[Out] 3/2*a^5/b^6/(a+b*x^(1/3))^2-15*a^4/b^6/(a+b*x^(1/3))+18*a^2*x^(1/
3)/b^5-9/2*a*x^(2/3)/b^4+x/b^3-30*a^3*ln(a+b*x^(1/3))/b^6
```

Maxima [A] time = 1.43712, size = 127, normalized size = 1.41

$$-\frac{30 a^3\log\left(bx^{\frac{1}{3}}+a\right)}{b^6}+\frac{\left(bx^{\frac{1}{3}}+a\right)^3}{b^6}-\frac{15\left(bx^{\frac{1}{3}}+a\right)^2 a}{2 b^6}+\frac{30\left(bx^{\frac{1}{3}}+a\right)a^2}{b^6}-\frac{15 a^4}{\left(bx^{\frac{1}{3}}+a\right)b^6}+\frac{3 a^5}{2\left(bx^{\frac{1}{3}}+a\right)^2 b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(b*x^(1/3) + a)^3,x, algorithm="maxima")
```

```
[Out] -30*a^3*log(b*x^(1/3) + a)/b^6 + (b*x^(1/3) + a)^3/b^6 - 15/2*(b*
x^(1/3) + a)^2*a/b^6 + 30*(b*x^(1/3) + a)*a^2/b^6 - 15*a^4/((b*x^
(1/3) + a)*b^6) + 3/2*a^5/((b*x^(1/3) + a)^2*b^6)
```

Fricas [A] time = 0.226502, size = 154, normalized size = 1.71

$$\frac{20 a^2b^3x-27 a^5-60\left(a^3b^2x^{\frac{2}{3}}+2 a^4bx^{\frac{1}{3}}+a^5\right)\log\left(bx^{\frac{1}{3}}+a\right)+\left(2 b^5x+63 a^3b^2\right)x^{\frac{2}{3}}-\left(5 ab^4x-6 a^4b\right)x^{\frac{1}{3}}}{2\left(b^8x^{\frac{2}{3}}+2 ab^7x^{\frac{1}{3}}+a^2b^6\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(b*x^(1/3) + a)^3,x, algorithm="fricas")
```

```
[Out] 1/2*(20*a^2*b^3*x - 27*a^5 - 60*(a^3*b^2*x^(2/3) + 2*a^4*b*x^(1/3
) + a^5)*log(b*x^(1/3) + a) + (2*b^5*x + 63*a^3*b^2)*x^(2/3) - (5
*a*b^4*x - 6*a^4*b)*x^(1/3))/(b^8*x^(2/3) + 2*a*b^7*x^(1/3) + a^2
*b^6)
```

Sympy [A] time = 25.5478, size = 622, normalized size = 6.91

$$-\frac{60a^6x^{30}\log\left(1+\frac{b\sqrt[3]{x}}{a}\right)}{2a^3b^6x^{30}+6a^2b^7x^{\frac{91}{3}}+6ab^8x^{\frac{92}{3}}+2b^9x^{31}}-\frac{180a^5bx^{\frac{91}{3}}\log\left(1+\frac{b\sqrt[3]{x}}{a}\right)}{2a^3b^6x^{30}+6a^2b^7x^{\frac{91}{3}}+6ab^8x^{\frac{92}{3}}+2b^9x^{31}}$$
$$+\frac{60a^5bx^{\frac{91}{3}}}{2a^3b^6x^{30}+6a^2b^7x^{\frac{91}{3}}+6ab^8x^{\frac{92}{3}}+2b^9x^{31}}-\frac{180a^4b^2x^{\frac{92}{3}}\log\left(1+\frac{b\sqrt[3]{x}}{a}\right)}{2a^3b^6x^{30}+6a^2b^7x^{\frac{91}{3}}+6ab^8x^{\frac{92}{3}}+2b^9x^{31}}$$
$$+\frac{150a^4b^2x^{\frac{92}{3}}}{2a^3b^6x^{30}+6a^2b^7x^{\frac{91}{3}}+6ab^8x^{\frac{92}{3}}+2b^9x^{31}}-\frac{60a^3b^3x^{31}\log\left(1+\frac{b\sqrt[3]{x}}{a}\right)}{2a^3b^6x^{30}+6a^2b^7x^{\frac{91}{3}}+6ab^8x^{\frac{92}{3}}+2b^9x^{31}}$$
$$+\frac{110a^3b^3x^{31}}{2a^3b^6x^{30}+6a^2b^7x^{\frac{91}{3}}+6ab^8x^{\frac{92}{3}}+2b^9x^{31}}+\frac{15a^2b^4x^{\frac{94}{3}}}{2a^3b^6x^{30}+6a^2b^7x^{\frac{91}{3}}+6ab^8x^{\frac{92}{3}}+2b^9x^{31}}$$
$$-\frac{3ab^5x^{\frac{95}{3}}}{2a^3b^6x^{30}+6a^2b^7x^{\frac{91}{3}}+6ab^8x^{\frac{92}{3}}+2b^9x^{31}}+\frac{2b^6x^{32}}{2a^3b^6x^{30}+6a^2b^7x^{\frac{91}{3}}+6ab^8x^{\frac{92}{3}}+2b^9x^{31}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b*x**(1/3))**3,x)
```

```
[Out] -60*a**6*x**30*log(1 + b*x**(1/3)/a)/(2*a**3*b**6*x**30 + 6*a**2*
b**7*x**(91/3) + 6*a*b**8*x**(92/3) + 2*b**9*x**31) - 180*a**5*b*
x**(91/3)*log(1 + b*x**(1/3)/a)/(2*a**3*b**6*x**30 + 6*a**2*b**7*
x**(91/3) + 6*a*b**8*x**(92/3) + 2*b**9*x**31) + 60*a**5*b*x**(91
/3)/(2*a**3*b**6*x**30 + 6*a**2*b**7*x**(91/3) + 6*a*b**8*x**(92/
3) + 2*b**9*x**31) - 180*a**4*b**2*x**(92/3)*log(1 + b*x**(1/3)/a
)/(2*a**3*b**6*x**30 + 6*a**2*b**7*x**(91/3) + 6*a*b**8*x**(92/3)
 + 2*b**9*x**31) + 150*a**4*b**2*x**(92/3)/(2*a**3*b**6*x**30 + 6
*a**2*b**7*x**(91/3) + 6*a*b**8*x**(92/3) + 2*b**9*x**31) - 60*a*
*3*b**3*x**31*log(1 + b*x**(1/3)/a)/(2*a**3*b**6*x**30 + 6*a**2*b
**7*x**(91/3) + 6*a*b**8*x**(92/3) + 2*b**9*x**31) + 110*a**3*b**
3*x**31/(2*a**3*b**6*x**30 + 6*a**2*b**7*x**(91/3) + 6*a*b**8*x**
(92/3) + 2*b**9*x**31) + 15*a**2*b**4*x**(94/3)/(2*a**3*b**6*x**3
0 + 6*a**2*b**7*x**(91/3) + 6*a*b**8*x**(92/3) + 2*b**9*x**31) -
3*a*b**5*x**(95/3)/(2*a**3*b**6*x**30 + 6*a**2*b**7*x**(91/3) + 6
*a*b**8*x**(92/3) + 2*b**9*x**31) + 2*b**6*x**32/(2*a**3*b**6*x**
30 + 6*a**2*b**7*x**(91/3) + 6*a*b**8*x**(92/3) + 2*b**9*x**31)
```

GIAC/XCAS [A] time = 0.2179, size = 107, normalized size = 1.19

$$-\frac{30\,a^{3}\ln\left(\left|bx^{\frac{1}{3}}+a\right|\right)}{b^{6}}-\frac{3\left(10\,a^{4}bx^{\frac{1}{3}}+9\,a^{5}\right)}{2\left(bx^{\frac{1}{3}}+a\right)^{2}b^{6}}+\frac{2\,b^{6}x-9\,ab^{5}x^{\frac{2}{3}}+36\,a^{2}b^{4}x^{\frac{1}{3}}}{2\,b^{9}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^(1/3) + a)^3,x, algorithm="giac")
```

```
[Out] -30*a^3*ln(abs(b*x^(1/3) + a))/b^6 - 3/2*(10*a^4*b*x^(1/3) + 9*a^
5)/((b*x^(1/3) + a)^2*b^6) + 1/2*(2*b^6*x - 9*a*b^5*x^(2/3) + 36*
a^2*b^4*x^(1/3))/b^9
```

3.2369 $\int \frac{1}{\left(a+b\sqrt[3]{x}\right)^3}\,dx$

Optimal. Leaf size=54

$$-\frac{3a^2}{2b^3\left(a+b\sqrt[3]{x}\right)^2}+\frac{6a}{b^3\left(a+b\sqrt[3]{x}\right)}+\frac{3\log\left(a+b\sqrt[3]{x}\right)}{b^3}$$

```
[Out] (-3*a^2)/(2*b^3*(a + b*x^(1/3))^2) + (6*a)/(b^3*(a + b*x^(1/3)))
+ (3*Log[a + b*x^(1/3)])/b^3
```

Rubi [A] time = 0.0759707, antiderivative size = 54, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$-\frac{3a^2}{2b^3\left(a+b\sqrt[3]{x}\right)^2}+\frac{6a}{b^3\left(a+b\sqrt[3]{x}\right)}+\frac{3\log\left(a+b\sqrt[3]{x}\right)}{b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^(1/3))^(-3),x]
```

```
[Out] (-3*a^2)/(2*b^3*(a + b*x^(1/3))^2) + (6*a)/(b^3*(a + b*x^(1/3)))
+ (3*Log[a + b*x^(1/3)])/b^3
```

Rubi in Sympy [A] time = 10.5878, size = 49, normalized size = 0.91

$$-\frac{3a^2}{2b^3\left(a+b\sqrt[3]{x}\right)^2}+\frac{6a}{b^3\left(a+b\sqrt[3]{x}\right)}+\frac{3\log\left(a+b\sqrt[3]{x}\right)}{b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*x**(1/3))**3,x)
```

```
[Out] -3*a**2/(2*b**3*(a + b*x**(1/3))**2) + 6*a/(b**3*(a + b*x**(1/3))
) + 3*log(a + b*x**(1/3))/b**3
```

Mathematica [A] time = 0.0368934, size = 45, normalized size = 0.83

$$\frac{3\left(\frac{a\left(3a+4b\sqrt[3]{x}\right)}{\left(a+b\sqrt[3]{x}\right)^2}+2\log\left(a+b\sqrt[3]{x}\right)\right)}{2b^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^(1/3))^(-3),x]
```

```
[Out] (3*((a*(3*a + 4*b*x^(1/3)))/(a + b*x^(1/3))^2 + 2*Log[a + b*x^(1/
3)]))/(2*b^3)
```

Maple [B] time = 0.101, size = 330, normalized size = 6.1

$$-\frac{9\,a^{6}}{2\,(b^{3}x+a^{3})^{2}\,b^{3}}+9\,\frac{a^{3}}{b^{3}\,(b^{3}x+a^{3})}+\frac{\ln\left(b^{3}x+a^{3}\right)}{b^{3}}+2\,\frac{\ln\left(a+b\sqrt[3]{x}\right)}{b^{3}}-\frac{a^{2}}{b^{3}}\left(a+b\sqrt[3]{x}\right)^{-2}$$
$$-\frac{13\,a^{2}}{2\,b}x^{\frac{2}{3}}\left(b^{2}x^{\frac{2}{3}}-ab\sqrt[3]{x}+a^{2}\right)^{-2}+5\,\frac{a^{3}\sqrt[3]{x}}{b^{2}\left(b^{2}x^{2/3}-ab\sqrt[3]{x}+a^{2}\right)^{2}}-3\,\frac{a^{4}}{b^{3}\left(b^{2}x^{2/3}-ab\sqrt[3]{x}+a^{2}\right)^{2}}$$
$$-\frac{1}{2\,b^{3}}\ln\left(b\left(b^{2}x^{\frac{2}{3}}-ab\sqrt[3]{x}+a^{2}\right)\right)+\frac{\sqrt{3}}{b^{3}}\arctan\left(\frac{\sqrt{3}}{3\,ab^{2}}\left(2\,\sqrt[3]{x}b^{3}-ab^{2}\right)\right)+4\,\frac{a}{b^{3}\left(a+b\sqrt[3]{x}\right)}$$
$$+2\,\frac{ax}{\left(b^{2}x^{2/3}-ab\sqrt[3]{x}+a^{2}\right)^{2}}-\frac{1}{2\,b^{3}}\ln\left(b^{2}x^{\frac{2}{3}}-ab\sqrt[3]{x}+a^{2}\right)-\frac{\sqrt{3}}{b^{3}}\arctan\left(\frac{\sqrt{3}}{3\,ab}\left(2\,b^{2}\sqrt[3]{x}-ab\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*x^(1/3))^3,x)
```

```
[Out] -9/2*a^6/(b^3*x+a^3)^2/b^3+9/b^3*a^3/(b^3*x+a^3)+ln(b^3*x+a^3)/b^
3+2*ln(a+b*x^(1/3))/b^3-a^2/b^3/(a+b*x^(1/3))^2-13/2*a^2/b/(b^2*x
^(2/3)-a*b*x^(1/3)+a^2)^2*x^(2/3)+5*a^3/b^2/(b^2*x^(2/3)-a*b*x^(1
/3)+a^2)^2*x^(1/3)-3*a^4/b^3/(b^2*x^(2/3)-a*b*x^(1/3)+a^2)^2-1/2/
b^3*ln(b*(b^2*x^(2/3)-a*b*x^(1/3)+a^2))+1/b^3*3^(1/2)*arctan(1/3*
(2*x^(1/3)*b^3-a*b^2)*3^(1/2)/a/b^2)+4*a/b^3/(a+b*x^(1/3))+2*a/(b
^2*x^(2/3)-a*b*x^(1/3)+a^2)^2*x-1/2/b^3*ln(b^2*x^(2/3)-a*b*x^(1/3
)+a^2)-1/b^3*3^(1/2)*arctan(1/3*(2*b^2*x^(1/3)-a*b)*3^(1/2)/a/b)
```

Maxima [A] time = 1.44246, size = 62, normalized size = 1.15

$$\frac{3\,\log\left(bx^{\frac{1}{3}}+a\right)}{b^{3}}+\frac{6\,a}{\left(bx^{\frac{1}{3}}+a\right)b^{3}}-\frac{3\,a^{2}}{2\left(bx^{\frac{1}{3}}+a\right)^{2}b^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^(-3),x, algorithm="maxima")
```

```
[Out] 3*log(b*x^(1/3) + a)/b^3 + 6*a/((b*x^(1/3) + a)*b^3) - 3/2*a^2/((
b*x^(1/3) + a)^2*b^3)
```

Fricas [A] time = 0.2207, size = 93, normalized size = 1.72

$$\frac{3\left(4\,abx^{\frac{1}{3}}+3\,a^{2}+2\left(b^{2}x^{\frac{2}{3}}+2\,abx^{\frac{1}{3}}+a^{2}\right)\log\left(bx^{\frac{1}{3}}+a\right)\right)}{2\left(b^{5}x^{\frac{2}{3}}+2\,ab^{4}x^{\frac{1}{3}}+a^{2}b^{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^(-3),x, algorithm="fricas")
```

```
[Out] 3/2*(4*a*b*x^(1/3) + 3*a^2 + 2*(b^2*x^(2/3) + 2*a*b*x^(1/3) + a^2
)*log(b*x^(1/3) + a))/(b^5*x^(2/3) + 2*a*b^4*x^(1/3) + a^2*b^3)
```

Sympy [A] time = 2.43413, size = 228, normalized size = 4.22

$$\begin{cases}\frac{6a^{2}\log\left(\frac{a}{b}+\sqrt[3]{x}\right)}{2a^{2}b^{3}+4ab^{4}\sqrt[3]{x}+2b^{5}x^{\frac{2}{3}}}+\frac{3a^{2}}{2a^{2}b^{3}+4ab^{4}\sqrt[3]{x}+2b^{5}x^{\frac{2}{3}}}+\frac{12ab\sqrt[3]{x}\log\left(\frac{a}{b}+\sqrt[3]{x}\right)}{2a^{2}b^{3}+4ab^{4}\sqrt[3]{x}+2b^{5}x^{\frac{2}{3}}}+\frac{6b^{2}x^{\frac{2}{3}}\log\left(\frac{a}{b}+\sqrt[3]{x}\right)}{2a^{2}b^{3}+4ab^{4}\sqrt[3]{x}+2b^{5}x^{\frac{2}{3}}}-\frac{6b^{2}x^{\frac{2}{3}}}{2a^{2}b^{3}+4ab^{4}\sqrt[3]{x}+2b^{5}x^{\frac{2}{3}}} & \text{for } b\neq 0\\ \frac{x}{a^{3}} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*x**(1/3))**3,x)
```

```
[Out] Piecewise((6*a**2*log(a/b + x**(1/3))/(2*a**2*b**3 + 4*a*b**4*x**
(1/3) + 2*b**5*x**(2/3)) + 3*a**2/(2*a**2*b**3 + 4*a*b**4*x**(1/3
) + 2*b**5*x**(2/3)) + 12*a*b*x**(1/3)*log(a/b + x**(1/3))/(2*a**
2*b**3 + 4*a*b**4*x**(1/3) + 2*b**5*x**(2/3)) + 6*b**2*x**(2/3)*l
og(a/b + x**(1/3))/(2*a**2*b**3 + 4*a*b**4*x**(1/3) + 2*b**5*x**(
2/3)) - 6*b**2*x**(2/3)/(2*a**2*b**3 + 4*a*b**4*x**(1/3) + 2*b**5
*x**(2/3)), Ne(b, 0)), (x/a**3, True))
```

GIAC/XCAS [A] time = 0.220071, size = 59, normalized size = 1.09

$$\frac{3 \ln \left(\left|bx^{\frac{1}{3}} + a\right|\right)}{b^3} + \frac{3 \left(4 \, ax^{\frac{1}{3}} + \frac{3 \, a^2}{b}\right)}{2 \left(bx^{\frac{1}{3}} + a\right)^2 b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(1/3) + a)^(-3),x, algorithm="giac")
```

```
[Out] 3*ln(abs(b*x^(1/3) + a))/b^3 + 3/2*(4*a*x^(1/3) + 3*a^2/b)/((b*x^
(1/3) + a)^2*b^2)
```

3.2370 $\int \frac{1}{\left(a+b\sqrt[3]{x}\right)^3 x}\,dx$

Optimal. Leaf size=56

$$-\frac{3\log\left(a+b\sqrt[3]{x}\right)}{a^3}+\frac{\log(x)}{a^3}+\frac{3}{a^2\left(a+b\sqrt[3]{x}\right)}+\frac{3}{2a\left(a+b\sqrt[3]{x}\right)^2}$$

```
[Out] 3/(2*a*(a + b*x^(1/3))^2) + 3/(a^2*(a + b*x^(1/3))) - (3*Log[a +
b*x^(1/3)])/a^3 + Log[x]/a^3
```

Rubi [A] time = 0.0791987, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{3\log\left(a+b\sqrt[3]{x}\right)}{a^3}+\frac{\log(x)}{a^3}+\frac{3}{a^2\left(a+b\sqrt[3]{x}\right)}+\frac{3}{2a\left(a+b\sqrt[3]{x}\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b*x^(1/3))^3*x),x]
```

```
[Out] 3/(2*a*(a + b*x^(1/3))^2) + 3/(a^2*(a + b*x^(1/3))) - (3*Log[a +
b*x^(1/3)])/a^3 + Log[x]/a^3
```

Rubi in Sympy [A] time = 11.0858, size = 54, normalized size = 0.96

$$\frac{3}{2a\left(a+b\sqrt[3]{x}\right)^2}+\frac{3}{a^2\left(a+b\sqrt[3]{x}\right)}+\frac{3\log\left(\sqrt[3]{x}\right)}{a^3}-\frac{3\log\left(a+b\sqrt[3]{x}\right)}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*x**(1/3))**3/x,x)
```

```
[Out] 3/(2*a*(a + b*x**(1/3))**2) + 3/(a**2*(a + b*x**(1/3))) + 3*log(x
**(1/3))/a**3 - 3*log(a + b*x**(1/3))/a**3
```

Mathematica [A] time = 0.0668966, size = 51, normalized size = 0.91

$$\frac{3\left(\frac{a\left(3a+2b\sqrt[3]{x}\right)}{\left(a+b\sqrt[3]{x}\right)^2}-2\log\left(a+b\sqrt[3]{x}\right)+\frac{2\log(x)}{3}\right)}{2a^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b*x^(1/3))^3*x),x]
```

```
[Out] (3*((a*(3*a + 2*b*x^(1/3)))/(a + b*x^(1/3))^2 - 2*Log[a + b*x^(1/
3)] + (2*Log[x])/3))/(2*a^3)
```

Maple [A] time = 0.003, size = 49, normalized size = 0.9

$$\frac{3}{2\,a}\left(a+b\sqrt[3]{x}\right)^{-2}+3\,\frac{1}{a^2\left(a+b\sqrt[3]{x}\right)}-3\,\frac{\ln\left(a+b\sqrt[3]{x}\right)}{a^3}+\frac{\ln(x)}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*x^(1/3))^3/x,x)
```

```
[Out] 3/2/a/(a+b*x^(1/3))^2+3/a^2/(a+b*x^(1/3))-3*ln(a+b*x^(1/3))/a^3+l
n(x)/a^3
```

Maxima [A] time = 1.44009, size = 77, normalized size = 1.38

$$\frac{3\left(2\,bx^{\frac{1}{3}}+3\,a\right)}{2\left(a^2b^2x^{\frac{2}{3}}+2\,a^3bx^{\frac{1}{3}}+a^4\right)}-\frac{3\,\log\left(bx^{\frac{1}{3}}+a\right)}{a^3}+\frac{\log\left(x\right)}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + a)^3*x),x, algorithm="maxima")
```

```
[Out] 3/2*(2*b*x^(1/3) + 3*a)/(a^2*b^2*x^(2/3) + 2*a^3*b*x^(1/3) + a^4)
 - 3*log(b*x^(1/3) + a)/a^3 + log(x)/a^3
```

Fricas [A] time = 0.22849, size = 124, normalized size = 2.21

$$\frac{3\left(2\,abx^{\frac{1}{3}}+3\,a^2-2\left(b^2x^{\frac{2}{3}}+2\,abx^{\frac{1}{3}}+a^2\right)\log\left(bx^{\frac{1}{3}}+a\right)+2\left(b^2x^{\frac{2}{3}}+2\,abx^{\frac{1}{3}}+a^2\right)\log\left(x^{\frac{1}{3}}\right)\right)}{2\left(a^3b^2x^{\frac{2}{3}}+2\,a^4bx^{\frac{1}{3}}+a^5\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + a)^3*x),x, algorithm="fricas")
```

```
[Out] 3/2*(2*a*b*x^(1/3) + 3*a^2 - 2*(b^2*x^(2/3) + 2*a*b*x^(1/3) + a^2
)*log(b*x^(1/3) + a) + 2*(b^2*x^(2/3) + 2*a*b*x^(1/3) + a^2)*log(
x^(1/3)))/(a^3*b^2*x^(2/3) + 2*a^4*b*x^(1/3) + a^5)
```

Sympy [A] time = 6.45339, size = 386, normalized size = 6.89

$$\begin{cases}\frac{\tilde{\infty}}{x}\\ -\frac{1}{b^3x}\\ \frac{\log\left(x\right)}{a^3}\\ \frac{2a^2x^{\frac{2}{3}}\log\left(x\right)}{2a^5x^{\frac{2}{3}}+4a^4bx+2a^3b^2x^{\frac{4}{3}}}-\frac{6a^2x^{\frac{2}{3}}\log\left(\frac{a}{b}+\sqrt[3]{x}\right)}{2a^5x^{\frac{2}{3}}+4a^4bx+2a^3b^2x^{\frac{4}{3}}}+\frac{9a^2x^{\frac{2}{3}}}{2a^5x^{\frac{2}{3}}+4a^4bx+2a^3b^2x^{\frac{4}{3}}}+\frac{4abx\log\left(x\right)}{2a^5x^{\frac{2}{3}}+4a^4bx+2a^3b^2x^{\frac{4}{3}}}-\frac{12abx\log\left(\frac{a}{b}+\sqrt[3]{x}\right)}{2a^5x^{\frac{2}{3}}+4a^4bx+2a^3b^2x^{\frac{4}{3}}}+\frac{6}{2a^5x^{\frac{2}{3}}+4a}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*x**(1/3))**3/x,x)
```

```
[Out] Piecewise((zoo/x, Eq(a, 0) & Eq(b, 0)), (-1/(b**3*x), Eq(a, 0)),
(log(x)/a**3, Eq(b, 0)), (2*a**2*x**(2/3)*log(x)/(2*a**5*x**(2/3)
 + 4*a**4*b*x + 2*a**3*b**2*x**(4/3)) - 6*a**2*x**(2/3)*log(a/b +
 x**(1/3))/(2*a**5*x**(2/3) + 4*a**4*b*x + 2*a**3*b**2*x**(4/3))
+ 9*a**2*x**(2/3)/(2*a**5*x**(2/3) + 4*a**4*b*x + 2*a**3*b**2*x**
(4/3)) + 4*a*b*x*log(x)/(2*a**5*x**(2/3) + 4*a**4*b*x + 2*a**3*b*
*2*x**(4/3)) - 12*a*b*x*log(a/b + x**(1/3))/(2*a**5*x**(2/3) + 4*
a**4*b*x + 2*a**3*b**2*x**(4/3)) + 6*a*b*x/(2*a**5*x**(2/3) + 4*a
**4*b*x + 2*a**3*b**2*x**(4/3)) + 2*b**2*x**(4/3)*log(x)/(2*a**5*
x**(2/3) + 4*a**4*b*x + 2*a**3*b**2*x**(4/3)) - 6*b**2*x**(4/3)*l
og(a/b + x**(1/3))/(2*a**5*x**(2/3) + 4*a**4*b*x + 2*a**3*b**2*x*
```

```
*(4/3)), True))
```

GIAC/XCAS [A] time = 0.224045, size = 66, normalized size = 1.18

$$-\frac{3\,\ln\left(\left|bx^{\frac{1}{3}}+a\right|\right)}{a^{3}}+\frac{\ln\left(|x|\right)}{a^{3}}+\frac{3\,\left(2\,abx^{\frac{1}{3}}+3\,a^{2}\right)}{2\,\left(bx^{\frac{1}{3}}+a\right)^{2}a^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + a)^3*x),x, algorithm="giac")
```

```
[Out] -3*ln(abs(b*x^(1/3) + a))/a^3 + ln(abs(x))/a^3 + 3/2*(2*a*b*x^(1/
3) + 3*a^2)/((b*x^(1/3) + a)^2*a^3)
```

3.2371 $\int \frac{1}{\left(a+b\sqrt[3]{x}\right)^3 x^2}\,dx$

Optimal. Leaf size=103

$$\frac{30b^3\log\left(a+b\sqrt[3]{x}\right)}{a^6}-\frac{10b^3\log(x)}{a^6}-\frac{12b^3}{a^5\left(a+b\sqrt[3]{x}\right)}-\frac{18b^2}{a^5\sqrt[3]{x}}-\frac{3b^3}{2a^4\left(a+b\sqrt[3]{x}\right)^2}+\frac{9b}{2a^4x^{2/3}}-\frac{1}{a^3x}$$

```
[Out] (-3*b^3)/(2*a^4*(a + b*x^(1/3))^2) - (12*b^3)/(a^5*(a + b*x^(1/3)
)) - 1/(a^3*x) + (9*b)/(2*a^4*x^(2/3)) - (18*b^2)/(a^5*x^(1/3)) +
 (30*b^3*Log[a + b*x^(1/3)])/a^6 - (10*b^3*Log[x])/a^6
```

Rubi [A] time = 0.153794, antiderivative size = 103, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{30b^3\log\left(a+b\sqrt[3]{x}\right)}{a^6}-\frac{10b^3\log(x)}{a^6}-\frac{12b^3}{a^5\left(a+b\sqrt[3]{x}\right)}-\frac{18b^2}{a^5\sqrt[3]{x}}-\frac{3b^3}{2a^4\left(a+b\sqrt[3]{x}\right)^2}+\frac{9b}{2a^4x^{2/3}}-\frac{1}{a^3x}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b*x^(1/3))^3*x^2),x]
```

```
[Out] (-3*b^3)/(2*a^4*(a + b*x^(1/3))^2) - (12*b^3)/(a^5*(a + b*x^(1/3)
)) - 1/(a^3*x) + (9*b)/(2*a^4*x^(2/3)) - (18*b^2)/(a^5*x^(1/3)) +
 (30*b^3*Log[a + b*x^(1/3)])/a^6 - (10*b^3*Log[x])/a^6
```

Rubi in Sympy [A] time = 21.3877, size = 104, normalized size = 1.01

$$-\frac{1}{a^3x}-\frac{3b^3}{2a^4\left(a+b\sqrt[3]{x}\right)^2}+\frac{9b}{2a^4x^{\frac{2}{3}}}-\frac{12b^3}{a^5\left(a+b\sqrt[3]{x}\right)}-\frac{18b^2}{a^5\sqrt[3]{x}}-\frac{30b^3\log\left(\sqrt[3]{x}\right)}{a^6}+\frac{30b^3\log\left(a+b\sqrt[3]{x}\right)}{a^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*x**(1/3))**3/x**2,x)
```

```
[Out] -1/(a**3*x) - 3*b**3/(2*a**4*(a + b*x**(1/3))**2) + 9*b/(2*a**4*x
**(2/3)) - 12*b**3/(a**5*(a + b*x**(1/3))) - 18*b**2/(a**5*x**(1/
3)) - 30*b**3*log(x**(1/3))/a**6 + 30*b**3*log(a + b*x**(1/3))/a*
*6
```

Mathematica [A] time = 0.215498, size = 93, normalized size = 0.9

$$-\frac{\frac{a\left(2a^4-5a^3b\sqrt[3]{x}+20a^2b^2x^{2/3}+90ab^3x+60b^4x^{4/3}\right)}{x\left(a+b\sqrt[3]{x}\right)^2}-60b^3\log\left(a+b\sqrt[3]{x}\right)+20b^3\log(x)}{2a^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b*x^(1/3))^3*x^2),x]
```

```
[Out] -((a*(2*a^4 - 5*a^3*b*x^(1/3) + 20*a^2*b^2*x^(2/3) + 90*a*b^3*x +
 60*b^4*x^(4/3)))/((a + b*x^(1/3))^2*x) - 60*b^3*Log[a + b*x^(1/3
)] + 20*b^3*Log[x])/(2*a^6)
```

Maple [A] time = 0.017, size = 90, normalized size = 0.9

$$-\frac{3\,b^{3}}{2\,a^{4}}\left(a+b\sqrt[3]{x}\right)^{-2}-12\,\frac{b^{3}}{a^{5}\left(a+b\sqrt[3]{x}\right)}-\frac{1}{a^{3}x}+\frac{9\,b}{2\,a^{4}}x^{-\frac{2}{3}}-18\,\frac{b^{2}}{a^{5}\sqrt[3]{x}}+30\,\frac{b^{3}\ln\left(a+b\sqrt[3]{x}\right)}{a^{6}}-10\,\frac{b^{3}\ln\left(x\right)}{a^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*x^(1/3))^3/x^2,x)
```

```
[Out] -3/2*b^3/a^4/(a+b*x^(1/3))^2-12*b^3/a^5/(a+b*x^(1/3))-1/a^3/x+9/2
*b/a^4/x^(2/3)-18*b^2/a^5/x^(1/3)+30*b^3*ln(a+b*x^(1/3))/a^6-10*b
^3*ln(x)/a^6
```

Maxima [A] time = 1.44166, size = 131, normalized size = 1.27

$$-\frac{60\,b^{4}x^{\frac{4}{3}}+90\,ab^{3}x+20\,a^{2}b^{2}x^{\frac{2}{3}}-5\,a^{3}bx^{\frac{1}{3}}+2\,a^{4}}{2\left(a^{5}b^{2}x^{\frac{5}{3}}+2\,a^{6}bx^{\frac{4}{3}}+a^{7}x\right)}+\frac{30\,b^{3}\log\left(bx^{\frac{1}{3}}+a\right)}{a^{6}}-\frac{10\,b^{3}\log\left(x\right)}{a^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + a)^3*x^2),x, algorithm="maxima")
```

```
[Out] -1/2*(60*b^4*x^(4/3) + 90*a*b^3*x + 20*a^2*b^2*x^(2/3) - 5*a^3*b*
x^(1/3) + 2*a^4)/(a^5*b^2*x^(5/3) + 2*a^6*b*x^(4/3) + a^7*x) + 30
*b^3*log(b*x^(1/3) + a)/a^6 - 10*b^3*log(x)/a^6
```

Fricas [A] time = 0.237774, size = 189, normalized size = 1.83

$$-\frac{90\,a^{2}b^{3}x+20\,a^{3}b^{2}x^{\frac{2}{3}}+2\,a^{5}-60\left(b^{5}x^{\frac{5}{3}}+2\,ab^{4}x^{\frac{4}{3}}+a^{2}b^{3}x\right)\log\left(bx^{\frac{1}{3}}+a\right)+60\left(b^{5}x^{\frac{5}{3}}+2\,ab^{4}x^{\frac{4}{3}}+a^{2}b^{3}x\right)\log\left(x^{\frac{1}{3}}\right)+5\,(1}{2\left(a^{6}b^{2}x^{\frac{5}{3}}+2\,a^{7}bx^{\frac{4}{3}}+a^{8}x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + a)^3*x^2),x, algorithm="fricas")
```

```
[Out] -1/2*(90*a^2*b^3*x + 20*a^3*b^2*x^(2/3) + 2*a^5 - 60*(b^5*x^(5/3)
 + 2*a*b^4*x^(4/3) + a^2*b^3*x)*log(b*x^(1/3) + a) + 60*(b^5*x^(5
/3) + 2*a*b^4*x^(4/3) + a^2*b^3*x)*log(x^(1/3)) + 5*(12*a*b^4*x -
 a^4*b)*x^(1/3))/(a^6*b^2*x^(5/3) + 2*a^7*b*x^(4/3) + a^8*x)
```

Sympy [A] time = 28.3452, size = 561, normalized size = 5.45

$$\begin{cases} \frac{\tilde{\infty}}{x^{2}} \\ -\frac{1}{2b^{3}x^{2}} \\ -\frac{1}{a^{3}x} \\ -\frac{2a^{5}x^{\frac{2}{3}}}{2a^{8}x^{\frac{5}{3}}+4a^{7}bx^{2}+2a^{6}b^{2}x^{\frac{7}{3}}}+\frac{5a^{4}bx}{2a^{8}x^{\frac{5}{3}}+4a^{7}bx^{2}+2a^{6}b^{2}x^{\frac{7}{3}}}-\frac{20a^{3}b^{2}x^{\frac{4}{3}}}{2a^{8}x^{\frac{5}{3}}+4a^{7}bx^{2}+2a^{6}b^{2}x^{\frac{7}{3}}}-\frac{20a^{2}b^{3}x^{\frac{5}{3}}\log\left(x\right)}{2a^{8}x^{\frac{5}{3}}+4a^{7}bx^{2}+2a^{6}b^{2}x^{\frac{7}{3}}}+\frac{60a^{2}b^{3}x^{\frac{5}{3}}\log\left(\frac{a}{b}+\sqrt[3]{x}\right)}{2a^{8}x^{\frac{5}{3}}+4a^{7}bx^{2}+2a^{6}b^{2}x^{\frac{7}{3}}}-\frac{}{2a^{8}} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*x**(1/3))**3/x**2,x)
```

```
[Out] Piecewise((zoo/x**2, Eq(a, 0) & Eq(b, 0)), (-1/(2*b**3*x**2), Eq(
a, 0)), (-1/(a**3*x), Eq(b, 0)), (-2*a**5*x**(2/3)/(2*a**8*x**(5/
```

```
3) + 4*a**7*b*x**2 + 2*a**6*b**2*x**(7/3)) + 5*a**4*b*x/(2*a**8*x
**(5/3) + 4*a**7*b*x**2 + 2*a**6*b**2*x**(7/3)) - 20*a**3*b**2*x*
*(4/3)/(2*a**8*x**(5/3) + 4*a**7*b*x**2 + 2*a**6*b**2*x**(7/3)) -
 20*a**2*b**3*x**(5/3)*log(x)/(2*a**8*x**(5/3) + 4*a**7*b*x**2 +
2*a**6*b**2*x**(7/3)) + 60*a**2*b**3*x**(5/3)*log(a/b + x**(1/3))
/(2*a**8*x**(5/3) + 4*a**7*b*x**2 + 2*a**6*b**2*x**(7/3)) - 90*a*
*2*b**3*x**(5/3)/(2*a**8*x**(5/3) + 4*a**7*b*x**2 + 2*a**6*b**2*x
**(7/3)) - 40*a*b**4*x**2*log(x)/(2*a**8*x**(5/3) + 4*a**7*b*x**2
 + 2*a**6*b**2*x**(7/3)) + 120*a*b**4*x**2*log(a/b + x**(1/3))/(2
*a**8*x**(5/3) + 4*a**7*b*x**2 + 2*a**6*b**2*x**(7/3)) - 60*a*b**
4*x**2/(2*a**8*x**(5/3) + 4*a**7*b*x**2 + 2*a**6*b**2*x**(7/3)) -
 20*b**5*x**(7/3)*log(x)/(2*a**8*x**(5/3) + 4*a**7*b*x**2 + 2*a**
6*b**2*x**(7/3)) + 60*b**5*x**(7/3)*log(a/b + x**(1/3))/(2*a**8*x
**(5/3) + 4*a**7*b*x**2 + 2*a**6*b**2*x**(7/3)), True))
```

GIAC/XCAS [A] time = 0.226235, size = 122, normalized size = 1.18

$$\frac{30\,b^3\ln\left(\left|bx^{\frac{1}{3}}+a\right|\right)}{a^6}-\frac{10\,b^3\ln\left(|x|\right)}{a^6}-\frac{60\,ab^4x^{\frac{4}{3}}+90\,a^2b^3x+20\,a^3b^2x^{\frac{2}{3}}-5\,a^4bx^{\frac{1}{3}}+2\,a^5}{2\left(bx^{\frac{1}{3}}+a\right)^2a^6x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + a)^3*x^2),x, algorithm="giac")
```

```
[Out] 30*b^3*ln(abs(b*x^(1/3) + a))/a^6 - 10*b^3*ln(abs(x))/a^6 - 1/2*(
60*a*b^4*x^(4/3) + 90*a^2*b^3*x + 20*a^3*b^2*x^(2/3) - 5*a^4*b*x^
(1/3) + 2*a^5)/((b*x^(1/3) + a)^2*a^6*x)
```

3.2372 $\int \frac{1}{\left(a+b\sqrt[3]{x}\right)^3 x^3} dx$

Optimal. Leaf size=146

$$-\frac{84b^6\log\left(a+b\sqrt[3]{x}\right)}{a^9}+\frac{28b^6\log(x)}{a^9}+\frac{21b^6}{a^8\left(a+b\sqrt[3]{x}\right)}+\frac{63b^5}{a^8\sqrt[3]{x}}+\frac{3b^6}{2a^7\left(a+b\sqrt[3]{x}\right)^2}-\frac{45b^4}{2a^7x^{2/3}}+\frac{10b^3}{a^6x}-\frac{9b^2}{2a^5x^{4/3}}+\frac{9b}{5a^4x^{5/3}}-\frac{1}{2a^3x^2}$$

```
[Out] (3*b^6)/(2*a^7*(a + b*x^(1/3))^2) + (21*b^6)/(a^8*(a + b*x^(1/3))
) - 1/(2*a^3*x^2) + (9*b)/(5*a^4*x^(5/3)) - (9*b^2)/(2*a^5*x^(4/3
)) + (10*b^3)/(a^6*x) - (45*b^4)/(2*a^7*x^(2/3)) + (63*b^5)/(a^8*
x^(1/3)) - (84*b^6*Log[a + b*x^(1/3)])/a^9 + (28*b^6*Log[x])/a^9
```

Rubi [A] time = 0.232653, antiderivative size = 146, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{84b^6\log\left(a+b\sqrt[3]{x}\right)}{a^9}+\frac{28b^6\log(x)}{a^9}+\frac{21b^6}{a^8\left(a+b\sqrt[3]{x}\right)}+\frac{63b^5}{a^8\sqrt[3]{x}}+\frac{3b^6}{2a^7\left(a+b\sqrt[3]{x}\right)^2}-\frac{45b^4}{2a^7x^{2/3}}+\frac{10b^3}{a^6x}-\frac{9b^2}{2a^5x^{4/3}}+\frac{9b}{5a^4x^{5/3}}-\frac{1}{2a^3x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b*x^(1/3))^3*x^3),x]
```

```
[Out] (3*b^6)/(2*a^7*(a + b*x^(1/3))^2) + (21*b^6)/(a^8*(a + b*x^(1/3))
) - 1/(2*a^3*x^2) + (9*b)/(5*a^4*x^(5/3)) - (9*b^2)/(2*a^5*x^(4/3
)) + (10*b^3)/(a^6*x) - (45*b^4)/(2*a^7*x^(2/3)) + (63*b^5)/(a^8*
x^(1/3)) - (84*b^6*Log[a + b*x^(1/3)])/a^9 + (28*b^6*Log[x])/a^9
```

Rubi in Sympy [A] time = 39.3296, size = 148, normalized size = 1.01

$$-\frac{1}{2a^3x^2}+\frac{9b}{5a^4x^{\frac{5}{3}}}-\frac{9b^2}{2a^5x^{\frac{4}{3}}}+\frac{10b^3}{a^6x}+\frac{3b^6}{2a^7\left(a+b\sqrt[3]{x}\right)^2}-\frac{45b^4}{2a^7x^{\frac{2}{3}}}+\frac{21b^6}{a^8\left(a+b\sqrt[3]{x}\right)}+\frac{63b^5}{a^8\sqrt[3]{x}}+\frac{84b^6\log\left(\sqrt[3]{x}\right)}{a^9}-\frac{84b^6\log\left(a+b\sqrt[3]{x}\right)}{a^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*x**(1/3))**3/x**3,x)
```

```
[Out] -1/(2*a**3*x**2) + 9*b/(5*a**4*x**(5/3)) - 9*b**2/(2*a**5*x**(4/3
)) + 10*b**3/(a**6*x) + 3*b**6/(2*a**7*(a + b*x**(1/3))**2) - 45*
b**4/(2*a**7*x**(2/3)) + 21*b**6/(a**8*(a + b*x**(1/3))) + 63*b**
5/(a**8*x**(1/3)) + 84*b**6*log(x**(1/3))/a**9 - 84*b**6*log(a +
b*x**(1/3))/a**9
```

Mathematica [A] time = 0.279978, size = 130, normalized size = 0.89

$$\frac{\frac{a\left(-5a^7+8a^6b\sqrt[3]{x}-14a^5b^2x^{2/3}+28a^4b^3x-70a^3b^4x^{4/3}+280a^2b^5x^{5/3}+1260ab^6x^2+840b^7x^{7/3}\right)}{x^2\left(a+b\sqrt[3]{x}\right)^2}-840b^6\log\left(a+b\sqrt[3]{x}\right)+280b^6\log(x)}{10a^9}$$

Antiderivative was successfully verified.

```
[In]   Integrate[1/((a + b*x^(1/3))^3*x^3),x]
```

```
[Out] ((a*(-5*a^7 + 8*a^6*b*x^(1/3) - 14*a^5*b^2*x^(2/3) + 28*a^4*b^3*x
 - 70*a^3*b^4*x^(4/3) + 280*a^2*b^5*x^(5/3) + 1260*a*b^6*x^2 + 84
0*b^7*x^(7/3)))/((a + b*x^(1/3))^2*x^2) - 840*b^6*Log[a + b*x^(1/
3)] + 280*b^6*Log[x])/(10*a^9)
```

Maple [A]   time = 0.003, size = 123, normalized size = 0.8

$$\frac{3\,b^6}{2\,a^7}\left(a+b\sqrt[3]{x}\right)^{-2}+21\,\frac{b^6}{a^8\left(a+b\sqrt[3]{x}\right)}-\frac{1}{2\,x^2a^3}+\frac{9\,b}{5\,a^4}x^{-\frac{5}{3}}-\frac{9\,b^2}{2\,a^5}x^{-\frac{4}{3}}+10\,\frac{b^3}{a^6x}-\frac{45\,b^4}{2\,a^7}x^{-\frac{2}{3}}+63\,\frac{b^5}{a^8\sqrt[3]{x}}-84\,\frac{b^6\ln\left(a+b\sqrt[3]{x}\right)}{a^9}+28\,\frac{b^6\ln(x)}{a^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/(a+b*x^(1/3))^3/x^3,x)
```

```
[Out] 3/2*b^6/a^7/(a+b*x^(1/3))^2+21*b^6/a^8/(a+b*x^(1/3))-1/2/x^2/a^3+
9/5*b/a^4/x^(5/3)-9/2*b^2/a^5/x^(4/3)+10*b^3/a^6/x-45/2*b^4/a^7/x
^(2/3)+63*b^5/a^8/x^(1/3)-84*b^6*ln(a+b*x^(1/3))/a^9+28*b^6*ln(x)
/a^9
```

Maxima [A]   time = 1.45677, size = 178, normalized size = 1.22

$$\frac{840\,b^7x^{\frac{7}{3}}+1260\,ab^6x^2+280\,a^2b^5x^{\frac{5}{3}}-70\,a^3b^4x^{\frac{4}{3}}+28\,a^4b^3x-14\,a^5b^2x^{\frac{2}{3}}+8\,a^6bx^{\frac{1}{3}}-5\,a^7}{10\left(a^8b^2x^{\frac{8}{3}}+2\,a^9bx^{\frac{7}{3}}+a^{10}x^2\right)}-\frac{84\,b^6\log\left(bx^{\frac{1}{3}}+a\right)}{a^9}+\frac{28\,b^6\log(x)}{a^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((b*x^(1/3) + a)^3*x^3),x, algorithm="maxima")
```

```
[Out] 1/10*(840*b^7*x^(7/3) + 1260*a*b^6*x^2 + 280*a^2*b^5*x^(5/3) - 70
*a^3*b^4*x^(4/3) + 28*a^4*b^3*x - 14*a^5*b^2*x^(2/3) + 8*a^6*b*x^
(1/3) - 5*a^7)/(a^8*b^2*x^(8/3) + 2*a^9*b*x^(7/3) + a^10*x^2) - 8
4*b^6*log(b*x^(1/3) + a)/a^9 + 28*b^6*log(x)/a^9
```

Fricas [A]   time = 0.229895, size = 243, normalized size = 1.66

$$\frac{1260\,a^2b^6x^2+28\,a^5b^3x-5\,a^8-840\left(b^8x^{\frac{8}{3}}+2\,ab^7x^{\frac{7}{3}}+a^2b^6x^2\right)\log\left(bx^{\frac{1}{3}}+a\right)+840\left(b^8x^{\frac{8}{3}}+2\,ab^7x^{\frac{7}{3}}+a^2b^6x^2\right)\log\left(x^{\frac{1}{3}}\right)+}{10\left(a^9b^2x^{\frac{8}{3}}+2\,a^{10}bx^{\frac{7}{3}}+a^{11}x^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((b*x^(1/3) + a)^3*x^3),x, algorithm="fricas")
```

```
[Out] 1/10*(1260*a^2*b^6*x^2 + 28*a^5*b^3*x - 5*a^8 - 840*(b^8*x^(8/3)
+ 2*a*b^7*x^(7/3) + a^2*b^6*x^2)*log(b*x^(1/3) + a) + 840*(b^8*x^
(8/3) + 2*a*b^7*x^(7/3) + a^2*b^6*x^2)*log(x^(1/3)) + 14*(20*a^3*
b^5*x - a^6*b^2)*x^(2/3) + 2*(420*a*b^7*x^2 - 35*a^4*b^4*x + 4*a^
```

```
7*b)*x^(1/3))/(a^9*b^2*x^(8/3) + 2*a^10*b*x^(7/3) + a^11*x^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*x**(1/3))**3/x**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.223216, size = 166, normalized size = 1.14

$$-\frac{84\,b^{6}\ln\left(\left|bx^{\frac{1}{3}}+a\right|\right)}{a^{9}}+\frac{28\,b^{6}\ln\left(|x|\right)}{a^{9}}+\frac{840\,ab^{7}x^{\frac{7}{3}}+1260\,a^{2}b^{6}x^{2}+280\,a^{3}b^{5}x^{\frac{5}{3}}-70\,a^{4}b^{4}x^{\frac{4}{3}}+28\,a^{5}b^{3}x-14\,a^{6}b^{2}x^{\frac{2}{3}}+8\,a^{7}bx^{\frac{1}{3}}-5\,a^{8}}{10\left(bx^{\frac{1}{3}}+a\right)^{2}a^{9}x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + a)^3*x^3),x, algorithm="giac")
```

```
[Out] -84*b^6*ln(abs(b*x^(1/3) + a))/a^9 + 28*b^6*ln(abs(x))/a^9 + 1/10
*(840*a*b^7*x^(7/3) + 1260*a^2*b^6*x^2 + 280*a^3*b^5*x^(5/3) - 70
*a^4*b^4*x^(4/3) + 28*a^5*b^3*x - 14*a^6*b^2*x^(2/3) + 8*a^7*b*x^
(1/3) - 5*a^8)/((b*x^(1/3) + a)^2*a^9*x^2)
```

3.2373 $\int \frac{1}{\left(a+b\sqrt[3]{x}\right)^3 x^4}\,dx$

Optimal. Leaf size=183

$$\frac{165b^9\log\left(a+b\sqrt[3]{x}\right)}{a^{12}}-\frac{55b^9\log(x)}{a^{12}}-\frac{30b^9}{a^{11}\left(a+b\sqrt[3]{x}\right)}-\frac{135b^8}{a^{11}\sqrt[3]{x}}-\frac{3b^9}{2a^{10}\left(a+b\sqrt[3]{x}\right)^2}+\frac{54b^7}{a^{10}x^{2/3}}-\frac{28b^6}{a^9x}+\frac{63b^5}{4a^8x^{4/3}}-\frac{9b^4}{a^7x^{5/3}}+\frac{5b^3}{a^6x^2}-\frac{18b^2}{7a^5x^{7/3}}+\frac{9b}{8a^4x^{8/3}}-\frac{1}{3a^3x^3}$$

```
[Out] (-3*b^9)/(2*a^10*(a + b*x^(1/3))^2) - (30*b^9)/(a^11*(a + b*x^(1/
3))) - 1/(3*a^3*x^3) + (9*b)/(8*a^4*x^(8/3)) - (18*b^2)/(7*a^5*x^
(7/3)) + (5*b^3)/(a^6*x^2) - (9*b^4)/(a^7*x^(5/3)) + (63*b^5)/(4*
a^8*x^(4/3)) - (28*b^6)/(a^9*x) + (54*b^7)/(a^10*x^(2/3)) - (135*
b^8)/(a^11*x^(1/3)) + (165*b^9*Log[a + b*x^(1/3)])/a^12 - (55*b^9
*Log[x])/a^12
```

Rubi [A] time = 0.317381, antiderivative size = 183, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{165b^9\log\left(a+b\sqrt[3]{x}\right)}{a^{12}}-\frac{55b^9\log(x)}{a^{12}}-\frac{30b^9}{a^{11}\left(a+b\sqrt[3]{x}\right)}-\frac{135b^8}{a^{11}\sqrt[3]{x}}-\frac{3b^9}{2a^{10}\left(a+b\sqrt[3]{x}\right)^2}+\frac{54b^7}{a^{10}x^{2/3}}-\frac{28b^6}{a^9x}+\frac{63b^5}{4a^8x^{4/3}}-\frac{9b^4}{a^7x^{5/3}}+\frac{5b^3}{a^6x^2}-\frac{18b^2}{7a^5x^{7/3}}+\frac{9b}{8a^4x^{8/3}}-\frac{1}{3a^3x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b*x^(1/3))^3*x^4),x]
```

```
[Out] (-3*b^9)/(2*a^10*(a + b*x^(1/3))^2) - (30*b^9)/(a^11*(a + b*x^(1/
3))) - 1/(3*a^3*x^3) + (9*b)/(8*a^4*x^(8/3)) - (18*b^2)/(7*a^5*x^
(7/3)) + (5*b^3)/(a^6*x^2) - (9*b^4)/(a^7*x^(5/3)) + (63*b^5)/(4*
a^8*x^(4/3)) - (28*b^6)/(a^9*x) + (54*b^7)/(a^10*x^(2/3)) - (135*
b^8)/(a^11*x^(1/3)) + (165*b^9*Log[a + b*x^(1/3)])/a^12 - (55*b^9
*Log[x])/a^12
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*x**(1/3))**3/x**4,x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.419691, size = 167, normalized size = 0.91

$$-\frac{\frac{a\left(56a^{10}-77a^9b\sqrt[3]{x}+110a^8b^2x^{2/3}-165a^7b^3x+264a^6b^4x^{4/3}-462a^5b^5x^{5/3}+924a^4b^6x^2-2310a^3b^7x^{7/3}+9240a^2b^8x^{8/3}+41580ab^9x^3+27720b^{10}x^{10/3}\right)}{x^3\left(a+b\sqrt[3]{x}\right)^2}-27720}{168a^{12}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b*x^(1/3))^3*x^4),x]
```

```
[Out] -((a*(56*a^10 - 77*a^9*b*x^(1/3) + 110*a^8*b^2*x^(2/3) - 165*a^7*
b^3*x + 264*a^6*b^4*x^(4/3) - 462*a^5*b^5*x^(5/3) + 924*a^4*b^6*x
^2 - 2310*a^3*b^7*x^(7/3) + 9240*a^2*b^8*x^(8/3) + 41580*a*b^9*x^
3 + 27720*b^10*x^(10/3)))/((a + b*x^(1/3))^2*x^3) - 27720*b^9*Log
[a + b*x^(1/3)] + 9240*b^9*Log[x])/(168*a^12)
```

Maple [A] time = 0.021, size = 156, normalized size = 0.9

$$-\frac{3\,b^{9}}{2\,a^{10}}\left(a+b\sqrt[3]{x}\right)^{-2}-30\,\frac{b^{9}}{a^{11}\left(a+b\sqrt[3]{x}\right)}-\frac{1}{3\,a^{3}x^{3}}+\frac{9\,b}{8\,a^{4}}x^{-\frac{8}{3}}-\frac{18\,b^{2}}{7\,a^{5}}x^{-\frac{7}{3}}+5\,\frac{b^{3}}{a^{6}x^{2}}-9\,\frac{b^{4}}{a^{7}x^{5/3}}+\frac{63\,b^{5}}{4\,a^{8}}x^{-\frac{4}{3}}-28\,\frac{b^{6}}{a^{9}x}+54\,\frac{b^{7}}{a^{10}x^{2/3}}-135\,\frac{b^{8}}{a^{11}\sqrt[3]{x}}+165\,\frac{b^{9}\ln\left(a+b\sqrt[3]{x}\right)}{a^{12}}-55\,\frac{b^{9}\ln(x)}{a^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b*x^(1/3))^3/x^4,x)
```

```
[Out] -3/2*b^9/a^10/(a+b*x^(1/3))^2-30*b^9/a^11/(a+b*x^(1/3))-1/3/a^3/x
^3+9/8*b/a^4/x^(8/3)-18/7*b^2/a^5/x^(7/3)+5*b^3/a^6/x^2-9*b^4/a^7
/x^(5/3)+63/4*b^5/a^8/x^(4/3)-28*b^6/a^9/x+54*b^7/a^10/x^(2/3)-13
5*b^8/a^11/x^(1/3)+165*b^9*ln(a+b*x^(1/3))/a^12-55*b^9*ln(x)/a^12
```

Maxima [A] time = 1.45634, size = 223, normalized size = 1.22

$$-\frac{27720\,b^{10}x^{\frac{10}{3}}+41580\,ab^{9}x^{3}+9240\,a^{2}b^{8}x^{\frac{8}{3}}-2310\,a^{3}b^{7}x^{\frac{7}{3}}+924\,a^{4}b^{6}x^{2}-462\,a^{5}b^{5}x^{\frac{5}{3}}+264\,a^{6}b^{4}x^{\frac{4}{3}}-165\,a^{7}b^{3}x+110\,a^{8}b}{168\left(a^{11}b^{2}x^{\frac{11}{3}}+2\,a^{12}bx^{\frac{10}{3}}+a^{13}x^{3}\right)}+\frac{165\,b^{9}\log\left(bx^{\frac{1}{3}}+a\right)}{a^{12}}-\frac{55\,b^{9}\log(x)}{a^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((b*x^(1/3) + a)^3*x^4),x, algorithm="maxima")
```

```
[Out] -1/168*(27720*b^10*x^(10/3) + 41580*a*b^9*x^3 + 9240*a^2*b^8*x^(8
/3) - 2310*a^3*b^7*x^(7/3) + 924*a^4*b^6*x^2 - 462*a^5*b^5*x^(5/3
) + 264*a^6*b^4*x^(4/3) - 165*a^7*b^3*x + 110*a^8*b^2*x^(2/3) - 7
7*a^9*b*x^(1/3) + 56*a^10)/(a^11*b^2*x^(11/3) + 2*a^12*b*x^(10/3)
 + a^13*x^3) + 165*b^9*log(b*x^(1/3) + a)/a^12 - 55*b^9*log(x)/a^
12
```

Fricas [A] time = 0.23256, size = 288, normalized size = 1.57

$$-\frac{41580\,a^{2}b^{9}x^{3}+924\,a^{5}b^{6}x^{2}-165\,a^{8}b^{3}x+56\,a^{11}-27720\left(b^{11}x^{\frac{11}{3}}+2\,ab^{10}x^{\frac{10}{3}}+a^{2}b^{9}x^{3}\right)\log\left(bx^{\frac{1}{3}}+a\right)+27720\left(b^{11}x^{\frac{11}{3}}+2\right.}{168\left(a^{12}b^{2}x^{\frac{11}{3}}+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((b*x^(1/3) + a)^3*x^4),x, algorithm="fricas")
```

```
[Out] -1/168*(41580*a^2*b^9*x^3 + 924*a^5*b^6*x^2 - 165*a^8*b^3*x + 56*
a^11 - 27720*(b^11*x^(11/3) + 2*a*b^10*x^(10/3) + a^2*b^9*x^3)*lo
g(b*x^(1/3) + a) + 27720*(b^11*x^(11/3) + 2*a*b^10*x^(10/3) + a^2
*b^9*x^3)*log(x^(1/3)) + 22*(420*a^3*b^8*x^2 - 21*a^6*b^5*x + 5*a
^9*b^2)*x^(2/3) + 11*(2520*a*b^10*x^3 - 210*a^4*b^7*x^2 + 24*a^7*
b^4*x - 7*a^10*b)*x^(1/3))/(a^12*b^2*x^(11/3) + 2*a^13*b*x^(10/3)
```

```
+ a^14*x^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*x**(1/3))**3/x**4,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.224199, size = 211, normalized size = 1.15

$$\frac{165 b^9 \ln\left(\left|bx^{\frac{1}{3}} + a\right|\right)}{a^{12}} - \frac{55 b^9 \ln\left(|x|\right)}{a^{12}} - \frac{27720 ab^{10}x^{\frac{10}{3}} + 41580 a^2b^9x^3 + 9240 a^3b^8x^{\frac{8}{3}} - 2310 a^4b^7x^{\frac{7}{3}} + 924 a^5b^6x^2 - 462 a^6b^5x^{\frac{5}{3}} + 264 a^7b^4x^{\frac{4}{3}} - 165 a^8b^3x + 110 a}{168 \left(bx^{\frac{1}{3}} + a\right)^2 a^{12}x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^(1/3) + a)^3*x^4),x, algorithm="giac")
```

```
[Out] 165*b^9*ln(abs(b*x^(1/3) + a))/a^12 - 55*b^9*ln(abs(x))/a^12 - 1/
168*(27720*a*b^10*x^(10/3) + 41580*a^2*b^9*x^3 + 9240*a^3*b^8*x^(
8/3) - 2310*a^4*b^7*x^(7/3) + 924*a^5*b^6*x^2 - 462*a^6*b^5*x^(5/
3) + 264*a^7*b^4*x^(4/3) - 165*a^8*b^3*x + 110*a^9*b^2*x^(2/3) -
77*a^10*b*x^(1/3) + 56*a^11)/((b*x^(1/3) + a)^2*a^12*x^3)
```

3.2374 $\int \frac{1}{\sqrt{1+\sqrt[3]{x}}}\,dx$

Optimal. Leaf size=42

$$\frac{6}{5}\left(\sqrt[3]{x}+1\right)^{5/2}-4\left(\sqrt[3]{x}+1\right)^{3/2}+6\sqrt{\sqrt[3]{x}+1}$$

```
[Out] 6*Sqrt[1 + x^(1/3)] - 4*(1 + x^(1/3))^(3/2) + (6*(1 + x^(1/3))^(5
/2))/5
```

Rubi [A] time = 0.0306214, antiderivative size = 42, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{6}{5}\left(\sqrt[3]{x}+1\right)^{5/2}-4\left(\sqrt[3]{x}+1\right)^{3/2}+6\sqrt{\sqrt[3]{x}+1}$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[1 + x^(1/3)],x]
```

```
[Out] 6*Sqrt[1 + x^(1/3)] - 4*(1 + x^(1/3))^(3/2) + (6*(1 + x^(1/3))^(5
/2))/5
```

Rubi in Sympy [A] time = 3.11279, size = 36, normalized size = 0.86

$$\frac{6\left(\sqrt[3]{x}+1\right)^{\frac{5}{2}}}{5}-4\left(\sqrt[3]{x}+1\right)^{\frac{3}{2}}+6\sqrt{\sqrt[3]{x}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(1+x**(1/3))**(1/2),x)
```

```
[Out] 6*(x**(1/3) + 1)**(5/2)/5 - 4*(x**(1/3) + 1)**(3/2) + 6*sqrt(x**(
1/3) + 1)
```

Mathematica [A] time = 0.0141608, size = 31, normalized size = 0.74

$$\frac{2}{5}\sqrt{\sqrt[3]{x}+1}\left(3x^{2/3}-4\sqrt[3]{x}+8\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/Sqrt[1 + x^(1/3)],x]
```

```
[Out] (2*Sqrt[1 + x^(1/3)]*(8 - 4*x^(1/3) + 3*x^(2/3)))/5
```

Maple [A] time = 0.009, size = 29, normalized size = 0.7

$$-4\left(1+\sqrt[3]{x}\right)^{3/2}+\frac{6}{5}\left(1+\sqrt[3]{x}\right)^{\frac{5}{2}}+6\sqrt{1+\sqrt[3]{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(1+x^(1/3))^(1/2),x)
```

```
[Out] -4*(1+x^(1/3))^(3/2)+6/5*(1+x^(1/3))^(5/2)+6*(1+x^(1/3))^(1/2)
```

Maxima [A] time = 1.43318, size = 38, normalized size = 0.9

$$\frac{6}{5}\left(x^{\frac{1}{3}}+1\right)^{\frac{5}{2}}-4\left(x^{\frac{1}{3}}+1\right)^{\frac{3}{2}}+6\sqrt{x^{\frac{1}{3}}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(x^(1/3) + 1),x, algorithm="maxima")
```

```
[Out] 6/5*(x^(1/3) + 1)^(5/2) - 4*(x^(1/3) + 1)^(3/2) + 6*sqrt(x^(1/3)
+ 1)
```

Fricas [A] time = 0.224581, size = 28, normalized size = 0.67

$$\frac{2}{5}\left(3\,x^{\frac{2}{3}}-4\,x^{\frac{1}{3}}+8\right)\sqrt{x^{\frac{1}{3}}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(x^(1/3) + 1),x, algorithm="fricas")
```

```
[Out] 2/5*(3*x^(2/3) - 4*x^(1/3) + 8)*sqrt(x^(1/3) + 1)
```

Sympy [A] time = 4.19682, size = 359, normalized size = 8.55

$$\frac{6x^{\frac{14}{3}}\sqrt{\sqrt[3]{x}+1}}{15x^{\frac{11}{3}}+15x^{\frac{10}{3}}+5x^4+5x^3}+\frac{10x^{\frac{13}{3}}\sqrt{\sqrt[3]{x}+1}}{15x^{\frac{11}{3}}+15x^{\frac{10}{3}}+5x^4+5x^3}+\frac{30x^{\frac{11}{3}}\sqrt{\sqrt[3]{x}+1}}{15x^{\frac{11}{3}}+15x^{\frac{10}{3}}+5x^4+5x^3}-\frac{48x^{\frac{11}{3}}}{15x^{\frac{11}{3}}+15x^{\frac{10}{3}}+5x^4+5x^3}+\frac{40x^{\frac{10}{3}}\sqrt{\sqrt[3]{x}+1}}{15x^{\frac{11}{3}}+15x^{\frac{10}{3}}+5x^4+5x^3}-\frac{48x^{\frac{10}{3}}}{15x^{\frac{11}{3}}+15x^{\frac{10}{3}}+5x^4+5x^3}+\frac{10x^4\sqrt{\sqrt[3]{x}+1}}{15x^{\frac{11}{3}}+15x^{\frac{10}{3}}+5x^4+5x^3}-\frac{16x^4}{15x^{\frac{11}{3}}+15x^{\frac{10}{3}}+5x^4+5x^3}+\frac{16x^3\sqrt{\sqrt[3]{x}+1}}{15x^{\frac{11}{3}}+15x^{\frac{10}{3}}+5x^4+5x^3}-\frac{16x^3}{15x^{\frac{11}{3}}+15x^{\frac{10}{3}}+5x^4+5x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(1+x**(1/3))**(1/2),x)
```

```
[Out] 6*x**(14/3)*sqrt(x**(1/3) + 1)/(15*x**(11/3) + 15*x**(10/3) + 5*x
**4 + 5*x**3) + 10*x**(13/3)*sqrt(x**(1/3) + 1)/(15*x**(11/3) + 1
5*x**(10/3) + 5*x**4 + 5*x**3) + 30*x**(11/3)*sqrt(x**(1/3) + 1)/
(15*x**(11/3) + 15*x**(10/3) + 5*x**4 + 5*x**3) - 48*x**(11/3)/(1
5*x**(11/3) + 15*x**(10/3) + 5*x**4 + 5*x**3) + 40*x**(10/3)*sqrt
(x**(1/3) + 1)/(15*x**(11/3) + 15*x**(10/3) + 5*x**4 + 5*x**3) -
48*x**(10/3)/(15*x**(11/3) + 15*x**(10/3) + 5*x**4 + 5*x**3) + 10
*x**4*sqrt(x**(1/3) + 1)/(15*x**(11/3) + 15*x**(10/3) + 5*x**4 +
5*x**3) - 16*x**4/(15*x**(11/3) + 15*x**(10/3) + 5*x**4 + 5*x**3)
 + 16*x**3*sqrt(x**(1/3) + 1)/(15*x**(11/3) + 15*x**(10/3) + 5*x*
*4 + 5*x**3) - 16*x**3/(15*x**(11/3) + 15*x**(10/3) + 5*x**4 + 5*
x**3)
```

GIAC/XCAS [A] time = 0.215376, size = 38, normalized size = 0.9

$$\frac{6}{5}\left(x^{\frac{1}{3}}+1\right)^{\frac{5}{2}}-4\left(x^{\frac{1}{3}}+1\right)^{\frac{3}{2}}+6\sqrt{x^{\frac{1}{3}}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(x^(1/3) + 1),x, algorithm="giac")
```

```
[Out] 6/5*(x^(1/3) + 1)^(5/2) - 4*(x^(1/3) + 1)^(3/2) + 6*sqrt(x^(1/3)
+ 1)
```

3.2375 $\int \frac{1}{\left(1+\sqrt[3]{x}\right)x^{3/2}}\,dx$

Optimal. Leaf size=23

$$\frac{6}{\sqrt[6]{x}}-\frac{2}{\sqrt{x}}+6\tan^{-1}\left(\sqrt[6]{x}\right)$$

[Out] -2/Sqrt[x] + 6/x^(1/6) + 6*ArcTan[x^(1/6)]

Rubi [A] time = 0.0314003, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{6}{\sqrt[6]{x}}-\frac{2}{\sqrt{x}}+6\tan^{-1}\left(\sqrt[6]{x}\right)$$

Antiderivative was successfully verified.

[In] Int[1/((1 + x^(1/3))*x^(3/2)),x]

[Out] -2/Sqrt[x] + 6/x^(1/6) + 6*ArcTan[x^(1/6)]

Rubi in Sympy [A] time = 4.85307, size = 20, normalized size = 0.87

$$6\,\mathrm{atan}\left(\sqrt[6]{x}\right)-\frac{2}{\sqrt{x}}+\frac{6}{\sqrt[6]{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(1/(1+x**(1/3))/x**(3/2),x)

[Out] 6*atan(x**(1/6)) - 2/sqrt(x) + 6/x**(1/6)

Mathematica [A] time = 0.0195794, size = 23, normalized size = 1.

$$\frac{6}{\sqrt[6]{x}}-\frac{2}{\sqrt{x}}+6\tan^{-1}\left(\sqrt[6]{x}\right)$$

Antiderivative was successfully verified.

[In] Integrate[1/((1 + x^(1/3))*x^(3/2)),x]

[Out] -2/Sqrt[x] + 6/x^(1/6) + 6*ArcTan[x^(1/6)]

Maple [A] time = 0.01, size = 18, normalized size = 0.8

$$6\,\frac{1}{\sqrt[6]{x}}+6\,\arctan\left(\sqrt[6]{x}\right)-2\,\frac{1}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(1+x^(1/3))/x^(3/2),x)

[Out] 6/x^(1/6)+6*arctan(x^(1/6))-2/x^(1/2)

Maxima [A] time = 1.599, size = 26, normalized size = 1.13

$$\frac{2\left(3x^{\frac{1}{3}}-1\right)}{\sqrt{x}}+6\arctan\left(x^{\frac{1}{6}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^(3/2)*(x^(1/3) + 1)),x, algorithm="maxima")
```

```
[Out] 2*(3*x^(1/3) - 1)/sqrt(x) + 6*arctan(x^(1/6))
```

Fricas [A] time = 0.223659, size = 28, normalized size = 1.22

$$\frac{2\left(3\sqrt{x}\arctan\left(x^{\frac{1}{6}}\right)+3x^{\frac{1}{3}}-1\right)}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^(3/2)*(x^(1/3) + 1)),x, algorithm="fricas")
```

```
[Out] 2*(3*sqrt(x)*arctan(x^(1/6)) + 3*x^(1/3) - 1)/sqrt(x)
```

Sympy [A] time = 3.54313, size = 20, normalized size = 0.87

$$6\,\mathrm{atan}\left(\sqrt[6]{x}\right)-\frac{2}{\sqrt{x}}+\frac{6}{\sqrt[6]{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(1+x**(1/3))/x**(3/2),x)
```

```
[Out] 6*atan(x**(1/6)) - 2/sqrt(x) + 6/x**(1/6)
```

GIAC/XCAS [A] time = 0.218293, size = 26, normalized size = 1.13

$$\frac{2\left(3x^{\frac{1}{3}}-1\right)}{\sqrt{x}}+6\arctan\left(x^{\frac{1}{6}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^(3/2)*(x^(1/3) + 1)),x, algorithm="giac")
```

```
[Out] 2*(3*x^(1/3) - 1)/sqrt(x) + 6*arctan(x^(1/6))
```

3.2376 $\int \frac{x^{2/3}}{1+\sqrt[3]{x}} \, dx$

Optimal. Leaf size=39

$$\frac{3x^{4/3}}{4} + \frac{3x^{2/3}}{2} - x - 3\sqrt[3]{x} + 3\log\left(\sqrt[3]{x} + 1\right)$$

```
[Out] -3*x^(1/3) + (3*x^(2/3))/2 - x + (3*x^(4/3))/4 + 3*Log[1 + x^(1/3
)]
```

Rubi [A] time = 0.0427283, antiderivative size = 39, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{3x^{4/3}}{4} + \frac{3x^{2/3}}{2} - x - 3\sqrt[3]{x} + 3\log\left(\sqrt[3]{x} + 1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^(2/3)/(1 + x^(1/3)),x]
```

```
[Out] -3*x^(1/3) + (3*x^(2/3))/2 - x + (3*x^(4/3))/4 + 3*Log[1 + x^(1/3
)]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{3x^{\frac{4}{3}}}{4} - 3\sqrt[3]{x} - x + 3\log\left(\sqrt[3]{x} + 1\right) + 3\int^{\sqrt[3]{x}} x \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(2/3)/(1+x**(1/3)),x)
```

```
[Out] 3*x**(4/3)/4 - 3*x**(1/3) - x + 3*log(x**(1/3) + 1) + 3*Integral(
x, (x, x**(1/3)))
```

Mathematica [A] time = 0.0106657, size = 39, normalized size = 1.

$$\frac{3x^{4/3}}{4} + \frac{3x^{2/3}}{2} - x - 3\sqrt[3]{x} + 3\log\left(\sqrt[3]{x} + 1\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(2/3)/(1 + x^(1/3)),x]
```

```
[Out] -3*x^(1/3) + (3*x^(2/3))/2 - x + (3*x^(4/3))/4 + 3*Log[1 + x^(1/3
)]
```

Maple [A] time = 0.003, size = 28, normalized size = 0.7

$$-3\sqrt[3]{x} + \frac{3}{2}x^{\frac{2}{3}} - x + \frac{3}{4}x^{\frac{4}{3}} + 3\ln\left(1 + \sqrt[3]{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(2/3)/(1+x^(1/3)),x)
```

```
[Out] -3*x^(1/3)+3/2*x^(2/3)-x+3/4*x^(4/3)+3*ln(1+x^(1/3))
```

Maxima [A] time = 1.43089, size = 57, normalized size = 1.46

$$\frac{3}{4}\left(x^{\frac{1}{3}}+1\right)^{4}-4\left(x^{\frac{1}{3}}+1\right)^{3}+9\left(x^{\frac{1}{3}}+1\right)^{2}-12\,x^{\frac{1}{3}}+3\,\log\left(x^{\frac{1}{3}}+1\right)-12$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(2/3)/(x^(1/3) + 1),x, algorithm="maxima")
```

```
[Out] 3/4*(x^(1/3) + 1)^4 - 4*(x^(1/3) + 1)^3 + 9*(x^(1/3) + 1)^2 - 12*
x^(1/3) + 3*log(x^(1/3) + 1) - 12
```

Fricas [A] time = 0.221714, size = 34, normalized size = 0.87

$$\frac{3}{4}\,(x-4)x^{\frac{1}{3}}-x+\frac{3}{2}\,x^{\frac{2}{3}}+3\,\log\left(x^{\frac{1}{3}}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(2/3)/(x^(1/3) + 1),x, algorithm="fricas")
```

```
[Out] 3/4*(x - 4)*x^(1/3) - x + 3/2*x^(2/3) + 3*log(x^(1/3) + 1)
```

Sympy [A] time = 0.597698, size = 34, normalized size = 0.87

$$\frac{3x^{\frac{4}{3}}}{4}+\frac{3x^{\frac{2}{3}}}{2}-3\sqrt[3]{x}-x+3\log\left(\sqrt[3]{x}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(2/3)/(1+x**(1/3)),x)
```

```
[Out] 3*x**(4/3)/4 + 3*x**(2/3)/2 - 3*x**(1/3) - x + 3*log(x**(1/3) + 1
)
```

GIAC/XCAS [A] time = 0.223957, size = 36, normalized size = 0.92

$$\frac{3}{4}\,x^{\frac{4}{3}}-x+\frac{3}{2}\,x^{\frac{2}{3}}-3\,x^{\frac{1}{3}}+3\ln\left(x^{\frac{1}{3}}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(2/3)/(x^(1/3) + 1),x, algorithm="giac")
```

```
[Out] 3/4*x^(4/3) - x + 3/2*x^(2/3) - 3*x^(1/3) + 3*ln(x^(1/3) + 1)
```

3.2377 $\int \frac{1}{1+x^{2/3}}\,dx$

Optimal. Leaf size=16

$$3\sqrt[3]{x} - 3\tan^{-1}\left(\sqrt[3]{x}\right)$$

```
[Out] 3*x^(1/3) - 3*ArcTan[x^(1/3)]
```

Rubi [A] time = 0.0186947, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$3\sqrt[3]{x} - 3\tan^{-1}\left(\sqrt[3]{x}\right)$$

Antiderivative was successfully verified.

```
[In] Int[(1 + x^(2/3))^(-1),x]
```

```
[Out] 3*x^(1/3) - 3*ArcTan[x^(1/3)]
```

Rubi in Sympy [A] time = 3.57968, size = 14, normalized size = 0.88

$$3\sqrt[3]{x} - 3\operatorname{atan}\left(\sqrt[3]{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(1+x**(2/3)),x)
```

```
[Out] 3*x**(1/3) - 3*atan(x**(1/3))
```

Mathematica [A] time = 0.00737561, size = 16, normalized size = 1.

$$3\sqrt[3]{x} - 3\tan^{-1}\left(\sqrt[3]{x}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(1 + x^(2/3))^(-1),x]
```

```
[Out] 3*x^(1/3) - 3*ArcTan[x^(1/3)]
```

Maple [B] time = 0.01, size = 41, normalized size = 2.6

$$\arctan(x) + 3\sqrt[3]{x} - \arctan\left(2\sqrt[3]{x} - \sqrt{3}\right) - \arctan\left(2\sqrt[3]{x} + \sqrt{3}\right) - 2\arctan\left(\sqrt[3]{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(1+x^(2/3)),x)
```

```
[Out] arctan(x)+3*x^(1/3)-arctan(2*x^(1/3)-3^(1/2))-arctan(2*x^(1/3)+3^
(1/2))-2*arctan(x^(1/3))
```

Maxima [A] time = 1.61226, size = 16, normalized size = 1.

$$3\,x^{\frac{1}{3}} - 3\,\arctan\left(x^{\frac{1}{3}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^(2/3) + 1),x, algorithm="maxima")
```

```
[Out] 3*x^(1/3) - 3*arctan(x^(1/3))
```

Fricas [A] time = 0.224141, size = 16, normalized size = 1.

$$3\,x^{\frac{1}{3}} - 3\,\arctan\left(x^{\frac{1}{3}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^(2/3) + 1),x, algorithm="fricas")
```

```
[Out] 3*x^(1/3) - 3*arctan(x^(1/3))
```

Sympy [A] time = 0.376882, size = 14, normalized size = 0.88

$$3\sqrt[3]{x} - 3\,\mathrm{atan}\left(\sqrt[3]{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(1+x**(2/3)),x)
```

```
[Out] 3*x**(1/3) - 3*atan(x**(1/3))
```

GIAC/XCAS [A] time = 0.218314, size = 16, normalized size = 1.

$$3\,x^{\frac{1}{3}} - 3\,\arctan\left(x^{\frac{1}{3}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^(2/3) + 1),x, algorithm="giac")
```

```
[Out] 3*x^(1/3) - 3*arctan(x^(1/3))
```

3.2378 $\int \frac{1}{\left(1+x^{2/3}\right)\sqrt[3]{x}}\,dx$

Optimal. Leaf size=12

$$\frac{3}{2}\log\left(x^{2/3}+1\right)$$

```
[Out] (3*Log[1 + x^(2/3)])/2
```

Rubi [A] time = 0.0115411, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$\frac{3}{2}\log\left(x^{2/3}+1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/((1 + x^(2/3))*x^(1/3)),x]

[Out] (3*Log[1 + x^(2/3)])/2
```

Rubi in Sympy [A] time = 1.71504, size = 10, normalized size = 0.83

$$\frac{3\log\left(x^{\frac{2}{3}}+1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(1+x**(2/3))/x**(1/3),x)

[Out] 3*log(x**(2/3) + 1)/2
```

Mathematica [A] time = 0.00341518, size = 12, normalized size = 1.

$$\frac{3}{2}\log\left(x^{2/3}+1\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((1 + x^(2/3))*x^(1/3)),x]

[Out] (3*Log[1 + x^(2/3)])/2
```

Maple [A] time = 0.004, size = 9, normalized size = 0.8

$$\frac{3}{2}\ln\left(1+x^{\frac{2}{3}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(1+x^(2/3))/x^(1/3),x)

[Out] 3/2*ln(1+x^(2/3))
```

Maxima [A] time = 1.48496, size = 11, normalized size = 0.92

$$\frac{3}{2}\,\log\left(x^{\frac{2}{3}}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^(1/3)*(x^(2/3) + 1)),x, algorithm="maxima")
```

```
[Out] 3/2*log(x^(2/3) + 1)
```

Fricas [A] time = 0.22047, size = 11, normalized size = 0.92

$$\frac{3}{2}\,\log\left(x^{\frac{2}{3}}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^(1/3)*(x^(2/3) + 1)),x, algorithm="fricas")
```

```
[Out] 3/2*log(x^(2/3) + 1)
```

Sympy [A] time = 0.452449, size = 10, normalized size = 0.83

$$\frac{3\log\left(x^{\frac{2}{3}}+1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(1+x**(2/3))/x**(1/3),x)
```

```
[Out] 3*log(x**(2/3) + 1)/2
```

GIAC/XCAS [A] time = 0.215437, size = 11, normalized size = 0.92

$$\frac{3}{2}\,\ln\left(x^{\frac{2}{3}}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^(1/3)*(x^(2/3) + 1)),x, algorithm="giac")
```

```
[Out] 3/2*ln(x^(2/3) + 1)
```

3.2379 $\int \frac{1}{\left(1+x^{2/3}\right)x^{2/3}}\,dx$

Optimal. Leaf size=8

$$3\tan^{-1}\left(\sqrt[3]{x}\right)$$

```
[Out] 3*ArcTan[x^(1/3)]
```

Rubi [A] time = 0.0149051, antiderivative size = 8, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$3\tan^{-1}\left(\sqrt[3]{x}\right)$$

Antiderivative was successfully verified.

```
[In] Int[1/((1 + x^(2/3))*x^(2/3)),x]

[Out] 3*ArcTan[x^(1/3)]
```

Rubi in Sympy [A] time = 2.82581, size = 7, normalized size = 0.88

$$3\,\mathrm{atan}\left(\sqrt[3]{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(1+x**(2/3))/x**(2/3),x)

[Out] 3*atan(x**(1/3))
```

Mathematica [A] time = 0.00567746, size = 8, normalized size = 1.

$$3\tan^{-1}\left(\sqrt[3]{x}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((1 + x^(2/3))*x^(2/3)),x]

[Out] 3*ArcTan[x^(1/3)]
```

Maple [A] time = 0.003, size = 7, normalized size = 0.9

$$3\arctan\left(\sqrt[3]{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(1+x^(2/3))/x^(2/3),x)

[Out] 3*arctan(x^(1/3))
```

Maxima [A] time = 1.56723, size = 8, normalized size = 1.

$$3\arctan\left(x^{\frac{1}{3}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(x^(2/3)*(x^(2/3) + 1)),x, algorithm="maxima")

[Out] 3*arctan(x^(1/3))
```

Fricas [A] time = 0.224865, size = 8, normalized size = 1.

$$3 \arctan\left(x^{\frac{1}{3}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(x^(2/3)*(x^(2/3) + 1)),x, algorithm="fricas")

[Out] 3*arctan(x^(1/3))
```

Sympy [A] time = 0.918791, size = 7, normalized size = 0.88

$$3 \operatorname{atan}\left(\sqrt[3]{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(1+x**(2/3))/x**(2/3),x)

[Out] 3*atan(x**(1/3))
```

GIAC/XCAS [A] time = 0.215738, size = 8, normalized size = 1.

$$3 \arctan\left(x^{\frac{1}{3}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(x^(2/3)*(x^(2/3) + 1)),x, algorithm="giac")

[Out] 3*arctan(x^(1/3))
```

3.2380 $\int \frac{\sqrt{-1+x^{2/3}}}{\sqrt[3]{x}}\,dx$

Optimal. Leaf size=11

$$\left(x^{2/3}-1\right)^{3/2}$$

```
[Out] (-1 + x^(2/3))^(3/2)
```

Rubi [A] time = 0.0120813, antiderivative size = 11, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.059

$$\left(x^{2/3}-1\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[-1 + x^(2/3)]/x^(1/3),x]

[Out] (-1 + x^(2/3))^(3/2)
```

Rubi in Sympy [A] time = 1.63986, size = 8, normalized size = 0.73

$$\left(x^{\frac{2}{3}}-1\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((-1+x**(2/3))**(1/2)/x**(1/3),x)

[Out] (x**(2/3) - 1)**(3/2)
```

Mathematica [A] time = 0.00608896, size = 11, normalized size = 1.

$$\left(x^{2/3}-1\right)^{3/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[-1 + x^(2/3)]/x^(1/3),x]

[Out] (-1 + x^(2/3))^(3/2)
```

Maple [A] time = 0.008, size = 8, normalized size = 0.7

$$\left(-1+x^{\frac{2}{3}}\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((-1+x^(2/3))^(1/2)/x^(1/3),x)

[Out] (-1+x^(2/3))^(3/2)
```

Maxima [A] time = 1.49041, size = 9, normalized size = 0.82

$$\left(x^{\frac{2}{3}}-1\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^(2/3) - 1)/x^(1/3),x, algorithm="maxima")
```

```
[Out] (x^(2/3) - 1)^(3/2)
```

Fricas [A] time = 0.916564, size = 9, normalized size = 0.82

$$\left(x^{\frac{2}{3}}-1\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^(2/3) - 1)/x^(1/3),x, algorithm="fricas")
```

```
[Out] (x^(2/3) - 1)^(3/2)
```

Sympy [A] time = 0.539039, size = 24, normalized size = 2.18

$$x^{\frac{2}{3}}\sqrt{x^{\frac{2}{3}}-1}-\sqrt{x^{\frac{2}{3}}-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-1+x**(2/3))**(1/2)/x**(1/3),x)
```

```
[Out] x**(2/3)*sqrt(x**(2/3) - 1) - sqrt(x**(2/3) - 1)
```

GIAC/XCAS [A] time = 0.218424, size = 9, normalized size = 0.82

$$\left(x^{\frac{2}{3}}-1\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x^(2/3) - 1)/x^(1/3),x, algorithm="giac")
```

```
[Out] (x^(2/3) - 1)^(3/2)
```

3.2381 $\int \frac{\left(1+x^{2/3}\right)^{3/2}}{\sqrt[3]{x}}\,dx$

Optimal. Leaf size=15

$$\frac{3}{5}\left(x^{2/3}+1\right)^{5/2}$$

```
[Out] (3*(1 + x^(2/3))^(5/2))/5
```

Rubi [A] time = 0.0135666, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.059

$$\frac{3}{5}\left(x^{2/3}+1\right)^{5/2}$$

Antiderivative was successfully verified.

```
[In]  Int[(1 + x^(2/3))^(3/2)/x^(1/3),x]

[Out] (3*(1 + x^(2/3))^(5/2))/5
```

Rubi in Sympy [A] time = 1.66932, size = 12, normalized size = 0.8

$$\frac{3\left(x^{\frac{2}{3}}+1\right)^{\frac{5}{2}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((1+x**(2/3))**(3/2)/x**(1/3),x)

[Out] 3*(x**(2/3) + 1)**(5/2)/5
```

Mathematica [A] time = 0.00905232, size = 15, normalized size = 1.

$$\frac{3}{5}\left(x^{2/3}+1\right)^{5/2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(1 + x^(2/3))^(3/2)/x^(1/3),x]

[Out] (3*(1 + x^(2/3))^(5/2))/5
```

Maple [A] time = 0.008, size = 10, normalized size = 0.7

$$\frac{3}{5}\left(1+x^{\frac{2}{3}}\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((1+x^(2/3))^(3/2)/x^(1/3),x)
```

```
[Out] 3/5*(1+x^(2/3))^(5/2)
```

Maxima [A] time = 1.43581, size = 12, normalized size = 0.8

$$\frac{3}{5}\left(x^{\frac{2}{3}}+1\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((x^(2/3) + 1)^(3/2)/x^(1/3),x, algorithm="maxima")
```

```
[Out] 3/5*(x^(2/3) + 1)^(5/2)
```

Fricas [A] time = 0.935298, size = 26, normalized size = 1.73

$$\frac{3}{5}\left(x^{\frac{4}{3}}+2\,x^{\frac{2}{3}}+1\right)\sqrt{x^{\frac{2}{3}}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((x^(2/3) + 1)^(3/2)/x^(1/3),x, algorithm="fricas")
```

```
[Out] 3/5*(x^(4/3) + 2*x^(2/3) + 1)*sqrt(x^(2/3) + 1)
```

Sympy [A] time = 3.94053, size = 49, normalized size = 3.27

$$\frac{3x^{\frac{4}{3}}\sqrt{x^{\frac{2}{3}}+1}}{5}+\frac{6x^{\frac{2}{3}}\sqrt{x^{\frac{2}{3}}+1}}{5}+\frac{3\sqrt{x^{\frac{2}{3}}+1}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+x**(2/3))**(3/2)/x**(1/3),x)
```

```
[Out] 3*x**(4/3)*sqrt(x**(2/3) + 1)/5 + 6*x**(2/3)*sqrt(x**(2/3) + 1)/5
 + 3*sqrt(x**(2/3) + 1)/5
```

GIAC/XCAS [A] time = 0.221197, size = 12, normalized size = 0.8

$$\frac{3}{5}\left(x^{\frac{2}{3}}+1\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((x^(2/3) + 1)^(3/2)/x^(1/3),x, algorithm="giac")
```

```
[Out] 3/5*(x^(2/3) + 1)^(5/2)
```

3.2382 $\int \frac{\sqrt{x}}{1+x^{2/3}}\,dx$

Optimal. Leaf size=117

$$\frac{6x^{5/6}}{5}-6\sqrt[6]{x}-\frac{3\log\left(\sqrt[3]{x}-\sqrt{2}\sqrt[6]{x}+1\right)}{2\sqrt{2}}+\frac{3\log\left(\sqrt[3]{x}+\sqrt{2}\sqrt[6]{x}+1\right)}{2\sqrt{2}}-\frac{3\tan^{-1}\left(1-\sqrt{2}\sqrt[6]{x}\right)}{\sqrt{2}}+\frac{3\tan^{-1}\left(\sqrt{2}\sqrt[6]{x}+1\right)}{\sqrt{2}}$$

```
[Out] -6*x^(1/6) + (6*x^(5/6))/5 - (3*ArcTan[1 - Sqrt[2]*x^(1/6)])/Sqrt
[2] + (3*ArcTan[1 + Sqrt[2]*x^(1/6)])/Sqrt[2] - (3*Log[1 - Sqrt[2
]*x^(1/6) + x^(1/3)])/(2*Sqrt[2]) + (3*Log[1 + Sqrt[2]*x^(1/6) +
x^(1/3)])/(2*Sqrt[2])
```

Rubi [A] time = 0.182967, antiderivative size = 117, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 9, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.6

$$\frac{6x^{5/6}}{5}-6\sqrt[6]{x}-\frac{3\log\left(\sqrt[3]{x}-\sqrt{2}\sqrt[6]{x}+1\right)}{2\sqrt{2}}+\frac{3\log\left(\sqrt[3]{x}+\sqrt{2}\sqrt[6]{x}+1\right)}{2\sqrt{2}}-\frac{3\tan^{-1}\left(1-\sqrt{2}\sqrt[6]{x}\right)}{\sqrt{2}}+\frac{3\tan^{-1}\left(\sqrt{2}\sqrt[6]{x}+1\right)}{\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[x]/(1 + x^(2/3)),x]
```

```
[Out] -6*x^(1/6) + (6*x^(5/6))/5 - (3*ArcTan[1 - Sqrt[2]*x^(1/6)])/Sqrt
[2] + (3*ArcTan[1 + Sqrt[2]*x^(1/6)])/Sqrt[2] - (3*Log[1 - Sqrt[2
]*x^(1/6) + x^(1/3)])/(2*Sqrt[2]) + (3*Log[1 + Sqrt[2]*x^(1/6) +
x^(1/3)])/(2*Sqrt[2])
```

Rubi in Sympy [A] time = 21.8284, size = 112, normalized size = 0.96

$$\frac{6x^{\frac{5}{6}}}{5}-6\sqrt[6]{x}-\frac{3\sqrt{2}\log\left(-\sqrt{2}\sqrt[6]{x}+\sqrt[3]{x}+1\right)}{4}+\frac{3\sqrt{2}\log\left(\sqrt{2}\sqrt[6]{x}+\sqrt[3]{x}+1\right)}{4}+\frac{3\sqrt{2}\,\mathrm{atan}\left(\sqrt{2}\sqrt[6]{x}-1\right)}{2}+\frac{3\sqrt{2}\,\mathrm{atan}\left(\sqrt{2}\sqrt[6]{x}+1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(1/2)/(1+x**(2/3)),x)
```

```
[Out] 6*x**(5/6)/5 - 6*x**(1/6) - 3*sqrt(2)*log(-sqrt(2)*x**(1/6) + x**
(1/3) + 1)/4 + 3*sqrt(2)*log(sqrt(2)*x**(1/6) + x**(1/3) + 1)/4 +
 3*sqrt(2)*atan(sqrt(2)*x**(1/6) - 1)/2 + 3*sqrt(2)*atan(sqrt(2)*
x**(1/6) + 1)/2
```

Mathematica [A] time = 0.0529053, size = 115, normalized size = 0.98

$$\frac{3}{20}\left(8x^{5/6}-40\sqrt[6]{x}-5\sqrt{2}\log\left(\sqrt[3]{x}-\sqrt{2}\sqrt[6]{x}+1\right)+5\sqrt{2}\log\left(\sqrt[3]{x}+\sqrt{2}\sqrt[6]{x}+1\right)-10\sqrt{2}\tan^{-1}\left(1-\sqrt{2}\sqrt[6]{x}\right)+10\sqrt{2}\tan^{-1}\left(\sqrt{2}\sqrt[6]{x}+1\right)\right)$$

Antiderivative was successfully verified.

```
[In]   Integrate[Sqrt[x]/(1 + x^(2/3)),x]
```

```
[Out] (3*(-40*x^(1/6) + 8*x^(5/6) - 10*Sqrt[2]*ArcTan[1 - Sqrt[2]*x^(1/
6)] + 10*Sqrt[2]*ArcTan[1 + Sqrt[2]*x^(1/6)] - 5*Sqrt[2]*Log[1 -
Sqrt[2]*x^(1/6) + x^(1/3)] + 5*Sqrt[2]*Log[1 + Sqrt[2]*x^(1/6) +
x^(1/3)]))/20
```

Maple [A]   time = 0.006, size = 76, normalized size = 0.7

$$\frac{6}{5}x^{\frac{5}{6}} - 6\sqrt[6]{x} + \frac{3\sqrt{2}}{2}\arctan\left(\sqrt[6]{x}\sqrt{2} - 1\right) + \frac{3\sqrt{2}}{4}\ln\left(1\left(1 + \sqrt[3]{x} + \sqrt[6]{x}\sqrt{2}\right)\left(1 + \sqrt[3]{x} - \sqrt[6]{x}\sqrt{2}\right)^{-1}\right) + \frac{3\sqrt{2}}{2}\arctan\left(1 + \sqrt[6]{x}\sqrt{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^(1/2)/(1+x^(2/3)),x)
```

```
[Out] 6/5*x^(5/6)-6*x^(1/6)+3/2*arctan(x^(1/6)*2^(1/2)-1)*2^(1/2)+3/4*2
^(1/2)*ln((1+x^(1/3)+x^(1/6)*2^(1/2))/(1+x^(1/3)-x^(1/6)*2^(1/2))
)+3/2*arctan(1+x^(1/6)*2^(1/2))*2^(1/2)
```

Maxima [A]   time = 1.59657, size = 119, normalized size = 1.02

$$\frac{3}{2}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(\sqrt{2} + 2x^{\frac{1}{6}}\right)\right) + \frac{3}{2}\sqrt{2}\arctan\left(-\frac{1}{2}\sqrt{2}\left(\sqrt{2} - 2x^{\frac{1}{6}}\right)\right) + \frac{3}{4}\sqrt{2}\log\left(\sqrt{2}x^{\frac{1}{6}} + x^{\frac{1}{3}} + 1\right) - \frac{3}{4}\sqrt{2}\log\left(-\sqrt{2}x^{\frac{1}{6}} + x^{\frac{1}{3}} + 1\right) + \frac{6}{5}x^{\frac{5}{6}} - 6x^{\frac{1}{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(x)/(x^(2/3) + 1),x, algorithm="maxima")
```

```
[Out] 3/2*sqrt(2)*arctan(1/2*sqrt(2)*(sqrt(2) + 2*x^(1/6))) + 3/2*sqrt(
2)*arctan(-1/2*sqrt(2)*(sqrt(2) - 2*x^(1/6))) + 3/4*sqrt(2)*log(s
qrt(2)*x^(1/6) + x^(1/3) + 1) - 3/4*sqrt(2)*log(-sqrt(2)*x^(1/6)
+ x^(1/3) + 1) + 6/5*x^(5/6) - 6*x^(1/6)
```

Fricas [A]   time = 0.239029, size = 163, normalized size = 1.39

$$-3\sqrt{2}\arctan\left(\frac{1}{\sqrt{2}x^{\frac{1}{6}} + \sqrt{2\sqrt{2}x^{\frac{1}{6}} + 2x^{\frac{1}{3}} + 2} + 1}\right) - 3\sqrt{2}\arctan\left(\frac{1}{\sqrt{2}x^{\frac{1}{6}} + \sqrt{-2\sqrt{2}x^{\frac{1}{6}} + 2x^{\frac{1}{3}} + 2} - 1}\right) + \frac{3}{4}\sqrt{2}\log\left(2\sqrt{2}x^{\frac{1}{6}} + 2x^{\frac{1}{3}} + 2\right) - \frac{3}{4}\sqrt{2}\log\left(-2\sqrt{2}x^{\frac{1}{6}} + 2x^{\frac{1}{3}} + 2\right) + \frac{6}{5}x^{\frac{5}{6}} - 6x^{\frac{1}{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(x)/(x^(2/3) + 1),x, algorithm="fricas")
```

```
[Out] -3*sqrt(2)*arctan(1/(sqrt(2)*x^(1/6) + sqrt(2*sqrt(2)*x^(1/6) + 2
*x^(1/3) + 2) + 1)) - 3*sqrt(2)*arctan(1/(sqrt(2)*x^(1/6) + sqrt(
-2*sqrt(2)*x^(1/6) + 2*x^(1/3) + 2) - 1)) + 3/4*sqrt(2)*log(2*sqr
t(2)*x^(1/6) + 2*x^(1/3) + 2) - 3/4*sqrt(2)*log(-2*sqrt(2)*x^(1/6
) + 2*x^(1/3) + 2) + 6/5*x^(5/6) - 6*x^(1/6)
```

Sympy [A] time = 2.86361, size = 187, normalized size = 1.6

$$\frac{27x^{\frac{5}{6}}\Gamma\left(\frac{9}{4}\right)}{10\Gamma\left(\frac{13}{4}\right)}-\frac{27\sqrt[6]{x}\Gamma\left(\frac{9}{4}\right)}{2\Gamma\left(\frac{13}{4}\right)}-\frac{27e^{-\frac{i\pi}{4}}\log\left(-\sqrt[6]{x}e^{\frac{i\pi}{4}}+1\right)\Gamma\left(\frac{9}{4}\right)}{8\Gamma\left(\frac{13}{4}\right)}+\frac{27ie^{-\frac{i\pi}{4}}\log\left(-\sqrt[6]{x}e^{\frac{3i\pi}{4}}+1\right)\Gamma\left(\frac{9}{4}\right)}{8\Gamma\left(\frac{13}{4}\right)}+\frac{27e^{-\frac{i\pi}{4}}\log\left(-\sqrt[6]{x}e^{\frac{5i\pi}{4}}+1\right)\Gamma\left(\frac{9}{4}\right)}{8\Gamma\left(\frac{13}{4}\right)}-\frac{27ie^{-\frac{i\pi}{4}}\log\left(-\sqrt[6]{x}e^{\frac{7i\pi}{4}}+1\right)\Gamma\left(\frac{9}{4}\right)}{8\Gamma\left(\frac{13}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(1/2)/(1+x**(2/3)),x)
```

```
[Out] 27*x**(5/6)*gamma(9/4)/(10*gamma(13/4)) - 27*x**(1/6)*gamma(9/4)/
(2*gamma(13/4)) - 27*exp(-I*pi/4)*log(-x**(1/6)*exp_polar(I*pi/4)
 + 1)*gamma(9/4)/(8*gamma(13/4)) + 27*I*exp(-I*pi/4)*log(-x**(1/6
)*exp_polar(3*I*pi/4) + 1)*gamma(9/4)/(8*gamma(13/4)) + 27*exp(-I
*pi/4)*log(-x**(1/6)*exp_polar(5*I*pi/4) + 1)*gamma(9/4)/(8*gamma
(13/4)) - 27*I*exp(-I*pi/4)*log(-x**(1/6)*exp_polar(7*I*pi/4) + 1
)*gamma(9/4)/(8*gamma(13/4))
```

GIAC/XCAS [A] time = 0.223195, size = 119, normalized size = 1.02

$$\frac{3}{2}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(\sqrt{2}+2x^{\frac{1}{6}}\right)\right)+\frac{3}{2}\sqrt{2}\arctan\left(-\frac{1}{2}\sqrt{2}\left(\sqrt{2}-2x^{\frac{1}{6}}\right)\right)+\frac{3}{4}\sqrt{2}\ln\left(\sqrt{2}x^{\frac{1}{6}}+x^{\frac{1}{3}}+1\right)-\frac{3}{4}\sqrt{2}\ln\left(-\sqrt{2}x^{\frac{1}{6}}+x^{\frac{1}{3}}+1\right)+\frac{6}{5}x^{\frac{5}{6}}-6x^{\frac{1}{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(x)/(x^(2/3) + 1),x, algorithm="giac")
```

```
[Out] 3/2*sqrt(2)*arctan(1/2*sqrt(2)*(sqrt(2) + 2*x^(1/6))) + 3/2*sqrt(
2)*arctan(-1/2*sqrt(2)*(sqrt(2) - 2*x^(1/6))) + 3/4*sqrt(2)*ln(sq
rt(2)*x^(1/6) + x^(1/3) + 1) - 3/4*sqrt(2)*ln(-sqrt(2)*x^(1/6) +
x^(1/3) + 1) + 6/5*x^(5/6) - 6*x^(1/6)
```

3.2383 $\int \frac{\sqrt[3]{x}}{-1+x^{5/6}} \, dx$

Optimal. Leaf size=188

$$2\sqrt{x}+\frac{6}{5}\log\left(1-\sqrt[6]{x}\right)-\frac{3}{10}\left(1+\sqrt{5}\right)\log\left(2\sqrt[3]{x}+\left(1-\sqrt{5}\right)\sqrt[6]{x}+2\right)-\frac{3}{10}\left(1-\sqrt{5}\right)\log\left(2\sqrt[3]{x}+\left(1+\sqrt{5}\right)\sqrt[6]{x}+2\right)+\frac{3}{5}\sqrt{10-2\sqrt{5}}\tan^{-1}\left(\frac{4\sqrt[6]{x}-\sqrt{5}+1}{\sqrt{10+2\sqrt{5}}}\right)-\frac{3}{5}\sqrt{10+2\sqrt{5}}\tan^{-1}\left(\frac{4\sqrt[6]{x}+\sqrt{5}+1}{\sqrt{10-2\sqrt{5}}}\right)$$

```
[Out] 2*Sqrt[x] + (3*Sqrt[10 - 2*Sqrt[5]]*ArcTan[(1 - Sqrt[5] + 4*x^(1/
6))/Sqrt[10 + 2*Sqrt[5]]])/5 - (3*Sqrt[10 + 2*Sqrt[5]]*ArcTan[(1
+ Sqrt[5] + 4*x^(1/6))/Sqrt[10 - 2*Sqrt[5]]])/5 + (6*Log[1 - x^(1
/6)])/5 - (3*(1 + Sqrt[5])*Log[2 + (1 - Sqrt[5])*x^(1/6) + 2*x^(1
/3)])/10 - (3*(1 - Sqrt[5])*Log[2 + (1 + Sqrt[5])*x^(1/6) + 2*x^(
1/3)])/10
```

Rubi [A] time = 0.744024, antiderivative size = 200, normalized size of antiderivative = 1.06, number of steps used = 8, number of rules used = 8, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.533

$$2\sqrt{x}+\frac{6}{5}\log\left(1-\sqrt[6]{x}\right)-\frac{3}{10}\left(1+\sqrt{5}\right)\log\left(2\sqrt[3]{x}-\sqrt{5}\sqrt[6]{x}+\sqrt[6]{x}+2\right)-\frac{3}{10}\left(1-\sqrt{5}\right)\log\left(2\sqrt[3]{x}+\sqrt{5}\sqrt[6]{x}+\sqrt[6]{x}+2\right)+\frac{3}{5}\sqrt{2\left(5-\sqrt{5}\right)}\tan^{-1}\left(\frac{4\sqrt[6]{x}-\sqrt{5}+1}{\sqrt{2\left(5+\sqrt{5}\right)}}\right)-\frac{3}{5}\sqrt{2\left(5+\sqrt{5}\right)}\tan^{-1}\left(\frac{1}{2}\sqrt{\frac{1}{10}\left(5+\sqrt{5}\right)}\left(4\sqrt[6]{x}+\sqrt{5}+1\right)\right)$$

Antiderivative was successfully verified.

```
[In] Int[x^(1/3)/(-1 + x^(5/6)),x]
```

```
[Out] 2*Sqrt[x] + (3*Sqrt[2*(5 - Sqrt[5])]*ArcTan[(1 - Sqrt[5] + 4*x^(1
/6))/Sqrt[2*(5 + Sqrt[5])]])/5 - (3*Sqrt[2*(5 + Sqrt[5])]*ArcTan[
(Sqrt[(5 + Sqrt[5])/10]*(1 + Sqrt[5] + 4*x^(1/6)))/2])/5 + (6*Log
[1 - x^(1/6)])/5 - (3*(1 + Sqrt[5])*Log[2 + x^(1/6) - Sqrt[5]*x^(
1/6) + 2*x^(1/3)])/10 - (3*(1 - Sqrt[5])*Log[2 + x^(1/6) + Sqrt[5
]*x^(1/6) + 2*x^(1/3)])/10
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(1/3)/(-1+x**(5/6)),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.250425, size = 180, normalized size = 0.96

$$\frac{1}{10}\left(20\sqrt{x}+12\log\left(1-\sqrt[6]{x}\right)-3\left(1+\sqrt{5}\right)\log\left(\sqrt[3]{x}-\frac{1}{2}\left(\sqrt{5}-1\right)\sqrt[6]{x}+1\right)\right.$$
$$+3\left(\sqrt{5}-1\right)\log\left(\sqrt[3]{x}+\frac{1}{2}\left(1+\sqrt{5}\right)\sqrt[6]{x}+1\right)$$
$$\left.+6\sqrt{10-2\sqrt{5}}\tan^{-1}\left(\frac{4\sqrt[6]{x}-\sqrt{5}+1}{\sqrt{2\left(5+\sqrt{5}\right)}}\right)-6\sqrt{2\left(5+\sqrt{5}\right)}\tan^{-1}\left(\frac{4\sqrt[6]{x}+\sqrt{5}+1}{\sqrt{10-2\sqrt{5}}}\right)\right)$$

Antiderivative was successfully verified.

```
[In]   Integrate[x^(1/3)/(-1 + x^(5/6)),x]
```

```
[Out] (20*Sqrt[x] + 6*Sqrt[10 - 2*Sqrt[5]]*ArcTan[(1 - Sqrt[5] + 4*x^(1
/6))/Sqrt[2*(5 + Sqrt[5])]] - 6*Sqrt[2*(5 + Sqrt[5])]*ArcTan[(1 +
 Sqrt[5] + 4*x^(1/6))/Sqrt[10 - 2*Sqrt[5]]] + 12*Log[1 - x^(1/6)]
 - 3*(1 + Sqrt[5])*Log[1 - ((-1 + Sqrt[5])*x^(1/6))/2 + x^(1/3)]
+ 3*(-1 + Sqrt[5])*Log[1 + ((1 + Sqrt[5])*x^(1/6))/2 + x^(1/3)])/
10
```

Maple [A] time = 0.033, size = 175, normalized size = 0.9

$$2\sqrt{x}+\frac{6}{5}\ln\left(\sqrt[6]{x}-1\right)+\frac{3\sqrt{5}}{10}\ln\left(2+\sqrt[6]{x}+2\sqrt[3]{x}+\sqrt[6]{x}\sqrt{5}\right)-\frac{3}{10}\ln\left(2+\sqrt[6]{x}+2\sqrt[3]{x}+\sqrt[6]{x}\sqrt{5}\right)$$
$$-\frac{12\sqrt{5}}{5\sqrt{10-2\sqrt{5}}}\arctan\left(\frac{1}{\sqrt{10-2\sqrt{5}}}\left(1+4\sqrt[6]{x}+\sqrt{5}\right)\right)-\frac{3\sqrt{5}}{10}\ln\left(2+\sqrt[6]{x}+2\sqrt[3]{x}-\sqrt[6]{x}\sqrt{5}\right)$$
$$-\frac{3}{10}\ln\left(2+\sqrt[6]{x}+2\sqrt[3]{x}-\sqrt[6]{x}\sqrt{5}\right)+\frac{12\sqrt{5}}{5\sqrt{10+2\sqrt{5}}}\arctan\left(\frac{1}{\sqrt{10+2\sqrt{5}}}\left(1+4\sqrt[6]{x}-\sqrt{5}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^(1/3)/(-1+x^(5/6)),x)
```

```
[Out] 2*x^(1/2)+6/5*ln(x^(1/6)-1)+3/10*ln(2+x^(1/6)+2*x^(1/3)+x^(1/6)*5
^(1/2))*5^(1/2)-3/10*ln(2+x^(1/6)+2*x^(1/3)+x^(1/6)*5^(1/2))-12/5
/(10-2*5^(1/2))^(1/2)*arctan((1+4*x^(1/6)+5^(1/2))/(10-2*5^(1/2))
^(1/2))*5^(1/2)-3/10*ln(2+x^(1/6)+2*x^(1/3)-x^(1/6)*5^(1/2))*5^(1
/2)-3/10*ln(2+x^(1/6)+2*x^(1/3)-x^(1/6)*5^(1/2))+12/5/(10+2*5^(1/
2))^(1/2)*arctan((1+4*x^(1/6)-5^(1/2))/(10+2*5^(1/2))^(1/2))*5^(1
/2)
```

Maxima [A] time = 1.59125, size = 367, normalized size = 1.95

$$-\frac{6}{5}\left(-1\right)^{\frac{3}{5}}\log\left(\left(-1\right)^{\frac{1}{5}}+x^{\frac{1}{6}}\right)-\frac{6\sqrt{5}\left(-1\right)^{\frac{3}{5}}\log\left(\frac{\sqrt{5}(-1)^{\frac{1}{5}}+(-1)^{\frac{1}{5}}\sqrt{2\sqrt{5}-10}+(-1)^{\frac{1}{5}}-4x^{\frac{1}{6}}}{\sqrt{5}(-1)^{\frac{1}{5}}-(-1)^{\frac{1}{5}}\sqrt{2\sqrt{5}-10}+(-1)^{\frac{1}{5}}-4x^{\frac{1}{6}}}\right)}{5\sqrt{2\sqrt{5}-10}}$$
$$+\frac{6\sqrt{5}\left(-1\right)^{\frac{3}{5}}\log\left(\frac{\sqrt{5}(-1)^{\frac{1}{5}}-(-1)^{\frac{1}{5}}\sqrt{-2\sqrt{5}-10}-(-1)^{\frac{1}{5}}+4x^{\frac{1}{6}}}{\sqrt{5}(-1)^{\frac{1}{5}}+(-1)^{\frac{1}{5}}\sqrt{-2\sqrt{5}-10}-(-1)^{\frac{1}{5}}+4x^{\frac{1}{6}}}\right)}{5\sqrt{-2\sqrt{5}-10}}+2\sqrt{x}$$
$$+\frac{6\log\left(-x^{\frac{1}{6}}\left(\sqrt{5}\left(-1\right)^{\frac{1}{5}}+\left(-1\right)^{\frac{1}{5}}\right)+2\left(-1\right)^{\frac{2}{5}}+2x^{\frac{1}{3}}\right)}{5\left(\sqrt{5}\left(-1\right)^{\frac{2}{5}}+\left(-1\right)^{\frac{2}{5}}\right)}$$
$$-\frac{6\log\left(x^{\frac{1}{6}}\left(\sqrt{5}\left(-1\right)^{\frac{1}{5}}-\left(-1\right)^{\frac{1}{5}}\right)+2\left(-1\right)^{\frac{2}{5}}+2x^{\frac{1}{3}}\right)}{5\left(\sqrt{5}\left(-1\right)^{\frac{2}{5}}-\left(-1\right)^{\frac{2}{5}}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(1/3)/(x^(5/6) - 1),x, algorithm="maxima")
```

```
[Out] -6/5*(-1)^(3/5)*log((-1)^(1/5) + x^(1/6)) - 6/5*sqrt(5)*(-1)^(3/5
)*log((sqrt(5)*(-1)^(1/5) + (-1)^(1/5)*sqrt(2*sqrt(5) - 10) + (-1
)^(1/5) - 4*x^(1/6))/(sqrt(5)*(-1)^(1/5) - (-1)^(1/5)*sqrt(2*sqrt
(5) - 10) + (-1)^(1/5) - 4*x^(1/6)))/sqrt(2*sqrt(5) - 10) + 6/5*s
qrt(5)*(-1)^(3/5)*log((sqrt(5)*(-1)^(1/5) - (-1)^(1/5)*sqrt(-2*sq
rt(5) - 10) - (-1)^(1/5) + 4*x^(1/6))/(sqrt(5)*(-1)^(1/5) + (-1)^
(1/5)*sqrt(-2*sqrt(5) - 10) - (-1)^(1/5) + 4*x^(1/6)))/sqrt(-2*sq
rt(5) - 10) + 2*sqrt(x) + 6/5*log(-x^(1/6)*(sqrt(5)*(-1)^(1/5) +
(-1)^(1/5)) + 2*(-1)^(2/5) + 2*x^(1/3))/(sqrt(5)*(-1)^(2/5) + (-1
)^(2/5)) - 6/5*log(x^(1/6)*(sqrt(5)*(-1)^(1/5) - (-1)^(1/5)) + 2*
(-1)^(2/5) + 2*x^(1/3))/(sqrt(5)*(-1)^(2/5) - (-1)^(2/5))
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(1/3)/(x^(5/6) - 1),x, algorithm="fricas")
```

```
[Out] Exception raised: NotImplementedError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(1/3)/(-1+x**(5/6)),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.311599, size = 188, normalized size = 1.

$$\frac{3}{5}\sqrt{-2\sqrt{5}+10}\arctan\left(-\frac{\sqrt{5}-4x^{\frac{1}{6}}-1}{\sqrt{2\sqrt{5}+10}}\right)-\frac{3}{5}\sqrt{2\sqrt{5}+10}\arctan\left(\frac{\sqrt{5}+4x^{\frac{1}{6}}+1}{\sqrt{-2\sqrt{5}+10}}\right)+\frac{3}{10}\sqrt{5}\ln\left(\frac{1}{2}x^{\frac{1}{6}}\left(\sqrt{5}+1\right)+x^{\frac{1}{3}}+1\right)-\frac{3}{10}\sqrt{5}\ln\left(-\frac{1}{2}x^{\frac{1}{6}}\left(\sqrt{5}-1\right)+x^{\frac{1}{3}}+1\right)+2\sqrt{x}-\frac{3}{10}\ln\left(x^{\frac{2}{3}}+\sqrt{x}+x^{\frac{1}{3}}+x^{\frac{1}{6}}+1\right)+\frac{6}{5}\ln\left(\left|x^{\frac{1}{6}}-1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(1/3)/(x^(5/6) - 1),x, algorithm="giac")
```

```
[Out] 3/5*sqrt(-2*sqrt(5) + 10)*arctan(-(sqrt(5) - 4*x^(1/6) - 1)/sqrt(
2*sqrt(5) + 10)) - 3/5*sqrt(2*sqrt(5) + 10)*arctan((sqrt(5) + 4*x
^(1/6) + 1)/sqrt(-2*sqrt(5) + 10)) + 3/10*sqrt(5)*ln(1/2*x^(1/6)*
(sqrt(5) + 1) + x^(1/3) + 1) - 3/10*sqrt(5)*ln(-1/2*x^(1/6)*(sqrt
(5) - 1) + x^(1/3) + 1) + 2*sqrt(x) - 3/10*ln(x^(2/3) + sqrt(x) +
 x^(1/3) + x^(1/6) + 1) + 6/5*ln(abs(x^(1/6) - 1))
```

3.2384 $\int \sqrt{3-\frac{1}{\sqrt{x}}}\,dx$

Optimal. Leaf size=67

$$\sqrt{3-\frac{1}{\sqrt{x}}}x-\frac{1}{6}\sqrt{3-\frac{1}{\sqrt{x}}}\sqrt{x}-\frac{\tanh^{-1}\left(\frac{\sqrt{3-\frac{1}{\sqrt{x}}}}{\sqrt{3}}\right)}{6\sqrt{3}}$$

```
[Out] -(Sqrt[3 - 1/Sqrt[x]]*Sqrt[x])/6 + Sqrt[3 - 1/Sqrt[x]]*x - ArcTan
h[Sqrt[3 - 1/Sqrt[x]]/Sqrt[3]]/(6*Sqrt[3])
```

Rubi [A] time = 0.0752693, antiderivative size = 67, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385

$$\sqrt{3-\frac{1}{\sqrt{x}}}x-\frac{1}{6}\sqrt{3-\frac{1}{\sqrt{x}}}\sqrt{x}-\frac{\tanh^{-1}\left(\frac{\sqrt{3-\frac{1}{\sqrt{x}}}}{\sqrt{3}}\right)}{6\sqrt{3}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[3 - 1/Sqrt[x]],x]
```

```
[Out] -(Sqrt[3 - 1/Sqrt[x]]*Sqrt[x])/6 + Sqrt[3 - 1/Sqrt[x]]*x - ArcTan
h[Sqrt[3 - 1/Sqrt[x]]/Sqrt[3]]/(6*Sqrt[3])
```

Rubi in Sympy [A] time = 6.19566, size = 58, normalized size = 0.87

$$-\frac{\sqrt{x}\sqrt{3-\frac{1}{\sqrt{x}}}}{6}+x\sqrt{3-\frac{1}{\sqrt{x}}}-\frac{\sqrt{3}\,\mathrm{atanh}\left(\frac{\sqrt{3}\sqrt{3-\frac{1}{\sqrt{x}}}}{3}\right)}{18}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((3-1/x**(1/2))**(1/2),x)
```

```
[Out] -sqrt(x)*sqrt(3 - 1/sqrt(x))/6 + x*sqrt(3 - 1/sqrt(x)) - sqrt(3)*
atanh(sqrt(3)*sqrt(3 - 1/sqrt(x))/3)/18
```

Mathematica [A] time = 0.0970739, size = 63, normalized size = 0.94

$$\frac{1}{36}\left(6\sqrt{3-\frac{1}{\sqrt{x}}}\left(6x-\sqrt{x}\right)-\sqrt{3}\log\left(1-2\left(\sqrt{9-\frac{3}{\sqrt{x}}}+3\right)\sqrt{x}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[3 - 1/Sqrt[x]],x]
```

```
[Out] (6*Sqrt[3 - 1/Sqrt[x]]*(-Sqrt[x] + 6*x) - Sqrt[3]*Log[1 - 2*(3 +
Sqrt[9 - 3/Sqrt[x]])*Sqrt[x]])/36
```

Maple [A] time = 0.02, size = 91, normalized size = 1.4

$$-\frac{1}{36}\sqrt{1\left(3\sqrt{x}-1\right)\frac{1}{\sqrt{x}}}\,\sqrt{x}\left(\ln\left(-\frac{\sqrt{3}}{6}+\sqrt{3}\sqrt{x}+\sqrt{3x-\sqrt{x}}\right)\sqrt{3}-36\sqrt{3x-\sqrt{x}}\sqrt{x}+6\sqrt{3x-\sqrt{x}}\right)\frac{1}{\sqrt{\left(3\sqrt{x}-1\right)\sqrt{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((3-1/x^(1/2))^(1/2),x)
```

```
[Out] -1/36*((3*x^(1/2)-1)/x^(1/2))^(1/2)*x^(1/2)*(ln(-1/6*3^(1/2)+3^(1
/2)*x^(1/2)+(3*x-x^(1/2))^(1/2))*3^(1/2)-36*(3*x-x^(1/2))^(1/2)*x
^(1/2)+6*(3*x-x^(1/2))^(1/2))/((3*x^(1/2)-1)*x^(1/2))^(1/2)
```

Maxima [A] time = 1.61529, size = 105, normalized size = 1.57

$$\frac{1}{36}\sqrt{3}\log\left(-\frac{\sqrt{3}-\sqrt{-\frac{1}{\sqrt{x}}+3}}{\sqrt{3}+\sqrt{-\frac{1}{\sqrt{x}}+3}}\right)+\frac{\left(-\frac{1}{\sqrt{x}}+3\right)^{\frac{3}{2}}+3\sqrt{-\frac{1}{\sqrt{x}}+3}}{6\left(\left(\frac{1}{\sqrt{x}}-3\right)^{2}+\frac{6}{\sqrt{x}}-9\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(-1/sqrt(x) + 3),x, algorithm="maxima")
```

```
[Out] 1/36*sqrt(3)*log(-(sqrt(3) - sqrt(-1/sqrt(x) + 3))/(sqrt(3) + sqr
t(-1/sqrt(x) + 3))) + 1/6*((-1/sqrt(x) + 3)^(3/2) + 3*sqrt(-1/sqr
t(x) + 3))/((1/sqrt(x) - 3)^2 + 6/sqrt(x) - 9)
```

Fricas [A] time = 0.233806, size = 100, normalized size = 1.49

$$\frac{\sqrt{3}\left(2\left(6\sqrt{3}x^{\frac{3}{2}}-\sqrt{3}x\right)\sqrt{\frac{3\sqrt{x}-1}{\sqrt{x}}}+\sqrt{x}\log\left(-6\sqrt{3}\sqrt{x}+6\sqrt{x}\sqrt{\frac{3\sqrt{x}-1}{\sqrt{x}}}+\sqrt{3}\right)\right)}{36\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(-1/sqrt(x) + 3),x, algorithm="fricas")
```

```
[Out] 1/36*sqrt(3)*(2*(6*sqrt(3)*x^(3/2) - sqrt(3)*x)*sqrt((3*sqrt(x) -
 1)/sqrt(x)) + sqrt(x)*log(-6*sqrt(3)*sqrt(x) + 6*sqrt(x)*sqrt((3
*sqrt(x) - 1)/sqrt(x)) + sqrt(3)))/sqrt(x)
```

Sympy [A] time = 10.0706, size = 165, normalized size = 2.46

$$\begin{cases}\frac{3x^{\frac{5}{4}}}{\sqrt{3\sqrt{x}-1}}-\frac{3x^{\frac{3}{4}}}{2\sqrt{3\sqrt{x}-1}}+\frac{\sqrt[4]{x}}{6\sqrt{3\sqrt{x}-1}}-\frac{\sqrt{3}\operatorname{acosh}\left(\sqrt{3}\sqrt[4]{x}\right)}{18} & \text{for}\ 3\left|\sqrt{x}\right|>1\\-\frac{3ix^{\frac{5}{4}}}{\sqrt{-3\sqrt{x}+1}}+\frac{3ix^{\frac{3}{4}}}{2\sqrt{-3\sqrt{x}+1}}-\frac{i\sqrt[4]{x}}{6\sqrt{-3\sqrt{x}+1}}+\frac{\sqrt{3}i\operatorname{asin}\left(\sqrt{3}\sqrt[4]{x}\right)}{18} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((3-1/x**(1/2))**(1/2),x)
```

```
[Out] Piecewise((3*x**(5/4)/sqrt(3*sqrt(x) - 1) - 3*x**(3/4)/(2*sqrt(3*
sqrt(x) - 1)) + x**(1/4)/(6*sqrt(3*sqrt(x) - 1)) - sqrt(3)*acosh(
```

```
sqrt(3)*x**(1/4))/18, 3*Abs(sqrt(x)) > 1), (-3*I*x**(5/4)/sqrt(-3
*sqrt(x) + 1) + 3*I*x**(3/4)/(2*sqrt(-3*sqrt(x) + 1)) - I*x**(1/4
)/(6*sqrt(-3*sqrt(x) + 1)) + sqrt(3)*I*asin(sqrt(3)*x**(1/4))/18,
 True))
```

GIAC/XCAS [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(-1/sqrt(x) + 3),x, algorithm="giac")
```

```
[Out] Timed out
```

3.2385 $\int \frac{1}{\sqrt{1+\frac{1}{\sqrt{x}}}}\,dx$

Optimal. Leaf size=50

$$\sqrt{\frac{1}{\sqrt{x}}+1}x-\frac{3}{2}\sqrt{\frac{1}{\sqrt{x}}+1}\sqrt{x}+\frac{3}{2}\tanh^{-1}\left(\sqrt{\frac{1}{\sqrt{x}}+1}\right)$$

```
[Out] (-3*Sqrt[1 + 1/Sqrt[x]]*Sqrt[x])/2 + Sqrt[1 + 1/Sqrt[x]]*x + (3*A
rcTanh[Sqrt[1 + 1/Sqrt[x]]])/2
```

Rubi [A] time = 0.0480614, antiderivative size = 50, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364

$$\sqrt{\frac{1}{\sqrt{x}}+1}x-\frac{3}{2}\sqrt{\frac{1}{\sqrt{x}}+1}\sqrt{x}+\frac{3}{2}\tanh^{-1}\left(\sqrt{\frac{1}{\sqrt{x}}+1}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[1 + 1/Sqrt[x]],x]
```

```
[Out] (-3*Sqrt[1 + 1/Sqrt[x]]*Sqrt[x])/2 + Sqrt[1 + 1/Sqrt[x]]*x + (3*A
rcTanh[Sqrt[1 + 1/Sqrt[x]]])/2
```

Rubi in Sympy [A] time = 4.73955, size = 49, normalized size = 0.98

$$-\frac{3\sqrt{x}\sqrt{1+\frac{1}{\sqrt{x}}}}{2}+x\sqrt{1+\frac{1}{\sqrt{x}}}+\frac{3\operatorname{atanh}\left(\sqrt{1+\frac{1}{\sqrt{x}}}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(1+1/x**(1/2))**(1/2),x)
```

```
[Out] -3*sqrt(x)*sqrt(1 + 1/sqrt(x))/2 + x*sqrt(1 + 1/sqrt(x)) + 3*atan
h(sqrt(1 + 1/sqrt(x)))/2
```

Mathematica [A] time = 0.0456849, size = 54, normalized size = 1.08

$$\frac{1}{2}\sqrt{\frac{1}{\sqrt{x}}+1}\left(2x-3\sqrt{x}\right)+\frac{3}{4}\log\left(2\sqrt{x}\left(\sqrt{\frac{1}{\sqrt{x}}+1}+1\right)+1\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/Sqrt[1 + 1/Sqrt[x]],x]
```

```
[Out] (Sqrt[1 + 1/Sqrt[x]]*(-3*Sqrt[x] + 2*x))/2 + (3*Log[1 + 2*(1 + Sq
rt[1 + 1/Sqrt[x]])*Sqrt[x]])/4
```

Maple [A] time = 0.02, size = 65, normalized size = 1.3

$$\frac{1}{4}\sqrt{1\left(1+\sqrt{x}\right)\frac{1}{\sqrt{x}}}\sqrt{x}\left(4\sqrt{x+\sqrt{x}}\sqrt{x}-6\sqrt{x+\sqrt{x}}+3\ln\left(1/2+\sqrt{x}+\sqrt{x+\sqrt{x}}\right)\right)\frac{1}{\sqrt{\left(1+\sqrt{x}\right)\sqrt{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(1+1/x^(1/2))^(1/2),x)
```

```
[Out] 1/4*((1+x^(1/2))/x^(1/2))^(1/2)*x^(1/2)*(4*(x+x^(1/2))^(1/2)*x^(1
/2)-6*(x+x^(1/2))^(1/2)+3*ln(1/2+x^(1/2)+(x+x^(1/2))^(1/2)))/((1+
x^(1/2))*x^(1/2))^(1/2)
```

Maxima [A] time = 1.4299, size = 84, normalized size = 1.68

$$-\frac{3\left(\frac{1}{\sqrt{x}}+1\right)^{\frac{3}{2}}-5\sqrt{\frac{1}{\sqrt{x}}+1}}{2\left(\left(\frac{1}{\sqrt{x}}+1\right)^{2}-\frac{2}{\sqrt{x}}-1\right)}+\frac{3}{4}\log\left(\sqrt{\frac{1}{\sqrt{x}}+1}+1\right)-\frac{3}{4}\log\left(\sqrt{\frac{1}{\sqrt{x}}+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(1/sqrt(x) + 1),x, algorithm="maxima")
```

```
[Out] -1/2*(3*(1/sqrt(x) + 1)^(3/2) - 5*sqrt(1/sqrt(x) + 1))/((1/sqrt(x
) + 1)^2 - 2/sqrt(x) - 1) + 3/4*log(sqrt(1/sqrt(x) + 1) + 1) - 3/
4*log(sqrt(1/sqrt(x) + 1) - 1)
```

Fricas [A] time = 0.229207, size = 89, normalized size = 1.78

$$\frac{2\left(2x^{\frac{3}{2}}-3x\right)\sqrt{\frac{\sqrt{x}+1}{\sqrt{x}}}+3\sqrt{x}\log\left(\sqrt{\frac{\sqrt{x}+1}{\sqrt{x}}}+1\right)-3\sqrt{x}\log\left(\sqrt{\frac{\sqrt{x}+1}{\sqrt{x}}}-1\right)}{4\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(1/sqrt(x) + 1),x, algorithm="fricas")
```

```
[Out] 1/4*(2*(2*x^(3/2) - 3*x)*sqrt((sqrt(x) + 1)/sqrt(x)) + 3*sqrt(x)*
log(sqrt((sqrt(x) + 1)/sqrt(x)) + 1) - 3*sqrt(x)*log(sqrt((sqrt(x
) + 1)/sqrt(x)) - 1))/sqrt(x)
```

Sympy [A] time = 10.7005, size = 60, normalized size = 1.2

$$\frac{x^{\frac{5}{4}}}{\sqrt{\sqrt{x}+1}}-\frac{x^{\frac{3}{4}}}{2\sqrt{\sqrt{x}+1}}-\frac{3\sqrt[4]{x}}{2\sqrt{\sqrt{x}+1}}+\frac{3\operatorname{asinh}\left(\sqrt[4]{x}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(1+1/x**(1/2))**(1/2),x)
```

```
[Out] x**(5/4)/sqrt(sqrt(x) + 1) - x**(3/4)/(2*sqrt(sqrt(x) + 1)) - 3*x
**(1/4)/(2*sqrt(sqrt(x) + 1)) + 3*asinh(x**(1/4))/2
```

GIAC/XCAS [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(1/sqrt(x) + 1),x, algorithm="giac")
```

```
[Out] Timed out
```

3.2386 $\int \left(a+\frac{b}{x^{3/2}}\right)^{2/3} dx$

Optimal. Leaf size=95

$$b^{2/3}\log\left(\sqrt[3]{a+\frac{b}{x^{3/2}}}-\frac{\sqrt[3]{b}}{\sqrt{x}}\right)-\frac{2b^{2/3}\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}}{\sqrt{x}\sqrt[3]{a+\frac{b}{x^{3/2}}}}+1}{\sqrt{3}}\right)}{\sqrt{3}}+x\left(a+\frac{b}{x^{3/2}}\right)^{2/3}$$

```
[Out] (a + b/x^(3/2))^(2/3)*x - (2*b^(2/3)*ArcTan[(1 + (2*b^(1/3))/((a
+ b/x^(3/2))^(1/3)*Sqrt[x]))/Sqrt[3]])/Sqrt[3] + b^(2/3)*Log[(a +
 b/x^(3/2))^(1/3) - b^(1/3)/Sqrt[x]]
```

Rubi [A] time = 0.190498, antiderivative size = 95, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$b^{2/3}\log\left(\sqrt[3]{a+\frac{b}{x^{3/2}}}-\frac{\sqrt[3]{b}}{\sqrt{x}}\right)-\frac{2b^{2/3}\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}}{\sqrt{x}\sqrt[3]{a+\frac{b}{x^{3/2}}}}+1}{\sqrt{3}}\right)}{\sqrt{3}}+x\left(a+\frac{b}{x^{3/2}}\right)^{2/3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^(3/2))^(2/3),x]
```

```
[Out] (a + b/x^(3/2))^(2/3)*x - (2*b^(2/3)*ArcTan[(1 + (2*b^(1/3))/((a
+ b/x^(3/2))^(1/3)*Sqrt[x]))/Sqrt[3]])/Sqrt[3] + b^(2/3)*Log[(a +
 b/x^(3/2))^(1/3) - b^(1/3)/Sqrt[x]]
```

Rubi in Sympy [A] time = 21.2598, size = 146, normalized size = 1.54

$$\frac{2b^{\frac{2}{3}}\log\left(-\frac{\sqrt[3]{b}}{\sqrt{x}\sqrt[3]{a+\frac{b}{x^{\frac{3}{2}}}}}+1\right)}{3}-\frac{b^{\frac{2}{3}}\log\left(\frac{b^{\frac{2}{3}}}{x\left(a+\frac{b}{x^{\frac{3}{2}}}\right)^{\frac{2}{3}}}+\frac{\sqrt[3]{b}}{\sqrt{x}\sqrt[3]{a+\frac{b}{x^{\frac{3}{2}}}}}+1\right)}{3}-\frac{2\sqrt{3}b^{\frac{2}{3}}\operatorname{atan}\left(\sqrt{3}\left(\frac{2\sqrt[3]{b}}{3\sqrt{x}\sqrt[3]{a+\frac{b}{x^{\frac{3}{2}}}}}+\frac{1}{3}\right)\right)}{3}+x\left(a+\frac{b}{x^{\frac{3}{2}}}\right)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**(3/2))**(2/3),x)
```

```
[Out] 2*b**(2/3)*log(-b**(1/3)/(sqrt(x)*(a + b/x**(3/2))**(1/3)) + 1)/3
 - b**(2/3)*log(b**(2/3)/(x*(a + b/x**(3/2))**(2/3)) + b**(1/3)/(
sqrt(x)*(a + b/x**(3/2))**(1/3)) + 1)/3 - 2*sqrt(3)*b**(2/3)*atan
(sqrt(3)*(2*b**(1/3)/(3*sqrt(x)*(a + b/x**(3/2))**(1/3)) + 1/3))/
```

```
3 + x*(a + b/x**(3/2))**(2/3)
```

Mathematica [C] time = 0.0881688, size = 53, normalized size = 0.56

$$\frac{x\left(a+\frac{b}{x^{3/2}}\right)^{2/3}\,_2F_1\left(-\frac{2}{3},-\frac{2}{3};\frac{1}{3};-\frac{b}{ax^{3/2}}\right)}{\left(\frac{a+\frac{b}{x^{3/2}}}{a}\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^(3/2))^(2/3),x]

[Out] ((a + b/x^(3/2))^(2/3)*x*Hypergeometric2F1[-2/3, -2/3, 1/3, -(b/(
a*x^(3/2)))])/((a + b/x^(3/2))/a)^(2/3)
```

Maple [F] time = 0.025, size = 0, normalized size = 0.

$$\int\left(a+bx^{-\frac{3}{2}}\right)^{\frac{2}{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^(3/2))^(2/3),x)

[Out] int((a+b/x^(3/2))^(2/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(3/2))^(2/3),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(3/2))^(2/3),x, algorithm="fricas")

[Out] Timed out
```

Sympy [A] time = 46.9952, size = 46, normalized size = 0.48

$$-\frac{2a^{\frac{2}{3}}x\,\Gamma\left(-\frac{2}{3}\right)\,_2F_1\left(\begin{matrix}-\frac{2}{3},-\frac{2}{3}\\ \frac{1}{3}\end{matrix}\middle|\frac{be^{i\pi}}{ax^{\frac{3}{2}}}\right)}{3\,\Gamma\left(\frac{1}{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**(3/2))**(2/3),x)
```

```
[Out] -2*a**(2/3)*x*gamma(-2/3)*hyper((-2/3, -2/3), (1/3,), b*exp_polar
(I*pi)/(a*x**(3/2)))/(3*gamma(1/3))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(a + \frac{b}{x^{\frac{3}{2}}}\right)^{\frac{2}{3}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(3/2))^(2/3),x, algorithm="giac")
```

```
[Out] integrate((a + b/x^(3/2))^(2/3), x)
```

3.2387 $\int \left(a+\frac{b}{\sqrt[3]{x}}\right) x^4 \, dx$

Optimal. Leaf size=19

$$\frac{ax^5}{5}+\frac{3}{14}bx^{14/3}$$

```
[Out] (3*b*x^(14/3))/14 + (a*x^5)/5
```

Rubi [A] time = 0.0169405, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$\frac{ax^5}{5}+\frac{3}{14}bx^{14/3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x^(1/3))*x^4,x]

[Out] (3*b*x^(14/3))/14 + (a*x^5)/5
```

Rubi in Sympy [A] time = 2.80179, size = 15, normalized size = 0.79

$$\frac{ax^5}{5}+\frac{3bx^{\frac{14}{3}}}{14}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x**(1/3))*x**4,x)

[Out] a*x**5/5 + 3*b*x**(14/3)/14
```

Mathematica [A] time = 0.00806421, size = 19, normalized size = 1.

$$\frac{ax^5}{5}+\frac{3}{14}bx^{14/3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x^(1/3))*x^4,x]

[Out] (3*b*x^(14/3))/14 + (a*x^5)/5
```

Maple [A] time = 0.002, size = 14, normalized size = 0.7

$$\frac{3\,b}{14}x^{\frac{14}{3}}+\frac{ax^5}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x^(1/3))*x^4,x)
```

```
[Out] 3/14*b*x^(14/3)+1/5*a*x^5
```

Maxima [A] time = 1.4179, size = 20, normalized size = 1.05

$$\frac{1}{70}\left(14\,a+\frac{15\,b}{x^{\frac{1}{3}}}\right)x^{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))*x^4,x, algorithm="maxima")
```

```
[Out] 1/70*(14*a + 15*b/x^(1/3))*x^5
```

Fricas [A] time = 0.226547, size = 18, normalized size = 0.95

$$\frac{1}{5}\,ax^{5}+\frac{3}{14}\,bx^{\frac{14}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))*x^4,x, algorithm="fricas")
```

```
[Out] 1/5*a*x^5 + 3/14*b*x^(14/3)
```

Sympy [A] time = 7.54741, size = 15, normalized size = 0.79

$$\frac{ax^{5}}{5}+\frac{3bx^{\frac{14}{3}}}{14}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**(1/3))*x**4,x)
```

```
[Out] a*x**5/5 + 3*b*x**(14/3)/14
```

GIAC/XCAS [A] time = 0.218596, size = 18, normalized size = 0.95

$$\frac{1}{5}\,ax^{5}+\frac{3}{14}\,bx^{\frac{14}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))*x^4,x, algorithm="giac")
```

```
[Out] 1/5*a*x^5 + 3/14*b*x^(14/3)
```

3.2388 $\int \left(a+\frac{b}{\sqrt[3]{x}}\right) x^3 \, dx$

Optimal. Leaf size=19

$$\frac{ax^4}{4}+\frac{3}{11}bx^{11/3}$$

```
[Out] (3*b*x^(11/3))/11 + (a*x^4)/4
```

Rubi [A] time = 0.0153371, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{ax^4}{4}+\frac{3}{11}bx^{11/3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^(1/3))*x^3,x]

[Out] (3*b*x^(11/3))/11 + (a*x^4)/4
```

Rubi in Sympy [A] time = 2.82716, size = 15, normalized size = 0.79

$$\frac{ax^4}{4}+\frac{3bx^{\frac{11}{3}}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**(1/3))*x**3,x)

[Out] a*x**4/4 + 3*b*x**(11/3)/11
```

Mathematica [A] time = 0.00477479, size = 19, normalized size = 1.

$$\frac{ax^4}{4}+\frac{3}{11}bx^{11/3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^(1/3))*x^3,x]

[Out] (3*b*x^(11/3))/11 + (a*x^4)/4
```

Maple [A] time = 0.002, size = 14, normalized size = 0.7

$$\frac{3\,b}{11}x^{\frac{11}{3}}+\frac{ax^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^(1/3))*x^3,x)
```

```
[Out] 3/11*b*x^(11/3)+1/4*a*x^4
```

Maxima [A] time = 1.42034, size = 20, normalized size = 1.05

$$\frac{1}{44}\left(11\,a+\frac{12\,b}{x^{\frac{1}{3}}}\right)x^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))*x^3,x, algorithm="maxima")
```

```
[Out] 1/44*(11*a + 12*b/x^(1/3))*x^4
```

Fricas [A] time = 0.224965, size = 18, normalized size = 0.95

$$\frac{1}{4}\,ax^4+\frac{3}{11}\,bx^{\frac{11}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))*x^3,x, algorithm="fricas")
```

```
[Out] 1/4*a*x^4 + 3/11*b*x^(11/3)
```

Sympy [A] time = 3.5993, size = 15, normalized size = 0.79

$$\frac{ax^4}{4}+\frac{3bx^{\frac{11}{3}}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**(1/3))*x**3,x)
```

```
[Out] a*x**4/4 + 3*b*x**(11/3)/11
```

GIAC/XCAS [A] time = 0.218359, size = 18, normalized size = 0.95

$$\frac{1}{4}\,ax^4+\frac{3}{11}\,bx^{\frac{11}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))*x^3,x, algorithm="giac")
```

```
[Out] 1/4*a*x^4 + 3/11*b*x^(11/3)
```

3.2389 $\int \left(a+\frac{b}{\sqrt[3]{x}}\right) x^2 \, dx$

Optimal. Leaf size=19

$$\frac{ax^3}{3}+\frac{3}{8}bx^{8/3}$$

```
[Out] (3*b*x^(8/3))/8 + (a*x^3)/3
```

Rubi [A] time = 0.0160699, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{ax^3}{3}+\frac{3}{8}bx^{8/3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^(1/3))*x^2,x]

[Out] (3*b*x^(8/3))/8 + (a*x^3)/3
```

Rubi in Sympy [A] time = 2.93624, size = 15, normalized size = 0.79

$$\frac{ax^3}{3}+\frac{3bx^{\frac{8}{3}}}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**(1/3))*x**2,x)

[Out] a*x**3/3 + 3*b*x**(8/3)/8
```

Mathematica [A] time = 0.00454728, size = 19, normalized size = 1.

$$\frac{ax^3}{3}+\frac{3}{8}bx^{8/3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^(1/3))*x^2,x]

[Out] (3*b*x^(8/3))/8 + (a*x^3)/3
```

Maple [A] time = 0.002, size = 14, normalized size = 0.7

$$\frac{3\,b}{8}x^{\frac{8}{3}}+\frac{ax^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^(1/3))*x^2,x)
```

```
[Out] 3/8*b*x^(8/3)+1/3*a*x^3
```

Maxima [A] time = 1.42558, size = 20, normalized size = 1.05

$$\frac{1}{24}\left(8\,a+\frac{9\,b}{x^{\frac{1}{3}}}\right)x^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))*x^2,x, algorithm="maxima")
```

```
[Out] 1/24*(8*a + 9*b/x^(1/3))*x^3
```

Fricas [A] time = 0.223526, size = 18, normalized size = 0.95

$$\frac{1}{3}\,ax^3+\frac{3}{8}\,bx^{\frac{8}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))*x^2,x, algorithm="fricas")
```

```
[Out] 1/3*a*x^3 + 3/8*b*x^(8/3)
```

Sympy [A] time = 1.38101, size = 15, normalized size = 0.79

$$\frac{ax^3}{3}+\frac{3bx^{\frac{8}{3}}}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**(1/3))*x**2,x)
```

```
[Out] a*x**3/3 + 3*b*x**(8/3)/8
```

GIAC/XCAS [A] time = 0.217181, size = 18, normalized size = 0.95

$$\frac{1}{3}\,ax^3+\frac{3}{8}\,bx^{\frac{8}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))*x^2,x, algorithm="giac")
```

```
[Out] 1/3*a*x^3 + 3/8*b*x^(8/3)
```

3.2390 $\int \left(a+\frac{b}{\sqrt[3]{x}}\right) x \, dx$

Optimal. Leaf size=19

$$\frac{ax^2}{2}+\frac{3}{5}bx^{5/3}$$

```
[Out] (3*b*x^(5/3))/5 + (a*x^2)/2
```

Rubi [A] time = 0.0157675, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{ax^2}{2}+\frac{3}{5}bx^{5/3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x^(1/3))*x,x]
```

```
[Out] (3*b*x^(5/3))/5 + (a*x^2)/2
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$a\int x\,dx+\frac{3bx^{\frac{5}{3}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x**(1/3))*x,x)
```

```
[Out] a*Integral(x, x) + 3*b*x**(5/3)/5
```

Mathematica [A] time = 0.00468519, size = 19, normalized size = 1.

$$\frac{ax^2}{2}+\frac{3}{5}bx^{5/3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x^(1/3))*x,x]
```

```
[Out] (3*b*x^(5/3))/5 + (a*x^2)/2
```

Maple [A] time = 0.002, size = 14, normalized size = 0.7

$$\frac{3\,b}{5}x^{\frac{5}{3}}+\frac{ax^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x^(1/3))*x,x)
```

```
[Out] 3/5*b*x^(5/3)+1/2*a*x^2
```

Maxima [A] time = 1.41882, size = 20, normalized size = 1.05

$$\frac{1}{10}\left(5\,a+\frac{6\,b}{x^{\frac{1}{3}}}\right)x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))*x,x, algorithm="maxima")
```

```
[Out] 1/10*(5*a + 6*b/x^(1/3))*x^2
```

Fricas [A] time = 0.21738, size = 18, normalized size = 0.95

$$\frac{1}{2}\,ax^2+\frac{3}{5}\,bx^{\frac{5}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))*x,x, algorithm="fricas")
```

```
[Out] 1/2*a*x^2 + 3/5*b*x^(5/3)
```

Sympy [A] time = 2.59045, size = 15, normalized size = 0.79

$$\frac{ax^2}{2}+\frac{3bx^{\frac{5}{3}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**(1/3))*x,x)
```

```
[Out] a*x**2/2 + 3*b*x**(5/3)/5
```

GIAC/XCAS [A] time = 0.220028, size = 18, normalized size = 0.95

$$\frac{1}{2}\,ax^2+\frac{3}{5}\,bx^{\frac{5}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))*x,x, algorithm="giac")
```

```
[Out] 1/2*a*x^2 + 3/5*b*x^(5/3)
```

3.2391 $\int \left(a+\frac{b}{\sqrt[3]{x}}\right) dx$

Optimal. Leaf size=14

$$ax+\frac{3}{2}bx^{2/3}$$

```
[Out] (3*b*x^(2/3))/2 + a*x
```

Rubi [A] time = 0.0108887, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 0, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.

$$ax+\frac{3}{2}bx^{2/3}$$

Antiderivative was successfully verified.

```
[In]  Int[a + b/x^(1/3),x]

[Out] (3*b*x^(2/3))/2 + a*x
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{3bx^{\frac{2}{3}}}{2}+\int a\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(a+b/x**(1/3),x)

[Out] 3*b*x**(2/3)/2 + Integral(a, x)
```

Mathematica [A] time = 0.00256594, size = 14, normalized size = 1.

$$ax+\frac{3}{2}bx^{2/3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[a + b/x^(1/3),x]

[Out] (3*b*x^(2/3))/2 + a*x
```

Maple [A] time = 0.001, size = 11, normalized size = 0.8

$$\frac{3\,b}{2}x^{\frac{2}{3}}+ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(a+b/x^(1/3),x)

[Out] 3/2*b*x^(2/3)+a*x
```

Maxima [A] time = 1.42328, size = 14, normalized size = 1.

$$ax + \frac{3}{2} b x^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(a + b/x^(1/3),x, algorithm="maxima")

[Out] a*x + 3/2*b*x^(2/3)
```

Fricas [A] time = 0.215945, size = 14, normalized size = 1.

$$ax + \frac{3}{2} b x^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(a + b/x^(1/3),x, algorithm="fricas")

[Out] a*x + 3/2*b*x^(2/3)
```

Sympy [A] time = 0.066027, size = 12, normalized size = 0.86

$$ax + \frac{3 b x^{\frac{2}{3}}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(a+b/x**(1/3),x)

[Out] a*x + 3*b*x**(2/3)/2
```

GIAC/XCAS [A] time = 0.220599, size = 14, normalized size = 1.

$$ax + \frac{3}{2} b x^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(a + b/x^(1/3),x, algorithm="giac")

[Out] a*x + 3/2*b*x^(2/3)
```

3.2392 $\int \frac{a+\frac{b}{\sqrt[3]{x}}}{x} \, dx$

Optimal. Leaf size=13

$$a\log(x) - \frac{3b}{\sqrt[3]{x}}$$

```
[Out] (-3*b)/x^(1/3) + a*Log[x]
```

Rubi [A] time = 0.0148795, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$a\log(x) - \frac{3b}{\sqrt[3]{x}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^(1/3))/x,x]
```

```
[Out] (-3*b)/x^(1/3) + a*Log[x]
```

Rubi in Sympy [A] time = 2.86631, size = 12, normalized size = 0.92

$$a\log(x) - \frac{3b}{\sqrt[3]{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**(1/3))/x,x)
```

```
[Out] a*log(x) - 3*b/x**(1/3)
```

Mathematica [A] time = 0.0113008, size = 13, normalized size = 1.

$$a\log(x) - \frac{3b}{\sqrt[3]{x}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^(1/3))/x,x]
```

```
[Out] (-3*b)/x^(1/3) + a*Log[x]
```

Maple [A] time = 0.009, size = 12, normalized size = 0.9

$$-3\,\frac{b}{\sqrt[3]{x}} + a\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^(1/3))/x,x)
```

```
[Out] -3*b/x^(1/3)+a*ln(x)
```

Maxima [A] time = 1.42461, size = 15, normalized size = 1.15

$$a\log(x) - \frac{3b}{x^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))/x,x, algorithm="maxima")
```

```
[Out] a*log(x) - 3*b/x^(1/3)
```

Fricas [A] time = 0.224472, size = 24, normalized size = 1.85

$$\frac{3\left(ax^{\frac{1}{3}}\log\left(x^{\frac{1}{3}}\right) - b\right)}{x^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))/x,x, algorithm="fricas")
```

```
[Out] 3*(a*x^(1/3)*log(x^(1/3)) - b)/x^(1/3)
```

Sympy [A] time = 1.56687, size = 12, normalized size = 0.92

$$a\log(x) - \frac{3b}{\sqrt[3]{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**(1/3))/x,x)
```

```
[Out] a*log(x) - 3*b/x**(1/3)
```

GIAC/XCAS [A] time = 0.219377, size = 16, normalized size = 1.23

$$a\ln(|x|) - \frac{3b}{x^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))/x,x, algorithm="giac")
```

```
[Out] a*ln(abs(x)) - 3*b/x^(1/3)
```

3.2393 $\int \frac{a+\frac{b}{\sqrt[3]{x}}}{x^2} \, dx$

Optimal. Leaf size=17

$$-\frac{a}{x}-\frac{3b}{4x^{4/3}}$$

```
[Out] (-3*b)/(4*x^(4/3)) - a/x
```

Rubi [A] time = 0.0161339, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a}{x}-\frac{3b}{4x^{4/3}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x^(1/3))/x^2,x]

[Out] (-3*b)/(4*x^(4/3)) - a/x
```

Rubi in Sympy [A] time = 2.90105, size = 14, normalized size = 0.82

$$-\frac{a}{x}-\frac{3b}{4x^{\frac{4}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x**(1/3))/x**2,x)

[Out] -a/x - 3*b/(4*x**(4/3))
```

Mathematica [A] time = 0.0089736, size = 17, normalized size = 1.

$$-\frac{a}{x}-\frac{3b}{4x^{4/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x^(1/3))/x^2,x]

[Out] (-3*b)/(4*x^(4/3)) - a/x
```

Maple [A] time = 0.008, size = 14, normalized size = 0.8

$$-\frac{3\,b}{4}x^{-\frac{4}{3}}-\frac{a}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x^(1/3))/x^2,x)

[Out] -3/4*b/x^(4/3)-a/x
```

Maxima [A] time = 1.45291, size = 63, normalized size = 3.71

$$-\frac{3\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{4}}{4\,b^{3}}+\frac{2\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{3}a}{b^{3}}-\frac{3\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{2}a^{2}}{2\,b^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))/x^2,x, algorithm="maxima")
```

```
[Out] -3/4*(a + b/x^(1/3))^4/b^3 + 2*(a + b/x^(1/3))^3*a/b^3 - 3/2*(a +
 b/x^(1/3))^2*a^2/b^3
```

Fricas [A] time = 0.222576, size = 20, normalized size = 1.18

$$-\frac{4\,ax^{\frac{1}{3}}+3\,b}{4\,x^{\frac{4}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))/x^2,x, algorithm="fricas")
```

```
[Out] -1/4*(4*a*x^(1/3) + 3*b)/x^(4/3)
```

Sympy [A] time = 2.4667, size = 14, normalized size = 0.82

$$-\frac{a}{x}-\frac{3b}{4x^{\frac{4}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**(1/3))/x**2,x)
```

```
[Out] -a/x - 3*b/(4*x**(4/3))
```

GIAC/XCAS [A] time = 0.210327, size = 20, normalized size = 1.18

$$-\frac{4\,ax^{\frac{1}{3}}+3\,b}{4\,x^{\frac{4}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))/x^2,x, algorithm="giac")
```

```
[Out] -1/4*(4*a*x^(1/3) + 3*b)/x^(4/3)
```

3.2394 $\int \frac{a+\frac{b}{\sqrt[3]{x}}}{x^3}\,dx$

Optimal. Leaf size=19

$$-\frac{a}{2x^2}-\frac{3b}{7x^{7/3}}$$

```
[Out] (-3*b)/(7*x^(7/3)) - a/(2*x^2)
```

Rubi [A] time = 0.016074, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a}{2x^2}-\frac{3b}{7x^{7/3}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x^(1/3))/x^3,x]
```

```
[Out] (-3*b)/(7*x^(7/3)) - a/(2*x^2)
```

Rubi in Sympy [A] time = 2.92499, size = 17, normalized size = 0.89

$$-\frac{a}{2x^2}-\frac{3b}{7x^{\frac{7}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x**(1/3))/x**3,x)
```

```
[Out] -a/(2*x**2) - 3*b/(7*x**(7/3))
```

Mathematica [A] time = 0.00952621, size = 19, normalized size = 1.

$$-\frac{a}{2x^2}-\frac{3b}{7x^{7/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x^(1/3))/x^3,x]
```

```
[Out] (-3*b)/(7*x^(7/3)) - a/(2*x^2)
```

Maple [A] time = 0.008, size = 14, normalized size = 0.7

$$-\frac{3b}{7}x^{-\frac{7}{3}}-\frac{a}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x^(1/3))/x^3,x)
```

```
[Out] -3/7*b/x^(7/3)-1/2*a/x^2
```

Maxima [A] time = 1.44598, size = 132, normalized size = 6.95

$$-\frac{3\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{7}}{7\,b^{6}}+\frac{5\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{6}a}{2\,b^{6}}-\frac{6\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{5}a^{2}}{b^{6}}+\frac{15\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{4}a^{3}}{2\,b^{6}}-\frac{5\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{3}a^{4}}{b^{6}}+\frac{3\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{2}a^{5}}{2\,b^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))/x^3,x, algorithm="maxima")
```

```
[Out] -3/7*(a + b/x^(1/3))^7/b^6 + 5/2*(a + b/x^(1/3))^6*a/b^6 - 6*(a +
 b/x^(1/3))^5*a^2/b^6 + 15/2*(a + b/x^(1/3))^4*a^3/b^6 - 5*(a + b
/x^(1/3))^3*a^4/b^6 + 3/2*(a + b/x^(1/3))^2*a^5/b^6
```

Fricas [A] time = 0.221057, size = 20, normalized size = 1.05

$$-\frac{7\,ax^{\frac{1}{3}}+6\,b}{14\,x^{\frac{7}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))/x^3,x, algorithm="fricas")
```

```
[Out] -1/14*(7*a*x^(1/3) + 6*b)/x^(7/3)
```

Sympy [A] time = 4.77961, size = 17, normalized size = 0.89

$$-\frac{a}{2x^{2}}-\frac{3b}{7x^{\frac{7}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**(1/3))/x**3,x)
```

```
[Out] -a/(2*x**2) - 3*b/(7*x**(7/3))
```

GIAC/XCAS [A] time = 0.209446, size = 20, normalized size = 1.05

$$-\frac{7\,ax^{\frac{1}{3}}+6\,b}{14\,x^{\frac{7}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))/x^3,x, algorithm="giac")
```

```
[Out] -1/14*(7*a*x^(1/3) + 6*b)/x^(7/3)
```

3.2395 $\int \frac{a+\frac{b}{\sqrt[3]{x}}}{x^4}\,dx$

Optimal. Leaf size=19

$$-\frac{a}{3x^3}-\frac{3b}{10x^{10/3}}$$

```
[Out] (-3*b)/(10*x^(10/3)) - a/(3*x^3)
```

Rubi [A] time = 0.0164452, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a}{3x^3}-\frac{3b}{10x^{10/3}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x^(1/3))/x^4,x]

[Out] (-3*b)/(10*x^(10/3)) - a/(3*x^3)
```

Rubi in Sympy [A] time = 2.85443, size = 17, normalized size = 0.89

$$-\frac{a}{3x^3}-\frac{3b}{10x^{\frac{10}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x**(1/3))/x**4,x)

[Out] -a/(3*x**3) - 3*b/(10*x**(10/3))
```

Mathematica [A] time = 0.00966701, size = 19, normalized size = 1.

$$-\frac{a}{3x^3}-\frac{3b}{10x^{10/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x^(1/3))/x^4,x]

[Out] (-3*b)/(10*x^(10/3)) - a/(3*x^3)
```

Maple [A] time = 0.008, size = 14, normalized size = 0.7

$$-\frac{3\,b}{10}x^{-\frac{10}{3}}-\frac{a}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x^(1/3))/x^4,x)

[Out] -3/10*b/x^(10/3)-1/3*a/x^3
```

MaximA [A] time = 1.5851, size = 201, normalized size = 10.58

$$-\frac{3\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{10}}{10\,b^{9}}+\frac{8\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{9}a}{3\,b^{9}}-\frac{21\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{8}a^{2}}{2\,b^{9}}+\frac{24\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{7}a^{3}}{b^{9}}-\frac{35\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{6}a^{4}}{b^{9}}+\frac{168\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{5}a^{5}}{5\,b^{9}}-\frac{21\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{4}a^{6}}{b^{9}}+\frac{8\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{3}a^{7}}{b^{9}}-\frac{3\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{2}a^{8}}{2\,b^{9}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))/x^4,x, algorithm="maxima")
```

```
[Out] -3/10*(a + b/x^(1/3))^10/b^9 + 8/3*(a + b/x^(1/3))^9*a/b^9 - 21/2
*(a + b/x^(1/3))^8*a^2/b^9 + 24*(a + b/x^(1/3))^7*a^3/b^9 - 35*(a
 + b/x^(1/3))^6*a^4/b^9 + 168/5*(a + b/x^(1/3))^5*a^5/b^9 - 21*(a
 + b/x^(1/3))^4*a^6/b^9 + 8*(a + b/x^(1/3))^3*a^7/b^9 - 3/2*(a +
b/x^(1/3))^2*a^8/b^9
```

Fricas [A] time = 0.21969, size = 20, normalized size = 1.05

$$-\frac{10\,ax^{\frac{1}{3}}+9\,b}{30\,x^{\frac{10}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))/x^4,x, algorithm="fricas")
```

```
[Out] -1/30*(10*a*x^(1/3) + 9*b)/x^(10/3)
```

Sympy [A] time = 9.07927, size = 17, normalized size = 0.89

$$-\frac{a}{3x^{3}}-\frac{3b}{10x^{\frac{10}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**(1/3))/x**4,x)
```

```
[Out] -a/(3*x**3) - 3*b/(10*x**(10/3))
```

GIAC/XCAS [A] time = 0.209772, size = 20, normalized size = 1.05

$$-\frac{10\,ax^{\frac{1}{3}}+9\,b}{30\,x^{\frac{10}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))/x^4,x, algorithm="giac")
```

```
[Out] -1/30*(10*a*x^(1/3) + 9*b)/x^(10/3)
```

3.2396 $\int \left(a+\frac{b}{\sqrt[3]{x}}\right)^2 x^4 \, dx$

Optimal. Leaf size=34

$$\frac{a^2x^5}{5}+\frac{3}{7}abx^{14/3}+\frac{3}{13}b^2x^{13/3}$$

```
[Out] (3*b^2*x^(13/3))/13 + (3*a*b*x^(14/3))/7 + (a^2*x^5)/5
```

Rubi [A] time = 0.0811189, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{a^2x^5}{5}+\frac{3}{7}abx^{14/3}+\frac{3}{13}b^2x^{13/3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^(1/3))^2*x^4,x]

[Out] (3*b^2*x^(13/3))/13 + (3*a*b*x^(14/3))/7 + (a^2*x^5)/5
```

Rubi in Sympy [A] time = 12.8685, size = 31, normalized size = 0.91

$$\frac{a^2x^5}{5}+\frac{3abx^{\frac{14}{3}}}{7}+\frac{3b^2x^{\frac{13}{3}}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**(1/3))**2*x**4,x)

[Out] a**2*x**5/5 + 3*a*b*x**(14/3)/7 + 3*b**2*x**(13/3)/13
```

Mathematica [A] time = 0.014837, size = 34, normalized size = 1.

$$\frac{a^2x^5}{5}+\frac{3}{7}abx^{14/3}+\frac{3}{13}b^2x^{13/3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^(1/3))^2*x^4,x]

[Out] (3*b^2*x^(13/3))/13 + (3*a*b*x^(14/3))/7 + (a^2*x^5)/5
```

Maple [A] time = 0.001, size = 25, normalized size = 0.7

$$\frac{3\,b^2}{13}x^{\frac{13}{3}}+\frac{3\,ab}{7}x^{\frac{14}{3}}+\frac{x^5a^2}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^(1/3))^2*x^4,x)
```

```
[Out] 3/13*b^2*x^(13/3)+3/7*a*b*x^(14/3)+1/5*x^5*a^2
```

Maxima [A] time = 1.44566, size = 35, normalized size = 1.03

$$\frac{1}{455}\left(91\,a^2+\frac{195\,ab}{x^{\frac{1}{3}}}+\frac{105\,b^2}{x^{\frac{2}{3}}}\right)x^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^2*x^4,x, algorithm="maxima")
```

```
[Out] 1/455*(91*a^2 + 195*a*b/x^(1/3) + 105*b^2/x^(2/3))*x^5
```

Fricas [A] time = 0.217415, size = 32, normalized size = 0.94

$$\frac{1}{5}\,a^2x^5+\frac{3}{7}\,abx^{\frac{14}{3}}+\frac{3}{13}\,b^2x^{\frac{13}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^2*x^4,x, algorithm="fricas")
```

```
[Out] 1/5*a^2*x^5 + 3/7*a*b*x^(14/3) + 3/13*b^2*x^(13/3)
```

Sympy [A] time = 11.6249, size = 31, normalized size = 0.91

$$\frac{a^2x^5}{5}+\frac{3abx^{\frac{14}{3}}}{7}+\frac{3b^2x^{\frac{13}{3}}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**(1/3))**2*x**4,x)
```

```
[Out] a**2*x**5/5 + 3*a*b*x**(14/3)/7 + 3*b**2*x**(13/3)/13
```

GIAC/XCAS [A] time = 0.209569, size = 32, normalized size = 0.94

$$\frac{1}{5}\,a^2x^5+\frac{3}{7}\,abx^{\frac{14}{3}}+\frac{3}{13}\,b^2x^{\frac{13}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^2*x^4,x, algorithm="giac")
```

```
[Out] 1/5*a^2*x^5 + 3/7*a*b*x^(14/3) + 3/13*b^2*x^(13/3)
```

3.2397 $\int \left(a+\frac{b}{\sqrt[3]{x}}\right)^2 x^3 \, dx$

Optimal. Leaf size=34

$$\frac{a^2x^4}{4}+\frac{6}{11}abx^{11/3}+\frac{3}{10}b^2x^{10/3}$$

```
[Out] (3*b^2*x^(10/3))/10 + (6*a*b*x^(11/3))/11 + (a^2*x^4)/4
```

Rubi [A] time = 0.0734771, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{a^2x^4}{4}+\frac{6}{11}abx^{11/3}+\frac{3}{10}b^2x^{10/3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^(1/3))^2*x^3,x]

[Out] (3*b^2*x^(10/3))/10 + (6*a*b*x^(11/3))/11 + (a^2*x^4)/4
```

Rubi in Sympy [A] time = 11.4955, size = 31, normalized size = 0.91

$$\frac{a^2x^4}{4}+\frac{6abx^{\frac{11}{3}}}{11}+\frac{3b^2x^{\frac{10}{3}}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**(1/3))**2*x**3,x)

[Out] a**2*x**4/4 + 6*a*b*x**(11/3)/11 + 3*b**2*x**(10/3)/10
```

Mathematica [A] time = 0.0090696, size = 34, normalized size = 1.

$$\frac{a^2x^4}{4}+\frac{6}{11}abx^{11/3}+\frac{3}{10}b^2x^{10/3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^(1/3))^2*x^3,x]

[Out] (3*b^2*x^(10/3))/10 + (6*a*b*x^(11/3))/11 + (a^2*x^4)/4
```

Maple [A] time = 0.002, size = 25, normalized size = 0.7

$$\frac{3\,b^2}{10}x^{\frac{10}{3}}+\frac{6\,ab}{11}x^{\frac{11}{3}}+\frac{x^4a^2}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^(1/3))^2*x^3,x)
```

```
[Out] 3/10*b^2*x^(10/3)+6/11*a*b*x^(11/3)+1/4*x^4*a^2
```

Maxima [A] time = 1.43193, size = 35, normalized size = 1.03

$$\frac{1}{220}\left(55\,a^2+\frac{120\,ab}{x^{\frac{1}{3}}}+\frac{66\,b^2}{x^{\frac{2}{3}}}\right)x^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^2*x^3,x, algorithm="maxima")
```

```
[Out] 1/220*(55*a^2 + 120*a*b/x^(1/3) + 66*b^2/x^(2/3))*x^4
```

Fricas [A] time = 0.219807, size = 32, normalized size = 0.94

$$\frac{1}{4}\,a^2x^4+\frac{6}{11}\,abx^{\frac{11}{3}}+\frac{3}{10}\,b^2x^{\frac{10}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^2*x^3,x, algorithm="fricas")
```

```
[Out] 1/4*a^2*x^4 + 6/11*a*b*x^(11/3) + 3/10*b^2*x^(10/3)
```

Sympy [A] time = 5.70381, size = 31, normalized size = 0.91

$$\frac{a^2x^4}{4}+\frac{6abx^{\frac{11}{3}}}{11}+\frac{3b^2x^{\frac{10}{3}}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**(1/3))**2*x**3,x)
```

```
[Out] a**2*x**4/4 + 6*a*b*x**(11/3)/11 + 3*b**2*x**(10/3)/10
```

GIAC/XCAS [A] time = 0.209805, size = 32, normalized size = 0.94

$$\frac{1}{4}\,a^2x^4+\frac{6}{11}\,abx^{\frac{11}{3}}+\frac{3}{10}\,b^2x^{\frac{10}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^2*x^3,x, algorithm="giac")
```

```
[Out] 1/4*a^2*x^4 + 6/11*a*b*x^(11/3) + 3/10*b^2*x^(10/3)
```

3.2398 $\int \left(a+\frac{b}{\sqrt[3]{x}}\right)^2 x^2 \, dx$

Optimal. Leaf size=34

$$\frac{a^2x^3}{3}+\frac{3}{4}abx^{8/3}+\frac{3}{7}b^2x^{7/3}$$

```
[Out] (3*b^2*x^(7/3))/7 + (3*a*b*x^(8/3))/4 + (a^2*x^3)/3
```

Rubi [A] time = 0.064753, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{a^2x^3}{3}+\frac{3}{4}abx^{8/3}+\frac{3}{7}b^2x^{7/3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x^(1/3))^2*x^2,x]

[Out] (3*b^2*x^(7/3))/7 + (3*a*b*x^(8/3))/4 + (a^2*x^3)/3
```

Rubi in Sympy [A] time = 9.85524, size = 31, normalized size = 0.91

$$\frac{a^2x^3}{3}+\frac{3abx^{\frac{8}{3}}}{4}+\frac{3b^2x^{\frac{7}{3}}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x**(1/3))**2*x**2,x)

[Out] a**2*x**3/3 + 3*a*b*x**(8/3)/4 + 3*b**2*x**(7/3)/7
```

Mathematica [A] time = 0.0157086, size = 34, normalized size = 1.

$$\frac{a^2x^3}{3}+\frac{3}{4}abx^{8/3}+\frac{3}{7}b^2x^{7/3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x^(1/3))^2*x^2,x]

[Out] (3*b^2*x^(7/3))/7 + (3*a*b*x^(8/3))/4 + (a^2*x^3)/3
```

Maple [A] time = 0.001, size = 25, normalized size = 0.7

$$\frac{3\,b^2}{7}x^{\frac{7}{3}}+\frac{3\,ab}{4}x^{\frac{8}{3}}+\frac{x^3a^2}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x^(1/3))^2*x^2,x)
```

```
[Out] 3/7*b^2*x^(7/3)+3/4*a*b*x^(8/3)+1/3*x^3*a^2
```

Maxima [A] time = 1.43734, size = 35, normalized size = 1.03

$$\frac{1}{84}\left(28\,a^2 + \frac{63\,ab}{x^{\frac{1}{3}}} + \frac{36\,b^2}{x^{\frac{2}{3}}}\right)x^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^2*x^2,x, algorithm="maxima")
```

```
[Out] 1/84*(28*a^2 + 63*a*b/x^(1/3) + 36*b^2/x^(2/3))*x^3
```

Fricas [A] time = 0.219427, size = 32, normalized size = 0.94

$$\frac{1}{3}\,a^2x^3 + \frac{3}{4}\,abx^{\frac{8}{3}} + \frac{3}{7}\,b^2x^{\frac{7}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^2*x^2,x, algorithm="fricas")
```

```
[Out] 1/3*a^2*x^3 + 3/4*a*b*x^(8/3) + 3/7*b^2*x^(7/3)
```

Sympy [A] time = 2.39865, size = 31, normalized size = 0.91

$$\frac{a^2x^3}{3} + \frac{3abx^{\frac{8}{3}}}{4} + \frac{3b^2x^{\frac{7}{3}}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**(1/3))**2*x**2,x)
```

```
[Out] a**2*x**3/3 + 3*a*b*x**(8/3)/4 + 3*b**2*x**(7/3)/7
```

GIAC/XCAS [A] time = 0.21014, size = 32, normalized size = 0.94

$$\frac{1}{3}\,a^2x^3 + \frac{3}{4}\,abx^{\frac{8}{3}} + \frac{3}{7}\,b^2x^{\frac{7}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^2*x^2,x, algorithm="giac")
```

```
[Out] 1/3*a^2*x^3 + 3/4*a*b*x^(8/3) + 3/7*b^2*x^(7/3)
```

3.2399 $\int \left(a+\frac{b}{\sqrt[3]{x}}\right)^2 x\,dx$

Optimal. Leaf size=34

$$\frac{a^2x^2}{2}+\frac{6}{5}abx^{5/3}+\frac{3}{4}b^2x^{4/3}$$

```
[Out] (3*b^2*x^(4/3))/4 + (6*a*b*x^(5/3))/5 + (a^2*x^2)/2
```

Rubi [A] time = 0.0587188, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{a^2x^2}{2}+\frac{6}{5}abx^{5/3}+\frac{3}{4}b^2x^{4/3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^(1/3))^2*x,x]
```

```
[Out] (3*b^2*x^(4/3))/4 + (6*a*b*x^(5/3))/5 + (a^2*x^2)/2
```

Rubi in Sympy [A] time = 8.84955, size = 31, normalized size = 0.91

$$\frac{a^2x^2}{2}+\frac{6abx^{\frac{5}{3}}}{5}+\frac{3b^2x^{\frac{4}{3}}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**(1/3))**2*x,x)
```

```
[Out] a**2*x**2/2 + 6*a*b*x**(5/3)/5 + 3*b**2*x**(4/3)/4
```

Mathematica [A] time = 0.0111799, size = 34, normalized size = 1.

$$\frac{a^2x^2}{2}+\frac{6}{5}abx^{5/3}+\frac{3}{4}b^2x^{4/3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^(1/3))^2*x,x]
```

```
[Out] (3*b^2*x^(4/3))/4 + (6*a*b*x^(5/3))/5 + (a^2*x^2)/2
```

Maple [A] time = 0.001, size = 25, normalized size = 0.7

$$\frac{3\,b^2}{4}x^{\frac{4}{3}}+\frac{6\,ab}{5}x^{\frac{5}{3}}+\frac{a^2x^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^(1/3))^2*x,x)
```

```
[Out] 3/4*b^2*x^(4/3)+6/5*a*b*x^(5/3)+1/2*a^2*x^2
```

Maxima [A] time = 1.43608, size = 35, normalized size = 1.03

$$\frac{1}{20}\left(10\,a^2 + \frac{24\,ab}{x^{\frac{1}{3}}} + \frac{15\,b^2}{x^{\frac{2}{3}}}\right)x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^2*x,x, algorithm="maxima")
```

```
[Out] 1/20*(10*a^2 + 24*a*b/x^(1/3) + 15*b^2/x^(2/3))*x^2
```

Fricas [A] time = 0.221071, size = 32, normalized size = 0.94

$$\frac{1}{2}\,a^2x^2 + \frac{6}{5}\,abx^{\frac{5}{3}} + \frac{3}{4}\,b^2x^{\frac{4}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^2*x,x, algorithm="fricas")
```

```
[Out] 1/2*a^2*x^2 + 6/5*a*b*x^(5/3) + 3/4*b^2*x^(4/3)
```

Sympy [A] time = 1.9747, size = 31, normalized size = 0.91

$$\frac{a^2x^2}{2} + \frac{6abx^{\frac{5}{3}}}{5} + \frac{3b^2x^{\frac{4}{3}}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**(1/3))**2*x,x)
```

```
[Out] a**2*x**2/2 + 6*a*b*x**(5/3)/5 + 3*b**2*x**(4/3)/4
```

GIAC/XCAS [A] time = 0.211286, size = 32, normalized size = 0.94

$$\frac{1}{2}\,a^2x^2 + \frac{6}{5}\,abx^{\frac{5}{3}} + \frac{3}{4}\,b^2x^{\frac{4}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^2*x,x, algorithm="giac")
```

```
[Out] 1/2*a^2*x^2 + 6/5*a*b*x^(5/3) + 3/4*b^2*x^(4/3)
```

3.2400 $\int \left(a+\frac{b}{\sqrt[3]{x}}\right)^2 \, dx$

Optimal. Leaf size=16

$$\frac{x\left(a+\frac{b}{\sqrt[3]{x}}\right)^3}{a}$$

```
[Out] ((a + b/x^(1/3))^3*x)/a
```

Rubi [A] time = 0.0252124, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{x\left(a+\frac{b}{\sqrt[3]{x}}\right)^3}{a}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^(1/3))^2,x]

[Out] ((a + b/x^(1/3))^3*x)/a
```

Rubi in Sympy [A] time = 1.28571, size = 12, normalized size = 0.75

$$\frac{x\left(a+\frac{b}{\sqrt[3]{x}}\right)^3}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**(1/3))**2,x)

[Out] x*(a + b/x**(1/3))**3/a
```

Mathematica [A] time = 0.007462, size = 25, normalized size = 1.56

$$a^2x+3abx^{2/3}+3b^2\sqrt[3]{x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^(1/3))^2,x]

[Out] 3*b^2*x^(1/3) + 3*a*b*x^(2/3) + a^2*x
```

Maple [A] time = 0.002, size = 14, normalized size = 0.9

$$\frac{1}{a}\left(b+a\sqrt[3]{x}\right)^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^(1/3))^2,x)

[Out] (b+a*x^(1/3))^3/a
```

Maxima [A] time = 1.441, size = 28, normalized size = 1.75

$$a^2x + 3\,abx^{\frac{2}{3}} + 3\,b^2x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^2,x, algorithm="maxima")

[Out] a^2*x + 3*a*b*x^(2/3) + 3*b^2*x^(1/3)
```

Fricas [A] time = 0.217698, size = 28, normalized size = 1.75

$$a^2x + 3\,abx^{\frac{2}{3}} + 3\,b^2x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^2,x, algorithm="fricas")

[Out] a^2*x + 3*a*b*x^(2/3) + 3*b^2*x^(1/3)
```

Sympy [A] time = 0.421584, size = 24, normalized size = 1.5

$$a^2x + 3abx^{\frac{2}{3}} + 3b^2\sqrt[3]{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**(1/3))**2,x)

[Out] a**2*x + 3*a*b*x**(2/3) + 3*b**2*x**(1/3)
```

GIAC/XCAS [A] time = 0.211036, size = 28, normalized size = 1.75

$$a^2x + 3\,abx^{\frac{2}{3}} + 3\,b^2x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^2,x, algorithm="giac")

[Out] a^2*x + 3*a*b*x^(2/3) + 3*b^2*x^(1/3)
```

3.2401 $\int \frac{\left(a+\frac{b}{\sqrt[3]{x}}\right)^2}{x} \, dx$

Optimal. Leaf size=28

$$a^2 \log(x) - \frac{6ab}{\sqrt[3]{x}} - \frac{3b^2}{2x^{2/3}}$$

```
[Out] (-3*b^2)/(2*x^(2/3)) - (6*a*b)/x^(1/3) + a^2*Log[x]
```

Rubi [A] time = 0.0486285, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$a^2 \log(x) - \frac{6ab}{\sqrt[3]{x}} - \frac{3b^2}{2x^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x^(1/3))^2/x,x]
```

```
[Out] (-3*b^2)/(2*x^(2/3)) - (6*a*b)/x^(1/3) + a^2*Log[x]
```

Rubi in Sympy [A] time = 7.9464, size = 32, normalized size = 1.14

$$3a^2 \log\left(\sqrt[3]{x}\right) - \frac{6ab}{\sqrt[3]{x}} - \frac{3b^2}{2x^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x**(1/3))**2/x,x)
```

```
[Out] 3*a**2*log(x**(1/3)) - 6*a*b/x**(1/3) - 3*b**2/(2*x**(2/3))
```

Mathematica [A] time = 0.0369235, size = 27, normalized size = 0.96

$$a^2 \log(x) - \frac{3b\left(4a\sqrt[3]{x} + b\right)}{2x^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x^(1/3))^2/x,x]
```

```
[Out] (-3*b*(b + 4*a*x^(1/3)))/(2*x^(2/3)) + a^2*Log[x]
```

Maple [A] time = 0.008, size = 23, normalized size = 0.8

$$-\frac{3\,b^2}{2}x^{-\frac{2}{3}} - 6\,\frac{ab}{\sqrt[3]{x}} + a^2\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b/x^(1/3))^2/x,x)
```

```
[Out] -3/2*b^2/x^(2/3)-6*a*b/x^(1/3)+a^2*ln(x)
```

Maxima [A] time = 1.44041, size = 30, normalized size = 1.07

$$a^2 \log(x) - \frac{6\,ab}{x^{\frac{1}{3}}} - \frac{3\,b^2}{2\,x^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^2/x,x, algorithm="maxima")
```

```
[Out] a^2*log(x) - 6*a*b/x^(1/3) - 3/2*b^2/x^(2/3)
```

Fricas [A] time = 0.22528, size = 41, normalized size = 1.46

$$\frac{3\left(2\,a^2 x^{\frac{2}{3}} \log\left(x^{\frac{1}{3}}\right) - 4\,abx^{\frac{1}{3}} - b^2\right)}{2\,x^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^2/x,x, algorithm="fricas")
```

```
[Out] 3/2*(2*a^2*x^(2/3)*log(x^(1/3)) - 4*a*b*x^(1/3) - b^2)/x^(2/3)
```

Sympy [A] time = 1.96242, size = 27, normalized size = 0.96

$$a^2 \log(x) - \frac{6ab}{\sqrt[3]{x}} - \frac{3b^2}{2x^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**(1/3))**2/x,x)
```

```
[Out] a**2*log(x) - 6*a*b/x**(1/3) - 3*b**2/(2*x**(2/3))
```

GIAC/XCAS [A] time = 0.212894, size = 32, normalized size = 1.14

$$a^2 \ln(|x|) - \frac{3\left(4\,abx^{\frac{1}{3}} + b^2\right)}{2\,x^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^2/x,x, algorithm="giac")
```

```
[Out] a^2*ln(abs(x)) - 3/2*(4*a*b*x^(1/3) + b^2)/x^(2/3)
```

3.2402 $\int \frac{\left(a+\frac{b}{\sqrt[3]{x}}\right)^2}{x^2} dx$

Optimal. Leaf size=32

$$-\frac{a^2}{x}-\frac{3ab}{2x^{4/3}}-\frac{3b^2}{5x^{5/3}}$$

```
[Out] (-3*b^2)/(5*x^(5/3)) - (3*a*b)/(2*x^(4/3)) - a^2/x
```

Rubi [A] time = 0.0480176, antiderivative size = 32, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{a^2}{x}-\frac{3ab}{2x^{4/3}}-\frac{3b^2}{5x^{5/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^(1/3))^2/x^2,x]
```

```
[Out] (-3*b^2)/(5*x^(5/3)) - (3*a*b)/(2*x^(4/3)) - a^2/x
```

Rubi in Sympy [A] time = 8.01112, size = 29, normalized size = 0.91

$$-\frac{a^2}{x}-\frac{3ab}{2x^{\frac{4}{3}}}-\frac{3b^2}{5x^{\frac{5}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**(1/3))**2/x**2,x)
```

```
[Out] -a**2/x - 3*a*b/(2*x**(4/3)) - 3*b**2/(5*x**(5/3))
```

Mathematica [A] time = 0.0201804, size = 32, normalized size = 1.

$$-\frac{a^2}{x}-\frac{3ab}{2x^{4/3}}-\frac{3b^2}{5x^{5/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^(1/3))^2/x^2,x]
```

```
[Out] (-3*b^2)/(5*x^(5/3)) - (3*a*b)/(2*x^(4/3)) - a^2/x
```

Maple [A] time = 0.009, size = 25, normalized size = 0.8

$$-\frac{3\,b^2}{5}x^{-\frac{5}{3}}-\frac{3\,ab}{2}x^{-\frac{4}{3}}-\frac{a^2}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^(1/3))^2/x^2,x)
```

```
[Out] -3/5*b^2/x^(5/3)-3/2*a*b/x^(4/3)-a^2/x
```

Maxima [A] time = 1.43103, size = 63, normalized size = 1.97

$$-\frac{3\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{5}}{5\,b^{3}}+\frac{3\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{4}a}{2\,b^{3}}-\frac{\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{3}a^{2}}{b^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a + b/x^(1/3))^2/x^2,x, algorithm="maxima")
```

```
[Out] -3/5*(a + b/x^(1/3))^5/b^3 + 3/2*(a + b/x^(1/3))^4*a/b^3 - (a + b
/x^(1/3))^3*a^2/b^3
```

Fricas [A] time = 0.220105, size = 35, normalized size = 1.09

$$-\frac{10\,a^{2}x^{\frac{2}{3}}+15\,abx^{\frac{1}{3}}+6\,b^{2}}{10\,x^{\frac{5}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a + b/x^(1/3))^2/x^2,x, algorithm="fricas")
```

```
[Out] -1/10*(10*a^2*x^(2/3) + 15*a*b*x^(1/3) + 6*b^2)/x^(5/3)
```

Sympy [A] time = 3.11919, size = 29, normalized size = 0.91

$$-\frac{a^{2}}{x}-\frac{3ab}{2x^{\frac{4}{3}}}-\frac{3b^{2}}{5x^{\frac{5}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b/x**(1/3))**2/x**2,x)
```

```
[Out] -a**2/x - 3*a*b/(2*x**(4/3)) - 3*b**2/(5*x**(5/3))
```

GIAC/XCAS [A] time = 0.211076, size = 35, normalized size = 1.09

$$-\frac{10\,a^{2}x^{\frac{2}{3}}+15\,abx^{\frac{1}{3}}+6\,b^{2}}{10\,x^{\frac{5}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a + b/x^(1/3))^2/x^2,x, algorithm="giac")
```

```
[Out] -1/10*(10*a^2*x^(2/3) + 15*a*b*x^(1/3) + 6*b^2)/x^(5/3)
```

3.2403 $\int \frac{\left(a+\frac{b}{\sqrt[3]{x}}\right)^2}{x^3} dx$

Optimal. Leaf size=34

$$-\frac{a^2}{2x^2} - \frac{6ab}{7x^{7/3}} - \frac{3b^2}{8x^{8/3}}$$

```
[Out] (-3*b^2)/(8*x^(8/3)) - (6*a*b)/(7*x^(7/3)) - a^2/(2*x^2)
```

Rubi [A] time = 0.0511726, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{a^2}{2x^2} - \frac{6ab}{7x^{7/3}} - \frac{3b^2}{8x^{8/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^(1/3))^2/x^3,x]
```

```
[Out] (-3*b^2)/(8*x^(8/3)) - (6*a*b)/(7*x^(7/3)) - a^2/(2*x^2)
```

Rubi in Sympy [A] time = 8.04342, size = 32, normalized size = 0.94

$$-\frac{a^2}{2x^2} - \frac{6ab}{7x^{\frac{7}{3}}} - \frac{3b^2}{8x^{\frac{8}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**(1/3))**2/x**3,x)
```

```
[Out] -a**2/(2*x**2) - 6*a*b/(7*x**(7/3)) - 3*b**2/(8*x**(8/3))
```

Mathematica [A] time = 0.0165527, size = 34, normalized size = 1.

$$-\frac{a^2}{2x^2} - \frac{6ab}{7x^{7/3}} - \frac{3b^2}{8x^{8/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^(1/3))^2/x^3,x]
```

```
[Out] (-3*b^2)/(8*x^(8/3)) - (6*a*b)/(7*x^(7/3)) - a^2/(2*x^2)
```

Maple [A] time = 0.008, size = 25, normalized size = 0.7

$$-\frac{3\,b^2}{8}x^{-\frac{8}{3}} - \frac{6\,ab}{7}x^{-\frac{7}{3}} - \frac{a^2}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^(1/3))^2/x^3,x)
```

```
[Out] -3/8*b^2/x^(8/3)-6/7*a*b/x^(7/3)-1/2*a^2/x^2
```

Maxima [A] time = 1.44569, size = 131, normalized size = 3.85

$$-\frac{3\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{8}}{8\,b^{6}}+\frac{15\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{7}a}{7\,b^{6}}-\frac{5\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{6}a^{2}}{b^{6}}+\frac{6\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{5}a^{3}}{b^{6}}-\frac{15\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{4}a^{4}}{4\,b^{6}}+\frac{\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{3}a^{5}}{b^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^2/x^3,x, algorithm="maxima")
```

```
[Out] -3/8*(a + b/x^(1/3))^8/b^6 + 15/7*(a + b/x^(1/3))^7*a/b^6 - 5*(a
+ b/x^(1/3))^6*a^2/b^6 + 6*(a + b/x^(1/3))^5*a^3/b^6 - 15/4*(a +
b/x^(1/3))^4*a^4/b^6 + (a + b/x^(1/3))^3*a^5/b^6
```

Fricas [A] time = 0.219145, size = 35, normalized size = 1.03

$$-\frac{28\,a^{2}x^{\frac{2}{3}}+48\,abx^{\frac{1}{3}}+21\,b^{2}}{56\,x^{\frac{8}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^2/x^3,x, algorithm="fricas")
```

```
[Out] -1/56*(28*a^2*x^(2/3) + 48*a*b*x^(1/3) + 21*b^2)/x^(8/3)
```

Sympy [A] time = 6.05623, size = 32, normalized size = 0.94

$$-\frac{a^{2}}{2x^{2}}-\frac{6ab}{7x^{\frac{7}{3}}}-\frac{3b^{2}}{8x^{\frac{8}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**(1/3))**2/x**3,x)
```

```
[Out] -a**2/(2*x**2) - 6*a*b/(7*x**(7/3)) - 3*b**2/(8*x**(8/3))
```

GIAC/XCAS [A] time = 0.212049, size = 35, normalized size = 1.03

$$-\frac{28\,a^{2}x^{\frac{2}{3}}+48\,abx^{\frac{1}{3}}+21\,b^{2}}{56\,x^{\frac{8}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^2/x^3,x, algorithm="giac")
```

```
[Out] -1/56*(28*a^2*x^(2/3) + 48*a*b*x^(1/3) + 21*b^2)/x^(8/3)
```

3.2404 $\int \frac{\left(a+\frac{b}{\sqrt[3]{x}}\right)^2}{x^4} dx$

Optimal. Leaf size=34

$$-\frac{a^2}{3x^3}-\frac{3ab}{5x^{10/3}}-\frac{3b^2}{11x^{11/3}}$$

```
[Out] (-3*b^2)/(11*x^(11/3)) - (3*a*b)/(5*x^(10/3)) - a^2/(3*x^3)
```

Rubi [A] time = 0.0501065, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{a^2}{3x^3}-\frac{3ab}{5x^{10/3}}-\frac{3b^2}{11x^{11/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^(1/3))^2/x^4,x]
```

```
[Out] (-3*b^2)/(11*x^(11/3)) - (3*a*b)/(5*x^(10/3)) - a^2/(3*x^3)
```

Rubi in Sympy [A] time = 8.28133, size = 32, normalized size = 0.94

$$-\frac{a^2}{3x^3}-\frac{3ab}{5x^{\frac{10}{3}}}-\frac{3b^2}{11x^{\frac{11}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**(1/3))**2/x**4,x)
```

```
[Out] -a**2/(3*x**3) - 3*a*b/(5*x**(10/3)) - 3*b**2/(11*x**(11/3))
```

Mathematica [A] time = 0.0180864, size = 34, normalized size = 1.

$$-\frac{a^2}{3x^3}-\frac{3ab}{5x^{10/3}}-\frac{3b^2}{11x^{11/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^(1/3))^2/x^4,x]
```

```
[Out] (-3*b^2)/(11*x^(11/3)) - (3*a*b)/(5*x^(10/3)) - a^2/(3*x^3)
```

Maple [A] time = 0.008, size = 25, normalized size = 0.7

$$-\frac{3\,b^2}{11}x^{-\frac{11}{3}}-\frac{3\,ab}{5}x^{-\frac{10}{3}}-\frac{a^2}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^(1/3))^2/x^4,x)
```

```
[Out] -3/11*b^2/x^(11/3)-3/5*a*b/x^(10/3)-1/3*a^2/x^3
```

Maxima [A] time = 1.44088, size = 201, normalized size = 5.91

$$-\frac{3\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{11}}{11\,b^9}+\frac{12\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{10}a}{5\,b^9}-\frac{28\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{9}a^2}{3\,b^9}+\frac{21\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{8}a^3}{b^9}-\frac{30\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{7}a^4}{b^9}+\frac{28\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{6}a^5}{b^9}-\frac{84\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{5}a^6}{5\,b^9}+\frac{6\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{4}a^7}{b^9}-\frac{\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{3}a^8}{b^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^2/x^4,x, algorithm="maxima")
```

```
[Out] -3/11*(a + b/x^(1/3))^11/b^9 + 12/5*(a + b/x^(1/3))^10*a/b^9 - 28
/3*(a + b/x^(1/3))^9*a^2/b^9 + 21*(a + b/x^(1/3))^8*a^3/b^9 - 30*
(a + b/x^(1/3))^7*a^4/b^9 + 28*(a + b/x^(1/3))^6*a^5/b^9 - 84/5*(
a + b/x^(1/3))^5*a^6/b^9 + 6*(a + b/x^(1/3))^4*a^7/b^9 - (a + b/x
^(1/3))^3*a^8/b^9
```

Fricas [A] time = 0.22193, size = 35, normalized size = 1.03

$$-\frac{55\,a^2x^{\frac{2}{3}}+99\,abx^{\frac{1}{3}}+45\,b^2}{165\,x^{\frac{11}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^2/x^4,x, algorithm="fricas")
```

```
[Out] -1/165*(55*a^2*x^(2/3) + 99*a*b*x^(1/3) + 45*b^2)/x^(11/3)
```

Sympy [A] time = 11.4025, size = 32, normalized size = 0.94

$$-\frac{a^2}{3x^3}-\frac{3ab}{5x^{\frac{10}{3}}}-\frac{3b^2}{11x^{\frac{11}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**(1/3))**2/x**4,x)
```

```
[Out] -a**2/(3*x**3) - 3*a*b/(5*x**(10/3)) - 3*b**2/(11*x**(11/3))
```

GIAC/XCAS [A] time = 0.210804, size = 35, normalized size = 1.03

$$-\frac{55\,a^2x^{\frac{2}{3}}+99\,abx^{\frac{1}{3}}+45\,b^2}{165\,x^{\frac{11}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^2/x^4,x, algorithm="giac")
```

```
[Out] -1/165*(55*a^2*x^(2/3) + 99*a*b*x^(1/3) + 45*b^2)/x^(11/3)
```

3.2405 $\int \left(a+\frac{b}{\sqrt[3]{x}}\right)^3 x^4 \, dx$

Optimal. Leaf size=47

$$\frac{a^3x^5}{5}+\frac{9}{14}a^2bx^{14/3}+\frac{9}{13}ab^2x^{13/3}+\frac{b^3x^4}{4}$$

```
[Out] (b^3*x^4)/4 + (9*a*b^2*x^(13/3))/13 + (9*a^2*b*x^(14/3))/14 + (a^
3*x^5)/5
```

Rubi [A] time = 0.0933029, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{a^3x^5}{5}+\frac{9}{14}a^2bx^{14/3}+\frac{9}{13}ab^2x^{13/3}+\frac{b^3x^4}{4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^(1/3))^3*x^4,x]
```

```
[Out] (b^3*x^4)/4 + (9*a*b^2*x^(13/3))/13 + (9*a^2*b*x^(14/3))/14 + (a^
3*x^5)/5
```

Rubi in Sympy [A] time = 14.6472, size = 42, normalized size = 0.89

$$\frac{a^3x^5}{5}+\frac{9a^2bx^{\frac{14}{3}}}{14}+\frac{9ab^2x^{\frac{13}{3}}}{13}+\frac{b^3x^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**(1/3))**3*x**4,x)
```

```
[Out] a**3*x**5/5 + 9*a**2*b*x**(14/3)/14 + 9*a*b**2*x**(13/3)/13 + b**
3*x**4/4
```

Mathematica [A] time = 0.0142908, size = 47, normalized size = 1.

$$\frac{a^3x^5}{5}+\frac{9}{14}a^2bx^{14/3}+\frac{9}{13}ab^2x^{13/3}+\frac{b^3x^4}{4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^(1/3))^3*x^4,x]
```

```
[Out] (b^3*x^4)/4 + (9*a*b^2*x^(13/3))/13 + (9*a^2*b*x^(14/3))/14 + (a^
3*x^5)/5
```

Maple [A] time = 0.002, size = 36, normalized size = 0.8

$$\frac{b^3x^4}{4}+\frac{9\,ab^2}{13}x^{\frac{13}{3}}+\frac{9\,a^2b}{14}x^{\frac{14}{3}}+\frac{a^3x^5}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^(1/3))^3*x^4,x)

[Out] 1/4*b^3*x^4+9/13*a*b^2*x^(13/3)+9/14*a^2*b*x^(14/3)+1/5*a^3*x^5
```

Maxima [A] time = 1.43955, size = 50, normalized size = 1.06

$$\frac{1}{1820}\left(364\,a^3 + \frac{1170\,a^2 b}{x^{\frac{1}{3}}} + \frac{1260\,ab^2}{x^{\frac{2}{3}}} + \frac{455\,b^3}{x}\right)x^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^3*x^4,x, algorithm="maxima")

[Out] 1/1820*(364*a^3 + 1170*a^2*b/x^(1/3) + 1260*a*b^2/x^(2/3) + 455*b
^3/x)*x^5
```

Fricas [A] time = 0.21962, size = 47, normalized size = 1.

$$\frac{1}{5}\,a^3x^5 + \frac{9}{14}\,a^2bx^{\frac{14}{3}} + \frac{9}{13}\,ab^2x^{\frac{13}{3}} + \frac{1}{4}\,b^3x^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^3*x^4,x, algorithm="fricas")

[Out] 1/5*a^3*x^5 + 9/14*a^2*b*x^(14/3) + 9/13*a*b^2*x^(13/3) + 1/4*b^3
*x^4
```

Sympy [A] time = 14.4227, size = 42, normalized size = 0.89

$$\frac{a^3x^5}{5} + \frac{9a^2bx^{\frac{14}{3}}}{14} + \frac{9ab^2x^{\frac{13}{3}}}{13} + \frac{b^3x^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**(1/3))**3*x**4,x)

[Out] a**3*x**5/5 + 9*a**2*b*x**(14/3)/14 + 9*a*b**2*x**(13/3)/13 + b**
3*x**4/4
```

GIAC/XCAS [A] time = 0.210331, size = 47, normalized size = 1.

$$\frac{1}{5}\,a^3x^5 + \frac{9}{14}\,a^2bx^{\frac{14}{3}} + \frac{9}{13}\,ab^2x^{\frac{13}{3}} + \frac{1}{4}\,b^3x^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^3*x^4,x, algorithm="giac")

[Out] 1/5*a^3*x^5 + 9/14*a^2*b*x^(14/3) + 9/13*a*b^2*x^(13/3) + 1/4*b^3
*x^4
```

3.2406 $\int \left(a+\frac{b}{\sqrt[3]{x}}\right)^3 x^3 \, dx$

Optimal. Leaf size=47

$$\frac{a^3x^4}{4}+\frac{9}{11}a^2bx^{11/3}+\frac{9}{10}ab^2x^{10/3}+\frac{b^3x^3}{3}$$

```
[Out] (b^3*x^3)/3 + (9*a*b^2*x^(10/3))/10 + (9*a^2*b*x^(11/3))/11 + (a^
3*x^4)/4
```

Rubi [A] time = 0.0838871, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{a^3x^4}{4}+\frac{9}{11}a^2bx^{11/3}+\frac{9}{10}ab^2x^{10/3}+\frac{b^3x^3}{3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^(1/3))^3*x^3,x]
```

```
[Out] (b^3*x^3)/3 + (9*a*b^2*x^(10/3))/10 + (9*a^2*b*x^(11/3))/11 + (a^
3*x^4)/4
```

Rubi in Sympy [A] time = 13.1242, size = 42, normalized size = 0.89

$$\frac{a^3x^4}{4}+\frac{9a^2bx^{\frac{11}{3}}}{11}+\frac{9ab^2x^{\frac{10}{3}}}{10}+\frac{b^3x^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**(1/3))**3*x**3,x)
```

```
[Out] a**3*x**4/4 + 9*a**2*b*x**(11/3)/11 + 9*a*b**2*x**(10/3)/10 + b**
3*x**3/3
```

Mathematica [A] time = 0.0121181, size = 41, normalized size = 0.87

$$\frac{1}{660}x^3\left(165a^3x+540a^2bx^{2/3}+594ab^2\sqrt[3]{x}+220b^3\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^(1/3))^3*x^3,x]
```

```
[Out] (x^3*(220*b^3 + 594*a*b^2*x^(1/3) + 540*a^2*b*x^(2/3) + 165*a^3*x
))/660
```

Maple [A] time = 0.003, size = 36, normalized size = 0.8

$$\frac{b^3x^3}{3}+\frac{9\,ab^2}{10}x^{\frac{10}{3}}+\frac{9\,a^2b}{11}x^{\frac{11}{3}}+\frac{a^3x^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^(1/3))^3*x^3,x)
```

```
[Out] 1/3*b^3*x^3+9/10*a*b^2*x^(10/3)+9/11*a^2*b*x^(11/3)+1/4*a^3*x^4
```

Maxima [A] time = 1.43766, size = 50, normalized size = 1.06

$$\frac{1}{660}\left(165\,a^3 + \frac{540\,a^2 b}{x^{\frac{1}{3}}} + \frac{594\,ab^2}{x^{\frac{2}{3}}} + \frac{220\,b^3}{x}\right)x^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^3*x^3,x, algorithm="maxima")
```

```
[Out] 1/660*(165*a^3 + 540*a^2*b/x^(1/3) + 594*a*b^2/x^(2/3) + 220*b^3/
x)*x^4
```

Fricas [A] time = 0.218987, size = 47, normalized size = 1.

$$\frac{1}{4}\,a^3x^4 + \frac{9}{11}\,a^2bx^{\frac{11}{3}} + \frac{9}{10}\,ab^2x^{\frac{10}{3}} + \frac{1}{3}\,b^3x^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^3*x^3,x, algorithm="fricas")
```

```
[Out] 1/4*a^3*x^4 + 9/11*a^2*b*x^(11/3) + 9/10*a*b^2*x^(10/3) + 1/3*b^3
*x^3
```

Sympy [A] time = 7.31447, size = 42, normalized size = 0.89

$$\frac{a^3x^4}{4} + \frac{9a^2bx^{\frac{11}{3}}}{11} + \frac{9ab^2x^{\frac{10}{3}}}{10} + \frac{b^3x^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**(1/3))**3*x**3,x)
```

```
[Out] a**3*x**4/4 + 9*a**2*b*x**(11/3)/11 + 9*a*b**2*x**(10/3)/10 + b**
3*x**3/3
```

GIAC/XCAS [A] time = 0.212023, size = 47, normalized size = 1.

$$\frac{1}{4}\,a^3x^4 + \frac{9}{11}\,a^2bx^{\frac{11}{3}} + \frac{9}{10}\,ab^2x^{\frac{10}{3}} + \frac{1}{3}\,b^3x^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^3*x^3,x, algorithm="giac")
```

```
[Out] 1/4*a^3*x^4 + 9/11*a^2*b*x^(11/3) + 9/10*a*b^2*x^(10/3) + 1/3*b^3
*x^3
```

3.2407 $\int \left(a+\frac{b}{\sqrt[3]{x}}\right)^3 x^2 \, dx$

Optimal. Leaf size=47

$$\frac{a^3x^3}{3}+\frac{9}{8}a^2bx^{8/3}+\frac{9}{7}ab^2x^{7/3}+\frac{b^3x^2}{2}$$

```
[Out] (b^3*x^2)/2 + (9*a*b^2*x^(7/3))/7 + (9*a^2*b*x^(8/3))/8 + (a^3*x^
3)/3
```

Rubi [A] time = 0.0766702, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{a^3x^3}{3}+\frac{9}{8}a^2bx^{8/3}+\frac{9}{7}ab^2x^{7/3}+\frac{b^3x^2}{2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^(1/3))^3*x^2,x]
```

```
[Out] (b^3*x^2)/2 + (9*a*b^2*x^(7/3))/7 + (9*a^2*b*x^(8/3))/8 + (a^3*x^
3)/3
```

Rubi in Sympy [A] time = 11.7312, size = 42, normalized size = 0.89

$$\frac{a^3x^3}{3}+\frac{9a^2bx^{\frac{8}{3}}}{8}+\frac{9ab^2x^{\frac{7}{3}}}{7}+\frac{b^3x^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**(1/3))**3*x**2,x)
```

```
[Out] a**3*x**3/3 + 9*a**2*b*x**(8/3)/8 + 9*a*b**2*x**(7/3)/7 + b**3*x*
*2/2
```

Mathematica [A] time = 0.0120192, size = 47, normalized size = 1.

$$\frac{a^3x^3}{3}+\frac{9}{8}a^2bx^{8/3}+\frac{9}{7}ab^2x^{7/3}+\frac{b^3x^2}{2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^(1/3))^3*x^2,x]
```

```
[Out] (b^3*x^2)/2 + (9*a*b^2*x^(7/3))/7 + (9*a^2*b*x^(8/3))/8 + (a^3*x^
3)/3
```

Maple [A] time = 0.002, size = 36, normalized size = 0.8

$$\frac{b^3x^2}{2}+\frac{9\,ab^2}{7}x^{\frac{7}{3}}+\frac{9\,a^2b}{8}x^{\frac{8}{3}}+\frac{a^3x^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^(1/3))^3*x^2,x)

[Out] 1/2*b^3*x^2+9/7*a*b^2*x^(7/3)+9/8*a^2*b*x^(8/3)+1/3*a^3*x^3
```

Maxima [A] time = 1.43676, size = 50, normalized size = 1.06

$$\frac{1}{168}\left(56\,a^3 + \frac{189\,a^2b}{x^{\frac{1}{3}}} + \frac{216\,ab^2}{x^{\frac{2}{3}}} + \frac{84\,b^3}{x}\right)x^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^3*x^2,x, algorithm="maxima")

[Out] 1/168*(56*a^3 + 189*a^2*b/x^(1/3) + 216*a*b^2/x^(2/3) + 84*b^3/x)
*x^3
```

Fricas [A] time = 0.217441, size = 47, normalized size = 1.

$$\frac{1}{3}\,a^3x^3 + \frac{9}{8}\,a^2bx^{\frac{8}{3}} + \frac{9}{7}\,ab^2x^{\frac{7}{3}} + \frac{1}{2}\,b^3x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^3*x^2,x, algorithm="fricas")

[Out] 1/3*a^3*x^3 + 9/8*a^2*b*x^(8/3) + 9/7*a*b^2*x^(7/3) + 1/2*b^3*x^2
```

Sympy [A] time = 3.51304, size = 42, normalized size = 0.89

$$\frac{a^3x^3}{3} + \frac{9a^2bx^{\frac{8}{3}}}{8} + \frac{9ab^2x^{\frac{7}{3}}}{7} + \frac{b^3x^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**(1/3))**3*x**2,x)

[Out] a**3*x**3/3 + 9*a**2*b*x**(8/3)/8 + 9*a*b**2*x**(7/3)/7 + b**3*x*
*2/2
```

GIAC/XCAS [A] time = 0.208947, size = 47, normalized size = 1.

$$\frac{1}{3}\,a^3x^3 + \frac{9}{8}\,a^2bx^{\frac{8}{3}} + \frac{9}{7}\,ab^2x^{\frac{7}{3}} + \frac{1}{2}\,b^3x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^3*x^2,x, algorithm="giac")

[Out] 1/3*a^3*x^3 + 9/8*a^2*b*x^(8/3) + 9/7*a*b^2*x^(7/3) + 1/2*b^3*x^2
```

3.2408 $\int \left(a+\frac{b}{\sqrt[3]{x}}\right)^3 x \, dx$

Optimal. Leaf size=42

$$\frac{a^3x^2}{2}+\frac{9}{5}a^2bx^{5/3}+\frac{9}{4}ab^2x^{4/3}+b^3x$$

```
[Out] b^3*x + (9*a*b^2*x^(4/3))/4 + (9*a^2*b*x^(5/3))/5 + (a^3*x^2)/2
```

Rubi [A] time = 0.0670374, antiderivative size = 42, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{a^3x^2}{2}+\frac{9}{5}a^2bx^{5/3}+\frac{9}{4}ab^2x^{4/3}+b^3x$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^(1/3))^3*x,x]

[Out] b^3*x + (9*a*b^2*x^(4/3))/4 + (9*a^2*b*x^(5/3))/5 + (a^3*x^2)/2
```

Rubi in Sympy [A] time = 9.73014, size = 39, normalized size = 0.93

$$\frac{a^3x^2}{2}+\frac{9a^2bx^{\frac{5}{3}}}{5}+\frac{9ab^2x^{\frac{4}{3}}}{4}+b^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**(1/3))**3*x,x)

[Out] a**3*x**2/2 + 9*a**2*b*x**(5/3)/5 + 9*a*b**2*x**(4/3)/4 + b**3*x
```

Mathematica [A] time = 0.00955789, size = 42, normalized size = 1.

$$\frac{a^3x^2}{2}+\frac{9}{5}a^2bx^{5/3}+\frac{9}{4}ab^2x^{4/3}+b^3x$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^(1/3))^3*x,x]

[Out] b^3*x + (9*a*b^2*x^(4/3))/4 + (9*a^2*b*x^(5/3))/5 + (a^3*x^2)/2
```

Maple [A] time = 0.003, size = 33, normalized size = 0.8

$$b^3x+\frac{9\,ab^2}{4}x^{\frac{4}{3}}+\frac{9\,a^2b}{5}x^{\frac{5}{3}}+\frac{x^2a^3}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^(1/3))^3*x,x)
```

```
[Out] b^3*x+9/4*a*b^2*x^(4/3)+9/5*a^2*b*x^(5/3)+1/2*x^2*a^3
```

Maxima [A] time = 1.43768, size = 50, normalized size = 1.19

$$\frac{1}{20}\left(10\,a^3+\frac{36\,a^2b}{x^{\frac{1}{3}}}+\frac{45\,ab^2}{x^{\frac{2}{3}}}+\frac{20\,b^3}{x}\right)x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^3*x,x, algorithm="maxima")
```

```
[Out] 1/20*(10*a^3 + 36*a^2*b/x^(1/3) + 45*a*b^2/x^(2/3) + 20*b^3/x)*x^
2
```

Fricas [A] time = 0.217973, size = 43, normalized size = 1.02

$$\frac{1}{2}\,a^3x^2+\frac{9}{5}\,a^2bx^{\frac{5}{3}}+\frac{9}{4}\,ab^2x^{\frac{4}{3}}+b^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^3*x,x, algorithm="fricas")
```

```
[Out] 1/2*a^3*x^2 + 9/5*a^2*b*x^(5/3) + 9/4*a*b^2*x^(4/3) + b^3*x
```

Sympy [A] time = 2.486, size = 39, normalized size = 0.93

$$\frac{a^3x^2}{2}+\frac{9a^2bx^{\frac{5}{3}}}{5}+\frac{9ab^2x^{\frac{4}{3}}}{4}+b^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**(1/3))**3*x,x)
```

```
[Out] a**3*x**2/2 + 9*a**2*b*x**(5/3)/5 + 9*a*b**2*x**(4/3)/4 + b**3*x
```

GIAC/XCAS [A] time = 0.211498, size = 43, normalized size = 1.02

$$\frac{1}{2}\,a^3x^2+\frac{9}{5}\,a^2bx^{\frac{5}{3}}+\frac{9}{4}\,ab^2x^{\frac{4}{3}}+b^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^3*x,x, algorithm="giac")
```

```
[Out] 1/2*a^3*x^2 + 9/5*a^2*b*x^(5/3) + 9/4*a*b^2*x^(4/3) + b^3*x
```

3.2409 $\int \left(a+\frac{b}{\sqrt[3]{x}}\right)^3 \, dx$

Optimal. Leaf size=36

$$a^3x+\frac{9}{2}a^2bx^{2/3}+9ab^2\sqrt[3]{x}+b^3\log(x)$$

```
[Out] 9*a*b^2*x^(1/3) + (9*a^2*b*x^(2/3))/2 + a^3*x + b^3*Log[x]
```

Rubi [A] time = 0.053992, antiderivative size = 36, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$a^3x+\frac{9}{2}a^2bx^{2/3}+9ab^2\sqrt[3]{x}+b^3\log(x)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^(1/3))^3,x]
```

```
[Out] 9*a*b^2*x^(1/3) + (9*a^2*b*x^(2/3))/2 + a^3*x + b^3*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$a^3x+9a^2b\int^{\sqrt[3]{x}} x\,dx+9ab^2\sqrt[3]{x}+3b^3\log\left(\sqrt[3]{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**(1/3))**3,x)
```

```
[Out] a**3*x + 9*a**2*b*Integral(x, (x, x**(1/3))) + 9*a*b**2*x**(1/3)
+ 3*b**3*log(x**(1/3))
```

Mathematica [A] time = 0.0150235, size = 36, normalized size = 1.

$$a^3x+\frac{9}{2}a^2bx^{2/3}+9ab^2\sqrt[3]{x}+b^3\log(x)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^(1/3))^3,x]
```

```
[Out] 9*a*b^2*x^(1/3) + (9*a^2*b*x^(2/3))/2 + a^3*x + b^3*Log[x]
```

Maple [A] time = 0.004, size = 31, normalized size = 0.9

$$9\,ab^2\sqrt[3]{x}+\frac{9\,a^2b}{2}x^{\frac{2}{3}}+a^3x+b^3\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^(1/3))^3,x)
```

```
[Out] 9*a*b^2*x^(1/3)+9/2*a^2*b*x^(2/3)+a^3*x+b^3*ln(x)
```

Maxima [A] time = 1.43471, size = 41, normalized size = 1.14

$$a^3x + b^3\log(x) + \frac{9}{2}a^2bx^{\frac{2}{3}} + 9ab^2x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^3,x, algorithm="maxima")

[Out] a^3*x + b^3*log(x) + 9/2*a^2*b*x^(2/3) + 9*a*b^2*x^(1/3)
```

Fricas [A] time = 0.222779, size = 45, normalized size = 1.25

$$a^3x + 3b^3\log\left(x^{\frac{1}{3}}\right) + \frac{9}{2}a^2bx^{\frac{2}{3}} + 9ab^2x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^3,x, algorithm="fricas")

[Out] a^3*x + 3*b^3*log(x^(1/3)) + 9/2*a^2*b*x^(2/3) + 9*a*b^2*x^(1/3)
```

Sympy [A] time = 0.624887, size = 36, normalized size = 1.

$$a^3x + \frac{9a^2bx^{\frac{2}{3}}}{2} + 9ab^2\sqrt[3]{x} + b^3\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**(1/3))**3,x)

[Out] a**3*x + 9*a**2*b*x**(2/3)/2 + 9*a*b**2*x**(1/3) + b**3*log(x)
```

GIAC/XCAS [A] time = 0.210034, size = 42, normalized size = 1.17

$$a^3x + b^3\ln(|x|) + \frac{9}{2}a^2bx^{\frac{2}{3}} + 9ab^2x^{\frac{1}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^3,x, algorithm="giac")

[Out] a^3*x + b^3*ln(abs(x)) + 9/2*a^2*b*x^(2/3) + 9*a*b^2*x^(1/3)
```

3.2410 $\int \frac{\left(a+\frac{b}{\sqrt[3]{x}}\right)^3}{x} \, dx$

Optimal. Leaf size=39

$$a^3 \log(x) - \frac{9a^2b}{\sqrt[3]{x}} - \frac{9ab^2}{2x^{2/3}} - \frac{b^3}{x}$$

```
[Out] -(b^3/x) - (9*a*b^2)/(2*x^(2/3)) - (9*a^2*b)/x^(1/3) + a^3*Log[x]
```

Rubi [A] time = 0.0601997, antiderivative size = 39, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$a^3 \log(x) - \frac{9a^2b}{\sqrt[3]{x}} - \frac{9ab^2}{2x^{2/3}} - \frac{b^3}{x}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x^(1/3))^3/x,x]
```

```
[Out] -(b^3/x) - (9*a*b^2)/(2*x^(2/3)) - (9*a^2*b)/x^(1/3) + a^3*Log[x]
```

Rubi in Sympy [A] time = 9.86226, size = 41, normalized size = 1.05

$$3a^3 \log\left(\sqrt[3]{x}\right) - \frac{9a^2b}{\sqrt[3]{x}} - \frac{9ab^2}{2x^{\frac{2}{3}}} - \frac{b^3}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b/x**(1/3))**3/x,x)
```

```
[Out] 3*a**3*log(x**(1/3)) - 9*a**2*b/x**(1/3) - 9*a*b**2/(2*x**(2/3))
- b**3/x
```

Mathematica [A] time = 0.0358506, size = 40, normalized size = 1.03

$$a^3 \log(x) - \frac{b\left(18a^2x^{2/3} + 9ab\sqrt[3]{x} + 2b^2\right)}{2x}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x^(1/3))^3/x,x]
```

```
[Out] -(b*(2*b^2 + 9*a*b*x^(1/3) + 18*a^2*x^(2/3)))/(2*x) + a^3*Log[x]
```

Maple [A] time = 0.01, size = 34, normalized size = 0.9

$$-\frac{b^3}{x} - \frac{9\,ab^2}{2}x^{-\frac{2}{3}} - 9\,\frac{a^2b}{\sqrt[3]{x}} + a^3\ln(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^(1/3))^3/x,x)

[Out] -b^3/x-9/2*a*b^2/x^(2/3)-9*a^2*b/x^(1/3)+a^3*ln(x)
```

Maxima [A] time = 1.42827, size = 45, normalized size = 1.15

$$a^3 \log(x) - \frac{9\,a^2 b}{x^{\frac{1}{3}}} - \frac{9\,ab^2}{2\,x^{\frac{2}{3}}} - \frac{b^3}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^3/x,x, algorithm="maxima")

[Out] a^3*log(x) - 9*a^2*b/x^(1/3) - 9/2*a*b^2/x^(2/3) - b^3/x
```

Fricas [A] time = 0.22596, size = 53, normalized size = 1.36

$$\frac{6\,a^3 x \log\left(x^{\frac{1}{3}}\right) - 18\,a^2 b x^{\frac{2}{3}} - 9\,ab^2 x^{\frac{1}{3}} - 2\,b^3}{2\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^3/x,x, algorithm="fricas")

[Out] 1/2*(6*a^3*x*log(x^(1/3)) - 18*a^2*b*x^(2/3) - 9*a*b^2*x^(1/3) -
2*b^3)/x
```

Sympy [A] time = 2.31978, size = 36, normalized size = 0.92

$$a^3 \log(x) - \frac{9a^2 b}{\sqrt[3]{x}} - \frac{9ab^2}{2x^{\frac{2}{3}}} - \frac{b^3}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**(1/3))**3/x,x)

[Out] a**3*log(x) - 9*a**2*b/x**(1/3) - 9*a*b**2/(2*x**(2/3)) - b**3/x
```

GIAC/XCAS [A] time = 0.214629, size = 50, normalized size = 1.28

$$a^3 \ln(|x|) - \frac{18\,a^2 b x^{\frac{2}{3}} + 9\,ab^2 x^{\frac{1}{3}} + 2\,b^3}{2\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^3/x,x, algorithm="giac")

[Out] a^3*ln(abs(x)) - 1/2*(18*a^2*b*x^(2/3) + 9*a*b^2*x^(1/3) + 2*b^3)
/x
```

3.2411 $\int \frac{\left(a+\frac{b}{\sqrt[3]{x}}\right)^3}{x^2} dx$

Optimal. Leaf size=45

$$-\frac{a^3}{x}-\frac{9a^2b}{4x^{4/3}}-\frac{9ab^2}{5x^{5/3}}-\frac{b^3}{2x^2}$$

```
[Out] -b^3/(2*x^2) - (9*a*b^2)/(5*x^(5/3)) - (9*a^2*b)/(4*x^(4/3)) - a^
3/x
```

Rubi [A] time = 0.0618226, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{a^3}{x}-\frac{9a^2b}{4x^{4/3}}-\frac{9ab^2}{5x^{5/3}}-\frac{b^3}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^(1/3))^3/x^2,x]
```

```
[Out] -b^3/(2*x^2) - (9*a*b^2)/(5*x^(5/3)) - (9*a^2*b)/(4*x^(4/3)) - a^
3/x
```

Rubi in Sympy [A] time = 10.2589, size = 41, normalized size = 0.91

$$-\frac{a^3}{x}-\frac{9a^2b}{4x^{\frac{4}{3}}}-\frac{9ab^2}{5x^{\frac{5}{3}}}-\frac{b^3}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**(1/3))**3/x**2,x)
```

```
[Out] -a**3/x - 9*a**2*b/(4*x**(4/3)) - 9*a*b**2/(5*x**(5/3)) - b**3/(2
*x**2)
```

Mathematica [A] time = 0.018159, size = 41, normalized size = 0.91

$$-\frac{20a^3x+45a^2bx^{2/3}+36ab^2\sqrt[3]{x}+10b^3}{20x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^(1/3))^3/x^2,x]
```

```
[Out] -(10*b^3 + 36*a*b^2*x^(1/3) + 45*a^2*b*x^(2/3) + 20*a^3*x)/(20*x^
2)
```

Maple [A] time = 0.008, size = 36, normalized size = 0.8

$$-\frac{b^3}{2\,x^2}-\frac{9\,ab^2}{5}x^{-\frac{5}{3}}-\frac{9\,a^2b}{4}x^{-\frac{4}{3}}-\frac{a^3}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^(1/3))^3/x^2,x)

[Out] -1/2*b^3/x^2-9/5*a*b^2/x^(5/3)-9/4*a^2*b/x^(4/3)-a^3/x
```

Maxima [A] time = 1.43777, size = 63, normalized size = 1.4

$$-\frac{\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{6}}{2\,b^{3}}+\frac{6\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{5}a}{5\,b^{3}}-\frac{3\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{4}a^{2}}{4\,b^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^3/x^2,x, algorithm="maxima")

[Out] -1/2*(a + b/x^(1/3))^6/b^3 + 6/5*(a + b/x^(1/3))^5*a/b^3 - 3/4*(a
 + b/x^(1/3))^4*a^2/b^3
```

Fricas [A] time = 0.225213, size = 47, normalized size = 1.04

$$-\frac{20\,a^{3}x+45\,a^{2}bx^{\frac{2}{3}}+36\,ab^{2}x^{\frac{1}{3}}+10\,b^{3}}{20\,x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^3/x^2,x, algorithm="fricas")

[Out] -1/20*(20*a^3*x + 45*a^2*b*x^(2/3) + 36*a*b^2*x^(1/3) + 10*b^3)/x
^2
```

Sympy [A] time = 4.21301, size = 41, normalized size = 0.91

$$-\frac{a^{3}}{x}-\frac{9a^{2}b}{4x^{\frac{4}{3}}}-\frac{9ab^{2}}{5x^{\frac{5}{3}}}-\frac{b^{3}}{2x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**(1/3))**3/x**2,x)

[Out] -a**3/x - 9*a**2*b/(4*x**(4/3)) - 9*a*b**2/(5*x**(5/3)) - b**3/(2
*x**2)
```

GIAC/XCAS [A] time = 0.212779, size = 47, normalized size = 1.04

$$-\frac{20\,a^{3}x+45\,a^{2}bx^{\frac{2}{3}}+36\,ab^{2}x^{\frac{1}{3}}+10\,b^{3}}{20\,x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^3/x^2,x, algorithm="giac")

[Out] -1/20*(20*a^3*x + 45*a^2*b*x^(2/3) + 36*a*b^2*x^(1/3) + 10*b^3)/x
^2
```

3.2412 $\int \frac{\left(a+\frac{b}{\sqrt[3]{x}}\right)^3}{x^3} dx$

Optimal. Leaf size=47

$$-\frac{a^3}{2x^2}-\frac{9a^2b}{7x^{7/3}}-\frac{9ab^2}{8x^{8/3}}-\frac{b^3}{3x^3}$$

```
[Out] -b^3/(3*x^3) - (9*a*b^2)/(8*x^(8/3)) - (9*a^2*b)/(7*x^(7/3)) - a^
3/(2*x^2)
```

Rubi [A] time = 0.0633822, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{a^3}{2x^2}-\frac{9a^2b}{7x^{7/3}}-\frac{9ab^2}{8x^{8/3}}-\frac{b^3}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^(1/3))^3/x^3,x]
```

```
[Out] -b^3/(3*x^3) - (9*a*b^2)/(8*x^(8/3)) - (9*a^2*b)/(7*x^(7/3)) - a^
3/(2*x^2)
```

Rubi in Sympy [A] time = 10.2856, size = 44, normalized size = 0.94

$$-\frac{a^3}{2x^2}-\frac{9a^2b}{7x^{\frac{7}{3}}}-\frac{9ab^2}{8x^{\frac{8}{3}}}-\frac{b^3}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**(1/3))**3/x**3,x)
```

```
[Out] -a**3/(2*x**2) - 9*a**2*b/(7*x**(7/3)) - 9*a*b**2/(8*x**(8/3)) -
b**3/(3*x**3)
```

Mathematica [A] time = 0.0140633, size = 41, normalized size = 0.87

$$-\frac{84a^3x+216a^2bx^{2/3}+189ab^2\sqrt[3]{x}+56b^3}{168x^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^(1/3))^3/x^3,x]
```

```
[Out] -(56*b^3 + 189*a*b^2*x^(1/3) + 216*a^2*b*x^(2/3) + 84*a^3*x)/(168
*x^3)
```

Maple [A] time = 0.008, size = 36, normalized size = 0.8

$$-\frac{b^3}{3\,x^3}-\frac{9\,ab^2}{8}x^{-\frac{8}{3}}-\frac{9\,a^2b}{7}x^{-\frac{7}{3}}-\frac{a^3}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^(1/3))^3/x^3,x)
```

```
[Out] -1/3*b^3/x^3-9/8*a*b^2/x^(8/3)-9/7*a^2*b/x^(7/3)-1/2*a^3/x^2
```

Maxima [A] time = 1.43185, size = 132, normalized size = 2.81

$$-\frac{\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{9}}{3\,b^{6}}+\frac{15\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{8}a}{8\,b^{6}}-\frac{30\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{7}a^{2}}{7\,b^{6}}+\frac{5\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{6}a^{3}}{b^{6}}-\frac{3\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{5}a^{4}}{b^{6}}+\frac{3\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{4}a^{5}}{4\,b^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^3/x^3,x, algorithm="maxima")
```

```
[Out] -1/3*(a + b/x^(1/3))^9/b^6 + 15/8*(a + b/x^(1/3))^8*a/b^6 - 30/7*
(a + b/x^(1/3))^7*a^2/b^6 + 5*(a + b/x^(1/3))^6*a^3/b^6 - 3*(a +
b/x^(1/3))^5*a^4/b^6 + 3/4*(a + b/x^(1/3))^4*a^5/b^6
```

Fricas [A] time = 0.227734, size = 47, normalized size = 1.

$$-\frac{84\,a^{3}x+216\,a^{2}bx^{\frac{2}{3}}+189\,ab^{2}x^{\frac{1}{3}}+56\,b^{3}}{168\,x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^3/x^3,x, algorithm="fricas")
```

```
[Out] -1/168*(84*a^3*x + 216*a^2*b*x^(2/3) + 189*a*b^2*x^(1/3) + 56*b^3
)/x^3
```

Sympy [A] time = 7.59288, size = 44, normalized size = 0.94

$$-\frac{a^{3}}{2x^{2}}-\frac{9a^{2}b}{7x^{\frac{7}{3}}}-\frac{9ab^{2}}{8x^{\frac{8}{3}}}-\frac{b^{3}}{3x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**(1/3))**3/x**3,x)
```

```
[Out] -a**3/(2*x**2) - 9*a**2*b/(7*x**(7/3)) - 9*a*b**2/(8*x**(8/3)) -
b**3/(3*x**3)
```

GIAC/XCAS [A] time = 0.211153, size = 47, normalized size = 1.

$$-\frac{84\,a^{3}x+216\,a^{2}bx^{\frac{2}{3}}+189\,ab^{2}x^{\frac{1}{3}}+56\,b^{3}}{168\,x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^3/x^3,x, algorithm="giac")
```

```
[Out] -1/168*(84*a^3*x + 216*a^2*b*x^(2/3) + 189*a*b^2*x^(1/3) + 56*b^3
)/x^3
```

3.2413 $\int \frac{\left(a+\frac{b}{\sqrt[3]{x}}\right)^3}{x^4} dx$

Optimal. Leaf size=47

$$-\frac{a^3}{3x^3} - \frac{9a^2b}{10x^{10/3}} - \frac{9ab^2}{11x^{11/3}} - \frac{b^3}{4x^4}$$

```
[Out] -b^3/(4*x^4) - (9*a*b^2)/(11*x^(11/3)) - (9*a^2*b)/(10*x^(10/3))
- a^3/(3*x^3)
```

Rubi [A] time = 0.0631515, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$-\frac{a^3}{3x^3} - \frac{9a^2b}{10x^{10/3}} - \frac{9ab^2}{11x^{11/3}} - \frac{b^3}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^(1/3))^3/x^4,x]
```

```
[Out] -b^3/(4*x^4) - (9*a*b^2)/(11*x^(11/3)) - (9*a^2*b)/(10*x^(10/3))
- a^3/(3*x^3)
```

Rubi in Sympy [A] time = 10.5861, size = 44, normalized size = 0.94

$$-\frac{a^3}{3x^3} - \frac{9a^2b}{10x^{\frac{10}{3}}} - \frac{9ab^2}{11x^{\frac{11}{3}}} - \frac{b^3}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**(1/3))**3/x**4,x)
```

```
[Out] -a**3/(3*x**3) - 9*a**2*b/(10*x**(10/3)) - 9*a*b**2/(11*x**(11/3)
) - b**3/(4*x**4)
```

Mathematica [A] time = 0.0159019, size = 41, normalized size = 0.87

$$-\frac{220a^3x + 594a^2bx^{2/3} + 540ab^2\sqrt[3]{x} + 165b^3}{660x^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^(1/3))^3/x^4,x]
```

```
[Out] -(165*b^3 + 540*a*b^2*x^(1/3) + 594*a^2*b*x^(2/3) + 220*a^3*x)/(6
60*x^4)
```

Maple [A] time = 0.009, size = 36, normalized size = 0.8

$$-\frac{b^3}{4\,x^4} - \frac{9\,ab^2}{11}x^{-\frac{11}{3}} - \frac{9\,a^2b}{10}x^{-\frac{10}{3}} - \frac{a^3}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^(1/3))^3/x^4,x)
```

```
[Out] -1/4*b^3/x^4-9/11*a*b^2/x^(11/3)-9/10*a^2*b/x^(10/3)-1/3*a^3/x^3
```

Maxima [A] time = 1.44016, size = 201, normalized size = 4.28

$$-\frac{\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{12}}{4\,b^{9}}+\frac{24\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{11}a}{11\,b^{9}}-\frac{42\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{10}a^{2}}{5\,b^{9}}+\frac{56\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{9}a^{3}}{3\,b^{9}}-\frac{105\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{8}a^{4}}{4\,b^{9}}+\frac{24\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{7}a^{5}}{b^{9}}-\frac{14\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{6}a^{6}}{b^{9}}+\frac{24\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{5}a^{7}}{5\,b^{9}}-\frac{3\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{4}a^{8}}{4\,b^{9}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^3/x^4,x, algorithm="maxima")
```

```
[Out] -1/4*(a + b/x^(1/3))^12/b^9 + 24/11*(a + b/x^(1/3))^11*a/b^9 - 42
/5*(a + b/x^(1/3))^10*a^2/b^9 + 56/3*(a + b/x^(1/3))^9*a^3/b^9 -
105/4*(a + b/x^(1/3))^8*a^4/b^9 + 24*(a + b/x^(1/3))^7*a^5/b^9 -
14*(a + b/x^(1/3))^6*a^6/b^9 + 24/5*(a + b/x^(1/3))^5*a^7/b^9 - 3
/4*(a + b/x^(1/3))^4*a^8/b^9
```

Fricas [A] time = 0.223081, size = 47, normalized size = 1.

$$-\frac{220\,a^{3}x+594\,a^{2}bx^{\frac{2}{3}}+540\,ab^{2}x^{\frac{1}{3}}+165\,b^{3}}{660\,x^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^3/x^4,x, algorithm="fricas")
```

```
[Out] -1/660*(220*a^3*x + 594*a^2*b*x^(2/3) + 540*a*b^2*x^(1/3) + 165*b
^3)/x^4
```

Sympy [A] time = 14.1571, size = 44, normalized size = 0.94

$$-\frac{a^{3}}{3x^{3}}-\frac{9a^{2}b}{10x^{\frac{10}{3}}}-\frac{9ab^{2}}{11x^{\frac{11}{3}}}-\frac{b^{3}}{4x^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**(1/3))**3/x**4,x)
```

```
[Out] -a**3/(3*x**3) - 9*a**2*b/(10*x**(10/3)) - 9*a*b**2/(11*x**(11/3)
) - b**3/(4*x**4)
```

GIAC/XCAS [A] time = 0.212173, size = 47, normalized size = 1.

$$-\frac{220\,a^{3}x+594\,a^{2}bx^{\frac{2}{3}}+540\,ab^{2}x^{\frac{1}{3}}+165\,b^{3}}{660\,x^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^3/x^4,x, algorithm="giac")
```

```
[Out] -1/660*(220*a^3*x + 594*a^2*b*x^(2/3) + 540*a*b^2*x^(1/3) + 165*b
^3)/x^4
```

3.2414 $\int \frac{x^2}{a+\frac{b}{\sqrt[3]{x}}}\,dx$

Optimal. Leaf size=136

$$-\frac{3b^9\log\left(a\sqrt[3]{x}+b\right)}{a^{10}}+\frac{3b^8\sqrt[3]{x}}{a^9}-\frac{3b^7x^{2/3}}{2a^8}+\frac{b^6x}{a^7}-\frac{3b^5x^{4/3}}{4a^6}+\frac{3b^4x^{5/3}}{5a^5}-\frac{b^3x^2}{2a^4}+\frac{3b^2x^{7/3}}{7a^3}-\frac{3bx^{8/3}}{8a^2}+\frac{x^3}{3a}$$

```
[Out] (3*b^8*x^(1/3))/a^9 - (3*b^7*x^(2/3))/(2*a^8) + (b^6*x)/a^7 - (3*
b^5*x^(4/3))/(4*a^6) + (3*b^4*x^(5/3))/(5*a^5) - (b^3*x^2)/(2*a^4
) + (3*b^2*x^(7/3))/(7*a^3) - (3*b*x^(8/3))/(8*a^2) + x^3/(3*a) -
 (3*b^9*Log[b + a*x^(1/3)])/a^10
```

Rubi [A] time = 0.212783, antiderivative size = 136, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{3b^9\log\left(a\sqrt[3]{x}+b\right)}{a^{10}}+\frac{3b^8\sqrt[3]{x}}{a^9}-\frac{3b^7x^{2/3}}{2a^8}+\frac{b^6x}{a^7}-\frac{3b^5x^{4/3}}{4a^6}+\frac{3b^4x^{5/3}}{5a^5}-\frac{b^3x^2}{2a^4}+\frac{3b^2x^{7/3}}{7a^3}-\frac{3bx^{8/3}}{8a^2}+\frac{x^3}{3a}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b/x^(1/3)),x]
```

```
[Out] (3*b^8*x^(1/3))/a^9 - (3*b^7*x^(2/3))/(2*a^8) + (b^6*x)/a^7 - (3*
b^5*x^(4/3))/(4*a^6) + (3*b^4*x^(5/3))/(5*a^5) - (b^3*x^2)/(2*a^4
) + (3*b^2*x^(7/3))/(7*a^3) - (3*b*x^(8/3))/(8*a^2) + x^3/(3*a) -
 (3*b^9*Log[b + a*x^(1/3)])/a^10
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$3b^8\int^{\sqrt[3]{x}}\frac{1}{a^9}\,dx+\frac{x^3}{3a}-\frac{3bx^{\frac{8}{3}}}{8a^2}+\frac{3b^2x^{\frac{7}{3}}}{7a^3}-\frac{b^3x^2}{2a^4}+\frac{3b^4x^{\frac{5}{3}}}{5a^5}-\frac{3b^5x^{\frac{4}{3}}}{4a^6}+\frac{b^6x}{a^7}-\frac{3b^7\int^{\sqrt[3]{x}}x\,dx}{a^8}-\frac{3b^9\log\left(a\sqrt[3]{x}+b\right)}{a^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b/x**(1/3)),x)
```

```
[Out] 3*b**8*Integral(a**(-9), (x, x**(1/3))) + x**3/(3*a) - 3*b*x**(8/
3)/(8*a**2) + 3*b**2*x**(7/3)/(7*a**3) - b**3*x**2/(2*a**4) + 3*b
**4*x**(5/3)/(5*a**5) - 3*b**5*x**(4/3)/(4*a**6) + b**6*x/a**7 -
3*b**7*Integral(x, (x, x**(1/3)))/a**8 - 3*b**9*log(a*x**(1/3) +
b)/a**10
```

Mathematica [A] time = 0.0803983, size = 136, normalized size = 1.

$$-\frac{3b^9\log\left(a\sqrt[3]{x}+b\right)}{a^{10}}+\frac{3b^8\sqrt[3]{x}}{a^9}-\frac{3b^7x^{2/3}}{2a^8}+\frac{b^6x}{a^7}-\frac{3b^5x^{4/3}}{4a^6}+\frac{3b^4x^{5/3}}{5a^5}-\frac{b^3x^2}{2a^4}+\frac{3b^2x^{7/3}}{7a^3}-\frac{3bx^{8/3}}{8a^2}+\frac{x^3}{3a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a + b/x^(1/3)),x]
```

```
[Out] (3*b^8*x^(1/3))/a^9 - (3*b^7*x^(2/3))/(2*a^8) + (b^6*x)/a^7 - (3*
b^5*x^(4/3))/(4*a^6) + (3*b^4*x^(5/3))/(5*a^5) - (b^3*x^2)/(2*a^4
) + (3*b^2*x^(7/3))/(7*a^3) - (3*b*x^(8/3))/(8*a^2) + x^3/(3*a) -
 (3*b^9*Log[b + a*x^(1/3)])/a^10
```

Maple [A] time = 0.007, size = 109, normalized size = 0.8

$$3\frac{b^{8}\sqrt[3]{x}}{a^{9}}-\frac{3b^{7}}{2a^{8}}x^{\frac{2}{3}}+\frac{b^{6}x}{a^{7}}-\frac{3b^{5}}{4a^{6}}x^{\frac{4}{3}}+\frac{3b^{4}}{5a^{5}}x^{\frac{5}{3}}-\frac{b^{3}x^{2}}{2a^{4}}+\frac{3b^{2}}{7a^{3}}x^{\frac{7}{3}}-\frac{3b}{8a^{2}}x^{\frac{8}{3}}+\frac{x^{3}}{3a}-3\frac{b^{9}\ln\left(b+a\sqrt[3]{x}\right)}{a^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(a+b/x^(1/3)),x)
```

```
[Out] 3*b^8*x^(1/3)/a^9-3/2*b^7*x^(2/3)/a^8+b^6*x/a^7-3/4*b^5*x^(4/3)/a
^6+3/5*b^4*x^(5/3)/a^5-1/2*b^3*x^2/a^4+3/7*b^2*x^(7/3)/a^3-3/8*b*
x^(8/3)/a^2+1/3*x^3/a-3*b^9*ln(b+a*x^(1/3))/a^10
```

Maxima [A] time = 1.44537, size = 165, normalized size = 1.21

$$-\frac{3b^{9}\log\left(a+\frac{b}{x^{\frac{1}{3}}}\right)}{a^{10}}-\frac{b^{9}\log\left(x\right)}{a^{10}}+\frac{\left(280a^{8}-\frac{315a^{7}b}{x^{\frac{1}{3}}}+\frac{360a^{6}b^{2}}{x^{\frac{2}{3}}}-\frac{420a^{5}b^{3}}{x}+\frac{504a^{4}b^{4}}{x^{\frac{4}{3}}}-\frac{630a^{3}b^{5}}{x^{\frac{5}{3}}}+\frac{840a^{2}b^{6}}{x^{2}}-\frac{1260ab^{7}}{x^{\frac{7}{3}}}+\frac{2520b^{8}}{x^{\frac{8}{3}}}\right)x^{3}}{840a^{9}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x^(1/3)),x, algorithm="maxima")
```

```
[Out] -3*b^9*log(a + b/x^(1/3))/a^10 - b^9*log(x)/a^10 + 1/840*(280*a^8
 - 315*a^7*b/x^(1/3) + 360*a^6*b^2/x^(2/3) - 420*a^5*b^3/x + 504*
a^4*b^4/x^(4/3) - 630*a^3*b^5/x^(5/3) + 840*a^2*b^6/x^2 - 1260*a*
b^7/x^(7/3) + 2520*b^8/x^(8/3))*x^3/a^9
```

Fricas [A] time = 0.230547, size = 150, normalized size = 1.1

$$\frac{280a^{9}x^{3}-420a^{6}b^{3}x^{2}+840a^{3}b^{6}x-2520b^{9}\log\left(ax^{\frac{1}{3}}+b\right)-63\left(5a^{8}bx^{2}-8a^{5}b^{4}x+20a^{2}b^{7}\right)x^{\frac{2}{3}}+90\left(4a^{7}b^{2}x^{2}-7a^{4}b^{5}x\right.}{840a^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x^(1/3)),x, algorithm="fricas")
```

```
[Out] 1/840*(280*a^9*x^3 - 420*a^6*b^3*x^2 + 840*a^3*b^6*x - 2520*b^9*l
og(a*x^(1/3) + b) - 63*(5*a^8*b*x^2 - 8*a^5*b^4*x + 20*a^2*b^7)*x
^(2/3) + 90*(4*a^7*b^2*x^2 - 7*a^4*b^5*x + 28*a*b^8)*x^(1/3))/a^1
0
```

Sympy [A] time = 13.7876, size = 143, normalized size = 1.05

$$\begin{cases}\frac{x^{3}}{3a}-\frac{3bx^{\frac{8}{3}}}{8a^{2}}+\frac{3b^{2}x^{\frac{7}{3}}}{7a^{3}}-\frac{b^{3}x^{2}}{2a^{4}}+\frac{3b^{4}x^{\frac{5}{3}}}{5a^{5}}-\frac{3b^{5}x^{\frac{4}{3}}}{4a^{6}}+\frac{b^{6}x}{a^{7}}-\frac{3b^{7}x^{\frac{2}{3}}}{2a^{8}}+\frac{3b^{8}\sqrt[3]{x}}{a^{9}}-\frac{3b^{9}\log\left(\sqrt[3]{x}+\frac{b}{a}\right)}{a^{10}} & \text{for}\: a\neq 0\\\frac{3x^{\frac{10}{3}}}{10b} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b/x**(1/3)),x)
```

```
[Out] Piecewise((x**3/(3*a) - 3*b*x**(8/3)/(8*a**2) + 3*b**2*x**(7/3)/(
7*a**3) - b**3*x**2/(2*a**4) + 3*b**4*x**(5/3)/(5*a**5) - 3*b**5*
x**(4/3)/(4*a**6) + b**6*x/a**7 - 3*b**7*x**(2/3)/(2*a**8) + 3*b*
*8*x**(1/3)/a**9 - 3*b**9*log(x**(1/3) + b/a)/a**10, Ne(a, 0)), (
3*x**(10/3)/(10*b), True))
```

GIAC/XCAS [A] time = 0.216447, size = 150, normalized size = 1.1

$$-\frac{3\,b^{9}\ln\left(\left|ax^{\frac{1}{3}}+b\right|\right)}{a^{10}}+\frac{280\,a^{8}x^{3}-315\,a^{7}bx^{\frac{8}{3}}+360\,a^{6}b^{2}x^{\frac{7}{3}}-420\,a^{5}b^{3}x^{2}+504\,a^{4}b^{4}x^{\frac{5}{3}}-630\,a^{3}b^{5}x^{\frac{4}{3}}+840\,a^{2}b^{6}x-1260\,ab^{7}x^{\frac{2}{3}}+2520\,b^{8}x^{\frac{1}{3}}}{840\,a^{9}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x^(1/3)),x, algorithm="giac")
```

```
[Out] -3*b^9*ln(abs(a*x^(1/3) + b))/a^10 + 1/840*(280*a^8*x^3 - 315*a^7
*b*x^(8/3) + 360*a^6*b^2*x^(7/3) - 420*a^5*b^3*x^2 + 504*a^4*b^4*
x^(5/3) - 630*a^3*b^5*x^(4/3) + 840*a^2*b^6*x - 1260*a*b^7*x^(2/3
) + 2520*b^8*x^(1/3))/a^9
```

3.2415 $\int \frac{x}{a+\frac{b}{\sqrt[3]{x}}} \, dx$

Optimal. Leaf size=94

$$\frac{3b^6 \log \left(a\sqrt[3]{x}+b\right)}{a^7}-\frac{3b^5\sqrt[3]{x}}{a^6}+\frac{3b^4x^{2/3}}{2a^5}-\frac{b^3x}{a^4}+\frac{3b^2x^{4/3}}{4a^3}-\frac{3bx^{5/3}}{5a^2}+\frac{x^2}{2a}$$

```
[Out] (-3*b^5*x^(1/3))/a^6 + (3*b^4*x^(2/3))/(2*a^5) - (b^3*x)/a^4 + (3
*b^2*x^(4/3))/(4*a^3) - (3*b*x^(5/3))/(5*a^2) + x^2/(2*a) + (3*b^
6*Log[b + a*x^(1/3)])/a^7
```

Rubi [A] time = 0.135585, antiderivative size = 94, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{3b^6 \log \left(a\sqrt[3]{x}+b\right)}{a^7}-\frac{3b^5\sqrt[3]{x}}{a^6}+\frac{3b^4x^{2/3}}{2a^5}-\frac{b^3x}{a^4}+\frac{3b^2x^{4/3}}{4a^3}-\frac{3bx^{5/3}}{5a^2}+\frac{x^2}{2a}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b/x^(1/3)),x]
```

```
[Out] (-3*b^5*x^(1/3))/a^6 + (3*b^4*x^(2/3))/(2*a^5) - (b^3*x)/a^4 + (3
*b^2*x^(4/3))/(4*a^3) - (3*b*x^(5/3))/(5*a^2) + x^2/(2*a) + (3*b^
6*Log[b + a*x^(1/3)])/a^7
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-3b^5 \int^{\sqrt[3]{x}} \frac{1}{a^6}\, dx+\frac{x^2}{2a}-\frac{3bx^{\frac{5}{3}}}{5a^2}+\frac{3b^2x^{\frac{4}{3}}}{4a^3}-\frac{b^3x}{a^4}+\frac{3b^4\int^{\sqrt[3]{x}} x\, dx}{a^5}+\frac{3b^6 \log \left(a\sqrt[3]{x}+b\right)}{a^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b/x**(1/3)),x)
```

```
[Out] -3*b**5*Integral(a**(-6), (x, x**(1/3))) + x**2/(2*a) - 3*b*x**(5
/3)/(5*a**2) + 3*b**2*x**(4/3)/(4*a**3) - b**3*x/a**4 + 3*b**4*In
tegral(x, (x, x**(1/3)))/a**5 + 3*b**6*log(a*x**(1/3) + b)/a**7
```

Mathematica [A] time = 0.0253235, size = 88, normalized size = 0.94

$$\frac{10a^6x^2-12a^5bx^{5/3}+15a^4b^2x^{4/3}-20a^3b^3x+30a^2b^4x^{2/3}+60b^6\log \left(a\sqrt[3]{x}+b\right)-60ab^5\sqrt[3]{x}}{20a^7}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b/x^(1/3)),x]
```

```
[Out] (-60*a*b^5*x^(1/3) + 30*a^2*b^4*x^(2/3) - 20*a^3*b^3*x + 15*a^4*b
^2*x^(4/3) - 12*a^5*b*x^(5/3) + 10*a^6*x^2 + 60*b^6*Log[b + a*x^(
1/3)])/(20*a^7)
```

Maple [A] time = 0.005, size = 77, normalized size = 0.8

$$-3\,\frac{b^5\sqrt[3]{x}}{a^6}+\frac{3\,b^4}{2\,a^5}x^{\frac{2}{3}}-\frac{b^3x}{a^4}+\frac{3\,b^2}{4\,a^3}x^{\frac{4}{3}}-\frac{3\,b}{5\,a^2}x^{\frac{5}{3}}+\frac{x^2}{2\,a}+3\,\frac{b^6\ln \left(b+a\sqrt[3]{x}\right)}{a^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x/(a+b/x^(1/3)),x)
```

```
[Out] -3*b^5*x^(1/3)/a^6+3/2*b^4*x^(2/3)/a^5-b^3*x/a^4+3/4*b^2*x^(4/3)/
a^3-3/5*b*x^(5/3)/a^2+1/2*x^2/a+3*b^6*ln(b+a*x^(1/3))/a^7
```

Maxima [A] time = 1.43698, size = 119, normalized size = 1.27

$$\frac{3\,b^6\log\left(a+\frac{b}{x^{\frac{1}{3}}}\right)}{a^7}+\frac{b^6\log\left(x\right)}{a^7}+\frac{\left(10\,a^5-\frac{12\,a^4b}{x^{\frac{1}{3}}}+\frac{15\,a^3b^2}{x^{\frac{2}{3}}}-\frac{20\,a^2b^3}{x}+\frac{30\,ab^4}{x^{\frac{4}{3}}}-\frac{60\,b^5}{x^{\frac{5}{3}}}\right)x^2}{20\,a^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(a + b/x^(1/3)),x, algorithm="maxima")
```

```
[Out] 3*b^6*log(a + b/x^(1/3))/a^7 + b^6*log(x)/a^7 + 1/20*(10*a^5 - 12
*a^4*b/x^(1/3) + 15*a^3*b^2/x^(2/3) - 20*a^2*b^3/x + 30*a*b^4/x^(
4/3) - 60*b^5/x^(5/3))*x^2/a^6
```

Fricas [A] time = 0.226243, size = 104, normalized size = 1.11

$$\frac{10\,a^6x^2-20\,a^3b^3x+60\,b^6\log\left(ax^{\frac{1}{3}}+b\right)-6\left(2\,a^5bx-5\,a^2b^4\right)x^{\frac{2}{3}}+15\left(a^4b^2x-4\,ab^5\right)x^{\frac{1}{3}}}{20\,a^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(a + b/x^(1/3)),x, algorithm="fricas")
```

```
[Out] 1/20*(10*a^6*x^2 - 20*a^3*b^3*x + 60*b^6*log(a*x^(1/3) + b) - 6*(
2*a^5*b*x - 5*a^2*b^4)*x^(2/3) + 15*(a^4*b^2*x - 4*a*b^5)*x^(1/3)
)/a^7
```

Sympy [A] time = 35.3014, size = 92, normalized size = 0.98

$$\frac{x^2}{2a}-\frac{3bx^{\frac{5}{3}}}{5a^2}+\frac{3b^2x^{\frac{4}{3}}}{4a^3}-\frac{b^3x}{a^4}+\frac{3b^4x^{\frac{2}{3}}}{2a^5}-\frac{3b^5\sqrt[3]{x}}{a^6}+\frac{3b^6\log\left(\frac{a\sqrt[3]{x}}{b}+1\right)}{a^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(a+b/x**(1/3)),x)
```

```
[Out] x**2/(2*a) - 3*b*x**(5/3)/(5*a**2) + 3*b**2*x**(4/3)/(4*a**3) - b
**3*x/a**4 + 3*b**4*x**(2/3)/(2*a**5) - 3*b**5*x**(1/3)/a**6 + 3*
b**6*log(a*x**(1/3)/b + 1)/a**7
```

GIAC/XCAS [A] time = 0.216151, size = 105, normalized size = 1.12

$$\frac{3\,b^6\ln\left(\left|ax^{\frac{1}{3}}+b\right|\right)}{a^7}+\frac{10\,a^5x^2-12\,a^4bx^{\frac{5}{3}}+15\,a^3b^2x^{\frac{4}{3}}-20\,a^2b^3x+30\,ab^4x^{\frac{2}{3}}-60\,b^5x^{\frac{1}{3}}}{20\,a^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x^(1/3)),x, algorithm="giac")
```

```
[Out] 3*b^6*ln(abs(a*x^(1/3) + b))/a^7 + 1/20*(10*a^5*x^2 - 12*a^4*b*x^
(5/3) + 15*a^3*b^2*x^(4/3) - 20*a^2*b^3*x + 30*a*b^4*x^(2/3) - 60
*b^5*x^(1/3))/a^6
```

3.2416 $\int \frac{1}{a+\frac{b}{\sqrt[3]{x}}} dx$

Optimal. Leaf size=60

$$-\frac{3b^3 \log \left(a+\frac{b}{\sqrt[3]{x}}\right)}{a^4}-\frac{b^3 \log(x)}{a^4}+\frac{3b^2 \sqrt[3]{x}}{a^3}-\frac{3bx^{2/3}}{2a^2}+\frac{x}{a}$$

```
[Out] (3*b^2*x^(1/3))/a^3 - (3*b*x^(2/3))/(2*a^2) + x/a - (3*b^3*Log[a
+ b/x^(1/3)])/a^4 - (b^3*Log[x])/a^4
```

Rubi [A] time = 0.0881969, antiderivative size = 60, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$

$$-\frac{3b^3 \log \left(a+\frac{b}{\sqrt[3]{x}}\right)}{a^4}-\frac{b^3 \log(x)}{a^4}+\frac{3b^2 \sqrt[3]{x}}{a^3}-\frac{3bx^{2/3}}{2a^2}+\frac{x}{a}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^(1/3))^(-1),x]
```

```
[Out] (3*b^2*x^(1/3))/a^3 - (3*b*x^(2/3))/(2*a^2) + x/a - (3*b^3*Log[a
+ b/x^(1/3)])/a^4 - (b^3*Log[x])/a^4
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$3b^2 \int^{\sqrt[3]{x}} \frac{1}{a^3} dx + \frac{x}{a} - \frac{3b \int^{\sqrt[3]{x}} x\, dx}{a^2} - \frac{3b^3 \log \left(a\sqrt[3]{x}+b\right)}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**(1/3)),x)
```

```
[Out] 3*b**2*Integral(a**(-3), (x, x**(1/3))) + x/a - 3*b*Integral(x, (
x, x**(1/3)))/a**2 - 3*b**3*log(a*x**(1/3) + b)/a**4
```

Mathematica [A] time = 0.0132086, size = 50, normalized size = 0.83

$$-\frac{3b^3 \log \left(a\sqrt[3]{x}+b\right)}{a^4}+\frac{3b^2 \sqrt[3]{x}}{a^3}-\frac{3bx^{2/3}}{2a^2}+\frac{x}{a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^(1/3))^(-1),x]
```

```
[Out] (3*b^2*x^(1/3))/a^3 - (3*b*x^(2/3))/(2*a^2) + x/a - (3*b^3*Log[b
+ a*x^(1/3)])/a^4
```

Maple [A] time = 0.004, size = 43, normalized size = 0.7

$$\frac{x}{a}-\frac{3\,b}{2\,a^2}x^{\frac{2}{3}}+3\,\frac{b^2\sqrt[3]{x}}{a^3}-3\,\frac{b^3 \ln \left(b+a\sqrt[3]{x}\right)}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^(1/3)),x)
```

```
[Out] x/a-3/2*b*x^(2/3)/a^2+3*b^2*x^(1/3)/a^3-3*b^3/a^4*ln(b+a*x^(1/3))
```

Maxima [A] time = 1.45889, size = 73, normalized size = 1.22

$$-\frac{3\,b^3\log\left(a+\frac{b}{x^{\frac{1}{3}}}\right)}{a^4}-\frac{b^3\log\left(x\right)}{a^4}+\frac{\left(2\,a^2-\frac{3\,ab}{x^{\frac{1}{3}}}+\frac{6\,b^2}{x^{\frac{2}{3}}}\right)x}{2\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a + b/x^(1/3)),x, algorithm="maxima")
```

```
[Out] -3*b^3*log(a + b/x^(1/3))/a^4 - b^3*log(x)/a^4 + 1/2*(2*a^2 - 3*a
*b/x^(1/3) + 6*b^2/x^(2/3))*x/a^3
```

Fricas [A] time = 0.224799, size = 58, normalized size = 0.97

$$\frac{2\,a^3x-6\,b^3\log\left(ax^{\frac{1}{3}}+b\right)-3\,a^2bx^{\frac{2}{3}}+6\,ab^2x^{\frac{1}{3}}}{2\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a + b/x^(1/3)),x, algorithm="fricas")
```

```
[Out] 1/2*(2*a^3*x - 6*b^3*log(a*x^(1/3) + b) - 3*a^2*b*x^(2/3) + 6*a*b
^2*x^(1/3))/a^4
```

Sympy [A] time = 1.57456, size = 58, normalized size = 0.97

$$\begin{cases}\frac{x}{a}-\frac{3bx^{\frac{2}{3}}}{2a^2}+\frac{3b^2\sqrt[3]{x}}{a^3}-\frac{3b^3\log\left(\sqrt[3]{x}+\frac{b}{a}\right)}{a^4} & \text{for}\ a\neq 0\\ \frac{3x^{\frac{4}{3}}}{4b} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**(1/3)),x)
```

```
[Out] Piecewise((x/a - 3*b*x**(2/3)/(2*a**2) + 3*b**2*x**(1/3)/a**3 - 3
*b**3*log(x**(1/3) + b/a)/a**4, Ne(a, 0)), (3*x**(4/3)/(4*b), Tru
e))
```

GIAC/XCAS [A] time = 0.213628, size = 61, normalized size = 1.02

$$-\frac{3\,b^3\ln\left(\left|ax^{\frac{1}{3}}+b\right|\right)}{a^4}+\frac{2\,a^2x-3\,abx^{\frac{2}{3}}+6\,b^2x^{\frac{1}{3}}}{2\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a + b/x^(1/3)),x, algorithm="giac")
```

```
[Out] -3*b^3*ln(abs(a*x^(1/3) + b))/a^4 + 1/2*(2*a^2*x - 3*a*b*x^(2/3)
+ 6*b^2*x^(1/3))/a^3
```

3.2417 $\int \frac{1}{\left(a+\frac{b}{\sqrt[3]{x}}\right)x}\,dx$

Optimal. Leaf size=15

$$\frac{3\log\left(a\sqrt[3]{x}+b\right)}{a}$$

```
[Out] (3*Log[b + a*x^(1/3)])/a
```

Rubi [A] time = 0.0231028, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{3\log\left(a\sqrt[3]{x}+b\right)}{a}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b/x^(1/3))*x),x]
```

```
[Out] (3*Log[b + a*x^(1/3)])/a
```

Rubi in Sympy [A] time = 4.04181, size = 12, normalized size = 0.8

$$\frac{3\log\left(a\sqrt[3]{x}+b\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b/x**(1/3))/x,x)
```

```
[Out] 3*log(a*x**(1/3) + b)/a
```

Mathematica [A] time = 0.00711098, size = 15, normalized size = 1.

$$\frac{3\log\left(a\sqrt[3]{x}+b\right)}{a}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b/x^(1/3))*x),x]
```

```
[Out] (3*Log[b + a*x^(1/3)])/a
```

Maple [A] time = 0.001, size = 14, normalized size = 0.9

$$3\,\frac{\ln\left(b+a\sqrt[3]{x}\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b/x^(1/3))/x,x)
```

```
[Out] 3*ln(b+a*x^(1/3))/a
```

Maxima [A] time = 1.41762, size = 27, normalized size = 1.8

$$\frac{3 \log\left(a + \frac{b}{x^{\frac{1}{3}}}\right)}{a} + \frac{\log(x)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))*x),x, algorithm="maxima")
```

```
[Out] 3*log(a + b/x^(1/3))/a + log(x)/a
```

Fricas [A] time = 0.228615, size = 18, normalized size = 1.2

$$\frac{3 \log\left(ax^{\frac{1}{3}} + b\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))*x),x, algorithm="fricas")
```

```
[Out] 3*log(a*x^(1/3) + b)/a
```

Sympy [A] time = 2.35549, size = 20, normalized size = 1.33

$$\begin{cases} \frac{3 \log\left(\sqrt[3]{x} + \frac{b}{a}\right)}{a} & \text{for}\: a \neq 0 \\ \frac{3 \sqrt[3]{x}}{b} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**(1/3))/x,x)
```

```
[Out] Piecewise((3*log(x**(1/3) + b/a)/a, Ne(a, 0)), (3*x**(1/3)/b, Tru
e))
```

GIAC/XCAS [A] time = 0.213621, size = 19, normalized size = 1.27

$$\frac{3 \ln\left(\left|ax^{\frac{1}{3}} + b\right|\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))*x),x, algorithm="giac")
```

```
[Out] 3*ln(abs(a*x^(1/3) + b))/a
```

3.2418 $\int \frac{1}{\left(a+\frac{b}{\sqrt[3]{x}}\right)x^2}\,dx$

Optimal. Leaf size=51

$$-\frac{3a^2\log\left(a\sqrt[3]{x}+b\right)}{b^3}+\frac{a^2\log(x)}{b^3}+\frac{3a}{b^2\sqrt[3]{x}}-\frac{3}{2bx^{2/3}}$$

```
[Out] -3/(2*b*x^(2/3)) + (3*a)/(b^2*x^(1/3)) - (3*a^2*Log[b + a*x^(1/3)
])/b^3 + (a^2*Log[x])/b^3
```

Rubi [A] time = 0.0822004, antiderivative size = 51, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{3a^2\log\left(a\sqrt[3]{x}+b\right)}{b^3}+\frac{a^2\log(x)}{b^3}+\frac{3a}{b^2\sqrt[3]{x}}-\frac{3}{2bx^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b/x^(1/3))*x^2),x]
```

```
[Out] -3/(2*b*x^(2/3)) + (3*a)/(b^2*x^(1/3)) - (3*a^2*Log[b + a*x^(1/3)
])/b^3 + (a^2*Log[x])/b^3
```

Rubi in Sympy [A] time = 12.2909, size = 54, normalized size = 1.06

$$\frac{3a^2\log\left(\sqrt[3]{x}\right)}{b^3}-\frac{3a^2\log\left(a\sqrt[3]{x}+b\right)}{b^3}+\frac{3a}{b^2\sqrt[3]{x}}-\frac{3}{2bx^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b/x**(1/3))/x**2,x)
```

```
[Out] 3*a**2*log(x**(1/3))/b**3 - 3*a**2*log(a*x**(1/3) + b)/b**3 + 3*a
/(b**2*x**(1/3)) - 3/(2*b*x**(2/3))
```

Mathematica [A] time = 0.0545129, size = 48, normalized size = 0.94

$$\frac{-6a^2\log\left(a\sqrt[3]{x}+b\right)+2a^2\log(x)-\frac{3b\left(b-2a\sqrt[3]{x}\right)}{x^{2/3}}}{2b^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b/x^(1/3))*x^2),x]
```

```
[Out] ((-3*b*(b - 2*a*x^(1/3)))/x^(2/3) - 6*a^2*Log[b + a*x^(1/3)] + 2*
a^2*Log[x])/(2*b^3)
```

Maple [A] time = 0.013, size = 44, normalized size = 0.9

$$-\frac{3}{2\,b}x^{-\frac{2}{3}}+3\,\frac{a}{b^2\sqrt[3]{x}}-3\,\frac{a^2\ln\left(b+a\sqrt[3]{x}\right)}{b^3}+\frac{a^2\ln(x)}{b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^(1/3))/x^2,x)
```

```
[Out] -3/2/b/x^(2/3)+3*a/b^2/x^(1/3)-3*a^2*ln(b+a*x^(1/3))/b^3+a^2*ln(x
)/b^3
```

Maxima [A] time = 1.44236, size = 59, normalized size = 1.16

$$-\frac{3\,a^2\log\left(a+\frac{b}{x^{\frac{1}{3}}}\right)}{b^3}-\frac{3\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^2}{2\,b^3}+\frac{6\left(a+\frac{b}{x^{\frac{1}{3}}}\right)a}{b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))*x^2),x, algorithm="maxima")
```

```
[Out] -3*a^2*log(a + b/x^(1/3))/b^3 - 3/2*(a + b/x^(1/3))^2/b^3 + 6*(a
+ b/x^(1/3))*a/b^3
```

Fricas [A] time = 0.235754, size = 63, normalized size = 1.24

$$-\frac{3\left(2\,a^2x^{\frac{2}{3}}\log\left(ax^{\frac{1}{3}}+b\right)-2\,a^2x^{\frac{2}{3}}\log\left(x^{\frac{1}{3}}\right)-2\,abx^{\frac{1}{3}}+b^2\right)}{2\,b^3x^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))*x^2),x, algorithm="fricas")
```

```
[Out] -3/2*(2*a^2*x^(2/3)*log(a*x^(1/3) + b) - 2*a^2*x^(2/3)*log(x^(1/3
)) - 2*a*b*x^(1/3) + b^2)/(b^3*x^(2/3))
```

Sympy [A] time = 5.86471, size = 73, normalized size = 1.43

$$\begin{cases} \frac{\tilde{\infty}}{x^{\frac{2}{3}}} & \text{for}\: a = 0 \wedge b = 0 \\ -\frac{1}{ax} & \text{for}\: b = 0 \\ -\frac{3}{2bx^{\frac{2}{3}}} & \text{for}\: a = 0 \\ \frac{a^2\log(x)}{b^3} - \frac{3a^2\log\left(\sqrt[3]{x}+\frac{b}{a}\right)}{b^3} + \frac{3a}{b^2\sqrt[3]{x}} - \frac{3}{2bx^{\frac{2}{3}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**(1/3))/x**2,x)
```

```
[Out] Piecewise((zoo/x**(2/3), Eq(a, 0) & Eq(b, 0)), (-1/(a*x), Eq(b, 0
)), (-3/(2*b*x**(2/3)), Eq(a, 0)), (a**2*log(x)/b**3 - 3*a**2*log
(x**(1/3) + b/a)/b**3 + 3*a/(b**2*x**(1/3)) - 3/(2*b*x**(2/3)), T
rue))
```

GIAC/XCAS [A] time = 0.215069, size = 66, normalized size = 1.29

$$-\frac{3\,a^2\ln\left(\left|ax^{\frac{1}{3}}+b\right|\right)}{b^3}+\frac{a^2\ln\left(|x|\right)}{b^3}+\frac{3\left(2\,abx^{\frac{1}{3}}-b^2\right)}{2\,b^3x^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))*x^2),x, algorithm="giac")
```

```
[Out] -3*a^2*ln(abs(a*x^(1/3) + b))/b^3 + a^2*ln(abs(x))/b^3 + 3/2*(2*a
*b*x^(1/3) - b^2)/(b^3*x^(2/3))
```

3.2419 $\int \frac{1}{\left(a+\frac{b}{\sqrt[3]{x}}\right)x^3}\,dx$

Optimal. Leaf size=93

$$\frac{3a^5\log\left(a\sqrt[3]{x}+b\right)}{b^6}-\frac{a^5\log(x)}{b^6}-\frac{3a^4}{b^5\sqrt[3]{x}}+\frac{3a^3}{2b^4x^{2/3}}-\frac{a^2}{b^3x}+\frac{3a}{4b^2x^{4/3}}-\frac{3}{5bx^{5/3}}$$

```
[Out] -3/(5*b*x^(5/3)) + (3*a)/(4*b^2*x^(4/3)) - a^2/(b^3*x) + (3*a^3)/
(2*b^4*x^(2/3)) - (3*a^4)/(b^5*x^(1/3)) + (3*a^5*Log[b + a*x^(1/3
)])/b^6 - (a^5*Log[x])/b^6
```

Rubi [A] time = 0.126447, antiderivative size = 93, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{3a^5\log\left(a\sqrt[3]{x}+b\right)}{b^6}-\frac{a^5\log(x)}{b^6}-\frac{3a^4}{b^5\sqrt[3]{x}}+\frac{3a^3}{2b^4x^{2/3}}-\frac{a^2}{b^3x}+\frac{3a}{4b^2x^{4/3}}-\frac{3}{5bx^{5/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^(1/3))*x^3),x]
```

```
[Out] -3/(5*b*x^(5/3)) + (3*a)/(4*b^2*x^(4/3)) - a^2/(b^3*x) + (3*a^3)/
(2*b^4*x^(2/3)) - (3*a^4)/(b^5*x^(1/3)) + (3*a^5*Log[b + a*x^(1/3
)])/b^6 - (a^5*Log[x])/b^6
```

Rubi in Sympy [A] time = 18.9429, size = 94, normalized size = 1.01

$$-\frac{3a^5\log\left(\sqrt[3]{x}\right)}{b^6}+\frac{3a^5\log\left(a\sqrt[3]{x}+b\right)}{b^6}-\frac{3a^4}{b^5\sqrt[3]{x}}+\frac{3a^3}{2b^4x^{\frac{2}{3}}}-\frac{a^2}{b^3x}+\frac{3a}{4b^2x^{\frac{4}{3}}}-\frac{3}{5bx^{\frac{5}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**(1/3))/x**3,x)
```

```
[Out] -3*a**5*log(x**(1/3))/b**6 + 3*a**5*log(a*x**(1/3) + b)/b**6 - 3*
a**4/(b**5*x**(1/3)) + 3*a**3/(2*b**4*x**(2/3)) - a**2/(b**3*x) +
 3*a/(4*b**2*x**(4/3)) - 3/(5*b*x**(5/3))
```

Mathematica [A] time = 0.103311, size = 84, normalized size = 0.9

$$\frac{60a^5\log\left(a\sqrt[3]{x}+b\right)-20a^5\log(x)+\frac{b\left(-60a^4x^{4/3}+30a^3bx-20a^2b^2x^{2/3}+15ab^3\sqrt[3]{x}-12b^4\right)}{x^{5/3}}}{20b^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^(1/3))*x^3),x]
```

```
[Out] ((b*(-12*b^4 + 15*a*b^3*x^(1/3) - 20*a^2*b^2*x^(2/3) + 30*a^3*b*x
 - 60*a^4*x^(4/3)))/x^(5/3) + 60*a^5*Log[b + a*x^(1/3)] - 20*a^5*
Log[x])/(20*b^6)
```

Maple [A] time = 0.014, size = 78, normalized size = 0.8

$$-\frac{3}{5b}x^{-\frac{5}{3}}+\frac{3a}{4b^{2}}x^{-\frac{4}{3}}-\frac{a^{2}}{b^{3}x}+\frac{3a^{3}}{2b^{4}}x^{-\frac{2}{3}}-3\frac{a^{4}}{b^{5}\sqrt[3]{x}}+3\frac{a^{5}\ln\left(b+a\sqrt[3]{x}\right)}{b^{6}}-\frac{a^{5}\ln\left(x\right)}{b^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^(1/3))/x^3,x)
```

```
[Out] -3/5/b/x^(5/3)+3/4*a/b^2/x^(4/3)-a^2/b^3/x+3/2*a^3/b^4/x^(2/3)-3*
a^4/b^5/x^(1/3)+3*a^5*ln(b+a*x^(1/3))/b^6-a^5*ln(x)/b^6
```

Maxima [A] time = 1.4422, size = 128, normalized size = 1.38

$$\frac{3a^{5}\log\left(a+\frac{b}{x^{\frac{1}{3}}}\right)}{b^{6}}-\frac{3\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{5}}{5b^{6}}+\frac{15\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{4}a}{4b^{6}}-\frac{10\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{3}a^{2}}{b^{6}}+\frac{15\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{2}a^{3}}{b^{6}}-\frac{15\left(a+\frac{b}{x^{\frac{1}{3}}}\right)a^{4}}{b^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))*x^3),x, algorithm="maxima")
```

```
[Out] 3*a^5*log(a + b/x^(1/3))/b^6 - 3/5*(a + b/x^(1/3))^5/b^6 + 15/4*(
a + b/x^(1/3))^4*a/b^6 - 10*(a + b/x^(1/3))^3*a^2/b^6 + 15*(a + b
/x^(1/3))^2*a^3/b^6 - 15*(a + b/x^(1/3))*a^4/b^6
```

Fricas [A] time = 0.237978, size = 109, normalized size = 1.17

$$\frac{60a^{5}x^{\frac{5}{3}}\log\left(ax^{\frac{1}{3}}+b\right)-60a^{5}x^{\frac{5}{3}}\log\left(x^{\frac{1}{3}}\right)+30a^{3}b^{2}x-20a^{2}b^{3}x^{\frac{2}{3}}-12b^{5}-15\left(4a^{4}bx-ab^{4}\right)x^{\frac{1}{3}}}{20b^{6}x^{\frac{5}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))*x^3),x, algorithm="fricas")
```

```
[Out] 1/20*(60*a^5*x^(5/3)*log(a*x^(1/3) + b) - 60*a^5*x^(5/3)*log(x^(1
/3)) + 30*a^3*b^2*x - 20*a^2*b^3*x^(2/3) - 12*b^5 - 15*(4*a^4*b*x
 - a*b^4)*x^(1/3))/(b^6*x^(5/3))
```

Sympy [A] time = 18.5777, size = 116, normalized size = 1.25

$$\begin{cases}\frac{\tilde{\infty}}{x^{\frac{5}{3}}} & \text{for}\: a = 0 \wedge b = 0\\-\frac{1}{2ax^{2}} & \text{for}\: b = 0\\-\frac{3}{5bx^{\frac{5}{3}}} & \text{for}\: a = 0\\-\frac{a^{5}\log\left(x\right)}{b^{6}}+\frac{3a^{5}\log\left(\sqrt[3]{x}+\frac{b}{a}\right)}{b^{6}}-\frac{3a^{4}}{b^{5}\sqrt[3]{x}}+\frac{3a^{3}}{2b^{4}x^{\frac{2}{3}}}-\frac{a^{2}}{b^{3}x}+\frac{3a}{4b^{2}x^{\frac{4}{3}}}-\frac{3}{5bx^{\frac{5}{3}}} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**(1/3))/x**3,x)
```

```
[Out] Piecewise((zoo/x**(5/3), Eq(a, 0) & Eq(b, 0)), (-1/(2*a*x**2), Eq
(b, 0)), (-3/(5*b*x**(5/3)), Eq(a, 0)), (-a**5*log(x)/b**6 + 3*a*
*5*log(x**(1/3) + b/a)/b**6 - 3*a**4/(b**5*x**(1/3)) + 3*a**3/(2*
b**4*x**(2/3)) - a**2/(b**3*x) + 3*a/(4*b**2*x**(4/3)) - 3/(5*b*x
```

```
**(5/3)), True))
```

GIAC/XCAS [A] time = 0.217522, size = 109, normalized size = 1.17

$$\frac{3\,a^5\ln\left(\left|ax^{\frac{1}{3}}+b\right|\right)}{b^6}-\frac{a^5\ln\left(|x|\right)}{b^6}-\frac{60\,a^4bx^{\frac{4}{3}}-30\,a^3b^2x+20\,a^2b^3x^{\frac{2}{3}}-15\,ab^4x^{\frac{1}{3}}+12\,b^5}{20\,b^6x^{\frac{5}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))*x^3),x, algorithm="giac")
```

```
[Out] 3*a^5*ln(abs(a*x^(1/3) + b))/b^6 - a^5*ln(abs(x))/b^6 - 1/20*(60*
a^4*b*x^(4/3) - 30*a^3*b^2*x + 20*a^2*b^3*x^(2/3) - 15*a*b^4*x^(1
/3) + 12*b^5)/(b^6*x^(5/3))
```

3.2420 $\int \frac{1}{\left(a+\frac{b}{\sqrt[3]{x}}\right)x^4}\,dx$

Optimal. Leaf size=134

$$-\frac{3a^8\log\left(a\sqrt[3]{x}+b\right)}{b^9}+\frac{a^8\log(x)}{b^9}+\frac{3a^7}{b^8\sqrt[3]{x}}-\frac{3a^6}{2b^7x^{2/3}}+\frac{a^5}{b^6x}-\frac{3a^4}{4b^5x^{4/3}}+\frac{3a^3}{5b^4x^{5/3}}-\frac{a^2}{2b^3x^2}+\frac{3a}{7b^2x^{7/3}}-\frac{3}{8bx^{8/3}}$$

```
[Out] -3/(8*b*x^(8/3)) + (3*a)/(7*b^2*x^(7/3)) - a^2/(2*b^3*x^2) + (3*a
^3)/(5*b^4*x^(5/3)) - (3*a^4)/(4*b^5*x^(4/3)) + a^5/(b^6*x) - (3*
a^6)/(2*b^7*x^(2/3)) + (3*a^7)/(b^8*x^(1/3)) - (3*a^8*Log[b + a*x
^(1/3)])/b^9 + (a^8*Log[x])/b^9
```

Rubi [A] time = 0.181652, antiderivative size = 134, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{3a^8\log\left(a\sqrt[3]{x}+b\right)}{b^9}+\frac{a^8\log(x)}{b^9}+\frac{3a^7}{b^8\sqrt[3]{x}}-\frac{3a^6}{2b^7x^{2/3}}+\frac{a^5}{b^6x}-\frac{3a^4}{4b^5x^{4/3}}+\frac{3a^3}{5b^4x^{5/3}}-\frac{a^2}{2b^3x^2}+\frac{3a}{7b^2x^{7/3}}-\frac{3}{8bx^{8/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^(1/3))*x^4),x]
```

```
[Out] -3/(8*b*x^(8/3)) + (3*a)/(7*b^2*x^(7/3)) - a^2/(2*b^3*x^2) + (3*a
^3)/(5*b^4*x^(5/3)) - (3*a^4)/(4*b^5*x^(4/3)) + a^5/(b^6*x) - (3*
a^6)/(2*b^7*x^(2/3)) + (3*a^7)/(b^8*x^(1/3)) - (3*a^8*Log[b + a*x
^(1/3)])/b^9 + (a^8*Log[x])/b^9
```

Rubi in Sympy [A] time = 26.558, size = 136, normalized size = 1.01

$$\frac{3a^8\log\left(\sqrt[3]{x}\right)}{b^9}-\frac{3a^8\log\left(a\sqrt[3]{x}+b\right)}{b^9}+\frac{3a^7}{b^8\sqrt[3]{x}}-\frac{3a^6}{2b^7x^{\frac{2}{3}}}+\frac{a^5}{b^6x}-\frac{3a^4}{4b^5x^{\frac{4}{3}}}+\frac{3a^3}{5b^4x^{\frac{5}{3}}}-\frac{a^2}{2b^3x^2}+\frac{3a}{7b^2x^{\frac{7}{3}}}-\frac{3}{8bx^{\frac{8}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**(1/3))/x**4,x)
```

```
[Out] 3*a**8*log(x**(1/3))/b**9 - 3*a**8*log(a*x**(1/3) + b)/b**9 + 3*a
**7/(b**8*x**(1/3)) - 3*a**6/(2*b**7*x**(2/3)) + a**5/(b**6*x) -
3*a**4/(4*b**5*x**(4/3)) + 3*a**3/(5*b**4*x**(5/3)) - a**2/(2*b**
3*x**2) + 3*a/(7*b**2*x**(7/3)) - 3/(8*b*x**(8/3))
```

Mathematica [A] time = 0.152259, size = 121, normalized size = 0.9

$$\frac{-840a^8\log\left(a\sqrt[3]{x}+b\right)+280a^8\log(x)+\frac{b\left(840a^7x^{7/3}-420a^6bx^2+280a^5b^2x^{5/3}-210a^4b^3x^{4/3}+168a^3b^4x-140a^2b^5x^{2/3}+120ab^6\sqrt[3]{x}-105b^7\right)}{x^{8/3}}}{280b^9}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^(1/3))*x^4),x]
```

```
[Out] ((b*(-105*b^7 + 120*a*b^6*x^(1/3) - 140*a^2*b^5*x^(2/3) + 168*a^3
*b^4*x - 210*a^4*b^3*x^(4/3) + 280*a^5*b^2*x^(5/3) - 420*a^6*b*x^
2 + 840*a^7*x^(7/3)))/x^(8/3) - 840*a^8*Log[b + a*x^(1/3)] + 280*
```

```
a^8*Log[x])/(280*b^9)
```

Maple [A] time = 0.016, size = 109, normalized size = 0.8

$$-\frac{3}{8\,b}x^{-\frac{8}{3}}+\frac{3\,a}{7\,b^{2}}x^{-\frac{7}{3}}-\frac{a^{2}}{2\,b^{3}x^{2}}+\frac{3\,a^{3}}{5\,b^{4}}x^{-\frac{5}{3}}-\frac{3\,a^{4}}{4\,b^{5}}x^{-\frac{4}{3}}+\frac{a^{5}}{b^{6}x}-\frac{3\,a^{6}}{2\,b^{7}}x^{-\frac{2}{3}}+3\,\frac{a^{7}}{b^{8}\sqrt[3]{x}}-3\,\frac{a^{8}\ln\left(b+a\sqrt[3]{x}\right)}{b^{9}}+\frac{a^{8}\ln\left(x\right)}{b^{9}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^(1/3))/x^4,x)
```

```
[Out] -3/8/b/x^(8/3)+3/7*a/b^2/x^(7/3)-1/2*a^2/b^3/x^2+3/5*a^3/b^4/x^(5
/3)-3/4*a^4/b^5/x^(4/3)+a^5/b^6/x-3/2*a^6/b^7/x^(2/3)+3*a^7/b^8/x
^(1/3)-3*a^8*ln(b+a*x^(1/3))/b^9+a^8*ln(x)/b^9
```

Maxima [A] time = 1.44244, size = 197, normalized size = 1.47

$$-\frac{3\,a^{8}\log\left(a+\frac{b}{x^{\frac{1}{3}}}\right)}{b^{9}}-\frac{3\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{8}}{8\,b^{9}}+\frac{24\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{7}a}{7\,b^{9}}-\frac{14\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{6}a^{2}}{b^{9}}+\frac{168\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{5}a^{3}}{5\,b^{9}}-\frac{105\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{4}a^{4}}{2\,b^{9}}+\frac{56\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{3}a^{5}}{b^{9}}-\frac{42\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{2}a^{6}}{b^{9}}+\frac{24\left(a+\frac{b}{x^{\frac{1}{3}}}\right)a^{7}}{b^{9}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))*x^4),x, algorithm="maxima")
```

```
[Out] -3*a^8*log(a + b/x^(1/3))/b^9 - 3/8*(a + b/x^(1/3))^8/b^9 + 24/7*
(a + b/x^(1/3))^7*a/b^9 - 14*(a + b/x^(1/3))^6*a^2/b^9 + 168/5*(a
 + b/x^(1/3))^5*a^3/b^9 - 105/2*(a + b/x^(1/3))^4*a^4/b^9 + 56*(a
 + b/x^(1/3))^3*a^5/b^9 - 42*(a + b/x^(1/3))^2*a^6/b^9 + 24*(a +
b/x^(1/3))*a^7/b^9
```

Fricas [A] time = 0.237042, size = 155, normalized size = 1.16

$$-\frac{840\,a^{8}x^{\frac{8}{3}}\log\left(ax^{\frac{1}{3}}+b\right)-840\,a^{8}x^{\frac{8}{3}}\log\left(x^{\frac{1}{3}}\right)+420\,a^{6}b^{2}x^{2}-168\,a^{3}b^{5}x+105\,b^{8}-140\left(2\,a^{5}b^{3}x-a^{2}b^{6}\right)x^{\frac{2}{3}}-30\left(28\,a^{7}bx^{2}\right.}{280\,b^{9}x^{\frac{8}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))*x^4),x, algorithm="fricas")
```

```
[Out] -1/280*(840*a^8*x^(8/3)*log(a*x^(1/3) + b) - 840*a^8*x^(8/3)*log(
x^(1/3)) + 420*a^6*b^2*x^2 - 168*a^3*b^5*x + 105*b^8 - 140*(2*a^5
*b^3*x - a^2*b^6)*x^(2/3) - 30*(28*a^7*b*x^2 - 7*a^4*b^4*x + 4*a*
b^7)*x^(1/3))/(b^9*x^(8/3))
```

Sympy [A] time = 61.8769, size = 158, normalized size = 1.18

$$\begin{cases} \frac{\tilde{\infty}}{x^{\frac{8}{3}}} & \text{for}\: a = 0 \wedge b = 0 \\ -\frac{3}{8bx^{\frac{8}{3}}} & \text{for}\: a = 0 \\ -\frac{1}{3ax^{3}} & \text{for}\: b = 0 \\ \frac{a^{8}\log\left(x\right)}{b^{9}}-\frac{3a^{8}\log\left(\sqrt[3]{x}+\frac{b}{a}\right)}{b^{9}}+\frac{3a^{7}}{b^{8}\sqrt[3]{x}}-\frac{3a^{6}}{2b^{7}x^{\frac{2}{3}}}+\frac{a^{5}}{b^{6}x}-\frac{3a^{4}}{4b^{5}x^{\frac{4}{3}}}+\frac{3a^{3}}{5b^{4}x^{\frac{5}{3}}}-\frac{a^{2}}{2b^{3}x^{2}}+\frac{3a}{7b^{2}x^{\frac{7}{3}}}-\frac{3}{8bx^{\frac{8}{3}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**(1/3))/x**4,x)
```

```
[Out] Piecewise((zoo/x**(8/3), Eq(a, 0) & Eq(b, 0)), (-3/(8*b*x**(8/3))
, Eq(a, 0)), (-1/(3*a*x**3), Eq(b, 0)), (a**8*log(x)/b**9 - 3*a**
8*log(x**(1/3) + b/a)/b**9 + 3*a**7/(b**8*x**(1/3)) - 3*a**6/(2*b
**7*x**(2/3)) + a**5/(b**6*x) - 3*a**4/(4*b**5*x**(4/3)) + 3*a**3
/(5*b**4*x**(5/3)) - a**2/(2*b**3*x**2) + 3*a/(7*b**2*x**(7/3)) -
 3/(8*b*x**(8/3)), True))
```

GIAC/XCAS [A] time = 0.21732, size = 153, normalized size = 1.14

$$-\frac{3\,a^{8}\ln\left(\left|ax^{\frac{1}{3}}+b\right|\right)}{b^{9}}+\frac{a^{8}\ln\left(|x|\right)}{b^{9}}+\frac{840\,a^{7}bx^{\frac{7}{3}}-420\,a^{6}b^{2}x^{2}+280\,a^{5}b^{3}x^{\frac{5}{3}}-210\,a^{4}b^{4}x^{\frac{4}{3}}+168\,a^{3}b^{5}x-140\,a^{2}b^{6}x^{\frac{2}{3}}+120\,ab^{7}x^{\frac{1}{3}}-105\,b^{8}}{280\,b^{9}x^{\frac{8}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))*x^4),x, algorithm="giac")
```

```
[Out] -3*a^8*ln(abs(a*x^(1/3) + b))/b^9 + a^8*ln(abs(x))/b^9 + 1/280*(8
40*a^7*b*x^(7/3) - 420*a^6*b^2*x^2 + 280*a^5*b^3*x^(5/3) - 210*a^
4*b^4*x^(4/3) + 168*a^3*b^5*x - 140*a^2*b^6*x^(2/3) + 120*a*b^7*x
^(1/3) - 105*b^8)/(b^9*x^(8/3))
```

3.2421 $\int \frac{1}{\left(a+\frac{b}{\sqrt[3]{x}}\right)x^5}\,dx$

Optimal. Leaf size=179

$$\frac{3a^{11}\log\left(a\sqrt[3]{x}+b\right)}{b^{12}}-\frac{a^{11}\log(x)}{b^{12}}-\frac{3a^{10}}{b^{11}\sqrt[3]{x}}+\frac{3a^9}{2b^{10}x^{2/3}}-\frac{a^8}{b^9x}+\frac{3a^7}{4b^8x^{4/3}}-\frac{3a^6}{5b^7x^{5/3}}+\frac{a^5}{2b^6x^2}-\frac{3a^4}{7b^5x^{7/3}}+\frac{3a^3}{8b^4x^{8/3}}-\frac{a^2}{3b^3x^3}+\frac{3a}{10b^2x^{10/3}}-\frac{3}{11bx^{11/3}}$$

```
[Out] -3/(11*b*x^(11/3)) + (3*a)/(10*b^2*x^(10/3)) - a^2/(3*b^3*x^3) +
(3*a^3)/(8*b^4*x^(8/3)) - (3*a^4)/(7*b^5*x^(7/3)) + a^5/(2*b^6*x^
2) - (3*a^6)/(5*b^7*x^(5/3)) + (3*a^7)/(4*b^8*x^(4/3)) - a^8/(b^9
*x) + (3*a^9)/(2*b^10*x^(2/3)) - (3*a^10)/(b^11*x^(1/3)) + (3*a^1
1*Log[b + a*x^(1/3)])/b^12 - (a^11*Log[x])/b^12
```

Rubi [A] time = 0.2345, antiderivative size = 179, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{3a^{11}\log\left(a\sqrt[3]{x}+b\right)}{b^{12}}-\frac{a^{11}\log(x)}{b^{12}}-\frac{3a^{10}}{b^{11}\sqrt[3]{x}}+\frac{3a^9}{2b^{10}x^{2/3}}-\frac{a^8}{b^9x}+\frac{3a^7}{4b^8x^{4/3}}-\frac{3a^6}{5b^7x^{5/3}}+\frac{a^5}{2b^6x^2}-\frac{3a^4}{7b^5x^{7/3}}+\frac{3a^3}{8b^4x^{8/3}}-\frac{a^2}{3b^3x^3}+\frac{3a}{10b^2x^{10/3}}-\frac{3}{11bx^{11/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^(1/3))*x^5),x]
```

```
[Out] -3/(11*b*x^(11/3)) + (3*a)/(10*b^2*x^(10/3)) - a^2/(3*b^3*x^3) +
(3*a^3)/(8*b^4*x^(8/3)) - (3*a^4)/(7*b^5*x^(7/3)) + a^5/(2*b^6*x^
2) - (3*a^6)/(5*b^7*x^(5/3)) + (3*a^7)/(4*b^8*x^(4/3)) - a^8/(b^9
*x) + (3*a^9)/(2*b^10*x^(2/3)) - (3*a^10)/(b^11*x^(1/3)) + (3*a^1
1*Log[b + a*x^(1/3)])/b^12 - (a^11*Log[x])/b^12
```

Rubi in Sympy [A] time = 35.9582, size = 178, normalized size = 0.99

$$-\frac{3a^{11}\log\left(\sqrt[3]{x}\right)}{b^{12}}+\frac{3a^{11}\log\left(a\sqrt[3]{x}+b\right)}{b^{12}}-\frac{3a^{10}}{b^{11}\sqrt[3]{x}}+\frac{3a^9}{2b^{10}x^{\frac{2}{3}}}-\frac{a^8}{b^9x}+\frac{3a^7}{4b^8x^{\frac{4}{3}}}-\frac{3a^6}{5b^7x^{\frac{5}{3}}}+\frac{a^5}{2b^6x^2}-\frac{3a^4}{7b^5x^{\frac{7}{3}}}+\frac{3a^3}{8b^4x^{\frac{8}{3}}}-\frac{a^2}{3b^3x^3}+\frac{3a}{10b^2x^{\frac{10}{3}}}-\frac{3}{11bx^{\frac{11}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**(1/3))/x**5,x)
```

```
[Out] -3*a**11*log(x**(1/3))/b**12 + 3*a**11*log(a*x**(1/3) + b)/b**12
- 3*a**10/(b**11*x**(1/3)) + 3*a**9/(2*b**10*x**(2/3)) - a**8/(b*
*9*x) + 3*a**7/(4*b**8*x**(4/3)) - 3*a**6/(5*b**7*x**(5/3)) + a**
5/(2*b**6*x**2) - 3*a**4/(7*b**5*x**(7/3)) + 3*a**3/(8*b**4*x**(8
/3)) - a**2/(3*b**3*x**3) + 3*a/(10*b**2*x**(10/3)) - 3/(11*b*x**
(11/3))
```

Mathematica [A] time = 0.331807, size = 158, normalized size = 0.88

$$\frac{27720a^{11}\log\left(a\sqrt[3]{x}+b\right)-9240a^{11}\log(x)+\frac{b\left(-27720a^{10}x^{10/3}+13860a^9bx^3-9240a^8b^2x^{8/3}+6930a^7b^3x^{7/3}-5544a^6b^4x^2+4620a^5b^5x^{5/3}-3960a^4b^6x\right.}{x^{11/3}}}{9240b^{12}}$$

Antiderivative was successfully verified.

```
[In]   Integrate[1/((a + b/x^(1/3))*x^5),x]
```

```
[Out] ((b*(-2520*b^10 + 2772*a*b^9*x^(1/3) - 3080*a^2*b^8*x^(2/3) + 346
5*a^3*b^7*x - 3960*a^4*b^6*x^(4/3) + 4620*a^5*b^5*x^(5/3) - 5544*
a^6*b^4*x^2 + 6930*a^7*b^3*x^(7/3) - 9240*a^8*b^2*x^(8/3) + 13860
*a^9*b*x^3 - 27720*a^10*x^(10/3)))/x^(11/3) + 27720*a^11*Log[b +
a*x^(1/3)] - 9240*a^11*Log[x])/(9240*b^12)
```

Maple [A] time = 0.016, size = 144, normalized size = 0.8

$$-\frac{3}{11\,b}x^{-\frac{11}{3}}+\frac{3\,a}{10\,b^{2}}x^{-\frac{10}{3}}-\frac{a^{2}}{3\,b^{3}x^{3}}+\frac{3\,a^{3}}{8\,b^{4}}x^{-\frac{8}{3}}-\frac{3\,a^{4}}{7\,b^{5}}x^{-\frac{7}{3}}+\frac{a^{5}}{2\,b^{6}x^{2}}-\frac{3\,a^{6}}{5\,b^{7}}x^{-\frac{5}{3}}+\frac{3\,a^{7}}{4\,b^{8}}x^{-\frac{4}{3}}-\frac{a^{8}}{b^{9}x}+\frac{3\,a^{9}}{2\,b^{10}}x^{-\frac{2}{3}}-3\,\frac{a^{10}}{b^{11}\sqrt[3]{x}}+3\,\frac{a^{11}\ln\left(b+a\sqrt[3]{x}\right)}{b^{12}}-\frac{a^{11}\ln(x)}{b^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/(a+b/x^(1/3))/x^5,x)
```

```
[Out] -3/11/b/x^(11/3)+3/10*a/b^2/x^(10/3)-1/3*a^2/b^3/x^3+3/8*a^3/b^4/
x^(8/3)-3/7*a^4/b^5/x^(7/3)+1/2*a^5/b^6/x^2-3/5*a^6/b^7/x^(5/3)+3
/4*a^7/b^8/x^(4/3)-a^8/b^9/x+3/2*a^9/b^10/x^(2/3)-3*a^10/b^11/x^(
1/3)+3*a^11*ln(b+a*x^(1/3))/b^12-a^11*ln(x)/b^12
```

Maxima [A] time = 1.43824, size = 266, normalized size = 1.49

$$\frac{3\,a^{11}\log\left(a+\frac{b}{x^{\frac{1}{3}}}\right)}{b^{12}}-\frac{3\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{11}}{11\,b^{12}}+\frac{33\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{10}a}{10\,b^{12}}-\frac{55\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{9}a^{2}}{3\,b^{12}}+\frac{495\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{8}a^{3}}{8\,b^{12}}-\frac{990\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{7}a^{4}}{7\,b^{12}}+\frac{231\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{6}a^{5}}{b^{12}}-\frac{1386\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{5}a^{6}}{5\,b^{12}}+\frac{495\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{4}a^{7}}{2\,b^{12}}-\frac{165\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{3}a^{8}}{b^{12}}+\frac{165\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{2}a^{9}}{2\,b^{12}}-\frac{33\left(a+\frac{b}{x^{\frac{1}{3}}}\right)a^{10}}{b^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x^(1/3))*x^5),x, algorithm="maxima")
```

```
[Out] 3*a^11*log(a + b/x^(1/3))/b^12 - 3/11*(a + b/x^(1/3))^11/b^12 + 3
3/10*(a + b/x^(1/3))^10*a/b^12 - 55/3*(a + b/x^(1/3))^9*a^2/b^12
+ 495/8*(a + b/x^(1/3))^8*a^3/b^12 - 990/7*(a + b/x^(1/3))^7*a^4/
b^12 + 231*(a + b/x^(1/3))^6*a^5/b^12 - 1386/5*(a + b/x^(1/3))^5*
a^6/b^12 + 495/2*(a + b/x^(1/3))^4*a^7/b^12 - 165*(a + b/x^(1/3))
^3*a^8/b^12 + 165/2*(a + b/x^(1/3))^2*a^9/b^12 - 33*(a + b/x^(1/3
))*a^10/b^12
```

Fricas [A] time = 0.236319, size = 200, normalized size = 1.12

$$\frac{27720\,a^{11}x^{\frac{11}{3}}\log\left(ax^{\frac{1}{3}}+b\right)-27720\,a^{11}x^{\frac{11}{3}}\log\left(x^{\frac{1}{3}}\right)+13860\,a^{9}b^{2}x^{3}-5544\,a^{6}b^{5}x^{2}+3465\,a^{3}b^{8}x-2520\,b^{11}-1540\left(6\,a^{8}b^{3}\right.}{9240\,b^{12}x^{\frac{11}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x^(1/3))*x^5),x, algorithm="fricas")
```

```
[Out] 1/9240*(27720*a^11*x^(11/3)*log(a*x^(1/3) + b) - 27720*a^11*x^(11
/3)*log(x^(1/3)) + 13860*a^9*b^2*x^3 - 5544*a^6*b^5*x^2 + 3465*a^
3*b^8*x - 2520*b^11 - 1540*(6*a^8*b^3*x^2 - 3*a^5*b^6*x + 2*a^2*b
^9)*x^(2/3) - 198*(140*a^10*b*x^3 - 35*a^7*b^4*x^2 + 20*a^4*b^7*x
 - 14*a*b^10)*x^(1/3))/(b^12*x^(11/3))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**(1/3))/x**5,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.217236, size = 198, normalized size = 1.11

$$\frac{3\,a^{11}\ln\left(\left|ax^{\frac{1}{3}}+b\right|\right)}{b^{12}}-\frac{a^{11}\ln\left(|x|\right)}{b^{12}}-\frac{27720\,a^{10}bx^{\frac{10}{3}}-13860\,a^{9}b^{2}x^{3}+9240\,a^{8}b^{3}x^{\frac{8}{3}}-6930\,a^{7}b^{4}x^{\frac{7}{3}}+5544\,a^{6}b^{5}x^{2}-4620\,a^{5}b^{6}x^{\frac{5}{3}}+3960\,a^{4}b^{7}x^{\frac{4}{3}}-3465\,a^{3}b^{8}x+}{9240\,b^{12}x^{\frac{11}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))*x^5),x, algorithm="giac")
```

```
[Out] 3*a^11*ln(abs(a*x^(1/3) + b))/b^12 - a^11*ln(abs(x))/b^12 - 1/924
0*(27720*a^10*b*x^(10/3) - 13860*a^9*b^2*x^3 + 9240*a^8*b^3*x^(8/
3) - 6930*a^7*b^4*x^(7/3) + 5544*a^6*b^5*x^2 - 4620*a^5*b^6*x^(5/
3) + 3960*a^4*b^7*x^(4/3) - 3465*a^3*b^8*x + 3080*a^2*b^9*x^(2/3)
 - 2772*a*b^10*x^(1/3) + 2520*b^11)/(b^12*x^(11/3))
```

3.2422 $\int \frac{x^2}{\left(a+\frac{b}{\sqrt[3]{x}}\right)^2} dx$

Optimal. Leaf size=150

$$-\frac{3b^{10}}{a^{11}\left(a\sqrt[3]{x}+b\right)}-\frac{30b^9\log\left(a\sqrt[3]{x}+b\right)}{a^{11}}+\frac{27b^8\sqrt[3]{x}}{a^{10}}-\frac{12b^7x^{2/3}}{a^9}+\frac{7b^6x}{a^8}-\frac{9b^5x^{4/3}}{2a^7}+\frac{3b^4x^{5/3}}{a^6}-\frac{2b^3x^2}{a^5}+\frac{9b^2x^{7/3}}{7a^4}-\frac{3bx^{8/3}}{4a^3}+\frac{x^3}{3a^2}$$

```
[Out] (-3*b^10)/(a^11*(b + a*x^(1/3))) + (27*b^8*x^(1/3))/a^10 - (12*b^
7*x^(2/3))/a^9 + (7*b^6*x)/a^8 - (9*b^5*x^(4/3))/(2*a^7) + (3*b^4
*x^(5/3))/a^6 - (2*b^3*x^2)/a^5 + (9*b^2*x^(7/3))/(7*a^4) - (3*b*
x^(8/3))/(4*a^3) + x^3/(3*a^2) - (30*b^9*Log[b + a*x^(1/3)])/a^11
```

Rubi [A] time = 0.281659, antiderivative size = 150, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{3b^{10}}{a^{11}\left(a\sqrt[3]{x}+b\right)}-\frac{30b^9\log\left(a\sqrt[3]{x}+b\right)}{a^{11}}+\frac{27b^8\sqrt[3]{x}}{a^{10}}-\frac{12b^7x^{2/3}}{a^9}+\frac{7b^6x}{a^8}-\frac{9b^5x^{4/3}}{2a^7}+\frac{3b^4x^{5/3}}{a^6}-\frac{2b^3x^2}{a^5}+\frac{9b^2x^{7/3}}{7a^4}-\frac{3bx^{8/3}}{4a^3}+\frac{x^3}{3a^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b/x^(1/3))^2,x]
```

```
[Out] (-3*b^10)/(a^11*(b + a*x^(1/3))) + (27*b^8*x^(1/3))/a^10 - (12*b^
7*x^(2/3))/a^9 + (7*b^6*x)/a^8 - (9*b^5*x^(4/3))/(2*a^7) + (3*b^4
*x^(5/3))/a^6 - (2*b^3*x^2)/a^5 + (9*b^2*x^(7/3))/(7*a^4) - (3*b*
x^(8/3))/(4*a^3) + x^3/(3*a^2) - (30*b^9*Log[b + a*x^(1/3)])/a^11
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{x^3}{3a^2}-\frac{3bx^{\frac{8}{3}}}{4a^3}+\frac{9b^2x^{\frac{7}{3}}}{7a^4}-\frac{2b^3x^2}{a^5}+\frac{3b^4x^{\frac{5}{3}}}{a^6}-\frac{9b^5x^{\frac{4}{3}}}{2a^7}+\frac{7b^6x}{a^8}-\frac{24b^7\int^{\sqrt[3]{x}}x\,dx}{a^9}+\frac{27b^8\sqrt[3]{x}}{a^{10}}-\frac{3b^{10}}{a^{11}\left(a\sqrt[3]{x}+b\right)}-\frac{30b^9\log\left(a\sqrt[3]{x}+b\right)}{a^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b/x**(1/3))**2,x)
```

```
[Out] x**3/(3*a**2) - 3*b*x**(8/3)/(4*a**3) + 9*b**2*x**(7/3)/(7*a**4)
- 2*b**3*x**2/a**5 + 3*b**4*x**(5/3)/a**6 - 9*b**5*x**(4/3)/(2*a*
*7) + 7*b**6*x/a**8 - 24*b**7*Integral(x, (x, x**(1/3)))/a**9 + 2
7*b**8*x**(1/3)/a**10 - 3*b**10/(a**11*(a*x**(1/3) + b)) - 30*b**
9*log(a*x**(1/3) + b)/a**11
```

Mathematica [A] time = 0.104455, size = 150, normalized size = 1.

$$-\frac{3b^{10}}{a^{11}\left(a\sqrt[3]{x}+b\right)}-\frac{30b^9\log\left(a\sqrt[3]{x}+b\right)}{a^{11}}+\frac{27b^8\sqrt[3]{x}}{a^{10}}-\frac{12b^7x^{2/3}}{a^9}+\frac{7b^6x}{a^8}-\frac{9b^5x^{4/3}}{2a^7}+\frac{3b^4x^{5/3}}{a^6}-\frac{2b^3x^2}{a^5}+\frac{9b^2x^{7/3}}{7a^4}-\frac{3bx^{8/3}}{4a^3}+\frac{x^3}{3a^2}$$

Antiderivative was successfully verified.

```
[In]   Integrate[x^2/(a + b/x^(1/3))^2,x]
```

```
[Out] (-3*b^10)/(a^11*(b + a*x^(1/3))) + (27*b^8*x^(1/3))/a^10 - (12*b^
7*x^(2/3))/a^9 + (7*b^6*x)/a^8 - (9*b^5*x^(4/3))/(2*a^7) + (3*b^4
*x^(5/3))/a^6 - (2*b^3*x^2)/a^5 + (9*b^2*x^(7/3))/(7*a^4) - (3*b*
x^(8/3))/(4*a^3) + x^3/(3*a^2) - (30*b^9*Log[b + a*x^(1/3)])/a^11
```

Maple [A] time = 0.012, size = 127, normalized size = 0.9

$$-3\frac{b^{10}}{a^{11}\left(b+a\sqrt[3]{x}\right)}+27\frac{b^{8}\sqrt[3]{x}}{a^{10}}-12\frac{b^{7}x^{2/3}}{a^{9}}+7\frac{b^{6}x}{a^{8}}-\frac{9b^{5}}{2a^{7}}x^{\frac{4}{3}}+3\frac{b^{4}x^{5/3}}{a^{6}}-2\frac{b^{3}x^{2}}{a^{5}}+\frac{9b^{2}}{7a^{4}}x^{\frac{7}{3}}-\frac{3b}{4a^{3}}x^{\frac{8}{3}}+\frac{x^{3}}{3a^{2}}-30\frac{b^{9}\ln\left(b+a\sqrt[3]{x}\right)}{a^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^2/(a+b/x^(1/3))^2,x)
```

```
[Out] -3*b^10/a^11/(b+a*x^(1/3))+27*b^8*x^(1/3)/a^10-12*b^7*x^(2/3)/a^9
+7*b^6*x/a^8-9/2*b^5*x^(4/3)/a^7+3*b^4*x^(5/3)/a^6-2*b^3*x^2/a^5+
9/7*b^2*x^(7/3)/a^4-3/4*b*x^(8/3)/a^3+1/3*x^3/a^2-30*b^9*ln(b+a*x
^(1/3))/a^11
```

Maxima [A] time = 1.44173, size = 196, normalized size = 1.31

$$\frac{28a^{9}-\frac{35a^{8}b}{x^{\frac{1}{3}}}+\frac{45a^{7}b^{2}}{x^{\frac{2}{3}}}-\frac{60a^{6}b^{3}}{x}+\frac{84a^{5}b^{4}}{x^{\frac{4}{3}}}-\frac{126a^{4}b^{5}}{x^{\frac{5}{3}}}+\frac{210a^{3}b^{6}}{x^{2}}-\frac{420a^{2}b^{7}}{x^{\frac{7}{3}}}+\frac{1260ab^{8}}{x^{\frac{8}{3}}}+\frac{2520b^{9}}{x^{3}}}{84\left(\frac{a^{11}}{x^{3}}+\frac{a^{10}b}{x^{\frac{10}{3}}}\right)}-\frac{30b^{9}\log\left(a+\frac{b}{x^{\frac{1}{3}}}\right)}{a^{11}}-\frac{10b^{9}\log\left(x\right)}{a^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^2/(a + b/x^(1/3))^2,x, algorithm="maxima")
```

```
[Out] 1/84*(28*a^9 - 35*a^8*b/x^(1/3) + 45*a^7*b^2/x^(2/3) - 60*a^6*b^3
/x + 84*a^5*b^4/x^(4/3) - 126*a^4*b^5/x^(5/3) + 210*a^3*b^6/x^2 -
 420*a^2*b^7/x^(7/3) + 1260*a*b^8/x^(8/3) + 2520*b^9/x^3)/(a^11/x
^3 + a^10*b/x^(10/3)) - 30*b^9*log(a + b/x^(1/3))/a^11 - 10*b^9*l
og(x)/a^11
```

Fricas [A] time = 0.22898, size = 200, normalized size = 1.33

$$-\frac{35a^{9}bx^{3}-84a^{6}b^{4}x^{2}+420a^{3}b^{7}x+252b^{10}+2520\left(ab^{9}x^{\frac{1}{3}}+b^{10}\right)\log\left(ax^{\frac{1}{3}}+b\right)-9\left(5a^{8}b^{2}x^{2}-14a^{5}b^{5}x+140a^{2}b^{8}\right)x^{\frac{2}{3}}-}{84\left(a^{12}x^{\frac{1}{3}}+a^{11}b\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^2/(a + b/x^(1/3))^2,x, algorithm="fricas")
```

```
[Out] -1/84*(35*a^9*b*x^3 - 84*a^6*b^4*x^2 + 420*a^3*b^7*x + 252*b^10 +
 2520*(a*b^9*x^(1/3) + b^10)*log(a*x^(1/3) + b) - 9*(5*a^8*b^2*x^
2 - 14*a^5*b^5*x + 140*a^2*b^8)*x^(2/3) - 2*(14*a^10*x^3 - 30*a^7
```

```
*b^3*x^2 + 105*a^4*b^6*x + 1134*a*b^9)*x^(1/3))/(a^12*x^(1/3) + a
^11*b)
```

Sympy [A] time = 23.5188, size = 367, normalized size = 2.45

$$\begin{cases} \frac{28a^{10}x^{\frac{10}{3}}}{84a^{12}\sqrt[3]{x}+84a^{11}b} - \frac{35a^9bx^3}{84a^{12}\sqrt[3]{x}+84a^{11}b} + \frac{45a^8b^2x^{\frac{8}{3}}}{84a^{12}\sqrt[3]{x}+84a^{11}b} - \frac{60a^7b^3x^{\frac{7}{3}}}{84a^{12}\sqrt[3]{x}+84a^{11}b} + \frac{84a^6b^4x^2}{84a^{12}\sqrt[3]{x}+84a^{11}b} - \frac{126a^5b^5x^{\frac{5}{3}}}{84a^{12}\sqrt[3]{x}+84a^{11}b} + \frac{210a^4b^6x^{\frac{4}{3}}}{84a^{12}\sqrt[3]{x}+84a^{11}b} - \\ \frac{3x^{\frac{11}{3}}}{11b^2} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b/x**(1/3))**2,x)
```

```
[Out] Piecewise((28*a**10*x**(10/3)/(84*a**12*x**(1/3) + 84*a**11*b) -
35*a**9*b*x**3/(84*a**12*x**(1/3) + 84*a**11*b) + 45*a**8*b**2*x*
*(8/3)/(84*a**12*x**(1/3) + 84*a**11*b) - 60*a**7*b**3*x**(7/3)/(
84*a**12*x**(1/3) + 84*a**11*b) + 84*a**6*b**4*x**2/(84*a**12*x**
(1/3) + 84*a**11*b) - 126*a**5*b**5*x**(5/3)/(84*a**12*x**(1/3) +
 84*a**11*b) + 210*a**4*b**6*x**(4/3)/(84*a**12*x**(1/3) + 84*a**
11*b) - 420*a**3*b**7*x/(84*a**12*x**(1/3) + 84*a**11*b) + 1260*a
**2*b**8*x**(2/3)/(84*a**12*x**(1/3) + 84*a**11*b) - 2520*a*b**9*
x**(1/3)*log(x**(1/3) + b/a)/(84*a**12*x**(1/3) + 84*a**11*b) - 2
520*b**10*log(x**(1/3) + b/a)/(84*a**12*x**(1/3) + 84*a**11*b) -
2520*b**10/(84*a**12*x**(1/3) + 84*a**11*b), Ne(a, 0)), (3*x**(11
/3)/(11*b**2), True))
```

GIAC/XCAS [A] time = 0.214604, size = 180, normalized size = 1.2

$$-\frac{30\,b^9\ln\left(\left|ax^{\frac{1}{3}}+b\right|\right)}{a^{11}} - \frac{3\,b^{10}}{\left(ax^{\frac{1}{3}}+b\right)a^{11}} + \frac{28\,a^{16}x^3 - 63\,a^{15}bx^{\frac{8}{3}} + 108\,a^{14}b^2x^{\frac{7}{3}} - 168\,a^{13}b^3x^2 + 252\,a^{12}b^4x^{\frac{5}{3}} - 378\,a^{11}b^5x^{\frac{4}{3}} + 588\,a^{10}b^6x - 1008\,a^9b^7x^{\frac{2}{3}} + 2268\,a^8b^8x^{\frac{1}{3}}}{84\,a^{18}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x^(1/3))^2,x, algorithm="giac")
```

```
[Out] -30*b^9*ln(abs(a*x^(1/3) + b))/a^11 - 3*b^10/((a*x^(1/3) + b)*a^1
1) + 1/84*(28*a^16*x^3 - 63*a^15*b*x^(8/3) + 108*a^14*b^2*x^(7/3)
 - 168*a^13*b^3*x^2 + 252*a^12*b^4*x^(5/3) - 378*a^11*b^5*x^(4/3)
 + 588*a^10*b^6*x - 1008*a^9*b^7*x^(2/3) + 2268*a^8*b^8*x^(1/3))/
a^18
```

3.2423 $\int \frac{x}{\left(a+\frac{b}{\sqrt[3]{x}}\right)^2}\,dx$

Optimal. Leaf size=113

$$\frac{3b^7}{a^8\left(a\sqrt[3]{x}+b\right)}+\frac{21b^6\log\left(a\sqrt[3]{x}+b\right)}{a^8}-\frac{18b^5\sqrt[3]{x}}{a^7}+\frac{15b^4x^{2/3}}{2a^6}-\frac{4b^3x}{a^5}+\frac{9b^2x^{4/3}}{4a^4}-\frac{6bx^{5/3}}{5a^3}+\frac{x^2}{2a^2}$$

```
[Out] (3*b^7)/(a^8*(b + a*x^(1/3))) - (18*b^5*x^(1/3))/a^7 + (15*b^4*x^
(2/3))/(2*a^6) - (4*b^3*x)/a^5 + (9*b^2*x^(4/3))/(4*a^4) - (6*b*x
^(5/3))/(5*a^3) + x^2/(2*a^2) + (21*b^6*Log[b + a*x^(1/3)])/a^8
```

Rubi [A] time = 0.194628, antiderivative size = 113, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{3b^7}{a^8\left(a\sqrt[3]{x}+b\right)}+\frac{21b^6\log\left(a\sqrt[3]{x}+b\right)}{a^8}-\frac{18b^5\sqrt[3]{x}}{a^7}+\frac{15b^4x^{2/3}}{2a^6}-\frac{4b^3x}{a^5}+\frac{9b^2x^{4/3}}{4a^4}-\frac{6bx^{5/3}}{5a^3}+\frac{x^2}{2a^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b/x^(1/3))^2,x]
```

```
[Out] (3*b^7)/(a^8*(b + a*x^(1/3))) - (18*b^5*x^(1/3))/a^7 + (15*b^4*x^
(2/3))/(2*a^6) - (4*b^3*x)/a^5 + (9*b^2*x^(4/3))/(4*a^4) - (6*b*x
^(5/3))/(5*a^3) + x^2/(2*a^2) + (21*b^6*Log[b + a*x^(1/3)])/a^8
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{x^2}{2a^2}-\frac{6bx^{\frac{5}{3}}}{5a^3}+\frac{9b^2x^{\frac{4}{3}}}{4a^4}-\frac{4b^3x}{a^5}+\frac{15b^4\int^{\sqrt[3]{x}}x\,dx}{a^6}-\frac{18b^5\sqrt[3]{x}}{a^7}+\frac{3b^7}{a^8\left(a\sqrt[3]{x}+b\right)}+\frac{21b^6\log\left(a\sqrt[3]{x}+b\right)}{a^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b/x**(1/3))**2,x)
```

```
[Out] x**2/(2*a**2) - 6*b*x**(5/3)/(5*a**3) + 9*b**2*x**(4/3)/(4*a**4)
- 4*b**3*x/a**5 + 15*b**4*Integral(x, (x, x**(1/3)))/a**6 - 18*b*
*5*x**(1/3)/a**7 + 3*b**7/(a**8*(a*x**(1/3) + b)) + 21*b**6*log(a
*x**(1/3) + b)/a**8
```

Mathematica [A] time = 0.0605347, size = 104, normalized size = 0.92

$$\frac{10a^6x^2-24a^5bx^{5/3}+45a^4b^2x^{4/3}-80a^3b^3x+150a^2b^4x^{2/3}+\frac{60b^7}{a\sqrt[3]{x}+b}+420b^6\log\left(a\sqrt[3]{x}+b\right)-360ab^5\sqrt[3]{x}}{20a^8}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b/x^(1/3))^2,x]
```

```
[Out] ((60*b^7)/(b + a*x^(1/3)) - 360*a*b^5*x^(1/3) + 150*a^2*b^4*x^(2/
3) - 80*a^3*b^3*x + 45*a^4*b^2*x^(4/3) - 24*a^5*b*x^(5/3) + 10*a^
6*x^2 + 420*b^6*Log[b + a*x^(1/3)])/(20*a^8)
```

Maple [A] time = 0.011, size = 94, normalized size = 0.8

$$3\frac{b^{7}}{a^{8}\left(b+a\sqrt[3]{x}\right)}-18\frac{b^{5}\sqrt[3]{x}}{a^{7}}+\frac{15\,b^{4}}{2\,a^{6}}x^{\frac{2}{3}}-4\frac{b^{3}x}{a^{5}}+\frac{9\,b^{2}}{4\,a^{4}}x^{\frac{4}{3}}-\frac{6\,b}{5\,a^{3}}x^{\frac{5}{3}}+\frac{x^{2}}{2\,a^{2}}+21\frac{b^{6}\ln\left(b+a\sqrt[3]{x}\right)}{a^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+b/x^(1/3))^2,x)
```

```
[Out] 3*b^7/a^8/(b+a*x^(1/3))-18*b^5*x^(1/3)/a^7+15/2*b^4*x^(2/3)/a^6-4
*b^3*x/a^5+9/4*b^2*x^(4/3)/a^4-6/5*b*x^(5/3)/a^3+1/2*x^2/a^2+21*b
^6*ln(b+a*x^(1/3))/a^8
```

Maxima [A] time = 1.42656, size = 151, normalized size = 1.34

$$\frac{10\,a^{6}-\frac{14\,a^{5}b}{x^{\frac{1}{3}}}+\frac{21\,a^{4}b^{2}}{x^{\frac{2}{3}}}-\frac{35\,a^{3}b^{3}}{x}+\frac{70\,a^{2}b^{4}}{x^{\frac{4}{3}}}-\frac{210\,ab^{5}}{x^{\frac{5}{3}}}-\frac{420\,b^{6}}{x^{2}}}{20\left(\frac{a^{8}}{x^{2}}+\frac{a^{7}b}{x^{\frac{7}{3}}}\right)}+\frac{21\,b^{6}\log\left(a+\frac{b}{x^{\frac{1}{3}}}\right)}{a^{8}}+\frac{7\,b^{6}\log\left(x\right)}{a^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x^(1/3))^2,x, algorithm="maxima")
```

```
[Out] 1/20*(10*a^6 - 14*a^5*b/x^(1/3) + 21*a^4*b^2/x^(2/3) - 35*a^3*b^3
/x + 70*a^2*b^4/x^(4/3) - 210*a*b^5/x^(5/3) - 420*b^6/x^2)/(a^8/x
^2 + a^7*b/x^(7/3)) + 21*b^6*log(a + b/x^(1/3))/a^8 + 7*b^6*log(x
)/a^8
```

Fricas [A] time = 0.230294, size = 154, normalized size = 1.36

$$-\frac{14\,a^{6}bx^{2}-70\,a^{3}b^{4}x-60\,b^{7}-420\left(ab^{6}x^{\frac{1}{3}}+b^{7}\right)\log\left(ax^{\frac{1}{3}}+b\right)-21\left(a^{5}b^{2}x-10\,a^{2}b^{5}\right)x^{\frac{2}{3}}-5\left(2\,a^{7}x^{2}-7\,a^{4}b^{3}x-72\,ab^{6}\right)}{20\left(a^{9}x^{\frac{1}{3}}+a^{8}b\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x^(1/3))^2,x, algorithm="fricas")
```

```
[Out] -1/20*(14*a^6*b*x^2 - 70*a^3*b^4*x - 60*b^7 - 420*(a*b^6*x^(1/3)
+ b^7)*log(a*x^(1/3) + b) - 21*(a^5*b^2*x - 10*a^2*b^5)*x^(2/3) -
 5*(2*a^7*x^2 - 7*a^4*b^3*x - 72*a*b^6)*x^(1/3))/(a^9*x^(1/3) + a
^8*b)
```

Sympy [A] time = 48.0661, size = 415, normalized size = 3.67

$$\frac{10a^{7}x^{\frac{137}{3}}}{20a^{9}x^{\frac{131}{3}}+20a^{8}bx^{\frac{130}{3}}}-\frac{14a^{6}bx^{\frac{136}{3}}}{20a^{9}x^{\frac{131}{3}}+20a^{8}bx^{\frac{130}{3}}}+\frac{21a^{5}b^{2}x^{45}}{20a^{9}x^{\frac{131}{3}}+20a^{8}bx^{\frac{130}{3}}}-\frac{35a^{4}b^{3}x^{\frac{134}{3}}}{20a^{9}x^{\frac{131}{3}}+20a^{8}bx^{\frac{130}{3}}}+\frac{70a^{3}b^{4}x^{\frac{133}{3}}}{20a^{9}x^{\frac{131}{3}}+20a^{8}bx^{\frac{130}{3}}}-\frac{210a^{2}b^{5}x^{44}}{20a^{9}x^{\frac{131}{3}}+20a^{8}bx^{\frac{130}{3}}}-\frac{420ab^{6}x^{\frac{131}{3}}\log\left(\frac{b}{a\sqrt[3]{x}}\right)}{20a^{9}x^{\frac{131}{3}}+20a^{8}bx^{\frac{130}{3}}}+\frac{420ab^{6}x^{\frac{131}{3}}\log\left(1+\frac{b}{a\sqrt[3]{x}}\right)}{20a^{9}x^{\frac{131}{3}}+20a^{8}bx^{\frac{130}{3}}}-\frac{420ab^{6}x^{\frac{131}{3}}}{20a^{9}x^{\frac{131}{3}}+20a^{8}bx^{\frac{130}{3}}}-\frac{420b^{7}x^{\frac{130}{3}}\log\left(\frac{b}{a\sqrt[3]{x}}\right)}{20a^{9}x^{\frac{131}{3}}+20a^{8}bx^{\frac{130}{3}}}+\frac{420b^{7}x^{\frac{130}{3}}\log\left(1+\frac{b}{a\sqrt[3]{x}}\right)}{20a^{9}x^{\frac{131}{3}}+20a^{8}bx^{\frac{130}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b/x**(1/3))**2,x)
```

```
[Out] 10*a**7*x**(137/3)/(20*a**9*x**(131/3) + 20*a**8*b*x**(130/3)) -
14*a**6*b*x**(136/3)/(20*a**9*x**(131/3) + 20*a**8*b*x**(130/3))
+ 21*a**5*b**2*x**45/(20*a**9*x**(131/3) + 20*a**8*b*x**(130/3))
- 35*a**4*b**3*x**(134/3)/(20*a**9*x**(131/3) + 20*a**8*b*x**(130
/3)) + 70*a**3*b**4*x**(133/3)/(20*a**9*x**(131/3) + 20*a**8*b*x*
*(130/3)) - 210*a**2*b**5*x**44/(20*a**9*x**(131/3) + 20*a**8*b*x
**(130/3)) - 420*a*b**6*x**(131/3)*log(b/(a*x**(1/3)))/(20*a**9*x
**(131/3) + 20*a**8*b*x**(130/3)) + 420*a*b**6*x**(131/3)*log(1 +
 b/(a*x**(1/3)))/(20*a**9*x**(131/3) + 20*a**8*b*x**(130/3)) - 42
0*a*b**6*x**(131/3)/(20*a**9*x**(131/3) + 20*a**8*b*x**(130/3)) -
 420*b**7*x**(130/3)*log(b/(a*x**(1/3)))/(20*a**9*x**(131/3) + 20
*a**8*b*x**(130/3)) + 420*b**7*x**(130/3)*log(1 + b/(a*x**(1/3)))
/(20*a**9*x**(131/3) + 20*a**8*b*x**(130/3))
```

GIAC/XCAS [A] time = 0.215663, size = 135, normalized size = 1.19

$$\frac{21\,b^{6}\ln\left(\left|ax^{\frac{1}{3}}+b\right|\right)}{a^{8}}+\frac{3\,b^{7}}{\left(ax^{\frac{1}{3}}+b\right)a^{8}}+\frac{10\,a^{10}x^{2}-24\,a^{9}bx^{\frac{5}{3}}+45\,a^{8}b^{2}x^{\frac{4}{3}}-80\,a^{7}b^{3}x+150\,a^{6}b^{4}x^{\frac{2}{3}}-360\,a^{5}b^{5}x^{\frac{1}{3}}}{20\,a^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x^(1/3))^2,x, algorithm="giac")
```

```
[Out] 21*b^6*ln(abs(a*x^(1/3) + b))/a^8 + 3*b^7/((a*x^(1/3) + b)*a^8) +
 1/20*(10*a^10*x^2 - 24*a^9*b*x^(5/3) + 45*a^8*b^2*x^(4/3) - 80*a
^7*b^3*x + 150*a^6*b^4*x^(2/3) - 360*a^5*b^5*x^(1/3))/a^12
```

3.2424 $\int \frac{1}{\left(a+\frac{b}{\sqrt[3]{x}}\right)^2} dx$

Optimal. Leaf size=77

$$-\frac{12b^3\log\left(a+\frac{b}{\sqrt[3]{x}}\right)}{a^5}-\frac{4b^3\log(x)}{a^5}+\frac{3b^3}{a^4\left(a+\frac{b}{\sqrt[3]{x}}\right)}+\frac{9b^2\sqrt[3]{x}}{a^4}-\frac{3bx^{2/3}}{a^3}+\frac{x}{a^2}$$

```
[Out] (3*b^3)/(a^4*(a + b/x^(1/3))) + (9*b^2*x^(1/3))/a^4 - (3*b*x^(2/3
))/a^3 + x/a^2 - (12*b^3*Log[a + b/x^(1/3)])/a^5 - (4*b^3*Log[x])
/a^5
```

Rubi [A] time = 0.124196, antiderivative size = 77, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$-\frac{12b^3\log\left(a+\frac{b}{\sqrt[3]{x}}\right)}{a^5}-\frac{4b^3\log(x)}{a^5}+\frac{3b^3}{a^4\left(a+\frac{b}{\sqrt[3]{x}}\right)}+\frac{9b^2\sqrt[3]{x}}{a^4}-\frac{3bx^{2/3}}{a^3}+\frac{x}{a^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^(1/3))^(-2),x]
```

```
[Out] (3*b^3)/(a^4*(a + b/x^(1/3))) + (9*b^2*x^(1/3))/a^4 - (3*b*x^(2/3
))/a^3 + x/a^2 - (12*b^3*Log[a + b/x^(1/3)])/a^5 - (4*b^3*Log[x])
/a^5
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{12b^2\int^{\sqrt[3]{x}}\frac{1}{a^3}\,dx}{a}-\frac{3x}{a\left(a+\frac{b}{\sqrt[3]{x}}\right)}+\frac{4x}{a^2}-\frac{12b\int^{\sqrt[3]{x}}x\,dx}{a^3}-\frac{12b^3\log\left(a\sqrt[3]{x}+b\right)}{a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**(1/3))**2,x)
```

```
[Out] 12*b**2*Integral(a**(-3), (x, x**(1/3)))/a - 3*x/(a*(a + b/x**(1/
3))) + 4*x/a**2 - 12*b*Integral(x, (x, x**(1/3)))/a**3 - 12*b**3*
log(a*x**(1/3) + b)/a**5
```

Mathematica [A] time = 0.0431833, size = 63, normalized size = 0.82

$$\frac{a^3x-3a^2bx^{2/3}-\frac{3b^4}{a\sqrt[3]{x}+b}-12b^3\log\left(a\sqrt[3]{x}+b\right)+9ab^2\sqrt[3]{x}}{a^5}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^(1/3))^(-2),x]
```

```
[Out] ((-3*b^4)/(b + a*x^(1/3)) + 9*a*b^2*x^(1/3) - 3*a^2*b*x^(2/3) + a
^3*x - 12*b^3*Log[b + a*x^(1/3)])/a^5
```

Maple [A] time = 0.01, size = 60, normalized size = 0.8

$$\frac{x}{a^2} - 3\,\frac{bx^{2/3}}{a^3} + 9\,\frac{b^2\sqrt[3]{x}}{a^4} - 3\,\frac{b^4}{\left(b + a\sqrt[3]{x}\right)a^5} - 12\,\frac{b^3\ln\left(b + a\sqrt[3]{x}\right)}{a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b/x^(1/3))^2,x)
```

```
[Out] x/a^2-3*b*x^(2/3)/a^3+9*b^2*x^(1/3)/a^4-3*b^4/(b+a*x^(1/3))/a^5-1
2/a^5*b^3*ln(b+a*x^(1/3))
```

Maxima [A] time = 1.44707, size = 103, normalized size = 1.34

$$\frac{a^3 - \frac{2\,a^2b}{x^{\frac{1}{3}}} + \frac{6\,ab^2}{x^{\frac{2}{3}}} + \frac{12\,b^3}{x}}{\frac{a^5}{x} + \frac{a^4b}{x^{\frac{4}{3}}}} - \frac{12\,b^3\log\left(a + \frac{b}{x^{\frac{1}{3}}}\right)}{a^5} - \frac{4\,b^3\log(x)}{a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a + b/x^(1/3))^(-2),x, algorithm="maxima")
```

```
[Out] (a^3 - 2*a^2*b/x^(1/3) + 6*a*b^2/x^(2/3) + 12*b^3/x)/(a^5/x + a^4
*b/x^(4/3)) - 12*b^3*log(a + b/x^(1/3))/a^5 - 4*b^3*log(x)/a^5
```

Fricas [A] time = 0.226975, size = 108, normalized size = 1.4

$$-\frac{2\,a^3bx - 6\,a^2b^2x^{\frac{2}{3}} + 3\,b^4 + 12\left(ab^3x^{\frac{1}{3}} + b^4\right)\log\left(ax^{\frac{1}{3}} + b\right) - \left(a^4x + 9\,ab^3\right)x^{\frac{1}{3}}}{a^6x^{\frac{1}{3}} + a^5b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a + b/x^(1/3))^(-2),x, algorithm="fricas")
```

```
[Out] -(2*a^3*b*x - 6*a^2*b^2*x^(2/3) + 3*b^4 + 12*(a*b^3*x^(1/3) + b^4
)*log(a*x^(1/3) + b) - (a^4*x + 9*a*b^3)*x^(1/3))/(a^6*x^(1/3) +
a^5*b)
```

Sympy [A] time = 2.26063, size = 165, normalized size = 2.14

$$\begin{cases} \frac{a^4x^{\frac{4}{3}}}{a^6\sqrt[3]{x}+a^5b} - \frac{2a^3bx}{a^6\sqrt[3]{x}+a^5b} + \frac{6a^2b^2x^{\frac{2}{3}}}{a^6\sqrt[3]{x}+a^5b} - \frac{12ab^3\sqrt[3]{x}\log\left(\sqrt[3]{x}+\frac{b}{a}\right)}{a^6\sqrt[3]{x}+a^5b} - \frac{12b^4\log\left(\sqrt[3]{x}+\frac{b}{a}\right)}{a^6\sqrt[3]{x}+a^5b} - \frac{12b^4}{a^6\sqrt[3]{x}+a^5b} & \text{for}\ a \neq 0 \\ \frac{3x^{\frac{5}{3}}}{5b^2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b/x**(1/3))**2,x)
```

```
[Out] Piecewise((a**4*x**(4/3)/(a**6*x**(1/3) + a**5*b) - 2*a**3*b*x/(a
**6*x**(1/3) + a**5*b) + 6*a**2*b**2*x**(2/3)/(a**6*x**(1/3) + a*
```

```
*5*b) - 12*a*b**3*x**(1/3)*log(x**(1/3) + b/a)/(a**6*x**(1/3) + a
**5*b) - 12*b**4*log(x**(1/3) + b/a)/(a**6*x**(1/3) + a**5*b) - 1
2*b**4/(a**6*x**(1/3) + a**5*b), Ne(a, 0)), (3*x**(5/3)/(5*b**2),
 True))
```

GIAC/XCAS [A] time = 0.215128, size = 88, normalized size = 1.14

$$-\frac{12\,b^3\ln\left(\left|ax^{\frac{1}{3}}+b\right|\right)}{a^5}-\frac{3\,b^4}{\left(ax^{\frac{1}{3}}+b\right)a^5}+\frac{a^4x-3\,a^3bx^{\frac{2}{3}}+9\,a^2b^2x^{\frac{1}{3}}}{a^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^(-2),x, algorithm="giac")
```

```
[Out] -12*b^3*ln(abs(a*x^(1/3) + b))/a^5 - 3*b^4/((a*x^(1/3) + b)*a^5)
+ (a^4*x - 3*a^3*b*x^(2/3) + 9*a^2*b^2*x^(1/3))/a^6
```

3.2425 $\int \frac{1}{\left(a+\frac{b}{\sqrt[3]{x}}\right)^2 x} dx$

Optimal. Leaf size=33

$$\frac{3b}{a^2\left(a\sqrt[3]{x}+b\right)}+\frac{3\log\left(a\sqrt[3]{x}+b\right)}{a^2}$$

```
[Out] (3*b)/(a^2*(b + a*x^(1/3))) + (3*Log[b + a*x^(1/3)])/a^2
```

Rubi [A] time = 0.0604464, antiderivative size = 33, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{3b}{a^2\left(a\sqrt[3]{x}+b\right)}+\frac{3\log\left(a\sqrt[3]{x}+b\right)}{a^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^(1/3))^2*x),x]

[Out] (3*b)/(a^2*(b + a*x^(1/3))) + (3*Log[b + a*x^(1/3)])/a^2
```

Rubi in Sympy [A] time = 9.14488, size = 29, normalized size = 0.88

$$\frac{3b}{a^2\left(a\sqrt[3]{x}+b\right)}+\frac{3\log\left(a\sqrt[3]{x}+b\right)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**(1/3))**2/x,x)

[Out] 3*b/(a**2*(a*x**(1/3) + b)) + 3*log(a*x**(1/3) + b)/a**2
```

Mathematica [A] time = 0.0213829, size = 29, normalized size = 0.88

$$\frac{3\left(\frac{b}{a\sqrt[3]{x}+b}+\log\left(a\sqrt[3]{x}+b\right)\right)}{a^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^(1/3))^2*x),x]

[Out] (3*(b/(b + a*x^(1/3)) + Log[b + a*x^(1/3)]))/a^2
```

Maple [A] time = 0.003, size = 30, normalized size = 0.9

$$3\,\frac{b}{a^2\left(b+a\sqrt[3]{x}\right)}+3\,\frac{\ln\left(b+a\sqrt[3]{x}\right)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^(1/3))^2/x,x)

[Out] 3*b/a^2/(b+a*x^(1/3))+3*ln(b+a*x^(1/3))/a^2
```

Maxima [A] time = 1.43999, size = 46, normalized size = 1.39

$$-\frac{3}{a^2+\frac{ab}{x^{\frac{1}{3}}}}+\frac{3\,\log\left(a+\frac{b}{x^{\frac{1}{3}}}\right)}{a^2}+\frac{\log(x)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))^2*x),x, algorithm="maxima")

[Out] -3/(a^2 + a*b/x^(1/3)) + 3*log(a + b/x^(1/3))/a^2 + log(x)/a^2
```

Fricas [A] time = 0.229404, size = 47, normalized size = 1.42

$$\frac{3\left(\left(ax^{\frac{1}{3}}+b\right)\log\left(ax^{\frac{1}{3}}+b\right)+b\right)}{a^3x^{\frac{1}{3}}+a^2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))^2*x),x, algorithm="fricas")

[Out] 3*((a*x^(1/3) + b)*log(a*x^(1/3) + b) + b)/(a^3*x^(1/3) + a^2*b)
```

Sympy [A] time = 3.9554, size = 99, normalized size = 3.

$$\begin{cases}\frac{3ax\log\left(\sqrt[3]{x}+\frac{b}{a}\right)}{a^3x+a^2bx^{\frac{2}{3}}}+\frac{3bx^{\frac{2}{3}}\log\left(\sqrt[3]{x}+\frac{b}{a}\right)}{a^3x+a^2bx^{\frac{2}{3}}}+\frac{3bx^{\frac{2}{3}}}{a^3x+a^2bx^{\frac{2}{3}}} & \text{for}\ a\neq 0\\ \frac{3x^{\frac{2}{3}}}{2b^2} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**(1/3))**2/x,x)

[Out] Piecewise((3*a*x*log(x**(1/3) + b/a)/(a**3*x + a**2*b*x**(2/3)) +
 3*b*x**(2/3)*log(x**(1/3) + b/a)/(a**3*x + a**2*b*x**(2/3)) + 3*
b*x**(2/3)/(a**3*x + a**2*b*x**(2/3)), Ne(a, 0)), (3*x**(2/3)/(2*
b**2), True))
```

GIAC/XCAS [A] time = 0.214898, size = 41, normalized size = 1.24

$$\frac{3\ln\left(\left|ax^{\frac{1}{3}}+b\right|\right)}{a^2}+\frac{3\,b}{\left(ax^{\frac{1}{3}}+b\right)a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))^2*x),x, algorithm="giac")

[Out] 3*ln(abs(a*x^(1/3) + b))/a^2 + 3*b/((a*x^(1/3) + b)*a^2)
```

3.2426 $\int \frac{1}{\left(a+\frac{b}{\sqrt[3]{x}}\right)^2 x^2} dx$

Optimal. Leaf size=52

$$\frac{6a\log\left(a\sqrt[3]{x}+b\right)}{b^3}-\frac{2a\log(x)}{b^3}-\frac{3a}{b^2\left(a\sqrt[3]{x}+b\right)}-\frac{3}{b^2\sqrt[3]{x}}$$

```
[Out] (-3*a)/(b^2*(b + a*x^(1/3))) - 3/(b^2*x^(1/3)) + (6*a*Log[b + a*x
^(1/3)])/b^3 - (2*a*Log[x])/b^3
```

Rubi [A] time = 0.0882315, antiderivative size = 52, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{6a\log\left(a\sqrt[3]{x}+b\right)}{b^3}-\frac{2a\log(x)}{b^3}-\frac{3a}{b^2\left(a\sqrt[3]{x}+b\right)}-\frac{3}{b^2\sqrt[3]{x}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^(1/3))^2*x^2),x]
```

```
[Out] (-3*a)/(b^2*(b + a*x^(1/3))) - 3/(b^2*x^(1/3)) + (6*a*Log[b + a*x
^(1/3)])/b^3 - (2*a*Log[x])/b^3
```

Rubi in Sympy [A] time = 12.0973, size = 54, normalized size = 1.04

$$-\frac{3a}{b^2\left(a\sqrt[3]{x}+b\right)}-\frac{6a\log\left(\sqrt[3]{x}\right)}{b^3}+\frac{6a\log\left(a\sqrt[3]{x}+b\right)}{b^3}-\frac{3}{b^2\sqrt[3]{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**(1/3))**2/x**2,x)
```

```
[Out] -3*a/(b**2*(a*x**(1/3) + b)) - 6*a*log(x**(1/3))/b**3 + 6*a*log(a
*x**(1/3) + b)/b**3 - 3/(b**2*x**(1/3))
```

Mathematica [A] time = 0.101208, size = 49, normalized size = 0.94

$$\frac{3\left(-\frac{ab}{a\sqrt[3]{x}+b}+2a\log\left(a\sqrt[3]{x}+b\right)-\frac{2}{3}a\log(x)-\frac{b}{\sqrt[3]{x}}\right)}{b^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^(1/3))^2*x^2),x]
```

```
[Out] (3*(-((a*b)/(b + a*x^(1/3))) - b/x^(1/3) + 2*a*Log[b + a*x^(1/3)]
 - (2*a*Log[x])/3))/b^3
```

Maple [A] time = 0.016, size = 47, normalized size = 0.9

$$-3\frac{a}{b^2\left(b+a\sqrt[3]{x}\right)}-3\frac{1}{b^2\sqrt[3]{x}}+6\frac{a\ln\left(b+a\sqrt[3]{x}\right)}{b^3}-2\frac{a\ln(x)}{b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/(a+b/x^(1/3))^2/x^2,x)
```

```
[Out] -3*a/b^2/(b+a*x^(1/3))-3/b^2/x^(1/3)+6*a*ln(b+a*x^(1/3))/b^3-2*a*
ln(x)/b^3
```

Maxima [A] time = 1.43214, size = 59, normalized size = 1.13

$$\frac{6\,a\log\left(a+\frac{b}{x^{\frac{1}{3}}}\right)}{b^3}-\frac{3\left(a+\frac{b}{x^{\frac{1}{3}}}\right)}{b^3}+\frac{3\,a^2}{\left(a+\frac{b}{x^{\frac{1}{3}}}\right)b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x^(1/3))^2*x^2),x, algorithm="maxima")
```

```
[Out] 6*a*log(a + b/x^(1/3))/b^3 - 3*(a + b/x^(1/3))/b^3 + 3*a^2/((a +
b/x^(1/3))*b^3)
```

Fricas [A] time = 0.237582, size = 101, normalized size = 1.94

$$-\frac{3\left(2\,abx^{\frac{1}{3}}+b^2-2\left(a^2x^{\frac{2}{3}}+abx^{\frac{1}{3}}\right)\log\left(ax^{\frac{1}{3}}+b\right)+2\left(a^2x^{\frac{2}{3}}+abx^{\frac{1}{3}}\right)\log\left(x^{\frac{1}{3}}\right)\right)}{ab^3x^{\frac{2}{3}}+b^4x^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x^(1/3))^2*x^2),x, algorithm="fricas")
```

```
[Out] -3*(2*a*b*x^(1/3) + b^2 - 2*(a^2*x^(2/3) + a*b*x^(1/3))*log(a*x^(
1/3) + b) + 2*(a^2*x^(2/3) + a*b*x^(1/3))*log(x^(1/3)))/(a*b^3*x^
(2/3) + b^4*x^(1/3))
```

Sympy [A] time = 10.258, size = 211, normalized size = 4.06

$$\begin{cases} \frac{\tilde{\infty}}{\sqrt[3]{x}} & \text{for}\: a = 0 \wedge b = 0 \\ -\frac{3}{b^2\sqrt[3]{x}} & \text{for}\: a = 0 \\ -\frac{1}{a^2x} & \text{for}\: b = 0 \\ -\frac{2a^2x^2\log(x)}{ab^3x^2+b^4x^{\frac{5}{3}}}+\frac{6a^2x^2\log\left(\sqrt[3]{x}+\frac{b}{a}\right)}{ab^3x^2+b^4x^{\frac{5}{3}}}-\frac{2abx^{\frac{5}{3}}\log(x)}{ab^3x^2+b^4x^{\frac{5}{3}}}+\frac{6abx^{\frac{5}{3}}\log\left(\sqrt[3]{x}+\frac{b}{a}\right)}{ab^3x^2+b^4x^{\frac{5}{3}}}-\frac{6abx^{\frac{5}{3}}}{ab^3x^2+b^4x^{\frac{5}{3}}}-\frac{3b^2x^{\frac{4}{3}}}{ab^3x^2+b^4x^{\frac{5}{3}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(a+b/x**(1/3))**2/x**2,x)
```

```
[Out] Piecewise((zoo/x**(1/3), Eq(a, 0) & Eq(b, 0)), (-3/(b**2*x**(1/3)
), Eq(a, 0)), (-1/(a**2*x), Eq(b, 0)), (-2*a**2*x**2*log(x)/(a*b*
*3*x**2 + b**4*x**(5/3)) + 6*a**2*x**2*log(x**(1/3) + b/a)/(a*b**
3*x**2 + b**4*x**(5/3)) - 2*a*b*x**(5/3)*log(x)/(a*b**3*x**2 + b*
*4*x**(5/3)) + 6*a*b*x**(5/3)*log(x**(1/3) + b/a)/(a*b**3*x**2 +
b**4*x**(5/3)) - 6*a*b*x**(5/3)/(a*b**3*x**2 + b**4*x**(5/3)) - 3
*b**2*x**(4/3)/(a*b**3*x**2 + b**4*x**(5/3)), True))
```

GIAC/XCAS [A] time = 0.222346, size = 69, normalized size = 1.33

$$\frac{6\,a\ln\left(\left|ax^{\frac{1}{3}}+b\right|\right)}{b^3}-\frac{2\,a\ln\left(\left|x\right|\right)}{b^3}-\frac{3\left(2\,ax^{\frac{1}{3}}+b\right)}{\left(ax^{\frac{2}{3}}+bx^{\frac{1}{3}}\right)b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))^2*x^2),x, algorithm="giac")
```

```
[Out] 6*a*ln(abs(a*x^(1/3) + b))/b^3 - 2*a*ln(abs(x))/b^3 - 3*(2*a*x^(1
/3) + b)/((a*x^(2/3) + b*x^(1/3))*b^2)
```

3.2427 $\int \frac{1}{\left(a+\frac{b}{\sqrt[3]{x}}\right)^2 x^3}\,dx$

Optimal. Leaf size=97

$$-\frac{15a^4\log\left(a\sqrt[3]{x}+b\right)}{b^6}+\frac{5a^4\log(x)}{b^6}+\frac{3a^4}{b^5\left(a\sqrt[3]{x}+b\right)}+\frac{12a^3}{b^5\sqrt[3]{x}}-\frac{9a^2}{2b^4x^{2/3}}+\frac{2a}{b^3x}-\frac{3}{4b^2x^{4/3}}$$

```
[Out] (3*a^4)/(b^5*(b + a*x^(1/3))) - 3/(4*b^2*x^(4/3)) + (2*a)/(b^3*x)
 - (9*a^2)/(2*b^4*x^(2/3)) + (12*a^3)/(b^5*x^(1/3)) - (15*a^4*Log
[b + a*x^(1/3)])/b^6 + (5*a^4*Log[x])/b^6
```

Rubi [A] time = 0.157355, antiderivative size = 97, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{15a^4\log\left(a\sqrt[3]{x}+b\right)}{b^6}+\frac{5a^4\log(x)}{b^6}+\frac{3a^4}{b^5\left(a\sqrt[3]{x}+b\right)}+\frac{12a^3}{b^5\sqrt[3]{x}}-\frac{9a^2}{2b^4x^{2/3}}+\frac{2a}{b^3x}-\frac{3}{4b^2x^{4/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^(1/3))^2*x^3),x]
```

```
[Out] (3*a^4)/(b^5*(b + a*x^(1/3))) - 3/(4*b^2*x^(4/3)) + (2*a)/(b^3*x)
 - (9*a^2)/(2*b^4*x^(2/3)) + (12*a^3)/(b^5*x^(1/3)) - (15*a^4*Log
[b + a*x^(1/3)])/b^6 + (5*a^4*Log[x])/b^6
```

Rubi in Sympy [A] time = 21.6068, size = 99, normalized size = 1.02

$$\frac{3a^4}{b^5\left(a\sqrt[3]{x}+b\right)}+\frac{15a^4\log\left(\sqrt[3]{x}\right)}{b^6}-\frac{15a^4\log\left(a\sqrt[3]{x}+b\right)}{b^6}+\frac{12a^3}{b^5\sqrt[3]{x}}-\frac{9a^2}{2b^4x^{\frac{2}{3}}}+\frac{2a}{b^3x}-\frac{3}{4b^2x^{\frac{4}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**(1/3))**2/x**3,x)
```

```
[Out] 3*a**4/(b**5*(a*x**(1/3) + b)) + 15*a**4*log(x**(1/3))/b**6 - 15*
a**4*log(a*x**(1/3) + b)/b**6 + 12*a**3/(b**5*x**(1/3)) - 9*a**2/
(2*b**4*x**(2/3)) + 2*a/(b**3*x) - 3/(4*b**2*x**(4/3))
```

Mathematica [A] time = 0.229858, size = 89, normalized size = 0.92

$$\frac{-60a^4\log\left(a\sqrt[3]{x}+b\right)+20a^4\log(x)+b\left(\frac{12a^4}{a\sqrt[3]{x}+b}+\frac{48a^3}{\sqrt[3]{x}}-\frac{18a^2b}{x^{2/3}}+\frac{8ab^2}{x}-\frac{3b^3}{x^{4/3}}\right)}{4b^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^(1/3))^2*x^3),x]
```

```
[Out] (b*((12*a^4)/(b + a*x^(1/3)) - (3*b^3)/x^(4/3) + (8*a*b^2)/x - (1
8*a^2*b)/x^(2/3) + (48*a^3)/x^(1/3)) - 60*a^4*Log[b + a*x^(1/3)]
+ 20*a^4*Log[x])/(4*b^6)
```

Maple [A] time = 0.017, size = 84, normalized size = 0.9

$$3\frac{a^4}{b^5\left(b+a\sqrt[3]{x}\right)}-\frac{3}{4\,b^2}x^{-\frac{4}{3}}+2\,\frac{a}{b^3x}-\frac{9\,a^2}{2\,b^4}x^{-\frac{2}{3}}+12\,\frac{a^3}{b^5\sqrt[3]{x}}-15\,\frac{a^4\ln\left(b+a\sqrt[3]{x}\right)}{b^6}+5\,\frac{a^4\ln\left(x\right)}{b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/(a+b/x^(1/3))^2/x^3,x)
```

```
[Out] 3*a^4/b^5/(b+a*x^(1/3))-3/4/b^2/x^(4/3)+2*a/b^3/x-9/2*a^2/b^4/x^(
2/3)+12*a^3/b^5/x^(1/3)-15*a^4*ln(b+a*x^(1/3))/b^6+5*a^4*ln(x)/b^
6
```

Maxima [A] time = 1.43851, size = 128, normalized size = 1.32

$$-\frac{15\,a^4\log\left(a+\frac{b}{x^{\frac{1}{3}}}\right)}{b^6}-\frac{3\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^4}{4\,b^6}+\frac{5\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^3a}{b^6}-\frac{15\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^2a^2}{b^6}+\frac{30\left(a+\frac{b}{x^{\frac{1}{3}}}\right)a^3}{b^6}-\frac{3\,a^5}{\left(a+\frac{b}{x^{\frac{1}{3}}}\right)b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x^(1/3))^2*x^3),x, algorithm="maxima")
```

```
[Out] -15*a^4*log(a + b/x^(1/3))/b^6 - 3/4*(a + b/x^(1/3))^4/b^6 + 5*(a
 + b/x^(1/3))^3*a/b^6 - 15*(a + b/x^(1/3))^2*a^2/b^6 + 30*(a + b/
x^(1/3))*a^3/b^6 - 3*a^5/((a + b/x^(1/3))*b^6)
```

Fricas [A] time = 0.237325, size = 151, normalized size = 1.56

$$\frac{30\,a^3b^2x-10\,a^2b^3x^{\frac{2}{3}}-3\,b^5-60\left(a^5x^{\frac{5}{3}}+a^4bx^{\frac{4}{3}}\right)\log\left(ax^{\frac{1}{3}}+b\right)+60\left(a^5x^{\frac{5}{3}}+a^4bx^{\frac{4}{3}}\right)\log\left(x^{\frac{1}{3}}\right)+5\left(12\,a^4bx+ab^4\right)x^{\frac{1}{3}}}{4\left(ab^6x^{\frac{5}{3}}+b^7x^{\frac{4}{3}}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x^(1/3))^2*x^3),x, algorithm="fricas")
```

```
[Out] 1/4*(30*a^3*b^2*x - 10*a^2*b^3*x^(2/3) - 3*b^5 - 60*(a^5*x^(5/3)
+ a^4*b*x^(4/3))*log(a*x^(1/3) + b) + 60*(a^5*x^(5/3) + a^4*b*x^(
4/3))*log(x^(1/3)) + 5*(12*a^4*b*x + a*b^4)*x^(1/3))/(a*b^6*x^(5/
3) + b^7*x^(4/3))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(a+b/x**(1/3))**2/x**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.217641, size = 122, normalized size = 1.26

$$-\frac{15\,a^{4}\ln\left(\left|ax^{\frac{1}{3}}+b\right|\right)}{b^{6}}+\frac{5\,a^{4}\ln\left(|x|\right)}{b^{6}}+\frac{60\,a^{4}bx^{\frac{4}{3}}+30\,a^{3}b^{2}x-10\,a^{2}b^{3}x^{\frac{2}{3}}+5\,ab^{4}x^{\frac{1}{3}}-3\,b^{5}}{4\left(ax^{\frac{1}{3}}+b\right)b^{6}x^{\frac{4}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))^2*x^3),x, algorithm="giac")
```

```
[Out] -15*a^4*ln(abs(a*x^(1/3) + b))/b^6 + 5*a^4*ln(abs(x))/b^6 + 1/4*(
60*a^4*b*x^(4/3) + 30*a^3*b^2*x - 10*a^2*b^3*x^(2/3) + 5*a*b^4*x^
(1/3) - 3*b^5)/((a*x^(1/3) + b)*b^6*x^(4/3))
```

3.2428 $\int \frac{1}{\left(a+\frac{b}{\sqrt[3]{x}}\right)^2 x^4} dx$

Optimal. Leaf size=133

$$\frac{24a^7 \log\left(a\sqrt[3]{x}+b\right)}{b^9}-\frac{8a^7\log(x)}{b^9}-\frac{3a^7}{b^8\left(a\sqrt[3]{x}+b\right)}-\frac{21a^6}{b^8\sqrt[3]{x}}+\frac{9a^5}{b^7x^{2/3}}-\frac{5a^4}{b^6x}+\frac{3a^3}{b^5x^{4/3}}-\frac{9a^2}{5b^4x^{5/3}}+\frac{a}{b^3x^2}-\frac{3}{7b^2x^{7/3}}$$

```
[Out] (-3*a^7)/(b^8*(b + a*x^(1/3))) - 3/(7*b^2*x^(7/3)) + a/(b^3*x^2)
- (9*a^2)/(5*b^4*x^(5/3)) + (3*a^3)/(b^5*x^(4/3)) - (5*a^4)/(b^6*
x) + (9*a^5)/(b^7*x^(2/3)) - (21*a^6)/(b^8*x^(1/3)) + (24*a^7*Log
[b + a*x^(1/3)])/b^9 - (8*a^7*Log[x])/b^9
```

Rubi [A] time = 0.221285, antiderivative size = 133, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{24a^7 \log\left(a\sqrt[3]{x}+b\right)}{b^9}-\frac{8a^7\log(x)}{b^9}-\frac{3a^7}{b^8\left(a\sqrt[3]{x}+b\right)}-\frac{21a^6}{b^8\sqrt[3]{x}}+\frac{9a^5}{b^7x^{2/3}}-\frac{5a^4}{b^6x}+\frac{3a^3}{b^5x^{4/3}}-\frac{9a^2}{5b^4x^{5/3}}+\frac{a}{b^3x^2}-\frac{3}{7b^2x^{7/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^(1/3))^2*x^4),x]
```

```
[Out] (-3*a^7)/(b^8*(b + a*x^(1/3))) - 3/(7*b^2*x^(7/3)) + a/(b^3*x^2)
- (9*a^2)/(5*b^4*x^(5/3)) + (3*a^3)/(b^5*x^(4/3)) - (5*a^4)/(b^6*
x) + (9*a^5)/(b^7*x^(2/3)) - (21*a^6)/(b^8*x^(1/3)) + (24*a^7*Log
[b + a*x^(1/3)])/b^9 - (8*a^7*Log[x])/b^9
```

Rubi in Sympy [A] time = 32.7418, size = 136, normalized size = 1.02

$$-\frac{3a^7}{b^8\left(a\sqrt[3]{x}+b\right)}-\frac{24a^7\log\left(\sqrt[3]{x}\right)}{b^9}+\frac{24a^7\log\left(a\sqrt[3]{x}+b\right)}{b^9}-\frac{21a^6}{b^8\sqrt[3]{x}}+\frac{9a^5}{b^7x^{\frac{2}{3}}}-\frac{5a^4}{b^6x}+\frac{3a^3}{b^5x^{\frac{4}{3}}}-\frac{9a^2}{5b^4x^{\frac{5}{3}}}+\frac{a}{b^3x^2}-\frac{3}{7b^2x^{\frac{7}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**(1/3))**2/x**4,x)
```

```
[Out] -3*a**7/(b**8*(a*x**(1/3) + b)) - 24*a**7*log(x**(1/3))/b**9 + 24
*a**7*log(a*x**(1/3) + b)/b**9 - 21*a**6/(b**8*x**(1/3)) + 9*a**5
/(b**7*x**(2/3)) - 5*a**4/(b**6*x) + 3*a**3/(b**5*x**(4/3)) - 9*a
**2/(5*b**4*x**(5/3)) + a/(b**3*x**2) - 3/(7*b**2*x**(7/3))
```

Mathematica [A] time = 0.359899, size = 132, normalized size = 0.99

$$-\frac{-840a^7\log\left(a\sqrt[3]{x}+b\right)+280a^7\log(x)+\frac{b\left(840a^7x^{7/3}+420a^6bx^2-140a^5b^2x^{5/3}+70a^4b^3x^{4/3}-42a^3b^4x+28a^2b^5x^{2/3}-20ab^6\sqrt[3]{x}+15b^7\right)}{x^{7/3}\left(a\sqrt[3]{x}+b\right)}}{35b^9}$$

Antiderivative was successfully verified.

```
[In]   Integrate[1/((a + b/x^(1/3))^2*x^4),x]
```

```
[Out] -((b*(15*b^7 - 20*a*b^6*x^(1/3) + 28*a^2*b^5*x^(2/3) - 42*a^3*b^4
*x + 70*a^4*b^3*x^(4/3) - 140*a^5*b^2*x^(5/3) + 420*a^6*b*x^2 + 8
40*a^7*x^(7/3)))/((b + a*x^(1/3))*x^(7/3)) - 840*a^7*Log[b + a*x^
(1/3)] + 280*a^7*Log[x])/(35*b^9)
```

Maple [A] time = 0.02, size = 116, normalized size = 0.9

$$-3\,{\frac {{a}^{7}}{{b}^{8} \left(b+a\sqrt [3]{x} \right) }}-{\frac {3}{7\,{b}^{2}}{x}^{-{\frac {7}{3}}}}+{\frac {a}{{b}^{3}{x}^{2}}}-{\frac {9\,{a}^{2}}{5\,{b}^{4}}{x}^{-{\frac {5}{3}}}}+3\,{\frac {{a}^{3}}{{b}^{5}{x}^{4/3}}}-5\,{\frac {{a}^{4}}{{b}^{6}x}}+9\,{\frac {{a}^{5}}{{b}^{7}{x}^{2/3}}}-21\,{\frac {{a}^{6}}{{b}^{8}\sqrt [3]{x}}}+24\,{\frac {{a}^{7}\ln \left(b+a\sqrt [3]{x} \right) }{{b}^{9}}}-8\,{\frac {{a}^{7}\ln \left(x \right) }{{b}^{9}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/(a+b/x^(1/3))^2/x^4,x)
```

```
[Out] -3*a^7/b^8/(b+a*x^(1/3))-3/7/b^2/x^(7/3)+a/b^3/x^2-9/5*a^2/b^4/x^
(5/3)+3*a^3/b^5/x^(4/3)-5*a^4/b^6/x+9*a^5/b^7/x^(2/3)-21*a^6/b^8/
x^(1/3)+24*a^7*ln(b+a*x^(1/3))/b^9-8*a^7*ln(x)/b^9
```

Maxima [A] time = 1.44979, size = 197, normalized size = 1.48

$$\frac{24\,a^{7}\log\left(a+\frac{b}{x^{\frac{1}{3}}}\right)}{b^{9}}-\frac{3\,\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{7}}{7\,b^{9}}+\frac{4\,\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{6}a}{b^{9}}-\frac{84\,\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{5}a^{2}}{5\,b^{9}}+\frac{42\,\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{4}a^{3}}{b^{9}}-\frac{70\,\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{3}a^{4}}{b^{9}}+\frac{84\,\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{2}a^{5}}{b^{9}}-\frac{84\,\left(a+\frac{b}{x^{\frac{1}{3}}}\right)a^{6}}{b^{9}}+\frac{3\,a^{8}}{\left(a+\frac{b}{x^{\frac{1}{3}}}\right)b^{9}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x^(1/3))^2*x^4),x, algorithm="maxima")
```

```
[Out] 24*a^7*log(a + b/x^(1/3))/b^9 - 3/7*(a + b/x^(1/3))^7/b^9 + 4*(a
+ b/x^(1/3))^6*a/b^9 - 84/5*(a + b/x^(1/3))^5*a^2/b^9 + 42*(a + b
/x^(1/3))^4*a^3/b^9 - 70*(a + b/x^(1/3))^3*a^4/b^9 + 84*(a + b/x^
(1/3))^2*a^5/b^9 - 84*(a + b/x^(1/3))*a^6/b^9 + 3*a^8/((a + b/x^(
1/3))*b^9)
```

Fricas [A] time = 0.238848, size = 198, normalized size = 1.49

$$-\frac{420\,a^{6}b^{2}x^{2}-42\,a^{3}b^{5}x+15\,b^{8}-840\,\left(a^{8}x^{\frac{8}{3}}+a^{7}bx^{\frac{7}{3}}\right)\log\left(ax^{\frac{1}{3}}+b\right)+840\,\left(a^{8}x^{\frac{8}{3}}+a^{7}bx^{\frac{7}{3}}\right)\log\left(x^{\frac{1}{3}}\right)-28\,\left(5\,a^{5}b^{3}x-a^{2}b^{6}\right)}{35\,\left(ab^{9}x^{\frac{8}{3}}+b^{10}x^{\frac{7}{3}}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x^(1/3))^2*x^4),x, algorithm="fricas")
```

```
[Out] -1/35*(420*a^6*b^2*x^2 - 42*a^3*b^5*x + 15*b^8 - 840*(a^8*x^(8/3)
 + a^7*b*x^(7/3))*log(a*x^(1/3) + b) + 840*(a^8*x^(8/3) + a^7*b*x
^(7/3))*log(x^(1/3)) - 28*(5*a^5*b^3*x - a^2*b^6)*x^(2/3) + 10*(8
4*a^7*b*x^2 + 7*a^4*b^4*x - 2*a*b^7)*x^(1/3))/(a*b^9*x^(8/3) + b^
10*x^(7/3))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**(1/3))**2/x**4,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.216691, size = 166, normalized size = 1.25

$$\frac{24\,a^7\ln\left(\left|ax^{\frac{1}{3}}+b\right|\right)}{b^9}-\frac{8\,a^7\ln\left(|x|\right)}{b^9}-\frac{840\,a^7bx^{\frac{7}{3}}+420\,a^6b^2x^2-140\,a^5b^3x^{\frac{5}{3}}+70\,a^4b^4x^{\frac{4}{3}}-42\,a^3b^5x+28\,a^2b^6x^{\frac{2}{3}}-20\,ab^7x^{\frac{1}{3}}+15\,b^8}{35\left(ax^{\frac{1}{3}}+b\right)b^9x^{\frac{7}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))^2*x^4),x, algorithm="giac")
```

```
[Out] 24*a^7*ln(abs(a*x^(1/3) + b))/b^9 - 8*a^7*ln(abs(x))/b^9 - 1/35*(
840*a^7*b*x^(7/3) + 420*a^6*b^2*x^2 - 140*a^5*b^3*x^(5/3) + 70*a^
4*b^4*x^(4/3) - 42*a^3*b^5*x + 28*a^2*b^6*x^(2/3) - 20*a*b^7*x^(1
/3) + 15*b^8)/((a*x^(1/3) + b)*b^9*x^(7/3))
```

3.2429 $\int \frac{1}{\left(a+\frac{b}{\sqrt[3]{x}}\right)^2 x^5} dx$

Optimal. Leaf size=183

$$-\frac{33a^{10}\log\left(a\sqrt[3]{x}+b\right)}{b^{12}}+\frac{11a^{10}\log(x)}{b^{12}}+\frac{3a^{10}}{b^{11}\left(a\sqrt[3]{x}+b\right)}+\frac{30a^9}{b^{11}\sqrt[3]{x}}-\frac{27a^8}{2b^{10}x^{2/3}}+\frac{8a^7}{b^9x}-\frac{21a^6}{4b^8x^{4/3}}+\frac{18a^5}{5b^7x^{5/3}}-\frac{5a^4}{2b^6x^2}+\frac{12a^3}{7b^5x^{7/3}}-\frac{9a^2}{8b^4x^{8/3}}+\frac{2a}{3b^3x^3}-\frac{3}{10b^2x^{10/3}}$$

```
[Out] (3*a^10)/(b^11*(b + a*x^(1/3))) - 3/(10*b^2*x^(10/3)) + (2*a)/(3*
b^3*x^3) - (9*a^2)/(8*b^4*x^(8/3)) + (12*a^3)/(7*b^5*x^(7/3)) - (
5*a^4)/(2*b^6*x^2) + (18*a^5)/(5*b^7*x^(5/3)) - (21*a^6)/(4*b^8*x
^(4/3)) + (8*a^7)/(b^9*x) - (27*a^8)/(2*b^10*x^(2/3)) + (30*a^9)/
(b^11*x^(1/3)) - (33*a^10*Log[b + a*x^(1/3)])/b^12 + (11*a^10*Log
[x])/b^12
```

Rubi [A] time = 0.30437, antiderivative size = 183, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{33a^{10}\log\left(a\sqrt[3]{x}+b\right)}{b^{12}}+\frac{11a^{10}\log(x)}{b^{12}}+\frac{3a^{10}}{b^{11}\left(a\sqrt[3]{x}+b\right)}+\frac{30a^9}{b^{11}\sqrt[3]{x}}-\frac{27a^8}{2b^{10}x^{2/3}}+\frac{8a^7}{b^9x}-\frac{21a^6}{4b^8x^{4/3}}+\frac{18a^5}{5b^7x^{5/3}}-\frac{5a^4}{2b^6x^2}+\frac{12a^3}{7b^5x^{7/3}}-\frac{9a^2}{8b^4x^{8/3}}+\frac{2a}{3b^3x^3}-\frac{3}{10b^2x^{10/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^(1/3))^2*x^5),x]
```

```
[Out] (3*a^10)/(b^11*(b + a*x^(1/3))) - 3/(10*b^2*x^(10/3)) + (2*a)/(3*
b^3*x^3) - (9*a^2)/(8*b^4*x^(8/3)) + (12*a^3)/(7*b^5*x^(7/3)) - (
5*a^4)/(2*b^6*x^2) + (18*a^5)/(5*b^7*x^(5/3)) - (21*a^6)/(4*b^8*x
^(4/3)) + (8*a^7)/(b^9*x) - (27*a^8)/(2*b^10*x^(2/3)) + (30*a^9)/
(b^11*x^(1/3)) - (33*a^10*Log[b + a*x^(1/3)])/b^12 + (11*a^10*Log
[x])/b^12
```

Rubi in Sympy [A] time = 59.1396, size = 187, normalized size = 1.02

$$\frac{3a^{10}}{b^{11}\left(a\sqrt[3]{x}+b\right)}+\frac{33a^{10}\log\left(\sqrt[3]{x}\right)}{b^{12}}-\frac{33a^{10}\log\left(a\sqrt[3]{x}+b\right)}{b^{12}}+\frac{30a^9}{b^{11}\sqrt[3]{x}}-\frac{27a^8}{2b^{10}x^{\frac{2}{3}}}+\frac{8a^7}{b^9x}-\frac{21a^6}{4b^8x^{\frac{4}{3}}}+\frac{18a^5}{5b^7x^{\frac{5}{3}}}-\frac{5a^4}{2b^6x^2}+\frac{12a^3}{7b^5x^{\frac{7}{3}}}-\frac{9a^2}{8b^4x^{\frac{8}{3}}}+\frac{2a}{3b^3x^3}-\frac{3}{10b^2x^{\frac{10}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**(1/3))**2/x**5,x)
```

```
[Out] 3*a**10/(b**11*(a*x**(1/3) + b)) + 33*a**10*log(x**(1/3))/b**12 -
 33*a**10*log(a*x**(1/3) + b)/b**12 + 30*a**9/(b**11*x**(1/3)) -
27*a**8/(2*b**10*x**(2/3)) + 8*a**7/(b**9*x) - 21*a**6/(4*b**8*x*
*(4/3)) + 18*a**5/(5*b**7*x**(5/3)) - 5*a**4/(2*b**6*x**2) + 12*a
**3/(7*b**5*x**(7/3)) - 9*a**2/(8*b**4*x**(8/3)) + 2*a/(3*b**3*x*
*3) - 3/(10*b**2*x**(10/3))
```

Mathematica [A] time = 0.45466, size = 169, normalized size = 0.92

$$\frac{-27720a^{10}\log\left(a\sqrt[3]{x}+b\right)+9240a^{10}\log(x)+\frac{b\left(27720a^{10}x^{10/3}+13860a^9bx^3-4620a^8b^2x^{8/3}+2310a^7b^3x^{7/3}-1386a^6b^4x^2+924a^5b^5x^{5/3}-660a^4b^6x^{4/}\right.}{x^{10/3}\left(a\sqrt[3]{x}+b\right)}}{840b^{12}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^(1/3))^2*x^5),x]
```

```
[Out] ((b*(-252*b^10 + 308*a*b^9*x^(1/3) - 385*a^2*b^8*x^(2/3) + 495*a^
3*b^7*x - 660*a^4*b^6*x^(4/3) + 924*a^5*b^5*x^(5/3) - 1386*a^6*b^
4*x^2 + 2310*a^7*b^3*x^(7/3) - 4620*a^8*b^2*x^(8/3) + 13860*a^9*b
*x^3 + 27720*a^10*x^(10/3)))/((b + a*x^(1/3))*x^(10/3)) - 27720*a
^10*Log[b + a*x^(1/3)] + 9240*a^10*Log[x])/(840*b^12)
```

Maple [A] time = 0.021, size = 150, normalized size = 0.8

$$3\frac{a^{10}}{b^{11}\left(b+a\sqrt[3]{x}\right)}-\frac{3}{10b^2}x^{-\frac{10}{3}}+\frac{2a}{3b^3x^3}-\frac{9a^2}{8b^4}x^{-\frac{8}{3}}+\frac{12a^3}{7b^5}x^{-\frac{7}{3}}-\frac{5a^4}{2b^6x^2}+\frac{18a^5}{5b^7}x^{-\frac{5}{3}}-\frac{21a^6}{4b^8}x^{-\frac{4}{3}}+8\frac{a^7}{b^9x}-\frac{27a^8}{2b^{10}}x^{-\frac{2}{3}}+30\frac{a^9}{b^{11}\sqrt[3]{x}}-33\frac{a^{10}\ln\left(b+a\sqrt[3]{x}\right)}{b^{12}}+11\frac{a^{10}\ln(x)}{b^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^(1/3))^2/x^5,x)
```

```
[Out] 3*a^10/b^11/(b+a*x^(1/3))-3/10/b^2/x^(10/3)+2/3*a/b^3/x^3-9/8*a^2
/b^4/x^(8/3)+12/7*a^3/b^5/x^(7/3)-5/2*a^4/b^6/x^2+18/5*a^5/b^7/x^
(5/3)-21/4*a^6/b^8/x^(4/3)+8*a^7/b^9/x-27/2*a^8/b^10/x^(2/3)+30*a
^9/b^11/x^(1/3)-33*a^10*ln(b+a*x^(1/3))/b^12+11*a^10*ln(x)/b^12
```

Maxima [A] time = 1.43217, size = 266, normalized size = 1.45

$$-\frac{33a^{10}\log\left(a+\frac{b}{x^{\frac{1}{3}}}\right)}{b^{12}}-\frac{3\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{10}}{10b^{12}}+\frac{11\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{9}a}{3b^{12}}-\frac{165\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{8}a^2}{8b^{12}}+\frac{495\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{7}a^3}{7b^{12}}-\frac{165\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{6}a^4}{b^{12}}+\frac{1386\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{5}a^5}{5b^{12}}-\frac{693\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{4}a^6}{2b^{12}}+\frac{330\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{3}a^7}{b^{12}}-\frac{495\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^{2}a^8}{2b^{12}}+\frac{165\left(a+\frac{b}{x^{\frac{1}{3}}}\right)a^9}{b^{12}}-\frac{3a^{11}}{\left(a+\frac{b}{x^{\frac{1}{3}}}\right)b^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))^2*x^5),x, algorithm="maxima")
```

```
[Out] -33*a^10*log(a + b/x^(1/3))/b^12 - 3/10*(a + b/x^(1/3))^10/b^12 +
 11/3*(a + b/x^(1/3))^9*a/b^12 - 165/8*(a + b/x^(1/3))^8*a^2/b^12
 + 495/7*(a + b/x^(1/3))^7*a^3/b^12 - 165*(a + b/x^(1/3))^6*a^4/b
^12 + 1386/5*(a + b/x^(1/3))^5*a^5/b^12 - 693/2*(a + b/x^(1/3))^4
*a^6/b^12 + 330*(a + b/x^(1/3))^3*a^7/b^12 - 495/2*(a + b/x^(1/3)
)^2*a^8/b^12 + 165*(a + b/x^(1/3))*a^9/b^12 - 3*a^11/((a + b/x^(1
/3))*b^12)
```

Fricas [A] time = 0.239893, size = 243, normalized size = 1.33

$$\frac{13860\,a^{9}b^{2}x^{3} - 1386\,a^{6}b^{5}x^{2} + 495\,a^{3}b^{8}x - 252\,b^{11} - 27720\left(a^{11}x^{\frac{11}{3}} + a^{10}bx^{\frac{10}{3}}\right)\log\left(ax^{\frac{1}{3}} + b\right) + 27720\left(a^{11}x^{\frac{11}{3}} + a^{10}bx^{\frac{10}{3}}\right)\cdots}{840\left(ab^{12}x^{\frac{11}{3}} + b^{13}x^{\cdots}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))^2*x^5),x, algorithm="fricas")
```

```
[Out] 1/840*(13860*a^9*b^2*x^3 - 1386*a^6*b^5*x^2 + 495*a^3*b^8*x - 252
*b^11 - 27720*(a^11*x^(11/3) + a^10*b*x^(10/3))*log(a*x^(1/3) + b
) + 27720*(a^11*x^(11/3) + a^10*b*x^(10/3))*log(x^(1/3)) - 77*(60
*a^8*b^3*x^2 - 12*a^5*b^6*x + 5*a^2*b^9)*x^(2/3) + 22*(1260*a^10*
b*x^3 + 105*a^7*b^4*x^2 - 30*a^4*b^7*x + 14*a*b^10)*x^(1/3))/(a*b
^12*x^(11/3) + b^13*x^(10/3))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**(1/3))**2/x**5,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.218323, size = 211, normalized size = 1.15

$$-\frac{33\,a^{10}\ln\left(\left|ax^{\frac{1}{3}} + b\right|\right)}{b^{12}} + \frac{11\,a^{10}\ln\left(|x|\right)}{b^{12}} + \frac{27720\,a^{10}bx^{\frac{10}{3}} + 13860\,a^{9}b^{2}x^{3} - 4620\,a^{8}b^{3}x^{\frac{8}{3}} + 2310\,a^{7}b^{4}x^{\frac{7}{3}} - 1386\,a^{6}b^{5}x^{2} + 924\,a^{5}b^{6}x^{\frac{5}{3}} - 660\,a^{4}b^{7}x^{\frac{4}{3}} + 495\,a^{3}b^{8}x - 385\cdots}{840\left(ax^{\frac{1}{3}} + b\right)b^{12}x^{\frac{10}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))^2*x^5),x, algorithm="giac")
```

```
[Out] -33*a^10*ln(abs(a*x^(1/3) + b))/b^12 + 11*a^10*ln(abs(x))/b^12 +
1/840*(27720*a^10*b*x^(10/3) + 13860*a^9*b^2*x^3 - 4620*a^8*b^3*x
^(8/3) + 2310*a^7*b^4*x^(7/3) - 1386*a^6*b^5*x^2 + 924*a^5*b^6*x^
(5/3) - 660*a^4*b^7*x^(4/3) + 495*a^3*b^8*x - 385*a^2*b^9*x^(2/3)
 + 308*a*b^10*x^(1/3) - 252*b^11)/((a*x^(1/3) + b)*b^12*x^(10/3))
```

3.2430 $\int \frac{x^2}{\left(a+\frac{b}{\sqrt[3]{x}}\right)^3} dx$

Optimal. Leaf size=171

$$\frac{3b^{11}}{2a^{12}\left(a\sqrt[3]{x}+b\right)^2}-\frac{33b^{10}}{a^{12}\left(a\sqrt[3]{x}+b\right)}-\frac{165b^9\log\left(a\sqrt[3]{x}+b\right)}{a^{12}}+\frac{135b^8\sqrt[3]{x}}{a^{11}}-\frac{54b^7x^{2/3}}{a^{10}}+\frac{28b^6x}{a^9}-\frac{63b^5x^{4/3}}{4a^8}+\frac{9b^4x^{5/3}}{a^7}-\frac{5b^3x^2}{a^6}+\frac{18b^2x^{7/3}}{7a^5}-\frac{9bx^{8/3}}{8a^4}+\frac{x^3}{3a^3}$$

```
[Out] (3*b^11)/(2*a^12*(b + a*x^(1/3))^2) - (33*b^10)/(a^12*(b + a*x^(1
/3))) + (135*b^8*x^(1/3))/a^11 - (54*b^7*x^(2/3))/a^10 + (28*b^6*
x)/a^9 - (63*b^5*x^(4/3))/(4*a^8) + (9*b^4*x^(5/3))/a^7 - (5*b^3*
x^2)/a^6 + (18*b^2*x^(7/3))/(7*a^5) - (9*b*x^(8/3))/(8*a^4) + x^3
/(3*a^3) - (165*b^9*Log[b + a*x^(1/3)])/a^12
```

Rubi [A] time = 0.339949, antiderivative size = 171, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{3b^{11}}{2a^{12}\left(a\sqrt[3]{x}+b\right)^2}-\frac{33b^{10}}{a^{12}\left(a\sqrt[3]{x}+b\right)}-\frac{165b^9\log\left(a\sqrt[3]{x}+b\right)}{a^{12}}+\frac{135b^8\sqrt[3]{x}}{a^{11}}-\frac{54b^7x^{2/3}}{a^{10}}+\frac{28b^6x}{a^9}-\frac{63b^5x^{4/3}}{4a^8}+\frac{9b^4x^{5/3}}{a^7}-\frac{5b^3x^2}{a^6}+\frac{18b^2x^{7/3}}{7a^5}-\frac{9bx^{8/3}}{8a^4}+\frac{x^3}{3a^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b/x^(1/3))^3,x]
```

```
[Out] (3*b^11)/(2*a^12*(b + a*x^(1/3))^2) - (33*b^10)/(a^12*(b + a*x^(1
/3))) + (135*b^8*x^(1/3))/a^11 - (54*b^7*x^(2/3))/a^10 + (28*b^6*
x)/a^9 - (63*b^5*x^(4/3))/(4*a^8) + (9*b^4*x^(5/3))/a^7 - (5*b^3*
x^2)/a^6 + (18*b^2*x^(7/3))/(7*a^5) - (9*b*x^(8/3))/(8*a^4) + x^3
/(3*a^3) - (165*b^9*Log[b + a*x^(1/3)])/a^12
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{x^3}{3a^3}-\frac{9bx^{\frac{8}{3}}}{8a^4}+\frac{18b^2x^{\frac{7}{3}}}{7a^5}-\frac{5b^3x^2}{a^6}+\frac{9b^4x^{\frac{5}{3}}}{a^7}-\frac{63b^5x^{\frac{4}{3}}}{4a^8}+\frac{28b^6x}{a^9}-\frac{108b^7\int^{\sqrt[3]{x}}x\,dx}{a^{10}}+\frac{135b^8\sqrt[3]{x}}{a^{11}}+\frac{3b^{11}}{2a^{12}\left(a\sqrt[3]{x}+b\right)^2}-\frac{33b^{10}}{a^{12}\left(a\sqrt[3]{x}+b\right)}-\frac{165b^9\log\left(a\sqrt[3]{x}+b\right)}{a^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b/x**(1/3))**3,x)
```

```
[Out] x**3/(3*a**3) - 9*b*x**(8/3)/(8*a**4) + 18*b**2*x**(7/3)/(7*a**5)
 - 5*b**3*x**2/a**6 + 9*b**4*x**(5/3)/a**7 - 63*b**5*x**(4/3)/(4*
a**8) + 28*b**6*x/a**9 - 108*b**7*Integral(x, (x, x**(1/3)))/a**1
0 + 135*b**8*x**(1/3)/a**11 + 3*b**11/(2*a**12*(a*x**(1/3) + b)**
2) - 33*b**10/(a**12*(a*x**(1/3) + b)) - 165*b**9*log(a*x**(1/3)
+ b)/a**12
```

Mathematica [A] time = 0.102834, size = 157, normalized size = 0.92

$$\frac{56a^9x^3-189a^8bx^{8/3}+432a^7b^2x^{7/3}-840a^6b^3x^2+1512a^5b^4x^{5/3}-2646a^4b^5x^{4/3}+4704a^3b^6x-9072a^2b^7x^{2/3}+\frac{252b^{11}}{\left(a\sqrt[3]{x}+b\right)^2}}{168a^{12}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2/(a + b/x^(1/3))^3,x]
```

```
[Out] ((252*b^11)/(b + a*x^(1/3))^2 - (5544*b^10)/(b + a*x^(1/3)) + 226
80*a*b^8*x^(1/3) - 9072*a^2*b^7*x^(2/3) + 4704*a^3*b^6*x - 2646*a
^4*b^5*x^(4/3) + 1512*a^5*b^4*x^(5/3) - 840*a^6*b^3*x^2 + 432*a^7
*b^2*x^(7/3) - 189*a^8*b*x^(8/3) + 56*a^9*x^3 - 27720*b^9*Log[b +
 a*x^(1/3)])/(168*a^12)
```

Maple [A] time = 0.013, size = 144, normalized size = 0.8

$$\frac{3\,b^{11}}{2\,a^{12}}\left(b+a\sqrt[3]{x}\right)^{-2}-33\,\frac{b^{10}}{a^{12}\left(b+a\sqrt[3]{x}\right)}+135\,\frac{b^{8}\sqrt[3]{x}}{a^{11}}-54\,\frac{b^{7}x^{2/3}}{a^{10}}+28\,\frac{b^{6}x}{a^{9}}-\frac{63\,b^{5}}{4\,a^{8}}x^{\frac{4}{3}}+9\,\frac{b^{4}x^{5/3}}{a^{7}}-5\,\frac{b^{3}x^{2}}{a^{6}}+\frac{18\,b^{2}}{7\,a^{5}}x^{\frac{7}{3}}-\frac{9\,b}{8\,a^{4}}x^{\frac{8}{3}}+\frac{x^{3}}{3\,a^{3}}-165\,\frac{b^{9}\ln\left(b+a\sqrt[3]{x}\right)}{a^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(a+b/x^(1/3))^3,x)
```

```
[Out] 3/2*b^11/a^12/(b+a*x^(1/3))^2-33*b^10/a^12/(b+a*x^(1/3))+135*b^8*
x^(1/3)/a^11-54*b^7*x^(2/3)/a^10+28*b^6*x/a^9-63/4*b^5*x^(4/3)/a^
8+9*b^4*x^(5/3)/a^7-5*b^3*x^2/a^6+18/7*b^2*x^(7/3)/a^5-9/8*b*x^(8
/3)/a^4+1/3*x^3/a^3-165*b^9*ln(b+a*x^(1/3))/a^12
```

Maxima [A] time = 1.43974, size = 225, normalized size = 1.32

$$\frac{56\,a^{10}-\frac{77\,a^{9}b}{x^{\frac{1}{3}}}+\frac{110\,a^{8}b^{2}}{x^{\frac{2}{3}}}-\frac{165\,a^{7}b^{3}}{x}+\frac{264\,a^{6}b^{4}}{x^{\frac{4}{3}}}-\frac{462\,a^{5}b^{5}}{x^{\frac{5}{3}}}+\frac{924\,a^{4}b^{6}}{x^{2}}-\frac{2310\,a^{3}b^{7}}{x^{\frac{7}{3}}}+\frac{9240\,a^{2}b^{8}}{x^{\frac{8}{3}}}+\frac{41580\,ab^{9}}{x^{3}}+\frac{27720\,b^{10}}{x^{\frac{10}{3}}}}{168\left(\frac{a^{13}}{x^{3}}+\frac{2\,a^{12}b}{x^{\frac{10}{3}}}+\frac{a^{11}b^{2}}{x^{\frac{11}{3}}}\right)}-\frac{165\,b^{9}\log\left(a+\frac{b}{x^{\frac{1}{3}}}\right)}{a^{12}}-\frac{55\,b^{9}\log\left(x\right)}{a^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x^(1/3))^3,x, algorithm="maxima")
```

```
[Out] 1/168*(56*a^10 - 77*a^9*b/x^(1/3) + 110*a^8*b^2/x^(2/3) - 165*a^7
*b^3/x + 264*a^6*b^4/x^(4/3) - 462*a^5*b^5/x^(5/3) + 924*a^4*b^6/
x^2 - 2310*a^3*b^7/x^(7/3) + 9240*a^2*b^8/x^(8/3) + 41580*a*b^9/x
^3 + 27720*b^10/x^(10/3))/(a^13/x^3 + 2*a^12*b/x^(10/3) + a^11*b^
2/x^(11/3)) - 165*b^9*log(a + b/x^(1/3))/a^12 - 55*b^9*log(x)/a^1
2
```

Fricas [A] time = 0.230786, size = 243, normalized size = 1.42

$$\frac{110\,a^{9}b^{2}x^{3}-462\,a^{6}b^{5}x^{2}+9240\,a^{3}b^{8}x-5292\,b^{11}-27720\left(a^{2}b^{9}x^{\frac{2}{3}}+2\,ab^{10}x^{\frac{1}{3}}+b^{11}\right)\log\left(ax^{\frac{1}{3}}+b\right)+\left(56\,a^{11}x^{3}-165\,a^{8}b^{3}x\right.}{168\left(a^{14}x^{\frac{2}{3}}+2\,a^{13}bx^{\frac{1}{3}}+a^{12}b^{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x^(1/3))^3,x, algorithm="fricas")
```

```
[Out] 1/168*(110*a^9*b^2*x^3 - 462*a^6*b^5*x^2 + 9240*a^3*b^8*x - 5292*
b^11 - 27720*(a^2*b^9*x^(2/3) + 2*a*b^10*x^(1/3) + b^11)*log(a*x^
```

```
(1/3) + b) + (56*a^11*x^3 - 165*a^8*b^3*x^2 + 924*a^5*b^6*x + 362
88*a^2*b^9)*x^(2/3) - (77*a^10*b*x^3 - 264*a^7*b^4*x^2 + 2310*a^4
*b^7*x - 17136*a*b^10)*x^(1/3))/(a^14*x^(2/3) + 2*a^13*b*x^(1/3)
+ a^12*b^2)
```

Sympy [A] time = 21.1259, size = 624, normalized size = 3.65

$$\begin{cases} \frac{56a^{11}x^{\frac{11}{3}}}{168a^{14}x^{\frac{2}{3}}+336a^{13}b\sqrt[3]{x}+168a^{12}b^2} - \frac{77a^{10}bx^{\frac{10}{3}}}{168a^{14}x^{\frac{2}{3}}+336a^{13}b\sqrt[3]{x}+168a^{12}b^2} + \frac{110a^9b^2x^3}{168a^{14}x^{\frac{2}{3}}+336a^{13}b\sqrt[3]{x}+168a^{12}b^2} - \frac{165a^8b^3x^{\frac{8}{3}}}{168a^{14}x^{\frac{2}{3}}+336a^{13}b\sqrt[3]{x}+168a^{12}b^2} + \cdots \\ \frac{x^4}{4b^3} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b/x**(1/3))**3,x)
```

```
[Out] Piecewise((56*a**11*x**(11/3)/(168*a**14*x**(2/3) + 336*a**13*b*x
**(1/3) + 168*a**12*b**2) - 77*a**10*b*x**(10/3)/(168*a**14*x**(2
/3) + 336*a**13*b*x**(1/3) + 168*a**12*b**2) + 110*a**9*b**2*x**3
/(168*a**14*x**(2/3) + 336*a**13*b*x**(1/3) + 168*a**12*b**2) - 1
65*a**8*b**3*x**(8/3)/(168*a**14*x**(2/3) + 336*a**13*b*x**(1/3)
+ 168*a**12*b**2) + 264*a**7*b**4*x**(7/3)/(168*a**14*x**(2/3) +
336*a**13*b*x**(1/3) + 168*a**12*b**2) - 462*a**6*b**5*x**2/(168*
a**14*x**(2/3) + 336*a**13*b*x**(1/3) + 168*a**12*b**2) + 924*a**
5*b**6*x**(5/3)/(168*a**14*x**(2/3) + 336*a**13*b*x**(1/3) + 168*
a**12*b**2) - 2310*a**4*b**7*x**(4/3)/(168*a**14*x**(2/3) + 336*a
**13*b*x**(1/3) + 168*a**12*b**2) + 9240*a**3*b**8*x/(168*a**14*x
**(2/3) + 336*a**13*b*x**(1/3) + 168*a**12*b**2) - 27720*a**2*b**
9*x**(2/3)*log(x**(1/3) + b/a)/(168*a**14*x**(2/3) + 336*a**13*b*
x**(1/3) + 168*a**12*b**2) - 55440*a*b**10*x**(1/3)*log(x**(1/3)
+ b/a)/(168*a**14*x**(2/3) + 336*a**13*b*x**(1/3) + 168*a**12*b**
2) - 55440*a*b**10*x**(1/3)/(168*a**14*x**(2/3) + 336*a**13*b*x**
(1/3) + 168*a**12*b**2) - 27720*b**11*log(x**(1/3) + b/a)/(168*a*
*14*x**(2/3) + 336*a**13*b*x**(1/3) + 168*a**12*b**2) - 41580*b**
11/(168*a**14*x**(2/3) + 336*a**13*b*x**(1/3) + 168*a**12*b**2),
Ne(a, 0)), (x**4/(4*b**3), True))
```

GIAC/XCAS [A] time = 0.223706, size = 196, normalized size = 1.15

$$-\frac{165\,b^9\ln\left(\left|ax^{\frac{1}{3}}+b\right|\right)}{a^{12}} - \frac{3\left(22\,ab^{10}x^{\frac{1}{3}}+21\,b^{11}\right)}{2\left(ax^{\frac{1}{3}}+b\right)^2 a^{12}} + \frac{56\,a^{24}x^3 - 189\,a^{23}bx^{\frac{8}{3}} + 432\,a^{22}b^2x^{\frac{7}{3}} - 840\,a^{21}b^3x^2 + 1512\,a^{20}b^4x^{\frac{5}{3}} - 2646\,a^{19}b^5x^{\frac{4}{3}} + 4704\,a^{18}b^6x - 9072\,a^{17}b^7x^{\frac{2}{3}} + 22680 \cdots}{168\,a^{27}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/(a + b/x^(1/3))^3,x, algorithm="giac")
```

```
[Out] -165*b^9*ln(abs(a*x^(1/3) + b))/a^12 - 3/2*(22*a*b^10*x^(1/3) + 2
1*b^11)/((a*x^(1/3) + b)^2*a^12) + 1/168*(56*a^24*x^3 - 189*a^23*
b*x^(8/3) + 432*a^22*b^2*x^(7/3) - 840*a^21*b^3*x^2 + 1512*a^20*b
^4*x^(5/3) - 2646*a^19*b^5*x^(4/3) + 4704*a^18*b^6*x - 9072*a^17*
b^7*x^(2/3) + 22680*a^16*b^8*x^(1/3))/a^27
```

3.2431 $\int \frac{x}{\left(a+\frac{b}{\sqrt[3]{x}}\right)^3} dx$

Optimal. Leaf size=134

$$-\frac{3b^8}{2a^9\left(a\sqrt[3]{x}+b\right)^2}+\frac{24b^7}{a^9\left(a\sqrt[3]{x}+b\right)}+\frac{84b^6\log\left(a\sqrt[3]{x}+b\right)}{a^9}-\frac{63b^5\sqrt[3]{x}}{a^8}+\frac{45b^4x^{2/3}}{2a^7}-\frac{10b^3x}{a^6}+\frac{9b^2x^{4/3}}{2a^5}-\frac{9bx^{5/3}}{5a^4}+\frac{x^2}{2a^3}$$

```
[Out] (-3*b^8)/(2*a^9*(b + a*x^(1/3))^2) + (24*b^7)/(a^9*(b + a*x^(1/3)
)) - (63*b^5*x^(1/3))/a^8 + (45*b^4*x^(2/3))/(2*a^7) - (10*b^3*x)
/a^6 + (9*b^2*x^(4/3))/(2*a^5) - (9*b*x^(5/3))/(5*a^4) + x^2/(2*a
^3) + (84*b^6*Log[b + a*x^(1/3)])/a^9
```

Rubi [A] time = 0.236058, antiderivative size = 134, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{3b^8}{2a^9\left(a\sqrt[3]{x}+b\right)^2}+\frac{24b^7}{a^9\left(a\sqrt[3]{x}+b\right)}+\frac{84b^6\log\left(a\sqrt[3]{x}+b\right)}{a^9}-\frac{63b^5\sqrt[3]{x}}{a^8}+\frac{45b^4x^{2/3}}{2a^7}-\frac{10b^3x}{a^6}+\frac{9b^2x^{4/3}}{2a^5}-\frac{9bx^{5/3}}{5a^4}+\frac{x^2}{2a^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b/x^(1/3))^3,x]
```


```
[Out] (-3*b^8)/(2*a^9*(b + a*x^(1/3))^2) + (24*b^7)/(a^9*(b + a*x^(1/3)
)) - (63*b^5*x^(1/3))/a^8 + (45*b^4*x^(2/3))/(2*a^7) - (10*b^3*x)
/a^6 + (9*b^2*x^(4/3))/(2*a^5) - (9*b*x^(5/3))/(5*a^4) + x^2/(2*a
^3) + (84*b^6*Log[b + a*x^(1/3)])/a^9
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{x^2}{2a^3}-\frac{9bx^{\frac{5}{3}}}{5a^4}+\frac{9b^2x^{\frac{4}{3}}}{2a^5}-\frac{10b^3x}{a^6}+\frac{45b^4\int^{\sqrt[3]{x}} x\,dx}{a^7}-\frac{63b^5\sqrt[3]{x}}{a^8}-\frac{3b^8}{2a^9\left(a\sqrt[3]{x}+b\right)^2}+\frac{24b^7}{a^9\left(a\sqrt[3]{x}+b\right)}+\frac{84b^6\log\left(a\sqrt[3]{x}+b\right)}{a^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b/x**(1/3))**3,x)
```

```
[Out] x**2/(2*a**3) - 9*b*x**(5/3)/(5*a**4) + 9*b**2*x**(4/3)/(2*a**5)
- 10*b**3*x/a**6 + 45*b**4*Integral(x, (x, x**(1/3)))/a**7 - 63*b
**5*x**(1/3)/a**8 - 3*b**8/(2*a**9*(a*x**(1/3) + b)**2) + 24*b**7
/(a**9*(a*x**(1/3) + b)) + 84*b**6*log(a*x**(1/3) + b)/a**9
```

Mathematica [A] time = 0.0741221, size = 120, normalized size = 0.9

$$\frac{5a^6x^2-18a^5bx^{5/3}+45a^4b^2x^{4/3}-100a^3b^3x+225a^2b^4x^{2/3}-\frac{15b^8}{\left(a\sqrt[3]{x}+b\right)^2}+\frac{240b^7}{a\sqrt[3]{x}+b}+840b^6\log\left(a\sqrt[3]{x}+b\right)-630ab^5\sqrt[3]{x}}{10a^9}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b/x^(1/3))^3,x]
```

```
[Out] ((-15*b^8)/(b + a*x^(1/3))^2 + (240*b^7)/(b + a*x^(1/3)) - 630*a*
b^5*x^(1/3) + 225*a^2*b^4*x^(2/3) - 100*a^3*b^3*x + 45*a^4*b^2*x^
(4/3) - 18*a^5*b*x^(5/3) + 5*a^6*x^2 + 840*b^6*Log[b + a*x^(1/3)]
)/(10*a^9)
```

Maple [A] time = 0.012, size = 111, normalized size = 0.8

$$-\frac{3\,b^8}{2\,a^9}\left(b+a\sqrt[3]{x}\right)^{-2}+24\,\frac{b^7}{a^9\left(b+a\sqrt[3]{x}\right)}-63\,\frac{b^5\sqrt[3]{x}}{a^8}+\frac{45\,b^4}{2\,a^7}x^{\frac{2}{3}}-10\,\frac{b^3x}{a^6}+\frac{9\,b^2}{2\,a^5}x^{\frac{4}{3}}-\frac{9\,b}{5\,a^4}x^{\frac{5}{3}}+\frac{x^2}{2\,a^3}+84\,\frac{b^6\ln\left(b+a\sqrt[3]{x}\right)}{a^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+b/x^(1/3))^3,x)
```

```
[Out] -3/2*b^8/a^9/(b+a*x^(1/3))^2+24*b^7/a^9/(b+a*x^(1/3))-63*b^5*x^(1
/3)/a^8+45/2*b^4*x^(2/3)/a^7-10*b^3*x/a^6+9/2*b^2*x^(4/3)/a^5-9/5
*b*x^(5/3)/a^4+1/2*x^2/a^3+84*b^6*ln(b+a*x^(1/3))/a^9
```

Maxima [A] time = 1.46607, size = 181, normalized size = 1.35

$$\frac{5\,a^7-\frac{8\,a^6b}{x^{\frac{1}{3}}}+\frac{14\,a^5b^2}{x^{\frac{2}{3}}}-\frac{28\,a^4b^3}{x}+\frac{70\,a^3b^4}{x^{\frac{4}{3}}}-\frac{280\,a^2b^5}{x^{\frac{5}{3}}}-\frac{1260\,ab^6}{x^2}-\frac{840\,b^7}{x^{\frac{7}{3}}}}{10\left(\frac{a^{10}}{x^2}+\frac{2\,a^9b}{x^{\frac{7}{3}}}+\frac{a^8b^2}{x^{\frac{8}{3}}}\right)}+\frac{84\,b^6\log\left(a+\frac{b}{x^{\frac{1}{3}}}\right)}{a^9}+\frac{28\,b^6\log\left(x\right)}{a^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x^(1/3))^3,x, algorithm="maxima")
```

```
[Out] 1/10*(5*a^7 - 8*a^6*b/x^(1/3) + 14*a^5*b^2/x^(2/3) - 28*a^4*b^3/x
 + 70*a^3*b^4/x^(4/3) - 280*a^2*b^5/x^(5/3) - 1260*a*b^6/x^2 - 84
0*b^7/x^(7/3))/(a^10/x^2 + 2*a^9*b/x^(7/3) + a^8*b^2/x^(8/3)) + 8
4*b^6*log(a + b/x^(1/3))/a^9 + 28*b^6*log(x)/a^9
```

Fricas [A] time = 0.227002, size = 198, normalized size = 1.48

$$\frac{14\,a^6b^2x^2-280\,a^3b^5x+225\,b^8+840\left(a^2b^6x^{\frac{2}{3}}+2\,ab^7x^{\frac{1}{3}}+b^8\right)\log\left(ax^{\frac{1}{3}}+b\right)+\left(5\,a^8x^2-28\,a^5b^3x-1035\,a^2b^6\right)x^{\frac{2}{3}}-2\,(4\,a}{10\left(a^{11}x^{\frac{2}{3}}+2\,a^{10}bx^{\frac{1}{3}}+a^9b^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x^(1/3))^3,x, algorithm="fricas")
```

```
[Out] 1/10*(14*a^6*b^2*x^2 - 280*a^3*b^5*x + 225*b^8 + 840*(a^2*b^6*x^(
2/3) + 2*a*b^7*x^(1/3) + b^8)*log(a*x^(1/3) + b) + (5*a^8*x^2 - 2
8*a^5*b^3*x - 1035*a^2*b^6)*x^(2/3) - 2*(4*a^7*b*x^2 - 35*a^4*b^4
*x + 195*a*b^7)*x^(1/3))/(a^11*x^(2/3) + 2*a^10*b*x^(1/3) + a^9*b
^2)
```

Sympy [A] time = 62.6536, size = 1069, normalized size = 7.98

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b/x**(1/3))**3,x)
```

```
[Out] 5*a**9*x**60/(10*a**12*x**58 + 30*a**11*b*x**(173/3) + 30*a**10*b
**2*x**(172/3) + 10*a**9*b**3*x**57) - 3*a**8*b*x**(179/3)/(10*a*
*12*x**58 + 30*a**11*b*x**(173/3) + 30*a**10*b**2*x**(172/3) + 10
*a**9*b**3*x**57) + 6*a**7*b**2*x**(178/3)/(10*a**12*x**58 + 30*a
**11*b*x**(173/3) + 30*a**10*b**2*x**(172/3) + 10*a**9*b**3*x**57
) - 14*a**6*b**3*x**59/(10*a**12*x**58 + 30*a**11*b*x**(173/3) +
30*a**10*b**2*x**(172/3) + 10*a**9*b**3*x**57) + 42*a**5*b**4*x**
(176/3)/(10*a**12*x**58 + 30*a**11*b*x**(173/3) + 30*a**10*b**2*x
**(172/3) + 10*a**9*b**3*x**57) - 210*a**4*b**5*x**(175/3)/(10*a*
*12*x**58 + 30*a**11*b*x**(173/3) + 30*a**10*b**2*x**(172/3) + 10
*a**9*b**3*x**57) - 840*a**3*b**6*x**58*log(b/(a*x**(1/3)))/(10*a
**12*x**58 + 30*a**11*b*x**(173/3) + 30*a**10*b**2*x**(172/3) + 1
0*a**9*b**3*x**57) + 840*a**3*b**6*x**58*log(1 + b/(a*x**(1/3)))/
(10*a**12*x**58 + 30*a**11*b*x**(173/3) + 30*a**10*b**2*x**(172/3
) + 10*a**9*b**3*x**57) - 1540*a**3*b**6*x**58/(10*a**12*x**58 +
30*a**11*b*x**(173/3) + 30*a**10*b**2*x**(172/3) + 10*a**9*b**3*x
**57) - 2520*a**2*b**7*x**(173/3)*log(b/(a*x**(1/3)))/(10*a**12*x
**58 + 30*a**11*b*x**(173/3) + 30*a**10*b**2*x**(172/3) + 10*a**9
*b**3*x**57) + 2520*a**2*b**7*x**(173/3)*log(1 + b/(a*x**(1/3)))/
(10*a**12*x**58 + 30*a**11*b*x**(173/3) + 30*a**10*b**2*x**(172/3
) + 10*a**9*b**3*x**57) - 2100*a**2*b**7*x**(173/3)/(10*a**12*x**
58 + 30*a**11*b*x**(173/3) + 30*a**10*b**2*x**(172/3) + 10*a**9*b
**3*x**57) - 2520*a*b**8*x**(172/3)*log(b/(a*x**(1/3)))/(10*a**12
*x**58 + 30*a**11*b*x**(173/3) + 30*a**10*b**2*x**(172/3) + 10*a*
*9*b**3*x**57) + 2520*a*b**8*x**(172/3)*log(1 + b/(a*x**(1/3)))/(
10*a**12*x**58 + 30*a**11*b*x**(173/3) + 30*a**10*b**2*x**(172/3)
 + 10*a**9*b**3*x**57) - 840*a*b**8*x**(172/3)/(10*a**12*x**58 +
30*a**11*b*x**(173/3) + 30*a**10*b**2*x**(172/3) + 10*a**9*b**3*x
**57) - 840*b**9*x**57*log(b/(a*x**(1/3)))/(10*a**12*x**58 + 30*a
**11*b*x**(173/3) + 30*a**10*b**2*x**(172/3) + 10*a**9*b**3*x**57
) + 840*b**9*x**57*log(1 + b/(a*x**(1/3)))/(10*a**12*x**58 + 30*a
**11*b*x**(173/3) + 30*a**10*b**2*x**(172/3) + 10*a**9*b**3*x**57
)
```

GIAC/XCAS [A] time = 0.21799, size = 151, normalized size = 1.13

$$\frac{84\,b^{6}\ln\left(\left|ax^{\frac{1}{3}}+b\right|\right)}{a^{9}}+\frac{3\left(16\,ab^{7}x^{\frac{1}{3}}+15\,b^{8}\right)}{2\left(ax^{\frac{1}{3}}+b\right)^{2}a^{9}}+\frac{5\,a^{15}x^{2}-18\,a^{14}bx^{\frac{5}{3}}+45\,a^{13}b^{2}x^{\frac{4}{3}}-100\,a^{12}b^{3}x+225\,a^{11}b^{4}x^{\frac{2}{3}}-630\,a^{10}b^{5}x^{\frac{1}{3}}}{10\,a^{18}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a + b/x^(1/3))^3,x, algorithm="giac")
```

```
[Out] 84*b^6*ln(abs(a*x^(1/3) + b))/a^9 + 3/2*(16*a*b^7*x^(1/3) + 15*b^
8)/((a*x^(1/3) + b)^2*a^9) + 1/10*(5*a^15*x^2 - 18*a^14*b*x^(5/3)
 + 45*a^13*b^2*x^(4/3) - 100*a^12*b^3*x + 225*a^11*b^4*x^(2/3) -
630*a^10*b^5*x^(1/3))/a^18
```

3.2432 $\int \frac{1}{\left(a+\frac{b}{\sqrt[3]{x}}\right)^3}\,dx$

Optimal. Leaf size=100

$$-\frac{30b^3\log\left(a+\frac{b}{\sqrt[3]{x}}\right)}{a^6}-\frac{10b^3\log(x)}{a^6}+\frac{12b^3}{a^5\left(a+\frac{b}{\sqrt[3]{x}}\right)}+\frac{18b^2\sqrt[3]{x}}{a^5}+\frac{3b^3}{2a^4\left(a+\frac{b}{\sqrt[3]{x}}\right)^2}-\frac{9bx^{2/3}}{2a^4}+\frac{x}{a^3}$$

```
[Out] (3*b^3)/(2*a^4*(a + b/x^(1/3))^2) + (12*b^3)/(a^5*(a + b/x^(1/3))
) + (18*b^2*x^(1/3))/a^5 - (9*b*x^(2/3))/(2*a^4) + x/a^3 - (30*b^
3*Log[a + b/x^(1/3)])/a^6 - (10*b^3*Log[x])/a^6
```

Rubi [A] time = 0.159936, antiderivative size = 100, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$-\frac{30b^3\log\left(a+\frac{b}{\sqrt[3]{x}}\right)}{a^6}-\frac{10b^3\log(x)}{a^6}+\frac{12b^3}{a^5\left(a+\frac{b}{\sqrt[3]{x}}\right)}+\frac{18b^2\sqrt[3]{x}}{a^5}+\frac{3b^3}{2a^4\left(a+\frac{b}{\sqrt[3]{x}}\right)^2}-\frac{9bx^{2/3}}{2a^4}+\frac{x}{a^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b/x^(1/3))^(-3),x]
```

```
[Out] (3*b^3)/(2*a^4*(a + b/x^(1/3))^2) + (12*b^3)/(a^5*(a + b/x^(1/3))
) + (18*b^2*x^(1/3))/a^5 - (9*b*x^(2/3))/(2*a^4) + x/a^3 - (30*b^
3*Log[a + b/x^(1/3)])/a^6 - (10*b^3*Log[x])/a^6
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{3x}{2a\left(a+\frac{b}{\sqrt[3]{x}}\right)^2}+\frac{30b^2\int^{\sqrt[3]{x}}\frac{1}{a^3}\,dx}{a^2}-\frac{15x}{2a^2\left(a+\frac{b}{\sqrt[3]{x}}\right)}+\frac{10x}{a^3}-\frac{30b\int^{\sqrt[3]{x}}x\,dx}{a^4}-\frac{30b^3\log\left(a\sqrt[3]{x}+b\right)}{a^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b/x**(1/3))**3,x)
```

```
[Out] -3*x/(2*a*(a + b/x**(1/3))**2) + 30*b**2*Integral(a**(-3), (x, x*
*(1/3)))/a**2 - 15*x/(2*a**2*(a + b/x**(1/3))) + 10*x/a**3 - 30*b
*Integral(x, (x, x**(1/3)))/a**4 - 30*b**3*log(a*x**(1/3) + b)/a*
*6
```

Mathematica [A] time = 0.0533127, size = 83, normalized size = 0.83

$$\frac{2a^3x-9a^2bx^{2/3}+\frac{3b^5}{\left(a\sqrt[3]{x}+b\right)^2}-\frac{30b^4}{a\sqrt[3]{x}+b}-60b^3\log\left(a\sqrt[3]{x}+b\right)+36ab^2\sqrt[3]{x}}{2a^6}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b/x^(1/3))^(-3),x]
```

```
[Out] ((3*b^5)/(b + a*x^(1/3))^2 - (30*b^4)/(b + a*x^(1/3)) + 36*a*b^2*
x^(1/3) - 9*a^2*b*x^(2/3) + 2*a^3*x - 60*b^3*Log[b + a*x^(1/3)])/
(2*a^6)
```

Maple [A] time = 0.011, size = 77, normalized size = 0.8

$$\frac{x}{a^3}-\frac{9\,b}{2\,a^4}x^{\frac{2}{3}}+18\,\frac{b^2\sqrt[3]{x}}{a^5}-15\,\frac{b^4}{\left(b+a\sqrt[3]{x}\right)a^6}+\frac{3\,b^5}{2\,a^6}\left(b+a\sqrt[3]{x}\right)^{-2}-30\,\frac{b^3\ln\left(b+a\sqrt[3]{x}\right)}{a^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^(1/3))^3,x)
```

```
[Out] x/a^3-9/2*b*x^(2/3)/a^4+18*b^2*x^(1/3)/a^5-15*b^4/(b+a*x^(1/3))/a
^6+3/2*b^5/(b+a*x^(1/3))^2/a^6-30/a^6*b^3*ln(b+a*x^(1/3))
```

Maxima [A] time = 1.42037, size = 136, normalized size = 1.36

$$\frac{2\,a^4-\frac{5\,a^3b}{x^{\frac{1}{3}}}+\frac{20\,a^2b^2}{x^{\frac{2}{3}}}+\frac{90\,ab^3}{x}+\frac{60\,b^4}{x^{\frac{4}{3}}}}{2\left(\frac{a^7}{x}+\frac{2\,a^6b}{x^{\frac{4}{3}}}+\frac{a^5b^2}{x^{\frac{5}{3}}}\right)}-\frac{30\,b^3\log\left(a+\frac{b}{x^{\frac{1}{3}}}\right)}{a^6}-\frac{10\,b^3\log\left(x\right)}{a^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^(-3),x, algorithm="maxima")
```

```
[Out] 1/2*(2*a^4 - 5*a^3*b/x^(1/3) + 20*a^2*b^2/x^(2/3) + 90*a*b^3/x +
60*b^4/x^(4/3))/(a^7/x + 2*a^6*b/x^(4/3) + a^5*b^2/x^(5/3)) - 30*
b^3*log(a + b/x^(1/3))/a^6 - 10*b^3*log(x)/a^6
```

Fricas [A] time = 0.225781, size = 154, normalized size = 1.54

$$\frac{20\,a^3b^2x-27\,b^5-60\left(a^2b^3x^{\frac{2}{3}}+2\,ab^4x^{\frac{1}{3}}+b^5\right)\log\left(ax^{\frac{1}{3}}+b\right)+\left(2\,a^5x+63\,a^2b^3\right)x^{\frac{2}{3}}-\left(5\,a^4bx-6\,ab^4\right)x^{\frac{1}{3}}}{2\left(a^8x^{\frac{2}{3}}+2\,a^7bx^{\frac{1}{3}}+a^6b^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^(-3),x, algorithm="fricas")
```

```
[Out] 1/2*(20*a^3*b^2*x - 27*b^5 - 60*(a^2*b^3*x^(2/3) + 2*a*b^4*x^(1/3
) + b^5)*log(a*x^(1/3) + b) + (2*a^5*x + 63*a^2*b^3)*x^(2/3) - (5
*a^4*b*x - 6*a*b^4)*x^(1/3))/(a^8*x^(2/3) + 2*a^7*b*x^(1/3) + a^6
*b^2)
```

Sympy [A] time = 2.90255, size = 364, normalized size = 3.64

$$\begin{cases}\frac{2a^5x^{\frac{5}{3}}}{2a^8x^{\frac{2}{3}}+4a^7b\sqrt[3]{x}+2a^6b^2}-\frac{5a^4bx^{\frac{4}{3}}}{2a^8x^{\frac{2}{3}}+4a^7b\sqrt[3]{x}+2a^6b^2}+\frac{20a^3b^2x}{2a^8x^{\frac{2}{3}}+4a^7b\sqrt[3]{x}+2a^6b^2}-\frac{60a^2b^3x^{\frac{2}{3}}\log\left(\sqrt[3]{x}+\frac{b}{a}\right)}{2a^8x^{\frac{2}{3}}+4a^7b\sqrt[3]{x}+2a^6b^2}+\frac{60a^2b^3x^{\frac{2}{3}}}{2a^8x^{\frac{2}{3}}+4a^7b\sqrt[3]{x}+2a^6b^2}-\frac{120ab^4\sqrt[3]{x}\,\mathrm{l}}{2a^8x^{\frac{2}{3}}+4a^7b} \\ \frac{x^2}{2b^3}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**(1/3))**3,x)
```

```
[Out] Piecewise((2*a**5*x**(5/3)/(2*a**8*x**(2/3) + 4*a**7*b*x**(1/3) +
 2*a**6*b**2) - 5*a**4*b*x**(4/3)/(2*a**8*x**(2/3) + 4*a**7*b*x**
(1/3) + 2*a**6*b**2) + 20*a**3*b**2*x/(2*a**8*x**(2/3) + 4*a**7*b
*x**(1/3) + 2*a**6*b**2) - 60*a**2*b**3*x**(2/3)*log(x**(1/3) + b
/a)/(2*a**8*x**(2/3) + 4*a**7*b*x**(1/3) + 2*a**6*b**2) + 60*a**2
*b**3*x**(2/3)/(2*a**8*x**(2/3) + 4*a**7*b*x**(1/3) + 2*a**6*b**2
) - 120*a*b**4*x**(1/3)*log(x**(1/3) + b/a)/(2*a**8*x**(2/3) + 4*
a**7*b*x**(1/3) + 2*a**6*b**2) - 60*b**5*log(x**(1/3) + b/a)/(2*a
**8*x**(2/3) + 4*a**7*b*x**(1/3) + 2*a**6*b**2) - 30*b**5/(2*a**8
*x**(2/3) + 4*a**7*b*x**(1/3) + 2*a**6*b**2), Ne(a, 0)), (x**2/(2
*b**3), True))
```

GIAC/XCAS [A] time = 0.21633, size = 107, normalized size = 1.07

$$-\frac{30\,b^3\ln\left(\left|ax^{\frac{1}{3}}+b\right|\right)}{a^6}-\frac{3\left(10\,ab^4x^{\frac{1}{3}}+9\,b^5\right)}{2\left(ax^{\frac{1}{3}}+b\right)^2a^6}+\frac{2\,a^6x-9\,a^5bx^{\frac{2}{3}}+36\,a^4b^2x^{\frac{1}{3}}}{2\,a^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(1/3))^(-3),x, algorithm="giac")
```

```
[Out] -30*b^3*ln(abs(a*x^(1/3) + b))/a^6 - 3/2*(10*a*b^4*x^(1/3) + 9*b^
5)/((a*x^(1/3) + b)^2*a^6) + 1/2*(2*a^6*x - 9*a^5*b*x^(2/3) + 36*
a^4*b^2*x^(1/3))/a^9
```

3.2433 $\int \frac{1}{\left(a+\frac{b}{\sqrt[3]{x}}\right)^3 x} dx$

Optimal. Leaf size=54

$$-\frac{3b^2}{2a^3\left(a\sqrt[3]{x}+b\right)^2}+\frac{6b}{a^3\left(a\sqrt[3]{x}+b\right)}+\frac{3\log\left(a\sqrt[3]{x}+b\right)}{a^3}$$

```
[Out] (-3*b^2)/(2*a^3*(b + a*x^(1/3))^2) + (6*b)/(a^3*(b + a*x^(1/3)))
+ (3*Log[b + a*x^(1/3)])/a^3
```

Rubi [A] time = 0.0836381, antiderivative size = 54, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$-\frac{3b^2}{2a^3\left(a\sqrt[3]{x}+b\right)^2}+\frac{6b}{a^3\left(a\sqrt[3]{x}+b\right)}+\frac{3\log\left(a\sqrt[3]{x}+b\right)}{a^3}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + b/x^(1/3))^3*x),x]
```

```
[Out] (-3*b^2)/(2*a^3*(b + a*x^(1/3))^2) + (6*b)/(a^3*(b + a*x^(1/3)))
+ (3*Log[b + a*x^(1/3)])/a^3
```

Rubi in Sympy [A] time = 12.109, size = 49, normalized size = 0.91

$$-\frac{3b^2}{2a^3\left(a\sqrt[3]{x}+b\right)^2}+\frac{6b}{a^3\left(a\sqrt[3]{x}+b\right)}+\frac{3\log\left(a\sqrt[3]{x}+b\right)}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b/x**(1/3))**3/x,x)
```

```
[Out] -3*b**2/(2*a**3*(a*x**(1/3) + b)**2) + 6*b/(a**3*(a*x**(1/3) + b)
) + 3*log(a*x**(1/3) + b)/a**3
```

Mathematica [A] time = 0.0414173, size = 45, normalized size = 0.83

$$\frac{3\left(\frac{b\left(4a\sqrt[3]{x}+3b\right)}{\left(a\sqrt[3]{x}+b\right)^2}+2\log\left(a\sqrt[3]{x}+b\right)\right)}{2a^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + b/x^(1/3))^3*x),x]
```

```
[Out] (3*((b*(3*b + 4*a*x^(1/3)))/(b + a*x^(1/3))^2 + 2*Log[b + a*x^(1/
3)]))/(2*a^3)
```

Maple [B] time = 0.112, size = 330, normalized size = 6.1

$$-\frac{9\,b^{6}}{2\,(a^{3}x+b^{3})^{2}\,a^{3}}+\frac{\ln\left(a^{3}x+b^{3}\right)}{a^{3}}+9\,\frac{b^{3}}{a^{3}\,(a^{3}x+b^{3})}+2\,\frac{\ln\left(b+a\sqrt[3]{x}\right)}{a^{3}}-\frac{b^{2}}{a^{3}}\left(b+a\sqrt[3]{x}\right)^{-2}$$
$$-\frac{13\,b^{2}}{2\,a}x^{\frac{2}{3}}\left(a^{2}x^{\frac{2}{3}}-ab\sqrt[3]{x}+b^{2}\right)^{-2}+5\,\frac{\sqrt[3]{x}b^{3}}{a^{2}\left(a^{2}x^{2/3}-ab\sqrt[3]{x}+b^{2}\right)^{2}}-3\,\frac{b^{4}}{a^{3}\left(a^{2}x^{2/3}-ab\sqrt[3]{x}+b^{2}\right)^{2}}$$
$$-\frac{1}{2\,a^{3}}\ln\left(a\left(a^{2}x^{\frac{2}{3}}-ab\sqrt[3]{x}+b^{2}\right)\right)+\frac{\sqrt{3}}{a^{3}}\arctan\left(\frac{\sqrt{3}}{3\,a^{2}b}\left(2\,\sqrt[3]{x}a^{3}-a^{2}b\right)\right)+4\,\frac{b}{a^{3}\left(b+a\sqrt[3]{x}\right)}$$
$$+2\,\frac{bx}{\left(a^{2}x^{2/3}-ab\sqrt[3]{x}+b^{2}\right)^{2}}-\frac{1}{2\,a^{3}}\ln\left(a^{2}x^{\frac{2}{3}}-ab\sqrt[3]{x}+b^{2}\right)-\frac{\sqrt{3}}{a^{3}}\arctan\left(\frac{\sqrt{3}}{3\,ab}\left(2\,\sqrt[3]{x}a^{2}-ab\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^(1/3))^3/x,x)
```

```
[Out] -9/2*b^6/(a^3*x+b^3)^2/a^3+1/a^3*ln(a^3*x+b^3)+9/a^3*b^3/(a^3*x+b
^3)+2*ln(b+a*x^(1/3))/a^3-b^2/a^3/(b+a*x^(1/3))^2-13/2/a*b^2/(a^2
*x^(2/3)-a*b*x^(1/3)+b^2)^2*x^(2/3)+5/a^2*b^3/(a^2*x^(2/3)-a*b*x^
(1/3)+b^2)^2*x^(1/3)-3/a^3*b^4/(a^2*x^(2/3)-a*b*x^(1/3)+b^2)^2-1/
2/a^3*ln(a*(a^2*x^(2/3)-a*b*x^(1/3)+b^2))+1/a^3*3^(1/2)*arctan(1/
3*(2*x^(1/3)*a^3-a^2*b)*3^(1/2)/a^2/b)+4*b/a^3/(b+a*x^(1/3))+2*b/
(a^2*x^(2/3)-a*b*x^(1/3)+b^2)^2*x-1/2/a^3*ln(a^2*x^(2/3)-a*b*x^(1
/3)+b^2)-1/a^3*3^(1/2)*arctan(1/3*(2*x^(1/3)*a^2-a*b)*3^(1/2)/a/b
)
```

Maxima [A] time = 1.42611, size = 77, normalized size = 1.43

$$-\frac{3\left(3\,a+\frac{2\,b}{x^{\frac{1}{3}}}\right)}{2\left(a^{4}+\frac{2\,a^{3}b}{x^{\frac{1}{3}}}+\frac{a^{2}b^{2}}{x^{\frac{2}{3}}}\right)}+\frac{3\,\log\left(a+\frac{b}{x^{\frac{1}{3}}}\right)}{a^{3}}+\frac{\log\left(x\right)}{a^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))^3*x),x, algorithm="maxima")
```

```
[Out] -3/2*(3*a + 2*b/x^(1/3))/(a^4 + 2*a^3*b/x^(1/3) + a^2*b^2/x^(2/3)
) + 3*log(a + b/x^(1/3))/a^3 + log(x)/a^3
```

Fricas [A] time = 0.229324, size = 93, normalized size = 1.72

$$\frac{3\left(4\,abx^{\frac{1}{3}}+3\,b^{2}+2\left(a^{2}x^{\frac{2}{3}}+2\,abx^{\frac{1}{3}}+b^{2}\right)\log\left(ax^{\frac{1}{3}}+b\right)\right)}{2\left(a^{5}x^{\frac{2}{3}}+2\,a^{4}bx^{\frac{1}{3}}+a^{3}b^{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))^3*x),x, algorithm="fricas")
```

```
[Out] 3/2*(4*a*b*x^(1/3) + 3*b^2 + 2*(a^2*x^(2/3) + 2*a*b*x^(1/3) + b^2
)*log(a*x^(1/3) + b))/(a^5*x^(2/3) + 2*a^4*b*x^(1/3) + a^3*b^2)
```

Sympy [A] time = 6.24801, size = 240, normalized size = 4.44

$$\begin{cases}\frac{6a^{2}x^{\frac{4}{3}}\log\left(\sqrt[3]{x}+\frac{b}{a}\right)}{2a^{5}x^{\frac{4}{3}}+4a^{4}bx+2a^{3}b^{2}x^{\frac{2}{3}}}+\frac{12abx\log\left(\sqrt[3]{x}+\frac{b}{a}\right)}{2a^{5}x^{\frac{4}{3}}+4a^{4}bx+2a^{3}b^{2}x^{\frac{2}{3}}}+\frac{12abx}{2a^{5}x^{\frac{4}{3}}+4a^{4}bx+2a^{3}b^{2}x^{\frac{2}{3}}}+\frac{6b^{2}x^{\frac{2}{3}}\log\left(\sqrt[3]{x}+\frac{b}{a}\right)}{2a^{5}x^{\frac{4}{3}}+4a^{4}bx+2a^{3}b^{2}x^{\frac{2}{3}}}+\frac{9b^{2}x^{\frac{2}{3}}}{2a^{5}x^{\frac{4}{3}}+4a^{4}bx+2a^{3}b^{2}x^{\frac{2}{3}}} & \text{for}\ a\neq 0\\ \frac{x}{b^{3}} & \text{otherwis}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**(1/3))**3/x,x)
```

```
[Out] Piecewise((6*a**2*x**(4/3)*log(x**(1/3) + b/a)/(2*a**5*x**(4/3) +
 4*a**4*b*x + 2*a**3*b**2*x**(2/3)) + 12*a*b*x*log(x**(1/3) + b/a
)/(2*a**5*x**(4/3) + 4*a**4*b*x + 2*a**3*b**2*x**(2/3)) + 12*a*b*
x/(2*a**5*x**(4/3) + 4*a**4*b*x + 2*a**3*b**2*x**(2/3)) + 6*b**2*
x**(2/3)*log(x**(1/3) + b/a)/(2*a**5*x**(4/3) + 4*a**4*b*x + 2*a*
*3*b**2*x**(2/3)) + 9*b**2*x**(2/3)/(2*a**5*x**(4/3) + 4*a**4*b*x
 + 2*a**3*b**2*x**(2/3)), Ne(a, 0)), (x/b**3, True))
```

GIAC/XCAS [A] time = 0.215782, size = 59, normalized size = 1.09

$$\frac{3\ln\left(\left|ax^{\frac{1}{3}}+b\right|\right)}{a^3}+\frac{3\left(4\,bx^{\frac{1}{3}}+\frac{3\,b^2}{a}\right)}{2\left(ax^{\frac{1}{3}}+b\right)^2a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))^3*x),x, algorithm="giac")
```

```
[Out] 3*ln(abs(a*x^(1/3) + b))/a^3 + 3/2*(4*b*x^(1/3) + 3*b^2/a)/((a*x^
(1/3) + b)^2*a^2)
```

3.2434 $\int \frac{1}{\left(a+\frac{b}{\sqrt[3]{x}}\right)^3 x^2} dx$

Optimal. Leaf size=56

$$-\frac{3\log\left(a\sqrt[3]{x}+b\right)}{b^3}+\frac{3}{b^2\left(a\sqrt[3]{x}+b\right)}+\frac{3}{2b\left(a\sqrt[3]{x}+b\right)^2}+\frac{\log(x)}{b^3}$$

```
[Out] 3/(2*b*(b + a*x^(1/3))^2) + 3/(b^2*(b + a*x^(1/3))) - (3*Log[b +
a*x^(1/3)])/b^3 + Log[x]/b^3
```

Rubi [A] time = 0.084505, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{3\log\left(a\sqrt[3]{x}+b\right)}{b^3}+\frac{3}{b^2\left(a\sqrt[3]{x}+b\right)}+\frac{3}{2b\left(a\sqrt[3]{x}+b\right)^2}+\frac{\log(x)}{b^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^(1/3))^3*x^2),x]
```

```
[Out] 3/(2*b*(b + a*x^(1/3))^2) + 3/(b^2*(b + a*x^(1/3))) - (3*Log[b +
a*x^(1/3)])/b^3 + Log[x]/b^3
```

Rubi in Sympy [A] time = 13.0205, size = 54, normalized size = 0.96

$$\frac{3}{2b\left(a\sqrt[3]{x}+b\right)^2}+\frac{3}{b^2\left(a\sqrt[3]{x}+b\right)}+\frac{3\log\left(\sqrt[3]{x}\right)}{b^3}-\frac{3\log\left(a\sqrt[3]{x}+b\right)}{b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**(1/3))**3/x**2,x)
```

```
[Out] 3/(2*b*(a*x**(1/3) + b)**2) + 3/(b**2*(a*x**(1/3) + b)) + 3*log(x
**(1/3))/b**3 - 3*log(a*x**(1/3) + b)/b**3
```

Mathematica [A] time = 0.0683004, size = 51, normalized size = 0.91

$$\frac{3\left(\frac{b\left(2a\sqrt[3]{x}+3b\right)}{\left(a\sqrt[3]{x}+b\right)^2}-2\log\left(a\sqrt[3]{x}+b\right)+\frac{2\log(x)}{3}\right)}{2b^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^(1/3))^3*x^2),x]
```

```
[Out] (3*((b*(3*b + 2*a*x^(1/3)))/(b + a*x^(1/3))^2 - 2*Log[b + a*x^(1/
3)] + (2*Log[x])/3))/(2*b^3)
```

Maple [A] time = 0.013, size = 49, normalized size = 0.9

$$\frac{3}{2\,b}\left(b+a\sqrt[3]{x}\right)^{-2}+3\,\frac{1}{b^2\left(b+a\sqrt[3]{x}\right)}-3\,\frac{\ln\left(b+a\sqrt[3]{x}\right)}{b^3}+\frac{\ln(x)}{b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^(1/3))^3/x^2,x)
```

```
[Out] 3/2/b/(b+a*x^(1/3))^2+3/b^2/(b+a*x^(1/3))-3*ln(b+a*x^(1/3))/b^3+l
n(x)/b^3
```

Maxima [A] time = 1.42439, size = 62, normalized size = 1.11

$$-\frac{3\log\left(a+\frac{b}{x^{\frac{1}{3}}}\right)}{b^3}-\frac{6\,a}{\left(a+\frac{b}{x^{\frac{1}{3}}}\right)b^3}+\frac{3\,a^2}{2\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^2 b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))^3*x^2),x, algorithm="maxima")
```

```
[Out] -3*log(a + b/x^(1/3))/b^3 - 6*a/((a + b/x^(1/3))*b^3) + 3/2*a^2/(
(a + b/x^(1/3))^2*b^3)
```

Fricas [A] time = 0.241925, size = 124, normalized size = 2.21

$$\frac{3\left(2\,abx^{\frac{1}{3}}+3\,b^2-2\left(a^2x^{\frac{2}{3}}+2\,abx^{\frac{1}{3}}+b^2\right)\log\left(ax^{\frac{1}{3}}+b\right)+2\left(a^2x^{\frac{2}{3}}+2\,abx^{\frac{1}{3}}+b^2\right)\log\left(x^{\frac{1}{3}}\right)\right)}{2\left(a^2b^3x^{\frac{2}{3}}+2\,ab^4x^{\frac{1}{3}}+b^5\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))^3*x^2),x, algorithm="fricas")
```

```
[Out] 3/2*(2*a*b*x^(1/3) + 3*b^2 - 2*(a^2*x^(2/3) + 2*a*b*x^(1/3) + b^2
)*log(a*x^(1/3) + b) + 2*(a^2*x^(2/3) + 2*a*b*x^(1/3) + b^2)*log(
x^(1/3)))/(a^2*b^3*x^(2/3) + 2*a*b^4*x^(1/3) + b^5)
```

Sympy [A] time = 27.4345, size = 406, normalized size = 7.25

$$\begin{cases} \tilde{\infty}\log(x) \\ \frac{\log(x)}{b^3} \\ -\frac{1}{a^3x} \\ \frac{2a^2x^{\frac{7}{3}}\log(x)}{2a^2b^3x^{\frac{7}{3}}+4ab^4x^2+2b^5x^{\frac{5}{3}}}-\frac{6a^2x^{\frac{7}{3}}\log\left(\sqrt[3]{x}+\frac{b}{a}\right)}{2a^2b^3x^{\frac{7}{3}}+4ab^4x^2+2b^5x^{\frac{5}{3}}}+\frac{4abx^2\log(x)}{2a^2b^3x^{\frac{7}{3}}+4ab^4x^2+2b^5x^{\frac{5}{3}}}-\frac{12abx^2\log\left(\sqrt[3]{x}+\frac{b}{a}\right)}{2a^2b^3x^{\frac{7}{3}}+4ab^4x^2+2b^5x^{\frac{5}{3}}}+\frac{6abx^2}{2a^2b^3x^{\frac{7}{3}}+4ab^4x^2+2b^5x^{\frac{5}{3}}}+\frac{}{2a^2b^3} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**(1/3))**3/x**2,x)
```

```
[Out] Piecewise((zoo*log(x), Eq(a, 0) & Eq(b, 0)), (log(x)/b**3, Eq(a,
0)), (-1/(a**3*x), Eq(b, 0)), (2*a**2*x**(7/3)*log(x)/(2*a**2*b**
3*x**(7/3) + 4*a*b**4*x**2 + 2*b**5*x**(5/3)) - 6*a**2*x**(7/3)*l
og(x**(1/3) + b/a)/(2*a**2*b**3*x**(7/3) + 4*a*b**4*x**2 + 2*b**5
*x**(5/3)) + 4*a*b*x**2*log(x)/(2*a**2*b**3*x**(7/3) + 4*a*b**4*x
**2 + 2*b**5*x**(5/3)) - 12*a*b*x**2*log(x**(1/3) + b/a)/(2*a**2*
b**3*x**(7/3) + 4*a*b**4*x**2 + 2*b**5*x**(5/3)) + 6*a*b*x**2/(2*
a**2*b**3*x**(7/3) + 4*a*b**4*x**2 + 2*b**5*x**(5/3)) + 2*b**2*x*
*(5/3)*log(x)/(2*a**2*b**3*x**(7/3) + 4*a*b**4*x**2 + 2*b**5*x**(
5/3)) - 6*b**2*x**(5/3)*log(x**(1/3) + b/a)/(2*a**2*b**3*x**(7/3)
```

```
 + 4*a*b**4*x**2 + 2*b**5*x**(5/3)) + 9*b**2*x**(5/3)/(2*a**2*b**
3*x**(7/3) + 4*a*b**4*x**2 + 2*b**5*x**(5/3)), True))
```

GIAC/XCAS [A] time = 0.217232, size = 66, normalized size = 1.18

$$-\frac{3 \ln\left(\left|ax^{\frac{1}{3}} + b\right|\right)}{b^3} + \frac{\ln\left(|x|\right)}{b^3} + \frac{3\left(2\,abx^{\frac{1}{3}} + 3\,b^2\right)}{2\left(ax^{\frac{1}{3}} + b\right)^2 b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))^3*x^2),x, algorithm="giac")
```

```
[Out] -3*ln(abs(a*x^(1/3) + b))/b^3 + ln(abs(x))/b^3 + 3/2*(2*a*b*x^(1/
3) + 3*b^2)/((a*x^(1/3) + b)^2*b^3)
```

3.2435 $\int \frac{1}{\left(a+\frac{b}{\sqrt[3]{x}}\right)^3 x^3} \, dx$

Optimal. Leaf size=103

$$\frac{30a^3 \log\left(a\sqrt[3]{x}+b\right)}{b^6} - \frac{10a^3 \log(x)}{b^6} - \frac{12a^3}{b^5\left(a\sqrt[3]{x}+b\right)} - \frac{3a^3}{2b^4\left(a\sqrt[3]{x}+b\right)^2} - \frac{18a^2}{b^5\sqrt[3]{x}} + \frac{9a}{2b^4x^{2/3}} - \frac{1}{b^3x}$$

```
[Out] (-3*a^3)/(2*b^4*(b + a*x^(1/3))^2) - (12*a^3)/(b^5*(b + a*x^(1/3)
)) - 1/(b^3*x) + (9*a)/(2*b^4*x^(2/3)) - (18*a^2)/(b^5*x^(1/3)) +
 (30*a^3*Log[b + a*x^(1/3)])/b^6 - (10*a^3*Log[x])/b^6
```

Rubi [A] time = 0.168791, antiderivative size = 103, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{30a^3 \log\left(a\sqrt[3]{x}+b\right)}{b^6} - \frac{10a^3 \log(x)}{b^6} - \frac{12a^3}{b^5\left(a\sqrt[3]{x}+b\right)} - \frac{3a^3}{2b^4\left(a\sqrt[3]{x}+b\right)^2} - \frac{18a^2}{b^5\sqrt[3]{x}} + \frac{9a}{2b^4x^{2/3}} - \frac{1}{b^3x}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^(1/3))^3*x^3),x]
```

```
[Out] (-3*a^3)/(2*b^4*(b + a*x^(1/3))^2) - (12*a^3)/(b^5*(b + a*x^(1/3)
)) - 1/(b^3*x) + (9*a)/(2*b^4*x^(2/3)) - (18*a^2)/(b^5*x^(1/3)) +
 (30*a^3*Log[b + a*x^(1/3)])/b^6 - (10*a^3*Log[x])/b^6
```

Rubi in Sympy [A] time = 22.2117, size = 104, normalized size = 1.01

$$-\frac{3a^3}{2b^4\left(a\sqrt[3]{x}+b\right)^2} - \frac{12a^3}{b^5\left(a\sqrt[3]{x}+b\right)} - \frac{30a^3 \log\left(\sqrt[3]{x}\right)}{b^6} + \frac{30a^3 \log\left(a\sqrt[3]{x}+b\right)}{b^6} - \frac{18a^2}{b^5\sqrt[3]{x}} + \frac{9a}{2b^4x^{\frac{2}{3}}} - \frac{1}{b^3x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**(1/3))**3/x**3,x)
```

```
[Out] -3*a**3/(2*b**4*(a*x**(1/3) + b)**2) - 12*a**3/(b**5*(a*x**(1/3)
+ b)) - 30*a**3*log(x**(1/3))/b**6 + 30*a**3*log(a*x**(1/3) + b)/
b**6 - 18*a**2/(b**5*x**(1/3)) + 9*a/(2*b**4*x**(2/3)) - 1/(b**3*
x)
```

Mathematica [A] time = 0.208748, size = 93, normalized size = 0.9

$$-\frac{-60a^3 \log\left(a\sqrt[3]{x}+b\right) + 20a^3 \log(x) + \frac{b\left(60a^4x^{4/3}+90a^3bx+20a^2b^2x^{2/3}-5ab^3\sqrt[3]{x}+2b^4\right)}{x\left(a\sqrt[3]{x}+b\right)^2}}{2b^6}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^(1/3))^3*x^3),x]
```

```
[Out] -((b*(2*b^4 - 5*a*b^3*x^(1/3) + 20*a^2*b^2*x^(2/3) + 90*a^3*b*x +
 60*a^4*x^(4/3)))/((b + a*x^(1/3))^2*x) - 60*a^3*Log[b + a*x^(1/3
)] + 20*a^3*Log[x])/(2*b^6)
```

Maple [A] time = 0.018, size = 90, normalized size = 0.9

$$-\frac{3\,a^3}{2\,b^4}\left(b+a\sqrt[3]{x}\right)^{-2}-12\,\frac{a^3}{b^5\left(b+a\sqrt[3]{x}\right)}-\frac{1}{b^3x}+\frac{9\,a}{2\,b^4}x^{-\frac{2}{3}}-18\,\frac{a^2}{b^5\sqrt[3]{x}}+30\,\frac{a^3\ln\left(b+a\sqrt[3]{x}\right)}{b^6}-10\,\frac{a^3\ln(x)}{b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^(1/3))^3/x^3,x)
```

```
[Out] -3/2*a^3/b^4/(b+a*x^(1/3))^2-12*a^3/b^5/(b+a*x^(1/3))-1/b^3/x+9/2
*a/b^4/x^(2/3)-18*a^2/b^5/x^(1/3)+30*a^3*ln(b+a*x^(1/3))/b^6-10*a
^3*ln(x)/b^6
```

Maxima [A] time = 1.44807, size = 128, normalized size = 1.24

$$\frac{30\,a^3\log\left(a+\frac{b}{x^{\frac{1}{3}}}\right)}{b^6}-\frac{\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^3}{b^6}+\frac{15\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^2a}{2\,b^6}-\frac{30\left(a+\frac{b}{x^{\frac{1}{3}}}\right)a^2}{b^6}+\frac{15\,a^4}{\left(a+\frac{b}{x^{\frac{1}{3}}}\right)b^6}-\frac{3\,a^5}{2\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^2b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))^3*x^3),x, algorithm="maxima")
```

```
[Out] 30*a^3*log(a + b/x^(1/3))/b^6 - (a + b/x^(1/3))^3/b^6 + 15/2*(a +
 b/x^(1/3))^2*a/b^6 - 30*(a + b/x^(1/3))*a^2/b^6 + 15*a^4/((a + b
/x^(1/3))*b^6) - 3/2*a^5/((a + b/x^(1/3))^2*b^6)
```

Fricas [A] time = 0.236942, size = 189, normalized size = 1.83

$$-\frac{90\,a^3b^2x+20\,a^2b^3x^{\frac{2}{3}}+2\,b^5-60\left(a^5x^{\frac{5}{3}}+2\,a^4bx^{\frac{4}{3}}+a^3b^2x\right)\log\left(ax^{\frac{1}{3}}+b\right)+60\left(a^5x^{\frac{5}{3}}+2\,a^4bx^{\frac{4}{3}}+a^3b^2x\right)\log\left(x^{\frac{1}{3}}\right)+5\,(1}{2\left(a^2b^6x^{\frac{5}{3}}+2\,ab^7x^{\frac{4}{3}}+b^8x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))^3*x^3),x, algorithm="fricas")
```

```
[Out] -1/2*(90*a^3*b^2*x + 20*a^2*b^3*x^(2/3) + 2*b^5 - 60*(a^5*x^(5/3)
 + 2*a^4*b*x^(4/3) + a^3*b^2*x)*log(a*x^(1/3) + b) + 60*(a^5*x^(5
/3) + 2*a^4*b*x^(4/3) + a^3*b^2*x)*log(x^(1/3)) + 5*(12*a^4*b*x -
 a*b^4)*x^(1/3))/(a^2*b^6*x^(5/3) + 2*a*b^7*x^(4/3) + b^8*x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**(1/3))**3/x**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.217029, size = 122, normalized size = 1.18

$$\frac{30\,a^3\ln\left(\left|ax^{\frac{1}{3}}+b\right|\right)}{b^6}-\frac{10\,a^3\ln\left(|x|\right)}{b^6}-\frac{60\,a^4bx^{\frac{4}{3}}+90\,a^3b^2x+20\,a^2b^3x^{\frac{2}{3}}-5\,ab^4x^{\frac{1}{3}}+2\,b^5}{2\left(ax^{\frac{1}{3}}+b\right)^2b^6x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))^3*x^3),x, algorithm="giac")
```

```
[Out] 30*a^3*ln(abs(a*x^(1/3) + b))/b^6 - 10*a^3*ln(abs(x))/b^6 - 1/2*(
60*a^4*b*x^(4/3) + 90*a^3*b^2*x + 20*a^2*b^3*x^(2/3) - 5*a*b^4*x^
(1/3) + 2*b^5)/((a*x^(1/3) + b)^2*b^6*x)
```

3.2436 $\int \frac{1}{\left(a+\frac{b}{\sqrt[3]{x}}\right)^3 x^4}\,dx$

Optimal. Leaf size=146

$$-\frac{84a^6\log\left(a\sqrt[3]{x}+b\right)}{b^9}+\frac{28a^6\log(x)}{b^9}+\frac{21a^6}{b^8\left(a\sqrt[3]{x}+b\right)}+\frac{3a^6}{2b^7\left(a\sqrt[3]{x}+b\right)^2}+\frac{63a^5}{b^8\sqrt[3]{x}}-\frac{45a^4}{2b^7x^{2/3}}+\frac{10a^3}{b^6x}-\frac{9a^2}{2b^5x^{4/3}}+\frac{9a}{5b^4x^{5/3}}-\frac{1}{2b^3x^2}$$

```
[Out] (3*a^6)/(2*b^7*(b + a*x^(1/3))^2) + (21*a^6)/(b^8*(b + a*x^(1/3))
) - 1/(2*b^3*x^2) + (9*a)/(5*b^4*x^(5/3)) - (9*a^2)/(2*b^5*x^(4/3
)) + (10*a^3)/(b^6*x) - (45*a^4)/(2*b^7*x^(2/3)) + (63*a^5)/(b^8*
x^(1/3)) - (84*a^6*Log[b + a*x^(1/3)])/b^9 + (28*a^6*Log[x])/b^9
```

Rubi [A] time = 0.243702, antiderivative size = 146, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{84a^6\log\left(a\sqrt[3]{x}+b\right)}{b^9}+\frac{28a^6\log(x)}{b^9}+\frac{21a^6}{b^8\left(a\sqrt[3]{x}+b\right)}+\frac{3a^6}{2b^7\left(a\sqrt[3]{x}+b\right)^2}+\frac{63a^5}{b^8\sqrt[3]{x}}-\frac{45a^4}{2b^7x^{2/3}}+\frac{10a^3}{b^6x}-\frac{9a^2}{2b^5x^{4/3}}+\frac{9a}{5b^4x^{5/3}}-\frac{1}{2b^3x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^(1/3))^3*x^4),x]
```

```
[Out] (3*a^6)/(2*b^7*(b + a*x^(1/3))^2) + (21*a^6)/(b^8*(b + a*x^(1/3))
) - 1/(2*b^3*x^2) + (9*a)/(5*b^4*x^(5/3)) - (9*a^2)/(2*b^5*x^(4/3
)) + (10*a^3)/(b^6*x) - (45*a^4)/(2*b^7*x^(2/3)) + (63*a^5)/(b^8*
x^(1/3)) - (84*a^6*Log[b + a*x^(1/3)])/b^9 + (28*a^6*Log[x])/b^9
```

Rubi in Sympy [A] time = 42.6693, size = 148, normalized size = 1.01

$$\frac{3a^6}{2b^7\left(a\sqrt[3]{x}+b\right)^2}+\frac{21a^6}{b^8\left(a\sqrt[3]{x}+b\right)}+\frac{84a^6\log\left(\sqrt[3]{x}\right)}{b^9}-\frac{84a^6\log\left(a\sqrt[3]{x}+b\right)}{b^9}+\frac{63a^5}{b^8\sqrt[3]{x}}-\frac{45a^4}{2b^7x^{\frac{2}{3}}}+\frac{10a^3}{b^6x}-\frac{9a^2}{2b^5x^{\frac{4}{3}}}+\frac{9a}{5b^4x^{\frac{5}{3}}}-\frac{1}{2b^3x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**(1/3))**3/x**4,x)
```

```
[Out] 3*a**6/(2*b**7*(a*x**(1/3) + b)**2) + 21*a**6/(b**8*(a*x**(1/3) +
 b)) + 84*a**6*log(x**(1/3))/b**9 - 84*a**6*log(a*x**(1/3) + b)/b
**9 + 63*a**5/(b**8*x**(1/3)) - 45*a**4/(2*b**7*x**(2/3)) + 10*a*
*3/(b**6*x) - 9*a**2/(2*b**5*x**(4/3)) + 9*a/(5*b**4*x**(5/3)) -
1/(2*b**3*x**2)
```

Mathematica [A] time = 0.277282, size = 130, normalized size = 0.89

$$\frac{-840a^6\log\left(a\sqrt[3]{x}+b\right)+280a^6\log(x)+\frac{b\left(840a^7x^{7/3}+1260a^6bx^2+280a^5b^2x^{5/3}-70a^4b^3x^{4/3}+28a^3b^4x-14a^2b^5x^{2/3}+8ab^6\sqrt[3]{x}-5b^7\right)}{x^2\left(a\sqrt[3]{x}+b\right)^2}}{10b^9}$$

Antiderivative was successfully verified.

```
[In]   Integrate[1/((a + b/x^(1/3))^3*x^4),x]
```

```
[Out] ((b*(-5*b^7 + 8*a*b^6*x^(1/3) - 14*a^2*b^5*x^(2/3) + 28*a^3*b^4*x
 - 70*a^4*b^3*x^(4/3) + 280*a^5*b^2*x^(5/3) + 1260*a^6*b*x^2 + 84
0*a^7*x^(7/3)))/((b + a*x^(1/3))^2*x^2) - 840*a^6*Log[b + a*x^(1/
3)] + 280*a^6*Log[x])/(10*b^9)
```

Maple [A] time = 0.019, size = 123, normalized size = 0.8

$$\frac{3a^6}{2b^7}\left(b+a\sqrt[3]{x}\right)^{-2}+21\frac{a^6}{b^8\left(b+a\sqrt[3]{x}\right)}-\frac{1}{2b^3x^2}+\frac{9a}{5b^4}x^{-\frac{5}{3}}-\frac{9a^2}{2b^5}x^{-\frac{4}{3}}+10\frac{a^3}{b^6x}-\frac{45a^4}{2b^7}x^{-\frac{2}{3}}+63\frac{a^5}{b^8\sqrt[3]{x}}-84\frac{a^6\ln\left(b+a\sqrt[3]{x}\right)}{b^9}+28\frac{a^6\ln(x)}{b^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/(a+b/x^(1/3))^3/x^4,x)
```

```
[Out] 3/2*a^6/b^7/(b+a*x^(1/3))^2+21*a^6/b^8/(b+a*x^(1/3))-1/2/b^3/x^2+
9/5*a/b^4/x^(5/3)-9/2*a^2/b^5/x^(4/3)+10*a^3/b^6/x-45/2*a^4/b^7/x
^(2/3)+63*a^5/b^8/x^(1/3)-84*a^6*ln(b+a*x^(1/3))/b^9+28*a^6*ln(x)
/b^9
```

Maxima [A] time = 1.44466, size = 197, normalized size = 1.35

$$-\frac{84a^6\log\left(a+\frac{b}{x^{\frac{1}{3}}}\right)}{b^9}-\frac{\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^6}{2b^9}+\frac{24\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^5a}{5b^9}-\frac{21\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^4a^2}{b^9}+\frac{56\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^3a^3}{b^9}-\frac{105\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^2a^4}{b^9}+\frac{168\left(a+\frac{b}{x^{\frac{1}{3}}}\right)a^5}{b^9}-\frac{24a^7}{\left(a+\frac{b}{x^{\frac{1}{3}}}\right)b^9}+\frac{3a^8}{2\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^2b^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x^(1/3))^3*x^4),x, algorithm="maxima")
```

```
[Out] -84*a^6*log(a + b/x^(1/3))/b^9 - 1/2*(a + b/x^(1/3))^6/b^9 + 24/5
*(a + b/x^(1/3))^5*a/b^9 - 21*(a + b/x^(1/3))^4*a^2/b^9 + 56*(a +
 b/x^(1/3))^3*a^3/b^9 - 105*(a + b/x^(1/3))^2*a^4/b^9 + 168*(a +
b/x^(1/3))*a^5/b^9 - 24*a^7/((a + b/x^(1/3))*b^9) + 3/2*a^8/((a +
 b/x^(1/3))^2*b^9)
```

Fricas [A] time = 0.238961, size = 243, normalized size = 1.66

$$\frac{1260a^6b^2x^2+28a^3b^5x-5b^8-840\left(a^8x^{\frac{8}{3}}+2a^7bx^{\frac{7}{3}}+a^6b^2x^2\right)\log\left(ax^{\frac{1}{3}}+b\right)+840\left(a^8x^{\frac{8}{3}}+2a^7bx^{\frac{7}{3}}+a^6b^2x^2\right)\log\left(x^{\frac{1}{3}}\right)+}{10\left(a^2b^9x^{\frac{8}{3}}+2ab^{10}x^{\frac{7}{3}}+b^{11}x^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/((a + b/x^(1/3))^3*x^4),x, algorithm="fricas")
```

```
[Out] 1/10*(1260*a^6*b^2*x^2 + 28*a^3*b^5*x - 5*b^8 - 840*(a^8*x^(8/3)
+ 2*a^7*b*x^(7/3) + a^6*b^2*x^2)*log(a*x^(1/3) + b) + 840*(a^8*x^
```

```
(8/3) + 2*a^7*b*x^(7/3) + a^6*b^2*x^2)*log(x^(1/3)) + 14*(20*a^5*
b^3*x - a^2*b^6)*x^(2/3) + 2*(420*a^7*b*x^2 - 35*a^4*b^4*x + 4*a*
b^7)*x^(1/3))/(a^2*b^9*x^(8/3) + 2*a*b^10*x^(7/3) + b^11*x^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**(1/3))**3/x**4,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.21801, size = 166, normalized size = 1.14

$$-\frac{84\,a^6\ln\left(\left|ax^{\frac{1}{3}}+b\right|\right)}{b^9}+\frac{28\,a^6\ln\left(|x|\right)}{b^9}+\frac{840\,a^7bx^{\frac{7}{3}}+1260\,a^6b^2x^2+280\,a^5b^3x^{\frac{5}{3}}-70\,a^4b^4x^{\frac{4}{3}}+28\,a^3b^5x-14\,a^2b^6x^{\frac{2}{3}}+8\,ab^7x^{\frac{1}{3}}-5\,b^8}{10\left(ax^{\frac{1}{3}}+b\right)^2b^9x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))^3*x^4),x, algorithm="giac")
```

```
[Out] -84*a^6*ln(abs(a*x^(1/3) + b))/b^9 + 28*a^6*ln(abs(x))/b^9 + 1/10
*(840*a^7*b*x^(7/3) + 1260*a^6*b^2*x^2 + 280*a^5*b^3*x^(5/3) - 70
*a^4*b^4*x^(4/3) + 28*a^3*b^5*x - 14*a^2*b^6*x^(2/3) + 8*a*b^7*x^
(1/3) - 5*b^8)/((a*x^(1/3) + b)^2*b^9*x^2)
```

3.2437 $\int \frac{1}{\left(a+\frac{b}{\sqrt[3]{x}}\right)^3 x^5} \, dx$

Optimal. Leaf size=183

$$\frac{165a^9 \log \left(a\sqrt[3]{x}+b\right)}{b^{12}}-\frac{55a^9 \log(x)}{b^{12}}-\frac{30a^9}{b^{11}\left(a\sqrt[3]{x}+b\right)}-\frac{3a^9}{2b^{10}\left(a\sqrt[3]{x}+b\right)^2}-\frac{135a^8}{b^{11}\sqrt[3]{x}}+\frac{54a^7}{b^{10}x^{2/3}}-\frac{28a^6}{b^9 x}+\frac{63a^5}{4b^8 x^{4/3}}-\frac{9a^4}{b^7 x^{5/3}}+\frac{5a^3}{b^6 x^2}-\frac{18a^2}{7b^5 x^{7/3}}+\frac{9a}{8b^4 x^{8/3}}-\frac{1}{3b^3 x^3}$$

```
[Out] (-3*a^9)/(2*b^10*(b + a*x^(1/3))^2) - (30*a^9)/(b^11*(b + a*x^(1/
3))) - 1/(3*b^3*x^3) + (9*a)/(8*b^4*x^(8/3)) - (18*a^2)/(7*b^5*x^
(7/3)) + (5*a^3)/(b^6*x^2) - (9*a^4)/(b^7*x^(5/3)) + (63*a^5)/(4*
b^8*x^(4/3)) - (28*a^6)/(b^9*x) + (54*a^7)/(b^10*x^(2/3)) - (135*
a^8)/(b^11*x^(1/3)) + (165*a^9*Log[b + a*x^(1/3)])/b^12 - (55*a^9
*Log[x])/b^12
```

Rubi [A] time = 0.338117, antiderivative size = 183, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{165a^9 \log \left(a\sqrt[3]{x}+b\right)}{b^{12}}-\frac{55a^9 \log(x)}{b^{12}}-\frac{30a^9}{b^{11}\left(a\sqrt[3]{x}+b\right)}-\frac{3a^9}{2b^{10}\left(a\sqrt[3]{x}+b\right)^2}-\frac{135a^8}{b^{11}\sqrt[3]{x}}+\frac{54a^7}{b^{10}x^{2/3}}-\frac{28a^6}{b^9 x}+\frac{63a^5}{4b^8 x^{4/3}}-\frac{9a^4}{b^7 x^{5/3}}+\frac{5a^3}{b^6 x^2}-\frac{18a^2}{7b^5 x^{7/3}}+\frac{9a}{8b^4 x^{8/3}}-\frac{1}{3b^3 x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b/x^(1/3))^3*x^5),x]
```

```
[Out] (-3*a^9)/(2*b^10*(b + a*x^(1/3))^2) - (30*a^9)/(b^11*(b + a*x^(1/
3))) - 1/(3*b^3*x^3) + (9*a)/(8*b^4*x^(8/3)) - (18*a^2)/(7*b^5*x^
(7/3)) + (5*a^3)/(b^6*x^2) - (9*a^4)/(b^7*x^(5/3)) + (63*a^5)/(4*
b^8*x^(4/3)) - (28*a^6)/(b^9*x) + (54*a^7)/(b^10*x^(2/3)) - (135*
a^8)/(b^11*x^(1/3)) + (165*a^9*Log[b + a*x^(1/3)])/b^12 - (55*a^9
*Log[x])/b^12
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b/x**(1/3))**3/x**5,x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.480855, size = 167, normalized size = 0.91

$$-\frac{-27720a^9 \log\left(a\sqrt[3]{x}+b\right)+9240a^9\log(x)+\frac{b\left(27720a^{10}x^{10/3}+41580a^9bx^3+9240a^8b^2x^{8/3}-2310a^7b^3x^{7/3}+924a^6b^4x^2-462a^5b^5x^{5/3}+264a^4b^6x^{4/3}\right.}{x^3\left(a\sqrt[3]{x}+b\right)^2}}{168b^{12}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b/x^(1/3))^3*x^5),x]
```

```
[Out] -((b*(56*b^10 - 77*a*b^9*x^(1/3) + 110*a^2*b^8*x^(2/3) - 165*a^3*
b^7*x + 264*a^4*b^6*x^(4/3) - 462*a^5*b^5*x^(5/3) + 924*a^6*b^4*x
^2 - 2310*a^7*b^3*x^(7/3) + 9240*a^8*b^2*x^(8/3) + 41580*a^9*b*x^
3 + 27720*a^10*x^(10/3)))/((b + a*x^(1/3))^2*x^3) - 27720*a^9*Log
[b + a*x^(1/3)] + 9240*a^9*Log[x])/(168*b^12)
```

Maple [A] time = 0.021, size = 156, normalized size = 0.9

$$-\frac{3a^9}{2b^{10}}\left(b+a\sqrt[3]{x}\right)^{-2}-30\frac{a^9}{b^{11}\left(b+a\sqrt[3]{x}\right)}-\frac{1}{3b^3x^3}+\frac{9a}{8b^4}x^{-\frac{8}{3}}-\frac{18a^2}{7b^5}x^{-\frac{7}{3}}+5\frac{a^3}{b^6x^2}-9\frac{a^4}{b^7x^{5/3}}+\frac{63a^5}{4b^8}x^{-\frac{4}{3}}-28\frac{a^6}{b^9x}+54\frac{a^7}{b^{10}x^{2/3}}-135\frac{a^8}{b^{11}\sqrt[3]{x}}+165\frac{a^9\ln\left(b+a\sqrt[3]{x}\right)}{b^{12}}-55\frac{a^9\ln(x)}{b^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b/x^(1/3))^3/x^5,x)
```

```
[Out] -3/2*a^9/b^10/(b+a*x^(1/3))^2-30*a^9/b^11/(b+a*x^(1/3))-1/3/b^3/x
^3+9/8*a/b^4/x^(8/3)-18/7*a^2/b^5/x^(7/3)+5*a^3/b^6/x^2-9*a^4/b^7
/x^(5/3)+63/4*a^5/b^8/x^(4/3)-28*a^6/b^9/x+54*a^7/b^10/x^(2/3)-13
5*a^8/b^11/x^(1/3)+165*a^9*ln(b+a*x^(1/3))/b^12-55*a^9*ln(x)/b^12
```

Maxima [A] time = 1.43798, size = 266, normalized size = 1.45

$$\frac{165a^9\log\left(a+\frac{b}{x^{\frac{1}{3}}}\right)}{b^{12}}-\frac{\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^9}{3b^{12}}+\frac{33\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^8a}{8b^{12}}-\frac{165\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^7a^2}{7b^{12}}+\frac{165\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^6a^3}{2b^{12}}-\frac{198\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^5a^4}{b^{12}}+\frac{693\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^4a^5}{2b^{12}}-\frac{462\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^3a^6}{b^{12}}+\frac{495\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^2a^7}{b^{12}}-\frac{495\left(a+\frac{b}{x^{\frac{1}{3}}}\right)a^8}{b^{12}}+\frac{33a^{10}}{\left(a+\frac{b}{x^{\frac{1}{3}}}\right)b^{12}}-\frac{3a^{11}}{2\left(a+\frac{b}{x^{\frac{1}{3}}}\right)^2b^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))^3*x^5),x, algorithm="maxima")
```

```
[Out] 165*a^9*log(a + b/x^(1/3))/b^12 - 1/3*(a + b/x^(1/3))^9/b^12 + 33
/8*(a + b/x^(1/3))^8*a/b^12 - 165/7*(a + b/x^(1/3))^7*a^2/b^12 +
165/2*(a + b/x^(1/3))^6*a^3/b^12 - 198*(a + b/x^(1/3))^5*a^4/b^12
 + 693/2*(a + b/x^(1/3))^4*a^5/b^12 - 462*(a + b/x^(1/3))^3*a^6/b
^12 + 495*(a + b/x^(1/3))^2*a^7/b^12 - 495*(a + b/x^(1/3))*a^8/b^
12 + 33*a^10/((a + b/x^(1/3))*b^12) - 3/2*a^11/((a + b/x^(1/3))^2
*b^12)
```

Fricas [A] time = 0.239665, size = 288, normalized size = 1.57

$$-\frac{41580a^9b^2x^3+924a^6b^5x^2-165a^3b^8x+56b^{11}-27720\left(a^{11}x^{\frac{11}{3}}+2a^{10}bx^{\frac{10}{3}}+a^9b^2x^3\right)\log\left(ax^{\frac{1}{3}}+b\right)+27720\left(a^{11}x^{\frac{11}{3}}+2\right.}{168\left(a^2b^{12}x^{\frac{11}{3}}+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))^3*x^5),x, algorithm="fricas")
```

```
[Out] -1/168*(41580*a^9*b^2*x^3 + 924*a^6*b^5*x^2 - 165*a^3*b^8*x + 56*
b^11 - 27720*(a^11*x^(11/3) + 2*a^10*b*x^(10/3) + a^9*b^2*x^3)*lo
```

```
g(a*x^(1/3) + b) + 27720*(a^11*x^(11/3) + 2*a^10*b*x^(10/3) + a^9
*b^2*x^3)*log(x^(1/3)) + 22*(420*a^8*b^3*x^2 - 21*a^5*b^6*x + 5*a
^2*b^9)*x^(2/3) + 11*(2520*a^10*b*x^3 - 210*a^7*b^4*x^2 + 24*a^4*
b^7*x - 7*a*b^10)*x^(1/3))/(a^2*b^12*x^(11/3) + 2*a*b^13*x^(10/3)
 + b^14*x^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b/x**(1/3))**3/x**5,x)

[Out] Timed out
```

GIAC/XCAS [A] time = 0.218758, size = 211, normalized size = 1.15

$$\frac{165\,a^9\ln\left(\left|ax^{\frac{1}{3}}+b\right|\right)}{b^{12}}-\frac{55\,a^9\ln\left(|x|\right)}{b^{12}}-\frac{27720\,a^{10}bx^{\frac{10}{3}}+41580\,a^9b^2x^3+9240\,a^8b^3x^{\frac{8}{3}}-2310\,a^7b^4x^{\frac{7}{3}}+924\,a^6b^5x^2-462\,a^5b^6x^{\frac{5}{3}}+264\,a^4b^7x^{\frac{4}{3}}-165\,a^3b^8x+110\,a}{168\left(ax^{\frac{1}{3}}+b\right)^2b^{12}x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^(1/3))^3*x^5),x, algorithm="giac")

[Out] 165*a^9*ln(abs(a*x^(1/3) + b))/b^12 - 55*a^9*ln(abs(x))/b^12 - 1/
168*(27720*a^10*b*x^(10/3) + 41580*a^9*b^2*x^3 + 9240*a^8*b^3*x^(
8/3) - 2310*a^7*b^4*x^(7/3) + 924*a^6*b^5*x^2 - 462*a^5*b^6*x^(5/
3) + 264*a^4*b^7*x^(4/3) - 165*a^3*b^8*x + 110*a^2*b^9*x^(2/3) -
77*a*b^10*x^(1/3) + 56*b^11)/((a*x^(1/3) + b)^2*b^12*x^3)
```

3.2438 $\int \frac{1}{1+\frac{b}{\sqrt[3]{x}}} dx$

Optimal. Leaf size=44

$$-3b^3 \log \left(\frac{b}{\sqrt[3]{x}}+1\right) - b^3 \log(x) + 3b^2 \sqrt[3]{x} - \frac{3}{2} b x^{2/3} + x$$

```
[Out] 3*b^2*x^(1/3) - (3*b*x^(2/3))/2 + x - 3*b^3*Log[1 + b/x^(1/3)] -
b^3*Log[x]
```

Rubi [A] time = 0.0595172, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$

$$-3b^3 \log \left(\frac{b}{\sqrt[3]{x}}+1\right) - b^3 \log(x) + 3b^2 \sqrt[3]{x} - \frac{3}{2} b x^{2/3} + x$$

Antiderivative was successfully verified.

```
[In]  Int[(1 + b/x^(1/3))^(-1),x]
```

```
[Out] 3*b^2*x^(1/3) - (3*b*x^(2/3))/2 + x - 3*b^3*Log[1 + b/x^(1/3)] -
b^3*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-3b^3 \log \left(b + \sqrt[3]{x}\right) - 3b \int^{\sqrt[3]{x}} x\, dx + x + 3 \int^{\sqrt[3]{x}} b^2\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(1+b/x**(1/3)),x)
```

```
[Out] -3*b**3*log(b + x**(1/3)) - 3*b*Integral(x, (x, x**(1/3))) + x +
3*Integral(b**2, (x, x**(1/3)))
```

Mathematica [A] time = 0.0127456, size = 35, normalized size = 0.8

$$-3b^3 \log \left(b + \sqrt[3]{x}\right) + 3b^2 \sqrt[3]{x} - \frac{3}{2} b x^{2/3} + x$$

Antiderivative was successfully verified.

```
[In]  Integrate[(1 + b/x^(1/3))^(-1),x]
```

```
[Out] 3*b^2*x^(1/3) - (3*b*x^(2/3))/2 + x - 3*b^3*Log[b + x^(1/3)]
```

Maple [A] time = 0.005, size = 28, normalized size = 0.6

$$x - \frac{3\,b}{2} x^{\frac{2}{3}} + 3\,b^2 \sqrt[3]{x} - 3\,b^3 \ln \left(\sqrt[3]{x} + b\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(1+b/x^(1/3)),x)
```

```
[Out] x-3/2*b*x^(2/3)+3*b^2*x^(1/3)-3*b^3*ln(x^(1/3)+b)
```

Maxima [A] time = 1.48262, size = 54, normalized size = 1.23

$$-b^3 \log(x) - 3\,b^3 \log\left(\frac{b}{x^{\frac{1}{3}}} + 1\right) + \frac{1}{2}\left(\frac{6\,b^2}{x^{\frac{2}{3}}} - \frac{3\,b}{x^{\frac{1}{3}}} + 2\right)x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b/x^(1/3) + 1),x, algorithm="maxima")
```

```
[Out] -b^3*log(x) - 3*b^3*log(b/x^(1/3) + 1) + 1/2*(6*b^2/x^(2/3) - 3*b
/x^(1/3) + 2)*x
```

Fricas [A] time = 0.22868, size = 36, normalized size = 0.82

$$-3\,b^3 \log\left(b + x^{\frac{1}{3}}\right) + 3\,b^2 x^{\frac{1}{3}} - \frac{3}{2}\,b x^{\frac{2}{3}} + x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b/x^(1/3) + 1),x, algorithm="fricas")
```

```
[Out] -3*b^3*log(b + x^(1/3)) + 3*b^2*x^(1/3) - 3/2*b*x^(2/3) + x
```

Sympy [A] time = 0.407957, size = 34, normalized size = 0.77

$$-3b^3 \log\left(b + \sqrt[3]{x}\right) + 3b^2 \sqrt[3]{x} - \frac{3bx^{\frac{2}{3}}}{2} + x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(1+b/x**(1/3)),x)
```

```
[Out] -3*b**3*log(b + x**(1/3)) + 3*b**2*x**(1/3) - 3*b*x**(2/3)/2 + x
```

GIAC/XCAS [A] time = 0.213372, size = 38, normalized size = 0.86

$$-3\,b^3 \ln\left(\left|b + x^{\frac{1}{3}}\right|\right) + 3\,b^2 x^{\frac{1}{3}} - \frac{3}{2}\,b x^{\frac{2}{3}} + x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b/x^(1/3) + 1),x, algorithm="giac")
```

```
[Out] -3*b^3*ln(abs(b + x^(1/3))) + 3*b^2*x^(1/3) - 3/2*b*x^(2/3) + x
```

3.2439 $\int x^{2/3} \left(1+x^{5/3}\right)^{2/3} dx$

Optimal. Leaf size=15

$$\frac{9}{25}\left(x^{5/3}+1\right)^{5/3}$$

```
[Out] (9*(1 + x^(5/3))^(5/3))/25
```

Rubi [A] time = 0.0140645, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.059$

$$\frac{9}{25}\left(x^{5/3}+1\right)^{5/3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(2/3)*(1 + x^(5/3))^(2/3),x]

[Out] (9*(1 + x^(5/3))^(5/3))/25
```

Rubi in Sympy [A] time = 1.66251, size = 12, normalized size = 0.8

$$\frac{9\left(x^{\frac{5}{3}}+1\right)^{\frac{5}{3}}}{25}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(2/3)*(1+x**(5/3))**(2/3),x)

[Out] 9*(x**(5/3) + 1)**(5/3)/25
```

Mathematica [A] time = 0.00807221, size = 15, normalized size = 1.

$$\frac{9}{25}\left(x^{5/3}+1\right)^{5/3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(2/3)*(1 + x^(5/3))^(2/3),x]

[Out] (9*(1 + x^(5/3))^(5/3))/25
```

Maple [A] time = 0.003, size = 10, normalized size = 0.7

$$\frac{9}{25}\left(1+x^{\frac{5}{3}}\right)^{\frac{5}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(2/3)*(1+x^(5/3))^(2/3),x)

[Out] 9/25*(1+x^(5/3))^(5/3)
```

Maxima [A] time = 1.43765, size = 12, normalized size = 0.8

$$\frac{9}{25} \left(x^{\frac{5}{3}} + 1\right)^{\frac{5}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x^(5/3) + 1)^(2/3)*x^(2/3),x, algorithm="maxima")
```

```
[Out] 9/25*(x^(5/3) + 1)^(5/3)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x^(5/3) + 1)^(2/3)*x^(2/3),x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [A] time = 6.24355, size = 31, normalized size = 2.07

$$\frac{9x^{\frac{5}{3}} \left(x^{\frac{5}{3}} + 1\right)^{\frac{2}{3}}}{25} + \frac{9 \left(x^{\frac{5}{3}} + 1\right)^{\frac{2}{3}}}{25}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(2/3)*(1+x**(5/3))**(2/3),x)
```

```
[Out] 9*x**(5/3)*(x**(5/3) + 1)**(2/3)/25 + 9*(x**(5/3) + 1)**(2/3)/25
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(x^{\frac{5}{3}} + 1\right)^{\frac{2}{3}} x^{\frac{2}{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x^(5/3) + 1)^(2/3)*x^(2/3),x, algorithm="giac")
```

```
[Out] integrate((x^(5/3) + 1)^(2/3)*x^(2/3), x)
```

3.2440 $\int x^{7/3} \left(a^{10/3} - x^{10/3}\right)^{19/7} dx$

Optimal. Leaf size=21

$$-\frac{21}{260} \left(a^{10/3} - x^{10/3}\right)^{26/7}$$

```
[Out] (-21*(a^(10/3) - x^(10/3))^(26/7))/260
```

Rubi [A] time = 0.0188208, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.043$

$$-\frac{21}{260} \left(a^{10/3} - x^{10/3}\right)^{26/7}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(7/3)*(a^(10/3) - x^(10/3))^(19/7),x]

[Out] (-21*(a^(10/3) - x^(10/3))^(26/7))/260
```

Rubi in Sympy [A] time = 2.10471, size = 17, normalized size = 0.81

$$-\frac{21 \left(a^{\frac{10}{3}} - x^{\frac{10}{3}}\right)^{\frac{26}{7}}}{260}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(7/3)*(a**(10/3)-x**(10/3))**(19/7),x)

[Out] -21*(a**(10/3) - x**(10/3))**(26/7)/260
```

Mathematica [A] time = 0.0194828, size = 21, normalized size = 1.

$$-\frac{21}{260} \left(a^{10/3} - x^{10/3}\right)^{26/7}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(7/3)*(a^(10/3) - x^(10/3))^(19/7),x]

[Out] (-21*(a^(10/3) - x^(10/3))^(26/7))/260
```

Maple [A] time = 0.003, size = 14, normalized size = 0.7

$$-\frac{21}{260} \left(a^{\frac{10}{3}} - x^{\frac{10}{3}}\right)^{\frac{26}{7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(7/3)*(a^(10/3)-x^(10/3))^(19/7),x)

[Out] -21/260*(a^(10/3)-x^(10/3))^(26/7)
```

Maxima [A] time = 1.43771, size = 18, normalized size = 0.86

$$-\frac{21}{260}\left(a^{\frac{10}{3}}-x^{\frac{10}{3}}\right)^{\frac{26}{7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^(10/3) - x^(10/3))^(19/7)*x^(7/3),x, algorithm="maxima")
```

```
[Out] -21/260*(a^(10/3) - x^(10/3))^(26/7)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^(10/3) - x^(10/3))^(19/7)*x^(7/3),x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**(7/3)*(a**(10/3)-x**(10/3))**(19/7),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(a^{\frac{10}{3}}-x^{\frac{10}{3}}\right)^{\frac{19}{7}} x^{\frac{7}{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^(10/3) - x^(10/3))^(19/7)*x^(7/3),x, algorithm="giac")
```

```
[Out] integrate((a^(10/3) - x^(10/3))^(19/7)*x^(7/3), x)
```

3.2441 $\int \frac{1}{1+\sqrt[5]{x}} \, dx$

Optimal. Leaf size=45

$$\frac{5x^{4/5}}{4} - \frac{5x^{3/5}}{3} + \frac{5x^{2/5}}{2} - 5\sqrt[5]{x} + 5\log\left(\sqrt[5]{x}+1\right)$$

```
[Out] -5*x^(1/5) + (5*x^(2/5))/2 - (5*x^(3/5))/3 + (5*x^(4/5))/4 + 5*Lo
g[1 + x^(1/5)]
```

Rubi [A] time = 0.04009, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$

$$\frac{5x^{4/5}}{4} - \frac{5x^{3/5}}{3} + \frac{5x^{2/5}}{2} - 5\sqrt[5]{x} + 5\log\left(\sqrt[5]{x}+1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[(1 + x^(1/5))^(-1),x]
```

```
[Out] -5*x^(1/5) + (5*x^(2/5))/2 - (5*x^(3/5))/3 + (5*x^(4/5))/4 + 5*Lo
g[1 + x^(1/5)]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{5x^{\frac{4}{5}}}{4} - \frac{5x^{\frac{3}{5}}}{3} - 5\sqrt[5]{x} + 5\log\left(\sqrt[5]{x}+1\right) + 5\int^{\sqrt[5]{x}} x\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(1+x**(1/5)),x)
```

```
[Out] 5*x**(4/5)/4 - 5*x**(3/5)/3 - 5*x**(1/5) + 5*log(x**(1/5) + 1) +
5*Integral(x, (x, x**(1/5)))
```

Mathematica [A] time = 0.0160331, size = 45, normalized size = 1.

$$\frac{5x^{4/5}}{4} - \frac{5x^{3/5}}{3} + \frac{5x^{2/5}}{2} - 5\sqrt[5]{x} + 5\log\left(\sqrt[5]{x}+1\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(1 + x^(1/5))^(-1),x]
```

```
[Out] -5*x^(1/5) + (5*x^(2/5))/2 - (5*x^(3/5))/3 + (5*x^(4/5))/4 + 5*Lo
g[1 + x^(1/5)]
```

Maple [B] time = 0.065, size = 79, normalized size = 1.8

$$\ln(1+x) + \frac{5}{2}x^{\frac{2}{5}} + 4\ln\left(1+\sqrt[5]{x}\right) - \ln\left(-\sqrt[5]{x}\sqrt{5} + 2x^{2/5} - \sqrt[5]{x} + 2\right) - \ln\left(\sqrt[5]{x}\sqrt{5} + 2x^{2/5} - \sqrt[5]{x} + 2\right) + \frac{5}{4}x^{\frac{4}{5}} - 5\sqrt[5]{x} - \frac{5}{3}x^{\frac{3}{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(1+x^(1/5)),x)
```

```
[Out] ln(1+x)+5/2*x^(2/5)+4*ln(1+x^(1/5))-ln(-x^(1/5)*5^(1/2)+2*x^(2/5)
-x^(1/5)+2)-ln(x^(1/5)*5^(1/2)+2*x^(2/5)-x^(1/5)+2)+5/4*x^(4/5)-5
*x^(1/5)-5/3*x^(3/5)
```

Maxima [A] time = 1.44003, size = 57, normalized size = 1.27

$$\frac{5}{4}\left(x^{\frac{1}{5}}+1\right)^{4}-\frac{20}{3}\left(x^{\frac{1}{5}}+1\right)^{3}+15\left(x^{\frac{1}{5}}+1\right)^{2}-20\,x^{\frac{1}{5}}+5\,\log\left(x^{\frac{1}{5}}+1\right)-20$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^(1/5) + 1),x, algorithm="maxima")
```

```
[Out] 5/4*(x^(1/5) + 1)^4 - 20/3*(x^(1/5) + 1)^3 + 15*(x^(1/5) + 1)^2 -
 20*x^(1/5) + 5*log(x^(1/5) + 1) - 20
```

Fricas [A] time = 0.237965, size = 39, normalized size = 0.87

$$\frac{5}{4}\,x^{\frac{4}{5}}-\frac{5}{3}\,x^{\frac{3}{5}}+\frac{5}{2}\,x^{\frac{2}{5}}-5\,x^{\frac{1}{5}}+5\,\log\left(x^{\frac{1}{5}}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^(1/5) + 1),x, algorithm="fricas")
```

```
[Out] 5/4*x^(4/5) - 5/3*x^(3/5) + 5/2*x^(2/5) - 5*x^(1/5) + 5*log(x^(1/
5) + 1)
```

Sympy [A] time = 12.8416, size = 41, normalized size = 0.91

$$\frac{5x^{\frac{4}{5}}}{4}-\frac{5x^{\frac{3}{5}}}{3}+\frac{5x^{\frac{2}{5}}}{2}-5\sqrt[5]{x}+5\log\left(\sqrt[5]{x}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(1+x**(1/5)),x)
```

```
[Out] 5*x**(4/5)/4 - 5*x**(3/5)/3 + 5*x**(2/5)/2 - 5*x**(1/5) + 5*log(x
**(1/5) + 1)
```

GIAC/XCAS [A] time = 0.214154, size = 39, normalized size = 0.87

$$\frac{5}{4}\,x^{\frac{4}{5}}-\frac{5}{3}\,x^{\frac{3}{5}}+\frac{5}{2}\,x^{\frac{2}{5}}-5\,x^{\frac{1}{5}}+5\ln\left(x^{\frac{1}{5}}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^(1/5) + 1),x, algorithm="giac")
```

```
[Out] 5/4*x^(4/5) - 5/3*x^(3/5) + 5/2*x^(2/5) - 5*x^(1/5) + 5*ln(x^(1/5
) + 1)
```

3.2442 $\int \frac{1}{\sqrt{1+x^{4/5}}\sqrt[5]{x}} \, dx$

Optimal. Leaf size=15

$$\frac{5}{2}\sqrt{x^{4/5}+1}$$

```
[Out] (5*Sqrt[1 + x^(4/5)])/2
```

Rubi [A] time = 0.0173229, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.059$

$$\frac{5}{2}\sqrt{x^{4/5}+1}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[1 + x^(4/5)]*x^(1/5)),x]

[Out] (5*Sqrt[1 + x^(4/5)])/2
```

Rubi in Sympy [A] time = 1.70384, size = 12, normalized size = 0.8

$$\frac{5\sqrt{x^{\frac{4}{5}}+1}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**(1/5)/(1+x**(4/5))**(1/2),x)

[Out] 5*sqrt(x**(4/5) + 1)/2
```

Mathematica [A] time = 0.00733209, size = 15, normalized size = 1.

$$\frac{5}{2}\sqrt{x^{4/5}+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[1 + x^(4/5)]*x^(1/5)),x]

[Out] (5*Sqrt[1 + x^(4/5)])/2
```

Maple [A] time = 0.006, size = 10, normalized size = 0.7

$$\frac{5}{2}\sqrt{1+x^{\frac{4}{5}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^(1/5)/(1+x^(4/5))^(1/2),x)

[Out] 5/2*(1+x^(4/5))^(1/2)
```

Maxima [A] time = 1.43872, size = 12, normalized size = 0.8

$$\frac{5}{2}\sqrt{x^{\frac{4}{5}} + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^(1/5)*sqrt(x^(4/5) + 1)),x, algorithm="maxima")

[Out] 5/2*sqrt(x^(4/5) + 1)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^(1/5)*sqrt(x^(4/5) + 1)),x, algorithm="fricas")

[Out] Timed out
```

Sympy [A] time = 1.80942, size = 12, normalized size = 0.8

$$\frac{5\sqrt{x^{\frac{4}{5}} + 1}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**(1/5)/(1+x**(4/5))**(1/2),x)

[Out] 5*sqrt(x**(4/5) + 1)/2
```

GIAC/XCAS [A] time = 0.212391, size = 12, normalized size = 0.8

$$\frac{5}{2}\sqrt{x^{\frac{4}{5}} + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x^(1/5)*sqrt(x^(4/5) + 1)),x, algorithm="giac")

[Out] 5/2*sqrt(x^(4/5) + 1)
```

3.2443 $\int \left(a+\frac{b}{x^{3/5}}\right)^{2/3} dx$

Optimal. Leaf size=18

$$\frac{x\left(a+\frac{b}{x^{3/5}}\right)^{5/3}}{a}$$

```
[Out] ((a + b/x^(3/5))^(5/3)*x)/a
```

Rubi [A] time = 0.013214, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{x\left(a+\frac{b}{x^{3/5}}\right)^{5/3}}{a}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^(3/5))^(2/3),x]

[Out] ((a + b/x^(3/5))^(5/3)*x)/a
```

Rubi in Sympy [A] time = 1.34892, size = 14, normalized size = 0.78

$$\frac{x\left(a+\frac{b}{x^{\frac{3}{5}}}\right)^{\frac{5}{3}}}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**(3/5))**(2/3),x)

[Out] x*(a + b/x**(3/5))**(5/3)/a
```

Mathematica [A] time = 0.0345687, size = 28, normalized size = 1.56

$$\frac{\left(a+\frac{b}{x^{3/5}}\right)^{2/3}\left(ax+bx^{2/5}\right)}{a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^(3/5))^(2/3),x]

[Out] ((a + b/x^(3/5))^(2/3)*(b*x^(2/5) + a*x))/a
```

Maple [F] time = 0.023, size = 0, normalized size = 0.

$$\int \left(a+bx^{-\frac{3}{5}}\right)^{\frac{2}{3}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^(3/5))^(2/3),x)
```

```
[Out] int((a+b/x^(3/5))^(2/3),x)
```

Maxima [A] time = 1.44677, size = 19, normalized size = 1.06

$$\frac{\left(a+\frac{b}{x^{\frac{3}{5}}}\right)^{\frac{5}{3}}x}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(3/5))^(2/3),x, algorithm="maxima")
```

```
[Out] (a + b/x^(3/5))^(5/3)*x/a
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(3/5))^(2/3),x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**(3/5))**(2/3),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\left(a+\frac{b}{x^{\frac{3}{5}}}\right)^{\frac{2}{3}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(3/5))^(2/3),x, algorithm="giac")
```

```
[Out] integrate((a + b/x^(3/5))^(2/3), x)
```

3.2444 $\int x^3 (a + bx^n) \, dx$

Optimal. Leaf size=21

$$\frac{ax^4}{4} + \frac{bx^{n+4}}{n+4}$$

```
[Out] (a*x^4)/4 + (b*x^(4 + n))/(4 + n)
```

Rubi [A] time = 0.0268645, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$

$$\frac{ax^4}{4} + \frac{bx^{n+4}}{n+4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3*(a + b*x^n),x]

[Out] (a*x^4)/4 + (b*x^(4 + n))/(4 + n)
```

Rubi in Sympy [A] time = 3.57214, size = 15, normalized size = 0.71

$$\frac{ax^4}{4} + \frac{bx^{n+4}}{n+4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3*(a+b*x**n),x)

[Out] a*x**4/4 + b*x**(n + 4)/(n + 4)
```

Mathematica [A] time = 0.0172007, size = 21, normalized size = 1.

$$\frac{ax^4}{4} + \frac{bx^{n+4}}{n+4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3*(a + b*x^n),x]

[Out] (a*x^4)/4 + (b*x^(4 + n))/(4 + n)
```

Maple [A] time = 0.015, size = 23, normalized size = 1.1

$$\frac{bx^4 e^{n \ln(x)}}{4+n} + \frac{ax^4}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3*(a+b*x^n),x)

[Out] b/(4+n)*x^4*exp(n*ln(x))+1/4*a*x^4
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.239493, size = 38, normalized size = 1.81

$$\frac{4\,bx^4x^n + (an + 4\,a)x^4}{4\,(n + 4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^3,x, algorithm="fricas")
```

```
[Out] 1/4*(4*b*x^4*x^n + (a*n + 4*a)*x^4)/(n + 4)
```

Sympy [A] time = 1.407, size = 51, normalized size = 2.43

$$\begin{cases} \frac{anx^4}{4n+16} + \frac{4ax^4}{4n+16} + \frac{4bx^4x^n}{4n+16} & \text{for } n \neq -4 \\ \frac{ax^4}{4} + b\log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(a+b*x**n),x)
```

```
[Out] Piecewise((a*n*x**4/(4*n + 16) + 4*a*x**4/(4*n + 16) + 4*b*x**4*x
**n/(4*n + 16), Ne(n, -4)), (a*x**4/4 + b*log(x), True))
```

GIAC/XCAS [A] time = 0.213113, size = 42, normalized size = 2.

$$\frac{anx^4 + 4\,bx^4e^{(n\ln(x))} + 4\,ax^4}{4\,(n + 4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^3,x, algorithm="giac")
```

```
[Out] 1/4*(a*n*x^4 + 4*b*x^4*e^(n*ln(x)) + 4*a*x^4)/(n + 4)
```

3.2445 $\int x^2 (a + bx^n) \, dx$

Optimal. Leaf size=21

$$\frac{ax^3}{3} + \frac{bx^{n+3}}{n+3}$$

```
[Out] (a*x^3)/3 + (b*x^(3 + n))/(3 + n)
```

Rubi [A] time = 0.021508, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$

$$\frac{ax^3}{3} + \frac{bx^{n+3}}{n+3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2*(a + b*x^n),x]

[Out] (a*x^3)/3 + (b*x^(3 + n))/(3 + n)
```

Rubi in Sympy [A] time = 3.6623, size = 15, normalized size = 0.71

$$\frac{ax^3}{3} + \frac{bx^{n+3}}{n+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(a+b*x**n),x)

[Out] a*x**3/3 + b*x**(n + 3)/(n + 3)
```

Mathematica [A] time = 0.0163777, size = 21, normalized size = 1.

$$\frac{ax^3}{3} + \frac{bx^{n+3}}{n+3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2*(a + b*x^n),x]

[Out] (a*x^3)/3 + (b*x^(3 + n))/(3 + n)
```

Maple [A] time = 0.014, size = 23, normalized size = 1.1

$$\frac{bx^3 e^{n \ln(x)}}{3+n} + \frac{ax^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(a+b*x^n),x)

[Out] b/(3+n)*x^3*exp(n*ln(x))+1/3*a*x^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.236021, size = 38, normalized size = 1.81

$$\frac{3\,bx^3x^n + (an + 3\,a)x^3}{3\,(n+3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^2,x, algorithm="fricas")
```

```
[Out] 1/3*(3*b*x^3*x^n + (a*n + 3*a)*x^3)/(n + 3)
```

Sympy [A] time = 1.02459, size = 51, normalized size = 2.43

$$\begin{cases} \frac{anx^3}{3n+9} + \frac{3ax^3}{3n+9} + \frac{3bx^3x^n}{3n+9} & \text{for } n \neq -3 \\ \frac{ax^3}{3} + b\log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(a+b*x**n),x)
```

```
[Out] Piecewise((a*n*x**3/(3*n + 9) + 3*a*x**3/(3*n + 9) + 3*b*x**3*x**
n/(3*n + 9), Ne(n, -3)), (a*x**3/3 + b*log(x), True))
```

GIAC/XCAS [A] time = 0.212706, size = 42, normalized size = 2.

$$\frac{anx^3 + 3\,bx^3e^{(n\ln(x))} + 3\,ax^3}{3\,(n+3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^2,x, algorithm="giac")
```

```
[Out] 1/3*(a*n*x^3 + 3*b*x^3*e^(n*ln(x)) + 3*a*x^3)/(n + 3)
```

3.2446 $\int x(a + bx^n) \, dx$

Optimal. Leaf size=21

$$\frac{ax^2}{2} + \frac{bx^{n+2}}{n+2}$$

```
[Out] (a*x^2)/2 + (b*x^(2 + n))/(2 + n)
```

Rubi [A] time = 0.023482, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$

$$\frac{ax^2}{2} + \frac{bx^{n+2}}{n+2}$$

Antiderivative was successfully verified.

```
[In]  Int[x*(a + b*x^n),x]

[Out] (a*x^2)/2 + (b*x^(2 + n))/(2 + n)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$a \int x \, dx + \frac{bx^{n+2}}{n+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(a+b*x**n),x)

[Out] a*Integral(x, x) + b*x**(n + 2)/(n + 2)
```

Mathematica [A] time = 0.0158452, size = 21, normalized size = 1.

$$\frac{ax^2}{2} + \frac{bx^{n+2}}{n+2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x*(a + b*x^n),x]

[Out] (a*x^2)/2 + (b*x^(2 + n))/(2 + n)
```

Maple [A] time = 0.012, size = 23, normalized size = 1.1

$$\frac{bx^2 e^{n \ln(x)}}{2+n} + \frac{ax^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(a+b*x^n),x)

[Out] b/(2+n)*x^2*exp(n*ln(x))+1/2*a*x^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.237998, size = 38, normalized size = 1.81

$$\frac{2\,bx^2x^n + (an + 2\,a)x^2}{2\,(n+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x,x, algorithm="fricas")
```

```
[Out] 1/2*(2*b*x^2*x^n + (a*n + 2*a)*x^2)/(n + 2)
```

Sympy [A] time = 0.713776, size = 51, normalized size = 2.43

$$\begin{cases} \frac{anx^2}{2n+4} + \frac{2ax^2}{2n+4} + \frac{2bx^2x^n}{2n+4} & \text{for}\ n \neq -2 \\ \frac{ax^2}{2} + b\log{(x)} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(a+b*x**n),x)
```

```
[Out] Piecewise((a*n*x**2/(2*n + 4) + 2*a*x**2/(2*n + 4) + 2*b*x**2*x**
n/(2*n + 4), Ne(n, -2)), (a*x**2/2 + b*log(x), True))
```

GIAC/XCAS [A] time = 0.213672, size = 42, normalized size = 2.

$$\frac{anx^2 + 2\,bx^2e^{(n\ln(x))} + 2\,ax^2}{2\,(n+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x,x, algorithm="giac")
```

```
[Out] 1/2*(a*n*x^2 + 2*b*x^2*e^(n*ln(x)) + 2*a*x^2)/(n + 2)
```

3.2447 $\int (a + bx^n)\, dx$

Optimal. Leaf size=16

$$ax + \frac{bx^{n+1}}{n+1}$$

```
[Out] a*x + (b*x^(1 + n))/(1 + n)
```

Rubi [A] time = 0.0156328, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 0, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$

$$ax + \frac{bx^{n+1}}{n+1}$$

Antiderivative was successfully verified.

```
[In]  Int[a + b*x^n,x]
```

```
[Out] a*x + (b*x^(1 + n))/(1 + n)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{bx^{n+1}}{n+1} + \int a\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(a+b*x**n,x)
```

```
[Out] b*x**(n + 1)/(n + 1) + Integral(a, x)
```

Mathematica [A] time = 0.00938126, size = 16, normalized size = 1.

$$ax + \frac{bx^{n+1}}{n+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[a + b*x^n,x]
```

```
[Out] a*x + (b*x^(1 + n))/(1 + n)
```

Maple [A] time = 0.002, size = 17, normalized size = 1.1

$$ax + \frac{bx^{1+n}}{1+n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(a+b*x^n,x)
```

```
[Out] a*x+b*x^(1+n)/(1+n)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(b*x^n + a,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.237069, size = 27, normalized size = 1.69

$$\frac{bxx^n + (an + a)x}{n + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(b*x^n + a,x, algorithm="fricas")
```

```
[Out] (b*x*x^n + (a*n + a)*x)/(n + 1)
```

Sympy [A] time = 0.065156, size = 17, normalized size = 1.06

$$ax + b\left(\begin{cases} \frac{x^{n+1}}{n+1} & \text{for } n \neq -1 \\ \log(x) & \text{otherwise} \end{cases}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(a+b*x**n,x)
```

```
[Out] a*x + b*Piecewise((x**(n + 1)/(n + 1), Ne(n, -1)), (log(x), True)
)
```

GIAC/XCAS [A] time = 0.210342, size = 22, normalized size = 1.38

$$ax + \frac{bx^{n+1}}{n + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(b*x^n + a,x, algorithm="giac")
```

```
[Out] a*x + b*x^(n + 1)/(n + 1)
```

3.2448 $\int \frac{a+bx^n}{x} dx$

Optimal. Leaf size=13

$$a\log(x) + \frac{bx^n}{n}$$

```
[Out] (b*x^n)/n + a*Log[x]
```

Rubi [A] time = 0.0199583, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$

$$a\log(x) + \frac{bx^n}{n}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^n)/x,x]

[Out] (b*x^n)/n + a*Log[x]
```

Rubi in Sympy [A] time = 3.27541, size = 10, normalized size = 0.77

$$a\log(x) + \frac{bx^n}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b*x**n)/x,x)

[Out] a*log(x) + b*x**n/n
```

Mathematica [A] time = 0.00746008, size = 13, normalized size = 1.

$$a\log(x) + \frac{bx^n}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^n)/x,x]

[Out] (b*x^n)/n + a*Log[x]
```

Maple [A] time = 0.007, size = 19, normalized size = 1.5

$$\frac{a\ln(x^n)}{n} + \frac{bx^n}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*x^n)/x,x)

[Out] 1/n*a*ln(x^n)+b*x^n/n
```

Maxima [A] time = 1.43756, size = 24, normalized size = 1.85

$$\frac{bx^n}{n} + \frac{a\log\left(x^n\right)}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)/x,x, algorithm="maxima")
```

```
[Out] b*x^n/n + a*log(x^n)/n
```

Fricas [A] time = 0.237897, size = 20, normalized size = 1.54

$$\frac{an\log\left(x\right) + bx^n}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)/x,x, algorithm="fricas")
```

```
[Out] (a*n*log(x) + b*x^n)/n
```

Sympy [A] time = 0.47016, size = 17, normalized size = 1.31

$$\begin{cases} a\log\left(x\right) + \frac{bx^n}{n} & \text{for}\ n \neq 0 \\ \left(a + b\right)\log\left(x\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)/x,x)
```

```
[Out] Piecewise((a*log(x) + b*x**n/n, Ne(n, 0)), ((a + b)*log(x), True)
)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{bx^n + a}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)/x,x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)/x, x)
```

3.2449 $\int \frac{a+bx^n}{x^2}\,dx$

Optimal. Leaf size=22

$$-\frac{a}{x}-\frac{bx^{n-1}}{1-n}$$

```
[Out] -(a/x) - (b*x^(-1 + n))/(1 - n)
```

Rubi [A] time = 0.0295907, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$-\frac{a}{x}-\frac{bx^{n-1}}{1-n}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^n)/x^2,x]

[Out] -(a/x) - (b*x^(-1 + n))/(1 - n)
```

Rubi in Sympy [A] time = 3.69423, size = 14, normalized size = 0.64

$$-\frac{a}{x}-\frac{bx^{n-1}}{-n+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b*x**n)/x**2,x)

[Out] -a/x - b*x**(n - 1)/(-n + 1)
```

Mathematica [A] time = 0.0141125, size = 19, normalized size = 0.86

$$\frac{bx^{n-1}}{n-1}-\frac{a}{x}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^n)/x^2,x]

[Out] -(a/x) + (b*x^(-1 + n))/(-1 + n)
```

Maple [A] time = 0.014, size = 21, normalized size = 1.

$$\frac{1}{x}\left(\frac{be^{n\ln(x)}}{-1+n}-a\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*x^n)/x^2,x)

[Out] (b/(-1+n)*exp(n*ln(x))-a)/x
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.242982, size = 31, normalized size = 1.41

$$-\frac{an - bx^n - a}{(n-1)x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)/x^2,x, algorithm="fricas")
```

```
[Out] -(a*n - b*x^n - a)/((n - 1)*x)
```

Sympy [A] time = 1.56892, size = 32, normalized size = 1.45

$$\begin{cases} -\frac{an}{nx-x} + \frac{a}{nx-x} + \frac{bx^n}{nx-x} & \text{for } n \neq 1 \\ -\frac{a}{x} + b\log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)/x**2,x)
```

```
[Out] Piecewise((-a*n/(n*x - x) + a/(n*x - x) + b*x**n/(n*x - x), Ne(n,
 1)), (-a/x + b*log(x), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{bx^n + a}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)/x^2,x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)/x^2, x)
```

3.2450 $\int \frac{a+bx^n}{x^3} \, dx$

Optimal. Leaf size=24

$$-\frac{a}{2x^2} - \frac{bx^{n-2}}{2-n}$$

```
[Out] -a/(2*x^2) - (b*x^(-2 + n))/(2 - n)
```

Rubi [A] time = 0.0282935, antiderivative size = 24, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$-\frac{a}{2x^2} - \frac{bx^{n-2}}{2-n}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^n)/x^3,x]
```

```
[Out] -a/(2*x^2) - (b*x^(-2 + n))/(2 - n)
```

Rubi in Sympy [A] time = 3.71605, size = 17, normalized size = 0.71

$$-\frac{a}{2x^2} - \frac{bx^{n-2}}{-n+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b*x**n)/x**3,x)
```

```
[Out] -a/(2*x**2) - b*x**(n - 2)/(-n + 2)
```

Mathematica [A] time = 0.0199218, size = 21, normalized size = 0.88

$$\frac{bx^{n-2}}{n-2} - \frac{a}{2x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^n)/x^3,x]
```

```
[Out] -a/(2*x^2) + (b*x^(-2 + n))/(-2 + n)
```

Maple [A] time = 0.014, size = 21, normalized size = 0.9

$$\frac{1}{x^2}\left(\frac{be^{n\ln(x)}}{-2+n} - \frac{a}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*x^n)/x^3,x)
```

```
[Out] (b/(-2+n)*exp(n*ln(x))-1/2*a)/x^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)/x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.237072, size = 31, normalized size = 1.29

$$-\frac{an - 2\,bx^n - 2\,a}{2\,(n-2)x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)/x^3,x, algorithm="fricas")
```

```
[Out] -1/2*(a*n - 2*b*x^n - 2*a)/((n - 2)*x^2)
```

Sympy [A] time = 1.99042, size = 60, normalized size = 2.5

$$\begin{cases} -\frac{an}{2nx^2-4x^2} + \frac{2a}{2nx^2-4x^2} + \frac{2bx^n}{2nx^2-4x^2} & \text{for}\ n \neq 2 \\ -\frac{a}{2x^2} + b\log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)/x**3,x)
```

```
[Out] Piecewise((-a*n/(2*n*x**2 - 4*x**2) + 2*a/(2*n*x**2 - 4*x**2) + 2
*b*x**n/(2*n*x**2 - 4*x**2), Ne(n, 2)), (-a/(2*x**2) + b*log(x),
True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{bx^n + a}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)/x^3,x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)/x^3, x)
```

3.2451 $\int x^3 (a + bx^n)^2 \, dx$

Optimal. Leaf size=44

$$\frac{a^2x^4}{4} + \frac{2abx^{n+4}}{n+4} + \frac{b^2x^{2(n+2)}}{2(n+2)}$$

```
[Out] (a^2*x^4)/4 + (b^2*x^(2*(2 + n)))/(2*(2 + n)) + (2*a*b*x^(4 + n))
/(4 + n)
```

Rubi [A] time = 0.0566562, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$\frac{a^2x^4}{4} + \frac{2abx^{n+4}}{n+4} + \frac{b^2x^{2(n+2)}}{2(n+2)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3*(a + b*x^n)^2,x]
```

```
[Out] (a^2*x^4)/4 + (b^2*x^(2*(2 + n)))/(2*(2 + n)) + (2*a*b*x^(4 + n))
/(4 + n)
```

Rubi in Sympy [A] time = 8.14883, size = 36, normalized size = 0.82

$$\frac{a^2x^4}{4} + \frac{2abx^{n+4}}{n+4} + \frac{b^2x^{2n+4}}{2(n+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3*(a+b*x**n)**2,x)
```

```
[Out] a**2*x**4/4 + 2*a*b*x**(n + 4)/(n + 4) + b**2*x**(2*n + 4)/(2*(n
+ 2))
```

Mathematica [A] time = 0.0581358, size = 38, normalized size = 0.86

$$\frac{1}{4}x^4\left(a^2 + \frac{8abx^n}{n+4} + \frac{2b^2x^{2n}}{n+2}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3*(a + b*x^n)^2,x]
```

```
[Out] (x^4*(a^2 + (8*a*b*x^n)/(4 + n) + (2*b^2*x^(2*n))/(2 + n)))/4
```

Maple [A] time = 0.019, size = 47, normalized size = 1.1

$$\frac{x^4a^2}{4} + \frac{b^2x^4\left(e^{n\ln(x)}\right)^2}{4+2n} + 2\frac{abx^4e^{n\ln(x)}}{4+n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3*(a+b*x^n)^2,x)
```

```
[Out] 1/4*x^4*a^2+1/2*b^2/(2+n)*x^4*exp(n*ln(x))^2+2*a*b/(4+n)*x^4*exp(
n*ln(x))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^n + a)^2*x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.238972, size = 100, normalized size = 2.27

$$\frac{2\left(b^{2}n+4\,b^{2}\right)x^{4}x^{2\,n}+8\,(abn+2\,ab)x^{4}x^{n}+\left(a^{2}n^{2}+6\,a^{2}n+8\,a^{2}\right)x^{4}}{4\,(n^{2}+6\,n+8)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^n + a)^2*x^3,x, algorithm="fricas")
```

```
[Out] 1/4*(2*(b^2*n + 4*b^2)*x^4*x^(2*n) + 8*(a*b*n + 2*a*b)*x^4*x^n +
(a^2*n^2 + 6*a^2*n + 8*a^2)*x^4)/(n^2 + 6*n + 8)
```

Sympy [A] time = 2.74612, size = 202, normalized size = 4.59

$$\begin{cases} \frac{a^{2}x^{4}}{4}+2ab\log{(x)}-\frac{b^{2}}{4x^{4}} & \text{for}\ n=-4\\ \frac{a^{2}x^{4}}{4}+abx^{2}+b^{2}\log{(x)} & \text{for}\ n=-2\\ \frac{a^{2}n^{2}x^{4}}{4n^{2}+24n+32}+\frac{6a^{2}nx^{4}}{4n^{2}+24n+32}+\frac{8a^{2}x^{4}}{4n^{2}+24n+32}+\frac{8abnx^{4}x^{n}}{4n^{2}+24n+32}+\frac{16abx^{4}x^{n}}{4n^{2}+24n+32}+\frac{2b^{2}nx^{4}x^{2n}}{4n^{2}+24n+32}+\frac{8b^{2}x^{4}x^{2n}}{4n^{2}+24n+32} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*x**n)**2,x)
```

```
[Out] Piecewise((a**2*x**4/4 + 2*a*b*log(x) - b**2/(4*x**4), Eq(n, -4))
, (a**2*x**4/4 + a*b*x**2 + b**2*log(x), Eq(n, -2)), (a**2*n**2*x
**4/(4*n**2 + 24*n + 32) + 6*a**2*n*x**4/(4*n**2 + 24*n + 32) + 8
*a**2*x**4/(4*n**2 + 24*n + 32) + 8*a*b*n*x**4*x**n/(4*n**2 + 24*
n + 32) + 16*a*b*x**4*x**n/(4*n**2 + 24*n + 32) + 2*b**2*n*x**4*x
**(2*n)/(4*n**2 + 24*n + 32) + 8*b**2*x**4*x**(2*n)/(4*n**2 + 24*
n + 32), True))
```

GIAC/XCAS [A] time = 0.216387, size = 127, normalized size = 2.89

$$\frac{a^{2}n^{2}x^{4}+2\,b^{2}nx^{4}e^{(2\,n\ln(x))}+8\,abnx^{4}e^{(n\ln(x))}+6\,a^{2}nx^{4}+8\,b^{2}x^{4}e^{(2\,n\ln(x))}+16\,abx^{4}e^{(n\ln(x))}+8\,a^{2}x^{4}}{4\,(n^{2}+6\,n+8)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^n + a)^2*x^3,x, algorithm="giac")
```

```
[Out] 1/4*(a^2*n^2*x^4 + 2*b^2*n*x^4*e^(2*n*ln(x)) + 8*a*b*n*x^4*e^(n*l
n(x)) + 6*a^2*n*x^4 + 8*b^2*x^4*e^(2*n*ln(x)) + 16*a*b*x^4*e^(n*l
n(x)) + 8*a^2*x^4)/(n^2 + 6*n + 8)
```

3.2452 $\int x^2 (a + bx^n)^2 \, dx$

Optimal. Leaf size=43

$$\frac{a^2x^3}{3} + \frac{2abx^{n+3}}{n+3} + \frac{b^2x^{2n+3}}{2n+3}$$

```
[Out] (a^2*x^3)/3 + (2*a*b*x^(3 + n))/(3 + n) + (b^2*x^(3 + 2*n))/(3 +
2*n)
```

Rubi [A] time = 0.0540864, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$\frac{a^2x^3}{3} + \frac{2abx^{n+3}}{n+3} + \frac{b^2x^{2n+3}}{2n+3}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(a + b*x^n)^2,x]
```

```
[Out] (a^2*x^3)/3 + (2*a*b*x^(3 + n))/(3 + n) + (b^2*x^(3 + 2*n))/(3 +
2*n)
```

Rubi in Sympy [A] time = 8.43175, size = 36, normalized size = 0.84

$$\frac{a^2x^3}{3} + \frac{2abx^{n+3}}{n+3} + \frac{b^2x^{2n+3}}{2n+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**2*(a+b*x**n)**2,x)
```

```
[Out] a**2*x**3/3 + 2*a*b*x**(n + 3)/(n + 3) + b**2*x**(2*n + 3)/(2*n +
 3)
```

Mathematica [A] time = 0.0536579, size = 40, normalized size = 0.93

$$\frac{1}{3}x^3\left(a^2 + \frac{6abx^n}{n+3} + \frac{3b^2x^{2n}}{2n+3}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(a + b*x^n)^2,x]
```

```
[Out] (x^3*(a^2 + (6*a*b*x^n)/(3 + n) + (3*b^2*x^(2*n))/(3 + 2*n)))/3
```

Maple [A] time = 0.017, size = 48, normalized size = 1.1

$$\frac{b^2x^3\left(e^{n\ln(x)}\right)^2}{3+2n} + \frac{x^3a^2}{3} + 2\frac{abx^3e^{n\ln(x)}}{3+n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*x^n)^2,x)
```

```
[Out] b^2/(3+2*n)*x^3*exp(n*ln(x))^2+1/3*x^3*a^2+2*a*b/(3+n)*x^3*exp(n*
ln(x))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.238887, size = 105, normalized size = 2.44

$$\frac{3\left(b^{2} n+3 b^{2}\right) x^{3} x^{2 n}+6(2 a b n+3 a b) x^{3} x^{n}+\left(2 a^{2} n^{2}+9 a^{2} n+9 a^{2}\right) x^{3}}{3\left(2 n^{2}+9 n+9\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^2,x, algorithm="fricas")
```

```
[Out] 1/3*(3*(b^2*n + 3*b^2)*x^3*x^(2*n) + 6*(2*a*b*n + 3*a*b)*x^3*x^n
+ (2*a^2*n^2 + 9*a^2*n + 9*a^2)*x^3)/(2*n^2 + 9*n + 9)
```

Sympy [A] time = 6.19677, size = 211, normalized size = 4.91

$$\begin{cases} \frac{a^{2} x^{3}}{3}+2 a b \log (x)-\frac{b^{2}}{3 x^{3}} & \text { for } n=-3 \\ \frac{a^{2} x^{3}}{3}+\frac{4 a b x^{\frac{3}{2}}}{3}+b^{2} \log (x) & \text { for } n=-\frac{3}{2} \\ \frac{2 a^{2} n^{2} x^{3}}{6 n^{2}+27 n+27}+\frac{9 a^{2} n x^{3}}{6 n^{2}+27 n+27}+\frac{9 a^{2} x^{3}}{6 n^{2}+27 n+27}+\frac{12 a b n x^{3} x^{n}}{6 n^{2}+27 n+27}+\frac{18 a b x^{3} x^{n}}{6 n^{2}+27 n+27}+\frac{3 b^{2} n x^{3} x^{2 n}}{6 n^{2}+27 n+27}+\frac{9 b^{2} x^{3} x^{2 n}}{6 n^{2}+27 n+27} & \text { otherwise } \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(a+b*x**n)**2,x)
```

```
[Out] Piecewise((a**2*x**3/3 + 2*a*b*log(x) - b**2/(3*x**3), Eq(n, -3))
, (a**2*x**3/3 + 4*a*b*x**(3/2)/3 + b**2*log(x), Eq(n, -3/2)), (2
*a**2*n**2*x**3/(6*n**2 + 27*n + 27) + 9*a**2*n*x**3/(6*n**2 + 27
*n + 27) + 9*a**2*x**3/(6*n**2 + 27*n + 27) + 12*a*b*n*x**3*x**n/
(6*n**2 + 27*n + 27) + 18*a*b*x**3*x**n/(6*n**2 + 27*n + 27) + 3*
b**2*n*x**3*x**(2*n)/(6*n**2 + 27*n + 27) + 9*b**2*x**3*x**(2*n)/
(6*n**2 + 27*n + 27), True))
```

GIAC/XCAS [A] time = 0.213767, size = 131, normalized size = 3.05

$$\frac{2 a^{2} n^{2} x^{3}+3 b^{2} n x^{3} e^{(2 n \ln (x))}+12 a b n x^{3} e^{(n \ln (x))}+9 a^{2} n x^{3}+9 b^{2} x^{3} e^{(2 n \ln (x))}+18 a b x^{3} e^{(n \ln (x))}+9 a^{2} x^{3}}{3\left(2 n^{2}+9 n+9\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^2,x, algorithm="giac")
```

```
[Out] 1/3*(2*a^2*n^2*x^3 + 3*b^2*n*x^3*e^(2*n*ln(x)) + 12*a*b*n*x^3*e^(
n*ln(x)) + 9*a^2*n*x^3 + 9*b^2*x^3*e^(2*n*ln(x)) + 18*a*b*x^3*e^(
n*ln(x)) + 9*a^2*x^3)/(2*n^2 + 9*n + 9)
```

3.2453 $\int x\left(a+bx^n\right)^2\,dx$

Optimal. Leaf size=44

$$\frac{a^2x^2}{2}+\frac{2abx^{n+2}}{n+2}+\frac{b^2x^{2(n+1)}}{2(n+1)}$$

```
[Out] (a^2*x^2)/2 + (b^2*x^(2*(1 + n)))/(2*(1 + n)) + (2*a*b*x^(2 + n))
/(2 + n)
```

Rubi [A] time = 0.0491267, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{a^2x^2}{2}+\frac{2abx^{n+2}}{n+2}+\frac{b^2x^{2(n+1)}}{2(n+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[x*(a + b*x^n)^2,x]
```

```
[Out] (a^2*x^2)/2 + (b^2*x^(2*(1 + n)))/(2*(1 + n)) + (2*a*b*x^(2 + n))
/(2 + n)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$a^2\int x\,dx+\frac{2abx^{n+2}}{n+2}+\frac{b^2x^{2n+2}}{2\,(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(a+b*x**n)**2,x)
```

```
[Out] a**2*Integral(x, x) + 2*a*b*x**(n + 2)/(n + 2) + b**2*x**(2*n + 2
)/(2*(n + 1))
```

Mathematica [A] time = 0.0561429, size = 37, normalized size = 0.84

$$\frac{1}{2}x^2\left(a^2+\frac{4abx^n}{n+2}+\frac{b^2x^{2n}}{n+1}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x*(a + b*x^n)^2,x]
```

```
[Out] (x^2*(a^2 + (4*a*b*x^n)/(2 + n) + (b^2*x^(2*n))/(1 + n)))/2
```

Maple [A] time = 0.014, size = 47, normalized size = 1.1

$$\frac{a^2x^2}{2}+\frac{b^2x^2\left(e^{n\ln(x)}\right)^2}{2+2\,n}+2\,\frac{abx^2e^{n\ln(x)}}{2+n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(a+b*x^n)^2,x)
```

```
[Out] 1/2*a^2*x^2+1/2*b^2/(1+n)*x^2*exp(n*ln(x))^2+2*a*b/(2+n)*x^2*exp(
n*ln(x))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.242504, size = 97, normalized size = 2.2

$$\frac{\left(b^2 n+2 b^2\right) x^2 x^{2 n}+4 \left(a b n+a b\right) x^2 x^n+\left(a^2 n^2+3 a^2 n+2 a^2\right) x^2}{2 \left(n^2+3 n+2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x,x, algorithm="fricas")
```

```
[Out] 1/2*((b^2*n + 2*b^2)*x^2*x^(2*n) + 4*(a*b*n + a*b)*x^2*x^n + (a^2
*n^2 + 3*a^2*n + 2*a^2)*x^2)/(n^2 + 3*n + 2)
```

Sympy [A] time = 1.45732, size = 201, normalized size = 4.57

$$\begin{cases} \frac{a^2 x^2}{2} + 2ab \log(x) - \frac{b^2}{2x^2} & \text{for } n = -2 \\ \frac{a^2 x^2}{2} + 2abx + b^2 \log(x) & \text{for } n = -1 \\ \frac{a^2 n^2 x^2}{2n^2+6n+4} + \frac{3a^2 n x^2}{2n^2+6n+4} + \frac{2a^2 x^2}{2n^2+6n+4} + \frac{4abnx^2 x^n}{2n^2+6n+4} + \frac{4abx^2 x^n}{2n^2+6n+4} + \frac{b^2 n x^2 x^{2n}}{2n^2+6n+4} + \frac{2b^2 x^2 x^{2n}}{2n^2+6n+4} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(a+b*x**n)**2,x)
```

```
[Out] Piecewise((a**2*x**2/2 + 2*a*b*log(x) - b**2/(2*x**2), Eq(n, -2))
, (a**2*x**2/2 + 2*a*b*x + b**2*log(x), Eq(n, -1)), (a**2*n**2*x*
*2/(2*n**2 + 6*n + 4) + 3*a**2*n*x**2/(2*n**2 + 6*n + 4) + 2*a**2
*x**2/(2*n**2 + 6*n + 4) + 4*a*b*n*x**2*x**n/(2*n**2 + 6*n + 4) +
 4*a*b*x**2*x**n/(2*n**2 + 6*n + 4) + b**2*n*x**2*x**(2*n)/(2*n**
2 + 6*n + 4) + 2*b**2*x**2*x**(2*n)/(2*n**2 + 6*n + 4), True))
```

GIAC/XCAS [A] time = 0.214292, size = 126, normalized size = 2.86

$$\frac{a^2 n^2 x^2 + b^2 n x^2 e^{(2 n \ln(x))} + 4 abnx^2 e^{(n \ln(x))} + 3 a^2 n x^2 + 2 b^2 x^2 e^{(2 n \ln(x))} + 4 abx^2 e^{(n \ln(x))} + 2 a^2 x^2}{2 \left(n^2+3 n+2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x,x, algorithm="giac")
```

```
[Out] 1/2*(a^2*n^2*x^2 + b^2*n*x^2*e^(2*n*ln(x)) + 4*a*b*n*x^2*e^(n*ln(
x)) + 3*a^2*n*x^2 + 2*b^2*x^2*e^(2*n*ln(x)) + 4*a*b*x^2*e^(n*ln(x
)) + 2*a^2*x^2)/(n^2 + 3*n + 2)
```

3.2454 $\int (a+bx^n)^2\,dx$

Optimal. Leaf size=38

$$a^2x+\frac{2abx^{n+1}}{n+1}+\frac{b^2x^{2n+1}}{2n+1}$$

```
[Out] a^2*x + (2*a*b*x^(1 + n))/(1 + n) + (b^2*x^(1 + 2*n))/(1 + 2*n)
```

Rubi [A] time = 0.040138, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111

$$a^2x+\frac{2abx^{n+1}}{n+1}+\frac{b^2x^{2n+1}}{2n+1}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^2,x]
```

```
[Out] a^2*x + (2*a*b*x^(1 + n))/(1 + n) + (b^2*x^(1 + 2*n))/(1 + 2*n)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{2abx^{n+1}}{n+1}+\frac{b^2x^{2n+1}}{2n+1}+\int a^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**n)**2,x)
```

```
[Out] 2*a*b*x**(n + 1)/(n + 1) + b**2*x**(2*n + 1)/(2*n + 1) + Integral
(a**2, x)
```

Mathematica [A] time = 0.0423635, size = 34, normalized size = 0.89

$$x\left(a^2+\frac{2abx^n}{n+1}+\frac{b^2x^{2n}}{2n+1}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^2,x]
```

```
[Out] x*(a^2 + (2*a*b*x^n)/(1 + n) + (b^2*x^(2*n))/(1 + 2*n))
```

Maple [A] time = 0.012, size = 41, normalized size = 1.1

$$xa^2+\frac{b^2x\left(e^{n\ln(x)}\right)^2}{1+2n}+2\,\frac{abxe^{n\ln(x)}}{1+n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^2,x)
```

```
[Out] x*a^2+b^2/(1+2*n)*x*exp(n*ln(x))^2+2*a*b/(1+n)*x*exp(n*ln(x))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.240577, size = 88, normalized size = 2.32

$$\frac{\left(b^2 n + b^2\right) x x^{2\,n} + 2\,(2\,abn + ab) x x^n + \left(2\,a^2 n^2 + 3\,a^2 n + a^2\right) x}{2\,n^2 + 3\,n + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2,x, algorithm="fricas")
```

```
[Out] ((b^2*n + b^2)*x*x^(2*n) + 2*(2*a*b*n + a*b)*x*x^n + (2*a^2*n^2 +
 3*a^2*n + a^2)*x)/(2*n^2 + 3*n + 1)
```

Sympy [A] time = 1.16047, size = 182, normalized size = 4.79

$$\begin{cases} a^2 x + 2ab \log(x) - \frac{b^2}{x} & \text{for}\: n = -1 \\ a^2 x + 4ab\sqrt{x} + b^2 \log(x) & \text{for}\: n = -\frac{1}{2} \\ \frac{2a^2 n^2 x}{2n^2+3n+1} + \frac{3a^2 nx}{2n^2+3n+1} + \frac{a^2 x}{2n^2+3n+1} + \frac{4abnxx^n}{2n^2+3n+1} + \frac{2abxx^n}{2n^2+3n+1} + \frac{b^2 nxx^{2n}}{2n^2+3n+1} + \frac{b^2 xx^{2n}}{2n^2+3n+1} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**2,x)
```

```
[Out] Piecewise((a**2*x + 2*a*b*log(x) - b**2/x, Eq(n, -1)), (a**2*x +
4*a*b*sqrt(x) + b**2*log(x), Eq(n, -1/2)), (2*a**2*n**2*x/(2*n**2
 + 3*n + 1) + 3*a**2*n*x/(2*n**2 + 3*n + 1) + a**2*x/(2*n**2 + 3*
n + 1) + 4*a*b*n*x*x**n/(2*n**2 + 3*n + 1) + 2*a*b*x*x**n/(2*n**2
 + 3*n + 1) + b**2*n*x*x**(2*n)/(2*n**2 + 3*n + 1) + b**2*x*x**(2
*n)/(2*n**2 + 3*n + 1), True))
```

GIAC/XCAS [A] time = 0.214771, size = 107, normalized size = 2.82

$$\frac{2\,a^2 n^2 x + b^2 nxe^{(2\,n\ln(x))} + 4\,abnxe^{(n\ln(x))} + 3\,a^2 nx + b^2 xe^{(2\,n\ln(x))} + 2\,abxe^{(n\ln(x))} + a^2 x}{2\,n^2 + 3\,n + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2,x, algorithm="giac")
```

```
[Out] (2*a^2*n^2*x + b^2*n*x*e^(2*n*ln(x)) + 4*a*b*n*x*e^(n*ln(x)) + 3*
a^2*n*x + b^2*x*e^(2*n*ln(x)) + 2*a*b*x*e^(n*ln(x)) + a^2*x)/(2*n
^2 + 3*n + 1)
```

3.2455 $\int \frac{(a+bx^n)^2}{x} \, dx$

Optimal. Leaf size=32

$$a^2 \log(x) + \frac{2abx^n}{n} + \frac{b^2 x^{2n}}{2n}$$

```
[Out] (2*a*b*x^n)/n + (b^2*x^(2*n))/(2*n) + a^2*Log[x]
```

Rubi [A] time = 0.0434729, antiderivative size = 32, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$a^2 \log(x) + \frac{2abx^n}{n} + \frac{b^2 x^{2n}}{2n}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^2/x,x]

[Out] (2*a*b*x^n)/n + (b^2*x^(2*n))/(2*n) + a^2*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^2 \log(x^n)}{n} + \frac{2abx^n}{n} + \frac{b^2 \int^{x^n} x \, dx}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**n)**2/x,x)

[Out] a**2*log(x**n)/n + 2*a*b*x**n/n + b**2*Integral(x, (x, x**n))/n
```

Mathematica [A] time = 0.0277067, size = 27, normalized size = 0.84

$$a^2 \log(x) + \frac{bx^n (4a + bx^n)}{2n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^2/x,x]

[Out] (b*x^n*(4*a + b*x^n))/(2*n) + a^2*Log[x]
```

Maple [A] time = 0.003, size = 36, normalized size = 1.1

$$\frac{(x^n)^2 b^2}{2n} + 2\frac{abx^n}{n} + \frac{a^2 \ln(x^n)}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^2/x,x)

[Out] 1/2/n*(x^n)^2*b^2+2*a*b*x^n/n+1/n*a^2*ln(x^n)
```

Maxima [A] time = 1.44274, size = 46, normalized size = 1.44

$$\frac{a^2 \log(x^n)}{n} + \frac{b^2 x^{2n} + 4abx^n}{2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2/x,x, algorithm="maxima")
```

```
[Out] a^2*log(x^n)/n + 1/2*(b^2*x^(2*n) + 4*a*b*x^n)/n
```

Fricas [A] time = 0.238836, size = 41, normalized size = 1.28

$$\frac{2a^2 n \log(x) + b^2 x^{2n} + 4abx^n}{2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2/x,x, algorithm="fricas")
```

```
[Out] 1/2*(2*a^2*n*log(x) + b^2*x^(2*n) + 4*a*b*x^n)/n
```

Sympy [A] time = 0.71041, size = 36, normalized size = 1.12

$$\begin{cases} a^2 \log(x) + \frac{2abx^n}{n} + \frac{b^2x^{2n}}{2n} & \text{for } n \neq 0 \\ (a+b)^2 \log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**2/x,x)
```

```
[Out] Piecewise((a**2*log(x) + 2*a*b*x**n/n + b**2*x**(2*n)/(2*n), Ne(n
, 0)), ((a + b)**2*log(x), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^n + a)^2}{x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2/x,x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^2/x, x)
```

3.2456 $\int \frac{(a+bx^n)^2}{x^2} dx$

Optimal. Leaf size=44

$$-\frac{a^2}{x}-\frac{2abx^{n-1}}{1-n}-\frac{b^2x^{2n-1}}{1-2n}$$

```
[Out] -(a^2/x) - (2*a*b*x^(-1 + n))/(1 - n) - (b^2*x^(-1 + 2*n))/(1 - 2
*n)
```

Rubi [A] time = 0.061702, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a^2}{x}-\frac{2abx^{n-1}}{1-n}-\frac{b^2x^{2n-1}}{1-2n}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^2/x^2,x]
```

```
[Out] -(a^2/x) - (2*a*b*x^(-1 + n))/(1 - n) - (b^2*x^(-1 + 2*n))/(1 - 2
*n)
```

Rubi in Sympy [A] time = 8.9575, size = 34, normalized size = 0.77

$$-\frac{a^2}{x}-\frac{2abx^{n-1}}{-n+1}-\frac{b^2x^{2n-1}}{-2n+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**n)**2/x**2,x)
```

```
[Out] -a**2/x - 2*a*b*x**(n - 1)/(-n + 1) - b**2*x**(2*n - 1)/(-2*n + 1
)
```

Mathematica [A] time = 0.0489686, size = 38, normalized size = 0.86

$$\frac{-a^2+\frac{2abx^n}{n-1}+\frac{b^2x^{2n}}{2n-1}}{x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^2/x^2,x]
```

```
[Out] (-a^2 + (2*a*b*x^n)/(-1 + n) + (b^2*x^(2*n))/(-1 + 2*n))/x
```

Maple [A] time = 0.016, size = 43, normalized size = 1.

$$\frac{1}{x}\left(\frac{b^2\left(e^{n\ln(x)}\right)^2}{-1+2\,n}-a^2+2\,\frac{abe^{n\ln(x)}}{-1+n}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^2/x^2,x)
```

```
[Out] (b^2/(-1+2*n)*exp(n*ln(x))^2-a^2+2*a*b/(-1+n)*exp(n*ln(x)))/x
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.241311, size = 92, normalized size = 2.09

$$-\frac{2\,a^2n^2 - 3\,a^2n + a^2 - \left(b^2n - b^2\right)x^{2\,n} - 2\,(2\,abn - ab)x^n}{(2\,n^2 - 3\,n + 1)x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2/x^2,x, algorithm="fricas")
```

```
[Out] -(2*a^2*n^2 - 3*a^2*n + a^2 - (b^2*n - b^2)*x^(2*n) - 2*(2*a*b*n
- a*b)*x^n)/((2*n^2 - 3*n + 1)*x)
```

Sympy [A] time = 2.46162, size = 190, normalized size = 4.32

$$\begin{cases} -\frac{a^2}{x} - \frac{4ab}{\sqrt{x}} + b^2\log(x) & \text{for } n = \frac{1}{2} \\ -\frac{a^2}{x} + 2ab\log(x) + b^2x & \text{for } n = 1 \\ -\frac{2a^2n^2}{2n^2x-3nx+x} + \frac{3a^2n}{2n^2x-3nx+x} - \frac{a^2}{2n^2x-3nx+x} + \frac{4abnx^n}{2n^2x-3nx+x} - \frac{2abx^n}{2n^2x-3nx+x} + \frac{b^2nx^{2n}}{2n^2x-3nx+x} - \frac{b^2x^{2n}}{2n^2x-3nx+x} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**2/x**2,x)
```

```
[Out] Piecewise((-a**2/x - 4*a*b/sqrt(x) + b**2*log(x), Eq(n, 1/2)), (-
a**2/x + 2*a*b*log(x) + b**2*x, Eq(n, 1)), (-2*a**2*n**2/(2*n**2*
x - 3*n*x + x) + 3*a**2*n/(2*n**2*x - 3*n*x + x) - a**2/(2*n**2*x
 - 3*n*x + x) + 4*a*b*n*x**n/(2*n**2*x - 3*n*x + x) - 2*a*b*x**n/
(2*n**2*x - 3*n*x + x) + b**2*n*x**(2*n)/(2*n**2*x - 3*n*x + x) -
 b**2*x**(2*n)/(2*n**2*x - 3*n*x + x), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^n + a)^2}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2/x^2,x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^2/x^2, x)
```

3.2457 $\int \frac{(a+bx^n)^2}{x^3} dx$

Optimal. Leaf size=50

$$-\frac{a^2}{2x^2}-\frac{2abx^{n-2}}{2-n}-\frac{b^2x^{-2(1-n)}}{2(1-n)}$$

```
[Out] -a^2/(2*x^2) - b^2/(2*(1 - n)*x^(2*(1 - n))) - (2*a*b*x^(-2 + n))
/(2 - n)
```

Rubi [A] time = 0.0581579, antiderivative size = 50, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a^2}{2x^2}-\frac{2abx^{n-2}}{2-n}-\frac{b^2x^{-2(1-n)}}{2(1-n)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^n)^2/x^3,x]
```

```
[Out] -a^2/(2*x^2) - b^2/(2*(1 - n)*x^(2*(1 - n))) - (2*a*b*x^(-2 + n))
/(2 - n)
```

Rubi in Sympy [A] time = 8.67337, size = 37, normalized size = 0.74

$$-\frac{a^2}{2x^2}-\frac{2abx^{n-2}}{-n+2}-\frac{b^2x^{2n-2}}{2\left(-n+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b*x**n)**2/x**3,x)
```

```
[Out] -a**2/(2*x**2) - 2*a*b*x**(n - 2)/(-n + 2) - b**2*x**(2*n - 2)/(2
*(-n + 1))
```

Mathematica [A] time = 0.0427123, size = 39, normalized size = 0.78

$$\frac{-a^2+\frac{4abx^n}{n-2}+\frac{b^2x^{2n}}{n-1}}{2x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^n)^2/x^3,x]
```

```
[Out] (-a^2 + (4*a*b*x^n)/(-2 + n) + (b^2*x^(2*n))/(-1 + n))/(2*x^2)
```

Maple [A] time = 0.019, size = 42, normalized size = 0.8

$$\frac{1}{x^2}\left(-\frac{a^2}{2}+\frac{b^2\left(e^{n\ln(x)}\right)^2}{-2+2n}+2\frac{abe^{n\ln(x)}}{-2+n}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^2/x^3,x)
```

```
[Out] (-1/2*a^2+1/2*b^2/(-1+n)*exp(n*ln(x))^2+2*a*b/(-2+n)*exp(n*ln(x))
)/x^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2/x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.239361, size = 89, normalized size = 1.78

$$-\frac{a^2n^2 - 3\,a^2n + 2\,a^2 - \left(b^2n - 2\,b^2\right)x^{2\,n} - 4\,(abn - ab)x^n}{2\,(n^2 - 3\,n + 2)x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2/x^3,x, algorithm="fricas")
```

```
[Out] -1/2*(a^2*n^2 - 3*a^2*n + 2*a^2 - (b^2*n - 2*b^2)*x^(2*n) - 4*(a*
b*n - a*b)*x^n)/((n^2 - 3*n + 2)*x^2)
```

Sympy [A] time = 2.34751, size = 245, normalized size = 4.9

$$\begin{cases} -\frac{a^2}{2x^2} - \frac{2ab}{x} + b^2\log(x) & \text{fo} \\ -\frac{a^2}{2x^2} + 2ab\log(x) + \frac{b^2x^2}{2} & \text{fo} \\ -\frac{a^2n^2}{2n^2x^2-6nx^2+4x^2} + \frac{3a^2n}{2n^2x^2-6nx^2+4x^2} - \frac{2a^2}{2n^2x^2-6nx^2+4x^2} + \frac{4abnx^n}{2n^2x^2-6nx^2+4x^2} - \frac{4abx^n}{2n^2x^2-6nx^2+4x^2} + \frac{b^2nx^{2n}}{2n^2x^2-6nx^2+4x^2} - \frac{2b^2x^{2n}}{2n^2x^2-6nx^2+4x^2} & \text{o} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**2/x**3,x)
```

```
[Out] Piecewise((-a**2/(2*x**2) - 2*a*b/x + b**2*log(x), Eq(n, 1)), (-a
**2/(2*x**2) + 2*a*b*log(x) + b**2*x**2/2, Eq(n, 2)), (-a**2*n**2
/(2*n**2*x**2 - 6*n*x**2 + 4*x**2) + 3*a**2*n/(2*n**2*x**2 - 6*n*
x**2 + 4*x**2) - 2*a**2/(2*n**2*x**2 - 6*n*x**2 + 4*x**2) + 4*a*b
*n*x**n/(2*n**2*x**2 - 6*n*x**2 + 4*x**2) - 4*a*b*x**n/(2*n**2*x*
*2 - 6*n*x**2 + 4*x**2) + b**2*n*x**(2*n)/(2*n**2*x**2 - 6*n*x**2
 + 4*x**2) - 2*b**2*x**(2*n)/(2*n**2*x**2 - 6*n*x**2 + 4*x**2), T
rue))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^n + a)^2}{x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2/x^3,x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^2/x^3, x)
```

3.2458 $\int x^3 (a + bx^n)^3 \, dx$

Optimal. Leaf size=65

$$\frac{a^3x^4}{4} + \frac{3a^2bx^{n+4}}{n+4} + \frac{3ab^2x^{2(n+2)}}{2(n+2)} + \frac{b^3x^{3n+4}}{3n+4}$$

```
[Out] (a^3*x^4)/4 + (3*a*b^2*x^(2*(2 + n)))/(2*(2 + n)) + (3*a^2*b*x^(4
 + n))/(4 + n) + (b^3*x^(4 + 3*n))/(4 + 3*n)
```

Rubi [A] time = 0.081155, antiderivative size = 65, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$\frac{a^3x^4}{4} + \frac{3a^2bx^{n+4}}{n+4} + \frac{3ab^2x^{2(n+2)}}{2(n+2)} + \frac{b^3x^{3n+4}}{3n+4}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3*(a + b*x^n)^3,x]
```

```
[Out] (a^3*x^4)/4 + (3*a*b^2*x^(2*(2 + n)))/(2*(2 + n)) + (3*a^2*b*x^(4
 + n))/(4 + n) + (b^3*x^(4 + 3*n))/(4 + 3*n)
```

Rubi in Sympy [A] time = 11.8536, size = 56, normalized size = 0.86

$$\frac{a^3x^4}{4} + \frac{3a^2bx^{n+4}}{n+4} + \frac{3ab^2x^{2n+4}}{2(n+2)} + \frac{b^3x^{3n+4}}{3n+4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3*(a+b*x**n)**3,x)
```

```
[Out] a**3*x**4/4 + 3*a**2*b*x**(n + 4)/(n + 4) + 3*a*b**2*x**(2*n + 4)
/(2*(n + 2)) + b**3*x**(3*n + 4)/(3*n + 4)
```

Mathematica [A] time = 0.0693182, size = 58, normalized size = 0.89

$$\frac{1}{4}x^4\left(a^3 + \frac{12a^2bx^n}{n+4} + \frac{6ab^2x^{2n}}{n+2} + \frac{4b^3x^{3n}}{3n+4}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3*(a + b*x^n)^3,x]
```

```
[Out] (x^4*(a^3 + (12*a^2*b*x^n)/(4 + n) + (6*a*b^2*x^(2*n))/(2 + n) +
(4*b^3*x^(3*n))/(4 + 3*n)))/4
```

Maple [A] time = 0.017, size = 65, normalized size = 1.

$$\frac{a^3x^4}{4} + \frac{b^3x^4(x^n)^3}{4+3n} + \frac{3ab^2x^4(x^n)^2}{4+2n} + 3\frac{a^2bx^4x^n}{4+n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3*(a+b*x^n)^3,x)
```

```
[Out] 1/4*a^3*x^4+b^3/(4+3*n)*x^4*(x^n)^3+3/2*a*b^2*x^4/(2+n)*(x^n)^2+3
*a^2*b/(4+n)*x^4*x^n
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.243073, size = 196, normalized size = 3.02

$$\frac{4\left(b^3n^2+6\,b^3n+8\,b^3\right)x^4x^{3\,n}+6\left(3\,ab^2n^2+16\,ab^2n+16\,ab^2\right)x^4x^{2\,n}+12\left(3\,a^2bn^2+10\,a^2bn+8\,a^2b\right)x^4x^n+\left(3\,a^3n^3+22\,a^3\right.}{4\left(3\,n^3+22\,n^2+48\,n+32\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^3,x, algorithm="fricas")
```

```
[Out] 1/4*(4*(b^3*n^2 + 6*b^3*n + 8*b^3)*x^4*x^(3*n) + 6*(3*a*b^2*n^2 +
 16*a*b^2*n + 16*a*b^2)*x^4*x^(2*n) + 12*(3*a^2*b*n^2 + 10*a^2*b*
n + 8*a^2*b)*x^4*x^n + (3*a^3*n^3 + 22*a^3*n^2 + 48*a^3*n + 32*a^
3)*x^4)/(3*n^3 + 22*n^2 + 48*n + 32)
```

Sympy [A] time = 41.5301, size = 507, normalized size = 7.8

$$\begin{cases} \frac{a^3x^4}{4}+3a^2b\log(x)-\frac{3ab^2}{4x^4}-\frac{b^3}{8x^8} \\ \frac{a^3x^4}{4}+\frac{3a^2bx^2}{2}+3ab^2\log(x)-\frac{b^3}{2x^2} \\ \frac{a^3x^4}{4}+\frac{9a^2bx^{\frac{8}{3}}}{8}+\frac{9ab^2x^{\frac{4}{3}}}{4}+b^3\log(x) \\ \frac{3a^3n^3x^4}{12n^3+88n^2+192n+128}+\frac{22a^3n^2x^4}{12n^3+88n^2+192n+128}+\frac{48a^3nx^4}{12n^3+88n^2+192n+128}+\frac{32a^3x^4}{12n^3+88n^2+192n+128}+\frac{36a^2bn^2x^4x^n}{12n^3+88n^2+192n+128}+\frac{120a^2bnx^4x^n}{12n^3+88n^2+192n+128}+ \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(a+b*x**n)**3,x)
```

```
[Out] Piecewise((a**3*x**4/4 + 3*a**2*b*log(x) - 3*a*b**2/(4*x**4) - b*
*3/(8*x**8), Eq(n, -4)), (a**3*x**4/4 + 3*a**2*b*x**2/2 + 3*a*b**
2*log(x) - b**3/(2*x**2), Eq(n, -2)), (a**3*x**4/4 + 9*a**2*b*x**
(8/3)/8 + 9*a*b**2*x**(4/3)/4 + b**3*log(x), Eq(n, -4/3)), (3*a**
3*n**3*x**4/(12*n**3 + 88*n**2 + 192*n + 128) + 22*a**3*n**2*x**4
/(12*n**3 + 88*n**2 + 192*n + 128) + 48*a**3*n*x**4/(12*n**3 + 88
*n**2 + 192*n + 128) + 32*a**3*x**4/(12*n**3 + 88*n**2 + 192*n +
128) + 36*a**2*b*n**2*x**4*x**n/(12*n**3 + 88*n**2 + 192*n + 128)
 + 120*a**2*b*n*x**4*x**n/(12*n**3 + 88*n**2 + 192*n + 128) + 96*
a**2*b*x**4*x**n/(12*n**3 + 88*n**2 + 192*n + 128) + 18*a*b**2*n*
*2*x**4*x**(2*n)/(12*n**3 + 88*n**2 + 192*n + 128) + 96*a*b**2*n*
x**4*x**(2*n)/(12*n**3 + 88*n**2 + 192*n + 128) + 96*a*b**2*x**4*
x**(2*n)/(12*n**3 + 88*n**2 + 192*n + 128) + 4*b**3*n**2*x**4*x**
(3*n)/(12*n**3 + 88*n**2 + 192*n + 128) + 24*b**3*n*x**4*x**(3*n)
/(12*n**3 + 88*n**2 + 192*n + 128) + 32*b**3*x**4*x**(3*n)/(12*n*
*3 + 88*n**2 + 192*n + 128), True))
```

GIAC/XCAS [A] time = 0.218156, size = 270, normalized size = 4.15

$$\frac{3\,a^3n^3x^4 + 4\,b^3n^2x^4e^{(3\,n\ln(x))} + 18\,ab^2n^2x^4e^{(2\,n\ln(x))} + 36\,a^2bn^2x^4e^{(n\ln(x))} + 22\,a^3n^2x^4 + 24\,b^3nx^4e^{(3\,n\ln(x))} + 96\,ab^2nx^4e^{(2\,n\ln(x)}}{4\,(3\,n^3 + 22\,n^2 + 48\,n + 32}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^3,x, algorithm="giac")
```

```
[Out] 1/4*(3*a^3*n^3*x^4 + 4*b^3*n^2*x^4*e^(3*n*ln(x)) + 18*a*b^2*n^2*x
^4*e^(2*n*ln(x)) + 36*a^2*b*n^2*x^4*e^(n*ln(x)) + 22*a^3*n^2*x^4
+ 24*b^3*n*x^4*e^(3*n*ln(x)) + 96*a*b^2*n*x^4*e^(2*n*ln(x)) + 120
*a^2*b*n*x^4*e^(n*ln(x)) + 48*a^3*n*x^4 + 32*b^3*x^4*e^(3*n*ln(x)
) + 96*a*b^2*x^4*e^(2*n*ln(x)) + 96*a^2*b*x^4*e^(n*ln(x)) + 32*a^
3*x^4)/(3*n^3 + 22*n^2 + 48*n + 32)
```

3.2459 $\int x^2 (a + bx^n)^3 \, dx$

Optimal. Leaf size=66

$$\frac{a^3x^3}{3} + \frac{3a^2bx^{n+3}}{n+3} + \frac{3ab^2x^{2n+3}}{2n+3} + \frac{b^3x^{3(n+1)}}{3(n+1)}$$

```
[Out] (a^3*x^3)/3 + (b^3*x^(3*(1 + n)))/(3*(1 + n)) + (3*a^2*b*x^(3 + n
))/(3 + n) + (3*a*b^2*x^(3 + 2*n))/(3 + 2*n)
```

Rubi [A] time = 0.0846406, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$\frac{a^3x^3}{3} + \frac{3a^2bx^{n+3}}{n+3} + \frac{3ab^2x^{2n+3}}{2n+3} + \frac{b^3x^{3(n+1)}}{3(n+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2*(a + b*x^n)^3,x]
```

```
[Out] (a^3*x^3)/3 + (b^3*x^(3*(1 + n)))/(3*(1 + n)) + (3*a^2*b*x^(3 + n
))/(3 + n) + (3*a*b^2*x^(3 + 2*n))/(3 + 2*n)
```

Rubi in Sympy [A] time = 12.2373, size = 56, normalized size = 0.85

$$\frac{a^3x^3}{3} + \frac{3a^2bx^{n+3}}{n+3} + \frac{3ab^2x^{2n+3}}{2n+3} + \frac{b^3x^{3n+3}}{3(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(a+b*x**n)**3,x)
```

```
[Out] a**3*x**3/3 + 3*a**2*b*x**(n + 3)/(n + 3) + 3*a*b**2*x**(2*n + 3)
/(2*n + 3) + b**3*x**(3*n + 3)/(3*(n + 1))
```

Mathematica [A] time = 0.0599207, size = 57, normalized size = 0.86

$$\frac{1}{3}x^3\left(a^3 + \frac{9a^2bx^n}{n+3} + \frac{9ab^2x^{2n}}{2n+3} + \frac{b^3x^{3n}}{n+1}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2*(a + b*x^n)^3,x]
```

```
[Out] (x^3*(a^3 + (9*a^2*b*x^n)/(3 + n) + (9*a*b^2*x^(2*n))/(3 + 2*n) +
 (b^3*x^(3*n))/(1 + n)))/3
```

Maple [A] time = 0.019, size = 72, normalized size = 1.1

$$\frac{a^3x^3}{3} + \frac{b^3x^3\left(e^{n\ln(x)}\right)^3}{3+3n} + 3\frac{ab^2x^3\left(e^{n\ln(x)}\right)^2}{3+2n} + 3\frac{a^2bx^3e^{n\ln(x)}}{3+n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(a+b*x^n)^3,x)
```

```
[Out] 1/3*a^3*x^3+1/3*b^3/(1+n)*x^3*exp(n*ln(x))^3+3*a*b^2/(3+2*n)*x^3*
exp(n*ln(x))^2+3*a^2*b/(3+n)*x^3*exp(n*ln(x))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.238913, size = 194, normalized size = 2.94

$$\frac{\left(2\,b^3n^2 + 9\,b^3n + 9\,b^3\right)x^3x^{3\,n} + 9\left(ab^2n^2 + 4\,ab^2n + 3\,ab^2\right)x^3x^{2\,n} + 9\left(2\,a^2bn^2 + 5\,a^2bn + 3\,a^2b\right)x^3x^n + \left(2\,a^3n^3 + 11\,a^3n^2 + 18\right.}{3\left(2\,n^3 + 11\,n^2 + 18\,n + 9\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^2,x, algorithm="fricas")
```

```
[Out] 1/3*((2*b^3*n^2 + 9*b^3*n + 9*b^3)*x^3*x^(3*n) + 9*(a*b^2*n^2 + 4
*a*b^2*n + 3*a*b^2)*x^3*x^(2*n) + 9*(2*a^2*b*n^2 + 5*a^2*b*n + 3*
a^2*b)*x^3*x^n + (2*a^3*n^3 + 11*a^3*n^2 + 18*a^3*n + 9*a^3)*x^3)
/(2*n^3 + 11*n^2 + 18*n + 9)
```

Sympy [A] time = 11.7765, size = 500, normalized size = 7.58

$$\begin{cases} \frac{a^3x^3}{3} + 3a^2b\log(x) - \frac{ab^2}{x^3} - \frac{b^3}{6x^6} \\ \frac{a^3x^3}{3} + 2a^2bx^{\frac{3}{2}} + 3ab^2\log(x) - \frac{2b^3}{3x^{\frac{3}{2}}} \\ \frac{a^3x^3}{3} + \frac{3a^2bx^2}{2} + 3ab^2x + b^3\log(x) \\ \frac{2a^3n^3x^3}{6n^3+33n^2+54n+27} + \frac{11a^3n^2x^3}{6n^3+33n^2+54n+27} + \frac{18a^3nx^3}{6n^3+33n^2+54n+27} + \frac{9a^3x^3}{6n^3+33n^2+54n+27} + \frac{18a^2bn^2x^3x^n}{6n^3+33n^2+54n+27} + \frac{45a^2bnx^3x^n}{6n^3+33n^2+54n+27} + \frac{27a^2bx^3x^n}{6n^3+33n^2+54n+27} + \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(a+b*x**n)**3,x)
```

```
[Out] Piecewise((a**3*x**3/3 + 3*a**2*b*log(x) - a*b**2/x**3 - b**3/(6*
x**6), Eq(n, -3)), (a**3*x**3/3 + 2*a**2*b*x**(3/2) + 3*a*b**2*lo
g(x) - 2*b**3/(3*x**(3/2)), Eq(n, -3/2)), (a**3*x**3/3 + 3*a**2*b
*x**2/2 + 3*a*b**2*x + b**3*log(x), Eq(n, -1)), (2*a**3*n**3*x**3
/(6*n**3 + 33*n**2 + 54*n + 27) + 11*a**3*n**2*x**3/(6*n**3 + 33*
n**2 + 54*n + 27) + 18*a**3*n*x**3/(6*n**3 + 33*n**2 + 54*n + 27)
 + 9*a**3*x**3/(6*n**3 + 33*n**2 + 54*n + 27) + 18*a**2*b*n**2*x*
*3*x**n/(6*n**3 + 33*n**2 + 54*n + 27) + 45*a**2*b*n*x**3*x**n/(6
*n**3 + 33*n**2 + 54*n + 27) + 27*a**2*b*x**3*x**n/(6*n**3 + 33*n
**2 + 54*n + 27) + 9*a*b**2*n**2*x**3*x**(2*n)/(6*n**3 + 33*n**2
+ 54*n + 27) + 36*a*b**2*n*x**3*x**(2*n)/(6*n**3 + 33*n**2 + 54*n
 + 27) + 27*a*b**2*x**3*x**(2*n)/(6*n**3 + 33*n**2 + 54*n + 27) +
 2*b**3*n**2*x**3*x**(3*n)/(6*n**3 + 33*n**2 + 54*n + 27) + 9*b**
3*n*x**3*x**(3*n)/(6*n**3 + 33*n**2 + 54*n + 27) + 9*b**3*x**3*x*
*(3*n)/(6*n**3 + 33*n**2 + 54*n + 27), True))
```

GIAC/XCAS [A] time = 0.217295, size = 270, normalized size = 4.09

$$\frac{2\,a^3n^3x^3 + 2\,b^3n^2x^3e^{(3\,n\ln(x))} + 9\,ab^2n^2x^3e^{(2\,n\ln(x))} + 18\,a^2bn^2x^3e^{(n\ln(x))} + 11\,a^3n^2x^3 + 9\,b^3nx^3e^{(3\,n\ln(x))} + 36\,ab^2nx^3e^{(2\,n\ln(x))} +}{3\,(2\,n^3 + 11\,n^2 + 18\,n + 9)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^2,x, algorithm="giac")
```

```
[Out] 1/3*(2*a^3*n^3*x^3 + 2*b^3*n^2*x^3*e^(3*n*ln(x)) + 9*a*b^2*n^2*x^
3*e^(2*n*ln(x)) + 18*a^2*b*n^2*x^3*e^(n*ln(x)) + 11*a^3*n^2*x^3 +
 9*b^3*n*x^3*e^(3*n*ln(x)) + 36*a*b^2*n*x^3*e^(2*n*ln(x)) + 45*a^
2*b*n*x^3*e^(n*ln(x)) + 18*a^3*n*x^3 + 9*b^3*x^3*e^(3*n*ln(x)) +
27*a*b^2*x^3*e^(2*n*ln(x)) + 27*a^2*b*x^3*e^(n*ln(x)) + 9*a^3*x^3
)/(2*n^3 + 11*n^2 + 18*n + 9)
```

3.2460 $\int x\,(a+bx^n)^3\,dx$

Optimal. Leaf size=65

$$\frac{a^3x^2}{2}+\frac{3a^2bx^{n+2}}{n+2}+\frac{3ab^2x^{2(n+1)}}{2(n+1)}+\frac{b^3x^{3n+2}}{3n+2}$$

```
[Out] (a^3*x^2)/2 + (3*a*b^2*x^(2*(1 + n)))/(2*(1 + n)) + (3*a^2*b*x^(2
 + n))/(2 + n) + (b^3*x^(2 + 3*n))/(2 + 3*n)
```

Rubi [A] time = 0.0740201, antiderivative size = 65, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{a^3x^2}{2}+\frac{3a^2bx^{n+2}}{n+2}+\frac{3ab^2x^{2(n+1)}}{2(n+1)}+\frac{b^3x^{3n+2}}{3n+2}$$

Antiderivative was successfully verified.

```
[In] Int[x*(a + b*x^n)^3,x]
```

```
[Out] (a^3*x^2)/2 + (3*a*b^2*x^(2*(1 + n)))/(2*(1 + n)) + (3*a^2*b*x^(2
 + n))/(2 + n) + (b^3*x^(2 + 3*n))/(2 + 3*n)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$a^3\int x\,dx+\frac{3a^2bx^{n+2}}{n+2}+\frac{3ab^2x^{2n+2}}{2\,(n+1)}+\frac{b^3x^{3n+2}}{3n+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x*(a+b*x**n)**3,x)
```

```
[Out] a**3*Integral(x, x) + 3*a**2*b*x**(n + 2)/(n + 2) + 3*a*b**2*x**(
2*n + 2)/(2*(n + 1)) + b**3*x**(3*n + 2)/(3*n + 2)
```

Mathematica [A] time = 0.0608854, size = 58, normalized size = 0.89

$$\frac{1}{2}x^2\left(a^3+\frac{6a^2bx^n}{n+2}+\frac{3ab^2x^{2n}}{n+1}+\frac{2b^3x^{3n}}{3n+2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(a + b*x^n)^3,x]
```

```
[Out] (x^2*(a^3 + (6*a^2*b*x^n)/(2 + n) + (3*a*b^2*x^(2*n))/(1 + n) + (
2*b^3*x^(3*n))/(2 + 3*n)))/2
```

Maple [A] time = 0.018, size = 71, normalized size = 1.1

$$\frac{b^3x^2\left(e^{n\ln(x)}\right)^3}{2+3\,n}+\frac{x^2a^3}{2}+\frac{3\,ab^2x^2\left(e^{n\ln(x)}\right)^2}{2+2\,n}+3\,\frac{a^2bx^2e^{n\ln(x)}}{2+n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(a+b*x^n)^3,x)
```

```
[Out] b^3/(2+3*n)*x^2*exp(n*ln(x))^3+1/2*x^2*a^3+3/2*a*b^2/(1+n)*x^2*ex
p(n*ln(x))^2+3*a^2*b/(2+n)*x^2*exp(n*ln(x))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.242931, size = 196, normalized size = 3.02

$$\frac{2\left(b^3n^2+3\,b^3n+2\,b^3\right)x^2x^{3\,n}+3\left(3\,ab^2n^2+8\,ab^2n+4\,ab^2\right)x^2x^{2\,n}+6\left(3\,a^2bn^2+5\,a^2bn+2\,a^2b\right)x^2x^n+\left(3\,a^3n^3+11\,a^3n^2+\cdots\right.}{2\left(3\,n^3+11\,n^2+12\,n+4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x,x, algorithm="fricas")
```

```
[Out] 1/2*(2*(b^3*n^2 + 3*b^3*n + 2*b^3)*x^2*x^(3*n) + 3*(3*a*b^2*n^2 +
 8*a*b^2*n + 4*a*b^2)*x^2*x^(2*n) + 6*(3*a^2*b*n^2 + 5*a^2*b*n +
2*a^2*b)*x^2*x^n + (3*a^3*n^3 + 11*a^3*n^2 + 12*a^3*n + 4*a^3)*x^
2)/(3*n^3 + 11*n^2 + 12*n + 4)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(a+b*x**n)**3,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [A] time = 0.217834, size = 270, normalized size = 4.15

$$\frac{3\,a^3n^3x^2+2\,b^3n^2x^2e^{(3\,n\ln(x))}+9\,ab^2n^2x^2e^{(2\,n\ln(x))}+18\,a^2bn^2x^2e^{(n\ln(x))}+11\,a^3n^2x^2+6\,b^3nx^2e^{(3\,n\ln(x))}+24\,ab^2nx^2e^{(2\,n\ln(x))}+\cdots}{2\left(3\,n^3+11\,n^2+12\,n+4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x,x, algorithm="giac")
```

```
[Out] 1/2*(3*a^3*n^3*x^2 + 2*b^3*n^2*x^2*e^(3*n*ln(x)) + 9*a*b^2*n^2*x^
2*e^(2*n*ln(x)) + 18*a^2*b*n^2*x^2*e^(n*ln(x)) + 11*a^3*n^2*x^2 +
 6*b^3*n*x^2*e^(3*n*ln(x)) + 24*a*b^2*n*x^2*e^(2*n*ln(x)) + 30*a^
2*b*n*x^2*e^(n*ln(x)) + 12*a^3*n*x^2 + 4*b^3*x^2*e^(3*n*ln(x)) +
12*a*b^2*x^2*e^(2*n*ln(x)) + 12*a^2*b*x^2*e^(n*ln(x)) + 4*a^3*x^2
)/(3*n^3 + 11*n^2 + 12*n + 4)
```

3.2461 $\int (a+bx^n)^3\,dx$

Optimal. Leaf size=60

$$a^3x+\frac{3a^2bx^{n+1}}{n+1}+\frac{3ab^2x^{2n+1}}{2n+1}+\frac{b^3x^{3n+1}}{3n+1}$$

```
[Out] a^3*x + (3*a^2*b*x^(1 + n))/(1 + n) + (3*a*b^2*x^(1 + 2*n))/(1 +
2*n) + (b^3*x^(1 + 3*n))/(1 + 3*n)
```

Rubi [A] time = 0.0595546, antiderivative size = 60, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$

$$a^3x+\frac{3a^2bx^{n+1}}{n+1}+\frac{3ab^2x^{2n+1}}{2n+1}+\frac{b^3x^{3n+1}}{3n+1}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^3,x]
```

```
[Out] a^3*x + (3*a^2*b*x^(1 + n))/(1 + n) + (3*a*b^2*x^(1 + 2*n))/(1 +
2*n) + (b^3*x^(1 + 3*n))/(1 + 3*n)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{3a^2bx^{n+1}}{n+1}+\frac{3ab^2x^{2n+1}}{2n+1}+\frac{b^3x^{3n+1}}{3n+1}+\int a^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**n)**3,x)
```

```
[Out] 3*a**2*b*x**(n + 1)/(n + 1) + 3*a*b**2*x**(2*n + 1)/(2*n + 1) + b
**3*x**(3*n + 1)/(3*n + 1) + Integral(a**3, x)
```

Mathematica [A] time = 0.0396337, size = 54, normalized size = 0.9

$$x\left(a^3+\frac{3a^2bx^n}{n+1}+\frac{3ab^2x^{2n}}{2n+1}+\frac{b^3x^{3n}}{3n+1}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^3,x]
```

```
[Out] x*(a^3 + (3*a^2*b*x^n)/(1 + n) + (3*a*b^2*x^(2*n))/(1 + 2*n) + (b
^3*x^(3*n))/(1 + 3*n))
```

Maple [A] time = 0.015, size = 64, normalized size = 1.1

$$a^3x+\frac{b^3x\left(e^{n\ln(x)}\right)^3}{1+3\,n}+3\,\frac{ab^2x\left(e^{n\ln(x)}\right)^2}{1+2\,n}+3\,\frac{a^2bxe^{n\ln(x)}}{1+n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^3,x)
```

```
[Out] a^3*x+b^3/(1+3*n)*x*exp(n*ln(x))^3+3*a*b^2/(1+2*n)*x*exp(n*ln(x))
^2+3*a^2*b/(1+n)*x*exp(n*ln(x))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.238675, size = 176, normalized size = 2.93

$$\frac{\left(2\,b^3n^2 + 3\,b^3n + b^3\right)xx^{3\,n} + 3\,\left(3\,ab^2n^2 + 4\,ab^2n + ab^2\right)xx^{2\,n} + 3\,\left(6\,a^2bn^2 + 5\,a^2bn + a^2b\right)xx^{n} + \left(6\,a^3n^3 + 11\,a^3n^2 + 6\,a^3n + \cdots\right.}{6\,n^3 + 11\,n^2 + 6\,n + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3,x, algorithm="fricas")
```

```
[Out] ((2*b^3*n^2 + 3*b^3*n + b^3)*x*x^(3*n) + 3*(3*a*b^2*n^2 + 4*a*b^2
*n + a*b^2)*x*x^(2*n) + 3*(6*a^2*b*n^2 + 5*a^2*b*n + a^2*b)*x*x^n
 + (6*a^3*n^3 + 11*a^3*n^2 + 6*a^3*n + a^3)*x)/(6*n^3 + 11*n^2 +
6*n + 1)
```

Sympy [A] time = 2.16393, size = 469, normalized size = 7.82

$$\begin{cases} a^3x + 3a^2b\log{(x)} - \frac{3ab^2}{x} - \frac{b^3}{2x^2} \\ a^3x + 6a^2b\sqrt{x} + 3ab^2\log{(x)} - \frac{2b^3}{\sqrt{x}} \\ a^3x + \frac{9a^2bx^{\frac{2}{3}}}{2} + 9ab^2\sqrt[3]{x} + b^3\log{(x)} \\ \frac{6a^3n^3x}{6n^3+11n^2+6n+1} + \frac{11a^3n^2x}{6n^3+11n^2+6n+1} + \frac{6a^3nx}{6n^3+11n^2+6n+1} + \frac{a^3x}{6n^3+11n^2+6n+1} + \frac{18a^2bn^2xx^n}{6n^3+11n^2+6n+1} + \frac{15a^2bnxx^n}{6n^3+11n^2+6n+1} + \frac{3a^2bxx^n}{6n^3+11n^2+6n+1} + \frac{9ab^2n^2xx^{2n}}{6n^3+11n^2+6n+1} \cdots \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**3,x)
```

```
[Out] Piecewise((a**3*x + 3*a**2*b*log(x) - 3*a*b**2/x - b**3/(2*x**2),
 Eq(n, -1)), (a**3*x + 6*a**2*b*sqrt(x) + 3*a*b**2*log(x) - 2*b**
3/sqrt(x), Eq(n, -1/2)), (a**3*x + 9*a**2*b*x**(2/3)/2 + 9*a*b**2
*x**(1/3) + b**3*log(x), Eq(n, -1/3)), (6*a**3*n**3*x/(6*n**3 + 1
1*n**2 + 6*n + 1) + 11*a**3*n**2*x/(6*n**3 + 11*n**2 + 6*n + 1) +
 6*a**3*n*x/(6*n**3 + 11*n**2 + 6*n + 1) + a**3*x/(6*n**3 + 11*n*
*2 + 6*n + 1) + 18*a**2*b*n**2*x*x**n/(6*n**3 + 11*n**2 + 6*n + 1
) + 15*a**2*b*n*x*x**n/(6*n**3 + 11*n**2 + 6*n + 1) + 3*a**2*b*x*
x**n/(6*n**3 + 11*n**2 + 6*n + 1) + 9*a*b**2*n**2*x*x**(2*n)/(6*n
**3 + 11*n**2 + 6*n + 1) + 12*a*b**2*n*x*x**(2*n)/(6*n**3 + 11*n*
*2 + 6*n + 1) + 3*a*b**2*x*x**(2*n)/(6*n**3 + 11*n**2 + 6*n + 1)
+ 2*b**3*n**2*x*x**(3*n)/(6*n**3 + 11*n**2 + 6*n + 1) + 3*b**3*n*
x*x**(3*n)/(6*n**3 + 11*n**2 + 6*n + 1) + b**3*x*x**(3*n)/(6*n**3
 + 11*n**2 + 6*n + 1), True))
```

GIAC/XCAS [A] time = 0.216177, size = 231, normalized size = 3.85

$$\frac{6\,a^3n^3x + 2\,b^3n^2xe^{(3\,n\ln(x))} + 9\,ab^2n^2xe^{(2\,n\ln(x))} + 18\,a^2bn^2xe^{(n\ln(x))} + 11\,a^3n^2x + 3\,b^3nxe^{(3\,n\ln(x))} + 12\,ab^2nxe^{(2\,n\ln(x))} + 15\,a^2b}{6\,n^3 + 11\,n^2 + 6\,n + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3,x, algorithm="giac")
```

```
[Out] (6*a^3*n^3*x + 2*b^3*n^2*x*e^(3*n*ln(x)) + 9*a*b^2*n^2*x*e^(2*n*l
n(x)) + 18*a^2*b*n^2*x*e^(n*ln(x)) + 11*a^3*n^2*x + 3*b^3*n*x*e^(
3*n*ln(x)) + 12*a*b^2*n*x*e^(2*n*ln(x)) + 15*a^2*b*n*x*e^(n*ln(x)
) + 6*a^3*n*x + b^3*x*e^(3*n*ln(x)) + 3*a*b^2*x*e^(2*n*ln(x)) + 3
*a^2*b*x*e^(n*ln(x)) + a^3*x)/(6*n^3 + 11*n^2 + 6*n + 1)
```

3.2462 $\int \frac{(a+bx^n)^3}{x} \, dx$

Optimal. Leaf size=50

$$a^3 \log(x) + \frac{3a^2bx^n}{n} + \frac{3ab^2x^{2n}}{2n} + \frac{b^3x^{3n}}{3n}$$

```
[Out] (3*a^2*b*x^n)/n + (3*a*b^2*x^(2*n))/(2*n) + (b^3*x^(3*n))/(3*n) +
 a^3*Log[x]
```

Rubi [A] time = 0.0596317, antiderivative size = 50, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$a^3 \log(x) + \frac{3a^2bx^n}{n} + \frac{3ab^2x^{2n}}{2n} + \frac{b^3x^{3n}}{3n}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^3/x,x]
```

```
[Out] (3*a^2*b*x^n)/n + (3*a*b^2*x^(2*n))/(2*n) + (b^3*x^(3*n))/(3*n) +
 a^3*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^3 \log(x^n)}{n} + \frac{3a^2bx^n}{n} + \frac{3ab^2 \int^{x^n} x \, dx}{n} + \frac{b^3x^{3n}}{3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**n)**3/x,x)
```

```
[Out] a**3*log(x**n)/n + 3*a**2*b*x**n/n + 3*a*b**2*Integral(x, (x, x**
n))/n + b**3*x**(3*n)/(3*n)
```

Mathematica [A] time = 0.040683, size = 41, normalized size = 0.82

$$a^3 \log(x) + \frac{bx^n \left(18a^2 + 9abx^n + 2b^2x^{2n}\right)}{6n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^3/x,x]
```

```
[Out] (b*x^n*(18*a^2 + 9*a*b*x^n + 2*b^2*x^(2*n)))/(6*n) + a^3*Log[x]
```

Maple [A] time = 0.003, size = 52, normalized size = 1.

$$\frac{b^3 (x^n)^3}{3\,n} + \frac{3\,ab^2 (x^n)^2}{2\,n} + 3\,\frac{a^2bx^n}{n} + \frac{a^3 \ln(x^n)}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^3/x,x)
```

```
[Out] 1/3/n*b^3*(x^n)^3+3/2/n*a*b^2*(x^n)^2+3*a^2*b*x^n/n+1/n*a^3*ln(x^
n)
```

Maxima [A] time = 1.43931, size = 65, normalized size = 1.3

$$\frac{a^3 \log(x^n)}{n} + \frac{2\, b^3 x^{3\,n} + 9\, ab^2 x^{2\,n} + 18\, a^2 b x^n}{6\, n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3/x,x, algorithm="maxima")
```

```
[Out] a^3*log(x^n)/n + 1/6*(2*b^3*x^(3*n) + 9*a*b^2*x^(2*n) + 18*a^2*b*
x^n)/n
```

Fricas [A] time = 0.23774, size = 59, normalized size = 1.18

$$\frac{6\, a^3 n \log(x) + 2\, b^3 x^{3\,n} + 9\, ab^2 x^{2\,n} + 18\, a^2 b x^n}{6\, n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3/x,x, algorithm="fricas")
```

```
[Out] 1/6*(6*a^3*n*log(x) + 2*b^3*x^(3*n) + 9*a*b^2*x^(2*n) + 18*a^2*b*
x^n)/n
```

Sympy [A] time = 1.14323, size = 53, normalized size = 1.06

$$\begin{cases} a^3 \log(x) + \frac{3a^2bx^n}{n} + \frac{3ab^2x^{2n}}{2n} + \frac{b^3x^{3n}}{3n} & \text{for } n \neq 0 \\ (a+b)^3 \log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**3/x,x)
```

```
[Out] Piecewise((a**3*log(x) + 3*a**2*b*x**n/n + 3*a*b**2*x**(2*n)/(2*n
) + b**3*x**(3*n)/(3*n), Ne(n, 0)), ((a + b)**3*log(x), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^n + a)^3}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3/x,x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^3/x, x)
```

3.2463 $\int \frac{(a+bx^n)^3}{x^2}\,dx$

Optimal. Leaf size=66

$$-\frac{a^3}{x}-\frac{3a^2bx^{n-1}}{1-n}-\frac{3ab^2x^{2n-1}}{1-2n}-\frac{b^3x^{3n-1}}{1-3n}$$

```
[Out] -(a^3/x) - (3*a^2*b*x^(-1 + n))/(1 - n) - (3*a*b^2*x^(-1 + 2*n))/
(1 - 2*n) - (b^3*x^(-1 + 3*n))/(1 - 3*n)
```

Rubi [A] time = 0.0880049, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$-\frac{a^3}{x}-\frac{3a^2bx^{n-1}}{1-n}-\frac{3ab^2x^{2n-1}}{1-2n}-\frac{b^3x^{3n-1}}{1-3n}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^3/x^2,x]
```

```
[Out] -(a^3/x) - (3*a^2*b*x^(-1 + n))/(1 - n) - (3*a*b^2*x^(-1 + 2*n))/
(1 - 2*n) - (b^3*x^(-1 + 3*n))/(1 - 3*n)
```

Rubi in Sympy [A] time = 12.2987, size = 54, normalized size = 0.82

$$-\frac{a^3}{x}-\frac{3a^2bx^{n-1}}{-n+1}-\frac{3ab^2x^{2n-1}}{-2n+1}-\frac{b^3x^{3n-1}}{-3n+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**n)**3/x**2,x)
```

```
[Out] -a**3/x - 3*a**2*b*x**(n - 1)/(-n + 1) - 3*a*b**2*x**(2*n - 1)/(-
2*n + 1) - b**3*x**(3*n - 1)/(-3*n + 1)
```

Mathematica [A] time = 0.0473072, size = 58, normalized size = 0.88

$$\frac{-a^3+\frac{3a^2bx^n}{n-1}+\frac{3ab^2x^{2n}}{2n-1}+\frac{b^3x^{3n}}{3n-1}}{x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^3/x^2,x]
```

```
[Out] (-a^3 + (3*a^2*b*x^n)/(-1 + n) + (3*a*b^2*x^(2*n))/(-1 + 2*n) + (
b^3*x^(3*n))/(-1 + 3*n))/x
```

Maple [A] time = 0.021, size = 65, normalized size = 1.

$$\frac{1}{x}\left(\frac{b^3\left(e^{n\ln(x)}\right)^3}{-1+3\,n}-a^3+3\,\frac{ab^2\left(e^{n\ln(x)}\right)^2}{-1+2\,n}+3\,\frac{a^2be^{n\ln(x)}}{-1+n}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^3/x^2,x)
```

```
[Out] (b^3/(-1+3*n)*exp(n*ln(x))^3-a^3+3*a*b^2/(-1+2*n)*exp(n*ln(x))^2+
3*a^2*b/(-1+n)*exp(n*ln(x)))/x
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.242692, size = 177, normalized size = 2.68

$$-\frac{6\,a^3n^3 - 11\,a^3n^2 + 6\,a^3n - a^3 - \left(2\,b^3n^2 - 3\,b^3n + b^3\right)x^{3\,n} - 3\left(3\,ab^2n^2 - 4\,ab^2n + ab^2\right)x^{2\,n} - 3\left(6\,a^2bn^2 - 5\,a^2bn + a^2b\right)x^n}{(6\,n^3 - 11\,n^2 + 6\,n - 1)x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3/x^2,x, algorithm="fricas")
```

```
[Out] -(6*a^3*n^3 - 11*a^3*n^2 + 6*a^3*n - a^3 - (2*b^3*n^2 - 3*b^3*n +
 b^3)*x^(3*n) - 3*(3*a*b^2*n^2 - 4*a*b^2*n + a*b^2)*x^(2*n) - 3*(
6*a^2*b*n^2 - 5*a^2*b*n + a^2*b)*x^n)/((6*n^3 - 11*n^2 + 6*n - 1)
*x)
```

Sympy [A] time = 4.11775, size = 508, normalized size = 7.7

$$\begin{cases} -\frac{a^3}{x} - \frac{9a^2b}{2x^{\frac{2}{3}}} - \frac{9ab^2}{\sqrt[3]{x}} + b^3\log(x) \\ -\frac{a^3}{x} - \frac{6a^2b}{\sqrt{x}} + 3ab^2\log(x) + 2b^3\sqrt{x} \\ -\frac{a^3}{x} + 3a^2b\log(x) + 3ab^2x + \frac{b^3x^2}{2} \\ -\frac{6a^3n^3}{6n^3x-11n^2x+6nx-x} + \frac{11a^3n^2}{6n^3x-11n^2x+6nx-x} - \frac{6a^3n}{6n^3x-11n^2x+6nx-x} + \frac{a^3}{6n^3x-11n^2x+6nx-x} + \frac{18a^2bn^2x^n}{6n^3x-11n^2x+6nx-x} - \frac{15a^2bnx^n}{6n^3x-11n^2x+6nx-x} + \cdots \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**3/x**2,x)
```

```
[Out] Piecewise((-a**3/x - 9*a**2*b/(2*x**(2/3)) - 9*a*b**2/x**(1/3) +
b**3*log(x), Eq(n, 1/3)), (-a**3/x - 6*a**2*b/sqrt(x) + 3*a*b**2*
log(x) + 2*b**3*sqrt(x), Eq(n, 1/2)), (-a**3/x + 3*a**2*b*log(x)
+ 3*a*b**2*x + b**3*x**2/2, Eq(n, 1)), (-6*a**3*n**3/(6*n**3*x -
11*n**2*x + 6*n*x - x) + 11*a**3*n**2/(6*n**3*x - 11*n**2*x + 6*n
*x - x) - 6*a**3*n/(6*n**3*x - 11*n**2*x + 6*n*x - x) + a**3/(6*n
**3*x - 11*n**2*x + 6*n*x - x) + 18*a**2*b*n**2*x**n/(6*n**3*x -
11*n**2*x + 6*n*x - x) - 15*a**2*b*n*x**n/(6*n**3*x - 11*n**2*x +
 6*n*x - x) + 3*a**2*b*x**n/(6*n**3*x - 11*n**2*x + 6*n*x - x) +
9*a*b**2*n**2*x**(2*n)/(6*n**3*x - 11*n**2*x + 6*n*x - x) - 12*a*
b**2*n*x**(2*n)/(6*n**3*x - 11*n**2*x + 6*n*x - x) + 3*a*b**2*x**
(2*n)/(6*n**3*x - 11*n**2*x + 6*n*x - x) + 2*b**3*n**2*x**(3*n)/(
6*n**3*x - 11*n**2*x + 6*n*x - x) - 3*b**3*n*x**(3*n)/(6*n**3*x -
 11*n**2*x + 6*n*x - x) + b**3*x**(3*n)/(6*n**3*x - 11*n**2*x + 6
*n*x - x), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^n + a)^3}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3/x^2,x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^3/x^2, x)
```

3.2464 $\int \frac{(a+bx^n)^3}{x^3} dx$

Optimal. Leaf size=72

$$-\frac{a^3}{2x^2}-\frac{3a^2bx^{n-2}}{2-n}-\frac{3ab^2x^{-2(1-n)}}{2(1-n)}-\frac{b^3x^{3n-2}}{2-3n}$$

```
[Out] -a^3/(2*x^2) - (3*a*b^2)/(2*(1 - n)*x^(2*(1 - n))) - (3*a^2*b*x^(
-2 + n))/(2 - n) - (b^3*x^(-2 + 3*n))/(2 - 3*n)
```

Rubi [A] time = 0.0895498, antiderivative size = 72, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{a^3}{2x^2}-\frac{3a^2bx^{n-2}}{2-n}-\frac{3ab^2x^{-2(1-n)}}{2(1-n)}-\frac{b^3x^{3n-2}}{2-3n}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^n)^3/x^3,x]
```

```
[Out] -a^3/(2*x^2) - (3*a*b^2)/(2*(1 - n)*x^(2*(1 - n))) - (3*a^2*b*x^(
-2 + n))/(2 - n) - (b^3*x^(-2 + 3*n))/(2 - 3*n)
```

Rubi in Sympy [A] time = 12.0609, size = 58, normalized size = 0.81

$$-\frac{a^3}{2x^2}-\frac{3a^2bx^{n-2}}{-n+2}-\frac{3ab^2x^{2n-2}}{2(-n+1)}-\frac{b^3x^{3n-2}}{-3n+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b*x**n)**3/x**3,x)
```

```
[Out] -a**3/(2*x**2) - 3*a**2*b*x**(n - 2)/(-n + 2) - 3*a*b**2*x**(2*n
- 2)/(2*(-n + 1)) - b**3*x**(3*n - 2)/(-3*n + 2)
```

Mathematica [A] time = 0.0499695, size = 60, normalized size = 0.83

$$\frac{-a^3+\frac{6a^2bx^n}{n-2}+\frac{3ab^2x^{2n}}{n-1}+\frac{2b^3x^{3n}}{3n-2}}{2x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^n)^3/x^3,x]
```

```
[Out] (-a^3 + (6*a^2*b*x^n)/(-2 + n) + (3*a*b^2*x^(2*n))/(-1 + n) + (2*
b^3*x^(3*n))/(-2 + 3*n))/(2*x^2)
```

Maple [A] time = 0.03, size = 65, normalized size = 0.9

$$-\frac{a^3}{2\,x^2}+\frac{b^3\,(x^n)^3}{(-2+3\,n)\,x^2}+\frac{3\,ab^2\,(x^n)^2}{(2\,n-2)\,x^2}+3\,\frac{a^2bx^n}{(-2+n)\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^3/x^3,x)
```

```
[Out] -1/2*a^3/x^2+1/(-2+3*n)*b^3/x^2*(x^n)^3+3/2/(-1+n)*a*b^2/x^2*(x^n
)^2+3/(-2+n)*a^2*b/x^2*x^n
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3/x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.241313, size = 181, normalized size = 2.51

$$-\frac{3\,a^3n^3 - 11\,a^3n^2 + 12\,a^3n - 4\,a^3 - 2\left(b^3n^2 - 3\,b^3n + 2\,b^3\right)x^{3\,n} - 3\left(3\,ab^2n^2 - 8\,ab^2n + 4\,ab^2\right)x^{2\,n} - 6\left(3\,a^2bn^2 - 5\,a^2bn + 2\right.}{2\left(3\,n^3 - 11\,n^2 + 12\,n - 4\right)x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3/x^3,x, algorithm="fricas")
```

```
[Out] -1/2*(3*a^3*n^3 - 11*a^3*n^2 + 12*a^3*n - 4*a^3 - 2*(b^3*n^2 - 3*
b^3*n + 2*b^3)*x^(3*n) - 3*(3*a*b^2*n^2 - 8*a*b^2*n + 4*a*b^2)*x^
(2*n) - 6*(3*a^2*b*n^2 - 5*a^2*b*n + 2*a^2*b)*x^n)/((3*n^3 - 11*n
^2 + 12*n - 4)*x^2)
```

Sympy [A] time = 5.66216, size = 627, normalized size = 8.71

$$\begin{cases} -\frac{a^3}{2x^2} - \frac{9a^2b}{4x^{\frac{4}{3}}} - \frac{9ab^2}{2x^{\frac{2}{3}}} + b^3\log(x) \\ -\frac{a^3}{2x^2} - \frac{3a^2b}{x} + 3ab^2\log(x) + b^3x \\ -\frac{a^3}{2x^2} + 3a^2b\log(x) + \frac{3ab^2x^2}{2} + \frac{b^3x^4}{4} \\ -\frac{3a^3n^3}{6n^3x^2-22n^2x^2+24nx^2-8x^2} + \frac{11a^3n^2}{6n^3x^2-22n^2x^2+24nx^2-8x^2} - \frac{12a^3n}{6n^3x^2-22n^2x^2+24nx^2-8x^2} + \frac{4a^3}{6n^3x^2-22n^2x^2+24nx^2-8x^2} + \frac{18a^2bn^2x^n}{6n^3x^2-22n^2x^2+24nx^2-8x^2} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**3/x**3,x)
```

```
[Out] Piecewise((-a**3/(2*x**2) - 9*a**2*b/(4*x**(4/3)) - 9*a*b**2/(2*x
**(2/3)) + b**3*log(x), Eq(n, 2/3)), (-a**3/(2*x**2) - 3*a**2*b/x
 + 3*a*b**2*log(x) + b**3*x, Eq(n, 1)), (-a**3/(2*x**2) + 3*a**2*
b*log(x) + 3*a*b**2*x**2/2 + b**3*x**4/4, Eq(n, 2)), (-3*a**3*n**
3/(6*n**3*x**2 - 22*n**2*x**2 + 24*n*x**2 - 8*x**2) + 11*a**3*n**
2/(6*n**3*x**2 - 22*n**2*x**2 + 24*n*x**2 - 8*x**2) - 12*a**3*n/(
6*n**3*x**2 - 22*n**2*x**2 + 24*n*x**2 - 8*x**2) + 4*a**3/(6*n**3
*x**2 - 22*n**2*x**2 + 24*n*x**2 - 8*x**2) + 18*a**2*b*n**2*x**n/
(6*n**3*x**2 - 22*n**2*x**2 + 24*n*x**2 - 8*x**2) - 30*a**2*b*n*x
**n/(6*n**3*x**2 - 22*n**2*x**2 + 24*n*x**2 - 8*x**2) + 12*a**2*b
*x**n/(6*n**3*x**2 - 22*n**2*x**2 + 24*n*x**2 - 8*x**2) + 9*a*b**
2*n**2*x**(2*n)/(6*n**3*x**2 - 22*n**2*x**2 + 24*n*x**2 - 8*x**2)
 - 24*a*b**2*n*x**(2*n)/(6*n**3*x**2 - 22*n**2*x**2 + 24*n*x**2 -
 8*x**2) + 12*a*b**2*x**(2*n)/(6*n**3*x**2 - 22*n**2*x**2 + 24*n*
x**2 - 8*x**2) + 2*b**3*n**2*x**(3*n)/(6*n**3*x**2 - 22*n**2*x**2
 + 24*n*x**2 - 8*x**2) - 6*b**3*n*x**(3*n)/(6*n**3*x**2 - 22*n**2
*x**2 + 24*n*x**2 - 8*x**2) + 4*b**3*x**(3*n)/(6*n**3*x**2 - 22*n
```

```
**2*x**2 + 24*n*x**2 - 8*x**2), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^n + a)^3}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3/x^3,x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^3/x^3, x)
```

3.2465 $\int \frac{x}{a+bx^n} dx$

Optimal. Leaf size=33

$$\frac{x^2\,{}_2F_1\left(1,\frac{2}{n};\frac{n+2}{n};-\frac{bx^n}{a}\right)}{2a}$$

```
[Out] (x^2*Hypergeometric2F1[1, 2/n, (2 + n)/n, -((b*x^n)/a)])/(2*a)
```

Rubi [A] time = 0.0312275, antiderivative size = 33, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{x^2\,{}_2F_1\left(1,\frac{2}{n};\frac{n+2}{n};-\frac{bx^n}{a}\right)}{2a}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b*x^n),x]
```

```
[Out] (x^2*Hypergeometric2F1[1, 2/n, (2 + n)/n, -((b*x^n)/a)])/(2*a)
```

Rubi in Sympy [A] time = 3.66271, size = 20, normalized size = 0.61

$$\frac{x^2{}_2F_1\left(\begin{matrix} 1, \frac{2}{n} \\ \frac{n+2}{n} \end{matrix}\middle| -\frac{bx^n}{a}\right)}{2a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b*x**n),x)
```

```
[Out] x**2*hyper((1, 2/n), ((n + 2)/n,), -b*x**n/a)/(2*a)
```

Mathematica [A] time = 0.0141384, size = 33, normalized size = 1.

$$\frac{x^2\,{}_2F_1\left(1,\frac{2}{n};1+\frac{2}{n};-\frac{bx^n}{a}\right)}{2a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b*x^n),x]
```

```
[Out] (x^2*Hypergeometric2F1[1, 2/n, 1 + 2/n, -((b*x^n)/a)])/(2*a)
```

Maple [F] time = 0.054, size = 0, normalized size = 0.

$$\int \frac{x}{a+bx^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+b*x^n),x)
```

```
[Out] int(x/(a+b*x^n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{bx^n + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] integrate(x/(b*x^n + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x}{bx^n + a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] integral(x/(b*x^n + a), x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a+b*x**n),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{bx^n + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x/(b*x^n + a), x)
```

3.2466 $\int \frac{1}{a+bx^n} dx$

Optimal. Leaf size=24

$$\frac{x\,_2F_1\left(1,\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)}{a}$$

```
[Out] (x*Hypergeometric2F1[1, n^(-1), 1 + n^(-1), -((b*x^n)/a)])/a
```

Rubi [A] time = 0.0195887, antiderivative size = 24, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111

$$\frac{x\,_2F_1\left(1,\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)}{a}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^n)^(-1),x]

[Out] (x*Hypergeometric2F1[1, n^(-1), 1 + n^(-1), -((b*x^n)/a)])/a
```

Rubi in Sympy [A] time = 1.77875, size = 17, normalized size = 0.71

$$\frac{x_2F_1\left(\begin{matrix}1,\frac{1}{n}\\1+\frac{1}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b*x**n),x)

[Out] x*hyper((1, 1/n), (1 + 1/n,), -b*x**n/a)/a
```

Mathematica [A] time = 0.00778167, size = 24, normalized size = 1.

$$\frac{x\,_2F_1\left(1,\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)}{a}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^n)^(-1),x]

[Out] (x*Hypergeometric2F1[1, n^(-1), 1 + n^(-1), -((b*x^n)/a)])/a
```

Maple [F] time = 0.046, size = 0, normalized size = 0.

$$\int (a+bx^n)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b*x^n),x)
```

```
[Out] int(1/(a+b*x^n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{bx^n + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] integrate(1/(b*x^n + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{bx^n + a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] integral(1/(b*x^n + a), x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*x**n),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{bx^n + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(1/(b*x^n + a), x)
```

3.2467 $\int \frac{1}{x(a+bx^n)}\,dx$

Optimal. Leaf size=23

$$\frac{\log(x)}{a}-\frac{\log(a+bx^n)}{an}$$

```
[Out] Log[x]/a - Log[a + b*x^n]/(a*n)
```

Rubi [A] time = 0.0363581, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{\log(x)}{a}-\frac{\log(a+bx^n)}{an}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a + b*x^n)),x]

[Out] Log[x]/a - Log[a + b*x^n]/(a*n)
```

Rubi in Sympy [A] time = 6.36424, size = 19, normalized size = 0.83

$$\frac{\log(x^n)}{an}-\frac{\log(a+bx^n)}{an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(a+b*x**n),x)

[Out] log(x**n)/(a*n) - log(a + b*x**n)/(a*n)
```

Mathematica [A] time = 0.0163694, size = 22, normalized size = 0.96

$$\frac{n\log(x)-\log(a+bx^n)}{an}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a + b*x^n)),x]

[Out] (n*Log[x] - Log[a + b*x^n])/(a*n)
```

Maple [A] time = 0.003, size = 29, normalized size = 1.3

$$\frac{\ln(x^n)}{na}-\frac{\ln(a+bx^n)}{na}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(a+b*x^n),x)

[Out] 1/n/a*ln(x^n)-ln(a+b*x^n)/a/n
```

Maxima [A] time = 1.44482, size = 38, normalized size = 1.65

$$-\frac{\log\left(bx^n+a\right)}{an}+\frac{\log\left(x^n\right)}{an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)*x),x, algorithm="maxima")
```

```
[Out] -log(b*x^n + a)/(a*n) + log(x^n)/(a*n)
```

Fricas [A] time = 0.245461, size = 30, normalized size = 1.3

$$\frac{n\log\left(x\right)-\log\left(bx^n+a\right)}{an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)*x),x, algorithm="fricas")
```

```
[Out] (n*log(x) - log(b*x^n + a))/(a*n)
```

Sympy [A] time = 2.20038, size = 41, normalized size = 1.78

$$\begin{cases} \tilde{\infty}\log\left(x\right) & \text{for } a=0\wedge b=0\wedge n=0 \\ \frac{\log\left(x\right)}{a} & \text{for } b=0 \\ \frac{\log\left(x\right)}{a+b} & \text{for } n=0 \\ -\frac{x^{-n}}{bn} & \text{for } a=0 \\ \frac{\log\left(x\right)}{a}-\frac{\log\left(\frac{a}{b}+x^n\right)}{an} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(a+b*x**n),x)
```

```
[Out] Piecewise((zoo*log(x), Eq(a, 0) & Eq(b, 0) & Eq(n, 0)), (log(x)/a
, Eq(b, 0)), (log(x)/(a + b), Eq(n, 0)), (-x**(-n)/(b*n), Eq(a, 0
)), (log(x)/a - log(a/b + x**n)/(a*n), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\left(bx^n+a\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)*x),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^n + a)*x), x)
```

3.2468 $\int \frac{1}{x^2(a+bx^n)}\,dx$

Optimal. Leaf size=34

$$-\frac{{}_2F_1\left(1,-\frac{1}{n};-\frac{1-n}{n};-\frac{bx^n}{a}\right)}{ax}$$

```
[Out] -(Hypergeometric2F1[1, -n^(-1), -((1 - n)/n), -((b*x^n)/a)]/(a*x)
)
```

Rubi [A] time = 0.0355479, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{{}_2F_1\left(1,-\frac{1}{n};-\frac{1-n}{n};-\frac{bx^n}{a}\right)}{ax}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^2*(a + b*x^n)),x]
```

```
[Out] -(Hypergeometric2F1[1, -n^(-1), -((1 - n)/n), -((b*x^n)/a)]/(a*x)
)
```

Rubi in Sympy [A] time = 4.02507, size = 20, normalized size = 0.59

$$-\frac{{}_2F_1\left(\begin{matrix}1,-\frac{1}{n}\\ \frac{n-1}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**2/(a+b*x**n),x)
```

```
[Out] -hyper((1, -1/n), ((n - 1)/n,), -b*x**n/a)/(a*x)
```

Mathematica [A] time = 0.0123853, size = 31, normalized size = 0.91

$$-\frac{{}_2F_1\left(1,-\frac{1}{n};1-\frac{1}{n};-\frac{bx^n}{a}\right)}{ax}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^2*(a + b*x^n)),x]
```

```
[Out] -(Hypergeometric2F1[1, -n^(-1), 1 - n^(-1), -((b*x^n)/a)]/(a*x))
```

Maple [F] time = 0.052, size = 0, normalized size = 0.

$$\int \frac{1}{x^2\,(a+bx^n)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(a+b*x^n),x)
```

```
[Out] int(1/x^2/(a+b*x^n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^n + a)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)*x^2),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x^n + a)*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{bx^2x^n + ax^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)*x^2),x, algorithm="fricas")
```

```
[Out] integral(1/(b*x^2*x^n + a*x^2), x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(a+b*x**n),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^n + a)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^n + a)*x^2), x)
```

3.2469 $\int \frac{1}{x^3(a+bx^n)}\,dx$

Optimal. Leaf size=36

$$-\frac{{}_2F_1\left(1,-\frac{2}{n};-\frac{2-n}{n};-\frac{bx^n}{a}\right)}{2ax^2}$$

```
[Out] -Hypergeometric2F1[1, -2/n, -((2 - n)/n), -((b*x^n)/a)]/(2*a*x^2)
```

Rubi [A] time = 0.0295274, antiderivative size = 36, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{{}_2F_1\left(1,-\frac{2}{n};-\frac{2-n}{n};-\frac{bx^n}{a}\right)}{2ax^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(a + b*x^n)),x]
```

```
[Out] -Hypergeometric2F1[1, -2/n, -((2 - n)/n), -((b*x^n)/a)]/(2*a*x^2)
```

Rubi in Sympy [A] time = 4.13581, size = 24, normalized size = 0.67

$$-\frac{{}_2F_1\left(\begin{matrix} 1,-\frac{2}{n} \\ \frac{n-2}{n} \end{matrix}\middle| -\frac{bx^n}{a}\right)}{2ax^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(a+b*x**n),x)
```

```
[Out] -hyper((1, -2/n), ((n - 2)/n,), -b*x**n/a)/(2*a*x**2)
```

Mathematica [A] time = 0.0116058, size = 33, normalized size = 0.92

$$-\frac{{}_2F_1\left(1,-\frac{2}{n};1-\frac{2}{n};-\frac{bx^n}{a}\right)}{2ax^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*(a + b*x^n)),x]
```

```
[Out] -Hypergeometric2F1[1, -2/n, 1 - 2/n, -((b*x^n)/a)]/(2*a*x^2)
```

Maple [F] time = 0.073, size = 0, normalized size = 0.

$$\int \frac{1}{x^3\,(a+bx^n)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(a+b*x^n),x)
```

```
[Out] int(1/x^3/(a+b*x^n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^n + a)x^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)*x^3),x, algorithm="maxima")

[Out] integrate(1/((b*x^n + a)*x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{bx^3x^n + ax^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)*x^3),x, algorithm="fricas")

[Out] integral(1/(b*x^3*x^n + a*x^3), x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(a+b*x**n),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^n + a)x^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)*x^3),x, algorithm="giac")

[Out] integrate(1/((b*x^n + a)*x^3), x)
```

3.2470 $\int \frac{x}{(a+bx^n)^2} dx$

Optimal. Leaf size=33

$$\frac{x^2\,{}_2F_1\left(2,\frac{2}{n};\frac{n+2}{n};-\frac{bx^n}{a}\right)}{2a^2}$$

```
[Out] (x^2*Hypergeometric2F1[2, 2/n, (2 + n)/n, -((b*x^n)/a)])/(2*a^2)
```

Rubi [A] time = 0.027139, antiderivative size = 33, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{x^2\,{}_2F_1\left(2,\frac{2}{n};\frac{n+2}{n};-\frac{bx^n}{a}\right)}{2a^2}$$

Antiderivative was successfully verified.

```
[In] Int[x/(a + b*x^n)^2,x]
```

```
[Out] (x^2*Hypergeometric2F1[2, 2/n, (2 + n)/n, -((b*x^n)/a)])/(2*a^2)
```

Rubi in Sympy [A] time = 3.29808, size = 22, normalized size = 0.67

$$\frac{x^2\,{}_2F_1\left(\begin{matrix} 2, \frac{2}{n} \\ \frac{n+2}{n} \end{matrix}\middle| -\frac{bx^n}{a}\right)}{2a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x/(a+b*x**n)**2,x)
```

```
[Out] x**2*hyper((2, 2/n), ((n + 2)/n,), -b*x**n/a)/(2*a**2)
```

Mathematica [A] time = 0.0520846, size = 53, normalized size = 1.61

$$\frac{x^2\left((n-2)\,{}_2F_1\left(1,\frac{2}{n};\frac{n+2}{n};-\frac{bx^n}{a}\right)+\frac{2a}{a+bx^n}\right)}{2a^2n}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/(a + b*x^n)^2,x]
```

```
[Out] (x^2*((2*a)/(a + b*x^n) + (-2 + n)*Hypergeometric2F1[1, 2/n, (2 +
 n)/n, -((b*x^n)/a)]))/(2*a^2*n)
```

Maple [F] time = 0.074, size = 0, normalized size = 0.

$$\int \frac{x}{(a+bx^n)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+b*x^n)^2,x)
```

```
[Out] int(x/(a+b*x^n)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$(n-2)\int \frac{x}{abnx^n + a^2n}\,dx + \frac{x^2}{abnx^n + a^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^n + a)^2,x, algorithm="maxima")
```

```
[Out] (n - 2)*integrate(x/(a*b*n*x^n + a^2*n), x) + x^2/(a*b*n*x^n + a^
2*n)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x}{b^2x^{2\,n} + 2\,abx^n + a^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^n + a)^2,x, algorithm="fricas")
```

```
[Out] integral(x/(b^2*x^(2*n) + 2*a*b*x^n + a^2), x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b*x**n)**2,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{(bx^n + a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^n + a)^2,x, algorithm="giac")
```

```
[Out] integrate(x/(b*x^n + a)^2, x)
```

3.2471 $\int \frac{1}{(a+bx^n)^2} dx$

Optimal. Leaf size=24

$$\frac{x\,_2F_1\left(2,\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)}{a^2}$$

```
[Out] (x*Hypergeometric2F1[2, n^(-1), 1 + n^(-1), -((b*x^n)/a)])/a^2
```

Rubi [A] time = 0.0188835, antiderivative size = 24, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111

$$\frac{x\,_2F_1\left(2,\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)}{a^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^(-2),x]

[Out] (x*Hypergeometric2F1[2, n^(-1), 1 + n^(-1), -((b*x^n)/a)])/a^2
```

Rubi in Sympy [A] time = 1.83814, size = 19, normalized size = 0.79

$$\frac{x_2F_1\left(\begin{matrix} 2, \frac{1}{n} \\ 1+\frac{1}{n} \end{matrix}\middle| -\frac{bx^n}{a}\right)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*x**n)**2,x)

[Out] x*hyper((2, 1/n), (1 + 1/n,), -b*x**n/a)/a**2
```

Mathematica [B] time = 0.0437842, size = 49, normalized size = 2.04

$$\frac{x\left((n-1)(a+bx^n)\,_2F_1\left(1,\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)+a\right)}{a^2n(a+bx^n)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^(-2),x]

[Out] (x*(a + (-1 + n)*(a + b*x^n)*Hypergeometric2F1[1, n^(-1), 1 + n^(
-1), -((b*x^n)/a)]))/(a^2*n*(a + b*x^n))
```

Maple [F] time = 0.063, size = 0, normalized size = 0.

$$\int (a+bx^n)^{-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*x^n)^2,x)

[Out] int(1/(a+b*x^n)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$(n-1)\int \frac{1}{abnx^n + a^2n}\,dx + \frac{x}{abnx^n + a^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(-2),x, algorithm="maxima")

[Out] (n - 1)*integrate(1/(a*b*n*x^n + a^2*n), x) + x/(a*b*n*x^n + a^2*
n)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{b^2x^{2n} + 2\,abx^n + a^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(-2),x, algorithm="fricas")

[Out] integral(1/(b^2*x^(2*n) + 2*a*b*x^n + a^2), x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*x**n)**2,x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^n + a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(-2),x, algorithm="giac")

[Out] integrate((b*x^n + a)^(-2), x)
```

3.2472 $\int \frac{1}{x(a+bx^n)^2}\,dx$

Optimal. Leaf size=39

$$-\frac{\log(a+bx^n)}{a^2n}+\frac{\log(x)}{a^2}+\frac{1}{an(a+bx^n)}$$

```
[Out] 1/(a*n*(a + b*x^n)) + Log[x]/a^2 - Log[a + b*x^n]/(a^2*n)
```

Rubi [A] time = 0.0651361, antiderivative size = 39, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{\log(a+bx^n)}{a^2n}+\frac{\log(x)}{a^2}+\frac{1}{an(a+bx^n)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a + b*x^n)^2),x]
```

```
[Out] 1/(a*n*(a + b*x^n)) + Log[x]/a^2 - Log[a + b*x^n]/(a^2*n)
```

Rubi in Sympy [A] time = 10.012, size = 34, normalized size = 0.87

$$\frac{1}{an(a+bx^n)}+\frac{\log(x^n)}{a^2n}-\frac{\log(a+bx^n)}{a^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(a+b*x**n)**2,x)
```

```
[Out] 1/(a*n*(a + b*x**n)) + log(x**n)/(a**2*n) - log(a + b*x**n)/(a**2
*n)
```

Mathematica [A] time = 0.0696459, size = 34, normalized size = 0.87

$$\frac{\frac{a}{an+bnx^n}-\frac{\log(a+bx^n)}{n}+\log(x)}{a^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a + b*x^n)^2),x]
```

```
[Out] (a/(a*n + b*n*x^n) + Log[x] - Log[a + b*x^n]/n)/a^2
```

Maple [A] time = 0.002, size = 45, normalized size = 1.2

$$\frac{\ln(x^n)}{na^2}-\frac{\ln(a+bx^n)}{na^2}+\frac{1}{an(a+bx^n)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(a+b*x^n)^2,x)
```

```
[Out] 1/n/a^2*ln(x^n)-ln(a+b*x^n)/a^2/n+1/a/n/(a+b*x^n)
```

Maxima [A] time = 1.43028, size = 58, normalized size = 1.49

$$\frac{1}{abnx^n + a^2n} - \frac{\log(bx^n + a)}{a^2n} + \frac{\log(x^n)}{a^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((b*x^n + a)^2*x),x, algorithm="maxima")
```

```
[Out] 1/(a*b*n*x^n + a^2*n) - log(b*x^n + a)/(a^2*n) + log(x^n)/(a^2*n)
```

Fricas [A] time = 0.228551, size = 68, normalized size = 1.74

$$\frac{bnx^n\log(x) + an\log(x) - (bx^n + a)\log(bx^n + a) + a}{a^2bnx^n + a^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((b*x^n + a)^2*x),x, algorithm="fricas")
```

```
[Out] (b*n*x^n*log(x) + a*n*log(x) - (b*x^n + a)*log(b*x^n + a) + a)/(a
^2*b*n*x^n + a^3*n)
```

Sympy [A] time = 3.54163, size = 160, normalized size = 4.1

$$\begin{cases} \tilde{\infty}\log(x) & \text{for}\: a = 0 \wedge b = 0 \wedge n = 0 \\ \frac{\log(x)}{a^2} & \text{for}\: b = 0 \\ -\frac{x^{-2n}}{2b^2n} & \text{for}\: a = 0 \\ \tilde{\infty}\log(x) & \text{for}\: b = -ax^{-n} \\ \frac{\log(x)}{(a+b)^2} & \text{for}\: n = 0 \\ \frac{an\log(x)}{a^3n+a^2bnx^n} - \frac{a\log\left(\frac{a}{b}+x^n\right)}{a^3n+a^2bnx^n} + \frac{a}{a^3n+a^2bnx^n} + \frac{bnx^n\log(x)}{a^3n+a^2bnx^n} - \frac{bx^n\log\left(\frac{a}{b}+x^n\right)}{a^3n+a^2bnx^n} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a+b*x**n)**2,x)
```

```
[Out] Piecewise((zoo*log(x), Eq(a, 0) & Eq(b, 0) & Eq(n, 0)), (log(x)/a
**2, Eq(b, 0)), (-x**(-2*n)/(2*b**2*n), Eq(a, 0)), (zoo*log(x), E
q(b, -a*x**(-n))), (log(x)/(a + b)**2, Eq(n, 0)), (a*n*log(x)/(a*
*3*n + a**2*b*n*x**n) - a*log(a/b + x**n)/(a**3*n + a**2*b*n*x**n
) + a/(a**3*n + a**2*b*n*x**n) + b*n*x**n*log(x)/(a**3*n + a**2*b
*n*x**n) - b*x**n*log(a/b + x**n)/(a**3*n + a**2*b*n*x**n), True)
)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^n + a)^2 x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((b*x^n + a)^2*x),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^n + a)^2*x), x)
```

3.2473 $\int \frac{1}{x^2(a+bx^n)^2} dx$

Optimal. Leaf size=34

$$-\frac{{}_2F_1\left(2,-\frac{1}{n};-\frac{1-n}{n};-\frac{bx^n}{a}\right)}{a^2x}$$

```
[Out] -(Hypergeometric2F1[2, -n^(-1), -((1 - n)/n), -((b*x^n)/a)]/(a^2*
x))
```

Rubi [A] time = 0.029889, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$-\frac{{}_2F_1\left(2,-\frac{1}{n};-\frac{1-n}{n};-\frac{bx^n}{a}\right)}{a^2x}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(a + b*x^n)^2),x]
```

```
[Out] -(Hypergeometric2F1[2, -n^(-1), -((1 - n)/n), -((b*x^n)/a)]/(a^2*
x))
```

Rubi in Sympy [A] time = 4.08492, size = 22, normalized size = 0.65

$$-\frac{{}_2F_1\left(\begin{matrix} 2, -\frac{1}{n} \\ \frac{n-1}{n} \end{matrix}\middle| -\frac{bx^n}{a}\right)}{a^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(a+b*x**n)**2,x)
```

```
[Out] -hyper((2, -1/n), ((n - 1)/n,), -b*x**n/a)/(a**2*x)
```

Mathematica [A] time = 0.0604563, size = 56, normalized size = 1.65

$$\frac{a-(n+1)(a+bx^n)\,{}_2F_1\left(1,-\frac{1}{n};\frac{n-1}{n};-\frac{bx^n}{a}\right)}{a^2nx(a+bx^n)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*(a + b*x^n)^2),x]
```

```
[Out] (a - (1 + n)*(a + b*x^n)*Hypergeometric2F1[1, -n^(-1), (-1 + n)/n
, -((b*x^n)/a)])/(a^2*n*x*(a + b*x^n))
```

Maple [F] time = 0.075, size = 0, normalized size = 0.

$$\int \frac{1}{x^2(a+bx^n)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(a+b*x^n)^2,x)
```

```
[Out] int(1/x^2/(a+b*x^n)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$(n+1)\int \frac{1}{abnx^2x^n + a^2nx^2}\,dx + \frac{1}{abnxx^n + a^2nx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^2*x^2),x, algorithm="maxima")
```

```
[Out] (n + 1)*integrate(1/(a*b*n*x^2*x^n + a^2*n*x^2), x) + 1/(a*b*n*x*
x^n + a^2*n*x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{b^2x^2x^{2\,n} + 2\,abx^2x^n + a^2x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^2*x^2),x, algorithm="fricas")
```

```
[Out] integral(1/(b^2*x^2*x^(2*n) + 2*a*b*x^2*x^n + a^2*x^2), x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(a+b*x**n)**2,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^n + a)^2x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^2*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^n + a)^2*x^2), x)
```

3.2474 $\int \frac{1}{x^3(a+bx^n)^2}\,dx$

Optimal. Leaf size=36

$$-\frac{{}_2F_1\left(2,-\frac{2}{n};-\frac{2-n}{n};-\frac{bx^n}{a}\right)}{2a^2x^2}$$

```
[Out] -Hypergeometric2F1[2, -2/n, -((2 - n)/n), -((b*x^n)/a)]/(2*a^2*x^
2)
```

Rubi [A] time = 0.030105, antiderivative size = 36, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{{}_2F_1\left(2,-\frac{2}{n};-\frac{2-n}{n};-\frac{bx^n}{a}\right)}{2a^2x^2}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^3*(a + b*x^n)^2),x]
```

```
[Out] -Hypergeometric2F1[2, -2/n, -((2 - n)/n), -((b*x^n)/a)]/(2*a^2*x^
2)
```

Rubi in Sympy [A] time = 3.78401, size = 26, normalized size = 0.72

$$-\frac{{}_2F_1\left(\begin{matrix} 2,-\frac{2}{n} \\ \frac{n-2}{n} \end{matrix}\middle| -\frac{bx^n}{a}\right)}{2a^2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**3/(a+b*x**n)**2,x)
```

```
[Out] -hyper((2, -2/n), ((n - 2)/n,), -b*x**n/a)/(2*a**2*x**2)
```

Mathematica [A] time = 0.0502815, size = 61, normalized size = 1.69

$$\frac{2a-(n+2)\left(a+bx^n\right)\,{}_2F_1\left(1,-\frac{2}{n};\frac{n-2}{n};-\frac{bx^n}{a}\right)}{2a^2nx^2\left(a+bx^n\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^3*(a + b*x^n)^2),x]
```

```
[Out] (2*a - (2 + n)*(a + b*x^n)*Hypergeometric2F1[1, -2/n, (-2 + n)/n,
 -((b*x^n)/a)])/(2*a^2*n*x^2*(a + b*x^n))
```

Maple [F] time = 0.084, size = 0, normalized size = 0.

$$\int \frac{1}{x^3\left(a+bx^n\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(a+b*x^n)^2,x)

[Out] int(1/x^3/(a+b*x^n)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$(n+2)\int \frac{1}{abnx^3x^n + a^2nx^3}\,dx + \frac{1}{abnx^2x^n + a^2nx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^2*x^3),x, algorithm="maxima")

[Out] (n + 2)*integrate(1/(a*b*n*x^3*x^n + a^2*n*x^3), x) + 1/(a*b*n*x^
2*x^n + a^2*n*x^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{b^2x^3x^{2\,n} + 2\,abx^3x^n + a^2x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^2*x^3),x, algorithm="fricas")

[Out] integral(1/(b^2*x^3*x^(2*n) + 2*a*b*x^3*x^n + a^2*x^3), x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(a+b*x**n)**2,x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^n + a)^2x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^2*x^3),x, algorithm="giac")

[Out] integrate(1/((b*x^n + a)^2*x^3), x)
```

3.2475 $\int \frac{x}{(a+bx^n)^3}\,dx$

Optimal. Leaf size=33

$$\frac{x^2\,{}_2F_1\left(3,\frac{2}{n};\frac{n+2}{n};-\frac{bx^n}{a}\right)}{2a^3}$$

```
[Out] (x^2*Hypergeometric2F1[3, 2/n, (2 + n)/n, -((b*x^n)/a)])/(2*a^3)
```

Rubi [A] time = 0.0267032, antiderivative size = 33, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{x^2\,{}_2F_1\left(3,\frac{2}{n};\frac{n+2}{n};-\frac{bx^n}{a}\right)}{2a^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b*x^n)^3,x]
```

```
[Out] (x^2*Hypergeometric2F1[3, 2/n, (2 + n)/n, -((b*x^n)/a)])/(2*a^3)
```

Rubi in Sympy [A] time = 3.43929, size = 22, normalized size = 0.67

$$\frac{x^2\,{}_2F_1\left(\begin{matrix}3,\frac{2}{n}\\ \frac{n+2}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{2a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b*x**n)**3,x)
```

```
[Out] x**2*hyper((3, 2/n), ((n + 2)/n,), -b*x**n/a)/(2*a**3)
```

Mathematica [B] time = 0.0981823, size = 74, normalized size = 2.24

$$\frac{x^2\left(\left(n^2-3n+2\right)\,{}_2F_1\left(1,\frac{2}{n};\frac{n+2}{n};-\frac{bx^n}{a}\right)+\frac{a(a(3n-2)+2b(n-1)x^n)}{(a+bx^n)^2}\right)}{2a^3n^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b*x^n)^3,x]
```

```
[Out] (x^2*((a*(a*(-2 + 3*n) + 2*b*(-1 + n)*x^n))/(a + b*x^n)^2 + (2 -
3*n + n^2)*Hypergeometric2F1[1, 2/n, (2 + n)/n, -((b*x^n)/a)]))/(
2*a^3*n^2)
```

Maple [F] time = 0.084, size = 0, normalized size = 0.

$$\int \frac{x}{(a+bx^n)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+b*x^n)^3,x)
```

```
[Out] int(x/(a+b*x^n)^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$(n^2-3n+2)\int \frac{x}{a^2bn^2x^n+a^3n^2}\,dx+\frac{2\,b(n-1)x^2x^n+a(3\,n-2)x^2}{2\,(a^2b^2n^2x^{2\,n}+2\,a^3bn^2x^n+a^4n^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^n + a)^3,x, algorithm="maxima")
```

```
[Out] (n^2 - 3*n + 2)*integrate(x/(a^2*b*n^2*x^n + a^3*n^2), x) + 1/2*(
2*b*(n - 1)*x^2*x^n + a*(3*n - 2)*x^2)/(a^2*b^2*n^2*x^(2*n) + 2*a
^3*b*n^2*x^n + a^4*n^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x}{b^3x^{3\,n}+3\,ab^2x^{2\,n}+3\,a^2bx^n+a^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^n + a)^3,x, algorithm="fricas")
```

```
[Out] integral(x/(b^3*x^(3*n) + 3*a*b^2*x^(2*n) + 3*a^2*b*x^n + a^3), x
)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b*x**n)**3,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{(bx^n+a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^n + a)^3,x, algorithm="giac")
```

```
[Out] integrate(x/(b*x^n + a)^3, x)
```

3.2476 $\int \frac{1}{(a+bx^n)^3} dx$

Optimal. Leaf size=24

$$\frac{x\,{}_2F_1\left(3,\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)}{a^3}$$

```
[Out] (x*Hypergeometric2F1[3, n^(-1), 1 + n^(-1), -((b*x^n)/a)])/a^3
```

Rubi [A] time = 0.0185046, antiderivative size = 24, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111

$$\frac{x\,{}_2F_1\left(3,\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)}{a^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^(-3),x]
```

```
[Out] (x*Hypergeometric2F1[3, n^(-1), 1 + n^(-1), -((b*x^n)/a)])/a^3
```

Rubi in Sympy [A] time = 1.7985, size = 19, normalized size = 0.79

$$\frac{x{}_2F_1\left(\begin{matrix} 3, \frac{1}{n} \\ 1+\frac{1}{n} \end{matrix}\middle| -\frac{bx^n}{a}\right)}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*x**n)**3,x)
```

```
[Out] x*hyper((3, 1/n), (1 + 1/n,), -b*x**n/a)/a**3
```

Mathematica [B] time = 0.085951, size = 71, normalized size = 2.96

$$\frac{x\left(\left(2n^2-3n+1\right)\,{}_2F_1\left(1,\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)+\frac{a(a(3n-1)+b(2n-1)x^n)}{(a+bx^n)^2}\right)}{2a^3n^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^(-3),x]
```

```
[Out] (x*((a*(a*(-1 + 3*n) + b*(-1 + 2*n)*x^n))/(a + b*x^n)^2 + (1 - 3*
n + 2*n^2)*Hypergeometric2F1[1, n^(-1), 1 + n^(-1), -((b*x^n)/a)]
))/(2*a^3*n^2)
```

Maple [F] time = 0.073, size = 0, normalized size = 0.

$$\int (a+bx^n)^{-3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*x^n)^3,x)
```

```
[Out] int(1/(a+b*x^n)^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\left(2 n^{2}-3 n+1\right) \int \frac{1}{2 \left(a^{2} b n^{2} x^{n}+a^{3} n^{2}\right)}\, dx+\frac{b (2 n-1) x x^{n}+a (3 n-1) x}{2 \left(a^{2} b^{2} n^{2} x^{2 n}+2 a^{3} b n^{2} x^{n}+a^{4} n^{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(-3),x, algorithm="maxima")
```

```
[Out] (2*n^2 - 3*n + 1)*integrate(1/2/(a^2*b*n^2*x^n + a^3*n^2), x) + 1
/2*(b*(2*n - 1)*x*x^n + a*(3*n - 1)*x)/(a^2*b^2*n^2*x^(2*n) + 2*a
^3*b*n^2*x^n + a^4*n^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{b^{3} x^{3 n}+3 a b^{2} x^{2 n}+3 a^{2} b x^{n}+a^{3}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(-3),x, algorithm="fricas")
```

```
[Out] integral(1/(b^3*x^(3*n) + 3*a*b^2*x^(2*n) + 3*a^2*b*x^n + a^3), x
)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*x**n)**3,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(b x^{n}+a)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(-3),x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^(-3), x)
```

3.2477 $\int \frac{1}{x(a+bx^n)^3} dx$

Optimal. Leaf size=58

$$-\frac{\log(a+bx^n)}{a^3n}+\frac{\log(x)}{a^3}+\frac{1}{a^2n(a+bx^n)}+\frac{1}{2an(a+bx^n)^2}$$

```
[Out] 1/(2*a*n*(a + b*x^n)^2) + 1/(a^2*n*(a + b*x^n)) + Log[x]/a^3 - Lo
g[a + b*x^n]/(a^3*n)
```

Rubi [A] time = 0.0841658, antiderivative size = 58, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{\log(a+bx^n)}{a^3n}+\frac{\log(x)}{a^3}+\frac{1}{a^2n(a+bx^n)}+\frac{1}{2an(a+bx^n)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a + b*x^n)^3),x]
```

```
[Out] 1/(2*a*n*(a + b*x^n)^2) + 1/(a^2*n*(a + b*x^n)) + Log[x]/a^3 - Lo
g[a + b*x^n]/(a^3*n)
```

Rubi in Sympy [A] time = 12.9604, size = 51, normalized size = 0.88

$$\frac{1}{2an(a+bx^n)^2}+\frac{1}{a^2n(a+bx^n)}+\frac{\log(x^n)}{a^3n}-\frac{\log(a+bx^n)}{a^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(a+b*x**n)**3,x)
```

```
[Out] 1/(2*a*n*(a + b*x**n)**2) + 1/(a**2*n*(a + b*x**n)) + log(x**n)/(
a**3*n) - log(a + b*x**n)/(a**3*n)
```

Mathematica [A] time = 0.171271, size = 48, normalized size = 0.83

$$\frac{\frac{\frac{a(3a+2bx^n)}{(a+bx^n)^2}-2\log(a+bx^n)}{n}+2\log(x)}{2a^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a + b*x^n)^3),x]
```

```
[Out] (2*Log[x] + ((a*(3*a + 2*b*x^n))/(a + b*x^n)^2 - 2*Log[a + b*x^n]
)/n)/(2*a^3)
```

Maple [A] time = 0.004, size = 62, normalized size = 1.1

$$\frac{\ln(x^n)}{na^3}-\frac{\ln(a+bx^n)}{na^3}+\frac{1}{a^2n(a+bx^n)}+\frac{1}{2an(a+bx^n)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(a+b*x^n)^3,x)
```

```
[Out] 1/n/a^3*ln(x^n)-ln(a+b*x^n)/a^3/n+1/a^2/n/(a+b*x^n)+1/2/a/n/(a+b*
x^n)^2
```

Maxima [A] time = 1.44153, size = 96, normalized size = 1.66

$$\frac{2\,bx^n + 3\,a}{2\,(a^2b^2nx^{2\,n} + 2\,a^3bnx^n + a^4n)} - \frac{\log\left(bx^n + a\right)}{a^3n} + \frac{\log\left(x^n\right)}{a^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^3*x),x, algorithm="maxima")
```

```
[Out] 1/2*(2*b*x^n + 3*a)/(a^2*b^2*n*x^(2*n) + 2*a^3*b*n*x^n + a^4*n) -
 log(b*x^n + a)/(a^3*n) + log(x^n)/(a^3*n)
```

Fricas [A] time = 0.227049, size = 143, normalized size = 2.47

$$\frac{2\,b^2nx^{2\,n}\log\left(x\right) + 2\,a^2n\log\left(x\right) + 3\,a^2 + 2\,(2\,abn\log\left(x\right) + ab)x^n - 2\,\left(b^2x^{2\,n} + 2\,abx^n + a^2\right)\log\left(bx^n + a\right)}{2\,(a^3b^2nx^{2\,n} + 2\,a^4bnx^n + a^5n)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^3*x),x, algorithm="fricas")
```

```
[Out] 1/2*(2*b^2*n*x^(2*n)*log(x) + 2*a^2*n*log(x) + 3*a^2 + 2*(2*a*b*n
*log(x) + a*b)*x^n - 2*(b^2*x^(2*n) + 2*a*b*x^n + a^2)*log(b*x^n
+ a))/(a^3*b^2*n*x^(2*n) + 2*a^4*b*n*x^n + a^5*n)
```

Sympy [A] time = 5.56056, size = 406, normalized size = 7.

$$\begin{cases} \tilde{\infty}\log\left(x\right) \\ \frac{\log\left(x\right)}{a^3} \\ -\frac{x^{-3n}}{3b^3n} \\ \frac{\log\left(x\right)}{(a+b)^3} \\ \frac{2a^2n\log\left(x\right)}{2a^5n+4a^4bnx^n+2a^3b^2nx^{2n}} - \frac{2a^2\log\left(\frac{a}{b}+x^n\right)}{2a^5n+4a^4bnx^n+2a^3b^2nx^{2n}} + \frac{3a^2}{2a^5n+4a^4bnx^n+2a^3b^2nx^{2n}} + \frac{4abnx^n\log\left(x\right)}{2a^5n+4a^4bnx^n+2a^3b^2nx^{2n}} - \frac{4abx^n\log\left(\frac{a}{b}+x^n\right)}{2a^5n+4a^4bnx^n+2a^3b^2nx^{2n}} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(a+b*x**n)**3,x)
```

```
[Out] Piecewise((zoo*log(x), Eq(a, 0) & Eq(b, 0) & Eq(n, 0)), (log(x)/a
**3, Eq(b, 0)), (-x**(-3*n)/(3*b**3*n), Eq(a, 0)), (log(x)/(a + b
)**3, Eq(n, 0)), (2*a**2*n*log(x)/(2*a**5*n + 4*a**4*b*n*x**n + 2
*a**3*b**2*n*x**(2*n)) - 2*a**2*log(a/b + x**n)/(2*a**5*n + 4*a**
4*b*n*x**n + 2*a**3*b**2*n*x**(2*n)) + 3*a**2/(2*a**5*n + 4*a**4*
b*n*x**n + 2*a**3*b**2*n*x**(2*n)) + 4*a*b*n*x**n*log(x)/(2*a**5*
n + 4*a**4*b*n*x**n + 2*a**3*b**2*n*x**(2*n)) - 4*a*b*x**n*log(a/
b + x**n)/(2*a**5*n + 4*a**4*b*n*x**n + 2*a**3*b**2*n*x**(2*n)) +
 2*a*b*x**n/(2*a**5*n + 4*a**4*b*n*x**n + 2*a**3*b**2*n*x**(2*n))
 + 2*b**2*n*x**(2*n)*log(x)/(2*a**5*n + 4*a**4*b*n*x**n + 2*a**3*
b**2*n*x**(2*n)) - 2*b**2*x**(2*n)*log(a/b + x**n)/(2*a**5*n + 4*
a**4*b*n*x**n + 2*a**3*b**2*n*x**(2*n)), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^n + a)^3 x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^3*x),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^n + a)^3*x), x)
```

3.2478 $\int \frac{1}{x^2(a+bx^n)^3}\,dx$

Optimal. Leaf size=34

$$-\frac{{}_2F_1\left(3,-\frac{1}{n};-\frac{1-n}{n};-\frac{bx^n}{a}\right)}{a^3x}$$

```
[Out] -(Hypergeometric2F1[3, -n^(-1), -((1 - n)/n), -((b*x^n)/a)]/(a^3*
x))
```

Rubi [A] time = 0.029681, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{{}_2F_1\left(3,-\frac{1}{n};-\frac{1-n}{n};-\frac{bx^n}{a}\right)}{a^3x}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^2*(a + b*x^n)^3),x]

[Out] -(Hypergeometric2F1[3, -n^(-1), -((1 - n)/n), -((b*x^n)/a)]/(a^3*
x))
```

Rubi in Sympy [A] time = 3.66769, size = 22, normalized size = 0.65

$$-\frac{{}_2F_1\left(\begin{matrix}3,-\frac{1}{n}\\ \frac{n-1}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{a^3x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**2/(a+b*x**n)**3,x)

[Out] -hyper((3, -1/n), ((n - 1)/n,), -b*x**n/a)/(a**3*x)
```

Mathematica [B] time = 0.0996309, size = 76, normalized size = 2.24

$$\frac{\frac{a(3an+a+b(2n+1)x^n)}{(a+bx^n)^2}-\left(2n^2+3n+1\right)\,{}_2F_1\left(1,-\frac{1}{n};\frac{n-1}{n};-\frac{bx^n}{a}\right)}{2a^3n^2x}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(x^2*(a + b*x^n)^3),x]

[Out] ((a*(a + 3*a*n + b*(1 + 2*n)*x^n))/(a + b*x^n)^2 - (1 + 3*n + 2*n
^2)*Hypergeometric2F1[1, -n^(-1), (-1 + n)/n, -((b*x^n)/a)])/(2*a
^3*n^2*x)
```

Maple [F] time = 0.094, size = 0, normalized size = 0.

$$\int \frac{1}{x^2\left(a+bx^n\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(a+b*x^n)^3,x)
```

```
[Out] int(1/x^2/(a+b*x^n)^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\left(2n^2+3n+1\right)\int \frac{1}{2\left(a^2bn^2x^2x^n+a^3n^2x^2\right)}\,dx+\frac{b(2n+1)x^n+a(3n+1)}{2\left(a^2b^2n^2xx^{2n}+2a^3bn^2xx^n+a^4n^2x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^3*x^2),x, algorithm="maxima")
```

```
[Out] (2*n^2 + 3*n + 1)*integrate(1/2/(a^2*b*n^2*x^2*x^n + a^3*n^2*x^2)
, x) + 1/2*(b*(2*n + 1)*x^n + a*(3*n + 1))/(a^2*b^2*n^2*x*x^(2*n)
 + 2*a^3*b*n^2*x*x^n + a^4*n^2*x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{b^3x^2x^{3n}+3ab^2x^2x^{2n}+3a^2bx^2x^n+a^3x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^3*x^2),x, algorithm="fricas")
```

```
[Out] integral(1/(b^3*x^2*x^(3*n) + 3*a*b^2*x^2*x^(2*n) + 3*a^2*b*x^2*x
^n + a^3*x^2), x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(a+b*x**n)**3,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^n+a)^3x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^3*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^n + a)^3*x^2), x)
```

3.2479 $\int \frac{1}{x^3(a+bx^n)^3}\,dx$

Optimal. Leaf size=36

$$-\frac{{}_2F_1\left(3,-\frac{2}{n};-\frac{2-n}{n};-\frac{bx^n}{a}\right)}{2a^3x^2}$$

```
[Out] -Hypergeometric2F1[3, -2/n, -((2 - n)/n), -((b*x^n)/a)]/(2*a^3*x^
2)
```

Rubi [A] time = 0.0299955, antiderivative size = 36, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{{}_2F_1\left(3,-\frac{2}{n};-\frac{2-n}{n};-\frac{bx^n}{a}\right)}{2a^3x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(a + b*x^n)^3),x]
```

```
[Out] -Hypergeometric2F1[3, -2/n, -((2 - n)/n), -((b*x^n)/a)]/(2*a^3*x^
2)
```

Rubi in Sympy [A] time = 3.78734, size = 26, normalized size = 0.72

$$-\frac{{}_2F_1\left(\begin{matrix} 3, -\frac{2}{n} \\ \frac{n-2}{n} \end{matrix}\middle| -\frac{bx^n}{a}\right)}{2a^3x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(a+b*x**n)**3,x)
```

```
[Out] -hyper((3, -2/n), ((n - 2)/n,), -b*x**n/a)/(2*a**3*x**2)
```

Mathematica [B] time = 0.101694, size = 75, normalized size = 2.08

$$\frac{\frac{a(a(3n+2)+2b(n+1)x^n)}{(a+bx^n)^2}-\left(n^2+3n+2\right)\,{}_2F_1\left(1,-\frac{2}{n};\frac{n-2}{n};-\frac{bx^n}{a}\right)}{2a^3n^2x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*(a + b*x^n)^3),x]
```

```
[Out] ((a*(a*(2 + 3*n) + 2*b*(1 + n)*x^n))/(a + b*x^n)^2 - (2 + 3*n + n
^2)*Hypergeometric2F1[1, -2/n, (-2 + n)/n, -((b*x^n)/a)])/(2*a^3*
n^2*x^2)
```

Maple [F] time = 0.065, size = 0, normalized size = 0.

$$\int \frac{1}{x^3\left(a+bx^n\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(a+b*x^n)^3,x)
```

```
[Out] int(1/x^3/(a+b*x^n)^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\left(n^{2}+3\,n+2\right)\int\frac{1}{a^{2}bn^{2}x^{3}x^{n}+a^{3}n^{2}x^{3}}\,dx+\frac{2\,b(n+1)x^{n}+a(3\,n+2)}{2\left(a^{2}b^{2}n^{2}x^{2}x^{2\,n}+2\,a^{3}bn^{2}x^{2}x^{n}+a^{4}n^{2}x^{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^3*x^3),x, algorithm="maxima")
```

```
[Out] (n^2 + 3*n + 2)*integrate(1/(a^2*b*n^2*x^3*x^n + a^3*n^2*x^3), x)
 + 1/2*(2*b*(n + 1)*x^n + a*(3*n + 2))/(a^2*b^2*n^2*x^2*x^(2*n) +
 2*a^3*b*n^2*x^2*x^n + a^4*n^2*x^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{b^{3}x^{3}x^{3\,n}+3\,ab^{2}x^{3}x^{2\,n}+3\,a^{2}bx^{3}x^{n}+a^{3}x^{3}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^3*x^3),x, algorithm="fricas")
```

```
[Out] integral(1/(b^3*x^3*x^(3*n) + 3*a*b^2*x^3*x^(2*n) + 3*a^2*b*x^3*x
^n + a^3*x^3), x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(a+b*x**n)**3,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\left(bx^{n}+a\right)^{3}x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^3*x^3),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^n + a)^3*x^3), x)
```

3.2480 $\int x\sqrt{a+bx^n}\,dx$

Optimal. Leaf size=48

$$\frac{x^2(a+bx^n)^{3/2}\,{}_2F_1\left(1,\frac{3}{2}+\frac{2}{n};\frac{n+2}{n};-\frac{bx^n}{a}\right)}{2a}$$

```
[Out] (x^2*(a + b*x^n)^(3/2)*Hypergeometric2F1[1, 3/2 + 2/n, (2 + n)/n,
 -((b*x^n)/a)])/(2*a)
```

Rubi [A] time = 0.0547318, antiderivative size = 57, normalized size of antiderivative = 1.19, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{x^2\sqrt{a+bx^n}\,{}_2F_1\left(-\frac{1}{2},\frac{2}{n};\frac{n+2}{n};-\frac{bx^n}{a}\right)}{2\sqrt{\frac{bx^n}{a}+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x*Sqrt[a + b*x^n],x]
```

```
[Out] (x^2*Sqrt[a + b*x^n]*Hypergeometric2F1[-1/2, 2/n, (2 + n)/n, -((b
*x^n)/a)])/(2*Sqrt[1 + (b*x^n)/a])
```

Rubi in Sympy [A] time = 6.22069, size = 44, normalized size = 0.92

$$\frac{x^2\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}-\frac{1}{2},\frac{2}{n}\\ \frac{n+2}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{2\sqrt{1+\frac{bx^n}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(a+b*x**n)**(1/2),x)
```

```
[Out] x**2*sqrt(a + b*x**n)*hyper((-1/2, 2/n), ((n + 2)/n,), -b*x**n/a)
/(2*sqrt(1 + b*x**n/a))
```

Mathematica [A] time = 0.0886558, size = 75, normalized size = 1.56

$$\frac{x^2\left(an\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{2}{n};\frac{n+2}{n};-\frac{bx^n}{a}\right)+4(a+bx^n)\right)}{2(n+4)\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x*Sqrt[a + b*x^n],x]
```

```
[Out] (x^2*(4*(a + b*x^n) + a*n*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1
/2, 2/n, (2 + n)/n, -((b*x^n)/a)]))/(2*(4 + n)*Sqrt[a + b*x^n])
```

Maple [F] time = 0.072, size = 0, normalized size = 0.

$$\int x\sqrt{a+bx^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(a+b*x^n)^(1/2),x)
```

```
[Out] int(x*(a+b*x^n)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{bx^n + a}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)*x,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*x^n + a)*x, x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)*x,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(a+b*x**n)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{bx^n + a}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)*x,x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*x^n + a)*x, x)
```

3.2481 $\int \sqrt{a+bx^n}\,dx$

Optimal. Leaf size=39

$$\frac{x(a+bx^n)^{3/2}\,{}_2F_1\left(1,\frac{3}{2}+\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)}{a}$$

```
[Out] (x*(a + b*x^n)^(3/2)*Hypergeometric2F1[1, 3/2 + n^(-1), 1 + n^(-1
), -((b*x^n)/a)])/a
```

Rubi [A] time = 0.0406641, antiderivative size = 48, normalized size of antiderivative = 1.23, number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{x\sqrt{a+bx^n}\,{}_2F_1\left(-\frac{1}{2},\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)}{\sqrt{\frac{bx^n}{a}+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*x^n],x]
```

```
[Out] (x*Sqrt[a + b*x^n]*Hypergeometric2F1[-1/2, n^(-1), 1 + n^(-1), -(
(b*x^n)/a)])/Sqrt[1 + (b*x^n)/a]
```

Rubi in Sympy [A] time = 3.44159, size = 41, normalized size = 1.05

$$\frac{x\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}-\frac{1}{2},\frac{1}{n}\\1+\frac{1}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{\sqrt{1+\frac{bx^n}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**n)**(1/2),x)
```

```
[Out] x*sqrt(a + b*x**n)*hyper((-1/2, 1/n), (1 + 1/n,), -b*x**n/a)/sqrt
(1 + b*x**n/a)
```

Mathematica [A] time = 0.0595879, size = 66, normalized size = 1.69

$$\frac{x\left(an\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)+2(a+bx^n)\right)}{(n+2)\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b*x^n],x]
```

```
[Out] (x*(2*(a + b*x^n) + a*n*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1/2
, n^(-1), 1 + n^(-1), -((b*x^n)/a)]))/((2 + n)*Sqrt[a + b*x^n])
```

Maple [F] time = 0.06, size = 0, normalized size = 0.

$$\int \sqrt{a+bx^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^(1/2),x)
```

```
[Out] int((a+b*x^n)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{bx^n + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*x^n + a), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{bx^n + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*x^n + a), x)
```

3.2482 $\int \frac{\sqrt{a+bx^n}}{x}\,dx$

Optimal. Leaf size=45

$$\frac{2\sqrt{a+bx^n}}{n}-\frac{2\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{n}$$

```
[Out] (2*Sqrt[a + b*x^n])/n - (2*Sqrt[a]*ArcTanh[Sqrt[a + b*x^n]/Sqrt[a
]])/n
```

Rubi [A] time = 0.0799839, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{2\sqrt{a+bx^n}}{n}-\frac{2\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{n}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*x^n]/x,x]
```

```
[Out] (2*Sqrt[a + b*x^n])/n - (2*Sqrt[a]*ArcTanh[Sqrt[a + b*x^n]/Sqrt[a
]])/n
```

Rubi in Sympy [A] time = 7.61599, size = 37, normalized size = 0.82

$$-\frac{2\sqrt{a}\operatorname{atanh}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{n}+\frac{2\sqrt{a+bx^n}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**n)**(1/2)/x,x)
```

```
[Out] -2*sqrt(a)*atanh(sqrt(a + b*x**n)/sqrt(a))/n + 2*sqrt(a + b*x**n)
/n
```

Mathematica [A] time = 0.0331685, size = 42, normalized size = 0.93

$$\frac{2\left(\sqrt{a+bx^n}-\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)\right)}{n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b*x^n]/x,x]
```

```
[Out] (2*(Sqrt[a + b*x^n] - Sqrt[a]*ArcTanh[Sqrt[a + b*x^n]/Sqrt[a]]))/
n
```

Maple [A] time = 0.002, size = 36, normalized size = 0.8

$$\frac{1}{n}\left(2\sqrt{a+bx^n}-2\sqrt{a}Artanh\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^(1/2)/x,x)
```

```
[Out] 1/n*(2*(a+b*x^n)^(1/2)-2*a^(1/2)*arctanh((a+b*x^n)^(1/2)/a^(1/2)))
)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.229079, size = 1, normalized size = 0.02

$$\left[\frac{\sqrt{a}\log\left(\frac{bx^n-2\sqrt{bx^n+a}\sqrt{a}+2a}{x^n}\right)+2\sqrt{bx^n+a}}{n}, -\frac{2\left(\sqrt{-a}\arctan\left(\frac{\sqrt{bx^n+a}}{\sqrt{-a}}\right)-\sqrt{bx^n+a}\right)}{n}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)/x,x, algorithm="fricas")
```

```
[Out] [(sqrt(a)*log((b*x^n - 2*sqrt(b*x^n + a)*sqrt(a) + 2*a)/x^n) + 2*
sqrt(b*x^n + a))/n, -2*(sqrt(-a)*arctan(sqrt(b*x^n + a)/sqrt(-a))
 - sqrt(b*x^n + a))/n]
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**(1/2)/x,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{bx^n+a}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)/x,x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*x^n + a)/x, x)
```

3.2483 $\int \frac{\sqrt{a+bx^n}}{x^2} \, dx$

Optimal. Leaf size=49

$$-\frac{(a+bx^n)^{3/2} \, _2F_1\left(1,\frac{3}{2}-\frac{1}{n};-\frac{1-n}{n};-\frac{bx^n}{a}\right)}{ax}$$

```
[Out] -(((a + b*x^n)^(3/2)*Hypergeometric2F1[1, 3/2 - n^(-1), -((1 - n)
/n), -((b*x^n)/a)])/(a*x))
```

Rubi [A] time = 0.0673001, antiderivative size = 58, normalized size of antiderivative = 1.18, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$-\frac{\sqrt{a+bx^n} \, _2F_1\left(-\frac{1}{2},-\frac{1}{n};-\frac{1-n}{n};-\frac{bx^n}{a}\right)}{x\sqrt{\frac{bx^n}{a}+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*x^n]/x^2,x]
```

```
[Out] -((Sqrt[a + b*x^n]*Hypergeometric2F1[-1/2, -n^(-1), -((1 - n)/n),
 -((b*x^n)/a)])/(x*Sqrt[1 + (b*x^n)/a]))
```

Rubi in Sympy [A] time = 6.71517, size = 44, normalized size = 0.9

$$-\frac{\sqrt{a+bx^n} \, {}_2F_1\left(\begin{matrix} -\frac{1}{2},-\frac{1}{n} \\ \frac{n-1}{n} \end{matrix}\middle| -\frac{bx^n}{a}\right)}{x\sqrt{1+\frac{bx^n}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**n)**(1/2)/x**2,x)
```

```
[Out] -sqrt(a + b*x**n)*hyper((-1/2, -1/n), ((n - 1)/n,), -b*x**n/a)/(x
*sqrt(1 + b*x**n/a))
```

Mathematica [A] time = 0.0712452, size = 73, normalized size = 1.49

$$\frac{2(a+bx^n)-an\sqrt{\frac{bx^n}{a}+1} \, _2F_1\left(\frac{1}{2},-\frac{1}{n};\frac{n-1}{n};-\frac{bx^n}{a}\right)}{(n-2)x\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b*x^n]/x^2,x]
```

```
[Out] (2*(a + b*x^n) - a*n*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1/2, -
n^(-1), (-1 + n)/n, -((b*x^n)/a)])/((-2 + n)*x*Sqrt[a + b*x^n])
```

Maple [F] time = 0.067, size = 0, normalized size = 0.

$$\int \frac{1}{x^2}\sqrt{a+bx^n} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^(1/2)/x^2,x)

[Out] int((a+b*x^n)^(1/2)/x^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{bx^n + a}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)/x^2,x, algorithm="maxima")

[Out] integrate(sqrt(b*x^n + a)/x^2, x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)/x^2,x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**(1/2)/x**2,x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{bx^n + a}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)/x^2,x, algorithm="giac")

[Out] integrate(sqrt(b*x^n + a)/x^2, x)
```

3.2484 $\int \frac{\sqrt{a+bx^n}}{x^3} dx$

Optimal. Leaf size=51

$$-\frac{(a+bx^n)^{3/2} \, _2F_1\left(1,\frac{3}{2}-\frac{2}{n};-\frac{2-n}{n};-\frac{bx^n}{a}\right)}{2ax^2}$$

```
[Out] -((a + b*x^n)^(3/2)*Hypergeometric2F1[1, 3/2 - 2/n, -((2 - n)/n),
 -((b*x^n)/a)])/(2*a*x^2)
```

Rubi [A] time = 0.0643137, antiderivative size = 60, normalized size of antiderivative = 1.18, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{\sqrt{a+bx^n} \, _2F_1\left(-\frac{1}{2},-\frac{2}{n};-\frac{2-n}{n};-\frac{bx^n}{a}\right)}{2x^2\sqrt{\frac{bx^n}{a}+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*x^n]/x^3,x]
```

```
[Out] -(Sqrt[a + b*x^n]*Hypergeometric2F1[-1/2, -2/n, -((2 - n)/n), -((
b*x^n)/a)])/(2*x^2*Sqrt[1 + (b*x^n)/a])
```

Rubi in Sympy [A] time = 6.86546, size = 48, normalized size = 0.94

$$-\frac{\sqrt{a+bx^n} \, {}_2F_1\left(\begin{matrix} -\frac{1}{2},-\frac{2}{n} \\ \frac{n-2}{n} \end{matrix}\middle| -\frac{bx^n}{a}\right)}{2x^2\sqrt{1+\frac{bx^n}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**n)**(1/2)/x**3,x)
```

```
[Out] -sqrt(a + b*x**n)*hyper((-1/2, -2/n), ((n - 2)/n,), -b*x**n/a)/(2
*x**2*sqrt(1 + b*x**n/a))
```

Mathematica [A] time = 0.0689557, size = 76, normalized size = 1.49

$$\frac{4(a+bx^n)-an\sqrt{\frac{bx^n}{a}+1} \, _2F_1\left(\frac{1}{2},-\frac{2}{n};\frac{n-2}{n};-\frac{bx^n}{a}\right)}{2(n-4)x^2\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b*x^n]/x^3,x]
```

```
[Out] (4*(a + b*x^n) - a*n*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1/2, -
2/n, (-2 + n)/n, -((b*x^n)/a)])/(2*(-4 + n)*x^2*Sqrt[a + b*x^n])
```

Maple [F] time = 0.069, size = 0, normalized size = 0.

$$\int \frac{1}{x^3}\sqrt{a+bx^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^(1/2)/x^3,x)
```

```
[Out] int((a+b*x^n)^(1/2)/x^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{bx^n + a}}{x^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)/x^3,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*x^n + a)/x^3, x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)/x^3,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**(1/2)/x**3,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{bx^n + a}}{x^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)/x^3,x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*x^n + a)/x^3, x)
```

3.2485 $\int x\,(a+bx^n)^{3/2}\,dx$

Optimal. Leaf size=48

$$\frac{x^2\,(a+bx^n)^{5/2}\,{}_2F_1\left(1,\frac{5}{2}+\frac{2}{n};\frac{n+2}{n};-\frac{bx^n}{a}\right)}{2a}$$

```
[Out] (x^2*(a + b*x^n)^(5/2)*Hypergeometric2F1[1, 5/2 + 2/n, (2 + n)/n,
 -((b*x^n)/a)])/(2*a)
```

Rubi [A] time = 0.0563045, antiderivative size = 58, normalized size of antiderivative = 1.21, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{ax^2\sqrt{a+bx^n}\,{}_2F_1\left(-\frac{3}{2},\frac{2}{n};\frac{n+2}{n};-\frac{bx^n}{a}\right)}{2\sqrt{\frac{bx^n}{a}+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x*(a + b*x^n)^(3/2),x]
```

```
[Out] (a*x^2*Sqrt[a + b*x^n]*Hypergeometric2F1[-3/2, 2/n, (2 + n)/n, -(
(b*x^n)/a)])/(2*Sqrt[1 + (b*x^n)/a])
```

Rubi in Sympy [A] time = 6.25513, size = 46, normalized size = 0.96

$$\frac{ax^2\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}-\frac{3}{2},\frac{2}{n}\\ \frac{n+2}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{2\sqrt{1+\frac{bx^n}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(a+b*x**n)**(3/2),x)
```

```
[Out] a*x**2*sqrt(a + b*x**n)*hyper((-3/2, 2/n), ((n + 2)/n,), -b*x**n/
a)/(2*sqrt(1 + b*x**n/a))
```

Mathematica [B] time = 0.147185, size = 102, normalized size = 2.12

$$\frac{x^2\left(3a^2n^2\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{2}{n};\frac{n+2}{n};-\frac{bx^n}{a}\right)+4\,(a+bx^n)\,(4a(n+1)+b(n+4)x^n)\right)}{2(n+4)(3n+4)\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x*(a + b*x^n)^(3/2),x]
```

```
[Out] (x^2*(4*(a + b*x^n)*(4*a*(1 + n) + b*(4 + n)*x^n) + 3*a^2*n^2*Sqr
t[1 + (b*x^n)/a]*Hypergeometric2F1[1/2, 2/n, (2 + n)/n, -((b*x^n)
/a)]))/(2*(4 + n)*(4 + 3*n)*Sqrt[a + b*x^n])
```

Maple [F] time = 0.052, size = 0, normalized size = 0.

$$\int x\,(a+bx^n)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(a+b*x^n)^(3/2),x)

[Out] int(x*(a+b*x^n)^(3/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^{\frac{3}{2}} x \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(3/2)*x,x, algorithm="maxima")

[Out] integrate((b*x^n + a)^(3/2)*x, x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(3/2)*x,x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(a+b*x**n)**(3/2),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^{\frac{3}{2}} x \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(3/2)*x,x, algorithm="giac")

[Out] integrate((b*x^n + a)^(3/2)*x, x)
```

3.2486 $\int (a+bx^n)^{3/2}\,dx$

Optimal. Leaf size=39

$$\frac{x\left(a+bx^n\right)^{5/2}\,{}_2F_1\left(1,\frac{5}{2}+\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)}{a}$$

```
[Out] (x*(a + b*x^n)^(5/2)*Hypergeometric2F1[1, 5/2 + n^(-1), 1 + n^(-1
), -((b*x^n)/a)])/a
```

Rubi [A] time = 0.0329826, antiderivative size = 49, normalized size of antiderivative = 1.26, number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{ax\sqrt{a+bx^n}\,{}_2F_1\left(-\frac{3}{2},\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)}{\sqrt{\frac{bx^n}{a}+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^(3/2),x]
```

```
[Out] (a*x*Sqrt[a + b*x^n]*Hypergeometric2F1[-3/2, n^(-1), 1 + n^(-1),
-((b*x^n)/a)])/Sqrt[1 + (b*x^n)/a]
```

Rubi in Sympy [A] time = 3.53029, size = 42, normalized size = 1.08

$$\frac{ax\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}-\frac{3}{2},\frac{1}{n}\\1+\frac{1}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{\sqrt{1+\frac{bx^n}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**n)**(3/2),x)
```

```
[Out] a*x*sqrt(a + b*x**n)*hyper((-3/2, 1/n), (1 + 1/n,), -b*x**n/a)/sq
rt(1 + b*x**n/a)
```

Mathematica [B] time = 0.121871, size = 94, normalized size = 2.41

$$\frac{x\left(3a^2n^2\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)+2\left(a+bx^n\right)\left(a(4n+2)+b(n+2)x^n\right)\right)}{(n+2)(3n+2)\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^(3/2),x]
```

```
[Out] (x*(2*(a + b*x^n)*(a*(2 + 4*n) + b*(2 + n)*x^n) + 3*a^2*n^2*Sqrt[
1 + (b*x^n)/a]*Hypergeometric2F1[1/2, n^(-1), 1 + n^(-1), -((b*x^
n)/a)]))/((2 + n)*(2 + 3*n)*Sqrt[a + b*x^n])
```

Maple [F] time = 0.049, size = 0, normalized size = 0.

$$\int \left(a+bx^n\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^(3/2),x)

[Out] int((a+b*x^n)^(3/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(3/2),x, algorithm="maxima")

[Out] integrate((b*x^n + a)^(3/2), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(3/2),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**(3/2),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(3/2),x, algorithm="giac")

[Out] integrate((b*x^n + a)^(3/2), x)
```

3.2487 $\int \frac{(a+bx^n)^{3/2}}{x}\,dx$

Optimal. Leaf size=64

$$-\frac{2a^{3/2}\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{n}+\frac{2a\sqrt{a+bx^n}}{n}+\frac{2\left(a+bx^n\right)^{3/2}}{3n}$$

```
[Out] (2*a*Sqrt[a + b*x^n])/n + (2*(a + b*x^n)^(3/2))/(3*n) - (2*a^(3/2
)*ArcTanh[Sqrt[a + b*x^n]/Sqrt[a]])/n
```

Rubi [A] time = 0.097879, antiderivative size = 64, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{2a^{3/2}\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{n}+\frac{2a\sqrt{a+bx^n}}{n}+\frac{2\left(a+bx^n\right)^{3/2}}{3n}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^(3/2)/x,x]
```

```
[Out] (2*a*Sqrt[a + b*x^n])/n + (2*(a + b*x^n)^(3/2))/(3*n) - (2*a^(3/2
)*ArcTanh[Sqrt[a + b*x^n]/Sqrt[a]])/n
```

Rubi in Sympy [A] time = 9.75589, size = 54, normalized size = 0.84

$$-\frac{2a^{\frac{3}{2}}\operatorname{atanh}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{n}+\frac{2a\sqrt{a+bx^n}}{n}+\frac{2\left(a+bx^n\right)^{\frac{3}{2}}}{3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**n)**(3/2)/x,x)
```

```
[Out] -2*a**(3/2)*atanh(sqrt(a + b*x**n)/sqrt(a))/n + 2*a*sqrt(a + b*x*
*n)/n + 2*(a + b*x**n)**(3/2)/(3*n)
```

Mathematica [A] time = 0.0590007, size = 55, normalized size = 0.86

$$\frac{2\sqrt{a+bx^n}\left(4a+bx^n\right)-6a^{3/2}\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{3n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^(3/2)/x,x]
```

```
[Out] (2*Sqrt[a + b*x^n]*(4*a + b*x^n) - 6*a^(3/2)*ArcTanh[Sqrt[a + b*x
^n]/Sqrt[a]])/(3*n)
```

Maple [A] time = 0.004, size = 48, normalized size = 0.8

$$\frac{1}{n}\left(\frac{2}{3}\left(a+bx^n\right)^{\frac{3}{2}}+2\,a\sqrt{a+bx^n}-2\,a^{3/2}Artanh\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^(3/2)/x,x)
```

```
[Out] 1/n*(2/3*(a+b*x^n)^(3/2)+2*a*(a+b*x^n)^(1/2)-2*a^(3/2)*arctanh((a
+b*x^n)^(1/2)/a^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(3/2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.228426, size = 1, normalized size = 0.02

$$\left[\frac{3\,a^{\frac{3}{2}}\log\left(\frac{bx^n-2\,\sqrt{bx^n+a}\sqrt{a}+2\,a}{x^n}\right)+2\,(bx^n+4\,a)\sqrt{bx^n+a}}{3\,n},\ -\frac{2\left(3\,\sqrt{-a}a\arctan\left(\frac{\sqrt{bx^n+a}}{\sqrt{-a}}\right)-(bx^n+4\,a)\sqrt{bx^n+a}\right)}{3\,n}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(3/2)/x,x, algorithm="fricas")
```

```
[Out] [1/3*(3*a^(3/2)*log((b*x^n - 2*sqrt(b*x^n + a)*sqrt(a) + 2*a)/x^n
) + 2*(b*x^n + 4*a)*sqrt(b*x^n + a))/n, -2/3*(3*sqrt(-a)*a*arctan
(sqrt(b*x^n + a)/sqrt(-a)) - (b*x^n + 4*a)*sqrt(b*x^n + a))/n]
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**(3/2)/x,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^n+a)^{\frac{3}{2}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(3/2)/x,x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^(3/2)/x, x)
```

3.2488 $\int \frac{(a+bx^n)^{3/2}}{x^2} dx$

Optimal. Leaf size=49

$$-\frac{(a+bx^n)^{5/2}\,{}_2F_1\left(1,\frac{5}{2}-\frac{1}{n};-\frac{1-n}{n};-\frac{bx^n}{a}\right)}{ax}$$

```
[Out] -(((a + b*x^n)^(5/2)*Hypergeometric2F1[1, 5/2 - n^(-1), -((1 - n)
/n), -((b*x^n)/a)])/(a*x))
```

Rubi [A] time = 0.0662963, antiderivative size = 59, normalized size of antiderivative = 1.2, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a\sqrt{a+bx^n}\,{}_2F_1\left(-\frac{3}{2},-\frac{1}{n};-\frac{1-n}{n};-\frac{bx^n}{a}\right)}{x\sqrt{\frac{bx^n}{a}+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^(3/2)/x^2,x]
```

```
[Out] -((a*Sqrt[a + b*x^n]*Hypergeometric2F1[-3/2, -n^(-1), -((1 - n)/n
), -((b*x^n)/a)])/(x*Sqrt[1 + (b*x^n)/a]))
```

Rubi in Sympy [A] time = 6.88113, size = 46, normalized size = 0.94

$$-\frac{a\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}-\frac{3}{2},-\frac{1}{n}\\ \frac{n-1}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{x\sqrt{1+\frac{bx^n}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**n)**(3/2)/x**2,x)
```

```
[Out] -a*sqrt(a + b*x**n)*hyper((-3/2, -1/n), ((n - 1)/n,), -b*x**n/a)/
(x*sqrt(1 + b*x**n/a))
```

Mathematica [B] time = 0.145794, size = 100, normalized size = 2.04

$$\frac{2\left(a+bx^n\right)\left(a(4n-2)+b(n-2)x^n\right)-3a^2n^2\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},-\frac{1}{n};\frac{n-1}{n};-\frac{bx^n}{a}\right)}{(n-2)(3n-2)x\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^(3/2)/x^2,x]
```

```
[Out] (2*(a + b*x^n)*(a*(-2 + 4*n) + b*(-2 + n)*x^n) - 3*a^2*n^2*Sqrt[1
 + (b*x^n)/a]*Hypergeometric2F1[1/2, -n^(-1), (-1 + n)/n, -((b*x^
n)/a)])/((-2 + n)*(-2 + 3*n)*x*Sqrt[a + b*x^n])
```

Maple [F] time = 0.061, size = 0, normalized size = 0.

$$\int \frac{1}{x^2}\left(a+bx^n\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^(3/2)/x^2,x)
```

```
[Out] int((a+b*x^n)^(3/2)/x^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^n + a)^{\frac{3}{2}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(3/2)/x^2,x, algorithm="maxima")
```

```
[Out] integrate((b*x^n + a)^(3/2)/x^2, x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(3/2)/x^2,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**(3/2)/x**2,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^n + a)^{\frac{3}{2}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(3/2)/x^2,x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^(3/2)/x^2, x)
```

3.2489 $\int \frac{(a+bx^n)^{3/2}}{x^3}\,dx$

Optimal. Leaf size=51

$$-\frac{(a+bx^n)^{5/2}\,{}_2F_1\left(1,\frac{5}{2}-\frac{2}{n};-\frac{2-n}{n};-\frac{bx^n}{a}\right)}{2ax^2}$$

```
[Out] -((a + b*x^n)^(5/2)*Hypergeometric2F1[1, 5/2 - 2/n, -((2 - n)/n),
 -((b*x^n)/a)])/(2*a*x^2)
```

Rubi [A] time = 0.074685, antiderivative size = 61, normalized size of antiderivative = 1.2, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a\sqrt{a+bx^n}\,{}_2F_1\left(-\frac{3}{2},-\frac{2}{n};-\frac{2-n}{n};-\frac{bx^n}{a}\right)}{2x^2\sqrt{\frac{bx^n}{a}+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^(3/2)/x^3,x]
```

```
[Out] -(a*Sqrt[a + b*x^n]*Hypergeometric2F1[-3/2, -2/n, -((2 - n)/n), -
((b*x^n)/a)])/(2*x^2*Sqrt[1 + (b*x^n)/a])
```

Rubi in Sympy [A] time = 6.94971, size = 49, normalized size = 0.96

$$-\frac{a\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}-\frac{3}{2},-\frac{2}{n}\\ \frac{n-2}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{2x^2\sqrt{1+\frac{bx^n}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**n)**(3/2)/x**3,x)
```

```
[Out] -a*sqrt(a + b*x**n)*hyper((-3/2, -2/n), ((n - 2)/n,), -b*x**n/a)/
(2*x**2*sqrt(1 + b*x**n/a))
```

Mathematica [A] time = 0.139143, size = 102, normalized size = 2.

$$\frac{4\,(a+bx^n)\,(4a(n-1)+b(n-4)x^n)-3a^2n^2\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},-\frac{2}{n};\frac{n-2}{n};-\frac{bx^n}{a}\right)}{2(n-4)(3n-4)x^2\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^(3/2)/x^3,x]
```

```
[Out] (4*(a + b*x^n)*(4*a*(-1 + n) + b*(-4 + n)*x^n) - 3*a^2*n^2*Sqrt[1
 + (b*x^n)/a]*Hypergeometric2F1[1/2, -2/n, (-2 + n)/n, -((b*x^n)/
a)])/(2*(-4 + n)*(-4 + 3*n)*x^2*Sqrt[a + b*x^n])
```

Maple [F] time = 0.062, size = 0, normalized size = 0.

$$\int \frac{1}{x^3}(a+bx^n)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^(3/2)/x^3,x)

[Out] int((a+b*x^n)^(3/2)/x^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^n + a)^{\frac{3}{2}}}{x^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(3/2)/x^3,x, algorithm="maxima")

[Out] integrate((b*x^n + a)^(3/2)/x^3, x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(3/2)/x^3,x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**(3/2)/x**3,x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^n + a)^{\frac{3}{2}}}{x^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(3/2)/x^3,x, algorithm="giac")

[Out] integrate((b*x^n + a)^(3/2)/x^3, x)
```

3.2490 $\int x\left(a+bx^n\right)^{5/2}\,dx$

Optimal. Leaf size=48

$$\frac{x^2\left(a+bx^n\right)^{7/2}\,{}_2F_1\left(1,\frac{7}{2}+\frac{2}{n};\frac{n+2}{n};-\frac{bx^n}{a}\right)}{2a}$$

```
[Out] (x^2*(a + b*x^n)^(7/2)*Hypergeometric2F1[1, 7/2 + 2/n, (2 + n)/n,
 -((b*x^n)/a)])/(2*a)
```

Rubi [A] time = 0.0589421, antiderivative size = 60, normalized size of antiderivative = 1.25, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{a^2x^2\sqrt{a+bx^n}\,{}_2F_1\left(-\frac{5}{2},\frac{2}{n};\frac{n+2}{n};-\frac{bx^n}{a}\right)}{2\sqrt{\frac{bx^n}{a}+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x*(a + b*x^n)^(5/2),x]
```

```
[Out] (a^2*x^2*Sqrt[a + b*x^n]*Hypergeometric2F1[-5/2, 2/n, (2 + n)/n,
-((b*x^n)/a)])/(2*Sqrt[1 + (b*x^n)/a])
```

Rubi in Sympy [A] time = 6.4851, size = 48, normalized size = 1.

$$\frac{a^2x^2\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}-\frac{5}{2},\frac{2}{n}\\ \frac{n+2}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{2\sqrt{1+\frac{bx^n}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(a+b*x**n)**(5/2),x)
```

```
[Out] a**2*x**2*sqrt(a + b*x**n)*hyper((-5/2, 2/n), ((n + 2)/n,), -b*x*
*n/a)/(2*sqrt(1 + b*x**n/a))
```

Mathematica [B] time = 0.286405, size = 144, normalized size = 3.

$$\frac{x^2\left(15a^3n^3\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{2}{n};\frac{n+2}{n};-\frac{bx^n}{a}\right)+4\left(a+bx^n\right)\left(a^2\left(23n^2+36n+16\right)+ab\left(11n^2+52n+32\right)x^n+b^2\left(3n^2+16n+\right.\right.\right.}{2(n+4)(3n+4)(5n+4)\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x*(a + b*x^n)^(5/2),x]
```

```
[Out] (x^2*(4*(a + b*x^n)*(a^2*(16 + 36*n + 23*n^2) + a*b*(32 + 52*n +
11*n^2)*x^n + b^2*(16 + 16*n + 3*n^2)*x^(2*n)) + 15*a^3*n^3*Sqrt[
1 + (b*x^n)/a]*Hypergeometric2F1[1/2, 2/n, (2 + n)/n, -((b*x^n)/a
)]))/(2*(4 + n)*(4 + 3*n)*(4 + 5*n)*Sqrt[a + b*x^n])
```

Maple [F] time = 0.054, size = 0, normalized size = 0.

$$\int x\left(a+b x^{n}\right)^{\frac{5}{2}} d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(a+b*x^n)^(5/2),x)

[Out] int(x*(a+b*x^n)^(5/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^{n}+a)^{\frac{5}{2}} x \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(5/2)*x,x, algorithm="maxima")

[Out] integrate((b*x^n + a)^(5/2)*x, x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(5/2)*x,x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(a+b*x**n)**(5/2),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^{n}+a)^{\frac{5}{2}} x \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(5/2)*x,x, algorithm="giac")

[Out] integrate((b*x^n + a)^(5/2)*x, x)
```

3.2491 $\int (a+bx^n)^{5/2}\,dx$

Optimal. Leaf size=39

$$\frac{x(a+bx^n)^{7/2}\,{}_2F_1\left(1,\frac{7}{2}+\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)}{a}$$

```
[Out] (x*(a + b*x^n)^(7/2)*Hypergeometric2F1[1, 7/2 + n^(-1), 1 + n^(-1
), -((b*x^n)/a)])/a
```

Rubi [A] time = 0.0339041, antiderivative size = 51, normalized size of antiderivative = 1.31, number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{a^2x\sqrt{a+bx^n}\,{}_2F_1\left(-\frac{5}{2},\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)}{\sqrt{\frac{bx^n}{a}+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^(5/2),x]
```

```
[Out] (a^2*x*Sqrt[a + b*x^n]*Hypergeometric2F1[-5/2, n^(-1), 1 + n^(-1)
, -((b*x^n)/a)])/Sqrt[1 + (b*x^n)/a]
```

Rubi in Sympy [A] time = 3.79977, size = 44, normalized size = 1.13

$$\frac{a^2x\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}-\frac{5}{2},\frac{1}{n}\\1+\frac{1}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{\sqrt{1+\frac{bx^n}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**n)**(5/2),x)
```

```
[Out] a**2*x*sqrt(a + b*x**n)*hyper((-5/2, 1/n), (1 + 1/n,), -b*x**n/a)
/sqrt(1 + b*x**n/a)
```

Mathematica [B] time = 0.221857, size = 135, normalized size = 3.46

$$\frac{x\left(15a^3n^3\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)+2(a+bx^n)\left(a^2\left(23n^2+18n+4\right)+ab\left(11n^2+26n+8\right)x^n+b^2\left(3n^2+8n+4\right)\right.\right.}{(n+2)(3n+2)(5n+2)\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^(5/2),x]
```

```
[Out] (x*(2*(a + b*x^n)*(a^2*(4 + 18*n + 23*n^2) + a*b*(8 + 26*n + 11*n
^2)*x^n + b^2*(4 + 8*n + 3*n^2)*x^(2*n)) + 15*a^3*n^3*Sqrt[1 + (b
*x^n)/a]*Hypergeometric2F1[1/2, n^(-1), 1 + n^(-1), -((b*x^n)/a)]
))/((2 + n)*(2 + 3*n)*(2 + 5*n)*Sqrt[a + b*x^n])
```

Maple [F] time = 0.053, size = 0, normalized size = 0.

$$\int (a + bx^n)^{\frac{5}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^(5/2),x)

[Out] int((a+b*x^n)^(5/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^{\frac{5}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(5/2),x, algorithm="maxima")

[Out] integrate((b*x^n + a)^(5/2), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(5/2),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**(5/2),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^{\frac{5}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(5/2),x, algorithm="giac")

[Out] integrate((b*x^n + a)^(5/2), x)
```

3.2492 $\int \frac{(a+bx^n)^{5/2}}{x} \, dx$

Optimal. Leaf size=85

$$-\frac{2a^{5/2}\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{n}+\frac{2a^2\sqrt{a+bx^n}}{n}+\frac{2a(a+bx^n)^{3/2}}{3n}+\frac{2(a+bx^n)^{5/2}}{5n}$$

```
[Out] (2*a^2*Sqrt[a + b*x^n])/n + (2*a*(a + b*x^n)^(3/2))/(3*n) + (2*(a
 + b*x^n)^(5/2))/(5*n) - (2*a^(5/2)*ArcTanh[Sqrt[a + b*x^n]/Sqrt[
a]])/n
```

Rubi [A] time = 0.115577, antiderivative size = 85, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{2a^{5/2}\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{n}+\frac{2a^2\sqrt{a+bx^n}}{n}+\frac{2a(a+bx^n)^{3/2}}{3n}+\frac{2(a+bx^n)^{5/2}}{5n}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^(5/2)/x,x]
```

```
[Out] (2*a^2*Sqrt[a + b*x^n])/n + (2*a*(a + b*x^n)^(3/2))/(3*n) + (2*(a
 + b*x^n)^(5/2))/(5*n) - (2*a^(5/2)*ArcTanh[Sqrt[a + b*x^n]/Sqrt[
a]])/n
```

Rubi in Sympy [A] time = 12.8996, size = 73, normalized size = 0.86

$$-\frac{2a^{\frac{5}{2}}\operatorname{atanh}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{n}+\frac{2a^2\sqrt{a+bx^n}}{n}+\frac{2a(a+bx^n)^{\frac{3}{2}}}{3n}+\frac{2(a+bx^n)^{\frac{5}{2}}}{5n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**n)**(5/2)/x,x)
```

```
[Out] -2*a**(5/2)*atanh(sqrt(a + b*x**n)/sqrt(a))/n + 2*a**2*sqrt(a + b
*x**n)/n + 2*a*(a + b*x**n)**(3/2)/(3*n) + 2*(a + b*x**n)**(5/2)/
(5*n)
```

Mathematica [A] time = 0.0926866, size = 69, normalized size = 0.81

$$\frac{2\sqrt{a+bx^n}\left(23a^2+11abx^n+3b^2x^{2n}\right)-30a^{5/2}\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{15n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^(5/2)/x,x]
```

```
[Out] (2*Sqrt[a + b*x^n]*(23*a^2 + 11*a*b*x^n + 3*b^2*x^(2*n)) - 30*a^(
5/2)*ArcTanh[Sqrt[a + b*x^n]/Sqrt[a]])/(15*n)
```

Maple [A] time = 0.006, size = 62, normalized size = 0.7

$$\frac{1}{n}\left(\frac{2}{5}(a+bx^n)^{\frac{5}{2}}+\frac{2a}{3}(a+bx^n)^{\frac{3}{2}}+2\sqrt{a+bx^n}a^2-2a^{5/2}Artanh\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^(5/2)/x,x)
```

```
[Out] 1/n*(2/5*(a+b*x^n)^(5/2)+2/3*(a+b*x^n)^(3/2)*a+2*(a+b*x^n)^(1/2)*
a^2-2*a^(5/2)*arctanh((a+b*x^n)^(1/2)/a^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(5/2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.230742, size = 1, normalized size = 0.01

$$\left[\frac{15\,a^{\frac{5}{2}}\log\left(\frac{bx^{n}-2\,\sqrt{bx^{n}+a}\sqrt{a}+2\,a}{x^{n}}\right)+2\left(3\,b^{2}x^{2\,n}+11\,abx^{n}+23\,a^{2}\right)\sqrt{bx^{n}+a}}{15\,n},\right.$$
$$\left.-\frac{2\left(15\,\sqrt{-a}a^{2}\arctan\left(\frac{\sqrt{bx^{n}+a}}{\sqrt{-a}}\right)-\left(3\,b^{2}x^{2\,n}+11\,abx^{n}+23\,a^{2}\right)\sqrt{bx^{n}+a}\right)}{15\,n}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(5/2)/x,x, algorithm="fricas")
```

```
[Out] [1/15*(15*a^(5/2)*log((b*x^n - 2*sqrt(b*x^n + a)*sqrt(a) + 2*a)/x
^n) + 2*(3*b^2*x^(2*n) + 11*a*b*x^n + 23*a^2)*sqrt(b*x^n + a))/n,
 -2/15*(15*sqrt(-a)*a^2*arctan(sqrt(b*x^n + a)/sqrt(-a)) - (3*b^2
*x^(2*n) + 11*a*b*x^n + 23*a^2)*sqrt(b*x^n + a))/n]
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**(5/2)/x,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^{n}+a)^{\frac{5}{2}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(5/2)/x,x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^(5/2)/x, x)
```

3.2493 $\int \frac{(a+bx^n)^{5/2}}{x^2}\,dx$

Optimal. Leaf size=49

$$-\frac{(a+bx^n)^{7/2}\,{}_2F_1\left(1,\frac{7}{2}-\frac{1}{n};-\frac{1-n}{n};-\frac{bx^n}{a}\right)}{ax}$$

```
[Out] -(((a + b*x^n)^(7/2)*Hypergeometric2F1[1, 7/2 - n^(-1), -((1 - n)
/n), -((b*x^n)/a)])/(a*x))
```

Rubi [A] time = 0.060704, antiderivative size = 61, normalized size of antiderivative = 1.24, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{a^2\sqrt{a+bx^n}\,{}_2F_1\left(-\frac{5}{2},-\frac{1}{n};-\frac{1-n}{n};-\frac{bx^n}{a}\right)}{x\sqrt{\frac{bx^n}{a}+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^(5/2)/x^2,x]
```

```
[Out] -((a^2*Sqrt[a + b*x^n]*Hypergeometric2F1[-5/2, -n^(-1), -((1 - n)
/n), -((b*x^n)/a)])/(x*Sqrt[1 + (b*x^n)/a]))
```

Rubi in Sympy [A] time = 7.22326, size = 48, normalized size = 0.98

$$-\frac{a^2\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}-\frac{5}{2},-\frac{1}{n}\\ \frac{n-1}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{x\sqrt{1+\frac{bx^n}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**n)**(5/2)/x**2,x)
```

```
[Out] -a**2*sqrt(a + b*x**n)*hyper((-5/2, -1/n), ((n - 1)/n,), -b*x**n/
a)/(x*sqrt(1 + b*x**n/a))
```

Mathematica [B] time = 0.236969, size = 141, normalized size = 2.88

$$\frac{2\left(a+bx^n\right)\left(a^2\left(23n^2-18n+4\right)+ab\left(11n^2-26n+8\right)x^n+b^2\left(3n^2-8n+4\right)x^{2n}\right)-15a^3n^3\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},-\frac{1}{n};\frac{n-1}{n};-\frac{bx^n}{a}\right)}{(n-2)(3n-2)(5n-2)x\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^(5/2)/x^2,x]
```

```
[Out] (2*(a + b*x^n)*(a^2*(4 - 18*n + 23*n^2) + a*b*(8 - 26*n + 11*n^2)
*x^n + b^2*(4 - 8*n + 3*n^2)*x^(2*n)) - 15*a^3*n^3*Sqrt[1 + (b*x^
n)/a]*Hypergeometric2F1[1/2, -n^(-1), (-1 + n)/n, -((b*x^n)/a)])/
((-2 + n)*(-2 + 3*n)*(-2 + 5*n)*x*Sqrt[a + b*x^n])
```

Maple [F] time = 0.067, size = 0, normalized size = 0.

$$\int \frac{1}{x^2}(a+bx^n)^{\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^(5/2)/x^2,x)

[Out] int((a+b*x^n)^(5/2)/x^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^n+a)^{\frac{5}{2}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(5/2)/x^2,x, algorithm="maxima")

[Out] integrate((b*x^n + a)^(5/2)/x^2, x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(5/2)/x^2,x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**(5/2)/x**2,x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^n+a)^{\frac{5}{2}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(5/2)/x^2,x, algorithm="giac")

[Out] integrate((b*x^n + a)^(5/2)/x^2, x)
```

3.2494 $\int \frac{(a+bx^n)^{5/2}}{x^3}\,dx$

Optimal. Leaf size=51

$$-\frac{(a+bx^n)^{7/2}\,{}_2F_1\left(1,\frac{7}{2}-\frac{2}{n};-\frac{2-n}{n};-\frac{bx^n}{a}\right)}{2ax^2}$$

```
[Out] -((a + b*x^n)^(7/2)*Hypergeometric2F1[1, 7/2 - 2/n, -((2 - n)/n),
 -((b*x^n)/a)])/(2*a*x^2)
```

Rubi [A] time = 0.0661571, antiderivative size = 63, normalized size of antiderivative = 1.24, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$-\frac{a^2\sqrt{a+bx^n}\,{}_2F_1\left(-\frac{5}{2},-\frac{2}{n};-\frac{2-n}{n};-\frac{bx^n}{a}\right)}{2x^2\sqrt{\frac{bx^n}{a}+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^(5/2)/x^3,x]
```

```
[Out] -(a^2*Sqrt[a + b*x^n]*Hypergeometric2F1[-5/2, -2/n, -((2 - n)/n),
 -((b*x^n)/a)])/(2*x^2*Sqrt[1 + (b*x^n)/a])
```

Rubi in Sympy [A] time = 7.13268, size = 51, normalized size = 1.

$$-\frac{a^2\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}-\frac{5}{2},-\frac{2}{n}\\ \frac{n-2}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{2x^2\sqrt{1+\frac{bx^n}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**n)**(5/2)/x**3,x)
```

```
[Out] -a**2*sqrt(a + b*x**n)*hyper((-5/2, -2/n), ((n - 2)/n,), -b*x**n/
a)/(2*x**2*sqrt(1 + b*x**n/a))
```

Mathematica [B] time = 0.253055, size = 144, normalized size = 2.82

$$\frac{4(a+bx^n)\left(a^2\left(23n^2-36n+16\right)+ab\left(11n^2-52n+32\right)x^n+b^2\left(3n^2-16n+16\right)x^{2n}\right)-15a^3n^3\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},-\frac{2}{n};\frac{n-2}{n}\right.}{2(n-4)(3n-4)(5n-4)x^2\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^(5/2)/x^3,x]
```

```
[Out] (4*(a + b*x^n)*(a^2*(16 - 36*n + 23*n^2) + a*b*(32 - 52*n + 11*n^
2)*x^n + b^2*(16 - 16*n + 3*n^2)*x^(2*n)) - 15*a^3*n^3*Sqrt[1 + (
b*x^n)/a]*Hypergeometric2F1[1/2, -2/n, (-2 + n)/n, -((b*x^n)/a)])
/(2*(-4 + n)*(-4 + 3*n)*(-4 + 5*n)*x^2*Sqrt[a + b*x^n])
```

Maple [F] time = 0.069, size = 0, normalized size = 0.

$$\int \frac{1}{x^3} (a + bx^n)^{\frac{5}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^(5/2)/x^3,x)

[Out] int((a+b*x^n)^(5/2)/x^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^n + a)^{\frac{5}{2}}}{x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(5/2)/x^3,x, algorithm="maxima")

[Out] integrate((b*x^n + a)^(5/2)/x^3, x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(5/2)/x^3,x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**(5/2)/x**3,x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^n + a)^{\frac{5}{2}}}{x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(5/2)/x^3,x, algorithm="giac")

[Out] integrate((b*x^n + a)^(5/2)/x^3, x)
```

3.2495 $\int \frac{x}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=48

$$\frac{x^2\sqrt{a+bx^n}\,{}_2F_1\left(1,\frac{1}{2}+\frac{2}{n};\frac{n+2}{n};-\frac{bx^n}{a}\right)}{2a}$$

```
[Out] (x^2*Sqrt[a + b*x^n]*Hypergeometric2F1[1, 1/2 + 2/n, (2 + n)/n, -
((b*x^n)/a)])/(2*a)
```

Rubi [A] time = 0.0548144, antiderivative size = 57, normalized size of antiderivative = 1.19, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{x^2\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{2}{n};\frac{n+2}{n};-\frac{bx^n}{a}\right)}{2\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/Sqrt[a + b*x^n],x]
```

```
[Out] (x^2*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1/2, 2/n, (2 + n)/n, -
((b*x^n)/a)])/(2*Sqrt[a + b*x^n])
```

Rubi in Sympy [A] time = 6.36802, size = 44, normalized size = 0.92

$$\frac{x^2\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{2}{n}\\ \frac{n+2}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{2a\sqrt{1+\frac{bx^n}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b*x**n)**(1/2),x)
```

```
[Out] x**2*sqrt(a + b*x**n)*hyper((1/2, 2/n), ((n + 2)/n,), -b*x**n/a)/
(2*a*sqrt(1 + b*x**n/a))
```

Mathematica [A] time = 0.0466798, size = 58, normalized size = 1.21

$$\frac{x^2\sqrt{\frac{a+bx^n}{a}}\,{}_2F_1\left(\frac{1}{2},\frac{2}{n};1+\frac{2}{n};-\frac{bx^n}{a}\right)}{2\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/Sqrt[a + b*x^n],x]
```

```
[Out] (x^2*Sqrt[(a + b*x^n)/a]*Hypergeometric2F1[1/2, 2/n, 1 + 2/n, -((
b*x^n)/a)])/(2*Sqrt[a + b*x^n])
```

Maple [F] time = 0.042, size = 0, normalized size = 0.

$$\int x\frac{1}{\sqrt{a+bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+b*x^n)^(1/2),x)

[Out] int(x/(a+b*x^n)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt{bx^n + a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(b*x^n + a),x, algorithm="maxima")

[Out] integrate(x/sqrt(b*x^n + a), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(b*x^n + a),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b*x**n)**(1/2),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt{bx^n + a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(b*x^n + a),x, algorithm="giac")

[Out] integrate(x/sqrt(b*x^n + a), x)
```

3.2496 $\int \frac{1}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=39

$$\frac{x\sqrt{a+bx^n}\,{}_2F_1\left(1,\frac{1}{2}+\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)}{a}$$

```
[Out] (x*Sqrt[a + b*x^n]*Hypergeometric2F1[1, 1/2 + n^(-1), 1 + n^(-1),
 -((b*x^n)/a)])/a
```

Rubi [A] time = 0.0321292, antiderivative size = 48, normalized size of antiderivative = 1.23, number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{x\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)}{\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[a + b*x^n],x]
```

```
[Out] (x*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1/2, n^(-1), 1 + n^(-1),
 -((b*x^n)/a)])/Sqrt[a + b*x^n]
```

Rubi in Sympy [A] time = 3.75639, size = 41, normalized size = 1.05

$$\frac{x\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{1}{n}\\1+\frac{1}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{a\sqrt{1+\frac{bx^n}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*x**n)**(1/2),x)
```

```
[Out] x*sqrt(a + b*x**n)*hyper((1/2, 1/n), (1 + 1/n,), -b*x**n/a)/(a*sq
rt(1 + b*x**n/a))
```

Mathematica [A] time = 0.0309481, size = 49, normalized size = 1.26

$$\frac{x\sqrt{\frac{a+bx^n}{a}}\,{}_2F_1\left(\frac{1}{2},\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)}{\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/Sqrt[a + b*x^n],x]
```

```
[Out] (x*Sqrt[(a + b*x^n)/a]*Hypergeometric2F1[1/2, n^(-1), 1 + n^(-1),
 -((b*x^n)/a)])/Sqrt[a + b*x^n]
```

Maple [F] time = 0.041, size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a+bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*x^n)^(1/2),x)
```

```
[Out] int(1/(a+b*x^n)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{bx^n + a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*x^n + a),x, algorithm="maxima")
```

```
[Out] integrate(1/sqrt(b*x^n + a), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*x^n + a),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*x**n)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{bx^n + a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(1/sqrt(b*x^n + a), x)
```

3.2497 $\int \frac{1}{x\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=28

$$-\frac{2\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{\sqrt{a}n}$$

```
[Out] (-2*ArcTanh[Sqrt[a + b*x^n]/Sqrt[a]])/(Sqrt[a]*n)
```

Rubi [A] time = 0.0528606, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{2\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{\sqrt{a}n}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*Sqrt[a + b*x^n]),x]

[Out] (-2*ArcTanh[Sqrt[a + b*x^n]/Sqrt[a]])/(Sqrt[a]*n)
```

Rubi in Sympy [A] time = 5.72062, size = 26, normalized size = 0.93

$$-\frac{2\,\text{atanh}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{\sqrt{a}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(a+b*x**n)**(1/2),x)

[Out] -2*atanh(sqrt(a + b*x**n)/sqrt(a))/(sqrt(a)*n)
```

Mathematica [A] time = 0.024119, size = 28, normalized size = 1.

$$-\frac{2\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{\sqrt{a}n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*Sqrt[a + b*x^n]),x]

[Out] (-2*ArcTanh[Sqrt[a + b*x^n]/Sqrt[a]])/(Sqrt[a]*n)
```

Maple [A] time = 0.006, size = 23, normalized size = 0.8

$$-2\,\frac{1}{n\sqrt{a}}\,Artanh\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(a+b*x^n)^(1/2),x)
```

```
[Out] -2*arctanh((a+b*x^n)^(1/2)/a^(1/2))/n/a^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^n + a)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.227175, size = 1, normalized size = 0.04

$$\left[\frac{\log\left(\frac{\sqrt{a}bx^n-2\sqrt{bx^n+a}a+2a^{\frac{3}{2}}}{x^n}\right)}{\sqrt{a}n}, \frac{2\arctan\left(\frac{a}{\sqrt{bx^n+a}\sqrt{-a}}\right)}{\sqrt{-a}n}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^n + a)*x),x, algorithm="fricas")
```

```
[Out] [log((sqrt(a)*b*x^n - 2*sqrt(b*x^n + a)*a + 2*a^(3/2))/x^n)/(sqrt
(a)*n), 2*arctan(a/(sqrt(b*x^n + a)*sqrt(-a)))/(sqrt(-a)*n)]
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(a+b*x**n)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{bx^n + a}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^n + a)*x),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(b*x^n + a)*x), x)
```

3.2498 $\int \frac{1}{x^2\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=49

$$-\frac{\sqrt{a+bx^n}\,{}_2F_1\left(1,\frac{1}{2}-\frac{1}{n};-\frac{1-n}{n};-\frac{bx^n}{a}\right)}{ax}$$

```
[Out] -((Sqrt[a + b*x^n]*Hypergeometric2F1[1, 1/2 - n^(-1), -((1 - n)/n
), -((b*x^n)/a)])/(a*x))
```

Rubi [A] time = 0.0653137, antiderivative size = 58, normalized size of antiderivative = 1.18, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},-\frac{1}{n};-\frac{1-n}{n};-\frac{bx^n}{a}\right)}{x\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*Sqrt[a + b*x^n]),x]
```

```
[Out] -((Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1/2, -n^(-1), -((1 - n)/
n), -((b*x^n)/a)])/(x*Sqrt[a + b*x^n]))
```

Rubi in Sympy [A] time = 7.15841, size = 44, normalized size = 0.9

$$-\frac{\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}\frac{1}{2},-\frac{1}{n}\\ \frac{n-1}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{ax\sqrt{1+\frac{bx^n}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(a+b*x**n)**(1/2),x)
```

```
[Out] -sqrt(a + b*x**n)*hyper((1/2, -1/n), ((n - 1)/n,), -b*x**n/a)/(a*
x*sqrt(1 + b*x**n/a))
```

Mathematica [A] time = 0.0413789, size = 56, normalized size = 1.14

$$-\frac{\sqrt{\frac{a+bx^n}{a}}\,{}_2F_1\left(\frac{1}{2},-\frac{1}{n};1-\frac{1}{n};-\frac{bx^n}{a}\right)}{x\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*Sqrt[a + b*x^n]),x]
```

```
[Out] -((Sqrt[(a + b*x^n)/a]*Hypergeometric2F1[1/2, -n^(-1), 1 - n^(-1)
, -((b*x^n)/a)])/(x*Sqrt[a + b*x^n]))
```

Maple [F] time = 0.04, size = 0, normalized size = 0.

$$\int \frac{1}{x^2}\frac{1}{\sqrt{a+bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(a+b*x^n)^(1/2),x)
```

```
[Out] int(1/x^2/(a+b*x^n)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{bx^n + a}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^n + a)*x^2),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(b*x^n + a)*x^2), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^n + a)*x^2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(a+b*x**n)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{bx^n + a}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^n + a)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(b*x^n + a)*x^2), x)
```

3.2499 $\int \frac{1}{x^3\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=51

$$-\frac{\sqrt{a+bx^n}\,{}_2F_1\left(1,\frac{1}{2}-\frac{2}{n};-\frac{2-n}{n};-\frac{bx^n}{a}\right)}{2ax^2}$$

```
[Out] -(Sqrt[a + b*x^n]*Hypergeometric2F1[1, 1/2 - 2/n, -((2 - n)/n), -((b*x^n)/a)])/(2*a*x^2)
```

Rubi [A] time = 0.0635509, antiderivative size = 60, normalized size of antiderivative = 1.18, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},-\frac{2}{n};-\frac{2-n}{n};-\frac{bx^n}{a}\right)}{2x^2\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*Sqrt[a + b*x^n]),x]
```

```
[Out] -(Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1/2, -2/n, -((2 - n)/n), -((b*x^n)/a)])/(2*x^2*Sqrt[a + b*x^n])
```

Rubi in Sympy [A] time = 7.0744, size = 48, normalized size = 0.94

$$-\frac{\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}\frac{1}{2},-\frac{2}{n}\\ \frac{n-2}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{2ax^2\sqrt{1+\frac{bx^n}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(a+b*x**n)**(1/2),x)
```

```
[Out] -sqrt(a + b*x**n)*hyper((1/2, -2/n), ((n - 2)/n,), -b*x**n/a)/(2*a*x**2*sqrt(1 + b*x**n/a))
```

Mathematica [A] time = 0.0422867, size = 58, normalized size = 1.14

$$-\frac{\sqrt{\frac{a+bx^n}{a}}\,{}_2F_1\left(\frac{1}{2},-\frac{2}{n};1-\frac{2}{n};-\frac{bx^n}{a}\right)}{2x^2\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*Sqrt[a + b*x^n]),x]
```

```
[Out] -(Sqrt[(a + b*x^n)/a]*Hypergeometric2F1[1/2, -2/n, 1 - 2/n, -((b*x^n)/a)])/(2*x^2*Sqrt[a + b*x^n])
```

Maple [F] time = 0.043, size = 0, normalized size = 0.

$$\int \frac{1}{x^3}\frac{1}{\sqrt{a+bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(a+b*x^n)^(1/2),x)
```

```
[Out] int(1/x^3/(a+b*x^n)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{bx^n + a}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^n + a)*x^3),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(b*x^n + a)*x^3), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^n + a)*x^3),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(a+b*x**n)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{bx^n + a}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^n + a)*x^3),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(b*x^n + a)*x^3), x)
```

3.2500 $\int \frac{x}{(a+bx^n)^{3/2}}\,dx$

Optimal. Leaf size=48

$$\frac{x^2\,{}_2F_1\left(1,\frac{2}{n}-\frac{1}{2};\frac{n+2}{n};-\frac{bx^n}{a}\right)}{2a\sqrt{a+bx^n}}$$

```
[Out] (x^2*Hypergeometric2F1[1, -1/2 + 2/n, (2 + n)/n, -((b*x^n)/a)])/(
2*a*Sqrt[a + b*x^n])
```

Rubi [A] time = 0.0564546, antiderivative size = 60, normalized size of antiderivative = 1.25, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{x^2\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{3}{2},\frac{2}{n};\frac{n+2}{n};-\frac{bx^n}{a}\right)}{2a\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b*x^n)^(3/2),x]
```

```
[Out] (x^2*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[3/2, 2/n, (2 + n)/n, -
((b*x^n)/a)])/(2*a*Sqrt[a + b*x^n])
```

Rubi in Sympy [A] time = 6.56893, size = 46, normalized size = 0.96

$$\frac{x^2\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}\frac{3}{2},\frac{2}{n}\\ \frac{n+2}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{2a^2\sqrt{1+\frac{bx^n}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b*x**n)**(3/2),x)
```

```
[Out] x**2*sqrt(a + b*x**n)*hyper((3/2, 2/n), ((n + 2)/n,), -b*x**n/a)/
(2*a**2*sqrt(1 + b*x**n/a))
```

Mathematica [A] time = 0.101374, size = 69, normalized size = 1.44

$$\frac{x^2\left((n-4)\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{2}{n};\frac{n+2}{n};-\frac{bx^n}{a}\right)+4\right)}{2an\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b*x^n)^(3/2),x]
```

```
[Out] (x^2*(4 + (-4 + n)*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1/2, 2/n
, (2 + n)/n, -((b*x^n)/a)]))/(2*a*n*Sqrt[a + b*x^n])
```

Maple [F] time = 0.042, size = 0, normalized size = 0.

$$\int x\left(a+bx^n\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+b*x^n)^(3/2),x)
```

```
[Out] int(x/(a+b*x^n)^(3/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{(bx^n + a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^n + a)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x/(b*x^n + a)^(3/2), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^n + a)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b*x**n)**(3/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{(bx^n + a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^n + a)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x/(b*x^n + a)^(3/2), x)
```

3.2501 $\int \frac{1}{(a+bx^n)^{3/2}} dx$

Optimal. Leaf size=39

$$\frac{x\,{}_2F_1\left(1,\frac{1}{n}-\frac{1}{2};1+\frac{1}{n};-\frac{bx^n}{a}\right)}{a\sqrt{a+bx^n}}$$

```
[Out] (x*Hypergeometric2F1[1, -1/2 + n^(-1), 1 + n^(-1), -((b*x^n)/a)])
/(a*Sqrt[a + b*x^n])
```

Rubi [A] time = 0.0338792, antiderivative size = 51, normalized size of antiderivative = 1.31, number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{x\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{3}{2},\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)}{a\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^(-3/2),x]
```

```
[Out] (x*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[3/2, n^(-1), 1 + n^(-1),
 -((b*x^n)/a)])/(a*Sqrt[a + b*x^n])
```

Rubi in Sympy [A] time = 3.81049, size = 42, normalized size = 1.08

$$\frac{x\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}\frac{3}{2},\frac{1}{n}\\1+\frac{1}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{a^2\sqrt{1+\frac{bx^n}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*x**n)**(3/2),x)
```

```
[Out] x*sqrt(a + b*x**n)*hyper((3/2, 1/n), (1 + 1/n,), -b*x**n/a)/(a**2
*sqrt(1 + b*x**n/a))
```

Mathematica [A] time = 0.0672204, size = 60, normalized size = 1.54

$$\frac{x\left((n-2)\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)+2\right)}{an\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^(-3/2),x]
```

```
[Out] (x*(2 + (-2 + n)*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1/2, n^(-1
), 1 + n^(-1), -((b*x^n)/a)]))/(a*n*Sqrt[a + b*x^n])
```

Maple [F] time = 0.04, size = 0, normalized size = 0.

$$\int (a+bx^n)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*x^n)^(3/2),x)
```

```
[Out] int(1/(a+b*x^n)^(3/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^n + a)^{\frac{3}{2}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(-3/2),x, algorithm="maxima")
```

```
[Out] integrate((b*x^n + a)^(-3/2), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(-3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*x**n)**(3/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^n + a)^{\frac{3}{2}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(-3/2),x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^(-3/2), x)
```

3.2502 $\int \frac{1}{x(a+bx^n)^{3/2}}\,dx$

Optimal. Leaf size=48

$$\frac{2}{an\sqrt{a+bx^n}}-\frac{2\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{a^{3/2}n}$$

```
[Out] 2/(a*n*Sqrt[a + b*x^n]) - (2*ArcTanh[Sqrt[a + b*x^n]/Sqrt[a]])/(a
^(3/2)*n)
```

Rubi [A] time = 0.0779357, antiderivative size = 48, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{2}{an\sqrt{a+bx^n}}-\frac{2\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{a^{3/2}n}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a + b*x^n)^(3/2)),x]
```

```
[Out] 2/(a*n*Sqrt[a + b*x^n]) - (2*ArcTanh[Sqrt[a + b*x^n]/Sqrt[a]])/(a
^(3/2)*n)
```

Rubi in Sympy [A] time = 8.01529, size = 39, normalized size = 0.81

$$\frac{2}{an\sqrt{a+bx^n}}-\frac{2\,\mathrm{atanh}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{a^{\frac{3}{2}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(a+b*x**n)**(3/2),x)
```

```
[Out] 2/(a*n*sqrt(a + b*x**n)) - 2*atanh(sqrt(a + b*x**n)/sqrt(a))/(a**
(3/2)*n)
```

Mathematica [A] time = 0.0663472, size = 48, normalized size = 1.

$$\frac{2}{an\sqrt{a+bx^n}}-\frac{2\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{a^{3/2}n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a + b*x^n)^(3/2)),x]
```

```
[Out] 2/(a*n*Sqrt[a + b*x^n]) - (2*ArcTanh[Sqrt[a + b*x^n]/Sqrt[a]])/(a
^(3/2)*n)
```

Maple [A] time = 0.008, size = 39, normalized size = 0.8

$$\frac{1}{n}\left(-2\,\frac{1}{a^{3/2}}\mathrm{Artanh}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)+2\,\frac{1}{a\sqrt{a+bx^n}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(a+b*x^n)^(3/2),x)
```

```
[Out] 1/n*(-2/a^(3/2)*arctanh((a+b*x^n)^(1/2)/a^(1/2))+2/a/(a+b*x^n)^(1
/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^(3/2)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.229056, size = 1, normalized size = 0.02

$$\left[\frac{\sqrt{bx^n+a}\log\left(\frac{\sqrt{a}bx^n-2\sqrt{bx^n+a}a+2a^{\frac{3}{2}}}{x^n}\right)+2\sqrt{a}}{\sqrt{bx^n+a}a^{\frac{3}{2}}n}, \frac{2\left(\sqrt{bx^n+a}\arctan\left(\frac{a}{\sqrt{bx^n+a}\sqrt{-a}}\right)+\sqrt{-a}\right)}{\sqrt{bx^n+a}\sqrt{-a}an}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^(3/2)*x),x, algorithm="fricas")
```

```
[Out] [(sqrt(b*x^n + a)*log((sqrt(a)*b*x^n - 2*sqrt(b*x^n + a)*a + 2*a^
(3/2))/x^n) + 2*sqrt(a))/(sqrt(b*x^n + a)*a^(3/2)*n), 2*(sqrt(b*x
^n + a)*arctan(a/(sqrt(b*x^n + a)*sqrt(-a))) + sqrt(-a))/(sqrt(b*
x^n + a)*sqrt(-a)*a*n)]
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(a+b*x**n)**(3/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^n+a)^{\frac{3}{2}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^(3/2)*x),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^n + a)^(3/2)*x), x)
```

3.2503 $\int \frac{1}{x^2(a+bx^n)^{3/2}}\,dx$

Optimal. Leaf size=49

$$-\frac{{}_2F_1\left(1,-\frac{1}{2}-\frac{1}{n};-\frac{1-n}{n};-\frac{bx^n}{a}\right)}{ax\sqrt{a+bx^n}}$$

```
[Out] -(Hypergeometric2F1[1, -1/2 - n^(-1), -((1 - n)/n), -((b*x^n)/a)]
/(a*x*Sqrt[a + b*x^n]))
```

Rubi [A] time = 0.0671232, antiderivative size = 61, normalized size of antiderivative = 1.24, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$-\frac{\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{3}{2},-\frac{1}{n};-\frac{1-n}{n};-\frac{bx^n}{a}\right)}{ax\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(a + b*x^n)^(3/2)),x]
```

```
[Out] -((Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[3/2, -n^(-1), -((1 - n)/
n), -((b*x^n)/a)])/(a*x*Sqrt[a + b*x^n]))
```

Rubi in Sympy [A] time = 7.11889, size = 46, normalized size = 0.94

$$-\frac{\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}\frac{3}{2},-\frac{1}{n}\\ \frac{n-1}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{a^2x\sqrt{1+\frac{bx^n}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(a+b*x**n)**(3/2),x)
```

```
[Out] -sqrt(a + b*x**n)*hyper((3/2, -1/n), ((n - 1)/n,), -b*x**n/a)/(a*
*2*x*sqrt(1 + b*x**n/a))
```

Mathematica [A] time = 0.0935102, size = 67, normalized size = 1.37

$$\frac{2-(n+2)\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},-\frac{1}{n};\frac{n-1}{n};-\frac{bx^n}{a}\right)}{anx\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*(a + b*x^n)^(3/2)),x]
```

```
[Out] (2 - (2 + n)*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1/2, -n^(-1),
(-1 + n)/n, -((b*x^n)/a)])/(a*n*x*Sqrt[a + b*x^n])
```

Maple [F] time = 0.041, size = 0, normalized size = 0.

$$\int \frac{1}{x^2}\left(a+bx^n\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(a+b*x^n)^(3/2),x)
```

```
[Out] int(1/x^2/(a+b*x^n)^(3/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^n+a)^{\frac{3}{2}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^(3/2)*x^2),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x^n + a)^(3/2)*x^2), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^(3/2)*x^2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(a+b*x**n)**(3/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^n+a)^{\frac{3}{2}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^(3/2)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^n + a)^(3/2)*x^2), x)
```

3.2504 $\int \frac{1}{x^3(a+bx^n)^{3/2}}\,dx$

Optimal. Leaf size=51

$$-\frac{{}_2F_1\left(1,-\frac{1}{2}-\frac{2}{n};-\frac{2-n}{n};-\frac{bx^n}{a}\right)}{2ax^2\sqrt{a+bx^n}}$$

```
[Out] -Hypergeometric2F1[1, -1/2 - 2/n, -((2 - n)/n), -((b*x^n)/a)]/(2*
a*x^2*Sqrt[a + b*x^n])
```

Rubi [A] time = 0.0666393, antiderivative size = 63, normalized size of antiderivative = 1.24, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{3}{2},-\frac{2}{n};-\frac{2-n}{n};-\frac{bx^n}{a}\right)}{2ax^2\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(a + b*x^n)^(3/2)),x]
```

```
[Out] -(Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[3/2, -2/n, -((2 - n)/n),
-((b*x^n)/a)])/(2*a*x^2*Sqrt[a + b*x^n])
```

Rubi in Sympy [A] time = 7.12809, size = 49, normalized size = 0.96

$$-\frac{\sqrt{a+bx^n}\,{}_2F_1\left(\left.\begin{matrix}\frac{3}{2},-\frac{2}{n}\\ \frac{n-2}{n}\end{matrix}\right|-\frac{bx^n}{a}\right)}{2a^2x^2\sqrt{1+\frac{bx^n}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(a+b*x**n)**(3/2),x)
```

```
[Out] -sqrt(a + b*x**n)*hyper((3/2, -2/n), ((n - 2)/n,), -b*x**n/a)/(2*
a**2*x**2*sqrt(1 + b*x**n/a))
```

Mathematica [A] time = 0.0867548, size = 70, normalized size = 1.37

$$\frac{4-(n+4)\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},-\frac{2}{n};\frac{n-2}{n};-\frac{bx^n}{a}\right)}{2anx^2\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*(a + b*x^n)^(3/2)),x]
```

```
[Out] (4 - (4 + n)*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1/2, -2/n, (-2
 + n)/n, -((b*x^n)/a)])/(2*a*n*x^2*Sqrt[a + b*x^n])
```

Maple [F] time = 0.04, size = 0, normalized size = 0.

$$\int \frac{1}{x^3}\left(a+bx^n\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(a+b*x^n)^(3/2),x)
```

```
[Out] int(1/x^3/(a+b*x^n)^(3/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^n + a)^{\frac{3}{2}}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^(3/2)*x^3),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x^n + a)^(3/2)*x^3), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^(3/2)*x^3),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(a+b*x**n)**(3/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^n + a)^{\frac{3}{2}}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^(3/2)*x^3),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^n + a)^(3/2)*x^3), x)
```

3.2505 $\int \frac{x}{(a+bx^n)^{5/2}}\,dx$

Optimal. Leaf size=48

$$\frac{x^2\,{}_2F_1\left(1,\frac{2}{n}-\frac{3}{2};\frac{n+2}{n};-\frac{bx^n}{a}\right)}{2a\left(a+bx^n\right)^{3/2}}$$

```
[Out] (x^2*Hypergeometric2F1[1, -3/2 + 2/n, (2 + n)/n, -((b*x^n)/a)])/(
2*a*(a + b*x^n)^(3/2))
```

Rubi [A] time = 0.0563192, antiderivative size = 60, normalized size of antiderivative = 1.25, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{x^2\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{5}{2},\frac{2}{n};\frac{n+2}{n};-\frac{bx^n}{a}\right)}{2a^2\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b*x^n)^(5/2),x]
```

```
[Out] (x^2*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[5/2, 2/n, (2 + n)/n, -
((b*x^n)/a)])/(2*a^2*Sqrt[a + b*x^n])
```

Rubi in Sympy [A] time = 6.66869, size = 46, normalized size = 0.96

$$\frac{x^2\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}\frac{5}{2},\frac{2}{n}\\ \frac{n+2}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{2a^3\sqrt{1+\frac{bx^n}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b*x**n)**(5/2),x)
```

```
[Out] x**2*sqrt(a + b*x**n)*hyper((5/2, 2/n), ((n + 2)/n,), -b*x**n/a)/
(2*a**3*sqrt(1 + b*x**n/a))
```

Mathematica [B] time = 0.15881, size = 100, normalized size = 2.08

$$\frac{x^2\left(\left(3n^2-16n+16\right)\left(a+bx^n\right)\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{2}{n};\frac{n+2}{n};-\frac{bx^n}{a}\right)+4(3n-4)\left(a+bx^n\right)+4an\right)}{6a^2n^2\left(a+bx^n\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/(a + b*x^n)^(5/2),x]
```

```
[Out] (x^2*(4*a*n + 4*(-4 + 3*n)*(a + b*x^n) + (16 - 16*n + 3*n^2)*(a +
 b*x^n)*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1/2, 2/n, (2 + n)/n
, -((b*x^n)/a)]))/(6*a^2*n^2*(a + b*x^n)^(3/2))
```

Maple [F] time = 0.041, size = 0, normalized size = 0.

$$\int x\left(a+bx^n\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+b*x^n)^(5/2),x)

[Out] int(x/(a+b*x^n)^(5/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{(bx^n + a)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^n + a)^(5/2),x, algorithm="maxima")

[Out] integrate(x/(b*x^n + a)^(5/2), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^n + a)^(5/2),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b*x**n)**(5/2),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{(bx^n + a)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(b*x^n + a)^(5/2),x, algorithm="giac")

[Out] integrate(x/(b*x^n + a)^(5/2), x)
```

3.2506 $\int \frac{1}{(a+bx^n)^{5/2}}\,dx$

Optimal. Leaf size=39

$$\frac{x\,{}_2F_1\left(1,\frac{1}{n}-\frac{3}{2};1+\frac{1}{n};-\frac{bx^n}{a}\right)}{a\,(a+bx^n)^{3/2}}$$

```
[Out] (x*Hypergeometric2F1[1, -3/2 + n^(-1), 1 + n^(-1), -((b*x^n)/a)])
/(a*(a + b*x^n)^(3/2))
```

Rubi [A] time = 0.0349105, antiderivative size = 51, normalized size of antiderivative = 1.31, number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{x\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{5}{2},\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)}{a^2\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^(-5/2),x]
```

```
[Out] (x*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[5/2, n^(-1), 1 + n^(-1),
 -((b*x^n)/a)])/(a^2*Sqrt[a + b*x^n])
```

Rubi in Sympy [A] time = 3.88484, size = 42, normalized size = 1.08

$$\frac{x\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}\frac{5}{2},\frac{1}{n}\\1+\frac{1}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{a^3\sqrt{1+\frac{bx^n}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*x**n)**(5/2),x)
```

```
[Out] x*sqrt(a + b*x**n)*hyper((5/2, 1/n), (1 + 1/n,), -b*x**n/a)/(a**3
*sqrt(1 + b*x**n/a))
```

Mathematica [B] time = 0.148702, size = 94, normalized size = 2.41

$$\frac{x\left(\left(3n^2-8n+4\right)(a+bx^n)\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)+2(3n-2)(a+bx^n)+2an\right)}{3a^2n^2(a+bx^n)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^(-5/2),x]
```

```
[Out] (x*(2*a*n + 2*(-2 + 3*n)*(a + b*x^n) + (4 - 8*n + 3*n^2)*(a + b*x
^n)*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1/2, n^(-1), 1 + n^(-1)
, -((b*x^n)/a)]))/(3*a^2*n^2*(a + b*x^n)^(3/2))
```

Maple [F] time = 0.04, size = 0, normalized size = 0.

$$\int (a+bx^n)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*x^n)^(5/2),x)

[Out] int(1/(a+b*x^n)^(5/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^n + a)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(-5/2),x, algorithm="maxima")

[Out] integrate((b*x^n + a)^(-5/2), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(-5/2),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*x**n)**(5/2),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^n + a)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(-5/2),x, algorithm="giac")

[Out] integrate((b*x^n + a)^(-5/2), x)
```

3.2507 $\int \frac{1}{x(a+bx^n)^{5/2}}\,dx$

Optimal. Leaf size=69

$$-\frac{2\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{a^{5/2}n}+\frac{2}{a^2n\sqrt{a+bx^n}}+\frac{2}{3an\left(a+bx^n\right)^{3/2}}$$

```
[Out] 2/(3*a*n*(a + b*x^n)^(3/2)) + 2/(a^2*n*Sqrt[a + b*x^n]) - (2*ArcT
anh[Sqrt[a + b*x^n]/Sqrt[a]])/(a^(5/2)*n)
```

Rubi [A] time = 0.103123, antiderivative size = 69, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{2\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{a^{5/2}n}+\frac{2}{a^2n\sqrt{a+bx^n}}+\frac{2}{3an\left(a+bx^n\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a + b*x^n)^(5/2)),x]
```

```
[Out] 2/(3*a*n*(a + b*x^n)^(3/2)) + 2/(a^2*n*Sqrt[a + b*x^n]) - (2*ArcT
anh[Sqrt[a + b*x^n]/Sqrt[a]])/(a^(5/2)*n)
```

Rubi in Sympy [A] time = 11.0653, size = 58, normalized size = 0.84

$$\frac{2}{3an\left(a+bx^n\right)^{\frac{3}{2}}}+\frac{2}{a^2n\sqrt{a+bx^n}}-\frac{2\,\text{atanh}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{a^{\frac{5}{2}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(a+b*x**n)**(5/2),x)
```

```
[Out] 2/(3*a*n*(a + b*x**n)**(3/2)) + 2/(a**2*n*sqrt(a + b*x**n)) - 2*a
tanh(sqrt(a + b*x**n)/sqrt(a))/(a**(5/2)*n)
```

Mathematica [A] time = 0.153165, size = 60, normalized size = 0.87

$$\frac{2\left(\frac{\sqrt{a}(4a+3bx^n)}{(a+bx^n)^{3/2}}-3\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)\right)}{3a^{5/2}n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a + b*x^n)^(5/2)),x]
```

```
[Out] (2*((Sqrt[a]*(4*a + 3*b*x^n))/(a + b*x^n)^(3/2) - 3*ArcTanh[Sqrt[
a + b*x^n]/Sqrt[a]]))/(3*a^(5/2)*n)
```

Maple [A] time = 0.01, size = 53, normalized size = 0.8

$$\frac{1}{n}\left(2\,\frac{1}{\sqrt{a+bx^n}a^2}+\frac{2}{3\,a}\left(a+bx^n\right)^{-\frac{3}{2}}-2\,\frac{1}{a^{5/2}}Artanh\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(a+b*x^n)^(5/2),x)
```

```
[Out] 1/n*(2/a^2/(a+b*x^n)^(1/2)+2/3/a/(a+b*x^n)^(3/2)-2/a^(5/2)*arctan
h((a+b*x^n)^(1/2)/a^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^(5/2)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.230397, size = 1, normalized size = 0.01

$$\left[\frac{6\sqrt{a}bx^n + 3(bx^n+a)^{\frac{3}{2}}\log\left(\frac{\sqrt{a}bx^n - 2\sqrt{bx^n+a}a + 2a^{\frac{3}{2}}}{x^n}\right) + 8a^{\frac{3}{2}}}{3\left(a^{\frac{5}{2}}bnx^n + a^{\frac{7}{2}}n\right)\sqrt{bx^n+a}}, \frac{2\left(3\sqrt{-a}bx^n + 3(bx^n+a)^{\frac{3}{2}}\arctan\left(\frac{a}{\sqrt{bx^n+a}\sqrt{-a}}\right) + 4\sqrt{-a}a\right)}{3\left(\sqrt{-a}a^2bnx^n + \sqrt{-a}a^3n\right)\sqrt{bx^n+a}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^(5/2)*x),x, algorithm="fricas")
```

```
[Out] [1/3*(6*sqrt(a)*b*x^n + 3*(b*x^n + a)^(3/2)*log((sqrt(a)*b*x^n -
2*sqrt(b*x^n + a)*a + 2*a^(3/2))/x^n) + 8*a^(3/2))/((a^(5/2)*b*n*
x^n + a^(7/2)*n)*sqrt(b*x^n + a)), 2/3*(3*sqrt(-a)*b*x^n + 3*(b*x
^n + a)^(3/2)*arctan(a/(sqrt(b*x^n + a)*sqrt(-a))) + 4*sqrt(-a)*a
)/((sqrt(-a)*a^2*b*n*x^n + sqrt(-a)*a^3*n)*sqrt(b*x^n + a))]
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(a+b*x**n)**(5/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^n+a)^{\frac{5}{2}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^(5/2)*x),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^n + a)^(5/2)*x), x)
```

3.2508 $\int \frac{1}{x^2(a+bx^n)^{5/2}}\,dx$

Optimal. Leaf size=49

$$-\frac{{}_2F_1\left(1,-\frac{3}{2}-\frac{1}{n};-\frac{1-n}{n};-\frac{bx^n}{a}\right)}{ax\left(a+bx^n\right)^{3/2}}$$

```
[Out] -(Hypergeometric2F1[1, -3/2 - n^(-1), -((1 - n)/n), -((b*x^n)/a)]
/(a*x*(a + b*x^n)^(3/2)))
```

Rubi [A] time = 0.0664841, antiderivative size = 61, normalized size of antiderivative = 1.24, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$-\frac{\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{5}{2},-\frac{1}{n};-\frac{1-n}{n};-\frac{bx^n}{a}\right)}{a^2x\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(a + b*x^n)^(5/2)),x]
```

```
[Out] -((Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[5/2, -n^(-1), -((1 - n)/
n), -((b*x^n)/a)])/(a^2*x*Sqrt[a + b*x^n]))
```

Rubi in Sympy [A] time = 7.14974, size = 46, normalized size = 0.94

$$-\frac{\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}\frac{5}{2},-\frac{1}{n}\\ \frac{n-1}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{a^3x\sqrt{1+\frac{bx^n}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(a+b*x**n)**(5/2),x)
```

```
[Out] -sqrt(a + b*x**n)*hyper((5/2, -1/n), ((n - 1)/n,), -b*x**n/a)/(a*
*3*x*sqrt(1 + b*x**n/a))
```

Mathematica [B] time = 0.152693, size = 101, normalized size = 2.06

$$\frac{-\left(3n^2+8n+4\right)\left(a+bx^n\right)\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},-\frac{1}{n};\frac{n-1}{n};-\frac{bx^n}{a}\right)+2(3n+2)\left(a+bx^n\right)+2an}{3a^2n^2x\left(a+bx^n\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^2*(a + b*x^n)^(5/2)),x]
```

```
[Out] (2*a*n + 2*(2 + 3*n)*(a + b*x^n) - (4 + 8*n + 3*n^2)*(a + b*x^n)*
Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1/2, -n^(-1), (-1 + n)/n, -
((b*x^n)/a)])/(3*a^2*n^2*x*(a + b*x^n)^(3/2))
```

Maple [F] time = 0.04, size = 0, normalized size = 0.

$$\int \frac{1}{x^2}\left(a+bx^n\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(a+b*x^n)^(5/2),x)
```

```
[Out] int(1/x^2/(a+b*x^n)^(5/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^n + a)^{\frac{5}{2}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^(5/2)*x^2),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x^n + a)^(5/2)*x^2), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^(5/2)*x^2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(a+b*x**n)**(5/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^n + a)^{\frac{5}{2}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^(5/2)*x^2),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^n + a)^(5/2)*x^2), x)
```

3.2509 $\int \frac{1}{x^3(a+bx^n)^{5/2}}\,dx$

Optimal. Leaf size=51

$$-\frac{{}_2F_1\left(1,-\frac{3}{2}-\frac{2}{n};-\frac{2-n}{n};-\frac{bx^n}{a}\right)}{2ax^2\left(a+bx^n\right)^{3/2}}$$

```
[Out] -Hypergeometric2F1[1, -3/2 - 2/n, -((2 - n)/n), -((b*x^n)/a)]/(2*
a*x^2*(a + b*x^n)^(3/2))
```

Rubi [A] time = 0.0685791, antiderivative size = 63, normalized size of antiderivative = 1.24, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{5}{2},-\frac{2}{n};-\frac{2-n}{n};-\frac{bx^n}{a}\right)}{2a^2x^2\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(a + b*x^n)^(5/2)),x]
```

```
[Out] -(Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[5/2, -2/n, -((2 - n)/n),
-((b*x^n)/a)])/(2*a^2*x^2*Sqrt[a + b*x^n])
```

Rubi in Sympy [A] time = 7.08746, size = 49, normalized size = 0.96

$$-\frac{\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}\frac{5}{2},-\frac{2}{n}\\ \frac{n-2}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{2a^3x^2\sqrt{1+\frac{bx^n}{a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(a+b*x**n)**(5/2),x)
```

```
[Out] -sqrt(a + b*x**n)*hyper((5/2, -2/n), ((n - 2)/n,), -b*x**n/a)/(2*
a**3*x**2*sqrt(1 + b*x**n/a))
```

Mathematica [A] time = 0.152639, size = 101, normalized size = 1.98

$$\frac{-\left(3n^2+16n+16\right)\left(a+bx^n\right)\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},-\frac{2}{n};\frac{n-2}{n};-\frac{bx^n}{a}\right)+4(3n+4)\left(a+bx^n\right)+4an}{6a^2n^2x^2\left(a+bx^n\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x^3*(a + b*x^n)^(5/2)),x]
```

```
[Out] (4*a*n + 4*(4 + 3*n)*(a + b*x^n) - (16 + 16*n + 3*n^2)*(a + b*x^n
)*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1/2, -2/n, (-2 + n)/n, -(
(b*x^n)/a)])/(6*a^2*n^2*x^2*(a + b*x^n)^(3/2))
```

Maple [F] time = 0.04, size = 0, normalized size = 0.

$$\int \frac{1}{x^3}\left(a+bx^n\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(a+b*x^n)^(5/2),x)
```

```
[Out] int(1/x^3/(a+b*x^n)^(5/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bx^n + a\right)^{\frac{5}{2}} x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^(5/2)*x^3),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*x^n + a)^(5/2)*x^3), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^(5/2)*x^3),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(a+b*x**n)**(5/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bx^n + a\right)^{\frac{5}{2}} x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^(5/2)*x^3),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^n + a)^(5/2)*x^3), x)
```

3.2510 $\int \frac{\sqrt[3]{a+bx^n}}{x}\,dx$

Optimal. Leaf size=106

$$\frac{3\sqrt[3]{a+bx^n}}{n}+\frac{3\sqrt[3]{a}\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^n}\right)}{2n}-\frac{\sqrt{3}\sqrt[3]{a}\tan^{-1}\left(\frac{2\sqrt[3]{a+bx^n}+\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{n}-\frac{1}{2}\sqrt[3]{a}\log(x)$$

```
[Out] (3*(a + b*x^n)^(1/3))/n - (Sqrt[3]*a^(1/3)*ArcTan[(a^(1/3) + 2*(a
 + b*x^n)^(1/3))/(Sqrt[3]*a^(1/3))])/n - (a^(1/3)*Log[x])/2 + (3*
a^(1/3)*Log[a^(1/3) - (a + b*x^n)^(1/3)])/(2*n)
```

Rubi [A] time = 0.173095, antiderivative size = 106, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4

$$\frac{3\sqrt[3]{a+bx^n}}{n}+\frac{3\sqrt[3]{a}\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^n}\right)}{2n}-\frac{\sqrt{3}\sqrt[3]{a}\tan^{-1}\left(\frac{2\sqrt[3]{a+bx^n}+\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{n}-\frac{1}{2}\sqrt[3]{a}\log(x)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^(1/3)/x,x]
```

```
[Out] (3*(a + b*x^n)^(1/3))/n - (Sqrt[3]*a^(1/3)*ArcTan[(a^(1/3) + 2*(a
 + b*x^n)^(1/3))/(Sqrt[3]*a^(1/3))])/n - (a^(1/3)*Log[x])/2 + (3*
a^(1/3)*Log[a^(1/3) - (a + b*x^n)^(1/3)])/(2*n)
```

Rubi in Sympy [A] time = 11.4656, size = 97, normalized size = 0.92

$$-\frac{\sqrt[3]{a}\log\left(x^n\right)}{2n}+\frac{3\sqrt[3]{a}\log\left(\sqrt[3]{a}-\sqrt[3]{a+bx^n}\right)}{2n}-\frac{\sqrt{3}\sqrt[3]{a}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\frac{2\sqrt[3]{a+bx^n}}{3}\right)}{\sqrt[3]{a}}\right)}{n}+\frac{3\sqrt[3]{a+bx^n}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**n)**(1/3)/x,x)
```

```
[Out] -a**(1/3)*log(x**n)/(2*n) + 3*a**(1/3)*log(a**(1/3) - (a + b*x**n
)**(1/3))/(2*n) - sqrt(3)*a**(1/3)*atan(sqrt(3)*(a**(1/3)/3 + 2*(
a + b*x**n)**(1/3)/3)/a**(1/3))/n + 3*(a + b*x**n)**(1/3)/n
```

Mathematica [C] time = 0.0673516, size = 68, normalized size = 0.64

$$\frac{6\left(a+bx^n\right)-3a\left(\frac{ax^{-n}}{b}+1\right)^{2/3}{}_2F_1\left(\frac{2}{3},\frac{2}{3};\frac{5}{3};-\frac{ax^{-n}}{b}\right)}{2n\left(a+bx^n\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^(1/3)/x,x]
```

```
[Out] (6*(a + b*x^n) - 3*a*(1 + a/(b*x^n))^(2/3)*Hypergeometric2F1[2/3,
 2/3, 5/3, -(a/(b*x^n))])/(2*n*(a + b*x^n)^(2/3))
```

Maple [A] time = 0.008, size = 107, normalized size = 1.

$$3\frac{\sqrt[3]{a+bx^n}}{n}+\frac{1}{n}\sqrt[3]{a}\ln\left(\sqrt[3]{a+bx^n}-\sqrt[3]{a}\right)-\frac{1}{2n}\sqrt[3]{a}\ln\left((a+bx^n)^{\frac{2}{3}}+\sqrt[3]{a+bx^n}\sqrt[3]{a}+a^{\frac{2}{3}}\right)\\-\frac{\sqrt{3}}{n}\sqrt[3]{a}\arctan\left(\frac{\sqrt{3}}{3}\left(2\frac{\sqrt[3]{a+bx^n}}{\sqrt[3]{a}}+1\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^(1/3)/x,x)
```

```
[Out] 3*(a+b*x^n)^(1/3)/n+1/n*a^(1/3)*ln((a+b*x^n)^(1/3)-a^(1/3))-1/2/n
*a^(1/3)*ln((a+b*x^n)^(2/3)+(a+b*x^n)^(1/3)*a^(1/3)+a^(2/3))-1/n*
a^(1/3)*3^(1/2)*arctan(1/3*3^(1/2)*(2/a^(1/3)*(a+b*x^n)^(1/3)+1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(1/3)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.227586, size = 136, normalized size = 1.28

$$-\frac{2\sqrt{3}a^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(2(bx^n+a)^{\frac{1}{3}}+a^{\frac{1}{3}}\right)}{3a^{\frac{1}{3}}}\right)+a^{\frac{1}{3}}\log\left((bx^n+a)^{\frac{2}{3}}+(bx^n+a)^{\frac{1}{3}}a^{\frac{1}{3}}+a^{\frac{2}{3}}\right)-2a^{\frac{1}{3}}\log\left((bx^n+a)^{\frac{1}{3}}-a^{\frac{1}{3}}\right)-6(bx^n+a)^{\frac{1}{3}}}{2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(1/3)/x,x, algorithm="fricas")
```

```
[Out] -1/2*(2*sqrt(3)*a^(1/3)*arctan(1/3*sqrt(3)*(2*(b*x^n + a)^(1/3) +
 a^(1/3))/a^(1/3)) + a^(1/3)*log((b*x^n + a)^(2/3) + (b*x^n + a)^
(1/3)*a^(1/3) + a^(2/3)) - 2*a^(1/3)*log((b*x^n + a)^(1/3) - a^(1
/3)) - 6*(b*x^n + a)^(1/3))/n
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**(1/3)/x,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{(bx^n+a)^{\frac{1}{3}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(1/3)/x,x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^(1/3)/x, x)
```

3.2511 $\int x^{-1+4n} (a + bx^n) \, dx$

Optimal. Leaf size=27

$$\frac{ax^{4n}}{4n} + \frac{bx^{5n}}{5n}$$

```
[Out] (a*x^(4*n))/(4*n) + (b*x^(5*n))/(5*n)
```

Rubi [A] time = 0.0230532, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{ax^{4n}}{4n} + \frac{bx^{5n}}{5n}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 + 4*n)*(a + b*x^n),x]

[Out] (a*x^(4*n))/(4*n) + (b*x^(5*n))/(5*n)
```

Rubi in Sympy [A] time = 4.01291, size = 19, normalized size = 0.7

$$\frac{ax^{4n}}{4n} + \frac{bx^{5n}}{5n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1+4*n)*(a+b*x**n),x)

[Out] a*x**(4*n)/(4*n) + b*x**(5*n)/(5*n)
```

Mathematica [A] time = 0.0101591, size = 22, normalized size = 0.81

$$\frac{x^{4n} (5a + 4bx^n)}{20n}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 + 4*n)*(a + b*x^n),x]

[Out] (x^(4*n)*(5*a + 4*b*x^n))/(20*n)
```

Maple [A] time = 0.027, size = 28, normalized size = 1.

$$\frac{a \left(e^{n \ln(x)}\right)^4}{4\,n} + \frac{b \left(e^{n \ln(x)}\right)^5}{5\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-1+4*n)*(a+b*x^n),x)

[Out] 1/4*a/n*exp(n*ln(x))^4+1/5*b/n*exp(n*ln(x))^5
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^(4*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.222595, size = 30, normalized size = 1.11

$$\frac{4\,bx^{5\,n} + 5\,ax^{4\,n}}{20\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^(4*n - 1),x, algorithm="fricas")
```

```
[Out] 1/20*(4*b*x^(5*n) + 5*a*x^(4*n))/n
```

Sympy [A] time = 14.5463, size = 26, normalized size = 0.96

$$\begin{cases} \frac{ax^{4n}}{4n} + \frac{bx^{5n}}{5n} & \text{for}\: n \neq 0 \\ (a + b)\log{(x)} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+4*n)*(a+b*x**n),x)
```

```
[Out] Piecewise((a*x**(4*n)/(4*n) + b*x**(5*n)/(5*n), Ne(n, 0)), ((a +
b)*log(x), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^{n} + a)x^{4\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^(4*n - 1),x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)*x^(4*n - 1), x)
```

3.2512 $\int x^{-1+3n}(a+bx^n)\,dx$

Optimal. Leaf size=27

$$\frac{ax^{3n}}{3n}+\frac{bx^{4n}}{4n}$$

```
[Out] (a*x^(3*n))/(3*n) + (b*x^(4*n))/(4*n)
```

Rubi [A] time = 0.0220859, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{ax^{3n}}{3n}+\frac{bx^{4n}}{4n}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 + 3*n)*(a + b*x^n),x]

[Out] (a*x^(3*n))/(3*n) + (b*x^(4*n))/(4*n)
```

Rubi in Sympy [A] time = 4.0274, size = 19, normalized size = 0.7

$$\frac{ax^{3n}}{3n}+\frac{bx^{4n}}{4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1+3*n)*(a+b*x**n),x)

[Out] a*x**(3*n)/(3*n) + b*x**(4*n)/(4*n)
```

Mathematica [A] time = 0.0106695, size = 22, normalized size = 0.81

$$\frac{x^{3n}(4a+3bx^n)}{12n}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 + 3*n)*(a + b*x^n),x]

[Out] (x^(3*n)*(4*a + 3*b*x^n))/(12*n)
```

Maple [A] time = 0.025, size = 28, normalized size = 1.

$$\frac{a\left(e^{n\ln(x)}\right)^3}{3\,n}+\frac{b\left(e^{n\ln(x)}\right)^4}{4\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-1+3*n)*(a+b*x^n),x)

[Out] 1/3*a/n*exp(n*ln(x))^3+1/4*b/n*exp(n*ln(x))^4
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^(3*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.221819, size = 30, normalized size = 1.11

$$\frac{3\,bx^{4\,n} + 4\,ax^{3\,n}}{12\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^(3*n - 1),x, algorithm="fricas")
```

```
[Out] 1/12*(3*b*x^(4*n) + 4*a*x^(3*n))/n
```

Sympy [A] time = 14.7338, size = 26, normalized size = 0.96

$$\begin{cases} \frac{ax^{3n}}{3n} + \frac{bx^{4n}}{4n} & \text{for}\: n \neq 0 \\ (a + b) \log{(x)} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+3*n)*(a+b*x**n),x)
```

```
[Out] Piecewise((a*x**(3*n)/(3*n) + b*x**(4*n)/(4*n), Ne(n, 0)), ((a +
b)*log(x), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)x^{3\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^(3*n - 1),x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)*x^(3*n - 1), x)
```

3.2513 $\int x^{-1+2n}\left(a+bx^n\right)\,dx$

Optimal. Leaf size=27

$$\frac{ax^{2n}}{2n}+\frac{bx^{3n}}{3n}$$

```
[Out] (a*x^(2*n))/(2*n) + (b*x^(3*n))/(3*n)
```

Rubi [A] time = 0.0223623, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{ax^{2n}}{2n}+\frac{bx^{3n}}{3n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + 2*n)*(a + b*x^n),x]

[Out] (a*x^(2*n))/(2*n) + (b*x^(3*n))/(3*n)
```

Rubi in Sympy [A] time = 4.01799, size = 19, normalized size = 0.7

$$\frac{ax^{2n}}{2n}+\frac{bx^{3n}}{3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+2*n)*(a+b*x**n),x)

[Out] a*x**(2*n)/(2*n) + b*x**(3*n)/(3*n)
```

Mathematica [A] time = 0.00965357, size = 22, normalized size = 0.81

$$\frac{x^{2n}\left(3a+2bx^n\right)}{6n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + 2*n)*(a + b*x^n),x]

[Out] (x^(2*n)*(3*a + 2*b*x^n))/(6*n)
```

Maple [A] time = 0.022, size = 28, normalized size = 1.

$$\frac{a\left(e^{n\ln(x)}\right)^2}{2\,n}+\frac{b\left(e^{n\ln(x)}\right)^3}{3\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+2*n)*(a+b*x^n),x)

[Out] 1/2*a/n*exp(n*ln(x))^2+1/3*b/n*exp(n*ln(x))^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^(2*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.223527, size = 30, normalized size = 1.11

$$\frac{2\,bx^{3\,n} + 3\,ax^{2\,n}}{6\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^(2*n - 1),x, algorithm="fricas")
```

```
[Out] 1/6*(2*b*x^(3*n) + 3*a*x^(2*n))/n
```

Sympy [A] time = 14.2686, size = 26, normalized size = 0.96

$$\begin{cases} \frac{ax^{2n}}{2n} + \frac{bx^{3n}}{3n} & \text{for}\: n \neq 0 \\ (a + b) \log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+2*n)*(a+b*x**n),x)
```

```
[Out] Piecewise((a*x**(2*n)/(2*n) + b*x**(3*n)/(3*n), Ne(n, 0)), ((a +
b)*log(x), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)x^{2\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^(2*n - 1),x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)*x^(2*n - 1), x)
```

3.2514 $\int x^{-1+n}(a+bx^n)\,dx$

Optimal. Leaf size=22

$$\frac{ax^n}{n}+\frac{bx^{2n}}{2n}$$

```
[Out] (a*x^n)/n + (b*x^(2*n))/(2*n)
```

Rubi [A] time = 0.020589, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{ax^n}{n}+\frac{bx^{2n}}{2n}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 + n)*(a + b*x^n),x]

[Out] (a*x^n)/n + (b*x^(2*n))/(2*n)
```

Rubi in Sympy [A] time = 3.79068, size = 15, normalized size = 0.68

$$\frac{ax^n}{n}+\frac{bx^{2n}}{2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1+n)*(a+b*x**n),x)

[Out] a*x**n/n + b*x**(2*n)/(2*n)
```

Mathematica [A] time = 0.00790198, size = 19, normalized size = 0.86

$$\frac{x^n(2a+bx^n)}{2n}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 + n)*(a + b*x^n),x]

[Out] (x^n*(2*a + b*x^n))/(2*n)
```

Maple [A] time = 0.02, size = 25, normalized size = 1.1

$$\frac{ae^{n\ln(x)}}{n}+\frac{b\left(e^{n\ln(x)}\right)^2}{2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-1+n)*(a+b*x^n),x)

[Out] a/n*exp(n*ln(x))+1/2*b/n*exp(n*ln(x))^2
```

Maxima [A] time = 1.43313, size = 23, normalized size = 1.05

$$\frac{(bx^n + a)^2}{2\,bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^(n - 1),x, algorithm="maxima")
```

```
[Out] 1/2*(b*x^n + a)^2/(b*n)
```

Fricas [A] time = 0.221738, size = 26, normalized size = 1.18

$$\frac{bx^{2\,n} + 2\,ax^n}{2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^(n - 1),x, algorithm="fricas")
```

```
[Out] 1/2*(b*x^(2*n) + 2*a*x^n)/n
```

Sympy [A] time = 4.06205, size = 22, normalized size = 1.

$$\begin{cases} \frac{ax^n}{n} + \frac{bx^{2n}}{2n} & \text{for}\: n \neq 0 \\ (a + b)\log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+n)*(a+b*x**n),x)
```

```
[Out] Piecewise((a*x**n/n + b*x**(2*n)/(2*n), Ne(n, 0)), ((a + b)*log(x
), True))
```

GIAC/XCAS [A] time = 0.211288, size = 26, normalized size = 1.18

$$\frac{bx^{2\,n} + 2\,ax^n}{2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^(n - 1),x, algorithm="giac")
```

```
[Out] 1/2*(b*x^(2*n) + 2*a*x^n)/n
```

3.2515 $\int \frac{a+bx^n}{x}\,dx$

Optimal. Leaf size=13

$$a\log(x)+\frac{bx^n}{n}$$

```
[Out] (b*x^n)/n + a*Log[x]
```

Rubi [A] time = 0.0192118, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$a\log(x)+\frac{bx^n}{n}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)/x,x]

[Out] (b*x^n)/n + a*Log[x]
```

Rubi in Sympy [A] time = 3.28882, size = 10, normalized size = 0.77

$$a\log(x)+\frac{bx^n}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**n)/x,x)

[Out] a*log(x) + b*x**n/n
```

Mathematica [A] time = 0.00739225, size = 13, normalized size = 1.

$$a\log(x)+\frac{bx^n}{n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)/x,x]

[Out] (b*x^n)/n + a*Log[x]
```

Maple [A] time = 0., size = 19, normalized size = 1.5

$$\frac{a\ln(x^n)}{n}+\frac{bx^n}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)/x,x)

[Out] 1/n*a*ln(x^n)+b*x^n/n
```

Maxima [A] time = 1.42045, size = 24, normalized size = 1.85

$$\frac{bx^n}{n} + \frac{a\log(x^n)}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)/x,x, algorithm="maxima")
```

```
[Out] b*x^n/n + a*log(x^n)/n
```

Fricas [A] time = 0.224572, size = 20, normalized size = 1.54

$$\frac{an\log(x) + bx^n}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)/x,x, algorithm="fricas")
```

```
[Out] (a*n*log(x) + b*x^n)/n
```

Sympy [A] time = 0.473415, size = 17, normalized size = 1.31

$$\begin{cases} a\log(x) + \frac{bx^n}{n} & \text{for } n \neq 0 \\ (a+b)\log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)/x,x)
```

```
[Out] Piecewise((a*log(x) + b*x**n/n, Ne(n, 0)), ((a + b)*log(x), True)
)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{bx^n + a}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)/x,x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)/x, x)
```

3.2516 $\int x^{-1-n}\left(a+bx^n\right)\,dx$

Optimal. Leaf size=16

$$b\log(x)-\frac{ax^{-n}}{n}$$

```
[Out] -(a/(n*x^n)) + b*Log[x]
```

Rubi [A] time = 0.0176003, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$b\log(x)-\frac{ax^{-n}}{n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - n)*(a + b*x^n),x]

[Out] -(a/(n*x^n)) + b*Log[x]
```

Rubi in Sympy [A] time = 3.53646, size = 10, normalized size = 0.62

$$-\frac{ax^{-n}}{n}+b\log{(x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-n)*(a+b*x**n),x)

[Out] -a*x**(-n)/n + b*log(x)
```

Mathematica [A] time = 0.0127804, size = 16, normalized size = 1.

$$b\log(x)-\frac{ax^{-n}}{n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - n)*(a + b*x^n),x]

[Out] -(a/(n*x^n)) + b*Log[x]
```

Maple [A] time = 0.018, size = 25, normalized size = 1.6

$$\frac{1}{e^{n\ln(x)}}\left(b\ln{(x)}\,e^{n\ln(x)}-\frac{a}{n}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-n)*(a+b*x^n),x)

[Out] (b*ln(x)*exp(n*ln(x))-a/n)/exp(n*ln(x))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^(-n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.223729, size = 28, normalized size = 1.75

$$\frac{bnx^n \log(x) - a}{nx^n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^(-n - 1),x, algorithm="fricas")
```

```
[Out] (b*n*x^n*log(x) - a)/(n*x^n)
```

Sympy [A] time = 40.4747, size = 107, normalized size = 6.69

$$\begin{cases} ax + b\log(x) & \text{for } n = -1 \\ (a+b)\log(x) & \text{for } n = 0 \\ -\frac{an}{n^2x^n+nx^n} - \frac{a}{n^2x^n+nx^n} + \frac{bn^2x^n\log(x)}{n^2x^n+nx^n} + \frac{bnx^n\log(x)}{n^2x^n+nx^n} + \frac{bnx^n}{n^2x^n+nx^n} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-n)*(a+b*x**n),x)
```

```
[Out] Piecewise((a*x + b*log(x), Eq(n, -1)), ((a + b)*log(x), Eq(n, 0))
, (-a*n/(n**2*x**n + n*x**n) - a/(n**2*x**n + n*x**n) + b*n**2*x*
*n*log(x)/(n**2*x**n + n*x**n) + b*n*x**n*log(x)/(n**2*x**n + n*x
**n) + b*n*x**n/(n**2*x**n + n*x**n), True))
```

GIAC/XCAS [A] time = 0.216169, size = 32, normalized size = 2.

$$\frac{\left(bne^{(n\ln(x))}\ln(x) - a\right)e^{(-n\ln(x))}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^(-n - 1),x, algorithm="giac")
```

```
[Out] (b*n*e^(n*ln(x))*ln(x) - a)*e^(-n*ln(x))/n
```

3.2517 $\int x^{-1-2n}(a+bx^n)\,dx$

Optimal. Leaf size=25

$$-\frac{ax^{-2n}}{2n}-\frac{bx^{-n}}{n}$$

```
[Out] -a/(2*n*x^(2*n)) - b/(n*x^n)
```

Rubi [A] time = 0.0222497, antiderivative size = 25, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{ax^{-2n}}{2n}-\frac{bx^{-n}}{n}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 - 2*n)*(a + b*x^n),x]

[Out] -a/(2*n*x^(2*n)) - b/(n*x^n)
```

Rubi in Sympy [A] time = 3.95813, size = 17, normalized size = 0.68

$$-\frac{ax^{-2n}}{2n}-\frac{bx^{-n}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1-2*n)*(a+b*x**n),x)

[Out] -a*x**(-2*n)/(2*n) - b*x**(-n)/n
```

Mathematica [A] time = 0.0106446, size = 20, normalized size = 0.8

$$-\frac{x^{-2n}(a+2bx^n)}{2n}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 - 2*n)*(a + b*x^n),x]

[Out] -(a + 2*b*x^n)/(2*n*x^(2*n))
```

Maple [A] time = 0.023, size = 27, normalized size = 1.1

$$\frac{1}{\left(e^{n\ln(x)}\right)^2}\left(-\frac{a}{2\,n}-\frac{be^{n\ln(x)}}{n}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-1-2*n)*(a+b*x^n),x)

[Out] (-1/2*a/n-b/n*exp(n*ln(x)))/exp(n*ln(x))^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^(-2*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.221604, size = 27, normalized size = 1.08

$$-\frac{2\,bx^{n}+a}{2\,nx^{2\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^(-2*n - 1),x, algorithm="fricas")
```

```
[Out] -1/2*(2*b*x^n + a)/(n*x^(2*n))
```

Sympy [A] time = 16.2041, size = 24, normalized size = 0.96

$$\begin{cases} -\frac{ax^{-2n}}{2n} - \frac{bx^{-n}}{n} & \text{for}\: n \neq 0 \\ (a+b)\log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-2*n)*(a+b*x**n),x)
```

```
[Out] Piecewise((-a*x**(-2*n)/(2*n) - b*x**(-n)/n, Ne(n, 0)), ((a + b)*
log(x), True))
```

GIAC/XCAS [A] time = 0.214343, size = 28, normalized size = 1.12

$$-\frac{\left(2\,be^{\left(n\ln(x)\right)}+a\right)e^{\left(-2\,n\ln(x)\right)}}{2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^(-2*n - 1),x, algorithm="giac")
```

```
[Out] -1/2*(2*b*e^(n*ln(x)) + a)*e^(-2*n*ln(x))/n
```

3.2518 $\int x^{-1-3n}\left(a+bx^n\right)\,dx$

Optimal. Leaf size=27

$$-\frac{ax^{-3n}}{3n}-\frac{bx^{-2n}}{2n}$$

```
[Out] -a/(3*n*x^(3*n)) - b/(2*n*x^(2*n))
```

Rubi [A] time = 0.0217624, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{ax^{-3n}}{3n}-\frac{bx^{-2n}}{2n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 3*n)*(a + b*x^n),x]

[Out] -a/(3*n*x^(3*n)) - b/(2*n*x^(2*n))
```

Rubi in Sympy [A] time = 4.04937, size = 20, normalized size = 0.74

$$-\frac{ax^{-3n}}{3n}-\frac{bx^{-2n}}{2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-3*n)*(a+b*x**n),x)

[Out] -a*x**(-3*n)/(3*n) - b*x**(-2*n)/(2*n)
```

Mathematica [A] time = 0.0110749, size = 22, normalized size = 0.81

$$-\frac{x^{-3n}\left(2a+3bx^n\right)}{6n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 3*n)*(a + b*x^n),x]

[Out] -(2*a + 3*b*x^n)/(6*n*x^(3*n))
```

Maple [A] time = 0.023, size = 27, normalized size = 1.

$$\frac{1}{\left(e^{n\ln(x)}\right)^3}\left(-\frac{a}{3\,n}-\frac{be^{n\ln(x)}}{2\,n}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-3*n)*(a+b*x^n),x)

[Out] (-1/3*a/n-1/2*b/n*exp(n*ln(x)))/exp(n*ln(x))^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^(-3*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.22287, size = 30, normalized size = 1.11

$$-\frac{3\,bx^{n}+2\,a}{6\,nx^{3\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^(-3*n - 1),x, algorithm="fricas")
```

```
[Out] -1/6*(3*b*x^n + 2*a)/(n*x^(3*n))
```

Sympy [A] time = 15.9825, size = 27, normalized size = 1.

$$\begin{cases} -\frac{ax^{-3n}}{3n}-\frac{bx^{-2n}}{2n} & \text{for}\ n\neq 0 \\ (a+b)\log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-3*n)*(a+b*x**n),x)
```

```
[Out] Piecewise((-a*x**(-3*n)/(3*n) - b*x**(-2*n)/(2*n), Ne(n, 0)), ((a
 + b)*log(x), True))
```

GIAC/XCAS [A] time = 0.214024, size = 31, normalized size = 1.15

$$-\frac{\left(3\,be^{(n\ln(x))}+2\,a\right)e^{(-3\,n\ln(x))}}{6\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^(-3*n - 1),x, algorithm="giac")
```

```
[Out] -1/6*(3*b*e^(n*ln(x)) + 2*a)*e^(-3*n*ln(x))/n
```

3.2519 $\int x^{-1-4n} (a + bx^n) \, dx$

Optimal. Leaf size=27

$$-\frac{ax^{-4n}}{4n} - \frac{bx^{-3n}}{3n}$$

```
[Out] -a/(4*n*x^(4*n)) - b/(3*n*x^(3*n))
```

Rubi [A] time = 0.0233111, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{ax^{-4n}}{4n} - \frac{bx^{-3n}}{3n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 4*n)*(a + b*x^n),x]

[Out] -a/(4*n*x^(4*n)) - b/(3*n*x^(3*n))
```

Rubi in Sympy [A] time = 3.97649, size = 20, normalized size = 0.74

$$-\frac{ax^{-4n}}{4n} - \frac{bx^{-3n}}{3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-4*n)*(a+b*x**n),x)

[Out] -a*x**(-4*n)/(4*n) - b*x**(-3*n)/(3*n)
```

Mathematica [A] time = 0.0115411, size = 22, normalized size = 0.81

$$-\frac{x^{-4n} (3a + 4bx^n)}{12n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 4*n)*(a + b*x^n),x]

[Out] -(3*a + 4*b*x^n)/(12*n*x^(4*n))
```

Maple [A] time = 0.026, size = 27, normalized size = 1.

$$\frac{1}{\left(e^{n\ln(x)}\right)^4}\left(-\frac{a}{4\,n} - \frac{be^{n\ln(x)}}{3\,n}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-4*n)*(a+b*x^n),x)

[Out] (-1/4*a/n-1/3*b/n*exp(n*ln(x)))/exp(n*ln(x))^4
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^(-4*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.222717, size = 30, normalized size = 1.11

$$-\frac{4\,bx^{n} + 3\,a}{12\,nx^{4\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^(-4*n - 1),x, algorithm="fricas")
```

```
[Out] -1/12*(4*b*x^n + 3*a)/(n*x^(4*n))
```

Sympy [A] time = 15.8574, size = 27, normalized size = 1.

$$\begin{cases} -\frac{ax^{-4n}}{4n} - \frac{bx^{-3n}}{3n} & \text{for}\ n \neq 0 \\ (a+b)\log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-4*n)*(a+b*x**n),x)
```

```
[Out] Piecewise((-a*x**(-4*n)/(4*n) - b*x**(-3*n)/(3*n), Ne(n, 0)), ((a
 + b)*log(x), True))
```

GIAC/XCAS [A] time = 0.215324, size = 31, normalized size = 1.15

$$-\frac{\left(4\,be^{(n\ln(x))} + 3\,a\right)e^{(-4\,n\ln(x))}}{12\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^(-4*n - 1),x, algorithm="giac")
```

```
[Out] -1/12*(4*b*e^(n*ln(x)) + 3*a)*e^(-4*n*ln(x))/n
```

3.2520 $\int x^{-1-5n}(a+bx^n)\,dx$

Optimal. Leaf size=27

$$-\frac{ax^{-5n}}{5n}-\frac{bx^{-4n}}{4n}$$

```
[Out] -a/(5*n*x^(5*n)) - b/(4*n*x^(4*n))
```

Rubi [A] time = 0.0222001, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{ax^{-5n}}{5n}-\frac{bx^{-4n}}{4n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 5*n)*(a + b*x^n),x]

[Out] -a/(5*n*x^(5*n)) - b/(4*n*x^(4*n))
```

Rubi in Sympy [A] time = 4.08659, size = 20, normalized size = 0.74

$$-\frac{ax^{-5n}}{5n}-\frac{bx^{-4n}}{4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-5*n)*(a+b*x**n),x)

[Out] -a*x**(-5*n)/(5*n) - b*x**(-4*n)/(4*n)
```

Mathematica [A] time = 0.0118371, size = 22, normalized size = 0.81

$$-\frac{x^{-5n}\left(4a+5bx^n\right)}{20n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 5*n)*(a + b*x^n),x]

[Out] -(4*a + 5*b*x^n)/(20*n*x^(5*n))
```

Maple [A] time = 0.028, size = 27, normalized size = 1.

$$\frac{1}{\left(e^{n\ln(x)}\right)^5}\left(-\frac{a}{5\,n}-\frac{be^{n\ln(x)}}{4\,n}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-5*n)*(a+b*x^n),x)

[Out] (-1/5*a/n-1/4*b/n*exp(n*ln(x)))/exp(n*ln(x))^5
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^(-5*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.223685, size = 30, normalized size = 1.11

$$-\frac{5\,bx^{n}+4\,a}{20\,nx^{5\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^(-5*n - 1),x, algorithm="fricas")
```

```
[Out] -1/20*(5*b*x^n + 4*a)/(n*x^(5*n))
```

Sympy [A] time = 15.7871, size = 27, normalized size = 1.

$$\begin{cases} -\frac{ax^{-5n}}{5n} - \frac{bx^{-4n}}{4n} & \text{for}\ n \neq 0 \\ (a+b)\log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-5*n)*(a+b*x**n),x)
```

```
[Out] Piecewise((-a*x**(-5*n)/(5*n) - b*x**(-4*n)/(4*n), Ne(n, 0)), ((a
 + b)*log(x), True))
```

GIAC/XCAS [A] time = 0.213549, size = 31, normalized size = 1.15

$$-\frac{\left(5\,be^{(n\ln(x))}+4\,a\right)e^{(-5\,n\ln(x))}}{20\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^(-5*n - 1),x, algorithm="giac")
```

```
[Out] -1/20*(5*b*e^(n*ln(x)) + 4*a)*e^(-5*n*ln(x))/n
```

3.2521 $\int x^{-1+4n}(a+bx^n)^2\,dx$

Optimal. Leaf size=45

$$\frac{a^2x^{4n}}{4n}+\frac{2abx^{5n}}{5n}+\frac{b^2x^{6n}}{6n}$$

```
[Out] (a^2*x^(4*n))/(4*n) + (2*a*b*x^(5*n))/(5*n) + (b^2*x^(6*n))/(6*n)
```

Rubi [A] time = 0.0625384, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{a^2x^{4n}}{4n}+\frac{2abx^{5n}}{5n}+\frac{b^2x^{6n}}{6n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + 4*n)*(a + b*x^n)^2,x]
```

```
[Out] (a^2*x^(4*n))/(4*n) + (2*a*b*x^(5*n))/(5*n) + (b^2*x^(6*n))/(6*n)
```

Rubi in Sympy [A] time = 8.86768, size = 36, normalized size = 0.8

$$\frac{a^2x^{4n}}{4n}+\frac{2abx^{5n}}{5n}+\frac{b^2x^{6n}}{6n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+4*n)*(a+b*x**n)**2,x)
```

```
[Out] a**2*x**(4*n)/(4*n) + 2*a*b*x**(5*n)/(5*n) + b**2*x**(6*n)/(6*n)
```

Mathematica [A] time = 0.0209899, size = 35, normalized size = 0.78

$$\frac{x^{4n}\left(15a^2+24abx^n+10b^2x^{2n}\right)}{60n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + 4*n)*(a + b*x^n)^2,x]
```

```
[Out] (x^(4*n)*(15*a^2 + 24*a*b*x^n + 10*b^2*x^(2*n)))/(60*n)
```

Maple [A] time = 0.03, size = 40, normalized size = 0.9

$$\frac{b^2\,(x^n)^6}{6\,n}+\frac{2\,ab\,(x^n)^5}{5\,n}+\frac{a^2\,(x^n)^4}{4\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+4*n)*(a+b*x^n)^2,x)
```

```
[Out] 1/6*b^2/n*(x^n)^6+2/5*a*b/n*(x^n)^5+1/4*a^2/n*(x^n)^4
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^(4*n - 1),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [A] time = 0.223662, size = 47, normalized size = 1.04

$$\frac{10 \, b^{2} x^{6 \, n} + 24 \, a b x^{5 \, n} + 15 \, a^{2} x^{4 \, n}}{60 \, n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^(4*n - 1),x, algorithm="fricas")

[Out] 1/60*(10*b^2*x^(6*n) + 24*a*b*x^(5*n) + 15*a^2*x^(4*n))/n
```

Sympy [A] time = 37.3782, size = 44, normalized size = 0.98

$$\begin{cases} \frac{a^{2} x^{4 n}}{4 n} + \frac{2 a b x^{5 n}}{5 n} + \frac{b^{2} x^{6 n}}{6 n} & \text{for}\: n \neq 0 \\ \left(a + b\right)^{2} \log{\left(x \right)} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+4*n)*(a+b*x**n)**2,x)

[Out] Piecewise((a**2*x**(4*n)/(4*n) + 2*a*b*x**(5*n)/(5*n) + b**2*x**(
6*n)/(6*n), Ne(n, 0)), ((a + b)**2*log(x), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int {\left(b x^{n} + a\right)}^{2} x^{4 \, n - 1}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^(4*n - 1),x, algorithm="giac")

[Out] integrate((b*x^n + a)^2*x^(4*n - 1), x)
```

3.2522 $\int x^{-1+3n} (a + bx^n)^2 \, dx$

Optimal. Leaf size=45

$$\frac{a^2x^{3n}}{3n} + \frac{abx^{4n}}{2n} + \frac{b^2x^{5n}}{5n}$$

```
[Out] (a^2*x^(3*n))/(3*n) + (a*b*x^(4*n))/(2*n) + (b^2*x^(5*n))/(5*n)
```

Rubi [A] time = 0.0553094, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$

$$\frac{a^2x^{3n}}{3n} + \frac{abx^{4n}}{2n} + \frac{b^2x^{5n}}{5n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + 3*n)*(a + b*x^n)^2,x]
```

```
[Out] (a^2*x^(3*n))/(3*n) + (a*b*x^(4*n))/(2*n) + (b^2*x^(5*n))/(5*n)
```

Rubi in Sympy [A] time = 8.59623, size = 34, normalized size = 0.76

$$\frac{a^2x^{3n}}{3n} + \frac{abx^{4n}}{2n} + \frac{b^2x^{5n}}{5n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+3*n)*(a+b*x**n)**2,x)
```

```
[Out] a**2*x**(3*n)/(3*n) + a*b*x**(4*n)/(2*n) + b**2*x**(5*n)/(5*n)
```

Mathematica [A] time = 0.0190441, size = 35, normalized size = 0.78

$$\frac{x^{3n} \left(10a^2 + 15abx^n + 6b^2x^{2n}\right)}{30n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + 3*n)*(a + b*x^n)^2,x]
```

```
[Out] (x^(3*n)*(10*a^2 + 15*a*b*x^n + 6*b^2*x^(2*n)))/(30*n)
```

Maple [A] time = 0.027, size = 46, normalized size = 1.

$$\frac{a^2 \left(e^{n \ln(x)}\right)^3}{3\,n} + \frac{b^2 \left(e^{n \ln(x)}\right)^5}{5\,n} + \frac{ab \left(e^{n \ln(x)}\right)^4}{2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+3*n)*(a+b*x^n)^2,x)
```

```
[Out] 1/3*a^2/n*exp(n*ln(x))^3+1/5*b^2/n*exp(n*ln(x))^5+1/2*a*b/n*exp(n
*ln(x))^4
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^(3*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.223234, size = 47, normalized size = 1.04

$$\frac{6\,b^2x^{5\,n} + 15\,abx^{4\,n} + 10\,a^2x^{3\,n}}{30\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^(3*n - 1),x, algorithm="fricas")
```

```
[Out] 1/30*(6*b^2*x^(5*n) + 15*a*b*x^(4*n) + 10*a^2*x^(3*n))/n
```

Sympy [A] time = 37.11, size = 42, normalized size = 0.93

$$\begin{cases} \frac{a^2x^{3n}}{3n} + \frac{abx^{4n}}{2n} + \frac{b^2x^{5n}}{5n} & \text{for}\: n \neq 0 \\ (a+b)^2 \log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+3*n)*(a+b*x**n)**2,x)
```

```
[Out] Piecewise((a**2*x**(3*n)/(3*n) + a*b*x**(4*n)/(2*n) + b**2*x**(5*
n)/(5*n), Ne(n, 0)), ((a + b)**2*log(x), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^2 x^{3\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^(3*n - 1),x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^2*x^(3*n - 1), x)
```

3.2523 $\int x^{-1+2n}(a+bx^n)^2\,dx$

Optimal. Leaf size=45

$$\frac{a^2x^{2n}}{2n}+\frac{2abx^{3n}}{3n}+\frac{b^2x^{4n}}{4n}$$

```
[Out] (a^2*x^(2*n))/(2*n) + (2*a*b*x^(3*n))/(3*n) + (b^2*x^(4*n))/(4*n)
```

Rubi [A] time = 0.0532772, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{a^2x^{2n}}{2n}+\frac{2abx^{3n}}{3n}+\frac{b^2x^{4n}}{4n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + 2*n)*(a + b*x^n)^2,x]
```

```
[Out] (a^2*x^(2*n))/(2*n) + (2*a*b*x^(3*n))/(3*n) + (b^2*x^(4*n))/(4*n)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^2\int^{x^n}x\,dx}{n}+\frac{2abx^{3n}}{3n}+\frac{b^2x^{4n}}{4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+2*n)*(a+b*x**n)**2,x)
```

```
[Out] a**2*Integral(x, (x, x**n))/n + 2*a*b*x**(3*n)/(3*n) + b**2*x**(4
*n)/(4*n)
```

Mathematica [A] time = 0.0189312, size = 35, normalized size = 0.78

$$\frac{x^{2n}\left(6a^2+8abx^n+3b^2x^{2n}\right)}{12n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + 2*n)*(a + b*x^n)^2,x]
```

```
[Out] (x^(2*n)*(6*a^2 + 8*a*b*x^n + 3*b^2*x^(2*n)))/(12*n)
```

Maple [A] time = 0.025, size = 46, normalized size = 1.

$$\frac{a^2\left(e^{n\ln(x)}\right)^2}{2\,n}+\frac{b^2\left(e^{n\ln(x)}\right)^4}{4\,n}+\frac{2\,ab\left(e^{n\ln(x)}\right)^3}{3\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+2*n)*(a+b*x^n)^2,x)
```

```
[Out] 1/2*a^2/n*exp(n*ln(x))^2+1/4*b^2/n*exp(n*ln(x))^4+2/3*a*b/n*exp(n
*ln(x))^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^(2*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.22452, size = 47, normalized size = 1.04

$$\frac{3\,b^2x^{4\,n} + 8\,abx^{3\,n} + 6\,a^2x^{2\,n}}{12\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^(2*n - 1),x, algorithm="fricas")
```

```
[Out] 1/12*(3*b^2*x^(4*n) + 8*a*b*x^(3*n) + 6*a^2*x^(2*n))/n
```

Sympy [A] time = 37.535, size = 44, normalized size = 0.98

$$\begin{cases} \frac{a^2x^{2n}}{2n} + \frac{2abx^{3n}}{3n} + \frac{b^2x^{4n}}{4n} & \text{for } n \neq 0 \\ (a+b)^2 \log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+2*n)*(a+b*x**n)**2,x)
```

```
[Out] Piecewise((a**2*x**(2*n)/(2*n) + 2*a*b*x**(3*n)/(3*n) + b**2*x**(
4*n)/(4*n), Ne(n, 0)), ((a + b)**2*log(x), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^2 x^{2\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^(2*n - 1),x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^2*x^(2*n - 1), x)
```

3.2524 $\int x^{-1+n} (a + bx^n)^2 \, dx$

Optimal. Leaf size=19

$$\frac{(a + bx^n)^3}{3bn}$$

```
[Out] (a + b*x^n)^3/(3*b*n)
```

Rubi [A] time = 0.0194742, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{(a + bx^n)^3}{3bn}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 + n)*(a + b*x^n)^2,x]

[Out] (a + b*x^n)^3/(3*b*n)
```

Rubi in Sympy [A] time = 2.43293, size = 12, normalized size = 0.63

$$\frac{(a + bx^n)^3}{3bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1+n)*(a+b*x**n)**2,x)

[Out] (a + b*x**n)**3/(3*b*n)
```

Mathematica [A] time = 0.0111226, size = 19, normalized size = 1.

$$\frac{(a + bx^n)^3}{3bn}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 + n)*(a + b*x^n)^2,x]

[Out] (a + b*x^n)^3/(3*b*n)
```

Maple [B] time = 0.023, size = 42, normalized size = 2.2

$$\frac{a^2 e^{n \ln(x)}}{n} + \frac{ab \left(e^{n \ln(x)}\right)^2}{n} + \frac{b^2 \left(e^{n \ln(x)}\right)^3}{3\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-1+n)*(a+b*x^n)^2,x)

[Out] a^2/n*exp(n*ln(x))+a*b/n*exp(n*ln(x))^2+1/3*b^2/n*exp(n*ln(x))^3
```

Maxima [A] time = 1.43268, size = 23, normalized size = 1.21

$$\frac{(bx^n + a)^3}{3\,bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^(n - 1),x, algorithm="maxima")
```

```
[Out] 1/3*(b*x^n + a)^3/(b*n)
```

Fricas [A] time = 0.225397, size = 43, normalized size = 2.26

$$\frac{b^2x^{3\,n} + 3\,abx^{2\,n} + 3\,a^2x^n}{3\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^(n - 1),x, algorithm="fricas")
```

```
[Out] 1/3*(b^2*x^(3*n) + 3*a*b*x^(2*n) + 3*a^2*x^n)/n
```

Sympy [A] time = 8.79257, size = 37, normalized size = 1.95

$$\begin{cases} \frac{a^2x^n}{n} + \frac{abx^{2n}}{n} + \frac{b^2x^{3n}}{3n} & \text{for}\ n \neq 0 \\ (a+b)^2 \log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+n)*(a+b*x**n)**2,x)
```

```
[Out] Piecewise((a**2*x**n/n + a*b*x**(2*n)/n + b**2*x**(3*n)/(3*n), Ne
(n, 0)), ((a + b)**2*log(x), True))
```

GIAC/XCAS [A] time = 0.214922, size = 43, normalized size = 2.26

$$\frac{b^2x^{3\,n} + 3\,abx^{2\,n} + 3\,a^2x^n}{3\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^(n - 1),x, algorithm="giac")
```

```
[Out] 1/3*(b^2*x^(3*n) + 3*a*b*x^(2*n) + 3*a^2*x^n)/n
```

3.2525 $\int \frac{(a+bx^n)^2}{x} \, dx$

Optimal. Leaf size=32

$$a^2 \log(x) + \frac{2abx^n}{n} + \frac{b^2x^{2n}}{2n}$$

```
[Out] (2*a*b*x^n)/n + (b^2*x^(2*n))/(2*n) + a^2*Log[x]
```

Rubi [A] time = 0.0411937, antiderivative size = 32, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$a^2 \log(x) + \frac{2abx^n}{n} + \frac{b^2x^{2n}}{2n}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^2/x,x]

[Out] (2*a*b*x^n)/n + (b^2*x^(2*n))/(2*n) + a^2*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^2 \log(x^n)}{n} + \frac{2abx^n}{n} + \frac{b^2 \int^{x^n} x \, dx}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**n)**2/x,x)

[Out] a**2*log(x**n)/n + 2*a*b*x**n/n + b**2*Integral(x, (x, x**n))/n
```

Mathematica [A] time = 0.0284948, size = 27, normalized size = 0.84

$$a^2 \log(x) + \frac{bx^n(4a + bx^n)}{2n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^2/x,x]

[Out] (b*x^n*(4*a + b*x^n))/(2*n) + a^2*Log[x]
```

Maple [A] time = 0., size = 36, normalized size = 1.1

$$\frac{(x^n)^2 b^2}{2n} + 2\frac{abx^n}{n} + \frac{a^2 \ln(x^n)}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^2/x,x)

[Out] 1/2/n*(x^n)^2*b^2+2*a*b*x^n/n+1/n*a^2*ln(x^n)
```

Maxima [A] time = 1.43455, size = 46, normalized size = 1.44

$$\frac{a^2 \log(x^n)}{n} + \frac{b^2 x^{2\,n} + 4\,abx^n}{2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2/x,x, algorithm="maxima")
```

```
[Out] a^2*log(x^n)/n + 1/2*(b^2*x^(2*n) + 4*a*b*x^n)/n
```

Fricas [A] time = 0.225988, size = 41, normalized size = 1.28

$$\frac{2\,a^2 n \log(x) + b^2 x^{2\,n} + 4\,abx^n}{2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2/x,x, algorithm="fricas")
```

```
[Out] 1/2*(2*a^2*n*log(x) + b^2*x^(2*n) + 4*a*b*x^n)/n
```

Sympy [A] time = 0.695519, size = 36, normalized size = 1.12

$$\begin{cases} a^2 \log(x) + \frac{2abx^n}{n} + \frac{b^2x^{2n}}{2n} & \text{for}\ n \neq 0 \\ (a+b)^2 \log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**2/x,x)
```

```
[Out] Piecewise((a**2*log(x) + 2*a*b*x**n/n + b**2*x**(2*n)/(2*n), Ne(n
, 0)), ((a + b)**2*log(x), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^n + a)^2}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2/x,x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^2/x, x)
```

3.2526 $\int x^{-1-n}(a+bx^n)^2\,dx$

Optimal. Leaf size=30

$$-\frac{a^2x^{-n}}{n}+2ab\log(x)+\frac{b^2x^n}{n}$$

```
[Out] -(a^2/(n*x^n)) + (b^2*x^n)/n + 2*a*b*Log[x]
```

Rubi [A] time = 0.0457713, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{a^2x^{-n}}{n}+2ab\log(x)+\frac{b^2x^n}{n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - n)*(a + b*x^n)^2,x]

[Out] -(a^2/(n*x^n)) + (b^2*x^n)/n + 2*a*b*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^2x^{-n}}{n}+\frac{2ab\log\left(x^n\right)}{n}+\frac{\int^{x^n}b^2\,dx}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-n)*(a+b*x**n)**2,x)

[Out] -a**2*x**(-n)/n + 2*a*b*log(x**n)/n + Integral(b**2, (x, x**n))/n
```

Mathematica [A] time = 0.028202, size = 30, normalized size = 1.

$$-\frac{a^2x^{-n}}{n}+2ab\log(x)+\frac{b^2x^n}{n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - n)*(a + b*x^n)^2,x]

[Out] -(a^2/(n*x^n)) + (b^2*x^n)/n + 2*a*b*Log[x]
```

Maple [A] time = 0.021, size = 43, normalized size = 1.4

$$\frac{1}{e^{n\ln(x)}}\left(\frac{b^2\left(e^{n\ln(x)}\right)^2}{n}+2\,ab\ln(x)\,e^{n\ln(x)}-\frac{a^2}{n}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-n)*(a+b*x^n)^2,x)
```

```
[Out] (b^2/n*exp(n*ln(x))^2+2*a*b*ln(x)*exp(n*ln(x))-a^2/n)/exp(n*ln(x)
)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^(-n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.225097, size = 46, normalized size = 1.53

$$\frac{2\,abnx^{n}\log\left(x\right)+b^{2}x^{2\,n}-a^{2}}{nx^{n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^(-n - 1),x, algorithm="fricas")
```

```
[Out] (2*a*b*n*x^n*log(x) + b^2*x^(2*n) - a^2)/(n*x^n)
```

Sympy [A] time = 137.979, size = 175, normalized size = 5.83

$$\begin{cases} a^{2}x+2ab\log\left(x\right)-\frac{b^{2}}{x} & \text{for}\ n=-1\\ \left(a+b\right)^{2}\log\left(x\right) & \text{for}\ n=0\\ -\frac{a^{2}n}{n^{2}x^{n}+nx^{n}}-\frac{a^{2}}{n^{2}x^{n}+nx^{n}}+\frac{2abn^{2}x^{n}\log\left(x\right)}{n^{2}x^{n}+nx^{n}}+\frac{2abnx^{n}\log\left(x\right)}{n^{2}x^{n}+nx^{n}}+\frac{2abnx^{n}}{n^{2}x^{n}+nx^{n}}+\frac{b^{2}nx^{2n}}{n^{2}x^{n}+nx^{n}}+\frac{b^{2}x^{2n}}{n^{2}x^{n}+nx^{n}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-n)*(a+b*x**n)**2,x)
```

```
[Out] Piecewise((a**2*x + 2*a*b*log(x) - b**2/x, Eq(n, -1)), ((a + b)**
2*log(x), Eq(n, 0)), (-a**2*n/(n**2*x**n + n*x**n) - a**2/(n**2*x
**n + n*x**n) + 2*a*b*n**2*x**n*log(x)/(n**2*x**n + n*x**n) + 2*a
*b*n*x**n*log(x)/(n**2*x**n + n*x**n) + 2*a*b*n*x**n/(n**2*x**n +
 n*x**n) + b**2*n*x**(2*n)/(n**2*x**n + n*x**n) + b**2*x**(2*n)/(
n**2*x**n + n*x**n), True))
```

GIAC/XCAS [A] time = 0.221215, size = 51, normalized size = 1.7

$$\frac{\left(2\,abne^{\left(n\ln\left(x\right)\right)}\ln\left(x\right)+b^{2}e^{\left(2\,n\ln\left(x\right)\right)}-a^{2}\right)e^{\left(-n\ln\left(x\right)\right)}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^(-n - 1),x, algorithm="giac")
```

```
[Out] (2*a*b*n*e^(n*ln(x))*ln(x) + b^2*e^(2*n*ln(x)) - a^2)*e^(-n*ln(x)
)/n
```

3.2527 $\int x^{-1-2n} (a + bx^n)^2 \, dx$

Optimal. Leaf size=34

$$-\frac{a^2x^{-2n}}{2n} - \frac{2abx^{-n}}{n} + b^2\log(x)$$

```
[Out] -a^2/(2*n*x^(2*n)) - (2*a*b)/(n*x^n) + b^2*Log[x]
```

Rubi [A] time = 0.0477683, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{a^2x^{-2n}}{2n} - \frac{2abx^{-n}}{n} + b^2\log(x)$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 2*n)*(a + b*x^n)^2,x]
```

```
[Out] -a^2/(2*n*x^(2*n)) - (2*a*b)/(n*x^n) + b^2*Log[x]
```

Rubi in Sympy [A] time = 7.65974, size = 31, normalized size = 0.91

$$-\frac{a^2x^{-2n}}{2n} - \frac{2abx^{-n}}{n} + \frac{b^2\log(x^n)}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-2*n)*(a+b*x**n)**2,x)
```

```
[Out] -a**2*x**(-2*n)/(2*n) - 2*a*b*x**(-n)/n + b**2*log(x**n)/n
```

Mathematica [A] time = 0.0587054, size = 28, normalized size = 0.82

$$b^2\log(x) - \frac{ax^{-2n}(a + 4bx^n)}{2n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 2*n)*(a + b*x^n)^2,x]
```

```
[Out] -(a*(a + 4*b*x^n))/(2*n*x^(2*n)) + b^2*Log[x]
```

Maple [A] time = 0.021, size = 43, normalized size = 1.3

$$\frac{1}{\left(e^{n\ln(x)}\right)^2}\left(b^2\ln(x)\left(e^{n\ln(x)}\right)^2 - \frac{a^2}{2n} - 2\frac{ae^{n\ln(x)}b}{n}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-2*n)*(a+b*x^n)^2,x)
```

```
[Out] (b^2*ln(x)*exp(n*ln(x))^2-1/2*a^2/n-2*a*b/n*exp(n*ln(x)))/exp(n*l
n(x))^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^(-2*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.224981, size = 51, normalized size = 1.5

$$\frac{2\, b^{2} n x^{2\, n} \log\left(x\right) - 4\, a b x^{n} - a^{2}}{2\, n x^{2\, n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^(-2*n - 1),x, algorithm="fricas")
```

```
[Out] 1/2*(2*b^2*n*x^(2*n)*log(x) - 4*a*b*x^n - a^2)/(n*x^(2*n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-2*n)*(a+b*x**n)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.219392, size = 54, normalized size = 1.59

$$\frac{\left(2\, b^{2} n e^{\left(2\, n \ln\left(x\right)\right)} \ln\left(x\right) - 4\, a b e^{\left(n \ln\left(x\right)\right)} - a^{2}\right) e^{\left(-2\, n \ln\left(x\right)\right)}}{2\, n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^(-2*n - 1),x, algorithm="giac")
```

```
[Out] 1/2*(2*b^2*n*e^(2*n*ln(x))*ln(x) - 4*a*b*e^(n*ln(x)) - a^2)*e^(-2
*n*ln(x))/n
```

3.2528 $\int x^{-1-3n}(a+bx^n)^2\,dx$

Optimal. Leaf size=24

$$-\frac{x^{-3n}(a+bx^n)^3}{3an}$$

```
[Out] -(a + b*x^n)^3/(3*a*n*x^(3*n))
```

Rubi [A] time = 0.0210002, antiderivative size = 24, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.059$

$$-\frac{x^{-3n}(a+bx^n)^3}{3an}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 3*n)*(a + b*x^n)^2,x]

[Out] -(a + b*x^n)^3/(3*a*n*x^(3*n))
```

Rubi in Sympy [A] time = 3.11272, size = 19, normalized size = 0.79

$$-\frac{x^{-3n}(a+bx^n)^3}{3an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-3*n)*(a+b*x**n)**2,x)

[Out] -x**(-3*n)*(a + b*x**n)**3/(3*a*n)
```

Mathematica [A] time = 0.0219348, size = 33, normalized size = 1.38

$$-\frac{x^{-3n}\left(a^2+3abx^n+3b^2x^{2n}\right)}{3n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 3*n)*(a + b*x^n)^2,x]

[Out] -(a^2 + 3*a*b*x^n + 3*b^2*x^(2*n))/(3*n*x^(3*n))
```

Maple [A] time = 0.023, size = 45, normalized size = 1.9

$$\frac{1}{\left(e^{n\ln(x)}\right)^3}\left(-\frac{a^2}{3\,n}-\frac{b^2\left(e^{n\ln(x)}\right)^2}{n}-\frac{ae^{n\ln(x)}b}{n}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-3*n)*(a+b*x^n)^2,x)
```

```
[Out] (-1/3*a^2/n-b^2/n*exp(n*ln(x))^2-a*b/n*exp(n*ln(x)))/exp(n*ln(x))
^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^(-3*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.225579, size = 45, normalized size = 1.88

$$-\frac{3\,b^2x^{2\,n} + 3\,abx^n + a^2}{3\,nx^{3\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^(-3*n - 1),x, algorithm="fricas")
```

```
[Out] -1/3*(3*b^2*x^(2*n) + 3*a*b*x^n + a^2)/(n*x^(3*n))
```

Sympy [A] time = 38.6669, size = 39, normalized size = 1.62

$$\begin{cases} -\frac{a^2x^{-3n}}{3n} - \frac{abx^{-2n}}{n} - \frac{b^2x^{-n}}{n} & \text{for } n \neq 0 \\ (a+b)^2\log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-3*n)*(a+b*x**n)**2,x)
```

```
[Out] Piecewise((-a**2*x**(-3*n)/(3*n) - a*b*x**(-2*n)/n - b**2*x**(-n)
/n, Ne(n, 0)), ((a + b)**2*log(x), True))
```

GIAC/XCAS [A] time = 0.219769, size = 47, normalized size = 1.96

$$-\frac{\left(3\,b^2e^{(2\,n\ln(x))} + 3\,abe^{(n\ln(x))} + a^2\right)e^{(-3\,n\ln(x))}}{3\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^(-3*n - 1),x, algorithm="giac")
```

```
[Out] -1/3*(3*b^2*e^(2*n*ln(x)) + 3*a*b*e^(n*ln(x)) + a^2)*e^(-3*n*ln(x
))/n
```

3.2529 $\int x^{-1-4n}(a+bx^n)^2\,dx$

Optimal. Leaf size=45

$$-\frac{a^2x^{-4n}}{4n}-\frac{2abx^{-3n}}{3n}-\frac{b^2x^{-2n}}{2n}$$

```
[Out] -a^2/(4*n*x^(4*n)) - (2*a*b)/(3*n*x^(3*n)) - b^2/(2*n*x^(2*n))
```

Rubi [A] time = 0.0527223, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{a^2x^{-4n}}{4n}-\frac{2abx^{-3n}}{3n}-\frac{b^2x^{-2n}}{2n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 4*n)*(a + b*x^n)^2,x]
```

```
[Out] -a^2/(4*n*x^(4*n)) - (2*a*b)/(3*n*x^(3*n)) - b^2/(2*n*x^(2*n))
```

Rubi in Sympy [A] time = 8.10305, size = 37, normalized size = 0.82

$$-\frac{a^2x^{-4n}}{4n}-\frac{2abx^{-3n}}{3n}-\frac{b^2x^{-2n}}{2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-4*n)*(a+b*x**n)**2,x)
```

```
[Out] -a**2*x**(-4*n)/(4*n) - 2*a*b*x**(-3*n)/(3*n) - b**2*x**(-2*n)/(2
*n)
```

Mathematica [A] time = 0.0234455, size = 35, normalized size = 0.78

$$-\frac{x^{-4n}\left(3a^2+8abx^n+6b^2x^{2n}\right)}{12n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 4*n)*(a + b*x^n)^2,x]
```

```
[Out] -(3*a^2 + 8*a*b*x^n + 6*b^2*x^(2*n))/(12*n*x^(4*n))
```

Maple [A] time = 0.025, size = 45, normalized size = 1.

$$\frac{1}{\left(e^{n\ln(x)}\right)^4}\left(-\frac{a^2}{4\,n}-\frac{b^2\left(e^{n\ln(x)}\right)^2}{2\,n}-\frac{2\,ae^{n\ln(x)}b}{3\,n}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-4*n)*(a+b*x^n)^2,x)
```

```
[Out] (-1/4*a^2/n-1/2*b^2/n*exp(n*ln(x))^2-2/3*a*b/n*exp(n*ln(x)))/exp(
n*ln(x))^4
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^(-4*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.224183, size = 47, normalized size = 1.04

$$-\frac{6\,b^2x^{2\,n} + 8\,abx^n + 3\,a^2}{12\,nx^{4\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^(-4*n - 1),x, algorithm="fricas")
```

```
[Out] -1/12*(6*b^2*x^(2*n) + 8*a*b*x^n + 3*a^2)/(n*x^(4*n))
```

Sympy [A] time = 38.6359, size = 46, normalized size = 1.02

$$\begin{cases} -\frac{a^2x^{-4n}}{4n} - \frac{2abx^{-3n}}{3n} - \frac{b^2x^{-2n}}{2n} & \text{for}\: n \neq 0 \\ (a+b)^2\log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-4*n)*(a+b*x**n)**2,x)
```

```
[Out] Piecewise((-a**2*x**(-4*n)/(4*n) - 2*a*b*x**(-3*n)/(3*n) - b**2*x
**(-2*n)/(2*n), Ne(n, 0)), ((a + b)**2*log(x), True))
```

GIAC/XCAS [A] time = 0.218653, size = 50, normalized size = 1.11

$$-\frac{\left(6\,b^2e^{(2\,n\ln(x))} + 8\,abe^{(n\ln(x))} + 3\,a^2\right)e^{(-4\,n\ln(x))}}{12\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^(-4*n - 1),x, algorithm="giac")
```

```
[Out] -1/12*(6*b^2*e^(2*n*ln(x)) + 8*a*b*e^(n*ln(x)) + 3*a^2)*e^(-4*n*l
n(x))/n
```

3.2530 $\int x^{-1-5n} (a + bx^n)^2 \, dx$

Optimal. Leaf size=45

$$-\frac{a^2x^{-5n}}{5n} - \frac{abx^{-4n}}{2n} - \frac{b^2x^{-3n}}{3n}$$

```
[Out] -a^2/(5*n*x^(5*n)) - (a*b)/(2*n*x^(4*n)) - b^2/(3*n*x^(3*n))
```

Rubi [A] time = 0.0525738, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{a^2x^{-5n}}{5n} - \frac{abx^{-4n}}{2n} - \frac{b^2x^{-3n}}{3n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 5*n)*(a + b*x^n)^2,x]
```

```
[Out] -a^2/(5*n*x^(5*n)) - (a*b)/(2*n*x^(4*n)) - b^2/(3*n*x^(3*n))
```

Rubi in Sympy [A] time = 8.09847, size = 36, normalized size = 0.8

$$-\frac{a^2x^{-5n}}{5n} - \frac{abx^{-4n}}{2n} - \frac{b^2x^{-3n}}{3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-5*n)*(a+b*x**n)**2,x)
```

```
[Out] -a**2*x**(-5*n)/(5*n) - a*b*x**(-4*n)/(2*n) - b**2*x**(-3*n)/(3*n
)
```

Mathematica [A] time = 0.0233207, size = 35, normalized size = 0.78

$$-\frac{x^{-5n} \left(6a^2 + 15abx^n + 10b^2x^{2n}\right)}{30n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 5*n)*(a + b*x^n)^2,x]
```

```
[Out] -(6*a^2 + 15*a*b*x^n + 10*b^2*x^(2*n))/(30*n*x^(5*n))
```

Maple [A] time = 0.028, size = 45, normalized size = 1.

$$\frac{1}{\left(e^{n\ln(x)}\right)^5} \left(-\frac{a^2}{5\,n} - \frac{b^2 \left(e^{n\ln(x)}\right)^2}{3\,n} - \frac{a e^{n\ln(x)} b}{2\,n}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-5*n)*(a+b*x^n)^2,x)
```

```
[Out] (-1/5*a^2/n-1/3*b^2/n*exp(n*ln(x))^2-1/2*a*b/n*exp(n*ln(x)))/exp(
n*ln(x))^5
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^(-5*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.224038, size = 47, normalized size = 1.04

$$-\frac{10\,b^2x^{2\,n} + 15\,abx^n + 6\,a^2}{30\,nx^{5\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^(-5*n - 1),x, algorithm="fricas")
```

```
[Out] -1/30*(10*b^2*x^(2*n) + 15*a*b*x^n + 6*a^2)/(n*x^(5*n))
```

Sympy [A] time = 37.4153, size = 44, normalized size = 0.98

$$\begin{cases} -\frac{a^2x^{-5n}}{5n} - \frac{abx^{-4n}}{2n} - \frac{b^2x^{-3n}}{3n} & \text{for}\ n \neq 0 \\ (a+b)^2\log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-5*n)*(a+b*x**n)**2,x)
```

```
[Out] Piecewise((-a**2*x**(-5*n)/(5*n) - a*b*x**(-4*n)/(2*n) - b**2*x**
(-3*n)/(3*n), Ne(n, 0)), ((a + b)**2*log(x), True))
```

GIAC/XCAS [A] time = 0.221069, size = 50, normalized size = 1.11

$$-\frac{\left(10\,b^2e^{(2\,n\ln(x))} + 15\,abe^{(n\ln(x))} + 6\,a^2\right)e^{(-5\,n\ln(x))}}{30\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^(-5*n - 1),x, algorithm="giac")
```

```
[Out] -1/30*(10*b^2*e^(2*n*ln(x)) + 15*a*b*e^(n*ln(x)) + 6*a^2)*e^(-5*n
*ln(x))/n
```

3.2531 $\int x^{-1-6n} (a + bx^n)^2 \, dx$

Optimal. Leaf size=45

$$-\frac{a^2x^{-6n}}{6n} - \frac{2abx^{-5n}}{5n} - \frac{b^2x^{-4n}}{4n}$$

```
[Out] -a^2/(6*n*x^(6*n)) - (2*a*b)/(5*n*x^(5*n)) - b^2/(4*n*x^(4*n))
```

Rubi [A] time = 0.0517531, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{a^2x^{-6n}}{6n} - \frac{2abx^{-5n}}{5n} - \frac{b^2x^{-4n}}{4n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 6*n)*(a + b*x^n)^2,x]
```

```
[Out] -a^2/(6*n*x^(6*n)) - (2*a*b)/(5*n*x^(5*n)) - b^2/(4*n*x^(4*n))
```

Rubi in Sympy [A] time = 8.30522, size = 37, normalized size = 0.82

$$-\frac{a^2x^{-6n}}{6n} - \frac{2abx^{-5n}}{5n} - \frac{b^2x^{-4n}}{4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-6*n)*(a+b*x**n)**2,x)
```

```
[Out] -a**2*x**(-6*n)/(6*n) - 2*a*b*x**(-5*n)/(5*n) - b**2*x**(-4*n)/(4
*n)
```

Mathematica [A] time = 0.0242048, size = 35, normalized size = 0.78

$$-\frac{x^{-6n}\left(10a^2 + 24abx^n + 15b^2x^{2n}\right)}{60n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 6*n)*(a + b*x^n)^2,x]
```

```
[Out] -(10*a^2 + 24*a*b*x^n + 15*b^2*x^(2*n))/(60*n*x^(6*n))
```

Maple [A] time = 0.031, size = 40, normalized size = 0.9

$$-\frac{b^2}{4\,n\,(x^n)^4} - \frac{2\,ab}{5\,n\,(x^n)^5} - \frac{a^2}{6\,n\,(x^n)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-6*n)*(a+b*x^n)^2,x)
```

```
[Out] -1/4*b^2/n/(x^n)^4-2/5*a*b/n/(x^n)^5-1/6*a^2/n/(x^n)^6
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^(-6*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.224991, size = 47, normalized size = 1.04

$$-\frac{15\, b^{2} x^{2\, n} + 24\, a b x^{n} + 10\, a^{2}}{60\, n x^{6\, n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^(-6*n - 1),x, algorithm="fricas")
```

```
[Out] -1/60*(15*b^2*x^(2*n) + 24*a*b*x^n + 10*a^2)/(n*x^(6*n))
```

Sympy [A] time = 38.7945, size = 46, normalized size = 1.02

$$\begin{cases} -\frac{a^{2} x^{-6n}}{6n} - \frac{2abx^{-5n}}{5n} - \frac{b^{2} x^{-4n}}{4n} & \text{for}\: n \neq 0 \\ (a+b)^{2} \log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-6*n)*(a+b*x**n)**2,x)
```

```
[Out] Piecewise((-a**2*x**(-6*n)/(6*n) - 2*a*b*x**(-5*n)/(5*n) - b**2*x
**(-4*n)/(4*n), Ne(n, 0)), ((a + b)**2*log(x), True))
```

GIAC/XCAS [A] time = 0.219009, size = 50, normalized size = 1.11

$$-\frac{\left(15\, b^{2} e^{\left(2\, n \ln(x)\right)} + 24\, a b e^{\left(n \ln(x)\right)} + 10\, a^{2}\right) e^{\left(-6\, n \ln(x)\right)}}{60\, n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^(-6*n - 1),x, algorithm="giac")
```

```
[Out] -1/60*(15*b^2*e^(2*n*ln(x)) + 24*a*b*e^(n*ln(x)) + 10*a^2)*e^(-6*
n*ln(x))/n
```

3.2532 $\int x^{-1+4n}(a+bx^n)^3\,dx$

Optimal. Leaf size=63

$$\frac{a^3x^{4n}}{4n}+\frac{3a^2bx^{5n}}{5n}+\frac{ab^2x^{6n}}{2n}+\frac{b^3x^{7n}}{7n}$$

```
[Out] (a^3*x^(4*n))/(4*n) + (3*a^2*b*x^(5*n))/(5*n) + (a*b^2*x^(6*n))/(
2*n) + (b^3*x^(7*n))/(7*n)
```

Rubi [A] time = 0.0774832, antiderivative size = 63, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{a^3x^{4n}}{4n}+\frac{3a^2bx^{5n}}{5n}+\frac{ab^2x^{6n}}{2n}+\frac{b^3x^{7n}}{7n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + 4*n)*(a + b*x^n)^3,x]
```

```
[Out] (a^3*x^(4*n))/(4*n) + (3*a^2*b*x^(5*n))/(5*n) + (a*b^2*x^(6*n))/(
2*n) + (b^3*x^(7*n))/(7*n)
```

Rubi in Sympy [A] time = 11.8985, size = 51, normalized size = 0.81

$$\frac{a^3x^{4n}}{4n}+\frac{3a^2bx^{5n}}{5n}+\frac{ab^2x^{6n}}{2n}+\frac{b^3x^{7n}}{7n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+4*n)*(a+b*x**n)**3,x)
```

```
[Out] a**3*x**(4*n)/(4*n) + 3*a**2*b*x**(5*n)/(5*n) + a*b**2*x**(6*n)/(
2*n) + b**3*x**(7*n)/(7*n)
```

Mathematica [A] time = 0.0272536, size = 48, normalized size = 0.76

$$\frac{x^{4n}\left(35a^3+84a^2bx^n+70ab^2x^{2n}+20b^3x^{3n}\right)}{140n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + 4*n)*(a + b*x^n)^3,x]
```

```
[Out] (x^(4*n)*(35*a^3 + 84*a^2*b*x^n + 70*a*b^2*x^(2*n) + 20*b^3*x^(3*
n)))/(140*n)
```

Maple [A] time = 0.031, size = 56, normalized size = 0.9

$$\frac{b^3\left(x^n\right)^7}{7\,n}+\frac{ab^2\left(x^n\right)^6}{2\,n}+\frac{3\,a^2b\left(x^n\right)^5}{5\,n}+\frac{a^3\left(x^n\right)^4}{4\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+4*n)*(a+b*x^n)^3,x)
```

```
[Out] 1/7*b^3/n*(x^n)^7+1/2*a*b^2/n*(x^n)^6+3/5*a^2*b/n*(x^n)^5+1/4*a^3
/n*(x^n)^4
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^(4*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.224153, size = 65, normalized size = 1.03

$$\frac{20\, b^{3} x^{7\, n} + 70\, a b^{2} x^{6\, n} + 84\, a^{2} b x^{5\, n} + 35\, a^{3} x^{4\, n}}{140\, n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^(4*n - 1),x, algorithm="fricas")
```

```
[Out] 1/140*(20*b^3*x^(7*n) + 70*a*b^2*x^(6*n) + 84*a^2*b*x^(5*n) + 35*
a^3*x^(4*n))/n
```

Sympy [A] time = 115.963, size = 60, normalized size = 0.95

$$\begin{cases} \frac{a^{3} x^{4 n}}{4 n} + \frac{3 a^{2} b x^{5 n}}{5 n} + \frac{a b^{2} x^{6 n}}{2 n} + \frac{b^{3} x^{7 n}}{7 n} & \text{for}\: n \neq 0 \\\left(a + b\right)^{3} \log{\left(x \right)} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+4*n)*(a+b*x**n)**3,x)
```

```
[Out] Piecewise((a**3*x**(4*n)/(4*n) + 3*a**2*b*x**(5*n)/(5*n) + a*b**2
*x**(6*n)/(2*n) + b**3*x**(7*n)/(7*n), Ne(n, 0)), ((a + b)**3*log
(x), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^3 x^{4\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^(4*n - 1),x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^3*x^(4*n - 1), x)
```

3.2533 $\int x^{-1+3n}(a+bx^n)^3\,dx$

Optimal. Leaf size=63

$$\frac{a^3x^{3n}}{3n}+\frac{3a^2bx^{4n}}{4n}+\frac{3ab^2x^{5n}}{5n}+\frac{b^3x^{6n}}{6n}$$

```
[Out] (a^3*x^(3*n))/(3*n) + (3*a^2*b*x^(4*n))/(4*n) + (3*a*b^2*x^(5*n))
/(5*n) + (b^3*x^(6*n))/(6*n)
```

Rubi [A] time = 0.0721114, antiderivative size = 63, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{a^3x^{3n}}{3n}+\frac{3a^2bx^{4n}}{4n}+\frac{3ab^2x^{5n}}{5n}+\frac{b^3x^{6n}}{6n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + 3*n)*(a + b*x^n)^3,x]
```

```
[Out] (a^3*x^(3*n))/(3*n) + (3*a^2*b*x^(4*n))/(4*n) + (3*a*b^2*x^(5*n))
/(5*n) + (b^3*x^(6*n))/(6*n)
```

Rubi in Sympy [A] time = 11.2901, size = 53, normalized size = 0.84

$$\frac{a^3x^{3n}}{3n}+\frac{3a^2bx^{4n}}{4n}+\frac{3ab^2x^{5n}}{5n}+\frac{b^3x^{6n}}{6n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+3*n)*(a+b*x**n)**3,x)
```

```
[Out] a**3*x**(3*n)/(3*n) + 3*a**2*b*x**(4*n)/(4*n) + 3*a*b**2*x**(5*n)
/(5*n) + b**3*x**(6*n)/(6*n)
```

Mathematica [A] time = 0.0234826, size = 48, normalized size = 0.76

$$\frac{x^{3n}\left(20a^3+45a^2bx^n+36ab^2x^{2n}+10b^3x^{3n}\right)}{60n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + 3*n)*(a + b*x^n)^3,x]
```

```
[Out] (x^(3*n)*(20*a^3 + 45*a^2*b*x^n + 36*a*b^2*x^(2*n) + 10*b^3*x^(3*
n)))/(60*n)
```

Maple [A] time = 0.03, size = 56, normalized size = 0.9

$$\frac{b^3\left(x^n\right)^6}{6\,n}+\frac{3\,ab^2\left(x^n\right)^5}{5\,n}+\frac{3\,a^2b\left(x^n\right)^4}{4\,n}+\frac{a^3\left(x^n\right)^3}{3\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+3*n)*(a+b*x^n)^3,x)
```

```
[Out] 1/6*b^3/n*(x^n)^6+3/5*a*b^2/n*(x^n)^5+3/4*a^2*b/n*(x^n)^4+1/3*a^3
/n*(x^n)^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^(3*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.22497, size = 65, normalized size = 1.03

$$\frac{10\,b^3 x^{6\,n} + 36\,ab^2 x^{5\,n} + 45\,a^2 bx^{4\,n} + 20\,a^3 x^{3\,n}}{60\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^(3*n - 1),x, algorithm="fricas")
```

```
[Out] 1/60*(10*b^3*x^(6*n) + 36*a*b^2*x^(5*n) + 45*a^2*b*x^(4*n) + 20*a
^3*x^(3*n))/n
```

Sympy [A] time = 116.467, size = 61, normalized size = 0.97

$$\begin{cases} \frac{a^3x^{3n}}{3n} + \frac{3a^2bx^{4n}}{4n} + \frac{3ab^2x^{5n}}{5n} + \frac{b^3x^{6n}}{6n} & \text{for}\ n \neq 0 \\ (a+b)^3 \log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+3*n)*(a+b*x**n)**3,x)
```

```
[Out] Piecewise((a**3*x**(3*n)/(3*n) + 3*a**2*b*x**(4*n)/(4*n) + 3*a*b*
*2*x**(5*n)/(5*n) + b**3*x**(6*n)/(6*n), Ne(n, 0)), ((a + b)**3*l
og(x), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^3 x^{3\,n-1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^(3*n - 1),x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^3*x^(3*n - 1), x)
```

3.2534 $\int x^{-1+2n}(a+bx^n)^3\,dx$

Optimal. Leaf size=40

$$\frac{(a+bx^n)^5}{5b^2n}-\frac{a(a+bx^n)^4}{4b^2n}$$

```
[Out] -(a*(a + b*x^n)^4)/(4*b^2*n) + (a + b*x^n)^5/(5*b^2*n)
```

Rubi [A] time = 0.0577, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{(a+bx^n)^5}{5b^2n}-\frac{a(a+bx^n)^4}{4b^2n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + 2*n)*(a + b*x^n)^3,x]
```

```
[Out] -(a*(a + b*x^n)^4)/(4*b^2*n) + (a + b*x^n)^5/(5*b^2*n)
```

Rubi in Sympy [A] time = 9.04643, size = 31, normalized size = 0.78

$$-\frac{a(a+bx^n)^4}{4b^2n}+\frac{(a+bx^n)^5}{5b^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+2*n)*(a+b*x**n)**3,x)
```

```
[Out] -a*(a + b*x**n)**4/(4*b**2*n) + (a + b*x**n)**5/(5*b**2*n)
```

Mathematica [A] time = 0.023384, size = 48, normalized size = 1.2

$$\frac{x^{2n}\left(10a^3+20a^2bx^n+15ab^2x^{2n}+4b^3x^{3n}\right)}{20n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + 2*n)*(a + b*x^n)^3,x]
```

```
[Out] (x^(2*n)*(10*a^3 + 20*a^2*b*x^n + 15*a*b^2*x^(2*n) + 4*b^3*x^(3*n
)))/(20*n)
```

Maple [A] time = 0.026, size = 63, normalized size = 1.6

$$\frac{a^2b\left(e^{n\ln(x)}\right)^3}{n}+\frac{a^3\left(e^{n\ln(x)}\right)^2}{2n}+\frac{b^3\left(e^{n\ln(x)}\right)^5}{5n}+\frac{3ab^2\left(e^{n\ln(x)}\right)^4}{4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+2*n)*(a+b*x^n)^3,x)
```

```
[Out] a^2*b/n*exp(n*ln(x))^3+1/2*a^3/n*exp(n*ln(x))^2+1/5*b^3/n*exp(n*l
n(x))^5+3/4*a*b^2/n*exp(n*ln(x))^4
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^(2*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.224449, size = 65, normalized size = 1.62

$$\frac{4\,b^3x^{5\,n} + 15\,ab^2x^{4\,n} + 20\,a^2bx^{3\,n} + 10\,a^3x^{2\,n}}{20\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^(2*n - 1),x, algorithm="fricas")
```

```
[Out] 1/20*(4*b^3*x^(5*n) + 15*a*b^2*x^(4*n) + 20*a^2*b*x^(3*n) + 10*a^
3*x^(2*n))/n
```

Sympy [A] time = 116.127, size = 58, normalized size = 1.45

$$\begin{cases} \frac{a^3x^{2n}}{2n} + \frac{a^2bx^{3n}}{n} + \frac{3ab^2x^{4n}}{4n} + \frac{b^3x^{5n}}{5n} & \text{for } n \neq 0 \\ (a+b)^3 \log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+2*n)*(a+b*x**n)**3,x)
```

```
[Out] Piecewise((a**3*x**(2*n)/(2*n) + a**2*b*x**(3*n)/n + 3*a*b**2*x**
(4*n)/(4*n) + b**3*x**(5*n)/(5*n), Ne(n, 0)), ((a + b)**3*log(x),
 True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^3 x^{2\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^(2*n - 1),x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^3*x^(2*n - 1), x)
```

3.2535 $\int x^{-1+n} (a + bx^n)^3 \, dx$

Optimal. Leaf size=19

$$\frac{(a + bx^n)^4}{4bn}$$

```
[Out] (a + b*x^n)^4/(4*b*n)
```

Rubi [A] time = 0.0191692, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$\frac{(a + bx^n)^4}{4bn}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 + n)*(a + b*x^n)^3,x]
```

```
[Out] (a + b*x^n)^4/(4*b*n)
```

Rubi in Sympy [A] time = 2.45639, size = 12, normalized size = 0.63

$$\frac{(a + bx^n)^4}{4bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1+n)*(a+b*x**n)**3,x)
```

```
[Out] (a + b*x**n)**4/(4*b*n)
```

Mathematica [A] time = 0.0121418, size = 19, normalized size = 1.

$$\frac{(a + bx^n)^4}{4bn}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 + n)*(a + b*x^n)^3,x]
```

```
[Out] (a + b*x^n)^4/(4*b*n)
```

Maple [B] time = 0.024, size = 60, normalized size = 3.2

$$\frac{a^3 e^{n \ln(x)}}{n} + \frac{ab^2 \left(e^{n \ln(x)}\right)^3}{n} + \frac{b^3 \left(e^{n \ln(x)}\right)^4}{4\,n} + \frac{3\,a^2 b \left(e^{n \ln(x)}\right)^2}{2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-1+n)*(a+b*x^n)^3,x)
```

```
[Out] a^3/n*exp(n*ln(x))+a*b^2/n*exp(n*ln(x))^3+1/4*b^3/n*exp(n*ln(x))^
4+3/2*a^2*b/n*exp(n*ln(x))^2
```

Maxima [A] time = 1.4463, size = 23, normalized size = 1.21

$$\frac{(bx^n + a)^4}{4\,bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^(n - 1),x, algorithm="maxima")
```

```
[Out] 1/4*(b*x^n + a)^4/(b*n)
```

Fricas [A] time = 0.225572, size = 61, normalized size = 3.21

$$\frac{b^3x^{4\,n} + 4\,ab^2x^{3\,n} + 6\,a^2bx^{2\,n} + 4\,a^3x^n}{4\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^(n - 1),x, algorithm="fricas")
```

```
[Out] 1/4*(b^3*x^(4*n) + 4*a*b^2*x^(3*n) + 6*a^2*b*x^(2*n) + 4*a^3*x^n)
/n
```

Sympy [A] time = 16.7306, size = 54, normalized size = 2.84

$$\begin{cases} \frac{a^3x^n}{n} + \frac{3a^2bx^{2n}}{2n} + \frac{ab^2x^{3n}}{n} + \frac{b^3x^{4n}}{4n} & \text{for } n \neq 0 \\ (a+b)^3 \log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+n)*(a+b*x**n)**3,x)
```

```
[Out] Piecewise((a**3*x**n/n + 3*a**2*b*x**(2*n)/(2*n) + a*b**2*x**(3*n
)/n + b**3*x**(4*n)/(4*n), Ne(n, 0)), ((a + b)**3*log(x), True))
```

GIAC/XCAS [A] time = 0.216132, size = 61, normalized size = 3.21

$$\frac{b^3x^{4\,n} + 4\,ab^2x^{3\,n} + 6\,a^2bx^{2\,n} + 4\,a^3x^n}{4\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^(n - 1),x, algorithm="giac")
```

```
[Out] 1/4*(b^3*x^(4*n) + 4*a*b^2*x^(3*n) + 6*a^2*b*x^(2*n) + 4*a^3*x^n)
/n
```

3.2536 $\int \frac{(a+bx^n)^3}{x} dx$

Optimal. Leaf size=50

$$a^3 \log(x) + \frac{3a^2bx^n}{n} + \frac{3ab^2x^{2n}}{2n} + \frac{b^3x^{3n}}{3n}$$

```
[Out] (3*a^2*b*x^n)/n + (3*a*b^2*x^(2*n))/(2*n) + (b^3*x^(3*n))/(3*n) +
 a^3*Log[x]
```

Rubi [A] time = 0.054967, antiderivative size = 50, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$a^3 \log(x) + \frac{3a^2bx^n}{n} + \frac{3ab^2x^{2n}}{2n} + \frac{b^3x^{3n}}{3n}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^n)^3/x,x]
```

```
[Out] (3*a^2*b*x^n)/n + (3*a*b^2*x^(2*n))/(2*n) + (b^3*x^(3*n))/(3*n) +
 a^3*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^3 \log(x^n)}{n} + \frac{3a^2bx^n}{n} + \frac{3ab^2 \int^{x^n} x\, dx}{n} + \frac{b^3x^{3n}}{3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b*x**n)**3/x,x)
```

```
[Out] a**3*log(x**n)/n + 3*a**2*b*x**n/n + 3*a*b**2*Integral(x, (x, x**
n))/n + b**3*x**(3*n)/(3*n)
```

Mathematica [A] time = 0.0401134, size = 41, normalized size = 0.82

$$a^3 \log(x) + \frac{bx^n \left(18a^2 + 9abx^n + 2b^2x^{2n}\right)}{6n}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^n)^3/x,x]
```

```
[Out] (b*x^n*(18*a^2 + 9*a*b*x^n + 2*b^2*x^(2*n)))/(6*n) + a^3*Log[x]
```

Maple [A] time = 0., size = 52, normalized size = 1.

$$\frac{b^3 (x^n)^3}{3\,n} + \frac{3\,ab^2 (x^n)^2}{2\,n} + 3\,\frac{a^2bx^n}{n} + \frac{a^3 \ln(x^n)}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*x^n)^3/x,x)
```

```
[Out] 1/3/n*b^3*(x^n)^3+3/2/n*a*b^2*(x^n)^2+3*a^2*b*x^n/n+1/n*a^3*ln(x^
n)
```

Maxima [A] time = 1.44071, size = 65, normalized size = 1.3

$$\frac{a^3\log(x^n)}{n}+\frac{2\,b^3x^{3\,n}+9\,ab^2x^{2\,n}+18\,a^2bx^n}{6\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3/x,x, algorithm="maxima")
```

```
[Out] a^3*log(x^n)/n + 1/6*(2*b^3*x^(3*n) + 9*a*b^2*x^(2*n) + 18*a^2*b*
x^n)/n
```

Fricas [A] time = 0.226023, size = 59, normalized size = 1.18

$$\frac{6\,a^3n\log(x)+2\,b^3x^{3\,n}+9\,ab^2x^{2\,n}+18\,a^2bx^n}{6\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3/x,x, algorithm="fricas")
```

```
[Out] 1/6*(6*a^3*n*log(x) + 2*b^3*x^(3*n) + 9*a*b^2*x^(2*n) + 18*a^2*b*
x^n)/n
```

Sympy [A] time = 1.14972, size = 53, normalized size = 1.06

$$\begin{cases} a^3\log(x)+\frac{3a^2bx^n}{n}+\frac{3ab^2x^{2n}}{2n}+\frac{b^3x^{3n}}{3n} & \text{for}\ n\neq 0\\ (a+b)^3\log(x) & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**3/x,x)
```

```
[Out] Piecewise((a**3*log(x) + 3*a**2*b*x**n/n + 3*a*b**2*x**(2*n)/(2*n
) + b**3*x**(3*n)/(3*n), Ne(n, 0)), ((a + b)**3*log(x), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{(bx^n+a)^3}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3/x,x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^3/x, x)
```

3.2537 $\int x^{-1-n}(a+bx^n)^3\,dx$

Optimal. Leaf size=49

$$-\frac{a^3x^{-n}}{n}+3a^2b\log(x)+\frac{3ab^2x^n}{n}+\frac{b^3x^{2n}}{2n}$$

```
[Out] -(a^3/(n*x^n)) + (3*a*b^2*x^n)/n + (b^3*x^(2*n))/(2*n) + 3*a^2*b*
Log[x]
```

Rubi [A] time = 0.0639627, antiderivative size = 49, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{a^3x^{-n}}{n}+3a^2b\log(x)+\frac{3ab^2x^n}{n}+\frac{b^3x^{2n}}{2n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - n)*(a + b*x^n)^3,x]
```

```
[Out] -(a^3/(n*x^n)) + (3*a*b^2*x^n)/n + (b^3*x^(2*n))/(2*n) + 3*a^2*b*
Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^3x^{-n}}{n}+\frac{3a^2b\log(x^n)}{n}+\frac{3ab^2x^n}{n}+\frac{b^3\int^{x^n}x\,dx}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-n)*(a+b*x**n)**3,x)
```

```
[Out] -a**3*x**(-n)/n + 3*a**2*b*log(x**n)/n + 3*a*b**2*x**n/n + b**3*I
ntegral(x, (x, x**n))/n
```

Mathematica [A] time = 0.0500665, size = 46, normalized size = 0.94

$$-\frac{2a^3x^{-n}-6a^2bn\log(x)-6ab^2x^n-b^3x^{2n}}{2n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - n)*(a + b*x^n)^3,x]
```

```
[Out] -((2*a^3)/x^n - 6*a*b^2*x^n - b^3*x^(2*n) - 6*a^2*b*n*Log[x])/(2*
n)
```

Maple [A] time = 0.023, size = 62, normalized size = 1.3

$$\frac{1}{e^{n\ln(x)}}\left(3\,a^2b\ln(x)\,e^{n\ln(x)}-\frac{a^3}{n}+\frac{b^3\left(e^{n\ln(x)}\right)^3}{2\,n}+3\,\frac{ab^2\left(e^{n\ln(x)}\right)^2}{n}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-n)*(a+b*x^n)^3,x)
```

```
[Out] (3*a^2*b*ln(x)*exp(n*ln(x))-a^3/n+1/2*b^3/n*exp(n*ln(x))^3+3*a*b^
2/n*exp(n*ln(x))^2)/exp(n*ln(x))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^(-n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.225691, size = 65, normalized size = 1.33

$$\frac{6\,a^2bnx^n\log\left(x\right)+b^3x^{3\,n}+6\,ab^2x^{2\,n}-2\,a^3}{2\,nx^n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^(-n - 1),x, algorithm="fricas")
```

```
[Out] 1/2*(6*a^2*b*n*x^n*log(x) + b^3*x^(3*n) + 6*a*b^2*x^(2*n) - 2*a^3
)/(n*x^n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-n)*(a+b*x**n)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.222891, size = 72, normalized size = 1.47

$$\frac{\left(6\,a^2bne^{\left(n\ln\left(x\right)\right)}\ln\left(x\right)+b^3e^{\left(3\,n\ln\left(x\right)\right)}+6\,ab^2e^{\left(2\,n\ln\left(x\right)\right)}-2\,a^3\right)e^{\left(-n\ln\left(x\right)\right)}}{2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^(-n - 1),x, algorithm="giac")
```

```
[Out] 1/2*(6*a^2*b*n*e^(n*ln(x))*ln(x) + b^3*e^(3*n*ln(x)) + 6*a*b^2*e^
(2*n*ln(x)) - 2*a^3)*e^(-n*ln(x))/n
```

3.2538 $\int x^{-1-2n}(a+bx^n)^3\,dx$

Optimal. Leaf size=48

$$-\frac{a^3x^{-2n}}{2n}-\frac{3a^2bx^{-n}}{n}+3ab^2\log(x)+\frac{b^3x^n}{n}$$

```
[Out] -a^3/(2*n*x^(2*n)) - (3*a^2*b)/(n*x^n) + (b^3*x^n)/n + 3*a*b^2*Lo
g[x]
```

Rubi [A] time = 0.061919, antiderivative size = 48, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{a^3x^{-2n}}{2n}-\frac{3a^2bx^{-n}}{n}+3ab^2\log(x)+\frac{b^3x^n}{n}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 - 2*n)*(a + b*x^n)^3,x]
```

```
[Out] -a^3/(2*n*x^(2*n)) - (3*a^2*b)/(n*x^n) + (b^3*x^n)/n + 3*a*b^2*Lo
g[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^3x^{-2n}}{2n}-\frac{3a^2bx^{-n}}{n}+\frac{3ab^2\log\left(x^n\right)}{n}+\frac{\int^{x^n}b^3\,dx}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1-2*n)*(a+b*x**n)**3,x)
```

```
[Out] -a**3*x**(-2*n)/(2*n) - 3*a**2*b*x**(-n)/n + 3*a*b**2*log(x**n)/n
 + Integral(b**3, (x, x**n))/n
```

Mathematica [A] time = 0.0696971, size = 45, normalized size = 0.94

$$-\frac{a^3x^{-2n}+6a^2bx^{-n}-6ab^2n\log(x)-2b^3x^n}{2n}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 - 2*n)*(a + b*x^n)^3,x]
```

```
[Out] -(a^3/x^(2*n) + (6*a^2*b)/x^n - 2*b^3*x^n - 6*a*b^2*n*Log[x])/(2*
n)
```

Maple [A] time = 0.023, size = 61, normalized size = 1.3

$$\frac{1}{\left(e^{n\ln(x)}\right)^2}\left(\frac{b^3\left(e^{n\ln(x)}\right)^3}{n}+3\,ab^2\ln(x)\left(e^{n\ln(x)}\right)^2-\frac{a^3}{2\,n}-3\,\frac{a^2be^{n\ln(x)}}{n}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-2*n)*(a+b*x^n)^3,x)
```

```
[Out] (b^3/n*exp(n*ln(x))^3+3*a*b^2*ln(x)*exp(n*ln(x))^2-1/2*a^3/n-3*a^
2*b/n*exp(n*ln(x)))/exp(n*ln(x))^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^(-2*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.225111, size = 69, normalized size = 1.44

$$\frac{6\,ab^2nx^{2\,n}\log\left(x\right) + 2\,b^3x^{3\,n} - 6\,a^2bx^n - a^3}{2\,nx^{2\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^(-2*n - 1),x, algorithm="fricas")
```

```
[Out] 1/2*(6*a*b^2*n*x^(2*n)*log(x) + 2*b^3*x^(3*n) - 6*a^2*b*x^n - a^3
)/(n*x^(2*n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-2*n)*(a+b*x**n)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.220434, size = 73, normalized size = 1.52

$$\frac{\left(6\,ab^2ne^{\left(2\,n\ln\left(x\right)\right)}\ln\left(x\right) + 2\,b^3e^{\left(3\,n\ln\left(x\right)\right)} - 6\,a^2be^{\left(n\ln\left(x\right)\right)} - a^3\right)e^{\left(-2\,n\ln\left(x\right)\right)}}{2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^(-2*n - 1),x, algorithm="giac")
```

```
[Out] 1/2*(6*a*b^2*n*e^(2*n*ln(x))*ln(x) + 2*b^3*e^(3*n*ln(x)) - 6*a^2*
b*e^(n*ln(x)) - a^3)*e^(-2*n*ln(x))/n
```

3.2539 $\int x^{-1-3n} (a + bx^n)^3 \, dx$

Optimal. Leaf size=52

$$-\frac{a^3 x^{-3n}}{3n} - \frac{3a^2 b x^{-2n}}{2n} - \frac{3ab^2 x^{-n}}{n} + b^3 \log(x)$$

```
[Out] -a^3/(3*n*x^(3*n)) - (3*a^2*b)/(2*n*x^(2*n)) - (3*a*b^2)/(n*x^n)
+ b^3*Log[x]
```

Rubi [A] time = 0.0628968, antiderivative size = 52, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{a^3 x^{-3n}}{3n} - \frac{3a^2 b x^{-2n}}{2n} - \frac{3ab^2 x^{-n}}{n} + b^3 \log(x)$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 - 3*n)*(a + b*x^n)^3,x]
```

```
[Out] -a^3/(3*n*x^(3*n)) - (3*a^2*b)/(2*n*x^(2*n)) - (3*a*b^2)/(n*x^n)
+ b^3*Log[x]
```

Rubi in Sympy [A] time = 10.6021, size = 48, normalized size = 0.92

$$-\frac{a^3 x^{-3n}}{3n} - \frac{3a^2 b x^{-2n}}{2n} - \frac{3ab^2 x^{-n}}{n} + \frac{b^3 \log(x^n)}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1-3*n)*(a+b*x**n)**3,x)
```

```
[Out] -a**3*x**(-3*n)/(3*n) - 3*a**2*b*x**(-2*n)/(2*n) - 3*a*b**2*x**(-
n)/n + b**3*log(x**n)/n
```

Mathematica [A] time = 0.0474944, size = 43, normalized size = 0.83

$$b^3 \log(x) - \frac{ax^{-3n} \left(2a^2 + 9abx^n + 18b^2 x^{2n}\right)}{6n}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 - 3*n)*(a + b*x^n)^3,x]
```

```
[Out] -(a*(2*a^2 + 9*a*b*x^n + 18*b^2*x^(2*n)))/(6*n*x^(3*n)) + b^3*Log
[x]
```

Maple [A] time = 0.024, size = 61, normalized size = 1.2

$$\frac{1}{\left(e^{n\ln(x)}\right)^3} \left(b^3 \ln(x) \left(e^{n\ln(x)}\right)^3 - \frac{a^3}{3n} - 3\frac{ab^2 \left(e^{n\ln(x)}\right)^2}{n} - \frac{3a^2 b e^{n\ln(x)}}{2n} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-3*n)*(a+b*x^n)^3,x)
```

```
[Out] (b^3*ln(x)*exp(n*ln(x))^3-1/3*a^3/n-3*a*b^2/n*exp(n*ln(x))^2-3/2*
a^2*b/n*exp(n*ln(x)))/exp(n*ln(x))^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^(-3*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.225226, size = 69, normalized size = 1.33

$$\frac{6\,b^{3}nx^{3\,n}\log\left(x\right)-18\,ab^{2}x^{2\,n}-9\,a^{2}bx^{n}-2\,a^{3}}{6\,nx^{3\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^(-3*n - 1),x, algorithm="fricas")
```

```
[Out] 1/6*(6*b^3*n*x^(3*n)*log(x) - 18*a*b^2*x^(2*n) - 9*a^2*b*x^n - 2*
a^3)/(n*x^(3*n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-3*n)*(a+b*x**n)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.220839, size = 73, normalized size = 1.4

$$\frac{\left(6\,b^{3}ne^{\left(3\,n\ln\left(x\right)\right)}\ln\left(x\right)-18\,ab^{2}e^{\left(2\,n\ln\left(x\right)\right)}-9\,a^{2}be^{\left(n\ln\left(x\right)\right)}-2\,a^{3}\right)e^{\left(-3\,n\ln\left(x\right)\right)}}{6\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^(-3*n - 1),x, algorithm="giac")
```

```
[Out] 1/6*(6*b^3*n*e^(3*n*ln(x))*ln(x) - 18*a*b^2*e^(2*n*ln(x)) - 9*a^2
*b*e^(n*ln(x)) - 2*a^3)*e^(-3*n*ln(x))/n
```

3.2540 $\int x^{-1-4n}\left(a+bx^n\right)^3\,dx$

Optimal. Leaf size=24

$$-\frac{x^{-4n}\left(a+bx^n\right)^4}{4an}$$

```
[Out] -(a + b*x^n)^4/(4*a*n*x^(4*n))
```

Rubi [A] time = 0.0216792, antiderivative size = 24, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.059

$$-\frac{x^{-4n}\left(a+bx^n\right)^4}{4an}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 4*n)*(a + b*x^n)^3,x]
```

```
[Out] -(a + b*x^n)^4/(4*a*n*x^(4*n))
```

Rubi in Sympy [A] time = 3.13279, size = 19, normalized size = 0.79

$$-\frac{x^{-4n}\left(a+bx^n\right)^4}{4an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-4*n)*(a+b*x**n)**3,x)
```

```
[Out] -x**(-4*n)*(a + b*x**n)**4/(4*a*n)
```

Mathematica [A] time = 0.0273179, size = 46, normalized size = 1.92

$$-\frac{x^{-4n}\left(a^3+4a^2bx^n+6ab^2x^{2n}+4b^3x^{3n}\right)}{4n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 4*n)*(a + b*x^n)^3,x]
```

```
[Out] -(a^3 + 4*a^2*b*x^n + 6*a*b^2*x^(2*n) + 4*b^3*x^(3*n))/(4*n*x^(4*
n))
```

Maple [B] time = 0.026, size = 63, normalized size = 2.6

$$\frac{1}{\left(e^{n\ln(x)}\right)^4}\left(-\frac{a^3}{4\,n}-\frac{b^3\left(e^{n\ln(x)}\right)^3}{n}-\frac{3\,ab^2\left(e^{n\ln(x)}\right)^2}{2\,n}-\frac{a^2be^{n\ln(x)}}{n}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-4*n)*(a+b*x^n)^3,x)
```

```
[Out] (-1/4*a^3/n-b^3/n*exp(n*ln(x))^3-3/2*a*b^2/n*exp(n*ln(x))^2-a^2*b
/n*exp(n*ln(x)))/exp(n*ln(x))^4
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^(-4*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.224071, size = 62, normalized size = 2.58

$$-\frac{4\,b^{3}x^{3\,n}+6\,ab^{2}x^{2\,n}+4\,a^{2}bx^{n}+a^{3}}{4\,nx^{4\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^(-4*n - 1),x, algorithm="fricas")
```

```
[Out] -1/4*(4*b^3*x^(3*n) + 6*a*b^2*x^(2*n) + 4*a^2*b*x^n + a^3)/(n*x^(
4*n))
```

Sympy [A] time = 117.792, size = 56, normalized size = 2.33

$$\begin{cases} -\frac{a^{3}x^{-4n}}{4n}-\frac{a^{2}bx^{-3n}}{n}-\frac{3ab^{2}x^{-2n}}{2n}-\frac{b^{3}x^{-n}}{n} & \text{for}\ n\neq 0 \\ (a+b)^{3}\log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-4*n)*(a+b*x**n)**3,x)
```

```
[Out] Piecewise((-a**3*x**(-4*n)/(4*n) - a**2*b*x**(-3*n)/n - 3*a*b**2*
x**(-2*n)/(2*n) - b**3*x**(-n)/n, Ne(n, 0)), ((a + b)**3*log(x),
True))
```

GIAC/XCAS [A] time = 0.220548, size = 66, normalized size = 2.75

$$-\frac{\left(4\,b^{3}e^{(3\,n\ln(x))}+6\,ab^{2}e^{(2\,n\ln(x))}+4\,a^{2}be^{(n\ln(x))}+a^{3}\right)e^{(-4\,n\ln(x))}}{4\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^(-4*n - 1),x, algorithm="giac")
```

```
[Out] -1/4*(4*b^3*e^(3*n*ln(x)) + 6*a*b^2*e^(2*n*ln(x)) + 4*a^2*b*e^(n*
ln(x)) + a^3)*e^(-4*n*ln(x))/n
```

3.2541 $\int x^{-1-5n} (a + bx^n)^3 \, dx$

Optimal. Leaf size=50

$$\frac{bx^{-4n} (a + bx^n)^4}{20a^2n} - \frac{x^{-5n} (a + bx^n)^4}{5an}$$

```
[Out] -(a + b*x^n)^4/(5*a*n*x^(5*n)) + (b*(a + b*x^n)^4)/(20*a^2*n*x^(4
*n))
```

Rubi [A] time = 0.0558028, antiderivative size = 50, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.176$

$$\frac{bx^{-4n} (a + bx^n)^4}{20a^2n} - \frac{x^{-5n} (a + bx^n)^4}{5an}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 5*n)*(a + b*x^n)^3,x]
```

```
[Out] -(a + b*x^n)^4/(5*a*n*x^(5*n)) + (b*(a + b*x^n)^4)/(20*a^2*n*x^(4
*n))
```

Rubi in Sympy [A] time = 10.9464, size = 51, normalized size = 1.02

$$-\frac{a^3x^{-5n}}{5n} - \frac{3a^2bx^{-4n}}{4n} - \frac{ab^2x^{-3n}}{n} - \frac{b^3x^{-2n}}{2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-5*n)*(a+b*x**n)**3,x)
```

```
[Out] -a**3*x**(-5*n)/(5*n) - 3*a**2*b*x**(-4*n)/(4*n) - a*b**2*x**(-3*
n)/n - b**3*x**(-2*n)/(2*n)
```

Mathematica [A] time = 0.0267365, size = 48, normalized size = 0.96

$$-\frac{x^{-5n} \left(4a^3 + 15a^2bx^n + 20ab^2x^{2n} + 10b^3x^{3n}\right)}{20n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 5*n)*(a + b*x^n)^3,x]
```

```
[Out] -(4*a^3 + 15*a^2*b*x^n + 20*a*b^2*x^(2*n) + 10*b^3*x^(3*n))/(20*n
*x^(5*n))
```

Maple [A] time = 0.029, size = 63, normalized size = 1.3

$$\frac{1}{\left(e^{n\ln(x)}\right)^5}\left(-\frac{a^3}{5\,n} - \frac{b^3\left(e^{n\ln(x)}\right)^3}{2\,n} - \frac{ab^2\left(e^{n\ln(x)}\right)^2}{n} - \frac{3\,a^2be^{n\ln(x)}}{4\,n}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-5*n)*(a+b*x^n)^3,x)
```

```
[Out] (-1/5*a^3/n-1/2*b^3/n*exp(n*ln(x))^3-a*b^2/n*exp(n*ln(x))^2-3/4*a
^2*b/n*exp(n*ln(x)))/exp(n*ln(x))^5
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^(-5*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.223662, size = 65, normalized size = 1.3

$$-\frac{10\,b^{3}x^{3\,n}+20\,ab^{2}x^{2\,n}+15\,a^{2}bx^{n}+4\,a^{3}}{20\,nx^{5\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^(-5*n - 1),x, algorithm="fricas")
```

```
[Out] -1/20*(10*b^3*x^(3*n) + 20*a*b^2*x^(2*n) + 15*a^2*b*x^n + 4*a^3)/
(n*x^(5*n))
```

Sympy [A] time = 118.366, size = 60, normalized size = 1.2

$$\begin{cases} -\frac{a^{3}x^{-5n}}{5n}-\frac{3a^{2}bx^{-4n}}{4n}-\frac{ab^{2}x^{-3n}}{n}-\frac{b^{3}x^{-2n}}{2n} & \text{for}\ n\neq 0\\ (a+b)^{3}\log(x) & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-5*n)*(a+b*x**n)**3,x)
```

```
[Out] Piecewise((-a**3*x**(-5*n)/(5*n) - 3*a**2*b*x**(-4*n)/(4*n) - a*b
**2*x**(-3*n)/n - b**3*x**(-2*n)/(2*n), Ne(n, 0)), ((a + b)**3*lo
g(x), True))
```

GIAC/XCAS [A] time = 0.222688, size = 69, normalized size = 1.38

$$-\frac{\left(10\,b^{3}e^{(3\,n\ln(x))}+20\,ab^{2}e^{(2\,n\ln(x))}+15\,a^{2}be^{(n\ln(x))}+4\,a^{3}\right)e^{(-5\,n\ln(x))}}{20\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^(-5*n - 1),x, algorithm="giac")
```

```
[Out] -1/20*(10*b^3*e^(3*n*ln(x)) + 20*a*b^2*e^(2*n*ln(x)) + 15*a^2*b*e
^(n*ln(x)) + 4*a^3)*e^(-5*n*ln(x))/n
```

3.2542 $\int x^{-1-6n}(a+bx^n)^3\,dx$

Optimal. Leaf size=63

$$-\frac{a^3x^{-6n}}{6n}-\frac{3a^2bx^{-5n}}{5n}-\frac{3ab^2x^{-4n}}{4n}-\frac{b^3x^{-3n}}{3n}$$

```
[Out] -a^3/(6*n*x^(6*n)) - (3*a^2*b)/(5*n*x^(5*n)) - (3*a*b^2)/(4*n*x^(
4*n)) - b^3/(3*n*x^(3*n))
```

Rubi [A] time = 0.0666669, antiderivative size = 63, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{a^3x^{-6n}}{6n}-\frac{3a^2bx^{-5n}}{5n}-\frac{3ab^2x^{-4n}}{4n}-\frac{b^3x^{-3n}}{3n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 6*n)*(a + b*x^n)^3,x]
```

```
[Out] -a^3/(6*n*x^(6*n)) - (3*a^2*b)/(5*n*x^(5*n)) - (3*a*b^2)/(4*n*x^(
4*n)) - b^3/(3*n*x^(3*n))
```

Rubi in Sympy [A] time = 10.8654, size = 54, normalized size = 0.86

$$-\frac{a^3x^{-6n}}{6n}-\frac{3a^2bx^{-5n}}{5n}-\frac{3ab^2x^{-4n}}{4n}-\frac{b^3x^{-3n}}{3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-6*n)*(a+b*x**n)**3,x)
```

```
[Out] -a**3*x**(-6*n)/(6*n) - 3*a**2*b*x**(-5*n)/(5*n) - 3*a*b**2*x**(-
4*n)/(4*n) - b**3*x**(-3*n)/(3*n)
```

Mathematica [A] time = 0.0276948, size = 48, normalized size = 0.76

$$-\frac{x^{-6n}\left(10a^3+36a^2bx^n+45ab^2x^{2n}+20b^3x^{3n}\right)}{60n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 6*n)*(a + b*x^n)^3,x]
```

```
[Out] -(10*a^3 + 36*a^2*b*x^n + 45*a*b^2*x^(2*n) + 20*b^3*x^(3*n))/(60*
n*x^(6*n))
```

Maple [A] time = 0.031, size = 56, normalized size = 0.9

$$-\frac{b^3}{3\,n\,(x^n)^3}-\frac{3\,ab^2}{4\,n\,(x^n)^4}-\frac{3\,a^2b}{5\,n\,(x^n)^5}-\frac{a^3}{6\,n\,(x^n)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-6*n)*(a+b*x^n)^3,x)
```

```
[Out] -1/3*b^3/n/(x^n)^3-3/4*a*b^2/n/(x^n)^4-3/5*a^2*b/n/(x^n)^5-1/6*a^
3/n/(x^n)^6
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^(-6*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.223979, size = 65, normalized size = 1.03

$$-\frac{20\,b^3x^{3\,n} + 45\,ab^2x^{2\,n} + 36\,a^2bx^n + 10\,a^3}{60\,nx^{6\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^(-6*n - 1),x, algorithm="fricas")
```

```
[Out] -1/60*(20*b^3*x^(3*n) + 45*a*b^2*x^(2*n) + 36*a^2*b*x^n + 10*a^3)
/(n*x^(6*n))
```

Sympy [A] time = 117.865, size = 63, normalized size = 1.

$$\begin{cases} -\frac{a^3x^{-6n}}{6n} - \frac{3a^2bx^{-5n}}{5n} - \frac{3ab^2x^{-4n}}{4n} - \frac{b^3x^{-3n}}{3n} & \text{for } n \neq 0 \\ (a+b)^3 \log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-6*n)*(a+b*x**n)**3,x)
```

```
[Out] Piecewise((-a**3*x**(-6*n)/(6*n) - 3*a**2*b*x**(-5*n)/(5*n) - 3*a
*b**2*x**(-4*n)/(4*n) - b**3*x**(-3*n)/(3*n), Ne(n, 0)), ((a + b)
**3*log(x), True))
```

GIAC/XCAS [A] time = 0.22154, size = 69, normalized size = 1.1

$$-\frac{\left(20\,b^3e^{(3\,n\ln(x))} + 45\,ab^2e^{(2\,n\ln(x))} + 36\,a^2be^{(n\ln(x))} + 10\,a^3\right)e^{(-6\,n\ln(x))}}{60\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^(-6*n - 1),x, algorithm="giac")
```

```
[Out] -1/60*(20*b^3*e^(3*n*ln(x)) + 45*a*b^2*e^(2*n*ln(x)) + 36*a^2*b*e
^(n*ln(x)) + 10*a^3)*e^(-6*n*ln(x))/n
```

3.2543 $\int x^{-1-7n}(a+bx^n)^3\,dx$

Optimal. Leaf size=63

$$-\frac{a^3x^{-7n}}{7n}-\frac{a^2bx^{-6n}}{2n}-\frac{3ab^2x^{-5n}}{5n}-\frac{b^3x^{-4n}}{4n}$$

```
[Out] -a^3/(7*n*x^(7*n)) - (a^2*b)/(2*n*x^(6*n)) - (3*a*b^2)/(5*n*x^(5*
n)) - b^3/(4*n*x^(4*n))
```

Rubi [A] time = 0.0686943, antiderivative size = 63, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{a^3x^{-7n}}{7n}-\frac{a^2bx^{-6n}}{2n}-\frac{3ab^2x^{-5n}}{5n}-\frac{b^3x^{-4n}}{4n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 7*n)*(a + b*x^n)^3,x]
```

```
[Out] -a^3/(7*n*x^(7*n)) - (a^2*b)/(2*n*x^(6*n)) - (3*a*b^2)/(5*n*x^(5*
n)) - b^3/(4*n*x^(4*n))
```

Rubi in Sympy [A] time = 10.6924, size = 53, normalized size = 0.84

$$-\frac{a^3x^{-7n}}{7n}-\frac{a^2bx^{-6n}}{2n}-\frac{3ab^2x^{-5n}}{5n}-\frac{b^3x^{-4n}}{4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-7*n)*(a+b*x**n)**3,x)
```

```
[Out] -a**3*x**(-7*n)/(7*n) - a**2*b*x**(-6*n)/(2*n) - 3*a*b**2*x**(-5*
n)/(5*n) - b**3*x**(-4*n)/(4*n)
```

Mathematica [A] time = 0.0280766, size = 48, normalized size = 0.76

$$-\frac{x^{-7n}\left(20a^3+70a^2bx^n+84ab^2x^{2n}+35b^3x^{3n}\right)}{140n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 7*n)*(a + b*x^n)^3,x]
```

```
[Out] -(20*a^3 + 70*a^2*b*x^n + 84*a*b^2*x^(2*n) + 35*b^3*x^(3*n))/(140
*n*x^(7*n))
```

Maple [A] time = 0.032, size = 56, normalized size = 0.9

$$-\frac{b^3}{4\,n\,(x^n)^4}-\frac{3\,ab^2}{5\,n\,(x^n)^5}-\frac{a^2b}{2\,n\,(x^n)^6}-\frac{a^3}{7\,n\,(x^n)^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-7*n)*(a+b*x^n)^3,x)
```

```
[Out] -1/4*b^3/n/(x^n)^4-3/5*a*b^2/n/(x^n)^5-1/2*a^2*b/n/(x^n)^6-1/7*a^
3/n/(x^n)^7
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^n + a)^3*x^(-7*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.223881, size = 65, normalized size = 1.03

$$-\frac{35\,b^3x^{3\,n} + 84\,ab^2x^{2\,n} + 70\,a^2bx^n + 20\,a^3}{140\,nx^{7\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^n + a)^3*x^(-7*n - 1),x, algorithm="fricas")
```

```
[Out] -1/140*(35*b^3*x^(3*n) + 84*a*b^2*x^(2*n) + 70*a^2*b*x^n + 20*a^3
)/(n*x^(7*n))
```

Sympy [A] time = 118.801, size = 61, normalized size = 0.97

$$\begin{cases} -\frac{a^3x^{-7n}}{7n} - \frac{a^2bx^{-6n}}{2n} - \frac{3ab^2x^{-5n}}{5n} - \frac{b^3x^{-4n}}{4n} & \text{for } n \neq 0 \\ (a+b)^3\log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**(-1-7*n)*(a+b*x**n)**3,x)
```

```
[Out] Piecewise((-a**3*x**(-7*n)/(7*n) - a**2*b*x**(-6*n)/(2*n) - 3*a*b
**2*x**(-5*n)/(5*n) - b**3*x**(-4*n)/(4*n), Ne(n, 0)), ((a + b)**
3*log(x), True))
```

GIAC/XCAS [A] time = 0.221645, size = 69, normalized size = 1.1

$$-\frac{\left(35\,b^3e^{(3\,n\ln(x))} + 84\,ab^2e^{(2\,n\ln(x))} + 70\,a^2be^{(n\ln(x))} + 20\,a^3\right)e^{(-7\,n\ln(x))}}{140\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^n + a)^3*x^(-7*n - 1),x, algorithm="giac")
```

```
[Out] -1/140*(35*b^3*e^(3*n*ln(x)) + 84*a*b^2*e^(2*n*ln(x)) + 70*a^2*b*
e^(n*ln(x)) + 20*a^3)*e^(-7*n*ln(x))/n
```

3.2544 $\int x^{-1+4n}(a+bx^n)^5\,dx$

Optimal. Leaf size=84

$$-\frac{a^3(a+bx^n)^6}{6b^4n}+\frac{3a^2(a+bx^n)^7}{7b^4n}+\frac{(a+bx^n)^9}{9b^4n}-\frac{3a(a+bx^n)^8}{8b^4n}$$

```
[Out] -(a^3*(a + b*x^n)^6)/(6*b^4*n) + (3*a^2*(a + b*x^n)^7)/(7*b^4*n)
- (3*a*(a + b*x^n)^8)/(8*b^4*n) + (a + b*x^n)^9/(9*b^4*n)
```

Rubi [A] time = 0.114485, antiderivative size = 84, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$

$$-\frac{a^3(a+bx^n)^6}{6b^4n}+\frac{3a^2(a+bx^n)^7}{7b^4n}+\frac{(a+bx^n)^9}{9b^4n}-\frac{3a(a+bx^n)^8}{8b^4n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + 4*n)*(a + b*x^n)^5,x]
```

```
[Out] -(a^3*(a + b*x^n)^6)/(6*b^4*n) + (3*a^2*(a + b*x^n)^7)/(7*b^4*n)
- (3*a*(a + b*x^n)^8)/(8*b^4*n) + (a + b*x^n)^9/(9*b^4*n)
```

Rubi in Sympy [A] time = 12.1463, size = 83, normalized size = 0.99

$$\frac{a^5x^{4n}}{4n}+\frac{a^4bx^{5n}}{n}+\frac{5a^3b^2x^{6n}}{3n}+\frac{10a^2b^3x^{7n}}{7n}+\frac{5ab^4x^{8n}}{8n}+\frac{b^5x^{9n}}{9n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+4*n)*(a+b*x**n)**5,x)
```

```
[Out] a**5*x**(4*n)/(4*n) + a**4*b*x**(5*n)/n + 5*a**3*b**2*x**(6*n)/(3
*n) + 10*a**2*b**3*x**(7*n)/(7*n) + 5*a*b**4*x**(8*n)/(8*n) + b**
5*x**(9*n)/(9*n)
```

Mathematica [A] time = 0.0359968, size = 74, normalized size = 0.88

$$\frac{x^{4n}\left(126a^5+504a^4bx^n+840a^3b^2x^{2n}+720a^2b^3x^{3n}+315ab^4x^{4n}+56b^5x^{5n}\right)}{504n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + 4*n)*(a + b*x^n)^5,x]
```

```
[Out] (x^(4*n)*(126*a^5 + 504*a^4*b*x^n + 840*a^3*b^2*x^(2*n) + 720*a^2
*b^3*x^(3*n) + 315*a*b^4*x^(4*n) + 56*b^5*x^(5*n)))/(504*n)
```

Maple [A] time = 0.036, size = 87, normalized size = 1.

$$\frac{b^5(x^n)^9}{9n}+\frac{5ab^4(x^n)^8}{8n}+\frac{10a^2b^3(x^n)^7}{7n}+\frac{5a^3b^2(x^n)^6}{3n}+\frac{a^4b(x^n)^5}{n}+\frac{a^5(x^n)^4}{4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+4*n)*(a+b*x^n)^5,x)
```

```
[Out] 1/9*b^5/n*(x^n)^9+5/8*a*b^4/n*(x^n)^8+10/7*a^2*b^3/n*(x^n)^7+5/3*
a^3*b^2/n*(x^n)^6+a^4*b/n*(x^n)^5+1/4*a^5/n*(x^n)^4
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(4*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.225725, size = 100, normalized size = 1.19

$$\frac{56\, b^5 x^{9\, n} + 315\, ab^4 x^{8\, n} + 720\, a^2 b^3 x^{7\, n} + 840\, a^3 b^2 x^{6\, n} + 504\, a^4 b x^{5\, n} + 126\, a^5 x^{4\, n}}{504\, n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(4*n - 1),x, algorithm="fricas")
```

```
[Out] 1/504*(56*b^5*x^(9*n) + 315*a*b^4*x^(8*n) + 720*a^2*b^3*x^(7*n) +
 840*a^3*b^2*x^(6*n) + 504*a^4*b*x^(5*n) + 126*a^5*x^(4*n))/n
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+4*n)*(a+b*x**n)**5,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^5 x^{4\, n-1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(4*n - 1),x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^5*x^(4*n - 1), x)
```

3.2545 $\int x^{-1+3n}(a+bx^n)^5\,dx$

Optimal. Leaf size=62

$$\frac{a^2(a+bx^n)^6}{6b^3n}+\frac{(a+bx^n)^8}{8b^3n}-\frac{2a(a+bx^n)^7}{7b^3n}$$

```
[Out] (a^2*(a + b*x^n)^6)/(6*b^3*n) - (2*a*(a + b*x^n)^7)/(7*b^3*n) + (
a + b*x^n)^8/(8*b^3*n)
```

Rubi [A] time = 0.0944203, antiderivative size = 62, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{a^2(a+bx^n)^6}{6b^3n}+\frac{(a+bx^n)^8}{8b^3n}-\frac{2a(a+bx^n)^7}{7b^3n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + 3*n)*(a + b*x^n)^5,x]
```

```
[Out] (a^2*(a + b*x^n)^6)/(6*b^3*n) - (2*a*(a + b*x^n)^7)/(7*b^3*n) + (
a + b*x^n)^8/(8*b^3*n)
```

Rubi in Sympy [A] time = 7.55437, size = 51, normalized size = 0.82

$$\frac{a^2(a+bx^n)^6}{6b^3n}-\frac{2a(a+bx^n)^7}{7b^3n}+\frac{(a+bx^n)^8}{8b^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+3*n)*(a+b*x**n)**5,x)
```

```
[Out] a**2*(a + b*x**n)**6/(6*b**3*n) - 2*a*(a + b*x**n)**7/(7*b**3*n)
+ (a + b*x**n)**8/(8*b**3*n)
```

Mathematica [A] time = 0.0322421, size = 74, normalized size = 1.19

$$\frac{x^{3n}\left(56a^5+210a^4bx^n+336a^3b^2x^{2n}+280a^2b^3x^{3n}+120ab^4x^{4n}+21b^5x^{5n}\right)}{168n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + 3*n)*(a + b*x^n)^5,x]
```

```
[Out] (x^(3*n)*(56*a^5 + 210*a^4*b*x^n + 336*a^3*b^2*x^(2*n) + 280*a^2*
b^3*x^(3*n) + 120*a*b^4*x^(4*n) + 21*b^5*x^(5*n)))/(168*n)
```

Maple [A] time = 0.034, size = 88, normalized size = 1.4

$$\frac{b^5(x^n)^8}{8\,n}+\frac{5\,ab^4(x^n)^7}{7\,n}+\frac{5\,a^2b^3(x^n)^6}{3\,n}+2\,\frac{a^3b^2(x^n)^5}{n}+\frac{5\,a^4b(x^n)^4}{4\,n}+\frac{a^5(x^n)^3}{3\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+3*n)*(a+b*x^n)^5,x)
```

```
[Out] 1/8*b^5/n*(x^n)^8+5/7*a*b^4/n*(x^n)^7+5/3*a^2*b^3/n*(x^n)^6+2*a^3
*b^2/n*(x^n)^5+5/4*a^4*b/n*(x^n)^4+1/3*a^5/n*(x^n)^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^n + a)^5*x^(3*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.224709, size = 100, normalized size = 1.61

$$\frac{21\, b^{5} x^{8\, n} + 120\, a b^{4} x^{7\, n} + 280\, a^{2} b^{3} x^{6\, n} + 336\, a^{3} b^{2} x^{5\, n} + 210\, a^{4} b x^{4\, n} + 56\, a^{5} x^{3\, n}}{168\, n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^n + a)^5*x^(3*n - 1),x, algorithm="fricas")
```

```
[Out] 1/168*(21*b^5*x^(8*n) + 120*a*b^4*x^(7*n) + 280*a^2*b^3*x^(6*n) +
 336*a^3*b^2*x^(5*n) + 210*a^4*b*x^(4*n) + 56*a^5*x^(3*n))/n
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**(-1+3*n)*(a+b*x**n)**5,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^{n} + a)^{5} x^{3\, n-1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^n + a)^5*x^(3*n - 1),x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^5*x^(3*n - 1), x)
```

3.2546 $\int x^{-1+2n}(a+bx^n)^5\,dx$

Optimal. Leaf size=40

$$\frac{(a+bx^n)^7}{7b^2n}-\frac{a(a+bx^n)^6}{6b^2n}$$

```
[Out] -(a*(a + b*x^n)^6)/(6*b^2*n) + (a + b*x^n)^7/(7*b^2*n)
```

Rubi [A] time = 0.0565317, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{(a+bx^n)^7}{7b^2n}-\frac{a(a+bx^n)^6}{6b^2n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + 2*n)*(a + b*x^n)^5,x]
```

```
[Out] -(a*(a + b*x^n)^6)/(6*b^2*n) + (a + b*x^n)^7/(7*b^2*n)
```

Rubi in Sympy [A] time = 5.18729, size = 31, normalized size = 0.78

$$-\frac{a(a+bx^n)^6}{6b^2n}+\frac{(a+bx^n)^7}{7b^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+2*n)*(a+b*x**n)**5,x)
```

```
[Out] -a*(a + b*x**n)**6/(6*b**2*n) + (a + b*x**n)**7/(7*b**2*n)
```

Mathematica [A] time = 0.0314927, size = 74, normalized size = 1.85

$$\frac{x^{2n}\left(21a^5+70a^4bx^n+105a^3b^2x^{2n}+84a^2b^3x^{3n}+35ab^4x^{4n}+6b^5x^{5n}\right)}{42n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + 2*n)*(a + b*x^n)^5,x]
```

```
[Out] (x^(2*n)*(21*a^5 + 70*a^4*b*x^n + 105*a^3*b^2*x^(2*n) + 84*a^2*b^
3*x^(3*n) + 35*a*b^4*x^(4*n) + 6*b^5*x^(5*n)))/(42*n)
```

Maple [B] time = 0.036, size = 88, normalized size = 2.2

$$\frac{b^5(x^n)^7}{7n}+\frac{5ab^4(x^n)^6}{6n}+2\frac{a^2b^3(x^n)^5}{n}+\frac{5a^3b^2(x^n)^4}{2n}+\frac{5a^4b(x^n)^3}{3n}+\frac{a^5(x^n)^2}{2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+2*n)*(a+b*x^n)^5,x)
```

```
[Out] 1/7*b^5/n*(x^n)^7+5/6*a*b^4/n*(x^n)^6+2*a^2*b^3/n*(x^n)^5+5/2*a^3
*b^2/n*(x^n)^4+5/3*a^4*b/n*(x^n)^3+1/2*a^5/n*(x^n)^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(2*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.226285, size = 100, normalized size = 2.5

$$\frac{6\,b^5x^{7\,n}+35\,ab^4x^{6\,n}+84\,a^2b^3x^{5\,n}+105\,a^3b^2x^{4\,n}+70\,a^4bx^{3\,n}+21\,a^5x^{2\,n}}{42\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(2*n - 1),x, algorithm="fricas")
```

```
[Out] 1/42*(6*b^5*x^(7*n) + 35*a*b^4*x^(6*n) + 84*a^2*b^3*x^(5*n) + 105
*a^3*b^2*x^(4*n) + 70*a^4*b*x^(3*n) + 21*a^5*x^(2*n))/n
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+2*n)*(a+b*x**n)**5,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n+a)^5x^{2\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(2*n - 1),x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^5*x^(2*n - 1), x)
```

3.2547 $\int x^{-1+n} (a + bx^n)^5 \, dx$

Optimal. Leaf size=19

$$\frac{(a + bx^n)^6}{6bn}$$

```
[Out] (a + b*x^n)^6/(6*b*n)
```

Rubi [A] time = 0.0187513, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$\frac{(a + bx^n)^6}{6bn}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + n)*(a + b*x^n)^5,x]

[Out] (a + b*x^n)^6/(6*b*n)
```

Rubi in Sympy [A] time = 1.22625, size = 12, normalized size = 0.63

$$\frac{(a + bx^n)^6}{6bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+n)*(a+b*x**n)**5,x)

[Out] (a + b*x**n)**6/(6*b*n)
```

Mathematica [A] time = 0.0149867, size = 19, normalized size = 1.

$$\frac{(a + bx^n)^6}{6bn}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + n)*(a + b*x^n)^5,x]

[Out] (a + b*x^n)^6/(6*b*n)
```

Maple [B] time = 0.036, size = 84, normalized size = 4.4

$$\frac{b^5 (x^n)^6}{6\,n} + \frac{ab^4 (x^n)^5}{n} + \frac{5\,a^2b^3 (x^n)^4}{2\,n} + \frac{10\,a^3b^2 (x^n)^3}{3\,n} + \frac{5\,a^4b\,(x^n)^2}{2\,n} + \frac{a^5x^n}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+n)*(a+b*x^n)^5,x)

[Out] 1/6*b^5/n*(x^n)^6+a*b^4/n*(x^n)^5+5/2*a^2*b^3/n*(x^n)^4+10/3*a^3*
b^2/n*(x^n)^3+5/2*a^4*b/n*(x^n)^2+a^5/n*x^n
```

Maxima [A] time = 1.43421, size = 23, normalized size = 1.21

$$\frac{(bx^n + a)^6}{6\,bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(n - 1),x, algorithm="maxima")
```

```
[Out] 1/6*(b*x^n + a)^6/(b*n)
```

Fricas [A] time = 0.224737, size = 96, normalized size = 5.05

$$\frac{b^5x^{6\,n} + 6\,ab^4x^{5\,n} + 15\,a^2b^3x^{4\,n} + 20\,a^3b^2x^{3\,n} + 15\,a^4bx^{2\,n} + 6\,a^5x^n}{6\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(n - 1),x, algorithm="fricas")
```

```
[Out] 1/6*(b^5*x^(6*n) + 6*a*b^4*x^(5*n) + 15*a^2*b^3*x^(4*n) + 20*a^3*
b^2*x^(3*n) + 15*a^4*b*x^(2*n) + 6*a^5*x^n)/n
```

Sympy [A] time = 49.307, size = 88, normalized size = 4.63

$$\begin{cases} \frac{a^5x^n}{n} + \frac{5a^4bx^{2n}}{2n} + \frac{10a^3b^2x^{3n}}{3n} + \frac{5a^2b^3x^{4n}}{2n} + \frac{ab^4x^{5n}}{n} + \frac{b^5x^{6n}}{6n} & \text{for}\ n \neq 0 \\ (a+b)^5 \log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+n)*(a+b*x**n)**5,x)
```

```
[Out] Piecewise((a**5*x**n/n + 5*a**4*b*x**(2*n)/(2*n) + 10*a**3*b**2*x
**(3*n)/(3*n) + 5*a**2*b**3*x**(4*n)/(2*n) + a*b**4*x**(5*n)/n +
b**5*x**(6*n)/(6*n), Ne(n, 0)), ((a + b)**5*log(x), True))
```

GIAC/XCAS [A] time = 0.215021, size = 96, normalized size = 5.05

$$\frac{b^5x^{6\,n} + 6\,ab^4x^{5\,n} + 15\,a^2b^3x^{4\,n} + 20\,a^3b^2x^{3\,n} + 15\,a^4bx^{2\,n} + 6\,a^5x^n}{6\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(n - 1),x, algorithm="giac")
```

```
[Out] 1/6*(b^5*x^(6*n) + 6*a*b^4*x^(5*n) + 15*a^2*b^3*x^(4*n) + 20*a^3*
b^2*x^(3*n) + 15*a^4*b*x^(2*n) + 6*a^5*x^n)/n
```

3.2548 $\int \frac{(a+bx^n)^5}{x} dx$

Optimal. Leaf size=84

$$a^5\log(x)+\frac{5a^4bx^n}{n}+\frac{5a^3b^2x^{2n}}{n}+\frac{10a^2b^3x^{3n}}{3n}+\frac{5ab^4x^{4n}}{4n}+\frac{b^5x^{5n}}{5n}$$

```
[Out] (5*a^4*b*x^n)/n + (5*a^3*b^2*x^(2*n))/n + (10*a^2*b^3*x^(3*n))/(3
*n) + (5*a*b^4*x^(4*n))/(4*n) + (b^5*x^(5*n))/(5*n) + a^5*Log[x]
```

Rubi [A] time = 0.0894612, antiderivative size = 84, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$a^5\log(x)+\frac{5a^4bx^n}{n}+\frac{5a^3b^2x^{2n}}{n}+\frac{10a^2b^3x^{3n}}{3n}+\frac{5ab^4x^{4n}}{4n}+\frac{b^5x^{5n}}{5n}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^n)^5/x,x]
```

```
[Out] (5*a^4*b*x^n)/n + (5*a^3*b^2*x^(2*n))/n + (10*a^2*b^3*x^(3*n))/(3
*n) + (5*a*b^4*x^(4*n))/(4*n) + (b^5*x^(5*n))/(5*n) + a^5*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^5\log(x^n)}{n}+\frac{5a^4bx^n}{n}+\frac{10a^3b^2\int^{x^n}x\,dx}{n}+\frac{10a^2b^3x^{3n}}{3n}+\frac{5ab^4x^{4n}}{4n}+\frac{b^5x^{5n}}{5n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b*x**n)**5/x,x)
```

```
[Out] a**5*log(x**n)/n + 5*a**4*b*x**n/n + 10*a**3*b**2*Integral(x, (x,
 x**n))/n + 10*a**2*b**3*x**(3*n)/(3*n) + 5*a*b**4*x**(4*n)/(4*n)
 + b**5*x**(5*n)/(5*n)
```

Mathematica [A] time = 0.0574277, size = 67, normalized size = 0.8

$$a^5\log(x)+\frac{bx^n\left(300a^4+300a^3bx^n+200a^2b^2x^{2n}+75ab^3x^{3n}+12b^4x^{4n}\right)}{60n}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^n)^5/x,x]
```

```
[Out] (b*x^n*(300*a^4 + 300*a^3*b*x^n + 200*a^2*b^2*x^(2*n) + 75*a*b^3*
x^(3*n) + 12*b^4*x^(4*n)))/(60*n) + a^5*Log[x]
```

Maple [A] time = 0.003, size = 84, normalized size = 1.

$$\frac{b^5(x^n)^5}{5n}+\frac{5ab^4(x^n)^4}{4n}+\frac{10a^2b^3(x^n)^3}{3n}+5\frac{a^3b^2(x^n)^2}{n}+5\frac{a^4bx^n}{n}+\frac{a^5\ln(x^n)}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^5/x,x)
```

```
[Out] 1/5/n*b^5*(x^n)^5+5/4/n*a*b^4*(x^n)^4+10/3/n*a^2*b^3*(x^n)^3+5/n*
a^3*b^2*(x^n)^2+5*a^4*b*x^n/n+1/n*a^5*ln(x^n)
```

Maxima [A] time = 1.42592, size = 100, normalized size = 1.19

$$\frac{a^5 \log(x^n)}{n} + \frac{12\, b^5 x^{5\,n} + 75\, a b^4 x^{4\,n} + 200\, a^2 b^3 x^{3\,n} + 300\, a^3 b^2 x^{2\,n} + 300\, a^4 b x^n}{60\, n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5/x,x, algorithm="maxima")
```

```
[Out] a^5*log(x^n)/n + 1/60*(12*b^5*x^(5*n) + 75*a*b^4*x^(4*n) + 200*a^
2*b^3*x^(3*n) + 300*a^3*b^2*x^(2*n) + 300*a^4*b*x^n)/n
```

Fricas [A] time = 0.227897, size = 95, normalized size = 1.13

$$\frac{60\, a^5 n \log(x) + 12\, b^5 x^{5\,n} + 75\, a b^4 x^{4\,n} + 200\, a^2 b^3 x^{3\,n} + 300\, a^3 b^2 x^{2\,n} + 300\, a^4 b x^n}{60\, n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5/x,x, algorithm="fricas")
```

```
[Out] 1/60*(60*a^5*n*log(x) + 12*b^5*x^(5*n) + 75*a*b^4*x^(4*n) + 200*a
^2*b^3*x^(3*n) + 300*a^3*b^2*x^(2*n) + 300*a^4*b*x^n)/n
```

Sympy [A] time = 2.32435, size = 85, normalized size = 1.01

$$\begin{cases} a^5 \log(x) + \frac{5a^4 b x^n}{n} + \frac{5a^3 b^2 x^{2n}}{n} + \frac{10a^2 b^3 x^{3n}}{3n} + \frac{5ab^4 x^{4n}}{4n} + \frac{b^5 x^{5n}}{5n} & \text{for}\: n \neq 0 \\ (a+b)^5 \log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**5/x,x)
```

```
[Out] Piecewise((a**5*log(x) + 5*a**4*b*x**n/n + 5*a**3*b**2*x**(2*n)/n
 + 10*a**2*b**3*x**(3*n)/(3*n) + 5*a*b**4*x**(4*n)/(4*n) + b**5*x
**(5*n)/(5*n), Ne(n, 0)), ((a + b)**5*log(x), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^n + a)^5}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5/x,x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^5/x, x)
```

3.2549 $\int x^{-1-n}\left(a+bx^n\right)^5\,dx$

Optimal. Leaf size=83

$$-\frac{a^5x^{-n}}{n}+5a^4b\log(x)+\frac{10a^3b^2x^n}{n}+\frac{5a^2b^3x^{2n}}{n}+\frac{5ab^4x^{3n}}{3n}+\frac{b^5x^{4n}}{4n}$$

```
[Out] -(a^5/(n*x^n)) + (10*a^3*b^2*x^n)/n + (5*a^2*b^3*x^(2*n))/n + (5*
a*b^4*x^(3*n))/(3*n) + (b^5*x^(4*n))/(4*n) + 5*a^4*b*Log[x]
```

Rubi [A] time = 0.0962486, antiderivative size = 83, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{a^5x^{-n}}{n}+5a^4b\log(x)+\frac{10a^3b^2x^n}{n}+\frac{5a^2b^3x^{2n}}{n}+\frac{5ab^4x^{3n}}{3n}+\frac{b^5x^{4n}}{4n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - n)*(a + b*x^n)^5,x]
```

```
[Out] -(a^5/(n*x^n)) + (10*a^3*b^2*x^n)/n + (5*a^2*b^3*x^(2*n))/n + (5*
a*b^4*x^(3*n))/(3*n) + (b^5*x^(4*n))/(4*n) + 5*a^4*b*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^5x^{-n}}{n}+\frac{5a^4b\log\left(x^n\right)}{n}+\frac{10a^3b^2x^n}{n}+\frac{10a^2b^3\int^{x^n}x\,dx}{n}+\frac{5ab^4x^{3n}}{3n}+\frac{b^5x^{4n}}{4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-n)*(a+b*x**n)**5,x)
```

```
[Out] -a**5*x**(-n)/n + 5*a**4*b*log(x**n)/n + 10*a**3*b**2*x**n/n + 10
*a**2*b**3*Integral(x, (x, x**n))/n + 5*a*b**4*x**(3*n)/(3*n) + b
**5*x**(4*n)/(4*n)
```

Mathematica [A] time = 0.0424755, size = 72, normalized size = 0.87

$$-\frac{12a^5x^{-n}-60a^4bn\log(x)-120a^3b^2x^n-60a^2b^3x^{2n}-20ab^4x^{3n}-3b^5x^{4n}}{12n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - n)*(a + b*x^n)^5,x]
```

```
[Out] -((12*a^5)/x^n - 120*a^3*b^2*x^n - 60*a^2*b^3*x^(2*n) - 20*a*b^4*
x^(3*n) - 3*b^5*x^(4*n) - 60*a^4*b*n*Log[x])/(12*n)
```

Maple [A] time = 0.027, size = 98, normalized size = 1.2

$$\frac{1}{e^{n\ln(x)}}\left(5\,a^4b\ln(x)\,e^{n\ln(x)}-\frac{a^5}{n}+\frac{b^5\left(e^{n\ln(x)}\right)^5}{4\,n}+\frac{5\,ab^4\left(e^{n\ln(x)}\right)^4}{3\,n}+5\,\frac{a^2b^3\left(e^{n\ln(x)}\right)^3}{n}+10\,\frac{a^3b^2\left(e^{n\ln(x)}\right)^2}{n}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-n)*(a+b*x^n)^5,x)
```

```
[Out] (5*a^4*b*ln(x)*exp(n*ln(x))-a^5/n+1/4*b^5/n*exp(n*ln(x))^5+5/3*a*
b^4/n*exp(n*ln(x))^4+5*a^2*b^3/n*exp(n*ln(x))^3+10*a^3*b^2/n*exp(
n*ln(x))^2)/exp(n*ln(x))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(-n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.226039, size = 101, normalized size = 1.22

$$\frac{60\,a^4bnx^n\log(x) + 3\,b^5x^{5\,n} + 20\,ab^4x^{4\,n} + 60\,a^2b^3x^{3\,n} + 120\,a^3b^2x^{2\,n} - 12\,a^5}{12\,nx^n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(-n - 1),x, algorithm="fricas")
```

```
[Out] 1/12*(60*a^4*b*n*x^n*log(x) + 3*b^5*x^(5*n) + 20*a*b^4*x^(4*n) +
60*a^2*b^3*x^(3*n) + 120*a^3*b^2*x^(2*n) - 12*a^5)/(n*x^n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-n)*(a+b*x**n)**5,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.229502, size = 111, normalized size = 1.34

$$\frac{\left(60\,a^4bne^{(n\ln(x))}\ln(x) + 3\,b^5e^{(5\,n\ln(x))} + 20\,ab^4e^{(4\,n\ln(x))} + 60\,a^2b^3e^{(3\,n\ln(x))} + 120\,a^3b^2e^{(2\,n\ln(x))} - 12\,a^5\right)e^{(-n\ln(x))}}{12\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(-n - 1),x, algorithm="giac")
```

```
[Out] 1/12*(60*a^4*b*n*e^(n*ln(x))*ln(x) + 3*b^5*e^(5*n*ln(x)) + 20*a*b
^4*e^(4*n*ln(x)) + 60*a^2*b^3*e^(3*n*ln(x)) + 120*a^3*b^2*e^(2*n*
ln(x)) - 12*a^5)*e^(-n*ln(x))/n
```

3.2550 $\int x^{-1-2n}(a+bx^n)^5\,dx$

Optimal. Leaf size=85

$$-\frac{a^5x^{-2n}}{2n}-\frac{5a^4bx^{-n}}{n}+10a^3b^2\log(x)+\frac{10a^2b^3x^n}{n}+\frac{5ab^4x^{2n}}{2n}+\frac{b^5x^{3n}}{3n}$$

```
[Out] -a^5/(2*n*x^(2*n)) - (5*a^4*b)/(n*x^n) + (10*a^2*b^3*x^n)/n + (5*
a*b^4*x^(2*n))/(2*n) + (b^5*x^(3*n))/(3*n) + 10*a^3*b^2*Log[x]
```

Rubi [A] time = 0.0961271, antiderivative size = 85, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{a^5x^{-2n}}{2n}-\frac{5a^4bx^{-n}}{n}+10a^3b^2\log(x)+\frac{10a^2b^3x^n}{n}+\frac{5ab^4x^{2n}}{2n}+\frac{b^5x^{3n}}{3n}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 - 2*n)*(a + b*x^n)^5,x]
```

```
[Out] -a^5/(2*n*x^(2*n)) - (5*a^4*b)/(n*x^n) + (10*a^2*b^3*x^n)/n + (5*
a*b^4*x^(2*n))/(2*n) + (b^5*x^(3*n))/(3*n) + 10*a^3*b^2*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^5x^{-2n}}{2n}-\frac{5a^4bx^{-n}}{n}+\frac{10a^3b^2\log(x^n)}{n}+\frac{10a^2b^3x^n}{n}+\frac{5ab^4\int^{x^n}x\,dx}{n}+\frac{b^5x^{3n}}{3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1-2*n)*(a+b*x**n)**5,x)
```

```
[Out] -a**5*x**(-2*n)/(2*n) - 5*a**4*b*x**(-n)/n + 10*a**3*b**2*log(x**
n)/n + 10*a**2*b**3*x**n/n + 5*a*b**4*Integral(x, (x, x**n))/n +
b**5*x**(3*n)/(3*n)
```

Mathematica [A] time = 0.073103, size = 72, normalized size = 0.85

$$-\frac{3a^5x^{-2n}+30a^4bx^{-n}-60a^3b^2n\log(x)-60a^2b^3x^n-15ab^4x^{2n}-2b^5x^{3n}}{6n}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 - 2*n)*(a + b*x^n)^5,x]
```

```
[Out] -((3*a^5)/x^(2*n) + (30*a^4*b)/x^n - 60*a^2*b^3*x^n - 15*a*b^4*x^
(2*n) - 2*b^5*x^(3*n) - 60*a^3*b^2*n*Log[x])/(6*n)
```

Maple [A] time = 0.027, size = 98, normalized size = 1.2

$$\frac{1}{\left(e^{n\ln(x)}\right)^2}\left(10\,a^3b^2\ln(x)\left(e^{n\ln(x)}\right)^2-\frac{a^5}{2\,n}+\frac{b^5\left(e^{n\ln(x)}\right)^5}{3\,n}+\frac{5\,ab^4\left(e^{n\ln(x)}\right)^4}{2\,n}+10\,\frac{a^2b^3\left(e^{n\ln(x)}\right)^3}{n}-5\,\frac{a^4be^{n\ln(x)}}{n}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-2*n)*(a+b*x^n)^5,x)
```

```
[Out] (10*a^3*b^2*ln(x)*exp(n*ln(x))^2-1/2*a^5/n+1/3*b^5/n*exp(n*ln(x))
^5+5/2*a*b^4/n*exp(n*ln(x))^4+10*a^2*b^3/n*exp(n*ln(x))^3-5*a^4*b
/n*exp(n*ln(x)))/exp(n*ln(x))^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(-2*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.228342, size = 104, normalized size = 1.22

$$\frac{60\,a^{3}b^{2}nx^{2\,n}\log\left(x\right)+2\,b^{5}x^{5\,n}+15\,ab^{4}x^{4\,n}+60\,a^{2}b^{3}x^{3\,n}-30\,a^{4}bx^{n}-3\,a^{5}}{6\,nx^{2\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(-2*n - 1),x, algorithm="fricas")
```

```
[Out] 1/6*(60*a^3*b^2*n*x^(2*n)*log(x) + 2*b^5*x^(5*n) + 15*a*b^4*x^(4*
n) + 60*a^2*b^3*x^(3*n) - 30*a^4*b*x^n - 3*a^5)/(n*x^(2*n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-2*n)*(a+b*x**n)**5,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.226677, size = 111, normalized size = 1.31

$$\frac{\left(60\,a^{3}b^{2}ne^{\left(2\,n\ln\left(x\right)\right)}\ln\left(x\right)+2\,b^{5}e^{\left(5\,n\ln\left(x\right)\right)}+15\,ab^{4}e^{\left(4\,n\ln\left(x\right)\right)}+60\,a^{2}b^{3}e^{\left(3\,n\ln\left(x\right)\right)}-30\,a^{4}be^{\left(n\ln\left(x\right)\right)}-3\,a^{5}\right)e^{\left(-2\,n\ln\left(x\right)\right)}}{6\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(-2*n - 1),x, algorithm="giac")
```

```
[Out] 1/6*(60*a^3*b^2*n*e^(2*n*ln(x))*ln(x) + 2*b^5*e^(5*n*ln(x)) + 15*
a*b^4*e^(4*n*ln(x)) + 60*a^2*b^3*e^(3*n*ln(x)) - 30*a^4*b*e^(n*ln
(x)) - 3*a^5)*e^(-2*n*ln(x))/n
```

3.2551 $\int x^{-1-3n}(a+bx^n)^5\,dx$

Optimal. Leaf size=85

$$-\frac{a^5x^{-3n}}{3n}-\frac{5a^4bx^{-2n}}{2n}-\frac{10a^3b^2x^{-n}}{n}+10a^2b^3\log(x)+\frac{5ab^4x^n}{n}+\frac{b^5x^{2n}}{2n}$$

```
[Out] -a^5/(3*n*x^(3*n)) - (5*a^4*b)/(2*n*x^(2*n)) - (10*a^3*b^2)/(n*x^
n) + (5*a*b^4*x^n)/n + (b^5*x^(2*n))/(2*n) + 10*a^2*b^3*Log[x]
```

Rubi [A] time = 0.0962733, antiderivative size = 85, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{a^5x^{-3n}}{3n}-\frac{5a^4bx^{-2n}}{2n}-\frac{10a^3b^2x^{-n}}{n}+10a^2b^3\log(x)+\frac{5ab^4x^n}{n}+\frac{b^5x^{2n}}{2n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 3*n)*(a + b*x^n)^5,x]
```

```
[Out] -a^5/(3*n*x^(3*n)) - (5*a^4*b)/(2*n*x^(2*n)) - (10*a^3*b^2)/(n*x^
n) + (5*a*b^4*x^n)/n + (b^5*x^(2*n))/(2*n) + 10*a^2*b^3*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^5x^{-3n}}{3n}-\frac{5a^4bx^{-2n}}{2n}-\frac{10a^3b^2x^{-n}}{n}+\frac{10a^2b^3\log(x^n)}{n}+\frac{5ab^4x^n}{n}+\frac{b^5\int^{x^n}x\,dx}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-3*n)*(a+b*x**n)**5,x)
```

```
[Out] -a**5*x**(-3*n)/(3*n) - 5*a**4*b*x**(-2*n)/(2*n) - 10*a**3*b**2*x
**(-n)/n + 10*a**2*b**3*log(x**n)/n + 5*a*b**4*x**n/n + b**5*Inte
gral(x, (x, x**n))/n
```

Mathematica [A] time = 0.0825211, size = 72, normalized size = 0.85

$$-\frac{2a^5x^{-3n}+15a^4bx^{-2n}+60a^3b^2x^{-n}-60a^2b^3n\log(x)-30ab^4x^n-3b^5x^{2n}}{6n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 3*n)*(a + b*x^n)^5,x]
```

```
[Out] -((2*a^5)/x^(3*n) + (15*a^4*b)/x^(2*n) + (60*a^3*b^2)/x^n - 30*a*
b^4*x^n - 3*b^5*x^(2*n) - 60*a^2*b^3*n*Log[x])/(6*n)
```

Maple [A] time = 0.028, size = 98, normalized size = 1.2

$$\frac{1}{\left(e^{n\ln(x)}\right)^3}\left(10\,a^2b^3\ln(x)\left(e^{n\ln(x)}\right)^3-\frac{a^5}{3\,n}+\frac{b^5\left(e^{n\ln(x)}\right)^5}{2\,n}+5\,\frac{ab^4\left(e^{n\ln(x)}\right)^4}{n}-10\,\frac{a^3b^2\left(e^{n\ln(x)}\right)^2}{n}-\frac{5\,a^4be^{n\ln(x)}}{2\,n}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-3*n)*(a+b*x^n)^5,x)
```

```
[Out] (10*a^2*b^3*ln(x)*exp(n*ln(x))^3-1/3*a^5/n+1/2*b^5/n*exp(n*ln(x))
^5+5*a*b^4/n*exp(n*ln(x))^4-10*a^3*b^2/n*exp(n*ln(x))^2-5/2*a^4*b
/n*exp(n*ln(x)))/exp(n*ln(x))^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(-3*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.227236, size = 104, normalized size = 1.22

$$\frac{60\, a^{2} b^{3} n x^{3\, n} \log\left(x\right) + 3\, b^{5} x^{5\, n} + 30\, a b^{4} x^{4\, n} - 60\, a^{3} b^{2} x^{2\, n} - 15\, a^{4} b x^{n} - 2\, a^{5}}{6\, n x^{3\, n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(-3*n - 1),x, algorithm="fricas")
```

```
[Out] 1/6*(60*a^2*b^3*n*x^(3*n)*log(x) + 3*b^5*x^(5*n) + 30*a*b^4*x^(4*
n) - 60*a^3*b^2*x^(2*n) - 15*a^4*b*x^n - 2*a^5)/(n*x^(3*n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-3*n)*(a+b*x**n)**5,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.226243, size = 111, normalized size = 1.31

$$\frac{\left(60\, a^{2} b^{3} n e^{\left(3\, n \ln\left(x\right)\right)} \ln\left(x\right) + 3\, b^{5} e^{\left(5\, n \ln\left(x\right)\right)} + 30\, a b^{4} e^{\left(4\, n \ln\left(x\right)\right)} - 60\, a^{3} b^{2} e^{\left(2\, n \ln\left(x\right)\right)} - 15\, a^{4} b e^{\left(n \ln\left(x\right)\right)} - 2\, a^{5}\right)} e^{\left(-3\, n \ln\left(x\right)\right)}}{6\, n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(-3*n - 1),x, algorithm="giac")
```

```
[Out] 1/6*(60*a^2*b^3*n*e^(3*n*ln(x))*ln(x) + 3*b^5*e^(5*n*ln(x)) + 30*
a*b^4*e^(4*n*ln(x)) - 60*a^3*b^2*e^(2*n*ln(x)) - 15*a^4*b*e^(n*ln
(x)) - 2*a^5)*e^(-3*n*ln(x))/n
```

3.2552 $\int x^{-1-4n}(a+bx^n)^5\,dx$

Optimal. Leaf size=82

$$-\frac{a^5x^{-4n}}{4n}-\frac{5a^4bx^{-3n}}{3n}-\frac{5a^3b^2x^{-2n}}{n}-\frac{10a^2b^3x^{-n}}{n}+5ab^4\log(x)+\frac{b^5x^n}{n}$$

```
[Out] -a^5/(4*n*x^(4*n)) - (5*a^4*b)/(3*n*x^(3*n)) - (5*a^3*b^2)/(n*x^(
2*n)) - (10*a^2*b^3)/(n*x^n) + (b^5*x^n)/n + 5*a*b^4*Log[x]
```

Rubi [A] time = 0.0974764, antiderivative size = 82, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{a^5x^{-4n}}{4n}-\frac{5a^4bx^{-3n}}{3n}-\frac{5a^3b^2x^{-2n}}{n}-\frac{10a^2b^3x^{-n}}{n}+5ab^4\log(x)+\frac{b^5x^n}{n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 4*n)*(a + b*x^n)^5,x]
```

```
[Out] -a^5/(4*n*x^(4*n)) - (5*a^4*b)/(3*n*x^(3*n)) - (5*a^3*b^2)/(n*x^(
2*n)) - (10*a^2*b^3)/(n*x^n) + (b^5*x^n)/n + 5*a*b^4*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^5x^{-4n}}{4n}-\frac{5a^4bx^{-3n}}{3n}-\frac{5a^3b^2x^{-2n}}{n}-\frac{10a^2b^3x^{-n}}{n}+\frac{5ab^4\log(x^n)}{n}+\frac{\int^{x^n}b^5\,dx}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-4*n)*(a+b*x**n)**5,x)
```

```
[Out] -a**5*x**(-4*n)/(4*n) - 5*a**4*b*x**(-3*n)/(3*n) - 5*a**3*b**2*x*
*(-2*n)/n - 10*a**2*b**3*x**(-n)/n + 5*a*b**4*log(x**n)/n + Integ
ral(b**5, (x, x**n))/n
```

Mathematica [A] time = 0.101281, size = 72, normalized size = 0.88

$$5ab^4\log(x)-\frac{x^{-4n}\left(3a^5+20a^4bx^n+60a^3b^2x^{2n}+120a^2b^3x^{3n}-12b^5x^{5n}\right)}{12n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 4*n)*(a + b*x^n)^5,x]
```

```
[Out] -(3*a^5 + 20*a^4*b*x^n + 60*a^3*b^2*x^(2*n) + 120*a^2*b^3*x^(3*n)
 - 12*b^5*x^(5*n))/(12*n*x^(4*n)) + 5*a*b^4*Log[x]
```

Maple [A] time = 0.028, size = 97, normalized size = 1.2

$$\frac{1}{\left(e^{n\ln(x)}\right)^4}\left(\frac{b^5\left(e^{n\ln(x)}\right)^5}{n}+5\,ab^4\ln(x)\left(e^{n\ln(x)}\right)^4-\frac{a^5}{4\,n}-10\,\frac{a^2b^3\left(e^{n\ln(x)}\right)^3}{n}-5\,\frac{a^3b^2\left(e^{n\ln(x)}\right)^2}{n}-\frac{5\,a^4be^{n\ln(x)}}{3\,n}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-4*n)*(a+b*x^n)^5,x)
```

```
[Out] (b^5/n*exp(n*ln(x))^5+5*a*b^4*ln(x)*exp(n*ln(x))^4-1/4*a^5/n-10*a
^2*b^3/n*exp(n*ln(x))^3-5*a^3*b^2/n*exp(n*ln(x))^2-5/3*a^4*b/n*ex
p(n*ln(x)))/exp(n*ln(x))^4
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(-4*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.226463, size = 104, normalized size = 1.27

$$\frac{60\,ab^4nx^{4\,n}\log\left(x\right) + 12\,b^5x^{5\,n} - 120\,a^2b^3x^{3\,n} - 60\,a^3b^2x^{2\,n} - 20\,a^4bx^n - 3\,a^5}{12\,nx^{4\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(-4*n - 1),x, algorithm="fricas")
```

```
[Out] 1/12*(60*a*b^4*n*x^(4*n)*log(x) + 12*b^5*x^(5*n) - 120*a^2*b^3*x^
(3*n) - 60*a^3*b^2*x^(2*n) - 20*a^4*b*x^n - 3*a^5)/(n*x^(4*n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-4*n)*(a+b*x**n)**5,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.228652, size = 111, normalized size = 1.35

$$\frac{\left(60\,ab^4ne^{\left(4\,n\ln\left(x\right)\right)}\ln\left(x\right) + 12\,b^5e^{\left(5\,n\ln\left(x\right)\right)} - 120\,a^2b^3e^{\left(3\,n\ln\left(x\right)\right)} - 60\,a^3b^2e^{\left(2\,n\ln\left(x\right)\right)} - 20\,a^4be^{\left(n\ln\left(x\right)\right)} - 3\,a^5\right)e^{\left(-4\,n\ln\left(x\right)\right)}}{12\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(-4*n - 1),x, algorithm="giac")
```

```
[Out] 1/12*(60*a*b^4*n*e^(4*n*ln(x))*ln(x) + 12*b^5*e^(5*n*ln(x)) - 120
*a^2*b^3*e^(3*n*ln(x)) - 60*a^3*b^2*e^(2*n*ln(x)) - 20*a^4*b*e^(n
*ln(x)) - 3*a^5)*e^(-4*n*ln(x))/n
```

3.2553 $\int x^{-1-5n} (a+bx^n)^5 \, dx$

Optimal. Leaf size=86

$$-\frac{a^5x^{-5n}}{5n}-\frac{5a^4bx^{-4n}}{4n}-\frac{10a^3b^2x^{-3n}}{3n}-\frac{5a^2b^3x^{-2n}}{n}-\frac{5ab^4x^{-n}}{n}+b^5\log(x)$$

```
[Out] -a^5/(5*n*x^(5*n)) - (5*a^4*b)/(4*n*x^(4*n)) - (10*a^3*b^2)/(3*n*
x^(3*n)) - (5*a^2*b^3)/(n*x^(2*n)) - (5*a*b^4)/(n*x^n) + b^5*Log[
x]
```

Rubi [A] time = 0.0956464, antiderivative size = 86, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$

$$-\frac{a^5x^{-5n}}{5n}-\frac{5a^4bx^{-4n}}{4n}-\frac{10a^3b^2x^{-3n}}{3n}-\frac{5a^2b^3x^{-2n}}{n}-\frac{5ab^4x^{-n}}{n}+b^5\log(x)$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 5*n)*(a + b*x^n)^5,x]
```

```
[Out] -a^5/(5*n*x^(5*n)) - (5*a^4*b)/(4*n*x^(4*n)) - (10*a^3*b^2)/(3*n*
x^(3*n)) - (5*a^2*b^3)/(n*x^(2*n)) - (5*a*b^4)/(n*x^n) + b^5*Log[
x]
```

Rubi in Sympy [A] time = 16.4995, size = 80, normalized size = 0.93

$$-\frac{a^5x^{-5n}}{5n}-\frac{5a^4bx^{-4n}}{4n}-\frac{10a^3b^2x^{-3n}}{3n}-\frac{5a^2b^3x^{-2n}}{n}-\frac{5ab^4x^{-n}}{n}+\frac{b^5\log(x^n)}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-5*n)*(a+b*x**n)**5,x)
```

```
[Out] -a**5*x**(-5*n)/(5*n) - 5*a**4*b*x**(-4*n)/(4*n) - 10*a**3*b**2*x
**(-3*n)/(3*n) - 5*a**2*b**3*x**(-2*n)/n - 5*a*b**4*x**(-n)/n + b
**5*log(x**n)/n
```

Mathematica [A] time = 0.0659197, size = 69, normalized size = 0.8

$$b^5\log(x)-\frac{ax^{-5n}\left(12a^4+75a^3bx^n+200a^2b^2x^{2n}+300ab^3x^{3n}+300b^4x^{4n}\right)}{60n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 5*n)*(a + b*x^n)^5,x]
```

```
[Out] -(a*(12*a^4 + 75*a^3*b*x^n + 200*a^2*b^2*x^(2*n) + 300*a*b^3*x^(3
*n) + 300*b^4*x^(4*n)))/(60*n*x^(5*n)) + b^5*Log[x]
```

Maple [A] time = 0.029, size = 97, normalized size = 1.1

$$\frac{1}{\left(e^{n\ln(x)}\right)^5}\left(b^5\ln(x)\left(e^{n\ln(x)}\right)^5-\frac{a^5}{5n}-5\frac{ab^4\left(e^{n\ln(x)}\right)^4}{n}-5\frac{a^2b^3\left(e^{n\ln(x)}\right)^3}{n}-\frac{10a^3b^2\left(e^{n\ln(x)}\right)^2}{3n}-\frac{5a^4be^{n\ln(x)}}{4n}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-5*n)*(a+b*x^n)^5,x)
```

```
[Out] (b^5*ln(x)*exp(n*ln(x))^5-1/5*a^5/n-5*a*b^4/n*exp(n*ln(x))^4-5*a^
2*b^3/n*exp(n*ln(x))^3-10/3*a^3*b^2/n*exp(n*ln(x))^2-5/4*a^4*b/n*
exp(n*ln(x)))/exp(n*ln(x))^5
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(-5*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.226253, size = 104, normalized size = 1.21

$$\frac{60\,b^5nx^{5\,n}\log\left(x\right) - 300\,ab^4x^{4\,n} - 300\,a^2b^3x^{3\,n} - 200\,a^3b^2x^{2\,n} - 75\,a^4bx^n - 12\,a^5}{60\,nx^{5\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(-5*n - 1),x, algorithm="fricas")
```

```
[Out] 1/60*(60*b^5*n*x^(5*n)*log(x) - 300*a*b^4*x^(4*n) - 300*a^2*b^3*x
^(3*n) - 200*a^3*b^2*x^(2*n) - 75*a^4*b*x^n - 12*a^5)/(n*x^(5*n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-5*n)*(a+b*x**n)**5,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.226778, size = 111, normalized size = 1.29

$$\frac{\left(60\,b^5ne^{\left(5\,n\ln\left(x\right)\right)}\ln\left(x\right) - 300\,ab^4e^{\left(4\,n\ln\left(x\right)\right)} - 300\,a^2b^3e^{\left(3\,n\ln\left(x\right)\right)} - 200\,a^3b^2e^{\left(2\,n\ln\left(x\right)\right)} - 75\,a^4be^{\left(n\ln\left(x\right)\right)} - 12\,a^5\right)e^{\left(-5\,n\ln\left(x\right)\right)}}{60\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(-5*n - 1),x, algorithm="giac")
```

```
[Out] 1/60*(60*b^5*n*e^(5*n*ln(x))*ln(x) - 300*a*b^4*e^(4*n*ln(x)) - 30
0*a^2*b^3*e^(3*n*ln(x)) - 200*a^3*b^2*e^(2*n*ln(x)) - 75*a^4*b*e^
(n*ln(x)) - 12*a^5)*e^(-5*n*ln(x))/n
```

3.2554 $\int x^{-1-6n}(a+bx^n)^5\,dx$

Optimal. Leaf size=24

$$-\frac{x^{-6n}(a+bx^n)^6}{6an}$$

```
[Out] -(a + b*x^n)^6/(6*a*n*x^(6*n))
```

Rubi [A] time = 0.0212702, antiderivative size = 24, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.059$

$$-\frac{x^{-6n}(a+bx^n)^6}{6an}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 6*n)*(a + b*x^n)^5,x]

[Out] -(a + b*x^n)^6/(6*a*n*x^(6*n))
```

Rubi in Sympy [A] time = 3.09178, size = 19, normalized size = 0.79

$$-\frac{x^{-6n}(a+bx^n)^6}{6an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-6*n)*(a+b*x**n)**5,x)

[Out] -x**(-6*n)*(a + b*x**n)**6/(6*a*n)
```

Mathematica [B] time = 0.0377001, size = 72, normalized size = 3.

$$-\frac{x^{-6n}\left(a^5+6a^4bx^n+15a^3b^2x^{2n}+20a^2b^3x^{3n}+15ab^4x^{4n}+6b^5x^{5n}\right)}{6n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 6*n)*(a + b*x^n)^5,x]

[Out] -(a^5 + 6*a^4*b*x^n + 15*a^3*b^2*x^(2*n) + 20*a^2*b^3*x^(3*n) + 1
5*a*b^4*x^(4*n) + 6*b^5*x^(5*n))/(6*n*x^(6*n))
```

Maple [B] time = 0.036, size = 88, normalized size = 3.7

$$-\frac{b^5}{nx^n}-\frac{5\,ab^4}{2\,n\,(x^n)^2}-\frac{10\,a^2b^3}{3\,n\,(x^n)^3}-\frac{5\,a^3b^2}{2\,n\,(x^n)^4}-\frac{a^4b}{n\,(x^n)^5}-\frac{a^5}{6\,n\,(x^n)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-6*n)*(a+b*x^n)^5,x)
```

```
[Out] -b^5/n/(x^n)-5/2*a*b^4/n/(x^n)^2-10/3*a^2*b^3/n/(x^n)^3-5/2*a^3*b
^2/n/(x^n)^4-a^4*b/n/(x^n)^5-1/6*a^5/n/(x^n)^6
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(-6*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.226407, size = 97, normalized size = 4.04

$$-\frac{6\,b^5x^{5\,n} + 15\,ab^4x^{4\,n} + 20\,a^2b^3x^{3\,n} + 15\,a^3b^2x^{2\,n} + 6\,a^4bx^n + a^5}{6\,nx^{6\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(-6*n - 1),x, algorithm="fricas")
```

```
[Out] -1/6*(6*b^5*x^(5*n) + 15*a*b^4*x^(4*n) + 20*a^2*b^3*x^(3*n) + 15*
a^3*b^2*x^(2*n) + 6*a^4*b*x^n + a^5)/(n*x^(6*n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-6*n)*(a+b*x**n)**5,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.228178, size = 104, normalized size = 4.33

$$-\frac{\left(6\,b^5e^{(5\,n\ln(x))} + 15\,ab^4e^{(4\,n\ln(x))} + 20\,a^2b^3e^{(3\,n\ln(x))} + 15\,a^3b^2e^{(2\,n\ln(x))} + 6\,a^4be^{(n\ln(x))} + a^5\right)e^{(-6\,n\ln(x))}}{6\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(-6*n - 1),x, algorithm="giac")
```

```
[Out] -1/6*(6*b^5*e^(5*n*ln(x)) + 15*a*b^4*e^(4*n*ln(x)) + 20*a^2*b^3*e
^(3*n*ln(x)) + 15*a^3*b^2*e^(2*n*ln(x)) + 6*a^4*b*e^(n*ln(x)) + a
^5)*e^(-6*n*ln(x))/n
```

3.2555 $\int x^{-1-7n}(a+bx^n)^5\,dx$

Optimal. Leaf size=50

$$\frac{bx^{-6n}(a+bx^n)^6}{42a^2n}-\frac{x^{-7n}(a+bx^n)^6}{7an}$$

```
[Out] -(a + b*x^n)^6/(7*a*n*x^(7*n)) + (b*(a + b*x^n)^6)/(42*a^2*n*x^(6
*n))
```

Rubi [A] time = 0.055605, antiderivative size = 50, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176

$$\frac{bx^{-6n}(a+bx^n)^6}{42a^2n}-\frac{x^{-7n}(a+bx^n)^6}{7an}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 7*n)*(a + b*x^n)^5,x]
```

```
[Out] -(a + b*x^n)^6/(7*a*n*x^(7*n)) + (b*(a + b*x^n)^6)/(42*a^2*n*x^(6
*n))
```

Rubi in Sympy [A] time = 6.85739, size = 39, normalized size = 0.78

$$-\frac{x^{-7n}(a+bx^n)^6}{7an}+\frac{bx^{-6n}(a+bx^n)^6}{42a^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-7*n)*(a+b*x**n)**5,x)
```

```
[Out] -x**(-7*n)*(a + b*x**n)**6/(7*a*n) + b*x**(-6*n)*(a + b*x**n)**6/
(42*a**2*n)
```

Mathematica [A] time = 0.0383964, size = 74, normalized size = 1.48

$$-\frac{x^{-7n}\left(6a^5+35a^4bx^n+84a^3b^2x^{2n}+105a^2b^3x^{3n}+70ab^4x^{4n}+21b^5x^{5n}\right)}{42n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 7*n)*(a + b*x^n)^5,x]
```

```
[Out] -(6*a^5 + 35*a^4*b*x^n + 84*a^3*b^2*x^(2*n) + 105*a^2*b^3*x^(3*n)
 + 70*a*b^4*x^(4*n) + 21*b^5*x^(5*n))/(42*n*x^(7*n))
```

Maple [A] time = 0.036, size = 88, normalized size = 1.8

$$-\frac{b^5}{2\,n\,(x^n)^2}-\frac{5\,ab^4}{3\,n\,(x^n)^3}-\frac{5\,a^2b^3}{2\,n\,(x^n)^4}-2\,\frac{a^3b^2}{n\,(x^n)^5}-\frac{5\,a^4b}{6\,n\,(x^n)^6}-\frac{a^5}{7\,n\,(x^n)^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-7*n)*(a+b*x^n)^5,x)
```

```
[Out] -1/2*b^5/n/(x^n)^2-5/3*a*b^4/n/(x^n)^3-5/2*a^2*b^3/n/(x^n)^4-2*a^
3*b^2/n/(x^n)^5-5/6*a^4*b/n/(x^n)^6-1/7*a^5/n/(x^n)^7
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(-7*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.22702, size = 100, normalized size = 2.

$$-\frac{21\, b^5 x^{5\, n} + 70\, a b^4 x^{4\, n} + 105\, a^2 b^3 x^{3\, n} + 84\, a^3 b^2 x^{2\, n} + 35\, a^4 b x^n + 6\, a^5}{42\, n x^{7\, n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(-7*n - 1),x, algorithm="fricas")
```

```
[Out] -1/42*(21*b^5*x^(5*n) + 70*a*b^4*x^(4*n) + 105*a^2*b^3*x^(3*n) +
84*a^3*b^2*x^(2*n) + 35*a^4*b*x^n + 6*a^5)/(n*x^(7*n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-7*n)*(a+b*x**n)**5,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.227318, size = 107, normalized size = 2.14

$$-\frac{\left(21\, b^5 e^{(5\, n\ln(x))} + 70\, a b^4 e^{(4\, n\ln(x))} + 105\, a^2 b^3 e^{(3\, n\ln(x))} + 84\, a^3 b^2 e^{(2\, n\ln(x))} + 35\, a^4 b e^{(n\ln(x))} + 6\, a^5\right) e^{(-7\, n\ln(x))}}{42\, n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(-7*n - 1),x, algorithm="giac")
```

```
[Out] -1/42*(21*b^5*e^(5*n*ln(x)) + 70*a*b^4*e^(4*n*ln(x)) + 105*a^2*b^
3*e^(3*n*ln(x)) + 84*a^3*b^2*e^(2*n*ln(x)) + 35*a^4*b*e^(n*ln(x))
 + 6*a^5)*e^(-7*n*ln(x))/n
```

3.2556 $\int x^{-1-8n}(a+bx^n)^5\,dx$

Optimal. Leaf size=77

$$-\frac{b^2x^{-6n}(a+bx^n)^6}{168a^3n}+\frac{bx^{-7n}(a+bx^n)^6}{28a^2n}-\frac{x^{-8n}(a+bx^n)^6}{8an}$$

```
[Out] -(a + b*x^n)^6/(8*a*n*x^(8*n)) + (b*(a + b*x^n)^6)/(28*a^2*n*x^(7
*n)) - (b^2*(a + b*x^n)^6)/(168*a^3*n*x^(6*n))
```

Rubi [A] time = 0.0835373, antiderivative size = 77, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176

$$-\frac{b^2x^{-6n}(a+bx^n)^6}{168a^3n}+\frac{bx^{-7n}(a+bx^n)^6}{28a^2n}-\frac{x^{-8n}(a+bx^n)^6}{8an}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 8*n)*(a + b*x^n)^5,x]
```

```
[Out] -(a + b*x^n)^6/(8*a*n*x^(8*n)) + (b*(a + b*x^n)^6)/(28*a^2*n*x^(7
*n)) - (b^2*(a + b*x^n)^6)/(168*a^3*n*x^(6*n))
```

Rubi in Sympy [A] time = 17.499, size = 87, normalized size = 1.13

$$-\frac{a^5x^{-8n}}{8n}-\frac{5a^4bx^{-7n}}{7n}-\frac{5a^3b^2x^{-6n}}{3n}-\frac{2a^2b^3x^{-5n}}{n}-\frac{5ab^4x^{-4n}}{4n}-\frac{b^5x^{-3n}}{3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-8*n)*(a+b*x**n)**5,x)
```

```
[Out] -a**5*x**(-8*n)/(8*n) - 5*a**4*b*x**(-7*n)/(7*n) - 5*a**3*b**2*x*
*(-6*n)/(3*n) - 2*a**2*b**3*x**(-5*n)/n - 5*a*b**4*x**(-4*n)/(4*n
) - b**5*x**(-3*n)/(3*n)
```

Mathematica [A] time = 0.0378441, size = 74, normalized size = 0.96

$$-\frac{x^{-8n}\left(21a^5+120a^4bx^n+280a^3b^2x^{2n}+336a^2b^3x^{3n}+210ab^4x^{4n}+56b^5x^{5n}\right)}{168n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 8*n)*(a + b*x^n)^5,x]
```

```
[Out] -(21*a^5 + 120*a^4*b*x^n + 280*a^3*b^2*x^(2*n) + 336*a^2*b^3*x^(3
*n) + 210*a*b^4*x^(4*n) + 56*b^5*x^(5*n))/(168*n*x^(8*n))
```

Maple [A] time = 0.036, size = 88, normalized size = 1.1

$$-\frac{b^5}{3\,n\,(x^n)^3}-\frac{5\,ab^4}{4\,n\,(x^n)^4}-2\,\frac{a^2b^3}{n\,(x^n)^5}-\frac{5\,a^3b^2}{3\,n\,(x^n)^6}-\frac{5\,a^4b}{7\,n\,(x^n)^7}-\frac{a^5}{8\,n\,(x^n)^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-8*n)*(a+b*x^n)^5,x)
```

```
[Out] -1/3*b^5/n/(x^n)^3-5/4*a*b^4/n/(x^n)^4-2*a^2*b^3/n/(x^n)^5-5/3*a^
3*b^2/n/(x^n)^6-5/7*a^4*b/n/(x^n)^7-1/8*a^5/n/(x^n)^8
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(-8*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.225728, size = 100, normalized size = 1.3

$$-\frac{56\, b^{5} x^{5\, n} + 210\, a b^{4} x^{4\, n} + 336\, a^{2} b^{3} x^{3\, n} + 280\, a^{3} b^{2} x^{2\, n} + 120\, a^{4} b x^{n} + 21\, a^{5}}{168\, n x^{8\, n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(-8*n - 1),x, algorithm="fricas")
```

```
[Out] -1/168*(56*b^5*x^(5*n) + 210*a*b^4*x^(4*n) + 336*a^2*b^3*x^(3*n)
+ 280*a^3*b^2*x^(2*n) + 120*a^4*b*x^n + 21*a^5)/(n*x^(8*n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-8*n)*(a+b*x**n)**5,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.228996, size = 107, normalized size = 1.39

$$-\frac{\left(56\, b^{5} e^{\left(5\, n \ln\left(x\right)\right)} + 210\, a b^{4} e^{\left(4\, n \ln\left(x\right)\right)} + 336\, a^{2} b^{3} e^{\left(3\, n \ln\left(x\right)\right)} + 280\, a^{3} b^{2} e^{\left(2\, n \ln\left(x\right)\right)} + 120\, a^{4} b e^{\left(n \ln\left(x\right)\right)} + 21\, a^{5}\right)} e^{\left(-8\, n \ln\left(x\right)\right)}}{168\, n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(-8*n - 1),x, algorithm="giac")
```

```
[Out] -1/168*(56*b^5*e^(5*n*ln(x)) + 210*a*b^4*e^(4*n*ln(x)) + 336*a^2*
b^3*e^(3*n*ln(x)) + 280*a^3*b^2*e^(2*n*ln(x)) + 120*a^4*b*e^(n*ln
(x)) + 21*a^5)*e^(-8*n*ln(x))/n
```

3.2557 $\int x^{-1-9n}(a+bx^n)^5\,dx$

Optimal. Leaf size=97

$$-\frac{a^5x^{-9n}}{9n}-\frac{5a^4bx^{-8n}}{8n}-\frac{10a^3b^2x^{-7n}}{7n}-\frac{5a^2b^3x^{-6n}}{3n}-\frac{ab^4x^{-5n}}{n}-\frac{b^5x^{-4n}}{4n}$$

```
[Out] -a^5/(9*n*x^(9*n)) - (5*a^4*b)/(8*n*x^(8*n)) - (10*a^3*b^2)/(7*n*
x^(7*n)) - (5*a^2*b^3)/(3*n*x^(6*n)) - (a*b^4)/(n*x^(5*n)) - b^5/
(4*n*x^(4*n))
```

Rubi [A] time = 0.103649, antiderivative size = 97, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$

$$-\frac{a^5x^{-9n}}{9n}-\frac{5a^4bx^{-8n}}{8n}-\frac{10a^3b^2x^{-7n}}{7n}-\frac{5a^2b^3x^{-6n}}{3n}-\frac{ab^4x^{-5n}}{n}-\frac{b^5x^{-4n}}{4n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 9*n)*(a + b*x^n)^5,x]
```

```
[Out] -a^5/(9*n*x^(9*n)) - (5*a^4*b)/(8*n*x^(8*n)) - (10*a^3*b^2)/(7*n*
x^(7*n)) - (5*a^2*b^3)/(3*n*x^(6*n)) - (a*b^4)/(n*x^(5*n)) - b^5/
(4*n*x^(4*n))
```

Rubi in Sympy [A] time = 16.9831, size = 85, normalized size = 0.88

$$-\frac{a^5x^{-9n}}{9n}-\frac{5a^4bx^{-8n}}{8n}-\frac{10a^3b^2x^{-7n}}{7n}-\frac{5a^2b^3x^{-6n}}{3n}-\frac{ab^4x^{-5n}}{n}-\frac{b^5x^{-4n}}{4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-9*n)*(a+b*x**n)**5,x)
```

```
[Out] -a**5*x**(-9*n)/(9*n) - 5*a**4*b*x**(-8*n)/(8*n) - 10*a**3*b**2*x
**(-7*n)/(7*n) - 5*a**2*b**3*x**(-6*n)/(3*n) - a*b**4*x**(-5*n)/n
 - b**5*x**(-4*n)/(4*n)
```

Mathematica [A] time = 0.0367907, size = 74, normalized size = 0.76

$$-\frac{x^{-9n}\left(56a^5+315a^4bx^n+720a^3b^2x^{2n}+840a^2b^3x^{3n}+504ab^4x^{4n}+126b^5x^{5n}\right)}{504n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 9*n)*(a + b*x^n)^5,x]
```

```
[Out] -(56*a^5 + 315*a^4*b*x^n + 720*a^3*b^2*x^(2*n) + 840*a^2*b^3*x^(3
*n) + 504*a*b^4*x^(4*n) + 126*b^5*x^(5*n))/(504*n*x^(9*n))
```

Maple [A] time = 0.035, size = 88, normalized size = 0.9

$$-\frac{b^5}{4\,n\,(x^n)^4}-\frac{ab^4}{n\,(x^n)^5}-\frac{5\,a^2b^3}{3\,n\,(x^n)^6}-\frac{10\,a^3b^2}{7\,n\,(x^n)^7}-\frac{5\,a^4b}{8\,n\,(x^n)^8}-\frac{a^5}{9\,n\,(x^n)^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-9*n)*(a+b*x^n)^5,x)
```

```
[Out] -1/4*b^5/n/(x^n)^4-a*b^4/n/(x^n)^5-5/3*a^2*b^3/n/(x^n)^6-10/7*a^3
*b^2/n/(x^n)^7-5/8*a^4*b/n/(x^n)^8-1/9*a^5/n/(x^n)^9
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(-9*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.22556, size = 100, normalized size = 1.03

$$-\frac{126\,b^5x^{5\,n} + 504\,ab^4x^{4\,n} + 840\,a^2b^3x^{3\,n} + 720\,a^3b^2x^{2\,n} + 315\,a^4bx^n + 56\,a^5}{504\,nx^{9\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(-9*n - 1),x, algorithm="fricas")
```

```
[Out] -1/504*(126*b^5*x^(5*n) + 504*a*b^4*x^(4*n) + 840*a^2*b^3*x^(3*n)
 + 720*a^3*b^2*x^(2*n) + 315*a^4*b*x^n + 56*a^5)/(n*x^(9*n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-9*n)*(a+b*x**n)**5,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.227272, size = 107, normalized size = 1.1

$$-\frac{\left(126\,b^5e^{(5\,n\ln(x))} + 504\,ab^4e^{(4\,n\ln(x))} + 840\,a^2b^3e^{(3\,n\ln(x))} + 720\,a^3b^2e^{(2\,n\ln(x))} + 315\,a^4be^{(n\ln(x))} + 56\,a^5\right)e^{(-9\,n\ln(x))}}{504\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(-9*n - 1),x, algorithm="giac")
```

```
[Out] -1/504*(126*b^5*e^(5*n*ln(x)) + 504*a*b^4*e^(4*n*ln(x)) + 840*a^2
*b^3*e^(3*n*ln(x)) + 720*a^3*b^2*e^(2*n*ln(x)) + 315*a^4*b*e^(n*l
n(x)) + 56*a^5)*e^(-9*n*ln(x))/n
```

3.2558 $\int x^{-1-10n}(a+bx^n)^5\,dx$

Optimal. Leaf size=99

$$-\frac{a^5x^{-10n}}{10n}-\frac{5a^4bx^{-9n}}{9n}-\frac{5a^3b^2x^{-8n}}{4n}-\frac{10a^2b^3x^{-7n}}{7n}-\frac{5ab^4x^{-6n}}{6n}-\frac{b^5x^{-5n}}{5n}$$

```
[Out] -a^5/(10*n*x^(10*n)) - (5*a^4*b)/(9*n*x^(9*n)) - (5*a^3*b^2)/(4*n
*x^(8*n)) - (10*a^2*b^3)/(7*n*x^(7*n)) - (5*a*b^4)/(6*n*x^(6*n))
- b^5/(5*n*x^(5*n))
```

Rubi [A] time = 0.103916, antiderivative size = 99, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{a^5x^{-10n}}{10n}-\frac{5a^4bx^{-9n}}{9n}-\frac{5a^3b^2x^{-8n}}{4n}-\frac{10a^2b^3x^{-7n}}{7n}-\frac{5ab^4x^{-6n}}{6n}-\frac{b^5x^{-5n}}{5n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 10*n)*(a + b*x^n)^5,x]
```

```
[Out] -a^5/(10*n*x^(10*n)) - (5*a^4*b)/(9*n*x^(9*n)) - (5*a^3*b^2)/(4*n
*x^(8*n)) - (10*a^2*b^3)/(7*n*x^(7*n)) - (5*a*b^4)/(6*n*x^(6*n))
- b^5/(5*n*x^(5*n))
```

Rubi in Sympy [A] time = 16.9153, size = 88, normalized size = 0.89

$$-\frac{a^5x^{-10n}}{10n}-\frac{5a^4bx^{-9n}}{9n}-\frac{5a^3b^2x^{-8n}}{4n}-\frac{10a^2b^3x^{-7n}}{7n}-\frac{5ab^4x^{-6n}}{6n}-\frac{b^5x^{-5n}}{5n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-10*n)*(a+b*x**n)**5,x)
```

```
[Out] -a**5*x**(-10*n)/(10*n) - 5*a**4*b*x**(-9*n)/(9*n) - 5*a**3*b**2*
x**(-8*n)/(4*n) - 10*a**2*b**3*x**(-7*n)/(7*n) - 5*a*b**4*x**(-6*
n)/(6*n) - b**5*x**(-5*n)/(5*n)
```

Mathematica [A] time = 0.0384869, size = 74, normalized size = 0.75

$$-\frac{x^{-10n}\left(126a^5+700a^4bx^n+1575a^3b^2x^{2n}+1800a^2b^3x^{3n}+1050ab^4x^{4n}+252b^5x^{5n}\right)}{1260n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 10*n)*(a + b*x^n)^5,x]
```

```
[Out] -(126*a^5 + 700*a^4*b*x^n + 1575*a^3*b^2*x^(2*n) + 1800*a^2*b^3*x
^(3*n) + 1050*a*b^4*x^(4*n) + 252*b^5*x^(5*n))/(1260*n*x^(10*n))
```

Maple [A] time = 0.037, size = 88, normalized size = 0.9

$$-\frac{b^5}{5\,n\,(x^n)^5}-\frac{5\,ab^4}{6\,n\,(x^n)^6}-\frac{10\,a^2b^3}{7\,n\,(x^n)^7}-\frac{5\,a^3b^2}{4\,n\,(x^n)^8}-\frac{5\,a^4b}{9\,n\,(x^n)^9}-\frac{a^5}{10\,n\,(x^n)^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-10*n)*(a+b*x^n)^5,x)
```

```
[Out] -1/5*b^5/n/(x^n)^5-5/6*a*b^4/n/(x^n)^6-10/7*a^2*b^3/n/(x^n)^7-5/4
*a^3*b^2/n/(x^n)^8-5/9*a^4*b/n/(x^n)^9-1/10*a^5/n/(x^n)^10
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(-10*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.227062, size = 100, normalized size = 1.01

$$-\frac{252\, b^{5} x^{5\, n} + 1050\, a b^{4} x^{4\, n} + 1800\, a^{2} b^{3} x^{3\, n} + 1575\, a^{3} b^{2} x^{2\, n} + 700\, a^{4} b x^{n} + 126\, a^{5}}{1260\, n x^{10\, n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(-10*n - 1),x, algorithm="fricas")
```

```
[Out] -1/1260*(252*b^5*x^(5*n) + 1050*a*b^4*x^(4*n) + 1800*a^2*b^3*x^(3
*n) + 1575*a^3*b^2*x^(2*n) + 700*a^4*b*x^n + 126*a^5)/(n*x^(10*n)
)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-10*n)*(a+b*x**n)**5,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.228078, size = 107, normalized size = 1.08

$$-\frac{\left(252\, b^{5} e^{\left(5\, n \ln\left(x\right)\right)} + 1050\, a b^{4} e^{\left(4\, n \ln\left(x\right)\right)} + 1800\, a^{2} b^{3} e^{\left(3\, n \ln\left(x\right)\right)} + 1575\, a^{3} b^{2} e^{\left(2\, n \ln\left(x\right)\right)} + 700\, a^{4} b e^{\left(n \ln\left(x\right)\right)} + 126\, a^{5}\right)} e^{\left(-10\, n \ln\left(x\right)\right)}}{1260\, n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^5*x^(-10*n - 1),x, algorithm="giac")
```

```
[Out] -1/1260*(252*b^5*e^(5*n*ln(x)) + 1050*a*b^4*e^(4*n*ln(x)) + 1800*
a^2*b^3*e^(3*n*ln(x)) + 1575*a^3*b^2*e^(2*n*ln(x)) + 700*a^4*b*e^
(n*ln(x)) + 126*a^5)*e^(-10*n*ln(x))/n
```

3.2559 $\int x^{-1+9n} (a + bx^n)^8 \, dx$

Optimal. Leaf size=151

$$\frac{a^8x^{9n}}{9n} + \frac{4a^7bx^{10n}}{5n} + \frac{28a^6b^2x^{11n}}{11n} + \frac{14a^5b^3x^{12n}}{3n} + \frac{70a^4b^4x^{13n}}{13n} + \frac{4a^3b^5x^{14n}}{n} + \frac{28a^2b^6x^{15n}}{15n} + \frac{ab^7x^{16n}}{2n} + \frac{b^8x^{17n}}{17n}$$

```
[Out] (a^8*x^(9*n))/(9*n) + (4*a^7*b*x^(10*n))/(5*n) + (28*a^6*b^2*x^(1
1*n))/(11*n) + (14*a^5*b^3*x^(12*n))/(3*n) + (70*a^4*b^4*x^(13*n)
)/(13*n) + (4*a^3*b^5*x^(14*n))/n + (28*a^2*b^6*x^(15*n))/(15*n)
+ (a*b^7*x^(16*n))/(2*n) + (b^8*x^(17*n))/(17*n)
```

Rubi [A] time = 0.192947, antiderivative size = 151, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$

$$\frac{a^8x^{9n}}{9n} + \frac{4a^7bx^{10n}}{5n} + \frac{28a^6b^2x^{11n}}{11n} + \frac{14a^5b^3x^{12n}}{3n} + \frac{70a^4b^4x^{13n}}{13n} + \frac{4a^3b^5x^{14n}}{n} + \frac{28a^2b^6x^{15n}}{15n} + \frac{ab^7x^{16n}}{2n} + \frac{b^8x^{17n}}{17n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + 9*n)*(a + b*x^n)^8,x]
```

```
[Out] (a^8*x^(9*n))/(9*n) + (4*a^7*b*x^(10*n))/(5*n) + (28*a^6*b^2*x^(1
1*n))/(11*n) + (14*a^5*b^3*x^(12*n))/(3*n) + (70*a^4*b^4*x^(13*n)
)/(13*n) + (4*a^3*b^5*x^(14*n))/n + (28*a^2*b^6*x^(15*n))/(15*n)
+ (a*b^7*x^(16*n))/(2*n) + (b^8*x^(17*n))/(17*n)
```

Rubi in Sympy [A] time = 31.1735, size = 134, normalized size = 0.89

$$\frac{a^8x^{9n}}{9n} + \frac{4a^7bx^{10n}}{5n} + \frac{28a^6b^2x^{11n}}{11n} + \frac{14a^5b^3x^{12n}}{3n} + \frac{70a^4b^4x^{13n}}{13n} + \frac{4a^3b^5x^{14n}}{n} + \frac{28a^2b^6x^{15n}}{15n} + \frac{ab^7x^{16n}}{2n} + \frac{b^8x^{17n}}{17n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+9*n)*(a+b*x**n)**8,x)
```

```
[Out] a**8*x**(9*n)/(9*n) + 4*a**7*b*x**(10*n)/(5*n) + 28*a**6*b**2*x**
(11*n)/(11*n) + 14*a**5*b**3*x**(12*n)/(3*n) + 70*a**4*b**4*x**(1
3*n)/(13*n) + 4*a**3*b**5*x**(14*n)/n + 28*a**2*b**6*x**(15*n)/(1
5*n) + a*b**7*x**(16*n)/(2*n) + b**8*x**(17*n)/(17*n)
```

Mathematica [A] time = 0.0448421, size = 113, normalized size = 0.75

$$\frac{x^{9n} \left(24310a^8 + 175032a^7bx^n + 556920a^6b^2x^{2n} + 1021020a^5b^3x^{3n} + 1178100a^4b^4x^{4n} + 875160a^3b^5x^{5n} + 408408a^2b^6x^{6n} + 1\right.}{218790n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + 9*n)*(a + b*x^n)^8,x]
```

```
[Out] (x^(9*n)*(24310*a^8 + 175032*a^7*b*x^n + 556920*a^6*b^2*x^(2*n) +
 1021020*a^5*b^3*x^(3*n) + 1178100*a^4*b^4*x^(4*n) + 875160*a^3*b
^5*x^(5*n) + 408408*a^2*b^6*x^(6*n) + 109395*a*b^7*x^(7*n) + 1287
0*b^8*x^(8*n)))/(218790*n)
```

Maple [A] time = 0.041, size = 136, normalized size = 0.9

$$\frac{b^8 (x^n)^{17}}{17 n}+\frac{a b^7 (x^n)^{16}}{2 n}+\frac{28 a^2 b^6 (x^n)^{15}}{15 n}+4\frac{a^3 b^5 (x^n)^{14}}{n}+\frac{70 a^4 b^4 (x^n)^{13}}{13 n}+\frac{14 a^5 b^3 (x^n)^{12}}{3 n}+\frac{28 a^6 b^2 (x^n)^{11}}{11 n}+\frac{4 b a^7 (x^n)^{10}}{5 n}+\frac{a^8 (x^n)^9}{9 n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^(-1+9*n)*(a+b*x^n)^8,x)
```

```
[Out] 1/17*b^8/n*(x^n)^17+1/2*a*b^7/n*(x^n)^16+28/15*a^2*b^6/n*(x^n)^15
+4*a^3*b^5/n*(x^n)^14+70/13*a^4*b^4/n*(x^n)^13+14/3*a^5*b^3/n*(x^
n)^12+28/11*a^6*b^2/n*(x^n)^11+4/5*a^7*b/n*(x^n)^10+1/9*a^8/n*(x^
n)^9
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^n + a)^8*x^(9*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.227268, size = 153, normalized size = 1.01

$$\frac{12870 b^8 x^{17 n} + 109395 a b^7 x^{16 n} + 408408 a^2 b^6 x^{15 n} + 875160 a^3 b^5 x^{14 n} + 1178100 a^4 b^4 x^{13 n} + 1021020 a^5 b^3 x^{12 n} + 556920 a^6}{218790 n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^n + a)^8*x^(9*n - 1),x, algorithm="fricas")
```

```
[Out] 1/218790*(12870*b^8*x^(17*n) + 109395*a*b^7*x^(16*n) + 408408*a^2
*b^6*x^(15*n) + 875160*a^3*b^5*x^(14*n) + 1178100*a^4*b^4*x^(13*n
) + 1021020*a^5*b^3*x^(12*n) + 556920*a^6*b^2*x^(11*n) + 175032*a
^7*b*x^(10*n) + 24310*a^8*x^(9*n))/n
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**(-1+9*n)*(a+b*x**n)**8,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^8 x^{9 n-1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(9*n - 1),x, algorithm="giac")

[Out] integrate((b*x^n + a)^8*x^(9*n - 1), x)
```

3.2560 $\int x^{-1+8n} (a+bx^n)^8\, dx$

Optimal. Leaf size=151

$$\frac{a^8x^{8n}}{8n}+\frac{8a^7bx^{9n}}{9n}+\frac{14a^6b^2x^{10n}}{5n}+\frac{56a^5b^3x^{11n}}{11n}+\frac{35a^4b^4x^{12n}}{6n}+\frac{56a^3b^5x^{13n}}{13n}+\frac{2a^2b^6x^{14n}}{n}+\frac{8ab^7x^{15n}}{15n}+\frac{b^8x^{16n}}{16n}$$

```
[Out] (a^8*x^(8*n))/(8*n) + (8*a^7*b*x^(9*n))/(9*n) + (14*a^6*b^2*x^(10
*n))/(5*n) + (56*a^5*b^3*x^(11*n))/(11*n) + (35*a^4*b^4*x^(12*n))
/(6*n) + (56*a^3*b^5*x^(13*n))/(13*n) + (2*a^2*b^6*x^(14*n))/n +
(8*a*b^7*x^(15*n))/(15*n) + (b^8*x^(16*n))/(16*n)
```

Rubi [A] time = 0.185411, antiderivative size = 151, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{a^8x^{8n}}{8n}+\frac{8a^7bx^{9n}}{9n}+\frac{14a^6b^2x^{10n}}{5n}+\frac{56a^5b^3x^{11n}}{11n}+\frac{35a^4b^4x^{12n}}{6n}+\frac{56a^3b^5x^{13n}}{13n}+\frac{2a^2b^6x^{14n}}{n}+\frac{8ab^7x^{15n}}{15n}+\frac{b^8x^{16n}}{16n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + 8*n)*(a + b*x^n)^8,x]
```

```
[Out] (a^8*x^(8*n))/(8*n) + (8*a^7*b*x^(9*n))/(9*n) + (14*a^6*b^2*x^(10
*n))/(5*n) + (56*a^5*b^3*x^(11*n))/(11*n) + (35*a^4*b^4*x^(12*n))
/(6*n) + (56*a^3*b^5*x^(13*n))/(13*n) + (2*a^2*b^6*x^(14*n))/n +
(8*a*b^7*x^(15*n))/(15*n) + (b^8*x^(16*n))/(16*n)
```

Rubi in Sympy [A] time = 30.515, size = 136, normalized size = 0.9

$$\frac{a^8x^{8n}}{8n}+\frac{8a^7bx^{9n}}{9n}+\frac{14a^6b^2x^{10n}}{5n}+\frac{56a^5b^3x^{11n}}{11n}+\frac{35a^4b^4x^{12n}}{6n}+\frac{56a^3b^5x^{13n}}{13n}+\frac{2a^2b^6x^{14n}}{n}+\frac{8ab^7x^{15n}}{15n}+\frac{b^8x^{16n}}{16n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+8*n)*(a+b*x**n)**8,x)
```

```
[Out] a**8*x**(8*n)/(8*n) + 8*a**7*b*x**(9*n)/(9*n) + 14*a**6*b**2*x**(
10*n)/(5*n) + 56*a**5*b**3*x**(11*n)/(11*n) + 35*a**4*b**4*x**(12
*n)/(6*n) + 56*a**3*b**5*x**(13*n)/(13*n) + 2*a**2*b**6*x**(14*n)
/n + 8*a*b**7*x**(15*n)/(15*n) + b**8*x**(16*n)/(16*n)
```

Mathematica [A] time = 0.043549, size = 113, normalized size = 0.75

$$\frac{x^{8n}\left(12870a^8+91520a^7bx^n+288288a^6b^2x^{2n}+524160a^5b^3x^{3n}+600600a^4b^4x^{4n}+443520a^3b^5x^{5n}+205920a^2b^6x^{6n}+5491\right.}{102960n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + 8*n)*(a + b*x^n)^8,x]
```

```
[Out] (x^(8*n)*(12870*a^8 + 91520*a^7*b*x^n + 288288*a^6*b^2*x^(2*n) +
524160*a^5*b^3*x^(3*n) + 600600*a^4*b^4*x^(4*n) + 443520*a^3*b^5*
x^(5*n) + 205920*a^2*b^6*x^(6*n) + 54912*a*b^7*x^(7*n) + 6435*b^8
*x^(8*n)))/(102960*n)
```

Maple [A] time = 0.04, size = 136, normalized size = 0.9

$$\frac{b^8 (x^n)^{16}}{16\, n} + \frac{8\, a b^7 (x^n)^{15}}{15\, n} + 2\, \frac{a^2 b^6 (x^n)^{14}}{n} + \frac{56\, a^3 b^5 (x^n)^{13}}{13\, n} + \frac{35\, a^4 b^4 (x^n)^{12}}{6\, n} + \frac{56\, a^5 b^3 (x^n)^{11}}{11\, n} + \frac{14\, a^6 b^2 (x^n)^{10}}{5\, n} + \frac{8\, b a^7 (x^n)^9}{9\, n} + \frac{a^8 (x^n)^8}{8\, n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+8*n)*(a+b*x^n)^8,x)
```

```
[Out] 1/16*b^8/n*(x^n)^16+8/15*a*b^7/n*(x^n)^15+2*a^2*b^6/n*(x^n)^14+56
/13*a^3*b^5/n*(x^n)^13+35/6*a^4*b^4/n*(x^n)^12+56/11*a^5*b^3/n*(x
^n)^11+14/5*a^6*b^2/n*(x^n)^10+8/9*a^7*b/n*(x^n)^9+1/8*a^8/n*(x^n
)^8
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(8*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.225603, size = 153, normalized size = 1.01

$$\frac{6435\, b^8 x^{16\, n} + 54912\, a b^7 x^{15\, n} + 205920\, a^2 b^6 x^{14\, n} + 443520\, a^3 b^5 x^{13\, n} + 600600\, a^4 b^4 x^{12\, n} + 524160\, a^5 b^3 x^{11\, n} + 288288\, a^6 b^2 x^{1}}{102960\, n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(8*n - 1),x, algorithm="fricas")
```

```
[Out] 1/102960*(6435*b^8*x^(16*n) + 54912*a*b^7*x^(15*n) + 205920*a^2*b
^6*x^(14*n) + 443520*a^3*b^5*x^(13*n) + 600600*a^4*b^4*x^(12*n) +
 524160*a^5*b^3*x^(11*n) + 288288*a^6*b^2*x^(10*n) + 91520*a^7*b*
x^(9*n) + 12870*a^8*x^(8*n))/n
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+8*n)*(a+b*x**n)**8,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^8 x^{8\, n-1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(8*n - 1),x, algorithm="giac")

[Out] integrate((b*x^n + a)^8*x^(8*n - 1), x)
```

3.2561 $\int x^{-1+7n} (a + bx^n)^8 \, dx$

Optimal. Leaf size=150

$$\frac{a^6 (a + bx^n)^9}{9b^7 n} - \frac{3a^5 (a + bx^n)^{10}}{5b^7 n} + \frac{15a^4 (a + bx^n)^{11}}{11b^7 n} - \frac{5a^3 (a + bx^n)^{12}}{3b^7 n} + \frac{15a^2 (a + bx^n)^{13}}{13b^7 n} + \frac{(a + bx^n)^{15}}{15b^7 n} - \frac{3a (a + bx^n)^{14}}{7b^7 n}$$

```
[Out] (a^6*(a + b*x^n)^9)/(9*b^7*n) - (3*a^5*(a + b*x^n)^10)/(5*b^7*n)
+ (15*a^4*(a + b*x^n)^11)/(11*b^7*n) - (5*a^3*(a + b*x^n)^12)/(3*
b^7*n) + (15*a^2*(a + b*x^n)^13)/(13*b^7*n) - (3*a*(a + b*x^n)^14
)/(7*b^7*n) + (a + b*x^n)^15/(15*b^7*n)
```

Rubi [A] time = 0.194401, antiderivative size = 150, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{a^6 (a + bx^n)^9}{9b^7 n} - \frac{3a^5 (a + bx^n)^{10}}{5b^7 n} + \frac{15a^4 (a + bx^n)^{11}}{11b^7 n} - \frac{5a^3 (a + bx^n)^{12}}{3b^7 n} + \frac{15a^2 (a + bx^n)^{13}}{13b^7 n} + \frac{(a + bx^n)^{15}}{15b^7 n} - \frac{3a (a + bx^n)^{14}}{7b^7 n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + 7*n)*(a + b*x^n)^8,x]
```

```
[Out] (a^6*(a + b*x^n)^9)/(9*b^7*n) - (3*a^5*(a + b*x^n)^10)/(5*b^7*n)
+ (15*a^4*(a + b*x^n)^11)/(11*b^7*n) - (5*a^3*(a + b*x^n)^12)/(3*
b^7*n) + (15*a^2*(a + b*x^n)^13)/(13*b^7*n) - (3*a*(a + b*x^n)^14
)/(7*b^7*n) + (a + b*x^n)^15/(15*b^7*n)
```

Rubi in Sympy [A] time = 30.3127, size = 134, normalized size = 0.89

$$\frac{a^8 x^{7n}}{7n} + \frac{a^7 b x^{8n}}{n} + \frac{28a^6 b^2 x^{9n}}{9n} + \frac{28a^5 b^3 x^{10n}}{5n} + \frac{70a^4 b^4 x^{11n}}{11n} + \frac{14a^3 b^5 x^{12n}}{3n} + \frac{28a^2 b^6 x^{13n}}{13n} + \frac{4ab^7 x^{14n}}{7n} + \frac{b^8 x^{15n}}{15n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+7*n)*(a+b*x**n)**8,x)
```

```
[Out] a**8*x**(7*n)/(7*n) + a**7*b*x**(8*n)/n + 28*a**6*b**2*x**(9*n)/(
9*n) + 28*a**5*b**3*x**(10*n)/(5*n) + 70*a**4*b**4*x**(11*n)/(11*
n) + 14*a**3*b**5*x**(12*n)/(3*n) + 28*a**2*b**6*x**(13*n)/(13*n)
 + 4*a*b**7*x**(14*n)/(7*n) + b**8*x**(15*n)/(15*n)
```

Mathematica [A] time = 0.0420576, size = 113, normalized size = 0.75

$$\frac{x^{7n} \left(6435a^8 + 45045a^7 bx^n + 140140a^6 b^2 x^{2n} + 252252a^5 b^3 x^{3n} + 286650a^4 b^4 x^{4n} + 210210a^3 b^5 x^{5n} + 97020a^2 b^6 x^{6n} + 25740a\right.}{45045n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + 7*n)*(a + b*x^n)^8,x]
```

```
[Out] (x^(7*n)*(6435*a^8 + 45045*a^7*b*x^n + 140140*a^6*b^2*x^(2*n) + 2
52252*a^5*b^3*x^(3*n) + 286650*a^4*b^4*x^(4*n) + 210210*a^3*b^5*x
^(5*n) + 97020*a^2*b^6*x^(6*n) + 25740*a*b^7*x^(7*n) + 3003*b^8*x
```

```
^(8*n)))/(45045*n)
```

Maple [A] time = 0.041, size = 135, normalized size = 0.9

$$\frac{b^{8}\left(x^{n}\right)^{15}}{15\,n}+\frac{4\,a b^{7}\left(x^{n}\right)^{14}}{7\,n}+\frac{28\,a^{2} b^{6}\left(x^{n}\right)^{13}}{13\,n}+\frac{14\,a^{3} b^{5}\left(x^{n}\right)^{12}}{3\,n}+\frac{70\,a^{4} b^{4}\left(x^{n}\right)^{11}}{11\,n}+\frac{28\,a^{5} b^{3}\left(x^{n}\right)^{10}}{5\,n}+\frac{28\,a^{6} b^{2}\left(x^{n}\right)^{9}}{9\,n}+\frac{b a^{7}\left(x^{n}\right)^{8}}{n}+\frac{a^{8}\left(x^{n}\right)^{7}}{7\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+7*n)*(a+b*x^n)^8,x)
```

```
[Out] 1/15*b^8/n*(x^n)^15+4/7*a*b^7/n*(x^n)^14+28/13*a^2*b^6/n*(x^n)^13
+14/3*a^3*b^5/n*(x^n)^12+70/11*a^4*b^4/n*(x^n)^11+28/5*a^5*b^3/n*
(x^n)^10+28/9*a^6*b^2/n*(x^n)^9+a^7*b/n*(x^n)^8+1/7*a^8/n*(x^n)^7
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(7*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.239124, size = 153, normalized size = 1.02

$$\frac{3003\,b^{8}x^{15\,n}+25740\,a b^{7}x^{14\,n}+97020\,a^{2} b^{6}x^{13\,n}+210210\,a^{3} b^{5}x^{12\,n}+286650\,a^{4} b^{4}x^{11\,n}+252252\,a^{5} b^{3}x^{10\,n}+140140\,a^{6} b^{2}x^{9\,n}}{45045\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(7*n - 1),x, algorithm="fricas")
```

```
[Out] 1/45045*(3003*b^8*x^(15*n) + 25740*a*b^7*x^(14*n) + 97020*a^2*b^6
*x^(13*n) + 210210*a^3*b^5*x^(12*n) + 286650*a^4*b^4*x^(11*n) + 2
52252*a^5*b^3*x^(10*n) + 140140*a^6*b^2*x^(9*n) + 45045*a^7*b*x^(
8*n) + 6435*a^8*x^(7*n))/n
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+7*n)*(a+b*x**n)**8,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^{n}+a)^{8}x^{7\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(7*n - 1),x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^8*x^(7*n - 1), x)
```

3.2562 $\int x^{-1+6n} (a + bx^n)^8 \, dx$

Optimal. Leaf size=128

$$-\frac{a^5 (a + bx^n)^9}{9b^6 n} + \frac{a^4 (a + bx^n)^{10}}{2b^6 n} - \frac{10a^3 (a + bx^n)^{11}}{11b^6 n} + \frac{5a^2 (a + bx^n)^{12}}{6b^6 n} + \frac{(a + bx^n)^{14}}{14b^6 n} - \frac{5a (a + bx^n)^{13}}{13b^6 n}$$

```
[Out] -(a^5*(a + b*x^n)^9)/(9*b^6*n) + (a^4*(a + b*x^n)^10)/(2*b^6*n) -
 (10*a^3*(a + b*x^n)^11)/(11*b^6*n) + (5*a^2*(a + b*x^n)^12)/(6*b
^6*n) - (5*a*(a + b*x^n)^13)/(13*b^6*n) + (a + b*x^n)^14/(14*b^6*
n)
```

Rubi [A] time = 0.170739, antiderivative size = 128, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$

$$-\frac{a^5 (a + bx^n)^9}{9b^6 n} + \frac{a^4 (a + bx^n)^{10}}{2b^6 n} - \frac{10a^3 (a + bx^n)^{11}}{11b^6 n} + \frac{5a^2 (a + bx^n)^{12}}{6b^6 n} + \frac{(a + bx^n)^{14}}{14b^6 n} - \frac{5a (a + bx^n)^{13}}{13b^6 n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + 6*n)*(a + b*x^n)^8,x]
```

```
[Out] -(a^5*(a + b*x^n)^9)/(9*b^6*n) + (a^4*(a + b*x^n)^10)/(2*b^6*n) -
 (10*a^3*(a + b*x^n)^11)/(11*b^6*n) + (5*a^2*(a + b*x^n)^12)/(6*b
^6*n) - (5*a*(a + b*x^n)^13)/(13*b^6*n) + (a + b*x^n)^14/(14*b^6*
n)
```

Rubi in Sympy [A] time = 30.619, size = 110, normalized size = 0.86

$$-\frac{a^5 (a + bx^n)^9}{9b^6 n} + \frac{a^4 (a + bx^n)^{10}}{2b^6 n} - \frac{10a^3 (a + bx^n)^{11}}{11b^6 n} + \frac{5a^2 (a + bx^n)^{12}}{6b^6 n} - \frac{5a (a + bx^n)^{13}}{13b^6 n} + \frac{(a + bx^n)^{14}}{14b^6 n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+6*n)*(a+b*x**n)**8,x)
```

```
[Out] -a**5*(a + b*x**n)**9/(9*b**6*n) + a**4*(a + b*x**n)**10/(2*b**6*
n) - 10*a**3*(a + b*x**n)**11/(11*b**6*n) + 5*a**2*(a + b*x**n)**
12/(6*b**6*n) - 5*a*(a + b*x**n)**13/(13*b**6*n) + (a + b*x**n)**
14/(14*b**6*n)
```

Mathematica [A] time = 0.0432265, size = 113, normalized size = 0.88

$$\frac{x^{6n} \left(3003a^8 + 20592a^7bx^n + 63063a^6b^2x^{2n} + 112112a^5b^3x^{3n} + 126126a^4b^4x^{4n} + 91728a^3b^5x^{5n} + 42042a^2b^6x^{6n} + 11088ab^7\right.}{18018n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + 6*n)*(a + b*x^n)^8,x]
```

```
[Out] (x^(6*n)*(3003*a^8 + 20592*a^7*b*x^n + 63063*a^6*b^2*x^(2*n) + 11
2112*a^5*b^3*x^(3*n) + 126126*a^4*b^4*x^(4*n) + 91728*a^3*b^5*x^(
5*n) + 42042*a^2*b^6*x^(6*n) + 11088*a*b^7*x^(7*n) + 1287*b^8*x^(
8*n)))/(18018*n)
```

Maple [A] time = 0.041, size = 136, normalized size = 1.1

$$\frac{b^8 (x^n)^{14}}{14\,n}+\frac{8\,ab^7 (x^n)^{13}}{13\,n}+\frac{7\,a^2b^6 (x^n)^{12}}{3\,n}+\frac{56\,a^3b^5 (x^n)^{11}}{11\,n}+7\,\frac{a^4b^4 (x^n)^{10}}{n}+\frac{56\,a^5b^3 (x^n)^{9}}{9\,n}+\frac{7\,a^6b^2 (x^n)^{8}}{2\,n}+\frac{8\,ba^7 (x^n)^{7}}{7\,n}+\frac{a^8 (x^n)^{6}}{6\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+6*n)*(a+b*x^n)^8,x)
```

```
[Out] 1/14*b^8/n*(x^n)^14+8/13*a*b^7/n*(x^n)^13+7/3*a^2*b^6/n*(x^n)^12+
56/11*a^3*b^5/n*(x^n)^11+7*a^4*b^4/n*(x^n)^10+56/9*a^5*b^3/n*(x^n
)^9+7/2*a^6*b^2/n*(x^n)^8+8/7*a^7*b/n*(x^n)^7+1/6*a^8/n*(x^n)^6
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(6*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.227374, size = 153, normalized size = 1.2

$$\frac{1287\,b^8x^{14\,n}+11088\,ab^7x^{13\,n}+42042\,a^2b^6x^{12\,n}+91728\,a^3b^5x^{11\,n}+126126\,a^4b^4x^{10\,n}+112112\,a^5b^3x^{9\,n}+63063\,a^6b^2x^{8\,n}+}{18018\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(6*n - 1),x, algorithm="fricas")
```

```
[Out] 1/18018*(1287*b^8*x^(14*n) + 11088*a*b^7*x^(13*n) + 42042*a^2*b^6
*x^(12*n) + 91728*a^3*b^5*x^(11*n) + 126126*a^4*b^4*x^(10*n) + 11
2112*a^5*b^3*x^(9*n) + 63063*a^6*b^2*x^(8*n) + 20592*a^7*b*x^(7*n
) + 3003*a^8*x^(6*n))/n
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+6*n)*(a+b*x**n)**8,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n+a)^8 x^{6\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(6*n - 1),x, algorithm="giac")

[Out] integrate((b*x^n + a)^8*x^(6*n - 1), x)
```

3.2563 $\int x^{-1+5n} (a + bx^n)^8 \, dx$

Optimal. Leaf size=106

$$\frac{a^4 (a + bx^n)^9}{9b^5 n} - \frac{2a^3 (a + bx^n)^{10}}{5b^5 n} + \frac{6a^2 (a + bx^n)^{11}}{11b^5 n} + \frac{(a + bx^n)^{13}}{13b^5 n} - \frac{a (a + bx^n)^{12}}{3b^5 n}$$

```
[Out] (a^4*(a + b*x^n)^9)/(9*b^5*n) - (2*a^3*(a + b*x^n)^10)/(5*b^5*n)
+ (6*a^2*(a + b*x^n)^11)/(11*b^5*n) - (a*(a + b*x^n)^12)/(3*b^5*n
) + (a + b*x^n)^13/(13*b^5*n)
```

Rubi [A] time = 0.150641, antiderivative size = 106, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$

$$\frac{a^4 (a + bx^n)^9}{9b^5 n} - \frac{2a^3 (a + bx^n)^{10}}{5b^5 n} + \frac{6a^2 (a + bx^n)^{11}}{11b^5 n} + \frac{(a + bx^n)^{13}}{13b^5 n} - \frac{a (a + bx^n)^{12}}{3b^5 n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + 5*n)*(a + b*x^n)^8,x]
```

```
[Out] (a^4*(a + b*x^n)^9)/(9*b^5*n) - (2*a^3*(a + b*x^n)^10)/(5*b^5*n)
+ (6*a^2*(a + b*x^n)^11)/(11*b^5*n) - (a*(a + b*x^n)^12)/(3*b^5*n
) + (a + b*x^n)^13/(13*b^5*n)
```

Rubi in Sympy [A] time = 25.8409, size = 90, normalized size = 0.85

$$\frac{a^4 (a + bx^n)^9}{9b^5 n} - \frac{2a^3 (a + bx^n)^{10}}{5b^5 n} + \frac{6a^2 (a + bx^n)^{11}}{11b^5 n} - \frac{a (a + bx^n)^{12}}{3b^5 n} + \frac{(a + bx^n)^{13}}{13b^5 n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+5*n)*(a+b*x**n)**8,x)
```

```
[Out] a**4*(a + b*x**n)**9/(9*b**5*n) - 2*a**3*(a + b*x**n)**10/(5*b**5
*n) + 6*a**2*(a + b*x**n)**11/(11*b**5*n) - a*(a + b*x**n)**12/(3
*b**5*n) + (a + b*x**n)**13/(13*b**5*n)
```

Mathematica [A] time = 0.0426221, size = 113, normalized size = 1.07

$$\frac{x^{5n} \left(1287a^8 + 8580a^7 bx^n + 25740a^6 b^2 x^{2n} + 45045a^5 b^3 x^{3n} + 50050a^4 b^4 x^{4n} + 36036a^3 b^5 x^{5n} + 16380a^2 b^6 x^{6n} + 4290ab^7 x^{7n} \cdot\right.}{6435n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + 5*n)*(a + b*x^n)^8,x]
```

```
[Out] (x^(5*n)*(1287*a^8 + 8580*a^7*b*x^n + 25740*a^6*b^2*x^(2*n) + 450
45*a^5*b^3*x^(3*n) + 50050*a^4*b^4*x^(4*n) + 36036*a^3*b^5*x^(5*n
) + 16380*a^2*b^6*x^(6*n) + 4290*a*b^7*x^(7*n) + 495*b^8*x^(8*n))
)/(6435*n)
```

Maple [A] time = 0.043, size = 136, normalized size = 1.3

$$\frac{b^8 (x^n)^{13}}{13\,n} + \frac{2\,ab^7 (x^n)^{12}}{3\,n} + \frac{28\,a^2 b^6 (x^n)^{11}}{11\,n} + \frac{28\,a^3 b^5 (x^n)^{10}}{5\,n} + \frac{70\,a^4 b^4 (x^n)^9}{9\,n} + 7\,\frac{a^5 b^3 (x^n)^8}{n} + 4\,\frac{a^6 b^2 (x^n)^7}{n} + \frac{4\,ba^7 (x^n)^6}{3\,n} + \frac{a^8 (x^n)^5}{5\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+5*n)*(a+b*x^n)^8,x)
```

```
[Out] 1/13*b^8/n*(x^n)^13+2/3*a*b^7/n*(x^n)^12+28/11*a^2*b^6/n*(x^n)^11
+28/5*a^3*b^5/n*(x^n)^10+70/9*a^4*b^4/n*(x^n)^9+7*a^5*b^3/n*(x^n)
^8+4*a^6*b^2/n*(x^n)^7+4/3*a^7*b/n*(x^n)^6+1/5*a^8/n*(x^n)^5
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(5*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.226501, size = 153, normalized size = 1.44

$$\frac{495\,b^{8}x^{13\,n} + 4290\,ab^{7}x^{12\,n} + 16380\,a^{2}b^{6}x^{11\,n} + 36036\,a^{3}b^{5}x^{10\,n} + 50050\,a^{4}b^{4}x^{9\,n} + 45045\,a^{5}b^{3}x^{8\,n} + 25740\,a^{6}b^{2}x^{7\,n} + 8580\,a}{6435\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(5*n - 1),x, algorithm="fricas")
```

```
[Out] 1/6435*(495*b^8*x^(13*n) + 4290*a*b^7*x^(12*n) + 16380*a^2*b^6*x^
(11*n) + 36036*a^3*b^5*x^(10*n) + 50050*a^4*b^4*x^(9*n) + 45045*a
^5*b^3*x^(8*n) + 25740*a^6*b^2*x^(7*n) + 8580*a^7*b*x^(6*n) + 128
7*a^8*x^(5*n))/n
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+5*n)*(a+b*x**n)**8,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^{n} + a)^{8}x^{5\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(5*n - 1),x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^8*x^(5*n - 1), x)
```

3.2564 $\int x^{-1+4n}(a+bx^n)^8\,dx$

Optimal. Leaf size=84

$$-\frac{a^3(a+bx^n)^9}{9b^4n}+\frac{3a^2(a+bx^n)^{10}}{10b^4n}+\frac{(a+bx^n)^{12}}{12b^4n}-\frac{3a(a+bx^n)^{11}}{11b^4n}$$

```
[Out] -(a^3*(a + b*x^n)^9)/(9*b^4*n) + (3*a^2*(a + b*x^n)^10)/(10*b^4*n
) - (3*a*(a + b*x^n)^11)/(11*b^4*n) + (a + b*x^n)^12/(12*b^4*n)
```

Rubi [A] time = 0.126183, antiderivative size = 84, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{a^3(a+bx^n)^9}{9b^4n}+\frac{3a^2(a+bx^n)^{10}}{10b^4n}+\frac{(a+bx^n)^{12}}{12b^4n}-\frac{3a(a+bx^n)^{11}}{11b^4n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + 4*n)*(a + b*x^n)^8,x]
```

```
[Out] -(a^3*(a + b*x^n)^9)/(9*b^4*n) + (3*a^2*(a + b*x^n)^10)/(10*b^4*n
) - (3*a*(a + b*x^n)^11)/(11*b^4*n) + (a + b*x^n)^12/(12*b^4*n)
```

Rubi in Sympy [A] time = 22.1104, size = 71, normalized size = 0.85

$$-\frac{a^3(a+bx^n)^9}{9b^4n}+\frac{3a^2(a+bx^n)^{10}}{10b^4n}-\frac{3a(a+bx^n)^{11}}{11b^4n}+\frac{(a+bx^n)^{12}}{12b^4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+4*n)*(a+b*x**n)**8,x)
```

```
[Out] -a**3*(a + b*x**n)**9/(9*b**4*n) + 3*a**2*(a + b*x**n)**10/(10*b*
*4*n) - 3*a*(a + b*x**n)**11/(11*b**4*n) + (a + b*x**n)**12/(12*b
**4*n)
```

Mathematica [A] time = 0.0462353, size = 113, normalized size = 1.35

$$\frac{x^{4n}\left(495a^8+3168a^7bx^n+9240a^6b^2x^{2n}+15840a^5b^3x^{3n}+17325a^4b^4x^{4n}+12320a^3b^5x^{5n}+5544a^2b^6x^{6n}+1440ab^7x^{7n}+16\right.}{1980n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + 4*n)*(a + b*x^n)^8,x]
```

```
[Out] (x^(4*n)*(495*a^8 + 3168*a^7*b*x^n + 9240*a^6*b^2*x^(2*n) + 15840
*a^5*b^3*x^(3*n) + 17325*a^4*b^4*x^(4*n) + 12320*a^3*b^5*x^(5*n)
+ 5544*a^2*b^6*x^(6*n) + 1440*a*b^7*x^(7*n) + 165*b^8*x^(8*n)))/(
1980*n)
```

Maple [A] time = 0.04, size = 136, normalized size = 1.6

$$\frac{b^8(x^n)^{12}}{12n}+\frac{8ab^7(x^n)^{11}}{11n}+\frac{14a^2b^6(x^n)^{10}}{5n}+\frac{56a^3b^5(x^n)^9}{9n}+\frac{35a^4b^4(x^n)^8}{4n}+8\frac{a^5b^3(x^n)^7}{n}+\frac{14a^6b^2(x^n)^6}{3n}+\frac{8ba^7(x^n)^5}{5n}+\frac{a^8(x^n)^4}{4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+4*n)*(a+b*x^n)^8,x)
```

```
[Out] 1/12*b^8/n*(x^n)^12+8/11*a*b^7/n*(x^n)^11+14/5*a^2*b^6/n*(x^n)^10
+56/9*a^3*b^5/n*(x^n)^9+35/4*a^4*b^4/n*(x^n)^8+8*a^5*b^3/n*(x^n)^
7+14/3*a^6*b^2/n*(x^n)^6+8/5*a^7*b/n*(x^n)^5+1/4*a^8/n*(x^n)^4
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(4*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.22563, size = 153, normalized size = 1.82

$$\frac{165\,b^{8}x^{12\,n} + 1440\,ab^{7}x^{11\,n} + 5544\,a^{2}b^{6}x^{10\,n} + 12320\,a^{3}b^{5}x^{9\,n} + 17325\,a^{4}b^{4}x^{8\,n} + 15840\,a^{5}b^{3}x^{7\,n} + 9240\,a^{6}b^{2}x^{6\,n} + 3168\,a^{7}b}{1980\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(4*n - 1),x, algorithm="fricas")
```

```
[Out] 1/1980*(165*b^8*x^(12*n) + 1440*a*b^7*x^(11*n) + 5544*a^2*b^6*x^(
10*n) + 12320*a^3*b^5*x^(9*n) + 17325*a^4*b^4*x^(8*n) + 15840*a^5
*b^3*x^(7*n) + 9240*a^6*b^2*x^(6*n) + 3168*a^7*b*x^(5*n) + 495*a^
8*x^(4*n))/n
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+4*n)*(a+b*x**n)**8,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^{n} + a)^{8}x^{4\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(4*n - 1),x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^8*x^(4*n - 1), x)
```

3.2565 $\int x^{-1+3n}(a+bx^n)^8\,dx$

Optimal. Leaf size=62

$$\frac{a^2(a+bx^n)^9}{9b^3n}+\frac{(a+bx^n)^{11}}{11b^3n}-\frac{a(a+bx^n)^{10}}{5b^3n}$$

```
[Out] (a^2*(a + b*x^n)^9)/(9*b^3*n) - (a*(a + b*x^n)^10)/(5*b^3*n) + (a
 + b*x^n)^11/(11*b^3*n)
```

Rubi [A] time = 0.105918, antiderivative size = 62, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{a^2(a+bx^n)^9}{9b^3n}+\frac{(a+bx^n)^{11}}{11b^3n}-\frac{a(a+bx^n)^{10}}{5b^3n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + 3*n)*(a + b*x^n)^8,x]
```

```
[Out] (a^2*(a + b*x^n)^9)/(9*b^3*n) - (a*(a + b*x^n)^10)/(5*b^3*n) + (a
 + b*x^n)^11/(11*b^3*n)
```

Rubi in Sympy [A] time = 17.5499, size = 49, normalized size = 0.79

$$\frac{a^2(a+bx^n)^9}{9b^3n}-\frac{a(a+bx^n)^{10}}{5b^3n}+\frac{(a+bx^n)^{11}}{11b^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+3*n)*(a+b*x**n)**8,x)
```

```
[Out] a**2*(a + b*x**n)**9/(9*b**3*n) - a*(a + b*x**n)**10/(5*b**3*n) +
 (a + b*x**n)**11/(11*b**3*n)
```

Mathematica [A] time = 0.0411991, size = 113, normalized size = 1.82

$$\frac{x^{3n}\left(165a^8+990a^7bx^n+2772a^6b^2x^{2n}+4620a^5b^3x^{3n}+4950a^4b^4x^{4n}+3465a^3b^5x^{5n}+1540a^2b^6x^{6n}+396ab^7x^{7n}+45b^8x^{8n}\right)}{495n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + 3*n)*(a + b*x^n)^8,x]
```

```
[Out] (x^(3*n)*(165*a^8 + 990*a^7*b*x^n + 2772*a^6*b^2*x^(2*n) + 4620*a
^5*b^3*x^(3*n) + 4950*a^4*b^4*x^(4*n) + 3465*a^3*b^5*x^(5*n) + 15
40*a^2*b^6*x^(6*n) + 396*a*b^7*x^(7*n) + 45*b^8*x^(8*n)))/(495*n)
```

Maple [B] time = 0.04, size = 136, normalized size = 2.2

$$\frac{b^8(x^n)^{11}}{11\,n}+\frac{4\,ab^7(x^n)^{10}}{5\,n}+\frac{28\,a^2b^6(x^n)^9}{9\,n}+7\,\frac{a^3b^5(x^n)^8}{n}+10\,\frac{a^4b^4(x^n)^7}{n}+\frac{28\,a^5b^3(x^n)^6}{3\,n}+\frac{28\,a^6b^2(x^n)^5}{5\,n}+2\,\frac{ba^7(x^n)^4}{n}+\frac{a^8(x^n)^3}{3\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+3*n)*(a+b*x^n)^8,x)
```

```
[Out] 1/11*b^8/n*(x^n)^11+4/5*a*b^7/n*(x^n)^10+28/9*a^2*b^6/n*(x^n)^9+7
*a^3*b^5/n*(x^n)^8+10*a^4*b^4/n*(x^n)^7+28/3*a^5*b^3/n*(x^n)^6+28
/5*a^6*b^2/n*(x^n)^5+2*a^7*b/n*(x^n)^4+1/3*a^8/n*(x^n)^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(3*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.227273, size = 153, normalized size = 2.47

$$\frac{45\, b^{8} x^{11\, n} + 396\, a b^{7} x^{10\, n} + 1540\, a^{2} b^{6} x^{9\, n} + 3465\, a^{3} b^{5} x^{8\, n} + 4950\, a^{4} b^{4} x^{7\, n} + 4620\, a^{5} b^{3} x^{6\, n} + 2772\, a^{6} b^{2} x^{5\, n} + 990\, a^{7} b x^{4\, n} + 16}{495\, n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(3*n - 1),x, algorithm="fricas")
```

```
[Out] 1/495*(45*b^8*x^(11*n) + 396*a*b^7*x^(10*n) + 1540*a^2*b^6*x^(9*n
) + 3465*a^3*b^5*x^(8*n) + 4950*a^4*b^4*x^(7*n) + 4620*a^5*b^3*x^
(6*n) + 2772*a^6*b^2*x^(5*n) + 990*a^7*b*x^(4*n) + 165*a^8*x^(3*n
))/n
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+3*n)*(a+b*x**n)**8,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^{n} + a)^{8} x^{3\, n-1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(3*n - 1),x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^8*x^(3*n - 1), x)
```

3.2566 $\int x^{-1+2n} (a + bx^n)^8 \, dx$

Optimal. Leaf size=40

$$\frac{(a+bx^n)^{10}}{10b^2n} - \frac{a\,(a+bx^n)^9}{9b^2n}$$

```
[Out] -(a*(a + b*x^n)^9)/(9*b^2*n) + (a + b*x^n)^10/(10*b^2*n)
```

Rubi [A] time = 0.0599271, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{(a+bx^n)^{10}}{10b^2n} - \frac{a\,(a+bx^n)^9}{9b^2n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + 2*n)*(a + b*x^n)^8,x]
```

```
[Out] -(a*(a + b*x^n)^9)/(9*b^2*n) + (a + b*x^n)^10/(10*b^2*n)
```

Rubi in Sympy [A] time = 13.266, size = 31, normalized size = 0.78

$$-\frac{a\,(a+bx^n)^9}{9b^2n} + \frac{(a+bx^n)^{10}}{10b^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+2*n)*(a+b*x**n)**8,x)
```

```
[Out] -a*(a + b*x**n)**9/(9*b**2*n) + (a + b*x**n)**10/(10*b**2*n)
```

Mathematica [B] time = 0.0412804, size = 113, normalized size = 2.82

$$\frac{x^{2n}\left(45a^8+240a^7bx^n+630a^6b^2x^{2n}+1008a^5b^3x^{3n}+1050a^4b^4x^{4n}+720a^3b^5x^{5n}+315a^2b^6x^{6n}+80ab^7x^{7n}+9b^8x^{8n}\right)}{90n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + 2*n)*(a + b*x^n)^8,x]
```

```
[Out] (x^(2*n)*(45*a^8 + 240*a^7*b*x^n + 630*a^6*b^2*x^(2*n) + 1008*a^5
*b^3*x^(3*n) + 1050*a^4*b^4*x^(4*n) + 720*a^3*b^5*x^(5*n) + 315*a
^2*b^6*x^(6*n) + 80*a*b^7*x^(7*n) + 9*b^8*x^(8*n)))/(90*n)
```

Maple [B] time = 0.04, size = 136, normalized size = 3.4

$$\frac{b^8\,(x^n)^{10}}{10\,n} + \frac{8\,ab^7\,(x^n)^9}{9\,n} + \frac{7\,a^2b^6\,(x^n)^8}{2\,n} + 8\,\frac{a^3b^5\,(x^n)^7}{n} + \frac{35\,a^4b^4\,(x^n)^6}{3\,n} + \frac{56\,a^5b^3\,(x^n)^5}{5\,n} + 7\,\frac{a^6b^2\,(x^n)^4}{n} + \frac{8\,ba^7\,(x^n)^3}{3\,n} + \frac{a^8\,(x^n)^2}{2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+2*n)*(a+b*x^n)^8,x)
```

```
[Out] 1/10*b^8/n*(x^n)^10+8/9*a*b^7/n*(x^n)^9+7/2*a^2*b^6/n*(x^n)^8+8*a
^3*b^5/n*(x^n)^7+35/3*a^4*b^4/n*(x^n)^6+56/5*a^5*b^3/n*(x^n)^5+7*
a^6*b^2/n*(x^n)^4+8/3*a^7*b/n*(x^n)^3+1/2*a^8/n*(x^n)^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(2*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.226286, size = 153, normalized size = 3.82

$$\frac{9\, b^{8} x^{10\, n} + 80\, a b^{7} x^{9\, n} + 315\, a^{2} b^{6} x^{8\, n} + 720\, a^{3} b^{5} x^{7\, n} + 1050\, a^{4} b^{4} x^{6\, n} + 1008\, a^{5} b^{3} x^{5\, n} + 630\, a^{6} b^{2} x^{4\, n} + 240\, a^{7} b x^{3\, n} + 45\, a^{8} x^{2\, n}}{90\, n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(2*n - 1),x, algorithm="fricas")
```

```
[Out] 1/90*(9*b^8*x^(10*n) + 80*a*b^7*x^(9*n) + 315*a^2*b^6*x^(8*n) + 7
20*a^3*b^5*x^(7*n) + 1050*a^4*b^4*x^(6*n) + 1008*a^5*b^3*x^(5*n)
+ 630*a^6*b^2*x^(4*n) + 240*a^7*b*x^(3*n) + 45*a^8*x^(2*n))/n
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+2*n)*(a+b*x**n)**8,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^{n} + a)^{8} x^{2\, n - 1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(2*n - 1),x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^8*x^(2*n - 1), x)
```

3.2567 $\int x^{-1+n} (a + bx^n)^8 \, dx$

Optimal. Leaf size=19

$$\frac{(a + bx^n)^9}{9bn}$$

[Out] (a + b*x^n)^9/(9*b*n)

Rubi [A] time = 0.0191555, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$\frac{(a + bx^n)^9}{9bn}$$

Antiderivative was successfully verified.

[In] Int[x^(-1 + n)*(a + b*x^n)^8,x]

[Out] (a + b*x^n)^9/(9*b*n)

Rubi in Sympy [A] time = 2.48917, size = 12, normalized size = 0.63

$$\frac{(a + bx^n)^9}{9bn}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(x**(-1+n)*(a+b*x**n)**8,x)

[Out] (a + b*x**n)**9/(9*b*n)

Mathematica [A] time = 0.0132198, size = 19, normalized size = 1.

$$\frac{(a + bx^n)^9}{9bn}$$

Antiderivative was successfully verified.

[In] Integrate[x^(-1 + n)*(a + b*x^n)^8,x]

[Out] (a + b*x^n)^9/(9*b*n)

Maple [B] time = 0.04, size = 132, normalized size = 7.

$$\frac{b^8 (x^n)^9}{9\,n} + \frac{ab^7 (x^n)^8}{n} + 4\,\frac{a^2b^6 (x^n)^7}{n} + \frac{28\,a^3b^5 (x^n)^6}{3\,n} + 14\,\frac{a^4b^4 (x^n)^5}{n} + 14\,\frac{a^5b^3 (x^n)^4}{n} + \frac{28\,a^6b^2 (x^n)^3}{3\,n} + 4\,\frac{ba^7 (x^n)^2}{n} + \frac{a^8x^n}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^(-1+n)*(a+b*x^n)^8,x)

```
[Out] 1/9*b^8/n*(x^n)^9+a*b^7/n*(x^n)^8+4*a^2*b^6/n*(x^n)^7+28/3*a^3*b^
5/n*(x^n)^6+14*a^4*b^4/n*(x^n)^5+14*a^5*b^3/n*(x^n)^4+28/3*a^6*b^
2/n*(x^n)^3+4*a^7*b/n*(x^n)^2+a^8/n*x^n
```

Maxima [A] time = 1.43503, size = 23, normalized size = 1.21

$$\frac{(bx^n + a)^9}{9\,bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^n + a)^8*x^(n - 1),x, algorithm="maxima")
```

```
[Out] 1/9*(b*x^n + a)^9/(b*n)
```

Fricas [A] time = 0.224952, size = 149, normalized size = 7.84

$$\frac{b^8x^{9\,n} + 9\,ab^7x^{8\,n} + 36\,a^2b^6x^{7\,n} + 84\,a^3b^5x^{6\,n} + 126\,a^4b^4x^{5\,n} + 126\,a^5b^3x^{4\,n} + 84\,a^6b^2x^{3\,n} + 36\,a^7bx^{2\,n} + 9\,a^8x^n}{9\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^n + a)^8*x^(n - 1),x, algorithm="fricas")
```

```
[Out] 1/9*(b^8*x^(9*n) + 9*a*b^7*x^(8*n) + 36*a^2*b^6*x^(7*n) + 84*a^3*
b^5*x^(6*n) + 126*a^4*b^4*x^(5*n) + 126*a^5*b^3*x^(4*n) + 84*a^6*
b^2*x^(3*n) + 36*a^7*b*x^(2*n) + 9*a^8*x^n)/n
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**(-1+n)*(a+b*x**n)**8,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.216181, size = 149, normalized size = 7.84

$$\frac{b^8x^{9\,n} + 9\,ab^7x^{8\,n} + 36\,a^2b^6x^{7\,n} + 84\,a^3b^5x^{6\,n} + 126\,a^4b^4x^{5\,n} + 126\,a^5b^3x^{4\,n} + 84\,a^6b^2x^{3\,n} + 36\,a^7bx^{2\,n} + 9\,a^8x^n}{9\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^n + a)^8*x^(n - 1),x, algorithm="giac")
```

```
[Out] 1/9*(b^8*x^(9*n) + 9*a*b^7*x^(8*n) + 36*a^2*b^6*x^(7*n) + 84*a^3*
b^5*x^(6*n) + 126*a^4*b^4*x^(5*n) + 126*a^5*b^3*x^(4*n) + 84*a^6*
b^2*x^(3*n) + 36*a^7*b*x^(2*n) + 9*a^8*x^n)/n
```

3.2568 $\int \frac{(a+bx^n)^8}{x}\,dx$

Optimal. Leaf size=138

$$a^8\log(x)+\frac{8a^7bx^n}{n}+\frac{14a^6b^2x^{2n}}{n}+\frac{56a^5b^3x^{3n}}{3n}+\frac{35a^4b^4x^{4n}}{2n}+\frac{56a^3b^5x^{5n}}{5n}+\frac{14a^2b^6x^{6n}}{3n}+\frac{8ab^7x^{7n}}{7n}+\frac{b^8x^{8n}}{8n}$$

```
[Out] (8*a^7*b*x^n)/n + (14*a^6*b^2*x^(2*n))/n + (56*a^5*b^3*x^(3*n))/(
3*n) + (35*a^4*b^4*x^(4*n))/(2*n) + (56*a^3*b^5*x^(5*n))/(5*n) +
(14*a^2*b^6*x^(6*n))/(3*n) + (8*a*b^7*x^(7*n))/(7*n) + (b^8*x^(8*
n))/(8*n) + a^8*Log[x]
```

Rubi [A] time = 0.140255, antiderivative size = 138, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$a^8\log(x)+\frac{8a^7bx^n}{n}+\frac{14a^6b^2x^{2n}}{n}+\frac{56a^5b^3x^{3n}}{3n}+\frac{35a^4b^4x^{4n}}{2n}+\frac{56a^3b^5x^{5n}}{5n}+\frac{14a^2b^6x^{6n}}{3n}+\frac{8ab^7x^{7n}}{7n}+\frac{b^8x^{8n}}{8n}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^8/x,x]
```

```
[Out] (8*a^7*b*x^n)/n + (14*a^6*b^2*x^(2*n))/n + (56*a^5*b^3*x^(3*n))/(
3*n) + (35*a^4*b^4*x^(4*n))/(2*n) + (56*a^3*b^5*x^(5*n))/(5*n) +
(14*a^2*b^6*x^(6*n))/(3*n) + (8*a*b^7*x^(7*n))/(7*n) + (b^8*x^(8*
n))/(8*n) + a^8*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^8\log\left(x^n\right)}{n}+\frac{8a^7bx^n}{n}+\frac{28a^6b^2\int^{x^n}x\,dx}{n}+\frac{56a^5b^3x^{3n}}{3n}+\frac{35a^4b^4x^{4n}}{2n}+\frac{56a^3b^5x^{5n}}{5n}+\frac{14a^2b^6x^{6n}}{3n}+\frac{8ab^7x^{7n}}{7n}+\frac{b^8x^{8n}}{8n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**n)**8/x,x)
```

```
[Out] a**8*log(x**n)/n + 8*a**7*b*x**n/n + 28*a**6*b**2*Integral(x, (x,
 x**n))/n + 56*a**5*b**3*x**(3*n)/(3*n) + 35*a**4*b**4*x**(4*n)/(
2*n) + 56*a**3*b**5*x**(5*n)/(5*n) + 14*a**2*b**6*x**(6*n)/(3*n)
+ 8*a*b**7*x**(7*n)/(7*n) + b**8*x**(8*n)/(8*n)
```

Mathematica [A] time = 0.0838256, size = 106, normalized size = 0.77

$$a^8\log(x)+\frac{bx^n\left(6720a^7+11760a^6bx^n+15680a^5b^2x^{2n}+14700a^4b^3x^{3n}+9408a^3b^4x^{4n}+3920a^2b^5x^{5n}+960ab^6x^{6n}+105b^7x^{7n}\right)}{840n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^8/x,x]
```

```
[Out] (b*x^n*(6720*a^7 + 11760*a^6*b*x^n + 15680*a^5*b^2*x^(2*n) + 1470
0*a^4*b^3*x^(3*n) + 9408*a^3*b^4*x^(4*n) + 3920*a^2*b^5*x^(5*n) +
 960*a*b^6*x^(6*n) + 105*b^7*x^(7*n)))/(840*n) + a^8*Log[x]
```

Maple [A] time = 0.003, size = 132, normalized size = 1.

$$\frac{b^8 (x^n)^8}{8n} + \frac{8ab^7 (x^n)^7}{7n} + \frac{14a^2b^6 (x^n)^6}{3n} + \frac{56a^3b^5 (x^n)^5}{5n} + \frac{35a^4b^4 (x^n)^4}{2n} + \frac{56a^5b^3 (x^n)^3}{3n} + 14\frac{a^6b^2 (x^n)^2}{n} + 8\frac{ba^7x^n}{n} + \frac{a^8 \ln (x^n)}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^8/x,x)
```

```
[Out] 1/8/n*b^8*(x^n)^8+8/7/n*a*b^7*(x^n)^7+14/3/n*a^2*b^6*(x^n)^6+56/5
/n*a^3*b^5*(x^n)^5+35/2/n*a^4*b^4*(x^n)^4+56/3/n*a^5*b^3*(x^n)^3+
14/n*a^6*b^2*(x^n)^2+8*a^7*b*x^n/n+1/n*a^8*ln(x^n)
```

Maxima [A] time = 1.44968, size = 153, normalized size = 1.11

$$\frac{a^8 \log (x^n)}{n} + \frac{105b^8x^{8n} + 960ab^7x^{7n} + 3920a^2b^6x^{6n} + 9408a^3b^5x^{5n} + 14700a^4b^4x^{4n} + 15680a^5b^3x^{3n} + 11760a^6b^2x^{2n} + 6720a^7bx^n}{840n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8/x,x, algorithm="maxima")
```

```
[Out] a^8*log(x^n)/n + 1/840*(105*b^8*x^(8*n) + 960*a*b^7*x^(7*n) + 392
0*a^2*b^6*x^(6*n) + 9408*a^3*b^5*x^(5*n) + 14700*a^4*b^4*x^(4*n)
+ 15680*a^5*b^3*x^(3*n) + 11760*a^6*b^2*x^(2*n) + 6720*a^7*b*x^n)
/n
```

Fricas [A] time = 0.226953, size = 147, normalized size = 1.07

$$\frac{840a^8n\log (x) + 105b^8x^{8n} + 960ab^7x^{7n} + 3920a^2b^6x^{6n} + 9408a^3b^5x^{5n} + 14700a^4b^4x^{4n} + 15680a^5b^3x^{3n} + 11760a^6b^2x^2}{840n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8/x,x, algorithm="fricas")
```

```
[Out] 1/840*(840*a^8*n*log(x) + 105*b^8*x^(8*n) + 960*a*b^7*x^(7*n) + 3
920*a^2*b^6*x^(6*n) + 9408*a^3*b^5*x^(5*n) + 14700*a^4*b^4*x^(4*n
) + 15680*a^5*b^3*x^(3*n) + 11760*a^6*b^2*x^(2*n) + 6720*a^7*b*x^
n)/n
```

Sympy [A] time = 6.77068, size = 136, normalized size = 0.99

$$\begin{cases} a^8 \log (x) + \frac{8a^7bx^n}{n} + \frac{14a^6b^2x^{2n}}{n} + \frac{56a^5b^3x^{3n}}{3n} + \frac{35a^4b^4x^{4n}}{2n} + \frac{56a^3b^5x^{5n}}{5n} + \frac{14a^2b^6x^{6n}}{3n} + \frac{8ab^7x^{7n}}{7n} + \frac{b^8x^{8n}}{8n} & \text{for } n \neq 0 \\ (a+b)^8 \log (x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**8/x,x)
```

```
[Out] Piecewise((a**8*log(x) + 8*a**7*b*x**n/n + 14*a**6*b**2*x**(2*n)/
n + 56*a**5*b**3*x**(3*n)/(3*n) + 35*a**4*b**4*x**(4*n)/(2*n) + 5
```

```
6*a**3*b**5*x**(5*n)/(5*n) + 14*a**2*b**6*x**(6*n)/(3*n) + 8*a*b*
*7*x**(7*n)/(7*n) + b**8*x**(8*n)/(8*n), Ne(n, 0)), ((a + b)**8*l
og(x), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^n + a)^8}{x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8/x,x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^8/x, x)
```

3.2569 $\int x^{-1-n} (a + bx^n)^8 \, dx$

Optimal. Leaf size=135

$$-\frac{a^8x^{-n}}{n} + 8a^7b\log(x) + \frac{28a^6b^2x^n}{n} + \frac{28a^5b^3x^{2n}}{n} + \frac{70a^4b^4x^{3n}}{3n} + \frac{14a^3b^5x^{4n}}{n} + \frac{28a^2b^6x^{5n}}{5n} + \frac{4ab^7x^{6n}}{3n} + \frac{b^8x^{7n}}{7n}$$

```
[Out] -(a^8/(n*x^n)) + (28*a^6*b^2*x^n)/n + (28*a^5*b^3*x^(2*n))/n + (7
0*a^4*b^4*x^(3*n))/(3*n) + (14*a^3*b^5*x^(4*n))/n + (28*a^2*b^6*x
^(5*n))/(5*n) + (4*a*b^7*x^(6*n))/(3*n) + (b^8*x^(7*n))/(7*n) + 8
*a^7*b*Log[x]
```

Rubi [A] time = 0.15267, antiderivative size = 135, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$

$$-\frac{a^8x^{-n}}{n} + 8a^7b\log(x) + \frac{28a^6b^2x^n}{n} + \frac{28a^5b^3x^{2n}}{n} + \frac{70a^4b^4x^{3n}}{3n} + \frac{14a^3b^5x^{4n}}{n} + \frac{28a^2b^6x^{5n}}{5n} + \frac{4ab^7x^{6n}}{3n} + \frac{b^8x^{7n}}{7n}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 - n)*(a + b*x^n)^8,x]
```

```
[Out] -(a^8/(n*x^n)) + (28*a^6*b^2*x^n)/n + (28*a^5*b^3*x^(2*n))/n + (7
0*a^4*b^4*x^(3*n))/(3*n) + (14*a^3*b^5*x^(4*n))/n + (28*a^2*b^6*x
^(5*n))/(5*n) + (4*a*b^7*x^(6*n))/(3*n) + (b^8*x^(7*n))/(7*n) + 8
*a^7*b*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^8x^{-n}}{n} + \frac{8a^7b\log(x^n)}{n} + \frac{28a^6b^2x^n}{n} + \frac{56a^5b^3\int^{x^n} x\,dx}{n} + \frac{70a^4b^4x^{3n}}{3n} + \frac{14a^3b^5x^{4n}}{n} + \frac{28a^2b^6x^{5n}}{5n} + \frac{4ab^7x^{6n}}{3n} + \frac{b^8x^{7n}}{7n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1-n)*(a+b*x**n)**8,x)
```

```
[Out] -a**8*x**(-n)/n + 8*a**7*b*log(x**n)/n + 28*a**6*b**2*x**n/n + 56
*a**5*b**3*Integral(x, (x, x**n))/n + 70*a**4*b**4*x**(3*n)/(3*n)
 + 14*a**3*b**5*x**(4*n)/n + 28*a**2*b**6*x**(5*n)/(5*n) + 4*a*b*
*7*x**(6*n)/(3*n) + b**8*x**(7*n)/(7*n)
```

Mathematica [A] time = 0.0532273, size = 116, normalized size = 0.86

$$\frac{x^{-n}\left(-105a^8 + 840a^7bnx^n\log(x) + 2940a^6b^2x^{2n} + 2940a^5b^3x^{3n} + 2450a^4b^4x^{4n} + 1470a^3b^5x^{5n} + 588a^2b^6x^{6n} + 140ab^7x^{7n} + \right.}{105n}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 - n)*(a + b*x^n)^8,x]
```

```
[Out] (-105*a^8 + 2940*a^6*b^2*x^(2*n) + 2940*a^5*b^3*x^(3*n) + 2450*a^
4*b^4*x^(4*n) + 1470*a^3*b^5*x^(5*n) + 588*a^2*b^6*x^(6*n) + 140*
a*b^7*x^(7*n) + 15*b^8*x^(8*n) + 840*a^7*b*n*x^n*Log[x])/(105*n*x
^n)
```

Maple [A] time = 0.044, size = 128, normalized size = 1.

$$8a^7 b\ln(x) + \frac{b^8 (x^n)^7}{7n} + \frac{4ab^7 (x^n)^6}{3n} + \frac{28a^2 b^6 (x^n)^5}{5n} + 14\frac{a^3 b^5 (x^n)^4}{n} + \frac{70a^4 b^4 (x^n)^3}{3n} + 28\frac{a^5 b^3 (x^n)^2}{n} + 28\frac{a^6 b^2 x^n}{n} - \frac{a^8}{nx^n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-n)*(a+b*x^n)^8,x)
```

```
[Out] 8*a^7*b*ln(x)+1/7*b^8/n*(x^n)^7+4/3*a*b^7/n*(x^n)^6+28/5*a^2*b^6/
n*(x^n)^5+14*a^3*b^5/n*(x^n)^4+70/3*a^4*b^4/n*(x^n)^3+28*a^5*b^3/
n*(x^n)^2+28*a^6*b^2*x^n/n-a^8/n/(x^n)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.227965, size = 154, normalized size = 1.14

$$\frac{840a^7 bnx^n\log(x) + 15b^8 x^{8n} + 140ab^7 x^{7n} + 588a^2 b^6 x^{6n} + 1470a^3 b^5 x^{5n} + 2450a^4 b^4 x^{4n} + 2940a^5 b^3 x^{3n} + 2940a^6 b^2 x^{2n}}{105nx^n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-n - 1),x, algorithm="fricas")
```

```
[Out] 1/105*(840*a^7*b*n*x^n*log(x) + 15*b^8*x^(8*n) + 140*a*b^7*x^(7*n
) + 588*a^2*b^6*x^(6*n) + 1470*a^3*b^5*x^(5*n) + 2450*a^4*b^4*x^(
4*n) + 2940*a^5*b^3*x^(3*n) + 2940*a^6*b^2*x^(2*n) - 105*a^8)/(n*
x^n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-n)*(a+b*x**n)**8,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.233057, size = 167, normalized size = 1.24

$$\frac{\left(840a^7 bne^{(n\ln(x))}\ln(x) + 15b^8 e^{(8n\ln(x))} + 140ab^7 e^{(7n\ln(x))} + 588a^2 b^6 e^{(6n\ln(x))} + 1470a^3 b^5 e^{(5n\ln(x))} + 2450a^4 b^4 e^{(4n\ln(x))} + 29}{105n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-n - 1),x, algorithm="giac")
```

```
[Out] 1/105*(840*a^7*b*n*e^(n*ln(x))*ln(x) + 15*b^8*e^(8*n*ln(x)) + 140
*a*b^7*e^(7*n*ln(x)) + 588*a^2*b^6*e^(6*n*ln(x)) + 1470*a^3*b^5*e
^(5*n*ln(x)) + 2450*a^4*b^4*e^(4*n*ln(x)) + 2940*a^5*b^3*e^(3*n*l
n(x)) + 2940*a^6*b^2*e^(2*n*ln(x)) - 105*a^8)*e^(-n*ln(x))/n
```

3.2570 $\int x^{-1-2n}(a+bx^n)^8\,dx$

Optimal. Leaf size=135

$$-\frac{a^8x^{-2n}}{2n}-\frac{8a^7bx^{-n}}{n}+28a^6b^2\log(x)+\frac{56a^5b^3x^n}{n}+\frac{35a^4b^4x^{2n}}{n}+\frac{56a^3b^5x^{3n}}{3n}+\frac{7a^2b^6x^{4n}}{n}+\frac{8ab^7x^{5n}}{5n}+\frac{b^8x^{6n}}{6n}$$

```
[Out] -a^8/(2*n*x^(2*n)) - (8*a^7*b)/(n*x^n) + (56*a^5*b^3*x^n)/n + (35
*a^4*b^4*x^(2*n))/n + (56*a^3*b^5*x^(3*n))/(3*n) + (7*a^2*b^6*x^(
4*n))/n + (8*a*b^7*x^(5*n))/(5*n) + (b^8*x^(6*n))/(6*n) + 28*a^6*
b^2*Log[x]
```

Rubi [A] time = 0.151508, antiderivative size = 135, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{a^8x^{-2n}}{2n}-\frac{8a^7bx^{-n}}{n}+28a^6b^2\log(x)+\frac{56a^5b^3x^n}{n}+\frac{35a^4b^4x^{2n}}{n}+\frac{56a^3b^5x^{3n}}{3n}+\frac{7a^2b^6x^{4n}}{n}+\frac{8ab^7x^{5n}}{5n}+\frac{b^8x^{6n}}{6n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 2*n)*(a + b*x^n)^8,x]
```

```
[Out] -a^8/(2*n*x^(2*n)) - (8*a^7*b)/(n*x^n) + (56*a^5*b^3*x^n)/n + (35
*a^4*b^4*x^(2*n))/n + (56*a^3*b^5*x^(3*n))/(3*n) + (7*a^2*b^6*x^(
4*n))/n + (8*a*b^7*x^(5*n))/(5*n) + (b^8*x^(6*n))/(6*n) + 28*a^6*
b^2*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^8x^{-2n}}{2n}-\frac{8a^7bx^{-n}}{n}+\frac{28a^6b^2\log(x^n)}{n}+\frac{56a^5b^3x^n}{n}+\frac{70a^4b^4\int^{x^n}x\,dx}{n}+\frac{56a^3b^5x^{3n}}{3n}+\frac{7a^2b^6x^{4n}}{n}+\frac{8ab^7x^{5n}}{5n}+\frac{b^8x^{6n}}{6n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-2*n)*(a+b*x**n)**8,x)
```

```
[Out] -a**8*x**(-2*n)/(2*n) - 8*a**7*b*x**(-n)/n + 28*a**6*b**2*log(x**
n)/n + 56*a**5*b**3*x**n/n + 70*a**4*b**4*Integral(x, (x, x**n))/
n + 56*a**3*b**5*x**(3*n)/(3*n) + 7*a**2*b**6*x**(4*n)/n + 8*a*b
*7*x**(5*n)/(5*n) + b**8*x**(6*n)/(6*n)
```

Mathematica [A] time = 0.0519688, size = 116, normalized size = 0.86

$$\frac{x^{-2n}\left(-15a^8-240a^7bx^n+840a^6b^2nx^{2n}\log(x)+1680a^5b^3x^{3n}+1050a^4b^4x^{4n}+560a^3b^5x^{5n}+210a^2b^6x^{6n}+48ab^7x^{7n}+5b^8\right.}{30n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 2*n)*(a + b*x^n)^8,x]
```

```
[Out] (-15*a^8 - 240*a^7*b*x^n + 1680*a^5*b^3*x^(3*n) + 1050*a^4*b^4*x^
(4*n) + 560*a^3*b^5*x^(5*n) + 210*a^2*b^6*x^(6*n) + 48*a*b^7*x^(7
*n) + 5*b^8*x^(8*n) + 840*a^6*b^2*n*x^(2*n)*Log[x])/(30*n*x^(2*n)
)
```

Maple [A] time = 0.045, size = 128, normalized size = 1.

$$28\,a^{6}b^{2}\ln\left(x\right)+\frac{b^{8}\left(x^{n}\right)^{6}}{6\,n}+\frac{8\,ab^{7}\left(x^{n}\right)^{5}}{5\,n}+7\,\frac{a^{2}b^{6}\left(x^{n}\right)^{4}}{n}+\frac{56\,a^{3}b^{5}\left(x^{n}\right)^{3}}{3\,n}+35\,\frac{a^{4}b^{4}\left(x^{n}\right)^{2}}{n}+56\,\frac{a^{5}b^{3}x^{n}}{n}-8\,\frac{ba^{7}}{nx^{n}}-\frac{a^{8}}{2\,n\left(x^{n}\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-2*n)*(a+b*x^n)^8,x)
```

```
[Out] 28*a^6*b^2*ln(x)+1/6*b^8/n*(x^n)^6+8/5*a*b^7/n*(x^n)^5+7*a^2*b^6/
n*(x^n)^4+56/3*a^3*b^5/n*(x^n)^3+35*a^4*b^4/n*(x^n)^2+56*a^5*b^3*
x^n/n-8*a^7*b/n/(x^n)-1/2*a^8/n/(x^n)^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-2*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.228129, size = 157, normalized size = 1.16

$$\frac{840\,a^{6}b^{2}nx^{2\,n}\log\left(x\right)+5\,b^{8}x^{8\,n}+48\,ab^{7}x^{7\,n}+210\,a^{2}b^{6}x^{6\,n}+560\,a^{3}b^{5}x^{5\,n}+1050\,a^{4}b^{4}x^{4\,n}+1680\,a^{5}b^{3}x^{3\,n}-240\,a^{7}bx^{n}-15}{30\,nx^{2\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-2*n - 1),x, algorithm="fricas")
```

```
[Out] 1/30*(840*a^6*b^2*n*x^(2*n)*log(x) + 5*b^8*x^(8*n) + 48*a*b^7*x^(
7*n) + 210*a^2*b^6*x^(6*n) + 560*a^3*b^5*x^(5*n) + 1050*a^4*b^4*x
^(4*n) + 1680*a^5*b^3*x^(3*n) - 240*a^7*b*x^n - 15*a^8)/(n*x^(2*n
))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-2*n)*(a+b*x**n)**8,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.233199, size = 167, normalized size = 1.24

$$\frac{\left(840\,a^{6}b^{2}ne^{(2\,n\ln(x))}\ln\left(x\right)+5\,b^{8}e^{(8\,n\ln(x))}+48\,ab^{7}e^{(7\,n\ln(x))}+210\,a^{2}b^{6}e^{(6\,n\ln(x))}+560\,a^{3}b^{5}e^{(5\,n\ln(x))}+1050\,a^{4}b^{4}e^{(4\,n\ln(x))}+168}{30\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-2*n - 1),x, algorithm="giac")
```

```
[Out] 1/30*(840*a^6*b^2*n*e^(2*n*ln(x))*ln(x) + 5*b^8*e^(8*n*ln(x)) + 4
8*a*b^7*e^(7*n*ln(x)) + 210*a^2*b^6*e^(6*n*ln(x)) + 560*a^3*b^5*e
^(5*n*ln(x)) + 1050*a^4*b^4*e^(4*n*ln(x)) + 1680*a^5*b^3*e^(3*n*l
n(x)) - 240*a^7*b*e^(n*ln(x)) - 15*a^8)*e^(-2*n*ln(x))/n
```

3.2571 $\int x^{-1-3n}(a+bx^n)^8\,dx$

Optimal. Leaf size=133

$$-\frac{a^8x^{-3n}}{3n}-\frac{4a^7bx^{-2n}}{n}-\frac{28a^6b^2x^{-n}}{n}+56a^5b^3\log(x)+\frac{70a^4b^4x^n}{n}+\frac{28a^3b^5x^{2n}}{n}+\frac{28a^2b^6x^{3n}}{3n}+\frac{2ab^7x^{4n}}{n}+\frac{b^8x^{5n}}{5n}$$

```
[Out] -a^8/(3*n*x^(3*n)) - (4*a^7*b)/(n*x^(2*n)) - (28*a^6*b^2)/(n*x^n)
 + (70*a^4*b^4*x^n)/n + (28*a^3*b^5*x^(2*n))/n + (28*a^2*b^6*x^(3
*n))/(3*n) + (2*a*b^7*x^(4*n))/n + (b^8*x^(5*n))/(5*n) + 56*a^5*b
^3*Log[x]
```

Rubi [A] time = 0.154912, antiderivative size = 133, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{a^8x^{-3n}}{3n}-\frac{4a^7bx^{-2n}}{n}-\frac{28a^6b^2x^{-n}}{n}+56a^5b^3\log(x)+\frac{70a^4b^4x^n}{n}+\frac{28a^3b^5x^{2n}}{n}+\frac{28a^2b^6x^{3n}}{3n}+\frac{2ab^7x^{4n}}{n}+\frac{b^8x^{5n}}{5n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 3*n)*(a + b*x^n)^8,x]
```

```
[Out] -a^8/(3*n*x^(3*n)) - (4*a^7*b)/(n*x^(2*n)) - (28*a^6*b^2)/(n*x^n)
 + (70*a^4*b^4*x^n)/n + (28*a^3*b^5*x^(2*n))/n + (28*a^2*b^6*x^(3
*n))/(3*n) + (2*a*b^7*x^(4*n))/n + (b^8*x^(5*n))/(5*n) + 56*a^5*b
^3*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^8x^{-3n}}{3n}-\frac{4a^7bx^{-2n}}{n}-\frac{28a^6b^2x^{-n}}{n}+\frac{56a^5b^3\log(x^n)}{n}+\frac{70a^4b^4x^n}{n}+\frac{56a^3b^5\int^{x^n}x\,dx}{n}+\frac{28a^2b^6x^{3n}}{3n}+\frac{2ab^7x^{4n}}{n}+\frac{b^8x^{5n}}{5n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-3*n)*(a+b*x**n)**8,x)
```

```
[Out] -a**8*x**(-3*n)/(3*n) - 4*a**7*b*x**(-2*n)/n - 28*a**6*b**2*x**(-
n)/n + 56*a**5*b**3*log(x**n)/n + 70*a**4*b**4*x**n/n + 56*a**3*b
**5*Integral(x, (x, x**n))/n + 28*a**2*b**6*x**(3*n)/(3*n) + 2*a*
b**7*x**(4*n)/n + b**8*x**(5*n)/(5*n)
```

Mathematica [A] time = 0.0505343, size = 116, normalized size = 0.87

$$\frac{x^{-3n}\left(-5a^8-60a^7bx^n-420a^6b^2x^{2n}+840a^5b^3nx^{3n}\log(x)+1050a^4b^4x^{4n}+420a^3b^5x^{5n}+140a^2b^6x^{6n}+30ab^7x^{7n}+3b^8x^{8n}\right)}{15n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 3*n)*(a + b*x^n)^8,x]
```

```
[Out] (-5*a^8 - 60*a^7*b*x^n - 420*a^6*b^2*x^(2*n) + 1050*a^4*b^4*x^(4*
n) + 420*a^3*b^5*x^(5*n) + 140*a^2*b^6*x^(6*n) + 30*a*b^7*x^(7*n)
 + 3*b^8*x^(8*n) + 840*a^5*b^3*n*x^(3*n)*Log[x])/(15*n*x^(3*n))
```

Maple [A] time = 0.045, size = 128, normalized size = 1.

$$56\,a^{5}b^{3}\ln\left(x\right)+\frac{b^{8}\left(x^{n}\right)^{5}}{5\,n}+2\,\frac{ab^{7}\left(x^{n}\right)^{4}}{n}+\frac{28\,a^{2}b^{6}\left(x^{n}\right)^{3}}{3\,n}+28\,\frac{a^{3}b^{5}\left(x^{n}\right)^{2}}{n}+70\,\frac{a^{4}b^{4}x^{n}}{n}-28\,\frac{a^{6}b^{2}}{nx^{n}}-4\,\frac{ba^{7}}{n\left(x^{n}\right)^{2}}-\frac{a^{8}}{3\,n\left(x^{n}\right)^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-3*n)*(a+b*x^n)^8,x)
```

```
[Out] 56*a^5*b^3*ln(x)+1/5*b^8/n*(x^n)^5+2*a*b^7/n*(x^n)^4+28/3*a^2*b^6
/n*(x^n)^3+28*a^3*b^5/n*(x^n)^2+70*a^4*b^4*x^n/n-28*a^6*b^2/n/(x^
n)-4*a^7*b/n/(x^n)^2-1/3*a^8/n/(x^n)^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-3*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.228931, size = 157, normalized size = 1.18

$$\frac{840\,a^{5}b^{3}nx^{3\,n}\log\left(x\right)+3\,b^{8}x^{8\,n}+30\,ab^{7}x^{7\,n}+140\,a^{2}b^{6}x^{6\,n}+420\,a^{3}b^{5}x^{5\,n}+1050\,a^{4}b^{4}x^{4\,n}-420\,a^{6}b^{2}x^{2\,n}-60\,a^{7}bx^{n}-5\,a^{8}}{15\,nx^{3\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-3*n - 1),x, algorithm="fricas")
```

```
[Out] 1/15*(840*a^5*b^3*n*x^(3*n)*log(x) + 3*b^8*x^(8*n) + 30*a*b^7*x^(
7*n) + 140*a^2*b^6*x^(6*n) + 420*a^3*b^5*x^(5*n) + 1050*a^4*b^4*x
^(4*n) - 420*a^6*b^2*x^(2*n) - 60*a^7*b*x^n - 5*a^8)/(n*x^(3*n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-3*n)*(a+b*x**n)**8,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.234832, size = 167, normalized size = 1.26

$$\frac{\left(840\,a^{5}b^{3}ne^{\left(3\,n\ln\left(x\right)\right)}\ln\left(x\right)+3\,b^{8}e^{\left(8\,n\ln\left(x\right)\right)}+30\,ab^{7}e^{\left(7\,n\ln\left(x\right)\right)}+140\,a^{2}b^{6}e^{\left(6\,n\ln\left(x\right)\right)}+420\,a^{3}b^{5}e^{\left(5\,n\ln\left(x\right)\right)}+1050\,a^{4}b^{4}e^{\left(4\,n\ln\left(x\right)\right)}-420}{15\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-3*n - 1),x, algorithm="giac")
```

```
[Out] 1/15*(840*a^5*b^3*n*e^(3*n*ln(x))*ln(x) + 3*b^8*e^(8*n*ln(x)) + 3
0*a*b^7*e^(7*n*ln(x)) + 140*a^2*b^6*e^(6*n*ln(x)) + 420*a^3*b^5*e
^(5*n*ln(x)) + 1050*a^4*b^4*e^(4*n*ln(x)) - 420*a^6*b^2*e^(2*n*ln
(x)) - 60*a^7*b*e^(n*ln(x)) - 5*a^8)*e^(-3*n*ln(x))/n
```

3.2572 $\int x^{-1-4n} (a+bx^n)^8 \, dx$

Optimal. Leaf size=135

$$-\frac{a^8x^{-4n}}{4n}-\frac{8a^7bx^{-3n}}{3n}-\frac{14a^6b^2x^{-2n}}{n}-\frac{56a^5b^3x^{-n}}{n}+70a^4b^4\log(x)+\frac{56a^3b^5x^n}{n}+\frac{14a^2b^6x^{2n}}{n}+\frac{8ab^7x^{3n}}{3n}+\frac{b^8x^{4n}}{4n}$$

```
[Out] -a^8/(4*n*x^(4*n)) - (8*a^7*b)/(3*n*x^(3*n)) - (14*a^6*b^2)/(n*x^
(2*n)) - (56*a^5*b^3)/(n*x^n) + (56*a^3*b^5*x^n)/n + (14*a^2*b^6*
x^(2*n))/n + (8*a*b^7*x^(3*n))/(3*n) + (b^8*x^(4*n))/(4*n) + 70*a
^4*b^4*Log[x]
```

Rubi [A] time = 0.157235, antiderivative size = 135, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{a^8x^{-4n}}{4n}-\frac{8a^7bx^{-3n}}{3n}-\frac{14a^6b^2x^{-2n}}{n}-\frac{56a^5b^3x^{-n}}{n}+70a^4b^4\log(x)+\frac{56a^3b^5x^n}{n}+\frac{14a^2b^6x^{2n}}{n}+\frac{8ab^7x^{3n}}{3n}+\frac{b^8x^{4n}}{4n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 4*n)*(a + b*x^n)^8,x]
```

```
[Out] -a^8/(4*n*x^(4*n)) - (8*a^7*b)/(3*n*x^(3*n)) - (14*a^6*b^2)/(n*x^
(2*n)) - (56*a^5*b^3)/(n*x^n) + (56*a^3*b^5*x^n)/n + (14*a^2*b^6*
x^(2*n))/n + (8*a*b^7*x^(3*n))/(3*n) + (b^8*x^(4*n))/(4*n) + 70*a
^4*b^4*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^8x^{-4n}}{4n}-\frac{8a^7bx^{-3n}}{3n}-\frac{14a^6b^2x^{-2n}}{n}-\frac{56a^5b^3x^{-n}}{n}+\frac{70a^4b^4\log\left(x^n\right)}{n}+\frac{56a^3b^5x^n}{n}+\frac{28a^2b^6\int^{x^n}x\,dx}{n}+\frac{8ab^7x^{3n}}{3n}+\frac{b^8x^{4n}}{4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-4*n)*(a+b*x**n)**8,x)
```

```
[Out] -a**8*x**(-4*n)/(4*n) - 8*a**7*b*x**(-3*n)/(3*n) - 14*a**6*b**2*x
**(-2*n)/n - 56*a**5*b**3*x**(-n)/n + 70*a**4*b**4*log(x**n)/n +
56*a**3*b**5*x**n/n + 28*a**2*b**6*Integral(x, (x, x**n))/n + 8*a
*b**7*x**(3*n)/(3*n) + b**8*x**(4*n)/(4*n)
```

Mathematica [A] time = 0.0562005, size = 111, normalized size = 0.82

$$-\frac{3a^8x^{-4n}+32a^7bx^{-3n}+168a^6b^2x^{-2n}+672a^5b^3x^{-n}-840a^4b^4n\log(x)-672a^3b^5x^n-168a^2b^6x^{2n}-32ab^7x^{3n}-3b^8x^{4n}}{12n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 4*n)*(a + b*x^n)^8,x]
```

```
[Out] -((3*a^8)/x^(4*n) + (32*a^7*b)/x^(3*n) + (168*a^6*b^2)/x^(2*n) +
(672*a^5*b^3)/x^n - 672*a^3*b^5*x^n - 168*a^2*b^6*x^(2*n) - 32*a*
```

```
b^7*x^(3*n) - 3*b^8*x^(4*n) - 840*a^4*b^4*n*Log[x])/(12*n)
```

Maple [A] time = 0.044, size = 128, normalized size = 1.

$$70\,a^{4}b^{4}\ln\left(x\right)+\frac{b^{8}\left(x^{n}\right)^{4}}{4\,n}+\frac{8\,ab^{7}\left(x^{n}\right)^{3}}{3\,n}+14\,\frac{a^{2}b^{6}\left(x^{n}\right)^{2}}{n}+56\,\frac{a^{3}b^{5}x^{n}}{n}-56\,\frac{a^{5}b^{3}}{nx^{n}}-14\,\frac{a^{6}b^{2}}{n\left(x^{n}\right)^{2}}-\frac{8\,ba^{7}}{3\,n\left(x^{n}\right)^{3}}-\frac{a^{8}}{4\,n\left(x^{n}\right)^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-4*n)*(a+b*x^n)^8,x)
```

```
[Out] 70*a^4*b^4*ln(x)+1/4*b^8/n*(x^n)^4+8/3*a*b^7/n*(x^n)^3+14*a^2*b^6
/n*(x^n)^2+56*a^3*b^5*x^n/n-56*a^5*b^3/n/(x^n)-14*a^6*b^2/n/(x^n)
^2-8/3*a^7*b/n/(x^n)^3-1/4*a^8/n/(x^n)^4
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-4*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.226898, size = 157, normalized size = 1.16

$$\frac{840\,a^{4}b^{4}nx^{4\,n}\log\left(x\right)+3\,b^{8}x^{8\,n}+32\,ab^{7}x^{7\,n}+168\,a^{2}b^{6}x^{6\,n}+672\,a^{3}b^{5}x^{5\,n}-672\,a^{5}b^{3}x^{3\,n}-168\,a^{6}b^{2}x^{2\,n}-32\,a^{7}bx^{n}-3\,a^{8}}{12\,nx^{4\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-4*n - 1),x, algorithm="fricas")
```

```
[Out] 1/12*(840*a^4*b^4*n*x^(4*n)*log(x) + 3*b^8*x^(8*n) + 32*a*b^7*x^(
7*n) + 168*a^2*b^6*x^(6*n) + 672*a^3*b^5*x^(5*n) - 672*a^5*b^3*x^
(3*n) - 168*a^6*b^2*x^(2*n) - 32*a^7*b*x^n - 3*a^8)/(n*x^(4*n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-4*n)*(a+b*x**n)**8,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.23332, size = 167, normalized size = 1.24

$$\frac{\left(840\,a^{4}b^{4}ne^{\left(4\,n\ln(x)\right)}\ln\left(x\right)+3\,b^{8}e^{\left(8\,n\ln(x)\right)}+32\,ab^{7}e^{\left(7\,n\ln(x)\right)}+168\,a^{2}b^{6}e^{\left(6\,n\ln(x)\right)}+672\,a^{3}b^{5}e^{\left(5\,n\ln(x)\right)}-672\,a^{5}b^{3}e^{\left(3\,n\ln(x)\right)}-168\,a\right.}{12\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-4*n - 1),x, algorithm="giac")
```

```
[Out] 1/12*(840*a^4*b^4*n*e^(4*n*ln(x))*ln(x) + 3*b^8*e^(8*n*ln(x)) + 3
2*a*b^7*e^(7*n*ln(x)) + 168*a^2*b^6*e^(6*n*ln(x)) + 672*a^3*b^5*e
^(5*n*ln(x)) - 672*a^5*b^3*e^(3*n*ln(x)) - 168*a^6*b^2*e^(2*n*ln(
x)) - 32*a^7*b*e^(n*ln(x)) - 3*a^8)*e^(-4*n*ln(x))/n
```

3.2573 $\int x^{-1-5n}(a+bx^n)^8\,dx$

Optimal. Leaf size=133

$$-\frac{a^8x^{-5n}}{5n}-\frac{2a^7bx^{-4n}}{n}-\frac{28a^6b^2x^{-3n}}{3n}-\frac{28a^5b^3x^{-2n}}{n}-\frac{70a^4b^4x^{-n}}{n}+56a^3b^5\log(x)+\frac{28a^2b^6x^n}{n}+\frac{4ab^7x^{2n}}{n}+\frac{b^8x^{3n}}{3n}$$

```
[Out] -a^8/(5*n*x^(5*n)) - (2*a^7*b)/(n*x^(4*n)) - (28*a^6*b^2)/(3*n*x^
(3*n)) - (28*a^5*b^3)/(n*x^(2*n)) - (70*a^4*b^4)/(n*x^n) + (28*a^
2*b^6*x^n)/n + (4*a*b^7*x^(2*n))/n + (b^8*x^(3*n))/(3*n) + 56*a^3
*b^5*Log[x]
```

Rubi [A] time = 0.155108, antiderivative size = 133, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{a^8x^{-5n}}{5n}-\frac{2a^7bx^{-4n}}{n}-\frac{28a^6b^2x^{-3n}}{3n}-\frac{28a^5b^3x^{-2n}}{n}-\frac{70a^4b^4x^{-n}}{n}+56a^3b^5\log(x)+\frac{28a^2b^6x^n}{n}+\frac{4ab^7x^{2n}}{n}+\frac{b^8x^{3n}}{3n}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 - 5*n)*(a + b*x^n)^8,x]
```

```
[Out] -a^8/(5*n*x^(5*n)) - (2*a^7*b)/(n*x^(4*n)) - (28*a^6*b^2)/(3*n*x^
(3*n)) - (28*a^5*b^3)/(n*x^(2*n)) - (70*a^4*b^4)/(n*x^n) + (28*a^
2*b^6*x^n)/n + (4*a*b^7*x^(2*n))/n + (b^8*x^(3*n))/(3*n) + 56*a^3
*b^5*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^8x^{-5n}}{5n}-\frac{2a^7bx^{-4n}}{n}-\frac{28a^6b^2x^{-3n}}{3n}-\frac{28a^5b^3x^{-2n}}{n}-\frac{70a^4b^4x^{-n}}{n}+\frac{56a^3b^5\log(x^n)}{n}+\frac{28a^2b^6x^n}{n}+\frac{8ab^7\int^{x^n}x\,dx}{n}+\frac{b^8x^{3n}}{3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1-5*n)*(a+b*x**n)**8,x)
```

```
[Out] -a**8*x**(-5*n)/(5*n) - 2*a**7*b*x**(-4*n)/n - 28*a**6*b**2*x**(-
3*n)/(3*n) - 28*a**5*b**3*x**(-2*n)/n - 70*a**4*b**4*x**(-n)/n +
56*a**3*b**5*log(x**n)/n + 28*a**2*b**6*x**n/n + 8*a*b**7*Integra
l(x, (x, x**n))/n + b**8*x**(3*n)/(3*n)
```

Mathematica [A] time = 0.152126, size = 111, normalized size = 0.83

$$56a^3b^5\log(x)-\frac{x^{-5n}\left(3a^8+30a^7bx^n+140a^6b^2x^{2n}+420a^5b^3x^{3n}+1050a^4b^4x^{4n}-420a^2b^6x^{6n}-60ab^7x^{7n}-5b^8x^{8n}\right)}{15n}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 - 5*n)*(a + b*x^n)^8,x]
```

```
[Out] -(3*a^8 + 30*a^7*b*x^n + 140*a^6*b^2*x^(2*n) + 420*a^5*b^3*x^(3*n
) + 1050*a^4*b^4*x^(4*n) - 420*a^2*b^6*x^(6*n) - 60*a*b^7*x^(7*n)
 - 5*b^8*x^(8*n))/(15*n*x^(5*n)) + 56*a^3*b^5*Log[x]
```

Maple [A] time = 0.045, size = 128, normalized size = 1.

$$56\,a^3b^5\ln(x)+\frac{b^8\,(x^n)^3}{3\,n}+4\,\frac{ab^7\,(x^n)^2}{n}+28\,\frac{a^2b^6x^n}{n}-70\,\frac{a^4b^4}{nx^n}-28\,\frac{a^5b^3}{n\,(x^n)^2}-\frac{28\,a^6b^2}{3\,n\,(x^n)^3}-2\,\frac{ba^7}{n\,(x^n)^4}-\frac{a^8}{5\,n\,(x^n)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-5*n)*(a+b*x^n)^8,x)
```

```
[Out] 56*a^3*b^5*ln(x)+1/3*b^8/n*(x^n)^3+4*a*b^7/n*(x^n)^2+28*a^2*b^6*x
^n/n-70*a^4*b^4/n/(x^n)-28*a^5*b^3/n/(x^n)^2-28/3*a^6*b^2/n/(x^n)
^3-2*a^7*b/n/(x^n)^4-1/5*a^8/n/(x^n)^5
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-5*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.228435, size = 157, normalized size = 1.18

$$\frac{840\,a^3b^5nx^{5\,n}\log(x)+5\,b^8x^{8\,n}+60\,ab^7x^{7\,n}+420\,a^2b^6x^{6\,n}-1050\,a^4b^4x^{4\,n}-420\,a^5b^3x^{3\,n}-140\,a^6b^2x^{2\,n}-30\,a^7bx^n-3\,a^8}{15\,nx^{5\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-5*n - 1),x, algorithm="fricas")
```

```
[Out] 1/15*(840*a^3*b^5*n*x^(5*n)*log(x) + 5*b^8*x^(8*n) + 60*a*b^7*x^(
7*n) + 420*a^2*b^6*x^(6*n) - 1050*a^4*b^4*x^(4*n) - 420*a^5*b^3*x
^(3*n) - 140*a^6*b^2*x^(2*n) - 30*a^7*b*x^n - 3*a^8)/(n*x^(5*n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-5*n)*(a+b*x**n)**8,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.236424, size = 167, normalized size = 1.26

$$\frac{\left(840\,a^3b^5ne^{(5\,n\ln(x))}\ln(x)+5\,b^8e^{(8\,n\ln(x))}+60\,ab^7e^{(7\,n\ln(x))}+420\,a^2b^6e^{(6\,n\ln(x))}-1050\,a^4b^4e^{(4\,n\ln(x))}-420\,a^5b^3e^{(3\,n\ln(x))}-140\right.}{15\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-5*n - 1),x, algorithm="giac")
```

```
[Out] 1/15*(840*a^3*b^5*n*e^(5*n*ln(x))*ln(x) + 5*b^8*e^(8*n*ln(x)) + 6
0*a*b^7*e^(7*n*ln(x)) + 420*a^2*b^6*e^(6*n*ln(x)) - 1050*a^4*b^4*
e^(4*n*ln(x)) - 420*a^5*b^3*e^(3*n*ln(x)) - 140*a^6*b^2*e^(2*n*ln
(x)) - 30*a^7*b*e^(n*ln(x)) - 3*a^8)*e^(-5*n*ln(x))/n
```

3.2574 $\int x^{-1-6n}(a+bx^n)^8\,dx$

Optimal. Leaf size=135

$$-\frac{a^8x^{-6n}}{6n}-\frac{8a^7bx^{-5n}}{5n}-\frac{7a^6b^2x^{-4n}}{n}-\frac{56a^5b^3x^{-3n}}{3n}-\frac{35a^4b^4x^{-2n}}{n}-\frac{56a^3b^5x^{-n}}{n}+28a^2b^6\log(x)+\frac{8ab^7x^n}{n}+\frac{b^8x^{2n}}{2n}$$

```
[Out] -a^8/(6*n*x^(6*n)) - (8*a^7*b)/(5*n*x^(5*n)) - (7*a^6*b^2)/(n*x^(
4*n)) - (56*a^5*b^3)/(3*n*x^(3*n)) - (35*a^4*b^4)/(n*x^(2*n)) - (
56*a^3*b^5)/(n*x^n) + (8*a*b^7*x^n)/n + (b^8*x^(2*n))/(2*n) + 28*
a^2*b^6*Log[x]
```

Rubi [A] time = 0.158556, antiderivative size = 135, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{a^8x^{-6n}}{6n}-\frac{8a^7bx^{-5n}}{5n}-\frac{7a^6b^2x^{-4n}}{n}-\frac{56a^5b^3x^{-3n}}{3n}-\frac{35a^4b^4x^{-2n}}{n}-\frac{56a^3b^5x^{-n}}{n}+28a^2b^6\log(x)+\frac{8ab^7x^n}{n}+\frac{b^8x^{2n}}{2n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 6*n)*(a + b*x^n)^8,x]
```

```
[Out] -a^8/(6*n*x^(6*n)) - (8*a^7*b)/(5*n*x^(5*n)) - (7*a^6*b^2)/(n*x^(
4*n)) - (56*a^5*b^3)/(3*n*x^(3*n)) - (35*a^4*b^4)/(n*x^(2*n)) - (
56*a^3*b^5)/(n*x^n) + (8*a*b^7*x^n)/n + (b^8*x^(2*n))/(2*n) + 28*
a^2*b^6*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^8x^{-6n}}{6n}-\frac{8a^7bx^{-5n}}{5n}-\frac{7a^6b^2x^{-4n}}{n}-\frac{56a^5b^3x^{-3n}}{3n}-\frac{35a^4b^4x^{-2n}}{n}-\frac{56a^3b^5x^{-n}}{n}+\frac{28a^2b^6\log(x^n)}{n}+\frac{8ab^7x^n}{n}+\frac{b^8\int^{x^n}x\,dx}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-6*n)*(a+b*x**n)**8,x)
```

```
[Out] -a**8*x**(-6*n)/(6*n) - 8*a**7*b*x**(-5*n)/(5*n) - 7*a**6*b**2*x*
*(-4*n)/n - 56*a**5*b**3*x**(-3*n)/(3*n) - 35*a**4*b**4*x**(-2*n)
/n - 56*a**3*b**5*x**(-n)/n + 28*a**2*b**6*log(x**n)/n + 8*a*b**7
*x**n/n + b**8*Integral(x, (x, x**n))/n
```

Mathematica [A] time = 0.155288, size = 111, normalized size = 0.82

$$28a^2b^6\log(x)-\frac{x^{-6n}\left(5a^8+48a^7bx^n+210a^6b^2x^{2n}+560a^5b^3x^{3n}+1050a^4b^4x^{4n}+1680a^3b^5x^{5n}-240ab^7x^{7n}-15b^8x^{8n}\right)}{30n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 6*n)*(a + b*x^n)^8,x]
```

```
[Out] -(5*a^8 + 48*a^7*b*x^n + 210*a^6*b^2*x^(2*n) + 560*a^5*b^3*x^(3*n
) + 1050*a^4*b^4*x^(4*n) + 1680*a^3*b^5*x^(5*n) - 240*a*b^7*x^(7*
n) - 15*b^8*x^(8*n))/(30*n*x^(6*n)) + 28*a^2*b^6*Log[x]
```

Maple [A] time = 0.043, size = 128, normalized size = 1.

$$28\,a^{2}b^{6}\ln\left(x\right)+\frac{b^{8}\left(x^{n}\right)^{2}}{2\,n}+8\,\frac{ab^{7}x^{n}}{n}-56\,\frac{a^{3}b^{5}}{nx^{n}}-35\,\frac{a^{4}b^{4}}{n\left(x^{n}\right)^{2}}-\frac{56\,a^{5}b^{3}}{3\,n\left(x^{n}\right)^{3}}-7\,\frac{a^{6}b^{2}}{n\left(x^{n}\right)^{4}}-\frac{8\,ba^{7}}{5\,n\left(x^{n}\right)^{5}}-\frac{a^{8}}{6\,n\left(x^{n}\right)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-6*n)*(a+b*x^n)^8,x)
```

```
[Out] 28*a^2*b^6*ln(x)+1/2*b^8/n*(x^n)^2+8*a*b^7*x^n/n-56*a^3*b^5/n/(x^
n)-35*a^4*b^4/n/(x^n)^2-56/3*a^5*b^3/n/(x^n)^3-7*a^6*b^2/n/(x^n)^
4-8/5*a^7*b/n/(x^n)^5-1/6*a^8/n/(x^n)^6
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-6*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.228656, size = 157, normalized size = 1.16

$$\frac{840\,a^{2}b^{6}nx^{6\,n}\log\left(x\right)+15\,b^{8}x^{8\,n}+240\,ab^{7}x^{7\,n}-1680\,a^{3}b^{5}x^{5\,n}-1050\,a^{4}b^{4}x^{4\,n}-560\,a^{5}b^{3}x^{3\,n}-210\,a^{6}b^{2}x^{2\,n}-48\,a^{7}bx^{n}-}{30\,nx^{6\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-6*n - 1),x, algorithm="fricas")
```

```
[Out] 1/30*(840*a^2*b^6*n*x^(6*n)*log(x) + 15*b^8*x^(8*n) + 240*a*b^7*x
^(7*n) - 1680*a^3*b^5*x^(5*n) - 1050*a^4*b^4*x^(4*n) - 560*a^5*b^
3*x^(3*n) - 210*a^6*b^2*x^(2*n) - 48*a^7*b*x^n - 5*a^8)/(n*x^(6*n
))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-6*n)*(a+b*x**n)**8,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.236683, size = 167, normalized size = 1.24

$$\frac{\left(840\,a^{2}b^{6}ne^{\left(6\,n\ln\left(x\right)\right)}\ln\left(x\right)+15\,b^{8}e^{\left(8\,n\ln\left(x\right)\right)}+240\,ab^{7}e^{\left(7\,n\ln\left(x\right)\right)}-1680\,a^{3}b^{5}e^{\left(5\,n\ln\left(x\right)\right)}-1050\,a^{4}b^{4}e^{\left(4\,n\ln\left(x\right)\right)}-560\,a^{5}b^{3}e^{\left(3\,n\ln\left(x\right)\right)}-\right.}{30\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-6*n - 1),x, algorithm="giac")
```

```
[Out] 1/30*(840*a^2*b^6*n*e^(6*n*ln(x))*ln(x) + 15*b^8*e^(8*n*ln(x)) +
240*a*b^7*e^(7*n*ln(x)) - 1680*a^3*b^5*e^(5*n*ln(x)) - 1050*a^4*b
^4*e^(4*n*ln(x)) - 560*a^5*b^3*e^(3*n*ln(x)) - 210*a^6*b^2*e^(2*n
*ln(x)) - 48*a^7*b*e^(n*ln(x)) - 5*a^8)*e^(-6*n*ln(x))/n
```

3.2575 $\int x^{-1-7n}(a+bx^n)^8\,dx$

Optimal. Leaf size=134

$$-\frac{a^8x^{-7n}}{7n}-\frac{4a^7bx^{-6n}}{3n}-\frac{28a^6b^2x^{-5n}}{5n}-\frac{14a^5b^3x^{-4n}}{n}-\frac{70a^4b^4x^{-3n}}{3n}-\frac{28a^3b^5x^{-2n}}{n}-\frac{28a^2b^6x^{-n}}{n}+8ab^7\log(x)+\frac{b^8x^n}{n}$$

```
[Out] -a^8/(7*n*x^(7*n)) - (4*a^7*b)/(3*n*x^(6*n)) - (28*a^6*b^2)/(5*n*
x^(5*n)) - (14*a^5*b^3)/(n*x^(4*n)) - (70*a^4*b^4)/(3*n*x^(3*n))
- (28*a^3*b^5)/(n*x^(2*n)) - (28*a^2*b^6)/(n*x^n) + (b^8*x^n)/n +
 8*a*b^7*Log[x]
```

Rubi [A] time = 0.157496, antiderivative size = 134, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{a^8x^{-7n}}{7n}-\frac{4a^7bx^{-6n}}{3n}-\frac{28a^6b^2x^{-5n}}{5n}-\frac{14a^5b^3x^{-4n}}{n}-\frac{70a^4b^4x^{-3n}}{3n}-\frac{28a^3b^5x^{-2n}}{n}-\frac{28a^2b^6x^{-n}}{n}+8ab^7\log(x)+\frac{b^8x^n}{n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 7*n)*(a + b*x^n)^8,x]
```

```
[Out] -a^8/(7*n*x^(7*n)) - (4*a^7*b)/(3*n*x^(6*n)) - (28*a^6*b^2)/(5*n*
x^(5*n)) - (14*a^5*b^3)/(n*x^(4*n)) - (70*a^4*b^4)/(3*n*x^(3*n))
- (28*a^3*b^5)/(n*x^(2*n)) - (28*a^2*b^6)/(n*x^n) + (b^8*x^n)/n +
 8*a*b^7*Log[x]
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^8x^{-7n}}{7n}-\frac{4a^7bx^{-6n}}{3n}-\frac{28a^6b^2x^{-5n}}{5n}-\frac{14a^5b^3x^{-4n}}{n}-\frac{70a^4b^4x^{-3n}}{3n}-\frac{28a^3b^5x^{-2n}}{n}-\frac{28a^2b^6x^{-n}}{n}+\frac{8ab^7\log(x^n)}{n}+\frac{\int^{x^n}b^8\,dx}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-7*n)*(a+b*x**n)**8,x)
```

```
[Out] -a**8*x**(-7*n)/(7*n) - 4*a**7*b*x**(-6*n)/(3*n) - 28*a**6*b**2*x
**(-5*n)/(5*n) - 14*a**5*b**3*x**(-4*n)/n - 70*a**4*b**4*x**(-3*n
)/(3*n) - 28*a**3*b**5*x**(-2*n)/n - 28*a**2*b**6*x**(-n)/n + 8*a
*b**7*log(x**n)/n + Integral(b**8, (x, x**n))/n
```

Mathematica [A] time = 0.190376, size = 111, normalized size = 0.83

$$8ab^7\log(x)-\frac{x^{-7n}\left(15a^8+140a^7bx^n+588a^6b^2x^{2n}+1470a^5b^3x^{3n}+2450a^4b^4x^{4n}+2940a^3b^5x^{5n}+2940a^2b^6x^{6n}-105b^8x^{8n}\right)}{105n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 7*n)*(a + b*x^n)^8,x]
```

```
[Out] -(15*a^8 + 140*a^7*b*x^n + 588*a^6*b^2*x^(2*n) + 1470*a^5*b^3*x^(
3*n) + 2450*a^4*b^4*x^(4*n) + 2940*a^3*b^5*x^(5*n) + 2940*a^2*b^6
*x^(6*n) - 105*b^8*x^(8*n))/(105*n*x^(7*n)) + 8*a*b^7*Log[x]
```

Maple [A] time = 0.043, size = 127, normalized size = 1.

$$8\,ab^{7}\ln \left(x \right) +{\frac{{b}^{8}{x}^{n}}{n}}-28\,{\frac{{a}^{2}{b}^{6}}{n{x}^{n}}}-28\,{\frac{{a}^{3}{b}^{5}}{n \left({x}^{n} \right) ^{2}}}-{\frac{70\,{a}^{4}{b}^{4}}{3\,n \left({x}^{n} \right) ^{3}}}-14\,{\frac{{a}^{5}{b}^{3}}{n \left({x}^{n} \right) ^{4}}}-{\frac{28\,{a}^{6}{b}^{2}}{5\,n \left({x}^{n} \right) ^{5}}}-{\frac{4\,b{a}^{7}}{3\,n \left({x}^{n} \right) ^{6}}}-{\frac{{a}^{8}}{7\,n \left({x}^{n} \right) ^{7}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-7*n)*(a+b*x^n)^8,x)
```

```
[Out] 8*a*b^7*ln(x)+b^8*x^n/n-28*a^2*b^6/n/(x^n)-28*a^3*b^5/n/(x^n)^2-7
0/3*a^4*b^4/n/(x^n)^3-14*a^5*b^3/n/(x^n)^4-28/5*a^6*b^2/n/(x^n)^5
-4/3*a^7*b/n/(x^n)^6-1/7*a^8/n/(x^n)^7
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-7*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.228666, size = 157, normalized size = 1.17

$$\frac{840\,ab^{7}nx^{7\,n}\log\left(x\right) + 105\,b^{8}x^{8\,n} - 2940\,a^{2}b^{6}x^{6\,n} - 2940\,a^{3}b^{5}x^{5\,n} - 2450\,a^{4}b^{4}x^{4\,n} - 1470\,a^{5}b^{3}x^{3\,n} - 588\,a^{6}b^{2}x^{2\,n} - 140\,a^{7}bx$$ $$105\,nx^{7\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-7*n - 1),x, algorithm="fricas")
```

```
[Out] 1/105*(840*a*b^7*n*x^(7*n)*log(x) + 105*b^8*x^(8*n) - 2940*a^2*b^
6*x^(6*n) - 2940*a^3*b^5*x^(5*n) - 2450*a^4*b^4*x^(4*n) - 1470*a^
5*b^3*x^(3*n) - 588*a^6*b^2*x^(2*n) - 140*a^7*b*x^n - 15*a^8)/(n*
x^(7*n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-7*n)*(a+b*x**n)**8,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.236093, size = 167, normalized size = 1.25

$$\left(840\,ab^{7}ne^{\left(7\,n\ln\left(x\right)\right)}\ln\left(x\right) + 105\,b^{8}e^{\left(8\,n\ln\left(x\right)\right)} - 2940\,a^{2}b^{6}e^{\left(6\,n\ln\left(x\right)\right)} - 2940\,a^{3}b^{5}e^{\left(5\,n\ln\left(x\right)\right)} - 2450\,a^{4}b^{4}e^{\left(4\,n\ln\left(x\right)\right)} - 1470\,a^{5}b^{3}e^{\left(3\,n\ln\left(x\right)\right.}$$ $$105\,n$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-7*n - 1),x, algorithm="giac")
```

```
[Out] 1/105*(840*a*b^7*n*e^(7*n*ln(x))*ln(x) + 105*b^8*e^(8*n*ln(x)) -
2940*a^2*b^6*e^(6*n*ln(x)) - 2940*a^3*b^5*e^(5*n*ln(x)) - 2450*a^
4*b^4*e^(4*n*ln(x)) - 1470*a^5*b^3*e^(3*n*ln(x)) - 588*a^6*b^2*e^
(2*n*ln(x)) - 140*a^7*b*e^(n*ln(x)) - 15*a^8)*e^(-7*n*ln(x))/n
```

3.2576 $\int x^{-1-8n}\left(a+bx^n\right)^8\,dx$

Optimal. Leaf size=140

$$-\frac{a^8x^{-8n}}{8n}-\frac{8a^7bx^{-7n}}{7n}-\frac{14a^6b^2x^{-6n}}{3n}-\frac{56a^5b^3x^{-5n}}{5n}-\frac{35a^4b^4x^{-4n}}{2n}-\frac{56a^3b^5x^{-3n}}{3n}-\frac{14a^2b^6x^{-2n}}{n}-\frac{8ab^7x^{-n}}{n}+b^8\log(x)$$

```
[Out] -a^8/(8*n*x^(8*n)) - (8*a^7*b)/(7*n*x^(7*n)) - (14*a^6*b^2)/(3*n*
x^(6*n)) - (56*a^5*b^3)/(5*n*x^(5*n)) - (35*a^4*b^4)/(2*n*x^(4*n)
) - (56*a^3*b^5)/(3*n*x^(3*n)) - (14*a^2*b^6)/(n*x^(2*n)) - (8*a*
b^7)/(n*x^n) + b^8*Log[x]
```

Rubi [A] time = 0.159078, antiderivative size = 140, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{a^8x^{-8n}}{8n}-\frac{8a^7bx^{-7n}}{7n}-\frac{14a^6b^2x^{-6n}}{3n}-\frac{56a^5b^3x^{-5n}}{5n}-\frac{35a^4b^4x^{-4n}}{2n}-\frac{56a^3b^5x^{-3n}}{3n}-\frac{14a^2b^6x^{-2n}}{n}-\frac{8ab^7x^{-n}}{n}+b^8\log(x)$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 8*n)*(a + b*x^n)^8,x]
```

```
[Out] -a^8/(8*n*x^(8*n)) - (8*a^7*b)/(7*n*x^(7*n)) - (14*a^6*b^2)/(3*n*
x^(6*n)) - (56*a^5*b^3)/(5*n*x^(5*n)) - (35*a^4*b^4)/(2*n*x^(4*n)
) - (56*a^3*b^5)/(3*n*x^(3*n)) - (14*a^2*b^6)/(n*x^(2*n)) - (8*a*
b^7)/(n*x^n) + b^8*Log[x]
```

Rubi in Sympy [A] time = 27.3092, size = 131, normalized size = 0.94

$$-\frac{a^8x^{-8n}}{8n}-\frac{8a^7bx^{-7n}}{7n}-\frac{14a^6b^2x^{-6n}}{3n}-\frac{56a^5b^3x^{-5n}}{5n}-\frac{35a^4b^4x^{-4n}}{2n}-\frac{56a^3b^5x^{-3n}}{3n}-\frac{14a^2b^6x^{-2n}}{n}-\frac{8ab^7x^{-n}}{n}+\frac{b^8\log\left(x^n\right)}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-8*n)*(a+b*x**n)**8,x)
```

```
[Out] -a**8*x**(-8*n)/(8*n) - 8*a**7*b*x**(-7*n)/(7*n) - 14*a**6*b**2*x
**(-6*n)/(3*n) - 56*a**5*b**3*x**(-5*n)/(5*n) - 35*a**4*b**4*x**(
-4*n)/(2*n) - 56*a**3*b**5*x**(-3*n)/(3*n) - 14*a**2*b**6*x**(-2*
n)/n - 8*a*b**7*x**(-n)/n + b**8*log(x**n)/n
```

Mathematica [A] time = 0.0975139, size = 108, normalized size = 0.77

$$b^8\log(x)-\frac{ax^{-8n}\left(105a^7+960a^6bx^n+3920a^5b^2x^{2n}+9408a^4b^3x^{3n}+14700a^3b^4x^{4n}+15680a^2b^5x^{5n}+11760ab^6x^{6n}+6720b^7x^{7n}\right)}{840n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 8*n)*(a + b*x^n)^8,x]
```

```
[Out] -(a*(105*a^7 + 960*a^6*b*x^n + 3920*a^5*b^2*x^(2*n) + 9408*a^4*b^
3*x^(3*n) + 14700*a^3*b^4*x^(4*n) + 15680*a^2*b^5*x^(5*n) + 11760
*a*b^6*x^(6*n) + 6720*b^7*x^(7*n)))/(840*n*x^(8*n)) + b^8*Log[x]
```

Maple [A] time = 0.043, size = 129, normalized size = 0.9

$$b^8\ln(x) - 8\,\frac{ab^7}{nx^n} - 14\,\frac{a^2b^6}{n(x^n)^2} - \frac{56\,a^3b^5}{3\,n(x^n)^3} - \frac{35\,a^4b^4}{2\,n(x^n)^4} - \frac{56\,a^5b^3}{5\,n(x^n)^5} - \frac{14\,a^6b^2}{3\,n(x^n)^6} - \frac{8\,ba^7}{7\,n(x^n)^7} - \frac{a^8}{8\,n(x^n)^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-8*n)*(a+b*x^n)^8,x)
```

```
[Out] b^8*ln(x)-8*a*b^7/n/(x^n)-14*a^2*b^6/n/(x^n)^2-56/3*a^3*b^5/n/(x^
n)^3-35/2*a^4*b^4/n/(x^n)^4-56/5*a^5*b^3/n/(x^n)^5-14/3*a^6*b^2/n
/(x^n)^6-8/7*a^7*b/n/(x^n)^7-1/8*a^8/n/(x^n)^8
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-8*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.230016, size = 157, normalized size = 1.12

$$\frac{840\,b^8nx^{8\,n}\log(x) - 6720\,ab^7x^{7\,n} - 11760\,a^2b^6x^{6\,n} - 15680\,a^3b^5x^{5\,n} - 14700\,a^4b^4x^{4\,n} - 9408\,a^5b^3x^{3\,n} - 3920\,a^6b^2x^{2\,n} - 96}{840\,nx^{8\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-8*n - 1),x, algorithm="fricas")
```

```
[Out] 1/840*(840*b^8*n*x^(8*n)*log(x) - 6720*a*b^7*x^(7*n) - 11760*a^2*
b^6*x^(6*n) - 15680*a^3*b^5*x^(5*n) - 14700*a^4*b^4*x^(4*n) - 940
8*a^5*b^3*x^(3*n) - 3920*a^6*b^2*x^(2*n) - 960*a^7*b*x^n - 105*a^
8)/(n*x^(8*n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-8*n)*(a+b*x**n)**8,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.23567, size = 167, normalized size = 1.19

$$\frac{\left(840\,b^8ne^{(8\,n\ln(x))}\ln(x) - 6720\,ab^7e^{(7\,n\ln(x))} - 11760\,a^2b^6e^{(6\,n\ln(x))} - 15680\,a^3b^5e^{(5\,n\ln(x))} - 14700\,a^4b^4e^{(4\,n\ln(x))} - 9408\,a^5b^3e^{(}\right.}{840\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-8*n - 1),x, algorithm="giac")
```

```
[Out] 1/840*(840*b^8*n*e^(8*n*ln(x))*ln(x) - 6720*a*b^7*e^(7*n*ln(x)) -
 11760*a^2*b^6*e^(6*n*ln(x)) - 15680*a^3*b^5*e^(5*n*ln(x)) - 1470
0*a^4*b^4*e^(4*n*ln(x)) - 9408*a^5*b^3*e^(3*n*ln(x)) - 3920*a^6*b
^2*e^(2*n*ln(x)) - 960*a^7*b*e^(n*ln(x)) - 105*a^8)*e^(-8*n*ln(x)
)/n
```

3.2577 $\int x^{-1-9n}(a+bx^n)^8\,dx$

Optimal. Leaf size=24

$$-\frac{x^{-9n}(a+bx^n)^9}{9an}$$

```
[Out] -(a + b*x^n)^9/(9*a*n*x^(9*n))
```

Rubi [A] time = 0.0224423, antiderivative size = 24, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.059

$$-\frac{x^{-9n}(a+bx^n)^9}{9an}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 9*n)*(a + b*x^n)^8,x]
```

```
[Out] -(a + b*x^n)^9/(9*a*n*x^(9*n))
```

Rubi in Sympy [A] time = 3.11049, size = 19, normalized size = 0.79

$$-\frac{x^{-9n}(a+bx^n)^9}{9an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-9*n)*(a+b*x**n)**8,x)
```

```
[Out] -x**(-9*n)*(a + b*x**n)**9/(9*a*n)
```

Mathematica [B] time = 0.0508399, size = 111, normalized size = 4.62

$$-\frac{x^{-9n}\left(a^8+9a^7bx^n+36a^6b^2x^{2n}+84a^5b^3x^{3n}+126a^4b^4x^{4n}+126a^3b^5x^{5n}+84a^2b^6x^{6n}+36ab^7x^{7n}+9b^8x^{8n}\right)}{9n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 9*n)*(a + b*x^n)^8,x]
```

```
[Out] -(a^8 + 9*a^7*b*x^n + 36*a^6*b^2*x^(2*n) + 84*a^5*b^3*x^(3*n) + 1
26*a^4*b^4*x^(4*n) + 126*a^3*b^5*x^(5*n) + 84*a^2*b^6*x^(6*n) + 3
6*a*b^7*x^(7*n) + 9*b^8*x^(8*n))/(9*n*x^(9*n))
```

Maple [B] time = 0.041, size = 136, normalized size = 5.7

$$-\frac{b^8}{nx^n}-4\,\frac{ab^7}{n(x^n)^2}-\frac{28\,a^2b^6}{3\,n(x^n)^3}-14\,\frac{a^3b^5}{n(x^n)^4}-14\,\frac{a^4b^4}{n(x^n)^5}-\frac{28\,a^5b^3}{3\,n(x^n)^6}-4\,\frac{a^6b^2}{n(x^n)^7}-\frac{ba^7}{n(x^n)^8}-\frac{a^8}{9\,n(x^n)^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-9*n)*(a+b*x^n)^8,x)
```

```
[Out] -b^8/n/(x^n)-4*a*b^7/n/(x^n)^2-28/3*a^2*b^6/n/(x^n)^3-14*a^3*b^5/
n/(x^n)^4-14*a^4*b^4/n/(x^n)^5-28/3*a^5*b^3/n/(x^n)^6-4*a^6*b^2/n
/(x^n)^7-a^7*b/n/(x^n)^8-1/9*a^8/n/(x^n)^9
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-9*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.22633, size = 150, normalized size = 6.25

$$-\frac{9\,b^{8}x^{8\,n}+36\,ab^{7}x^{7\,n}+84\,a^{2}b^{6}x^{6\,n}+126\,a^{3}b^{5}x^{5\,n}+126\,a^{4}b^{4}x^{4\,n}+84\,a^{5}b^{3}x^{3\,n}+36\,a^{6}b^{2}x^{2\,n}+9\,a^{7}bx^{n}+a^{8}}{9\,nx^{9\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-9*n - 1),x, algorithm="fricas")
```

```
[Out] -1/9*(9*b^8*x^(8*n) + 36*a*b^7*x^(7*n) + 84*a^2*b^6*x^(6*n) + 126
*a^3*b^5*x^(5*n) + 126*a^4*b^4*x^(4*n) + 84*a^5*b^3*x^(3*n) + 36*
a^6*b^2*x^(2*n) + 9*a^7*b*x^n + a^8)/(n*x^(9*n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-9*n)*(a+b*x**n)**8,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.235153, size = 161, normalized size = 6.71

$$-\frac{\left(9\,b^{8}e^{(8\,n\ln(x))}+36\,ab^{7}e^{(7\,n\ln(x))}+84\,a^{2}b^{6}e^{(6\,n\ln(x))}+126\,a^{3}b^{5}e^{(5\,n\ln(x))}+126\,a^{4}b^{4}e^{(4\,n\ln(x))}+84\,a^{5}b^{3}e^{(3\,n\ln(x))}+36\,a^{6}b^{2}e^{(2\,n\ln}\right.}{9\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-9*n - 1),x, algorithm="giac")
```

```
[Out] -1/9*(9*b^8*e^(8*n*ln(x)) + 36*a*b^7*e^(7*n*ln(x)) + 84*a^2*b^6*e
^(6*n*ln(x)) + 126*a^3*b^5*e^(5*n*ln(x)) + 126*a^4*b^4*e^(4*n*ln(
x)) + 84*a^5*b^3*e^(3*n*ln(x)) + 36*a^6*b^2*e^(2*n*ln(x)) + 9*a^7
*b*e^(n*ln(x)) + a^8)*e^(-9*n*ln(x))/n
```

3.2578 $\int x^{-1-10n} (a + bx^n)^8 \, dx$

Optimal. Leaf size=50

$$\frac{bx^{-9n}(a+bx^n)^9}{90a^2n} - \frac{x^{-10n}(a+bx^n)^9}{10an}$$

```
[Out] -(a + b*x^n)^9/(10*a*n*x^(10*n)) + (b*(a + b*x^n)^9)/(90*a^2*n*x^
(9*n))
```

Rubi [A] time = 0.0599408, antiderivative size = 50, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.176$

$$\frac{bx^{-9n}(a+bx^n)^9}{90a^2n} - \frac{x^{-10n}(a+bx^n)^9}{10an}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 10*n)*(a + b*x^n)^8,x]
```

```
[Out] -(a + b*x^n)^9/(10*a*n*x^(10*n)) + (b*(a + b*x^n)^9)/(90*a^2*n*x^
(9*n))
```

Rubi in Sympy [A] time = 6.86058, size = 39, normalized size = 0.78

$$-\frac{x^{-10n}(a+bx^n)^9}{10an} + \frac{bx^{-9n}(a+bx^n)^9}{90a^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-10*n)*(a+b*x**n)**8,x)
```

```
[Out] -x**(-10*n)*(a + b*x**n)**9/(10*a*n) + b*x**(-9*n)*(a + b*x**n)**
9/(90*a**2*n)
```

Mathematica [B] time = 0.0519608, size = 113, normalized size = 2.26

$$-\frac{x^{-10n}\left(9a^8+80a^7bx^n+315a^6b^2x^{2n}+720a^5b^3x^{3n}+1050a^4b^4x^{4n}+1008a^3b^5x^{5n}+630a^2b^6x^{6n}+240ab^7x^{7n}+45b^8x^{8n}\right)}{90n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 10*n)*(a + b*x^n)^8,x]
```

```
[Out] -(9*a^8 + 80*a^7*b*x^n + 315*a^6*b^2*x^(2*n) + 720*a^5*b^3*x^(3*n
) + 1050*a^4*b^4*x^(4*n) + 1008*a^3*b^5*x^(5*n) + 630*a^2*b^6*x^(
6*n) + 240*a*b^7*x^(7*n) + 45*b^8*x^(8*n))/(90*n*x^(10*n))
```

Maple [B] time = 0.042, size = 136, normalized size = 2.7

$$-\frac{b^8}{2n(x^n)^2} - \frac{8ab^7}{3n(x^n)^3} - 7\frac{a^2b^6}{n(x^n)^4} - \frac{56a^3b^5}{5n(x^n)^5} - \frac{35a^4b^4}{3n(x^n)^6} - 8\frac{a^5b^3}{n(x^n)^7} - \frac{7a^6b^2}{2n(x^n)^8} - \frac{8ba^7}{9n(x^n)^9} - \frac{a^8}{10n(x^n)^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-10*n)*(a+b*x^n)^8,x)
```

```
[Out] -1/2*b^8/n/(x^n)^2-8/3*a*b^7/n/(x^n)^3-7*a^2*b^6/n/(x^n)^4-56/5*a
^3*b^5/n/(x^n)^5-35/3*a^4*b^4/n/(x^n)^6-8*a^5*b^3/n/(x^n)^7-7/2*a
^6*b^2/n/(x^n)^8-8/9*a^7*b/n/(x^n)^9-1/10*a^8/n/(x^n)^10
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-10*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.227039, size = 153, normalized size = 3.06

$$-\frac{45\,b^8x^{8\,n} + 240\,ab^7x^{7\,n} + 630\,a^2b^6x^{6\,n} + 1008\,a^3b^5x^{5\,n} + 1050\,a^4b^4x^{4\,n} + 720\,a^5b^3x^{3\,n} + 315\,a^6b^2x^{2\,n} + 80\,a^7bx^n + 9\,a^8}{90\,nx^{10\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-10*n - 1),x, algorithm="fricas")
```

```
[Out] -1/90*(45*b^8*x^(8*n) + 240*a*b^7*x^(7*n) + 630*a^2*b^6*x^(6*n) +
 1008*a^3*b^5*x^(5*n) + 1050*a^4*b^4*x^(4*n) + 720*a^5*b^3*x^(3*n
) + 315*a^6*b^2*x^(2*n) + 80*a^7*b*x^n + 9*a^8)/(n*x^(10*n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-10*n)*(a+b*x**n)**8,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.234951, size = 163, normalized size = 3.26

$$-\frac{\left(45\,b^8e^{(8\,n\ln(x))} + 240\,ab^7e^{(7\,n\ln(x))} + 630\,a^2b^6e^{(6\,n\ln(x))} + 1008\,a^3b^5e^{(5\,n\ln(x))} + 1050\,a^4b^4e^{(4\,n\ln(x))} + 720\,a^5b^3e^{(3\,n\ln(x))} + 315\,a}{90\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-10*n - 1),x, algorithm="giac")
```

```
[Out] -1/90*(45*b^8*e^(8*n*ln(x)) + 240*a*b^7*e^(7*n*ln(x)) + 630*a^2*b
^6*e^(6*n*ln(x)) + 1008*a^3*b^5*e^(5*n*ln(x)) + 1050*a^4*b^4*e^(4
*n*ln(x)) + 720*a^5*b^3*e^(3*n*ln(x)) + 315*a^6*b^2*e^(2*n*ln(x))
 + 80*a^7*b*e^(n*ln(x)) + 9*a^8)*e^(-10*n*ln(x))/n
```

3.2579 $\int x^{-1-11n}(a+bx^n)^8\,dx$

Optimal. Leaf size=77

$$-\frac{b^2x^{-9n}(a+bx^n)^9}{495a^3n}+\frac{bx^{-10n}(a+bx^n)^9}{55a^2n}-\frac{x^{-11n}(a+bx^n)^9}{11an}$$

```
[Out] -(a + b*x^n)^9/(11*a*n*x^(11*n)) + (b*(a + b*x^n)^9)/(55*a^2*n*x^
(10*n)) - (b^2*(a + b*x^n)^9)/(495*a^3*n*x^(9*n))
```

Rubi [A] time = 0.0871573, antiderivative size = 77, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176

$$-\frac{b^2x^{-9n}(a+bx^n)^9}{495a^3n}+\frac{bx^{-10n}(a+bx^n)^9}{55a^2n}-\frac{x^{-11n}(a+bx^n)^9}{11an}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 11*n)*(a + b*x^n)^8,x]
```

```
[Out] -(a + b*x^n)^9/(11*a*n*x^(11*n)) + (b*(a + b*x^n)^9)/(55*a^2*n*x^
(10*n)) - (b^2*(a + b*x^n)^9)/(495*a^3*n*x^(9*n))
```

Rubi in Sympy [A] time = 10.042, size = 63, normalized size = 0.82

$$-\frac{x^{-11n}(a+bx^n)^9}{11an}+\frac{bx^{-10n}(a+bx^n)^9}{55a^2n}-\frac{b^2x^{-9n}(a+bx^n)^9}{495a^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-11*n)*(a+b*x**n)**8,x)
```

```
[Out] -x**(-11*n)*(a + b*x**n)**9/(11*a*n) + b*x**(-10*n)*(a + b*x**n)*
*9/(55*a**2*n) - b**2*x**(-9*n)*(a + b*x**n)**9/(495*a**3*n)
```

Mathematica [A] time = 0.0532717, size = 113, normalized size = 1.47

$$-\frac{x^{-11n}\left(45a^8+396a^7bx^n+1540a^6b^2x^{2n}+3465a^5b^3x^{3n}+4950a^4b^4x^{4n}+4620a^3b^5x^{5n}+2772a^2b^6x^{6n}+990ab^7x^{7n}+165b^8\right.}{495n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 11*n)*(a + b*x^n)^8,x]
```

```
[Out] -(45*a^8 + 396*a^7*b*x^n + 1540*a^6*b^2*x^(2*n) + 3465*a^5*b^3*x^
(3*n) + 4950*a^4*b^4*x^(4*n) + 4620*a^3*b^5*x^(5*n) + 2772*a^2*b^
6*x^(6*n) + 990*a*b^7*x^(7*n) + 165*b^8*x^(8*n))/(495*n*x^(11*n))
```

Maple [A] time = 0.041, size = 136, normalized size = 1.8

$$-\frac{b^8}{3n(x^n)^3}-2\frac{ab^7}{n(x^n)^4}-\frac{28a^2b^6}{5n(x^n)^5}-\frac{28a^3b^5}{3n(x^n)^6}-10\frac{a^4b^4}{n(x^n)^7}-7\frac{a^5b^3}{n(x^n)^8}-\frac{28a^6b^2}{9n(x^n)^9}-\frac{4ba^7}{5n(x^n)^{10}}-\frac{a^8}{11n(x^n)^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-11*n)*(a+b*x^n)^8,x)
```

```
[Out] -1/3*b^8/n/(x^n)^3-2*a*b^7/n/(x^n)^4-28/5*a^2*b^6/n/(x^n)^5-28/3*
a^3*b^5/n/(x^n)^6-10*a^4*b^4/n/(x^n)^7-7*a^5*b^3/n/(x^n)^8-28/9*a
^6*b^2/n/(x^n)^9-4/5*a^7*b/n/(x^n)^10-1/11*a^8/n/(x^n)^11
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-11*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.227325, size = 153, normalized size = 1.99

$$-\frac{165\,b^8x^{8\,n} + 990\,ab^7x^{7\,n} + 2772\,a^2b^6x^{6\,n} + 4620\,a^3b^5x^{5\,n} + 4950\,a^4b^4x^{4\,n} + 3465\,a^5b^3x^{3\,n} + 1540\,a^6b^2x^{2\,n} + 396\,a^7bx^n + 45}{495\,nx^{11\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-11*n - 1),x, algorithm="fricas")
```

```
[Out] -1/495*(165*b^8*x^(8*n) + 990*a*b^7*x^(7*n) + 2772*a^2*b^6*x^(6*n
) + 4620*a^3*b^5*x^(5*n) + 4950*a^4*b^4*x^(4*n) + 3465*a^5*b^3*x^
(3*n) + 1540*a^6*b^2*x^(2*n) + 396*a^7*b*x^n + 45*a^8)/(n*x^(11*n
))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-11*n)*(a+b*x**n)**8,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.231535, size = 163, normalized size = 2.12

$$-\frac{\left(165\,b^8e^{(8\,n\ln(x))} + 990\,ab^7e^{(7\,n\ln(x))} + 2772\,a^2b^6e^{(6\,n\ln(x))} + 4620\,a^3b^5e^{(5\,n\ln(x))} + 4950\,a^4b^4e^{(4\,n\ln(x))} + 3465\,a^5b^3e^{(3\,n\ln(x))} + 15}{495\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-11*n - 1),x, algorithm="giac")
```

```
[Out] -1/495*(165*b^8*e^(8*n*ln(x)) + 990*a*b^7*e^(7*n*ln(x)) + 2772*a^
2*b^6*e^(6*n*ln(x)) + 4620*a^3*b^5*e^(5*n*ln(x)) + 4950*a^4*b^4*e
^(4*n*ln(x)) + 3465*a^5*b^3*e^(3*n*ln(x)) + 1540*a^6*b^2*e^(2*n*l
n(x)) + 396*a^7*b*e^(n*ln(x)) + 45*a^8)*e^(-11*n*ln(x))/n
```

3.2580 $\int x^{-1-12n} (a+bx^n)^8 \, dx$

Optimal. Leaf size=104

$$\frac{b^3x^{-9n}(a+bx^n)^9}{1980a^4n}-\frac{b^2x^{-10n}(a+bx^n)^9}{220a^3n}+\frac{bx^{-11n}(a+bx^n)^9}{44a^2n}-\frac{x^{-12n}(a+bx^n)^9}{12an}$$

```
[Out] -(a + b*x^n)^9/(12*a*n*x^(12*n)) + (b*(a + b*x^n)^9)/(44*a^2*n*x^
(11*n)) - (b^2*(a + b*x^n)^9)/(220*a^3*n*x^(10*n)) + (b^3*(a + b*
x^n)^9)/(1980*a^4*n*x^(9*n))
```

Rubi [A] time = 0.117756, antiderivative size = 104, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176

$$\frac{b^3x^{-9n}(a+bx^n)^9}{1980a^4n}-\frac{b^2x^{-10n}(a+bx^n)^9}{220a^3n}+\frac{bx^{-11n}(a+bx^n)^9}{44a^2n}-\frac{x^{-12n}(a+bx^n)^9}{12an}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 12*n)*(a + b*x^n)^8,x]
```

```
[Out] -(a + b*x^n)^9/(12*a*n*x^(12*n)) + (b*(a + b*x^n)^9)/(44*a^2*n*x^
(11*n)) - (b^2*(a + b*x^n)^9)/(220*a^3*n*x^(10*n)) + (b^3*(a + b*
x^n)^9)/(1980*a^4*n*x^(9*n))
```

Rubi in Sympy [A] time = 14.3627, size = 87, normalized size = 0.84

$$-\frac{x^{-12n}(a+bx^n)^9}{12an}+\frac{bx^{-11n}(a+bx^n)^9}{44a^2n}-\frac{b^2x^{-10n}(a+bx^n)^9}{220a^3n}+\frac{b^3x^{-9n}(a+bx^n)^9}{1980a^4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-12*n)*(a+b*x**n)**8,x)
```

```
[Out] -x**(-12*n)*(a + b*x**n)**9/(12*a*n) + b*x**(-11*n)*(a + b*x**n)*
*9/(44*a**2*n) - b**2*x**(-10*n)*(a + b*x**n)**9/(220*a**3*n) + b
**3*x**(-9*n)*(a + b*x**n)**9/(1980*a**4*n)
```

Mathematica [A] time = 0.0516853, size = 113, normalized size = 1.09

$$-\frac{x^{-12n}\left(165a^8+1440a^7bx^n+5544a^6b^2x^{2n}+12320a^5b^3x^{3n}+17325a^4b^4x^{4n}+15840a^3b^5x^{5n}+9240a^2b^6x^{6n}+3168ab^7x^{7n}\right.}{1980n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 12*n)*(a + b*x^n)^8,x]
```

```
[Out] -(165*a^8 + 1440*a^7*b*x^n + 5544*a^6*b^2*x^(2*n) + 12320*a^5*b^3
*x^(3*n) + 17325*a^4*b^4*x^(4*n) + 15840*a^3*b^5*x^(5*n) + 9240*a
^2*b^6*x^(6*n) + 3168*a*b^7*x^(7*n) + 495*b^8*x^(8*n))/(1980*n*x^
(12*n))
```

Maple [A] time = 0.043, size = 136, normalized size = 1.3

$$-\frac{b^8}{4\,n\,(x^n)^4}-\frac{8\,ab^7}{5\,n\,(x^n)^5}-\frac{14\,a^2b^6}{3\,n\,(x^n)^6}-8\,\frac{a^3b^5}{n\,(x^n)^7}-\frac{35\,a^4b^4}{4\,n\,(x^n)^8}-\frac{56\,a^5b^3}{9\,n\,(x^n)^9}-\frac{14\,a^6b^2}{5\,n\,(x^n)^{10}}-\frac{8\,ba^7}{11\,n\,(x^n)^{11}}-\frac{a^8}{12\,n\,(x^n)^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-12*n)*(a+b*x^n)^8,x)
```

```
[Out] -1/4*b^8/n/(x^n)^4-8/5*a*b^7/n/(x^n)^5-14/3*a^2*b^6/n/(x^n)^6-8*a
^3*b^5/n/(x^n)^7-35/4*a^4*b^4/n/(x^n)^8-56/9*a^5*b^3/n/(x^n)^9-14
/5*a^6*b^2/n/(x^n)^10-8/11*a^7*b/n/(x^n)^11-1/12*a^8/n/(x^n)^12
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-12*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.229135, size = 153, normalized size = 1.47

$$-\frac{495\,b^8x^{8\,n} + 3168\,ab^7x^{7\,n} + 9240\,a^2b^6x^{6\,n} + 15840\,a^3b^5x^{5\,n} + 17325\,a^4b^4x^{4\,n} + 12320\,a^5b^3x^{3\,n} + 5544\,a^6b^2x^{2\,n} + 1440\,a^7bx}{1980\,nx^{12\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-12*n - 1),x, algorithm="fricas")
```

```
[Out] -1/1980*(495*b^8*x^(8*n) + 3168*a*b^7*x^(7*n) + 9240*a^2*b^6*x^(6
*n) + 15840*a^3*b^5*x^(5*n) + 17325*a^4*b^4*x^(4*n) + 12320*a^5*b
^3*x^(3*n) + 5544*a^6*b^2*x^(2*n) + 1440*a^7*b*x^n + 165*a^8)/(n*
x^(12*n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-12*n)*(a+b*x**n)**8,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.233383, size = 163, normalized size = 1.57

$$-\frac{\left(495\,b^8e^{(8\,n\ln(x))} + 3168\,ab^7e^{(7\,n\ln(x))} + 9240\,a^2b^6e^{(6\,n\ln(x))} + 15840\,a^3b^5e^{(5\,n\ln(x))} + 17325\,a^4b^4e^{(4\,n\ln(x))} + 12320\,a^5b^3e^{(3\,n\ln(x))}\right.}{1980\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-12*n - 1),x, algorithm="giac")
```

```
[Out] -1/1980*(495*b^8*e^(8*n*ln(x)) + 3168*a*b^7*e^(7*n*ln(x)) + 9240*
a^2*b^6*e^(6*n*ln(x)) + 15840*a^3*b^5*e^(5*n*ln(x)) + 17325*a^4*b
^4*e^(4*n*ln(x)) + 12320*a^5*b^3*e^(3*n*ln(x)) + 5544*a^6*b^2*e^(
2*n*ln(x)) + 1440*a^7*b*e^(n*ln(x)) + 165*a^8)*e^(-12*n*ln(x))/n
```

3.2581 $\int x^{-1-13n}(a+bx^n)^8\,dx$

Optimal. Leaf size=131

$$-\frac{b^4x^{-9n}(a+bx^n)^9}{6435a^5n}+\frac{b^3x^{-10n}(a+bx^n)^9}{715a^4n}-\frac{b^2x^{-11n}(a+bx^n)^9}{143a^3n}+\frac{bx^{-12n}(a+bx^n)^9}{39a^2n}-\frac{x^{-13n}(a+bx^n)^9}{13an}$$

```
[Out] -(a + b*x^n)^9/(13*a*n*x^(13*n)) + (b*(a + b*x^n)^9)/(39*a^2*n*x^
(12*n)) - (b^2*(a + b*x^n)^9)/(143*a^3*n*x^(11*n)) + (b^3*(a + b*
x^n)^9)/(715*a^4*n*x^(10*n)) - (b^4*(a + b*x^n)^9)/(6435*a^5*n*x^
(9*n))
```

Rubi [A] time = 0.150569, antiderivative size = 131, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176

$$-\frac{b^4x^{-9n}(a+bx^n)^9}{6435a^5n}+\frac{b^3x^{-10n}(a+bx^n)^9}{715a^4n}-\frac{b^2x^{-11n}(a+bx^n)^9}{143a^3n}+\frac{bx^{-12n}(a+bx^n)^9}{39a^2n}-\frac{x^{-13n}(a+bx^n)^9}{13an}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 13*n)*(a + b*x^n)^8,x]
```

```
[Out] -(a + b*x^n)^9/(13*a*n*x^(13*n)) + (b*(a + b*x^n)^9)/(39*a^2*n*x^
(12*n)) - (b^2*(a + b*x^n)^9)/(143*a^3*n*x^(11*n)) + (b^3*(a + b*
x^n)^9)/(715*a^4*n*x^(10*n)) - (b^4*(a + b*x^n)^9)/(6435*a^5*n*x^
(9*n))
```

Rubi in Sympy [A] time = 27.9394, size = 136, normalized size = 1.04

$$-\frac{a^8x^{-13n}}{13n}-\frac{2a^7bx^{-12n}}{3n}-\frac{28a^6b^2x^{-11n}}{11n}-\frac{28a^5b^3x^{-10n}}{5n}-\frac{70a^4b^4x^{-9n}}{9n}-\frac{7a^3b^5x^{-8n}}{n}-\frac{4a^2b^6x^{-7n}}{n}-\frac{4ab^7x^{-6n}}{3n}-\frac{b^8x^{-5n}}{5n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-13*n)*(a+b*x**n)**8,x)
```

```
[Out] -a**8*x**(-13*n)/(13*n) - 2*a**7*b*x**(-12*n)/(3*n) - 28*a**6*b**
2*x**(-11*n)/(11*n) - 28*a**5*b**3*x**(-10*n)/(5*n) - 70*a**4*b**
4*x**(-9*n)/(9*n) - 7*a**3*b**5*x**(-8*n)/n - 4*a**2*b**6*x**(-7*
n)/n - 4*a*b**7*x**(-6*n)/(3*n) - b**8*x**(-5*n)/(5*n)
```

Mathematica [A] time = 0.0516625, size = 113, normalized size = 0.86

$$-\frac{x^{-13n}\left(495a^8+4290a^7bx^n+16380a^6b^2x^{2n}+36036a^5b^3x^{3n}+50050a^4b^4x^{4n}+45045a^3b^5x^{5n}+25740a^2b^6x^{6n}+8580ab^7x^{7}\right.}{6435n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 13*n)*(a + b*x^n)^8,x]
```

```
[Out] -(495*a^8 + 4290*a^7*b*x^n + 16380*a^6*b^2*x^(2*n) + 36036*a^5*b^
3*x^(3*n) + 50050*a^4*b^4*x^(4*n) + 45045*a^3*b^5*x^(5*n) + 25740
*a^2*b^6*x^(6*n) + 8580*a*b^7*x^(7*n) + 1287*b^8*x^(8*n))/(6435*n
*x^(13*n))
```

Maple [A] time = 0.04, size = 136, normalized size = 1.

$$-\frac{b^{8}}{5\,n\,(x^{n})^{5}}-\frac{4\,ab^{7}}{3\,n\,(x^{n})^{6}}-4\,\frac{a^{2}b^{6}}{n\,(x^{n})^{7}}-7\,\frac{a^{3}b^{5}}{n\,(x^{n})^{8}}-\frac{70\,a^{4}b^{4}}{9\,n\,(x^{n})^{9}}-\frac{28\,a^{5}b^{3}}{5\,n\,(x^{n})^{10}}-\frac{28\,a^{6}b^{2}}{11\,n\,(x^{n})^{11}}-\frac{2\,ba^{7}}{3\,n\,(x^{n})^{12}}-\frac{a^{8}}{13\,n\,(x^{n})^{13}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-13*n)*(a+b*x^n)^8,x)
```

```
[Out] -1/5*b^8/n/(x^n)^5-4/3*a*b^7/n/(x^n)^6-4*a^2*b^6/n/(x^n)^7-7*a^3*
b^5/n/(x^n)^8-70/9*a^4*b^4/n/(x^n)^9-28/5*a^5*b^3/n/(x^n)^10-28/1
1*a^6*b^2/n/(x^n)^11-2/3*a^7*b/n/(x^n)^12-1/13*a^8/n/(x^n)^13
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-13*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.227498, size = 153, normalized size = 1.17

$$-\frac{1287\,b^{8}x^{8\,n}+8580\,ab^{7}x^{7\,n}+25740\,a^{2}b^{6}x^{6\,n}+45045\,a^{3}b^{5}x^{5\,n}+50050\,a^{4}b^{4}x^{4\,n}+36036\,a^{5}b^{3}x^{3\,n}+16380\,a^{6}b^{2}x^{2\,n}+4290\,a}{6435\,nx^{13\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-13*n - 1),x, algorithm="fricas")
```

```
[Out] -1/6435*(1287*b^8*x^(8*n) + 8580*a*b^7*x^(7*n) + 25740*a^2*b^6*x^
(6*n) + 45045*a^3*b^5*x^(5*n) + 50050*a^4*b^4*x^(4*n) + 36036*a^5
*b^3*x^(3*n) + 16380*a^6*b^2*x^(2*n) + 4290*a^7*b*x^n + 495*a^8)/
(n*x^(13*n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-13*n)*(a+b*x**n)**8,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.233937, size = 163, normalized size = 1.24

$$-\frac{\left(1287\,b^{8}e^{(8\,n\ln(x))}+8580\,ab^{7}e^{(7\,n\ln(x))}+25740\,a^{2}b^{6}e^{(6\,n\ln(x))}+45045\,a^{3}b^{5}e^{(5\,n\ln(x))}+50050\,a^{4}b^{4}e^{(4\,n\ln(x))}+36036\,a^{5}b^{3}e^{(3\,n\ln}\right.}{6435\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-13*n - 1),x, algorithm="giac")
```

```
[Out] -1/6435*(1287*b^8*e^(8*n*ln(x)) + 8580*a*b^7*e^(7*n*ln(x)) + 2574
0*a^2*b^6*e^(6*n*ln(x)) + 45045*a^3*b^5*e^(5*n*ln(x)) + 50050*a^4
*b^4*e^(4*n*ln(x)) + 36036*a^5*b^3*e^(3*n*ln(x)) + 16380*a^6*b^2*
e^(2*n*ln(x)) + 4290*a^7*b*e^(n*ln(x)) + 495*a^8)*e^(-13*n*ln(x))
/n
```

3.2582 $\int x^{-1-14n}(a+bx^n)^8\,dx$

Optimal. Leaf size=151

$$-\frac{a^8x^{-14n}}{14n}-\frac{8a^7bx^{-13n}}{13n}-\frac{7a^6b^2x^{-12n}}{3n}-\frac{56a^5b^3x^{-11n}}{11n}-\frac{7a^4b^4x^{-10n}}{n}-\frac{56a^3b^5x^{-9n}}{9n}-\frac{7a^2b^6x^{-8n}}{2n}-\frac{8ab^7x^{-7n}}{7n}-\frac{b^8x^{-6n}}{6n}$$

```
[Out] -a^8/(14*n*x^(14*n)) - (8*a^7*b)/(13*n*x^(13*n)) - (7*a^6*b^2)/(3
*n*x^(12*n)) - (56*a^5*b^3)/(11*n*x^(11*n)) - (7*a^4*b^4)/(n*x^(1
0*n)) - (56*a^3*b^5)/(9*n*x^(9*n)) - (7*a^2*b^6)/(2*n*x^(8*n)) -
(8*a*b^7)/(7*n*x^(7*n)) - b^8/(6*n*x^(6*n))
```

Rubi [A] time = 0.171064, antiderivative size = 151, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{a^8x^{-14n}}{14n}-\frac{8a^7bx^{-13n}}{13n}-\frac{7a^6b^2x^{-12n}}{3n}-\frac{56a^5b^3x^{-11n}}{11n}-\frac{7a^4b^4x^{-10n}}{n}-\frac{56a^3b^5x^{-9n}}{9n}-\frac{7a^2b^6x^{-8n}}{2n}-\frac{8ab^7x^{-7n}}{7n}-\frac{b^8x^{-6n}}{6n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 14*n)*(a + b*x^n)^8,x]
```

```
[Out] -a^8/(14*n*x^(14*n)) - (8*a^7*b)/(13*n*x^(13*n)) - (7*a^6*b^2)/(3
*n*x^(12*n)) - (56*a^5*b^3)/(11*n*x^(11*n)) - (7*a^4*b^4)/(n*x^(1
0*n)) - (56*a^3*b^5)/(9*n*x^(9*n)) - (7*a^2*b^6)/(2*n*x^(8*n)) -
(8*a*b^7)/(7*n*x^(7*n)) - b^8/(6*n*x^(6*n))
```

Rubi in Sympy [A] time = 28.08, size = 138, normalized size = 0.91

$$-\frac{a^8x^{-14n}}{14n}-\frac{8a^7bx^{-13n}}{13n}-\frac{7a^6b^2x^{-12n}}{3n}-\frac{56a^5b^3x^{-11n}}{11n}-\frac{7a^4b^4x^{-10n}}{n}-\frac{56a^3b^5x^{-9n}}{9n}-\frac{7a^2b^6x^{-8n}}{2n}-\frac{8ab^7x^{-7n}}{7n}-\frac{b^8x^{-6n}}{6n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-14*n)*(a+b*x**n)**8,x)
```

```
[Out] -a**8*x**(-14*n)/(14*n) - 8*a**7*b*x**(-13*n)/(13*n) - 7*a**6*b**
2*x**(-12*n)/(3*n) - 56*a**5*b**3*x**(-11*n)/(11*n) - 7*a**4*b**4
*x**(-10*n)/n - 56*a**3*b**5*x**(-9*n)/(9*n) - 7*a**2*b**6*x**(-8
*n)/(2*n) - 8*a*b**7*x**(-7*n)/(7*n) - b**8*x**(-6*n)/(6*n)
```

Mathematica [A] time = 0.0525172, size = 113, normalized size = 0.75

$$-\frac{x^{-14n}\left(1287a^8+11088a^7bx^n+42042a^6b^2x^{2n}+91728a^5b^3x^{3n}+126126a^4b^4x^{4n}+112112a^3b^5x^{5n}+63063a^2b^6x^{6n}+20592\right.}{18018n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 14*n)*(a + b*x^n)^8,x]
```

```
[Out] -(1287*a^8 + 11088*a^7*b*x^n + 42042*a^6*b^2*x^(2*n) + 91728*a^5*
b^3*x^(3*n) + 126126*a^4*b^4*x^(4*n) + 112112*a^3*b^5*x^(5*n) + 6
```

```
3063*a^2*b^6*x^(6*n) + 20592*a*b^7*x^(7*n) + 3003*b^8*x^(8*n))/(1
8018*n*x^(14*n))
```

Maple [A] time = 0.042, size = 136, normalized size = 0.9

$$-\frac{b^8}{6\,n\,(x^n)^6}-\frac{8\,ab^7}{7\,n\,(x^n)^7}-\frac{7\,a^2b^6}{2\,n\,(x^n)^8}-\frac{56\,a^3b^5}{9\,n\,(x^n)^9}-7\,\frac{a^4b^4}{n\,(x^n)^{10}}-\frac{56\,a^5b^3}{11\,n\,(x^n)^{11}}-\frac{7\,a^6b^2}{3\,n\,(x^n)^{12}}-\frac{8\,ba^7}{13\,n\,(x^n)^{13}}-\frac{a^8}{14\,n\,(x^n)^{14}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-14*n)*(a+b*x^n)^8,x)
```

```
[Out] -1/6*b^8/n/(x^n)^6-8/7*a*b^7/n/(x^n)^7-7/2*a^2*b^6/n/(x^n)^8-56/9
*a^3*b^5/n/(x^n)^9-7*a^4*b^4/n/(x^n)^10-56/11*a^5*b^3/n/(x^n)^11-
7/3*a^6*b^2/n/(x^n)^12-8/13*a^7*b/n/(x^n)^13-1/14*a^8/n/(x^n)^14
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-14*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.22651, size = 153, normalized size = 1.01

$$-\frac{3003\,b^8x^{8\,n}+20592\,ab^7x^{7\,n}+63063\,a^2b^6x^{6\,n}+112112\,a^3b^5x^{5\,n}+126126\,a^4b^4x^{4\,n}+91728\,a^5b^3x^{3\,n}+42042\,a^6b^2x^{2\,n}+110}{18018\,nx^{14\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-14*n - 1),x, algorithm="fricas")
```

```
[Out] -1/18018*(3003*b^8*x^(8*n) + 20592*a*b^7*x^(7*n) + 63063*a^2*b^6*
x^(6*n) + 112112*a^3*b^5*x^(5*n) + 126126*a^4*b^4*x^(4*n) + 91728
*a^5*b^3*x^(3*n) + 42042*a^6*b^2*x^(2*n) + 11088*a^7*b*x^n + 1287
*a^8)/(n*x^(14*n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-14*n)*(a+b*x**n)**8,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.235877, size = 163, normalized size = 1.08

$$-\frac{\left(3003\,b^8e^{(8\,n\ln(x))} + 20592\,ab^7e^{(7\,n\ln(x))} + 63063\,a^2b^6e^{(6\,n\ln(x))} + 112112\,a^3b^5e^{(5\,n\ln(x))} + 126126\,a^4b^4e^{(4\,n\ln(x))} + 91728\,a^5b^3e^{(3}\right.}{18018\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-14*n - 1),x, algorithm="giac")
```

```
[Out] -1/18018*(3003*b^8*e^(8*n*ln(x)) + 20592*a*b^7*e^(7*n*ln(x)) + 63
063*a^2*b^6*e^(6*n*ln(x)) + 112112*a^3*b^5*e^(5*n*ln(x)) + 126126
*a^4*b^4*e^(4*n*ln(x)) + 91728*a^5*b^3*e^(3*n*ln(x)) + 42042*a^6*
b^2*e^(2*n*ln(x)) + 11088*a^7*b*e^(n*ln(x)) + 1287*a^8)*e^(-14*n*
ln(x))/n
```

3.2583 $\int x^{-1-15n}(a+bx^n)^8\,dx$

Optimal. Leaf size=151

$$-\frac{a^8x^{-15n}}{15n}-\frac{4a^7bx^{-14n}}{7n}-\frac{28a^6b^2x^{-13n}}{13n}-\frac{14a^5b^3x^{-12n}}{3n}-\frac{70a^4b^4x^{-11n}}{11n}-\frac{28a^3b^5x^{-10n}}{5n}-\frac{28a^2b^6x^{-9n}}{9n}-\frac{ab^7x^{-8n}}{n}-\frac{b^8x^{-7n}}{7n}$$

```
[Out] -a^8/(15*n*x^(15*n)) - (4*a^7*b)/(7*n*x^(14*n)) - (28*a^6*b^2)/(1
3*n*x^(13*n)) - (14*a^5*b^3)/(3*n*x^(12*n)) - (70*a^4*b^4)/(11*n*
x^(11*n)) - (28*a^3*b^5)/(5*n*x^(10*n)) - (28*a^2*b^6)/(9*n*x^(9*
n)) - (a*b^7)/(n*x^(8*n)) - b^8/(7*n*x^(7*n))
```

Rubi [A] time = 0.165057, antiderivative size = 151, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$

$$-\frac{a^8x^{-15n}}{15n}-\frac{4a^7bx^{-14n}}{7n}-\frac{28a^6b^2x^{-13n}}{13n}-\frac{14a^5b^3x^{-12n}}{3n}-\frac{70a^4b^4x^{-11n}}{11n}-\frac{28a^3b^5x^{-10n}}{5n}-\frac{28a^2b^6x^{-9n}}{9n}-\frac{ab^7x^{-8n}}{n}-\frac{b^8x^{-7n}}{7n}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 - 15*n)*(a + b*x^n)^8,x]
```

```
[Out] -a^8/(15*n*x^(15*n)) - (4*a^7*b)/(7*n*x^(14*n)) - (28*a^6*b^2)/(1
3*n*x^(13*n)) - (14*a^5*b^3)/(3*n*x^(12*n)) - (70*a^4*b^4)/(11*n*
x^(11*n)) - (28*a^3*b^5)/(5*n*x^(10*n)) - (28*a^2*b^6)/(9*n*x^(9*
n)) - (a*b^7)/(n*x^(8*n)) - b^8/(7*n*x^(7*n))
```

Rubi in Sympy [A] time = 28.2679, size = 136, normalized size = 0.9

$$-\frac{a^8x^{-15n}}{15n}-\frac{4a^7bx^{-14n}}{7n}-\frac{28a^6b^2x^{-13n}}{13n}-\frac{14a^5b^3x^{-12n}}{3n}-\frac{70a^4b^4x^{-11n}}{11n}-\frac{28a^3b^5x^{-10n}}{5n}-\frac{28a^2b^6x^{-9n}}{9n}-\frac{ab^7x^{-8n}}{n}-\frac{b^8x^{-7n}}{7n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1-15*n)*(a+b*x**n)**8,x)
```

```
[Out] -a**8*x**(-15*n)/(15*n) - 4*a**7*b*x**(-14*n)/(7*n) - 28*a**6*b**
2*x**(-13*n)/(13*n) - 14*a**5*b**3*x**(-12*n)/(3*n) - 70*a**4*b**
4*x**(-11*n)/(11*n) - 28*a**3*b**5*x**(-10*n)/(5*n) - 28*a**2*b**
6*x**(-9*n)/(9*n) - a*b**7*x**(-8*n)/n - b**8*x**(-7*n)/(7*n)
```

Mathematica [A] time = 0.0510606, size = 113, normalized size = 0.75

$$-\frac{x^{-15n}\left(3003a^8+25740a^7bx^n+97020a^6b^2x^{2n}+210210a^5b^3x^{3n}+286650a^4b^4x^{4n}+252252a^3b^5x^{5n}+140140a^2b^6x^{6n}+450\right.}{45045n}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 - 15*n)*(a + b*x^n)^8,x]
```

```
[Out] -(3003*a^8 + 25740*a^7*b*x^n + 97020*a^6*b^2*x^(2*n) + 210210*a^5
*b^3*x^(3*n) + 286650*a^4*b^4*x^(4*n) + 252252*a^3*b^5*x^(5*n) +
```

```
140140*a^2*b^6*x^(6*n) + 45045*a*b^7*x^(7*n) + 6435*b^8*x^(8*n))/
(45045*n*x^(15*n))
```

Maple [A] time = 0.042, size = 136, normalized size = 0.9

$$-\frac{b^8}{7\,n\,(x^n)^7}-\frac{ab^7}{n\,(x^n)^8}-\frac{28\,a^2b^6}{9\,n\,(x^n)^9}-\frac{28\,a^3b^5}{5\,n\,(x^n)^{10}}-\frac{70\,a^4b^4}{11\,n\,(x^n)^{11}}-\frac{14\,a^5b^3}{3\,n\,(x^n)^{12}}-\frac{28\,a^6b^2}{13\,n\,(x^n)^{13}}-\frac{4\,ba^7}{7\,n\,(x^n)^{14}}-\frac{a^8}{15\,n\,(x^n)^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-15*n)*(a+b*x^n)^8,x)
```

```
[Out] -1/7*b^8/n/(x^n)^7-a*b^7/n/(x^n)^8-28/9*a^2*b^6/n/(x^n)^9-28/5*a^
3*b^5/n/(x^n)^10-70/11*a^4*b^4/n/(x^n)^11-14/3*a^5*b^3/n/(x^n)^12
-28/13*a^6*b^2/n/(x^n)^13-4/7*a^7*b/n/(x^n)^14-1/15*a^8/n/(x^n)^1
5
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-15*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.226939, size = 153, normalized size = 1.01

$$-\frac{6435\,b^8x^{8\,n}+45045\,ab^7x^{7\,n}+140140\,a^2b^6x^{6\,n}+252252\,a^3b^5x^{5\,n}+286650\,a^4b^4x^{4\,n}+210210\,a^5b^3x^{3\,n}+97020\,a^6b^2x^{2\,n}+2}{45045\,nx^{15\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-15*n - 1),x, algorithm="fricas")
```

```
[Out] -1/45045*(6435*b^8*x^(8*n) + 45045*a*b^7*x^(7*n) + 140140*a^2*b^6
*x^(6*n) + 252252*a^3*b^5*x^(5*n) + 286650*a^4*b^4*x^(4*n) + 2102
10*a^5*b^3*x^(3*n) + 97020*a^6*b^2*x^(2*n) + 25740*a^7*b*x^n + 30
03*a^8)/(n*x^(15*n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-15*n)*(a+b*x**n)**8,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.233031, size = 163, normalized size = 1.08

$$-\frac{\left(6435\, b^{8} e^{(8\, n\ln(x))} + 45045\, a b^{7} e^{(7\, n\ln(x))} + 140140\, a^{2} b^{6} e^{(6\, n\ln(x))} + 252252\, a^{3} b^{5} e^{(5\, n\ln(x))} + 286650\, a^{4} b^{4} e^{(4\, n\ln(x))} + 210210\, a^{5} b^{3}}{45045\, n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^8*x^(-15*n - 1),x, algorithm="giac")
```

```
[Out] -1/45045*(6435*b^8*e^(8*n*ln(x)) + 45045*a*b^7*e^(7*n*ln(x)) + 14
0140*a^2*b^6*e^(6*n*ln(x)) + 252252*a^3*b^5*e^(5*n*ln(x)) + 28665
0*a^4*b^4*e^(4*n*ln(x)) + 210210*a^5*b^3*e^(3*n*ln(x)) + 97020*a^
6*b^2*e^(2*n*ln(x)) + 25740*a^7*b*e^(n*ln(x)) + 3003*a^8)*e^(-15*
n*ln(x))/n
```

3.2584 $\int x^{-1+n}(a+bx^n)^{16}\,dx$

Optimal. Leaf size=19

$$\frac{(a+bx^n)^{17}}{17bn}$$

```
[Out] (a + b*x^n)^17/(17*b*n)
```

Rubi [A] time = 0.0191769, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{(a+bx^n)^{17}}{17bn}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 + n)*(a + b*x^n)^16,x]
```

```
[Out] (a + b*x^n)^17/(17*b*n)
```

Rubi in Sympy [A] time = 2.44017, size = 12, normalized size = 0.63

$$\frac{(a+bx^n)^{17}}{17bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1+n)*(a+b*x**n)**16,x)
```

```
[Out] (a + b*x**n)**17/(17*b*n)
```

Mathematica [A] time = 0.0167338, size = 19, normalized size = 1.

$$\frac{(a+bx^n)^{17}}{17bn}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 + n)*(a + b*x^n)^16,x]
```

```
[Out] (a + b*x^n)^17/(17*b*n)
```

Maple [B] time = 0.056, size = 260, normalized size = 13.7

$$\frac{b^{16}(x^n)^{17}}{17\,n}+\frac{ab^{15}(x^n)^{16}}{n}+8\,\frac{a^2b^{14}(x^n)^{15}}{n}+40\,\frac{a^3b^{13}(x^n)^{14}}{n}+140\,\frac{a^4b^{12}(x^n)^{13}}{n}+364\,\frac{a^5b^{11}(x^n)^{12}}{n}+728\,\frac{a^6b^{10}(x^n)^{11}}{n}+1144\,\frac{b^9a^7(x^n)^{10}}{n}+1430\,\frac{a^8b^8(x^n)^9}{n}+1430\,\frac{a^9b^7(x^n)^8}{n}+1144\,\frac{a^{10}b^6(x^n)^7}{n}+728\,\frac{a^{11}b^5(x^n)^6}{n}+364\,\frac{a^{12}b^4(x^n)^5}{n}+140\,\frac{a^{13}b^3(x^n)^4}{n}+40\,\frac{a^{14}b^2(x^n)^3}{n}+8\,\frac{a^{15}b(x^n)^2}{n}+\frac{a^{16}x^n}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+n)*(a+b*x^n)^16,x)
```

```
[Out] 1/17*b^16/n*(x^n)^17+a*b^15/n*(x^n)^16+8*a^2*b^14/n*(x^n)^15+40*a
^3*b^13/n*(x^n)^14+140*a^4*b^12/n*(x^n)^13+364*a^5*b^11/n*(x^n)^1
2+728*a^6*b^10/n*(x^n)^11+1144*b^9*a^7/n*(x^n)^10+1430*a^8*b^8/n*
(x^n)^9+1430*a^9*b^7/n*(x^n)^8+1144*a^10*b^6/n*(x^n)^7+728*a^11*b
^5/n*(x^n)^6+364*a^12*b^4/n*(x^n)^5+140*a^13*b^3/n*(x^n)^4+40*a^1
4*b^2/n*(x^n)^3+8*a^15*b/n*(x^n)^2+a^16/n*x^n
```

Maxima [A] time = 1.42749, size = 23, normalized size = 1.21

$$\frac{(bx^n + a)^{17}}{17\, bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^16*x^(n - 1),x, algorithm="maxima")
```

```
[Out] 1/17*(b*x^n + a)^17/(b*n)
```

Fricas [A] time = 0.229803, size = 289, normalized size = 15.21

$$\frac{b^{16}x^{17\,n} + 17\,ab^{15}x^{16\,n} + 136\,a^2b^{14}x^{15\,n} + 680\,a^3b^{13}x^{14\,n} + 2380\,a^4b^{12}x^{13\,n} + 6188\,a^5b^{11}x^{12\,n} + 12376\,a^6b^{10}x^{11\,n} + 19448\,a^7b^9}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^16*x^(n - 1),x, algorithm="fricas")
```

```
[Out] 1/17*(b^16*x^(17*n) + 17*a*b^15*x^(16*n) + 136*a^2*b^14*x^(15*n)
+ 680*a^3*b^13*x^(14*n) + 2380*a^4*b^12*x^(13*n) + 6188*a^5*b^11*
x^(12*n) + 12376*a^6*b^10*x^(11*n) + 19448*a^7*b^9*x^(10*n) + 243
10*a^8*b^8*x^(9*n) + 24310*a^9*b^7*x^(8*n) + 19448*a^10*b^6*x^(7*
n) + 12376*a^11*b^5*x^(6*n) + 6188*a^12*b^4*x^(5*n) + 2380*a^13*b
^3*x^(4*n) + 680*a^14*b^2*x^(3*n) + 136*a^15*b*x^(2*n) + 17*a^16*
x^n)/n
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+n)*(a+b*x**n)**16,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.218285, size = 289, normalized size = 15.21

$$\frac{b^{16}x^{17\,n} + 17\,ab^{15}x^{16\,n} + 136\,a^2b^{14}x^{15\,n} + 680\,a^3b^{13}x^{14\,n} + 2380\,a^4b^{12}x^{13\,n} + 6188\,a^5b^{11}x^{12\,n} + 12376\,a^6b^{10}x^{11\,n} + 19448\,a^7b^9}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^16*x^(n - 1),x, algorithm="giac")
```

```
[Out] 1/17*(b^16*x^(17*n) + 17*a*b^15*x^(16*n) + 136*a^2*b^14*x^(15*n)
+ 680*a^3*b^13*x^(14*n) + 2380*a^4*b^12*x^(13*n) + 6188*a^5*b^11*
x^(12*n) + 12376*a^6*b^10*x^(11*n) + 19448*a^7*b^9*x^(10*n) + 243
10*a^8*b^8*x^(9*n) + 24310*a^9*b^7*x^(8*n) + 19448*a^10*b^6*x^(7*
n) + 12376*a^11*b^5*x^(6*n) + 6188*a^12*b^4*x^(5*n) + 2380*a^13*b
^3*x^(4*n) + 680*a^14*b^2*x^(3*n) + 136*a^15*b*x^(2*n) + 17*a^16*
x^n)/n
```

3.2585 $\int x^{12} \left(a+bx^{13}\right)^{12} dx$

Optimal. Leaf size=16

$$\frac{\left(a+bx^{13}\right)^{13}}{169b}$$

```
[Out] (a + b*x^13)^13/(169*b)
```

Rubi [A] time = 0.015675, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{\left(a+bx^{13}\right)^{13}}{169b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^12*(a + b*x^13)^12,x]

[Out] (a + b*x^13)^13/(169*b)
```

Rubi in Sympy [A] time = 2.21604, size = 10, normalized size = 0.62

$$\frac{\left(a+bx^{13}\right)^{13}}{169b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**12*(b*x**13+a)**12,x)

[Out] (a + b*x**13)**13/(169*b)
```

Mathematica [B] time = 0.00826004, size = 160, normalized size = 10.

$$\frac{a^{12}x^{13}}{13}+\frac{6}{13}a^{11}bx^{26}+\frac{22}{13}a^{10}b^{2}x^{39}+\frac{55}{13}a^{9}b^{3}x^{52}+\frac{99}{13}a^{8}b^{4}x^{65}+\frac{132}{13}a^{7}b^{5}x^{78}+\frac{132}{13}a^{6}b^{6}x^{91}+\frac{99}{13}a^{5}b^{7}x^{104}+\frac{55}{13}a^{4}b^{8}x^{117}+\frac{22}{13}a^{3}b^{9}x^{130}+\frac{6}{13}a^{2}b^{10}x^{143}+\frac{1}{13}ab^{11}x^{156}+\frac{b^{12}x^{169}}{169}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^12*(a + b*x^13)^12,x]

[Out] (a^12*x^13)/13 + (6*a^11*b*x^26)/13 + (22*a^10*b^2*x^39)/13 + (55
*a^9*b^3*x^52)/13 + (99*a^8*b^4*x^65)/13 + (132*a^7*b^5*x^78)/13
+ (132*a^6*b^6*x^91)/13 + (99*a^5*b^7*x^104)/13 + (55*a^4*b^8*x^1
17)/13 + (22*a^3*b^9*x^130)/13 + (6*a^2*b^10*x^143)/13 + (a*b^11*
x^156)/13 + (b^12*x^169)/169
```

Maple [B] time = 0.004, size = 135, normalized size = 8.4

$$\frac{b^{12}x^{169}}{169}+\frac{ab^{11}x^{156}}{13}+\frac{6\,a^{2}b^{10}x^{143}}{13}+\frac{22\,a^{3}b^{9}x^{130}}{13}+\frac{55\,b^{8}a^{4}x^{117}}{13}+\frac{99\,a^{5}b^{7}x^{104}}{13}+\frac{132\,a^{6}b^{6}x^{91}}{13}+\frac{132\,a^{7}b^{5}x^{78}}{13}+\frac{99\,a^{8}b^{4}x^{65}}{13}+\frac{55\,a^{9}b^{3}x^{52}}{13}+\frac{22\,a^{10}b^{2}x^{39}}{13}+\frac{6\,a^{11}bx^{26}}{13}+\frac{a^{12}x^{13}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^12*(b*x^13+a)^12,x)
```

```
[Out] 1/169*b^12*x^169+1/13*a*b^11*x^156+6/13*a^2*b^10*x^143+22/13*a^3*
b^9*x^130+55/13*b^8*a^4*x^117+99/13*a^5*b^7*x^104+132/13*a^6*b^6*
x^91+132/13*a^7*b^5*x^78+99/13*a^8*b^4*x^65+55/13*a^9*b^3*x^52+22
/13*a^10*b^2*x^39+6/13*a^11*b*x^26+1/13*a^12*x^13
```

Maxima [A] time = 1.43242, size = 19, normalized size = 1.19

$$\frac{\left(bx^{13}+a\right)^{13}}{169\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^13 + a)^12*x^12,x, algorithm="maxima")
```

```
[Out] 1/169*(b*x^13 + a)^13/b
```

Fricas [A] time = 0.181347, size = 1, normalized size = 0.06

$$\frac{1}{169}x^{169}b^{12}+\frac{1}{13}x^{156}b^{11}a+\frac{6}{13}x^{143}b^{10}a^2+\frac{22}{13}x^{130}b^9a^3+\frac{55}{13}x^{117}b^8a^4+\frac{99}{13}x^{104}b^7a^5+\frac{132}{13}x^{91}b^6a^6+\frac{132}{13}x^{78}b^5a^7+\frac{99}{13}x^{65}b^4a^8+\frac{55}{13}x^{52}b^3a^9+\frac{22}{13}x^{39}b^2a^{10}+\frac{6}{13}x^{26}ba^{11}+\frac{1}{13}x^{13}a^{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^13 + a)^12*x^12,x, algorithm="fricas")
```

```
[Out] 1/169*x^169*b^12 + 1/13*x^156*b^11*a + 6/13*x^143*b^10*a^2 + 22/1
3*x^130*b^9*a^3 + 55/13*x^117*b^8*a^4 + 99/13*x^104*b^7*a^5 + 132
/13*x^91*b^6*a^6 + 132/13*x^78*b^5*a^7 + 99/13*x^65*b^4*a^8 + 55/
13*x^52*b^3*a^9 + 22/13*x^39*b^2*a^10 + 6/13*x^26*b*a^11 + 1/13*x
^13*a^12
```

Sympy [A] time = 0.224503, size = 160, normalized size = 10.

$$\frac{a^{12}x^{13}}{13}+\frac{6a^{11}bx^{26}}{13}+\frac{22a^{10}b^2x^{39}}{13}+\frac{55a^9b^3x^{52}}{13}+\frac{99a^8b^4x^{65}}{13}+\frac{132a^7b^5x^{78}}{13}+\frac{132a^6b^6x^{91}}{13}+\frac{99a^5b^7x^{104}}{13}+\frac{55a^4b^8x^{117}}{13}+\frac{22a^3b^9x^{130}}{13}+\frac{6a^2b^{10}x^{143}}{13}+\frac{ab^{11}x^{156}}{13}+\frac{b^{12}x^{169}}{169}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**12*(b*x**13+a)**12,x)
```

```
[Out] a**12*x**13/13 + 6*a**11*b*x**26/13 + 22*a**10*b**2*x**39/13 + 55
*a**9*b**3*x**52/13 + 99*a**8*b**4*x**65/13 + 132*a**7*b**5*x**78
/13 + 132*a**6*b**6*x**91/13 + 99*a**5*b**7*x**104/13 + 55*a**4*b
**8*x**117/13 + 22*a**3*b**9*x**130/13 + 6*a**2*b**10*x**143/13 +
 a*b**11*x**156/13 + b**12*x**169/169
```

GIAC/XCAS [A] time = 0.214371, size = 19, normalized size = 1.19

$$\frac{\left(bx^{13}+a\right)^{13}}{169\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^13 + a)^12*x^12,x, algorithm="giac")
```

```
[Out] 1/169*(b*x^13 + a)^13/b
```

3.2586 $\int x^{24} \left(a + bx^{25}\right)^{12} \, dx$

Optimal. Leaf size=16

$$\frac{\left(a + bx^{25}\right)^{13}}{325b}$$

```
[Out] (a + b*x^25)^13/(325*b)
```

Rubi [A] time = 0.0164596, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$\frac{\left(a + bx^{25}\right)^{13}}{325b}$$

Antiderivative was successfully verified.

```
[In] Int[x^24*(a + b*x^25)^12,x]
```

```
[Out] (a + b*x^25)^13/(325*b)
```

Rubi in Sympy [A] time = 2.15456, size = 10, normalized size = 0.62

$$\frac{\left(a + bx^{25}\right)^{13}}{325b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**24*(b*x**25+a)**12,x)
```

```
[Out] (a + b*x**25)**13/(325*b)
```

Mathematica [B] time = 0.00974764, size = 160, normalized size = 10.

$$\frac{a^{12}x^{25}}{25} + \frac{6}{25}a^{11}bx^{50} + \frac{22}{25}a^{10}b^2x^{75} + \frac{11}{5}a^9b^3x^{100} + \frac{99}{25}a^8b^4x^{125} + \frac{132}{25}a^7b^5x^{150} + \frac{132}{25}a^6b^6x^{175} + \frac{99}{25}a^5b^7x^{200} + \frac{11}{5}a^4b^8x^{225} + \frac{22}{25}a^3b^9x^{250} + \frac{6}{25}a^2b^{10}x^{275} + \frac{1}{25}ab^{11}x^{300} + \frac{b^{12}x^{325}}{325}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^24*(a + b*x^25)^12,x]
```

```
[Out] (a^12*x^25)/25 + (6*a^11*b*x^50)/25 + (22*a^10*b^2*x^75)/25 + (11
*a^9*b^3*x^100)/5 + (99*a^8*b^4*x^125)/25 + (132*a^7*b^5*x^150)/2
5 + (132*a^6*b^6*x^175)/25 + (99*a^5*b^7*x^200)/25 + (11*a^4*b^8*
x^225)/5 + (22*a^3*b^9*x^250)/25 + (6*a^2*b^10*x^275)/25 + (a*b^1
1*x^300)/25 + (b^12*x^325)/325
```

Maple [B] time = 0.003, size = 135, normalized size = 8.4

$$\frac{b^{12}x^{325}}{325} + \frac{ab^{11}x^{300}}{25} + \frac{6\,a^2b^{10}x^{275}}{25} + \frac{22\,a^3b^9x^{250}}{25} + \frac{11\,b^8a^4x^{225}}{5} + \frac{99\,a^5b^7x^{200}}{25} + \frac{132\,a^6b^6x^{175}}{25} + \frac{132\,a^7b^5x^{150}}{25} + \frac{99\,a^8b^4x^{125}}{25} + \frac{11\,a^9b^3x^{100}}{5} + \frac{22\,a^{10}b^2x^{75}}{25} + \frac{6\,a^{11}bx^{50}}{25} + \frac{a^{12}x^{25}}{25}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^24*(b*x^25+a)^12,x)
```

```
[Out] 1/325*b^12*x^325+1/25*a*b^11*x^300+6/25*a^2*b^10*x^275+22/25*a^3*
b^9*x^250+11/5*b^8*a^4*x^225+99/25*a^5*b^7*x^200+132/25*a^6*b^6*x
^175+132/25*a^7*b^5*x^150+99/25*a^8*b^4*x^125+11/5*a^9*b^3*x^100+
22/25*a^10*b^2*x^75+6/25*a^11*b*x^50+1/25*a^12*x^25
```

Maxima [A] time = 1.4211, size = 19, normalized size = 1.19

$$\frac{\left(bx^{25}+a\right)^{13}}{325\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^25 + a)^12*x^24,x, algorithm="maxima")
```

```
[Out] 1/325*(b*x^25 + a)^13/b
```

Fricas [A] time = 0.181352, size = 1, normalized size = 0.06

$$\frac{1}{325}x^{325}b^{12}+\frac{1}{25}x^{300}b^{11}a+\frac{6}{25}x^{275}b^{10}a^{2}+\frac{22}{25}x^{250}b^{9}a^{3}+\frac{11}{5}x^{225}b^{8}a^{4}+\frac{99}{25}x^{200}b^{7}a^{5}+\frac{132}{25}x^{175}b^{6}a^{6}+\frac{132}{25}x^{150}b^{5}a^{7}+\frac{99}{25}x^{125}b^{4}a^{8}+\frac{11}{5}x^{100}b^{3}a^{9}+\frac{22}{25}x^{75}b^{2}a^{10}+\frac{6}{25}x^{50}ba^{11}+\frac{1}{25}x^{25}a^{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^25 + a)^12*x^24,x, algorithm="fricas")
```

```
[Out] 1/325*x^325*b^12 + 1/25*x^300*b^11*a + 6/25*x^275*b^10*a^2 + 22/2
5*x^250*b^9*a^3 + 11/5*x^225*b^8*a^4 + 99/25*x^200*b^7*a^5 + 132/
25*x^175*b^6*a^6 + 132/25*x^150*b^5*a^7 + 99/25*x^125*b^4*a^8 + 1
1/5*x^100*b^3*a^9 + 22/25*x^75*b^2*a^10 + 6/25*x^50*b*a^11 + 1/25
*x^25*a^12
```

Sympy [A] time = 0.231571, size = 160, normalized size = 10.

$$\frac{a^{12}x^{25}}{25}+\frac{6a^{11}bx^{50}}{25}+\frac{22a^{10}b^{2}x^{75}}{25}+\frac{11a^{9}b^{3}x^{100}}{5}+\frac{99a^{8}b^{4}x^{125}}{25}+\frac{132a^{7}b^{5}x^{150}}{25}+\frac{132a^{6}b^{6}x^{175}}{25}+\frac{99a^{5}b^{7}x^{200}}{25}+\frac{11a^{4}b^{8}x^{225}}{5}+\frac{22a^{3}b^{9}x^{250}}{25}+\frac{6a^{2}b^{10}x^{275}}{25}+\frac{ab^{11}x^{300}}{25}+\frac{b^{12}x^{325}}{325}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**24*(b*x**25+a)**12,x)
```

```
[Out] a**12*x**25/25 + 6*a**11*b*x**50/25 + 22*a**10*b**2*x**75/25 + 11
*a**9*b**3*x**100/5 + 99*a**8*b**4*x**125/25 + 132*a**7*b**5*x**1
50/25 + 132*a**6*b**6*x**175/25 + 99*a**5*b**7*x**200/25 + 11*a**
4*b**8*x**225/5 + 22*a**3*b**9*x**250/25 + 6*a**2*b**10*x**275/25
 + a*b**11*x**300/25 + b**12*x**325/325
```

GIAC/XCAS [A] time = 0.214628, size = 19, normalized size = 1.19

$$\frac{\left(bx^{25}+a\right)^{13}}{325\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^25 + a)^12*x^24,x, algorithm="giac")
```

```
[Out] 1/325*(b*x^25 + a)^13/b
```

3.2587 $\int x^{36} \left(a+b x^{37}\right)^{12} \, dx$

Optimal. Leaf size=16

$$\frac{\left(a+b x^{37}\right)^{13}}{481 b}$$

```
[Out] (a + b*x^37)^13/(481*b)
```

Rubi [A] time = 0.015955, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$\frac{\left(a+b x^{37}\right)^{13}}{481 b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^36*(a + b*x^37)^12,x]

[Out] (a + b*x^37)^13/(481*b)
```

Rubi in Sympy [A] time = 2.21874, size = 10, normalized size = 0.62

$$\frac{\left(a+b x^{37}\right)^{13}}{481 b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**36*(b*x**37+a)**12,x)

[Out] (a + b*x**37)**13/(481*b)
```

Mathematica [B] time = 0.0116387, size = 160, normalized size = 10.

$$\frac{a^{12} x^{37}}{37}+\frac{6}{37} a^{11} b x^{74}+\frac{22}{37} a^{10} b^2 x^{111}+\frac{55}{37} a^9 b^3 x^{148}+\frac{99}{37} a^8 b^4 x^{185}+\frac{132}{37} a^7 b^5 x^{222}+\frac{132}{37} a^6 b^6 x^{259}+\frac{99}{37} a^5 b^7 x^{296}+\frac{55}{37} a^4 b^8 x^{333}+\frac{22}{37} a^3 b^9 x^{370}+\frac{6}{37} a^2 b^{10} x^{407}+\frac{1}{37} a b^{11} x^{444}+\frac{b^{12} x^{481}}{481}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^36*(a + b*x^37)^12,x]

[Out] (a^12*x^37)/37 + (6*a^11*b*x^74)/37 + (22*a^10*b^2*x^111)/37 + (5
5*a^9*b^3*x^148)/37 + (99*a^8*b^4*x^185)/37 + (132*a^7*b^5*x^222)
/37 + (132*a^6*b^6*x^259)/37 + (99*a^5*b^7*x^296)/37 + (55*a^4*b^
8*x^333)/37 + (22*a^3*b^9*x^370)/37 + (6*a^2*b^10*x^407)/37 + (a*
b^11*x^444)/37 + (b^12*x^481)/481
```

Maple [B] time = 0.003, size = 135, normalized size = 8.4

$$\frac{b^{12} x^{481}}{481}+\frac{a b^{11} x^{444}}{37}+\frac{6 a^2 b^{10} x^{407}}{37}+\frac{22 a^3 b^9 x^{370}}{37}+\frac{55 b^8 a^4 x^{333}}{37}+\frac{99 a^5 b^7 x^{296}}{37}+\frac{132 a^6 b^6 x^{259}}{37}+\frac{132 a^7 b^5 x^{222}}{37}+\frac{99 a^8 b^4 x^{185}}{37}+\frac{55 a^9 b^3 x^{148}}{37}+\frac{22 a^{10} b^2 x^{111}}{37}+\frac{6 a^{11} b x^{74}}{37}+\frac{a^{12} x^{37}}{37}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^36*(b*x^37+a)^12,x)
```

```
[Out] 1/481*b^12*x^481+1/37*a*b^11*x^444+6/37*a^2*b^10*x^407+22/37*a^3*
b^9*x^370+55/37*b^8*a^4*x^333+99/37*a^5*b^7*x^296+132/37*a^6*b^6*
x^259+132/37*a^7*b^5*x^222+99/37*a^8*b^4*x^185+55/37*a^9*b^3*x^14
8+22/37*a^10*b^2*x^111+6/37*a^11*b*x^74+1/37*a^12*x^37
```

Maxima [A] time = 1.42537, size = 19, normalized size = 1.19

$$\frac{\left(bx^{37}+a\right)^{13}}{481\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^37 + a)^12*x^36,x, algorithm="maxima")
```

```
[Out] 1/481*(b*x^37 + a)^13/b
```

Fricas [A] time = 0.181291, size = 1, normalized size = 0.06

$$\frac{1}{481}x^{481}b^{12}+\frac{1}{37}x^{444}b^{11}a+\frac{6}{37}x^{407}b^{10}a^2+\frac{22}{37}x^{370}b^9a^3+\frac{55}{37}x^{333}b^8a^4+\frac{99}{37}x^{296}b^7a^5+\frac{132}{37}x^{259}b^6a^6+\frac{132}{37}x^{222}b^5a^7+\frac{99}{37}x^{185}b^4a^8+\frac{55}{37}x^{148}b^3a^9+\frac{22}{37}x^{111}b^2a^{10}+\frac{6}{37}x^{74}ba^{11}+\frac{1}{37}x^{37}a^{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((b*x^37 + a)^12*x^36,x, algorithm="fricas")
```

```
[Out] 1/481*x^481*b^12 + 1/37*x^444*b^11*a + 6/37*x^407*b^10*a^2 + 22/3
7*x^370*b^9*a^3 + 55/37*x^333*b^8*a^4 + 99/37*x^296*b^7*a^5 + 132
/37*x^259*b^6*a^6 + 132/37*x^222*b^5*a^7 + 99/37*x^185*b^4*a^8 +
55/37*x^148*b^3*a^9 + 22/37*x^111*b^2*a^10 + 6/37*x^74*b*a^11 + 1
/37*x^37*a^12
```

Sympy [A] time = 0.247612, size = 160, normalized size = 10.

$$\frac{a^{12}x^{37}}{37}+\frac{6a^{11}bx^{74}}{37}+\frac{22a^{10}b^2x^{111}}{37}+\frac{55a^9b^3x^{148}}{37}+\frac{99a^8b^4x^{185}}{37}+\frac{132a^7b^5x^{222}}{37}+\frac{132a^6b^6x^{259}}{37}+\frac{99a^5b^7x^{296}}{37}+\frac{55a^4b^8x^{333}}{37}+\frac{22a^3b^9x^{370}}{37}+\frac{6a^2b^{10}x^{407}}{37}+\frac{ab^{11}x^{444}}{37}+\frac{b^{12}x^{481}}{481}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**36*(b*x**37+a)**12,x)
```

```
[Out] a**12*x**37/37 + 6*a**11*b*x**74/37 + 22*a**10*b**2*x**111/37 + 5
5*a**9*b**3*x**148/37 + 99*a**8*b**4*x**185/37 + 132*a**7*b**5*x*
*222/37 + 132*a**6*b**6*x**259/37 + 99*a**5*b**7*x**296/37 + 55*a
**4*b**8*x**333/37 + 22*a**3*b**9*x**370/37 + 6*a**2*b**10*x**407
/37 + a*b**11*x**444/37 + b**12*x**481/481
```

GIAC/XCAS [A] time = 0.214509, size = 19, normalized size = 1.19

$$\frac{\left(bx^{37}+a\right)^{13}}{481\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^37 + a)^12*x^36,x, algorithm="giac")
```

```
[Out] 1/481*(b*x^37 + a)^13/b
```

3.2588 $\int x^{12m} \left(a+bx^{1+12m}\right)^{12} dx$

Optimal. Leaf size=27

$$\frac{\left(a+bx^{12m+1}\right)^{13}}{13b(12m+1)}$$

```
[Out] (a + b*x^(1 + 12*m))^13/(13*b*(1 + 12*m))
```

Rubi [A] time = 0.0273397, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.053$

$$\frac{\left(a+bx^{12m+1}\right)^{13}}{13b(12m+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(12*m)*(a + b*x^(1 + 12*m))^12,x]

[Out] (a + b*x^(1 + 12*m))^13/(13*b*(1 + 12*m))
```

Rubi in Sympy [A] time = 2.72379, size = 19, normalized size = 0.7

$$\frac{\left(a+bx^{12m+1}\right)^{13}}{13b\left(12m+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(12*m)*(a+b*x**(1+12*m))**12,x)

[Out] (a + b*x**(12*m + 1))**13/(13*b*(12*m + 1))
```

Mathematica [A] time = 0.0296112, size = 24, normalized size = 0.89

$$\frac{\left(a+bx^{12m+1}\right)^{13}}{156bm+13b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(12*m)*(a + b*x^(1 + 12*m))^12,x]

[Out] (a + b*x^(1 + 12*m))^13/(13*b + 156*b*m)
```

Maple [B] time = 0.046, size = 311, normalized size = 11.5

$$\frac{b^{12}x^{13}\left(x^{12m}\right)^{13}}{13+156m}+\frac{ab^{11}x^{12}\left(x^{12m}\right)^{12}}{1+12m}+6\frac{a^{2}b^{10}x^{11}\left(x^{12m}\right)^{11}}{1+12m}+22\frac{a^{3}b^{9}x^{10}\left(x^{12m}\right)^{10}}{1+12m}+55\frac{a^{4}b^{8}x^{9}\left(x^{12m}\right)^{9}}{1+12m}+99\frac{a^{5}b^{7}x^{8}\left(x^{12m}\right)^{8}}{1+12m}+132\frac{a^{6}b^{6}x^{7}\left(x^{12m}\right)^{7}}{1+12m}+132\frac{a^{7}b^{5}x^{6}\left(x^{12m}\right)^{6}}{1+12m}+99\frac{a^{8}b^{4}x^{5}\left(x^{12m}\right)^{5}}{1+12m}+55\frac{a^{9}b^{3}x^{4}\left(x^{12m}\right)^{4}}{1+12m}+22\frac{a^{10}b^{2}x^{3}\left(x^{12m}\right)^{3}}{1+12m}+6\frac{a^{11}bx^{2}\left(x^{12m}\right)^{2}}{1+12m}+\frac{a^{12}xx^{12m}}{1+12m}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(12*m)*(a+b*x^(1+12*m))^12,x)
```

```
[Out] 1/13*b^12*x^13/(1+12*m)*(x^(12*m))^13+a*b^11*x^12/(1+12*m)*(x^(12
*m))^12+6*a^2*b^10*x^11/(1+12*m)*(x^(12*m))^11+22*a^3*b^9*x^10/(1
+12*m)*(x^(12*m))^10+55*a^4*b^8*x^9/(1+12*m)*(x^(12*m))^9+99*a^5*
b^7*x^8/(1+12*m)*(x^(12*m))^8+132*a^6*b^6*x^7/(1+12*m)*(x^(12*m))
^7+132*a^7*b^5*x^6/(1+12*m)*(x^(12*m))^6+99*a^8*b^4*x^5/(1+12*m)*
(x^(12*m))^5+55*a^9*b^3*x^4/(1+12*m)*(x^(12*m))^4+22*a^10*b^2*x^3
/(1+12*m)*(x^(12*m))^3+6*a^11*b*x^2/(1+12*m)*(x^(12*m))^2+a^12/(1
+12*m)*x*x^(12*m)
```

Maxima [A] time = 1.45438, size = 34, normalized size = 1.26

$$\frac{\left(bx^{12\,m+1}+a\right)^{13}}{13\,b(12\,m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(12*m + 1) + a)^12*x^(12*m),x, algorithm="maxima")
```

```
[Out] 1/13*(b*x^(12*m + 1) + a)^13/(b*(12*m + 1))
```

Fricas [A] time = 0.229357, size = 262, normalized size = 9.7

$$\frac{b^{12}x^{156\,m+13}+13\,ab^{11}x^{144\,m+12}+78\,a^2b^{10}x^{132\,m+11}+286\,a^3b^9x^{120\,m+10}+715\,a^4b^8x^{108\,m+9}+1287\,a^5b^7x^{96\,m+8}+1716\,a^6b^6x^{84}}{13\,(12\,m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(12*m + 1) + a)^12*x^(12*m),x, algorithm="fricas")
```

```
[Out] 1/13*(b^12*x^(156*m + 13) + 13*a*b^11*x^(144*m + 12) + 78*a^2*b^1
0*x^(132*m + 11) + 286*a^3*b^9*x^(120*m + 10) + 715*a^4*b^8*x^(10
8*m + 9) + 1287*a^5*b^7*x^(96*m + 8) + 1716*a^6*b^6*x^(84*m + 7)
+ 1716*a^7*b^5*x^(72*m + 6) + 1287*a^8*b^4*x^(60*m + 5) + 715*a^9
*b^3*x^(48*m + 4) + 286*a^10*b^2*x^(36*m + 3) + 78*a^11*b*x^(24*m
 + 2) + 13*a^12*x^(12*m + 1))/(12*m + 1)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(12*m)*(a+b*x**(1+12*m))**12,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.245124, size = 294, normalized size = 10.89

$$\frac{b^{12}x^{13}e^{(156\,m\ln(x))}+13\,ab^{11}x^{12}e^{(144\,m\ln(x))}+78\,a^2b^{10}x^{11}e^{(132\,m\ln(x))}+286\,a^3b^9x^{10}e^{(120\,m\ln(x))}+715\,a^4b^8x^9e^{(108\,m\ln(x))}+1287\,a}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(12*m + 1) + a)^12*x^(12*m),x, algorithm="giac")
```

```
[Out] 1/13*(b^12*x^13*e^(156*m*ln(x)) + 13*a*b^11*x^12*e^(144*m*ln(x))
+ 78*a^2*b^10*x^11*e^(132*m*ln(x)) + 286*a^3*b^9*x^10*e^(120*m*ln
(x)) + 715*a^4*b^8*x^9*e^(108*m*ln(x)) + 1287*a^5*b^7*x^8*e^(96*m
*ln(x)) + 1716*a^6*b^6*x^7*e^(84*m*ln(x)) + 1716*a^7*b^5*x^6*e^(7
2*m*ln(x)) + 1287*a^8*b^4*x^5*e^(60*m*ln(x)) + 715*a^9*b^3*x^4*e^
(48*m*ln(x)) + 286*a^10*b^2*x^3*e^(36*m*ln(x)) + 78*a^11*b*x^2*e^
(24*m*ln(x)) + 13*a^12*x*e^(12*m*ln(x)))/(12*m + 1)
```

3.2589 $\int x^{12+12(-1+m)} \left(a+bx^{1+12m}\right)^{12} dx$

Optimal. Leaf size=27

$$\frac{\left(a+bx^{12m+1}\right)^{13}}{13b(12m+1)}$$

```
[Out] (a + b*x^(1 + 12*m))^13/(13*b*(1 + 12*m))
```

Rubi [A] time = 0.0229146, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.043$

$$\frac{\left(a+bx^{12m+1}\right)^{13}}{13b(12m+1)}$$

Antiderivative was successfully verified.

```
[In] Int[x^(12 + 12*(-1 + m))*(a + b*x^(1 + 12*m))^12,x]

[Out] (a + b*x^(1 + 12*m))^13/(13*b*(1 + 12*m))
```

Rubi in Sympy [A] time = 2.72144, size = 19, normalized size = 0.7

$$\frac{\left(a+bx^{12m+1}\right)^{13}}{13b\left(12m+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(12*m)*(a+b*x**(1+12*m))**12,x)

[Out] (a + b*x**(12*m + 1))**13/(13*b*(12*m + 1))
```

Mathematica [A] time = 0.0104215, size = 24, normalized size = 0.89

$$\frac{\left(a+bx^{12m+1}\right)^{13}}{156bm+13b}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(12 + 12*(-1 + m))*(a + b*x^(1 + 12*m))^12,x]

[Out] (a + b*x^(1 + 12*m))^13/(13*b + 156*b*m)
```

Maple [B] time = 0., size = 311, normalized size = 11.5

$$\frac{b^{12}x^{13}\left(x^{12m}\right)^{13}}{13+156m}+\frac{ab^{11}x^{12}\left(x^{12m}\right)^{12}}{1+12m}+6\frac{a^{2}b^{10}x^{11}\left(x^{12m}\right)^{11}}{1+12m}+22\frac{a^{3}b^{9}x^{10}\left(x^{12m}\right)^{10}}{1+12m}+55\frac{a^{4}b^{8}x^{9}\left(x^{12m}\right)^{9}}{1+12m}+99\frac{a^{5}b^{7}x^{8}\left(x^{12m}\right)^{8}}{1+12m}+132\frac{a^{6}b^{6}x^{7}\left(x^{12m}\right)^{7}}{1+12m}+132\frac{a^{7}b^{5}x^{6}\left(x^{12m}\right)^{6}}{1+12m}+99\frac{a^{8}b^{4}x^{5}\left(x^{12m}\right)^{5}}{1+12m}+55\frac{a^{9}b^{3}x^{4}\left(x^{12m}\right)^{4}}{1+12m}+22\frac{a^{10}b^{2}x^{3}\left(x^{12m}\right)^{3}}{1+12m}+6\frac{a^{11}bx^{2}\left(x^{12m}\right)^{2}}{1+12m}+\frac{a^{12}xx^{12m}}{1+12m}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(12*m)*(a+b*x^(1+12*m))^12,x)
```

```
[Out] 1/13*b^12*x^13/(1+12*m)*(x^(12*m))^13+a*b^11*x^12/(1+12*m)*(x^(12
*m))^12+6*a^2*b^10*x^11/(1+12*m)*(x^(12*m))^11+22*a^3*b^9*x^10/(1
+12*m)*(x^(12*m))^10+55*a^4*b^8*x^9/(1+12*m)*(x^(12*m))^9+99*a^5*
b^7*x^8/(1+12*m)*(x^(12*m))^8+132*a^6*b^6*x^7/(1+12*m)*(x^(12*m))
^7+132*a^7*b^5*x^6/(1+12*m)*(x^(12*m))^6+99*a^8*b^4*x^5/(1+12*m)*
(x^(12*m))^5+55*a^9*b^3*x^4/(1+12*m)*(x^(12*m))^4+22*a^10*b^2*x^3
/(1+12*m)*(x^(12*m))^3+6*a^11*b*x^2/(1+12*m)*(x^(12*m))^2+a^12/(1
+12*m)*x*x^(12*m)
```

Maxima [A] time = 1.43444, size = 34, normalized size = 1.26

$$\frac{\left(bx^{12\,m+1}+a\right)^{13}}{13\,b(12\,m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(12*m + 1) + a)^12*x^(12*m),x, algorithm="maxima")
```

```
[Out] 1/13*(b*x^(12*m + 1) + a)^13/(b*(12*m + 1))
```

Fricas [A] time = 0.227371, size = 262, normalized size = 9.7

$$\frac{b^{12}x^{156\,m+13}+13\,ab^{11}x^{144\,m+12}+78\,a^{2}b^{10}x^{132\,m+11}+286\,a^{3}b^{9}x^{120\,m+10}+715\,a^{4}b^{8}x^{108\,m+9}+1287\,a^{5}b^{7}x^{96\,m+8}+1716\,a^{6}b^{6}x^{84}}{13\,(12\,m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(12*m + 1) + a)^12*x^(12*m),x, algorithm="fricas")
```

```
[Out] 1/13*(b^12*x^(156*m + 13) + 13*a*b^11*x^(144*m + 12) + 78*a^2*b^1
0*x^(132*m + 11) + 286*a^3*b^9*x^(120*m + 10) + 715*a^4*b^8*x^(10
8*m + 9) + 1287*a^5*b^7*x^(96*m + 8) + 1716*a^6*b^6*x^(84*m + 7)
+ 1716*a^7*b^5*x^(72*m + 6) + 1287*a^8*b^4*x^(60*m + 5) + 715*a^9
*b^3*x^(48*m + 4) + 286*a^10*b^2*x^(36*m + 3) + 78*a^11*b*x^(24*m
 + 2) + 13*a^12*x^(12*m + 1))/(12*m + 1)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(12*m)*(a+b*x**(1+12*m))**12,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.241854, size = 294, normalized size = 10.89

$$\frac{b^{12}x^{13}e^{(156\,m\ln(x))}+13\,ab^{11}x^{12}e^{(144\,m\ln(x))}+78\,a^{2}b^{10}x^{11}e^{(132\,m\ln(x))}+286\,a^{3}b^{9}x^{10}e^{(120\,m\ln(x))}+715\,a^{4}b^{8}x^{9}e^{(108\,m\ln(x))}+1287\,a}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(12*m + 1) + a)^12*x^(12*m),x, algorithm="giac")
```

```
[Out] 1/13*(b^12*x^13*e^(156*m*ln(x)) + 13*a*b^11*x^12*e^(144*m*ln(x))
+ 78*a^2*b^10*x^11*e^(132*m*ln(x)) + 286*a^3*b^9*x^10*e^(120*m*ln
(x)) + 715*a^4*b^8*x^9*e^(108*m*ln(x)) + 1287*a^5*b^7*x^8*e^(96*m
*ln(x)) + 1716*a^6*b^6*x^7*e^(84*m*ln(x)) + 1716*a^7*b^5*x^6*e^(7
2*m*ln(x)) + 1287*a^8*b^4*x^5*e^(60*m*ln(x)) + 715*a^9*b^3*x^4*e^
(48*m*ln(x)) + 286*a^10*b^2*x^3*e^(36*m*ln(x)) + 78*a^11*b*x^2*e^
(24*m*ln(x)) + 13*a^12*x*e^(12*m*ln(x)))/(12*m + 1)
```

3.2590 $\int \frac{x^{-1+5n}}{a+bx^n}\,dx$

Optimal. Leaf size=82

$$\frac{a^4\log(a+bx^n)}{b^5n}-\frac{a^3x^n}{b^4n}+\frac{a^2x^{2n}}{2b^3n}-\frac{ax^{3n}}{3b^2n}+\frac{x^{4n}}{4bn}$$

```
[Out] -((a^3*x^n)/(b^4*n)) + (a^2*x^(2*n))/(2*b^3*n) - (a*x^(3*n))/(3*b
^2*n) + x^(4*n)/(4*b*n) + (a^4*Log[a + b*x^n])/(b^5*n)
```

Rubi [A] time = 0.115967, antiderivative size = 82, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{a^4\log(a+bx^n)}{b^5n}-\frac{a^3x^n}{b^4n}+\frac{a^2x^{2n}}{2b^3n}-\frac{ax^{3n}}{3b^2n}+\frac{x^{4n}}{4bn}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + 5*n)/(a + b*x^n),x]
```

```
[Out] -((a^3*x^n)/(b^4*n)) + (a^2*x^(2*n))/(2*b^3*n) - (a*x^(3*n))/(3*b
^2*n) + x^(4*n)/(4*b*n) + (a^4*Log[a + b*x^n])/(b^5*n)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^4\log(a+bx^n)}{b^5n}+\frac{a^2\int^{x^n}x\,dx}{b^3n}-\frac{ax^{3n}}{3b^2n}+\frac{x^{4n}}{4bn}-\frac{\int^{x^n}a^3\,dx}{b^4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+5*n)/(a+b*x**n),x)
```

```
[Out] a**4*log(a + b*x**n)/(b**5*n) + a**2*Integral(x, (x, x**n))/(b**3
*n) - a*x**(3*n)/(3*b**2*n) + x**(4*n)/(4*b*n) - Integral(a**3, (
x, x**n))/(b**4*n)
```

Mathematica [A] time = 0.0473184, size = 65, normalized size = 0.79

$$\frac{12a^4\log(a+bx^n)+bx^n\left(-12a^3+6a^2bx^n-4ab^2x^{2n}+3b^3x^{3n}\right)}{12b^5n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + 5*n)/(a + b*x^n),x]
```

```
[Out] (b*x^n*(-12*a^3 + 6*a^2*b*x^n - 4*a*b^2*x^(2*n) + 3*b^3*x^(3*n))
+ 12*a^4*Log[a + b*x^n])/(12*b^5*n)
```

Maple [A] time = 0.041, size = 87, normalized size = 1.1

$$\frac{\left(e^{n\ln(x)}\right)^4}{4\,bn}-\frac{a\left(e^{n\ln(x)}\right)^3}{3\,b^2n}+\frac{a^2\left(e^{n\ln(x)}\right)^2}{2\,b^3n}-\frac{a^3e^{n\ln(x)}}{b^4n}+\frac{a^4\ln\left(a+be^{n\ln(x)}\right)}{b^5n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+5*n)/(a+b*x^n),x)
```

```
[Out] 1/4/b/n*exp(n*ln(x))^4-1/3*a/b^2/n*exp(n*ln(x))^3+1/2*a^2/b^3/n*e
xp(n*ln(x))^2-a^3/b^4/n*exp(n*ln(x))+a^4/b^5/n*ln(a+b*exp(n*ln(x)
))
```

Maxima [A] time = 1.45404, size = 97, normalized size = 1.18

$$\frac{a^4 \log\left(\frac{bx^n+a}{b}\right)}{b^5 n} + \frac{3\, b^3 x^{4\,n} - 4\, ab^2 x^{3\,n} + 6\, a^2 b x^{2\,n} - 12\, a^3 x^n}{12\, b^4 n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5*n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] a^4*log((b*x^n + a)/b)/(b^5*n) + 1/12*(3*b^3*x^(4*n) - 4*a*b^2*x^
(3*n) + 6*a^2*b*x^(2*n) - 12*a^3*x^n)/(b^4*n)
```

Fricas [A] time = 0.227608, size = 88, normalized size = 1.07

$$\frac{3\, b^4 x^{4\,n} - 4\, ab^3 x^{3\,n} + 6\, a^2 b^2 x^{2\,n} - 12\, a^3 b x^n + 12\, a^4 \log\left(bx^n + a\right)}{12\, b^5 n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5*n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] 1/12*(3*b^4*x^(4*n) - 4*a*b^3*x^(3*n) + 6*a^2*b^2*x^(2*n) - 12*a^
3*b*x^n + 12*a^4*log(b*x^n + a))/(b^5*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+5*n)/(a+b*x**n),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{5\,n-1}}{bx^n + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5*n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(5*n - 1)/(b*x^n + a), x)
```

3.2591 $\int \frac{x^{-1+4n}}{a+bx^n} dx$

Optimal. Leaf size=64

$$-\frac{a^3 \log(a+bx^n)}{b^4 n}+\frac{a^2 x^n}{b^3 n}-\frac{a x^{2n}}{2 b^2 n}+\frac{x^{3n}}{3 b n}$$

```
[Out] (a^2*x^n)/(b^3*n) - (a*x^(2*n))/(2*b^2*n) + x^(3*n)/(3*b*n) - (a^
3*Log[a + b*x^n])/(b^4*n)
```

Rubi [A] time = 0.0872107, antiderivative size = 64, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$

$$-\frac{a^3 \log(a+bx^n)}{b^4 n}+\frac{a^2 x^n}{b^3 n}-\frac{a x^{2n}}{2 b^2 n}+\frac{x^{3n}}{3 b n}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 + 4*n)/(a + b*x^n),x]
```

```
[Out] (a^2*x^n)/(b^3*n) - (a*x^(2*n))/(2*b^2*n) + x^(3*n)/(3*b*n) - (a^
3*Log[a + b*x^n])/(b^4*n)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^3 \log(a+bx^n)}{b^4 n}-\frac{a \int^{x^n} x\, dx}{b^2 n}+\frac{x^{3n}}{3 b n}+\frac{\int^{x^n} a^2\, dx}{b^3 n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1+4*n)/(a+b*x**n),x)
```

```
[Out] -a**3*log(a + b*x**n)/(b**4*n) - a*Integral(x, (x, x**n))/(b**2*n
) + x**(3*n)/(3*b*n) + Integral(a**2, (x, x**n))/(b**3*n)
```

Mathematica [A] time = 0.0366665, size = 52, normalized size = 0.81

$$\frac{bx^n\left(6a^2-3abx^n+2b^2x^{2n}\right)-6a^3\log(a+bx^n)}{6b^4 n}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 + 4*n)/(a + b*x^n),x]
```

```
[Out] (b*x^n*(6*a^2 - 3*a*b*x^n + 2*b^2*x^(2*n)) - 6*a^3*Log[a + b*x^n]
)/(6*b^4*n)
```

Maple [A] time = 0.035, size = 69, normalized size = 1.1

$$\frac{a^2 e^{n\ln(x)}}{b^3 n}+\frac{\left(e^{n\ln(x)}\right)^3}{3\,bn}-\frac{a\left(e^{n\ln(x)}\right)^2}{2\,b^2 n}-\frac{a^3\ln\left(a+be^{n\ln(x)}\right)}{b^4 n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+4*n)/(a+b*x^n),x)
```

```
[Out] a^2/b^3/n*exp(n*ln(x))+1/3/b/n*exp(n*ln(x))^3-1/2*a/b^2/n*exp(n*l
n(x))^2-a^3/b^4/n*ln(a+b*exp(n*ln(x)))
```

Maxima [A] time = 1.44879, size = 81, normalized size = 1.27

$$-\frac{a^3 \log\left(\frac{bx^n+a}{b}\right)}{b^4 n} + \frac{2\, b^2 x^{3\, n} - 3\, abx^{2\, n} + 6\, a^2 x^n}{6\, b^3 n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(4*n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] -a^3*log((b*x^n + a)/b)/(b^4*n) + 1/6*(2*b^2*x^(3*n) - 3*a*b*x^(2
*n) + 6*a^2*x^n)/(b^3*n)
```

Fricas [A] time = 0.226907, size = 70, normalized size = 1.09

$$\frac{2\, b^3 x^{3\, n} - 3\, ab^2 x^{2\, n} + 6\, a^2 bx^n - 6\, a^3 \log\left(bx^n + a\right)}{6\, b^4 n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(4*n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] 1/6*(2*b^3*x^(3*n) - 3*a*b^2*x^(2*n) + 6*a^2*b*x^n - 6*a^3*log(b*
x^n + a))/(b^4*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+4*n)/(a+b*x**n),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{4\, n-1}}{bx^n + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(4*n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(4*n - 1)/(b*x^n + a), x)
```

3.2592 $\int \frac{x^{-1+3n}}{a+bx^n} dx$

Optimal. Leaf size=46

$$\frac{a^2 \log(a+bx^n)}{b^3 n} - \frac{ax^n}{b^2 n} + \frac{x^{2n}}{2bn}$$

```
[Out] -((a*x^n)/(b^2*n)) + x^(2*n)/(2*b*n) + (a^2*Log[a + b*x^n])/(b^3*
n)
```

Rubi [A] time = 0.0678636, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{a^2 \log(a+bx^n)}{b^3 n} - \frac{ax^n}{b^2 n} + \frac{x^{2n}}{2bn}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 + 3*n)/(a + b*x^n),x]
```

```
[Out] -((a*x^n)/(b^2*n)) + x^(2*n)/(2*b*n) + (a^2*Log[a + b*x^n])/(b^3*
n)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^2 \log(a+bx^n)}{b^3 n} + \frac{\int^{x^n} x\, dx}{bn} - \frac{\int^{x^n} a\, dx}{b^2 n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1+3*n)/(a+b*x**n),x)
```

```
[Out] a**2*log(a + b*x**n)/(b**3*n) + Integral(x, (x, x**n))/(b*n) - In
tegral(a, (x, x**n))/(b**2*n)
```

Mathematica [A] time = 0.0276904, size = 38, normalized size = 0.83

$$\frac{2a^2 \log(a+bx^n) + bx^n(bx^n - 2a)}{2b^3 n}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 + 3*n)/(a + b*x^n),x]
```

```
[Out] (b*x^n*(-2*a + b*x^n) + 2*a^2*Log[a + b*x^n])/(2*b^3*n)
```

Maple [A] time = 0.031, size = 51, normalized size = 1.1

$$\frac{\left(e^{n\ln(x)}\right)^2}{2\,bn} - \frac{ae^{n\ln(x)}}{b^2 n} + \frac{a^2 \ln\left(a+be^{n\ln(x)}\right)}{b^3 n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-1+3*n)/(a+b*x^n),x)
```

```
[Out] 1/2/b/n*exp(n*ln(x))^2-a/b^2/n*exp(n*ln(x))+a^2/b^3/n*ln(a+b*exp(
n*ln(x)))
```

Maxima [A] time = 1.43554, size = 61, normalized size = 1.33

$$\frac{a^2 \log\left(\frac{bx^n+a}{b}\right)}{b^3 n} + \frac{bx^{2n} - 2\,ax^n}{2\,b^2 n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3*n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] a^2*log((b*x^n + a)/b)/(b^3*n) + 1/2*(b*x^(2*n) - 2*a*x^n)/(b^2*n
)
```

Fricas [A] time = 0.227472, size = 51, normalized size = 1.11

$$\frac{b^2x^{2n} - 2\,abx^n + 2\,a^2 \log\left(bx^n + a\right)}{2\,b^3 n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3*n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] 1/2*(b^2*x^(2*n) - 2*a*b*x^n + 2*a^2*log(b*x^n + a))/(b^3*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+3*n)/(a+b*x**n),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{3n-1}}{bx^n + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3*n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(3*n - 1)/(b*x^n + a), x)
```

3.2593 $\int \frac{x^{-1+2n}}{a+bx^n}\,dx$

Optimal. Leaf size=28

$$\frac{x^n}{bn}-\frac{a\log\left(a+bx^n\right)}{b^2n}$$

```
[Out] x^n/(b*n) - (a*Log[a + b*x^n])/(b^2*n)
```

Rubi [A] time = 0.049351, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{x^n}{bn}-\frac{a\log\left(a+bx^n\right)}{b^2n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + 2*n)/(a + b*x^n),x]

[Out] x^n/(b*n) - (a*Log[a + b*x^n])/(b^2*n)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a\log\left(a+bx^n\right)}{b^2n}+\frac{\int^{x^n}\frac{1}{b}\,dx}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+2*n)/(a+b*x**n),x)

[Out] -a*log(a + b*x**n)/(b**2*n) + Integral(1/b, (x, x**n))/n
```

Mathematica [A] time = 0.0177155, size = 24, normalized size = 0.86

$$\frac{bx^n-a\log\left(a+bx^n\right)}{b^2n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + 2*n)/(a + b*x^n),x]

[Out] (b*x^n - a*Log[a + b*x^n])/(b^2*n)
```

Maple [A] time = 0.026, size = 33, normalized size = 1.2

$$\frac{e^{n\ln(x)}}{bn}-\frac{a\ln\left(a+be^{n\ln(x)}\right)}{b^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+2*n)/(a+b*x^n),x)

[Out] 1/b/n*exp(n*ln(x))-a/b^2/n*ln(a+b*exp(n*ln(x)))
```

Maxima [A] time = 1.4294, size = 43, normalized size = 1.54

$$\frac{x^n}{bn} - \frac{a\log\left(\frac{bx^n+a}{b}\right)}{b^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(2*n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] x^n/(b*n) - a*log((b*x^n + a)/b)/(b^2*n)
```

Fricas [A] time = 0.226178, size = 32, normalized size = 1.14

$$\frac{bx^n - a\log\left(bx^n + a\right)}{b^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(2*n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] (b*x^n - a*log(b*x^n + a))/(b^2*n)
```

Sympy [A] time = 46.084, size = 41, normalized size = 1.46

$$\begin{cases} \frac{\log(x)}{a} & \text{for } b = 0 \wedge n = 0 \\ \frac{\log(x)}{a+b} & \text{for } n = 0 \\ \frac{x^{2n}}{2an} & \text{for } b = 0 \\ -\frac{a\log\left(\frac{a}{b}+x^n\right)}{b^2n} + \frac{x^n}{bn} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+2*n)/(a+b*x**n),x)
```

```
[Out] Piecewise((log(x)/a, Eq(b, 0) & Eq(n, 0)), (log(x)/(a + b), Eq(n,
 0)), (x**(2*n)/(2*a*n), Eq(b, 0)), (-a*log(a/b + x**n)/(b**2*n)
+ x**n/(b*n), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{2n-1}}{bx^n + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(2*n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(2*n - 1)/(b*x^n + a), x)
```

3.2594 $\int \frac{x^{-1+n}}{a+bx^n} \, dx$

Optimal. Leaf size=15

$$\frac{\log(a+bx^n)}{bn}$$

```
[Out] Log[a + b*x^n]/(b*n)
```

Rubi [A] time = 0.0198588, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$\frac{\log(a+bx^n)}{bn}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + n)/(a + b*x^n),x]

[Out] Log[a + b*x^n]/(b*n)
```

Rubi in Sympy [A] time = 2.46656, size = 10, normalized size = 0.67

$$\frac{\log(a+bx^n)}{bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+n)/(a+b*x**n),x)

[Out] log(a + b*x**n)/(b*n)
```

Mathematica [A] time = 0.00406986, size = 15, normalized size = 1.

$$\frac{\log(a+bx^n)}{bn}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + n)/(a + b*x^n),x]

[Out] Log[a + b*x^n]/(b*n)
```

Maple [A] time = 0.021, size = 18, normalized size = 1.2

$$\frac{\ln\left(a+be^{n\ln(x)}\right)}{bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+n)/(a+b*x^n),x)

[Out] 1/b/n*ln(a+b*exp(n*ln(x)))
```

Maxima [A] time = 1.43817, size = 20, normalized size = 1.33

$$\frac{\log\left(bx^{n}+a\right)}{bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] log(b*x^n + a)/(b*n)
```

Fricas [A] time = 0.218754, size = 20, normalized size = 1.33

$$\frac{\log\left(bx^{n}+a\right)}{bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] log(b*x^n + a)/(b*n)
```

Sympy [A] time = 8.18411, size = 27, normalized size = 1.8

$$\begin{cases} \frac{\log\left(x\right)}{a} & \text{for}\: b = 0 \wedge n = 0 \\ \frac{\log\left(x\right)}{a+b} & \text{for}\: n = 0 \\ \frac{x^{n}}{an} & \text{for}\: b = 0 \\ \frac{\log\left(\frac{a}{b}+x^{n}\right)}{bn} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+n)/(a+b*x**n),x)
```

```
[Out] Piecewise((log(x)/a, Eq(b, 0) & Eq(n, 0)), (log(x)/(a + b), Eq(n,
 0)), (x**n/(a*n), Eq(b, 0)), (log(a/b + x**n)/(b*n), True))
```

GIAC/XCAS [A] time = 0.215302, size = 22, normalized size = 1.47

$$\frac{\ln\left(|bx^{n}+a|\right)}{bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] ln(abs(b*x^n + a))/(b*n)
```

3.2595 $\int \frac{1}{x(a+bx^n)} \, dx$

Optimal. Leaf size=23

$$\frac{\log(x)}{a} - \frac{\log(a+bx^n)}{an}$$

```
[Out] Log[x]/a - Log[a + b*x^n]/(a*n)
```

Rubi [A] time = 0.0352205, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{\log(x)}{a} - \frac{\log(a+bx^n)}{an}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a + b*x^n)),x]

[Out] Log[x]/a - Log[a + b*x^n]/(a*n)
```

Rubi in Sympy [A] time = 6.48004, size = 19, normalized size = 0.83

$$\frac{\log(x^n)}{an} - \frac{\log(a+bx^n)}{an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(a+b*x**n),x)

[Out] log(x**n)/(a*n) - log(a + b*x**n)/(a*n)
```

Mathematica [A] time = 0.0144277, size = 22, normalized size = 0.96

$$\frac{n\log(x) - \log(a+bx^n)}{an}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a + b*x^n)),x]

[Out] (n*Log[x] - Log[a + b*x^n])/(a*n)
```

Maple [A] time = 0.002, size = 29, normalized size = 1.3

$$\frac{\ln(x^n)}{an} - \frac{\ln(a+bx^n)}{an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(a+b*x^n),x)

[Out] 1/n/a*ln(x^n)-ln(a+b*x^n)/a/n
```

Maxima [A] time = 1.4205, size = 38, normalized size = 1.65

$$-\frac{\log\left(bx^n+a\right)}{an}+\frac{\log\left(x^n\right)}{an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)*x),x, algorithm="maxima")
```

```
[Out] -log(b*x^n + a)/(a*n) + log(x^n)/(a*n)
```

Fricas [A] time = 0.226676, size = 30, normalized size = 1.3

$$\frac{n\log\left(x\right)-\log\left(bx^n+a\right)}{an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)*x),x, algorithm="fricas")
```

```
[Out] (n*log(x) - log(b*x^n + a))/(a*n)
```

Sympy [A] time = 2.27346, size = 41, normalized size = 1.78

$$\begin{cases} \tilde{\infty}\log\left(x\right) & \text{for } a=0\wedge b=0\wedge n=0 \\ \frac{\log\left(x\right)}{a} & \text{for } b=0 \\ \frac{\log\left(x\right)}{a+b} & \text{for } n=0 \\ -\frac{x^{-n}}{bn} & \text{for } a=0 \\ \frac{\log\left(x\right)}{a}-\frac{\log\left(\frac{a}{b}+x^n\right)}{an} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(a+b*x**n),x)
```

```
[Out] Piecewise((zoo*log(x), Eq(a, 0) & Eq(b, 0) & Eq(n, 0)), (log(x)/a
, Eq(b, 0)), (log(x)/(a + b), Eq(n, 0)), (-x**(-n)/(b*n), Eq(a, 0
)), (log(x)/a - log(a/b + x**n)/(a*n), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\left(bx^n+a\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)*x),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^n + a)*x), x)
```

3.2596 $\int \frac{x^{-1-n}}{a+bx^n}\,dx$

Optimal. Leaf size=38

$$\frac{b\log\left(a+bx^n\right)}{a^2n}-\frac{b\log(x)}{a^2}-\frac{x^{-n}}{an}$$

```
[Out] -(1/(a*n*x^n)) - (b*Log[x])/a^2 + (b*Log[a + b*x^n])/(a^2*n)
```

Rubi [A] time = 0.0625487, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{b\log\left(a+bx^n\right)}{a^2n}-\frac{b\log(x)}{a^2}-\frac{x^{-n}}{an}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 - n)/(a + b*x^n),x]

[Out] -(1/(a*n*x^n)) - (b*Log[x])/a^2 + (b*Log[a + b*x^n])/(a^2*n)
```

Rubi in Sympy [A] time = 9.73305, size = 34, normalized size = 0.89

$$-\frac{x^{-n}}{an}-\frac{b\log\left(x^n\right)}{a^2n}+\frac{b\log\left(a+bx^n\right)}{a^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1-n)/(a+b*x**n),x)

[Out] -x**(-n)/(a*n) - b*log(x**n)/(a**2*n) + b*log(a + b*x**n)/(a**2*n
)
```

Mathematica [A] time = 0.0246109, size = 32, normalized size = 0.84

$$\frac{b\log\left(ax^{-n}+b\right)}{a^2n}-\frac{x^{-n}}{an}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 - n)/(a + b*x^n),x]

[Out] -(1/(a*n*x^n)) + (b*Log[b + a/x^n])/(a^2*n)
```

Maple [A] time = 0.027, size = 50, normalized size = 1.3

$$\frac{1}{e^{n\ln(x)}}\left(-\frac{1}{an}-\frac{b\ln(x)\,e^{n\ln(x)}}{a^2}\right)+\frac{b\ln\left(a+be^{n\ln(x)}\right)}{a^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-1-n)/(a+b*x^n),x)
```

```
[Out] (-1/a/n-b/a^2*ln(x)*exp(n*ln(x)))/exp(n*ln(x))+b/a^2/n*ln(a+b*exp
(n*ln(x)))
```

Maxima [A] time = 1.43813, size = 57, normalized size = 1.5

$$-\frac{b\log(x)}{a^2}-\frac{x^{-n}}{an}+\frac{b\log\left(\frac{bx^n+a}{b}\right)}{a^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] -b*log(x)/a^2 - x^(-n)/(a*n) + b*log((b*x^n + a)/b)/(a^2*n)
```

Fricas [A] time = 0.227562, size = 50, normalized size = 1.32

$$-\frac{bnx^n\log(x)-bx^n\log(bx^n+a)+a}{a^2nx^n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] -(b*n*x^n*log(x) - b*x^n*log(b*x^n + a) + a)/(a^2*n*x^n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-n)/(a+b*x**n),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^{-n-1}}{bx^n+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(-n - 1)/(b*x^n + a), x)
```

3.2597 $\int \frac{x^{-1-2n}}{a+bx^n}\,dx$

Optimal. Leaf size=57

$$-\frac{b^2\log(a+bx^n)}{a^3n}+\frac{b^2\log(x)}{a^3}+\frac{bx^{-n}}{a^2n}-\frac{x^{-2n}}{2an}$$

```
[Out] -1/(2*a*n*x^(2*n)) + b/(a^2*n*x^n) + (b^2*Log[x])/a^3 - (b^2*Log[
a + b*x^n])/(a^3*n)
```

Rubi [A] time = 0.0799289, antiderivative size = 57, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{b^2\log(a+bx^n)}{a^3n}+\frac{b^2\log(x)}{a^3}+\frac{bx^{-n}}{a^2n}-\frac{x^{-2n}}{2an}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 - 2*n)/(a + b*x^n),x]
```

```
[Out] -1/(2*a*n*x^(2*n)) + b/(a^2*n*x^n) + (b^2*Log[x])/a^3 - (b^2*Log[
a + b*x^n])/(a^3*n)
```

Rubi in Sympy [A] time = 12.9972, size = 51, normalized size = 0.89

$$-\frac{x^{-2n}}{2an}+\frac{bx^{-n}}{a^2n}+\frac{b^2\log(x^n)}{a^3n}-\frac{b^2\log(a+bx^n)}{a^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1-2*n)/(a+b*x**n),x)
```

```
[Out] -x**(-2*n)/(2*a*n) + b*x**(-n)/(a**2*n) + b**2*log(x**n)/(a**3*n)
 - b**2*log(a + b*x**n)/(a**3*n)
```

Mathematica [A] time = 0.0389531, size = 46, normalized size = 0.81

$$-\frac{x^{-2n}\left(2b^2x^{2n}\log(ax^{-n}+b)+a(a-2bx^n)\right)}{2a^3n}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 - 2*n)/(a + b*x^n),x]
```

```
[Out] -(a*(a - 2*b*x^n) + 2*b^2*x^(2*n)*Log[b + a/x^n])/(2*a^3*n*x^(2*n
))
```

Maple [A] time = 0.032, size = 69, normalized size = 1.2

$$\frac{1}{\left(e^{n\ln(x)}\right)^2}\left(\frac{be^{n\ln(x)}}{a^2n}-\frac{1}{2\,an}+\frac{b^2\ln(x)\left(e^{n\ln(x)}\right)^2}{a^3}\right)-\frac{b^2\ln\left(a+be^{n\ln(x)}\right)}{a^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-2*n)/(a+b*x^n),x)
```

```
[Out] (b/a^2/n*exp(n*ln(x))-1/2/a/n+b^2/a^3*ln(x)*exp(n*ln(x))^2)/exp(n
*ln(x))^2-b^2/a^3/n*ln(a+b*exp(n*ln(x)))
```

Maxima [A] time = 1.4628, size = 76, normalized size = 1.33

$$\frac{b^2 \log(x)}{a^3} + \frac{(2\,bx^n - a)x^{-2\,n}}{2\,a^2 n} - \frac{b^2 \log\left(\frac{bx^n+a}{b}\right)}{a^3 n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-2*n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] b^2*log(x)/a^3 + 1/2*(2*b*x^n - a)*x^(-2*n)/(a^2*n) - b^2*log((b*
x^n + a)/b)/(a^3*n)
```

Fricas [A] time = 0.230255, size = 80, normalized size = 1.4

$$\frac{2\,b^2 n x^{2\,n} \log(x) - 2\,b^2 x^{2\,n} \log(bx^n + a) + 2\,abx^n - a^2}{2\,a^3 n x^{2\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-2*n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] 1/2*(2*b^2*n*x^(2*n)*log(x) - 2*b^2*x^(2*n)*log(b*x^n + a) + 2*a*
b*x^n - a^2)/(a^3*n*x^(2*n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-2*n)/(a+b*x**n),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{-2\,n-1}}{bx^n + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-2*n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(-2*n - 1)/(b*x^n + a), x)
```

3.2598 $\int \frac{x^{-1-3n}}{a+bx^n}\,dx$

Optimal. Leaf size=76

$$\frac{b^3\log(a+bx^n)}{a^4n}-\frac{b^3\log(x)}{a^4}-\frac{b^2x^{-n}}{a^3n}+\frac{bx^{-2n}}{2a^2n}-\frac{x^{-3n}}{3an}$$

```
[Out] -1/(3*a*n*x^(3*n)) + b/(2*a^2*n*x^(2*n)) - b^2/(a^3*n*x^n) - (b^3
*Log[x])/a^4 + (b^3*Log[a + b*x^n])/(a^4*n)
```

Rubi [A] time = 0.0945419, antiderivative size = 76, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{b^3\log(a+bx^n)}{a^4n}-\frac{b^3\log(x)}{a^4}-\frac{b^2x^{-n}}{a^3n}+\frac{bx^{-2n}}{2a^2n}-\frac{x^{-3n}}{3an}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 3*n)/(a + b*x^n),x]
```

```
[Out] -1/(3*a*n*x^(3*n)) + b/(2*a^2*n*x^(2*n)) - b^2/(a^3*n*x^n) - (b^3
*Log[x])/a^4 + (b^3*Log[a + b*x^n])/(a^4*n)
```

Rubi in Sympy [A] time = 15.5498, size = 66, normalized size = 0.87

$$-\frac{x^{-3n}}{3an}+\frac{bx^{-2n}}{2a^2n}-\frac{b^2x^{-n}}{a^3n}-\frac{b^3\log(x^n)}{a^4n}+\frac{b^3\log(a+bx^n)}{a^4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-3*n)/(a+b*x**n),x)
```

```
[Out] -x**(-3*n)/(3*a*n) + b*x**(-2*n)/(2*a**2*n) - b**2*x**(-n)/(a**3*
n) - b**3*log(x**n)/(a**4*n) + b**3*log(a + b*x**n)/(a**4*n)
```

Mathematica [A] time = 0.0403614, size = 61, normalized size = 0.8

$$\frac{x^{-3n}\left(a\left(-2a^2+3abx^n-6b^2x^{2n}\right)+6b^3x^{3n}\log\left(ax^{-n}+b\right)\right)}{6a^4n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 3*n)/(a + b*x^n),x]
```

```
[Out] (a*(-2*a^2 + 3*a*b*x^n - 6*b^2*x^(2*n)) + 6*b^3*x^(3*n)*Log[b + a
/x^n])/(6*a^4*n*x^(3*n))
```

Maple [A] time = 0.038, size = 88, normalized size = 1.2

$$\frac{1}{\left(e^{n\ln(x)}\right)^3}\left(-\frac{1}{3\,an}+\frac{be^{n\ln(x)}}{2\,a^2n}-\frac{b^2\left(e^{n\ln(x)}\right)^2}{a^3n}-\frac{b^3\ln(x)\left(e^{n\ln(x)}\right)^3}{a^4}\right)+\frac{b^3\ln\left(a+be^{n\ln(x)}\right)}{a^4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-3*n)/(a+b*x^n),x)
```

```
[Out] (-1/3/a/n+1/2*b/a^2/n*exp(n*ln(x))-b^2/a^3/n*exp(n*ln(x))^2-b^3/a
^4*ln(x)*exp(n*ln(x))^3)/exp(n*ln(x))^3+b^3/a^4/n*ln(a+b*exp(n*ln
(x)))
```

Maxima [A] time = 1.42239, size = 93, normalized size = 1.22

$$-\frac{b^3 \log(x)}{a^4} + \frac{b^3 \log\left(\frac{bx^n+a}{b}\right)}{a^4 n} - \frac{\left(6\, b^2 x^{2\,n} - 3\, abx^n + 2\, a^2\right) x^{-3\,n}}{6\, a^3 n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-3*n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] -b^3*log(x)/a^4 + b^3*log((b*x^n + a)/b)/(a^4*n) - 1/6*(6*b^2*x^(
2*n) - 3*a*b*x^n + 2*a^2)*x^(-3*n)/(a^3*n)
```

Fricas [A] time = 0.228453, size = 97, normalized size = 1.28

$$-\frac{6\, b^3 n x^{3\,n} \log(x) - 6\, b^3 x^{3\,n} \log\left(bx^n + a\right) + 6\, ab^2 x^{2\,n} - 3\, a^2 bx^n + 2\, a^3}{6\, a^4 n x^{3\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-3*n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] -1/6*(6*b^3*n*x^(3*n)*log(x) - 6*b^3*x^(3*n)*log(b*x^n + a) + 6*a
*b^2*x^(2*n) - 3*a^2*b*x^n + 2*a^3)/(a^4*n*x^(3*n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-3*n)/(a+b*x**n),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{-3\,n-1}}{bx^n + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-3*n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(-3*n - 1)/(b*x^n + a), x)
```

3.2599 $\int \frac{x^{4+5(-1+n)}}{a+bx^n}\,dx$

Optimal. Leaf size=82

$$\frac{a^4\log(a+bx^n)}{b^5n}-\frac{a^3x^n}{b^4n}+\frac{a^2x^{2n}}{2b^3n}-\frac{ax^{3n}}{3b^2n}+\frac{x^{4n}}{4bn}$$

```
[Out] -((a^3*x^n)/(b^4*n)) + (a^2*x^(2*n))/(2*b^3*n) - (a*x^(3*n))/(3*b
^2*n) + x^(4*n)/(4*b*n) + (a^4*Log[a + b*x^n])/(b^5*n)
```

Rubi [A] time = 0.105551, antiderivative size = 82, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$\frac{a^4\log(a+bx^n)}{b^5n}-\frac{a^3x^n}{b^4n}+\frac{a^2x^{2n}}{2b^3n}-\frac{ax^{3n}}{3b^2n}+\frac{x^{4n}}{4bn}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(4 + 5*(-1 + n))/(a + b*x^n),x]
```

```
[Out] -((a^3*x^n)/(b^4*n)) + (a^2*x^(2*n))/(2*b^3*n) - (a*x^(3*n))/(3*b
^2*n) + x^(4*n)/(4*b*n) + (a^4*Log[a + b*x^n])/(b^5*n)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^4\log(a+bx^n)}{b^5n}+\frac{a^2\int^{x^n}x\,dx}{b^3n}-\frac{ax^{3n}}{3b^2n}+\frac{x^{4n}}{4bn}-\frac{\int^{x^n}a^3\,dx}{b^4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+5*n)/(a+b*x**n),x)
```

```
[Out] a**4*log(a + b*x**n)/(b**5*n) + a**2*Integral(x, (x, x**n))/(b**3
*n) - a*x**(3*n)/(3*b**2*n) + x**(4*n)/(4*b*n) - Integral(a**3, (
x, x**n))/(b**4*n)
```

Mathematica [A] time = 0.0435782, size = 65, normalized size = 0.79

$$\frac{12a^4\log(a+bx^n)+bx^n\left(-12a^3+6a^2bx^n-4ab^2x^{2n}+3b^3x^{3n}\right)}{12b^5n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(4 + 5*(-1 + n))/(a + b*x^n),x]
```

```
[Out] (b*x^n*(-12*a^3 + 6*a^2*b*x^n - 4*a*b^2*x^(2*n) + 3*b^3*x^(3*n))
+ 12*a^4*Log[a + b*x^n])/(12*b^5*n)
```

Maple [A] time = 0., size = 87, normalized size = 1.1

$$\frac{\left(e^{n\ln(x)}\right)^4}{4bn}-\frac{a\left(e^{n\ln(x)}\right)^3}{3b^2n}+\frac{a^2\left(e^{n\ln(x)}\right)^2}{2b^3n}-\frac{a^3e^{n\ln(x)}}{b^4n}+\frac{a^4\ln\left(a+be^{n\ln(x)}\right)}{b^5n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+5*n)/(a+b*x^n),x)
```

```
[Out] 1/4/b/n*exp(n*ln(x))^4-1/3*a/b^2/n*exp(n*ln(x))^3+1/2*a^2/b^3/n*e
xp(n*ln(x))^2-a^3/b^4/n*exp(n*ln(x))+a^4/b^5/n*ln(a+b*exp(n*ln(x)
))
```

Maxima [A] time = 1.42853, size = 97, normalized size = 1.18

$$\frac{a^4 \log\left(\frac{bx^n+a}{b}\right)}{b^5 n} + \frac{3 b^3 x^{4n} - 4 ab^2 x^{3n} + 6 a^2 b x^{2n} - 12 a^3 x^n}{12 b^4 n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5*n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] a^4*log((b*x^n + a)/b)/(b^5*n) + 1/12*(3*b^3*x^(4*n) - 4*a*b^2*x^
(3*n) + 6*a^2*b*x^(2*n) - 12*a^3*x^n)/(b^4*n)
```

Fricas [A] time = 0.230745, size = 88, normalized size = 1.07

$$\frac{3 b^4 x^{4n} - 4 ab^3 x^{3n} + 6 a^2 b^2 x^{2n} - 12 a^3 bx^n + 12 a^4 \log(bx^n + a)}{12 b^5 n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5*n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] 1/12*(3*b^4*x^(4*n) - 4*a*b^3*x^(3*n) + 6*a^2*b^2*x^(2*n) - 12*a^
3*b*x^n + 12*a^4*log(b*x^n + a))/(b^5*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+5*n)/(a+b*x**n),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{5n-1}}{bx^n + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5*n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(5*n - 1)/(b*x^n + a), x)
```

3.2600 $\int \frac{x^{3+4(-1+n)}}{a+bx^n}\,dx$

Optimal. Leaf size=64

$$-\frac{a^3\log(a+bx^n)}{b^4n}+\frac{a^2x^n}{b^3n}-\frac{ax^{2n}}{2b^2n}+\frac{x^{3n}}{3bn}$$

```
[Out] (a^2*x^n)/(b^3*n) - (a*x^(2*n))/(2*b^2*n) + x^(3*n)/(3*b*n) - (a^
3*Log[a + b*x^n])/(b^4*n)
```

Rubi [A] time = 0.0812594, antiderivative size = 64, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$-\frac{a^3\log(a+bx^n)}{b^4n}+\frac{a^2x^n}{b^3n}-\frac{ax^{2n}}{2b^2n}+\frac{x^{3n}}{3bn}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(3 + 4*(-1 + n))/(a + b*x^n),x]
```

```
[Out] (a^2*x^n)/(b^3*n) - (a*x^(2*n))/(2*b^2*n) + x^(3*n)/(3*b*n) - (a^
3*Log[a + b*x^n])/(b^4*n)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^3\log(a+bx^n)}{b^4n}-\frac{a\int^{x^n}x\,dx}{b^2n}+\frac{x^{3n}}{3bn}+\frac{\int^{x^n}a^2\,dx}{b^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+4*n)/(a+b*x**n),x)
```

```
[Out] -a**3*log(a + b*x**n)/(b**4*n) - a*Integral(x, (x, x**n))/(b**2*n
) + x**(3*n)/(3*b*n) + Integral(a**2, (x, x**n))/(b**3*n)
```

Mathematica [A] time = 0.0365072, size = 52, normalized size = 0.81

$$\frac{bx^n\left(6a^2-3abx^n+2b^2x^{2n}\right)-6a^3\log(a+bx^n)}{6b^4n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(3 + 4*(-1 + n))/(a + b*x^n),x]
```

```
[Out] (b*x^n*(6*a^2 - 3*a*b*x^n + 2*b^2*x^(2*n)) - 6*a^3*Log[a + b*x^n]
)/(6*b^4*n)
```

Maple [A] time = 0., size = 69, normalized size = 1.1

$$\frac{a^2e^{n\ln(x)}}{b^3n}+\frac{\left(e^{n\ln(x)}\right)^3}{3\,bn}-\frac{a\left(e^{n\ln(x)}\right)^2}{2\,b^2n}-\frac{a^3\ln\left(a+be^{n\ln(x)}\right)}{b^4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+4*n)/(a+b*x^n),x)
```

```
[Out] a^2/b^3/n*exp(n*ln(x))+1/3/b/n*exp(n*ln(x))^3-1/2*a/b^2/n*exp(n*l
n(x))^2-a^3/b^4/n*ln(a+b*exp(n*ln(x)))
```

Maxima [A] time = 1.42216, size = 81, normalized size = 1.27

$$-\frac{a^3 \log\left(\frac{bx^n+a}{b}\right)}{b^4 n} + \frac{2\,b^2 x^{3\,n} - 3\,abx^{2\,n} + 6\,a^2 x^n}{6\,b^3 n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(4*n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] -a^3*log((b*x^n + a)/b)/(b^4*n) + 1/6*(2*b^2*x^(3*n) - 3*a*b*x^(2
*n) + 6*a^2*x^n)/(b^3*n)
```

Fricas [A] time = 0.227456, size = 70, normalized size = 1.09

$$\frac{2\,b^3 x^{3\,n} - 3\,ab^2 x^{2\,n} + 6\,a^2 bx^n - 6\,a^3 \log\left(bx^n + a\right)}{6\,b^4 n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(4*n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] 1/6*(2*b^3*x^(3*n) - 3*a*b^2*x^(2*n) + 6*a^2*b*x^n - 6*a^3*log(b*
x^n + a))/(b^4*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+4*n)/(a+b*x**n),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{4\,n-1}}{bx^n + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(4*n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(4*n - 1)/(b*x^n + a), x)
```

3.2601 $\int \frac{x^{2+3(-1+n)}}{a+bx^n}\,dx$

Optimal. Leaf size=46

$$\frac{a^2\log(a+bx^n)}{b^3n}-\frac{ax^n}{b^2n}+\frac{x^{2n}}{2bn}$$

```
[Out] -((a*x^n)/(b^2*n)) + x^(2*n)/(2*b*n) + (a^2*Log[a + b*x^n])/(b^3*
n)
```

Rubi [A] time = 0.0658019, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$\frac{a^2\log(a+bx^n)}{b^3n}-\frac{ax^n}{b^2n}+\frac{x^{2n}}{2bn}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(2 + 3*(-1 + n))/(a + b*x^n),x]
```

```
[Out] -((a*x^n)/(b^2*n)) + x^(2*n)/(2*b*n) + (a^2*Log[a + b*x^n])/(b^3*
n)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^2\log(a+bx^n)}{b^3n}+\frac{\int^{x^n} x\,dx}{bn}-\frac{\int^{x^n} a\,dx}{b^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+3*n)/(a+b*x**n),x)
```

```
[Out] a**2*log(a + b*x**n)/(b**3*n) + Integral(x, (x, x**n))/(b*n) - In
tegral(a, (x, x**n))/(b**2*n)
```

Mathematica [A] time = 0.0252838, size = 38, normalized size = 0.83

$$\frac{2a^2\log(a+bx^n)+bx^n(bx^n-2a)}{2b^3n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(2 + 3*(-1 + n))/(a + b*x^n),x]
```

```
[Out] (b*x^n*(-2*a + b*x^n) + 2*a^2*Log[a + b*x^n])/(2*b^3*n)
```

Maple [A] time = 0.001, size = 51, normalized size = 1.1

$$\frac{\left(e^{n\ln(x)}\right)^2}{2\,bn}-\frac{ae^{n\ln(x)}}{b^2n}+\frac{a^2\ln\left(a+be^{n\ln(x)}\right)}{b^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+3*n)/(a+b*x^n),x)
```

```
[Out] 1/2/b/n*exp(n*ln(x))^2-a/b^2/n*exp(n*ln(x))+a^2/b^3/n*ln(a+b*exp(
n*ln(x)))
```

Maxima [A] time = 1.45392, size = 61, normalized size = 1.33

$$\frac{a^2 \log\left(\frac{bx^n+a}{b}\right)}{b^3 n} + \frac{bx^{2n} - 2\,ax^n}{2\,b^2 n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3*n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] a^2*log((b*x^n + a)/b)/(b^3*n) + 1/2*(b*x^(2*n) - 2*a*x^n)/(b^2*n
)
```

Fricas [A] time = 0.226673, size = 51, normalized size = 1.11

$$\frac{b^2x^{2n} - 2\,abx^n + 2\,a^2 \log\left(bx^n + a\right)}{2\,b^3 n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3*n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] 1/2*(b^2*x^(2*n) - 2*a*b*x^n + 2*a^2*log(b*x^n + a))/(b^3*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+3*n)/(a+b*x**n),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{3n-1}}{bx^n + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3*n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(3*n - 1)/(b*x^n + a), x)
```

3.2602 $\int \frac{x^{1+2(-1+n)}}{a+bx^n}\,dx$

Optimal. Leaf size=28

$$\frac{x^n}{bn}-\frac{a\log\left(a+bx^n\right)}{b^2n}$$

```
[Out] x^n/(b*n) - (a*Log[a + b*x^n])/(b^2*n)
```

Rubi [A] time = 0.0473098, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$\frac{x^n}{bn}-\frac{a\log\left(a+bx^n\right)}{b^2n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(1 + 2*(-1 + n))/(a + b*x^n),x]
```

```
[Out] x^n/(b*n) - (a*Log[a + b*x^n])/(b^2*n)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a\log\left(a+bx^n\right)}{b^2n}+\frac{\int^{x^n}\frac{1}{b}\,dx}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+2*n)/(a+b*x**n),x)
```

```
[Out] -a*log(a + b*x**n)/(b**2*n) + Integral(1/b, (x, x**n))/n
```

Mathematica [A] time = 0.0135542, size = 24, normalized size = 0.86

$$\frac{bx^n-a\log\left(a+bx^n\right)}{b^2n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(1 + 2*(-1 + n))/(a + b*x^n),x]
```

```
[Out] (b*x^n - a*Log[a + b*x^n])/(b^2*n)
```

Maple [A] time = 0., size = 33, normalized size = 1.2

$$\frac{e^{n\ln(x)}}{bn}-\frac{a\ln\left(a+be^{n\ln(x)}\right)}{b^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+2*n)/(a+b*x^n),x)
```

```
[Out] 1/b/n*exp(n*ln(x))-a/b^2/n*ln(a+b*exp(n*ln(x)))
```

Maxima [A] time = 1.44976, size = 43, normalized size = 1.54

$$\frac{x^n}{bn} - \frac{a\log\left(\frac{bx^n+a}{b}\right)}{b^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(2*n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] x^n/(b*n) - a*log((b*x^n + a)/b)/(b^2*n)
```

Fricas [A] time = 0.226984, size = 32, normalized size = 1.14

$$\frac{bx^n - a\log\left(bx^n + a\right)}{b^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(2*n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] (b*x^n - a*log(b*x^n + a))/(b^2*n)
```

Sympy [A] time = 45.8575, size = 41, normalized size = 1.46

$$\begin{cases} \frac{\log\left(x\right)}{a} & \text{for}\ b = 0 \wedge n = 0 \\ \frac{\log\left(x\right)}{a+b} & \text{for}\ n = 0 \\ \frac{x^{2n}}{2an} & \text{for}\ b = 0 \\ -\frac{a\log\left(\frac{a}{b}+x^n\right)}{b^2n} + \frac{x^n}{bn} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+2*n)/(a+b*x**n),x)
```

```
[Out] Piecewise((log(x)/a, Eq(b, 0) & Eq(n, 0)), (log(x)/(a + b), Eq(n,
 0)), (x**(2*n)/(2*a*n), Eq(b, 0)), (-a*log(a/b + x**n)/(b**2*n)
+ x**n/(b*n), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{2\,n-1}}{bx^n + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(2*n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(2*n - 1)/(b*x^n + a), x)
```

3.2603 $\int \frac{x^{-1+n}}{a+bx^n}\,dx$

Optimal. Leaf size=15

$$\frac{\log(a+bx^n)}{bn}$$

```
[Out] Log[a + b*x^n]/(b*n)
```

Rubi [A] time = 0.0194998, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{\log(a+bx^n)}{bn}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + n)/(a + b*x^n),x]

[Out] Log[a + b*x^n]/(b*n)
```

Rubi in Sympy [A] time = 2.45018, size = 10, normalized size = 0.67

$$\frac{\log(a+bx^n)}{bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+n)/(a+b*x**n),x)

[Out] log(a + b*x**n)/(b*n)
```

Mathematica [A] time = 0.00423689, size = 15, normalized size = 1.

$$\frac{\log(a+bx^n)}{bn}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + n)/(a + b*x^n),x]

[Out] Log[a + b*x^n]/(b*n)
```

Maple [A] time = 0., size = 18, normalized size = 1.2

$$\frac{\ln\left(a+be^{n\ln(x)}\right)}{bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+n)/(a+b*x^n),x)

[Out] 1/b/n*ln(a+b*exp(n*ln(x)))
```

Maxima [A] time = 1.44396, size = 20, normalized size = 1.33

$$\frac{\log(bx^n + a)}{bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] log(b*x^n + a)/(b*n)
```

Fricas [A] time = 0.222249, size = 20, normalized size = 1.33

$$\frac{\log(bx^n + a)}{bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] log(b*x^n + a)/(b*n)
```

Sympy [A] time = 8.14317, size = 27, normalized size = 1.8

$$\begin{cases} \frac{\log(x)}{a} & \text{for } b = 0 \wedge n = 0 \\ \frac{\log(x)}{a+b} & \text{for } n = 0 \\ \frac{x^n}{an} & \text{for } b = 0 \\ \frac{\log\left(\frac{a}{b} + x^n\right)}{bn} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+n)/(a+b*x**n),x)
```

```
[Out] Piecewise((log(x)/a, Eq(b, 0) & Eq(n, 0)), (log(x)/(a + b), Eq(n,
 0)), (x**n/(a*n), Eq(b, 0)), (log(a/b + x**n)/(b*n), True))
```

GIAC/XCAS [A] time = 0.215837, size = 22, normalized size = 1.47

$$\frac{\ln(|bx^n + a|)}{bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] ln(abs(b*x^n + a))/(b*n)
```

3.2604 $\int \frac{1}{x(a+bx^n)}\,dx$

Optimal. Leaf size=23

$$\frac{\log(x)}{a} - \frac{\log(a+bx^n)}{an}$$

```
[Out] Log[x]/a - Log[a + b*x^n]/(a*n)
```

Rubi [A] time = 0.0347156, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{\log(x)}{a} - \frac{\log(a+bx^n)}{an}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a + b*x^n)),x]

[Out] Log[x]/a - Log[a + b*x^n]/(a*n)
```

Rubi in Sympy [A] time = 6.3723, size = 19, normalized size = 0.83

$$\frac{\log(x^n)}{an} - \frac{\log(a+bx^n)}{an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(a+b*x**n),x)

[Out] log(x**n)/(a*n) - log(a + b*x**n)/(a*n)
```

Mathematica [A] time = 0.0137634, size = 22, normalized size = 0.96

$$\frac{n\log(x) - \log(a+bx^n)}{an}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a + b*x^n)),x]

[Out] (n*Log[x] - Log[a + b*x^n])/(a*n)
```

Maple [A] time = 0., size = 29, normalized size = 1.3

$$\frac{\ln(x^n)}{an} - \frac{\ln(a+bx^n)}{an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(a+b*x^n),x)

[Out] 1/n/a*ln(x^n)-ln(a+b*x^n)/a/n
```

Maxima [A] time = 1.43845, size = 38, normalized size = 1.65

$$-\frac{\log\left(bx^n+a\right)}{an}+\frac{\log\left(x^n\right)}{an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)*x),x, algorithm="maxima")
```

```
[Out] -log(b*x^n + a)/(a*n) + log(x^n)/(a*n)
```

Fricas [A] time = 0.226472, size = 30, normalized size = 1.3

$$\frac{n\log\left(x\right)-\log\left(bx^n+a\right)}{an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)*x),x, algorithm="fricas")
```

```
[Out] (n*log(x) - log(b*x^n + a))/(a*n)
```

Sympy [A] time = 2.22386, size = 41, normalized size = 1.78

$$\begin{cases}\tilde{\infty}\log\left(x\right) & \text{for } a=0\wedge b=0\wedge n=0\\ \frac{\log\left(x\right)}{a} & \text{for } b=0\\ \frac{\log\left(x\right)}{a+b} & \text{for } n=0\\ -\frac{x^{-n}}{bn} & \text{for } a=0\\ \frac{\log\left(x\right)}{a}-\frac{\log\left(\frac{a}{b}+x^n\right)}{an} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(a+b*x**n),x)
```

```
[Out] Piecewise((zoo*log(x), Eq(a, 0) & Eq(b, 0) & Eq(n, 0)), (log(x)/a
, Eq(b, 0)), (log(x)/(a + b), Eq(n, 0)), (-x**(-n)/(b*n), Eq(a, 0
)), (log(x)/a - log(a/b + x**n)/(a*n), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\left(bx^n+a\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)*x),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^n + a)*x), x)
```

3.2605 $\int \frac{x^{-1-n}}{a+bx^n}\,dx$

Optimal. Leaf size=38

$$\frac{b\log(a+bx^n)}{a^2n}-\frac{b\log(x)}{a^2}-\frac{x^{-n}}{an}$$

```
[Out] -(1/(a*n*x^n)) - (b*Log[x])/a^2 + (b*Log[a + b*x^n])/(a^2*n)
```

Rubi [A] time = 0.0603693, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{b\log(a+bx^n)}{a^2n}-\frac{b\log(x)}{a^2}-\frac{x^{-n}}{an}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 - n)/(a + b*x^n),x]

[Out] -(1/(a*n*x^n)) - (b*Log[x])/a^2 + (b*Log[a + b*x^n])/(a^2*n)
```

Rubi in Sympy [A] time = 9.67534, size = 34, normalized size = 0.89

$$-\frac{x^{-n}}{an}-\frac{b\log(x^n)}{a^2n}+\frac{b\log(a+bx^n)}{a^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1-n)/(a+b*x**n),x)

[Out] -x**(-n)/(a*n) - b*log(x**n)/(a**2*n) + b*log(a + b*x**n)/(a**2*n
)
```

Mathematica [A] time = 0.016275, size = 32, normalized size = 0.84

$$\frac{b\log(ax^{-n}+b)}{a^2n}-\frac{x^{-n}}{an}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 - n)/(a + b*x^n),x]

[Out] -(1/(a*n*x^n)) + (b*Log[b + a/x^n])/(a^2*n)
```

Maple [A] time = 0., size = 50, normalized size = 1.3

$$\frac{1}{e^{n\ln(x)}}\left(-\frac{1}{an}-\frac{b\ln(x)\,e^{n\ln(x)}}{a^2}\right)+\frac{b\ln\left(a+be^{n\ln(x)}\right)}{a^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-1-n)/(a+b*x^n),x)
```

```
[Out] (-1/a/n-b/a^2*ln(x)*exp(n*ln(x)))/exp(n*ln(x))+b/a^2/n*ln(a+b*exp
(n*ln(x)))
```

Maxima [A] time = 1.44861, size = 57, normalized size = 1.5

$$-\frac{b\log\left(x\right)}{a^2}-\frac{x^{-n}}{an}+\frac{b\log\left(\frac{bx^n+a}{b}\right)}{a^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] -b*log(x)/a^2 - x^(-n)/(a*n) + b*log((b*x^n + a)/b)/(a^2*n)
```

Fricas [A] time = 0.22769, size = 50, normalized size = 1.32

$$-\frac{bnx^n\log\left(x\right)-bx^n\log\left(bx^n+a\right)+a}{a^2nx^n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] -(b*n*x^n*log(x) - b*x^n*log(b*x^n + a) + a)/(a^2*n*x^n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-n)/(a+b*x**n),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^{-n-1}}{bx^n+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(-n - 1)/(b*x^n + a), x)
```

3.2606 $\int \frac{x^{-3-2(-1+n)}}{a+bx^n}\,dx$

Optimal. Leaf size=57

$$-\frac{b^2\log(a+bx^n)}{a^3n}+\frac{b^2\log(x)}{a^3}+\frac{bx^{-n}}{a^2n}-\frac{x^{-2n}}{2an}$$

```
[Out] -1/(2*a*n*x^(2*n)) + b/(a^2*n*x^n) + (b^2*Log[x])/a^3 - (b^2*Log[
a + b*x^n])/(a^3*n)
```

Rubi [A] time = 0.0771905, antiderivative size = 57, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$-\frac{b^2\log(a+bx^n)}{a^3n}+\frac{b^2\log(x)}{a^3}+\frac{bx^{-n}}{a^2n}-\frac{x^{-2n}}{2an}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-3 - 2*(-1 + n))/(a + b*x^n),x]
```

```
[Out] -1/(2*a*n*x^(2*n)) + b/(a^2*n*x^n) + (b^2*Log[x])/a^3 - (b^2*Log[
a + b*x^n])/(a^3*n)
```

Rubi in Sympy [A] time = 12.9494, size = 51, normalized size = 0.89

$$-\frac{x^{-2n}}{2an}+\frac{bx^{-n}}{a^2n}+\frac{b^2\log(x^n)}{a^3n}-\frac{b^2\log(a+bx^n)}{a^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1-2*n)/(a+b*x**n),x)
```

```
[Out] -x**(-2*n)/(2*a*n) + b*x**(-n)/(a**2*n) + b**2*log(x**n)/(a**3*n)
 - b**2*log(a + b*x**n)/(a**3*n)
```

Mathematica [A] time = 0.0300973, size = 46, normalized size = 0.81

$$-\frac{x^{-2n}\left(2b^2x^{2n}\log(ax^{-n}+b)+a(a-2bx^n)\right)}{2a^3n}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-3 - 2*(-1 + n))/(a + b*x^n),x]
```

```
[Out] -(a*(a - 2*b*x^n) + 2*b^2*x^(2*n)*Log[b + a/x^n])/(2*a^3*n*x^(2*n
))
```

Maple [A] time = 0., size = 69, normalized size = 1.2

$$\frac{1}{\left(e^{n\ln(x)}\right)^2}\left(\frac{be^{n\ln(x)}}{a^2n}-\frac{1}{2\,an}+\frac{b^2\ln(x)\left(e^{n\ln(x)}\right)^2}{a^3}\right)-\frac{b^2\ln\left(a+be^{n\ln(x)}\right)}{a^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-2*n)/(a+b*x^n),x)
```

```
[Out] (b/a^2/n*exp(n*ln(x))-1/2/a/n+b^2/a^3*ln(x)*exp(n*ln(x))^2)/exp(n
*ln(x))^2-b^2/a^3/n*ln(a+b*exp(n*ln(x)))
```

Maxima [A] time = 1.44451, size = 76, normalized size = 1.33

$$\frac{b^2 \log(x)}{a^3} + \frac{(2\,bx^n - a)x^{-2\,n}}{2\,a^2n} - \frac{b^2 \log\left(\frac{bx^n+a}{b}\right)}{a^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-2*n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] b^2*log(x)/a^3 + 1/2*(2*b*x^n - a)*x^(-2*n)/(a^2*n) - b^2*log((b*
x^n + a)/b)/(a^3*n)
```

Fricas [A] time = 0.228186, size = 80, normalized size = 1.4

$$\frac{2\,b^2nx^{2\,n}\log(x) - 2\,b^2x^{2\,n}\log(bx^n + a) + 2\,abx^n - a^2}{2\,a^3nx^{2\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-2*n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] 1/2*(2*b^2*n*x^(2*n)*log(x) - 2*b^2*x^(2*n)*log(b*x^n + a) + 2*a*
b*x^n - a^2)/(a^3*n*x^(2*n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-2*n)/(a+b*x**n),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{-2\,n-1}}{bx^n + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-2*n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(-2*n - 1)/(b*x^n + a), x)
```

3.2607 $\int \frac{x^{-4-3(-1+n)}}{a+bx^n} dx$

Optimal. Leaf size=76

$$\frac{b^3 \log(a+bx^n)}{a^4 n} - \frac{b^3 \log(x)}{a^4} - \frac{b^2 x^{-n}}{a^3 n} + \frac{b x^{-2n}}{2a^2 n} - \frac{x^{-3n}}{3an}$$

```
[Out] -1/(3*a*n*x^(3*n)) + b/(2*a^2*n*x^(2*n)) - b^2/(a^3*n*x^n) - (b^3
*Log[x])/a^4 + (b^3*Log[a + b*x^n])/(a^4*n)
```

Rubi [A] time = 0.0935381, antiderivative size = 76, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$\frac{b^3 \log(a+bx^n)}{a^4 n} - \frac{b^3 \log(x)}{a^4} - \frac{b^2 x^{-n}}{a^3 n} + \frac{b x^{-2n}}{2a^2 n} - \frac{x^{-3n}}{3an}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-4 - 3*(-1 + n))/(a + b*x^n),x]
```

```
[Out] -1/(3*a*n*x^(3*n)) + b/(2*a^2*n*x^(2*n)) - b^2/(a^3*n*x^n) - (b^3
*Log[x])/a^4 + (b^3*Log[a + b*x^n])/(a^4*n)
```

Rubi in Sympy [A] time = 15.7223, size = 66, normalized size = 0.87

$$-\frac{x^{-3n}}{3an} + \frac{b x^{-2n}}{2a^2 n} - \frac{b^2 x^{-n}}{a^3 n} - \frac{b^3 \log(x^n)}{a^4 n} + \frac{b^3 \log(a+bx^n)}{a^4 n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1-3*n)/(a+b*x**n),x)
```

```
[Out] -x**(-3*n)/(3*a*n) + b*x**(-2*n)/(2*a**2*n) - b**2*x**(-n)/(a**3*
n) - b**3*log(x**n)/(a**4*n) + b**3*log(a + b*x**n)/(a**4*n)
```

Mathematica [A] time = 0.016154, size = 61, normalized size = 0.8

$$\frac{x^{-3n}\left(a\left(-2a^2+3abx^n-6b^2x^{2n}\right)+6b^3x^{3n}\log\left(ax^{-n}+b\right)\right)}{6a^4 n}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-4 - 3*(-1 + n))/(a + b*x^n),x]
```

```
[Out] (a*(-2*a^2 + 3*a*b*x^n - 6*b^2*x^(2*n)) + 6*b^3*x^(3*n)*Log[b + a
/x^n])/(6*a^4*n*x^(3*n))
```

Maple [A] time = 0., size = 88, normalized size = 1.2

$$\frac{1}{\left(e^{n\ln(x)}\right)^3}\left(-\frac{1}{3\,an} + \frac{b e^{n\ln(x)}}{2\,a^2 n} - \frac{b^2\left(e^{n\ln(x)}\right)^2}{a^3 n} - \frac{b^3 \ln(x)\left(e^{n\ln(x)}\right)^3}{a^4}\right) + \frac{b^3 \ln\left(a+be^{n\ln(x)}\right)}{a^4 n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-3*n)/(a+b*x^n),x)
```

```
[Out] (-1/3/a/n+1/2*b/a^2/n*exp(n*ln(x))-b^2/a^3/n*exp(n*ln(x))^2-b^3/a
^4*ln(x)*exp(n*ln(x))^3)/exp(n*ln(x))^3+b^3/a^4/n*ln(a+b*exp(n*ln
(x)))
```

Maxima [A] time = 1.44633, size = 93, normalized size = 1.22

$$-\frac{b^3 \log(x)}{a^4} + \frac{b^3 \log\left(\frac{bx^n+a}{b}\right)}{a^4 n} - \frac{\left(6\, b^2 x^{2\,n} - 3\, abx^n + 2\, a^2\right) x^{-3\,n}}{6\, a^3 n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-3*n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] -b^3*log(x)/a^4 + b^3*log((b*x^n + a)/b)/(a^4*n) - 1/6*(6*b^2*x^(
2*n) - 3*a*b*x^n + 2*a^2)*x^(-3*n)/(a^3*n)
```

Fricas [A] time = 0.230023, size = 97, normalized size = 1.28

$$-\frac{6\, b^3 n x^{3\,n} \log(x) - 6\, b^3 x^{3\,n} \log(bx^n + a) + 6\, ab^2 x^{2\,n} - 3\, a^2 bx^n + 2\, a^3}{6\, a^4 n x^{3\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-3*n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] -1/6*(6*b^3*n*x^(3*n)*log(x) - 6*b^3*x^(3*n)*log(b*x^n + a) + 6*a
*b^2*x^(2*n) - 3*a^2*b*x^n + 2*a^3)/(a^4*n*x^(3*n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-3*n)/(a+b*x**n),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{-3\,n-1}}{bx^n + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-3*n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(-3*n - 1)/(b*x^n + a), x)
```

3.2608 $\int \frac{x^{-1+5n}}{2+bx^n} dx$

Optimal. Leaf size=71

$$\frac{16\log\left(bx^n+2\right)}{b^5n}-\frac{8x^n}{b^4n}+\frac{2x^{2n}}{b^3n}-\frac{2x^{3n}}{3b^2n}+\frac{x^{4n}}{4bn}$$

```
[Out] (-8*x^n)/(b^4*n) + (2*x^(2*n))/(b^3*n) - (2*x^(3*n))/(3*b^2*n) +
x^(4*n)/(4*b*n) + (16*Log[2 + b*x^n])/(b^5*n)
```

Rubi [A] time = 0.092397, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{16\log\left(bx^n+2\right)}{b^5n}-\frac{8x^n}{b^4n}+\frac{2x^{2n}}{b^3n}-\frac{2x^{3n}}{3b^2n}+\frac{x^{4n}}{4bn}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 + 5*n)/(2 + b*x^n),x]
```

```
[Out] (-8*x^n)/(b^4*n) + (2*x^(2*n))/(b^3*n) - (2*x^(3*n))/(3*b^2*n) +
x^(4*n)/(4*b*n) + (16*Log[2 + b*x^n])/(b^5*n)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{x^{4n}}{4bn}-\frac{2x^{3n}}{3b^2n}+\frac{4\int^{x^n}x\,dx}{b^3n}-\frac{8x^n}{b^4n}+\frac{16\log\left(bx^n+2\right)}{b^5n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1+5*n)/(2+b*x**n),x)
```

```
[Out] x**(4*n)/(4*b*n) - 2*x**(3*n)/(3*b**2*n) + 4*Integral(x, (x, x**n
))/(b**3*n) - 8*x**n/(b**4*n) + 16*log(b*x**n + 2)/(b**5*n)
```

Mathematica [A] time = 0.0355076, size = 54, normalized size = 0.76

$$\frac{bx^n\left(3b^3x^{3n}-8b^2x^{2n}+24bx^n-96\right)+192\log\left(bx^n+2\right)}{12b^5n}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 + 5*n)/(2 + b*x^n),x]
```

```
[Out] (b*x^n*(-96 + 24*b*x^n - 8*b^2*x^(2*n) + 3*b^3*x^(3*n)) + 192*Log
[2 + b*x^n])/(12*b^5*n)
```

Maple [A] time = 0.041, size = 78, normalized size = 1.1

$$-8\,\frac{e^{n\ln(x)}}{b^4n}+2\,\frac{\left(e^{n\ln(x)}\right)^2}{b^3n}-\frac{2\left(e^{n\ln(x)}\right)^3}{3\,b^2n}+\frac{\left(e^{n\ln(x)}\right)^4}{4\,bn}+16\,\frac{\ln\left(2+be^{n\ln(x)}\right)}{b^5n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+5*n)/(2+b*x^n),x)
```

```
[Out] -8/b^4/n*exp(n*ln(x))+2/b^3/n*exp(n*ln(x))^2-2/3/b^2/n*exp(n*ln(x
))^3+1/4/b/n*exp(n*ln(x))^4+16/b^5/n*ln(2+b*exp(n*ln(x)))
```

Maxima [A] time = 1.43926, size = 85, normalized size = 1.2

$$\frac{3\,b^3x^{4\,n}-8\,b^2x^{3\,n}+24\,bx^{2\,n}-96\,x^n}{12\,b^4n}+\frac{16\,\log\left(\frac{bx^n+2}{b}\right)}{b^5n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5*n - 1)/(b*x^n + 2),x, algorithm="maxima")
```

```
[Out] 1/12*(3*b^3*x^(4*n) - 8*b^2*x^(3*n) + 24*b*x^(2*n) - 96*x^n)/(b^4
*n) + 16*log((b*x^n + 2)/b)/(b^5*n)
```

Fricas [A] time = 0.227474, size = 74, normalized size = 1.04

$$\frac{3\,b^4x^{4\,n}-8\,b^3x^{3\,n}+24\,b^2x^{2\,n}-96\,bx^n+192\,\log\left(bx^n+2\right)}{12\,b^5n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5*n - 1)/(b*x^n + 2),x, algorithm="fricas")
```

```
[Out] 1/12*(3*b^4*x^(4*n) - 8*b^3*x^(3*n) + 24*b^2*x^(2*n) - 96*b*x^n +
 192*log(b*x^n + 2))/(b^5*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+5*n)/(2+b*x**n),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{5\,n-1}}{bx^n+2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5*n - 1)/(b*x^n + 2),x, algorithm="giac")
```

```
[Out] integrate(x^(5*n - 1)/(b*x^n + 2), x)
```

3.2609 $\int \frac{x^{-1+4n}}{2+bx^n} dx$

Optimal. Leaf size=56

$$-\frac{8\log(bx^n+2)}{b^4n}+\frac{4x^n}{b^3n}-\frac{x^{2n}}{b^2n}+\frac{x^{3n}}{3bn}$$

```
[Out] (4*x^n)/(b^3*n) - x^(2*n)/(b^2*n) + x^(3*n)/(3*b*n) - (8*Log[2 +
b*x^n])/(b^4*n)
```

Rubi [A] time = 0.0726141, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{8\log(bx^n+2)}{b^4n}+\frac{4x^n}{b^3n}-\frac{x^{2n}}{b^2n}+\frac{x^{3n}}{3bn}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 + 4*n)/(2 + b*x^n),x]
```

```
[Out] (4*x^n)/(b^3*n) - x^(2*n)/(b^2*n) + x^(3*n)/(3*b*n) - (8*Log[2 +
b*x^n])/(b^4*n)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{x^{3n}}{3bn}-\frac{2\int^{x^n} x\,dx}{b^2n}+\frac{4x^n}{b^3n}-\frac{8\log(bx^n+2)}{b^4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1+4*n)/(2+b*x**n),x)
```

```
[Out] x**(3*n)/(3*b*n) - 2*Integral(x, (x, x**n))/(b**2*n) + 4*x**n/(b*
*3*n) - 8*log(b*x**n + 2)/(b**4*n)
```

Mathematica [A] time = 0.0279009, size = 43, normalized size = 0.77

$$\frac{bx^n\left(b^2x^{2n}-3bx^n+12\right)-24\log(bx^n+2)}{3b^4n}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 + 4*n)/(2 + b*x^n),x]
```

```
[Out] (b*x^n*(12 - 3*b*x^n + b^2*x^(2*n)) - 24*Log[2 + b*x^n])/(3*b^4*n
)
```

Maple [A] time = 0.034, size = 63, normalized size = 1.1

$$4\,\frac{e^{n\ln(x)}}{b^3n}-\frac{\left(e^{n\ln(x)}\right)^2}{b^2n}+\frac{\left(e^{n\ln(x)}\right)^3}{3\,bn}-8\,\frac{\ln\left(2+be^{n\ln(x)}\right)}{b^4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+4*n)/(2+b*x^n),x)
```

```
[Out] 4/b^3/n*exp(n*ln(x))-1/b^2/n*exp(n*ln(x))^2+1/3/b/n*exp(n*ln(x))^
3-8/b^4/n*ln(2+b*exp(n*ln(x)))
```

Maxima [A] time = 1.44734, size = 70, normalized size = 1.25

$$\frac{b^2x^{3\,n} - 3\,bx^{2\,n} + 12\,x^n}{3\,b^3n} - \frac{8\,\log\left(\frac{bx^n+2}{b}\right)}{b^4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(4*n - 1)/(b*x^n + 2),x, algorithm="maxima")
```

```
[Out] 1/3*(b^2*x^(3*n) - 3*b*x^(2*n) + 12*x^n)/(b^3*n) - 8*log((b*x^n +
 2)/b)/(b^4*n)
```

Fricas [A] time = 0.22594, size = 59, normalized size = 1.05

$$\frac{b^3x^{3\,n} - 3\,b^2x^{2\,n} + 12\,bx^n - 24\,\log\left(bx^n + 2\right)}{3\,b^4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(4*n - 1)/(b*x^n + 2),x, algorithm="fricas")
```

```
[Out] 1/3*(b^3*x^(3*n) - 3*b^2*x^(2*n) + 12*b*x^n - 24*log(b*x^n + 2))/
(b^4*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+4*n)/(2+b*x**n),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{4\,n-1}}{bx^n + 2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(4*n - 1)/(b*x^n + 2),x, algorithm="giac")
```

```
[Out] integrate(x^(4*n - 1)/(b*x^n + 2), x)
```

3.2610 $\int \frac{x^{-1+3n}}{2+bx^n}\,dx$

Optimal. Leaf size=43

$$\frac{4\log\left(bx^n+2\right)}{b^3n}-\frac{2x^n}{b^2n}+\frac{x^{2n}}{2bn}$$

```
[Out] (-2*x^n)/(b^2*n) + x^(2*n)/(2*b*n) + (4*Log[2 + b*x^n])/(b^3*n)
```

Rubi [A] time = 0.0593684, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{4\log\left(bx^n+2\right)}{b^3n}-\frac{2x^n}{b^2n}+\frac{x^{2n}}{2bn}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + 3*n)/(2 + b*x^n),x]

[Out] (-2*x^n)/(b^2*n) + x^(2*n)/(2*b*n) + (4*Log[2 + b*x^n])/(b^3*n)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int^{x^n} x\,dx}{bn}-\frac{2x^n}{b^2n}+\frac{4\log\left(bx^n+2\right)}{b^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+3*n)/(2+b*x**n),x)

[Out] Integral(x, (x, x**n))/(b*n) - 2*x**n/(b**2*n) + 4*log(b*x**n + 2
)/(b**3*n)
```

Mathematica [A] time = 0.0220743, size = 33, normalized size = 0.77

$$\frac{bx^n\left(bx^n-4\right)+8\log\left(bx^n+2\right)}{2b^3n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + 3*n)/(2 + b*x^n),x]

[Out] (b*x^n*(-4 + b*x^n) + 8*Log[2 + b*x^n])/(2*b^3*n)
```

Maple [A] time = 0.032, size = 48, normalized size = 1.1

$$-2\,\frac{e^{n\ln(x)}}{b^2n}+\frac{\left(e^{n\ln(x)}\right)^2}{2\,bn}+4\,\frac{\ln\left(2+be^{n\ln(x)}\right)}{b^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+3*n)/(2+b*x^n),x)
```

```
[Out] -2/b^2/n*exp(n*ln(x))+1/2/b/n*exp(n*ln(x))^2+4/b^3/n*ln(2+b*exp(n
*ln(x)))
```

Maxima [A] time = 1.44422, size = 57, normalized size = 1.33

$$\frac{bx^{2n} - 4x^{n}}{2b^{2}n} + \frac{4\log\left(\frac{bx^{n}+2}{b}\right)}{b^{3}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3*n - 1)/(b*x^n + 2),x, algorithm="maxima")
```

```
[Out] 1/2*(b*x^(2*n) - 4*x^n)/(b^2*n) + 4*log((b*x^n + 2)/b)/(b^3*n)
```

Fricas [A] time = 0.225858, size = 46, normalized size = 1.07

$$\frac{b^{2}x^{2n} - 4bx^{n} + 8\log\left(bx^{n} + 2\right)}{2b^{3}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3*n - 1)/(b*x^n + 2),x, algorithm="fricas")
```

```
[Out] 1/2*(b^2*x^(2*n) - 4*b*x^n + 8*log(b*x^n + 2))/(b^3*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+3*n)/(2+b*x**n),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{3n-1}}{bx^{n} + 2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3*n - 1)/(b*x^n + 2),x, algorithm="giac")
```

```
[Out] integrate(x^(3*n - 1)/(b*x^n + 2), x)
```

3.2611 $\int \frac{x^{-1+2n}}{2+bx^n}\,dx$

Optimal. Leaf size=27

$$\frac{x^n}{bn}-\frac{2\log\left(bx^n+2\right)}{b^2n}$$

```
[Out] x^n/(b*n) - (2*Log[2 + b*x^n])/(b^2*n)
```

Rubi [A] time = 0.0444568, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{x^n}{bn}-\frac{2\log\left(bx^n+2\right)}{b^2n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + 2*n)/(2 + b*x^n),x]
```

```
[Out] x^n/(b*n) - (2*Log[2 + b*x^n])/(b^2*n)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int^{x^n}\frac{1}{b}\,dx}{n}-\frac{2\log\left(bx^n+2\right)}{b^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+2*n)/(2+b*x**n),x)
```

```
[Out] Integral(1/b, (x, x**n))/n - 2*log(b*x**n + 2)/(b**2*n)
```

Mathematica [A] time = 0.0150376, size = 23, normalized size = 0.85

$$\frac{bx^n-2\log\left(bx^n+2\right)}{b^2n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + 2*n)/(2 + b*x^n),x]
```

```
[Out] (b*x^n - 2*Log[2 + b*x^n])/(b^2*n)
```

Maple [A] time = 0.026, size = 32, normalized size = 1.2

$$\frac{e^{n\ln(x)}}{bn}-2\,\frac{\ln\left(2+be^{n\ln(x)}\right)}{b^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+2*n)/(2+b*x^n),x)
```

```
[Out] 1/b/n*exp(n*ln(x))-2/b^2/n*ln(2+b*exp(n*ln(x)))
```

Maxima [A] time = 1.44441, size = 42, normalized size = 1.56

$$\frac{x^n}{bn} - \frac{2\,\log\left(\frac{bx^n+2}{b}\right)}{b^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(2*n - 1)/(b*x^n + 2),x, algorithm="maxima")
```

```
[Out] x^n/(b*n) - 2*log((b*x^n + 2)/b)/(b^2*n)
```

Fricas [A] time = 0.226077, size = 31, normalized size = 1.15

$$\frac{bx^n - 2\,\log\left(bx^n + 2\right)}{b^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(2*n - 1)/(b*x^n + 2),x, algorithm="fricas")
```

```
[Out] (b*x^n - 2*log(b*x^n + 2))/(b^2*n)
```

Sympy [A] time = 45.4758, size = 39, normalized size = 1.44

$$\begin{cases} \frac{\log\left(x\right)}{2} & \text{for}\: b = 0 \wedge n = 0 \\ \frac{\log\left(x\right)}{b+2} & \text{for}\: n = 0 \\ \frac{x^{2n}}{4n} & \text{for}\: b = 0 \\ \frac{x^n}{bn} - \frac{2\log\left(x^n + \frac{2}{b}\right)}{b^2n} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+2*n)/(2+b*x**n),x)
```

```
[Out] Piecewise((log(x)/2, Eq(b, 0) & Eq(n, 0)), (log(x)/(b + 2), Eq(n,
 0)), (x**(2*n)/(4*n), Eq(b, 0)), (x**n/(b*n) - 2*log(x**n + 2/b)
/(b**2*n), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{2\,n-1}}{bx^n + 2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(2*n - 1)/(b*x^n + 2),x, algorithm="giac")
```

```
[Out] integrate(x^(2*n - 1)/(b*x^n + 2), x)
```

3.2612 $\int \frac{x^{-1+n}}{2+bx^n}\,dx$

Optimal. Leaf size=15

$$\frac{\log(bx^n+2)}{bn}$$

```
[Out] Log[2 + b*x^n]/(b*n)
```

Rubi [A] time = 0.0187385, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{\log(bx^n+2)}{bn}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + n)/(2 + b*x^n),x]
```

```
[Out] Log[2 + b*x^n]/(b*n)
```

Rubi in Sympy [A] time = 2.41564, size = 10, normalized size = 0.67

$$\frac{\log(bx^n+2)}{bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+n)/(2+b*x**n),x)
```

```
[Out] log(b*x**n + 2)/(b*n)
```

Mathematica [A] time = 0.00394347, size = 15, normalized size = 1.

$$\frac{\log(bx^n+2)}{bn}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + n)/(2 + b*x^n),x]
```

```
[Out] Log[2 + b*x^n]/(b*n)
```

Maple [A] time = 0.021, size = 18, normalized size = 1.2

$$\frac{\ln\left(2+be^{n\ln(x)}\right)}{bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+n)/(2+b*x^n),x)
```

```
[Out] 1/b/n*ln(2+b*exp(n*ln(x)))
```

Maxima [A] time = 1.43609, size = 20, normalized size = 1.33

$$\frac{\log(bx^n + 2)}{bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(n - 1)/(b*x^n + 2),x, algorithm="maxima")
```

```
[Out] log(b*x^n + 2)/(b*n)
```

Fricas [A] time = 0.217868, size = 20, normalized size = 1.33

$$\frac{\log(bx^n + 2)}{bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(n - 1)/(b*x^n + 2),x, algorithm="fricas")
```

```
[Out] log(b*x^n + 2)/(b*n)
```

Sympy [A] time = 8.26104, size = 27, normalized size = 1.8

$$\begin{cases} \frac{\log(x)}{2} & \text{for } b = 0 \wedge n = 0 \\ \frac{\log(x)}{b+2} & \text{for } n = 0 \\ \frac{x^n}{2n} & \text{for } b = 0 \\ \frac{\log\left(x^n + \frac{2}{b}\right)}{bn} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+n)/(2+b*x**n),x)
```

```
[Out] Piecewise((log(x)/2, Eq(b, 0) & Eq(n, 0)), (log(x)/(b + 2), Eq(n,
 0)), (x**n/(2*n), Eq(b, 0)), (log(x**n + 2/b)/(b*n), True))
```

GIAC/XCAS [A] time = 0.219021, size = 22, normalized size = 1.47

$$\frac{\ln(|bx^n + 2|)}{bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(n - 1)/(b*x^n + 2),x, algorithm="giac")
```

```
[Out] ln(abs(b*x^n + 2))/(b*n)
```

3.2613 $\int \frac{1}{x(2+bx^n)}\,dx$

Optimal. Leaf size=22

$$\frac{\log(x)}{2} - \frac{\log(bx^n+2)}{2n}$$

```
[Out] Log[x]/2 - Log[2 + b*x^n]/(2*n)
```

Rubi [A] time = 0.0290522, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{\log(x)}{2} - \frac{\log(bx^n+2)}{2n}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(2 + b*x^n)),x]

[Out] Log[x]/2 - Log[2 + b*x^n]/(2*n)
```

Rubi in Sympy [A] time = 5.01186, size = 19, normalized size = 0.86

$$\frac{\log(x^n)}{2n} - \frac{\log(bx^n+2)}{2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(2+b*x**n),x)

[Out] log(x**n)/(2*n) - log(b*x**n + 2)/(2*n)
```

Mathematica [A] time = 0.0123414, size = 22, normalized size = 1.

$$\frac{n\log(x) - \log(bx^n+2)}{2n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(2 + b*x^n)),x]

[Out] (n*Log[x] - Log[2 + b*x^n])/(2*n)
```

Maple [A] time = 0.004, size = 24, normalized size = 1.1

$$\frac{\ln(x^n)}{2\,n} - \frac{\ln(2+bx^n)}{2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(2+b*x^n),x)

[Out] 1/2/n*ln(x^n)-1/2*ln(2+b*x^n)/n
```

Maxima [A] time = 1.42195, size = 31, normalized size = 1.41

$$-\frac{\log\left(bx^{n}+2\right)}{2\,n}+\frac{\log\left(x^{n}\right)}{2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + 2)*x),x, algorithm="maxima")
```

```
[Out] -1/2*log(b*x^n + 2)/n + 1/2*log(x^n)/n
```

Fricas [A] time = 0.223746, size = 27, normalized size = 1.23

$$\frac{n\log\left(x\right)-\log\left(bx^{n}+2\right)}{2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + 2)*x),x, algorithm="fricas")
```

```
[Out] 1/2*(n*log(x) - log(b*x^n + 2))/n
```

Sympy [A] time = 2.17578, size = 31, normalized size = 1.41

$$\begin{cases}\frac{\log\left(x\right)}{2} & \text{for}\ b=0\wedge n=0\\ \frac{\log\left(x\right)}{b+2} & \text{for}\ n=0\\ \frac{\log\left(x\right)}{2} & \text{for}\ b=0\\ \frac{\log\left(x\right)}{2}-\frac{\log\left(x^{n}+\frac{2}{b}\right)}{2n} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(2+b*x**n),x)
```

```
[Out] Piecewise((log(x)/2, Eq(b, 0) & Eq(n, 0)), (log(x)/(b + 2), Eq(n,
 0)), (log(x)/2, Eq(b, 0)), (log(x)/2 - log(x**n + 2/b)/(2*n), Tr
ue))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\left(bx^{n}+2\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + 2)*x),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^n + 2)*x), x)
```

3.2614 $\int \frac{x^{-1-n}}{2+bx^n} dx$

Optimal. Leaf size=36

$$\frac{b\log(bx^n+2)}{4n}-\frac{1}{4}b\log(x)-\frac{x^{-n}}{2n}$$

```
[Out] -1/(2*n*x^n) - (b*Log[x])/4 + (b*Log[2 + b*x^n])/(4*n)
```

Rubi [A] time = 0.0506997, antiderivative size = 36, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{b\log(bx^n+2)}{4n}-\frac{1}{4}b\log(x)-\frac{x^{-n}}{2n}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 - n)/(2 + b*x^n),x]

[Out] -1/(2*n*x^n) - (b*Log[x])/4 + (b*Log[2 + b*x^n])/(4*n)
```

Rubi in Sympy [A] time = 7.52773, size = 31, normalized size = 0.86

$$-\frac{b\log(x^n)}{4n}+\frac{b\log(bx^n+2)}{4n}-\frac{x^{-n}}{2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1-n)/(2+b*x**n),x)

[Out] -b*log(x**n)/(4*n) + b*log(b*x**n + 2)/(4*n) - x**(-n)/(2*n)
```

Mathematica [A] time = 0.0186937, size = 31, normalized size = 0.86

$$\frac{b\log(b+2x^{-n})}{4n}-\frac{x^{-n}}{2n}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 - n)/(2 + b*x^n),x]

[Out] -1/(2*n*x^n) + (b*Log[b + 2/x^n])/(4*n)
```

Maple [A] time = 0.026, size = 42, normalized size = 1.2

$$\frac{1}{e^{n\ln(x)}}\left(-\frac{b\ln(x)e^{n\ln(x)}}{4}-\frac{1}{2n}\right)+\frac{b\ln\left(2+be^{n\ln(x)}\right)}{4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-1-n)/(2+b*x^n),x)

[Out] (-1/4*b*ln(x)*exp(n*ln(x))-1/2/n)/exp(n*ln(x))+1/4*b/n*ln(2+b*exp
(n*ln(x)))
```

Maxima [A] time = 1.44282, size = 46, normalized size = 1.28

$$-\frac{1}{4}\, b \log\left(x\right) + \frac{b \log\left(\frac{b x^{n} + 2}{b}\right)}{4\, n} - \frac{x^{-n}}{2\, n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-n - 1)/(b*x^n + 2),x, algorithm="maxima")
```

```
[Out] -1/4*b*log(x) + 1/4*b*log((b*x^n + 2)/b)/n - 1/2*x^(-n)/n
```

Fricas [A] time = 0.229114, size = 46, normalized size = 1.28

$$-\frac{b n x^{n} \log\left(x\right) - b x^{n} \log\left(b x^{n} + 2\right) + 2}{4\, n x^{n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-n - 1)/(b*x^n + 2),x, algorithm="fricas")
```

```
[Out] -1/4*(b*n*x^n*log(x) - b*x^n*log(b*x^n + 2) + 2)/(n*x^n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-n)/(2+b*x**n),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{-n-1}}{b x^{n} + 2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-n - 1)/(b*x^n + 2),x, algorithm="giac")
```

```
[Out] integrate(x^(-n - 1)/(b*x^n + 2), x)
```

3.2615 $\int \frac{x^{-1-2n}}{2+bx^n}\,dx$

Optimal. Leaf size=53

$$-\frac{b^2\log(bx^n+2)}{8n}+\frac{1}{8}b^2\log(x)+\frac{bx^{-n}}{4n}-\frac{x^{-2n}}{4n}$$

```
[Out] -1/(4*n*x^(2*n)) + b/(4*n*x^n) + (b^2*Log[x])/8 - (b^2*Log[2 + b*
x^n])/(8*n)
```

Rubi [A] time = 0.0639633, antiderivative size = 53, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{b^2\log(bx^n+2)}{8n}+\frac{1}{8}b^2\log(x)+\frac{bx^{-n}}{4n}-\frac{x^{-2n}}{4n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 2*n)/(2 + b*x^n),x]
```

```
[Out] -1/(4*n*x^(2*n)) + b/(4*n*x^n) + (b^2*Log[x])/8 - (b^2*Log[2 + b*
x^n])/(8*n)
```

Rubi in Sympy [A] time = 9.38569, size = 44, normalized size = 0.83

$$\frac{b^2\log(x^n)}{8n}-\frac{b^2\log(bx^n+2)}{8n}+\frac{bx^{-n}}{4n}-\frac{x^{-2n}}{4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-2*n)/(2+b*x**n),x)
```

```
[Out] b**2*log(x**n)/(8*n) - b**2*log(b*x**n + 2)/(8*n) + b*x**(-n)/(4*
n) - x**(-2*n)/(4*n)
```

Mathematica [A] time = 0.0236503, size = 39, normalized size = 0.74

$$-\frac{x^{-2n}\left(b^2x^{2n}\log(b+2x^{-n})-2bx^n+2\right)}{8n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 2*n)/(2 + b*x^n),x]
```

```
[Out] -(2 - 2*b*x^n + b^2*x^(2*n)*Log[b + 2/x^n])/(8*n*x^(2*n))
```

Maple [A] time = 0.031, size = 59, normalized size = 1.1

$$\frac{1}{\left(e^{n\ln(x)}\right)^2}\left(\frac{b^2\ln(x)\left(e^{n\ln(x)}\right)^2}{8}-\frac{1}{4n}+\frac{be^{n\ln(x)}}{4n}\right)-\frac{b^2\ln\left(2+be^{n\ln(x)}\right)}{8n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-2*n)/(2+b*x^n),x)
```

```
[Out] (1/8*b^2*ln(x)*exp(n*ln(x))^2-1/4/n+1/4*b/n*exp(n*ln(x)))/exp(n*l
n(x))^2-1/8*b^2/n*ln(2+b*exp(n*ln(x)))
```

Maxima [A] time = 1.44246, size = 61, normalized size = 1.15

$$\frac{1}{8}\,b^2\log\left(x\right) - \frac{b^2\log\left(\frac{bx^n+2}{b}\right)}{8\,n} + \frac{(bx^n-1)x^{-2\,n}}{4\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-2*n - 1)/(b*x^n + 2),x, algorithm="maxima")
```

```
[Out] 1/8*b^2*log(x) - 1/8*b^2*log((b*x^n + 2)/b)/n + 1/4*(b*x^n - 1)*x
^(-2*n)/n
```

Fricas [A] time = 0.228343, size = 68, normalized size = 1.28

$$\frac{b^2nx^{2\,n}\log\left(x\right) - b^2x^{2\,n}\log\left(bx^n+2\right) + 2\,bx^n - 2}{8\,nx^{2\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-2*n - 1)/(b*x^n + 2),x, algorithm="fricas")
```

```
[Out] 1/8*(b^2*n*x^(2*n)*log(x) - b^2*x^(2*n)*log(b*x^n + 2) + 2*b*x^n
- 2)/(n*x^(2*n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-2*n)/(2+b*x**n),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{-2\,n-1}}{bx^n+2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-2*n - 1)/(b*x^n + 2),x, algorithm="giac")
```

```
[Out] integrate(x^(-2*n - 1)/(b*x^n + 2), x)
```

3.2616 $\int \frac{x^{-1-3n}}{2+bx^n}\,dx$

Optimal. Leaf size=68

$$\frac{b^3\log(bx^n+2)}{16n}-\frac{1}{16}b^3\log(x)-\frac{b^2x^{-n}}{8n}+\frac{bx^{-2n}}{8n}-\frac{x^{-3n}}{6n}$$

```
[Out] -1/(6*n*x^(3*n)) + b/(8*n*x^(2*n)) - b^2/(8*n*x^n) - (b^3*Log[x])
/16 + (b^3*Log[2 + b*x^n])/(16*n)
```

Rubi [A] time = 0.0752581, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{b^3\log(bx^n+2)}{16n}-\frac{1}{16}b^3\log(x)-\frac{b^2x^{-n}}{8n}+\frac{bx^{-2n}}{8n}-\frac{x^{-3n}}{6n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 3*n)/(2 + b*x^n),x]
```

```
[Out] -1/(6*n*x^(3*n)) + b/(8*n*x^(2*n)) - b^2/(8*n*x^n) - (b^3*Log[x])
/16 + (b^3*Log[2 + b*x^n])/(16*n)
```

Rubi in Sympy [A] time = 11.3594, size = 56, normalized size = 0.82

$$-\frac{b^3\log(x^n)}{16n}+\frac{b^3\log(bx^n+2)}{16n}-\frac{b^2x^{-n}}{8n}+\frac{bx^{-2n}}{8n}-\frac{x^{-3n}}{6n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-3*n)/(2+b*x**n),x)
```

```
[Out] -b**3*log(x**n)/(16*n) + b**3*log(b*x**n + 2)/(16*n) - b**2*x**(-
n)/(8*n) + b*x**(-2*n)/(8*n) - x**(-3*n)/(6*n)
```

Mathematica [A] time = 0.0225313, size = 50, normalized size = 0.74

$$\frac{x^{-3n}\left(3b^3x^{3n}\log\left(b+2x^{-n}\right)-6b^2x^{2n}+6bx^n-8\right)}{48n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 3*n)/(2 + b*x^n),x]
```

```
[Out] (-8 + 6*b*x^n - 6*b^2*x^(2*n) + 3*b^3*x^(3*n)*Log[b + 2/x^n])/(48
*n*x^(3*n))
```

Maple [A] time = 0.037, size = 74, normalized size = 1.1

$$\frac{1}{\left(e^{n\ln(x)}\right)^3}\left(-\frac{b^3\ln(x)\left(e^{n\ln(x)}\right)^3}{16}-\frac{1}{6\,n}+\frac{be^{n\ln(x)}}{8\,n}-\frac{b^2\left(e^{n\ln(x)}\right)^2}{8\,n}\right)+\frac{b^3\ln\left(2+be^{n\ln(x)}\right)}{16\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^(-1-3*n)/(2+b*x^n),x)
```

```
[Out] (-1/16*b^3*ln(x)*exp(n*ln(x))^3-1/6/n+1/8*b/n*exp(n*ln(x))-1/8*b^
2/n*exp(n*ln(x))^2)/exp(n*ln(x))^3+1/16*b^3/n*ln(2+b*exp(n*ln(x))
)
```

Maxima [A] time = 1.44389, size = 76, normalized size = 1.12

$$-\frac{1}{16}\,b^3\log\left(x\right)+\frac{b^3\log\left(\frac{bx^n+2}{b}\right)}{16\,n}-\frac{\left(3\,b^2x^{2\,n}-3\,bx^n+4\right)x^{-3\,n}}{24\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^(-3*n - 1)/(b*x^n + 2),x, algorithm="maxima")
```

```
[Out] -1/16*b^3*log(x) + 1/16*b^3*log((b*x^n + 2)/b)/n - 1/24*(3*b^2*x^
(2*n) - 3*b*x^n + 4)*x^(-3*n)/n
```

Fricas [A] time = 0.228238, size = 82, normalized size = 1.21

$$-\frac{3\,b^3nx^{3\,n}\log\left(x\right)-3\,b^3x^{3\,n}\log\left(bx^n+2\right)+6\,b^2x^{2\,n}-6\,bx^n+8}{48\,nx^{3\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^(-3*n - 1)/(b*x^n + 2),x, algorithm="fricas")
```

```
[Out] -1/48*(3*b^3*n*x^(3*n)*log(x) - 3*b^3*x^(3*n)*log(b*x^n + 2) + 6*
b^2*x^(2*n) - 6*b*x^n + 8)/(n*x^(3*n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**(-1-3*n)/(2+b*x**n),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^{-3\,n-1}}{bx^n+2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^(-3*n - 1)/(b*x^n + 2),x, algorithm="giac")
```

```
[Out] integrate(x^(-3*n - 1)/(b*x^n + 2), x)
```

3.2617 $\int \frac{x^{-1+4n}}{(a+bx^n)^2}\,dx$

Optimal. Leaf size=66

$$\frac{a^3}{b^4n(a+bx^n)}+\frac{3a^2\log(a+bx^n)}{b^4n}-\frac{2ax^n}{b^3n}+\frac{x^{2n}}{2b^2n}$$

```
[Out] (-2*a*x^n)/(b^3*n) + x^(2*n)/(2*b^2*n) + a^3/(b^4*n*(a + b*x^n))
+ (3*a^2*Log[a + b*x^n])/(b^4*n)
```

Rubi [A] time = 0.10375, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{a^3}{b^4n(a+bx^n)}+\frac{3a^2\log(a+bx^n)}{b^4n}-\frac{2ax^n}{b^3n}+\frac{x^{2n}}{2b^2n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + 4*n)/(a + b*x^n)^2,x]
```

```
[Out] (-2*a*x^n)/(b^3*n) + x^(2*n)/(2*b^2*n) + a^3/(b^4*n*(a + b*x^n))
+ (3*a^2*Log[a + b*x^n])/(b^4*n)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^3}{b^4n(a+bx^n)}+\frac{3a^2\log(a+bx^n)}{b^4n}-\frac{2ax^n}{b^3n}+\frac{\int^{x^n}x\,dx}{b^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+4*n)/(a+b*x**n)**2,x)
```

```
[Out] a**3/(b**4*n*(a + b*x**n)) + 3*a**2*log(a + b*x**n)/(b**4*n) - 2*
a*x**n/(b**3*n) + Integral(x, (x, x**n))/(b**2*n)
```

Mathematica [A] time = 0.0585582, size = 54, normalized size = 0.82

$$\frac{\frac{2a^3}{a+bx^n}+6a^2\log(a+bx^n)-4abx^n+b^2x^{2n}}{2b^4n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + 4*n)/(a + b*x^n)^2,x]
```

```
[Out] (-4*a*b*x^n + b^2*x^(2*n) + (2*a^3)/(a + b*x^n) + 6*a^2*Log[a + b
*x^n])/(2*b^4*n)
```

Maple [A] time = 0.035, size = 78, normalized size = 1.2

$$\frac{1}{a+be^{n\ln(x)}}\left(3\,\frac{a^3}{b^4n}+\frac{\left(e^{n\ln(x)}\right)^3}{2\,bn}-\frac{3\,a\left(e^{n\ln(x)}\right)^2}{2\,b^2n}\right)+3\,\frac{a^2\ln\left(a+be^{n\ln(x)}\right)}{b^4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^(-1+4*n)/(a+b*x^n)^2,x)
```

```
[Out] (3*a^3/b^4/n+1/2/b/n*exp(n*ln(x))^3-3/2*a/b^2/n*exp(n*ln(x))^2)/(
a+b*exp(n*ln(x)))+3*a^2/b^4/n*ln(a+b*exp(n*ln(x)))
```

Maxima [A] time = 1.4517, size = 105, normalized size = 1.59

$$\frac{b^3x^{3n} - 3\,ab^2x^{2n} - 4\,a^2bx^n + 2\,a^3}{2\,(b^5nx^n + ab^4n)} + \frac{3\,a^2\log\left(\frac{bx^n+a}{b}\right)}{b^4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^(4*n - 1)/(b*x^n + a)^2,x, algorithm="maxima")
```

```
[Out] 1/2*(b^3*x^(3*n) - 3*a*b^2*x^(2*n) - 4*a^2*b*x^n + 2*a^3)/(b^5*n*
x^n + a*b^4*n) + 3*a^2*log((b*x^n + a)/b)/(b^4*n)
```

Fricas [A] time = 0.228132, size = 103, normalized size = 1.56

$$\frac{b^3x^{3n} - 3\,ab^2x^{2n} - 4\,a^2bx^n + 2\,a^3 + 6\,\left(a^2bx^n + a^3\right)\log\left(bx^n + a\right)}{2\,(b^5nx^n + ab^4n)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^(4*n - 1)/(b*x^n + a)^2,x, algorithm="fricas")
```

```
[Out] 1/2*(b^3*x^(3*n) - 3*a*b^2*x^(2*n) - 4*a^2*b*x^n + 2*a^3 + 6*(a^2
*b*x^n + a^3)*log(b*x^n + a))/(b^5*n*x^n + a*b^4*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**(-1+4*n)/(a+b*x**n)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{4\,n-1}}{(bx^n + a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^(4*n - 1)/(b*x^n + a)^2,x, algorithm="giac")
```

```
[Out] integrate(x^(4*n - 1)/(b*x^n + a)^2, x)
```

3.2618 $\int \frac{x^{-1+3n}}{(a+bx^n)^2} dx$

Optimal. Leaf size=48

$$-\frac{a^2}{b^3 n (a+bx^n)} - \frac{2a\log(a+bx^n)}{b^3 n} + \frac{x^n}{b^2 n}$$

```
[Out] x^n/(b^2*n) - a^2/(b^3*n*(a + b*x^n)) - (2*a*Log[a + b*x^n])/(b^3
*n)
```

Rubi [A] time = 0.0783434, antiderivative size = 48, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{a^2}{b^3 n (a+bx^n)} - \frac{2a\log(a+bx^n)}{b^3 n} + \frac{x^n}{b^2 n}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 + 3*n)/(a + b*x^n)^2,x]
```

```
[Out] x^n/(b^2*n) - a^2/(b^3*n*(a + b*x^n)) - (2*a*Log[a + b*x^n])/(b^3
*n)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^2}{b^3 n (a+bx^n)} - \frac{2a\log(a+bx^n)}{b^3 n} + \frac{\int^{x^n} \frac{1}{b^2} dx}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1+3*n)/(a+b*x**n)**2,x)
```

```
[Out] -a**2/(b**3*n*(a + b*x**n)) - 2*a*log(a + b*x**n)/(b**3*n) + Inte
gral(b**(-2), (x, x**n))/n
```

Mathematica [A] time = 0.0511669, size = 38, normalized size = 0.79

$$\frac{-\frac{a^2}{a+bx^n} - 2a\log(a+bx^n) + bx^n}{b^3 n}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 + 3*n)/(a + b*x^n)^2,x]
```

```
[Out] (b*x^n - a^2/(a + b*x^n) - 2*a*Log[a + b*x^n])/(b^3*n)
```

Maple [A] time = 0.031, size = 59, normalized size = 1.2

$$\frac{1}{a+b\mathrm{e}^{n\ln(x)}}\left(\frac{\left(\mathrm{e}^{n\ln(x)}\right)^2}{bn} - 2\frac{a^2}{b^3 n}\right) - 2\frac{a\ln\left(a+b\mathrm{e}^{n\ln(x)}\right)}{b^3 n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+3*n)/(a+b*x^n)^2,x)
```

```
[Out] (1/b/n*exp(n*ln(x))^2-2*a^2/b^3/n)/(a+b*exp(n*ln(x)))-2*a/b^3/n*l
n(a+b*exp(n*ln(x)))
```

Maxima [A] time = 1.4509, size = 82, normalized size = 1.71

$$\frac{b^2x^{2\,n}+abx^n-a^2}{b^4nx^n+ab^3n}-\frac{2\,a\log\left(\frac{bx^n+a}{b}\right)}{b^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3*n - 1)/(b*x^n + a)^2,x, algorithm="maxima")
```

```
[Out] (b^2*x^(2*n) + a*b*x^n - a^2)/(b^4*n*x^n + a*b^3*n) - 2*a*log((b*
x^n + a)/b)/(b^3*n)
```

Fricas [A] time = 0.228412, size = 80, normalized size = 1.67

$$\frac{b^2x^{2\,n}+abx^n-a^2-2\left(abx^n+a^2\right)\log\left(bx^n+a\right)}{b^4nx^n+ab^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3*n - 1)/(b*x^n + a)^2,x, algorithm="fricas")
```

```
[Out] (b^2*x^(2*n) + a*b*x^n - a^2 - 2*(a*b*x^n + a^2)*log(b*x^n + a))/
(b^4*n*x^n + a*b^3*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+3*n)/(a+b*x**n)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{3\,n-1}}{\left(bx^n+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3*n - 1)/(b*x^n + a)^2,x, algorithm="giac")
```

```
[Out] integrate(x^(3*n - 1)/(b*x^n + a)^2, x)
```

3.2619 $\int \frac{x^{-1+2n}}{(a+bx^n)^2}\,dx$

Optimal. Leaf size=33

$$\frac{a}{b^2n\,(a+bx^n)}+\frac{\log\,(a+bx^n)}{b^2n}$$

```
[Out] a/(b^2*n*(a + b*x^n)) + Log[a + b*x^n]/(b^2*n)
```

Rubi [A] time = 0.0593578, antiderivative size = 33, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{a}{b^2n\,(a+bx^n)}+\frac{\log\,(a+bx^n)}{b^2n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + 2*n)/(a + b*x^n)^2,x]
```

```
[Out] a/(b^2*n*(a + b*x^n)) + Log[a + b*x^n]/(b^2*n)
```

Rubi in Sympy [A] time = 8.4168, size = 26, normalized size = 0.79

$$\frac{a}{b^2n\,(a+bx^n)}+\frac{\log\,(a+bx^n)}{b^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+2*n)/(a+b*x**n)**2,x)
```

```
[Out] a/(b**2*n*(a + b*x**n)) + log(a + b*x**n)/(b**2*n)
```

Mathematica [A] time = 0.0288903, size = 33, normalized size = 1.

$$\frac{a}{b^2n\,(a+bx^n)}+\frac{\log\,(a+bx^n)}{b^2n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + 2*n)/(a + b*x^n)^2,x]
```

```
[Out] a/(b^2*n*(a + b*x^n)) + Log[a + b*x^n]/(b^2*n)
```

Maple [A] time = 0.027, size = 38, normalized size = 1.2

$$\frac{a}{b^2n\left(a+be^{n\ln(x)}\right)}+\frac{\ln\left(a+be^{n\ln(x)}\right)}{b^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+2*n)/(a+b*x^n)^2,x)
```

```
[Out] a/b^2/n/(a+b*exp(n*ln(x)))+1/b^2/n*ln(a+b*exp(n*ln(x)))
```

Maxima [A] time = 1.4447, size = 53, normalized size = 1.61

$$\frac{a}{b^3nx^n + ab^2n} + \frac{\log\left(\frac{bx^n+a}{b}\right)}{b^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(2*n - 1)/(b*x^n + a)^2,x, algorithm="maxima")
```

```
[Out] a/(b^3*n*x^n + a*b^2*n) + log((b*x^n + a)/b)/(b^2*n)
```

Fricas [A] time = 0.219493, size = 49, normalized size = 1.48

$$\frac{(bx^n + a)\log(bx^n + a) + a}{b^3nx^n + ab^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(2*n - 1)/(b*x^n + a)^2,x, algorithm="fricas")
```

```
[Out] ((b*x^n + a)*log(b*x^n + a) + a)/(b^3*n*x^n + a*b^2*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**(-1+2*n)/(a+b*x**n)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{2n-1}}{(bx^n + a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(2*n - 1)/(b*x^n + a)^2,x, algorithm="giac")
```

```
[Out] integrate(x^(2*n - 1)/(b*x^n + a)^2, x)
```

3.2620 $\int \frac{x^{-1+n}}{(a+bx^n)^2}\,dx$

Optimal. Leaf size=17

$$-\frac{1}{bn\,(a+bx^n)}$$

```
[Out] -(1/(b*n*(a + b*x^n)))
```

Rubi [A] time = 0.0207707, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$-\frac{1}{bn\,(a+bx^n)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + n)/(a + b*x^n)^2,x]

[Out] -(1/(b*n*(a + b*x^n)))
```

Rubi in Sympy [A] time = 2.43382, size = 12, normalized size = 0.71

$$-\frac{1}{bn\,(a+bx^n)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+n)/(a+b*x**n)**2,x)

[Out] -1/(b*n*(a + b*x**n))
```

Mathematica [A] time = 0.0135782, size = 17, normalized size = 1.

$$-\frac{1}{bn\,(a+bx^n)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + n)/(a + b*x^n)^2,x]

[Out] -(1/(b*n*(a + b*x^n)))
```

Maple [A] time = 0.027, size = 24, normalized size = 1.4

$$\frac{e^{n\ln(x)}}{an\,\left(a+be^{n\ln(x)}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+n)/(a+b*x^n)^2,x)

[Out] 1/a/n*exp(n*ln(x))/(a+b*exp(n*ln(x)))
```

Maxima [A] time = 1.44208, size = 23, normalized size = 1.35

$$-\frac{1}{(bx^n + a)bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(n - 1)/(b*x^n + a)^2,x, algorithm="maxima")
```

```
[Out] -1/((b*x^n + a)*b*n)
```

Fricas [A] time = 0.214431, size = 23, normalized size = 1.35

$$-\frac{1}{b^2nx^n + abn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(n - 1)/(b*x^n + a)^2,x, algorithm="fricas")
```

```
[Out] -1/(b^2*n*x^n + a*b*n)
```

Sympy [A] time = 36.2281, size = 51, normalized size = 3.

$$\begin{cases} \tilde{\infty}\log(x) & \text{for } a = 0 \wedge b = 0 \wedge n = 0 \\ -\frac{x^{-n}}{b^2n} & \text{for } a = 0 \\ \frac{\tilde{\infty}x^n}{n} & \text{for } b = -ax^{-n} \\ \frac{\log(x)}{(a+b)^2} & \text{for } n = 0 \\ \frac{x^n}{a^2n+abnx^n} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+n)/(a+b*x**n)**2,x)
```

```
[Out] Piecewise((zoo*log(x), Eq(a, 0) & Eq(b, 0) & Eq(n, 0)), (-x**(-n)
/(b**2*n), Eq(a, 0)), (zoo*x**n/n, Eq(b, -a*x**(-n))), (log(x)/(a
 + b)**2, Eq(n, 0)), (x**n/(a**2*n + a*b*n*x**n), True))
```

GIAC/XCAS [A] time = 0.214616, size = 23, normalized size = 1.35

$$-\frac{1}{(bx^n + a)bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(n - 1)/(b*x^n + a)^2,x, algorithm="giac")
```

```
[Out] -1/((b*x^n + a)*b*n)
```

3.2621 $\int \frac{1}{x(a+bx^n)^2}\,dx$

Optimal. Leaf size=39

$$-\frac{\log\left(a+bx^n\right)}{a^2n}+\frac{\log(x)}{a^2}+\frac{1}{an\left(a+bx^n\right)}$$

```
[Out] 1/(a*n*(a + b*x^n)) + Log[x]/a^2 - Log[a + b*x^n]/(a^2*n)
```

Rubi [A] time = 0.064068, antiderivative size = 39, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{\log\left(a+bx^n\right)}{a^2n}+\frac{\log(x)}{a^2}+\frac{1}{an\left(a+bx^n\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a + b*x^n)^2),x]
```

```
[Out] 1/(a*n*(a + b*x^n)) + Log[x]/a^2 - Log[a + b*x^n]/(a^2*n)
```

Rubi in Sympy [A] time = 9.59624, size = 34, normalized size = 0.87

$$\frac{1}{an\left(a+bx^n\right)}+\frac{\log\left(x^n\right)}{a^2n}-\frac{\log\left(a+bx^n\right)}{a^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(a+b*x**n)**2,x)
```

```
[Out] 1/(a*n*(a + b*x**n)) + log(x**n)/(a**2*n) - log(a + b*x**n)/(a**2
*n)
```

Mathematica [A] time = 0.070419, size = 34, normalized size = 0.87

$$\frac{\frac{a}{an+bnx^n}-\frac{\log(a+bx^n)}{n}+\log(x)}{a^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a + b*x^n)^2),x]
```

```
[Out] (a/(a*n + b*n*x^n) + Log[x] - Log[a + b*x^n]/n)/a^2
```

Maple [A] time = 0., size = 45, normalized size = 1.2

$$\frac{\ln\left(x^n\right)}{a^2n}-\frac{\ln\left(a+bx^n\right)}{a^2n}+\frac{1}{an\left(a+bx^n\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(a+b*x^n)^2,x)
```

```
[Out] 1/n/a^2*ln(x^n)-ln(a+b*x^n)/a^2/n+1/a/n/(a+b*x^n)
```

Maxima [A] time = 1.43452, size = 58, normalized size = 1.49

$$\frac{1}{abnx^n + a^2n} - \frac{\log(bx^n + a)}{a^2n} + \frac{\log(x^n)}{a^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^2*x),x, algorithm="maxima")
```

```
[Out] 1/(a*b*n*x^n + a^2*n) - log(b*x^n + a)/(a^2*n) + log(x^n)/(a^2*n)
```

Fricas [A] time = 0.226626, size = 68, normalized size = 1.74

$$\frac{bnx^n \log(x) + an\log(x) - (bx^n + a)\log(bx^n + a) + a}{a^2bnx^n + a^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^2*x),x, algorithm="fricas")
```

```
[Out] (b*n*x^n*log(x) + a*n*log(x) - (b*x^n + a)*log(b*x^n + a) + a)/(a
^2*b*n*x^n + a^3*n)
```

Sympy [A] time = 3.65584, size = 160, normalized size = 4.1

$$\begin{cases} \tilde{\infty}\log(x) & \text{for}\: a = 0 \wedge b = 0 \wedge n = 0 \\ \frac{\log(x)}{a^2} & \text{for}\: b = 0 \\ -\frac{x^{-2n}}{2b^2n} & \text{for}\: a = 0 \\ \tilde{\infty}\log(x) & \text{for}\: b = -ax^{-n} \\ \frac{\log(x)}{(a+b)^2} & \text{for}\: n = 0 \\ \frac{an\log(x)}{a^3n+a^2bnx^n} - \frac{a\log\left(\frac{a}{b}+x^n\right)}{a^3n+a^2bnx^n} + \frac{a}{a^3n+a^2bnx^n} + \frac{bnx^n\log(x)}{a^3n+a^2bnx^n} - \frac{bx^n\log\left(\frac{a}{b}+x^n\right)}{a^3n+a^2bnx^n} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(a+b*x**n)**2,x)
```

```
[Out] Piecewise((zoo*log(x), Eq(a, 0) & Eq(b, 0) & Eq(n, 0)), (log(x)/a
**2, Eq(b, 0)), (-x**(-2*n)/(2*b**2*n), Eq(a, 0)), (zoo*log(x), E
q(b, -a*x**(-n))), (log(x)/(a + b)**2, Eq(n, 0)), (a*n*log(x)/(a*
*3*n + a**2*b*n*x**n) - a*log(a/b + x**n)/(a**3*n + a**2*b*n*x**n
) + a/(a**3*n + a**2*b*n*x**n) + b*n*x**n*log(x)/(a**3*n + a**2*b
*n*x**n) - b*x**n*log(a/b + x**n)/(a**3*n + a**2*b*n*x**n), True)
)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^n + a)^2x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^2*x),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^n + a)^2*x), x)
```

3.2622 $\int \frac{x^{-1-n}}{(a+bx^n)^2}\,dx$

Optimal. Leaf size=57

$$\frac{2b\log(a+bx^n)}{a^3n}-\frac{2b\log(x)}{a^3}-\frac{b}{a^2n(a+bx^n)}-\frac{x^{-n}}{a^2n}$$

```
[Out] -(1/(a^2*n*x^n)) - b/(a^2*n*(a + b*x^n)) - (2*b*Log[x])/a^3 + (2*
b*Log[a + b*x^n])/(a^3*n)
```

Rubi [A] time = 0.0880273, antiderivative size = 57, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{2b\log(a+bx^n)}{a^3n}-\frac{2b\log(x)}{a^3}-\frac{b}{a^2n(a+bx^n)}-\frac{x^{-n}}{a^2n}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 - n)/(a + b*x^n)^2,x]
```

```
[Out] -(1/(a^2*n*x^n)) - b/(a^2*n*(a + b*x^n)) - (2*b*Log[x])/a^3 + (2*
b*Log[a + b*x^n])/(a^3*n)
```

Rubi in Sympy [A] time = 13.1157, size = 53, normalized size = 0.93

$$-\frac{b}{a^2n(a+bx^n)}-\frac{x^{-n}}{a^2n}-\frac{2b\log(x^n)}{a^3n}+\frac{2b\log(a+bx^n)}{a^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1-n)/(a+b*x**n)**2,x)
```

```
[Out] -b/(a**2*n*(a + b*x**n)) - x**(-n)/(a**2*n) - 2*b*log(x**n)/(a**3
*n) + 2*b*log(a + b*x**n)/(a**3*n)
```

Mathematica [A] time = 0.0792345, size = 45, normalized size = 0.79

$$\frac{\frac{b^2x^n}{a+bx^n}+2b\log(ax^{-n}+b)-ax^{-n}}{a^3n}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 - n)/(a + b*x^n)^2,x]
```

```
[Out] (-(a/x^n) + (b^2*x^n)/(a + b*x^n) + 2*b*Log[b + a/x^n])/(a^3*n)
```

Maple [A] time = 0.033, size = 97, normalized size = 1.7

$$\frac{1}{e^{n\ln(x)}\left(a+be^{n\ln(x)}\right)}\left(2\frac{b^2\left(e^{n\ln(x)}\right)^2}{a^3n}-\frac{1}{an}-2\frac{b\ln(x)e^{n\ln(x)}}{a^2}-2\frac{b^2\ln(x)\left(e^{n\ln(x)}\right)^2}{a^3}\right)+2\frac{b\ln\left(a+be^{n\ln(x)}\right)}{a^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-n)/(a+b*x^n)^2,x)
```

```
[Out] (2*b^2/a^3/n*exp(n*ln(x))^2-1/a/n-2*b/a^2*ln(x)*exp(n*ln(x))-2*b^
2/a^3*ln(x)*exp(n*ln(x))^2)/exp(n*ln(x))/(a+b*exp(n*ln(x)))+2*b/a
^3/n*ln(a+b*exp(n*ln(x)))
```

Maxima [A] time = 1.45245, size = 84, normalized size = 1.47

$$-\frac{2\,bx^{n}+a}{a^{2}bnx^{2\,n}+a^{3}nx^{n}}-\frac{2\,b\log\left(x\right)}{a^{3}}+\frac{2\,b\log\left(\frac{bx^{n}+a}{b}\right)}{a^{3}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-n - 1)/(b*x^n + a)^2,x, algorithm="maxima")
```

```
[Out] -(2*b*x^n + a)/(a^2*b*n*x^(2*n) + a^3*n*x^n) - 2*b*log(x)/a^3 + 2
*b*log((b*x^n + a)/b)/(a^3*n)
```

Fricas [A] time = 0.230616, size = 111, normalized size = 1.95

$$-\frac{2\,b^{2}nx^{2\,n}\log\left(x\right)+a^{2}+2\,(abn\log\left(x\right)+ab)x^{n}-2\,\left(b^{2}x^{2\,n}+abx^{n}\right)\log\left(bx^{n}+a\right)}{a^{3}bnx^{2\,n}+a^{4}nx^{n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-n - 1)/(b*x^n + a)^2,x, algorithm="fricas")
```

```
[Out] -(2*b^2*n*x^(2*n)*log(x) + a^2 + 2*(a*b*n*log(x) + a*b)*x^n - 2*(
b^2*x^(2*n) + a*b*x^n)*log(b*x^n + a))/(a^3*b*n*x^(2*n) + a^4*n*x
^n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-n)/(a+b*x**n)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{-n-1}}{\left(bx^{n}+a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-n - 1)/(b*x^n + a)^2,x, algorithm="giac")
```

```
[Out] integrate(x^(-n - 1)/(b*x^n + a)^2, x)
```

3.2623 $\int \frac{x^{-1-2n}}{(a+bx^n)^2}\,dx$

Optimal. Leaf size=78

$$-\frac{3b^2\log(a+bx^n)}{a^4n}+\frac{3b^2\log(x)}{a^4}+\frac{b^2}{a^3n(a+bx^n)}+\frac{2bx^{-n}}{a^3n}-\frac{x^{-2n}}{2a^2n}$$

```
[Out] -1/(2*a^2*n*x^(2*n)) + (2*b)/(a^3*n*x^n) + b^2/(a^3*n*(a + b*x^n)
) + (3*b^2*Log[x])/a^4 - (3*b^2*Log[a + b*x^n])/(a^4*n)
```

Rubi [A] time = 0.115309, antiderivative size = 78, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{3b^2\log(a+bx^n)}{a^4n}+\frac{3b^2\log(x)}{a^4}+\frac{b^2}{a^3n(a+bx^n)}+\frac{2bx^{-n}}{a^3n}-\frac{x^{-2n}}{2a^2n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 2*n)/(a + b*x^n)^2,x]
```

```
[Out] -1/(2*a^2*n*x^(2*n)) + (2*b)/(a^3*n*x^n) + b^2/(a^3*n*(a + b*x^n)
) + (3*b^2*Log[x])/a^4 - (3*b^2*Log[a + b*x^n])/(a^4*n)
```

Rubi in Sympy [A] time = 17.73, size = 73, normalized size = 0.94

$$-\frac{x^{-2n}}{2a^2n}+\frac{b^2}{a^3n(a+bx^n)}+\frac{2bx^{-n}}{a^3n}+\frac{3b^2\log(x^n)}{a^4n}-\frac{3b^2\log(a+bx^n)}{a^4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-2*n)/(a+b*x**n)**2,x)
```

```
[Out] -x**(-2*n)/(2*a**2*n) + b**2/(a**3*n*(a + b*x**n)) + 2*b*x**(-n)/
(a**3*n) + 3*b**2*log(x**n)/(a**4*n) - 3*b**2*log(a + b*x**n)/(a*
*4*n)
```

Mathematica [A] time = 0.160889, size = 62, normalized size = 0.79

$$-\frac{x^{-2n}\left(a^2+\frac{2b^3x^{3n}}{a+bx^n}-4abx^n\right)+6b^2\log(ax^{-n}+b)}{2a^4n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 2*n)/(a + b*x^n)^2,x]
```

```
[Out] -((a^2 - 4*a*b*x^n + (2*b^3*x^(3*n))/(a + b*x^n))/x^(2*n) + 6*b^2
*Log[b + a/x^n])/(2*a^4*n)
```

Maple [A] time = 0.039, size = 117, normalized size = 1.5

$$\frac{1}{\left(e^{n\ln(x)}\right)^2\left(a+be^{n\ln(x)}\right)}\left(-3\frac{b^3\left(e^{n\ln(x)}\right)^3}{a^4n}-\frac{1}{2\,an}+\frac{3\,be^{n\ln(x)}}{2\,a^2n}+3\frac{b^2\ln(x)\left(e^{n\ln(x)}\right)^2}{a^3}+3\frac{b^3\ln(x)\left(e^{n\ln(x)}\right)^3}{a^4}\right)-3\frac{b^2\ln\left(a+be^{n\ln(x)}\right)}{a^4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-2*n)/(a+b*x^n)^2,x)
```

```
[Out] (-3*b^3/a^4/n*exp(n*ln(x))^3-1/2/a/n+3/2*b/a^2/n*exp(n*ln(x))+3*b
^2/a^3*ln(x)*exp(n*ln(x))^2+3*b^3/a^4*ln(x)*exp(n*ln(x))^3)/exp(n
*ln(x))^2/(a+b*exp(n*ln(x)))-3*b^2/a^4/n*ln(a+b*exp(n*ln(x)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-2*n - 1)/(b*x^n + a)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [A] time = 0.232531, size = 142, normalized size = 1.82

$$\frac{6\,b^3nx^{3\,n}\log\left(x\right)+3\,a^2bx^n-a^3+6\,\left(ab^2n\log\left(x\right)+ab^2\right)x^{2\,n}-6\,\left(b^3x^{3\,n}+ab^2x^{2\,n}\right)\log\left(bx^n+a\right)}{2\,\left(a^4bnx^{3\,n}+a^5nx^{2\,n}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-2*n - 1)/(b*x^n + a)^2,x, algorithm="fricas")
```

```
[Out] 1/2*(6*b^3*n*x^(3*n)*log(x) + 3*a^2*b*x^n - a^3 + 6*(a*b^2*n*log(
x) + a*b^2)*x^(2*n) - 6*(b^3*x^(3*n) + a*b^2*x^(2*n))*log(b*x^n +
 a))/(a^4*b*n*x^(3*n) + a^5*n*x^(2*n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-2*n)/(a+b*x**n)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{-2\,n-1}}{\left(bx^n+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-2*n - 1)/(b*x^n + a)^2,x, algorithm="giac")
```

```
[Out] integrate(x^(-2*n - 1)/(b*x^n + a)^2, x)
```

3.2624 $\int \frac{x^{-1-3n}}{(a+bx^n)^2}\,dx$

Optimal. Leaf size=94

$$\frac{4b^3\log(a+bx^n)}{a^5n}-\frac{4b^3\log(x)}{a^5}-\frac{b^3}{a^4n(a+bx^n)}-\frac{3b^2x^{-n}}{a^4n}+\frac{bx^{-2n}}{a^3n}-\frac{x^{-3n}}{3a^2n}$$

```
[Out] -1/(3*a^2*n*x^(3*n)) + b/(a^3*n*x^(2*n)) - (3*b^2)/(a^4*n*x^n) -
b^3/(a^4*n*(a + b*x^n)) - (4*b^3*Log[x])/a^5 + (4*b^3*Log[a + b*x
^n])/(a^5*n)
```

Rubi [A] time = 0.137872, antiderivative size = 94, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{4b^3\log(a+bx^n)}{a^5n}-\frac{4b^3\log(x)}{a^5}-\frac{b^3}{a^4n(a+bx^n)}-\frac{3b^2x^{-n}}{a^4n}+\frac{bx^{-2n}}{a^3n}-\frac{x^{-3n}}{3a^2n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 3*n)/(a + b*x^n)^2,x]
```

```
[Out] -1/(3*a^2*n*x^(3*n)) + b/(a^3*n*x^(2*n)) - (3*b^2)/(a^4*n*x^n) -
b^3/(a^4*n*(a + b*x^n)) - (4*b^3*Log[x])/a^5 + (4*b^3*Log[a + b*x
^n])/(a^5*n)
```

Rubi in Sympy [A] time = 20.2003, size = 87, normalized size = 0.93

$$-\frac{x^{-3n}}{3a^2n}+\frac{bx^{-2n}}{a^3n}-\frac{b^3}{a^4n(a+bx^n)}-\frac{3b^2x^{-n}}{a^4n}-\frac{4b^3\log(x^n)}{a^5n}+\frac{4b^3\log(a+bx^n)}{a^5n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-3*n)/(a+b*x**n)**2,x)
```

```
[Out] -x**(-3*n)/(3*a**2*n) + b*x**(-2*n)/(a**3*n) - b**3/(a**4*n*(a +
b*x**n)) - 3*b**2*x**(-n)/(a**4*n) - 4*b**3*log(x**n)/(a**5*n) +
4*b**3*log(a + b*x**n)/(a**5*n)
```

Mathematica [A] time = 0.137936, size = 77, normalized size = 0.82

$$\frac{x^{-3n}\left(-a^3+3a^2bx^n+\frac{3b^4x^{4n}}{a+bx^n}-9ab^2x^{2n}\right)+12b^3\log\left(ax^{-n}+b\right)}{3a^5n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 3*n)/(a + b*x^n)^2,x]
```

```
[Out] ((-a^3 + 3*a^2*b*x^n - 9*a*b^2*x^(2*n) + (3*b^4*x^(4*n))/(a + b*x
^n))/x^(3*n) + 12*b^3*Log[b + a/x^n])/(3*a^5*n)
```

Maple [A] time = 0.042, size = 135, normalized size = 1.4

$$\frac{1}{\left(e^{n\ln(x)}\right)^{3}\left(a+b e^{n\ln(x)}\right)}\left(4\frac{b^{4}\left(e^{n\ln(x)}\right)^{4}}{a^{5}n}-\frac{1}{3\,an}+\frac{2\,b e^{n\ln(x)}}{3\,a^{2}n}-2\frac{b^{2}\left(e^{n\ln(x)}\right)^{2}}{a^{3}n}-4\frac{b^{3}\ln(x)\left(e^{n\ln(x)}\right)^{3}}{a^{4}}-4\frac{b^{4}\ln(x)\left(e^{n\ln(x)}\right.}{a^{5}}\right.$$

$$+4\frac{b^{3}\ln\left(a+b e^{n\ln(x)}\right)}{a^{5}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-3*n)/(a+b*x^n)^2,x)
```

```
[Out] (4*b^4/a^5/n*exp(n*ln(x))^4-1/3/a/n+2/3*b/a^2/n*exp(n*ln(x))-2*b^
2/a^3/n*exp(n*ln(x))^2-4*b^3/a^4*ln(x)*exp(n*ln(x))^3-4*b^4/a^5*l
n(x)*exp(n*ln(x))^4)/exp(n*ln(x))^3/(a+b*exp(n*ln(x)))+4*b^3/a^5/
n*ln(a+b*exp(n*ln(x)))
```

Maxima [A] time = 1.45409, size = 127, normalized size = 1.35

$$-\frac{12\,b^{3}x^{3\,n}+6\,ab^{2}x^{2\,n}-2\,a^{2}bx^{n}+a^{3}}{3\,(a^{4}bnx^{4\,n}+a^{5}nx^{3\,n})}-\frac{4\,b^{3}\log(x)}{a^{5}}+\frac{4\,b^{3}\log\left(\frac{bx^{n}+a}{b}\right)}{a^{5}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-3*n - 1)/(b*x^n + a)^2,x, algorithm="maxima")
```

```
[Out] -1/3*(12*b^3*x^(3*n) + 6*a*b^2*x^(2*n) - 2*a^2*b*x^n + a^3)/(a^4*
b*n*x^(4*n) + a^5*n*x^(3*n)) - 4*b^3*log(x)/a^5 + 4*b^3*log((b*x^
n + a)/b)/(a^5*n)
```

Fricas [A] time = 0.23224, size = 157, normalized size = 1.67

$$-\frac{12\,b^{4}nx^{4\,n}\log(x)+6\,a^{2}b^{2}x^{2\,n}-2\,a^{3}bx^{n}+a^{4}+12\,\left(ab^{3}n\log(x)+ab^{3}\right)x^{3\,n}-12\,\left(b^{4}x^{4\,n}+ab^{3}x^{3\,n}\right)\log(bx^{n}+a)}{3\,(a^{5}bnx^{4\,n}+a^{6}nx^{3\,n})}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-3*n - 1)/(b*x^n + a)^2,x, algorithm="fricas")
```

```
[Out] -1/3*(12*b^4*n*x^(4*n)*log(x) + 6*a^2*b^2*x^(2*n) - 2*a^3*b*x^n +
 a^4 + 12*(a*b^3*n*log(x) + a*b^3)*x^(3*n) - 12*(b^4*x^(4*n) + a*
b^3*x^(3*n))*log(b*x^n + a))/(a^5*b*n*x^(4*n) + a^6*n*x^(3*n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-3*n)/(a+b*x**n)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{-3\,n-1}}{\left(bx^n+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-3*n - 1)/(b*x^n + a)^2,x, algorithm="giac")

[Out] integrate(x^(-3*n - 1)/(b*x^n + a)^2, x)
```

3.2625 $\int \frac{x^{-1+4n}}{(a+bx^n)^3} dx$

Optimal. Leaf size=70

$$\frac{a^3}{2b^4n(a+bx^n)^2}-\frac{3a^2}{b^4n(a+bx^n)}-\frac{3a\log(a+bx^n)}{b^4n}+\frac{x^n}{b^3n}$$

```
[Out] x^n/(b^3*n) + a^3/(2*b^4*n*(a + b*x^n)^2) - (3*a^2)/(b^4*n*(a + b
*x^n)) - (3*a*Log[a + b*x^n])/(b^4*n)
```

Rubi [A] time = 0.101758, antiderivative size = 70, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{a^3}{2b^4n(a+bx^n)^2}-\frac{3a^2}{b^4n(a+bx^n)}-\frac{3a\log(a+bx^n)}{b^4n}+\frac{x^n}{b^3n}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 + 4*n)/(a + b*x^n)^3,x]
```

```
[Out] x^n/(b^3*n) + a^3/(2*b^4*n*(a + b*x^n)^2) - (3*a^2)/(b^4*n*(a + b
*x^n)) - (3*a*Log[a + b*x^n])/(b^4*n)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^3}{2b^4n(a+bx^n)^2}-\frac{3a^2}{b^4n(a+bx^n)}-\frac{3a\log(a+bx^n)}{b^4n}+\frac{\int^{x^n}\frac{1}{b^3}\,dx}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1+4*n)/(a+b*x**n)**3,x)
```

```
[Out] a**3/(2*b**4*n*(a + b*x**n)**2) - 3*a**2/(b**4*n*(a + b*x**n)) -
3*a*log(a + b*x**n)/(b**4*n) + Integral(b**(-3), (x, x**n))/n
```

Mathematica [A] time = 0.0570648, size = 70, normalized size = 1.

$$\frac{a^3}{2b^4n(a+bx^n)^2}-\frac{3a^2}{b^4n(a+bx^n)}-\frac{3a\log(a+bx^n)}{b^4n}+\frac{x^n}{b^3n}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 + 4*n)/(a + b*x^n)^3,x]
```

```
[Out] x^n/(b^3*n) + a^3/(2*b^4*n*(a + b*x^n)^2) - (3*a^2)/(b^4*n*(a + b
*x^n)) - (3*a*Log[a + b*x^n])/(b^4*n)
```

Maple [A] time = 0.049, size = 75, normalized size = 1.1

$$\frac{1}{\left(a+b\mathrm{e}^{n\ln(x)}\right)^2}\left(\frac{\left(\mathrm{e}^{n\ln(x)}\right)^3}{bn}-\frac{9\,a^3}{2\,b^4n}-6\,\frac{a^2\mathrm{e}^{n\ln(x)}}{b^3n}\right)-3\,\frac{a\ln\left(a+b\mathrm{e}^{n\ln(x)}\right)}{b^4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+4*n)/(a+b*x^n)^3,x)
```

```
[Out] (1/b/n*exp(n*ln(x))^3-9/2*a^3/b^4/n-6*a^2/b^3/n*exp(n*ln(x)))/(a+
b*exp(n*ln(x)))^2-3*a/b^4/n*ln(a+b*exp(n*ln(x)))
```

Maxima [A] time = 1.45841, size = 123, normalized size = 1.76

$$\frac{2\,b^3x^{3\,n} + 4\,ab^2x^{2\,n} - 4\,a^2bx^n - 5\,a^3}{2\,(b^6nx^{2\,n} + 2\,ab^5nx^n + a^2b^4n)} - \frac{3\,a\log\left(\frac{bx^n+a}{b}\right)}{b^4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(4*n - 1)/(b*x^n + a)^3,x, algorithm="maxima")
```

```
[Out] 1/2*(2*b^3*x^(3*n) + 4*a*b^2*x^(2*n) - 4*a^2*b*x^n - 5*a^3)/(b^6*
n*x^(2*n) + 2*a*b^5*n*x^n + a^2*b^4*n) - 3*a*log((b*x^n + a)/b)/(
b^4*n)
```

Fricas [A] time = 0.226444, size = 138, normalized size = 1.97

$$\frac{2\,b^3x^{3\,n} + 4\,ab^2x^{2\,n} - 4\,a^2bx^n - 5\,a^3 - 6\,\left(ab^2x^{2\,n} + 2\,a^2bx^n + a^3\right)\log\left(bx^n + a\right)}{2\,(b^6nx^{2\,n} + 2\,ab^5nx^n + a^2b^4n)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(4*n - 1)/(b*x^n + a)^3,x, algorithm="fricas")
```

```
[Out] 1/2*(2*b^3*x^(3*n) + 4*a*b^2*x^(2*n) - 4*a^2*b*x^n - 5*a^3 - 6*(a
*b^2*x^(2*n) + 2*a^2*b*x^n + a^3)*log(b*x^n + a))/(b^6*n*x^(2*n)
+ 2*a*b^5*n*x^n + a^2*b^4*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+4*n)/(a+b*x**n)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{4\,n-1}}{(bx^n + a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(4*n - 1)/(b*x^n + a)^3,x, algorithm="giac")
```

```
[Out] integrate(x^(4*n - 1)/(b*x^n + a)^3, x)
```

3.2626 $\int \frac{x^{-1+3n}}{(a+bx^n)^3} dx$

Optimal. Leaf size=56

$$-\frac{a^2}{2b^3n(a+bx^n)^2}+\frac{2a}{b^3n(a+bx^n)}+\frac{\log(a+bx^n)}{b^3n}$$

```
[Out] -a^2/(2*b^3*n*(a + b*x^n)^2) + (2*a)/(b^3*n*(a + b*x^n)) + Log[a
+ b*x^n]/(b^3*n)
```

Rubi [A] time = 0.0892145, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{a^2}{2b^3n(a+bx^n)^2}+\frac{2a}{b^3n(a+bx^n)}+\frac{\log(a+bx^n)}{b^3n}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 + 3*n)/(a + b*x^n)^3,x]
```

```
[Out] -a^2/(2*b^3*n*(a + b*x^n)^2) + (2*a)/(b^3*n*(a + b*x^n)) + Log[a
+ b*x^n]/(b^3*n)
```

Rubi in Sympy [A] time = 13.0085, size = 46, normalized size = 0.82

$$-\frac{a^2}{2b^3n(a+bx^n)^2}+\frac{2a}{b^3n(a+bx^n)}+\frac{\log(a+bx^n)}{b^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1+3*n)/(a+b*x**n)**3,x)
```

```
[Out] -a**2/(2*b**3*n*(a + b*x**n)**2) + 2*a/(b**3*n*(a + b*x**n)) + lo
g(a + b*x**n)/(b**3*n)
```

Mathematica [A] time = 0.0546697, size = 42, normalized size = 0.75

$$\frac{\frac{a(3a+4bx^n)}{(a+bx^n)^2}+2\log(a+bx^n)}{2b^3n}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 + 3*n)/(a + b*x^n)^3,x]
```

```
[Out] ((a*(3*a + 4*b*x^n))/(a + b*x^n)^2 + 2*Log[a + b*x^n])/(2*b^3*n)
```

Maple [A] time = 0.039, size = 57, normalized size = 1.

$$\frac{1}{\left(a+be^{n\ln(x)}\right)^2}\left(\frac{3\,a^2}{2\,b^3n}+2\,\frac{ae^{n\ln(x)}}{b^2n}\right)+\frac{\ln\left(a+be^{n\ln(x)}\right)}{b^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+3*n)/(a+b*x^n)^3,x)
```

```
[Out] (3/2*a^2/b^3/n+2*a/b^2/n*exp(n*ln(x)))/(a+b*exp(n*ln(x)))^2+1/b^3
/n*ln(a+b*exp(n*ln(x)))
```

Maxima [A] time = 1.45562, size = 89, normalized size = 1.59

$$\frac{4\,abx^n + 3\,a^2}{2\,(b^5nx^{2\,n} + 2\,ab^4nx^n + a^2b^3n)} + \frac{\log\left(\frac{bx^n+a}{b}\right)}{b^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3*n - 1)/(b*x^n + a)^3,x, algorithm="maxima")
```

```
[Out] 1/2*(4*a*b*x^n + 3*a^2)/(b^5*n*x^(2*n) + 2*a*b^4*n*x^n + a^2*b^3*
n) + log((b*x^n + a)/b)/(b^3*n)
```

Fricas [A] time = 0.221159, size = 103, normalized size = 1.84

$$\frac{4\,abx^n + 3\,a^2 + 2\,\left(b^2x^{2\,n} + 2\,abx^n + a^2\right)\log\left(bx^n + a\right)}{2\,(b^5nx^{2\,n} + 2\,ab^4nx^n + a^2b^3n)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3*n - 1)/(b*x^n + a)^3,x, algorithm="fricas")
```

```
[Out] 1/2*(4*a*b*x^n + 3*a^2 + 2*(b^2*x^(2*n) + 2*a*b*x^n + a^2)*log(b*
x^n + a))/(b^5*n*x^(2*n) + 2*a*b^4*n*x^n + a^2*b^3*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+3*n)/(a+b*x**n)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{3\,n-1}}{(bx^n + a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3*n - 1)/(b*x^n + a)^3,x, algorithm="giac")
```

```
[Out] integrate(x^(3*n - 1)/(b*x^n + a)^3, x)
```

3.2627 $\int \frac{x^{-1+2n}}{(a+bx^n)^3}\,dx$

Optimal. Leaf size=24

$$\frac{x^{2n}}{2an\,(a+bx^n)^2}$$

```
[Out] x^(2*n)/(2*a*n*(a + b*x^n)^2)
```

Rubi [A] time = 0.0229047, antiderivative size = 24, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.059

$$\frac{x^{2n}}{2an\,(a+bx^n)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + 2*n)/(a + b*x^n)^3,x]

[Out] x^(2*n)/(2*a*n*(a + b*x^n)^2)
```

Rubi in Sympy [A] time = 3.08278, size = 17, normalized size = 0.71

$$\frac{x^{2n}}{2an\,(a+bx^n)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+2*n)/(a+b*x**n)**3,x)

[Out] x**(2*n)/(2*a*n*(a + b*x**n)**2)
```

Mathematica [A] time = 0.020997, size = 27, normalized size = 1.12

$$-\frac{a+2bx^n}{2b^2n\,(a+bx^n)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + 2*n)/(a + b*x^n)^3,x]

[Out] -(a + 2*b*x^n)/(2*b^2*n*(a + b*x^n)^2)
```

Maple [A] time = 0.039, size = 36, normalized size = 1.5

$$\frac{1}{\left(a+b\mathrm{e}^{n\ln(x)}\right)^2}\left(-\frac{\mathrm{e}^{n\ln(x)}}{bn}-\frac{a}{2\,b^2n}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+2*n)/(a+b*x^n)^3,x)
```

```
[Out] (-1/b/n*exp(n*ln(x))-1/2*a/b^2/n)/(a+b*exp(n*ln(x)))^2
```

Maxima [A] time = 1.51647, size = 55, normalized size = 2.29

$$-\frac{2\,bx^{n}+a}{2\,(b^{4}nx^{2\,n}+2\,ab^{3}nx^{n}+a^{2}b^{2}n)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(2*n - 1)/(b*x^n + a)^3,x, algorithm="maxima")
```

```
[Out] -1/2*(2*b*x^n + a)/(b^4*n*x^(2*n) + 2*a*b^3*n*x^n + a^2*b^2*n)
```

Fricas [A] time = 0.217433, size = 55, normalized size = 2.29

$$-\frac{2\,bx^{n}+a}{2\,(b^{4}nx^{2\,n}+2\,ab^{3}nx^{n}+a^{2}b^{2}n)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(2*n - 1)/(b*x^n + a)^3,x, algorithm="fricas")
```

```
[Out] -1/2*(2*b*x^n + a)/(b^4*n*x^(2*n) + 2*a*b^3*n*x^n + a^2*b^2*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+2*n)/(a+b*x**n)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{2\,n-1}}{(bx^{n}+a)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(2*n - 1)/(b*x^n + a)^3,x, algorithm="giac")
```

```
[Out] integrate(x^(2*n - 1)/(b*x^n + a)^3, x)
```

3.2628 $\int \frac{x^{-1+n}}{(a+bx^n)^3}\,dx$

Optimal. Leaf size=19

$$-\frac{1}{2bn\,(a+bx^n)^2}$$

```
[Out] -1/(2*b*n*(a + b*x^n)^2)
```

Rubi [A] time = 0.0200066, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$-\frac{1}{2bn\,(a+bx^n)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 + n)/(a + b*x^n)^3,x]

[Out] -1/(2*b*n*(a + b*x^n)^2)
```

Rubi in Sympy [A] time = 2.45218, size = 15, normalized size = 0.79

$$-\frac{1}{2bn\,(a+bx^n)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1+n)/(a+b*x**n)**3,x)

[Out] -1/(2*b*n*(a + b*x**n)**2)
```

Mathematica [A] time = 0.0106049, size = 19, normalized size = 1.

$$-\frac{1}{2bn\,(a+bx^n)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 + n)/(a + b*x^n)^3,x]

[Out] -1/(2*b*n*(a + b*x^n)^2)
```

Maple [A] time = 0.039, size = 20, normalized size = 1.1

$$-\frac{1}{2\,bn\,\left(a+be^{n\ln(x)}\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-1+n)/(a+b*x^n)^3,x)

[Out] -1/2/b/n/(a+b*exp(n*ln(x)))^2
```

Maxima [A] time = 1.44062, size = 23, normalized size = 1.21

$$-\frac{1}{2\,(bx^n + a)^2 bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(n - 1)/(b*x^n + a)^3,x, algorithm="maxima")
```

```
[Out] -1/2/((b*x^n + a)^2*b*n)
```

Fricas [A] time = 0.214794, size = 42, normalized size = 2.21

$$-\frac{1}{2\,(b^3nx^{2\,n} + 2\,ab^2nx^n + a^2bn)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(n - 1)/(b*x^n + a)^3,x, algorithm="fricas")
```

```
[Out] -1/2/(b^3*n*x^(2*n) + 2*a*b^2*n*x^n + a^2*b*n)
```

Sympy [A] time = 87.276, size = 109, normalized size = 5.74

$$\begin{cases} \frac{\log(x)}{b^3} & \text{for } a = 0 \wedge n = 0 \\ -\frac{x^{-2n}}{2b^3n} & \text{for } a = 0 \\ \frac{\log(x)}{(a+b)^3} & \text{for } n = 0 \\ \frac{2ax^n}{2a^4n+4a^3bnx^n+2a^2b^2nx^{2n}} + \frac{bx^{2n}}{2a^4n+4a^3bnx^n+2a^2b^2nx^{2n}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+n)/(a+b*x**n)**3,x)
```

```
[Out] Piecewise((log(x)/b**3, Eq(a, 0) & Eq(n, 0)), (-x**(-2*n)/(2*b**3
*n), Eq(a, 0)), (log(x)/(a + b)**3, Eq(n, 0)), (2*a*x**n/(2*a**4*
n + 4*a**3*b*n*x**n + 2*a**2*b**2*n*x**(2*n)) + b*x**(2*n)/(2*a**
4*n + 4*a**3*b*n*x**n + 2*a**2*b**2*n*x**(2*n)), True))
```

GIAC/XCAS [A] time = 0.213305, size = 23, normalized size = 1.21

$$-\frac{1}{2\,(bx^n + a)^2 bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(n - 1)/(b*x^n + a)^3,x, algorithm="giac")
```

```
[Out] -1/2/((b*x^n + a)^2*b*n)
```

3.2629 $\int \frac{1}{x(a+bx^n)^3} dx$

Optimal. Leaf size=58

$$-\frac{\log(a+bx^n)}{a^3n}+\frac{\log(x)}{a^3}+\frac{1}{a^2n(a+bx^n)}+\frac{1}{2an(a+bx^n)^2}$$

```
[Out] 1/(2*a*n*(a + b*x^n)^2) + 1/(a^2*n*(a + b*x^n)) + Log[x]/a^3 - Lo
g[a + b*x^n]/(a^3*n)
```

Rubi [A] time = 0.0865848, antiderivative size = 58, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$-\frac{\log(a+bx^n)}{a^3n}+\frac{\log(x)}{a^3}+\frac{1}{a^2n(a+bx^n)}+\frac{1}{2an(a+bx^n)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a + b*x^n)^3),x]
```

```
[Out] 1/(2*a*n*(a + b*x^n)^2) + 1/(a^2*n*(a + b*x^n)) + Log[x]/a^3 - Lo
g[a + b*x^n]/(a^3*n)
```

Rubi in Sympy [A] time = 12.6208, size = 51, normalized size = 0.88

$$\frac{1}{2an(a+bx^n)^2}+\frac{1}{a^2n(a+bx^n)}+\frac{\log(x^n)}{a^3n}-\frac{\log(a+bx^n)}{a^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(a+b*x**n)**3,x)
```

```
[Out] 1/(2*a*n*(a + b*x**n)**2) + 1/(a**2*n*(a + b*x**n)) + log(x**n)/(
a**3*n) - log(a + b*x**n)/(a**3*n)
```

Mathematica [A] time = 0.173414, size = 48, normalized size = 0.83

$$\frac{\frac{\frac{a(3a+2bx^n)}{(a+bx^n)^2}-2\log(a+bx^n)}{n}+2\log(x)}{2a^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a + b*x^n)^3),x]
```

```
[Out] (2*Log[x] + ((a*(3*a + 2*b*x^n))/(a + b*x^n)^2 - 2*Log[a + b*x^n]
)/n)/(2*a^3)
```

Maple [A] time = 0., size = 62, normalized size = 1.1

$$\frac{\ln(x^n)}{na^3}-\frac{\ln(a+bx^n)}{na^3}+\frac{1}{a^2n(a+bx^n)}+\frac{1}{2\,an(a+bx^n)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(a+b*x^n)^3,x)
```

```
[Out] 1/n/a^3*ln(x^n)-ln(a+b*x^n)/a^3/n+1/a^2/n/(a+b*x^n)+1/2/a/n/(a+b*
x^n)^2
```

Maxima [A] time = 1.43441, size = 96, normalized size = 1.66

$$\frac{2\,bx^{n}+3\,a}{2\,(a^{2}b^{2}nx^{2\,n}+2\,a^{3}bnx^{n}+a^{4}n)}-\frac{\log\left(bx^{n}+a\right)}{a^{3}n}+\frac{\log\left(x^{n}\right)}{a^{3}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^3*x),x, algorithm="maxima")
```

```
[Out] 1/2*(2*b*x^n + 3*a)/(a^2*b^2*n*x^(2*n) + 2*a^3*b*n*x^n + a^4*n) -
 log(b*x^n + a)/(a^3*n) + log(x^n)/(a^3*n)
```

Fricas [A] time = 0.229757, size = 143, normalized size = 2.47

$$\frac{2\,b^{2}nx^{2\,n}\log\left(x\right)+2\,a^{2}n\log\left(x\right)+3\,a^{2}+2\,(2\,abn\log\left(x\right)+ab)x^{n}-2\,\left(b^{2}x^{2\,n}+2\,abx^{n}+a^{2}\right)\log\left(bx^{n}+a\right)}{2\,(a^{3}b^{2}nx^{2\,n}+2\,a^{4}bnx^{n}+a^{5}n)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^3*x),x, algorithm="fricas")
```

```
[Out] 1/2*(2*b^2*n*x^(2*n)*log(x) + 2*a^2*n*log(x) + 3*a^2 + 2*(2*a*b*n
*log(x) + a*b)*x^n - 2*(b^2*x^(2*n) + 2*a*b*x^n + a^2)*log(b*x^n
+ a))/(a^3*b^2*n*x^(2*n) + 2*a^4*b*n*x^n + a^5*n)
```

Sympy [A] time = 5.62519, size = 406, normalized size = 7.

$$\begin{cases}\tilde{\infty}\log\left(x\right)\\ \frac{\log\left(x\right)}{a^{3}}\\ -\frac{x^{-3n}}{3b^{3}n}\\ \frac{\log\left(x\right)}{(a+b)^{3}}\\ \frac{2a^{2}n\log\left(x\right)}{2a^{5}n+4a^{4}bnx^{n}+2a^{3}b^{2}nx^{2n}}-\frac{2a^{2}\log\left(\frac{a}{b}+x^{n}\right)}{2a^{5}n+4a^{4}bnx^{n}+2a^{3}b^{2}nx^{2n}}+\frac{3a^{2}}{2a^{5}n+4a^{4}bnx^{n}+2a^{3}b^{2}nx^{2n}}+\frac{4abnx^{n}\log\left(x\right)}{2a^{5}n+4a^{4}bnx^{n}+2a^{3}b^{2}nx^{2n}}-\frac{4abx^{n}\log\left(\frac{a}{b}+x^{n}\right)}{2a^{5}n+4a^{4}bnx^{n}+2a^{3}b^{2}nx^{2n}}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(a+b*x**n)**3,x)
```

```
[Out] Piecewise((zoo*log(x), Eq(a, 0) & Eq(b, 0) & Eq(n, 0)), (log(x)/a
**3, Eq(b, 0)), (-x**(-3*n)/(3*b**3*n), Eq(a, 0)), (log(x)/(a + b
)**3, Eq(n, 0)), (2*a**2*n*log(x)/(2*a**5*n + 4*a**4*b*n*x**n + 2
*a**3*b**2*n*x**(2*n)) - 2*a**2*log(a/b + x**n)/(2*a**5*n + 4*a**
4*b*n*x**n + 2*a**3*b**2*n*x**(2*n)) + 3*a**2/(2*a**5*n + 4*a**4*
b*n*x**n + 2*a**3*b**2*n*x**(2*n)) + 4*a*b*n*x**n*log(x)/(2*a**5*
n + 4*a**4*b*n*x**n + 2*a**3*b**2*n*x**(2*n)) - 4*a*b*x**n*log(a/
b + x**n)/(2*a**5*n + 4*a**4*b*n*x**n + 2*a**3*b**2*n*x**(2*n)) +
 2*a*b*x**n/(2*a**5*n + 4*a**4*b*n*x**n + 2*a**3*b**2*n*x**(2*n))
 + 2*b**2*n*x**(2*n)*log(x)/(2*a**5*n + 4*a**4*b*n*x**n + 2*a**3*
b**2*n*x**(2*n)) - 2*b**2*x**(2*n)*log(a/b + x**n)/(2*a**5*n + 4*
a**4*b*n*x**n + 2*a**3*b**2*n*x**(2*n)), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^n + a)^3 x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^3*x),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^n + a)^3*x), x)
```

3.2630 $\int \frac{x^{-1-n}}{(a+bx^n)^3} dx$

Optimal. Leaf size=77

$$\frac{3b\log(a+bx^n)}{a^4n}-\frac{3b\log(x)}{a^4}-\frac{2b}{a^3n(a+bx^n)}-\frac{x^{-n}}{a^3n}-\frac{b}{2a^2n(a+bx^n)^2}$$

```
[Out] -(1/(a^3*n*x^n)) - b/(2*a^2*n*(a + b*x^n)^2) - (2*b)/(a^3*n*(a +
b*x^n)) - (3*b*Log[x])/a^4 + (3*b*Log[a + b*x^n])/(a^4*n)
```

Rubi [A] time = 0.114486, antiderivative size = 77, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{3b\log(a+bx^n)}{a^4n}-\frac{3b\log(x)}{a^4}-\frac{2b}{a^3n(a+bx^n)}-\frac{x^{-n}}{a^3n}-\frac{b}{2a^2n(a+bx^n)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 - n)/(a + b*x^n)^3,x]
```

```
[Out] -(1/(a^3*n*x^n)) - b/(2*a^2*n*(a + b*x^n)^2) - (2*b)/(a^3*n*(a +
b*x^n)) - (3*b*Log[x])/a^4 + (3*b*Log[a + b*x^n])/(a^4*n)
```

Rubi in Sympy [A] time = 16.9118, size = 71, normalized size = 0.92

$$-\frac{b}{2a^2n(a+bx^n)^2}-\frac{2b}{a^3n(a+bx^n)}-\frac{x^{-n}}{a^3n}-\frac{3b\log(x^n)}{a^4n}+\frac{3b\log(a+bx^n)}{a^4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1-n)/(a+b*x**n)**3,x)
```

```
[Out] -b/(2*a**2*n*(a + b*x**n)**2) - 2*b/(a**3*n*(a + b*x**n)) - x**(-
n)/(a**3*n) - 3*b*log(x**n)/(a**4*n) + 3*b*log(a + b*x**n)/(a**4*
n)
```

Mathematica [A] time = 0.065776, size = 79, normalized size = 1.03

$$-\frac{b^3}{2a^4n(ax^{-n}+b)^2}+\frac{3b^2}{a^4n(ax^{-n}+b)}+\frac{3b\log(ax^{-n}+b)}{a^4n}-\frac{x^{-n}}{a^3n}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 - n)/(a + b*x^n)^3,x]
```

```
[Out] -(1/(a^3*n*x^n)) - b^3/(2*a^4*n*(b + a/x^n)^2) + (3*b^2)/(a^4*n*(
b + a/x^n)) + (3*b*Log[b + a/x^n])/(a^4*n)
```

Maple [A] time = 0.05, size = 132, normalized size = 1.7

$$\frac{1}{e^{n\ln(x)}\left(a+be^{n\ln(x)}\right)^2}\left(-\frac{1}{an}-3\frac{b\ln(x)e^{n\ln(x)}}{a^2}-6\frac{b^2\ln(x)\left(e^{n\ln(x)}\right)^2}{a^3}+6\frac{b^2\left(e^{n\ln(x)}\right)^2}{a^3n}-3\frac{b^3\ln(x)\left(e^{n\ln(x)}\right)^3}{a^4}+\frac{9b^3\left(e^{n\ln}\right.}{2a^4}\right.$$
$$+3\frac{b\ln\left(a+be^{n\ln(x)}\right)}{a^4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-n)/(a+b*x^n)^3,x)
```

```
[Out] (-1/a/n-3*b/a^2*ln(x)*exp(n*ln(x))-6*b^2/a^3*ln(x)*exp(n*ln(x))^2
+6*b^2/a^3/n*exp(n*ln(x))^2-3*b^3/a^4*ln(x)*exp(n*ln(x))^3+9/2*b^
3/a^4/n*exp(n*ln(x))^3)/exp(n*ln(x))/(a+b*exp(n*ln(x)))^2+3*b/a^4
/n*ln(a+b*exp(n*ln(x)))
```

Maxima [A] time = 1.45285, size = 123, normalized size = 1.6

$$-\frac{6\,b^2x^{2\,n}+9\,abx^n+2\,a^2}{2\,(a^3b^2nx^{3\,n}+2\,a^4bnx^{2\,n}+a^5nx^n)}-\frac{3\,b\log(x)}{a^4}+\frac{3\,b\log\left(\frac{bx^n+a}{b}\right)}{a^4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-n - 1)/(b*x^n + a)^3,x, algorithm="maxima")
```

```
[Out] -1/2*(6*b^2*x^(2*n) + 9*a*b*x^n + 2*a^2)/(a^3*b^2*n*x^(3*n) + 2*a
^4*b*n*x^(2*n) + a^5*n*x^n) - 3*b*log(x)/a^4 + 3*b*log((b*x^n + a
)/b)/(a^4*n)
```

Fricas [A] time = 0.232108, size = 188, normalized size = 2.44

$$-\frac{6\,b^3nx^{3\,n}\log(x)+2\,a^3+6\left(2\,ab^2n\log(x)+ab^2\right)x^{2\,n}+3\left(2\,a^2bn\log(x)+3\,a^2b\right)x^n-6\left(b^3x^{3\,n}+2\,ab^2x^{2\,n}+a^2bx^n\right)\log(b}{2\,(a^4b^2nx^{3\,n}+2\,a^5bnx^{2\,n}+a^6nx^n)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-n - 1)/(b*x^n + a)^3,x, algorithm="fricas")
```

```
[Out] -1/2*(6*b^3*n*x^(3*n)*log(x) + 2*a^3 + 6*(2*a*b^2*n*log(x) + a*b^
2)*x^(2*n) + 3*(2*a^2*b*n*log(x) + 3*a^2*b)*x^n - 6*(b^3*x^(3*n)
+ 2*a*b^2*x^(2*n) + a^2*b*x^n)*log(b*x^n + a))/(a^4*b^2*n*x^(3*n)
 + 2*a^5*b*n*x^(2*n) + a^6*n*x^n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-n)/(a+b*x**n)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{-n-1}}{(bx^n+a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-n - 1)/(b*x^n + a)^3,x, algorithm="giac")
```

```
[Out] integrate(x^(-n - 1)/(b*x^n + a)^3, x)
```

3.2631 $\int \frac{x^{-1-2n}}{(a+bx^n)^3} dx$

Optimal. Leaf size=101

$$-\frac{6b^2\log(a+bx^n)}{a^5n}+\frac{6b^2\log(x)}{a^5}+\frac{3b^2}{a^4n(a+bx^n)}+\frac{3bx^{-n}}{a^4n}+\frac{b^2}{2a^3n(a+bx^n)^2}-\frac{x^{-2n}}{2a^3n}$$

```
[Out] -1/(2*a^3*n*x^(2*n)) + (3*b)/(a^4*n*x^n) + b^2/(2*a^3*n*(a + b*x^
n)^2) + (3*b^2)/(a^4*n*(a + b*x^n)) + (6*b^2*Log[x])/a^5 - (6*b^2
*Log[a + b*x^n])/(a^5*n)
```

Rubi [A] time = 0.141831, antiderivative size = 101, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$-\frac{6b^2\log(a+bx^n)}{a^5n}+\frac{6b^2\log(x)}{a^5}+\frac{3b^2}{a^4n(a+bx^n)}+\frac{3bx^{-n}}{a^4n}+\frac{b^2}{2a^3n(a+bx^n)^2}-\frac{x^{-2n}}{2a^3n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 2*n)/(a + b*x^n)^3,x]
```

```
[Out] -1/(2*a^3*n*x^(2*n)) + (3*b)/(a^4*n*x^n) + b^2/(2*a^3*n*(a + b*x^
n)^2) + (3*b^2)/(a^4*n*(a + b*x^n)) + (6*b^2*Log[x])/a^5 - (6*b^2
*Log[a + b*x^n])/(a^5*n)
```

Rubi in Sympy [A] time = 22.6642, size = 94, normalized size = 0.93

$$\frac{b^2}{2a^3n(a+bx^n)^2}-\frac{x^{-2n}}{2a^3n}+\frac{3b^2}{a^4n(a+bx^n)}+\frac{3bx^{-n}}{a^4n}+\frac{6b^2\log(x^n)}{a^5n}-\frac{6b^2\log(a+bx^n)}{a^5n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-2*n)/(a+b*x**n)**3,x)
```

```
[Out] b**2/(2*a**3*n*(a + b*x**n)**2) - x**(-2*n)/(2*a**3*n) + 3*b**2/(
a**4*n*(a + b*x**n)) + 3*b*x**(-n)/(a**4*n) + 6*b**2*log(x**n)/(a
**5*n) - 6*b**2*log(a + b*x**n)/(a**5*n)
```

Mathematica [A] time = 0.0822267, size = 97, normalized size = 0.96

$$\frac{b^4}{2a^5n(ax^{-n}+b)^2}-\frac{4b^3}{a^5n(ax^{-n}+b)}-\frac{6b^2\log(ax^{-n}+b)}{a^5n}+\frac{3bx^{-n}}{a^4n}-\frac{x^{-2n}}{2a^3n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 2*n)/(a + b*x^n)^3,x]
```

```
[Out] -1/(2*a^3*n*x^(2*n)) + (3*b)/(a^4*n*x^n) + b^4/(2*a^5*n*(b + a/x^
n)^2) - (4*b^3)/(a^5*n*(b + a/x^n)) - (6*b^2*Log[b + a/x^n])/(a^5
*n)
```

Maple [A] time = 0.058, size = 152, normalized size = 1.5

$$\frac{1}{\left(e^{n\ln(x)}\right)^2\left(a+be^{n\ln(x)}\right)^2}\left(9\frac{b^2\left(e^{n\ln(x)}\right)^2}{a^3n}-\frac{1}{2\,an}+6\frac{b^2\ln(x)\left(e^{n\ln(x)}\right)^2}{a^3}+2\frac{be^{n\ln(x)}}{a^2n}+12\frac{b^3\ln(x)\left(e^{n\ln(x)}\right)^3}{a^4}+6\frac{b^4\ln(x)\left(\right.}{a}\right.$$
$$-6\frac{b^2\ln\left(a+be^{n\ln(x)}\right)}{a^5n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-2*n)/(a+b*x^n)^3,x)
```

```
[Out] (9*b^2/a^3/n*exp(n*ln(x))^2-1/2/a/n+6*b^2/a^3*ln(x)*exp(n*ln(x))^
2+2*b/a^2/n*exp(n*ln(x))+12*b^3/a^4*ln(x)*exp(n*ln(x))^3+6*b^4/a^
5*ln(x)*exp(n*ln(x))^4+6*b^3/a^4/n*exp(n*ln(x))^3)/exp(n*ln(x))^2
/(a+b*exp(n*ln(x)))^2-6*b^2/a^5/n*ln(a+b*exp(n*ln(x)))
```

Maxima [A] time = 1.43712, size = 149, normalized size = 1.48

$$\frac{12\,b^3x^{3\,n}+18\,ab^2x^{2\,n}+4\,a^2bx^n-a^3}{2\,(a^4b^2nx^{4\,n}+2\,a^5bnx^{3\,n}+a^6nx^{2\,n})}+\frac{6\,b^2\log(x)}{a^5}-\frac{6\,b^2\log\left(\frac{bx^n+a}{b}\right)}{a^5n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-2*n - 1)/(b*x^n + a)^3,x, algorithm="maxima")
```

```
[Out] 1/2*(12*b^3*x^(3*n) + 18*a*b^2*x^(2*n) + 4*a^2*b*x^n - a^3)/(a^4*
b^2*n*x^(4*n) + 2*a^5*b*n*x^(3*n) + a^6*n*x^(2*n)) + 6*b^2*log(x)
/a^5 - 6*b^2*log((b*x^n + a)/b)/(a^5*n)
```

Fricas [A] time = 0.232328, size = 216, normalized size = 2.14

$$\frac{12\,b^4nx^{4\,n}\log(x)+4\,a^3bx^n-a^4+12\left(2\,ab^3n\log(x)+ab^3\right)x^{3\,n}+6\left(2\,a^2b^2n\log(x)+3\,a^2b^2\right)x^{2\,n}-12\left(b^4x^{4\,n}+2\,ab^3x^{3\,n}+\right.}{2\,(a^5b^2nx^{4\,n}+2\,a^6bnx^{3\,n}+a^7nx^{2\,n})}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-2*n - 1)/(b*x^n + a)^3,x, algorithm="fricas")
```

```
[Out] 1/2*(12*b^4*n*x^(4*n)*log(x) + 4*a^3*b*x^n - a^4 + 12*(2*a*b^3*n*
log(x) + a*b^3)*x^(3*n) + 6*(2*a^2*b^2*n*log(x) + 3*a^2*b^2)*x^(2
*n) - 12*(b^4*x^(4*n) + 2*a*b^3*x^(3*n) + a^2*b^2*x^(2*n))*log(b*
x^n + a))/(a^5*b^2*n*x^(4*n) + 2*a^6*b*n*x^(3*n) + a^7*n*x^(2*n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-2*n)/(a+b*x**n)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{-2\,n-1}}{(bx^n + a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-2*n - 1)/(b*x^n + a)^3,x, algorithm="giac")
```

```
[Out] integrate(x^(-2*n - 1)/(b*x^n + a)^3, x)
```

3.2632 $\int \frac{x^{-1-\frac{n}{2}}}{a+bx^n} \, dx$

Optimal. Leaf size=50

$$\frac{2\sqrt{b}\tan^{-1}\left(\frac{\sqrt{a}x^{-n/2}}{\sqrt{b}}\right)}{a^{3/2}n}-\frac{2x^{-n/2}}{an}$$

```
[Out] -2/(a*n*x^(n/2)) + (2*Sqrt[b]*ArcTan[Sqrt[a]/(Sqrt[b]*x^(n/2))])/
(a^(3/2)*n)
```

Rubi [A] time = 0.070891, antiderivative size = 50, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.21

$$\frac{2\sqrt{b}\tan^{-1}\left(\frac{\sqrt{a}x^{-n/2}}{\sqrt{b}}\right)}{a^{3/2}n}-\frac{2x^{-n/2}}{an}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 - n/2)/(a + b*x^n),x]
```

```
[Out] -2/(a*n*x^(n/2)) + (2*Sqrt[b]*ArcTan[Sqrt[a]/(Sqrt[b]*x^(n/2))])/
(a^(3/2)*n)
```

Rubi in Sympy [A] time = 11.2382, size = 39, normalized size = 0.78

$$-\frac{2x^{-\frac{n}{2}}}{an}+\frac{2\sqrt{b}\,\mathrm{atan}\left(\frac{\sqrt{a}x^{-\frac{n}{2}}}{\sqrt{b}}\right)}{a^{\frac{3}{2}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1-1/2*n)/(a+b*x**n),x)
```

```
[Out] -2*x**(-n/2)/(a*n) + 2*sqrt(b)*atan(sqrt(a)*x**(-n/2)/sqrt(b))/(a
**(3/2)*n)
```

Mathematica [A] time = 0.0400289, size = 50, normalized size = 1.

$$\frac{2\sqrt{b}\tan^{-1}\left(\frac{\sqrt{a}x^{-n/2}}{\sqrt{b}}\right)}{a^{3/2}n}-\frac{2x^{-n/2}}{an}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 - n/2)/(a + b*x^n),x]
```

```
[Out] -2/(a*n*x^(n/2)) + (2*Sqrt[b]*ArcTan[Sqrt[a]/(Sqrt[b]*x^(n/2))])/
(a^(3/2)*n)
```

Maple [A] time = 0.086, size = 79, normalized size = 1.6

$$-2\frac{1}{anx^{n/2}}+\frac{1}{a^2n}\sqrt{-ab}\ln\left(x^{\frac{n}{2}}-\frac{1}{b}\sqrt{-ab}\right)-\frac{1}{a^2n}\sqrt{-ab}\ln\left(x^{\frac{n}{2}}+\frac{1}{b}\sqrt{-ab}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-1/2*n)/(a+b*x^n),x)
```

```
[Out] -2/a/n/(x^(1/2*n))+(-a*b)^(1/2)/a^2/n*ln(x^(1/2*n)-1/b*(-a*b)^(1/
2))-(-a*b)^(1/2)/a^2/n*ln(x^(1/2*n)+1/b*(-a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-1/2*n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.237728, size = 1, normalized size = 0.02

$$\left[-\frac{2\,xx^{-\frac{1}{2}\,n-1}-\sqrt{-\frac{b}{a}}\log\left(\frac{ax^{2}x^{-n-2}+2\,axx^{-\frac{1}{2}\,n-1}\sqrt{-\frac{b}{a}}-b}{ax^{2}x^{-n-2}+b}\right)}{an},-\frac{2\left(xx^{-\frac{1}{2}\,n-1}+\sqrt{\frac{b}{a}}\arctan\left(\frac{\sqrt{\frac{b}{a}}}{xx^{-\frac{1}{2}\,n-1}}\right)\right)}{an}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-1/2*n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] [-(2*x*x^(-1/2*n - 1) - sqrt(-b/a)*log((a*x^2*x^(-n - 2) + 2*a*x*
x^(-1/2*n - 1)*sqrt(-b/a) - b)/(a*x^2*x^(-n - 2) + b)))/(a*n), -2
*(x*x^(-1/2*n - 1) + sqrt(b/a)*arctan(sqrt(b/a)/(x*x^(-1/2*n - 1)
)))/(a*n)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-1/2*n)/(a+b*x**n),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{-\frac{1}{2}\,n-1}}{bx^{n}+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-1/2*n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(-1/2*n - 1)/(b*x^n + a), x)
```

3.2633 $\int \frac{x^{-1-\frac{2n}{3}}}{a+bx^n} \, dx$

Optimal. Leaf size=160

$$-\frac{b^{2/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^{n/3}\right)}{a^{5/3}n}+\frac{b^{2/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x^{n/3}+b^{2/3}x^{2n/3}\right)}{2a^{5/3}n}+\frac{\sqrt{3}b^{2/3}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x^{n/3}}{\sqrt{3}\sqrt[3]{a}}\right)}{a^{5/3}n}-\frac{3x^{-2n/3}}{2an}$$

```
[Out] -3/(2*a*n*x^((2*n)/3)) + (Sqrt[3]*b^(2/3)*ArcTan[(a^(1/3) - 2*b^(
1/3)*x^(n/3))/(Sqrt[3]*a^(1/3))])/(a^(5/3)*n) - (b^(2/3)*Log[a^(1
/3) + b^(1/3)*x^(n/3)])/(a^(5/3)*n) + (b^(2/3)*Log[a^(2/3) - a^(1
/3)*b^(1/3)*x^(n/3) + b^(2/3)*x^((2*n)/3)])/(2*a^(5/3)*n)
```

Rubi [A] time = 0.259612, antiderivative size = 160, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.421$

$$-\frac{b^{2/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^{n/3}\right)}{a^{5/3}n}+\frac{b^{2/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x^{n/3}+b^{2/3}x^{2n/3}\right)}{2a^{5/3}n}+\frac{\sqrt{3}b^{2/3}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x^{n/3}}{\sqrt{3}\sqrt[3]{a}}\right)}{a^{5/3}n}-\frac{3x^{-2n/3}}{2an}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - (2*n)/3)/(a + b*x^n),x]
```

```
[Out] -3/(2*a*n*x^((2*n)/3)) + (Sqrt[3]*b^(2/3)*ArcTan[(a^(1/3) - 2*b^(
1/3)*x^(n/3))/(Sqrt[3]*a^(1/3))])/(a^(5/3)*n) - (b^(2/3)*Log[a^(1
/3) + b^(1/3)*x^(n/3)])/(a^(5/3)*n) + (b^(2/3)*Log[a^(2/3) - a^(1
/3)*b^(1/3)*x^(n/3) + b^(2/3)*x^((2*n)/3)])/(2*a^(5/3)*n)
```

Rubi in Sympy [A] time = 38.1632, size = 138, normalized size = 0.86

$$-\frac{3x^{-\frac{2n}{3}}}{2an}-\frac{b^{\frac{2}{3}}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^{\frac{n}{3}}\right)}{a^{\frac{5}{3}}n}+\frac{b^{\frac{2}{3}}\log\left(a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x^{\frac{n}{3}}+b^{\frac{2}{3}}x^{\frac{2n}{3}}\right)}{2a^{\frac{5}{3}}n}+\frac{\sqrt{3}b^{\frac{2}{3}}\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}-\frac{2\sqrt[3]{b}x^{\frac{n}{3}}}{3}\right)}{\sqrt[3]{a}}\right)}{a^{\frac{5}{3}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-2/3*n)/(a+b*x**n),x)
```

```
[Out] -3*x**(-2*n/3)/(2*a*n) - b**(2/3)*log(a**(1/3) + b**(1/3)*x**(n/3
))/(a**(5/3)*n) + b**(2/3)*log(a**(2/3) - a**(1/3)*b**(1/3)*x**(n
/3) + b**(2/3)*x**(2*n/3))/(2*a**(5/3)*n) + sqrt(3)*b**(2/3)*atan
(sqrt(3)*(a**(1/3)/3 - 2*b**(1/3)*x**(n/3)/3)/a**(1/3))/(a**(5/3)
*n)
```

Mathematica [C] time = 0.0423757, size = 60, normalized size = 0.38

$$\frac{2b\text{RootSum}\left[\#1^3a+b\&,\frac{3\log\left(x^{-n/3}-\#1\right)+n\log(x)}{\#1}\&\right]-9ax^{-2n/3}}{6a^2n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - (2*n)/3)/(a + b*x^n),x]
```

```
[Out] ((-9*a)/x^((2*n)/3) + 2*b*RootSum[b + a*#1^3 & , (n*Log[x] + 3*Lo
g[x^(-n/3) - #1])/#1 & ])/(6*a^2*n)
```

Maple [C] time = 0.32, size = 54, normalized size = 0.3

$$-\frac{3}{2\,an}\left(x^{\frac{n}{3}}\right)^{-2}+\sum_{\_R=RootOf\left(a^5n^3\_Z^3+b^2\right)}\_R\ln\left(x^{\frac{n}{3}}-\frac{a^2n\_R}{b}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-2/3*n)/(a+b*x^n),x)
```

```
[Out] -3/2/a/n/(x^(1/3*n))^2+sum(_R*ln(x^(1/3*n)-a^2*n/b*_R),_R=RootOf(
_Z^3*a^5*n^3+b^2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-2/3*n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.301768, size = 250, normalized size = 1.56

$$-\frac{3\,xx^{-\frac{2}{3}n-1}+2\sqrt{3}\left(-\frac{b^2}{a^2}\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,b\sqrt{x}x^{-\frac{1}{3}n-\frac{1}{2}}-a\left(-\frac{b^2}{a^2}\right)^{\frac{2}{3}}\right)}{3\,a\left(-\frac{b^2}{a^2}\right)^{\frac{2}{3}}}\right)-2\left(-\frac{b^2}{a^2}\right)^{\frac{1}{3}}\log\left(\frac{b\sqrt{x}x^{-\frac{1}{3}n-\frac{1}{2}}+a\left(-\frac{b^2}{a^2}\right)^{\frac{2}{3}}}{\sqrt{x}}\right)+\left(-\frac{b^2}{a^2}\right)^{\frac{1}{3}}\log\left(-\frac{a\sqrt{x}\cdots}{\cdots}\right)}{2\,an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-2/3*n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] -1/2*(3*x*x^(-2/3*n - 1) + 2*sqrt(3)*(-b^2/a^2)^(1/3)*arctan(1/3*
sqrt(3)*(2*b*sqrt(x)*x^(-1/3*n - 1/2) - a*(-b^2/a^2)^(2/3))/(a*(-
b^2/a^2)^(2/3))) - 2*(-b^2/a^2)^(1/3)*log((b*sqrt(x)*x^(-1/3*n -
1/2) + a*(-b^2/a^2)^(2/3))/sqrt(x)) + (-b^2/a^2)^(1/3)*log(-(a*sq
rt(x)*x^(-1/3*n - 1/2)*(-b^2/a^2)^(2/3) - b*x*x^(-2/3*n - 1) + b*
(-b^2/a^2)^(1/3))/x))/(a*n)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-2/3*n)/(a+b*x**n),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{-\frac{2}{3}\,n-1}}{bx^n + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-2/3*n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(-2/3*n - 1)/(b*x^n + a), x)
```

3.2634 $\int \frac{x^{-1-\frac{3n}{4}}}{a+bx^n} dx$

Optimal. Leaf size=236

$$\frac{b^{3/4}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{n/4}+\sqrt{a}+\sqrt{b}x^{n/2}\right)}{\sqrt{2}a^{7/4}n}-\frac{b^{3/4}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{n/4}+\sqrt{a}+\sqrt{b}x^{n/2}\right)}{\sqrt{2}a^{7/4}n}+\frac{\sqrt{2}b^{3/4}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x^{n/4}}{\sqrt[4]{a}}\right)}{a^{7/4}n}-\frac{\sqrt{2}b^{3/4}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x^{n/4}}{\sqrt[4]{a}}+1\right)}{a^{7/4}n}-\frac{4x^{-3n/4}}{3an}$$

```
[Out] -4/(3*a*n*x^((3*n)/4)) + (Sqrt[2]*b^(3/4)*ArcTan[1 - (Sqrt[2]*b^(
1/4)*x^(n/4))/a^(1/4)])/(a^(7/4)*n) - (Sqrt[2]*b^(3/4)*ArcTan[1 +
 (Sqrt[2]*b^(1/4)*x^(n/4))/a^(1/4)])/(a^(7/4)*n) + (b^(3/4)*Log[S
qrt[a] - Sqrt[2]*a^(1/4)*b^(1/4)*x^(n/4) + Sqrt[b]*x^(n/2)])/(Sqr
t[2]*a^(7/4)*n) - (b^(3/4)*Log[Sqrt[a] + Sqrt[2]*a^(1/4)*b^(1/4)*
x^(n/4) + Sqrt[b]*x^(n/2)])/(Sqrt[2]*a^(7/4)*n)
```

Rubi [A] time = 0.440814, antiderivative size = 236, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 8, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.421$

$$\frac{b^{3/4}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{n/4}+\sqrt{a}+\sqrt{b}x^{n/2}\right)}{\sqrt{2}a^{7/4}n}-\frac{b^{3/4}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{n/4}+\sqrt{a}+\sqrt{b}x^{n/2}\right)}{\sqrt{2}a^{7/4}n}+\frac{\sqrt{2}b^{3/4}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x^{n/4}}{\sqrt[4]{a}}\right)}{a^{7/4}n}-\frac{\sqrt{2}b^{3/4}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x^{n/4}}{\sqrt[4]{a}}+1\right)}{a^{7/4}n}-\frac{4x^{-3n/4}}{3an}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - (3*n)/4)/(a + b*x^n),x]
```

```
[Out] -4/(3*a*n*x^((3*n)/4)) + (Sqrt[2]*b^(3/4)*ArcTan[1 - (Sqrt[2]*b^(
1/4)*x^(n/4))/a^(1/4)])/(a^(7/4)*n) - (Sqrt[2]*b^(3/4)*ArcTan[1 +
 (Sqrt[2]*b^(1/4)*x^(n/4))/a^(1/4)])/(a^(7/4)*n) + (b^(3/4)*Log[S
qrt[a] - Sqrt[2]*a^(1/4)*b^(1/4)*x^(n/4) + Sqrt[b]*x^(n/2)])/(Sqr
t[2]*a^(7/4)*n) - (b^(3/4)*Log[Sqrt[a] + Sqrt[2]*a^(1/4)*b^(1/4)*
x^(n/4) + Sqrt[b]*x^(n/2)])/(Sqrt[2]*a^(7/4)*n)
```

Rubi in Sympy [A] time = 65.3219, size = 206, normalized size = 0.87

$$-\frac{4x^{-\frac{3n}{4}}}{3an}+\frac{\sqrt{2}b^{\frac{3}{4}}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{\frac{n}{4}}+\sqrt{a}+\sqrt{b}x^{\frac{n}{2}}\right)}{2a^{\frac{7}{4}}n}-\frac{\sqrt{2}b^{\frac{3}{4}}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{\frac{n}{4}}+\sqrt{a}+\sqrt{b}x^{\frac{n}{2}}\right)}{2a^{\frac{7}{4}}n}+\frac{\sqrt{2}b^{\frac{3}{4}}\operatorname{atan}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x^{\frac{n}{4}}}{\sqrt[4]{a}}\right)}{a^{\frac{7}{4}}n}-\frac{\sqrt{2}b^{\frac{3}{4}}\operatorname{atan}\left(1+\frac{\sqrt{2}\sqrt[4]{b}x^{\frac{n}{4}}}{\sqrt[4]{a}}\right)}{a^{\frac{7}{4}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-3/4*n)/(a+b*x**n),x)
```

```
[Out] -4*x**(-3*n/4)/(3*a*n) + sqrt(2)*b**(3/4)*log(-sqrt(2)*a**(1/4)*b
**(1/4)*x**(n/4) + sqrt(a) + sqrt(b)*x**(n/2))/(2*a**(7/4)*n) - s
qrt(2)*b**(3/4)*log(sqrt(2)*a**(1/4)*b**(1/4)*x**(n/4) + sqrt(a)
+ sqrt(b)*x**(n/2))/(2*a**(7/4)*n) + sqrt(2)*b**(3/4)*atan(1 - sq
rt(2)*b**(1/4)*x**(n/4)/a**(1/4))/(a**(7/4)*n) - sqrt(2)*b**(3/4)
*atan(1 + sqrt(2)*b**(1/4)*x**(n/4)/a**(1/4))/(a**(7/4)*n)
```

Mathematica [C] time = 0.0438319, size = 60, normalized size = 0.25

$$\frac{3b\text{RootSum}\left[\#1^4a+b\&,\frac{4\log\left(x^{-n/4}-\#1\right)+n\log(x)}{\#1}\&\right]-16ax^{-3n/4}}{12a^2n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - (3*n)/4)/(a + b*x^n),x]
```

```
[Out] ((-16*a)/x^((3*n)/4) + 3*b*RootSum[b + a*#1^4 & , (n*Log[x] + 4*L
og[x^(-n/4) - #1])/#1 & ])/(12*a^2*n)
```

Maple [C] time = 0.089, size = 54, normalized size = 0.2

$$-\frac{4}{3\,an}\left(x^{\frac{n}{4}}\right)^{-3}+\sum_{\_R=RootOf\left(a^7n^4\_Z^4+b^3\right)}\_R\ln\left(x^{\frac{n}{4}}-\frac{a^2n\_R}{b}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-3/4*n)/(a+b*x^n),x)
```

```
[Out] -4/3/a/n/(x^(1/4*n))^3+sum(_R*ln(x^(1/4*n)-a^2*n/b*_R),_R=RootOf(
_Z^4*a^7*n^4+b^3))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-3/4*n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.342121, size = 324, normalized size = 1.37

$$\frac{12\,an\left(-\frac{b^3}{a^7n^4}\right)^{\frac{1}{4}}\arctan\left(\frac{a^5n^3\left(-\frac{b^3}{a^7n^4}\right)^{\frac{3}{4}}}{b^2x^{\frac{1}{3}}x^{-\frac{1}{4}n-\frac{1}{3}}+x^{\frac{1}{3}}\sqrt{-\frac{a^3b^3n^2\sqrt{-\frac{b^3}{a^7n^4}}-b^4x^{\frac{2}{3}}x^{-\frac{1}{2}n-\frac{2}{3}}}{x^{\frac{2}{3}}}}}\right)+3\,an\left(-\frac{b^3}{a^7n^4}\right)^{\frac{1}{4}}\log\left(\frac{a^5n^3\left(-\frac{b^3}{a^7n^4}\right)^{\frac{3}{4}}+b^2x^{\frac{1}{3}}x^{-\frac{1}{4}n-\frac{1}{3}}}{x^{\frac{1}{3}}}\right)-3\,an}{3\,an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-3/4*n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] 1/3*(12*a*n*(-b^3/(a^7*n^4))^(1/4)*arctan(a^5*n^3*(-b^3/(a^7*n^4)
)^(3/4)/(b^2*x^(1/3)*x^(-1/4*n - 1/3) + x^(1/3)*sqrt(-(a^3*b^3*n^
2*sqrt(-b^3/(a^7*n^4)) - b^4*x^(2/3)*x^(-1/2*n - 2/3))/x^(2/3))))
 + 3*a*n*(-b^3/(a^7*n^4))^(1/4)*log((a^5*n^3*(-b^3/(a^7*n^4))^(3/
4) + b^2*x^(1/3)*x^(-1/4*n - 1/3))/x^(1/3)) - 3*a*n*(-b^3/(a^7*n^
4))^(1/4)*log(-(a^5*n^3*(-b^3/(a^7*n^4))^(3/4) - b^2*x^(1/3)*x^(-
1/4*n - 1/3))/x^(1/3)) - 4*x*x^(-3/4*n - 1))/(a*n)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-3/4*n)/(a+b*x**n),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{-\frac{3}{4}n-1}}{bx^n + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-3/4*n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(-3/4*n - 1)/(b*x^n + a), x)
```

3.2635 $\int \frac{x^{-1-n}}{a+bx^n}\,dx$

Optimal. Leaf size=38

$$\frac{b\log(a+bx^n)}{a^2n}-\frac{b\log(x)}{a^2}-\frac{x^{-n}}{an}$$

```
[Out] -(1/(a*n*x^n)) - (b*Log[x])/a^2 + (b*Log[a + b*x^n])/(a^2*n)
```

Rubi [A] time = 0.0646212, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{b\log(a+bx^n)}{a^2n}-\frac{b\log(x)}{a^2}-\frac{x^{-n}}{an}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - n)/(a + b*x^n),x]
```

```
[Out] -(1/(a*n*x^n)) - (b*Log[x])/a^2 + (b*Log[a + b*x^n])/(a^2*n)
```

Rubi in Sympy [A] time = 9.76393, size = 34, normalized size = 0.89

$$-\frac{x^{-n}}{an}-\frac{b\log(x^n)}{a^2n}+\frac{b\log(a+bx^n)}{a^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-n)/(a+b*x**n),x)
```

```
[Out] -x**(-n)/(a*n) - b*log(x**n)/(a**2*n) + b*log(a + b*x**n)/(a**2*n
)
```

Mathematica [A] time = 0.0235453, size = 32, normalized size = 0.84

$$\frac{b\log(ax^{-n}+b)}{a^2n}-\frac{x^{-n}}{an}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - n)/(a + b*x^n),x]
```

```
[Out] -(1/(a*n*x^n)) + (b*Log[b + a/x^n])/(a^2*n)
```

Maple [A] time = 0., size = 50, normalized size = 1.3

$$\frac{1}{e^{n\ln(x)}}\left(-\frac{1}{an}-\frac{b\ln(x)\,e^{n\ln(x)}}{a^2}\right)+\frac{b\ln\left(a+be^{n\ln(x)}\right)}{a^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-n)/(a+b*x^n),x)
```

```
[Out] (-1/a/n-b/a^2*ln(x)*exp(n*ln(x)))/exp(n*ln(x))+b/a^2/n*ln(a+b*exp
(n*ln(x)))
```

Maxima [A] time = 1.44099, size = 57, normalized size = 1.5

$$-\frac{b\log(x)}{a^2}-\frac{x^{-n}}{an}+\frac{b\log\left(\frac{bx^n+a}{b}\right)}{a^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] -b*log(x)/a^2 - x^(-n)/(a*n) + b*log((b*x^n + a)/b)/(a^2*n)
```

Fricas [A] time = 0.227185, size = 50, normalized size = 1.32

$$-\frac{bnx^n\log(x)-bx^n\log(bx^n+a)+a}{a^2nx^n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] -(b*n*x^n*log(x) - b*x^n*log(b*x^n + a) + a)/(a^2*n*x^n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-n)/(a+b*x**n),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^{-n-1}}{bx^n+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(-n - 1)/(b*x^n + a), x)
```

3.2636 $\int \frac{x^{-1-\frac{n}{2}}}{a+bx^n}\,dx$

Optimal. Leaf size=50

$$\frac{2\sqrt{b}\tan^{-1}\left(\frac{\sqrt{a}x^{-n/2}}{\sqrt{b}}\right)}{a^{3/2}n}-\frac{2x^{-n/2}}{an}$$

```
[Out] -2/(a*n*x^(n/2)) + (2*Sqrt[b]*ArcTan[Sqrt[a]/(Sqrt[b]*x^(n/2))])/
(a^(3/2)*n)
```

Rubi [A] time = 0.0663002, antiderivative size = 50, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.21

$$\frac{2\sqrt{b}\tan^{-1}\left(\frac{\sqrt{a}x^{-n/2}}{\sqrt{b}}\right)}{a^{3/2}n}-\frac{2x^{-n/2}}{an}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - n/2)/(a + b*x^n),x]
```

```
[Out] -2/(a*n*x^(n/2)) + (2*Sqrt[b]*ArcTan[Sqrt[a]/(Sqrt[b]*x^(n/2))])/
(a^(3/2)*n)
```

Rubi in Sympy [A] time = 11.6626, size = 39, normalized size = 0.78

$$-\frac{2x^{-\frac{n}{2}}}{an}+\frac{2\sqrt{b}\,\mathrm{atan}\left(\frac{\sqrt{a}x^{-\frac{n}{2}}}{\sqrt{b}}\right)}{a^{\frac{3}{2}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-1/2*n)/(a+b*x**n),x)
```

```
[Out] -2*x**(-n/2)/(a*n) + 2*sqrt(b)*atan(sqrt(a)*x**(-n/2)/sqrt(b))/(a
**(3/2)*n)
```

Mathematica [A] time = 0.0140553, size = 50, normalized size = 1.

$$\frac{2\sqrt{b}\tan^{-1}\left(\frac{\sqrt{a}x^{-n/2}}{\sqrt{b}}\right)}{a^{3/2}n}-\frac{2x^{-n/2}}{an}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - n/2)/(a + b*x^n),x]
```

```
[Out] -2/(a*n*x^(n/2)) + (2*Sqrt[b]*ArcTan[Sqrt[a]/(Sqrt[b]*x^(n/2))])/
(a^(3/2)*n)
```

Maple [A] time = 0., size = 79, normalized size = 1.6

$$-2\,\frac{1}{anx^{n/2}}+\frac{1}{a^2n}\sqrt{-ab}\ln\left(x^{\frac{n}{2}}-\frac{1}{b}\sqrt{-ab}\right)-\frac{1}{a^2n}\sqrt{-ab}\ln\left(x^{\frac{n}{2}}+\frac{1}{b}\sqrt{-ab}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-1/2*n)/(a+b*x^n),x)
```

```
[Out] -2/a/n/(x^(1/2*n))+(-a*b)^(1/2)/a^2/n*ln(x^(1/2*n)-1/b*(-a*b)^(1/
2))-(-a*b)^(1/2)/a^2/n*ln(x^(1/2*n)+1/b*(-a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-1/2*n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.240631, size = 1, normalized size = 0.02

$$\left[-\frac{2\,xx^{-\frac{1}{2}\,n-1}-\sqrt{-\frac{b}{a}}\log\left(\frac{ax^{2}x^{-n-2}+2\,axx^{-\frac{1}{2}\,n-1}\sqrt{-\frac{b}{a}}-b}{ax^{2}x^{-n-2}+b}\right)}{an},-\frac{2\left(xx^{-\frac{1}{2}\,n-1}+\sqrt{\frac{b}{a}}\arctan\left(\frac{\sqrt{\frac{b}{a}}}{xx^{-\frac{1}{2}\,n-1}}\right)\right)}{an}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-1/2*n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] [-(2*x*x^(-1/2*n - 1) - sqrt(-b/a)*log((a*x^2*x^(-n - 2) + 2*a*x*
x^(-1/2*n - 1)*sqrt(-b/a) - b)/(a*x^2*x^(-n - 2) + b)))/(a*n), -2
*(x*x^(-1/2*n - 1) + sqrt(b/a)*arctan(sqrt(b/a)/(x*x^(-1/2*n - 1)
)))/(a*n)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-1/2*n)/(a+b*x**n),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{-\frac{1}{2}\,n-1}}{bx^{n}+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-1/2*n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(-1/2*n - 1)/(b*x^n + a), x)
```

3.2637 $\int \frac{x^{-1-\frac{n}{3}}}{a+bx^n}\,dx$

Optimal. Leaf size=158

$$-\frac{\sqrt[3]{b}\log\left(a^{2/3}x^{-2n/3}-\sqrt[3]{a}\sqrt[3]{b}x^{-n/3}+b^{2/3}\right)}{2a^{4/3}n}+\frac{\sqrt[3]{b}\log\left(\sqrt[3]{a}x^{-n/3}+\sqrt[3]{b}\right)}{a^{4/3}n}-\frac{\sqrt{3}\sqrt[3]{b}\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x^{-n/3}}{\sqrt{3}\sqrt[3]{b}}\right)}{a^{4/3}n}-\frac{3x^{-n/3}}{an}$$

```
[Out] -3/(a*n*x^(n/3)) - (Sqrt[3]*b^(1/3)*ArcTan[(b^(1/3) - (2*a^(1/3))
/x^(n/3))/(Sqrt[3]*b^(1/3))])/(a^(4/3)*n) + (b^(1/3)*Log[b^(1/3)
+ a^(1/3)/x^(n/3)])/(a^(4/3)*n) - (b^(1/3)*Log[b^(2/3) + a^(2/3)/
x^((2*n)/3) - (a^(1/3)*b^(1/3))/x^(n/3)])/(2*a^(4/3)*n)
```

Rubi [A] time = 0.253491, antiderivative size = 158, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 9, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.474

$$-\frac{\sqrt[3]{b}\log\left(a^{2/3}x^{-2n/3}-\sqrt[3]{a}\sqrt[3]{b}x^{-n/3}+b^{2/3}\right)}{2a^{4/3}n}+\frac{\sqrt[3]{b}\log\left(\sqrt[3]{a}x^{-n/3}+\sqrt[3]{b}\right)}{a^{4/3}n}-\frac{\sqrt{3}\sqrt[3]{b}\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x^{-n/3}}{\sqrt{3}\sqrt[3]{b}}\right)}{a^{4/3}n}-\frac{3x^{-n/3}}{an}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - n/3)/(a + b*x^n),x]
```

```
[Out] -3/(a*n*x^(n/3)) - (Sqrt[3]*b^(1/3)*ArcTan[(b^(1/3) - (2*a^(1/3))
/x^(n/3))/(Sqrt[3]*b^(1/3))])/(a^(4/3)*n) + (b^(1/3)*Log[b^(1/3)
+ a^(1/3)/x^(n/3)])/(a^(4/3)*n) - (b^(1/3)*Log[b^(2/3) + a^(2/3)/
x^((2*n)/3) - (a^(1/3)*b^(1/3))/x^(n/3)])/(2*a^(4/3)*n)
```

Rubi in Sympy [A] time = 38.6411, size = 134, normalized size = 0.85

$$-\frac{3x^{-\frac{n}{3}}}{an}+\frac{\sqrt[3]{b}\log\left(\sqrt[3]{a}x^{-\frac{n}{3}}+\sqrt[3]{b}\right)}{a^{\frac{4}{3}}n}-\frac{\sqrt[3]{b}\log\left(a^{\frac{2}{3}}x^{-\frac{2n}{3}}-\sqrt[3]{a}\sqrt[3]{b}x^{-\frac{n}{3}}+b^{\frac{2}{3}}\right)}{2a^{\frac{4}{3}}n}-\frac{\sqrt{3}\sqrt[3]{b}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(-\frac{2\sqrt[3]{a}x^{-\frac{n}{3}}}{3}+\frac{\sqrt[3]{b}}{3}\right)}{\sqrt[3]{b}}\right)}{a^{\frac{4}{3}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-1/3*n)/(a+b*x**n),x)
```

```
[Out] -3*x**(-n/3)/(a*n) + b**(1/3)*log(a**(1/3)*x**(-n/3) + b**(1/3))/
(a**(4/3)*n) - b**(1/3)*log(a**(2/3)*x**(-2*n/3) - a**(1/3)*b**(1
/3)*x**(-n/3) + b**(2/3))/(2*a**(4/3)*n) - sqrt(3)*b**(1/3)*atan(
sqrt(3)*(-2*a**(1/3)*x**(-n/3)/3 + b**(1/3)/3)/b**(1/3))/(a**(4/3
)*n)
```

Mathematica [C] time = 0.0367305, size = 59, normalized size = 0.37

$$\frac{b\text{RootSum}\left[\#1^3a+b\&,\frac{3\log\left(x^{-n/3}-\#1\right)+n\log(x)}{\#1^2}\&\right]-9ax^{-n/3}}{3a^2n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - n/3)/(a + b*x^n),x]
```

```
[Out] ((-9*a)/x^(n/3) + b*RootSum[b + a*#1^3 & , (n*Log[x] + 3*Log[x^(-
n/3) - #1])/#1^2 & ])/(3*a^2*n)
```

Maple [C] time = 0.079, size = 57, normalized size = 0.4

$$-3\frac{1}{anx^{n/3}}+\sum_{\_R=RootOf\left(a^4n^3\_Z^3-b\right)}\_R\ln\left(x^{\frac{n}{3}}+\frac{a^3n^2\_R^2}{b}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-1/3*n)/(a+b*x^n),x)
```

```
[Out] -3/a/n/(x^(1/3*n))+sum(_R*ln(x^(1/3*n)+a^3*n^2/b*_R^2),_R=RootOf(
_Z^3*a^4*n^3-b))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-1/3*n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.237047, size = 194, normalized size = 1.23

$$-\frac{6\,xx^{-\frac{1}{3}\,n-1}-2\sqrt{3}\left(\frac{b}{a}\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,xx^{-\frac{1}{3}\,n-1}-\left(\frac{b}{a}\right)^{\frac{1}{3}}\right)}{3\left(\frac{b}{a}\right)^{\frac{1}{3}}}\right)-2\left(\frac{b}{a}\right)^{\frac{1}{3}}\log\left(\frac{xx^{-\frac{1}{3}\,n-1}+\left(\frac{b}{a}\right)^{\frac{1}{3}}}{x}\right)+\left(\frac{b}{a}\right)^{\frac{1}{3}}\log\left(\frac{x^2x^{-\frac{2}{3}\,n-2}-xx^{-\frac{1}{3}\,n-1}\left(\frac{b}{a}\right)^{\frac{1}{3}}+\left(\frac{b}{a}\right)^{\frac{2}{3}}}{x^2}\right)}{2\,an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-1/3*n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] -1/2*(6*x*x^(-1/3*n - 1) - 2*sqrt(3)*(b/a)^(1/3)*arctan(1/3*sqrt(
3)*(2*x*x^(-1/3*n - 1) - (b/a)^(1/3))/(b/a)^(1/3)) - 2*(b/a)^(1/3
)*log((x*x^(-1/3*n - 1) + (b/a)^(1/3))/x) + (b/a)^(1/3)*log((x^2*
x^(-2/3*n - 2) - x*x^(-1/3*n - 1)*(b/a)^(1/3) + (b/a)^(2/3))/x^2)
)/(a*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-1/3*n)/(a+b*x**n),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{-\frac{1}{3}n-1}}{bx^n + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-1/3*n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(-1/3*n - 1)/(b*x^n + a), x)
```

3.2638 $\int \frac{x^{-1-\frac{n}{4}}}{a+bx^n}\,dx$

Optimal. Leaf size=234

$$-\frac{\sqrt[4]{b}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{-n/4}+\sqrt{a}x^{-n/2}+\sqrt{b}\right)}{\sqrt{2}a^{5/4}n}+\frac{\sqrt[4]{b}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{-n/4}+\sqrt{a}x^{-n/2}+\sqrt{b}\right)}{\sqrt{2}a^{5/4}n}-\frac{\sqrt{2}\sqrt[4]{b}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{a}x^{-n/4}}{\sqrt[4]{b}}\right)}{a^{5/4}n}+\frac{\sqrt{2}\sqrt[4]{b}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{a}x^{-n/4}}{\sqrt[4]{b}}+1\right)}{a^{5/4}n}-\frac{4x^{-n/4}}{an}$$

```
[Out] -4/(a*n*x^(n/4)) - (Sqrt[2]*b^(1/4)*ArcTan[1 - (Sqrt[2]*a^(1/4))/
(b^(1/4)*x^(n/4))])/(a^(5/4)*n) + (Sqrt[2]*b^(1/4)*ArcTan[1 + (Sq
rt[2]*a^(1/4))/(b^(1/4)*x^(n/4))])/(a^(5/4)*n) - (b^(1/4)*Log[Sqr
t[b] + Sqrt[a]/x^(n/2) - (Sqrt[2]*a^(1/4)*b^(1/4))/x^(n/4)])/(Sqr
t[2]*a^(5/4)*n) + (b^(1/4)*Log[Sqrt[b] + Sqrt[a]/x^(n/2) + (Sqrt[
2]*a^(1/4)*b^(1/4))/x^(n/4)])/(Sqrt[2]*a^(5/4)*n)
```

Rubi [A] time = 0.408694, antiderivative size = 234, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 9, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.474

$$-\frac{\sqrt[4]{b}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{-n/4}+\sqrt{a}x^{-n/2}+\sqrt{b}\right)}{\sqrt{2}a^{5/4}n}+\frac{\sqrt[4]{b}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{-n/4}+\sqrt{a}x^{-n/2}+\sqrt{b}\right)}{\sqrt{2}a^{5/4}n}-\frac{\sqrt{2}\sqrt[4]{b}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{a}x^{-n/4}}{\sqrt[4]{b}}\right)}{a^{5/4}n}+\frac{\sqrt{2}\sqrt[4]{b}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{a}x^{-n/4}}{\sqrt[4]{b}}+1\right)}{a^{5/4}n}-\frac{4x^{-n/4}}{an}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - n/4)/(a + b*x^n),x]
```

```
[Out] -4/(a*n*x^(n/4)) - (Sqrt[2]*b^(1/4)*ArcTan[1 - (Sqrt[2]*a^(1/4))/
(b^(1/4)*x^(n/4))])/(a^(5/4)*n) + (Sqrt[2]*b^(1/4)*ArcTan[1 + (Sq
rt[2]*a^(1/4))/(b^(1/4)*x^(n/4))])/(a^(5/4)*n) - (b^(1/4)*Log[Sqr
t[b] + Sqrt[a]/x^(n/2) - (Sqrt[2]*a^(1/4)*b^(1/4))/x^(n/4)])/(Sqr
t[2]*a^(5/4)*n) + (b^(1/4)*Log[Sqrt[b] + Sqrt[a]/x^(n/2) + (Sqrt[
2]*a^(1/4)*b^(1/4))/x^(n/4)])/(Sqrt[2]*a^(5/4)*n)
```

Rubi in Sympy [A] time = 62.902, size = 202, normalized size = 0.86

$$-\frac{4x^{-\frac{n}{4}}}{an}-\frac{\sqrt{2}\sqrt[4]{b}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{-\frac{n}{4}}+\sqrt{a}x^{-\frac{n}{2}}+\sqrt{b}\right)}{2a^{\frac{5}{4}}n}+\frac{\sqrt{2}\sqrt[4]{b}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{-\frac{n}{4}}+\sqrt{a}x^{-\frac{n}{2}}+\sqrt{b}\right)}{2a^{\frac{5}{4}}n}+\frac{\sqrt{2}\sqrt[4]{b}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[4]{a}x^{-\frac{n}{4}}}{\sqrt[4]{b}}-1\right)}{a^{\frac{5}{4}}n}+\frac{\sqrt{2}\sqrt[4]{b}\,\mathrm{atan}\left(\frac{\sqrt{2}\sqrt[4]{a}x^{-\frac{n}{4}}}{\sqrt[4]{b}}+1\right)}{a^{\frac{5}{4}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-1/4*n)/(a+b*x**n),x)
```

```
[Out] -4*x**(-n/4)/(a*n) - sqrt(2)*b**(1/4)*log(-sqrt(2)*a**(1/4)*b**(1
/4)*x**(-n/4) + sqrt(a)*x**(-n/2) + sqrt(b))/(2*a**(5/4)*n) + sqr
t(2)*b**(1/4)*log(sqrt(2)*a**(1/4)*b**(1/4)*x**(-n/4) + sqrt(a)*x
**(-n/2) + sqrt(b))/(2*a**(5/4)*n) + sqrt(2)*b**(1/4)*atan(sqrt(2
)*a**(1/4)*x**(-n/4)/b**(1/4) - 1)/(a**(5/4)*n) + sqrt(2)*b**(1/4
)*atan(sqrt(2)*a**(1/4)*x**(-n/4)/b**(1/4) + 1)/(a**(5/4)*n)
```

Mathematica [C] time = 0.0378012, size = 59, normalized size = 0.25

$$\frac{b\text{RootSum}\left[\#1^4a+b\&,\frac{4\log\left(x^{-n/4}-\#1\right)+n\log(x)}{\#1^3}\&\right]-16ax^{-n/4}}{4a^2n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - n/4)/(a + b*x^n),x]
```

```
[Out] ((-16*a)/x^(n/4) + b*RootSum[b + a*#1^4 & , (n*Log[x] + 4*Log[x^(
-n/4) - #1])/#1^3 & ])/(4*a^2*n)
```

Maple [C] time = 0.085, size = 56, normalized size = 0.2

$$-4\frac{1}{anx^{n/4}}+\sum_{\_R=RootOf\left(a^5n^4\_Z^4+b\right)}\_R\ln\left(x^{\frac{n}{4}}-\frac{a^4n^3\_R^3}{b}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-1/4*n)/(a+b*x^n),x)
```

```
[Out] -4/a/n/(x^(1/4*n))+sum(_R*ln(x^(1/4*n)-a^4*n^3/b*_R^3),_R=RootOf(
_Z^4*a^5*n^4+b))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-1/4*n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.246396, size = 254, normalized size = 1.09

$$-\frac{4\,an\left(-\frac{b}{a^5n^4}\right)^{\frac{1}{4}}\arctan\left(\frac{an\left(-\frac{b}{a^5n^4}\right)^{\frac{1}{4}}}{xx^{-\frac{1}{4}n-1}+x\sqrt{\frac{a^2n^2\sqrt{-\frac{b}{a^5n^4}}+x^2x^{-\frac{1}{2}n-2}}{x^2}}}\right)-an\left(-\frac{b}{a^5n^4}\right)^{\frac{1}{4}}\log\left(\frac{an\left(-\frac{b}{a^5n^4}\right)^{\frac{1}{4}}+xx^{-\frac{1}{4}n-1}}{x}\right)+an\left(-\frac{b}{a^5n^4}\right)^{\frac{1}{4}}\log\left(-\frac{a\cdots}{\cdots}\right.}{an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-1/4*n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] -(4*a*n*(-b/(a^5*n^4))^(1/4)*arctan(a*n*(-b/(a^5*n^4))^(1/4)/(x*x
^(-1/4*n - 1) + x*sqrt((a^2*n^2*sqrt(-b/(a^5*n^4)) + x^2*x^(-1/2*
n - 2))/x^2))) - a*n*(-b/(a^5*n^4))^(1/4)*log((a*n*(-b/(a^5*n^4))
^(1/4) + x*x^(-1/4*n - 1))/x) + a*n*(-b/(a^5*n^4))^(1/4)*log(-(a*
n*(-b/(a^5*n^4))^(1/4) - x*x^(-1/4*n - 1))/x) + 4*x*x^(-1/4*n - 1
))/(a*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-1/4*n)/(a+b*x**n),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{-\frac{1}{4}n-1}}{bx^n + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-1/4*n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(-1/4*n - 1)/(b*x^n + a), x)
```

3.2639 $\int \frac{x^{-1-\frac{3n}{2}}}{a+bx^n}\,dx$

Optimal. Leaf size=68

$$-\frac{2b^{3/2}\tan^{-1}\left(\frac{\sqrt{a}x^{-n/2}}{\sqrt{b}}\right)}{a^{5/2}n}+\frac{2bx^{-n/2}}{a^2n}-\frac{2x^{-3n/2}}{3an}$$

```
[Out] -2/(3*a*n*x^((3*n)/2)) + (2*b)/(a^2*n*x^(n/2)) - (2*b^(3/2)*ArcTa
n[Sqrt[a]/(Sqrt[b]*x^(n/2))])/(a^(5/2)*n)
```

Rubi [A] time = 0.0975609, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263

$$-\frac{2b^{3/2}\tan^{-1}\left(\frac{\sqrt{a}x^{-n/2}}{\sqrt{b}}\right)}{a^{5/2}n}+\frac{2bx^{-n/2}}{a^2n}-\frac{2x^{-3n/2}}{3an}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 - (3*n)/2)/(a + b*x^n),x]
```

```
[Out] -2/(3*a*n*x^((3*n)/2)) + (2*b)/(a^2*n*x^(n/2)) - (2*b^(3/2)*ArcTa
n[Sqrt[a]/(Sqrt[b]*x^(n/2))])/(a^(5/2)*n)
```

Rubi in Sympy [A] time = 15.5261, size = 56, normalized size = 0.82

$$-\frac{2x^{-\frac{3n}{2}}}{3an}+\frac{2bx^{-\frac{n}{2}}}{a^2n}-\frac{2b^{\frac{3}{2}}\operatorname{atan}\left(\frac{\sqrt{a}x^{-\frac{n}{2}}}{\sqrt{b}}\right)}{a^{\frac{5}{2}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1-3/2*n)/(a+b*x**n),x)
```

```
[Out] -2*x**(-3*n/2)/(3*a*n) + 2*b*x**(-n/2)/(a**2*n) - 2*b**(3/2)*atan
(sqrt(a)*x**(-n/2)/sqrt(b))/(a**(5/2)*n)
```

Mathematica [A] time = 0.0911584, size = 62, normalized size = 0.91

$$\frac{2\left(\sqrt{a}x^{-3n/2}\left(3bx^n-a\right)-3b^{3/2}\tan^{-1}\left(\frac{\sqrt{a}x^{-n/2}}{\sqrt{b}}\right)\right)}{3a^{5/2}n}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 - (3*n)/2)/(a + b*x^n),x]
```

```
[Out] (2*((Sqrt[a]*(-a + 3*b*x^n))/x^((3*n)/2) - 3*b^(3/2)*ArcTan[Sqrt[
a]/(Sqrt[b]*x^(n/2))]))/(3*a^(5/2)*n)
```

Maple [A] time = 0.12, size = 97, normalized size = 1.4

$$2\,\frac{b}{a^2nx^{n/2}}-\frac{2}{3\,an}\left(x^{\frac{n}{2}}\right)^{-3}+\frac{b}{a^3n}\sqrt{-ab}\ln\left(x^{\frac{n}{2}}+\frac{1}{b}\sqrt{-ab}\right)-\frac{b}{a^3n}\sqrt{-ab}\ln\left(x^{\frac{n}{2}}-\frac{1}{b}\sqrt{-ab}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-3/2*n)/(a+b*x^n),x)
```

```
[Out] 2*b/a^2/n/(x^(1/2*n))-2/3/a/n/(x^(1/2*n))^3+(-a*b)^(1/2)/a^3*b/n*
ln(x^(1/2*n)+1/b*(-a*b)^(1/2))-(-a*b)^(1/2)/a^3*b/n*ln(x^(1/2*n)-
1/b*(-a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-3/2*n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.261498, size = 1, normalized size = 0.01

$$\left[-\frac{2\,ax x^{-\frac{3}{2}\,n-1} - 3\,b\sqrt{-\frac{b}{a}}\log\left(-\frac{2\,ax^{\frac{1}{3}}x^{-\frac{1}{2}\,n-\frac{1}{3}}\sqrt{-\frac{b}{a}}-ax^{\frac{2}{3}}x^{-n-\frac{2}{3}}+b}{ax^{\frac{2}{3}}x^{-n-\frac{2}{3}}+b}\right) - 6\,bx^{\frac{1}{3}}x^{-\frac{1}{2}\,n-\frac{1}{3}}}{3\,a^2 n},\; -\frac{2\left(ax x^{-\frac{3}{2}\,n-1} - 3\,b\sqrt{\frac{b}{a}}\arctan\left(\frac{\sqrt{\frac{b}{a}}}{x^{\frac{1}{3}}x^{-\frac{1}{2}\,n-\frac{1}{3}}}\right) - 3\,bx^{\frac{1}{3}}x^{-\frac{1}{2}\,n-\frac{1}{3}}\right)}{3\,a^2 n}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-3/2*n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] [-1/3*(2*a*x*x^(-3/2*n - 1) - 3*b*sqrt(-b/a)*log(-(2*a*x^(1/3)*x^
(-1/2*n - 1/3)*sqrt(-b/a) - a*x^(2/3)*x^(-n - 2/3) + b)/(a*x^(2/3
)*x^(-n - 2/3) + b)) - 6*b*x^(1/3)*x^(-1/2*n - 1/3))/(a^2*n), -2/
3*(a*x*x^(-3/2*n - 1) - 3*b*sqrt(b/a)*arctan(sqrt(b/a)/(x^(1/3)*x
^(-1/2*n - 1/3))) - 3*b*x^(1/3)*x^(-1/2*n - 1/3))/(a^2*n)]
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-3/2*n)/(a+b*x**n),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{-\frac{3}{2}\,n-1}}{bx^n + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-3/2*n - 1)/(b*x^n + a),x, algorithm="giac")

[Out] integrate(x^(-3/2*n - 1)/(b*x^n + a), x)
```

3.2640 $\int \frac{x^{-1-\frac{4n}{3}}}{a+bx^n} \, dx$

Optimal. Leaf size=176

$$-\frac{b^{4/3}\log\left(\sqrt[3]{a}x^{-n/3}+\sqrt[3]{b}\right)}{a^{7/3}n}+\frac{b^{4/3}\log\left(a^{2/3}x^{-2n/3}-\sqrt[3]{a}\sqrt[3]{b}x^{-n/3}+b^{2/3}\right)}{2a^{7/3}n}+\frac{\sqrt{3}b^{4/3}\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x^{-n/3}}{\sqrt{3}\sqrt[3]{b}}\right)}{a^{7/3}n}+\frac{3bx^{-n/3}}{a^2n}-\frac{3x^{-4n/3}}{4an}$$

```
[Out] -3/(4*a*n*x^((4*n)/3)) + (3*b)/(a^2*n*x^(n/3)) + (Sqrt[3]*b^(4/3)
*ArcTan[(b^(1/3) - (2*a^(1/3))/x^(n/3))/(Sqrt[3]*b^(1/3))])/(a^(7
/3)*n) - (b^(4/3)*Log[b^(1/3) + a^(1/3)/x^(n/3)])/(a^(7/3)*n) + (
b^(4/3)*Log[b^(2/3) + a^(2/3)/x^((2*n)/3) - (a^(1/3)*b^(1/3))/x^(
n/3)])/(2*a^(7/3)*n)
```

Rubi [A] time = 0.293486, antiderivative size = 176, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 10, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.526

$$-\frac{b^{4/3}\log\left(\sqrt[3]{a}x^{-n/3}+\sqrt[3]{b}\right)}{a^{7/3}n}+\frac{b^{4/3}\log\left(a^{2/3}x^{-2n/3}-\sqrt[3]{a}\sqrt[3]{b}x^{-n/3}+b^{2/3}\right)}{2a^{7/3}n}+\frac{\sqrt{3}b^{4/3}\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x^{-n/3}}{\sqrt{3}\sqrt[3]{b}}\right)}{a^{7/3}n}+\frac{3bx^{-n/3}}{a^2n}-\frac{3x^{-4n/3}}{4an}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - (4*n)/3)/(a + b*x^n),x]
```

```
[Out] -3/(4*a*n*x^((4*n)/3)) + (3*b)/(a^2*n*x^(n/3)) + (Sqrt[3]*b^(4/3)
*ArcTan[(b^(1/3) - (2*a^(1/3))/x^(n/3))/(Sqrt[3]*b^(1/3))])/(a^(7
/3)*n) - (b^(4/3)*Log[b^(1/3) + a^(1/3)/x^(n/3)])/(a^(7/3)*n) + (
b^(4/3)*Log[b^(2/3) + a^(2/3)/x^((2*n)/3) - (a^(1/3)*b^(1/3))/x^(
n/3)])/(2*a^(7/3)*n)
```

Rubi in Sympy [A] time = 45.3485, size = 151, normalized size = 0.86

$$-\frac{3x^{-\frac{4n}{3}}}{4an}+\frac{3bx^{-\frac{n}{3}}}{a^2n}-\frac{b^{\frac{4}{3}}\log\left(\sqrt[3]{a}x^{-\frac{n}{3}}+\sqrt[3]{b}\right)}{a^{\frac{7}{3}}n}+\frac{b^{\frac{4}{3}}\log\left(a^{\frac{2}{3}}x^{-\frac{2n}{3}}-\sqrt[3]{a}\sqrt[3]{b}x^{-\frac{n}{3}}+b^{\frac{2}{3}}\right)}{2a^{\frac{7}{3}}n}+\frac{\sqrt{3}b^{\frac{4}{3}}\operatorname{atan}\left(\frac{\sqrt{3}\left(-\frac{2\sqrt[3]{a}x^{-\frac{n}{3}}}{3}+\frac{\sqrt[3]{b}}{3}\right)}{\sqrt[3]{b}}\right)}{a^{\frac{7}{3}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-4/3*n)/(a+b*x**n),x)
```

```
[Out] -3*x**(-4*n/3)/(4*a*n) + 3*b*x**(-n/3)/(a**2*n) - b**(4/3)*log(a*
*(1/3)*x**(-n/3) + b**(1/3))/(a**(7/3)*n) + b**(4/3)*log(a**(2/3)
*x**(-2*n/3) - a**(1/3)*b**(1/3)*x**(-n/3) + b**(2/3))/(2*a**(7/3
)*n) + sqrt(3)*b**(4/3)*atan(sqrt(3)*(-2*a**(1/3)*x**(-n/3)/3 + b
**(1/3)/3)/b**(1/3))/(a**(7/3)*n)
```

Mathematica [C] time = 0.0799826, size = 70, normalized size = 0.4

$$-\frac{4b^2\text{RootSum}\left[\#1^3a+b\&,\frac{3\log\left(x^{-n/3}-\#1\right)+n\log(x)}{\#1^2}\&\right]+9ax^{-4n/3}\left(a-4bx^n\right)}{12a^3n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - (4*n)/3)/(a + b*x^n),x]
```

```
[Out] -((9*a*(a - 4*b*x^n))/x^((4*n)/3) + 4*b^2*RootSum[b + a*#1^3 & ,
(n*Log[x] + 3*Log[x^(-n/3) - #1])/#1^2 & ])/(12*a^3*n)
```

Maple [C] time = 0.102, size = 73, normalized size = 0.4

$$3\frac{b}{a^2nx^{n/3}}-\frac{3}{4\,an}\left(x^{\frac{n}{3}}\right)^{-4}+\sum_{\_R=RootOf\left(a^7n^3\_Z^3+b^4\right)}\_R\ln\left(x^{\frac{n}{3}}+\frac{a^5n^2\_R^2}{b^3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-4/3*n)/(a+b*x^n),x)
```

```
[Out] 3*b/a^2/n/(x^(1/3*n))-3/4/a/n/(x^(1/3*n))^4+sum(_R*ln(x^(1/3*n)+a
^5*n^2/b^3*_R^2),_R=RootOf(_Z^3*a^7*n^3+b^4))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-4/3*n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.267212, size = 236, normalized size = 1.34

$$-\frac{3\,axx^{-\frac{4}{3}\,n-1}+4\,\sqrt{3}b\left(-\frac{b}{a}\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(2\,x^{\frac{1}{4}}x^{-\frac{1}{3}\,n-\frac{1}{4}}+\left(-\frac{b}{a}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{b}{a}\right)^{\frac{1}{3}}}\right)-4\,b\left(-\frac{b}{a}\right)^{\frac{1}{3}}\log\left(\frac{x^{\frac{1}{4}}x^{-\frac{1}{3}\,n-\frac{1}{4}}-\left(-\frac{b}{a}\right)^{\frac{1}{3}}}{x^{\frac{1}{4}}}\right)+2\,b\left(-\frac{b}{a}\right)^{\frac{1}{3}}\log\left(\frac{x^{\frac{1}{4}}x^{-\frac{1}{3}}\cdots}{\cdots}\right.}{4\,a^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-4/3*n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] -1/4*(3*a*x*x^(-4/3*n - 1) + 4*sqrt(3)*b*(-b/a)^(1/3)*arctan(1/3*
sqrt(3)*(2*x^(1/4)*x^(-1/3*n - 1/4) + (-b/a)^(1/3))/(-b/a)^(1/3))
 - 4*b*(-b/a)^(1/3)*log((x^(1/4)*x^(-1/3*n - 1/4) - (-b/a)^(1/3))
/x^(1/4)) + 2*b*(-b/a)^(1/3)*log((x^(1/4)*x^(-1/3*n - 1/4)*(-b/a)
^(1/3) + sqrt(x)*x^(-2/3*n - 1/2) + (-b/a)^(2/3))/sqrt(x)) - 12*b
*x^(1/4)*x^(-1/3*n - 1/4))/(a^2*n)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-4/3*n)/(a+b*x**n),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{-\frac{4}{3}\,n-1}}{bx^n + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-4/3*n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(-4/3*n - 1)/(b*x^n + a), x)
```

3.2641 $\int \frac{x^{-1-\frac{5n}{4}}}{a+bx^n}\,dx$

Optimal. Leaf size=252

$$\frac{b^{5/4}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{-n/4}+\sqrt{a}x^{-n/2}+\sqrt{b}\right)}{\sqrt{2}a^{9/4}n}-\frac{b^{5/4}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{-n/4}+\sqrt{a}x^{-n/2}+\sqrt{b}\right)}{\sqrt{2}a^{9/4}n}+\frac{\sqrt{2}b^{5/4}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{a}x^{-n/4}}{\sqrt[4]{b}}\right)}{a^{9/4}n}-\frac{\sqrt{2}b^{5/4}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{a}x^{-n/4}}{\sqrt[4]{b}}+1\right)}{a^{9/4}n}+\frac{4bx^{-n/4}}{a^2n}-\frac{4x^{-5n/4}}{5an}$$

```
[Out] -4/(5*a*n*x^((5*n)/4)) + (4*b)/(a^2*n*x^(n/4)) + (Sqrt[2]*b^(5/4)
*ArcTan[1 - (Sqrt[2]*a^(1/4))/(b^(1/4)*x^(n/4))])/(a^(9/4)*n) - (
Sqrt[2]*b^(5/4)*ArcTan[1 + (Sqrt[2]*a^(1/4))/(b^(1/4)*x^(n/4))])/
(a^(9/4)*n) + (b^(5/4)*Log[Sqrt[b] + Sqrt[a]/x^(n/2) - (Sqrt[2]*a
^(1/4)*b^(1/4))/x^(n/4)])/(Sqrt[2]*a^(9/4)*n) - (b^(5/4)*Log[Sqrt
[b] + Sqrt[a]/x^(n/2) + (Sqrt[2]*a^(1/4)*b^(1/4))/x^(n/4)])/(Sqrt
[2]*a^(9/4)*n)
```

Rubi [A] time = 0.446151, antiderivative size = 252, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 10, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.526

$$\frac{b^{5/4}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{-n/4}+\sqrt{a}x^{-n/2}+\sqrt{b}\right)}{\sqrt{2}a^{9/4}n}-\frac{b^{5/4}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{-n/4}+\sqrt{a}x^{-n/2}+\sqrt{b}\right)}{\sqrt{2}a^{9/4}n}+\frac{\sqrt{2}b^{5/4}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{a}x^{-n/4}}{\sqrt[4]{b}}\right)}{a^{9/4}n}-\frac{\sqrt{2}b^{5/4}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{a}x^{-n/4}}{\sqrt[4]{b}}+1\right)}{a^{9/4}n}+\frac{4bx^{-n/4}}{a^2n}-\frac{4x^{-5n/4}}{5an}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - (5*n)/4)/(a + b*x^n),x]
```


```
[Out] -4/(5*a*n*x^((5*n)/4)) + (4*b)/(a^2*n*x^(n/4)) + (Sqrt[2]*b^(5/4)
*ArcTan[1 - (Sqrt[2]*a^(1/4))/(b^(1/4)*x^(n/4))])/(a^(9/4)*n) - (
Sqrt[2]*b^(5/4)*ArcTan[1 + (Sqrt[2]*a^(1/4))/(b^(1/4)*x^(n/4))])/
(a^(9/4)*n) + (b^(5/4)*Log[Sqrt[b] + Sqrt[a]/x^(n/2) - (Sqrt[2]*a
^(1/4)*b^(1/4))/x^(n/4)])/(Sqrt[2]*a^(9/4)*n) - (b^(5/4)*Log[Sqrt
[b] + Sqrt[a]/x^(n/2) + (Sqrt[2]*a^(1/4)*b^(1/4))/x^(n/4)])/(Sqrt
[2]*a^(9/4)*n)
```

Rubi in Sympy [A] time = 74.4801, size = 219, normalized size = 0.87

$$-\frac{4x^{-\frac{5n}{4}}}{5an}+\frac{4bx^{-\frac{n}{4}}}{a^2n}+\frac{\sqrt{2}b^{\frac{5}{4}}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{-\frac{n}{4}}+\sqrt{a}x^{-\frac{n}{2}}+\sqrt{b}\right)}{2a^{\frac{9}{4}}n}-\frac{\sqrt{2}b^{\frac{5}{4}}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{-\frac{n}{4}}+\sqrt{a}x^{-\frac{n}{2}}+\sqrt{b}\right)}{2a^{\frac{9}{4}}n}-\frac{\sqrt{2}b^{\frac{5}{4}}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[4]{a}x^{-\frac{n}{4}}}{\sqrt[4]{b}}-1\right)}{a^{\frac{9}{4}}n}-\frac{\sqrt{2}b^{\frac{5}{4}}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[4]{a}x^{-\frac{n}{4}}}{\sqrt[4]{b}}+1\right)}{a^{\frac{9}{4}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-5/4*n)/(a+b*x**n),x)
```

```
[Out] -4*x**(-5*n/4)/(5*a*n) + 4*b*x**(-n/4)/(a**2*n) + sqrt(2)*b**(5/4
)*log(-sqrt(2)*a**(1/4)*b**(1/4)*x**(-n/4) + sqrt(a)*x**(-n/2) +
sqrt(b))/(2*a**(9/4)*n) - sqrt(2)*b**(5/4)*log(sqrt(2)*a**(1/4)*b
```

```
**(1/4)*x**(-n/4) + sqrt(a)*x**(-n/2) + sqrt(b))/(2*a**(9/4)*n) -
 sqrt(2)*b**(5/4)*atan(sqrt(2)*a**(1/4)*x**(-n/4)/b**(1/4) - 1)/(
a**(9/4)*n) - sqrt(2)*b**(5/4)*atan(sqrt(2)*a**(1/4)*x**(-n/4)/b*
*(1/4) + 1)/(a**(9/4)*n)
```

Mathematica [C] time = 0.0803548, size = 70, normalized size = 0.28

$$-\frac{5b^2\text{RootSum}\left[\#1^4a+b\&,\frac{4\log\left(x^{-n/4}-\#1\right)+n\log(x)}{\#1^3}\&\right]+16ax^{-5n/4}\left(a-5bx^n\right)}{20a^3n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - (5*n)/4)/(a + b*x^n),x]
```

```
[Out] -((16*a*(a - 5*b*x^n))/x^((5*n)/4) + 5*b^2*RootSum[b + a*#1^4 & ,
 (n*Log[x] + 4*Log[x^(-n/4) - #1])/#1^3 & ])/(20*a^3*n)
```

Maple [C] time = 0.115, size = 73, normalized size = 0.3

$$4\,\frac{b}{a^2nx^{n/4}}-\frac{4}{5\,an}\left(x^{\frac{n}{4}}\right)^{-5}+\sum_{\_R=RootOf\left(a^9n^4\_Z^4+b^5\right)}\_R\,\ln\left(x^{\frac{n}{4}}+\frac{a^7n^3\_R^3}{b^4}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-5/4*n)/(a+b*x^n),x)
```

```
[Out] 4*b/a^2/n/(x^(1/4*n))-4/5/a/n/(x^(1/4*n))^5+sum(_R*ln(x^(1/4*n)+a
^7*n^3/b^4*_R^3),_R=RootOf(_Z^4*a^9*n^4+b^5))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-5/4*n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.28204, size = 331, normalized size = 1.31

$$\frac{20\,a^2n\left(-\frac{b^5}{a^9n^4}\right)^{\frac{1}{4}}\arctan\left(\frac{a^2nx^{\frac{4}{5}}\left(-\frac{b^5}{a^9n^4}\right)^{\frac{1}{4}}}{bxx^{-\frac{1}{4}\,n-\frac{1}{5}}+x\sqrt{\frac{a^4n^2x^{\frac{3}{5}}\sqrt{-\frac{b^5}{a^9n^4}}+b^2xx^{-\frac{1}{2}\,n-\frac{2}{5}}}{x}}}\right)-5\,a^2n\left(-\frac{b^5}{a^9n^4}\right)^{\frac{1}{4}}\log\left(\frac{a^2nx^{\frac{4}{5}}\left(-\frac{b^5}{a^9n^4}\right)^{\frac{1}{4}}+bxx^{-\frac{1}{4}\,n-\frac{1}{5}}}{x}\right)+5\,a^2n\left(-\right.}{5\,a^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-5/4*n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] 1/5*(20*a^2*n*(-b^5/(a^9*n^4))^(1/4)*arctan(a^2*n*x^(4/5)*(-b^5/(
a^9*n^4))^(1/4)/(b*x*x^(-1/4*n - 1/5) + x*sqrt((a^4*n^2*x^(3/5)*s
```

```
qrt(-b^5/(a^9*n^4)) + b^2*x*x^(-1/2*n - 2/5))/x))) - 5*a^2*n*(-b^
5/(a^9*n^4))^(1/4)*log((a^2*n*x^(4/5)*(-b^5/(a^9*n^4))^(1/4) + b*
x*x^(-1/4*n - 1/5))/x) + 5*a^2*n*(-b^5/(a^9*n^4))^(1/4)*log(-(a^2
*n*x^(4/5)*(-b^5/(a^9*n^4))^(1/4) - b*x*x^(-1/4*n - 1/5))/x) - 4*
a*x*x^(-5/4*n - 1) + 20*b*x^(1/5)*x^(-1/4*n - 1/5))/(a^2*n)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-5/4*n)/(a+b*x**n),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{-\frac{5}{4}n-1}}{bx^n + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-5/4*n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(-5/4*n - 1)/(b*x^n + a), x)
```

3.2642 $\int x^{-1+4n}\sqrt{a+bx^n}\,dx$

Optimal. Leaf size=92

$$-\frac{2a^3(a+bx^n)^{3/2}}{3b^4n}+\frac{6a^2(a+bx^n)^{5/2}}{5b^4n}+\frac{2(a+bx^n)^{9/2}}{9b^4n}-\frac{6a(a+bx^n)^{7/2}}{7b^4n}$$

```
[Out] (-2*a^3*(a + b*x^n)^(3/2))/(3*b^4*n) + (6*a^2*(a + b*x^n)^(5/2))/
(5*b^4*n) - (6*a*(a + b*x^n)^(7/2))/(7*b^4*n) + (2*(a + b*x^n)^(9
/2))/(9*b^4*n)
```

Rubi [A] time = 0.116044, antiderivative size = 92, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$-\frac{2a^3(a+bx^n)^{3/2}}{3b^4n}+\frac{6a^2(a+bx^n)^{5/2}}{5b^4n}+\frac{2(a+bx^n)^{9/2}}{9b^4n}-\frac{6a(a+bx^n)^{7/2}}{7b^4n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + 4*n)*Sqrt[a + b*x^n],x]
```

```
[Out] (-2*a^3*(a + b*x^n)^(3/2))/(3*b^4*n) + (6*a^2*(a + b*x^n)^(5/2))/
(5*b^4*n) - (6*a*(a + b*x^n)^(7/2))/(7*b^4*n) + (2*(a + b*x^n)^(9
/2))/(9*b^4*n)
```

Rubi in Sympy [A] time = 16.837, size = 82, normalized size = 0.89

$$-\frac{2a^3(a+bx^n)^{\frac{3}{2}}}{3b^4n}+\frac{6a^2(a+bx^n)^{\frac{5}{2}}}{5b^4n}-\frac{6a(a+bx^n)^{\frac{7}{2}}}{7b^4n}+\frac{2(a+bx^n)^{\frac{9}{2}}}{9b^4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+4*n)*(a+b*x**n)**(1/2),x)
```

```
[Out] -2*a**3*(a + b*x**n)**(3/2)/(3*b**4*n) + 6*a**2*(a + b*x**n)**(5/
2)/(5*b**4*n) - 6*a*(a + b*x**n)**(7/2)/(7*b**4*n) + 2*(a + b*x**
n)**(9/2)/(9*b**4*n)
```

Mathematica [A] time = 0.0519288, size = 70, normalized size = 0.76

$$\frac{2\sqrt{a+bx^n}\left(-16a^4+8a^3bx^n-6a^2b^2x^{2n}+5ab^3x^{3n}+35b^4x^{4n}\right)}{315b^4n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + 4*n)*Sqrt[a + b*x^n],x]
```

```
[Out] (2*Sqrt[a + b*x^n]*(-16*a^4 + 8*a^3*b*x^n - 6*a^2*b^2*x^(2*n) + 5
*a*b^3*x^(3*n) + 35*b^4*x^(4*n)))/(315*b^4*n)
```

Maple [A] time = 0.035, size = 67, normalized size = 0.7

$$-\frac{-70\,(x^n)^4\,b^4-10\,a\,(x^n)^3\,b^3+12\,a^2\,(x^n)^2\,b^2-16\,a^3x^nb+32\,a^4}{315\,b^4n}\sqrt{a+bx^n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+4*n)*(a+b*x^n)^(1/2),x)
```

```
[Out] -2/315*(-35*(x^n)^4*b^4-5*a*(x^n)^3*b^3+6*a^2*(x^n)^2*b^2-8*a^3*x
^n*b+16*a^4)*(a+b*x^n)^(1/2)/b^4/n
```

Maxima [A] time = 1.46528, size = 89, normalized size = 0.97

$$\frac{2\,\left(35\,b^4x^{4\,n}+5\,ab^3x^{3\,n}-6\,a^2b^2x^{2\,n}+8\,a^3bx^n-16\,a^4\right)\sqrt{bx^n+a}}{315\,b^4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)*x^(4*n - 1),x, algorithm="maxima")
```

```
[Out] 2/315*(35*b^4*x^(4*n) + 5*a*b^3*x^(3*n) - 6*a^2*b^2*x^(2*n) + 8*a
^3*b*x^n - 16*a^4)*sqrt(b*x^n + a)/(b^4*n)
```

Fricas [A] time = 0.2203, size = 89, normalized size = 0.97

$$\frac{2\,\left(35\,b^4x^{4\,n}+5\,ab^3x^{3\,n}-6\,a^2b^2x^{2\,n}+8\,a^3bx^n-16\,a^4\right)\sqrt{bx^n+a}}{315\,b^4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)*x^(4*n - 1),x, algorithm="fricas")
```

```
[Out] 2/315*(35*b^4*x^(4*n) + 5*a*b^3*x^(3*n) - 6*a^2*b^2*x^(2*n) + 8*a
^3*b*x^n - 16*a^4)*sqrt(b*x^n + a)/(b^4*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+4*n)*(a+b*x**n)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{bx^n+a}x^{4\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)*x^(4*n - 1),x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*x^n + a)*x^(4*n - 1), x)
```

3.2643 $\int x^{-1+3n}\sqrt{a+bx^n}\,dx$

Optimal. Leaf size=68

$$\frac{2a^2(a+bx^n)^{3/2}}{3b^3n}+\frac{2(a+bx^n)^{7/2}}{7b^3n}-\frac{4a(a+bx^n)^{5/2}}{5b^3n}$$

```
[Out] (2*a^2*(a + b*x^n)^(3/2))/(3*b^3*n) - (4*a*(a + b*x^n)^(5/2))/(5*
b^3*n) + (2*(a + b*x^n)^(7/2))/(7*b^3*n)
```

Rubi [A] time = 0.0919977, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$\frac{2a^2(a+bx^n)^{3/2}}{3b^3n}+\frac{2(a+bx^n)^{7/2}}{7b^3n}-\frac{4a(a+bx^n)^{5/2}}{5b^3n}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 + 3*n)*Sqrt[a + b*x^n],x]
```

```
[Out] (2*a^2*(a + b*x^n)^(3/2))/(3*b^3*n) - (4*a*(a + b*x^n)^(5/2))/(5*
b^3*n) + (2*(a + b*x^n)^(7/2))/(7*b^3*n)
```

Rubi in Sympy [A] time = 12.3256, size = 60, normalized size = 0.88

$$\frac{2a^2(a+bx^n)^{\frac{3}{2}}}{3b^3n}-\frac{4a(a+bx^n)^{\frac{5}{2}}}{5b^3n}+\frac{2(a+bx^n)^{\frac{7}{2}}}{7b^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1+3*n)*(a+b*x**n)**(1/2),x)
```

```
[Out] 2*a**2*(a + b*x**n)**(3/2)/(3*b**3*n) - 4*a*(a + b*x**n)**(5/2)/(
5*b**3*n) + 2*(a + b*x**n)**(7/2)/(7*b**3*n)
```

Mathematica [A] time = 0.0415162, size = 57, normalized size = 0.84

$$\frac{2\sqrt{a+bx^n}\left(8a^3-4a^2bx^n+3ab^2x^{2n}+15b^3x^{3n}\right)}{105b^3n}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 + 3*n)*Sqrt[a + b*x^n],x]
```

```
[Out] (2*Sqrt[a + b*x^n]*(8*a^3 - 4*a^2*b*x^n + 3*a*b^2*x^(2*n) + 15*b^
3*x^(3*n)))/(105*b^3*n)
```

Maple [A] time = 0.032, size = 54, normalized size = 0.8

$$\frac{30\,(x^n)^3b^3+6\,a\,(x^n)^2b^2-8\,a^2x^nb+16\,a^3}{105\,b^3n}\sqrt{a+bx^n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+3*n)*(a+b*x^n)^(1/2),x)
```

```
[Out] 2/105*(15*(x^n)^3*b^3+3*a*(x^n)^2*b^2-4*a^2*x^n*b+8*a^3)*(a+b*x^n
)^(1/2)/b^3/n
```

Maxima [A] time = 1.46713, size = 72, normalized size = 1.06

$$\frac{2\left(15\,b^{3}x^{3\,n}+3\,ab^{2}x^{2\,n}-4\,a^{2}bx^{n}+8\,a^{3}\right)\sqrt{bx^{n}+a}}{105\,b^{3}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)*x^(3*n - 1),x, algorithm="maxima")
```

```
[Out] 2/105*(15*b^3*x^(3*n) + 3*a*b^2*x^(2*n) - 4*a^2*b*x^n + 8*a^3)*sq
rt(b*x^n + a)/(b^3*n)
```

Fricas [A] time = 0.221839, size = 72, normalized size = 1.06

$$\frac{2\left(15\,b^{3}x^{3\,n}+3\,ab^{2}x^{2\,n}-4\,a^{2}bx^{n}+8\,a^{3}\right)\sqrt{bx^{n}+a}}{105\,b^{3}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)*x^(3*n - 1),x, algorithm="fricas")
```

```
[Out] 2/105*(15*b^3*x^(3*n) + 3*a*b^2*x^(2*n) - 4*a^2*b*x^n + 8*a^3)*sq
rt(b*x^n + a)/(b^3*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+3*n)*(a+b*x**n)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{bx^{n}+a}x^{3\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)*x^(3*n - 1),x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*x^n + a)*x^(3*n - 1), x)
```

3.2644 $\int x^{-1+2n}\sqrt{a+bx^n}\,dx$

Optimal. Leaf size=44

$$\frac{2(a+bx^n)^{5/2}}{5b^2n}-\frac{2a(a+bx^n)^{3/2}}{3b^2n}$$

```
[Out] (-2*a*(a + b*x^n)^(3/2))/(3*b^2*n) + (2*(a + b*x^n)^(5/2))/(5*b^2
*n)
```

Rubi [A] time = 0.0618802, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$\frac{2(a+bx^n)^{5/2}}{5b^2n}-\frac{2a(a+bx^n)^{3/2}}{3b^2n}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 + 2*n)*Sqrt[a + b*x^n],x]
```

```
[Out] (-2*a*(a + b*x^n)^(3/2))/(3*b^2*n) + (2*(a + b*x^n)^(5/2))/(5*b^2
*n)
```

Rubi in Sympy [A] time = 8.30575, size = 37, normalized size = 0.84

$$-\frac{2a(a+bx^n)^{\frac{3}{2}}}{3b^2n}+\frac{2(a+bx^n)^{\frac{5}{2}}}{5b^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1+2*n)*(a+b*x**n)**(1/2),x)
```

```
[Out] -2*a*(a + b*x**n)**(3/2)/(3*b**2*n) + 2*(a + b*x**n)**(5/2)/(5*b*
*2*n)
```

Mathematica [A] time = 0.0364608, size = 43, normalized size = 0.98

$$\frac{2\sqrt{a+bx^n}\left(-2a^2+abx^n+3b^2x^{2n}\right)}{15b^2n}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 + 2*n)*Sqrt[a + b*x^n],x]
```

```
[Out] (2*Sqrt[a + b*x^n]*(-2*a^2 + a*b*x^n + 3*b^2*x^(2*n)))/(15*b^2*n)
```

Maple [A] time = 0.031, size = 41, normalized size = 0.9

$$-\frac{-6\,b^2\,(x^n)^2-2\,ax^nb+4\,a^2}{15\,b^2n}\sqrt{a+bx^n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-1+2*n)*(a+b*x^n)^(1/2),x)
```

```
[Out] -2/15*(-3*b^2*(x^n)^2-a*x^n*b+2*a^2)*(a+b*x^n)^(1/2)/b^2/n
```

Maxima [A] time = 1.47734, size = 53, normalized size = 1.2

$$\frac{2\left(3\,b^{2}x^{2\,n}+abx^{n}-2\,a^{2}\right)\sqrt{bx^{n}+a}}{15\,b^{2}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)*x^(2*n - 1),x, algorithm="maxima")
```

```
[Out] 2/15*(3*b^2*x^(2*n) + a*b*x^n - 2*a^2)*sqrt(b*x^n + a)/(b^2*n)
```

Fricas [A] time = 0.218373, size = 53, normalized size = 1.2

$$\frac{2\left(3\,b^{2}x^{2\,n}+abx^{n}-2\,a^{2}\right)\sqrt{bx^{n}+a}}{15\,b^{2}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)*x^(2*n - 1),x, algorithm="fricas")
```

```
[Out] 2/15*(3*b^2*x^(2*n) + a*b*x^n - 2*a^2)*sqrt(b*x^n + a)/(b^2*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+2*n)*(a+b*x**n)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{bx^{n}+a}x^{2\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)*x^(2*n - 1),x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*x^n + a)*x^(2*n - 1), x)
```

3.2645 $\int x^{-1+n}\sqrt{a+bx^n}\,dx$

Optimal. Leaf size=21

$$\frac{2\left(a+bx^n\right)^{3/2}}{3bn}$$

```
[Out] (2*(a + b*x^n)^(3/2))/(3*b*n)
```

Rubi [A] time = 0.0240563, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.059$

$$\frac{2\left(a+bx^n\right)^{3/2}}{3bn}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + n)*Sqrt[a + b*x^n],x]

[Out] (2*(a + b*x^n)^(3/2))/(3*b*n)
```

Rubi in Sympy [A] time = 2.45398, size = 15, normalized size = 0.71

$$\frac{2\left(a+bx^n\right)^{\frac{3}{2}}}{3bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+n)*(a+b*x**n)**(1/2),x)

[Out] 2*(a + b*x**n)**(3/2)/(3*b*n)
```

Mathematica [A] time = 0.0172333, size = 21, normalized size = 1.

$$\frac{2\left(a+bx^n\right)^{3/2}}{3bn}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + n)*Sqrt[a + b*x^n],x]

[Out] (2*(a + b*x^n)^(3/2))/(3*b*n)
```

Maple [A] time = 0.029, size = 18, normalized size = 0.9

$$\frac{2}{3\,bn}\left(a+bx^n\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+n)*(a+b*x^n)^(1/2),x)

[Out] 2/3*(a+b*x^n)^(3/2)/b/n
```

Maxima [A] time = 1.43325, size = 23, normalized size = 1.1

$$\frac{2\,{\left(b x^{n} + a\right)}^{\frac{3}{2}}}{3\,b n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)*x^(n - 1),x, algorithm="maxima")

[Out] 2/3*(b*x^n + a)^(3/2)/(b*n)
```

Fricas [A] time = 0.218471, size = 23, normalized size = 1.1

$$\frac{2\,{\left(b x^{n} + a\right)}^{\frac{3}{2}}}{3\,b n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)*x^(n - 1),x, algorithm="fricas")

[Out] 2/3*(b*x^n + a)^(3/2)/(b*n)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+n)*(a+b*x**n)**(1/2),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [A] time = 0.215752, size = 23, normalized size = 1.1

$$\frac{2\,{\left(b x^{n} + a\right)}^{\frac{3}{2}}}{3\,b n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)*x^(n - 1),x, algorithm="giac")

[Out] 2/3*(b*x^n + a)^(3/2)/(b*n)
```

3.2646 $\int \frac{\sqrt{a+bx^n}}{x}\,dx$

Optimal. Leaf size=45

$$\frac{2\sqrt{a+bx^n}}{n}-\frac{2\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{n}$$

```
[Out] (2*Sqrt[a + b*x^n])/n - (2*Sqrt[a]*ArcTanh[Sqrt[a + b*x^n]/Sqrt[a
]])/n
```

Rubi [A] time = 0.0721446, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{2\sqrt{a+bx^n}}{n}-\frac{2\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{n}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*x^n]/x,x]
```

```
[Out] (2*Sqrt[a + b*x^n])/n - (2*Sqrt[a]*ArcTanh[Sqrt[a + b*x^n]/Sqrt[a
]])/n
```

Rubi in Sympy [A] time = 7.84398, size = 37, normalized size = 0.82

$$-\frac{2\sqrt{a}\,\text{atanh}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{n}+\frac{2\sqrt{a+bx^n}}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**n)**(1/2)/x,x)
```

```
[Out] -2*sqrt(a)*atanh(sqrt(a + b*x**n)/sqrt(a))/n + 2*sqrt(a + b*x**n)
/n
```

Mathematica [A] time = 0.0328248, size = 42, normalized size = 0.93

$$\frac{2\left(\sqrt{a+bx^n}-\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)\right)}{n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b*x^n]/x,x]
```

```
[Out] (2*(Sqrt[a + b*x^n] - Sqrt[a]*ArcTanh[Sqrt[a + b*x^n]/Sqrt[a]]))/
n
```

Maple [A] time = 0., size = 36, normalized size = 0.8

$$\frac{1}{n}\left(2\sqrt{a+bx^n}-2\sqrt{a}Artanh\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^(1/2)/x,x)
```

```
[Out] 1/n*(2*(a+b*x^n)^(1/2)-2*a^(1/2)*arctanh((a+b*x^n)^(1/2)/a^(1/2))
)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.231398, size = 1, normalized size = 0.02

$$\left[\frac{\sqrt{a}\log\left(\frac{bx^n-2\sqrt{bx^n+a}\sqrt{a}+2a}{x^n}\right)+2\sqrt{bx^n+a}}{n}, -\frac{2\left(\sqrt{-a}\arctan\left(\frac{\sqrt{bx^n+a}}{\sqrt{-a}}\right)-\sqrt{bx^n+a}\right)}{n}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)/x,x, algorithm="fricas")
```

```
[Out] [(sqrt(a)*log((b*x^n - 2*sqrt(b*x^n + a)*sqrt(a) + 2*a)/x^n) + 2*
sqrt(b*x^n + a))/n, -2*(sqrt(-a)*arctan(sqrt(b*x^n + a)/sqrt(-a))
 - sqrt(b*x^n + a))/n]
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**(1/2)/x,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{bx^n+a}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)/x,x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*x^n + a)/x, x)
```

3.2647 $\int x^{-1-n}\sqrt{a+bx^n}\,dx$

Optimal. Leaf size=51

$$-\frac{b\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{\sqrt{a}n}-\frac{x^{-n}\sqrt{a+bx^n}}{n}$$

```
[Out] -(Sqrt[a + b*x^n]/(n*x^n)) - (b*ArcTanh[Sqrt[a + b*x^n]/Sqrt[a]])
/(Sqrt[a]*n)
```

Rubi [A] time = 0.0777012, antiderivative size = 51, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.21

$$-\frac{b\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{\sqrt{a}n}-\frac{x^{-n}\sqrt{a+bx^n}}{n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - n)*Sqrt[a + b*x^n],x]
```

```
[Out] -(Sqrt[a + b*x^n]/(n*x^n)) - (b*ArcTanh[Sqrt[a + b*x^n]/Sqrt[a]])
/(Sqrt[a]*n)
```

Rubi in Sympy [A] time = 8.45508, size = 41, normalized size = 0.8

$$-\frac{x^{-n}\sqrt{a+bx^n}}{n}-\frac{b\,\mathrm{atanh}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{\sqrt{a}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-n)*(a+b*x**n)**(1/2),x)
```

```
[Out] -x**(-n)*sqrt(a + b*x**n)/n - b*atanh(sqrt(a + b*x**n)/sqrt(a))/(
sqrt(a)*n)
```

Mathematica [A] time = 0.120056, size = 67, normalized size = 1.31

$$-\frac{2x^{-n}\sqrt{a+bx^n}+\frac{b\log\left(x^{-n}\left(2\sqrt{a}\sqrt{a+bx^n}+2a+bx^n\right)\right)}{\sqrt{a}}}{2n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - n)*Sqrt[a + b*x^n],x]
```

```
[Out] -((2*Sqrt[a + b*x^n])/x^n + (b*Log[(2*a + b*x^n + 2*Sqrt[a]*Sqrt[
a + b*x^n])/x^n])/Sqrt[a])/(2*n)
```

Maple [F] time = 0.071, size = 0, normalized size = 0.

$$\int x^{-1-n}\sqrt{a+bx^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-n)*(a+b*x^n)^(1/2),x)
```

```
[Out] int(x^(-1-n)*(a+b*x^n)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)*x^(-n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.231253, size = 1, normalized size = 0.02

$$\left[\frac{bx^n \log\left(\frac{\sqrt{a}bx^n - 2\sqrt{bx^n + a}a + 2a^{\frac{3}{2}}}{x^n}\right) - 2\sqrt{bx^n + a}\sqrt{a}}{2\sqrt{a}nx^n}, \frac{bx^n \arctan\left(\frac{a}{\sqrt{bx^n + a}\sqrt{-a}}\right) - \sqrt{bx^n + a}\sqrt{-a}}{\sqrt{-a}nx^n}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)*x^(-n - 1),x, algorithm="fricas")
```

```
[Out] [1/2*(b*x^n*log((sqrt(a)*b*x^n - 2*sqrt(b*x^n + a)*a + 2*a^(3/2))
/x^n) - 2*sqrt(b*x^n + a)*sqrt(a))/(sqrt(a)*n*x^n), (b*x^n*arctan
(a/(sqrt(b*x^n + a)*sqrt(-a))) - sqrt(b*x^n + a)*sqrt(-a))/(sqrt(
-a)*n*x^n)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-n)*(a+b*x**n)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{bx^n + a}x^{-n-1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)*x^(-n - 1),x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*x^n + a)*x^(-n - 1), x)
```

3.2648 $\int x^{-1-2n}\sqrt{a+bx^n}\,dx$

Optimal. Leaf size=84

$$\frac{b^2\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{4a^{3/2}n}-\frac{x^{-2n}\sqrt{a+bx^n}}{2n}-\frac{bx^{-n}\sqrt{a+bx^n}}{4an}$$

```
[Out] -Sqrt[a + b*x^n]/(2*n*x^(2*n)) - (b*Sqrt[a + b*x^n])/(4*a*n*x^n)
+ (b^2*ArcTanh[Sqrt[a + b*x^n]/Sqrt[a]])/(4*a^(3/2)*n)
```

Rubi [A] time = 0.11252, antiderivative size = 84, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263

$$\frac{b^2\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{4a^{3/2}n}-\frac{x^{-2n}\sqrt{a+bx^n}}{2n}-\frac{bx^{-n}\sqrt{a+bx^n}}{4an}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 2*n)*Sqrt[a + b*x^n],x]
```

```
[Out] -Sqrt[a + b*x^n]/(2*n*x^(2*n)) - (b*Sqrt[a + b*x^n])/(4*a*n*x^n)
+ (b^2*ArcTanh[Sqrt[a + b*x^n]/Sqrt[a]])/(4*a^(3/2)*n)
```

Rubi in Sympy [A] time = 11.5432, size = 66, normalized size = 0.79

$$-\frac{x^{-2n}\sqrt{a+bx^n}}{2n}-\frac{bx^{-n}\sqrt{a+bx^n}}{4an}+\frac{b^2\operatorname{atanh}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{4a^{\frac{3}{2}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-2*n)*(a+b*x**n)**(1/2),x)
```

```
[Out] -x**(-2*n)*sqrt(a + b*x**n)/(2*n) - b*x**(-n)*sqrt(a + b*x**n)/(4
*a*n) + b**2*atanh(sqrt(a + b*x**n)/sqrt(a))/(4*a**(3/2)*n)
```

Mathematica [A] time = 0.114894, size = 83, normalized size = 0.99

$$\frac{b^2\log\left(x^{-n}\left(2\sqrt{a}\sqrt{a+bx^n}+2a+bx^n\right)\right)-2\sqrt{a}x^{-2n}\sqrt{a+bx^n}\,(2a+bx^n)}{8a^{3/2}n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 2*n)*Sqrt[a + b*x^n],x]
```

```
[Out] ((-2*Sqrt[a]*Sqrt[a + b*x^n]*(2*a + b*x^n))/x^(2*n) + b^2*Log[(2*
a + b*x^n + 2*Sqrt[a]*Sqrt[a + b*x^n])/x^n])/(8*a^(3/2)*n)
```

Maple [F] time = 0.066, size = 0, normalized size = 0.

$$\int x^{-1-2\,n}\sqrt{a+bx^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-2*n)*(a+b*x^n)^(1/2),x)
```

```
[Out] int(x^(-1-2*n)*(a+b*x^n)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)*x^(-2*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.230974, size = 1, normalized size = 0.01

$$\left[\frac{b^2x^{2n}\log\left(\frac{\sqrt{a}bx^n+2\sqrt{bx^n+a}a+2a^{\frac{3}{2}}}{x^n}\right)-2\left(\sqrt{a}bx^n+2a^{\frac{3}{2}}\right)\sqrt{bx^n+a}}{8a^{\frac{3}{2}}nx^{2n}},\; -\frac{b^2x^{2n}\arctan\left(\frac{a}{\sqrt{bx^n+a}\sqrt{-a}}\right)+\left(\sqrt{-a}bx^n+2\sqrt{-a}a\right)\sqrt{bx^n+a}}{4\sqrt{-a}anx^{2n}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)*x^(-2*n - 1),x, algorithm="fricas")
```

```
[Out] [1/8*(b^2*x^(2*n)*log((sqrt(a)*b*x^n + 2*sqrt(b*x^n + a)*a + 2*a^
(3/2))/x^n) - 2*(sqrt(a)*b*x^n + 2*a^(3/2))*sqrt(b*x^n + a))/(a^(
3/2)*n*x^(2*n)), -1/4*(b^2*x^(2*n)*arctan(a/(sqrt(b*x^n + a)*sqrt
(-a))) + (sqrt(-a)*b*x^n + 2*sqrt(-a)*a)*sqrt(b*x^n + a))/(sqrt(-
a)*a*n*x^(2*n))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-2*n)*(a+b*x**n)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{bx^n + a}x^{-2\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)*x^(-2*n - 1),x, algorithm="giac")

[Out] integrate(sqrt(b*x^n + a)*x^(-2*n - 1), x)
```

3.2649 $\int x^{-1-3n}\sqrt{a+bx^n}\,dx$

Optimal. Leaf size=113

$$-\frac{b^3\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{8a^{5/2}n}+\frac{b^2x^{-n}\sqrt{a+bx^n}}{8a^2n}-\frac{x^{-3n}\sqrt{a+bx^n}}{3n}-\frac{bx^{-2n}\sqrt{a+bx^n}}{12an}$$

```
[Out] -Sqrt[a + b*x^n]/(3*n*x^(3*n)) - (b*Sqrt[a + b*x^n])/(12*a*n*x^(2
*n)) + (b^2*Sqrt[a + b*x^n])/(8*a^2*n*x^n) - (b^3*ArcTanh[Sqrt[a
+ b*x^n]/Sqrt[a]])/(8*a^(5/2)*n)
```

Rubi [A] time = 0.14719, antiderivative size = 113, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263

$$-\frac{b^3\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{8a^{5/2}n}+\frac{b^2x^{-n}\sqrt{a+bx^n}}{8a^2n}-\frac{x^{-3n}\sqrt{a+bx^n}}{3n}-\frac{bx^{-2n}\sqrt{a+bx^n}}{12an}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 3*n)*Sqrt[a + b*x^n],x]
```

```
[Out] -Sqrt[a + b*x^n]/(3*n*x^(3*n)) - (b*Sqrt[a + b*x^n])/(12*a*n*x^(2
*n)) + (b^2*Sqrt[a + b*x^n])/(8*a^2*n*x^n) - (b^3*ArcTanh[Sqrt[a
+ b*x^n]/Sqrt[a]])/(8*a^(5/2)*n)
```

Rubi in Sympy [A] time = 16.599, size = 92, normalized size = 0.81

$$-\frac{x^{-3n}\sqrt{a+bx^n}}{3n}-\frac{bx^{-2n}\sqrt{a+bx^n}}{12an}+\frac{b^2x^{-n}\sqrt{a+bx^n}}{8a^2n}-\frac{b^3\operatorname{atanh}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{8a^{\frac{5}{2}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-3*n)*(a+b*x**n)**(1/2),x)
```

```
[Out] -x**(-3*n)*sqrt(a + b*x**n)/(3*n) - b*x**(-2*n)*sqrt(a + b*x**n)/
(12*a*n) + b**2*x**(-n)*sqrt(a + b*x**n)/(8*a**2*n) - b**3*atanh(
sqrt(a + b*x**n)/sqrt(a))/(8*a**(5/2)*n)
```

Mathematica [A] time = 0.137018, size = 98, normalized size = 0.87

$$\frac{-2\sqrt{a}x^{-3n}\sqrt{a+bx^n}\left(8a^2+2abx^n-3b^2x^{2n}\right)-3b^3\log\left(x^{-n}\left(2\sqrt{a}\sqrt{a+bx^n}+2a+bx^n\right)\right)}{48a^{5/2}n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 3*n)*Sqrt[a + b*x^n],x]
```

```
[Out] ((-2*Sqrt[a]*Sqrt[a + b*x^n]*(8*a^2 + 2*a*b*x^n - 3*b^2*x^(2*n)))
/x^(3*n) - 3*b^3*Log[(2*a + b*x^n + 2*Sqrt[a]*Sqrt[a + b*x^n])/x^
n])/(48*a^(5/2)*n)
```

Maple [F] time = 0.068, size = 0, normalized size = 0.

$$\int x^{-1-3\,n}\sqrt{a+bx^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-3*n)*(a+b*x^n)^(1/2),x)
```

```
[Out] int(x^(-1-3*n)*(a+b*x^n)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)*x^(-3*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.237258, size = 1, normalized size = 0.01

$$\left[\frac{3\,b^3x^{3\,n}\log\left(\frac{\sqrt{a}bx^n-2\,\sqrt{bx^n+a}a+2\,a^{\frac{3}{2}}}{x^n}\right)+2\left(3\,\sqrt{a}b^2x^{2\,n}-2\,a^{\frac{3}{2}}bx^n-8\,a^{\frac{5}{2}}\right)\sqrt{bx^n+a}}{48\,a^{\frac{5}{2}}nx^{3\,n}},\ \frac{3\,b^3x^{3\,n}\arctan\left(\frac{a}{\sqrt{bx^n+a}\sqrt{-a}}\right)+\left(3\,\sqrt{-a}b\right.}{24\,\sqrt{-a}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)*x^(-3*n - 1),x, algorithm="fricas")
```

```
[Out] [1/48*(3*b^3*x^(3*n)*log((sqrt(a)*b*x^n - 2*sqrt(b*x^n + a)*a + 2
*a^(3/2))/x^n) + 2*(3*sqrt(a)*b^2*x^(2*n) - 2*a^(3/2)*b*x^n - 8*a
^(5/2))*sqrt(b*x^n + a))/(a^(5/2)*n*x^(3*n)), 1/24*(3*b^3*x^(3*n)
*arctan(a/(sqrt(b*x^n + a)*sqrt(-a))) + (3*sqrt(-a)*b^2*x^(2*n) -
 2*sqrt(-a)*a*b*x^n - 8*sqrt(-a)*a^2)*sqrt(b*x^n + a))/(sqrt(-a)*
a^2*n*x^(3*n))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-3*n)*(a+b*x**n)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{bx^n+a}x^{-3\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)*x^(-3*n - 1),x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*x^n + a)*x^(-3*n - 1), x)
```

3.2650 $\int x^{-1-4n}\sqrt{a+bx^n}\,dx$

Optimal. Leaf size=142

$$\frac{5b^4\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{64a^{7/2}n}-\frac{5b^3x^{-n}\sqrt{a+bx^n}}{64a^3n}+\frac{5b^2x^{-2n}\sqrt{a+bx^n}}{96a^2n}-\frac{x^{-4n}\sqrt{a+bx^n}}{4n}-\frac{bx^{-3n}\sqrt{a+bx^n}}{24an}$$

```
[Out] -Sqrt[a + b*x^n]/(4*n*x^(4*n)) - (b*Sqrt[a + b*x^n])/(24*a*n*x^(3
*n)) + (5*b^2*Sqrt[a + b*x^n])/(96*a^2*n*x^(2*n)) - (5*b^3*Sqrt[a
 + b*x^n])/(64*a^3*n*x^n) + (5*b^4*ArcTanh[Sqrt[a + b*x^n]/Sqrt[a
]])/(64*a^(7/2)*n)
```

Rubi [A] time = 0.192269, antiderivative size = 142, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263

$$\frac{5b^4\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{64a^{7/2}n}-\frac{5b^3x^{-n}\sqrt{a+bx^n}}{64a^3n}+\frac{5b^2x^{-2n}\sqrt{a+bx^n}}{96a^2n}-\frac{x^{-4n}\sqrt{a+bx^n}}{4n}-\frac{bx^{-3n}\sqrt{a+bx^n}}{24an}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 4*n)*Sqrt[a + b*x^n],x]
```

```
[Out] -Sqrt[a + b*x^n]/(4*n*x^(4*n)) - (b*Sqrt[a + b*x^n])/(24*a*n*x^(3
*n)) + (5*b^2*Sqrt[a + b*x^n])/(96*a^2*n*x^(2*n)) - (5*b^3*Sqrt[a
 + b*x^n])/(64*a^3*n*x^n) + (5*b^4*ArcTanh[Sqrt[a + b*x^n]/Sqrt[a
]])/(64*a^(7/2)*n)
```

Rubi in Sympy [A] time = 21.0638, size = 122, normalized size = 0.86

$$-\frac{x^{-4n}\sqrt{a+bx^n}}{4n}-\frac{bx^{-3n}\sqrt{a+bx^n}}{24an}+\frac{5b^2x^{-2n}\sqrt{a+bx^n}}{96a^2n}-\frac{5b^3x^{-n}\sqrt{a+bx^n}}{64a^3n}+\frac{5b^4\operatorname{atanh}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{64a^{\frac{7}{2}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-4*n)*(a+b*x**n)**(1/2),x)
```

```
[Out] -x**(-4*n)*sqrt(a + b*x**n)/(4*n) - b*x**(-3*n)*sqrt(a + b*x**n)/
(24*a*n) + 5*b**2*x**(-2*n)*sqrt(a + b*x**n)/(96*a**2*n) - 5*b**3
*x**(-n)*sqrt(a + b*x**n)/(64*a**3*n) + 5*b**4*atanh(sqrt(a + b*x
**n)/sqrt(a))/(64*a**(7/2)*n)
```

Mathematica [A] time = 0.182649, size = 111, normalized size = 0.78

$$\frac{15b^4\log\left(x^{-n}\left(2\sqrt{a}\sqrt{a+bx^n}+2a+bx^n\right)\right)-2\sqrt{a}x^{-4n}\sqrt{a+bx^n}\left(48a^3+8a^2bx^n-10ab^2x^{2n}+15b^3x^{3n}\right)}{384a^{7/2}n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 4*n)*Sqrt[a + b*x^n],x]
```

```
[Out] ((-2*Sqrt[a]*Sqrt[a + b*x^n]*(48*a^3 + 8*a^2*b*x^n - 10*a*b^2*x^(
2*n) + 15*b^3*x^(3*n)))/x^(4*n) + 15*b^4*Log[(2*a + b*x^n + 2*Sqr
t[a]*Sqrt[a + b*x^n])/x^n])/(384*a^(7/2)*n)
```

Maple [F] time = 0.068, size = 0, normalized size = 0.

$$\int x^{-1-4n}\sqrt{a+bx^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-4*n)*(a+b*x^n)^(1/2),x)

[Out] int(x^(-1-4*n)*(a+b*x^n)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)*x^(-4*n - 1),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [A] time = 0.243192, size = 1, normalized size = 0.01

$$\left[\frac{15\,b^4x^{4\,n}\log\left(\frac{\sqrt{a}bx^n+2\,\sqrt{bx^n+a}a+2\,a^{\frac{3}{2}}}{x^n}\right)-2\left(15\,\sqrt{a}b^3x^{3\,n}-10\,a^{\frac{3}{2}}b^2x^{2\,n}+8\,a^{\frac{5}{2}}bx^n+48\,a^{\frac{7}{2}}\right)\sqrt{bx^n+a}}{384\,a^{\frac{7}{2}}nx^{4\,n}},\right.$$
$$\left.-\frac{15\,b^4x^{4\,n}\arctan\left(\frac{a}{\sqrt{bx^n+a}\sqrt{-a}}\right)+\left(15\,\sqrt{-a}b^3x^{3\,n}-10\,\sqrt{-a}ab^2x^{2\,n}+8\,\sqrt{-a}a^2bx^n+48\,\sqrt{-a}a^3\right)\sqrt{bx^n+a}}{192\,\sqrt{-a}a^3nx^{4\,n}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)*x^(-4*n - 1),x, algorithm="fricas")

[Out] [1/384*(15*b^4*x^(4*n)*log((sqrt(a)*b*x^n + 2*sqrt(b*x^n + a)*a +
 2*a^(3/2))/x^n) - 2*(15*sqrt(a)*b^3*x^(3*n) - 10*a^(3/2)*b^2*x^(
2*n) + 8*a^(5/2)*b*x^n + 48*a^(7/2))*sqrt(b*x^n + a))/(a^(7/2)*n*
x^(4*n)), -1/192*(15*b^4*x^(4*n)*arctan(a/(sqrt(b*x^n + a)*sqrt(-
a))) + (15*sqrt(-a)*b^3*x^(3*n) - 10*sqrt(-a)*a*b^2*x^(2*n) + 8*s
qrt(-a)*a^2*b*x^n + 48*sqrt(-a)*a^3)*sqrt(b*x^n + a))/(sqrt(-a)*a
^3*n*x^(4*n))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-4*n)*(a+b*x**n)**(1/2),x)

[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{bx^n + ax}^{-4\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)*x^(-4*n - 1),x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*x^n + a)*x^(-4*n - 1), x)
```

3.2651 $\int \frac{x^{-1+4n}}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=88

$$-\frac{2a^3\sqrt{a+bx^n}}{b^4n}+\frac{2a^2(a+bx^n)^{3/2}}{b^4n}+\frac{2(a+bx^n)^{7/2}}{7b^4n}-\frac{6a(a+bx^n)^{5/2}}{5b^4n}$$

```
[Out] (-2*a^3*Sqrt[a + b*x^n])/(b^4*n) + (2*a^2*(a + b*x^n)^(3/2))/(b^4
*n) - (6*a*(a + b*x^n)^(5/2))/(5*b^4*n) + (2*(a + b*x^n)^(7/2))/(
7*b^4*n)
```

Rubi [A] time = 0.115258, antiderivative size = 88, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$-\frac{2a^3\sqrt{a+bx^n}}{b^4n}+\frac{2a^2(a+bx^n)^{3/2}}{b^4n}+\frac{2(a+bx^n)^{7/2}}{7b^4n}-\frac{6a(a+bx^n)^{5/2}}{5b^4n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + 4*n)/Sqrt[a + b*x^n],x]
```

```
[Out] (-2*a^3*Sqrt[a + b*x^n])/(b^4*n) + (2*a^2*(a + b*x^n)^(3/2))/(b^4
*n) - (6*a*(a + b*x^n)^(5/2))/(5*b^4*n) + (2*(a + b*x^n)^(7/2))/(
7*b^4*n)
```

Rubi in Sympy [A] time = 16.5084, size = 78, normalized size = 0.89

$$-\frac{2a^3\sqrt{a+bx^n}}{b^4n}+\frac{2a^2(a+bx^n)^{\frac{3}{2}}}{b^4n}-\frac{6a(a+bx^n)^{\frac{5}{2}}}{5b^4n}+\frac{2(a+bx^n)^{\frac{7}{2}}}{7b^4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+4*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] -2*a**3*sqrt(a + b*x**n)/(b**4*n) + 2*a**2*(a + b*x**n)**(3/2)/(b
**4*n) - 6*a*(a + b*x**n)**(5/2)/(5*b**4*n) + 2*(a + b*x**n)**(7/
2)/(7*b**4*n)
```

Mathematica [A] time = 0.051858, size = 57, normalized size = 0.65

$$\frac{2\sqrt{a+bx^n}\left(-16a^3+8a^2bx^n-6ab^2x^{2n}+5b^3x^{3n}\right)}{35b^4n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + 4*n)/Sqrt[a + b*x^n],x]
```

```
[Out] (2*Sqrt[a + b*x^n]*(-16*a^3 + 8*a^2*b*x^n - 6*a*b^2*x^(2*n) + 5*b
^3*x^(3*n)))/(35*b^4*n)
```

Maple [A] time = 0.035, size = 54, normalized size = 0.6

$$-\frac{-10\,(x^n)^3\,b^3+12\,a\,(x^n)^2\,b^2-16\,a^2x^nb+32\,a^3}{35\,b^4n}\sqrt{a+bx^n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^(-1+4*n)/(a+b*x^n)^(1/2),x)
```

```
[Out] -2/35*(-5*(x^n)^3*b^3+6*a*(x^n)^2*b^2-8*a^2*x^n*b+16*a^3)*(a+b*x^
n)^(1/2)/b^4/n
```

Maxima [A] time = 1.46873, size = 89, normalized size = 1.01

$$\frac{2\left(5\,b^4x^{4\,n} - ab^3x^{3\,n} + 2\,a^2b^2x^{2\,n} - 8\,a^3bx^n - 16\,a^4\right)}{35\,\sqrt{bx^n + a}b^4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^(4*n - 1)/sqrt(b*x^n + a),x, algorithm="maxima")
```

```
[Out] 2/35*(5*b^4*x^(4*n) - a*b^3*x^(3*n) + 2*a^2*b^2*x^(2*n) - 8*a^3*b
*x^n - 16*a^4)/(sqrt(b*x^n + a)*b^4*n)
```

Fricas [A] time = 0.229767, size = 72, normalized size = 0.82

$$\frac{2\left(5\,b^3x^{3\,n} - 6\,ab^2x^{2\,n} + 8\,a^2bx^n - 16\,a^3\right)\sqrt{bx^n + a}}{35\,b^4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^(4*n - 1)/sqrt(b*x^n + a),x, algorithm="fricas")
```

```
[Out] 2/35*(5*b^3*x^(3*n) - 6*a*b^2*x^(2*n) + 8*a^2*b*x^n - 16*a^3)*sqr
t(b*x^n + a)/(b^4*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**(-1+4*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{4\,n-1}}{\sqrt{bx^n + a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^(4*n - 1)/sqrt(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(4*n - 1)/sqrt(b*x^n + a), x)
```

3.2652 $\int \frac{x^{-1+3n}}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=66

$$\frac{2a^2\sqrt{a+bx^n}}{b^3n}+\frac{2(a+bx^n)^{5/2}}{5b^3n}-\frac{4a(a+bx^n)^{3/2}}{3b^3n}$$

```
[Out] (2*a^2*Sqrt[a + b*x^n])/(b^3*n) - (4*a*(a + b*x^n)^(3/2))/(3*b^3*
n) + (2*(a + b*x^n)^(5/2))/(5*b^3*n)
```

Rubi [A] time = 0.0895722, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$\frac{2a^2\sqrt{a+bx^n}}{b^3n}+\frac{2(a+bx^n)^{5/2}}{5b^3n}-\frac{4a(a+bx^n)^{3/2}}{3b^3n}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 + 3*n)/Sqrt[a + b*x^n],x]
```

```
[Out] (2*a^2*Sqrt[a + b*x^n])/(b^3*n) - (4*a*(a + b*x^n)^(3/2))/(3*b^3*
n) + (2*(a + b*x^n)^(5/2))/(5*b^3*n)
```

Rubi in Sympy [A] time = 12.3223, size = 58, normalized size = 0.88

$$\frac{2a^2\sqrt{a+bx^n}}{b^3n}-\frac{4a(a+bx^n)^{\frac{3}{2}}}{3b^3n}+\frac{2(a+bx^n)^{\frac{5}{2}}}{5b^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1+3*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] 2*a**2*sqrt(a + b*x**n)/(b**3*n) - 4*a*(a + b*x**n)**(3/2)/(3*b**
3*n) + 2*(a + b*x**n)**(5/2)/(5*b**3*n)
```

Mathematica [A] time = 0.0423846, size = 44, normalized size = 0.67

$$\frac{2\sqrt{a+bx^n}\left(8a^2-4abx^n+3b^2x^{2n}\right)}{15b^3n}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 + 3*n)/Sqrt[a + b*x^n],x]
```

```
[Out] (2*Sqrt[a + b*x^n]*(8*a^2 - 4*a*b*x^n + 3*b^2*x^(2*n)))/(15*b^3*n
)
```

Maple [A] time = 0.032, size = 41, normalized size = 0.6

$$\frac{6\,b^2\,(x^n)^2-8\,ax^nb+16\,a^2}{15\,b^3n}\sqrt{a+bx^n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+3*n)/(a+b*x^n)^(1/2),x)
```

```
[Out] 2/15*(3*b^2*(x^n)^2-4*a*x^n*b+8*a^2)*(a+b*x^n)^(1/2)/b^3/n
```

Maxima [A] time = 1.46928, size = 72, normalized size = 1.09

$$\frac{2\left(3\,b^3x^{3\,n}-ab^2x^{2\,n}+4\,a^2bx^n+8\,a^3\right)}{15\,\sqrt{bx^n+a}b^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3*n - 1)/sqrt(b*x^n + a),x, algorithm="maxima")
```

```
[Out] 2/15*(3*b^3*x^(3*n) - a*b^2*x^(2*n) + 4*a^2*b*x^n + 8*a^3)/(sqrt(
b*x^n + a)*b^3*n)
```

Fricas [A] time = 0.231316, size = 54, normalized size = 0.82

$$\frac{2\left(3\,b^2x^{2\,n}-4\,abx^n+8\,a^2\right)\sqrt{bx^n+a}}{15\,b^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3*n - 1)/sqrt(b*x^n + a),x, algorithm="fricas")
```

```
[Out] 2/15*(3*b^2*x^(2*n) - 4*a*b*x^n + 8*a^2)*sqrt(b*x^n + a)/(b^3*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+3*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{3\,n-1}}{\sqrt{bx^n+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3*n - 1)/sqrt(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(3*n - 1)/sqrt(b*x^n + a), x)
```

3.2653 $\int \frac{x^{-1+2n}}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=42

$$\frac{2(a+bx^n)^{3/2}}{3b^2n}-\frac{2a\sqrt{a+bx^n}}{b^2n}$$

```
[Out] (-2*a*Sqrt[a + b*x^n])/(b^2*n) + (2*(a + b*x^n)^(3/2))/(3*b^2*n)
```

Rubi [A] time = 0.0630181, antiderivative size = 42, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$\frac{2(a+bx^n)^{3/2}}{3b^2n}-\frac{2a\sqrt{a+bx^n}}{b^2n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + 2*n)/Sqrt[a + b*x^n],x]
```

```
[Out] (-2*a*Sqrt[a + b*x^n])/(b^2*n) + (2*(a + b*x^n)^(3/2))/(3*b^2*n)
```

Rubi in Sympy [A] time = 8.21604, size = 36, normalized size = 0.86

$$-\frac{2a\sqrt{a+bx^n}}{b^2n}+\frac{2(a+bx^n)^{\frac{3}{2}}}{3b^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] -2*a*sqrt(a + b*x**n)/(b**2*n) + 2*(a + b*x**n)**(3/2)/(3*b**2*n)
```

Mathematica [A] time = 0.0366854, size = 30, normalized size = 0.71

$$\frac{2(bx^n-2a)\sqrt{a+bx^n}}{3b^2n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + 2*n)/Sqrt[a + b*x^n],x]
```

```
[Out] (2*(-2*a + b*x^n)*Sqrt[a + b*x^n])/(3*b^2*n)
```

Maple [A] time = 0.031, size = 28, normalized size = 0.7

$$-\frac{-2\,bx^n+4\,a}{3\,b^2n}\sqrt{a+bx^n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+2*n)/(a+b*x^n)^(1/2),x)
```

```
[Out] -2/3*(-b*x^n+2*a)*(a+b*x^n)^(1/2)/b^2/n
```

Maxima [A] time = 1.463, size = 53, normalized size = 1.26

$$\frac{2\left(b^{2}x^{2n} - abx^{n} - 2a^{2}\right)}{3\sqrt{bx^{n} + a}b^{2}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(2*n - 1)/sqrt(b*x^n + a),x, algorithm="maxima")
```

```
[Out] 2/3*(b^2*x^(2*n) - a*b*x^n - 2*a^2)/(sqrt(b*x^n + a)*b^2*n)
```

Fricas [A] time = 0.232123, size = 35, normalized size = 0.83

$$\frac{2\sqrt{bx^{n} + a}(bx^{n} - 2a)}{3b^{2}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(2*n - 1)/sqrt(b*x^n + a),x, algorithm="fricas")
```

```
[Out] 2/3*sqrt(b*x^n + a)*(b*x^n - 2*a)/(b^2*n)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{2n-1}}{\sqrt{bx^{n} + a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(2*n - 1)/sqrt(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(2*n - 1)/sqrt(b*x^n + a), x)
```

3.2654 $\int \frac{x^{-1+n}}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=19

$$\frac{2\sqrt{a+bx^n}}{bn}$$

```
[Out] (2*Sqrt[a + b*x^n])/(b*n)
```

Rubi [A] time = 0.0246793, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.059

$$\frac{2\sqrt{a+bx^n}}{bn}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 + n)/Sqrt[a + b*x^n],x]

[Out] (2*Sqrt[a + b*x^n])/(b*n)
```

Rubi in Sympy [A] time = 2.43325, size = 14, normalized size = 0.74

$$\frac{2\sqrt{a+bx^n}}{bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1+n)/(a+b*x**n)**(1/2),x)

[Out] 2*sqrt(a + b*x**n)/(b*n)
```

Mathematica [A] time = 0.0137314, size = 19, normalized size = 1.

$$\frac{2\sqrt{a+bx^n}}{bn}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 + n)/Sqrt[a + b*x^n],x]

[Out] (2*Sqrt[a + b*x^n])/(b*n)
```

Maple [A] time = 0.029, size = 18, normalized size = 1.

$$2\,\frac{\sqrt{a+bx^n}}{bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-1+n)/(a+b*x^n)^(1/2),x)

[Out] 2*(a+b*x^n)^(1/2)/b/n
```

Maxima [A] time = 1.42855, size = 23, normalized size = 1.21

$$\frac{2\sqrt{bx^n + a}}{bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(n - 1)/sqrt(b*x^n + a),x, algorithm="maxima")
```

```
[Out] 2*sqrt(b*x^n + a)/(b*n)
```

Fricas [A] time = 0.231386, size = 23, normalized size = 1.21

$$\frac{2\sqrt{bx^n + a}}{bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(n - 1)/sqrt(b*x^n + a),x, algorithm="fricas")
```

```
[Out] 2*sqrt(b*x^n + a)/(b*n)
```

Sympy [A] time = 21.6292, size = 41, normalized size = 2.16

$$\begin{cases} \frac{\log(x)}{\sqrt{a}} & \text{for}\: b = 0 \wedge n = 0 \\ \frac{\log(x)}{\sqrt{a+b}} & \text{for}\: n = 0 \\ \frac{x^n}{\sqrt{a}n} & \text{for}\: b = 0 \\ \frac{2\sqrt{a+bx^n}}{bn} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+n)/(a+b*x**n)**(1/2),x)
```

```
[Out] Piecewise((log(x)/sqrt(a), Eq(b, 0) & Eq(n, 0)), (log(x)/sqrt(a +
 b), Eq(n, 0)), (x**n/(sqrt(a)*n), Eq(b, 0)), (2*sqrt(a + b*x**n)
/(b*n), True))
```

GIAC/XCAS [A] time = 0.217321, size = 23, normalized size = 1.21

$$\frac{2\sqrt{bx^n + a}}{bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(n - 1)/sqrt(b*x^n + a),x, algorithm="giac")
```

```
[Out] 2*sqrt(b*x^n + a)/(b*n)
```

3.2655 $\int \frac{1}{x\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=28

$$-\frac{2\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{\sqrt{a}n}$$

```
[Out] (-2*ArcTanh[Sqrt[a + b*x^n]/Sqrt[a]])/(Sqrt[a]*n)
```

Rubi [A] time = 0.0529034, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{2\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{\sqrt{a}n}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*Sqrt[a + b*x^n]),x]

[Out] (-2*ArcTanh[Sqrt[a + b*x^n]/Sqrt[a]])/(Sqrt[a]*n)
```

Rubi in Sympy [A] time = 5.68451, size = 26, normalized size = 0.93

$$-\frac{2\,\mathrm{atanh}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{\sqrt{a}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(a+b*x**n)**(1/2),x)

[Out] -2*atanh(sqrt(a + b*x**n)/sqrt(a))/(sqrt(a)*n)
```

Mathematica [A] time = 0.0214613, size = 28, normalized size = 1.

$$-\frac{2\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{\sqrt{a}n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*Sqrt[a + b*x^n]),x]

[Out] (-2*ArcTanh[Sqrt[a + b*x^n]/Sqrt[a]])/(Sqrt[a]*n)
```

Maple [A] time = 0., size = 23, normalized size = 0.8

$$-2\,\frac{1}{n\sqrt{a}}\mathit{Artanh}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(a+b*x^n)^(1/2),x)
```

```
[Out] -2*arctanh((a+b*x^n)^(1/2)/a^(1/2))/n/a^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^n + a)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.240346, size = 1, normalized size = 0.04

$$\left[\frac{\log\left(\frac{\sqrt{a}bx^n-2\sqrt{bx^n+a}a+2a^{\frac{3}{2}}}{x^n}\right)}{\sqrt{a}n}, \frac{2\arctan\left(\frac{a}{\sqrt{bx^n+a}\sqrt{-a}}\right)}{\sqrt{-a}n}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^n + a)*x),x, algorithm="fricas")
```

```
[Out] [log((sqrt(a)*b*x^n - 2*sqrt(b*x^n + a)*a + 2*a^(3/2))/x^n)/(sqrt
(a)*n), 2*arctan(a/(sqrt(b*x^n + a)*sqrt(-a)))/(sqrt(-a)*n)]
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(a+b*x**n)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{bx^n + a}x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*x^n + a)*x),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(b*x^n + a)*x), x)
```

3.2656 $\int \frac{x^{-1-n}}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=53

$$\frac{b\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{a^{3/2}n}-\frac{x^{-n}\sqrt{a+bx^n}}{an}$$

```
[Out] -(Sqrt[a + b*x^n]/(a*n*x^n)) + (b*ArcTanh[Sqrt[a + b*x^n]/Sqrt[a]
])/(a^(3/2)*n)
```

Rubi [A] time = 0.0785427, antiderivative size = 53, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.21

$$\frac{b\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{a^{3/2}n}-\frac{x^{-n}\sqrt{a+bx^n}}{an}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 - n)/Sqrt[a + b*x^n],x]
```

```
[Out] -(Sqrt[a + b*x^n]/(a*n*x^n)) + (b*ArcTanh[Sqrt[a + b*x^n]/Sqrt[a]
])/(a^(3/2)*n)
```

Rubi in Sympy [A] time = 8.21417, size = 41, normalized size = 0.77

$$-\frac{x^{-n}\sqrt{a+bx^n}}{an}+\frac{b\,\mathrm{atanh}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{a^{\frac{3}{2}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1-n)/(a+b*x**n)**(1/2),x)
```

```
[Out] -x**(-n)*sqrt(a + b*x**n)/(a*n) + b*atanh(sqrt(a + b*x**n)/sqrt(a
))/(a**(3/2)*n)
```

Mathematica [A] time = 0.0891101, size = 72, normalized size = 1.36

$$\frac{b\log\left(x^{-n}\left(2\sqrt{a}\sqrt{a+bx^n}+2a+bx^n\right)\right)-2\sqrt{a}x^{-n}\sqrt{a+bx^n}}{2a^{3/2}n}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 - n)/Sqrt[a + b*x^n],x]
```

```
[Out] ((-2*Sqrt[a]*Sqrt[a + b*x^n])/x^n + b*Log[(2*a + b*x^n + 2*Sqrt[a
]*Sqrt[a + b*x^n])/x^n])/(2*a^(3/2)*n)
```

Maple [F] time = 0.068, size = 0, normalized size = 0.

$$\int x^{-1-n}\frac{1}{\sqrt{a+bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-n)/(a+b*x^n)^(1/2),x)

[Out] int(x^(-1-n)/(a+b*x^n)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-n - 1)/sqrt(b*x^n + a),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [A] time = 0.242122, size = 1, normalized size = 0.02

$$\left[\frac{bx^n \log\left(\frac{\sqrt{a}bx^n+2\sqrt{bx^n+a}a+2a^{\frac{3}{2}}}{x^n}\right) - 2\sqrt{bx^n+a}\sqrt{a}}{2a^{\frac{3}{2}}nx^n}, -\frac{bx^n \arctan\left(\frac{a}{\sqrt{bx^n+a}\sqrt{-a}}\right) + \sqrt{bx^n+a}\sqrt{-a}}{\sqrt{-a}anx^n}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-n - 1)/sqrt(b*x^n + a),x, algorithm="fricas")

[Out] [1/2*(b*x^n*log((sqrt(a)*b*x^n + 2*sqrt(b*x^n + a)*a + 2*a^(3/2))
/x^n) - 2*sqrt(b*x^n + a)*sqrt(a))/(a^(3/2)*n*x^n), -(b*x^n*arcta
n(a/(sqrt(b*x^n + a)*sqrt(-a))) + sqrt(b*x^n + a)*sqrt(-a))/(sqrt
(-a)*a*n*x^n)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-n)/(a+b*x**n)**(1/2),x)

[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{-n-1}}{\sqrt{bx^n + a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-n - 1)/sqrt(b*x^n + a),x, algorithm="giac")

[Out] integrate(x^(-n - 1)/sqrt(b*x^n + a), x)
```

3.2657 $\int \frac{x^{-1-2n}}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=87

$$-\frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{4a^{5/2}n}+\frac{3bx^{-n}\sqrt{a+bx^n}}{4a^2n}-\frac{x^{-2n}\sqrt{a+bx^n}}{2an}$$

```
[Out] -Sqrt[a + b*x^n]/(2*a*n*x^(2*n)) + (3*b*Sqrt[a + b*x^n])/(4*a^2*n
*x^n) - (3*b^2*ArcTanh[Sqrt[a + b*x^n]/Sqrt[a]])/(4*a^(5/2)*n)
```

Rubi [A] time = 0.112258, antiderivative size = 87, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.21

$$-\frac{3b^2\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{4a^{5/2}n}+\frac{3bx^{-n}\sqrt{a+bx^n}}{4a^2n}-\frac{x^{-2n}\sqrt{a+bx^n}}{2an}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 2*n)/Sqrt[a + b*x^n],x]
```

```
[Out] -Sqrt[a + b*x^n]/(2*a*n*x^(2*n)) + (3*b*Sqrt[a + b*x^n])/(4*a^2*n
*x^n) - (3*b^2*ArcTanh[Sqrt[a + b*x^n]/Sqrt[a]])/(4*a^(5/2)*n)
```

Rubi in Sympy [A] time = 11.8329, size = 73, normalized size = 0.84

$$-\frac{x^{-2n}\sqrt{a+bx^n}}{2an}+\frac{3bx^{-n}\sqrt{a+bx^n}}{4a^2n}-\frac{3b^2\,\mathrm{atanh}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{4a^{\frac{5}{2}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] -x**(-2*n)*sqrt(a + b*x**n)/(2*a*n) + 3*b*x**(-n)*sqrt(a + b*x**n
)/(4*a**2*n) - 3*b**2*atanh(sqrt(a + b*x**n)/sqrt(a))/(4*a**(5/2)
*n)
```

Mathematica [A] time = 0.127679, size = 85, normalized size = 0.98

$$\frac{-3b^2\log\left(x^{-n}\left(2\sqrt{a}\sqrt{a+bx^n}+2a+bx^n\right)\right)-2\sqrt{a}x^{-2n}\left(2a-3bx^n\right)\sqrt{a+bx^n}}{8a^{5/2}n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 2*n)/Sqrt[a + b*x^n],x]
```

```
[Out] ((-2*Sqrt[a]*(2*a - 3*b*x^n)*Sqrt[a + b*x^n])/x^(2*n) - 3*b^2*Log
[(2*a + b*x^n + 2*Sqrt[a]*Sqrt[a + b*x^n])/x^n])/(8*a^(5/2)*n)
```

Maple [F] time = 0.069, size = 0, normalized size = 0.

$$\int x^{-1-2\,n}\frac{1}{\sqrt{a+bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-2*n)/(a+b*x^n)^(1/2),x)
```

```
[Out] int(x^(-1-2*n)/(a+b*x^n)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-2*n - 1)/sqrt(b*x^n + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.244004, size = 1, normalized size = 0.01

$$\left[\frac{3\,b^2x^{2\,n}\log\left(\frac{\sqrt{a}bx^n-2\,\sqrt{bx^n+a}a+2\,a^{\frac{3}{2}}}{x^n}\right)+2\left(3\,\sqrt{a}bx^n-2\,a^{\frac{3}{2}}\right)\sqrt{bx^n+a}}{8\,a^{\frac{5}{2}}nx^{2\,n}},\ \frac{3\,b^2x^{2\,n}\arctan\left(\frac{a}{\sqrt{bx^n+a}\sqrt{-a}}\right)+\left(3\,\sqrt{-a}bx^n-2\,\sqrt{-a}a\right.}{4\,\sqrt{-a}a^2nx^{2\,n}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-2*n - 1)/sqrt(b*x^n + a),x, algorithm="fricas")
```

```
[Out] [1/8*(3*b^2*x^(2*n)*log((sqrt(a)*b*x^n - 2*sqrt(b*x^n + a)*a + 2*
a^(3/2))/x^n) + 2*(3*sqrt(a)*b*x^n - 2*a^(3/2))*sqrt(b*x^n + a))/
(a^(5/2)*n*x^(2*n)), 1/4*(3*b^2*x^(2*n)*arctan(a/(sqrt(b*x^n + a)
*sqrt(-a))) + (3*sqrt(-a)*b*x^n - 2*sqrt(-a)*a)*sqrt(b*x^n + a))/
(sqrt(-a)*a^2*n*x^(2*n))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{-2\,n-1}}{\sqrt{bx^n+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-2*n - 1)/sqrt(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(-2*n - 1)/sqrt(b*x^n + a), x)
```

3.2658 $\int \frac{x^{-1-3n}}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=116

$$\frac{5b^3\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{8a^{7/2}n}-\frac{5b^2x^{-n}\sqrt{a+bx^n}}{8a^3n}+\frac{5bx^{-2n}\sqrt{a+bx^n}}{12a^2n}-\frac{x^{-3n}\sqrt{a+bx^n}}{3an}$$

```
[Out] -Sqrt[a + b*x^n]/(3*a*n*x^(3*n)) + (5*b*Sqrt[a + b*x^n])/(12*a^2*
n*x^(2*n)) - (5*b^2*Sqrt[a + b*x^n])/(8*a^3*n*x^n) + (5*b^3*ArcTa
nh[Sqrt[a + b*x^n]/Sqrt[a]])/(8*a^(7/2)*n)
```

Rubi [A] time = 0.148356, antiderivative size = 116, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.21

$$\frac{5b^3\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{8a^{7/2}n}-\frac{5b^2x^{-n}\sqrt{a+bx^n}}{8a^3n}+\frac{5bx^{-2n}\sqrt{a+bx^n}}{12a^2n}-\frac{x^{-3n}\sqrt{a+bx^n}}{3an}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 3*n)/Sqrt[a + b*x^n],x]
```

```
[Out] -Sqrt[a + b*x^n]/(3*a*n*x^(3*n)) + (5*b*Sqrt[a + b*x^n])/(12*a^2*
n*x^(2*n)) - (5*b^2*Sqrt[a + b*x^n])/(8*a^3*n*x^n) + (5*b^3*ArcTa
nh[Sqrt[a + b*x^n]/Sqrt[a]])/(8*a^(7/2)*n)
```

Rubi in Sympy [A] time = 16.3717, size = 100, normalized size = 0.86

$$-\frac{x^{-3n}\sqrt{a+bx^n}}{3an}+\frac{5bx^{-2n}\sqrt{a+bx^n}}{12a^2n}-\frac{5b^2x^{-n}\sqrt{a+bx^n}}{8a^3n}+\frac{5b^3\operatorname{atanh}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{8a^{\frac{7}{2}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-3*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] -x**(-3*n)*sqrt(a + b*x**n)/(3*a*n) + 5*b*x**(-2*n)*sqrt(a + b*x*
*n)/(12*a**2*n) - 5*b**2*x**(-n)*sqrt(a + b*x**n)/(8*a**3*n) + 5*
b**3*atanh(sqrt(a + b*x**n)/sqrt(a))/(8*a**(7/2)*n)
```

Mathematica [A] time = 0.144626, size = 98, normalized size = 0.84

$$\frac{15b^3\log\left(x^{-n}\left(2\sqrt{a}\sqrt{a+bx^n}+2a+bx^n\right)\right)-2\sqrt{a}x^{-3n}\sqrt{a+bx^n}\left(8a^2-10abx^n+15b^2x^{2n}\right)}{48a^{7/2}n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 3*n)/Sqrt[a + b*x^n],x]
```

```
[Out] ((-2*Sqrt[a]*Sqrt[a + b*x^n]*(8*a^2 - 10*a*b*x^n + 15*b^2*x^(2*n)
))/x^(3*n) + 15*b^3*Log[(2*a + b*x^n + 2*Sqrt[a]*Sqrt[a + b*x^n])
/x^n])/(48*a^(7/2)*n)
```

Maple [F] time = 0.079, size = 0, normalized size = 0.

$$\int x^{-1-3n} \frac{1}{\sqrt{a+bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-3*n)/(a+b*x^n)^(1/2),x)
```

```
[Out] int(x^(-1-3*n)/(a+b*x^n)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-3*n - 1)/sqrt(b*x^n + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.243697, size = 1, normalized size = 0.01

$$\left[\frac{15\,b^{3}x^{3\,n}\log\left(\frac{\sqrt{a}bx^{n}+2\,\sqrt{bx^{n}+a}a+2\,a^{\frac{3}{2}}}{x^{n}}\right)-2\left(15\,\sqrt{a}b^{2}x^{2\,n}-10\,a^{\frac{3}{2}}bx^{n}+8\,a^{\frac{5}{2}}\right)\sqrt{bx^{n}+a}}{48\,a^{\frac{7}{2}}nx^{3\,n}},\ -\frac{15\,b^{3}x^{3\,n}\arctan\left(\frac{a}{\sqrt{bx^{n}+a}\sqrt{-a}}\right)+\left(15\,\sqrt{-a}b^{2}x^{2\,n}-10\,\sqrt{-a}abx^{n}+8\,\sqrt{-a}a^{2}\right)\sqrt{bx^{n}+a}}{24\,\sqrt{-a}a^{3}nx^{3\,n}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-3*n - 1)/sqrt(b*x^n + a),x, algorithm="fricas")
```

```
[Out] [1/48*(15*b^3*x^(3*n)*log((sqrt(a)*b*x^n + 2*sqrt(b*x^n + a)*a +
2*a^(3/2))/x^n) - 2*(15*sqrt(a)*b^2*x^(2*n) - 10*a^(3/2)*b*x^n +
8*a^(5/2))*sqrt(b*x^n + a))/(a^(7/2)*n*x^(3*n)), -1/24*(15*b^3*x^
(3*n)*arctan(a/(sqrt(b*x^n + a)*sqrt(-a))) + (15*sqrt(-a)*b^2*x^(
2*n) - 10*sqrt(-a)*a*b*x^n + 8*sqrt(-a)*a^2)*sqrt(b*x^n + a))/(sq
rt(-a)*a^3*n*x^(3*n))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-3*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{-3\,n-1}}{\sqrt{bx^n + a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-3*n - 1)/sqrt(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(-3*n - 1)/sqrt(b*x^n + a), x)
```

3.2659 $\int \frac{x^{-1-4n}}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=145

$$-\frac{35b^4\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{64a^{9/2}n}+\frac{35b^3x^{-n}\sqrt{a+bx^n}}{64a^4n}-\frac{35b^2x^{-2n}\sqrt{a+bx^n}}{96a^3n}+\frac{7bx^{-3n}\sqrt{a+bx^n}}{24a^2n}-\frac{x^{-4n}\sqrt{a+bx^n}}{4an}$$

```
[Out] -Sqrt[a + b*x^n]/(4*a*n*x^(4*n)) + (7*b*Sqrt[a + b*x^n])/(24*a^2*
n*x^(3*n)) - (35*b^2*Sqrt[a + b*x^n])/(96*a^3*n*x^(2*n)) + (35*b^
3*Sqrt[a + b*x^n])/(64*a^4*n*x^n) - (35*b^4*ArcTanh[Sqrt[a + b*x^
n]/Sqrt[a]])/(64*a^(9/2)*n)
```

Rubi [A] time = 0.193634, antiderivative size = 145, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.21

$$-\frac{35b^4\tanh^{-1}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{64a^{9/2}n}+\frac{35b^3x^{-n}\sqrt{a+bx^n}}{64a^4n}-\frac{35b^2x^{-2n}\sqrt{a+bx^n}}{96a^3n}+\frac{7bx^{-3n}\sqrt{a+bx^n}}{24a^2n}-\frac{x^{-4n}\sqrt{a+bx^n}}{4an}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 4*n)/Sqrt[a + b*x^n],x]
```

```
[Out] -Sqrt[a + b*x^n]/(4*a*n*x^(4*n)) + (7*b*Sqrt[a + b*x^n])/(24*a^2*
n*x^(3*n)) - (35*b^2*Sqrt[a + b*x^n])/(96*a^3*n*x^(2*n)) + (35*b^
3*Sqrt[a + b*x^n])/(64*a^4*n*x^n) - (35*b^4*ArcTanh[Sqrt[a + b*x^
n]/Sqrt[a]])/(64*a^(9/2)*n)
```

Rubi in Sympy [A] time = 21.1643, size = 128, normalized size = 0.88

$$-\frac{x^{-4n}\sqrt{a+bx^n}}{4an}+\frac{7bx^{-3n}\sqrt{a+bx^n}}{24a^2n}-\frac{35b^2x^{-2n}\sqrt{a+bx^n}}{96a^3n}+\frac{35b^3x^{-n}\sqrt{a+bx^n}}{64a^4n}-\frac{35b^4\operatorname{atanh}\left(\frac{\sqrt{a+bx^n}}{\sqrt{a}}\right)}{64a^{\frac{9}{2}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-4*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] -x**(-4*n)*sqrt(a + b*x**n)/(4*a*n) + 7*b*x**(-3*n)*sqrt(a + b*x*
*n)/(24*a**2*n) - 35*b**2*x**(-2*n)*sqrt(a + b*x**n)/(96*a**3*n)
+ 35*b**3*x**(-n)*sqrt(a + b*x**n)/(64*a**4*n) - 35*b**4*atanh(sq
rt(a + b*x**n)/sqrt(a))/(64*a**(9/2)*n)
```

Mathematica [A] time = 0.181982, size = 111, normalized size = 0.77

$$\frac{-2\sqrt{a}x^{-4n}\sqrt{a+bx^n}\left(48a^3-56a^2bx^n+70ab^2x^{2n}-105b^3x^{3n}\right)-105b^4\log\left(x^{-n}\left(2\sqrt{a}\sqrt{a+bx^n}+2a+bx^n\right)\right)}{384a^{9/2}n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 4*n)/Sqrt[a + b*x^n],x]
```

```
[Out] ((-2*Sqrt[a]*Sqrt[a + b*x^n]*(48*a^3 - 56*a^2*b*x^n + 70*a*b^2*x^
(2*n) - 105*b^3*x^(3*n)))/x^(4*n) - 105*b^4*Log[(2*a + b*x^n + 2*
Sqrt[a]*Sqrt[a + b*x^n])/x^n])/(384*a^(9/2)*n)
```

Maple [F] time = 0.068, size = 0, normalized size = 0.

$$\int x^{-1-4n}\frac{1}{\sqrt{a+bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-4*n)/(a+b*x^n)^(1/2),x)
```

```
[Out] int(x^(-1-4*n)/(a+b*x^n)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-4*n - 1)/sqrt(b*x^n + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.244343, size = 1, normalized size = 0.01

$$\left[\frac{105\,b^4x^{4\,n}\log\left(\frac{\sqrt{a}bx^n-2\,\sqrt{bx^n+a}a+2\,a^{\frac{3}{2}}}{x^n}\right)+2\left(105\,\sqrt{a}b^3x^{3\,n}-70\,a^{\frac{3}{2}}b^2x^{2\,n}+56\,a^{\frac{5}{2}}bx^n-48\,a^{\frac{7}{2}}\right)\sqrt{bx^n+a}}{384\,a^{\frac{9}{2}}nx^{4\,n}},\ \frac{105\,b^4x^{4\,n}\arctan\left(\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-4*n - 1)/sqrt(b*x^n + a),x, algorithm="fricas")
```

```
[Out] [1/384*(105*b^4*x^(4*n)*log((sqrt(a)*b*x^n - 2*sqrt(b*x^n + a)*a
+ 2*a^(3/2))/x^n) + 2*(105*sqrt(a)*b^3*x^(3*n) - 70*a^(3/2)*b^2*x
^(2*n) + 56*a^(5/2)*b*x^n - 48*a^(7/2))*sqrt(b*x^n + a))/(a^(9/2)
*n*x^(4*n)), 1/192*(105*b^4*x^(4*n)*arctan(a/(sqrt(b*x^n + a)*sqr
t(-a))) + (105*sqrt(-a)*b^3*x^(3*n) - 70*sqrt(-a)*a*b^2*x^(2*n) +
 56*sqrt(-a)*a^2*b*x^n - 48*sqrt(-a)*a^3)*sqrt(b*x^n + a))/(sqrt(
-a)*a^4*n*x^(4*n))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-4*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{-4\,n-1}}{\sqrt{bx^n+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-4*n - 1)/sqrt(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(-4*n - 1)/sqrt(b*x^n + a), x)
```

3.2660 $\int x^m (a + bx^n)^3 \, dx$

Optimal. Leaf size=75

$$\frac{a^3x^{m+1}}{m+1} + \frac{3a^2bx^{m+n+1}}{m+n+1} + \frac{3ab^2x^{m+2n+1}}{m+2n+1} + \frac{b^3x^{m+3n+1}}{m+3n+1}$$

```
[Out] (a^3*x^(1 + m))/(1 + m) + (3*a^2*b*x^(1 + m + n))/(1 + m + n) + (
3*a*b^2*x^(1 + m + 2*n))/(1 + m + 2*n) + (b^3*x^(1 + m + 3*n))/(1
 + m + 3*n)
```

Rubi [A] time = 0.0886964, antiderivative size = 75, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{a^3x^{m+1}}{m+1} + \frac{3a^2bx^{m+n+1}}{m+n+1} + \frac{3ab^2x^{m+2n+1}}{m+2n+1} + \frac{b^3x^{m+3n+1}}{m+3n+1}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m*(a + b*x^n)^3,x]
```

```
[Out] (a^3*x^(1 + m))/(1 + m) + (3*a^2*b*x^(1 + m + n))/(1 + m + n) + (
3*a*b^2*x^(1 + m + 2*n))/(1 + m + 2*n) + (b^3*x^(1 + m + 3*n))/(1
 + m + 3*n)
```

Rubi in Sympy [A] time = 13.7855, size = 70, normalized size = 0.93

$$\frac{a^3x^{m+1}}{m+1} + \frac{3a^2bx^{m+n+1}}{m+n+1} + \frac{3ab^2x^{m+2n+1}}{m+2n+1} + \frac{b^3x^{m+3n+1}}{m+3n+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(a+b*x**n)**3,x)
```

```
[Out] a**3*x**(m + 1)/(m + 1) + 3*a**2*b*x**(m + n + 1)/(m + n + 1) + 3
*a*b**2*x**(m + 2*n + 1)/(m + 2*n + 1) + b**3*x**(m + 3*n + 1)/(m
 + 3*n + 1)
```

Mathematica [A] time = 0.0673276, size = 67, normalized size = 0.89

$$x^{m+1}\left(\frac{a^3}{m+1} + \frac{3a^2bx^n}{m+n+1} + \frac{3ab^2x^{2n}}{m+2n+1} + \frac{b^3x^{3n}}{m+3n+1}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m*(a + b*x^n)^3,x]
```

```
[Out] x^(1 + m)*(a^3/(1 + m) + (3*a^2*b*x^n)/(1 + m + n) + (3*a*b^2*x^(
2*n))/(1 + m + 2*n) + (b^3*x^(3*n))/(1 + m + 3*n))
```

Maple [A] time = 0.027, size = 92, normalized size = 1.2

$$\frac{a^3xe^{m\ln(x)}}{1+m} + \frac{b^3xe^{m\ln(x)}\left(e^{n\ln(x)}\right)^3}{1+m+3n} + 3\frac{ab^2xe^{m\ln(x)}\left(e^{n\ln(x)}\right)^2}{1+m+2n} + 3\frac{a^2bxe^{m\ln(x)}e^{n\ln(x)}}{1+m+n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(a+b*x^n)^3,x)
```

```
[Out] a^3/(1+m)*x*exp(m*ln(x))+b^3/(1+m+3*n)*x*exp(m*ln(x))*exp(n*ln(x)
)^3+3*a*b^2/(1+m+2*n)*x*exp(m*ln(x))*exp(n*ln(x))^2+3*a^2*b/(1+m+
n)*x*exp(m*ln(x))*exp(n*ln(x))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^m,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.243464, size = 489, normalized size = 6.52

$$\frac{\left(b^3m^3 + 3\,b^3m^2 + 3\,b^3m + b^3 + 2\,\left(b^3m + b^3\right)n^2 + 3\,\left(b^3m^2 + 2\,b^3m + b^3\right)n\right)xx^mx^{3\,n} + 3\,\left(ab^2m^3 + 3\,ab^2m^2 + 3\,ab^2m + ab^2 + 3\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^m,x, algorithm="fricas")
```

```
[Out] ((b^3*m^3 + 3*b^3*m^2 + 3*b^3*m + b^3 + 2*(b^3*m + b^3)*n^2 + 3*(
b^3*m^2 + 2*b^3*m + b^3)*n)*x*x^m*x^(3*n) + 3*(a*b^2*m^3 + 3*a*b^
2*m^2 + 3*a*b^2*m + a*b^2 + 3*(a*b^2*m + a*b^2)*n^2 + 4*(a*b^2*m^
2 + 2*a*b^2*m + a*b^2)*n)*x*x^m*x^(2*n) + 3*(a^2*b*m^3 + 3*a^2*b*
m^2 + 3*a^2*b*m + a^2*b + 6*(a^2*b*m + a^2*b)*n^2 + 5*(a^2*b*m^2
+ 2*a^2*b*m + a^2*b)*n)*x*x^m*x^n + (a^3*m^3 + 6*a^3*n^3 + 3*a^3*
m^2 + 3*a^3*m + a^3 + 11*(a^3*m + a^3)*n^2 + 6*(a^3*m^2 + 2*a^3*m
 + a^3)*n)*x*x^m)/(m^4 + 6*(m + 1)*n^3 + 4*m^3 + 11*(m^2 + 2*m +
1)*n^2 + 6*m^2 + 6*(m^3 + 3*m^2 + 3*m + 1)*n + 4*m + 1)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(a+b*x**n)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.234546, size = 988, normalized size = 13.17

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^3*x^m,x, algorithm="giac")
```

```
[Out] (b^3*m^3*x*e^(m*ln(x) + 3*n*ln(x)) + 3*b^3*m^2*n*x*e^(m*ln(x) + 3
*n*ln(x)) + 2*b^3*m*n^2*x*e^(m*ln(x) + 3*n*ln(x)) + 3*a*b^2*m^3*x
*e^(m*ln(x) + 2*n*ln(x)) + 12*a*b^2*m^2*n*x*e^(m*ln(x) + 2*n*ln(x
)) + 9*a*b^2*m*n^2*x*e^(m*ln(x) + 2*n*ln(x)) + 3*a^2*b*m^3*x*e^(m
*ln(x) + n*ln(x)) + 15*a^2*b*m^2*n*x*e^(m*ln(x) + n*ln(x)) + 18*a
^2*b*m*n^2*x*e^(m*ln(x) + n*ln(x)) + a^3*m^3*x*e^(m*ln(x)) + 6*a^
3*m^2*n*x*e^(m*ln(x)) + 11*a^3*m*n^2*x*e^(m*ln(x)) + 6*a^3*n^3*x*
e^(m*ln(x)) + 3*b^3*m^2*x*e^(m*ln(x) + 3*n*ln(x)) + 6*b^3*m*n*x*e
^(m*ln(x) + 3*n*ln(x)) + 2*b^3*n^2*x*e^(m*ln(x) + 3*n*ln(x)) + 9*
a*b^2*m^2*x*e^(m*ln(x) + 2*n*ln(x)) + 24*a*b^2*m*n*x*e^(m*ln(x) +
 2*n*ln(x)) + 9*a*b^2*n^2*x*e^(m*ln(x) + 2*n*ln(x)) + 9*a^2*b*m^2
*x*e^(m*ln(x) + n*ln(x)) + 30*a^2*b*m*n*x*e^(m*ln(x) + n*ln(x)) +
 18*a^2*b*n^2*x*e^(m*ln(x) + n*ln(x)) + 3*a^3*m^2*x*e^(m*ln(x)) +
 12*a^3*m*n*x*e^(m*ln(x)) + 11*a^3*n^2*x*e^(m*ln(x)) + 3*b^3*m*x*
e^(m*ln(x) + 3*n*ln(x)) + 3*b^3*n*x*e^(m*ln(x) + 3*n*ln(x)) + 9*a
*b^2*m*x*e^(m*ln(x) + 2*n*ln(x)) + 12*a*b^2*n*x*e^(m*ln(x) + 2*n*
ln(x)) + 9*a^2*b*m*x*e^(m*ln(x) + n*ln(x)) + 15*a^2*b*n*x*e^(m*ln
(x) + n*ln(x)) + 3*a^3*m*x*e^(m*ln(x)) + 6*a^3*n*x*e^(m*ln(x)) +
b^3*x*e^(m*ln(x) + 3*n*ln(x)) + 3*a*b^2*x*e^(m*ln(x) + 2*n*ln(x))
 + 3*a^2*b*x*e^(m*ln(x) + n*ln(x)) + a^3*x*e^(m*ln(x)))/(m^4 + 6*
m^3*n + 11*m^2*n^2 + 6*m*n^3 + 4*m^3 + 18*m^2*n + 22*m*n^2 + 6*n^
3 + 6*m^2 + 18*m*n + 11*n^2 + 4*m + 6*n + 1)
```

3.2661 $\int x^m (a + bx^n)^2 \, dx$

Optimal. Leaf size=51

$$\frac{a^2 x^{m+1}}{m+1} + \frac{2abx^{m+n+1}}{m+n+1} + \frac{b^2 x^{m+2n+1}}{m+2n+1}$$

```
[Out] (a^2*x^(1 + m))/(1 + m) + (2*a*b*x^(1 + m + n))/(1 + m + n) + (b^
2*x^(1 + m + 2*n))/(1 + m + 2*n)
```

Rubi [A] time = 0.0517128, antiderivative size = 51, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$\frac{a^2 x^{m+1}}{m+1} + \frac{2abx^{m+n+1}}{m+n+1} + \frac{b^2 x^{m+2n+1}}{m+2n+1}$$

Antiderivative was successfully verified.

```
[In] Int[x^m*(a + b*x^n)^2,x]
```

```
[Out] (a^2*x^(1 + m))/(1 + m) + (2*a*b*x^(1 + m + n))/(1 + m + n) + (b^
2*x^(1 + m + 2*n))/(1 + m + 2*n)
```

Rubi in Sympy [A] time = 8.99589, size = 46, normalized size = 0.9

$$\frac{a^2 x^{m+1}}{m+1} + \frac{2abx^{m+n+1}}{m+n+1} + \frac{b^2 x^{m+2n+1}}{m+2n+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**m*(a+b*x**n)**2,x)
```

```
[Out] a**2*x**(m + 1)/(m + 1) + 2*a*b*x**(m + n + 1)/(m + n + 1) + b**2
*x**(m + 2*n + 1)/(m + 2*n + 1)
```

Mathematica [A] time = 0.048814, size = 46, normalized size = 0.9

$$x^{m+1} \left(\frac{a^2}{m+1} + \frac{2abx^n}{m+n+1} + \frac{b^2 x^{2n}}{m+2n+1} \right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^m*(a + b*x^n)^2,x]
```

```
[Out] x^(1 + m)*(a^2/(1 + m) + (2*a*b*x^n)/(1 + m + n) + (b^2*x^(2*n))/
(1 + m + 2*n))
```

Maple [A] time = 0.023, size = 63, normalized size = 1.2

$$\frac{xa^2 e^{m \ln(x)}}{1+m} + \frac{b^2 x e^{m \ln(x)} \left(e^{n \ln(x)}\right)^2}{1+m+2n} + 2 \frac{abxe^{m \ln(x)} e^{n \ln(x)}}{1+m+n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(a+b*x^n)^2,x)
```

```
[Out] a^2/(1+m)*x*exp(m*ln(x))+b^2/(1+m+2*n)*x*exp(m*ln(x))*exp(n*ln(x)
)^2+2*a*b/(1+m+n)*x*exp(m*ln(x))*exp(n*ln(x))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^m,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.238254, size = 204, normalized size = 4.

$$\frac{\left(b^2m^2 + 2\,b^2m + b^2 + \left(b^2m + b^2\right)n\right)xx^mx^{2\,n} + 2\,\left(abm^2 + 2\,abm + ab + 2\,(abm + ab)n\right)xx^mx^n + \left(a^2m^2 + 2\,a^2n^2 + 2\,a^2m + a^2\right.}{m^3 + 2\,(m+1)n^2 + 3\,m^2 + 3\,(m^2 + 2\,m + 1)n + 3\,m + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^m,x, algorithm="fricas")
```

```
[Out] ((b^2*m^2 + 2*b^2*m + b^2 + (b^2*m + b^2)*n)*x*x^m*x^(2*n) + 2*(a
*b*m^2 + 2*a*b*m + a*b + 2*(a*b*m + a*b)*n)*x*x^m*x^n + (a^2*m^2
+ 2*a^2*n^2 + 2*a^2*m + a^2 + 3*(a^2*m + a^2)*n)*x*x^m)/(m^3 + 2*
(m + 1)*n^2 + 3*m^2 + 3*(m^2 + 2*m + 1)*n + 3*m + 1)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(a+b*x**n)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.222618, size = 385, normalized size = 7.55

$$\frac{b^2m^2xe^{(m\ln(x)+2\,n\ln(x))} + b^2mnxe^{(m\ln(x)+2\,n\ln(x))} + 2\,abm^2xe^{(m\ln(x)+n\ln(x))} + 4\,abmnxe^{(m\ln(x)+n\ln(x))} + a^2m^2xe^{(m\ln(x))} + 3\,a^2mnx}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*x^m,x, algorithm="giac")
```

```
[Out] (b^2*m^2*x*e^(m*ln(x) + 2*n*ln(x)) + b^2*m*n*x*e^(m*ln(x) + 2*n*l
n(x)) + 2*a*b*m^2*x*e^(m*ln(x) + n*ln(x)) + 4*a*b*m*n*x*e^(m*ln(x
) + n*ln(x)) + a^2*m^2*x*e^(m*ln(x)) + 3*a^2*m*n*x*e^(m*ln(x)) +
2*a^2*n^2*x*e^(m*ln(x)) + 2*b^2*m*x*e^(m*ln(x) + 2*n*ln(x)) + b^2
*n*x*e^(m*ln(x) + 2*n*ln(x)) + 4*a*b*m*x*e^(m*ln(x) + n*ln(x)) +
4*a*b*n*x*e^(m*ln(x) + n*ln(x)) + 2*a^2*m*x*e^(m*ln(x)) + 3*a^2*n
*x*e^(m*ln(x)) + b^2*x*e^(m*ln(x) + 2*n*ln(x)) + 2*a*b*x*e^(m*ln(
x) + n*ln(x)) + a^2*x*e^(m*ln(x)))/(m^3 + 3*m^2*n + 2*m*n^2 + 3*m
^2 + 6*m*n + 2*n^2 + 3*m + 3*n + 1)
```

3.2662 $\int x^m (a + bx^n) \, dx$

Optimal. Leaf size=27

$$\frac{ax^{m+1}}{m+1} + \frac{bx^{m+n+1}}{m+n+1}$$

```
[Out] (a*x^(1 + m))/(1 + m) + (b*x^(1 + m + n))/(1 + m + n)
```

Rubi [A] time = 0.0249212, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$

$$\frac{ax^{m+1}}{m+1} + \frac{bx^{m+n+1}}{m+n+1}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m*(a + b*x^n),x]

[Out] (a*x^(1 + m))/(1 + m) + (b*x^(1 + m + n))/(1 + m + n)
```

Rubi in Sympy [A] time = 4.4022, size = 22, normalized size = 0.81

$$\frac{ax^{m+1}}{m+1} + \frac{bx^{m+n+1}}{m+n+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(a+b*x**n),x)

[Out] a*x**(m + 1)/(m + 1) + b*x**(m + n + 1)/(m + n + 1)
```

Mathematica [A] time = 0.0274097, size = 27, normalized size = 1.

$$\frac{ax^{m+1}}{m+1} + \frac{bx^{m+n+1}}{m+n+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m*(a + b*x^n),x]

[Out] (a*x^(1 + m))/(1 + m) + (b*x^(1 + m + n))/(1 + m + n)
```

Maple [A] time = 0.021, size = 34, normalized size = 1.3

$$\frac{axe^{m\ln(x)}}{1+m} + \frac{bxe^{m\ln(x)}e^{n\ln(x)}}{1+m+n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(a+b*x^n),x)

[Out] a/(1+m)*x*exp(m*ln(x))+b/(1+m+n)*x*exp(m*ln(x))*exp(n*ln(x))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^m,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.23744, size = 58, normalized size = 2.15

$$\frac{(bm+b)xx^mx^n+(am+an+a)xx^m}{m^2+(m+1)n+2\,m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^m,x, algorithm="fricas")
```

```
[Out] ((b*m + b)*x*x^m*x^n + (a*m + a*n + a)*x*x^m)/(m^2 + (m + 1)*n +
2*m + 1)
```

Sympy [A] time = 12.3647, size = 165, normalized size = 6.11

$$\begin{cases} (a+b)\log(x) & \text{for}\ m=-1\wedge n=0 \\ a\log(x)+\frac{bx^n}{n} & \text{for}\ m=-1 \\ \frac{axx^m}{m+1}+\frac{bm\log(x)}{m+1}+\frac{b\log(x)}{m+1} & \text{for}\ n=-m-1 \\ \frac{amxx^m}{m^2+mn+2m+n+1}+\frac{anxx^m}{m^2+mn+2m+n+1}+\frac{axx^m}{m^2+mn+2m+n+1}+\frac{bmxx^mx^n}{m^2+mn+2m+n+1}+\frac{bxx^mx^n}{m^2+mn+2m+n+1} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(a+b*x**n),x)
```

```
[Out] Piecewise(((a + b)*log(x), Eq(m, -1) & Eq(n, 0)), (a*log(x) + b*x
**n/n, Eq(m, -1)), (a*x*x**m/(m + 1) + b*m*log(x)/(m + 1) + b*log
(x)/(m + 1), Eq(n, -m - 1)), (a*m*x*x**m/(m**2 + m*n + 2*m + n +
1) + a*n*x*x**m/(m**2 + m*n + 2*m + n + 1) + a*x*x**m/(m**2 + m*n
 + 2*m + n + 1) + b*m*x*x**m*x**n/(m**2 + m*n + 2*m + n + 1) + b*
x*x**m*x**n/(m**2 + m*n + 2*m + n + 1), True))
```

GIAC/XCAS [A] time = 0.219354, size = 93, normalized size = 3.44

$$\frac{bmxe^{(m\ln(x)+n\ln(x))}+amxe^{(m\ln(x))}+anxe^{(m\ln(x))}+bxe^{(m\ln(x)+n\ln(x))}+axe^{(m\ln(x))}}{m^2+mn+2\,m+n+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)*x^m,x, algorithm="giac")
```

```
[Out] (b*m*x*e^(m*ln(x) + n*ln(x)) + a*m*x*e^(m*ln(x)) + a*n*x*e^(m*ln(
x)) + b*x*e^(m*ln(x) + n*ln(x)) + a*x*e^(m*ln(x)))/(m^2 + m*n + 2
*m + n + 1)
```

3.2663 $\int \frac{x^m}{a+bx^n} dx$

Optimal. Leaf size=40

$$\frac{x^{m+1} {}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{a(m+1)}$$

```
[Out] (x^(1 + m)*Hypergeometric2F1[1, (1 + m)/n, (1 + m + n)/n, -((b*x^
n)/a)])/(a*(1 + m))
```

Rubi [A] time = 0.0356912, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$\frac{x^{m+1} {}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{a(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m/(a + b*x^n),x]
```

```
[Out] (x^(1 + m)*Hypergeometric2F1[1, (1 + m)/n, (1 + m + n)/n, -((b*x^
n)/a)])/(a*(1 + m))
```

Rubi in Sympy [A] time = 4.65345, size = 27, normalized size = 0.68

$$\frac{x^{m+1} {}_2F_1\left(\begin{matrix} 1, \frac{m+1}{n} \\ \frac{m+n+1}{n} \end{matrix}\middle| -\frac{bx^n}{a}\right)}{a\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m/(a+b*x**n),x)
```

```
[Out] x**(m + 1)*hyper((1, (m + 1)/n), ((m + n + 1)/n,), -b*x**n/a)/(a*
(m + 1))
```

Mathematica [A] time = 0.0253583, size = 41, normalized size = 1.02

$$\frac{x^{m+1} {}_2F_1\left(1,\frac{m+1}{n};\frac{m+1}{n}+1;-\frac{bx^n}{a}\right)}{a(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m/(a + b*x^n),x]
```

```
[Out] (x^(1 + m)*Hypergeometric2F1[1, (1 + m)/n, 1 + (1 + m)/n, -((b*x^
n)/a)])/(a*(1 + m))
```

Maple [F] time = 0.066, size = 0, normalized size = 0.

$$\int \frac{x^m}{a+bx^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m/(a+b*x^n),x)

[Out] int(x^m/(a+b*x^n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{bx^n + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^n + a),x, algorithm="maxima")

[Out] integrate(x^m/(b*x^n + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^m}{bx^n + a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^n + a),x, algorithm="fricas")

[Out] integral(x^m/(b*x^n + a), x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m/(a+b*x**n),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{bx^n + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^n + a),x, algorithm="giac")

[Out] integrate(x^m/(b*x^n + a), x)
```

3.2664 $\int \frac{x^m}{(a+bx^n)^2} \, dx$

Optimal. Leaf size=40

$$\frac{x^{m+1} \, _2F_1\left(2, \frac{m+1}{n}; \frac{m+n+1}{n}; -\frac{bx^n}{a}\right)}{a^2(m+1)}$$

```
[Out] (x^(1 + m)*Hypergeometric2F1[2, (1 + m)/n, (1 + m + n)/n, -((b*x^
n)/a)])/(a^2*(1 + m))
```

Rubi [A] time = 0.0341787, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{x^{m+1} \, _2F_1\left(2, \frac{m+1}{n}; \frac{m+n+1}{n}; -\frac{bx^n}{a}\right)}{a^2(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m/(a + b*x^n)^2,x]
```

```
[Out] (x^(1 + m)*Hypergeometric2F1[2, (1 + m)/n, (1 + m + n)/n, -((b*x^
n)/a)])/(a^2*(1 + m))
```

Rubi in Sympy [A] time = 4.28041, size = 29, normalized size = 0.72

$$\frac{x^{m+1} {}_2F_1\left(\begin{matrix} 2, \frac{m+1}{n} \\ \frac{m+n+1}{n} \end{matrix}\middle| -\frac{bx^n}{a}\right)}{a^2 (m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m/(a+b*x**n)**2,x)
```

```
[Out] x**(m + 1)*hyper((2, (m + 1)/n), ((m + n + 1)/n,), -b*x**n/a)/(a*
*2*(m + 1))
```

Mathematica [A] time = 0.0859673, size = 73, normalized size = 1.82

$$\frac{x^{m+1} \left(a(m+1) - (m-n+1)(a+bx^n) \, _2F_1\left(1, \frac{m+1}{n}; \frac{m+n+1}{n}; -\frac{bx^n}{a}\right)\right)}{a^2(m+1)n(a+bx^n)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m/(a + b*x^n)^2,x]
```

```
[Out] (x^(1 + m)*(a*(1 + m) - (1 + m - n)*(a + b*x^n)*Hypergeometric2F1
[1, (1 + m)/n, (1 + m + n)/n, -((b*x^n)/a)]))/(a^2*(1 + m)*n*(a +
 b*x^n))
```

Maple [F] time = 0.097, size = 0, normalized size = 0.

$$\int \frac{x^m}{(a+bx^n)^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m/(a+b*x^n)^2,x)
```

```
[Out] int(x^m/(a+b*x^n)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-(m-n+1)\int \frac{x^m}{abnx^n + a^2n}\,dx + \frac{xx^m}{abnx^n + a^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^n + a)^2,x, algorithm="maxima")
```

```
[Out] -(m - n + 1)*integrate(x^m/(a*b*n*x^n + a^2*n), x) + x*x^m/(a*b*n
*x^n + a^2*n)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^m}{b^2x^{2\,n} + 2\,abx^n + a^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^n + a)^2,x, algorithm="fricas")
```

```
[Out] integral(x^m/(b^2*x^(2*n) + 2*a*b*x^n + a^2), x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m/(a+b*x**n)**2,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{(bx^n + a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^n + a)^2,x, algorithm="giac")
```

```
[Out] integrate(x^m/(b*x^n + a)^2, x)
```

3.2665 $\int \frac{x^m}{(a+bx^n)^3} dx$

Optimal. Leaf size=40

$$\frac{x^{m+1} \, _2F_1\left(3,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{a^3(m+1)}$$

```
[Out] (x^(1 + m)*Hypergeometric2F1[3, (1 + m)/n, (1 + m + n)/n, -((b*x^
n)/a)])/(a^3*(1 + m))
```

Rubi [A] time = 0.033387, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{x^{m+1} \, _2F_1\left(3,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{a^3(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m/(a + b*x^n)^3,x]
```

```
[Out] (x^(1 + m)*Hypergeometric2F1[3, (1 + m)/n, (1 + m + n)/n, -((b*x^
n)/a)])/(a^3*(1 + m))
```

Rubi in Sympy [A] time = 4.32861, size = 29, normalized size = 0.72

$$\frac{x^{m+1} {}_{2}F_{1}\left(\begin{matrix} 3, \frac{m+1}{n} \\ \frac{m+n+1}{n} \end{matrix}\middle| -\frac{bx^n}{a} \right)}{a^3 \left(m+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m/(a+b*x**n)**3,x)
```

```
[Out] x**(m + 1)*hyper((3, (m + 1)/n), ((m + n + 1)/n,), -b*x**n/a)/(a*
*3*(m + 1))
```

Mathematica [B] time = 0.116015, size = 100, normalized size = 2.5

$$\frac{x^{m+1}\left(\frac{a^2n}{(a+bx^n)^2}+\frac{\left(m^2+m(2-3n)+2n^2-3n+1\right) \, _2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{m+1}-\frac{a(m-2n+1)}{a+bx^n}\right)}{2a^3n^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m/(a + b*x^n)^3,x]
```

```
[Out] (x^(1 + m)*((a^2*n)/(a + b*x^n)^2 - (a*(1 + m - 2*n))/(a + b*x^n)
 + ((1 + m^2 + m*(2 - 3*n) - 3*n + 2*n^2)*Hypergeometric2F1[1, (1
 + m)/n, (1 + m + n)/n, -((b*x^n)/a)])/(1 + m)))/(2*a^3*n^2)
```

Maple [F] time = 0.115, size = 0, normalized size = 0.

$$\int \frac{x^m}{(a+bx^n)^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^m/(a+b*x^n)^3,x)
```

```
[Out] int(x^m/(a+b*x^n)^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\left(m^2 - m(3\,n - 2) + 2\,n^2 - 3\,n + 1\right) \int \frac{x^m}{2\left(a^2 b n^2 x^n + a^3 n^2\right)}\,dx - \frac{a(m - 3\,n + 1)x x^m + b(m - 2\,n + 1)x e^{(m\log(x) + n\log(x))}}{2\left(a^2 b^2 n^2 x^{2\,n} + 2\,a^3 b n^2 x^n + a^4 n^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^m/(b*x^n + a)^3,x, algorithm="maxima")
```

```
[Out] (m^2 - m*(3*n - 2) + 2*n^2 - 3*n + 1)*integrate(1/2*x^m/(a^2*b*n^
2*x^n + a^3*n^2), x) - 1/2*(a*(m - 3*n + 1)*x*x^m + b*(m - 2*n +
1)*x*e^(m*log(x) + n*log(x)))/(a^2*b^2*n^2*x^(2*n) + 2*a^3*b*n^2*
x^n + a^4*n^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x^m}{b^3 x^{3\,n} + 3\,a b^2 x^{2\,n} + 3\,a^2 b x^n + a^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^m/(b*x^n + a)^3,x, algorithm="fricas")
```

```
[Out] integral(x^m/(b^3*x^(3*n) + 3*a*b^2*x^(2*n) + 3*a^2*b*x^n + a^3),
 x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**m/(a+b*x**n)**3,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{(bx^n + a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^m/(b*x^n + a)^3,x, algorithm="giac")
```

```
[Out] integrate(x^m/(b*x^n + a)^3, x)
```

3.2666 $\int x^m (a + bx^n)^{3/2} \, dx$

Optimal. Leaf size=55

$$\frac{x^{m+1} (a + bx^n)^{5/2} \, {}_2F_1\left(1, \frac{m+1}{n} + \frac{5}{2}; \frac{m+n+1}{n}; -\frac{bx^n}{a}\right)}{a(m+1)}$$

```
[Out] (x^(1 + m)*(a + b*x^n)^(5/2)*Hypergeometric2F1[1, 5/2 + (1 + m)/n
, (1 + m + n)/n, -((b*x^n)/a)])/(a*(1 + m))
```

Rubi [A] time = 0.0703188, antiderivative size = 65, normalized size of antiderivative = 1.18, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{ax^{m+1}\sqrt{a + bx^n} \, {}_2F_1\left(-\frac{3}{2}, \frac{m+1}{n}; \frac{m+n+1}{n}; -\frac{bx^n}{a}\right)}{(m+1)\sqrt{\frac{bx^n}{a} + 1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m*(a + b*x^n)^(3/2),x]
```

```
[Out] (a*x^(1 + m)*Sqrt[a + b*x^n]*Hypergeometric2F1[-3/2, (1 + m)/n, (
1 + m + n)/n, -((b*x^n)/a)])/((1 + m)*Sqrt[1 + (b*x^n)/a])
```

Rubi in Sympy [A] time = 7.56252, size = 53, normalized size = 0.96

$$\frac{ax^{m+1}\sqrt{a + bx^n} {}_2F_1\left(\begin{matrix} -\frac{3}{2}, \frac{m+1}{n} \\ \frac{m+n+1}{n} \end{matrix}\middle| -\frac{bx^n}{a}\right)}{\sqrt{1 + \frac{bx^n}{a}}(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(a+b*x**n)**(3/2),x)
```

```
[Out] a*x**(m + 1)*sqrt(a + b*x**n)*hyper((-3/2, (m + 1)/n), ((m + n +
1)/n,), -b*x**n/a)/(sqrt(1 + b*x**n/a)*(m + 1))
```

Mathematica [B] time = 0.276402, size = 124, normalized size = 2.25

$$\frac{x^{m+1}\left(3a^2n^2\sqrt{\frac{bx^n}{a}+1} \, {}_2F_1\left(\frac{1}{2}, \frac{m+1}{n}; \frac{m+n+1}{n}; -\frac{bx^n}{a}\right) + 2(m+1)(a+bx^n)(2a(m+2n+1) + b(2m+n+2)x^n)\right)}{(m+1)(2m+n+2)(2m+3n+2)\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m*(a + b*x^n)^(3/2),x]
```

```
[Out] (x^(1 + m)*(2*(1 + m)*(a + b*x^n)*(2*a*(1 + m + 2*n) + b*(2 + 2*m
 + n)*x^n) + 3*a^2*n^2*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1/2,
 (1 + m)/n, (1 + m + n)/n, -((b*x^n)/a)]))/((1 + m)*(2 + 2*m + n)
*(2 + 2*m + 3*n)*Sqrt[a + b*x^n])
```

Maple [F] time = 0.107, size = 0, normalized size = 0.

$$\int x^m (a + bx^n)^{\frac{3}{2}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(a+b*x^n)^(3/2),x)

[Out] int(x^m*(a+b*x^n)^(3/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^{\frac{3}{2}} x^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(3/2)*x^m,x, algorithm="maxima")

[Out] integrate((b*x^n + a)^(3/2)*x^m, x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(3/2)*x^m,x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(a+b*x**n)**(3/2),x)

[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^{\frac{3}{2}} x^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(3/2)*x^m,x, algorithm="giac")

[Out] integrate((b*x^n + a)^(3/2)*x^m, x)
```

3.2667 $\int x^m \sqrt{a+bx^n}\,dx$

Optimal. Leaf size=55

$$\frac{x^{m+1}\left(a+bx^n\right)^{3/2}\,{}_2F_1\left(1,\frac{m+1}{n}+\frac{3}{2};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{a(m+1)}$$

```
[Out] (x^(1 + m)*(a + b*x^n)^(3/2)*Hypergeometric2F1[1, 3/2 + (1 + m)/n
, (1 + m + n)/n, -((b*x^n)/a)])/(a*(1 + m))
```

Rubi [A] time = 0.0672495, antiderivative size = 64, normalized size of antiderivative = 1.16, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{x^{m+1}\sqrt{a+bx^n}\,{}_2F_1\left(-\frac{1}{2},\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{(m+1)\sqrt{\frac{bx^n}{a}+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m*Sqrt[a + b*x^n],x]
```

```
[Out] (x^(1 + m)*Sqrt[a + b*x^n]*Hypergeometric2F1[-1/2, (1 + m)/n, (1
+ m + n)/n, -((b*x^n)/a)])/((1 + m)*Sqrt[1 + (b*x^n)/a])
```

Rubi in Sympy [A] time = 7.48744, size = 51, normalized size = 0.93

$$\frac{x^{m+1}\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}-\frac{1}{2},\frac{m+1}{n}\\ \frac{m+n+1}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{\sqrt{1+\frac{bx^n}{a}}\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(a+b*x**n)**(1/2),x)
```

```
[Out] x**(m + 1)*sqrt(a + b*x**n)*hyper((-1/2, (m + 1)/n), ((m + n + 1)
/n,), -b*x**n/a)/(sqrt(1 + b*x**n/a)*(m + 1))
```

Mathematica [A] time = 0.114909, size = 88, normalized size = 1.6

$$\frac{x^{m+1}\left(an\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)+2(m+1)\left(a+bx^n\right)\right)}{(m+1)(2m+n+2)\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m*Sqrt[a + b*x^n],x]
```

```
[Out] (x^(1 + m)*(2*(1 + m)*(a + b*x^n) + a*n*Sqrt[1 + (b*x^n)/a]*Hyper
geometric2F1[1/2, (1 + m)/n, (1 + m + n)/n, -((b*x^n)/a)]))/((1 +
 m)*(2 + 2*m + n)*Sqrt[a + b*x^n])
```

Maple [F] time = 0.091, size = 0, normalized size = 0.

$$\int x^m \sqrt{a+b x^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(a+b*x^n)^(1/2),x)

[Out] int(x^m*(a+b*x^n)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{b x^n + a}\, x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)*x^m,x, algorithm="maxima")

[Out] integrate(sqrt(b*x^n + a)*x^m, x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)*x^m,x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(a+b*x**n)**(1/2),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{b x^n + a}\, x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^n + a)*x^m,x, algorithm="giac")

[Out] integrate(sqrt(b*x^n + a)*x^m, x)
```

3.2668 $\int \frac{x^m}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=55

$$\frac{x^{m+1}\sqrt{a+bx^n}\,{}_2F_1\left(1,\frac{m+1}{n}+\frac{1}{2};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{a(m+1)}$$

```
[Out] (x^(1 + m)*Sqrt[a + b*x^n]*Hypergeometric2F1[1, 1/2 + (1 + m)/n,
(1 + m + n)/n, -((b*x^n)/a)])/(a*(1 + m))
```

Rubi [A] time = 0.0670956, antiderivative size = 64, normalized size of antiderivative = 1.16, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{x^{m+1}\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{(m+1)\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m/Sqrt[a + b*x^n],x]
```

```
[Out] (x^(1 + m)*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1/2, (1 + m)/n,
(1 + m + n)/n, -((b*x^n)/a)])/((1 + m)*Sqrt[a + b*x^n])
```

Rubi in Sympy [A] time = 8.08685, size = 51, normalized size = 0.93

$$\frac{x^{m+1}\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{m+1}{n}\\ \frac{m+n+1}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{a\sqrt{1+\frac{bx^n}{a}}\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m/(a+b*x**n)**(1/2),x)
```

```
[Out] x**(m + 1)*sqrt(a + b*x**n)*hyper((1/2, (m + 1)/n), ((m + n + 1)/
n,), -b*x**n/a)/(a*sqrt(1 + b*x**n/a)*(m + 1))
```

Mathematica [A] time = 0.0509487, size = 66, normalized size = 1.2

$$\frac{x^{m+1}\sqrt{\frac{a+bx^n}{a}}\,{}_2F_1\left(\frac{1}{2},\frac{m+1}{n};\frac{m+1}{n}+1;-\frac{bx^n}{a}\right)}{(m+1)\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m/Sqrt[a + b*x^n],x]
```

```
[Out] (x^(1 + m)*Sqrt[(a + b*x^n)/a]*Hypergeometric2F1[1/2, (1 + m)/n,
1 + (1 + m)/n, -((b*x^n)/a)])/((1 + m)*Sqrt[a + b*x^n])
```

Maple [F] time = 0.051, size = 0, normalized size = 0.

$$\int x^m\frac{1}{\sqrt{a+bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m/(a+b*x^n)^(1/2),x)
```

```
[Out] int(x^m/(a+b*x^n)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{\sqrt{bx^n + a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/sqrt(b*x^n + a),x, algorithm="maxima")
```

```
[Out] integrate(x^m/sqrt(b*x^n + a), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/sqrt(b*x^n + a),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m/(a+b*x**n)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{\sqrt{bx^n + a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/sqrt(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^m/sqrt(b*x^n + a), x)
```

3.2669 $\int \frac{x^m}{(a+bx^n)^{3/2}}\,dx$

Optimal. Leaf size=55

$$\frac{x^{m+1}\,{}_2F_1\left(1,\frac{m+1}{n}-\frac{1}{2};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{a(m+1)\sqrt{a+bx^n}}$$

```
[Out] (x^(1 + m)*Hypergeometric2F1[1, -1/2 + (1 + m)/n, (1 + m + n)/n,
-((b*x^n)/a)])/(a*(1 + m)*Sqrt[a + b*x^n])
```

Rubi [A] time = 0.0704068, antiderivative size = 67, normalized size of antiderivative = 1.22, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{x^{m+1}\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{3}{2},\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{a(m+1)\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m/(a + b*x^n)^(3/2),x]
```

```
[Out] (x^(1 + m)*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[3/2, (1 + m)/n,
(1 + m + n)/n, -((b*x^n)/a)])/(a*(1 + m)*Sqrt[a + b*x^n])
```

Rubi in Sympy [A] time = 7.95995, size = 53, normalized size = 0.96

$$\frac{x^{m+1}\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}\frac{3}{2},\frac{m+1}{n}\\ \frac{m+n+1}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{a^2\sqrt{1+\frac{bx^n}{a}}\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m/(a+b*x**n)**(3/2),x)
```

```
[Out] x**(m + 1)*sqrt(a + b*x**n)*hyper((3/2, (m + 1)/n), ((m + n + 1)/
n,), -b*x**n/a)/(a**2*sqrt(1 + b*x**n/a)*(m + 1))
```

Mathematica [A] time = 0.133389, size = 83, normalized size = 1.51

$$\frac{x^{m+1}\left((-2m+n-2)\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)+2(m+1)\right)}{a(m+1)n\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m/(a + b*x^n)^(3/2),x]
```

```
[Out] (x^(1 + m)*(2*(1 + m) + (-2 - 2*m + n)*Sqrt[1 + (b*x^n)/a]*Hyperg
eometric2F1[1/2, (1 + m)/n, (1 + m + n)/n, -((b*x^n)/a)]))/(a*(1
+ m)*n*Sqrt[a + b*x^n])
```

Maple [F] time = 0.051, size = 0, normalized size = 0.

$$\int x^m\,(a+bx^n)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m/(a+b*x^n)^(3/2),x)

[Out] int(x^m/(a+b*x^n)^(3/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{(bx^n + a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^n + a)^(3/2),x, algorithm="maxima")

[Out] integrate(x^m/(b*x^n + a)^(3/2), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^n + a)^(3/2),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m/(a+b*x**n)**(3/2),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{(bx^n + a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^n + a)^(3/2),x, algorithm="giac")

[Out] integrate(x^m/(b*x^n + a)^(3/2), x)
```

3.2670 $\int \frac{x^m}{(a+bx^n)^{5/2}}\,dx$

Optimal. Leaf size=55

$$\frac{x^{m+1}\,{}_2F_1\left(1,\frac{m+1}{n}-\frac{3}{2};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{a(m+1)\left(a+bx^n\right)^{3/2}}$$

```
[Out] (x^(1 + m)*Hypergeometric2F1[1, -3/2 + (1 + m)/n, (1 + m + n)/n,
-((b*x^n)/a)])/(a*(1 + m)*(a + b*x^n)^(3/2))
```

Rubi [A] time = 0.0686236, antiderivative size = 67, normalized size of antiderivative = 1.22, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{x^{m+1}\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{5}{2},\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{a^2(m+1)\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m/(a + b*x^n)^(5/2),x]
```

```
[Out] (x^(1 + m)*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[5/2, (1 + m)/n,
(1 + m + n)/n, -((b*x^n)/a)])/(a^2*(1 + m)*Sqrt[a + b*x^n])
```

Rubi in Sympy [A] time = 8.49707, size = 53, normalized size = 0.96

$$\frac{x^{m+1}\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}\frac{5}{2},\frac{m+1}{n}\\ \frac{m+n+1}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{a^3\sqrt{1+\frac{bx^n}{a}}\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m/(a+b*x**n)**(5/2),x)
```

```
[Out] x**(m + 1)*sqrt(a + b*x**n)*hyper((5/2, (m + 1)/n), ((m + n + 1)/
n,), -b*x**n/a)/(a**3*sqrt(1 + b*x**n/a)*(m + 1))
```

Mathematica [B] time = 0.269432, size = 129, normalized size = 2.35

$$\frac{x^{m+1}\left(\left(4m^2-8m(n-1)+3n^2-8n+4\right)\left(a+bx^n\right)\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)+2(m+1)\left(an-(2m-3n+2)\left(a+\right.\right.\right.}{3a^2(m+1)n^2\left(a+bx^n\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m/(a + b*x^n)^(5/2),x]
```

```
[Out] (x^(1 + m)*(2*(1 + m)*(a*n - (2 + 2*m - 3*n)*(a + b*x^n)) + (4 +
4*m^2 - 8*m*(-1 + n) - 8*n + 3*n^2)*(a + b*x^n)*Sqrt[1 + (b*x^n)/
a]*Hypergeometric2F1[1/2, (1 + m)/n, (1 + m + n)/n, -((b*x^n)/a)]
))/(3*a^2*(1 + m)*n^2*(a + b*x^n)^(3/2))
```

Maple [F] time = 0.051, size = 0, normalized size = 0.

$$\int x^m (a + bx^n)^{-\frac{5}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m/(a+b*x^n)^(5/2),x)

[Out] int(x^m/(a+b*x^n)^(5/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{(bx^n + a)^{\frac{5}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^n + a)^(5/2),x, algorithm="maxima")

[Out] integrate(x^m/(b*x^n + a)^(5/2), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^n + a)^(5/2),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m/(a+b*x**n)**(5/2),x)

[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{(bx^n + a)^{\frac{5}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^n + a)^(5/2),x, algorithm="giac")

[Out] integrate(x^m/(b*x^n + a)^(5/2), x)
```

3.2671 $\int \frac{x^{3+2n}}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=59

$$\frac{x^{2(n+2)}\sqrt{a+bx^n}\,{}_2F_1\left(1,\frac{1}{2}\left(5+\frac{8}{n}\right);3+\frac{4}{n};-\frac{bx^n}{a}\right)}{2a(n+2)}$$

```
[Out] (x^(2*(2 + n))*Sqrt[a + b*x^n]*Hypergeometric2F1[1, (5 + 8/n)/2,
3 + 4/n, -((b*x^n)/a)])/(2*a*(2 + n))
```

Rubi [A] time = 0.076905, antiderivative size = 70, normalized size of antiderivative = 1.19, number of steps used = 2, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.105$

$$\frac{x^{2(n+2)}\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},2\left(1+\frac{2}{n}\right);3+\frac{4}{n};-\frac{bx^n}{a}\right)}{2(n+2)\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(3 + 2*n)/Sqrt[a + b*x^n],x]
```

```
[Out] (x^(2*(2 + n))*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1/2, 2*(1 +
2/n), 3 + 4/n, -((b*x^n)/a)])/(2*(2 + n)*Sqrt[a + b*x^n])
```

Rubi in Sympy [A] time = 8.03668, size = 53, normalized size = 0.9

$$\frac{x^{2n+4}\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}\frac{1}{2},2+\frac{4}{n}\\3+\frac{4}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{2a\sqrt{1+\frac{bx^n}{a}}\,(n+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(3+2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] x**(2*n + 4)*sqrt(a + b*x**n)*hyper((1/2, 2 + 4/n), (3 + 4/n,), -
b*x**n/a)/(2*a*sqrt(1 + b*x**n/a)*(n + 2))
```

Mathematica [A] time = 0.20525, size = 104, normalized size = 1.76

$$\frac{2x^4\left(2a^2(n+4)\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{4}{n};\frac{n+4}{n};-\frac{bx^n}{a}\right)-(a+bx^n)\left(2a(n+4)-b(n+8)x^n\right)\right)}{b^2(n+8)(3n+8)\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(3 + 2*n)/Sqrt[a + b*x^n],x]
```

```
[Out] (2*x^4*(-((a + b*x^n)*(2*a*(4 + n) - b*(8 + n)*x^n)) + 2*a^2*(4 +
 n)*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1/2, 4/n, (4 + n)/n, -(
(b*x^n)/a)]))/(b^2*(8 + n)*(8 + 3*n)*Sqrt[a + b*x^n])
```

Maple [F] time = 0.081, size = 0, normalized size = 0.

$$\int x^{3+2\,n}\frac{1}{\sqrt{a+bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(3+2*n)/(a+b*x^n)^(1/2),x)
```

```
[Out] int(x^(3+2*n)/(a+b*x^n)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{2n+3}}{\sqrt{bx^n + a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(2*n + 3)/sqrt(b*x^n + a),x, algorithm="maxima")
```

```
[Out] integrate(x^(2*n + 3)/sqrt(b*x^n + a), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(2*n + 3)/sqrt(b*x^n + a),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(3+2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{2n+3}}{\sqrt{bx^n + a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(2*n + 3)/sqrt(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(2*n + 3)/sqrt(b*x^n + a), x)
```

3.2672 $\int \frac{x^{3+n}}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=56

$$\frac{x^{n+4}\sqrt{a+bx^n}\,{}_2F_1\left(1,\frac{1}{2}\left(3+\frac{8}{n}\right);2\left(1+\frac{2}{n}\right);-\frac{bx^n}{a}\right)}{a(n+4)}$$

```
[Out] (x^(4 + n)*Sqrt[a + b*x^n]*Hypergeometric2F1[1, (3 + 8/n)/2, 2*(1
 + 2/n), -((b*x^n)/a)])/(a*(4 + n))
```

Rubi [A] time = 0.0733811, antiderivative size = 65, normalized size of antiderivative = 1.16, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{x^{n+4}\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{n+4}{n};2\left(1+\frac{2}{n}\right);-\frac{bx^n}{a}\right)}{(n+4)\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(3 + n)/Sqrt[a + b*x^n],x]
```

```
[Out] (x^(4 + n)*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1/2, (4 + n)/n,
2*(1 + 2/n), -((b*x^n)/a)])/((4 + n)*Sqrt[a + b*x^n])
```

Rubi in Sympy [A] time = 7.83545, size = 49, normalized size = 0.88

$$\frac{x^{n+4}\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{n+4}{n}\\ 2+\frac{4}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{a\sqrt{1+\frac{bx^n}{a}}\,(n+4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(3+n)/(a+b*x**n)**(1/2),x)
```

```
[Out] x**(n + 4)*sqrt(a + b*x**n)*hyper((1/2, (n + 4)/n), (2 + 4/n,), -
b*x**n/a)/(a*sqrt(1 + b*x**n/a)*(n + 4))
```

Mathematica [A] time = 0.0815198, size = 73, normalized size = 1.3

$$\frac{2x^4\left(-a\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{4}{n};\frac{n+4}{n};-\frac{bx^n}{a}\right)+a+bx^n\right)}{b(n+8)\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(3 + n)/Sqrt[a + b*x^n],x]
```

```
[Out] (2*x^4*(a + b*x^n - a*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1/2,
4/n, (4 + n)/n, -((b*x^n)/a)]))/(b*(8 + n)*Sqrt[a + b*x^n])
```

Maple [F] time = 0.064, size = 0, normalized size = 0.

$$\int x^{3+n}\frac{1}{\sqrt{a+bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(3+n)/(a+b*x^n)^(1/2),x)
```

```
[Out] int(x^(3+n)/(a+b*x^n)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{n+3}}{\sqrt{bx^n + a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(n + 3)/sqrt(b*x^n + a),x, algorithm="maxima")
```

```
[Out] integrate(x^(n + 3)/sqrt(b*x^n + a), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(n + 3)/sqrt(b*x^n + a),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(3+n)/(a+b*x**n)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{n+3}}{\sqrt{bx^n + a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(n + 3)/sqrt(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(n + 3)/sqrt(b*x^n + a), x)
```

3.2673 $\int \frac{x^{3-n}}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=56

$$\frac{x^{4-n}\sqrt{a+bx^n}\,{}_2F_1\left(1,\frac{1}{2}\left(\frac{8}{n}-1\right);\frac{4}{n};-\frac{bx^n}{a}\right)}{a(4-n)}$$

```
[Out] (x^(4 - n)*Sqrt[a + b*x^n]*Hypergeometric2F1[1, (-1 + 8/n)/2, 4/n
, -((b*x^n)/a)])/(a*(4 - n))
```

Rubi [A] time = 0.0751198, antiderivative size = 65, normalized size of antiderivative = 1.16, number of steps used = 2, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$\frac{x^{4-n}\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{4}{n}-1;\frac{4}{n};-\frac{bx^n}{a}\right)}{(4-n)\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(3 - n)/Sqrt[a + b*x^n],x]
```

```
[Out] (x^(4 - n)*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1/2, -1 + 4/n, 4
/n, -((b*x^n)/a)])/((4 - n)*Sqrt[a + b*x^n])
```

Rubi in Sympy [A] time = 8.02197, size = 49, normalized size = 0.88

$$\frac{x^{-n+4}\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}\frac{1}{2},-\frac{n-4}{n}\\ \frac{4}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{a\sqrt{1+\frac{bx^n}{a}}(-n+4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(3-n)/(a+b*x**n)**(1/2),x)
```

```
[Out] x**(-n + 4)*sqrt(a + b*x**n)*hyper((1/2, -(n - 4)/n), (4/n,), -b*
x**n/a)/(a*sqrt(1 + b*x**n/a)*(-n + 4))
```

Mathematica [A] time = 0.24922, size = 83, normalized size = 1.48

$$\frac{x^4\left(-b(n-8)\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{4}{n};\frac{n+4}{n};-\frac{bx^n}{a}\right)-8ax^{-n}-8b\right)}{8a(n-4)\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(3 - n)/Sqrt[a + b*x^n],x]
```

```
[Out] (x^4*(-8*b - (8*a)/x^n - b*(-8 + n)*Sqrt[1 + (b*x^n)/a]*Hypergeom
etric2F1[1/2, 4/n, (4 + n)/n, -((b*x^n)/a)]))/(8*a*(-4 + n)*Sqrt[
a + b*x^n])
```

Maple [F] time = 0.062, size = 0, normalized size = 0.

$$\int x^{3-n}\frac{1}{\sqrt{a+bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(3-n)/(a+b*x^n)^(1/2),x)
```

```
[Out] int(x^(3-n)/(a+b*x^n)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{-n+3}}{\sqrt{bx^n + a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-n + 3)/sqrt(b*x^n + a),x, algorithm="maxima")
```

```
[Out] integrate(x^(-n + 3)/sqrt(b*x^n + a), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-n + 3)/sqrt(b*x^n + a),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(3-n)/(a+b*x**n)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{-n+3}}{\sqrt{bx^n + a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-n + 3)/sqrt(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(-n + 3)/sqrt(b*x^n + a), x)
```

3.2674 $\int \frac{x^{3-2n}}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=61

$$\frac{x^{4-2n}\sqrt{a+bx^n}\,{}_2F_1\left(1,\frac{1}{2}\left(\frac{8}{n}-3\right);\frac{4}{n}-1;-\frac{bx^n}{a}\right)}{2a(2-n)}$$

```
[Out] (x^(4 - 2*n)*Sqrt[a + b*x^n]*Hypergeometric2F1[1, (-3 + 8/n)/2, -
1 + 4/n, -((b*x^n)/a)])/(2*a*(2 - n))
```

Rubi [A] time = 0.0795379, antiderivative size = 72, normalized size of antiderivative = 1.18, number of steps used = 2, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$\frac{x^{4-2n}\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},-2\left(1-\frac{2}{n}\right);\frac{4}{n}-1;-\frac{bx^n}{a}\right)}{2(2-n)\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(3 - 2*n)/Sqrt[a + b*x^n],x]
```

```
[Out] (x^(4 - 2*n)*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1/2, -2*(1 - 2
/n), -1 + 4/n, -((b*x^n)/a)])/(2*(2 - n)*Sqrt[a + b*x^n])
```

Rubi in Sympy [A] time = 8.14306, size = 54, normalized size = 0.89

$$\frac{x^{-2n+4}\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}\frac{1}{2},-2+\frac{4}{n}\\ -\frac{n-4}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{2a\sqrt{1+\frac{bx^n}{a}}\,(-n+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(3-2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] x**(-2*n + 4)*sqrt(a + b*x**n)*hyper((1/2, -2 + 4/n), (-(n - 4)/n
,), -b*x**n/a)/(2*a*sqrt(1 + b*x**n/a)*(-n + 2))
```

Mathematica [A] time = 0.418328, size = 116, normalized size = 1.9

$$\frac{x^4\left(b^2\left(3n^2-32n+64\right)\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{4}{n};\frac{n+4}{n};-\frac{bx^n}{a}\right)+8x^{-2n}\left(a+bx^n\right)\left(b(3n-8)x^n-2a(n-4)\right)\right)}{32a^2(n-4)(n-2)\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(3 - 2*n)/Sqrt[a + b*x^n],x]
```

```
[Out] (x^4*((8*(a + b*x^n)*(-2*a*(-4 + n) + b*(-8 + 3*n)*x^n))/x^(2*n)
+ b^2*(64 - 32*n + 3*n^2)*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1
/2, 4/n, (4 + n)/n, -((b*x^n)/a)]))/(32*a^2*(-4 + n)*(-2 + n)*Sqr
t[a + b*x^n])
```

Maple [F] time = 0.061, size = 0, normalized size = 0.

$$\int x^{3-2n} \frac{1}{\sqrt{a+bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(3-2*n)/(a+b*x^n)^(1/2),x)

[Out] int(x^(3-2*n)/(a+b*x^n)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{-2n+3}}{\sqrt{bx^n+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-2*n + 3)/sqrt(b*x^n + a),x, algorithm="maxima")

[Out] integrate(x^(-2*n + 3)/sqrt(b*x^n + a), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-2*n + 3)/sqrt(b*x^n + a),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(3-2*n)/(a+b*x**n)**(1/2),x)

[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{-2n+3}}{\sqrt{bx^n+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-2*n + 3)/sqrt(b*x^n + a),x, algorithm="giac")

[Out] integrate(x^(-2*n + 3)/sqrt(b*x^n + a), x)
```

3.2675 $\int \frac{x^{m+2n}}{\sqrt{a+bx^n}} dx$

Optimal. Leaf size=66

$$\frac{x^{m+2n+1}\sqrt{a+bx^n}\,{}_2F_1\left(1,\frac{1}{2}\left(\frac{2(m+1)}{n}+5\right);\frac{m+3n+1}{n};-\frac{bx^n}{a}\right)}{a(m+2n+1)}$$

```
[Out] (x^(1 + m + 2*n)*Sqrt[a + b*x^n]*Hypergeometric2F1[1, (5 + (2*(1
+ m))/n)/2, (1 + m + 3*n)/n, -((b*x^n)/a)])/(a*(1 + m + 2*n))
```

Rubi [A] time = 0.0803257, antiderivative size = 75, normalized size of antiderivative = 1.14, number of steps used = 2, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.105$

$$\frac{x^{m+2n+1}\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{m+2n+1}{n};\frac{m+3n+1}{n};-\frac{bx^n}{a}\right)}{(m+2n+1)\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(m + 2*n)/Sqrt[a + b*x^n],x]
```

```
[Out] (x^(1 + m + 2*n)*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1/2, (1 +
m + 2*n)/n, (1 + m + 3*n)/n, -((b*x^n)/a)])/((1 + m + 2*n)*Sqrt[a
 + b*x^n])
```

Rubi in Sympy [A] time = 8.4231, size = 63, normalized size = 0.95

$$\frac{x^{m+2n+1}\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{m+2n+1}{n}\\ \frac{m+3n+1}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{a\sqrt{1+\frac{bx^n}{a}}\,(m+2n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(m+2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] x**(m + 2*n + 1)*sqrt(a + b*x**n)*hyper((1/2, (m + 2*n + 1)/n), (
(m + 3*n + 1)/n,), -b*x**n/a)/(a*sqrt(1 + b*x**n/a)*(m + 2*n + 1)
)
```

Mathematica [A] time = 0.0662304, size = 75, normalized size = 1.14

$$\frac{x^{m+2n+1}\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{m+2n+1}{n};\frac{m+3n+1}{n};-\frac{bx^n}{a}\right)}{(m+2n+1)\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(m + 2*n)/Sqrt[a + b*x^n],x]
```

```
[Out] (x^(1 + m + 2*n)*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1/2, (1 +
m + 2*n)/n, (1 + m + 3*n)/n, -((b*x^n)/a)])/((1 + m + 2*n)*Sqrt[a
 + b*x^n])
```

Maple [F] time = 0.062, size = 0, normalized size = 0.

$$\int x^{m+2n} \frac{1}{\sqrt{a+bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(m+2*n)/(a+b*x^n)^(1/2),x)

[Out] int(x^(m+2*n)/(a+b*x^n)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{m+2n}}{\sqrt{bx^n+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(m + 2*n)/sqrt(b*x^n + a),x, algorithm="maxima")

[Out] integrate(x^(m + 2*n)/sqrt(b*x^n + a), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(m + 2*n)/sqrt(b*x^n + a),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(m+2*n)/(a+b*x**n)**(1/2),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{m+2n}}{\sqrt{bx^n+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(m + 2*n)/sqrt(b*x^n + a),x, algorithm="giac")

[Out] integrate(x^(m + 2*n)/sqrt(b*x^n + a), x)
```

3.2676 $\int \frac{x^{m+n}}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=60

$$\frac{x^{m+n+1}\sqrt{a+bx^n}\,{}_2F_1\left(1,\frac{m+n+1}{n}+\frac{1}{2};\frac{m+2n+1}{n};-\frac{bx^n}{a}\right)}{a(m+n+1)}$$

```
[Out] (x^(1 + m + n)*Sqrt[a + b*x^n]*Hypergeometric2F1[1, 1/2 + (1 + m
+ n)/n, (1 + m + 2*n)/n, -((b*x^n)/a)])/(a*(1 + m + n))
```

Rubi [A] time = 0.0771706, antiderivative size = 69, normalized size of antiderivative = 1.15, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{x^{m+n+1}\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{m+n+1}{n};\frac{m+2n+1}{n};-\frac{bx^n}{a}\right)}{(m+n+1)\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(m + n)/Sqrt[a + b*x^n],x]
```

```
[Out] (x^(1 + m + n)*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1/2, (1 + m
+ n)/n, (1 + m + 2*n)/n, -((b*x^n)/a)])/((1 + m + n)*Sqrt[a + b*x
^n])
```

Rubi in Sympy [A] time = 8.29935, size = 58, normalized size = 0.97

$$\frac{x^{m+n+1}\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{m+n+1}{n}\\\frac{m+2n+1}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{a\sqrt{1+\frac{bx^n}{a}}\,(m+n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(m+n)/(a+b*x**n)**(1/2),x)
```

```
[Out] x**(m + n + 1)*sqrt(a + b*x**n)*hyper((1/2, (m + n + 1)/n), ((m +
 2*n + 1)/n,), -b*x**n/a)/(a*sqrt(1 + b*x**n/a)*(m + n + 1))
```

Mathematica [A] time = 0.0575739, size = 70, normalized size = 1.17

$$\frac{x^{m+n+1}\sqrt{\frac{a+bx^n}{a}}\,{}_2F_1\left(\frac{1}{2},\frac{m+n+1}{n};\frac{m+n+1}{n}+1;-\frac{bx^n}{a}\right)}{(m+n+1)\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(m + n)/Sqrt[a + b*x^n],x]
```

```
[Out] (x^(1 + m + n)*Sqrt[(a + b*x^n)/a]*Hypergeometric2F1[1/2, (1 + m
+ n)/n, 1 + (1 + m + n)/n, -((b*x^n)/a)])/((1 + m + n)*Sqrt[a + b
*x^n])
```

Maple [F] time = 0.075, size = 0, normalized size = 0.

$$\int x^{m+n} \frac{1}{\sqrt{a+b x^n}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(m+n)/(a+b*x^n)^(1/2),x)

[Out] int(x^(m+n)/(a+b*x^n)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{m+n}}{\sqrt{b x^n+a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(m + n)/sqrt(b*x^n + a),x, algorithm="maxima")

[Out] integrate(x^(m + n)/sqrt(b*x^n + a), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(m + n)/sqrt(b*x^n + a),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(m+n)/(a+b*x**n)**(1/2),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{m+n}}{\sqrt{b x^n+a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(m + n)/sqrt(b*x^n + a),x, algorithm="giac")

[Out] integrate(x^(m + n)/sqrt(b*x^n + a), x)
```

3.2677 $\int \frac{x^{m-n}}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=63

$$\frac{x^{m-n+1}\sqrt{a+bx^n}\,{}_2F_1\left(1,\frac{1}{2}\left(\frac{2(m+1)}{n}-1\right);\frac{m+1}{n};-\frac{bx^n}{a}\right)}{a(m-n+1)}$$

```
[Out] (x^(1 + m - n)*Sqrt[a + b*x^n]*Hypergeometric2F1[1, (-1 + (2*(1 +
 m))/n)/2, (1 + m)/n, -((b*x^n)/a)])/(a*(1 + m - n))
```

Rubi [A] time = 0.0791248, antiderivative size = 72, normalized size of antiderivative = 1.14, number of steps used = 2, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$\frac{x^{m-n+1}\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{m-n+1}{n};\frac{m+1}{n};-\frac{bx^n}{a}\right)}{(m-n+1)\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(m - n)/Sqrt[a + b*x^n],x]
```

```
[Out] (x^(1 + m - n)*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1/2, (1 + m
- n)/n, (1 + m)/n, -((b*x^n)/a)])/((1 + m - n)*Sqrt[a + b*x^n])
```

Rubi in Sympy [A] time = 8.40322, size = 54, normalized size = 0.86

$$\frac{x^{m-n+1}\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{m-n+1}{n}\\ \frac{m+1}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{a\sqrt{1+\frac{bx^n}{a}}\,(m-n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(m-n)/(a+b*x**n)**(1/2),x)
```

```
[Out] x**(m - n + 1)*sqrt(a + b*x**n)*hyper((1/2, (m - n + 1)/n), ((m +
 1)/n,), -b*x**n/a)/(a*sqrt(1 + b*x**n/a)*(m - n + 1))
```

Mathematica [A] time = 0.0584686, size = 72, normalized size = 1.14

$$\frac{x^{m-n+1}\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{m-n+1}{n};\frac{m+1}{n};-\frac{bx^n}{a}\right)}{(m-n+1)\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(m - n)/Sqrt[a + b*x^n],x]
```

```
[Out] (x^(1 + m - n)*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1/2, (1 + m
- n)/n, (1 + m)/n, -((b*x^n)/a)])/((1 + m - n)*Sqrt[a + b*x^n])
```

Maple [F] time = 0.062, size = 0, normalized size = 0.

$$\int x^{m-n}\frac{1}{\sqrt{a+bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(m-n)/(a+b*x^n)^(1/2),x)
```

```
[Out] int(x^(m-n)/(a+b*x^n)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{m-n}}{\sqrt{bx^n + a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(m - n)/sqrt(b*x^n + a),x, algorithm="maxima")
```

```
[Out] integrate(x^(m - n)/sqrt(b*x^n + a), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(m - n)/sqrt(b*x^n + a),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(m-n)/(a+b*x**n)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{m-n}}{\sqrt{bx^n + a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(m - n)/sqrt(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(m - n)/sqrt(b*x^n + a), x)
```

3.2678 $\int \frac{x^{m-2n}}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=66

$$\frac{x^{m-2n+1}\sqrt{a+bx^n}\,{}_2F_1\left(1,\frac{1}{2}\left(\frac{2(m+1)}{n}-3\right);\frac{m-n+1}{n};-\frac{bx^n}{a}\right)}{a(m-2n+1)}$$

```
[Out] (x^(1 + m - 2*n)*Sqrt[a + b*x^n]*Hypergeometric2F1[1, (-3 + (2*(1
 + m))/n)/2, (1 + m - n)/n, -((b*x^n)/a)])/(a*(1 + m - 2*n))
```

Rubi [A] time = 0.0820849, antiderivative size = 75, normalized size of antiderivative = 1.14, number of steps used = 2, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$\frac{x^{m-2n+1}\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{m-2n+1}{n};\frac{m-n+1}{n};-\frac{bx^n}{a}\right)}{(m-2n+1)\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(m - 2*n)/Sqrt[a + b*x^n],x]
```

```
[Out] (x^(1 + m - 2*n)*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1/2, (1 +
m - 2*n)/n, (1 + m - n)/n, -((b*x^n)/a)])/((1 + m - 2*n)*Sqrt[a +
 b*x^n])
```

Rubi in Sympy [A] time = 8.55109, size = 61, normalized size = 0.92

$$\frac{x^{m-2n+1}\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{m-2n+1}{n}\\ \frac{m-n+1}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{a\sqrt{1+\frac{bx^n}{a}}\,(m-2n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(m-2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] x**(m - 2*n + 1)*sqrt(a + b*x**n)*hyper((1/2, (m - 2*n + 1)/n), (
(m - n + 1)/n,), -b*x**n/a)/(a*sqrt(1 + b*x**n/a)*(m - 2*n + 1))
```

Mathematica [A] time = 0.0637589, size = 75, normalized size = 1.14

$$\frac{x^{m-2n+1}\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{m-2n+1}{n};\frac{m-n+1}{n};-\frac{bx^n}{a}\right)}{(m-2n+1)\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(m - 2*n)/Sqrt[a + b*x^n],x]
```

```
[Out] (x^(1 + m - 2*n)*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1/2, (1 +
m - 2*n)/n, (1 + m - n)/n, -((b*x^n)/a)])/((1 + m - 2*n)*Sqrt[a +
 b*x^n])
```

Maple [F] time = 0.061, size = 0, normalized size = 0.

$$\int x^{m-2\,n} \frac{1}{\sqrt{a+bx^n}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(m-2*n)/(a+b*x^n)^(1/2),x)

[Out] int(x^(m-2*n)/(a+b*x^n)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{m-2\,n}}{\sqrt{bx^n+a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(m - 2*n)/sqrt(b*x^n + a),x, algorithm="maxima")

[Out] integrate(x^(m - 2*n)/sqrt(b*x^n + a), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(m - 2*n)/sqrt(b*x^n + a),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(m-2*n)/(a+b*x**n)**(1/2),x)

[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{m-2\,n}}{\sqrt{bx^n+a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(m - 2*n)/sqrt(b*x^n + a),x, algorithm="giac")

[Out] integrate(x^(m - 2*n)/sqrt(b*x^n + a), x)
```

3.2679 $\int \left(-\frac{bnx^{-1+m+n}}{2(a+bx^n)^{3/2}}+\frac{mx^{-1+m}}{\sqrt{a+bx^n}}\right)\,dx$

Optimal. Leaf size=15

$$\frac{x^m}{\sqrt{a+bx^n}}$$

```
[Out] x^m/Sqrt[a + b*x^n]
```

Rubi [C] time = 0.199999, antiderivative size = 126, normalized size of antiderivative = 8.4, number of steps used = 5, number of rules used = 2, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048

$$\frac{x^m\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{m}{n};\frac{m+n}{n};-\frac{bx^n}{a}\right)}{\sqrt{a+bx^n}}-\frac{bnx^{m+n}\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{3}{2},\frac{m+n}{n};\frac{m}{n}+2;-\frac{bx^n}{a}\right)}{2a(m+n)\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In] Int[-(b*n*x^(-1 + m + n))/(2*(a + b*x^n)^(3/2)) + (m*x^(-1 + m))/Sqrt[a + b*x^n],x
```

```
[Out] (x^m*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1/2, m/n, (m + n)/n, -
((b*x^n)/a)])/Sqrt[a + b*x^n] - (b*n*x^(m + n)*Sqrt[1 + (b*x^n)/a
]*Hypergeometric2F1[3/2, (m + n)/n, 2 + m/n, -((b*x^n)/a)])/(2*a*
(m + n)*Sqrt[a + b*x^n])
```

Rubi in Sympy [A] time = 19.1809, size = 100, normalized size = 6.67

$$\frac{x^m\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{m}{n}\\\frac{m+n}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{a\sqrt{1+\frac{bx^n}{a}}}-\frac{bnx^{m+n}\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}\frac{3}{2},\frac{m+n}{n}\\\frac{m}{n}+2\end{matrix}\middle|-\frac{bx^n}{a}\right)}{2a^2\sqrt{1+\frac{bx^n}{a}}\,(m+n)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(-1/2*b*n*x**(-1+m+n)/(a+b*x**n)**(3/2)+m*x**(-1+m)/(a+b*x**n)**
```

```
[Out] x**m*sqrt(a + b*x**n)*hyper((1/2, m/n), ((m + n)/n,), -b*x**n/a)/
(a*sqrt(1 + b*x**n/a)) - b*n*x**(m + n)*sqrt(a + b*x**n)*hyper((3
/2, (m + n)/n), (m/n + 2,), -b*x**n/a)/(2*a**2*sqrt(1 + b*x**n/a)
*(m + n))
```

Mathematica [A] time = 0.0936821, size = 15, normalized size = 1.

$$\frac{x^m}{\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In] Integrate[-(b*n*x^(-1 + m + n))/(2*(a + b*x^n)^(3/2)) + (m*x^(-
1 + m))/Sqrt[a + b*x^n],x]
```

```
[Out] x^m/Sqrt[a + b*x^n]
```

Maple [F] time = 0.095, size = 0, normalized size = 0.

$$\int -\frac{bnx^{-1+m+n}}{2}(a+bx^n)^{-\frac{3}{2}}+mx^{-1+m}\frac{1}{\sqrt{a+bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-1/2*b*n*x^(-1+m+n)/(a+b*x^n)^(3/2)+m*x^(-1+m)/(a+b*x^n)^(1/2),x)
```

```
[Out] int(-1/2*b*n*x^(-1+m+n)/(a+b*x^n)^(3/2)+m*x^(-1+m)/(a+b*x^n)^(1/2
),x)
```

Maxima [A] time = 1.70229, size = 18, normalized size = 1.2

$$\frac{x^m}{\sqrt{bx^n+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(-1/2*b*n*x^(m + n - 1)/(b*x^n + a)^(3/2) + m*x^(m - 1)/sqrt(b*x^n + a),x
```

```
[Out] x^m/sqrt(b*x^n + a)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(-1/2*b*n*x^(m + n - 1)/(b*x^n + a)^(3/2) + m*x^(m - 1)/sqrt(b*x^n + a),x
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(-1/2*b*n*x**(-1+m+n)/(a+b*x**n)**(3/2)+m*x**(-1+m)/(a+b*x**n)**(1/2)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{bnx^{m+n-1}}{2\,(bx^n+a)^{\frac{3}{2}}}+\frac{mx^{m-1}}{\sqrt{bx^n+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(-1/2*b*n*x^(m + n - 1)/(b*x^n + a)^(3/2) + m*x^(m - 1)/sqrt(b*x^n + a),x
```

```
[Out] integrate(-1/2*b*n*x^(m + n - 1)/(b*x^n + a)^(3/2) + m*x^(m - 1)/
sqrt(b*x^n + a), x)
```

3.2680 $\int \frac{x^{-1+\frac{7n}{2}}}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=129

$$-\frac{5a^3\tanh^{-1}\left(\frac{\sqrt{b}x^{n/2}}{\sqrt{a+bx^n}}\right)}{8b^{7/2}n}+\frac{5a^2x^{n/2}\sqrt{a+bx^n}}{8b^3n}-\frac{5ax^{3n/2}\sqrt{a+bx^n}}{12b^2n}+\frac{x^{5n/2}\sqrt{a+bx^n}}{3bn}$$

```
[Out] (5*a^2*x^(n/2)*Sqrt[a + b*x^n])/(8*b^3*n) - (5*a*x^((3*n)/2)*Sqrt
[a + b*x^n])/(12*b^2*n) + (x^((5*n)/2)*Sqrt[a + b*x^n])/(3*b*n) -
 (5*a^3*ArcTanh[(Sqrt[b]*x^(n/2))/Sqrt[a + b*x^n]])/(8*b^(7/2)*n)
```

Rubi [A] time = 0.160444, antiderivative size = 129, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$-\frac{5a^3\tanh^{-1}\left(\frac{\sqrt{b}x^{n/2}}{\sqrt{a+bx^n}}\right)}{8b^{7/2}n}+\frac{5a^2x^{n/2}\sqrt{a+bx^n}}{8b^3n}-\frac{5ax^{3n/2}\sqrt{a+bx^n}}{12b^2n}+\frac{x^{5n/2}\sqrt{a+bx^n}}{3bn}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + (7*n)/2)/Sqrt[a + b*x^n],x]
```

```
[Out] (5*a^2*x^(n/2)*Sqrt[a + b*x^n])/(8*b^3*n) - (5*a*x^((3*n)/2)*Sqrt
[a + b*x^n])/(12*b^2*n) + (x^((5*n)/2)*Sqrt[a + b*x^n])/(3*b*n) -
 (5*a^3*ArcTanh[(Sqrt[b]*x^(n/2))/Sqrt[a + b*x^n]])/(8*b^(7/2)*n)
```

Rubi in Sympy [A] time = 20.6, size = 160, normalized size = 1.24

$$\frac{a^3x^{\frac{5n}{2}}}{3bn\left(a+bx^n\right)^{\frac{5}{2}}\left(-\frac{bx^n}{a+bx^n}+1\right)^3}-\frac{5a^3x^{\frac{3n}{2}}}{12b^2n\left(a+bx^n\right)^{\frac{3}{2}}\left(-\frac{bx^n}{a+bx^n}+1\right)^2}+\frac{5a^3x^{\frac{n}{2}}}{8b^3n\sqrt{a+bx^n}\left(-\frac{bx^n}{a+bx^n}+1\right)}-\frac{5a^3\operatorname{atanh}\left(\frac{\sqrt{b}x^{\frac{n}{2}}}{\sqrt{a+bx^n}}\right)}{8b^{\frac{7}{2}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+7/2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] a**3*x**(5*n/2)/(3*b*n*(a + b*x**n)**(5/2)*(-b*x**n/(a + b*x**n)
+ 1)**3) - 5*a**3*x**(3*n/2)/(12*b**2*n*(a + b*x**n)**(3/2)*(-b*x
**n/(a + b*x**n) + 1)**2) + 5*a**3*x**(n/2)/(8*b**3*n*sqrt(a + b*
x**n)*(-b*x**n/(a + b*x**n) + 1)) - 5*a**3*atanh(sqrt(b)*x**(n/2)
/sqrt(a + b*x**n))/(8*b**(7/2)*n)
```

Mathematica [A] time = 0.121634, size = 93, normalized size = 0.72

$$\frac{\sqrt{b}x^{n/2}\sqrt{a+bx^n}\left(15a^2-10abx^n+8b^2x^{2n}\right)-15a^3\log\left(\sqrt{b}\sqrt{a+bx^n}+bx^{n/2}\right)}{24b^{7/2}n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + (7*n)/2)/Sqrt[a + b*x^n],x]
```

```
[Out] (Sqrt[b]*x^(n/2)*Sqrt[a + b*x^n]*(15*a^2 - 10*a*b*x^n + 8*b^2*x^(
2*n)) - 15*a^3*Log[b*x^(n/2) + Sqrt[b]*Sqrt[a + b*x^n]])/(24*b^(7
```

```
/2)*n)
```

Maple [A] time = 0.088, size = 98, normalized size = 0.8

$$\frac{1}{24\,b^3n}\mathrm{e}^{\frac{n\ln(x)}{2}}\left(8\left(\mathrm{e}^{1/2\,n\ln(x)}\right)^4b^2-10\,a\left(\mathrm{e}^{1/2\,n\ln(x)}\right)^2b+15\,a^2\right)\sqrt{a+b\left(\mathrm{e}^{\frac{n\ln(x)}{2}}\right)^2}-\frac{5\,a^3}{8\,n}\ln\left(\mathrm{e}^{\frac{n\ln(x)}{2}}\sqrt{b}+\sqrt{a+b\left(\mathrm{e}^{\frac{n\ln(x)}{2}}\right)^2}\right)b^{-\frac{7}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+7/2*n)/(a+b*x^n)^(1/2),x)
```

```
[Out] 1/24*exp(1/2*n*ln(x))*(8*exp(1/2*n*ln(x))^4*b^2-10*a*exp(1/2*n*ln
(x))^2*b+15*a^2)*(a+b*exp(1/2*n*ln(x))^2)^(1/2)/b^3/n-5/8*a^3/b^(
7/2)/n*ln(exp(1/2*n*ln(x))*b^(1/2)+(a+b*exp(1/2*n*ln(x))^2)^(1/2)
)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(7/2*n - 1)/sqrt(b*x^n + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.265074, size = 1, normalized size = 0.01

$$\left[\frac{15\,a^3\log\left(2\,\sqrt{bx^n+a}bx^{\frac{1}{2}\,n}-2\,b^{\frac{3}{2}}x^n-a\sqrt{b}\right)+2\left(8\,b^{\frac{5}{2}}x^{\frac{5}{2}\,n}-10\,ab^{\frac{3}{2}}x^{\frac{3}{2}\,n}+15\,a^2\sqrt{b}x^{\frac{1}{2}\,n}\right)\sqrt{bx^n+a}}{48\,b^{\frac{7}{2}}n},\right.$$
$$\left.-\frac{15\,a^3\arctan\left(\frac{\sqrt{-b}x^{\frac{1}{2}\,n}}{\sqrt{bx^n+a}}\right)-\left(8\,\sqrt{-b}b^2x^{\frac{5}{2}\,n}-10\,a\sqrt{-b}bx^{\frac{3}{2}\,n}+15\,a^2\sqrt{-b}x^{\frac{1}{2}\,n}\right)\sqrt{bx^n+a}}{24\,\sqrt{-b}b^3n}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(7/2*n - 1)/sqrt(b*x^n + a),x, algorithm="fricas")
```

```
[Out] [1/48*(15*a^3*log(2*sqrt(b*x^n + a)*b*x^(1/2*n) - 2*b^(3/2)*x^n -
 a*sqrt(b)) + 2*(8*b^(5/2)*x^(5/2*n) - 10*a*b^(3/2)*x^(3/2*n) + 1
5*a^2*sqrt(b)*x^(1/2*n))*sqrt(b*x^n + a))/(b^(7/2)*n), -1/24*(15*
a^3*arctan(sqrt(-b)*x^(1/2*n)/sqrt(b*x^n + a)) - (8*sqrt(-b)*b^2*
x^(5/2*n) - 10*a*sqrt(-b)*b*x^(3/2*n) + 15*a^2*sqrt(-b)*x^(1/2*n)
)*sqrt(b*x^n + a))/(sqrt(-b)*b^3*n)]
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+7/2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{\frac{7}{2}n-1}}{\sqrt{bx^n+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(7/2*n - 1)/sqrt(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(7/2*n - 1)/sqrt(b*x^n + a), x)
```

3.2681 $\int \frac{x^{-1+\frac{5n}{2}}}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=98

$$\frac{3a^2\tanh^{-1}\left(\frac{\sqrt{b}x^{n/2}}{\sqrt{a+bx^n}}\right)}{4b^{5/2}n}-\frac{3ax^{n/2}\sqrt{a+bx^n}}{4b^2n}+\frac{x^{3n/2}\sqrt{a+bx^n}}{2bn}$$

```
[Out] (-3*a*x^(n/2)*Sqrt[a + b*x^n])/(4*b^2*n) + (x^((3*n)/2)*Sqrt[a +
b*x^n])/(2*b*n) + (3*a^2*ArcTanh[(Sqrt[b]*x^(n/2))/Sqrt[a + b*x^n
]])/(4*b^(5/2)*n)
```

Rubi [A] time = 0.108191, antiderivative size = 98, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$\frac{3a^2\tanh^{-1}\left(\frac{\sqrt{b}x^{n/2}}{\sqrt{a+bx^n}}\right)}{4b^{5/2}n}-\frac{3ax^{n/2}\sqrt{a+bx^n}}{4b^2n}+\frac{x^{3n/2}\sqrt{a+bx^n}}{2bn}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + (5*n)/2)/Sqrt[a + b*x^n],x]
```

```
[Out] (-3*a*x^(n/2)*Sqrt[a + b*x^n])/(4*b^2*n) + (x^((3*n)/2)*Sqrt[a +
b*x^n])/(2*b*n) + (3*a^2*ArcTanh[(Sqrt[b]*x^(n/2))/Sqrt[a + b*x^n
]])/(4*b^(5/2)*n)
```

Rubi in Sympy [A] time = 15.3045, size = 116, normalized size = 1.18

$$\frac{a^2x^{\frac{3n}{2}}}{2bn\left(a+bx^n\right)^{\frac{3}{2}}\left(-\frac{bx^n}{a+bx^n}+1\right)^2}-\frac{3a^2x^{\frac{n}{2}}}{4b^2n\sqrt{a+bx^n}\left(-\frac{bx^n}{a+bx^n}+1\right)}+\frac{3a^2\operatorname{atanh}\left(\frac{\sqrt{b}x^{\frac{n}{2}}}{\sqrt{a+bx^n}}\right)}{4b^{\frac{5}{2}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+5/2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] a**2*x**(3*n/2)/(2*b*n*(a + b*x**n)**(3/2)*(-b*x**n/(a + b*x**n)
+ 1)**2) - 3*a**2*x**(n/2)/(4*b**2*n*sqrt(a + b*x**n)*(-b*x**n/(a
 + b*x**n) + 1)) + 3*a**2*atanh(sqrt(b)*x**(n/2)/sqrt(a + b*x**n)
)/(4*b**(5/2)*n)
```

Mathematica [A] time = 0.0847465, size = 80, normalized size = 0.82

$$\frac{3a^2\log\left(\sqrt{b}\sqrt{a+bx^n}+bx^{n/2}\right)+\sqrt{b}x^{n/2}\sqrt{a+bx^n}\left(2bx^n-3a\right)}{4b^{5/2}n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + (5*n)/2)/Sqrt[a + b*x^n],x]
```

```
[Out] (Sqrt[b]*x^(n/2)*Sqrt[a + b*x^n]*(-3*a + 2*b*x^n) + 3*a^2*Log[b*x
^(n/2) + Sqrt[b]*Sqrt[a + b*x^n]])/(4*b^(5/2)*n)
```

Maple [A] time = 0.051, size = 82, normalized size = 0.8

$$-\frac{1}{4\,b^{2}n}\mathrm{e}^{\frac{n\ln(x)}{2}}\left(-2\,b\left(\mathrm{e}^{1/2\,n\ln(x)}\right)^{2}+3\,a\right)\sqrt{a+b\left(\mathrm{e}^{\frac{n\ln(x)}{2}}\right)^{2}}+\frac{3\,a^{2}}{4\,n}\ln\left(\mathrm{e}^{\frac{n\ln(x)}{2}}\sqrt{b}+\sqrt{a+b\left(\mathrm{e}^{\frac{n\ln(x)}{2}}\right)^{2}}\right)b^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+5/2*n)/(a+b*x^n)^(1/2),x)
```

```
[Out] -1/4*exp(1/2*n*ln(x))*(-2*b*exp(1/2*n*ln(x))^2+3*a)*(a+b*exp(1/2*
n*ln(x))^2)^(1/2)/b^2/n+3/4*a^2/b^(5/2)/n*ln(exp(1/2*n*ln(x))*b^(
1/2)+(a+b*exp(1/2*n*ln(x))^2)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5/2*n - 1)/sqrt(b*x^n + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.25389, size = 1, normalized size = 0.01

$$\left[\frac{3\,a^{2}\log\left(-2\,\sqrt{bx^{n}+a}bx^{\frac{1}{2}\,n}-2\,b^{\frac{3}{2}}x^{n}-a\sqrt{b}\right)+2\left(2\,b^{\frac{3}{2}}x^{\frac{3}{2}\,n}-3\,a\sqrt{b}x^{\frac{1}{2}\,n}\right)\sqrt{bx^{n}+a}}{8\,b^{\frac{5}{2}}n},\ \frac{3\,a^{2}\arctan\left(\frac{\sqrt{-b}x^{\frac{1}{2}\,n}}{\sqrt{bx^{n}+a}}\right)+\left(2\,\sqrt{-b}bx^{\frac{3}{2}\,n}\right.}{4\,\sqrt{-b}b^{2}n}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5/2*n - 1)/sqrt(b*x^n + a),x, algorithm="fricas")
```

```
[Out] [1/8*(3*a^2*log(-2*sqrt(b*x^n + a)*b*x^(1/2*n) - 2*b^(3/2)*x^n -
a*sqrt(b)) + 2*(2*b^(3/2)*x^(3/2*n) - 3*a*sqrt(b)*x^(1/2*n))*sqrt
(b*x^n + a))/(b^(5/2)*n), 1/4*(3*a^2*arctan(sqrt(-b)*x^(1/2*n)/sq
rt(b*x^n + a)) + (2*sqrt(-b)*b*x^(3/2*n) - 3*a*sqrt(-b)*x^(1/2*n)
)*sqrt(b*x^n + a))/(sqrt(-b)*b^2*n)]
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+5/2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{\frac{5}{2}\,n-1}}{\sqrt{bx^{n}+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(5/2*n - 1)/sqrt(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(5/2*n - 1)/sqrt(b*x^n + a), x)
```

3.2682 $\int \frac{x^{-1+\frac{3n}{2}}}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=62

$$\frac{x^{n/2}\sqrt{a+bx^n}}{bn}-\frac{a\tanh^{-1}\left(\frac{\sqrt{b}x^{n/2}}{\sqrt{a+bx^n}}\right)}{b^{3/2}n}$$

```
[Out] (x^(n/2)*Sqrt[a + b*x^n])/(b*n) - (a*ArcTanh[(Sqrt[b]*x^(n/2))/Sq
rt[a + b*x^n]])/(b^(3/2)*n)
```

Rubi [A] time = 0.071625, antiderivative size = 62, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$\frac{x^{n/2}\sqrt{a+bx^n}}{bn}-\frac{a\tanh^{-1}\left(\frac{\sqrt{b}x^{n/2}}{\sqrt{a+bx^n}}\right)}{b^{3/2}n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + (3*n)/2)/Sqrt[a + b*x^n],x]
```

```
[Out] (x^(n/2)*Sqrt[a + b*x^n])/(b*n) - (a*ArcTanh[(Sqrt[b]*x^(n/2))/Sq
rt[a + b*x^n]])/(b^(3/2)*n)
```

Rubi in Sympy [A] time = 9.1099, size = 63, normalized size = 1.02

$$\frac{ax^{\frac{n}{2}}}{bn\sqrt{a+bx^n}\left(-\frac{bx^n}{a+bx^n}+1\right)}-\frac{a\,\mathrm{atanh}\left(\frac{\sqrt{b}x^{\frac{n}{2}}}{\sqrt{a+bx^n}}\right)}{b^{\frac{3}{2}}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+3/2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] a*x**(n/2)/(b*n*sqrt(a + b*x**n)*(-b*x**n/(a + b*x**n) + 1)) - a*
atanh(sqrt(b)*x**(n/2)/sqrt(a + b*x**n))/(b**(3/2)*n)
```

Mathematica [A] time = 0.0503704, size = 65, normalized size = 1.05

$$\frac{x^{n/2}\sqrt{a+bx^n}}{bn}-\frac{a\log\left(\sqrt{b}\sqrt{a+bx^n}+bx^{n/2}\right)}{b^{3/2}n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + (3*n)/2)/Sqrt[a + b*x^n],x]
```

```
[Out] (x^(n/2)*Sqrt[a + b*x^n])/(b*n) - (a*Log[b*x^(n/2) + Sqrt[b]*Sqrt
[a + b*x^n]])/(b^(3/2)*n)
```

Maple [A] time = 0.049, size = 64, normalized size = 1.

$$\frac{1}{bn}e^{\frac{n\ln(x)}{2}}\sqrt{a+b\left(e^{\frac{n\ln(x)}{2}}\right)^2}-\frac{a}{n}\ln\left(e^{\frac{n\ln(x)}{2}}\sqrt{b}+\sqrt{a+b\left(e^{\frac{n\ln(x)}{2}}\right)^2}\right)b^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+3/2*n)/(a+b*x^n)^(1/2),x)
```

```
[Out] 1/b/n*exp(1/2*n*ln(x))*(a+b*exp(1/2*n*ln(x))^2)^(1/2)-a/b^(3/2)/n
*ln(exp(1/2*n*ln(x))*b^(1/2)+(a+b*exp(1/2*n*ln(x))^2)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2*n - 1)/sqrt(b*x^n + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.248847, size = 1, normalized size = 0.02

$$\left[\frac{2\sqrt{bx^n+a}\sqrt{b}x^{\frac{1}{2}n}+a\log\left(2\sqrt{bx^n+a}bx^{\frac{1}{2}n}-2b^{\frac{3}{2}}x^n-a\sqrt{b}\right)}{2b^{\frac{3}{2}}n}, \frac{\sqrt{bx^n+a}\sqrt{-b}x^{\frac{1}{2}n}-a\arctan\left(\frac{\sqrt{-b}x^{\frac{1}{2}n}}{\sqrt{bx^n+a}}\right)}{\sqrt{-b}bn}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2*n - 1)/sqrt(b*x^n + a),x, algorithm="fricas")
```

```
[Out] [1/2*(2*sqrt(b*x^n + a)*sqrt(b)*x^(1/2*n) + a*log(2*sqrt(b*x^n +
a)*b*x^(1/2*n) - 2*b^(3/2)*x^n - a*sqrt(b)))/(b^(3/2)*n), (sqrt(b
*x^n + a)*sqrt(-b)*x^(1/2*n) - a*arctan(sqrt(-b)*x^(1/2*n)/sqrt(b
*x^n + a)))/(sqrt(-b)*b*n)]
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+3/2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{\frac{3}{2}n-1}}{\sqrt{bx^n+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(3/2*n - 1)/sqrt(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(3/2*n - 1)/sqrt(b*x^n + a), x)
```

3.2683 $\int \frac{x^{-1+\frac{n}{2}}}{\sqrt{a+bx^n}} dx$

Optimal. Leaf size=35

$$\frac{2\tanh^{-1}\left(\frac{\sqrt{b}x^{n/2}}{\sqrt{a+bx^n}}\right)}{\sqrt{b}n}$$

```
[Out] (2*ArcTanh[(Sqrt[b]*x^(n/2))/Sqrt[a + b*x^n]])/(Sqrt[b]*n)
```

Rubi [A] time = 0.0488729, antiderivative size = 35, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$\frac{2\tanh^{-1}\left(\frac{\sqrt{b}x^{n/2}}{\sqrt{a+bx^n}}\right)}{\sqrt{b}n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + n/2)/Sqrt[a + b*x^n],x]

[Out] (2*ArcTanh[(Sqrt[b]*x^(n/2))/Sqrt[a + b*x^n]])/(Sqrt[b]*n)
```

Rubi in Sympy [A] time = 5.30955, size = 29, normalized size = 0.83

$$\frac{2\,\mathrm{atanh}\left(\frac{\sqrt{b}x^{\frac{n}{2}}}{\sqrt{a+bx^n}}\right)}{\sqrt{b}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+1/2*n)/(a+b*x**n)**(1/2),x)

[Out] 2*atanh(sqrt(b)*x**(n/2)/sqrt(a + b*x**n))/(sqrt(b)*n)
```

Mathematica [A] time = 0.0302835, size = 38, normalized size = 1.09

$$\frac{2\log\left(\sqrt{b}\sqrt{a+bx^n}+bx^{n/2}\right)}{\sqrt{b}n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + n/2)/Sqrt[a + b*x^n],x]

[Out] (2*Log[b*x^(n/2) + Sqrt[b]*Sqrt[a + b*x^n]])/(Sqrt[b]*n)
```

Maple [F] time = 0.072, size = 0, normalized size = 0.

$$\int 1x^{-1+\frac{n}{2}}\frac{1}{\sqrt{a+bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+1/2*n)/(a+b*x^n)^(1/2),x)

[Out] int(x^(-1+1/2*n)/(a+b*x^n)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(1/2*n - 1)/sqrt(b*x^n + a),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(1/2*n - 1)/sqrt(b*x^n + a),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+1/2*n)/(a+b*x**n)**(1/2),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{\frac{1}{2}\,n-1}}{\sqrt{bx^n + a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(1/2*n - 1)/sqrt(b*x^n + a),x, algorithm="giac")

[Out] integrate(x^(1/2*n - 1)/sqrt(b*x^n + a), x)
```

3.2684 $\int \frac{x^{-1-\frac{n}{2}}}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=26

$$-\frac{2x^{-n/2}\sqrt{a+bx^n}}{an}$$

```
[Out] (-2*Sqrt[a + b*x^n])/(a*n*x^(n/2))
```

Rubi [A] time = 0.0270315, antiderivative size = 26, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048

$$-\frac{2x^{-n/2}\sqrt{a+bx^n}}{an}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 - n/2)/Sqrt[a + b*x^n],x]
```

```
[Out] (-2*Sqrt[a + b*x^n])/(a*n*x^(n/2))
```

Rubi in Sympy [A] time = 3.09779, size = 20, normalized size = 0.77

$$-\frac{2x^{-\frac{n}{2}}\sqrt{a+bx^n}}{an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1-1/2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] -2*x**(-n/2)*sqrt(a + b*x**n)/(a*n)
```

Mathematica [A] time = 0.0348794, size = 26, normalized size = 1.

$$-\frac{2x^{-n/2}\sqrt{a+bx^n}}{an}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 - n/2)/Sqrt[a + b*x^n],x]
```

```
[Out] (-2*Sqrt[a + b*x^n])/(a*n*x^(n/2))
```

Maple [F] time = 0.083, size = 0, normalized size = 0.

$$\int 1x^{-1-\frac{n}{2}}\frac{1}{\sqrt{a+bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-1-1/2*n)/(a+b*x^n)^(1/2),x)
```

```
[Out] int(x^(-1-1/2*n)/(a+b*x^n)^(1/2),x)
```

Maxima [A] time = 1.53584, size = 30, normalized size = 1.15

$$-\frac{2\sqrt{bx^n + a}x^{-\frac{1}{2}n}}{an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-1/2*n - 1)/sqrt(b*x^n + a),x, algorithm="maxima")
```

```
[Out] -2*sqrt(b*x^n + a)*x^(-1/2*n)/(a*n)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-1/2*n - 1)/sqrt(b*x^n + a),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-1/2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{-\frac{1}{2}n-1}}{\sqrt{bx^n + a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-1/2*n - 1)/sqrt(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(-1/2*n - 1)/sqrt(b*x^n + a), x)
```

3.2685 $\int \frac{x^{-1-\frac{3n}{2}}}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=58

$$\frac{4bx^{-n/2}\sqrt{a+bx^n}}{3a^2n}-\frac{2x^{-3n/2}\sqrt{a+bx^n}}{3an}$$

```
[Out] (-2*Sqrt[a + b*x^n])/(3*a*n*x^((3*n)/2)) + (4*b*Sqrt[a + b*x^n])/
(3*a^2*n*x^(n/2))
```

Rubi [A] time = 0.056414, antiderivative size = 58, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095

$$\frac{4bx^{-n/2}\sqrt{a+bx^n}}{3a^2n}-\frac{2x^{-3n/2}\sqrt{a+bx^n}}{3an}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - (3*n)/2)/Sqrt[a + b*x^n],x]
```

```
[Out] (-2*Sqrt[a + b*x^n])/(3*a*n*x^((3*n)/2)) + (4*b*Sqrt[a + b*x^n])/
(3*a^2*n*x^(n/2))
```

Rubi in Sympy [A] time = 5.36357, size = 48, normalized size = 0.83

$$-\frac{2x^{-\frac{3n}{2}}\sqrt{a+bx^n}}{3an}+\frac{4bx^{-\frac{n}{2}}\sqrt{a+bx^n}}{3a^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-3/2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] -2*x**(-3*n/2)*sqrt(a + b*x**n)/(3*a*n) + 4*b*x**(-n/2)*sqrt(a +
b*x**n)/(3*a**2*n)
```

Mathematica [A] time = 0.0474612, size = 36, normalized size = 0.62

$$-\frac{2x^{-3n/2}\left(a-2bx^n\right)\sqrt{a+bx^n}}{3a^2n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - (3*n)/2)/Sqrt[a + b*x^n],x]
```

```
[Out] (-2*(a - 2*b*x^n)*Sqrt[a + b*x^n])/(3*a^2*n*x^((3*n)/2))
```

Maple [F] time = 0.083, size = 0, normalized size = 0.

$$\int 1x^{-1-\frac{3n}{2}}\frac{1}{\sqrt{a+bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-3/2*n)/(a+b*x^n)^(1/2),x)
```

```
[Out] int(x^(-1-3/2*n)/(a+b*x^n)^(1/2),x)
```

Maxima [A] time = 1.53043, size = 62, normalized size = 1.07

$$\frac{2\sqrt{bx^n + a}bx^{-\frac{1}{2}n}}{a^2n} - \frac{2(bx^n + a)^{\frac{3}{2}}x^{-\frac{3}{2}n}}{3a^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-3/2*n - 1)/sqrt(b*x^n + a),x, algorithm="maxima")
```

```
[Out] 2*sqrt(b*x^n + a)*b*x^(-1/2*n)/(a^2*n) - 2/3*(b*x^n + a)^(3/2)*x^
(-3/2*n)/(a^2*n)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-3/2*n - 1)/sqrt(b*x^n + a),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-3/2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{-\frac{3}{2}n-1}}{\sqrt{bx^n + a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-3/2*n - 1)/sqrt(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(-3/2*n - 1)/sqrt(b*x^n + a), x)
```

3.2686 $\int \frac{x^{-1-\frac{5n}{2}}}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=89

$$-\frac{16b^2x^{-n/2}\sqrt{a+bx^n}}{15a^3n}+\frac{8bx^{-3n/2}\sqrt{a+bx^n}}{15a^2n}-\frac{2x^{-5n/2}\sqrt{a+bx^n}}{5an}$$

```
[Out] (-2*Sqrt[a + b*x^n])/(5*a*n*x^((5*n)/2)) + (8*b*Sqrt[a + b*x^n])/
(15*a^2*n*x^((3*n)/2)) - (16*b^2*Sqrt[a + b*x^n])/(15*a^3*n*x^(n/
2))
```

Rubi [A] time = 0.0889409, antiderivative size = 89, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095

$$-\frac{16b^2x^{-n/2}\sqrt{a+bx^n}}{15a^3n}+\frac{8bx^{-3n/2}\sqrt{a+bx^n}}{15a^2n}-\frac{2x^{-5n/2}\sqrt{a+bx^n}}{5an}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 - (5*n)/2)/Sqrt[a + b*x^n],x]
```

```
[Out] (-2*Sqrt[a + b*x^n])/(5*a*n*x^((5*n)/2)) + (8*b*Sqrt[a + b*x^n])/
(15*a^2*n*x^((3*n)/2)) - (16*b^2*Sqrt[a + b*x^n])/(15*a^3*n*x^(n/
2))
```

Rubi in Sympy [A] time = 8.75745, size = 76, normalized size = 0.85

$$-\frac{2x^{-\frac{5n}{2}}\sqrt{a+bx^n}}{5an}+\frac{8bx^{-\frac{3n}{2}}\sqrt{a+bx^n}}{15a^2n}-\frac{16b^2x^{-\frac{n}{2}}\sqrt{a+bx^n}}{15a^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1-5/2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] -2*x**(-5*n/2)*sqrt(a + b*x**n)/(5*a*n) + 8*b*x**(-3*n/2)*sqrt(a
+ b*x**n)/(15*a**2*n) - 16*b**2*x**(-n/2)*sqrt(a + b*x**n)/(15*a*
*3*n)
```

Mathematica [A] time = 0.0540237, size = 51, normalized size = 0.57

$$-\frac{2x^{-5n/2}\sqrt{a+bx^n}\left(3a^2-4abx^n+8b^2x^{2n}\right)}{15a^3n}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 - (5*n)/2)/Sqrt[a + b*x^n],x]
```

```
[Out] (-2*Sqrt[a + b*x^n]*(3*a^2 - 4*a*b*x^n + 8*b^2*x^(2*n)))/(15*a^3*
n*x^((5*n)/2))
```

Maple [F] time = 0.085, size = 0, normalized size = 0.

$$\int 1x^{-1-\frac{5n}{2}}\frac{1}{\sqrt{a+bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-5/2*n)/(a+b*x^n)^(1/2),x)
```

```
[Out] int(x^(-1-5/2*n)/(a+b*x^n)^(1/2),x)
```

Maxima [A] time = 1.5411, size = 96, normalized size = 1.08

$$-\frac{2\sqrt{bx^n+a}b^2x^{-\frac{1}{2}n}}{a^3n}+\frac{4(bx^n+a)^{\frac{3}{2}}bx^{-\frac{3}{2}n}}{3a^3n}-\frac{2(bx^n+a)^{\frac{5}{2}}x^{-\frac{5}{2}n}}{5a^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-5/2*n - 1)/sqrt(b*x^n + a),x, algorithm="maxima")
```

```
[Out] -2*sqrt(b*x^n + a)*b^2*x^(-1/2*n)/(a^3*n) + 4/3*(b*x^n + a)^(3/2)
*b*x^(-3/2*n)/(a^3*n) - 2/5*(b*x^n + a)^(5/2)*x^(-5/2*n)/(a^3*n)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-5/2*n - 1)/sqrt(b*x^n + a),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-5/2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{-\frac{5}{2}n-1}}{\sqrt{bx^n+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-5/2*n - 1)/sqrt(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(-5/2*n - 1)/sqrt(b*x^n + a), x)
```

3.2687 $\int \frac{x^{-1-\frac{7n}{2}}}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=120

$$\frac{32b^3x^{-n/2}\sqrt{a+bx^n}}{35a^4n}-\frac{16b^2x^{-3n/2}\sqrt{a+bx^n}}{35a^3n}+\frac{12bx^{-5n/2}\sqrt{a+bx^n}}{35a^2n}-\frac{2x^{-7n/2}\sqrt{a+bx^n}}{7an}$$

```
[Out] (-2*Sqrt[a + b*x^n])/(7*a*n*x^((7*n)/2)) + (12*b*Sqrt[a + b*x^n])
/(35*a^2*n*x^((5*n)/2)) - (16*b^2*Sqrt[a + b*x^n])/(35*a^3*n*x^((
3*n)/2)) + (32*b^3*Sqrt[a + b*x^n])/(35*a^4*n*x^(n/2))
```

Rubi [A] time = 0.126124, antiderivative size = 120, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095

$$\frac{32b^3x^{-n/2}\sqrt{a+bx^n}}{35a^4n}-\frac{16b^2x^{-3n/2}\sqrt{a+bx^n}}{35a^3n}+\frac{12bx^{-5n/2}\sqrt{a+bx^n}}{35a^2n}-\frac{2x^{-7n/2}\sqrt{a+bx^n}}{7an}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 - (7*n)/2)/Sqrt[a + b*x^n],x]
```

```
[Out] (-2*Sqrt[a + b*x^n])/(7*a*n*x^((7*n)/2)) + (12*b*Sqrt[a + b*x^n])
/(35*a^2*n*x^((5*n)/2)) - (16*b^2*Sqrt[a + b*x^n])/(35*a^3*n*x^((
3*n)/2)) + (32*b^3*Sqrt[a + b*x^n])/(35*a^4*n*x^(n/2))
```

Rubi in Sympy [A] time = 13.4536, size = 105, normalized size = 0.88

$$-\frac{2x^{-\frac{7n}{2}}\sqrt{a+bx^n}}{7an}+\frac{12bx^{-\frac{5n}{2}}\sqrt{a+bx^n}}{35a^2n}-\frac{16b^2x^{-\frac{3n}{2}}\sqrt{a+bx^n}}{35a^3n}+\frac{32b^3x^{-\frac{n}{2}}\sqrt{a+bx^n}}{35a^4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1-7/2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] -2*x**(-7*n/2)*sqrt(a + b*x**n)/(7*a*n) + 12*b*x**(-5*n/2)*sqrt(a
 + b*x**n)/(35*a**2*n) - 16*b**2*x**(-3*n/2)*sqrt(a + b*x**n)/(35
*a**3*n) + 32*b**3*x**(-n/2)*sqrt(a + b*x**n)/(35*a**4*n)
```

Mathematica [A] time = 0.0671014, size = 64, normalized size = 0.53

$$\frac{2x^{-7n/2}\sqrt{a+bx^n}\left(-5a^3+6a^2bx^n-8ab^2x^{2n}+16b^3x^{3n}\right)}{35a^4n}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 - (7*n)/2)/Sqrt[a + b*x^n],x]
```

```
[Out] (2*Sqrt[a + b*x^n]*(-5*a^3 + 6*a^2*b*x^n - 8*a*b^2*x^(2*n) + 16*b
^3*x^(3*n)))/(35*a^4*n*x^((7*n)/2))
```

Maple [F] time = 0.085, size = 0, normalized size = 0.

$$\int 1x^{-1-\frac{7n}{2}}\frac{1}{\sqrt{a+bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-7/2*n)/(a+b*x^n)^(1/2),x)
```

```
[Out] int(x^(-1-7/2*n)/(a+b*x^n)^(1/2),x)
```

Maxima [A] time = 1.5498, size = 130, normalized size = 1.08

$$\frac{2\sqrt{bx^n+a}b^3x^{-\frac{1}{2}n}}{a^4n}-\frac{2(bx^n+a)^{\frac{3}{2}}b^2x^{-\frac{3}{2}n}}{a^4n}+\frac{6(bx^n+a)^{\frac{5}{2}}bx^{-\frac{5}{2}n}}{5a^4n}-\frac{2(bx^n+a)^{\frac{7}{2}}x^{-\frac{7}{2}n}}{7a^4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-7/2*n - 1)/sqrt(b*x^n + a),x, algorithm="maxima")
```

```
[Out] 2*sqrt(b*x^n + a)*b^3*x^(-1/2*n)/(a^4*n) - 2*(b*x^n + a)^(3/2)*b^
2*x^(-3/2*n)/(a^4*n) + 6/5*(b*x^n + a)^(5/2)*b*x^(-5/2*n)/(a^4*n)
 - 2/7*(b*x^n + a)^(7/2)*x^(-7/2*n)/(a^4*n)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-7/2*n - 1)/sqrt(b*x^n + a),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-7/2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{-\frac{7}{2}n-1}}{\sqrt{bx^n+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(-7/2*n - 1)/sqrt(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate(x^(-7/2*n - 1)/sqrt(b*x^n + a), x)
```

3.2688 $\int \frac{x^m}{\sqrt{a+bx^{-2+m}}}\,dx$

Optimal. Leaf size=65

$$\frac{x^{m+1}\sqrt{a+bx^{m-2}}\,{}_2F_1\left(1,-\frac{3m}{2(2-m)};\frac{1-2m}{2-m};-\frac{bx^{m-2}}{a}\right)}{a(m+1)}$$

```
[Out] (x^(1 + m)*Sqrt[a + b*x^(-2 + m)]*Hypergeometric2F1[1, (-3*m)/(2*
(2 - m)), (1 - 2*m)/(2 - m), -((b*x^(-2 + m))/a)])/(a*(1 + m))
```

Rubi [A] time = 0.10332, antiderivative size = 80, normalized size of antiderivative = 1.23, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$

$$\frac{x^{m+1}\sqrt{\frac{bx^{m-2}}{a}+1}\,{}_2F_1\left(\frac{1}{2},-\frac{m+1}{2-m};\frac{1-2m}{2-m};-\frac{bx^{m-2}}{a}\right)}{(m+1)\sqrt{a+bx^{m-2}}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m/Sqrt[a + b*x^(-2 + m)],x]
```

```
[Out] (x^(1 + m)*Sqrt[1 + (b*x^(-2 + m))/a]*Hypergeometric2F1[1/2, -((1
 + m)/(2 - m)), (1 - 2*m)/(2 - m), -((b*x^(-2 + m))/a)])/((1 + m)
*Sqrt[a + b*x^(-2 + m)])
```

Rubi in Sympy [A] time = 8.56817, size = 60, normalized size = 0.92

$$\frac{x^{m+1}\sqrt{a+bx^{m-2}}\,{}_2F_1\left(\left.\begin{matrix}\frac{1}{2},\frac{m+1}{m-2}\\ \frac{2m-1}{m-2}\end{matrix}\right|-\frac{bx^{m-2}}{a}\right)}{a\sqrt{1+\frac{bx^{m-2}}{a}}\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m/(a+b*x**(-2+m))**(1/2),x)
```

```
[Out] x**(m + 1)*sqrt(a + b*x**(m - 2))*hyper((1/2, (m + 1)/(m - 2)), (
(2*m - 1)/(m - 2),), -b*x**(m - 2)/a)/(a*sqrt(1 + b*x**(m - 2)/a)
*(m + 1))
```

Mathematica [A] time = 0.199285, size = 110, normalized size = 1.69

$$\frac{2x\left(6ax^2\sqrt{\frac{ax^{2-m}}{b}+1}\,{}_2F_1\left(\frac{1}{2},\frac{m-8}{2(m-2)};\frac{3(m-4)}{2(m-2)};-\frac{ax^{2-m}}{b}\right)+(m-8)\left(ax^2+bx^m\right)\right)}{b(m-8)(m+4)\sqrt{a+bx^{m-2}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m/Sqrt[a + b*x^(-2 + m)],x]
```

```
[Out] (2*x*((-8 + m)*(a*x^2 + b*x^m) + 6*a*x^2*Sqrt[1 + (a*x^(2 - m))/b
]*Hypergeometric2F1[1/2, (-8 + m)/(2*(-2 + m)), (3*(-4 + m))/(2*(
-2 + m)), -((a*x^(2 - m))/b)]))/(b*(-8 + m)*(4 + m)*Sqrt[a + b*x^
(-2 + m)])
```

Maple [F] time = 0.137, size = 0, normalized size = 0.

$$\int x^m \frac{1}{\sqrt{a+b x^{-2+m}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m/(a+b*x^(-2+m))^(1/2),x)

[Out] int(x^m/(a+b*x^(-2+m))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{\sqrt{b x^{m-2}+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/sqrt(b*x^(m - 2) + a),x, algorithm="maxima")

[Out] integrate(x^m/sqrt(b*x^(m - 2) + a), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/sqrt(b*x^(m - 2) + a),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m/(a+b*x**(-2+m))**(1/2),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{\sqrt{b x^{m-2}+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/sqrt(b*x^(m - 2) + a),x, algorithm="giac")

[Out] integrate(x^m/sqrt(b*x^(m - 2) + a), x)
```

3.2689 $\int \frac{x^m}{\sqrt{a+bx^{2-m}}}\,dx$

Optimal. Leaf size=67

$$\frac{x^{m+1}\sqrt{a+bx^{2-m}}\,{}_2F_1\left(1,\frac{m+4}{2(2-m)};\frac{3}{2-m};-\frac{bx^{2-m}}{a}\right)}{a(m+1)}$$

```
[Out] (x^(1 + m)*Sqrt[a + b*x^(2 - m)]*Hypergeometric2F1[1, (4 + m)/(2*
(2 - m)), 3/(2 - m), -((b*x^(2 - m))/a)])/(a*(1 + m))
```

Rubi [A] time = 0.105769, antiderivative size = 81, normalized size of antiderivative = 1.21, number of steps used = 2, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$\frac{x^{m+1}\sqrt{\frac{bx^{2-m}}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{m+1}{2-m};\frac{3}{2-m};-\frac{bx^{2-m}}{a}\right)}{(m+1)\sqrt{a+bx^{2-m}}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m/Sqrt[a + b*x^(2 - m)],x]
```

```
[Out] (x^(1 + m)*Sqrt[1 + (b*x^(2 - m))/a]*Hypergeometric2F1[1/2, (1 +
m)/(2 - m), 3/(2 - m), -((b*x^(2 - m))/a)])/((1 + m)*Sqrt[a + b*x
^(2 - m)])
```

Rubi in Sympy [A] time = 8.40574, size = 60, normalized size = 0.9

$$\frac{x^{m+1}\sqrt{a+bx^{-m+2}}\,{}_2F_1\left(\begin{matrix}\frac{1}{2},-\frac{m+1}{m-2}\\ -\frac{3}{m-2}\end{matrix}\middle|-\frac{bx^{-m+2}}{a}\right)}{a\sqrt{1+\frac{bx^{-m+2}}{a}}\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m/(a+b*x**(2-m))**(1/2),x)
```

```
[Out] x**(m + 1)*sqrt(a + b*x**(-m + 2))*hyper((1/2, -(m + 1)/(m - 2)),
 (-3/(m - 2),), -b*x**(-m + 2)/a)/(a*sqrt(1 + b*x**(-m + 2)/a)*(m
 + 1))
```

Mathematica [A] time = 0.229026, size = 79, normalized size = 1.18

$$\frac{x^{m+1}\sqrt{\frac{bx^{2-m}}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{m+1}{2-m};-\frac{3}{m-2};-\frac{bx^{2-m}}{a}\right)}{(m+1)\sqrt{a+bx^{2-m}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m/Sqrt[a + b*x^(2 - m)],x]
```

```
[Out] (x^(1 + m)*Sqrt[1 + (b*x^(2 - m))/a]*Hypergeometric2F1[1/2, (1 +
m)/(2 - m), -3/(-2 + m), -((b*x^(2 - m))/a)])/((1 + m)*Sqrt[a + b
*x^(2 - m)])
```

Maple [F] time = 0.074, size = 0, normalized size = 0.

$$\int x^m \frac{1}{\sqrt{a+bx^{2-m}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m/(a+b*x^(2-m))^(1/2),x)

[Out] int(x^m/(a+b*x^(2-m))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

crash

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/sqrt(a + b*x^(2 - m)),x, algorithm="maxima")

[Out] crash
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/sqrt(b*x^(-m + 2) + a),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m/(a+b*x**(2-m))**(1/2),x)

[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{\sqrt{bx^{-m+2}+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/sqrt(b*x^(-m + 2) + a),x, algorithm="giac")

[Out] integrate(x^m/sqrt(b*x^(-m + 2) + a), x)
```

3.2690 $\int \left(\frac{6ax^2}{b(4+m)\sqrt{a+bx^{-2+m}}}+\frac{x^m}{\sqrt{a+bx^{-2+m}}}\right)\,dx$

Optimal. Leaf size=26

$$\frac{2x^3\sqrt{a+bx^{m-2}}}{b(m+4)}$$

```
[Out] (2*x^3*Sqrt[a + b*x^(-2 + m)])/(b*(4 + m))
```

Rubi [C] time = 0.256842, antiderivative size = 160, normalized size of antiderivative = 6.15, number of steps used = 5, number of rules used = 2, integrand size = 45, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.044

$$\frac{x^{m+1}\sqrt{\frac{bx^{m-2}}{a}+1}\,{}_2F_1\left(\frac{1}{2},-\frac{m+1}{2-m};\frac{1-2m}{2-m};-\frac{bx^{m-2}}{a}\right)}{(m+1)\sqrt{a+bx^{m-2}}}+\frac{2ax^3\sqrt{\frac{bx^{m-2}}{a}+1}\,{}_2F_1\left(\frac{1}{2},-\frac{3}{2-m};-\frac{m+1}{2-m};-\frac{bx^{m-2}}{a}\right)}{b(m+4)\sqrt{a+bx^{m-2}}}$$

Antiderivative was successfully verified.

```
[In] Int[(6*a*x^2)/(b*(4 + m)*Sqrt[a + b*x^(-2 + m)]) + x^m/Sqrt[a + b*x^(-
2 + m)],x]
```

```
[Out] (2*a*x^3*Sqrt[1 + (b*x^(-2 + m))/a]*Hypergeometric2F1[1/2, -3/(2
- m), -((1 + m)/(2 - m)), -((b*x^(-2 + m))/a)])/(b*(4 + m)*Sqrt[a
 + b*x^(-2 + m)]) + (x^(1 + m)*Sqrt[1 + (b*x^(-2 + m))/a]*Hyperge
ometric2F1[1/2, -((1 + m)/(2 - m)), (1 - 2*m)/(2 - m), -((b*x^(-2
 + m))/a)])/((1 + m)*Sqrt[a + b*x^(-2 + m)])
```

Rubi in Sympy [A] time = 18.8859, size = 117, normalized size = 4.5

$$\frac{2x^3\sqrt{a+bx^{m-2}}\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{3}{m-2}\\ \frac{m+1}{m-2}\end{matrix}\middle|-\frac{bx^{m-2}}{a}\right)}{b\sqrt{1+\frac{bx^{m-2}}{a}}\,(m+4)}+\frac{x^{m+1}\sqrt{a+bx^{m-2}}\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{m+1}{m-2}\\ \frac{2m-1}{m-2}\end{matrix}\middle|-\frac{bx^{m-2}}{a}\right)}{a\sqrt{1+\frac{bx^{m-2}}{a}}\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(6*a*x**2/b/(4+m)/(a+b*x**(-2+m))**(1/2)+x**m/(a+b*x**(-
2+m))**(1/2),x)
```

```
[Out] 2*x**3*sqrt(a + b*x**(m - 2))*hyper((1/2, 3/(m - 2)), ((m + 1)/(m
 - 2),), -b*x**(m - 2)/a)/(b*sqrt(1 + b*x**(m - 2)/a)*(m + 4)) +
x**(m + 1)*sqrt(a + b*x**(m - 2))*hyper((1/2, (m + 1)/(m - 2)), (
(2*m - 1)/(m - 2),), -b*x**(m - 2)/a)/(a*sqrt(1 + b*x**(m - 2)/a)
*(m + 1))
```

Mathematica [A] time = 0.0907494, size = 26, normalized size = 1.

$$\frac{2x^3\sqrt{a+bx^{m-2}}}{b(m+4)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(6*a*x^2)/(b*(4 + m)*Sqrt[a + b*x^(-2 + m)]) + x^m/Sqrt[a + b*x^(-
2 + m)],x]
```

```
[Out] (2*x^3*Sqrt[a + b*x^(-2 + m)])/(b*(4 + m))
```

Maple [A] time = 0.053, size = 40, normalized size = 1.5

$$2\,\frac{x\left(ax^{2}+bx^{m}\right)}{\left(4+m\right)b}\frac{1}{\sqrt{\frac{ax^{2}+bx^{m}}{x^{2}}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(6*a*x^2/b/(4+m)/(a+b*x^(-2+m))^(1/2)+x^m/(a+b*x^(-2+m))^(1/2),x)
```

```
[Out] 2*x*(a*x^2+b*x^m)/b/(4+m)/((a*x^2+b*x^m)/x^2)^(1/2)
```

Maxima [A] time = 1.55777, size = 50, normalized size = 1.92

$$\frac{2\left(ax^{4}+bx^{2}x^{m}\right)}{\sqrt{ax^{2}+bx^{m}}b(m+4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/sqrt(b*x^(m - 2) + a) + 6*a*x^2/(sqrt(b*x^(m - 2) + a)*b*(m + 4)),x,
```

```
[Out] 2*(a*x^4 + b*x^2*x^m)/(sqrt(a*x^2 + b*x^m)*b*(m + 4))
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/sqrt(b*x^(m - 2) + a) + 6*a*x^2/(sqrt(b*x^(m - 2) + a)*b*(m + 4)),x,
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(6*a*x**2/b/(4+m)/(a+b*x**(-2+m))**(1/2)+x**m/(a+b*x**(-
2+m))**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{m}}{\sqrt{bx^{m-2}+a}}+\frac{6\,ax^{2}}{\sqrt{bx^{m-2}+a}b(m+4)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/sqrt(b*x^(m - 2) + a) + 6*a*x^2/(sqrt(b*x^(m - 2) + a)*b*(m + 4)),x,
```

```
[Out] integrate(x^m/sqrt(b*x^(m - 2) + a) + 6*a*x^2/(sqrt(b*x^(m - 2) +
 a)*b*(m + 4)), x)
```

3.2691 $\int \frac{x^{-1+m}(2am+b(2m-n)x^n)}{2(a+bx^n)^{3/2}}\,dx$

Optimal. Leaf size=15

$$\frac{x^m}{\sqrt{a+bx^n}}$$

```
[Out] x^m/Sqrt[a + b*x^n]
```

Rubi [A] time = 0.0638875, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.054$

$$\frac{x^m}{\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^(-1 + m)*(2*a*m + b*(2*m - n)*x^n))/(2*(a + b*x^n)^(3/2)),x]

[Out] x^m/Sqrt[a + b*x^n]
```

Rubi in Sympy [A] time = 7.56898, size = 12, normalized size = 0.8

$$\frac{x^m}{\sqrt{a+bx^n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/2*x**(-1+m)*(2*a*m+b*(2*m-n)*x**n)/(a+b*x**n)**(3/2),x)

[Out] x**m/sqrt(a + b*x**n)
```

Mathematica [A] time = 0.0843373, size = 15, normalized size = 1.

$$\frac{x^m}{\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^(-1 + m)*(2*a*m + b*(2*m - n)*x^n))/(2*(a + b*x^n)^(3/2)),x]

[Out] x^m/Sqrt[a + b*x^n]
```

Maple [F] time = 0.053, size = 0, normalized size = 0.

$$\int \frac{x^{-1+m}\left(2\,am+b\left(2\,m-n\right)x^n\right)}{2}\left(a+bx^n\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/2*x^(-1+m)*(2*a*m+b*(2*m-n)*x^n)/(a+b*x^n)^(3/2),x)

[Out] int(1/2*x^(-1+m)*(2*a*m+b*(2*m-n)*x^n)/(a+b*x^n)^(3/2),x)
```

Maxima [A] time = 1.63231, size = 18, normalized size = 1.2

$$\frac{x^m}{\sqrt{bx^n+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/2*(b*(2*m - n)*x^n + 2*a*m)*x^(m - 1)/(b*x^n + a)^(3/2),x, algorithm=
```

```
[Out] x^m/sqrt(b*x^n + a)
```

Fricas [A] time = 0.238836, size = 22, normalized size = 1.47

$$\frac{xx^{m-1}}{\sqrt{bx^n+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/2*(b*(2*m - n)*x^n + 2*a*m)*x^(m - 1)/(b*x^n + a)^(3/2),x, algorithm=
```

```
[Out] x*x^(m - 1)/sqrt(b*x^n + a)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/2*x**(-1+m)*(2*a*m+b*(2*m-n)*x**n)/(a+b*x**n)**(3/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b(2\,m-n)x^n+2\,am)x^{m-1}}{2\,(bx^n+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/2*(b*(2*m - n)*x^n + 2*a*m)*x^(m - 1)/(b*x^n + a)^(3/2),x, algorithm=
```

```
[Out] integrate(1/2*(b*(2*m - n)*x^n + 2*a*m)*x^(m - 1)/(b*x^n + a)^(3/
2), x)
```

3.2692 $\int \left(-\frac{bnx^{-1+m+n}}{2(a+bx^n)^{3/2}}+\frac{mx^{-1+m}}{\sqrt{a+bx^n}}\right)\,dx$

Optimal. Leaf size=15

$$\frac{x^m}{\sqrt{a+bx^n}}$$

```
[Out] x^m/Sqrt[a + b*x^n]
```

Rubi [C] time = 0.190587, antiderivative size = 126, normalized size of antiderivative = 8.4, number of steps used = 5, number of rules used = 2, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048

$$\frac{x^m\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{2},\frac{m}{n};\frac{m+n}{n};-\frac{bx^n}{a}\right)}{\sqrt{a+bx^n}}-\frac{bnx^{m+n}\sqrt{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{3}{2},\frac{m+n}{n};\frac{m}{n}+2;-\frac{bx^n}{a}\right)}{2a(m+n)\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In] Int[-(b*n*x^(-1 + m + n))/(2*(a + b*x^n)^(3/2)) + (m*x^(-1 + m))/Sqrt[a + b*x^n],x
```

```
[Out] (x^m*Sqrt[1 + (b*x^n)/a]*Hypergeometric2F1[1/2, m/n, (m + n)/n, -
((b*x^n)/a)])/Sqrt[a + b*x^n] - (b*n*x^(m + n)*Sqrt[1 + (b*x^n)/a
]*Hypergeometric2F1[3/2, (m + n)/n, 2 + m/n, -((b*x^n)/a)])/(2*a*
(m + n)*Sqrt[a + b*x^n])
```

Rubi in Sympy [A] time = 19.0928, size = 100, normalized size = 6.67

$$\frac{x^m\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{m}{n}\\ \frac{m+n}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{a\sqrt{1+\frac{bx^n}{a}}}-\frac{bnx^{m+n}\sqrt{a+bx^n}\,{}_2F_1\left(\begin{matrix}\frac{3}{2},\frac{m+n}{n}\\ \frac{m}{n}+2\end{matrix}\middle|-\frac{bx^n}{a}\right)}{2a^2\sqrt{1+\frac{bx^n}{a}}\,(m+n)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(-1/2*b*n*x**(-1+m+n)/(a+b*x**n)**(3/2)+m*x**(-1+m)/(a+b*x**n)**
```

```
[Out] x**m*sqrt(a + b*x**n)*hyper((1/2, m/n), ((m + n)/n,), -b*x**n/a)/
(a*sqrt(1 + b*x**n/a)) - b*n*x**(m + n)*sqrt(a + b*x**n)*hyper((3
/2, (m + n)/n), (m/n + 2,), -b*x**n/a)/(2*a**2*sqrt(1 + b*x**n/a)
*(m + n))
```

Mathematica [A] time = 0.0663734, size = 15, normalized size = 1.

$$\frac{x^m}{\sqrt{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[-(b*n*x^(-1 + m + n))/(2*(a + b*x^n)^(3/2)) + (m*x^(-
1 + m))/Sqrt[a + b*x^n],x]
```

```
[Out] x^m/Sqrt[a + b*x^n]
```

Maple [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{bnx^{-1+m+n}}{2}(a+bx^n)^{-\frac{3}{2}}+mx^{-1+m}\frac{1}{\sqrt{a+bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-1/2*b*n*x^(-1+m+n)/(a+b*x^n)^(3/2)+m*x^(-1+m)/(a+b*x^n)^(1/2),x)
```

```
[Out] int(-1/2*b*n*x^(-1+m+n)/(a+b*x^n)^(3/2)+m*x^(-1+m)/(a+b*x^n)^(1/2
),x)
```

Maxima [A] time = 1.64235, size = 18, normalized size = 1.2

$$\frac{x^m}{\sqrt{bx^n+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(-1/2*b*n*x^(m + n - 1)/(b*x^n + a)^(3/2) + m*x^(m - 1)/sqrt(b*x^n + a),x
```

```
[Out] x^m/sqrt(b*x^n + a)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(-1/2*b*n*x^(m + n - 1)/(b*x^n + a)^(3/2) + m*x^(m - 1)/sqrt(b*x^n + a),x
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(-1/2*b*n*x**(-1+m+n)/(a+b*x**n)**(3/2)+m*x**(-1+m)/(a+b*x**n)**(1/2)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{bnx^{m+n-1}}{2\,(bx^n+a)^{\frac{3}{2}}}+\frac{mx^{m-1}}{\sqrt{bx^n+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(-1/2*b*n*x^(m + n - 1)/(b*x^n + a)^(3/2) + m*x^(m - 1)/sqrt(b*x^n + a),x
```

```
[Out] integrate(-1/2*b*n*x^(m + n - 1)/(b*x^n + a)^(3/2) + m*x^(m - 1)/
sqrt(b*x^n + a), x)
```

3.2693 $\int \frac{x^m}{\sqrt[3]{a+bx^{3(1+m)}}}\,dx$

Optimal. Leaf size=97

$$\frac{\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x^{m+1}}{\sqrt[3]{a+bx^{3(m+1)}}}+1}{\sqrt{3}}\right)}{\sqrt{3}\sqrt[3]{b}(m+1)}-\frac{\log\left(\sqrt[3]{b}x^{m+1}-\sqrt[3]{a+bx^{3(m+1)}}\right)}{2\sqrt[3]{b}(m+1)}$$

```
[Out] ArcTan[(1 + (2*b^(1/3)*x^(1 + m))/(a + b*x^(3*(1 + m)))^(1/3))/Sq
rt[3]]/(Sqrt[3]*b^(1/3)*(1 + m)) - Log[b^(1/3)*x^(1 + m) - (a + b
*x^(3*(1 + m)))^(1/3)]/(2*b^(1/3)*(1 + m))
```

Rubi [A] time = 0.115021, antiderivative size = 97, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$\frac{\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x^{m+1}}{\sqrt[3]{a+bx^{3(m+1)}}}+1}{\sqrt{3}}\right)}{\sqrt{3}\sqrt[3]{b}(m+1)}-\frac{\log\left(\sqrt[3]{b}x^{m+1}-\sqrt[3]{a+bx^{3(m+1)}}\right)}{2\sqrt[3]{b}(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m/(a + b*x^(3*(1 + m)))^(1/3),x]
```

```
[Out] ArcTan[(1 + (2*b^(1/3)*x^(1 + m))/(a + b*x^(3*(1 + m)))^(1/3))/Sq
rt[3]]/(Sqrt[3]*b^(1/3)*(1 + m)) - Log[b^(1/3)*x^(1 + m) - (a + b
*x^(3*(1 + m)))^(1/3)]/(2*b^(1/3)*(1 + m))
```

Rubi in Sympy [A] time = 7.52415, size = 56, normalized size = 0.58

$$\frac{x^{m+1}\left(a+bx^{3m+3}\right)^{\frac{2}{3}}{}_2F_1\left(\begin{matrix}\frac{1}{3},\frac{1}{3}\\\frac{4}{3}\end{matrix}\middle|-\frac{bx^{3m+3}}{a}\right)}{a\left(1+\frac{bx^{3m+3}}{a}\right)^{\frac{2}{3}}(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m/(a+b*x**(3+3*m))**(1/3),x)
```

```
[Out] x**(m + 1)*(a + b*x**(3*m + 3))**(2/3)*hyper((1/3, 1/3), (4/3,),
-b*x**(3*m + 3)/a)/(a*(1 + b*x**(3*m + 3)/a)**(2/3)*(m + 1))
```

Mathematica [C] time = 0.080677, size = 68, normalized size = 0.7

$$\frac{x^{m+1}\sqrt[3]{\frac{a+bx^{3m+3}}{a}}\,{}_2F_1\left(\frac{1}{3},\frac{1}{3};\frac{4}{3};-\frac{bx^{3m+3}}{a}\right)}{(m+1)\sqrt[3]{a+bx^{3m+3}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m/(a + b*x^(3*(1 + m)))^(1/3),x]
```

```
[Out] (x^(1 + m)*((a + b*x^(3 + 3*m))/a)^(1/3)*Hypergeometric2F1[1/3, 1
/3, 4/3, -((b*x^(3 + 3*m))/a)])/((1 + m)*(a + b*x^(3 + 3*m))^(1/3
))
```

Maple [F] time = 0.069, size = 0, normalized size = 0.

$$\int x^{m} \frac{1}{\sqrt[3]{a+b x^{3+3 m}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(a+b*x^(3+3*m))^(1/3),x)
```

```
[Out] int(x^m/(a+b*x^(3+3*m))^(1/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{m}}{(b x^{3 m+3}+a)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(b*x^(3*m + 3) + a)^(1/3),x, algorithm="maxima")
```

```
[Out] integrate(x^m/(b*x^(3*m + 3) + a)^(1/3), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(b*x^(3*m + 3) + a)^(1/3),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(a+b*x**(3+3*m))**(1/3),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{m}}{(b x^{3 m+3}+a)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^(3*m + 3) + a)^(1/3),x, algorithm="giac")

[Out] integrate(x^m/(b*x^(3*m + 3) + a)^(1/3), x)
```

3.2694 $\int x^m \left(a+bx^{-\frac{3}{2}(1+m)}\right)^{2/3} dx$

Optimal. Leaf size=139

$$\frac{b^{2/3}\log\left(\sqrt[3]{b}x^{\frac{1}{2}(-m-1)}-\sqrt[3]{a+bx^{-\frac{3}{2}(m+1)}}\right)}{m+1}-\frac{2b^{2/3}\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x^{\frac{1}{2}(-m-1)}}{\sqrt[3]{a+bx^{-\frac{3}{2}(m+1)}}}+1}{\sqrt{3}}\right)}{\sqrt{3}(m+1)}+\frac{x^{m+1}\left(a+bx^{-\frac{3}{2}(m+1)}\right)^{2/3}}{m+1}$$

```
[Out] (x^(1 + m)*(a + b/x^((3*(1 + m))/2))^(2/3))/(1 + m) - (2*b^(2/3)*
ArcTan[(1 + (2*b^(1/3)*x^((-1 - m)/2))/(a + b/x^((3*(1 + m))/2))^
(1/3))/Sqrt[3]])/(Sqrt[3]*(1 + m)) + (b^(2/3)*Log[b^(1/3)*x^((-1
- m)/2) - (a + b/x^((3*(1 + m))/2))^(1/3)])/(1 + m)
```

Rubi [A] time = 0.279096, antiderivative size = 139, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$\frac{b^{2/3}\log\left(\sqrt[3]{b}x^{\frac{1}{2}(-m-1)}-\sqrt[3]{a+bx^{-\frac{3}{2}(m+1)}}\right)}{m+1}-\frac{2b^{2/3}\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x^{\frac{1}{2}(-m-1)}}{\sqrt[3]{a+bx^{-\frac{3}{2}(m+1)}}}+1}{\sqrt{3}}\right)}{\sqrt{3}(m+1)}+\frac{x^{m+1}\left(a+bx^{-\frac{3}{2}(m+1)}\right)^{2/3}}{m+1}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m*(a + b/x^((3*(1 + m))/2))^(2/3),x]
```

```
[Out] (x^(1 + m)*(a + b/x^((3*(1 + m))/2))^(2/3))/(1 + m) - (2*b^(2/3)*
ArcTan[(1 + (2*b^(1/3)*x^((-1 - m)/2))/(a + b/x^((3*(1 + m))/2))^
(1/3))/Sqrt[3]])/(Sqrt[3]*(1 + m)) + (b^(2/3)*Log[b^(1/3)*x^((-1
- m)/2) - (a + b/x^((3*(1 + m))/2))^(1/3)])/(1 + m)
```

Rubi in Sympy [A] time = 11.7437, size = 107, normalized size = 0.77

$$\frac{x^{m+1}\left(a+bx^{-\frac{3m}{2}-\frac{3}{2}}\right)^{\frac{2}{3}}}{m+1}-\frac{2bx^{-\frac{m}{2}-\frac{1}{2}}\left(a+bx^{-\frac{3m}{2}-\frac{3}{2}}\right)^{\frac{2}{3}}{}_2F_1\left(\begin{matrix}\frac{1}{3},\frac{1}{3}\\ \frac{4}{3}\end{matrix}\middle|-\frac{bx^{-\frac{3m}{2}-\frac{3}{2}}}{a}\right)}{a\left(1+\frac{bx^{-\frac{3m}{2}-\frac{3}{2}}}{a}\right)^{\frac{2}{3}}(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(a+b/(x**(3/2+3/2*m)))**(2/3),x)
```

```
[Out] x**(m + 1)*(a + b*x**(-3*m/2 - 3/2))**(2/3)/(m + 1) - 2*b*x**(-m/
2 - 1/2)*(a + b*x**(-3*m/2 - 3/2))**(2/3)*hyper((1/3, 1/3), (4/3,
), -b*x**(-3*m/2 - 3/2)/a)/(a*(1 + b*x**(-3*m/2 - 3/2)/a)**(2/3)*
(m + 1))
```

Mathematica [C] time = 0.184405, size = 73, normalized size = 0.53

$$\frac{x^{m+1}\left(a+bx^{-\frac{3}{2}(m+1)}\right)^{2/3}{}_2F_1\left(-\frac{2}{3},-\frac{2}{3};\frac{1}{3};-\frac{bx^{-\frac{3}{2}(m+1)}}{a}\right)}{(m+1)\left(\frac{bx^{-\frac{3}{2}(m+1)}}{a}+1\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m*(a + b/x^((3*(1 + m))/2))^(2/3),x]
```

```
[Out] (x^(1 + m)*(a + b/x^((3*(1 + m))/2))^(2/3)*Hypergeometric2F1[-2/3
, -2/3, 1/3, -(b/(a*x^((3*(1 + m))/2)))])/((1 + m)*(1 + b/(a*x^((
3*(1 + m))/2)))^(2/3))
```

Maple [F] time = 0.095, size = 0, normalized size = 0.

$$\int x^{m} \left(a+b \left(x^{\frac{3}{2}+\frac{3 m}{2}}\right)^{-1}\right)^{\frac{2}{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(a+b/(x^(3/2+3/2*m)))^(2/3),x)
```

```
[Out] int(x^m*(a+b/(x^(3/2+3/2*m)))^(2/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b x^{-\frac{3}{2} \, m - \frac{3}{2}} + a\right)^{\frac{2}{3}} x^{m}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(3/2*m + 3/2))^(2/3)*x^m,x, algorithm="maxima")
```

```
[Out] integrate((b*x^(-3/2*m - 3/2) + a)^(2/3)*x^m, x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(3/2*m + 3/2))^(2/3)*x^m,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(a+b/(x**(3/2+3/2*m)))**(2/3),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(a + \frac{b}{x^{\frac{3}{2}m+\frac{3}{2}}}\right)^{\frac{2}{3}} x^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a + b/x^(3/2*m + 3/2))^(2/3)*x^m,x, algorithm="giac")

[Out] integrate((a + b/x^(3/2*m + 3/2))^(2/3)*x^m, x)
```

3.2695 $\int \frac{x^{-1+\frac{n}{3}}}{\sqrt[3]{a+bx^n}}\,dx$

Optimal. Leaf size=89

$$\frac{\sqrt{3}\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x^{n/3}}{\sqrt[3]{a+bx^n}}+1}{\sqrt{3}}\right)}{\sqrt[3]{b}n}-\frac{3\log\left(\sqrt[3]{b}x^{n/3}-\sqrt[3]{a+bx^n}\right)}{2\sqrt[3]{b}n}$$

```
[Out] (Sqrt[3]*ArcTan[(1 + (2*b^(1/3)*x^(n/3))/(a + b*x^n)^(1/3))/Sqrt[
3]])/(b^(1/3)*n) - (3*Log[b^(1/3)*x^(n/3) - (a + b*x^n)^(1/3)])/(
2*b^(1/3)*n)
```

Rubi [A] time = 0.100837, antiderivative size = 89, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095

$$\frac{\sqrt{3}\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x^{n/3}}{\sqrt[3]{a+bx^n}}+1}{\sqrt{3}}\right)}{\sqrt[3]{b}n}-\frac{3\log\left(\sqrt[3]{b}x^{n/3}-\sqrt[3]{a+bx^n}\right)}{2\sqrt[3]{b}n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + n/3)/(a + b*x^n)^(1/3),x]
```

```
[Out] (Sqrt[3]*ArcTan[(1 + (2*b^(1/3)*x^(n/3))/(a + b*x^n)^(1/3))/Sqrt[
3]])/(b^(1/3)*n) - (3*Log[b^(1/3)*x^(n/3) - (a + b*x^n)^(1/3)])/(
2*b^(1/3)*n)
```

Rubi in Sympy [A] time = 19.1853, size = 129, normalized size = 1.45

$$-\frac{\log\left(-\frac{\sqrt[3]{b}x^{\frac{n}{3}}}{\sqrt[3]{a+bx^n}}+1\right)}{\sqrt[3]{b}n}+\frac{\log\left(\frac{b^{\frac{2}{3}}x^{\frac{2n}{3}}}{(a+bx^n)^{\frac{2}{3}}}+\frac{\sqrt[3]{b}x^{\frac{n}{3}}}{\sqrt[3]{a+bx^n}}+1\right)}{2\sqrt[3]{b}n}+\frac{\sqrt{3}\,\mathrm{atan}\left(\sqrt{3}\left(\frac{2\sqrt[3]{b}x^{\frac{n}{3}}}{3\sqrt[3]{a+bx^n}}+\frac{1}{3}\right)\right)}{\sqrt[3]{b}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+1/3*n)/(a+b*x**n)**(1/3),x)
```

```
[Out] -log(-b**(1/3)*x**(n/3)/(a + b*x**n)**(1/3) + 1)/(b**(1/3)*n) + l
og(b**(2/3)*x**(2*n/3)/(a + b*x**n)**(2/3) + b**(1/3)*x**(n/3)/(a
 + b*x**n)**(1/3) + 1)/(2*b**(1/3)*n) + sqrt(3)*atan(sqrt(3)*(2*b
**(1/3)*x**(n/3)/(3*(a + b*x**n)**(1/3)) + 1/3))/(b**(1/3)*n)
```

Mathematica [C] time = 0.0555622, size = 57, normalized size = 0.64

$$\frac{3x^{n/3}\sqrt[3]{\frac{a+bx^n}{a}}\,{}_2F_1\left(\frac{1}{3},\frac{1}{3};\frac{4}{3};-\frac{bx^n}{a}\right)}{n\sqrt[3]{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + n/3)/(a + b*x^n)^(1/3),x]
```

```
[Out] (3*x^(n/3)*((a + b*x^n)/a)^(1/3)*Hypergeometric2F1[1/3, 1/3, 4/3,
 -((b*x^n)/a)])/(n*(a + b*x^n)^(1/3))
```

Maple [F] time = 0.086, size = 0, normalized size = 0.

$$\int 1x^{-1+\frac{n}{3}}\frac{1}{\sqrt[3]{a+bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-1+1/3*n)/(a+b*x^n)^(1/3),x)
```

```
[Out] int(x^(-1+1/3*n)/(a+b*x^n)^(1/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(1/3*n - 1)/(b*x^n + a)^(1/3),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(1/3*n - 1)/(b*x^n + a)^(1/3),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**(-1+1/3*n)/(a+b*x**n)**(1/3),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{\frac{1}{3}\,n-1}}{(bx^n+a)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^(1/3*n - 1)/(b*x^n + a)^(1/3),x, algorithm="giac")

[Out] integrate(x^(1/3*n - 1)/(b*x^n + a)^(1/3), x)
```

3.2696 $\int x^{-1-\frac{2n}{3}} (a+bx^n)^{2/3} \, dx$

Optimal. Leaf size=114

$$-\frac{3b^{2/3}\log\left(\sqrt[3]{b}x^{n/3}-\sqrt[3]{a+bx^n}\right)}{2n}+\frac{\sqrt{3}b^{2/3}\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x^{n/3}}{\sqrt[3]{a+bx^n}}+1}{\sqrt{3}}\right)}{n}-\frac{3x^{-2n/3}(a+bx^n)^{2/3}}{2n}$$

```
[Out] (-3*(a + b*x^n)^(2/3))/(2*n*x^((2*n)/3)) + (Sqrt[3]*b^(2/3)*ArcTa
n[(1 + (2*b^(1/3)*x^(n/3))/(a + b*x^n)^(1/3))/Sqrt[3]])/n - (3*b^
(2/3)*Log[b^(1/3)*x^(n/3) - (a + b*x^n)^(1/3)])/(2*n)
```

Rubi [A] time = 0.128699, antiderivative size = 114, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$-\frac{3b^{2/3}\log\left(\sqrt[3]{b}x^{n/3}-\sqrt[3]{a+bx^n}\right)}{2n}+\frac{\sqrt{3}b^{2/3}\tan^{-1}\left(\frac{\frac{2\sqrt[3]{b}x^{n/3}}{\sqrt[3]{a+bx^n}}+1}{\sqrt{3}}\right)}{n}-\frac{3x^{-2n/3}(a+bx^n)^{2/3}}{2n}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - (2*n)/3)*(a + b*x^n)^(2/3),x]
```


```
[Out] (-3*(a + b*x^n)^(2/3))/(2*n*x^((2*n)/3)) + (Sqrt[3]*b^(2/3)*ArcTa
n[(1 + (2*b^(1/3)*x^(n/3))/(a + b*x^n)^(1/3))/Sqrt[3]])/n - (3*b^
(2/3)*Log[b^(1/3)*x^(n/3) - (a + b*x^n)^(1/3)])/(2*n)
```

Rubi in Sympy [A] time = 24.0984, size = 151, normalized size = 1.32

$$-\frac{b^{\frac{2}{3}}\log\left(-\frac{\sqrt[3]{b}x^{\frac{n}{3}}}{\sqrt[3]{a+bx^n}}+1\right)}{n}+\frac{b^{\frac{2}{3}}\log\left(\frac{b^{\frac{2}{3}}x^{\frac{2n}{3}}}{(a+bx^n)^{\frac{2}{3}}}+\frac{\sqrt[3]{b}x^{\frac{n}{3}}}{\sqrt[3]{a+bx^n}}+1\right)}{2n}+\frac{\sqrt{3}b^{\frac{2}{3}}\operatorname{atan}\left(\sqrt{3}\left(\frac{2\sqrt[3]{b}x^{\frac{n}{3}}}{3\sqrt[3]{a+bx^n}}+\frac{1}{3}\right)\right)}{n}-\frac{3x^{-\frac{2n}{3}}(a+bx^n)^{\frac{2}{3}}}{2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-2/3*n)*(a+b*x**n)**(2/3),x)
```

```
[Out] -b**(2/3)*log(-b**(1/3)*x**(n/3)/(a + b*x**n)**(1/3) + 1)/n + b**
(2/3)*log(b**(2/3)*x**(2*n/3)/(a + b*x**n)**(2/3) + b**(1/3)*x**(
n/3)/(a + b*x**n)**(1/3) + 1)/(2*n) + sqrt(3)*b**(2/3)*atan(sqrt(
3)*(2*b**(1/3)*x**(n/3)/(3*(a + b*x**n)**(1/3)) + 1/3))/n - 3*x**
(-2*n/3)*(a + b*x**n)**(2/3)/(2*n)
```

Mathematica [C] time = 0.0972262, size = 71, normalized size = 0.62

$$-\frac{3x^{-2n/3}\left(-2bx^n\sqrt[3]{\frac{bx^n}{a}+1}\,{}_2F_1\left(\frac{1}{3},\frac{1}{3};\frac{4}{3};-\frac{bx^n}{a}\right)+a+bx^n\right)}{2n\sqrt[3]{a+bx^n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - (2*n)/3)*(a + b*x^n)^(2/3),x]
```

```
[Out] (-3*(a + b*x^n - 2*b*x^n*(1 + (b*x^n)/a)^(1/3)*Hypergeometric2F1[
1/3, 1/3, 4/3, -((b*x^n)/a)]))/(2*n*x^((2*n)/3)*(a + b*x^n)^(1/3)
)
```

Maple [F] time = 0.082, size = 0, normalized size = 0.

$$\int x^{-1-\frac{2n}{3}} \left(a+b x^{n}\right)^{\frac{2}{3}} d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-2/3*n)*(a+b*x^n)^(2/3),x)
```

```
[Out] int(x^(-1-2/3*n)*(a+b*x^n)^(2/3),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(2/3)*x^(-2/3*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(2/3)*x^(-2/3*n - 1),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1-2/3*n)*(a+b*x**n)**(2/3),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b x^{n}+a\right)^{\frac{2}{3}} x^{-\frac{2}{3} n-1} d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(2/3)*x^(-2/3*n - 1),x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^(2/3)*x^(-2/3*n - 1), x)
```

3.2697 $\int x^m (a + bx^n)^p \, dx$

Optimal. Leaf size=54

$$\frac{x^{m+1} (a + bx^n)^{p+1} \, _2F_1\left(1, \frac{m+1}{n} + p + 1; \frac{m+n+1}{n}; -\frac{bx^n}{a}\right)}{a(m+1)}$$

```
[Out] (x^(1 + m)*(a + b*x^n)^(1 + p)*Hypergeometric2F1[1, 1 + (1 + m)/n
 + p, (1 + m + n)/n, -((b*x^n)/a)])/(a*(1 + m))
```

Rubi [A] time = 0.0595514, antiderivative size = 62, normalized size of antiderivative = 1.15, number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$\frac{x^{m+1} (a + bx^n)^p \left(\frac{bx^n}{a} + 1\right)^{-p} \, _2F_1\left(\frac{m+1}{n}, -p; \frac{m+n+1}{n}; -\frac{bx^n}{a}\right)}{m+1}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m*(a + b*x^n)^p,x]
```

```
[Out] (x^(1 + m)*(a + b*x^n)^p*Hypergeometric2F1[(1 + m)/n, -p, (1 + m
+ n)/n, -((b*x^n)/a)])/((1 + m)*(1 + (b*x^n)/a)^p)
```

Rubi in Sympy [A] time = 8.20038, size = 46, normalized size = 0.85

$$\frac{x^{m+1} \left(1 + \frac{bx^n}{a}\right)^{-p} (a + bx^n)^p \, _2F_1\left(\begin{matrix} -p, \frac{m+1}{n} \\ \frac{m+n+1}{n} \end{matrix}\middle| -\frac{bx^n}{a}\right)}{m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(a+b*x**n)**p,x)
```

```
[Out] x**(m + 1)*(1 + b*x**n/a)**(-p)*(a + b*x**n)**p*hyper((-p, (m + 1
)/n), ((m + n + 1)/n,), -b*x**n/a)/(m + 1)
```

Mathematica [A] time = 0.0650122, size = 63, normalized size = 1.17

$$\frac{x^{m+1} (a + bx^n)^p \left(\frac{bx^n}{a} + 1\right)^{-p} \, _2F_1\left(\frac{m+1}{n}, -p; \frac{m+1}{n} + 1; -\frac{bx^n}{a}\right)}{m+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m*(a + b*x^n)^p,x]
```

```
[Out] (x^(1 + m)*(a + b*x^n)^p*Hypergeometric2F1[(1 + m)/n, -p, 1 + (1
+ m)/n, -((b*x^n)/a)])/((1 + m)*(1 + (b*x^n)/a)^p)
```

Maple [F] time = 0.158, size = 0, normalized size = 0.

$$\int x^m (a + bx^n)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(a+b*x^n)^p,x)

[Out] int(x^m*(a+b*x^n)^p,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^p x^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*x^m,x, algorithm="maxima")

[Out] integrate((b*x^n + a)^p*x^m, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left((bx^n + a)^p x^m, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*x^m,x, algorithm="fricas")

[Out] integral((b*x^n + a)^p*x^m, x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(a+b*x**n)**p,x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^p x^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*x^m,x, algorithm="giac")

[Out] integrate((b*x^n + a)^p*x^m, x)
```

3.2698 $\int (a+bx^n)^{-4-\frac{1}{n}}\,dx$

Optimal. Leaf size=146

$$\frac{6n^3x(a+bx^n)^{-1/n}}{a^4(n+1)(2n+1)(3n+1)}+\frac{6n^2x(a+bx^n)^{-\frac{1}{n}-1}}{a^3(n+1)(2n+1)(3n+1)}+\frac{3nx(a+bx^n)^{-\frac{1}{n}-2}}{a^2(6n^2+5n+1)}+\frac{x(a+bx^n)^{-\frac{1}{n}-3}}{a(3n+1)}$$

```
[Out] (x*(a + b*x^n)^(-3 - n^(-1)))/(a*(1 + 3*n)) + (3*n*x*(a + b*x^n)^
(-2 - n^(-1)))/(a^2*(1 + 5*n + 6*n^2)) + (6*n^2*x*(a + b*x^n)^(-1
 - n^(-1)))/(a^3*(1 + n)*(1 + 2*n)*(1 + 3*n)) + (6*n^3*x)/(a^4*(1
 + n)*(1 + 2*n)*(1 + 3*n)*(a + b*x^n)^n^(-1))
```

Rubi [A] time = 0.206559, antiderivative size = 146, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{6n^3x(a+bx^n)^{-1/n}}{a^4(n+1)(2n+1)(3n+1)}+\frac{6n^2x(a+bx^n)^{-\frac{1}{n}-1}}{a^3(n+1)(2n+1)(3n+1)}+\frac{3nx(a+bx^n)^{-\frac{1}{n}-2}}{a^2(6n^2+5n+1)}+\frac{x(a+bx^n)^{-\frac{1}{n}-3}}{a(3n+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^(-4 - n^(-1)),x]
```

```
[Out] (x*(a + b*x^n)^(-3 - n^(-1)))/(a*(1 + 3*n)) + (3*n*x*(a + b*x^n)^
(-2 - n^(-1)))/(a^2*(1 + 5*n + 6*n^2)) + (6*n^2*x*(a + b*x^n)^(-1
 - n^(-1)))/(a^3*(1 + n)*(1 + 2*n)*(1 + 3*n)) + (6*n^3*x)/(a^4*(1
 + n)*(1 + 2*n)*(1 + 3*n)*(a + b*x^n)^n^(-1))
```

Rubi in Sympy [A] time = 21.7323, size = 124, normalized size = 0.85

$$\frac{x(a+bx^n)^{-3-\frac{1}{n}}}{a(3n+1)}+\frac{3nx(a+bx^n)^{-2-\frac{1}{n}}}{a^2(2n+1)(3n+1)}+\frac{6n^2x(a+bx^n)^{-1-\frac{1}{n}}}{a^3(n+1)(2n+1)(3n+1)}+\frac{6n^3x(a+bx^n)^{-\frac{1}{n}}}{a^4(n+1)(2n+1)(3n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**n)**(-4-1/n),x)
```

```
[Out] x*(a + b*x**n)**(-3 - 1/n)/(a*(3*n + 1)) + 3*n*x*(a + b*x**n)**(-
2 - 1/n)/(a**2*(2*n + 1)*(3*n + 1)) + 6*n**2*x*(a + b*x**n)**(-1
- 1/n)/(a**3*(n + 1)*(2*n + 1)*(3*n + 1)) + 6*n**3*x*(a + b*x**n)
**(-1/n)/(a**4*(n + 1)*(2*n + 1)*(3*n + 1))
```

Mathematica [C] time = 0.0677958, size = 55, normalized size = 0.38

$$\frac{x(a+bx^n)^{-1/n}\left(\frac{bx^n}{a}+1\right)^{\frac{1}{n}}{}_2F_1\left(4+\frac{1}{n},\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)}{a^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^(-4 - n^(-1)),x]
```

```
[Out] (x*(1 + (b*x^n)/a)^n^(-1)*Hypergeometric2F1[4 + n^(-1), n^(-1), 1
 + n^(-1), -((b*x^n)/a)])/(a^4*(a + b*x^n)^n^(-1))
```

Maple [F] time = 0.171, size = 0, normalized size = 0.

$$\int (a+bx^n)^{-4-n^{-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^(-4-1/n),x)

[Out] int((a+b*x^n)^(-4-1/n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n+a)^{-\frac{1}{n}-4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(-1/n - 4),x, algorithm="maxima")

[Out] integrate((b*x^n + a)^(-1/n - 4), x)
```

Fricas [A] time = 0.239981, size = 259, normalized size = 1.77

$$\frac{6\,b^4n^3xx^{4\,n}+6\left(4\,ab^3n^3+ab^3n^2\right)xx^{3\,n}+3\left(12\,a^2b^2n^3+7\,a^2b^2n^2+a^2b^2n\right)xx^{2\,n}+\left(24\,a^3bn^3+26\,a^3bn^2+9\,a^3bn+a^3b\right)xx^n}{(6\,a^4n^3+11\,a^4n^2+6\,a^4n+a^4)(bx^n+a)^{\frac{4\,n+1}{n}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(-1/n - 4),x, algorithm="fricas")

[Out] (6*b^4*n^3*x*x^(4*n) + 6*(4*a*b^3*n^3 + a*b^3*n^2)*x*x^(3*n) + 3*
(12*a^2*b^2*n^3 + 7*a^2*b^2*n^2 + a^2*b^2*n)*x*x^(2*n) + (24*a^3*
b*n^3 + 26*a^3*b*n^2 + 9*a^3*b*n + a^3*b)*x*x^n + (6*a^4*n^3 + 11
*a^4*n^2 + 6*a^4*n + a^4)*x)/((6*a^4*n^3 + 11*a^4*n^2 + 6*a^4*n +
 a^4)*(b*x^n + a)^((4*n + 1)/n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**(-4-1/n),x)

[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n+a)^{-\frac{1}{n}-4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(-1/n - 4),x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^(-1/n - 4), x)
```

3.2699 $\int (a+bx^n)^{-3-\frac{1}{n}}\,dx$

Optimal. Leaf size=96

$$\frac{2n^2x(a+bx^n)^{-1/n}}{a^3(n+1)(2n+1)}+\frac{2nx(a+bx^n)^{-\frac{1}{n}-1}}{a^2(n+1)(2n+1)}+\frac{x(a+bx^n)^{-\frac{1}{n}-2}}{a(2n+1)}$$

```
[Out] (x*(a + b*x^n)^(-2 - n^(-1)))/(a*(1 + 2*n)) + (2*n*x*(a + b*x^n)^
(-1 - n^(-1)))/(a^2*(1 + n)*(1 + 2*n)) + (2*n^2*x)/(a^3*(1 + n)*(
1 + 2*n)*(a + b*x^n)^n^(-1))
```

Rubi [A] time = 0.0949738, antiderivative size = 96, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{2n^2x(a+bx^n)^{-1/n}}{a^3(n+1)(2n+1)}+\frac{2nx(a+bx^n)^{-\frac{1}{n}-1}}{a^2(n+1)(2n+1)}+\frac{x(a+bx^n)^{-\frac{1}{n}-2}}{a(2n+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^(-3 - n^(-1)),x]
```

```
[Out] (x*(a + b*x^n)^(-2 - n^(-1)))/(a*(1 + 2*n)) + (2*n*x*(a + b*x^n)^
(-1 - n^(-1)))/(a^2*(1 + n)*(1 + 2*n)) + (2*n^2*x)/(a^3*(1 + n)*(
1 + 2*n)*(a + b*x^n)^n^(-1))
```

Rubi in Sympy [A] time = 10.6053, size = 80, normalized size = 0.83

$$\frac{x(a+bx^n)^{-2-\frac{1}{n}}}{a(2n+1)}+\frac{2nx(a+bx^n)^{-1-\frac{1}{n}}}{a^2(n+1)(2n+1)}+\frac{2n^2x(a+bx^n)^{-\frac{1}{n}}}{a^3(n+1)(2n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**n)**(-3-1/n),x)
```

```
[Out] x*(a + b*x**n)**(-2 - 1/n)/(a*(2*n + 1)) + 2*n*x*(a + b*x**n)**(-
1 - 1/n)/(a**2*(n + 1)*(2*n + 1)) + 2*n**2*x*(a + b*x**n)**(-1/n)
/(a**3*(n + 1)*(2*n + 1))
```

Mathematica [C] time = 0.0513605, size = 55, normalized size = 0.57

$$\frac{x(a+bx^n)^{-1/n}\left(\frac{bx^n}{a}+1\right)^{\frac{1}{n}}{}_2F_1\left(3+\frac{1}{n},\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)}{a^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^(-3 - n^(-1)),x]
```

```
[Out] (x*(1 + (b*x^n)/a)^n^(-1)*Hypergeometric2F1[3 + n^(-1), n^(-1), 1
 + n^(-1), -((b*x^n)/a)])/(a^3*(a + b*x^n)^n^(-1))
```

Maple [F] time = 0.15, size = 0, normalized size = 0.

$$\int (a+bx^n)^{-3-n^{-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^(-3-1/n),x)
```

```
[Out] int((a+b*x^n)^(-3-1/n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^{-\frac{1}{n}-3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(-1/n - 3),x, algorithm="maxima")
```

```
[Out] integrate((b*x^n + a)^(-1/n - 3), x)
```

Fricas [A] time = 0.242118, size = 170, normalized size = 1.77

$$\frac{2\,b^3n^2xx^{3\,n} + 2\,\left(3\,ab^2n^2 + ab^2n\right)xx^{2\,n} + \left(6\,a^2bn^2 + 5\,a^2bn + a^2b\right)xx^n + \left(2\,a^3n^2 + 3\,a^3n + a^3\right)x}{(2\,a^3n^2 + 3\,a^3n + a^3)(bx^n + a)^{\frac{3\,n+1}{n}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(-1/n - 3),x, algorithm="fricas")
```

```
[Out] (2*b^3*n^2*x*x^(3*n) + 2*(3*a*b^2*n^2 + a*b^2*n)*x*x^(2*n) + (6*a
^2*b*n^2 + 5*a^2*b*n + a^2*b)*x*x^n + (2*a^3*n^2 + 3*a^3*n + a^3)
*x)/((2*a^3*n^2 + 3*a^3*n + a^3)*(b*x^n + a)^((3*n + 1)/n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**(-3-1/n),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^{-\frac{1}{n}-3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(-1/n - 3),x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^(-1/n - 3), x)
```

3.2700 $\int (a+bx^n)^{-2-\frac{1}{n}}\,dx$

Optimal. Leaf size=50

$$\frac{nx(a+bx^n)^{-1/n}}{a^2(n+1)}+\frac{x(a+bx^n)^{-\frac{1}{n}-1}}{a(n+1)}$$

```
[Out] (x*(a + b*x^n)^(-1 - n^(-1)))/(a*(1 + n)) + (n*x)/(a^2*(1 + n)*(a
 + b*x^n)^n^(-1))
```

Rubi [A] time = 0.0405838, antiderivative size = 50, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{nx(a+bx^n)^{-1/n}}{a^2(n+1)}+\frac{x(a+bx^n)^{-\frac{1}{n}-1}}{a(n+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^(-2 - n^(-1)),x]
```

```
[Out] (x*(a + b*x^n)^(-1 - n^(-1)))/(a*(1 + n)) + (n*x)/(a^2*(1 + n)*(a
 + b*x^n)^n^(-1))
```

Rubi in Sympy [A] time = 3.77428, size = 39, normalized size = 0.78

$$\frac{x(a+bx^n)^{-1-\frac{1}{n}}}{a(n+1)}+\frac{nx(a+bx^n)^{-\frac{1}{n}}}{a^2(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**n)**(-2-1/n),x)
```

```
[Out] x*(a + b*x**n)**(-1 - 1/n)/(a*(n + 1)) + n*x*(a + b*x**n)**(-1/n)
/(a**2*(n + 1))
```

Mathematica [C] time = 0.0410468, size = 55, normalized size = 1.1

$$\frac{x(a+bx^n)^{-1/n}\left(\frac{bx^n}{a}+1\right)^{\frac{1}{n}}{}_2F_1\left(2+\frac{1}{n},\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)}{a^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^(-2 - n^(-1)),x]
```

```
[Out] (x*(1 + (b*x^n)/a)^n^(-1)*Hypergeometric2F1[2 + n^(-1), n^(-1), 1
 + n^(-1), -((b*x^n)/a)])/(a^2*(a + b*x^n)^n^(-1))
```

Maple [F] time = 0.132, size = 0, normalized size = 0.

$$\int (a+bx^n)^{-2-n^{-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^(-2-1/n),x)

[Out] int((a+b*x^n)^(-2-1/n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^{-\frac{1}{n}-2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(-1/n - 2),x, algorithm="maxima")

[Out] integrate((b*x^n + a)^(-1/n - 2), x)
```

Fricas [A] time = 0.242405, size = 92, normalized size = 1.84

$$\frac{b^2nxx^{2\,n} + (2\,abn + ab)xx^n + \left(a^2n + a^2\right)x}{(a^2n + a^2)(bx^n + a)^{\frac{2\,n+1}{n}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(-1/n - 2),x, algorithm="fricas")

[Out] (b^2*n*x*x^(2*n) + (2*a*b*n + a*b)*x*x^n + (a^2*n + a^2)*x)/((a^2
*n + a^2)*(b*x^n + a)^((2*n + 1)/n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**(-2-1/n),x)

[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^{-\frac{1}{n}-2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(-1/n - 2),x, algorithm="giac")

[Out] integrate((b*x^n + a)^(-1/n - 2), x)
```

3.2701 $\int (a+bx^n)^{-1-\frac{1}{n}}\,dx$

Optimal. Leaf size=18

$$\frac{x(a+bx^n)^{-1/n}}{a}$$

```
[Out] x/(a*(a + b*x^n)^n^(-1))
```

Rubi [A] time = 0.0118179, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$\frac{x(a+bx^n)^{-1/n}}{a}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^n)^(-1 - n^(-1)),x]
```

```
[Out] x/(a*(a + b*x^n)^n^(-1))
```

Rubi in Sympy [A] time = 1.39549, size = 12, normalized size = 0.67

$$\frac{x(a+bx^n)^{-\frac{1}{n}}}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b*x**n)**(-1-1/n),x)
```

```
[Out] x*(a + b*x**n)**(-1/n)/a
```

Mathematica [A] time = 0.036151, size = 18, normalized size = 1.

$$\frac{x(a+bx^n)^{-1/n}}{a}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^n)^(-1 - n^(-1)),x]
```

```
[Out] x/(a*(a + b*x^n)^n^(-1))
```

Maple [B] time = 0.036, size = 53, normalized size = 2.9

$$xe^{\left(-1-n^{-1}\right)\ln\left(a+be^{n\ln(x)}\right)}+\frac{bxe^{n\ln(x)}}{a}e^{\left(-1-n^{-1}\right)\ln\left(a+be^{n\ln(x)}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*x^n)^(-1-1/n),x)
```

```
[Out] x*exp((-1-1/n)*ln(a+b*exp(n*ln(x))))+b/a*x*exp(n*ln(x))*exp((-1-1
/n)*ln(a+b*exp(n*ln(x))))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^{-\frac{1}{n}-1} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(-1/n - 1),x, algorithm="maxima")
```

```
[Out] integrate((b*x^n + a)^(-1/n - 1), x)
```

Fricas [A] time = 0.239941, size = 42, normalized size = 2.33

$$\frac{bxx^n + ax}{(bx^n + a)^{\frac{n+1}{n}} a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(-1/n - 1),x, algorithm="fricas")
```

```
[Out] (b*x*x^n + a*x)/((b*x^n + a)^((n + 1)/n)*a)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RecursionError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**(-1-1/n),x)
```

```
[Out] Exception raised: RecursionError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^{-\frac{1}{n}-1} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(-1/n - 1),x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^(-1/n - 1), x)
```

3.2702 $\int (a+bx^n)^{-1/n} \, dx$

Optimal. Leaf size=50

$$x(a+bx^n)^{-1/n}\left(\frac{bx^n}{a}+1\right)^{\frac{1}{n}} {}_2F_1\left(\frac{1}{n},\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)$$

```
[Out] (x*(1 + (b*x^n)/a)^n^(-1)*Hypergeometric2F1[n^(-1), n^(-1), 1 + n
^(-1), -((b*x^n)/a)])/(a + b*x^n)^n^(-1)
```

Rubi [A] time = 0.0337528, antiderivative size = 50, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$x(a+bx^n)^{-1/n}\left(\frac{bx^n}{a}+1\right)^{\frac{1}{n}} {}_2F_1\left(\frac{1}{n},\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^(-n^(-1)),x]
```

```
[Out] (x*(1 + (b*x^n)/a)^n^(-1)*Hypergeometric2F1[n^(-1), n^(-1), 1 + n
^(-1), -((b*x^n)/a)])/(a + b*x^n)^n^(-1)
```

Rubi in Sympy [A] time = 4.02374, size = 39, normalized size = 0.78

$$x\left(1+\frac{bx^n}{a}\right)^{\frac{1}{n}}(a+bx^n)^{-\frac{1}{n}} {}_2F_1\left(\begin{matrix}\frac{1}{n},\frac{1}{n}\\ 1+\frac{1}{n}\end{matrix}\middle| -\frac{bx^n}{a}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/((a+b*x**n)**(1/n)),x)
```

```
[Out] x*(1 + b*x**n/a)**(1/n)*(a + b*x**n)**(-1/n)*hyper((1/n, 1/n), (1
 + 1/n,), -b*x**n/a)
```

Mathematica [A] time = 0.022817, size = 50, normalized size = 1.

$$x(a+bx^n)^{-1/n}\left(\frac{bx^n}{a}+1\right)^{\frac{1}{n}} {}_2F_1\left(\frac{1}{n},\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^(-n^(-1)),x]
```

```
[Out] (x*(1 + (b*x^n)/a)^n^(-1)*Hypergeometric2F1[n^(-1), n^(-1), 1 + n
^(-1), -((b*x^n)/a)])/(a + b*x^n)^n^(-1)
```

Maple [F] time = 0.092, size = 0, normalized size = 0.

$$\int \left(\sqrt[n]{a+bx^n}\right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/((a+b*x^n)^(1/n)),x)

[Out] int(1/((a+b*x^n)^(1/n)),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^{-\frac{1}{n}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^(1/n)),x, algorithm="maxima")

[Out] integrate((b*x^n + a)^(-1/n), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{(bx^n + a)^{\left(\frac{1}{n}\right)}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^(1/n)),x, algorithm="fricas")

[Out] integral(1/((b*x^n + a)^(1/n)), x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a+b*x**n)**(1/n)),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^n + a)^{\left(\frac{1}{n}\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^(1/n)),x, algorithm="giac")

[Out] integrate(1/((b*x^n + a)^(1/n)), x)
```

3.2703 $\int (a+bx^n)^{1-\frac{1}{n}}\,dx$

Optimal. Leaf size=53

$$ax\left(a+bx^n\right)^{-1/n}\left(\frac{bx^n}{a}+1\right)^{\frac{1}{n}}\,{}_2F_1\left(\frac{1}{n}-1,\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)$$

```
[Out] (a*x*(1 + (b*x^n)/a)^n^(-1)*Hypergeometric2F1[-1 + n^(-1), n^(-1)
, 1 + n^(-1), -((b*x^n)/a)])/(a + b*x^n)^n^(-1)
```

Rubi [A] time = 0.0351041, antiderivative size = 53, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$ax\left(a+bx^n\right)^{-1/n}\left(\frac{bx^n}{a}+1\right)^{\frac{1}{n}}\,{}_2F_1\left(\frac{1}{n}-1,\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^(1 - n^(-1)),x]
```

```
[Out] (a*x*(1 + (b*x^n)/a)^n^(-1)*Hypergeometric2F1[-1 + n^(-1), n^(-1)
, 1 + n^(-1), -((b*x^n)/a)])/(a + b*x^n)^n^(-1)
```

Rubi in Sympy [A] time = 4.40203, size = 42, normalized size = 0.79

$$ax\left(1+\frac{bx^n}{a}\right)^{\frac{1}{n}}\left(a+bx^n\right)^{-\frac{1}{n}}\,{}_2F_1\left(\begin{matrix}-1+\frac{1}{n},\frac{1}{n}\\1+\frac{1}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**n)**(1-1/n),x)
```

```
[Out] a*x*(1 + b*x**n/a)**(1/n)*(a + b*x**n)**(-1/n)*hyper((-1 + 1/n, 1
/n), (1 + 1/n,), -b*x**n/a)
```

Mathematica [A] time = 0.0370572, size = 53, normalized size = 1.

$$ax\left(a+bx^n\right)^{-1/n}\left(\frac{bx^n}{a}+1\right)^{\frac{1}{n}}\,{}_2F_1\left(\frac{1}{n}-1,\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^(1 - n^(-1)),x]
```

```
[Out] (a*x*(1 + (b*x^n)/a)^n^(-1)*Hypergeometric2F1[-1 + n^(-1), n^(-1)
, 1 + n^(-1), -((b*x^n)/a)])/(a + b*x^n)^n^(-1)
```

Maple [F] time = 0.105, size = 0, normalized size = 0.

$$\int \left(a+bx^n\right)^{1-n^{-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^(1-1/n),x)

[Out] int((a+b*x^n)^(1-1/n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^{-\frac{1}{n}+1} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(-1/n + 1),x, algorithm="maxima")

[Out] integrate((b*x^n + a)^(-1/n + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left((bx^n + a)^{\frac{n-1}{n}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(-1/n + 1),x, algorithm="fricas")

[Out] integral((b*x^n + a)^((n - 1)/n), x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**(1-1/n),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^{-\frac{1}{n}+1} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(-1/n + 1),x, algorithm="giac")

[Out] integrate((b*x^n + a)^(-1/n + 1), x)
```

3.2704 $\int (a+bx^n)^{2-\frac{1}{n}} \, dx$

Optimal. Leaf size=55

$$a^2x(a+bx^n)^{-1/n}\left(\frac{bx^n}{a}+1\right)^{\frac{1}{n}} {}_2F_1\left(\frac{1}{n}-2,\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)$$

```
[Out] (a^2*x*(1 + (b*x^n)/a)^n^(-1)*Hypergeometric2F1[-2 + n^(-1), n^(-
1), 1 + n^(-1), -((b*x^n)/a)])/(a + b*x^n)^n^(-1)
```

Rubi [A] time = 0.0359431, antiderivative size = 55, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$a^2x(a+bx^n)^{-1/n}\left(\frac{bx^n}{a}+1\right)^{\frac{1}{n}} {}_2F_1\left(\frac{1}{n}-2,\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^(2 - n^(-1)),x]
```

```
[Out] (a^2*x*(1 + (b*x^n)/a)^n^(-1)*Hypergeometric2F1[-2 + n^(-1), n^(-
1), 1 + n^(-1), -((b*x^n)/a)])/(a + b*x^n)^n^(-1)
```

Rubi in Sympy [A] time = 4.5856, size = 44, normalized size = 0.8

$$a^2x\left(1+\frac{bx^n}{a}\right)^{\frac{1}{n}}(a+bx^n)^{-\frac{1}{n}} {}_2F_1\left(\begin{matrix} -2+\frac{1}{n},\frac{1}{n} \\ 1+\frac{1}{n} \end{matrix}\middle| -\frac{bx^n}{a}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**n)**(2-1/n),x)
```

```
[Out] a**2*x*(1 + b*x**n/a)**(1/n)*(a + b*x**n)**(-1/n)*hyper((-2 + 1/n
, 1/n), (1 + 1/n,), -b*x**n/a)
```

Mathematica [A] time = 0.0492444, size = 55, normalized size = 1.

$$a^2x(a+bx^n)^{-1/n}\left(\frac{bx^n}{a}+1\right)^{\frac{1}{n}} {}_2F_1\left(\frac{1}{n}-2,\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^(2 - n^(-1)),x]
```

```
[Out] (a^2*x*(1 + (b*x^n)/a)^n^(-1)*Hypergeometric2F1[-2 + n^(-1), n^(-
1), 1 + n^(-1), -((b*x^n)/a)])/(a + b*x^n)^n^(-1)
```

Maple [F] time = 0.108, size = 0, normalized size = 0.

$$\int (a+bx^n)^{2-n^{-1}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^(2-1/n),x)

[Out] int((a+b*x^n)^(2-1/n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^{-\frac{1}{n}+2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(-1/n + 2),x, algorithm="maxima")

[Out] integrate((b*x^n + a)^(-1/n + 2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left((bx^n + a)^{\frac{2n-1}{n}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(-1/n + 2),x, algorithm="fricas")

[Out] integral((b*x^n + a)^((2*n - 1)/n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**(2-1/n),x)

[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^{-\frac{1}{n}+2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^(-1/n + 2),x, algorithm="giac")

[Out] integrate((b*x^n + a)^(-1/n + 2), x)
```

3.2705 $\int x^m (bx^n)^p \, dx$

Optimal. Leaf size=21

$$\frac{x^{m+1}(bx^n)^p}{m+np+1}$$

```
[Out] (x^(1 + m)*(b*x^n)^p)/(1 + m + n*p)
```

Rubi [A] time = 0.017872, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{x^{m+1}(bx^n)^p}{m+np+1}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m*(b*x^n)^p,x]

[Out] (x^(1 + m)*(b*x^n)^p)/(1 + m + n*p)
```

Rubi in Sympy [A] time = 3.03791, size = 26, normalized size = 1.24

$$\frac{x^{-np}x^{m+np+1}(bx^n)^p}{m+np+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(b*x**n)**p,x)

[Out] x**(-n*p)*x**(m + n*p + 1)*(b*x**n)**p/(m + n*p + 1)
```

Mathematica [A] time = 0.00851219, size = 21, normalized size = 1.

$$\frac{x^{m+1}(bx^n)^p}{m+np+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m*(b*x^n)^p,x]

[Out] (x^(1 + m)*(b*x^n)^p)/(1 + m + n*p)
```

Maple [A] time = 0.003, size = 22, normalized size = 1.1

$$\frac{x^{1+m}(bx^n)^p}{np+m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(b*x^n)^p,x)

[Out] x^(1+m)*(b*x^n)^p/(n*p+m+1)
```

Maxima [A] time = 1.37878, size = 34, normalized size = 1.62

$$\frac{b^p x e^{(m\log(x)+p\log(x^n))}}{np+m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p*x^m,x, algorithm="maxima")
```

```
[Out] b^p*x*e^(m*log(x) + p*log(x^n))/(n*p + m + 1)
```

Fricas [A] time = 0.233575, size = 32, normalized size = 1.52

$$\frac{xx^m e^{(np\log(x)+p\log(b))}}{np+m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p*x^m,x, algorithm="fricas")
```

```
[Out] x*x^m*e^(n*p*log(x) + p*log(b))/(n*p + m + 1)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(b*x**n)**p,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [A] time = 0.219029, size = 34, normalized size = 1.62

$$\frac{xe^{(np\ln(x)+p\ln(b)+m\ln(x))}}{np+m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p*x^m,x, algorithm="giac")
```

```
[Out] x*e^(n*p*ln(x) + p*ln(b) + m*ln(x))/(n*p + m + 1)
```

3.2706 $\int x^2 (bx^n)^p \, dx$

Optimal. Leaf size=18

$$\frac{x^3 (bx^n)^p}{np+3}$$

```
[Out] (x^3*(b*x^n)^p)/(3 + n*p)
```

Rubi [A] time = 0.0177079, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{x^3 (bx^n)^p}{np+3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2*(b*x^n)^p,x]

[Out] (x^3*(b*x^n)^p)/(3 + n*p)
```

Rubi in Sympy [A] time = 2.91685, size = 22, normalized size = 1.22

$$\frac{x^{-np} x^{np+3} (bx^n)^p}{np+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(b*x**n)**p,x)

[Out] x**(-n*p)*x**(n*p + 3)*(b*x**n)**p/(n*p + 3)
```

Mathematica [A] time = 0.00457416, size = 18, normalized size = 1.

$$\frac{x^3 (bx^n)^p}{np+3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2*(b*x^n)^p,x]

[Out] (x^3*(b*x^n)^p)/(3 + n*p)
```

Maple [A] time = 0.002, size = 19, normalized size = 1.1

$$\frac{x^3 (bx^n)^p}{np+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(b*x^n)^p,x)

[Out] x^3*(b*x^n)^p/(n*p+3)
```

Maxima [A] time = 1.43682, size = 26, normalized size = 1.44

$$\frac{b^p x^3 (x^n)^p}{np+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p*x^2,x, algorithm="maxima")
```

```
[Out] b^p*x^3*(x^n)^p/(n*p + 3)
```

Fricas [A] time = 0.236989, size = 30, normalized size = 1.67

$$\frac{x^3 e^{(np\log(x)+p\log(b))}}{np+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p*x^2,x, algorithm="fricas")
```

```
[Out] x^3*e^(n*p*log(x) + p*log(b))/(n*p + 3)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(b*x**n)**p,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [A] time = 0.218961, size = 30, normalized size = 1.67

$$\frac{x^3 e^{(np\ln(x)+p\ln(b))}}{np+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p*x^2,x, algorithm="giac")
```

```
[Out] x^3*e^(n*p*ln(x) + p*ln(b))/(n*p + 3)
```

3.2707 $\int x (bx^n)^p \, dx$

Optimal. Leaf size=18

$$\frac{x^2 (bx^n)^p}{np + 2}$$

```
[Out] (x^2*(b*x^n)^p)/(2 + n*p)
```

Rubi [A] time = 0.0164161, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{x^2 (bx^n)^p}{np + 2}$$

Antiderivative was successfully verified.

```
[In]  Int[x*(b*x^n)^p,x]

[Out] (x^2*(b*x^n)^p)/(2 + n*p)
```

Rubi in Sympy [A] time = 2.78981, size = 22, normalized size = 1.22

$$\frac{x^{-np} x^{np+2} (bx^n)^p}{np + 2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(b*x**n)**p,x)

[Out] x**(-n*p)*x**(n*p + 2)*(b*x**n)**p/(n*p + 2)
```

Mathematica [A] time = 0.00436617, size = 18, normalized size = 1.

$$\frac{x^2 (bx^n)^p}{np + 2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x*(b*x^n)^p,x]

[Out] (x^2*(b*x^n)^p)/(2 + n*p)
```

Maple [A] time = 0.001, size = 19, normalized size = 1.1

$$\frac{x^2 (bx^n)^p}{np + 2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(b*x^n)^p,x)

[Out] x^2*(b*x^n)^p/(n*p+2)
```

Maxima [A] time = 1.43012, size = 26, normalized size = 1.44

$$\frac{b^p x^2 (x^n)^p}{np + 2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p*x,x, algorithm="maxima")
```

```
[Out] b^p*x^2*(x^n)^p/(n*p + 2)
```

Fricas [A] time = 0.232329, size = 30, normalized size = 1.67

$$\frac{x^2 e^{(np \log(x) + p \log(b))}}{np + 2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p*x,x, algorithm="fricas")
```

```
[Out] x^2*e^(n*p*log(x) + p*log(b))/(n*p + 2)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(b*x**n)**p,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [A] time = 0.218035, size = 30, normalized size = 1.67

$$\frac{x^2 e^{(np\ln(x) + p\ln(b))}}{np + 2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p*x,x, algorithm="giac")
```

```
[Out] x^2*e^(n*p*ln(x) + p*ln(b))/(n*p + 2)
```

3.2708 $\int (bx^n)^p \, dx$

Optimal. Leaf size=16

$$\frac{x(bx^n)^p}{np+1}$$

```
[Out] (x*(b*x^n)^p)/(1 + n*p)
```

Rubi [A] time = 0.0155755, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286

$$\frac{x(bx^n)^p}{np+1}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^n)^p,x]

[Out] (x*(b*x^n)^p)/(1 + n*p)
```

Rubi in Sympy [A] time = 2.06392, size = 22, normalized size = 1.38

$$\frac{x^{-np}x^{np+1}(bx^n)^p}{np+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**n)**p,x)

[Out] x**(-n*p)*x**(n*p + 1)*(b*x**n)**p/(n*p + 1)
```

Mathematica [A] time = 0.00320527, size = 16, normalized size = 1.

$$\frac{x(bx^n)^p}{np+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^n)^p,x]

[Out] (x*(b*x^n)^p)/(1 + n*p)
```

Maple [A] time = 0.002, size = 17, normalized size = 1.1

$$\frac{x(bx^n)^p}{np+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^n)^p,x)

[Out] x*(b*x^n)^p/(n*p+1)
```

Maxima [A] time = 1.37435, size = 23, normalized size = 1.44

$$\frac{b^p x (x^n)^p}{np+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p,x, algorithm="maxima")
```

```
[Out] b^p*x*(x^n)^p/(n*p + 1)
```

Fricas [A] time = 0.232321, size = 27, normalized size = 1.69

$$\frac{xe^{(np\log(x)+p\log(b))}}{np+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p,x, algorithm="fricas")
```

```
[Out] x*e^(n*p*log(x) + p*log(b))/(n*p + 1)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**n)**p,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [A] time = 0.218252, size = 27, normalized size = 1.69

$$\frac{xe^{(np\ln(x)+p\ln(b))}}{np+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p,x, algorithm="giac")
```

```
[Out] x*e^(n*p*ln(x) + p*ln(b))/(n*p + 1)
```

3.2709 $\int \frac{(bx^n)^p}{x} dx$

Optimal. Leaf size=14

$$\frac{(bx^n)^p}{np}$$

[Out] (b*x^n)^p/(n*p)

Rubi [A] time = 0.0139109, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$\frac{(bx^n)^p}{np}$$

Antiderivative was successfully verified.

[In] Int[(b*x^n)^p/x,x]

[Out] (b*x^n)^p/(n*p)

Rubi in Sympy [A] time = 3.02343, size = 8, normalized size = 0.57

$$\frac{(bx^n)^p}{np}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((b*x**n)**p/x,x)

[Out] (b*x**n)**p/(n*p)

Mathematica [A] time = 0.0026197, size = 14, normalized size = 1.

$$\frac{(bx^n)^p}{np}$$

Antiderivative was successfully verified.

[In] Integrate[(b*x^n)^p/x,x]

[Out] (b*x^n)^p/(n*p)

Maple [A] time = 0.002, size = 15, normalized size = 1.1

$$\frac{(bx^n)^p}{np}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((b*x^n)^p/x,x)

[Out] (b*x^n)^p/n/p

Maxima [A] time = 1.36991, size = 20, normalized size = 1.43

$$\frac{b^p (x^n)^p}{np}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p/x,x, algorithm="maxima")
```

```
[Out] b^p*(x^n)^p/(n*p)
```

Fricas [A] time = 0.23329, size = 24, normalized size = 1.71

$$\frac{e^{(np\log(x)+p\log(b))}}{np}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p/x,x, algorithm="fricas")
```

```
[Out] e^(n*p*log(x) + p*log(b))/(n*p)
```

Sympy [A] time = 0.770203, size = 22, normalized size = 1.57

$$\begin{cases} \log(x) & \text{for } n = 0 \wedge p = 0 \\ b^p \log(x) & \text{for } n = 0 \\ \log(x) & \text{for } p = 0 \\ \frac{b^p (x^n)^p}{np} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**n)**p/x,x)
```

```
[Out] Piecewise((log(x), Eq(n, 0) & Eq(p, 0)), (b**p*log(x), Eq(n, 0)),
 (log(x), Eq(p, 0)), (b**p*(x**n)**p/(n*p), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^n)^p}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p/x,x, algorithm="giac")
```

```
[Out] integrate((b*x^n)^p/x, x)
```

3.2710 $\int \frac{(bx^n)^p}{x^2} dx$

Optimal. Leaf size=20

$$-\frac{(bx^n)^p}{x(1-np)}$$

```
[Out] -((b*x^n)^p/((1 - n*p)*x))
```

Rubi [A] time = 0.0201919, antiderivative size = 20, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$-\frac{(bx^n)^p}{x(1-np)}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^n)^p/x^2,x]

[Out] -((b*x^n)^p/((1 - n*p)*x))
```

Rubi in Sympy [A] time = 2.98825, size = 24, normalized size = 1.2

$$-\frac{x^{-np}x^{np-1}(bx^n)^p}{-np+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**n)**p/x**2,x)

[Out] -x**(-n*p)*x**(n*p - 1)*(b*x**n)**p/(-n*p + 1)
```

Mathematica [A] time = 0.00612895, size = 18, normalized size = 0.9

$$\frac{(bx^n)^p}{x(np-1)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^n)^p/x^2,x]

[Out] (b*x^n)^p/((-1 + n*p)*x)
```

Maple [A] time = 0.001, size = 19, normalized size = 1.

$$\frac{(bx^n)^p}{x(np-1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^n)^p/x^2,x)

[Out] 1/x/(n*p-1)*(b*x^n)^p
```

Maxima [A] time = 1.40111, size = 26, normalized size = 1.3

$$\frac{b^p (x^n)^p}{(np - 1)x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p/x^2,x, algorithm="maxima")

[Out] b^p*(x^n)^p/((n*p - 1)*x)
```

Fricas [A] time = 0.235588, size = 30, normalized size = 1.5

$$\frac{e^{(np \log(x) + p \log(b))}}{(np - 1)x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p/x^2,x, algorithm="fricas")

[Out] e^(n*p*log(x) + p*log(b))/((n*p - 1)*x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**n)**p/x**2,x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^n)^p}{x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p/x^2,x, algorithm="giac")

[Out] integrate((b*x^n)^p/x^2, x)
```

3.2711 $\int \frac{(bx^n)^p}{x^3} dx$

Optimal. Leaf size=20

$$-\frac{(bx^n)^p}{x^2(2-np)}$$

```
[Out] -((b*x^n)^p/((2 - n*p)*x^2))
```

Rubi [A] time = 0.0197881, antiderivative size = 20, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$

$$-\frac{(bx^n)^p}{x^2(2-np)}$$

Antiderivative was successfully verified.

```
[In] Int[(b*x^n)^p/x^3,x]

[Out] -((b*x^n)^p/((2 - n*p)*x^2))
```

Rubi in Sympy [A] time = 2.92664, size = 24, normalized size = 1.2

$$-\frac{x^{-np}x^{np-2}(bx^n)^p}{-np+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x**n)**p/x**3,x)

[Out] -x**(-n*p)*x**(n*p - 2)*(b*x**n)**p/(-n*p + 2)
```

Mathematica [A] time = 0.00441641, size = 18, normalized size = 0.9

$$\frac{(bx^n)^p}{x^2(np-2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(b*x^n)^p/x^3,x]

[Out] (b*x^n)^p/((-2 + n*p)*x^2)
```

Maple [A] time = 0.001, size = 19, normalized size = 1.

$$\frac{(bx^n)^p}{x^2(np-2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x^n)^p/x^3,x)

[Out] 1/x^2/(n*p-2)*(b*x^n)^p
```

Maxima [A] time = 1.37531, size = 26, normalized size = 1.3

$$\frac{b^p (x^n)^p}{(np-2)x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p/x^3,x, algorithm="maxima")

[Out] b^p*(x^n)^p/((n*p - 2)*x^2)
```

Fricas [A] time = 0.232934, size = 30, normalized size = 1.5

$$\frac{e^{(np\log(x)+p\log(b))}}{(np-2)x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p/x^3,x, algorithm="fricas")

[Out] e^(n*p*log(x) + p*log(b))/((n*p - 2)*x^2)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**n)**p/x**3,x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^n)^p}{x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p/x^3,x, algorithm="giac")

[Out] integrate((b*x^n)^p/x^3, x)
```

3.2712 $\int \frac{(bx^n)^p}{x^4} dx$

Optimal. Leaf size=20

$$-\frac{(bx^n)^p}{x^3(3-np)}$$

```
[Out] -((b*x^n)^p/((3 - n*p)*x^3))
```

Rubi [A] time = 0.0197813, antiderivative size = 20, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$-\frac{(bx^n)^p}{x^3(3-np)}$$

Antiderivative was successfully verified.

```
[In]  Int[(b*x^n)^p/x^4,x]

[Out] -((b*x^n)^p/((3 - n*p)*x^3))
```

Rubi in Sympy [A] time = 2.95283, size = 24, normalized size = 1.2

$$-\frac{x^{-np}x^{np-3}\left(bx^n\right)^p}{-np+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**n)**p/x**4,x)

[Out] -x**(-n*p)*x**(n*p - 3)*(b*x**n)**p/(-n*p + 3)
```

Mathematica [A] time = 0.00429097, size = 18, normalized size = 0.9

$$\frac{(bx^n)^p}{x^3(np-3)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(b*x^n)^p/x^4,x]

[Out] (b*x^n)^p/((-3 + n*p)*x^3)
```

Maple [A] time = 0.002, size = 19, normalized size = 1.

$$\frac{(bx^n)^p}{x^3\left(np-3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^n)^p/x^4,x)

[Out] 1/x^3/(n*p-3)*(b*x^n)^p
```

Maxima [A] time = 1.40118, size = 26, normalized size = 1.3

$$\frac{b^p(x^n)^p}{(np-3)x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p/x^4,x, algorithm="maxima")
```

```
[Out] b^p*(x^n)^p/((n*p - 3)*x^3)
```

Fricas [A] time = 0.231254, size = 30, normalized size = 1.5

$$\frac{e^{(np\log(x)+p\log(b))}}{(np-3)x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p/x^4,x, algorithm="fricas")
```

```
[Out] e^(n*p*log(x) + p*log(b))/((n*p - 3)*x^3)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**n)**p/x**4,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^n)^p}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n)^p/x^4,x, algorithm="giac")
```

```
[Out] integrate((b*x^n)^p/x^4, x)
```

3.2713 $\int x^{-1+n} (a + bx^n)^p \, dx$

Optimal. Leaf size=23

$$\frac{(a + bx^n)^{p+1}}{bn(p + 1)}$$

```
[Out] (a + b*x^n)^(1 + p)/(b*n*(1 + p))
```

Rubi [A] time = 0.0284346, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{(a + bx^n)^{p+1}}{bn(p + 1)}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 + n)*(a + b*x^n)^p,x]

[Out] (a + b*x^n)^(1 + p)/(b*n*(1 + p))
```

Rubi in Sympy [A] time = 3.00776, size = 15, normalized size = 0.65

$$\frac{(a + bx^n)^{p+1}}{bn\,(p + 1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-1+n)*(a+b*x**n)**p,x)

[Out] (a + b*x**n)**(p + 1)/(b*n*(p + 1))
```

Mathematica [A] time = 0.0335867, size = 22, normalized size = 0.96

$$\frac{(a + bx^n)^{p+1}}{bnp + bn}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 + n)*(a + b*x^n)^p,x]

[Out] (a + b*x^n)^(1 + p)/(b*n + b*n*p)
```

Maple [A] time = 0.069, size = 29, normalized size = 1.3

$$\frac{(a + bx^n)\,(a + bx^n)^p}{b\,(1 + p)\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-1+n)*(a+b*x^n)^p,x)

[Out] (a+b*x^n)/b/(1+p)/n*(a+b*x^n)^p
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*x^(n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.237404, size = 36, normalized size = 1.57

$$\frac{(bx^n + a)(bx^n + a)^p}{bnp + bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*x^(n - 1),x, algorithm="fricas")
```

```
[Out] (b*x^n + a)*(b*x^n + a)^p/(b*n*p + b*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+n)*(a+b*x**n)**p,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.215972, size = 31, normalized size = 1.35

$$\frac{(bx^n + a)^{p+1}}{bn(p + 1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*x^(n - 1),x, algorithm="giac")
```

```
[Out] (b*x^n + a)^(p + 1)/(b*n*(p + 1))
```

3.2714 $\int x^{-1+2n} (a + bx^n)^p \, dx$

Optimal. Leaf size=49

$$\frac{(a + bx^n)^{p+2}}{b^2 n(p + 2)} - \frac{a (a + bx^n)^{p+1}}{b^2 n(p + 1)}$$

```
[Out] -((a*(a + b*x^n)^(1 + p))/(b^2*n*(1 + p))) + (a + b*x^n)^(2 + p)/
(b^2*n*(2 + p))
```

Rubi [A] time = 0.0779127, antiderivative size = 49, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{(a + bx^n)^{p+2}}{b^2 n(p + 2)} - \frac{a (a + bx^n)^{p+1}}{b^2 n(p + 1)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + 2*n)*(a + b*x^n)^p,x]
```

```
[Out] -((a*(a + b*x^n)^(1 + p))/(b^2*n*(1 + p))) + (a + b*x^n)^(2 + p)/
(b^2*n*(2 + p))
```

Rubi in Sympy [A] time = 11.5897, size = 37, normalized size = 0.76

$$-\frac{a (a + bx^n)^{p+1}}{b^2 n (p + 1)} + \frac{(a + bx^n)^{p+2}}{b^2 n (p + 2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+2*n)*(a+b*x**n)**p,x)
```

```
[Out] -a*(a + b*x**n)**(p + 1)/(b**2*n*(p + 1)) + (a + b*x**n)**(p + 2)
/(b**2*n*(p + 2))
```

Mathematica [A] time = 0.051251, size = 40, normalized size = 0.82

$$\frac{(a + bx^n)^{p+1} (b(p + 1)x^n - a)}{b^2 n(p + 1)(p + 2)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + 2*n)*(a + b*x^n)^p,x]
```

```
[Out] ((a + b*x^n)^(1 + p)*(-a + b*(1 + p)*x^n))/(b^2*n*(1 + p)*(2 + p)
)
```

Maple [A] time = 0.083, size = 61, normalized size = 1.2

$$-\frac{\left(-b^2 p \left(x^n\right)^2 - apx^n b - b^2 \left(x^n\right)^2 + a^2\right) (a + bx^n)^p}{(1 + p)(2 + p)\, nb^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+2*n)*(a+b*x^n)^p,x)
```

```
[Out] -(-b^2*p*(x^n)^2-a*p*x^n*b-b^2*(x^n)^2+a^2)/(1+p)/(2+p)/n/b^2*(a+
b*x^n)^p
```

Maxima [A] time = 1.40728, size = 69, normalized size = 1.41

$$\frac{\left(b^2(p+1)x^{2n}+abpx^n-a^2\right)(bx^n+a)^p}{(p^2+3p+2)b^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*x^(2*n - 1),x, algorithm="maxima")
```

```
[Out] (b^2*(p + 1)*x^(2*n) + a*b*p*x^n - a^2)*(b*x^n + a)^p/((p^2 + 3*p
 + 2)*b^2*n)
```

Fricas [A] time = 0.238824, size = 84, normalized size = 1.71

$$\frac{\left(abpx^n-a^2+\left(b^2p+b^2\right)x^{2n}\right)(bx^n+a)^p}{b^2np^2+3b^2np+2b^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*x^(2*n - 1),x, algorithm="fricas")
```

```
[Out] (a*b*p*x^n - a^2 + (b^2*p + b^2)*x^(2*n))*(b*x^n + a)^p/(b^2*n*p^
2 + 3*b^2*n*p + 2*b^2*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+2*n)*(a+b*x**n)**p,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n+a)^p x^{2n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*x^(2*n - 1),x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^p*x^(2*n - 1), x)
```

3.2715 $\int x^{-1+3n} (a + bx^n)^p \, dx$

Optimal. Leaf size=75

$$\frac{a^2 (a + bx^n)^{p+1}}{b^3 n(p + 1)} - \frac{2a (a + bx^n)^{p+2}}{b^3 n(p + 2)} + \frac{(a + bx^n)^{p+3}}{b^3 n(p + 3)}$$

```
[Out] (a^2*(a + b*x^n)^(1 + p))/(b^3*n*(1 + p)) - (2*a*(a + b*x^n)^(2 +
 p))/(b^3*n*(2 + p)) + (a + b*x^n)^(3 + p)/(b^3*n*(3 + p))
```

Rubi [A] time = 0.112925, antiderivative size = 75, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$

$$\frac{a^2 (a + bx^n)^{p+1}}{b^3 n(p + 1)} - \frac{2a (a + bx^n)^{p+2}}{b^3 n(p + 2)} + \frac{(a + bx^n)^{p+3}}{b^3 n(p + 3)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + 3*n)*(a + b*x^n)^p,x]
```

```
[Out] (a^2*(a + b*x^n)^(1 + p))/(b^3*n*(1 + p)) - (2*a*(a + b*x^n)^(2 +
 p))/(b^3*n*(2 + p)) + (a + b*x^n)^(3 + p)/(b^3*n*(3 + p))
```

Rubi in Sympy [A] time = 18.4928, size = 61, normalized size = 0.81

$$\frac{a^2 (a + bx^n)^{p+1}}{b^3 n (p + 1)} - \frac{2a (a + bx^n)^{p+2}}{b^3 n (p + 2)} + \frac{(a + bx^n)^{p+3}}{b^3 n (p + 3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+3*n)*(a+b*x**n)**p,x)
```

```
[Out] a**2*(a + b*x**n)**(p + 1)/(b**3*n*(p + 1)) - 2*a*(a + b*x**n)**(
p + 2)/(b**3*n*(p + 2)) + (a + b*x**n)**(p + 3)/(b**3*n*(p + 3))
```

Mathematica [A] time = 0.0716653, size = 66, normalized size = 0.88

$$\frac{(a + bx^n)^{p+1} \left(2a^2 - 2ab(p + 1)x^n + b^2 \left(p^2 + 3p + 2\right) x^{2n}\right)}{b^3 n(p + 1)(p + 2)(p + 3)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + 3*n)*(a + b*x^n)^p,x]
```

```
[Out] ((a + b*x^n)^(1 + p)*(2*a^2 - 2*a*b*(1 + p)*x^n + b^2*(2 + 3*p +
p^2)*x^(2*n)))/(b^3*n*(1 + p)*(2 + p)*(3 + p))
```

Maple [A] time = 0.097, size = 105, normalized size = 1.4

$$\frac{\left(b^3 p^2 (x^n)^3 + ab^2 p^2 (x^n)^2 + 3\, b^3 p\, (x^n)^3 + ap\, (x^n)^2 b^2 + 2\, (x^n)^3 b^3 - 2\, a^2 p x^n b + 2\, a^3\right) (a + bx^n)^p}{(2 + p)\,(3 + p)\,(1 + p)\, nb^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+3*n)*(a+b*x^n)^p,x)
```

```
[Out] (b^3*p^2*(x^n)^3+a*b^2*p^2*(x^n)^2+3*b^3*p*(x^n)^3+a*p*(x^n)^2*b^
2+2*(x^n)^3*b^3-2*a^2*p*x^n*b+2*a^3)/(2+p)/(3+p)/(1+p)/n/b^3*(a+b
*x^n)^p
```

Maxima [A] time = 1.39821, size = 107, normalized size = 1.43

$$\frac{\left(\left(p^2+3\,p+2\right)b^3x^{3\,n}+\left(p^2+p\right)ab^2x^{2\,n}-2\,a^2bpx^n+2\,a^3\right)\left(bx^n+a\right)^p}{\left(p^3+6\,p^2+11\,p+6\right)b^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*x^(3*n - 1),x, algorithm="maxima")
```

```
[Out] ((p^2 + 3*p + 2)*b^3*x^(3*n) + (p^2 + p)*a*b^2*x^(2*n) - 2*a^2*b*
p*x^n + 2*a^3)*(b*x^n + a)^p/((p^3 + 6*p^2 + 11*p + 6)*b^3*n)
```

Fricas [A] time = 0.238641, size = 146, normalized size = 1.95

$$-\frac{\left(2\,a^2bpx^n-2\,a^3-\left(b^3p^2+3\,b^3p+2\,b^3\right)x^{3\,n}-\left(ab^2p^2+ab^2p\right)x^{2\,n}\right)\left(bx^n+a\right)^p}{b^3np^3+6\,b^3np^2+11\,b^3np+6\,b^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*x^(3*n - 1),x, algorithm="fricas")
```

```
[Out] -(2*a^2*b*p*x^n - 2*a^3 - (b^3*p^2 + 3*b^3*p + 2*b^3)*x^(3*n) - (
a*b^2*p^2 + a*b^2*p)*x^(2*n))*(b*x^n + a)^p/(b^3*n*p^3 + 6*b^3*n*
p^2 + 11*b^3*n*p + 6*b^3*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+3*n)*(a+b*x**n)**p,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bx^n+a\right)^p x^{3\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*x^(3*n - 1),x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^p*x^(3*n - 1), x)
```

3.2716 $\int x^{-1+4n} (a + bx^n)^p \, dx$

Optimal. Leaf size=103

$$-\frac{a^3 (a + bx^n)^{p+1}}{b^4 n(p + 1)} + \frac{3a^2 (a + bx^n)^{p+2}}{b^4 n(p + 2)} - \frac{3a (a + bx^n)^{p+3}}{b^4 n(p + 3)} + \frac{(a + bx^n)^{p+4}}{b^4 n(p + 4)}$$

```
[Out] -((a^3*(a + b*x^n)^(1 + p))/(b^4*n*(1 + p))) + (3*a^2*(a + b*x^n)
^(2 + p))/(b^4*n*(2 + p)) - (3*a*(a + b*x^n)^(3 + p))/(b^4*n*(3 +
 p)) + (a + b*x^n)^(4 + p)/(b^4*n*(4 + p))
```

Rubi [A] time = 0.148039, antiderivative size = 103, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$

$$-\frac{a^3 (a + bx^n)^{p+1}}{b^4 n(p + 1)} + \frac{3a^2 (a + bx^n)^{p+2}}{b^4 n(p + 2)} - \frac{3a (a + bx^n)^{p+3}}{b^4 n(p + 3)} + \frac{(a + bx^n)^{p+4}}{b^4 n(p + 4)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 + 4*n)*(a + b*x^n)^p,x]
```

```
[Out] -((a^3*(a + b*x^n)^(1 + p))/(b^4*n*(1 + p))) + (3*a^2*(a + b*x^n)
^(2 + p))/(b^4*n*(2 + p)) - (3*a*(a + b*x^n)^(3 + p))/(b^4*n*(3 +
 p)) + (a + b*x^n)^(4 + p)/(b^4*n*(4 + p))
```

Rubi in Sympy [A] time = 25.4495, size = 85, normalized size = 0.83

$$-\frac{a^3 (a + bx^n)^{p+1}}{b^4 n (p + 1)} + \frac{3a^2 (a + bx^n)^{p+2}}{b^4 n (p + 2)} - \frac{3a (a + bx^n)^{p+3}}{b^4 n (p + 3)} + \frac{(a + bx^n)^{p+4}}{b^4 n (p + 4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1+4*n)*(a+b*x**n)**p,x)
```

```
[Out] -a**3*(a + b*x**n)**(p + 1)/(b**4*n*(p + 1)) + 3*a**2*(a + b*x**n
)**(p + 2)/(b**4*n*(p + 2)) - 3*a*(a + b*x**n)**(p + 3)/(b**4*n*(
p + 3)) + (a + b*x**n)**(p + 4)/(b**4*n*(p + 4))
```

Mathematica [A] time = 0.0931778, size = 97, normalized size = 0.94

$$\frac{(a + bx^n)^{p+1} \left(-6a^3 + 6a^2 b(p + 1)x^n - 3ab^2 \left(p^2 + 3p + 2\right) x^{2n} + b^3 \left(p^3 + 6p^2 + 11p + 6\right) x^{3n}\right)}{b^4 n(p + 1)(p + 2)(p + 3)(p + 4)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 + 4*n)*(a + b*x^n)^p,x]
```

```
[Out] ((a + b*x^n)^(1 + p)*(-6*a^3 + 6*a^2*b*(1 + p)*x^n - 3*a*b^2*(2 +
 3*p + p^2)*x^(2*n) + b^3*(6 + 11*p + 6*p^2 + p^3)*x^(3*n)))/(b^4
*n*(1 + p)*(2 + p)*(3 + p)*(4 + p))
```

Maple [A] time = 0.114, size = 171, normalized size = 1.7

$$-\frac{\left(-b^4p^3 (x^n)^4 - ab^3p^3 (x^n)^3 - 6\, b^4p^2 (x^n)^4 - 3\, ab^3p^2 (x^n)^3 - 11\, b^4p (x^n)^4 + 3\, a^2b^2p^2 (x^n)^2 - 2\, ap (x^n)^3 b^3 - 6\, (x^n)^4 b^4 + 3\, a^2 \cdots\right.}{(3 + p) (4 + p) (2 + p) (1 + p) nb^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1+4*n)*(a+b*x^n)^p,x)
```

```
[Out] -(-b^4*p^3*(x^n)^4-a*b^3*p^3*(x^n)^3-6*b^4*p^2*(x^n)^4-3*a*b^3*p^
2*(x^n)^3-11*b^4*p*(x^n)^4+3*a^2*b^2*p^2*(x^n)^2-2*a*p*(x^n)^3*b^
3-6*(x^n)^4*b^4+3*a^2*p*(x^n)^2*b^2-6*a^3*p*x^n*b+6*a^4)/(3+p)/(4
+p)/(2+p)/(1+p)/n/b^4*(a+b*x^n)^p
```

Maxima [A] time = 1.37778, size = 154, normalized size = 1.5

$$\frac{\left(\left(p^3+6\,p^2+11\,p+6\right)b^4x^{4\,n}+\left(p^3+3\,p^2+2\,p\right)ab^3x^{3\,n}-3\,\left(p^2+p\right)a^2b^2x^{2\,n}+6\,a^3bpx^n-6\,a^4\right)(bx^n+a)^p}{(p^4+10\,p^3+35\,p^2+50\,p+24)b^4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*x^(4*n - 1),x, algorithm="maxima")
```

```
[Out] ((p^3 + 6*p^2 + 11*p + 6)*b^4*x^(4*n) + (p^3 + 3*p^2 + 2*p)*a*b^3
*x^(3*n) - 3*(p^2 + p)*a^2*b^2*x^(2*n) + 6*a^3*b*p*x^n - 6*a^4)*(
b*x^n + a)^p/((p^4 + 10*p^3 + 35*p^2 + 50*p + 24)*b^4*n)
```

Fricas [A] time = 0.239498, size = 213, normalized size = 2.07

$$\frac{\left(6\,a^3bpx^n-6\,a^4+\left(b^4p^3+6\,b^4p^2+11\,b^4p+6\,b^4\right)x^{4\,n}+\left(ab^3p^3+3\,ab^3p^2+2\,ab^3p\right)x^{3\,n}-3\,\left(a^2b^2p^2+a^2b^2p\right)x^{2\,n}\right)(bx^n+a)^p}{b^4np^4+10\,b^4np^3+35\,b^4np^2+50\,b^4np+24\,b^4n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*x^(4*n - 1),x, algorithm="fricas")
```

```
[Out] (6*a^3*b*p*x^n - 6*a^4 + (b^4*p^3 + 6*b^4*p^2 + 11*b^4*p + 6*b^4)
*x^(4*n) + (a*b^3*p^3 + 3*a*b^3*p^2 + 2*a*b^3*p)*x^(3*n) - 3*(a^2
*b^2*p^2 + a^2*b^2*p)*x^(2*n))*(b*x^n + a)^p/(b^4*n*p^4 + 10*b^4*
n*p^3 + 35*b^4*n*p^2 + 50*b^4*n*p + 24*b^4*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-1+4*n)*(a+b*x**n)**p,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n+a)^p x^{4\,n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*x^(4*n - 1),x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^p*x^(4*n - 1), x)
```

3.2717 $\int x^{-1-n-np} (a+bx^n)^p \, dx$

Optimal. Leaf size=32

$$-\frac{x^{-n(p+1)} (a+bx^n)^{p+1}}{an(p+1)}$$

```
[Out] -((a + b*x^n)^(1 + p)/(a*n*(1 + p)*x^(n*(1 + p))))
```

Rubi [A] time = 0.0336558, antiderivative size = 32, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048

$$-\frac{x^{-n(p+1)} (a+bx^n)^{p+1}}{an(p+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - n - n*p)*(a + b*x^n)^p,x]

[Out] -((a + b*x^n)^(1 + p)/(a*n*(1 + p)*x^(n*(1 + p))))
```

Rubi in Sympy [A] time = 3.93618, size = 24, normalized size = 0.75

$$-\frac{x^{-n(p+1)} (a+bx^n)^{p+1}}{an\,(p+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-n*p-n-1)*(a+b*x**n)**p,x)

[Out] -x**(-n*(p + 1))*(a + b*x**n)**(p + 1)/(a*n*(p + 1))
```

Mathematica [A] time = 0.0811157, size = 32, normalized size = 1.

$$-\frac{x^{-n(p+1)} (a+bx^n)^{p+1}}{an(p+1)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - n - n*p)*(a + b*x^n)^p,x]

[Out] -((a + b*x^n)^(1 + p)/(a*n*(1 + p)*x^(n*(1 + p))))
```

Maple [F] time = 0.108, size = 0, normalized size = 0.

$$\int x^{-np-n-1} (a+bx^n)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-n*p-n-1)*(a+b*x^n)^p,x)

[Out] int(x^(-n*p-n-1)*(a+b*x^n)^p,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^p x^{-np-n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*x^(-n*p - n - 1),x, algorithm="maxima")
```

```
[Out] integrate((b*x^n + a)^p*x^(-n*p - n - 1), x)
```

Fricas [A] time = 0.239435, size = 72, normalized size = 2.25

$$-\frac{\left(bxx^{-np-n-1}x^n + axx^{-np-n-1}\right)(bx^n + a)^p}{anp + an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*x^(-n*p - n - 1),x, algorithm="fricas")
```

```
[Out] -(b*x*x^(-n*p - n - 1)*x^n + a*x*x^(-n*p - n - 1))*(b*x^n + a)^p/
(a*n*p + a*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-n*p-n-1)*(a+b*x**n)**p,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^p x^{-np-n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*x^(-n*p - n - 1),x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^p*x^(-n*p - n - 1), x)
```

3.2718 $\int x^{-1-9n}\,(a+bx^n)^8\,dx$

Optimal. Leaf size=24

$$-\frac{x^{-9n}\,(a+bx^n)^9}{9an}$$

```
[Out] -(a + b*x^n)^9/(9*a*n*x^(9*n))
```

Rubi [A] time = 0.0216856, antiderivative size = 24, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.059

$$-\frac{x^{-9n}\,(a+bx^n)^9}{9an}$$

Antiderivative was successfully verified.

```
[In]  Int[x^(-1 - 9*n)*(a + b*x^n)^8,x]
```

```
[Out] -(a + b*x^n)^9/(9*a*n*x^(9*n))
```

Rubi in Sympy [A] time = 3.10034, size = 19, normalized size = 0.79

$$-\frac{x^{-9n}\,(a+bx^n)^9}{9an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**(-1-9*n)*(a+b*x**n)**8,x)
```

```
[Out] -x**(-9*n)*(a + b*x**n)**9/(9*a*n)
```

Mathematica [B] time = 0.0528804, size = 111, normalized size = 4.62

$$-\frac{x^{-9n}\left(a^8+9a^7bx^n+36a^6b^2x^{2n}+84a^5b^3x^{3n}+126a^4b^4x^{4n}+126a^3b^5x^{5n}+84a^2b^6x^{6n}+36ab^7x^{7n}+9b^8x^{8n}\right)}{9n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^(-1 - 9*n)*(a + b*x^n)^8,x]
```

```
[Out] -(a^8 + 9*a^7*b*x^n + 36*a^6*b^2*x^(2*n) + 84*a^5*b^3*x^(3*n) + 1
26*a^4*b^4*x^(4*n) + 126*a^3*b^5*x^(5*n) + 84*a^2*b^6*x^(6*n) + 3
6*a*b^7*x^(7*n) + 9*b^8*x^(8*n))/(9*n*x^(9*n))
```

Maple [B] time = 0., size = 136, normalized size = 5.7

$$-\frac{b^8}{nx^n}-4\,\frac{ab^7}{n\,(x^n)^2}-\frac{28\,a^2b^6}{3\,n\,(x^n)^3}-14\,\frac{a^3b^5}{n\,(x^n)^4}-14\,\frac{a^4b^4}{n\,(x^n)^5}-\frac{28\,a^5b^3}{3\,n\,(x^n)^6}-4\,\frac{a^6b^2}{n\,(x^n)^7}-\frac{ba^7}{n\,(x^n)^8}-\frac{a^8}{9\,n\,(x^n)^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^(-1-9*n)*(a+b*x^n)^8,x)
```

```
[Out] -b^8/n/(x^n)-4*a*b^7/n/(x^n)^2-28/3*a^2*b^6/n/(x^n)^3-14*a^3*b^5/
n/(x^n)^4-14*a^4*b^4/n/(x^n)^5-28/3*a^5*b^3/n/(x^n)^6-4*a^6*b^2/n
/(x^n)^7-a^7*b/n/(x^n)^8-1/9*a^8/n/(x^n)^9
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^n + a)^8*x^(-9*n - 1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.239559, size = 150, normalized size = 6.25

$$-\frac{9\,b^{8}x^{8\,n}+36\,ab^{7}x^{7\,n}+84\,a^{2}b^{6}x^{6\,n}+126\,a^{3}b^{5}x^{5\,n}+126\,a^{4}b^{4}x^{4\,n}+84\,a^{5}b^{3}x^{3\,n}+36\,a^{6}b^{2}x^{2\,n}+9\,a^{7}bx^{n}+a^{8}}{9\,nx^{9\,n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^n + a)^8*x^(-9*n - 1),x, algorithm="fricas")
```

```
[Out] -1/9*(9*b^8*x^(8*n) + 36*a*b^7*x^(7*n) + 84*a^2*b^6*x^(6*n) + 126
*a^3*b^5*x^(5*n) + 126*a^4*b^4*x^(4*n) + 84*a^5*b^3*x^(3*n) + 36*
a^6*b^2*x^(2*n) + 9*a^7*b*x^n + a^8)/(n*x^(9*n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**(-1-9*n)*(a+b*x**n)**8,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.232475, size = 161, normalized size = 6.71

$$-\frac{\left(9\,b^{8}e^{\left(8\,n\ln(x)\right)}+36\,ab^{7}e^{\left(7\,n\ln(x)\right)}+84\,a^{2}b^{6}e^{\left(6\,n\ln(x)\right)}+126\,a^{3}b^{5}e^{\left(5\,n\ln(x)\right)}+126\,a^{4}b^{4}e^{\left(4\,n\ln(x)\right)}+84\,a^{5}b^{3}e^{\left(3\,n\ln(x)\right)}+36\,a^{6}b^{2}e^{\left(2\,n\ln\right.}\right.}{9\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^n + a)^8*x^(-9*n - 1),x, algorithm="giac")
```

```
[Out] -1/9*(9*b^8*e^(8*n*ln(x)) + 36*a*b^7*e^(7*n*ln(x)) + 84*a^2*b^6*e
^(6*n*ln(x)) + 126*a^3*b^5*e^(5*n*ln(x)) + 126*a^4*b^4*e^(4*n*ln(
x)) + 84*a^5*b^3*e^(3*n*ln(x)) + 36*a^6*b^2*e^(2*n*ln(x)) + 9*a^7
*b*e^(n*ln(x)) + a^8)*e^(-9*n*ln(x))/n
```

3.2719 $\int x^{-4-3p} (a + bx^3)^p \, dx$

Optimal. Leaf size=30

$$-\frac{x^{-3(p+1)} (a + bx^3)^{p+1}}{3a(p + 1)}$$

```
[Out] -(a + b*x^3)^(1 + p)/(3*a*(1 + p)*x^(3*(1 + p)))
```

Rubi [A] time = 0.0273358, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.059$

$$-\frac{x^{-3(p+1)} (a + bx^3)^{p+1}}{3a(p + 1)}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-4 - 3*p)*(a + b*x^3)^p,x]
```

```
[Out] -(a + b*x^3)^(1 + p)/(3*a*(1 + p)*x^(3*(1 + p)))
```

Rubi in Sympy [A] time = 3.42212, size = 26, normalized size = 0.87

$$-\frac{x^{-3p-3} (a + bx^3)^{p+1}}{3a (p + 1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**(-4-3*p)*(b*x**3+a)**p,x)
```

```
[Out] -x**(-3*p - 3)*(a + b*x**3)**(p + 1)/(3*a*(p + 1))
```

Mathematica [A] time = 0.0449106, size = 30, normalized size = 1.

$$-\frac{x^{-3p-3} (a + bx^3)^{p+1}}{3ap + 3a}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-4 - 3*p)*(a + b*x^3)^p,x]
```

```
[Out] -((x^(-3 - 3*p)*(a + b*x^3)^(1 + p))/(3*a + 3*a*p))
```

Maple [A] time = 0.004, size = 29, normalized size = 1.

$$-\frac{x^{-3-3p} (bx^3 + a)^{1+p}}{3a(1 + p)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-4-3*p)*(b*x^3+a)^p,x)
```

```
[Out] -1/3*x^(-3-3*p)*(b*x^3+a)^(1+p)/a/(1+p)
```

Maxima [A] time = 1.38232, size = 50, normalized size = 1.67

$$-\frac{(bx^3+a)\,e^{(p\log(bx^3+a)-3\,p\log(x))}}{3\,a(p+1)x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^p*x^(-3*p - 4),x, algorithm="maxima")
```

```
[Out] -1/3*(b*x^3 + a)*e^(p*log(b*x^3 + a) - 3*p*log(x))/(a*(p + 1)*x^3
)
```

Fricas [A] time = 0.241068, size = 46, normalized size = 1.53

$$-\frac{(bx^4+ax)\,(bx^3+a)^p x^{-3\,p-4}}{3\,(ap+a)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^p*x^(-3*p - 4),x, algorithm="fricas")
```

```
[Out] -1/3*(b*x^4 + a*x)*(b*x^3 + a)^p*x^(-3*p - 4)/(a*p + a)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**(-4-3*p)*(b*x**3+a)**p,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^3+a)^p x^{-3\,p-4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^p*x^(-3*p - 4),x, algorithm="giac")
```

```
[Out] integrate((b*x^3 + a)^p*x^(-3*p - 4), x)
```

3.2720 $\int \frac{(a+bx^3)^8}{x^{28}}\,dx$

Optimal. Leaf size=19

$$-\frac{(a+bx^3)^9}{27ax^{27}}$$

```
[Out] -(a + b*x^3)^9/(27*a*x^27)
```

Rubi [A] time = 0.0193318, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$-\frac{(a+bx^3)^9}{27ax^{27}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^3)^8/x^28,x]

[Out] -(a + b*x^3)^9/(27*a*x^27)
```

Rubi in Sympy [A] time = 2.74221, size = 15, normalized size = 0.79

$$-\frac{(a+bx^3)^9}{27ax^{27}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x**3+a)**8/x**28,x)

[Out] -(a + b*x**3)**9/(27*a*x**27)
```

Mathematica [B] time = 0.0144024, size = 108, normalized size = 5.68

$$-\frac{a^8}{27x^{27}}-\frac{a^7b}{3x^{24}}-\frac{4a^6b^2}{3x^{21}}-\frac{28a^5b^3}{9x^{18}}-\frac{14a^4b^4}{3x^{15}}-\frac{14a^3b^5}{3x^{12}}-\frac{28a^2b^6}{9x^9}-\frac{4ab^7}{3x^6}-\frac{b^8}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^3)^8/x^28,x]

[Out] -a^8/(27*x^27) - (a^7*b)/(3*x^24) - (4*a^6*b^2)/(3*x^21) - (28*a^
5*b^3)/(9*x^18) - (14*a^4*b^4)/(3*x^15) - (14*a^3*b^5)/(3*x^12) -
 (28*a^2*b^6)/(9*x^9) - (4*a*b^7)/(3*x^6) - b^8/(3*x^3)
```

Maple [B] time = 0.002, size = 91, normalized size = 4.8

$$-\frac{14\,a^3b^5}{3\,x^{12}}-\frac{14\,a^4b^4}{3\,x^{15}}-\frac{4\,a^6b^2}{3\,x^{21}}-\frac{28\,a^5b^3}{9\,x^{18}}-\frac{4\,ab^7}{3\,x^6}-\frac{ba^7}{3\,x^{24}}-\frac{28\,a^2b^6}{9\,x^9}-\frac{b^8}{3\,x^3}-\frac{a^8}{27\,x^{27}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x^3+a)^8/x^28,x)
```

```
[Out] -14/3*a^3*b^5/x^12-14/3*a^4*b^4/x^15-4/3*a^6*b^2/x^21-28/9*a^5*b^
3/x^18-4/3*a*b^7/x^6-1/3*a^7*b/x^24-28/9*a^2*b^6/x^9-1/3*b^8/x^3-
1/27*a^8/x^27
```

Maxima [A] time = 1.3448, size = 122, normalized size = 6.42

$$-\frac{9\,b^8x^{24} + 36\,ab^7x^{21} + 84\,a^2b^6x^{18} + 126\,a^3b^5x^{15} + 126\,a^4b^4x^{12} + 84\,a^5b^3x^9 + 36\,a^6b^2x^6 + 9\,a^7bx^3 + a^8}{27\,x^{27}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^28,x, algorithm="maxima")
```

```
[Out] -1/27*(9*b^8*x^24 + 36*a*b^7*x^21 + 84*a^2*b^6*x^18 + 126*a^3*b^5
*x^15 + 126*a^4*b^4*x^12 + 84*a^5*b^3*x^9 + 36*a^6*b^2*x^6 + 9*a^
7*b*x^3 + a^8)/x^27
```

Fricas [A] time = 0.206211, size = 122, normalized size = 6.42

$$-\frac{9\,b^8x^{24} + 36\,ab^7x^{21} + 84\,a^2b^6x^{18} + 126\,a^3b^5x^{15} + 126\,a^4b^4x^{12} + 84\,a^5b^3x^9 + 36\,a^6b^2x^6 + 9\,a^7bx^3 + a^8}{27\,x^{27}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^28,x, algorithm="fricas")
```

```
[Out] -1/27*(9*b^8*x^24 + 36*a*b^7*x^21 + 84*a^2*b^6*x^18 + 126*a^3*b^5
*x^15 + 126*a^4*b^4*x^12 + 84*a^5*b^3*x^9 + 36*a^6*b^2*x^6 + 9*a^
7*b*x^3 + a^8)/x^27
```

Sympy [A] time = 4.90974, size = 97, normalized size = 5.11

$$-\frac{a^8 + 9a^7bx^3 + 36a^6b^2x^6 + 84a^5b^3x^9 + 126a^4b^4x^{12} + 126a^3b^5x^{15} + 84a^2b^6x^{18} + 36ab^7x^{21} + 9b^8x^{24}}{27x^{27}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x**3+a)**8/x**28,x)
```

```
[Out] -(a**8 + 9*a**7*b*x**3 + 36*a**6*b**2*x**6 + 84*a**5*b**3*x**9 +
126*a**4*b**4*x**12 + 126*a**3*b**5*x**15 + 84*a**2*b**6*x**18 +
36*a*b**7*x**21 + 9*b**8*x**24)/(27*x**27)
```

GIAC/XCAS [A] time = 0.216665, size = 122, normalized size = 6.42

$$-\frac{9\,b^8x^{24} + 36\,ab^7x^{21} + 84\,a^2b^6x^{18} + 126\,a^3b^5x^{15} + 126\,a^4b^4x^{12} + 84\,a^5b^3x^9 + 36\,a^6b^2x^6 + 9\,a^7bx^3 + a^8}{27\,x^{27}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^8/x^28,x, algorithm="giac")
```

```
[Out] -1/27*(9*b^8*x^24 + 36*a*b^7*x^21 + 84*a^2*b^6*x^18 + 126*a^3*b^5
*x^15 + 126*a^4*b^4*x^12 + 84*a^5*b^3*x^9 + 36*a^6*b^2*x^6 + 9*a^
7*b*x^3 + a^8)/x^27
```

3.2721 $\int \frac{1}{x(a+bx^n)}\,dx$

Optimal. Leaf size=23

$$\frac{\log(x)}{a}-\frac{\log(a+bx^n)}{an}$$

```
[Out] Log[x]/a - Log[a + b*x^n]/(a*n)
```

Rubi [A] time = 0.0355037, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{\log(x)}{a}-\frac{\log(a+bx^n)}{an}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a + b*x^n)),x]

[Out] Log[x]/a - Log[a + b*x^n]/(a*n)
```

Rubi in Sympy [A] time = 6.28034, size = 19, normalized size = 0.83

$$\frac{\log(x^n)}{an}-\frac{\log(a+bx^n)}{an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(a+b*x**n),x)

[Out] log(x**n)/(a*n) - log(a + b*x**n)/(a*n)
```

Mathematica [A] time = 0.0172266, size = 22, normalized size = 0.96

$$\frac{n\log(x)-\log(a+bx^n)}{an}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a + b*x^n)),x]

[Out] (n*Log[x] - Log[a + b*x^n])/(a*n)
```

Maple [A] time = 0., size = 29, normalized size = 1.3

$$\frac{\ln(x^n)}{an}-\frac{\ln(a+bx^n)}{an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(a+b*x^n),x)

[Out] 1/n/a*ln(x^n)-ln(a+b*x^n)/a/n
```

Maxima [A] time = 1.38114, size = 38, normalized size = 1.65

$$-\frac{\log(bx^n + a)}{an} + \frac{\log(x^n)}{an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)*x),x, algorithm="maxima")
```

```
[Out] -log(b*x^n + a)/(a*n) + log(x^n)/(a*n)
```

Fricas [A] time = 0.246484, size = 30, normalized size = 1.3

$$\frac{n\log(x) - \log(bx^n + a)}{an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)*x),x, algorithm="fricas")
```

```
[Out] (n*log(x) - log(b*x^n + a))/(a*n)
```

Sympy [A] time = 2.1566, size = 41, normalized size = 1.78

$$\begin{cases} \tilde{\infty}\log(x) & \text{for } a = 0 \wedge b = 0 \wedge n = 0 \\ \frac{\log(x)}{a} & \text{for } b = 0 \\ \frac{\log(x)}{a+b} & \text{for } n = 0 \\ -\frac{x^{-n}}{bn} & \text{for } a = 0 \\ \frac{\log(x)}{a} - \frac{\log\left(\frac{a}{b} + x^n\right)}{an} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(a+b*x**n),x)
```

```
[Out] Piecewise((zoo*log(x), Eq(a, 0) & Eq(b, 0) & Eq(n, 0)), (log(x)/a
, Eq(b, 0)), (log(x)/(a + b), Eq(n, 0)), (-x**(-n)/(b*n), Eq(a, 0
)), (log(x)/a - log(a/b + x**n)/(a*n), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^n + a)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)*x),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^n + a)*x), x)
```

3.2722 $\int \frac{1}{x(a+bx^3)}\,dx$

Optimal. Leaf size=22

$$\frac{\log(x)}{a}-\frac{\log\left(a+bx^3\right)}{3a}$$

```
[Out] Log[x]/a - Log[a + b*x^3]/(3*a)
```

Rubi [A] time = 0.0378885, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{\log(x)}{a}-\frac{\log\left(a+bx^3\right)}{3a}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a + b*x^3)),x]

[Out] Log[x]/a - Log[a + b*x^3]/(3*a)
```

Rubi in Sympy [A] time = 5.43752, size = 19, normalized size = 0.86

$$\frac{\log\left(x^3\right)}{3a}-\frac{\log\left(a+bx^3\right)}{3a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(b*x**3+a),x)

[Out] log(x**3)/(3*a) - log(a + b*x**3)/(3*a)
```

Mathematica [A] time = 0.00889521, size = 22, normalized size = 1.

$$\frac{\log(x)}{a}-\frac{\log\left(a+bx^3\right)}{3a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a + b*x^3)),x]

[Out] Log[x]/a - Log[a + b*x^3]/(3*a)
```

Maple [A] time = 0.001, size = 21, normalized size = 1.

$$\frac{\ln(x)}{a}-\frac{\ln\left(bx^3+a\right)}{3\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(b*x^3+a),x)

[Out] ln(x)/a-1/3*ln(b*x^3+a)/a
```

Maxima [A] time = 1.34389, size = 31, normalized size = 1.41

$$-\frac{\log\left(bx^3+a\right)}{3\,a}+\frac{\log\left(x^3\right)}{3\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)*x),x, algorithm="maxima")
```

```
[Out] -1/3*log(b*x^3 + a)/a + 1/3*log(x^3)/a
```

Fricas [A] time = 0.216405, size = 24, normalized size = 1.09

$$-\frac{\log\left(bx^3+a\right)-3\,\log\left(x\right)}{3\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)*x),x, algorithm="fricas")
```

```
[Out] -1/3*(log(b*x^3 + a) - 3*log(x))/a
```

Sympy [A] time = 0.572219, size = 15, normalized size = 0.68

$$\frac{\log\left(x\right)}{a}-\frac{\log\left(\frac{a}{b}+x^3\right)}{3a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(b*x**3+a),x)
```

```
[Out] log(x)/a - log(a/b + x**3)/(3*a)
```

GIAC/XCAS [A] time = 0.217243, size = 30, normalized size = 1.36

$$-\frac{\ln\left(\left|bx^3+a\right|\right)}{3\,a}+\frac{\ln\left(\left|x\right|\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^3 + a)*x),x, algorithm="giac")
```

```
[Out] -1/3*ln(abs(b*x^3 + a))/a + ln(abs(x))/a
```

3.2723 $\int (a+bx^n)^{-\frac{1+4n}{n}}\,dx$

Optimal. Leaf size=147

$$\frac{6n^3x\,(a+bx^n)^{-1/n}}{a^4(n+1)(2n+1)(3n+1)}+\frac{6n^2x\,(a+bx^n)^{-\frac{n+1}{n}}}{a^3(n+1)(2n+1)(3n+1)}+\frac{3nx\,(a+bx^n)^{-\frac{1}{n}-2}}{a^2\,(6n^2+5n+1)}+\frac{x\,(a+bx^n)^{-\frac{1}{n}-3}}{a(3n+1)}$$

```
[Out] (x*(a + b*x^n)^(-3 - n^(-1)))/(a*(1 + 3*n)) + (3*n*x*(a + b*x^n)^
(-2 - n^(-1)))/(a^2*(1 + 5*n + 6*n^2)) + (6*n^3*x)/(a^4*(1 + n)*(
1 + 2*n)*(1 + 3*n)*(a + b*x^n)^n^(-1)) + (6*n^2*x)/(a^3*(1 + n)*(
1 + 2*n)*(1 + 3*n)*(a + b*x^n)^((1 + n)/n))
```

Rubi [A] time = 0.236429, antiderivative size = 147, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111

$$\frac{6n^3x\,(a+bx^n)^{-1/n}}{a^4(n+1)(2n+1)(3n+1)}+\frac{6n^2x\,(a+bx^n)^{-\frac{n+1}{n}}}{a^3(n+1)(2n+1)(3n+1)}+\frac{3nx\,(a+bx^n)^{-\frac{1}{n}-2}}{a^2\,(6n^2+5n+1)}+\frac{x\,(a+bx^n)^{-\frac{1}{n}-3}}{a(3n+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^(-((1 + 4*n)/n)),x]
```

```
[Out] (x*(a + b*x^n)^(-3 - n^(-1)))/(a*(1 + 3*n)) + (3*n*x*(a + b*x^n)^
(-2 - n^(-1)))/(a^2*(1 + 5*n + 6*n^2)) + (6*n^3*x)/(a^4*(1 + n)*(
1 + 2*n)*(1 + 3*n)*(a + b*x^n)^n^(-1)) + (6*n^2*x)/(a^3*(1 + n)*(
1 + 2*n)*(1 + 3*n)*(a + b*x^n)^((1 + n)/n))
```

Rubi in Sympy [A] time = 4.62421, size = 46, normalized size = 0.31

$$x\left(1+\frac{bx^n}{a}\right)^{4+\frac{1}{n}}(a+bx^n)^{-4-\frac{1}{n}}\,{}_2F_1\left(\begin{matrix}4+\frac{1}{n},\frac{1}{n}\\1+\frac{1}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/((a+b*x**n)**((1+4*n)/n)),x)
```

```
[Out] x*(1 + b*x**n/a)**(4 + 1/n)*(a + b*x**n)**(-4 - 1/n)*hyper((4 + 1
/n, 1/n), (1 + 1/n,), -b*x**n/a)
```

Mathematica [C] time = 0.0712452, size = 55, normalized size = 0.37

$$\frac{x\,(a+bx^n)^{-1/n}\left(\frac{bx^n}{a}+1\right)^{\frac{1}{n}}\,{}_2F_1\left(4+\frac{1}{n},\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)}{a^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^(-((1 + 4*n)/n)),x]
```

```
[Out] (x*(1 + (b*x^n)/a)^n^(-1)*Hypergeometric2F1[4 + n^(-1), n^(-1), 1
 + n^(-1), -((b*x^n)/a)])/(a^4*(a + b*x^n)^n^(-1))
```

Maple [F] time = 0.17, size = 0, normalized size = 0.

$$\int\left((a+bx^n)^{\frac{1+4\,n}{n}}\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/((a+b*x^n)^((1+4*n)/n)),x)
```

```
[Out] int(1/((a+b*x^n)^((1+4*n)/n)),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^{-\frac{4n+1}{n}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^((4*n + 1)/n)),x, algorithm="maxima")
```

```
[Out] integrate((b*x^n + a)^(-(4*n + 1)/n), x)
```

Fricas [A] time = 0.239461, size = 259, normalized size = 1.76

$$\frac{6 b^4n^3xx^{4n} + 6 \left(4 ab^3n^3 + ab^3n^2\right) xx^{3n} + 3 \left(12 a^2b^2n^3 + 7 a^2b^2n^2 + a^2b^2n\right) xx^{2n} + \left(24 a^3bn^3 + 26 a^3bn^2 + 9 a^3bn + a^3b\right) xx^n}{(6 a^4n^3 + 11 a^4n^2 + 6 a^4n + a^4)(bx^n + a)^{\frac{4n+1}{n}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^((4*n + 1)/n)),x, algorithm="fricas")
```

```
[Out] (6*b^4*n^3*x*x^(4*n) + 6*(4*a*b^3*n^3 + a*b^3*n^2)*x*x^(3*n) + 3*
(12*a^2*b^2*n^3 + 7*a^2*b^2*n^2 + a^2*b^2*n)*x*x^(2*n) + (24*a^3*
b*n^3 + 26*a^3*b*n^2 + 9*a^3*b*n + a^3*b)*x*x^n + (6*a^4*n^3 + 11
*a^4*n^2 + 6*a^4*n + a^4)*x)/((6*a^4*n^3 + 11*a^4*n^2 + 6*a^4*n +
 a^4)*(b*x^n + a)^((4*n + 1)/n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a+b*x**n)**((1+4*n)/n)),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^n + a)^{\frac{4n+1}{n}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^((4*n + 1)/n)),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^n + a)^((4*n + 1)/n)), x)
```

3.2724 $\int (a+bx^n)^{-\frac{1+3n}{n}}\,dx$

Optimal. Leaf size=97

$$\frac{2n^2x\,(a+bx^n)^{-1/n}}{a^3(n+1)(2n+1)}+\frac{2nx\,(a+bx^n)^{-\frac{n+1}{n}}}{a^2(n+1)(2n+1)}+\frac{x\,(a+bx^n)^{-\frac{1}{n}-2}}{a(2n+1)}$$

```
[Out] (x*(a + b*x^n)^(-2 - n^(-1)))/(a*(1 + 2*n)) + (2*n^2*x)/(a^3*(1 +
 n)*(1 + 2*n)*(a + b*x^n)^n^(-1)) + (2*n*x)/(a^2*(1 + n)*(1 + 2*n
)*(a + b*x^n)^((1 + n)/n))
```

Rubi [A] time = 0.123963, antiderivative size = 97, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111

$$\frac{2n^2x\,(a+bx^n)^{-1/n}}{a^3(n+1)(2n+1)}+\frac{2nx\,(a+bx^n)^{-\frac{n+1}{n}}}{a^2(n+1)(2n+1)}+\frac{x\,(a+bx^n)^{-\frac{1}{n}-2}}{a(2n+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^(-((1 + 3*n)/n)),x]
```

```
[Out] (x*(a + b*x^n)^(-2 - n^(-1)))/(a*(1 + 2*n)) + (2*n^2*x)/(a^3*(1 +
 n)*(1 + 2*n)*(a + b*x^n)^n^(-1)) + (2*n*x)/(a^2*(1 + n)*(1 + 2*n
)*(a + b*x^n)^((1 + n)/n))
```

Rubi in Sympy [A] time = 4.66019, size = 46, normalized size = 0.47

$$x\left(1+\frac{bx^n}{a}\right)^{3+\frac{1}{n}}(a+bx^n)^{-3-\frac{1}{n}}\,{}_2F_1\left(\begin{matrix}3+\frac{1}{n},\frac{1}{n}\\1+\frac{1}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/((a+b*x**n)**((1+3*n)/n)),x)
```

```
[Out] x*(1 + b*x**n/a)**(3 + 1/n)*(a + b*x**n)**(-3 - 1/n)*hyper((3 + 1
/n, 1/n), (1 + 1/n,), -b*x**n/a)
```

Mathematica [C] time = 0.0465988, size = 55, normalized size = 0.57

$$\frac{x\,(a+bx^n)^{-1/n}\left(\frac{bx^n}{a}+1\right)^{\frac{1}{n}}{}_2F_1\left(3+\frac{1}{n},\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)}{a^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^(-((1 + 3*n)/n)),x]
```

```
[Out] (x*(1 + (b*x^n)/a)^n^(-1)*Hypergeometric2F1[3 + n^(-1), n^(-1), 1
 + n^(-1), -((b*x^n)/a)])/(a^3*(a + b*x^n)^n^(-1))
```

Maple [F] time = 0.149, size = 0, normalized size = 0.

$$\int\left((a+bx^n)^{\frac{1+3\,n}{n}}\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/((a+b*x^n)^((1+3*n)/n)),x)
```

```
[Out] int(1/((a+b*x^n)^((1+3*n)/n)),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^{-\frac{3n+1}{n}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^((3*n + 1)/n)),x, algorithm="maxima")
```

```
[Out] integrate((b*x^n + a)^(-(3*n + 1)/n), x)
```

Fricas [A] time = 0.238664, size = 170, normalized size = 1.75

$$\frac{2 b^3 n^2 x x^{3n} + 2 \left(3 a b^2 n^2 + a b^2 n\right) x x^{2n} + \left(6 a^2 b n^2 + 5 a^2 b n + a^2 b\right) x x^n + \left(2 a^3 n^2 + 3 a^3 n + a^3\right) x}{(2 a^3 n^2 + 3 a^3 n + a^3)(bx^n + a)^{\frac{3n+1}{n}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^((3*n + 1)/n)),x, algorithm="fricas")
```

```
[Out] (2*b^3*n^2*x*x^(3*n) + 2*(3*a*b^2*n^2 + a*b^2*n)*x*x^(2*n) + (6*a
^2*b*n^2 + 5*a^2*b*n + a^2*b)*x*x^n + (2*a^3*n^2 + 3*a^3*n + a^3)
*x)/((2*a^3*n^2 + 3*a^3*n + a^3)*(b*x^n + a)^((3*n + 1)/n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a+b*x**n)**((1+3*n)/n)),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^n + a)^{\frac{3n+1}{n}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^((3*n + 1)/n)),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^n + a)^((3*n + 1)/n)), x)
```

3.2725 $\int (a+bx^n)^{-\frac{1+2n}{n}}\,dx$

Optimal. Leaf size=51

$$\frac{nx(a+bx^n)^{-1/n}}{a^2(n+1)}+\frac{x(a+bx^n)^{-\frac{n+1}{n}}}{a(n+1)}$$

```
[Out] (n*x)/(a^2*(1 + n)*(a + b*x^n)^n^(-1)) + x/(a*(1 + n)*(a + b*x^n)
^((1 + n)/n))
```

Rubi [A] time = 0.0489196, antiderivative size = 51, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111

$$\frac{nx(a+bx^n)^{-1/n}}{a^2(n+1)}+\frac{x(a+bx^n)^{-\frac{n+1}{n}}}{a(n+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^(-((1 + 2*n)/n)),x]
```

```
[Out] (n*x)/(a^2*(1 + n)*(a + b*x^n)^n^(-1)) + x/(a*(1 + n)*(a + b*x^n)
^((1 + n)/n))
```

Rubi in Sympy [A] time = 4.63327, size = 46, normalized size = 0.9

$$x\left(1+\frac{bx^n}{a}\right)^{2+\frac{1}{n}}(a+bx^n)^{-2-\frac{1}{n}}\,{}_2F_1\left(\begin{matrix}2+\frac{1}{n},\frac{1}{n}\\1+\frac{1}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/((a+b*x**n)**((1+2*n)/n)),x)
```

```
[Out] x*(1 + b*x**n/a)**(2 + 1/n)*(a + b*x**n)**(-2 - 1/n)*hyper((2 + 1
/n, 1/n), (1 + 1/n,), -b*x**n/a)
```

Mathematica [C] time = 0.0366189, size = 55, normalized size = 1.08

$$\frac{x(a+bx^n)^{-1/n}\left(\frac{bx^n}{a}+1\right)^{\frac{1}{n}}\,{}_2F_1\left(2+\frac{1}{n},\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)}{a^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^(-((1 + 2*n)/n)),x]
```

```
[Out] (x*(1 + (b*x^n)/a)^n^(-1)*Hypergeometric2F1[2 + n^(-1), n^(-1), 1
 + n^(-1), -((b*x^n)/a)])/(a^2*(a + b*x^n)^n^(-1))
```

Maple [F] time = 0.128, size = 0, normalized size = 0.

$$\int\left((a+bx^n)^{\frac{1+2n}{n}}\right)^{-1}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/((a+b*x^n)^((1+2*n)/n)),x)

[Out] int(1/((a+b*x^n)^((1+2*n)/n)),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^{-\frac{2n+1}{n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^((2*n + 1)/n)),x, algorithm="maxima")

[Out] integrate((b*x^n + a)^(-(2*n + 1)/n), x)
```

Fricas [A] time = 0.240196, size = 92, normalized size = 1.8

$$\frac{b^2nxx^{2n} + (2abn + ab)xx^n + (a^2n + a^2)x}{(a^2n + a^2)(bx^n + a)^{\frac{2n+1}{n}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^((2*n + 1)/n)),x, algorithm="fricas")

[Out] (b^2*n*x*x^(2*n) + (2*a*b*n + a*b)*x*x^n + (a^2*n + a^2)*x)/((a^2
*n + a^2)*(b*x^n + a)^((2*n + 1)/n))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a+b*x**n)**((1+2*n)/n)),x)

[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^n + a)^{\frac{2n+1}{n}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^((2*n + 1)/n)),x, algorithm="giac")

[Out] integrate(1/((b*x^n + a)^((2*n + 1)/n)), x)
```

3.2726 $\int (a+bx^n)^{-\frac{1+n}{n}}\,dx$

Optimal. Leaf size=18

$$\frac{x(a+bx^n)^{-1/n}}{a}$$

```
[Out] x/(a*(a + b*x^n)^n^(-1))
```

Rubi [A] time = 0.012528, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062

$$\frac{x(a+bx^n)^{-1/n}}{a}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^n)^(-((1 + n)/n)),x]
```

```
[Out] x/(a*(a + b*x^n)^n^(-1))
```

Rubi in Sympy [A] time = 1.43926, size = 12, normalized size = 0.67

$$\frac{x(a+bx^n)^{-\frac{1}{n}}}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/((a+b*x**n)**((1+n)/n)),x)
```

```
[Out] x*(a + b*x**n)**(-1/n)/a
```

Mathematica [A] time = 0.0325714, size = 18, normalized size = 1.

$$\frac{x(a+bx^n)^{-1/n}}{a}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^n)^(-((1 + n)/n)),x]
```

```
[Out] x/(a*(a + b*x^n)^n^(-1))
```

Maple [A] time = 0.036, size = 35, normalized size = 1.9

$$1\left(x+\frac{bx\mathrm{e}^{n\ln(x)}}{a}\right)\left(\mathrm{e}^{\frac{(1+n)\ln\left(a+b\mathrm{e}^{n\ln(x)}\right)}{n}}\right)^{-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a+b*x^n)^((1+n)/n)),x)
```

```
[Out] (x+b/a*x*exp(n*ln(x)))/exp((1+n)/n*ln(a+b*exp(n*ln(x))))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^{-\frac{n+1}{n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^((n + 1)/n)),x, algorithm="maxima")
```

```
[Out] integrate((b*x^n + a)^(-(n + 1)/n), x)
```

Fricas [A] time = 0.237092, size = 42, normalized size = 2.33

$$\frac{bxx^n + ax}{(bx^n + a)^{\frac{n+1}{n}}a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^((n + 1)/n)),x, algorithm="fricas")
```

```
[Out] (b*x*x^n + a*x)/((b*x^n + a)^((n + 1)/n)*a)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a+b*x**n)**((1+n)/n)),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^n + a)^{\frac{n+1}{n}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^((n + 1)/n)),x, algorithm="giac")
```

```
[Out] integrate(1/((b*x^n + a)^((n + 1)/n)), x)
```

3.2727 $\int (a + bx^n)^{-1/n} \, dx$

Optimal. Leaf size=50

$$x (a + bx^n)^{-1/n} \left(\frac{bx^n}{a} + 1\right)^{\frac{1}{n}} {}_2F_1\left(\frac{1}{n}, \frac{1}{n}; 1 + \frac{1}{n}; -\frac{bx^n}{a}\right)$$

```
[Out] (x*(1 + (b*x^n)/a)^n^(-1)*Hypergeometric2F1[n^(-1), n^(-1), 1 + n
^(-1), -((b*x^n)/a)])/(a + b*x^n)^n^(-1)
```

Rubi [A] time = 0.0336286, antiderivative size = 50, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$x (a + bx^n)^{-1/n} \left(\frac{bx^n}{a} + 1\right)^{\frac{1}{n}} {}_2F_1\left(\frac{1}{n}, \frac{1}{n}; 1 + \frac{1}{n}; -\frac{bx^n}{a}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^(-n^(-1)),x]
```

```
[Out] (x*(1 + (b*x^n)/a)^n^(-1)*Hypergeometric2F1[n^(-1), n^(-1), 1 + n
^(-1), -((b*x^n)/a)])/(a + b*x^n)^n^(-1)
```

Rubi in Sympy [A] time = 4.02037, size = 39, normalized size = 0.78

$$x \left(1 + \frac{bx^n}{a}\right)^{\frac{1}{n}} (a + bx^n)^{-\frac{1}{n}} {}_2F_1\left(\begin{matrix} \frac{1}{n}, \frac{1}{n} \\ 1 + \frac{1}{n} \end{matrix} \middle| -\frac{bx^n}{a}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/((a+b*x**n)**(1/n)),x)
```

```
[Out] x*(1 + b*x**n/a)**(1/n)*(a + b*x**n)**(-1/n)*hyper((1/n, 1/n), (1
 + 1/n,), -b*x**n/a)
```

Mathematica [A] time = 0.0218699, size = 50, normalized size = 1.

$$x (a + bx^n)^{-1/n} \left(\frac{bx^n}{a} + 1\right)^{\frac{1}{n}} {}_2F_1\left(\frac{1}{n}, \frac{1}{n}; 1 + \frac{1}{n}; -\frac{bx^n}{a}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^(-n^(-1)),x]
```

```
[Out] (x*(1 + (b*x^n)/a)^n^(-1)*Hypergeometric2F1[n^(-1), n^(-1), 1 + n
^(-1), -((b*x^n)/a)])/(a + b*x^n)^n^(-1)
```

Maple [F] time = 0., size = 0, normalized size = 0.

$$\int \left(\sqrt[n]{a + bx^n}\right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/((a+b*x^n)^(1/n)),x)

[Out] int(1/((a+b*x^n)^(1/n)),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^{-\frac{1}{n}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^(1/n)),x, algorithm="maxima")

[Out] integrate((b*x^n + a)^(-1/n), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{(bx^n + a)^{\left(\frac{1}{n}\right)}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^(1/n)),x, algorithm="fricas")

[Out] integral(1/((b*x^n + a)^(1/n)), x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a+b*x**n)**(1/n)),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bx^n + a)^{\left(\frac{1}{n}\right)}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^(1/n)),x, algorithm="giac")

[Out] integrate(1/((b*x^n + a)^(1/n)), x)
```

3.2728 $\int (a+bx^n)^{-\frac{1-n}{n}}\,dx$

Optimal. Leaf size=59

$$x(a+bx^n)^{-\frac{1-n}{n}}\left(\frac{bx^n}{a}+1\right)^{\frac{1}{n}-1}{}_2F_1\left(\frac{1}{n}-1,\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)$$

```
[Out] (x*(1 + (b*x^n)/a)^(-1 + n^(-1))*Hypergeometric2F1[-1 + n^(-1), n
^(-1), 1 + n^(-1), -((b*x^n)/a)])/(a + b*x^n)^((1 - n)/n)
```

Rubi [A] time = 0.0384988, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111

$$x(a+bx^n)^{-\frac{1-n}{n}}\left(\frac{bx^n}{a}+1\right)^{\frac{1}{n}-1}{}_2F_1\left(\frac{1}{n}-1,\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x^n)^(-((1 - n)/n)),x]
```

```
[Out] (x*(1 + (b*x^n)/a)^(-1 + n^(-1))*Hypergeometric2F1[-1 + n^(-1), n
^(-1), 1 + n^(-1), -((b*x^n)/a)])/(a + b*x^n)^((1 - n)/n)
```

Rubi in Sympy [A] time = 4.93949, size = 46, normalized size = 0.78

$$x\left(1+\frac{bx^n}{a}\right)^{-\frac{n-1}{n}}(a+bx^n)^{\frac{n-1}{n}}{}_2F_1\left(\begin{matrix}-\frac{n-1}{n},\frac{1}{n}\\1+\frac{1}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/((a+b*x**n)**((1-n)/n)),x)
```

```
[Out] x*(1 + b*x**n/a)**(-(n - 1)/n)*(a + b*x**n)**((n - 1)/n)*hyper((-
(n - 1)/n, 1/n), (1 + 1/n,), -b*x**n/a)
```

Mathematica [A] time = 0.0358157, size = 53, normalized size = 0.9

$$ax(a+bx^n)^{-1/n}\left(\frac{bx^n}{a}+1\right)^{\frac{1}{n}}{}_2F_1\left(\frac{1}{n}-1,\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x^n)^(-((1 - n)/n)),x]
```

```
[Out] (a*x*(1 + (b*x^n)/a)^n^(-1)*Hypergeometric2F1[-1 + n^(-1), n^(-1)
, 1 + n^(-1), -((b*x^n)/a)])/(a + b*x^n)^n^(-1)
```

Maple [F] time = 0.103, size = 0, normalized size = 0.

$$\int \left((a+bx^n)^{\frac{1-n}{n}}\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/((a+b*x^n)^((1-n)/n)),x)

[Out] int(1/((a+b*x^n)^((1-n)/n)),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^{\frac{n-1}{n}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^(-(n - 1)/n)),x, algorithm="maxima")

[Out] integrate((b*x^n + a)^((n - 1)/n), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left((bx^n + a)^{\frac{n-1}{n}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^((n - 1)/n),x, algorithm="fricas")

[Out] integral((b*x^n + a)^((n - 1)/n), x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a+b*x**n)**((1-n)/n)),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^{\frac{n-1}{n}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^((n - 1)/n),x, algorithm="giac")

[Out] integrate((b*x^n + a)^((n - 1)/n), x)
```

3.2729 $\int (a+bx^n)^{-\frac{1-2n}{n}}\,dx$

Optimal. Leaf size=56

$$x(a+bx^n)^{2-\frac{1}{n}}\left(\frac{bx^n}{a}+1\right)^{\frac{1}{n}-2}\,{}_2F_1\left(\frac{1}{n}-2,\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)$$

```
[Out] x*(a + b*x^n)^(2 - n^(-1))*(1 + (b*x^n)/a)^(-2 + n^(-1))*Hypergeo
metric2F1[-2 + n^(-1), n^(-1), 1 + n^(-1), -((b*x^n)/a)]
```

Rubi [A] time = 0.0398779, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$

$$x(a+bx^n)^{2-\frac{1}{n}}\left(\frac{bx^n}{a}+1\right)^{\frac{1}{n}-2}\,{}_2F_1\left(\frac{1}{n}-2,\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^(-((1 - 2*n)/n)),x]
```

```
[Out] x*(a + b*x^n)^(2 - n^(-1))*(1 + (b*x^n)/a)^(-2 + n^(-1))*Hypergeo
metric2F1[-2 + n^(-1), n^(-1), 1 + n^(-1), -((b*x^n)/a)]
```

Rubi in Sympy [A] time = 4.74937, size = 44, normalized size = 0.79

$$x\left(1+\frac{bx^n}{a}\right)^{-2+\frac{1}{n}}(a+bx^n)^{2-\frac{1}{n}}\,{}_2F_1\left(\begin{matrix}-2+\frac{1}{n},\frac{1}{n}\\1+\frac{1}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/((a+b*x**n)**((1-2*n)/n)),x)
```

```
[Out] x*(1 + b*x**n/a)**(-2 + 1/n)*(a + b*x**n)**(2 - 1/n)*hyper((-2 +
1/n, 1/n), (1 + 1/n,), -b*x**n/a)
```

Mathematica [A] time = 0.046043, size = 55, normalized size = 0.98

$$a^2x(a+bx^n)^{-1/n}\left(\frac{bx^n}{a}+1\right)^{\frac{1}{n}}\,{}_2F_1\left(\frac{1}{n}-2,\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^(-((1 - 2*n)/n)),x]
```

```
[Out] (a^2*x*(1 + (b*x^n)/a)^n^(-1)*Hypergeometric2F1[-2 + n^(-1), n^(-
1), 1 + n^(-1), -((b*x^n)/a)])/(a + b*x^n)^n^(-1)
```

Maple [F] time = 0.116, size = 0, normalized size = 0.

$$\int\left((a+bx^n)^{\frac{1-2n}{n}}\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/((a+b*x^n)^((1-2*n)/n)),x)

[Out] int(1/((a+b*x^n)^((1-2*n)/n)),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^{\frac{2n-1}{n}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((b*x^n + a)^(-(2*n - 1)/n)),x, algorithm="maxima")

[Out] integrate((b*x^n + a)^((2*n - 1)/n), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left((bx^n + a)^{\frac{2n-1}{n}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^((2*n - 1)/n),x, algorithm="fricas")

[Out] integral((b*x^n + a)^((2*n - 1)/n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a+b*x**n)**((1-2*n)/n)),x)

[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^{\frac{2n-1}{n}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^((2*n - 1)/n),x, algorithm="giac")

[Out] integrate((b*x^n + a)^((2*n - 1)/n), x)
```

3.2730 $\int \frac{1}{x(a+bx^{-n})}\,dx$

Optimal. Leaf size=15

$$\frac{\log (ax^n+b)}{an}$$

```
[Out] Log[b + a*x^n]/(a*n)
```

Rubi [A] time = 0.0335621, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{\log (ax^n+b)}{an}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a + b/x^n)),x]
```

```
[Out] Log[b + a*x^n]/(a*n)
```

Rubi in Sympy [A] time = 4.10531, size = 10, normalized size = 0.67

$$\frac{\log (ax^n+b)}{an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(a+b/(x**n)),x)
```

```
[Out] log(a*x**n + b)/(a*n)
```

Mathematica [A] time = 0.00617183, size = 15, normalized size = 1.

$$\frac{\log (ax^n+b)}{an}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a + b/x^n)),x]
```

```
[Out] Log[b + a*x^n]/(a*n)
```

Maple [A] time = 0.003, size = 16, normalized size = 1.1

$$\frac{\ln (b+ax^n)}{an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(a+b/(x^n)),x)
```

```
[Out] ln(b+a*x^n)/a/n
```

Maxima [A] time = 1.38408, size = 43, normalized size = 2.87

$$\frac{\log\left(bx^{-n}+a\right)}{an}-\frac{\log\left(x^{-n}\right)}{an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^n)*x),x, algorithm="maxima")
```

```
[Out] log(b*x^(-n) + a)/(a*n) - log(x^(-n))/(a*n)
```

Fricas [A] time = 0.227582, size = 20, normalized size = 1.33

$$\frac{\log\left(ax^{n}+b\right)}{an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^n)*x),x, algorithm="fricas")
```

```
[Out] log(a*x^n + b)/(a*n)
```

Sympy [A] time = 2.37263, size = 39, normalized size = 2.6

$$\begin{cases} \tilde{\infty}\log\left(x\right) & \text{for } a=0\wedge b=0\wedge n=0 \\ \frac{\log\left(x\right)}{a} & \text{for } b=0 \\ \frac{\log\left(x\right)}{a+b} & \text{for } n=0 \\ \frac{x^{n}}{bn} & \text{for } a=0 \\ \frac{\log\left(x\right)}{a}+\frac{\log\left(\frac{a}{b}+x^{-n}\right)}{an} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(a+b/(x**n)),x)
```

```
[Out] Piecewise((zoo*log(x), Eq(a, 0) & Eq(b, 0) & Eq(n, 0)), (log(x)/a
, Eq(b, 0)), (log(x)/(a + b), Eq(n, 0)), (x**n/(b*n), Eq(a, 0)),
(log(x)/a + log(a/b + x**(-n))/(a*n), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+\frac{b}{x^{n}}\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((a + b/x^n)*x),x, algorithm="giac")
```

```
[Out] integrate(1/((a + b/x^n)*x), x)
```

3.2731 $\int \frac{x^m}{a+bx^{1+m}}\,dx$

Optimal. Leaf size=19

$$\frac{\log\left(a+bx^{m+1}\right)}{b(m+1)}$$

```
[Out] Log[a + b*x^(1 + m)]/(b*(1 + m))
```

Rubi [A] time = 0.0242368, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{\log\left(a+bx^{m+1}\right)}{b(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m/(a + b*x^(1 + m)),x]
```

```
[Out] Log[a + b*x^(1 + m)]/(b*(1 + m))
```

Rubi in Sympy [A] time = 2.79787, size = 14, normalized size = 0.74

$$\frac{\log\left(a+bx^{m+1}\right)}{b\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m/(a+b*x**(1+m)),x)
```

```
[Out] log(a + b*x**(m + 1))/(b*(m + 1))
```

Mathematica [A] time = 0.0101044, size = 19, normalized size = 1.

$$\frac{\log\left(a+bx^{m+1}\right)}{b(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m/(a + b*x^(1 + m)),x]
```

```
[Out] Log[a + b*x^(1 + m)]/(b*(1 + m))
```

Maple [A] time = 0.022, size = 21, normalized size = 1.1

$$\frac{\ln\left(a+bx\mathrm{e}^{m\ln(x)}\right)}{b\,(1+m)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m/(a+b*x^(1+m)),x)
```

```
[Out] 1/b/(1+m)*ln(a+b*x*exp(m*ln(x)))
```

Maxima [A] time = 1.40971, size = 26, normalized size = 1.37

$$\frac{\log\left(bx^{m+1}+a\right)}{b(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^(m + 1) + a),x, algorithm="maxima")
```

```
[Out] log(b*x^(m + 1) + a)/(b*(m + 1))
```

Fricas [A] time = 0.229625, size = 24, normalized size = 1.26

$$\frac{\log\left(bx^{m+1}+a\right)}{bm+b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^(m + 1) + a),x, algorithm="fricas")
```

```
[Out] log(b*x^(m + 1) + a)/(b*m + b)
```

Sympy [A] time = 2.60728, size = 37, normalized size = 1.95

$$\begin{cases} \frac{\log(x)}{a} & \text{for}\ b = 0 \wedge m = -1 \\ \frac{xx^{m}}{a(m+1)} & \text{for}\ b = 0 \\ \frac{\log(x)}{a+b} & \text{for}\ m = -1 \\ \frac{\log\left(\frac{a}{b}+xx^{m}\right)}{bm+b} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m/(a+b*x**(1+m)),x)
```

```
[Out] Piecewise((log(x)/a, Eq(b, 0) & Eq(m, -1)), (x*x**m/(a*(m + 1)),
Eq(b, 0)), (log(x)/(a + b), Eq(m, -1)), (log(a/b + x*x**m)/(b*m +
 b), True))
```

GIAC/XCAS [A] time = 0.21729, size = 26, normalized size = 1.37

$$\frac{\ln\left(\left|bx^{m+1}+a\right|\right)}{bm+b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^(m + 1) + a),x, algorithm="giac")
```

```
[Out] ln(abs(b*x^(m + 1) + a))/(b*m + b)
```

3.2732 $\int x^m \left(a + bx^{1+m}\right)^n dx$

Optimal. Leaf size=27

$$\frac{\left(a + bx^{m+1}\right)^{n+1}}{b(m+1)(n+1)}$$

```
[Out] (a + b*x^(1 + m))^(1 + n)/(b*(1 + m)*(1 + n))
```

Rubi [A] time = 0.0287156, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$\frac{\left(a + bx^{m+1}\right)^{n+1}}{b(m+1)(n+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m*(a + b*x^(1 + m))^n,x]

[Out] (a + b*x^(1 + m))^(1 + n)/(b*(1 + m)*(1 + n))
```

Rubi in Sympy [A] time = 3.3963, size = 19, normalized size = 0.7

$$\frac{\left(a + bx^{m+1}\right)^{n+1}}{b\left(m+1\right)\left(n+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(a+b*x**(1+m))**n,x)

[Out] (a + b*x**(m + 1))**(n + 1)/(b*(m + 1)*(n + 1))
```

Mathematica [A] time = 0.0451166, size = 28, normalized size = 1.04

$$\frac{\left(a + bx^{m+1}\right)^{n+1}}{bmn + bm + bn + b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m*(a + b*x^(1 + m))^n,x]

[Out] (a + b*x^(1 + m))^(1 + n)/(b + b*m + b*n + b*m*n)
```

Maple [B] time = 0.044, size = 60, normalized size = 2.2

$$\frac{a e^{n \ln\left(a+bx e^{m \ln(x)}\right)}}{b\left(nm+m+n+1\right)} + \frac{x e^{m \ln(x)} e^{n \ln\left(a+bx e^{m \ln(x)}\right)}}{nm+m+n+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(a+b*x^(1+m))^n,x)
```

```
[Out] a/b/(m*n+m+n+1)*exp(n*ln(a+b*x*exp(m*ln(x))))+1/(m*n+m+n+1)*x*exp
(m*ln(x))*exp(n*ln(a+b*x*exp(m*ln(x))))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(m + 1) + a)^n*x^m,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.236822, size = 47, normalized size = 1.74

$$\frac{\left(bx^{m+1}+a\right)\left(bx^{m+1}+a\right)^{n}}{bm+(bm+b)n+b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(m + 1) + a)^n*x^m,x, algorithm="fricas")
```

```
[Out] (b*x^(m + 1) + a)*(b*x^(m + 1) + a)^n/(b*m + (b*m + b)*n + b)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(a+b*x**(1+m))**n,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.214024, size = 36, normalized size = 1.33

$$\frac{\left(bx^{m+1}+a\right)^{n+1}}{b(m+1)(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(m + 1) + a)^n*x^m,x, algorithm="giac")
```

```
[Out] (b*x^(m + 1) + a)^(n + 1)/(b*(m + 1)*(n + 1))
```

3.2733 $\int x^m \left(a+bx^{2+2m}\right)^3 dx$

Optimal. Leaf size=71

$$\frac{a^3x^{m+1}}{m+1}+\frac{a^2bx^{3(m+1)}}{m+1}+\frac{3ab^2x^{5(m+1)}}{5(m+1)}+\frac{b^3x^{7(m+1)}}{7(m+1)}$$

```
[Out] (a^3*x^(1 + m))/(1 + m) + (a^2*b*x^(3*(1 + m)))/(1 + m) + (3*a*b^
2*x^(5*(1 + m)))/(5*(1 + m)) + (b^3*x^(7*(1 + m)))/(7*(1 + m))
```

Rubi [A] time = 0.0882571, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.059

$$\frac{a^3x^{m+1}}{m+1}+\frac{a^2bx^{3(m+1)}}{m+1}+\frac{3ab^2x^{5(m+1)}}{5(m+1)}+\frac{b^3x^{7(m+1)}}{7(m+1)}$$

Antiderivative was successfully verified.

```
[In] Int[x^m*(a + b*x^(2 + 2*m))^3,x]
```

```
[Out] (a^3*x^(1 + m))/(1 + m) + (a^2*b*x^(3*(1 + m)))/(1 + m) + (3*a*b^
2*x^(5*(1 + m)))/(5*(1 + m)) + (b^3*x^(7*(1 + m)))/(7*(1 + m))
```

Rubi in Sympy [A] time = 13.1738, size = 60, normalized size = 0.85

$$\frac{a^3x^{m+1}}{m+1}+\frac{a^2bx^{3m+3}}{m+1}+\frac{3ab^2x^{5m+5}}{5\,(m+1)}+\frac{b^3x^{7m+7}}{7\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**m*(a+b*x**(2+2*m))**3,x)
```

```
[Out] a**3*x**(m + 1)/(m + 1) + a**2*b*x**(3*m + 3)/(m + 1) + 3*a*b**2*
x**(5*m + 5)/(5*(m + 1)) + b**3*x**(7*m + 7)/(7*(m + 1))
```

Mathematica [A] time = 0.0544144, size = 57, normalized size = 0.8

$$\frac{35a^3x^{m+1}+35a^2bx^{3m+3}+21ab^2x^{5m+5}+5b^3x^{7m+7}}{35m+35}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^m*(a + b*x^(2 + 2*m))^3,x]
```

```
[Out] (35*a^3*x^(1 + m) + 35*a^2*b*x^(3 + 3*m) + 21*a*b^2*x^(5 + 5*m) +
 5*b^3*x^(7 + 7*m))/(35 + 35*m)
```

Maple [A] time = 0.031, size = 70, normalized size = 1.

$$\frac{b^3x^7\left(x^m\right)^7}{7+7\,m}+\frac{3\,ab^2x^5\left(x^m\right)^5}{5+5\,m}+\frac{a^2bx^3\left(x^m\right)^3}{1+m}+\frac{a^3xx^m}{1+m}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(a+b*x^(2+2*m))^3,x)
```

```
[Out] 1/7*b^3*x^7/(1+m)*(x^m)^7+3/5*a*b^2*x^5/(1+m)*(x^m)^5+a^2*b*x^3/(
1+m)*(x^m)^3+a^3/(1+m)*x*x^m
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(2*m + 2) + a)^3*x^m,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.23596, size = 78, normalized size = 1.1

$$\frac{5\, b^3 x^7 x^{7\, m} + 21\, ab^2 x^5 x^{5\, m} + 35\, a^2 bx^3 x^{3\, m} + 35\, a^3 xx^m}{35\, (m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(2*m + 2) + a)^3*x^m,x, algorithm="fricas")
```

```
[Out] 1/35*(5*b^3*x^7*x^(7*m) + 21*a*b^2*x^5*x^(5*m) + 35*a^2*b*x^3*x^(
3*m) + 35*a^3*x*x^m)/(m + 1)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(a+b*x**(2+2*m))**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.225, size = 85, normalized size = 1.2

$$\frac{5\, b^3 x^7 e^{(7\, m \ln(x))} + 21\, ab^2 x^5 e^{(5\, m \ln(x))} + 35\, a^2 bx^3 e^{(3\, m \ln(x))} + 35\, a^3 xe^{(m \ln(x))}}{35\, (m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(2*m + 2) + a)^3*x^m,x, algorithm="giac")
```

```
[Out] 1/35*(5*b^3*x^7*e^(7*m*ln(x)) + 21*a*b^2*x^5*e^(5*m*ln(x)) + 35*a
^2*b*x^3*e^(3*m*ln(x)) + 35*a^3*x*e^(m*ln(x)))/(m + 1)
```

3.2734 $\int x^m \left(a+bx^{2+2m}\right)^2 dx$

Optimal. Leaf size=52

$$\frac{a^2x^{m+1}}{m+1}+\frac{2abx^{3(m+1)}}{3(m+1)}+\frac{b^2x^{5(m+1)}}{5(m+1)}$$

```
[Out] (a^2*x^(1 + m))/(1 + m) + (2*a*b*x^(3*(1 + m)))/(3*(1 + m)) + (b^
2*x^(5*(1 + m)))/(5*(1 + m))
```

Rubi [A] time = 0.058339, antiderivative size = 52, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.059

$$\frac{a^2x^{m+1}}{m+1}+\frac{2abx^{3(m+1)}}{3(m+1)}+\frac{b^2x^{5(m+1)}}{5(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m*(a + b*x^(2 + 2*m))^2,x]
```

```
[Out] (a^2*x^(1 + m))/(1 + m) + (2*a*b*x^(3*(1 + m)))/(3*(1 + m)) + (b^
2*x^(5*(1 + m)))/(5*(1 + m))
```

Rubi in Sympy [A] time = 9.57496, size = 42, normalized size = 0.81

$$\frac{a^2x^{m+1}}{m+1}+\frac{2abx^{3m+3}}{3\,(m+1)}+\frac{b^2x^{5m+5}}{5\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(a+b*x**(2+2*m))**2,x)
```

```
[Out] a**2*x**(m + 1)/(m + 1) + 2*a*b*x**(3*m + 3)/(3*(m + 1)) + b**2*x
**(5*m + 5)/(5*(m + 1))
```

Mathematica [A] time = 0.0324639, size = 42, normalized size = 0.81

$$\frac{15a^2x^{m+1}+10abx^{3m+3}+3b^2x^{5m+5}}{15m+15}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m*(a + b*x^(2 + 2*m))^2,x]
```

```
[Out] (15*a^2*x^(1 + m) + 10*a*b*x^(3 + 3*m) + 3*b^2*x^(5 + 5*m))/(15 +
 15*m)
```

Maple [A] time = 0.029, size = 50, normalized size = 1.

$$\frac{b^2x^5\,(x^m)^5}{5+5\,m}+\frac{2\,abx^3\,(x^m)^3}{3+3\,m}+\frac{xa^2x^m}{1+m}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(a+b*x^(2+2*m))^2,x)
```

```
[Out] 1/5*b^2*x^5/(1+m)*(x^m)^5+2/3*a*b*x^3/(1+m)*(x^m)^3+a^2/(1+m)*x*x
^m
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(2*m + 2) + a)^2*x^m,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.232124, size = 57, normalized size = 1.1

$$\frac{3\,b^{2}x^{5}x^{5\,m} + 10\,abx^{3}x^{3\,m} + 15\,a^{2}xx^{m}}{15\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(2*m + 2) + a)^2*x^m,x, algorithm="fricas")
```

```
[Out] 1/15*(3*b^2*x^5*x^(5*m) + 10*a*b*x^3*x^(3*m) + 15*a^2*x*x^m)/(m +
 1)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(a+b*x**(2+2*m))**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.220197, size = 62, normalized size = 1.19

$$\frac{3\,b^{2}x^{5}e^{(5\,m\ln(x))} + 10\,abx^{3}e^{(3\,m\ln(x))} + 15\,a^{2}xe^{(m\ln(x))}}{15\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(2*m + 2) + a)^2*x^m,x, algorithm="giac")
```

```
[Out] 1/15*(3*b^2*x^5*e^(5*m*ln(x)) + 10*a*b*x^3*e^(3*m*ln(x)) + 15*a^2
*x*e^(m*ln(x)))/(m + 1)
```

3.2735 $\int x^m \left(a + bx^{2+2m}\right) dx$

Optimal. Leaf size=30

$$\frac{ax^{m+1}}{m+1} + \frac{bx^{3(m+1)}}{3(m+1)}$$

```
[Out] (a*x^(1 + m))/(1 + m) + (b*x^(3*(1 + m)))/(3*(1 + m))
```

Rubi [A] time = 0.0263151, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$\frac{ax^{m+1}}{m+1} + \frac{bx^{3(m+1)}}{3(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m*(a + b*x^(2 + 2*m)),x]

[Out] (a*x^(1 + m))/(1 + m) + (b*x^(3*(1 + m)))/(3*(1 + m))
```

Rubi in Sympy [A] time = 4.55048, size = 22, normalized size = 0.73

$$\frac{ax^{m+1}}{m+1} + \frac{bx^{3m+3}}{3(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(a+b*x**(2+2*m)),x)

[Out] a*x**(m + 1)/(m + 1) + b*x**(3*m + 3)/(3*(m + 1))
```

Mathematica [A] time = 0.01554, size = 26, normalized size = 0.87

$$\frac{3ax^{m+1} + bx^{3m+3}}{3m+3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m*(a + b*x^(2 + 2*m)),x]

[Out] (3*a*x^(1 + m) + b*x^(3 + 3*m))/(3 + 3*m)
```

Maple [A] time = 0.025, size = 33, normalized size = 1.1

$$\frac{axe^{m\ln(x)}}{1+m} + \frac{bx^3\left(e^{m\ln(x)}\right)^3}{3+3m}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(a+b*x^(2+2*m)),x)

[Out] a/(1+m)*x*exp(m*ln(x))+1/3*b/(1+m)*x^3*exp(m*ln(x))^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(2*m + 2) + a)*x^m,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.231383, size = 34, normalized size = 1.13

$$\frac{bx^3x^{3\,m} + 3\,axx^m}{3\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(2*m + 2) + a)*x^m,x, algorithm="fricas")
```

```
[Out] 1/3*(b*x^3*x^(3*m) + 3*a*x*x^m)/(m + 1)
```

Sympy [A] time = 40.6921, size = 36, normalized size = 1.2

$$\begin{cases} \frac{3axx^m}{3m+3} + \frac{bx^3x^{3m}}{3m+3} & \text{for}\ m \neq -1 \\ (a+b)\log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(a+b*x**(2+2*m)),x)
```

```
[Out] Piecewise((3*a*x*x**m/(3*m + 3) + b*x**3*x**(3*m)/(3*m + 3), Ne(m
, -1)), ((a + b)*log(x), True))
```

GIAC/XCAS [A] time = 0.217384, size = 38, normalized size = 1.27

$$\frac{bx^3e^{(3\,m\ln(x))} + 3\,axe^{(m\ln(x))}}{3\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(2*m + 2) + a)*x^m,x, algorithm="giac")
```

```
[Out] 1/3*(b*x^3*e^(3*m*ln(x)) + 3*a*x*e^(m*ln(x)))/(m + 1)
```

3.2736 $\int \frac{x^m}{a+bx^{2+2m}}\,dx$

Optimal. Leaf size=33

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}x^{m+1}}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}(m+1)}$$

```
[Out] ArcTan[(Sqrt[b]*x^(1 + m))/Sqrt[a]]/(Sqrt[a]*Sqrt[b]*(1 + m))
```

Rubi [A] time = 0.0504952, antiderivative size = 33, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}x^{m+1}}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m/(a + b*x^(2 + 2*m)),x]

[Out] ArcTan[(Sqrt[b]*x^(1 + m))/Sqrt[a]]/(Sqrt[a]*Sqrt[b]*(1 + m))
```

Rubi in Sympy [A] time = 5.25988, size = 26, normalized size = 0.79

$$\frac{x^{m+1}{}_2F_1\left(\begin{matrix}1, \frac{1}{2} \\ \frac{3}{2}\end{matrix}\middle| -\frac{bx^{2m+2}}{a}\right)}{a\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m/(a+b*x**(2+2*m)),x)

[Out] x**(m + 1)*hyper((1, 1/2), (3/2,), -b*x**(2*m + 2)/a)/(a*(m + 1))
```

Mathematica [A] time = 0.0178915, size = 33, normalized size = 1.

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}x^{m+1}}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m/(a + b*x^(2 + 2*m)),x]

[Out] ArcTan[(Sqrt[b]*x^(1 + m))/Sqrt[a]]/(Sqrt[a]*Sqrt[b]*(1 + m))
```

Maple [B] time = 0.069, size = 61, normalized size = 1.9

$$-\frac{1}{2+2\,m}\ln\left(x^m-\frac{a}{x}\frac{1}{\sqrt{-ab}}\right)\frac{1}{\sqrt{-ab}}+\frac{1}{2+2\,m}\ln\left(x^m+\frac{a}{x}\frac{1}{\sqrt{-ab}}\right)\frac{1}{\sqrt{-ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m/(a+b*x^(2+2*m)),x)
```

```
[Out] -1/2/(-a*b)^(1/2)/(1+m)*ln(x^m-a/x/(-a*b)^(1/2))+1/2/(-a*b)^(1/2)
/(1+m)*ln(x^m+a/x/(-a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{bx^{2m+2}+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^(2*m + 2) + a),x, algorithm="maxima")
```

```
[Out] integrate(x^m/(b*x^(2*m + 2) + a), x)
```

Fricas [A] time = 0.24023, size = 1, normalized size = 0.03

$$\left[\frac{\log\left(\frac{\sqrt{-ab}bx^2x^{2m}+2abxx^m-\sqrt{-ab}a}{bx^2x^{2m}+a}\right)}{2\sqrt{-ab}(m+1)}, -\frac{\arctan\left(\frac{a}{\sqrt{ab}xx^m}\right)}{\sqrt{ab}(m+1)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^(2*m + 2) + a),x, algorithm="fricas")
```

```
[Out] [1/2*log((sqrt(-a*b)*b*x^2*x^(2*m) + 2*a*b*x*x^m - sqrt(-a*b)*a)/
(b*x^2*x^(2*m) + a))/(sqrt(-a*b)*(m + 1)), -arctan(a/(sqrt(a*b)*x
*x^m))/(sqrt(a*b)*(m + 1))]
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m/(a+b*x**(2+2*m)),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{bx^{2m+2}+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^(2*m + 2) + a),x, algorithm="giac")
```

```
[Out] integrate(x^m/(b*x^(2*m + 2) + a), x)
```

3.2737 $\int \frac{x^m}{(a+bx^{2+2m})^2} dx$

Optimal. Leaf size=67

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}x^{m+1}}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}(m+1)}+\frac{x^{m+1}}{2a(m+1)\left(a+bx^{2(m+1)}\right)}$$

```
[Out] x^(1 + m)/(2*a*(1 + m)*(a + b*x^(2*(1 + m)))) + ArcTan[(Sqrt[b]*x
^(1 + m))/Sqrt[a]]/(2*a^(3/2)*Sqrt[b]*(1 + m))
```

Rubi [A] time = 0.0739474, antiderivative size = 67, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.176$

$$\frac{\tan^{-1}\left(\frac{\sqrt{b}x^{m+1}}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}(m+1)}+\frac{x^{m+1}}{2a(m+1)\left(a+bx^{2(m+1)}\right)}$$

Antiderivative was successfully verified.

```
[In] Int[x^m/(a + b*x^(2 + 2*m))^2,x]
```

```
[Out] x^(1 + m)/(2*a*(1 + m)*(a + b*x^(2*(1 + m)))) + ArcTan[(Sqrt[b]*x
^(1 + m))/Sqrt[a]]/(2*a^(3/2)*Sqrt[b]*(1 + m))
```

Rubi in Sympy [A] time = 4.98206, size = 27, normalized size = 0.4

$$\frac{x^{m+1}{}_2F_1\left(\begin{matrix}2,\frac{1}{2}\\ \frac{3}{2}\end{matrix}\middle|-\frac{bx^{2m+2}}{a}\right)}{a^2(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**m/(a+b*x**(2+2*m))**2,x)
```

```
[Out] x**(m + 1)*hyper((2, 1/2), (3/2,), -b*x**(2*m + 2)/a)/(a**2*(m +
1))
```

Mathematica [A] time = 0.115383, size = 59, normalized size = 0.88

$$\frac{\frac{\tan^{-1}\left(\frac{\sqrt{b}x^{m+1}}{\sqrt{a}}\right)}{a^{3/2}\sqrt{b}}+\frac{x^{m+1}}{a^2+abx^{2m+2}}}{2m+2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^m/(a + b*x^(2 + 2*m))^2,x]
```

```
[Out] (x^(1 + m)/(a^2 + a*b*x^(2 + 2*m)) + ArcTan[(Sqrt[b]*x^(1 + m))/S
qrt[a]]/(a^(3/2)*Sqrt[b]))/(2 + 2*m)
```

Maple [A] time = 0.056, size = 95, normalized size = 1.4

$$\frac{xx^m}{(2+2m)a\left(a+bx^2(x^m)^2\right)}-\frac{1}{(4+4m)a}\ln\left(x^m-\frac{a}{x}\frac{1}{\sqrt{-ab}}\right)\frac{1}{\sqrt{-ab}}+\frac{1}{(4+4m)a}\ln\left(x^m+\frac{a}{x}\frac{1}{\sqrt{-ab}}\right)\frac{1}{\sqrt{-ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m/(a+b*x^(2+2*m))^2,x)
```

```
[Out] 1/2*x/(1+m)/a*x^m/(a+b*x^2*(x^m)^2)-1/4/(-a*b)^(1/2)/(1+m)/a*ln(x
^m-a/x/(-a*b)^(1/2))+1/4/(-a*b)^(1/2)/(1+m)/a*ln(x^m+a/x/(-a*b)^(
1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{xx^m}{2\,(ab(m+1)x^2x^{2\,m}+a^2(m+1))}+\int\frac{x^m}{2\,(abx^2x^{2\,m}+a^2)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^(2*m + 2) + a)^2,x, algorithm="maxima")
```

```
[Out] 1/2*x*x^m/(a*b*(m + 1)*x^2*x^(2*m) + a^2*(m + 1)) + integrate(1/2
*x^m/(a*b*x^2*x^(2*m) + a^2), x)
```

Fricas [A] time = 0.237882, size = 1, normalized size = 0.01

$$\left[\frac{2\,\sqrt{-ab}xx^m+\left(bx^2x^{2\,m}+a\right)\log\left(\frac{\sqrt{-ab}bx^2x^{2\,m}+2\,abxx^m-\sqrt{-ab}a}{bx^2x^{2\,m}+a}\right)}{4\left((abm+ab)\sqrt{-ab}x^2x^{2\,m}+(a^2m+a^2)\sqrt{-ab}\right)},\frac{\sqrt{ab}xx^m-\left(bx^2x^{2\,m}+a\right)\arctan\left(\frac{a}{\sqrt{ab}xx^m}\right)}{2\left((abm+ab)\sqrt{ab}x^2x^{2\,m}+(a^2m+a^2)\sqrt{ab}\right)}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^(2*m + 2) + a)^2,x, algorithm="fricas")
```

```
[Out] [1/4*(2*sqrt(-a*b)*x*x^m + (b*x^2*x^(2*m) + a)*log((sqrt(-a*b)*b*
x^2*x^(2*m) + 2*a*b*x*x^m - sqrt(-a*b)*a)/(b*x^2*x^(2*m) + a)))/(
(a*b*m + a*b)*sqrt(-a*b)*x^2*x^(2*m) + (a^2*m + a^2)*sqrt(-a*b)),
 1/2*(sqrt(a*b)*x*x^m - (b*x^2*x^(2*m) + a)*arctan(a/(sqrt(a*b)*x
*x^m)))/((a*b*m + a*b)*sqrt(a*b)*x^2*x^(2*m) + (a^2*m + a^2)*sqrt
(a*b))]
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m/(a+b*x**(2+2*m))**2,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^m}{(bx^{2\,m+2}+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^(2*m + 2) + a)^2,x, algorithm="giac")
```

```
[Out] integrate(x^m/(b*x^(2*m + 2) + a)^2, x)
```

3.2738 $\int \frac{x^m}{(a+bx^{2+2m})^3}\,dx$

Optimal. Leaf size=97

$$\frac{3\tan^{-1}\left(\frac{\sqrt{b}x^{m+1}}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}(m+1)}+\frac{3x^{m+1}}{8a^2(m+1)\left(a+bx^{2(m+1)}\right)}+\frac{x^{m+1}}{4a(m+1)\left(a+bx^{2(m+1)}\right)^2}$$

```
[Out] x^(1 + m)/(4*a*(1 + m)*(a + b*x^(2*(1 + m)))^2) + (3*x^(1 + m))/(
8*a^2*(1 + m)*(a + b*x^(2*(1 + m)))) + (3*ArcTan[(Sqrt[b]*x^(1 +
m))/Sqrt[a]])/(8*a^(5/2)*Sqrt[b]*(1 + m))
```

Rubi [A] time = 0.097519, antiderivative size = 97, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176

$$\frac{3\tan^{-1}\left(\frac{\sqrt{b}x^{m+1}}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}(m+1)}+\frac{3x^{m+1}}{8a^2(m+1)\left(a+bx^{2(m+1)}\right)}+\frac{x^{m+1}}{4a(m+1)\left(a+bx^{2(m+1)}\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m/(a + b*x^(2 + 2*m))^3,x]
```

```
[Out] x^(1 + m)/(4*a*(1 + m)*(a + b*x^(2*(1 + m)))^2) + (3*x^(1 + m))/(
8*a^2*(1 + m)*(a + b*x^(2*(1 + m)))) + (3*ArcTan[(Sqrt[b]*x^(1 +
m))/Sqrt[a]])/(8*a^(5/2)*Sqrt[b]*(1 + m))
```

Rubi in Sympy [A] time = 4.93338, size = 27, normalized size = 0.28

$$\frac{x^{m+1}{}_2F_1\left(\begin{matrix}3,\frac{1}{2}\\ \frac{3}{2}\end{matrix}\middle|-\frac{bx^{2m+2}}{a}\right)}{a^3\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m/(a+b*x**(2+2*m))**3,x)
```

```
[Out] x**(m + 1)*hyper((3, 1/2), (3/2,), -b*x**(2*m + 2)/a)/(a**3*(m +
1))
```

Mathematica [A] time = 0.123544, size = 77, normalized size = 0.79

$$\frac{\frac{\sqrt{a}x^{m+1}(5a+3bx^{2m+2})}{(a+bx^{2m+2})^2}+\frac{3\tan^{-1}\left(\frac{\sqrt{b}x^{m+1}}{\sqrt{a}}\right)}{\sqrt{b}}}{8a^{5/2}(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m/(a + b*x^(2 + 2*m))^3,x]
```

```
[Out] ((Sqrt[a]*x^(1 + m)*(5*a + 3*b*x^(2 + 2*m)))/(a + b*x^(2 + 2*m))^
2 + (3*ArcTan[(Sqrt[b]*x^(1 + m))/Sqrt[a]])/Sqrt[b])/(8*a^(5/2)*(
1 + m))
```

Maple [A] time = 0.06, size = 110, normalized size = 1.1

$$\frac{xx^{m}\left(3\,bx^{2}\left(x^{m}\right)^{2}+5\,a\right)}{\left(8+8\,m\right)a^{2}\left(a+bx^{2}\left(x^{m}\right)^{2}\right)^{2}}-\frac{3}{\left(16+16\,m\right)a^{2}}\ln\left(x^{m}-\frac{a}{x}\frac{1}{\sqrt{-ab}}\right)\frac{1}{\sqrt{-ab}}+\frac{3}{\left(16+16\,m\right)a^{2}}\ln\left(x^{m}+\frac{a}{x}\frac{1}{\sqrt{-ab}}\right)\frac{1}{\sqrt{-ab}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m/(a+b*x^(2+2*m))^3,x)
```

```
[Out] 1/8*x*x^m*(3*b*x^2*(x^m)^2+5*a)/(1+m)/a^2/(a+b*x^2*(x^m)^2)^2-3/1
6/(-a*b)^(1/2)/(1+m)/a^2*ln(x^m-a/x/(-a*b)^(1/2))+3/16/(-a*b)^(1/
2)/(1+m)/a^2*ln(x^m+a/x/(-a*b)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{3\,bx^{3}x^{3\,m}+5\,axx^{m}}{8\,(a^{2}b^{2}(m+1)x^{4}x^{4\,m}+2\,a^{3}b(m+1)x^{2}x^{2\,m}+a^{4}(m+1))}+3\int\frac{x^{m}}{8\,(a^{2}bx^{2}x^{2\,m}+a^{3})}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^(2*m + 2) + a)^3,x, algorithm="maxima")
```

```
[Out] 1/8*(3*b*x^3*x^(3*m) + 5*a*x*x^m)/(a^2*b^2*(m + 1)*x^4*x^(4*m) +
2*a^3*b*(m + 1)*x^2*x^(2*m) + a^4*(m + 1)) + 3*integrate(1/8*x^m/
(a^2*b*x^2*x^(2*m) + a^3), x)
```

Fricas [A] time = 0.240547, size = 1, normalized size = 0.01

$$\left[\frac{6\sqrt{-ab}bx^{3}x^{3\,m}+10\sqrt{-ab}axx^{m}+3\left(b^{2}x^{4}x^{4\,m}+2\,abx^{2}x^{2\,m}+a^{2}\right)\log\left(\frac{\sqrt{-ab}bx^{2}x^{2\,m}+2\,abxx^{m}-\sqrt{-ab}a}{bx^{2}x^{2\,m}+a}\right)}{16\left(\left(a^{2}b^{2}m+a^{2}b^{2}\right)\sqrt{-ab}x^{4}x^{4\,m}+2\left(a^{3}bm+a^{3}b\right)\sqrt{-ab}x^{2}x^{2\,m}+\left(a^{4}m+a^{4}\right)\sqrt{-ab}\right)},\frac{3\sqrt{ab}bx^{3}x^{3\,m}+5\sqrt{a}}{8\left(\left(a^{2}b^{2}m+a^{2}b^{2}\right)\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^(2*m + 2) + a)^3,x, algorithm="fricas")
```

```
[Out] [1/16*(6*sqrt(-a*b)*b*x^3*x^(3*m) + 10*sqrt(-a*b)*a*x*x^m + 3*(b^
2*x^4*x^(4*m) + 2*a*b*x^2*x^(2*m) + a^2)*log((sqrt(-a*b)*b*x^2*x^
(2*m) + 2*a*b*x*x^m - sqrt(-a*b)*a)/(b*x^2*x^(2*m) + a)))/((a^2*b
^2*m + a^2*b^2)*sqrt(-a*b)*x^4*x^(4*m) + 2*(a^3*b*m + a^3*b)*sqrt
(-a*b)*x^2*x^(2*m) + (a^4*m + a^4)*sqrt(-a*b)), 1/8*(3*sqrt(a*b)*
b*x^3*x^(3*m) + 5*sqrt(a*b)*a*x*x^m - 3*(b^2*x^4*x^(4*m) + 2*a*b*
x^2*x^(2*m) + a^2)*arctan(a/(sqrt(a*b)*x*x^m)))/((a^2*b^2*m + a^2
*b^2)*sqrt(a*b)*x^4*x^(4*m) + 2*(a^3*b*m + a^3*b)*sqrt(a*b)*x^2*x
^(2*m) + (a^4*m + a^4)*sqrt(a*b))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m/(a+b*x**(2+2*m))**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{(bx^{2m+2}+a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^(2*m + 2) + a)^3,x, algorithm="giac")
```

```
[Out] integrate(x^m/(b*x^(2*m + 2) + a)^3, x)
```

3.2739 $\int x^m \left(a+bx^{2+2m}\right)^{5/2}\,dx$

Optimal. Leaf size=136

$$\frac{5a^3\tanh^{-1}\left(\frac{\sqrt{b}x^{m+1}}{\sqrt{a+bx^{2(m+1)}}}\right)}{16\sqrt{b}(m+1)}+\frac{5a^2x^{m+1}\sqrt{a+bx^{2(m+1)}}}{16(m+1)}+\frac{x^{m+1}\left(a+bx^{2(m+1)}\right)^{5/2}}{6(m+1)}+\frac{5ax^{m+1}\left(a+bx^{2(m+1)}\right)^{3/2}}{24(m+1)}$$

```
[Out] (5*a^2*x^(1 + m)*Sqrt[a + b*x^(2*(1 + m))])/(16*(1 + m)) + (5*a*x
^(1 + m)*(a + b*x^(2*(1 + m)))^(3/2))/(24*(1 + m)) + (x^(1 + m)*(
a + b*x^(2*(1 + m)))^(5/2))/(6*(1 + m)) + (5*a^3*ArcTanh[(Sqrt[b]
*x^(1 + m))/Sqrt[a + b*x^(2*(1 + m))]])/(16*Sqrt[b]*(1 + m))
```

Rubi [A] time = 0.131797, antiderivative size = 136, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.21

$$\frac{5a^3\tanh^{-1}\left(\frac{\sqrt{b}x^{m+1}}{\sqrt{a+bx^{2(m+1)}}}\right)}{16\sqrt{b}(m+1)}+\frac{5a^2x^{m+1}\sqrt{a+bx^{2(m+1)}}}{16(m+1)}+\frac{x^{m+1}\left(a+bx^{2(m+1)}\right)^{5/2}}{6(m+1)}+\frac{5ax^{m+1}\left(a+bx^{2(m+1)}\right)^{3/2}}{24(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m*(a + b*x^(2 + 2*m))^(5/2),x]
```


```
[Out] (5*a^2*x^(1 + m)*Sqrt[a + b*x^(2*(1 + m))])/(16*(1 + m)) + (5*a*x
^(1 + m)*(a + b*x^(2*(1 + m)))^(3/2))/(24*(1 + m)) + (x^(1 + m)*(
a + b*x^(2*(1 + m)))^(5/2))/(6*(1 + m)) + (5*a^3*ArcTanh[(Sqrt[b]
*x^(1 + m))/Sqrt[a + b*x^(2*(1 + m))]])/(16*Sqrt[b]*(1 + m))
```

Rubi in Sympy [A] time = 7.46824, size = 60, normalized size = 0.44

$$\frac{a^2x^{m+1}\sqrt{a+bx^{2m+2}}\,{}_2F_1\left(\begin{matrix}-\frac{5}{2},\frac{1}{2}\\\frac{3}{2}\end{matrix}\middle|-\frac{bx^{2m+2}}{a}\right)}{\sqrt{1+\frac{bx^{2m+2}}{a}}\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(a+b*x**(2+2*m))**(5/2),x)
```

```
[Out] a**2*x**(m + 1)*sqrt(a + b*x**(2*m + 2))*hyper((-5/2, 1/2), (3/2,
), -b*x**(2*m + 2)/a)/(sqrt(1 + b*x**(2*m + 2)/a)*(m + 1))
```

Mathematica [A] time = 0.241332, size = 127, normalized size = 0.93

$$\frac{15a^{7/2}\sqrt{\frac{bx^{2m+2}}{a}+1}\sinh^{-1}\left(\frac{\sqrt{b}x^{m+1}}{\sqrt{a}}\right)+\sqrt{b}x^{m+1}\left(33a^3+59a^2bx^{2m+2}+34ab^2x^{4m+4}+8b^3x^{6m+6}\right)}{48\sqrt{b}(m+1)\sqrt{a+bx^{2m+2}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m*(a + b*x^(2 + 2*m))^(5/2),x]
```

```
[Out] (Sqrt[b]*x^(1 + m)*(33*a^3 + 59*a^2*b*x^(2 + 2*m) + 34*a*b^2*x^(4
 + 4*m) + 8*b^3*x^(6 + 6*m)) + 15*a^(7/2)*Sqrt[1 + (b*x^(2 + 2*m)
)/a]*ArcSinh[(Sqrt[b]*x^(1 + m))/Sqrt[a]])/(48*Sqrt[b]*(1 + m)*Sq
```

```
rt[a + b*x^(2 + 2*m)])
```

Maple [F] time = 0.116, size = 0, normalized size = 0.

$$\int x^{m} \left(a + b x^{2+2 m}\right)^{\frac{5}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(a+b*x^(2+2*m))^(5/2),x)

[Out] int(x^m*(a+b*x^(2+2*m))^(5/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b x^{2 m+2} + a\right)^{\frac{5}{2}} x^{m} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(2*m + 2) + a)^(5/2)*x^m,x, algorithm="maxima")

[Out] integrate((b*x^(2*m + 2) + a)^(5/2)*x^m, x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(2*m + 2) + a)^(5/2)*x^m,x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(a+b*x**(2+2*m))**(5/2),x)

[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b x^{2 m+2} + a\right)^{\frac{5}{2}} x^{m} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(2*m + 2) + a)^(5/2)*x^m,x, algorithm="giac")

[Out] integrate((b*x^(2*m + 2) + a)^(5/2)*x^m, x)
```

3.2740 $\int x^m \left(a+bx^{2+2m}\right)^{3/2} dx$

Optimal. Leaf size=104

$$\frac{3a^2\tanh^{-1}\left(\frac{\sqrt{b}x^{m+1}}{\sqrt{a+bx^{2(m+1)}}}\right)}{8\sqrt{b}(m+1)}+\frac{x^{m+1}\left(a+bx^{2(m+1)}\right)^{3/2}}{4(m+1)}+\frac{3ax^{m+1}\sqrt{a+bx^{2(m+1)}}}{8(m+1)}$$

```
[Out] (3*a*x^(1 + m)*Sqrt[a + b*x^(2*(1 + m))])/(8*(1 + m)) + (x^(1 + m
)*(a + b*x^(2*(1 + m)))^(3/2))/(4*(1 + m)) + (3*a^2*ArcTanh[(Sqrt
[b]*x^(1 + m))/Sqrt[a + b*x^(2*(1 + m))]])/(8*Sqrt[b]*(1 + m))
```

Rubi [A] time = 0.0990939, antiderivative size = 104, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.21

$$\frac{3a^2\tanh^{-1}\left(\frac{\sqrt{b}x^{m+1}}{\sqrt{a+bx^{2(m+1)}}}\right)}{8\sqrt{b}(m+1)}+\frac{x^{m+1}\left(a+bx^{2(m+1)}\right)^{3/2}}{4(m+1)}+\frac{3ax^{m+1}\sqrt{a+bx^{2(m+1)}}}{8(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m*(a + b*x^(2 + 2*m))^(3/2),x]
```

```
[Out] (3*a*x^(1 + m)*Sqrt[a + b*x^(2*(1 + m))])/(8*(1 + m)) + (x^(1 + m
)*(a + b*x^(2*(1 + m)))^(3/2))/(4*(1 + m)) + (3*a^2*ArcTanh[(Sqrt
[b]*x^(1 + m))/Sqrt[a + b*x^(2*(1 + m))]])/(8*Sqrt[b]*(1 + m))
```

Rubi in Sympy [A] time = 6.89625, size = 58, normalized size = 0.56

$$\frac{ax^{m+1}\sqrt{a+bx^{2m+2}}\,{}_2F_1\left(\begin{matrix}-\frac{3}{2},\frac{1}{2}\\ \frac{3}{2}\end{matrix}\middle|-\frac{bx^{2m+2}}{a}\right)}{\sqrt{1+\frac{bx^{2m+2}}{a}}\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(a+b*x**(2+2*m))**(3/2),x)
```

```
[Out] a*x**(m + 1)*sqrt(a + b*x**(2*m + 2))*hyper((-3/2, 1/2), (3/2,),
-b*x**(2*m + 2)/a)/(sqrt(1 + b*x**(2*m + 2)/a)*(m + 1))
```

Mathematica [A] time = 0.190514, size = 112, normalized size = 1.08

$$\frac{3a^{5/2}\sqrt{\frac{bx^{2m+2}}{a}+1}\sinh^{-1}\left(\frac{\sqrt{b}x^{m+1}}{\sqrt{a}}\right)+\sqrt{b}x^{m+1}\left(5a^2+7abx^{2m+2}+2b^2x^{4m+4}\right)}{8\sqrt{b}(m+1)\sqrt{a+bx^{2m+2}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m*(a + b*x^(2 + 2*m))^(3/2),x]
```

```
[Out] (Sqrt[b]*x^(1 + m)*(5*a^2 + 7*a*b*x^(2 + 2*m) + 2*b^2*x^(4 + 4*m)
) + 3*a^(5/2)*Sqrt[1 + (b*x^(2 + 2*m))/a]*ArcSinh[(Sqrt[b]*x^(1 +
 m))/Sqrt[a]])/(8*Sqrt[b]*(1 + m)*Sqrt[a + b*x^(2 + 2*m)])
```

Maple [F] time = 0.077, size = 0, normalized size = 0.

$$\int x^{m} \left(a+b x^{2+2 m}\right)^{\frac{3}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(a+b*x^(2+2*m))^(3/2),x)

[Out] int(x^m*(a+b*x^(2+2*m))^(3/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b x^{2 m+2}+a\right)^{\frac{3}{2}} x^{m} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(2*m + 2) + a)^(3/2)*x^m,x, algorithm="maxima")

[Out] integrate((b*x^(2*m + 2) + a)^(3/2)*x^m, x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(2*m + 2) + a)^(3/2)*x^m,x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(a+b*x**(2+2*m))**(3/2),x)

[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(b x^{2 m+2}+a\right)^{\frac{3}{2}} x^{m} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^(2*m + 2) + a)^(3/2)*x^m,x, algorithm="giac")

[Out] integrate((b*x^(2*m + 2) + a)^(3/2)*x^m, x)
```

3.2741 $\int x^m\sqrt{a+bx^{2+2m}}\,dx$

Optimal. Leaf size=72

$$\frac{x^{m+1}\sqrt{a+bx^{2(m+1)}}}{2(m+1)}+\frac{a\tanh^{-1}\left(\frac{\sqrt{b}x^{m+1}}{\sqrt{a+bx^{2(m+1)}}}\right)}{2\sqrt{b}(m+1)}$$

```
[Out] (x^(1 + m)*Sqrt[a + b*x^(2*(1 + m))])/(2*(1 + m)) + (a*ArcTanh[(S
qrt[b]*x^(1 + m))/Sqrt[a + b*x^(2*(1 + m))]])/(2*Sqrt[b]*(1 + m))
```

Rubi [A] time = 0.074197, antiderivative size = 72, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.21

$$\frac{x^{m+1}\sqrt{a+bx^{2(m+1)}}}{2(m+1)}+\frac{a\tanh^{-1}\left(\frac{\sqrt{b}x^{m+1}}{\sqrt{a+bx^{2(m+1)}}}\right)}{2\sqrt{b}(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m*Sqrt[a + b*x^(2 + 2*m)],x]
```

```
[Out] (x^(1 + m)*Sqrt[a + b*x^(2*(1 + m))])/(2*(1 + m)) + (a*ArcTanh[(S
qrt[b]*x^(1 + m))/Sqrt[a + b*x^(2*(1 + m))]])/(2*Sqrt[b]*(1 + m))
```

Rubi in Sympy [A] time = 6.85381, size = 56, normalized size = 0.78

$$\frac{x^{m+1}\sqrt{a+bx^{2m+2}}\,{}_2F_1\left(\begin{matrix}-\frac{1}{2},\frac{1}{2}\\ \frac{3}{2}\end{matrix}\middle|-\frac{bx^{2m+2}}{a}\right)}{\sqrt{1+\frac{bx^{2m+2}}{a}}\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(a+b*x**(2+2*m))**(1/2),x)
```

```
[Out] x**(m + 1)*sqrt(a + b*x**(2*m + 2))*hyper((-1/2, 1/2), (3/2,), -b
*x**(2*m + 2)/a)/(sqrt(1 + b*x**(2*m + 2)/a)*(m + 1))
```

Mathematica [A] time = 0.139838, size = 93, normalized size = 1.29

$$\frac{a^{3/2}\sqrt{\frac{bx^{2m+2}}{a}+1}\,\sinh^{-1}\left(\frac{\sqrt{b}x^{m+1}}{\sqrt{a}}\right)+\sqrt{b}x^{m+1}\left(a+bx^{2m+2}\right)}{2\sqrt{b}(m+1)\sqrt{a+bx^{2m+2}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m*Sqrt[a + b*x^(2 + 2*m)],x]
```

```
[Out] (Sqrt[b]*x^(1 + m)*(a + b*x^(2 + 2*m)) + a^(3/2)*Sqrt[1 + (b*x^(2
 + 2*m))/a]*ArcSinh[(Sqrt[b]*x^(1 + m))/Sqrt[a]])/(2*Sqrt[b]*(1 +
 m)*Sqrt[a + b*x^(2 + 2*m)])
```

Maple [F] time = 0.087, size = 0, normalized size = 0.

$$\int x^m\sqrt{a+bx^{2+2\,m}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(a+b*x^(2+2*m))^(1/2),x)
```

```
[Out] int(x^m*(a+b*x^(2+2*m))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{bx^{2m+2} + a}x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^(2*m + 2) + a)*x^m,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*x^(2*m + 2) + a)*x^m, x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^(2*m + 2) + a)*x^m,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(a+b*x**(2+2*m))**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{bx^{2m+2} + a}x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*x^(2*m + 2) + a)*x^m,x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*x^(2*m + 2) + a)*x^m, x)
```

3.2742 $\int \frac{x^m}{\sqrt{a+bx^{2+2m}}}\,dx$

Optimal. Leaf size=38

$$\frac{\tanh^{-1}\left(\frac{\sqrt{b}x^{m+1}}{\sqrt{a+bx^{2(m+1)}}}\right)}{\sqrt{b}(m+1)}$$

```
[Out] ArcTanh[(Sqrt[b]*x^(1 + m))/Sqrt[a + b*x^(2*(1 + m))]]/(Sqrt[b]*(
1 + m))
```

Rubi [A] time = 0.0524139, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158

$$\frac{\tanh^{-1}\left(\frac{\sqrt{b}x^{m+1}}{\sqrt{a+bx^{2(m+1)}}}\right)}{\sqrt{b}(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m/Sqrt[a + b*x^(2 + 2*m)],x]
```

```
[Out] ArcTanh[(Sqrt[b]*x^(1 + m))/Sqrt[a + b*x^(2*(1 + m))]]/(Sqrt[b]*(
1 + m))
```

Rubi in Sympy [A] time = 7.41139, size = 56, normalized size = 1.47

$$\frac{x^{m+1}\sqrt{a+bx^{2m+2}}\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{1}{2}\\ \frac{3}{2}\end{matrix}\middle|-\frac{bx^{2m+2}}{a}\right)}{a\sqrt{1+\frac{bx^{2m+2}}{a}}\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m/(a+b*x**(2+2*m))**(1/2),x)
```

```
[Out] x**(m + 1)*sqrt(a + b*x**(2*m + 2))*hyper((1/2, 1/2), (3/2,), -b*
x**(2*m + 2)/a)/(a*sqrt(1 + b*x**(2*m + 2)/a)*(m + 1))
```

Mathematica [A] time = 0.0837293, size = 66, normalized size = 1.74

$$\frac{\sqrt{a}\sqrt{\frac{bx^{2m+2}}{a}+1}\,\sinh^{-1}\left(\frac{\sqrt{b}x^{m+1}}{\sqrt{a}}\right)}{\sqrt{b}(m+1)\sqrt{a+bx^{2m+2}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m/Sqrt[a + b*x^(2 + 2*m)],x]
```

```
[Out] (Sqrt[a]*Sqrt[1 + (b*x^(2 + 2*m))/a]*ArcSinh[(Sqrt[b]*x^(1 + m))/
Sqrt[a]])/(Sqrt[b]*(1 + m)*Sqrt[a + b*x^(2 + 2*m)])
```

Maple [F] time = 0.057, size = 0, normalized size = 0.

$$\int x^m \frac{1}{\sqrt{a+bx^{2+2\,m}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m/(a+b*x^(2+2*m))^(1/2),x)

[Out] int(x^m/(a+b*x^(2+2*m))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{\sqrt{bx^{2\,m+2}+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/sqrt(b*x^(2*m + 2) + a),x, algorithm="maxima")

[Out] integrate(x^m/sqrt(b*x^(2*m + 2) + a), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/sqrt(b*x^(2*m + 2) + a),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m/(a+b*x**(2+2*m))**(1/2),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{\sqrt{bx^{2\,m+2}+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/sqrt(b*x^(2*m + 2) + a),x, algorithm="giac")

[Out] integrate(x^m/sqrt(b*x^(2*m + 2) + a), x)
```

3.2743 $\int \frac{x^m}{(a+bx^{2+2m})^{3/2}} dx$

Optimal. Leaf size=29

$$\frac{x^{m+1}}{a(m+1)\sqrt{a+bx^{2(m+1)}}}$$

```
[Out] x^(1 + m)/(a*(1 + m)*Sqrt[a + b*x^(2*(1 + m))])
```

Rubi [A] time = 0.0321369, antiderivative size = 29, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.053$

$$\frac{x^{m+1}}{a(m+1)\sqrt{a+bx^{2(m+1)}}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m/(a + b*x^(2 + 2*m))^(3/2),x]

[Out] x^(1 + m)/(a*(1 + m)*Sqrt[a + b*x^(2*(1 + m))])
```

Rubi in Sympy [A] time = 3.31619, size = 22, normalized size = 0.76

$$\frac{x^{m+1}}{a\sqrt{a+bx^{2m+2}}\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m/(a+b*x**(2+2*m))**(3/2),x)

[Out] x**(m + 1)/(a*sqrt(a + b*x**(2*m + 2))*(m + 1))
```

Mathematica [A] time = 0.0440921, size = 29, normalized size = 1.

$$\frac{x^{m+1}}{a(m+1)\sqrt{a+bx^{2m+2}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m/(a + b*x^(2 + 2*m))^(3/2),x]

[Out] x^(1 + m)/(a*(1 + m)*Sqrt[a + b*x^(2 + 2*m)])
```

Maple [F] time = 0.055, size = 0, normalized size = 0.

$$\int x^m \left(a+bx^{2+2\,m}\right)^{-\frac{3}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m/(a+b*x^(2+2*m))^(3/2),x)
```

```
[Out] int(x^m/(a+b*x^(2+2*m))^(3/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{(bx^{2m+2}+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^(2*m + 2) + a)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^m/(b*x^(2*m + 2) + a)^(3/2), x)
```

Fricas [A] time = 0.22842, size = 63, normalized size = 2.17

$$\frac{\sqrt{bx^2x^{2m}+a}\,xx^m}{(abm+ab)x^2x^{2m}+a^2m+a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^(2*m + 2) + a)^(3/2),x, algorithm="fricas")
```

```
[Out] sqrt(b*x^2*x^(2*m) + a)*x*x^m/((a*b*m + a*b)*x^2*x^(2*m) + a^2*m
+ a^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m/(a+b*x**(2+2*m))**(3/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{(bx^{2m+2}+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^(2*m + 2) + a)^(3/2),x, algorithm="giac")
```

```
[Out] integrate(x^m/(b*x^(2*m + 2) + a)^(3/2), x)
```

3.2744 $\int \frac{x^m}{(a+bx^{2+2m})^{5/2}}\,dx$

Optimal. Leaf size=65

$$\frac{2bx^{3(m+1)}}{3a^2(m+1)\left(a+bx^{2(m+1)}\right)^{3/2}}+\frac{x^{m+1}}{a(m+1)\left(a+bx^{2(m+1)}\right)^{3/2}}$$

```
[Out] x^(1 + m)/(a*(1 + m)*(a + b*x^(2*(1 + m)))^(3/2)) + (2*b*x^(3*(1
+ m)))/(3*a^2*(1 + m)*(a + b*x^(2*(1 + m)))^(3/2))
```

Rubi [A] time = 0.0801516, antiderivative size = 65, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$\frac{2bx^{3(m+1)}}{3a^2(m+1)\left(a+bx^{2(m+1)}\right)^{3/2}}+\frac{x^{m+1}}{a(m+1)\left(a+bx^{2(m+1)}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m/(a + b*x^(2 + 2*m))^(5/2),x]
```

```
[Out] x^(1 + m)/(a*(1 + m)*(a + b*x^(2*(1 + m)))^(3/2)) + (2*b*x^(3*(1
+ m)))/(3*a^2*(1 + m)*(a + b*x^(2*(1 + m)))^(3/2))
```

Rubi in Sympy [A] time = 7.42366, size = 58, normalized size = 0.89

$$\frac{x^{m+1}\sqrt{a+bx^{2m+2}}\,{}_2F_1\left(\begin{matrix}\frac{5}{2},\frac{1}{2}\\ \frac{3}{2}\end{matrix}\middle|-\frac{bx^{2m+2}}{a}\right)}{a^3\sqrt{1+\frac{bx^{2m+2}}{a}}\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m/(a+b*x**(2+2*m))**(5/2),x)
```

```
[Out] x**(m + 1)*sqrt(a + b*x**(2*m + 2))*hyper((5/2, 1/2), (3/2,), -b*
x**(2*m + 2)/a)/(a**3*sqrt(1 + b*x**(2*m + 2)/a)*(m + 1))
```

Mathematica [A] time = 0.0641326, size = 46, normalized size = 0.71

$$\frac{x^{m+1}\left(3a+2bx^{2m+2}\right)}{3a^2(m+1)\left(a+bx^{2m+2}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m/(a + b*x^(2 + 2*m))^(5/2),x]
```

```
[Out] (x^(1 + m)*(3*a + 2*b*x^(2 + 2*m)))/(3*a^2*(1 + m)*(a + b*x^(2 +
2*m))^(3/2))
```

Maple [F] time = 0.055, size = 0, normalized size = 0.

$$\int x^m\left(a+bx^{2+2\,m}\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m/(a+b*x^(2+2*m))^(5/2),x)
```

```
[Out] int(x^m/(a+b*x^(2+2*m))^(5/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{(bx^{2\,m+2}+a)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^(2*m + 2) + a)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate(x^m/(b*x^(2*m + 2) + a)^(5/2), x)
```

Fricas [A] time = 0.228888, size = 126, normalized size = 1.94

$$\frac{\left(2\,bx^3x^{3\,m}+3\,axx^m\right)\sqrt{bx^2x^{2\,m}+a}}{3\left((a^2b^2m+a^2b^2)x^4x^{4\,m}+a^4m+a^4+2\,(a^3bm+a^3b)x^2x^{2\,m}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^(2*m + 2) + a)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/3*(2*b*x^3*x^(3*m) + 3*a*x*x^m)*sqrt(b*x^2*x^(2*m) + a)/((a^2*b
^2*m + a^2*b^2)*x^4*x^(4*m) + a^4*m + a^4 + 2*(a^3*b*m + a^3*b)*x
^2*x^(2*m))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m/(a+b*x**(2+2*m))**(5/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{(bx^{2\,m+2}+a)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/(b*x^(2*m + 2) + a)^(5/2),x, algorithm="giac")
```

```
[Out] integrate(x^m/(b*x^(2*m + 2) + a)^(5/2), x)
```

3.2745 $\int \frac{x^m}{(a+bx^{2+2m})^{7/2}}\,dx$

Optimal. Leaf size=102

$$\frac{8b^2x^{5(m+1)}}{15a^3(m+1)\left(a+bx^{2(m+1)}\right)^{5/2}}+\frac{4bx^{3(m+1)}}{3a^2(m+1)\left(a+bx^{2(m+1)}\right)^{5/2}}+\frac{x^{m+1}}{a(m+1)\left(a+bx^{2(m+1)}\right)^{5/2}}$$

```
[Out] x^(1 + m)/(a*(1 + m)*(a + b*x^(2*(1 + m)))^(5/2)) + (4*b*x^(3*(1
+ m)))/(3*a^2*(1 + m)*(a + b*x^(2*(1 + m)))^(5/2)) + (8*b^2*x^(5*
(1 + m)))/(15*a^3*(1 + m)*(a + b*x^(2*(1 + m)))^(5/2))
```

Rubi [A] time = 0.143099, antiderivative size = 102, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$\frac{8b^2x^{5(m+1)}}{15a^3(m+1)\left(a+bx^{2(m+1)}\right)^{5/2}}+\frac{4bx^{3(m+1)}}{3a^2(m+1)\left(a+bx^{2(m+1)}\right)^{5/2}}+\frac{x^{m+1}}{a(m+1)\left(a+bx^{2(m+1)}\right)^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m/(a + b*x^(2 + 2*m))^(7/2),x]
```

```
[Out] x^(1 + m)/(a*(1 + m)*(a + b*x^(2*(1 + m)))^(5/2)) + (4*b*x^(3*(1
+ m)))/(3*a^2*(1 + m)*(a + b*x^(2*(1 + m)))^(5/2)) + (8*b^2*x^(5*
(1 + m)))/(15*a^3*(1 + m)*(a + b*x^(2*(1 + m)))^(5/2))
```

Rubi in Sympy [A] time = 7.45887, size = 58, normalized size = 0.57

$$\frac{x^{m+1}\sqrt{a+bx^{2m+2}}\,{}_2F_1\left(\begin{matrix}\frac{7}{2},\frac{1}{2}\\ \frac{3}{2}\end{matrix}\middle|-\frac{bx^{2m+2}}{a}\right)}{a^4\sqrt{1+\frac{bx^{2m+2}}{a}}\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m/(a+b*x**(2+2*m))**(7/2),x)
```

```
[Out] x**(m + 1)*sqrt(a + b*x**(2*m + 2))*hyper((7/2, 1/2), (3/2,), -b*
x**(2*m + 2)/a)/(a**4*sqrt(1 + b*x**(2*m + 2)/a)*(m + 1))
```

Mathematica [A] time = 0.0923721, size = 61, normalized size = 0.6

$$\frac{x^{m+1}\left(15a^2+20abx^{2m+2}+8b^2x^{4m+4}\right)}{15a^3(m+1)\left(a+bx^{2m+2}\right)^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^m/(a + b*x^(2 + 2*m))^(7/2),x]
```

```
[Out] (x^(1 + m)*(15*a^2 + 20*a*b*x^(2 + 2*m) + 8*b^2*x^(4 + 4*m)))/(15
*a^3*(1 + m)*(a + b*x^(2 + 2*m))^(5/2))
```

Maple [F] time = 0.056, size = 0, normalized size = 0.

$$\int x^m\left(a+bx^{2+2\,m}\right)^{-\frac{7}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^m/(a+b*x^(2+2*m))^(7/2),x)
```

```
[Out] int(x^m/(a+b*x^(2+2*m))^(7/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{(bx^{2m+2} + a)^{\frac{7}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^m/(b*x^(2*m + 2) + a)^(7/2),x, algorithm="maxima")
```

```
[Out] integrate(x^m/(b*x^(2*m + 2) + a)^(7/2), x)
```

Fricas [A] time = 0.229814, size = 182, normalized size = 1.78

$$\frac{\left(8\, b^2 x^5 x^{5\, m} + 20\, abx^3 x^{3\, m} + 15\, a^2 x x^m\right) \sqrt{bx^2 x^{2\, m} + a}}{15\left((a^3 b^3 m + a^3 b^3) x^6 x^{6\, m} + a^6 m + a^6 + 3\,(a^4 b^2 m + a^4 b^2) x^4 x^{4\, m} + 3\,(a^5 bm + a^5 b) x^2 x^{2\, m}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^m/(b*x^(2*m + 2) + a)^(7/2),x, algorithm="fricas")
```

```
[Out] 1/15*(8*b^2*x^5*x^(5*m) + 20*a*b*x^3*x^(3*m) + 15*a^2*x*x^m)*sqrt
(b*x^2*x^(2*m) + a)/((a^3*b^3*m + a^3*b^3)*x^6*x^(6*m) + a^6*m +
a^6 + 3*(a^4*b^2*m + a^4*b^2)*x^4*x^(4*m) + 3*(a^5*b*m + a^5*b)*x
^2*x^(2*m))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**m/(a+b*x**(2+2*m))**(7/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{(bx^{2m+2} + a)^{\frac{7}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^m/(b*x^(2*m + 2) + a)^(7/2),x, algorithm="giac")
```

```
[Out] integrate(x^m/(b*x^(2*m + 2) + a)^(7/2), x)
```

3.2746 $\int x^n \sqrt{1+x^{1+n}}\,dx$

Optimal. Leaf size=20

$$\frac{2\left(x^{n+1}+1\right)^{3/2}}{3(n+1)}$$

```
[Out] (2*(1 + x^(1 + n))^(3/2))/(3*(1 + n))
```

Rubi [A] time = 0.0201132, antiderivative size = 20, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{2\left(x^{n+1}+1\right)^{3/2}}{3(n+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^n*Sqrt[1 + x^(1 + n)],x]

[Out] (2*(1 + x^(1 + n))^(3/2))/(3*(1 + n))
```

Rubi in Sympy [A] time = 1.98794, size = 15, normalized size = 0.75

$$\frac{2\left(x^{n+1}+1\right)^{\frac{3}{2}}}{3\left(n+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**n*(1+x**(1+n))**(1/2),x)

[Out] 2*(x**(n + 1) + 1)**(3/2)/(3*(n + 1))
```

Mathematica [A] time = 0.0197861, size = 20, normalized size = 1.

$$\frac{2\left(x^{n+1}+1\right)^{3/2}}{3(n+1)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^n*Sqrt[1 + x^(1 + n)],x]

[Out] (2*(1 + x^(1 + n))^(3/2))/(3*(1 + n))
```

Maple [A] time = 0.043, size = 17, normalized size = 0.9

$$\frac{2}{3+3\,n}\left(1+xx^{n}\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^n*(1+x^(1+n))^(1/2),x)
```

```
[Out] 2/3*(1+x*x^n)^(3/2)/(1+n)
```

Maxima [A] time = 1.33615, size = 22, normalized size = 1.1

$$\frac{2\left(x^{n+1}+1\right)^{\frac{3}{2}}}{3(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sqrt(x^(n + 1) + 1)*x^n,x, algorithm="maxima")
```

```
[Out] 2/3*(x^(n + 1) + 1)^(3/2)/(n + 1)
```

Fricas [A] time = 0.221292, size = 22, normalized size = 1.1

$$\frac{2\left(x^{n+1}+1\right)^{\frac{3}{2}}}{3(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sqrt(x^(n + 1) + 1)*x^n,x, algorithm="fricas")
```

```
[Out] 2/3*(x^(n + 1) + 1)^(3/2)/(n + 1)
```

Sympy [A] time = 16.5285, size = 48, normalized size = 2.4

$$\begin{cases} \frac{2xx^n\sqrt{xx^n+1}}{3n+3} + \frac{2\sqrt{xx^n+1}}{3n+3} & \text{for } n \neq -1 \\ \sqrt{2}\log(x) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**n*(1+x**(1+n))**(1/2),x)
```

```
[Out] Piecewise((2*x*x**n*sqrt(x*x**n + 1)/(3*n + 3) + 2*sqrt(x*x**n +
1)/(3*n + 3), Ne(n, -1)), (sqrt(2)*log(x), True))
```

GIAC/XCAS [A] time = 0.214726, size = 22, normalized size = 1.1

$$\frac{2\left(x^{n+1}+1\right)^{\frac{3}{2}}}{3(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sqrt(x^(n + 1) + 1)*x^n,x, algorithm="giac")
```

```
[Out] 2/3*(x^(n + 1) + 1)^(3/2)/(n + 1)
```

3.2747 $\int x^n\sqrt{a^2+x^{1+n}}\,dx$

Optimal. Leaf size=22

$$\frac{2\left(a^2+x^{n+1}\right)^{3/2}}{3(n+1)}$$

```
[Out] (2*(a^2 + x^(1 + n))^(3/2))/(3*(1 + n))
```

Rubi [A] time = 0.0202642, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.059$

$$\frac{2\left(a^2+x^{n+1}\right)^{3/2}}{3(n+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^n*Sqrt[a^2 + x^(1 + n)],x]

[Out] (2*(a^2 + x^(1 + n))^(3/2))/(3*(1 + n))
```

Rubi in Sympy [A] time = 2.16257, size = 17, normalized size = 0.77

$$\frac{2\left(a^2+x^{n+1}\right)^{\frac{3}{2}}}{3\left(n+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**n*(a**2+x**(1+n))**(1/2),x)

[Out] 2*(a**2 + x**(n + 1))**(3/2)/(3*(n + 1))
```

Mathematica [A] time = 0.0218392, size = 22, normalized size = 1.

$$\frac{2\left(a^2+x^{n+1}\right)^{3/2}}{3(n+1)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^n*Sqrt[a^2 + x^(1 + n)],x]

[Out] (2*(a^2 + x^(1 + n))^(3/2))/(3*(1 + n))
```

Maple [A] time = 0.039, size = 19, normalized size = 0.9

$$\frac{2}{3+3\,n}\left(a^2+xx^n\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^n*(a^2+x^(1+n))^(1/2),x)
```

```
[Out] 2/3*(a^2+x*x^n)^(3/2)/(1+n)
```

Maxima [A] time = 1.35033, size = 24, normalized size = 1.09

$$\frac{2\left(a^2+x^{n+1}\right)^{\frac{3}{2}}}{3\left(n+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a^2 + x^(n + 1))*x^n,x, algorithm="maxima")
```

```
[Out] 2/3*(a^2 + x^(n + 1))^(3/2)/(n + 1)
```

Fricas [A] time = 0.223003, size = 24, normalized size = 1.09

$$\frac{2\left(a^2+x^{n+1}\right)^{\frac{3}{2}}}{3\left(n+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a^2 + x^(n + 1))*x^n,x, algorithm="fricas")
```

```
[Out] 2/3*(a^2 + x^(n + 1))^(3/2)/(n + 1)
```

Sympy [A] time = 16.5236, size = 58, normalized size = 2.64

$$\begin{cases} \frac{2a^2\sqrt{a^2+xx^n}}{3n+3}+\frac{2xx^n\sqrt{a^2+xx^n}}{3n+3} & \text{for } n\neq -1 \\ \sqrt{a^2+1}\log\left(x\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**n*(a**2+x**(1+n))**(1/2),x)
```

```
[Out] Piecewise((2*a**2*sqrt(a**2 + x*x**n)/(3*n + 3) + 2*x*x**n*sqrt(a
**2 + x*x**n)/(3*n + 3), Ne(n, -1)), (sqrt(a**2 + 1)*log(x), True
))
```

GIAC/XCAS [A] time = 0.215144, size = 24, normalized size = 1.09

$$\frac{2\left(a^2+x^{n+1}\right)^{\frac{3}{2}}}{3\left(n+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(a^2 + x^(n + 1))*x^n,x, algorithm="giac")
```

```
[Out] 2/3*(a^2 + x^(n + 1))^(3/2)/(n + 1)
```

3.2748 $\int (cx)^m (a+bx^n)^2 \, dx$

Optimal. Leaf size=64

$$\frac{a^2(cx)^{m+1}}{c(m+1)}+\frac{2abx^{n+1}(cx)^m}{m+n+1}+\frac{b^2x^{2n+1}(cx)^m}{m+2n+1}$$

```
[Out] (2*a*b*x^(1 + n)*(c*x)^m)/(1 + m + n) + (b^2*x^(1 + 2*n)*(c*x)^m)
/(1 + m + 2*n) + (a^2*(c*x)^(1 + m))/(c*(1 + m))
```

Rubi [A] time = 0.0879358, antiderivative size = 64, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$\frac{a^2(cx)^{m+1}}{c(m+1)}+\frac{2abx^{n+1}(cx)^m}{m+n+1}+\frac{b^2x^{2n+1}(cx)^m}{m+2n+1}$$

Antiderivative was successfully verified.

```
[In] Int[(c*x)^m*(a + b*x^n)^2,x]
```

```
[Out] (2*a*b*x^(1 + n)*(c*x)^m)/(1 + m + n) + (b^2*x^(1 + 2*n)*(c*x)^m)
/(1 + m + 2*n) + (a^2*(c*x)^(1 + m))/(c*(1 + m))
```

Rubi in Sympy [A] time = 12.6754, size = 73, normalized size = 1.14

$$\frac{a^2\left(cx\right)^{m+1}}{c\left(m+1\right)}+\frac{2abx^{-m}x^{m+n+1}\left(cx\right)^m}{m+n+1}+\frac{b^2x^{2n}\left(cx\right)^{-2n}\left(cx\right)^{m+2n+1}}{c\left(m+2n+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((c*x)**m*(a+b*x**n)**2,x)
```

```
[Out] a**2*(c*x)**(m + 1)/(c*(m + 1)) + 2*a*b*x**(-m)*x**(m + n + 1)*(c
*x)**m/(m + n + 1) + b**2*x**(2*n)*(c*x)**(-2*n)*(c*x)**(m + 2*n
+ 1)/(c*(m + 2*n + 1))
```

Mathematica [A] time = 0.0537255, size = 47, normalized size = 0.73

$$x(cx)^m\left(\frac{a^2}{m+1}+\frac{2abx^n}{m+n+1}+\frac{b^2x^{2n}}{m+2n+1}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*x)^m*(a + b*x^n)^2,x]
```

```
[Out] x*(c*x)^m*(a^2/(1 + m) + (2*a*b*x^n)/(1 + m + n) + (b^2*x^(2*n))/
(1 + m + 2*n))
```

Maple [C] time = 0.075, size = 234, normalized size = 3.7

$$\frac{x\left(b^2m^2\left(x^n\right)^2+b^2mn\left(x^n\right)^2+2\,abm^2x^n+4\,abmnx^n+2\,mb^2\left(x^n\right)^2+b^2n\left(x^n\right)^2+a^2m^2+3\,a^2mn+2\,a^2n^2+4\,mabx^n+4\,abn\right.}{\left(1+m\right)\left(1+m+n\right)\left(1+m+2\,n\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^m*(a+b*x^n)^2,x)
```

```
[Out] x*(b^2*m^2*(x^n)^2+b^2*m*n*(x^n)^2+2*a*b*m^2*x^n+4*a*b*m*n*x^n+2*
m*b^2*(x^n)^2+b^2*n*(x^n)^2+a^2*m^2+3*a^2*m*n+2*a^2*n^2+4*m*a*b*x
^n+4*a*b*n*x^n+b^2*(x^n)^2+2*m*a^2+3*a^2*n+2*a*x^n*b+a^2)/(1+m)/(
1+m+n)/(1+m+2*n)*exp(1/2*m*(-I*Pi*csgn(I*c*x)^3+I*Pi*csgn(I*c*x)^
2*csgn(I*c)+I*Pi*csgn(I*c*x)^2*csgn(I*x)-I*Pi*csgn(I*c*x)*csgn(I*
c)*csgn(I*x)+2*ln(x)+2*ln(c)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*(c*x)^m,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.235314, size = 232, normalized size = 3.62

$$\frac{\left(b^2m^2 + 2\,b^2m + b^2 + \left(b^2m + b^2\right)n\right)xx^{2\,n}e^{(m\log(c)+m\log(x))} + 2\,\left(abm^2 + 2\,abm + ab + 2\,(abm + ab)n\right)xx^{n}e^{(m\log(c)+m\log(x))} + (}{m^3 + 2\,(m+1)n^2 + 3\,m^2 + 3\,(m^2 + 2\,m + 1)n + 3\,m + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*(c*x)^m,x, algorithm="fricas")
```

```
[Out] ((b^2*m^2 + 2*b^2*m + b^2 + (b^2*m + b^2)*n)*x*x^(2*n)*e^(m*log(c
) + m*log(x)) + 2*(a*b*m^2 + 2*a*b*m + a*b + 2*(a*b*m + a*b)*n)*x
*x^n*e^(m*log(c) + m*log(x)) + (a^2*m^2 + 2*a^2*n^2 + 2*a^2*m + a
^2 + 3*(a^2*m + a^2)*n)*x*e^(m*log(c) + m*log(x)))/(m^3 + 2*(m +
1)*n^2 + 3*m^2 + 3*(m^2 + 2*m + 1)*n + 3*m + 1)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**m*(a+b*x**n)**2,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [A] time = 0.230653, size = 841, normalized size = 13.14

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^2*(c*x)^m,x, algorithm="giac")
```

```
[Out] (b^2*m^2*x*e^(m*ln(c) + m*ln(x) + 2*n*ln(x)) + b^2*m*n*x*e^(m*ln(
c) + m*ln(x) + 2*n*ln(x)) + 2*a*b*m^2*x*e^(m*ln(c) + m*ln(x) + n*
```

```
ln(x)) + b^2*m^2*x*e^(m*ln(c) + m*ln(x) + n*ln(x)) + 4*a*b*m*n*x*
e^(m*ln(c) + m*ln(x) + n*ln(x)) + b^2*m*n*x*e^(m*ln(c) + m*ln(x)
+ n*ln(x)) + a^2*m^2*x*e^(m*ln(c) + m*ln(x)) + 2*a*b*m^2*x*e^(m*l
n(c) + m*ln(x)) + b^2*m^2*x*e^(m*ln(c) + m*ln(x)) + 3*a^2*m*n*x*e
^(m*ln(c) + m*ln(x)) + 4*a*b*m*n*x*e^(m*ln(c) + m*ln(x)) + b^2*m*
n*x*e^(m*ln(c) + m*ln(x)) + 2*a^2*n^2*x*e^(m*ln(c) + m*ln(x)) + 2
*b^2*m*x*e^(m*ln(c) + m*ln(x) + 2*n*ln(x)) + b^2*n*x*e^(m*ln(c) +
 m*ln(x) + 2*n*ln(x)) + 4*a*b*m*x*e^(m*ln(c) + m*ln(x) + n*ln(x))
 + 2*b^2*m*x*e^(m*ln(c) + m*ln(x) + n*ln(x)) + 4*a*b*n*x*e^(m*ln(
c) + m*ln(x) + n*ln(x)) + b^2*n*x*e^(m*ln(c) + m*ln(x) + n*ln(x))
 + 2*a^2*m*x*e^(m*ln(c) + m*ln(x)) + 4*a*b*m*x*e^(m*ln(c) + m*ln(
x)) + 2*b^2*m*x*e^(m*ln(c) + m*ln(x)) + 3*a^2*n*x*e^(m*ln(c) + m*
ln(x)) + 4*a*b*n*x*e^(m*ln(c) + m*ln(x)) + b^2*n*x*e^(m*ln(c) + m
*ln(x)) + b^2*x*e^(m*ln(c) + m*ln(x) + 2*n*ln(x)) + 2*a*b*x*e^(m*
ln(c) + m*ln(x) + n*ln(x)) + b^2*x*e^(m*ln(c) + m*ln(x) + n*ln(x)
) + a^2*x*e^(m*ln(c) + m*ln(x)) + 2*a*b*x*e^(m*ln(c) + m*ln(x)) +
 b^2*x*e^(m*ln(c) + m*ln(x)))/(m^3 + 3*m^2*n + 2*m*n^2 + 3*m^2 +
6*m*n + 2*n^2 + 3*m + 3*n + 1)
```

3.2749 $\int (cx)^m \left(a+bx^3\right)^2 \, dx$

Optimal. Leaf size=58

$$\frac{a^2(cx)^{m+1}}{c(m+1)}+\frac{2ab(cx)^{m+4}}{c^4(m+4)}+\frac{b^2(cx)^{m+7}}{c^7(m+7)}$$

```
[Out] (a^2*(c*x)^(1 + m))/(c*(1 + m)) + (2*a*b*(c*x)^(4 + m))/(c^4*(4 +
 m)) + (b^2*(c*x)^(7 + m))/(c^7*(7 + m))
```

Rubi [A] time = 0.0777792, antiderivative size = 58, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$\frac{a^2(cx)^{m+1}}{c(m+1)}+\frac{2ab(cx)^{m+4}}{c^4(m+4)}+\frac{b^2(cx)^{m+7}}{c^7(m+7)}$$

Antiderivative was successfully verified.

```
[In] Int[(c*x)^m*(a + b*x^3)^2,x]
```

```
[Out] (a^2*(c*x)^(1 + m))/(c*(1 + m)) + (2*a*b*(c*x)^(4 + m))/(c^4*(4 +
 m)) + (b^2*(c*x)^(7 + m))/(c^7*(7 + m))
```

Rubi in Sympy [A] time = 13.0846, size = 49, normalized size = 0.84

$$\frac{a^2 (cx)^{m+1}}{c (m+1)}+\frac{2ab (cx)^{m+4}}{c^4 (m+4)}+\frac{b^2 (cx)^{m+7}}{c^7 (m+7)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((c*x)**m*(b*x**3+a)**2,x)
```

```
[Out] a**2*(c*x)**(m + 1)/(c*(m + 1)) + 2*a*b*(c*x)**(m + 4)/(c**4*(m +
 4)) + b**2*(c*x)**(m + 7)/(c**7*(m + 7))
```

Mathematica [A] time = 0.0289169, size = 41, normalized size = 0.71

$$(cx)^m\left(\frac{a^2x}{m+1}+\frac{2abx^4}{m+4}+\frac{b^2x^7}{m+7}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*x)^m*(a + b*x^3)^2,x]
```

```
[Out] (c*x)^m*((a^2*x)/(1 + m) + (2*a*b*x^4)/(4 + m) + (b^2*x^7)/(7 + m
))
```

Maple [A] time = 0.014, size = 94, normalized size = 1.6

$$\frac{\left(b^2m^2x^6+5\,b^2mx^6+4\,b^2x^6+2\,abm^2x^3+16\,abmx^3+14\,abx^3+a^2m^2+11\,ma^2+28\,a^2\right)x\,(cx)^m}{(7+m)\,(4+m)\,(1+m)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^m*(b*x^3+a)^2,x)
```

```
[Out] x*(b^2*m^2*x^6+5*b^2*m*x^6+4*b^2*x^6+2*a*b*m^2*x^3+16*a*b*m*x^3+1
4*a*b*x^3+a^2*m^2+11*a^2*m+28*a^2)*(c*x)^m/(7+m)/(4+m)/(1+m)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2*(c*x)^m,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.227715, size = 117, normalized size = 2.02

$$\frac{\left(\left(b^2m^2 + 5\,b^2m + 4\,b^2\right)x^7 + 2\left(abm^2 + 8\,abm + 7\,ab\right)x^4 + \left(a^2m^2 + 11\,a^2m + 28\,a^2\right)x\right)(cx)^m}{m^3 + 12\,m^2 + 39\,m + 28}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2*(c*x)^m,x, algorithm="fricas")
```

```
[Out] ((b^2*m^2 + 5*b^2*m + 4*b^2)*x^7 + 2*(a*b*m^2 + 8*a*b*m + 7*a*b)*
x^4 + (a^2*m^2 + 11*a^2*m + 28*a^2)*x)*(c*x)^m/(m^3 + 12*m^2 + 39
*m + 28)
```

Sympy [A] time = 4.31937, size = 352, normalized size = 6.07

$$\begin{cases} \frac{-\frac{a^2}{6x^6} - \frac{2ab}{3x^3} + b^2\log(x)}{c^7} \\ \frac{-\frac{a^2}{3x^3} + 2ab\log(x) + \frac{b^2x^3}{3}}{c^4} \\ \frac{a^2\log(x) + \frac{2abx^3}{3} + \frac{b^2x^6}{6}}{c} \\ \frac{a^2c^mm^2xx^m}{m^3+12m^2+39m+28} + \frac{11a^2c^mmxx^m}{m^3+12m^2+39m+28} + \frac{28a^2c^mxx^m}{m^3+12m^2+39m+28} + \frac{2abc^mm^2x^4x^m}{m^3+12m^2+39m+28} + \frac{16abc^mmx^4x^m}{m^3+12m^2+39m+28} + \frac{14abc^mx^4x^m}{m^3+12m^2+39m+28} + \frac{b^2c^mm^2x^7x^m}{m^3+12m^2+39m+2} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**m*(b*x**3+a)**2,x)
```

```
[Out] Piecewise(((-a**2/(6*x**6) - 2*a*b/(3*x**3) + b**2*log(x))/c**7,
Eq(m, -7)), ((-a**2/(3*x**3) + 2*a*b*log(x) + b**2*x**3/3)/c**4,
Eq(m, -4)), ((a**2*log(x) + 2*a*b*x**3/3 + b**2*x**6/6)/c, Eq(m,
-1)), (a**2*c**m*m**2*x*x**m/(m**3 + 12*m**2 + 39*m + 28) + 11*a*
*2*c**m*m*x*x**m/(m**3 + 12*m**2 + 39*m + 28) + 28*a**2*c**m*x*x*
*m/(m**3 + 12*m**2 + 39*m + 28) + 2*a*b*c**m*m**2*x**4*x**m/(m**3
 + 12*m**2 + 39*m + 28) + 16*a*b*c**m*m*x**4*x**m/(m**3 + 12*m**2
 + 39*m + 28) + 14*a*b*c**m*x**4*x**m/(m**3 + 12*m**2 + 39*m + 28
) + b**2*c**m*m**2*x**7*x**m/(m**3 + 12*m**2 + 39*m + 28) + 5*b**
2*c**m*m*x**7*x**m/(m**3 + 12*m**2 + 39*m + 28) + 4*b**2*c**m*x**
7*x**m/(m**3 + 12*m**2 + 39*m + 28), True))
```

GIAC/XCAS [A] time = 0.220322, size = 207, normalized size = 3.57

$$\frac{b^2m^2x^7e^{(m\ln(cx))} + 5\,b^2mx^7e^{(m\ln(cx))} + 4\,b^2x^7e^{(m\ln(cx))} + 2\,abm^2x^4e^{(m\ln(cx))} + 16\,abmx^4e^{(m\ln(cx))} + 14\,abx^4e^{(m\ln(cx))} + a^2m^2xe}{m^3 + 12\,m^2 + 39\,m + 28}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^3 + a)^2*(c*x)^m,x, algorithm="giac")
```

```
[Out] (b^2*m^2*x^7*e^(m*ln(c*x)) + 5*b^2*m*x^7*e^(m*ln(c*x)) + 4*b^2*x^
7*e^(m*ln(c*x)) + 2*a*b*m^2*x^4*e^(m*ln(c*x)) + 16*a*b*m*x^4*e^(m
*ln(c*x)) + 14*a*b*x^4*e^(m*ln(c*x)) + a^2*m^2*x*e^(m*ln(c*x)) +
11*a^2*m*x*e^(m*ln(c*x)) + 28*a^2*x*e^(m*ln(c*x)))/(m^3 + 12*m^2
+ 39*m + 28)
```

3.2750 $\int (cx)^m \left(a+bx^2\right)^2 \, dx$

Optimal. Leaf size=58

$$\frac{a^2(cx)^{m+1}}{c(m+1)}+\frac{2ab(cx)^{m+3}}{c^3(m+3)}+\frac{b^2(cx)^{m+5}}{c^5(m+5)}$$

```
[Out] (a^2*(c*x)^(1 + m))/(c*(1 + m)) + (2*a*b*(c*x)^(3 + m))/(c^3*(3 +
 m)) + (b^2*(c*x)^(5 + m))/(c^5*(5 + m))
```

Rubi [A] time = 0.0749419, antiderivative size = 58, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{a^2(cx)^{m+1}}{c(m+1)}+\frac{2ab(cx)^{m+3}}{c^3(m+3)}+\frac{b^2(cx)^{m+5}}{c^5(m+5)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^m*(a + b*x^2)^2,x]
```

```
[Out] (a^2*(c*x)^(1 + m))/(c*(1 + m)) + (2*a*b*(c*x)^(3 + m))/(c^3*(3 +
 m)) + (b^2*(c*x)^(5 + m))/(c^5*(5 + m))
```

Rubi in Sympy [A] time = 13.4871, size = 49, normalized size = 0.84

$$\frac{a^2\left(cx\right)^{m+1}}{c\left(m+1\right)}+\frac{2ab\left(cx\right)^{m+3}}{c^3\left(m+3\right)}+\frac{b^2\left(cx\right)^{m+5}}{c^5\left(m+5\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**m*(b*x**2+a)**2,x)
```

```
[Out] a**2*(c*x)**(m + 1)/(c*(m + 1)) + 2*a*b*(c*x)**(m + 3)/(c**3*(m +
 3)) + b**2*(c*x)**(m + 5)/(c**5*(m + 5))
```

Mathematica [A] time = 0.0265579, size = 41, normalized size = 0.71

$$(cx)^m\left(\frac{a^2x}{m+1}+\frac{2abx^3}{m+3}+\frac{b^2x^5}{m+5}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^m*(a + b*x^2)^2,x]
```

```
[Out] (c*x)^m*((a^2*x)/(1 + m) + (2*a*b*x^3)/(3 + m) + (b^2*x^5)/(5 + m
))
```

Maple [A] time = 0.008, size = 94, normalized size = 1.6

$$\frac{\left(b^2m^2x^4+4\,b^2mx^4+2\,abm^2x^2+3\,b^2x^4+12\,abmx^2+a^2m^2+10\,abx^2+8\,ma^2+15\,a^2\right)x\left(cx\right)^m}{(5+m)\,(3+m)\,(1+m)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^m*(b*x^2+a)^2,x)
```

```
[Out] x*(b^2*m^2*x^4+4*b^2*m*x^4+2*a*b*m^2*x^2+3*b^2*x^4+12*a*b*m*x^2+a
^2*m^2+10*a*b*x^2+8*a^2*m+15*a^2)*(c*x)^m/(5+m)/(3+m)/(1+m)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2 + a)^2*(c*x)^m,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.229408, size = 117, normalized size = 2.02

$$\frac{\left(\left(b^2m^2 + 4\,b^2m + 3\,b^2\right)x^5 + 2\left(abm^2 + 6\,abm + 5\,ab\right)x^3 + \left(a^2m^2 + 8\,a^2m + 15\,a^2\right)x\right)(cx)^m}{m^3 + 9\,m^2 + 23\,m + 15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2 + a)^2*(c*x)^m,x, algorithm="fricas")
```

```
[Out] ((b^2*m^2 + 4*b^2*m + 3*b^2)*x^5 + 2*(a*b*m^2 + 6*a*b*m + 5*a*b)*
x^3 + (a^2*m^2 + 8*a^2*m + 15*a^2)*x)*(c*x)^m/(m^3 + 9*m^2 + 23*m
 + 15)
```

Sympy [A] time = 2.65615, size = 345, normalized size = 5.95

$$\begin{cases} \frac{-\frac{a^2}{4x^4} - \frac{ab}{x^2} + b^2\log(x)}{c^5} \\ \frac{-\frac{a^2}{2x^2} + 2ab\log(x) + \frac{b^2x^2}{2}}{c^3} \\ \frac{a^2\log(x) + abx^2 + \frac{b^4x^4}{4}}{c} \\ \frac{a^2c^mm^2xx^m}{m^3+9m^2+23m+15} + \frac{8a^2c^mmxx^m}{m^3+9m^2+23m+15} + \frac{15a^2c^mxx^m}{m^3+9m^2+23m+15} + \frac{2abc^mm^2x^3x^m}{m^3+9m^2+23m+15} + \frac{12abc^mmx^3x^m}{m^3+9m^2+23m+15} + \frac{10abc^mx^3x^m}{m^3+9m^2+23m+15} + \frac{b^2c^mm^2x^5x^m}{m^3+9m^2+23m+15} + \frac{4}{m^3} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**m*(b*x**2+a)**2,x)
```

```
[Out] Piecewise(((-a**2/(4*x**4) - a*b/x**2 + b**2*log(x))/c**5, Eq(m,
-5)), ((-a**2/(2*x**2) + 2*a*b*log(x) + b**2*x**2/2)/c**3, Eq(m,
-3)), ((a**2*log(x) + a*b*x**2 + b**2*x**4/4)/c, Eq(m, -1)), (a**
2*c**m*m**2*x*x**m/(m**3 + 9*m**2 + 23*m + 15) + 8*a**2*c**m*m*x*
x**m/(m**3 + 9*m**2 + 23*m + 15) + 15*a**2*c**m*x*x**m/(m**3 + 9*
m**2 + 23*m + 15) + 2*a*b*c**m*m**2*x**3*x**m/(m**3 + 9*m**2 + 23
*m + 15) + 12*a*b*c**m*m*x**3*x**m/(m**3 + 9*m**2 + 23*m + 15) +
10*a*b*c**m*x**3*x**m/(m**3 + 9*m**2 + 23*m + 15) + b**2*c**m*m**
2*x**5*x**m/(m**3 + 9*m**2 + 23*m + 15) + 4*b**2*c**m*m*x**5*x**m
/(m**3 + 9*m**2 + 23*m + 15) + 3*b**2*c**m*x**5*x**m/(m**3 + 9*m*
*2 + 23*m + 15), True))
```

GIAC/XCAS [A] time = 0.218646, size = 207, normalized size = 3.57

$$\frac{b^2m^2x^5e^{(m\ln(cx))} + 4\,b^2mx^5e^{(m\ln(cx))} + 2\,abm^2x^3e^{(m\ln(cx))} + 3\,b^2x^5e^{(m\ln(cx))} + 12\,abmx^3e^{(m\ln(cx))} + a^2m^2xe^{(m\ln(cx))} + 10\,abx^3e}{m^3 + 9\,m^2 + 23\,m + 15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^2 + a)^2*(c*x)^m,x, algorithm="giac")
```

```
[Out] (b^2*m^2*x^5*e^(m*ln(c*x)) + 4*b^2*m*x^5*e^(m*ln(c*x)) + 2*a*b*m^
2*x^3*e^(m*ln(c*x)) + 3*b^2*x^5*e^(m*ln(c*x)) + 12*a*b*m*x^3*e^(m
*ln(c*x)) + a^2*m^2*x*e^(m*ln(c*x)) + 10*a*b*x^3*e^(m*ln(c*x)) +
8*a^2*m*x*e^(m*ln(c*x)) + 15*a^2*x*e^(m*ln(c*x)))/(m^3 + 9*m^2 +
23*m + 15)
```

3.2751 $\int (cx)^m (a+bx)^2 \, dx$

Optimal. Leaf size=58

$$\frac{a^2(cx)^{m+1}}{c(m+1)}+\frac{2ab(cx)^{m+2}}{c^2(m+2)}+\frac{b^2(cx)^{m+3}}{c^3(m+3)}$$

```
[Out] (a^2*(c*x)^(1 + m))/(c*(1 + m)) + (2*a*b*(c*x)^(2 + m))/(c^2*(2 +
 m)) + (b^2*(c*x)^(3 + m))/(c^3*(3 + m))
```

Rubi [A] time = 0.0698293, antiderivative size = 58, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$\frac{a^2(cx)^{m+1}}{c(m+1)}+\frac{2ab(cx)^{m+2}}{c^2(m+2)}+\frac{b^2(cx)^{m+3}}{c^3(m+3)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^m*(a + b*x)^2,x]
```

```
[Out] (a^2*(c*x)^(1 + m))/(c*(1 + m)) + (2*a*b*(c*x)^(2 + m))/(c^2*(2 +
 m)) + (b^2*(c*x)^(3 + m))/(c^3*(3 + m))
```

Rubi in Sympy [A] time = 12.7376, size = 49, normalized size = 0.84

$$\frac{a^2\left(cx\right)^{m+1}}{c\left(m+1\right)}+\frac{2ab\left(cx\right)^{m+2}}{c^2\left(m+2\right)}+\frac{b^2\left(cx\right)^{m+3}}{c^3\left(m+3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**m*(b*x+a)**2,x)
```

```
[Out] a**2*(c*x)**(m + 1)/(c*(m + 1)) + 2*a*b*(c*x)**(m + 2)/(c**2*(m +
 2)) + b**2*(c*x)**(m + 3)/(c**3*(m + 3))
```

Mathematica [A] time = 0.0284321, size = 41, normalized size = 0.71

$$(cx)^m\left(\frac{a^2x}{m+1}+\frac{2abx^2}{m+2}+\frac{b^2x^3}{m+3}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^m*(a + b*x)^2,x]
```

```
[Out] (c*x)^m*((a^2*x)/(1 + m) + (2*a*b*x^2)/(2 + m) + (b^2*x^3)/(3 + m
))
```

Maple [A] time = 0.007, size = 88, normalized size = 1.5

$$\frac{\left(b^2m^2x^2+2\,abm^2x+3\,b^2mx^2+a^2m^2+8\,abmx+2\,b^2x^2+5\,ma^2+6\,abx+6\,a^2\right)x\left(cx\right)^m}{(3+m)(2+m)(1+m)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^m*(b*x+a)^2,x)
```

```
[Out] x*(b^2*m^2*x^2+2*a*b*m^2*x+3*b^2*m*x^2+a^2*m^2+8*a*b*m*x+2*b^2*x^
2+5*a^2*m+6*a*b*x+6*a^2)*(c*x)^m/(3+m)/(2+m)/(1+m)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x + a)^2*(c*x)^m,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.228486, size = 117, normalized size = 2.02

$$\frac{\left(\left(b^2m^2 + 3\,b^2m + 2\,b^2\right)x^3 + 2\,\left(abm^2 + 4\,abm + 3\,ab\right)x^2 + \left(a^2m^2 + 5\,a^2m + 6\,a^2\right)x\right)\,(cx)^m}{m^3 + 6\,m^2 + 11\,m + 6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x + a)^2*(c*x)^m,x, algorithm="fricas")
```

```
[Out] ((b^2*m^2 + 3*b^2*m + 2*b^2)*x^3 + 2*(a*b*m^2 + 4*a*b*m + 3*a*b)*
x^2 + (a^2*m^2 + 5*a^2*m + 6*a^2)*x)*(c*x)^m/(m^3 + 6*m^2 + 11*m
+ 6)
```

Sympy [A] time = 1.46635, size = 338, normalized size = 5.83

$$\begin{cases} \frac{-\frac{a^2}{2x^2} - \frac{2ab}{x} + b^2\log(x)}{c^3} \\ \frac{-\frac{a^2}{x} + 2ab\log(x) + b^2x}{c^2} \\ \frac{a^2\log(x) + 2abx + \frac{b^2x^2}{2}}{c} \\ \frac{a^2c^m m^2 x x^m}{m^3+6m^2+11m+6} + \frac{5a^2c^m m x x^m}{m^3+6m^2+11m+6} + \frac{6a^2c^m x x^m}{m^3+6m^2+11m+6} + \frac{2abc^m m^2x^2x^m}{m^3+6m^2+11m+6} + \frac{8abc^m mx^2x^m}{m^3+6m^2+11m+6} + \frac{6abc^m x^2x^m}{m^3+6m^2+11m+6} + \frac{b^2c^m m^2x^3x^m}{m^3+6m^2+11m+6} + \frac{3b^2c^m m x}{m^3+6m^2+1} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**m*(b*x+a)**2,x)
```

```
[Out] Piecewise(((-a**2/(2*x**2) - 2*a*b/x + b**2*log(x))/c**3, Eq(m, -
3)), ((-a**2/x + 2*a*b*log(x) + b**2*x)/c**2, Eq(m, -2)), ((a**2*
log(x) + 2*a*b*x + b**2*x**2/2)/c, Eq(m, -1)), (a**2*c**m*m**2*x*
x**m/(m**3 + 6*m**2 + 11*m + 6) + 5*a**2*c**m*m*x*x**m/(m**3 + 6*
m**2 + 11*m + 6) + 6*a**2*c**m*x*x**m/(m**3 + 6*m**2 + 11*m + 6)
+ 2*a*b*c**m*m**2*x**2*x**m/(m**3 + 6*m**2 + 11*m + 6) + 8*a*b*c*
*m*m*x**2*x**m/(m**3 + 6*m**2 + 11*m + 6) + 6*a*b*c**m*x**2*x**m/
(m**3 + 6*m**2 + 11*m + 6) + b**2*c**m*m**2*x**3*x**m/(m**3 + 6*m
**2 + 11*m + 6) + 3*b**2*c**m*m*x**3*x**m/(m**3 + 6*m**2 + 11*m +
 6) + 2*b**2*c**m*x**3*x**m/(m**3 + 6*m**2 + 11*m + 6), True))
```

GIAC/XCAS [A] time = 0.22003, size = 207, normalized size = 3.57

$$\frac{b^2m^2x^3e^{(m\ln(cx))} + 2\,abm^2x^2e^{(m\ln(cx))} + 3\,b^2mx^3e^{(m\ln(cx))} + a^2m^2xe^{(m\ln(cx))} + 8\,abmx^2e^{(m\ln(cx))} + 2\,b^2x^3e^{(m\ln(cx))} + 5\,a^2mxe^{(}}{m^3 + 6\,m^2 + 11\,m + 6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x + a)^2*(c*x)^m,x, algorithm="giac")
```

```
[Out] (b^2*m^2*x^3*e^(m*ln(c*x)) + 2*a*b*m^2*x^2*e^(m*ln(c*x)) + 3*b^2*
m*x^3*e^(m*ln(c*x)) + a^2*m^2*x*e^(m*ln(c*x)) + 8*a*b*m*x^2*e^(m*
ln(c*x)) + 2*b^2*x^3*e^(m*ln(c*x)) + 5*a^2*m*x*e^(m*ln(c*x)) + 6*
a*b*x^2*e^(m*ln(c*x)) + 6*a^2*x*e^(m*ln(c*x)))/(m^3 + 6*m^2 + 11*
m + 6)
```

3.2752 $\int \left(a+\frac{b}{x}\right)^2 (cx)^m \, dx$

Optimal. Leaf size=52

$$\frac{a^2(cx)^{m+1}}{c(m+1)}+\frac{2ab(cx)^m}{m}-\frac{b^2c(cx)^{m-1}}{1-m}$$

```
[Out] -((b^2*c*(c*x)^(-1 + m))/(1 - m)) + (2*a*b*(c*x)^m)/m + (a^2*(c*x
)^(1 + m))/(c*(1 + m))
```

Rubi [A] time = 0.0626562, antiderivative size = 52, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{a^2(cx)^{m+1}}{c(m+1)}+\frac{2ab(cx)^m}{m}-\frac{b^2c(cx)^{m-1}}{1-m}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x)^2*(c*x)^m,x]
```

```
[Out] -((b^2*c*(c*x)^(-1 + m))/(1 - m)) + (2*a*b*(c*x)^m)/m + (a^2*(c*x
)^(1 + m))/(c*(1 + m))
```

Rubi in Sympy [A] time = 11.5973, size = 41, normalized size = 0.79

$$\frac{a^2\left(cx\right)^{m+1}}{c\left(m+1\right)}+\frac{2ab\left(cx\right)^m}{m}-\frac{b^2c\left(cx\right)^{m-1}}{-m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x)**2*(c*x)**m,x)
```

```
[Out] a**2*(c*x)**(m + 1)/(c*(m + 1)) + 2*a*b*(c*x)**m/m - b**2*c*(c*x)
**(m - 1)/(-m + 1)
```

Mathematica [A] time = 0.0401067, size = 36, normalized size = 0.69

$$(cx)^m\left(\frac{a^2x}{m+1}+\frac{2ab}{m}+\frac{b^2}{(m-1)x}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x)^2*(c*x)^m,x]
```

```
[Out] (c*x)^m*((2*a*b)/m + b^2/((-1 + m)*x) + (a^2*x)/(1 + m))
```

Maple [A] time = 0.006, size = 68, normalized size = 1.3

$$\frac{\left(cx\right)^m\left(a^2x^2m^2-a^2x^2m+2\,abm^2x+b^2m^2-2\,abx+b^2m\right)}{x\left(1+m\right)m\left(-1+m\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x)^2*(c*x)^m,x)
```

```
[Out] (c*x)^m*(a^2*m^2*x^2-a^2*m*x^2+2*a*b*m^2*x+b^2*m^2-2*a*b*x+b^2*m)
/x/(1+m)/m/(-1+m)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m*(a + b/x)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.229684, size = 85, normalized size = 1.63

$$\frac{\left(b^2m^2 + b^2m + \left(a^2m^2 - a^2m\right)x^2 + 2\left(abm^2 - ab\right)x\right)(cx)^m}{(m^3 - m)x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m*(a + b/x)^2,x, algorithm="fricas")
```

```
[Out] (b^2*m^2 + b^2*m + (a^2*m^2 - a^2*m)*x^2 + 2*(a*b*m^2 - a*b)*x)*(
c*x)^m/((m^3 - m)*x)
```

Sympy [A] time = 1.50403, size = 202, normalized size = 3.88

$$\begin{cases} \frac{a^2\log(x) - \frac{2ab}{x} - \frac{b^2}{2x^2}}{c} & \text{for } m = -1 \\ a^2x + 2ab\log(x) - \frac{b^2}{x} & \text{for } m = 0 \\ c\left(\frac{a^2x^2}{2} + 2abx + b^2\log(x)\right) & \text{for } m = 1 \\ \frac{a^2c^mm^2x^2x^m}{m^3x - mx} - \frac{a^2c^mmx^2x^m}{m^3x - mx} + \frac{2abc^mm^2xx^m}{m^3x - mx} - \frac{2abc^mxx^m}{m^3x - mx} + \frac{b^2c^mm^2x^m}{m^3x - mx} + \frac{b^2c^mmx^m}{m^3x - mx} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x)**2*(c*x)**m,x)
```

```
[Out] Piecewise(((a**2*log(x) - 2*a*b/x - b**2/(2*x**2))/c, Eq(m, -1)),
 (a**2*x + 2*a*b*log(x) - b**2/x, Eq(m, 0)), (c*(a**2*x**2/2 + 2*
a*b*x + b**2*log(x)), Eq(m, 1)), (a**2*c**m*m**2*x**2*x**m/(m**3*
x - m*x) - a**2*c**m*m*x**2*x**m/(m**3*x - m*x) + 2*a*b*c**m*m**2
*x*x**m/(m**3*x - m*x) - 2*a*b*c**m*x*x**m/(m**3*x - m*x) + b**2*
c**m*m**2*x**m/(m**3*x - m*x) + b**2*c**m*m*x**m/(m**3*x - m*x),
True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (cx)^m\left(a + \frac{b}{x}\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m*(a + b/x)^2,x, algorithm="giac")

[Out] integrate((c*x)^m*(a + b/x)^2, x)
```

3.2753 $\int \left(a+\frac{b}{x^2}\right)^2 (cx)^m \, dx$

Optimal. Leaf size=61

$$\frac{a^2(cx)^{m+1}}{c(m+1)}-\frac{2abc(cx)^{m-1}}{1-m}-\frac{b^2c^3(cx)^{m-3}}{3-m}$$

```
[Out] -((b^2*c^3*(c*x)^(-3 + m))/(3 - m)) - (2*a*b*c*(c*x)^(-1 + m))/(1
 - m) + (a^2*(c*x)^(1 + m))/(c*(1 + m))
```

Rubi [A] time = 0.07653, antiderivative size = 61, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{a^2(cx)^{m+1}}{c(m+1)}-\frac{2abc(cx)^{m-1}}{1-m}-\frac{b^2c^3(cx)^{m-3}}{3-m}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^2)^2*(c*x)^m,x]
```

```
[Out] -((b^2*c^3*(c*x)^(-3 + m))/(3 - m)) - (2*a*b*c*(c*x)^(-1 + m))/(1
 - m) + (a^2*(c*x)^(1 + m))/(c*(1 + m))
```

Rubi in Sympy [A] time = 13.4688, size = 48, normalized size = 0.79

$$\frac{a^2\left(cx\right)^{m+1}}{c\left(m+1\right)}-\frac{2abc\left(cx\right)^{m-1}}{-m+1}-\frac{b^2c^3\left(cx\right)^{m-3}}{-m+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**2)**2*(c*x)**m,x)
```

```
[Out] a**2*(c*x)**(m + 1)/(c*(m + 1)) - 2*a*b*c*(c*x)**(m - 1)/(-m + 1)
 - b**2*c**3*(c*x)**(m - 3)/(-m + 3)
```

Mathematica [A] time = 0.0520785, size = 62, normalized size = 1.02

$$\frac{x^4\left(a+\frac{b}{x^2}\right)^2(cx)^m\left(\frac{a^2x}{m+1}+\frac{2ab}{(m-1)x}+\frac{b^2}{(m-3)x^3}\right)}{\left(ax^2+b\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^2)^2*(c*x)^m,x]
```

```
[Out] ((a + b/x^2)^2*x^4*(c*x)^m*(b^2/((-3 + m)*x^3) + (2*a*b)/((-1 + m
)*x) + (a^2*x)/(1 + m)))/(b + a*x^2)^2
```

Maple [A] time = 0.007, size = 90, normalized size = 1.5

$$\frac{\left(cx\right)^m\left(a^2m^2x^4-4\,a^2mx^4+3\,x^4a^2+2\,abm^2x^2-4\,abmx^2-6\,abx^2+b^2m^2-b^2\right)}{x^3\left(1+m\right)\left(-1+m\right)\left(-3+m\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^2)^2*(c*x)^m,x)
```

```
[Out] (c*x)^m*(a^2*m^2*x^4-4*a^2*m*x^4+3*a^2*x^4+2*a*b*m^2*x^2-4*a*b*m*
x^2-6*a*b*x^2+b^2*m^2-b^2)/x^3/(1+m)/(-1+m)/(-3+m)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m*(a + b/x^2)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.230261, size = 109, normalized size = 1.79

$$\frac{\left(\left(a^2m^2 - 4\,a^2m + 3\,a^2\right)x^4 + b^2m^2 + 2\left(abm^2 - 2\,abm - 3\,ab\right)x^2 - b^2\right)(cx)^m}{(m^3 - 3\,m^2 - m + 3)x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m*(a + b/x^2)^2,x, algorithm="fricas")
```

```
[Out] ((a^2*m^2 - 4*a^2*m + 3*a^2)*x^4 + b^2*m^2 + 2*(a*b*m^2 - 2*a*b*m
 - 3*a*b)*x^2 - b^2)*(c*x)^m/((m^3 - 3*m^2 - m + 3)*x^3)
```

Sympy [A] time = 3.59968, size = 401, normalized size = 6.57

$$\begin{cases} \frac{a^2\log(x) - \frac{ab}{x^2} - \frac{b^2}{4x^4}}{c} \\ c\left(\frac{a^2x^2}{2} + 2ab\log(x) - \frac{b^2}{2x^2}\right) \\ c^3\left(\frac{a^2x^4}{4} + abx^2 + b^2\log(x)\right) \\ \frac{a^2c^mm^2x^4x^m}{m^3x^3-3m^2x^3-mx^3+3x^3} - \frac{4a^2c^mmx^4x^m}{m^3x^3-3m^2x^3-mx^3+3x^3} + \frac{3a^2c^mx^4x^m}{m^3x^3-3m^2x^3-mx^3+3x^3} + \frac{2abc^mm^2x^2x^m}{m^3x^3-3m^2x^3-mx^3+3x^3} - \frac{4abc^mmx^2x^m}{m^3x^3-3m^2x^3-mx^3+3x^3} - \frac{6abc}{m^3x^3-3m} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**2)**2*(c*x)**m,x)
```

```
[Out] Piecewise(((a**2*log(x) - a*b/x**2 - b**2/(4*x**4))/c, Eq(m, -1))
, (c*(a**2*x**2/2 + 2*a*b*log(x) - b**2/(2*x**2)), Eq(m, 1)), (c*
*3*(a**2*x**4/4 + a*b*x**2 + b**2*log(x)), Eq(m, 3)), (a**2*c**m*
m**2*x**4*x**m/(m**3*x**3 - 3*m**2*x**3 - m*x**3 + 3*x**3) - 4*a*
*2*c**m*m*x**4*x**m/(m**3*x**3 - 3*m**2*x**3 - m*x**3 + 3*x**3) +
 3*a**2*c**m*x**4*x**m/(m**3*x**3 - 3*m**2*x**3 - m*x**3 + 3*x**3
) + 2*a*b*c**m*m**2*x**2*x**m/(m**3*x**3 - 3*m**2*x**3 - m*x**3 +
 3*x**3) - 4*a*b*c**m*m*x**2*x**m/(m**3*x**3 - 3*m**2*x**3 - m*x*
*3 + 3*x**3) - 6*a*b*c**m*x**2*x**m/(m**3*x**3 - 3*m**2*x**3 - m*
x**3 + 3*x**3) + b**2*c**m*m**2*x**m/(m**3*x**3 - 3*m**2*x**3 - m
*x**3 + 3*x**3) - b**2*c**m*x**m/(m**3*x**3 - 3*m**2*x**3 - m*x**
3 + 3*x**3), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (cx)^m \left(a + \frac{b}{x^2}\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m*(a + b/x^2)^2,x, algorithm="giac")

[Out] integrate((c*x)^m*(a + b/x^2)^2, x)
```

3.2754 $\int \left(a+\frac{b}{x^3}\right)^2 (cx)^m \, dx$

Optimal. Leaf size=63

$$\frac{a^2(cx)^{m+1}}{c(m+1)}-\frac{2abc^2(cx)^{m-2}}{2-m}-\frac{b^2c^5(cx)^{m-5}}{5-m}$$

```
[Out] -((b^2*c^5*(c*x)^(-5 + m))/(5 - m)) - (2*a*b*c^2*(c*x)^(-2 + m))/
(2 - m) + (a^2*(c*x)^(1 + m))/(c*(1 + m))
```

Rubi [A] time = 0.0797327, antiderivative size = 63, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{a^2(cx)^{m+1}}{c(m+1)}-\frac{2abc^2(cx)^{m-2}}{2-m}-\frac{b^2c^5(cx)^{m-5}}{5-m}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b/x^3)^2*(c*x)^m,x]
```

```
[Out] -((b^2*c^5*(c*x)^(-5 + m))/(5 - m)) - (2*a*b*c^2*(c*x)^(-2 + m))/
(2 - m) + (a^2*(c*x)^(1 + m))/(c*(1 + m))
```

Rubi in Sympy [A] time = 14.0617, size = 49, normalized size = 0.78

$$\frac{a^2\,(cx)^{m+1}}{c\,(m+1)}-\frac{2abc^2\,(cx)^{m-2}}{-m+2}-\frac{b^2c^5\,(cx)^{m-5}}{-m+5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b/x**3)**2*(c*x)**m,x)
```

```
[Out] a**2*(c*x)**(m + 1)/(c*(m + 1)) - 2*a*b*c**2*(c*x)**(m - 2)/(-m +
 2) - b**2*c**5*(c*x)**(m - 5)/(-m + 5)
```

Mathematica [A] time = 0.0545363, size = 62, normalized size = 0.98

$$\frac{x^6\left(a+\frac{b}{x^3}\right)^2(cx)^m\left(\frac{a^2x}{m+1}+\frac{2ab}{(m-2)x^2}+\frac{b^2}{(m-5)x^5}\right)}{(ax^3+b)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b/x^3)^2*(c*x)^m,x]
```

```
[Out] ((a + b/x^3)^2*x^6*(c*x)^m*(b^2/((-5 + m)*x^5) + (2*a*b)/((-2 + m
)*x^2) + (a^2*x)/(1 + m)))/(b + a*x^3)^2
```

Maple [A] time = 0.007, size = 96, normalized size = 1.5

$$\frac{(cx)^m\left(a^2m^2x^6-7\,a^2mx^6+10\,a^2x^6+2\,abm^2x^3-8\,abmx^3-10\,abx^3+b^2m^2-b^2m-2\,b^2\right)}{x^5\,(1+m)\,(-2+m)\,(-5+m)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b/x^3)^2*(c*x)^m,x)
```

```
[Out] (c*x)^m*(a^2*m^2*x^6-7*a^2*m*x^6+10*a^2*x^6+2*a*b*m^2*x^3-8*a*b*m
*x^3-10*a*b*x^3+b^2*m^2-b^2*m-2*b^2)/x^5/(1+m)/(-2+m)/(-5+m)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m*(a + b/x^3)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.229839, size = 117, normalized size = 1.86

$$\frac{\left(\left(a^2m^2 - 7\,a^2m + 10\,a^2\right)x^6 + b^2m^2 + 2\left(abm^2 - 4\,abm - 5\,ab\right)x^3 - b^2m - 2\,b^2\right)(cx)^m}{(m^3 - 6\,m^2 + 3\,m + 10)x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m*(a + b/x^3)^2,x, algorithm="fricas")
```

```
[Out] ((a^2*m^2 - 7*a^2*m + 10*a^2)*x^6 + b^2*m^2 + 2*(a*b*m^2 - 4*a*b*
m - 5*a*b)*x^3 - b^2*m - 2*b^2)*(c*x)^m/((m^3 - 6*m^2 + 3*m + 10)
*x^5)
```

Sympy [A] time = 5.44974, size = 464, normalized size = 7.37

$$\begin{cases} \frac{a^2\log(x) - \frac{2ab}{3x^3} - \frac{b^2}{6x^6}}{c} \\ c^2\left(\frac{a^2x^3}{3} + 2ab\log(x) - \frac{b^2}{3x^3}\right) \\ c^5\left(\frac{a^2x^6}{6} + \frac{2abx^3}{3} + b^2\log(x)\right) \\ \frac{a^2c^mm^2x^6x^m}{m^3x^5 - 6m^2x^5 + 3mx^5 + 10x^5} - \frac{7a^2c^mmx^6x^m}{m^3x^5 - 6m^2x^5 + 3mx^5 + 10x^5} + \frac{10a^2c^mx^6x^m}{m^3x^5 - 6m^2x^5 + 3mx^5 + 10x^5} + \frac{2abc^mm^2x^3x^m}{m^3x^5 - 6m^2x^5 + 3mx^5 + 10x^5} - \frac{8abc^mmx^3x^m}{m^3x^5 - 6m^2x^5 + 3mx^5 + 10x^5} - \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b/x**3)**2*(c*x)**m,x)
```

```
[Out] Piecewise(((a**2*log(x) - 2*a*b/(3*x**3) - b**2/(6*x**6))/c, Eq(m
, -1)), (c**2*(a**2*x**3/3 + 2*a*b*log(x) - b**2/(3*x**3)), Eq(m,
 2)), (c**5*(a**2*x**6/6 + 2*a*b*x**3/3 + b**2*log(x)), Eq(m, 5))
, (a**2*c**m*m**2*x**6*x**m/(m**3*x**5 - 6*m**2*x**5 + 3*m*x**5 +
 10*x**5) - 7*a**2*c**m*m*x**6*x**m/(m**3*x**5 - 6*m**2*x**5 + 3*
m*x**5 + 10*x**5) + 10*a**2*c**m*x**6*x**m/(m**3*x**5 - 6*m**2*x*
*5 + 3*m*x**5 + 10*x**5) + 2*a*b*c**m*m**2*x**3*x**m/(m**3*x**5 -
 6*m**2*x**5 + 3*m*x**5 + 10*x**5) - 8*a*b*c**m*m*x**3*x**m/(m**3
*x**5 - 6*m**2*x**5 + 3*m*x**5 + 10*x**5) - 10*a*b*c**m*x**3*x**m
/(m**3*x**5 - 6*m**2*x**5 + 3*m*x**5 + 10*x**5) + b**2*c**m*m**2*
x**m/(m**3*x**5 - 6*m**2*x**5 + 3*m*x**5 + 10*x**5) - b**2*c**m*m
*x**m/(m**3*x**5 - 6*m**2*x**5 + 3*m*x**5 + 10*x**5) - 2*b**2*c**
m*x**m/(m**3*x**5 - 6*m**2*x**5 + 3*m*x**5 + 10*x**5), True))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (cx)^m \left(a + \frac{b}{x^3}\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^m*(a + b/x^3)^2,x, algorithm="giac")
```

```
[Out] integrate((c*x)^m*(a + b/x^3)^2, x)
```

3.2755 $\int \frac{(cx)^{-1-\frac{n}{2}}}{a+bx^n}\,dx$

Optimal. Leaf size=74

$$\frac{2\sqrt{b}x^{n/2}(cx)^{-n/2}\tan^{-1}\left(\frac{\sqrt{a}x^{-n/2}}{\sqrt{b}}\right)}{a^{3/2}cn}-\frac{2(cx)^{-n/2}}{acn}$$

```
[Out] -2/(a*c*n*(c*x)^(n/2)) + (2*Sqrt[b]*x^(n/2)*ArcTan[Sqrt[a]/(Sqrt[
b]*x^(n/2))])/(a^(3/2)*c*n*(c*x)^(n/2))
```

Rubi [A] time = 0.103681, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238

$$\frac{2\sqrt{b}x^{n/2}(cx)^{-n/2}\tan^{-1}\left(\frac{\sqrt{a}x^{-n/2}}{\sqrt{b}}\right)}{a^{3/2}cn}-\frac{2(cx)^{-n/2}}{acn}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^(-1 - n/2)/(a + b*x^n),x]
```

```
[Out] -2/(a*c*n*(c*x)^(n/2)) + (2*Sqrt[b]*x^(n/2)*ArcTan[Sqrt[a]/(Sqrt[
b]*x^(n/2))])/(a^(3/2)*c*n*(c*x)^(n/2))
```

Rubi in Sympy [A] time = 16.828, size = 56, normalized size = 0.76

$$-\frac{2\,(cx)^{-\frac{n}{2}}}{acn}+\frac{2\sqrt{b}x^{\frac{n}{2}}\,(cx)^{-\frac{n}{2}}\operatorname{atan}\left(\frac{\sqrt{a}x^{-\frac{n}{2}}}{\sqrt{b}}\right)}{a^{\frac{3}{2}}cn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**(-1-1/2*n)/(a+b*x**n),x)
```

```
[Out] -2*(c*x)**(-n/2)/(a*c*n) + 2*sqrt(b)*x**(n/2)*(c*x)**(-n/2)*atan(
sqrt(a)*x**(-n/2)/sqrt(b))/(a**(3/2)*c*n)
```

Mathematica [A] time = 0.0407082, size = 61, normalized size = 0.82

$$-\frac{2(cx)^{-n/2}\left(\sqrt{a}-\sqrt{b}x^{n/2}\tan^{-1}\left(\frac{\sqrt{a}x^{-n/2}}{\sqrt{b}}\right)\right)}{a^{3/2}cn}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^(-1 - n/2)/(a + b*x^n),x]
```

```
[Out] (-2*(Sqrt[a] - Sqrt[b]*x^(n/2)*ArcTan[Sqrt[a]/(Sqrt[b]*x^(n/2))])
)/(a^(3/2)*c*n*(c*x)^(n/2))
```

Maple [F] time = 0.089, size = 0, normalized size = 0.

$$\int \frac{1}{a+bx^n}(cx)^{-1-\frac{n}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^(-1-1/2*n)/(a+b*x^n),x)

[Out] int((c*x)^(-1-1/2*n)/(a+b*x^n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-1/2*n - 1)/(b*x^n + a),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [A] time = 0.249168, size = 1, normalized size = 0.01

$$\left[-\frac{2\,xe^{\left(-\frac{1}{2}\,(n+2)\log(c)-\frac{1}{2}\,(n+2)\log(x)\right)}-\sqrt{-\frac{bc^{-n-2}}{a}}\log\left(\frac{ax^2e^{\left(-(n+2)\log(c)-(n+2)\log(x)\right)}+2\,a\sqrt{-\frac{bc^{-n-2}}{a}}xe^{\left(-\frac{1}{2}\,(n+2)\log(c)-\frac{1}{2}\,(n+2)\log(x)\right)}-bc^{-n-2}}{ax^2e^{\left(-(n+2)\log(c)-(n+2)\log(x)\right)}+bc^{-n-2}}\right)}{an},\; -\frac{2\left(xe^{\left(-\frac{1}{2}\,(n+2)\log(c)-\frac{1}{2}\,(n+2)\log(x)\right)}+\sqrt{\frac{bc^{-n-2}}{a}}\arctan\left(\frac{\sqrt{\frac{bc^{-n-2}}{a}}e^{\left(\frac{1}{2}\,(n+2)\log(c)+\frac{1}{2}\,(n+2)\log(x)\right)}}{x}\right)\right)}{an}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-1/2*n - 1)/(b*x^n + a),x, algorithm="fricas")

[Out] [-(2*x*e^(-1/2*(n + 2)*log(c) - 1/2*(n + 2)*log(x)) - sqrt(-b*c^(
-n - 2)/a)*log((a*x^2*e^(-(n + 2)*log(c) - (n + 2)*log(x)) + 2*a*
sqrt(-b*c^(-n - 2)/a)*x*e^(-1/2*(n + 2)*log(c) - 1/2*(n + 2)*log(
x)) - b*c^(-n - 2))/(a*x^2*e^(-(n + 2)*log(c) - (n + 2)*log(x)) +
 b*c^(-n - 2))))/(a*n), -2*(x*e^(-1/2*(n + 2)*log(c) - 1/2*(n + 2
)*log(x)) + sqrt(b*c^(-n - 2)/a)*arctan(sqrt(b*c^(-n - 2)/a)*e^(1
/2*(n + 2)*log(c) + 1/2*(n + 2)*log(x))/x))/(a*n)]
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**(-1-1/2*n)/(a+b*x**n),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx)^{-\frac{1}{2}\,n-1}}{bx^n+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-1/2*n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate((c*x)^(-1/2*n - 1)/(b*x^n + a), x)
```

3.2756 $\int \frac{(cx)^{-1-\frac{2n}{3}}}{a+bx^n} dx$

Optimal. Leaf size=222

$$-\frac{b^{2/3}x^{2n/3}(cx)^{-2n/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^{n/3}\right)}{a^{5/3}cn}+\frac{b^{2/3}x^{2n/3}(cx)^{-2n/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x^{n/3}+b^{2/3}x^{2n/3}\right)}{2a^{5/3}cn}+\frac{\sqrt{3}b^{2/3}x^{2n/3}(cx)^{-2n/3}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x^{n/3}}{\sqrt{3}\sqrt[3]{a}}\right)}{a^{5/3}cn}-\frac{3(cx)^{-2n/3}}{2acn}$$

```
[Out] -3/(2*a*c*n*(c*x)^((2*n)/3)) + (Sqrt[3]*b^(2/3)*x^((2*n)/3)*ArcTa
n[(a^(1/3) - 2*b^(1/3)*x^(n/3))/(Sqrt[3]*a^(1/3))])/(a^(5/3)*c*n*
(c*x)^((2*n)/3)) - (b^(2/3)*x^((2*n)/3)*Log[a^(1/3) + b^(1/3)*x^(
n/3)])/(a^(5/3)*c*n*(c*x)^((2*n)/3)) + (b^(2/3)*x^((2*n)/3)*Log[a
^(2/3) - a^(1/3)*b^(1/3)*x^(n/3) + b^(2/3)*x^((2*n)/3)])/(2*a^(5/
3)*c*n*(c*x)^((2*n)/3))
```

Rubi [A] time = 0.324833, antiderivative size = 222, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429

$$-\frac{b^{2/3}x^{2n/3}(cx)^{-2n/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^{n/3}\right)}{a^{5/3}cn}+\frac{b^{2/3}x^{2n/3}(cx)^{-2n/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}x^{n/3}+b^{2/3}x^{2n/3}\right)}{2a^{5/3}cn}+\frac{\sqrt{3}b^{2/3}x^{2n/3}(cx)^{-2n/3}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}x^{n/3}}{\sqrt{3}\sqrt[3]{a}}\right)}{a^{5/3}cn}-\frac{3(cx)^{-2n/3}}{2acn}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^(-1 - (2*n)/3)/(a + b*x^n),x]
```

```
[Out] -3/(2*a*c*n*(c*x)^((2*n)/3)) + (Sqrt[3]*b^(2/3)*x^((2*n)/3)*ArcTa
n[(a^(1/3) - 2*b^(1/3)*x^(n/3))/(Sqrt[3]*a^(1/3))])/(a^(5/3)*c*n*
(c*x)^((2*n)/3)) - (b^(2/3)*x^((2*n)/3)*Log[a^(1/3) + b^(1/3)*x^(
n/3)])/(a^(5/3)*c*n*(c*x)^((2*n)/3)) + (b^(2/3)*x^((2*n)/3)*Log[a
^(2/3) - a^(1/3)*b^(1/3)*x^(n/3) + b^(2/3)*x^((2*n)/3)])/(2*a^(5/
3)*c*n*(c*x)^((2*n)/3))
```

Rubi in Sympy [A] time = 47.8695, size = 192, normalized size = 0.86

$$-\frac{3(cx)^{-\frac{2n}{3}}}{2acn}-\frac{b^{\frac{2}{3}}x^{\frac{2n}{3}}(cx)^{-\frac{2n}{3}}\log\left(\sqrt[3]{a}+\sqrt[3]{b}x^{\frac{n}{3}}\right)}{a^{\frac{5}{3}}cn}+\frac{b^{\frac{2}{3}}x^{\frac{2n}{3}}(cx)^{-\frac{2n}{3}}\log\left(a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}x^{\frac{n}{3}}+b^{\frac{2}{3}}x^{\frac{2n}{3}}\right)}{2a^{\frac{5}{3}}cn}+\frac{\sqrt{3}b^{\frac{2}{3}}x^{\frac{2n}{3}}(cx)^{-\frac{2n}{3}}\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}-\frac{2\sqrt[3]{b}x^{\frac{n}{3}}}{3}\right)}{\sqrt[3]{a}}\right)}{a^{\frac{5}{3}}cn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**(-1-2/3*n)/(a+b*x**n),x)
```

```
[Out] -3*(c*x)**(-2*n/3)/(2*a*c*n) - b**(2/3)*x**(2*n/3)*(c*x)**(-2*n/3
)*log(a**(1/3) + b**(1/3)*x**(n/3))/(a**(5/3)*c*n) + b**(2/3)*x**
(2*n/3)*(c*x)**(-2*n/3)*log(a**(2/3) - a**(1/3)*b**(1/3)*x**(n/3)
 + b**(2/3)*x**(2*n/3))/(2*a**(5/3)*c*n) + sqrt(3)*b**(2/3)*x**(2
*n/3)*(c*x)**(-2*n/3)*atan(sqrt(3)*(a**(1/3)/3 - 2*b**(1/3)*x**(n
/3)/3)/a**(1/3))/(a**(5/3)*c*n)
```

Mathematica [C] time = 0.0483066, size = 72, normalized size = 0.32

$$\frac{(cx)^{-2n/3}\left(2bx^{2n/3}\text{RootSum}\left[\#1^3a+b\&,\frac{3\log\left(x^{-n/3}-\#1\right)+n\log(x)}{\#1}\&\right]-9a\right)}{6a^2cn}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^(-1 - (2*n)/3)/(a + b*x^n),x]
```

```
[Out] (-9*a + 2*b*x^((2*n)/3)*RootSum[b + a*#1^3 & , (n*Log[x] + 3*Log[
x^(-n/3) - #1])/#1 & ])/(6*a^2*c*n*(c*x)^((2*n)/3))
```

Maple [F] time = 0.089, size = 0, normalized size = 0.

$$\int \frac{1}{a+bx^n}(cx)^{-1-\frac{2n}{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^(-1-2/3*n)/(a+b*x^n),x)
```

```
[Out] int((c*x)^(-1-2/3*n)/(a+b*x^n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-2/3*n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.460795, size = 451, normalized size = 2.03

$$-\frac{3\,xe^{\left(-\frac{1}{3}\,(2\,n+3)\log(c)-\frac{1}{3}\,(2\,n+3)\log(x)\right)}-2\,\sqrt{3}\left(-\frac{b^2c^{-2\,n-3}}{a^2}\right)^{\frac{1}{3}}\arctan\left(-\frac{\sqrt{3}\left(2\,bc^{-n-\frac{3}{2}}\sqrt{x}e^{\left(-\frac{1}{6}\,(2\,n+3)\log(c)-\frac{1}{6}\,(2\,n+3)\log(x)\right)}-a\left(-\frac{b^2c^{-2\,n-3}}{a^2}\right)^{\frac{2}{3}}\right)}{3\,a\left(-\frac{b^2c^{-2\,n-3}}{a^2}\right)^{\frac{2}{3}}}\right)-2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-2/3*n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] -1/2*(3*x*e^(-1/3*(2*n + 3)*log(c) - 1/3*(2*n + 3)*log(x)) - 2*sq
rt(3)*(-b^2*c^(-2*n - 3)/a^2)^(1/3)*arctan(-1/3*sqrt(3)*(2*b*c^(-
n - 3/2)*sqrt(x)*e^(-1/6*(2*n + 3)*log(c) - 1/6*(2*n + 3)*log(x))
 - a*(-b^2*c^(-2*n - 3)/a^2)^(2/3))/(a*(-b^2*c^(-2*n - 3)/a^2)^(2
/3))) - 2*(-b^2*c^(-2*n - 3)/a^2)^(1/3)*log((b*c^(-n - 3/2)*sqrt(
x)*e^(-1/6*(2*n + 3)*log(c) - 1/6*(2*n + 3)*log(x)) + a*(-b^2*c^(
-2*n - 3)/a^2)^(2/3))/sqrt(x)) + (-b^2*c^(-2*n - 3)/a^2)^(1/3)*lo
g((b*c^(-n - 3/2)*x*e^(-1/3*(2*n + 3)*log(c) - 1/3*(2*n + 3)*log(
x)) - a*(-b^2*c^(-2*n - 3)/a^2)^(2/3)*sqrt(x)*e^(-1/6*(2*n + 3)*l
```

```
og(c) - 1/6*(2*n + 3)*log(x)) - b*c^(-n - 3/2)*(-b^2*c^(-2*n - 3)
/a^2)^(1/3))/x))/(a*n)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**(-1-2/3*n)/(a+b*x**n),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx)^{-\frac{2}{3}n-1}}{bx^n + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-2/3*n - 1)/(b*x^n + a),x, algorithm="giac")

[Out] integrate((c*x)^(-2/3*n - 1)/(b*x^n + a), x)
```

3.2757 $\int \frac{(cx)^{-1-\frac{3n}{4}}}{a+bx^n}\,dx$

Optimal. Leaf size=317

$$\frac{b^{3/4}x^{3n/4}(cx)^{-3n/4}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{n/4}+\sqrt{a}+\sqrt{b}x^{n/2}\right)}{\sqrt{2}a^{7/4}cn} - \frac{b^{3/4}x^{3n/4}(cx)^{-3n/4}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{n/4}+\sqrt{a}+\sqrt{b}x^{n/2}\right)}{\sqrt{2}a^{7/4}cn} + \frac{\sqrt{2}b^{3/4}x^{3n/4}(cx)^{-3n/4}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x^{n/4}}{\sqrt[4]{a}}\right)}{a^{7/4}cn} - \frac{\sqrt{2}b^{3/4}x^{3n/4}(cx)^{-3n/4}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x^{n/4}}{\sqrt[4]{a}}+1\right)}{a^{7/4}cn} - \frac{4(cx)^{-3n/4}}{3acn}$$

```
[Out] -4/(3*a*c*n*(c*x)^((3*n)/4)) + (Sqrt[2]*b^(3/4)*x^((3*n)/4)*ArcTa
n[1 - (Sqrt[2]*b^(1/4)*x^(n/4))/a^(1/4)])/(a^(7/4)*c*n*(c*x)^((3*
n)/4)) - (Sqrt[2]*b^(3/4)*x^((3*n)/4)*ArcTan[1 + (Sqrt[2]*b^(1/4)
*x^(n/4))/a^(1/4)])/(a^(7/4)*c*n*(c*x)^((3*n)/4)) + (b^(3/4)*x^((
3*n)/4)*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*b^(1/4)*x^(n/4) + Sqrt[b]*x
^(n/2)])/(Sqrt[2]*a^(7/4)*c*n*(c*x)^((3*n)/4)) - (b^(3/4)*x^((3*n
)/4)*Log[Sqrt[a] + Sqrt[2]*a^(1/4)*b^(1/4)*x^(n/4) + Sqrt[b]*x^(n
/2)])/(Sqrt[2]*a^(7/4)*c*n*(c*x)^((3*n)/4))
```

Rubi [A] time = 0.548636, antiderivative size = 317, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429

$$\frac{b^{3/4}x^{3n/4}(cx)^{-3n/4}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{n/4}+\sqrt{a}+\sqrt{b}x^{n/2}\right)}{\sqrt{2}a^{7/4}cn} - \frac{b^{3/4}x^{3n/4}(cx)^{-3n/4}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{n/4}+\sqrt{a}+\sqrt{b}x^{n/2}\right)}{\sqrt{2}a^{7/4}cn} + \frac{\sqrt{2}b^{3/4}x^{3n/4}(cx)^{-3n/4}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x^{n/4}}{\sqrt[4]{a}}\right)}{a^{7/4}cn} - \frac{\sqrt{2}b^{3/4}x^{3n/4}(cx)^{-3n/4}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{b}x^{n/4}}{\sqrt[4]{a}}+1\right)}{a^{7/4}cn} - \frac{4(cx)^{-3n/4}}{3acn}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^(-1 - (3*n)/4)/(a + b*x^n),x]
```


```
[Out] -4/(3*a*c*n*(c*x)^((3*n)/4)) + (Sqrt[2]*b^(3/4)*x^((3*n)/4)*ArcTa
n[1 - (Sqrt[2]*b^(1/4)*x^(n/4))/a^(1/4)])/(a^(7/4)*c*n*(c*x)^((3*
n)/4)) - (Sqrt[2]*b^(3/4)*x^((3*n)/4)*ArcTan[1 + (Sqrt[2]*b^(1/4)
*x^(n/4))/a^(1/4)])/(a^(7/4)*c*n*(c*x)^((3*n)/4)) + (b^(3/4)*x^((
3*n)/4)*Log[Sqrt[a] - Sqrt[2]*a^(1/4)*b^(1/4)*x^(n/4) + Sqrt[b]*x
^(n/2)])/(Sqrt[2]*a^(7/4)*c*n*(c*x)^((3*n)/4)) - (b^(3/4)*x^((3*n
)/4)*Log[Sqrt[a] + Sqrt[2]*a^(1/4)*b^(1/4)*x^(n/4) + Sqrt[b]*x^(n
/2)])/(Sqrt[2]*a^(7/4)*c*n*(c*x)^((3*n)/4))
```

Rubi in Sympy [A] time = 76.9261, size = 277, normalized size = 0.87

$$-\frac{4(cx)^{-\frac{3n}{4}}}{3acn}+\frac{\sqrt{2}b^{\frac{3}{4}}x^{\frac{3n}{4}}(cx)^{-\frac{3n}{4}}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{\frac{n}{4}}+\sqrt{a}+\sqrt{b}x^{\frac{n}{2}}\right)}{2a^{\frac{7}{4}}cn}-\frac{\sqrt{2}b^{\frac{3}{4}}x^{\frac{3n}{4}}(cx)^{-\frac{3n}{4}}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{\frac{n}{4}}+\sqrt{a}+\sqrt{b}x^{\frac{n}{2}}\right)}{2a^{\frac{7}{4}}cn}+\frac{\sqrt{2}b^{\frac{3}{4}}x^{\frac{3n}{4}}(cx)^{-\frac{3n}{4}}\operatorname{atan}\left(1-\frac{\sqrt{2}\sqrt[4]{b}x^{\frac{n}{4}}}{\sqrt[4]{a}}\right)}{a^{\frac{7}{4}}cn}-\frac{\sqrt{2}b^{\frac{3}{4}}x^{\frac{3n}{4}}(cx)^{-\frac{3n}{4}}\operatorname{atan}\left(1+\frac{\sqrt{2}\sqrt[4]{b}x^{\frac{n}{4}}}{\sqrt[4]{a}}\right)}{a^{\frac{7}{4}}cn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**(-1-3/4*n)/(a+b*x**n),x)
```

```
[Out] -4*(c*x)**(-3*n/4)/(3*a*c*n) + sqrt(2)*b**(3/4)*x**(3*n/4)*(c*x)*
*(-3*n/4)*log(-sqrt(2)*a**(1/4)*b**(1/4)*x**(n/4) + sqrt(a) + sqr
t(b)*x**(n/2))/(2*a**(7/4)*c*n) - sqrt(2)*b**(3/4)*x**(3*n/4)*(c*
x)**(-3*n/4)*log(sqrt(2)*a**(1/4)*b**(1/4)*x**(n/4) + sqrt(a) + s
qrt(b)*x**(n/2))/(2*a**(7/4)*c*n) + sqrt(2)*b**(3/4)*x**(3*n/4)*(
c*x)**(-3*n/4)*atan(1 - sqrt(2)*b**(1/4)*x**(n/4)/a**(1/4))/(a**(
7/4)*c*n) - sqrt(2)*b**(3/4)*x**(3*n/4)*(c*x)**(-3*n/4)*atan(1 +
sqrt(2)*b**(1/4)*x**(n/4)/a**(1/4))/(a**(7/4)*c*n)
```

Mathematica [C] time = 0.049287, size = 72, normalized size = 0.23

$$\frac{(cx)^{-3n/4}\left(3bx^{3n/4}\text{RootSum}\left[\#1^4a+b\&,\frac{4\log\left(x^{-n/4}-\#1\right)+n\log(x)}{\#1}\&\right]-16a\right)}{12a^2cn}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^(-1 - (3*n)/4)/(a + b*x^n),x]
```

```
[Out] (-16*a + 3*b*x^((3*n)/4)*RootSum[b + a*#1^4 & , (n*Log[x] + 4*Log
[x^(-n/4) - #1])/#1 & ])/(12*a^2*c*n*(c*x)^((3*n)/4))
```

Maple [F] time = 0.091, size = 0, normalized size = 0.

$$\int\frac{1}{a+bx^n}(cx)^{-1-\frac{3n}{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^(-1-3/4*n)/(a+b*x^n),x)
```

```
[Out] int((c*x)^(-1-3/4*n)/(a+b*x^n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-3/4*n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.59834, size = 525, normalized size = 1.66

$$12\,an\left(-\frac{b^{3}c^{-3\,n-4}}{a^{7}n^{4}}\right)^{\frac{1}{4}}\arctan\left(\frac{a^{5}n^{3}\left(-\frac{b^{3}c^{-3\,n-4}}{a^{7}n^{4}}\right)^{\frac{3}{4}}}{b^{2}c^{-2\,n-\frac{8}{3}}x^{\frac{1}{3}}e^{\left(-\frac{1}{12}\,(3\,n+4)\log(c)-\frac{1}{12}\,(3\,n+4)\log(x)\right)}+x^{\frac{1}{3}}\sqrt{-\frac{a^{3}b^{3}c^{-3\,n-4}n^{2}\sqrt{-\frac{b^{3}c^{-3\,n-4}}{a^{7}n^{4}}}-b^{4}c^{-4\,n-\frac{16}{3}}x^{\frac{2}{3}}e^{\left(-\frac{1}{6}\,(3\,n+4)\log(c)-\frac{1}{6}\,(3\,n+4)\log(\cdots\right)}}{x^{\frac{2}{3}}}}}\cdots\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-3/4*n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] 1/3*(12*a*n*(-b^3*c^(-3*n - 4)/(a^7*n^4))^(1/4)*arctan(a^5*n^3*(-
b^3*c^(-3*n - 4)/(a^7*n^4))^(3/4)/(b^2*c^(-2*n - 8/3)*x^(1/3)*e^(
-1/12*(3*n + 4)*log(c) - 1/12*(3*n + 4)*log(x)) + x^(1/3)*sqrt(-(
a^3*b^3*c^(-3*n - 4)*n^2*sqrt(-b^3*c^(-3*n - 4)/(a^7*n^4)) - b^4*
c^(-4*n - 16/3)*x^(2/3)*e^(-1/6*(3*n + 4)*log(c) - 1/6*(3*n + 4)*
log(x)))/x^(2/3)))) + 3*a*n*(-b^3*c^(-3*n - 4)/(a^7*n^4))^(1/4)*l
og((a^5*n^3*(-b^3*c^(-3*n - 4)/(a^7*n^4))^(3/4) + b^2*c^(-2*n - 8
/3)*x^(1/3)*e^(-1/12*(3*n + 4)*log(c) - 1/12*(3*n + 4)*log(x)))/x
^(1/3)) - 3*a*n*(-b^3*c^(-3*n - 4)/(a^7*n^4))^(1/4)*log(-(a^5*n^3
*(-b^3*c^(-3*n - 4)/(a^7*n^4))^(3/4) - b^2*c^(-2*n - 8/3)*x^(1/3)
*e^(-1/12*(3*n + 4)*log(c) - 1/12*(3*n + 4)*log(x)))/x^(1/3)) - 4
*x*e^(-1/4*(3*n + 4)*log(c) - 1/4*(3*n + 4)*log(x)))/(a*n)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**(-1-3/4*n)/(a+b*x**n),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx)^{-\frac{3}{4}\,n-1}}{bx^{n}+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-3/4*n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate((c*x)^(-3/4*n - 1)/(b*x^n + a), x)
```

3.2758 $\int \frac{(cx)^{-1-n}}{a+bx^n} dx$

Optimal. Leaf size=69

$$-\frac{bx^n \log(x)(cx)^{-n}}{a^2c}+\frac{bx^n(cx)^{-n}\log(a+bx^n)}{a^2cn}-\frac{(cx)^{-n}}{acn}$$

```
[Out] -(1/(a*c*n*(c*x)^n)) - (b*x^n*Log[x])/(a^2*c*(c*x)^n) + (b*x^n*Lo
g[a + b*x^n])/(a^2*c*n*(c*x)^n)
```

Rubi [A] time = 0.0990706, antiderivative size = 69, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158

$$-\frac{bx^n \log(x)(cx)^{-n}}{a^2c}+\frac{bx^n(cx)^{-n}\log(a+bx^n)}{a^2cn}-\frac{(cx)^{-n}}{acn}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^(-1 - n)/(a + b*x^n),x]
```

```
[Out] -(1/(a*c*n*(c*x)^n)) - (b*x^n*Log[x])/(a^2*c*(c*x)^n) + (b*x^n*Lo
g[a + b*x^n])/(a^2*c*n*(c*x)^n)
```

Rubi in Sympy [A] time = 14.4659, size = 58, normalized size = 0.84

$$-\frac{(cx)^{-n}}{acn}-\frac{bx^n\,(cx)^{-n}\log(x^n)}{a^2cn}+\frac{bx^n\,(cx)^{-n}\log(a+bx^n)}{a^2cn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**(-1-n)/(a+b*x**n),x)
```

```
[Out] -(c*x)**(-n)/(a*c*n) - b*x**n*(c*x)**(-n)*log(x**n)/(a**2*c*n) +
b*x**n*(c*x)**(-n)*log(a + b*x**n)/(a**2*c*n)
```

Mathematica [A] time = 0.0356842, size = 36, normalized size = 0.52

$$\frac{(cx)^{-n}\left(bx^n\log\left(ax^{-n}+b\right)-a\right)}{a^2cn}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^(-1 - n)/(a + b*x^n),x]
```

```
[Out] (-a + b*x^n*Log[b + a/x^n])/(a^2*c*n*(c*x)^n)
```

Maple [F] time = 0.084, size = 0, normalized size = 0.

$$\int \frac{(cx)^{-1-n}}{a+bx^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^(-1-n)/(a+b*x^n),x)
```

```
[Out] int((c*x)^(-1-n)/(a+b*x^n),x)
```

Maxima [A] time = 1.35684, size = 85, normalized size = 1.23

$$-\frac{bc^{-n-1}\log(x)}{a^2}-\frac{c^{-n-1}x^{-n}}{an}+\frac{bc^{-n-1}\log\left(\frac{bx^n+a}{b}\right)}{a^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] -b*c^(-n - 1)*log(x)/a^2 - c^(-n - 1)*x^(-n)/(a*n) + b*c^(-n - 1)
*log((b*x^n + a)/b)/(a^2*n)
```

Fricas [A] time = 0.236272, size = 80, normalized size = 1.16

$$-\frac{bc^{-n-1}nx^n\log(x)-bc^{-n-1}x^n\log(bx^n+a)+ac^{-n-1}}{a^2nx^n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] -(b*c^(-n - 1)*n*x^n*log(x) - b*c^(-n - 1)*x^n*log(b*x^n + a) + a
*c^(-n - 1))/(a^2*n*x^n)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**(-1-n)/(a+b*x**n),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{(cx)^{-n-1}}{bx^n+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate((c*x)^(-n - 1)/(b*x^n + a), x)
```

3.2759 $\int \frac{(cx)^{-1-\frac{n}{2}}}{a+bx^n}\,dx$

Optimal. Leaf size=74

$$\frac{2\sqrt{b}x^{n/2}(cx)^{-n/2}\tan^{-1}\left(\frac{\sqrt{a}x^{-n/2}}{\sqrt{b}}\right)}{a^{3/2}cn}-\frac{2(cx)^{-n/2}}{acn}$$

```
[Out] -2/(a*c*n*(c*x)^(n/2)) + (2*Sqrt[b]*x^(n/2)*ArcTan[Sqrt[a]/(Sqrt[
b]*x^(n/2))])/(a^(3/2)*c*n*(c*x)^(n/2))
```

Rubi [A] time = 0.098988, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238

$$\frac{2\sqrt{b}x^{n/2}(cx)^{-n/2}\tan^{-1}\left(\frac{\sqrt{a}x^{-n/2}}{\sqrt{b}}\right)}{a^{3/2}cn}-\frac{2(cx)^{-n/2}}{acn}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^(-1 - n/2)/(a + b*x^n),x]
```

```
[Out] -2/(a*c*n*(c*x)^(n/2)) + (2*Sqrt[b]*x^(n/2)*ArcTan[Sqrt[a]/(Sqrt[
b]*x^(n/2))])/(a^(3/2)*c*n*(c*x)^(n/2))
```

Rubi in Sympy [A] time = 16.5115, size = 56, normalized size = 0.76

$$-\frac{2\,(cx)^{-\frac{n}{2}}}{acn}+\frac{2\sqrt{b}x^{\frac{n}{2}}\,(cx)^{-\frac{n}{2}}\,\text{atan}\left(\frac{\sqrt{a}x^{-\frac{n}{2}}}{\sqrt{b}}\right)}{a^{\frac{3}{2}}cn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**(-1-1/2*n)/(a+b*x**n),x)
```

```
[Out] -2*(c*x)**(-n/2)/(a*c*n) + 2*sqrt(b)*x**(n/2)*(c*x)**(-n/2)*atan(
sqrt(a)*x**(-n/2)/sqrt(b))/(a**(3/2)*c*n)
```

Mathematica [A] time = 0.0190134, size = 61, normalized size = 0.82

$$-\frac{2(cx)^{-n/2}\left(\sqrt{a}-\sqrt{b}x^{n/2}\tan^{-1}\left(\frac{\sqrt{a}x^{-n/2}}{\sqrt{b}}\right)\right)}{a^{3/2}cn}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^(-1 - n/2)/(a + b*x^n),x]
```

```
[Out] (-2*(Sqrt[a] - Sqrt[b]*x^(n/2)*ArcTan[Sqrt[a]/(Sqrt[b]*x^(n/2))])
)/(a^(3/2)*c*n*(c*x)^(n/2))
```

Maple [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{a+bx^n}\,(cx)^{-1-\frac{n}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((c*x)^(-1-1/2*n)/(a+b*x^n),x)

[Out] int((c*x)^(-1-1/2*n)/(a+b*x^n),x)
```

Maxima [F]   time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((c*x)^(-1/2*n - 1)/(b*x^n + a),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [A]   time = 0.248757, size = 1, normalized size = 0.01

$$\left[-\frac{2\,xe^{\left(-\frac{1}{2}\,(n+2)\log(c)-\frac{1}{2}\,(n+2)\log(x)\right)}-\sqrt{-\frac{bc^{-n-2}}{a}}\log\left(\frac{ax^{2}e^{(-(n+2)\log(c)-(n+2)\log(x))}+2\,a\sqrt{-\frac{bc^{-n-2}}{a}}xe^{\left(-\frac{1}{2}\,(n+2)\log(c)-\frac{1}{2}\,(n+2)\log(x)\right)}-bc^{-n-2}}{ax^{2}e^{(-(n+2)\log(c)-(n+2)\log(x))}+bc^{-n-2}}\right)}{an},\right.$$
$$\left.-\frac{2\left(xe^{\left(-\frac{1}{2}\,(n+2)\log(c)-\frac{1}{2}\,(n+2)\log(x)\right)}+\sqrt{\frac{bc^{-n-2}}{a}}\arctan\left(\frac{\sqrt{\frac{bc^{-n-2}}{a}}e^{\left(\frac{1}{2}\,(n+2)\log(c)+\frac{1}{2}\,(n+2)\log(x)\right)}}{x}\right)\right)}{an}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((c*x)^(-1/2*n - 1)/(b*x^n + a),x, algorithm="fricas")

[Out] [-(2*x*e^(-1/2*(n + 2)*log(c) - 1/2*(n + 2)*log(x)) - sqrt(-b*c^(
-n - 2)/a)*log((a*x^2*e^(-(n + 2)*log(c) - (n + 2)*log(x)) + 2*a*
sqrt(-b*c^(-n - 2)/a)*x*e^(-1/2*(n + 2)*log(c) - 1/2*(n + 2)*log(
x)) - b*c^(-n - 2))/(a*x^2*e^(-(n + 2)*log(c) - (n + 2)*log(x)) +
 b*c^(-n - 2))))/(a*n), -2*(x*e^(-1/2*(n + 2)*log(c) - 1/2*(n + 2
)*log(x)) + sqrt(b*c^(-n - 2)/a)*arctan(sqrt(b*c^(-n - 2)/a)*e^(1
/2*(n + 2)*log(c) + 1/2*(n + 2)*log(x))/x))/(a*n)]
```

Sympy [F(-2)]   time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((c*x)**(-1-1/2*n)/(a+b*x**n),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F]   time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx)^{-\frac{1}{2}\,n-1}}{bx^{n}+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-1/2*n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate((c*x)^(-1/2*n - 1)/(b*x^n + a), x)
```

3.2760 $\int \frac{(cx)^{-1-\frac{n}{3}}}{a+bx^n}\,dx$

Optimal. Leaf size=220

$$-\frac{\sqrt[3]{b}x^{n/3}(cx)^{-n/3}\log\left(a^{2/3}x^{-2n/3}-\sqrt[3]{a}\sqrt[3]{b}x^{-n/3}+b^{2/3}\right)}{2a^{4/3}cn}+\frac{\sqrt[3]{b}x^{n/3}(cx)^{-n/3}\log\left(\sqrt[3]{a}x^{-n/3}+\sqrt[3]{b}\right)}{a^{4/3}cn}-\frac{\sqrt{3}\sqrt[3]{b}x^{n/3}(cx)^{-n/3}\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x^{-n/3}}{\sqrt{3}\sqrt[3]{b}}\right)}{a^{4/3}cn}-\frac{3(cx)^{-n/3}}{acn}$$

```
[Out] -3/(a*c*n*(c*x)^(n/3)) - (Sqrt[3]*b^(1/3)*x^(n/3)*ArcTan[(b^(1/3)
 - (2*a^(1/3))/x^(n/3))/(Sqrt[3]*b^(1/3))])/(a^(4/3)*c*n*(c*x)^(n
/3)) + (b^(1/3)*x^(n/3)*Log[b^(1/3) + a^(1/3)/x^(n/3)])/(a^(4/3)*
c*n*(c*x)^(n/3)) - (b^(1/3)*x^(n/3)*Log[b^(2/3) + a^(2/3)/x^((2*n
)/3) - (a^(1/3)*b^(1/3))/x^(n/3)])/(2*a^(4/3)*c*n*(c*x)^(n/3))
```

Rubi [A] time = 0.324649, antiderivative size = 220, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 10, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.476

$$-\frac{\sqrt[3]{b}x^{n/3}(cx)^{-n/3}\log\left(a^{2/3}x^{-2n/3}-\sqrt[3]{a}\sqrt[3]{b}x^{-n/3}+b^{2/3}\right)}{2a^{4/3}cn}+\frac{\sqrt[3]{b}x^{n/3}(cx)^{-n/3}\log\left(\sqrt[3]{a}x^{-n/3}+\sqrt[3]{b}\right)}{a^{4/3}cn}-\frac{\sqrt{3}\sqrt[3]{b}x^{n/3}(cx)^{-n/3}\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x^{-n/3}}{\sqrt{3}\sqrt[3]{b}}\right)}{a^{4/3}cn}-\frac{3(cx)^{-n/3}}{acn}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^(-1 - n/3)/(a + b*x^n),x]
```

```
[Out] -3/(a*c*n*(c*x)^(n/3)) - (Sqrt[3]*b^(1/3)*x^(n/3)*ArcTan[(b^(1/3)
 - (2*a^(1/3))/x^(n/3))/(Sqrt[3]*b^(1/3))])/(a^(4/3)*c*n*(c*x)^(n
/3)) + (b^(1/3)*x^(n/3)*Log[b^(1/3) + a^(1/3)/x^(n/3)])/(a^(4/3)*
c*n*(c*x)^(n/3)) - (b^(1/3)*x^(n/3)*Log[b^(2/3) + a^(2/3)/x^((2*n
)/3) - (a^(1/3)*b^(1/3))/x^(n/3)])/(2*a^(4/3)*c*n*(c*x)^(n/3))
```

Rubi in Sympy [A] time = 47.2296, size = 178, normalized size = 0.81

$$-\frac{3\,(cx)^{-\frac{n}{3}}}{acn}+\frac{\sqrt[3]{b}x^{\frac{n}{3}}\,(cx)^{-\frac{n}{3}}\log\left(\sqrt[3]{a}x^{-\frac{n}{3}}+\sqrt[3]{b}\right)}{a^{\frac{4}{3}}cn}-\frac{\sqrt[3]{b}x^{\frac{n}{3}}\,(cx)^{-\frac{n}{3}}\log\left(a^{\frac{2}{3}}x^{-\frac{2n}{3}}-\sqrt[3]{a}\sqrt[3]{b}x^{-\frac{n}{3}}+b^{\frac{2}{3}}\right)}{2a^{\frac{4}{3}}cn}-\frac{\sqrt{3}\sqrt[3]{b}x^{\frac{n}{3}}\,(cx)^{-\frac{n}{3}}\operatorname{atan}\left(\frac{\sqrt{3}\left(-\frac{2\sqrt[3]{a}x^{-\frac{n}{3}}}{3}+\frac{\sqrt[3]{b}}{3}\right)}{\sqrt[3]{b}}\right)}{a^{\frac{4}{3}}cn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**(-1-1/3*n)/(a+b*x**n),x)
```

```
[Out] -3*(c*x)**(-n/3)/(a*c*n) + b**(1/3)*x**(n/3)*(c*x)**(-n/3)*log(a*
*(1/3)*x**(-n/3) + b**(1/3))/(a**(4/3)*c*n) - b**(1/3)*x**(n/3)*(
c*x)**(-n/3)*log(a**(2/3)*x**(-2*n/3) - a**(1/3)*b**(1/3)*x**(-n/
3) + b**(2/3))/(2*a**(4/3)*c*n) - sqrt(3)*b**(1/3)*x**(n/3)*(c*x)
**(-n/3)*atan(sqrt(3)*(-2*a**(1/3)*x**(-n/3)/3 + b**(1/3)/3)/b**(
1/3))/(a**(4/3)*c*n)
```

Mathematica [C] time = 0.0430835, size = 71, normalized size = 0.32

$$\frac{(cx)^{-n/3}\left(bx^{n/3}\text{RootSum}\left[\#1^3a+b\&,\frac{3\log\left(x^{-n/3}-\#1\right)+n\log(x)}{\#1^2}\&\right]-9a\right)}{3a^2cn}$$

Antiderivative was successfully verified.

```
[In]   Integrate[(c*x)^(-1 - n/3)/(a + b*x^n),x]
```

```
[Out] (-9*a + b*x^(n/3)*RootSum[b + a*#1^3 & , (n*Log[x] + 3*Log[x^(-n/
3) - #1])/#1^2 & ])/(3*a^2*c*n*(c*x)^(n/3))
```

Maple [F] time = 0.096, size = 0, normalized size = 0.

$$\int \frac{1}{a+bx^n}(cx)^{-1-\frac{n}{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((c*x)^(-1-1/3*n)/(a+b*x^n),x)
```

```
[Out] int((c*x)^(-1-1/3*n)/(a+b*x^n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((c*x)^(-1/3*n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.249284, size = 331, normalized size = 1.5

$$-\frac{6xe^{\left(-\frac{1}{3}(n+3)\log(c)-\frac{1}{3}(n+3)\log(x)\right)}+2\sqrt{3}\left(\frac{bc^{-n-3}}{a}\right)^{\frac{1}{3}}\arctan\left(-\frac{\sqrt{3}\left(2xe^{\left(-\frac{1}{3}(n+3)\log(c)-\frac{1}{3}(n+3)\log(x)\right)}-\left(\frac{bc^{-n-3}}{a}\right)^{\frac{1}{3}}\right)}{3\left(\frac{bc^{-n-3}}{a}\right)^{\frac{1}{3}}}\right)-2\left(\frac{bc^{-n-3}}{a}\right)^{\frac{1}{3}}\log\left(\frac{xe^{(-}}{}\right.}{2an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((c*x)^(-1/3*n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] -1/2*(6*x*e^(-1/3*(n + 3)*log(c) - 1/3*(n + 3)*log(x)) + 2*sqrt(3
)*(b*c^(-n - 3)/a)^(1/3)*arctan(-1/3*sqrt(3)*(2*x*e^(-1/3*(n + 3)
*log(c) - 1/3*(n + 3)*log(x)) - (b*c^(-n - 3)/a)^(1/3))/(b*c^(-n
- 3)/a)^(1/3)) - 2*(b*c^(-n - 3)/a)^(1/3)*log((x*e^(-1/3*(n + 3)*
log(c) - 1/3*(n + 3)*log(x)) + (b*c^(-n - 3)/a)^(1/3))/x) + (b*c^
(-n - 3)/a)^(1/3)*log((x^2*e^(-2/3*(n + 3)*log(c) - 2/3*(n + 3)*l
og(x)) - (b*c^(-n - 3)/a)^(1/3)*x*e^(-1/3*(n + 3)*log(c) - 1/3*(n
 + 3)*log(x)) + (b*c^(-n - 3)/a)^(2/3))/x^2))/(a*n)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**(-1-1/3*n)/(a+b*x**n),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx)^{-\frac{1}{3}n-1}}{bx^n + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-1/3*n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate((c*x)^(-1/3*n - 1)/(b*x^n + a), x)
```

3.2761 $\int \frac{(cx)^{-1-\frac{n}{4}}}{a+bx^n}\,dx$

Optimal. Leaf size=315

$$-\frac{\sqrt[4]{b}x^{n/4}(cx)^{-n/4}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{-n/4}+\sqrt{a}x^{-n/2}+\sqrt{b}\right)}{\sqrt{2}a^{5/4}cn}+\frac{\sqrt[4]{b}x^{n/4}(cx)^{-n/4}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{-n/4}+\sqrt{a}x^{-n/2}+\sqrt{b}\right)}{\sqrt{2}a^{5/4}cn}-\frac{\sqrt{2}\sqrt[4]{b}x^{n/4}(cx)^{-n/4}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{a}x^{-n/4}}{\sqrt[4]{b}}\right)}{a^{5/4}cn}+\frac{\sqrt{2}\sqrt[4]{b}x^{n/4}(cx)^{-n/4}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{a}x^{-n/4}}{\sqrt[4]{b}}+1\right)}{a^{5/4}cn}-\frac{4(cx)^{-n/4}}{acn}$$

```
[Out] -4/(a*c*n*(c*x)^(n/4)) - (Sqrt[2]*b^(1/4)*x^(n/4)*ArcTan[1 - (Sqr
t[2]*a^(1/4))/(b^(1/4)*x^(n/4))])/(a^(5/4)*c*n*(c*x)^(n/4)) + (Sq
rt[2]*b^(1/4)*x^(n/4)*ArcTan[1 + (Sqrt[2]*a^(1/4))/(b^(1/4)*x^(n/
4))])/(a^(5/4)*c*n*(c*x)^(n/4)) - (b^(1/4)*x^(n/4)*Log[Sqrt[b] +
Sqrt[a]/x^(n/2) - (Sqrt[2]*a^(1/4)*b^(1/4))/x^(n/4)])/(Sqrt[2]*a^
(5/4)*c*n*(c*x)^(n/4)) + (b^(1/4)*x^(n/4)*Log[Sqrt[b] + Sqrt[a]/x
^(n/2) + (Sqrt[2]*a^(1/4)*b^(1/4))/x^(n/4)])/(Sqrt[2]*a^(5/4)*c*n
*(c*x)^(n/4))
```

Rubi [A] time = 0.506051, antiderivative size = 315, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 10, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.476$

$$-\frac{\sqrt[4]{b}x^{n/4}(cx)^{-n/4}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{-n/4}+\sqrt{a}x^{-n/2}+\sqrt{b}\right)}{\sqrt{2}a^{5/4}cn}+\frac{\sqrt[4]{b}x^{n/4}(cx)^{-n/4}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{-n/4}+\sqrt{a}x^{-n/2}+\sqrt{b}\right)}{\sqrt{2}a^{5/4}cn}-\frac{\sqrt{2}\sqrt[4]{b}x^{n/4}(cx)^{-n/4}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{a}x^{-n/4}}{\sqrt[4]{b}}\right)}{a^{5/4}cn}+\frac{\sqrt{2}\sqrt[4]{b}x^{n/4}(cx)^{-n/4}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{a}x^{-n/4}}{\sqrt[4]{b}}+1\right)}{a^{5/4}cn}-\frac{4(cx)^{-n/4}}{acn}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^(-1 - n/4)/(a + b*x^n),x]
```



```
[Out] -4/(a*c*n*(c*x)^(n/4)) - (Sqrt[2]*b^(1/4)*x^(n/4)*ArcTan[1 - (Sqr
t[2]*a^(1/4))/(b^(1/4)*x^(n/4))])/(a^(5/4)*c*n*(c*x)^(n/4)) + (Sq
rt[2]*b^(1/4)*x^(n/4)*ArcTan[1 + (Sqrt[2]*a^(1/4))/(b^(1/4)*x^(n/
4))])/(a^(5/4)*c*n*(c*x)^(n/4)) - (b^(1/4)*x^(n/4)*Log[Sqrt[b] +
Sqrt[a]/x^(n/2) - (Sqrt[2]*a^(1/4)*b^(1/4))/x^(n/4)])/(Sqrt[2]*a^
(5/4)*c*n*(c*x)^(n/4)) + (b^(1/4)*x^(n/4)*Log[Sqrt[b] + Sqrt[a]/x
^(n/2) + (Sqrt[2]*a^(1/4)*b^(1/4))/x^(n/4)])/(Sqrt[2]*a^(5/4)*c*n
*(c*x)^(n/4))
```

Rubi in Sympy [A] time = 77.1497, size = 260, normalized size = 0.83

$$-\frac{4(cx)^{-\frac{n}{4}}}{acn}-\frac{\sqrt{2}\sqrt[4]{b}x^{\frac{n}{4}}(cx)^{-\frac{n}{4}}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{-\frac{n}{4}}+\sqrt{a}x^{-\frac{n}{2}}+\sqrt{b}\right)}{2a^{\frac{5}{4}}cn}+\frac{\sqrt{2}\sqrt[4]{b}x^{\frac{n}{4}}(cx)^{-\frac{n}{4}}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{-\frac{n}{4}}+\sqrt{a}x^{-\frac{n}{2}}+\sqrt{b}\right)}{2a^{\frac{5}{4}}cn}+\frac{\sqrt{2}\sqrt[4]{b}x^{\frac{n}{4}}(cx)^{-\frac{n}{4}}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[4]{a}x^{-\frac{n}{4}}}{\sqrt[4]{b}}-1\right)}{a^{\frac{5}{4}}cn}+\frac{\sqrt{2}\sqrt[4]{b}x^{\frac{n}{4}}(cx)^{-\frac{n}{4}}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[4]{a}x^{-\frac{n}{4}}}{\sqrt[4]{b}}+1\right)}{a^{\frac{5}{4}}cn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**(-1-1/4*n)/(a+b*x**n),x)
```

```
[Out] -4*(c*x)**(-n/4)/(a*c*n) - sqrt(2)*b**(1/4)*x**(n/4)*(c*x)**(-n/4
)*log(-sqrt(2)*a**(1/4)*b**(1/4)*x**(-n/4) + sqrt(a)*x**(-n/2) +
sqrt(b))/(2*a**(5/4)*c*n) + sqrt(2)*b**(1/4)*x**(n/4)*(c*x)**(-n/
4)*log(sqrt(2)*a**(1/4)*b**(1/4)*x**(-n/4) + sqrt(a)*x**(-n/2) +
sqrt(b))/(2*a**(5/4)*c*n) + sqrt(2)*b**(1/4)*x**(n/4)*(c*x)**(-n/
4)*atan(sqrt(2)*a**(1/4)*x**(-n/4)/b**(1/4) - 1)/(a**(5/4)*c*n) +
 sqrt(2)*b**(1/4)*x**(n/4)*(c*x)**(-n/4)*atan(sqrt(2)*a**(1/4)*x*
*(-n/4)/b**(1/4) + 1)/(a**(5/4)*c*n)
```

Mathematica [C] time = 0.0454645, size = 71, normalized size = 0.23

$$\frac{(cx)^{-n/4}\left(bx^{n/4}\text{RootSum}\left[\#1^4a+b\&,\frac{4\log\left(x^{-n/4}-\#1\right)+n\log(x)}{\#1^3}\&\right]-16a\right)}{4a^2cn}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^(-1 - n/4)/(a + b*x^n),x]
```

```
[Out] (-16*a + b*x^(n/4)*RootSum[b + a*#1^4 & , (n*Log[x] + 4*Log[x^(-n
/4) - #1])/#1^3 & ])/(4*a^2*c*n*(c*x)^(n/4))
```

Maple [F] time = 0.089, size = 0, normalized size = 0.

$$\int\frac{1}{a+bx^n}(cx)^{-1-\frac{n}{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^(-1-1/4*n)/(a+b*x^n),x)
```

```
[Out] int((c*x)^(-1-1/4*n)/(a+b*x^n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-1/4*n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.257466, size = 381, normalized size = 1.21

$$-\frac{4\,an\left(-\frac{bc^{-n-4}}{a^5n^4}\right)^{\frac{1}{4}}\arctan\left(\frac{an\left(-\frac{bc^{-n-4}}{a^5n^4}\right)^{\frac{1}{4}}}{xe^{\left(-\frac{1}{4}(n+4)\log(c)-\frac{1}{4}(n+4)\log(x)\right)}+x\sqrt{\frac{a^2n^2\sqrt{-\frac{bc^{-n-4}}{a^5n^4}}+x^2e^{\left(-\frac{1}{2}(n+4)\log(c)-\frac{1}{2}(n+4)\log(x)\right)}}{x^2}}}\right)-an\left(-\frac{bc^{-n-4}}{a^5n^4}\right)^{\frac{1}{4}}\log\left(\frac{an\left(-\frac{bc^{-n}}{a^5n}\right.}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-1/4*n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] -(4*a*n*(-b*c^(-n - 4)/(a^5*n^4))^(1/4)*arctan(a*n*(-b*c^(-n - 4)
/(a^5*n^4))^(1/4)/(x*e^(-1/4*(n + 4)*log(c) - 1/4*(n + 4)*log(x))
 + x*sqrt((a^2*n^2*sqrt(-b*c^(-n - 4)/(a^5*n^4)) + x^2*e^(-1/2*(n
 + 4)*log(c) - 1/2*(n + 4)*log(x)))/x^2))) - a*n*(-b*c^(-n - 4)/(
a^5*n^4))^(1/4)*log((a*n*(-b*c^(-n - 4)/(a^5*n^4))^(1/4) + x*e^(-
1/4*(n + 4)*log(c) - 1/4*(n + 4)*log(x)))/x) + a*n*(-b*c^(-n - 4)
/(a^5*n^4))^(1/4)*log(-(a*n*(-b*c^(-n - 4)/(a^5*n^4))^(1/4) - x*e
^(-1/4*(n + 4)*log(c) - 1/4*(n + 4)*log(x)))/x) + 4*x*e^(-1/4*(n
+ 4)*log(c) - 1/4*(n + 4)*log(x)))/(a*n)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**(-1-1/4*n)/(a+b*x**n),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx)^{-\frac{1}{4}\,n-1}}{bx^n+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-1/4*n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate((c*x)^(-1/4*n - 1)/(b*x^n + a), x)
```

3.2762 $\int \frac{(cx)^{-1-\frac{3n}{2}}}{a+bx^n}\,dx$

Optimal. Leaf size=100

$$-\frac{2b^{3/2}x^{3n/2}(cx)^{-3n/2}\tan^{-1}\left(\frac{\sqrt{a}x^{-n/2}}{\sqrt{b}}\right)}{a^{5/2}cn}+\frac{2bx^n(cx)^{-3n/2}}{a^2cn}-\frac{2(cx)^{-3n/2}}{3acn}$$

```
[Out] -2/(3*a*c*n*(c*x)^((3*n)/2)) + (2*b*x^n)/(a^2*c*n*(c*x)^((3*n)/2)
) - (2*b^(3/2)*x^((3*n)/2)*ArcTan[Sqrt[a]/(Sqrt[b]*x^(n/2))])/(a^
(5/2)*c*n*(c*x)^((3*n)/2))
```

Rubi [A] time = 0.140504, antiderivative size = 100, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286

$$-\frac{2b^{3/2}x^{3n/2}(cx)^{-3n/2}\tan^{-1}\left(\frac{\sqrt{a}x^{-n/2}}{\sqrt{b}}\right)}{a^{5/2}cn}+\frac{2bx^n(cx)^{-3n/2}}{a^2cn}-\frac{2(cx)^{-3n/2}}{3acn}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^(-1 - (3*n)/2)/(a + b*x^n),x]
```

```
[Out] -2/(3*a*c*n*(c*x)^((3*n)/2)) + (2*b*x^n)/(a^2*c*n*(c*x)^((3*n)/2)
) - (2*b^(3/2)*x^((3*n)/2)*ArcTan[Sqrt[a]/(Sqrt[b]*x^(n/2))])/(a^
(5/2)*c*n*(c*x)^((3*n)/2))
```

Rubi in Sympy [A] time = 23.175, size = 85, normalized size = 0.85

$$-\frac{2\left(cx\right)^{-\frac{3n}{2}}}{3acn}+\frac{2bx^{n}\left(cx\right)^{-\frac{3n}{2}}}{a^{2}cn}-\frac{2b^{\frac{3}{2}}x^{\frac{3n}{2}}\left(cx\right)^{-\frac{3n}{2}}\operatorname{atan}\left(\frac{\sqrt{a}x^{-\frac{n}{2}}}{\sqrt{b}}\right)}{a^{\frac{5}{2}}cn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**(-1-3/2*n)/(a+b*x**n),x)
```

```
[Out] -2*(c*x)**(-3*n/2)/(3*a*c*n) + 2*b*x**n*(c*x)**(-3*n/2)/(a**2*c*n
) - 2*b**(3/2)*x**(3*n/2)*(c*x)**(-3*n/2)*atan(sqrt(a)*x**(-n/2)/
sqrt(b))/(a**(5/2)*c*n)
```

Mathematica [A] time = 0.0584139, size = 72, normalized size = 0.72

$$-\frac{2(cx)^{-3n/2}\left(3b^{3/2}x^{3n/2}\tan^{-1}\left(\frac{\sqrt{a}x^{-n/2}}{\sqrt{b}}\right)+\sqrt{a}\left(a-3bx^n\right)\right)}{3a^{5/2}cn}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^(-1 - (3*n)/2)/(a + b*x^n),x]
```

```
[Out] (-2*(Sqrt[a]*(a - 3*b*x^n) + 3*b^(3/2)*x^((3*n)/2)*ArcTan[Sqrt[a]
/(Sqrt[b]*x^(n/2))]))/(3*a^(5/2)*c*n*(c*x)^((3*n)/2))
```

Maple [F] time = 0.09, size = 0, normalized size = 0.

$$\int \frac{1}{a+bx^{n}}\left(cx\right)^{-1-\frac{3n}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^(-1-3/2*n)/(a+b*x^n),x)

[Out] int((c*x)^(-1-3/2*n)/(a+b*x^n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-3/2*n - 1)/(b*x^n + a),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [A] time = 0.312595, size = 1, normalized size = 0.01

$$\left[\frac{3\,bc^{-n-\frac{2}{3}}\sqrt{-\frac{bc^{-n-\frac{2}{3}}}{a}}\log\left(-\frac{2\,a\sqrt{-\frac{bc^{-n-\frac{2}{3}}}{a}}x^{\frac{1}{3}}e^{\left(-\frac{1}{6}\,(3\,n+2)\log(c)-\frac{1}{6}\,(3\,n+2)\log(x)\right)}-ax^{\frac{2}{3}}e^{\left(-\frac{1}{3}\,(3\,n+2)\log(c)-\frac{1}{3}\,(3\,n+2)\log(x)\right)}+bc^{-n-\frac{2}{3}}}{ax^{\frac{2}{3}}e^{\left(-\frac{1}{3}\,(3\,n+2)\log(c)-\frac{1}{3}\,(3\,n+2)\log(x)\right)}+bc^{-n-\frac{2}{3}}}\right)+6\,bc^{-n-\frac{2}{3}}x^{\frac{1}{3}}e^{\left(-\frac{1}{6}\,(3\right.}}{3\,a^2n}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-3/2*n - 1)/(b*x^n + a),x, algorithm="fricas")

[Out] [1/3*(3*b*c^(-n - 2/3)*sqrt(-b*c^(-n - 2/3)/a)*log(-(2*a*sqrt(-b*
c^(-n - 2/3)/a)*x^(1/3)*e^(-1/6*(3*n + 2)*log(c) - 1/6*(3*n + 2)*
log(x)) - a*x^(2/3)*e^(-1/3*(3*n + 2)*log(c) - 1/3*(3*n + 2)*log(
x)) + b*c^(-n - 2/3))/(a*x^(2/3)*e^(-1/3*(3*n + 2)*log(c) - 1/3*(
3*n + 2)*log(x)) + b*c^(-n - 2/3))) + 6*b*c^(-n - 2/3)*x^(1/3)*e^
(-1/6*(3*n + 2)*log(c) - 1/6*(3*n + 2)*log(x)) - 2*a*x*e^(-1/2*(3
*n + 2)*log(c) - 1/2*(3*n + 2)*log(x)))/(a^2*n), 2/3*(3*b*c^(-n -
 2/3)*sqrt(b*c^(-n - 2/3)/a)*arctan(sqrt(b*c^(-n - 2/3)/a)*e^(1/6
*(3*n + 2)*log(c) + 1/6*(3*n + 2)*log(x))/x^(1/3)) + 3*b*c^(-n -
2/3)*x^(1/3)*e^(-1/6*(3*n + 2)*log(c) - 1/6*(3*n + 2)*log(x)) - a
*x*e^(-1/2*(3*n + 2)*log(c) - 1/2*(3*n + 2)*log(x)))/(a^2*n)]
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**(-1-3/2*n)/(a+b*x**n),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx)^{-\frac{3}{2}\,n-1}}{bx^n+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-3/2*n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate((c*x)^(-3/2*n - 1)/(b*x^n + a), x)
```

3.2763 $\int \frac{(cx)^{-1-\frac{4n}{3}}}{a+bx^n}\,dx$

Optimal. Leaf size=246

$$-\frac{b^{4/3}x^{4n/3}(cx)^{-4n/3}\log\left(\sqrt[3]{a}x^{-n/3}+\sqrt[3]{b}\right)}{a^{7/3}cn}+\frac{b^{4/3}x^{4n/3}(cx)^{-4n/3}\log\left(a^{2/3}x^{-2n/3}-\sqrt[3]{a}\sqrt[3]{b}x^{-n/3}+b^{2/3}\right)}{2a^{7/3}cn}+\frac{\sqrt{3}b^{4/3}x^{4n/3}(cx)^{-4n/3}\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x^{-n/3}}{\sqrt{3}\sqrt[3]{b}}\right)}{a^{7/3}cn}+\frac{3bx^n(cx)^{-4n/3}}{a^2cn}-\frac{3(cx)^{-4n/3}}{4acn}$$

```
[Out] -3/(4*a*c*n*(c*x)^((4*n)/3)) + (3*b*x^n)/(a^2*c*n*(c*x)^((4*n)/3)
) + (Sqrt[3]*b^(4/3)*x^((4*n)/3)*ArcTan[(b^(1/3) - (2*a^(1/3))/x^
(n/3))/(Sqrt[3]*b^(1/3))])/(a^(7/3)*c*n*(c*x)^((4*n)/3)) - (b^(4/
3)*x^((4*n)/3)*Log[b^(1/3) + a^(1/3)/x^(n/3)])/(a^(7/3)*c*n*(c*x)
^((4*n)/3)) + (b^(4/3)*x^((4*n)/3)*Log[b^(2/3) + a^(2/3)/x^((2*n)
/3) - (a^(1/3)*b^(1/3))/x^(n/3)])/(2*a^(7/3)*c*n*(c*x)^((4*n)/3))
```

Rubi [A] time = 0.36578, antiderivative size = 246, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 11, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.524

$$-\frac{b^{4/3}x^{4n/3}(cx)^{-4n/3}\log\left(\sqrt[3]{a}x^{-n/3}+\sqrt[3]{b}\right)}{a^{7/3}cn}+\frac{b^{4/3}x^{4n/3}(cx)^{-4n/3}\log\left(a^{2/3}x^{-2n/3}-\sqrt[3]{a}\sqrt[3]{b}x^{-n/3}+b^{2/3}\right)}{2a^{7/3}cn}+\frac{\sqrt{3}b^{4/3}x^{4n/3}(cx)^{-4n/3}\tan^{-1}\left(\frac{\sqrt[3]{b}-2\sqrt[3]{a}x^{-n/3}}{\sqrt{3}\sqrt[3]{b}}\right)}{a^{7/3}cn}+\frac{3bx^n(cx)^{-4n/3}}{a^2cn}-\frac{3(cx)^{-4n/3}}{4acn}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^(-1 - (4*n)/3)/(a + b*x^n),x]
```


```
[Out] -3/(4*a*c*n*(c*x)^((4*n)/3)) + (3*b*x^n)/(a^2*c*n*(c*x)^((4*n)/3)
) + (Sqrt[3]*b^(4/3)*x^((4*n)/3)*ArcTan[(b^(1/3) - (2*a^(1/3))/x^
(n/3))/(Sqrt[3]*b^(1/3))])/(a^(7/3)*c*n*(c*x)^((4*n)/3)) - (b^(4/
3)*x^((4*n)/3)*Log[b^(1/3) + a^(1/3)/x^(n/3)])/(a^(7/3)*c*n*(c*x)
^((4*n)/3)) + (b^(4/3)*x^((4*n)/3)*Log[b^(2/3) + a^(2/3)/x^((2*n)
/3) - (a^(1/3)*b^(1/3))/x^(n/3)])/(2*a^(7/3)*c*n*(c*x)^((4*n)/3))
```

Rubi in Sympy [A] time = 57.4544, size = 214, normalized size = 0.87

$$-\frac{3(cx)^{-\frac{4n}{3}}}{4acn}+\frac{3bx^n(cx)^{-\frac{4n}{3}}}{a^2cn}-\frac{b^{\frac{4}{3}}x^{\frac{4n}{3}}(cx)^{-\frac{4n}{3}}\log\left(\sqrt[3]{a}x^{-\frac{n}{3}}+\sqrt[3]{b}\right)}{a^{\frac{7}{3}}cn}+\frac{b^{\frac{4}{3}}x^{\frac{4n}{3}}(cx)^{-\frac{4n}{3}}\log\left(a^{\frac{2}{3}}x^{-\frac{2n}{3}}-\sqrt[3]{a}\sqrt[3]{b}x^{-\frac{n}{3}}+b^{\frac{2}{3}}\right)}{2a^{\frac{7}{3}}cn}+\frac{\sqrt{3}b^{\frac{4}{3}}x^{\frac{4n}{3}}(cx)^{-\frac{4n}{3}}\operatorname{atan}\left(\frac{\sqrt{3}\left(-\frac{2\sqrt[3]{a}x^{-\frac{n}{3}}}{3}+\frac{\sqrt[3]{b}}{3}\right)}{\sqrt[3]{b}}\right)}{a^{\frac{7}{3}}cn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**(-1-4/3*n)/(a+b*x**n),x)
```

```
[Out] -3*(c*x)**(-4*n/3)/(4*a*c*n) + 3*b*x**n*(c*x)**(-4*n/3)/(a**2*c*n
) - b**(4/3)*x**(4*n/3)*(c*x)**(-4*n/3)*log(a**(1/3)*x**(-n/3) +
b**(1/3))/(a**(7/3)*c*n) + b**(4/3)*x**(4*n/3)*(c*x)**(-4*n/3)*lo
g(a**(2/3)*x**(-2*n/3) - a**(1/3)*b**(1/3)*x**(-n/3) + b**(2/3))/
(2*a**(7/3)*c*n) + sqrt(3)*b**(4/3)*x**(4*n/3)*(c*x)**(-4*n/3)*at
an(sqrt(3)*(-2*a**(1/3)*x**(-n/3)/3 + b**(1/3)/3)/b**(1/3))/(a**(
```

```
7/3)*c*n)
```

Mathematica [C] time = 0.0534554, size = 82, normalized size = 0.33

$$\frac{(cx)^{-4n/3}\left(-4b^2x^{4n/3}\text{RootSum}\left[\#1^3a+b\&,\frac{3\log\left(x^{-n/3}-\#1\right)+n\log(x)}{\#1^2}\&\right]-9a\left(a-4bx^n\right)\right)}{12a^3cn}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^(-1 - (4*n)/3)/(a + b*x^n),x]
```

```
[Out] (-9*a*(a - 4*b*x^n) - 4*b^2*x^((4*n)/3)*RootSum[b + a*#1^3 & , (n
*Log[x] + 3*Log[x^(-n/3) - #1])/#1^2 & ])/(12*a^3*c*n*(c*x)^((4*n
)/3))
```

Maple [F] time = 0.09, size = 0, normalized size = 0.

$$\int \frac{1}{a+bx^n}\,(cx)^{-1-\frac{4n}{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^(-1-4/3*n)/(a+b*x^n),x)
```

```
[Out] int((c*x)^(-1-4/3*n)/(a+b*x^n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-4/3*n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.33591, size = 455, normalized size = 1.85

$$-\frac{4\sqrt{3}bc^{-n-\frac{3}{4}}\left(-\frac{bc^{-n-\frac{3}{4}}}{a}\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(2x^{\frac{1}{4}}e^{\left(-\frac{1}{12}(4n+3)\log(c)-\frac{1}{12}(4n+3)\log(x)\right)}+\left(-\frac{bc^{-n-\frac{3}{4}}}{a}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{bc^{-n-\frac{3}{4}}}{a}\right)^{\frac{1}{3}}}\right)-4bc^{-n-\frac{3}{4}}\left(-\frac{bc^{-n-\frac{3}{4}}}{a}\right)^{\frac{1}{3}}\log\left(\frac{x^{\frac{1}{4}}e^{\left(-\frac{1}{12}(4n+3)\log\cdots\right.}}{\cdots}\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-4/3*n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] -1/4*(4*sqrt(3)*b*c^(-n - 3/4)*(-b*c^(-n - 3/4)/a)^(1/3)*arctan(1
/3*sqrt(3)*(2*x^(1/4)*e^(-1/12*(4*n + 3)*log(c) - 1/12*(4*n + 3)*
log(x)) + (-b*c^(-n - 3/4)/a)^(1/3))/(-b*c^(-n - 3/4)/a)^(1/3)) -
 4*b*c^(-n - 3/4)*(-b*c^(-n - 3/4)/a)^(1/3)*log((x^(1/4)*e^(-1/12
*(4*n + 3)*log(c) - 1/12*(4*n + 3)*log(x)) - (-b*c^(-n - 3/4)/a)^
```

```
(1/3))/x^(1/4)) + 2*b*c^(-n - 3/4)*(-b*c^(-n - 3/4)/a)^(1/3)*log(
((-b*c^(-n - 3/4)/a)^(1/3)*x^(1/4)*e^(-1/12*(4*n + 3)*log(c) - 1/
12*(4*n + 3)*log(x)) + sqrt(x)*e^(-1/6*(4*n + 3)*log(c) - 1/6*(4*
n + 3)*log(x)) + (-b*c^(-n - 3/4)/a)^(2/3))/sqrt(x)) - 12*b*c^(-n
 - 3/4)*x^(1/4)*e^(-1/12*(4*n + 3)*log(c) - 1/12*(4*n + 3)*log(x)
) + 3*a*x*e^(-1/3*(4*n + 3)*log(c) - 1/3*(4*n + 3)*log(x)))/(a^2*
n)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**(-1-4/3*n)/(a+b*x**n),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx)^{-\frac{4}{3}n-1}}{bx^n + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-4/3*n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate((c*x)^(-4/3*n - 1)/(b*x^n + a), x)
```

3.2764 $\int \frac{(cx)^{-1-\frac{5n}{4}}}{a+bx^n}\,dx$

Optimal. Leaf size=341

$$\frac{b^{5/4}x^{5n/4}(cx)^{-5n/4}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{-n/4}+\sqrt{a}x^{-n/2}+\sqrt{b}\right)}{\sqrt{2}a^{9/4}cn} - \frac{b^{5/4}x^{5n/4}(cx)^{-5n/4}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{-n/4}+\sqrt{a}x^{-n/2}+\sqrt{b}\right)}{\sqrt{2}a^{9/4}cn} + \frac{\sqrt{2}b^{5/4}x^{5n/4}(cx)^{-5n/4}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{a}x^{-n/4}}{\sqrt[4]{b}}\right)}{a^{9/4}cn} - \frac{\sqrt{2}b^{5/4}x^{5n/4}(cx)^{-5n/4}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{a}x^{-n/4}}{\sqrt[4]{b}}+1\right)}{a^{9/4}cn} + \frac{4bx^n(cx)^{-5n/4}}{a^2cn} - \frac{4(cx)^{-5n/4}}{5acn}$$

```
[Out] -4/(5*a*c*n*(c*x)^((5*n)/4)) + (4*b*x^n)/(a^2*c*n*(c*x)^((5*n)/4)
) + (Sqrt[2]*b^(5/4)*x^((5*n)/4)*ArcTan[1 - (Sqrt[2]*a^(1/4))/(b^
(1/4)*x^(n/4))])/(a^(9/4)*c*n*(c*x)^((5*n)/4)) - (Sqrt[2]*b^(5/4)
*x^((5*n)/4)*ArcTan[1 + (Sqrt[2]*a^(1/4))/(b^(1/4)*x^(n/4))])/(a^
(9/4)*c*n*(c*x)^((5*n)/4)) + (b^(5/4)*x^((5*n)/4)*Log[Sqrt[b] + S
qrt[a]/x^(n/2) - (Sqrt[2]*a^(1/4)*b^(1/4))/x^(n/4)])/(Sqrt[2]*a^(
9/4)*c*n*(c*x)^((5*n)/4)) - (b^(5/4)*x^((5*n)/4)*Log[Sqrt[b] + Sq
rt[a]/x^(n/2) + (Sqrt[2]*a^(1/4)*b^(1/4))/x^(n/4)])/(Sqrt[2]*a^(9
/4)*c*n*(c*x)^((5*n)/4))
```

Rubi [A] time = 0.551685, antiderivative size = 341, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 11, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.524

$$\frac{b^{5/4}x^{5n/4}(cx)^{-5n/4}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{-n/4}+\sqrt{a}x^{-n/2}+\sqrt{b}\right)}{\sqrt{2}a^{9/4}cn} - \frac{b^{5/4}x^{5n/4}(cx)^{-5n/4}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{-n/4}+\sqrt{a}x^{-n/2}+\sqrt{b}\right)}{\sqrt{2}a^{9/4}cn} + \frac{\sqrt{2}b^{5/4}x^{5n/4}(cx)^{-5n/4}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt[4]{a}x^{-n/4}}{\sqrt[4]{b}}\right)}{a^{9/4}cn} - \frac{\sqrt{2}b^{5/4}x^{5n/4}(cx)^{-5n/4}\tan^{-1}\left(\frac{\sqrt{2}\sqrt[4]{a}x^{-n/4}}{\sqrt[4]{b}}+1\right)}{a^{9/4}cn} + \frac{4bx^n(cx)^{-5n/4}}{a^2cn} - \frac{4(cx)^{-5n/4}}{5acn}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^(-1 - (5*n)/4)/(a + b*x^n),x]
```


```
[Out] -4/(5*a*c*n*(c*x)^((5*n)/4)) + (4*b*x^n)/(a^2*c*n*(c*x)^((5*n)/4)
) + (Sqrt[2]*b^(5/4)*x^((5*n)/4)*ArcTan[1 - (Sqrt[2]*a^(1/4))/(b^
(1/4)*x^(n/4))])/(a^(9/4)*c*n*(c*x)^((5*n)/4)) - (Sqrt[2]*b^(5/4)
*x^((5*n)/4)*ArcTan[1 + (Sqrt[2]*a^(1/4))/(b^(1/4)*x^(n/4))])/(a^
(9/4)*c*n*(c*x)^((5*n)/4)) + (b^(5/4)*x^((5*n)/4)*Log[Sqrt[b] + S
qrt[a]/x^(n/2) - (Sqrt[2]*a^(1/4)*b^(1/4))/x^(n/4)])/(Sqrt[2]*a^(
9/4)*c*n*(c*x)^((5*n)/4)) - (b^(5/4)*x^((5*n)/4)*Log[Sqrt[b] + Sq
rt[a]/x^(n/2) + (Sqrt[2]*a^(1/4)*b^(1/4))/x^(n/4)])/(Sqrt[2]*a^(9
/4)*c*n*(c*x)^((5*n)/4))
```

Rubi in Sympy [A] time = 87.6908, size = 299, normalized size = 0.88

$$-\frac{4(cx)^{-\frac{5n}{4}}}{5acn}+\frac{4bx^n(cx)^{-\frac{5n}{4}}}{a^2cn}+\frac{\sqrt{2}b^{\frac{5}{4}}x^{\frac{5n}{4}}(cx)^{-\frac{5n}{4}}\log\left(-\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{-\frac{n}{4}}+\sqrt{a}x^{-\frac{n}{2}}+\sqrt{b}\right)}{2a^{\frac{9}{4}}cn}-\frac{\sqrt{2}b^{\frac{5}{4}}x^{\frac{5n}{4}}(cx)^{-\frac{5n}{4}}\log\left(\sqrt{2}\sqrt[4]{a}\sqrt[4]{b}x^{-\frac{n}{4}}+\sqrt{a}x^{-\frac{n}{2}}+\sqrt{b}\right)}{2a^{\frac{9}{4}}cn}-\frac{\sqrt{2}b^{\frac{5}{4}}x^{\frac{5n}{4}}(cx)^{-\frac{5n}{4}}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[4]{a}x^{-\frac{n}{4}}}{\sqrt[4]{b}}-1\right)}{a^{\frac{9}{4}}cn}-\frac{\sqrt{2}b^{\frac{5}{4}}x^{\frac{5n}{4}}(cx)^{-\frac{5n}{4}}\operatorname{atan}\left(\frac{\sqrt{2}\sqrt[4]{a}x^{-\frac{n}{4}}}{\sqrt[4]{b}}+1\right)}{a^{\frac{9}{4}}cn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**(-1-5/4*n)/(a+b*x**n),x)
```

```
[Out] -4*(c*x)**(-5*n/4)/(5*a*c*n) + 4*b*x**n*(c*x)**(-5*n/4)/(a**2*c*n
) + sqrt(2)*b**(5/4)*x**(5*n/4)*(c*x)**(-5*n/4)*log(-sqrt(2)*a**(
1/4)*b**(1/4)*x**(-n/4) + sqrt(a)*x**(-n/2) + sqrt(b))/(2*a**(9/4
)*c*n) - sqrt(2)*b**(5/4)*x**(5*n/4)*(c*x)**(-5*n/4)*log(sqrt(2)*
a**(1/4)*b**(1/4)*x**(-n/4) + sqrt(a)*x**(-n/2) + sqrt(b))/(2*a**
(9/4)*c*n) - sqrt(2)*b**(5/4)*x**(5*n/4)*(c*x)**(-5*n/4)*atan(sqr
t(2)*a**(1/4)*x**(-n/4)/b**(1/4) - 1)/(a**(9/4)*c*n) - sqrt(2)*b*
*(5/4)*x**(5*n/4)*(c*x)**(-5*n/4)*atan(sqrt(2)*a**(1/4)*x**(-n/4)
/b**(1/4) + 1)/(a**(9/4)*c*n)
```

Mathematica [C] time = 0.0585601, size = 82, normalized size = 0.24

$$\frac{(cx)^{-5n/4}\left(-5b^2x^{5n/4}\text{RootSum}\left[\#1^4a+b\&,\frac{4\log\left(x^{-n/4}-\#1\right)+n\log(x)}{\#1^3}\&\right]-16a\left(a-5bx^n\right)\right)}{20a^3cn}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^(-1 - (5*n)/4)/(a + b*x^n),x]
```

```
[Out] (-16*a*(a - 5*b*x^n) - 5*b^2*x^((5*n)/4)*RootSum[b + a*#1^4 & , (
n*Log[x] + 4*Log[x^(-n/4) - #1])/#1^3 & ])/(20*a^3*c*n*(c*x)^((5*
n)/4))
```

Maple [F] time = 0.086, size = 0, normalized size = 0.

$$\int \frac{1}{a+bx^n}(cx)^{-1-\frac{5n}{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^(-1-5/4*n)/(a+b*x^n),x)
```

```
[Out] int((c*x)^(-1-5/4*n)/(a+b*x^n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-5/4*n - 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.375324, size = 549, normalized size = 1.61

$$\frac{20\,a^{2}n\left(-\frac{b^{5}c^{-5\,n-4}}{a^{9}n^{4}}\right)^{\frac{1}{4}}\arctan\left(\frac{a^{2}nx^{\frac{4}{5}}\left(-\frac{b^{5}c^{-5\,n-4}}{a^{9}n^{4}}\right)^{\frac{1}{4}}}{bc^{-n-\frac{4}{5}}xe^{\left(-\frac{1}{20}\,(5\,n+4)\log(c)-\frac{1}{20}\,(5\,n+4)\log(x)\right)}+x\sqrt{\frac{a^{4}n^{2}x^{\frac{3}{5}}\sqrt{-\frac{b^{5}c^{-5\,n-4}}{a^{9}n^{4}}}+b^{2}c^{-2\,n-\frac{8}{5}}xe^{\left(-\frac{1}{10}\,(5\,n+4)\log(c)-\frac{1}{10}\,(5\,n+4)\log(x)\right)}}{x}}}\right)-5\,a^{2}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-5/4*n - 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] 1/5*(20*a^2*n*(-b^5*c^(-5*n - 4)/(a^9*n^4))^(1/4)*arctan(a^2*n*x^
(4/5)*(-b^5*c^(-5*n - 4)/(a^9*n^4))^(1/4)/(b*c^(-n - 4/5)*x*e^(-1
/20*(5*n + 4)*log(c) - 1/20*(5*n + 4)*log(x)) + x*sqrt((a^4*n^2*x
^(3/5)*sqrt(-b^5*c^(-5*n - 4)/(a^9*n^4)) + b^2*c^(-2*n - 8/5)*x*e
^(-1/10*(5*n + 4)*log(c) - 1/10*(5*n + 4)*log(x)))/x))) - 5*a^2*n
*(-b^5*c^(-5*n - 4)/(a^9*n^4))^(1/4)*log((a^2*n*x^(4/5)*(-b^5*c^(
-5*n - 4)/(a^9*n^4))^(1/4) + b*c^(-n - 4/5)*x*e^(-1/20*(5*n + 4)*
log(c) - 1/20*(5*n + 4)*log(x)))/x) + 5*a^2*n*(-b^5*c^(-5*n - 4)/
(a^9*n^4))^(1/4)*log(-(a^2*n*x^(4/5)*(-b^5*c^(-5*n - 4)/(a^9*n^4)
)^(1/4) - b*c^(-n - 4/5)*x*e^(-1/20*(5*n + 4)*log(c) - 1/20*(5*n
+ 4)*log(x)))/x) + 20*b*c^(-n - 4/5)*x^(1/5)*e^(-1/20*(5*n + 4)*l
og(c) - 1/20*(5*n + 4)*log(x)) - 4*a*x*e^(-1/4*(5*n + 4)*log(c) -
 1/4*(5*n + 4)*log(x)))/(a^2*n)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**(-1-5/4*n)/(a+b*x**n),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx)^{-\frac{5}{4}\,n-1}}{bx^{n}+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-5/4*n - 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate((c*x)^(-5/4*n - 1)/(b*x^n + a), x)
```

3.2765 $\int \frac{(cx)^{4+n}}{a+bx^n}\,dx$

Optimal. Leaf size=44

$$\frac{(cx)^{n+5}\,{}_2F_1\left(1,\frac{n+5}{n};2+\frac{5}{n};-\frac{bx^n}{a}\right)}{ac(n+5)}$$

```
[Out] ((c*x)^(5 + n)*Hypergeometric2F1[1, (5 + n)/n, 2 + 5/n, -((b*x^n)
/a)])/(a*c*(5 + n))
```

Rubi [A] time = 0.0472557, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.059

$$\frac{(cx)^{n+5}\,{}_2F_1\left(1,\frac{n+5}{n};2+\frac{5}{n};-\frac{bx^n}{a}\right)}{ac(n+5)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^(4 + n)/(a + b*x^n),x]
```

```
[Out] ((c*x)^(5 + n)*Hypergeometric2F1[1, (5 + n)/n, 2 + 5/n, -((b*x^n)
/a)])/(a*c*(5 + n))
```

Rubi in Sympy [A] time = 4.67581, size = 29, normalized size = 0.66

$$\frac{(cx)^{n+5}\,{}_2F_1\left(\begin{matrix}1,\frac{n+5}{n}\\2+\frac{5}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{ac\,(n+5)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**(4+n)/(a+b*x**n),x)
```

```
[Out] (c*x)**(n + 5)*hyper((1, (n + 5)/n), (2 + 5/n,), -b*x**n/a)/(a*c*
(n + 5))
```

Mathematica [A] time = 0.0385234, size = 47, normalized size = 1.07

$$-\frac{c^4x^{5-n}(cx)^n\left({}_2F_1\left(1,\frac{5}{n};\frac{n+5}{n};-\frac{bx^n}{a}\right)-1\right)}{5b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^(4 + n)/(a + b*x^n),x]
```

```
[Out] -(c^4*x^(5 - n)*(c*x)^n*(-1 + Hypergeometric2F1[1, 5/n, (5 + n)/n
, -((b*x^n)/a)]))/(5*b)
```

Maple [F] time = 0.085, size = 0, normalized size = 0.

$$\int \frac{(cx)^{4+n}}{a+bx^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^(4+n)/(a+b*x^n),x)
```

```
[Out] int((c*x)^(4+n)/(a+b*x^n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{c^{n+4}x^5}{5\,b} - ac^{n+4}\int \frac{x^4}{b^2x^n + ab}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(n + 4)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] 1/5*c^(n + 4)*x^5/b - a*c^(n + 4)*integrate(x^4/(b^2*x^n + a*b),
x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(cx)^{n+4}}{bx^n + a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(n + 4)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] integral((c*x)^(n + 4)/(b*x^n + a), x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**(4+n)/(a+b*x**n),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx)^{n+4}}{bx^n + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(n + 4)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate((c*x)^(n + 4)/(b*x^n + a), x)
```

3.2766 $\int \frac{(cx)^{3+n}}{a+bx^n} dx$

Optimal. Leaf size=46

$$\frac{(cx)^{n+4} {}_2F_1\left(1,\frac{n+4}{n};2\left(1+\frac{2}{n}\right);-\frac{bx^n}{a}\right)}{ac(n+4)}$$

```
[Out] ((c*x)^(4 + n)*Hypergeometric2F1[1, (4 + n)/n, 2*(1 + 2/n), -((b*
x^n)/a)])/(a*c*(4 + n))
```

Rubi [A] time = 0.0465882, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.059$

$$\frac{(cx)^{n+4} {}_2F_1\left(1,\frac{n+4}{n};2\left(1+\frac{2}{n}\right);-\frac{bx^n}{a}\right)}{ac(n+4)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^(3 + n)/(a + b*x^n),x]
```

```
[Out] ((c*x)^(4 + n)*Hypergeometric2F1[1, (4 + n)/n, 2*(1 + 2/n), -((b*
x^n)/a)])/(a*c*(4 + n))
```

Rubi in Sympy [A] time = 4.74193, size = 29, normalized size = 0.63

$$\frac{(cx)^{n+4} {}_2F_1\left(\begin{matrix} 1, \frac{n+4}{n} \\ 2+\frac{4}{n} \end{matrix}\middle| -\frac{bx^n}{a}\right)}{ac\,(n+4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**(3+n)/(a+b*x**n),x)
```

```
[Out] (c*x)**(n + 4)*hyper((1, (n + 4)/n), (2 + 4/n,), -b*x**n/a)/(a*c*
(n + 4))
```

Mathematica [A] time = 0.0340571, size = 47, normalized size = 1.02

$$-\frac{c^3x^{4-n}(cx)^n\left({}_2F_1\left(1,\frac{4}{n};\frac{n+4}{n};-\frac{bx^n}{a}\right)-1\right)}{4b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^(3 + n)/(a + b*x^n),x]
```

```
[Out] -(c^3*x^(4 - n)*(c*x)^n*(-1 + Hypergeometric2F1[1, 4/n, (4 + n)/n
, -((b*x^n)/a)]))/(4*b)
```

Maple [F] time = 0.086, size = 0, normalized size = 0.

$$\int \frac{(cx)^{3+n}}{a+bx^n}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^(3+n)/(a+b*x^n),x)
```

```
[Out] int((c*x)^(3+n)/(a+b*x^n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{c^{n+3}x^4}{4\,b} - ac^{n+3}\int \frac{x^3}{b^2x^n + ab}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(n + 3)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] 1/4*c^(n + 3)*x^4/b - a*c^(n + 3)*integrate(x^3/(b^2*x^n + a*b),
x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(cx)^{n+3}}{bx^n + a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(n + 3)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] integral((c*x)^(n + 3)/(b*x^n + a), x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**(3+n)/(a+b*x**n),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx)^{n+3}}{bx^n + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(n + 3)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate((c*x)^(n + 3)/(b*x^n + a), x)
```

3.2767 $\int \frac{(cx)^{2+n}}{a+bx^n}\,dx$

Optimal. Leaf size=44

$$\frac{(cx)^{n+3}\,{}_2F_1\left(1,\frac{n+3}{n};2+\frac{3}{n};-\frac{bx^n}{a}\right)}{ac(n+3)}$$

```
[Out] ((c*x)^(3 + n)*Hypergeometric2F1[1, (3 + n)/n, 2 + 3/n, -((b*x^n)
/a)])/(a*c*(3 + n))
```

Rubi [A] time = 0.0448661, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.059

$$\frac{(cx)^{n+3}\,{}_2F_1\left(1,\frac{n+3}{n};2+\frac{3}{n};-\frac{bx^n}{a}\right)}{ac(n+3)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^(2 + n)/(a + b*x^n),x]
```

```
[Out] ((c*x)^(3 + n)*Hypergeometric2F1[1, (3 + n)/n, 2 + 3/n, -((b*x^n)
/a)])/(a*c*(3 + n))
```

Rubi in Sympy [A] time = 4.67701, size = 29, normalized size = 0.66

$$\frac{(cx)^{n+3}\,{}_2F_1\left(\begin{matrix}1,\frac{n+3}{n}\\2+\frac{3}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{ac\,(n+3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**(2+n)/(a+b*x**n),x)
```

```
[Out] (c*x)**(n + 3)*hyper((1, (n + 3)/n), (2 + 3/n,), -b*x**n/a)/(a*c*
(n + 3))
```

Mathematica [A] time = 0.0371593, size = 47, normalized size = 1.07

$$-\frac{c^2x^{3-n}(cx)^n\left({}_2F_1\left(1,\frac{3}{n};\frac{n+3}{n};-\frac{bx^n}{a}\right)-1\right)}{3b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^(2 + n)/(a + b*x^n),x]
```

```
[Out] -(c^2*x^(3 - n)*(c*x)^n*(-1 + Hypergeometric2F1[1, 3/n, (3 + n)/n
, -((b*x^n)/a)]))/(3*b)
```

Maple [F] time = 0.085, size = 0, normalized size = 0.

$$\int \frac{(cx)^{2+n}}{a+bx^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^(2+n)/(a+b*x^n),x)
```

```
[Out] int((c*x)^(2+n)/(a+b*x^n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{c^{n+2}x^3}{3\,b} - ac^{n+2}\int \frac{x^2}{b^2x^n + ab}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(n + 2)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] 1/3*c^(n + 2)*x^3/b - a*c^(n + 2)*integrate(x^2/(b^2*x^n + a*b),
x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(cx)^{n+2}}{bx^n + a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(n + 2)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] integral((c*x)^(n + 2)/(b*x^n + a), x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**(2+n)/(a+b*x**n),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx)^{n+2}}{bx^n + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(n + 2)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate((c*x)^(n + 2)/(b*x^n + a), x)
```

3.2768 $\int \frac{(cx)^{1+n}}{a+bx^n}\,dx$

Optimal. Leaf size=44

$$\frac{(cx)^{n+2}\,{}_2F_1\left(1,\frac{n+2}{n};2\left(1+\frac{1}{n}\right);-\frac{bx^n}{a}\right)}{ac(n+2)}$$

```
[Out] ((c*x)^(2 + n)*Hypergeometric2F1[1, (2 + n)/n, 2*(1 + n^(-1)), -(
(b*x^n)/a)])/(a*c*(2 + n))
```

Rubi [A] time = 0.0458456, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.059

$$\frac{(cx)^{n+2}\,{}_2F_1\left(1,\frac{n+2}{n};2\left(1+\frac{1}{n}\right);-\frac{bx^n}{a}\right)}{ac(n+2)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^(1 + n)/(a + b*x^n),x]
```

```
[Out] ((c*x)^(2 + n)*Hypergeometric2F1[1, (2 + n)/n, 2*(1 + n^(-1)), -(
(b*x^n)/a)])/(a*c*(2 + n))
```

Rubi in Sympy [A] time = 4.7211, size = 29, normalized size = 0.66

$$\frac{(cx)^{n+2}\,{}_2F_1\left(\begin{matrix}1,\frac{n+2}{n}\\2+\frac{2}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{ac\,(n+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**(1+n)/(a+b*x**n),x)
```

```
[Out] (c*x)**(n + 2)*hyper((1, (n + 2)/n), (2 + 2/n,), -b*x**n/a)/(a*c*
(n + 2))
```

Mathematica [A] time = 0.0336782, size = 45, normalized size = 1.02

$$-\frac{cx^{2-n}(cx)^n\left({}_2F_1\left(1,\frac{2}{n};\frac{n+2}{n};-\frac{bx^n}{a}\right)-1\right)}{2b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^(1 + n)/(a + b*x^n),x]
```

```
[Out] -(c*x^(2 - n)*(c*x)^n*(-1 + Hypergeometric2F1[1, 2/n, (2 + n)/n,
-((b*x^n)/a)]))/(2*b)
```

Maple [F] time = 0.085, size = 0, normalized size = 0.

$$\int \frac{(cx)^{1+n}}{a+bx^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^(1+n)/(a+b*x^n),x)
```

```
[Out] int((c*x)^(1+n)/(a+b*x^n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-ac^{n+1}\int \frac{x}{b^2x^n + ab}\,dx + \frac{c^{n+1}x^2}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(n + 1)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] -a*c^(n + 1)*integrate(x/(b^2*x^n + a*b), x) + 1/2*c^(n + 1)*x^2/
b
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(cx)^{n+1}}{bx^n + a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(n + 1)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] integral((c*x)^(n + 1)/(b*x^n + a), x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**(1+n)/(a+b*x**n),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx)^{n+1}}{bx^n + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(n + 1)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate((c*x)^(n + 1)/(b*x^n + a), x)
```

3.2769 $\int \frac{(cx)^n}{a+bx^n}\,dx$

Optimal. Leaf size=40

$$\frac{(cx)^{n+1}\,{}_2F_1\left(1,1+\frac{1}{n};2+\frac{1}{n};-\frac{bx^n}{a}\right)}{ac(n+1)}$$

```
[Out] ((c*x)^(1 + n)*Hypergeometric2F1[1, 1 + n^(-1), 2 + n^(-1), -((b*
x^n)/a)])/(a*c*(1 + n))
```

Rubi [A] time = 0.0403035, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067

$$\frac{(cx)^{n+1}\,{}_2F_1\left(1,1+\frac{1}{n};2+\frac{1}{n};-\frac{bx^n}{a}\right)}{ac(n+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^n/(a + b*x^n),x]
```

```
[Out] ((c*x)^(1 + n)*Hypergeometric2F1[1, 1 + n^(-1), 2 + n^(-1), -((b*
x^n)/a)])/(a*c*(1 + n))
```

Rubi in Sympy [A] time = 4.74888, size = 29, normalized size = 0.72

$$\frac{(cx)^{n+1}\,{}_2F_1\left(\begin{matrix}1, \frac{n+1}{n}\\ 2+\frac{1}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{ac\,(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**n/(a+b*x**n),x)
```

```
[Out] (c*x)**(n + 1)*hyper((1, (n + 1)/n), (2 + 1/n,), -b*x**n/a)/(a*c*
(n + 1))
```

Mathematica [A] time = 0.021484, size = 38, normalized size = 0.95

$$-\frac{x^{1-n}(cx)^n\left({}_2F_1\left(1,\frac{1}{n};1+\frac{1}{n};-\frac{bx^n}{a}\right)-1\right)}{b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^n/(a + b*x^n),x]
```

```
[Out] -((x^(1 - n)*(c*x)^n*(-1 + Hypergeometric2F1[1, n^(-1), 1 + n^(-1
), -((b*x^n)/a)]))/b)
```

Maple [F] time = 0.085, size = 0, normalized size = 0.

$$\int \frac{(cx)^n}{a+bx^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^n/(a+b*x^n),x)
```

```
[Out] int((c*x)^n/(a+b*x^n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-ac^n \int \frac{1}{b^2x^n + ab}\,dx + \frac{c^n x}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^n/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] -a*c^n*integrate(1/(b^2*x^n + a*b), x) + c^n*x/b
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(cx)^n}{bx^n + a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^n/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] integral((c*x)^n/(b*x^n + a), x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**n/(a+b*x**n),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx)^n}{bx^n + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^n/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate((c*x)^n/(b*x^n + a), x)
```

3.2770 $\int \frac{(cx)^{-1+n}}{a+bx^n} dx$

Optimal. Leaf size=28

$$\frac{x^{-n}(cx)^n \log(a+bx^n)}{bcn}$$

```
[Out] ((c*x)^n*Log[a + b*x^n])/(b*c*n*x^n)
```

Rubi [A] time = 0.0411639, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{x^{-n}(cx)^n \log(a+bx^n)}{bcn}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^(-1 + n)/(a + b*x^n),x]

[Out] ((c*x)^n*Log[a + b*x^n])/(b*c*n*x^n)
```

Rubi in Sympy [A] time = 4.76296, size = 20, normalized size = 0.71

$$\frac{x^{-n}(cx)^n \log(a+bx^n)}{bcn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**(-1+n)/(a+b*x**n),x)

[Out] x**(-n)*(c*x)**n*log(a + b*x**n)/(b*c*n)
```

Mathematica [A] time = 0.0110343, size = 29, normalized size = 1.04

$$\frac{x^{1-n}(cx)^{n-1} \log(a+bx^n)}{bn}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^(-1 + n)/(a + b*x^n),x]

[Out] (x^(1 - n)*(c*x)^(-1 + n)*Log[a + b*x^n])/(b*n)
```

Maple [F] time = 0.084, size = 0, normalized size = 0.

$$\int \frac{(cx)^{-1+n}}{a+bx^n} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^(-1+n)/(a+b*x^n),x)

[Out] int((c*x)^(-1+n)/(a+b*x^n),x)
```

Maxima [A] time = 1.3717, size = 32, normalized size = 1.14

$$\frac{c^{n-1}\log\left(\frac{bx^n+a}{b}\right)}{bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(n - 1)/(b*x^n + a),x, algorithm="maxima")

[Out] c^(n - 1)*log((b*x^n + a)/b)/(b*n)
```

Fricas [A] time = 0.233131, size = 27, normalized size = 0.96

$$\frac{c^{n-1}\log\left(bx^n+a\right)}{bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(n - 1)/(b*x^n + a),x, algorithm="fricas")

[Out] c^(n - 1)*log(b*x^n + a)/(b*n)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**(-1+n)/(a+b*x**n),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{(cx)^{n-1}}{bx^n+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(n - 1)/(b*x^n + a),x, algorithm="giac")

[Out] integrate((c*x)^(n - 1)/(b*x^n + a), x)
```

3.2771 $\int \frac{(cx)^{-2+n}}{a+bx^n}\,dx$

Optimal. Leaf size=50

$$-\frac{(cx)^{n-1}\,{}_2F_1\left(1,-\frac{1-n}{n};2-\frac{1}{n};-\frac{bx^n}{a}\right)}{ac(1-n)}$$

```
[Out] -(((c*x)^(-1 + n)*Hypergeometric2F1[1, -((1 - n)/n), 2 - n^(-1),
-((b*x^n)/a)])/(a*c*(1 - n)))
```

Rubi [A] time = 0.0506085, antiderivative size = 50, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.059$

$$-\frac{(cx)^{n-1}\,{}_2F_1\left(1,-\frac{1-n}{n};2-\frac{1}{n};-\frac{bx^n}{a}\right)}{ac(1-n)}$$

Antiderivative was successfully verified.

```
[In] Int[(c*x)^(-2 + n)/(a + b*x^n),x]
```

```
[Out] -(((c*x)^(-1 + n)*Hypergeometric2F1[1, -((1 - n)/n), 2 - n^(-1),
-((b*x^n)/a)])/(a*c*(1 - n)))
```

Rubi in Sympy [A] time = 4.93389, size = 31, normalized size = 0.62

$$-\frac{(cx)^{n-1}\,{}_2F_1\left(\begin{matrix}1,\frac{n-1}{n}\\2-\frac{1}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{ac\,(-n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((c*x)**(-2+n)/(a+b*x**n),x)
```

```
[Out] -(c*x)**(n - 1)*hyper((1, (n - 1)/n), (2 - 1/n,), -b*x**n/a)/(a*c
*(-n + 1))
```

Mathematica [A] time = 0.0342763, size = 44, normalized size = 0.88

$$\frac{x^{-n-1}(cx)^n\left({}_2F_1\left(1,-\frac{1}{n};\frac{n-1}{n};-\frac{bx^n}{a}\right)-1\right)}{bc^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*x)^(-2 + n)/(a + b*x^n),x]
```

```
[Out] (x^(-1 - n)*(c*x)^n*(-1 + Hypergeometric2F1[1, -n^(-1), (-1 + n)/
n, -((b*x^n)/a)]))/(b*c^2)
```

Maple [F] time = 0.1, size = 0, normalized size = 0.

$$\int \frac{(cx)^{-2+n}}{a+bx^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^(-2+n)/(a+b*x^n),x)
```

```
[Out] int((c*x)^(-2+n)/(a+b*x^n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-ac^n \int \frac{1}{b^2c^2x^2x^n + abc^2x^2} \, dx - \frac{c^{n-2}}{bx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(n - 2)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] -a*c^n*integrate(1/(b^2*c^2*x^2*x^n + a*b*c^2*x^2), x) - c^(n - 2
)/(b*x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(cx)^{n-2}}{bx^n + a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(n - 2)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] integral((c*x)^(n - 2)/(b*x^n + a), x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**(-2+n)/(a+b*x**n),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx)^{n-2}}{bx^n + a} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(n - 2)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate((c*x)^(n - 2)/(b*x^n + a), x)
```

3.2772 $\int \frac{(cx)^{-3+n}}{a+bx^n}\,dx$

Optimal. Leaf size=52

$$-\frac{(cx)^{n-2}\,{}_2F_1\left(1,-\frac{2-n}{n};2\left(1-\frac{1}{n}\right);-\frac{bx^n}{a}\right)}{ac(2-n)}$$

```
[Out] -(((c*x)^(-2 + n)*Hypergeometric2F1[1, -((2 - n)/n), 2*(1 - n^(-1
)), -((b*x^n)/a)])/(a*c*(2 - n)))
```

Rubi [A] time = 0.0509951, antiderivative size = 52, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.059

$$-\frac{(cx)^{n-2}\,{}_2F_1\left(1,-\frac{2-n}{n};2\left(1-\frac{1}{n}\right);-\frac{bx^n}{a}\right)}{ac(2-n)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^(-3 + n)/(a + b*x^n),x]
```

```
[Out] -(((c*x)^(-2 + n)*Hypergeometric2F1[1, -((2 - n)/n), 2*(1 - n^(-1
)), -((b*x^n)/a)])/(a*c*(2 - n)))
```

Rubi in Sympy [A] time = 4.98069, size = 31, normalized size = 0.6

$$-\frac{(cx)^{n-2}\,{}_2F_1\left(\begin{matrix}1,\frac{n-2}{n}\\2-\frac{2}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{ac\,(-n+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**(-3+n)/(a+b*x**n),x)
```

```
[Out] -(c*x)**(n - 2)*hyper((1, (n - 2)/n), (2 - 2/n,), -b*x**n/a)/(a*c
*(-n + 2))
```

Mathematica [A] time = 0.0340331, size = 47, normalized size = 0.9

$$\frac{x^{-n-2}(cx)^n\left({}_2F_1\left(1,-\frac{2}{n};\frac{n-2}{n};-\frac{bx^n}{a}\right)-1\right)}{2bc^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^(-3 + n)/(a + b*x^n),x]
```

```
[Out] (x^(-2 - n)*(c*x)^n*(-1 + Hypergeometric2F1[1, -2/n, (-2 + n)/n,
-((b*x^n)/a)]))/(2*b*c^3)
```

Maple [F] time = 0.096, size = 0, normalized size = 0.

$$\int \frac{(cx)^{-3+n}}{a+bx^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^(-3+n)/(a+b*x^n),x)
```

```
[Out] int((c*x)^(-3+n)/(a+b*x^n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-ac^n \int \frac{1}{b^2c^3x^3x^n + abc^3x^3}\,dx - \frac{c^{n-3}}{2\,bx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(n - 3)/(b*x^n + a),x, algorithm="maxima")
```

```
[Out] -a*c^n*integrate(1/(b^2*c^3*x^3*x^n + a*b*c^3*x^3), x) - 1/2*c^(n
 - 3)/(b*x^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(cx)^{n-3}}{bx^n + a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(n - 3)/(b*x^n + a),x, algorithm="fricas")
```

```
[Out] integral((c*x)^(n - 3)/(b*x^n + a), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**(-3+n)/(a+b*x**n),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx)^{n-3}}{bx^n + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(n - 3)/(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate((c*x)^(n - 3)/(b*x^n + a), x)
```

3.2773 $\int \frac{(cx)^{-1+n}}{(a+bx^n)^2} dx$

Optimal. Leaf size=24

$$\frac{(cx)^n}{acn\,(a+bx^n)}$$

```
[Out] (c*x)^n/(a*c*n*(a + b*x^n))
```

Rubi [A] time = 0.0256383, antiderivative size = 24, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.059

$$\frac{(cx)^n}{acn\,(a+bx^n)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^(-1 + n)/(a + b*x^n)^2,x]

[Out] (c*x)^n/(a*c*n*(a + b*x^n))
```

Rubi in Sympy [A] time = 3.68305, size = 15, normalized size = 0.62

$$\frac{(cx)^n}{acn\,(a+bx^n)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**(-1+n)/(a+b*x**n)**2,x)

[Out] (c*x)**n/(a*c*n*(a + b*x**n))
```

Mathematica [A] time = 0.0264796, size = 31, normalized size = 1.29

$$-\frac{x^{1-n}(cx)^{n-1}}{bn\,(a+bx^n)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^(-1 + n)/(a + b*x^n)^2,x]

[Out] -((x^(1 - n)*(c*x)^(-1 + n))/(b*n*(a + b*x^n)))
```

Maple [C] time = 0.038, size = 99, normalized size = 4.1

$$\frac{x}{an\,(a+bx^n)}\mathrm{e}^{\frac{(-1+n)\left(-i\pi\,(\mathrm{csgn}(icx))^3+i\pi\,(\mathrm{csgn}(icx))^2\mathrm{csgn}(ic)+i\pi\,(\mathrm{csgn}(icx))^2\mathrm{csgn}(ix)-i\pi\,\mathrm{csgn}(icx)\mathrm{csgn}(ic)\mathrm{csgn}(ix)+2\ln(x)+2\ln(c)\right)}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^(-1+n)/(a+b*x^n)^2,x)

[Out] 1/a/n*x/(a+b*x^n)*exp(1/2*(-1+n)*(-I*Pi*csgn(I*c*x)^3+I*Pi*csgn(I
*c*x)^2*csgn(I*c)+I*Pi*csgn(I*c*x)^2*csgn(I*x)-I*Pi*csgn(I*c*x)*c
```

```
sgn(I*c)*csgn(I*x)+2*ln(x)+2*ln(c)))
```

Maxima [A] time = 1.45415, size = 30, normalized size = 1.25

$$-\frac{c^n}{b^2cnx^n + abcn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(n - 1)/(b*x^n + a)^2,x, algorithm="maxima")

[Out] -c^n/(b^2*c*n*x^n + a*b*c*n)
```

Fricas [A] time = 0.223368, size = 30, normalized size = 1.25

$$-\frac{c^{n-1}}{b^2nx^n + abn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(n - 1)/(b*x^n + a)^2,x, algorithm="fricas")

[Out] -c^(n - 1)/(b^2*n*x^n + a*b*n)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**(-1+n)/(a+b*x**n)**2,x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx)^{n-1}}{(bx^n + a)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(n - 1)/(b*x^n + a)^2,x, algorithm="giac")

[Out] integrate((c*x)^(n - 1)/(b*x^n + a)^2, x)
```

3.2774 $\int \frac{(cx)^{-1+\frac{7n}{2}}}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=178

$$-\frac{5a^3x^{-7n/2}(cx)^{7n/2}\tanh^{-1}\left(\frac{\sqrt{b}x^{n/2}}{\sqrt{a+bx^n}}\right)}{8b^{7/2}cn}+\frac{5a^2x^{-3n}(cx)^{7n/2}\sqrt{a+bx^n}}{8b^3cn}-\frac{5ax^{-2n}(cx)^{7n/2}\sqrt{a+bx^n}}{12b^2cn}+\frac{x^{-n}(cx)^{7n/2}\sqrt{a+bx^n}}{3bcn}$$

```
[Out] (5*a^2*(c*x)^((7*n)/2)*Sqrt[a + b*x^n])/(8*b^3*c*n*x^(3*n)) - (5*
a*(c*x)^((7*n)/2)*Sqrt[a + b*x^n])/(12*b^2*c*n*x^(2*n)) + ((c*x)^
((7*n)/2)*Sqrt[a + b*x^n])/(3*b*c*n*x^n) - (5*a^3*(c*x)^((7*n)/2)
*ArcTanh[(Sqrt[b]*x^(n/2))/Sqrt[a + b*x^n]])/(8*b^(7/2)*c*n*x^((7
*n)/2))
```

Rubi [A] time = 0.226015, antiderivative size = 178, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174

$$-\frac{5a^3x^{-7n/2}(cx)^{7n/2}\tanh^{-1}\left(\frac{\sqrt{b}x^{n/2}}{\sqrt{a+bx^n}}\right)}{8b^{7/2}cn}+\frac{5a^2x^{-3n}(cx)^{7n/2}\sqrt{a+bx^n}}{8b^3cn}-\frac{5ax^{-2n}(cx)^{7n/2}\sqrt{a+bx^n}}{12b^2cn}+\frac{x^{-n}(cx)^{7n/2}\sqrt{a+bx^n}}{3bcn}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^(-1 + (7*n)/2)/Sqrt[a + b*x^n],x]
```

```
[Out] (5*a^2*(c*x)^((7*n)/2)*Sqrt[a + b*x^n])/(8*b^3*c*n*x^(3*n)) - (5*
a*(c*x)^((7*n)/2)*Sqrt[a + b*x^n])/(12*b^2*c*n*x^(2*n)) + ((c*x)^
((7*n)/2)*Sqrt[a + b*x^n])/(3*b*c*n*x^n) - (5*a^3*(c*x)^((7*n)/2)
*ArcTanh[(Sqrt[b]*x^(n/2))/Sqrt[a + b*x^n]])/(8*b^(7/2)*c*n*x^((7
*n)/2))
```

Rubi in Sympy [A] time = 30.9365, size = 202, normalized size = 1.13

$$\frac{a^3x^{-n}(cx)^{\frac{7n}{2}}}{3bcn(a+bx^n)^{\frac{5}{2}}\left(-\frac{bx^n}{a+bx^n}+1\right)^3}-\frac{5a^3x^{-2n}(cx)^{\frac{7n}{2}}}{12b^2cn(a+bx^n)^{\frac{3}{2}}\left(-\frac{bx^n}{a+bx^n}+1\right)^2}+\frac{5a^3x^{-3n}(cx)^{\frac{7n}{2}}}{8b^3cn\sqrt{a+bx^n}\left(-\frac{bx^n}{a+bx^n}+1\right)}-\frac{5a^3x^{-\frac{7n}{2}}(cx)^{\frac{7n}{2}}\operatorname{atanh}\left(\frac{\sqrt{b}x^{\frac{n}{2}}}{\sqrt{a+bx^n}}\right)}{8b^{\frac{7}{2}}cn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**(-1+7/2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] a**3*x**(-n)*(c*x)**(7*n/2)/(3*b*c*n*(a + b*x**n)**(5/2)*(-b*x**n
/(a + b*x**n) + 1)**3) - 5*a**3*x**(-2*n)*(c*x)**(7*n/2)/(12*b**2
*c*n*(a + b*x**n)**(3/2)*(-b*x**n/(a + b*x**n) + 1)**2) + 5*a**3*
x**(-3*n)*(c*x)**(7*n/2)/(8*b**3*c*n*sqrt(a + b*x**n)*(-b*x**n/(a
 + b*x**n) + 1)) - 5*a**3*x**(-7*n/2)*(c*x)**(7*n/2)*atanh(sqrt(b
)*x**(n/2)/sqrt(a + b*x**n))/(8*b**(7/2)*c*n)
```

Mathematica [A] time = 0.156697, size = 112, normalized size = 0.63

$$\frac{x^{-7n/2}(cx)^{7n/2}\left(\sqrt{b}x^{n/2}\sqrt{a+bx^n}\left(15a^2-10abx^n+8b^2x^{2n}\right)-15a^3\log\left(\sqrt{b}\sqrt{a+bx^n}+bx^{n/2}\right)\right)}{24b^{7/2}cn}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^(-1 + (7*n)/2)/Sqrt[a + b*x^n],x]
```

```
[Out] ((c*x)^((7*n)/2)*(Sqrt[b]*x^(n/2)*Sqrt[a + b*x^n]*(15*a^2 - 10*a*
b*x^n + 8*b^2*x^(2*n)) - 15*a^3*Log[b*x^(n/2) + Sqrt[b]*Sqrt[a +
b*x^n]]))/(24*b^(7/2)*c*n*x^((7*n)/2))
```

Maple [F] time = 0.073, size = 0, normalized size = 0.

$$\int 1\,(cx)^{-1+\frac{7n}{2}}\,\frac{1}{\sqrt{a+bx^{n}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^(-1+7/2*n)/(a+b*x^n)^(1/2),x)
```

```
[Out] int((c*x)^(-1+7/2*n)/(a+b*x^n)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(7/2*n - 1)/sqrt(b*x^n + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.263089, size = 1, normalized size = 0.01

$$\left[\frac{15\,a^{3}c^{\frac{7}{2}\,n-1}\log\left(2\,\sqrt{bx^{n}+a}bx^{\frac{1}{2}\,n}-2\,b^{\frac{3}{2}}x^{n}-a\sqrt{b}\right)+2\left(8\,b^{\frac{5}{2}}c^{\frac{7}{2}\,n-1}x^{\frac{5}{2}\,n}-10\,ab^{\frac{3}{2}}c^{\frac{7}{2}\,n-1}x^{\frac{3}{2}\,n}+15\,a^{2}\sqrt{b}c^{\frac{7}{2}\,n-1}x^{\frac{1}{2}\,n}\right)\sqrt{bx^{n}+a}}{48\,b^{\frac{7}{2}}n},\right.$$
$$\left.-\frac{15\,a^{3}c^{\frac{7}{2}\,n-1}\arctan\left(\frac{\sqrt{-b}x^{\frac{1}{2}\,n}}{\sqrt{bx^{n}+a}}\right)-\left(8\,\sqrt{-b}b^{2}c^{\frac{7}{2}\,n-1}x^{\frac{5}{2}\,n}-10\,a\sqrt{-b}bc^{\frac{7}{2}\,n-1}x^{\frac{3}{2}\,n}+15\,a^{2}\sqrt{-b}c^{\frac{7}{2}\,n-1}x^{\frac{1}{2}\,n}\right)\sqrt{bx^{n}+a}}{24\,\sqrt{-b}b^{3}n}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(7/2*n - 1)/sqrt(b*x^n + a),x, algorithm="fricas")
```

```
[Out] [1/48*(15*a^3*c^(7/2*n - 1)*log(2*sqrt(b*x^n + a)*b*x^(1/2*n) - 2
*b^(3/2)*x^n - a*sqrt(b)) + 2*(8*b^(5/2)*c^(7/2*n - 1)*x^(5/2*n)
- 10*a*b^(3/2)*c^(7/2*n - 1)*x^(3/2*n) + 15*a^2*sqrt(b)*c^(7/2*n
- 1)*x^(1/2*n))*sqrt(b*x^n + a))/(b^(7/2)*n), -1/24*(15*a^3*c^(7/
2*n - 1)*arctan(sqrt(-b)*x^(1/2*n)/sqrt(b*x^n + a)) - (8*sqrt(-b)
*b^2*c^(7/2*n - 1)*x^(5/2*n) - 10*a*sqrt(-b)*b*c^(7/2*n - 1)*x^(3
/2*n) + 15*a^2*sqrt(-b)*c^(7/2*n - 1)*x^(1/2*n))*sqrt(b*x^n + a))
/(sqrt(-b)*b^3*n)]
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**(-1+7/2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx)^{\frac{7}{2}n-1}}{\sqrt{bx^n + a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(7/2*n - 1)/sqrt(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate((c*x)^(7/2*n - 1)/sqrt(b*x^n + a), x)
```

3.2775 $\int \frac{(cx)^{-1+\frac{5n}{2}}}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=137

$$\frac{3a^2x^{-5n/2}(cx)^{5n/2}\tanh^{-1}\left(\frac{\sqrt{b}x^{n/2}}{\sqrt{a+bx^n}}\right)}{4b^{5/2}cn}-\frac{3ax^{-2n}(cx)^{5n/2}\sqrt{a+bx^n}}{4b^2cn}+\frac{x^{-n}(cx)^{5n/2}\sqrt{a+bx^n}}{2bcn}$$

```
[Out] (-3*a*(c*x)^((5*n)/2)*Sqrt[a + b*x^n])/(4*b^2*c*n*x^(2*n)) + ((c*
x)^((5*n)/2)*Sqrt[a + b*x^n])/(2*b*c*n*x^n) + (3*a^2*(c*x)^((5*n)
/2)*ArcTanh[(Sqrt[b]*x^(n/2))/Sqrt[a + b*x^n]])/(4*b^(5/2)*c*n*x^
((5*n)/2))
```

Rubi [A] time = 0.158779, antiderivative size = 137, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174

$$\frac{3a^2x^{-5n/2}(cx)^{5n/2}\tanh^{-1}\left(\frac{\sqrt{b}x^{n/2}}{\sqrt{a+bx^n}}\right)}{4b^{5/2}cn}-\frac{3ax^{-2n}(cx)^{5n/2}\sqrt{a+bx^n}}{4b^2cn}+\frac{x^{-n}(cx)^{5n/2}\sqrt{a+bx^n}}{2bcn}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^(-1 + (5*n)/2)/Sqrt[a + b*x^n],x]
```

```
[Out] (-3*a*(c*x)^((5*n)/2)*Sqrt[a + b*x^n])/(4*b^2*c*n*x^(2*n)) + ((c*
x)^((5*n)/2)*Sqrt[a + b*x^n])/(2*b*c*n*x^n) + (3*a^2*(c*x)^((5*n)
/2)*ArcTanh[(Sqrt[b]*x^(n/2))/Sqrt[a + b*x^n]])/(4*b^(5/2)*c*n*x^
((5*n)/2))
```

Rubi in Sympy [A] time = 23.199, size = 150, normalized size = 1.09

$$\frac{a^2x^{-n}(cx)^{\frac{5n}{2}}}{2bcn(a+bx^n)^{\frac{3}{2}}\left(-\frac{bx^n}{a+bx^n}+1\right)^2}-\frac{3a^2x^{-2n}(cx)^{\frac{5n}{2}}}{4b^2cn\sqrt{a+bx^n}\left(-\frac{bx^n}{a+bx^n}+1\right)}+\frac{3a^2x^{-\frac{5n}{2}}(cx)^{\frac{5n}{2}}\operatorname{atanh}\left(\frac{\sqrt{b}x^{\frac{n}{2}}}{\sqrt{a+bx^n}}\right)}{4b^{\frac{5}{2}}cn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**(-1+5/2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] a**2*x**(-n)*(c*x)**(5*n/2)/(2*b*c*n*(a + b*x**n)**(3/2)*(-b*x**n
/(a + b*x**n) + 1)**2) - 3*a**2*x**(-2*n)*(c*x)**(5*n/2)/(4*b**2*
c*n*sqrt(a + b*x**n)*(-b*x**n/(a + b*x**n) + 1)) + 3*a**2*x**(-5*
n/2)*(c*x)**(5*n/2)*atanh(sqrt(b)*x**(n/2)/sqrt(a + b*x**n))/(4*b
**(5/2)*c*n)
```

Mathematica [A] time = 0.105287, size = 99, normalized size = 0.72

$$\frac{x^{-5n/2}(cx)^{5n/2}\left(3a^2\log\left(\sqrt{b}\sqrt{a+bx^n}+bx^{n/2}\right)+\sqrt{b}x^{n/2}\sqrt{a+bx^n}\left(2bx^n-3a\right)\right)}{4b^{5/2}cn}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^(-1 + (5*n)/2)/Sqrt[a + b*x^n],x]
```

```
[Out] ((c*x)^((5*n)/2)*(Sqrt[b]*x^(n/2)*Sqrt[a + b*x^n]*(-3*a + 2*b*x^n
) + 3*a^2*Log[b*x^(n/2) + Sqrt[b]*Sqrt[a + b*x^n]]))/(4*b^(5/2)*c
```

```
*n*x^((5*n)/2))
```

Maple [F] time = 0.072, size = 0, normalized size = 0.

$$\int 1\,(cx)^{-1+\frac{5n}{2}}\,\frac{1}{\sqrt{a+bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^(-1+5/2*n)/(a+b*x^n)^(1/2),x)

[Out] int((c*x)^(-1+5/2*n)/(a+b*x^n)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(5/2*n - 1)/sqrt(b*x^n + a),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [A] time = 0.249425, size = 1, normalized size = 0.01

$$\left[\frac{3\,a^2c^{\frac{5}{2}\,n-1}\log\left(-2\,\sqrt{bx^n+a}bx^{\frac{1}{2}\,n}-2\,b^{\frac{3}{2}}x^n-a\sqrt{b}\right)+2\left(2\,b^{\frac{3}{2}}c^{\frac{5}{2}\,n-1}x^{\frac{3}{2}\,n}-3\,a\sqrt{b}c^{\frac{5}{2}\,n-1}x^{\frac{1}{2}\,n}\right)\sqrt{bx^n+a}}{8\,b^{\frac{5}{2}}n},\ \frac{3\,a^2c^{\frac{5}{2}\,n-1}\arctan\left(\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(5/2*n - 1)/sqrt(b*x^n + a),x, algorithm="fricas")

[Out] [1/8*(3*a^2*c^(5/2*n - 1)*log(-2*sqrt(b*x^n + a)*b*x^(1/2*n) - 2*
b^(3/2)*x^n - a*sqrt(b)) + 2*(2*b^(3/2)*c^(5/2*n - 1)*x^(3/2*n) -
 3*a*sqrt(b)*c^(5/2*n - 1)*x^(1/2*n))*sqrt(b*x^n + a))/(b^(5/2)*n
), 1/4*(3*a^2*c^(5/2*n - 1)*arctan(sqrt(-b)*x^(1/2*n)/sqrt(b*x^n
+ a)) + (2*sqrt(-b)*b*c^(5/2*n - 1)*x^(3/2*n) - 3*a*sqrt(-b)*c^(5
/2*n - 1)*x^(1/2*n))*sqrt(b*x^n + a))/(sqrt(-b)*b^2*n)]
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**(-1+5/2*n)/(a+b*x**n)**(1/2),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx)^{\frac{5}{2}n-1}}{\sqrt{bx^n+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(5/2*n - 1)/sqrt(b*x^n + a),x, algorithm="giac")

[Out] integrate((c*x)^(5/2*n - 1)/sqrt(b*x^n + a), x)
```

3.2776 $\int \frac{(cx)^{-1+\frac{3n}{2}}}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=91

$$\frac{x^{-n}(cx)^{3n/2}\sqrt{a+bx^n}}{bcn}-\frac{ax^{-3n/2}(cx)^{3n/2}\tanh^{-1}\left(\frac{\sqrt{b}x^{n/2}}{\sqrt{a+bx^n}}\right)}{b^{3/2}cn}$$

```
[Out] ((c*x)^((3*n)/2)*Sqrt[a + b*x^n])/(b*c*n*x^n) - (a*(c*x)^((3*n)/2
)*ArcTanh[(Sqrt[b]*x^(n/2))/Sqrt[a + b*x^n]])/(b^(3/2)*c*n*x^((3*
n)/2))
```

Rubi [A] time = 0.114104, antiderivative size = 91, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174

$$\frac{x^{-n}(cx)^{3n/2}\sqrt{a+bx^n}}{bcn}-\frac{ax^{-3n/2}(cx)^{3n/2}\tanh^{-1}\left(\frac{\sqrt{b}x^{n/2}}{\sqrt{a+bx^n}}\right)}{b^{3/2}cn}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^(-1 + (3*n)/2)/Sqrt[a + b*x^n],x]
```

```
[Out] ((c*x)^((3*n)/2)*Sqrt[a + b*x^n])/(b*c*n*x^n) - (a*(c*x)^((3*n)/2
)*ArcTanh[(Sqrt[b]*x^(n/2))/Sqrt[a + b*x^n]])/(b^(3/2)*c*n*x^((3*
n)/2))
```

Rubi in Sympy [A] time = 14.31, size = 88, normalized size = 0.97

$$\frac{ax^{-n}(cx)^{\frac{3n}{2}}}{bcn\sqrt{a+bx^n}\left(-\frac{bx^n}{a+bx^n}+1\right)}-\frac{ax^{-\frac{3n}{2}}(cx)^{\frac{3n}{2}}\operatorname{atanh}\left(\frac{\sqrt{b}x^{\frac{n}{2}}}{\sqrt{a+bx^n}}\right)}{b^{\frac{3}{2}}cn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**(-1+3/2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] a*x**(-n)*(c*x)**(3*n/2)/(b*c*n*sqrt(a + b*x**n)*(-b*x**n/(a + b*
x**n) + 1)) - a*x**(-3*n/2)*(c*x)**(3*n/2)*atanh(sqrt(b)*x**(n/2)
/sqrt(a + b*x**n))/(b**(3/2)*c*n)
```

Mathematica [A] time = 0.0690079, size = 84, normalized size = 0.92

$$\frac{x^{-3n/2}(cx)^{3n/2}\left(\sqrt{b}x^{n/2}\sqrt{a+bx^n}-a\log\left(\sqrt{b}\sqrt{a+bx^n}+bx^{n/2}\right)\right)}{b^{3/2}cn}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^(-1 + (3*n)/2)/Sqrt[a + b*x^n],x]
```

```
[Out] ((c*x)^((3*n)/2)*(Sqrt[b]*x^(n/2)*Sqrt[a + b*x^n] - a*Log[b*x^(n/
2) + Sqrt[b]*Sqrt[a + b*x^n]]))/(b^(3/2)*c*n*x^((3*n)/2))
```

Maple [F] time = 0.075, size = 0, normalized size = 0.

$$\int 1\,(cx)^{-1+\frac{3n}{2}}\,\frac{1}{\sqrt{a+bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^(-1+3/2*n)/(a+b*x^n)^(1/2),x)
```

```
[Out] int((c*x)^(-1+3/2*n)/(a+b*x^n)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(3/2*n - 1)/sqrt(b*x^n + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.246567, size = 1, normalized size = 0.01

$$\left[\frac{2\sqrt{bx^n+a}\sqrt{b}c^{\frac{3}{2}n-1}x^{\frac{1}{2}n}+ac^{\frac{3}{2}n-1}\log\left(2\sqrt{bx^n+a}bx^{\frac{1}{2}n}-2b^{\frac{3}{2}}x^n-a\sqrt{b}\right)}{2b^{\frac{3}{2}}n},\frac{\sqrt{bx^n+a}\sqrt{-b}c^{\frac{3}{2}n-1}x^{\frac{1}{2}n}-ac^{\frac{3}{2}n-1}\arctan\left(\frac{\sqrt{-b}\ldots}{\sqrt{bx\ldots}}\right.}{\sqrt{-b}bn}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(3/2*n - 1)/sqrt(b*x^n + a),x, algorithm="fricas")
```

```
[Out] [1/2*(2*sqrt(b*x^n + a)*sqrt(b)*c^(3/2*n - 1)*x^(1/2*n) + a*c^(3/
2*n - 1)*log(2*sqrt(b*x^n + a)*b*x^(1/2*n) - 2*b^(3/2)*x^n - a*sq
rt(b)))/(b^(3/2)*n), (sqrt(b*x^n + a)*sqrt(-b)*c^(3/2*n - 1)*x^(1
/2*n) - a*c^(3/2*n - 1)*arctan(sqrt(-b)*x^(1/2*n)/sqrt(b*x^n + a)
))/(sqrt(-b)*b*n)]
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**(-1+3/2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx)^{\frac{3}{2}n-1}}{\sqrt{bx^n+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(3/2*n - 1)/sqrt(b*x^n + a),x, algorithm="giac")

[Out] integrate((c*x)^(3/2*n - 1)/sqrt(b*x^n + a), x)
```

3.2777 $\int \frac{(cx)^{-1+\frac{n}{2}}}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=54

$$\frac{2x^{-n/2}(cx)^{n/2}\tanh^{-1}\left(\frac{\sqrt{b}x^{n/2}}{\sqrt{a+bx^n}}\right)}{\sqrt{b}cn}$$

```
[Out] (2*(c*x)^(n/2)*ArcTanh[(Sqrt[b]*x^(n/2))/Sqrt[a + b*x^n]])/(Sqrt[
b]*c*n*x^(n/2))
```

Rubi [A] time = 0.0781306, antiderivative size = 54, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174

$$\frac{2x^{-n/2}(cx)^{n/2}\tanh^{-1}\left(\frac{\sqrt{b}x^{n/2}}{\sqrt{a+bx^n}}\right)}{\sqrt{b}cn}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^(-1 + n/2)/Sqrt[a + b*x^n],x]
```

```
[Out] (2*(c*x)^(n/2)*ArcTanh[(Sqrt[b]*x^(n/2))/Sqrt[a + b*x^n]])/(Sqrt[
b]*c*n*x^(n/2))
```

Rubi in Sympy [A] time = 8.64597, size = 42, normalized size = 0.78

$$\frac{2x^{-\frac{n}{2}}(cx)^{\frac{n}{2}}\operatorname{atanh}\left(\frac{\sqrt{b}x^{\frac{n}{2}}}{\sqrt{a+bx^n}}\right)}{\sqrt{b}cn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**(-1+1/2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] 2*x**(-n/2)*(c*x)**(n/2)*atanh(sqrt(b)*x**(n/2)/sqrt(a + b*x**n))
/(sqrt(b)*c*n)
```

Mathematica [A] time = 0.0759691, size = 54, normalized size = 1.

$$\frac{2x^{-n/2}(cx)^{n/2}\tanh^{-1}\left(\frac{\sqrt{b}x^{n/2}}{\sqrt{a+bx^n}}\right)}{\sqrt{b}cn}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^(-1 + n/2)/Sqrt[a + b*x^n],x]
```

```
[Out] (2*(c*x)^(n/2)*ArcTanh[(Sqrt[b]*x^(n/2))/Sqrt[a + b*x^n]])/(Sqrt[
b]*c*n*x^(n/2))
```

Maple [F] time = 0.069, size = 0, normalized size = 0.

$$\int 1\,(cx)^{-1+\frac{n}{2}}\frac{1}{\sqrt{a+bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^(-1+1/2*n)/(a+b*x^n)^(1/2),x)

[Out] int((c*x)^(-1+1/2*n)/(a+b*x^n)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(1/2*n - 1)/sqrt(b*x^n + a),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(1/2*n - 1)/sqrt(b*x^n + a),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**(-1+1/2*n)/(a+b*x**n)**(1/2),x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx)^{\frac{1}{2}n-1}}{\sqrt{bx^n + a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(1/2*n - 1)/sqrt(b*x^n + a),x, algorithm="giac")

[Out] integrate((c*x)^(1/2*n - 1)/sqrt(b*x^n + a), x)
```

3.2778 $\int \frac{(cx)^{-1-\frac{n}{2}}}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=31

$$-\frac{2(cx)^{-n/2}\sqrt{a+bx^n}}{acn}$$

```
[Out] (-2*Sqrt[a + b*x^n])/(a*c*n*(c*x)^(n/2))
```

Rubi [A] time = 0.033722, antiderivative size = 31, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.043$

$$-\frac{2(cx)^{-n/2}\sqrt{a+bx^n}}{acn}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^(-1 - n/2)/Sqrt[a + b*x^n],x]

[Out] (-2*Sqrt[a + b*x^n])/(a*c*n*(c*x)^(n/2))
```

Rubi in Sympy [A] time = 3.78073, size = 24, normalized size = 0.77

$$-\frac{2\,(cx)^{-\frac{n}{2}}\,\sqrt{a+bx^n}}{acn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**(-1-1/2*n)/(a+b*x**n)**(1/2),x)

[Out] -2*(c*x)**(-n/2)*sqrt(a + b*x**n)/(a*c*n)
```

Mathematica [A] time = 0.0386011, size = 31, normalized size = 1.

$$-\frac{2(cx)^{-n/2}\sqrt{a+bx^n}}{acn}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^(-1 - n/2)/Sqrt[a + b*x^n],x]

[Out] (-2*Sqrt[a + b*x^n])/(a*c*n*(c*x)^(n/2))
```

Maple [F] time = 0.073, size = 0, normalized size = 0.

$$\int 1\,(cx)^{-1-\frac{n}{2}}\frac{1}{\sqrt{a+bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^(-1-1/2*n)/(a+b*x^n)^(1/2),x)

[Out] int((c*x)^(-1-1/2*n)/(a+b*x^n)^(1/2),x)
```

Maxima [A] time = 1.44208, size = 39, normalized size = 1.26

$$-\frac{2\sqrt{bx^n+a}c^{-\frac{1}{2}n-1}x^{-\frac{1}{2}n}}{an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-1/2*n - 1)/sqrt(b*x^n + a),x, algorithm="maxima")
```

```
[Out] -2*sqrt(b*x^n + a)*c^(-1/2*n - 1)*x^(-1/2*n)/(a*n)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-1/2*n - 1)/sqrt(b*x^n + a),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**(-1-1/2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx)^{-\frac{1}{2}n-1}}{\sqrt{bx^n+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-1/2*n - 1)/sqrt(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate((c*x)^(-1/2*n - 1)/sqrt(b*x^n + a), x)
```

3.2779 $\int \frac{(cx)^{-1-\frac{3n}{2}}}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=65

$$\frac{4(cx)^{-3n/2}(a+bx^n)^{3/2}}{3a^2cn}-\frac{2(cx)^{-3n/2}\sqrt{a+bx^n}}{acn}$$

```
[Out] (-2*Sqrt[a + b*x^n])/(a*c*n*(c*x)^((3*n)/2)) + (4*(a + b*x^n)^(3/
2))/(3*a^2*c*n*(c*x)^((3*n)/2))
```

Rubi [A] time = 0.0674947, antiderivative size = 65, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087

$$\frac{4(cx)^{-3n/2}(a+bx^n)^{3/2}}{3a^2cn}-\frac{2(cx)^{-3n/2}\sqrt{a+bx^n}}{acn}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^(-1 - (3*n)/2)/Sqrt[a + b*x^n],x]
```

```
[Out] (-2*Sqrt[a + b*x^n])/(a*c*n*(c*x)^((3*n)/2)) + (4*(a + b*x^n)^(3/
2))/(3*a^2*c*n*(c*x)^((3*n)/2))
```

Rubi in Sympy [A] time = 7.28303, size = 53, normalized size = 0.82

$$-\frac{2\,(cx)^{-\frac{3n}{2}}\sqrt{a+bx^n}}{acn}+\frac{4\,(cx)^{-\frac{3n}{2}}(a+bx^n)^{\frac{3}{2}}}{3a^2cn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**(-1-3/2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] -2*(c*x)**(-3*n/2)*sqrt(a + b*x**n)/(a*c*n) + 4*(c*x)**(-3*n/2)*(
a + b*x**n)**(3/2)/(3*a**2*c*n)
```

Mathematica [A] time = 0.0512587, size = 41, normalized size = 0.63

$$-\frac{2(cx)^{-3n/2}(a-2bx^n)\sqrt{a+bx^n}}{3a^2cn}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^(-1 - (3*n)/2)/Sqrt[a + b*x^n],x]
```

```
[Out] (-2*(a - 2*b*x^n)*Sqrt[a + b*x^n])/(3*a^2*c*n*(c*x)^((3*n)/2))
```

Maple [F] time = 0.07, size = 0, normalized size = 0.

$$\int 1\,(cx)^{-1-\frac{3n}{2}}\frac{1}{\sqrt{a+bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^(-1-3/2*n)/(a+b*x^n)^(1/2),x)
```

```
[Out] int((c*x)^(-1-3/2*n)/(a+b*x^n)^(1/2),x)
```

Maxima [A] time = 1.44557, size = 74, normalized size = 1.14

$$\frac{2}{3}c^{-\frac{3}{2}n-1}\left(\frac{3\sqrt{bx^n+a}bx^{-\frac{1}{2}n}}{a^2n}-\frac{(bx^n+a)^{\frac{3}{2}}x^{-\frac{3}{2}n}}{a^2n}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-3/2*n - 1)/sqrt(b*x^n + a),x, algorithm="maxima")
```

```
[Out] 2/3*c^(-3/2*n - 1)*(3*sqrt(b*x^n + a)*b*x^(-1/2*n)/(a^2*n) - (b*x
^n + a)^(3/2)*x^(-3/2*n)/(a^2*n))
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-3/2*n - 1)/sqrt(b*x^n + a),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**(-1-3/2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx)^{-\frac{3}{2}n-1}}{\sqrt{bx^n+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-3/2*n - 1)/sqrt(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate((c*x)^(-3/2*n - 1)/sqrt(b*x^n + a), x)
```

3.2780 $\int \frac{(cx)^{-1-\frac{5n}{2}}}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=98

$$-\frac{16(cx)^{-5n/2}\left(a+bx^n\right)^{5/2}}{15a^3cn}+\frac{8(cx)^{-5n/2}\left(a+bx^n\right)^{3/2}}{3a^2cn}-\frac{2(cx)^{-5n/2}\sqrt{a+bx^n}}{acn}$$

```
[Out] (-2*Sqrt[a + b*x^n])/(a*c*n*(c*x)^((5*n)/2)) + (8*(a + b*x^n)^(3/
2))/(3*a^2*c*n*(c*x)^((5*n)/2)) - (16*(a + b*x^n)^(5/2))/(15*a^3*
c*n*(c*x)^((5*n)/2))
```

Rubi [A] time = 0.103744, antiderivative size = 98, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087

$$-\frac{16(cx)^{-5n/2}\left(a+bx^n\right)^{5/2}}{15a^3cn}+\frac{8(cx)^{-5n/2}\left(a+bx^n\right)^{3/2}}{3a^2cn}-\frac{2(cx)^{-5n/2}\sqrt{a+bx^n}}{acn}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^(-1 - (5*n)/2)/Sqrt[a + b*x^n],x]
```

```
[Out] (-2*Sqrt[a + b*x^n])/(a*c*n*(c*x)^((5*n)/2)) + (8*(a + b*x^n)^(3/
2))/(3*a^2*c*n*(c*x)^((5*n)/2)) - (16*(a + b*x^n)^(5/2))/(15*a^3*
c*n*(c*x)^((5*n)/2))
```

Rubi in Sympy [A] time = 12.5213, size = 82, normalized size = 0.84

$$-\frac{2\,(cx)^{-\frac{5n}{2}}\sqrt{a+bx^n}}{acn}+\frac{8\,(cx)^{-\frac{5n}{2}}\left(a+bx^n\right)^{\frac{3}{2}}}{3a^2cn}-\frac{16\,(cx)^{-\frac{5n}{2}}\left(a+bx^n\right)^{\frac{5}{2}}}{15a^3cn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**(-1-5/2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] -2*(c*x)**(-5*n/2)*sqrt(a + b*x**n)/(a*c*n) + 8*(c*x)**(-5*n/2)*(
a + b*x**n)**(3/2)/(3*a**2*c*n) - 16*(c*x)**(-5*n/2)*(a + b*x**n)
**(5/2)/(15*a**3*c*n)
```

Mathematica [A] time = 0.0581889, size = 56, normalized size = 0.57

$$-\frac{2(cx)^{-5n/2}\sqrt{a+bx^n}\left(3a^2-4abx^n+8b^2x^{2n}\right)}{15a^3cn}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^(-1 - (5*n)/2)/Sqrt[a + b*x^n],x]
```

```
[Out] (-2*Sqrt[a + b*x^n]*(3*a^2 - 4*a*b*x^n + 8*b^2*x^(2*n)))/(15*a^3*
c*n*(c*x)^((5*n)/2))
```

Maple [F] time = 0.083, size = 0, normalized size = 0.

$$\int 1\,(cx)^{-1-\frac{5n}{2}}\frac{1}{\sqrt{a+bx^n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^(-1-5/2*n)/(a+b*x^n)^(1/2),x)
```

```
[Out] int((c*x)^(-1-5/2*n)/(a+b*x^n)^(1/2),x)
```

Maxima [A] time = 1.44165, size = 108, normalized size = 1.1

$$-\frac{2}{15}\, c^{-\frac{5}{2}\, n-1} \left(\frac{15\, \sqrt{b x^n + a} b^2 x^{-\frac{1}{2}\, n}}{a^3 n} - \frac{10\, (b x^n + a)^{\frac{3}{2}} b x^{-\frac{3}{2}\, n}}{a^3 n} + \frac{3\, (b x^n + a)^{\frac{5}{2}} x^{-\frac{5}{2}\, n}}{a^3 n}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-5/2*n - 1)/sqrt(b*x^n + a),x, algorithm="maxima")
```

```
[Out] -2/15*c^(-5/2*n - 1)*(15*sqrt(b*x^n + a)*b^2*x^(-1/2*n)/(a^3*n) -
 10*(b*x^n + a)^(3/2)*b*x^(-3/2*n)/(a^3*n) + 3*(b*x^n + a)^(5/2)*
x^(-5/2*n)/(a^3*n))
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-5/2*n - 1)/sqrt(b*x^n + a),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**(-1-5/2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx)^{-\frac{5}{2}\, n-1}}{\sqrt{b x^n + a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-5/2*n - 1)/sqrt(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate((c*x)^(-5/2*n - 1)/sqrt(b*x^n + a), x)
```

3.2781 $\int \frac{(cx)^{-1-\frac{7n}{2}}}{\sqrt{a+bx^n}}\,dx$

Optimal. Leaf size=129

$$\frac{32(cx)^{-7n/2}(a+bx^n)^{7/2}}{35a^4cn}-\frac{16(cx)^{-7n/2}(a+bx^n)^{5/2}}{5a^3cn}+\frac{4(cx)^{-7n/2}(a+bx^n)^{3/2}}{a^2cn}-\frac{2(cx)^{-7n/2}\sqrt{a+bx^n}}{acn}$$

```
[Out] (-2*Sqrt[a + b*x^n])/(a*c*n*(c*x)^((7*n)/2)) + (4*(a + b*x^n)^(3/
2))/(a^2*c*n*(c*x)^((7*n)/2)) - (16*(a + b*x^n)^(5/2))/(5*a^3*c*n
*(c*x)^((7*n)/2)) + (32*(a + b*x^n)^(7/2))/(35*a^4*c*n*(c*x)^((7*
n)/2))
```

Rubi [A] time = 0.148921, antiderivative size = 129, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087

$$\frac{32(cx)^{-7n/2}(a+bx^n)^{7/2}}{35a^4cn}-\frac{16(cx)^{-7n/2}(a+bx^n)^{5/2}}{5a^3cn}+\frac{4(cx)^{-7n/2}(a+bx^n)^{3/2}}{a^2cn}-\frac{2(cx)^{-7n/2}\sqrt{a+bx^n}}{acn}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^(-1 - (7*n)/2)/Sqrt[a + b*x^n],x]
```

```
[Out] (-2*Sqrt[a + b*x^n])/(a*c*n*(c*x)^((7*n)/2)) + (4*(a + b*x^n)^(3/
2))/(a^2*c*n*(c*x)^((7*n)/2)) - (16*(a + b*x^n)^(5/2))/(5*a^3*c*n
*(c*x)^((7*n)/2)) + (32*(a + b*x^n)^(7/2))/(35*a^4*c*n*(c*x)^((7*
n)/2))
```

Rubi in Sympy [A] time = 17.9944, size = 109, normalized size = 0.84

$$-\frac{2(cx)^{-\frac{7n}{2}}\sqrt{a+bx^n}}{acn}+\frac{4(cx)^{-\frac{7n}{2}}(a+bx^n)^{\frac{3}{2}}}{a^2cn}-\frac{16(cx)^{-\frac{7n}{2}}(a+bx^n)^{\frac{5}{2}}}{5a^3cn}+\frac{32(cx)^{-\frac{7n}{2}}(a+bx^n)^{\frac{7}{2}}}{35a^4cn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**(-1-7/2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] -2*(c*x)**(-7*n/2)*sqrt(a + b*x**n)/(a*c*n) + 4*(c*x)**(-7*n/2)*(
a + b*x**n)**(3/2)/(a**2*c*n) - 16*(c*x)**(-7*n/2)*(a + b*x**n)**
(5/2)/(5*a**3*c*n) + 32*(c*x)**(-7*n/2)*(a + b*x**n)**(7/2)/(35*a
**4*c*n)
```

Mathematica [A] time = 0.0718752, size = 69, normalized size = 0.53

$$\frac{2(cx)^{-7n/2}\sqrt{a+bx^n}\left(-5a^3+6a^2bx^n-8ab^2x^{2n}+16b^3x^{3n}\right)}{35a^4cn}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^(-1 - (7*n)/2)/Sqrt[a + b*x^n],x]
```

```
[Out] (2*Sqrt[a + b*x^n]*(-5*a^3 + 6*a^2*b*x^n - 8*a*b^2*x^(2*n) + 16*b
^3*x^(3*n)))/(35*a^4*c*n*(c*x)^((7*n)/2))
```

Maple [F] time = 0.074, size = 0, normalized size = 0.

$$\int 1 \, (cx)^{-1-\frac{7n}{2}} \frac{1}{\sqrt{a+b x^n}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^(-1-7/2*n)/(a+b*x^n)^(1/2),x)
```

```
[Out] int((c*x)^(-1-7/2*n)/(a+b*x^n)^(1/2),x)
```

Maxima [A] time = 1.4411, size = 142, normalized size = 1.1

$$\frac{2}{35} c^{-\frac{7}{2}n-1} \left(\frac{35 \sqrt{bx^n+a} b^3 x^{-\frac{1}{2}n}}{a^4 n} - \frac{35 (bx^n+a)^{\frac{3}{2}} b^2 x^{-\frac{3}{2}n}}{a^4 n} + \frac{21 (bx^n+a)^{\frac{5}{2}} b x^{-\frac{5}{2}n}}{a^4 n} - \frac{5 (bx^n+a)^{\frac{7}{2}} x^{-\frac{7}{2}n}}{a^4 n} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-7/2*n - 1)/sqrt(b*x^n + a),x, algorithm="maxima")
```

```
[Out] 2/35*c^(-7/2*n - 1)*(35*sqrt(b*x^n + a)*b^3*x^(-1/2*n)/(a^4*n) -
35*(b*x^n + a)^(3/2)*b^2*x^(-3/2*n)/(a^4*n) + 21*(b*x^n + a)^(5/2
)*b*x^(-5/2*n)/(a^4*n) - 5*(b*x^n + a)^(7/2)*x^(-7/2*n)/(a^4*n))
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-7/2*n - 1)/sqrt(b*x^n + a),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**(-1-7/2*n)/(a+b*x**n)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx)^{-\frac{7}{2}n-1}}{\sqrt{bx^n+a}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)^(-7/2*n - 1)/sqrt(b*x^n + a),x, algorithm="giac")
```

```
[Out] integrate((c*x)^(-7/2*n - 1)/sqrt(b*x^n + a), x)
```

3.2782 $\int (cx)^m (a+bx^n)^p \, dx$

Optimal. Leaf size=59

$$\frac{(cx)^{m+1}(a+bx^n)^{p+1}\,{}_2F_1\left(1,\frac{m+1}{n}+p+1;\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{ac(m+1)}$$

```
[Out] ((c*x)^(1 + m)*(a + b*x^n)^(1 + p)*Hypergeometric2F1[1, 1 + (1 +
m)/n + p, (1 + m + n)/n, -((b*x^n)/a)])/(a*c*(1 + m))
```

Rubi [A] time = 0.0670979, antiderivative size = 67, normalized size of antiderivative = 1.14, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{(cx)^{m+1}(a+bx^n)^p\left(\frac{bx^n}{a}+1\right)^{-p}\,{}_2F_1\left(\frac{m+1}{n},-p;\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{c(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^m*(a + b*x^n)^p,x]
```

```
[Out] ((c*x)^(1 + m)*(a + b*x^n)^p*Hypergeometric2F1[(1 + m)/n, -p, (1
+ m + n)/n, -((b*x^n)/a)])/(c*(1 + m)*(1 + (b*x^n)/a)^p)
```

Rubi in Sympy [A] time = 9.06727, size = 49, normalized size = 0.83

$$\frac{(cx)^{m+1}\left(1+\frac{bx^n}{a}\right)^{-p}(a+bx^n)^p\,{}_2F_1\left(\begin{matrix}-p,\frac{m+1}{n}\\ \frac{m+n+1}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{c\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**m*(a+b*x**n)**p,x)
```

```
[Out] (c*x)**(m + 1)*(1 + b*x**n/a)**(-p)*(a + b*x**n)**p*hyper((-p, (m
 + 1)/n), ((m + n + 1)/n,), -b*x**n/a)/(c*(m + 1))
```

Mathematica [A] time = 0.0587902, size = 64, normalized size = 1.08

$$\frac{x(cx)^m(a+bx^n)^p\left(\frac{bx^n}{a}+1\right)^{-p}\,{}_2F_1\left(\frac{m+1}{n},-p;\frac{m+1}{n}+1;-\frac{bx^n}{a}\right)}{m+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^m*(a + b*x^n)^p,x]
```

```
[Out] (x*(c*x)^m*(a + b*x^n)^p*Hypergeometric2F1[(1 + m)/n, -p, 1 + (1
+ m)/n, -((b*x^n)/a)])/((1 + m)*(1 + (b*x^n)/a)^p)
```

Maple [F] time = 0.102, size = 0, normalized size = 0.

$$\int (cx)^m (a+bx^n)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^m*(a+b*x^n)^p,x)
```

```
[Out] int((c*x)^m*(a+b*x^n)^p,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^p (cx)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*(c*x)^m,x, algorithm="maxima")
```

```
[Out] integrate((b*x^n + a)^p*(c*x)^m, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left((bx^n + a)^p (cx)^m, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*(c*x)^m,x, algorithm="fricas")
```

```
[Out] integral((b*x^n + a)^p*(c*x)^m, x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**m*(a+b*x**n)**p,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^p (cx)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*(c*x)^m,x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^p*(c*x)^m, x)
```

3.2783 $\int (cx)^{3n} (a + bx^n)^p \, dx$

Optimal. Leaf size=56

$$\frac{(cx)^{3n+1} (a + bx^n)^{p+1} \, {}_2F_1\left(1, p + \frac{1}{n} + 4; 4 + \frac{1}{n}; -\frac{bx^n}{a}\right)}{ac(3n + 1)}$$

```
[Out] ((c*x)^(1 + 3*n)*(a + b*x^n)^(1 + p)*Hypergeometric2F1[1, 4 + n^(
-1) + p, 4 + n^(-1), -((b*x^n)/a)])/(a*c*(1 + 3*n))
```

Rubi [A] time = 0.0693173, antiderivative size = 66, normalized size of antiderivative = 1.18, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{(cx)^{3n+1} (a + bx^n)^p \left(\frac{bx^n}{a} + 1\right)^{-p} \, {}_2F_1\left(3 + \frac{1}{n}, -p; 4 + \frac{1}{n}; -\frac{bx^n}{a}\right)}{c(3n + 1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^(3*n)*(a + b*x^n)^p,x]
```

```
[Out] ((c*x)^(1 + 3*n)*(a + b*x^n)^p*Hypergeometric2F1[3 + n^(-1), -p,
4 + n^(-1), -((b*x^n)/a)])/(c*(1 + 3*n)*(1 + (b*x^n)/a)^p)
```

Rubi in Sympy [A] time = 9.05925, size = 51, normalized size = 0.91

$$\frac{(cx)^{3n+1} \left(1 + \frac{bx^n}{a}\right)^{-p} (a + bx^n)^p \, {}_2F_1\left(\begin{matrix} -p, 3 + \frac{1}{n} \\ 4 + \frac{1}{n} \end{matrix}\middle| -\frac{bx^n}{a}\right)}{c\,(3n + 1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**(3*n)*(a+b*x**n)**p,x)
```

```
[Out] (c*x)**(3*n + 1)*(1 + b*x**n/a)**(-p)*(a + b*x**n)**p*hyper((-p,
3 + 1/n), (4 + 1/n,), -b*x**n/a)/(c*(3*n + 1))
```

Mathematica [A] time = 0.149781, size = 62, normalized size = 1.11

$$\frac{x(cx)^{3n} (a + bx^n)^p \left(\frac{bx^n}{a} + 1\right)^{-p} \, {}_2F_1\left(3 + \frac{1}{n}, -p; 4 + \frac{1}{n}; -\frac{bx^n}{a}\right)}{3n + 1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^(3*n)*(a + b*x^n)^p,x]
```

```
[Out] (x*(c*x)^(3*n)*(a + b*x^n)^p*Hypergeometric2F1[3 + n^(-1), -p, 4
+ n^(-1), -((b*x^n)/a)])/((1 + 3*n)*(1 + (b*x^n)/a)^p)
```

Maple [F] time = 0.1, size = 0, normalized size = 0.

$$\int (cx)^{3n} (a + bx^n)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^(3*n)*(a+b*x^n)^p,x)

[Out] int((c*x)^(3*n)*(a+b*x^n)^p,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^p (cx)^{3n} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*(c*x)^(3*n),x, algorithm="maxima")

[Out] integrate((b*x^n + a)^p*(c*x)^(3*n), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left((bx^n + a)^p (cx)^{3n}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*(c*x)^(3*n),x, algorithm="fricas")

[Out] integral((b*x^n + a)^p*(c*x)^(3*n), x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**(3*n)*(a+b*x**n)**p,x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^p (cx)^{3n} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*(c*x)^(3*n),x, algorithm="giac")

[Out] integrate((b*x^n + a)^p*(c*x)^(3*n), x)
```

3.2784 $\int (cx)^{2n}(a+bx^n)^p\,dx$

Optimal. Leaf size=56

$$\frac{(cx)^{2n+1}(a+bx^n)^{p+1}\,{}_2F_1\left(1,p+\frac{1}{n}+3;3+\frac{1}{n};-\frac{bx^n}{a}\right)}{ac(2n+1)}$$

```
[Out] ((c*x)^(1 + 2*n)*(a + b*x^n)^(1 + p)*Hypergeometric2F1[1, 3 + n^(
-1) + p, 3 + n^(-1), -((b*x^n)/a)])/(a*c*(1 + 2*n))
```

Rubi [A] time = 0.0677654, antiderivative size = 66, normalized size of antiderivative = 1.18, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{(cx)^{2n+1}(a+bx^n)^p\left(\frac{bx^n}{a}+1\right)^{-p}\,{}_2F_1\left(2+\frac{1}{n},-p;3+\frac{1}{n};-\frac{bx^n}{a}\right)}{c(2n+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^(2*n)*(a + b*x^n)^p,x]
```

```
[Out] ((c*x)^(1 + 2*n)*(a + b*x^n)^p*Hypergeometric2F1[2 + n^(-1), -p,
3 + n^(-1), -((b*x^n)/a)])/(c*(1 + 2*n)*(1 + (b*x^n)/a)^p)
```

Rubi in Sympy [A] time = 9.00047, size = 51, normalized size = 0.91

$$\frac{(cx)^{2n+1}\left(1+\frac{bx^n}{a}\right)^{-p}(a+bx^n)^p\,{}_2F_1\left(\begin{matrix}-p,2+\frac{1}{n}\\3+\frac{1}{n}\end{matrix}\middle|-\frac{bx^n}{a}\right)}{c\,(2n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**(2*n)*(a+b*x**n)**p,x)
```

```
[Out] (c*x)**(2*n + 1)*(1 + b*x**n/a)**(-p)*(a + b*x**n)**p*hyper((-p,
2 + 1/n), (3 + 1/n,), -b*x**n/a)/(c*(2*n + 1))
```

Mathematica [A] time = 0.0990834, size = 62, normalized size = 1.11

$$\frac{x(cx)^{2n}(a+bx^n)^p\left(\frac{bx^n}{a}+1\right)^{-p}\,{}_2F_1\left(2+\frac{1}{n},-p;3+\frac{1}{n};-\frac{bx^n}{a}\right)}{2n+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^(2*n)*(a + b*x^n)^p,x]
```

```
[Out] (x*(c*x)^(2*n)*(a + b*x^n)^p*Hypergeometric2F1[2 + n^(-1), -p, 3
+ n^(-1), -((b*x^n)/a)])/((1 + 2*n)*(1 + (b*x^n)/a)^p)
```

Maple [F] time = 0.101, size = 0, normalized size = 0.

$$\int (cx)^{2n}(a+bx^n)^p\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^(2*n)*(a+b*x^n)^p,x)

[Out] int((c*x)^(2*n)*(a+b*x^n)^p,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^p (cx)^{2n} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*(c*x)^(2*n),x, algorithm="maxima")

[Out] integrate((b*x^n + a)^p*(c*x)^(2*n), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left((bx^n + a)^p (cx)^{2n}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*(c*x)^(2*n),x, algorithm="fricas")

[Out] integral((b*x^n + a)^p*(c*x)^(2*n), x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**(2*n)*(a+b*x**n)**p,x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^p (cx)^{2n} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*(c*x)^(2*n),x, algorithm="giac")

[Out] integrate((b*x^n + a)^p*(c*x)^(2*n), x)
```

3.2785 $\int (cx)^n (a+bx^n)^p \, dx$

Optimal. Leaf size=52

$$\frac{(cx)^{n+1}(a+bx^n)^{p+1} {}_2F_1\left(1,p+\frac{1}{n}+2;2+\frac{1}{n};-\frac{bx^n}{a}\right)}{ac(n+1)}$$

```
[Out] ((c*x)^(1 + n)*(a + b*x^n)^(1 + p)*Hypergeometric2F1[1, 2 + n^(-1
) + p, 2 + n^(-1), -((b*x^n)/a)])/(a*c*(1 + n))
```

Rubi [A] time = 0.0613631, antiderivative size = 62, normalized size of antiderivative = 1.19, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{(cx)^{n+1}(a+bx^n)^p \left(\frac{bx^n}{a}+1\right)^{-p} {}_2F_1\left(1+\frac{1}{n},-p;2+\frac{1}{n};-\frac{bx^n}{a}\right)}{c(n+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^n*(a + b*x^n)^p,x]
```

```
[Out] ((c*x)^(1 + n)*(a + b*x^n)^p*Hypergeometric2F1[1 + n^(-1), -p, 2
+ n^(-1), -((b*x^n)/a)])/(c*(1 + n)*(1 + (b*x^n)/a)^p)
```

Rubi in Sympy [A] time = 8.93175, size = 48, normalized size = 0.92

$$\frac{(cx)^{n+1}\left(1+\frac{bx^n}{a}\right)^{-p}(a+bx^n)^p {}_2F_1\left(\begin{matrix} -p, \frac{n+1}{n} \\ 2+\frac{1}{n} \end{matrix}\middle| -\frac{bx^n}{a}\right)}{c\,(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**n*(a+b*x**n)**p,x)
```

```
[Out] (c*x)**(n + 1)*(1 + b*x**n/a)**(-p)*(a + b*x**n)**p*hyper((-p, (n
 + 1)/n), (2 + 1/n,), -b*x**n/a)/(c*(n + 1))
```

Mathematica [A] time = 0.0695096, size = 58, normalized size = 1.12

$$\frac{x(cx)^n(a+bx^n)^p\left(\frac{bx^n}{a}+1\right)^{-p} {}_2F_1\left(1+\frac{1}{n},-p;2+\frac{1}{n};-\frac{bx^n}{a}\right)}{n+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^n*(a + b*x^n)^p,x]
```

```
[Out] (x*(c*x)^n*(a + b*x^n)^p*Hypergeometric2F1[1 + n^(-1), -p, 2 + n^
(-1), -((b*x^n)/a)])/((1 + n)*(1 + (b*x^n)/a)^p)
```

Maple [F] time = 0.104, size = 0, normalized size = 0.

$$\int (cx)^n (a+bx^n)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^n*(a+b*x^n)^p,x)
```

```
[Out] int((c*x)^n*(a+b*x^n)^p,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^p (cx)^n \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*(c*x)^n,x, algorithm="maxima")
```

```
[Out] integrate((b*x^n + a)^p*(c*x)^n, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left((bx^n + a)^p (cx)^n, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*(c*x)^n,x, algorithm="fricas")
```

```
[Out] integral((b*x^n + a)^p*(c*x)^n, x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**n*(a+b*x**n)**p,x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^p (cx)^n \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*(c*x)^n,x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^p*(c*x)^n, x)
```

3.2786 $\int (a + bx^n)^p \, dx$

Optimal. Leaf size=38

$$\frac{x (a + bx^n)^{p+1} \, {}_2F_1\left(1, p + \frac{1}{n} + 1; 1 + \frac{1}{n}; -\frac{bx^n}{a}\right)}{a}$$

```
[Out] (x*(a + b*x^n)^(1 + p)*Hypergeometric2F1[1, 1 + n^(-1) + p, 1 + n
^(-1), -((b*x^n)/a)])/a
```

Rubi [A] time = 0.0339992, antiderivative size = 46, normalized size of antiderivative = 1.21, number of steps used = 2, number of rules used = 2, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$

$$x (a + bx^n)^p \left(\frac{bx^n}{a} + 1\right)^{-p} {}_2F_1\left(\frac{1}{n}, -p; 1 + \frac{1}{n}; -\frac{bx^n}{a}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^p,x]
```

```
[Out] (x*(a + b*x^n)^p*Hypergeometric2F1[n^(-1), -p, 1 + n^(-1), -((b*x
^n)/a)])/(1 + (b*x^n)/a)^p
```

Rubi in Sympy [A] time = 3.84992, size = 36, normalized size = 0.95

$$x \left(1 + \frac{bx^n}{a}\right)^{-p} (a + bx^n)^p \, {}_2F_1\left(\begin{matrix} -p, \frac{1}{n} \\ 1 + \frac{1}{n} \end{matrix}\middle| -\frac{bx^n}{a}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**n)**p,x)
```

```
[Out] x*(1 + b*x**n/a)**(-p)*(a + b*x**n)**p*hyper((-p, 1/n), (1 + 1/n,
), -b*x**n/a)
```

Mathematica [A] time = 0.0281771, size = 46, normalized size = 1.21

$$x (a + bx^n)^p \left(\frac{bx^n}{a} + 1\right)^{-p} {}_2F_1\left(\frac{1}{n}, -p; 1 + \frac{1}{n}; -\frac{bx^n}{a}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^p,x]
```

```
[Out] (x*(a + b*x^n)^p*Hypergeometric2F1[n^(-1), -p, 1 + n^(-1), -((b*x
^n)/a)])/(1 + (b*x^n)/a)^p
```

Maple [F] time = 0.094, size = 0, normalized size = 0.

$$\int (a + bx^n)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^p,x)

[Out] int((a+b*x^n)^p,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p,x, algorithm="maxima")

[Out] integrate((b*x^n + a)^p, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left((bx^n + a)^p, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p,x, algorithm="fricas")

[Out] integral((b*x^n + a)^p, x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**p,x)

[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p,x, algorithm="giac")

[Out] integrate((b*x^n + a)^p, x)
```

3.2787 $\int (cx)^{-n} (a + bx^n)^p \, dx$

Optimal. Leaf size=53

$$\frac{(cx)^{1-n} (a + bx^n)^{p+1} \, {}_2F_1\left(1, p + \frac{1}{n}; \frac{1}{n}; -\frac{bx^n}{a}\right)}{ac(1-n)}$$

```
[Out] ((c*x)^(1 - n)*(a + b*x^n)^(1 + p)*Hypergeometric2F1[1, n^(-1) +
p, n^(-1), -((b*x^n)/a)])/(a*c*(1 - n))
```

Rubi [A] time = 0.0633778, antiderivative size = 64, normalized size of antiderivative = 1.21, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{(cx)^{1-n} (a + bx^n)^p \left(\frac{bx^n}{a} + 1\right)^{-p} {}_2F_1\left(\frac{1}{n} - 1, -p; \frac{1}{n}; -\frac{bx^n}{a}\right)}{c(1-n)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^p/(c*x)^n,x]
```

```
[Out] ((c*x)^(1 - n)*(a + b*x^n)^p*Hypergeometric2F1[-1 + n^(-1), -p, n
^(-1), -((b*x^n)/a)])/(c*(1 - n)*(1 + (b*x^n)/a)^p)
```

Rubi in Sympy [A] time = 9.32617, size = 48, normalized size = 0.91

$$\frac{(cx)^{-n+1} \left(1 + \frac{bx^n}{a}\right)^{-p} (a + bx^n)^p \, {}_2F_1\left(\begin{matrix} -p, -\frac{n-1}{n} \\ \frac{1}{n} \end{matrix}\middle| -\frac{bx^n}{a}\right)}{c(-n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**n)**p/((c*x)**n),x)
```

```
[Out] (c*x)**(-n + 1)*(1 + b*x**n/a)**(-p)*(a + b*x**n)**p*hyper((-p, -
(n - 1)/n), (1/n,), -b*x**n/a)/(c*(-n + 1))
```

Mathematica [A] time = 0.132383, size = 59, normalized size = 1.11

$$-\frac{x(cx)^{-n} (a + bx^n)^p \left(\frac{bx^n}{a} + 1\right)^{-p} {}_2F_1\left(\frac{1}{n} - 1, -p; \frac{1}{n}; -\frac{bx^n}{a}\right)}{n-1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^p/(c*x)^n,x]
```

```
[Out] -((x*(a + b*x^n)^p*Hypergeometric2F1[-1 + n^(-1), -p, n^(-1), -((
b*x^n)/a)])/((-1 + n)*(c*x)^n*(1 + (b*x^n)/a)^p))
```

Maple [F] time = 0.097, size = 0, normalized size = 0.

$$\int \frac{(a + bx^n)^p}{(cx)^n} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^p/((c*x)^n),x)
```

```
[Out] int((a+b*x^n)^p/((c*x)^n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^p (cx)^{-n} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p/(c*x)^n,x, algorithm="maxima")
```

```
[Out] integrate((b*x^n + a)^p*(c*x)^(-n), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(bx^n + a)^p}{(cx)^n}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p/(c*x)^n,x, algorithm="fricas")
```

```
[Out] integral((b*x^n + a)^p/(c*x)^n, x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**p/((c*x)**n),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^n + a)^p}{(cx)^n} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p/(c*x)^n,x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^p/(c*x)^n, x)
```

3.2788 $\int (cx)^{-2n} (a + bx^n)^p \, dx$

Optimal. Leaf size=56

$$\frac{(cx)^{1-2n} (a + bx^n)^{p+1} \, {}_2F_1\left(1, p + \frac{1}{n} - 1; \frac{1}{n} - 1; -\frac{bx^n}{a}\right)}{ac(1 - 2n)}$$

```
[Out] ((c*x)^(1 - 2*n)*(a + b*x^n)^(1 + p)*Hypergeometric2F1[1, -1 + n^
(-1) + p, -1 + n^(-1), -((b*x^n)/a)])/(a*c*(1 - 2*n))
```

Rubi [A] time = 0.0682265, antiderivative size = 66, normalized size of antiderivative = 1.18, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{(cx)^{1-2n} (a + bx^n)^p \left(\frac{bx^n}{a} + 1\right)^{-p} {}_2F_1\left(\frac{1}{n} - 2, -p; \frac{1}{n} - 1; -\frac{bx^n}{a}\right)}{c(1 - 2n)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^p/(c*x)^(2*n),x]
```

```
[Out] ((c*x)^(1 - 2*n)*(a + b*x^n)^p*Hypergeometric2F1[-2 + n^(-1), -p,
 -1 + n^(-1), -((b*x^n)/a)])/(c*(1 - 2*n)*(1 + (b*x^n)/a)^p)
```

Rubi in Sympy [A] time = 9.4531, size = 53, normalized size = 0.95

$$\frac{(cx)^{-2n+1} \left(1 + \frac{bx^n}{a}\right)^{-p} (a + bx^n)^p \, {}_2F_1\left(\begin{matrix} -p, -2 + \frac{1}{n} \\ -\frac{n-1}{n} \end{matrix}\middle| -\frac{bx^n}{a}\right)}{c\,(-2n + 1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**n)**p/((c*x)**(2*n)),x)
```

```
[Out] (c*x)**(-2*n + 1)*(1 + b*x**n/a)**(-p)*(a + b*x**n)**p*hyper((-p,
 -2 + 1/n), (-(n - 1)/n,), -b*x**n/a)/(c*(-2*n + 1))
```

Mathematica [A] time = 0.200105, size = 63, normalized size = 1.12

$$-\frac{x(cx)^{-2n} (a + bx^n)^p \left(\frac{bx^n}{a} + 1\right)^{-p} {}_2F_1\left(\frac{1}{n} - 2, -p; \frac{1}{n} - 1; -\frac{bx^n}{a}\right)}{2n - 1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^p/(c*x)^(2*n),x]
```

```
[Out] -((x*(a + b*x^n)^p*Hypergeometric2F1[-2 + n^(-1), -p, -1 + n^(-1)
, -((b*x^n)/a)])/((-1 + 2*n)*(c*x)^(2*n)*(1 + (b*x^n)/a)^p))
```

Maple [F] time = 0.101, size = 0, normalized size = 0.

$$\int \frac{(a + bx^n)^p}{(cx)^{2n}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^p/((c*x)^(2*n)),x)
```

```
[Out] int((a+b*x^n)^p/((c*x)^(2*n)),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^p (cx)^{-2n} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p/(c*x)^(2*n),x, algorithm="maxima")
```

```
[Out] integrate((b*x^n + a)^p*(c*x)^(-2*n), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(bx^n + a)^p}{(cx)^{2n}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p/(c*x)^(2*n),x, algorithm="fricas")
```

```
[Out] integral((b*x^n + a)^p/(c*x)^(2*n), x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**p/((c*x)**(2*n)),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^n + a)^p}{(cx)^{2n}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p/(c*x)^(2*n),x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^p/(c*x)^(2*n), x)
```

3.2789 $\int (cx)^{-3n} (a + bx^n)^p \, dx$

Optimal. Leaf size=56

$$\frac{(cx)^{1-3n} (a + bx^n)^{p+1} \, {}_2F_1\left(1, p + \frac{1}{n} - 2; \frac{1}{n} - 2; -\frac{bx^n}{a}\right)}{ac(1 - 3n)}$$

```
[Out] ((c*x)^(1 - 3*n)*(a + b*x^n)^(1 + p)*Hypergeometric2F1[1, -2 + n^
(-1) + p, -2 + n^(-1), -((b*x^n)/a)])/(a*c*(1 - 3*n))
```

Rubi [A] time = 0.0679794, antiderivative size = 66, normalized size of antiderivative = 1.18, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$

$$\frac{(cx)^{1-3n} (a + bx^n)^p \left(\frac{bx^n}{a} + 1\right)^{-p} {}_2F_1\left(\frac{1}{n} - 3, -p; \frac{1}{n} - 2; -\frac{bx^n}{a}\right)}{c(1 - 3n)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x^n)^p/(c*x)^(3*n),x]
```

```
[Out] ((c*x)^(1 - 3*n)*(a + b*x^n)^p*Hypergeometric2F1[-3 + n^(-1), -p,
 -2 + n^(-1), -((b*x^n)/a)])/(c*(1 - 3*n)*(1 + (b*x^n)/a)^p)
```

Rubi in Sympy [A] time = 9.52405, size = 51, normalized size = 0.91

$$\frac{(cx)^{-3n+1} \left(1 + \frac{bx^n}{a}\right)^{-p} (a + bx^n)^p \, {}_2F_1\left(\left.\begin{matrix} -p, -3 + \frac{1}{n} \\ -2 + \frac{1}{n} \end{matrix}\right| -\frac{bx^n}{a}\right)}{c\,(-3n + 1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x**n)**p/((c*x)**(3*n)),x)
```

```
[Out] (c*x)**(-3*n + 1)*(1 + b*x**n/a)**(-p)*(a + b*x**n)**p*hyper((-p,
 -3 + 1/n), (-2 + 1/n,), -b*x**n/a)/(c*(-3*n + 1))
```

Mathematica [A] time = 0.32161, size = 63, normalized size = 1.12

$$-\frac{x(cx)^{-3n} (a + bx^n)^p \left(\frac{bx^n}{a} + 1\right)^{-p} {}_2F_1\left(\frac{1}{n} - 3, -p; \frac{1}{n} - 2; -\frac{bx^n}{a}\right)}{3n - 1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x^n)^p/(c*x)^(3*n),x]
```

```
[Out] -((x*(a + b*x^n)^p*Hypergeometric2F1[-3 + n^(-1), -p, -2 + n^(-1)
, -((b*x^n)/a)])/((-1 + 3*n)*(c*x)^(3*n)*(1 + (b*x^n)/a)^p))
```

Maple [F] time = 0.102, size = 0, normalized size = 0.

$$\int \frac{(a + bx^n)^p}{(cx)^{3\,n}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x^n)^p/((c*x)^(3*n)),x)
```

```
[Out] int((a+b*x^n)^p/((c*x)^(3*n)),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^p (cx)^{-3n} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p/(c*x)^(3*n),x, algorithm="maxima")
```

```
[Out] integrate((b*x^n + a)^p*(c*x)^(-3*n), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(bx^n + a)^p}{(cx)^{3n}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p/(c*x)^(3*n),x, algorithm="fricas")
```

```
[Out] integral((b*x^n + a)^p/(c*x)^(3*n), x)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*x**n)**p/((c*x)**(3*n)),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx^n + a)^p}{(cx)^{3n}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p/(c*x)^(3*n),x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^p/(c*x)^(3*n), x)
```

3.2790 $\int (cx)^{-1-np} (a+bx^n)^p \, dx$

Optimal. Leaf size=63

$$-\frac{(cx)^{-np}(a+bx^n)^p \left(\frac{bx^n}{a}+1\right)^{-p} {}_2F_1\left(-p,-p;1-p;-\frac{bx^n}{a}\right)}{cnp}$$

```
[Out] -(((a + b*x^n)^p*Hypergeometric2F1[-p, -p, 1 - p, -((b*x^n)/a)])/
(c*n*p*(c*x)^(n*p)*(1 + (b*x^n)/a)^p))
```

Rubi [A] time = 0.0656724, antiderivative size = 63, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1

$$-\frac{(cx)^{-np}(a+bx^n)^p \left(\frac{bx^n}{a}+1\right)^{-p} {}_2F_1\left(-p,-p;1-p;-\frac{bx^n}{a}\right)}{cnp}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^(-1 - n*p)*(a + b*x^n)^p,x]
```

```
[Out] -(((a + b*x^n)^p*Hypergeometric2F1[-p, -p, 1 - p, -((b*x^n)/a)])/
(c*n*p*(c*x)^(n*p)*(1 + (b*x^n)/a)^p))
```

Rubi in Sympy [A] time = 8.53604, size = 46, normalized size = 0.73

$$-\frac{(cx)^{-np}\left(1+\frac{bx^n}{a}\right)^{-p}(a+bx^n)^p \, {}_2F_1\left(\begin{matrix} -p,-p \\ -p+1 \end{matrix}\middle| -\frac{bx^n}{a}\right)}{cnp}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**(-n*p-1)*(a+b*x**n)**p,x)
```

```
[Out] -(c*x)**(-n*p)*(1 + b*x**n/a)**(-p)*(a + b*x**n)**p*hyper((-p, -p
), (-p + 1,), -b*x**n/a)/(c*n*p)
```

Mathematica [A] time = 0.059904, size = 63, normalized size = 1.

$$-\frac{x(cx)^{-np-1}(a+bx^n)^p \left(\frac{bx^n}{a}+1\right)^{-p} {}_2F_1\left(-p,-p;1-p;-\frac{bx^n}{a}\right)}{np}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^(-1 - n*p)*(a + b*x^n)^p,x]
```

```
[Out] -((x*(c*x)^(-1 - n*p)*(a + b*x^n)^p*Hypergeometric2F1[-p, -p, 1 -
 p, -((b*x^n)/a)])/(n*p*(1 + (b*x^n)/a)^p))
```

Maple [F] time = 0.104, size = 0, normalized size = 0.

$$\int (cx)^{-np-1}(a+bx^n)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^(-n*p-1)*(a+b*x^n)^p,x)

[Out] int((c*x)^(-n*p-1)*(a+b*x^n)^p,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^p (cx)^{-np-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*(c*x)^(-n*p - 1),x, algorithm="maxima")

[Out] integrate((b*x^n + a)^p*(c*x)^(-n*p - 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left((bx^n + a)^p (cx)^{-np-1}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*(c*x)^(-n*p - 1),x, algorithm="fricas")

[Out] integral((b*x^n + a)^p*(c*x)^(-n*p - 1), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**(-n*p-1)*(a+b*x**n)**p,x)

[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^p (cx)^{-np-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*(c*x)^(-n*p - 1),x, algorithm="giac")

[Out] integrate((b*x^n + a)^p*(c*x)^(-n*p - 1), x)
```

3.2791 $\int (cx)^{-1-n-np} (a + bx^n)^p \, dx$

Optimal. Leaf size=37

$$-\frac{(cx)^{-n(p+1)} (a + bx^n)^{p+1}}{acn(p + 1)}$$

```
[Out] -((a + b*x^n)^(1 + p)/(a*c*n*(1 + p)*(c*x)^(n*(1 + p))))
```

Rubi [A] time = 0.0448546, antiderivative size = 37, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.043$

$$-\frac{(cx)^{-n(p+1)} (a + bx^n)^{p+1}}{acn(p + 1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^(-1 - n - n*p)*(a + b*x^n)^p,x]

[Out] -((a + b*x^n)^(1 + p)/(a*c*n*(1 + p)*(c*x)^(n*(1 + p))))
```

Rubi in Sympy [A] time = 4.66829, size = 27, normalized size = 0.73

$$-\frac{(cx)^{-n(p+1)} (a + bx^n)^{p+1}}{acn (p + 1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**(-n*p-n-1)*(a+b*x**n)**p,x)

[Out] -(c*x)**(-n*(p + 1))*(a + b*x**n)**(p + 1)/(a*c*n*(p + 1))
```

Mathematica [A] time = 0.0806578, size = 37, normalized size = 1.

$$-\frac{x(cx)^{-n(p+1)-1} (a + bx^n)^{p+1}}{an(p + 1)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^(-1 - n - n*p)*(a + b*x^n)^p,x]

[Out] -((x*(c*x)^(-1 - n*(1 + p))*(a + b*x^n)^(1 + p))/(a*n*(1 + p)))
```

Maple [F] time = 0.104, size = 0, normalized size = 0.

$$\int (cx)^{-np-n-1} (a + bx^n)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^(-n*p-n-1)*(a+b*x^n)^p,x)

[Out] int((c*x)^(-n*p-n-1)*(a+b*x^n)^p,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^p (cx)^{-np-n-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*(c*x)^(-n*p - n - 1),x, algorithm="maxima")
```

```
[Out] integrate((b*x^n + a)^p*(c*x)^(-n*p - n - 1), x)
```

Fricas [A] time = 0.235307, size = 101, normalized size = 2.73

$$-\frac{\left(bxx^n e^{(-(np+n+1)\log(c)-(np+n+1)\log(x))} + axe^{(-(np+n+1)\log(c)-(np+n+1)\log(x))}\right)(bx^n + a)^p}{anp + an}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*(c*x)^(-n*p - n - 1),x, algorithm="fricas")
```

```
[Out] -(b*x*x^n*e^(-(n*p + n + 1)*log(c) - (n*p + n + 1)*log(x)) + a*x*
e^(-(n*p + n + 1)*log(c) - (n*p + n + 1)*log(x)))*(b*x^n + a)^p/(
a*n*p + a*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**(-n*p-n-1)*(a+b*x**n)**p,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^p (cx)^{-np-n-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*(c*x)^(-n*p - n - 1),x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^p*(c*x)^(-n*p - n - 1), x)
```

3.2792 $\int (cx)^{-1-2n-np} (a + bx^n)^p \, dx$

Optimal. Leaf size=79

$$\frac{(cx)^{-n(p+2)}(a+bx^n)^{p+2}}{a^2cn(p+1)(p+2)} - \frac{(cx)^{-n(p+2)}(a+bx^n)^{p+1}}{acn(p+1)}$$

```
[Out] -((a + b*x^n)^(1 + p)/(a*c*n*(1 + p)*(c*x)^(n*(2 + p)))) + (a + b
*x^n)^(2 + p)/(a^2*c*n*(1 + p)*(2 + p)*(c*x)^(n*(2 + p)))
```

Rubi [A] time = 0.103998, antiderivative size = 79, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.087$

$$\frac{(cx)^{-n(p+2)}(a+bx^n)^{p+2}}{a^2cn(p+1)(p+2)} - \frac{(cx)^{-n(p+2)}(a+bx^n)^{p+1}}{acn(p+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^(-1 - 2*n - n*p)*(a + b*x^n)^p,x]
```

```
[Out] -((a + b*x^n)^(1 + p)/(a*c*n*(1 + p)*(c*x)^(n*(2 + p)))) + (a + b
*x^n)^(2 + p)/(a^2*c*n*(1 + p)*(2 + p)*(c*x)^(n*(2 + p)))
```

Rubi in Sympy [A] time = 9.34479, size = 53, normalized size = 0.67

$$-\frac{(cx)^{-n(p+2)}\left(1+\frac{bx^n}{a}\right)^{-p}(a+bx^n)^p\,{}_2F_1\left(\begin{matrix}-p,-p-2\\-p-1\end{matrix}\middle|-\frac{bx^n}{a}\right)}{cn\,(p+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**(-n*p-2*n-1)*(a+b*x**n)**p,x)
```

```
[Out] -(c*x)**(-n*(p + 2))*(1 + b*x**n/a)**(-p)*(a + b*x**n)**p*hyper((
-p, -p - 2), (-p - 1,), -b*x**n/a)/(c*n*(p + 2))
```

Mathematica [C] time = 0.0885399, size = 69, normalized size = 0.87

$$-\frac{x(cx)^{-n(p+2)-1}(a+bx^n)^p\left(\frac{bx^n}{a}+1\right)^{-p}{}_2F_1\left(-p-2,-p;-p-1;-\frac{bx^n}{a}\right)}{n(p+2)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^(-1 - 2*n - n*p)*(a + b*x^n)^p,x]
```

```
[Out] -((x*(c*x)^(-1 - n*(2 + p))*(a + b*x^n)^p*Hypergeometric2F1[-2 -
p, -p, -1 - p, -((b*x^n)/a)])/(n*(2 + p)*(1 + (b*x^n)/a)^p))
```

Maple [F] time = 0.105, size = 0, normalized size = 0.

$$\int (cx)^{-np-2n-1}(a+bx^n)^p\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^(-n*p-2*n-1)*(a+b*x^n)^p,x)
```

```
[Out] int((c*x)^(-n*p-2*n-1)*(a+b*x^n)^p,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^p (cx)^{-np-2n-1} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^n + a)^p*(c*x)^(-n*p - 2*n - 1),x, algorithm="maxima")
```

```
[Out] integrate((b*x^n + a)^p*(c*x)^(-n*p - 2*n - 1), x)
```

Fricas [A] time = 0.237452, size = 194, normalized size = 2.46

$$-\frac{\left(abpxx^n e^{(-(np+2n+1)\log(c)-(np+2n+1)\log(x))} - b^2xx^{2n}e^{(-(np+2n+1)\log(c)-(np+2n+1)\log(x))} + \left(a^2p + a^2\right)xe^{(-(np+2n+1)\log(c)-(np+2n+}}{a^2np^2 + 3a^2np + 2a^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^n + a)^p*(c*x)^(-n*p - 2*n - 1),x, algorithm="fricas")
```

```
[Out] -(a*b*p*x*x^n*e^(-(n*p + 2*n + 1)*log(c) - (n*p + 2*n + 1)*log(x)
) - b^2*x*x^(2*n)*e^(-(n*p + 2*n + 1)*log(c) - (n*p + 2*n + 1)*lo
g(x)) + (a^2*p + a^2)*x*e^(-(n*p + 2*n + 1)*log(c) - (n*p + 2*n +
 1)*log(x)))*(b*x^n + a)^p/(a^2*n*p^2 + 3*a^2*n*p + 2*a^2*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**(-n*p-2*n-1)*(a+b*x**n)**p,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^p (cx)^{-np-2n-1} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*(c*x)^(-n*p - 2*n - 1),x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^p*(c*x)^(-n*p - 2*n - 1), x)
```

3.2793 $\int (cx)^{-1-3n-np} (a+bx^n)^p \, dx$

Optimal. Leaf size=127

$$-\frac{2(cx)^{-n(p+3)}(a+bx^n)^{p+3}}{a^3cn(p+1)(p+2)(p+3)}+\frac{2(cx)^{-n(p+3)}(a+bx^n)^{p+2}}{a^2cn(p+1)(p+2)}-\frac{(cx)^{-n(p+3)}(a+bx^n)^{p+1}}{acn(p+1)}$$

```
[Out] -((a + b*x^n)^(1 + p)/(a*c*n*(1 + p)*(c*x)^(n*(3 + p)))) + (2*(a
+ b*x^n)^(2 + p))/(a^2*c*n*(1 + p)*(2 + p)*(c*x)^(n*(3 + p))) - (
2*(a + b*x^n)^(3 + p))/(a^3*c*n*(1 + p)*(2 + p)*(3 + p)*(c*x)^(n*
(3 + p)))
```

Rubi [A] time = 0.195138, antiderivative size = 127, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.087$

$$-\frac{2(cx)^{-n(p+3)}(a+bx^n)^{p+3}}{a^3cn(p+1)(p+2)(p+3)}+\frac{2(cx)^{-n(p+3)}(a+bx^n)^{p+2}}{a^2cn(p+1)(p+2)}-\frac{(cx)^{-n(p+3)}(a+bx^n)^{p+1}}{acn(p+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^(-1 - 3*n - n*p)*(a + b*x^n)^p,x]
```

```
[Out] -((a + b*x^n)^(1 + p)/(a*c*n*(1 + p)*(c*x)^(n*(3 + p)))) + (2*(a
+ b*x^n)^(2 + p))/(a^2*c*n*(1 + p)*(2 + p)*(c*x)^(n*(3 + p))) - (
2*(a + b*x^n)^(3 + p))/(a^3*c*n*(1 + p)*(2 + p)*(3 + p)*(c*x)^(n*
(3 + p)))
```

Rubi in Sympy [A] time = 9.42377, size = 53, normalized size = 0.42

$$-\frac{(cx)^{-n(p+3)}\left(1+\frac{bx^n}{a}\right)^{-p}(a+bx^n)^p\,{}_2F_1\left(\begin{matrix}-p,-p-3\\-p-2\end{matrix}\middle|-\frac{bx^n}{a}\right)}{cn\,(p+3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**(-n*p-3*n-1)*(a+b*x**n)**p,x)
```

```
[Out] -(c*x)**(-n*(p + 3))*(1 + b*x**n/a)**(-p)*(a + b*x**n)**p*hyper((
-p, -p - 3), (-p - 2,), -b*x**n/a)/(c*n*(p + 3))
```

Mathematica [C] time = 0.0886295, size = 69, normalized size = 0.54

$$-\frac{x(cx)^{-n(p+3)-1}(a+bx^n)^p\left(\frac{bx^n}{a}+1\right)^{-p}{}_2F_1\left(-p-3,-p;-p-2;-\frac{bx^n}{a}\right)}{n(p+3)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^(-1 - 3*n - n*p)*(a + b*x^n)^p,x]
```

```
[Out] -((x*(c*x)^(-1 - n*(3 + p))*(a + b*x^n)^p*Hypergeometric2F1[-3 -
p, -p, -2 - p, -((b*x^n)/a)])/(n*(3 + p)*(1 + (b*x^n)/a)^p))
```

Maple [F] time = 0.105, size = 0, normalized size = 0.

$$\int (cx)^{-np-3n-1} (a+bx^n)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x)^(-n*p-3*n-1)*(a+b*x^n)^p,x)

[Out] int((c*x)^(-n*p-3*n-1)*(a+b*x^n)^p,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^p (cx)^{-np-3n-1} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^n + a)^p*(c*x)^(-n*p - 3*n - 1),x, algorithm="maxima")

[Out] integrate((b*x^n + a)^p*(c*x)^(-n*p - 3*n - 1), x)
```

Fricas [A] time = 0.237157, size = 290, normalized size = 2.28

$$\frac{\left(2\,ab^2pxx^{2\,n}e^{(-(np+3\,n+1)\log(c)-(np+3\,n+1)\log(x))} - 2\,b^3xx^{3\,n}e^{(-(np+3\,n+1)\log(c)-(np+3\,n+1)\log(x))} - \left(a^2bp^2 + a^2bp\right)xx^ne^{(-(np+3\,n+1)\log}}{a^3np^3 + 6\,a^3np^2 + 11\,a^3np + 6\,a^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^n + a)^p*(c*x)^(-n*p - 3*n - 1),x, algorithm="fricas")

[Out] (2*a*b^2*p*x*x^(2*n)*e^(-(n*p + 3*n + 1)*log(c) - (n*p + 3*n + 1)
*log(x)) - 2*b^3*x*x^(3*n)*e^(-(n*p + 3*n + 1)*log(c) - (n*p + 3*
n + 1)*log(x)) - (a^2*b*p^2 + a^2*b*p)*x*x^n*e^(-(n*p + 3*n + 1)*
log(c) - (n*p + 3*n + 1)*log(x)) - (a^3*p^2 + 3*a^3*p + 2*a^3)*x*
e^(-(n*p + 3*n + 1)*log(c) - (n*p + 3*n + 1)*log(x)))*(b*x^n + a)
^p/(a^3*n*p^3 + 6*a^3*n*p^2 + 11*a^3*n*p + 6*a^3*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x)**(-n*p-3*n-1)*(a+b*x**n)**p,x)

[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^p (cx)^{-np-3n-1} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*(c*x)^(-n*p - 3*n - 1),x, algorithm="giac")

[Out] integrate((b*x^n + a)^p*(c*x)^(-n*p - 3*n - 1), x)
```

3.2794 $\int (cx)^{-1-4n-np} (a+bx^n)^p \, dx$

Optimal. Leaf size=179

$$\frac{6(cx)^{-n(p+4)}(a+bx^n)^{p+4}}{a^4cn(p+1)(p+2)(p+3)(p+4)}-\frac{6(cx)^{-n(p+4)}(a+bx^n)^{p+3}}{a^3cn(p+1)(p+2)(p+3)}+\frac{3(cx)^{-n(p+4)}(a+bx^n)^{p+2}}{a^2cn(p+1)(p+2)}-\frac{(cx)^{-n(p+4)}(a+bx^n)^{p+1}}{acn(p+1)}$$

```
[Out] -((a + b*x^n)^(1 + p)/(a*c*n*(1 + p)*(c*x)^(n*(4 + p)))) + (3*(a
+ b*x^n)^(2 + p))/(a^2*c*n*(1 + p)*(2 + p)*(c*x)^(n*(4 + p))) - (
6*(a + b*x^n)^(3 + p))/(a^3*c*n*(1 + p)*(2 + p)*(3 + p)*(c*x)^(n*
(4 + p))) + (6*(a + b*x^n)^(4 + p))/(a^4*c*n*(1 + p)*(2 + p)*(3 +
 p)*(4 + p)*(c*x)^(n*(4 + p)))
```

Rubi [A] time = 0.316793, antiderivative size = 179, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087

$$\frac{6(cx)^{-n(p+4)}(a+bx^n)^{p+4}}{a^4cn(p+1)(p+2)(p+3)(p+4)}-\frac{6(cx)^{-n(p+4)}(a+bx^n)^{p+3}}{a^3cn(p+1)(p+2)(p+3)}+\frac{3(cx)^{-n(p+4)}(a+bx^n)^{p+2}}{a^2cn(p+1)(p+2)}-\frac{(cx)^{-n(p+4)}(a+bx^n)^{p+1}}{acn(p+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x)^(-1 - 4*n - n*p)*(a + b*x^n)^p,x]
```

```
[Out] -((a + b*x^n)^(1 + p)/(a*c*n*(1 + p)*(c*x)^(n*(4 + p)))) + (3*(a
+ b*x^n)^(2 + p))/(a^2*c*n*(1 + p)*(2 + p)*(c*x)^(n*(4 + p))) - (
6*(a + b*x^n)^(3 + p))/(a^3*c*n*(1 + p)*(2 + p)*(3 + p)*(c*x)^(n*
(4 + p))) + (6*(a + b*x^n)^(4 + p))/(a^4*c*n*(1 + p)*(2 + p)*(3 +
 p)*(4 + p)*(c*x)^(n*(4 + p)))
```

Rubi in Sympy [A] time = 9.40146, size = 53, normalized size = 0.3

$$-\frac{(cx)^{-n(p+4)}\left(1+\frac{bx^n}{a}\right)^{-p}(a+bx^n)^p\,{}_2F_1\left(\begin{matrix}-p,-p-4\\-p-3\end{matrix}\middle|-\frac{bx^n}{a}\right)}{cn\,(p+4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x)**(-n*p-4*n-1)*(a+b*x**n)**p,x)
```

```
[Out] -(c*x)**(-n*(p + 4))*(1 + b*x**n/a)**(-p)*(a + b*x**n)**p*hyper((
-p, -p - 4), (-p - 3,), -b*x**n/a)/(c*n*(p + 4))
```

Mathematica [C] time = 0.0905603, size = 69, normalized size = 0.39

$$-\frac{x(cx)^{-n(p+4)-1}(a+bx^n)^p\left(\frac{bx^n}{a}+1\right)^{-p}{}_2F_1\left(-p-4,-p;-p-3;-\frac{bx^n}{a}\right)}{n(p+4)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x)^(-1 - 4*n - n*p)*(a + b*x^n)^p,x]
```

```
[Out] -((x*(c*x)^(-1 - n*(4 + p))*(a + b*x^n)^p*Hypergeometric2F1[-4 -
p, -p, -3 - p, -((b*x^n)/a)])/(n*(4 + p)*(1 + (b*x^n)/a)^p))
```

Maple [F] time = 0.104, size = 0, normalized size = 0.

$$\int (cx)^{-np-4n-1} (a + bx^n)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*x)^(-n*p-4*n-1)*(a+b*x^n)^p,x)
```

```
[Out] int((c*x)^(-n*p-4*n-1)*(a+b*x^n)^p,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^p (cx)^{-np-4n-1} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^n + a)^p*(c*x)^(-n*p - 4*n - 1),x, algorithm="maxima")
```

```
[Out] integrate((b*x^n + a)^p*(c*x)^(-n*p - 4*n - 1), x)
```

Fricas [A] time = 0.238891, size = 397, normalized size = 2.22

$$-\frac{\left(6\,ab^3pxx^{3\,n}e^{(-(np+4\,n+1)\log(c)-(np+4\,n+1)\log(x))} - 6\,b^4xx^{4\,n}e^{(-(np+4\,n+1)\log(c)-(np+4\,n+1)\log(x))} - 3\left(a^2b^2p^2 + a^2b^2p\right)xx^{2\,n}e^{(-(np+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x^n + a)^p*(c*x)^(-n*p - 4*n - 1),x, algorithm="fricas")
```

```
[Out] -(6*a*b^3*p*x*x^(3*n)*e^(-(n*p + 4*n + 1)*log(c) - (n*p + 4*n + 1
)*log(x)) - 6*b^4*x*x^(4*n)*e^(-(n*p + 4*n + 1)*log(c) - (n*p + 4
*n + 1)*log(x)) - 3*(a^2*b^2*p^2 + a^2*b^2*p)*x*x^(2*n)*e^(-(n*p
+ 4*n + 1)*log(c) - (n*p + 4*n + 1)*log(x)) + (a^3*b*p^3 + 3*a^3*
b*p^2 + 2*a^3*b*p)*x*x^n*e^(-(n*p + 4*n + 1)*log(c) - (n*p + 4*n
+ 1)*log(x)) + (a^4*p^3 + 6*a^4*p^2 + 11*a^4*p + 6*a^4)*x*e^(-(n*
p + 4*n + 1)*log(c) - (n*p + 4*n + 1)*log(x)))*(b*x^n + a)^p/(a^4
*n*p^4 + 10*a^4*n*p^3 + 35*a^4*n*p^2 + 50*a^4*n*p + 24*a^4*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*x)**(-n*p-4*n-1)*(a+b*x**n)**p,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (bx^n + a)^p (cx)^{-np-4n-1} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x^n + a)^p*(c*x)^(-n*p - 4*n - 1),x, algorithm="giac")
```

```
[Out] integrate((b*x^n + a)^p*(c*x)^(-n*p - 4*n - 1), x)
```

3.2795 $\int \left(c(a+bx)^2\right)^{5/2} dx$

Optimal. Leaf size=30

$$\frac{c^2(a+bx)^5\sqrt{c(a+bx)^2}}{6b}$$

```
[Out] (c^2*(a + b*x)^5*Sqrt[c*(a + b*x)^2])/(6*b)
```

Rubi [A] time = 0.0323324, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$

$$\frac{c^2(a+bx)^5\sqrt{c(a+bx)^2}}{6b}$$

Antiderivative was successfully verified.

```
[In] Int[(c*(a + b*x)^2)^(5/2),x]
```

```
[Out] (c^2*(a + b*x)^5*Sqrt[c*(a + b*x)^2])/(6*b)
```

Rubi in Sympy [A] time = 2.7465, size = 36, normalized size = 1.2

$$\frac{(2a+2bx)\left(a^2c+2abcx+b^2cx^2\right)^{\frac{5}{2}}}{12b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((c*(b*x+a)**2)**(5/2),x)
```

```
[Out] (2*a + 2*b*x)*(a**2*c + 2*a*b*c*x + b**2*c*x**2)**(5/2)/(12*b)
```

Mathematica [A] time = 0.0352266, size = 25, normalized size = 0.83

$$\frac{(a+bx)\left(c(a+bx)^2\right)^{5/2}}{6b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*(a + b*x)^2)^(5/2),x]
```

```
[Out] ((a + b*x)*(c*(a + b*x)^2)^(5/2))/(6*b)
```

Maple [B] time = 0.007, size = 73, normalized size = 2.4

$$\frac{x\left(b^5x^5+6\,ab^4x^4+15\,a^2b^3x^3+20\,a^3b^2x^2+15\,a^4bx+6\,a^5\right)}{6\,(bx+a)^5}\left(c\,(bx+a)^2\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*(b*x+a)^2)^(5/2),x)
```

```
[Out] 1/6*x*(b^5*x^5+6*a*b^4*x^4+15*a^2*b^3*x^3+20*a^3*b^2*x^2+15*a^4*b
*x+6*a^5)*(c*(b*x+a)^2)^(5/2)/(b*x+a)^5
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x + a)^2*c)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.210082, size = 139, normalized size = 4.63

$$\frac{\left(b^5c^2x^6 + 6\,ab^4c^2x^5 + 15\,a^2b^3c^2x^4 + 20\,a^3b^2c^2x^3 + 15\,a^4bc^2x^2 + 6\,a^5c^2x\right)\sqrt{b^2cx^2 + 2\,abcx + a^2c}}{6\,(bx + a)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x + a)^2*c)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/6*(b^5*c^2*x^6 + 6*a*b^4*c^2*x^5 + 15*a^2*b^3*c^2*x^4 + 20*a^3*
b^2*c^2*x^3 + 15*a^4*b*c^2*x^2 + 6*a^5*c^2*x)*sqrt(b^2*c*x^2 + 2*
a*b*c*x + a^2*c)/(b*x + a)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*(b*x+a)**2)**(5/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.218288, size = 174, normalized size = 5.8

$$\frac{1}{6}\left(b^5c^2x^6\mathrm{sign}\left(bx + a\right) + 6\,ab^4c^2x^5\mathrm{sign}\left(bx + a\right) + 15\,a^2b^3c^2x^4\mathrm{sign}\left(bx + a\right) + 20\,a^3b^2c^2x^3\mathrm{sign}\left(bx + a\right) + 15\,a^4bc^2x^2\mathrm{sign}\left(bx\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x + a)^2*c)^(5/2),x, algorithm="giac")
```

```
[Out] 1/6*(b^5*c^2*x^6*sign(b*x + a) + 6*a*b^4*c^2*x^5*sign(b*x + a) +
15*a^2*b^3*c^2*x^4*sign(b*x + a) + 20*a^3*b^2*c^2*x^3*sign(b*x +
a) + 15*a^4*b*c^2*x^2*sign(b*x + a) + 6*a^5*c^2*x*sign(b*x + a) +
 a^6*c^2*sign(b*x + a)/b)*sqrt(c)
```

3.2796 $\int \left(c(a+bx)^2\right)^{3/2}\,dx$

Optimal. Leaf size=28

$$\frac{c(a+bx)^3\sqrt{c(a+bx)^2}}{4b}$$

```
[Out] (c*(a + b*x)^3*Sqrt[c*(a + b*x)^2])/(4*b)
```

Rubi [A] time = 0.0286164, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{c(a+bx)^3\sqrt{c(a+bx)^2}}{4b}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*(a + b*x)^2)^(3/2),x]

[Out] (c*(a + b*x)^3*Sqrt[c*(a + b*x)^2])/(4*b)
```

Rubi in Sympy [A] time = 2.7658, size = 36, normalized size = 1.29

$$\frac{(2a+2bx)\left(a^2c+2abcx+b^2cx^2\right)^{\frac{3}{2}}}{8b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*(b*x+a)**2)**(3/2),x)

[Out] (2*a + 2*b*x)*(a**2*c + 2*a*b*c*x + b**2*c*x**2)**(3/2)/(8*b)
```

Mathematica [A] time = 0.0186441, size = 25, normalized size = 0.89

$$\frac{(a+bx)\left(c(a+bx)^2\right)^{3/2}}{4b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*(a + b*x)^2)^(3/2),x]

[Out] ((a + b*x)*(c*(a + b*x)^2)^(3/2))/(4*b)
```

Maple [B] time = 0.005, size = 51, normalized size = 1.8

$$\frac{x\left(b^3x^3+4\,ab^2x^2+6\,a^2bx+4\,a^3\right)}{4\,(bx+a)^3}\left(c\,(bx+a)^2\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*(b*x+a)^2)^(3/2),x)
```

```
[Out] 1/4*x*(b^3*x^3+4*a*b^2*x^2+6*a^2*b*x+4*a^3)*(c*(b*x+a)^2)^(3/2)/(
b*x+a)^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x + a)^2*c)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.212155, size = 90, normalized size = 3.21

$$\frac{\left(b^3cx^4 + 4\,ab^2cx^3 + 6\,a^2bcx^2 + 4\,a^3cx\right)\sqrt{b^2cx^2 + 2\,abcx + a^2c}}{4\,(bx + a)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x + a)^2*c)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/4*(b^3*c*x^4 + 4*a*b^2*c*x^3 + 6*a^2*b*c*x^2 + 4*a^3*c*x)*sqrt(
b^2*c*x^2 + 2*a*b*c*x + a^2*c)/(b*x + a)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \left(c\,(a + bx)^2\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*(b*x+a)**2)**(3/2),x)
```

```
[Out] Integral((c*(a + b*x)**2)**(3/2), x)
```

GIAC/XCAS [A] time = 0.217388, size = 28, normalized size = 1.

$$\frac{(bx + a)^4 c^{\frac{3}{2}}\,\mathrm{sign}\,(bx + a)}{4\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x + a)^2*c)^(3/2),x, algorithm="giac")
```

```
[Out] 1/4*(b*x + a)^4*c^(3/2)*sign(b*x + a)/b
```

3.2797 $\int \sqrt{c(a+bx)^2}\,dx$

Optimal. Leaf size=25

$$\frac{(a+bx)\sqrt{c(a+bx)^2}}{2b}$$

```
[Out] ((a + b*x)*Sqrt[c*(a + b*x)^2])/(2*b)
```

Rubi [A] time = 0.0257906, antiderivative size = 25, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$

$$\frac{(a+bx)\sqrt{c(a+bx)^2}}{2b}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[c*(a + b*x)^2],x]

[Out] ((a + b*x)*Sqrt[c*(a + b*x)^2])/(2*b)
```

Rubi in Sympy [A] time = 2.74969, size = 36, normalized size = 1.44

$$\frac{(2a+2bx)\sqrt{a^2c+2abcx+b^2cx^2}}{4b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*(b*x+a)**2)**(1/2),x)

[Out] (2*a + 2*b*x)*sqrt(a**2*c + 2*a*b*c*x + b**2*c*x**2)/(4*b)
```

Mathematica [A] time = 0.0223195, size = 31, normalized size = 1.24

$$\frac{cx(a+bx)(2a+bx)}{2\sqrt{c(a+bx)^2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[c*(a + b*x)^2],x]

[Out] (c*x*(a + b*x)*(2*a + b*x))/(2*Sqrt[c*(a + b*x)^2])
```

Maple [A] time = 0.004, size = 29, normalized size = 1.2

$$\frac{x(bx+2a)}{2bx+2a}\sqrt{c(bx+a)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*(b*x+a)^2)^(1/2),x)

[Out] 1/2*x*(b*x+2*a)*(c*(b*x+a)^2)^(1/2)/(b*x+a)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((b*x + a)^2*c),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.211785, size = 55, normalized size = 2.2

$$\frac{\sqrt{b^2cx^2 + 2\,abcx + a^2c}\left(bx^2 + 2\,ax\right)}{2\,(bx + a)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((b*x + a)^2*c),x, algorithm="fricas")
```

```
[Out] 1/2*sqrt(b^2*c*x^2 + 2*a*b*c*x + a^2*c)*(b*x^2 + 2*a*x)/(b*x + a)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{c\,(a + bx)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*(b*x+a)**2)**(1/2),x)
```

```
[Out] Integral(sqrt(c*(a + b*x)**2), x)
```

GIAC/XCAS [A] time = 0.217353, size = 49, normalized size = 1.96

$$\frac{1}{2}\left(\left(bx^2 + 2\,ax\right)\mathrm{sign}\left(bx + a\right) + \frac{a^2\mathrm{sign}\left(bx + a\right)}{b}\right)\sqrt{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((b*x + a)^2*c),x, algorithm="giac")
```

```
[Out] 1/2*((b*x^2 + 2*a*x)*sign(b*x + a) + a^2*sign(b*x + a)/b)*sqrt(c)
```

3.2798 $\int \frac{1}{\sqrt{c(a+bx)^2}} dx$

Optimal. Leaf size=28

$$\frac{(a+bx)\log(a+bx)}{b\sqrt{c(a+bx)^2}}$$

```
[Out] ((a + b*x)*Log[a + b*x])/(b*Sqrt[c*(a + b*x)^2])
```

Rubi [A] time = 0.0288452, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{(a+bx)\log(a+bx)}{b\sqrt{c(a+bx)^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[c*(a + b*x)^2],x]

[Out] ((a + b*x)*Log[a + b*x])/(b*Sqrt[c*(a + b*x)^2])
```

Rubi in Sympy [A] time = 4.03479, size = 37, normalized size = 1.32

$$\frac{(a+bx)\log(a+bx)}{b\sqrt{a^2c+2abcx+b^2cx^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(c*(b*x+a)**2)**(1/2),x)

[Out] (a + b*x)*log(a + b*x)/(b*sqrt(a**2*c + 2*a*b*c*x + b**2*c*x**2))
```

Mathematica [A] time = 0.0108394, size = 28, normalized size = 1.

$$\frac{(a+bx)\log(a+bx)}{b\sqrt{c(a+bx)^2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/Sqrt[c*(a + b*x)^2],x]

[Out] ((a + b*x)*Log[a + b*x])/(b*Sqrt[c*(a + b*x)^2])
```

Maple [A] time = 0.011, size = 27, normalized size = 1.

$$\frac{(bx+a)\ln(bx+a)}{b}\frac{1}{\sqrt{c(bx+a)^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(c*(b*x+a)^2)^(1/2),x)
```

```
[Out] (b*x+a)*ln(b*x+a)/b/(c*(b*x+a)^2)^(1/2)
```

Maxima [A] time = 1.35333, size = 24, normalized size = 0.86

$$\sqrt{\frac{1}{b^2c}}\log\left(x+\frac{a}{b}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt((b*x + a)^2*c),x, algorithm="maxima")
```

```
[Out] sqrt(1/(b^2*c))*log(x + a/b)
```

Fricas [A] time = 0.213904, size = 57, normalized size = 2.04

$$\frac{\sqrt{b^2cx^2+2\,abcx+a^2c}\log\left(bx+a\right)}{b^2cx+abc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt((b*x + a)^2*c),x, algorithm="fricas")
```

```
[Out] sqrt(b^2*c*x^2 + 2*a*b*c*x + a^2*c)*log(b*x + a)/(b^2*c*x + a*b*c
)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\sqrt{c\left(a+bx\right)^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(c*(b*x+a)**2)**(1/2),x)
```

```
[Out] Integral(1/sqrt(c*(a + b*x)**2), x)
```

GIAC/XCAS [A] time = 0.218425, size = 45, normalized size = 1.61

$$\frac{\ln\left(\sqrt{c}|bx+a||\mathrm{sign}\left(bx+a\right)|\right)}{b\sqrt{c}\mathrm{sign}\left(bx+a\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt((b*x + a)^2*c),x, algorithm="giac")
```

```
[Out] ln(sqrt(c)*abs(b*x + a)*abs(sign(b*x + a)))/(b*sqrt(c)*sign(b*x +
 a))
```

3.2799 $\int \frac{1}{(c(a+bx)^2)^{3/2}}\,dx$

Optimal. Leaf size=30

$$-\frac{1}{2bc(a+bx)\sqrt{c(a+bx)^2}}$$

```
[Out] -1/(2*b*c*(a + b*x)*Sqrt[c*(a + b*x)^2])
```

Rubi [A] time = 0.0304208, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$

$$-\frac{1}{2bc(a+bx)\sqrt{c(a+bx)^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*(a + b*x)^2)^(-3/2),x]

[Out] -1/(2*b*c*(a + b*x)*Sqrt[c*(a + b*x)^2])
```

Rubi in Sympy [A] time = 2.7823, size = 37, normalized size = 1.23

$$-\frac{2a+2bx}{4b\left(a^2c+2abcx+b^2cx^2\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(c*(b*x+a)**2)**(3/2),x)

[Out] -(2*a + 2*b*x)/(4*b*(a**2*c + 2*a*b*c*x + b**2*c*x**2)**(3/2))
```

Mathematica [A] time = 0.0149022, size = 25, normalized size = 0.83

$$-\frac{a+bx}{2b\left(c(a+bx)^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*(a + b*x)^2)^(-3/2),x]

[Out] -(a + b*x)/(2*b*(c*(a + b*x)^2)^(3/2))
```

Maple [A] time = 0.005, size = 22, normalized size = 0.7

$$-\frac{bx+a}{2\,b}\left(c\left(bx+a\right)^2\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(c*(b*x+a)^2)^(3/2),x)

[Out] -1/2*(b*x+a)/b/(c*(b*x+a)^2)^(3/2)
```

Maxima [A] time = 1.34432, size = 24, normalized size = 0.8

$$-\frac{1}{2\,(b^2c)^{\frac{3}{2}}\left(x+\frac{a}{b}\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x + a)^2*c)^(-3/2),x, algorithm="maxima")
```

```
[Out] -1/2/((b^2*c)^(3/2)*(x + a/b)^2)
```

Fricas [A] time = 0.215344, size = 93, normalized size = 3.1

$$-\frac{\sqrt{b^2cx^2+2\,abcx+a^2c}}{2\,(b^4c^2x^3+3\,ab^3c^2x^2+3\,a^2b^2c^2x+a^3bc^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x + a)^2*c)^(-3/2),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(b^2*c*x^2 + 2*a*b*c*x + a^2*c)/(b^4*c^2*x^3 + 3*a*b^3*c
^2*x^2 + 3*a^2*b^2*c^2*x + a^3*b*c^2)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\left(c\,(a+bx)^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(c*(b*x+a)**2)**(3/2),x)
```

```
[Out] Integral((c*(a + b*x)**2)**(-3/2), x)
```

GIAC/XCAS [A] time = 0.554574, size = 4, normalized size = 0.13

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x + a)^2*c)^(-3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

3.2800 $\int \frac{1}{(c(a+bx)^2)^{5/2}}\,dx$

Optimal. Leaf size=30

$$-\frac{1}{4bc^2(a+bx)^3\sqrt{c(a+bx)^2}}$$

```
[Out] -1/(4*b*c^2*(a + b*x)^3*Sqrt[c*(a + b*x)^2])
```

Rubi [A] time = 0.0307744, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$

$$-\frac{1}{4bc^2(a+bx)^3\sqrt{c(a+bx)^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*(a + b*x)^2)^(-5/2),x]

[Out] -1/(4*b*c^2*(a + b*x)^3*Sqrt[c*(a + b*x)^2])
```

Rubi in Sympy [A] time = 2.74811, size = 37, normalized size = 1.23

$$-\frac{2a+2bx}{8b\left(a^2c+2abcx+b^2cx^2\right)^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(c*(b*x+a)**2)**(5/2),x)

[Out] -(2*a + 2*b*x)/(8*b*(a**2*c + 2*a*b*c*x + b**2*c*x**2)**(5/2))
```

Mathematica [A] time = 0.0217752, size = 25, normalized size = 0.83

$$-\frac{a+bx}{4b\left(c(a+bx)^2\right)^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*(a + b*x)^2)^(-5/2),x]

[Out] -(a + b*x)/(4*b*(c*(a + b*x)^2)^(5/2))
```

Maple [A] time = 0.007, size = 22, normalized size = 0.7

$$-\frac{bx+a}{4\,b}\left(c\,(bx+a)^2\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(c*(b*x+a)^2)^(5/2),x)

[Out] -1/4*(b*x+a)/b/(c*(b*x+a)^2)^(5/2)
```

Maxima [A] time = 1.41222, size = 24, normalized size = 0.8

$$-\frac{1}{4\,\left(b^2c\right)^{\frac{5}{2}}\left(x+\frac{a}{b}\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x + a)^2*c)^(-5/2),x, algorithm="maxima")
```

```
[Out] -1/4/((b^2*c)^(5/2)*(x + a/b)^4)
```

Fricas [A] time = 0.21454, size = 131, normalized size = 4.37

$$-\frac{\sqrt{b^2cx^2+2\,abcx+a^2c}}{4\,\left(b^6c^3x^5+5\,ab^5c^3x^4+10\,a^2b^4c^3x^3+10\,a^3b^3c^3x^2+5\,a^4b^2c^3x+a^5bc^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x + a)^2*c)^(-5/2),x, algorithm="fricas")
```

```
[Out] -1/4*sqrt(b^2*c*x^2 + 2*a*b*c*x + a^2*c)/(b^6*c^3*x^5 + 5*a*b^5*c
^3*x^4 + 10*a^2*b^4*c^3*x^3 + 10*a^3*b^3*c^3*x^2 + 5*a^4*b^2*c^3*
x + a^5*b*c^3)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(c\,(a+bx)^2\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(c*(b*x+a)**2)**(5/2),x)
```

```
[Out] Integral((c*(a + b*x)**2)**(-5/2), x)
```

GIAC/XCAS [A] time = 0.562534, size = 4, normalized size = 0.13

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x + a)^2*c)^(-5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

3.2801 $\int \sqrt{(3+5x)^2}\,dx$

Optimal. Leaf size=20

$$\frac{1}{10}(5x+3)\sqrt{(5x+3)^2}$$

```
[Out] ((3 + 5*x)*Sqrt[(3 + 5*x)^2])/10
```

Rubi [A] time = 0.0143624, antiderivative size = 20, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.273$

$$\frac{1}{10}(5x+3)\sqrt{(5x+3)^2}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[(3 + 5*x)^2],x]

[Out] ((3 + 5*x)*Sqrt[(3 + 5*x)^2])/10
```

Rubi in Sympy [A] time = 1.38744, size = 19, normalized size = 0.95

$$\frac{(50x+30)\sqrt{25x^2+30x+9}}{100}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(((3+5*x)**2)**(1/2),x)

[Out] (50*x + 30)*sqrt(25*x**2 + 30*x + 9)/100
```

Mathematica [A] time = 0.0145698, size = 25, normalized size = 1.25

$$\frac{x\sqrt{(5x+3)^2}(5x+6)}{10x+6}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[(3 + 5*x)^2],x]

[Out] (x*Sqrt[(3 + 5*x)^2]*(6 + 5*x))/(6 + 10*x)
```

Maple [A] time = 0.004, size = 25, normalized size = 1.3

$$\frac{x(5x+6)}{6+10x}\sqrt{(3+5x)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((3+5*x)^2)^(1/2),x)

[Out] 1/2*x*(5*x+6)*((3+5*x)^2)^(1/2)/(3+5*x)
```

Maxima [A] time = 1.51976, size = 41, normalized size = 2.05

$$\frac{1}{2}\sqrt{25\,x^2+30\,x+9}x+\frac{3}{10}\sqrt{25\,x^2+30\,x+9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((5*x + 3)^2),x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(25*x^2 + 30*x + 9)*x + 3/10*sqrt(25*x^2 + 30*x + 9)
```

Fricas [A] time = 0.208223, size = 12, normalized size = 0.6

$$\frac{5}{2}\,x^2+3\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((5*x + 3)^2),x, algorithm="fricas")
```

```
[Out] 5/2*x^2 + 3*x
```

Sympy [A] time = 0.095481, size = 8, normalized size = 0.4

$$\frac{5x^2}{2}+3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((3+5*x)**2)**(1/2),x)
```

```
[Out] 5*x**2/2 + 3*x
```

GIAC/XCAS [A] time = 0.217768, size = 35, normalized size = 1.75

$$\frac{1}{2}\left(5\,x^2+6\,x\right)\operatorname{sign}\left(5\,x+3\right)+\frac{9}{10}\operatorname{sign}\left(5\,x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((5*x + 3)^2),x, algorithm="giac")
```

```
[Out] 1/2*(5*x^2 + 6*x)*sign(5*x + 3) + 9/10*sign(5*x + 3)
```

3.2802 $\int \sqrt{(6+10x)^2}\,dx$

Optimal. Leaf size=20

$$\frac{1}{5}(5x+3)\sqrt{(5x+3)^2}$$

```
[Out] ((3 + 5*x)*Sqrt[(3 + 5*x)^2])/5
```

Rubi [A] time = 0.0134281, antiderivative size = 20, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.273$

$$\frac{1}{5}(5x+3)\sqrt{(5x+3)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[(6 + 10*x)^2],x]

[Out] ((3 + 5*x)*Sqrt[(3 + 5*x)^2])/5
```

Rubi in Sympy [A] time = 1.4266, size = 19, normalized size = 0.95

$$\frac{(200x+120)\sqrt{100x^2+120x+36}}{400}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(((6+10*x)**2)**(1/2),x)

[Out] (200*x + 120)*sqrt(100*x**2 + 120*x + 36)/400
```

Mathematica [A] time = 0.00919343, size = 25, normalized size = 1.25

$$\frac{x\sqrt{(5x+3)^2}(5x+6)}{5x+3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[(6 + 10*x)^2],x]

[Out] (x*Sqrt[(3 + 5*x)^2]*(6 + 5*x))/(3 + 5*x)
```

Maple [A] time = 0.003, size = 24, normalized size = 1.2

$$\frac{x(5x+6)}{3+5x}\sqrt{(3+5x)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(((6+10*x)^2)^(1/2),x)

[Out] x*(5*x+6)*((3+5*x)^2)^(1/2)/(3+5*x)
```

Maxima [A] time = 1.49382, size = 39, normalized size = 1.95

$$\sqrt{25\,x^2+30\,x+9}x+\frac{3}{5}\,\sqrt{25\,x^2+30\,x+9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(2*sqrt((5*x + 3)^2),x, algorithm="maxima")
```

```
[Out] sqrt(25*x^2 + 30*x + 9)*x + 3/5*sqrt(25*x^2 + 30*x + 9)
```

Fricas [A] time = 0.209063, size = 12, normalized size = 0.6

$$5\,x^2+6\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(2*sqrt((5*x + 3)^2),x, algorithm="fricas")
```

```
[Out] 5*x^2 + 6*x
```

Sympy [A] time = 0.098585, size = 7, normalized size = 0.35

$$5x^2+6x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((6+10*x)**2)**(1/2),x)
```

```
[Out] 5*x**2 + 6*x
```

GIAC/XCAS [A] time = 0.216737, size = 34, normalized size = 1.7

$$\left(5\,x^2+6\,x\right)\mathrm{sign}\left(5\,x+3\right)+\frac{9}{5}\,\mathrm{sign}\left(5\,x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(2*sqrt((5*x + 3)^2),x, algorithm="giac")
```

```
[Out] (5*x^2 + 6*x)*sign(5*x + 3) + 9/5*sign(5*x + 3)
```

3.2803 $\int \frac{1}{\sqrt{(3+5x)^2}}\,dx$

Optimal. Leaf size=26

$$\frac{(5x+3)\log(5x+3)}{5\sqrt{(5x+3)^2}}$$

```
[Out] ((3 + 5*x)*Log[3 + 5*x])/(5*Sqrt[(3 + 5*x)^2])
```

Rubi [A] time = 0.0162103, antiderivative size = 26, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273

$$\frac{(5x+3)\log(5x+3)}{5\sqrt{(5x+3)^2}}$$

Antiderivative was successfully verified.

```
[In] Int[1/Sqrt[(3 + 5*x)^2],x]

[Out] ((3 + 5*x)*Log[3 + 5*x])/(5*Sqrt[(3 + 5*x)^2])
```

Rubi in Sympy [A] time = 1.75355, size = 26, normalized size = 1.

$$\frac{(25x+15)\log(5x+3)}{25\sqrt{25x^2+30x+9}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/((3+5*x)**2)**(1/2),x)

[Out] (25*x + 15)*log(5*x + 3)/(25*sqrt(25*x**2 + 30*x + 9))
```

Mathematica [A] time = 0.0130783, size = 26, normalized size = 1.

$$\frac{(5x+3)\log(5x+3)}{5\sqrt{(5x+3)^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/Sqrt[(3 + 5*x)^2],x]

[Out] ((3 + 5*x)*Log[3 + 5*x])/(5*Sqrt[(3 + 5*x)^2])
```

Maple [A] time = 0.008, size = 23, normalized size = 0.9

$$\frac{(3+5x)\ln(3+5x)}{5}\frac{1}{\sqrt{(3+5x)^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((3+5*x)^2)^(1/2),x)
```

```
[Out] 1/5*(3+5*x)*ln(3+5*x)/((3+5*x)^2)^(1/2)
```

Maxima [A] time = 1.4816, size = 8, normalized size = 0.31

$$\frac{1}{5}\log\left(x+\frac{3}{5}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt((5*x + 3)^2),x, algorithm="maxima")
```

```
[Out] 1/5*log(x + 3/5)
```

Fricas [A] time = 0.214323, size = 11, normalized size = 0.42

$$\frac{1}{5}\log\left(5x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt((5*x + 3)^2),x, algorithm="fricas")
```

```
[Out] 1/5*log(5*x + 3)
```

Sympy [A] time = 0.106889, size = 7, normalized size = 0.27

$$\frac{\log\left(5x+3\right)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((3+5*x)**2)**(1/2),x)
```

```
[Out] log(5*x + 3)/5
```

GIAC/XCAS [A] time = 0.216018, size = 20, normalized size = 0.77

$$\frac{1}{5}\ln\left(|5x+3|\right)\operatorname{sign}\left(5x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt((5*x + 3)^2),x, algorithm="giac")
```

```
[Out] 1/5*ln(abs(5*x + 3))*sign(5*x + 3)
```

3.2804 $\int \frac{1}{\sqrt{(6+10x)^2}}\,dx$

Optimal. Leaf size=26

$$\frac{(5x+3)\log(5x+3)}{10\sqrt{(5x+3)^2}}$$

```
[Out] ((3 + 5*x)*Log[3 + 5*x])/(10*Sqrt[(3 + 5*x)^2])
```

Rubi [A] time = 0.0165697, antiderivative size = 26, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273

$$\frac{(5x+3)\log(10x+6)}{10\sqrt{(5x+3)^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[(6 + 10*x)^2],x]

[Out] ((3 + 5*x)*Log[6 + 10*x])/(10*Sqrt[(3 + 5*x)^2])
```

Rubi in Sympy [A] time = 1.77435, size = 26, normalized size = 1.

$$\frac{(100x+60)\log(5x+3)}{100\sqrt{100x^2+120x+36}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/((6+10*x)**2)**(1/2),x)

[Out] (100*x + 60)*log(5*x + 3)/(100*sqrt(100*x**2 + 120*x + 36))
```

Mathematica [A] time = 0.0121235, size = 26, normalized size = 1.

$$\frac{(10x+6)\log(10x+6)}{10\sqrt{(10x+6)^2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/Sqrt[(6 + 10*x)^2],x]

[Out] ((6 + 10*x)*Log[6 + 10*x])/(10*Sqrt[(6 + 10*x)^2])
```

Maple [A] time = 0.005, size = 26, normalized size = 1.

$$\frac{(3+5x)\sqrt{4}\ln(3+5x)}{20}\frac{1}{\sqrt{(3+5x)^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/((6+10*x)^2)^(1/2),x)
```

```
[Out] 1/20/((3+5*x)^2)^(1/2)*(3+5*x)*4^(1/2)*ln(3+5*x)
```

Maxima [A] time = 1.47944, size = 8, normalized size = 0.31

$$\frac{1}{10}\log\left(x+\frac{3}{5}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/2/sqrt((5*x + 3)^2),x, algorithm="maxima")
```

```
[Out] 1/10*log(x + 3/5)
```

Fricas [A] time = 0.211059, size = 11, normalized size = 0.42

$$\frac{1}{10}\log\left(5x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/2/sqrt((5*x + 3)^2),x, algorithm="fricas")
```

```
[Out] 1/10*log(5*x + 3)
```

Sympy [A] time = 0.101199, size = 7, normalized size = 0.27

$$\frac{\log\left(10x+6\right)}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((6+10*x)**2)**(1/2),x)
```

```
[Out] log(10*x + 6)/10
```

GIAC/XCAS [A] time = 0.215447, size = 20, normalized size = 0.77

$$\frac{1}{10}\ln\left(|5x+3|\right)\mathrm{sign}\left(5x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/2/sqrt((5*x + 3)^2),x, algorithm="giac")
```

```
[Out] 1/10*ln(abs(5*x + 3))*sign(5*x + 3)
```

3.2805 $\int \frac{1}{\sqrt{-(2+3x)^2}} dx$

Optimal. Leaf size=28

$$\frac{(3x+2)\log(3x+2)}{3\sqrt{-(3x+2)^2}}$$

```
[Out] ((2 + 3*x)*Log[2 + 3*x])/(3*Sqrt[-(2 + 3*x)^2])
```

Rubi [A] time = 0.0206008, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$

$$\frac{(3x+2)\log(3x+2)}{3\sqrt{-(3x+2)^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[-(2 + 3*x)^2],x]

[Out] ((2 + 3*x)*Log[2 + 3*x])/(3*Sqrt[-(2 + 3*x)^2])
```

Rubi in Sympy [A] time = 1.86288, size = 27, normalized size = 0.96

$$\frac{(9x+6)\log(3x+2)}{9\sqrt{-9x^2-12x-4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(-(2+3*x)**2)**(1/2),x)

[Out] (9*x + 6)*log(3*x + 2)/(9*sqrt(-9*x**2 - 12*x - 4))
```

Mathematica [A] time = 0.0106782, size = 28, normalized size = 1.

$$\frac{(3x+2)\log(3x+2)}{3\sqrt{-(3x+2)^2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/Sqrt[-(2 + 3*x)^2],x]

[Out] ((2 + 3*x)*Log[2 + 3*x])/(3*Sqrt[-(2 + 3*x)^2])
```

Maple [A] time = 0.009, size = 25, normalized size = 0.9

$$\frac{(2+3x)\ln(2+3x)}{3}\frac{1}{\sqrt{-(2+3x)^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(-(2+3*x)^2)^(1/2),x)
```

```
[Out] 1/3*(2+3*x)*ln(2+3*x)/(-(2+3*x)^2)^(1/2)
```

Maxima [A] time = 7.13664, size = 8, normalized size = 0.29

$$\frac{1}{3}i\log\left(x+\frac{2}{3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(-(3*x + 2)^2),x, algorithm="maxima")
```

```
[Out] 1/3*I*log(x + 2/3)
```

Fricas [A] time = 0.208803, size = 8, normalized size = 0.29

$$-\frac{1}{3}i\log\left(x+\frac{2}{3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(-(3*x + 2)^2),x, algorithm="fricas")
```

```
[Out] -1/3*I*log(x + 2/3)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\sqrt{-(3x+2)^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(-(2+3*x)**2)**(1/2),x)
```

```
[Out] Integral(1/sqrt(-(3*x + 2)**2), x)
```

GIAC/XCAS [A] time = 0.219437, size = 31, normalized size = 1.11

$$\frac{i\ln\left((-3i\,x-2i)\operatorname{sign}\left(-3\,x-2\right)\right)}{3\operatorname{sign}\left(-3\,x-2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(-(3*x + 2)^2),x, algorithm="giac")
```

```
[Out] 1/3*I*ln((-3*I*x - 2*I)*sign(-3*x - 2))/sign(-3*x - 2)
```

3.2806 $\int \left(c(a+bx)^3\right)^{5/2} dx$

Optimal. Leaf size=30

$$\frac{2c^2(a+bx)^7\sqrt{c(a+bx)^3}}{17b}$$

```
[Out] (2*c^2*(a + b*x)^7*Sqrt[c*(a + b*x)^3])/(17*b)
```

Rubi [A] time = 0.0348145, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$

$$\frac{2c^2(a+bx)^7\sqrt{c(a+bx)^3}}{17b}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*(a + b*x)^3)^(5/2),x]
```

```
[Out] (2*c^2*(a + b*x)^7*Sqrt[c*(a + b*x)^3])/(17*b)
```

Rubi in Sympy [A] time = 9.25371, size = 51, normalized size = 1.7

$$\frac{2\left(3a+3bx\right)\left(a^3c+3a^2bcx+3ab^2cx^2+b^3cx^3\right)^{\frac{5}{2}}}{51b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*(b*x+a)**3)**(5/2),x)
```

```
[Out] 2*(3*a + 3*b*x)*(a**3*c + 3*a**2*b*c*x + 3*a*b**2*c*x**2 + b**3*c
*x**3)**(5/2)/(51*b)
```

Mathematica [A] time = 0.051539, size = 25, normalized size = 0.83

$$\frac{2(a+bx)\left(c(a+bx)^3\right)^{5/2}}{17b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*(a + b*x)^3)^(5/2),x]
```

```
[Out] (2*(a + b*x)*(c*(a + b*x)^3)^(5/2))/(17*b)
```

Maple [A] time = 0.006, size = 22, normalized size = 0.7

$$\frac{2\,bx+2\,a}{17\,b}\left(c\left(bx+a\right)^3\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*(b*x+a)^3)^(5/2),x)
```

```
[Out] 2/17*(b*x+a)*(c*(b*x+a)^3)^(5/2)/b
```

Maxima [A] time = 1.42313, size = 146, normalized size = 4.87

$$\frac{2\left(b^{7}c^{\frac{5}{2}}x^{7}+7\,ab^{6}c^{\frac{5}{2}}x^{6}+21\,a^{2}b^{5}c^{\frac{5}{2}}x^{5}+35\,a^{3}b^{4}c^{\frac{5}{2}}x^{4}+35\,a^{4}b^{3}c^{\frac{5}{2}}x^{3}+21\,a^{5}b^{2}c^{\frac{5}{2}}x^{2}+7\,a^{6}bc^{\frac{5}{2}}x+a^{7}c^{\frac{5}{2}}\right)(bx+a)^{\frac{3}{2}}}{17\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x + a)^3*c)^(5/2),x, algorithm="maxima")
```

```
[Out] 2/17*(b^7*c^(5/2)*x^7 + 7*a*b^6*c^(5/2)*x^6 + 21*a^2*b^5*c^(5/2)*
x^5 + 35*a^3*b^4*c^(5/2)*x^4 + 35*a^4*b^3*c^(5/2)*x^3 + 21*a^5*b^
2*c^(5/2)*x^2 + 7*a^6*b*c^(5/2)*x + a^7*c^(5/2))*(b*x + a)^(3/2)/
b
```

Fricas [A] time = 0.21494, size = 182, normalized size = 6.07

$$\frac{2\left(b^{7}c^{2}x^{7}+7\,ab^{6}c^{2}x^{6}+21\,a^{2}b^{5}c^{2}x^{5}+35\,a^{3}b^{4}c^{2}x^{4}+35\,a^{4}b^{3}c^{2}x^{3}+21\,a^{5}b^{2}c^{2}x^{2}+7\,a^{6}bc^{2}x+a^{7}c^{2}\right)\sqrt{b^{3}cx^{3}+3\,ab^{2}cx^{2}+3\,a^{2}b}}{17\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x + a)^3*c)^(5/2),x, algorithm="fricas")
```

```
[Out] 2/17*(b^7*c^2*x^7 + 7*a*b^6*c^2*x^6 + 21*a^2*b^5*c^2*x^5 + 35*a^3
*b^4*c^2*x^4 + 35*a^4*b^3*c^2*x^3 + 21*a^5*b^2*c^2*x^2 + 7*a^6*b*
c^2*x + a^7*c^2)*sqrt(b^3*c*x^3 + 3*a*b^2*c*x^2 + 3*a^2*b*c*x + a
^3*c)/b
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*(b*x+a)**3)**(5/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.233734, size = 1, normalized size = 0.03

Done

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x + a)^3*c)^(5/2),x, algorithm="giac")
```

```
[Out] Done
```

3.2807 $\int \left(c(a+bx)^3\right)^{3/2} dx$

Optimal. Leaf size=28

$$\frac{2c(a+bx)^4\sqrt{c(a+bx)^3}}{11b}$$

```
[Out] (2*c*(a + b*x)^4*Sqrt[c*(a + b*x)^3])/(11*b)
```

Rubi [A] time = 0.0310163, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{2c(a+bx)^4\sqrt{c(a+bx)^3}}{11b}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*(a + b*x)^3)^(3/2),x]
```

```
[Out] (2*c*(a + b*x)^4*Sqrt[c*(a + b*x)^3])/(11*b)
```

Rubi in Sympy [A] time = 9.2625, size = 51, normalized size = 1.82

$$\frac{2\,(3a+3bx)\left(a^3c+3a^2bcx+3ab^2cx^2+b^3cx^3\right)^{\frac{3}{2}}}{33b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*(b*x+a)**3)**(3/2),x)
```

```
[Out] 2*(3*a + 3*b*x)*(a**3*c + 3*a**2*b*c*x + 3*a*b**2*c*x**2 + b**3*c
*x**3)**(3/2)/(33*b)
```

Mathematica [A] time = 0.0229572, size = 25, normalized size = 0.89

$$\frac{2(a+bx)\left(c(a+bx)^3\right)^{3/2}}{11b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*(a + b*x)^3)^(3/2),x]
```

```
[Out] (2*(a + b*x)*(c*(a + b*x)^3)^(3/2))/(11*b)
```

Maple [A] time = 0.004, size = 22, normalized size = 0.8

$$\frac{2\,bx+2\,a}{11\,b}\left(c\,(bx+a)^3\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*(b*x+a)^3)^(3/2),x)
```

```
[Out] 2/11*(b*x+a)*(c*(b*x+a)^3)^(3/2)/b
```

Maxima [A] time = 1.41236, size = 89, normalized size = 3.18

$$\frac{2\left(b^4c^{\frac{3}{2}}x^4+4\,ab^3c^{\frac{3}{2}}x^3+6\,a^2b^2c^{\frac{3}{2}}x^2+4\,a^3bc^{\frac{3}{2}}x+a^4c^{\frac{3}{2}}\right)(bx+a)^{\frac{3}{2}}}{11\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x + a)^3*c)^(3/2),x, algorithm="maxima")
```

```
[Out] 2/11*(b^4*c^(3/2)*x^4 + 4*a*b^3*c^(3/2)*x^3 + 6*a^2*b^2*c^(3/2)*x
^2 + 4*a^3*b*c^(3/2)*x + a^4*c^(3/2))*(b*x + a)^(3/2)/b
```

Fricas [A] time = 0.213404, size = 112, normalized size = 4.

$$\frac{2\left(b^4cx^4+4\,ab^3cx^3+6\,a^2b^2cx^2+4\,a^3bcx+a^4c\right)\sqrt{b^3cx^3+3\,ab^2cx^2+3\,a^2bcx+a^3c}}{11\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x + a)^3*c)^(3/2),x, algorithm="fricas")
```

```
[Out] 2/11*(b^4*c*x^4 + 4*a*b^3*c*x^3 + 6*a^2*b^2*c*x^2 + 4*a^3*b*c*x +
 a^4*c)*sqrt(b^3*c*x^3 + 3*a*b^2*c*x^2 + 3*a^2*b*c*x + a^3*c)/b
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\left(c\,(a+bx)^3\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*(b*x+a)**3)**(3/2),x)
```

```
[Out] Integral((c*(a + b*x)**3)**(3/2), x)
```

GIAC/XCAS [A] time = 0.225506, size = 477, normalized size = 17.04

$$2\left(1155\,(bcx+ac)^{\frac{3}{2}}a^4\mathrm{sign}\,(bx+a)-\frac{924\left(5\,(bcx+ac)^{\frac{3}{2}}ac-3\,(bcx+ac)^{\frac{5}{2}}\right)a^3\mathrm{sign}(bx+a)}{c}+\frac{198\left(35\,(bcx+ac)^{\frac{3}{2}}a^2b^{12}c^{14}-42\,(bcx+ac)^{\frac{5}{2}}ab^{12}c^{13}+15\,(b\right.}{b^{12}c^{14}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x + a)^3*c)^(3/2),x, algorithm="giac")
```

```
[Out] 2/3465*(1155*(b*c*x + a*c)^(3/2)*a^4*sign(b*x + a) - 924*(5*(b*c*
x + a*c)^(3/2)*a*c - 3*(b*c*x + a*c)^(5/2))*a^3*sign(b*x + a)/c +
 198*(35*(b*c*x + a*c)^(3/2)*a^2*b^12*c^14 - 42*(b*c*x + a*c)^(5/
2)*a*b^12*c^13 + 15*(b*c*x + a*c)^(7/2)*b^12*c^12)*a^2*sign(b*x +
 a)/(b^12*c^14) - 44*(105*(b*c*x + a*c)^(3/2)*a^3*b^24*c^27 - 189
*(b*c*x + a*c)^(5/2)*a^2*b^24*c^26 + 135*(b*c*x + a*c)^(7/2)*a*b^
24*c^25 - 35*(b*c*x + a*c)^(9/2)*b^24*c^24)*a*sign(b*x + a)/(b^24
```

```
*c^27) + (1155*(b*c*x + a*c)^(3/2)*a^4*b^40*c^44 - 2772*(b*c*x +
a*c)^(5/2)*a^3*b^40*c^43 + 2970*(b*c*x + a*c)^(7/2)*a^2*b^40*c^42
 - 1540*(b*c*x + a*c)^(9/2)*a*b^40*c^41 + 315*(b*c*x + a*c)^(11/2
)*b^40*c^40)*sign(b*x + a)/(b^40*c^44))/b
```

3.2808 $\int \sqrt{c(a+bx)^3}\,dx$

Optimal. Leaf size=25

$$\frac{2(a+bx)\sqrt{c(a+bx)^3}}{5b}$$

```
[Out] (2*(a + b*x)*Sqrt[c*(a + b*x)^3])/(5*b)
```

Rubi [A] time = 0.029352, antiderivative size = 25, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{2(a+bx)\sqrt{c(a+bx)^3}}{5b}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[c*(a + b*x)^3],x]

[Out] (2*(a + b*x)*Sqrt[c*(a + b*x)^3])/(5*b)
```

Rubi in Sympy [A] time = 9.29164, size = 51, normalized size = 2.04

$$\frac{2\,(3a+3bx)\,\sqrt{a^3c+3a^2bcx+3ab^2cx^2+b^3cx^3}}{15b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*(b*x+a)**3)**(1/2),x)

[Out] 2*(3*a + 3*b*x)*sqrt(a**3*c + 3*a**2*b*c*x + 3*a*b**2*c*x**2 + b*
*3*c*x**3)/(15*b)
```

Mathematica [A] time = 0.0114887, size = 25, normalized size = 1.

$$\frac{2(a+bx)\sqrt{c(a+bx)^3}}{5b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[c*(a + b*x)^3],x]

[Out] (2*(a + b*x)*Sqrt[c*(a + b*x)^3])/(5*b)
```

Maple [A] time = 0.004, size = 22, normalized size = 0.9

$$\frac{2\,bx+2\,a}{5\,b}\sqrt{c\,(bx+a)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*(b*x+a)^3)^(1/2),x)
```

```
[Out] 2/5*(b*x+a)*(c*(b*x+a)^3)^(1/2)/b
```

Maxima [A] time = 1.39501, size = 32, normalized size = 1.28

$$\frac{2\left(b\sqrt{c}x+a\sqrt{c}\right)(bx+a)^{\frac{3}{2}}}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((b*x + a)^3*c),x, algorithm="maxima")
```

```
[Out] 2/5*(b*sqrt(c)*x + a*sqrt(c))*(b*x + a)^(3/2)/b
```

Fricas [A] time = 0.214091, size = 59, normalized size = 2.36

$$\frac{2\sqrt{b^3cx^3+3\,ab^2cx^2+3\,a^2bcx+a^3c}(bx+a)}{5\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((b*x + a)^3*c),x, algorithm="fricas")
```

```
[Out] 2/5*sqrt(b^3*c*x^3 + 3*a*b^2*c*x^2 + 3*a^2*b*c*x + a^3*c)*(b*x +
a)/b
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\sqrt{c\,(a+bx)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*(b*x+a)**3)**(1/2),x)
```

```
[Out] Integral(sqrt(c*(a + b*x)**3), x)
```

GIAC/XCAS [A] time = 0.219801, size = 89, normalized size = 3.56

$$\frac{2\left(5\,(bcx+ac)^{\frac{3}{2}}a\mathrm{sign}\,(bx+a)-\frac{\left(5\,(bcx+ac)^{\frac{3}{2}}ac-3\,(bcx+ac)^{\frac{5}{2}}\right)\mathrm{sign}(bx+a)}{c}\right)}{15\,bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((b*x + a)^3*c),x, algorithm="giac")
```

```
[Out] 2/15*(5*(b*c*x + a*c)^(3/2)*a*sign(b*x + a) - (5*(b*c*x + a*c)^(3
/2)*a*c - 3*(b*c*x + a*c)^(5/2))*sign(b*x + a)/c)/(b*c)
```

3.2809 $\int \frac{1}{\sqrt{c(a+bx)^3}} dx$

Optimal. Leaf size=23

$$-\frac{2(a+bx)}{b\sqrt{c(a+bx)^3}}$$

```
[Out] (-2*(a + b*x))/(b*Sqrt[c*(a + b*x)^3])
```

Rubi [A] time = 0.0288196, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$

$$-\frac{2(a+bx)}{b\sqrt{c(a+bx)^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[c*(a + b*x)^3],x]
```

```
[Out] (-2*(a + b*x))/(b*Sqrt[c*(a + b*x)^3])
```

Rubi in Sympy [A] time = 9.32463, size = 51, normalized size = 2.22

$$-\frac{2\,(3a+3bx)}{3b\sqrt{a^3c+3a^2bcx+3ab^2cx^2+b^3cx^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(c*(b*x+a)**3)**(1/2),x)
```

```
[Out] -2*(3*a + 3*b*x)/(3*b*sqrt(a**3*c + 3*a**2*b*c*x + 3*a*b**2*c*x**
2 + b**3*c*x**3))
```

Mathematica [A] time = 0.0147842, size = 23, normalized size = 1.

$$-\frac{2(a+bx)}{b\sqrt{c(a+bx)^3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/Sqrt[c*(a + b*x)^3],x]
```

```
[Out] (-2*(a + b*x))/(b*Sqrt[c*(a + b*x)^3])
```

Maple [A] time = 0.004, size = 22, normalized size = 1.

$$-2\,\frac{bx+a}{b\sqrt{c\,(bx+a)^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(c*(b*x+a)^3)^(1/2),x)
```

```
[Out] -2*(b*x+a)/b/(c*(b*x+a)^3)^(1/2)
```

Maxima [A] time = 1.36705, size = 36, normalized size = 1.57

$$-\frac{2\left(b\sqrt{c}x+a\sqrt{c}\right)}{(bx+a)^{\frac{3}{2}}bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt((b*x + a)^3*c),x, algorithm="maxima")
```

```
[Out] -2*(b*sqrt(c)*x + a*sqrt(c))/((b*x + a)^(3/2)*b*c)
```

Fricas [A] time = 0.212834, size = 82, normalized size = 3.57

$$-\frac{2\sqrt{b^3cx^3+3\,ab^2cx^2+3\,a^2bcx+a^3c}}{b^3cx^2+2\,ab^2cx+a^2bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt((b*x + a)^3*c),x, algorithm="fricas")
```

```
[Out] -2*sqrt(b^3*c*x^3 + 3*a*b^2*c*x^2 + 3*a^2*b*c*x + a^3*c)/(b^3*c*x
^2 + 2*a*b^2*c*x + a^2*b*c)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{c\,(a+bx)^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(c*(b*x+a)**3)**(1/2),x)
```

```
[Out] Integral(1/sqrt(c*(a + b*x)**3), x)
```

GIAC/XCAS [A] time = 0.217114, size = 31, normalized size = 1.35

$$-\frac{2}{\sqrt{bcx+ac}b\mathrm{sign}\left(bx+a\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt((b*x + a)^3*c),x, algorithm="giac")
```

```
[Out] -2/(sqrt(b*c*x + a*c)*b*sign(b*x + a))
```

3.2810 $\int \frac{1}{(c(a+bx)^3)^{3/2}}\,dx$

Optimal. Leaf size=30

$$-\frac{2}{7bc(a+bx)^2\sqrt{c(a+bx)^3}}$$

```
[Out] -2/(7*b*c*(a + b*x)^2*Sqrt[c*(a + b*x)^3])
```

Rubi [A] time = 0.0325733, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{2}{7bc(a+bx)^2\sqrt{c(a+bx)^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*(a + b*x)^3)^(-3/2),x]
```

```
[Out] -2/(7*b*c*(a + b*x)^2*Sqrt[c*(a + b*x)^3])
```

Rubi in Sympy [A] time = 9.25948, size = 51, normalized size = 1.7

$$-\frac{2\,(3a+3bx)}{21b\,(a^3c+3a^2bcx+3ab^2cx^2+b^3cx^3)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(c*(b*x+a)**3)**(3/2),x)
```

```
[Out] -2*(3*a + 3*b*x)/(21*b*(a**3*c + 3*a**2*b*c*x + 3*a*b**2*c*x**2 +
 b**3*c*x**3)**(3/2))
```

Mathematica [A] time = 0.016754, size = 25, normalized size = 0.83

$$-\frac{2(a+bx)}{7b\,(c(a+bx)^3)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*(a + b*x)^3)^(-3/2),x]
```

```
[Out] (-2*(a + b*x))/(7*b*(c*(a + b*x)^3)^(3/2))
```

Maple [A] time = 0.003, size = 22, normalized size = 0.7

$$-\frac{2\,bx+2\,a}{7\,b}\left(c\,(bx+a)^3\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(c*(b*x+a)^3)^(3/2),x)
```

```
[Out] -2/7*(b*x+a)/b/(c*(b*x+a)^3)^(3/2)
```

Maxima [A] time = 1.42304, size = 58, normalized size = 1.93

$$-\frac{2\sqrt{c}}{7\,(b^3c^2x^2+2\,ab^2c^2x+a^2bc^2)(bx+a)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x + a)^3*c)^(-3/2),x, algorithm="maxima")
```

```
[Out] -2/7*sqrt(c)/((b^3*c^2*x^2 + 2*a*b^2*c^2*x + a^2*b*c^2)*(b*x + a)
^(3/2))
```

Fricas [A] time = 0.21556, size = 147, normalized size = 4.9

$$-\frac{2\sqrt{b^3cx^3+3\,ab^2cx^2+3\,a^2bcx+a^3c}}{7\,(b^6c^2x^5+5\,ab^5c^2x^4+10\,a^2b^4c^2x^3+10\,a^3b^3c^2x^2+5\,a^4b^2c^2x+a^5bc^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x + a)^3*c)^(-3/2),x, algorithm="fricas")
```

```
[Out] -2/7*sqrt(b^3*c*x^3 + 3*a*b^2*c*x^2 + 3*a^2*b*c*x + a^3*c)/(b^6*c
^2*x^5 + 5*a*b^5*c^2*x^4 + 10*a^2*b^4*c^2*x^3 + 10*a^3*b^3*c^2*x^
2 + 5*a^4*b^2*c^2*x + a^5*b*c^2)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(c\,(a+bx)^3\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(c*(b*x+a)**3)**(3/2),x)
```

```
[Out] Integral((c*(a + b*x)**3)**(-3/2), x)
```

GIAC/XCAS [A] time = 0.568761, size = 4, normalized size = 0.13

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x + a)^3*c)^(-3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

3.2811 $\int \frac{1}{(c(a+bx)^3)^{5/2}}\,dx$

Optimal. Leaf size=30

$$-\frac{2}{13bc^2(a+bx)^5\sqrt{c(a+bx)^3}}$$

```
[Out] -2/(13*b*c^2*(a + b*x)^5*Sqrt[c*(a + b*x)^3])
```

Rubi [A] time = 0.033819, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$

$$-\frac{2}{13bc^2(a+bx)^5\sqrt{c(a+bx)^3}}$$

Antiderivative was successfully verified.

```
[In] Int[(c*(a + b*x)^3)^(-5/2),x]
```

```
[Out] -2/(13*b*c^2*(a + b*x)^5*Sqrt[c*(a + b*x)^3])
```

Rubi in Sympy [A] time = 9.28985, size = 51, normalized size = 1.7

$$-\frac{2\,(3a+3bx)}{39b\,(a^3c+3a^2bcx+3ab^2cx^2+b^3cx^3)^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(c*(b*x+a)**3)**(5/2),x)
```

```
[Out] -2*(3*a + 3*b*x)/(39*b*(a**3*c + 3*a**2*b*c*x + 3*a*b**2*c*x**2 +
 b**3*c*x**3)**(5/2))
```

Mathematica [A] time = 0.0282359, size = 25, normalized size = 0.83

$$-\frac{2(a+bx)}{13b\,(c(a+bx)^3)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*(a + b*x)^3)^(-5/2),x]
```

```
[Out] (-2*(a + b*x))/(13*b*(c*(a + b*x)^3)^(5/2))
```

Maple [A] time = 0.003, size = 22, normalized size = 0.7

$$-\frac{2\,bx+2\,a}{13\,b}\left(c\,(bx+a)^3\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(c*(b*x+a)^3)^(5/2),x)
```

```
[Out] -2/13*(b*x+a)/b/(c*(b*x+a)^3)^(5/2)
```

Maxima [A] time = 1.45222, size = 115, normalized size = 3.83

$$-\frac{2\sqrt{c}}{13\left(b^6c^3x^5 + 5\,ab^5c^3x^4 + 10\,a^2b^4c^3x^3 + 10\,a^3b^3c^3x^2 + 5\,a^4b^2c^3x + a^5bc^3\right)(bx+a)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x + a)^3*c)^(-5/2),x, algorithm="maxima")
```

```
[Out] -2/13*sqrt(c)/((b^6*c^3*x^5 + 5*a*b^5*c^3*x^4 + 10*a^2*b^4*c^3*x^
3 + 10*a^3*b^3*c^3*x^2 + 5*a^4*b^2*c^3*x + a^5*b*c^3)*(b*x + a)^(
3/2))
```

Fricas [A] time = 0.215959, size = 204, normalized size = 6.8

$$-\frac{2\sqrt{b^3cx^3 + 3\,ab^2cx^2 + 3\,a^2bcx + a^3c}}{13\left(b^9c^3x^8 + 8\,ab^8c^3x^7 + 28\,a^2b^7c^3x^6 + 56\,a^3b^6c^3x^5 + 70\,a^4b^5c^3x^4 + 56\,a^5b^4c^3x^3 + 28\,a^6b^3c^3x^2 + 8\,a^7b^2c^3x + a^8bc^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x + a)^3*c)^(-5/2),x, algorithm="fricas")
```

```
[Out] -2/13*sqrt(b^3*c*x^3 + 3*a*b^2*c*x^2 + 3*a^2*b*c*x + a^3*c)/(b^9*
c^3*x^8 + 8*a*b^8*c^3*x^7 + 28*a^2*b^7*c^3*x^6 + 56*a^3*b^6*c^3*x
^5 + 70*a^4*b^5*c^3*x^4 + 56*a^5*b^4*c^3*x^3 + 28*a^6*b^3*c^3*x^2
 + 8*a^7*b^2*c^3*x + a^8*b*c^3)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(c\left(a+bx\right)^3\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(c*(b*x+a)**3)**(5/2),x)
```

```
[Out] Integral((c*(a + b*x)**3)**(-5/2), x)
```

GIAC/XCAS [A] time = 0.528523, size = 4, normalized size = 0.13

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((b*x + a)^3*c)^(-5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

3.2812 $\int \left(\frac{c}{a+bx}\right)^{5/2} dx$

Optimal. Leaf size=30

$$-\frac{2c^2\sqrt{\frac{c}{a+bx}}}{3b(a+bx)}$$

```
[Out] (-2*c^2*Sqrt[c/(a + b*x)])/(3*b*(a + b*x))
```

Rubi [A] time = 0.0251999, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$

$$-\frac{2c^2\sqrt{\frac{c}{a+bx}}}{3b(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Int[(c/(a + b*x))^(5/2),x]

[Out] (-2*c^2*Sqrt[c/(a + b*x)])/(3*b*(a + b*x))
```

Rubi in Sympy [A] time = 2.59199, size = 24, normalized size = 0.8

$$-\frac{2c^2\sqrt{\frac{c}{a+bx}}}{3b\left(a+bx\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((c/(b*x+a))**(5/2),x)

[Out] -2*c**2*sqrt(c/(a + b*x))/(3*b*(a + b*x))
```

Mathematica [A] time = 0.0194639, size = 21, normalized size = 0.7

$$-\frac{2c\left(\frac{c}{a+bx}\right)^{3/2}}{3b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c/(a + b*x))^(5/2),x]

[Out] (-2*c*(c/(a + b*x))^(3/2))/(3*b)
```

Maple [A] time = 0.002, size = 22, normalized size = 0.7

$$-\frac{2\,bx+2\,a}{3\,b}\left(\frac{c}{bx+a}\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c/(b*x+a))^(5/2),x)
```

```
[Out] -2/3*(b*x+a)*(c/(b*x+a))^(5/2)/b
```

Maxima [A] time = 1.37615, size = 23, normalized size = 0.77

$$-\frac{2\,c\left(\frac{c}{bx+a}\right)^{\frac{3}{2}}}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a))^(5/2),x, algorithm="maxima")
```

```
[Out] -2/3*c*(c/(b*x + a))^(3/2)/b
```

Fricas [A] time = 0.216045, size = 36, normalized size = 1.2

$$-\frac{2\,c^{2}\sqrt{\frac{c}{bx+a}}}{3\,(b^{2}x+ab)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a))^(5/2),x, algorithm="fricas")
```

```
[Out] -2/3*c^2*sqrt(c/(b*x + a))/(b^2*x + a*b)
```

Sympy [A] time = 8.79229, size = 51, normalized size = 1.7

$$\begin{cases} -\frac{2ac^{\frac{5}{2}}\left(\frac{1}{a+bx}\right)^{\frac{5}{2}}}{3b} - \frac{2c^{\frac{5}{2}}x\left(\frac{1}{a+bx}\right)^{\frac{5}{2}}}{3} & \text{for}\ b \neq 0 \\ x\left(\frac{c}{a}\right)^{\frac{5}{2}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x+a))**(5/2),x)
```

```
[Out] Piecewise((-2*a*c**(5/2)*(1/(a + b*x))**(5/2)/(3*b) - 2*c**(5/2)*
x*(1/(a + b*x))**(5/2)/3, Ne(b, 0)), (x*(c/a)**(5/2), True))
```

GIAC/XCAS [A] time = 0.217741, size = 32, normalized size = 1.07

$$-\frac{2\,c^{4}\operatorname{sign}(bx+a)}{3\,(bcx+ac)^{\frac{3}{2}}\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a))^(5/2),x, algorithm="giac")
```

```
[Out] -2/3*c^4*sign(b*x + a)/((b*c*x + a*c)^(3/2)*b)
```

3.2813 $\int \left(\frac{c}{a+bx}\right)^{3/2} dx$

Optimal. Leaf size=19

$$-\frac{2c\sqrt{\frac{c}{a+bx}}}{b}$$

```
[Out] (-2*c*Sqrt[c/(a + b*x)])/b
```

Rubi [A] time = 0.0190732, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{2c\sqrt{\frac{c}{a+bx}}}{b}$$

Antiderivative was successfully verified.

```
[In]  Int[(c/(a + b*x))^(3/2),x]
```

```
[Out] (-2*c*Sqrt[c/(a + b*x)])/b
```

Rubi in Sympy [A] time = 1.98011, size = 15, normalized size = 0.79

$$-\frac{2c\sqrt{\frac{c}{a+bx}}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c/(b*x+a))**(3/2),x)
```

```
[Out] -2*c*sqrt(c/(a + b*x))/b
```

Mathematica [A] time = 0.00808533, size = 19, normalized size = 1.

$$-\frac{2c\sqrt{\frac{c}{a+bx}}}{b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c/(a + b*x))^(3/2),x]
```

```
[Out] (-2*c*Sqrt[c/(a + b*x)])/b
```

Maple [A] time = 0.005, size = 22, normalized size = 1.2

$$-2\,\frac{bx+a}{b}\left(\frac{c}{bx+a}\right)^{3/2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c/(b*x+a))^(3/2),x)
```

```
[Out] -2*(b*x+a)*(c/(b*x+a))^(3/2)/b
```

Maxima [A] time = 1.34978, size = 23, normalized size = 1.21

$$-\frac{2\,c\sqrt{\frac{c}{bx+a}}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a))^(3/2),x, algorithm="maxima")
```

```
[Out] -2*c*sqrt(c/(b*x + a))/b
```

Fricas [A] time = 0.215668, size = 23, normalized size = 1.21

$$-\frac{2\,c\sqrt{\frac{c}{bx+a}}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a))^(3/2),x, algorithm="fricas")
```

```
[Out] -2*c*sqrt(c/(b*x + a))/b
```

Sympy [A] time = 2.61381, size = 48, normalized size = 2.53

$$\begin{cases} -\frac{2ac^{\frac{3}{2}}\left(\frac{1}{a+bx}\right)^{\frac{3}{2}}}{b} - 2c^{\frac{3}{2}}x\left(\frac{1}{a+bx}\right)^{\frac{3}{2}} & \text{for } b \neq 0 \\ x\left(\frac{c}{a}\right)^{\frac{3}{2}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x+a))**(3/2),x)
```

```
[Out] Piecewise((-2*a*c**(3/2)*(1/(a + b*x))**(3/2)/b - 2*c**(3/2)*x*(1
/(a + b*x))**(3/2), Ne(b, 0)), (x*(c/a)**(3/2), True))
```

GIAC/XCAS [A] time = 0.220024, size = 32, normalized size = 1.68

$$-\frac{2\,c^2\mathrm{sign}\left(bx+a\right)}{\sqrt{bcx+ac}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a))^(3/2),x, algorithm="giac")
```

```
[Out] -2*c^2*sign(b*x + a)/(sqrt(b*c*x + a*c)*b)
```

3.2814 $\int \sqrt{\frac{c}{a+bx}} dx$

Optimal. Leaf size=23

$$\frac{2(a+bx)\sqrt{\frac{c}{a+bx}}}{b}$$

```
[Out] (2*Sqrt[c/(a + b*x)]*(a + b*x))/b
```

Rubi [A] time = 0.020987, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$

$$\frac{2(a+bx)\sqrt{\frac{c}{a+bx}}}{b}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[c/(a + b*x)],x]

[Out] (2*Sqrt[c/(a + b*x)]*(a + b*x))/b
```

Rubi in Sympy [A] time = 1.93603, size = 17, normalized size = 0.74

$$\frac{2\sqrt{\frac{c}{a+bx}}(a+bx)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c/(b*x+a))**(1/2),x)

[Out] 2*sqrt(c/(a + b*x))*(a + b*x)/b
```

Mathematica [A] time = 0.0156059, size = 19, normalized size = 0.83

$$\frac{2c}{b\sqrt{\frac{c}{a+bx}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[c/(a + b*x)],x]

[Out] (2*c)/(b*Sqrt[c/(a + b*x)])
```

Maple [A] time = 0.005, size = 22, normalized size = 1.

$$2\frac{bx+a}{b}\sqrt{\frac{c}{bx+a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c/(b*x+a))^(1/2),x)

[Out] 2*(b*x+a)*(c/(b*x+a))^(1/2)/b
```

Maxima [A] time = 1.37526, size = 23, normalized size = 1.

$$\frac{2\,c}{b\sqrt{\frac{c}{bx+a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c/(b*x + a)),x, algorithm="maxima")
```

```
[Out] 2*c/(b*sqrt(c/(b*x + a)))
```

Fricas [A] time = 0.217475, size = 23, normalized size = 1.

$$\frac{2\,c}{b\sqrt{\frac{c}{bx+a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c/(b*x + a)),x, algorithm="fricas")
```

```
[Out] 2*c/(b*sqrt(c/(b*x + a)))
```

Sympy [A] time = 0.71416, size = 46, normalized size = 2.

$$\begin{cases} \frac{2a\sqrt{c}\sqrt{\frac{1}{a+bx}}}{b} + 2\sqrt{c}x\sqrt{\frac{1}{a+bx}} & \text{for}\ b \neq 0 \\ x\sqrt{\frac{c}{a}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x+a))**(1/2),x)
```

```
[Out] Piecewise((2*a*sqrt(c)*sqrt(1/(a + b*x))/b + 2*sqrt(c)*x*sqrt(1/(
a + b*x)), Ne(b, 0)), (x*sqrt(c/a), True))
```

GIAC/XCAS [A] time = 0.217833, size = 28, normalized size = 1.22

$$\frac{2\,\sqrt{bcx+ac}\mathrm{sign}\left(bx+a\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c/(b*x + a)),x, algorithm="giac")
```

```
[Out] 2*sqrt(b*c*x + a*c)*sign(b*x + a)/b
```

3.2815 $\int \frac{1}{\sqrt{\frac{c}{a+bx}}} dx$

Optimal. Leaf size=25

$$\frac{2(a+bx)}{3b\sqrt{\frac{c}{a+bx}}}$$

```
[Out] (2*(a + b*x))/(3*b*Sqrt[c/(a + b*x)])
```

Rubi [A] time = 0.0203903, antiderivative size = 25, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{2(a+bx)}{3b\sqrt{\frac{c}{a+bx}}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[c/(a + b*x)],x]

[Out] (2*(a + b*x))/(3*b*Sqrt[c/(a + b*x)])
```

Rubi in Sympy [A] time = 2.6183, size = 22, normalized size = 0.88

$$\frac{2\sqrt{\frac{c}{a+bx}}(a+bx)^2}{3bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(c/(b*x+a))**(1/2),x)

[Out] 2*sqrt(c/(a + b*x))*(a + b*x)**2/(3*b*c)
```

Mathematica [A] time = 0.0203679, size = 21, normalized size = 0.84

$$\frac{2c}{3b\left(\frac{c}{a+bx}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/Sqrt[c/(a + b*x)],x]

[Out] (2*c)/(3*b*(c/(a + b*x))^(3/2))
```

Maple [A] time = 0.004, size = 22, normalized size = 0.9

$$\frac{2\,bx+2\,a}{3\,b}\frac{1}{\sqrt{\frac{c}{bx+a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(c/(b*x+a))^(1/2),x)
```

```
[Out] 2/3*(b*x+a)/b/(c/(b*x+a))^(1/2)
```

Maxima [A] time = 1.48133, size = 23, normalized size = 0.92

$$\frac{2\,c}{3\,b\,\left(\frac{c}{bx+a}\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(c/(b*x + a)),x, algorithm="maxima")
```

```
[Out] 2/3*c/(b*(c/(b*x + a))^(3/2))
```

Fricas [A] time = 0.216505, size = 28, normalized size = 1.12

$$\frac{2\,(bx+a)}{3\,b\sqrt{\frac{c}{bx+a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(c/(b*x + a)),x, algorithm="fricas")
```

```
[Out] 2/3*(b*x + a)/(b*sqrt(c/(b*x + a)))
```

Sympy [A] time = 3.31804, size = 49, normalized size = 1.96

$$\begin{cases} \frac{2a}{3b\sqrt{c}\sqrt{\frac{1}{a+bx}}} + \frac{2x}{3\sqrt{c}\sqrt{\frac{1}{a+bx}}} & \text{for}\ b \neq 0 \\ \frac{x}{\sqrt{\frac{c}{a}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(c/(b*x+a))**(1/2),x)
```

```
[Out] Piecewise((2*a/(3*b*sqrt(c)*sqrt(1/(a + b*x))) + 2*x/(3*sqrt(c)*s
qrt(1/(a + b*x))), Ne(b, 0)), (x/sqrt(c/a), True))
```

GIAC/XCAS [A] time = 0.216532, size = 84, normalized size = 3.36

$$\frac{2\left(3\,\sqrt{bcx+ac}a - \frac{3\,\sqrt{bcx+ac}ac-(bcx+ac)^{\frac{3}{2}}}{c}\right)}{3\,b c\mathrm{sign}\,(bx+a)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(c/(b*x + a)),x, algorithm="giac")
```

```
[Out] 2/3*(3*sqrt(b*c*x + a*c)*a - (3*sqrt(b*c*x + a*c)*a*c - (b*c*x +
a*c)^(3/2))/c)/(b*c*sign(b*x + a))
```

3.2816 $\int \frac{1}{\left(\frac{c}{a+bx}\right)^{3/2}}\,dx$

Optimal. Leaf size=30

$$\frac{2(a+bx)^2}{5bc\sqrt{\frac{c}{a+bx}}}$$

```
[Out] (2*(a + b*x)^2)/(5*b*c*Sqrt[c/(a + b*x)])
```

Rubi [A] time = 0.02392, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$

$$\frac{2(a+bx)^2}{5bc\sqrt{\frac{c}{a+bx}}}$$

Antiderivative was successfully verified.

```
[In]  Int[(c/(a + b*x))^(-3/2),x]

[Out] (2*(a + b*x)^2)/(5*b*c*Sqrt[c/(a + b*x)])
```

Rubi in Sympy [A] time = 2.56321, size = 24, normalized size = 0.8

$$\frac{2\sqrt{\frac{c}{a+bx}}\,(a+bx)^3}{5bc^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(c/(b*x+a))**(3/2),x)

[Out] 2*sqrt(c/(a + b*x))*(a + b*x)**3/(5*b*c**2)
```

Mathematica [A] time = 0.0221646, size = 21, normalized size = 0.7

$$\frac{2c}{5b\left(\frac{c}{a+bx}\right)^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c/(a + b*x))^(-3/2),x]

[Out] (2*c)/(5*b*(c/(a + b*x))^(5/2))
```

Maple [A] time = 0.004, size = 22, normalized size = 0.7

$$\frac{2\,bx+2\,a}{5\,b}\left(\frac{c}{bx+a}\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(c/(b*x+a))^(3/2),x)
```

```
[Out] 2/5*(b*x+a)/b/(c/(b*x+a))^(3/2)
```

Maxima [A] time = 1.34105, size = 23, normalized size = 0.77

$$\frac{2\,c}{5\,b\,\left(\frac{c}{bx+a}\right)^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c/(b*x + a))^(-3/2),x, algorithm="maxima")
```

```
[Out] 2/5*c/(b*(c/(b*x + a))^(5/2))
```

Fricas [A] time = 0.215612, size = 47, normalized size = 1.57

$$\frac{2\,\left(b^2x^2+2\,abx+a^2\right)}{5\,bc\sqrt{\frac{c}{bx+a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c/(b*x + a))^(-3/2),x, algorithm="fricas")
```

```
[Out] 2/5*(b^2*x^2 + 2*a*b*x + a^2)/(b*c*sqrt(c/(b*x + a)))
```

Sympy [A] time = 4.11551, size = 49, normalized size = 1.63

$$\begin{cases} \frac{2a}{5bc^{\frac{3}{2}}\left(\frac{1}{a+bx}\right)^{\frac{3}{2}}} + \frac{2x}{5c^{\frac{3}{2}}\left(\frac{1}{a+bx}\right)^{\frac{3}{2}}} & \text{for}\ b \neq 0 \\ \frac{x}{\left(\frac{c}{a}\right)^{\frac{3}{2}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(c/(b*x+a))**(3/2),x)
```

```
[Out] Piecewise((2*a/(5*b*c**(3/2)*(1/(a + b*x))**(3/2)) + 2*x/(5*c**(3
/2)*(1/(a + b*x))**(3/2)), Ne(b, 0)), (x/(c/a)**(3/2), True))
```

GIAC/XCAS [A] time = 0.217871, size = 35, normalized size = 1.17

$$\frac{2\,(bx+a)^2}{5\,bc\sqrt{\frac{c}{bx+a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c/(b*x + a))^(-3/2),x, algorithm="giac")
```

```
[Out] 2/5*(b*x + a)^2/(b*c*sqrt(c/(b*x + a)))
```

3.2817 $\int \frac{1}{\left(\frac{c}{a+bx}\right)^{5/2}} dx$

Optimal. Leaf size=30

$$\frac{2(a+bx)^3}{7bc^2\sqrt{\frac{c}{a+bx}}}$$

```
[Out] (2*(a + b*x)^3)/(7*b*c^2*Sqrt[c/(a + b*x)])
```

Rubi [A] time = 0.0243568, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{2(a+bx)^3}{7bc^2\sqrt{\frac{c}{a+bx}}}$$

Antiderivative was successfully verified.

```
[In]  Int[(c/(a + b*x))^(-5/2),x]
```

```
[Out] (2*(a + b*x)^3)/(7*b*c^2*Sqrt[c/(a + b*x)])
```

Rubi in Sympy [A] time = 2.5368, size = 24, normalized size = 0.8

$$\frac{2\sqrt{\frac{c}{a+bx}}\,(a+bx)^4}{7bc^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(c/(b*x+a))**(5/2),x)
```

```
[Out] 2*sqrt(c/(a + b*x))*(a + b*x)**4/(7*b*c**3)
```

Mathematica [A] time = 0.0271589, size = 21, normalized size = 0.7

$$\frac{2c}{7b\left(\frac{c}{a+bx}\right)^{7/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c/(a + b*x))^(-5/2),x]
```

```
[Out] (2*c)/(7*b*(c/(a + b*x))^(7/2))
```

Maple [A] time = 0.003, size = 22, normalized size = 0.7

$$\frac{2\,bx+2\,a}{7\,b}\left(\frac{c}{bx+a}\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(c/(b*x+a))^(5/2),x)
```

```
[Out] 2/7*(b*x+a)/b/(c/(b*x+a))^(5/2)
```

Maxima [A] time = 1.37362, size = 23, normalized size = 0.77

$$\frac{2\,c}{7\,b\left(\frac{c}{bx+a}\right)^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a))^(-5/2),x, algorithm="maxima")
```

```
[Out] 2/7*c/(b*(c/(b*x + a))^(7/2))
```

Fricas [A] time = 0.214024, size = 62, normalized size = 2.07

$$\frac{2\left(b^3x^3 + 3\,ab^2x^2 + 3\,a^2bx + a^3\right)}{7\,bc^2\sqrt{\frac{c}{bx+a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a))^(-5/2),x, algorithm="fricas")
```

```
[Out] 2/7*(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3)/(b*c^2*sqrt(c/(b*x
+ a)))
```

Sympy [A] time = 6.42452, size = 49, normalized size = 1.63

$$\begin{cases} \frac{2a}{7bc^{\frac{5}{2}}\left(\frac{1}{a+bx}\right)^{\frac{5}{2}}} + \frac{2x}{7c^{\frac{5}{2}}\left(\frac{1}{a+bx}\right)^{\frac{5}{2}}} & \text{for}\: b \neq 0 \\ \frac{x}{\left(\frac{c}{a}\right)^{\frac{5}{2}}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(c/(b*x+a))**(5/2),x)
```

```
[Out] Piecewise((2*a/(7*b*c**(5/2)*(1/(a + b*x))**(5/2)) + 2*x/(7*c**(5
/2)*(1/(a + b*x))**(5/2)), Ne(b, 0)), (x/(c/a)**(5/2), True))
```

GIAC/XCAS [A] time = 0.217307, size = 35, normalized size = 1.17

$$\frac{2\,(bx + a)^3}{7\,bc^2\sqrt{\frac{c}{bx+a}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a))^(-5/2),x, algorithm="giac")
```

```
[Out] 2/7*(b*x + a)^3/(b*c^2*sqrt(c/(b*x + a)))
```

3.2818 $\int \left(\frac{c}{(a+bx)^2}\right)^{5/2} dx$

Optimal. Leaf size=30

$$-\frac{c^2\sqrt{\frac{c}{(a+bx)^2}}}{4b(a+bx)^3}$$

```
[Out] -(c^2*Sqrt[c/(a + b*x)^2])/(4*b*(a + b*x)^3)
```

Rubi [A] time = 0.0266223, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{c^2\sqrt{\frac{c}{(a+bx)^2}}}{4b(a+bx)^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(c/(a + b*x)^2)^(5/2),x]

[Out] -(c^2*Sqrt[c/(a + b*x)^2])/(4*b*(a + b*x)^3)
```

Rubi in Sympy [A] time = 2.56969, size = 26, normalized size = 0.87

$$-\frac{c^2\sqrt{\frac{c}{(a+bx)^2}}}{4b\left(a+bx\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c/(b*x+a)**2)**(5/2),x)

[Out] -c**2*sqrt(c/(a + b*x)**2)/(4*b*(a + b*x)**3)
```

Mathematica [A] time = 0.0172298, size = 25, normalized size = 0.83

$$-\frac{(a+bx)\left(\frac{c}{(a+bx)^2}\right)^{5/2}}{4b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c/(a + b*x)^2)^(5/2),x]

[Out] -((c/(a + b*x)^2)^(5/2)*(a + b*x))/(4*b)
```

Maple [A] time = 0.005, size = 22, normalized size = 0.7

$$-\frac{bx+a}{4\,b}\left(\frac{c}{(bx+a)^2}\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c/(b*x+a)^2)^(5/2),x)
```

```
[Out] -1/4*(b*x+a)/b*(c/(b*x+a)^2)^(5/2)
```

Maxima [A] time = 1.39646, size = 66, normalized size = 2.2

$$-\frac{c^{\frac{5}{2}}}{4\,(b^5x^4 + 4\,ab^4x^3 + 6\,a^2b^3x^2 + 4\,a^3b^2x + a^4b)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a)^2)^(5/2),x, algorithm="maxima")
```

```
[Out] -1/4*c^(5/2)/(b^5*x^4 + 4*a*b^4*x^3 + 6*a^2*b^3*x^2 + 4*a^3*b^2*x
 + a^4*b)
```

Fricas [A] time = 0.218031, size = 81, normalized size = 2.7

$$-\frac{c^2\sqrt{\frac{c}{b^2x^2+2\,abx+a^2}}}{4\,(b^4x^3 + 3\,ab^3x^2 + 3\,a^2b^2x + a^3b)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a)^2)^(5/2),x, algorithm="fricas")
```

```
[Out] -1/4*c^2*sqrt(c/(b^2*x^2 + 2*a*b*x + a^2))/(b^4*x^3 + 3*a*b^3*x^2
 + 3*a^2*b^2*x + a^3*b)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x+a)**2)**(5/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.215595, size = 1, normalized size = 0.03

$$+\infty$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a)^2)^(5/2),x, algorithm="giac")
```

```
[Out] +Infinity
```

3.2819 $\int \left(\frac{c}{(a+bx)^2}\right)^{3/2} dx$

Optimal. Leaf size=28

$$-\frac{c\sqrt{\frac{c}{(a+bx)^2}}}{2b(a+bx)}$$

```
[Out] -(c*Sqrt[c/(a + b*x)^2])/(2*b*(a + b*x))
```

Rubi [A] time = 0.0249929, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$

$$-\frac{c\sqrt{\frac{c}{(a+bx)^2}}}{2b(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Int[(c/(a + b*x)^2)^(3/2),x]

[Out] -(c*Sqrt[c/(a + b*x)^2])/(2*b*(a + b*x))
```

Rubi in Sympy [A] time = 2.14249, size = 22, normalized size = 0.79

$$-\frac{c\sqrt{\frac{c}{(a+bx)^2}}}{2b\,(a+bx)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((c/(b*x+a)**2)**(3/2),x)

[Out] -c*sqrt(c/(a + b*x)**2)/(2*b*(a + b*x))
```

Mathematica [A] time = 0.0135289, size = 25, normalized size = 0.89

$$-\frac{(a+bx)\left(\frac{c}{(a+bx)^2}\right)^{3/2}}{2b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c/(a + b*x)^2)^(3/2),x]

[Out] -((c/(a + b*x)^2)^(3/2)*(a + b*x))/(2*b)
```

Maple [A] time = 0.006, size = 22, normalized size = 0.8

$$-\frac{bx+a}{2\,b}\left(\frac{c}{(bx+a)^2}\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c/(b*x+a)^2)^(3/2),x)

[Out] -1/2*(b*x+a)/b*(c/(b*x+a)^2)^(3/2)
```

Maxima [A] time = 1.43811, size = 36, normalized size = 1.29

$$-\frac{c^{\frac{3}{2}}}{2\left(b^{3}x^{2}+2\,ab^{2}x+a^{2}b\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a)^2)^(3/2),x, algorithm="maxima")

[Out] -1/2*c^(3/2)/(b^3*x^2 + 2*a*b^2*x + a^2*b)
```

Fricas [A] time = 0.214771, size = 49, normalized size = 1.75

$$-\frac{c\sqrt{\frac{c}{b^{2}x^{2}+2\,abx+a^{2}}}}{2\left(b^{2}x+ab\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a)^2)^(3/2),x, algorithm="fricas")

[Out] -1/2*c*sqrt(c/(b^2*x^2 + 2*a*b*x + a^2))/(b^2*x + a*b)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\left(\frac{c}{(a+bx)^{2}}\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x+a)**2)**(3/2),x)

[Out] Integral((c/(a + b*x)**2)**(3/2), x)
```

GIAC/XCAS [A] time = 0.215048, size = 28, normalized size = 1.

$$-\frac{c^{\frac{3}{2}}\,\mathrm{sign}\left(bx+a\right)}{2\,(bx+a)^{2}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a)^2)^(3/2),x, algorithm="giac")

[Out] -1/2*c^(3/2)*sign(b*x + a)/((b*x + a)^2*b)
```

3.2820 $\int \sqrt{\frac{c}{(a+bx)^2}}\,dx$

Optimal. Leaf size=28

$$\frac{(a+bx)\sqrt{\frac{c}{(a+bx)^2}}\log(a+bx)}{b}$$

```
[Out] (Sqrt[c/(a + b*x)^2]*(a + b*x)*Log[a + b*x])/b
```

Rubi [A] time = 0.0265199, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$

$$\frac{(a+bx)\sqrt{\frac{c}{(a+bx)^2}}\log(a+bx)}{b}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[c/(a + b*x)^2],x]

[Out] (Sqrt[c/(a + b*x)^2]*(a + b*x)*Log[a + b*x])/b
```

Rubi in Sympy [A] time = 2.01883, size = 24, normalized size = 0.86

$$\frac{\sqrt{\frac{c}{(a+bx)^2}}\,(a+bx)\log(a+bx)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c/(b*x+a)**2)**(1/2),x)

[Out] sqrt(c/(a + b*x)**2)*(a + b*x)*log(a + b*x)/b
```

Mathematica [A] time = 0.0123437, size = 28, normalized size = 1.

$$\frac{(a+bx)\sqrt{\frac{c}{(a+bx)^2}}\log(a+bx)}{b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[c/(a + b*x)^2],x]

[Out] (Sqrt[c/(a + b*x)^2]*(a + b*x)*Log[a + b*x])/b
```

Maple [A] time = 0.007, size = 27, normalized size = 1.

$$\frac{(bx+a)\ln(bx+a)}{b}\sqrt{\frac{c}{(bx+a)^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c/(b*x+a)^2)^(1/2),x)
```

```
[Out] (b*x+a)*ln(b*x+a)*(c/(b*x+a)^2)^(1/2)/b
```

Maxima [A] time = 1.42467, size = 18, normalized size = 0.64

$$\frac{\sqrt{c}\log(bx+a)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c/(b*x + a)^2),x, algorithm="maxima")

[Out] sqrt(c)*log(b*x + a)/b
```

Fricas [A] time = 0.216869, size = 50, normalized size = 1.79

$$\frac{(bx+a)\sqrt{\frac{c}{b^2x^2+2\,abx+a^2}}\log(bx+a)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c/(b*x + a)^2),x, algorithm="fricas")

[Out] (b*x + a)*sqrt(c/(b^2*x^2 + 2*a*b*x + a^2))*log(b*x + a)/b
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\sqrt{\frac{c}{(a+bx)^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x+a)**2)**(1/2),x)

[Out] Integral(sqrt(c/(a + b*x)**2), x)
```

GIAC/XCAS [A] time = 0.220453, size = 27, normalized size = 0.96

$$\frac{\sqrt{c}\ln(|bx+a|)\,\mathrm{sign}(bx+a)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c/(b*x + a)^2),x, algorithm="giac")

[Out] sqrt(c)*ln(abs(b*x + a))*sign(b*x + a)/b
```

3.2821 $\int \frac{1}{\sqrt{\frac{c}{(a+bx)^2}}} dx$

Optimal. Leaf size=25

$$\frac{a+bx}{2b\sqrt{\frac{c}{(a+bx)^2}}}$$

```
[Out] (a + b*x)/(2*b*Sqrt[c/(a + b*x)^2])
```

Rubi [A] time = 0.0223095, antiderivative size = 25, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{a+bx}{2b\sqrt{\frac{c}{(a+bx)^2}}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[c/(a + b*x)^2],x]

[Out] (a + b*x)/(2*b*Sqrt[c/(a + b*x)^2])
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\sqrt{\frac{c}{(a+bx)^2}}\,(a+bx)\int^{a+bx} x\,dx}{bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(c/(b*x+a)**2)**(1/2),x)

[Out] sqrt(c/(a + b*x)**2)*(a + b*x)*Integral(x, (x, a + b*x))/(b*c)
```

Mathematica [A] time = 0.0219579, size = 32, normalized size = 1.28

$$\frac{x(2a+bx)}{2(a+bx)\sqrt{\frac{c}{(a+bx)^2}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/Sqrt[c/(a + b*x)^2],x]

[Out] (x*(2*a + b*x))/(2*Sqrt[c/(a + b*x)^2]*(a + b*x))
```

Maple [A] time = 0.005, size = 29, normalized size = 1.2

$$\frac{x\,(bx+2\,a)}{2\,bx+2\,a}\frac{1}{\sqrt{\frac{c}{(bx+a)^2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(c/(b*x+a)^2)^(1/2),x)

[Out] 1/2*x*(b*x+2*a)/(b*x+a)/(c/(b*x+a)^2)^(1/2)
```

Maxima [A] time = 1.3959, size = 20, normalized size = 0.8

$$\frac{bx^2 + 2\,ax}{2\,\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(c/(b*x + a)^2),x, algorithm="maxima")

[Out] 1/2*(b*x^2 + 2*a*x)/sqrt(c)
```

Fricas [A] time = 0.21445, size = 65, normalized size = 2.6

$$\frac{\left(b^2x^3 + 3\,abx^2 + 2\,a^2x\right)\sqrt{\frac{c}{b^2x^2+2\,abx+a^2}}}{2\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(c/(b*x + a)^2),x, algorithm="fricas")

[Out] 1/2*(b^2*x^3 + 3*a*b*x^2 + 2*a^2*x)*sqrt(c/(b^2*x^2 + 2*a*b*x + a
^2))/c
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{\frac{c}{(a+bx)^2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(c/(b*x+a)**2)**(1/2),x)

[Out] Integral(1/sqrt(c/(a + b*x)**2), x)
```

GIAC/XCAS [A] time = 0.21713, size = 45, normalized size = 1.8

$$\frac{bc^{\frac{3}{2}}x^2\mathrm{sign}\left(bx + a\right) + 2\,ac^{\frac{3}{2}}x\mathrm{sign}\left(bx + a\right)}{2\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(c/(b*x + a)^2),x, algorithm="giac")

[Out] 1/2*(b*c^(3/2)*x^2*sign(b*x + a) + 2*a*c^(3/2)*x*sign(b*x + a))/c
^2
```

3.2822 $\int \frac{1}{\left(\frac{c}{(a+bx)^2}\right)^{3/2}} dx$

Optimal. Leaf size=30

$$\frac{(a+bx)^3}{4bc\sqrt{\frac{c}{(a+bx)^2}}}$$

```
[Out] (a + b*x)^3/(4*b*c*Sqrt[c/(a + b*x)^2])
```

Rubi [A] time = 0.0260905, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{(a+bx)^3}{4bc\sqrt{\frac{c}{(a+bx)^2}}}$$

Antiderivative was successfully verified.

```
[In]  Int[(c/(a + b*x)^2)^(-3/2),x]

[Out] (a + b*x)^3/(4*b*c*Sqrt[c/(a + b*x)^2])
```

Rubi in Sympy [A] time = 2.56119, size = 24, normalized size = 0.8

$$\frac{\sqrt{\frac{c}{(a+bx)^2}}\,(a+bx)^5}{4bc^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(c/(b*x+a)**2)**(3/2),x)

[Out] sqrt(c/(a + b*x)**2)*(a + b*x)**5/(4*b*c**2)
```

Mathematica [A] time = 0.0248684, size = 25, normalized size = 0.83

$$\frac{a+bx}{4b\left(\frac{c}{(a+bx)^2}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c/(a + b*x)^2)^(-3/2),x]

[Out] (a + b*x)/(4*b*(c/(a + b*x)^2)^(3/2))
```

Maple [A] time = 0.004, size = 51, normalized size = 1.7

$$\frac{x\left(b^3x^3+4\,ab^2x^2+6\,a^2bx+4\,a^3\right)}{4\,(bx+a)^3}\left(\frac{c}{(bx+a)^2}\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(c/(b*x+a)^2)^(3/2),x)
```

```
[Out] 1/4*x*(b^3*x^3+4*a*b^2*x^2+6*a^2*b*x+4*a^3)/(b*x+a)^3/(c/(b*x+a)^
2)^(3/2)
```

Maxima [A] time = 1.39062, size = 50, normalized size = 1.67

$$\frac{b^3x^4 + 4\,ab^2x^3 + 6\,a^2bx^2 + 4\,a^3x}{4\,c^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a)^2)^(-3/2),x, algorithm="maxima")
```

```
[Out] 1/4*(b^3*x^4 + 4*a*b^2*x^3 + 6*a^2*b*x^2 + 4*a^3*x)/c^(3/2)
```

Fricas [A] time = 0.215979, size = 95, normalized size = 3.17

$$\frac{\left(b^4x^5 + 5\,ab^3x^4 + 10\,a^2b^2x^3 + 10\,a^3bx^2 + 4\,a^4x\right)\sqrt{\frac{c}{b^2x^2+2\,abx+a^2}}}{4\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a)^2)^(-3/2),x, algorithm="fricas")
```

```
[Out] 1/4*(b^4*x^5 + 5*a*b^3*x^4 + 10*a^2*b^2*x^3 + 10*a^3*b*x^2 + 4*a^
4*x)*sqrt(c/(b^2*x^2 + 2*a*b*x + a^2))/c^2
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(\frac{c}{(a+bx)^2}\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(c/(b*x+a)**2)**(3/2),x)
```

```
[Out] Integral((c/(a + b*x)**2)**(-3/2), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(\frac{c}{(bx+a)^2}\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a)^2)^(-3/2),x, algorithm="giac")
```

```
[Out] integrate((c/(b*x + a)^2)^(-3/2), x)
```

3.2823 $\int \frac{1}{\left(\frac{c}{(a+bx)^2}\right)^{5/2}}\,dx$

Optimal. Leaf size=30

$$\frac{(a+bx)^5}{6bc^2\sqrt{\frac{c}{(a+bx)^2}}}$$

```
[Out] (a + b*x)^5/(6*b*c^2*Sqrt[c/(a + b*x)^2])
```

Rubi [A] time = 0.0260773, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{(a+bx)^5}{6bc^2\sqrt{\frac{c}{(a+bx)^2}}}$$

Antiderivative was successfully verified.

```
[In]  Int[(c/(a + b*x)^2)^(-5/2),x]

[Out] (a + b*x)^5/(6*b*c^2*Sqrt[c/(a + b*x)^2])
```

Rubi in Sympy [A] time = 2.55311, size = 24, normalized size = 0.8

$$\frac{\sqrt{\frac{c}{(a+bx)^2}}\,(a+bx)^7}{6bc^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(c/(b*x+a)**2)**(5/2),x)

[Out] sqrt(c/(a + b*x)**2)*(a + b*x)**7/(6*b*c**3)
```

Mathematica [A] time = 0.0289677, size = 25, normalized size = 0.83

$$\frac{a+bx}{6b\left(\frac{c}{(a+bx)^2}\right)^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c/(a + b*x)^2)^(-5/2),x]

[Out] (a + b*x)/(6*b*(c/(a + b*x)^2)^(5/2))
```

Maple [B] time = 0.005, size = 73, normalized size = 2.4

$$\frac{x\left(b^5x^5+6\,ab^4x^4+15\,a^2b^3x^3+20\,a^3b^2x^2+15\,a^4bx+6\,a^5\right)}{6\,(bx+a)^5}\left(\frac{c}{(bx+a)^2}\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(c/(b*x+a)^2)^(5/2),x)
```

```
[Out] 1/6*x*(b^5*x^5+6*a*b^4*x^4+15*a^2*b^3*x^3+20*a^3*b^2*x^2+15*a^4*b
*x+6*a^5)/(b*x+a)^5/(c/(b*x+a)^2)^(5/2)
```

Maxima [A] time = 1.40529, size = 80, normalized size = 2.67

$$\frac{b^5x^6 + 6\,ab^4x^5 + 15\,a^2b^3x^4 + 20\,a^3b^2x^3 + 15\,a^4bx^2 + 6\,a^5x}{6\,c^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a)^2)^(-5/2),x, algorithm="maxima")
```

```
[Out] 1/6*(b^5*x^6 + 6*a*b^4*x^5 + 15*a^2*b^3*x^4 + 20*a^3*b^2*x^3 + 15
*a^4*b*x^2 + 6*a^5*x)/c^(5/2)
```

Fricas [A] time = 0.218509, size = 124, normalized size = 4.13

$$\frac{\left(b^6x^7 + 7\,ab^5x^6 + 21\,a^2b^4x^5 + 35\,a^3b^3x^4 + 35\,a^4b^2x^3 + 21\,a^5bx^2 + 6\,a^6x\right)\sqrt{\frac{c}{b^2x^2+2\,abx+a^2}}}{6\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a)^2)^(-5/2),x, algorithm="fricas")
```

```
[Out] 1/6*(b^6*x^7 + 7*a*b^5*x^6 + 21*a^2*b^4*x^5 + 35*a^3*b^3*x^4 + 35
*a^4*b^2*x^3 + 21*a^5*b*x^2 + 6*a^6*x)*sqrt(c/(b^2*x^2 + 2*a*b*x
+ a^2))/c^3
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(\frac{c}{(a+bx)^2}\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(c/(b*x+a)**2)**(5/2),x)
```

```
[Out] Integral((c/(a + b*x)**2)**(-5/2), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(\frac{c}{(bx+a)^2}\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a)^2)^(-5/2),x, algorithm="giac")
```

```
[Out] integrate((c/(b*x + a)^2)^(-5/2), x)
```

3.2824 $\int \left(\frac{c}{(a+bx)^3}\right)^{5/2} dx$

Optimal. Leaf size=30

$$-\frac{2c^2\sqrt{\frac{c}{(a+bx)^3}}}{13b(a+bx)^5}$$

```
[Out] (-2*c^2*Sqrt[c/(a + b*x)^3])/(13*b*(a + b*x)^5)
```

Rubi [A] time = 0.027195, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{2c^2\sqrt{\frac{c}{(a+bx)^3}}}{13b(a+bx)^5}$$

Antiderivative was successfully verified.

```
[In] Int[(c/(a + b*x)^3)^(5/2),x]

[Out] (-2*c^2*Sqrt[c/(a + b*x)^3])/(13*b*(a + b*x)^5)
```

Rubi in Sympy [A] time = 2.58562, size = 27, normalized size = 0.9

$$-\frac{2c^2\sqrt{\frac{c}{(a+bx)^3}}}{13b\,(a+bx)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((c/(b*x+a)**3)**(5/2),x)

[Out] -2*c**2*sqrt(c/(a + b*x)**3)/(13*b*(a + b*x)**5)
```

Mathematica [A] time = 0.0209611, size = 25, normalized size = 0.83

$$-\frac{2(a+bx)\left(\frac{c}{(a+bx)^3}\right)^{5/2}}{13b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c/(a + b*x)^3)^(5/2),x]

[Out] (-2*(c/(a + b*x)^3)^(5/2)*(a + b*x))/(13*b)
```

Maple [A] time = 0.004, size = 22, normalized size = 0.7

$$-\frac{2\,bx+2\,a}{13\,b}\left(\frac{c}{(bx+a)^3}\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c/(b*x+a)^3)^(5/2),x)
```

```
[Out] -2/13*(b*x+a)*(c/(b*x+a)^3)^(5/2)/b
```

Maxima [A] time = 1.54379, size = 32, normalized size = 1.07

$$-\frac{2\left(bc^{\frac{5}{2}}x+ac^{\frac{5}{2}}\right)}{13\,(bx+a)^{\frac{15}{2}}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a)^3)^(5/2),x, algorithm="maxima")
```

```
[Out] -2/13*(b*c^(5/2)*x + a*c^(5/2))/((b*x + a)^(15/2)*b)
```

Fricas [A] time = 0.220673, size = 126, normalized size = 4.2

$$-\frac{2\,c^2\sqrt{\frac{c}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}}}{13\,(b^6x^5+5\,ab^5x^4+10\,a^2b^4x^3+10\,a^3b^3x^2+5\,a^4b^2x+a^5b)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a)^3)^(5/2),x, algorithm="fricas")
```

```
[Out] -2/13*c^2*sqrt(c/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))/(b^6*
x^5 + 5*a*b^5*x^4 + 10*a^2*b^4*x^3 + 10*a^3*b^3*x^2 + 5*a^4*b^2*x
 + a^5*b)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x+a)**3)**(5/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.223281, size = 70, normalized size = 2.33

$$-\frac{2\,c^9\mathrm{sign}\left(b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3\right)\,\mathrm{sign}\,(bx+a)}{13\,(bcx+ac)^{\frac{13}{2}}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a)^3)^(5/2),x, algorithm="giac")
```

```
[Out] -2/13*c^9*sign(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3)*sign(b*x
+ a)/((b*c*x + a*c)^(13/2)*b)
```

3.2825 $\int \left(\frac{c}{(a+bx)^3}\right)^{3/2} dx$

Optimal. Leaf size=28

$$-\frac{2c\sqrt{\frac{c}{(a+bx)^3}}}{7b(a+bx)^2}$$

```
[Out] (-2*c*Sqrt[c/(a + b*x)^3])/(7*b*(a + b*x)^2)
```

Rubi [A] time = 0.0248742, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{2c\sqrt{\frac{c}{(a+bx)^3}}}{7b(a+bx)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(c/(a + b*x)^3)^(3/2),x]

[Out] (-2*c*Sqrt[c/(a + b*x)^3])/(7*b*(a + b*x)^2)
```

Rubi in Sympy [A] time = 2.09856, size = 26, normalized size = 0.93

$$-\frac{2c\sqrt{\frac{c}{(a+bx)^3}}}{7b\left(a+bx\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c/(b*x+a)**3)**(3/2),x)

[Out] -2*c*sqrt(c/(a + b*x)**3)/(7*b*(a + b*x)**2)
```

Mathematica [A] time = 0.0145915, size = 25, normalized size = 0.89

$$-\frac{2(a+bx)\left(\frac{c}{(a+bx)^3}\right)^{3/2}}{7b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c/(a + b*x)^3)^(3/2),x]

[Out] (-2*(c/(a + b*x)^3)^(3/2)*(a + b*x))/(7*b)
```

Maple [A] time = 0.002, size = 22, normalized size = 0.8

$$-\frac{2\,bx+2\,a}{7\,b}\left(\frac{c}{\left(bx+a\right)^3}\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c/(b*x+a)^3)^(3/2),x)
```

```
[Out] -2/7*(b*x+a)*(c/(b*x+a)^3)^(3/2)/b
```

Maxima [A] time = 1.47643, size = 32, normalized size = 1.14

$$-\frac{2\left(bc^{\frac{3}{2}}x + ac^{\frac{3}{2}}\right)}{7\,(bx + a)^{\frac{9}{2}}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a)^3)^(3/2),x, algorithm="maxima")
```

```
[Out] -2/7*(b*c^(3/2)*x + a*c^(3/2))/((b*x + a)^(9/2)*b)
```

Fricas [A] time = 0.218368, size = 78, normalized size = 2.79

$$-\frac{2\,c\sqrt{\frac{c}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}}}{7\,(b^3x^2 + 2\,ab^2x + a^2b)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a)^3)^(3/2),x, algorithm="fricas")
```

```
[Out] -2/7*c*sqrt(c/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))/(b^3*x^2
 + 2*a*b^2*x + a^2*b)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x+a)**3)**(3/2),x)
```

```
[Out] Exception raised: TypeError
```

GIAC/XCAS [A] time = 0.221549, size = 70, normalized size = 2.5

$$-\frac{2\,c^5\mathrm{sign}\left(b^3x^3 + 3\,ab^2x^2 + 3\,a^2bx + a^3\right)\,\mathrm{sign}\,(bx + a)}{7\,(bcx + ac)^{\frac{7}{2}}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a)^3)^(3/2),x, algorithm="giac")
```

```
[Out] -2/7*c^5*sign(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3)*sign(b*x +
 a)/((b*c*x + a*c)^(7/2)*b)
```

3.2826 $\int \sqrt{\frac{c}{(a+bx)^3}}\,dx$

Optimal. Leaf size=23

$$-\frac{2(a+bx)\sqrt{\frac{c}{(a+bx)^3}}}{b}$$

```
[Out] (-2*Sqrt[c/(a + b*x)^3]*(a + b*x))/b
```

Rubi [A] time = 0.0226791, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{2(a+bx)\sqrt{\frac{c}{(a+bx)^3}}}{b}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[c/(a + b*x)^3],x]

[Out] (-2*Sqrt[c/(a + b*x)^3]*(a + b*x))/b
```

Rubi in Sympy [A] time = 1.98856, size = 20, normalized size = 0.87

$$-\frac{2\sqrt{\frac{c}{(a+bx)^3}}\,(a+bx)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c/(b*x+a)**3)**(1/2),x)

[Out] -2*sqrt(c/(a + b*x)**3)*(a + b*x)/b
```

Mathematica [A] time = 0.0121398, size = 23, normalized size = 1.

$$-\frac{2(a+bx)\sqrt{\frac{c}{(a+bx)^3}}}{b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[c/(a + b*x)^3],x]

[Out] (-2*Sqrt[c/(a + b*x)^3]*(a + b*x))/b
```

Maple [A] time = 0.004, size = 22, normalized size = 1.

$$-2\,\frac{bx+a}{b}\sqrt{\frac{c}{(bx+a)^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c/(b*x+a)^3)^(1/2),x)
```

```
[Out] -2*(b*x+a)*(c/(b*x+a)^3)^(1/2)/b
```

Maxima [A] time = 1.41481, size = 32, normalized size = 1.39

$$-\frac{2\left(b\sqrt{c}x + a\sqrt{c}\right)}{(bx+a)^{\frac{3}{2}}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c/(b*x + a)^3),x, algorithm="maxima")
```

```
[Out] -2*(b*sqrt(c)*x + a*sqrt(c))/((b*x + a)^(3/2)*b)
```

Fricas [A] time = 0.2164, size = 58, normalized size = 2.52

$$-\frac{2\,(bx+a)\sqrt{\frac{c}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}}}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c/(b*x + a)^3),x, algorithm="fricas")
```

```
[Out] -2*(b*x + a)*sqrt(c/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))/b
```

Sympy [A] time = 3.10123, size = 97, normalized size = 4.22

$$\begin{cases} -\frac{2a\sqrt{c}\sqrt{\frac{1}{a^3+3a^2bx+3ab^2x^2+b^3x^3}}}{b} - 2\sqrt{c}x\sqrt{\frac{1}{a^3+3a^2bx+3ab^2x^2+b^3x^3}} & \text{for } b \neq 0 \\ x\sqrt{\frac{c}{a^3}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x+a)**3)**(1/2),x)
```

```
[Out] Piecewise((-2*a*sqrt(c)*sqrt(1/(a**3 + 3*a**2*b*x + 3*a*b**2*x**2
 + b**3*x**3))/b - 2*sqrt(c)*x*sqrt(1/(a**3 + 3*a**2*b*x + 3*a*b*
*2*x**2 + b**3*x**3)), Ne(b, 0)), (x*sqrt(c/a**3), True))
```

GIAC/XCAS [A] time = 0.218709, size = 68, normalized size = 2.96

$$-\frac{2\,\mathrm{csign}\left(b^3x^3 + 3\,ab^2x^2 + 3\,a^2bx + a^3\right)\,\mathrm{sign}\,(bx+a)}{\sqrt{bcx+ac}b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(c/(b*x + a)^3),x, algorithm="giac")
```

```
[Out] -2*c*sign(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3)*sign(b*x + a)/
(sqrt(b*c*x + a*c)*b)
```

3.2827 $\int \frac{1}{\sqrt{\frac{c}{(a+bx)^3}}}\,dx$

Optimal. Leaf size=25

$$\frac{2(a+bx)}{5b\sqrt{\frac{c}{(a+bx)^3}}}$$

```
[Out] (2*(a + b*x))/(5*b*Sqrt[c/(a + b*x)^3])
```

Rubi [A] time = 0.0220779, antiderivative size = 25, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{2(a+bx)}{5b\sqrt{\frac{c}{(a+bx)^3}}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[c/(a + b*x)^3],x]

[Out] (2*(a + b*x))/(5*b*Sqrt[c/(a + b*x)^3])
```

Rubi in Sympy [A] time = 2.52962, size = 24, normalized size = 0.96

$$\frac{2\sqrt{\frac{c}{(a+bx)^3}}\,(a+bx)^4}{5bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(c/(b*x+a)**3)**(1/2),x)

[Out] 2*sqrt(c/(a + b*x)**3)*(a + b*x)**4/(5*b*c)
```

Mathematica [A] time = 0.025573, size = 25, normalized size = 1.

$$\frac{2(a+bx)}{5b\sqrt{\frac{c}{(a+bx)^3}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/Sqrt[c/(a + b*x)^3],x]

[Out] (2*(a + b*x))/(5*b*Sqrt[c/(a + b*x)^3])
```

Maple [A] time = 0.003, size = 22, normalized size = 0.9

$$\frac{2\,bx+2\,a}{5\,b}\frac{1}{\sqrt{\frac{c}{(bx+a)^3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(c/(b*x+a)^3)^(1/2),x)
```

```
[Out] 2/5*(b*x+a)/b/(c/(b*x+a)^3)^(1/2)
```

Maxima [A] time = 1.54344, size = 36, normalized size = 1.44

$$\frac{2\left(b\sqrt{c}x + a\sqrt{c}\right)(bx + a)^{\frac{3}{2}}}{5\,bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(c/(b*x + a)^3),x, algorithm="maxima")
```

```
[Out] 2/5*(b*sqrt(c)*x + a*sqrt(c))*(b*x + a)^(3/2)/(b*c)
```

Fricas [A] time = 0.217922, size = 107, normalized size = 4.28

$$\frac{2\left(b^4x^4 + 4\,ab^3x^3 + 6\,a^2b^2x^2 + 4\,a^3bx + a^4\right)\sqrt{\frac{c}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}}}{5\,bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(c/(b*x + a)^3),x, algorithm="fricas")
```

```
[Out] 2/5*(b^4*x^4 + 4*a*b^3*x^3 + 6*a^2*b^2*x^2 + 4*a^3*b*x + a^4)*sqr
t(c/(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))/(b*c)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{\frac{c}{(a+bx)^3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(c/(b*x+a)**3)**(1/2),x)
```

```
[Out] Integral(1/sqrt(c/(a + b*x)**3), x)
```

GIAC/XCAS [A] time = 0.219584, size = 217, normalized size = 8.68

$$\frac{2\left(15\sqrt{bcx+ac}a^2 - \frac{10\left(3\sqrt{bcx+ac}ac-(bcx+ac)^{\frac{3}{2}}\right)a}{c} + \frac{15\sqrt{bcx+ac}a^2b^8c^{10}-10\,(bcx+ac)^{\frac{3}{2}}ab^8c^9+3\,(bcx+ac)^{\frac{5}{2}}b^8c^8}{b^8c^{10}}\right)}{15\,bc\mathrm{sign}\left(b^3x^3 + 3\,ab^2x^2 + 3\,a^2bx + a^3\right)\mathrm{sign}\left(bx + a\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(c/(b*x + a)^3),x, algorithm="giac")
```

```
[Out] 2/15*(15*sqrt(b*c*x + a*c)*a^2 - 10*(3*sqrt(b*c*x + a*c)*a*c - (b
*c*x + a*c)^(3/2))*a/c + (15*sqrt(b*c*x + a*c)*a^2*b^8*c^10 - 10*
(b*c*x + a*c)^(3/2)*a*b^8*c^9 + 3*(b*c*x + a*c)^(5/2)*b^8*c^8)/(b
^8*c^10))/(b*c*sign(b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3)*sign
(b*x + a))
```

3.2828 $\int \frac{1}{\left(\frac{c}{(a+bx)^3}\right)^{3/2}}\,dx$

Optimal. Leaf size=30

$$\frac{2(a+bx)^4}{11bc\sqrt{\frac{c}{(a+bx)^3}}}$$

```
[Out] (2*(a + b*x)^4)/(11*b*c*Sqrt[c/(a + b*x)^3])
```

Rubi [A] time = 0.0260761, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{2(a+bx)^4}{11bc\sqrt{\frac{c}{(a+bx)^3}}}$$

Antiderivative was successfully verified.

```
[In]  Int[(c/(a + b*x)^3)^(-3/2),x]

[Out] (2*(a + b*x)^4)/(11*b*c*Sqrt[c/(a + b*x)^3])
```

Rubi in Sympy [A] time = 2.53199, size = 26, normalized size = 0.87

$$\frac{2\sqrt{\frac{c}{(a+bx)^3}}\,(a+bx)^7}{11bc^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(c/(b*x+a)**3)**(3/2),x)

[Out] 2*sqrt(c/(a + b*x)**3)*(a + b*x)**7/(11*b*c**2)
```

Mathematica [A] time = 0.0326347, size = 25, normalized size = 0.83

$$\frac{2(a+bx)}{11b\left(\frac{c}{(a+bx)^3}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c/(a + b*x)^3)^(-3/2),x]

[Out] (2*(a + b*x))/(11*b*(c/(a + b*x)^3)^(3/2))
```

Maple [A] time = 0.004, size = 22, normalized size = 0.7

$$\frac{2\,bx+2\,a}{11\,b}\left(\frac{c}{(bx+a)^3}\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(c/(b*x+a)^3)^(3/2),x)
```

```
[Out] 2/11*(b*x+a)/b/(c/(b*x+a)^3)^(3/2)
```

Maxima [A] time = 1.43685, size = 36, normalized size = 1.2

$$\frac{2\left(b\sqrt{c}x+a\sqrt{c}\right)(bx+a)^{\frac{9}{2}}}{11\,bc^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a)^3)^(-3/2),x, algorithm="maxima")
```

```
[Out] 2/11*(b*sqrt(c)*x + a*sqrt(c))*(b*x + a)^(9/2)/(b*c^2)
```

Fricas [A] time = 0.21845, size = 151, normalized size = 5.03

$$\frac{2\left(b^7x^7+7\,ab^6x^6+21\,a^2b^5x^5+35\,a^3b^4x^4+35\,a^4b^3x^3+21\,a^5b^2x^2+7\,a^6bx+a^7\right)\sqrt{\frac{c}{b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3}}}{11\,bc^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a)^3)^(-3/2),x, algorithm="fricas")
```

```
[Out] 2/11*(b^7*x^7 + 7*a*b^6*x^6 + 21*a^2*b^5*x^5 + 35*a^3*b^4*x^4 + 3
5*a^4*b^3*x^3 + 21*a^5*b^2*x^2 + 7*a^6*b*x + a^7)*sqrt(c/(b^3*x^3
 + 3*a*b^2*x^2 + 3*a^2*b*x + a^3))/(b*c^2)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\left(\frac{c}{(a+bx)^3}\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(c/(b*x+a)**3)**(3/2),x)
```

```
[Out] Integral((c/(a + b*x)**3)**(-3/2), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\left(\frac{c}{(bx+a)^3}\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a)^3)^(-3/2),x, algorithm="giac")
```

```
[Out] integrate((c/(b*x + a)^3)^(-3/2), x)
```

3.2829 $\int \frac{1}{\left(\frac{c}{(a+bx)^3}\right)^{5/2}}\,dx$

Optimal. Leaf size=30

$$\frac{2(a+bx)^7}{17bc^2\sqrt{\frac{c}{(a+bx)^3}}}$$

```
[Out] (2*(a + b*x)^7)/(17*b*c^2*Sqrt[c/(a + b*x)^3])
```

Rubi [A] time = 0.0270123, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$

$$\frac{2(a+bx)^7}{17bc^2\sqrt{\frac{c}{(a+bx)^3}}}$$

Antiderivative was successfully verified.

```
[In]  Int[(c/(a + b*x)^3)^(-5/2),x]
```

```
[Out] (2*(a + b*x)^7)/(17*b*c^2*Sqrt[c/(a + b*x)^3])
```

Rubi in Sympy [A] time = 2.60042, size = 26, normalized size = 0.87

$$\frac{2\sqrt{\frac{c}{(a+bx)^3}}\,(a+bx)^{10}}{17bc^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(c/(b*x+a)**3)**(5/2),x)
```

```
[Out] 2*sqrt(c/(a + b*x)**3)*(a + b*x)**10/(17*b*c**3)
```

Mathematica [A] time = 0.0241552, size = 25, normalized size = 0.83

$$\frac{2(a+bx)}{17b\left(\frac{c}{(a+bx)^3}\right)^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c/(a + b*x)^3)^(-5/2),x]
```

```
[Out] (2*(a + b*x))/(17*b*(c/(a + b*x)^3)^(5/2))
```

Maple [A] time = 0.004, size = 22, normalized size = 0.7

$$\frac{2\,bx+2\,a}{17\,b}\left(\frac{c}{(bx+a)^3}\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(c/(b*x+a)^3)^(5/2),x)

[Out] 2/17*(b*x+a)/b/(c/(b*x+a)^3)^(5/2)
```

Maxima [A] time = 1.44559, size = 36, normalized size = 1.2

$$\frac{2\left(b\sqrt{c}x+a\sqrt{c}\right)(bx+a)^{\frac{15}{2}}}{17\,bc^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a)^3)^(-5/2),x, algorithm="maxima")

[Out] 2/17*(b*sqrt(c)*x + a*sqrt(c))*(b*x + a)^(15/2)/(b*c^3)
```

Fricas [A] time = 0.219366, size = 196, normalized size = 6.53

$$\frac{2\left(b^{10}x^{10}+10\,ab^9x^9+45\,a^2b^8x^8+120\,a^3b^7x^7+210\,a^4b^6x^6+252\,a^5b^5x^5+210\,a^6b^4x^4+120\,a^7b^3x^3+45\,a^8b^2x^2+10\,a^9bx+\right.}{17\,bc^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a)^3)^(-5/2),x, algorithm="fricas")

[Out] 2/17*(b^10*x^10 + 10*a*b^9*x^9 + 45*a^2*b^8*x^8 + 120*a^3*b^7*x^7
 + 210*a^4*b^6*x^6 + 252*a^5*b^5*x^5 + 210*a^6*b^4*x^4 + 120*a^7*
b^3*x^3 + 45*a^8*b^2*x^2 + 10*a^9*b*x + a^10)*sqrt(c/(b^3*x^3 + 3
*a*b^2*x^2 + 3*a^2*b*x + a^3))/(b*c^3)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(\frac{c}{(a+bx)^3}\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(c/(b*x+a)**3)**(5/2),x)

[Out] Integral((c/(a + b*x)**3)**(-5/2), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(\frac{c}{(bx+a)^3}\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a)^3)^(-5/2),x, algorithm="giac")

[Out] integrate((c/(b*x + a)^3)^(-5/2), x)
```

3.2830 $\int \left(c(a+bx)^{3/2}\right)^{2/3} dx$

Optimal. Leaf size=27

$$\frac{(a+bx)\left(c(a+bx)^{3/2}\right)^{2/3}}{2b}$$

```
[Out] ((a + b*x)*(c*(a + b*x)^(3/2))^(2/3))/(2*b)
```

Rubi [A] time = 0.0252825, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$\frac{(a+bx)\left(c(a+bx)^{3/2}\right)^{2/3}}{2b}$$

Antiderivative was successfully verified.

```
[In] Int[(c*(a + b*x)^(3/2))^(2/3),x]
```

```
[Out] ((a + b*x)*(c*(a + b*x)^(3/2))^(2/3))/(2*b)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\left(c\left(a+bx\right)^{\frac{3}{2}}\right)^{\frac{2}{3}}\int^{a+bx} x\,dx}{b\left(a+bx\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((c*(b*x+a)**(3/2))**(2/3),x)
```

```
[Out] (c*(a + b*x)**(3/2))**(2/3)*Integral(x, (x, a + b*x))/(b*(a + b*x
))
```

Mathematica [A] time = 0.0269301, size = 34, normalized size = 1.26

$$\frac{x(2a+bx)\left(c(a+bx)^{3/2}\right)^{2/3}}{2(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*(a + b*x)^(3/2))^(2/3),x]
```

```
[Out] (x*(c*(a + b*x)^(3/2))^(2/3)*(2*a + b*x))/(2*(a + b*x))
```

Maple [A] time = 0.003, size = 29, normalized size = 1.1

$$\frac{x\left(bx+2\,a\right)}{2\,bx+2\,a}\left(c\left(bx+a\right)^{\frac{3}{2}}\right)^{\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*(b*x+a)^(3/2))^(2/3),x)
```

```
[Out] 1/2*x*(b*x+2*a)*(c*(b*x+a)^(3/2))^(2/3)/(b*x+a)
```

Maxima [A] time = 1.33921, size = 28, normalized size = 1.04

$$\frac{\left((bx+a)^{\frac{3}{2}}c\right)^{\frac{2}{3}}(bx+a)}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((b*x + a)^(3/2)*c)^(2/3),x, algorithm="maxima")
```

```
[Out] 1/2*((b*x + a)^(3/2)*c)^(2/3)*(b*x + a)/b
```

Fricas [A] time = 0.321922, size = 50, normalized size = 1.85

$$\frac{\left(bx^{2}+2\,ax\right)\left((bcx+ac)\sqrt{bx+a}\right)^{\frac{2}{3}}}{2\,(bx+a)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((b*x + a)^(3/2)*c)^(2/3),x, algorithm="fricas")
```

```
[Out] 1/2*(b*x^2 + 2*a*x)*((b*c*x + a*c)*sqrt(b*x + a))^(2/3)/(b*x + a)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\left(c\,(a+bx)^{\frac{3}{2}}\right)^{\frac{2}{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*(b*x+a)**(3/2))**(2/3),x)
```

```
[Out] Integral((c*(a + b*x)**(3/2))**(2/3), x)
```

GIAC/XCAS [A] time = 0.220161, size = 20, normalized size = 0.74

$$\frac{(bx+a)^{2}c^{\frac{2}{3}}}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((b*x + a)^(3/2)*c)^(2/3),x, algorithm="giac")
```

```
[Out] 1/2*(b*x + a)^2*c^(2/3)/b
```

3.2831 $\int \left(c(a+bx)^{2/3}\right)^{3/2} dx$

Optimal. Leaf size=32

$$\frac{c(a+bx)^{5/3}\sqrt{c(a+bx)^{2/3}}}{2b}$$

```
[Out] (c*Sqrt[c*(a + b*x)^(2/3)]*(a + b*x)^(5/3))/(2*b)
```

Rubi [A] time = 0.0262344, antiderivative size = 32, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{c(a+bx)^{5/3}\sqrt{c(a+bx)^{2/3}}}{2b}$$

Antiderivative was successfully verified.

```
[In] Int[(c*(a + b*x)^(2/3))^(3/2),x]
```

```
[Out] (c*Sqrt[c*(a + b*x)^(2/3)]*(a + b*x)^(5/3))/(2*b)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{c\sqrt{c\left(a+bx\right)^{\frac{2}{3}}}\int^{a+bx} x\,dx}{b\sqrt[3]{a+bx}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((c*(b*x+a)**(2/3))**(3/2),x)
```

```
[Out] c*sqrt(c*(a + b*x)**(2/3))*Integral(x, (x, a + b*x))/(b*(a + b*x)
**(1/3))
```

Mathematica [A] time = 0.0268066, size = 34, normalized size = 1.06

$$\frac{x(2a+bx)\left(c(a+bx)^{2/3}\right)^{3/2}}{2(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*(a + b*x)^(2/3))^(3/2),x]
```

```
[Out] (x*(c*(a + b*x)^(2/3))^(3/2)*(2*a + b*x))/(2*(a + b*x))
```

Maple [A] time = 0.006, size = 29, normalized size = 0.9

$$\frac{x\left(bx+2\,a\right)}{2\,bx+2\,a}\left(c\left(bx+a\right)^{\frac{2}{3}}\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*(b*x+a)^(2/3))^(3/2),x)
```

```
[Out] 1/2*x*(b*x+2*a)*(c*(b*x+a)^(2/3))^(3/2)/(b*x+a)
```

Maxima [A] time = 1.33913, size = 20, normalized size = 0.62

$$\frac{1}{2}\left(bx^2 + 2\,ax\right)c^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x + a)*c^(3/2),x, algorithm="maxima")
```

```
[Out] 1/2*(b*x^2 + 2*a*x)*c^(3/2)
```

Fricas [A] time = 0.210873, size = 23, normalized size = 0.72

$$\frac{1}{2}\left(bcx^2 + 2\,acx\right)\sqrt{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x + a)*c^(3/2),x, algorithm="fricas")
```

```
[Out] 1/2*(b*c*x^2 + 2*a*c*x)*sqrt(c)
```

Sympy [A] time = 20.1222, size = 65, normalized size = 2.03

$$\begin{cases} \frac{2a^2c^{\frac{3}{2}}x}{2a+2bx} + \frac{3abc^{\frac{3}{2}}x^2}{2a+2bx} + \frac{b^2c^{\frac{3}{2}}x^3}{2a+2bx} & \text{for}\ a \neq 0 \vee b \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*(b*x+a)**(2/3))**(3/2),x)
```

```
[Out] Piecewise((2*a**2*c**(3/2)*x/(2*a + 2*b*x) + 3*a*b*c**(3/2)*x**2/
(2*a + 2*b*x) + b**2*c**(3/2)*x**3/(2*a + 2*b*x), Ne(a, 0) | Ne(b
, 0)), (0, True))
```

GIAC/XCAS [A] time = 0.211809, size = 20, normalized size = 0.62

$$\frac{1}{2}\left(bx^2 + 2\,ax\right)c^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x + a)*c^(3/2),x, algorithm="giac")
```

```
[Out] 1/2*(b*x^2 + 2*a*x)*c^(3/2)
```

3.2832 $\int \frac{1}{\left(\frac{c}{(a+bx)^{3/2}}\right)^{2/3}}\,dx$

Optimal. Leaf size=27

$$\frac{a+bx}{2b\left(\frac{c}{(a+bx)^{3/2}}\right)^{2/3}}$$

```
[Out] (a + b*x)/(2*b*(c/(a + b*x)^(3/2))^(2/3))
```

Rubi [A] time = 0.0266699, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$\frac{a+bx}{2b\left(\frac{c}{(a+bx)^{3/2}}\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Int[(c/(a + b*x)^(3/2))^(-2/3),x]
```

```
[Out] (a + b*x)/(2*b*(c/(a + b*x)^(3/2))^(2/3))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\sqrt[3]{\frac{c}{(a+bx)^{\frac{3}{2}}}}\sqrt{a+bx}\int^{a+bx} x\,dx}{bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(c/(b*x+a)**(3/2))**(2/3),x)
```

```
[Out] (c/(a + b*x)**(3/2))**(1/3)*sqrt(a + b*x)*Integral(x, (x, a + b*x
))/(b*c)
```

Mathematica [A] time = 0.0345671, size = 34, normalized size = 1.26

$$\frac{x(2a+bx)}{2(a+bx)\left(\frac{c}{(a+bx)^{3/2}}\right)^{2/3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c/(a + b*x)^(3/2))^(-2/3),x]
```

```
[Out] (x*(2*a + b*x))/(2*(c/(a + b*x)^(3/2))^(2/3)*(a + b*x))
```

Maple [A] time = 0.002, size = 29, normalized size = 1.1

$$\frac{x\,(bx+2\,a)}{2\,bx+2\,a}\left(c\,(bx+a)^{-\frac{3}{2}}\right)^{-\frac{2}{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(c/(b*x+a)^(3/2))^(2/3),x)
```

```
[Out] 1/2*x*(b*x+2*a)/(b*x+a)/(c/(b*x+a)^(3/2))^(2/3)
```

Maxima [A] time = 1.33623, size = 28, normalized size = 1.04

$$\frac{bx+a}{2\,b\left(\frac{c}{(bx+a)^{\frac{3}{2}}}\right)^{\frac{2}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a)^(3/2))^(-2/3),x, algorithm="maxima")
```

```
[Out] 1/2*(b*x + a)/(b*(c/(b*x + a)^(3/2))^(2/3))
```

Fricas [A] time = 0.336873, size = 59, normalized size = 2.19

$$\frac{\left(b^2x^3+3\,abx^2+2\,a^2x\right)\left(\frac{c}{(bx+a)^{\frac{3}{2}}}\right)^{\frac{1}{3}}}{2\,\sqrt{bx+a}c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a)^(3/2))^(-2/3),x, algorithm="fricas")
```

```
[Out] 1/2*(b^2*x^3 + 3*a*b*x^2 + 2*a^2*x)*(c/(b*x + a)^(3/2))^(1/3)/(sq
rt(b*x + a)*c)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\left(\frac{c}{(a+bx)^{\frac{3}{2}}}\right)^{\frac{2}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(c/(b*x+a)**(3/2))**(2/3),x)
```

```
[Out] Integral((c/(a + b*x)**(3/2))**(-2/3), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\left(\frac{c}{(bx+a)^{\frac{3}{2}}}\right)^{\frac{2}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c/(b*x + a)^(3/2))^(-2/3),x, algorithm="giac")
```

```
[Out] integrate((c/(b*x + a)^(3/2))^(-2/3), x)
```

3.2833 $\int \frac{1}{\left(\frac{c}{(a+bx)^{2/3}}\right)^{3/2}} dx$

Optimal. Leaf size=34

$$\frac{(a+bx)^{5/3}}{2bc\sqrt{\frac{c}{(a+bx)^{2/3}}}}$$

```
[Out] (a + b*x)^(5/3)/(2*b*c*Sqrt[c/(a + b*x)^(2/3)])
```

Rubi [A] time = 0.0299885, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$\frac{(a+bx)^{5/3}}{2bc\sqrt{\frac{c}{(a+bx)^{2/3}}}}$$

Antiderivative was successfully verified.

```
[In]  Int[(c/(a + b*x)^(2/3))^(-3/2),x]
```

```
[Out] (a + b*x)^(5/3)/(2*b*c*Sqrt[c/(a + b*x)^(2/3)])
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\sqrt{\frac{c}{(a+bx)^{\frac{2}{3}}}}\sqrt[3]{a+bx}\int^{a+bx} x\,dx}{bc^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(c/(b*x+a)**(2/3))**(3/2),x)
```

```
[Out] sqrt(c/(a + b*x)**(2/3))*(a + b*x)**(1/3)*Integral(x, (x, a + b*x
))/(b*c**2)
```

Mathematica [A] time = 0.0340955, size = 34, normalized size = 1.

$$\frac{x(2a+bx)}{2(a+bx)\left(\frac{c}{(a+bx)^{2/3}}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c/(a + b*x)^(2/3))^(-3/2),x]
```

```
[Out] (x*(2*a + b*x))/(2*(c/(a + b*x)^(2/3))^(3/2)*(a + b*x))
```

Maple [A] time = 0.004, size = 29, normalized size = 0.9

$$\frac{x\,(bx+2\,a)}{2\,bx+2\,a}\left(c\,(bx+a)^{-\frac{2}{3}}\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(c/(b*x+a)^(2/3))^(3/2),x)

[Out] 1/2*x*(b*x+2*a)/(b*x+a)/(c/(b*x+a)^(2/3))^(3/2)
```

Maxima [A] time = 1.34058, size = 20, normalized size = 0.59

$$\frac{bx^2 + 2\,ax}{2\,c^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x + a)/c^(3/2),x, algorithm="maxima")

[Out] 1/2*(b*x^2 + 2*a*x)/c^(3/2)
```

Fricas [A] time = 0.210852, size = 20, normalized size = 0.59

$$\frac{bx^2 + 2\,ax}{2\,c^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x + a)/c^(3/2),x, algorithm="fricas")

[Out] 1/2*(b*x^2 + 2*a*x)/c^(3/2)
```

Sympy [A] time = 9.37012, size = 134, normalized size = 3.94

$$\begin{cases} \frac{x}{(\tilde{\infty} c)^{\frac{3}{2}}} & \text{for}\: a = 0 \wedge b = 0 \\ \frac{x}{\left(\frac{c}{a^{\frac{2}{3}}}\right)^{\frac{3}{2}}} & \text{for}\: b = 0 \\ \frac{2a^2}{\frac{2abc^{\frac{3}{2}}}{a+bx} + \frac{2b^2c^{\frac{3}{2}}x}{a+bx}} + \frac{2abx}{\frac{2abc^{\frac{3}{2}}}{a+bx} + \frac{2b^2c^{\frac{3}{2}}x}{a+bx}} + \frac{b^2x^2}{\frac{2abc^{\frac{3}{2}}}{a+bx} + \frac{2b^2c^{\frac{3}{2}}x}{a+bx}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(c/(b*x+a)**(2/3))**(3/2),x)

[Out] Piecewise((x/(zoo*c)**(3/2), Eq(a, 0) & Eq(b, 0)), (x/(c/a**(2/3)
)**(3/2), Eq(b, 0)), (2*a**2/(2*a*b*c**(3/2)/(a + b*x) + 2*b**2*c
**(3/2)*x/(a + b*x)) + 2*a*b*x/(2*a*b*c**(3/2)/(a + b*x) + 2*b**2
*c**(3/2)*x/(a + b*x)) + b**2*x**2/(2*a*b*c**(3/2)/(a + b*x) + 2*
b**2*c**(3/2)*x/(a + b*x)), True))
```

GIAC/XCAS [A] time = 0.213428, size = 20, normalized size = 0.59

$$\frac{bx^2 + 2\,ax}{2\,c^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x + a)/c^(3/2),x, algorithm="giac")

[Out] 1/2*(b*x^2 + 2*a*x)/c^(3/2)
```

3.2834 $\int (c+dx)^3 \left(a+b(c+dx)^2\right) \, dx$

Optimal. Leaf size=31

$$\frac{a(c+dx)^4}{4d}+\frac{b(c+dx)^6}{6d}$$

```
[Out] (a*(c + d*x)^4)/(4*d) + (b*(c + d*x)^6)/(6*d)
```

Rubi [A] time = 0.0711818, antiderivative size = 31, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$\frac{a(c+dx)^4}{4d}+\frac{b(c+dx)^6}{6d}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)^3*(a + b*(c + d*x)^2),x]
```

```
[Out] (a*(c + d*x)^4)/(4*d) + (b*(c + d*x)^6)/(6*d)
```

Rubi in Sympy [A] time = 7.08978, size = 22, normalized size = 0.71

$$\frac{a\,(c+dx)^4}{4d}+\frac{b\,(c+dx)^6}{6d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**3*(a+b*(d*x+c)**2),x)
```

```
[Out] a*(c + d*x)**4/(4*d) + b*(c + d*x)**6/(6*d)
```

Mathematica [B] time = 0.0326181, size = 77, normalized size = 2.48

$$\frac{1}{12}x(2c+dx)\left(3a\left(2c^2+2cdx+d^2x^2\right)+2b\left(3c^4+6c^3dx+7c^2d^2x^2+4cd^3x^3+d^4x^4\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c + d*x)^3*(a + b*(c + d*x)^2),x]
```

```
[Out] (x*(2*c + d*x)*(3*a*(2*c^2 + 2*c*d*x + d^2*x^2) + 2*b*(3*c^4 + 6*
c^3*d*x + 7*c^2*d^2*x^2 + 4*c*d^3*x^3 + d^4*x^4)))/12
```

Maple [B] time = 0.003, size = 112, normalized size = 3.6

$$\frac{d^5bx^6}{6}+cd^4bx^5+\frac{\left(9\,c^2d^3b+d^3\left(bc^2+a\right)\right)x^4}{4}+\frac{\left(7\,c^3bd^2+3\,cd^2\left(bc^2+a\right)\right)x^3}{3}+\frac{\left(2\,c^4bd+3\,c^2d\left(bc^2+a\right)\right)x^2}{2}+c^3\left(bc^2+a\right)x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^3*(a+b*(d*x+c)^2),x)
```

```
[Out] 1/6*d^5*b*x^6+c*d^4*b*x^5+1/4*(9*c^2*d^3*b+d^3*(b*c^2+a))*x^4+1/3
*(7*c^3*b*d^2+3*c*d^2*(b*c^2+a))*x^3+1/2*(2*c^4*b*d+3*c^2*d*(b*c^
2+a))*x^2+c^3*(b*c^2+a)*x
```

Maxima [A] time = 1.34101, size = 116, normalized size = 3.74

$$\frac{1}{6}\,bd^5x^6 + bcd^4x^5 + \frac{1}{4}\left(10\,bc^2 + a\right)d^3x^4 + \frac{1}{3}\left(10\,bc^3 + 3\,ac\right)d^2x^3 + \frac{1}{2}\left(5\,bc^4 + 3\,ac^2\right)dx^2 + \left(bc^5 + ac^3\right)x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^2*b + a)*(d*x + c)^3,x, algorithm="maxima")
```

```
[Out] 1/6*b*d^5*x^6 + b*c*d^4*x^5 + 1/4*(10*b*c^2 + a)*d^3*x^4 + 1/3*(1
0*b*c^3 + 3*a*c)*d^2*x^3 + 1/2*(5*b*c^4 + 3*a*c^2)*d*x^2 + (b*c^5
 + a*c^3)*x
```

Fricas [A] time = 0.186369, size = 1, normalized size = 0.03

$$\frac{1}{6}x^6d^5b + x^5d^4cb + \frac{5}{2}x^4d^3c^2b + \frac{10}{3}x^3d^2c^3b + \frac{5}{2}x^2dc^4b + \frac{1}{4}x^4d^3a + xc^5b + x^3d^2ca + \frac{3}{2}x^2dc^2a + xc^3a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^2*b + a)*(d*x + c)^3,x, algorithm="fricas")
```

```
[Out] 1/6*x^6*d^5*b + x^5*d^4*c*b + 5/2*x^4*d^3*c^2*b + 10/3*x^3*d^2*c^
3*b + 5/2*x^2*d*c^4*b + 1/4*x^4*d^3*a + x*c^5*b + x^3*d^2*c*a + 3
/2*x^2*d*c^2*a + x*c^3*a
```

Sympy [A] time = 0.135776, size = 99, normalized size = 3.19

$$bcd^4x^5 + \frac{bd^5x^6}{6} + x^4\left(\frac{ad^3}{4} + \frac{5bc^2d^3}{2}\right) + x^3\left(acd^2 + \frac{10bc^3d^2}{3}\right) + x^2\left(\frac{3ac^2d}{2} + \frac{5bc^4d}{2}\right) + x\left(ac^3 + bc^5\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**3*(a+b*(d*x+c)**2),x)
```

```
[Out] b*c*d**4*x**5 + b*d**5*x**6/6 + x**4*(a*d**3/4 + 5*b*c**2*d**3/2)
 + x**3*(a*c*d**2 + 10*b*c**3*d**2/3) + x**2*(3*a*c**2*d/2 + 5*b*
c**4*d/2) + x*(a*c**3 + b*c**5)
```

GIAC/XCAS [A] time = 0.212352, size = 126, normalized size = 4.06

$$\frac{1}{6}\,bd^5x^6 + bcd^4x^5 + \frac{5}{2}\,bc^2d^3x^4 + \frac{10}{3}\,bc^3d^2x^3 + \frac{5}{2}\,bc^4dx^2 + \frac{1}{4}\,ad^3x^4 + bc^5x + acd^2x^3 + \frac{3}{2}\,ac^2dx^2 + ac^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^2*b + a)*(d*x + c)^3,x, algorithm="giac")
```

```
[Out] 1/6*b*d^5*x^6 + b*c*d^4*x^5 + 5/2*b*c^2*d^3*x^4 + 10/3*b*c^3*d^2*
x^3 + 5/2*b*c^4*d*x^2 + 1/4*a*d^3*x^4 + b*c^5*x + a*c*d^2*x^3 + 3
/2*a*c^2*d*x^2 + a*c^3*x
```

3.2835 $\int (c+dx)^3 \left(a+b(c+dx)^2\right)^2 \, dx$

Optimal. Leaf size=51

$$\frac{a^2(c+dx)^4}{4d}+\frac{ab(c+dx)^6}{3d}+\frac{b^2(c+dx)^8}{8d}$$

```
[Out] (a^2*(c + d*x)^4)/(4*d) + (a*b*(c + d*x)^6)/(3*d) + (b^2*(c + d*x
)^8)/(8*d)
```

Rubi [A] time = 0.169338, antiderivative size = 51, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$

$$\frac{a^2(c+dx)^4}{4d}+\frac{ab(c+dx)^6}{3d}+\frac{b^2(c+dx)^8}{8d}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)^3*(a + b*(c + d*x)^2)^2,x]
```

```
[Out] (a^2*(c + d*x)^4)/(4*d) + (a*b*(c + d*x)^6)/(3*d) + (b^2*(c + d*x
)^8)/(8*d)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^2 \int^{(c+dx)^2} x \, dx}{2d}+\frac{ab\,(c+dx)^6}{3d}+\frac{b^2\,(c+dx)^8}{8d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**3*(a+b*(d*x+c)**2)**2,x)
```

```
[Out] a**2*Integral(x, (x, (c + d*x)**2))/(2*d) + a*b*(c + d*x)**6/(3*d
) + b**2*(c + d*x)**8/(8*d)
```

Mathematica [B] time = 0.0422352, size = 172, normalized size = 3.37

$$\frac{1}{4}d^3x^4\left(a^2+20abc^2+35b^2c^4\right)+\frac{1}{3}cd^2x^3\left(3a^2+20abc^2+21b^2c^4\right)+\frac{1}{2}c^2dx^2\left(3a^2+10abc^2+7b^2c^4\right)+\frac{1}{6}bd^5x^6\left(2a+21bc^2\right)+bcd^4x^5\left(2a+7bc^2\right)+c^3x\left(a+bc^2\right)^2+b^2cd^6x^7+\frac{1}{8}b^2d^7x^8$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c + d*x)^3*(a + b*(c + d*x)^2)^2,x]
```

```
[Out] c^3*(a + b*c^2)^2*x + (c^2*(3*a^2 + 10*a*b*c^2 + 7*b^2*c^4)*d*x^2
)/2 + (c*(3*a^2 + 20*a*b*c^2 + 21*b^2*c^4)*d^2*x^3)/3 + ((a^2 + 2
0*a*b*c^2 + 35*b^2*c^4)*d^3*x^4)/4 + b*c*(2*a + 7*b*c^2)*d^4*x^5
+ (b*(2*a + 21*b*c^2)*d^5*x^6)/6 + b^2*c*d^6*x^7 + (b^2*d^7*x^8)/
8
```

Maple [B] time = 0.001, size = 324, normalized size = 6.4

$$\frac{d^7b^2x^8}{8} + cd^6b^2x^7 + \frac{\left(15\,c^2d^5b^2 + d^3\left(2\,\left(bc^2+a\right)bd^2 + 4\,b^2c^2d^2\right)\right)x^6}{6} + \frac{\left(13\,c^3b^2d^4 + 3\,cd^2\left(2\,\left(bc^2+a\right)bd^2 + 4\,b^2c^2d^2\right) + 4\,d^4\left(bc^2+a\right)bc\right)x^5}{5} + \frac{\left(4\,c^4b^2d^3 + 3\,c^2d\left(2\,\left(bc^2+a\right)bd^2 + 4\,b^2c^2d^2\right) + 12\,c^2d^3\left(bc^2+a\right)b + d^3\left(bc^2+a\right)^2\right)x^4}{4} + \frac{\left(c^3\left(2\,\left(bc^2+a\right)bd^2 + 4\,b^2c^2d^2\right) + 12\,c^3d^2\left(bc^2+a\right)b + 3\,cd^2\left(bc^2+a\right)^2\right)x^3}{3} + \frac{\left(4\,c^4\left(bc^2+a\right)bd + 3\,c^2d\left(bc^2+a\right)^2\right)x^2}{2} + c^3\left(bc^2+a\right)^2x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((d*x+c)^3*(a+b*(d*x+c)^2)^2,x)
```

```
[Out] 1/8*d^7*b^2*x^8+c*d^6*b^2*x^7+1/6*(15*c^2*d^5*b^2+d^3*(2*(b*c^2+a
)*b*d^2+4*b^2*c^2*d^2))*x^6+1/5*(13*c^3*b^2*d^4+3*c*d^2*(2*(b*c^2
+a)*b*d^2+4*b^2*c^2*d^2)+4*d^4*(b*c^2+a)*b*c)*x^5+1/4*(4*c^4*b^2*
d^3+3*c^2*d*(2*(b*c^2+a)*b*d^2+4*b^2*c^2*d^2)+12*c^2*d^3*(b*c^2+a
)*b+d^3*(b*c^2+a)^2)*x^4+1/3*(c^3*(2*(b*c^2+a)*b*d^2+4*b^2*c^2*d^
2)+12*c^3*d^2*(b*c^2+a)*b+3*c*d^2*(b*c^2+a)^2)*x^3+1/2*(4*c^4*(b*
c^2+a)*b*d+3*c^2*d*(b*c^2+a)^2)*x^2+c^3*(b*c^2+a)^2*x
```

Maxima [A] time = 1.41231, size = 238, normalized size = 4.67

$$\frac{1}{8}\,b^2d^7x^8 + b^2cd^6x^7 + \frac{1}{6}\left(21\,b^2c^2 + 2\,ab\right)d^5x^6 + \left(7\,b^2c^3 + 2\,abc\right)d^4x^5 + \frac{1}{4}\left(35\,b^2c^4 + 20\,abc^2 + a^2\right)d^3x^4 + \frac{1}{3}\left(21\,b^2c^5 + 20\,abc^3 + 3\,a^2c\right)d^2x^3 + \frac{1}{2}\left(7\,b^2c^6 + 10\,abc^4 + 3\,a^2c^2\right)dx^2 + \left(b^2c^7 + 2\,abc^5 + a^2c^3\right)x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(((d*x + c)^2*b + a)^2*(d*x + c)^3,x, algorithm="maxima")
```

```
[Out] 1/8*b^2*d^7*x^8 + b^2*c*d^6*x^7 + 1/6*(21*b^2*c^2 + 2*a*b)*d^5*x^
6 + (7*b^2*c^3 + 2*a*b*c)*d^4*x^5 + 1/4*(35*b^2*c^4 + 20*a*b*c^2
+ a^2)*d^3*x^4 + 1/3*(21*b^2*c^5 + 20*a*b*c^3 + 3*a^2*c)*d^2*x^3
+ 1/2*(7*b^2*c^6 + 10*a*b*c^4 + 3*a^2*c^2)*d*x^2 + (b^2*c^7 + 2*a
*b*c^5 + a^2*c^3)*x
```

Fricas [A] time = 0.186226, size = 1, normalized size = 0.02

$$\frac{1}{8}x^8d^7b^2 + x^7d^6cb^2 + \frac{7}{2}x^6d^5c^2b^2 + 7x^5d^4c^3b^2 + \frac{35}{4}x^4d^3c^4b^2 + \frac{1}{3}x^6d^5ba + 7x^3d^2c^5b^2 + 2x^5d^4cba + \frac{7}{2}x^2dc^6b^2 + 5x^4d^3c^2ba + xc^7b^2 + \frac{20}{3}x^3d^2c^3ba + 5x^2dc^4ba + \frac{1}{4}x^4d^3a^2 + 2xc^5ba + x^3d^2ca^2 + \frac{3}{2}x^2dc^2a^2 + xc^3a^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(((d*x + c)^2*b + a)^2*(d*x + c)^3,x, algorithm="fricas")
```

```
[Out] 1/8*x^8*d^7*b^2 + x^7*d^6*c*b^2 + 7/2*x^6*d^5*c^2*b^2 + 7*x^5*d^4
*c^3*b^2 + 35/4*x^4*d^3*c^4*b^2 + 1/3*x^6*d^5*b*a + 7*x^3*d^2*c^5
*b^2 + 2*x^5*d^4*c*b*a + 7/2*x^2*d*c^6*b^2 + 5*x^4*d^3*c^2*b*a +
x*c^7*b^2 + 20/3*x^3*d^2*c^3*b*a + 5*x^2*d*c^4*b*a + 1/4*x^4*d^3*
```

```
a^2 + 2*x*c^5*b*a + x^3*d^2*c*a^2 + 3/2*x^2*d*c^2*a^2 + x*c^3*a^2
```

Sympy [A] time = 0.244625, size = 209, normalized size = 4.1

$$b^2cd^6x^7 + \frac{b^2d^7x^8}{8} + x^6\left(\frac{abd^5}{3} + \frac{7b^2c^2d^5}{2}\right) + x^5\left(2abcd^4 + 7b^2c^3d^4\right) + x^4\left(\frac{a^2d^3}{4} + 5abc^2d^3 + \frac{35b^2c^4d^3}{4}\right) + x^3\left(a^2cd^2 + \frac{20abc^3d^2}{3} + 7b^2c^5d^2\right) + x^2\left(\frac{3a^2c^2d}{2} + 5abc^4d + \frac{7b^2c^6d}{2}\right) + x\left(a^2c^3 + 2abc^5 + b^2c^7\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**3*(a+b*(d*x+c)**2)**2,x)
```

```
[Out] b**2*c*d**6*x**7 + b**2*d**7*x**8/8 + x**6*(a*b*d**5/3 + 7*b**2*c
**2*d**5/2) + x**5*(2*a*b*c*d**4 + 7*b**2*c**3*d**4) + x**4*(a**2
*d**3/4 + 5*a*b*c**2*d**3 + 35*b**2*c**4*d**3/4) + x**3*(a**2*c*d
**2 + 20*a*b*c**3*d**2/3 + 7*b**2*c**5*d**2) + x**2*(3*a**2*c**2*
d/2 + 5*a*b*c**4*d + 7*b**2*c**6*d/2) + x*(a**2*c**3 + 2*a*b*c**5
 + b**2*c**7)
```

GIAC/XCAS [A] time = 0.213998, size = 279, normalized size = 5.47

$$\frac{1}{8}b^2d^7x^8 + b^2cd^6x^7 + \frac{7}{2}b^2c^2d^5x^6 + 7b^2c^3d^4x^5 + \frac{35}{4}b^2c^4d^3x^4 + \frac{1}{3}abd^5x^6 + 7b^2c^5d^2x^3 + 2abcd^4x^5 + \frac{7}{2}b^2c^6dx^2 + 5abc^2d^3x^4 + b^2c^7x + \frac{20}{3}abc^3d^2x^3 + 5abc^4dx^2 + \frac{1}{4}a^2d^3x^4 + 2abc^5x + a^2cd^2x^3 + \frac{3}{2}a^2c^2dx^2 + a^2c^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^2*b + a)^2*(d*x + c)^3,x, algorithm="giac")
```

```
[Out] 1/8*b^2*d^7*x^8 + b^2*c*d^6*x^7 + 7/2*b^2*c^2*d^5*x^6 + 7*b^2*c^3
*d^4*x^5 + 35/4*b^2*c^4*d^3*x^4 + 1/3*a*b*d^5*x^6 + 7*b^2*c^5*d^2
*x^3 + 2*a*b*c*d^4*x^5 + 7/2*b^2*c^6*d*x^2 + 5*a*b*c^2*d^3*x^4 +
b^2*c^7*x + 20/3*a*b*c^3*d^2*x^3 + 5*a*b*c^4*d*x^2 + 1/4*a^2*d^3*
x^4 + 2*a*b*c^5*x + a^2*c*d^2*x^3 + 3/2*a^2*c^2*d*x^2 + a^2*c^3*x
```

3.2836 $\int (c+dx)^3 \left(a+b(c+dx)^2\right)^3 \, dx$

Optimal. Leaf size=48

$$\frac{\left(a+b(c+dx)^2\right)^5}{10b^2d}-\frac{a\left(a+b(c+dx)^2\right)^4}{8b^2d}$$

```
[Out] -(a*(a + b*(c + d*x)^2)^4)/(8*b^2*d) + (a + b*(c + d*x)^2)^5/(10*
b^2*d)
```

Rubi [A] time = 0.42651, antiderivative size = 48, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$\frac{\left(a+b(c+dx)^2\right)^5}{10b^2d}-\frac{a\left(a+b(c+dx)^2\right)^4}{8b^2d}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)^3*(a + b*(c + d*x)^2)^3,x]
```

```
[Out] -(a*(a + b*(c + d*x)^2)^4)/(8*b^2*d) + (a + b*(c + d*x)^2)^5/(10*
b^2*d)
```

Rubi in Sympy [A] time = 15.3011, size = 37, normalized size = 0.77

$$-\frac{a\left(a+b\left(c+dx\right)^2\right)^4}{8b^2d}+\frac{\left(a+b\left(c+dx\right)^2\right)^5}{10b^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**3*(a+b*(d*x+c)**2)**3,x)
```

```
[Out] -a*(a + b*(c + d*x)**2)**4/(8*b**2*d) + (a + b*(c + d*x)**2)**5/(
10*b**2*d)
```

Mathematica [B] time = 0.0597578, size = 249, normalized size = 5.19

$$\frac{1}{2}bd^5x^6\left(a^2+21abc^2+42b^2c^4\right)+\frac{3}{5}bcd^4x^5\left(5a^2+35abc^2+42b^2c^4\right)+\frac{1}{4}d^3x^4\left(a^3+30a^2bc^2+105ab^2c^4+84b^3c^6\right)+cd^2x^3\left(a^3+10a^2bc^2+21ab^2c^4+12b^3c^6\right)+\frac{3}{8}b^2d^7x^8\left(a+12bc^2\right)+3b^2cd^6x^7\left(a+4bc^2\right)+\frac{3}{2}c^2dx^2\left(a+bc^2\right)^2\left(a+3bc^2\right)+c^3x\left(a+bc^2\right)^3+b^3cd^8x^9+\frac{1}{10}b^3d^9x^{10}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c + d*x)^3*(a + b*(c + d*x)^2)^3,x]
```

```
[Out] c^3*(a + b*c^2)^3*x + (3*c^2*(a + b*c^2)^2*(a + 3*b*c^2)*d*x^2)/2
 + c*(a^3 + 10*a^2*b*c^2 + 21*a*b^2*c^4 + 12*b^3*c^6)*d^2*x^3 + (
(a^3 + 30*a^2*b*c^2 + 105*a*b^2*c^4 + 84*b^3*c^6)*d^3*x^4)/4 + (3
*b*c*(5*a^2 + 35*a*b*c^2 + 42*b^2*c^4)*d^4*x^5)/5 + (b*(a^2 + 21*
a*b*c^2 + 42*b^2*c^4)*d^5*x^6)/2 + 3*b^2*c*(a + 4*b*c^2)*d^6*x^7
+ (3*b^2*(a + 12*b*c^2)*d^7*x^8)/8 + b^3*c*d^8*x^9 + (b^3*d^9*x^1
0)/10
```

Maple [B] time = 0.002, size = 960, normalized size = 20.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^3*(a+b*(d*x+c)^2)^3,x)
```

```
[Out] 1/10*d^9*b^3*x^10+c*d^8*b^3*x^9+1/8*(21*c^2*d^7*b^3+d^3*((b*c^2+a
)*b^2*d^4+8*b^3*c^2*d^4+b*d^2*(2*(b*c^2+a)*b*d^2+4*b^2*c^2*d^2)))
*x^8+1/7*(19*c^3*b^3*d^6+3*c*d^2*((b*c^2+a)*b^2*d^4+8*b^3*c^2*d^4
+b*d^2*(2*(b*c^2+a)*b*d^2+4*b^2*c^2*d^2))+d^3*(8*(b*c^2+a)*b^2*c*
d^3+2*b*c*d*(2*(b*c^2+a)*b*d^2+4*b^2*c^2*d^2)))*x^7+1/6*(6*c^4*b^
3*d^5+3*c^2*d*((b*c^2+a)*b^2*d^4+8*b^3*c^2*d^4+b*d^2*(2*(b*c^2+a)
*b*d^2+4*b^2*c^2*d^2))+3*c*d^2*(8*(b*c^2+a)*b^2*c*d^3+2*b*c*d*(2*
(b*c^2+a)*b*d^2+4*b^2*c^2*d^2))+d^3*((b*c^2+a)*(2*(b*c^2+a)*b*d^2
+4*b^2*c^2*d^2)+8*b^2*c^2*d^2*(b*c^2+a)+b*d^2*(b*c^2+a)^2))*x^6+1
/5*(c^3*((b*c^2+a)*b^2*d^4+8*b^3*c^2*d^4+b*d^2*(2*(b*c^2+a)*b*d^2
+4*b^2*c^2*d^2))+3*c^2*d*(8*(b*c^2+a)*b^2*c*d^3+2*b*c*d*(2*(b*c^2
+a)*b*d^2+4*b^2*c^2*d^2))+3*c*d^2*((b*c^2+a)*(2*(b*c^2+a)*b*d^2+4
*b^2*c^2*d^2)+8*b^2*c^2*d^2*(b*c^2+a)+b*d^2*(b*c^2+a)^2)+6*d^4*(b
*c^2+a)^2*b*c)*x^5+1/4*(c^3*(8*(b*c^2+a)*b^2*c*d^3+2*b*c*d*(2*(b*
c^2+a)*b*d^2+4*b^2*c^2*d^2))+3*c^2*d*((b*c^2+a)*(2*(b*c^2+a)*b*d^
2+4*b^2*c^2*d^2)+8*b^2*c^2*d^2*(b*c^2+a)+b*d^2*(b*c^2+a)^2)+18*c^
2*d^3*(b*c^2+a)^2*b+d^3*(b*c^2+a)^3)*x^4+1/3*(c^3*((b*c^2+a)*(2*(
b*c^2+a)*b*d^2+4*b^2*c^2*d^2)+8*b^2*c^2*d^2*(b*c^2+a)+b*d^2*(b*c^
2+a)^2)+18*c^3*d^2*(b*c^2+a)^2*b+3*c*d^2*(b*c^2+a)^3)*x^3+1/2*(6*
c^4*(b*c^2+a)^2*b*d+3*c^2*d*(b*c^2+a)^3)*x^2+c^3*(b*c^2+a)^3*x
```

Maxima [A] time = 1.43381, size = 383, normalized size = 7.98

$$\frac{1}{10}\,b^3d^9x^{10}+b^3cd^8x^9+\frac{3}{8}\left(12\,b^3c^2+ab^2\right)d^7x^8+3\left(4\,b^3c^3+ab^2c\right)d^6x^7+\frac{1}{2}\left(42\,b^3c^4+21\,ab^2c^2+a^2b\right)d^5x^6+\frac{3}{5}\left(42\,b^3c^5+35\,ab^2c^3+5\,a^2bc\right)d^4x^5+\frac{1}{4}\left(84\,b^3c^6+105\,ab^2c^4+30\,a^2bc^2+a^3\right)d^3x^4+\left(12\,b^3c^7+21\,ab^2c^5+10\,a^2bc^3+a^3c\right)d^2x^3+\frac{3}{2}\left(3\,b^3c^8+7\,ab^2c^6+5\,a^2bc^4+a^3c^2\right)dx^2+\left(b^3c^9+3\,ab^2c^7+3\,a^2bc^5+a^3c^3\right)x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^2*b + a)^3*(d*x + c)^3,x, algorithm="maxima")
```

```
[Out] 1/10*b^3*d^9*x^10 + b^3*c*d^8*x^9 + 3/8*(12*b^3*c^2 + a*b^2)*d^7*
x^8 + 3*(4*b^3*c^3 + a*b^2*c)*d^6*x^7 + 1/2*(42*b^3*c^4 + 21*a*b^
2*c^2 + a^2*b)*d^5*x^6 + 3/5*(42*b^3*c^5 + 35*a*b^2*c^3 + 5*a^2*b
*c)*d^4*x^5 + 1/4*(84*b^3*c^6 + 105*a*b^2*c^4 + 30*a^2*b*c^2 + a^
3)*d^3*x^4 + (12*b^3*c^7 + 21*a*b^2*c^5 + 10*a^2*b*c^3 + a^3*c)*d
^2*x^3 + 3/2*(3*b^3*c^8 + 7*a*b^2*c^6 + 5*a^2*b*c^4 + a^3*c^2)*d*
x^2 + (b^3*c^9 + 3*a*b^2*c^7 + 3*a^2*b*c^5 + a^3*c^3)*x
```

Fricas [A] time = 0.189082, size = 1, normalized size = 0.02

$$\frac{1}{10}x^{10}d^9b^3+x^9d^8cb^3+\frac{9}{2}x^8d^7c^2b^3+12x^7d^6c^3b^3+21x^6d^5c^4b^3+\frac{3}{8}x^8d^7b^2a+\frac{126}{5}x^5d^4c^5b^3+3x^7d^6cb^2a+21x^4d^3c^6b^3+\frac{21}{2}x^6d^5c^2b^2a+12x^3d^2c^7b^3+21x^5d^4c^3b^2a+\frac{9}{2}x^2dc^8b^3+\frac{105}{4}x^4d^3c^4b^2a+\frac{1}{2}x^6d^5ba^2+xc^9b^3+21x^3d^2c^5b^2a+3x^5d^4cba^2+\frac{21}{2}x^2dc^6b^2a+\frac{15}{2}x^4d^3c^2ba^2+3xc^7b^2a+10x^3d^2c^3ba^2+\frac{15}{2}x^2dc^4ba^2+\frac{1}{4}x^4d^3a^3+3xc^5ba^2+x^3d^2ca^3+\frac{3}{2}x^2dc^2a^3+xc^3a^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^2*b + a)^3*(d*x + c)^3,x, algorithm="fricas")
```

```
[Out] 1/10*x^10*d^9*b^3 + x^9*d^8*c*b^3 + 9/2*x^8*d^7*c^2*b^3 + 12*x^7*
d^6*c^3*b^3 + 21*x^6*d^5*c^4*b^3 + 3/8*x^8*d^7*b^2*a + 126/5*x^5*
d^4*c^5*b^3 + 3*x^7*d^6*c*b^2*a + 21*x^4*d^3*c^6*b^3 + 21/2*x^6*d
^5*c^2*b^2*a + 12*x^3*d^2*c^7*b^3 + 21*x^5*d^4*c^3*b^2*a + 9/2*x^
2*d*c^8*b^3 + 105/4*x^4*d^3*c^4*b^2*a + 1/2*x^6*d^5*b*a^2 + x*c^9
*b^3 + 21*x^3*d^2*c^5*b^2*a + 3*x^5*d^4*c*b*a^2 + 21/2*x^2*d*c^6*
b^2*a + 15/2*x^4*d^3*c^2*b*a^2 + 3*x*c^7*b^2*a + 10*x^3*d^2*c^3*b
*a^2 + 15/2*x^2*d*c^4*b*a^2 + 1/4*x^4*d^3*a^3 + 3*x*c^5*b*a^2 + x
^3*d^2*c*a^3 + 3/2*x^2*d*c^2*a^3 + x*c^3*a^3
```

Sympy [A] time = 0.366245, size = 357, normalized size = 7.44

$$b^3cd^8x^9 + \frac{b^3d^9x^{10}}{10} + x^8\left(\frac{3ab^2d^7}{8} + \frac{9b^3c^2d^7}{2}\right) + x^7\left(3ab^2cd^6 + 12b^3c^3d^6\right) + x^6\left(\frac{a^2bd^5}{2} + \frac{21ab^2c^2d^5}{2} + 21b^3c^4d^5\right) + x^5\left(3a^2bcd^4 + 21ab^2c^3d^4 + \frac{126b^3c^5d^4}{5}\right) + x^4\left(\frac{a^3d^3}{4} + \frac{15a^2bc^2d^3}{2} + \frac{105ab^2c^4d^3}{4} + 21b^3c^6d^3\right) + x^3\left(a^3cd^2 + 10a^2bc^3d^2 + 21ab^2c^5d^2 + 12b^3c^7d^2\right) + x^2\left(\frac{3a^3c^2d}{2} + \frac{15a^2bc^4d}{2} + \frac{21ab^2c^6d}{2} + \frac{9b^3c^8d}{2}\right) + x\left(a^3c^3 + 3a^2bc^5 + 3ab^2c^7 + b^3c^9\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**3*(a+b*(d*x+c)**2)**3,x)
```

```
[Out] b**3*c*d**8*x**9 + b**3*d**9*x**10/10 + x**8*(3*a*b**2*d**7/8 + 9
*b**3*c**2*d**7/2) + x**7*(3*a*b**2*c*d**6 + 12*b**3*c**3*d**6) +
 x**6*(a**2*b*d**5/2 + 21*a*b**2*c**2*d**5/2 + 21*b**3*c**4*d**5)
 + x**5*(3*a**2*b*c*d**4 + 21*a*b**2*c**3*d**4 + 126*b**3*c**5*d*
*4/5) + x**4*(a**3*d**3/4 + 15*a**2*b*c**2*d**3/2 + 105*a*b**2*c*
*4*d**3/4 + 21*b**3*c**6*d**3) + x**3*(a**3*c*d**2 + 10*a**2*b*c*
*3*d**2 + 21*a*b**2*c**5*d**2 + 12*b**3*c**7*d**2) + x**2*(3*a**3
*c**2*d/2 + 15*a**2*b*c**4*d/2 + 21*a*b**2*c**6*d/2 + 9*b**3*c**8
*d/2) + x*(a**3*c**3 + 3*a**2*b*c**5 + 3*a*b**2*c**7 + b**3*c**9)
```

GIAC/XCAS [A] time = 0.213308, size = 479, normalized size = 9.98

$$\frac{1}{10}b^3d^9x^{10} + b^3cd^8x^9 + \frac{9}{2}b^3c^2d^7x^8 + 12\,b^3c^3d^6x^7 + 21\,b^3c^4d^5x^6 + \frac{3}{8}ab^2d^7x^8 + \frac{126}{5}b^3c^5d^4x^5 + 3\,ab^2cd^6x^7 + 21\,b^3c^6d^3x^4 + \frac{21}{2}ab^2c^2d^5x^6 + 12\,b^3c^7d^2x^3 + 21\,ab^2c^3d^4x^5 + \frac{9}{2}b^3c^8dx^2 + \frac{105}{4}ab^2c^4d^3x^4 + \frac{1}{2}a^2bd^5x^6 + b^3c^9x + 21\,ab^2c^5d^2x^3 + 3\,a^2bcd^4x^5 + \frac{21}{2}ab^2c^6dx^2 + \frac{15}{2}a^2bc^2d^3x^4 + 3\,ab^2c^7x + 10\,a^2bc^3d^2x^3 + \frac{15}{2}a^2bc^4dx^2 + \frac{1}{4}a^3d^3x^4 + 3\,a^2bc^5x + a^3cd^2x^3 + \frac{3}{2}a^3c^2dx^2 + a^3c^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^2*b + a)^3*(d*x + c)^3,x, algorithm="giac")
```

```
[Out] 1/10*b^3*d^9*x^10 + b^3*c*d^8*x^9 + 9/2*b^3*c^2*d^7*x^8 + 12*b^3*
c^3*d^6*x^7 + 21*b^3*c^4*d^5*x^6 + 3/8*a*b^2*d^7*x^8 + 126/5*b^3*
c^5*d^4*x^5 + 3*a*b^2*c*d^6*x^7 + 21*b^3*c^6*d^3*x^4 + 21/2*a*b^2
*c^2*d^5*x^6 + 12*b^3*c^7*d^2*x^3 + 21*a*b^2*c^3*d^4*x^5 + 9/2*b^
3*c^8*d*x^2 + 105/4*a*b^2*c^4*d^3*x^4 + 1/2*a^2*b*d^5*x^6 + b^3*c
^9*x + 21*a*b^2*c^5*d^2*x^3 + 3*a^2*b*c*d^4*x^5 + 21/2*a*b^2*c^6*
d*x^2 + 15/2*a^2*b*c^2*d^3*x^4 + 3*a*b^2*c^7*x + 10*a^2*b*c^3*d^2
*x^3 + 15/2*a^2*b*c^4*d*x^2 + 1/4*a^3*d^3*x^4 + 3*a^2*b*c^5*x + a
^3*c*d^2*x^3 + 3/2*a^3*c^2*d*x^2 + a^3*c^3*x
```

3.2837 $\int \frac{2+x}{1+(2+x)^2} dx$

Optimal. Leaf size=12

$$\frac{1}{2}\log\left((x+2)^2+1\right)$$

```
[Out] Log[1 + (2 + x)^2]/2
```

Rubi [A] time = 0.00808821, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$\frac{1}{2}\log\left((x+2)^2+1\right)$$

Antiderivative was successfully verified.

```
[In] Int[(2 + x)/(1 + (2 + x)^2),x]

[Out] Log[1 + (2 + x)^2]/2
```

Rubi in Sympy [A] time = 2.1565, size = 8, normalized size = 0.67

$$\frac{\log\left((x+2)^2+1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((2+x)/(1+(2+x)**2),x)

[Out] log((x + 2)**2 + 1)/2
```

Mathematica [A] time = 0.00372332, size = 12, normalized size = 1.

$$\frac{1}{2}\log\left((x+2)^2+1\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(2 + x)/(1 + (2 + x)^2),x]

[Out] Log[1 + (2 + x)^2]/2
```

Maple [A] time = 0.001, size = 12, normalized size = 1.

$$\frac{\ln\left(x^2+4x+5\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((2+x)/(1+(2+x)^2),x)

[Out] 1/2*ln(x^2+4*x+5)
```

Maxima [A] time = 1.37722, size = 14, normalized size = 1.17

$$\frac{1}{2}\,\log\left((x+2)^2+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x + 2)/((x + 2)^2 + 1),x, algorithm="maxima")
```

```
[Out] 1/2*log((x + 2)^2 + 1)
```

Fricas [A] time = 0.205985, size = 15, normalized size = 1.25

$$\frac{1}{2}\,\log\left(x^2+4\,x+5\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x + 2)/((x + 2)^2 + 1),x, algorithm="fricas")
```

```
[Out] 1/2*log(x^2 + 4*x + 5)
```

Sympy [A] time = 0.143202, size = 10, normalized size = 0.83

$$\frac{\log\left(x^2+4x+5\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2+x)/(1+(2+x)**2),x)
```

```
[Out] log(x**2 + 4*x + 5)/2
```

GIAC/XCAS [A] time = 0.215847, size = 15, normalized size = 1.25

$$\frac{1}{2}\,\ln\left(x^2+4\,x+5\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x + 2)/((x + 2)^2 + 1),x, algorithm="giac")
```

```
[Out] 1/2*ln(x^2 + 4*x + 5)
```

3.2838 $\int \frac{2+x}{(1+(2+x)^2)^2} dx$

Optimal. Leaf size=13

$$-\frac{1}{2((x+2)^2+1)}$$

```
[Out] -1/(2*(1 + (2 + x)^2))
```

Rubi [A] time = 0.0085989, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077

$$-\frac{1}{2((x+2)^2+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(2 + x)/(1 + (2 + x)^2)^2,x]

[Out] -1/(2*(1 + (2 + x)^2))
```

Rubi in Sympy [A] time = 2.15877, size = 10, normalized size = 0.77

$$-\frac{1}{2\left((x+2)^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2+x)/(1+(2+x)**2)**2,x)

[Out] -1/(2*((x + 2)**2 + 1))
```

Mathematica [A] time = 0.00420682, size = 13, normalized size = 1.

$$-\frac{1}{2((x+2)^2+1)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(2 + x)/(1 + (2 + x)^2)^2,x]

[Out] -1/(2*(1 + (2 + x)^2))
```

Maple [A] time = 0.002, size = 13, normalized size = 1.

$$-\frac{1}{2x^2+8x+10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2+x)/(1+(2+x)^2)^2,x)

[Out] -1/2/(x^2+4*x+5)
```

Maxima [A] time = 1.37199, size = 15, normalized size = 1.15

$$-\frac{1}{2\left((x+2)^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x + 2)/((x + 2)^2 + 1)^2,x, algorithm="maxima")
```

```
[Out] -1/2/((x + 2)^2 + 1)
```

Fricas [A] time = 0.201616, size = 16, normalized size = 1.23

$$-\frac{1}{2\,(x^2+4\,x+5)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x + 2)/((x + 2)^2 + 1)^2,x, algorithm="fricas")
```

```
[Out] -1/2/(x^2 + 4*x + 5)
```

Sympy [A] time = 0.198018, size = 12, normalized size = 0.92

$$-\frac{1}{2x^2+8x+10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2+x)/(1+(2+x)**2)**2,x)
```

```
[Out] -1/(2*x**2 + 8*x + 10)
```

GIAC/XCAS [A] time = 0.214925, size = 16, normalized size = 1.23

$$-\frac{1}{2\,(x^2+4\,x+5)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x + 2)/((x + 2)^2 + 1)^2,x, algorithm="giac")
```

```
[Out] -1/2/(x^2 + 4*x + 5)
```

3.2839 $\int \frac{2+x}{(1+(2+x)^2)^3} \, dx$

Optimal. Leaf size=13

$$-\frac{1}{4((x+2)^2+1)^2}$$

```
[Out] -1/(4*(1 + (2 + x)^2)^2)
```

Rubi [A] time = 0.00808053, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$

$$-\frac{1}{4((x+2)^2+1)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(2 + x)/(1 + (2 + x)^2)^3,x]

[Out] -1/(4*(1 + (2 + x)^2)^2)
```

Rubi in Sympy [A] time = 2.17161, size = 12, normalized size = 0.92

$$-\frac{1}{4\left((x+2)^2+1\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2+x)/(1+(2+x)**2)**3,x)

[Out] -1/(4*((x + 2)**2 + 1)**2)
```

Mathematica [A] time = 0.00441033, size = 13, normalized size = 1.

$$-\frac{1}{4((x+2)^2+1)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(2 + x)/(1 + (2 + x)^2)^3,x]

[Out] -1/(4*(1 + (2 + x)^2)^2)
```

Maple [A] time = 0., size = 13, normalized size = 1.

$$-\frac{1}{4(x^2+4x+5)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2+x)/(1+(2+x)^2)^3,x)

[Out] -1/4/(x^2+4*x+5)^2
```

Maxima [A] time = 1.42362, size = 15, normalized size = 1.15

$$-\frac{1}{4\left((x+2)^2+1\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x + 2)/((x + 2)^2 + 1)^3,x, algorithm="maxima")

[Out] -1/4/((x + 2)^2 + 1)^2
```

Fricas [A] time = 0.201345, size = 30, normalized size = 2.31

$$-\frac{1}{4\,(x^4+8\,x^3+26\,x^2+40\,x+25)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x + 2)/((x + 2)^2 + 1)^3,x, algorithm="fricas")

[Out] -1/4/(x^4 + 8*x^3 + 26*x^2 + 40*x + 25)
```

Sympy [A] time = 0.266931, size = 22, normalized size = 1.69

$$-\frac{1}{4x^4+32x^3+104x^2+160x+100}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2+x)/(1+(2+x)**2)**3,x)

[Out] -1/(4*x**4 + 32*x**3 + 104*x**2 + 160*x + 100)
```

GIAC/XCAS [A] time = 0.217095, size = 16, normalized size = 1.23

$$-\frac{1}{4\,(x^2+4\,x+5)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((x + 2)/((x + 2)^2 + 1)^3,x, algorithm="giac")

[Out] -1/4/(x^2 + 4*x + 5)^2
```

3.2840 $\int (c+dx)^5 \left(a+b(c+dx)^2\right)^p \, dx$

Optimal. Leaf size=93

$$\frac{a^2\left(a+b(c+dx)^2\right)^{p+1}}{2b^3d(p+1)}-\frac{a\left(a+b(c+dx)^2\right)^{p+2}}{b^3d(p+2)}+\frac{\left(a+b(c+dx)^2\right)^{p+3}}{2b^3d(p+3)}$$

```
[Out] (a^2*(a + b*(c + d*x)^2)^(1 + p))/(2*b^3*d*(1 + p)) - (a*(a + b*(
c + d*x)^2)^(2 + p))/(b^3*d*(2 + p)) + (a + b*(c + d*x)^2)^(3 + p
)/(2*b^3*d*(3 + p))
```

Rubi [A] time = 0.212051, antiderivative size = 93, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$

$$\frac{a^2\left(a+b(c+dx)^2\right)^{p+1}}{2b^3d(p+1)}-\frac{a\left(a+b(c+dx)^2\right)^{p+2}}{b^3d(p+2)}+\frac{\left(a+b(c+dx)^2\right)^{p+3}}{2b^3d(p+3)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)^5*(a + b*(c + d*x)^2)^p,x]
```

```
[Out] (a^2*(a + b*(c + d*x)^2)^(1 + p))/(2*b^3*d*(1 + p)) - (a*(a + b*(
c + d*x)^2)^(2 + p))/(b^3*d*(2 + p)) + (a + b*(c + d*x)^2)^(3 + p
)/(2*b^3*d*(3 + p))
```

Rubi in Sympy [A] time = 25.7369, size = 73, normalized size = 0.78

$$\frac{a^2\left(a+b\left(c+dx\right)^2\right)^{p+1}}{2b^3d\left(p+1\right)}-\frac{a\left(a+b\left(c+dx\right)^2\right)^{p+2}}{b^3d\left(p+2\right)}+\frac{\left(a+b\left(c+dx\right)^2\right)^{p+3}}{2b^3d\left(p+3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**5*(a+b*(d*x+c)**2)**p,x)
```

```
[Out] a**2*(a + b*(c + d*x)**2)**(p + 1)/(2*b**3*d*(p + 1)) - a*(a + b*
(c + d*x)**2)**(p + 2)/(b**3*d*(p + 2)) + (a + b*(c + d*x)**2)**(
p + 3)/(2*b**3*d*(p + 3))
```

Mathematica [A] time = 0.132039, size = 91, normalized size = 0.98

$$\frac{\left(a+b(c+dx)^2\right)^p\left(2a^3-2a^2bp(c+dx)^2+ab^2p(p+1)(c+dx)^4+b^3(p+1)(p+2)(c+dx)^6\right)}{2b^3d(p+1)(p+2)(p+3)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c + d*x)^5*(a + b*(c + d*x)^2)^p,x]
```

```
[Out] ((a + b*(c + d*x)^2)^p*(2*a^3 - 2*a^2*b*p*(c + d*x)^2 + a*b^2*p*(
1 + p)*(c + d*x)^4 + b^3*(1 + p)*(2 + p)*(c + d*x)^6))/(2*b^3*d*(
1 + p)*(2 + p)*(3 + p))
```

Maple [B] time = 0.022, size = 289, normalized size = 3.1

$$\left(bd^2x^2+2\,bcdx+bc^2+a\right)^{1+p}\left(b^2d^4p^2x^4+4\,b^2cd^3p^2x^3+3\,b^2d^4px^4+6\,b^2c^2d^2p^2x^2+12\,b^2cd^3px^3+2\,d^4x^4b^2+4\,b^2c^3dp^2x+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((d*x+c)^5*(a+b*(d*x+c)^2)^p,x)
```

```
[Out] 1/2*(b*d^2*x^2+2*b*c*d*x+b*c^2+a)^(1+p)*(b^2*d^4*p^2*x^4+4*b^2*c*
d^3*p^2*x^3+3*b^2*d^4*p*x^4+6*b^2*c^2*d^2*p^2*x^2+12*b^2*c*d^3*p*
x^3+2*b^2*d^4*x^4+4*b^2*c^3*d*p^2*x+18*b^2*c^2*d^2*p*x^2+8*b^2*c*
d^3*x^3+b^2*c^4*p^2+12*b^2*c^3*d*p*x+12*b^2*c^2*d^2*x^2-2*a*b*d^2
*p*x^2+3*b^2*c^4*p+8*b^2*c^3*d*x-4*a*b*c*d*p*x-2*a*b*d^2*x^2+2*b^
2*c^4-2*a*b*c^2*p-4*a*b*c*d*x-2*a*b*c^2+2*a^2)/b^3/d/(p^3+6*p^2+1
1*p+6)
```

Maxima [A] time = 1.5068, size = 405, normalized size = 4.35

$$\frac{\left(\left(p^2+3\,p+2\right)b^3d^6x^6+6\left(p^2+3\,p+2\right)b^3cd^5x^5+\left(p^2+3\,p+2\right)b^3c^6+\left(p^2+p\right)ab^2c^4-2\,a^2bc^2p+\left(15\left(p^2+3\,p+2\right)b^3c^2d^4\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^5*((d*x + c)^2*b + a)^p,x, algorithm="maxima")
```

```
[Out] 1/2*((p^2 + 3*p + 2)*b^3*d^6*x^6 + 6*(p^2 + 3*p + 2)*b^3*c*d^5*x^
5 + (p^2 + 3*p + 2)*b^3*c^6 + (p^2 + p)*a*b^2*c^4 - 2*a^2*b*c^2*p
 + (15*(p^2 + 3*p + 2)*b^3*c^2*d^4 + (p^2 + p)*a*b^2*d^4)*x^4 + 4
*(5*(p^2 + 3*p + 2)*b^3*c^3*d^3 + (p^2 + p)*a*b^2*c*d^3)*x^3 + 2*
a^3 + (15*(p^2 + 3*p + 2)*b^3*c^4*d^2 + 6*(p^2 + p)*a*b^2*c^2*d^2
 - 2*a^2*b*d^2*p)*x^2 + 2*(3*(p^2 + 3*p + 2)*b^3*c^5*d + 2*(p^2 +
 p)*a*b^2*c^3*d - 2*a^2*b*c*d*p)*x)*(b*d^2*x^2 + 2*b*c*d*x + b*c^
2 + a)^p/((p^3 + 6*p^2 + 11*p + 6)*b^3*d)
```

Fricas [A] time = 0.232473, size = 591, normalized size = 6.35

$$\frac{\left(2\,b^3c^6+\left(b^3d^6p^2+3\,b^3d^6p+2\,b^3d^6\right)x^6+6\left(b^3cd^5p^2+3\,b^3cd^5p+2\,b^3cd^5\right)x^5+\left(30\,b^3c^2d^4+\left(15\,b^3c^2+ab^2\right)d^4p^2+\left(45\,b^3c^2\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^5*((d*x + c)^2*b + a)^p,x, algorithm="fricas")
```

```
[Out] 1/2*(2*b^3*c^6 + (b^3*d^6*p^2 + 3*b^3*d^6*p + 2*b^3*d^6)*x^6 + 6*
(b^3*c*d^5*p^2 + 3*b^3*c*d^5*p + 2*b^3*c*d^5)*x^5 + (30*b^3*c^2*d
^4 + (15*b^3*c^2 + a*b^2)*d^4*p^2 + (45*b^3*c^2 + a*b^2)*d^4*p)*x
^4 + 4*(10*b^3*c^3*d^3 + (5*b^3*c^3 + a*b^2*c)*d^3*p^2 + (15*b^3*
c^3 + a*b^2*c)*d^3*p)*x^3 + 2*a^3 + (b^3*c^6 + a*b^2*c^4)*p^2 + (
30*b^3*c^4*d^2 + 3*(5*b^3*c^4 + 2*a*b^2*c^2)*d^2*p^2 + (45*b^3*c^
4 + 6*a*b^2*c^2 - 2*a^2*b)*d^2*p)*x^2 + (3*b^3*c^6 + a*b^2*c^4 -
2*a^2*b*c^2)*p + 2*(6*b^3*c^5*d + (3*b^3*c^5 + 2*a*b^2*c^3)*d*p^2
 + (9*b^3*c^5 + 2*a*b^2*c^3 - 2*a^2*b*c)*d*p)*x)*(b*d^2*x^2 + 2*b
*c*d*x + b*c^2 + a)^p/(b^3*d*p^3 + 6*b^3*d*p^2 + 11*b^3*d*p + 6*b
^3*d)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**5*(a+b*(d*x+c)**2)**p,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.220907, size = 1, normalized size = 0.01

Done

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^5*((d*x + c)^2*b + a)^p,x, algorithm="giac")
```

```
[Out] Done
```

3.2841 $\int (c+dx)^4 \left(a+b(c+dx)^2\right)^p \, dx$

Optimal. Leaf size=55

$$\frac{(c+dx)^5 \left(a+b(c+dx)^2\right)^{p+1} {}_2F_1\left(1,p+\frac{7}{2};\frac{7}{2};-\frac{b(c+dx)^2}{a}\right)}{5ad}$$

```
[Out] ((c + d*x)^5*(a + b*(c + d*x)^2)^(1 + p)*Hypergeometric2F1[1, 7/2
 + p, 7/2, -((b*(c + d*x)^2)/a)])/(5*a*d)
```

Rubi [A] time = 0.122669, antiderivative size = 68, normalized size of antiderivative = 1.24, number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$\frac{(c+dx)^5 \left(a+b(c+dx)^2\right)^p \left(\frac{b(c+dx)^2}{a}+1\right)^{-p} {}_2F_1\left(\frac{5}{2},-p;\frac{7}{2};-\frac{b(c+dx)^2}{a}\right)}{5d}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)^4*(a + b*(c + d*x)^2)^p,x]
```

```
[Out] ((c + d*x)^5*(a + b*(c + d*x)^2)^p*Hypergeometric2F1[5/2, -p, 7/2
, -((b*(c + d*x)^2)/a)])/(5*d*(1 + (b*(c + d*x)^2)/a)^p)
```

Rubi in Sympy [A] time = 12.0626, size = 53, normalized size = 0.96

$$\frac{\left(1+\frac{b(c+dx)^2}{a}\right)^{-p} \left(a+b\left(c+dx\right)^2\right)^p \left(c+dx\right)^5 {}_2F_1\left(\begin{matrix} -p, \frac{5}{2} \\ \frac{7}{2} \end{matrix}\middle| -\frac{b(c+dx)^2}{a}\right)}{5d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**4*(a+b*(d*x+c)**2)**p,x)
```

```
[Out] (1 + b*(c + d*x)**2/a)**(-p)*(a + b*(c + d*x)**2)**p*(c + d*x)**5
*hyper((-p, 5/2), (7/2,), -b*(c + d*x)**2/a)/(5*d)
```

Mathematica [A] time = 0.0584199, size = 68, normalized size = 1.24

$$\frac{(c+dx)^5 \left(a+b(c+dx)^2\right)^p \left(\frac{b(c+dx)^2}{a}+1\right)^{-p} {}_2F_1\left(\frac{5}{2},-p;\frac{7}{2};-\frac{b(c+dx)^2}{a}\right)}{5d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c + d*x)^4*(a + b*(c + d*x)^2)^p,x]
```

```
[Out] ((c + d*x)^5*(a + b*(c + d*x)^2)^p*Hypergeometric2F1[5/2, -p, 7/2
, -((b*(c + d*x)^2)/a)])/(5*d*(1 + (b*(c + d*x)^2)/a)^p)
```

Maple [F] time = 0.224, size = 0, normalized size = 0.

$$\int (dx+c)^4 \left(a+b\left(dx+c\right)^2\right)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^4*(a+b*(d*x+c)^2)^p,x)
```

```
[Out] int((d*x+c)^4*(a+b*(d*x+c)^2)^p,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (dx+c)^4\left((dx+c)^2b+a\right)^p\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^4*((d*x + c)^2*b + a)^p,x, algorithm="maxima")
```

```
[Out] integrate((d*x + c)^4*((d*x + c)^2*b + a)^p, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(d^4x^4+4\,cd^3x^3+6\,c^2d^2x^2+4\,c^3dx+c^4\right)\left(bd^2x^2+2\,bcdx+bc^2+a\right)^p,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^4*((d*x + c)^2*b + a)^p,x, algorithm="fricas")
```

```
[Out] integral((d^4*x^4 + 4*c*d^3*x^3 + 6*c^2*d^2*x^2 + 4*c^3*d*x + c^4
)*(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)^p, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**4*(a+b*(d*x+c)**2)**p,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (dx+c)^4\left((dx+c)^2b+a\right)^p\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^4*((d*x + c)^2*b + a)^p,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^4*((d*x + c)^2*b + a)^p, x)
```

3.2842 $\int (c+dx)^3 \left(a+b(c+dx)^2\right)^p \, dx$

Optimal. Leaf size=62

$$\frac{\left(a+b(c+dx)^2\right)^{p+2}}{2b^2d(p+2)}-\frac{a\left(a+b(c+dx)^2\right)^{p+1}}{2b^2d(p+1)}$$

```
[Out] -(a*(a + b*(c + d*x)^2)^(1 + p))/(2*b^2*d*(1 + p)) + (a + b*(c +
d*x)^2)^(2 + p)/(2*b^2*d*(2 + p))
```

Rubi [A] time = 0.138679, antiderivative size = 62, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$

$$\frac{\left(a+b(c+dx)^2\right)^{p+2}}{2b^2d(p+2)}-\frac{a\left(a+b(c+dx)^2\right)^{p+1}}{2b^2d(p+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)^3*(a + b*(c + d*x)^2)^p,x]
```

```
[Out] -(a*(a + b*(c + d*x)^2)^(1 + p))/(2*b^2*d*(1 + p)) + (a + b*(c +
d*x)^2)^(2 + p)/(2*b^2*d*(2 + p))
```

Rubi in Sympy [A] time = 16.7844, size = 48, normalized size = 0.77

$$-\frac{a\left(a+b\left(c+dx\right)^2\right)^{p+1}}{2b^2d\left(p+1\right)}+\frac{\left(a+b\left(c+dx\right)^2\right)^{p+2}}{2b^2d\left(p+2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**3*(a+b*(d*x+c)**2)**p,x)
```

```
[Out] -a*(a + b*(c + d*x)**2)**(p + 1)/(2*b**2*d*(p + 1)) + (a + b*(c +
 d*x)**2)**(p + 2)/(2*b**2*d*(p + 2))
```

Mathematica [A] time = 0.0519326, size = 51, normalized size = 0.82

$$\frac{\left(a+b(c+dx)^2\right)^{p+1}\left(b(p+1)(c+dx)^2-a\right)}{2b^2d(p+1)(p+2)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c + d*x)^3*(a + b*(c + d*x)^2)^p,x]
```

```
[Out] ((a + b*(c + d*x)^2)^(1 + p)*(-a + b*(1 + p)*(c + d*x)^2))/(2*b^2
*d*(1 + p)*(2 + p))
```

Maple [A] time = 0.012, size = 91, normalized size = 1.5

$$-\frac{\left(bd^2x^2+2\,bcdx+bc^2+a\right)^{1+p}\left(-bd^2px^2-2\,bcdpx-bd^2x^2-bc^2p-2\,bcdx-bc^2+a\right)}{2\,b^2d\left(p^2+3\,p+2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^3*(a+b*(d*x+c)^2)^p,x)
```

```
[Out] -1/2*(b*d^2*x^2+2*b*c*d*x+b*c^2+a)^(1+p)*(-b*d^2*p*x^2-2*b*c*d*p*
x-b*d^2*x^2-b*c^2*p-2*b*c*d*x-b*c^2+a)/b^2/d/(p^2+3*p+2)
```

Maxima [A] time = 1.47367, size = 189, normalized size = 3.05

$$\frac{\left(b^2d^4(p+1)x^4+4\,b^2cd^3(p+1)x^3+b^2c^4(p+1)+abc^2p+\left(6\,b^2c^2d^2(p+1)+abd^2p\right)x^2-a^2+2\left(2\,b^2c^3d(p+1)+abcdp\right)x\right)(}{2\left(p^2+3\,p+2\right)b^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^3*((d*x + c)^2*b + a)^p,x, algorithm="maxima")
```

```
[Out] 1/2*(b^2*d^4*(p + 1)*x^4 + 4*b^2*c*d^3*(p + 1)*x^3 + b^2*c^4*(p +
 1) + a*b*c^2*p + (6*b^2*c^2*d^2*(p + 1) + a*b*d^2*p)*x^2 - a^2 +
 2*(2*b^2*c^3*d*(p + 1) + a*b*c*d*p)*x)*(b*d^2*x^2 + 2*b*c*d*x +
b*c^2 + a)^p/((p^2 + 3*p + 2)*b^2*d)
```

Fricas [A] time = 0.230273, size = 247, normalized size = 3.98

$$\frac{\left(b^2c^4+\left(b^2d^4p+b^2d^4\right)x^4+4\left(b^2cd^3p+b^2cd^3\right)x^3+\left(6\,b^2c^2d^2+\left(6\,b^2c^2+ab\right)d^2p\right)x^2-a^2+\left(b^2c^4+abc^2\right)p+2\left(2\,b^2c^3d+(2\right.\right.}{2\left(b^2dp^2+3\,b^2dp+2\,b^2d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^3*((d*x + c)^2*b + a)^p,x, algorithm="fricas")
```

```
[Out] 1/2*(b^2*c^4 + (b^2*d^4*p + b^2*d^4)*x^4 + 4*(b^2*c*d^3*p + b^2*c
*d^3)*x^3 + (6*b^2*c^2*d^2 + (6*b^2*c^2 + a*b)*d^2*p)*x^2 - a^2 +
 (b^2*c^4 + a*b*c^2)*p + 2*(2*b^2*c^3*d + (2*b^2*c^3 + a*b*c)*d*p
)*x)*(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)^p/(b^2*d*p^2 + 3*b^2*d*p
 + 2*b^2*d)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**3*(a+b*(d*x+c)**2)**p,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.221825, size = 699, normalized size = 11.27

$$\frac{b^2d^4px^4e^{\left(p\ln\left(bd^2x^2+2\,bcdx+bc^2+a\right)\right)}+4\,b^2cd^3px^3e^{\left(p\ln\left(bd^2x^2+2\,bcdx+bc^2+a\right)\right)}+b^2d^4x^4e^{\left(p\ln\left(bd^2x^2+2\,bcdx+bc^2+a\right)\right)}+6\,b^2c^2d^2px^2e^{(p\ln}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^3*((d*x + c)^2*b + a)^p,x, algorithm="giac")
```

```
[Out] 1/2*(b^2*d^4*p*x^4*e^(p*ln(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)) +
4*b^2*c*d^3*p*x^3*e^(p*ln(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)) + b
```

```
^2*d^4*x^4*e^(p*ln(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)) + 6*b^2*c^
2*d^2*p*x^2*e^(p*ln(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)) + 4*b^2*c
*d^3*x^3*e^(p*ln(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)) + 4*b^2*c^3*
d*p*x*e^(p*ln(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)) + 6*b^2*c^2*d^2
*x^2*e^(p*ln(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)) + b^2*c^4*p*e^(p
*ln(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)) + 4*b^2*c^3*d*x*e^(p*ln(b
*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)) + a*b*d^2*p*x^2*e^(p*ln(b*d^2*
x^2 + 2*b*c*d*x + b*c^2 + a)) + b^2*c^4*e^(p*ln(b*d^2*x^2 + 2*b*c
*d*x + b*c^2 + a)) + 2*a*b*c*d*p*x*e^(p*ln(b*d^2*x^2 + 2*b*c*d*x
+ b*c^2 + a)) + a*b*c^2*p*e^(p*ln(b*d^2*x^2 + 2*b*c*d*x + b*c^2 +
 a)) - a^2*e^(p*ln(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)))/(b^2*d*p^
2 + 3*b^2*d*p + 2*b^2*d)
```

3.2843 $\int (c+dx)^2 \left(a+b(c+dx)^2\right)^p \, dx$

Optimal. Leaf size=55

$$\frac{(c+dx)^3 \left(a+b(c+dx)^2\right)^{p+1} {}_2F_1\left(1,p+\frac{5}{2};\frac{5}{2};-\frac{b(c+dx)^2}{a}\right)}{3ad}$$

```
[Out] ((c + d*x)^3*(a + b*(c + d*x)^2)^(1 + p)*Hypergeometric2F1[1, 5/2
 + p, 5/2, -((b*(c + d*x)^2)/a)])/(3*a*d)
```

Rubi [A] time = 0.118178, antiderivative size = 68, normalized size of antiderivative = 1.24, number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$\frac{(c+dx)^3 \left(a+b(c+dx)^2\right)^p \left(\frac{b(c+dx)^2}{a}+1\right)^{-p} {}_2F_1\left(\frac{3}{2},-p;\frac{5}{2};-\frac{b(c+dx)^2}{a}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)^2*(a + b*(c + d*x)^2)^p,x]
```

```
[Out] ((c + d*x)^3*(a + b*(c + d*x)^2)^p*Hypergeometric2F1[3/2, -p, 5/2
, -((b*(c + d*x)^2)/a)])/(3*d*(1 + (b*(c + d*x)^2)/a)^p)
```

Rubi in Sympy [A] time = 13.4556, size = 53, normalized size = 0.96

$$\frac{\left(1+\frac{b(c+dx)^2}{a}\right)^{-p} \left(a+b\left(c+dx\right)^2\right)^p (c+dx)^3 {}_2F_1\left(\begin{matrix} -p, \frac{3}{2} \\ \frac{5}{2} \end{matrix}\middle| -\frac{b(c+dx)^2}{a}\right)}{3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**2*(a+b*(d*x+c)**2)**p,x)
```

```
[Out] (1 + b*(c + d*x)**2/a)**(-p)*(a + b*(c + d*x)**2)**p*(c + d*x)**3
*hyper((-p, 3/2), (5/2,), -b*(c + d*x)**2/a)/(3*d)
```

Mathematica [A] time = 0.0348957, size = 68, normalized size = 1.24

$$\frac{(c+dx)^3 \left(a+b(c+dx)^2\right)^p \left(\frac{b(c+dx)^2}{a}+1\right)^{-p} {}_2F_1\left(\frac{3}{2},-p;\frac{5}{2};-\frac{b(c+dx)^2}{a}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c + d*x)^2*(a + b*(c + d*x)^2)^p,x]
```

```
[Out] ((c + d*x)^3*(a + b*(c + d*x)^2)^p*Hypergeometric2F1[3/2, -p, 5/2
, -((b*(c + d*x)^2)/a)])/(3*d*(1 + (b*(c + d*x)^2)/a)^p)
```

Maple [F] time = 0.152, size = 0, normalized size = 0.

$$\int (dx+c)^2 \left(a+b\left(dx+c\right)^2\right)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^2*(a+b*(d*x+c)^2)^p,x)

[Out] int((d*x+c)^2*(a+b*(d*x+c)^2)^p,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (dx+c)^2\left((dx+c)^2b+a\right)^p\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^2*((d*x + c)^2*b + a)^p,x, algorithm="maxima")

[Out] integrate((d*x + c)^2*((d*x + c)^2*b + a)^p, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(d^2x^2+2\,cdx+c^2\right)\left(bd^2x^2+2\,bcdx+bc^2+a\right)^p,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^2*((d*x + c)^2*b + a)^p,x, algorithm="fricas")

[Out] integral((d^2*x^2 + 2*c*d*x + c^2)*(b*d^2*x^2 + 2*b*c*d*x + b*c^2
 + a)^p, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**2*(a+b*(d*x+c)**2)**p,x)

[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (dx+c)^2\left((dx+c)^2b+a\right)^p\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^2*((d*x + c)^2*b + a)^p,x, algorithm="giac")

[Out] integrate((d*x + c)^2*((d*x + c)^2*b + a)^p, x)
```

3.2844 $\int (c+dx)\left(a+b(c+dx)^2\right)^p\,dx$

Optimal. Leaf size=30

$$\frac{\left(a+b(c+dx)^2\right)^{p+1}}{2bd(p+1)}$$

```
[Out] (a + b*(c + d*x)^2)^(1 + p)/(2*b*d*(1 + p))
```

Rubi [A] time = 0.024824, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.053$

$$\frac{\left(a+b(c+dx)^2\right)^{p+1}}{2bd(p+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)*(a + b*(c + d*x)^2)^p,x]

[Out] (a + b*(c + d*x)^2)^(1 + p)/(2*b*d*(1 + p))
```

Rubi in Sympy [A] time = 4.86639, size = 20, normalized size = 0.67

$$\frac{\left(a+b\,(c+dx)^2\right)^{p+1}}{2bd\,(p+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)*(a+b*(d*x+c)**2)**p,x)

[Out] (a + b*(c + d*x)**2)**(p + 1)/(2*b*d*(p + 1))
```

Mathematica [A] time = 0.0140591, size = 29, normalized size = 0.97

$$\frac{\left(a+b(c+dx)^2\right)^{p+1}}{d(2bp+2b)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c + d*x)*(a + b*(c + d*x)^2)^p,x]

[Out] (a + b*(c + d*x)^2)^(1 + p)/(d*(2*b + 2*b*p))
```

Maple [A] time = 0.005, size = 39, normalized size = 1.3

$$\frac{\left(bd^2x^2+2\,bcdx+bc^2+a\right)^{1+p}}{2\,bd\,(1+p)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)*(a+b*(d*x+c)^2)^p,x)
```

```
[Out] 1/2*(b*d^2*x^2+2*b*c*d*x+b*c^2+a)^(1+p)/b/d/(1+p)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)*((d*x + c)^2*b + a)^p,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.229411, size = 76, normalized size = 2.53

$$\frac{\left(bd^2x^2 + 2\,bcdx + bc^2 + a\right)\left(bd^2x^2 + 2\,bcdx + bc^2 + a\right)^p}{2\,(bdp + bd)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)*((d*x + c)^2*b + a)^p,x, algorithm="fricas")
```

```
[Out] 1/2*(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)*(b*d^2*x^2 + 2*b*c*d*x +
b*c^2 + a)^p/(b*d*p + b*d)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)*(a+b*(d*x+c)**2)**p,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.22003, size = 181, normalized size = 6.03

$$\frac{bd^2x^2e^{\left(p\ln\left(bd^2x^2+2\,bcdx+bc^2+a\right)\right)} + 2\,bcdxe^{\left(p\ln\left(bd^2x^2+2\,bcdx+bc^2+a\right)\right)} + bc^2e^{\left(p\ln\left(bd^2x^2+2\,bcdx+bc^2+a\right)\right)} + ae^{\left(p\ln\left(bd^2x^2+2\,bcdx+bc^2+a\right)\right)}}{2\,(bdp + bd)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)*((d*x + c)^2*b + a)^p,x, algorithm="giac")
```

```
[Out] 1/2*(b*d^2*x^2*e^(p*ln(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)) + 2*b*
c*d*x*e^(p*ln(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)) + b*c^2*e^(p*ln
(b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)) + a*e^(p*ln(b*d^2*x^2 + 2*b*
c*d*x + b*c^2 + a)))/(b*d*p + b*d)
```

3.2845 $\int \frac{(a+b(c+dx)^2)^p}{c+dx}\,dx$

Optimal. Leaf size=52

$$-\frac{(a+b(c+dx)^2)^{p+1}\,{}_2F_1\left(1,p+1;p+2;\frac{b(c+dx)^2}{a}+1\right)}{2ad(p+1)}$$

```
[Out] -((a + b*(c + d*x)^2)^(1 + p)*Hypergeometric2F1[1, 1 + p, 2 + p,
1 + (b*(c + d*x)^2)/a])/(2*a*d*(1 + p))
```

Rubi [A] time = 0.117322, antiderivative size = 52, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$

$$-\frac{(a+b(c+dx)^2)^{p+1}\,{}_2F_1\left(1,p+1;p+2;\frac{b(c+dx)^2}{a}+1\right)}{2ad(p+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(c + d*x)^2)^p/(c + d*x),x]
```

```
[Out] -((a + b*(c + d*x)^2)^(1 + p)*Hypergeometric2F1[1, 1 + p, 2 + p,
1 + (b*(c + d*x)^2)/a])/(2*a*d*(1 + p))
```

Rubi in Sympy [A] time = 10.1708, size = 39, normalized size = 0.75

$$-\frac{\left(a+b\left(c+dx\right)^2\right)^{p+1}{}_2F_1\left(\begin{matrix}1,p+1\\p+2\end{matrix}\middle|1+\frac{b(c+dx)^2}{a}\right)}{2ad\left(p+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(d*x+c)**2)**p/(d*x+c),x)
```

```
[Out] -(a + b*(c + d*x)**2)**(p + 1)*hyper((1, p + 1), (p + 2,), 1 + b*
(c + d*x)**2/a)/(2*a*d*(p + 1))
```

Mathematica [A] time = 0.0477715, size = 66, normalized size = 1.27

$$\frac{\left(\frac{a}{b(c+dx)^2}+1\right)^{-p}(a+b(c+dx)^2)^p\,{}_2F_1\left(-p,-p;1-p;-\frac{a}{b(c+dx)^2}\right)}{2dp}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(c + d*x)^2)^p/(c + d*x),x]
```

```
[Out] ((a + b*(c + d*x)^2)^p*Hypergeometric2F1[-p, -p, 1 - p, -(a/(b*(c
 + d*x)^2))])/(2*d*p*(1 + a/(b*(c + d*x)^2))^p)
```

Maple [F] time = 0.154, size = 0, normalized size = 0.

$$\int \frac{\left(a+b\left(dx+c\right)^2\right)^p}{dx+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(d*x+c)^2)^p/(d*x+c),x)
```

```
[Out] int((a+b*(d*x+c)^2)^p/(d*x+c),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left((dx+c)^2b+a\right)^p}{dx+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^2*b + a)^p/(d*x + c),x, algorithm="maxima")
```

```
[Out] integrate(((d*x + c)^2*b + a)^p/(d*x + c), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\left(bd^2x^2+2\,bcdx+bc^2+a\right)^p}{dx+c},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^2*b + a)^p/(d*x + c),x, algorithm="fricas")
```

```
[Out] integral((b*d^2*x^2 + 2*b*c*d*x + b*c^2 + a)^p/(d*x + c), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(d*x+c)**2)**p/(d*x+c),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left((dx+c)^2b+a\right)^p}{dx+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^2*b + a)^p/(d*x + c),x, algorithm="giac")
```

```
[Out] integrate(((d*x + c)^2*b + a)^p/(d*x + c), x)
```

3.2846 $\int (c+dx)^3 \left(a+b(c+dx)^3\right) dx$

Optimal. Leaf size=31

$$\frac{a(c+dx)^4}{4d} + \frac{b(c+dx)^7}{7d}$$

```
[Out] (a*(c + d*x)^4)/(4*d) + (b*(c + d*x)^7)/(7*d)
```

Rubi [A] time = 0.0739945, antiderivative size = 31, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.105$

$$\frac{a(c+dx)^4}{4d} + \frac{b(c+dx)^7}{7d}$$

Antiderivative was successfully verified.

```
[In] Int[(c + d*x)^3*(a + b*(c + d*x)^3),x]
```

```
[Out] (a*(c + d*x)^4)/(4*d) + (b*(c + d*x)^7)/(7*d)
```

Rubi in Sympy [A] time = 7.41833, size = 22, normalized size = 0.71

$$\frac{a\,(c+dx)^4}{4d} + \frac{b\,(c+dx)^7}{7d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((d*x+c)**3*(a+b*(d*x+c)**3),x)
```

```
[Out] a*(c + d*x)**4/(4*d) + b*(c + d*x)**7/(7*d)
```

Mathematica [B] time = 0.024695, size = 98, normalized size = 3.16

$$\frac{1}{4}d^3x^4\left(a+20bc^3\right)+cd^2x^3\left(a+5bc^3\right)+c^3x\left(a+bc^3\right)+\frac{3}{2}c^2dx^2\left(a+2bc^3\right)+3bc^2d^4x^5+bcd^5x^6+\frac{1}{7}bd^6x^7$$

Antiderivative was successfully verified.

```
[In] Integrate[(c + d*x)^3*(a + b*(c + d*x)^3),x]
```

```
[Out] c^3*(a + b*c^3)*x + (3*c^2*(a + 2*b*c^3)*d*x^2)/2 + c*(a + 5*b*c^
3)*d^2*x^3 + ((a + 20*b*c^3)*d^3*x^4)/4 + 3*b*c^2*d^4*x^5 + b*c*d
^5*x^6 + (b*d^6*x^7)/7
```

Maple [B] time = 0.001, size = 124, normalized size = 4.

$$\frac{d^6bx^7}{7}+cd^5bx^6+3\,c^2d^4bx^5+\frac{\left(19\,c^3bd^3+d^3\left(bc^3+a\right)\right)x^4}{4}+\frac{\left(12\,c^4bd^2+3\,cd^2\left(bc^3+a\right)\right)x^3}{3}+\frac{\left(3\,c^5bd+3\,c^2d\left(bc^3+a\right)\right)x^2}{2}+c^3\left(bc^3+a\right)x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*x+c)^3*(a+b*(d*x+c)^3),x)
```

```
[Out] 1/7*d^6*b*x^7+c*d^5*b*x^6+3*c^2*d^4*b*x^5+1/4*(19*c^3*b*d^3+d^3*(
b*c^3+a))*x^4+1/3*(12*c^4*b*d^2+3*c*d^2*(b*c^3+a))*x^3+1/2*(3*c^5
*b*d+3*c^2*d*(b*c^3+a))*x^2+c^3*(b*c^3+a)*x
```

Maxima [A] time = 1.41139, size = 128, normalized size = 4.13

$$\frac{1}{7}\,bd^6x^7 + bcd^5x^6 + 3\,bc^2d^4x^5 + \frac{1}{4}\left(20\,bc^3 + a\right)d^3x^4 + \left(5\,bc^4 + ac\right)d^2x^3 + \frac{3}{2}\left(2\,bc^5 + ac^2\right)dx^2 + \left(bc^6 + ac^3\right)x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^3*b + a)*(d*x + c)^3,x, algorithm="maxima")
```

```
[Out] 1/7*b*d^6*x^7 + b*c*d^5*x^6 + 3*b*c^2*d^4*x^5 + 1/4*(20*b*c^3 + a
)*d^3*x^4 + (5*b*c^4 + a*c)*d^2*x^3 + 3/2*(2*b*c^5 + a*c^2)*d*x^2
 + (b*c^6 + a*c^3)*x
```

Fricas [A] time = 0.18641, size = 1, normalized size = 0.03

$$\frac{1}{7}x^7d^6b + x^6d^5cb + 3x^5d^4c^2b + 5x^4d^3c^3b + 5x^3d^2c^4b + 3x^2dc^5b + xc^6b + \frac{1}{4}x^4d^3a + x^3d^2ca + \frac{3}{2}x^2dc^2a + xc^3a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^3*b + a)*(d*x + c)^3,x, algorithm="fricas")
```

```
[Out] 1/7*x^7*d^6*b + x^6*d^5*c*b + 3*x^5*d^4*c^2*b + 5*x^4*d^3*c^3*b +
 5*x^3*d^2*c^4*b + 3*x^2*d*c^5*b + x*c^6*b + 1/4*x^4*d^3*a + x^3*
d^2*c*a + 3/2*x^2*d*c^2*a + x*c^3*a
```

Sympy [A] time = 0.145986, size = 107, normalized size = 3.45

$$3bc^2d^4x^5 + bcd^5x^6 + \frac{bd^6x^7}{7} + x^4\left(\frac{ad^3}{4} + 5bc^3d^3\right) + x^3\left(acd^2 + 5bc^4d^2\right) + x^2\left(\frac{3ac^2d}{2} + 3bc^5d\right) + x\left(ac^3 + bc^6\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**3*(a+b*(d*x+c)**3),x)
```

```
[Out] 3*b*c**2*d**4*x**5 + b*c*d**5*x**6 + b*d**6*x**7/7 + x**4*(a*d**3
/4 + 5*b*c**3*d**3) + x**3*(a*c*d**2 + 5*b*c**4*d**2) + x**2*(3*a
*c**2*d/2 + 3*b*c**5*d) + x*(a*c**3 + b*c**6)
```

GIAC/XCAS [A] time = 0.213048, size = 142, normalized size = 4.58

$$\frac{1}{7}\,bd^6x^7 + bcd^5x^6 + 3\,bc^2d^4x^5 + 5\,bc^3d^3x^4 + 5\,bc^4d^2x^3 + 3\,bc^5dx^2 + bc^6x + \frac{1}{4}\,ad^3x^4 + acd^2x^3 + \frac{3}{2}\,ac^2dx^2 + ac^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^3*b + a)*(d*x + c)^3,x, algorithm="giac")
```

```
[Out] 1/7*b*d^6*x^7 + b*c*d^5*x^6 + 3*b*c^2*d^4*x^5 + 5*b*c^3*d^3*x^4 +
 5*b*c^4*d^2*x^3 + 3*b*c^5*d*x^2 + b*c^6*x + 1/4*a*d^3*x^4 + a*c*
d^2*x^3 + 3/2*a*c^2*d*x^2 + a*c^3*x
```

3.2847 $\int (c+dx)^3 \left(a+b(c+dx)^3\right)^2 \, dx$

Optimal. Leaf size=51

$$\frac{a^2(c+dx)^4}{4d}+\frac{2ab(c+dx)^7}{7d}+\frac{b^2(c+dx)^{10}}{10d}$$

```
[Out] (a^2*(c + d*x)^4)/(4*d) + (2*a*b*(c + d*x)^7)/(7*d) + (b^2*(c + d
*x)^10)/(10*d)
```

Rubi [A] time = 0.168195, antiderivative size = 51, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095

$$\frac{a^2(c+dx)^4}{4d}+\frac{2ab(c+dx)^7}{7d}+\frac{b^2(c+dx)^{10}}{10d}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)^3*(a + b*(c + d*x)^3)^2,x]
```

```
[Out] (a^2*(c + d*x)^4)/(4*d) + (2*a*b*(c + d*x)^7)/(7*d) + (b^2*(c + d
*x)^10)/(10*d)
```

Rubi in Sympy [A] time = 12.4207, size = 41, normalized size = 0.8

$$\frac{a^2\left(c+dx\right)^4}{4d}+\frac{2ab\left(c+dx\right)^7}{7d}+\frac{b^2\left(c+dx\right)^{10}}{10d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**3*(a+b*(d*x+c)**3)**2,x)
```

```
[Out] a**2*(c + d*x)**4/(4*d) + 2*a*b*(c + d*x)**7/(7*d) + b**2*(c + d*
x)**10/(10*d)
```

Mathematica [B] time = 0.0466759, size = 203, normalized size = 3.98

$$\frac{1}{4}d^3x^4\left(a^2+40abc^3+84b^2c^6\right)+cd^2x^3\left(a^2+10abc^3+12b^2c^6\right)+\frac{3}{2}c^2dx^2\left(a^2+4abc^3+3b^2c^6\right)+\frac{2}{7}bd^6x^7\left(a+42bc^3\right)+bcd^5x^6\left(2a+21bc^3\right)+c^3x\left(a+bc^3\right)^2+\frac{6}{5}bc^2d^4x^5\left(5a+21bc^3\right)+\frac{9}{2}b^2c^2d^7x^8+b^2cd^8x^9+\frac{1}{10}b^2d^9x^{10}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c + d*x)^3*(a + b*(c + d*x)^3)^2,x]
```

```
[Out] c^3*(a + b*c^3)^2*x + (3*c^2*(a^2 + 4*a*b*c^3 + 3*b^2*c^6)*d*x^2)
/2 + c*(a^2 + 10*a*b*c^3 + 12*b^2*c^6)*d^2*x^3 + ((a^2 + 40*a*b*c
^3 + 84*b^2*c^6)*d^3*x^4)/4 + (6*b*c^2*(5*a + 21*b*c^3)*d^4*x^5)/
5 + b*c*(2*a + 21*b*c^3)*d^5*x^6 + (2*b*(a + 42*b*c^3)*d^6*x^7)/7
 + (9*b^2*c^2*d^7*x^8)/2 + b^2*c*d^8*x^9 + (b^2*d^9*x^10)/10
```

Maple [B] time = 0.002, size = 470, normalized size = 9.2

$$\frac{d^{9} b^{2} x^{10}}{10}+c d^{8} b^{2} x^{9}+\frac{9 c^{2} d^{7} b^{2} x^{8}}{2}+\frac{\left(64 c^{3} b^{2} d^{6}+d^{3} \left(2 \left(b c^{3}+a\right) b d^{3}+18 b^{2} c^{3} d^{3}\right)\right) x^{7}}{7}+\frac{\left(51 c^{4} b^{2} d^{5}+3 c d^{2} \left(2 \left(b c^{3}+a\right) b d^{3}+18 b^{2} c^{3} d^{3}\right)+d^{3} \left(6 \left(b c^{3}+a\right) b c d^{2}+9 b^{2} c^{4} d^{2}\right)\right) x^{6}}{6}+\frac{\left(15 c^{5} b^{2} d^{4}+3 c^{2} d \left(2 \left(b c^{3}+a\right) b d^{3}+18 b^{2} c^{3} d^{3}\right)+3 c d^{2} \left(6 \left(b c^{3}+a\right) b c d^{2}+9 b^{2} c^{4} d^{2}\right)+6 d^{4} \left(b c^{3}+a\right) b c^{2}\right) x^{5}}{5}+\frac{\left(c^{3} \left(2 \left(b c^{3}+a\right) b d^{3}+18 b^{2} c^{3} d^{3}\right)+3 c^{2} d \left(6 \left(b c^{3}+a\right) b c d^{2}+9 b^{2} c^{4} d^{2}\right)+18 c^{3} d^{3} \left(b c^{3}+a\right) b+d^{3} \left(b c^{3}+a\right)^{2}\right) x^{4}}{4}+\frac{\left(c^{3} \left(6 \left(b c^{3}+a\right) b c d^{2}+9 b^{2} c^{4} d^{2}\right)+18 c^{4} d^{2} \left(b c^{3}+a\right) b+3 c d^{2} \left(b c^{3}+a\right)^{2}\right) x^{3}}{3}+\frac{\left(6 c^{5} \left(b c^{3}+a\right) b d+3 c^{2} d \left(b c^{3}+a\right)^{2}\right) x^{2}}{2}+c^{3} \left(b c^{3}+a\right)^{2} x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^3*(a+b*(d*x+c)^3)^2,x)
```

```
[Out] 1/10*d^9*b^2*x^10+c*d^8*b^2*x^9+9/2*c^2*d^7*b^2*x^8+1/7*(64*c^3*b
^2*d^6+d^3*(2*(b*c^3+a)*b*d^3+18*b^2*c^3*d^3))*x^7+1/6*(51*c^4*b^
2*d^5+3*c*d^2*(2*(b*c^3+a)*b*d^3+18*b^2*c^3*d^3)+d^3*(6*(b*c^3+a)
*b*c*d^2+9*b^2*c^4*d^2))*x^6+1/5*(15*c^5*b^2*d^4+3*c^2*d*(2*(b*c^
3+a)*b*d^3+18*b^2*c^3*d^3)+3*c*d^2*(6*(b*c^3+a)*b*c*d^2+9*b^2*c^4
*d^2)+6*d^4*(b*c^3+a)*b*c^2)*x^5+1/4*(c^3*(2*(b*c^3+a)*b*d^3+18*b
^2*c^3*d^3)+3*c^2*d*(6*(b*c^3+a)*b*c*d^2+9*b^2*c^4*d^2)+18*c^3*d^
3*(b*c^3+a)*b+d^3*(b*c^3+a)^2)*x^4+1/3*(c^3*(6*(b*c^3+a)*b*c*d^2+
9*b^2*c^4*d^2)+18*c^4*d^2*(b*c^3+a)*b+3*c*d^2*(b*c^3+a)^2)*x^3+1/
2*(6*c^5*(b*c^3+a)*b*d+3*c^2*d*(b*c^3+a)^2)*x^2+c^3*(b*c^3+a)^2*x
```

Maxima [A] time = 1.46951, size = 284, normalized size = 5.57

$$\frac{1}{10} b^{2} d^{9} x^{10}+b^{2} c d^{8} x^{9}+\frac{9}{2} b^{2} c^{2} d^{7} x^{8}+\frac{2}{7} \left(42 b^{2} c^{3}+a b\right) d^{6} x^{7}+\left(21 b^{2} c^{4}+2 a b c\right) d^{5} x^{6}+\frac{6}{5} \left(21 b^{2} c^{5}+5 a b c^{2}\right) d^{4} x^{5}+\frac{1}{4} \left(84 b^{2} c^{6}+40 a b c^{3}+a^{2}\right) d^{3} x^{4}+\left(12 b^{2} c^{7}+10 a b c^{4}+a^{2} c\right) d^{2} x^{3}+\frac{3}{2} \left(3 b^{2} c^{8}+4 a b c^{5}+a^{2} c^{2}\right) d x^{2}+\left(b^{2} c^{9}+2 a b c^{6}+a^{2} c^{3}\right) x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^3*b + a)^2*(d*x + c)^3,x, algorithm="maxima")
```

```
[Out] 1/10*b^2*d^9*x^10 + b^2*c*d^8*x^9 + 9/2*b^2*c^2*d^7*x^8 + 2/7*(42
*b^2*c^3 + a*b)*d^6*x^7 + (21*b^2*c^4 + 2*a*b*c)*d^5*x^6 + 6/5*(2
1*b^2*c^5 + 5*a*b*c^2)*d^4*x^5 + 1/4*(84*b^2*c^6 + 40*a*b*c^3 + a
^2)*d^3*x^4 + (12*b^2*c^7 + 10*a*b*c^4 + a^2*c)*d^2*x^3 + 3/2*(3*
b^2*c^8 + 4*a*b*c^5 + a^2*c^2)*d*x^2 + (b^2*c^9 + 2*a*b*c^6 + a^2
*c^3)*x
```

Fricas [A] time = 0.187033, size = 1, normalized size = 0.02

$$\frac{1}{10} x^{10} d^{9} b^{2}+x^{9} d^{8} c b^{2}+\frac{9}{2} x^{8} d^{7} c^{2} b^{2}+12 x^{7} d^{6} c^{3} b^{2}+21 x^{6} d^{5} c^{4} b^{2}+\frac{126}{5} x^{5} d^{4} c^{5} b^{2}+21 x^{4} d^{3} c^{6} b^{2}+\frac{2}{7} x^{7} d^{6} b a+12 x^{3} d^{2} c^{7} b^{2}+2 x^{6} d^{5} c b a+\frac{9}{2} x^{2} d c^{8} b^{2}+6 x^{5} d^{4} c^{2} b a+x c^{9} b^{2}+10 x^{4} d^{3} c^{3} b a+10 x^{3} d^{2} c^{4} b a+6 x^{2} d c^{5} b a+2 x c^{6} b a+\frac{1}{4} x^{4} d^{3} a^{2}+x^{3} d^{2} c a^{2}+\frac{3}{2} x^{2} d c^{2} a^{2}+x c^{3} a^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^3*b + a)^2*(d*x + c)^3,x, algorithm="fricas")
```

```
[Out] 1/10*x^10*d^9*b^2 + x^9*d^8*c*b^2 + 9/2*x^8*d^7*c^2*b^2 + 12*x^7*
d^6*c^3*b^2 + 21*x^6*d^5*c^4*b^2 + 126/5*x^5*d^4*c^5*b^2 + 21*x^4
*d^3*c^6*b^2 + 2/7*x^7*d^6*b*a + 12*x^3*d^2*c^7*b^2 + 2*x^6*d^5*c
*b*a + 9/2*x^2*d*c^8*b^2 + 6*x^5*d^4*c^2*b*a + x*c^9*b^2 + 10*x^4
*d^3*c^3*b*a + 10*x^3*d^2*c^4*b*a + 6*x^2*d*c^5*b*a + 2*x*c^6*b*a
 + 1/4*x^4*d^3*a^2 + x^3*d^2*c*a^2 + 3/2*x^2*d*c^2*a^2 + x*c^3*a^
2
```

Sympy [A] time = 0.27096, size = 252, normalized size = 4.94

$$\frac{9b^2c^2d^7x^8}{2} + b^2cd^8x^9 + \frac{b^2d^9x^{10}}{10} + x^7\left(\frac{2abd^6}{7} + 12b^2c^3d^6\right) + x^6\left(2abcd^5 + 21b^2c^4d^5\right) + x^5\left(6abc^2d^4 + \frac{126b^2c^5d^4}{5}\right) + x^4\left(\frac{a^2d^3}{4} + 10abc^3d^3 + 21b^2c^6d^3\right) + x^3\left(a^2cd^2 + 10abc^4d^2 + 12b^2c^7d^2\right) + x^2\left(\frac{3a^2c^2d}{2} + 6abc^5d + \frac{9b^2c^8d}{2}\right) + x\left(a^2c^3 + 2abc^6 + b^2c^9\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**3*(a+b*(d*x+c)**3)**2,x)
```

```
[Out] 9*b**2*c**2*d**7*x**8/2 + b**2*c*d**8*x**9 + b**2*d**9*x**10/10 +
 x**7*(2*a*b*d**6/7 + 12*b**2*c**3*d**6) + x**6*(2*a*b*c*d**5 + 2
1*b**2*c**4*d**5) + x**5*(6*a*b*c**2*d**4 + 126*b**2*c**5*d**4/5)
 + x**4*(a**2*d**3/4 + 10*a*b*c**3*d**3 + 21*b**2*c**6*d**3) + x*
*3*(a**2*c*d**2 + 10*a*b*c**4*d**2 + 12*b**2*c**7*d**2) + x**2*(3
*a**2*c**2*d/2 + 6*a*b*c**5*d + 9*b**2*c**8*d/2) + x*(a**2*c**3 +
 2*a*b*c**6 + b**2*c**9)
```

GIAC/XCAS [A] time = 0.213943, size = 335, normalized size = 6.57

$$\frac{1}{10}\,b^2d^9x^{10} + b^2cd^8x^9 + \frac{9}{2}\,b^2c^2d^7x^8 + 12\,b^2c^3d^6x^7 + 21\,b^2c^4d^5x^6 + \frac{126}{5}\,b^2c^5d^4x^5 + 21\,b^2c^6d^3x^4 + \frac{2}{7}\,abd^6x^7 + 12\,b^2c^7d^2x^3 + 2\,abcd^5x^6 + \frac{9}{2}\,b^2c^8dx^2 + 6\,abc^2d^4x^5 + b^2c^9x + 10\,abc^3d^3x^4 + 10\,abc^4d^2x^3 + 6\,abc^5dx^2 + 2\,abc^6x + \frac{1}{4}\,a^2d^3x^4 + a^2cd^2x^3 + \frac{3}{2}\,a^2c^2dx^2 + a^2c^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^3*b + a)^2*(d*x + c)^3,x, algorithm="giac")
```

```
[Out] 1/10*b^2*d^9*x^10 + b^2*c*d^8*x^9 + 9/2*b^2*c^2*d^7*x^8 + 12*b^2*
c^3*d^6*x^7 + 21*b^2*c^4*d^5*x^6 + 126/5*b^2*c^5*d^4*x^5 + 21*b^2
*c^6*d^3*x^4 + 2/7*a*b*d^6*x^7 + 12*b^2*c^7*d^2*x^3 + 2*a*b*c*d^5
*x^6 + 9/2*b^2*c^8*d*x^2 + 6*a*b*c^2*d^4*x^5 + b^2*c^9*x + 10*a*b
*c^3*d^3*x^4 + 10*a*b*c^4*d^2*x^3 + 6*a*b*c^5*d*x^2 + 2*a*b*c^6*x
 + 1/4*a^2*d^3*x^4 + a^2*c*d^2*x^3 + 3/2*a^2*c^2*d*x^2 + a^2*c^3*
x
```

3.2848 $\int (c+dx)^3 \left(a+b(c+dx)^3\right)^3 \, dx$

Optimal. Leaf size=71

$$\frac{a^3(c+dx)^4}{4d}+\frac{3a^2b(c+dx)^7}{7d}+\frac{3ab^2(c+dx)^{10}}{10d}+\frac{b^3(c+dx)^{13}}{13d}$$

```
[Out] (a^3*(c + d*x)^4)/(4*d) + (3*a^2*b*(c + d*x)^7)/(7*d) + (3*a*b^2*
(c + d*x)^10)/(10*d) + (b^3*(c + d*x)^13)/(13*d)
```

Rubi [A] time = 0.26073, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$

$$\frac{a^3(c+dx)^4}{4d}+\frac{3a^2b(c+dx)^7}{7d}+\frac{3ab^2(c+dx)^{10}}{10d}+\frac{b^3(c+dx)^{13}}{13d}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)^3*(a + b*(c + d*x)^3)^3,x]
```

```
[Out] (a^3*(c + d*x)^4)/(4*d) + (3*a^2*b*(c + d*x)^7)/(7*d) + (3*a*b^2*
(c + d*x)^10)/(10*d) + (b^3*(c + d*x)^13)/(13*d)
```

Rubi in Sympy [A] time = 15.9425, size = 60, normalized size = 0.85

$$\frac{a^3\left(c+dx\right)^4}{4d}+\frac{3a^2b\left(c+dx\right)^7}{7d}+\frac{3ab^2\left(c+dx\right)^{10}}{10d}+\frac{b^3\left(c+dx\right)^{13}}{13d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**3*(a+b*(d*x+c)**3)**3,x)
```

```
[Out] a**3*(c + d*x)**4/(4*d) + 3*a**2*b*(c + d*x)**7/(7*d) + 3*a*b**2*
(c + d*x)**10/(10*d) + b**3*(c + d*x)**13/(13*d)
```

Mathematica [B] time = 0.0760372, size = 323, normalized size = 4.55

$$\frac{3}{7}bd^6x^7\left(a^2+84abc^3+308b^2c^6\right)+3bcd^5x^6\left(a^2+21abc^3+44b^2c^6\right)+\frac{9}{5}bc^2d^4x^5\left(5a^2+42abc^3+55b^2c^6\right)+\frac{1}{4}d^3x^4\left(a^3+60a^2bc^3+252ab^2c^6+220b^3c^9\right)+cd^2x^3\left(a^3+15a^2bc^3+36ab^2c^6+22b^3c^9\right)+\frac{1}{10}b^2d^9x^{10}\left(3a+220bc^3\right)+b^2cd^8x^9\left(3a+55bc^3\right)+\frac{9}{2}b^2c^2d^7x^8\left(3a+22bc^3\right)+c^3x\left(a+bc^3\right)^3+\frac{3}{2}c^2dx^2\left(a+bc^3\right)^2\left(a+4bc^3\right)+6b^3c^2d^{10}x^{11}+b^3cd^{11}x^{12}+\frac{1}{13}b^3d^{12}x^{13}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c + d*x)^3*(a + b*(c + d*x)^3)^3,x]
```

```
[Out] c^3*(a + b*c^3)^3*x + (3*c^2*(a + b*c^3)^2*(a + 4*b*c^3)*d*x^2)/2
 + c*(a^3 + 15*a^2*b*c^3 + 36*a*b^2*c^6 + 22*b^3*c^9)*d^2*x^3 + (
(a^3 + 60*a^2*b*c^3 + 252*a*b^2*c^6 + 220*b^3*c^9)*d^3*x^4)/4 + (
9*b*c^2*(5*a^2 + 42*a*b*c^3 + 55*b^2*c^6)*d^4*x^5)/5 + 3*b*c*(a^2
 + 21*a*b*c^3 + 44*b^2*c^6)*d^5*x^6 + (3*b*(a^2 + 84*a*b*c^3 + 30
8*b^2*c^6)*d^6*x^7)/7 + (9*b^2*c^2*(3*a + 22*b*c^3)*d^7*x^8)/2 +
b^2*c*(3*a + 55*b*c^3)*d^8*x^9 + (b^2*(3*a + 220*b*c^3)*d^9*x^10)
```

```
/10 + 6*b^3*c^2*d^10*x^11 + b^3*c*d^11*x^12 + (b^3*d^12*x^13)/13
```

Maple [B] time = 0.003, size = 1948, normalized size = 27.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^3*(a+b*(d*x+c)^3)^3,x)
```

```
[Out] 1/13*d^12*b^3*x^13+c*d^11*b^3*x^12+6*c^2*d^10*b^3*x^11+1/10*(136*
c^3*b^3*d^9+d^3*((b*c^3+a)*b^2*d^6+63*c^3*b^3*d^6+b*d^3*(2*(b*c^3
+a)*b*d^3+18*b^2*c^3*d^3))))*x^10+1/9*(117*c^4*b^3*d^8+3*c*d^2*((b
*c^3+a)*b^2*d^6+63*c^3*b^3*d^6+b*d^3*(2*(b*c^3+a)*b*d^3+18*b^2*c^
3*d^3))+d^3*(6*(b*c^3+a)*b^2*c*d^5+45*c^4*b^3*d^5+3*b*c*d^2*(2*(b
*c^3+a)*b*d^3+18*b^2*c^3*d^3)+b*d^3*(6*(b*c^3+a)*b*c*d^2+9*b^2*c^
4*d^2)))*x^9+1/8*(36*c^5*d^7*b^3+3*c^2*d*((b*c^3+a)*b^2*d^6+63*c^
3*b^3*d^6+b*d^3*(2*(b*c^3+a)*b*d^3+18*b^2*c^3*d^3))+3*c*d^2*(6*(b
*c^3+a)*b^2*c*d^5+45*c^4*b^3*d^5+3*b*c*d^2*(2*(b*c^3+a)*b*d^3+18*
b^2*c^3*d^3)+b*d^3*(6*(b*c^3+a)*b*c*d^2+9*b^2*c^4*d^2))+d^3*(21*(
b*c^3+a)*b^2*c^2*d^4+3*b*c^2*d*(2*(b*c^3+a)*b*d^3+18*b^2*c^3*d^3)
+3*b*c*d^2*(6*(b*c^3+a)*b*c*d^2+9*b^2*c^4*d^2)))*x^8+1/7*(c^3*((b
*c^3+a)*b^2*d^6+63*c^3*b^3*d^6+b*d^3*(2*(b*c^3+a)*b*d^3+18*b^2*c^
3*d^3))+3*c^2*d*(6*(b*c^3+a)*b^2*c*d^5+45*c^4*b^3*d^5+3*b*c*d^2*(
2*(b*c^3+a)*b*d^3+18*b^2*c^3*d^3)+b*d^3*(6*(b*c^3+a)*b*c*d^2+9*b^
2*c^4*d^2))+3*c*d^2*(21*(b*c^3+a)*b^2*c^2*d^4+3*b*c^2*d*(2*(b*c^3
+a)*b*d^3+18*b^2*c^3*d^3)+3*b*c*d^2*(6*(b*c^3+a)*b*c*d^2+9*b^2*c^
4*d^2))+d^3*((b*c^3+a)*(2*(b*c^3+a)*b*d^3+18*b^2*c^3*d^3)+3*b*c^2
*d*(6*(b*c^3+a)*b*c*d^2+9*b^2*c^4*d^2)+18*b^2*c^3*d^3*(b*c^3+a)+b
*d^3*(b*c^3+a)^2))*x^7+1/6*(c^3*(6*(b*c^3+a)*b^2*c*d^5+45*c^4*b^3
*d^5+3*b*c*d^2*(2*(b*c^3+a)*b*d^3+18*b^2*c^3*d^3)+b*d^3*(6*(b*c^3
+a)*b*c*d^2+9*b^2*c^4*d^2))+3*c^2*d*(21*(b*c^3+a)*b^2*c^2*d^4+3*b
*c^2*d*(2*(b*c^3+a)*b*d^3+18*b^2*c^3*d^3)+3*b*c*d^2*(6*(b*c^3+a)*
b*c*d^2+9*b^2*c^4*d^2))+3*c*d^2*((b*c^3+a)*(2*(b*c^3+a)*b*d^3+18*
b^2*c^3*d^3)+3*b*c^2*d*(6*(b*c^3+a)*b*c*d^2+9*b^2*c^4*d^2)+18*b^2
*c^3*d^3*(b*c^3+a)+b*d^3*(b*c^3+a)^2)+d^3*((b*c^3+a)*(6*(b*c^3+a)
*b*c*d^2+9*b^2*c^4*d^2)+18*b^2*c^4*d^2*(b*c^3+a)+3*b*c*d^2*(b*c^3
+a)^2))*x^6+1/5*(c^3*(21*(b*c^3+a)*b^2*c^2*d^4+3*b*c^2*d*(2*(b*c^
3+a)*b*d^3+18*b^2*c^3*d^3)+3*b*c*d^2*(6*(b*c^3+a)*b*c*d^2+9*b^2*c
^4*d^2))+3*c^2*d*((b*c^3+a)*(2*(b*c^3+a)*b*d^3+18*b^2*c^3*d^3)+3*
b*c^2*d*(6*(b*c^3+a)*b*c*d^2+9*b^2*c^4*d^2)+18*b^2*c^3*d^3*(b*c^3
+a)+b*d^3*(b*c^3+a)^2)+3*c*d^2*((b*c^3+a)*(6*(b*c^3+a)*b*c*d^2+9*
b^2*c^4*d^2)+18*b^2*c^4*d^2*(b*c^3+a)+3*b*c*d^2*(b*c^3+a)^2)+9*d^
4*(b*c^3+a)^2*b*c^2)*x^5+1/4*(c^3*((b*c^3+a)*(2*(b*c^3+a)*b*d^3+1
8*b^2*c^3*d^3)+3*b*c^2*d*(6*(b*c^3+a)*b*c*d^2+9*b^2*c^4*d^2)+18*b
^2*c^3*d^3*(b*c^3+a)+b*d^3*(b*c^3+a)^2)+3*c^2*d*((b*c^3+a)*(6*(b*
c^3+a)*b*c*d^2+9*b^2*c^4*d^2)+18*b^2*c^4*d^2*(b*c^3+a)+3*b*c*d^2*
(b*c^3+a)^2)+27*c^3*d^3*(b*c^3+a)^2*b+d^3*(b*c^3+a)^3)*x^4+1/3*(c
^3*((b*c^3+a)*(6*(b*c^3+a)*b*c*d^2+9*b^2*c^4*d^2)+18*b^2*c^4*d^2*
(b*c^3+a)+3*b*c*d^2*(b*c^3+a)^2)+27*c^4*d^2*(b*c^3+a)^2*b+3*c*d^2
*(b*c^3+a)^3)*x^3+1/2*(9*c^5*(b*c^3+a)^2*b*d+3*c^2*d*(b*c^3+a)^3)
*x^2+c^3*(b*c^3+a)^3*x
```

Maxima [A] time = 1.35215, size = 485, normalized size = 6.83

$$\frac{1}{13}\,b^3d^{12}x^{13} + b^3cd^{11}x^{12} + 6\,b^3c^2d^{10}x^{11} + \frac{1}{10}\left(220\,b^3c^3 + 3\,ab^2\right)d^9x^{10} + \left(55\,b^3c^4 + 3\,ab^2c\right)d^8x^9 + \frac{9}{2}\left(22\,b^3c^5 + 3\,ab^2c^2\right)d^7x^8 + \frac{3}{7}\left(308\,b^3c^6 + 84\,ab^2c^3 + a^2b\right)d^6x^7 + 3\left(44\,b^3c^7 + 21\,ab^2c^4 + a^2bc\right)d^5x^6 + \frac{9}{5}\left(55\,b^3c^8 + 42\,ab^2c^5 + 5\,a^2bc^2\right)d^4x^5 + \frac{1}{4}\left(220\,b^3c^9 + 252\,ab^2c^6 + 60\,a^2bc^3 + a^3\right)d^3x^4 + \left(22\,b^3c^{10} + 36\,ab^2c^7 + 15\,a^2bc^4 + a^3c\right)d^2x^3 + \frac{3}{2}\left(4\,b^3c^{11} + 9\,ab^2c^8 + 6\,a^2bc^5 + a^3c^2\right)dx^2 + \left(b^3c^{12} + 3\,ab^2c^9 + 3\,a^2bc^6 + a^3c^3\right)x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^3*b + a)^3*(d*x + c)^3,x, algorithm="maxima")
```

```
[Out] 1/13*b^3*d^12*x^13 + b^3*c*d^11*x^12 + 6*b^3*c^2*d^10*x^11 + 1/10
*(220*b^3*c^3 + 3*a*b^2)*d^9*x^10 + (55*b^3*c^4 + 3*a*b^2*c)*d^8*
x^9 + 9/2*(22*b^3*c^5 + 3*a*b^2*c^2)*d^7*x^8 + 3/7*(308*b^3*c^6 +
 84*a*b^2*c^3 + a^2*b)*d^6*x^7 + 3*(44*b^3*c^7 + 21*a*b^2*c^4 + a
^2*b*c)*d^5*x^6 + 9/5*(55*b^3*c^8 + 42*a*b^2*c^5 + 5*a^2*b*c^2)*d
^4*x^5 + 1/4*(220*b^3*c^9 + 252*a*b^2*c^6 + 60*a^2*b*c^3 + a^3)*d
^3*x^4 + (22*b^3*c^10 + 36*a*b^2*c^7 + 15*a^2*b*c^4 + a^3*c)*d^2*
x^3 + 3/2*(4*b^3*c^11 + 9*a*b^2*c^8 + 6*a^2*b*c^5 + a^3*c^2)*d*x^
2 + (b^3*c^12 + 3*a*b^2*c^9 + 3*a^2*b*c^6 + a^3*c^3)*x
```

Fricas [A] time = 0.186461, size = 1, normalized size = 0.01

$$\frac{1}{13}x^{13}d^{12}b^3 + x^{12}d^{11}cb^3 + 6x^{11}d^{10}c^2b^3 + 22x^{10}d^9c^3b^3 + 55x^9d^8c^4b^3 + 99x^8d^7c^5b^3 + 132x^7d^6c^6b^3 + \frac{3}{10}x^{10}d^9b^2a + 132x^6d^5c^7b^3 + 3x^9d^8cb^2a + 99x^5d^4c^8b^3 + \frac{27}{2}x^8d^7c^2b^2a + 55x^4d^3c^9b^3 + 36x^7d^6c^3b^2a + 22x^3d^2c^{10}b^3 + 63x^6d^5c^4b^2a + 6x^2dc^{11}b^3 + \frac{378}{5}x^5d^4c^5b^2a + xc^{12}b^3 + 63x^4d^3c^6b^2a + \frac{3}{7}x^7d^6ba^2 + 36x^3d^2c^7b^2a + 3x^6d^5cba^2 + \frac{27}{2}x^2dc^8b^2a + 9x^5d^4c^2ba^2 + 3xc^9b^2a + 15x^4d^3c^3ba^2 + 15x^3d^2c^4ba^2 + 9x^2dc^5ba^2 + 3xc^6ba^2 + \frac{1}{4}x^4d^3a^3 + x^3d^2ca^3 + \frac{3}{2}x^2dc^2a^3 + xc^3a^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^3*b + a)^3*(d*x + c)^3,x, algorithm="fricas")
```

```
[Out] 1/13*x^13*d^12*b^3 + x^12*d^11*c*b^3 + 6*x^11*d^10*c^2*b^3 + 22*x
^10*d^9*c^3*b^3 + 55*x^9*d^8*c^4*b^3 + 99*x^8*d^7*c^5*b^3 + 132*x
^7*d^6*c^6*b^3 + 3/10*x^10*d^9*b^2*a + 132*x^6*d^5*c^7*b^3 + 3*x^
9*d^8*c*b^2*a + 99*x^5*d^4*c^8*b^3 + 27/2*x^8*d^7*c^2*b^2*a + 55*
x^4*d^3*c^9*b^3 + 36*x^7*d^6*c^3*b^2*a + 22*x^3*d^2*c^10*b^3 + 63
*x^6*d^5*c^4*b^2*a + 6*x^2*d*c^11*b^3 + 378/5*x^5*d^4*c^5*b^2*a +
 x*c^12*b^3 + 63*x^4*d^3*c^6*b^2*a + 3/7*x^7*d^6*b*a^2 + 36*x^3*d
^2*c^7*b^2*a + 3*x^6*d^5*c*b*a^2 + 27/2*x^2*d*c^8*b^2*a + 9*x^5*d
^4*c^2*b*a^2 + 3*x*c^9*b^2*a + 15*x^4*d^3*c^3*b*a^2 + 15*x^3*d^2*
c^4*b*a^2 + 9*x^2*d*c^5*b*a^2 + 3*x*c^6*b*a^2 + 1/4*x^4*d^3*a^3 +
 x^3*d^2*c*a^3 + 3/2*x^2*d*c^2*a^3 + x*c^3*a^3
```

Sympy [A] time = 0.411405, size = 437, normalized size = 6.15

$$6b^3c^2d^{10}x^{11} + b^3cd^{11}x^{12} + \frac{b^3d^{12}x^{13}}{13} + x^{10}\left(\frac{3ab^2d^9}{10} + 22b^3c^3d^9\right) + x^9\left(3ab^2cd^8 + 55b^3c^4d^8\right) + x^8\left(\frac{27ab^2c^2d^7}{2} + 99b^3c^5d^7\right) + x^7\left(\frac{3a^2bd^6}{7} + 36ab^2c^3d^6 + 132b^3c^6d^6\right) + x^6\left(3a^2bcd^5 + 63ab^2c^4d^5 + 132b^3c^7d^5\right) + x^5\left(9a^2bc^2d^4 + \frac{378ab^2c^5d^4}{5} + 99b^3c^8d^4\right) + x^4\left(\frac{a^3d^3}{4} + 15a^2bc^3d^3 + 63ab^2c^6d^3 + 55b^3c^9d^3\right) + x^3\left(a^3cd^2 + 15a^2bc^4d^2 + 36ab^2c^7d^2 + 22b^3c^{10}d^2\right) + x^2\left(\frac{3a^3c^2d}{2} + 9a^2bc^5d + \frac{27ab^2c^8d}{2} + 6b^3c^{11}d\right) + x\left(a^3c^3 + 3a^2bc^6 + 3ab^2c^9 + b^3c^{12}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**3*(a+b*(d*x+c)**3)**3,x)
```

```
[Out] 6*b**3*c**2*d**10*x**11 + b**3*c*d**11*x**12 + b**3*d**12*x**13/1
3 + x**10*(3*a*b**2*d**9/10 + 22*b**3*c**3*d**9) + x**9*(3*a*b**2
*c*d**8 + 55*b**3*c**4*d**8) + x**8*(27*a*b**2*c**2*d**7/2 + 99*b
**3*c**5*d**7) + x**7*(3*a**2*b*d**6/7 + 36*a*b**2*c**3*d**6 + 13
```

```
2*b**3*c**6*d**6) + x**6*(3*a**2*b*c*d**5 + 63*a*b**2*c**4*d**5 +
 132*b**3*c**7*d**5) + x**5*(9*a**2*b*c**2*d**4 + 378*a*b**2*c**5
*d**4/5 + 99*b**3*c**8*d**4) + x**4*(a**3*d**3/4 + 15*a**2*b*c**3
*d**3 + 63*a*b**2*c**6*d**3 + 55*b**3*c**9*d**3) + x**3*(a**3*c*d
**2 + 15*a**2*b*c**4*d**2 + 36*a*b**2*c**7*d**2 + 22*b**3*c**10*d
**2) + x**2*(3*a**3*c**2*d/2 + 9*a**2*b*c**5*d + 27*a*b**2*c**8*d
/2 + 6*b**3*c**11*d) + x*(a**3*c**3 + 3*a**2*b*c**6 + 3*a*b**2*c*
*9 + b**3*c**12)
```

GIAC/XCAS [A] time = 0.216285, size = 597, normalized size = 8.41

$$\frac{1}{13}\,b^3d^{12}x^{13} + b^3cd^{11}x^{12} + 6\,b^3c^2d^{10}x^{11} + 22\,b^3c^3d^9x^{10} + 55\,b^3c^4d^8x^9 + 99\,b^3c^5d^7x^8 + 132\,b^3c^6d^6x^7 + \frac{3}{10}\,ab^2d^9x^{10} + 132\,b^3c^7d^5x^6 + 3\,ab^2cd^8x^9 + 99\,b^3c^8d^4x^5 + \frac{27}{2}\,ab^2c^2d^7x^8 + 55\,b^3c^9d^3x^4 + 36\,ab^2c^3d^6x^7 + 22\,b^3c^{10}d^2x^3 + 63\,ab^2c^4d^5x^6 + 6\,b^3c^{11}dx^2 + \frac{378}{5}\,ab^2c^5d^4x^5 + b^3c^{12}x + 63\,ab^2c^6d^3x^4 + \frac{3}{7}\,a^2bd^6x^7 + 36\,ab^2c^7d^2x^3 + 3\,a^2bcd^5x^6 + \frac{27}{2}\,ab^2c^8dx^2 + 9\,a^2bc^2d^4x^5 + 3\,ab^2c^9x + 15\,a^2bc^3d^3x^4 + 15\,a^2bc^4d^2x^3 + 9\,a^2bc^5dx^2 + 3\,a^2bc^6x + \frac{1}{4}\,a^3d^3x^4 + a^3cd^2x^3 + \frac{3}{2}\,a^3c^2dx^2 + a^3c^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^3*b + a)^3*(d*x + c)^3,x, algorithm="giac")
```

```
[Out] 1/13*b^3*d^12*x^13 + b^3*c*d^11*x^12 + 6*b^3*c^2*d^10*x^11 + 22*b
^3*c^3*d^9*x^10 + 55*b^3*c^4*d^8*x^9 + 99*b^3*c^5*d^7*x^8 + 132*b
^3*c^6*d^6*x^7 + 3/10*a*b^2*d^9*x^10 + 132*b^3*c^7*d^5*x^6 + 3*a*
b^2*c*d^8*x^9 + 99*b^3*c^8*d^4*x^5 + 27/2*a*b^2*c^2*d^7*x^8 + 55*
b^3*c^9*d^3*x^4 + 36*a*b^2*c^3*d^6*x^7 + 22*b^3*c^10*d^2*x^3 + 63
*a*b^2*c^4*d^5*x^6 + 6*b^3*c^11*d*x^2 + 378/5*a*b^2*c^5*d^4*x^5 +
 b^3*c^12*x + 63*a*b^2*c^6*d^3*x^4 + 3/7*a^2*b*d^6*x^7 + 36*a*b^2
*c^7*d^2*x^3 + 3*a^2*b*c*d^5*x^6 + 27/2*a*b^2*c^8*d*x^2 + 9*a^2*b
*c^2*d^4*x^5 + 3*a*b^2*c^9*x + 15*a^2*b*c^3*d^3*x^4 + 15*a^2*b*c^
4*d^2*x^3 + 9*a^2*b*c^5*d*x^2 + 3*a^2*b*c^6*x + 1/4*a^3*d^3*x^4 +
 a^3*c*d^2*x^3 + 3/2*a^3*c^2*d*x^2 + a^3*c^3*x
```

3.2849 $\int (ce+dex)^3 \left(a+b(c+dx)^3\right) dx$

Optimal. Leaf size=37

$$\frac{ae^3(c+dx)^4}{4d}+\frac{be^3(c+dx)^7}{7d}$$

```
[Out] (a*e^3*(c + d*x)^4)/(4*d) + (b*e^3*(c + d*x)^7)/(7*d)
```

Rubi [A] time = 0.0805311, antiderivative size = 37, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{ae^3(c+dx)^4}{4d}+\frac{be^3(c+dx)^7}{7d}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*e + d*e*x)^3*(a + b*(c + d*x)^3),x]

[Out] (a*e^3*(c + d*x)^4)/(4*d) + (b*e^3*(c + d*x)^7)/(7*d)
```

Rubi in Sympy [A] time = 9.02726, size = 29, normalized size = 0.78

$$\frac{ae^3\,(c+dx)^4}{4d}+\frac{be^3\,(c+dx)^7}{7d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*e*x+c*e)**3*(a+b*(d*x+c)**3),x)

[Out] a*e**3*(c + d*x)**4/(4*d) + b*e**3*(c + d*x)**7/(7*d)
```

Mathematica [B] time = 0.00888593, size = 102, normalized size = 2.76

$$e^3\left(\frac{1}{4}d^3x^4\left(a+20bc^3\right)+cd^2x^3\left(a+5bc^3\right)+c^3x\left(a+bc^3\right)+\frac{3}{2}c^2dx^2\left(a+2bc^3\right)+3bc^2d^4x^5+bcd^5x^6+\frac{1}{7}bd^6x^7\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*e + d*e*x)^3*(a + b*(c + d*x)^3),x]

[Out] e^3*(c^3*(a + b*c^3)*x + (3*c^2*(a + 2*b*c^3)*d*x^2)/2 + c*(a + 5
*b*c^3)*d^2*x^3 + ((a + 20*b*c^3)*d^3*x^4)/4 + 3*b*c^2*d^4*x^5 +
b*c*d^5*x^6 + (b*d^6*x^7)/7)
```

Maple [B] time = 0.001, size = 154, normalized size = 4.2

$$\frac{d^6e^3bx^7}{7}+ce^3d^5bx^6+3\,c^2e^3d^4bx^5+\frac{\left(19\,c^3e^3bd^3+d^3e^3\left(bc^3+a\right)\right)x^4}{4}+\frac{\left(12\,c^4e^3bd^2+3\,ce^3d^2\left(bc^3+a\right)\right)x^3}{3}+\frac{\left(3\,c^5e^3bd+3\,c^2e^3d\left(bc^3+a\right)\right)x^2}{2}+c^3e^3\left(bc^3+a\right)x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*e*x+c*e)^3*(a+b*(d*x+c)^3),x)
```

```
[Out] 1/7*d^6*e^3*b*x^7+c*e^3*d^5*b*x^6+3*c^2*e^3*d^4*b*x^5+1/4*(19*c^3
*e^3*b*d^3+d^3*e^3*(b*c^3+a))*x^4+1/3*(12*c^4*e^3*b*d^2+3*c*e^3*d
^2*(b*c^3+a))*x^3+1/2*(3*c^5*e^3*b*d+3*c^2*e^3*d*(b*c^3+a))*x^2+c
^3*e^3*(b*c^3+a)*x
```

Maxima [A] time = 1.34586, size = 157, normalized size = 4.24

$$\frac{1}{7}\,bd^6e^3x^7 + bcd^5e^3x^6 + 3\,bc^2d^4e^3x^5 + \frac{1}{4}\left(20\,bc^3 + a\right)d^3e^3x^4 + \left(5\,bc^4 + ac\right)d^2e^3x^3 + \frac{3}{2}\left(2\,bc^5 + ac^2\right)de^3x^2 + \left(bc^6 + ac^3\right)e^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((d*x + c)^3*b + a)*(d*e*x + c*e)^3,x, algorithm="maxima")
```

```
[Out] 1/7*b*d^6*e^3*x^7 + b*c*d^5*e^3*x^6 + 3*b*c^2*d^4*e^3*x^5 + 1/4*(
20*b*c^3 + a)*d^3*e^3*x^4 + (5*b*c^4 + a*c)*d^2*e^3*x^3 + 3/2*(2*
b*c^5 + a*c^2)*d*e^3*x^2 + (b*c^6 + a*c^3)*e^3*x
```

Fricas [A] time = 0.187993, size = 1, normalized size = 0.03

$$\frac{1}{7}x^7e^3d^6b + x^6e^3d^5cb + 3x^5e^3d^4c^2b + 5x^4e^3d^3c^3b + 5x^3e^3d^2c^4b + 3x^2e^3dc^5b + xe^3c^6b + \frac{1}{4}x^4e^3d^3a + x^3e^3d^2ca + \frac{3}{2}x^2e^3dc^2a + xe^3c^3a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((d*x + c)^3*b + a)*(d*e*x + c*e)^3,x, algorithm="fricas")
```

```
[Out] 1/7*x^7*e^3*d^6*b + x^6*e^3*d^5*c*b + 3*x^5*e^3*d^4*c^2*b + 5*x^4
*e^3*d^3*c^3*b + 5*x^3*e^3*d^2*c^4*b + 3*x^2*e^3*d*c^5*b + x*e^3*
c^6*b + 1/4*x^4*e^3*d^3*a + x^3*e^3*d^2*c*a + 3/2*x^2*e^3*d*c^2*a
 + x*e^3*c^3*a
```

Sympy [A] time = 0.183919, size = 144, normalized size = 3.89

$$3bc^2d^4e^3x^5 + bcd^5e^3x^6 + \frac{bd^6e^3x^7}{7} + x^4\left(\frac{ad^3e^3}{4} + 5bc^3d^3e^3\right) + x^3\left(acd^2e^3 + 5bc^4d^2e^3\right) + x^2\left(\frac{3ac^2de^3}{2} + 3bc^5de^3\right) + x\left(ac^3e^3 + bc^6e^3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*e*x+c*e)**3*(a+b*(d*x+c)**3),x)
```

```
[Out] 3*b*c**2*d**4*e**3*x**5 + b*c*d**5*e**3*x**6 + b*d**6*e**3*x**7/7
 + x**4*(a*d**3*e**3/4 + 5*b*c**3*d**3*e**3) + x**3*(a*c*d**2*e**
3 + 5*b*c**4*d**2*e**3) + x**2*(3*a*c**2*d*e**3/2 + 3*b*c**5*d*e*
*3) + x*(a*c**3*e**3 + b*c**6*e**3)
```

GIAC/XCAS [A] time = 0.213156, size = 171, normalized size = 4.62

$$\frac{1}{7}\,bd^6x^7e^3 + bcd^5x^6e^3 + 3\,bc^2d^4x^5e^3 + 5\,bc^3d^3x^4e^3 + 5\,bc^4d^2x^3e^3 + 3\,bc^5dx^2e^3 + bc^6xe^3 + \frac{1}{4}\,ad^3x^4e^3 + acd^2x^3e^3 + \frac{3}{2}\,ac^2dx^2e^3 + ac^3xe^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^3*b + a)*(d*e*x + c*e)^3,x, algorithm="giac")
```

```
[Out] 1/7*b*d^6*x^7*e^3 + b*c*d^5*x^6*e^3 + 3*b*c^2*d^4*x^5*e^3 + 5*b*c
^3*d^3*x^4*e^3 + 5*b*c^4*d^2*x^3*e^3 + 3*b*c^5*d*x^2*e^3 + b*c^6*
x*e^3 + 1/4*a*d^3*x^4*e^3 + a*c*d^2*x^3*e^3 + 3/2*a*c^2*d*x^2*e^3
 + a*c^3*x*e^3
```

3.2850 $\int (ce+dex)^3 \left(a+b(c+dx)^3\right)^2 \, dx$

Optimal. Leaf size=60

$$\frac{a^2e^3(c+dx)^4}{4d}+\frac{2abe^3(c+dx)^7}{7d}+\frac{b^2e^3(c+dx)^{10}}{10d}$$

```
[Out] (a^2*e^3*(c + d*x)^4)/(4*d) + (2*a*b*e^3*(c + d*x)^7)/(7*d) + (b^
2*e^3*(c + d*x)^10)/(10*d)
```

Rubi [A] time = 0.171876, antiderivative size = 60, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083

$$\frac{a^2e^3(c+dx)^4}{4d}+\frac{2abe^3(c+dx)^7}{7d}+\frac{b^2e^3(c+dx)^{10}}{10d}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*e + d*e*x)^3*(a + b*(c + d*x)^3)^2,x]
```

```
[Out] (a^2*e^3*(c + d*x)^4)/(4*d) + (2*a*b*e^3*(c + d*x)^7)/(7*d) + (b^
2*e^3*(c + d*x)^10)/(10*d)
```

Rubi in Sympy [A] time = 14.1634, size = 51, normalized size = 0.85

$$\frac{a^2e^3\left(c+dx\right)^4}{4d}+\frac{2abe^3\left(c+dx\right)^7}{7d}+\frac{b^2e^3\left(c+dx\right)^{10}}{10d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*e*x+c*e)**3*(a+b*(d*x+c)**3)**2,x)
```

```
[Out] a**2*e**3*(c + d*x)**4/(4*d) + 2*a*b*e**3*(c + d*x)**7/(7*d) + b*
*2*e**3*(c + d*x)**10/(10*d)
```

Mathematica [B] time = 0.0493001, size = 207, normalized size = 3.45

$$e^3\left(\frac{1}{4}d^3x^4\left(a^2+40abc^3+84b^2c^6\right)+cd^2x^3\left(a^2+10abc^3+12b^2c^6\right)\right.$$
$$+\frac{3}{2}c^2dx^2\left(a^2+4abc^3+3b^2c^6\right)+\frac{2}{7}bd^6x^7\left(a+42bc^3\right)+bcd^5x^6\left(2a+21bc^3\right)$$
$$\left.+c^3x\left(a+bc^3\right)^2+\frac{6}{5}bc^2d^4x^5\left(5a+21bc^3\right)+\frac{9}{2}b^2c^2d^7x^8+b^2cd^8x^9+\frac{1}{10}b^2d^9x^{10}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*e + d*e*x)^3*(a + b*(c + d*x)^3)^2,x]
```

```
[Out] e^3*(c^3*(a + b*c^3)^2*x + (3*c^2*(a^2 + 4*a*b*c^3 + 3*b^2*c^6)*d
*x^2)/2 + c*(a^2 + 10*a*b*c^3 + 12*b^2*c^6)*d^2*x^3 + ((a^2 + 40*
a*b*c^3 + 84*b^2*c^6)*d^3*x^4)/4 + (6*b*c^2*(5*a + 21*b*c^3)*d^4*
x^5)/5 + b*c*(2*a + 21*b*c^3)*d^5*x^6 + (2*b*(a + 42*b*c^3)*d^6*x
^7)/7 + (9*b^2*c^2*d^7*x^8)/2 + b^2*c*d^8*x^9 + (b^2*d^9*x^10)/10
)
```

Maple [B] time = 0.002, size = 536, normalized size = 8.9

$$\frac{d^9e^3b^2x^{10}}{10}+ce^3d^8b^2x^9+\frac{9c^2e^3d^7b^2x^8}{2}+\frac{\left(64c^3e^3b^2d^6+d^3e^3\left(2\left(bc^3+a\right)bd^3+18b^2c^3d^3\right)\right)x^7}{7}+\frac{\left(51c^4e^3b^2d^5+3ce^3d^2\left(2\left(bc^3+a\right)bd^3+18b^2c^3d^3\right)+d^3e^3\left(6\left(bc^3+a\right)bcd^2+9b^2c^4d^2\right)\right)x^6}{6}+\frac{\left(15c^5e^3b^2d^4+3c^2e^3d\left(2\left(bc^3+a\right)bd^3+18b^2c^3d^3\right)+3ce^3d^2\left(6\left(bc^3+a\right)bcd^2+9b^2c^4d^2\right)+6d^4e^3\left(bc^3+a\right)bc^2\right)x^5}{5}+\frac{\left(c^3e^3\left(2\left(bc^3+a\right)bd^3+18b^2c^3d^3\right)+3c^2e^3d\left(6\left(bc^3+a\right)bcd^2+9b^2c^4d^2\right)+18c^3e^3d^3\left(bc^3+a\right)b+d^3e^3\left(bc^3+a\right)^2\right)x^4}{4}+\frac{\left(c^3e^3\left(6\left(bc^3+a\right)bcd^2+9b^2c^4d^2\right)+18c^4e^3d^2\left(bc^3+a\right)b+3ce^3d^2\left(bc^3+a\right)^2\right)x^3}{3}+\frac{\left(6c^5e^3\left(bc^3+a\right)bd+3c^2e^3d\left(bc^3+a\right)^2\right)x^2}{2}+c^3e^3\left(bc^3+a\right)^2x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*e*x+c*e)^3*(a+b*(d*x+c)^3)^2,x)
```

```
[Out] 1/10*d^9*e^3*b^2*x^10+c*e^3*d^8*b^2*x^9+9/2*c^2*e^3*d^7*b^2*x^8+1
/7*(64*c^3*e^3*b^2*d^6+d^3*e^3*(2*(b*c^3+a)*b*d^3+18*b^2*c^3*d^3)
)*x^7+1/6*(51*c^4*e^3*b^2*d^5+3*c*e^3*d^2*(2*(b*c^3+a)*b*d^3+18*b
^2*c^3*d^3)+d^3*e^3*(6*(b*c^3+a)*b*c*d^2+9*b^2*c^4*d^2))*x^6+1/5*
(15*c^5*e^3*b^2*d^4+3*c^2*e^3*d*(2*(b*c^3+a)*b*d^3+18*b^2*c^3*d^3
)+3*c*e^3*d^2*(6*(b*c^3+a)*b*c*d^2+9*b^2*c^4*d^2)+6*d^4*e^3*(b*c^
3+a)*b*c^2)*x^5+1/4*(c^3*e^3*(2*(b*c^3+a)*b*d^3+18*b^2*c^3*d^3)+3
*c^2*e^3*d*(6*(b*c^3+a)*b*c*d^2+9*b^2*c^4*d^2)+18*c^3*e^3*d^3*(b*
c^3+a)*b+d^3*e^3*(b*c^3+a)^2)*x^4+1/3*(c^3*e^3*(6*(b*c^3+a)*b*c*d
^2+9*b^2*c^4*d^2)+18*c^4*e^3*d^2*(b*c^3+a)*b+3*c*e^3*d^2*(b*c^3+a
)^2)*x^3+1/2*(6*c^5*e^3*(b*c^3+a)*b*d+3*c^2*e^3*d*(b*c^3+a)^2)*x^
2+c^3*e^3*(b*c^3+a)^2*x
```

Maxima [A] time = 1.34919, size = 324, normalized size = 5.4

$$\frac{1}{10}b^2d^9e^3x^{10}+b^2cd^8e^3x^9+\frac{9}{2}b^2c^2d^7e^3x^8+\frac{2}{7}\left(42b^2c^3+ab\right)d^6e^3x^7+\left(21b^2c^4+2abc\right)d^5e^3x^6+\frac{6}{5}\left(21b^2c^5+5abc^2\right)d^4e^3x^5+\frac{1}{4}\left(84b^2c^6+40abc^3+a^2\right)d^3e^3x^4+\left(12b^2c^7+10abc^4+a^2c\right)d^2e^3x^3+\frac{3}{2}\left(3b^2c^8+4abc^5+a^2c^2\right)de^3x^2+\left(b^2c^9+2abc^6+a^2c^3\right)e^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^3*b + a)^2*(d*e*x + c*e)^3,x, algorithm="maxima")
```

```
[Out] 1/10*b^2*d^9*e^3*x^10 + b^2*c*d^8*e^3*x^9 + 9/2*b^2*c^2*d^7*e^3*x
^8 + 2/7*(42*b^2*c^3 + a*b)*d^6*e^3*x^7 + (21*b^2*c^4 + 2*a*b*c)*
d^5*e^3*x^6 + 6/5*(21*b^2*c^5 + 5*a*b*c^2)*d^4*e^3*x^5 + 1/4*(84*
b^2*c^6 + 40*a*b*c^3 + a^2)*d^3*e^3*x^4 + (12*b^2*c^7 + 10*a*b*c^
4 + a^2*c)*d^2*e^3*x^3 + 3/2*(3*b^2*c^8 + 4*a*b*c^5 + a^2*c^2)*d*
e^3*x^2 + (b^2*c^9 + 2*a*b*c^6 + a^2*c^3)*e^3*x
```

Fricas [A] time = 0.186187, size = 1, normalized size = 0.02

$$\frac{1}{10}x^{10}e^3d^9b^2+x^9e^3d^8cb^2+\frac{9}{2}x^8e^3d^7c^2b^2+12x^7e^3d^6c^3b^2+21x^6e^3d^5c^4b^2+\frac{126}{5}x^5e^3d^4c^5b^2+21x^4e^3d^3c^6b^2+\frac{2}{7}x^7e^3d^6ba+12x^3e^3d^2c^7b^2+2x^6e^3d^5cba+\frac{9}{2}x^2e^3dc^8b^2+6x^5e^3d^4c^2ba+xe^3c^9b^2+10x^4e^3d^3c^3ba+10x^3e^3d^2c^4ba+6x^2e^3dc^5ba+2xe^3c^6ba+\frac{1}{4}x^4e^3d^3a^2+x^3e^3d^2ca^2+\frac{3}{2}x^2e^3dc^2a^2+xe^3c^3a^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((d*x + c)^3*b + a)^2*(d*e*x + c*e)^3,x, algorithm="fricas")
```

```
[Out] 1/10*x^10*e^3*d^9*b^2 + x^9*e^3*d^8*c*b^2 + 9/2*x^8*e^3*d^7*c^2*b
^2 + 12*x^7*e^3*d^6*c^3*b^2 + 21*x^6*e^3*d^5*c^4*b^2 + 126/5*x^5*
e^3*d^4*c^5*b^2 + 21*x^4*e^3*d^3*c^6*b^2 + 2/7*x^7*e^3*d^6*b*a +
12*x^3*e^3*d^2*c^7*b^2 + 2*x^6*e^3*d^5*c*b*a + 9/2*x^2*e^3*d*c^8*
b^2 + 6*x^5*e^3*d^4*c^2*b*a + x*e^3*c^9*b^2 + 10*x^4*e^3*d^3*c^3*
b*a + 10*x^3*e^3*d^2*c^4*b*a + 6*x^2*e^3*d*c^5*b*a + 2*x*e^3*c^6*
b*a + 1/4*x^4*e^3*d^3*a^2 + x^3*e^3*d^2*c*a^2 + 3/2*x^2*e^3*d*c^2
*a^2 + x*e^3*c^3*a^2
```

Sympy [A] time = 0.319006, size = 323, normalized size = 5.38

$$\frac{9b^2c^2d^7e^3x^8}{2} + b^2cd^8e^3x^9 + \frac{b^2d^9e^3x^{10}}{10} + x^7\left(\frac{2abd^6e^3}{7} + 12b^2c^3d^6e^3\right) + x^6\left(2abcd^5e^3 + 21b^2c^4d^5e^3\right) + x^5\left(6abc^2d^4e^3 + \frac{126b^2c^5d^4e^3}{5}\right) + x^4\left(\frac{a^2d^3e^3}{4} + 10abc^3d^3e^3 + 21b^2c^6d^3e^3\right) + x^3\left(a^2cd^2e^3 + 10abc^4d^2e^3 + 12b^2c^7d^2e^3\right) + x^2\left(\frac{3a^2c^2de^3}{2} + 6abc^5de^3 + \frac{9b^2c^8de^3}{2}\right) + x\left(a^2c^3e^3 + 2abc^6e^3 + b^2c^9e^3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*e*x+c*e)**3*(a+b*(d*x+c)**3)**2,x)
```

```
[Out] 9*b**2*c**2*d**7*e**3*x**8/2 + b**2*c*d**8*e**3*x**9 + b**2*d**9*
e**3*x**10/10 + x**7*(2*a*b*d**6*e**3/7 + 12*b**2*c**3*d**6*e**3)
 + x**6*(2*a*b*c*d**5*e**3 + 21*b**2*c**4*d**5*e**3) + x**5*(6*a*
b*c**2*d**4*e**3 + 126*b**2*c**5*d**4*e**3/5) + x**4*(a**2*d**3*e
**3/4 + 10*a*b*c**3*d**3*e**3 + 21*b**2*c**6*d**3*e**3) + x**3*(a
**2*c*d**2*e**3 + 10*a*b*c**4*d**2*e**3 + 12*b**2*c**7*d**2*e**3)
 + x**2*(3*a**2*c**2*d*e**3/2 + 6*a*b*c**5*d*e**3 + 9*b**2*c**8*d
*e**3/2) + x*(a**2*c**3*e**3 + 2*a*b*c**6*e**3 + b**2*c**9*e**3)
```

GIAC/XCAS [A] time = 0.218742, size = 392, normalized size = 6.53

$$\frac{1}{10}\,b^2d^9x^{10}e^3 + b^2cd^8x^9e^3 + \frac{9}{2}\,b^2c^2d^7x^8e^3 + 12\,b^2c^3d^6x^7e^3 + 21\,b^2c^4d^5x^6e^3 + \frac{126}{5}\,b^2c^5d^4x^5e^3 + 21\,b^2c^6d^3x^4e^3 + \frac{2}{7}\,abd^6x^7e^3 + 12\,b^2c^7d^2x^3e^3 + 2\,abcd^5x^6e^3 + \frac{9}{2}\,b^2c^8dx^2e^3 + 6\,abc^2d^4x^5e^3 + b^2c^9xe^3 + 10\,abc^3d^3x^4e^3 + 10\,abc^4d^2x^3e^3 + 6\,abc^5dx^2e^3 + 2\,abc^6xe^3 + \frac{1}{4}\,a^2d^3x^4e^3 + a^2cd^2x^3e^3 + \frac{3}{2}\,a^2c^2dx^2e^3 + a^2c^3xe^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((d*x + c)^3*b + a)^2*(d*e*x + c*e)^3,x, algorithm="giac")
```

```
[Out] 1/10*b^2*d^9*x^10*e^3 + b^2*c*d^8*x^9*e^3 + 9/2*b^2*c^2*d^7*x^8*e
^3 + 12*b^2*c^3*d^6*x^7*e^3 + 21*b^2*c^4*d^5*x^6*e^3 + 126/5*b^2*
c^5*d^4*x^5*e^3 + 21*b^2*c^6*d^3*x^4*e^3 + 2/7*a*b*d^6*x^7*e^3 +
12*b^2*c^7*d^2*x^3*e^3 + 2*a*b*c*d^5*x^6*e^3 + 9/2*b^2*c^8*d*x^2*
e^3 + 6*a*b*c^2*d^4*x^5*e^3 + b^2*c^9*x*e^3 + 10*a*b*c^3*d^3*x^4*
e^3 + 10*a*b*c^4*d^2*x^3*e^3 + 6*a*b*c^5*d*x^2*e^3 + 2*a*b*c^6*x*
e^3 + 1/4*a^2*d^3*x^4*e^3 + a^2*c*d^2*x^3*e^3 + 3/2*a^2*c^2*d*x^2
*e^3 + a^2*c^3*x*e^3
```

3.2851 $\int (ce+dex)^3 \left(a+b(c+dx)^3\right)^3 \, dx$

Optimal. Leaf size=83

$$\frac{a^3e^3(c+dx)^4}{4d}+\frac{3a^2be^3(c+dx)^7}{7d}+\frac{3ab^2e^3(c+dx)^{10}}{10d}+\frac{b^3e^3(c+dx)^{13}}{13d}$$

```
[Out] (a^3*e^3*(c + d*x)^4)/(4*d) + (3*a^2*b*e^3*(c + d*x)^7)/(7*d) + (
3*a*b^2*e^3*(c + d*x)^10)/(10*d) + (b^3*e^3*(c + d*x)^13)/(13*d)
```

Rubi [A] time = 0.256615, antiderivative size = 83, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083

$$\frac{a^3e^3(c+dx)^4}{4d}+\frac{3a^2be^3(c+dx)^7}{7d}+\frac{3ab^2e^3(c+dx)^{10}}{10d}+\frac{b^3e^3(c+dx)^{13}}{13d}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*e + d*e*x)^3*(a + b*(c + d*x)^3)^3,x]
```

```
[Out] (a^3*e^3*(c + d*x)^4)/(4*d) + (3*a^2*b*e^3*(c + d*x)^7)/(7*d) + (
3*a*b^2*e^3*(c + d*x)^10)/(10*d) + (b^3*e^3*(c + d*x)^13)/(13*d)
```

Rubi in Sympy [A] time = 17.302, size = 73, normalized size = 0.88

$$\frac{a^3e^3\left(c+dx\right)^4}{4d}+\frac{3a^2be^3\left(c+dx\right)^7}{7d}+\frac{3ab^2e^3\left(c+dx\right)^{10}}{10d}+\frac{b^3e^3\left(c+dx\right)^{13}}{13d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*e*x+c*e)**3*(a+b*(d*x+c)**3)**3,x)
```

```
[Out] a**3*e**3*(c + d*x)**4/(4*d) + 3*a**2*b*e**3*(c + d*x)**7/(7*d) +
 3*a*b**2*e**3*(c + d*x)**10/(10*d) + b**3*e**3*(c + d*x)**13/(13
*d)
```

Mathematica [B] time = 0.0706151, size = 327, normalized size = 3.94

$$e^3\left(\frac{3}{7}bd^6x^7\left(a^2+84abc^3+308b^2c^6\right)+3bcd^5x^6\left(a^2+21abc^3+44b^2c^6\right)+\frac{9}{5}bc^2d^4x^5\left(5a^2+42abc^3+55b^2c^6\right)+\frac{1}{4}d^3x^4\left(a^3+60a^2bc^3+252ab^2c^6+220b^3c^9\right)+cd^2x^3\left(a^3+15a^2bc^3+36ab^2c^6+22b^3c^9\right)+\frac{1}{10}b^2d^9x^{10}\left(3a+220bc^3\right)+b^2cd^8x^9\left(3a+55bc^3\right)+\frac{9}{2}b^2c^2d^7x^8\left(3a+22bc^3\right)+c^3x\left(a+bc^3\right)^3+\frac{3}{2}c^2dx^2\left(a+bc^3\right)^2\left(a+4bc^3\right)+6b^3c^2d^{10}x^{11}+b^3cd^{11}x^{12}+\frac{1}{13}b^3d^{12}x^{13}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*e + d*e*x)^3*(a + b*(c + d*x)^3)^3,x]
```

```
[Out] e^3*(c^3*(a + b*c^3)^3*x + (3*c^2*(a + b*c^3)^2*(a + 4*b*c^3)*d*x
^2)/2 + c*(a^3 + 15*a^2*b*c^3 + 36*a*b^2*c^6 + 22*b^3*c^9)*d^2*x^
3 + ((a^3 + 60*a^2*b*c^3 + 252*a*b^2*c^6 + 220*b^3*c^9)*d^3*x^4)/
4 + (9*b*c^2*(5*a^2 + 42*a*b*c^3 + 55*b^2*c^6)*d^4*x^5)/5 + 3*b*c
```

```
*(a^2 + 21*a*b*c^3 + 44*b^2*c^6)*d^5*x^6 + (3*b*(a^2 + 84*a*b*c^3
 + 308*b^2*c^6)*d^6*x^7)/7 + (9*b^2*c^2*(3*a + 22*b*c^3)*d^7*x^8)
/2 + b^2*c*(3*a + 55*b*c^3)*d^8*x^9 + (b^2*(3*a + 220*b*c^3)*d^9*
x^10)/10 + 6*b^3*c^2*d^10*x^11 + b^3*c*d^11*x^12 + (b^3*d^12*x^13
)/13)
```

Maple [B] time = 0.002, size = 2050, normalized size = 24.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*e*x+c*e)^3*(a+b*(d*x+c)^3)^3,x)
```

```
[Out] 1/13*d^12*e^3*b^3*x^13+c*e^3*d^11*b^3*x^12+6*c^2*e^3*d^10*b^3*x^1
1+1/10*(136*c^3*e^3*b^3*d^9+d^3*e^3*((b*c^3+a)*b^2*d^6+63*c^3*b^3
*d^6+b*d^3*(2*(b*c^3+a)*b*d^3+18*b^2*c^3*d^3)))*x^10+1/9*(117*c^4
*e^3*b^3*d^8+3*c*e^3*d^2*((b*c^3+a)*b^2*d^6+63*c^3*b^3*d^6+b*d^3*
(2*(b*c^3+a)*b*d^3+18*b^2*c^3*d^3))+d^3*e^3*(6*(b*c^3+a)*b^2*c*d^
5+45*c^4*b^3*d^5+3*b*c*d^2*(2*(b*c^3+a)*b*d^3+18*b^2*c^3*d^3)+b*d
^3*(6*(b*c^3+a)*b*c*d^2+9*b^2*c^4*d^2)))*x^9+1/8*(36*c^5*e^3*d^7*
b^3+3*c^2*e^3*d*((b*c^3+a)*b^2*d^6+63*c^3*b^3*d^6+b*d^3*(2*(b*c^3
+a)*b*d^3+18*b^2*c^3*d^3))+3*c*e^3*d^2*(6*(b*c^3+a)*b^2*c*d^5+45*
c^4*b^3*d^5+3*b*c*d^2*(2*(b*c^3+a)*b*d^3+18*b^2*c^3*d^3)+b*d^3*(6
*(b*c^3+a)*b*c*d^2+9*b^2*c^4*d^2))+d^3*e^3*(21*(b*c^3+a)*b^2*c^2*
d^4+3*b*c^2*d*(2*(b*c^3+a)*b*d^3+18*b^2*c^3*d^3)+3*b*c*d^2*(6*(b*
c^3+a)*b*c*d^2+9*b^2*c^4*d^2)))*x^8+1/7*(c^3*e^3*((b*c^3+a)*b^2*d
^6+63*c^3*b^3*d^6+b*d^3*(2*(b*c^3+a)*b*d^3+18*b^2*c^3*d^3))+3*c^2
*e^3*d*(6*(b*c^3+a)*b^2*c*d^5+45*c^4*b^3*d^5+3*b*c*d^2*(2*(b*c^3+
a)*b*d^3+18*b^2*c^3*d^3)+b*d^3*(6*(b*c^3+a)*b*c*d^2+9*b^2*c^4*d^2
))+3*c*e^3*d^2*(21*(b*c^3+a)*b^2*c^2*d^4+3*b*c^2*d*(2*(b*c^3+a)*b
*d^3+18*b^2*c^3*d^3)+3*b*c*d^2*(6*(b*c^3+a)*b*c*d^2+9*b^2*c^4*d^2
))+d^3*e^3*((b*c^3+a)*(2*(b*c^3+a)*b*d^3+18*b^2*c^3*d^3)+3*b*c^2*
d*(6*(b*c^3+a)*b*c*d^2+9*b^2*c^4*d^2)+18*b^2*c^3*d^3*(b*c^3+a)+b*
d^3*(b*c^3+a)^2))*x^7+1/6*(c^3*e^3*(6*(b*c^3+a)*b^2*c*d^5+45*c^4*
b^3*d^5+3*b*c*d^2*(2*(b*c^3+a)*b*d^3+18*b^2*c^3*d^3)+b*d^3*(6*(b*
c^3+a)*b*c*d^2+9*b^2*c^4*d^2))+3*c^2*e^3*d*(21*(b*c^3+a)*b^2*c^2*
d^4+3*b*c^2*d*(2*(b*c^3+a)*b*d^3+18*b^2*c^3*d^3)+3*b*c*d^2*(6*(b*
c^3+a)*b*c*d^2+9*b^2*c^4*d^2))+3*c*e^3*d^2*((b*c^3+a)*(2*(b*c^3+a
)*b*d^3+18*b^2*c^3*d^3)+3*b*c^2*d*(6*(b*c^3+a)*b*c*d^2+9*b^2*c^4*
d^2)+18*b^2*c^3*d^3*(b*c^3+a)+b*d^3*(b*c^3+a)^2)+d^3*e^3*((b*c^3+
a)*(6*(b*c^3+a)*b*c*d^2+9*b^2*c^4*d^2)+18*b^2*c^4*d^2*(b*c^3+a)+3
*b*c*d^2*(b*c^3+a)^2))*x^6+1/5*(c^3*e^3*(21*(b*c^3+a)*b^2*c^2*d^4
+3*b*c^2*d*(2*(b*c^3+a)*b*d^3+18*b^2*c^3*d^3)+3*b*c*d^2*(6*(b*c^3
+a)*b*c*d^2+9*b^2*c^4*d^2))+3*c^2*e^3*d*((b*c^3+a)*(2*(b*c^3+a)*b
*d^3+18*b^2*c^3*d^3)+3*b*c^2*d*(6*(b*c^3+a)*b*c*d^2+9*b^2*c^4*d^2
)+18*b^2*c^3*d^3*(b*c^3+a)+b*d^3*(b*c^3+a)^2)+3*c*e^3*d^2*((b*c^3
+a)*(6*(b*c^3+a)*b*c*d^2+9*b^2*c^4*d^2)+18*b^2*c^4*d^2*(b*c^3+a)+
3*b*c*d^2*(b*c^3+a)^2)+9*d^4*e^3*(b*c^3+a)^2*b*c^2)*x^5+1/4*(c^3*
e^3*((b*c^3+a)*(2*(b*c^3+a)*b*d^3+18*b^2*c^3*d^3)+3*b*c^2*d*(6*(b
*c^3+a)*b*c*d^2+9*b^2*c^4*d^2)+18*b^2*c^3*d^3*(b*c^3+a)+b*d^3*(b*
c^3+a)^2)+3*c^2*e^3*d*((b*c^3+a)*(6*(b*c^3+a)*b*c*d^2+9*b^2*c^4*d
^2)+18*b^2*c^4*d^2*(b*c^3+a)+3*b*c*d^2*(b*c^3+a)^2)+27*c^3*e^3*d^
3*(b*c^3+a)^2*b+d^3*e^3*(b*c^3+a)^3)*x^4+1/3*(c^3*e^3*((b*c^3+a)*
(6*(b*c^3+a)*b*c*d^2+9*b^2*c^4*d^2)+18*b^2*c^4*d^2*(b*c^3+a)+3*b*
c*d^2*(b*c^3+a)^2)+27*c^4*e^3*d^2*(b*c^3+a)^2*b+3*c*e^3*d^2*(b*c^
3+a)^3)*x^3+1/2*(9*c^5*e^3*(b*c^3+a)^2*b*d+3*c^2*e^3*d*(b*c^3+a)^
3)*x^2+c^3*e^3*(b*c^3+a)^3*x
```

Maxima [A] time = 1.38221, size = 537, normalized size = 6.47

$$\frac{1}{13} b^3 d^{12} e^3 x^{13} + b^3 c d^{11} e^3 x^{12} + 6 b^3 c^2 d^{10} e^3 x^{11} + \frac{1}{10} \left(220 b^3 c^3 + 3 a b^2\right) d^9 e^3 x^{10} + \left(55 b^3 c^4 + 3 a b^2 c\right) d^8 e^3 x^9 + \frac{9}{2} \left(22 b^3 c^5 + 3 a b^2 c^2\right) d^7 e^3 x^8 + \frac{3}{7} \left(308 b^3 c^6 + 84 a b^2 c^3 + a^2 b\right) d^6 e^3 x^7 + 3 \left(44 b^3 c^7 + 21 a b^2 c^4 + a^2 b c\right) d^5 e^3 x^6 + \frac{9}{5} \left(55 b^3 c^8 + 42 a b^2 c^5 + 5 a^2 b c^2\right) d^4 e^3 x^5 + \frac{1}{4} \left(220 b^3 c^9 + 252 a b^2 c^6 + 60 a^2 b c^3 + a^3\right) d^3 e^3 x^4 + \left(22 b^3 c^{10} + 36 a b^2 c^7 + 15 a^2 b c^4 + a^3 c\right) d^2 e^3 x^3 + \frac{3}{2} \left(4 b^3 c^{11} + 9 a b^2 c^8 + 6 a^2 b c^5 + a^3 c^2\right) d e^3 x^2 + \left(b^3 c^{12} + 3 a b^2 c^9 + 3 a^2 b c^6 + a^3 c^3\right) e^3 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((d*x + c)^3*b + a)^3*(d*e*x + c*e)^3,x, algorithm="maxima")
```

```
[Out] 1/13*b^3*d^12*e^3*x^13 + b^3*c*d^11*e^3*x^12 + 6*b^3*c^2*d^10*e^3
*x^11 + 1/10*(220*b^3*c^3 + 3*a*b^2)*d^9*e^3*x^10 + (55*b^3*c^4 +
 3*a*b^2*c)*d^8*e^3*x^9 + 9/2*(22*b^3*c^5 + 3*a*b^2*c^2)*d^7*e^3*
x^8 + 3/7*(308*b^3*c^6 + 84*a*b^2*c^3 + a^2*b)*d^6*e^3*x^7 + 3*(4
4*b^3*c^7 + 21*a*b^2*c^4 + a^2*b*c)*d^5*e^3*x^6 + 9/5*(55*b^3*c^8
 + 42*a*b^2*c^5 + 5*a^2*b*c^2)*d^4*e^3*x^5 + 1/4*(220*b^3*c^9 + 2
52*a*b^2*c^6 + 60*a^2*b*c^3 + a^3)*d^3*e^3*x^4 + (22*b^3*c^10 + 3
6*a*b^2*c^7 + 15*a^2*b*c^4 + a^3*c)*d^2*e^3*x^3 + 3/2*(4*b^3*c^11
 + 9*a*b^2*c^8 + 6*a^2*b*c^5 + a^3*c^2)*d*e^3*x^2 + (b^3*c^12 + 3
*a*b^2*c^9 + 3*a^2*b*c^6 + a^3*c^3)*e^3*x
```

Fricas [A] time = 0.187546, size = 1, normalized size = 0.01

$$\frac{1}{13} x^{13} e^3 d^{12} b^3 + x^{12} e^3 d^{11} c b^3 + 6 x^{11} e^3 d^{10} c^2 b^3 + 22 x^{10} e^3 d^9 c^3 b^3 + 55 x^9 e^3 d^8 c^4 b^3 + 99 x^8 e^3 d^7 c^5 b^3 + 132 x^7 e^3 d^6 c^6 b^3 + \frac{3}{10} x^{10} e^3 d^9 b^2 a + 132 x^6 e^3 d^5 c^7 b^3 + 3 x^9 e^3 d^8 c b^2 a + 99 x^5 e^3 d^4 c^8 b^3 + \frac{27}{2} x^8 e^3 d^7 c^2 b^2 a + 55 x^4 e^3 d^3 c^9 b^3 + 36 x^7 e^3 d^6 c^3 b^2 a + 22 x^3 e^3 d^2 c^{10} b^3 + 63 x^6 e^3 d^5 c^4 b^2 a + 6 x^2 e^3 d c^{11} b^3 + \frac{378}{5} x^5 e^3 d^4 c^5 b^2 a + x e^3 c^{12} b^3 + 63 x^4 e^3 d^3 c^6 b^2 a + \frac{3}{7} x^7 e^3 d^6 b a^2 + 36 x^3 e^3 d^2 c^7 b^2 a + 3 x^6 e^3 d^5 c b a^2 + \frac{27}{2} x^2 e^3 d c^8 b^2 a + 9 x^5 e^3 d^4 c^2 b a^2 + 3 x e^3 c^9 b^2 a + 15 x^4 e^3 d^3 c^3 b a^2 + 15 x^3 e^3 d^2 c^4 b a^2 + 9 x^2 e^3 d c^5 b a^2 + 3 x e^3 c^6 b a^2 + \frac{1}{4} x^4 e^3 d^3 a^3 + x^3 e^3 d^2 c a^3 + \frac{3}{2} x^2 e^3 d c^2 a^3 + x e^3 c^3 a^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((d*x + c)^3*b + a)^3*(d*e*x + c*e)^3,x, algorithm="fricas")
```

```
[Out] 1/13*x^13*e^3*d^12*b^3 + x^12*e^3*d^11*c*b^3 + 6*x^11*e^3*d^10*c^
2*b^3 + 22*x^10*e^3*d^9*c^3*b^3 + 55*x^9*e^3*d^8*c^4*b^3 + 99*x^8
*e^3*d^7*c^5*b^3 + 132*x^7*e^3*d^6*c^6*b^3 + 3/10*x^10*e^3*d^9*b^
2*a + 132*x^6*e^3*d^5*c^7*b^3 + 3*x^9*e^3*d^8*c*b^2*a + 99*x^5*e^
3*d^4*c^8*b^3 + 27/2*x^8*e^3*d^7*c^2*b^2*a + 55*x^4*e^3*d^3*c^9*b
^3 + 36*x^7*e^3*d^6*c^3*b^2*a + 22*x^3*e^3*d^2*c^10*b^3 + 63*x^6*
e^3*d^5*c^4*b^2*a + 6*x^2*e^3*d*c^11*b^3 + 378/5*x^5*e^3*d^4*c^5*
b^2*a + x*e^3*c^12*b^3 + 63*x^4*e^3*d^3*c^6*b^2*a + 3/7*x^7*e^3*d
^6*b*a^2 + 36*x^3*e^3*d^2*c^7*b^2*a + 3*x^6*e^3*d^5*c*b*a^2 + 27/
2*x^2*e^3*d*c^8*b^2*a + 9*x^5*e^3*d^4*c^2*b*a^2 + 3*x*e^3*c^9*b^2
*a + 15*x^4*e^3*d^3*c^3*b*a^2 + 15*x^3*e^3*d^2*c^4*b*a^2 + 9*x^2*
e^3*d*c^5*b*a^2 + 3*x*e^3*c^6*b*a^2 + 1/4*x^4*e^3*d^3*a^3 + x^3*e
^3*d^2*c*a^3 + 3/2*x^2*e^3*d*c^2*a^3 + x*e^3*c^3*a^3
```

Sympy [A] time = 0.456011, size = 552, normalized size = 6.65

$$6b^3c^2d^{10}e^3x^{11} + b^3cd^{11}e^3x^{12} + \frac{b^3d^{12}e^3x^{13}}{13} + x^{10}\left(\frac{3ab^2d^9e^3}{10} + 22b^3c^3d^9e^3\right) + x^9\left(3ab^2cd^8e^3 + 55b^3c^4d^8e^3\right) + x^8\left(\frac{27ab^2c^2d^7e^3}{2} + 99b^3c^5d^7e^3\right) + x^7\left(\frac{3a^2bd^6e^3}{7} + 36ab^2c^3d^6e^3 + 132b^3c^6d^6e^3\right) + x^6\left(3a^2bcd^5e^3 + 63ab^2c^4d^5e^3 + 132b^3c^7d^5e^3\right) + x^5\left(9a^2bc^2d^4e^3 + \frac{378ab^2c^5d^4e^3}{5} + 99b^3c^8d^4e^3\right) + x^4\left(\frac{a^3d^3e^3}{4} + 15a^2bc^3d^3e^3 + 63ab^2c^6d^3e^3 + 55b^3c^9d^3e^3\right) + x^3\left(a^3cd^2e^3 + 15a^2bc^4d^2e^3 + 36ab^2c^7d^2e^3 + 22b^3c^{10}d^2e^3\right) + x^2\left(\frac{3a^3c^2de^3}{2} + 9a^2bc^5de^3 + \frac{27ab^2c^8de^3}{2} + 6b^3c^{11}de^3\right) + x\left(a^3c^3e^3 + 3a^2bc^6e^3 + 3ab^2c^9e^3 + b^3c^{12}e^3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x+c*e)**3*(a+b*(d*x+c)**3)**3,x)
```

```
[Out] 6*b**3*c**2*d**10*e**3*x**11 + b**3*c*d**11*e**3*x**12 + b**3*d**
12*e**3*x**13/13 + x**10*(3*a*b**2*d**9*e**3/10 + 22*b**3*c**3*d*
*9*e**3) + x**9*(3*a*b**2*c*d**8*e**3 + 55*b**3*c**4*d**8*e**3) +
 x**8*(27*a*b**2*c**2*d**7*e**3/2 + 99*b**3*c**5*d**7*e**3) + x**
7*(3*a**2*b*d**6*e**3/7 + 36*a*b**2*c**3*d**6*e**3 + 132*b**3*c**
6*d**6*e**3) + x**6*(3*a**2*b*c*d**5*e**3 + 63*a*b**2*c**4*d**5*e
**3 + 132*b**3*c**7*d**5*e**3) + x**5*(9*a**2*b*c**2*d**4*e**3 +
378*a*b**2*c**5*d**4*e**3/5 + 99*b**3*c**8*d**4*e**3) + x**4*(a**
3*d**3*e**3/4 + 15*a**2*b*c**3*d**3*e**3 + 63*a*b**2*c**6*d**3*e*
*3 + 55*b**3*c**9*d**3*e**3) + x**3*(a**3*c*d**2*e**3 + 15*a**2*b
*c**4*d**2*e**3 + 36*a*b**2*c**7*d**2*e**3 + 22*b**3*c**10*d**2*e
**3) + x**2*(3*a**3*c**2*d*e**3/2 + 9*a**2*b*c**5*d*e**3 + 27*a*b
**2*c**8*d*e**3/2 + 6*b**3*c**11*d*e**3) + x*(a**3*c**3*e**3 + 3*
a**2*b*c**6*e**3 + 3*a*b**2*c**9*e**3 + b**3*c**12*e**3)
```

GIAC/XCAS [A] time = 0.218123, size = 689, normalized size = 8.3

$$\frac{1}{13}b^3d^{12}x^{13}e^3 + b^3cd^{11}x^{12}e^3 + 6\,b^3c^2d^{10}x^{11}e^3 + 22\,b^3c^3d^9x^{10}e^3 + 55\,b^3c^4d^8x^9e^3 + 99\,b^3c^5d^7x^8e^3 + 132\,b^3c^6d^6x^7e^3 + \frac{3}{10}ab^2d^9x^{10}e^3 + 132\,b^3c^7d^5x^6e^3 + 3\,ab^2cd^8x^9e^3 + 99\,b^3c^8d^4x^5e^3 + \frac{27}{2}ab^2c^2d^7x^8e^3 + 55\,b^3c^9d^3x^4e^3 + 36\,ab^2c^3d^6x^7e^3 + 22\,b^3c^{10}d^2x^3e^3 + 63\,ab^2c^4d^5x^6e^3 + 6\,b^3c^{11}dx^2e^3 + \frac{378}{5}ab^2c^5d^4x^5e^3 + b^3c^{12}xe^3 + 63\,ab^2c^6d^3x^4e^3 + \frac{3}{7}a^2bd^6x^7e^3 + 36\,ab^2c^7d^2x^3e^3 + 3\,a^2bcd^5x^6e^3 + \frac{27}{2}ab^2c^8dx^2e^3 + 9\,a^2bc^2d^4x^5e^3 + 3\,ab^2c^9xe^3 + 15\,a^2bc^3d^3x^4e^3 + 15\,a^2bc^4d^2x^3e^3 + 9\,a^2bc^5dx^2e^3 + 3\,a^2bc^6xe^3 + \frac{1}{4}a^3d^3x^4e^3 + a^3cd^2x^3e^3 + \frac{3}{2}a^3c^2dx^2e^3 + a^3c^3xe^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^3*b + a)^3*(d*e*x + c*e)^3,x, algorithm="giac")
```

```
[Out] 1/13*b^3*d^12*x^13*e^3 + b^3*c*d^11*x^12*e^3 + 6*b^3*c^2*d^10*x^1
1*e^3 + 22*b^3*c^3*d^9*x^10*e^3 + 55*b^3*c^4*d^8*x^9*e^3 + 99*b^3
*c^5*d^7*x^8*e^3 + 132*b^3*c^6*d^6*x^7*e^3 + 3/10*a*b^2*d^9*x^10*
e^3 + 132*b^3*c^7*d^5*x^6*e^3 + 3*a*b^2*c*d^8*x^9*e^3 + 99*b^3*c^
8*d^4*x^5*e^3 + 27/2*a*b^2*c^2*d^7*x^8*e^3 + 55*b^3*c^9*d^3*x^4*e
^3 + 36*a*b^2*c^3*d^6*x^7*e^3 + 22*b^3*c^10*d^2*x^3*e^3 + 63*a*b^
2*c^4*d^5*x^6*e^3 + 6*b^3*c^11*d*x^2*e^3 + 378/5*a*b^2*c^5*d^4*x^
5*e^3 + b^3*c^12*x*e^3 + 63*a*b^2*c^6*d^3*x^4*e^3 + 3/7*a^2*b*d^6
*x^7*e^3 + 36*a*b^2*c^7*d^2*x^3*e^3 + 3*a^2*b*c*d^5*x^6*e^3 + 27/
2*a*b^2*c^8*d*x^2*e^3 + 9*a^2*b*c^2*d^4*x^5*e^3 + 3*a*b^2*c^9*x*e
```

```
^3 + 15*a^2*b*c^3*d^3*x^4*e^3 + 15*a^2*b*c^4*d^2*x^3*e^3 + 9*a^2*
b*c^5*d*x^2*e^3 + 3*a^2*b*c^6*x*e^3 + 1/4*a^3*d^3*x^4*e^3 + a^3*c
*d^2*x^3*e^3 + 3/2*a^3*c^2*d*x^2*e^3 + a^3*c^3*x*e^3
```

3.2852 $\int \frac{(c+dx)^4}{a+b(c+dx)^3}\,dx$

Optimal. Leaf size=156

$$\frac{a^{2/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{3b^{5/3}d}-\frac{a^{2/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{6b^{5/3}d}+\frac{a^{2/3}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}b^{5/3}d}+\frac{(c+dx)^2}{2bd}$$

```
[Out] (c + d*x)^2/(2*b*d) + (a^(2/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d
*x))/(Sqrt[3]*a^(1/3))])/(Sqrt[3]*b^(5/3)*d) + (a^(2/3)*Log[a^(1/
3) + b^(1/3)*(c + d*x)])/(3*b^(5/3)*d) - (a^(2/3)*Log[a^(2/3) - a
^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/(6*b^(5/3)*d)
```

Rubi [A] time = 0.369284, antiderivative size = 156, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381

$$\frac{a^{2/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{3b^{5/3}d}-\frac{a^{2/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{6b^{5/3}d}+\frac{a^{2/3}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}b^{5/3}d}+\frac{(c+dx)^2}{2bd}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)^4/(a + b*(c + d*x)^3),x]
```

```
[Out] (c + d*x)^2/(2*b*d) + (a^(2/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d
*x))/(Sqrt[3]*a^(1/3))])/(Sqrt[3]*b^(5/3)*d) + (a^(2/3)*Log[a^(1/
3) + b^(1/3)*(c + d*x)])/(3*b^(5/3)*d) - (a^(2/3)*Log[a^(2/3) - a
^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/(6*b^(5/3)*d)
```

Rubi in Sympy [A] time = 38.3999, size = 146, normalized size = 0.94

$$\frac{a^{\frac{2}{3}}\log\left(\sqrt[3]{a}+\sqrt[3]{b}\,(c+dx)\right)}{3b^{\frac{5}{3}}d}-\frac{a^{\frac{2}{3}}\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}\,(-c-dx)+b^{\frac{2}{3}}\,(c+dx)^2\right)}{6b^{\frac{5}{3}}d}+\frac{\sqrt{3}a^{\frac{2}{3}}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{3b^{\frac{5}{3}}d}+\frac{(c+dx)^2}{2bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**4/(a+b*(d*x+c)**3),x)
```

```
[Out] a**(2/3)*log(a**(1/3) + b**(1/3)*(c + d*x))/(3*b**(5/3)*d) - a**(
2/3)*log(a**(2/3) + a**(1/3)*b**(1/3)*(-c - d*x) + b**(2/3)*(c +
d*x)**2)/(6*b**(5/3)*d) + sqrt(3)*a**(2/3)*atan(sqrt(3)*(a**(1/3)
/3 + b**(1/3)*(-2*c/3 - 2*d*x/3))/a**(1/3))/(3*b**(5/3)*d) + (c +
 d*x)**2/(2*b*d)
```

Mathematica [A] time = 0.0817617, size = 159, normalized size = 1.02

$$\frac{a^{2/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{3b^{5/3}d}-\frac{a^{2/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{6b^{5/3}d}-\frac{a^{2/3}\tan^{-1}\left(\frac{2\sqrt[3]{b}(c+dx)-\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}b^{5/3}d}+\frac{(c+dx)^2}{2bd}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c + d*x)^4/(a + b*(c + d*x)^3),x]
```

```
[Out] (c + d*x)^2/(2*b*d) - (a^(2/3)*ArcTan[(-a^(1/3) + 2*b^(1/3)*(c +
d*x))/(Sqrt[3]*a^(1/3))])/(Sqrt[3]*b^(5/3)*d) + (a^(2/3)*Log[a^(1
/3) + b^(1/3)*(c + d*x)])/(3*b^(5/3)*d) - (a^(2/3)*Log[a^(2/3) -
a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/(6*b^(5/3)*d)
```

Maple [C] time = 0.009, size = 93, normalized size = 0.6

$$\frac{dx^2}{2b}+\frac{cx}{b}-\frac{a}{3b^2d}\sum_{\_R=RootOf\left(bd^3\_Z^3+3bcd^2\_Z^2+3bc^2d\_Z+bc^3+a\right)}\frac{(\_Rd+c)\ln(x-\_R)}{d^2\_R^2+2cd\_R+c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^4/(a+b*(d*x+c)^3),x)
```

```
[Out] 1/2/b*d*x^2+1/b*c*x-1/3*a/b^2/d*sum((_R*d+c)/(_R^2*d^2+2*_R*c*d+c
^2)*ln(x-_R),_R=RootOf(_Z^3*b*d^3+3*_Z^2*b*c*d^2+3*_Z*b*c^2*d+b*c
^3+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a\int\frac{dx+c}{bd^3x^3+3bcd^2x^2+3bc^2dx+bc^3+a}\,dx}{b}+\frac{dx^2+2cx}{2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^4/((d*x + c)^3*b + a),x, algorithm="maxima")
```

```
[Out] -a*integrate((d*x + c)/(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x +
 b*c^3 + a), x)/b + 1/2*(d*x^2 + 2*c*x)/b
```

Fricas [A] time = 0.217276, size = 246, normalized size = 1.58

$$-\frac{\sqrt{3}\left(\sqrt{3}\left(\frac{a^2}{b^2}\right)^{\frac{1}{3}}\log\left(ad^2x^2+2acdx+ac^2-(bdx+bc)\left(\frac{a^2}{b^2}\right)^{\frac{2}{3}}+a\left(\frac{a^2}{b^2}\right)^{\frac{1}{3}}\right)-2\sqrt{3}\left(\frac{a^2}{b^2}\right)^{\frac{1}{3}}\log\left(adx+ac+b\left(\frac{a^2}{b^2}\right)^{\frac{2}{3}}\right)-3\sqrt{3}(c\right.}{18bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^4/((d*x + c)^3*b + a),x, algorithm="fricas")
```

```
[Out] -1/18*sqrt(3)*(sqrt(3)*(a^2/b^2)^(1/3)*log(a*d^2*x^2 + 2*a*c*d*x
+ a*c^2 - (b*d*x + b*c)*(a^2/b^2)^(2/3) + a*(a^2/b^2)^(1/3)) - 2*
```

```
sqrt(3)*(a^2/b^2)^(1/3)*log(a*d*x + a*c + b*(a^2/b^2)^(2/3)) - 3*
sqrt(3)*(d^2*x^2 + 2*c*d*x) - 6*(a^2/b^2)^(1/3)*arctan(1/3*(sqrt(
3)*b*(a^2/b^2)^(2/3) - 2*sqrt(3)*(a*d*x + a*c))/(b*(a^2/b^2)^(2/3
))))/(b*d)
```

Sympy [A] time = 1.96544, size = 46, normalized size = 0.29

$$\frac{\operatorname{RootSum}\left(27t^3b^5 - a^2, \left(t \mapsto t\log\left(x + \frac{9t^2b^3+ac}{ad}\right)\right)\right)}{d} + \frac{cx}{b} + \frac{dx^2}{2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**4/(a+b*(d*x+c)**3),x)
```

```
[Out] RootSum(27*_t**3*b**5 - a**2, Lambda(_t, _t*log(x + (9*_t**2*b**3
 + a*c)/(a*d))))/d + c*x/b + d*x**2/(2*b)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx+c)^4}{(dx+c)^3b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^4/((d*x + c)^3*b + a),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^4/((d*x + c)^3*b + a), x)
```

3.2853 $\int \frac{(c+dx)^3}{a+b(c+dx)^3} \, dx$

Optimal. Leaf size=144

$$\frac{\sqrt[3]{a}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{6b^{4/3}d}-\frac{\sqrt[3]{a}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{3b^{4/3}d}+\frac{\sqrt[3]{a}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}b^{4/3}d}+\frac{x}{b}$$

```
[Out] x/b + (a^(1/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^
(1/3))])/(Sqrt[3]*b^(4/3)*d) - (a^(1/3)*Log[a^(1/3) + b^(1/3)*(c
+ d*x)])/(3*b^(4/3)*d) + (a^(1/3)*Log[a^(2/3) - a^(1/3)*b^(1/3)*(
c + d*x) + b^(2/3)*(c + d*x)^2])/(6*b^(4/3)*d)
```

Rubi [A] time = 0.311739, antiderivative size = 144, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381

$$\frac{\sqrt[3]{a}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{6b^{4/3}d}-\frac{\sqrt[3]{a}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{3b^{4/3}d}+\frac{\sqrt[3]{a}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}b^{4/3}d}+\frac{x}{b}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)^3/(a + b*(c + d*x)^3),x]
```

```
[Out] x/b + (a^(1/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^
(1/3))])/(Sqrt[3]*b^(4/3)*d) - (a^(1/3)*Log[a^(1/3) + b^(1/3)*(c
+ d*x)])/(3*b^(4/3)*d) + (a^(1/3)*Log[a^(2/3) - a^(1/3)*b^(1/3)*(
c + d*x) + b^(2/3)*(c + d*x)^2])/(6*b^(4/3)*d)
```

Rubi in Sympy [A] time = 39.3598, size = 143, normalized size = 0.99

$$-\frac{\sqrt[3]{a}\log\left(\sqrt[3]{a}+\sqrt[3]{b}\,(c+dx)\right)}{3b^{\frac{4}{3}}d}+\frac{\sqrt[3]{a}\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}\,(-c-dx)+b^{\frac{2}{3}}\,(c+dx)^2\right)}{6b^{\frac{4}{3}}d}+\frac{\sqrt{3}\sqrt[3]{a}\,\text{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{3b^{\frac{4}{3}}d}+\frac{c+dx}{bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**3/(a+b*(d*x+c)**3),x)
```

```
[Out] -a**(1/3)*log(a**(1/3) + b**(1/3)*(c + d*x))/(3*b**(4/3)*d) + a**
(1/3)*log(a**(2/3) + a**(1/3)*b**(1/3)*(-c - d*x) + b**(2/3)*(c +
 d*x)**2)/(6*b**(4/3)*d) + sqrt(3)*a**(1/3)*atan(sqrt(3)*(a**(1/3
)/3 + b**(1/3)*(-2*c/3 - 2*d*x/3))/a**(1/3))/(3*b**(4/3)*d) + (c
+ d*x)/(b*d)
```

Mathematica [A] time = 0.0318521, size = 142, normalized size = 0.99

$$\frac{\sqrt[3]{a}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)-2\sqrt[3]{a}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)-2\sqrt{3}\sqrt[3]{a}\tan^{-1}\left(\frac{2\sqrt[3]{b}(c+dx)-\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)+6\sqrt[3]{b}c+6\sqrt[3]{b}}{6b^{4/3}d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c + d*x)^3/(a + b*(c + d*x)^3),x]
```

```
[Out] (6*b^(1/3)*c + 6*b^(1/3)*d*x - 2*Sqrt[3]*a^(1/3)*ArcTan[(-a^(1/3)
 + 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))] - 2*a^(1/3)*Log[a^(1/3
) + b^(1/3)*(c + d*x)] + a^(1/3)*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c
 + d*x) + b^(2/3)*(c + d*x)^2])/(6*b^(4/3)*d)
```

Maple [C] time = 0.006, size = 78, normalized size = 0.5

$$\frac{x}{b}-\frac{a}{3\,b^2d}\sum_{\_R=RootOf(\_Z^3bd^3+3\_Z^2bcd^2+3\_Z\,bc^2d+bc^3+a)}\frac{\ln(x-\_R)}{d^2\_R^2+2\,cd\_R+c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^3/(a+b*(d*x+c)^3),x)
```

```
[Out] x/b-1/3*a/b^2/d*sum(1/(_R^2*d^2+2*_R*c*d+c^2)*ln(x-_R),_R=RootOf(
_Z^3*b*d^3+3*_Z^2*b*c*d^2+3*_Z*b*c^2*d+b*c^3+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a\int\frac{1}{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}\,dx}{b}+\frac{x}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^3/((d*x + c)^3*b + a),x, algorithm="maxima")
```

```
[Out] -a*integrate(1/(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 +
 a), x)/b + x/b
```

Fricas [A] time = 0.217663, size = 194, normalized size = 1.35

$$\frac{\sqrt{3}\left(6\sqrt{3}dx-\sqrt{3}\left(-\frac{a}{b}\right)^{\frac{1}{3}}\log\left(d^2x^2+2\,cdx+c^2+(dx+c)\left(-\frac{a}{b}\right)^{\frac{1}{3}}+\left(-\frac{a}{b}\right)^{\frac{2}{3}}\right)+2\sqrt{3}\left(-\frac{a}{b}\right)^{\frac{1}{3}}\log\left(dx+c-\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right)-6\left(-\frac{a}{b}\right)\right.}{18\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^3/((d*x + c)^3*b + a),x, algorithm="fricas")
```

```
[Out] 1/18*sqrt(3)*(6*sqrt(3)*d*x - sqrt(3)*(-a/b)^(1/3)*log(d^2*x^2 +
2*c*d*x + c^2 + (d*x + c)*(-a/b)^(1/3) + (-a/b)^(2/3)) + 2*sqrt(3
)*(-a/b)^(1/3)*log(d*x + c - (-a/b)^(1/3)) - 6*(-a/b)^(1/3)*arcta
n(1/3*(2*sqrt(3)*(d*x + c) + sqrt(3)*(-a/b)^(1/3))/(-a/b)^(1/3)))
/(b*d)
```

Sympy [A] time = 1.71618, size = 27, normalized size = 0.19

$$\frac{\operatorname{RootSum}\left(27t^3b^4 + a, \left(t \mapsto t\log\left(x + \frac{-3tb+c}{d}\right)\right)\right)}{d} + \frac{x}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**3/(a+b*(d*x+c)**3),x)
```

```
[Out] RootSum(27*_t**3*b**4 + a, Lambda(_t, _t*log(x + (-3*_t*b + c)/d)
))/d + x/b
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx+c)^3}{(dx+c)^3b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^3/((d*x + c)^3*b + a),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^3/((d*x + c)^3*b + a), x)
```

3.2854 $\int \frac{(c+dx)^2}{a+b(c+dx)^3} dx$

Optimal. Leaf size=22

$$\frac{\log\left(a+b(c+dx)^3\right)}{3bd}$$

```
[Out] Log[a + b*(c + d*x)^3]/(3*b*d)
```

Rubi [A] time = 0.0162174, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048

$$\frac{\log\left(a+b(c+dx)^3\right)}{3bd}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)^2/(a + b*(c + d*x)^3),x]

[Out] Log[a + b*(c + d*x)^3]/(3*b*d)
```

Rubi in Sympy [A] time = 3.89799, size = 15, normalized size = 0.68

$$\frac{\log\left(a+b\left(c+dx\right)^3\right)}{3bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**2/(a+b*(d*x+c)**3),x)

[Out] log(a + b*(c + d*x)**3)/(3*b*d)
```

Mathematica [A] time = 0.0117895, size = 22, normalized size = 1.

$$\frac{\log\left(a+b(c+dx)^3\right)}{3bd}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c + d*x)^2/(a + b*(c + d*x)^3),x]

[Out] Log[a + b*(c + d*x)^3]/(3*b*d)
```

Maple [B] time = 0.003, size = 43, normalized size = 2.

$$\frac{\ln\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)}{3\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^2/(a+b*(d*x+c)^3),x)

[Out] 1/3/b/d*ln(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)
```

Maxima [A] time = 1.40982, size = 27, normalized size = 1.23

$$\frac{\log \left((dx+c)^3 b+a\right)}{3\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^2/((d*x + c)^3*b + a),x, algorithm="maxima")
```

```
[Out] 1/3*log((d*x + c)^3*b + a)/(b*d)
```

Fricas [A] time = 0.206996, size = 57, normalized size = 2.59

$$\frac{\log \left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)}{3\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^2/((d*x + c)^3*b + a),x, algorithm="fricas")
```

```
[Out] 1/3*log(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)/(b*d
)
```

Sympy [A] time = 1.59537, size = 42, normalized size = 1.91

$$\frac{\log \left(a+bc^3+3bc^2dx+3bcd^2x^2+bd^3x^3\right)}{3bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**2/(a+b*(d*x+c)**3),x)
```

```
[Out] log(a + b*c**3 + 3*b*c**2*d*x + 3*b*c*d**2*x**2 + b*d**3*x**3)/(3
*b*d)
```

GIAC/XCAS [A] time = 0.219181, size = 28, normalized size = 1.27

$$\frac{\ln \left(\left|(dx+c)^3 b+a\right|\right)}{3\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^2/((d*x + c)^3*b + a),x, algorithm="giac")
```

```
[Out] 1/3*ln(abs((d*x + c)^3*b + a))/(b*d)
```

3.2855 $\int \frac{c+dx}{a+b(c+dx)^3} \, dx$

Optimal. Leaf size=140

$$\frac{\log \left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{6\sqrt[3]{a}b^{2/3}d}-\frac{\log \left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{3\sqrt[3]{a}b^{2/3}d}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}\sqrt[3]{a}b^{2/3}d}$$

```
[Out] -(ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))]/(Sqrt
[3]*a^(1/3)*b^(2/3)*d)) - Log[a^(1/3) + b^(1/3)*(c + d*x)]/(3*a^(
1/3)*b^(2/3)*d) + Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/
3)*(c + d*x)^2]/(6*a^(1/3)*b^(2/3)*d)
```

Rubi [A] time = 0.263957, antiderivative size = 140, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.368

$$\frac{\log \left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{6\sqrt[3]{a}b^{2/3}d}-\frac{\log \left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{3\sqrt[3]{a}b^{2/3}d}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}\sqrt[3]{a}b^{2/3}d}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)/(a + b*(c + d*x)^3),x]
```

```
[Out] -(ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))]/(Sqrt
[3]*a^(1/3)*b^(2/3)*d)) - Log[a^(1/3) + b^(1/3)*(c + d*x)]/(3*a^(
1/3)*b^(2/3)*d) + Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/
3)*(c + d*x)^2]/(6*a^(1/3)*b^(2/3)*d)
```

Rubi in Sympy [A] time = 31.8789, size = 134, normalized size = 0.96

$$-\frac{\log \left(\sqrt[3]{a}+\sqrt[3]{b}\left(c+dx\right)\right)}{3\sqrt[3]{a}b^{\frac{2}{3}}d}+\frac{\log \left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}\left(-c-dx\right)+b^{\frac{2}{3}}\left(c+dx\right)^2\right)}{6\sqrt[3]{a}b^{\frac{2}{3}}d}-\frac{\sqrt{3}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{3\sqrt[3]{a}b^{\frac{2}{3}}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)/(a+b*(d*x+c)**3),x)
```

```
[Out] -log(a**(1/3) + b**(1/3)*(c + d*x))/(3*a**(1/3)*b**(2/3)*d) + log
(a**(2/3) + a**(1/3)*b**(1/3)*(-c - d*x) + b**(2/3)*(c + d*x)**2)
/(6*a**(1/3)*b**(2/3)*d) - sqrt(3)*atan(sqrt(3)*(a**(1/3)/3 + b**
(1/3)*(-2*c/3 - 2*d*x/3))/a**(1/3))/(3*a**(1/3)*b**(2/3)*d)
```

Mathematica [A] time = 0.0235431, size = 114, normalized size = 0.81

$$\frac{\log \left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)-2\log \left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)+2\sqrt{3}\tan^{-1}\left(\frac{2\sqrt[3]{b}(c+dx)-\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{6\sqrt[3]{a}b^{2/3}d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c + d*x)/(a + b*(c + d*x)^3),x]
```

```
[Out] (2*Sqrt[3]*ArcTan[(-a^(1/3) + 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/
3))] - 2*Log[a^(1/3) + b^(1/3)*(c + d*x)] + Log[a^(2/3) - a^(1/3)
*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/(6*a^(1/3)*b^(2/3)*d)
```

Maple [C] time = 0.002, size = 76, normalized size = 0.5

$$\frac{1}{3\,bd} \sum_{\_R=RootOf\left(\_Z^3bd^3+3\_Z^2bcd^2+3\_Z\,bc^2d+bc^3+a\right)} \frac{\left(\_R\,d+c\right)\ln\left(x-\_R\right)}{d^2\_R^2+2\,cd\_R+c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*x+c)/(a+b*(d*x+c)^3),x)
```

```
[Out] 1/3/b/d*sum((_R*d+c)/(_R^2*d^2+2*_R*c*d+c^2)*ln(x-_R),_R=RootOf(_
Z^3*b*d^3+3*_Z^2*b*c*d^2+3*_Z*b*c^2*d+b*c^3+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{dx+c}{(dx+c)^3b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x + c)/((d*x + c)^3*b + a),x, algorithm="maxima")
```

```
[Out] integrate((d*x + c)/((d*x + c)^3*b + a), x)
```

Fricas [A] time = 0.215159, size = 177, normalized size = 1.26

$$\frac{\sqrt{3}\left(2\sqrt{3}\log\left(ab+\left(-ab^2\right)^{\frac{2}{3}}(dx+c)\right)-\sqrt{3}\log\left(-ab+\left(-ab^2\right)^{\frac{2}{3}}(dx+c)+\left(bd^2x^2+2\,bcdx+bc^2\right)\left(-ab^2\right)^{\frac{1}{3}}\right)-6\,\arctan\left(-\right.\right.}{18\left(-ab^2\right)^{\frac{1}{3}}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x + c)/((d*x + c)^3*b + a),x, algorithm="fricas")
```

```
[Out] 1/18*sqrt(3)*(2*sqrt(3)*log(a*b + (-a*b^2)^(2/3)*(d*x + c)) - sqr
t(3)*log(-a*b + (-a*b^2)^(2/3)*(d*x + c) + (b*d^2*x^2 + 2*b*c*d*x
 + b*c^2)*(-a*b^2)^(1/3)) - 6*arctan(-1/3*(sqrt(3)*a*b - 2*sqrt(3
)*(-a*b^2)^(2/3)*(d*x + c))/(a*b)))/((-a*b^2)^(1/3)*d)
```

Sympy [A] time = 0.719889, size = 29, normalized size = 0.21

$$\frac{\operatorname{RootSum}\left(27t^3ab^2+1,\left(t\mapsto t\log\left(x+\frac{9t^2ab+c}{d}\right)\right)\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)/(a+b*(d*x+c)**3),x)
```

```
[Out] RootSum(27*_t**3*a*b**2 + 1, Lambda(_t, _t*log(x + (9*_t**2*a*b +
 c)/d)))/d
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{dx + c}{(dx + c)^3 b + a} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)/((d*x + c)^3*b + a),x, algorithm="giac")
```

```
[Out] integrate((d*x + c)/((d*x + c)^3*b + a), x)
```

3.2856 $\int \frac{1}{a+b(c+dx)^3}\,dx$

Optimal. Leaf size=140

$$-\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{6a^{2/3}\sqrt[3]{b}d}+\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{3a^{2/3}\sqrt[3]{b}d}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}a^{2/3}\sqrt[3]{b}d}$$

```
[Out] -(ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))]/(Sqrt
[3]*a^(2/3)*b^(1/3)*d)) + Log[a^(1/3) + b^(1/3)*(c + d*x)]/(3*a^(
2/3)*b^(1/3)*d) - Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/
3)*(c + d*x)^2]/(6*a^(2/3)*b^(1/3)*d)
```

Rubi [A] time = 0.249906, antiderivative size = 140, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.538$

$$-\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{6a^{2/3}\sqrt[3]{b}d}+\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{3a^{2/3}\sqrt[3]{b}d}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}a^{2/3}\sqrt[3]{b}d}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(c + d*x)^3)^(-1),x]
```

```
[Out] -(ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))]/(Sqrt
[3]*a^(2/3)*b^(1/3)*d)) + Log[a^(1/3) + b^(1/3)*(c + d*x)]/(3*a^(
2/3)*b^(1/3)*d) - Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/
3)*(c + d*x)^2]/(6*a^(2/3)*b^(1/3)*d)
```

Rubi in Sympy [A] time = 30.4873, size = 134, normalized size = 0.96

$$\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}\,(c+dx)\right)}{3a^{\frac{2}{3}}\sqrt[3]{b}d}-\frac{\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}\,(-c-dx)+b^{\frac{2}{3}}\,(c+dx)^2\right)}{6a^{\frac{2}{3}}\sqrt[3]{b}d}-\frac{\sqrt{3}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{3a^{\frac{2}{3}}\sqrt[3]{b}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*(d*x+c)**3),x)
```

```
[Out] log(a**(1/3) + b**(1/3)*(c + d*x))/(3*a**(2/3)*b**(1/3)*d) - log(
a**(2/3) + a**(1/3)*b**(1/3)*(-c - d*x) + b**(2/3)*(c + d*x)**2)/
(6*a**(2/3)*b**(1/3)*d) - sqrt(3)*atan(sqrt(3)*(a**(1/3)/3 + b**(
1/3)*(-2*c/3 - 2*d*x/3))/a**(1/3))/(3*a**(2/3)*b**(1/3)*d)
```

Mathematica [A] time = 0.0218152, size = 116, normalized size = 0.83

$$\frac{-\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)+2\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)+2\sqrt{3}\tan^{-1}\left(\frac{2\sqrt[3]{b}(c+dx)-\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{6a^{2/3}\sqrt[3]{b}d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(c + d*x)^3)^(-1),x]
```

```
[Out] (2*Sqrt[3]*ArcTan[(-a^(1/3) + 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/
3))] + 2*Log[a^(1/3) + b^(1/3)*(c + d*x)] - Log[a^(2/3) - a^(1/3)
*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/(6*a^(2/3)*b^(1/3)*d)
```

Maple [C] time = 0.002, size = 71, normalized size = 0.5

$$\frac{1}{3bd}\sum_{\_R=RootOf\left(\_Z^3bd^3+3\_Z^2bcd^2+3\_Z\,bc^2d+bc^3+a\right)}\frac{\ln\left(x-\_R\right)}{d^2\_R^2+2cd\_R+c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*(d*x+c)^3),x)
```

```
[Out] 1/3/b/d*sum(1/(_R^2*d^2+2*_R*c*d+c^2)*ln(x-_R),_R=RootOf(_Z^3*b*d
^3+3*_Z^2*b*c*d^2+3*_Z*b*c^2*d+b*c^3+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{(dx+c)^3b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((d*x + c)^3*b + a),x, algorithm="maxima")
```

```
[Out] integrate(1/((d*x + c)^3*b + a), x)
```

Fricas [A] time = 0.210618, size = 161, normalized size = 1.15

$$-\frac{\sqrt{3}\left(\sqrt{3}\log\left(a^2+\left(d^2x^2+2\,cdx+c^2\right)\left(a^2b\right)^{\frac{2}{3}}-\left(a^2b\right)^{\frac{1}{3}}(adx+ac)\right)-2\sqrt{3}\log\left(\left(a^2b\right)^{\frac{1}{3}}(dx+c)+a\right)-6\arctan\left(\frac{2\sqrt{3}\left(a^2b\right)^{\frac{1}{3}}\ldots}{\ldots}\right.\right.}{18\left(a^2b\right)^{\frac{1}{3}}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((d*x + c)^3*b + a),x, algorithm="fricas")
```

```
[Out] -1/18*sqrt(3)*(sqrt(3)*log(a^2 + (d^2*x^2 + 2*c*d*x + c^2)*(a^2*b
)^(2/3) - (a^2*b)^(1/3)*(a*d*x + a*c)) - 2*sqrt(3)*log((a^2*b)^(1
/3)*(d*x + c) + a) - 6*arctan(1/3*(2*sqrt(3)*(a^2*b)^(1/3)*(d*x +
 c) - sqrt(3)*a)/a))/((a^2*b)^(1/3)*d)
```

Sympy [A] time = 0.714936, size = 26, normalized size = 0.19

$$\frac{\operatorname{RootSum}\left(27t^3a^2b-1,\left(t\mapsto t\log\left(x+\frac{3ta+c}{d}\right)\right)\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*(d*x+c)**3),x)
```

```
[Out] RootSum(27*_t**3*a**2*b - 1, Lambda(_t, _t*log(x + (3*_t*a + c)/d
)))/d
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(dx+c)^3b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((d*x + c)^3*b + a),x, algorithm="giac")

[Out] integrate(1/((d*x + c)^3*b + a), x)
```

3.2857 $\int \frac{1}{(c+dx)(a+b(c+dx)^3)}\,dx$

Optimal. Leaf size=36

$$\frac{\log(c+dx)}{ad}-\frac{\log\left(a+b(c+dx)^3\right)}{3ad}$$

```
[Out] Log[c + d*x]/(a*d) - Log[a + b*(c + d*x)^3]/(3*a*d)
```

Rubi [A] time = 0.083706, antiderivative size = 36, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238

$$\frac{\log(c+dx)}{ad}-\frac{\log\left(a+b(c+dx)^3\right)}{3ad}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((c + d*x)*(a + b*(c + d*x)^3)),x]
```

```
[Out] Log[c + d*x]/(a*d) - Log[a + b*(c + d*x)^3]/(3*a*d)
```

Rubi in Sympy [A] time = 10.4335, size = 29, normalized size = 0.81

$$-\frac{\log\left(a+b\left(c+dx\right)^3\right)}{3ad}+\frac{\log\left(\left(c+dx\right)^3\right)}{3ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(d*x+c)/(a+b*(d*x+c)**3),x)
```

```
[Out] -log(a + b*(c + d*x)**3)/(3*a*d) + log((c + d*x)**3)/(3*a*d)
```

Mathematica [A] time = 0.0140258, size = 36, normalized size = 1.

$$\frac{\log(c+dx)}{ad}-\frac{\log\left(a+b(c+dx)^3\right)}{3ad}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((c + d*x)*(a + b*(c + d*x)^3)),x]
```

```
[Out] Log[c + d*x]/(a*d) - Log[a + b*(c + d*x)^3]/(3*a*d)
```

Maple [A] time = 0.007, size = 57, normalized size = 1.6

$$-\frac{\ln\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)}{3\,ad}+\frac{\ln\left(dx+c\right)}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(d*x+c)/(a+b*(d*x+c)^3),x)
```

```
[Out] -1/3/a/d*ln(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)+ln(d*x+c
)/a/d
```

Maxima [A] time = 1.36648, size = 76, normalized size = 2.11

$$-\frac{\log\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)}{3\,ad}+\frac{\log\left(dx+c\right)}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((((d*x + c)^3*b + a)*(d*x + c)),x, algorithm="maxima")
```

```
[Out] -1/3*log(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)/(a*
d) + log(d*x + c)/(a*d)
```

Fricas [A] time = 0.205578, size = 69, normalized size = 1.92

$$-\frac{\log\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)-3\,\log\left(dx+c\right)}{3\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((((d*x + c)^3*b + a)*(d*x + c)),x, algorithm="fricas")
```

```
[Out] -1/3*(log(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a) -
3*log(d*x + c))/(a*d)
```

Sympy [A] time = 1.39657, size = 49, normalized size = 1.36

$$\frac{\log\left(\frac{c}{d}+x\right)}{ad}-\frac{\log\left(\frac{3c^2x}{d^2}+\frac{3cx^2}{d}+x^3+\frac{a+bc^3}{bd^3}\right)}{3ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(d*x+c)/(a+b*(d*x+c)**3),x)
```

```
[Out] log(c/d + x)/(a*d) - log(3*c**2*x/d**2 + 3*c*x**2/d + x**3 + (a +
 b*c**3)/(b*d**3))/(3*a*d)
```

GIAC/XCAS [A] time = 0.220093, size = 78, normalized size = 2.17

$$-\frac{\ln\left(\left|bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right|\right)}{3\,ad}+\frac{\ln\left(\left|dx+c\right|\right)}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((((d*x + c)^3*b + a)*(d*x + c)),x, algorithm="giac")
```

```
[Out] -1/3*ln(abs(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a))
/(a*d) + ln(abs(d*x + c))/(a*d)
```

3.2858 $\int \frac{1}{(c+dx)^2(a+b(c+dx)^3)}\,dx$

Optimal. Leaf size=154

$$-\frac{\sqrt[3]{b}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{6a^{4/3}d}+\frac{\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{3a^{4/3}d}+\frac{\sqrt[3]{b}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}a^{4/3}d}-\frac{1}{ad(c+dx)}$$

```
[Out] -(1/(a*d*(c + d*x))) + (b^(1/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*(c +
d*x))/(Sqrt[3]*a^(1/3))])/(Sqrt[3]*a^(4/3)*d) + (b^(1/3)*Log[a^(1
/3) + b^(1/3)*(c + d*x)])/(3*a^(4/3)*d) - (b^(1/3)*Log[a^(2/3) -
a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/(6*a^(4/3)*d)
```

Rubi [A] time = 0.299315, antiderivative size = 154, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381

$$-\frac{\sqrt[3]{b}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{6a^{4/3}d}+\frac{\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{3a^{4/3}d}+\frac{\sqrt[3]{b}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}a^{4/3}d}-\frac{1}{ad(c+dx)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((c + d*x)^2*(a + b*(c + d*x)^3)),x]
```

```
[Out] -(1/(a*d*(c + d*x))) + (b^(1/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*(c +
d*x))/(Sqrt[3]*a^(1/3))])/(Sqrt[3]*a^(4/3)*d) + (b^(1/3)*Log[a^(1
/3) + b^(1/3)*(c + d*x)])/(3*a^(4/3)*d) - (b^(1/3)*Log[a^(2/3) -
a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/(6*a^(4/3)*d)
```

Rubi in Sympy [A] time = 38.0333, size = 144, normalized size = 0.94

$$-\frac{1}{ad\,(c+dx)}+\frac{\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}\,(c+dx)\right)}{3a^{\frac{4}{3}}d}-\frac{\sqrt[3]{b}\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}\,(-c-dx)+b^{\frac{2}{3}}\,(c+dx)^2\right)}{6a^{\frac{4}{3}}d}+\frac{\sqrt{3}\sqrt[3]{b}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{3a^{\frac{4}{3}}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(d*x+c)**2/(a+b*(d*x+c)**3),x)
```

```
[Out] -1/(a*d*(c + d*x)) + b**(1/3)*log(a**(1/3) + b**(1/3)*(c + d*x))/
(3*a**(4/3)*d) - b**(1/3)*log(a**(2/3) + a**(1/3)*b**(1/3)*(-c -
d*x) + b**(2/3)*(c + d*x)**2)/(6*a**(4/3)*d) + sqrt(3)*b**(1/3)*a
tan(sqrt(3)*(a**(1/3)/3 + b**(1/3)*(-2*c/3 - 2*d*x/3))/a**(1/3))/
(3*a**(4/3)*d)
```

Mathematica [A] time = 0.0747643, size = 140, normalized size = 0.91

$$\frac{-\sqrt[3]{b}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)+2\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)-2\sqrt{3}\sqrt[3]{b}\tan^{-1}\left(\frac{2\sqrt[3]{b}(c+dx)-\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)-\frac{6\sqrt[3]{a}}{c+dx}}{6a^{4/3}d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((c + d*x)^2*(a + b*(c + d*x)^3)),x]
```

```
[Out] ((-6*a^(1/3))/(c + d*x) - 2*Sqrt[3]*b^(1/3)*ArcTan[(-a^(1/3) + 2*
b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))] + 2*b^(1/3)*Log[a^(1/3) + b
^(1/3)*(c + d*x)] - b^(1/3)*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*
x) + b^(2/3)*(c + d*x)^2])/(6*a^(4/3)*d)
```

Maple [C] time = 0.006, size = 92, normalized size = 0.6

$$-\frac{1}{3ad}\sum_{\_R=RootOf\left(\_Z^3bd^3+3\_Z^2bcd^2+3\_Zbc^2d+bc^3+a\right)}\frac{(\_Rd+c)\ln(x-\_R)}{d^2\_R^2+2cd\_R+c^2}-\frac{1}{ad(dx+c)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(d*x+c)^2/(a+b*(d*x+c)^3),x)
```

```
[Out] -1/3/a/d*sum((_R*d+c)/(_R^2*d^2+2*_R*c*d+c^2)*ln(x-_R),_R=RootOf(
_Z^3*b*d^3+3*_Z^2*b*c*d^2+3*_Z*b*c^2*d+b*c^3+a))-1/a/d/(d*x+c)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{b\int\frac{dx+c}{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}\,dx}{a}-\frac{1}{ad^2x+acd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)*(d*x + c)^2),x, algorithm="maxima")
```

```
[Out] -b*integrate((d*x + c)/(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x +
 b*c^3 + a), x)/a - 1/(a*d^2*x + a*c*d)
```

Fricas [A] time = 0.21719, size = 236, normalized size = 1.53

$$-\frac{\sqrt{3}\left(\sqrt{3}(dx+c)\left(\frac{b}{a}\right)^{\frac{1}{3}}\log\left(bd^2x^2+2\,bcdx+bc^2-(adx+ac)\left(\frac{b}{a}\right)^{\frac{2}{3}}+a\left(\frac{b}{a}\right)^{\frac{1}{3}}\right)-2\,\sqrt{3}(dx+c)\left(\frac{b}{a}\right)^{\frac{1}{3}}\log\left(bdx+bc+a\left(\frac{b}{a}\right)\right.\right.}{18\,(ad^2x+acd)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)*(d*x + c)^2),x, algorithm="fricas")
```

```
[Out] -1/18*sqrt(3)*(sqrt(3)*(d*x + c)*(b/a)^(1/3)*log(b*d^2*x^2 + 2*b*
c*d*x + b*c^2 - (a*d*x + a*c)*(b/a)^(2/3) + a*(b/a)^(1/3)) - 2*sq
rt(3)*(d*x + c)*(b/a)^(1/3)*log(b*d*x + b*c + a*(b/a)^(2/3)) - 6*
(d*x + c)*(b/a)^(1/3)*arctan(1/3*(sqrt(3)*a*(b/a)^(2/3) - 2*sqrt(
3)*(b*d*x + b*c))/(a*(b/a)^(2/3))) + 6*sqrt(3))/(a*d^2*x + a*c*d)
```

Sympy [A] time = 2.95073, size = 44, normalized size = 0.29

$$-\frac{1}{acd+ad^2x}+\frac{\operatorname{RootSum}\left(27t^3a^4-b,\left(t\mapsto t\log\left(x+\frac{9t^2a^3+bc}{bd}\right)\right)\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(d*x+c)**2/(a+b*(d*x+c)**3),x)
```

```
[Out] -1/(a*c*d + a*d**2*x) + RootSum(27*_t**3*a**4 - b, Lambda(_t, _t*
log(x + (9*_t**2*a**3 + b*c)/(b*d))))/d
```

GIAC/XCAS [A] time = 0.231856, size = 236, normalized size = 1.53

$$\frac{\left(\frac{b}{ad^3}\right)^{\frac{1}{3}}\ln\left(\left|-\left(\frac{b}{ad^3}\right)^{\frac{1}{3}}-\frac{1}{(dx+c)d}\right|\right)}{3\,a}-\frac{\sqrt{3}\left(a^2b\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(\left(\frac{b}{ad^3}\right)^{\frac{1}{3}}-\frac{2}{(dx+c)d}\right)}{3\left(\frac{b}{ad^3}\right)^{\frac{1}{3}}}\right)}{3\,a^2d}-\frac{\left(a^2b\right)^{\frac{1}{3}}\ln\left(\left(\frac{b}{ad^3}\right)^{\frac{2}{3}}-\frac{\left(\frac{b}{ad^3}\right)^{\frac{1}{3}}}{(dx+c)d}+\frac{1}{(dx+c)^2d^2}\right)}{6\,a^2d}-\frac{1}{(dx+c)ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)*(d*x + c)^2),x, algorithm="giac")
```

```
[Out] 1/3*(b/(a*d^3))^(1/3)*ln(abs(-(b/(a*d^3))^(1/3) - 1/((d*x + c)*d)
))/a - 1/3*sqrt(3)*(a^2*b)^(1/3)*arctan(1/3*sqrt(3)*((b/(a*d^3))^
(1/3) - 2/((d*x + c)*d))/(b/(a*d^3))^(1/3))/(a^2*d) - 1/6*(a^2*b)
^(1/3)*ln((b/(a*d^3))^(2/3) - (b/(a*d^3))^(1/3)/((d*x + c)*d) + 1
/((d*x + c)^2*d^2))/(a^2*d) - 1/((d*x + c)*a*d)
```

3.2859 $\int \frac{1}{(c+dx)^3(a+b(c+dx)^3)}\,dx$

Optimal. Leaf size=156

$$-\frac{b^{2/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{3a^{5/3}d}+\frac{b^{2/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{6a^{5/3}d}+\frac{b^{2/3}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}a^{5/3}d}-\frac{1}{2ad(c+dx)^2}$$

```
[Out] -1/(2*a*d*(c + d*x)^2) + (b^(2/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*(c
+ d*x))/(Sqrt[3]*a^(1/3))])/(Sqrt[3]*a^(5/3)*d) - (b^(2/3)*Log[a^
(1/3) + b^(1/3)*(c + d*x)])/(3*a^(5/3)*d) + (b^(2/3)*Log[a^(2/3)
- a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/(6*a^(5/3)*d)
```

Rubi [A] time = 0.294321, antiderivative size = 156, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.381$

$$-\frac{b^{2/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{3a^{5/3}d}+\frac{b^{2/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{6a^{5/3}d}+\frac{b^{2/3}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}a^{5/3}d}-\frac{1}{2ad(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((c + d*x)^3*(a + b*(c + d*x)^3)),x]
```

```
[Out] -1/(2*a*d*(c + d*x)^2) + (b^(2/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*(c
+ d*x))/(Sqrt[3]*a^(1/3))])/(Sqrt[3]*a^(5/3)*d) - (b^(2/3)*Log[a^
(1/3) + b^(1/3)*(c + d*x)])/(3*a^(5/3)*d) + (b^(2/3)*Log[a^(2/3)
- a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/(6*a^(5/3)*d)
```

Rubi in Sympy [A] time = 39.342, size = 148, normalized size = 0.95

$$-\frac{1}{2ad\left(c+dx\right)^2}-\frac{b^{\frac{2}{3}}\log\left(\sqrt[3]{a}+\sqrt[3]{b}\left(c+dx\right)\right)}{3a^{\frac{5}{3}}d}+\frac{b^{\frac{2}{3}}\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}\left(-c-dx\right)+b^{\frac{2}{3}}\left(c+dx\right)^2\right)}{6a^{\frac{5}{3}}d}+\frac{\sqrt{3}b^{\frac{2}{3}}\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{3a^{\frac{5}{3}}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(d*x+c)**3/(a+b*(d*x+c)**3),x)
```

```
[Out] -1/(2*a*d*(c + d*x)**2) - b**(2/3)*log(a**(1/3) + b**(1/3)*(c + d
*x))/(3*a**(5/3)*d) + b**(2/3)*log(a**(2/3) + a**(1/3)*b**(1/3)*(
-c - d*x) + b**(2/3)*(c + d*x)**2)/(6*a**(5/3)*d) + sqrt(3)*b**(2
/3)*atan(sqrt(3)*(a**(1/3)/3 + b**(1/3)*(-2*c/3 - 2*d*x/3))/a**(1
/3))/(3*a**(5/3)*d)
```

Mathematica [A] time = 0.067749, size = 139, normalized size = 0.89

$$\frac{b^{2/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)-\frac{3a^{2/3}}{(c+dx)^2}-2b^{2/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)-2\sqrt{3}b^{2/3}\tan^{-1}\left(\frac{2\sqrt[3]{b}(c+dx)-\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{6a^{5/3}d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((c + d*x)^3*(a + b*(c + d*x)^3)),x]
```

```
[Out] ((-3*a^(2/3))/(c + d*x)^2 - 2*Sqrt[3]*b^(2/3)*ArcTan[(-a^(1/3) +
2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))] - 2*b^(2/3)*Log[a^(1/3) +
 b^(1/3)*(c + d*x)] + b^(2/3)*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c +
d*x) + b^(2/3)*(c + d*x)^2])/(6*a^(5/3)*d)
```

Maple [C] time = 0.007, size = 87, normalized size = 0.6

$$-\frac{1}{3\,ad}\sum_{\_R=RootOf(\_Z^3bd^3+3\_Z^2bcd^2+3\_Z\,bc^2d+bc^3+a)}\frac{\ln(x-\_R)}{d^2\_R^2+2\,cd\_R+c^2}-\frac{1}{2\,ad\,(dx+c)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(d*x+c)^3/(a+b*(d*x+c)^3),x)
```

```
[Out] -1/3/a/d*sum(1/(_R^2*d^2+2*_R*c*d+c^2)*ln(x-_R),_R=RootOf(_Z^3*b*
d^3+3*_Z^2*b*c*d^2+3*_Z*b*c^2*d+b*c^3+a))-1/2/a/d/(d*x+c)^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{b\int\frac{1}{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}\,dx}{a}-\frac{1}{2\,(ad^3x^2+2\,acd^2x+ac^2d)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)*(d*x + c)^3),x, algorithm="maxima")
```

```
[Out] -b*integrate(1/(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 +
 a), x)/a - 1/2/(a*d^3*x^2 + 2*a*c*d^2*x + a*c^2*d)
```

Fricas [A] time = 0.217644, size = 343, normalized size = 2.2

$$-\frac{\sqrt{3}\left(\sqrt{3}\left(d^2x^2+2\,cdx+c^2\right)\left(-\frac{b^2}{a^2}\right)^{\frac{1}{3}}\log\left(b^2d^2x^2+2\,b^2cdx+b^2c^2+a^2\left(-\frac{b^2}{a^2}\right)^{\frac{2}{3}}+(abdx+abc)\left(-\frac{b^2}{a^2}\right)^{\frac{1}{3}}\right)-2\,\sqrt{3}\left(d^2x^2+2\,cc\right.\right.}{18\,(ad^3x^2+2\,ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)*(d*x + c)^3),x, algorithm="fricas")
```

```
[Out] -1/18*sqrt(3)*(sqrt(3)*(d^2*x^2 + 2*c*d*x + c^2)*(-b^2/a^2)^(1/3)
*log(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2 + a^2*(-b^2/a^2)^(2/3) +
 (a*b*d*x + a*b*c)*(-b^2/a^2)^(1/3)) - 2*sqrt(3)*(d^2*x^2 + 2*c*d
*x + c^2)*(-b^2/a^2)^(1/3)*log(b*d*x + b*c - a*(-b^2/a^2)^(1/3))
+ 6*(d^2*x^2 + 2*c*d*x + c^2)*(-b^2/a^2)^(1/3)*arctan(1/3*(sqrt(3
)*a*(-b^2/a^2)^(1/3) + 2*sqrt(3)*(b*d*x + b*c))/(a*(-b^2/a^2)^(1/
```

```
3))) + 3*sqrt(3))/(a*d^3*x^2 + 2*a*c*d^2*x + a*c^2*d)
```

Sympy [A] time = 4.37909, size = 61, normalized size = 0.39

$$-\frac{1}{2ac^2d+4acd^2x+2ad^3x^2}+\frac{\operatorname{RootSum}\left(27t^3a^5+b^2,\left(t\mapsto t\log\left(x+\frac{-3ta^2+bc}{bd}\right)\right)\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(d*x+c)**3/(a+b*(d*x+c)**3),x)
```

```
[Out] -1/(2*a*c**2*d + 4*a*c*d**2*x + 2*a*d**3*x**2) + RootSum(27*_t**3
*a**5 + b**2, Lambda(_t, _t*log(x + (-3*_t*a**2 + b*c)/(b*d))))/d
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left((dx+c)^3b+a\right)(dx+c)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)*(d*x + c)^3),x, algorithm="giac")
```

```
[Out] integrate(1/(((d*x + c)^3*b + a)*(d*x + c)^3), x)
```

3.2860 $\int \frac{1}{(c+dx)^4(a+b(c+dx)^3)}\,dx$

Optimal. Leaf size=56

$$-\frac{b\log(c+dx)}{a^2d}+\frac{b\log\left(a+b(c+dx)^3\right)}{3a^2d}-\frac{1}{3ad(c+dx)^3}$$

```
[Out] -1/(3*a*d*(c + d*x)^3) - (b*Log[c + d*x])/(a^2*d) + (b*Log[a + b*
(c + d*x)^3])/(3*a^2*d)
```

Rubi [A] time = 0.114263, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$-\frac{b\log(c+dx)}{a^2d}+\frac{b\log\left(a+b(c+dx)^3\right)}{3a^2d}-\frac{1}{3ad(c+dx)^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((c + d*x)^4*(a + b*(c + d*x)^3)),x]
```

```
[Out] -1/(3*a*d*(c + d*x)^3) - (b*Log[c + d*x])/(a^2*d) + (b*Log[a + b*
(c + d*x)^3])/(3*a^2*d)
```

Rubi in Sympy [A] time = 14.28, size = 49, normalized size = 0.88

$$-\frac{1}{3ad\,(c+dx)^3}+\frac{b\log\left(a+b\,(c+dx)^3\right)}{3a^2d}-\frac{b\log\left((c+dx)^3\right)}{3a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(d*x+c)**4/(a+b*(d*x+c)**3),x)
```

```
[Out] -1/(3*a*d*(c + d*x)**3) + b*log(a + b*(c + d*x)**3)/(3*a**2*d) -
b*log((c + d*x)**3)/(3*a**2*d)
```

Mathematica [A] time = 0.0372345, size = 44, normalized size = 0.79

$$\frac{b\log\left(a+b(c+dx)^3\right)-\frac{a}{(c+dx)^3}-3b\log(c+dx)}{3a^2d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((c + d*x)^4*(a + b*(c + d*x)^3)),x]
```

```
[Out] (-(a/(c + d*x)^3) - 3*b*Log[c + d*x] + b*Log[a + b*(c + d*x)^3])/
(3*a^2*d)
```

Maple [A] time = 0.012, size = 75, normalized size = 1.3

$$\frac{b\ln\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)}{3\,a^2d}-\frac{1}{3\,ad\,(dx+c)^3}-\frac{b\ln(dx+c)}{a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(d*x+c)^4/(a+b*(d*x+c)^3),x)
```

```
[Out] 1/3/a^2*b/d*ln(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)-1/3/a
/d/(d*x+c)^3-b*ln(d*x+c)/a^2/d
```

Maxima [A] time = 1.35626, size = 132, normalized size = 2.36

$$-\frac{1}{3\,(ad^4x^3+3\,acd^3x^2+3\,ac^2d^2x+ac^3d)}+\frac{b\log\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)}{3\,a^2d}-\frac{b\log\left(dx+c\right)}{a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)*(d*x + c)^4),x, algorithm="maxima")
```

```
[Out] -1/3/(a*d^4*x^3 + 3*a*c*d^3*x^2 + 3*a*c^2*d^2*x + a*c^3*d) + 1/3*
b*log(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)/(a^2*d
) - b*log(d*x + c)/(a^2*d)
```

Fricas [A] time = 0.212311, size = 213, normalized size = 3.8

$$\frac{\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3\right)\log\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)-3\,\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3\right)\log(}{3\,(a^2d^4x^3+3\,a^2cd^3x^2+3\,a^2c^2d^2x+a^2c^3d)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)*(d*x + c)^4),x, algorithm="fricas")
```

```
[Out] 1/3*((b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(b*d^3*
x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a) - 3*(b*d^3*x^3 + 3
*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(d*x + c) - a)/(a^2*d^4*x^
3 + 3*a^2*c*d^3*x^2 + 3*a^2*c^2*d^2*x + a^2*c^3*d)
```

Sympy [A] time = 7.53402, size = 100, normalized size = 1.79

$$-\frac{1}{3ac^3d+9ac^2d^2x+9acd^3x^2+3ad^4x^3}-\frac{b\log\left(\frac{c}{d}+x\right)}{a^2d}+\frac{b\log\left(\frac{3c^2x}{d^2}+\frac{3cx^2}{d}+x^3+\frac{a+bc^3}{bd^3}\right)}{3a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(d*x+c)**4/(a+b*(d*x+c)**3),x)
```

```
[Out] -1/(3*a*c**3*d + 9*a*c**2*d**2*x + 9*a*c*d**3*x**2 + 3*a*d**4*x**
3) - b*log(c/d + x)/(a**2*d) + b*log(3*c**2*x/d**2 + 3*c*x**2/d +
 x**3 + (a + b*c**3)/(b*d**3))/(3*a**2*d)
```

GIAC/XCAS [A] time = 0.221809, size = 55, normalized size = 0.98

$$\frac{b\ln\left(\left|-b-\frac{a}{(dx+c)^3}\right|\right)}{3\,a^2d}-\frac{1}{3\,(dx+c)^3ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)*(d*x + c)^4),x, algorithm="giac")
```

```
[Out] 1/3*b*ln(abs(-b - a/(d*x + c)^3))/(a^2*d) - 1/3/((d*x + c)^3*a*d)
```

3.2861 $\int \frac{(c+dx)^4}{(a+b(c+dx)^3)^2}\,dx$

Optimal. Leaf size=172

$$\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{9\sqrt[3]{a}b^{5/3}d}-\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{9\sqrt[3]{a}b^{5/3}d}-\frac{2\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}\sqrt[3]{a}b^{5/3}d}-\frac{(c+dx)^2}{3bd\,(a+b(c+dx)^3)}$$

```
[Out] -(c + d*x)^2/(3*b*d*(a + b*(c + d*x)^3)) - (2*ArcTan[(a^(1/3) - 2
*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/(3*Sqrt[3]*a^(1/3)*b^(5/3
)*d) - (2*Log[a^(1/3) + b^(1/3)*(c + d*x)])/(9*a^(1/3)*b^(5/3)*d)
 + Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2]
/(9*a^(1/3)*b^(5/3)*d)
```

Rubi [A] time = 0.329584, antiderivative size = 172, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381

$$\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{9\sqrt[3]{a}b^{5/3}d}-\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{9\sqrt[3]{a}b^{5/3}d}-\frac{2\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}\sqrt[3]{a}b^{5/3}d}-\frac{(c+dx)^2}{3bd\,(a+b(c+dx)^3)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)^4/(a + b*(c + d*x)^3)^2,x]
```

```
[Out] -(c + d*x)^2/(3*b*d*(a + b*(c + d*x)^3)) - (2*ArcTan[(a^(1/3) - 2
*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/(3*Sqrt[3]*a^(1/3)*b^(5/3
)*d) - (2*Log[a^(1/3) + b^(1/3)*(c + d*x)])/(9*a^(1/3)*b^(5/3)*d)
 + Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2]
/(9*a^(1/3)*b^(5/3)*d)
```

Rubi in Sympy [A] time = 39.585, size = 160, normalized size = 0.93

$$-\frac{(c+dx)^2}{3bd\left(a+b\left(c+dx\right)^3\right)}-\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}\left(c+dx\right)\right)}{9\sqrt[3]{a}b^{\frac{5}{3}}d}+\frac{\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}\left(-c-dx\right)+b^{\frac{2}{3}}\left(c+dx\right)^2\right)}{9\sqrt[3]{a}b^{\frac{5}{3}}d}-\frac{2\sqrt{3}\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{9\sqrt[3]{a}b^{\frac{5}{3}}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**4/(a+b*(d*x+c)**3)**2,x)
```

```
[Out] -(c + d*x)**2/(3*b*d*(a + b*(c + d*x)**3)) - 2*log(a**(1/3) + b**
(1/3)*(c + d*x))/(9*a**(1/3)*b**(5/3)*d) + log(a**(2/3) + a**(1/3
)*b**(1/3)*(-c - d*x) + b**(2/3)*(c + d*x)**2)/(9*a**(1/3)*b**(5/
3)*d) - 2*sqrt(3)*atan(sqrt(3)*(a**(1/3)/3 + b**(1/3)*(-2*c/3 - 2
*d*x/3))/a**(1/3))/(9*a**(1/3)*b**(5/3)*d)
```

Mathematica [A] time = 0.174987, size = 152, normalized size = 0.88

$$\frac{\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{\sqrt[3]{a}}-\frac{3b^{2/3}(c+dx)^2}{a+b(c+dx)^3}-\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{\sqrt[3]{a}}+\frac{2\sqrt{3}\tan^{-1}\left(\frac{2\sqrt[3]{b}(c+dx)-\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt[3]{a}}}{9b^{5/3}d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c + d*x)^4/(a + b*(c + d*x)^3)^2,x]
```

```
[Out] ((-3*b^(2/3)*(c + d*x)^2)/(a + b*(c + d*x)^3) + (2*Sqrt[3]*ArcTan
[(-a^(1/3) + 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/a^(1/3) - (
2*Log[a^(1/3) + b^(1/3)*(c + d*x)])/a^(1/3) + Log[a^(2/3) - a^(1/
3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2]/a^(1/3))/(9*b^(5/3)*d
)
```

Maple [C] time = 0.018, size = 141, normalized size = 0.8

$$\frac{1}{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}\left(-\frac{dx^2}{3\,b}-\frac{2\,cx}{3\,b}-\frac{c^2}{3\,bd}\right)+\frac{2}{9\,b^2d}\sum_{\_R=RootOf(\_Z^3bd^3+3\_Z^2bcd^2+3\_Z\,bc^2d+bc^3+a)}\frac{(\_R\,d+c)\ln(x-\_R)}{d^2\_R^2+2\,cd\_R+c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^4/(a+b*(d*x+c)^3)^2,x)
```

```
[Out] (-1/3/b*d*x^2-2/3/b*c*x-1/3*c^2/b/d)/(b*d^3*x^3+3*b*c*d^2*x^2+3*b
*c^2*d*x+b*c^3+a)+2/9/b^2/d*sum((_R*d+c)/(_R^2*d^2+2*_R*c*d+c^2)*
ln(x-_R),_R=RootOf(_Z^3*b*d^3+3*_Z^2*b*c*d^2+3*_Z*b*c^2*d+b*c^3+a
))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{d^2x^2+2\,cdx+c^2}{3\,(b^2d^4x^3+3\,b^2cd^3x^2+3\,b^2c^2d^2x+(b^2c^3+ab)d)}+\frac{2\int\frac{dx+c}{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}\,dx}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^4/((d*x + c)^3*b + a)^2,x, algorithm="maxima")
```

```
[Out] -1/3*(d^2*x^2 + 2*c*d*x + c^2)/(b^2*d^4*x^3 + 3*b^2*c*d^3*x^2 + 3
*b^2*c^2*d^2*x + (b^2*c^3 + a*b)*d) + 2/3*integrate((d*x + c)/(b*
d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a), x)/b
```

Fricas [A] time = 0.218562, size = 413, normalized size = 2.4

$$\frac{\sqrt{3}\left(2\sqrt{3}(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)\log\left(ab+\left(-ab^2\right)^{\frac{2}{3}}(dx+c)\right)-\sqrt{3}(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)\,\mathrm{lo}\right.}{27}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^4/((d*x + c)^3*b + a)^2,x, algorithm="fricas")
```

```
[Out] 1/27*sqrt(3)*(2*sqrt(3)*(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x
+ b*c^3 + a)*log(a*b + (-a*b^2)^(2/3)*(d*x + c)) - sqrt(3)*(b*d^3
*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)*log(-a*b + (-a*b^
2)^(2/3)*(d*x + c) + (b*d^2*x^2 + 2*b*c*d*x + b*c^2)*(-a*b^2)^(1/
3)) - 6*(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)*arc
tan(-1/3*(sqrt(3)*a*b - 2*sqrt(3)*(-a*b^2)^(2/3)*(d*x + c))/(a*b)
) - 3*sqrt(3)*(d^2*x^2 + 2*c*d*x + c^2)*(-a*b^2)^(1/3))/((b^2*d^4
*x^3 + 3*b^2*c*d^3*x^2 + 3*b^2*c^2*d^2*x + (b^2*c^3 + a*b)*d)*(-a
*b^2)^(1/3))
```

Sympy [A] time = 9.89165, size = 107, normalized size = 0.62

$$-\frac{c^2+2cdx+d^2x^2}{3abd+3b^2c^3d+9b^2c^2d^2x+9b^2cd^3x^2+3b^2d^4x^3}+\frac{\operatorname{RootSum}\left(729t^3ab^5+8,\left(t\mapsto t\log\left(x+\frac{81t^2ab^3+4c}{4d}\right)\right)\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**4/(a+b*(d*x+c)**3)**2,x)
```

```
[Out] -(c**2 + 2*c*d*x + d**2*x**2)/(3*a*b*d + 3*b**2*c**3*d + 9*b**2*c
**2*d**2*x + 9*b**2*c*d**3*x**2 + 3*b**2*d**4*x**3) + RootSum(729
*_t**3*a*b**5 + 8, Lambda(_t, _t*log(x + (81*_t**2*a*b**3 + 4*c)/
(4*d))))/d
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx+c)^4}{\left((dx+c)^3b+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^4/((d*x + c)^3*b + a)^2,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^4/((d*x + c)^3*b + a)^2, x)
```

3.2862 $\int \frac{(c+dx)^3}{(a+b(c+dx)^3)^2}\,dx$

Optimal. Leaf size=170

$$\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{9a^{2/3}b^{4/3}d}-\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{18a^{2/3}b^{4/3}d}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{2/3}b^{4/3}d}-\frac{c+dx}{3bd\left(a+b(c+dx)^3\right)}$$

```
[Out] -(c + d*x)/(3*b*d*(a + b*(c + d*x)^3)) - ArcTan[(a^(1/3) - 2*b^(1
/3)*(c + d*x))/(Sqrt[3]*a^(1/3))]/(3*Sqrt[3]*a^(2/3)*b^(4/3)*d) +
 Log[a^(1/3) + b^(1/3)*(c + d*x)]/(9*a^(2/3)*b^(4/3)*d) - Log[a^(
2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2]/(18*a^(2/
3)*b^(4/3)*d)
```

Rubi [A] time = 0.318686, antiderivative size = 170, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.381$

$$\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{9a^{2/3}b^{4/3}d}-\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{18a^{2/3}b^{4/3}d}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{2/3}b^{4/3}d}-\frac{c+dx}{3bd\left(a+b(c+dx)^3\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)^3/(a + b*(c + d*x)^3)^2,x]
```

```
[Out] -(c + d*x)/(3*b*d*(a + b*(c + d*x)^3)) - ArcTan[(a^(1/3) - 2*b^(1
/3)*(c + d*x))/(Sqrt[3]*a^(1/3))]/(3*Sqrt[3]*a^(2/3)*b^(4/3)*d) +
 Log[a^(1/3) + b^(1/3)*(c + d*x)]/(9*a^(2/3)*b^(4/3)*d) - Log[a^(
2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2]/(18*a^(2/
3)*b^(4/3)*d)
```

Rubi in Sympy [A] time = 39.5413, size = 155, normalized size = 0.91

$$-\frac{c+dx}{3bd\left(a+b\left(c+dx\right)^3\right)}+\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}\left(c+dx\right)\right)}{9a^{\frac{2}{3}}b^{\frac{4}{3}}d}-\frac{\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}\left(-c-dx\right)+b^{\frac{2}{3}}\left(c+dx\right)^2\right)}{18a^{\frac{2}{3}}b^{\frac{4}{3}}d}-\frac{\sqrt{3}\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{9a^{\frac{2}{3}}b^{\frac{4}{3}}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**3/(a+b*(d*x+c)**3)**2,x)
```

```
[Out] -(c + d*x)/(3*b*d*(a + b*(c + d*x)**3)) + log(a**(1/3) + b**(1/3)
*(c + d*x))/(9*a**(2/3)*b**(4/3)*d) - log(a**(2/3) + a**(1/3)*b**
(1/3)*(-c - d*x) + b**(2/3)*(c + d*x)**2)/(18*a**(2/3)*b**(4/3)*d
) - sqrt(3)*atan(sqrt(3)*(a**(1/3)/3 + b**(1/3)*(-2*c/3 - 2*d*x/3
))/a**(1/3))/(9*a**(2/3)*b**(4/3)*d)
```

Mathematica [A] time = 0.114285, size = 151, normalized size = 0.89

$$\frac{-\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{a^{2/3}}+\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{a^{2/3}}+\frac{2\sqrt{3}\tan^{-1}\left(\frac{2\sqrt[3]{b}(c+dx)-\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{a^{2/3}}-\frac{6\sqrt[3]{b}(c+dx)}{a+b(c+dx)^3}}{18b^{4/3}d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c + d*x)^3/(a + b*(c + d*x)^3)^2,x]
```

```
[Out] ((-6*b^(1/3)*(c + d*x))/(a + b*(c + d*x)^3) + (2*Sqrt[3]*ArcTan[(
-a^(1/3) + 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/a^(2/3) + (2*
Log[a^(1/3) + b^(1/3)*(c + d*x)])/a^(2/3) - Log[a^(2/3) - a^(1/3)
*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2]/a^(2/3))/(18*b^(4/3)*d)
```

Maple [C] time = 0.016, size = 124, normalized size = 0.7

$$\frac{1}{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}\left(-\frac{x}{3\,b}-\frac{c}{3\,bd}\right)+\frac{1}{9\,b^2d}\sum_{\_R=RootOf\left(\_Z^3bd^3+3\_Z^2bcd^2+3\_Z\,bc^2d+bc^3+a\right)}\frac{\ln\left(x-\_R\right)}{d^2\_R^2+2\,cd\_R+c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^3/(a+b*(d*x+c)^3)^2,x)
```

```
[Out] (-1/3*x/b-1/3*c/d/b)/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a
)+1/9/b^2/d*sum(1/(_R^2*d^2+2*_R*c*d+c^2)*ln(x-_R),_R=RootOf(_Z^3
*b*d^3+3*_Z^2*b*c*d^2+3*_Z*b*c^2*d+b*c^3+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{dx+c}{3\left(b^2d^4x^3+3\,b^2cd^3x^2+3\,b^2c^2d^2x+\left(b^2c^3+ab\right)d\right)}+\frac{\int\frac{1}{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}\,dx}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^3/((d*x + c)^3*b + a)^2,x, algorithm="maxima")
```

```
[Out] -1/3*(d*x + c)/(b^2*d^4*x^3 + 3*b^2*c*d^3*x^2 + 3*b^2*c^2*d^2*x +
 (b^2*c^3 + a*b)*d) + 1/3*integrate(1/(b*d^3*x^3 + 3*b*c*d^2*x^2
+ 3*b*c^2*d*x + b*c^3 + a), x)/b
```

Fricas [A] time = 0.221282, size = 381, normalized size = 2.24

$$-\frac{\sqrt{3}\left(\sqrt{3}\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)\log\left(a^2+\left(d^2x^2+2\,cdx+c^2\right)\left(a^2b\right)^{\frac{2}{3}}-\left(a^2b\right)^{\frac{1}{3}}\left(adx+ac\right)\right)-2\,\sqrt{3}\left(bd^3x^3+\right.\right.}{54\left(b^2d^4x^3+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^3/((d*x + c)^3*b + a)^2,x, algorithm="fricas")
```

```
[Out] -1/54*sqrt(3)*(sqrt(3)*(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x +
 b*c^3 + a)*log(a^2 + (d^2*x^2 + 2*c*d*x + c^2)*(a^2*b)^(2/3) - (
```

```
a^2*b)^(1/3)*(a*d*x + a*c)) - 2*sqrt(3)*(b*d^3*x^3 + 3*b*c*d^2*x^
2 + 3*b*c^2*d*x + b*c^3 + a)*log((a^2*b)^(1/3)*(d*x + c) + a) - 6
*(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)*arctan(1/3
*(2*sqrt(3)*(a^2*b)^(1/3)*(d*x + c) - sqrt(3)*a)/a) + 6*sqrt(3)*(
a^2*b)^(1/3)*(d*x + c))/((b^2*d^4*x^3 + 3*b^2*c*d^3*x^2 + 3*b^2*c
^2*d^2*x + (b^2*c^3 + a*b)*d)*(a^2*b)^(1/3))
```

Sympy [A] time = 8.1914, size = 90, normalized size = 0.53

$$-\frac{c+dx}{3abd+3b^2c^3d+9b^2c^2d^2x+9b^2cd^3x^2+3b^2d^4x^3}+\frac{\operatorname{RootSum}\left(729t^3a^2b^4-1,\left(t\mapsto t\log\left(x+\frac{9tab+c}{d}\right)\right)\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**3/(a+b*(d*x+c)**3)**2,x)
```

```
[Out] -(c + d*x)/(3*a*b*d + 3*b**2*c**3*d + 9*b**2*c**2*d**2*x + 9*b**2
*c*d**3*x**2 + 3*b**2*d**4*x**3) + RootSum(729*_t**3*a**2*b**4 -
1, Lambda(_t, _t*log(x + (9*_t*a*b + c)/d)))/d
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx+c)^3}{\left((dx+c)^3b+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^3/((d*x + c)^3*b + a)^2,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^3/((d*x + c)^3*b + a)^2, x)
```

3.2863 $\int \frac{(c+dx)^2}{(a+b(c+dx)^3)^2}\,dx$

Optimal. Leaf size=23

$$-\frac{1}{3bd\left(a+b(c+dx)^3\right)}$$

```
[Out] -1/(3*b*d*(a + b*(c + d*x)^3))
```

Rubi [A] time = 0.0167671, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048

$$-\frac{1}{3bd\left(a+b(c+dx)^3\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)^2/(a + b*(c + d*x)^3)^2,x]

[Out] -1/(3*b*d*(a + b*(c + d*x)^3))
```

Rubi in Sympy [A] time = 3.98413, size = 17, normalized size = 0.74

$$-\frac{1}{3bd\left(a+b\left(c+dx\right)^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**2/(a+b*(d*x+c)**3)**2,x)

[Out] -1/(3*b*d*(a + b*(c + d*x)**3))
```

Mathematica [A] time = 0.0236333, size = 23, normalized size = 1.

$$-\frac{1}{3bd\left(a+b(c+dx)^3\right)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c + d*x)^2/(a + b*(c + d*x)^3)^2,x]

[Out] -1/(3*b*d*(a + b*(c + d*x)^3))
```

Maple [B] time = 0.001, size = 44, normalized size = 1.9

$$-\frac{1}{3\,bd\left(b{d}^{3}{x}^{3}+3\,bc{d}^{2}{x}^{2}+3\,b{c}^{2}dx+b{c}^{3}+a\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^2/(a+b*(d*x+c)^3)^2,x)

[Out] -1/3/b/d/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)
```

Maxima [A] time = 1.42555, size = 28, normalized size = 1.22

$$-\frac{1}{3\left((dx+c)^3b+a\right)bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^2/((d*x + c)^3*b + a)^2,x, algorithm="maxima")
```

```
[Out] -1/3/(((d*x + c)^3*b + a)*b*d)
```

Fricas [A] time = 0.204081, size = 70, normalized size = 3.04

$$-\frac{1}{3\left(b^2d^4x^3+3\,b^2cd^3x^2+3\,b^2c^2d^2x+(b^2c^3+ab)d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^2/((d*x + c)^3*b + a)^2,x, algorithm="fricas")
```

```
[Out] -1/3/(b^2*d^4*x^3 + 3*b^2*c*d^3*x^2 + 3*b^2*c^2*d^2*x + (b^2*c^3
+ a*b)*d)
```

Sympy [A] time = 6.75831, size = 58, normalized size = 2.52

$$-\frac{1}{3abd+3b^2c^3d+9b^2c^2d^2x+9b^2cd^3x^2+3b^2d^4x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**2/(a+b*(d*x+c)**3)**2,x)
```

```
[Out] -1/(3*a*b*d + 3*b**2*c**3*d + 9*b**2*c**2*d**2*x + 9*b**2*c*d**3*
x**2 + 3*b**2*d**4*x**3)
```

GIAC/XCAS [A] time = 0.215257, size = 28, normalized size = 1.22

$$-\frac{1}{3\left((dx+c)^3b+a\right)bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^2/((d*x + c)^3*b + a)^2,x, algorithm="giac")
```

```
[Out] -1/3/(((d*x + c)^3*b + a)*b*d)
```

3.2864 $\int \frac{c+dx}{(a+b(c+dx)^3)^2}\,dx$

Optimal. Leaf size=172

$$-\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{9a^{4/3}b^{2/3}d}+\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{18a^{4/3}b^{2/3}d}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{4/3}b^{2/3}d}+\frac{(c+dx)^2}{3ad\,(a+b(c+dx)^3)}$$

```
[Out] (c + d*x)^2/(3*a*d*(a + b*(c + d*x)^3)) - ArcTan[(a^(1/3) - 2*b^(
1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))]/(3*Sqrt[3]*a^(4/3)*b^(2/3)*d)
- Log[a^(1/3) + b^(1/3)*(c + d*x)]/(9*a^(4/3)*b^(2/3)*d) + Log[a^
(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2]/(18*a^(4
/3)*b^(2/3)*d)
```

Rubi [A] time = 0.314308, antiderivative size = 172, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.421$

$$-\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{9a^{4/3}b^{2/3}d}+\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{18a^{4/3}b^{2/3}d}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{4/3}b^{2/3}d}+\frac{(c+dx)^2}{3ad\,(a+b(c+dx)^3)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)/(a + b*(c + d*x)^3)^2,x]
```

```
[Out] (c + d*x)^2/(3*a*d*(a + b*(c + d*x)^3)) - ArcTan[(a^(1/3) - 2*b^(
1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))]/(3*Sqrt[3]*a^(4/3)*b^(2/3)*d)
- Log[a^(1/3) + b^(1/3)*(c + d*x)]/(9*a^(4/3)*b^(2/3)*d) + Log[a^
(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2]/(18*a^(4
/3)*b^(2/3)*d)
```

Rubi in Sympy [A] time = 37.9802, size = 156, normalized size = 0.91

$$\frac{(c+dx)^2}{3ad\left(a+b\left(c+dx\right)^3\right)}-\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}\left(c+dx\right)\right)}{9a^{\frac{4}{3}}b^{\frac{2}{3}}d}+\frac{\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}\left(-c-dx\right)+b^{\frac{2}{3}}\left(c+dx\right)^2\right)}{18a^{\frac{4}{3}}b^{\frac{2}{3}}d}-\frac{\sqrt{3}\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{9a^{\frac{4}{3}}b^{\frac{2}{3}}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)/(a+b*(d*x+c)**3)**2,x)
```

```
[Out] (c + d*x)**2/(3*a*d*(a + b*(c + d*x)**3)) - log(a**(1/3) + b**(1/
3)*(c + d*x))/(9*a**(4/3)*b**(2/3)*d) + log(a**(2/3) + a**(1/3)*b
**(1/3)*(-c - d*x) + b**(2/3)*(c + d*x)**2)/(18*a**(4/3)*b**(2/3)
*d) - sqrt(3)*atan(sqrt(3)*(a**(1/3)/3 + b**(1/3)*(-2*c/3 - 2*d*x
/3))/a**(1/3))/(9*a**(4/3)*b**(2/3)*d)
```

Mathematica [A] time = 0.150289, size = 152, normalized size = 0.88

$$\frac{\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{b^{2/3}}-\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{b^{2/3}}+\frac{2\sqrt{3}\tan^{-1}\left(\frac{2\sqrt[3]{b}(c+dx)-\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{b^{2/3}}+\frac{6\sqrt[3]{a}(c+dx)^2}{a+b(c+dx)^3}}{18a^{4/3}d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c + d*x)/(a + b*(c + d*x)^3)^2,x]
```

```
[Out] ((6*a^(1/3)*(c + d*x)^2)/(a + b*(c + d*x)^3) + (2*Sqrt[3]*ArcTan[
(-a^(1/3) + 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/b^(2/3) - (2
*Log[a^(1/3) + b^(1/3)*(c + d*x)])/b^(2/3) + Log[a^(2/3) - a^(1/3
)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2]/b^(2/3))/(18*a^(4/3)*d
)
```

Maple [C] time = 0.016, size = 144, normalized size = 0.8

$$\frac{1}{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}\left(\frac{dx^2}{3\,a}+\frac{2\,cx}{3\,a}+\frac{c^2}{3\,ad}\right)+\frac{1}{9\,abd}\sum_{\_R=RootOf(\_Z^3bd^3+3\_Z^2bcd^2+3\_Z\,bc^2d+bc^3+a)}\frac{(\_R\,d+c)\ln(x-\_R)}{d^2\_R^2+2\,cd\_R+c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)/(a+b*(d*x+c)^3)^2,x)
```

```
[Out] (1/3*d/a*x^2+2/3/a*c*x+1/3*c^2/d/a)/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*
c^2*d*x+b*c^3+a)+1/9/a/b/d*sum((_R*d+c)/(_R^2*d^2+2*_R*c*d+c^2)*l
n(x-_R),_R=RootOf(_Z^3*b*d^3+3*_Z^2*b*c*d^2+3*_Z*b*c^2*d+b*c^3+a)
)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{d^2x^2+2\,cdx+c^2}{3\,(abd^4x^3+3\,abcd^3x^2+3\,abc^2d^2x+(abc^3+a^2)d)}+\frac{\int\frac{dx+c}{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}\,dx}{3\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)/((d*x + c)^3*b + a)^2,x, algorithm="maxima")
```

```
[Out] 1/3*(d^2*x^2 + 2*c*d*x + c^2)/(a*b*d^4*x^3 + 3*a*b*c*d^3*x^2 + 3*
a*b*c^2*d^2*x + (a*b*c^3 + a^2)*d) + 1/3*integrate((d*x + c)/(b*d
^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a), x)/a
```

Fricas [A] time = 0.219591, size = 408, normalized size = 2.37

$$\frac{\sqrt{3}\left(2\sqrt{3}\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)\log\left(ab+\left(-ab^2\right)^{\frac{2}{3}}(dx+c)\right)-\sqrt{3}\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)\text{lo}\right.}{54}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)/((d*x + c)^3*b + a)^2,x, algorithm="fricas")
```

```
[Out] 1/54*sqrt(3)*(2*sqrt(3)*(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x
+ b*c^3 + a)*log(a*b + (-a*b^2)^(2/3)*(d*x + c)) - sqrt(3)*(b*d^3
*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)*log(-a*b + (-a*b^
2)^(2/3)*(d*x + c) + (b*d^2*x^2 + 2*b*c*d*x + b*c^2)*(-a*b^2)^(1/
3)) - 6*(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)*arc
tan(-1/3*(sqrt(3)*a*b - 2*sqrt(3)*(-a*b^2)^(2/3)*(d*x + c))/(a*b)
) + 6*sqrt(3)*(d^2*x^2 + 2*c*d*x + c^2)*(-a*b^2)^(1/3))/((a*b*d^4
*x^3 + 3*a*b*c*d^3*x^2 + 3*a*b*c^2*d^2*x + (a*b*c^3 + a^2)*d)*(-a
*b^2)^(1/3))
```

Sympy [A] time = 6.10617, size = 105, normalized size = 0.61

$$\frac{c^2 + 2cdx + d^2x^2}{3a^2d + 3abc^3d + 9abc^2d^2x + 9abcd^3x^2 + 3abd^4x^3} + \frac{\operatorname{RootSum}\left(729t^3a^4b^2 + 1, \left(t \mapsto t\log\left(x + \frac{81t^2a^3b+c}{d}\right)\right)\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)/(a+b*(d*x+c)**3)**2,x)
```

```
[Out] (c**2 + 2*c*d*x + d**2*x**2)/(3*a**2*d + 3*a*b*c**3*d + 9*a*b*c**
2*d**2*x + 9*a*b*c*d**3*x**2 + 3*a*b*d**4*x**3) + RootSum(729*_t*
*3*a**4*b**2 + 1, Lambda(_t, _t*log(x + (81*_t**2*a**3*b + c)/d))
)/d
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{dx + c}{\left((dx + c)^3b + a\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)/((d*x + c)^3*b + a)^2,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)/((d*x + c)^3*b + a)^2, x)
```

3.2865 $\int \frac{1}{(a+b(c+dx)^3)^2}\,dx$

Optimal. Leaf size=170

$$-\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{9a^{5/3}\sqrt[3]{b}d}+\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{9a^{5/3}\sqrt[3]{b}d}-\frac{2\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{5/3}\sqrt[3]{b}d}+\frac{c+dx}{3ad\left(a+b(c+dx)^3\right)}$$

```
[Out] (c + d*x)/(3*a*d*(a + b*(c + d*x)^3)) - (2*ArcTan[(a^(1/3) - 2*b^
(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/(3*Sqrt[3]*a^(5/3)*b^(1/3)*d
) + (2*Log[a^(1/3) + b^(1/3)*(c + d*x)])/(9*a^(5/3)*b^(1/3)*d) -
Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2]/(9
*a^(5/3)*b^(1/3)*d)
```

Rubi [A] time = 0.291087, antiderivative size = 170, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.615$

$$-\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{9a^{5/3}\sqrt[3]{b}d}+\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{9a^{5/3}\sqrt[3]{b}d}-\frac{2\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{5/3}\sqrt[3]{b}d}+\frac{c+dx}{3ad\left(a+b(c+dx)^3\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(c + d*x)^3)^(-2),x]
```

```
[Out] (c + d*x)/(3*a*d*(a + b*(c + d*x)^3)) - (2*ArcTan[(a^(1/3) - 2*b^
(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/(3*Sqrt[3]*a^(5/3)*b^(1/3)*d
) + (2*Log[a^(1/3) + b^(1/3)*(c + d*x)])/(9*a^(5/3)*b^(1/3)*d) -
Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2]/(9
*a^(5/3)*b^(1/3)*d)
```

Rubi in Sympy [A] time = 35.4552, size = 158, normalized size = 0.93

$$\frac{c+dx}{3ad\left(a+b\left(c+dx\right)^3\right)}+\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}\left(c+dx\right)\right)}{9a^{\frac{5}{3}}\sqrt[3]{b}d}-\frac{\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}\left(-c-dx\right)+b^{\frac{2}{3}}\left(c+dx\right)^2\right)}{9a^{\frac{5}{3}}\sqrt[3]{b}d}-\frac{2\sqrt{3}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{9a^{\frac{5}{3}}\sqrt[3]{b}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*(d*x+c)**3)**2,x)
```

```
[Out] (c + d*x)/(3*a*d*(a + b*(c + d*x)**3)) + 2*log(a**(1/3) + b**(1/3
)*(c + d*x))/(9*a**(5/3)*b**(1/3)*d) - log(a**(2/3) + a**(1/3)*b*
*(1/3)*(-c - d*x) + b**(2/3)*(c + d*x)**2)/(9*a**(5/3)*b**(1/3)*d
) - 2*sqrt(3)*atan(sqrt(3)*(a**(1/3)/3 + b**(1/3)*(-2*c/3 - 2*d*x
/3))/a**(1/3))/(9*a**(5/3)*b**(1/3)*d)
```

Mathematica [A] time = 0.0977292, size = 151, normalized size = 0.89

$$\frac{-\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{\sqrt[3]{b}}+\frac{3a^{2/3}(c+dx)}{a+b(c+dx)^3}+\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{\sqrt[3]{b}}+\frac{2\sqrt{3}\tan^{-1}\left(\frac{2\sqrt[3]{b}(c+dx)-\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt[3]{b}}}{9a^{5/3}d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(c + d*x)^3)^(-2),x]
```

```
[Out] ((3*a^(2/3)*(c + d*x))/(a + b*(c + d*x)^3) + (2*Sqrt[3]*ArcTan[(-
a^(1/3) + 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/b^(1/3) + (2*L
og[a^(1/3) + b^(1/3)*(c + d*x)])/b^(1/3) - Log[a^(2/3) - a^(1/3)*
b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2]/b^(1/3))/(9*a^(5/3)*d)
```

Maple [C] time = 0.013, size = 127, normalized size = 0.8

$$\frac{1}{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}\left(\frac{x}{3\,a}+\frac{c}{3\,ad}\right)+\frac{2}{9\,abd}\sum_{\_R=RootOf\left(\_Z^3bd^3+3\_Z^2bcd^2+3\_Z\,bc^2d+bc^3+a\right)}\frac{\ln(x-\_R)}{d^2\_R^2+2\,cd\_R+c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*(d*x+c)^3)^2,x)
```

```
[Out] (1/3*x/a+1/3*c/d/a)/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)
+2/9/a/b/d*sum(1/(_R^2*d^2+2*_R*c*d+c^2)*ln(x-_R),_R=RootOf(_Z^3*
b*d^3+3*_Z^2*b*c*d^2+3*_Z*b*c^2*d+b*c^3+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{dx+c}{3\left(abd^4x^3+3\,abcd^3x^2+3\,abc^2d^2x+(abc^3+a^2)d\right)}+\frac{2\int\frac{1}{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}\,dx}{3\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^3*b + a)^(-2),x, algorithm="maxima")
```

```
[Out] 1/3*(d*x + c)/(a*b*d^4*x^3 + 3*a*b*c*d^3*x^2 + 3*a*b*c^2*d^2*x +
(a*b*c^3 + a^2)*d) + 2/3*integrate(1/(b*d^3*x^3 + 3*b*c*d^2*x^2 +
 3*b*c^2*d*x + b*c^3 + a), x)/a
```

Fricas [A] time = 0.218236, size = 375, normalized size = 2.21

$$-\frac{\sqrt{3}\left(\sqrt{3}\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)\log\left(a^2+\left(d^2x^2+2\,cdx+c^2\right)\left(a^2b\right)^{\frac{2}{3}}-\left(a^2b\right)^{\frac{1}{3}}(adx+ac)\right)-2\sqrt{3}\left(bd^3x^3+\right.}{27\left(abd^4x^3+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^3*b + a)^(-2),x, algorithm="fricas")
```

```
[Out] -1/27*sqrt(3)*(sqrt(3)*(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x +
 b*c^3 + a)*log(a^2 + (d^2*x^2 + 2*c*d*x + c^2)*(a^2*b)^(2/3) - (
```

```
a^2*b)^(1/3)*(a*d*x + a*c)) - 2*sqrt(3)*(b*d^3*x^3 + 3*b*c*d^2*x^
2 + 3*b*c^2*d*x + b*c^3 + a)*log((a^2*b)^(1/3)*(d*x + c) + a) - 6
*(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)*arctan(1/3
*(2*sqrt(3)*(a^2*b)^(1/3)*(d*x + c) - sqrt(3)*a)/a) - 3*sqrt(3)*(
a^2*b)^(1/3)*(d*x + c))/((a*b*d^4*x^3 + 3*a*b*c*d^3*x^2 + 3*a*b*c
^2*d^2*x + (a*b*c^3 + a^2)*d)*(a^2*b)^(1/3))
```

Sympy [A] time = 4.9404, size = 92, normalized size = 0.54

$$\frac{c+dx}{3a^2d+3abc^3d+9abc^2d^2x+9abcd^3x^2+3abd^4x^3}+\frac{\operatorname{RootSum}\left(729t^3a^5b-8,\left(t\mapsto t\log\left(x+\frac{9ta^2+2c}{2d}\right)\right)\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*(d*x+c)**3)**2,x)
```

```
[Out] (c + d*x)/(3*a**2*d + 3*a*b*c**3*d + 9*a*b*c**2*d**2*x + 9*a*b*c*
d**3*x**2 + 3*a*b*d**4*x**3) + RootSum(729*_t**3*a**5*b - 8, Lamb
da(_t, _t*log(x + (9*_t*a**2 + 2*c)/(2*d))))/d
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\left((dx+c)^3b+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^3*b + a)^(-2),x, algorithm="giac")
```

```
[Out] integrate(((d*x + c)^3*b + a)^(-2), x)
```

3.2866 $\int \frac{1}{(c+dx)(a+b(c+dx)^3)^2}\,dx$

Optimal. Leaf size=59

$$-\frac{\log\left(a+b(c+dx)^3\right)}{3a^2d}+\frac{\log(c+dx)}{a^2d}+\frac{1}{3ad\left(a+b(c+dx)^3\right)}$$

```
[Out] 1/(3*a*d*(a + b*(c + d*x)^3)) + Log[c + d*x]/(a^2*d) - Log[a + b*
(c + d*x)^3]/(3*a^2*d)
```

Rubi [A] time = 0.137501, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$-\frac{\log\left(a+b(c+dx)^3\right)}{3a^2d}+\frac{\log(c+dx)}{a^2d}+\frac{1}{3ad\left(a+b(c+dx)^3\right)}$$

Antiderivative was successfully verified.

```
[In] Int[1/((c + d*x)*(a + b*(c + d*x)^3)^2),x]
```

```
[Out] 1/(3*a*d*(a + b*(c + d*x)^3)) + Log[c + d*x]/(a^2*d) - Log[a + b*
(c + d*x)^3]/(3*a^2*d)
```

Rubi in Sympy [A] time = 14.1872, size = 49, normalized size = 0.83

$$\frac{1}{3ad\left(a+b\left(c+dx\right)^3\right)}-\frac{\log\left(a+b\left(c+dx\right)^3\right)}{3a^2d}+\frac{\log\left(\left(c+dx\right)^3\right)}{3a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(d*x+c)/(a+b*(d*x+c)**3)**2,x)
```

```
[Out] 1/(3*a*d*(a + b*(c + d*x)**3)) - log(a + b*(c + d*x)**3)/(3*a**2*
d) + log((c + d*x)**3)/(3*a**2*d)
```

Mathematica [A] time = 0.0395537, size = 48, normalized size = 0.81

$$\frac{\frac{a}{a+b(c+dx)^3}-\log\left(a+b(c+dx)^3\right)+3\log(c+dx)}{3a^2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((c + d*x)*(a + b*(c + d*x)^3)^2),x]
```

```
[Out] (a/(a + b*(c + d*x)^3) + 3*Log[c + d*x] - Log[a + b*(c + d*x)^3])
/(3*a^2*d)
```

Maple [A] time = 0.023, size = 100, normalized size = 1.7

$$\frac{1}{3\,ad\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)}-\frac{\ln\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)}{3\,a^2d}+\frac{\ln\left(dx+c\right)}{a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(d*x+c)/(a+b*(d*x+c)^3)^2,x)
```

```
[Out] 1/3/a/d/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)-1/3/a^2/d*l
n(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)+ln(d*x+c)/a^2/d
```

Maxima [A] time = 1.8593, size = 140, normalized size = 2.37

$$\frac{1}{3\,(abd^4x^3 + 3\,abcd^3x^2 + 3\,abc^2d^2x + (abc^3 + a^2)d)} - \frac{\log\left(bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3 + a\right)}{3\,a^2d} + \frac{\log\left(dx + c\right)}{a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)^2*(d*x + c)),x, algorithm="maxima")
```

```
[Out] 1/3/(a*b*d^4*x^3 + 3*a*b*c*d^3*x^2 + 3*a*b*c^2*d^2*x + (a*b*c^3 +
 a^2)*d) - 1/3*log(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^
3 + a)/(a^2*d) + log(d*x + c)/(a^2*d)
```

Fricas [A] time = 0.213629, size = 228, normalized size = 3.86

$$-\frac{\left(bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3 + a\right)\log\left(bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3 + a\right) - 3\,\left(bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3\right.}{3\,(a^2bd^4x^3 + 3\,a^2bcd^3x^2 + 3\,a^2bc^2d^2x + (a^2bc^3 + a^3)d)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)^2*(d*x + c)),x, algorithm="fricas")
```

```
[Out] -1/3*((b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)*log(b
*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a) - 3*(b*d^3*x^
3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)*log(d*x + c) - a)/(a
^2*b*d^4*x^3 + 3*a^2*b*c*d^3*x^2 + 3*a^2*b*c^2*d^2*x + (a^2*b*c^3
 + a^3)*d)
```

Sympy [A] time = 8.83108, size = 110, normalized size = 1.86

$$\frac{1}{3a^2d + 3abc^3d + 9abc^2d^2x + 9abcd^3x^2 + 3abd^4x^3} + \frac{\log\left(\frac{c}{d} + x\right)}{a^2d} - \frac{\log\left(\frac{3c^2x}{d^2} + \frac{3cx^2}{d} + x^3 + \frac{a+bc^3}{bd^3}\right)}{3a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(d*x+c)/(a+b*(d*x+c)**3)**2,x)
```

```
[Out] 1/(3*a**2*d + 3*a*b*c**3*d + 9*a*b*c**2*d**2*x + 9*a*b*c*d**3*x**
2 + 3*a*b*d**4*x**3) + log(c/d + x)/(a**2*d) - log(3*c**2*x/d**2
+ 3*c*x**2/d + x**3 + (a + b*c**3)/(b*d**3))/(3*a**2*d)
```

GIAC/XCAS [A] time = 0.217147, size = 136, normalized size = 2.31

$$-\frac{\ln\left(\left|bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3 + a\right|\right)}{3\,a^2d} + \frac{\ln\left(\left|dx + c\right|\right)}{a^2d} + \frac{1}{3\,(bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3 + a)ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)^2*(d*x + c)),x, algorithm="giac")
```

```
[Out] -1/3*ln(abs(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a))
/(a^2*d) + ln(abs(d*x + c))/(a^2*d) + 1/3/((b*d^3*x^3 + 3*b*c*d^2
*x^2 + 3*b*c^2*d*x + b*c^3 + a)*a*d)
```

3.2867 $\int \frac{1}{(c+dx)^2(a+b(c+dx)^3)^2}\,dx$

Optimal. Leaf size=189

$$-\frac{2\sqrt[3]{b}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{9a^{7/3}d}+\frac{4\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{9a^{7/3}d}+\frac{4\sqrt[3]{b}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{7/3}d}-\frac{4}{3a^2d(c+dx)}+\frac{1}{3ad(c+dx)\left(a+b(c+dx)^3\right)}$$

```
[Out] -4/(3*a^2*d*(c + d*x)) + 1/(3*a*d*(c + d*x)*(a + b*(c + d*x)^3))
+ (4*b^(1/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1
/3))])/(3*Sqrt[3]*a^(7/3)*d) + (4*b^(1/3)*Log[a^(1/3) + b^(1/3)*(
c + d*x)])/(9*a^(7/3)*d) - (2*b^(1/3)*Log[a^(2/3) - a^(1/3)*b^(1/
3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/(9*a^(7/3)*d)
```

Rubi [A] time = 0.364614, antiderivative size = 189, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429

$$-\frac{2\sqrt[3]{b}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{9a^{7/3}d}+\frac{4\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{9a^{7/3}d}+\frac{4\sqrt[3]{b}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{7/3}d}-\frac{4}{3a^2d(c+dx)}+\frac{1}{3ad(c+dx)\left(a+b(c+dx)^3\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((c + d*x)^2*(a + b*(c + d*x)^3)^2),x]
```

```
[Out] -4/(3*a^2*d*(c + d*x)) + 1/(3*a*d*(c + d*x)*(a + b*(c + d*x)^3))
+ (4*b^(1/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1
/3))])/(3*Sqrt[3]*a^(7/3)*d) + (4*b^(1/3)*Log[a^(1/3) + b^(1/3)*(
c + d*x)])/(9*a^(7/3)*d) - (2*b^(1/3)*Log[a^(2/3) - a^(1/3)*b^(1/
3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/(9*a^(7/3)*d)
```

Rubi in Sympy [A] time = 44.4005, size = 175, normalized size = 0.93

$$\frac{1}{3ad\left(a+b(c+dx)^3\right)(c+dx)}-\frac{4}{3a^2d(c+dx)}+\frac{4\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{9a^{\frac{7}{3}}d}-\frac{2\sqrt[3]{b}\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}(-c-dx)+b^{\frac{2}{3}}(c+dx)^2\right)}{9a^{\frac{7}{3}}d}+\frac{4\sqrt{3}\sqrt[3]{b}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{9a^{\frac{7}{3}}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(d*x+c)**2/(a+b*(d*x+c)**3)**2,x)
```

```
[Out] 1/(3*a*d*(a + b*(c + d*x)**3)*(c + d*x)) - 4/(3*a**2*d*(c + d*x))
 + 4*b**(1/3)*log(a**(1/3) + b**(1/3)*(c + d*x))/(9*a**(7/3)*d) -
 2*b**(1/3)*log(a**(2/3) + a**(1/3)*b**(1/3)*(-c - d*x) + b**(2/3
)*(c + d*x)**2)/(9*a**(7/3)*d) + 4*sqrt(3)*b**(1/3)*atan(sqrt(3)*
(a**(1/3)/3 + b**(1/3)*(-2*c/3 - 2*d*x/3))/a**(1/3))/(9*a**(7/3)*
d)
```

Mathematica [A] time = 0.168418, size = 168, normalized size = 0.89

$$-\frac{-2\sqrt[3]{b}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)-\frac{3\sqrt[3]{a}b(c+dx)^2}{a+b(c+dx)^3}+4\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)-4\sqrt{3}\sqrt[3]{b}\tan^{-1}\left(\frac{2\sqrt[3]{b}(c+dx)-\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{9a^{7/3}d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((c + d*x)^2*(a + b*(c + d*x)^3)^2),x]
```

```
[Out] ((-9*a^(1/3))/(c + d*x) - (3*a^(1/3)*b*(c + d*x)^2)/(a + b*(c + d
*x)^3) - 4*Sqrt[3]*b^(1/3)*ArcTan[(-a^(1/3) + 2*b^(1/3)*(c + d*x)
)/(Sqrt[3]*a^(1/3))] + 4*b^(1/3)*Log[a^(1/3) + b^(1/3)*(c + d*x)]
 - 2*b^(1/3)*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c
 + d*x)^2])/(9*a^(7/3)*d)
```

Maple [C] time = 0.021, size = 227, normalized size = 1.2

$$-\frac{bx^2d}{3a^2(bd^3x^3+3bcd^2x^2+3bc^2dx+bc^3+a)}-\frac{2bcx}{3a^2(bd^3x^3+3bcd^2x^2+3bc^2dx+bc^3+a)}-\frac{bc^2}{3a^2(bd^3x^3+3bcd^2x^2+3bc^2dx+bc^3+a)d}-\frac{4}{9a^2d}\sum_{\_R=RootOf(\_Z^3bd^3+3\_Z^2bcd^2+3\_Zbc^2d+bc^3+a)}\frac{(\_Rd+c)\ln(x-\_R)}{d^2\_R^2+2cd\_R+c^2}-\frac{1}{a^2d(dx+c)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(d*x+c)^2/(a+b*(d*x+c)^3)^2,x)
```

```
[Out] -1/3*b/a^2/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)*x^2*d-2/
3*b/a^2/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)*c*x-1/3*b/a
^2/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)*c^2/d-4/9/a^2/d*
sum((_R*d+c)/(_R^2*d^2+2*_R*c*d+c^2)*ln(x-_R),_R=RootOf(_Z^3*b*d^
3+3*_Z^2*b*c*d^2+3*_Z*b*c^2*d+b*c^3+a))-1/a^2/d/(d*x+c)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{4bd^3x^3+12bcd^2x^2+12bc^2dx+4bc^3+3a}{3(a^2bd^5x^4+4a^2bcd^4x^3+6a^2bc^2d^3x^2+(4a^2bc^3+a^3)d^2x+(a^2bc^4+a^3c)d)}-\frac{4b\int\frac{dx+c}{bd^3x^3+3bcd^2x^2+3bc^2dx+bc^3+a}\,dx}{3a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)^2*(d*x + c)^2),x, algorithm="maxima")
```

```
[Out] -1/3*(4*b*d^3*x^3 + 12*b*c*d^2*x^2 + 12*b*c^2*d*x + 4*b*c^3 + 3*a
)/(a^2*b*d^5*x^4 + 4*a^2*b*c*d^4*x^3 + 6*a^2*b*c^2*d^3*x^2 + (4*a
^2*b*c^3 + a^3)*d^2*x + (a^2*b*c^4 + a^3*c)*d) - 4/3*b*integrate(
(d*x + c)/(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a),
x)/a^2
```

Fricas [A] time = 0.229928, size = 555, normalized size = 2.94

$$-\frac{\sqrt{3}\left(2\sqrt{3}\left(bd^4x^4+4bcd^3x^3+6bc^2d^2x^2+bc^4+\left(4bc^3+a\right)dx+ac\right)\left(\frac{b}{a}\right)^{\frac{1}{3}}\log\left(bd^2x^2+2bcdx+bc^2-(adx+ac)\left(\frac{b}{a}\right)^{\frac{2}{3}}+\cdots\right.\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((d*x + c)^3*b + a)^2*(d*x + c)^2),x, algorithm="fricas")
```

```
[Out] -1/27*sqrt(3)*(2*sqrt(3)*(b*d^4*x^4 + 4*b*c*d^3*x^3 + 6*b*c^2*d^2
*x^2 + b*c^4 + (4*b*c^3 + a)*d*x + a*c)*(b/a)^(1/3)*log(b*d^2*x^2
 + 2*b*c*d*x + b*c^2 - (a*d*x + a*c)*(b/a)^(2/3) + a*(b/a)^(1/3))
 - 4*sqrt(3)*(b*d^4*x^4 + 4*b*c*d^3*x^3 + 6*b*c^2*d^2*x^2 + b*c^4
 + (4*b*c^3 + a)*d*x + a*c)*(b/a)^(1/3)*log(b*d*x + b*c + a*(b/a)
^(2/3)) - 12*(b*d^4*x^4 + 4*b*c*d^3*x^3 + 6*b*c^2*d^2*x^2 + b*c^4
 + (4*b*c^3 + a)*d*x + a*c)*(b/a)^(1/3)*arctan(1/3*(sqrt(3)*a*(b/
a)^(2/3) - 2*sqrt(3)*(b*d*x + b*c))/(a*(b/a)^(2/3))) + 3*sqrt(3)*
(4*b*d^3*x^3 + 12*b*c*d^2*x^2 + 12*b*c^2*d*x + 4*b*c^3 + 3*a))/(a
^2*b*d^5*x^4 + 4*a^2*b*c*d^4*x^3 + 6*a^2*b*c^2*d^3*x^2 + (4*a^2*b
*c^3 + a^3)*d^2*x + (a^2*b*c^4 + a^3*c)*d)
```

Sympy [A] time = 29.3626, size = 168, normalized size = 0.89

$$-\frac{3a+4bc^3+12bc^2dx+12bcd^2x^2+4bd^3x^3}{3a^3cd+3a^2bc^4d+18a^2bc^2d^3x^2+12a^2bcd^4x^3+3a^2bd^5x^4+x\left(3a^3d^2+12a^2bc^3d^2\right)}+\frac{\operatorname{RootSum}\left(729t^3a^7-64b,\left(t\mapsto t\log\left(x+\frac{81t^2a^5+16bc}{16bd}\right)\right)\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(d*x+c)**2/(a+b*(d*x+c)**3)**2,x)
```

```
[Out] -(3*a + 4*b*c**3 + 12*b*c**2*d*x + 12*b*c*d**2*x**2 + 4*b*d**3*x*
*3)/(3*a**3*c*d + 3*a**2*b*c**4*d + 18*a**2*b*c**2*d**3*x**2 + 12
*a**2*b*c*d**4*x**3 + 3*a**2*b*d**5*x**4 + x*(3*a**3*d**2 + 12*a*
*2*b*c**3*d**2)) + RootSum(729*_t**3*a**7 - 64*b, Lambda(_t, _t*l
og(x + (81*_t**2*a**5 + 16*b*c)/(16*b*d))))/d
```

GIAC/XCAS [A] time = 0.230499, size = 275, normalized size = 1.46

$$\frac{4\left(\frac{b}{ad^3}\right)^{\frac{1}{3}}\ln\left(\left|-\left(\frac{b}{ad^3}\right)^{\frac{1}{3}}-\frac{1}{(dx+c)d}\right|\right)}{9a^2}-\frac{4\sqrt{3}\left(a^2b\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(\left(\frac{b}{ad^3}\right)^{\frac{1}{3}}-\frac{2}{(dx+c)d}\right)}{3\left(\frac{b}{ad^3}\right)^{\frac{1}{3}}}\right)}{9a^3d}-\frac{2\left(a^2b\right)^{\frac{1}{3}}\ln\left(\left(\frac{b}{ad^3}\right)^{\frac{2}{3}}-\frac{\left(\frac{b}{ad^3}\right)^{\frac{1}{3}}}{(dx+c)d}+\frac{1}{(dx+c)^2d^2}\right)}{9a^3d}-\frac{1}{(dx+c)a^2d}-\frac{b}{3(dx+c)a^2\left(b+\frac{a}{(dx+c)^3}\right)d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((d*x + c)^3*b + a)^2*(d*x + c)^2),x, algorithm="giac")
```

```
[Out] 4/9*(b/(a*d^3))^(1/3)*ln(abs(-(b/(a*d^3))^(1/3) - 1/((d*x + c)*d)
))/a^2 - 4/9*sqrt(3)*(a^2*b)^(1/3)*arctan(1/3*sqrt(3)*((b/(a*d^3)
)^(1/3) - 2/((d*x + c)*d))/(b/(a*d^3))^(1/3))/(a^3*d) - 2/9*(a^2*
b)^(1/3)*ln((b/(a*d^3))^(2/3) - (b/(a*d^3))^(1/3)/((d*x + c)*d) +
 1/((d*x + c)^2*d^2))/(a^3*d) - 1/((d*x + c)*a^2*d) - 1/3*b/((d*x
 + c)*a^2*(b + a/(d*x + c)^3)*d)
```

3.2868 $\int \frac{1}{(c+dx)^3(a+b(c+dx)^3)^2}\,dx$

Optimal. Leaf size=189

$$-\frac{5b^{2/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{9a^{8/3}d}+\frac{5b^{2/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{18a^{8/3}d}+\frac{5b^{2/3}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{8/3}d}-\frac{5}{6a^2d(c+dx)^2}+\frac{1}{3ad(c+dx)^2\left(a+b(c+dx)^3\right)}$$

```
[Out] -5/(6*a^2*d*(c + d*x)^2) + 1/(3*a*d*(c + d*x)^2*(a + b*(c + d*x)^
3)) + (5*b^(2/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d*x))/(Sqrt[3]*
a^(1/3))])/(3*Sqrt[3]*a^(8/3)*d) - (5*b^(2/3)*Log[a^(1/3) + b^(1/
3)*(c + d*x)])/(9*a^(8/3)*d) + (5*b^(2/3)*Log[a^(2/3) - a^(1/3)*b
^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/(18*a^(8/3)*d)
```

Rubi [A] time = 0.368759, antiderivative size = 189, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429

$$-\frac{5b^{2/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{9a^{8/3}d}+\frac{5b^{2/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{18a^{8/3}d}+\frac{5b^{2/3}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{8/3}d}-\frac{5}{6a^2d(c+dx)^2}+\frac{1}{3ad(c+dx)^2\left(a+b(c+dx)^3\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((c + d*x)^3*(a + b*(c + d*x)^3)^2),x]
```

```
[Out] -5/(6*a^2*d*(c + d*x)^2) + 1/(3*a*d*(c + d*x)^2*(a + b*(c + d*x)^
3)) + (5*b^(2/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d*x))/(Sqrt[3]*
a^(1/3))])/(3*Sqrt[3]*a^(8/3)*d) - (5*b^(2/3)*Log[a^(1/3) + b^(1/
3)*(c + d*x)])/(9*a^(8/3)*d) + (5*b^(2/3)*Log[a^(2/3) - a^(1/3)*b
^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/(18*a^(8/3)*d)
```

Rubi in Sympy [A] time = 45.1173, size = 178, normalized size = 0.94

$$\frac{1}{3ad\left(a+b\left(c+dx\right)^3\right)\left(c+dx\right)^2}-\frac{5}{6a^2d\left(c+dx\right)^2}-\frac{5b^{\frac{2}{3}}\log\left(\sqrt[3]{a}+\sqrt[3]{b}\left(c+dx\right)\right)}{9a^{\frac{8}{3}}d}+\frac{5b^{\frac{2}{3}}\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}\left(-c-dx\right)+b^{\frac{2}{3}}\left(c+dx\right)^2\right)}{18a^{\frac{8}{3}}d}+\frac{5\sqrt{3}b^{\frac{2}{3}}\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{9a^{\frac{8}{3}}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(d*x+c)**3/(a+b*(d*x+c)**3)**2,x)
```

```
[Out] 1/(3*a*d*(a + b*(c + d*x)**3)*(c + d*x)**2) - 5/(6*a**2*d*(c + d*
x)**2) - 5*b**(2/3)*log(a**(1/3) + b**(1/3)*(c + d*x))/(9*a**(8/3
)*d) + 5*b**(2/3)*log(a**(2/3) + a**(1/3)*b**(1/3)*(-c - d*x) + b
**(2/3)*(c + d*x)**2)/(18*a**(8/3)*d) + 5*sqrt(3)*b**(2/3)*atan(s
qrt(3)*(a**(1/3)/3 + b**(1/3)*(-2*c/3 - 2*d*x/3))/a**(1/3))/(9*a*
*(8/3)*d)
```

Mathematica [A] time = 0.14356, size = 166, normalized size = 0.88

$$\frac{5b^{2/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)-\frac{6a^{2/3}b(c+dx)}{a+b(c+dx)^3}-\frac{9a^{2/3}}{(c+dx)^2}-10b^{2/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)-10\sqrt{3}b^{2/3}\tan^{-1}\left(\right.}{18a^{8/3}d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((c + d*x)^3*(a + b*(c + d*x)^3)^2),x]
```

```
[Out] ((-9*a^(2/3))/(c + d*x)^2 - (6*a^(2/3)*b*(c + d*x))/(a + b*(c + d
*x)^3) - 10*Sqrt[3]*b^(2/3)*ArcTan[(-a^(1/3) + 2*b^(1/3)*(c + d*x
))/(Sqrt[3]*a^(1/3))] - 10*b^(2/3)*Log[a^(1/3) + b^(1/3)*(c + d*x
)] + 5*b^(2/3)*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*
(c + d*x)^2])/(18*a^(8/3)*d)
```

Maple [C] time = 0.02, size = 174, normalized size = 0.9

$$-\frac{bx}{3\,a^2\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)}-\frac{bc}{3\,a^2\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)d}-\frac{5}{9\,a^2d}\sum_{\_R=RootOf\left(\_Z^3bd^3+3\_Z^2bcd^2+3\_Z\,bc^2d+bc^3+a\right)}\frac{\ln\left(x-\_R\right)}{d^2\_R^2+2\,cd\_R+c^2}-\frac{1}{2\,a^2d\left(dx+c\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(d*x+c)^3/(a+b*(d*x+c)^3)^2,x)
```

```
[Out] -1/3*b/a^2/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)*x-1/3*b/
a^2/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)*c/d-5/9/a^2/d*s
um(1/(_R^2*d^2+2*_R*c*d+c^2)*ln(x-_R),_R=RootOf(_Z^3*b*d^3+3*_Z^2
*b*c*d^2+3*_Z*b*c^2*d+b*c^3+a))-1/2/a^2/d/(d*x+c)^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{5\,bd^3x^3+15\,bcd^2x^2+15\,bc^2dx+5\,bc^3+3\,a}{6\left(a^2bd^6x^5+5\,a^2bcd^5x^4+10\,a^2bc^2d^4x^3+\left(10\,a^2bc^3+a^3\right)d^3x^2+\left(5\,a^2bc^4+2\,a^3c\right)d^2x+\left(a^2bc^5+a^3c^2\right)d\right)}-\frac{5\,b\int\frac{1}{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}\,dx}{3\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)^2*(d*x + c)^3),x, algorithm="maxima")
```

```
[Out] -1/6*(5*b*d^3*x^3 + 15*b*c*d^2*x^2 + 15*b*c^2*d*x + 5*b*c^3 + 3*a
)/(a^2*b*d^6*x^5 + 5*a^2*b*c*d^5*x^4 + 10*a^2*b*c^2*d^4*x^3 + (10
*a^2*b*c^3 + a^3)*d^3*x^2 + (5*a^2*b*c^4 + 2*a^3*c)*d^2*x + (a^2*
b*c^5 + a^3*c^2)*d) - 5/3*b*integrate(1/(b*d^3*x^3 + 3*b*c*d^2*x^
2 + 3*b*c^2*d*x + b*c^3 + a), x)/a^2
```

Fricas [A] time = 0.245212, size = 716, normalized size = 3.79

$$-\frac{\sqrt{3}\left(5\sqrt{3}\left(bd^5x^5+5\,bcd^4x^4+10\,bc^2d^3x^3+bc^5+\left(10\,bc^3+a\right)d^2x^2+ac^2+\left(5\,bc^4+2\,ac\right)dx\right)\left(-\frac{b^2}{a^2}\right)^{\frac{1}{3}}\log\left(b^2d^2x^2+2\,b^2cd\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((d*x + c)^3*b + a)^2*(d*x + c)^3),x, algorithm="fricas")
```

```
[Out] -1/54*sqrt(3)*(5*sqrt(3)*(b*d^5*x^5 + 5*b*c*d^4*x^4 + 10*b*c^2*d^
3*x^3 + b*c^5 + (10*b*c^3 + a)*d^2*x^2 + a*c^2 + (5*b*c^4 + 2*a*c
)*d*x)*(-b^2/a^2)^(1/3)*log(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2 +
 a^2*(-b^2/a^2)^(2/3) + (a*b*d*x + a*b*c)*(-b^2/a^2)^(1/3)) - 10*
sqrt(3)*(b*d^5*x^5 + 5*b*c*d^4*x^4 + 10*b*c^2*d^3*x^3 + b*c^5 + (
10*b*c^3 + a)*d^2*x^2 + a*c^2 + (5*b*c^4 + 2*a*c)*d*x)*(-b^2/a^2)
^(1/3)*log(b*d*x + b*c - a*(-b^2/a^2)^(1/3)) + 30*(b*d^5*x^5 + 5*
b*c*d^4*x^4 + 10*b*c^2*d^3*x^3 + b*c^5 + (10*b*c^3 + a)*d^2*x^2 +
 a*c^2 + (5*b*c^4 + 2*a*c)*d*x)*(-b^2/a^2)^(1/3)*arctan(1/3*(sqrt
(3)*a*(-b^2/a^2)^(1/3) + 2*sqrt(3)*(b*d*x + b*c))/(a*(-b^2/a^2)^(
1/3))) + 3*sqrt(3)*(5*b*d^3*x^3 + 15*b*c*d^2*x^2 + 15*b*c^2*d*x +
 5*b*c^3 + 3*a))/(a^2*b*d^6*x^5 + 5*a^2*b*c*d^5*x^4 + 10*a^2*b*c^
2*d^4*x^3 + (10*a^2*b*c^3 + a^3)*d^3*x^2 + (5*a^2*b*c^4 + 2*a^3*c
)*d^2*x + (a^2*b*c^5 + a^3*c^2)*d)
```

Sympy [A] time = 167.694, size = 197, normalized size = 1.04

$$-\frac{3a + 5bc^3 + 15bc^2dx + 15bcd^2x^2 + 5bd^3x^3}{6a^3c^2d + 6a^2bc^5d + 60a^2bc^2d^4x^3 + 30a^2bcd^5x^4 + 6a^2bd^6x^5 + x^2\left(6a^3d^3 + 60a^2bc^3d^3\right) + x\left(12a^3cd^2 + 30a^2bc^4d^2\right)} + \frac{\operatorname{RootSum}\left(729t^3a^8 + 125b^2, \left(t \mapsto t\log\left(x + \frac{-9ta^3+5bc}{5bd}\right)\right)\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(d*x+c)**3/(a+b*(d*x+c)**3)**2,x)
```

```
[Out] -(3*a + 5*b*c**3 + 15*b*c**2*d*x + 15*b*c*d**2*x**2 + 5*b*d**3*x*
*3)/(6*a**3*c**2*d + 6*a**2*b*c**5*d + 60*a**2*b*c**2*d**4*x**3 +
 30*a**2*b*c*d**5*x**4 + 6*a**2*b*d**6*x**5 + x**2*(6*a**3*d**3 +
 60*a**2*b*c**3*d**3) + x*(12*a**3*c*d**2 + 30*a**2*b*c**4*d**2))
 + RootSum(729*_t**3*a**8 + 125*b**2, Lambda(_t, _t*log(x + (-9*_
t*a**3 + 5*b*c)/(5*b*d))))/d
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left((dx+c)^3b+a\right)^2(dx+c)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((d*x + c)^3*b + a)^2*(d*x + c)^3),x, algorithm="giac")
```

```
[Out] integrate(1/(((d*x + c)^3*b + a)^2*(d*x + c)^3), x)
```

3.2869 $\int \frac{1}{(c+dx)^4(a+b(c+dx)^3)^2}\,dx$

Optimal. Leaf size=80

$$-\frac{2b\log(c+dx)}{a^3d}+\frac{2b\log\left(a+b(c+dx)^3\right)}{3a^3d}-\frac{b}{3a^2d\left(a+b(c+dx)^3\right)}-\frac{1}{3a^2d(c+dx)^3}$$

```
[Out] -1/(3*a^2*d*(c + d*x)^3) - b/(3*a^2*d*(a + b*(c + d*x)^3)) - (2*b
*Log[c + d*x])/(a^3*d) + (2*b*Log[a + b*(c + d*x)^3])/(3*a^3*d)
```

Rubi [A] time = 0.168354, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$-\frac{2b\log(c+dx)}{a^3d}+\frac{2b\log\left(a+b(c+dx)^3\right)}{3a^3d}-\frac{b}{3a^2d\left(a+b(c+dx)^3\right)}-\frac{1}{3a^2d(c+dx)^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((c + d*x)^4*(a + b*(c + d*x)^3)^2),x]
```

```
[Out] -1/(3*a^2*d*(c + d*x)^3) - b/(3*a^2*d*(a + b*(c + d*x)^3)) - (2*b
*Log[c + d*x])/(a^3*d) + (2*b*Log[a + b*(c + d*x)^3])/(3*a^3*d)
```

Rubi in Sympy [A] time = 17.4529, size = 73, normalized size = 0.91

$$-\frac{b}{3a^2d\left(a+b\left(c+dx\right)^3\right)}-\frac{1}{3a^2d\left(c+dx\right)^3}+\frac{2b\log\left(a+b\left(c+dx\right)^3\right)}{3a^3d}-\frac{2b\log\left(\left(c+dx\right)^3\right)}{3a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(d*x+c)**4/(a+b*(d*x+c)**3)**2,x)
```

```
[Out] -b/(3*a**2*d*(a + b*(c + d*x)**3)) - 1/(3*a**2*d*(c + d*x)**3) +
2*b*log(a + b*(c + d*x)**3)/(3*a**3*d) - 2*b*log((c + d*x)**3)/(3
*a**3*d)
```

Mathematica [A] time = 0.116521, size = 60, normalized size = 0.75

$$-\frac{a\left(\frac{b}{a+b(c+dx)^3}+\frac{1}{(c+dx)^3}\right)-2b\log\left(a+b(c+dx)^3\right)+6b\log(c+dx)}{3a^3d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((c + d*x)^4*(a + b*(c + d*x)^3)^2),x]
```

```
[Out] -(a*((c + d*x)^(-3) + b/(a + b*(c + d*x)^3)) + 6*b*Log[c + d*x] -
 2*b*Log[a + b*(c + d*x)^3])/(3*a^3*d)
```

Maple [A] time = 0.026, size = 119, normalized size = 1.5

$$-\frac{b}{3\,a^2d\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)}+\frac{2\,b\ln\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)}{3\,a^3d}-\frac{1}{3\,a^2d\left(dx+c\right)^3}-2\,\frac{b\ln\left(dx+c\right)}{a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(d*x+c)^4/(a+b*(d*x+c)^3)^2,x)
```

```
[Out] -1/3/a^2*b/d/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)+2/3/a^
3*b/d*ln(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)-1/3/a^2/d/(
d*x+c)^3-2*b*ln(d*x+c)/a^3/d
```

Maxima [A] time = 1.47557, size = 300, normalized size = 3.75

$$-\frac{2\,bd^3x^3+6\,bcd^2x^2+6\,bc^2dx+2\,bc^3+a}{3\,(a^2bd^7x^6+6\,a^2bcd^6x^5+15\,a^2bc^2d^5x^4+(20\,a^2bc^3+a^3)d^4x^3+3\,(5\,a^2bc^4+a^3c)d^3x^2+3\,(2\,a^2bc^5+a^3c^2)d^2x+(a^2bc^6+a^3}$$
$$+\frac{2\,b\log\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)}{3\,a^3d}-\frac{2\,b\log\left(dx+c\right)}{a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((d*x + c)^3*b + a)^2*(d*x + c)^4),x, algorithm="maxima")
```

```
[Out] -1/3*(2*b*d^3*x^3 + 6*b*c*d^2*x^2 + 6*b*c^2*d*x + 2*b*c^3 + a)/(a
^2*b*d^7*x^6 + 6*a^2*b*c*d^6*x^5 + 15*a^2*b*c^2*d^5*x^4 + (20*a^2
*b*c^3 + a^3)*d^4*x^3 + 3*(5*a^2*b*c^4 + a^3*c)*d^3*x^2 + 3*(2*a^
2*b*c^5 + a^3*c^2)*d^2*x + (a^2*b*c^6 + a^3*c^3)*d) + 2/3*b*log(b
*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)/(a^3*d) - 2*b
*log(d*x + c)/(a^3*d)
```

Fricas [A] time = 0.248337, size = 582, normalized size = 7.28

$$-\frac{2\,abd^3x^3+6\,abcd^2x^2+6\,abc^2dx+2\,abc^3+a^2-2\left(b^2d^6x^6+6\,b^2cd^5x^5+15\,b^2c^2d^4x^4+b^2c^6+\left(20\,b^2c^3+ab\right)d^3x^3+abc^3}{3\,(a^3bd^7x^6+6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((d*x + c)^3*b + a)^2*(d*x + c)^4),x, algorithm="fricas")
```

```
[Out] -1/3*(2*a*b*d^3*x^3 + 6*a*b*c*d^2*x^2 + 6*a*b*c^2*d*x + 2*a*b*c^3
 + a^2 - 2*(b^2*d^6*x^6 + 6*b^2*c*d^5*x^5 + 15*b^2*c^2*d^4*x^4 +
b^2*c^6 + (20*b^2*c^3 + a*b)*d^3*x^3 + a*b*c^3 + 3*(5*b^2*c^4 + a
*b*c)*d^2*x^2 + 3*(2*b^2*c^5 + a*b*c^2)*d*x)*log(b*d^3*x^3 + 3*b*
c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a) + 6*(b^2*d^6*x^6 + 6*b^2*c*d
^5*x^5 + 15*b^2*c^2*d^4*x^4 + b^2*c^6 + (20*b^2*c^3 + a*b)*d^3*x^
3 + a*b*c^3 + 3*(5*b^2*c^4 + a*b*c)*d^2*x^2 + 3*(2*b^2*c^5 + a*b*
c^2)*d*x)*log(d*x + c))/(a^3*b*d^7*x^6 + 6*a^3*b*c*d^6*x^5 + 15*a
^3*b*c^2*d^5*x^4 + (20*a^3*b*c^3 + a^4)*d^4*x^3 + 3*(5*a^3*b*c^4
+ a^4*c)*d^3*x^2 + 3*(2*a^3*b*c^5 + a^4*c^2)*d^2*x + (a^3*b*c^6 +
 a^4*c^3)*d)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(d*x+c)**4/(a+b*(d*x+c)**3)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.224616, size = 88, normalized size = 1.1

$$\frac{2\,b\ln\left(\left|-b-\frac{a}{(dx+c)^3}\right|\right)}{3\,a^3d}+\frac{b^2}{3\,a^3\left(b+\frac{a}{(dx+c)^3}\right)d}-\frac{1}{3\,(dx+c)^3a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)^2*(d*x + c)^4),x, algorithm="giac")
```

```
[Out] 2/3*b*ln(abs(-b - a/(d*x + c)^3))/(a^3*d) + 1/3*b^2/(a^3*(b + a/(
d*x + c)^3)*d) - 1/3/((d*x + c)^3*a^2*d)
```

3.2870 $\int \frac{(c+dx)^4}{(a+b(c+dx)^3)^3}\,dx$

Optimal. Leaf size=205

$$-\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{27a^{4/3}b^{5/3}d}+\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{54a^{4/3}b^{5/3}d}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{4/3}b^{5/3}d}+\frac{(c+dx)^2}{9abd\,(a+b(c+dx)^3)}-\frac{(c+dx)^2}{6bd\,(a+b(c+dx)^3)^2}$$

```
[Out] -(c + d*x)^2/(6*b*d*(a + b*(c + d*x)^3)^2) + (c + d*x)^2/(9*a*b*d
*(a + b*(c + d*x)^3)) - ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d*x))/(S
qrt[3]*a^(1/3))]/(9*Sqrt[3]*a^(4/3)*b^(5/3)*d) - Log[a^(1/3) + b^
(1/3)*(c + d*x)]/(27*a^(4/3)*b^(5/3)*d) + Log[a^(2/3) - a^(1/3)*b
^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2]/(54*a^(4/3)*b^(5/3)*d)
```

Rubi [A] time = 0.405762, antiderivative size = 205, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429

$$-\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{27a^{4/3}b^{5/3}d}+\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{54a^{4/3}b^{5/3}d}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{4/3}b^{5/3}d}+\frac{(c+dx)^2}{9abd\,(a+b(c+dx)^3)}-\frac{(c+dx)^2}{6bd\,(a+b(c+dx)^3)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)^4/(a + b*(c + d*x)^3)^3,x]
```

```
[Out] -(c + d*x)^2/(6*b*d*(a + b*(c + d*x)^3)^2) + (c + d*x)^2/(9*a*b*d
*(a + b*(c + d*x)^3)) - ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d*x))/(S
qrt[3]*a^(1/3))]/(9*Sqrt[3]*a^(4/3)*b^(5/3)*d) - Log[a^(1/3) + b^
(1/3)*(c + d*x)]/(27*a^(4/3)*b^(5/3)*d) + Log[a^(2/3) - a^(1/3)*b
^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2]/(54*a^(4/3)*b^(5/3)*d)
```

Rubi in Sympy [A] time = 45.4543, size = 182, normalized size = 0.89

$$-\frac{(c+dx)^2}{6bd\left(a+b\left(c+dx\right)^3\right)^2}+\frac{(c+dx)^2}{9abd\left(a+b\left(c+dx\right)^3\right)}-\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}\left(c+dx\right)\right)}{27a^{\frac{4}{3}}b^{\frac{5}{3}}d}+\frac{\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}\left(-c-dx\right)+b^{\frac{2}{3}}\left(c+dx\right)^2\right)}{54a^{\frac{4}{3}}b^{\frac{5}{3}}d}-\frac{\sqrt{3}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{27a^{\frac{4}{3}}b^{\frac{5}{3}}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**4/(a+b*(d*x+c)**3)**3,x)
```

```
[Out] -(c + d*x)**2/(6*b*d*(a + b*(c + d*x)**3)**2) + (c + d*x)**2/(9*a
*b*d*(a + b*(c + d*x)**3)) - log(a**(1/3) + b**(1/3)*(c + d*x))/(
27*a**(4/3)*b**(5/3)*d) + log(a**(2/3) + a**(1/3)*b**(1/3)*(-c -
d*x) + b**(2/3)*(c + d*x)**2)/(54*a**(4/3)*b**(5/3)*d) - sqrt(3)*
atan(sqrt(3)*(a**(1/3)/3 + b**(1/3)*(-2*c/3 - 2*d*x/3))/a**(1/3))
/(27*a**(4/3)*b**(5/3)*d)
```

Mathematica [A] time = 0.339446, size = 182, normalized size = 0.89

$$\frac{\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{a^{4/3}}-\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{a^{4/3}}+\frac{2\sqrt{3}\tan^{-1}\left(\frac{2\sqrt[3]{b}(c+dx)-\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{a^{4/3}}+\frac{6b^{2/3}(c+dx)^2}{a(a+b(c+dx)^3)}-\frac{9b^{2/3}(c+dx)^2}{(a+b(c+dx)^3)^2}}{54b^{5/3}d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c + d*x)^4/(a + b*(c + d*x)^3)^3,x]
```

```
[Out] ((-9*b^(2/3)*(c + d*x)^2)/(a + b*(c + d*x)^3)^2 + (6*b^(2/3)*(c +
 d*x)^2)/(a*(a + b*(c + d*x)^3)) + (2*Sqrt[3]*ArcTan[(-a^(1/3) +
2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/a^(4/3) - (2*Log[a^(1/3)
 + b^(1/3)*(c + d*x)])/a^(4/3) + Log[a^(2/3) - a^(1/3)*b^(1/3)*(c
 + d*x) + b^(2/3)*(c + d*x)^2]/a^(4/3))/(54*b^(5/3)*d)
```

Maple [C] time = 0.028, size = 214, normalized size = 1.

$$\frac{1}{(bd^3x^3+3bcd^2x^2+3bc^2dx+bc^3+a)^2}\left(\frac{d^4x^5}{9a}+\frac{5cd^3x^4}{9a}+\frac{10c^2d^2x^3}{9a}-\frac{d(-20bc^3+a)x^2}{18ab}-\frac{c(-5bc^3+a)x}{9ab}-\frac{c^2(-2bc^3\ldots}{18bd\ldots}\right.$$
$$+\frac{1}{27ab^2d}\sum_{\_R=RootOf(\_Z^3bd^3+3\_Z^2bcd^2+3\_Zbc^2d+bc^3+a)}\frac{(\_Rd+c)\ln(x-\_R)}{d^2\_R^2+2cd\_R+c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^4/(a+b*(d*x+c)^3)^3,x)
```

```
[Out] (1/9*d^4/a*x^5+5/9*c*d^3/a*x^4+10/9*c^2*d^2/a*x^3-1/18/b*d*(-20*b
*c^3+a)/a*x^2-1/9/b*c*(-5*b*c^3+a)/a*x-1/18/b*c^2/d*(-2*b*c^3+a)/
a)/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2+1/27/a/b^2/d*s
um((_R*d+c)/(_R^2*d^2+2*_R*c*d+c^2)*ln(x-_R),_R=RootOf(_Z^3*b*d^3
+3*_Z^2*b*c*d^2+3*_Z*b*c^2*d+b*c^3+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{2bd^5x^5+10bcd^4x^4+20bc^2d^3x^3+2bc^5+\left(20bc^3-a\right)d^2x^2-ac^2+2\left(5bc^4-ac\right)dx}{18\left(ab^3d^7x^6+6ab^3cd^6x^5+15ab^3c^2d^5x^4+2\left(10ab^3c^3+a^2b^2\right)d^4x^3+3\left(5ab^3c^4+2a^2b^2c\right)d^3x^2+6\left(ab^3c^5+a^2b^2c^2\right)d^2x+(ab\ldots\right.}$$
$$+\frac{\int\frac{dx+c}{bd^3x^3+3bcd^2x^2+3bc^2dx+bc^3+a}\,dx}{9ab}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^4/((d*x + c)^3*b + a)^3,x, algorithm="maxima")
```

```
[Out] 1/18*(2*b*d^5*x^5 + 10*b*c*d^4*x^4 + 20*b*c^2*d^3*x^3 + 2*b*c^5 +
 (20*b*c^3 - a)*d^2*x^2 - a*c^2 + 2*(5*b*c^4 - a*c)*d*x)/(a*b^3*d
^7*x^6 + 6*a*b^3*c*d^6*x^5 + 15*a*b^3*c^2*d^5*x^4 + 2*(10*a*b^3*c
^3 + a^2*b^2)*d^4*x^3 + 3*(5*a*b^3*c^4 + 2*a^2*b^2*c)*d^3*x^2 + 6
*(a*b^3*c^5 + a^2*b^2*c^2)*d^2*x + (a*b^3*c^6 + 2*a^2*b^2*c^3 + a
^3*b)*d) + 1/9*integrate((d*x + c)/(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3
*b*c^2*d*x + b*c^3 + a), x)/(a*b)
```

Fricas [A] time = 0.241558, size = 952, normalized size = 4.64

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^4/((d*x + c)^3*b + a)^3,x, algorithm="fricas")
```

```
[Out] 1/162*sqrt(3)*(2*sqrt(3)*(b^2*d^6*x^6 + 6*b^2*c*d^5*x^5 + 15*b^2*
c^2*d^4*x^4 + b^2*c^6 + 2*(10*b^2*c^3 + a*b)*d^3*x^3 + 2*a*b*c^3
+ 3*(5*b^2*c^4 + 2*a*b*c)*d^2*x^2 + 6*(b^2*c^5 + a*b*c^2)*d*x + a
^2)*log(a*b + (-a*b^2)^(2/3)*(d*x + c)) - sqrt(3)*(b^2*d^6*x^6 +
6*b^2*c*d^5*x^5 + 15*b^2*c^2*d^4*x^4 + b^2*c^6 + 2*(10*b^2*c^3 +
a*b)*d^3*x^3 + 2*a*b*c^3 + 3*(5*b^2*c^4 + 2*a*b*c)*d^2*x^2 + 6*(b
^2*c^5 + a*b*c^2)*d*x + a^2)*log(-a*b + (-a*b^2)^(2/3)*(d*x + c)
+ (b*d^2*x^2 + 2*b*c*d*x + b*c^2)*(-a*b^2)^(1/3)) - 6*(b^2*d^6*x^
6 + 6*b^2*c*d^5*x^5 + 15*b^2*c^2*d^4*x^4 + b^2*c^6 + 2*(10*b^2*c^
3 + a*b)*d^3*x^3 + 2*a*b*c^3 + 3*(5*b^2*c^4 + 2*a*b*c)*d^2*x^2 +
6*(b^2*c^5 + a*b*c^2)*d*x + a^2)*arctan(-1/3*(sqrt(3)*a*b - 2*sqr
t(3)*(-a*b^2)^(2/3)*(d*x + c))/(a*b)) + 3*sqrt(3)*(2*b*d^5*x^5 +
10*b*c*d^4*x^4 + 20*b*c^2*d^3*x^3 + 2*b*c^5 + (20*b*c^3 - a)*d^2*
x^2 - a*c^2 + 2*(5*b*c^4 - a*c)*d*x)*(-a*b^2)^(1/3))/((a*b^3*d^7*
x^6 + 6*a*b^3*c*d^6*x^5 + 15*a*b^3*c^2*d^5*x^4 + 2*(10*a*b^3*c^3
+ a^2*b^2)*d^4*x^3 + 3*(5*a*b^3*c^4 + 2*a^2*b^2*c)*d^3*x^2 + 6*(a
*b^3*c^5 + a^2*b^2*c^2)*d^2*x + (a*b^3*c^6 + 2*a^2*b^2*c^3 + a^3*
b)*d)*(-a*b^2)^(1/3))
```

Sympy [A] time = 118.13, size = 287, normalized size = 1.4

$$\frac{-ac^2 + 2bc^5 + 20bc^2d^3x^3 + 10bcd^4x^4 + 2bd^5x^5 + x^2\left(-ad^2 + 20bc^3d^2\right) + x\left(-2acd + \right.}{18a^3bd + 36a^2b^2c^3d + 18ab^3c^6d + 270ab^3c^2d^5x^4 + 108ab^3cd^6x^5 + 18ab^3d^7x^6 + x^3\left(36a^2b^2d^4 + 360ab^3c^3d^4\right) + x^2\left(108a^2b^2cd\right.}$$
$$+ \frac{\operatorname{RootSum}\left(19683t^3a^4b^5 + 1, \left(t \mapsto t\log\left(x + \frac{729t^2a^3b^3+c}{d}\right)\right)\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**4/(a+b*(d*x+c)**3)**3,x)
```

```
[Out] (-a*c**2 + 2*b*c**5 + 20*b*c**2*d**3*x**3 + 10*b*c*d**4*x**4 + 2*
b*d**5*x**5 + x**2*(-a*d**2 + 20*b*c**3*d**2) + x*(-2*a*c*d + 10*
b*c**4*d))/(18*a**3*b*d + 36*a**2*b**2*c**3*d + 18*a*b**3*c**6*d
+ 270*a*b**3*c**2*d**5*x**4 + 108*a*b**3*c*d**6*x**5 + 18*a*b**3*
d**7*x**6 + x**3*(36*a**2*b**2*d**4 + 360*a*b**3*c**3*d**4) + x**
2*(108*a**2*b**2*c*d**3 + 270*a*b**3*c**4*d**3) + x*(108*a**2*b**
2*c**2*d**2 + 108*a*b**3*c**5*d**2)) + RootSum(19683*_t**3*a**4*b
**5 + 1, Lambda(_t, _t*log(x + (729*_t**2*a**3*b**3 + c)/d)))/d
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx+c)^4}{\left((dx+c)^3b+a\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^4/((d*x + c)^3*b + a)^3,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^4/((d*x + c)^3*b + a)^3, x)
```

3.2871 $\int \frac{(c+dx)^3}{(a+b(c+dx)^3)^3} dx$

Optimal. Leaf size=201

$$\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{27a^{5/3}b^{4/3}d}-\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{54a^{5/3}b^{4/3}d}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{5/3}b^{4/3}d}+\frac{c+dx}{18abd\,(a+b(c+dx)^3)}-\frac{c+dx}{6bd\,(a+b(c+dx)^3)^2}$$

```
[Out] -(c + d*x)/(6*b*d*(a + b*(c + d*x)^3)^2) + (c + d*x)/(18*a*b*d*(a
 + b*(c + d*x)^3)) - ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d*x))/(Sqrt
[3]*a^(1/3))]/(9*Sqrt[3]*a^(5/3)*b^(4/3)*d) + Log[a^(1/3) + b^(1/
3)*(c + d*x)]/(27*a^(5/3)*b^(4/3)*d) - Log[a^(2/3) - a^(1/3)*b^(1
/3)*(c + d*x) + b^(2/3)*(c + d*x)^2]/(54*a^(5/3)*b^(4/3)*d)
```

Rubi [A] time = 0.394964, antiderivative size = 201, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429

$$\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{27a^{5/3}b^{4/3}d}-\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{54a^{5/3}b^{4/3}d}-\frac{\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{5/3}b^{4/3}d}+\frac{c+dx}{18abd\,(a+b(c+dx)^3)}-\frac{c+dx}{6bd\,(a+b(c+dx)^3)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)^3/(a + b*(c + d*x)^3)^3,x]
```

```
[Out] -(c + d*x)/(6*b*d*(a + b*(c + d*x)^3)^2) + (c + d*x)/(18*a*b*d*(a
 + b*(c + d*x)^3)) - ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d*x))/(Sqrt
[3]*a^(1/3))]/(9*Sqrt[3]*a^(5/3)*b^(4/3)*d) + Log[a^(1/3) + b^(1/
3)*(c + d*x)]/(27*a^(5/3)*b^(4/3)*d) - Log[a^(2/3) - a^(1/3)*b^(1
/3)*(c + d*x) + b^(2/3)*(c + d*x)^2]/(54*a^(5/3)*b^(4/3)*d)
```

Rubi in Sympy [A] time = 45.306, size = 178, normalized size = 0.89

$$-\frac{c+dx}{6bd\left(a+b\left(c+dx\right)^3\right)^2}+\frac{c+dx}{18abd\left(a+b\left(c+dx\right)^3\right)}+\frac{\log\left(\sqrt[3]{a}+\sqrt[3]{b}\left(c+dx\right)\right)}{27a^{\frac{5}{3}}b^{\frac{4}{3}}d}-\frac{\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}\left(-c-dx\right)+b^{\frac{2}{3}}\left(c+dx\right)^2\right)}{54a^{\frac{5}{3}}b^{\frac{4}{3}}d}-\frac{\sqrt{3}\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{27a^{\frac{5}{3}}b^{\frac{4}{3}}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**3/(a+b*(d*x+c)**3)**3,x)
```

```
[Out] -(c + d*x)/(6*b*d*(a + b*(c + d*x)**3)**2) + (c + d*x)/(18*a*b*d*
(a + b*(c + d*x)**3)) + log(a**(1/3) + b**(1/3)*(c + d*x))/(27*a*
*(5/3)*b**(4/3)*d) - log(a**(2/3) + a**(1/3)*b**(1/3)*(-c - d*x)
+ b**(2/3)*(c + d*x)**2)/(54*a**(5/3)*b**(4/3)*d) - sqrt(3)*atan(
sqrt(3)*(a**(1/3)/3 + b**(1/3)*(-2*c/3 - 2*d*x/3))/a**(1/3))/(27*
a**(5/3)*b**(4/3)*d)
```

Mathematica [A] time = 0.224908, size = 179, normalized size = 0.89

$$-\frac{\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{a^{5/3}}+\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{a^{5/3}}+\frac{2\sqrt{3}\tan^{-1}\left(\frac{2\sqrt[3]{b}(c+dx)-\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{a^{5/3}}+\frac{3\sqrt[3]{b}(c+dx)}{a(a+b(c+dx)^3)}-\frac{9\sqrt[3]{b}(c+dx)}{(a+b(c+dx)^3)^2}}{54b^{4/3}d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c + d*x)^3/(a + b*(c + d*x)^3)^3,x]
```

```
[Out] ((-9*b^(1/3)*(c + d*x))/(a + b*(c + d*x)^3)^2 + (3*b^(1/3)*(c + d
*x))/(a*(a + b*(c + d*x)^3)) + (2*Sqrt[3]*ArcTan[(-a^(1/3) + 2*b^
(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/a^(5/3) + (2*Log[a^(1/3) + b
^(1/3)*(c + d*x)])/a^(5/3) - Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d
*x) + b^(2/3)*(c + d*x)^2]/a^(5/3))/(54*b^(4/3)*d)
```

Maple [C] time = 0.025, size = 186, normalized size = 0.9

$$\frac{1}{(bd^3x^3+3bcd^2x^2+3bc^2dx+bc^3+a)^2}\left(\frac{d^3x^4}{18a}+\frac{2cd^2x^3}{9a}+\frac{c^2dx^2}{3a}-\frac{(-2bc^3+a)x}{9ab}-\frac{c(-bc^3+2a)}{18abd}\right)+\frac{1}{27ab^2d}\sum_{\_R=RootOf(\_Z^3bd^3+3\_Z^2bcd^2+3\_Zbc^2d+bc^3+a)}\frac{\ln(x-\_R)}{d^2\_R^2+2cd\_R+c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^3/(a+b*(d*x+c)^3)^3,x)
```

```
[Out] (1/18*d^3/a*x^4+2/9*c*d^2/a*x^3+1/3*c^2*d/a*x^2-1/9/b*(-2*b*c^3+a
)/a*x-1/18/b*c/d*(-b*c^3+2*a)/a)/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2
*d*x+b*c^3+a)^2+1/27/b^2/a/d*sum(1/(_R^2*d^2+2*_R*c*d+c^2)*ln(x-_
R),_R=RootOf(_Z^3*b*d^3+3*_Z^2*b*c*d^2+3*_Z*b*c^2*d+b*c^3+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{bd^4x^4+4bcd^3x^3+6bc^2d^2x^2+bc^4+2(2bc^3-a)dx-2ac}{18(ab^3d^7x^6+6ab^3cd^6x^5+15ab^3c^2d^5x^4+2(10ab^3c^3+a^2b^2)d^4x^3+3(5ab^3c^4+2a^2b^2c)d^3x^2+6(ab^3c^5+a^2b^2c^2)d^2x+(ab}+\frac{\int\frac{1}{bd^3x^3+3bcd^2x^2+3bc^2dx+bc^3+a}\,dx}{9ab}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^3/((d*x + c)^3*b + a)^3,x, algorithm="maxima")
```

```
[Out] 1/18*(b*d^4*x^4 + 4*b*c*d^3*x^3 + 6*b*c^2*d^2*x^2 + b*c^4 + 2*(2*
b*c^3 - a)*d*x - 2*a*c)/(a*b^3*d^7*x^6 + 6*a*b^3*c*d^6*x^5 + 15*a
*b^3*c^2*d^5*x^4 + 2*(10*a*b^3*c^3 + a^2*b^2)*d^4*x^3 + 3*(5*a*b^
3*c^4 + 2*a^2*b^2*c)*d^3*x^2 + 6*(a*b^3*c^5 + a^2*b^2*c^2)*d^2*x
+ (a*b^3*c^6 + 2*a^2*b^2*c^3 + a^3*b)*d) + 1/9*integrate(1/(b*d^3
*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a), x)/(a*b)
```

Fricas [A] time = 0.244056, size = 905, normalized size = 4.5

$$-\frac{\sqrt{3}\left(\sqrt{3}\left(b^2d^6x^6+6b^2cd^5x^5+15b^2c^2d^4x^4+b^2c^6+2\left(10b^2c^3+ab\right)d^3x^3+2abc^3+3\left(5b^2c^4+2abc\right)d^2x^2+6\left(b^2c^5+abc^2\right.\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^3/((d*x + c)^3*b + a)^3,x, algorithm="fricas")
```

```
[Out] -1/162*sqrt(3)*(sqrt(3)*(b^2*d^6*x^6 + 6*b^2*c*d^5*x^5 + 15*b^2*c
^2*d^4*x^4 + b^2*c^6 + 2*(10*b^2*c^3 + a*b)*d^3*x^3 + 2*a*b*c^3 +
 3*(5*b^2*c^4 + 2*a*b*c)*d^2*x^2 + 6*(b^2*c^5 + a*b*c^2)*d*x + a^
2)*log(a^2 + (d^2*x^2 + 2*c*d*x + c^2)*(a^2*b)^(2/3) - (a^2*b)^(1
/3)*(a*d*x + a*c)) - 2*sqrt(3)*(b^2*d^6*x^6 + 6*b^2*c*d^5*x^5 + 1
5*b^2*c^2*d^4*x^4 + b^2*c^6 + 2*(10*b^2*c^3 + a*b)*d^3*x^3 + 2*a*
b*c^3 + 3*(5*b^2*c^4 + 2*a*b*c)*d^2*x^2 + 6*(b^2*c^5 + a*b*c^2)*d
*x + a^2)*log((a^2*b)^(1/3)*(d*x + c) + a) - 6*(b^2*d^6*x^6 + 6*b
^2*c*d^5*x^5 + 15*b^2*c^2*d^4*x^4 + b^2*c^6 + 2*(10*b^2*c^3 + a*b
)*d^3*x^3 + 2*a*b*c^3 + 3*(5*b^2*c^4 + 2*a*b*c)*d^2*x^2 + 6*(b^2*
c^5 + a*b*c^2)*d*x + a^2)*arctan(1/3*(2*sqrt(3)*(a^2*b)^(1/3)*(d*
x + c) - sqrt(3)*a)/a) - 3*sqrt(3)*(b*d^4*x^4 + 4*b*c*d^3*x^3 + 6
*b*c^2*d^2*x^2 + b*c^4 + 2*(2*b*c^3 - a)*d*x - 2*a*c)*(a^2*b)^(1/
3))/((a*b^3*d^7*x^6 + 6*a*b^3*c*d^6*x^5 + 15*a*b^3*c^2*d^5*x^4 +
2*(10*a*b^3*c^3 + a^2*b^2)*d^4*x^3 + 3*(5*a*b^3*c^4 + 2*a^2*b^2*c
)*d^3*x^2 + 6*(a*b^3*c^5 + a^2*b^2*c^2)*d^2*x + (a*b^3*c^6 + 2*a^
2*b^2*c^3 + a^3*b)*d)*(a^2*b)^(1/3))
```

Sympy [A] time = 99.5101, size = 260, normalized size = 1.29

$$\frac{-2ac + bc^4 + 6bc^2d^2x^2 + 4bcd^3x^3 + bd^4x^4 + x\left(-2ad + 4bc^3d\right)}{18a^3bd + 36a^2b^2c^3d + 18ab^3c^6d + 270ab^3c^2d^5x^4 + 108ab^3cd^6x^5 + 18ab^3d^7x^6 + x^3\left(36a^2b^2d^4 + 360ab^3c^3d^4\right) + x^2\left(108a^2b^2cd\cdots\right.} + \frac{\operatorname{RootSum}\left(19683t^3a^5b^4 - 1, \left(t \mapsto t\log\left(x + \frac{27ta^2b+c}{d}\right)\right)\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**3/(a+b*(d*x+c)**3)**3,x)
```

```
[Out] (-2*a*c + b*c**4 + 6*b*c**2*d**2*x**2 + 4*b*c*d**3*x**3 + b*d**4*
x**4 + x*(-2*a*d + 4*b*c**3*d))/(18*a**3*b*d + 36*a**2*b**2*c**3*
d + 18*a*b**3*c**6*d + 270*a*b**3*c**2*d**5*x**4 + 108*a*b**3*c*d
**6*x**5 + 18*a*b**3*d**7*x**6 + x**3*(36*a**2*b**2*d**4 + 360*a*
b**3*c**3*d**4) + x**2*(108*a**2*b**2*c*d**3 + 270*a*b**3*c**4*d*
*3) + x*(108*a**2*b**2*c**2*d**2 + 108*a*b**3*c**5*d**2)) + RootS
um(19683*_t**3*a**5*b**4 - 1, Lambda(_t, _t*log(x + (27*_t*a**2*b
 + c)/d)))/d
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx + c)^3}{\left((dx + c)^3 b + a\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^3/((d*x + c)^3*b + a)^3,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)^3/((d*x + c)^3*b + a)^3, x)
```

3.2872 $\int \frac{(c+dx)^2}{(a+b(c+dx)^3)^3} \, dx$

Optimal. Leaf size=23

$$-\frac{1}{6bd\,(a+b(c+dx)^3)^2}$$

```
[Out] -1/(6*b*d*(a + b*(c + d*x)^3)^2)
```

Rubi [A] time = 0.0170314, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$

$$-\frac{1}{6bd\,(a+b(c+dx)^3)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)^2/(a + b*(c + d*x)^3)^3,x]

[Out] -1/(6*b*d*(a + b*(c + d*x)^3)^2)
```

Rubi in Sympy [A] time = 4.04355, size = 19, normalized size = 0.83

$$-\frac{1}{6bd\left(a+b\left(c+dx\right)^3\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**2/(a+b*(d*x+c)**3)**3,x)

[Out] -1/(6*b*d*(a + b*(c + d*x)**3)**2)
```

Mathematica [A] time = 0.0238455, size = 23, normalized size = 1.

$$-\frac{1}{6bd\,(a+b(c+dx)^3)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c + d*x)^2/(a + b*(c + d*x)^3)^3,x]

[Out] -1/(6*b*d*(a + b*(c + d*x)^3)^2)
```

Maple [B] time = 0.001, size = 44, normalized size = 1.9

$$-\frac{1}{6\,bd\,(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^2/(a+b*(d*x+c)^3)^3,x)

[Out] -1/6/b/d/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2
```

Maxima [A] time = 1.3381, size = 28, normalized size = 1.22

$$-\frac{1}{6\left((dx+c)^3b+a\right)^2bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^2/((d*x + c)^3*b + a)^3,x, algorithm="maxima")
```

```
[Out] -1/6/(((d*x + c)^3*b + a)^2*b*d)
```

Fricas [A] time = 0.227018, size = 180, normalized size = 7.83

$$-\frac{1}{6\,(b^3d^7x^6+6\,b^3cd^6x^5+15\,b^3c^2d^5x^4+2\,(10\,b^3c^3+ab^2)d^4x^3+3\,(5\,b^3c^4+2\,ab^2c)d^3x^2+6\,(b^3c^5+ab^2c^2)d^2x+(b^3c^6+2\,ab^2c^3+a^2b)d)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^2/((d*x + c)^3*b + a)^3,x, algorithm="fricas")
```

```
[Out] -1/6/(b^3*d^7*x^6 + 6*b^3*c*d^6*x^5 + 15*b^3*c^2*d^5*x^4 + 2*(10*
b^3*c^3 + a*b^2)*d^4*x^3 + 3*(5*b^3*c^4 + 2*a*b^2*c)*d^3*x^2 + 6*
(b^3*c^5 + a*b^2*c^2)*d^2*x + (b^3*c^6 + 2*a*b^2*c^3 + a^2*b)*d)
```

Sympy [A] time = 84.02, size = 153, normalized size = 6.65

$$-\frac{1}{6a^2bd+12ab^2c^3d+6b^3c^6d+90b^3c^2d^5x^4+36b^3cd^6x^5+6b^3d^7x^6+x^3\left(12ab^2d^4+120b^3c^3d^4\right)+x^2\left(36ab^2cd^3+90b^3c^4d^3\right)+x\left(36ab^2c^2d^2+36b^3c^5d^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**2/(a+b*(d*x+c)**3)**3,x)
```

```
[Out] -1/(6*a**2*b*d + 12*a*b**2*c**3*d + 6*b**3*c**6*d + 90*b**3*c**2*
d**5*x**4 + 36*b**3*c*d**6*x**5 + 6*b**3*d**7*x**6 + x**3*(12*a*b
**2*d**4 + 120*b**3*c**3*d**4) + x**2*(36*a*b**2*c*d**3 + 90*b**3
*c**4*d**3) + x*(36*a*b**2*c**2*d**2 + 36*b**3*c**5*d**2))
```

GIAC/XCAS [A] time = 0.214606, size = 28, normalized size = 1.22

$$-\frac{1}{6\left((dx+c)^3b+a\right)^2bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^2/((d*x + c)^3*b + a)^3,x, algorithm="giac")
```

```
[Out] -1/6/(((d*x + c)^3*b + a)^2*b*d)
```

3.2873 $\int \frac{c+dx}{(a+b(c+dx)^3)^3} dx$

Optimal. Leaf size=202

$$-\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{27a^{7/3}b^{2/3}d}+\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{27a^{7/3}b^{2/3}d}-\frac{2\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{7/3}b^{2/3}d}+\frac{2(c+dx)^2}{9a^2d\,(a+b(c+dx)^3)}+\frac{(c+dx)^2}{6ad\,(a+b(c+dx)^3)^2}$$

```
[Out] (c + d*x)^2/(6*a*d*(a + b*(c + d*x)^3)^2) + (2*(c + d*x)^2)/(9*a^
2*d*(a + b*(c + d*x)^3)) - (2*ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d*
x))/(Sqrt[3]*a^(1/3))])/(9*Sqrt[3]*a^(7/3)*b^(2/3)*d) - (2*Log[a^
(1/3) + b^(1/3)*(c + d*x)])/(27*a^(7/3)*b^(2/3)*d) + Log[a^(2/3)
- a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2]/(27*a^(7/3)*b^
(2/3)*d)
```

Rubi [A] time = 0.379607, antiderivative size = 202, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 8, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.421

$$-\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{27a^{7/3}b^{2/3}d}+\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{27a^{7/3}b^{2/3}d}-\frac{2\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{7/3}b^{2/3}d}+\frac{2(c+dx)^2}{9a^2d\,(a+b(c+dx)^3)}+\frac{(c+dx)^2}{6ad\,(a+b(c+dx)^3)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)/(a + b*(c + d*x)^3)^3,x]
```

```
[Out] (c + d*x)^2/(6*a*d*(a + b*(c + d*x)^3)^2) + (2*(c + d*x)^2)/(9*a^
2*d*(a + b*(c + d*x)^3)) - (2*ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d*
x))/(Sqrt[3]*a^(1/3))])/(9*Sqrt[3]*a^(7/3)*b^(2/3)*d) - (2*Log[a^
(1/3) + b^(1/3)*(c + d*x)])/(27*a^(7/3)*b^(2/3)*d) + Log[a^(2/3)
- a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2]/(27*a^(7/3)*b^
(2/3)*d)
```

Rubi in Sympy [A] time = 45.0929, size = 187, normalized size = 0.93

$$\frac{(c+dx)^2}{6ad\left(a+b\left(c+dx\right)^3\right)^2}+\frac{2\left(c+dx\right)^2}{9a^2d\left(a+b\left(c+dx\right)^3\right)}-\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}\left(c+dx\right)\right)}{27a^{\frac{7}{3}}b^{\frac{2}{3}}d}+\frac{\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}\left(-c-dx\right)+b^{\frac{2}{3}}\left(c+dx\right)^2\right)}{27a^{\frac{7}{3}}b^{\frac{2}{3}}d}-\frac{2\sqrt{3}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{27a^{\frac{7}{3}}b^{\frac{2}{3}}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)/(a+b*(d*x+c)**3)**3,x)
```

```
[Out] (c + d*x)**2/(6*a*d*(a + b*(c + d*x)**3)**2) + 2*(c + d*x)**2/(9*
a**2*d*(a + b*(c + d*x)**3)) - 2*log(a**(1/3) + b**(1/3)*(c + d*x
))/(27*a**(7/3)*b**(2/3)*d) + log(a**(2/3) + a**(1/3)*b**(1/3)*(-
c - d*x) + b**(2/3)*(c + d*x)**2)/(27*a**(7/3)*b**(2/3)*d) - 2*sq
rt(3)*atan(sqrt(3)*(a**(1/3)/3 + b**(1/3)*(-2*c/3 - 2*d*x/3))/a**
(1/3))/(27*a**(7/3)*b**(2/3)*d)
```

Mathematica [A] time = 0.214277, size = 180, normalized size = 0.89

$$\frac{\frac{2\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{b^{2/3}}+\frac{9a^{4/3}(c+dx)^2}{(a+b(c+dx)^3)^2}-\frac{4\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{b^{2/3}}+\frac{4\sqrt{3}\tan^{-1}\left(\frac{2\sqrt[3]{b}(c+dx)-\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{b^{2/3}}+\frac{12\sqrt[3]{a}(c+dx)^2}{a+b(c+dx)^3}}{54a^{7/3}d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c + d*x)/(a + b*(c + d*x)^3)^3,x]
```

```
[Out] ((9*a^(4/3)*(c + d*x)^2)/(a + b*(c + d*x)^3)^2 + (12*a^(1/3)*(c +
 d*x)^2)/(a + b*(c + d*x)^3) + (4*Sqrt[3]*ArcTan[(-a^(1/3) + 2*b^
(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/b^(2/3) - (4*Log[a^(1/3) + b
^(1/3)*(c + d*x)])/b^(2/3) + (2*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c
+ d*x) + b^(2/3)*(c + d*x)^2])/b^(2/3))/(54*a^(7/3)*d)
```

Maple [C] time = 0.024, size = 214, normalized size = 1.1

$$\frac{1}{\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2}\left(\frac{2\,bd^4x^5}{9\,a^2}+\frac{10\,bcd^3x^4}{9\,a^2}+\frac{20\,c^2d^2bx^3}{9\,a^2}+\frac{d\left(40\,bc^3+7\,a\right)x^2}{18\,a^2}+\frac{c\left(10\,bc^3+7\,a\right)x}{9\,a^2}+\frac{c^2}{\ldots}\right.$$
$$+\frac{2}{27\,a^2bd}\sum_{\_R=RootOf\left(\_Z^3bd^3+3\_Z^2bcd^2+3\_Z\,bc^2d+bc^3+a\right)}\frac{(\_R\,d+c)\ln(x-\_R)}{d^2\_R^2+2\,cd\_R+c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)/(a+b*(d*x+c)^3)^3,x)
```

```
[Out] (2/9*b*d^4/a^2*x^5+10/9*b*c*d^3/a^2*x^4+20/9*c^2*d^2*b/a^2*x^3+1/
18*d*(40*b*c^3+7*a)/a^2*x^2+1/9*c*(10*b*c^3+7*a)/a^2*x+1/18*c^2/d
*(4*b*c^3+7*a)/a^2)/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)
^2+2/27/a^2/b/d*sum((_R*d+c)/(_R^2*d^2+2*_R*c*d+c^2)*ln(x-_R),_R=
RootOf(_Z^3*b*d^3+3*_Z^2*b*c*d^2+3*_Z*b*c^2*d+b*c^3+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{4\,bd^5x^5+20\,bcd^4x^4+40\,bc^2d^3x^3+4\,bc^5+\left(40\,bc^3+7\,a\right)d^2x^2+7\,ac^2+2\left(10\,bc^4+7\,ac\right)dx}{18\left(a^2b^2d^7x^6+6\,a^2b^2cd^6x^5+15\,a^2b^2c^2d^5x^4+2\left(10\,a^2b^2c^3+a^3b\right)d^4x^3+3\left(5\,a^2b^2c^4+2\,a^3bc\right)d^3x^2+6\left(a^2b^2c^5+a^3bc^2\right)d^2x+\ldots\right.}$$
$$+\frac{2\int\frac{dx+c}{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}\,dx}{9\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)/((d*x + c)^3*b + a)^3,x, algorithm="maxima")
```

```
[Out] 1/18*(4*b*d^5*x^5 + 20*b*c*d^4*x^4 + 40*b*c^2*d^3*x^3 + 4*b*c^5 +
 (40*b*c^3 + 7*a)*d^2*x^2 + 7*a*c^2 + 2*(10*b*c^4 + 7*a*c)*d*x)/(
a^2*b^2*d^7*x^6 + 6*a^2*b^2*c*d^6*x^5 + 15*a^2*b^2*c^2*d^5*x^4 +
2*(10*a^2*b^2*c^3 + a^3*b)*d^4*x^3 + 3*(5*a^2*b^2*c^4 + 2*a^3*b*c
)*d^3*x^2 + 6*(a^2*b^2*c^5 + a^3*b*c^2)*d^2*x + (a^2*b^2*c^6 + 2*
a^3*b*c^3 + a^4)*d) + 2/9*integrate((d*x + c)/(b*d^3*x^3 + 3*b*c*
d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a), x)/a^2
```

Fricas [A] time = 0.241543, size = 957, normalized size = 4.74

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)/((d*x + c)^3*b + a)^3,x, algorithm="fricas")
```

```
[Out] 1/162*sqrt(3)*(4*sqrt(3)*(b^2*d^6*x^6 + 6*b^2*c*d^5*x^5 + 15*b^2*
c^2*d^4*x^4 + b^2*c^6 + 2*(10*b^2*c^3 + a*b)*d^3*x^3 + 2*a*b*c^3
+ 3*(5*b^2*c^4 + 2*a*b*c)*d^2*x^2 + 6*(b^2*c^5 + a*b*c^2)*d*x + a
^2)*log(a*b + (-a*b^2)^(2/3)*(d*x + c)) - 2*sqrt(3)*(b^2*d^6*x^6
+ 6*b^2*c*d^5*x^5 + 15*b^2*c^2*d^4*x^4 + b^2*c^6 + 2*(10*b^2*c^3
+ a*b)*d^3*x^3 + 2*a*b*c^3 + 3*(5*b^2*c^4 + 2*a*b*c)*d^2*x^2 + 6*
(b^2*c^5 + a*b*c^2)*d*x + a^2)*log(-a*b + (-a*b^2)^(2/3)*(d*x + c
) + (b*d^2*x^2 + 2*b*c*d*x + b*c^2)*(-a*b^2)^(1/3)) - 12*(b^2*d^6
*x^6 + 6*b^2*c*d^5*x^5 + 15*b^2*c^2*d^4*x^4 + b^2*c^6 + 2*(10*b^2
*c^3 + a*b)*d^3*x^3 + 2*a*b*c^3 + 3*(5*b^2*c^4 + 2*a*b*c)*d^2*x^2
 + 6*(b^2*c^5 + a*b*c^2)*d*x + a^2)*arctan(-1/3*(sqrt(3)*a*b - 2*
sqrt(3)*(-a*b^2)^(2/3)*(d*x + c))/(a*b)) + 3*sqrt(3)*(4*b*d^5*x^5
 + 20*b*c*d^4*x^4 + 40*b*c^2*d^3*x^3 + 4*b*c^5 + (40*b*c^3 + 7*a)
*d^2*x^2 + 7*a*c^2 + 2*(10*b*c^4 + 7*a*c)*d*x)*(-a*b^2)^(1/3))/((
a^2*b^2*d^7*x^6 + 6*a^2*b^2*c*d^6*x^5 + 15*a^2*b^2*c^2*d^5*x^4 +
2*(10*a^2*b^2*c^3 + a^3*b)*d^4*x^3 + 3*(5*a^2*b^2*c^4 + 2*a^3*b*c
)*d^3*x^2 + 6*(a^2*b^2*c^5 + a^3*b*c^2)*d^2*x + (a^2*b^2*c^6 + 2*
a^3*b*c^3 + a^4)*d)*(-a*b^2)^(1/3))
```

Sympy [A] time = 70.1458, size = 296, normalized size = 1.47

$$\frac{7ac^2 + 4bc^5 + 40bc^2d^3x^3 + 20bcd^4x^4 + 4bd^5x^5 + x^2\left(7ad^2 + 40bc^3d^2\right) + x\left(14acd + \right.}{18a^4d + 36a^3bc^3d + 18a^2b^2c^6d + 270a^2b^2c^2d^5x^4 + 108a^2b^2cd^6x^5 + 18a^2b^2d^7x^6 + x^3\left(36a^3bd^4 + 360a^2b^2c^3d^4\right) + x^2\left(108a^3bc\right.}$$
$$+\frac{\operatorname{RootSum}\left(19683t^3a^7b^2 + 8, \left(t \mapsto t\log\left(x + \frac{729t^2a^5b+4c}{4d}\right)\right)\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)/(a+b*(d*x+c)**3)**3,x)
```

```
[Out] (7*a*c**2 + 4*b*c**5 + 40*b*c**2*d**3*x**3 + 20*b*c*d**4*x**4 + 4
*b*d**5*x**5 + x**2*(7*a*d**2 + 40*b*c**3*d**2) + x*(14*a*c*d + 2
0*b*c**4*d))/(18*a**4*d + 36*a**3*b*c**3*d + 18*a**2*b**2*c**6*d
+ 270*a**2*b**2*c**2*d**5*x**4 + 108*a**2*b**2*c*d**6*x**5 + 18*a
**2*b**2*d**7*x**6 + x**3*(36*a**3*b*d**4 + 360*a**2*b**2*c**3*d*
*4) + x**2*(108*a**3*b*c*d**3 + 270*a**2*b**2*c**4*d**3) + x*(108
*a**3*b*c**2*d**2 + 108*a**2*b**2*c**5*d**2)) + RootSum(19683*_t*
*3*a**7*b**2 + 8, Lambda(_t, _t*log(x + (729*_t**2*a**5*b + 4*c)/
(4*d))))/d
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{dx + c}{\left((dx + c)^3 b + a\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)/((d*x + c)^3*b + a)^3,x, algorithm="giac")
```

```
[Out] integrate((d*x + c)/((d*x + c)^3*b + a)^3, x)
```

3.2874 $\int \frac{1}{(a+b(c+dx)^3)^3} \, dx$

Optimal. Leaf size=198

$$-\frac{5\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{54a^{8/3}\sqrt[3]{b}d}+\frac{5\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{27a^{8/3}\sqrt[3]{b}d}-\frac{5\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{8/3}\sqrt[3]{b}d}+\frac{5(c+dx)}{18a^2d\,(a+b(c+dx)^3)}+\frac{c+dx}{6ad\,(a+b(c+dx)^3)^2}$$

```
[Out] (c + d*x)/(6*a*d*(a + b*(c + d*x)^3)^2) + (5*(c + d*x))/(18*a^2*d
*(a + b*(c + d*x)^3)) - (5*ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d*x))
/(Sqrt[3]*a^(1/3))])/(9*Sqrt[3]*a^(8/3)*b^(1/3)*d) + (5*Log[a^(1/
3) + b^(1/3)*(c + d*x)])/(27*a^(8/3)*b^(1/3)*d) - (5*Log[a^(2/3)
- a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/(54*a^(8/3)*b
^(1/3)*d)
```

Rubi [A] time = 0.360539, antiderivative size = 198, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615

$$-\frac{5\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{54a^{8/3}\sqrt[3]{b}d}+\frac{5\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{27a^{8/3}\sqrt[3]{b}d}-\frac{5\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{8/3}\sqrt[3]{b}d}+\frac{5(c+dx)}{18a^2d\,(a+b(c+dx)^3)}+\frac{c+dx}{6ad\,(a+b(c+dx)^3)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*(c + d*x)^3)^(-3),x]
```

```
[Out] (c + d*x)/(6*a*d*(a + b*(c + d*x)^3)^2) + (5*(c + d*x))/(18*a^2*d
*(a + b*(c + d*x)^3)) - (5*ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d*x))
/(Sqrt[3]*a^(1/3))])/(9*Sqrt[3]*a^(8/3)*b^(1/3)*d) + (5*Log[a^(1/
3) + b^(1/3)*(c + d*x)])/(27*a^(8/3)*b^(1/3)*d) - (5*Log[a^(2/3)
- a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/(54*a^(8/3)*b
^(1/3)*d)
```

Rubi in Sympy [A] time = 39.9692, size = 187, normalized size = 0.94

$$\frac{c+dx}{6ad\left(a+b\left(c+dx\right)^3\right)^2}+\frac{5\left(c+dx\right)}{18a^2d\left(a+b\left(c+dx\right)^3\right)}+\frac{5\log\left(\sqrt[3]{a}+\sqrt[3]{b}\left(c+dx\right)\right)}{27a^{\frac{8}{3}}\sqrt[3]{b}d}-\frac{5\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}\left(-c-dx\right)+b^{\frac{2}{3}}\left(c+dx\right)^2\right)}{54a^{\frac{8}{3}}\sqrt[3]{b}d}-\frac{5\sqrt{3}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{27a^{\frac{8}{3}}\sqrt[3]{b}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b*(d*x+c)**3)**3,x)
```

```
[Out] (c + d*x)/(6*a*d*(a + b*(c + d*x)**3)**2) + 5*(c + d*x)/(18*a**2*
d*(a + b*(c + d*x)**3)) + 5*log(a**(1/3) + b**(1/3)*(c + d*x))/(2
7*a**(8/3)*b**(1/3)*d) - 5*log(a**(2/3) + a**(1/3)*b**(1/3)*(-c -
 d*x) + b**(2/3)*(c + d*x)**2)/(54*a**(8/3)*b**(1/3)*d) - 5*sqrt(
3)*atan(sqrt(3)*(a**(1/3)/3 + b**(1/3)*(-2*c/3 - 2*d*x/3))/a**(1/
```

```
3))/(27*a**(8/3)*b**(1/3)*d)
```

Mathematica [A] time = 0.176096, size = 176, normalized size = 0.89

$$\frac{-\frac{5\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{\sqrt[3]{b}}+\frac{9a^{5/3}(c+dx)}{(a+b(c+dx)^3)^2}+\frac{15a^{2/3}(c+dx)}{a+b(c+dx)^3}+\frac{10\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{\sqrt[3]{b}}+\frac{10\sqrt{3}\tan^{-1}\left(\frac{2\sqrt[3]{b}(c+dx)-\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt[3]{b}}}{54a^{8/3}d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(c + d*x)^3)^(-3),x]
```

```
[Out] ((9*a^(5/3)*(c + d*x))/(a + b*(c + d*x)^3)^2 + (15*a^(2/3)*(c + d
*x))/(a + b*(c + d*x)^3) + (10*Sqrt[3]*ArcTan[(-a^(1/3) + 2*b^(1/
3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/b^(1/3) + (10*Log[a^(1/3) + b^(
1/3)*(c + d*x)])/b^(1/3) - (5*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c +
d*x) + b^(2/3)*(c + d*x)^2])/b^(1/3))/(54*a^(8/3)*d)
```

Maple [C] time = 0.023, size = 185, normalized size = 0.9

$$\frac{1}{(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)^2}\left(\frac{5\,bd^3x^4}{18\,a^2}+\frac{10\,bcd^2x^3}{9\,a^2}+\frac{5\,bc^2dx^2}{3\,a^2}+\frac{(10\,bc^3+4\,a)\,x}{9\,a^2}+\frac{c\,(5\,bc^3+8\,a)}{18\,a^2d}\right)+\frac{5}{27\,a^2bd}\sum_{\_R=RootOf(\_Z^3bd^3+3\_Z^2bcd^2+3\_Z\,bc^2d+bc^3+a)}\frac{\ln(x-\_R)}{d^2\_R^2+2\,cd\_R+c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*(d*x+c)^3)^3,x)
```

```
[Out] (5/18/a^2*b*d^3*x^4+10/9*c*d^2*b/a^2*x^3+5/3*b*c^2*d/a^2*x^2+2/9*
(5*b*c^3+2*a)/a^2*x+1/18*c/d*(5*b*c^3+8*a)/a^2)/(b*d^3*x^3+3*b*c*
d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2+5/27/a^2/b/d*sum(1/(_R^2*d^2+2*_R*
c*d+c^2)*ln(x-_R),_R=RootOf(_Z^3*b*d^3+3*_Z^2*b*c*d^2+3*_Z*b*c^2*
d+b*c^3+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{5\,bd^4x^4+20\,bcd^3x^3+30\,bc^2d^2x^2+5\,bc^4+4\,(5\,bc^3+2\,a)\,dx+8\,ac}{18\,(a^2b^2d^7x^6+6\,a^2b^2cd^6x^5+15\,a^2b^2c^2d^5x^4+2\,(10\,a^2b^2c^3+a^3b)d^4x^3+3\,(5\,a^2b^2c^4+2\,a^3bc)d^3x^2+6\,(a^2b^2c^5+a^3bc^2)d^2x+}+\frac{5\int\frac{1}{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}\,dx}{9\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^3*b + a)^(-3),x, algorithm="maxima")
```

```
[Out] 1/18*(5*b*d^4*x^4 + 20*b*c*d^3*x^3 + 30*b*c^2*d^2*x^2 + 5*b*c^4 +
 4*(5*b*c^3 + 2*a)*d*x + 8*a*c)/(a^2*b^2*d^7*x^6 + 6*a^2*b^2*c*d^
6*x^5 + 15*a^2*b^2*c^2*d^5*x^4 + 2*(10*a^2*b^2*c^3 + a^3*b)*d^4*x
^3 + 3*(5*a^2*b^2*c^4 + 2*a^3*b*c)*d^3*x^2 + 6*(a^2*b^2*c^5 + a^3
*b*c^2)*d^2*x + (a^2*b^2*c^6 + 2*a^3*b*c^3 + a^4)*d) + 5/9*integr
ate(1/(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a), x)/a
^2
```

Fricas [A] time = 0.242507, size = 914, normalized size = 4.62

$$-\frac{\sqrt{3}\Big(5\sqrt{3}\left(b^2d^6x^6 + 6\,b^2cd^5x^5 + 15\,b^2c^2d^4x^4 + b^2c^6 + 2\left(10\,b^2c^3 + ab\right)d^3x^3 + 2\,abc^3 + 3\left(5\,b^2c^4 + 2\,abc\right)d^2x^2 + 6\left(b^2c^5 + ab\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^3*b + a)^(-3),x, algorithm="fricas")
```

```
[Out] -1/162*sqrt(3)*(5*sqrt(3)*(b^2*d^6*x^6 + 6*b^2*c*d^5*x^5 + 15*b^2
*c^2*d^4*x^4 + b^2*c^6 + 2*(10*b^2*c^3 + a*b)*d^3*x^3 + 2*a*b*c^3
 + 3*(5*b^2*c^4 + 2*a*b*c)*d^2*x^2 + 6*(b^2*c^5 + a*b*c^2)*d*x +
a^2)*log(a^2 + (d^2*x^2 + 2*c*d*x + c^2)*(a^2*b)^(2/3) - (a^2*b)^
(1/3)*(a*d*x + a*c)) - 10*sqrt(3)*(b^2*d^6*x^6 + 6*b^2*c*d^5*x^5
+ 15*b^2*c^2*d^4*x^4 + b^2*c^6 + 2*(10*b^2*c^3 + a*b)*d^3*x^3 + 2
*a*b*c^3 + 3*(5*b^2*c^4 + 2*a*b*c)*d^2*x^2 + 6*(b^2*c^5 + a*b*c^2
)*d*x + a^2)*log((a^2*b)^(1/3)*(d*x + c) + a) - 30*(b^2*d^6*x^6 +
 6*b^2*c*d^5*x^5 + 15*b^2*c^2*d^4*x^4 + b^2*c^6 + 2*(10*b^2*c^3 +
 a*b)*d^3*x^3 + 2*a*b*c^3 + 3*(5*b^2*c^4 + 2*a*b*c)*d^2*x^2 + 6*(
b^2*c^5 + a*b*c^2)*d*x + a^2)*arctan(1/3*(2*sqrt(3)*(a^2*b)^(1/3)
*(d*x + c) - sqrt(3)*a)/a) - 3*sqrt(3)*(5*b*d^4*x^4 + 20*b*c*d^3*
x^3 + 30*b*c^2*d^2*x^2 + 5*b*c^4 + 4*(5*b*c^3 + 2*a)*d*x + 8*a*c)
*(a^2*b)^(1/3))/((a^2*b^2*d^7*x^6 + 6*a^2*b^2*c*d^6*x^5 + 15*a^2*
b^2*c^2*d^5*x^4 + 2*(10*a^2*b^2*c^3 + a^3*b)*d^4*x^3 + 3*(5*a^2*b
^2*c^4 + 2*a^3*b*c)*d^3*x^2 + 6*(a^2*b^2*c^5 + a^3*b*c^2)*d^2*x +
 (a^2*b^2*c^6 + 2*a^3*b*c^3 + a^4)*d)*(a^2*b)^(1/3))
```

Sympy [A] time = 54.1086, size = 267, normalized size = 1.35

$$\frac{8ac + 5bc^4 + 30bc^2d^2x^2 + 20bcd^3x^3 + 5bd^4x^4 + x\left(8ad + 20bc^3d\right)}{18a^4d + 36a^3bc^3d + 18a^2b^2c^6d + 270a^2b^2c^2d^5x^4 + 108a^2b^2cd^6x^5 + 18a^2b^2d^7x^6 + x^3\left(36a^3bd^4 + 360a^2b^2c^3d^4\right) + x^2\left(108a^3bc\ldots\right.}$$
$$+ \frac{\operatorname{RootSum}\left(19683t^3a^8b - 125, \left(t \mapsto t\log\left(x + \frac{27ta^3+5c}{5d}\right)\right)\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*(d*x+c)**3)**3,x)
```

```
[Out] (8*a*c + 5*b*c**4 + 30*b*c**2*d**2*x**2 + 20*b*c*d**3*x**3 + 5*b*
d**4*x**4 + x*(8*a*d + 20*b*c**3*d))/(18*a**4*d + 36*a**3*b*c**3*
d + 18*a**2*b**2*c**6*d + 270*a**2*b**2*c**2*d**5*x**4 + 108*a**2
*b**2*c*d**6*x**5 + 18*a**2*b**2*d**7*x**6 + x**3*(36*a**3*b*d**4
 + 360*a**2*b**2*c**3*d**4) + x**2*(108*a**3*b*c*d**3 + 270*a**2*
b**2*c**4*d**3) + x*(108*a**3*b*c**2*d**2 + 108*a**2*b**2*c**5*d*
*2)) + RootSum(19683*_t**3*a**8*b - 125, Lambda(_t, _t*log(x + (2
7*_t*a**3 + 5*c)/(5*d))))/d
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left((dx + c)^3b + a\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^3*b + a)^(-3),x, algorithm="giac")
```

```
[Out] integrate(((d*x + c)^3*b + a)^(-3), x)
```

3.2875 $\int \frac{1}{(c+dx)(a+b(c+dx)^3)^3} dx$

Optimal. Leaf size=82

$$-\frac{\log \left(a+b(c+dx)^3\right)}{3a^3d}+\frac{\log(c+dx)}{a^3d}+\frac{1}{3a^2d\left(a+b(c+dx)^3\right)}+\frac{1}{6ad\left(a+b(c+dx)^3\right)^2}$$

```
[Out] 1/(6*a*d*(a + b*(c + d*x)^3)^2) + 1/(3*a^2*d*(a + b*(c + d*x)^3))
 + Log[c + d*x]/(a^3*d) - Log[a + b*(c + d*x)^3]/(3*a^3*d)
```

Rubi [A] time = 0.187008, antiderivative size = 82, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$-\frac{\log \left(a+b(c+dx)^3\right)}{3a^3d}+\frac{\log(c+dx)}{a^3d}+\frac{1}{3a^2d\left(a+b(c+dx)^3\right)}+\frac{1}{6ad\left(a+b(c+dx)^3\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((c + d*x)*(a + b*(c + d*x)^3)^3),x]
```

```
[Out] 1/(6*a*d*(a + b*(c + d*x)^3)^2) + 1/(3*a^2*d*(a + b*(c + d*x)^3))
 + Log[c + d*x]/(a^3*d) - Log[a + b*(c + d*x)^3]/(3*a^3*d)
```

Rubi in Sympy [A] time = 17.5114, size = 70, normalized size = 0.85

$$\frac{1}{6ad\left(a+b\left(c+dx\right)^3\right)^2}+\frac{1}{3a^2d\left(a+b\left(c+dx\right)^3\right)}-\frac{\log \left(a+b\left(c+dx\right)^3\right)}{3a^3d}+\frac{\log \left(\left(c+dx\right)^3\right)}{3a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(d*x+c)/(a+b*(d*x+c)**3)**3,x)
```

```
[Out] 1/(6*a*d*(a + b*(c + d*x)**3)**2) + 1/(3*a**2*d*(a + b*(c + d*x)*
*3)) - log(a + b*(c + d*x)**3)/(3*a**3*d) + log((c + d*x)**3)/(3*
a**3*d)
```

Mathematica [A] time = 0.0842358, size = 63, normalized size = 0.77

$$\frac{\frac{a\left(2\left(a+b(c+dx)^3\right)+a\right)}{\left(a+b(c+dx)^3\right)^2}-2\log \left(a+b(c+dx)^3\right)+6\log(c+dx)}{6a^3d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((c + d*x)*(a + b*(c + d*x)^3)^3),x]
```

```
[Out] ((a*(a + 2*(a + b*(c + d*x)^3)))/(a + b*(c + d*x)^3)^2 + 6*Log[c
+ d*x] - 2*Log[a + b*(c + d*x)^3])/(6*a^3*d)
```

Maple [B] time = 0.036, size = 283, normalized size = 3.5

$$\frac{bd^2x^3}{3\,a^2\,(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)^2}+\frac{bcdx^2}{a^2\,(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)^2}+\frac{bc^2x}{a^2\,(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)^2}+\frac{bc^3}{3\,a^2\,(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)^2\,d}+\frac{1}{2\,a\,(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)^2\,d}-\frac{\ln\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)}{3\,a^3d}+\frac{\ln\left(dx+c\right)}{a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(d*x+c)/(a+b*(d*x+c)^3)^3,x)
```

```
[Out] 1/3*b/a^2/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*d^2*x^3
+b/a^2/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*c*d*x^2+b/
a^2/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*c^2*x+1/3*b/a
^2/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2/d*c^3+1/2/a/(b
*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2/d-1/3/a^3/d*ln(b*d^
3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)+ln(d*x+c)/a^3/d
```

Maxima [A] time = 1.38505, size = 331, normalized size = 4.04

$$\frac{2\,bd^3x^3+6\,bcd^2x^2+6\,bc^2dx+2\,bc^3+3\,a}{6\,(a^2b^2d^7x^6+6\,a^2b^2cd^6x^5+15\,a^2b^2c^2d^5x^4+2\,(10\,a^2b^2c^3+a^3b)d^4x^3+3\,(5\,a^2b^2c^4+2\,a^3bc)d^3x^2+6\,(a^2b^2c^5+a^3bc^2)d^2x+(\cdots}-\frac{\log\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)}{3\,a^3d}+\frac{\log\left(dx+c\right)}{a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)^3*(d*x + c)),x, algorithm="maxima")
```

```
[Out] 1/6*(2*b*d^3*x^3 + 6*b*c*d^2*x^2 + 6*b*c^2*d*x + 2*b*c^3 + 3*a)/(
a^2*b^2*d^7*x^6 + 6*a^2*b^2*c*d^6*x^5 + 15*a^2*b^2*c^2*d^5*x^4 +
2*(10*a^2*b^2*c^3 + a^3*b)*d^4*x^3 + 3*(5*a^2*b^2*c^4 + 2*a^3*b*c
)*d^3*x^2 + 6*(a^2*b^2*c^5 + a^3*b*c^2)*d^2*x + (a^2*b^2*c^6 + 2*
a^3*b*c^3 + a^4)*d) - 1/3*log(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2
*d*x + b*c^3 + a)/(a^3*d) + log(d*x + c)/(a^3*d)
```

Fricas [A] time = 0.26285, size = 630, normalized size = 7.68

$$\frac{2\,abd^3x^3+6\,abcd^2x^2+6\,abc^2dx+2\,abc^3+3\,a^2-2\,\left(b^2d^6x^6+6\,b^2cd^5x^5+15\,b^2c^2d^4x^4+b^2c^6+2\,\left(10\,b^2c^3+ab\right)d^3x^3+2\,ab\cdots\right.}{6\,(a^3b^2d^7x^6+6\,\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)^3*(d*x + c)),x, algorithm="fricas")
```

```
[Out] 1/6*(2*a*b*d^3*x^3 + 6*a*b*c*d^2*x^2 + 6*a*b*c^2*d*x + 2*a*b*c^3
+ 3*a^2 - 2*(b^2*d^6*x^6 + 6*b^2*c*d^5*x^5 + 15*b^2*c^2*d^4*x^4 +
 b^2*c^6 + 2*(10*b^2*c^3 + a*b)*d^3*x^3 + 2*a*b*c^3 + 3*(5*b^2*c^
4 + 2*a*b*c)*d^2*x^2 + 6*(b^2*c^5 + a*b*c^2)*d*x + a^2)*log(b*d^3
*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a) + 6*(b^2*d^6*x^6
+ 6*b^2*c*d^5*x^5 + 15*b^2*c^2*d^4*x^4 + b^2*c^6 + 2*(10*b^2*c^3
+ a*b)*d^3*x^3 + 2*a*b*c^3 + 3*(5*b^2*c^4 + 2*a*b*c)*d^2*x^2 + 6*
(b^2*c^5 + a*b*c^2)*d*x + a^2)*log(d*x + c))/(a^3*b^2*d^7*x^6 + 6
*a^3*b^2*c*d^6*x^5 + 15*a^3*b^2*c^2*d^5*x^4 + 2*(10*a^3*b^2*c^3 +
 a^4*b)*d^4*x^3 + 3*(5*a^3*b^2*c^4 + 2*a^4*b*c)*d^3*x^2 + 6*(a^3*
b^2*c^5 + a^4*b*c^2)*d^2*x + (a^3*b^2*c^6 + 2*a^4*b*c^3 + a^5)*d)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(d*x+c)/(a+b*(d*x+c)**3)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.219365, size = 194, normalized size = 2.37

$$-\frac{\ln\left(\left|bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3 + a\right|\right)}{3\,a^3d} + \frac{\ln\left(\left|dx + c\right|\right)}{a^3d} + \frac{2\,abd^3x^3 + 6\,abcd^2x^2 + 6\,abc^2dx + 2\,abc^3 + 3\,a^2}{6\,\left(bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3 + a\right)^2 a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)^3*(d*x + c)),x, algorithm="giac")
```

```
[Out] -1/3*ln(abs(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a))
/(a^3*d) + ln(abs(d*x + c))/(a^3*d) + 1/6*(2*a*b*d^3*x^3 + 6*a*b*
c*d^2*x^2 + 6*a*b*c^2*d*x + 2*a*b*c^3 + 3*a^2)/((b*d^3*x^3 + 3*b*
c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)^2*a^3*d)
```

3.2876 $\int \frac{1}{(c+dx)^2(a+b(c+dx)^3)^3}\,dx$

Optimal. Leaf size=219

$$-\frac{7\sqrt[3]{b}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{27a^{10/3}d}+\frac{14\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{27a^{10/3}d}+\frac{14\sqrt[3]{b}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{10/3}d}-\frac{14}{9a^3d(c+dx)}+\frac{7}{18a^2d(c+dx)(a+b(c+dx)^3)}+\frac{1}{6ad(c+dx)(a+b(c+dx)^3)^2}$$

```
[Out] -14/(9*a^3*d*(c + d*x)) + 1/(6*a*d*(c + d*x)*(a + b*(c + d*x)^3)^
2) + 7/(18*a^2*d*(c + d*x)*(a + b*(c + d*x)^3)) + (14*b^(1/3)*Arc
Tan[(a^(1/3) - 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/(9*Sqrt[3
]*a^(10/3)*d) + (14*b^(1/3)*Log[a^(1/3) + b^(1/3)*(c + d*x)])/(27
*a^(10/3)*d) - (7*b^(1/3)*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x)
 + b^(2/3)*(c + d*x)^2])/(27*a^(10/3)*d)
```

Rubi [A] time = 0.436296, antiderivative size = 219, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429

$$-\frac{7\sqrt[3]{b}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{27a^{10/3}d}+\frac{14\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{27a^{10/3}d}+\frac{14\sqrt[3]{b}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{10/3}d}-\frac{14}{9a^3d(c+dx)}+\frac{7}{18a^2d(c+dx)(a+b(c+dx)^3)}+\frac{1}{6ad(c+dx)(a+b(c+dx)^3)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((c + d*x)^2*(a + b*(c + d*x)^3)^3),x]
```

```
[Out] -14/(9*a^3*d*(c + d*x)) + 1/(6*a*d*(c + d*x)*(a + b*(c + d*x)^3)^
2) + 7/(18*a^2*d*(c + d*x)*(a + b*(c + d*x)^3)) + (14*b^(1/3)*Arc
Tan[(a^(1/3) - 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/(9*Sqrt[3
]*a^(10/3)*d) + (14*b^(1/3)*Log[a^(1/3) + b^(1/3)*(c + d*x)])/(27
*a^(10/3)*d) - (7*b^(1/3)*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x)
 + b^(2/3)*(c + d*x)^2])/(27*a^(10/3)*d)
```

Rubi in Sympy [A] time = 50.6071, size = 201, normalized size = 0.92

$$\frac{1}{6ad\left(a+b\left(c+dx\right)^3\right)^2\left(c+dx\right)}+\frac{7}{18a^2d\left(a+b\left(c+dx\right)^3\right)\left(c+dx\right)}-\frac{14}{9a^3d\left(c+dx\right)}+\frac{14\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}\left(c+dx\right)\right)}{27a^{\frac{10}{3}}d}-\frac{7\sqrt[3]{b}\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}\left(-c-dx\right)+b^{\frac{2}{3}}\left(c+dx\right)^2\right)}{27a^{\frac{10}{3}}d}+\frac{14\sqrt{3}\sqrt[3]{b}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{27a^{\frac{10}{3}}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(d*x+c)**2/(a+b*(d*x+c)**3)**3,x)
```

```
[Out] 1/(6*a*d*(a + b*(c + d*x)**3)**2*(c + d*x)) + 7/(18*a**2*d*(a + b
*(c + d*x)**3)*(c + d*x)) - 14/(9*a**3*d*(c + d*x)) + 14*b**(1/3)
*log(a**(1/3) + b**(1/3)*(c + d*x))/(27*a**(10/3)*d) - 7*b**(1/3)
*log(a**(2/3) + a**(1/3)*b**(1/3)*(-c - d*x) + b**(2/3)*(c + d*x)
**2)/(27*a**(10/3)*d) + 14*sqrt(3)*b**(1/3)*atan(sqrt(3)*(a**(1/3
)/3 + b**(1/3)*(-2*c/3 - 2*d*x/3))/a**(1/3))/(27*a**(10/3)*d)
```

Mathematica [A] time = 0.257518, size = 196, normalized size = 0.89

$$\frac{-14\sqrt[3]{b}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)-\frac{9a^{4/3}b(c+dx)^2}{(a+b(c+dx)^3)^2}-\frac{30\sqrt[3]{a}b(c+dx)^2}{a+b(c+dx)^3}+28\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)-28\sqrt{3}\sqrt[3]{b}\,t}{54a^{10/3}d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((c + d*x)^2*(a + b*(c + d*x)^3)^3),x]
```

```
[Out] ((-54*a^(1/3))/(c + d*x) - (9*a^(4/3)*b*(c + d*x)^2)/(a + b*(c +
d*x)^3)^2 - (30*a^(1/3)*b*(c + d*x)^2)/(a + b*(c + d*x)^3) - 28*S
qrt[3]*b^(1/3)*ArcTan[(-a^(1/3) + 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a
^(1/3))] + 28*b^(1/3)*Log[a^(1/3) + b^(1/3)*(c + d*x)] - 14*b^(1/
3)*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2]
)/(54*a^(10/3)*d)
```

Maple [C] time = 0.035, size = 524, normalized size = 2.4

$$-\frac{5b^2d^4x^5}{9a^3(bd^3x^3+3bcd^2x^2+3bc^2dx+bc^3+a)^2}-\frac{25b^2cd^3x^4}{9a^3(bd^3x^3+3bcd^2x^2+3bc^2dx+bc^3+a)^2}-\frac{50b^2c^2d^2x^3}{9a^3(bd^3x^3+3bcd^2x^2+3bc^2dx+bc^3+a)^2}-\frac{50b^2x^2c^3d}{9a^3(bd^3x^3+3bcd^2x^2+3bc^2dx+bc^3+a)^2}-\frac{13bdx^2}{18a^2(bd^3x^3+3bcd^2x^2+3bc^2dx+bc^3+a)^2}-\frac{25b^2xc^4}{9a^3(bd^3x^3+3bcd^2x^2+3bc^2dx+bc^3+a)^2}-\frac{13bxc}{9a^2(bd^3x^3+3bcd^2x^2+3bc^2dx+bc^3+a)^2}-\frac{5b^2c^5}{9a^3(bd^3x^3+3bcd^2x^2+3bc^2dx+bc^3+a)^2d}-\frac{13bc^2}{18a^2(bd^3x^3+3bcd^2x^2+3bc^2dx+bc^3+a)^2d}-\frac{14}{27a^3d}\sum_{\_R=RootOf(\_Z^3bd^3+3\_Z^2bcd^2+3\_Zbc^2d+bc^3+a)}\frac{(\_Rd+c)\ln(x-\_R)}{d^2\_R^2+2cd\_R+c^2}-\frac{1}{a^3d(dx+c)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(d*x+c)^2/(a+b*(d*x+c)^3)^3,x)
```

```
[Out] -5/9*b^2/a^3/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*d^4*
x^5-25/9*b^2/a^3/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*
c*d^3*x^4-50/9*b^2/a^3/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3
+a)^2*c^2*d^2*x^3-50/9*b^2/a^3/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d
*x+b*c^3+a)^2*x^2*c^3*d-13/18*b/a^2/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*
c^2*d*x+b*c^3+a)^2*d*x^2-25/9*b^2/a^3/(b*d^3*x^3+3*b*c*d^2*x^2+3*
b*c^2*d*x+b*c^3+a)^2*x*c^4-13/9*b/a^2/(b*d^3*x^3+3*b*c*d^2*x^2+3*
b*c^2*d*x+b*c^3+a)^2*x*c-5/9*b^2/a^3/(b*d^3*x^3+3*b*c*d^2*x^2+3*b
*c^2*d*x+b*c^3+a)^2*c^5/d-13/18*b/a^2/(b*d^3*x^3+3*b*c*d^2*x^2+3*
b*c^2*d*x+b*c^3+a)^2*c^2/d-14/27/a^3/d*sum((_R*d+c)/(_R^2*d^2+2*_
R*c*d+c^2)*ln(x-_R),_R=RootOf(_Z^3*b*d^3+3*_Z^2*b*c*d^2+3*_Z*b*c^
2*d+b*c^3+a))-1/a^3/d/(d*x+c)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{28\,b^2d^6x^6 + 168\,b^2cd^5x^5 + 420\,b^2c^2d^4x^4 + 28\,b^2c^6 + 7\left(80\,b^2c^3 + 7\,ab\right)d^3x^3 + 49\,abc^3 + 21\left(20\,b^2c^4 + 7\right.}{18\left(a^3b^2d^8x^7 + 7\,a^3b^2cd^7x^6 + 21\,a^3b^2c^2d^6x^5 + (35\,a^3b^2c^3 + 2\,a^4b)d^5x^4 + (35\,a^3b^2c^4 + 8\,a^4bc)d^4x^3 + 3\,(7\,a^3b^2c^5 + 4\,a^4bc^2)d^3\right.}$$
$$-\frac{14\,b\int\frac{dx+c}{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}\,dx}{9\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((d*x + c)^3*b + a)^3*(d*x + c)^2),x, algorithm="maxima")
```

```
[Out] -1/18*(28*b^2*d^6*x^6 + 168*b^2*c*d^5*x^5 + 420*b^2*c^2*d^4*x^4 +
 28*b^2*c^6 + 7*(80*b^2*c^3 + 7*a*b)*d^3*x^3 + 49*a*b*c^3 + 21*(2
0*b^2*c^4 + 7*a*b*c)*d^2*x^2 + 21*(8*b^2*c^5 + 7*a*b*c^2)*d*x + 1
8*a^2)/(a^3*b^2*d^8*x^7 + 7*a^3*b^2*c*d^7*x^6 + 21*a^3*b^2*c^2*d^
6*x^5 + (35*a^3*b^2*c^3 + 2*a^4*b)*d^5*x^4 + (35*a^3*b^2*c^4 + 8*
a^4*b*c)*d^4*x^3 + 3*(7*a^3*b^2*c^5 + 4*a^4*b*c^2)*d^3*x^2 + (7*a
^3*b^2*c^6 + 8*a^4*b*c^3 + a^5)*d^2*x + (a^3*b^2*c^7 + 2*a^4*b*c^
4 + a^5*c)*d) - 14/9*b*integrate((d*x + c)/(b*d^3*x^3 + 3*b*c*d^2
*x^2 + 3*b*c^2*d*x + b*c^3 + a), x)/a^3
```

Fricas [A] time = 0.305301, size = 1191, normalized size = 5.44

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((d*x + c)^3*b + a)^3*(d*x + c)^2),x, algorithm="fricas")
```

```
[Out] -1/162*sqrt(3)*(14*sqrt(3)*(b^2*d^7*x^7 + 7*b^2*c*d^6*x^6 + 21*b^
2*c^2*d^5*x^5 + b^2*c^7 + (35*b^2*c^3 + 2*a*b)*d^4*x^4 + (35*b^2*
c^4 + 8*a*b*c)*d^3*x^3 + 2*a*b*c^4 + 3*(7*b^2*c^5 + 4*a*b*c^2)*d^
2*x^2 + a^2*c + (7*b^2*c^6 + 8*a*b*c^3 + a^2)*d*x)*(b/a)^(1/3)*lo
g(b*d^2*x^2 + 2*b*c*d*x + b*c^2 - (a*d*x + a*c)*(b/a)^(2/3) + a*(
b/a)^(1/3)) - 28*sqrt(3)*(b^2*d^7*x^7 + 7*b^2*c*d^6*x^6 + 21*b^2*
c^2*d^5*x^5 + b^2*c^7 + (35*b^2*c^3 + 2*a*b)*d^4*x^4 + (35*b^2*c^
4 + 8*a*b*c)*d^3*x^3 + 2*a*b*c^4 + 3*(7*b^2*c^5 + 4*a*b*c^2)*d^2*
x^2 + a^2*c + (7*b^2*c^6 + 8*a*b*c^3 + a^2)*d*x)*(b/a)^(1/3)*log(
b*d*x + b*c + a*(b/a)^(2/3)) - 84*(b^2*d^7*x^7 + 7*b^2*c*d^6*x^6
+ 21*b^2*c^2*d^5*x^5 + b^2*c^7 + (35*b^2*c^3 + 2*a*b)*d^4*x^4 + (
35*b^2*c^4 + 8*a*b*c)*d^3*x^3 + 2*a*b*c^4 + 3*(7*b^2*c^5 + 4*a*b*
c^2)*d^2*x^2 + a^2*c + (7*b^2*c^6 + 8*a*b*c^3 + a^2)*d*x)*(b/a)^(
1/3)*arctan(1/3*(sqrt(3)*a*(b/a)^(2/3) - 2*sqrt(3)*(b*d*x + b*c))
/(a*(b/a)^(2/3))) + 3*sqrt(3)*(28*b^2*d^6*x^6 + 168*b^2*c*d^5*x^5
 + 420*b^2*c^2*d^4*x^4 + 28*b^2*c^6 + 7*(80*b^2*c^3 + 7*a*b)*d^3*
x^3 + 49*a*b*c^3 + 21*(20*b^2*c^4 + 7*a*b*c)*d^2*x^2 + 21*(8*b^2*
c^5 + 7*a*b*c^2)*d*x + 18*a^2))/(a^3*b^2*d^8*x^7 + 7*a^3*b^2*c*d^
7*x^6 + 21*a^3*b^2*c^2*d^6*x^5 + (35*a^3*b^2*c^3 + 2*a^4*b)*d^5*x
^4 + (35*a^3*b^2*c^4 + 8*a^4*b*c)*d^4*x^3 + 3*(7*a^3*b^2*c^5 + 4*
a^4*b*c^2)*d^3*x^2 + (7*a^3*b^2*c^6 + 8*a^4*b*c^3 + a^5)*d^2*x +
(a^3*b^2*c^7 + 2*a^4*b*c^4 + a^5*c)*d)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*x+c)**2/(a+b*(d*x+c)**3)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.229755, size = 301, normalized size = 1.37

$$\frac{14\left(\frac{b}{ad^3}\right)^{\frac{1}{3}}\ln\left(\left|-\left(\frac{b}{ad^3}\right)^{\frac{1}{3}}-\frac{1}{(dx+c)d}\right|\right)}{27\,a^3}-\frac{14\,\sqrt{3}\left(a^2b\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(\left(\frac{b}{ad^3}\right)^{\frac{1}{3}}-\frac{2}{(dx+c)d}\right)}{3\left(\frac{b}{ad^3}\right)^{\frac{1}{3}}}\right)}{27\,a^4d}-\frac{7\left(a^2b\right)^{\frac{1}{3}}\ln\left(\left(\frac{b}{ad^3}\right)^{\frac{2}{3}}-\frac{\left(\frac{b}{ad^3}\right)^{\frac{1}{3}}}{(dx+c)d}+\frac{1}{(dx+c)^2d^2}\right)}{27\,a^4d}-\frac{\frac{10\,b^2}{(dx+c)d}+\frac{13\,ab}{(dx+c)^4d}}{18\,a^3\left(b+\frac{a}{(dx+c)^3}\right)^2}-\frac{1}{(dx+c)a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)^3*(d*x + c)^2),x, algorithm="giac")
```

```
[Out] 14/27*(b/(a*d^3))^(1/3)*ln(abs(-(b/(a*d^3))^(1/3) - 1/((d*x + c)*
d)))/a^3 - 14/27*sqrt(3)*(a^2*b)^(1/3)*arctan(1/3*sqrt(3)*((b/(a*
d^3))^(1/3) - 2/((d*x + c)*d))/(b/(a*d^3))^(1/3))/(a^4*d) - 7/27*
(a^2*b)^(1/3)*ln((b/(a*d^3))^(2/3) - (b/(a*d^3))^(1/3)/((d*x + c)
*d) + 1/((d*x + c)^2*d^2))/(a^4*d) - 1/18*(10*b^2/((d*x + c)*d) +
 13*a*b/((d*x + c)^4*d))/(a^3*(b + a/(d*x + c)^3)^2) - 1/((d*x +
c)*a^3*d)
```

3.2877 $\int \frac{1}{(c+dx)^3(a+b(c+dx)^3)^3}\,dx$

Optimal. Leaf size=219

$$-\frac{20b^{2/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{27a^{11/3}d}+\frac{10b^{2/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{27a^{11/3}d}+\frac{20b^{2/3}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{11/3}d}-\frac{10}{9a^3d(c+dx)^2}+\frac{4}{9a^2d(c+dx)^2(a+b(c+dx)^3)}+\frac{1}{6ad(c+dx)^2(a+b(c+dx)^3)^2}$$

```
[Out] -10/(9*a^3*d*(c + d*x)^2) + 1/(6*a*d*(c + d*x)^2*(a + b*(c + d*x)
^3)^2) + 4/(9*a^2*d*(c + d*x)^2*(a + b*(c + d*x)^3)) + (20*b^(2/3
)*ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/(9*S
qrt[3]*a^(11/3)*d) - (20*b^(2/3)*Log[a^(1/3) + b^(1/3)*(c + d*x)]
)/(27*a^(11/3)*d) + (10*b^(2/3)*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c
+ d*x) + b^(2/3)*(c + d*x)^2])/(27*a^(11/3)*d)
```

Rubi [A] time = 0.436271, antiderivative size = 219, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429

$$-\frac{20b^{2/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{27a^{11/3}d}+\frac{10b^{2/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{27a^{11/3}d}+\frac{20b^{2/3}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{11/3}d}-\frac{10}{9a^3d(c+dx)^2}+\frac{4}{9a^2d(c+dx)^2(a+b(c+dx)^3)}+\frac{1}{6ad(c+dx)^2(a+b(c+dx)^3)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((c + d*x)^3*(a + b*(c + d*x)^3)^3),x]
```

```
[Out] -10/(9*a^3*d*(c + d*x)^2) + 1/(6*a*d*(c + d*x)^2*(a + b*(c + d*x)
^3)^2) + 4/(9*a^2*d*(c + d*x)^2*(a + b*(c + d*x)^3)) + (20*b^(2/3
)*ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/(9*S
qrt[3]*a^(11/3)*d) - (20*b^(2/3)*Log[a^(1/3) + b^(1/3)*(c + d*x)]
)/(27*a^(11/3)*d) + (10*b^(2/3)*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c
+ d*x) + b^(2/3)*(c + d*x)^2])/(27*a^(11/3)*d)
```

Rubi in Sympy [A] time = 52.7802, size = 206, normalized size = 0.94

$$\frac{1}{6ad\left(a+b\left(c+dx\right)^3\right)^2\left(c+dx\right)^2}+\frac{4}{9a^2d\left(a+b\left(c+dx\right)^3\right)\left(c+dx\right)^2}-\frac{10}{9a^3d\left(c+dx\right)^2}-\frac{20b^{\frac{2}{3}}\log\left(\sqrt[3]{a}+\sqrt[3]{b}\left(c+dx\right)\right)}{27a^{\frac{11}{3}}d}+\frac{10b^{\frac{2}{3}}\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}\left(-c-dx\right)+b^{\frac{2}{3}}\left(c+dx\right)^2\right)}{27a^{\frac{11}{3}}d}+\frac{20\sqrt{3}b^{\frac{2}{3}}\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{27a^{\frac{11}{3}}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(d*x+c)**3/(a+b*(d*x+c)**3)**3,x)
```

```
[Out] 1/(6*a*d*(a + b*(c + d*x)**3)**2*(c + d*x)**2) + 4/(9*a**2*d*(a +
 b*(c + d*x)**3)*(c + d*x)**2) - 10/(9*a**3*d*(c + d*x)**2) - 20*
b**(2/3)*log(a**(1/3) + b**(1/3)*(c + d*x))/(27*a**(11/3)*d) + 10
*b**(2/3)*log(a**(2/3) + a**(1/3)*b**(1/3)*(-c - d*x) + b**(2/3)*
(c + d*x)**2)/(27*a**(11/3)*d) + 20*sqrt(3)*b**(2/3)*atan(sqrt(3)
*(a**(1/3)/3 + b**(1/3)*(-2*c/3 - 2*d*x/3))/a**(1/3))/(27*a**(11/
3)*d)
```

Mathematica [A] time = 0.270168, size = 192, normalized size = 0.88

$$\frac{20b^{2/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)-\frac{9a^{5/3}b(c+dx)}{(a+b(c+dx)^3)^2}-\frac{33a^{2/3}b(c+dx)}{a+b(c+dx)^3}-\frac{27a^{2/3}}{(c+dx)^2}-40b^{2/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)-}{54a^{11/3}d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((c + d*x)^3*(a + b*(c + d*x)^3)^3),x]
```

```
[Out] ((-27*a^(2/3))/(c + d*x)^2 - (9*a^(5/3)*b*(c + d*x))/(a + b*(c +
d*x)^3)^2 - (33*a^(2/3)*b*(c + d*x))/(a + b*(c + d*x)^3) - 40*Sqr
t[3]*b^(2/3)*ArcTan[(-a^(1/3) + 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(
1/3))] - 40*b^(2/3)*Log[a^(1/3) + b^(1/3)*(c + d*x)] + 20*b^(2/3)
*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/
(54*a^(11/3)*d)
```

Maple [C] time = 0.033, size = 419, normalized size = 1.9

$$-\frac{11\,b^2d^3x^4}{18\,a^3\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2}-\frac{22\,cd^2b^2x^3}{9\,a^3\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2}$$
$$-\frac{11\,b^2c^2dx^2}{3\,a^3\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2}-\frac{22\,b^2xc^3}{9\,a^3\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2}$$
$$-\frac{7\,bx}{9\,a^2\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2}-\frac{11\,b^2c^4}{18\,a^3\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2d}$$
$$-\frac{7\,bc}{9\,a^2\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2d}$$
$$-\frac{20}{27\,a^3d}\sum_{\_R=RootOf\left(\_Z^3bd^3+3\,\_Z^2bcd^2+3\,\_Z\,bc^2d+bc^3+a\right)}\frac{\ln\left(x-\_R\right)}{d^2\_R^2+2\,cd\_R+c^2}-\frac{1}{2\,a^3d\left(dx+c\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(d*x+c)^3/(a+b*(d*x+c)^3)^3,x)
```

```
[Out] -11/18*b^2/a^3/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*d^
3*x^4-22/9*b^2/a^3/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^
2*c*d^2*x^3-11/3*b^2/a^3/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c
^3+a)^2*c^2*d*x^2-22/9*b^2/a^3/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d
*x+b*c^3+a)^2*x*c^3-7/9*b/a^2/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*
x+b*c^3+a)^2*x-11/18*b^2/a^3/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x
+b*c^3+a)^2*c^4/d-7/9*b/a^2/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+
b*c^3+a)^2*c/d-20/27/a^3/d*sum(1/(_R^2*d^2+2*_R*c*d+c^2)*ln(x-_R)
,_R=RootOf(_Z^3*b*d^3+3*_Z^2*b*c*d^2+3*_Z*b*c^2*d+b*c^3+a))-1/2/a
^3/d/(d*x+c)^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{20\,b^2d^6x^6+120\,b^2cd^5x^5+300\,b^2c^2d^4x^4+20\,b^2c^6+16\left(25\,b^2c^3+2\,ab\right)d^3x^3+32\,ab}{18\left(a^3b^2d^9x^8+8\,a^3b^2cd^8x^7+28\,a^3b^2c^2d^7x^6+2\left(28\,a^3b^2c^3+a^4b\right)d^6x^5+10\left(7\,a^3b^2c^4+a^4bc\right)d^5x^4+4\left(14\,a^3b^2c^5+5\,a^4bc^2\right)d}$$
$$-\frac{20\,b\int\frac{1}{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}\,dx}{9\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)^3*(d*x + c)^3),x, algorithm="maxima")
```

```
[Out] -1/18*(20*b^2*d^6*x^6 + 120*b^2*c*d^5*x^5 + 300*b^2*c^2*d^4*x^4 +
 20*b^2*c^6 + 16*(25*b^2*c^3 + 2*a*b)*d^3*x^3 + 32*a*b*c^3 + 12*(
25*b^2*c^4 + 8*a*b*c)*d^2*x^2 + 24*(5*b^2*c^5 + 4*a*b*c^2)*d*x +
9*a^2)/(a^3*b^2*d^9*x^8 + 8*a^3*b^2*c*d^8*x^7 + 28*a^3*b^2*c^2*d^
7*x^6 + 2*(28*a^3*b^2*c^3 + a^4*b)*d^6*x^5 + 10*(7*a^3*b^2*c^4 +
a^4*b*c)*d^5*x^4 + 4*(14*a^3*b^2*c^5 + 5*a^4*b*c^2)*d^4*x^3 + (28
*a^3*b^2*c^6 + 20*a^4*b*c^3 + a^5)*d^3*x^2 + 2*(4*a^3*b^2*c^7 + 5
*a^4*b*c^4 + a^5*c)*d^2*x + (a^3*b^2*c^8 + 2*a^4*b*c^5 + a^5*c^2)
*d) - 20/9*b*integrate(1/(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x
 + b*c^3 + a), x)/a^3
```

Fricas [A] time = 0.340867, size = 1411, normalized size = 6.44

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)^3*(d*x + c)^3),x, algorithm="fricas")
```

```
[Out] -1/162*sqrt(3)*(20*sqrt(3)*(b^2*d^8*x^8 + 8*b^2*c*d^7*x^7 + 28*b^
2*c^2*d^6*x^6 + 2*(28*b^2*c^3 + a*b)*d^5*x^5 + b^2*c^8 + 10*(7*b^
2*c^4 + a*b*c)*d^4*x^4 + 2*a*b*c^5 + 4*(14*b^2*c^5 + 5*a*b*c^2)*d
^3*x^3 + (28*b^2*c^6 + 20*a*b*c^3 + a^2)*d^2*x^2 + a^2*c^2 + 2*(4
*b^2*c^7 + 5*a*b*c^4 + a^2*c)*d*x)*(-b^2/a^2)^(1/3)*log(b^2*d^2*x
^2 + 2*b^2*c*d*x + b^2*c^2 + a^2*(-b^2/a^2)^(2/3) + (a*b*d*x + a*
b*c)*(-b^2/a^2)^(1/3)) - 40*sqrt(3)*(b^2*d^8*x^8 + 8*b^2*c*d^7*x^
7 + 28*b^2*c^2*d^6*x^6 + 2*(28*b^2*c^3 + a*b)*d^5*x^5 + b^2*c^8 +
 10*(7*b^2*c^4 + a*b*c)*d^4*x^4 + 2*a*b*c^5 + 4*(14*b^2*c^5 + 5*a
*b*c^2)*d^3*x^3 + (28*b^2*c^6 + 20*a*b*c^3 + a^2)*d^2*x^2 + a^2*c
^2 + 2*(4*b^2*c^7 + 5*a*b*c^4 + a^2*c)*d*x)*(-b^2/a^2)^(1/3)*log(
b*d*x + b*c - a*(-b^2/a^2)^(1/3)) + 120*(b^2*d^8*x^8 + 8*b^2*c*d^
7*x^7 + 28*b^2*c^2*d^6*x^6 + 2*(28*b^2*c^3 + a*b)*d^5*x^5 + b^2*c
^8 + 10*(7*b^2*c^4 + a*b*c)*d^4*x^4 + 2*a*b*c^5 + 4*(14*b^2*c^5 +
 5*a*b*c^2)*d^3*x^3 + (28*b^2*c^6 + 20*a*b*c^3 + a^2)*d^2*x^2 + a
^2*c^2 + 2*(4*b^2*c^7 + 5*a*b*c^4 + a^2*c)*d*x)*(-b^2/a^2)^(1/3)*
arctan(1/3*(sqrt(3)*a*(-b^2/a^2)^(1/3) + 2*sqrt(3)*(b*d*x + b*c))
/(a*(-b^2/a^2)^(1/3))) + 3*sqrt(3)*(20*b^2*d^6*x^6 + 120*b^2*c*d^
5*x^5 + 300*b^2*c^2*d^4*x^4 + 20*b^2*c^6 + 16*(25*b^2*c^3 + 2*a*b
)*d^3*x^3 + 32*a*b*c^3 + 12*(25*b^2*c^4 + 8*a*b*c)*d^2*x^2 + 24*(
5*b^2*c^5 + 4*a*b*c^2)*d*x + 9*a^2))/(a^3*b^2*d^9*x^8 + 8*a^3*b^2
*c*d^8*x^7 + 28*a^3*b^2*c^2*d^7*x^6 + 2*(28*a^3*b^2*c^3 + a^4*b)*
d^6*x^5 + 10*(7*a^3*b^2*c^4 + a^4*b*c)*d^5*x^4 + 4*(14*a^3*b^2*c^
5 + 5*a^4*b*c^2)*d^4*x^3 + (28*a^3*b^2*c^6 + 20*a^4*b*c^3 + a^5)*
d^3*x^2 + 2*(4*a^3*b^2*c^7 + 5*a^4*b*c^4 + a^5*c)*d^2*x + (a^3*b^
2*c^8 + 2*a^4*b*c^5 + a^5*c^2)*d)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(d*x+c)**3/(a+b*(d*x+c)**3)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left((dx+c)^3 b + a\right)^3 (dx+c)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)^3*(d*x + c)^3),x, algorithm="giac")
```

```
[Out] integrate(1/(((d*x + c)^3*b + a)^3*(d*x + c)^3), x)
```

3.2878 $\int \frac{1}{(c+dx)^4(a+b(c+dx)^3)^3}\,dx$

Optimal. Leaf size=101

$$-\frac{3b\log(c+dx)}{a^4d}+\frac{b\log\left(a+b(c+dx)^3\right)}{a^4d}-\frac{2b}{3a^3d\left(a+b(c+dx)^3\right)}-\frac{1}{3a^3d(c+dx)^3}-\frac{b}{6a^2d\left(a+b(c+dx)^3\right)^2}$$

```
[Out] -1/(3*a^3*d*(c + d*x)^3) - b/(6*a^2*d*(a + b*(c + d*x)^3)^2) - (2
*b)/(3*a^3*d*(a + b*(c + d*x)^3)) - (3*b*Log[c + d*x])/(a^4*d) +
(b*Log[a + b*(c + d*x)^3])/(a^4*d)
```

Rubi [A] time = 0.225557, antiderivative size = 101, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$-\frac{3b\log(c+dx)}{a^4d}+\frac{b\log\left(a+b(c+dx)^3\right)}{a^4d}-\frac{2b}{3a^3d\left(a+b(c+dx)^3\right)}-\frac{1}{3a^3d(c+dx)^3}-\frac{b}{6a^2d\left(a+b(c+dx)^3\right)^2}$$

Antiderivative was successfully verified.

```
[In] Int[1/((c + d*x)^4*(a + b*(c + d*x)^3)^3),x]
```

```
[Out] -1/(3*a^3*d*(c + d*x)^3) - b/(6*a^2*d*(a + b*(c + d*x)^3)^2) - (2
*b)/(3*a^3*d*(a + b*(c + d*x)^3)) - (3*b*Log[c + d*x])/(a^4*d) +
(b*Log[a + b*(c + d*x)^3])/(a^4*d)
```

Rubi in Sympy [A] time = 22.1083, size = 88, normalized size = 0.87

$$-\frac{b}{6a^2d\left(a+b\left(c+dx\right)^3\right)^2}-\frac{2b}{3a^3d\left(a+b\left(c+dx\right)^3\right)}-\frac{1}{3a^3d\left(c+dx\right)^3}+\frac{b\log\left(a+b\left(c+dx\right)^3\right)}{a^4d}-\frac{b\log\left(\left(c+dx\right)^3\right)}{a^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(d*x+c)**4/(a+b*(d*x+c)**3)**3,x)
```

```
[Out] -b/(6*a**2*d*(a + b*(c + d*x)**3)**2) - 2*b/(3*a**3*d*(a + b*(c +
 d*x)**3)) - 1/(3*a**3*d*(c + d*x)**3) + b*log(a + b*(c + d*x)**3
)/(a**4*d) - b*log((c + d*x)**3)/(a**4*d)
```

Mathematica [A] time = 0.187356, size = 80, normalized size = 0.79

$$\frac{a\left(-\frac{4b}{a+b(c+dx)^3}-\frac{ab}{(a+b(c+dx)^3)^2}-\frac{2}{(c+dx)^3}\right)+6b\log\left(a+b(c+dx)^3\right)-18b\log(c+dx)}{6a^4d}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((c + d*x)^4*(a + b*(c + d*x)^3)^3),x]
```

```
[Out] (a*(-2/(c + d*x)^3 - (a*b)/(a + b*(c + d*x)^3)^2 - (4*b)/(a + b*(
c + d*x)^3)) - 18*b*Log[c + d*x] + 6*b*Log[a + b*(c + d*x)^3])/(6
*a^4*d)
```

Maple [B] time = 0.041, size = 311, normalized size = 3.1

$$-\frac{2\,d^2b^2x^3}{3\,a^3\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2}-2\,\frac{b^2cdx^2}{a^3\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2}-2\,\frac{b^2c^2x}{a^3\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2}-\frac{2\,b^2c^3}{3\,a^3\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2d}-\frac{5\,b}{6\,a^2\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2d}+\frac{b\ln\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)}{a^4d}-\frac{1}{3\,a^3d\left(dx+c\right)^3}-3\,\frac{b\ln\left(dx+c\right)}{a^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(d*x+c)^4/(a+b*(d*x+c)^3)^3,x)
```

```
[Out] -2/3/a^3*b^2/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*d^2*
x^3-2/a^3*b^2/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*c*d
*x^2-2/a^3*b^2/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*c^
2*x-2/3/a^3*b^2/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2/d
*c^3-5/6/a^2*b/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2/d+
1/a^4*b/d*ln(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)-1/3/a^3
/d/(d*x+c)^3-3*b*ln(d*x+c)/a^4/d
```

Maxima [A] time = 1.58367, size = 591, normalized size = 5.85

$$-\frac{6\,b^2d^6x^6+36\,b^2cd^5x^5+90\,b^2c^2d^4x^4+6\,b^2c^6+3\,\left(40\,b^2c^3+\cdots\right.}{6\left(a^3b^2d^{10}x^9+9\,a^3b^2cd^9x^8+36\,a^3b^2c^2d^8x^7+2\left(42\,a^3b^2c^3+a^4b\right)d^7x^6+6\left(21\,a^3b^2c^4+2\,a^4bc\right)d^6x^5+6\left(21\,a^3b^2c^5+5\,a^4bc^2\cdots\right.\right.}+\frac{b\log\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)}{a^4d}-\frac{3\,b\log\left(dx+c\right)}{a^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)^3*(d*x + c)^4),x, algorithm="maxima")
```

```
[Out] -1/6*(6*b^2*d^6*x^6 + 36*b^2*c*d^5*x^5 + 90*b^2*c^2*d^4*x^4 + 6*b
^2*c^6 + 3*(40*b^2*c^3 + 3*a*b)*d^3*x^3 + 9*a*b*c^3 + 9*(10*b^2*c
^4 + 3*a*b*c)*d^2*x^2 + 9*(4*b^2*c^5 + 3*a*b*c^2)*d*x + 2*a^2)/(a
^3*b^2*d^10*x^9 + 9*a^3*b^2*c*d^9*x^8 + 36*a^3*b^2*c^2*d^8*x^7 +
2*(42*a^3*b^2*c^3 + a^4*b)*d^7*x^6 + 6*(21*a^3*b^2*c^4 + 2*a^4*b*
c)*d^6*x^5 + 6*(21*a^3*b^2*c^5 + 5*a^4*b*c^2)*d^5*x^4 + (84*a^3*b
^2*c^6 + 40*a^4*b*c^3 + a^5)*d^4*x^3 + 3*(12*a^3*b^2*c^7 + 10*a^4
*b*c^4 + a^5*c)*d^3*x^2 + 3*(3*a^3*b^2*c^8 + 4*a^4*b*c^5 + a^5*c^
2)*d^2*x + (a^3*b^2*c^9 + 2*a^4*b*c^6 + a^5*c^3)*d) + b*log(b*d^3
*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)/(a^4*d) - 3*b*log
(d*x + c)/(a^4*d)
```

Fricas [A] time = 0.379739, size = 1200, normalized size = 11.88

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)^3*(d*x + c)^4),x, algorithm="fricas")
```

```
[Out] -1/6*(6*a*b^2*d^6*x^6 + 36*a*b^2*c*d^5*x^5 + 90*a*b^2*c^2*d^4*x^4
 + 6*a*b^2*c^6 + 3*(40*a*b^2*c^3 + 3*a^2*b)*d^3*x^3 + 9*a^2*b*c^3
 + 9*(10*a*b^2*c^4 + 3*a^2*b*c)*d^2*x^2 + 2*a^3 + 9*(4*a*b^2*c^5
+ 3*a^2*b*c^2)*d*x - 6*(b^3*d^9*x^9 + 9*b^3*c*d^8*x^8 + 36*b^3*c^
2*d^7*x^7 + 2*(42*b^3*c^3 + a*b^2)*d^6*x^6 + b^3*c^9 + 6*(21*b^3*
c^4 + 2*a*b^2*c)*d^5*x^5 + 2*a*b^2*c^6 + 6*(21*b^3*c^5 + 5*a*b^2*
```

```
c^2)*d^4*x^4 + (84*b^3*c^6 + 40*a*b^2*c^3 + a^2*b)*d^3*x^3 + a^2*
b*c^3 + 3*(12*b^3*c^7 + 10*a*b^2*c^4 + a^2*b*c)*d^2*x^2 + 3*(3*b^
3*c^8 + 4*a*b^2*c^5 + a^2*b*c^2)*d*x)*log(b*d^3*x^3 + 3*b*c*d^2*x
^2 + 3*b*c^2*d*x + b*c^3 + a) + 18*(b^3*d^9*x^9 + 9*b^3*c*d^8*x^8
 + 36*b^3*c^2*d^7*x^7 + 2*(42*b^3*c^3 + a*b^2)*d^6*x^6 + b^3*c^9
+ 6*(21*b^3*c^4 + 2*a*b^2*c)*d^5*x^5 + 2*a*b^2*c^6 + 6*(21*b^3*c^
5 + 5*a*b^2*c^2)*d^4*x^4 + (84*b^3*c^6 + 40*a*b^2*c^3 + a^2*b)*d^
3*x^3 + a^2*b*c^3 + 3*(12*b^3*c^7 + 10*a*b^2*c^4 + a^2*b*c)*d^2*x
^2 + 3*(3*b^3*c^8 + 4*a*b^2*c^5 + a^2*b*c^2)*d*x)*log(d*x + c))/(
a^4*b^2*d^10*x^9 + 9*a^4*b^2*c*d^9*x^8 + 36*a^4*b^2*c^2*d^8*x^7 +
 2*(42*a^4*b^2*c^3 + a^5*b)*d^7*x^6 + 6*(21*a^4*b^2*c^4 + 2*a^5*b
*c)*d^6*x^5 + 6*(21*a^4*b^2*c^5 + 5*a^5*b*c^2)*d^5*x^4 + (84*a^4*
b^2*c^6 + 40*a^5*b*c^3 + a^6)*d^4*x^3 + 3*(12*a^4*b^2*c^7 + 10*a^
5*b*c^4 + a^6*c)*d^3*x^2 + 3*(3*a^4*b^2*c^8 + 4*a^5*b*c^5 + a^6*c
^2)*d^2*x + (a^4*b^2*c^9 + 2*a^5*b*c^6 + a^6*c^3)*d)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(d*x+c)**4/(a+b*(d*x+c)**3)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.223092, size = 108, normalized size = 1.07

$$\frac{b\ln\left(\left|-b-\frac{a}{(dx+c)^3}\right|\right)}{a^4 d}+\frac{5\,b^3+\frac{6\,ab^2}{(dx+c)^3}}{6\,a^4\left(b+\frac{a}{(dx+c)^3}\right)^2 d}-\frac{1}{3\,(dx+c)^3 a^3 d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)^3*(d*x + c)^4),x, algorithm="giac")
```

```
[Out] b*ln(abs(-b - a/(d*x + c)^3))/(a^4*d) + 1/6*(5*b^3 + 6*a*b^2/(d*x
 + c)^3)/(a^4*(b + a/(d*x + c)^3)^2*d) - 1/3/((d*x + c)^3*a^3*d)
```

3.2879 $\int \frac{(ce+dex)^4}{a+b(c+dx)^3}\,dx$

Optimal. Leaf size=168

$$\frac{a^{2/3}e^4\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{3b^{5/3}d}-\frac{a^{2/3}e^4\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{6b^{5/3}d}+\frac{a^{2/3}e^4\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}b^{5/3}d}+\frac{e^4(c+dx)^2}{2bd}$$

```
[Out] (e^4*(c + d*x)^2)/(2*b*d) + (a^(2/3)*e^4*ArcTan[(a^(1/3) - 2*b^(1
/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/(Sqrt[3]*b^(5/3)*d) + (a^(2/3)
*e^4*Log[a^(1/3) + b^(1/3)*(c + d*x)])/(3*b^(5/3)*d) - (a^(2/3)*e
^4*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2]
)/(6*b^(5/3)*d)
```

Rubi [A] time = 0.350035, antiderivative size = 168, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{a^{2/3}e^4\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{3b^{5/3}d}-\frac{a^{2/3}e^4\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{6b^{5/3}d}+\frac{a^{2/3}e^4\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}b^{5/3}d}+\frac{e^4(c+dx)^2}{2bd}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*e + d*e*x)^4/(a + b*(c + d*x)^3),x]
```

```
[Out] (e^4*(c + d*x)^2)/(2*b*d) + (a^(2/3)*e^4*ArcTan[(a^(1/3) - 2*b^(1
/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/(Sqrt[3]*b^(5/3)*d) + (a^(2/3)
*e^4*Log[a^(1/3) + b^(1/3)*(c + d*x)])/(3*b^(5/3)*d) - (a^(2/3)*e
^4*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2]
)/(6*b^(5/3)*d)
```

Rubi in Sympy [A] time = 41.8468, size = 160, normalized size = 0.95

$$\frac{a^{\frac{2}{3}}e^4\log\left(\sqrt[3]{a}+\sqrt[3]{b}\,(c+dx)\right)}{3b^{\frac{5}{3}}d}-\frac{a^{\frac{2}{3}}e^4\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}\,(-c-dx)+b^{\frac{2}{3}}\,(c+dx)^2\right)}{6b^{\frac{5}{3}}d}+\frac{\sqrt{3}a^{\frac{2}{3}}e^4\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{3b^{\frac{5}{3}}d}+\frac{e^4\,(c+dx)^2}{2bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*e*x+c*e)**4/(a+b*(d*x+c)**3),x)
```

```
[Out] a**(2/3)*e**4*log(a**(1/3) + b**(1/3)*(c + d*x))/(3*b**(5/3)*d) -
 a**(2/3)*e**4*log(a**(2/3) + a**(1/3)*b**(1/3)*(-c - d*x) + b**(
2/3)*(c + d*x)**2)/(6*b**(5/3)*d) + sqrt(3)*a**(2/3)*e**4*atan(sq
rt(3)*(a**(1/3)/3 + b**(1/3)*(-2*c/3 - 2*d*x/3))/a**(1/3))/(3*b**
(5/3)*d) + e**4*(c + d*x)**2/(2*b*d)
```

Mathematica [A] time = 0.0704846, size = 163, normalized size = 0.97

$$e^4\left(\frac{a^{2/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{3b^{5/3}d}-\frac{a^{2/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{6b^{5/3}d}-\frac{a^{2/3}\tan^{-1}\left(\frac{2\sqrt[3]{b}(c+dx)-\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}b^{5/3}d}+\frac{(c+dx)^2}{2bd}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*e + d*e*x)^4/(a + b*(c + d*x)^3),x]
```

```
[Out] e^4*((c + d*x)^2/(2*b*d) - (a^(2/3)*ArcTan[(-a^(1/3) + 2*b^(1/3)*
(c + d*x))/(Sqrt[3]*a^(1/3))])/(Sqrt[3]*b^(5/3)*d) + (a^(2/3)*Log
[a^(1/3) + b^(1/3)*(c + d*x)])/(3*b^(5/3)*d) - (a^(2/3)*Log[a^(2/
3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/(6*b^(5/3)
*d))
```

Maple [C] time = 0.004, size = 102, normalized size = 0.6

$$\frac{e^4dx^2}{2b}+\frac{e^4cx}{b}-\frac{e^4a}{3b^2d}\sum_{\_R=RootOf(\_Z^3bd^3+3\_Z^2bcd^2+3\_Zbc^2d+bc^3+a)}\frac{(\_Rd+c)\ln(x-\_R)}{d^2\_R^2+2cd\_R+c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*e*x+c*e)^4/(a+b*(d*x+c)^3),x)
```

```
[Out] 1/2*e^4/b*d*x^2+e^4/b*c*x-1/3*e^4*a/b^2/d*sum((_R*d+c)/(_R^2*d^2+
2*_R*c*d+c^2)*ln(x-_R),_R=RootOf(_Z^3*b*d^3+3*_Z^2*b*c*d^2+3*_Z*b
*c^2*d+b*c^3+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{ae^4\int\frac{dx+c}{bd^3x^3+3bcd^2x^2+3bc^2dx+bc^3+a}\,dx}{b}+\frac{de^4x^2+2ce^4x}{2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x + c*e)^4/((d*x + c)^3*b + a),x, algorithm="maxima")
```

```
[Out] -a*e^4*integrate((d*x + c)/(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d
*x + b*c^3 + a), x)/b + 1/2*(d*e^4*x^2 + 2*c*e^4*x)/b
```

Fricas [A] time = 0.213111, size = 266, normalized size = 1.58

$$-\frac{\sqrt{3}\left(\sqrt{3}e^4\left(\frac{a^2}{b^2}\right)^{\frac{1}{3}}\log\left(ad^2x^2+2acdx+ac^2-(bdx+bc)\left(\frac{a^2}{b^2}\right)^{\frac{2}{3}}+a\left(\frac{a^2}{b^2}\right)^{\frac{1}{3}}\right)-2\sqrt{3}e^4\left(\frac{a^2}{b^2}\right)^{\frac{1}{3}}\log\left(adx+ac+b\left(\frac{a^2}{b^2}\right)^{\frac{2}{3}}\right)-6\right.}{18bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x + c*e)^4/((d*x + c)^3*b + a),x, algorithm="fricas")
```

```
[Out] -1/18*sqrt(3)*(sqrt(3)*e^4*(a^2/b^2)^(1/3)*log(a*d^2*x^2 + 2*a*c*
d*x + a*c^2 - (b*d*x + b*c)*(a^2/b^2)^(2/3) + a*(a^2/b^2)^(1/3))
- 2*sqrt(3)*e^4*(a^2/b^2)^(1/3)*log(a*d*x + a*c + b*(a^2/b^2)^(2/
3)) - 6*e^4*(a^2/b^2)^(1/3)*arctan(1/3*(sqrt(3)*b*(a^2/b^2)^(2/3)
 - 2*sqrt(3)*(a*d*x + a*c))/(b*(a^2/b^2)^(2/3))) - 3*sqrt(3)*(d^2
*e^4*x^2 + 2*c*d*e^4*x))/(b*d)
```

Sympy [A] time = 2.248, size = 66, normalized size = 0.39

$$\frac{e^4 \operatorname{RootSum}\left(27t^3b^5 - a^2, \left(t \mapsto t \log\left(x + \frac{9t^2b^3e^8 + ace^8}{ade^8}\right)\right)\right)}{d} + \frac{ce^4x}{b} + \frac{de^4x^2}{2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x+c*e)**4/(a+b*(d*x+c)**3),x)
```

```
[Out] e**4*RootSum(27*_t**3*b**5 - a**2, Lambda(_t, _t*log(x + (9*_t**2
*b**3*e**8 + a*c*e**8)/(a*d*e**8))))/d + c*e**4*x/b + d*e**4*x**2
/(2*b)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dex + ce)^4}{(dx + c)^3 b + a} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x + c*e)^4/((d*x + c)^3*b + a),x, algorithm="giac")
```

```
[Out] integrate((d*e*x + c*e)^4/((d*x + c)^3*b + a), x)
```

3.2880 $\int \frac{(ce+dex)^3}{a+b(c+dx)^3}\,dx$

Optimal. Leaf size=156

$$\frac{\sqrt[3]{a}e^3\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{6b^{4/3}d}-\frac{\sqrt[3]{a}e^3\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{3b^{4/3}d}+\frac{\sqrt[3]{a}e^3\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}b^{4/3}d}+\frac{e^3x}{b}$$

```
[Out] (e^3*x)/b + (a^(1/3)*e^3*ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d*x))/(
Sqrt[3]*a^(1/3))])/(Sqrt[3]*b^(4/3)*d) - (a^(1/3)*e^3*Log[a^(1/3)
 + b^(1/3)*(c + d*x)])/(3*b^(4/3)*d) + (a^(1/3)*e^3*Log[a^(2/3) -
 a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/(6*b^(4/3)*d)
```

Rubi [A] time = 0.327719, antiderivative size = 156, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{\sqrt[3]{a}e^3\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{6b^{4/3}d}-\frac{\sqrt[3]{a}e^3\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{3b^{4/3}d}+\frac{\sqrt[3]{a}e^3\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}b^{4/3}d}+\frac{e^3x}{b}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*e + d*e*x)^3/(a + b*(c + d*x)^3),x]
```

```
[Out] (e^3*x)/b + (a^(1/3)*e^3*ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d*x))/(
Sqrt[3]*a^(1/3))])/(Sqrt[3]*b^(4/3)*d) - (a^(1/3)*e^3*Log[a^(1/3)
 + b^(1/3)*(c + d*x)])/(3*b^(4/3)*d) + (a^(1/3)*e^3*Log[a^(2/3) -
 a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/(6*b^(4/3)*d)
```

Rubi in Sympy [A] time = 41.978, size = 156, normalized size = 1.

$$-\frac{\sqrt[3]{a}e^3\log\left(\sqrt[3]{a}+\sqrt[3]{b}\left(c+dx\right)\right)}{3b^{\frac{4}{3}}d}+\frac{\sqrt[3]{a}e^3\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}\left(-c-dx\right)+b^{\frac{2}{3}}\left(c+dx\right)^2\right)}{6b^{\frac{4}{3}}d}+\frac{\sqrt{3}\sqrt[3]{a}e^3\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{3b^{\frac{4}{3}}d}+\frac{e^3\left(c+dx\right)}{bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*e*x+c*e)**3/(a+b*(d*x+c)**3),x)
```

```
[Out] -a**(1/3)*e**3*log(a**(1/3) + b**(1/3)*(c + d*x))/(3*b**(4/3)*d)
+ a**(1/3)*e**3*log(a**(2/3) + a**(1/3)*b**(1/3)*(-c - d*x) + b**
(2/3)*(c + d*x)**2)/(6*b**(4/3)*d) + sqrt(3)*a**(1/3)*e**3*atan(s
qrt(3)*(a**(1/3)/3 + b**(1/3)*(-2*c/3 - 2*d*x/3))/a**(1/3))/(3*b*
*(4/3)*d) + e**3*(c + d*x)/(b*d)
```

Mathematica [A] time = 0.0359661, size = 145, normalized size = 0.93

$$\frac{e^3\left(\sqrt[3]{a}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)-2\sqrt[3]{a}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)-2\sqrt{3}\sqrt[3]{a}\tan^{-1}\left(\frac{2\sqrt[3]{b}(c+dx)-\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)+6\sqrt[3]{b}c+\right.}{6b^{4/3}d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*e + d*e*x)^3/(a + b*(c + d*x)^3),x]
```

```
[Out] (e^3*(6*b^(1/3)*c + 6*b^(1/3)*d*x - 2*Sqrt[3]*a^(1/3)*ArcTan[(-a^
(1/3) + 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))] - 2*a^(1/3)*Log[a
^(1/3) + b^(1/3)*(c + d*x)] + a^(1/3)*Log[a^(2/3) - a^(1/3)*b^(1/
3)*(c + d*x) + b^(2/3)*(c + d*x)^2]))/(6*b^(4/3)*d)
```

Maple [C] time = 0.004, size = 84, normalized size = 0.5

$$\frac{e^3x}{b}-\frac{e^3a}{3\,b^2d}\sum_{\_R=RootOf(\_Z^3bd^3+3\_Z^2bcd^2+3\_Z\,bc^2d+bc^3+a)}\frac{\ln(x-\_R)}{d^2\_R^2+2\,cd\_R+c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*e*x+c*e)^3/(a+b*(d*x+c)^3),x)
```

```
[Out] e^3*x/b-1/3*e^3*a/b^2/d*sum(1/(_R^2*d^2+2*_R*c*d+c^2)*ln(x-_R),_R
=RootOf(_Z^3*b*d^3+3*_Z^2*b*c*d^2+3*_Z*b*c^2*d+b*c^3+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{ae^3\int\frac{1}{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}\,dx}{b}+\frac{e^3x}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x + c*e)^3/((d*x + c)^3*b + a),x, algorithm="maxima")
```

```
[Out] -a*e^3*integrate(1/(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c
^3 + a), x)/b + e^3*x/b
```

Fricas [A] time = 0.2131, size = 211, normalized size = 1.35

$$\frac{\sqrt{3}\left(6\sqrt{3}de^3x-\sqrt{3}e^3\left(-\frac{a}{b}\right)^{\frac{1}{3}}\log\left(d^2x^2+2\,cdx+c^2+(dx+c)\left(-\frac{a}{b}\right)^{\frac{1}{3}}+\left(-\frac{a}{b}\right)^{\frac{2}{3}}\right)+2\sqrt{3}e^3\left(-\frac{a}{b}\right)^{\frac{1}{3}}\log\left(dx+c-\left(-\frac{a}{b}\right)^{\frac{1}{3}}\right)-6\right.}{18\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x + c*e)^3/((d*x + c)^3*b + a),x, algorithm="fricas")
```

```
[Out] 1/18*sqrt(3)*(6*sqrt(3)*d*e^3*x - sqrt(3)*e^3*(-a/b)^(1/3)*log(d^
2*x^2 + 2*c*d*x + c^2 + (d*x + c)*(-a/b)^(1/3) + (-a/b)^(2/3)) +
2*sqrt(3)*e^3*(-a/b)^(1/3)*log(d*x + c - (-a/b)^(1/3)) - 6*e^3*(-
a/b)^(1/3)*arctan(1/3*(2*sqrt(3)*(d*x + c) + sqrt(3)*(-a/b)^(1/3)
)/(-a/b)^(1/3)))/(b*d)
```

Sympy [A] time = 1.98354, size = 44, normalized size = 0.28

$$\frac{e^3 \operatorname{RootSum}\left(27t^3b^4 + a, \left(t \mapsto t \log\left(x + \frac{-3tbe^3 + ce^3}{de^3}\right)\right)\right)}{d} + \frac{e^3x}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x+c*e)**3/(a+b*(d*x+c)**3),x)
```

```
[Out] e**3*RootSum(27*_t**3*b**4 + a, Lambda(_t, _t*log(x + (-3*_t*b*e*
*3 + c*e**3)/(d*e**3))))/d + e**3*x/b
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dex + ce)^3}{(dx + c)^3b + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x + c*e)^3/((d*x + c)^3*b + a),x, algorithm="giac")
```

```
[Out] integrate((d*e*x + c*e)^3/((d*x + c)^3*b + a), x)
```

3.2881 $\int \frac{(ce+dex)^2}{a+b(c+dx)^3}\,dx$

Optimal. Leaf size=25

$$\frac{e^2 \log\left(a+b(c+dx)^3\right)}{3bd}$$

```
[Out] (e^2*Log[a + b*(c + d*x)^3])/(3*b*d)
```

Rubi [A] time = 0.0209557, antiderivative size = 25, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.042

$$\frac{e^2 \log\left(a+b(c+dx)^3\right)}{3bd}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*e + d*e*x)^2/(a + b*(c + d*x)^3),x]

[Out] (e^2*Log[a + b*(c + d*x)^3])/(3*b*d)
```

Rubi in Sympy [A] time = 5.31493, size = 19, normalized size = 0.76

$$\frac{e^2 \log\left(a+b\,(c+dx)^3\right)}{3bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*e*x+c*e)**2/(a+b*(d*x+c)**3),x)

[Out] e**2*log(a + b*(c + d*x)**3)/(3*b*d)
```

Mathematica [A] time = 0.0138553, size = 25, normalized size = 1.

$$\frac{e^2 \log\left(a+b(c+dx)^3\right)}{3bd}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*e + d*e*x)^2/(a + b*(c + d*x)^3),x]

[Out] (e^2*Log[a + b*(c + d*x)^3])/(3*b*d)
```

Maple [A] time = 0.002, size = 46, normalized size = 1.8

$$\frac{e^2 \ln\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)}{3\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*e*x+c*e)^2/(a+b*(d*x+c)^3),x)

[Out] 1/3*e^2/b/d*ln(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)
```

Maxima [A] time = 1.34596, size = 61, normalized size = 2.44

$$\frac{e^2 \log\left(bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3 + a\right)}{3\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x + c*e)^2/((d*x + c)^3*b + a),x, algorithm="maxima")
```

```
[Out] 1/3*e^2*log(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)/
(b*d)
```

Fricas [A] time = 0.203188, size = 61, normalized size = 2.44

$$\frac{e^2 \log\left(bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3 + a\right)}{3\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x + c*e)^2/((d*x + c)^3*b + a),x, algorithm="fricas")
```

```
[Out] 1/3*e^2*log(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)/
(b*d)
```

Sympy [A] time = 1.82105, size = 46, normalized size = 1.84

$$\frac{e^2 \log\left(a + bc^3 + 3bc^2dx + 3bcd^2x^2 + bd^3x^3\right)}{3bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x+c*e)**2/(a+b*(d*x+c)**3),x)
```

```
[Out] e**2*log(a + b*c**3 + 3*b*c**2*d*x + 3*b*c*d**2*x**2 + b*d**3*x**
3)/(3*b*d)
```

GIAC/XCAS [A] time = 0.216519, size = 61, normalized size = 2.44

$$\frac{e^2 \ln\left(\left|bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3 + a\right|\right)}{3\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x + c*e)^2/((d*x + c)^3*b + a),x, algorithm="giac")
```

```
[Out] 1/3*e^2*ln(abs(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 +
a))/(b*d)
```

3.2882 $\int \frac{ce+dex}{a+b(c+dx)^3}\,dx$

Optimal. Leaf size=143

$$\frac{e\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{6\sqrt[3]{a}b^{2/3}d}-\frac{e\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{3\sqrt[3]{a}b^{2/3}d}-\frac{e\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}\sqrt[3]{a}b^{2/3}d}$$

```
[Out] -((e*ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/(
Sqrt[3]*a^(1/3)*b^(2/3)*d)) - (e*Log[a^(1/3) + b^(1/3)*(c + d*x)]
)/(3*a^(1/3)*b^(2/3)*d) + (e*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d
*x) + b^(2/3)*(c + d*x)^2])/(6*a^(1/3)*b^(2/3)*d)
```

Rubi [A] time = 0.28664, antiderivative size = 143, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.318

$$\frac{e\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{6\sqrt[3]{a}b^{2/3}d}-\frac{e\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{3\sqrt[3]{a}b^{2/3}d}-\frac{e\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}\sqrt[3]{a}b^{2/3}d}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*e + d*e*x)/(a + b*(c + d*x)^3),x]
```

```
[Out] -((e*ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/(
Sqrt[3]*a^(1/3)*b^(2/3)*d)) - (e*Log[a^(1/3) + b^(1/3)*(c + d*x)]
)/(3*a^(1/3)*b^(2/3)*d) + (e*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d
*x) + b^(2/3)*(c + d*x)^2])/(6*a^(1/3)*b^(2/3)*d)
```

Rubi in Sympy [A] time = 33.8951, size = 139, normalized size = 0.97

$$-\frac{e\log\left(\sqrt[3]{a}+\sqrt[3]{b}\,(c+dx)\right)}{3\sqrt[3]{a}b^{\frac{2}{3}}d}+\frac{e\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}\,(-c-dx)+b^{\frac{2}{3}}\,(c+dx)^2\right)}{6\sqrt[3]{a}b^{\frac{2}{3}}d}-\frac{\sqrt{3}e\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{3\sqrt[3]{a}b^{\frac{2}{3}}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*e*x+c*e)/(a+b*(d*x+c)**3),x)
```

```
[Out] -e*log(a**(1/3) + b**(1/3)*(c + d*x))/(3*a**(1/3)*b**(2/3)*d) + e
*log(a**(2/3) + a**(1/3)*b**(1/3)*(-c - d*x) + b**(2/3)*(c + d*x)
**2)/(6*a**(1/3)*b**(2/3)*d) - sqrt(3)*e*atan(sqrt(3)*(a**(1/3)/3
 + b**(1/3)*(-2*c/3 - 2*d*x/3))/a**(1/3))/(3*a**(1/3)*b**(2/3)*d)
```

Mathematica [A] time = 0.0232938, size = 115, normalized size = 0.8

$$\frac{e\left(\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)-2\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)+2\sqrt{3}\tan^{-1}\left(\frac{2\sqrt[3]{b}(c+dx)-\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)\right)}{6\sqrt[3]{a}b^{2/3}d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*e + d*e*x)/(a + b*(c + d*x)^3),x]
```

```
[Out] (e*(2*Sqrt[3]*ArcTan[(-a^(1/3) + 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^
(1/3))] - 2*Log[a^(1/3) + b^(1/3)*(c + d*x)] + Log[a^(2/3) - a^(1
/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2]))/(6*a^(1/3)*b^(2/3)
*d)
```

Maple [C] time = 0.002, size = 77, normalized size = 0.5

$$\frac{e}{3bd}\sum_{\_R=RootOf\left(\_Z^3bd^3+3\_Z^2bcd^2+3\_Z\,bc^2d+bc^3+a\right)}\frac{(\_Rd+c)\ln(x-\_R)}{d^2\_R^2+2cd\_R+c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*e*x+c*e)/(a+b*(d*x+c)^3),x)
```

```
[Out] 1/3*e/b/d*sum((_R*d+c)/(_R^2*d^2+2*_R*c*d+c^2)*ln(x-_R),_R=RootOf
(_Z^3*b*d^3+3*_Z^2*b*c*d^2+3*_Z*b*c^2*d+b*c^3+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{dex+ce}{(dx+c)^3b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*e*x + c*e)/((d*x + c)^3*b + a),x, algorithm="maxima")
```

```
[Out] integrate((d*e*x + c*e)/((d*x + c)^3*b + a), x)
```

Fricas [A] time = 0.214471, size = 181, normalized size = 1.27

$$\frac{\sqrt{3}\left(2\sqrt{3}e\log\left(ab+\left(-ab^2\right)^{\frac{2}{3}}(dx+c)\right)-\sqrt{3}e\log\left(-ab+\left(-ab^2\right)^{\frac{2}{3}}(dx+c)+\left(bd^2x^2+2bcdx+bc^2\right)\left(-ab^2\right)^{\frac{1}{3}}\right)-6e\arctan}{18\left(-ab^2\right)^{\frac{1}{3}}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*e*x + c*e)/((d*x + c)^3*b + a),x, algorithm="fricas")
```

```
[Out] 1/18*sqrt(3)*(2*sqrt(3)*e*log(a*b + (-a*b^2)^(2/3)*(d*x + c)) - s
qrt(3)*e*log(-a*b + (-a*b^2)^(2/3)*(d*x + c) + (b*d^2*x^2 + 2*b*c
*d*x + b*c^2)*(-a*b^2)^(1/3)) - 6*e*arctan(-1/3*(sqrt(3)*a*b - 2*
sqrt(3)*(-a*b^2)^(2/3)*(d*x + c))/(a*b)))/((-a*b^2)^(1/3)*d)
```

Sympy [A] time = 1.7702, size = 41, normalized size = 0.29

$$\frac{e\operatorname{RootSum}\left(27t^3ab^2+1,\left(t\mapsto t\log\left(x+\frac{9t^2abe^2+ce^2}{de^2}\right)\right)\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*e*x+c*e)/(a+b*(d*x+c)**3),x)
```

```
[Out] e*RootSum(27*_t**3*a*b**2 + 1, Lambda(_t, _t*log(x + (9*_t**2*a*b
*e**2 + c*e**2)/(d*e**2))))/d
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{dex + ce}{(dx + c)^3 b + a} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x + c*e)/((d*x + c)^3*b + a),x, algorithm="giac")
```

```
[Out] integrate((d*e*x + c*e)/((d*x + c)^3*b + a), x)
```

3.2883 $\int \frac{1}{(ce+dex)(a+b(c+dx)^3)}\,dx$

Optimal. Leaf size=42

$$\frac{\log(c+dx)}{ade}-\frac{\log\left(a+b(c+dx)^3\right)}{3ade}$$

```
[Out] Log[c + d*x]/(a*d*e) - Log[a + b*(c + d*x)^3]/(3*a*d*e)
```

Rubi [A] time = 0.0976713, antiderivative size = 42, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208

$$\frac{\log(c+dx)}{ade}-\frac{\log\left(a+b(c+dx)^3\right)}{3ade}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((c*e + d*e*x)*(a + b*(c + d*x)^3)),x]
```

```
[Out] Log[c + d*x]/(a*d*e) - Log[a + b*(c + d*x)^3]/(3*a*d*e)
```

Rubi in Sympy [A] time = 11.6847, size = 32, normalized size = 0.76

$$-\frac{\log\left(a+b\left(c+dx\right)^3\right)}{3ade}+\frac{\log\left(\left(c+dx\right)^3\right)}{3ade}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(d*e*x+c*e)/(a+b*(d*x+c)**3),x)
```

```
[Out] -log(a + b*(c + d*x)**3)/(3*a*d*e) + log((c + d*x)**3)/(3*a*d*e)
```

Mathematica [A] time = 0.0156859, size = 42, normalized size = 1.

$$\frac{\log(c+dx)}{ade}-\frac{\log\left(a+b(c+dx)^3\right)}{3ade}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((c*e + d*e*x)*(a + b*(c + d*x)^3)),x]
```

```
[Out] Log[c + d*x]/(a*d*e) - Log[a + b*(c + d*x)^3]/(3*a*d*e)
```

Maple [A] time = 0.006, size = 63, normalized size = 1.5

$$-\frac{\ln\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)}{3\,aed}+\frac{\ln\left(dx+c\right)}{aed}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(d*e*x+c*e)/(a+b*(d*x+c)^3),x)
```

```
[Out] -1/3/e/a/d*ln(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)+ln(d*x
+c)/a/e/d
```

Maxima [A] time = 1.41228, size = 84, normalized size = 2.

$$-\frac{\log\left(bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3 + a\right)}{3\,ade} + \frac{\log\left(dx + c\right)}{ade}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((d*x + c)^3*b + a)*(d*e*x + c*e)),x, algorithm="maxima")
```

```
[Out] -1/3*log(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)/(a*
d*e) + log(d*x + c)/(a*d*e)
```

Fricas [A] time = 0.203951, size = 73, normalized size = 1.74

$$-\frac{\log\left(bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3 + a\right) - 3\,\log\left(dx + c\right)}{3\,ade}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((d*x + c)^3*b + a)*(d*e*x + c*e)),x, algorithm="fricas")
```

```
[Out] -1/3*(log(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a) -
3*log(d*x + c))/(a*d*e)
```

Sympy [A] time = 1.78082, size = 53, normalized size = 1.26

$$\frac{\log\left(\frac{c}{d} + x\right)}{ade} - \frac{\log\left(\frac{3c^2x}{d^2} + \frac{3cx^2}{d} + x^3 + \frac{a+bc^3}{bd^3}\right)}{3ade}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(d*e*x+c*e)/(a+b*(d*x+c)**3),x)
```

```
[Out] log(c/d + x)/(a*d*e) - log(3*c**2*x/d**2 + 3*c*x**2/d + x**3 + (a
 + b*c**3)/(b*d**3))/(3*a*d*e)
```

GIAC/XCAS [A] time = 0.220951, size = 84, normalized size = 2.

$$-\frac{e^{(-1)}\ln\left(\left|bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3 + a\right|\right)}{3\,ad} + \frac{e^{(-1)}\ln\left(|dx + c|\right)}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((d*x + c)^3*b + a)*(d*e*x + c*e)),x, algorithm="giac")
```

```
[Out] -1/3*e^(-1)*ln(abs(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^
3 + a))/(a*d) + e^(-1)*ln(abs(d*x + c))/(a*d)
```

3.2884 $\int \frac{1}{(ce+dex)^2(a+b(c+dx)^3)}\,dx$

Optimal. Leaf size=166

$$-\frac{\sqrt[3]{b}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{6a^{4/3}de^2}+\frac{\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{3a^{4/3}de^2}+\frac{\sqrt[3]{b}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}a^{4/3}de^2}-\frac{1}{ade^2(c+dx)}$$

```
[Out] -(1/(a*d*e^2*(c + d*x))) + (b^(1/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*(
c + d*x))/(Sqrt[3]*a^(1/3))])/(Sqrt[3]*a^(4/3)*d*e^2) + (b^(1/3)*
Log[a^(1/3) + b^(1/3)*(c + d*x)])/(3*a^(4/3)*d*e^2) - (b^(1/3)*Lo
g[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/(6*
a^(4/3)*d*e^2)
```

Rubi [A] time = 0.328423, antiderivative size = 166, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$

$$-\frac{\sqrt[3]{b}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{6a^{4/3}de^2}+\frac{\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{3a^{4/3}de^2}+\frac{\sqrt[3]{b}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}a^{4/3}de^2}-\frac{1}{ade^2(c+dx)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((c*e + d*e*x)^2*(a + b*(c + d*x)^3)),x]
```

```
[Out] -(1/(a*d*e^2*(c + d*x))) + (b^(1/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*(
c + d*x))/(Sqrt[3]*a^(1/3))])/(Sqrt[3]*a^(4/3)*d*e^2) + (b^(1/3)*
Log[a^(1/3) + b^(1/3)*(c + d*x)])/(3*a^(4/3)*d*e^2) - (b^(1/3)*Lo
g[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/(6*
a^(4/3)*d*e^2)
```

Rubi in Sympy [A] time = 40.1681, size = 158, normalized size = 0.95

$$-\frac{1}{ade^2(c+dx)}+\frac{\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{3a^{\frac{4}{3}}de^2}-\frac{\sqrt[3]{b}\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}(-c-dx)+b^{\frac{2}{3}}(c+dx)^2\right)}{6a^{\frac{4}{3}}de^2}+\frac{\sqrt{3}\sqrt[3]{b}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{3a^{\frac{4}{3}}de^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(d*e*x+c*e)**2/(a+b*(d*x+c)**3),x)
```

```
[Out] -1/(a*d*e**2*(c + d*x)) + b**(1/3)*log(a**(1/3) + b**(1/3)*(c + d
*x))/(3*a**(4/3)*d*e**2) - b**(1/3)*log(a**(2/3) + a**(1/3)*b**(1
/3)*(-c - d*x) + b**(2/3)*(c + d*x)**2)/(6*a**(4/3)*d*e**2) + sqr
t(3)*b**(1/3)*atan(sqrt(3)*(a**(1/3)/3 + b**(1/3)*(-2*c/3 - 2*d*x
/3))/a**(1/3))/(3*a**(4/3)*d*e**2)
```

Mathematica [A] time = 0.0817886, size = 143, normalized size = 0.86

$$\frac{-\sqrt[3]{b}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)+2\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)-2\sqrt{3}\sqrt[3]{b}\tan^{-1}\left(\frac{2\sqrt[3]{b}(c+dx)-\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)-\frac{6\sqrt[3]{a}}{c+dx}}{6a^{4/3}de^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((c*e + d*e*x)^2*(a + b*(c + d*x)^3)),x]
```

```
[Out] ((-6*a^(1/3))/(c + d*x) - 2*Sqrt[3]*b^(1/3)*ArcTan[(-a^(1/3) + 2*
b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))] + 2*b^(1/3)*Log[a^(1/3) + b
^(1/3)*(c + d*x)] - b^(1/3)*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*
x) + b^(2/3)*(c + d*x)^2])/(6*a^(4/3)*d*e^2)
```

Maple [C] time = 0.006, size = 98, normalized size = 0.6

$$-\frac{1}{3\,e^2ad}\sum_{\_R=RootOf\left(\_Z^3bd^3+3\_Z^2bcd^2+3\_Z\,bc^2d+bc^3+a\right)}\frac{(\_R\,d+c)\ln(x-\_R)}{d^2\_R^2+2\,cd\_R+c^2}-\frac{1}{e^2ad\,(dx+c)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(d*e*x+c*e)^2/(a+b*(d*x+c)^3),x)
```

```
[Out] -1/3/e^2/a/d*sum((_R*d+c)/(_R^2*d^2+2*_R*c*d+c^2)*ln(x-_R),_R=Roo
tOf(_Z^3*b*d^3+3*_Z^2*b*c*d^2+3*_Z*b*c^2*d+b*c^3+a))-1/a/d/e^2/(d
*x+c)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{ad^2e^2x+acde^2}-\frac{b\int\frac{dx+c}{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}\,dx}{ae^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)*(d*e*x + c*e)^2),x, algorithm="maxima")
```

```
[Out] -1/(a*d^2*e^2*x + a*c*d*e^2) - b*integrate((d*x + c)/(b*d^3*x^3 +
 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a), x)/(a*e^2)
```

Fricas [A] time = 0.219099, size = 244, normalized size = 1.47

$$-\frac{\sqrt{3}\left(\sqrt{3}(dx+c)\left(\frac{b}{a}\right)^{\frac{1}{3}}\log\left(bd^2x^2+2\,bcdx+bc^2-(adx+ac)\left(\frac{b}{a}\right)^{\frac{2}{3}}+a\left(\frac{b}{a}\right)^{\frac{1}{3}}\right)-2\,\sqrt{3}(dx+c)\left(\frac{b}{a}\right)^{\frac{1}{3}}\log\left(bdx+bc+a\left(\frac{b}{a}\right)\right.\right.}{18\,(ad^2e^2x+acde^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)*(d*e*x + c*e)^2),x, algorithm="fricas")
```

```
[Out] -1/18*sqrt(3)*(sqrt(3)*(d*x + c)*(b/a)^(1/3)*log(b*d^2*x^2 + 2*b*
c*d*x + b*c^2 - (a*d*x + a*c)*(b/a)^(2/3) + a*(b/a)^(1/3)) - 2*sq
rt(3)*(d*x + c)*(b/a)^(1/3)*log(b*d*x + b*c + a*(b/a)^(2/3)) - 6*
(d*x + c)*(b/a)^(1/3)*arctan(1/3*(sqrt(3)*a*(b/a)^(2/3) - 2*sqrt(
3)*(b*d*x + b*c))/(a*(b/a)^(2/3))) + 6*sqrt(3))/(a*d^2*e^2*x + a*
```

```
c*d*e^2)
```

Sympy [A] time = 3.38947, size = 54, normalized size = 0.33

$$-\frac{1}{acde^2 + ad^2e^2x} + \frac{\operatorname{RootSum}\left(27t^3a^4 - b, \left(t \mapsto t\log\left(x + \frac{9t^2a^3+bc}{bd}\right)\right)\right)}{de^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(d*e*x+c*e)**2/(a+b*(d*x+c)**3),x)
```

```
[Out] -1/(a*c*d*e**2 + a*d**2*e**2*x) + RootSum(27*_t**3*a**4 - b, Lamb
da(_t, _t*log(x + (9*_t**2*a**3 + b*c)/(b*d))))/(d*e**2)
```

GIAC/XCAS [A] time = 0.234793, size = 305, normalized size = 1.84

$$\frac{\left(\frac{b}{ad^3}\right)^{\frac{1}{3}} e^{(-2)}\ln\left(\left|-\left(\frac{b}{ad^3}\right)^{\frac{1}{3}} e^{(-2)} - \frac{e^{(-1)}}{(dxe+ce)d}\right|\right)}{3\,a} - \frac{\sqrt{3}\left(a^2b\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(\left(\frac{b}{ad^3}\right)^{\frac{1}{3}} e^{(-2)} - \frac{2\,e^{(-1)}}{(dxe+ce)d}\right)e^2}{3\left(\frac{b}{ad^3}\right)^{\frac{1}{3}}}\right)e^{(-2)}}{3\,a^2d} - \frac{\left(a^2b\right)^{\frac{1}{3}} e^{(-2)}\ln\left(\left(\frac{b}{ad^3}\right)^{\frac{2}{3}} e^{(-4)} - \frac{\left(\frac{b}{ad^3}\right)^{\frac{1}{3}} e^{(-3)}}{(dxe+ce)d} + \frac{e^{(-2)}}{(dxe+ce)^2d^2}\right)}{6\,a^2d} - \frac{e^{(-1)}}{(dxe+ce)ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)*(d*e*x + c*e)^2),x, algorithm="giac")
```

```
[Out] 1/3*(b/(a*d^3))^(1/3)*e^(-2)*ln(abs(-(b/(a*d^3))^(1/3)*e^(-2) - e
^(-1)/((d*x*e + c*e)*d)))/a - 1/3*sqrt(3)*(a^2*b)^(1/3)*arctan(1/
3*sqrt(3)*((b/(a*d^3))^(1/3)*e^(-2) - 2*e^(-1)/((d*x*e + c*e)*d))
*e^2/(b/(a*d^3))^(1/3))*e^(-2)/(a^2*d) - 1/6*(a^2*b)^(1/3)*e^(-2)
*ln((b/(a*d^3))^(2/3)*e^(-4) - (b/(a*d^3))^(1/3)*e^(-3)/((d*x*e +
 c*e)*d) + e^(-2)/((d*x*e + c*e)^2*d^2))/(a^2*d) - e^(-1)/((d*x*e
 + c*e)*a*d)
```

3.2885 $\int \frac{1}{(ce+dex)^3(a+b(c+dx)^3)}\,dx$

Optimal. Leaf size=168

$$-\frac{b^{2/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{3a^{5/3}de^3}+\frac{b^{2/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{6a^{5/3}de^3}+\frac{b^{2/3}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}a^{5/3}de^3}-\frac{1}{2ade^3(c+dx)^2}$$

```
[Out] -1/(2*a*d*e^3*(c + d*x)^2) + (b^(2/3)*ArcTan[(a^(1/3) - 2*b^(1/3)
*(c + d*x))/(Sqrt[3]*a^(1/3))])/(Sqrt[3]*a^(5/3)*d*e^3) - (b^(2/3
)*Log[a^(1/3) + b^(1/3)*(c + d*x)])/(3*a^(5/3)*d*e^3) + (b^(2/3)*
Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/(
6*a^(5/3)*d*e^3)
```

Rubi [A] time = 0.324435, antiderivative size = 168, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$

$$-\frac{b^{2/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{3a^{5/3}de^3}+\frac{b^{2/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{6a^{5/3}de^3}+\frac{b^{2/3}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}a^{5/3}de^3}-\frac{1}{2ade^3(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((c*e + d*e*x)^3*(a + b*(c + d*x)^3)),x]
```

```
[Out] -1/(2*a*d*e^3*(c + d*x)^2) + (b^(2/3)*ArcTan[(a^(1/3) - 2*b^(1/3)
*(c + d*x))/(Sqrt[3]*a^(1/3))])/(Sqrt[3]*a^(5/3)*d*e^3) - (b^(2/3
)*Log[a^(1/3) + b^(1/3)*(c + d*x)])/(3*a^(5/3)*d*e^3) + (b^(2/3)*
Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/(
6*a^(5/3)*d*e^3)
```

Rubi in Sympy [A] time = 41.0089, size = 162, normalized size = 0.96

$$-\frac{1}{2ade^3(c+dx)^2}-\frac{b^{\frac{2}{3}}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{3a^{\frac{5}{3}}de^3}+\frac{b^{\frac{2}{3}}\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}(-c-dx)+b^{\frac{2}{3}}(c+dx)^2\right)}{6a^{\frac{5}{3}}de^3}+\frac{\sqrt{3}b^{\frac{2}{3}}\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{3a^{\frac{5}{3}}de^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(d*e*x+c*e)**3/(a+b*(d*x+c)**3),x)
```

```
[Out] -1/(2*a*d*e**3*(c + d*x)**2) - b**(2/3)*log(a**(1/3) + b**(1/3)*(
c + d*x))/(3*a**(5/3)*d*e**3) + b**(2/3)*log(a**(2/3) + a**(1/3)*
b**(1/3)*(-c - d*x) + b**(2/3)*(c + d*x)**2)/(6*a**(5/3)*d*e**3)
+ sqrt(3)*b**(2/3)*atan(sqrt(3)*(a**(1/3)/3 + b**(1/3)*(-2*c/3 -
2*d*x/3))/a**(1/3))/(3*a**(5/3)*d*e**3)
```

Mathematica [A] time = 0.0738975, size = 142, normalized size = 0.85

$$\frac{b^{2/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)-\frac{3a^{2/3}}{(c+dx)^2}-2b^{2/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)-2\sqrt{3}b^{2/3}\tan^{-1}\left(\frac{2\sqrt[3]{b}(c+dx)-\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{6a^{5/3}de^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((c*e + d*e*x)^3*(a + b*(c + d*x)^3)),x]
```

```
[Out] ((-3*a^(2/3))/(c + d*x)^2 - 2*Sqrt[3]*b^(2/3)*ArcTan[(-a^(1/3) +
2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))] - 2*b^(2/3)*Log[a^(1/3) +
 b^(1/3)*(c + d*x)] + b^(2/3)*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c +
d*x) + b^(2/3)*(c + d*x)^2])/(6*a^(5/3)*d*e^3)
```

Maple [C] time = 0.005, size = 93, normalized size = 0.6

$$-\frac{1}{3e^3ad}\sum_{\_R=RootOf(\_Z^3bd^3+3\_Z^2bcd^2+3\_Zbc^2d+bc^3+a)}\frac{\ln(x-\_R)}{d^2\_R^2+2cd\_R+c^2}-\frac{1}{2e^3ad(dx+c)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(d*e*x+c*e)^3/(a+b*(d*x+c)^3),x)
```

```
[Out] -1/3/e^3/a/d*sum(1/(_R^2*d^2+2*_R*c*d+c^2)*ln(x-_R),_R=RootOf(_Z^
3*b*d^3+3*_Z^2*b*c*d^2+3*_Z*b*c^2*d+b*c^3+a))-1/2/a/d/e^3/(d*x+c)
^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2(ad^3e^3x^2+2acd^2e^3x+ac^2de^3)}-\frac{b\int\frac{1}{bd^3x^3+3bcd^2x^2+3bc^2dx+bc^3+a}\,dx}{ae^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)*(d*e*x + c*e)^3),x, algorithm="maxima")
```

```
[Out] -1/2/(a*d^3*e^3*x^2 + 2*a*c*d^2*e^3*x + a*c^2*d*e^3) - b*integrat
e(1/(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a), x)/(a*
e^3)
```

Fricas [A] time = 0.219268, size = 355, normalized size = 2.11

$$-\frac{\sqrt{3}\left(\sqrt{3}(d^2x^2+2cdx+c^2)\left(-\frac{b^2}{a^2}\right)^{\frac{1}{3}}\log\left(b^2d^2x^2+2b^2cdx+b^2c^2+a^2\left(-\frac{b^2}{a^2}\right)^{\frac{2}{3}}+(abdx+abc)\left(-\frac{b^2}{a^2}\right)^{\frac{1}{3}}\right)-2\sqrt{3}(d^2x^2+2cc\right.}{18(ad^3e^3x^2+2acd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)*(d*e*x + c*e)^3),x, algorithm="fricas")
```

```
[Out] -1/18*sqrt(3)*(sqrt(3)*(d^2*x^2 + 2*c*d*x + c^2)*(-b^2/a^2)^(1/3)
*log(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2 + a^2*(-b^2/a^2)^(2/3) +
 (a*b*d*x + a*b*c)*(-b^2/a^2)^(1/3)) - 2*sqrt(3)*(d^2*x^2 + 2*c*d
*x + c^2)*(-b^2/a^2)^(1/3)*log(b*d*x + b*c - a*(-b^2/a^2)^(1/3))
```

```
+ 6*(d^2*x^2 + 2*c*d*x + c^2)*(-b^2/a^2)^(1/3)*arctan(1/3*(sqrt(3
)*a*(-b^2/a^2)^(1/3) + 2*sqrt(3)*(b*d*x + b*c))/(a*(-b^2/a^2)^(1/
3))) + 3*sqrt(3))/(a*d^3*e^3*x^2 + 2*a*c*d^2*e^3*x + a*c^2*d*e^3)
```

Sympy [A] time = 5.18409, size = 75, normalized size = 0.45

$$-\frac{1}{2ac^2de^3 + 4acd^2e^3x + 2ad^3e^3x^2} + \frac{\operatorname{RootSum}\left(27t^3a^5 + b^2, \left(t \mapsto t\log\left(x + \frac{-3ta^2+bc}{bd}\right)\right)\right)}{de^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(d*e*x+c*e)**3/(a+b*(d*x+c)**3),x)
```

```
[Out] -1/(2*a*c**2*d*e**3 + 4*a*c*d**2*e**3*x + 2*a*d**3*e**3*x**2) + R
ootSum(27*_t**3*a**5 + b**2, Lambda(_t, _t*log(x + (-3*_t*a**2 +
b*c)/(b*d))))/(d*e**3)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left((dx+c)^3b + a\right)(dex + ce)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((d*x + c)^3*b + a)*(d*e*x + c*e)^3),x, algorithm="giac")
```

```
[Out] integrate(1/(((d*x + c)^3*b + a)*(d*e*x + c*e)^3), x)
```

3.2886 $\int \frac{1}{(ce+dex)^4(a+b(c+dx)^3)}\,dx$

Optimal. Leaf size=65

$$-\frac{b\log(c+dx)}{a^2de^4}+\frac{b\log\left(a+b(c+dx)^3\right)}{3a^2de^4}-\frac{1}{3ade^4(c+dx)^3}$$

```
[Out] -1/(3*a*d*e^4*(c + d*x)^3) - (b*Log[c + d*x])/(a^2*d*e^4) + (b*Lo
g[a + b*(c + d*x)^3])/(3*a^2*d*e^4)
```

Rubi [A] time = 0.125712, antiderivative size = 65, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125

$$-\frac{b\log(c+dx)}{a^2de^4}+\frac{b\log\left(a+b(c+dx)^3\right)}{3a^2de^4}-\frac{1}{3ade^4(c+dx)^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((c*e + d*e*x)^4*(a + b*(c + d*x)^3)),x]
```

```
[Out] -1/(3*a*d*e^4*(c + d*x)^3) - (b*Log[c + d*x])/(a^2*d*e^4) + (b*Lo
g[a + b*(c + d*x)^3])/(3*a^2*d*e^4)
```

Rubi in Sympy [A] time = 15.4078, size = 60, normalized size = 0.92

$$-\frac{1}{3ade^4\left(c+dx\right)^3}+\frac{b\log\left(a+b\left(c+dx\right)^3\right)}{3a^2de^4}-\frac{b\log\left(\left(c+dx\right)^3\right)}{3a^2de^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(d*e*x+c*e)**4/(a+b*(d*x+c)**3),x)
```

```
[Out] -1/(3*a*d*e**4*(c + d*x)**3) + b*log(a + b*(c + d*x)**3)/(3*a**2*
d*e**4) - b*log((c + d*x)**3)/(3*a**2*d*e**4)
```

Mathematica [A] time = 0.0405102, size = 47, normalized size = 0.72

$$\frac{b\log\left(a+b(c+dx)^3\right)-\frac{a}{(c+dx)^3}-3b\log(c+dx)}{3a^2de^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((c*e + d*e*x)^4*(a + b*(c + d*x)^3)),x]
```

```
[Out] (-(a/(c + d*x)^3) - 3*b*Log[c + d*x] + b*Log[a + b*(c + d*x)^3])/
(3*a^2*d*e^4)
```

Maple [A] time = 0.006, size = 84, normalized size = 1.3

$$\frac{b\ln\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)}{3\,e^4a^2d}-\frac{1}{3\,ade^4\left(dx+c\right)^3}-\frac{b\ln\left(dx+c\right)}{e^4a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(d*e*x+c*e)^4/(a+b*(d*x+c)^3),x)
```

```
[Out] 1/3/e^4/a^2*b/d*ln(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)-1
/3/a/d/e^4/(d*x+c)^3-b*ln(d*x+c)/a^2/d/e^4
```

Maxima [A] time = 1.35391, size = 157, normalized size = 2.42

$$-\frac{1}{3\left(ad^4e^4x^3+3\,acd^3e^4x^2+3\,ac^2d^2e^4x+ac^3de^4\right)}+\frac{b\log\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)}{3\,a^2de^4}-\frac{b\log\left(dx+c\right)}{a^2de^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)*(d*e*x + c*e)^4),x, algorithm="maxima")
```

```
[Out] -1/3/(a*d^4*e^4*x^3 + 3*a*c*d^3*e^4*x^2 + 3*a*c^2*d^2*e^4*x + a*c
^3*d*e^4) + 1/3*b*log(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b
*c^3 + a)/(a^2*d*e^4) - b*log(d*x + c)/(a^2*d*e^4)
```

Fricas [A] time = 0.217469, size = 230, normalized size = 3.54

$$\frac{\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3\right)\log\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)-3\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3\right)\log(}{3\left(a^2d^4e^4x^3+3\,a^2cd^3e^4x^2+3\,a^2c^2d^2e^4x+a^2c^3de^4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)*(d*e*x + c*e)^4),x, algorithm="fricas")
```

```
[Out] 1/3*((b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(b*d^3*
x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a) - 3*(b*d^3*x^3 + 3
*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3)*log(d*x + c) - a)/(a^2*d^4*e^
4*x^3 + 3*a^2*c*d^3*e^4*x^2 + 3*a^2*c^2*d^2*e^4*x + a^2*c^3*d*e^4
)
```

Sympy [A] time = 8.96032, size = 121, normalized size = 1.86

$$-\frac{1}{3ac^3de^4+9ac^2d^2e^4x+9acd^3e^4x^2+3ad^4e^4x^3}-\frac{b\log\left(\frac{c}{d}+x\right)}{a^2de^4}+\frac{b\log\left(\frac{3c^2x}{d^2}+\frac{3cx^2}{d}+x^3+\frac{a+bc^3}{bd^3}\right)}{3a^2de^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(d*e*x+c*e)**4/(a+b*(d*x+c)**3),x)
```

```
[Out] -1/(3*a*c**3*d*e**4 + 9*a*c**2*d**2*e**4*x + 9*a*c*d**3*e**4*x**2
 + 3*a*d**4*e**4*x**3) - b*log(c/d + x)/(a**2*d*e**4) + b*log(3*c
**2*x/d**2 + 3*c*x**2/d + x**3 + (a + b*c**3)/(b*d**3))/(3*a**2*d
*e**4)
```

GIAC/XCAS [A] time = 0.219776, size = 111, normalized size = 1.71

$$\frac{be^{(-4)}\ln\left(\left|bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right|\right)}{3\,a^2d}-\frac{be^{(-4)}\ln\left(\left|dx+c\right|\right)}{a^2d}-\frac{e^{(-4)}}{3\left(dx+c\right)^3ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((d*x + c)^3*b + a)*(d*e*x + c*e)^4),x, algorithm="giac")
```

```
[Out] 1/3*b*e^(-4)*ln(abs(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c
^3 + a))/(a^2*d) - b*e^(-4)*ln(abs(d*x + c))/(a^2*d) - 1/3*e^(-4)
/((d*x + c)^3*a*d)
```

3.2887 $\int \frac{(ce+dex)^4}{(a+b(c+dx)^3)^2}\,dx$

Optimal. Leaf size=184

$$\frac{e^4\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{9\sqrt[3]{a}b^{5/3}d}-\frac{2e^4\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{9\sqrt[3]{a}b^{5/3}d}-\frac{2e^4\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}\sqrt[3]{a}b^{5/3}d}-\frac{e^4(c+dx)^2}{3bd\left(a+b(c+dx)^3\right)}$$

```
[Out] -(e^4*(c + d*x)^2)/(3*b*d*(a + b*(c + d*x)^3)) - (2*e^4*ArcTan[(a
^(1/3) - 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/(3*Sqrt[3]*a^(1
/3)*b^(5/3)*d) - (2*e^4*Log[a^(1/3) + b^(1/3)*(c + d*x)])/(9*a^(1
/3)*b^(5/3)*d) + (e^4*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b
^(2/3)*(c + d*x)^2])/(9*a^(1/3)*b^(5/3)*d)
```

Rubi [A] time = 0.351981, antiderivative size = 184, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{e^4\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{9\sqrt[3]{a}b^{5/3}d}-\frac{2e^4\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{9\sqrt[3]{a}b^{5/3}d}-\frac{2e^4\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}\sqrt[3]{a}b^{5/3}d}-\frac{e^4(c+dx)^2}{3bd\left(a+b(c+dx)^3\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*e + d*e*x)^4/(a + b*(c + d*x)^3)^2,x]
```

```
[Out] -(e^4*(c + d*x)^2)/(3*b*d*(a + b*(c + d*x)^3)) - (2*e^4*ArcTan[(a
^(1/3) - 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/(3*Sqrt[3]*a^(1
/3)*b^(5/3)*d) - (2*e^4*Log[a^(1/3) + b^(1/3)*(c + d*x)])/(9*a^(1
/3)*b^(5/3)*d) + (e^4*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b
^(2/3)*(c + d*x)^2])/(9*a^(1/3)*b^(5/3)*d)
```

Rubi in Sympy [A] time = 41.4329, size = 173, normalized size = 0.94

$$-\frac{e^4(c+dx)^2}{3bd\left(a+b(c+dx)^3\right)}-\frac{2e^4\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{9\sqrt[3]{a}b^{\frac{5}{3}}d}+\frac{e^4\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}(-c-dx)+b^{\frac{2}{3}}(c+dx)^2\right)}{9\sqrt[3]{a}b^{\frac{5}{3}}d}-\frac{2\sqrt{3}e^4\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{9\sqrt[3]{a}b^{\frac{5}{3}}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*e*x+c*e)**4/(a+b*(d*x+c)**3)**2,x)
```

```
[Out] -e**4*(c + d*x)**2/(3*b*d*(a + b*(c + d*x)**3)) - 2*e**4*log(a**(
1/3) + b**(1/3)*(c + d*x))/(9*a**(1/3)*b**(5/3)*d) + e**4*log(a**
(2/3) + a**(1/3)*b**(1/3)*(-c - d*x) + b**(2/3)*(c + d*x)**2)/(9*
a**(1/3)*b**(5/3)*d) - 2*sqrt(3)*e**4*atan(sqrt(3)*(a**(1/3)/3 +
b**(1/3)*(-2*c/3 - 2*d*x/3))/a**(1/3))/(9*a**(1/3)*b**(5/3)*d)
```

Mathematica [A] time = 0.181068, size = 155, normalized size = 0.84

$$\frac{e^4\left(\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{\sqrt[3]{a}}-\frac{3b^{2/3}(c+dx)^2}{a+b(c+dx)^3}-\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{\sqrt[3]{a}}+\frac{2\sqrt{3}\tan^{-1}\left(\frac{2\sqrt[3]{b}(c+dx)-\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt[3]{a}}\right)}{9b^{5/3}d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*e + d*e*x)^4/(a + b*(c + d*x)^3)^2,x]
```

```
[Out] (e^4*((-3*b^(2/3)*(c + d*x)^2)/(a + b*(c + d*x)^3) + (2*Sqrt[3]*A
rcTan[(-a^(1/3) + 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/a^(1/3
) - (2*Log[a^(1/3) + b^(1/3)*(c + d*x)])/a^(1/3) + Log[a^(2/3) -
a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2]/a^(1/3)))/(9*b^(
5/3)*d)
```

Maple [C] time = 0.007, size = 221, normalized size = 1.2

$$-\frac{e^4dx^2}{(3\,bd^3x^3+9\,bcd^2x^2+9\,bc^2dx+3\,bc^3+3\,a)\,b}-\frac{2\,e^4cx}{(3\,bd^3x^3+9\,bcd^2x^2+9\,bc^2dx+3\,bc^3+3\,a)\,b}-\frac{e^4c^2}{(3\,bd^3x^3+9\,bcd^2x^2+9\,bc^2dx+3\,bc^3+3\,a)\,bd}+\frac{2\,e^4}{9\,b^2d}\sum_{\_R=RootOf(\_Z^3bd^3+3\_Z^2bcd^2+3\_Z\,bc^2d+bc^3+a)}\frac{(\_R\,d+c)\ln(x-\_R)}{d^2\_R^2+2\,cd\_R+c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*e*x+c*e)^4/(a+b*(d*x+c)^3)^2,x)
```

```
[Out] -1/3*e^4/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)/b*d*x^2-2/
3*e^4/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)/b*c*x-1/3*e^4
/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)*c^2/b/d+2/9*e^4/b^
2/d*sum((_R*d+c)/(_R^2*d^2+2*_R*c*d+c^2)*ln(x-_R),_R=RootOf(_Z^3*
b*d^3+3*_Z^2*b*c*d^2+3*_Z*b*c^2*d+b*c^3+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{2\,e^4\int\frac{dx+c}{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}\,dx}{3\,b}-\frac{d^2e^4x^2+2\,cde^4x+c^2e^4}{3\,(b^2d^4x^3+3\,b^2cd^3x^2+3\,b^2c^2d^2x+(b^2c^3+ab)d)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x + c*e)^4/((d*x + c)^3*b + a)^2,x, algorithm="maxima")
```

```
[Out] 2/3*e^4*integrate((d*x + c)/(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*
d*x + b*c^3 + a), x)/b - 1/3*(d^2*e^4*x^2 + 2*c*d*e^4*x + c^2*e^4
)/(b^2*d^4*x^3 + 3*b^2*c*d^3*x^2 + 3*b^2*c^2*d^2*x + (b^2*c^3 + a
*b)*d)
```

Fricas [A] time = 0.219216, size = 483, normalized size = 2.62

$$\sqrt{3}\left(2\sqrt{3}\left(bd^3e^4x^3+3\,bcd^2e^4x^2+3\,bc^2de^4x+\left(bc^3+a\right)e^4\right)\log\left(ab+\left(-ab^2\right)^{\frac{2}{3}}(dx+c)\right)-\sqrt{3}\left(bd^3e^4x^3+3\,bcd^2e^4x^2+3\,bc^2\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x + c*e)^4/((d*x + c)^3*b + a)^2,x, algorithm="fricas")
```

```
[Out] 1/27*sqrt(3)*(2*sqrt(3)*(b*d^3*e^4*x^3 + 3*b*c*d^2*e^4*x^2 + 3*b*
c^2*d*e^4*x + (b*c^3 + a)*e^4)*log(a*b + (-a*b^2)^(2/3)*(d*x + c)
) - sqrt(3)*(b*d^3*e^4*x^3 + 3*b*c*d^2*e^4*x^2 + 3*b*c^2*d*e^4*x
+ (b*c^3 + a)*e^4)*log(-a*b + (-a*b^2)^(2/3)*(d*x + c) + (b*d^2*x
^2 + 2*b*c*d*x + b*c^2)*(-a*b^2)^(1/3)) - 6*(b*d^3*e^4*x^3 + 3*b*
c*d^2*e^4*x^2 + 3*b*c^2*d*e^4*x + (b*c^3 + a)*e^4)*arctan(-1/3*(s
qrt(3)*a*b - 2*sqrt(3)*(-a*b^2)^(2/3)*(d*x + c))/(a*b)) - 3*sqrt(
3)*(d^2*e^4*x^2 + 2*c*d*e^4*x + c^2*e^4)*(-a*b^2)^(1/3))/((b^2*d^
4*x^3 + 3*b^2*c*d^3*x^2 + 3*b^2*c^2*d^2*x + (b^2*c^3 + a*b)*d)*(-
a*b^2)^(1/3))
```

Sympy [A] time = 10.8324, size = 131, normalized size = 0.71

$$-\frac{c^2e^4 + 2cde^4x + d^2e^4x^2}{3abd + 3b^2c^3d + 9b^2c^2d^2x + 9b^2cd^3x^2 + 3b^2d^4x^3} + \frac{e^4 \operatorname{RootSum}\left(729t^3ab^5 + 8, \left(t \mapsto t\log\left(x + \frac{81t^2ab^3e^8 + 4ce^8}{4de^8}\right)\right)\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x+c*e)**4/(a+b*(d*x+c)**3)**2,x)
```

```
[Out] -(c**2*e**4 + 2*c*d*e**4*x + d**2*e**4*x**2)/(3*a*b*d + 3*b**2*c*
*3*d + 9*b**2*c**2*d**2*x + 9*b**2*c*d**3*x**2 + 3*b**2*d**4*x**3
) + e**4*RootSum(729*_t**3*a*b**5 + 8, Lambda(_t, _t*log(x + (81*
_t**2*a*b**3*e**8 + 4*c*e**8)/(4*d*e**8))))/d
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dex + ce)^4}{\left((dx + c)^3b + a\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x + c*e)^4/((d*x + c)^3*b + a)^2,x, algorithm="giac")
```

```
[Out] integrate((d*e*x + c*e)^4/((d*x + c)^3*b + a)^2, x)
```

3.2888 $\int \frac{(ce+dex)^3}{(a+b(c+dx)^3)^2}\,dx$

Optimal. Leaf size=182

$$\frac{e^3\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{9a^{2/3}b^{4/3}d}-\frac{e^3\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{18a^{2/3}b^{4/3}d}-\frac{e^3\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{2/3}b^{4/3}d}-\frac{e^3(c+dx)}{3bd\left(a+b(c+dx)^3\right)}$$

```
[Out] -(e^3*(c + d*x))/(3*b*d*(a + b*(c + d*x)^3)) - (e^3*ArcTan[(a^(1/
3) - 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/(3*Sqrt[3]*a^(2/3)*
b^(4/3)*d) + (e^3*Log[a^(1/3) + b^(1/3)*(c + d*x)])/(9*a^(2/3)*b^
(4/3)*d) - (e^3*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)
*(c + d*x)^2])/(18*a^(2/3)*b^(4/3)*d)
```

Rubi [A] time = 0.351053, antiderivative size = 182, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$\frac{e^3\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{9a^{2/3}b^{4/3}d}-\frac{e^3\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{18a^{2/3}b^{4/3}d}-\frac{e^3\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{2/3}b^{4/3}d}-\frac{e^3(c+dx)}{3bd\left(a+b(c+dx)^3\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*e + d*e*x)^3/(a + b*(c + d*x)^3)^2,x]
```

```
[Out] -(e^3*(c + d*x))/(3*b*d*(a + b*(c + d*x)^3)) - (e^3*ArcTan[(a^(1/
3) - 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/(3*Sqrt[3]*a^(2/3)*
b^(4/3)*d) + (e^3*Log[a^(1/3) + b^(1/3)*(c + d*x)])/(9*a^(2/3)*b^
(4/3)*d) - (e^3*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)
*(c + d*x)^2])/(18*a^(2/3)*b^(4/3)*d)
```

Rubi in Sympy [A] time = 41.5447, size = 168, normalized size = 0.92

$$-\frac{e^3\left(c+dx\right)}{3bd\left(a+b\left(c+dx\right)^3\right)}+\frac{e^3\log\left(\sqrt[3]{a}+\sqrt[3]{b}\left(c+dx\right)\right)}{9a^{\frac{2}{3}}b^{\frac{4}{3}}d}-\frac{e^3\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}\left(-c-dx\right)+b^{\frac{2}{3}}\left(c+dx\right)^2\right)}{18a^{\frac{2}{3}}b^{\frac{4}{3}}d}-\frac{\sqrt{3}e^3\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{9a^{\frac{2}{3}}b^{\frac{4}{3}}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*e*x+c*e)**3/(a+b*(d*x+c)**3)**2,x)
```

```
[Out] -e**3*(c + d*x)/(3*b*d*(a + b*(c + d*x)**3)) + e**3*log(a**(1/3)
+ b**(1/3)*(c + d*x))/(9*a**(2/3)*b**(4/3)*d) - e**3*log(a**(2/3)
 + a**(1/3)*b**(1/3)*(-c - d*x) + b**(2/3)*(c + d*x)**2)/(18*a**(
2/3)*b**(4/3)*d) - sqrt(3)*e**3*atan(sqrt(3)*(a**(1/3)/3 + b**(1/
3)*(-2*c/3 - 2*d*x/3))/a**(1/3))/(9*a**(2/3)*b**(4/3)*d)
```

Mathematica [A] time = 0.124237, size = 154, normalized size = 0.85

$$\frac{e^3\left(-\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{a^{2/3}}+\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{a^{2/3}}+\frac{2\sqrt{3}\tan^{-1}\left(\frac{2\sqrt[3]{b}(c+dx)-\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{a^{2/3}}-\frac{6\sqrt[3]{b}(c+dx)}{a+b(c+dx)^3}\right)}{18b^{4/3}d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*e + d*e*x)^3/(a + b*(c + d*x)^3)^2,x]
```

```
[Out] (e^3*((-6*b^(1/3)*(c + d*x))/(a + b*(c + d*x)^3) + (2*Sqrt[3]*Arc
Tan[(-a^(1/3) + 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/a^(2/3)
+ (2*Log[a^(1/3) + b^(1/3)*(c + d*x)])/a^(2/3) - Log[a^(2/3) - a^
(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2]/a^(2/3)))/(18*b^(4
/3)*d)
```

Maple [C] time = 0.007, size = 166, normalized size = 0.9

$$-\frac{e^3x}{(3bd^3x^3+9bcd^2x^2+9bc^2dx+3bc^3+3a)b}-\frac{e^3c}{(3bd^3x^3+9bcd^2x^2+9bc^2dx+3bc^3+3a)db}+\frac{e^3}{9b^2d}\sum_{\_R=RootOf(\_Z^3bd^3+3\_Z^2bcd^2+3\_Zbc^2d+bc^3+a)}\frac{\ln(x-\_R)}{d^2\_R^2+2cd\_R+c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*e*x+c*e)^3/(a+b*(d*x+c)^3)^2,x)
```

```
[Out] -1/3*e^3/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)/b*x-1/3*e^
3/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)*c/d/b+1/9*e^3/b^2
/d*sum(1/(_R^2*d^2+2*_R*c*d+c^2)*ln(x-_R),_R=RootOf(_Z^3*b*d^3+3*
_Z^2*b*c*d^2+3*_Z*b*c^2*d+b*c^3+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{e^3\int\frac{1}{bd^3x^3+3bcd^2x^2+3bc^2dx+bc^3+a}\,dx}{3b}-\frac{de^3x+ce^3}{3(b^2d^4x^3+3b^2cd^3x^2+3b^2c^2d^2x+(b^2c^3+ab)d)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x + c*e)^3/((d*x + c)^3*b + a)^2,x, algorithm="maxima")
```

```
[Out] 1/3*e^3*integrate(1/(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*
c^3 + a), x)/b - 1/3*(d*e^3*x + c*e^3)/(b^2*d^4*x^3 + 3*b^2*c*d^3
*x^2 + 3*b^2*c^2*d^2*x + (b^2*c^3 + a*b)*d)
```

Fricas [A] time = 0.221119, size = 447, normalized size = 2.46

$$-\frac{\sqrt{3}\left(\sqrt{3}\left(bd^3e^3x^3+3bcd^2e^3x^2+3bc^2de^3x+\left(bc^3+a\right)e^3\right)\log\left(a^2+\left(d^2x^2+2cdx+c^2\right)\left(a^2b\right)^{\frac{2}{3}}-\left(a^2b\right)^{\frac{1}{3}}(adx+ac)\right)-2\sqrt{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x + c*e)^3/((d*x + c)^3*b + a)^2,x, algorithm="fricas")
```

```
[Out] -1/54*sqrt(3)*(sqrt(3)*(b*d^3*e^3*x^3 + 3*b*c*d^2*e^3*x^2 + 3*b*c
^2*d*e^3*x + (b*c^3 + a)*e^3)*log(a^2 + (d^2*x^2 + 2*c*d*x + c^2)
*(a^2*b)^(2/3) - (a^2*b)^(1/3)*(a*d*x + a*c)) - 2*sqrt(3)*(b*d^3*
e^3*x^3 + 3*b*c*d^2*e^3*x^2 + 3*b*c^2*d*e^3*x + (b*c^3 + a)*e^3)*
log((a^2*b)^(1/3)*(d*x + c) + a) - 6*(b*d^3*e^3*x^3 + 3*b*c*d^2*e
^3*x^2 + 3*b*c^2*d*e^3*x + (b*c^3 + a)*e^3)*arctan(1/3*(2*sqrt(3)
*(a^2*b)^(1/3)*(d*x + c) - sqrt(3)*a)/a) + 6*sqrt(3)*(d*e^3*x + c
*e^3)*(a^2*b)^(1/3))/((b^2*d^4*x^3 + 3*b^2*c*d^3*x^2 + 3*b^2*c^2*
d^2*x + (b^2*c^3 + a*b)*d)*(a^2*b)^(1/3))
```

Sympy [A] time = 8.93972, size = 110, normalized size = 0.6

$$-\frac{ce^3 + de^3x}{3abd + 3b^2c^3d + 9b^2c^2d^2x + 9b^2cd^3x^2 + 3b^2d^4x^3} + \frac{e^3 \operatorname{RootSum}\left(729t^3a^2b^4 - 1, \left(t \mapsto t \log\left(x + \frac{9tabe^3+ce^3}{de^3}\right)\right)\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x+c*e)**3/(a+b*(d*x+c)**3)**2,x)
```

```
[Out] -(c*e**3 + d*e**3*x)/(3*a*b*d + 3*b**2*c**3*d + 9*b**2*c**2*d**2*
x + 9*b**2*c*d**3*x**2 + 3*b**2*d**4*x**3) + e**3*RootSum(729*_t*
*3*a**2*b**4 - 1, Lambda(_t, _t*log(x + (9*_t*a*b*e**3 + c*e**3)/
(d*e**3))))/d
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dex + ce)^3}{\left((dx + c)^3 b + a\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x + c*e)^3/((d*x + c)^3*b + a)^2,x, algorithm="giac")
```

```
[Out] integrate((d*e*x + c*e)^3/((d*x + c)^3*b + a)^2, x)
```

3.2889 $\int \frac{(ce+dex)^2}{(a+b(c+dx)^3)^2} dx$

Optimal. Leaf size=26

$$-\frac{e^2}{3bd\left(a+b(c+dx)^3\right)}$$

```
[Out] -e^2/(3*b*d*(a + b*(c + d*x)^3))
```

Rubi [A] time = 0.0210926, antiderivative size = 26, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.042$

$$-\frac{e^2}{3bd\left(a+b(c+dx)^3\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*e + d*e*x)^2/(a + b*(c + d*x)^3)^2,x]

[Out] -e^2/(3*b*d*(a + b*(c + d*x)^3))
```

Rubi in Sympy [A] time = 5.40842, size = 19, normalized size = 0.73

$$-\frac{e^2}{3bd\left(a+b\left(c+dx\right)^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*e*x+c*e)**2/(a+b*(d*x+c)**3)**2,x)

[Out] -e**2/(3*b*d*(a + b*(c + d*x)**3))
```

Mathematica [A] time = 0.029672, size = 26, normalized size = 1.

$$-\frac{e^2}{3bd\left(a+b(c+dx)^3\right)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*e + d*e*x)^2/(a + b*(c + d*x)^3)^2,x]

[Out] -e^2/(3*b*d*(a + b*(c + d*x)^3))
```

Maple [A] time = 0., size = 47, normalized size = 1.8

$$-\frac{e^2}{3\,bd\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*e*x+c*e)^2/(a+b*(d*x+c)^3)^2,x)
```

```
[Out] -1/3*e^2/b/d/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)
```

Maxima [A] time = 1.34842, size = 74, normalized size = 2.85

$$-\frac{e^2}{3\left(b^2d^4x^3+3\,b^2cd^3x^2+3\,b^2c^2d^2x+(b^2c^3+ab)d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*e*x + c*e)^2/((d*x + c)^3*b + a)^2,x, algorithm="maxima")
```

```
[Out] -1/3*e^2/(b^2*d^4*x^3 + 3*b^2*c*d^3*x^2 + 3*b^2*c^2*d^2*x + (b^2*
c^3 + a*b)*d)
```

Fricas [A] time = 0.203604, size = 74, normalized size = 2.85

$$-\frac{e^2}{3\left(b^2d^4x^3+3\,b^2cd^3x^2+3\,b^2c^2d^2x+(b^2c^3+ab)d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*e*x + c*e)^2/((d*x + c)^3*b + a)^2,x, algorithm="fricas")
```

```
[Out] -1/3*e^2/(b^2*d^4*x^3 + 3*b^2*c*d^3*x^2 + 3*b^2*c^2*d^2*x + (b^2*
c^3 + a*b)*d)
```

Sympy [A] time = 7.28998, size = 60, normalized size = 2.31

$$-\frac{e^2}{3abd+3b^2c^3d+9b^2c^2d^2x+9b^2cd^3x^2+3b^2d^4x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x+c*e)**2/(a+b*(d*x+c)**3)**2,x)
```

```
[Out] -e**2/(3*a*b*d + 3*b**2*c**3*d + 9*b**2*c**2*d**2*x + 9*b**2*c*d*
*3*x**2 + 3*b**2*d**4*x**3)
```

GIAC/XCAS [A] time = 0.215955, size = 61, normalized size = 2.35

$$-\frac{e^2}{3\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x + c*e)^2/((d*x + c)^3*b + a)^2,x, algorithm="giac")
```

```
[Out] -1/3*e^2/((b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)*b
*d)
```

3.2890 $\int \frac{ce+dex}{(a+b(c+dx)^3)^2}\,dx$

Optimal. Leaf size=176

$$-\frac{e\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{9a^{4/3}b^{2/3}d}+\frac{e\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{18a^{4/3}b^{2/3}d}-\frac{e\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{4/3}b^{2/3}d}+\frac{e(c+dx)^2}{3ad\,(a+b(c+dx)^3)}$$

```
[Out] (e*(c + d*x)^2)/(3*a*d*(a + b*(c + d*x)^3)) - (e*ArcTan[(a^(1/3)
- 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/(3*Sqrt[3]*a^(4/3)*b^(
2/3)*d) - (e*Log[a^(1/3) + b^(1/3)*(c + d*x)])/(9*a^(4/3)*b^(2/3)
*d) + (e*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d
*x)^2])/(18*a^(4/3)*b^(2/3)*d)
```

Rubi [A] time = 0.350857, antiderivative size = 176, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364

$$-\frac{e\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{9a^{4/3}b^{2/3}d}+\frac{e\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{18a^{4/3}b^{2/3}d}-\frac{e\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{4/3}b^{2/3}d}+\frac{e(c+dx)^2}{3ad\,(a+b(c+dx)^3)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*e + d*e*x)/(a + b*(c + d*x)^3)^2,x]
```

```
[Out] (e*(c + d*x)^2)/(3*a*d*(a + b*(c + d*x)^3)) - (e*ArcTan[(a^(1/3)
- 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/(3*Sqrt[3]*a^(4/3)*b^(
2/3)*d) - (e*Log[a^(1/3) + b^(1/3)*(c + d*x)])/(9*a^(4/3)*b^(2/3)
*d) + (e*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d
*x)^2])/(18*a^(4/3)*b^(2/3)*d)
```

Rubi in Sympy [A] time = 39.9313, size = 163, normalized size = 0.93

$$\frac{e\,(c+dx)^2}{3ad\,\left(a+b\,(c+dx)^3\right)}-\frac{e\log\left(\sqrt[3]{a}+\sqrt[3]{b}\,(c+dx)\right)}{9a^{\frac{4}{3}}b^{\frac{2}{3}}d}+\frac{e\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}\,(-c-dx)+b^{\frac{2}{3}}\,(c+dx)^2\right)}{18a^{\frac{4}{3}}b^{\frac{2}{3}}d}-\frac{\sqrt{3}e\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{9a^{\frac{4}{3}}b^{\frac{2}{3}}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*e*x+c*e)/(a+b*(d*x+c)**3)**2,x)
```

```
[Out] e*(c + d*x)**2/(3*a*d*(a + b*(c + d*x)**3)) - e*log(a**(1/3) + b*
*(1/3)*(c + d*x))/(9*a**(4/3)*b**(2/3)*d) + e*log(a**(2/3) + a**(
1/3)*b**(1/3)*(-c - d*x) + b**(2/3)*(c + d*x)**2)/(18*a**(4/3)*b*
*(2/3)*d) - sqrt(3)*e*atan(sqrt(3)*(a**(1/3)/3 + b**(1/3)*(-2*c/3
 - 2*d*x/3))/a**(1/3))/(9*a**(4/3)*b**(2/3)*d)
```

Mathematica [A] time = 0.155548, size = 153, normalized size = 0.87

$$\frac{e\left(\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{b^{2/3}}-\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{b^{2/3}}+\frac{2\sqrt{3}\tan^{-1}\left(\frac{2\sqrt[3]{b}(c+dx)-\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{b^{2/3}}+\frac{6\sqrt[3]{a}(c+dx)^2}{a+b(c+dx)^3}\right)}{18a^{4/3}d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*e + d*e*x)/(a + b*(c + d*x)^3)^2,x]
```

```
[Out] (e*((6*a^(1/3)*(c + d*x)^2)/(a + b*(c + d*x)^3) + (2*Sqrt[3]*ArcT
an[(-a^(1/3) + 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/b^(2/3) -
 (2*Log[a^(1/3) + b^(1/3)*(c + d*x)])/b^(2/3) + Log[a^(2/3) - a^(
1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2]/b^(2/3)))/(18*a^(4/
3)*d)
```

Maple [C] time = 0.007, size = 216, normalized size = 1.2

$$\frac{dex^2}{(3\,bd^3x^3+9\,bcd^2x^2+9\,bc^2dx+3\,bc^3+3\,a)\,a}+\frac{2\,cex}{(3\,bd^3x^3+9\,bcd^2x^2+9\,bc^2dx+3\,bc^3+3\,a)\,a}+\frac{ec^2}{(3\,bd^3x^3+9\,bcd^2x^2+9\,bc^2dx+3\,bc^3+3\,a)\,da}+\frac{e}{9\,abd}\sum_{\_R=RootOf(\_Z^3bd^3+3\,\_Z^2bcd^2+3\,\_Z\,bc^2d+bc^3+a)}\frac{(\_R\,d+c)\ln(x-\_R)}{d^2\_R^2+2\,cd\_R+c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*e*x+c*e)/(a+b*(d*x+c)^3)^2,x)
```

```
[Out] 1/3*e/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)*d/a*x^2+2/3*e
/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)/a*c*x+1/3*e/(b*d^3
*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)*c^2/d/a+1/9*e/a/b/d*sum((
_R*d+c)/(_R^2*d^2+2*_R*c*d+c^2)*ln(x-_R),_R=RootOf(_Z^3*b*d^3+3*_
Z^2*b*c*d^2+3*_Z*b*c^2*d+b*c^3+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{e\int\frac{dx+c}{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}\,dx}{3\,a}+\frac{d^2ex^2+2\,cdex+c^2e}{3\,(abd^4x^3+3\,abcd^3x^2+3\,abc^2d^2x+(abc^3+a^2)d)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x + c*e)/((d*x + c)^3*b + a)^2,x, algorithm="maxima")
```

```
[Out] 1/3*e*integrate((d*x + c)/(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*
x + b*c^3 + a), x)/a + 1/3*(d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(a*b*d
^4*x^3 + 3*a*b*c*d^3*x^2 + 3*a*b*c^2*d^2*x + (a*b*c^3 + a^2)*d)
```

Fricas [A] time = 0.22132, size = 437, normalized size = 2.48

$$\sqrt{3}\left(2\,\sqrt{3}\left(bd^3ex^3+3\,bcd^2ex^2+3\,bc^2dex+\left(bc^3+a\right)e\right)\log\left(ab+\left(-ab^2\right)^{\frac{2}{3}}(dx+c)\right)-\sqrt{3}\left(bd^3ex^3+3\,bcd^2ex^2+3\,bc^2dex+\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x + c*e)/((d*x + c)^3*b + a)^2,x, algorithm="fricas")
```

```
[Out] 1/54*sqrt(3)*(2*sqrt(3)*(b*d^3*e*x^3 + 3*b*c*d^2*e*x^2 + 3*b*c^2*
d*e*x + (b*c^3 + a)*e)*log(a*b + (-a*b^2)^(2/3)*(d*x + c)) - sqrt
(3)*(b*d^3*e*x^3 + 3*b*c*d^2*e*x^2 + 3*b*c^2*d*e*x + (b*c^3 + a)*
e)*log(-a*b + (-a*b^2)^(2/3)*(d*x + c) + (b*d^2*x^2 + 2*b*c*d*x +
 b*c^2)*(-a*b^2)^(1/3)) - 6*(b*d^3*e*x^3 + 3*b*c*d^2*e*x^2 + 3*b*
c^2*d*e*x + (b*c^3 + a)*e)*arctan(-1/3*(sqrt(3)*a*b - 2*sqrt(3)*(
-a*b^2)^(2/3)*(d*x + c))/(a*b)) + 6*sqrt(3)*(d^2*e*x^2 + 2*c*d*e*
x + c^2*e)*(-a*b^2)^(1/3))/((a*b*d^4*x^3 + 3*a*b*c*d^3*x^2 + 3*a*
b*c^2*d^2*x + (a*b*c^3 + a^2)*d)*(-a*b^2)^(1/3))
```

Sympy [A] time = 6.6052, size = 122, normalized size = 0.69

$$\frac{c^2e + 2cdex + d^2ex^2}{3a^2d + 3abc^3d + 9abc^2d^2x + 9abcd^3x^2 + 3abd^4x^3} + \frac{e \operatorname{RootSum}\left(729t^3a^4b^2 + 1, \left(t \mapsto t \log\left(x + \frac{81t^2a^3be^2 + ce^2}{de^2}\right)\right)\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x+c*e)/(a+b*(d*x+c)**3)**2,x)
```

```
[Out] (c**2*e + 2*c*d*e*x + d**2*e*x**2)/(3*a**2*d + 3*a*b*c**3*d + 9*a
*b*c**2*d**2*x + 9*a*b*c*d**3*x**2 + 3*a*b*d**4*x**3) + e*RootSum
(729*_t**3*a**4*b**2 + 1, Lambda(_t, _t*log(x + (81*_t**2*a**3*b*
e**2 + c*e**2)/(d*e**2))))/d
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{dex + ce}{\left((dx + c)^3b + a\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x + c*e)/((d*x + c)^3*b + a)^2,x, algorithm="giac")
```

```
[Out] integrate((d*e*x + c*e)/((d*x + c)^3*b + a)^2, x)
```

3.2891 $\int \frac{1}{(ce+dex)(a+b(c+dx)^3)^2}\,dx$

Optimal. Leaf size=68

$$-\frac{\log\left(a+b(c+dx)^3\right)}{3a^2de}+\frac{\log(c+dx)}{a^2de}+\frac{1}{3ade\left(a+b(c+dx)^3\right)}$$

```
[Out] 1/(3*a*d*e*(a + b*(c + d*x)^3)) + Log[c + d*x]/(a^2*d*e) - Log[a
+ b*(c + d*x)^3]/(3*a^2*d*e)
```

Rubi [A] time = 0.156223, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125

$$-\frac{\log\left(a+b(c+dx)^3\right)}{3a^2de}+\frac{\log(c+dx)}{a^2de}+\frac{1}{3ade\left(a+b(c+dx)^3\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((c*e + d*e*x)*(a + b*(c + d*x)^3)^2),x]
```

```
[Out] 1/(3*a*d*e*(a + b*(c + d*x)^3)) + Log[c + d*x]/(a^2*d*e) - Log[a
+ b*(c + d*x)^3]/(3*a^2*d*e)
```

Rubi in Sympy [A] time = 15.7981, size = 54, normalized size = 0.79

$$\frac{1}{3ade\left(a+b\left(c+dx\right)^3\right)}-\frac{\log\left(a+b\left(c+dx\right)^3\right)}{3a^2de}+\frac{\log\left(\left(c+dx\right)^3\right)}{3a^2de}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(d*e*x+c*e)/(a+b*(d*x+c)**3)**2,x)
```

```
[Out] 1/(3*a*d*e*(a + b*(c + d*x)**3)) - log(a + b*(c + d*x)**3)/(3*a**
2*d*e) + log((c + d*x)**3)/(3*a**2*d*e)
```

Mathematica [A] time = 0.0418403, size = 51, normalized size = 0.75

$$\frac{\frac{a}{a+b(c+dx)^3}-\log\left(a+b(c+dx)^3\right)+3\log(c+dx)}{3a^2de}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((c*e + d*e*x)*(a + b*(c + d*x)^3)^2),x]
```

```
[Out] (a/(a + b*(c + d*x)^3) + 3*Log[c + d*x] - Log[a + b*(c + d*x)^3])
/(3*a^2*d*e)
```

Maple [A] time = 0.013, size = 109, normalized size = 1.6

$$\frac{1}{3\,aed\,(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)}-\frac{\ln\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)}{3\,ea^2d}+\frac{\ln(dx+c)}{ea^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(d*e*x+c*e)/(a+b*(d*x+c)^3)^2,x)
```

```
[Out] 1/3/e/a/d/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)-1/3/e/a^2
/d*ln(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)+ln(d*x+c)/a^2/
d/e
```

Maxima [A] time = 1.38429, size = 154, normalized size = 2.26

$$\frac{1}{3\,(abd^4ex^3 + 3\,abcd^3ex^2 + 3\,abc^2d^2ex + (abc^3 + a^2)de)} - \frac{\log\left(bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3 + a\right)}{3\,a^2de} + \frac{\log\left(dx + c\right)}{a^2de}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)^2*(d*e*x + c*e)),x, algorithm="maxima")
```

```
[Out] 1/3/(a*b*d^4*e*x^3 + 3*a*b*c*d^3*e*x^2 + 3*a*b*c^2*d^2*e*x + (a*b
*c^3 + a^2)*d*e) - 1/3*log(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*
x + b*c^3 + a)/(a^2*d*e) + log(d*x + c)/(a^2*d*e)
```

Fricas [A] time = 0.215677, size = 234, normalized size = 3.44

$$-\frac{\left(bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3 + a\right)\log\left(bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3 + a\right) - 3\,\left(bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3}{3\,(a^2bd^4ex^3 + 3\,a^2bcd^3ex^2 + 3\,a^2bc^2d^2ex + (a^2bc^3 + a^3)de)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)^2*(d*e*x + c*e)),x, algorithm="fricas")
```

```
[Out] -1/3*((b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)*log(b
*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a) - 3*(b*d^3*x^
3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)*log(d*x + c) - a)/(a
^2*b*d^4*e*x^3 + 3*a^2*b*c*d^3*e*x^2 + 3*a^2*b*c^2*d^2*e*x + (a^2
*b*c^3 + a^3)*d*e)
```

Sympy [A] time = 10.1886, size = 122, normalized size = 1.79

$$\frac{1}{3a^2de + 3abc^3de + 9abc^2d^2ex + 9abcd^3ex^2 + 3abd^4ex^3} + \frac{\log\left(\frac{c}{d} + x\right)}{a^2de} - \frac{\log\left(\frac{3c^2x}{d^2} + \frac{3cx^2}{d} + x^3 + \frac{a+bc^3}{bd^3}\right)}{3a^2de}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(d*e*x+c*e)/(a+b*(d*x+c)**3)**2,x)
```

```
[Out] 1/(3*a**2*d*e + 3*a*b*c**3*d*e + 9*a*b*c**2*d**2*e*x + 9*a*b*c*d*
*3*e*x**2 + 3*a*b*d**4*e*x**3) + log(c/d + x)/(a**2*d*e) - log(3*
c**2*x/d**2 + 3*c*x**2/d + x**3 + (a + b*c**3)/(b*d**3))/(3*a**2*
d*e)
```

GIAC/XCAS [A] time = 0.220223, size = 144, normalized size = 2.12

$$-\frac{e^{(-1)}\ln\left(\left|bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3 + a\right|\right)}{3\,a^2d} + \frac{e^{(-1)}\ln\left(\left|dx + c\right|\right)}{a^2d} + \frac{e^{(-1)}}{3\,(bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3 + a)ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((d*x + c)^3*b + a)^2*(d*e*x + c*e)),x, algorithm="giac")
```

```
[Out] -1/3*e^(-1)*ln(abs(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^
3 + a))/(a^2*d) + e^(-1)*ln(abs(d*x + c))/(a^2*d) + 1/3*e^(-1)/((
b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)*a*d)
```

3.2892 $\int \frac{1}{(ce+dex)^2(a+b(c+dx)^3)^2}\,dx$

Optimal. Leaf size=204

$$-\frac{2\sqrt[3]{b}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{9a^{7/3}de^2}+\frac{4\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{9a^{7/3}de^2}+\frac{4\sqrt[3]{b}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{7/3}de^2}-\frac{4}{3a^2de^2(c+dx)}+\frac{1}{3ade^2(c+dx)(a+b(c+dx)^3)}$$

```
[Out] -4/(3*a^2*d*e^2*(c + d*x)) + 1/(3*a*d*e^2*(c + d*x)*(a + b*(c + d
*x)^3)) + (4*b^(1/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d*x))/(Sqrt
[3]*a^(1/3))])/(3*Sqrt[3]*a^(7/3)*d*e^2) + (4*b^(1/3)*Log[a^(1/3)
 + b^(1/3)*(c + d*x)])/(9*a^(7/3)*d*e^2) - (2*b^(1/3)*Log[a^(2/3)
 - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/(9*a^(7/3)*d
*e^2)
```

Rubi [A] time = 0.390851, antiderivative size = 204, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 9, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375

$$-\frac{2\sqrt[3]{b}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{9a^{7/3}de^2}+\frac{4\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{9a^{7/3}de^2}+\frac{4\sqrt[3]{b}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{7/3}de^2}-\frac{4}{3a^2de^2(c+dx)}+\frac{1}{3ade^2(c+dx)(a+b(c+dx)^3)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((c*e + d*e*x)^2*(a + b*(c + d*x)^3)^2),x]
```

```
[Out] -4/(3*a^2*d*e^2*(c + d*x)) + 1/(3*a*d*e^2*(c + d*x)*(a + b*(c + d
*x)^3)) + (4*b^(1/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d*x))/(Sqrt
[3]*a^(1/3))])/(3*Sqrt[3]*a^(7/3)*d*e^2) + (4*b^(1/3)*Log[a^(1/3)
 + b^(1/3)*(c + d*x)])/(9*a^(7/3)*d*e^2) - (2*b^(1/3)*Log[a^(2/3)
 - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/(9*a^(7/3)*d
*e^2)
```

Rubi in Sympy [A] time = 47.089, size = 192, normalized size = 0.94

$$\frac{1}{3ade^2\left(a+b\left(c+dx\right)^3\right)\left(c+dx\right)}-\frac{4}{3a^2de^2\left(c+dx\right)}+\frac{4\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}\left(c+dx\right)\right)}{9a^{\frac{7}{3}}de^2}-\frac{2\sqrt[3]{b}\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}\left(-c-dx\right)+b^{\frac{2}{3}}\left(c+dx\right)^2\right)}{9a^{\frac{7}{3}}de^2}+\frac{4\sqrt{3}\sqrt[3]{b}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{9a^{\frac{7}{3}}de^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(d*e*x+c*e)**2/(a+b*(d*x+c)**3)**2,x)
```

```
[Out] 1/(3*a*d*e**2*(a + b*(c + d*x)**3)*(c + d*x)) - 4/(3*a**2*d*e**2*
(c + d*x)) + 4*b**(1/3)*log(a**(1/3) + b**(1/3)*(c + d*x))/(9*a**
(7/3)*d*e**2) - 2*b**(1/3)*log(a**(2/3) + a**(1/3)*b**(1/3)*(-c -
 d*x) + b**(2/3)*(c + d*x)**2)/(9*a**(7/3)*d*e**2) + 4*sqrt(3)*b*
*(1/3)*atan(sqrt(3)*(a**(1/3)/3 + b**(1/3)*(-2*c/3 - 2*d*x/3))/a*
*(1/3))/(9*a**(7/3)*d*e**2)
```

Mathematica [A] time = 0.176949, size = 171, normalized size = 0.84

$$\frac{-2\sqrt[3]{b}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)-\frac{3\sqrt[3]{a}b(c+dx)^2}{a+b(c+dx)^3}+4\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)-4\sqrt{3}\sqrt[3]{b}\tan^{-1}\left(\frac{2\sqrt[3]{b}(c+dx)-\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)\ldots}{9a^{7/3}de^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((c*e + d*e*x)^2*(a + b*(c + d*x)^3)^2),x]
```

```
[Out] ((-9*a^(1/3))/(c + d*x) - (3*a^(1/3)*b*(c + d*x)^2)/(a + b*(c + d
*x)^3) - 4*Sqrt[3]*b^(1/3)*ArcTan[(-a^(1/3) + 2*b^(1/3)*(c + d*x)
)/(Sqrt[3]*a^(1/3))] + 4*b^(1/3)*Log[a^(1/3) + b^(1/3)*(c + d*x)]
 - 2*b^(1/3)*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c
 + d*x)^2])/(9*a^(7/3)*d*e^2)
```

Maple [C] time = 0.013, size = 242, normalized size = 1.2

$$-\frac{bx^2d}{3e^2a^2(bd^3x^3+3bcd^2x^2+3bc^2dx+bc^3+a)}-\frac{2bcx}{3e^2a^2(bd^3x^3+3bcd^2x^2+3bc^2dx+bc^3+a)}-\frac{bc^2}{3e^2a^2(bd^3x^3+3bcd^2x^2+3bc^2dx+bc^3+a)d}-\frac{4}{9e^2a^2d}\sum_{\_R=RootOf(\_Z^3bd^3+3\_Z^2bcd^2+3\_Z\,bc^2d+bc^3+a)}\frac{(\_Rd+c)\ln(x-\_R)}{d^2\_R^2+2cd\_R+c^2}-\frac{1}{e^2a^2d(dx+c)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(d*e*x+c*e)^2/(a+b*(d*x+c)^3)^2,x)
```

```
[Out] -1/3/e^2*b/a^2/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)*x^2*
d-2/3/e^2*b/a^2/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)*c*x
-1/3/e^2*b/a^2/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)*c^2/
d-4/9/e^2/a^2/d*sum((_R*d+c)/(_R^2*d^2+2*_R*c*d+c^2)*ln(x-_R),_R=
RootOf(_Z^3*b*d^3+3*_Z^2*b*c*d^2+3*_Z*b*c^2*d+b*c^3+a))-1/a^2/d/e
^2/(d*x+c)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{4bd^3x^3+12bcd^2x^2+12bc^2dx+4bc^3+3a}{3(a^2bd^5e^2x^4+4a^2bcd^4e^2x^3+6a^2bc^2d^3e^2x^2+(4a^2bc^3+a^3)d^2e^2x+(a^2bc^4+a^3c)de^2)}-\frac{4b\int\frac{dx+c}{bd^3x^3+3bcd^2x^2+3bc^2dx+bc^3+a}\,dx}{3a^2e^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)^2*(d*e*x + c*e)^2),x, algorithm="maxima")
```

```
[Out] -1/3*(4*b*d^3*x^3 + 12*b*c*d^2*x^2 + 12*b*c^2*d*x + 4*b*c^3 + 3*a
)/(a^2*b*d^5*e^2*x^4 + 4*a^2*b*c*d^4*e^2*x^3 + 6*a^2*b*c^2*d^3*e^
2*x^2 + (4*a^2*b*c^3 + a^3)*d^2*e^2*x + (a^2*b*c^4 + a^3*c)*d*e^2
) - 4/3*b*integrate((d*x + c)/(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^
2*d*x + b*c^3 + a), x)/(a^2*e^2)
```

Fricas [A] time = 0.231904, size = 575, normalized size = 2.82

$$-\frac{\sqrt{3}\left(2\sqrt{3}\left(bd^4x^4+4\,bcd^3x^3+6\,bc^2d^2x^2+bc^4+\left(4\,bc^3+a\right)dx+ac\right)\left(\frac{b}{a}\right)^{\frac{1}{3}}\log\left(bd^2x^2+2\,bcdx+bc^2-\left(adx+ac\right)\left(\frac{b}{a}\right)^{\frac{2}{3}}+\cdots\right.\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((d*x + c)^3*b + a)^2*(d*e*x + c*e)^2),x, algorithm="fricas")
```

```
[Out] -1/27*sqrt(3)*(2*sqrt(3)*(b*d^4*x^4 + 4*b*c*d^3*x^3 + 6*b*c^2*d^2
*x^2 + b*c^4 + (4*b*c^3 + a)*d*x + a*c)*(b/a)^(1/3)*log(b*d^2*x^2
 + 2*b*c*d*x + b*c^2 - (a*d*x + a*c)*(b/a)^(2/3) + a*(b/a)^(1/3))
 - 4*sqrt(3)*(b*d^4*x^4 + 4*b*c*d^3*x^3 + 6*b*c^2*d^2*x^2 + b*c^4
 + (4*b*c^3 + a)*d*x + a*c)*(b/a)^(1/3)*log(b*d*x + b*c + a*(b/a)
^(2/3)) - 12*(b*d^4*x^4 + 4*b*c*d^3*x^3 + 6*b*c^2*d^2*x^2 + b*c^4
 + (4*b*c^3 + a)*d*x + a*c)*(b/a)^(1/3)*arctan(1/3*(sqrt(3)*a*(b/
a)^(2/3) - 2*sqrt(3)*(b*d*x + b*c))/(a*(b/a)^(2/3))) + 3*sqrt(3)*
(4*b*d^3*x^3 + 12*b*c*d^2*x^2 + 12*b*c^2*d*x + 4*b*c^3 + 3*a))/(a
^2*b*d^5*e^2*x^4 + 4*a^2*b*c*d^4*e^2*x^3 + 6*a^2*b*c^2*d^3*e^2*x^
2 + (4*a^2*b*c^3 + a^3)*d^2*e^2*x + (a^2*b*c^4 + a^3*c)*d*e^2)
```

Sympy [A] time = 33.8171, size = 196, normalized size = 0.96

$$-\frac{3a+4bc^3+12bc^2dx+12bcd^2x^2+4bd^3x^3}{3a^3cde^2+3a^2bc^4de^2+18a^2bc^2d^3e^2x^2+12a^2bcd^4e^2x^3+3a^2bd^5e^2x^4+x\left(3a^3d^2e^2+12a^2bc^3d^2e^2\right)}+\frac{\operatorname{RootSum}\left(729t^3a^7-64b,\left(t\mapsto t\log\left(x+\frac{81t^2a^5+16bc}{16bd}\right)\right)\right)}{de^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(d*e*x+c*e)**2/(a+b*(d*x+c)**3)**2,x)
```

```
[Out] -(3*a + 4*b*c**3 + 12*b*c**2*d*x + 12*b*c*d**2*x**2 + 4*b*d**3*x*
*3)/(3*a**3*c*d*e**2 + 3*a**2*b*c**4*d*e**2 + 18*a**2*b*c**2*d**3
*e**2*x**2 + 12*a**2*b*c*d**4*e**2*x**3 + 3*a**2*b*d**5*e**2*x**4
 + x*(3*a**3*d**2*e**2 + 12*a**2*b*c**3*d**2*e**2)) + RootSum(729
*_t**3*a**7 - 64*b, Lambda(_t, _t*log(x + (81*_t**2*a**5 + 16*b*c
)/(16*b*d))))/(d*e**2)
```

GIAC/XCAS [A] time = 0.235175, size = 363, normalized size = 1.78

$$\frac{4\left(\frac{b}{ad^3}\right)^{\frac{1}{3}}e^{(-2)}\ln\left(\left|-\left(\frac{b}{ad^3}\right)^{\frac{1}{3}}e^{(-2)}-\frac{e^{(-1)}}{(dxe+ce)d}\right|\right)}{9\,a^2}-\frac{4\sqrt{3}\left(a^2b\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(\left(\frac{b}{ad^3}\right)^{\frac{1}{3}}e^{(-2)}-\frac{2\,e^{(-1)}}{(dxe+ce)d}\right)e^2}{3\left(\frac{b}{ad^3}\right)^{\frac{1}{3}}}\right)e^{(-2)}}{9\,a^3d}-\frac{2\left(a^2b\right)^{\frac{1}{3}}e^{(-2)}\ln\left(\left(\frac{b}{ad^3}\right)^{\frac{2}{3}}e^{(-4)}-\frac{\left(\frac{b}{ad^3}\right)^{\frac{1}{3}}e^{(-3)}}{(dxe+ce)d}+\frac{e^{(-2)}}{(dxe+ce)^2d^2}\right)}{9\,a^3d}-\frac{e^{(-1)}}{(dxe+ce)a^2d}-\frac{be^{(-1)}}{3\,(dxe+ce)a^2\left(b+\frac{ae^3}{(dxe+ce)^3}\right)d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((d*x + c)^3*b + a)^2*(d*e*x + c*e)^2),x, algorithm="giac")
```

```
[Out] 4/9*(b/(a*d^3))^(1/3)*e^(-2)*ln(abs(-(b/(a*d^3))^(1/3)*e^(-2) - e
^(-1)/((d*x*e + c*e)*d)))/a^2 - 4/9*sqrt(3)*(a^2*b)^(1/3)*arctan(
1/3*sqrt(3)*((b/(a*d^3))^(1/3)*e^(-2) - 2*e^(-1)/((d*x*e + c*e)*d
))*e^2/(b/(a*d^3))^(1/3))*e^(-2)/(a^3*d) - 2/9*(a^2*b)^(1/3)*e^(-
2)*ln((b/(a*d^3))^(2/3)*e^(-4) - (b/(a*d^3))^(1/3)*e^(-3)/((d*x*e
 + c*e)*d) + e^(-2)/((d*x*e + c*e)^2*d^2))/(a^3*d) - e^(-1)/((d*x
*e + c*e)*a^2*d) - 1/3*b*e^(-1)/((d*x*e + c*e)*a^2*(b + a*e^3/(d*
x*e + c*e)^3)*d)
```

3.2893 $\int \frac{1}{(ce+dex)^3(a+b(c+dx)^3)^2}\,dx$

Optimal. Leaf size=204

$$-\frac{5b^{2/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{9a^{8/3}de^3}+\frac{5b^{2/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{18a^{8/3}de^3}+\frac{5b^{2/3}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{8/3}de^3}-\frac{5}{6a^2de^3(c+dx)^2}+\frac{1}{3ade^3(c+dx)^2\left(a+b(c+dx)^3\right)}$$

```
[Out] -5/(6*a^2*d*e^3*(c + d*x)^2) + 1/(3*a*d*e^3*(c + d*x)^2*(a + b*(c
 + d*x)^3)) + (5*b^(2/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d*x))/(
Sqrt[3]*a^(1/3))])/(3*Sqrt[3]*a^(8/3)*d*e^3) - (5*b^(2/3)*Log[a^(
1/3) + b^(1/3)*(c + d*x)])/(9*a^(8/3)*d*e^3) + (5*b^(2/3)*Log[a^(
2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/(18*a^(8
/3)*d*e^3)
```

Rubi [A] time = 0.391774, antiderivative size = 204, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 9, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375

$$-\frac{5b^{2/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{9a^{8/3}de^3}+\frac{5b^{2/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{18a^{8/3}de^3}+\frac{5b^{2/3}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{8/3}de^3}-\frac{5}{6a^2de^3(c+dx)^2}+\frac{1}{3ade^3(c+dx)^2\left(a+b(c+dx)^3\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((c*e + d*e*x)^3*(a + b*(c + d*x)^3)^2),x]
```

```
[Out] -5/(6*a^2*d*e^3*(c + d*x)^2) + 1/(3*a*d*e^3*(c + d*x)^2*(a + b*(c
 + d*x)^3)) + (5*b^(2/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d*x))/(
Sqrt[3]*a^(1/3))])/(3*Sqrt[3]*a^(8/3)*d*e^3) - (5*b^(2/3)*Log[a^(
1/3) + b^(1/3)*(c + d*x)])/(9*a^(8/3)*d*e^3) + (5*b^(2/3)*Log[a^(
2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/(18*a^(8
/3)*d*e^3)
```

Rubi in Sympy [A] time = 47.9324, size = 196, normalized size = 0.96

$$\frac{1}{3ade^3\left(a+b\left(c+dx\right)^3\right)\left(c+dx\right)^2}-\frac{5}{6a^2de^3\left(c+dx\right)^2}-\frac{5b^{\frac{2}{3}}\log\left(\sqrt[3]{a}+\sqrt[3]{b}\left(c+dx\right)\right)}{9a^{\frac{8}{3}}de^3}+\frac{5b^{\frac{2}{3}}\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}\left(-c-dx\right)+b^{\frac{2}{3}}\left(c+dx\right)^2\right)}{18a^{\frac{8}{3}}de^3}+\frac{5\sqrt{3}b^{\frac{2}{3}}\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{9a^{\frac{8}{3}}de^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(d*e*x+c*e)**3/(a+b*(d*x+c)**3)**2,x)
```

```
[Out] 1/(3*a*d*e**3*(a + b*(c + d*x)**3)*(c + d*x)**2) - 5/(6*a**2*d*e*
*3*(c + d*x)**2) - 5*b**(2/3)*log(a**(1/3) + b**(1/3)*(c + d*x))/
(9*a**(8/3)*d*e**3) + 5*b**(2/3)*log(a**(2/3) + a**(1/3)*b**(1/3)
*(-c - d*x) + b**(2/3)*(c + d*x)**2)/(18*a**(8/3)*d*e**3) + 5*sqr
t(3)*b**(2/3)*atan(sqrt(3)*(a**(1/3)/3 + b**(1/3)*(-2*c/3 - 2*d*x
/3))/a**(1/3))/(9*a**(8/3)*d*e**3)
```

Mathematica [A] time = 0.156986, size = 169, normalized size = 0.83

$$\frac{5b^{2/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)-\frac{6a^{2/3}b(c+dx)}{a+b(c+dx)^3}-\frac{9a^{2/3}}{(c+dx)^2}-10b^{2/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)-10\sqrt{3}b^{2/3}\tan^{-1}\left(\right.}{18a^{8/3}de^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((c*e + d*e*x)^3*(a + b*(c + d*x)^3)^2),x]
```

```
[Out] ((-9*a^(2/3))/(c + d*x)^2 - (6*a^(2/3)*b*(c + d*x))/(a + b*(c + d
*x)^3) - 10*Sqrt[3]*b^(2/3)*ArcTan[(-a^(1/3) + 2*b^(1/3)*(c + d*x
))/(Sqrt[3]*a^(1/3))] - 10*b^(2/3)*Log[a^(1/3) + b^(1/3)*(c + d*x
)] + 5*b^(2/3)*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*
(c + d*x)^2])/(18*a^(8/3)*d*e^3)
```

Maple [C] time = 0.011, size = 186, normalized size = 0.9

$$-\frac{bx}{3\,e^3a^2\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)}-\frac{bc}{3\,e^3a^2\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)d}-\frac{5}{9\,e^3a^2d}\sum_{\_R=RootOf\left(\_Z^3bd^3+3\_Z^2bcd^2+3\_Z\,bc^2d+bc^3+a\right)}\frac{\ln\left(x-\_R\right)}{d^2\_R^2+2\,cd\_R+c^2}-\frac{1}{2\,e^3a^2d\left(dx+c\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(d*e*x+c*e)^3/(a+b*(d*x+c)^3)^2,x)
```

```
[Out] -1/3/e^3*b/a^2/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)*x-1/
3/e^3*b/a^2/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)*c/d-5/9
/e^3/a^2/d*sum(1/(_R^2*d^2+2*_R*c*d+c^2)*ln(x-_R),_R=RootOf(_Z^3*
b*d^3+3*_Z^2*b*c*d^2+3*_Z*b*c^2*d+b*c^3+a))-1/2/a^2/d/e^3/(d*x+c)
^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{5\,bd^3x^3+15\,bcd^2x^2+15\,bc^2dx+5\,bc^3+3\,a}{6\left(a^2bd^6e^3x^5+5\,a^2bcd^5e^3x^4+10\,a^2bc^2d^4e^3x^3+(10\,a^2bc^3+a^3)d^3e^3x^2+(5\,a^2bc^4+2\,a^3c)d^2e^3x+(a^2bc^5+a^3c^2)de^3\right)}-\frac{5\,b\int\frac{1}{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}\,dx}{3\,a^2e^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)^2*(d*e*x + c*e)^3),x, algorithm="maxima")
```

```
[Out] -1/6*(5*b*d^3*x^3 + 15*b*c*d^2*x^2 + 15*b*c^2*d*x + 5*b*c^3 + 3*a
)/(a^2*b*d^6*e^3*x^5 + 5*a^2*b*c*d^5*e^3*x^4 + 10*a^2*b*c^2*d^4*e
^3*x^3 + (10*a^2*b*c^3 + a^3)*d^3*e^3*x^2 + (5*a^2*b*c^4 + 2*a^3*
c)*d^2*e^3*x + (a^2*b*c^5 + a^3*c^2)*d*e^3) - 5/3*b*integrate(1/(
b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a), x)/(a^2*e^3
)
```

Fricas [A] time = 0.240279, size = 740, normalized size = 3.63

$$-\frac{\sqrt{3}\left(5\sqrt{3}\left(bd^5x^5+5\,bcd^4x^4+10\,bc^2d^3x^3+bc^5+\left(10\,bc^3+a\right)d^2x^2+ac^2+\left(5\,bc^4+2\,ac\right)dx\right)\left(-\frac{b^2}{a^2}\right)^{\frac{1}{3}}\log\left(b^2d^2x^2+2\,b^2cdx\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((((d*x + c)^3*b + a)^2*(d*e*x + c*e)^3),x, algorithm="fricas")
```

```
[Out] -1/54*sqrt(3)*(5*sqrt(3)*(b*d^5*x^5 + 5*b*c*d^4*x^4 + 10*b*c^2*d^
3*x^3 + b*c^5 + (10*b*c^3 + a)*d^2*x^2 + a*c^2 + (5*b*c^4 + 2*a*c
)*d*x)*(-b^2/a^2)^(1/3)*log(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2 +
 a^2*(-b^2/a^2)^(2/3) + (a*b*d*x + a*b*c)*(-b^2/a^2)^(1/3)) - 10*
sqrt(3)*(b*d^5*x^5 + 5*b*c*d^4*x^4 + 10*b*c^2*d^3*x^3 + b*c^5 + (
10*b*c^3 + a)*d^2*x^2 + a*c^2 + (5*b*c^4 + 2*a*c)*d*x)*(-b^2/a^2)
^(1/3)*log(b*d*x + b*c - a*(-b^2/a^2)^(1/3)) + 30*(b*d^5*x^5 + 5*
b*c*d^4*x^4 + 10*b*c^2*d^3*x^3 + b*c^5 + (10*b*c^3 + a)*d^2*x^2 +
 a*c^2 + (5*b*c^4 + 2*a*c)*d*x)*(-b^2/a^2)^(1/3)*arctan(1/3*(sqrt
(3)*a*(-b^2/a^2)^(1/3) + 2*sqrt(3)*(b*d*x + b*c))/(a*(-b^2/a^2)^(
1/3))) + 3*sqrt(3)*(5*b*d^3*x^3 + 15*b*c*d^2*x^2 + 15*b*c^2*d*x +
 5*b*c^3 + 3*a))/(a^2*b*d^6*e^3*x^5 + 5*a^2*b*c*d^5*e^3*x^4 + 10*
a^2*b*c^2*d^4*e^3*x^3 + (10*a^2*b*c^3 + a^3)*d^3*e^3*x^2 + (5*a^2
*b*c^4 + 2*a^3*c)*d^2*e^3*x + (a^2*b*c^5 + a^3*c^2)*d*e^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*e*x+c*e)**3/(a+b*(d*x+c)**3)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left((dx+c)^3 b + a\right)^2 (dex+ce)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((((d*x + c)^3*b + a)^2*(d*e*x + c*e)^3),x, algorithm="giac")
```

```
[Out] integrate(1/((((d*x + c)^3*b + a)^2*(d*e*x + c*e)^3), x)
```

3.2894 $\int \frac{1}{(ce+dex)^4(a+b(c+dx)^3)^2} dx$

Optimal. Leaf size=92

$$-\frac{2b\log(c+dx)}{a^3de^4}+\frac{2b\log\left(a+b(c+dx)^3\right)}{3a^3de^4}-\frac{b}{3a^2de^4\left(a+b(c+dx)^3\right)}-\frac{1}{3a^2de^4(c+dx)^3}$$

```
[Out] -1/(3*a^2*d*e^4*(c + d*x)^3) - b/(3*a^2*d*e^4*(a + b*(c + d*x)^3)
) - (2*b*Log[c + d*x])/(a^3*d*e^4) + (2*b*Log[a + b*(c + d*x)^3])
/(3*a^3*d*e^4)
```

Rubi [A] time = 0.1896, antiderivative size = 92, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125

$$-\frac{2b\log(c+dx)}{a^3de^4}+\frac{2b\log\left(a+b(c+dx)^3\right)}{3a^3de^4}-\frac{b}{3a^2de^4\left(a+b(c+dx)^3\right)}-\frac{1}{3a^2de^4(c+dx)^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((c*e + d*e*x)^4*(a + b*(c + d*x)^3)^2),x]
```

```
[Out] -1/(3*a^2*d*e^4*(c + d*x)^3) - b/(3*a^2*d*e^4*(a + b*(c + d*x)^3)
) - (2*b*Log[c + d*x])/(a^3*d*e^4) + (2*b*Log[a + b*(c + d*x)^3])
/(3*a^3*d*e^4)
```

Rubi in Sympy [A] time = 19.9334, size = 87, normalized size = 0.95

$$-\frac{b}{3a^2de^4\left(a+b\left(c+dx\right)^3\right)}-\frac{1}{3a^2de^4\left(c+dx\right)^3}+\frac{2b\log\left(a+b\left(c+dx\right)^3\right)}{3a^3de^4}-\frac{2b\log\left(\left(c+dx\right)^3\right)}{3a^3de^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(d*e*x+c*e)**4/(a+b*(d*x+c)**3)**2,x)
```

```
[Out] -b/(3*a**2*d*e**4*(a + b*(c + d*x)**3)) - 1/(3*a**2*d*e**4*(c + d
*x)**3) + 2*b*log(a + b*(c + d*x)**3)/(3*a**3*d*e**4) - 2*b*log((
c + d*x)**3)/(3*a**3*d*e**4)
```

Mathematica [A] time = 0.12536, size = 63, normalized size = 0.68

$$-\frac{a\left(\frac{b}{a+b(c+dx)^3}+\frac{1}{(c+dx)^3}\right)-2b\log\left(a+b(c+dx)^3\right)+6b\log(c+dx)}{3a^3de^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((c*e + d*e*x)^4*(a + b*(c + d*x)^3)^2),x]
```

```
[Out] -(a*((c + d*x)^(-3) + b/(a + b*(c + d*x)^3)) + 6*b*Log[c + d*x] -
 2*b*Log[a + b*(c + d*x)^3])/(3*a^3*d*e^4)
```

Maple [A] time = 0.015, size = 131, normalized size = 1.4

$$-\frac{b}{3e^4a^2d\left(bd^3x^3+3bcd^2x^2+3bc^2dx+bc^3+a\right)}+\frac{2b\ln\left(bd^3x^3+3bcd^2x^2+3bc^2dx+bc^3+a\right)}{3e^4a^3d}-\frac{1}{3e^4a^2d\left(dx+c\right)^3}-2\frac{b\ln\left(dx+c\right)}{e^4a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(d*e*x+c*e)^4/(a+b*(d*x+c)^3)^2,x)
```

```
[Out] -1/3/e^4/a^2*b/d/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)+2/
3/e^4/a^3*b/d*ln(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)-1/3
/a^2/d/e^4/(d*x+c)^3-2*b*ln(d*x+c)/a^3/d/e^4
```

Maxima [A] time = 1.41964, size = 336, normalized size = 3.65

$$-\frac{2\,bd^3x^3+6\,bcd^2x^2+6\,bc^2dx+2\,bc^3+a}{3\,(a^2bd^7e^4x^6+6\,a^2bcd^6e^4x^5+15\,a^2bc^2d^5e^4x^4+(20\,a^2bc^3+a^3)d^4e^4x^3+3\,(5\,a^2bc^4+a^3c)d^3e^4x^2+3\,(2\,a^2bc^5+a^3c^2)d^2e^4x}$$
$$+\frac{2\,b\log\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)}{3\,a^3de^4}-\frac{2\,b\log\left(dx+c\right)}{a^3de^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)^2*(d*e*x + c*e)^4),x, algorithm="maxima")
```

```
[Out] -1/3*(2*b*d^3*x^3 + 6*b*c*d^2*x^2 + 6*b*c^2*d*x + 2*b*c^3 + a)/(a
^2*b*d^7*e^4*x^6 + 6*a^2*b*c*d^6*e^4*x^5 + 15*a^2*b*c^2*d^5*e^4*x
^4 + (20*a^2*b*c^3 + a^3)*d^4*e^4*x^3 + 3*(5*a^2*b*c^4 + a^3*c)*d
^3*e^4*x^2 + 3*(2*a^2*b*c^5 + a^3*c^2)*d^2*e^4*x + (a^2*b*c^6 + a
^3*c^3)*d*e^4) + 2/3*b*log(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*
x + b*c^3 + a)/(a^3*d*e^4) - 2*b*log(d*x + c)/(a^3*d*e^4)
```

Fricas [A] time = 0.250942, size = 610, normalized size = 6.63

$$-\frac{2\,abd^3x^3+6\,abcd^2x^2+6\,abc^2dx+2\,abc^3+a^2-2\,\left(b^2d^6x^6+6\,b^2cd^5x^5+15\,b^2c^2d^4x^4+b^2c^6+\left(20\,b^2c^3+ab\right)d^3x^3+abc^3}{3\,(a^3bd^7e^4x^6+6\,a^3bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)^2*(d*e*x + c*e)^4),x, algorithm="fricas")
```

```
[Out] -1/3*(2*a*b*d^3*x^3 + 6*a*b*c*d^2*x^2 + 6*a*b*c^2*d*x + 2*a*b*c^3
 + a^2 - 2*(b^2*d^6*x^6 + 6*b^2*c*d^5*x^5 + 15*b^2*c^2*d^4*x^4 +
b^2*c^6 + (20*b^2*c^3 + a*b)*d^3*x^3 + a*b*c^3 + 3*(5*b^2*c^4 + a
*b*c)*d^2*x^2 + 3*(2*b^2*c^5 + a*b*c^2)*d*x)*log(b*d^3*x^3 + 3*b*
c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a) + 6*(b^2*d^6*x^6 + 6*b^2*c*d
^5*x^5 + 15*b^2*c^2*d^4*x^4 + b^2*c^6 + (20*b^2*c^3 + a*b)*d^3*x^
3 + a*b*c^3 + 3*(5*b^2*c^4 + a*b*c)*d^2*x^2 + 3*(2*b^2*c^5 + a*b*
c^2)*d*x)*log(d*x + c))/(a^3*b*d^7*e^4*x^6 + 6*a^3*b*c*d^6*e^4*x^
5 + 15*a^3*b*c^2*d^5*e^4*x^4 + (20*a^3*b*c^3 + a^4)*d^4*e^4*x^3 +
 3*(5*a^3*b*c^4 + a^4*c)*d^3*e^4*x^2 + 3*(2*a^3*b*c^5 + a^4*c^2)*
d^2*e^4*x + (a^3*b*c^6 + a^4*c^3)*d*e^4)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(d*e*x+c*e)**4/(a+b*(d*x+c)**3)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.219227, size = 213, normalized size = 2.32

$$\frac{2\,be^{(-4)}\ln\left(\left|bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3 + a\right|\right)}{3\,a^3d} - \frac{2\,be^{(-4)}\ln\left(\left|dx + c\right|\right)}{a^3d} - \frac{\left(2\,abd^3x^3 + 6\,abcd^2x^2 + 6\,abc^2dx + 2\,abc^3 + a^2\right)e^{(-4)}}{3\,(bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3 + a)(dx + c)^3a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)^2*(d*e*x + c*e)^4),x, algorithm="giac")
```

```
[Out] 2/3*b*e^(-4)*ln(abs(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c
^3 + a))/(a^3*d) - 2*b*e^(-4)*ln(abs(d*x + c))/(a^3*d) - 1/3*(2*a
*b*d^3*x^3 + 6*a*b*c*d^2*x^2 + 6*a*b*c^2*d*x + 2*a*b*c^3 + a^2)*e
^(-4)/((b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)*(d*x
 + c)^3*a^3*d)
```

3.2895 $\int \frac{(ce+dex)^4}{(a+b(c+dx)^3)^3}\,dx$

Optimal. Leaf size=220

$$-\frac{e^4\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{27a^{4/3}b^{5/3}d}+\frac{e^4\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{54a^{4/3}b^{5/3}d}-\frac{e^4\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{4/3}b^{5/3}d}+\frac{e^4(c+dx)^2}{9abd\left(a+b(c+dx)^3\right)}-\frac{e^4(c+dx)^2}{6bd\left(a+b(c+dx)^3\right)^2}$$

```
[Out] -(e^4*(c + d*x)^2)/(6*b*d*(a + b*(c + d*x)^3)^2) + (e^4*(c + d*x)
^2)/(9*a*b*d*(a + b*(c + d*x)^3)) - (e^4*ArcTan[(a^(1/3) - 2*b^(1
/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/(9*Sqrt[3]*a^(4/3)*b^(5/3)*d)
- (e^4*Log[a^(1/3) + b^(1/3)*(c + d*x)])/(27*a^(4/3)*b^(5/3)*d) +
 (e^4*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)
^2])/(54*a^(4/3)*b^(5/3)*d)
```

Rubi [A] time = 0.439012, antiderivative size = 220, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 9, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375

$$-\frac{e^4\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{27a^{4/3}b^{5/3}d}+\frac{e^4\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{54a^{4/3}b^{5/3}d}-\frac{e^4\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{4/3}b^{5/3}d}+\frac{e^4(c+dx)^2}{9abd\left(a+b(c+dx)^3\right)}-\frac{e^4(c+dx)^2}{6bd\left(a+b(c+dx)^3\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*e + d*e*x)^4/(a + b*(c + d*x)^3)^3,x]
```

```
[Out] -(e^4*(c + d*x)^2)/(6*b*d*(a + b*(c + d*x)^3)^2) + (e^4*(c + d*x)
^2)/(9*a*b*d*(a + b*(c + d*x)^3)) - (e^4*ArcTan[(a^(1/3) - 2*b^(1
/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/(9*Sqrt[3]*a^(4/3)*b^(5/3)*d)
- (e^4*Log[a^(1/3) + b^(1/3)*(c + d*x)])/(27*a^(4/3)*b^(5/3)*d) +
 (e^4*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)
^2])/(54*a^(4/3)*b^(5/3)*d)
```

Rubi in Sympy [A] time = 49.2808, size = 199, normalized size = 0.9

$$-\frac{e^4\left(c+dx\right)^2}{6bd\left(a+b\left(c+dx\right)^3\right)^2}+\frac{e^4\left(c+dx\right)^2}{9abd\left(a+b\left(c+dx\right)^3\right)}-\frac{e^4\log\left(\sqrt[3]{a}+\sqrt[3]{b}\left(c+dx\right)\right)}{27a^{\frac{4}{3}}b^{\frac{5}{3}}d}+\frac{e^4\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}\left(-c-dx\right)+b^{\frac{2}{3}}\left(c+dx\right)^2\right)}{54a^{\frac{4}{3}}b^{\frac{5}{3}}d}-\frac{\sqrt{3}e^4\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{27a^{\frac{4}{3}}b^{\frac{5}{3}}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*e*x+c*e)**4/(a+b*(d*x+c)**3)**3,x)
```

```
[Out] -e**4*(c + d*x)**2/(6*b*d*(a + b*(c + d*x)**3)**2) + e**4*(c + d*
x)**2/(9*a*b*d*(a + b*(c + d*x)**3)) - e**4*log(a**(1/3) + b**(1/
3)*(c + d*x))/(27*a**(4/3)*b**(5/3)*d) + e**4*log(a**(2/3) + a**(
1/3)*b**(1/3)*(-c - d*x) + b**(2/3)*(c + d*x)**2)/(54*a**(4/3)*b*
*(5/3)*d) - sqrt(3)*e**4*atan(sqrt(3)*(a**(1/3)/3 + b**(1/3)*(-2*
```

```
c/3 - 2*d*x/3))/a**(1/3))/(27*a**(4/3)*b**(5/3)*d)
```

Mathematica [A] time = 0.330224, size = 185, normalized size = 0.84

$$\frac{e^4\left(\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{a^{4/3}}-\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{a^{4/3}}+\frac{2\sqrt{3}\tan^{-1}\left(\frac{2\sqrt[3]{b}(c+dx)-\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{a^{4/3}}+\frac{6b^{2/3}(c+dx)^2}{a(a+b(c+dx)^3)}-\frac{9b^{2/3}(c+dx)^2}{(a+b(c+dx)^3)^2}\right)}{54b^{5/3}d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*e + d*e*x)^4/(a + b*(c + d*x)^3)^3,x]
```

```
[Out] (e^4*((-9*b^(2/3)*(c + d*x)^2)/(a + b*(c + d*x)^3)^2 + (6*b^(2/3)
*(c + d*x)^2)/(a*(a + b*(c + d*x)^3)) + (2*Sqrt[3]*ArcTan[(-a^(1/
3) + 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/a^(4/3) - (2*Log[a^
(1/3) + b^(1/3)*(c + d*x)])/a^(4/3) + Log[a^(2/3) - a^(1/3)*b^(1/
3)*(c + d*x) + b^(2/3)*(c + d*x)^2]/a^(4/3)))/(54*b^(5/3)*d)
```

Maple [C] time = 0.011, size = 521, normalized size = 2.4

$$\frac{e^4d^4x^5}{9\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2a}+\frac{5\,e^4cd^3x^4}{9\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2a}+\frac{10\,e^4c^2d^2x^3}{9\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2a}+\frac{10\,e^4dx^2c^3}{9\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2a}-\frac{e^4dx^2}{18\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2b}+\frac{5\,e^4c^4x}{9\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2a}-\frac{e^4cx}{9\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2b}+\frac{e^4c^5}{9\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2da}-\frac{e^4c^2}{18\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2bd}+\frac{e^4}{27\,ab^2d}\sum_{\_R=RootOf(\_Z^3bd^3+3\,\_Z^2bcd^2+3\,\_Z\,bc^2d+bc^3+a)}\frac{(\_R\,d+c)\ln(x-\_R)}{d^2\_R^2+2\,cd\_R+c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*e*x+c*e)^4/(a+b*(d*x+c)^3)^3,x)
```

```
[Out] 1/9*e^4/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*d^4/a*x^5
+5/9*e^4/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*c*d^3/a*
x^4+10/9*e^4/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*c^2*
d^2/a*x^3+10/9*e^4/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^
2*d/a*x^2*c^3-1/18*e^4/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3
+a)^2/b*d*x^2+5/9*e^4/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+
a)^2*c^4/a*x-1/9*e^4/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a
)^2/b*c*x+1/9*e^4/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2
*c^5/d/a-1/18*e^4/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2
*c^2/b/d+1/27*e^4/a/b^2/d*sum((_R*d+c)/(_R^2*d^2+2*_R*c*d+c^2)*ln
(x-_R),_R=RootOf(_Z^3*b*d^3+3*_Z^2*b*c*d^2+3*_Z*b*c^2*d+b*c^3+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{e^4\int\frac{dx+c}{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}\,dx}{9\,ab}+\frac{2\,bd^5e^4x^5+10\,bcd^4e^4x^4+20\,bc^2d^3e^4x^3+\left(20\,bc^3-a\right)d^2e^4x^2+2\left(5\,bc^4-ac\right)de^4x+\left(2\,bc^5-ac^2\right)e}{18\left(ab^3d^7x^6+6\,ab^3cd^6x^5+15\,ab^3c^2d^5x^4+2\left(10\,ab^3c^3+a^2b^2\right)d^4x^3+3\left(5\,ab^3c^4+2\,a^2b^2c\right)d^3x^2+6\left(ab^3c^5+a^2b^2c^2\right)d^2x+(a\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*e*x + c*e)^4/((d*x + c)^3*b + a)^3,x, algorithm="maxima")
```

```
[Out] 1/9*e^4*integrate((d*x + c)/(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*
d*x + b*c^3 + a), x)/(a*b) + 1/18*(2*b*d^5*e^4*x^5 + 10*b*c*d^4*e
^4*x^4 + 20*b*c^2*d^3*e^4*x^3 + (20*b*c^3 - a)*d^2*e^4*x^2 + 2*(5
*b*c^4 - a*c)*d*e^4*x + (2*b*c^5 - a*c^2)*e^4)/(a*b^3*d^7*x^6 + 6
*a*b^3*c*d^6*x^5 + 15*a*b^3*c^2*d^5*x^4 + 2*(10*a*b^3*c^3 + a^2*b
^2)*d^4*x^3 + 3*(5*a*b^3*c^4 + 2*a^2*b^2*c)*d^3*x^2 + 6*(a*b^3*c^
5 + a^2*b^2*c^2)*d^2*x + (a*b^3*c^6 + 2*a^2*b^2*c^3 + a^3*b)*d)
```

Fricas [A] time = 0.243853, size = 1072, normalized size = 4.87

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*e*x + c*e)^4/((d*x + c)^3*b + a)^3,x, algorithm="fricas")
```

```
[Out] 1/162*sqrt(3)*(2*sqrt(3)*(b^2*d^6*e^4*x^6 + 6*b^2*c*d^5*e^4*x^5 +
 15*b^2*c^2*d^4*e^4*x^4 + 2*(10*b^2*c^3 + a*b)*d^3*e^4*x^3 + 3*(5
*b^2*c^4 + 2*a*b*c)*d^2*e^4*x^2 + 6*(b^2*c^5 + a*b*c^2)*d*e^4*x +
 (b^2*c^6 + 2*a*b*c^3 + a^2)*e^4)*log(a*b + (-a*b^2)^(2/3)*(d*x +
 c)) - sqrt(3)*(b^2*d^6*e^4*x^6 + 6*b^2*c*d^5*e^4*x^5 + 15*b^2*c^
2*d^4*e^4*x^4 + 2*(10*b^2*c^3 + a*b)*d^3*e^4*x^3 + 3*(5*b^2*c^4 +
 2*a*b*c)*d^2*e^4*x^2 + 6*(b^2*c^5 + a*b*c^2)*d*e^4*x + (b^2*c^6
+ 2*a*b*c^3 + a^2)*e^4)*log(-a*b + (-a*b^2)^(2/3)*(d*x + c) + (b*
d^2*x^2 + 2*b*c*d*x + b*c^2)*(-a*b^2)^(1/3)) - 6*(b^2*d^6*e^4*x^6
 + 6*b^2*c*d^5*e^4*x^5 + 15*b^2*c^2*d^4*e^4*x^4 + 2*(10*b^2*c^3 +
 a*b)*d^3*e^4*x^3 + 3*(5*b^2*c^4 + 2*a*b*c)*d^2*e^4*x^2 + 6*(b^2*
c^5 + a*b*c^2)*d*e^4*x + (b^2*c^6 + 2*a*b*c^3 + a^2)*e^4)*arctan(
-1/3*(sqrt(3)*a*b - 2*sqrt(3)*(-a*b^2)^(2/3)*(d*x + c))/(a*b)) +
3*sqrt(3)*(2*b*d^5*e^4*x^5 + 10*b*c*d^4*e^4*x^4 + 20*b*c^2*d^3*e^
4*x^3 + (20*b*c^3 - a)*d^2*e^4*x^2 + 2*(5*b*c^4 - a*c)*d*e^4*x +
(2*b*c^5 - a*c^2)*e^4)*(-a*b^2)^(1/3))/((a*b^3*d^7*x^6 + 6*a*b^3*
c*d^6*x^5 + 15*a*b^3*c^2*d^5*x^4 + 2*(10*a*b^3*c^3 + a^2*b^2)*d^4
*x^3 + 3*(5*a*b^3*c^4 + 2*a^2*b^2*c)*d^3*x^2 + 6*(a*b^3*c^5 + a^2
*b^2*c^2)*d^2*x + (a*b^3*c^6 + 2*a^2*b^2*c^3 + a^3*b)*d)*(-a*b^2)
^(1/3))
```

Sympy [A] time = 117.098, size = 332, normalized size = 1.51

$$\frac{-ac^2e^4 + 2bc^5e^4 + 20bc^2d^3e^4x^3 + 10bcd^4e^4x^4 + 2bd^5e^4x^5 + x^2\left(-ad^2e^4 + 20bc^3d^2e^4\right) + x\left(-2a\right.}{18a^3bd + 36a^2b^2c^3d + 18ab^3c^6d + 270ab^3c^2d^5x^4 + 108ab^3cd^6x^5 + 18ab^3d^7x^6 + x^3\left(36a^2b^2d^4 + 360ab^3c^3d^4\right) + x^2\left(108a^2b^2cd\right.} + \frac{e^4 \operatorname{RootSum}\left(19683t^3a^4b^5 + 1, \left(t \mapsto t\log\left(x + \frac{729t^2a^3b^3e^8 + ce^8}{de^8}\right)\right)\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x+c*e)**4/(a+b*(d*x+c)**3)**3,x)
```

```
[Out] (-a*c**2*e**4 + 2*b*c**5*e**4 + 20*b*c**2*d**3*e**4*x**3 + 10*b*c
*d**4*e**4*x**4 + 2*b*d**5*e**4*x**5 + x**2*(-a*d**2*e**4 + 20*b*
c**3*d**2*e**4) + x*(-2*a*c*d*e**4 + 10*b*c**4*d*e**4))/(18*a**3*
b*d + 36*a**2*b**2*c**3*d + 18*a*b**3*c**6*d + 270*a*b**3*c**2*d*
*5*x**4 + 108*a*b**3*c*d**6*x**5 + 18*a*b**3*d**7*x**6 + x**3*(36
*a**2*b**2*d**4 + 360*a*b**3*c**3*d**4) + x**2*(108*a**2*b**2*c*d
**3 + 270*a*b**3*c**4*d**3) + x*(108*a**2*b**2*c**2*d**2 + 108*a*
b**3*c**5*d**2)) + e**4*RootSum(19683*_t**3*a**4*b**5 + 1, Lambda
(_t, _t*log(x + (729*_t**2*a**3*b**3*e**8 + c*e**8)/(d*e**8))))/d
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dex + ce)^4}{\left((dx + c)^3 b + a\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x + c*e)^4/((d*x + c)^3*b + a)^3,x, algorithm="giac")
```

```
[Out] integrate((d*e*x + c*e)^4/((d*x + c)^3*b + a)^3, x)
```

3.2896 $\int \frac{(ce+dex)^3}{(a+b(c+dx)^3)^3}\,dx$

Optimal. Leaf size=216

$$\frac{e^3\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{27a^{5/3}b^{4/3}d}-\frac{e^3\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{54a^{5/3}b^{4/3}d}-\frac{e^3\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{5/3}b^{4/3}d}+\frac{e^3(c+dx)}{18abd\,(a+b(c+dx)^3)}-\frac{e^3(c+dx)}{6bd\,(a+b(c+dx)^3)^2}$$

```
[Out] -(e^3*(c + d*x))/(6*b*d*(a + b*(c + d*x)^3)^2) + (e^3*(c + d*x))/
(18*a*b*d*(a + b*(c + d*x)^3)) - (e^3*ArcTan[(a^(1/3) - 2*b^(1/3)
*(c + d*x))/(Sqrt[3]*a^(1/3))])/(9*Sqrt[3]*a^(5/3)*b^(4/3)*d) + (
e^3*Log[a^(1/3) + b^(1/3)*(c + d*x)])/(27*a^(5/3)*b^(4/3)*d) - (e
^3*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2]
)/(54*a^(5/3)*b^(4/3)*d)
```

Rubi [A] time = 0.420451, antiderivative size = 216, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 9, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375

$$\frac{e^3\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{27a^{5/3}b^{4/3}d}-\frac{e^3\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{54a^{5/3}b^{4/3}d}-\frac{e^3\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{5/3}b^{4/3}d}+\frac{e^3(c+dx)}{18abd\,(a+b(c+dx)^3)}-\frac{e^3(c+dx)}{6bd\,(a+b(c+dx)^3)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*e + d*e*x)^3/(a + b*(c + d*x)^3)^3,x]
```

```
[Out] -(e^3*(c + d*x))/(6*b*d*(a + b*(c + d*x)^3)^2) + (e^3*(c + d*x))/
(18*a*b*d*(a + b*(c + d*x)^3)) - (e^3*ArcTan[(a^(1/3) - 2*b^(1/3)
*(c + d*x))/(Sqrt[3]*a^(1/3))])/(9*Sqrt[3]*a^(5/3)*b^(4/3)*d) + (
e^3*Log[a^(1/3) + b^(1/3)*(c + d*x)])/(27*a^(5/3)*b^(4/3)*d) - (e
^3*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2]
)/(54*a^(5/3)*b^(4/3)*d)
```

Rubi in Sympy [A] time = 48.57, size = 196, normalized size = 0.91

$$-\frac{e^3\,(c+dx)}{6bd\,\left(a+b\,(c+dx)^3\right)^2}+\frac{e^3\,(c+dx)}{18abd\,\left(a+b\,(c+dx)^3\right)}+\frac{e^3\log\left(\sqrt[3]{a}+\sqrt[3]{b}\,(c+dx)\right)}{27a^{\frac{5}{3}}b^{\frac{4}{3}}d}-\frac{e^3\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}\,(-c-dx)+b^{\frac{2}{3}}\,(c+dx)^2\right)}{54a^{\frac{5}{3}}b^{\frac{4}{3}}d}-\frac{\sqrt{3}e^3\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{27a^{\frac{5}{3}}b^{\frac{4}{3}}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*e*x+c*e)**3/(a+b*(d*x+c)**3)**3,x)
```

```
[Out] -e**3*(c + d*x)/(6*b*d*(a + b*(c + d*x)**3)**2) + e**3*(c + d*x)/
(18*a*b*d*(a + b*(c + d*x)**3)) + e**3*log(a**(1/3) + b**(1/3)*(c
 + d*x))/(27*a**(5/3)*b**(4/3)*d) - e**3*log(a**(2/3) + a**(1/3)*
b**(1/3)*(-c - d*x) + b**(2/3)*(c + d*x)**2)/(54*a**(5/3)*b**(4/3
)*d) - sqrt(3)*e**3*atan(sqrt(3)*(a**(1/3)/3 + b**(1/3)*(-2*c/3 -
```

```
2*d*x/3))/a**(1/3))/(27*a**(5/3)*b**(4/3)*d)
```

Mathematica [A] time = 0.230917, size = 182, normalized size = 0.84

$$\frac{e^3\left(-\frac{\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{a^{5/3}}+\frac{2\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{a^{5/3}}+\frac{2\sqrt{3}\tan^{-1}\left(\frac{2\sqrt[3]{b}(c+dx)-\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{a^{5/3}}+\frac{3\sqrt[3]{b}(c+dx)}{a(a+b(c+dx)^3)}-\frac{9\sqrt[3]{b}(c+dx)}{(a+b(c+dx)^3)^2}\right)}{54b^{4/3}d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*e + d*e*x)^3/(a + b*(c + d*x)^3)^3,x]
```

```
[Out] (e^3*((-9*b^(1/3)*(c + d*x))/(a + b*(c + d*x)^3)^2 + (3*b^(1/3)*(
c + d*x))/(a*(a + b*(c + d*x)^3)) + (2*Sqrt[3]*ArcTan[(-a^(1/3) +
 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/a^(5/3) + (2*Log[a^(1/3
) + b^(1/3)*(c + d*x)])/a^(5/3) - Log[a^(2/3) - a^(1/3)*b^(1/3)*(
c + d*x) + b^(2/3)*(c + d*x)^2]/a^(5/3)))/(54*b^(4/3)*d)
```

Maple [C] time = 0.008, size = 414, normalized size = 1.9

$$\frac{e^3d^3x^4}{18\,(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)^2\,a}+\frac{2\,e^3cd^2x^3}{9\,(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)^2\,a}+\frac{e^3c^2dx^2}{3\,(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)^2\,a}+\frac{2\,e^3xc^3}{9\,(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)^2\,a}-\frac{e^3x}{9\,(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)^2\,b}+\frac{e^3c^4}{18\,(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)^2\,da}-\frac{e^3c}{9\,(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)^2\,db}+\frac{e^3}{27\,ab^2d}\sum_{\_R=RootOf(\_Z^3bd^3+3\_Z^2bcd^2+3\_Z\,bc^2d+bc^3+a)}\frac{\ln(x-\_R)}{d^2\_R^2+2\,cd\_R+c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*e*x+c*e)^3/(a+b*(d*x+c)^3)^3,x)
```

```
[Out] 1/18*e^3/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*d^3/a*x^
4+2/9*e^3/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*c*d^2/a
*x^3+1/3*e^3/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*c^2*
d/a*x^2+2/9*e^3/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2/a
*x*c^3-1/9*e^3/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2/b*
x+1/18*e^3/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*c^4/d/
a-1/9*e^3/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*c/d/b+1
/27*e^3/b^2/a/d*sum(1/(_R^2*d^2+2*_R*c*d+c^2)*ln(x-_R),_R=RootOf(
_Z^3*b*d^3+3*_Z^2*b*c*d^2+3*_Z*b*c^2*d+b*c^3+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{e^3\int\frac{1}{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}\,dx}{9\,ab}+\frac{bd^4e^3x^4+4\,bcd^3e^3x^3+6\,bc^2d^2e^3x^2+2\left(2\,bc^3-a\right)de^3x+\left(bc^4-2\,ac\right)e^3}{18\,(ab^3d^7x^6+6\,ab^3cd^6x^5+15\,ab^3c^2d^5x^4+2\,(10\,ab^3c^3+a^2b^2)d^4x^3+3\,(5\,ab^3c^4+2\,a^2b^2c)d^3x^2+6\,(ab^3c^5+a^2b^2c^2)d^2x+(a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x + c*e)^3/((d*x + c)^3*b + a)^3,x, algorithm="maxima")
```

```
[Out] 1/9*e^3*integrate(1/(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*
c^3 + a), x)/(a*b) + 1/18*(b*d^4*e^3*x^4 + 4*b*c*d^3*e^3*x^3 + 6*
b*c^2*d^2*e^3*x^2 + 2*(2*b*c^3 - a)*d*e^3*x + (b*c^4 - 2*a*c)*e^3
)/(a*b^3*d^7*x^6 + 6*a*b^3*c*d^6*x^5 + 15*a*b^3*c^2*d^5*x^4 + 2*(
10*a*b^3*c^3 + a^2*b^2)*d^4*x^3 + 3*(5*a*b^3*c^4 + 2*a^2*b^2*c)*d
^3*x^2 + 6*(a*b^3*c^5 + a^2*b^2*c^2)*d^2*x + (a*b^3*c^6 + 2*a^2*b
^2*c^3 + a^3*b)*d)
```

Fricas [A] time = 0.245218, size = 1021, normalized size = 4.73

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*e*x + c*e)^3/((d*x + c)^3*b + a)^3,x, algorithm="fricas")
```

```
[Out] -1/162*sqrt(3)*(sqrt(3)*(b^2*d^6*e^3*x^6 + 6*b^2*c*d^5*e^3*x^5 +
15*b^2*c^2*d^4*e^3*x^4 + 2*(10*b^2*c^3 + a*b)*d^3*e^3*x^3 + 3*(5*
b^2*c^4 + 2*a*b*c)*d^2*e^3*x^2 + 6*(b^2*c^5 + a*b*c^2)*d*e^3*x +
(b^2*c^6 + 2*a*b*c^3 + a^2)*e^3)*log(a^2 + (d^2*x^2 + 2*c*d*x + c
^2)*(a^2*b)^(2/3) - (a^2*b)^(1/3)*(a*d*x + a*c)) - 2*sqrt(3)*(b^2
*d^6*e^3*x^6 + 6*b^2*c*d^5*e^3*x^5 + 15*b^2*c^2*d^4*e^3*x^4 + 2*(
10*b^2*c^3 + a*b)*d^3*e^3*x^3 + 3*(5*b^2*c^4 + 2*a*b*c)*d^2*e^3*x
^2 + 6*(b^2*c^5 + a*b*c^2)*d*e^3*x + (b^2*c^6 + 2*a*b*c^3 + a^2)*
e^3)*log((a^2*b)^(1/3)*(d*x + c) + a) - 6*(b^2*d^6*e^3*x^6 + 6*b^
2*c*d^5*e^3*x^5 + 15*b^2*c^2*d^4*e^3*x^4 + 2*(10*b^2*c^3 + a*b)*d
^3*e^3*x^3 + 3*(5*b^2*c^4 + 2*a*b*c)*d^2*e^3*x^2 + 6*(b^2*c^5 + a
*b*c^2)*d*e^3*x + (b^2*c^6 + 2*a*b*c^3 + a^2)*e^3)*arctan(1/3*(2*
sqrt(3)*(a^2*b)^(1/3)*(d*x + c) - sqrt(3)*a)/a) - 3*sqrt(3)*(b*d^
4*e^3*x^4 + 4*b*c*d^3*e^3*x^3 + 6*b*c^2*d^2*e^3*x^2 + 2*(2*b*c^3
- a)*d*e^3*x + (b*c^4 - 2*a*c)*e^3)*(a^2*b)^(1/3))/((a*b^3*d^7*x^
6 + 6*a*b^3*c*d^6*x^5 + 15*a*b^3*c^2*d^5*x^4 + 2*(10*a*b^3*c^3 +
a^2*b^2)*d^4*x^3 + 3*(5*a*b^3*c^4 + 2*a^2*b^2*c)*d^3*x^2 + 6*(a*b
^3*c^5 + a^2*b^2*c^2)*d^2*x + (a*b^3*c^6 + 2*a^2*b^2*c^3 + a^3*b)
*d)*(a^2*b)^(1/3))
```

Sympy [A] time = 99.3193, size = 298, normalized size = 1.38

$$\frac{-2ace^3 + bc^4e^3 + 6bc^2d^2e^3x^2 + 4bcd^3e^3x^3 + bd^4e^3x^4 + x\left(-2ade^3 + 4bc^3de^3\right)}{18a^3bd + 36a^2b^2c^3d + 18ab^3c^6d + 270ab^3c^2d^5x^4 + 108ab^3cd^6x^5 + 18ab^3d^7x^6 + x^3\left(36a^2b^2d^4 + 360ab^3c^3d^4\right) + x^2\left(108a^2b^2cd\right.} + \frac{e^3 \operatorname{RootSum}\left(19683t^3a^5b^4 - 1, \left(t \mapsto t\log\left(x + \frac{27ta^2be^3+ce^3}{de^3}\right)\right)\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x+c*e)**3/(a+b*(d*x+c)**3)**3,x)
```

```
[Out] (-2*a*c*e**3 + b*c**4*e**3 + 6*b*c**2*d**2*e**3*x**2 + 4*b*c*d**3
*e**3*x**3 + b*d**4*e**3*x**4 + x*(-2*a*d*e**3 + 4*b*c**3*d*e**3)
)/(18*a**3*b*d + 36*a**2*b**2*c**3*d + 18*a*b**3*c**6*d + 270*a*b
**3*c**2*d**5*x**4 + 108*a*b**3*c*d**6*x**5 + 18*a*b**3*d**7*x**6
 + x**3*(36*a**2*b**2*d**4 + 360*a*b**3*c**3*d**4) + x**2*(108*a*
*2*b**2*c*d**3 + 270*a*b**3*c**4*d**3) + x*(108*a**2*b**2*c**2*d*
*2 + 108*a*b**3*c**5*d**2)) + e**3*RootSum(19683*_t**3*a**5*b**4
- 1, Lambda(_t, _t*log(x + (27*_t*a**2*b*e**3 + c*e**3)/(d*e**3))
))/d
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dex + ce)^3}{\left((dx + c)^3 b + a\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x + c*e)^3/((d*x + c)^3*b + a)^3,x, algorithm="giac")
```

```
[Out] integrate((d*e*x + c*e)^3/((d*x + c)^3*b + a)^3, x)
```

3.2897 $\int \frac{(ce+dex)^2}{(a+b(c+dx)^3)^3}\,dx$

Optimal. Leaf size=26

$$-\frac{e^2}{6bd\,(a+b(c+dx)^3)^2}$$

```
[Out] -e^2/(6*b*d*(a + b*(c + d*x)^3)^2)
```

Rubi [A] time = 0.0205499, antiderivative size = 26, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.042

$$-\frac{e^2}{6bd\,(a+b(c+dx)^3)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*e + d*e*x)^2/(a + b*(c + d*x)^3)^3,x]

[Out] -e^2/(6*b*d*(a + b*(c + d*x)^3)^2)
```

Rubi in Sympy [A] time = 5.45966, size = 20, normalized size = 0.77

$$-\frac{e^2}{6bd\left(a+b\left(c+dx\right)^3\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*e*x+c*e)**2/(a+b*(d*x+c)**3)**3,x)

[Out] -e**2/(6*b*d*(a + b*(c + d*x)**3)**2)
```

Mathematica [A] time = 0.0310425, size = 26, normalized size = 1.

$$-\frac{e^2}{6bd\,(a+b(c+dx)^3)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*e + d*e*x)^2/(a + b*(c + d*x)^3)^3,x]

[Out] -e^2/(6*b*d*(a + b*(c + d*x)^3)^2)
```

Maple [A] time = 0.002, size = 47, normalized size = 1.8

$$-\frac{e^2}{6\,bd\,(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*e*x+c*e)^2/(a+b*(d*x+c)^3)^3,x)
```

```
[Out] -1/6*e^2/b/d/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2
```

Maxima [A] time = 1.43231, size = 184, normalized size = 7.08

$$-\frac{e^2}{6\,(b^3d^7x^6 + 6\,b^3cd^6x^5 + 15\,b^3c^2d^5x^4 + 2\,(10\,b^3c^3 + ab^2)d^4x^3 + 3\,(5\,b^3c^4 + 2\,ab^2c)d^3x^2 + 6\,(b^3c^5 + ab^2c^2)d^2x + (b^3c^6 + 2\,ab^2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*e*x + c*e)^2/((d*x + c)^3*b + a)^3,x, algorithm="maxima")
```

```
[Out] -1/6*e^2/(b^3*d^7*x^6 + 6*b^3*c*d^6*x^5 + 15*b^3*c^2*d^5*x^4 + 2*
(10*b^3*c^3 + a*b^2)*d^4*x^3 + 3*(5*b^3*c^4 + 2*a*b^2*c)*d^3*x^2
+ 6*(b^3*c^5 + a*b^2*c^2)*d^2*x + (b^3*c^6 + 2*a*b^2*c^3 + a^2*b)
*d)
```

Fricas [A] time = 0.226822, size = 184, normalized size = 7.08

$$-\frac{e^2}{6\,(b^3d^7x^6 + 6\,b^3cd^6x^5 + 15\,b^3c^2d^5x^4 + 2\,(10\,b^3c^3 + ab^2)d^4x^3 + 3\,(5\,b^3c^4 + 2\,ab^2c)d^3x^2 + 6\,(b^3c^5 + ab^2c^2)d^2x + (b^3c^6 + 2\,ab^2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*e*x + c*e)^2/((d*x + c)^3*b + a)^3,x, algorithm="fricas")
```

```
[Out] -1/6*e^2/(b^3*d^7*x^6 + 6*b^3*c*d^6*x^5 + 15*b^3*c^2*d^5*x^4 + 2*
(10*b^3*c^3 + a*b^2)*d^4*x^3 + 3*(5*b^3*c^4 + 2*a*b^2*c)*d^3*x^2
+ 6*(b^3*c^5 + a*b^2*c^2)*d^2*x + (b^3*c^6 + 2*a*b^2*c^3 + a^2*b)
*d)
```

Sympy [A] time = 83.7215, size = 155, normalized size = 5.96

$$-\frac{e^2}{6a^2bd + 12ab^2c^3d + 6b^3c^6d + 90b^3c^2d^5x^4 + 36b^3cd^6x^5 + 6b^3d^7x^6 + x^3\,(12ab^2d^4 + 120b^3c^3d^4) + x^2\,(36ab^2cd^3 + 90b^3c^4d^3) +}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x+c*e)**2/(a+b*(d*x+c)**3)**3,x)
```

```
[Out] -e**2/(6*a**2*b*d + 12*a*b**2*c**3*d + 6*b**3*c**6*d + 90*b**3*c*
*2*d**5*x**4 + 36*b**3*c*d**6*x**5 + 6*b**3*d**7*x**6 + x**3*(12*
a*b**2*d**4 + 120*b**3*c**3*d**4) + x**2*(36*a*b**2*c*d**3 + 90*b
**3*c**4*d**3) + x*(36*a*b**2*c**2*d**2 + 36*b**3*c**5*d**2))
```

GIAC/XCAS [A] time = 0.217033, size = 61, normalized size = 2.35

$$-\frac{e^2}{6\,(bd^3x^3 + 3\,bcd^2x^2 + 3\,bc^2dx + bc^3 + a)^2bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*e*x + c*e)^2/((d*x + c)^3*b + a)^3,x, algorithm="giac")
```

```
[Out] -1/6*e^2/((b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)^2
*b*d)
```

3.2898 $\int \frac{ce+dex}{(a+b(c+dx)^3)^3}\,dx$

Optimal. Leaf size=207

$$-\frac{2e\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{27a^{7/3}b^{2/3}d}+\frac{e\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{27a^{7/3}b^{2/3}d}-\frac{2e\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{7/3}b^{2/3}d}+\frac{2e(c+dx)^2}{9a^2d\,(a+b(c+dx)^3)}+\frac{e(c+dx)^2}{6ad\,(a+b(c+dx)^3)^2}$$

```
[Out] (e*(c + d*x)^2)/(6*a*d*(a + b*(c + d*x)^3)^2) + (2*e*(c + d*x)^2)
/(9*a^2*d*(a + b*(c + d*x)^3)) - (2*e*ArcTan[(a^(1/3) - 2*b^(1/3)
*(c + d*x))/(Sqrt[3]*a^(1/3))])/(9*Sqrt[3]*a^(7/3)*b^(2/3)*d) - (
2*e*Log[a^(1/3) + b^(1/3)*(c + d*x)])/(27*a^(7/3)*b^(2/3)*d) + (e
*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/
(27*a^(7/3)*b^(2/3)*d)
```

Rubi [A] time = 0.422248, antiderivative size = 207, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 8, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364

$$-\frac{2e\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{27a^{7/3}b^{2/3}d}+\frac{e\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{27a^{7/3}b^{2/3}d}-\frac{2e\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{7/3}b^{2/3}d}+\frac{2e(c+dx)^2}{9a^2d\,(a+b(c+dx)^3)}+\frac{e(c+dx)^2}{6ad\,(a+b(c+dx)^3)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*e + d*e*x)/(a + b*(c + d*x)^3)^3,x]
```

```
[Out] (e*(c + d*x)^2)/(6*a*d*(a + b*(c + d*x)^3)^2) + (2*e*(c + d*x)^2)
/(9*a^2*d*(a + b*(c + d*x)^3)) - (2*e*ArcTan[(a^(1/3) - 2*b^(1/3)
*(c + d*x))/(Sqrt[3]*a^(1/3))])/(9*Sqrt[3]*a^(7/3)*b^(2/3)*d) - (
2*e*Log[a^(1/3) + b^(1/3)*(c + d*x)])/(27*a^(7/3)*b^(2/3)*d) + (e
*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/
(27*a^(7/3)*b^(2/3)*d)
```

Rubi in Sympy [A] time = 47.1994, size = 196, normalized size = 0.95

$$\frac{e\,(c+dx)^2}{6ad\,\left(a+b\,(c+dx)^3\right)^2}+\frac{2e\,(c+dx)^2}{9a^2d\,\left(a+b\,(c+dx)^3\right)}-\frac{2e\log\left(\sqrt[3]{a}+\sqrt[3]{b}\,(c+dx)\right)}{27a^{\frac{7}{3}}b^{\frac{2}{3}}d}+\frac{e\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}\,(-c-dx)+b^{\frac{2}{3}}\,(c+dx)^2\right)}{27a^{\frac{7}{3}}b^{\frac{2}{3}}d}-\frac{2\sqrt{3}e\,\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{27a^{\frac{7}{3}}b^{\frac{2}{3}}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*e*x+c*e)/(a+b*(d*x+c)**3)**3,x)
```

```
[Out] e*(c + d*x)**2/(6*a*d*(a + b*(c + d*x)**3)**2) + 2*e*(c + d*x)**2
/(9*a**2*d*(a + b*(c + d*x)**3)) - 2*e*log(a**(1/3) + b**(1/3)*(c
 + d*x))/(27*a**(7/3)*b**(2/3)*d) + e*log(a**(2/3) + a**(1/3)*b**
(1/3)*(-c - d*x) + b**(2/3)*(c + d*x)**2)/(27*a**(7/3)*b**(2/3)*d
) - 2*sqrt(3)*e*atan(sqrt(3)*(a**(1/3)/3 + b**(1/3)*(-2*c/3 - 2*d
*x/3))/a**(1/3))/(27*a**(7/3)*b**(2/3)*d)
```

Mathematica [A] time = 0.219268, size = 181, normalized size = 0.87

$$\frac{e\left(\frac{2\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{b^{2/3}}+\frac{9a^{4/3}(c+dx)^2}{(a+b(c+dx)^3)^2}-\frac{4\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{b^{2/3}}+\frac{4\sqrt{3}\tan^{-1}\left(\frac{2\sqrt[3]{b}(c+dx)-\sqrt[3]{a}}{\sqrt{3}\sqrt[3]{a}}\right)}{b^{2/3}}+\frac{12\sqrt[3]{a}(c+dx)^2}{a+b(c+dx)^3}\right)}{54a^{7/3}d}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*e + d*e*x)/(a + b*(c + d*x)^3)^3,x]
```

```
[Out] (e*((9*a^(4/3)*(c + d*x)^2)/(a + b*(c + d*x)^3)^2 + (12*a^(1/3)*(
c + d*x)^2)/(a + b*(c + d*x)^3) + (4*Sqrt[3]*ArcTan[(-a^(1/3) + 2
*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))])/b^(2/3) - (4*Log[a^(1/3)
+ b^(1/3)*(c + d*x)])/b^(2/3) + (2*Log[a^(2/3) - a^(1/3)*b^(1/3)*
(c + d*x) + b^(2/3)*(c + d*x)^2])/b^(2/3)))/(54*a^(7/3)*d)
```

Maple [C] time = 0.009, size = 507, normalized size = 2.5

$$\frac{2\,bed^4x^5}{9\,(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)^2\,a^2}+\frac{10\,bced^3x^4}{9\,(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)^2\,a^2}+\frac{20\,ec^2d^2bx^3}{9\,(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)^2\,a^2}+\frac{20\,dex^2bc^3}{9\,(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)^2\,a^2}+\frac{7\,dex^2}{18\,(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)^2\,a}+\frac{10\,ec^4xb}{9\,(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)^2\,a^2}+\frac{7\,cex}{9\,(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)^2\,a}+\frac{2\,ec^5b}{9\,(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)^2\,da^2}+\frac{7\,ec^2}{18\,(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)^2\,da}+\frac{2\,e}{27\,a^2bd}\sum_{\_R=RootOf(\_Z^3bd^3+3\_Z^2bcd^2+3\_Z\,bc^2d+bc^3+a)}\frac{(\_Rd+c)\ln(x-\_R)}{d^2\_R^2+2\,cd\_R+c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*e*x+c*e)/(a+b*(d*x+c)^3)^3,x)
```

```
[Out] 2/9*e/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*b*d^4/a^2*x
^5+10/9*e/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*b*c*d^3
/a^2*x^4+20/9*e/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*c
^2*d^2*b/a^2*x^3+20/9*e/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^
3+a)^2*d/a^2*x^2*b*c^3+7/18*e/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*
x+b*c^3+a)^2*d/a*x^2+10/9*e/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+
b*c^3+a)^2*c^4/a^2*x*b+7/9*e/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x
+b*c^3+a)^2/a*c*x+2/9*e/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^
3+a)^2*c^5/d/a^2*b+7/18*e/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*
c^3+a)^2*c^2/d/a+2/27*e/a^2/b/d*sum((_R*d+c)/(_R^2*d^2+2*_R*c*d+c
^2)*ln(x-_R),_R=RootOf(_Z^3*b*d^3+3*_Z^2*b*c*d^2+3*_Z*b*c^2*d+b*c
^3+a))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{4\,bd^5ex^5+20\,bcd^4ex^4+40\,bc^2d^3ex^3+\left(40\,bc^3+7\,a\right)d^2ex^2+2\left(10\,bc^4+7\,ac\right)dex+\left(4\,bc^5+7\,ac^2\right)e}{18\,(a^2b^2d^7x^6+6\,a^2b^2cd^6x^5+15\,a^2b^2c^2d^5x^4+2\,(10\,a^2b^2c^3+a^3b)d^4x^3+3\,(5\,a^2b^2c^4+2\,a^3bc)d^3x^2+6\,(a^2b^2c^5+a^3bc^2)d^2x+}+\frac{2\,e\int\frac{dx+c}{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}\,dx}{9\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x + c*e)/((d*x + c)^3*b + a)^3,x, algorithm="maxima")
```

```
[Out] 1/18*(4*b*d^5*e*x^5 + 20*b*c*d^4*e*x^4 + 40*b*c^2*d^3*e*x^3 + (40
*b*c^3 + 7*a)*d^2*e*x^2 + 2*(10*b*c^4 + 7*a*c)*d*e*x + (4*b*c^5 +
 7*a*c^2)*e)/(a^2*b^2*d^7*x^6 + 6*a^2*b^2*c*d^6*x^5 + 15*a^2*b^2*
c^2*d^5*x^4 + 2*(10*a^2*b^2*c^3 + a^3*b)*d^4*x^3 + 3*(5*a^2*b^2*c
^4 + 2*a^3*b*c)*d^3*x^2 + 6*(a^2*b^2*c^5 + a^3*b*c^2)*d^2*x + (a^
2*b^2*c^6 + 2*a^3*b*c^3 + a^4)*d) + 2/9*e*integrate((d*x + c)/(b*
d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a), x)/a^2
```

Fricas [A] time = 0.244029, size = 1004, normalized size = 4.85

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x + c*e)/((d*x + c)^3*b + a)^3,x, algorithm="fricas")
```

```
[Out] 1/162*sqrt(3)*(4*sqrt(3)*(b^2*d^6*e*x^6 + 6*b^2*c*d^5*e*x^5 + 15*
b^2*c^2*d^4*e*x^4 + 2*(10*b^2*c^3 + a*b)*d^3*e*x^3 + 3*(5*b^2*c^4
 + 2*a*b*c)*d^2*e*x^2 + 6*(b^2*c^5 + a*b*c^2)*d*e*x + (b^2*c^6 +
2*a*b*c^3 + a^2)*e)*log(a*b + (-a*b^2)^(2/3)*(d*x + c)) - 2*sqrt(
3)*(b^2*d^6*e*x^6 + 6*b^2*c*d^5*e*x^5 + 15*b^2*c^2*d^4*e*x^4 + 2*
(10*b^2*c^3 + a*b)*d^3*e*x^3 + 3*(5*b^2*c^4 + 2*a*b*c)*d^2*e*x^2
+ 6*(b^2*c^5 + a*b*c^2)*d*e*x + (b^2*c^6 + 2*a*b*c^3 + a^2)*e)*lo
g(-a*b + (-a*b^2)^(2/3)*(d*x + c) + (b*d^2*x^2 + 2*b*c*d*x + b*c^
2)*(-a*b^2)^(1/3)) - 12*(b^2*d^6*e*x^6 + 6*b^2*c*d^5*e*x^5 + 15*b
^2*c^2*d^4*e*x^4 + 2*(10*b^2*c^3 + a*b)*d^3*e*x^3 + 3*(5*b^2*c^4
+ 2*a*b*c)*d^2*e*x^2 + 6*(b^2*c^5 + a*b*c^2)*d*e*x + (b^2*c^6 + 2
*a*b*c^3 + a^2)*e)*arctan(-1/3*(sqrt(3)*a*b - 2*sqrt(3)*(-a*b^2)^
(2/3)*(d*x + c))/(a*b)) + 3*sqrt(3)*(4*b*d^5*e*x^5 + 20*b*c*d^4*e
*x^4 + 40*b*c^2*d^3*e*x^3 + (40*b*c^3 + 7*a)*d^2*e*x^2 + 2*(10*b*
c^4 + 7*a*c)*d*e*x + (4*b*c^5 + 7*a*c^2)*e)*(-a*b^2)^(1/3))/((a^2
*b^2*d^7*x^6 + 6*a^2*b^2*c*d^6*x^5 + 15*a^2*b^2*c^2*d^5*x^4 + 2*(
10*a^2*b^2*c^3 + a^3*b)*d^4*x^3 + 3*(5*a^2*b^2*c^4 + 2*a^3*b*c)*d
^3*x^2 + 6*(a^2*b^2*c^5 + a^3*b*c^2)*d^2*x + (a^2*b^2*c^6 + 2*a^3
*b*c^3 + a^4)*d)*(-a*b^2)^(1/3))
```

Sympy [A] time = 69.453, size = 323, normalized size = 1.56

$$\frac{7ac^2e + 4bc^5e + 40bc^2d^3ex^3 + 20bcd^4ex^4 + 4bd^5ex^5 + x^2\left(7ad^2e + 40bc^3d^2e\right) + x\left(14acc\right.}{18a^4d + 36a^3bc^3d + 18a^2b^2c^6d + 270a^2b^2c^2d^5x^4 + 108a^2b^2cd^6x^5 + 18a^2b^2d^7x^6 + x^3\left(36a^3bd^4 + 360a^2b^2c^3d^4\right) + x^2\left(108a^3bcd\right.} + \frac{e\,\mathrm{RootSum}\left(19683t^3a^7b^2 + 8, \left(t \mapsto t\log\left(x + \frac{729t^2a^5be^2+4ce^2}{4de^2}\right)\right)\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x+c*e)/(a+b*(d*x+c)**3)**3,x)
```

```
[Out] (7*a*c**2*e + 4*b*c**5*e + 40*b*c**2*d**3*e*x**3 + 20*b*c*d**4*e*
x**4 + 4*b*d**5*e*x**5 + x**2*(7*a*d**2*e + 40*b*c**3*d**2*e) + x
*(14*a*c*d*e + 20*b*c**4*d*e))/(18*a**4*d + 36*a**3*b*c**3*d + 18
*a**2*b**2*c**6*d + 270*a**2*b**2*c**2*d**5*x**4 + 108*a**2*b**2*
c*d**6*x**5 + 18*a**2*b**2*d**7*x**6 + x**3*(36*a**3*b*d**4 + 360
*a**2*b**2*c**3*d**4) + x**2*(108*a**3*b*c*d**3 + 270*a**2*b**2*c
**4*d**3) + x*(108*a**3*b*c**2*d**2 + 108*a**2*b**2*c**5*d**2)) +
 e*RootSum(19683*_t**3*a**7*b**2 + 8, Lambda(_t, _t*log(x + (729*
_t**2*a**5*b*e**2 + 4*c*e**2)/(4*d*e**2))))/d
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{dex + ce}{\left((dx + c)^3 b + a\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*e*x + c*e)/((d*x + c)^3*b + a)^3,x, algorithm="giac")

[Out] integrate((d*e*x + c*e)/((d*x + c)^3*b + a)^3, x)
```

3.2899 $\int \frac{1}{(ce+dex)(a+b(c+dx)^3)^3} dx$

Optimal. Leaf size=94

$$-\frac{\log \left(a+b(c+dx)^3\right)}{3a^3de}+\frac{\log(c+dx)}{a^3de}+\frac{1}{3a^2de\left(a+b(c+dx)^3\right)}+\frac{1}{6ade\left(a+b(c+dx)^3\right)^2}$$

```
[Out] 1/(6*a*d*e*(a + b*(c + d*x)^3)^2) + 1/(3*a^2*d*e*(a + b*(c + d*x)
^3)) + Log[c + d*x]/(a^3*d*e) - Log[a + b*(c + d*x)^3]/(3*a^3*d*e
)
```

Rubi [A] time = 0.21203, antiderivative size = 94, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125

$$-\frac{\log \left(a+b(c+dx)^3\right)}{3a^3de}+\frac{\log(c+dx)}{a^3de}+\frac{1}{3a^2de\left(a+b(c+dx)^3\right)}+\frac{1}{6ade\left(a+b(c+dx)^3\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((c*e + d*e*x)*(a + b*(c + d*x)^3)^3),x]
```

```
[Out] 1/(6*a*d*e*(a + b*(c + d*x)^3)^2) + 1/(3*a^2*d*e*(a + b*(c + d*x)
^3)) + Log[c + d*x]/(a^3*d*e) - Log[a + b*(c + d*x)^3]/(3*a^3*d*e
)
```

Rubi in Sympy [A] time = 19.3734, size = 76, normalized size = 0.81

$$\frac{1}{6ade\left(a+b\left(c+dx\right)^3\right)^2}+\frac{1}{3a^2de\left(a+b\left(c+dx\right)^3\right)}-\frac{\log\left(a+b\left(c+dx\right)^3\right)}{3a^3de}+\frac{\log\left(\left(c+dx\right)^3\right)}{3a^3de}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(d*e*x+c*e)/(a+b*(d*x+c)**3)**3,x)
```

```
[Out] 1/(6*a*d*e*(a + b*(c + d*x)**3)**2) + 1/(3*a**2*d*e*(a + b*(c + d
*x)**3)) - log(a + b*(c + d*x)**3)/(3*a**3*d*e) + log((c + d*x)**
3)/(3*a**3*d*e)
```

Mathematica [A] time = 0.087772, size = 66, normalized size = 0.7

$$\frac{\frac{a\left(2\left(a+b(c+dx)^3\right)+a\right)}{\left(a+b(c+dx)^3\right)^2}-2\log\left(a+b(c+dx)^3\right)+6\log(c+dx)}{6a^3de}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((c*e + d*e*x)*(a + b*(c + d*x)^3)^3),x]
```

```
[Out] ((a*(a + 2*(a + b*(c + d*x)^3)))/(a + b*(c + d*x)^3)^2 + 6*Log[c
+ d*x] - 2*Log[a + b*(c + d*x)^3])/(6*a^3*d*e)
```

Maple [B] time = 0.017, size = 304, normalized size = 3.2

$$\frac{bd^2x^3}{3\,ea^2\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2}+\frac{bcdx^2}{ea^2\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2}+\frac{bc^2x}{ea^2\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2}+\frac{bc^3}{3\,ea^2\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2d}+\frac{1}{2\,ae\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2d}-\frac{\ln\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)}{3\,ea^3d}+\frac{\ln\left(dx+c\right)}{ea^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(d*e*x+c*e)/(a+b*(d*x+c)^3)^3,x)
```

```
[Out] 1/3/e*b/a^2/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*d^2*x
^3+1/e*b/a^2/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*c*d*
x^2+1/e*b/a^2/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*c^2
*x+1/3/e*b/a^2/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2/d*
c^3+1/2/e/a/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2/d-1/3
/e/a^3/d*ln(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)+ln(d*x+c
)/a^3/d/e
```

Maxima [A] time = 1.44509, size = 348, normalized size = 3.7

$$\frac{2\,bd^3x^3+6\,bcd^2x^2+6\,bc^2dx+2\,bc^3+3\,a}{6\left(a^2b^2d^7ex^6+6\,a^2b^2cd^6ex^5+15\,a^2b^2c^2d^5ex^4+2\left(10\,a^2b^2c^3+a^3b\right)d^4ex^3+3\left(5\,a^2b^2c^4+2\,a^3bc\right)d^3ex^2+6\left(a^2b^2c^5+a^3bc^2\right)d^2\right.}-\frac{\log\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)}{3\,a^3de}+\frac{\log\left(dx+c\right)}{a^3de}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)^3*(d*e*x + c*e)),x, algorithm="maxima")
```

```
[Out] 1/6*(2*b*d^3*x^3 + 6*b*c*d^2*x^2 + 6*b*c^2*d*x + 2*b*c^3 + 3*a)/(
a^2*b^2*d^7*e*x^6 + 6*a^2*b^2*c*d^6*e*x^5 + 15*a^2*b^2*c^2*d^5*e*
x^4 + 2*(10*a^2*b^2*c^3 + a^3*b)*d^4*e*x^3 + 3*(5*a^2*b^2*c^4 + 2
*a^3*b*c)*d^3*e*x^2 + 6*(a^2*b^2*c^5 + a^3*b*c^2)*d^2*e*x + (a^2*
b^2*c^6 + 2*a^3*b*c^3 + a^4)*d*e) - 1/3*log(b*d^3*x^3 + 3*b*c*d^2
*x^2 + 3*b*c^2*d*x + b*c^3 + a)/(a^3*d*e) + log(d*x + c)/(a^3*d*e
)
```

Fricas [A] time = 0.262632, size = 640, normalized size = 6.81

$$\frac{2\,abd^3x^3+6\,abcd^2x^2+6\,abc^2dx+2\,abc^3+3\,a^2-2\left(b^2d^6x^6+6\,b^2cd^5x^5+15\,b^2c^2d^4x^4+b^2c^6+2\left(10\,b^2c^3+ab\right)d^3x^3+2\,ab\right.}{6\left(a^3b^2d^7ex^6+6\,a^3b\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)^3*(d*e*x + c*e)),x, algorithm="fricas")
```

```
[Out] 1/6*(2*a*b*d^3*x^3 + 6*a*b*c*d^2*x^2 + 6*a*b*c^2*d*x + 2*a*b*c^3
+ 3*a^2 - 2*(b^2*d^6*x^6 + 6*b^2*c*d^5*x^5 + 15*b^2*c^2*d^4*x^4 +
 b^2*c^6 + 2*(10*b^2*c^3 + a*b)*d^3*x^3 + 2*a*b*c^3 + 3*(5*b^2*c^
4 + 2*a*b*c)*d^2*x^2 + 6*(b^2*c^5 + a*b*c^2)*d*x + a^2)*log(b*d^3
*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a) + 6*(b^2*d^6*x^6
+ 6*b^2*c*d^5*x^5 + 15*b^2*c^2*d^4*x^4 + b^2*c^6 + 2*(10*b^2*c^3
+ a*b)*d^3*x^3 + 2*a*b*c^3 + 3*(5*b^2*c^4 + 2*a*b*c)*d^2*x^2 + 6*
(b^2*c^5 + a*b*c^2)*d*x + a^2)*log(d*x + c))/(a^3*b^2*d^7*e*x^6 +
 6*a^3*b^2*c*d^6*e*x^5 + 15*a^3*b^2*c^2*d^5*e*x^4 + 2*(10*a^3*b^2
*c^3 + a^4*b)*d^4*e*x^3 + 3*(5*a^3*b^2*c^4 + 2*a^4*b*c)*d^3*e*x^2
```

```
 + 6*(a^3*b^2*c^5 + a^4*b*c^2)*d^2*e*x + (a^3*b^2*c^6 + 2*a^4*b*c
^3 + a^5)*d*e)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(d*e*x+c*e)/(a+b*(d*x+c)**3)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.220463, size = 203, normalized size = 2.16

$$-\frac{e^{(-1)}\ln\left(\left|bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right|\right)}{3\,a^3d}+\frac{e^{(-1)}\ln\left(\left|dx+c\right|\right)}{a^3d}+\frac{\left(2\,abd^3x^3+6\,abcd^2x^2+6\,abc^2dx+2\,abc^3+3\,a^2\right)e^{(-1)}}{6\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)^3*(d*e*x + c*e)),x, algorithm="giac")
```

```
[Out] -1/3*e^(-1)*ln(abs(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^
3 + a))/(a^3*d) + e^(-1)*ln(abs(d*x + c))/(a^3*d) + 1/6*(2*a*b*d^
3*x^3 + 6*a*b*c*d^2*x^2 + 6*a*b*c^2*d*x + 2*a*b*c^3 + 3*a^2)*e^(-
1)/((b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a)^2*a^3*d
)
```

3.2900 $\int \frac{1}{(ce+dex)^2(a+b(c+dx)^3)^3}\,dx$

Optimal. Leaf size=237

$$-\frac{7\sqrt[3]{b}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{27a^{10/3}de^2}+\frac{14\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{27a^{10/3}de^2}+\frac{14\sqrt[3]{b}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{10/3}de^2}-\frac{14}{9a^3de^2(c+dx)}+\frac{7}{18a^2de^2(c+dx)\left(a+b(c+dx)^3\right)}+\frac{1}{6ade^2(c+dx)\left(a+b(c+dx)^3\right)^2}$$

```
[Out] -14/(9*a^3*d*e^2*(c + d*x)) + 1/(6*a*d*e^2*(c + d*x)*(a + b*(c +
d*x)^3)^2) + 7/(18*a^2*d*e^2*(c + d*x)*(a + b*(c + d*x)^3)) + (14
*b^(1/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))
])/(9*Sqrt[3]*a^(10/3)*d*e^2) + (14*b^(1/3)*Log[a^(1/3) + b^(1/3)
*(c + d*x)])/(27*a^(10/3)*d*e^2) - (7*b^(1/3)*Log[a^(2/3) - a^(1/
3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/(27*a^(10/3)*d*e^2)
```

Rubi [A] time = 0.468065, antiderivative size = 237, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 9, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375

$$-\frac{7\sqrt[3]{b}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{27a^{10/3}de^2}+\frac{14\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{27a^{10/3}de^2}+\frac{14\sqrt[3]{b}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{10/3}de^2}-\frac{14}{9a^3de^2(c+dx)}+\frac{7}{18a^2de^2(c+dx)\left(a+b(c+dx)^3\right)}+\frac{1}{6ade^2(c+dx)\left(a+b(c+dx)^3\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((c*e + d*e*x)^2*(a + b*(c + d*x)^3)^3),x]
```

```
[Out] -14/(9*a^3*d*e^2*(c + d*x)) + 1/(6*a*d*e^2*(c + d*x)*(a + b*(c +
d*x)^3)^2) + 7/(18*a^2*d*e^2*(c + d*x)*(a + b*(c + d*x)^3)) + (14
*b^(1/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(1/3))
])/(9*Sqrt[3]*a^(10/3)*d*e^2) + (14*b^(1/3)*Log[a^(1/3) + b^(1/3)
*(c + d*x)])/(27*a^(10/3)*d*e^2) - (7*b^(1/3)*Log[a^(2/3) - a^(1/
3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/(27*a^(10/3)*d*e^2)
```

Rubi in Sympy [A] time = 52.826, size = 221, normalized size = 0.93

$$\frac{1}{6ade^2\left(a+b\left(c+dx\right)^3\right)^2\left(c+dx\right)}+\frac{7}{18a^2de^2\left(a+b\left(c+dx\right)^3\right)\left(c+dx\right)}-\frac{14}{9a^3de^2\left(c+dx\right)}+\frac{14\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}\left(c+dx\right)\right)}{27a^{\frac{10}{3}}de^2}-\frac{7\sqrt[3]{b}\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}\left(-c-dx\right)+b^{\frac{2}{3}}\left(c+dx\right)^2\right)}{27a^{\frac{10}{3}}de^2}+\frac{14\sqrt{3}\sqrt[3]{b}\,\mathrm{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{27a^{\frac{10}{3}}de^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(d*e*x+c*e)**2/(a+b*(d*x+c)**3)**3,x)
```

```
[Out] 1/(6*a*d*e**2*(a + b*(c + d*x)**3)**2*(c + d*x)) + 7/(18*a**2*d*e
**2*(a + b*(c + d*x)**3)*(c + d*x)) - 14/(9*a**3*d*e**2*(c + d*x)
) + 14*b**(1/3)*log(a**(1/3) + b**(1/3)*(c + d*x))/(27*a**(10/3)*
d*e**2) - 7*b**(1/3)*log(a**(2/3) + a**(1/3)*b**(1/3)*(-c - d*x)
+ b**(2/3)*(c + d*x)**2)/(27*a**(10/3)*d*e**2) + 14*sqrt(3)*b**(1
/3)*atan(sqrt(3)*(a**(1/3)/3 + b**(1/3)*(-2*c/3 - 2*d*x/3))/a**(1
/3))/(27*a**(10/3)*d*e**2)
```

Mathematica [A] time = 0.263711, size = 199, normalized size = 0.84

$$\frac{-14\sqrt[3]{b}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)-\frac{9a^{4/3}b(c+dx)^2}{(a+b(c+dx)^3)^2}-\frac{30\sqrt[3]{a}b(c+dx)^2}{a+b(c+dx)^3}+28\sqrt[3]{b}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)-28\sqrt{3}\sqrt[3]{b}\ldots}{54a^{10/3}de^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((c*e + d*e*x)^2*(a + b*(c + d*x)^3)^3),x]
```

```
[Out] ((-54*a^(1/3))/(c + d*x) - (9*a^(4/3)*b*(c + d*x)^2)/(a + b*(c +
d*x)^3)^2 - (30*a^(1/3)*b*(c + d*x)^2)/(a + b*(c + d*x)^3) - 28*S
qrt[3]*b^(1/3)*ArcTan[(-a^(1/3) + 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a
^(1/3))] + 28*b^(1/3)*Log[a^(1/3) + b^(1/3)*(c + d*x)] - 14*b^(1/
3)*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2]
)/(54*a^(10/3)*d*e^2)
```

Maple [C] time = 0.018, size = 557, normalized size = 2.4

$$-\frac{5\,b^2d^4x^5}{9\,e^2a^3\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2}-\frac{25\,b^2cd^3x^4}{9\,e^2a^3\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2}-\frac{50\,b^2c^2d^2x^3}{9\,e^2a^3\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2}-\frac{50\,b^2x^2c^3d}{9\,e^2a^3\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2}-\frac{13\,bdx^2}{18\,e^2a^2\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2}-\frac{25\,b^2xc^4}{9\,e^2a^3\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2}-\frac{13\,bxc}{9\,e^2a^2\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2}-\frac{5\,b^2c^5}{9\,e^2a^3\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2d}-\frac{13\,bc^2}{18\,e^2a^2\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2d}-\frac{14}{27\,e^2a^3d}\sum_{\_R=RootOf\left(\_Z^3bd^3+3\_Z^2bcd^2+3\_Z\,bc^2d+bc^3+a\right)}\frac{(\_R\,d+c)\ln(x-\_R)}{d^2\_R^2+2\,cd\_R+c^2}-\frac{1}{e^2a^3d\,(dx+c)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(d*e*x+c*e)^2/(a+b*(d*x+c)^3)^3,x)
```

```
[Out] -5/9/e^2*b^2/a^3/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*
d^4*x^5-25/9/e^2*b^2/a^3/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c
^3+a)^2*c*d^3*x^4-50/9/e^2*b^2/a^3/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c
^2*d*x+b*c^3+a)^2*c^2*d^2*x^3-50/9/e^2*b^2/a^3/(b*d^3*x^3+3*b*c*d
^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*x^2*c^3*d-13/18/e^2*b/a^2/(b*d^3*x^
3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*d*x^2-25/9/e^2*b^2/a^3/(b*
d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*x*c^4-13/9/e^2*b/a^2
/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*x*c-5/9/e^2*b^2/
a^3/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*c^5/d-13/18/e
^2*b/a^2/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*c^2/d-14
/27/e^2/a^3/d*sum((_R*d+c)/(_R^2*d^2+2*_R*c*d+c^2)*ln(x-_R),_R=Ro
otOf(_Z^3*b*d^3+3*_Z^2*b*c*d^2+3*_Z*b*c^2*d+b*c^3+a))-1/a^3/d/e^2
/(d*x+c)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{28\,b^{2}d^{6}x^{6}+168\,b^{2}cd^{5}x^{5}+420\,b^{2}c^{2}d^{4}x^{4}+28\,b^{2}c^{6}+7\,\left(80\,b^{2}c^{3}+7\,ab\right)d^{3}x^{3}+49\,abc^{3}+21\,(20}{18\,(a^{3}b^{2}d^{8}e^{2}x^{7}+7\,a^{3}b^{2}cd^{7}e^{2}x^{6}+21\,a^{3}b^{2}c^{2}d^{6}e^{2}x^{5}+(35\,a^{3}b^{2}c^{3}+2\,a^{4}b)d^{5}e^{2}x^{4}+(35\,a^{3}b^{2}c^{4}+8\,a^{4}bc)d^{4}e^{2}x^{3}+3\,(7\,a^{3}b^{2}c^{5}+}$$
$$-\frac{14\,b\int\frac{dx+c}{bd^{3}x^{3}+3\,bcd^{2}x^{2}+3\,bc^{2}dx+bc^{3}+a}\,dx}{9\,a^{3}e^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)^3*(d*e*x + c*e)^2),x, algorithm="maxima")
```

```
[Out] -1/18*(28*b^2*d^6*x^6 + 168*b^2*c*d^5*x^5 + 420*b^2*c^2*d^4*x^4 +
 28*b^2*c^6 + 7*(80*b^2*c^3 + 7*a*b)*d^3*x^3 + 49*a*b*c^3 + 21*(2
0*b^2*c^4 + 7*a*b*c)*d^2*x^2 + 21*(8*b^2*c^5 + 7*a*b*c^2)*d*x + 1
8*a^2)/(a^3*b^2*d^8*e^2*x^7 + 7*a^3*b^2*c*d^7*e^2*x^6 + 21*a^3*b^
2*c^2*d^6*e^2*x^5 + (35*a^3*b^2*c^3 + 2*a^4*b)*d^5*e^2*x^4 + (35*
a^3*b^2*c^4 + 8*a^4*b*c)*d^4*e^2*x^3 + 3*(7*a^3*b^2*c^5 + 4*a^4*b
*c^2)*d^3*e^2*x^2 + (7*a^3*b^2*c^6 + 8*a^4*b*c^3 + a^5)*d^2*e^2*x
 + (a^3*b^2*c^7 + 2*a^4*b*c^4 + a^5*c)*d*e^2) - 14/9*b*integrate(
(d*x + c)/(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a),
x)/(a^3*e^2)
```

Fricas [A] time = 0.304398, size = 1223, normalized size = 5.16

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((d*x + c)^3*b + a)^3*(d*e*x + c*e)^2),x, algorithm="fricas")
```

```
[Out] -1/162*sqrt(3)*(14*sqrt(3)*(b^2*d^7*x^7 + 7*b^2*c*d^6*x^6 + 21*b^
2*c^2*d^5*x^5 + b^2*c^7 + (35*b^2*c^3 + 2*a*b)*d^4*x^4 + (35*b^2*
c^4 + 8*a*b*c)*d^3*x^3 + 2*a*b*c^4 + 3*(7*b^2*c^5 + 4*a*b*c^2)*d^
2*x^2 + a^2*c + (7*b^2*c^6 + 8*a*b*c^3 + a^2)*d*x)*(b/a)^(1/3)*lo
g(b*d^2*x^2 + 2*b*c*d*x + b*c^2 - (a*d*x + a*c)*(b/a)^(2/3) + a*(
b/a)^(1/3)) - 28*sqrt(3)*(b^2*d^7*x^7 + 7*b^2*c*d^6*x^6 + 21*b^2*
c^2*d^5*x^5 + b^2*c^7 + (35*b^2*c^3 + 2*a*b)*d^4*x^4 + (35*b^2*c^
4 + 8*a*b*c)*d^3*x^3 + 2*a*b*c^4 + 3*(7*b^2*c^5 + 4*a*b*c^2)*d^2*
x^2 + a^2*c + (7*b^2*c^6 + 8*a*b*c^3 + a^2)*d*x)*(b/a)^(1/3)*log(
b*d*x + b*c + a*(b/a)^(2/3)) - 84*(b^2*d^7*x^7 + 7*b^2*c*d^6*x^6
+ 21*b^2*c^2*d^5*x^5 + b^2*c^7 + (35*b^2*c^3 + 2*a*b)*d^4*x^4 + (
35*b^2*c^4 + 8*a*b*c)*d^3*x^3 + 2*a*b*c^4 + 3*(7*b^2*c^5 + 4*a*b*
c^2)*d^2*x^2 + a^2*c + (7*b^2*c^6 + 8*a*b*c^3 + a^2)*d*x)*(b/a)^(
1/3)*arctan(1/3*(sqrt(3)*a*(b/a)^(2/3) - 2*sqrt(3)*(b*d*x + b*c))
/(a*(b/a)^(2/3))) + 3*sqrt(3)*(28*b^2*d^6*x^6 + 168*b^2*c*d^5*x^5
 + 420*b^2*c^2*d^4*x^4 + 28*b^2*c^6 + 7*(80*b^2*c^3 + 7*a*b)*d^3*
x^3 + 49*a*b*c^3 + 21*(20*b^2*c^4 + 7*a*b*c)*d^2*x^2 + 21*(8*b^2*
c^5 + 7*a*b*c^2)*d*x + 18*a^2))/(a^3*b^2*d^8*e^2*x^7 + 7*a^3*b^2*
c*d^7*e^2*x^6 + 21*a^3*b^2*c^2*d^6*e^2*x^5 + (35*a^3*b^2*c^3 + 2*
a^4*b)*d^5*e^2*x^4 + (35*a^3*b^2*c^4 + 8*a^4*b*c)*d^4*e^2*x^3 + 3
*(7*a^3*b^2*c^5 + 4*a^4*b*c^2)*d^3*e^2*x^2 + (7*a^3*b^2*c^6 + 8*a
^4*b*c^3 + a^5)*d^2*e^2*x + (a^3*b^2*c^7 + 2*a^4*b*c^4 + a^5*c)*d
*e^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(d*e*x+c*e)**2/(a+b*(d*x+c)**3)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.235488, size = 398, normalized size = 1.68

$$\frac{14\left(\frac{b}{ad^3}\right)^{\frac{1}{3}}e^{(-2)}\ln\left(\left|-\left(\frac{b}{ad^3}\right)^{\frac{1}{3}}e^{(-2)}-\frac{e^{(-1)}}{(dxe+ce)d}\right|\right)}{27\,a^3}-\frac{14\sqrt{3}\left(a^2b\right)^{\frac{1}{3}}\arctan\left(\frac{\sqrt{3}\left(\left(\frac{b}{ad^3}\right)^{\frac{1}{3}}e^{(-2)}-\frac{2\,e^{(-1)}}{(dxe+ce)d}\right)e^2}{3\left(\frac{b}{ad^3}\right)^{\frac{1}{3}}}\right)e^{(-2)}}{27\,a^4d}-\frac{7\left(a^2b\right)^{\frac{1}{3}}e^{(-2)}\ln\left(\left(\frac{b}{ad^3}\right)^{\frac{2}{3}}e^{(-4)}-\frac{\left(\frac{b}{ad^3}\right)^{\frac{1}{3}}e^{(-3)}}{(dxe+ce)d}+\frac{e^{(-2)}}{(dxe+ce)^2d^2}\right)}{27\,a^4d}-\frac{\frac{10\,b^2e^{(-1)}}{(dxe+ce)d}+\frac{13\,abe^2}{(dxe+ce)^4d}}{18\,a^3\left(b+\frac{ae^3}{(dxe+ce)^3}\right)^2}-\frac{e^{(-1)}}{(dxe+ce)a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((d*x + c)^3*b + a)^3*(d*e*x + c*e)^2),x, algorithm="giac")
```

```
[Out] 14/27*(b/(a*d^3))^(1/3)*e^(-2)*ln(abs(-(b/(a*d^3))^(1/3)*e^(-2) -
 e^(-1)/((d*x*e + c*e)*d)))/a^3 - 14/27*sqrt(3)*(a^2*b)^(1/3)*arc
tan(1/3*sqrt(3)*((b/(a*d^3))^(1/3)*e^(-2) - 2*e^(-1)/((d*x*e + c*
e)*d))*e^2/(b/(a*d^3))^(1/3))*e^(-2)/(a^4*d) - 7/27*(a^2*b)^(1/3)
*e^(-2)*ln((b/(a*d^3))^(2/3)*e^(-4) - (b/(a*d^3))^(1/3)*e^(-3)/((
d*x*e + c*e)*d) + e^(-2)/((d*x*e + c*e)^2*d^2))/(a^4*d) - 1/18*(1
0*b^2*e^(-1)/((d*x*e + c*e)*d) + 13*a*b*e^2/((d*x*e + c*e)^4*d))/
(a^3*(b + a*e^3/(d*x*e + c*e)^3)^2) - e^(-1)/((d*x*e + c*e)*a^3*d
)
```

3.2901 $\int \frac{1}{(ce+dex)^3(a+b(c+dx)^3)^3}\,dx$

Optimal. Leaf size=237

$$-\frac{20b^{2/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{27a^{11/3}de^3}+\frac{10b^{2/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{27a^{11/3}de^3}+\frac{20b^{2/3}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{11/3}de^3}-\frac{10}{9a^3de^3(c+dx)^2}+\frac{4}{9a^2de^3(c+dx)^2\left(a+b(c+dx)^3\right)}+\frac{1}{6ade^3(c+dx)^2\left(a+b(c+dx)^3\right)^2}$$

```
[Out] -10/(9*a^3*d*e^3*(c + d*x)^2) + 1/(6*a*d*e^3*(c + d*x)^2*(a + b*(
c + d*x)^3)^2) + 4/(9*a^2*d*e^3*(c + d*x)^2*(a + b*(c + d*x)^3))
+ (20*b^(2/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(
1/3))])/(9*Sqrt[3]*a^(11/3)*d*e^3) - (20*b^(2/3)*Log[a^(1/3) + b^
(1/3)*(c + d*x)])/(27*a^(11/3)*d*e^3) + (10*b^(2/3)*Log[a^(2/3) -
 a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/(27*a^(11/3)*d
*e^3)
```

Rubi [A] time = 0.462997, antiderivative size = 237, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 9, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375

$$-\frac{20b^{2/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)}{27a^{11/3}de^3}+\frac{10b^{2/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)}{27a^{11/3}de^3}+\frac{20b^{2/3}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(c+dx)}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{11/3}de^3}-\frac{10}{9a^3de^3(c+dx)^2}+\frac{4}{9a^2de^3(c+dx)^2\left(a+b(c+dx)^3\right)}+\frac{1}{6ade^3(c+dx)^2\left(a+b(c+dx)^3\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((c*e + d*e*x)^3*(a + b*(c + d*x)^3)^3),x]
```

```
[Out] -10/(9*a^3*d*e^3*(c + d*x)^2) + 1/(6*a*d*e^3*(c + d*x)^2*(a + b*(
c + d*x)^3)^2) + 4/(9*a^2*d*e^3*(c + d*x)^2*(a + b*(c + d*x)^3))
+ (20*b^(2/3)*ArcTan[(a^(1/3) - 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(
1/3))])/(9*Sqrt[3]*a^(11/3)*d*e^3) - (20*b^(2/3)*Log[a^(1/3) + b^
(1/3)*(c + d*x)])/(27*a^(11/3)*d*e^3) + (10*b^(2/3)*Log[a^(2/3) -
 a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/(27*a^(11/3)*d
*e^3)
```

Rubi in Sympy [A] time = 53.3033, size = 226, normalized size = 0.95

$$\frac{1}{6ade^3\left(a+b\left(c+dx\right)^3\right)^2\left(c+dx\right)^2}+\frac{4}{9a^2de^3\left(a+b\left(c+dx\right)^3\right)\left(c+dx\right)^2}-\frac{10}{9a^3de^3\left(c+dx\right)^2}-\frac{20b^{\frac{2}{3}}\log\left(\sqrt[3]{a}+\sqrt[3]{b}\left(c+dx\right)\right)}{27a^{\frac{11}{3}}de^3}+\frac{10b^{\frac{2}{3}}\log\left(a^{\frac{2}{3}}+\sqrt[3]{a}\sqrt[3]{b}\left(-c-dx\right)+b^{\frac{2}{3}}\left(c+dx\right)^2\right)}{27a^{\frac{11}{3}}de^3}+\frac{20\sqrt{3}b^{\frac{2}{3}}\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}+\sqrt[3]{b}\left(-\frac{2c}{3}-\frac{2dx}{3}\right)\right)}{\sqrt[3]{a}}\right)}{27a^{\frac{11}{3}}de^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(d*e*x+c*e)**3/(a+b*(d*x+c)**3)**3,x)
```

```
[Out] 1/(6*a*d*e**3*(a + b*(c + d*x)**3)**2*(c + d*x)**2) + 4/(9*a**2*d
*e**3*(a + b*(c + d*x)**3)*(c + d*x)**2) - 10/(9*a**3*d*e**3*(c +
 d*x)**2) - 20*b**(2/3)*log(a**(1/3) + b**(1/3)*(c + d*x))/(27*a*
*(11/3)*d*e**3) + 10*b**(2/3)*log(a**(2/3) + a**(1/3)*b**(1/3)*(-
c - d*x) + b**(2/3)*(c + d*x)**2)/(27*a**(11/3)*d*e**3) + 20*sqrt
(3)*b**(2/3)*atan(sqrt(3)*(a**(1/3)/3 + b**(1/3)*(-2*c/3 - 2*d*x/
3))/a**(1/3))/(27*a**(11/3)*d*e**3)
```

Mathematica [A] time = 0.26636, size = 195, normalized size = 0.82

$$\frac{20b^{2/3}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(c+dx)+b^{2/3}(c+dx)^2\right)-\frac{9a^{5/3}b(c+dx)}{(a+b(c+dx)^3)^2}-\frac{33a^{2/3}b(c+dx)}{a+b(c+dx)^3}-\frac{27a^{2/3}}{(c+dx)^2}-40b^{2/3}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(c+dx)\right)-}{54a^{11/3}de^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((c*e + d*e*x)^3*(a + b*(c + d*x)^3)^3),x]
```

```
[Out] ((-27*a^(2/3))/(c + d*x)^2 - (9*a^(5/3)*b*(c + d*x))/(a + b*(c +
d*x)^3)^2 - (33*a^(2/3)*b*(c + d*x))/(a + b*(c + d*x)^3) - 40*Sqr
t[3]*b^(2/3)*ArcTan[(-a^(1/3) + 2*b^(1/3)*(c + d*x))/(Sqrt[3]*a^(
1/3))] - 40*b^(2/3)*Log[a^(1/3) + b^(1/3)*(c + d*x)] + 20*b^(2/3)
*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c + d*x) + b^(2/3)*(c + d*x)^2])/
(54*a^(11/3)*d*e^3)
```

Maple [C] time = 0.014, size = 446, normalized size = 1.9

$$-\frac{11\,b^2d^3x^4}{18\,e^3a^3\,(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)^2}-\frac{22\,cd^2b^2x^3}{9\,e^3a^3\,(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)^2}$$
$$-\frac{11\,b^2c^2dx^2}{3\,e^3a^3\,(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)^2}-\frac{22\,b^2xc^3}{9\,e^3a^3\,(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)^2}$$
$$-\frac{7\,bx}{9\,e^3a^2\,(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)^2}-\frac{11\,b^2c^4}{18\,e^3a^3\,(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)^2\,d}$$
$$-\frac{7\,bc}{9\,e^3a^2\,(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a)^2\,d}$$
$$-\frac{20}{27\,e^3a^3d}\sum_{\_R=RootOf(\_Z^3bd^3+3\,\_Z^2bcd^2+3\,\_Z\,bc^2d+bc^3+a)}\frac{\ln(x-\_R)}{d^2\_R^2+2\,cd\_R+c^2}-\frac{1}{2\,e^3a^3d\,(dx+c)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(d*e*x+c*e)^3/(a+b*(d*x+c)^3)^3,x)
```

```
[Out] -11/18/e^3*b^2/a^3/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^
2*d^3*x^4-22/9/e^3*b^2/a^3/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b
*c^3+a)^2*c*d^2*x^3-11/3/e^3*b^2/a^3/(b*d^3*x^3+3*b*c*d^2*x^2+3*b
*c^2*d*x+b*c^3+a)^2*c^2*d*x^2-22/9/e^3*b^2/a^3/(b*d^3*x^3+3*b*c*d
^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*x*c^3-7/9/e^3*b/a^2/(b*d^3*x^3+3*b*
c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*x-11/18/e^3*b^2/a^3/(b*d^3*x^3+3
*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*c^4/d-7/9/e^3*b/a^2/(b*d^3*x^
3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*c/d-20/27/e^3/a^3/d*sum(1/
(_R^2*d^2+2*_R*c*d+c^2)*ln(x-_R),_R=RootOf(_Z^3*b*d^3+3*_Z^2*b*c*
d^2+3*_Z*b*c^2*d+b*c^3+a))-1/2/a^3/d/e^3/(d*x+c)^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{20\,b^2d^6x^6 + 120\,b^2cd^5x^5 + 300\,b^2c^2d^4x^4 + 20\,b^2c^6 + 16\left(25\,b^2c^3 + 2\,ab\right)d^3}{18\left(a^3b^2d^9e^3x^8 + 8\,a^3b^2cd^8e^3x^7 + 28\,a^3b^2c^2d^7e^3x^6 + 2\left(28\,a^3b^2c^3 + a^4b\right)d^6e^3x^5 + 10\left(7\,a^3b^2c^4 + a^4bc\right)d^5e^3x^4 + 4\left(14\,a^3b^2c^5\right.\right.}$$
$$-\frac{20\,b\int\frac{1}{bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a}\,dx}{9\,a^3e^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((((d*x + c)^3*b + a)^3*(d*e*x + c*e)^3),x, algorithm="maxima")
```

```
[Out] -1/18*(20*b^2*d^6*x^6 + 120*b^2*c*d^5*x^5 + 300*b^2*c^2*d^4*x^4 +
 20*b^2*c^6 + 16*(25*b^2*c^3 + 2*a*b)*d^3*x^3 + 32*a*b*c^3 + 12*(
25*b^2*c^4 + 8*a*b*c)*d^2*x^2 + 24*(5*b^2*c^5 + 4*a*b*c^2)*d*x +
9*a^2)/(a^3*b^2*d^9*e^3*x^8 + 8*a^3*b^2*c*d^8*e^3*x^7 + 28*a^3*b^
2*c^2*d^7*e^3*x^6 + 2*(28*a^3*b^2*c^3 + a^4*b)*d^6*e^3*x^5 + 10*(
7*a^3*b^2*c^4 + a^4*b*c)*d^5*e^3*x^4 + 4*(14*a^3*b^2*c^5 + 5*a^4*
b*c^2)*d^4*e^3*x^3 + (28*a^3*b^2*c^6 + 20*a^4*b*c^3 + a^5)*d^3*e^
3*x^2 + 2*(4*a^3*b^2*c^7 + 5*a^4*b*c^4 + a^5*c)*d^2*e^3*x + (a^3*
b^2*c^8 + 2*a^4*b*c^5 + a^5*c^2)*d*e^3) - 20/9*b*integrate(1/(b*d
^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 + a), x)/(a^3*e^3)
```

Fricas [A] time = 0.340866, size = 1447, normalized size = 6.11

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((((d*x + c)^3*b + a)^3*(d*e*x + c*e)^3),x, algorithm="fricas")
```

```
[Out] -1/162*sqrt(3)*(20*sqrt(3)*(b^2*d^8*x^8 + 8*b^2*c*d^7*x^7 + 28*b^
2*c^2*d^6*x^6 + 2*(28*b^2*c^3 + a*b)*d^5*x^5 + b^2*c^8 + 10*(7*b^
2*c^4 + a*b*c)*d^4*x^4 + 2*a*b*c^5 + 4*(14*b^2*c^5 + 5*a*b*c^2)*d
^3*x^3 + (28*b^2*c^6 + 20*a*b*c^3 + a^2)*d^2*x^2 + a^2*c^2 + 2*(4
*b^2*c^7 + 5*a*b*c^4 + a^2*c)*d*x)*(-b^2/a^2)^(1/3)*log(b^2*d^2*x
^2 + 2*b^2*c*d*x + b^2*c^2 + a^2*(-b^2/a^2)^(2/3) + (a*b*d*x + a*
b*c)*(-b^2/a^2)^(1/3)) - 40*sqrt(3)*(b^2*d^8*x^8 + 8*b^2*c*d^7*x^
7 + 28*b^2*c^2*d^6*x^6 + 2*(28*b^2*c^3 + a*b)*d^5*x^5 + b^2*c^8 +
 10*(7*b^2*c^4 + a*b*c)*d^4*x^4 + 2*a*b*c^5 + 4*(14*b^2*c^5 + 5*a
*b*c^2)*d^3*x^3 + (28*b^2*c^6 + 20*a*b*c^3 + a^2)*d^2*x^2 + a^2*c
^2 + 2*(4*b^2*c^7 + 5*a*b*c^4 + a^2*c)*d*x)*(-b^2/a^2)^(1/3)*log(
b*d*x + b*c - a*(-b^2/a^2)^(1/3)) + 120*(b^2*d^8*x^8 + 8*b^2*c*d^
7*x^7 + 28*b^2*c^2*d^6*x^6 + 2*(28*b^2*c^3 + a*b)*d^5*x^5 + b^2*c
^8 + 10*(7*b^2*c^4 + a*b*c)*d^4*x^4 + 2*a*b*c^5 + 4*(14*b^2*c^5 +
 5*a*b*c^2)*d^3*x^3 + (28*b^2*c^6 + 20*a*b*c^3 + a^2)*d^2*x^2 + a
^2*c^2 + 2*(4*b^2*c^7 + 5*a*b*c^4 + a^2*c)*d*x)*(-b^2/a^2)^(1/3)*
arctan(1/3*(sqrt(3)*a*(-b^2/a^2)^(1/3) + 2*sqrt(3)*(b*d*x + b*c))
/(a*(-b^2/a^2)^(1/3))) + 3*sqrt(3)*(20*b^2*d^6*x^6 + 120*b^2*c*d^
5*x^5 + 300*b^2*c^2*d^4*x^4 + 20*b^2*c^6 + 16*(25*b^2*c^3 + 2*a*b
)*d^3*x^3 + 32*a*b*c^3 + 12*(25*b^2*c^4 + 8*a*b*c)*d^2*x^2 + 24*(
5*b^2*c^5 + 4*a*b*c^2)*d*x + 9*a^2))/(a^3*b^2*d^9*e^3*x^8 + 8*a^3
*b^2*c*d^8*e^3*x^7 + 28*a^3*b^2*c^2*d^7*e^3*x^6 + 2*(28*a^3*b^2*c
^3 + a^4*b)*d^6*e^3*x^5 + 10*(7*a^3*b^2*c^4 + a^4*b*c)*d^5*e^3*x^
4 + 4*(14*a^3*b^2*c^5 + 5*a^4*b*c^2)*d^4*e^3*x^3 + (28*a^3*b^2*c^
6 + 20*a^4*b*c^3 + a^5)*d^3*e^3*x^2 + 2*(4*a^3*b^2*c^7 + 5*a^4*b*
c^4 + a^5*c)*d^2*e^3*x + (a^3*b^2*c^8 + 2*a^4*b*c^5 + a^5*c^2)*d*
e^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(d*e*x+c*e)**3/(a+b*(d*x+c)**3)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left((dx+c)^3b+a\right)^3(dex+ce)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((d*x + c)^3*b + a)^3*(d*e*x + c*e)^3),x, algorithm="giac")
```

```
[Out] integrate(1/(((d*x + c)^3*b + a)^3*(d*e*x + c*e)^3), x)
```

3.2902 $\int \frac{1}{(ce+dex)^4(a+b(c+dx)^3)^3} \, dx$

Optimal. Leaf size=116

$$-\frac{3b\log(c+dx)}{a^4de^4}+\frac{b\log\left(a+b(c+dx)^3\right)}{a^4de^4}-\frac{2b}{3a^3de^4\left(a+b(c+dx)^3\right)}-\frac{1}{3a^3de^4(c+dx)^3}-\frac{b}{6a^2de^4\left(a+b(c+dx)^3\right)^2}$$

```
[Out] -1/(3*a^3*d*e^4*(c + d*x)^3) - b/(6*a^2*d*e^4*(a + b*(c + d*x)^3)
^2) - (2*b)/(3*a^3*d*e^4*(a + b*(c + d*x)^3)) - (3*b*Log[c + d*x]
)/(a^4*d*e^4) + (b*Log[a + b*(c + d*x)^3])/(a^4*d*e^4)
```

Rubi [A] time = 0.248786, antiderivative size = 116, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125

$$-\frac{3b\log(c+dx)}{a^4de^4}+\frac{b\log\left(a+b(c+dx)^3\right)}{a^4de^4}-\frac{2b}{3a^3de^4\left(a+b(c+dx)^3\right)}-\frac{1}{3a^3de^4(c+dx)^3}-\frac{b}{6a^2de^4\left(a+b(c+dx)^3\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((c*e + d*e*x)^4*(a + b*(c + d*x)^3)^3),x]
```

```
[Out] -1/(3*a^3*d*e^4*(c + d*x)^3) - b/(6*a^2*d*e^4*(a + b*(c + d*x)^3)
^2) - (2*b)/(3*a^3*d*e^4*(a + b*(c + d*x)^3)) - (3*b*Log[c + d*x]
)/(a^4*d*e^4) + (b*Log[a + b*(c + d*x)^3])/(a^4*d*e^4)
```

Rubi in Sympy [A] time = 23.7652, size = 105, normalized size = 0.91

$$-\frac{b}{6a^2de^4\left(a+b\left(c+dx\right)^3\right)^2}-\frac{2b}{3a^3de^4\left(a+b\left(c+dx\right)^3\right)}-\frac{1}{3a^3de^4\left(c+dx\right)^3}+\frac{b\log\left(a+b\left(c+dx\right)^3\right)}{a^4de^4}-\frac{b\log\left(\left(c+dx\right)^3\right)}{a^4de^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(d*e*x+c*e)**4/(a+b*(d*x+c)**3)**3,x)
```

```
[Out] -b/(6*a**2*d*e**4*(a + b*(c + d*x)**3)**2) - 2*b/(3*a**3*d*e**4*(
a + b*(c + d*x)**3)) - 1/(3*a**3*d*e**4*(c + d*x)**3) + b*log(a +
 b*(c + d*x)**3)/(a**4*d*e**4) - b*log((c + d*x)**3)/(a**4*d*e**4
)
```

Mathematica [A] time = 0.189543, size = 83, normalized size = 0.72

$$\frac{a\left(-\frac{4b}{a+b(c+dx)^3}-\frac{ab}{(a+b(c+dx)^3)^2}-\frac{2}{(c+dx)^3}\right)+6b\log\left(a+b(c+dx)^3\right)-18b\log(c+dx)}{6a^4de^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((c*e + d*e*x)^4*(a + b*(c + d*x)^3)^3),x]
```

```
[Out] (a*(-2/(c + d*x)^3 - (a*b)/(a + b*(c + d*x)^3)^2 - (4*b)/(a + b*(
c + d*x)^3)) - 18*b*Log[c + d*x] + 6*b*Log[a + b*(c + d*x)^3])/(6
*a^4*d*e^4)
```

Maple [B] time = 0.02, size = 335, normalized size = 2.9

$$-\frac{2\,d^2b^2x^3}{3\,e^4a^3\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2}-2\,\frac{b^2cdx^2}{e^4a^3\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2}-2\,\frac{b^2c^2x}{e^4a^3\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2}-\frac{2\,b^2c^3}{3\,e^4a^3\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2d}-\frac{5\,b}{6\,e^4a^2\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2d}+\frac{b\ln\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)}{e^4a^4d}-\frac{1}{3\,a^3de^4\left(dx+c\right)^3}-3\,\frac{b\ln\left(dx+c\right)}{e^4a^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*e*x+c*e)^4/(a+b*(d*x+c)^3)^3,x)
```

```
[Out] -2/3/e^4/a^3*b^2/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+a)^2*
d^2*x^3-2/e^4/a^3*b^2/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b*c^3+
a)^2*c*d*x^2-2/e^4/a^3*b^2/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*d*x+b
*c^3+a)^2*c^2*x-2/3/e^4/a^3*b^2/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c^2*
d*x+b*c^3+a)^2/d*c^3-5/6/e^4/a^2*b/(b*d^3*x^3+3*b*c*d^2*x^2+3*b*c
^2*d*x+b*c^3+a)^2/d+1/e^4/a^4*b/d*ln(b*d^3*x^3+3*b*c*d^2*x^2+3*b*
c^2*d*x+b*c^3+a)-1/3/a^3/d/e^4/(d*x+c)^3-3*b*ln(d*x+c)/a^4/d/e^4
```

Maxima [A] time = 1.4304, size = 640, normalized size = 5.52

$$-\frac{6\,b^2d^6x^6+36\,b^2cd^5x^5+90\,b^2c^2d^4x^4+6\,b^2c^6+3}{6\left(a^3b^2d^{10}e^4x^9+9\,a^3b^2cd^9e^4x^8+36\,a^3b^2c^2d^8e^4x^7+2\left(42\,a^3b^2c^3+a^4b\right)d^7e^4x^6+6\left(21\,a^3b^2c^4+2\,a^4bc\right)d^6e^4x^5+6\left(21\,a^3b^2c\right.\right.}+\frac{b\log\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)}{a^4de^4}-\frac{3\,b\log\left(dx+c\right)}{a^4de^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((d*x + c)^3*b + a)^3*(d*e*x + c*e)^4),x, algorithm="maxima")
```

```
[Out] -1/6*(6*b^2*d^6*x^6 + 36*b^2*c*d^5*x^5 + 90*b^2*c^2*d^4*x^4 + 6*b
^2*c^6 + 3*(40*b^2*c^3 + 3*a*b)*d^3*x^3 + 9*a*b*c^3 + 9*(10*b^2*c
^4 + 3*a*b*c)*d^2*x^2 + 9*(4*b^2*c^5 + 3*a*b*c^2)*d*x + 2*a^2)/(a
^3*b^2*d^10*e^4*x^9 + 9*a^3*b^2*c*d^9*e^4*x^8 + 36*a^3*b^2*c^2*d^
8*e^4*x^7 + 2*(42*a^3*b^2*c^3 + a^4*b)*d^7*e^4*x^6 + 6*(21*a^3*b^
2*c^4 + 2*a^4*b*c)*d^6*e^4*x^5 + 6*(21*a^3*b^2*c^5 + 5*a^4*b*c^2)
*d^5*e^4*x^4 + (84*a^3*b^2*c^6 + 40*a^4*b*c^3 + a^5)*d^4*e^4*x^3
+ 3*(12*a^3*b^2*c^7 + 10*a^4*b*c^4 + a^5*c)*d^3*e^4*x^2 + 3*(3*a^
3*b^2*c^8 + 4*a^4*b*c^5 + a^5*c^2)*d^2*e^4*x + (a^3*b^2*c^9 + 2*a
^4*b*c^6 + a^5*c^3)*d*e^4) + b*log(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*
b*c^2*d*x + b*c^3 + a)/(a^4*d*e^4) - 3*b*log(d*x + c)/(a^4*d*e^4)
```

Fricas [A] time = 0.392273, size = 1241, normalized size = 10.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((d*x + c)^3*b + a)^3*(d*e*x + c*e)^4),x, algorithm="fricas")
```

```
[Out] -1/6*(6*a*b^2*d^6*x^6 + 36*a*b^2*c*d^5*x^5 + 90*a*b^2*c^2*d^4*x^4
 + 6*a*b^2*c^6 + 3*(40*a*b^2*c^3 + 3*a^2*b)*d^3*x^3 + 9*a^2*b*c^3
 + 9*(10*a*b^2*c^4 + 3*a^2*b*c)*d^2*x^2 + 2*a^3 + 9*(4*a*b^2*c^5
+ 3*a^2*b*c^2)*d*x - 6*(b^3*d^9*x^9 + 9*b^3*c*d^8*x^8 + 36*b^3*c^
2*d^7*x^7 + 2*(42*b^3*c^3 + a*b^2)*d^6*x^6 + b^3*c^9 + 6*(21*b^3*
c^4 + 2*a*b^2*c)*d^5*x^5 + 2*a*b^2*c^6 + 6*(21*b^3*c^5 + 5*a*b^2*
c^2)*d^4*x^4 + (84*b^3*c^6 + 40*a*b^2*c^3 + a^2*b)*d^3*x^3 + a^2*
b*c^3 + 3*(12*b^3*c^7 + 10*a*b^2*c^4 + a^2*b*c)*d^2*x^2 + 3*(3*b^
3*c^8 + 4*a*b^2*c^5 + a^2*b*c^2)*d*x)*log(b*d^3*x^3 + 3*b*c*d^2*x
^2 + 3*b*c^2*d*x + b*c^3 + a) + 18*(b^3*d^9*x^9 + 9*b^3*c*d^8*x^8
 + 36*b^3*c^2*d^7*x^7 + 2*(42*b^3*c^3 + a*b^2)*d^6*x^6 + b^3*c^9
+ 6*(21*b^3*c^4 + 2*a*b^2*c)*d^5*x^5 + 2*a*b^2*c^6 + 6*(21*b^3*c^
5 + 5*a*b^2*c^2)*d^4*x^4 + (84*b^3*c^6 + 40*a*b^2*c^3 + a^2*b)*d^
3*x^3 + a^2*b*c^3 + 3*(12*b^3*c^7 + 10*a*b^2*c^4 + a^2*b*c)*d^2*x
^2 + 3*(3*b^3*c^8 + 4*a*b^2*c^5 + a^2*b*c^2)*d*x)*log(d*x + c))/(
a^4*b^2*d^10*e^4*x^9 + 9*a^4*b^2*c*d^9*e^4*x^8 + 36*a^4*b^2*c^2*d
^8*e^4*x^7 + 2*(42*a^4*b^2*c^3 + a^5*b)*d^7*e^4*x^6 + 6*(21*a^4*b
^2*c^4 + 2*a^5*b*c)*d^6*e^4*x^5 + 6*(21*a^4*b^2*c^5 + 5*a^5*b*c^2
)*d^5*e^4*x^4 + (84*a^4*b^2*c^6 + 40*a^5*b*c^3 + a^6)*d^4*e^4*x^3
 + 3*(12*a^4*b^2*c^7 + 10*a^5*b*c^4 + a^6*c)*d^3*e^4*x^2 + 3*(3*a
^4*b^2*c^8 + 4*a^5*b*c^5 + a^6*c^2)*d^2*e^4*x + (a^4*b^2*c^9 + 2*
a^5*b*c^6 + a^6*c^3)*d*e^4)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*e*x+c*e)**4/(a+b*(d*x+c)**3)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.221445, size = 350, normalized size = 3.02

$$\frac{be^{(-4)}\ln\left(\left|bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right|\right)}{a^4d}-\frac{3\,be^{(-4)}\ln\left(\left|dx+c\right|\right)}{a^4d}-\frac{\left(6\,ab^2d^6x^6+36\,ab^2cd^5x^5+90\,ab^2c^2d^4x^4+6\,ab^2c^6+9\,a^2bc^3+3\,\left(40\,ab^2c^3d^3+3\,a^2bd^3\right)x^3+2\,a^3+9\,\left(10\,ab^2c^4d^2+3\,a^2bc\right.}{6\,\left(bd^3x^3+3\,bcd^2x^2+3\,bc^2dx+bc^3+a\right)^2\left(dx+c\right)^3a^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((d*x + c)^3*b + a)^3*(d*e*x + c*e)^4),x, algorithm="giac")
```

```
[Out] b*e^(-4)*ln(abs(b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x + b*c^3 +
 a))/(a^4*d) - 3*b*e^(-4)*ln(abs(d*x + c))/(a^4*d) - 1/6*(6*a*b^2
*d^6*x^6 + 36*a*b^2*c*d^5*x^5 + 90*a*b^2*c^2*d^4*x^4 + 6*a*b^2*c^
6 + 9*a^2*b*c^3 + 3*(40*a*b^2*c^3*d^3 + 3*a^2*b*d^3)*x^3 + 2*a^3
+ 9*(10*a*b^2*c^4*d^2 + 3*a^2*b*c*d^2)*x^2 + 9*(4*a*b^2*c^5*d + 3
*a^2*b*c^2*d)*x)*e^(-4)/((b*d^3*x^3 + 3*b*c*d^2*x^2 + 3*b*c^2*d*x
 + b*c^3 + a)^2*(d*x + c)^3*a^4*d)
```

3.2903 $\int (c+dx)^3 \left(a+b(c+dx)^4\right)^p \, dx$

Optimal. Leaf size=30

$$\frac{\left(a+b(c+dx)^4\right)^{p+1}}{4bd(p+1)}$$

```
[Out] (a + b*(c + d*x)^4)^(1 + p)/(4*b*d*(1 + p))
```

Rubi [A] time = 0.0272146, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$

$$\frac{\left(a+b(c+dx)^4\right)^{p+1}}{4bd(p+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)^3*(a + b*(c + d*x)^4)^p,x]
```

```
[Out] (a + b*(c + d*x)^4)^(1 + p)/(4*b*d*(1 + p))
```

Rubi in Sympy [A] time = 4.9432, size = 20, normalized size = 0.67

$$\frac{\left(a+b\left(c+dx\right)^4\right)^{p+1}}{4bd\left(p+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**3*(a+b*(d*x+c)**4)**p,x)
```

```
[Out] (a + b*(c + d*x)**4)**(p + 1)/(4*b*d*(p + 1))
```

Mathematica [A] time = 0.0328594, size = 32, normalized size = 1.07

$$\frac{\left(a+b(c+dx)^4\right)^{p+1}}{2d(2bp+2b)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c + d*x)^3*(a + b*(c + d*x)^4)^p,x]
```

```
[Out] (a + b*(c + d*x)^4)^(1 + p)/(2*d*(2*b + 2*b*p))
```

Maple [B] time = 0.01, size = 63, normalized size = 2.1

$$\frac{\left(bd^4x^4+4\,bcd^3x^3+6\,bc^2d^2x^2+4\,bc^3dx+bc^4+a\right)^{1+p}}{4\,bd\,(1+p)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^3*(a+b*(d*x+c)^4)^p,x)
```

```
[Out] 1/4*(b*d^4*x^4+4*b*c*d^3*x^3+6*b*c^2*d^2*x^2+4*b*c^3*d*x+b*c^4+a)
^(1+p)/b/d/(1+p)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x + c)^3*((d*x + c)^4*b + a)^p,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.224008, size = 140, normalized size = 4.67

$$\frac{\left(bd^4x^4 + 4\,bcd^3x^3 + 6\,bc^2d^2x^2 + 4\,bc^3dx + bc^4 + a\right)\left(bd^4x^4 + 4\,bcd^3x^3 + 6\,bc^2d^2x^2 + 4\,bc^3dx + bc^4 + a\right)^p}{4\,(bdp + bd)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x + c)^3*((d*x + c)^4*b + a)^p,x, algorithm="fricas")
```

```
[Out] 1/4*(b*d^4*x^4 + 4*b*c*d^3*x^3 + 6*b*c^2*d^2*x^2 + 4*b*c^3*d*x +
b*c^4 + a)*(b*d^4*x^4 + 4*b*c*d^3*x^3 + 6*b*c^2*d^2*x^2 + 4*b*c^3
*d*x + b*c^4 + a)^p/(b*d*p + b*d)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)**3*(a+b*(d*x+c)**4)**p,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.217122, size = 38, normalized size = 1.27

$$\frac{\left((dx + c)^4 b + a\right)^{p+1}}{4\,bd(p + 1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x + c)^3*((d*x + c)^4*b + a)^p,x, algorithm="giac")
```

```
[Out] 1/4*((d*x + c)^4*b + a)^(p + 1)/(b*d*(p + 1))
```

3.2904 $\int (c+dx)^3 \left(a+b(c+dx)^4\right) \, dx$

Optimal. Leaf size=23

$$\frac{\left(a+b(c+dx)^4\right)^2}{8bd}$$

```
[Out] (a + b*(c + d*x)^4)^2/(8*b*d)
```

Rubi [A] time = 0.0231063, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.053$

$$\frac{\left(a+b(c+dx)^4\right)^2}{8bd}$$

Antiderivative was successfully verified.

```
[In] Int[(c + d*x)^3*(a + b*(c + d*x)^4),x]
```

```
[Out] (a + b*(c + d*x)^4)^2/(8*b*d)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{b \int^{(c+dx)^4} x\,dx}{4d} + \frac{\int^{(c+dx)^4} a\,dx}{4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((d*x+c)**3*(a+b*(d*x+c)**4),x)
```

```
[Out] b*Integral(x, (x, (c + d*x)**4))/(4*d) + Integral(a, (x, (c + d*x
)**4))/(4*d)
```

Mathematica [B] time = 0.0321177, size = 80, normalized size = 3.48

$$\frac{1}{8}x\left(4c^3+6c^2dx+4cd^2x^2+d^3x^3\right)\left(2a+b\left(2c^4+4c^3dx+6c^2d^2x^2+4cd^3x^3+d^4x^4\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(c + d*x)^3*(a + b*(c + d*x)^4),x]
```

```
[Out] (x*(4*c^3 + 6*c^2*d*x + 4*c*d^2*x^2 + d^3*x^3)*(2*a + b*(2*c^4 +
4*c^3*d*x + 6*c^2*d^2*x^2 + 4*c*d^3*x^3 + d^4*x^4)))/8
```

Maple [B] time = 0.001, size = 136, normalized size = 5.9

$$\frac{d^7bx^8}{8}+cd^6bx^7+\frac{7\,c^2d^5bx^6}{2}+7\,c^3bd^4x^5+\frac{\left(34\,c^4bd^3+d^3\left(bc^4+a\right)\right)x^4}{4}+\frac{\left(18\,c^5d^2b+3\,cd^2\left(bc^4+a\right)\right)x^3}{3}+\frac{\left(4\,c^6db+3\,c^2d\left(bc^4+a\right)\right)x^2}{2}+c^3\left(bc^4+a\right)x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^3*(a+b*(d*x+c)^4),x)
```

```
[Out] 1/8*d^7*b*x^8+c*d^6*b*x^7+7/2*c^2*d^5*b*x^6+7*c^3*b*d^4*x^5+1/4*(
34*c^4*b*d^3+d^3*(b*c^4+a))*x^4+1/3*(18*c^5*d^2*b+3*c*d^2*(b*c^4+
a))*x^3+1/2*(4*c^6*d*b+3*c^2*d*(b*c^4+a))*x^2+c^3*(b*c^4+a)*x
```

Maxima [A] time = 1.36092, size = 28, normalized size = 1.22

$$\frac{\left((dx+c)^4 b+a\right)^2}{8\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^4*b + a)*(d*x + c)^3,x, algorithm="maxima")
```

```
[Out] 1/8*((d*x + c)^4*b + a)^2/(b*d)
```

Fricas [A] time = 0.181301, size = 1, normalized size = 0.04

$$\frac{1}{8}x^8d^7b + x^7d^6cb + \frac{7}{2}x^6d^5c^2b + 7x^5d^4c^3b + \frac{35}{4}x^4d^3c^4b + 7x^3d^2c^5b + \frac{7}{2}x^2dc^6b + xc^7b + \frac{1}{4}x^4d^3a + x^3d^2ca + \frac{3}{2}x^2dc^2a + xc^3a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^4*b + a)*(d*x + c)^3,x, algorithm="fricas")
```

```
[Out] 1/8*x^8*d^7*b + x^7*d^6*c*b + 7/2*x^6*d^5*c^2*b + 7*x^5*d^4*c^3*b
 + 35/4*x^4*d^3*c^4*b + 7*x^3*d^2*c^5*b + 7/2*x^2*d*c^6*b + x*c^7
*b + 1/4*x^4*d^3*a + x^3*d^2*c*a + 3/2*x^2*d*c^2*a + x*c^3*a
```

Sympy [A] time = 0.16641, size = 126, normalized size = 5.48

$$7bc^3d^4x^5 + \frac{7bc^2d^5x^6}{2} + bcd^6x^7 + \frac{bd^7x^8}{8} + x^4\left(\frac{ad^3}{4} + \frac{35bc^4d^3}{4}\right) + x^3\left(acd^2 + 7bc^5d^2\right) + x^2\left(\frac{3ac^2d}{2} + \frac{7bc^6d}{2}\right) + x\left(ac^3 + bc^7\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**3*(a+b*(d*x+c)**4),x)
```

```
[Out] 7*b*c**3*d**4*x**5 + 7*b*c**2*d**5*x**6/2 + b*c*d**6*x**7 + b*d**
7*x**8/8 + x**4*(a*d**3/4 + 35*b*c**4*d**3/4) + x**3*(a*c*d**2 +
7*b*c**5*d**2) + x**2*(3*a*c**2*d/2 + 7*b*c**6*d/2) + x*(a*c**3 +
 b*c**7)
```

GIAC/XCAS [A] time = 0.213079, size = 34, normalized size = 1.48

$$\frac{(dx+c)^8 b + 2\,(dx+c)^4 a}{8\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^4*b + a)*(d*x + c)^3,x, algorithm="giac")

[Out] 1/8*((d*x + c)^8*b + 2*(d*x + c)^4*a)/d
```

3.2905 $\int (c+dx)^3 \left(a+b(c+dx)^4\right)^2 \, dx$

Optimal. Leaf size=23

$$\frac{\left(a+b(c+dx)^4\right)^3}{12bd}$$

```
[Out] (a + b*(c + d*x)^4)^3/(12*b*d)
```

Rubi [A] time = 0.0300304, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$

$$\frac{\left(a+b(c+dx)^4\right)^3}{12bd}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)^3*(a + b*(c + d*x)^4)^2,x]

[Out] (a + b*(c + d*x)^4)^3/(12*b*d)
```

Rubi in Sympy [A] time = 5.24458, size = 15, normalized size = 0.65

$$\frac{\left(a+b\left(c+dx\right)^4\right)^3}{12bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**3*(a+b*(d*x+c)**4)**2,x)

[Out] (a + b*(c + d*x)**4)**3/(12*b*d)
```

Mathematica [B] time = 0.0662931, size = 172, normalized size = 7.48

$$\frac{1}{12}x\left(4c^3+6c^2dx+4cd^2x^2+d^3x^3\right)\left(3a^2+3ab\left(2c^4+4c^3dx+6c^2d^2x^2+4cd^3x^3+d^4x^4\right)+b^2\left(3c^8+12c^7dx+34c^6d^2x^2+60c^5d^3x^3+71c^4d^4x^4+56c^3d^5x^5+28c^2d^6x^6+8cd^7x^7+d^8x^8\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c + d*x)^3*(a + b*(c + d*x)^4)^2,x]

[Out] (x*(4*c^3 + 6*c^2*d*x + 4*c*d^2*x^2 + d^3*x^3)*(3*a^2 + 3*a*b*(2*
c^4 + 4*c^3*d*x + 6*c^2*d^2*x^2 + 4*c*d^3*x^3 + d^4*x^4) + b^2*(3
*c^8 + 12*c^7*d*x + 34*c^6*d^2*x^2 + 60*c^5*d^3*x^3 + 71*c^4*d^4*
x^4 + 56*c^3*d^5*x^5 + 28*c^2*d^6*x^6 + 8*c*d^7*x^7 + d^8*x^8)))/
12
```

Maple [B] time = 0.001, size = 622, normalized size = 27.

$$\frac{d^{11}b^2x^{12}}{12}+cd^{10}b^2x^{11}+\frac{11\,c^2d^9b^2x^{10}}{2}+\frac{55\,c^3b^2d^8x^9}{3}+\frac{\left(260\,c^4b^2d^7+d^3\left(2\left(bc^4+a\right)bd^4+68\,c^4d^4b^2\right)\right)x^8}{8}$$
$$+\frac{\left(196\,c^5d^6b^2+3\,cd^2\left(2\left(bc^4+a\right)bd^4+68\,c^4d^4b^2\right)+d^3\left(8\left(bc^4+a\right)bcd^3+48\,c^5d^3b^2\right)\right)x^7}{7}$$
$$+\frac{\left(56\,c^6d^5b^2+3\,c^2d\left(2\left(bc^4+a\right)bd^4+68\,c^4d^4b^2\right)+3\,cd^2\left(8\left(bc^4+a\right)bcd^3+48\,c^5d^3b^2\right)+d^3\left(12\left(bc^4+a\right)c^2d^2b+16\,c^6d^2b\right.}{6}$$
$$+\frac{\left(c^3\left(2\left(bc^4+a\right)bd^4+68\,c^4d^4b^2\right)+3\,c^2d\left(8\left(bc^4+a\right)bcd^3+48\,c^5d^3b^2\right)+3\,cd^2\left(12\left(bc^4+a\right)c^2d^2b+16\,c^6d^2b^2\right)+8\,d^4\left(b\right.\right.}{5}$$
$$+\frac{\left(c^3\left(8\left(bc^4+a\right)bcd^3+48\,c^5d^3b^2\right)+3\,c^2d\left(12\left(bc^4+a\right)c^2d^2b+16\,c^6d^2b^2\right)+24\,c^4d^3\left(bc^4+a\right)b+d^3\left(bc^4+a\right)^2\right)x^4}{4}$$
$$+\frac{\left(c^3\left(12\left(bc^4+a\right)c^2d^2b+16\,c^6d^2b^2\right)+24\,c^5d^2\left(bc^4+a\right)b+3\,cd^2\left(bc^4+a\right)^2\right)x^3}{3}$$
$$+\frac{\left(8\,c^6\left(bc^4+a\right)db+3\,c^2d\left(bc^4+a\right)^2\right)x^2}{2}+c^3\left(bc^4+a\right)^2x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^3*(a+b*(d*x+c)^4)^2,x)
```

```
[Out] 1/12*d^11*b^2*x^12+c*d^10*b^2*x^11+11/2*c^2*d^9*b^2*x^10+55/3*c^3
*b^2*d^8*x^9+1/8*(260*c^4*b^2*d^7+d^3*(2*(b*c^4+a)*b*d^4+68*c^4*d
^4*b^2))*x^8+1/7*(196*c^5*d^6*b^2+3*c*d^2*(2*(b*c^4+a)*b*d^4+68*c
^4*d^4*b^2)+d^3*(8*(b*c^4+a)*b*c*d^3+48*c^5*d^3*b^2))*x^7+1/6*(56
*c^6*d^5*b^2+3*c^2*d*(2*(b*c^4+a)*b*d^4+68*c^4*d^4*b^2)+3*c*d^2*(
8*(b*c^4+a)*b*c*d^3+48*c^5*d^3*b^2)+d^3*(12*(b*c^4+a)*c^2*d^2*b+1
6*c^6*d^2*b^2))*x^6+1/5*(c^3*(2*(b*c^4+a)*b*d^4+68*c^4*d^4*b^2)+3
*c^2*d*(8*(b*c^4+a)*b*c*d^3+48*c^5*d^3*b^2)+3*c*d^2*(12*(b*c^4+a)
*c^2*d^2*b+16*c^6*d^2*b^2)+8*d^4*(b*c^4+a)*c^3*b)*x^5+1/4*(c^3*(8
*(b*c^4+a)*b*c*d^3+48*c^5*d^3*b^2)+3*c^2*d*(12*(b*c^4+a)*c^2*d^2*
b+16*c^6*d^2*b^2)+24*c^4*d^3*(b*c^4+a)*b+d^3*(b*c^4+a)^2)*x^4+1/3
*(c^3*(12*(b*c^4+a)*c^2*d^2*b+16*c^6*d^2*b^2)+24*c^5*d^2*(b*c^4+a
)*b+3*c*d^2*(b*c^4+a)^2)*x^3+1/2*(8*c^6*(b*c^4+a)*d*b+3*c^2*d*(b*
c^4+a)^2)*x^2+c^3*(b*c^4+a)^2*x
```

Maxima [A] time = 1.39916, size = 28, normalized size = 1.22

$$\frac{\left((dx+c)^4b+a\right)^3}{12\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^4*b + a)^2*(d*x + c)^3,x, algorithm="maxima")
```

```
[Out] 1/12*((d*x + c)^4*b + a)^3/(b*d)
```

Fricas [A] time = 0.181994, size = 1, normalized size = 0.04

$$\frac{1}{12}x^{12}d^{11}b^2+x^{11}d^{10}cb^2+\frac{11}{2}x^{10}d^9c^2b^2+\frac{55}{3}x^9d^8c^3b^2+\frac{165}{4}x^8d^7c^4b^2+66x^7d^6c^5b^2+77x^6d^5c^6b^2$$
$$+66x^5d^4c^7b^2+\frac{165}{4}x^4d^3c^8b^2+\frac{1}{4}x^8d^7ba+\frac{55}{3}x^3d^2c^9b^2+2x^7d^6cba+\frac{11}{2}x^2dc^{10}b^2+7x^6d^5c^2ba+xc^{11}b^2$$
$$+14x^5d^4c^3ba+\frac{35}{2}x^4d^3c^4ba+14x^3d^2c^5ba+7x^2dc^6ba+2xc^7ba+\frac{1}{4}x^4d^3a^2+x^3d^2ca^2+\frac{3}{2}x^2dc^2a^2+xc^3a^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^4*b + a)^2*(d*x + c)^3,x, algorithm="fricas")
```

```
[Out] 1/12*x^12*d^11*b^2 + x^11*d^10*c*b^2 + 11/2*x^10*d^9*c^2*b^2 + 55
/3*x^9*d^8*c^3*b^2 + 165/4*x^8*d^7*c^4*b^2 + 66*x^7*d^6*c^5*b^2 +
 77*x^6*d^5*c^6*b^2 + 66*x^5*d^4*c^7*b^2 + 165/4*x^4*d^3*c^8*b^2
+ 1/4*x^8*d^7*b*a + 55/3*x^3*d^2*c^9*b^2 + 2*x^7*d^6*c*b*a + 11/2
*x^2*d*c^10*b^2 + 7*x^6*d^5*c^2*b*a + x*c^11*b^2 + 14*x^5*d^4*c^3
*b*a + 35/2*x^4*d^3*c^4*b*a + 14*x^3*d^2*c^5*b*a + 7*x^2*d*c^6*b*
a + 2*x*c^7*b*a + 1/4*x^4*d^3*a^2 + x^3*d^2*c*a^2 + 3/2*x^2*d*c^2
*a^2 + x*c^3*a^2
```

Sympy [A] time = 0.317147, size = 299, normalized size = 13.

$$\frac{55b^2c^3d^8x^9}{3}+\frac{11b^2c^2d^9x^{10}}{2}+b^2cd^{10}x^{11}+\frac{b^2d^{11}x^{12}}{12}+x^8\left(\frac{abd^7}{4}+\frac{165b^2c^4d^7}{4}\right)+x^7\left(2abcd^6+66b^2c^5d^6\right)+x^6\left(7abc^2d^5+77b^2c^6d^5\right)+x^5\left(14abc^3d^4+66b^2c^7d^4\right)+x^4\left(\frac{a^2d^3}{4}+\frac{35abc^4d^3}{2}+\frac{165b^2c^8d^3}{4}\right)+x^3\left(a^2cd^2+14abc^5d^2+\frac{55b^2c^9d^2}{3}\right)+x^2\left(\frac{3a^2c^2d}{2}+7abc^6d+\frac{11b^2c^{10}d}{2}\right)+x\left(a^2c^3+2abc^7+b^2c^{11}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**3*(a+b*(d*x+c)**4)**2,x)
```

```
[Out] 55*b**2*c**3*d**8*x**9/3 + 11*b**2*c**2*d**9*x**10/2 + b**2*c*d**
10*x**11 + b**2*d**11*x**12/12 + x**8*(a*b*d**7/4 + 165*b**2*c**4
*d**7/4) + x**7*(2*a*b*c*d**6 + 66*b**2*c**5*d**6) + x**6*(7*a*b*
c**2*d**5 + 77*b**2*c**6*d**5) + x**5*(14*a*b*c**3*d**4 + 66*b**2
*c**7*d**4) + x**4*(a**2*d**3/4 + 35*a*b*c**4*d**3/2 + 165*b**2*c
**8*d**3/4) + x**3*(a**2*c*d**2 + 14*a*b*c**5*d**2 + 55*b**2*c**9
*d**2/3) + x**2*(3*a**2*c**2*d/2 + 7*a*b*c**6*d + 11*b**2*c**10*d
/2) + x*(a**2*c**3 + 2*a*b*c**7 + b**2*c**11)
```

GIAC/XCAS [A] time = 0.214821, size = 28, normalized size = 1.22

$$\frac{\left((dx+c)^4b+a\right)^3}{12\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^4*b + a)^2*(d*x + c)^3,x, algorithm="giac")
```

```
[Out] 1/12*((d*x + c)^4*b + a)^3/(b*d)
```

3.2906 $\int (c+dx)^3 \left(a+b(c+dx)^4\right)^3 \, dx$

Optimal. Leaf size=23

$$\frac{\left(a+b(c+dx)^4\right)^4}{16bd}$$

```
[Out] (a + b*(c + d*x)^4)^4/(16*b*d)
```

Rubi [A] time = 0.0430844, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$

$$\frac{\left(a+b(c+dx)^4\right)^4}{16bd}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)^3*(a + b*(c + d*x)^4)^3,x]

[Out] (a + b*(c + d*x)^4)^4/(16*b*d)
```

Rubi in Sympy [A] time = 5.99503, size = 15, normalized size = 0.65

$$\frac{\left(a+b\left(c+dx\right)^4\right)^4}{16bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**3*(a+b*(d*x+c)**4)**3,x)

[Out] (a + b*(c + d*x)**4)**4/(16*b*d)
```

Mathematica [B] time = 0.157606, size = 308, normalized size = 13.39

$$\frac{1}{16}x\left(4c^3+6c^2dx+4cd^2x^2+d^3x^3\right)\left(4a^3+6a^2b\left(2c^4+4c^3dx+6c^2d^2x^2+4cd^3x^3+d^4x^4\right)\right.$$
$$+4ab^2\left(3c^8+12c^7dx+34c^6d^2x^2+60c^5d^3x^3+71c^4d^4x^4+56c^3d^5x^5+28c^2d^6x^6+8cd^7x^7+d^8x^8\right)$$
$$+b^3\left(4c^{12}+24c^{11}dx+100c^{10}d^2x^2+280c^9d^3x^3+566c^8d^4x^4+848c^7d^5x^5+952c^6d^6x^6\right.$$
$$\left.\left.+800c^5d^7x^7+496c^4d^8x^8+220c^3d^9x^9+66c^2d^{10}x^{10}+12cd^{11}x^{11}+d^{12}x^{12}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c + d*x)^3*(a + b*(c + d*x)^4)^3,x]

[Out] (x*(4*c^3 + 6*c^2*d*x + 4*c*d^2*x^2 + d^3*x^3)*(4*a^3 + 6*a^2*b*(
2*c^4 + 4*c^3*d*x + 6*c^2*d^2*x^2 + 4*c*d^3*x^3 + d^4*x^4) + 4*a*
b^2*(3*c^8 + 12*c^7*d*x + 34*c^6*d^2*x^2 + 60*c^5*d^3*x^3 + 71*c^
4*d^4*x^4 + 56*c^3*d^5*x^5 + 28*c^2*d^6*x^6 + 8*c*d^7*x^7 + d^8*x
^8) + b^3*(4*c^12 + 24*c^11*d*x + 100*c^10*d^2*x^2 + 280*c^9*d^3*
x^3 + 566*c^8*d^4*x^4 + 848*c^7*d^5*x^5 + 952*c^6*d^6*x^6 + 800*c
^5*d^7*x^7 + 496*c^4*d^8*x^8 + 220*c^3*d^9*x^9 + 66*c^2*d^10*x^10
 + 12*c*d^11*x^11 + d^12*x^12)))/16
```

Maple [B] time = 0.003, size = 3262, normalized size = 141.8

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^3*(a+b*(d*x+c)^4)^3,x)
```

```
[Out] 1/16*d^15*b^3*x^16+c*d^14*b^3*x^15+15/2*c^2*d^13*b^3*x^14+35*c^3*
b^3*d^12*x^13+1/12*(870*c^4*b^3*d^11+d^3*((b*c^4+a)*b^2*d^8+424*c
^4*b^3*d^8+b*d^4*(2*(b*c^4+a)*b*d^4+68*c^4*d^4*b^2)))*x^12+1/11*(
726*c^5*d^10*b^3+3*c*d^2*((b*c^4+a)*b^2*d^8+424*c^4*b^3*d^8+b*d^4
*(2*(b*c^4+a)*b*d^4+68*c^4*d^4*b^2))+d^3*(8*(b*c^4+a)*b^2*c*d^7+4
48*c^5*d^7*b^3+4*b*c*d^3*(2*(b*c^4+a)*b*d^4+68*c^4*d^4*b^2)+b*d^4
*(8*(b*c^4+a)*b*c*d^3+48*c^5*d^3*b^2)))*x^11+1/10*(220*c^6*b^3*d^
9+3*c^2*d*((b*c^4+a)*b^2*d^8+424*c^4*b^3*d^8+b*d^4*(2*(b*c^4+a)*b
*d^4+68*c^4*d^4*b^2))+3*c*d^2*(8*(b*c^4+a)*b^2*c*d^7+448*c^5*d^7*
b^3+4*b*c*d^3*(2*(b*c^4+a)*b*d^4+68*c^4*d^4*b^2)+b*d^4*(8*(b*c^4+
a)*b*c*d^3+48*c^5*d^3*b^2))+d^3*(28*(b*c^4+a)*c^2*d^6*b^2+224*c^6
*d^6*b^3+6*c^2*d^2*b*(2*(b*c^4+a)*b*d^4+68*c^4*d^4*b^2)+4*b*c*d^3
*(8*(b*c^4+a)*b*c*d^3+48*c^5*d^3*b^2)+b*d^4*(12*(b*c^4+a)*c^2*d^2
*b+16*c^6*d^2*b^2)))*x^10+1/9*(c^3*((b*c^4+a)*b^2*d^8+424*c^4*b^3
*d^8+b*d^4*(2*(b*c^4+a)*b*d^4+68*c^4*d^4*b^2))+3*c^2*d*(8*(b*c^4+
a)*b^2*c*d^7+448*c^5*d^7*b^3+4*b*c*d^3*(2*(b*c^4+a)*b*d^4+68*c^4*
d^4*b^2)+b*d^4*(8*(b*c^4+a)*b*c*d^3+48*c^5*d^3*b^2))+3*c*d^2*(28*
(b*c^4+a)*c^2*d^6*b^2+224*c^6*d^6*b^3+6*c^2*d^2*b*(2*(b*c^4+a)*b*
d^4+68*c^4*d^4*b^2)+4*b*c*d^3*(8*(b*c^4+a)*b*c*d^3+48*c^5*d^3*b^2
)+b*d^4*(12*(b*c^4+a)*c^2*d^2*b+16*c^6*d^2*b^2))+d^3*(64*(b*c^4+a
)*c^3*d^5*b^2+4*c^3*d*b*(2*(b*c^4+a)*b*d^4+68*c^4*d^4*b^2)+6*c^2*
d^2*b*(8*(b*c^4+a)*b*c*d^3+48*c^5*d^3*b^2)+4*b*c*d^3*(12*(b*c^4+a
)*c^2*d^2*b+16*c^6*d^2*b^2)))*x^9+1/8*(c^3*(8*(b*c^4+a)*b^2*c*d^7
+448*c^5*d^7*b^3+4*b*c*d^3*(2*(b*c^4+a)*b*d^4+68*c^4*d^4*b^2)+b*d
^4*(8*(b*c^4+a)*b*c*d^3+48*c^5*d^3*b^2))+3*c^2*d*(28*(b*c^4+a)*c^
2*d^6*b^2+224*c^6*d^6*b^3+6*c^2*d^2*b*(2*(b*c^4+a)*b*d^4+68*c^4*d
^4*b^2)+4*b*c*d^3*(8*(b*c^4+a)*b*c*d^3+48*c^5*d^3*b^2)+b*d^4*(12*
(b*c^4+a)*c^2*d^2*b+16*c^6*d^2*b^2))+3*c*d^2*(64*(b*c^4+a)*c^3*d^
5*b^2+4*c^3*d*b*(2*(b*c^4+a)*b*d^4+68*c^4*d^4*b^2)+6*c^2*d^2*b*(8
*(b*c^4+a)*b*c*d^3+48*c^5*d^3*b^2)+4*b*c*d^3*(12*(b*c^4+a)*c^2*d^
2*b+16*c^6*d^2*b^2))+d^3*((b*c^4+a)*(2*(b*c^4+a)*b*d^4+68*c^4*d^4
*b^2)+4*c^3*d*b*(8*(b*c^4+a)*b*c*d^3+48*c^5*d^3*b^2)+6*c^2*d^2*b*
(12*(b*c^4+a)*c^2*d^2*b+16*c^6*d^2*b^2)+32*b^2*c^4*d^4*(b*c^4+a)+
b*d^4*(b*c^4+a)^2))*x^8+1/7*(c^3*(28*(b*c^4+a)*c^2*d^6*b^2+224*c^
6*d^6*b^3+6*c^2*d^2*b*(2*(b*c^4+a)*b*d^4+68*c^4*d^4*b^2)+4*b*c*d^
3*(8*(b*c^4+a)*b*c*d^3+48*c^5*d^3*b^2)+b*d^4*(12*(b*c^4+a)*c^2*d^
2*b+16*c^6*d^2*b^2))+3*c^2*d*(64*(b*c^4+a)*c^3*d^5*b^2+4*c^3*d*b*
(2*(b*c^4+a)*b*d^4+68*c^4*d^4*b^2)+6*c^2*d^2*b*(8*(b*c^4+a)*b*c*d
^3+48*c^5*d^3*b^2)+4*b*c*d^3*(12*(b*c^4+a)*c^2*d^2*b+16*c^6*d^2*b
^2))+3*c*d^2*((b*c^4+a)*(2*(b*c^4+a)*b*d^4+68*c^4*d^4*b^2)+4*c^3*
d*b*(8*(b*c^4+a)*b*c*d^3+48*c^5*d^3*b^2)+6*c^2*d^2*b*(12*(b*c^4+a
)*c^2*d^2*b+16*c^6*d^2*b^2)+32*b^2*c^4*d^4*(b*c^4+a)+b*d^4*(b*c^4
+a)^2)+d^3*((b*c^4+a)*(8*(b*c^4+a)*b*c*d^3+48*c^5*d^3*b^2)+4*c^3*
d*b*(12*(b*c^4+a)*c^2*d^2*b+16*c^6*d^2*b^2)+48*c^5*d^3*b^2*(b*c^4
+a)+4*b*c*d^3*(b*c^4+a)^2))*x^7+1/6*(c^3*(64*(b*c^4+a)*c^3*d^5*b^
2+4*c^3*d*b*(2*(b*c^4+a)*b*d^4+68*c^4*d^4*b^2)+6*c^2*d^2*b*(8*(b*
c^4+a)*b*c*d^3+48*c^5*d^3*b^2)+4*b*c*d^3*(12*(b*c^4+a)*c^2*d^2*b+
16*c^6*d^2*b^2))+3*c^2*d*((b*c^4+a)*(2*(b*c^4+a)*b*d^4+68*c^4*d^4
*b^2)+4*c^3*d*b*(8*(b*c^4+a)*b*c*d^3+48*c^5*d^3*b^2)+6*c^2*d^2*b*
(12*(b*c^4+a)*c^2*d^2*b+16*c^6*d^2*b^2)+32*b^2*c^4*d^4*(b*c^4+a)+
b*d^4*(b*c^4+a)^2)+3*c*d^2*((b*c^4+a)*(8*(b*c^4+a)*b*c*d^3+48*c^5
*d^3*b^2)+4*c^3*d*b*(12*(b*c^4+a)*c^2*d^2*b+16*c^6*d^2*b^2)+48*c^
5*d^3*b^2*(b*c^4+a)+4*b*c*d^3*(b*c^4+a)^2)+d^3*((b*c^4+a)*(12*(b*
c^4+a)*c^2*d^2*b+16*c^6*d^2*b^2)+32*c^6*d^2*b^2*(b*c^4+a)+6*c^2*d
^2*b*(b*c^4+a)^2))*x^6+1/5*(c^3*((b*c^4+a)*(2*(b*c^4+a)*b*d^4+68*
c^4*d^4*b^2)+4*c^3*d*b*(8*(b*c^4+a)*b*c*d^3+48*c^5*d^3*b^2)+6*c^2
*d^2*b*(12*(b*c^4+a)*c^2*d^2*b+16*c^6*d^2*b^2)+32*b^2*c^4*d^4*(b*
c^4+a)+b*d^4*(b*c^4+a)^2)+3*c^2*d*((b*c^4+a)*(8*(b*c^4+a)*b*c*d^3
+48*c^5*d^3*b^2)+4*c^3*d*b*(12*(b*c^4+a)*c^2*d^2*b+16*c^6*d^2*b^2
)+48*c^5*d^3*b^2*(b*c^4+a)+4*b*c*d^3*(b*c^4+a)^2)+3*c*d^2*((b*c^4
+a)*(12*(b*c^4+a)*c^2*d^2*b+16*c^6*d^2*b^2)+32*c^6*d^2*b^2*(b*c^4
+a)+6*c^2*d^2*b*(b*c^4+a)^2)+12*d^4*(b*c^4+a)^2*c^3*b)*x^5+1/4*(c
^3*((b*c^4+a)*(8*(b*c^4+a)*b*c*d^3+48*c^5*d^3*b^2)+4*c^3*d*b*(12*
(b*c^4+a)*c^2*d^2*b+16*c^6*d^2*b^2)+48*c^5*d^3*b^2*(b*c^4+a)+4*b*
c*d^3*(b*c^4+a)^2)+3*c^2*d*((b*c^4+a)*(12*(b*c^4+a)*c^2*d^2*b+16*
c^6*d^2*b^2)+32*c^6*d^2*b^2*(b*c^4+a)+6*c^2*d^2*b*(b*c^4+a)^2)+36
*c^4*d^3*(b*c^4+a)^2*b+d^3*(b*c^4+a)^3)*x^4+1/3*(c^3*((b*c^4+a)*(
12*(b*c^4+a)*c^2*d^2*b+16*c^6*d^2*b^2)+32*c^6*d^2*b^2*(b*c^4+a)+6
*c^2*d^2*b*(b*c^4+a)^2)+36*c^5*d^2*(b*c^4+a)^2*b+3*c*d^2*(b*c^4+a
```

```
)^3)*x^3+1/2*(12*c^6*(b*c^4+a)^2*d*b+3*c^2*d*(b*c^4+a)^3)*x^2+c^3
*(b*c^4+a)^3*x
```

Maxima [A] time = 1.34622, size = 28, normalized size = 1.22

$$\frac{\left((dx+c)^4b+a\right)^4}{16\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^4*b + a)^3*(d*x + c)^3,x, algorithm="maxima")
```

```
[Out] 1/16*((d*x + c)^4*b + a)^4/(b*d)
```

Fricas [A] time = 0.182283, size = 1, normalized size = 0.04

$$\frac{1}{16}x^{16}d^{15}b^3 + x^{15}d^{14}cb^3 + \frac{15}{2}x^{14}d^{13}c^2b^3 + 35x^{13}d^{12}c^3b^3 + \frac{455}{4}x^{12}d^{11}c^4b^3 + 273x^{11}d^{10}c^5b^3 + \frac{1001}{2}x^{10}d^9c^6b^3 + 715x^9d^8c^7b^3 + \frac{6435}{8}x^8d^7c^8b^3 + \frac{1}{4}x^{12}d^{11}b^2a + 715x^7d^6c^9b^3 + 3x^{11}d^{10}cb^2a + \frac{1001}{2}x^6d^5c^{10}b^3 + \frac{33}{2}x^{10}d^9c^2b^2a + 273x^5d^4c^{11}b^3 + 55x^9d^8c^3b^2a + \frac{455}{4}x^4d^3c^{12}b^3 + \frac{495}{4}x^8d^7c^4b^2a + 35x^3d^2c^{13}b^3 + 198x^7d^6c^5b^2a + \frac{15}{2}x^2dc^{14}b^3 + 231x^6d^5c^6b^2a + xc^{15}b^3 + 198x^5d^4c^7b^2a + \frac{495}{4}x^4d^3c^8b^2a + \frac{3}{8}x^8d^7ba^2 + 55x^3d^2c^9b^2a + 3x^7d^6cba^2 + \frac{33}{2}x^2dc^{10}b^2a + \frac{21}{2}x^6d^5c^2ba^2 + 3xc^{11}b^2a + 21x^5d^4c^3ba^2 + \frac{105}{4}x^4d^3c^4ba^2 + 21x^3d^2c^5ba^2 + \frac{21}{2}x^2dc^6ba^2 + 3xc^7ba^2 + \frac{1}{4}x^4d^3a^3 + x^3d^2ca^3 + \frac{3}{2}x^2dc^2a^3 + xc^3a^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^4*b + a)^3*(d*x + c)^3,x, algorithm="fricas")
```

```
[Out] 1/16*x^16*d^15*b^3 + x^15*d^14*c*b^3 + 15/2*x^14*d^13*c^2*b^3 + 3
5*x^13*d^12*c^3*b^3 + 455/4*x^12*d^11*c^4*b^3 + 273*x^11*d^10*c^5
*b^3 + 1001/2*x^10*d^9*c^6*b^3 + 715*x^9*d^8*c^7*b^3 + 6435/8*x^8
*d^7*c^8*b^3 + 1/4*x^12*d^11*b^2*a + 715*x^7*d^6*c^9*b^3 + 3*x^11
*d^10*c*b^2*a + 1001/2*x^6*d^5*c^10*b^3 + 33/2*x^10*d^9*c^2*b^2*a
 + 273*x^5*d^4*c^11*b^3 + 55*x^9*d^8*c^3*b^2*a + 455/4*x^4*d^3*c^
12*b^3 + 495/4*x^8*d^7*c^4*b^2*a + 35*x^3*d^2*c^13*b^3 + 198*x^7*
d^6*c^5*b^2*a + 15/2*x^2*d*c^14*b^3 + 231*x^6*d^5*c^6*b^2*a + x*c
^15*b^3 + 198*x^5*d^4*c^7*b^2*a + 495/4*x^4*d^3*c^8*b^2*a + 3/8*x
^8*d^7*b*a^2 + 55*x^3*d^2*c^9*b^2*a + 3*x^7*d^6*c*b*a^2 + 33/2*x^
2*d*c^10*b^2*a + 21/2*x^6*d^5*c^2*b*a^2 + 3*x*c^11*b^2*a + 21*x^5
*d^4*c^3*b*a^2 + 105/4*x^4*d^3*c^4*b*a^2 + 21*x^3*d^2*c^5*b*a^2 +
 21/2*x^2*d*c^6*b*a^2 + 3*x*c^7*b*a^2 + 1/4*x^4*d^3*a^3 + x^3*d^2
*c*a^3 + 3/2*x^2*d*c^2*a^3 + x*c^3*a^3
```

Sympy [A] time = 0.471586, size = 541, normalized size = 23.52

$$35b^3c^3d^{12}x^{13} + \frac{15b^3c^2d^{13}x^{14}}{2} + b^3cd^{14}x^{15} + \frac{b^3d^{15}x^{16}}{16} + x^{12}\left(\frac{ab^2d^{11}}{4} + \frac{455b^3c^4d^{11}}{4}\right) + x^{11}\left(3ab^2cd^{10} + 273b^3c^5d^{10}\right) + x^{10}\left(\frac{33ab^2c^2d^9}{2} + \frac{1001b^3c^6d^9}{2}\right) + x^9\left(55ab^2c^3d^8 + 715b^3c^7d^8\right) + x^8\left(\frac{3a^2bd^7}{8} + \frac{495ab^2c^4d^7}{4} + \frac{6435b^3c^8d^7}{8}\right) + x^7\left(3a^2bcd^6 + 198ab^2c^5d^6 + 715b^3c^9d^6\right) + x^6\left(\frac{21a^2bc^2d^5}{2} + 231ab^2c^6d^5 + \frac{1001b^3c^{10}d^5}{2}\right) + x^5\left(21a^2bc^3d^4 + 198ab^2c^7d^4 + 273b^3c^{11}d^4\right) + x^4\left(\frac{a^3d^3}{4} + \frac{105a^2bc^4d^3}{4} + \frac{495ab^2c^8d^3}{4} + \frac{455b^3c^{12}d^3}{4}\right) + x^3\left(a^3cd^2 + 21a^2bc^5d^2 + 55ab^2c^9d^2 + 35b^3c^{13}d^2\right) + x^2\left(\frac{3a^3c^2d}{2} + \frac{21a^2bc^6d}{2} + \frac{33ab^2c^{10}d}{2} + \frac{15b^3c^{14}d}{2}\right) + x\left(a^3c^3 + 3a^2bc^7 + 3ab^2c^{11} + b^3c^{15}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**3*(a+b*(d*x+c)**4)**3,x)
```

```
[Out] 35*b**3*c**3*d**12*x**13 + 15*b**3*c**2*d**13*x**14/2 + b**3*c*d*
*14*x**15 + b**3*d**15*x**16/16 + x**12*(a*b**2*d**11/4 + 455*b**
3*c**4*d**11/4) + x**11*(3*a*b**2*c*d**10 + 273*b**3*c**5*d**10)
+ x**10*(33*a*b**2*c**2*d**9/2 + 1001*b**3*c**6*d**9/2) + x**9*(5
5*a*b**2*c**3*d**8 + 715*b**3*c**7*d**8) + x**8*(3*a**2*b*d**7/8
+ 495*a*b**2*c**4*d**7/4 + 6435*b**3*c**8*d**7/8) + x**7*(3*a**2*
b*c*d**6 + 198*a*b**2*c**5*d**6 + 715*b**3*c**9*d**6) + x**6*(21*
a**2*b*c**2*d**5/2 + 231*a*b**2*c**6*d**5 + 1001*b**3*c**10*d**5/
2) + x**5*(21*a**2*b*c**3*d**4 + 198*a*b**2*c**7*d**4 + 273*b**3*
c**11*d**4) + x**4*(a**3*d**3/4 + 105*a**2*b*c**4*d**3/4 + 495*a*
b**2*c**8*d**3/4 + 455*b**3*c**12*d**3/4) + x**3*(a**3*c*d**2 + 2
1*a**2*b*c**5*d**2 + 55*a*b**2*c**9*d**2 + 35*b**3*c**13*d**2) +
x**2*(3*a**3*c**2*d/2 + 21*a**2*b*c**6*d/2 + 33*a*b**2*c**10*d/2
+ 15*b**3*c**14*d/2) + x*(a**3*c**3 + 3*a**2*b*c**7 + 3*a*b**2*c*
*11 + b**3*c**15)
```

GIAC/XCAS [A] time = 0.216352, size = 28, normalized size = 1.22

$$\frac{\left((dx+c)^4b+a\right)^4}{16\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((d*x + c)^4*b + a)^3*(d*x + c)^3,x, algorithm="giac")
```

```
[Out] 1/16*((d*x + c)^4*b + a)^4/(b*d)
```

3.2907 $\int \frac{(c+dx)^3}{a+b(c+dx)^4} dx$

Optimal. Leaf size=22

$$\frac{\log(a+b(c+dx)^4)}{4bd}$$

```
[Out] Log[a + b*(c + d*x)^4]/(4*b*d)
```

Rubi [A] time = 0.0200594, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$

$$\frac{\log(a+b(c+dx)^4)}{4bd}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)^3/(a + b*(c + d*x)^4),x]
```

```
[Out] Log[a + b*(c + d*x)^4]/(4*b*d)
```

Rubi in Sympy [A] time = 3.96708, size = 15, normalized size = 0.68

$$\frac{\log(a+b(c+dx)^4)}{4bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**3/(a+b*(d*x+c)**4),x)
```

```
[Out] log(a + b*(c + d*x)**4)/(4*b*d)
```

Mathematica [A] time = 0.0149451, size = 22, normalized size = 1.

$$\frac{\log(a+b(c+dx)^4)}{4bd}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c + d*x)^3/(a + b*(c + d*x)^4),x]
```

```
[Out] Log[a + b*(c + d*x)^4]/(4*b*d)
```

Maple [B] time = 0.002, size = 55, normalized size = 2.5

$$\frac{\ln(bd^4x^4+4bcd^3x^3+6bc^2d^2x^2+4bc^3dx+bc^4+a)}{4bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^3/(a+b*(d*x+c)^4),x)
```

```
[Out] 1/4/b/d*ln(b*d^4*x^4+4*b*c*d^3*x^3+6*b*c^2*d^2*x^2+4*b*c^3*d*x+b*
c^4+a)
```

Maxima [A] time = 1.37055, size = 27, normalized size = 1.23

$$\frac{\log\left((dx+c)^4b+a\right)}{4\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^3/((d*x + c)^4*b + a),x, algorithm="maxima")
```

```
[Out] 1/4*log((d*x + c)^4*b + a)/(b*d)
```

Fricas [A] time = 0.200964, size = 73, normalized size = 3.32

$$\frac{\log\left(bd^4x^4+4\,bcd^3x^3+6\,bc^2d^2x^2+4\,bc^3dx+bc^4+a\right)}{4\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^3/((d*x + c)^4*b + a),x, algorithm="fricas")
```

```
[Out] 1/4*log(b*d^4*x^4 + 4*b*c*d^3*x^3 + 6*b*c^2*d^2*x^2 + 4*b*c^3*d*x
 + b*c^4 + a)/(b*d)
```

Sympy [A] time = 1.84045, size = 56, normalized size = 2.55

$$\frac{\log\left(a+bc^4+4bc^3dx+6bc^2d^2x^2+4bcd^3x^3+bd^4x^4\right)}{4bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**3/(a+b*(d*x+c)**4),x)
```

```
[Out] log(a + b*c**4 + 4*b*c**3*d*x + 6*b*c**2*d**2*x**2 + 4*b*c*d**3*x
**3 + b*d**4*x**4)/(4*b*d)
```

GIAC/XCAS [A] time = 0.217113, size = 28, normalized size = 1.27

$$\frac{\ln\left(\left|(dx+c)^4b+a\right|\right)}{4\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^3/((d*x + c)^4*b + a),x, algorithm="giac")
```

```
[Out] 1/4*ln(abs((d*x + c)^4*b + a))/(b*d)
```

3.2908 $\int \frac{(c+dx)^3}{(a+b(c+dx)^4)^2} dx$

Optimal. Leaf size=23

$$-\frac{1}{4bd(a+b(c+dx)^4)}$$

```
[Out] -1/(4*b*d*(a + b*(c + d*x)^4))
```

Rubi [A] time = 0.0206373, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$

$$-\frac{1}{4bd(a+b(c+dx)^4)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)^3/(a + b*(c + d*x)^4)^2,x]

[Out] -1/(4*b*d*(a + b*(c + d*x)^4))
```

Rubi in Sympy [A] time = 3.90277, size = 17, normalized size = 0.74

$$-\frac{1}{4bd\left(a+b\left(c+dx\right)^4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**3/(a+b*(d*x+c)**4)**2,x)

[Out] -1/(4*b*d*(a + b*(c + d*x)**4))
```

Mathematica [A] time = 0.0188896, size = 23, normalized size = 1.

$$-\frac{1}{4bd(a+b(c+dx)^4)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c + d*x)^3/(a + b*(c + d*x)^4)^2,x]

[Out] -1/(4*b*d*(a + b*(c + d*x)^4))
```

Maple [B] time = 0., size = 56, normalized size = 2.4

$$-\frac{1}{4\,bd\,(bd^4x^4+4\,bcd^3x^3+6\,bc^2d^2x^2+4\,bc^3dx+bc^4+a)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^3/(a+b*(d*x+c)^4)^2,x)

[Out] -1/4/b/d/(b*d^4*x^4+4*b*c*d^3*x^3+6*b*c^2*d^2*x^2+4*b*c^3*d*x+b*c
^4+a)
```

Maxima [A] time = 1.39415, size = 28, normalized size = 1.22

$$-\frac{1}{4\left((dx+c)^4b+a\right)bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^3/((d*x + c)^4*b + a)^2,x, algorithm="maxima")
```

```
[Out] -1/4/(((d*x + c)^4*b + a)*b*d)
```

Fricas [A] time = 0.208661, size = 89, normalized size = 3.87

$$-\frac{1}{4\left(b^2d^5x^4+4\,b^2cd^4x^3+6\,b^2c^2d^3x^2+4\,b^2c^3d^2x+(b^2c^4+ab)d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^3/((d*x + c)^4*b + a)^2,x, algorithm="fricas")
```

```
[Out] -1/4/(b^2*d^5*x^4 + 4*b^2*c*d^4*x^3 + 6*b^2*c^2*d^3*x^2 + 4*b^2*c
^3*d^2*x + (b^2*c^4 + a*b)*d)
```

Sympy [A] time = 22.2603, size = 73, normalized size = 3.17

$$-\frac{1}{4abd+4b^2c^4d+16b^2c^3d^2x+24b^2c^2d^3x^2+16b^2cd^4x^3+4b^2d^5x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**3/(a+b*(d*x+c)**4)**2,x)
```

```
[Out] -1/(4*a*b*d + 4*b**2*c**4*d + 16*b**2*c**3*d**2*x + 24*b**2*c**2*
d**3*x**2 + 16*b**2*c*d**4*x**3 + 4*b**2*d**5*x**4)
```

GIAC/XCAS [A] time = 0.213658, size = 28, normalized size = 1.22

$$-\frac{1}{4\left((dx+c)^4b+a\right)bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^3/((d*x + c)^4*b + a)^2,x, algorithm="giac")
```

```
[Out] -1/4/(((d*x + c)^4*b + a)*b*d)
```

3.2909 $\int \frac{(c+dx)^3}{(a+b(c+dx)^4)^3} dx$

Optimal. Leaf size=23

$$-\frac{1}{8bd(a+b(c+dx)^4)^2}$$

```
[Out] -1/(8*b*d*(a + b*(c + d*x)^4)^2)
```

Rubi [A] time = 0.020174, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$

$$-\frac{1}{8bd(a+b(c+dx)^4)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)^3/(a + b*(c + d*x)^4)^3,x]

[Out] -1/(8*b*d*(a + b*(c + d*x)^4)^2)
```

Rubi in Sympy [A] time = 3.89651, size = 19, normalized size = 0.83

$$-\frac{1}{8bd\left(a+b(c+dx)^4\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**3/(a+b*(d*x+c)**4)**3,x)

[Out] -1/(8*b*d*(a + b*(c + d*x)**4)**2)
```

Mathematica [A] time = 0.0176387, size = 23, normalized size = 1.

$$-\frac{1}{8bd(a+b(c+dx)^4)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c + d*x)^3/(a + b*(c + d*x)^4)^3,x]

[Out] -1/(8*b*d*(a + b*(c + d*x)^4)^2)
```

Maple [B] time = 0.001, size = 56, normalized size = 2.4

$$-\frac{1}{8\,bd\left(bd^4x^4+4\,bcd^3x^3+6\,bc^2d^2x^2+4\,bc^3dx+bc^4+a\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^3/(a+b*(d*x+c)^4)^3,x)
```

```
[Out] -1/8/b/d/(b*d^4*x^4+4*b*c*d^3*x^3+6*b*c^2*d^2*x^2+4*b*c^3*d*x+b*c
^4+a)^2
```

Maxima [A] time = 1.48478, size = 28, normalized size = 1.22

$$-\frac{1}{8\left((dx+c)^4b+a\right)^2bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^3/((d*x + c)^4*b + a)^3,x, algorithm="maxima")
```

```
[Out] -1/8/(((d*x + c)^4*b + a)^2*b*d)
```

Fricas [A] time = 0.276838, size = 232, normalized size = 10.09

$$-\frac{1}{8\left(b^3d^9x^8+8\,b^3cd^8x^7+28\,b^3c^2d^7x^6+56\,b^3c^3d^6x^5+2\,(35\,b^3c^4+ab^2)d^5x^4+8\,(7\,b^3c^5+ab^2c)d^4x^3+4\,(7\,b^3c^6+3\,ab^2c^2)d^3x\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^3/((d*x + c)^4*b + a)^3,x, algorithm="fricas")
```

```
[Out] -1/8/(b^3*d^9*x^8 + 8*b^3*c*d^8*x^7 + 28*b^3*c^2*d^7*x^6 + 56*b^3
*c^3*d^6*x^5 + 2*(35*b^3*c^4 + a*b^2)*d^5*x^4 + 8*(7*b^3*c^5 + a*
b^2*c)*d^4*x^3 + 4*(7*b^3*c^6 + 3*a*b^2*c^2)*d^3*x^2 + 8*(b^3*c^7
 + a*b^2*c^3)*d^2*x + (b^3*c^8 + 2*a*b^2*c^4 + a^2*b)*d)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**3/(a+b*(d*x+c)**4)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.213784, size = 28, normalized size = 1.22

$$-\frac{1}{8\left((dx+c)^4b+a\right)^2bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x + c)^3/((d*x + c)^4*b + a)^3,x, algorithm="giac")
```

```
[Out] -1/8/(((d*x + c)^4*b + a)^2*b*d)
```

3.2910 $\int \frac{1}{\sqrt{a+b(c+dx)^4}}\,dx$

Optimal. Leaf size=111

$$\frac{\left(\sqrt{a}+\sqrt{b}(c+dx)^2\right)\sqrt{\frac{a+b(c+dx)^4}{\left(\sqrt{a}+\sqrt{b}(c+dx)^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}(c+dx)}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{2\sqrt[4]{a}\sqrt[4]{b}d\sqrt{a+b(c+dx)^4}}$$

```
[Out] ((Sqrt[a] + Sqrt[b]*(c + d*x)^2)*Sqrt[(a + b*(c + d*x)^4)/(Sqrt[a
] + Sqrt[b]*(c + d*x)^2)^2]*EllipticF[2*ArcTan[(b^(1/4)*(c + d*x)
)/a^(1/4)], 1/2])/(2*a^(1/4)*b^(1/4)*d*Sqrt[a + b*(c + d*x)^4])
```

Rubi [A] time = 0.206459, antiderivative size = 111, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{\left(\sqrt{a}+\sqrt{b}(c+dx)^2\right)\sqrt{\frac{a+b(c+dx)^4}{\left(\sqrt{a}+\sqrt{b}(c+dx)^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}(c+dx)}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{2\sqrt[4]{a}\sqrt[4]{b}d\sqrt{a+b(c+dx)^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[a + b*(c + d*x)^4],x]
```

```
[Out] ((Sqrt[a] + Sqrt[b]*(c + d*x)^2)*Sqrt[(a + b*(c + d*x)^4)/(Sqrt[a
] + Sqrt[b]*(c + d*x)^2)^2]*EllipticF[2*ArcTan[(b^(1/4)*(c + d*x)
)/a^(1/4)], 1/2])/(2*a^(1/4)*b^(1/4)*d*Sqrt[a + b*(c + d*x)^4])
```

Rubi in Sympy [A] time = 6.97208, size = 97, normalized size = 0.87

$$\frac{\sqrt{\frac{a+b(c+dx)^4}{\left(\sqrt{a}+\sqrt{b}(c+dx)^2\right)^2}}\left(\sqrt{a}+\sqrt{b}\,(c+dx)^2\right)F\left(2\,\mathrm{atan}\left(\frac{\sqrt[4]{b}(c+dx)}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{2\sqrt[4]{a}\sqrt[4]{b}d\sqrt{a+b\,(c+dx)^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*(d*x+c)**4)**(1/2),x)
```

```
[Out] sqrt((a + b*(c + d*x)**4)/(sqrt(a) + sqrt(b)*(c + d*x)**2)**2)*(s
qrt(a) + sqrt(b)*(c + d*x)**2)*elliptic_f(2*atan(b**(1/4)*(c + d*
x)/a**(1/4)), 1/2)/(2*a**(1/4)*b**(1/4)*d*sqrt(a + b*(c + d*x)**4
))
```

Mathematica [C] time = 0.0934418, size = 90, normalized size = 0.81

$$-\frac{i\sqrt{\frac{a+b(c+dx)^4}{a}}F\left(i\sinh^{-1}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}(c+dx)\right)\middle|-1\right)}{d\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\sqrt{a+b(c+dx)^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/Sqrt[a + b*(c + d*x)^4],x]
```

```
[Out] ((-I)*Sqrt[(a + b*(c + d*x)^4)/a]*EllipticF[I*ArcSinh[Sqrt[(I*Sqr
t[b])/Sqrt[a]]*(c + d*x)], -1])/(Sqrt[(I*Sqrt[b])/Sqrt[a]]*d*Sqrt
[a + b*(c + d*x)^4])
```

Maple [C] time = 0.345, size = 1036, normalized size = 9.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*(d*x+c)^4)^(1/2),x)
```

```
[Out] 2*((1/b*(-a*b^3)^(1/4)-c)/d-(-I/b*(-a*b^3)^(1/4)-c)/d)*(((-I/b*(-
a*b^3)^(1/4)-c)/d-(I/b*(-a*b^3)^(1/4)-c)/d)*(x-(1/b*(-a*b^3)^(1/4
)-c)/d)/((-I/b*(-a*b^3)^(1/4)-c)/d-(1/b*(-a*b^3)^(1/4)-c)/d)/(x-(
I/b*(-a*b^3)^(1/4)-c)/d))^(1/2)*(x-(I/b*(-a*b^3)^(1/4)-c)/d)^2*((
(I/b*(-a*b^3)^(1/4)-c)/d-(1/b*(-a*b^3)^(1/4)-c)/d)*(x-(-1/b*(-a*b
^3)^(1/4)-c)/d)/((-1/b*(-a*b^3)^(1/4)-c)/d-(1/b*(-a*b^3)^(1/4)-c)
/d)/(x-(I/b*(-a*b^3)^(1/4)-c)/d))^(1/2)*(((I/b*(-a*b^3)^(1/4)-c)/
d-(1/b*(-a*b^3)^(1/4)-c)/d)*(x-(-I/b*(-a*b^3)^(1/4)-c)/d)/((-I/b*
(-a*b^3)^(1/4)-c)/d-(1/b*(-a*b^3)^(1/4)-c)/d)/(x-(I/b*(-a*b^3)^(1
/4)-c)/d))^(1/2)/((-I/b*(-a*b^3)^(1/4)-c)/d-(I/b*(-a*b^3)^(1/4)-c
)/d)/((I/b*(-a*b^3)^(1/4)-c)/d-(1/b*(-a*b^3)^(1/4)-c)/d)/(b*d^4*(
x-(1/b*(-a*b^3)^(1/4)-c)/d)*(x-(I/b*(-a*b^3)^(1/4)-c)/d)*(x-(-1/b
*(-a*b^3)^(1/4)-c)/d)*(x-(-I/b*(-a*b^3)^(1/4)-c)/d))^(1/2)*Ellipt
icF((((-I/b*(-a*b^3)^(1/4)-c)/d-(I/b*(-a*b^3)^(1/4)-c)/d)*(x-(1/b
*(-a*b^3)^(1/4)-c)/d)/((-I/b*(-a*b^3)^(1/4)-c)/d-(1/b*(-a*b^3)^(1
/4)-c)/d)/(x-(I/b*(-a*b^3)^(1/4)-c)/d))^(1/2),(((I/b*(-a*b^3)^(1/
4)-c)/d-(-1/b*(-a*b^3)^(1/4)-c)/d)*((1/b*(-a*b^3)^(1/4)-c)/d-(-I/
b*(-a*b^3)^(1/4)-c)/d)/((1/b*(-a*b^3)^(1/4)-c)/d-(-1/b*(-a*b^3)^(
1/4)-c)/d)/((I/b*(-a*b^3)^(1/4)-c)/d-(-I/b*(-a*b^3)^(1/4)-c)/d))^
(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{(dx+c)^4 b + a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt((d*x + c)^4*b + a),x, algorithm="maxima")
```

```
[Out] integrate(1/sqrt((d*x + c)^4*b + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{\sqrt{bd^4x^4 + 4\,bcd^3x^3 + 6\,bc^2d^2x^2 + 4\,bc^3dx + bc^4 + a}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt((d*x + c)^4*b + a),x, algorithm="fricas")
```

```
[Out] integral(1/sqrt(b*d^4*x^4 + 4*b*c*d^3*x^3 + 6*b*c^2*d^2*x^2 + 4*b
*c^3*d*x + b*c^4 + a), x)
```

Sympy [A] time = 2.99818, size = 46, normalized size = 0.41

$$\frac{\left(\frac{c}{d}+x\right)\left(\frac{1}{4}\right){}_2F_1\left(\begin{matrix}\frac{1}{4},\frac{1}{2}\\ \frac{5}{4}\end{matrix}\middle|\frac{bd^4\left(\frac{c}{d}+x\right)^4e^{i\pi}}{a}\right)}{4\sqrt{a}\left(\frac{5}{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*(d*x+c)**4)**(1/2),x)
```

```
[Out] (c/d + x)*gamma(1/4)*hyper((1/4, 1/2), (5/4,), b*d**4*(c/d + x)**
4*exp_polar(I*pi)/a)/(4*sqrt(a)*gamma(5/4))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{(dx+c)^4b+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt((d*x + c)^4*b + a),x, algorithm="giac")
```

```
[Out] integrate(1/sqrt((d*x + c)^4*b + a), x)
```

3.2911 $\int \frac{x}{\sqrt{a+b(c+dx)^4}}\,dx$

Optimal. Leaf size=154

$$\frac{\tanh^{-1}\left(\frac{\sqrt{b}(c+dx)^2}{\sqrt{a+b(c+dx)^4}}\right)}{2\sqrt{b}d^2}-\frac{c\left(\sqrt{a}+\sqrt{b}(c+dx)^2\right)\sqrt{\frac{a+b(c+dx)^4}{\left(\sqrt{a}+\sqrt{b}(c+dx)^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}(c+dx)}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{2\sqrt[4]{a}\sqrt[4]{b}d^2\sqrt{a+b(c+dx)^4}}$$

```
[Out] ArcTanh[(Sqrt[b]*(c + d*x)^2)/Sqrt[a + b*(c + d*x)^4]]/(2*Sqrt[b]
*d^2) - (c*(Sqrt[a] + Sqrt[b]*(c + d*x)^2)*Sqrt[(a + b*(c + d*x)^
4)/(Sqrt[a] + Sqrt[b]*(c + d*x)^2)^2]*EllipticF[2*ArcTan[(b^(1/4)
*(c + d*x))/a^(1/4)], 1/2])/(2*a^(1/4)*b^(1/4)*d^2*Sqrt[a + b*(c
+ d*x)^4])
```

Rubi [A] time = 0.369664, antiderivative size = 154, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.353

$$\frac{\tanh^{-1}\left(\frac{\sqrt{b}(c+dx)^2}{\sqrt{a+b(c+dx)^4}}\right)}{2\sqrt{b}d^2}-\frac{c\left(\sqrt{a}+\sqrt{b}(c+dx)^2\right)\sqrt{\frac{a+b(c+dx)^4}{\left(\sqrt{a}+\sqrt{b}(c+dx)^2\right)^2}}F\left(2\tan^{-1}\left(\frac{\sqrt[4]{b}(c+dx)}{\sqrt[4]{a}}\right)|\frac{1}{2}\right)}{2\sqrt[4]{a}\sqrt[4]{b}d^2\sqrt{a+b(c+dx)^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[x/Sqrt[a + b*(c + d*x)^4],x]
```

```
[Out] ArcTanh[(Sqrt[b]*(c + d*x)^2)/Sqrt[a + b*(c + d*x)^4]]/(2*Sqrt[b]
*d^2) - (c*(Sqrt[a] + Sqrt[b]*(c + d*x)^2)*Sqrt[(a + b*(c + d*x)^
4)/(Sqrt[a] + Sqrt[b]*(c + d*x)^2)^2]*EllipticF[2*ArcTan[(b^(1/4)
*(c + d*x))/a^(1/4)], 1/2])/(2*a^(1/4)*b^(1/4)*d^2*Sqrt[a + b*(c
+ d*x)^4])
```

Rubi in Sympy [A] time = 18.7274, size = 138, normalized size = 0.9

$$\frac{\operatorname{atanh}\left(\frac{\sqrt{b}(c+dx)^2}{\sqrt{a+b(c+dx)^4}}\right)}{2\sqrt{b}d^2}-\frac{c\sqrt{\frac{a+b(c+dx)^4}{\left(\sqrt{a}+\sqrt{b}(c+dx)^2\right)^2}}\left(\sqrt{a}+\sqrt{b}\,(c+dx)^2\right)F\left(2\operatorname{atan}\left(\frac{\sqrt[4]{b}(c+dx)}{\sqrt[4]{a}}\right)\middle|\frac{1}{2}\right)}{2\sqrt[4]{a}\sqrt[4]{b}d^2\sqrt{a+b\,(c+dx)^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b*(d*x+c)**4)**(1/2),x)
```

```
[Out] atanh(sqrt(b)*(c + d*x)**2/sqrt(a + b*(c + d*x)**4))/(2*sqrt(b)*d
**2) - c*sqrt((a + b*(c + d*x)**4)/(sqrt(a) + sqrt(b)*(c + d*x)**
2)**2)*(sqrt(a) + sqrt(b)*(c + d*x)**2)*elliptic_f(2*atan(b**(1/4
)*(c + d*x)/a**(1/4)), 1/2)/(2*a**(1/4)*b**(1/4)*d**2*sqrt(a + b*
(c + d*x)**4))
```

Mathematica [C] time = 0.895832, size = 330, normalized size = 2.14

$$\frac{\sqrt[4]{-1}\sqrt{2}\sqrt{-\frac{i\left(\sqrt[4]{-1}\sqrt[4]{a}+\sqrt[4]{b}(c+dx)\right)}{\sqrt[4]{-1}\sqrt[4]{a}-\sqrt[4]{b}(c+dx)}}\left(\sqrt{b}(c+dx)^2+i\sqrt{a}\right)\left(\left(\sqrt[4]{-1}\sqrt[4]{a}-\sqrt[4]{b}c\right)F\left(\sin^{-1}\left(\sqrt{-\frac{i\left(\sqrt[4]{b}(c+dx)+\sqrt[4]{-1}\sqrt[4]{a}\right)}{\sqrt[4]{-1}\sqrt[4]{a}-\sqrt[4]{b}(c+dx)}}\right)\middle|-1\right)-2\sqrt[4]{-1}}{\sqrt[4]{a}\sqrt{b}d^2\sqrt{\frac{\sqrt{b}(c+dx)^2+i\sqrt{a}}{\left(\sqrt[4]{-1}\sqrt[4]{a}-\sqrt[4]{b}(c+dx)\right)^2}}\sqrt{a+b(c+dx)^4}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/Sqrt[a + b*(c + d*x)^4],x]
```

```
[Out] ((-1)^(1/4)*Sqrt[2]*Sqrt[((-I)*((-1)^(1/4)*a^(1/4) + b^(1/4)*(c +
 d*x)))/((-1)^(1/4)*a^(1/4) - b^(1/4)*(c + d*x))]*(I*Sqrt[a] + Sq
rt[b]*(c + d*x)^2)*(((-1)^(1/4)*a^(1/4) - b^(1/4)*c)*EllipticF[Ar
cSin[Sqrt[((-I)*((-1)^(1/4)*a^(1/4) + b^(1/4)*(c + d*x)))/((-1)^(
1/4)*a^(1/4) - b^(1/4)*(c + d*x))]], -1] - 2*(-1)^(1/4)*a^(1/4)*E
llipticPi[-I, ArcSin[Sqrt[((-I)*((-1)^(1/4)*a^(1/4) + b^(1/4)*(c
+ d*x)))/((-1)^(1/4)*a^(1/4) - b^(1/4)*(c + d*x))]], -1]))/(a^(1/
4)*Sqrt[b]*d^2*Sqrt[(I*Sqrt[a] + Sqrt[b]*(c + d*x)^2)/((-1)^(1/4)
*a^(1/4) - b^(1/4)*(c + d*x))^2]*Sqrt[a + b*(c + d*x)^4])
```

Maple [C] time = 0.038, size = 1528, normalized size = 9.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+b*(d*x+c)^4)^(1/2),x)
```

```
[Out] 2*((1/b*(-a*b^3)^(1/4)-c)/d-(-I/b*(-a*b^3)^(1/4)-c)/d)*(((-I/b*(-
a*b^3)^(1/4)-c)/d-(I/b*(-a*b^3)^(1/4)-c)/d)*(x-(1/b*(-a*b^3)^(1/4
)-c)/d)/((-I/b*(-a*b^3)^(1/4)-c)/d-(1/b*(-a*b^3)^(1/4)-c)/d)/(x-(
I/b*(-a*b^3)^(1/4)-c)/d))^(1/2)*(x-(I/b*(-a*b^3)^(1/4)-c)/d)^2*((
(I/b*(-a*b^3)^(1/4)-c)/d-(1/b*(-a*b^3)^(1/4)-c)/d)*(x-(-1/b*(-a*b
^3)^(1/4)-c)/d)/((-1/b*(-a*b^3)^(1/4)-c)/d-(1/b*(-a*b^3)^(1/4)-c)
/d)/(x-(I/b*(-a*b^3)^(1/4)-c)/d))^(1/2)*(((I/b*(-a*b^3)^(1/4)-c)/
d-(1/b*(-a*b^3)^(1/4)-c)/d)*(x-(-I/b*(-a*b^3)^(1/4)-c)/d)/((-I/b*
(-a*b^3)^(1/4)-c)/d-(1/b*(-a*b^3)^(1/4)-c)/d)/(x-(I/b*(-a*b^3)^(1
/4)-c)/d))^(1/2)/((-I/b*(-a*b^3)^(1/4)-c)/d-(I/b*(-a*b^3)^(1/4)-c
)/d)/((I/b*(-a*b^3)^(1/4)-c)/d-(1/b*(-a*b^3)^(1/4)-c)/d)/(b*d^4*(
x-(1/b*(-a*b^3)^(1/4)-c)/d)*(x-(I/b*(-a*b^3)^(1/4)-c)/d)*(x-(-1/b
*(-a*b^3)^(1/4)-c)/d)*(x-(-I/b*(-a*b^3)^(1/4)-c)/d))^(1/2)*((I/b*
(-a*b^3)^(1/4)-c)/d*EllipticF((((-I/b*(-a*b^3)^(1/4)-c)/d-(I/b*(-
a*b^3)^(1/4)-c)/d)*(x-(1/b*(-a*b^3)^(1/4)-c)/d)/((-I/b*(-a*b^3)^(
1/4)-c)/d-(1/b*(-a*b^3)^(1/4)-c)/d)/(x-(I/b*(-a*b^3)^(1/4)-c)/d))
^(1/2),(((I/b*(-a*b^3)^(1/4)-c)/d-(-1/b*(-a*b^3)^(1/4)-c)/d)*((1/
b*(-a*b^3)^(1/4)-c)/d-(-I/b*(-a*b^3)^(1/4)-c)/d)/((1/b*(-a*b^3)^(
1/4)-c)/d-(-1/b*(-a*b^3)^(1/4)-c)/d)/((I/b*(-a*b^3)^(1/4)-c)/d-(-
I/b*(-a*b^3)^(1/4)-c)/d))^(1/2))+((1/b*(-a*b^3)^(1/4)-c)/d-(I/b*(
-a*b^3)^(1/4)-c)/d)*EllipticPi((((-I/b*(-a*b^3)^(1/4)-c)/d-(I/b*(
-a*b^3)^(1/4)-c)/d)*(x-(1/b*(-a*b^3)^(1/4)-c)/d)/((-I/b*(-a*b^3)^
(1/4)-c)/d-(1/b*(-a*b^3)^(1/4)-c)/d)/(x-(I/b*(-a*b^3)^(1/4)-c)/d)
)^(1/2),((-I/b*(-a*b^3)^(1/4)-c)/d-(1/b*(-a*b^3)^(1/4)-c)/d)/((-I
/b*(-a*b^3)^(1/4)-c)/d-(I/b*(-a*b^3)^(1/4)-c)/d),(((I/b*(-a*b^3)^
(1/4)-c)/d-(-1/b*(-a*b^3)^(1/4)-c)/d)*((1/b*(-a*b^3)^(1/4)-c)/d-(
-I/b*(-a*b^3)^(1/4)-c)/d)/((1/b*(-a*b^3)^(1/4)-c)/d-(-1/b*(-a*b^3
)^(1/4)-c)/d)/((I/b*(-a*b^3)^(1/4)-c)/d-(-I/b*(-a*b^3)^(1/4)-c)/d
))^(1/2)))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt{(dx+c)^4 b + a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt((d*x + c)^4*b + a),x, algorithm="maxima")
```

```
[Out] integrate(x/sqrt((d*x + c)^4*b + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x}{\sqrt{bd^4x^4 + 4\,bcd^3x^3 + 6\,bc^2d^2x^2 + 4\,bc^3dx + bc^4 + a}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt((d*x + c)^4*b + a),x, algorithm="fricas")
```

```
[Out] integral(x/sqrt(b*d^4*x^4 + 4*b*c*d^3*x^3 + 6*b*c^2*d^2*x^2 + 4*b
*c^3*d*x + b*c^4 + a), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt{a + bc^4 + 4bc^3dx + 6bc^2d^2x^2 + 4bcd^3x^3 + bd^4x^4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b*(d*x+c)**4)**(1/2),x)
```

```
[Out] Integral(x/sqrt(a + b*c**4 + 4*b*c**3*d*x + 6*b*c**2*d**2*x**2 +
4*b*c*d**3*x**3 + b*d**4*x**4), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt{(dx + c)^4 b + a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt((d*x + c)^4*b + a),x, algorithm="giac")
```

```
[Out] integrate(x/sqrt((d*x + c)^4*b + a), x)
```

3.2912 $\int (dx)^m \sqrt{a+b(cx)^{3/2}}\,dx$

Optimal. Leaf size=78

$$\frac{x(dx)^m\sqrt{a+b(cx)^{3/2}}\,{}_2F_1\left(-\frac{1}{2},\frac{2(m+1)}{3};\frac{1}{3}(2m+5);-\frac{b(cx)^{3/2}}{a}\right)}{(m+1)\sqrt{\frac{b(cx)^{3/2}}{a}+1}}$$

```
[Out] (x*(d*x)^m*Sqrt[a + b*(c*x)^(3/2)]*Hypergeometric2F1[-1/2, (2*(1
+ m))/3, (5 + 2*m)/3, -((b*(c*x)^(3/2))/a)])/((1 + m)*Sqrt[1 + (b
*(c*x)^(3/2))/a])
```

Rubi [A] time = 0.197142, antiderivative size = 78, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.238$

$$\frac{x(dx)^m\sqrt{a+b(cx)^{3/2}}\,{}_2F_1\left(-\frac{1}{2},\frac{2(m+1)}{3};\frac{1}{3}(2m+5);-\frac{b(cx)^{3/2}}{a}\right)}{(m+1)\sqrt{\frac{b(cx)^{3/2}}{a}+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[(d*x)^m*Sqrt[a + b*(c*x)^(3/2)],x]
```

```
[Out] (x*(d*x)^m*Sqrt[a + b*(c*x)^(3/2)]*Hypergeometric2F1[-1/2, (2*(1
+ m))/3, (5 + 2*m)/3, -((b*(c*x)^(3/2))/a)])/((1 + m)*Sqrt[1 + (b
*(c*x)^(3/2))/a])
```

Rubi in Sympy [A] time = 13.8224, size = 80, normalized size = 1.03

$$\frac{(cx)^{-m}(cx)^{m+1}(dx)^m\sqrt{a+b(cx)^{\frac{3}{2}}}\,{}_2F_1\left(\begin{matrix}-\frac{1}{2},\frac{2m}{3}+\frac{2}{3}\\ \frac{2m}{3}+\frac{5}{3}\end{matrix}\middle|-\frac{b(cx)^{\frac{3}{2}}}{a}\right)}{c\sqrt{1+\frac{b(cx)^{\frac{3}{2}}}{a}}(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x)**m*(a+b*(c*x)**(3/2))**(1/2),x)
```

```
[Out] (c*x)**(-m)*(c*x)**(m + 1)*(d*x)**m*sqrt(a + b*(c*x)**(3/2))*hype
r((-1/2, 2*m/3 + 2/3), (2*m/3 + 5/3,), -b*(c*x)**(3/2)/a)/(c*sqrt
(1 + b*(c*x)**(3/2)/a)*(m + 1))
```

Mathematica [A] time = 0.0873848, size = 79, normalized size = 1.01

$$\frac{x(dx)^m\sqrt{a+b(cx)^{3/2}}\,{}_2F_1\left(-\frac{1}{2},\frac{2(m+1)}{3};\frac{2(m+1)}{3}+1;-\frac{b(cx)^{3/2}}{a}\right)}{(m+1)\sqrt{\frac{a+b(cx)^{3/2}}{a}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(d*x)^m*Sqrt[a + b*(c*x)^(3/2)],x]
```

```
[Out] (x*(d*x)^m*Sqrt[a + b*(c*x)^(3/2)]*Hypergeometric2F1[-1/2, (2*(1
+ m))/3, 1 + (2*(1 + m))/3, -((b*(c*x)^(3/2))/a)])/((1 + m)*Sqrt[
```

```
(a + b*(c*x)^(3/2))/a])
```

Maple [F] time = 0.067, size = 0, normalized size = 0.

$$\int (dx)^{m} \sqrt{a+b\,(cx)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x)^m*(a+b*(c*x)^(3/2))^(1/2),x)

[Out] int((d*x)^m*(a+b*(c*x)^(3/2))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{(cx)^{\frac{3}{2}}\,b+a}\,(dx)^{m}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x)^(3/2)*b + a)*(d*x)^m,x, algorithm="maxima")

[Out] integrate(sqrt((c*x)^(3/2)*b + a)*(d*x)^m, x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x)^(3/2)*b + a)*(d*x)^m,x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^{m} \sqrt{a+b\,(cx)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)**m*(a+b*(c*x)**(3/2))**(1/2),x)

[Out] Integral((d*x)**m*sqrt(a + b*(c*x)**(3/2)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{(cx)^{\frac{3}{2}}\,b+a}\,(dx)^{m}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x)^(3/2)*b + a)*(d*x)^m,x, algorithm="giac")

[Out] integrate(sqrt((c*x)^(3/2)*b + a)*(d*x)^m, x)
```

3.2913 $\int (dx)^m \sqrt{a+b\sqrt{cx}}\,dx$

Optimal. Leaf size=74

$$-\frac{4a(dx)^m\left(a+b\sqrt{cx}\right)^{3/2}\left(-\frac{b\sqrt{cx}}{a}\right)^{-2m}{}_2F_1\left(\frac{3}{2},-2m-1;\frac{5}{2};\frac{\sqrt{cx}b}{a}+1\right)}{3b^2c}$$

```
[Out] (-4*a*(d*x)^m*(a + b*Sqrt[c*x])^(3/2)*Hypergeometric2F1[3/2, -1 -
 2*m, 5/2, 1 + (b*Sqrt[c*x])/a])/(3*b^2*c*(-((b*Sqrt[c*x])/a))^(2
*m))
```

Rubi [A] time = 0.161698, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238

$$-\frac{4a(dx)^m\left(a+b\sqrt{cx}\right)^{3/2}\left(-\frac{b\sqrt{cx}}{a}\right)^{-2m}{}_2F_1\left(\frac{3}{2},-2m-1;\frac{5}{2};\frac{\sqrt{cx}b}{a}+1\right)}{3b^2c}$$

Antiderivative was successfully verified.

```
[In] Int[(d*x)^m*Sqrt[a + b*Sqrt[c*x]],x]
```

```
[Out] (-4*a*(d*x)^m*(a + b*Sqrt[c*x])^(3/2)*Hypergeometric2F1[3/2, -1 -
 2*m, 5/2, 1 + (b*Sqrt[c*x])/a])/(3*b^2*c*(-((b*Sqrt[c*x])/a))^(2
*m))
```

Rubi in Sympy [A] time = 14.0396, size = 66, normalized size = 0.89

$$-\frac{4a\,(dx)^m\left(-\frac{b\sqrt{cx}}{a}\right)^{-2m}\left(a+b\sqrt{cx}\right)^{\frac{3}{2}}{}_2F_1\left(\begin{matrix}-2m-1,\frac{3}{2}\\ \frac{5}{2}\end{matrix}\middle|1+\frac{b\sqrt{cx}}{a}\right)}{3b^2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((d*x)**m*(a+b*(c*x)**(1/2))**(1/2),x)
```

```
[Out] -4*a*(d*x)**m*(-b*sqrt(c*x)/a)**(-2*m)*(a + b*sqrt(c*x))**(3/2)*h
yper((-2*m - 1, 3/2), (5/2,), 1 + b*sqrt(c*x)/a)/(3*b**2*c)
```

Mathematica [A] time = 0.0720285, size = 72, normalized size = 0.97

$$\frac{x(dx)^m\sqrt{a+b\sqrt{cx}}\,{}_2F_1\left(-\frac{1}{2},2m+2;2m+3;-\frac{b\sqrt{cx}}{a}\right)}{(m+1)\sqrt{\frac{b\sqrt{cx}}{a}+1}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*x)^m*Sqrt[a + b*Sqrt[c*x]],x]
```

```
[Out] (x*(d*x)^m*Sqrt[a + b*Sqrt[c*x]]*Hypergeometric2F1[-1/2, 2 + 2*m,
 3 + 2*m, -((b*Sqrt[c*x])/a)])/((1 + m)*Sqrt[1 + (b*Sqrt[c*x])/a]
)
```

Maple [F] time = 0.053, size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a+b\sqrt{cx}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x)^m*(a+b*(c*x)^(1/2))^(1/2),x)
```

```
[Out] int((d*x)^m*(a+b*(c*x)^(1/2))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{\sqrt{cx}b+a}\,(dx)^m\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x)*b + a)*(d*x)^m,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(sqrt(c*x)*b + a)*(d*x)^m, x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x)*b + a)*(d*x)^m,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a+b\sqrt{cx}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)**m*(a+b*(c*x)**(1/2))**(1/2),x)
```

```
[Out] Integral((d*x)**m*sqrt(a + b*sqrt(c*x)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{\sqrt{cx}b+a}\,(dx)^m\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x)*b + a)*(d*x)^m,x, algorithm="giac")
```

```
[Out] integrate(sqrt(sqrt(c*x)*b + a)*(d*x)^m, x)
```

3.2914 $\int (dx)^m \sqrt{a+\frac{b}{\sqrt{cx}}}\,dx$

Optimal. Leaf size=76

$$\frac{4b^2(dx)^m \left(a+\frac{b}{\sqrt{cx}}\right)^{3/2} \left(-\frac{b}{a\sqrt{cx}}\right)^{2m} {}_2F_1\left(\frac{3}{2},2m+3;\frac{5}{2};\frac{b}{a\sqrt{cx}}+1\right)}{3a^3c}$$

```
[Out] (4*b^2*(d*x)^m*(-(b/(a*Sqrt[c*x])))^(2*m)*(a + b/Sqrt[c*x])^(3/2)
*Hypergeometric2F1[3/2, 3 + 2*m, 5/2, 1 + b/(a*Sqrt[c*x])])/(3*a^
3*c)
```

Rubi [A] time = 0.251199, antiderivative size = 76, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$

$$\frac{4b^2(dx)^m \left(a+\frac{b}{\sqrt{cx}}\right)^{3/2} \left(-\frac{b}{a\sqrt{cx}}\right)^{2m} {}_2F_1\left(\frac{3}{2},2m+3;\frac{5}{2};\frac{b}{a\sqrt{cx}}+1\right)}{3a^3c}$$

Antiderivative was successfully verified.

```
[In]  Int[(d*x)^m*Sqrt[a + b/Sqrt[c*x]],x]
```

```
[Out] (4*b^2*(d*x)^m*(-(b/(a*Sqrt[c*x])))^(2*m)*(a + b/Sqrt[c*x])^(3/2)
*Hypergeometric2F1[3/2, 3 + 2*m, 5/2, 1 + b/(a*Sqrt[c*x])])/(3*a^
3*c)
```

Rubi in Sympy [A] time = 19.3112, size = 83, normalized size = 1.09

$$\frac{4b^2 (cx)^{-m-\frac{1}{2}} (cx)^{m+\frac{1}{2}} (dx)^m \left(-\frac{b}{a\sqrt{cx}}\right)^{2m} \left(a+\frac{b}{\sqrt{cx}}\right)^{\frac{3}{2}} {}_2F_1\left(\begin{matrix} 2m+3, \frac{3}{2} \\ \frac{5}{2} \end{matrix}\middle| 1+\frac{b}{a\sqrt{cx}}\right)}{3a^3c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x)**m*(a+b/(c*x)**(1/2))**(1/2),x)
```

```
[Out] 4*b**2*(c*x)**(-m - 1/2)*(c*x)**(m + 1/2)*(d*x)**m*(-b/(a*sqrt(c*
x)))**(2*m)*(a + b/sqrt(c*x))**(3/2)*hyper((2*m + 3, 3/2), (5/2,)
, 1 + b/(a*sqrt(c*x)))/(3*a**3*c)
```

Mathematica [A] time = 0.097326, size = 79, normalized size = 1.04

$$\frac{4x(dx)^m\sqrt{a+\frac{b}{\sqrt{cx}}}\,{}_2F_1\left(-\frac{1}{2},2m+\frac{3}{2};2m+\frac{5}{2};-\frac{a\sqrt{cx}}{b}\right)}{(4m+3)\sqrt{\frac{a\sqrt{cx}}{b}+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(d*x)^m*Sqrt[a + b/Sqrt[c*x]],x]
```

```
[Out] (4*x*(d*x)^m*Sqrt[a + b/Sqrt[c*x]]*Hypergeometric2F1[-1/2, 3/2 +
2*m, 5/2 + 2*m, -((a*Sqrt[c*x])/b)])/((3 + 4*m)*Sqrt[1 + (a*Sqrt[
c*x])/b])
```

Maple [F] time = 0.065, size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a + b\frac{1}{\sqrt{cx}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x)^m*(a+b/(c*x)^(1/2))^(1/2),x)

[Out] int((d*x)^m*(a+b/(c*x)^(1/2))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a + \frac{b}{\sqrt{cx}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m*sqrt(a + b/sqrt(c*x)),x, algorithm="maxima")

[Out] integrate((d*x)^m*sqrt(a + b/sqrt(c*x)), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m*sqrt(a + b/sqrt(c*x)),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a + \frac{b}{\sqrt{cx}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)**m*(a+b/(c*x)**(1/2))**(1/2),x)

[Out] Integral((d*x)**m*sqrt(a + b/sqrt(c*x)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a + \frac{b}{\sqrt{cx}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m*sqrt(a + b/sqrt(c*x)),x, algorithm="giac")

[Out] integrate((d*x)^m*sqrt(a + b/sqrt(c*x)), x)
```

3.2915 $\int (dx)^m \sqrt{a+\frac{b}{(cx)^{3/2}}}\,dx$

Optimal. Leaf size=78

$$\frac{x(dx)^m\sqrt{a+\frac{b}{(cx)^{3/2}}}\,{}_2F_1\left(-\frac{1}{2},-\frac{2}{3}(m+1);\frac{1}{3}(1-2m);-\frac{b}{a(cx)^{3/2}}\right)}{(m+1)\sqrt{\frac{b}{a(cx)^{3/2}}+1}}$$

```
[Out] (x*(d*x)^m*Sqrt[a + b/(c*x)^(3/2)]*Hypergeometric2F1[-1/2, (-2*(1
 + m))/3, (1 - 2*m)/3, -(b/(a*(c*x)^(3/2)))])/((1 + m)*Sqrt[1 + b
/(a*(c*x)^(3/2))])
```

Rubi [A] time = 0.286943, antiderivative size = 78, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286

$$\frac{x(dx)^m\sqrt{a+\frac{b}{(cx)^{3/2}}}\,{}_2F_1\left(-\frac{1}{2},-\frac{2}{3}(m+1);\frac{1}{3}(1-2m);-\frac{b}{a(cx)^{3/2}}\right)}{(m+1)\sqrt{\frac{b}{a(cx)^{3/2}}+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[(d*x)^m*Sqrt[a + b/(c*x)^(3/2)],x]
```

```
[Out] (x*(d*x)^m*Sqrt[a + b/(c*x)^(3/2)]*Hypergeometric2F1[-1/2, (-2*(1
 + m))/3, (1 - 2*m)/3, -(b/(a*(c*x)^(3/2)))])/((1 + m)*Sqrt[1 + b
/(a*(c*x)^(3/2))])
```

Rubi in Sympy [A] time = 17.3218, size = 100, normalized size = 1.28

$$\frac{(cx)^{-m}(cx)^{-m-\frac{1}{2}}(cx)^{m+\frac{1}{2}}(cx)^{m+1}(dx)^m\sqrt{a+\frac{b}{(cx)^{\frac{3}{2}}}}\,{}_2F_1\left(\begin{matrix}-\frac{1}{2},-\frac{2m}{3}-\frac{2}{3}\\-\frac{2m}{3}+\frac{1}{3}\end{matrix}\middle|-\frac{b}{a(cx)^{\frac{3}{2}}}\right)}{c\sqrt{1+\frac{b}{a(cx)^{\frac{3}{2}}}}(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x)**m*(a+b/(c*x)**(3/2))**(1/2),x)
```

```
[Out] (c*x)**(-m)*(c*x)**(-m - 1/2)*(c*x)**(m + 1/2)*(c*x)**(m + 1)*(d*
x)**m*sqrt(a + b/(c*x)**(3/2))*hyper((-1/2, -2*m/3 - 2/3), (-2*m/
3 + 1/3,), -b/(a*(c*x)**(3/2)))/(c*sqrt(1 + b/(a*(c*x)**(3/2)))*(
m + 1))
```

Mathematica [A] time = 0.113655, size = 86, normalized size = 1.1

$$\frac{4x(dx)^m\sqrt{a+\frac{b}{(cx)^{3/2}}}\,{}_2F_1\left(-\frac{1}{2},\frac{1}{6}(4m+1);\frac{1}{6}(4m+1)+1;-\frac{a(cx)^{3/2}}{b}\right)}{(4m+1)\sqrt{\frac{a(cx)^{3/2}+b}{b}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(d*x)^m*Sqrt[a + b/(c*x)^(3/2)],x]
```

```
[Out] (4*x*(d*x)^m*Sqrt[a + b/(c*x)^(3/2)]*Hypergeometric2F1[-1/2, (1 +
 4*m)/6, 1 + (1 + 4*m)/6, -((a*(c*x)^(3/2))/b)])/((1 + 4*m)*Sqrt[
```

```
(b + a*(c*x)^(3/2))/b])
```

Maple [F] time = 0.064, size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a + b\,(cx)^{-\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x)^m*(a+b/(c*x)^(3/2))^(1/2),x)

[Out] int((d*x)^m*(a+b/(c*x)^(3/2))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a + \frac{b}{(cx)^{\frac{3}{2}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m*sqrt(a + b/(c*x)^(3/2)),x, algorithm="maxima")

[Out] integrate((d*x)^m*sqrt(a + b/(c*x)^(3/2)), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m*sqrt(a + b/(c*x)^(3/2)),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)**m*(a+b/(c*x)**(3/2))**(1/2),x)

[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a + \frac{b}{(cx)^{\frac{3}{2}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m*sqrt(a + b/(c*x)^(3/2)),x, algorithm="giac")

[Out] integrate((d*x)^m*sqrt(a + b/(c*x)^(3/2)), x)
```

3.2916 $\int (dx)^m (a+b(cx)^n)^p \, dx$

Optimal. Leaf size=73

$$\frac{(dx)^{m+1}(a+b(cx)^n)^p\left(\frac{b(cx)^n}{a}+1\right)^{-p}{}_2F_1\left(\frac{m+1}{n},-p;\frac{m+n+1}{n};-\frac{b(cx)^n}{a}\right)}{d(m+1)}$$

```
[Out] ((d*x)^(1 + m)*(a + b*(c*x)^n)^p*Hypergeometric2F1[(1 + m)/n, -p,
 (1 + m + n)/n, -((b*(c*x)^n)/a)])/(d*(1 + m)*(1 + (b*(c*x)^n)/a)
^p)
```

Rubi [A] time = 0.116388, antiderivative size = 73, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.176$

$$\frac{(dx)^{m+1}(a+b(cx)^n)^p\left(\frac{b(cx)^n}{a}+1\right)^{-p}{}_2F_1\left(\frac{m+1}{n},-p;\frac{m+n+1}{n};-\frac{b(cx)^n}{a}\right)}{d(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(d*x)^m*(a + b*(c*x)^n)^p,x]
```

```
[Out] ((d*x)^(1 + m)*(a + b*(c*x)^n)^p*Hypergeometric2F1[(1 + m)/n, -p,
 (1 + m + n)/n, -((b*(c*x)^n)/a)])/(d*(1 + m)*(1 + (b*(c*x)^n)/a)
^p)
```

Rubi in Sympy [A] time = 12.137, size = 65, normalized size = 0.89

$$\frac{(cx)^{-m}(cx)^{m+1}(dx)^m\left(1+\frac{b(cx)^n}{a}\right)^{-p}(a+b(cx)^n)^p\,{}_2F_1\left(\begin{matrix}-p,\frac{m+1}{n}\\ \frac{m+n+1}{n}\end{matrix}\middle|-\frac{b(cx)^n}{a}\right)}{c(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x)**m*(a+b*(c*x)**n)**p,x)
```

```
[Out] (c*x)**(-m)*(c*x)**(m + 1)*(d*x)**m*(1 + b*(c*x)**n/a)**(-p)*(a +
 b*(c*x)**n)**p*hyper((-p, (m + 1)/n), ((m + n + 1)/n,), -b*(c*x)
**n/a)/(c*(m + 1))
```

Mathematica [A] time = 0.122609, size = 70, normalized size = 0.96

$$\frac{x(dx)^m(a+b(cx)^n)^p\left(\frac{b(cx)^n}{a}+1\right)^{-p}{}_2F_1\left(\frac{m+1}{n},-p;\frac{m+1}{n}+1;-\frac{b(cx)^n}{a}\right)}{m+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(d*x)^m*(a + b*(c*x)^n)^p,x]
```

```
[Out] (x*(d*x)^m*(a + b*(c*x)^n)^p*Hypergeometric2F1[(1 + m)/n, -p, 1 +
 (1 + m)/n, -((b*(c*x)^n)/a)])/((1 + m)*(1 + (b*(c*x)^n)/a)^p)
```

Maple [F] time = 0.467, size = 0, normalized size = 0.

$$\int (dx)^m (a + b (cx)^n)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x)^m*(a+b*(c*x)^n)^p,x)

[Out] int((d*x)^m*(a+b*(c*x)^n)^p,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int ((cx)^n b + a)^p (dx)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x)^n*b + a)^p*(d*x)^m,x, algorithm="maxima")

[Out] integrate(((c*x)^n*b + a)^p*(d*x)^m, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(((cx)^n b + a)^p (dx)^m, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x)^n*b + a)^p*(d*x)^m,x, algorithm="fricas")

[Out] integral(((c*x)^n*b + a)^p*(d*x)^m, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m (a + b (cx)^n)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)**m*(a+b*(c*x)**n)**p,x)

[Out] Integral((d*x)**m*(a + b*(c*x)**n)**p, x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int ((cx)^n b + a)^p (dx)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x)^n*b + a)^p*(d*x)^m,x, algorithm="giac")

[Out] integrate(((c*x)^n*b + a)^p*(d*x)^m, x)
```

3.2917 $\int x^2 (a + b(cx)^n)^p \, dx$

Optimal. Leaf size=61

$$\frac{1}{3}x^3 (a + b(cx)^n)^p \left(\frac{b(cx)^n}{a} + 1\right)^{-p} {}_2F_1\left(\frac{3}{n}, -p; \frac{n+3}{n}; -\frac{b(cx)^n}{a}\right)$$

```
[Out] (x^3*(a + b*(c*x)^n)^p*Hypergeometric2F1[3/n, -p, (3 + n)/n, -((b
*(c*x)^n)/a)])/(3*(1 + (b*(c*x)^n)/a)^p)
```

Rubi [A] time = 0.0961511, antiderivative size = 61, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$\frac{1}{3}x^3 (a + b(cx)^n)^p \left(\frac{b(cx)^n}{a} + 1\right)^{-p} {}_2F_1\left(\frac{3}{n}, -p; \frac{n+3}{n}; -\frac{b(cx)^n}{a}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^2*(a + b*(c*x)^n)^p,x]
```

```
[Out] (x^3*(a + b*(c*x)^n)^p*Hypergeometric2F1[3/n, -p, (3 + n)/n, -((b
*(c*x)^n)/a)])/(3*(1 + (b*(c*x)^n)/a)^p)
```

Rubi in Sympy [A] time = 10.0853, size = 44, normalized size = 0.72

$$\frac{x^3 \left(1 + \frac{b(cx)^n}{a}\right)^{-p} (a + b(cx)^n)^p {}_2F_1\left(\begin{matrix} -p, \frac{3}{n} \\ \frac{n+3}{n} \end{matrix}\middle| -\frac{b(cx)^n}{a}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(a+b*(c*x)**n)**p,x)
```

```
[Out] x**3*(1 + b*(c*x)**n/a)**(-p)*(a + b*(c*x)**n)**p*hyper((-p, 3/n)
, ((n + 3)/n,), -b*(c*x)**n/a)/3
```

Mathematica [A] time = 0.045285, size = 61, normalized size = 1.

$$\frac{1}{3}x^3 (a + b(cx)^n)^p \left(\frac{b(cx)^n}{a} + 1\right)^{-p} {}_2F_1\left(\frac{3}{n}, -p; 1 + \frac{3}{n}; -\frac{b(cx)^n}{a}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2*(a + b*(c*x)^n)^p,x]
```

```
[Out] (x^3*(a + b*(c*x)^n)^p*Hypergeometric2F1[3/n, -p, 1 + 3/n, -((b*(
c*x)^n)/a)])/(3*(1 + (b*(c*x)^n)/a)^p)
```

Maple [F] time = 0.071, size = 0, normalized size = 0.

$$\int x^2 (a + b(cx)^n)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(a+b*(c*x)^n)^p,x)
```

```
[Out] int(x^2*(a+b*(c*x)^n)^p,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int ((cx)^n b + a)^p x^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x)^n*b + a)^p*x^2,x, algorithm="maxima")
```

```
[Out] integrate(((c*x)^n*b + a)^p*x^2, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(((cx)^n b + a)^p x^2, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x)^n*b + a)^p*x^2,x, algorithm="fricas")
```

```
[Out] integral(((c*x)^n*b + a)^p*x^2, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^2 (a + b (cx)^n)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(a+b*(c*x)**n)**p,x)
```

```
[Out] Integral(x**2*(a + b*(c*x)**n)**p, x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int ((cx)^n b + a)^p x^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x)^n*b + a)^p*x^2,x, algorithm="giac")
```

```
[Out] integrate(((c*x)^n*b + a)^p*x^2, x)
```

3.2918 $\int x (a + b(cx)^n)^p \, dx$

Optimal. Leaf size=61

$$\frac{1}{2}x^2 (a + b(cx)^n)^p \left(\frac{b(cx)^n}{a} + 1\right)^{-p} {}_2F_1\left(\frac{2}{n}, -p; \frac{n+2}{n}; -\frac{b(cx)^n}{a}\right)$$

```
[Out] (x^2*(a + b*(c*x)^n)^p*Hypergeometric2F1[2/n, -p, (2 + n)/n, -((b
*(c*x)^n)/a)])/(2*(1 + (b*(c*x)^n)/a)^p)
```

Rubi [A] time = 0.0862629, antiderivative size = 61, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$

$$\frac{1}{2}x^2 (a + b(cx)^n)^p \left(\frac{b(cx)^n}{a} + 1\right)^{-p} {}_2F_1\left(\frac{2}{n}, -p; \frac{n+2}{n}; -\frac{b(cx)^n}{a}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x*(a + b*(c*x)^n)^p,x]
```

```
[Out] (x^2*(a + b*(c*x)^n)^p*Hypergeometric2F1[2/n, -p, (2 + n)/n, -((b
*(c*x)^n)/a)])/(2*(1 + (b*(c*x)^n)/a)^p)
```

Rubi in Sympy [A] time = 9.20675, size = 44, normalized size = 0.72

$$\frac{x^2 \left(1 + \frac{b(cx)^n}{a}\right)^{-p} (a + b\,(cx)^n)^p \, {}_2F_1\left(\left.\begin{matrix} -p, \frac{2}{n} \\ \frac{n+2}{n} \end{matrix}\right| -\frac{b(cx)^n}{a}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(a+b*(c*x)**n)**p,x)
```

```
[Out] x**2*(1 + b*(c*x)**n/a)**(-p)*(a + b*(c*x)**n)**p*hyper((-p, 2/n)
, ((n + 2)/n,), -b*(c*x)**n/a)/2
```

Mathematica [A] time = 0.0391579, size = 61, normalized size = 1.

$$\frac{1}{2}x^2 (a + b(cx)^n)^p \left(\frac{b(cx)^n}{a} + 1\right)^{-p} {}_2F_1\left(\frac{2}{n}, -p; 1 + \frac{2}{n}; -\frac{b(cx)^n}{a}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x*(a + b*(c*x)^n)^p,x]
```

```
[Out] (x^2*(a + b*(c*x)^n)^p*Hypergeometric2F1[2/n, -p, 1 + 2/n, -((b*(
c*x)^n)/a)])/(2*(1 + (b*(c*x)^n)/a)^p)
```

Maple [F] time = 0.069, size = 0, normalized size = 0.

$$\int x (a + b\,(cx)^n)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(a+b*(c*x)^n)^p,x)

[Out] int(x*(a+b*(c*x)^n)^p,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int ((cx)^n b + a)^p x \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x)^n*b + a)^p*x,x, algorithm="maxima")

[Out] integrate(((c*x)^n*b + a)^p*x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(((cx)^n b + a)^p x, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x)^n*b + a)^p*x,x, algorithm="fricas")

[Out] integral(((c*x)^n*b + a)^p*x, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x (a + b (cx)^n)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(a+b*(c*x)**n)**p,x)

[Out] Integral(x*(a + b*(c*x)**n)**p, x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int ((cx)^n b + a)^p x \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x)^n*b + a)^p*x,x, algorithm="giac")

[Out] integrate(((c*x)^n*b + a)^p*x, x)
```

3.2919 $\int (a+b(cx)^n)^p\,dx$

Optimal. Leaf size=52

$$x(a+b(cx)^n)^p\left(\frac{b(cx)^n}{a}+1\right)^{-p}{}_2F_1\left(\frac{1}{n},-p;1+\frac{1}{n};-\frac{b(cx)^n}{a}\right)$$

```
[Out] (x*(a + b*(c*x)^n)^p*Hypergeometric2F1[n^(-1), -p, 1 + n^(-1), -(
(b*(c*x)^n)/a)])/(1 + (b*(c*x)^n)/a)^p
```

Rubi [A] time = 0.0579275, antiderivative size = 52, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273

$$x(a+b(cx)^n)^p\left(\frac{b(cx)^n}{a}+1\right)^{-p}{}_2F_1\left(\frac{1}{n},-p;1+\frac{1}{n};-\frac{b(cx)^n}{a}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(c*x)^n)^p,x]
```

```
[Out] (x*(a + b*(c*x)^n)^p*Hypergeometric2F1[n^(-1), -p, 1 + n^(-1), -(
(b*(c*x)^n)/a)])/(1 + (b*(c*x)^n)/a)^p
```

Rubi in Sympy [A] time = 5.31379, size = 41, normalized size = 0.79

$$x\left(1+\frac{b\,(cx)^n}{a}\right)^{-p}(a+b\,(cx)^n)^p\,{}_2F_1\left(\begin{matrix}-p,\frac{1}{n}\\1+\frac{1}{n}\end{matrix}\middle|-\frac{b\,(cx)^n}{a}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x)**n)**p,x)
```

```
[Out] x*(1 + b*(c*x)**n/a)**(-p)*(a + b*(c*x)**n)**p*hyper((-p, 1/n), (
1 + 1/n,), -b*(c*x)**n/a)
```

Mathematica [A] time = 0.0295204, size = 52, normalized size = 1.

$$x(a+b(cx)^n)^p\left(\frac{b(cx)^n}{a}+1\right)^{-p}{}_2F_1\left(\frac{1}{n},-p;1+\frac{1}{n};-\frac{b(cx)^n}{a}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(c*x)^n)^p,x]
```

```
[Out] (x*(a + b*(c*x)^n)^p*Hypergeometric2F1[n^(-1), -p, 1 + n^(-1), -(
(b*(c*x)^n)/a)])/(1 + (b*(c*x)^n)/a)^p
```

Maple [F] time = 0.087, size = 0, normalized size = 0.

$$\int (a+b\,(cx)^n)^p\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x)^n)^p,x)

[Out] int((a+b*(c*x)^n)^p,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int ((cx)^n b + a)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x)^n*b + a)^p,x, algorithm="maxima")

[Out] integrate(((c*x)^n*b + a)^p, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(((cx)^n b + a)^p, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x)^n*b + a)^p,x, algorithm="fricas")

[Out] integral(((c*x)^n*b + a)^p, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (a + b (cx)^n)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x)**n)**p,x)

[Out] Integral((a + b*(c*x)**n)**p, x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int ((cx)^n b + a)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x)^n*b + a)^p,x, algorithm="giac")

[Out] integrate(((c*x)^n*b + a)^p, x)
```

3.2920 $\int \frac{(a+b(cx)^n)^p}{x} dx$

Optimal. Leaf size=46

$$-\frac{(a+b(cx)^n)^{p+1} {}_2F_1\left(1,p+1;p+2;\frac{b(cx)^n}{a}+1\right)}{an(p+1)}$$

```
[Out] -(((a + b*(c*x)^n)^(1 + p)*Hypergeometric2F1[1, 1 + p, 2 + p, 1 +
 (b*(c*x)^n)/a])/(a*n*(1 + p)))
```

Rubi [A] time = 0.100896, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{(a+b(cx)^n)^{p+1} {}_2F_1\left(1,p+1;p+2;\frac{b(cx)^n}{a}+1\right)}{an(p+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(c*x)^n)^p/x,x]
```

```
[Out] -(((a + b*(c*x)^n)^(1 + p)*Hypergeometric2F1[1, 1 + p, 2 + p, 1 +
 (b*(c*x)^n)/a])/(a*n*(1 + p)))
```

Rubi in Sympy [A] time = 7.80263, size = 34, normalized size = 0.74

$$-\frac{(a+b(cx)^n)^{p+1} {}_2F_1\left(\begin{matrix} 1,p+1 \\ p+2 \end{matrix}\middle| 1+\frac{b(cx)^n}{a}\right)}{an(p+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x)**n)**p/x,x)
```

```
[Out] -(a + b*(c*x)**n)**(p + 1)*hyper((1, p + 1), (p + 2,), 1 + b*(c*x
)**n/a)/(a*n*(p + 1))
```

Mathematica [A] time = 0.0485229, size = 61, normalized size = 1.33

$$\frac{\left(\frac{a(cx)^{-n}}{b}+1\right)^{-p}(a+b(cx)^n)^p {}_2F_1\left(-p,-p;1-p;-\frac{a(cx)^{-n}}{b}\right)}{np}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(c*x)^n)^p/x,x]
```

```
[Out] ((a + b*(c*x)^n)^p*Hypergeometric2F1[-p, -p, 1 - p, -(a/(b*(c*x)^
n))])/(n*p*(1 + a/(b*(c*x)^n))^p)
```

Maple [F] time = 0.073, size = 0, normalized size = 0.

$$\int \frac{(a+b(cx)^n)^p}{x} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x)^n)^p/x,x)
```

```
[Out] int((a+b*(c*x)^n)^p/x,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{((cx)^n b + a)^p}{x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x)^n*b + a)^p/x,x, algorithm="maxima")
```

```
[Out] integrate(((c*x)^n*b + a)^p/x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{((cx)^n b + a)^p}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x)^n*b + a)^p/x,x, algorithm="fricas")
```

```
[Out] integral(((c*x)^n*b + a)^p/x, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a + b (cx)^n)^p}{x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x)**n)**p/x,x)
```

```
[Out] Integral((a + b*(c*x)**n)**p/x, x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{((cx)^n b + a)^p}{x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x)^n*b + a)^p/x,x, algorithm="giac")
```

```
[Out] integrate(((c*x)^n*b + a)^p/x, x)
```

3.2921 $\int \frac{(a+b(cx)^n)^p}{x^2}\,dx$

Optimal. Leaf size=62

$$-\frac{(a+b(cx)^n)^p\left(\frac{b(cx)^n}{a}+1\right)^{-p}\,{}_2F_1\left(-\frac{1}{n},-p;-\frac{1-n}{n};-\frac{b(cx)^n}{a}\right)}{x}$$

```
[Out] -(((a + b*(c*x)^n)^p*Hypergeometric2F1[-n^(-1), -p, -((1 - n)/n),
 -((b*(c*x)^n)/a)])/(x*(1 + (b*(c*x)^n)/a)^p))
```

Rubi [A] time = 0.0905104, antiderivative size = 62, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267

$$-\frac{(a+b(cx)^n)^p\left(\frac{b(cx)^n}{a}+1\right)^{-p}\,{}_2F_1\left(-\frac{1}{n},-p;-\frac{1-n}{n};-\frac{b(cx)^n}{a}\right)}{x}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(c*x)^n)^p/x^2,x]
```

```
[Out] -(((a + b*(c*x)^n)^p*Hypergeometric2F1[-n^(-1), -p, -((1 - n)/n),
 -((b*(c*x)^n)/a)])/(x*(1 + (b*(c*x)^n)/a)^p))
```

Rubi in Sympy [A] time = 10.0767, size = 44, normalized size = 0.71

$$-\frac{\left(1+\frac{b(cx)^n}{a}\right)^{-p}(a+b\,(cx)^n)^p\,{}_2F_1\left(\left.\begin{matrix}-p,-\frac{1}{n}\\ \frac{n-1}{n}\end{matrix}\right|-\frac{b(cx)^n}{a}\right)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x)**n)**p/x**2,x)
```

```
[Out] -(1 + b*(c*x)**n/a)**(-p)*(a + b*(c*x)**n)**p*hyper((-p, -1/n), (
(n - 1)/n,), -b*(c*x)**n/a)/x
```

Mathematica [A] time = 0.0436399, size = 59, normalized size = 0.95

$$-\frac{(a+b(cx)^n)^p\left(\frac{b(cx)^n}{a}+1\right)^{-p}\,{}_2F_1\left(-\frac{1}{n},-p;1-\frac{1}{n};-\frac{b(cx)^n}{a}\right)}{x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(c*x)^n)^p/x^2,x]
```

```
[Out] -(((a + b*(c*x)^n)^p*Hypergeometric2F1[-n^(-1), -p, 1 - n^(-1), -
((b*(c*x)^n)/a)])/(x*(1 + (b*(c*x)^n)/a)^p))
```

Maple [F] time = 0.071, size = 0, normalized size = 0.

$$\int \frac{(a+b\,(cx)^n)^p}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x)^n)^p/x^2,x)

[Out] int((a+b*(c*x)^n)^p/x^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{((cx)^n b + a)^p}{x^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x)^n*b + a)^p/x^2,x, algorithm="maxima")

[Out] integrate(((c*x)^n*b + a)^p/x^2, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{((cx)^n b + a)^p}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x)^n*b + a)^p/x^2,x, algorithm="fricas")

[Out] integral(((c*x)^n*b + a)^p/x^2, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a + b(cx)^n)^p}{x^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x)**n)**p/x**2,x)

[Out] Integral((a + b*(c*x)**n)**p/x**2, x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{((cx)^n b + a)^p}{x^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x)^n*b + a)^p/x^2,x, algorithm="giac")

[Out] integrate(((c*x)^n*b + a)^p/x^2, x)
```

3.2922 $\int \frac{1}{1+(x^2)^{3/2}}\,dx$

Optimal. Leaf size=83

$$-\frac{x\log\left(x^2-\sqrt{x^2}+1\right)}{6\sqrt{x^2}}+\frac{x\log\left(\sqrt{x^2}+1\right)}{3\sqrt{x^2}}-\frac{x\tan^{-1}\left(\frac{1-2\sqrt{x^2}}{\sqrt{3}}\right)}{\sqrt{3}\sqrt{x^2}}$$

```
[Out] -((x*ArcTan[(1 - 2*Sqrt[x^2])/Sqrt[3]])/(Sqrt[3]*Sqrt[x^2])) - (x
*Log[1 + x^2 - Sqrt[x^2]])/(6*Sqrt[x^2]) + (x*Log[1 + Sqrt[x^2]])
/(3*Sqrt[x^2])
```

Rubi [A] time = 0.0859858, antiderivative size = 83, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.636

$$-\frac{x\log\left(x^2-\sqrt{x^2}+1\right)}{6\sqrt{x^2}}+\frac{x\log\left(\sqrt{x^2}+1\right)}{3\sqrt{x^2}}-\frac{x\tan^{-1}\left(\frac{1-2\sqrt{x^2}}{\sqrt{3}}\right)}{\sqrt{3}\sqrt{x^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(1 + (x^2)^(3/2))^(-1),x]
```

```
[Out] -((x*ArcTan[(1 - 2*Sqrt[x^2])/Sqrt[3]])/(Sqrt[3]*Sqrt[x^2])) - (x
*Log[1 + x^2 - Sqrt[x^2]])/(6*Sqrt[x^2]) + (x*Log[1 + Sqrt[x^2]])
/(3*Sqrt[x^2])
```

Rubi in Sympy [A] time = 7.58725, size = 78, normalized size = 0.94

$$\frac{x\log\left(\sqrt{x^2}+1\right)}{3\sqrt{x^2}}-\frac{x\log\left(x^2-\sqrt{x^2}+1\right)}{6\sqrt{x^2}}+\frac{\sqrt{3}x\,\mathrm{atan}\left(\sqrt{3}\left(\frac{2\sqrt{x^2}}{3}-\frac{1}{3}\right)\right)}{3\sqrt{x^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(1+(x**2)**(3/2)),x)
```

```
[Out] x*log(sqrt(x**2) + 1)/(3*sqrt(x**2)) - x*log(x**2 - sqrt(x**2) +
1)/(6*sqrt(x**2)) + sqrt(3)*x*atan(sqrt(3)*(2*sqrt(x**2)/3 - 1/3)
)/(3*sqrt(x**2))
```

Mathematica [A] time = 0.0441797, size = 0, normalized size = 0.

$$\int \frac{1}{1+(x^2)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(1 + (x^2)^(3/2))^(-1),x]
```

```
[Out] Integrate[(1 + (x^2)^(3/2))^(-1), x]
```

Maple [A] time = 0.011, size = 106, normalized size = 1.3

$$-\frac{x^{3}}{6}\left(2\sqrt{3}\arctan\left(1/3\sqrt{3}\left(-2x+\sqrt[3]{\frac{x^{3}}{(x^{2})^{3/2}}}\right)\frac{1}{\sqrt[3]{\frac{x^{3}}{(x^{2})^{3/2}}}}\right)-2\ln\left(x+\sqrt[3]{\frac{x^{3}}{(x^{2})^{3/2}}}\right)+\ln\left(x^{2}-x\sqrt[3]{x^{3}\left(x^{2}\right)^{-\frac{3}{2}}}+\left(x^{3}\left(x^{2}\right)^{-\frac{3}{2}}\right)^{\frac{2}{3}}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(1+(x^2)^(3/2)),x)
```

```
[Out] -1/6*x^3*(2*3^(1/2)*arctan(1/3*3^(1/2)*(-2*x+(1/(x^2)^(3/2)*x^3)^
(1/3))/(1/(x^2)^(3/2)*x^3)^(1/3))-2*ln(x+(1/(x^2)^(3/2)*x^3)^(1/3
))+ln(x^2-x*(1/(x^2)^(3/2)*x^3)^(1/3)+(1/(x^2)^(3/2)*x^3)^(2/3)))
/(x^2)^(3/2)/(1/(x^2)^(3/2)*x^3)^(2/3)
```

Maxima [A] time = 1.62341, size = 46, normalized size = 0.55

$$\frac{1}{3}\sqrt{3}\arctan\left(\frac{1}{3}\sqrt{3}(2x-1)\right)-\frac{1}{6}\log\left(x^{2}-x+1\right)+\frac{1}{3}\log\left(x+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^2)^(3/2) + 1),x, algorithm="maxima")
```

```
[Out] 1/3*sqrt(3)*arctan(1/3*sqrt(3)*(2*x - 1)) - 1/6*log(x^2 - x + 1)
+ 1/3*log(x + 1)
```

Fricas [A] time = 0.215099, size = 74, normalized size = 0.89

$$-\frac{1}{18}\sqrt{3}\left(\sqrt{3}\log\left(x^{2}-\sqrt{x^{2}}+1\right)-2\sqrt{3}\log\left(\sqrt{x^{2}}+1\right)-6\arctan\left(\frac{2}{3}\sqrt{3}\sqrt{x^{2}}-\frac{1}{3}\sqrt{3}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^2)^(3/2) + 1),x, algorithm="fricas")
```

```
[Out] -1/18*sqrt(3)*(sqrt(3)*log(x^2 - sqrt(x^2) + 1) - 2*sqrt(3)*log(s
qrt(x^2) + 1) - 6*arctan(2/3*sqrt(3)*sqrt(x^2) - 1/3*sqrt(3)))
```

Sympy [A] time = 0.368965, size = 41, normalized size = 0.49

$$\frac{\log\left(x+1\right)}{3}-\frac{\log\left(x^{2}-x+1\right)}{6}+\frac{\sqrt{3}\operatorname{atan}\left(\frac{2\sqrt{3}x}{3}-\frac{\sqrt{3}}{3}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(1+(x**2)**(3/2)),x)
```

```
[Out] log(x + 1)/3 - log(x**2 - x + 1)/6 + sqrt(3)*atan(2*sqrt(3)*x/3 -
 sqrt(3)/3)/3
```

GIAC/XCAS [A] time = 0.237638, size = 146, normalized size = 1.76

$$-\frac{\sqrt{3}\left(-i\sqrt{3}-1\right)\arctan\left(\frac{\sqrt{3}\left(2x+\left(-\frac{1}{\mathrm{sign}(x)}\right)^{\frac{1}{3}}\right)}{3\left(-\frac{1}{\mathrm{sign}(x)}\right)^{\frac{1}{3}}}\right)}{6\,\mathrm{sign}(x)^{\frac{1}{3}}}-\frac{1}{9}i\pi\,\mathrm{sign}(x)-\frac{\left(-i\sqrt{3}-1\right)\ln\left(x^2+x\left(-\frac{1}{\mathrm{sign}(x)}\right)^{\frac{1}{3}}+\left(-\frac{1}{\mathrm{sign}(x)}\right)^{\frac{2}{3}}\right)}{12\,\mathrm{sign}(x)^{\frac{1}{3}}}-\frac{1}{3}\left(-\frac{1}{\mathrm{sign}(x)}\right)^{\frac{1}{3}}\ln\left(\left|x-\left(-\frac{1}{\mathrm{sign}(x)}\right)^{\frac{1}{3}}\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((x^2)^(3/2) + 1),x, algorithm="giac")
```

```
[Out] -1/6*sqrt(3)*(-I*sqrt(3) - 1)*arctan(1/3*sqrt(3)*(2*x + (-1/sign(
x))^(1/3))/(-1/sign(x))^(1/3))/sign(x)^(1/3) - 1/9*I*pi*sign(x) -
 1/12*(-I*sqrt(3) - 1)*ln(x^2 + x*(-1/sign(x))^(1/3) + (-1/sign(x
))^(2/3))/sign(x)^(1/3) - 1/3*(-1/sign(x))^(1/3)*ln(abs(x - (-1/s
ign(x))^(1/3)))
```

3.2923 $\int x^5\sqrt{a+b\sqrt{cx^2}}\,dx$

Optimal. Leaf size=174

$$-\frac{2a^5\left(a+b\sqrt{cx^2}\right)^{3/2}}{3b^6c^3}+\frac{2a^4\left(a+b\sqrt{cx^2}\right)^{5/2}}{b^6c^3}-\frac{20a^3\left(a+b\sqrt{cx^2}\right)^{7/2}}{7b^6c^3}+\frac{20a^2\left(a+b\sqrt{cx^2}\right)^{9/2}}{9b^6c^3}+\frac{2\left(a+b\sqrt{cx^2}\right)^{13/2}}{13b^6c^3}-\frac{10a\left(a+b\sqrt{cx^2}\right)^{11/2}}{11b^6c^3}$$

```
[Out] (-2*a^5*(a + b*Sqrt[c*x^2])^(3/2))/(3*b^6*c^3) + (2*a^4*(a + b*Sq
rt[c*x^2])^(5/2))/(b^6*c^3) - (20*a^3*(a + b*Sqrt[c*x^2])^(7/2))/
(7*b^6*c^3) + (20*a^2*(a + b*Sqrt[c*x^2])^(9/2))/(9*b^6*c^3) - (1
0*a*(a + b*Sqrt[c*x^2])^(11/2))/(11*b^6*c^3) + (2*(a + b*Sqrt[c*x
^2])^(13/2))/(13*b^6*c^3)
```

Rubi [A] time = 0.204756, antiderivative size = 174, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095

$$-\frac{2a^5\left(a+b\sqrt{cx^2}\right)^{3/2}}{3b^6c^3}+\frac{2a^4\left(a+b\sqrt{cx^2}\right)^{5/2}}{b^6c^3}-\frac{20a^3\left(a+b\sqrt{cx^2}\right)^{7/2}}{7b^6c^3}+\frac{20a^2\left(a+b\sqrt{cx^2}\right)^{9/2}}{9b^6c^3}+\frac{2\left(a+b\sqrt{cx^2}\right)^{13/2}}{13b^6c^3}-\frac{10a\left(a+b\sqrt{cx^2}\right)^{11/2}}{11b^6c^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5*Sqrt[a + b*Sqrt[c*x^2]],x]
```

```
[Out] (-2*a^5*(a + b*Sqrt[c*x^2])^(3/2))/(3*b^6*c^3) + (2*a^4*(a + b*Sq
rt[c*x^2])^(5/2))/(b^6*c^3) - (20*a^3*(a + b*Sqrt[c*x^2])^(7/2))/
(7*b^6*c^3) + (20*a^2*(a + b*Sqrt[c*x^2])^(9/2))/(9*b^6*c^3) - (1
0*a*(a + b*Sqrt[c*x^2])^(11/2))/(11*b^6*c^3) + (2*(a + b*Sqrt[c*x
^2])^(13/2))/(13*b^6*c^3)
```

Rubi in Sympy [A] time = 25.523, size = 165, normalized size = 0.95

$$-\frac{2a^5\left(a+b\sqrt{cx^2}\right)^{\frac{3}{2}}}{3b^6c^3}+\frac{2a^4\left(a+b\sqrt{cx^2}\right)^{\frac{5}{2}}}{b^6c^3}-\frac{20a^3\left(a+b\sqrt{cx^2}\right)^{\frac{7}{2}}}{7b^6c^3}+\frac{20a^2\left(a+b\sqrt{cx^2}\right)^{\frac{9}{2}}}{9b^6c^3}-\frac{10a\left(a+b\sqrt{cx^2}\right)^{\frac{11}{2}}}{11b^6c^3}+\frac{2\left(a+b\sqrt{cx^2}\right)^{\frac{13}{2}}}{13b^6c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5*(a+b*(c*x**2)**(1/2))**(1/2),x)
```

```
[Out] -2*a**5*(a + b*sqrt(c*x**2))**(3/2)/(3*b**6*c**3) + 2*a**4*(a + b
*sqrt(c*x**2))**(5/2)/(b**6*c**3) - 20*a**3*(a + b*sqrt(c*x**2))*
*(7/2)/(7*b**6*c**3) + 20*a**2*(a + b*sqrt(c*x**2))**(9/2)/(9*b**
6*c**3) - 10*a*(a + b*sqrt(c*x**2))**(11/2)/(11*b**6*c**3) + 2*(a
 + b*sqrt(c*x**2))**(13/2)/(13*b**6*c**3)
```

Mathematica [A] time = 0.0860709, size = 103, normalized size = 0.59

$$\frac{2\left(a+b\sqrt{cx^2}\right)^{3/2}\left(-256a^5+384a^4b\sqrt{cx^2}-480a^3b^2cx^2+560a^2b^3\left(cx^2\right)^{3/2}-630ab^4c^2x^4+693b^5\left(cx^2\right)^{5/2}\right)}{9009b^6c^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5*Sqrt[a + b*Sqrt[c*x^2]],x]
```

```
[Out] (2*(a + b*Sqrt[c*x^2])^(3/2)*(-256*a^5 - 480*a^3*b^2*c*x^2 - 630*
a*b^4*c^2*x^4 + 384*a^4*b*Sqrt[c*x^2] + 560*a^2*b^3*(c*x^2)^(3/2)
 + 693*b^5*(c*x^2)^(5/2)))/(9009*b^6*c^3)
```

Maple [A] time = 0.011, size = 92, normalized size = 0.5

$$\frac{2}{9009\,c^3b^6}\left(a+b\sqrt{cx^2}\right)^{\frac{3}{2}}\left(693\,\left(cx^2\right)^{5/2}b^5-630\,c^2x^4ab^4+560\,\left(cx^2\right)^{3/2}a^2b^3-480\,cx^2a^3b^2+384\,\sqrt{cx^2}a^4b-256\,a^5\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5*(a+b*(c*x^2)^(1/2))^(1/2),x)
```

```
[Out] 2/9009*(a+b*(c*x^2)^(1/2))^(3/2)*(693*(c*x^2)^(5/2)*b^5-630*c^2*x
^4*a*b^4+560*(c*x^2)^(3/2)*a^2*b^3-480*c*x^2*a^3*b^2+384*(c*x^2)^
(1/2)*a^4*b-256*a^5)/c^3/b^6
```

Maxima [A] time = 1.38157, size = 171, normalized size = 0.98

$$\frac{2\left(\frac{693\left(\sqrt{cx^2}b+a\right)^{\frac{13}{2}}}{b^6}-\frac{4095\left(\sqrt{cx^2}b+a\right)^{\frac{11}{2}}a}{b^6}+\frac{10010\left(\sqrt{cx^2}b+a\right)^{\frac{9}{2}}a^2}{b^6}-\frac{12870\left(\sqrt{cx^2}b+a\right)^{\frac{7}{2}}a^3}{b^6}+\frac{9009\left(\sqrt{cx^2}b+a\right)^{\frac{5}{2}}a^4}{b^6}-\frac{3003\left(\sqrt{cx^2}b+a\right)^{\frac{3}{2}}a^5}{b^6}\right)}{9009\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)*x^5,x, algorithm="maxima")
```

```
[Out] 2/9009*(693*(sqrt(c*x^2)*b + a)^(13/2)/b^6 - 4095*(sqrt(c*x^2)*b
+ a)^(11/2)*a/b^6 + 10010*(sqrt(c*x^2)*b + a)^(9/2)*a^2/b^6 - 128
70*(sqrt(c*x^2)*b + a)^(7/2)*a^3/b^6 + 9009*(sqrt(c*x^2)*b + a)^(
5/2)*a^4/b^6 - 3003*(sqrt(c*x^2)*b + a)^(3/2)*a^5/b^6)/c^3
```

Fricas [A] time = 0.208768, size = 139, normalized size = 0.8

$$\frac{2\left(693\,b^6c^3x^6-70\,a^2b^4c^2x^4-96\,a^4b^2cx^2-256\,a^6+\left(63\,ab^5c^2x^4+80\,a^3b^3cx^2+128\,a^5b\right)\sqrt{cx^2}\right)\sqrt{\sqrt{cx^2}b+a}}{9009\,b^6c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)*x^5,x, algorithm="fricas")
```

```
[Out] 2/9009*(693*b^6*c^3*x^6 - 70*a^2*b^4*c^2*x^4 - 96*a^4*b^2*c*x^2 -
 256*a^6 + (63*a*b^5*c^2*x^4 + 80*a^3*b^3*c*x^2 + 128*a^5*b)*sqrt
(c*x^2))*sqrt(sqrt(c*x^2)*b + a)/(b^6*c^3)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^5\sqrt{a+b\sqrt{cx^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5*(a+b*(c*x**2)**(1/2))**(1/2),x)
```

```
[Out] Integral(x**5*sqrt(a + b*sqrt(c*x**2)), x)
```

GIAC/XCAS [A] time = 0.219944, size = 176, normalized size = 1.01

$$\frac{2\left(693\left(b\sqrt{c}x+a\right)^{\frac{13}{2}}b^{60}c^{\frac{73}{2}}-4095\left(b\sqrt{c}x+a\right)^{\frac{11}{2}}ab^{60}c^{\frac{73}{2}}+10010\left(b\sqrt{c}x+a\right)^{\frac{9}{2}}a^{2}b^{60}c^{\frac{73}{2}}-12870\left(b\sqrt{c}x+a\right)^{\frac{7}{2}}a^{3}b^{60}c^{\frac{73}{2}}+9009\right.}{9009\,b^{66}c^{\frac{79}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)*x^5,x, algorithm="giac")
```

```
[Out] 2/9009*(693*(b*sqrt(c)*x + a)^(13/2)*b^60*c^(73/2) - 4095*(b*sqrt
(c)*x + a)^(11/2)*a*b^60*c^(73/2) + 10010*(b*sqrt(c)*x + a)^(9/2)
*a^2*b^60*c^(73/2) - 12870*(b*sqrt(c)*x + a)^(7/2)*a^3*b^60*c^(73
/2) + 9009*(b*sqrt(c)*x + a)^(5/2)*a^4*b^60*c^(73/2) - 3003*(b*sq
rt(c)*x + a)^(3/2)*a^5*b^60*c^(73/2))/(b^66*c^(79/2))
```

3.2924 $\int x^3\sqrt{a+b\sqrt{cx^2}}\,dx$

Optimal. Leaf size=116

$$-\frac{2a^3\left(a+b\sqrt{cx^2}\right)^{3/2}}{3b^4c^2}+\frac{6a^2\left(a+b\sqrt{cx^2}\right)^{5/2}}{5b^4c^2}+\frac{2\left(a+b\sqrt{cx^2}\right)^{9/2}}{9b^4c^2}-\frac{6a\left(a+b\sqrt{cx^2}\right)^{7/2}}{7b^4c^2}$$

```
[Out] (-2*a^3*(a + b*Sqrt[c*x^2])^(3/2))/(3*b^4*c^2) + (6*a^2*(a + b*Sq
rt[c*x^2])^(5/2))/(5*b^4*c^2) - (6*a*(a + b*Sqrt[c*x^2])^(7/2))/(
7*b^4*c^2) + (2*(a + b*Sqrt[c*x^2])^(9/2))/(9*b^4*c^2)
```

Rubi [A] time = 0.140097, antiderivative size = 116, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095

$$-\frac{2a^3\left(a+b\sqrt{cx^2}\right)^{3/2}}{3b^4c^2}+\frac{6a^2\left(a+b\sqrt{cx^2}\right)^{5/2}}{5b^4c^2}+\frac{2\left(a+b\sqrt{cx^2}\right)^{9/2}}{9b^4c^2}-\frac{6a\left(a+b\sqrt{cx^2}\right)^{7/2}}{7b^4c^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*Sqrt[a + b*Sqrt[c*x^2]],x]
```

```
[Out] (-2*a^3*(a + b*Sqrt[c*x^2])^(3/2))/(3*b^4*c^2) + (6*a^2*(a + b*Sq
rt[c*x^2])^(5/2))/(5*b^4*c^2) - (6*a*(a + b*Sqrt[c*x^2])^(7/2))/(
7*b^4*c^2) + (2*(a + b*Sqrt[c*x^2])^(9/2))/(9*b^4*c^2)
```

Rubi in Sympy [A] time = 17.3633, size = 109, normalized size = 0.94

$$-\frac{2a^3\left(a+b\sqrt{cx^2}\right)^{\frac{3}{2}}}{3b^4c^2}+\frac{6a^2\left(a+b\sqrt{cx^2}\right)^{\frac{5}{2}}}{5b^4c^2}-\frac{6a\left(a+b\sqrt{cx^2}\right)^{\frac{7}{2}}}{7b^4c^2}+\frac{2\left(a+b\sqrt{cx^2}\right)^{\frac{9}{2}}}{9b^4c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**3*(a+b*(c*x**2)**(1/2))**(1/2),x)
```

```
[Out] -2*a**3*(a + b*sqrt(c*x**2))**(3/2)/(3*b**4*c**2) + 6*a**2*(a + b
*sqrt(c*x**2))**(5/2)/(5*b**4*c**2) - 6*a*(a + b*sqrt(c*x**2))**(
7/2)/(7*b**4*c**2) + 2*(a + b*sqrt(c*x**2))**(9/2)/(9*b**4*c**2)
```

Mathematica [A] time = 0.0456117, size = 86, normalized size = 0.74

$$\frac{2\sqrt{a+b\sqrt{cx^2}}\left(-16a^4+8a^3b\sqrt{cx^2}-6a^2b^2cx^2+5ab^3\left(cx^2\right)^{3/2}+35b^4c^2x^4\right)}{315b^4c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*Sqrt[a + b*Sqrt[c*x^2]],x]
```

```
[Out] (2*Sqrt[a + b*Sqrt[c*x^2]]*(-16*a^4 - 6*a^2*b^2*c*x^2 + 35*b^4*c^
2*x^4 + 8*a^3*b*Sqrt[c*x^2] + 5*a*b^3*(c*x^2)^(3/2)))/(315*b^4*c^
2)
```

Maple [A] time = 0.008, size = 63, normalized size = 0.5

$$\frac{2}{315\,c^2b^4}\left(a+b\sqrt{cx^2}\right)^{\frac{3}{2}}\left(35\,\left(cx^2\right)^{3/2}b^3-30\,cx^2ab^2+24\,\sqrt{cx^2}a^2b-16\,a^3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^3*(a+b*(c*x^2)^(1/2))^(1/2),x)
```

```
[Out] 2/315*(a+b*(c*x^2)^(1/2))^(3/2)*(35*(c*x^2)^(3/2)*b^3-30*c*x^2*a*
b^2+24*(c*x^2)^(1/2)*a^2*b-16*a^3)/c^2/b^4
```

Maxima [A] time = 1.37797, size = 115, normalized size = 0.99

$$\frac{2\left(\frac{35\left(\sqrt{cx^2}b+a\right)^{\frac{9}{2}}}{b^4}-\frac{135\left(\sqrt{cx^2}b+a\right)^{\frac{7}{2}}a}{b^4}+\frac{189\left(\sqrt{cx^2}b+a\right)^{\frac{5}{2}}a^2}{b^4}-\frac{105\left(\sqrt{cx^2}b+a\right)^{\frac{3}{2}}a^3}{b^4}\right)}{315\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(sqrt(c*x^2)*b + a)*x^3,x, algorithm="maxima")
```

```
[Out] 2/315*(35*(sqrt(c*x^2)*b + a)^(9/2)/b^4 - 135*(sqrt(c*x^2)*b + a)
^(7/2)*a/b^4 + 189*(sqrt(c*x^2)*b + a)^(5/2)*a^2/b^4 - 105*(sqrt(
c*x^2)*b + a)^(3/2)*a^3/b^4)/c^2
```

Fricas [A] time = 0.208497, size = 101, normalized size = 0.87

$$\frac{2\left(35\,b^4c^2x^4-6\,a^2b^2cx^2-16\,a^4+\left(5\,ab^3cx^2+8\,a^3b\right)\sqrt{cx^2}\right)\sqrt{\sqrt{cx^2}b+a}}{315\,b^4c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(sqrt(c*x^2)*b + a)*x^3,x, algorithm="fricas")
```

```
[Out] 2/315*(35*b^4*c^2*x^4 - 6*a^2*b^2*c*x^2 - 16*a^4 + (5*a*b^3*c*x^2
 + 8*a^3*b)*sqrt(c*x^2))*sqrt(sqrt(c*x^2)*b + a)/(b^4*c^2)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^3\sqrt{a+b\sqrt{cx^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**3*(a+b*(c*x**2)**(1/2))**(1/2),x)
```

```
[Out] Integral(x**3*sqrt(a + b*sqrt(c*x**2)), x)
```

GIAC/XCAS [A] time = 0.220537, size = 119, normalized size = 1.03

$$\frac{2\left(35\left(b\sqrt{c}x+a\right)^{\frac{9}{2}}b^{24}c^{\frac{33}{2}}-135\left(b\sqrt{c}x+a\right)^{\frac{7}{2}}ab^{24}c^{\frac{33}{2}}+189\left(b\sqrt{c}x+a\right)^{\frac{5}{2}}a^2b^{24}c^{\frac{33}{2}}-105\left(b\sqrt{c}x+a\right)^{\frac{3}{2}}a^3b^{24}c^{\frac{33}{2}}\right)}{315\,b^{28}c^{\frac{37}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)*x^3,x, algorithm="giac")
```

```
[Out] 2/315*(35*(b*sqrt(c)*x + a)^(9/2)*b^24*c^(33/2) - 135*(b*sqrt(c)*
x + a)^(7/2)*a*b^24*c^(33/2) + 189*(b*sqrt(c)*x + a)^(5/2)*a^2*b^
24*c^(33/2) - 105*(b*sqrt(c)*x + a)^(3/2)*a^3*b^24*c^(33/2))/(b^2
8*c^(37/2))
```

3.2925 $\int x\sqrt{a+b\sqrt{cx^2}}\,dx$

Optimal. Leaf size=56

$$\frac{2\left(a+b\sqrt{cx^2}\right)^{5/2}}{5b^2c}-\frac{2a\left(a+b\sqrt{cx^2}\right)^{3/2}}{3b^2c}$$

```
[Out] (-2*a*(a + b*Sqrt[c*x^2])^(3/2))/(3*b^2*c) + (2*(a + b*Sqrt[c*x^2
])^(5/2))/(5*b^2*c)
```

Rubi [A] time = 0.0762577, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158

$$\frac{2\left(a+b\sqrt{cx^2}\right)^{5/2}}{5b^2c}-\frac{2a\left(a+b\sqrt{cx^2}\right)^{3/2}}{3b^2c}$$

Antiderivative was successfully verified.

```
[In]  Int[x*Sqrt[a + b*Sqrt[c*x^2]],x]
```

```
[Out] (-2*a*(a + b*Sqrt[c*x^2])^(3/2))/(3*b^2*c) + (2*(a + b*Sqrt[c*x^2
])^(5/2))/(5*b^2*c)
```

Rubi in Sympy [A] time = 9.28637, size = 48, normalized size = 0.86

$$-\frac{2a\left(a+b\sqrt{cx^2}\right)^{\frac{3}{2}}}{3b^2c}+\frac{2\left(a+b\sqrt{cx^2}\right)^{\frac{5}{2}}}{5b^2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(a+b*(c*x**2)**(1/2))**(1/2),x)
```

```
[Out] -2*a*(a + b*sqrt(c*x**2))**(3/2)/(3*b**2*c) + 2*(a + b*sqrt(c*x**
2))**(5/2)/(5*b**2*c)
```

Mathematica [A] time = 0.0276478, size = 54, normalized size = 0.96

$$\frac{2\sqrt{a+b\sqrt{cx^2}}\left(-2a^2+ab\sqrt{cx^2}+3b^2cx^2\right)}{15b^2c}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x*Sqrt[a + b*Sqrt[c*x^2]],x]
```

```
[Out] (2*Sqrt[a + b*Sqrt[c*x^2]]*(-2*a^2 + 3*b^2*c*x^2 + a*b*Sqrt[c*x^2
]))/(15*b^2*c)
```

Maple [A] time = 0.007, size = 36, normalized size = 0.6

$$\frac{2}{15\,b^2c}\left(a+b\sqrt{cx^2}\right)^{\frac{3}{2}}\left(-2\,a+3\,b\sqrt{cx^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(a+b*(c*x^2)^(1/2))^(1/2),x)
```

```
[Out] 2/15*(a+b*(c*x^2)^(1/2))^(3/2)*(-2*a+3*b*(c*x^2)^(1/2))/b^2/c
```

Maxima [A] time = 1.34161, size = 58, normalized size = 1.04

$$\frac{2\left(\frac{3\left(\sqrt{cx^2}b+a\right)^{\frac{5}{2}}}{b^2}-\frac{5\left(\sqrt{cx^2}b+a\right)^{\frac{3}{2}}a}{b^2}\right)}{15\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)*x,x, algorithm="maxima")
```

```
[Out] 2/15*(3*(sqrt(c*x^2)*b + a)^(5/2)/b^2 - 5*(sqrt(c*x^2)*b + a)^(3/
2)*a/b^2)/c
```

Fricas [A] time = 0.20705, size = 62, normalized size = 1.11

$$\frac{2\left(3\,b^2cx^2+\sqrt{cx^2}ab-2\,a^2\right)\sqrt{\sqrt{cx^2}b+a}}{15\,b^2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)*x,x, algorithm="fricas")
```

```
[Out] 2/15*(3*b^2*c*x^2 + sqrt(c*x^2)*a*b - 2*a^2)*sqrt(sqrt(c*x^2)*b +
 a)/(b^2*c)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x\sqrt{a+b\sqrt{cx^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(a+b*(c*x**2)**(1/2))**(1/2),x)
```

```
[Out] Integral(x*sqrt(a + b*sqrt(c*x**2)), x)
```

GIAC/XCAS [A] time = 0.215624, size = 46, normalized size = 0.82

$$\frac{2\left(3\left(b\sqrt{c}x+a\right)^{\frac{5}{2}}-5\left(b\sqrt{c}x+a\right)^{\frac{3}{2}}a\right)}{15\,b^2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)*x,x, algorithm="giac")
```

```
[Out] 2/15*(3*(b*sqrt(c)*x + a)^(5/2) - 5*(b*sqrt(c)*x + a)^(3/2)*a)/(b
^2*c)
```

3.2926 $\int \frac{\sqrt{a+b\sqrt{cx^2}}}{x} dx$

Optimal. Leaf size=51

$$2\sqrt{a+b\sqrt{cx^2}}-2\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{cx^2}}}{\sqrt{a}}\right)$$

```
[Out] 2*Sqrt[a + b*Sqrt[c*x^2]] - 2*Sqrt[a]*ArcTanh[Sqrt[a + b*Sqrt[c*x
^2]]/Sqrt[a]]
```

Rubi [A] time = 0.0757166, antiderivative size = 51, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.19$

$$2\sqrt{a+b\sqrt{cx^2}}-2\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{cx^2}}}{\sqrt{a}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[c*x^2]]/x,x]
```

```
[Out] 2*Sqrt[a + b*Sqrt[c*x^2]] - 2*Sqrt[a]*ArcTanh[Sqrt[a + b*Sqrt[c*x
^2]]/Sqrt[a]]
```

Rubi in Sympy [A] time = 7.76847, size = 44, normalized size = 0.86

$$-2\sqrt{a}\,\text{atanh}\left(\frac{\sqrt{a+b\sqrt{cx^2}}}{\sqrt{a}}\right)+2\sqrt{a+b\sqrt{cx^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x**2)**(1/2))**(1/2)/x,x)
```

```
[Out] -2*sqrt(a)*atanh(sqrt(a + b*sqrt(c*x**2))/sqrt(a)) + 2*sqrt(a + b
*sqrt(c*x**2))
```

Mathematica [A] time = 0.0325621, size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\sqrt{cx^2}}}{x}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[Sqrt[a + b*Sqrt[c*x^2]]/x,x]
```

```
[Out] Integrate[Sqrt[a + b*Sqrt[c*x^2]]/x, x]
```

Maple [A] time = 0.009, size = 40, normalized size = 0.8

$$-2\,Artanh\left(\frac{\sqrt{a+b\sqrt{cx^2}}}{\sqrt{a}}\right)\sqrt{a}+2\sqrt{a+b\sqrt{cx^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^2)^(1/2))^(1/2)/x,x)
```

```
[Out] -2*arctanh((a+b*(c*x^2)^(1/2))^(1/2)/a^(1/2))*a^(1/2)+2*(a+b*(c*x
^2)^(1/2))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.224798, size = 1, normalized size = 0.02

$$\left[\sqrt{a}\log\left(\frac{\sqrt{cx^2}b - 2\sqrt{\sqrt{cx^2}b + a}\sqrt{a} + 2\,a}{x}\right) + 2\sqrt{\sqrt{cx^2}b + a},\right.$$
$$\left.-2\sqrt{-a}\arctan\left(\frac{\sqrt{\sqrt{cx^2}b + a}}{\sqrt{-a}}\right) + 2\sqrt{\sqrt{cx^2}b + a}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)/x,x, algorithm="fricas")
```

```
[Out] [sqrt(a)*log((sqrt(c*x^2)*b - 2*sqrt(sqrt(c*x^2)*b + a)*sqrt(a) +
 2*a)/x) + 2*sqrt(sqrt(c*x^2)*b + a), -2*sqrt(-a)*arctan(sqrt(sqr
t(c*x^2)*b + a)/sqrt(-a)) + 2*sqrt(sqrt(c*x^2)*b + a)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + b\sqrt{cx^2}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**2)**(1/2))**(1/2)/x,x)
```

```
[Out] Integral(sqrt(a + b*sqrt(c*x**2))/x, x)
```

GIAC/XCAS [A] time = 0.217812, size = 51, normalized size = 1.

$$\frac{2\,a\arctan\left(\frac{\sqrt{b\sqrt{c}x+a}}{\sqrt{-a}}\right)}{\sqrt{-a}} + 2\sqrt{b\sqrt{c}x + a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)/x,x, algorithm="giac")
```

```
[Out] 2*a*arctan(sqrt(b*sqrt(c)*x + a)/sqrt(-a))/sqrt(-a) + 2*sqrt(b*sq
rt(c)*x + a)
```

3.2927 $\int \frac{\sqrt{a+b\sqrt{cx^2}}}{x^3} dx$

Optimal. Leaf size=97

$$\frac{b^2c\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{cx^2}}}{\sqrt{a}}\right)}{4a^{3/2}}-\frac{bc\sqrt{a+b\sqrt{cx^2}}}{4a\sqrt{cx^2}}-\frac{\sqrt{a+b\sqrt{cx^2}}}{2x^2}$$

```
[Out] -Sqrt[a + b*Sqrt[c*x^2]]/(2*x^2) - (b*c*Sqrt[a + b*Sqrt[c*x^2]])/
(4*a*Sqrt[c*x^2]) + (b^2*c*ArcTanh[Sqrt[a + b*Sqrt[c*x^2]]/Sqrt[a
]])/(4*a^(3/2))
```

Rubi [A] time = 0.124414, antiderivative size = 97, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238

$$\frac{b^2c\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{cx^2}}}{\sqrt{a}}\right)}{4a^{3/2}}-\frac{bc\sqrt{a+b\sqrt{cx^2}}}{4a\sqrt{cx^2}}-\frac{\sqrt{a+b\sqrt{cx^2}}}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[c*x^2]]/x^3,x]
```

```
[Out] -Sqrt[a + b*Sqrt[c*x^2]]/(2*x^2) - (b*c*Sqrt[a + b*Sqrt[c*x^2]])/
(4*a*Sqrt[c*x^2]) + (b^2*c*ArcTanh[Sqrt[a + b*Sqrt[c*x^2]]/Sqrt[a
]])/(4*a^(3/2))
```

Rubi in Sympy [A] time = 11.5917, size = 83, normalized size = 0.86

$$-\frac{\sqrt{a+b\sqrt{cx^2}}}{2x^2}-\frac{bc\sqrt{a+b\sqrt{cx^2}}}{4a\sqrt{cx^2}}+\frac{b^2c\,\mathrm{atanh}\left(\frac{\sqrt{a+b\sqrt{cx^2}}}{\sqrt{a}}\right)}{4a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x**2)**(1/2))**(1/2)/x**3,x)
```

```
[Out] -sqrt(a + b*sqrt(c*x**2))/(2*x**2) - b*c*sqrt(a + b*sqrt(c*x**2))
/(4*a*sqrt(c*x**2)) + b**2*c*atanh(sqrt(a + b*sqrt(c*x**2))/sqrt(
a))/(4*a**(3/2))
```

Mathematica [A] time = 0.0317273, size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\sqrt{cx^2}}}{x^3} dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[Sqrt[a + b*Sqrt[c*x^2]]/x^3,x]
```

```
[Out] Integrate[Sqrt[a + b*Sqrt[c*x^2]]/x^3, x]
```

Maple [A] time = 0.008, size = 72, normalized size = 0.7

$$-\frac{1}{4\,x^{2}}\left(-Artanh\left(1\sqrt{a+b\sqrt{cx^{2}}}\,\frac{1}{\sqrt{a}}\right)cx^{2}ab^{2}+a^{\frac{3}{2}}\left(a+b\sqrt{cx^{2}}\right)^{\frac{3}{2}}+a^{\frac{5}{2}}\sqrt{a+b\sqrt{cx^{2}}}\right)a^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^2)^(1/2))^(1/2)/x^3,x)
```

```
[Out] -1/4*(-arctanh((a+b*(c*x^2)^(1/2))^(1/2)/a^(1/2))*c*x^2*a*b^2+a^(
3/2)*(a+b*(c*x^2)^(1/2))^(3/2)+a^(5/2)*(a+b*(c*x^2)^(1/2))^(1/2))
/x^2/a^(5/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)/x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.223849, size = 1, normalized size = 0.01

$$\left[\frac{\sqrt{a}b^{2}cx^{2}\log\left(\frac{\sqrt{cx^{2}}\sqrt{a}b+2\sqrt{\sqrt{cx^{2}}b+a}a+2\,a^{\frac{3}{2}}}{x}\right)-2\left(\sqrt{cx^{2}}ab+2\,a^{2}\right)\sqrt{\sqrt{cx^{2}}b+a}}{8\,a^{2}x^{2}},\ \frac{\sqrt{-a}b^{2}cx^{2}\arctan\left(\frac{a}{\sqrt{\sqrt{cx^{2}}b+a}\sqrt{-a}}\right)-\left(\sqrt{cx^{2}}ab+\right.}{4\,a^{2}x^{2}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)/x^3,x, algorithm="fricas")
```

```
[Out] [1/8*(sqrt(a)*b^2*c*x^2*log((sqrt(c*x^2)*sqrt(a)*b + 2*sqrt(sqrt(
c*x^2)*b + a)*a + 2*a^(3/2))/x) - 2*(sqrt(c*x^2)*a*b + 2*a^2)*sqr
t(sqrt(c*x^2)*b + a))/(a^2*x^2), 1/4*(sqrt(-a)*b^2*c*x^2*arctan(a
/(sqrt(sqrt(c*x^2)*b + a)*sqrt(-a))) - (sqrt(c*x^2)*a*b + 2*a^2)*
sqrt(sqrt(c*x^2)*b + a))/(a^2*x^2)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\sqrt{cx^{2}}}}{x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**2)**(1/2))**(1/2)/x**3,x)
```

```
[Out] Integral(sqrt(a + b*sqrt(c*x**2))/x**3, x)
```

GIAC/XCAS [A] time = 0.218893, size = 122, normalized size = 1.26

$$-\frac{\frac{b^{3}c^{\frac{3}{2}}\arctan\left(\frac{\sqrt{b\sqrt{c}x+a}}{\sqrt{-a}}\right)}{\sqrt{-a}a}+\frac{\left(b\sqrt{c}x+a\right)^{\frac{3}{2}}b^{3}c^{\frac{3}{2}}+\sqrt{b\sqrt{c}x+a}ab^{3}c^{\frac{3}{2}}}{ab^{2}cx^{2}}}{4\,b\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)/x^3,x, algorithm="giac")
```

```
[Out] -1/4*(b^3*c^(3/2)*arctan(sqrt(b*sqrt(c)*x + a)/sqrt(-a))/(sqrt(-a
)*a) + ((b*sqrt(c)*x + a)^(3/2)*b^3*c^(3/2) + sqrt(b*sqrt(c)*x +
a)*a*b^3*c^(3/2))/(a*b^2*c*x^2))/(b*sqrt(c))
```

3.2928 $\int \frac{\sqrt{a+b\sqrt{cx^2}}}{x^5}\,dx$

Optimal. Leaf size=171

$$\frac{5b^4c^2\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{cx^2}}}{\sqrt{a}}\right)}{64a^{7/2}}-\frac{5b^3c^2\sqrt{a+b\sqrt{cx^2}}}{64a^3\sqrt{cx^2}}+\frac{5b^2c\sqrt{a+b\sqrt{cx^2}}}{96a^2x^2}-\frac{bc^2\sqrt{a+b\sqrt{cx^2}}}{24a\,(cx^2)^{3/2}}-\frac{\sqrt{a+b\sqrt{cx^2}}}{4x^4}$$

```
[Out] -Sqrt[a + b*Sqrt[c*x^2]]/(4*x^4) + (5*b^2*c*Sqrt[a + b*Sqrt[c*x^2
]])/(96*a^2*x^2) - (b*c^2*Sqrt[a + b*Sqrt[c*x^2]])/(24*a*(c*x^2)^
(3/2)) - (5*b^3*c^2*Sqrt[a + b*Sqrt[c*x^2]])/(64*a^3*Sqrt[c*x^2])
 + (5*b^4*c^2*ArcTanh[Sqrt[a + b*Sqrt[c*x^2]]/Sqrt[a]])/(64*a^(7/
2))
```

Rubi [A] time = 0.218376, antiderivative size = 171, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238

$$\frac{5b^4c^2\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{cx^2}}}{\sqrt{a}}\right)}{64a^{7/2}}-\frac{5b^3c^2\sqrt{a+b\sqrt{cx^2}}}{64a^3\sqrt{cx^2}}+\frac{5b^2c\sqrt{a+b\sqrt{cx^2}}}{96a^2x^2}-\frac{bc^2\sqrt{a+b\sqrt{cx^2}}}{24a\,(cx^2)^{3/2}}-\frac{\sqrt{a+b\sqrt{cx^2}}}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[c*x^2]]/x^5,x]
```

```
[Out] -Sqrt[a + b*Sqrt[c*x^2]]/(4*x^4) + (5*b^2*c*Sqrt[a + b*Sqrt[c*x^2
]])/(96*a^2*x^2) - (b*c^2*Sqrt[a + b*Sqrt[c*x^2]])/(24*a*(c*x^2)^
(3/2)) - (5*b^3*c^2*Sqrt[a + b*Sqrt[c*x^2]])/(64*a^3*Sqrt[c*x^2])
 + (5*b^4*c^2*ArcTanh[Sqrt[a + b*Sqrt[c*x^2]]/Sqrt[a]])/(64*a^(7/
2))
```

Rubi in Sympy [A] time = 21.4676, size = 156, normalized size = 0.91

$$-\frac{\sqrt{a+b\sqrt{cx^2}}}{4x^4}-\frac{bc^2\sqrt{a+b\sqrt{cx^2}}}{24a\,(cx^2)^{\frac{3}{2}}}+\frac{5b^2c\sqrt{a+b\sqrt{cx^2}}}{96a^2x^2}-\frac{5b^3c^2\sqrt{a+b\sqrt{cx^2}}}{64a^3\sqrt{cx^2}}+\frac{5b^4c^2\,\text{atanh}\left(\frac{\sqrt{a+b\sqrt{cx^2}}}{\sqrt{a}}\right)}{64a^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x**2)**(1/2))**(1/2)/x**5,x)
```

```
[Out] -sqrt(a + b*sqrt(c*x**2))/(4*x**4) - b*c**2*sqrt(a + b*sqrt(c*x**
2))/(24*a*(c*x**2)**(3/2)) + 5*b**2*c*sqrt(a + b*sqrt(c*x**2))/(9
6*a**2*x**2) - 5*b**3*c**2*sqrt(a + b*sqrt(c*x**2))/(64*a**3*sqrt
(c*x**2)) + 5*b**4*c**2*atanh(sqrt(a + b*sqrt(c*x**2))/sqrt(a))/(
64*a**(7/2))
```

Mathematica [A] time = 0.0325477, size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\sqrt{cx^2}}}{x^5}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[Sqrt[a + b*Sqrt[c*x^2]]/x^5,x]
```

```
[Out] Integrate[Sqrt[a + b*Sqrt[c*x^2]]/x^5, x]
```

Maple [A] time = 0.008, size = 114, normalized size = 0.7

$$-\frac{1}{192\,x^4}\left(15\,a^{7/2}\left(a+b\sqrt{cx^2}\right)^{7/2}-15\,Artanh\left(\frac{\sqrt{a+b\sqrt{cx^2}}}{\sqrt{a}}\right)a^3b^4c^2x^4-55\,a^{9/2}\left(a+b\sqrt{cx^2}\right)^{5/2}+73\,a^{11/2}\left(a+b\sqrt{cx^2}\right)^{3/2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^2)^(1/2))^(1/2)/x^5,x)
```

```
[Out] -1/192*(15*a^(7/2)*(a+b*(c*x^2)^(1/2))^(7/2)-15*arctanh((a+b*(c*x
^2)^(1/2))^(1/2)/a^(1/2))*a^3*b^4*c^2*x^4-55*a^(9/2)*(a+b*(c*x^2)
^(1/2))^(5/2)+73*a^(11/2)*(a+b*(c*x^2)^(1/2))^(3/2)+15*a^(13/2)*(
a+b*(c*x^2)^(1/2))^(1/2))/a^(13/2)/x^4
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)/x^5,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.225364, size = 1, normalized size = 0.01

$$\left[\frac{15\,\sqrt{a}b^4c^2x^4\log\left(\frac{\sqrt{cx^2}\sqrt{a}b+2\,\sqrt{\sqrt{cx^2}b+a}a+2\,a^{\frac{3}{2}}}{x}\right)+2\left(10\,a^2b^2cx^2-48\,a^4-\left(15\,ab^3cx^2+8\,a^3b\right)\sqrt{cx^2}\right)\sqrt{\sqrt{cx^2}b+a}}{384\,a^4x^4},\ \frac{15\,\sqrt{-a}b^4c^2\cdots}{\cdots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)/x^5,x, algorithm="fricas")
```

```
[Out] [1/384*(15*sqrt(a)*b^4*c^2*x^4*log((sqrt(c*x^2)*sqrt(a)*b + 2*sqr
t(sqrt(c*x^2)*b + a)*a + 2*a^(3/2))/x) + 2*(10*a^2*b^2*c*x^2 - 48
*a^4 - (15*a*b^3*c*x^2 + 8*a^3*b)*sqrt(c*x^2))*sqrt(sqrt(c*x^2)*b
 + a))/(a^4*x^4), 1/192*(15*sqrt(-a)*b^4*c^2*x^4*arctan(a/(sqrt(s
qrt(c*x^2)*b + a)*sqrt(-a))) + (10*a^2*b^2*c*x^2 - 48*a^4 - (15*a
*b^3*c*x^2 + 8*a^3*b)*sqrt(c*x^2))*sqrt(sqrt(c*x^2)*b + a))/(a^4*
x^4)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\sqrt{a+b\sqrt{cx^2}}}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**2)**(1/2))**(1/2)/x**5,x)
```

```
[Out] Integral(sqrt(a + b*sqrt(c*x**2))/x**5, x)
```

GIAC/XCAS [A] time = 0.221841, size = 182, normalized size = 1.06

$$-\frac{\frac{15\,b^{5}c^{\frac{5}{2}}\arctan\left(\frac{\sqrt{b\sqrt{c}x+a}}{\sqrt{-a}}\right)}{\sqrt{-a}a^{3}}+\frac{15\,\left(b\sqrt{c}x+a\right)^{\frac{7}{2}}b^{5}c^{\frac{5}{2}}-55\,\left(b\sqrt{c}x+a\right)^{\frac{5}{2}}ab^{5}c^{\frac{5}{2}}+73\,\left(b\sqrt{c}x+a\right)^{\frac{3}{2}}a^{2}b^{5}c^{\frac{5}{2}}+15\,\sqrt{b\sqrt{c}x+a}a^{3}b^{5}c^{\frac{5}{2}}}{a^{3}b^{4}c^{2}x^{4}}}{192\,b\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)/x^5,x, algorithm="giac")
```

```
[Out] -1/192*(15*b^5*c^(5/2)*arctan(sqrt(b*sqrt(c)*x + a)/sqrt(-a))/(sq
rt(-a)*a^3) + (15*(b*sqrt(c)*x + a)^(7/2)*b^5*c^(5/2) - 55*(b*sqr
t(c)*x + a)^(5/2)*a*b^5*c^(5/2) + 73*(b*sqrt(c)*x + a)^(3/2)*a^2*
b^5*c^(5/2) + 15*sqrt(b*sqrt(c)*x + a)*a^3*b^5*c^(5/2))/(a^3*b^4*
c^2*x^4))/(b*sqrt(c))
```

3.2929 $\int x^4\sqrt{a+b\sqrt{cx^2}}\,dx$

Optimal. Leaf size=191

$$\frac{2a^4x^5\left(a+b\sqrt{cx^2}\right)^{3/2}}{3b^5\left(cx^2\right)^{5/2}}-\frac{8a^3x^5\left(a+b\sqrt{cx^2}\right)^{5/2}}{5b^5\left(cx^2\right)^{5/2}}+\frac{12a^2x^5\left(a+b\sqrt{cx^2}\right)^{7/2}}{7b^5\left(cx^2\right)^{5/2}}+\frac{2x^5\left(a+b\sqrt{cx^2}\right)^{11/2}}{11b^5\left(cx^2\right)^{5/2}}-\frac{8ax^5\left(a+b\sqrt{cx^2}\right)^{9/2}}{9b^5\left(cx^2\right)^{5/2}}$$

```
[Out] (2*a^4*x^5*(a + b*Sqrt[c*x^2])^(3/2))/(3*b^5*(c*x^2)^(5/2)) - (8*
a^3*x^5*(a + b*Sqrt[c*x^2])^(5/2))/(5*b^5*(c*x^2)^(5/2)) + (12*a^
2*x^5*(a + b*Sqrt[c*x^2])^(7/2))/(7*b^5*(c*x^2)^(5/2)) - (8*a*x^5
*(a + b*Sqrt[c*x^2])^(9/2))/(9*b^5*(c*x^2)^(5/2)) + (2*x^5*(a + b
*Sqrt[c*x^2])^(11/2))/(11*b^5*(c*x^2)^(5/2))
```

Rubi [A] time = 0.171214, antiderivative size = 191, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095

$$\frac{2a^4x^5\left(a+b\sqrt{cx^2}\right)^{3/2}}{3b^5\left(cx^2\right)^{5/2}}-\frac{8a^3x^5\left(a+b\sqrt{cx^2}\right)^{5/2}}{5b^5\left(cx^2\right)^{5/2}}+\frac{12a^2x^5\left(a+b\sqrt{cx^2}\right)^{7/2}}{7b^5\left(cx^2\right)^{5/2}}+\frac{2x^5\left(a+b\sqrt{cx^2}\right)^{11/2}}{11b^5\left(cx^2\right)^{5/2}}-\frac{8ax^5\left(a+b\sqrt{cx^2}\right)^{9/2}}{9b^5\left(cx^2\right)^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4*Sqrt[a + b*Sqrt[c*x^2]],x]
```

```
[Out] (2*a^4*x^5*(a + b*Sqrt[c*x^2])^(3/2))/(3*b^5*(c*x^2)^(5/2)) - (8*
a^3*x^5*(a + b*Sqrt[c*x^2])^(5/2))/(5*b^5*(c*x^2)^(5/2)) + (12*a^
2*x^5*(a + b*Sqrt[c*x^2])^(7/2))/(7*b^5*(c*x^2)^(5/2)) - (8*a*x^5
*(a + b*Sqrt[c*x^2])^(9/2))/(9*b^5*(c*x^2)^(5/2)) + (2*x^5*(a + b
*Sqrt[c*x^2])^(11/2))/(11*b^5*(c*x^2)^(5/2))
```

Rubi in Sympy [A] time = 20.0885, size = 180, normalized size = 0.94

$$\frac{2a^4x^5\left(a+b\sqrt{cx^2}\right)^{\frac{3}{2}}}{3b^5\left(cx^2\right)^{\frac{5}{2}}}-\frac{8a^3x^5\left(a+b\sqrt{cx^2}\right)^{\frac{5}{2}}}{5b^5\left(cx^2\right)^{\frac{5}{2}}}+\frac{12a^2x^5\left(a+b\sqrt{cx^2}\right)^{\frac{7}{2}}}{7b^5\left(cx^2\right)^{\frac{5}{2}}}-\frac{8ax^5\left(a+b\sqrt{cx^2}\right)^{\frac{9}{2}}}{9b^5\left(cx^2\right)^{\frac{5}{2}}}+\frac{2x^5\left(a+b\sqrt{cx^2}\right)^{\frac{11}{2}}}{11b^5\left(cx^2\right)^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4*(a+b*(c*x**2)**(1/2))**(1/2),x)
```

```
[Out] 2*a**4*x**5*(a + b*sqrt(c*x**2))**(3/2)/(3*b**5*(c*x**2)**(5/2))
- 8*a**3*x**5*(a + b*sqrt(c*x**2))**(5/2)/(5*b**5*(c*x**2)**(5/2)
) + 12*a**2*x**5*(a + b*sqrt(c*x**2))**(7/2)/(7*b**5*(c*x**2)**(5
/2)) - 8*a*x**5*(a + b*sqrt(c*x**2))**(9/2)/(9*b**5*(c*x**2)**(5/
2)) + 2*x**5*(a + b*sqrt(c*x**2))**(11/2)/(11*b**5*(c*x**2)**(5/2
))
```

Mathematica [A] time = 0.258565, size = 0, normalized size = 0.

$$\int x^4\sqrt{a+b\sqrt{cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[x^4*Sqrt[a + b*Sqrt[c*x^2]],x]
```

```
[Out] Integrate[x^4*Sqrt[a + b*Sqrt[c*x^2]], x]
```

Maple [A] time = 0.009, size = 84, normalized size = 0.4

$$-\frac{2x^5}{3465\,b^5}\left(a+b\sqrt{cx^2}\right)^{\frac{3}{2}}\left(-315\,c^2x^4b^4+280\,\left(cx^2\right)^{3/2}ab^3-240\,cx^2a^2b^2+192\,\sqrt{cx^2}a^3b-128\,a^4\right)\left(cx^2\right)^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4*(a+b*(c*x^2)^(1/2))^(1/2),x)
```

```
[Out] -2/3465*x^5*(a+b*(c*x^2)^(1/2))^(3/2)*(-315*c^2*x^4*b^4+280*(c*x^
2)^(3/2)*a*b^3-240*c*x^2*a^2*b^2+192*(c*x^2)^(1/2)*a^3*b-128*a^4)
/(c*x^2)^(5/2)/b^5
```

Maxima [A] time = 2.03099, size = 2959, normalized size = 15.49

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)*x^4,x, algorithm="maxima")
```

```
[Out] ((253*c^33 + 2558956*c^32 + 7217549950*c^31 + 8987703765844*c^30
+ 6036468373437617*c^29 + 2446429529849811272*c^28 + 642455910258
816305144*c^27 + 114777366281226527056208*c^26 + 1444420693122736
6367330858*c^25 + 1313654256537258900978878920*c^24 + 88007787535
651613090646185140*c^23 + 4405711003982878865632262198872*c^22 +
166544000020720524719921573991514*c^21 + 478943871606443480545984
1864162048*c^20 + 105284116366548048830595983583302024*c^19 + 177
3444928146150427905082217087812880*c^18 + 228948392597758710018 29
906064713305625*c^17 + 226076660023411473110523953150238987500*c^
16 + 170024646524692768615005073827382421875 0*c^15 + 967299324654
825183755789624448144531250 0*c^14 + 412301857207920352614374259 37
884033203125*c^13 + 1299567815203820498509393769020996093750 00*c^
12 + 297694072785916684263677284641113281250000*c^11 + 4843295295
024151887503573046875000000000000*c^10 + 542693518652974490238804 6
8750000000000000*c^9 + 401559737533954550888750000000000000000000
0*c^8 + 184849853908622316875000000000000000000000000*c^7 + 48394254
985190280000000000000000000000000*c^6 + 621216412668000000000000
00000000000000*c^5 + 292206528000000000000000000000000000000*c^4
 + 2099520000000000000000000000000000000*c^3 + (c^33 + 31444*c^32
 + 153361414*c^31 + 277761034468*c^30 + 249531421449205*c^29 + 12
8781547874762192*c^28 + 41710765820505500216*c^27 + 8988868827121
079441936*c^26 + 1342840780494748947766706*c^25 + 143266166424564
257427917848*c^24 + 11159995340528093004218780644*c^23 + 64530825
3745684073542574566840*c^22 + 28040775985068292094392289155714*c^
21 + 923839137257607053430155106920656*c^20 + 232177139090734972 5
7593845317682600*c^19 + 44669943434676545157858603421828961 6*c^18
 + 6587962278317998652016627783149754125*c^17 + 744113310474500 90
714926280659005912500*c^16 + 641687702611309496545321307620461343
750*c^15 + 42016270404022689571953161296266015625 00*c^14 + 207194
697035347698248478715227857910156 25*c^13 + 760874494615818722065 5
7314710546875000000*c^12 + 2049601164561651115844181060229492187 5
```

```
0000*c^11 + 39698346147974366208712478984375000000000*c^10 + 538
38717268202350494014375000000000000000*c^9 + 4932589180053796347
758750000000000000000000*c^8 + 29046014678305553487500000000000000
0000000*c^7 + 1022449625624296200000000000000000000000000*c^6 + 19
20379543439040000000000000000000000000*c^5 + 1572810307200000000
0000000000000000000000*c^4 + 35411904000000000000000000000000000
0*c^3)*sqrt(c))*b^5*x^5 + (c^33 + 30448*c^32 + 143612758*c^31 + 2
51188638796*c^30 + 217599624606565*c^29 + 108117268374716764*c^28
 + 33654923995101723352*c^27 + 6957523970007441794992*c^26 + 9950
5169888961908261746*c^25 + 101410165881894182490782352*c^24 + 75
27940968489364320155782596*c^23 + 413724159098907450302482347816*
c^22 + 17037518514719295836702957925282*c^21 + 530263433410233687
937716137759112*c^20 + 12544173979379497042757936065180200*c^19 +
 226269752550645208940329076927964720*c^18 + 31144986065437202834
41564145645938125*c^17 + 32663951713046131242671682730487700000*c
^16 + 260004289926401703985972418707308593750*c^15 + 156070981823
6985476370671875848242187500*c^14 + 69988538091335300965470365584
31884765625*c^13 + 23148367524550212705560195893920898437500*c^12
 + 55506870767440315469623732717285156250000*c^11 + 9431710261512
1972546395374755859375000000*c^10 + 11014269651431431068104052734
3750000000000*c^9 + 847679876225106447173046875000000000000000*c^8
 + 40508998607407646796875000000000000000000*c^7 + 10989524646462
70125000000000000000000000000*c^6 + 14591698370325000000000000000
000000000*c^5 + 70871193000000000000000000000000000000*c^4 + 5248
80000000000000000000000000000000*c^3 + (249*c^32 + 2437164*c^31 +
 6643098918*c^30 + 7982949210660*c^29 + 5166069875011357*c^28 + 2
013960456350944216*c^27 + 507836214278409411736*c^26 + 8694727040
1196759876240*c^25 + 10464000135667518734283874*c^24 + 9080135930
09682171015749512*c^23 + 57896023661694155810023054756*c^22 + 275
0814367587249064422332807608*c^21 + 98393925961843341373109742290
386*c^20 + 2668384982423500053708977313125600*c^19 + 551074204490
30060659564239322581224*c^18 + 8683659179435695921437659093759540
00*c^17 + 10436844833600989868063649482129553125*c^16 + 954208531
71226948139837222228288187500*c^15 + 6602293055413208702061610634
44589843750*c^14 + 3430153973600309932075208741088476562500*c^13
+ 13234770484257914875249279704156494140625*c^12 + 37363311422181
199028698593326416015625000*c^11 + 756665897161554223851823537719
72656250000*c^10 + 10706111904192729856477580566406250000000*c^9
 + 10212273259571724751464257812500000000000*c^8 + 6248778704391
197201953125000000000000000*c^7 + 22813859478991729687500000000
0000000000*c^6 + 44361563993394750000000000000000000000000*c^5 +
3754847785500000000000000000000000000*c^4 + 8721756000000000000
000000000000000000*c^3)*sqrt(c))*a*b^4*x^4 - 4*(c^32 + 29710*c^31
 + 136568656*c^30 + 232488459946*c^29 + 195743173114099*c^28 + 94
380747307709584*c^27 + 28462469351818276960*c^26 + 56901775513385
78052424*c^25 + 785421485648418831104842*c^24 + 77086958845727395
767874308*c^23 + 5497682819071864369019402832*c^22 + 289515233485
471762193587809036*c^21 + 11390712513326794503178249783782*c^20 +
 337598068144644814346991158941992*c^19 + 75774016454108002107539
24556281328*c^18 + 129144106012252228858421679966753000*c^17 + 16
71697806823281566736061537218853125*c^16 + 1639869747365269573910
5288119068718750*c^15 + 121330007675595121218408345094062500000*c
^14 + 671991970693378956717863791361035156250*c^13 + 275631962457
3010910782184457415771484375*c^12 + 82509326929335662768520168981
93359375000*c^11 + 17675330737298814875196104821777343750000*c^10
 + 26395310102345039267613256835937500000000*c^9 + 26517130309637
7683952324218750000000000000*c^8 + 1705396262209881773046875000000
0000000000*c^7 + 653130107456109031250000000000000000000000*c^6 + 1
3296558805373250000000000000000000000000*c^5 + 1176035638500000000
000000000000000000000*c^4 + 284893200000000000000000000000000000000*
c^3 + 2*(123*c^31 + 1174017*c^30 + 3116696475*c^29 + 364274191541
1*c^28 + 2289420177834530*c^27 + 865409107213907732*c^26 + 211224
403111477290428*c^25 + 34938368873590512859484*c^24 + 40538678393
61131120484674*c^23 + 338376358236249991856063294*c^22 + 20701487
602239281351482423130*c^21 + 941134333565416888920784690250*c^20
+ 32110894210931478931787496469520*c^19 + 82779538899478280533400
1918149812*c^18 + 16187607756398830013651232826868620*c^17 + 2404
66799953406452784250434737847500*c^16 + 2710875706565572583927732
435236496875*c^15 + 23112380375134430461260678935541015625*c^14 +
 148119641257267753275468014081201171875*c^13 + 70708903076008653
0960808683502685546875*c^12 + 24829058052694410714513631659545898
43750*c^11 + 6305256671690250099071271315917968750000*c^10 + 1132
0298752129488879797019653320312500000*c^9 + 139375943674460903809
68017578125000000000*c^8 + 11285670833401971164472656250000000000
```

```
000*c^7 + 5662949588807759414062500000000000000000*c^6 + 16099781
276542293750000000000000000000000*c^5 + 2235943788637500000000000
0000000000000*c^4 + 1133704350000000000000000000000000000*c^3 +
874800000000000000000000000000000*c^2)*sqrt(c))*a^2*b^3*x^3 + 1
2*(c^31 + 29222*c^30 + 131989476*c^29 + 220549631950*c^28 + 18205
4403980255*c^27 + 85951284212292484*c^26 + 25344638059811815968*c
^25 + 4946658491131916154584*c^24 + 665454644118584444285242*c^23
 + 63533306064757209063076580*c^22 + 4398310610385893237847455976
*c^21 + 224302525518058209739047940420*c^20 + 85233852811373597 86
451302784462*c^19 + 2432480324254683377656463842 01760*c^18 + 5239
212219133542340480502420489120*c^17 + 853505238631910781657387583
41235000*c^16 + 105123270246242006826201483163240 3125*c^15 + 9760
125457240085676442417704652343750*c^14 + 679209880040177420791353
00170507812500*c^13 + 3511973576803789119325329357182617 18750*c^1
2 + 133275293225418043466908146627807617 1875*c^11 + 3650321200872
523729722890099487304687500*c^10 + 7055588854027909397802579956 05
4687500000*c^9 + 933647050993872133963549804687500000000*c^8 + 8
112634879608292222990234375000000000000*c^7 + 4361818806924101992
18750000000000000000*c^6 + 132677794702646062500000000000000000000
000*c^5 + 19685515802625000000000000000000000000*c^4 + 106466805
000000000000000000000000000*c^3 + 874800000000000000000000000000
000000*c^2 + 2*(122*c^30 + 1144795*c^29 + 2984706999*c^28 + 34221
92283461*c^27 + 2107365773854275*c^26 + 779457823001615248*c^25 +
 185879765051665474460*c^24 + 29991710382458596704900*c^23 + 3388
413195242546676199432*c^22 + 274843052171492782792986714*c^21 + 1
6303176991853388113634967154*c^20 + 716831808047358679181736749 83
0*c^19 + 23587508929794119145336193685058*c^18 + 584547356569314 4
67568355533948052*c^17 + 10948395537265287673170730406379500*c^16
 + 155116276090215374618511676396612500*c^15 + 165964300410315251
5665717603604093750*c^14 + 13352254917894344784818261230888671875
*c^13 + 80198653253250011196332713910693359375*c^12 + 35589167307
9707619028275747784423828125*c^11 + 115015287301526063678228169 96
76513671875*c^10 + 2654935470817726369348381216430664062500*c^9 +
 4264709898101579481994439697265625000000*c^8 + 46011238575073690
4133251953125000000000*c^7 + 31730359537936789345703125000000000
00000*c^6 + 130113078188365742187500000000000000000000*c^5 + 283200
18062776875000000000000000000000*c^4 + 2673922083750000000000000
0000000000000*c^3 + 69036300000000000000000000000000000*c^2)*sqr
t(c))*a^3*b^2*x^2 - 24*(c^30 + 28979*c^29 + 129728865*c^28 + 2147
09946817*c^27 + 175424729360150*c^26 + 81911977393944084*c^25 + 2
3867634391202529556*c^24 + 4598766595419787735220*c^23 + 61006998
9949087038610662*c^22 + 57366549664221202749288378*c^21 + 3905991
055707128875010770926*c^20 + 195602162590058562386788777038*c^19
+ 7285323827632700990474618061840*c^18 + 203358338393512800465448
614893484*c^17 + 4273475844388426205809239967486500*c^16 + 677272
08633048929025206537495962500*c^15 + 808727358915038248050198016 3
35140625*c^14 + 7249566807948818893161180513779296875*c^13 + 4846
6044976177871402659958222509765625*c^12 + 23926609615005676094252
7466119384765625*c^11 + 860235682244821957555057436828613281250*c
^10 + 2210251137086824413713384136962890625000*c^9 + 395596904947
928107281920166015625000000*c^8 + 4763019763214843448465820312 50
0000000000*c^7 + 36734069278083975957031250000000000000*c^6 + 1
689153827145141718750000000000000000000*c^5 + 413670210404287500 0
0000000000000000000*c^4 + 44125007175000000000000000000000000000
*c^3 + 1293246000000000000000000000000000000*c^2 + (243*c^29 + 22
60611*c^28 + 5839685133*c^27 + 6629674620105*c^26 + 4039306818348
400*c^25 + 1477003668609286412*c^24 + 347891895712128419364*c^23
+ 55384654169497405674580*c^22 + 6166756400536006313788202*c^21 +
 492319554678764362836685050*c^20 + 28700362927999647352259163382
*c^19 + 1238061453504658795976684722622*c^18 + 398896940319555373
00197769308276*c^17 + 965736374745116134671262453002620*c^16 + 17
623315230142149140532220845272500*c^15 + 242505343547381820211816
815297262500*c^14 + 2510558649291266783281237190873046875*c^13 +
19454943027839870676475341947998046875*c^12 + 111931261530322150 9
9000546959887695312 5*c^11 + 472517250009358477114024029449462890 6
25*c^10 + 1440070063785699316009505962524414062500*c^9 + 30996198
04548628324983378295898437500000*c^8 + 4573450746723877891169677 7
34375000000000*c^7 + 443922795179989463419921875000000000000*c^6
 + 26726649797789602734375000000000000000000*c^5 + 913107736622173
1250000000000000000000000*c^4 + 152730150851250000000000000000000
00000*c^3 + 935343450000000000000000000000000000*c^2 + 874800000
000000000000000000000000*c)*sqrt(c))*a^4*b*x + 24*(c^29 + 28979
*c^28 + 129728865*c^27 + 214709946817*c^26 + 175424729360150*c^25
 + 81911977393944084*c^24 + 23867634391202529556*c^23 + 459876659
```

5419787735220*c^22 + 610069989949087038610662*c^21 + 573665496642
21202749288378*c^20 + 3905991055707128875010770926*c^19 + 1956021
62590058562386788777038*c^18 + 7285323827632700990474618061840*c^
17 + 203358338393512800465448614893484*c^16 + 4273475844388426205
809239967486500*c^15 + 67727208633048929025206537495962500*c^14 +
 808727358915038248050198016335140625*c^13 + 72495668079488188931
61180513779296875*c^12 + 48466044976177871402659958222509765625*c
^11 + 239266096150056760942527466119384765625*c^10 + 860235682244
821957555057436828613281250*c^9 + 2210251137086824413713384136962
890625000*c^8 + 3955969049479281072819201660156250000000*c^7 + 47
6301976321484344846582031250000000000*c^6 + 36734069278083975957
03125000000000000000*c^5 + 1689153827145141718750000000000000000
00*c^4 + 41367021040428750000000000000000000000000*c^3 + 4412500717
5000000000000000000000000000*c^2 + (243*c^28 + 2260611*c^27 + 583
9685133*c^26 + 6629674620105*c^25 + 4039306818348400*c^24 + 14770
03668609286412*c^23 + 347891895712128419364*c^22 + 55384654169497
405674580*c^21 + 6166756400536006313788202*c^20 + 492319554678764
362836685050*c^19 + 28700362927999647352259163382*c^18 + 12380614
53504658795976684722622*c^17 + 39889694031955537300197769308276*c
^16 + 965736374745116134671262453002620*c^15 + 176233152301421491
40532220845272500*c^14 + 242505343547381820211816815297262500*c^1
3 + 2510558649291266783281237190873046875*c^12 + 1945494302783987
0676475341947998046875*c^11 + 111931261530322150990005469598876953
125*c^10 + 472517250009358477114024029449462890625*c^9 + 1440070
063785699316009505962524414062500*c^8 + 3099619804548628324983378
295898437500000*c^7 + 4573450746723877891169677734375000000000*c^
6 + 44392279517998946341992187500000000000*c^5 + 26726649797789
6027343750000000000000000*c^4 + 9131077366221731250000000000000000
0000000*c^3 + 1527301508512500000000000000000000000*c^2 + 93534
34500000000000000000000000000000*c + 874800000000000000000000000
0000000)*sqrt(c) + 129324600000000000000000000000000000*c)*a^5)*
sqrt(b*sqrt(c)*x + a)/((c^34 + 32709*c^33 + 166156194*c^32 + 3138
48784218*c^31 + 294469940278425*c^30 + 158963889741950277*c^29 +
53942913469754556576*c^28 + 12201148378415160967656*c^27 + 191672
7611900881583047746*c^26 + 215487201080701089264572138*c^25 + 177
28266623214387509113175244*c^24 + 1085347191423942138995805492540
*c^23 + 50069331004982686422553600150074*c^22 + 17565591373612096
77029762976878226*c^21 + 47164907489395671284893054638492840*c^20
 + 973120016179505695731565952134799736*c^19 + 154551869190487507
91542038868588818525*c^18 + 1888855273463294457240758109825724406
25*c^17 + 1772071002728366862097941073371656281250*c^16 + 1270285
9366636907387945569820995722656250*c^15 + 69084435936276029012637
352745193017578125*c^14 + 282238378065542048513744444399967041015
625*c^13 + 854744024058075360839114990533447265625000*c^12 + 1885
453825409327083405511213049316406250000*c^11 + 296003482019409944
869193027343750000000000*c^10 + 32067265112702520859698984375000
00000000000*c^9 + 2298258834452828289318750000000000000000000*c^8
 + 1026494232105541204375000000000000000000000*c^7 + 261175070360
341800000000000000000000000*c^6 + 32633630940600000000000000000
0000000000000*c^5 + 1496445440000000000000000000000000000000*c^4
+ 1049760000000000000000000000000000000*c^3 + 2*(129*c^33 + 1358
088*c^32 + 3992178510*c^31 + 5188254469092*c^30 + 364206274034182
1*c^29 + 1545168634611811116*c^28 + 425504869680671903112*c^27 +
79860855208415962132944*c^26 + 10579205416850555553082194*c^25 +
1014992544330040094059234080*c^24 + 71903882119146039055870044180
*c^23 + 3816126136355649616672567516536*c^22 + 153373939973030992
595941509885042*c^21 + 4704317201176235036305308699382664*c^20 +
110686342955957767559282605085857512*c^19 + 200347104993998884289
9006194089630480*c^18 + 27917325325682932130956522490231038125*c^
17 + 299066657630330963342577678222634275000*c^16 + 2454342489151
737584438328638188065468750*c^15 + 153405642242797983117672384463
07226562500*c^14 + 72413767119232942192838391775906494140625*c^13
 + 255197014414145705441862975227416992187500*c^12 + 661247327533
371121092883907377929687500000*c^11 + 123462341845056674959299062
6953125000000000*c^10 + 161731469103154600746976171875000000000
00*c^9 + 1433927163780426362384062500000000000000000*c^8 + 818575
293911949995625000000000000000000*c^7 + 2798095338986691900000
00000000000000000000*c^6 + 511155706493160000000000000000000000
000*c^5 + 4078129032000000000000000000000000000*c^4 + 89579520
000000000000000000000000000*c^3)*sqrt(c))*b^5)

Fricas [A] time = 0.207801, size = 132, normalized size = 0.69

$$\frac{2\left(315\,b^5c^3x^6 - 40\,a^2b^3c^2x^4 - 64\,a^4bcx^2 + \left(35\,ab^4c^2x^4 + 48\,a^3b^2cx^2 + 128\,a^5\right)\sqrt{cx^2}\right)\sqrt{\sqrt{cx^2}b + a}}{3465\,b^5c^3x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)*x^4,x, algorithm="fricas")
```

```
[Out] 2/3465*(315*b^5*c^3*x^6 - 40*a^2*b^3*c^2*x^4 - 64*a^4*b*c*x^2 + (
35*a*b^4*c^2*x^4 + 48*a^3*b^2*c*x^2 + 128*a^5)*sqrt(c*x^2))*sqrt(
sqrt(c*x^2)*b + a)/(b^5*c^3*x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^4\sqrt{a + b\sqrt{cx^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4*(a+b*(c*x**2)**(1/2))**(1/2),x)
```

```
[Out] Integral(x**4*sqrt(a + b*sqrt(c*x**2)), x)
```

GIAC/XCAS [A] time = 0.217329, size = 147, normalized size = 0.77

$$\frac{2\left(315\left(b\sqrt{c}x + a\right)^{\frac{11}{2}}b^{40}c^{20} - 1540\left(b\sqrt{c}x + a\right)^{\frac{9}{2}}ab^{40}c^{20} + 2970\left(b\sqrt{c}x + a\right)^{\frac{7}{2}}a^2b^{40}c^{20} - 2772\left(b\sqrt{c}x + a\right)^{\frac{5}{2}}a^3b^{40}c^{20} + 1155\left(b\right.\right.}{3465\,b^{45}c^{\frac{45}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)*x^4,x, algorithm="giac")
```

```
[Out] 2/3465*(315*(b*sqrt(c)*x + a)^(11/2)*b^40*c^20 - 1540*(b*sqrt(c)*
x + a)^(9/2)*a*b^40*c^20 + 2970*(b*sqrt(c)*x + a)^(7/2)*a^2*b^40*
c^20 - 2772*(b*sqrt(c)*x + a)^(5/2)*a^3*b^40*c^20 + 1155*(b*sqrt(
c)*x + a)^(3/2)*a^4*b^40*c^20)/(b^45*c^(45/2))
```

3.2930 $\int x^2\sqrt{a+b\sqrt{cx^2}}\,dx$

Optimal. Leaf size=113

$$\frac{2a^2x^3\left(a+b\sqrt{cx^2}\right)^{3/2}}{3b^3\left(cx^2\right)^{3/2}}+\frac{2x^3\left(a+b\sqrt{cx^2}\right)^{7/2}}{7b^3\left(cx^2\right)^{3/2}}-\frac{4ax^3\left(a+b\sqrt{cx^2}\right)^{5/2}}{5b^3\left(cx^2\right)^{3/2}}$$

```
[Out] (2*a^2*x^3*(a + b*Sqrt[c*x^2])^(3/2))/(3*b^3*(c*x^2)^(3/2)) - (4*
a*x^3*(a + b*Sqrt[c*x^2])^(5/2))/(5*b^3*(c*x^2)^(3/2)) + (2*x^3*(
a + b*Sqrt[c*x^2])^(7/2))/(7*b^3*(c*x^2)^(3/2))
```

Rubi [A] time = 0.113564, antiderivative size = 113, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095

$$\frac{2a^2x^3\left(a+b\sqrt{cx^2}\right)^{3/2}}{3b^3\left(cx^2\right)^{3/2}}+\frac{2x^3\left(a+b\sqrt{cx^2}\right)^{7/2}}{7b^3\left(cx^2\right)^{3/2}}-\frac{4ax^3\left(a+b\sqrt{cx^2}\right)^{5/2}}{5b^3\left(cx^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2*Sqrt[a + b*Sqrt[c*x^2]],x]
```

```
[Out] (2*a^2*x^3*(a + b*Sqrt[c*x^2])^(3/2))/(3*b^3*(c*x^2)^(3/2)) - (4*
a*x^3*(a + b*Sqrt[c*x^2])^(5/2))/(5*b^3*(c*x^2)^(3/2)) + (2*x^3*(
a + b*Sqrt[c*x^2])^(7/2))/(7*b^3*(c*x^2)^(3/2))
```

Rubi in Sympy [A] time = 12.5006, size = 105, normalized size = 0.93

$$\frac{2a^2x^3\left(a+b\sqrt{cx^2}\right)^{\frac{3}{2}}}{3b^3\left(cx^2\right)^{\frac{3}{2}}}-\frac{4ax^3\left(a+b\sqrt{cx^2}\right)^{\frac{5}{2}}}{5b^3\left(cx^2\right)^{\frac{3}{2}}}+\frac{2x^3\left(a+b\sqrt{cx^2}\right)^{\frac{7}{2}}}{7b^3\left(cx^2\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(a+b*(c*x**2)**(1/2))**(1/2),x)
```

```
[Out] 2*a**2*x**3*(a + b*sqrt(c*x**2))**(3/2)/(3*b**3*(c*x**2)**(3/2))
- 4*a*x**3*(a + b*sqrt(c*x**2))**(5/2)/(5*b**3*(c*x**2)**(3/2)) +
 2*x**3*(a + b*sqrt(c*x**2))**(7/2)/(7*b**3*(c*x**2)**(3/2))
```

Mathematica [A] time = 0.177544, size = 0, normalized size = 0.

$$\int x^2\sqrt{a+b\sqrt{cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[x^2*Sqrt[a + b*Sqrt[c*x^2]],x]
```

```
[Out] Integrate[x^2*Sqrt[a + b*Sqrt[c*x^2]], x]
```

Maple [A] time = 0.008, size = 55, normalized size = 0.5

$$-\frac{2\,x^3}{105\,b^3}\left(a+b\sqrt{cx^2}\right)^{\frac{3}{2}}\left(-15\,x^2b^2c+12\,\sqrt{cx^2}ab-8\,a^2\right)\left(cx^2\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(a+b*(c*x^2)^(1/2))^(1/2),x)
```

```
[Out] -2/105*x^3*(a+b*(c*x^2)^(1/2))^(3/2)*(-15*x^2*b^2*c+12*(c*x^2)^(1
/2)*a*b-8*a^2)/(c*x^2)^(3/2)/b^3
```

Maxima [A] time = 1.45874, size = 522, normalized size = 4.62

$$\frac{((31\,c^8 + 3784\,c^7 + 91078\,c^6 + 622632\,c^5 + 1266003\,c^4 + 635688\,c^3 + 34992\,c^2 + (c^8 + 440\,c^7 + 21986\,c^6 + 276544\,c^5 + 103850}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)*x^2,x, algorithm="maxima")
```

```
[Out] ((31*c^8 + 3784*c^7 + 91078*c^6 + 622632*c^5 + 1266003*c^4 + 6356
88*c^3 + 34992*c^2 + (c^8 + 440*c^7 + 21986*c^6 + 276544*c^5 + 10
38501*c^4 + 1095120*c^3 + 221616*c^2)*sqrt(c))*b^3*x^3 + (c^8 + 3
82*c^7 + 15946*c^6 + 158172*c^5 + 425925*c^4 + 266814*c^3 + 17496
*c^2 + (29*c^7 + 3020*c^6 + 59186*c^5 + 306288*c^4 + 414153*c^3 +
 102060*c^2)*sqrt(c))*a*b^2*x^2 - 2*(c^7 + 354*c^6 + 13280*c^5 +
112266*c^4 + 231903*c^3 + 84564*c^2 + 2*(14*c^6 + 1333*c^5 + 2295
3*c^4 + 97011*c^3 + 91125*c^2 + 8748*c)*sqrt(c))*a^2*b*x + 2*(c^6
 + 354*c^5 + 13280*c^4 + 112266*c^3 + 231903*c^2 + 2*(14*c^5 + 13
33*c^4 + 22953*c^3 + 97011*c^2 + 91125*c + 8748)*sqrt(c) + 84564*
c)*a^3)*sqrt(b*sqrt(c)*x + a)/((c^9 + 533*c^8 + 33338*c^7 + 54977
8*c^6 + 2906397*c^5 + 4893129*c^4 + 2128680*c^3 + 104976*c^2 + 2*
(17*c^8 + 2552*c^7 + 78518*c^6 + 726132*c^5 + 2190753*c^4 + 19605
24*c^3 + 349920*c^2)*sqrt(c))*b^3)
```

Fricas [A] time = 0.207894, size = 95, normalized size = 0.84

$$\frac{2\left(15\,b^3c^2x^4 - 4\,a^2bcx^2 + \left(3\,ab^2cx^2 + 8\,a^3\right)\sqrt{cx^2}\right)\sqrt{\sqrt{cx^2}b + a}}{105\,b^3c^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)*x^2,x, algorithm="fricas")
```

```
[Out] 2/105*(15*b^3*c^2*x^4 - 4*a^2*b*c*x^2 + (3*a*b^2*c*x^2 + 8*a^3)*s
qrt(c*x^2))*sqrt(sqrt(c*x^2)*b + a)/(b^3*c^2*x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^2\sqrt{a + b\sqrt{cx^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(a+b*(c*x**2)**(1/2))**(1/2),x)
```

```
[Out] Integral(x**2*sqrt(a + b*sqrt(c*x**2)), x)
```

GIAC/XCAS [A] time = 0.21708, size = 90, normalized size = 0.8

$$\frac{2\left(15\left(b\sqrt{c}x+a\right)^{\frac{7}{2}}b^{12}c^{6}-42\left(b\sqrt{c}x+a\right)^{\frac{5}{2}}ab^{12}c^{6}+35\left(b\sqrt{c}x+a\right)^{\frac{3}{2}}a^{2}b^{12}c^{6}\right)}{105\,b^{15}c^{\frac{15}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)*x^2,x, algorithm="giac")
```

```
[Out] 2/105*(15*(b*sqrt(c)*x + a)^(7/2)*b^12*c^6 - 42*(b*sqrt(c)*x + a)
^(5/2)*a*b^12*c^6 + 35*(b*sqrt(c)*x + a)^(3/2)*a^2*b^12*c^6)/(b^1
5*c^(15/2))
```

3.2931 $\int \sqrt{a+b\sqrt{cx^2}}\,dx$

Optimal. Leaf size=34

$$\frac{2x\left(a+b\sqrt{cx^2}\right)^{3/2}}{3b\sqrt{cx^2}}$$

```
[Out] (2*x*(a + b*Sqrt[c*x^2])^(3/2))/(3*b*Sqrt[c*x^2])
```

Rubi [A] time = 0.0262264, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$

$$\frac{2x\left(a+b\sqrt{cx^2}\right)^{3/2}}{3b\sqrt{cx^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[c*x^2]],x]

[Out] (2*x*(a + b*Sqrt[c*x^2])^(3/2))/(3*b*Sqrt[c*x^2])
```

Rubi in Sympy [A] time = 2.15646, size = 29, normalized size = 0.85

$$\frac{2x\left(a+b\sqrt{cx^2}\right)^{\frac{3}{2}}}{3b\sqrt{cx^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x**2)**(1/2))**(1/2),x)

[Out] 2*x*(a + b*sqrt(c*x**2))**(3/2)/(3*b*sqrt(c*x**2))
```

Mathematica [A] time = 0.00634238, size = 34, normalized size = 1.

$$\frac{2x\left(a+b\sqrt{cx^2}\right)^{3/2}}{3b\sqrt{cx^2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b*Sqrt[c*x^2]],x]

[Out] (2*x*(a + b*Sqrt[c*x^2])^(3/2))/(3*b*Sqrt[c*x^2])
```

Maple [A] time = 0.004, size = 27, normalized size = 0.8

$$\frac{2\,x}{3\,b}\left(a+b\sqrt{cx^2}\right)^{\frac{3}{2}}\frac{1}{\sqrt{cx^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^2)^(1/2))^(1/2),x)
```

```
[Out] 2/3*x*(a+b*(c*x^2)^(1/2))^(3/2)/b/(c*x^2)^(1/2)
```

Maxima [A] time = 1.38011, size = 57, normalized size = 1.68

$$\frac{\left(\left(c^{\frac{3}{2}} + c\right) bx + a\left(c + \sqrt{c}\right)\right) \sqrt{b\sqrt{c}x + a}}{\left(c^2 + 2\,c^{\frac{3}{2}} + c\right) b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a),x, algorithm="maxima")
```

```
[Out] ((c^(3/2) + c)*b*x + a*(c + sqrt(c)))*sqrt(b*sqrt(c)*x + a)/((c^2
 + 2*c^(3/2) + c)*b)
```

Fricas [A] time = 0.206791, size = 54, normalized size = 1.59

$$\frac{2\left(bcx^2 + \sqrt{cx^2}a\right)\sqrt{\sqrt{cx^2}b + a}}{3\,bcx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a),x, algorithm="fricas")
```

```
[Out] 2/3*(b*c*x^2 + sqrt(c*x^2)*a)*sqrt(sqrt(c*x^2)*b + a)/(b*c*x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{a + b\sqrt{cx^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**2)**(1/2))**(1/2),x)
```

```
[Out] Integral(sqrt(a + b*sqrt(c*x**2)), x)
```

GIAC/XCAS [A] time = 0.213123, size = 24, normalized size = 0.71

$$\frac{2\left(b\sqrt{c}x + a\right)^{\frac{3}{2}}}{3\,b\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a),x, algorithm="giac")
```

```
[Out] 2/3*(b*sqrt(c)*x + a)^(3/2)/(b*sqrt(c))
```

3.2932 $\int \frac{\sqrt{a+b\sqrt{cx^2}}}{x^2} dx$

Optimal. Leaf size=67

$$-\frac{\sqrt{a+b\sqrt{cx^2}}}{x}-\frac{b\sqrt{cx^2}\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{cx^2}}}{\sqrt{a}}\right)}{\sqrt{a}x}$$

```
[Out] -(Sqrt[a + b*Sqrt[c*x^2]]/x) - (b*Sqrt[c*x^2]*ArcTanh[Sqrt[a + b*
Sqrt[c*x^2]]/Sqrt[a]])/(Sqrt[a]*x)
```

Rubi [A] time = 0.0844995, antiderivative size = 67, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.19

$$-\frac{\sqrt{a+b\sqrt{cx^2}}}{x}-\frac{b\sqrt{cx^2}\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{cx^2}}}{\sqrt{a}}\right)}{\sqrt{a}x}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[a + b*Sqrt[c*x^2]]/x^2,x]
```

```
[Out] -(Sqrt[a + b*Sqrt[c*x^2]]/x) - (b*Sqrt[c*x^2]*ArcTanh[Sqrt[a + b*
Sqrt[c*x^2]]/Sqrt[a]])/(Sqrt[a]*x)
```

Rubi in Sympy [A] time = 8.52983, size = 56, normalized size = 0.84

$$-\frac{\sqrt{a+b\sqrt{cx^2}}}{x}-\frac{b\sqrt{cx^2}\,\operatorname{atanh}\left(\frac{\sqrt{a+b\sqrt{cx^2}}}{\sqrt{a}}\right)}{\sqrt{a}x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((a+b*(c*x**2)**(1/2))**(1/2)/x**2,x)
```

```
[Out] -sqrt(a + b*sqrt(c*x**2))/x - b*sqrt(c*x**2)*atanh(sqrt(a + b*sqr
t(c*x**2))/sqrt(a))/(sqrt(a)*x)
```

Mathematica [A] time = 0.0339828, size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\sqrt{cx^2}}}{x^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[a + b*Sqrt[c*x^2]]/x^2,x]
```

```
[Out] Integrate[Sqrt[a + b*Sqrt[c*x^2]]/x^2, x]
```

Maple [A] time = 0.016, size = 54, normalized size = 0.8

$$-\frac{1}{x}\left(Artanh\left(1\sqrt{a+b\sqrt{cx^2}}\frac{1}{\sqrt{a}}\right)b\sqrt{cx^2}+\sqrt{a+b\sqrt{cx^2}}\sqrt{a}\right)\frac{1}{\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^2)^(1/2))^(1/2)/x^2,x)
```

```
[Out] -(arctanh((a+b*(c*x^2)^(1/2))^(1/2)/a^(1/2))*b*(c*x^2)^(1/2)+(a+b
*(c*x^2)^(1/2))^(1/2)*a^(1/2))/x/a^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.224231, size = 1, normalized size = 0.01

$$\left[\frac{bx\sqrt{\frac{c}{a}}\log\left(\frac{\sqrt{cx^2}bcx+2\,acx-2\,\sqrt{cx^2}\sqrt{\sqrt{cx^2}b+a}a\sqrt{\frac{c}{a}}}{x^2}\right)-2\,\sqrt{\sqrt{cx^2}b+a}}{2\,x},\ \frac{bx\sqrt{-\frac{c}{a}}\arctan\left(\frac{ax\sqrt{-\frac{c}{a}}}{\sqrt{cx^2}\sqrt{\sqrt{cx^2}b+a}}\right)-\sqrt{\sqrt{cx^2}b+a}}{x}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)/x^2,x, algorithm="fricas")
```

```
[Out] [1/2*(b*x*sqrt(c/a)*log((sqrt(c*x^2)*b*c*x + 2*a*c*x - 2*sqrt(c*x
^2)*sqrt(sqrt(c*x^2)*b + a)*a*sqrt(c/a))/x^2) - 2*sqrt(sqrt(c*x^2
)*b + a))/x, (b*x*sqrt(-c/a)*arctan(a*x*sqrt(-c/a)/(sqrt(c*x^2)*s
qrt(sqrt(c*x^2)*b + a))) - sqrt(sqrt(c*x^2)*b + a))/x]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\sqrt{a+b\sqrt{cx^2}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**2)**(1/2))**(1/2)/x**2,x)
```

```
[Out] Integral(sqrt(a + b*sqrt(c*x**2))/x**2, x)
```

GIAC/XCAS [A] time = 0.218932, size = 73, normalized size = 1.09

$$\frac{\frac{b^2c\arctan\left(\frac{\sqrt{b\sqrt{c}x+a}}{\sqrt{-a}}\right)}{\sqrt{-a}}-\frac{\sqrt{b\sqrt{c}x+a}b\sqrt{c}}{x}}{b\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)/x^2,x, algorithm="giac")
```

```
[Out] (b^2*c*arctan(sqrt(b*sqrt(c)*x + a)/sqrt(-a))/sqrt(-a) - sqrt(b*s
qrt(c)*x + a)*b*sqrt(c)/x)/(b*sqrt(c))
```

3.2933 $\int \frac{\sqrt{a+b\sqrt{cx^2}}}{x^4}\,dx$

Optimal. Leaf size=144

$$-\frac{b^3\left(cx^2\right)^{3/2}\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{cx^2}}}{\sqrt{a}}\right)}{8a^{5/2}x^3}+\frac{b^2c\sqrt{a+b\sqrt{cx^2}}}{8a^2x}-\frac{b\left(cx^2\right)^{3/2}\sqrt{a+b\sqrt{cx^2}}}{12acx^5}-\frac{\sqrt{a+b\sqrt{cx^2}}}{3x^3}$$

```
[Out] -Sqrt[a + b*Sqrt[c*x^2]]/(3*x^3) + (b^2*c*Sqrt[a + b*Sqrt[c*x^2]]
)/(8*a^2*x) - (b*(c*x^2)^(3/2)*Sqrt[a + b*Sqrt[c*x^2]])/(12*a*c*x
^5) - (b^3*(c*x^2)^(3/2)*ArcTanh[Sqrt[a + b*Sqrt[c*x^2]]/Sqrt[a]]
)/(8*a^(5/2)*x^3)
```

Rubi [A] time = 0.164832, antiderivative size = 144, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238

$$-\frac{b^3\left(cx^2\right)^{3/2}\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{cx^2}}}{\sqrt{a}}\right)}{8a^{5/2}x^3}+\frac{b^2c\sqrt{a+b\sqrt{cx^2}}}{8a^2x}-\frac{b\left(cx^2\right)^{3/2}\sqrt{a+b\sqrt{cx^2}}}{12acx^5}-\frac{\sqrt{a+b\sqrt{cx^2}}}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[c*x^2]]/x^4,x]
```

```
[Out] -Sqrt[a + b*Sqrt[c*x^2]]/(3*x^3) + (b^2*c*Sqrt[a + b*Sqrt[c*x^2]]
)/(8*a^2*x) - (b*(c*x^2)^(3/2)*Sqrt[a + b*Sqrt[c*x^2]])/(12*a*c*x
^5) - (b^3*(c*x^2)^(3/2)*ArcTanh[Sqrt[a + b*Sqrt[c*x^2]]/Sqrt[a]]
)/(8*a^(5/2)*x^3)
```

Rubi in Sympy [A] time = 15.6864, size = 124, normalized size = 0.86

$$-\frac{\sqrt{a+b\sqrt{cx^2}}}{3x^3}-\frac{b\left(cx^2\right)^{\frac{3}{2}}\sqrt{a+b\sqrt{cx^2}}}{12acx^5}+\frac{b^2c\sqrt{a+b\sqrt{cx^2}}}{8a^2x}-\frac{b^3\left(cx^2\right)^{\frac{3}{2}}\operatorname{atanh}\left(\frac{\sqrt{a+b\sqrt{cx^2}}}{\sqrt{a}}\right)}{8a^{\frac{5}{2}}x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x**2)**(1/2))**(1/2)/x**4,x)
```

```
[Out] -sqrt(a + b*sqrt(c*x**2))/(3*x**3) - b*(c*x**2)**(3/2)*sqrt(a + b
*sqrt(c*x**2))/(12*a*c*x**5) + b**2*c*sqrt(a + b*sqrt(c*x**2))/(8
*a**2*x) - b**3*(c*x**2)**(3/2)*atanh(sqrt(a + b*sqrt(c*x**2))/sq
rt(a))/(8*a**(5/2)*x**3)
```

Mathematica [A] time = 0.0324504, size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\sqrt{cx^2}}}{x^4}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[Sqrt[a + b*Sqrt[c*x^2]]/x^4,x]
```

```
[Out] Integrate[Sqrt[a + b*Sqrt[c*x^2]]/x^4, x]
```

Maple [A] time = 0.019, size = 97, normalized size = 0.7

$$-\frac{1}{24x^3}\left(3a^{9/2}\sqrt{a+b\sqrt{cx^2}}+8a^{7/2}\left(a+b\sqrt{cx^2}\right)^{3/2}-3a^{5/2}\left(a+b\sqrt{cx^2}\right)^{5/2}+3\,Artanh\left(\frac{\sqrt{a+b\sqrt{cx^2}}}{\sqrt{a}}\right)a^2b^3\left(cx^2\right)^{3/2}\right)a^{-\frac{9}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^2)^(1/2))^(1/2)/x^4,x)
```

```
[Out] -1/24*(3*a^(9/2)*(a+b*(c*x^2)^(1/2))^(1/2)+8*a^(7/2)*(a+b*(c*x^2)
^(1/2))^(3/2)-3*a^(5/2)*(a+b*(c*x^2)^(1/2))^(5/2)+3*arctanh((a+b*
(c*x^2)^(1/2))^(1/2)/a^(1/2))*a^2*b^3*(c*x^2)^(3/2))/x^3/a^(9/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)/x^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.224765, size = 1, normalized size = 0.01

$$\left[\frac{3b^3cx^3\sqrt{\frac{c}{a}}\log\left(\frac{\sqrt{cx^2}bcx+2acx-2\sqrt{cx^2}\sqrt{\sqrt{cx^2}b+a}a\sqrt{\frac{c}{a}}}{x^2}\right)+2\left(3b^2cx^2-2\sqrt{cx^2}ab-8a^2\right)\sqrt{\sqrt{cx^2}b+a}}{48a^2x^3}, \frac{3b^3cx^3\sqrt{-\frac{c}{a}}\arctan\left(\frac{c}{\sqrt{cx^2}}\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)/x^4,x, algorithm="fricas")
```

```
[Out] [1/48*(3*b^3*c*x^3*sqrt(c/a)*log((sqrt(c*x^2)*b*c*x + 2*a*c*x - 2
*sqrt(c*x^2)*sqrt(sqrt(c*x^2)*b + a)*a*sqrt(c/a))/x^2) + 2*(3*b^2
*c*x^2 - 2*sqrt(c*x^2)*a*b - 8*a^2)*sqrt(sqrt(c*x^2)*b + a))/(a^2
*x^3), 1/24*(3*b^3*c*x^3*sqrt(-c/a)*arctan(a*x*sqrt(-c/a)/(sqrt(c
*x^2)*sqrt(sqrt(c*x^2)*b + a))) + (3*b^2*c*x^2 - 2*sqrt(c*x^2)*a*
b - 8*a^2)*sqrt(sqrt(c*x^2)*b + a))/(a^2*x^3)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\sqrt{a+b\sqrt{cx^2}}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**2)**(1/2))**(1/2)/x**4,x)
```

```
[Out] Integral(sqrt(a + b*sqrt(c*x**2))/x**4, x)
```

GIAC/XCAS [A] time = 0.220577, size = 154, normalized size = 1.07

$$\frac{\frac{3\,b^4c^2\arctan\left(\frac{\sqrt{b\sqrt{c}x+a}}{\sqrt{-a}}\right)}{\sqrt{-a}a^2}+\frac{3\,\left(b\sqrt{c}x+a\right)^{\frac{5}{2}}b^4c^2-8\,\left(b\sqrt{c}x+a\right)^{\frac{3}{2}}ab^4c^2-3\,\sqrt{b\sqrt{c}x+a}a^2b^4c^2}{a^2b^3c^{\frac{3}{2}}x^3}}{24\,b\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)/x^4,x, algorithm="giac")
```

```
[Out] 1/24*(3*b^4*c^2*arctan(sqrt(b*sqrt(c)*x + a)/sqrt(-a))/(sqrt(-a)*
a^2) + (3*(b*sqrt(c)*x + a)^(5/2)*b^4*c^2 - 8*(b*sqrt(c)*x + a)^(
3/2)*a*b^4*c^2 - 3*sqrt(b*sqrt(c)*x + a)*a^2*b^4*c^2)/(a^2*b^3*c^
(3/2)*x^3))/(b*sqrt(c))
```

3.2934 $\int \frac{\sqrt{a+b\sqrt{cx^2}}}{x^6}\,dx$

Optimal. Leaf size=219

$$-\frac{7b^5\left(cx^2\right)^{5/2}\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{cx^2}}}{\sqrt{a}}\right)}{128a^{9/2}x^5}+\frac{7b^4c^2\sqrt{a+b\sqrt{cx^2}}}{128a^4x}-\frac{7b^3\left(cx^2\right)^{5/2}\sqrt{a+b\sqrt{cx^2}}}{192a^3cx^7}+\frac{7b^2c\sqrt{a+b\sqrt{cx^2}}}{240a^2x^3}-\frac{b\left(cx^2\right)^{5/2}\sqrt{a+b\sqrt{cx^2}}}{40ac^2x^9}-\frac{\sqrt{a+b\sqrt{cx^2}}}{5x^5}$$

```
[Out] -Sqrt[a + b*Sqrt[c*x^2]]/(5*x^5) + (7*b^2*c*Sqrt[a + b*Sqrt[c*x^2
]])/(240*a^2*x^3) + (7*b^4*c^2*Sqrt[a + b*Sqrt[c*x^2]])/(128*a^4*
x) - (b*(c*x^2)^(5/2)*Sqrt[a + b*Sqrt[c*x^2]])/(40*a*c^2*x^9) - (
7*b^3*(c*x^2)^(5/2)*Sqrt[a + b*Sqrt[c*x^2]])/(192*a^3*c*x^7) - (7
*b^5*(c*x^2)^(5/2)*ArcTanh[Sqrt[a + b*Sqrt[c*x^2]]/Sqrt[a]])/(128
*a^(9/2)*x^5)
```

Rubi [A] time = 0.266059, antiderivative size = 219, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.238$

$$-\frac{7b^5\left(cx^2\right)^{5/2}\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{cx^2}}}{\sqrt{a}}\right)}{128a^{9/2}x^5}+\frac{7b^4c^2\sqrt{a+b\sqrt{cx^2}}}{128a^4x}-\frac{7b^3\left(cx^2\right)^{5/2}\sqrt{a+b\sqrt{cx^2}}}{192a^3cx^7}+\frac{7b^2c\sqrt{a+b\sqrt{cx^2}}}{240a^2x^3}-\frac{b\left(cx^2\right)^{5/2}\sqrt{a+b\sqrt{cx^2}}}{40ac^2x^9}-\frac{\sqrt{a+b\sqrt{cx^2}}}{5x^5}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[c*x^2]]/x^6,x]
```

```
[Out] -Sqrt[a + b*Sqrt[c*x^2]]/(5*x^5) + (7*b^2*c*Sqrt[a + b*Sqrt[c*x^2
]])/(240*a^2*x^3) + (7*b^4*c^2*Sqrt[a + b*Sqrt[c*x^2]])/(128*a^4*
x) - (b*(c*x^2)^(5/2)*Sqrt[a + b*Sqrt[c*x^2]])/(40*a*c^2*x^9) - (
7*b^3*(c*x^2)^(5/2)*Sqrt[a + b*Sqrt[c*x^2]])/(192*a^3*c*x^7) - (7
*b^5*(c*x^2)^(5/2)*ArcTanh[Sqrt[a + b*Sqrt[c*x^2]]/Sqrt[a]])/(128
*a^(9/2)*x^5)
```

Rubi in Sympy [A] time = 26.5256, size = 201, normalized size = 0.92

$$-\frac{\sqrt{a+b\sqrt{cx^2}}}{5x^5}-\frac{b\left(cx^2\right)^{\frac{5}{2}}\sqrt{a+b\sqrt{cx^2}}}{40ac^2x^9}+\frac{7b^2c\sqrt{a+b\sqrt{cx^2}}}{240a^2x^3}-\frac{7b^3\left(cx^2\right)^{\frac{5}{2}}\sqrt{a+b\sqrt{cx^2}}}{192a^3cx^7}+\frac{7b^4c^2\sqrt{a+b\sqrt{cx^2}}}{128a^4x}-\frac{7b^5\left(cx^2\right)^{\frac{5}{2}}\operatorname{atanh}\left(\frac{\sqrt{a+b\sqrt{cx^2}}}{\sqrt{a}}\right)}{128a^{\frac{9}{2}}x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x**2)**(1/2))**(1/2)/x**6,x)
```

```
[Out] -sqrt(a + b*sqrt(c*x**2))/(5*x**5) - b*(c*x**2)**(5/2)*sqrt(a + b
*sqrt(c*x**2))/(40*a*c**2*x**9) + 7*b**2*c*sqrt(a + b*sqrt(c*x**2
))/(240*a**2*x**3) - 7*b**3*(c*x**2)**(5/2)*sqrt(a + b*sqrt(c*x**
2))/(192*a**3*c*x**7) + 7*b**4*c**2*sqrt(a + b*sqrt(c*x**2))/(128
*a**4*x) - 7*b**5*(c*x**2)**(5/2)*atanh(sqrt(a + b*sqrt(c*x**2))/
sqrt(a))/(128*a**(9/2)*x**5)
```

Mathematica [A] time = 0.0331099, size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\sqrt{cx^2}}}{x^6}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[Sqrt[a + b*Sqrt[c*x^2]]/x^6,x]
```

```
[Out] Integrate[Sqrt[a + b*Sqrt[c*x^2]]/x^6, x]
```

Maple [A] time = 0.021, size = 133, normalized size = 0.6

$$-\frac{1}{1920\,x^5}\left(105\,a^{17/2}\sqrt{a+b\sqrt{cx^2}}+790\,a^{15/2}\left(a+b\sqrt{cx^2}\right)^{3/2}-896\,a^{13/2}\left(a+b\sqrt{cx^2}\right)^{5/2}+490\,a^{11/2}\left(a+b\sqrt{cx^2}\right)^{7/2}-105\,a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^2)^(1/2))^(1/2)/x^6,x)
```

```
[Out] -1/1920*(105*a^(17/2)*(a+b*(c*x^2)^(1/2))^(1/2)+790*a^(15/2)*(a+b
*(c*x^2)^(1/2))^(3/2)-896*a^(13/2)*(a+b*(c*x^2)^(1/2))^(5/2)+490*
a^(11/2)*(a+b*(c*x^2)^(1/2))^(7/2)-105*a^(9/2)*(a+b*(c*x^2)^(1/2)
)^(9/2)+105*arctanh((a+b*(c*x^2)^(1/2))^(1/2)/a^(1/2))*a^4*b^5*(c
*x^2)^(5/2))/x^5/a^(17/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)/x^6,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.227067, size = 1, normalized size = 0.

$$\left[\frac{105\,b^5c^2x^5\sqrt{\frac{c}{a}}\log\left(\frac{\sqrt{cx^2}bcx+2\,acx-2\,\sqrt{cx^2}\sqrt{\sqrt{cx^2}b+a}a\sqrt{\frac{c}{a}}}{x^2}\right)+2\left(105\,b^4c^2x^4+56\,a^2b^2cx^2-384\,a^4-2\left(35\,ab^3cx^2+24\,a^3b\right)\sqrt{cx^2}\right.}{3840\,a^4x^5}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)/x^6,x, algorithm="fricas")
```

```
[Out] [1/3840*(105*b^5*c^2*x^5*sqrt(c/a)*log((sqrt(c*x^2)*b*c*x + 2*a*c
*x - 2*sqrt(c*x^2)*sqrt(sqrt(c*x^2)*b + a)*a*sqrt(c/a))/x^2) + 2*
(105*b^4*c^2*x^4 + 56*a^2*b^2*c*x^2 - 384*a^4 - 2*(35*a*b^3*c*x^2
 + 24*a^3*b)*sqrt(c*x^2))*sqrt(sqrt(c*x^2)*b + a))/(a^4*x^5), 1/1
920*(105*b^5*c^2*x^5*sqrt(-c/a)*arctan(a*x*sqrt(-c/a)/(sqrt(c*x^2
)*sqrt(sqrt(c*x^2)*b + a))) + (105*b^4*c^2*x^4 + 56*a^2*b^2*c*x^2
 - 384*a^4 - 2*(35*a*b^3*c*x^2 + 24*a^3*b)*sqrt(c*x^2))*sqrt(sqrt
(c*x^2)*b + a))/(a^4*x^5)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + b\sqrt{cx^2}}}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**2)**(1/2))**(1/2)/x**6,x)
```

```
[Out] Integral(sqrt(a + b*sqrt(c*x**2))/x**6, x)
```

GIAC/XCAS [A] time = 0.22202, size = 211, normalized size = 0.96

$$\frac{\frac{105\,b^6c^3\arctan\left(\frac{\sqrt{b\sqrt{c}x+a}}{\sqrt{-a}}\right)}{\sqrt{-a}a^4} + \frac{105\,\left(b\sqrt{c}x+a\right)^{\frac{9}{2}}b^6c^3 - 490\,\left(b\sqrt{c}x+a\right)^{\frac{7}{2}}ab^6c^3 + 896\,\left(b\sqrt{c}x+a\right)^{\frac{5}{2}}a^2b^6c^3 - 790\,\left(b\sqrt{c}x+a\right)^{\frac{3}{2}}a^3b^6c^3 - 105\,\sqrt{b\sqrt{c}x+a}a^4b^6c^3}{a^4b^5c^{\frac{5}{2}}x^5}}{1920\,b\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)/x^6,x, algorithm="giac")
```

```
[Out] 1/1920*(105*b^6*c^3*arctan(sqrt(b*sqrt(c)*x + a)/sqrt(-a))/(sqrt(
-a)*a^4) + (105*(b*sqrt(c)*x + a)^(9/2)*b^6*c^3 - 490*(b*sqrt(c)*
x + a)^(7/2)*a*b^6*c^3 + 896*(b*sqrt(c)*x + a)^(5/2)*a^2*b^6*c^3
- 790*(b*sqrt(c)*x + a)^(3/2)*a^3*b^6*c^3 - 105*sqrt(b*sqrt(c)*x
+ a)*a^4*b^6*c^3)/(a^4*b^5*c^(5/2)*x^5))/(b*sqrt(c))
```

3.2935 $\int x^8\sqrt{a+b\left(cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=113

$$\frac{2a^2x^9\left(a+b\left(cx^2\right)^{3/2}\right)^{3/2}}{9b^3\left(cx^2\right)^{9/2}}+\frac{2x^9\left(a+b\left(cx^2\right)^{3/2}\right)^{7/2}}{21b^3\left(cx^2\right)^{9/2}}-\frac{4ax^9\left(a+b\left(cx^2\right)^{3/2}\right)^{5/2}}{15b^3\left(cx^2\right)^{9/2}}$$

```
[Out] (2*a^2*x^9*(a + b*(c*x^2)^(3/2))^(3/2))/(9*b^3*(c*x^2)^(9/2)) - (
4*a*x^9*(a + b*(c*x^2)^(3/2))^(5/2))/(15*b^3*(c*x^2)^(9/2)) + (2*
x^9*(a + b*(c*x^2)^(3/2))^(7/2))/(21*b^3*(c*x^2)^(9/2))
```

Rubi [A] time = 0.160875, antiderivative size = 113, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$\frac{2a^2x^9\left(a+b\left(cx^2\right)^{3/2}\right)^{3/2}}{9b^3\left(cx^2\right)^{9/2}}+\frac{2x^9\left(a+b\left(cx^2\right)^{3/2}\right)^{7/2}}{21b^3\left(cx^2\right)^{9/2}}-\frac{4ax^9\left(a+b\left(cx^2\right)^{3/2}\right)^{5/2}}{15b^3\left(cx^2\right)^{9/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8*Sqrt[a + b*(c*x^2)^(3/2)],x]
```

```
[Out] (2*a^2*x^9*(a + b*(c*x^2)^(3/2))^(3/2))/(9*b^3*(c*x^2)^(9/2)) - (
4*a*x^9*(a + b*(c*x^2)^(3/2))^(5/2))/(15*b^3*(c*x^2)^(9/2)) + (2*
x^9*(a + b*(c*x^2)^(3/2))^(7/2))/(21*b^3*(c*x^2)^(9/2))
```

Rubi in Sympy [A] time = 15.1896, size = 105, normalized size = 0.93

$$\frac{2a^2x^9\left(a+b\left(cx^2\right)^{\frac{3}{2}}\right)^{\frac{3}{2}}}{9b^3\left(cx^2\right)^{\frac{9}{2}}}-\frac{4ax^9\left(a+b\left(cx^2\right)^{\frac{3}{2}}\right)^{\frac{5}{2}}}{15b^3\left(cx^2\right)^{\frac{9}{2}}}+\frac{2x^9\left(a+b\left(cx^2\right)^{\frac{3}{2}}\right)^{\frac{7}{2}}}{21b^3\left(cx^2\right)^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8*(a+b*(c*x**2)**(3/2))**(1/2),x)
```

```
[Out] 2*a**2*x**9*(a + b*(c*x**2)**(3/2))**(3/2)/(9*b**3*(c*x**2)**(9/2
)) - 4*a*x**9*(a + b*(c*x**2)**(3/2))**(5/2)/(15*b**3*(c*x**2)**(
9/2)) + 2*x**9*(a + b*(c*x**2)**(3/2))**(7/2)/(21*b**3*(c*x**2)**
(9/2))
```

Mathematica [A] time = 0.0720967, size = 0, normalized size = 0.

$$\int x^8\sqrt{a+b\left(cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[x^8*Sqrt[a + b*(c*x^2)^(3/2)],x]
```

```
[Out] Integrate[x^8*Sqrt[a + b*(c*x^2)^(3/2)], x]
```

Maple [F] time = 0.052, size = 0, normalized size = 0.

$$\int x^8\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8*(a+b*(c*x^2)^(3/2))^(1/2),x)
```

```
[Out] int(x^8*(a+b*(c*x^2)^(3/2))^(1/2),x)
```

Maxima [A] time = 1.44528, size = 1091, normalized size = 9.65

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)*x^8,x, algorithm="maxima")
```

```
[Out] 1/3*((c^7 + 3*c^6 + 2*c^5)*b^3*x^9 + (c^5 + c^4)*a*b^2*sqrt(c)*x^
6 - 2*a^2*b*c^3*x^3 + 2*a^3*sqrt(c))*sqrt(b*c^(3/2)*x^3 + a)/((c^
8 + 6*c^7 + 11*c^6 + 6*c^5)*b^3) + 2/315*(b^2*c^(11/2)*(15*(b*c^(
3/2)*x^3 + a)^(7/2)/(b^3*c^(9/2)) - 42*(b*c^(3/2)*x^3 + a)^(5/2)*
a/(b^3*c^(9/2)) + 35*(b*c^(3/2)*x^3 + a)^(3/2)*a^2/(b^3*c^(9/2)))
 - b^2*c^5*(15*(b*c^(3/2)*x^3 + a)^(7/2)/(b^3*c^(9/2)) - 42*(b*c^
(3/2)*x^3 + a)^(5/2)*a/(b^3*c^(9/2)) + 35*(b*c^(3/2)*x^3 + a)^(3/
2)*a^2/(b^3*c^(9/2))) + 3*b^2*c^(9/2)*(15*(b*c^(3/2)*x^3 + a)^(7/
2)/(b^3*c^(9/2)) - 42*(b*c^(3/2)*x^3 + a)^(5/2)*a/(b^3*c^(9/2)) +
 35*(b*c^(3/2)*x^3 + a)^(3/2)*a^2/(b^3*c^(9/2))) - 3*b^2*c^4*(15*
(b*c^(3/2)*x^3 + a)^(7/2)/(b^3*c^(9/2)) - 42*(b*c^(3/2)*x^3 + a)^
(5/2)*a/(b^3*c^(9/2)) + 35*(b*c^(3/2)*x^3 + a)^(3/2)*a^2/(b^3*c^(
9/2))) + 2*b^2*c^(7/2)*(15*(b*c^(3/2)*x^3 + a)^(7/2)/(b^3*c^(9/2)
) - 42*(b*c^(3/2)*x^3 + a)^(5/2)*a/(b^3*c^(9/2)) + 35*(b*c^(3/2)*
x^3 + a)^(3/2)*a^2/(b^3*c^(9/2))) - 14*a*b*c^3*(3*(b*c^(3/2)*x^3
+ a)^(5/2)/(b^2*c^3) - 5*(b*c^(3/2)*x^3 + a)^(3/2)*a/(b^2*c^3)) -
 2*b^2*c^3*(15*(b*c^(3/2)*x^3 + a)^(7/2)/(b^3*c^(9/2)) - 42*(b*c^
(3/2)*x^3 + a)^(5/2)*a/(b^3*c^(9/2)) + 35*(b*c^(3/2)*x^3 + a)^(3/
2)*a^2/(b^3*c^(9/2))) + 14*a*b*c^(5/2)*(3*(b*c^(3/2)*x^3 + a)^(5/
2)/(b^2*c^3) - 5*(b*c^(3/2)*x^3 + a)^(3/2)*a/(b^2*c^3)) - 14*a*b*
c^2*(3*(b*c^(3/2)*x^3 + a)^(5/2)/(b^2*c^3) - 5*(b*c^(3/2)*x^3 + a
)^(3/2)*a/(b^2*c^3)) + 14*a*b*c^(3/2)*(3*(b*c^(3/2)*x^3 + a)^(5/2
)/(b^2*c^3) - 5*(b*c^(3/2)*x^3 + a)^(3/2)*a/(b^2*c^3)) + 70*(b*c^
(3/2)*x^3 + a)^(3/2)*a^2/(b*c) - 70*(b*c^(3/2)*x^3 + a)^(3/2)*a^2
/(b*c^(3/2)))/((c^5 + 6*c^4 + 11*c^3 + 6*c^2)*b^2*sqrt(c))
```

Fricas [A] time = 0.211175, size = 105, normalized size = 0.93

$$\frac{2\left(15\,b^3c^5x^{10}-4\,a^2bc^2x^4+\left(3\,ab^2c^3x^6+8\,a^3\right)\sqrt{cx^2}\right)\sqrt{\sqrt{cx^2}bcx^2+a}}{315\,b^3c^5x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)*x^8,x, algorithm="fricas")
```

```
[Out] 2/315*(15*b^3*c^5*x^10 - 4*a^2*b*c^2*x^4 + (3*a*b^2*c^3*x^6 + 8*a
^3)*sqrt(c*x^2))*sqrt(sqrt(c*x^2)*b*c*x^2 + a)/(b^3*c^5*x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^8\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8*(a+b*(c*x**2)**(3/2))**(1/2),x)
```

```
[Out] Integral(x**8*sqrt(a + b*(c*x**2)**(3/2)), x)
```

GIAC/XCAS [A] time = 0.218875, size = 74, normalized size = 0.65

$$\frac{2\left(15\left(bc^{\frac{3}{2}}x^{3}+a\right)^{\frac{7}{2}}-42\left(bc^{\frac{3}{2}}x^{3}+a\right)^{\frac{5}{2}}a+35\left(bc^{\frac{3}{2}}x^{3}+a\right)^{\frac{3}{2}}a^{2}\right)}{315\,b^{3}c^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)*x^8,x, algorithm="giac")
```

```
[Out] 2/315*(15*(b*c^(3/2)*x^3 + a)^(7/2) - 42*(b*c^(3/2)*x^3 + a)^(5/2
)*a + 35*(b*c^(3/2)*x^3 + a)^(3/2)*a^2)/(b^3*c^(9/2))
```

3.2936 $\int x^5\sqrt{a+b\left(cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=56

$$\frac{2\left(a+b\left(cx^2\right)^{3/2}\right)^{5/2}}{15b^2c^3}-\frac{2a\left(a+b\left(cx^2\right)^{3/2}\right)^{3/2}}{9b^2c^3}$$

```
[Out] (-2*a*(a + b*(c*x^2)^(3/2))^(3/2))/(9*b^2*c^3) + (2*(a + b*(c*x^2
)^(3/2))^(5/2))/(15*b^2*c^3)
```

Rubi [A] time = 0.114753, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$\frac{2\left(a+b\left(cx^2\right)^{3/2}\right)^{5/2}}{15b^2c^3}-\frac{2a\left(a+b\left(cx^2\right)^{3/2}\right)^{3/2}}{9b^2c^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5*Sqrt[a + b*(c*x^2)^(3/2)],x]
```

```
[Out] (-2*a*(a + b*(c*x^2)^(3/2))^(3/2))/(9*b^2*c^3) + (2*(a + b*(c*x^2
)^(3/2))^(5/2))/(15*b^2*c^3)
```

Rubi in Sympy [A] time = 11.9638, size = 51, normalized size = 0.91

$$-\frac{2a\left(a+b\left(cx^2\right)^{\frac{3}{2}}\right)^{\frac{3}{2}}}{9b^2c^3}+\frac{2\left(a+b\left(cx^2\right)^{\frac{3}{2}}\right)^{\frac{5}{2}}}{15b^2c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5*(a+b*(c*x**2)**(3/2))**(1/2),x)
```

```
[Out] -2*a*(a + b*(c*x**2)**(3/2))**(3/2)/(9*b**2*c**3) + 2*(a + b*(c*x
**2)**(3/2))**(5/2)/(15*b**2*c**3)
```

Mathematica [A] time = 0.0904102, size = 0, normalized size = 0.

$$\int x^5\sqrt{a+b\left(cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[x^5*Sqrt[a + b*(c*x^2)^(3/2)],x]
```

```
[Out] Integrate[x^5*Sqrt[a + b*(c*x^2)^(3/2)], x]
```

Maple [F] time = 0.05, size = 0, normalized size = 0.

$$\int x^5\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5*(a+b*(c*x^2)^(3/2))^(1/2),x)

[Out] int(x^5*(a+b*(c*x^2)^(3/2))^(1/2),x)
```

Maxima [A] time = 1.34099, size = 58, normalized size = 1.04

$$\frac{2\left(\frac{3\left((cx^2)^{\frac{3}{2}}b+a\right)^{\frac{5}{2}}}{b^2}-\frac{5\left((cx^2)^{\frac{3}{2}}b+a\right)^{\frac{3}{2}}a}{b^2}\right)}{45\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)*x^5,x, algorithm="maxima")

[Out] 2/45*(3*((c*x^2)^(3/2)*b + a)^(5/2)/b^2 - 5*((c*x^2)^(3/2)*b + a)
^(3/2)*a/b^2)/c^3
```

Fricas [A] time = 0.210445, size = 76, normalized size = 1.36

$$\frac{2\left(3\,b^2c^3x^6+\sqrt{cx^2}abcx^2-2\,a^2\right)\sqrt{\sqrt{cx^2}bcx^2+a}}{45\,b^2c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)*x^5,x, algorithm="fricas")

[Out] 2/45*(3*b^2*c^3*x^6 + sqrt(c*x^2)*a*b*c*x^2 - 2*a^2)*sqrt(sqrt(c*
x^2)*b*c*x^2 + a)/(b^2*c^3)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^5\sqrt{a+b\,(cx^2)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5*(a+b*(c*x**2)**(3/2))**(1/2),x)

[Out] Integral(x**5*sqrt(a + b*(c*x**2)**(3/2)), x)
```

GIAC/XCAS [A] time = 0.218228, size = 51, normalized size = 0.91

$$\frac{2\left(3\left(bc^{\frac{3}{2}}x^3+a\right)^{\frac{5}{2}}-5\left(bc^{\frac{3}{2}}x^3+a\right)^{\frac{3}{2}}a\right)}{45\,b^2c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)*x^5,x, algorithm="giac")

[Out] 2/45*(3*(b*c^(3/2)*x^3 + a)^(5/2) - 5*(b*c^(3/2)*x^3 + a)^(3/2)*a
)/(b^2*c^3)
```

3.2937 $\int x^2\sqrt{a+b\left(cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=36

$$\frac{2x^3\left(a+b\left(cx^2\right)^{3/2}\right)^{3/2}}{9b\left(cx^2\right)^{3/2}}$$

```
[Out] (2*x^3*(a + b*(c*x^2)^(3/2))^(3/2))/(9*b*(c*x^2)^(3/2))
```

Rubi [A] time = 0.0481334, antiderivative size = 36, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095

$$\frac{2x^3\left(a+b\left(cx^2\right)^{3/2}\right)^{3/2}}{9b\left(cx^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2*Sqrt[a + b*(c*x^2)^(3/2)],x]

[Out] (2*x^3*(a + b*(c*x^2)^(3/2))^(3/2))/(9*b*(c*x^2)^(3/2))
```

Rubi in Sympy [A] time = 5.13997, size = 31, normalized size = 0.86

$$\frac{2x^3\left(a+b\left(cx^2\right)^{\frac{3}{2}}\right)^{\frac{3}{2}}}{9b\left(cx^2\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(a+b*(c*x**2)**(3/2))**(1/2),x)

[Out] 2*x**3*(a + b*(c*x**2)**(3/2))**(3/2)/(9*b*(c*x**2)**(3/2))
```

Mathematica [A] time = 0.0365523, size = 37, normalized size = 1.03

$$\frac{2x\left(a+b\left(cx^2\right)^{3/2}\right)^{3/2}}{9bc\sqrt{cx^2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2*Sqrt[a + b*(c*x^2)^(3/2)],x]

[Out] (2*x*(a + b*(c*x^2)^(3/2))^(3/2))/(9*b*c*Sqrt[c*x^2])
```

Maple [A] time = 0.009, size = 29, normalized size = 0.8

$$\frac{2\,x^3}{9\,b}\left(a+b\left(cx^2\right)^{\frac{3}{2}}\right)^{\frac{3}{2}}\left(cx^2\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(a+b*(c*x^2)^(3/2))^(1/2),x)
```

```
[Out] 2/9*x^3*(a+b*(c*x^2)^(3/2))^(3/2)/b/(c*x^2)^(3/2)
```

Maxima [A] time = 1.3573, size = 81, normalized size = 2.25

$$\frac{2\left(bc^{\frac{3}{2}}x^3+a\right)^{\frac{3}{2}}\left(c-\sqrt{c}\right)}{9\,b(c+1)c^{\frac{3}{2}}}+\frac{\left(bc^{\frac{3}{2}}x^3+a\right)^{\frac{3}{2}}}{3\left(c^2+c\right)b\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)*x^2,x, algorithm="maxima")
```

```
[Out] 2/9*(b*c^(3/2)*x^3 + a)^(3/2)*(c - sqrt(c))/(b*(c + 1)*c^(3/2)) +
 1/3*(b*c^(3/2)*x^3 + a)^(3/2)/((c^2 + c)*b*sqrt(c))
```

Fricas [A] time = 0.212305, size = 62, normalized size = 1.72

$$\frac{2\left(bc^2x^4+\sqrt{cx^2}a\right)\sqrt{\sqrt{cx^2}bcx^2+a}}{9\,bc^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)*x^2,x, algorithm="fricas")
```

```
[Out] 2/9*(b*c^2*x^4 + sqrt(c*x^2)*a)*sqrt(sqrt(c*x^2)*b*c*x^2 + a)/(b*
c^2*x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^2\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(a+b*(c*x**2)**(3/2))**(1/2),x)
```

```
[Out] Integral(x**2*sqrt(a + b*(c*x**2)**(3/2)), x)
```

GIAC/XCAS [A] time = 0.218206, size = 27, normalized size = 0.75

$$\frac{2\left(bc^{\frac{3}{2}}x^3+a\right)^{\frac{3}{2}}}{9\,bc^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)*x^2,x, algorithm="giac")
```

```
[Out] 2/9*(b*c^(3/2)*x^3 + a)^(3/2)/(b*c^(3/2))
```

3.2938 $\int \frac{\sqrt{a+b(cx^2)^{3/2}}}{x} dx$

Optimal. Leaf size=55

$$\frac{2}{3}\sqrt{a+b\left(cx^2\right)^{3/2}}-\frac{2}{3}\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+b\left(cx^2\right)^{3/2}}}{\sqrt{a}}\right)$$

```
[Out] (2*Sqrt[a + b*(c*x^2)^(3/2)])/3 - (2*Sqrt[a]*ArcTanh[Sqrt[a + b*(
c*x^2)^(3/2)]/Sqrt[a]])/3
```

Rubi [A] time = 0.109177, antiderivative size = 55, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238

$$\frac{2}{3}\sqrt{a+b\left(cx^2\right)^{3/2}}-\frac{2}{3}\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+b\left(cx^2\right)^{3/2}}}{\sqrt{a}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*(c*x^2)^(3/2)]/x,x]
```

```
[Out] (2*Sqrt[a + b*(c*x^2)^(3/2)])/3 - (2*Sqrt[a]*ArcTanh[Sqrt[a + b*(
c*x^2)^(3/2)]/Sqrt[a]])/3
```

Rubi in Sympy [A] time = 9.67446, size = 48, normalized size = 0.87

$$-\frac{2\sqrt{a}\operatorname{atanh}\left(\frac{\sqrt{a+b(cx^2)^{\frac{3}{2}}}}{\sqrt{a}}\right)}{3}+\frac{2\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x**2)**(3/2))**(1/2)/x,x)
```

```
[Out] -2*sqrt(a)*atanh(sqrt(a + b*(c*x**2)**(3/2))/sqrt(a))/3 + 2*sqrt(
a + b*(c*x**2)**(3/2))/3
```

Mathematica [A] time = 0.0467946, size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\left(cx^2\right)^{3/2}}}{x}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[Sqrt[a + b*(c*x^2)^(3/2)]/x,x]
```

```
[Out] Integrate[Sqrt[a + b*(c*x^2)^(3/2)]/x, x]
```

Maple [F] time = 0.049, size = 0, normalized size = 0.

$$\int \frac{1}{x}\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^2)^(3/2))^(1/2)/x,x)
```

```
[Out] int((a+b*(c*x^2)^(3/2))^(1/2)/x,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.223305, size = 1, normalized size = 0.02

$$\left[\frac{1}{3}\sqrt{a}\log\left(\frac{\sqrt{cx^2}bcx^2 - 2\sqrt{\sqrt{cx^2}bcx^2 + a}\sqrt{a} + 2a}{x^3}\right) + \frac{2}{3}\sqrt{\sqrt{cx^2}bcx^2 + a}, -\frac{2}{3}\sqrt{-a}\arctan\left(\frac{\sqrt{\sqrt{cx^2}bcx^2 + a}}{\sqrt{-a}}\right) + \frac{2}{3}\sqrt{\sqrt{cx^2}bcx^2 + a}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)/x,x, algorithm="fricas")
```

```
[Out] [1/3*sqrt(a)*log((sqrt(c*x^2)*b*c*x^2 - 2*sqrt(sqrt(c*x^2)*b*c*x^
2 + a)*sqrt(a) + 2*a)/x^3) + 2/3*sqrt(sqrt(c*x^2)*b*c*x^2 + a), -
2/3*sqrt(-a)*arctan(sqrt(sqrt(c*x^2)*b*c*x^2 + a)/sqrt(-a)) + 2/3
*sqrt(sqrt(c*x^2)*b*c*x^2 + a)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + b\left(cx^2\right)^{\frac{3}{2}}}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**2)**(3/2))**(1/2)/x,x)
```

```
[Out] Integral(sqrt(a + b*(c*x**2)**(3/2))/x, x)
```

GIAC/XCAS [A] time = 0.217552, size = 57, normalized size = 1.04

$$\frac{2\,a\arctan\left(\frac{\sqrt{bc^{\frac{3}{2}}x^3+a}}{\sqrt{-a}}\right)}{3\sqrt{-a}} + \frac{2}{3}\sqrt{bc^{\frac{3}{2}}x^3 + a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)/x,x, algorithm="giac")
```

```
[Out] 2/3*a*arctan(sqrt(b*c^(3/2)*x^3 + a)/sqrt(-a))/sqrt(-a) + 2/3*sqr
t(b*c^(3/2)*x^3 + a)
```

3.2939 $\int \frac{\sqrt{a+b(cx^2)^{3/2}}}{x^4}\,dx$

Optimal. Leaf size=71

$$-\frac{\sqrt{a+b\left(cx^2\right)^{3/2}}}{3x^3}-\frac{b\left(cx^2\right)^{3/2}\tanh^{-1}\left(\frac{\sqrt{a+b(cx^2)^{3/2}}}{\sqrt{a}}\right)}{3\sqrt{a}\,x^3}$$

```
[Out] -Sqrt[a + b*(c*x^2)^(3/2)]/(3*x^3) - (b*(c*x^2)^(3/2)*ArcTanh[Sqr
t[a + b*(c*x^2)^(3/2)]/Sqrt[a]])/(3*Sqrt[a]*x^3)
```

Rubi [A] time = 0.124638, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238

$$-\frac{\sqrt{a+b\left(cx^2\right)^{3/2}}}{3x^3}-\frac{b\left(cx^2\right)^{3/2}\tanh^{-1}\left(\frac{\sqrt{a+b(cx^2)^{3/2}}}{\sqrt{a}}\right)}{3\sqrt{a}\,x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*(c*x^2)^(3/2)]/x^4,x]
```

```
[Out] -Sqrt[a + b*(c*x^2)^(3/2)]/(3*x^3) - (b*(c*x^2)^(3/2)*ArcTanh[Sqr
t[a + b*(c*x^2)^(3/2)]/Sqrt[a]])/(3*Sqrt[a]*x^3)
```

Rubi in Sympy [A] time = 10.3422, size = 63, normalized size = 0.89

$$-\frac{\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}}{3x^3}-\frac{b\left(cx^2\right)^{\frac{3}{2}}\operatorname{atanh}\left(\frac{\sqrt{a+b(cx^2)^{\frac{3}{2}}}}{\sqrt{a}}\right)}{3\sqrt{a}\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x**2)**(3/2))**(1/2)/x**4,x)
```

```
[Out] -sqrt(a + b*(c*x**2)**(3/2))/(3*x**3) - b*(c*x**2)**(3/2)*atanh(s
qrt(a + b*(c*x**2)**(3/2))/sqrt(a))/(3*sqrt(a)*x**3)
```

Mathematica [A] time = 0.0423885, size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\left(cx^2\right)^{3/2}}}{x^4}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[Sqrt[a + b*(c*x^2)^(3/2)]/x^4,x]
```

```
[Out] Integrate[Sqrt[a + b*(c*x^2)^(3/2)]/x^4, x]
```

Maple [F] time = 0.049, size = 0, normalized size = 0.

$$\int \frac{1}{x^4}\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^2)^(3/2))^(1/2)/x^4,x)
```

```
[Out] int((a+b*(c*x^2)^(3/2))^(1/2)/x^4,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)/x^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.226451, size = 1, normalized size = 0.01

$$\left[\frac{bcx^3\sqrt{\frac{c}{a}}\log\left(\frac{\sqrt{cx^2}bc^2x^3+2\,acx-2\,\sqrt{\sqrt{cx^2}bcx^2+a}\sqrt{cx^2}a\sqrt{\frac{c}{a}}}{x^4}\right)-2\,\sqrt{\sqrt{cx^2}bcx^2+a}}{6\,x^3},\ \frac{bcx^3\sqrt{-\frac{c}{a}}\arctan\left(\frac{ax\sqrt{-\frac{c}{a}}}{\sqrt{\sqrt{cx^2}bcx^2+a}\sqrt{cx^2}}\right)-\sqrt{\sqrt{cx^2}bc}}{3\,x^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)/x^4,x, algorithm="fricas")
```

```
[Out] [1/6*(b*c*x^3*sqrt(c/a)*log((sqrt(c*x^2)*b*c^2*x^3 + 2*a*c*x - 2*
sqrt(sqrt(c*x^2)*b*c*x^2 + a)*sqrt(c*x^2)*a*sqrt(c/a))/x^4) - 2*s
qrt(sqrt(c*x^2)*b*c*x^2 + a))/x^3, 1/3*(b*c*x^3*sqrt(-c/a)*arctan
(a*x*sqrt(-c/a)/(sqrt(sqrt(c*x^2)*b*c*x^2 + a)*sqrt(c*x^2))) - sq
rt(sqrt(c*x^2)*b*c*x^2 + a))/x^3]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + b\left(cx^2\right)^{\frac{3}{2}}}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**2)**(3/2))**(1/2)/x**4,x)
```

```
[Out] Integral(sqrt(a + b*(c*x**2)**(3/2))/x**4, x)
```

GIAC/XCAS [A] time = 0.221922, size = 74, normalized size = 1.04

$$\frac{1}{3}\,bc^{\frac{3}{2}}\left(\frac{\arctan\left(\frac{\sqrt{bc^{\frac{3}{2}}x^3+a}}{\sqrt{-a}}\right)}{\sqrt{-a}}-\frac{\sqrt{bc^{\frac{3}{2}}x^3+a}}{bc^{\frac{3}{2}}x^3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)/x^4,x, algorithm="giac")
```

```
[Out] 1/3*b*c^(3/2)*(arctan(sqrt(b*c^(3/2)*x^3 + a)/sqrt(-a))/sqrt(-a)
- sqrt(b*c^(3/2)*x^3 + a)/(b*c^(3/2)*x^3))
```

3.2940 $\int x^3\sqrt{a+b\left(cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=340

$$-\frac{4\,3^{3/4}\sqrt{2+\sqrt{3}}\,a^2\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{2/3}cx^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\,F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}\sqrt{cx^2}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}\sqrt{cx^2}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{55b^{4/3}c^2\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{3/2}}}+\frac{6a\sqrt{cx^2}\sqrt{a+b\left(cx^2\right)^{3/2}}}{55bc^2}+\frac{2}{11}x^4\sqrt{a+b\left(cx^2\right)^{3/2}}$$

```
[Out] (2*x^4*Sqrt[a + b*(c*x^2)^(3/2)])/11 + (6*a*Sqrt[c*x^2]*Sqrt[a +
b*(c*x^2)^(3/2)])/(55*b*c^2) - (4*3^(3/4)*Sqrt[2 + Sqrt[3]]*a^2*(
a^(1/3) + b^(1/3)*Sqrt[c*x^2])*Sqrt[(a^(2/3) + b^(2/3)*c*x^2 - a^
(1/3)*b^(1/3)*Sqrt[c*x^2])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[
c*x^2])^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt
[c*x^2])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])], -7 - 4*S
qrt[3]])/(55*b^(4/3)*c^2*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*Sqrt[c*
x^2]))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])^2]*Sqrt[a +
b*(c*x^2)^(3/2)])
```

Rubi [A] time = 0.502507, antiderivative size = 340, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.19

$$-\frac{4\,3^{3/4}\sqrt{2+\sqrt{3}}\,a^2\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{2/3}cx^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\,F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}\sqrt{cx^2}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}\sqrt{cx^2}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{55b^{4/3}c^2\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{3/2}}}+\frac{6a\sqrt{cx^2}\sqrt{a+b\left(cx^2\right)^{3/2}}}{55bc^2}+\frac{2}{11}x^4\sqrt{a+b\left(cx^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3*Sqrt[a + b*(c*x^2)^(3/2)],x]
```


```
[Out] (2*x^4*Sqrt[a + b*(c*x^2)^(3/2)])/11 + (6*a*Sqrt[c*x^2]*Sqrt[a +
b*(c*x^2)^(3/2)])/(55*b*c^2) - (4*3^(3/4)*Sqrt[2 + Sqrt[3]]*a^2*(
a^(1/3) + b^(1/3)*Sqrt[c*x^2])*Sqrt[(a^(2/3) + b^(2/3)*c*x^2 - a^
(1/3)*b^(1/3)*Sqrt[c*x^2])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[
c*x^2])^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt
[c*x^2])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])], -7 - 4*S
qrt[3]])/(55*b^(4/3)*c^2*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*Sqrt[c*
x^2]))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])^2]*Sqrt[a +
b*(c*x^2)^(3/2)])
```

Rubi in Sympy [A] time = 24.6502, size = 301, normalized size = 0.89

$$-\frac{4\cdot 3^{\frac{3}{4}}a^2\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{\frac{2}{3}}cx^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}}\right)\middle|-7-4\sqrt{3}\right)}{55b^{\frac{4}{3}}c^2\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}}+\frac{6a\sqrt{cx^2}\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}}{55bc^2}+\frac{2x^4\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3*(a+b*(c*x**2)**(3/2))**(1/2),x)
```

```
[Out] -4*3**(3/4)*a**2*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*sqrt(c*x**2)
+ b**(2/3)*c*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c*x**2
))**2)*sqrt(sqrt(3) + 2)*(a**(1/3) + b**(1/3)*sqrt(c*x**2))*ellip
tic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)*sqrt(c*x**2))/(a*
*(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c*x**2))), -7 - 4*sqrt(3))/(
55*b**(4/3)*c**2*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*sqrt(c*x**2))
/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c*x**2))**2)*sqrt(a + b*
(c*x**2)**(3/2))) + 6*a*sqrt(c*x**2)*sqrt(a + b*(c*x**2)**(3/2))/
(55*b*c**2) + 2*x**4*sqrt(a + b*(c*x**2)**(3/2))/11
```

Mathematica [C] time = 0.256877, size = 132, normalized size = 0.39

$$\frac{-6a^2\sqrt{cx^2}\sqrt{\frac{a+b(cx^2)^{3/2}}{a}}\,{}_2F_1\left(\frac{1}{3},\frac{1}{2};\frac{4}{3};-\frac{b\left(cx^2\right)^{3/2}}{a}\right)+6a^2\sqrt{cx^2}+16abc^2x^4+10b^2c^3x^6\sqrt{cx^2}}{55bc^2\sqrt{a+b\left(cx^2\right)^{3/2}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3*Sqrt[a + b*(c*x^2)^(3/2)],x]
```

```
[Out] (16*a*b*c^2*x^4 + 6*a^2*Sqrt[c*x^2] + 10*b^2*c^3*x^6*Sqrt[c*x^2]
- 6*a^2*Sqrt[c*x^2]*Sqrt[(a + b*(c*x^2)^(3/2))/a]*Hypergeometric2
F1[1/3, 1/2, 4/3, -((b*(c*x^2)^(3/2))/a)])/(55*b*c^2*Sqrt[a + b*(
c*x^2)^(3/2)])
```

Maple [F] time = 0.049, size = 0, normalized size = 0.

$$\int x^3\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3*(a+b*(c*x^2)^(3/2))^(1/2),x)
```

```
[Out] int(x^3*(a+b*(c*x^2)^(3/2))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\sqrt{\left(cx^2\right)^{\frac{3}{2}}b+a}x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)*x^3,x, algorithm="maxima")
```

```
[Out] integrate(sqrt((c*x^2)^(3/2)*b + a)*x^3, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{\sqrt{cx^2}bcx^2 + a}x^3, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)*x^3,x, algorithm="fricas")
```

```
[Out] integral(sqrt(sqrt(c*x^2)*b*c*x^2 + a)*x^3, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^3\sqrt{a + b\left(cx^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(a+b*(c*x**2)**(3/2))**(1/2),x)
```

```
[Out] Integral(x**3*sqrt(a + b*(c*x**2)**(3/2)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{\left(cx^2\right)^{\frac{3}{2}}b + a}x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)*x^3,x, algorithm="giac")
```

```
[Out] integrate(sqrt((c*x^2)^(3/2)*b + a)*x^3, x)
```

3.2941 $\int \sqrt{a+b\left(cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=306

$$\frac{2\,3^{3/4}\sqrt{2+\sqrt{3}}ax\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{2/3}cx^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}\sqrt{cx^2}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}\sqrt{cx^2}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{5\sqrt[3]{b}\sqrt{cx^2}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{3/2}}}+\frac{2}{5}x\sqrt{a+b\left(cx^2\right)^{3/2}}$$

```
[Out] (2*x*Sqrt[a + b*(c*x^2)^(3/2)])/5 + (2*3^(3/4)*Sqrt[2 + Sqrt[3]]*
a*x*(a^(1/3) + b^(1/3)*Sqrt[c*x^2])*Sqrt[(a^(2/3) + b^(2/3)*c*x^2
 - a^(1/3)*b^(1/3)*Sqrt[c*x^2])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*
Sqrt[c*x^2])^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)
*Sqrt[c*x^2])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])], -7
- 4*Sqrt[3]])/(5*b^(1/3)*Sqrt[c*x^2]*Sqrt[(a^(1/3)*(a^(1/3) + b^(
1/3)*Sqrt[c*x^2]))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])^
2]*Sqrt[a + b*(c*x^2)^(3/2)])
```

Rubi [A] time = 0.318783, antiderivative size = 306, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176

$$\frac{2\,3^{3/4}\sqrt{2+\sqrt{3}}ax\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{2/3}cx^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}\sqrt{cx^2}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}\sqrt{cx^2}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{5\sqrt[3]{b}\sqrt{cx^2}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{3/2}}}+\frac{2}{5}x\sqrt{a+b\left(cx^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*(c*x^2)^(3/2)],x]
```

```
[Out] (2*x*Sqrt[a + b*(c*x^2)^(3/2)])/5 + (2*3^(3/4)*Sqrt[2 + Sqrt[3]]*
a*x*(a^(1/3) + b^(1/3)*Sqrt[c*x^2])*Sqrt[(a^(2/3) + b^(2/3)*c*x^2
 - a^(1/3)*b^(1/3)*Sqrt[c*x^2])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*
Sqrt[c*x^2])^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)
*Sqrt[c*x^2])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])], -7
- 4*Sqrt[3]])/(5*b^(1/3)*Sqrt[c*x^2]*Sqrt[(a^(1/3)*(a^(1/3) + b^(
1/3)*Sqrt[c*x^2]))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])^
2]*Sqrt[a + b*(c*x^2)^(3/2)])
```

Rubi in Sympy [A] time = 13.4397, size = 270, normalized size = 0.88

$$\frac{2\cdot 3^{\frac{3}{4}}ax\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{\frac{2}{3}}cx^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}}\right)\middle|-7-4\sqrt{3}\right)}{5\sqrt[3]{b}\sqrt{cx^2}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}}+\frac{2x\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate((a+b*(c*x**2)**(3/2))**(1/2),x)
```

```
[Out] 2*3**(3/4)*a*x*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*sqrt(c*x**2) +
b**(2/3)*c*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c*x**2))
**2)*sqrt(sqrt(3) + 2)*(a**(1/3) + b**(1/3)*sqrt(c*x**2))*ellipti
c_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)*sqrt(c*x**2))/(a**(
1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c*x**2))), -7 - 4*sqrt(3))/(5*
b**(1/3)*sqrt(c*x**2)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*sqrt(c*x
**2))/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c*x**2))**2)*sqrt(a
 + b*(c*x**2)**(3/2))) + 2*x*sqrt(a + b*(c*x**2)**(3/2))/5
```

Mathematica [A] time = 0.0150059, size = 0, normalized size = 0.

$$\int \sqrt{a+b\left(cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In]   Integrate[Sqrt[a + b*(c*x^2)^(3/2)],x]
```

```
[Out] Integrate[Sqrt[a + b*(c*x^2)^(3/2)], x]
```

Maple [F] time = 0.049, size = 0, normalized size = 0.

$$\int \sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((a+b*(c*x^2)^(3/2))^(1/2),x)
```

```
[Out] int((a+b*(c*x^2)^(3/2))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{\left(cx^2\right)^{\frac{3}{2}} b + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt((c*x^2)^(3/2)*b + a),x, algorithm="maxima")
```

```
[Out] integrate(sqrt((c*x^2)^(3/2)*b + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{\sqrt{cx^2}bcx^2 + a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt((c*x^2)^(3/2)*b + a),x, algorithm="fricas")
```

```
[Out] integral(sqrt(sqrt(c*x^2)*b*c*x^2 + a), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{a + b\left(cx^2\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**2)**(3/2))**(1/2),x)
```

```
[Out] Integral(sqrt(a + b*(c*x**2)**(3/2)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{\left(cx^2\right)^{\frac{3}{2}} b + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a),x, algorithm="giac")
```

```
[Out] integrate(sqrt((c*x^2)^(3/2)*b + a), x)
```

3.2942 $\int \frac{\sqrt{a+b(cx^2)^{3/2}}}{x^3}\,dx$

Optimal. Leaf size=298

$$\frac{3^{3/4}\sqrt{2+\sqrt{3}}\,b^{2/3}c\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{2/3}cx^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\,F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}\sqrt{cx^2}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}\sqrt{cx^2}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{2\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{3/2}}}$$

$$-\frac{\sqrt{a+b\left(cx^2\right)^{3/2}}}{2x^2}$$

```
[Out] -Sqrt[a + b*(c*x^2)^(3/2)]/(2*x^2) + (3^(3/4)*Sqrt[2 + Sqrt[3]]*b
^(2/3)*c*(a^(1/3) + b^(1/3)*Sqrt[c*x^2])*Sqrt[(a^(2/3) + b^(2/3)*
c*x^2 - a^(1/3)*b^(1/3)*Sqrt[c*x^2])/((1 + Sqrt[3])*a^(1/3) + b^(
1/3)*Sqrt[c*x^2])^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^
(1/3)*Sqrt[c*x^2])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])]
, -7 - 4*Sqrt[3]])/(2*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*Sqrt[c*x^2
]))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])^2]*Sqrt[a + b*(
c*x^2)^(3/2)])
```

Rubi [A] time = 0.338915, antiderivative size = 298, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$\frac{3^{3/4}\sqrt{2+\sqrt{3}}\,b^{2/3}c\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{2/3}cx^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\,F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}\sqrt{cx^2}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}\sqrt{cx^2}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{2\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{3/2}}}$$

$$-\frac{\sqrt{a+b\left(cx^2\right)^{3/2}}}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*(c*x^2)^(3/2)]/x^3,x]
```

```
[Out] -Sqrt[a + b*(c*x^2)^(3/2)]/(2*x^2) + (3^(3/4)*Sqrt[2 + Sqrt[3]]*b
^(2/3)*c*(a^(1/3) + b^(1/3)*Sqrt[c*x^2])*Sqrt[(a^(2/3) + b^(2/3)*
c*x^2 - a^(1/3)*b^(1/3)*Sqrt[c*x^2])/((1 + Sqrt[3])*a^(1/3) + b^(
1/3)*Sqrt[c*x^2])^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^
(1/3)*Sqrt[c*x^2])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])]
, -7 - 4*Sqrt[3]])/(2*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*Sqrt[c*x^2
]))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])^2]*Sqrt[a + b*(
c*x^2)^(3/2)])
```

Rubi in Sympy [A] time = 15.9602, size = 258, normalized size = 0.87

$$\frac{3^{\frac{3}{4}}b^{\frac{2}{3}}c\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{\frac{2}{3}}cx^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}}\right)\middle|-7-4\sqrt{3}\right)}{2\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}}$$

$$-\frac{\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x**2)**(3/2))**(1/2)/x**3,x)
```

```
[Out] 3**(3/4)*b**(2/3)*c*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*sqrt(c*x**
2) + b**(2/3)*c*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c*x
**2))**2)*sqrt(sqrt(3) + 2)*(a**(1/3) + b**(1/3)*sqrt(c*x**2))*el
liptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)*sqrt(c*x**2))/
(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c*x**2))), -7 - 4*sqrt(3)
)/(2*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*sqrt(c*x**2))/(a**(1/3)*(
1 + sqrt(3)) + b**(1/3)*sqrt(c*x**2))**2)*sqrt(a + b*(c*x**2)**(3
/2))) - sqrt(a + b*(c*x**2)**(3/2))/(2*x**2)
```

Mathematica [A] time = 0.0477482, size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\left(cx^2\right)^{3/2}}}{x^3}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[Sqrt[a + b*(c*x^2)^(3/2)]/x^3,x]
```

```
[Out] Integrate[Sqrt[a + b*(c*x^2)^(3/2)]/x^3, x]
```

Maple [F] time = 0.051, size = 0, normalized size = 0.

$$\int \frac{1}{x^3}\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^2)^(3/2))^(1/2)/x^3,x)
```

```
[Out] int((a+b*(c*x^2)^(3/2))^(1/2)/x^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{\left(cx^2\right)^{\frac{3}{2}}b+a}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)/x^3,x, algorithm="maxima")
```

```
[Out] integrate(sqrt((c*x^2)^(3/2)*b + a)/x^3, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{\sqrt{cx^2}bcx^2+a}}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)/x^3,x, algorithm="fricas")

[Out] integral(sqrt(sqrt(c*x^2)*b*c*x^2 + a)/x^3, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + b\left(cx^2\right)^{\frac{3}{2}}}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**2)**(3/2))**(1/2)/x**3,x)

[Out] Integral(sqrt(a + b*(c*x**2)**(3/2))/x**3, x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{\left(cx^2\right)^{\frac{3}{2}}b + a}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)/x^3,x, algorithm="giac")

[Out] integrate(sqrt((c*x^2)^(3/2)*b + a)/x^3, x)
```

3.2943 $\int \frac{\sqrt{a+b(cx^2)^{3/2}}}{x^6}\,dx$

Optimal. Leaf size=352

$$-\frac{3^{3/4}\sqrt{2+\sqrt{3}}\,b^{5/3}\left(cx^2\right)^{5/2}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{2/3}cx^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\,F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}\sqrt{cx^2}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}\sqrt{cx^2}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{20ax^5\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{3/2}}}-\frac{3b\left(cx^2\right)^{5/2}\sqrt{a+b\left(cx^2\right)^{3/2}}}{20acx^7}-\frac{\sqrt{a+b\left(cx^2\right)^{3/2}}}{5x^5}$$

```
[Out] -Sqrt[a + b*(c*x^2)^(3/2)]/(5*x^5) - (3*b*(c*x^2)^(5/2)*Sqrt[a +
b*(c*x^2)^(3/2)])/(20*a*c*x^7) - (3^(3/4)*Sqrt[2 + Sqrt[3]]*b^(5/
3)*(c*x^2)^(5/2)*(a^(1/3) + b^(1/3)*Sqrt[c*x^2])*Sqrt[(a^(2/3) +
b^(2/3)*c*x^2 - a^(1/3)*b^(1/3)*Sqrt[c*x^2])/((1 + Sqrt[3])*a^(1/
3) + b^(1/3)*Sqrt[c*x^2])^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1
/3) + b^(1/3)*Sqrt[c*x^2])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[
c*x^2])], -7 - 4*Sqrt[3]])/(20*a*x^5*Sqrt[(a^(1/3)*(a^(1/3) + b^(
1/3)*Sqrt[c*x^2]))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])^
2]*Sqrt[a + b*(c*x^2)^(3/2)])
```

Rubi [A] time = 0.43923, antiderivative size = 352, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.19$

$$-\frac{3^{3/4}\sqrt{2+\sqrt{3}}\,b^{5/3}\left(cx^2\right)^{5/2}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{2/3}cx^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\,F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}\sqrt{cx^2}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}\sqrt{cx^2}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{20ax^5\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{3/2}}}-\frac{3b\left(cx^2\right)^{5/2}\sqrt{a+b\left(cx^2\right)^{3/2}}}{20acx^7}-\frac{\sqrt{a+b\left(cx^2\right)^{3/2}}}{5x^5}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*(c*x^2)^(3/2)]/x^6,x]
```


```
[Out] -Sqrt[a + b*(c*x^2)^(3/2)]/(5*x^5) - (3*b*(c*x^2)^(5/2)*Sqrt[a +
b*(c*x^2)^(3/2)])/(20*a*c*x^7) - (3^(3/4)*Sqrt[2 + Sqrt[3]]*b^(5/
3)*(c*x^2)^(5/2)*(a^(1/3) + b^(1/3)*Sqrt[c*x^2])*Sqrt[(a^(2/3) +
b^(2/3)*c*x^2 - a^(1/3)*b^(1/3)*Sqrt[c*x^2])/((1 + Sqrt[3])*a^(1/
3) + b^(1/3)*Sqrt[c*x^2])^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1
/3) + b^(1/3)*Sqrt[c*x^2])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[
c*x^2])], -7 - 4*Sqrt[3]])/(20*a*x^5*Sqrt[(a^(1/3)*(a^(1/3) + b^(
1/3)*Sqrt[c*x^2]))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])^
2]*Sqrt[a + b*(c*x^2)^(3/2)])
```

Rubi in Sympy [A] time = 23.2697, size = 308, normalized size = 0.88

$$-\frac{\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}}{5x^5}-\frac{3^{\frac{3}{4}}b^{\frac{5}{3}}\left(cx^2\right)^{\frac{5}{2}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{\frac{2}{3}}cx^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}}\right)\middle|-7-4\sqrt{3}\right)}{20ax^5\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}}-\frac{3b\left(cx^2\right)^{\frac{5}{2}}\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}}{20acx^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate((a+b*(c*x**2)**(3/2))**(1/2)/x**6,x)
```

```
[Out] -sqrt(a + b*(c*x**2)**(3/2))/(5*x**5) - 3**(3/4)*b**(5/3)*(c*x**2
)**(5/2)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*sqrt(c*x**2) + b**(2/
3)*c*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c*x**2))**2)*s
qrt(sqrt(3) + 2)*(a**(1/3) + b**(1/3)*sqrt(c*x**2))*elliptic_f(as
in((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)*sqrt(c*x**2))/(a**(1/3)*(
1 + sqrt(3)) + b**(1/3)*sqrt(c*x**2))), -7 - 4*sqrt(3))/(20*a*x**
5*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*sqrt(c*x**2))/(a**(1/3)*(1 +
 sqrt(3)) + b**(1/3)*sqrt(c*x**2))**2)*sqrt(a + b*(c*x**2)**(3/2)
)) - 3*b*(c*x**2)**(5/2)*sqrt(a + b*(c*x**2)**(3/2))/(20*a*c*x**7
)
```

Mathematica [A] time = 0.0433417, size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\left(cx^2\right)^{3/2}}}{x^6}\,dx$$

Verification is Not applicable to the result.

```
[In]   Integrate[Sqrt[a + b*(c*x^2)^(3/2)]/x^6,x]
```

```
[Out] Integrate[Sqrt[a + b*(c*x^2)^(3/2)]/x^6, x]
```

Maple [F] time = 0.051, size = 0, normalized size = 0.

$$\int \frac{1}{x^6}\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((a+b*(c*x^2)^(3/2))^(1/2)/x^6,x)
```

```
[Out] int((a+b*(c*x^2)^(3/2))^(1/2)/x^6,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{\left(cx^2\right)^{\frac{3}{2}}b+a}}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)/x^6,x, algorithm="maxima")
```

```
[Out] integrate(sqrt((c*x^2)^(3/2)*b + a)/x^6, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{\sqrt{cx^2}bcx^2 + a}}{x^6}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)/x^6,x, algorithm="fricas")
```

```
[Out] integral(sqrt(sqrt(c*x^2)*b*c*x^2 + a)/x^6, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + b\left(cx^2\right)^{\frac{3}{2}}}}{x^6}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**2)**(3/2))**(1/2)/x**6,x)
```

```
[Out] Integral(sqrt(a + b*(c*x**2)**(3/2))/x**6, x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{\left(cx^2\right)^{\frac{3}{2}} b + a}}{x^6}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)/x^6,x, algorithm="giac")
```

```
[Out] integrate(sqrt((c*x^2)^(3/2)*b + a)/x^6, x)
```

3.2944 $\int x^4\sqrt{a+b\left(cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=709

$$-\frac{8\sqrt{2}3^{3/4}a^{7/3}x^5\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{2/3}cx^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}\sqrt{cx^2}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}\sqrt{cx^2}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{91b^{5/3}\left(cx^2\right)^{5/2}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{3/2}}}+\frac{12\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{7/3}x^5\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{2/3}cx^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}\sqrt{cx^2}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}\sqrt{cx^2}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{91b^{5/3}\left(cx^2\right)^{5/2}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{3/2}}}-\frac{24a^2x^5\sqrt{a+b\left(cx^2\right)^{3/2}}}{91b^{5/3}\left(cx^2\right)^{5/2}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}+\frac{6acx^7\sqrt{a+b\left(cx^2\right)^{3/2}}}{91b\left(cx^2\right)^{5/2}}+\frac{2}{13}x^5\sqrt{a+b\left(cx^2\right)^{3/2}}$$

```
[Out] (2*x^5*Sqrt[a + b*(c*x^2)^(3/2)])/13 + (6*a*c*x^7*Sqrt[a + b*(c*x
^2)^(3/2)])/(91*b*(c*x^2)^(5/2)) - (24*a^2*x^5*Sqrt[a + b*(c*x^2)
^(3/2)])/(91*b^(5/3)*(c*x^2)^(5/2)*((1 + Sqrt[3])*a^(1/3) + b^(1/
3)*Sqrt[c*x^2])) + (12*3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(7/3)*x^5*(a^(
1/3) + b^(1/3)*Sqrt[c*x^2])*Sqrt[(a^(2/3) + b^(2/3)*c*x^2 - a^(1/
3)*b^(1/3)*Sqrt[c*x^2])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x
^2])^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*
x^2])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])], -7 - 4*Sqrt
[3]])/(91*b^(5/3)*(c*x^2)^(5/2)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*
Sqrt[c*x^2]))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])^2]*Sq
rt[a + b*(c*x^2)^(3/2)]) - (8*Sqrt[2]*3^(3/4)*a^(7/3)*x^5*(a^(1/3
) + b^(1/3)*Sqrt[c*x^2])*Sqrt[(a^(2/3) + b^(2/3)*c*x^2 - a^(1/3)*
b^(1/3)*Sqrt[c*x^2])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2]
)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2
])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])], -7 - 4*Sqrt[3]
])/(91*b^(5/3)*(c*x^2)^(5/2)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*Sqr
t[c*x^2]))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])^2]*Sqrt[
a + b*(c*x^2)^(3/2)])
```

Rubi [A] time = 0.988472, antiderivative size = 709, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286

$$-\frac{8\sqrt{2}3^{3/4}a^{7/3}x^5\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{2/3}cx^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}\sqrt{cx^2}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}\sqrt{cx^2}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{91b^{5/3}\left(cx^2\right)^{5/2}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{3/2}}}+\frac{12\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{7/3}x^5\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{2/3}cx^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}\sqrt{cx^2}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}\sqrt{cx^2}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{91b^{5/3}\left(cx^2\right)^{5/2}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{3/2}}}-\frac{24a^2x^5\sqrt{a+b\left(cx^2\right)^{3/2}}}{91b^{5/3}\left(cx^2\right)^{5/2}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}+\frac{6acx^7\sqrt{a+b\left(cx^2\right)^{3/2}}}{91b\left(cx^2\right)^{5/2}}+\frac{2}{13}x^5\sqrt{a+b\left(cx^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^4*Sqrt[a + b*(c*x^2)^(3/2)],x]
```

```
[Out] (2*x^5*Sqrt[a + b*(c*x^2)^(3/2)])/13 + (6*a*c*x^7*Sqrt[a + b*(c*x
^2)^(3/2)])/(91*b*(c*x^2)^(5/2)) - (24*a^2*x^5*Sqrt[a + b*(c*x^2)
^(3/2)])/(91*b^(5/3)*(c*x^2)^(5/2)*((1 + Sqrt[3])*a^(1/3) + b^(1/
3)*Sqrt[c*x^2])) + (12*3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(7/3)*x^5*(a^(
1/3) + b^(1/3)*Sqrt[c*x^2])*Sqrt[(a^(2/3) + b^(2/3)*c*x^2 - a^(1/
3)*b^(1/3)*Sqrt[c*x^2])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x
^2])^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*
x^2])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])], -7 - 4*Sqrt
[3]])/(91*b^(5/3)*(c*x^2)^(5/2)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*
Sqrt[c*x^2]))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])^2]*Sq
rt[a + b*(c*x^2)^(3/2)]) - (8*Sqrt[2]*3^(3/4)*a^(7/3)*x^5*(a^(1/3
) + b^(1/3)*Sqrt[c*x^2])*Sqrt[(a^(2/3) + b^(2/3)*c*x^2 - a^(1/3)*
b^(1/3)*Sqrt[c*x^2])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2]
)^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2
])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])], -7 - 4*Sqrt[3]
])/(91*b^(5/3)*(c*x^2)^(5/2)*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*Sqr
t[c*x^2]))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])^2]*Sqrt[
a + b*(c*x^2)^(3/2)])
```

Rubi in Sympy [A] time = 56.8592, size = 629, normalized size = 0.89

$$\frac{12\sqrt[4]{3}a^{\frac{7}{3}}x^5\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{\frac{2}{3}}cx^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}}\right)\middle|-7-4\sqrt{3}\right)}{91b^{\frac{5}{3}}\left(cx^2\right)^{\frac{5}{2}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}} - \frac{8\sqrt{2}\cdot 3^{\frac{3}{4}}a^{\frac{7}{3}}x^5\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{\frac{2}{3}}cx^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}}\right)\middle|-7-4\sqrt{3}\right)}{91b^{\frac{5}{3}}\left(cx^2\right)^{\frac{5}{2}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}} - \frac{24a^2x^5\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}}{91b^{\frac{5}{3}}\left(cx^2\right)^{\frac{5}{2}}\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}\right)} + \frac{6acx^7\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}}{91b\left(cx^2\right)^{\frac{5}{2}}} + \frac{2x^5\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**4*(a+b*(c*x**2)**(3/2))**(1/2),x)
```

```
[Out] 12*3**(1/4)*a**(7/3)*x**5*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*sqrt
(c*x**2) + b**(2/3)*c*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*sq
rt(c*x**2))**2)*sqrt(-sqrt(3) + 2)*(a**(1/3) + b**(1/3)*sqrt(c*x*
*2))*elliptic_e(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)*sqrt(c*
x**2))/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c*x**2))), -7 - 4*
sqrt(3))/(91*b**(5/3)*(c*x**2)**(5/2)*sqrt(a**(1/3)*(a**(1/3) + b
**(1/3)*sqrt(c*x**2))/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c*x
**2))**2)*sqrt(a + b*(c*x**2)**(3/2))) - 8*sqrt(2)*3**(3/4)*a**(7
/3)*x**5*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*sqrt(c*x**2) + b**(2/
3)*c*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c*x**2))**2)*(
a**(1/3) + b**(1/3)*sqrt(c*x**2))*elliptic_f(asin((-a**(1/3)*(-1
+ sqrt(3)) + b**(1/3)*sqrt(c*x**2))/(a**(1/3)*(1 + sqrt(3)) + b**
(1/3)*sqrt(c*x**2))), -7 - 4*sqrt(3))/(91*b**(5/3)*(c*x**2)**(5/2
)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*sqrt(c*x**2))/(a**(1/3)*(1 +
 sqrt(3)) + b**(1/3)*sqrt(c*x**2))**2)*sqrt(a + b*(c*x**2)**(3/2)
)) - 24*a**2*x**5*sqrt(a + b*(c*x**2)**(3/2))/(91*b**(5/3)*(c*x**
2)**(5/2)*(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c*x**2))) + 6*a
*c*x**7*sqrt(a + b*(c*x**2)**(3/2))/(91*b*(c*x**2)**(5/2)) + 2*x*
*5*sqrt(a + b*(c*x**2)**(3/2))/13
```

Mathematica [A] time = 0.0542214, size = 0, normalized size = 0.

$$\int x^4\sqrt{a+b\left(cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[x^4*Sqrt[a + b*(c*x^2)^(3/2)],x]
```

```
[Out] Integrate[x^4*Sqrt[a + b*(c*x^2)^(3/2)], x]
```

Maple [F] time = 0.049, size = 0, normalized size = 0.

$$\int x^4\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^4*(a+b*(c*x^2)^(3/2))^(1/2),x)
```

```
[Out] int(x^4*(a+b*(c*x^2)^(3/2))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{\left(cx^2\right)^{\frac{3}{2}}b+a}x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)*x^4,x, algorithm="maxima")
```

```
[Out] integrate(sqrt((c*x^2)^(3/2)*b + a)*x^4, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\sqrt{\sqrt{cx^2}bcx^2+a}x^4, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)*x^4,x, algorithm="fricas")
```

```
[Out] integral(sqrt(sqrt(c*x^2)*b*c*x^2 + a)*x^4, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^4\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**4*(a+b*(c*x**2)**(3/2))**(1/2),x)
```

```
[Out] Integral(x**4*sqrt(a + b*(c*x**2)**(3/2)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{(cx^2)^{\frac{3}{2}} b + a} x^4 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)*x^4,x, algorithm="giac")
```

```
[Out] integrate(sqrt((c*x^2)^(3/2)*b + a)*x^4, x)
```

3.2945 $\int x\sqrt{a+b\left(cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=642

$$\frac{2\sqrt{2}3^{3/4}a^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{2/3}cx^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}\sqrt{cx^2}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}\sqrt{cx^2}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{7b^{2/3}c\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{3/2}}}$$
$$-\frac{3\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{2/3}cx^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}\sqrt{cx^2}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}\sqrt{cx^2}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{7b^{2/3}c\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{3/2}}}$$
$$+\frac{6a\sqrt{a+b\left(cx^2\right)^{3/2}}}{7b^{2/3}c\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}+\frac{2}{7}x^2\sqrt{a+b\left(cx^2\right)^{3/2}}$$

```
[Out] (2*x^2*Sqrt[a + b*(c*x^2)^(3/2)])/7 + (6*a*Sqrt[a + b*(c*x^2)^(3/
2)])/(7*b^(2/3)*c*((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2]))
- (3*3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(4/3)*(a^(1/3) + b^(1/3)*Sqrt[c*
x^2])*Sqrt[(a^(2/3) + b^(2/3)*c*x^2 - a^(1/3)*b^(1/3)*Sqrt[c*x^2]
)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])^2]*EllipticE[ArcS
in[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])/((1 + Sqrt[3])*a
^(1/3) + b^(1/3)*Sqrt[c*x^2])], -7 - 4*Sqrt[3]])/(7*b^(2/3)*c*Sqr
t[(a^(1/3)*(a^(1/3) + b^(1/3)*Sqrt[c*x^2]))/((1 + Sqrt[3])*a^(1/3
) + b^(1/3)*Sqrt[c*x^2])^2]*Sqrt[a + b*(c*x^2)^(3/2)]) + (2*Sqrt[
2]*3^(3/4)*a^(4/3)*(a^(1/3) + b^(1/3)*Sqrt[c*x^2])*Sqrt[(a^(2/3)
+ b^(2/3)*c*x^2 - a^(1/3)*b^(1/3)*Sqrt[c*x^2])/((1 + Sqrt[3])*a^(
1/3) + b^(1/3)*Sqrt[c*x^2])^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^
(1/3) + b^(1/3)*Sqrt[c*x^2])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqr
t[c*x^2])], -7 - 4*Sqrt[3]])/(7*b^(2/3)*c*Sqrt[(a^(1/3)*(a^(1/3)
+ b^(1/3)*Sqrt[c*x^2]))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x
^2])^2]*Sqrt[a + b*(c*x^2)^(3/2)])
```

Rubi [A] time = 1.03985, antiderivative size = 642, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.316

$$\frac{2\sqrt{2}3^{3/4}a^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{2/3}cx^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}\sqrt{cx^2}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}\sqrt{cx^2}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{7b^{2/3}c\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{3/2}}}$$
$$-\frac{3\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{2/3}cx^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}\sqrt{cx^2}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}\sqrt{cx^2}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{7b^{2/3}c\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{3/2}}}$$
$$+\frac{6a\sqrt{a+b\left(cx^2\right)^{3/2}}}{7b^{2/3}c\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}+\frac{2}{7}x^2\sqrt{a+b\left(cx^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[x*Sqrt[a + b*(c*x^2)^(3/2)],x]
```

```
[Out] (2*x^2*Sqrt[a + b*(c*x^2)^(3/2)])/7 + (6*a*Sqrt[a + b*(c*x^2)^(3/
2)])/(7*b^(2/3)*c*((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2]))
- (3*3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(4/3)*(a^(1/3) + b^(1/3)*Sqrt[c*
x^2])*Sqrt[(a^(2/3) + b^(2/3)*c*x^2 - a^(1/3)*b^(1/3)*Sqrt[c*x^2]
)/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])^2]*EllipticE[ArcS
in[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])/((1 + Sqrt[3])*a
^(1/3) + b^(1/3)*Sqrt[c*x^2])], -7 - 4*Sqrt[3]])/(7*b^(2/3)*c*Sqr
t[(a^(1/3)*(a^(1/3) + b^(1/3)*Sqrt[c*x^2]))/((1 + Sqrt[3])*a^(1/3
) + b^(1/3)*Sqrt[c*x^2])^2]*Sqrt[a + b*(c*x^2)^(3/2)]) + (2*Sqrt[
2]*3^(3/4)*a^(4/3)*(a^(1/3) + b^(1/3)*Sqrt[c*x^2])*Sqrt[(a^(2/3)
+ b^(2/3)*c*x^2 - a^(1/3)*b^(1/3)*Sqrt[c*x^2])/((1 + Sqrt[3])*a^(
1/3) + b^(1/3)*Sqrt[c*x^2])^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^
(1/3) + b^(1/3)*Sqrt[c*x^2])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqr
t[c*x^2])], -7 - 4*Sqrt[3]])/(7*b^(2/3)*c*Sqrt[(a^(1/3)*(a^(1/3)
+ b^(1/3)*Sqrt[c*x^2]))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x
^2])^2]*Sqrt[a + b*(c*x^2)^(3/2)])
```

Rubi in Sympy [A] time = 46.1792, size = 561, normalized size = 0.87

$$-\frac{3\sqrt[4]{3}a^{\frac{4}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{\frac{2}{3}}cx^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}}\right)\middle|-7-4\sqrt{3}\right)}{7b^{\frac{2}{3}}c\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}}+\frac{2\sqrt{2}\cdot 3^{\frac{3}{4}}a^{\frac{4}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{\frac{2}{3}}cx^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}}\right)\middle|-7-4\sqrt{3}\right)}{7b^{\frac{2}{3}}c\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}}+\frac{6a\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}}{7b^{\frac{2}{3}}c\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}\right)}+\frac{2x^2\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(a+b*(c*x**2)**(3/2))**(1/2),x)
```

```
[Out] -3*3**(1/4)*a**(4/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*sqrt(c*x*
*2) + b**(2/3)*c*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c*
x**2))**2)*sqrt(-sqrt(3) + 2)*(a**(1/3) + b**(1/3)*sqrt(c*x**2))*
elliptic_e(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)*sqrt(c*x**2)
)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c*x**2))), -7 - 4*sqrt(
3))/(7*b**(2/3)*c*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*sqrt(c*x**2)
)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c*x**2))**2)*sqrt(a + b
*(c*x**2)**(3/2))) + 2*sqrt(2)*3**(3/4)*a**(4/3)*sqrt((a**(2/3) -
 a**(1/3)*b**(1/3)*sqrt(c*x**2) + b**(2/3)*c*x**2)/(a**(1/3)*(1 +
 sqrt(3)) + b**(1/3)*sqrt(c*x**2))**2)*(a**(1/3) + b**(1/3)*sqrt(
c*x**2))*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)*sqr
t(c*x**2))/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c*x**2))), -7
- 4*sqrt(3))/(7*b**(2/3)*c*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*sqr
t(c*x**2))/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c*x**2))**2)*s
qrt(a + b*(c*x**2)**(3/2))) + 6*a*sqrt(a + b*(c*x**2)**(3/2))/(7*
b**(2/3)*c*(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c*x**2))) + 2*
x**2*sqrt(a + b*(c*x**2)**(3/2))/7
```

Mathematica [C] time = 0.119353, size = 89, normalized size = 0.14

$$\frac{x^2\left(3a\sqrt{\frac{a+b\left(cx^2\right)^{3/2}}{a}}\,{}_2F_1\left(\frac{1}{2},\frac{2}{3};\frac{5}{3};-\frac{b\left(cx^2\right)^{3/2}}{a}\right)+4\left(a+b\left(cx^2\right)^{3/2}\right)\right)}{14\sqrt{a+b\left(cx^2\right)^{3/2}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x*Sqrt[a + b*(c*x^2)^(3/2)],x]
```

```
[Out] (x^2*(4*(a + b*(c*x^2)^(3/2)) + 3*a*Sqrt[(a + b*(c*x^2)^(3/2))/a]
*Hypergeometric2F1[1/2, 2/3, 5/3, -((b*(c*x^2)^(3/2))/a)]))/(14*S
qrt[a + b*(c*x^2)^(3/2)])
```

Maple [A] time = 0.015, size = 495, normalized size = 0.8

$$\frac{1}{2c}\left(\frac{4cx^2}{7}\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}-\frac{\frac{4i}{7}a\sqrt{3}}{b}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(\sqrt{cx^2}+\frac{1}{2b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(\sqrt{cx^2}-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2b}\cdots\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(a+b*(c*x^2)^(3/2))^(1/2),x)
```

```
[Out] 1/2/c*(4/7*c*x^2*(a+b*(c*x^2)^(3/2))^(1/2)-4/7*I*a*3^(1/2)/b*(-a*
b^2)^(1/3)*(I*((c*x^2)^(1/2)+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b
*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)*(((c*x^2)^(1/2)-
1/b*(-a*b^2)^(1/3))/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^
2)^(1/3)))^(1/2)*(-I*((c*x^2)^(1/2)+1/2/b*(-a*b^2)^(1/3)+1/2*I*3^
(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)/(a+b*(c*x
^2)^(3/2))^(1/2)*((-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)
^(1/3))*EllipticE(1/3*3^(1/2)*(I*((c*x^2)^(1/2)+1/2/b*(-a*b^2)^(1
/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/
2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/
2)/b*(-a*b^2)^(1/3)))^(1/2))+1/b*(-a*b^2)^(1/3)*EllipticF(1/3*3^(
1/2)*(I*((c*x^2)^(1/2)+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b
^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^
(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/
2))))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\sqrt{\left(cx^2\right)^{\frac{3}{2}}b+a}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)*x,x, algorithm="maxima")
```

```
[Out] integrate(sqrt((c*x^2)^(3/2)*b + a)*x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\sqrt{\sqrt{cx^2}bcx^2+a}x,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)*x,x, algorithm="fricas")
```

```
[Out] integral(sqrt(sqrt(c*x^2)*b*c*x^2 + a)*x, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(a+b*(c*x**2)**(3/2))**(1/2),x)

[Out] Integral(x*sqrt(a + b*(c*x**2)**(3/2)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{\left(cx^2\right)^{\frac{3}{2}}b+a}\,x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)*x,x, algorithm="giac")

[Out] integrate(sqrt((c*x^2)^(3/2)*b + a)*x, x)
```

3.2946 $\int \frac{\sqrt{a+b(cx^2)^{3/2}}}{x^2}\,dx$

Optimal. Leaf size=661

$$\frac{\sqrt{2}3^{3/4}\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{2/3}cx^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}\sqrt{cx^2}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}\sqrt{cx^2}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{x\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{3/2}}}-\frac{3\sqrt[4]{3}\sqrt{2-\sqrt{3}}\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{2/3}cx^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}\sqrt{cx^2}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}\sqrt{cx^2}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{2x\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{3/2}}}-\frac{\sqrt{a+b\left(cx^2\right)^{3/2}}}{x}+\frac{3\sqrt[3]{b}\sqrt{cx^2}\sqrt{a+b\left(cx^2\right)^{3/2}}}{x\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}$$

```
[Out] -(Sqrt[a + b*(c*x^2)^(3/2)]/x) + (3*b^(1/3)*Sqrt[c*x^2]*Sqrt[a +
b*(c*x^2)^(3/2)])/(x*((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2]
)) - (3*3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(1/3)*b^(1/3)*Sqrt[c*x^2]*(a^
(1/3) + b^(1/3)*Sqrt[c*x^2])*Sqrt[(a^(2/3) + b^(2/3)*c*x^2 - a^(1
/3)*b^(1/3)*Sqrt[c*x^2])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*
x^2])^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c
*x^2])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])], -7 - 4*Sqr
t[3]])/(2*x*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*Sqrt[c*x^2]))/((1 +
Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])^2]*Sqrt[a + b*(c*x^2)^(3/
2)]) + (Sqrt[2]*3^(3/4)*a^(1/3)*b^(1/3)*Sqrt[c*x^2]*(a^(1/3) + b^
(1/3)*Sqrt[c*x^2])*Sqrt[(a^(2/3) + b^(2/3)*c*x^2 - a^(1/3)*b^(1/3
)*Sqrt[c*x^2])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])^2]*E
llipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])/((1
 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])], -7 - 4*Sqrt[3]])/(x*
Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*Sqrt[c*x^2]))/((1 + Sqrt[3])*a^(
1/3) + b^(1/3)*Sqrt[c*x^2])^2]*Sqrt[a + b*(c*x^2)^(3/2)])
```

Rubi [A] time = 0.813717, antiderivative size = 661, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238

$$\frac{\sqrt{2}3^{3/4}\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{2/3}cx^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}\sqrt{cx^2}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}\sqrt{cx^2}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{x\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{3/2}}}-\frac{3\sqrt[4]{3}\sqrt{2-\sqrt{3}}\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{2/3}cx^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}\sqrt{cx^2}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}\sqrt{cx^2}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{2x\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{3/2}}}-\frac{\sqrt{a+b\left(cx^2\right)^{3/2}}}{x}+\frac{3\sqrt[3]{b}\sqrt{cx^2}\sqrt{a+b\left(cx^2\right)^{3/2}}}{x\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*(c*x^2)^(3/2)]/x^2,x]
```

```
[Out] -(Sqrt[a + b*(c*x^2)^(3/2)]/x) + (3*b^(1/3)*Sqrt[c*x^2]*Sqrt[a +
b*(c*x^2)^(3/2)])/(x*((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2]
)) - (3*3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(1/3)*b^(1/3)*Sqrt[c*x^2]*(a^
(1/3) + b^(1/3)*Sqrt[c*x^2])*Sqrt[(a^(2/3) + b^(2/3)*c*x^2 - a^(1
/3)*b^(1/3)*Sqrt[c*x^2])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*
x^2])^2]*EllipticE[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c
*x^2])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])], -7 - 4*Sqr
t[3]])/(2*x*Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*Sqrt[c*x^2]))/((1 +
Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])^2]*Sqrt[a + b*(c*x^2)^(3/
2)]) + (Sqrt[2]*3^(3/4)*a^(1/3)*b^(1/3)*Sqrt[c*x^2]*(a^(1/3) + b^
(1/3)*Sqrt[c*x^2])*Sqrt[(a^(2/3) + b^(2/3)*c*x^2 - a^(1/3)*b^(1/3
)*Sqrt[c*x^2])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])^2]*E
llipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])/((1
 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])], -7 - 4*Sqrt[3]])/(x*
Sqrt[(a^(1/3)*(a^(1/3) + b^(1/3)*Sqrt[c*x^2]))/((1 + Sqrt[3])*a^(
1/3) + b^(1/3)*Sqrt[c*x^2])^2]*Sqrt[a + b*(c*x^2)^(3/2)])
```

Rubi in Sympy [A] time = 44.8861, size = 575, normalized size = 0.87

$$-\frac{3\sqrt[4]{3}\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{\frac{2}{3}}cx^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}}\right)\middle|-7-4\sqrt{3}\right)}{2x\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}}+\frac{\sqrt{2}\cdot 3^{\frac{3}{4}}\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{\frac{2}{3}}cx^2}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}}\right)\middle|-7-4\sqrt{3}\right)}{x\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}}+\frac{3\sqrt[3]{b}\sqrt{cx^2}\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}}{x\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^2}\right)}-\frac{\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x**2)**(3/2))**(1/2)/x**2,x)
```

```
[Out] -3*3**(1/4)*a**(1/3)*b**(1/3)*sqrt(c*x**2)*sqrt((a**(2/3) - a**(1
/3)*b**(1/3)*sqrt(c*x**2) + b**(2/3)*c*x**2)/(a**(1/3)*(1 + sqrt(
3)) + b**(1/3)*sqrt(c*x**2))**2)*sqrt(-sqrt(3) + 2)*(a**(1/3) + b
**(1/3)*sqrt(c*x**2))*elliptic_e(asin((-a**(1/3)*(-1 + sqrt(3)) +
 b**(1/3)*sqrt(c*x**2))/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c
*x**2))), -7 - 4*sqrt(3))/(2*x*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)
*sqrt(c*x**2))/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c*x**2))**
2)*sqrt(a + b*(c*x**2)**(3/2))) + sqrt(2)*3**(3/4)*a**(1/3)*b**(1
/3)*sqrt(c*x**2)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*sqrt(c*x**2)
+ b**(2/3)*c*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c*x**2
))**2)*(a**(1/3) + b**(1/3)*sqrt(c*x**2))*elliptic_f(asin((-a**(1
/3)*(-1 + sqrt(3)) + b**(1/3)*sqrt(c*x**2))/(a**(1/3)*(1 + sqrt(3
)) + b**(1/3)*sqrt(c*x**2))), -7 - 4*sqrt(3))/(x*sqrt(a**(1/3)*(a
**(1/3) + b**(1/3)*sqrt(c*x**2))/(a**(1/3)*(1 + sqrt(3)) + b**(1/
3)*sqrt(c*x**2))**2)*sqrt(a + b*(c*x**2)**(3/2))) + 3*b**(1/3)*sq
rt(c*x**2)*sqrt(a + b*(c*x**2)**(3/2))/(x*(a**(1/3)*(1 + sqrt(3))
 + b**(1/3)*sqrt(c*x**2))) - sqrt(a + b*(c*x**2)**(3/2))/x
```

Mathematica [A] time = 0.0435468, size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\left(cx^2\right)^{3/2}}}{x^2}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[Sqrt[a + b*(c*x^2)^(3/2)]/x^2,x]
```

```
[Out] Integrate[Sqrt[a + b*(c*x^2)^(3/2)]/x^2, x]
```

Maple [F] time = 0.05, size = 0, normalized size = 0.

$$\int \frac{1}{x^2}\sqrt{a + b\left(cx^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^2)^(3/2))^(1/2)/x^2,x)
```

```
[Out] int((a+b*(c*x^2)^(3/2))^(1/2)/x^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{\left(cx^2\right)^{\frac{3}{2}}b + a}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)/x^2,x, algorithm="maxima")
```

```
[Out] integrate(sqrt((c*x^2)^(3/2)*b + a)/x^2, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\sqrt{\sqrt{cx^2}bcx^2 + a}}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)/x^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(sqrt(c*x^2)*b*c*x^2 + a)/x^2, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + b\left(cx^2\right)^{\frac{3}{2}}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**2)**(3/2))**(1/2)/x**2,x)
```

```
[Out] Integral(sqrt(a + b*(c*x**2)**(3/2))/x**2, x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{(cx^2)^{\frac{3}{2}}b + a}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)/x^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt((c*x^2)^(3/2)*b + a)/x^2, x)
```

3.2947 $\int \frac{\sqrt{a+b(cx^2)^{3/2}}}{x^5}\,dx$

Optimal. Leaf size=681

$$\frac{3^{3/4}b^{4/3}c^2\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{2/3}cx^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}\sqrt{cx^2}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}\sqrt{cx^2}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{4\sqrt{2}a^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{3/2}}} - \frac{3\sqrt[4]{3}\sqrt{2-\sqrt{3}}b^{4/3}c^2\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{2/3}cx^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}\sqrt{cx^2}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}\sqrt{cx^2}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{16a^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{3/2}}} + \frac{3b^{4/3}c^2\sqrt{a+b\left(cx^2\right)^{3/2}}}{8a\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)} - \frac{3bc^2\sqrt{a+b\left(cx^2\right)^{3/2}}}{8a\sqrt{cx^2}} - \frac{\sqrt{a+b\left(cx^2\right)^{3/2}}}{4x^4}$$

```
[Out] -Sqrt[a + b*(c*x^2)^(3/2)]/(4*x^4) - (3*b*c^2*Sqrt[a + b*(c*x^2)^
(3/2)])/(8*a*Sqrt[c*x^2]) + (3*b^(4/3)*c^2*Sqrt[a + b*(c*x^2)^(3/
2)])/(8*a*((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])) - (3*3^(
1/4)*Sqrt[2 - Sqrt[3]]*b^(4/3)*c^2*(a^(1/3) + b^(1/3)*Sqrt[c*x^2]
)*Sqrt[(a^(2/3) + b^(2/3)*c*x^2 - a^(1/3)*b^(1/3)*Sqrt[c*x^2])/((
1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])^2]*EllipticE[ArcSin[(
(1 - Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])/((1 + Sqrt[3])*a^(1/
3) + b^(1/3)*Sqrt[c*x^2])], -7 - 4*Sqrt[3]])/(16*a^(2/3)*Sqrt[(a^
(1/3)*(a^(1/3) + b^(1/3)*Sqrt[c*x^2]))/((1 + Sqrt[3])*a^(1/3) + b
^(1/3)*Sqrt[c*x^2])^2]*Sqrt[a + b*(c*x^2)^(3/2)]) + (3^(3/4)*b^(4
/3)*c^2*(a^(1/3) + b^(1/3)*Sqrt[c*x^2])*Sqrt[(a^(2/3) + b^(2/3)*c
*x^2 - a^(1/3)*b^(1/3)*Sqrt[c*x^2])/((1 + Sqrt[3])*a^(1/3) + b^(1
/3)*Sqrt[c*x^2])^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(
1/3)*Sqrt[c*x^2])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])],
 -7 - 4*Sqrt[3]])/(4*Sqrt[2]*a^(2/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(
1/3)*Sqrt[c*x^2]))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])^
2]*Sqrt[a + b*(c*x^2)^(3/2)])
```

Rubi [A] time = 0.990057, antiderivative size = 681, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$

$$\frac{3^{3/4}b^{4/3}c^2\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{2/3}cx^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}\sqrt{cx^2}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}\sqrt{cx^2}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{4\sqrt{2}a^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{3/2}}} - \frac{3\sqrt[4]{3}\sqrt{2-\sqrt{3}}b^{4/3}c^2\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^2}+b^{2/3}cx^2}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}\sqrt{cx^2}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}\sqrt{cx^2}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{16a^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)^2}}\sqrt{a+b\left(cx^2\right)^{3/2}}} + \frac{3b^{4/3}c^2\sqrt{a+b\left(cx^2\right)^{3/2}}}{8a\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^2}\right)} - \frac{3bc^2\sqrt{a+b\left(cx^2\right)^{3/2}}}{8a\sqrt{cx^2}} - \frac{\sqrt{a+b\left(cx^2\right)^{3/2}}}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*(c*x^2)^(3/2)]/x^5,x]
```

```
[Out] -Sqrt[a + b*(c*x^2)^(3/2)]/(4*x^4) - (3*b*c^2*Sqrt[a + b*(c*x^2)^
(3/2)])/(8*a*Sqrt[c*x^2]) + (3*b^(4/3)*c^2*Sqrt[a + b*(c*x^2)^(3/
2)])/(8*a*((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])) - (3*3^(
1/4)*Sqrt[2 - Sqrt[3]]*b^(4/3)*c^2*(a^(1/3) + b^(1/3)*Sqrt[c*x^2]
)*Sqrt[(a^(2/3) + b^(2/3)*c*x^2 - a^(1/3)*b^(1/3)*Sqrt[c*x^2])/((
1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])^2]*EllipticE[ArcSin[(
(1 - Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])/((1 + Sqrt[3])*a^(1/
3) + b^(1/3)*Sqrt[c*x^2])], -7 - 4*Sqrt[3]])/(16*a^(2/3)*Sqrt[(a^
(1/3)*(a^(1/3) + b^(1/3)*Sqrt[c*x^2]))/((1 + Sqrt[3])*a^(1/3) + b
^(1/3)*Sqrt[c*x^2])^2]*Sqrt[a + b*(c*x^2)^(3/2)]) + (3^(3/4)*b^(4
/3)*c^2*(a^(1/3) + b^(1/3)*Sqrt[c*x^2])*Sqrt[(a^(2/3) + b^(2/3)*c
*x^2 - a^(1/3)*b^(1/3)*Sqrt[c*x^2])/((1 + Sqrt[3])*a^(1/3) + b^(1
/3)*Sqrt[c*x^2])^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + b^(
1/3)*Sqrt[c*x^2])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])],
 -7 - 4*Sqrt[3]])/(4*Sqrt[2]*a^(2/3)*Sqrt[(a^(1/3)*(a^(1/3) + b^(
1/3)*Sqrt[c*x^2]))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^2])^
2]*Sqrt[a + b*(c*x^2)^(3/2)])
```

Rubi in Sympy [A] time = 58.0226, size = 597, normalized size = 0.88

$$-\frac{\sqrt{a+b\left(cx^{2}\right)^{\frac{3}{2}}}}{4x^{4}}+\frac{3b^{\frac{4}{3}}c^{2}\sqrt{a+b\left(cx^{2}\right)^{\frac{3}{2}}}}{8a\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^{2}}\right)}-\frac{3bc^{2}\sqrt{a+b\left(cx^{2}\right)^{\frac{3}{2}}}}{8a\sqrt{cx^{2}}}$$
$$-\frac{3\sqrt[4]{3}b^{\frac{4}{3}}c^{2}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^{2}}+b^{\frac{2}{3}}cx^{2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^{2}}\right)^{2}}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^{2}}\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^{2}}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^{2}}}\right)\middle|-7-4\sqrt{3}\right)}{16a^{\frac{2}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^{2}}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^{2}}\right)^{2}}}\sqrt{a+b\left(cx^{2}\right)^{\frac{3}{2}}}}$$
$$+\frac{\sqrt{2}\cdot 3^{\frac{3}{4}}b^{\frac{4}{3}}c^{2}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^{2}}+b^{\frac{2}{3}}cx^{2}}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^{2}}\right)^{2}}}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^{2}}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^{2}}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^{2}}}\right)\middle|-7-4\sqrt{3}\right)}{8a^{\frac{2}{3}}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^{2}}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^{2}}\right)^{2}}}\sqrt{a+b\left(cx^{2}\right)^{\frac{3}{2}}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x**2)**(3/2))**(1/2)/x**5,x)
```

```
[Out] -sqrt(a + b*(c*x**2)**(3/2))/(4*x**4) + 3*b**(4/3)*c**2*sqrt(a +
b*(c*x**2)**(3/2))/(8*a*(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c
*x**2))) - 3*b*c**2*sqrt(a + b*(c*x**2)**(3/2))/(8*a*sqrt(c*x**2)
) - 3*3**(1/4)*b**(4/3)*c**2*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*s
qrt(c*x**2) + b**(2/3)*c*x**2)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)
*sqrt(c*x**2))**2)*sqrt(-sqrt(3) + 2)*(a**(1/3) + b**(1/3)*sqrt(c
*x**2))*elliptic_e(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)*sqrt
(c*x**2))/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c*x**2))), -7 -
 4*sqrt(3))/(16*a**(2/3)*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*sqrt(
c*x**2))/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c*x**2))**2)*sqr
t(a + b*(c*x**2)**(3/2))) + sqrt(2)*3**(3/4)*b**(4/3)*c**2*sqrt((
a**(2/3) - a**(1/3)*b**(1/3)*sqrt(c*x**2) + b**(2/3)*c*x**2)/(a**
(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c*x**2))**2)*(a**(1/3) + b**(
1/3)*sqrt(c*x**2))*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b*
*(1/3)*sqrt(c*x**2))/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c*x*
*2))), -7 - 4*sqrt(3))/(8*a**(2/3)*sqrt(a**(1/3)*(a**(1/3) + b**(
1/3)*sqrt(c*x**2))/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c*x**2
))**2)*sqrt(a + b*(c*x**2)**(3/2)))
```

Mathematica [A] time = 0.0429488, size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\left(cx^2\right)^{3/2}}}{x^5}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[Sqrt[a + b*(c*x^2)^(3/2)]/x^5,x]
```

```
[Out] Integrate[Sqrt[a + b*(c*x^2)^(3/2)]/x^5, x]
```

Maple [F] time = 0.049, size = 0, normalized size = 0.

$$\int \frac{1}{x^5}\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^2)^(3/2))^(1/2)/x^5,x)
```

```
[Out] int((a+b*(c*x^2)^(3/2))^(1/2)/x^5,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{\left(cx^2\right)^{\frac{3}{2}}b+a}}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)/x^5,x, algorithm="maxima")
```

```
[Out] integrate(sqrt((c*x^2)^(3/2)*b + a)/x^5, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{\sqrt{cx^2}bcx^2+a}}{x^5},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)/x^5,x, algorithm="fricas")
```

```
[Out] integral(sqrt(sqrt(c*x^2)*b*c*x^2 + a)/x^5, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**2)**(3/2))**(1/2)/x**5,x)
```

```
[Out] Integral(sqrt(a + b*(c*x**2)**(3/2))/x**5, x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{(cx^2)^{\frac{3}{2}} b + a}}{x^5} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)/x^5,x, algorithm="giac")
```

```
[Out] integrate(sqrt((c*x^2)^(3/2)*b + a)/x^5, x)
```

3.2948 $\int (dx)^m \sqrt{a+b\left(cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=86

$$\frac{(dx)^{m+1}\sqrt{a+b\left(cx^2\right)^{3/2}}\,{}_2F_1\left(-\frac{1}{2},\frac{m+1}{3};\frac{m+4}{3};-\frac{b\left(cx^2\right)^{3/2}}{a}\right)}{d(m+1)\sqrt{\frac{b\left(cx^2\right)^{3/2}}{a}+1}}$$

```
[Out] ((d*x)^(1 + m)*Sqrt[a + b*(c*x^2)^(3/2)]*Hypergeometric2F1[-1/2,
(1 + m)/3, (4 + m)/3, -((b*(c*x^2)^(3/2))/a)])/(d*(1 + m)*Sqrt[1
+ (b*(c*x^2)^(3/2))/a])
```

Rubi [A] time = 0.143826, antiderivative size = 86, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.13

$$\frac{(dx)^{m+1}\sqrt{a+b\left(cx^2\right)^{3/2}}\,{}_2F_1\left(-\frac{1}{2},\frac{m+1}{3};\frac{m+4}{3};-\frac{b\left(cx^2\right)^{3/2}}{a}\right)}{d(m+1)\sqrt{\frac{b\left(cx^2\right)^{3/2}}{a}+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[(d*x)^m*Sqrt[a + b*(c*x^2)^(3/2)],x]
```

```
[Out] ((d*x)^(1 + m)*Sqrt[a + b*(c*x^2)^(3/2)]*Hypergeometric2F1[-1/2,
(1 + m)/3, (4 + m)/3, -((b*(c*x^2)^(3/2))/a)])/(d*(1 + m)*Sqrt[1
+ (b*(c*x^2)^(3/2))/a])
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x)**m*(a+b*(c*x**2)**(3/2))**(1/2),x)
```

```
[Out] Integral((d*x)**m*sqrt(a + b*(c*x**2)**(3/2)), x)
```

Mathematica [A] time = 0.0485507, size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a+b\left(cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(d*x)^m*Sqrt[a + b*(c*x^2)^(3/2)],x]
```

```
[Out] Integrate[(d*x)^m*Sqrt[a + b*(c*x^2)^(3/2)], x]
```

Maple [F] time = 0.044, size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a+b\left(cx^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x)^m*(a+b*(c*x^2)^(3/2))^(1/2),x)
```

```
[Out] int((d*x)^m*(a+b*(c*x^2)^(3/2))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{(cx^2)^{\frac{3}{2}} b + a} (dx)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)*(d*x)^m,x, algorithm="maxima")
```

```
[Out] integrate(sqrt((c*x^2)^(3/2)*b + a)*(d*x)^m, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{\sqrt{cx^2} bcx^2 + a} (dx)^m, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)*(d*x)^m,x, algorithm="fricas")
```

```
[Out] integral(sqrt(sqrt(c*x^2)*b*c*x^2 + a)*(d*x)^m, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a + b (cx^2)^{\frac{3}{2}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)**m*(a+b*(c*x**2)**(3/2))**(1/2),x)
```

```
[Out] Integral((d*x)**m*sqrt(a + b*(c*x**2)**(3/2)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{(cx^2)^{\frac{3}{2}} b + a} (dx)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^2)^(3/2)*b + a)*(d*x)^m,x, algorithm="giac")
```

```
[Out] integrate(sqrt((c*x^2)^(3/2)*b + a)*(d*x)^m, x)
```

3.2949 $\int (dx)^m\sqrt{a+b\sqrt{cx^2}}\,dx$

Optimal. Leaf size=88

$$\frac{2(dx)^{m+1}\left(a+b\sqrt{cx^2}\right)^{3/2}\left(-\frac{b\sqrt{cx^2}}{a}\right)^{-m}{}_2F_1\left(\frac{3}{2},-m;\frac{5}{2};\frac{\sqrt{cx^2}b}{a}+1\right)}{3bd\sqrt{cx^2}}$$

```
[Out] (2*(d*x)^(1 + m)*(a + b*Sqrt[c*x^2])^(3/2)*Hypergeometric2F1[3/2,
 -m, 5/2, 1 + (b*Sqrt[c*x^2])/a])/(3*b*d*Sqrt[c*x^2]*(-((b*Sqrt[c
*x^2])/a))^m)
```

Rubi [A] time = 0.108945, antiderivative size = 88, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.13

$$\frac{2(dx)^{m+1}\left(a+b\sqrt{cx^2}\right)^{3/2}\left(-\frac{b\sqrt{cx^2}}{a}\right)^{-m}{}_2F_1\left(\frac{3}{2},-m;\frac{5}{2};\frac{\sqrt{cx^2}b}{a}+1\right)}{3bd\sqrt{cx^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(d*x)^m*Sqrt[a + b*Sqrt[c*x^2]],x]
```

```
[Out] (2*(d*x)^(1 + m)*(a + b*Sqrt[c*x^2])^(3/2)*Hypergeometric2F1[3/2,
 -m, 5/2, 1 + (b*Sqrt[c*x^2])/a])/(3*b*d*Sqrt[c*x^2]*(-((b*Sqrt[c
*x^2])/a))^m)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m\sqrt{a+b\sqrt{cx^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x)**m*(a+b*(c*x**2)**(1/2))**(1/2),x)
```

```
[Out] Integral((d*x)**m*sqrt(a + b*sqrt(c*x**2)), x)
```

Mathematica [A] time = 0.0623717, size = 74, normalized size = 0.84

$$\frac{x(dx)^m\sqrt{a+b\sqrt{cx^2}}\,{}_2F_1\left(-\frac{1}{2},m+1;m+2;-\frac{b\sqrt{cx^2}}{a}\right)}{(m+1)\sqrt{\frac{b\sqrt{cx^2}}{a}+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(d*x)^m*Sqrt[a + b*Sqrt[c*x^2]],x]
```

```
[Out] (x*(d*x)^m*Sqrt[a + b*Sqrt[c*x^2]]*Hypergeometric2F1[-1/2, 1 + m,
 2 + m, -((b*Sqrt[c*x^2])/a)])/((1 + m)*Sqrt[1 + (b*Sqrt[c*x^2])/
a])
```

Maple [F] time = 0.046, size = 0, normalized size = 0.

$$\int (dx)^m\sqrt{a+b\sqrt{cx^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x)^m*(a+b*(c*x^2)^(1/2))^(1/2),x)

[Out] int((d*x)^m*(a+b*(c*x^2)^(1/2))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{\sqrt{cx^2}b + a}\,(dx)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)*(d*x)^m,x, algorithm="maxima")

[Out] integrate(sqrt(sqrt(c*x^2)*b + a)*(d*x)^m, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{\sqrt{cx^2}b + a}\,(dx)^m\,, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)*(d*x)^m,x, algorithm="fricas")

[Out] integral(sqrt(sqrt(c*x^2)*b + a)*(d*x)^m, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m\,\sqrt{a + b\sqrt{cx^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)**m*(a+b*(c*x**2)**(1/2))**(1/2),x)

[Out] Integral((d*x)**m*sqrt(a + b*sqrt(c*x**2)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{\sqrt{cx^2}b + a}\,(dx)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^2)*b + a)*(d*x)^m,x, algorithm="giac")

[Out] integrate(sqrt(sqrt(c*x^2)*b + a)*(d*x)^m, x)
```

3.2950 $\int (dx)^m \sqrt{a+\frac{b}{\sqrt{cx^2}}}\,dx$

Optimal. Leaf size=87

$$-\frac{2b(dx)^{m+1}\left(a+\frac{b}{\sqrt{cx^2}}\right)^{3/2}\left(-\frac{b}{a\sqrt{cx^2}}\right)^m {}_2F_1\left(\frac{3}{2},m+2;\frac{5}{2};\frac{b}{a\sqrt{cx^2}}+1\right)}{3a^2d\sqrt{cx^2}}$$

```
[Out] (-2*b*(d*x)^(1 + m)*(-(b/(a*Sqrt[c*x^2])))^m*(a + b/Sqrt[c*x^2])^
(3/2)*Hypergeometric2F1[3/2, 2 + m, 5/2, 1 + b/(a*Sqrt[c*x^2])])/
(3*a^2*d*Sqrt[c*x^2])
```

Rubi [A] time = 0.183341, antiderivative size = 87, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174

$$-\frac{2b(dx)^{m+1}\left(a+\frac{b}{\sqrt{cx^2}}\right)^{3/2}\left(-\frac{b}{a\sqrt{cx^2}}\right)^m {}_2F_1\left(\frac{3}{2},m+2;\frac{5}{2};\frac{b}{a\sqrt{cx^2}}+1\right)}{3a^2d\sqrt{cx^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(d*x)^m*Sqrt[a + b/Sqrt[c*x^2]],x]
```

```
[Out] (-2*b*(d*x)^(1 + m)*(-(b/(a*Sqrt[c*x^2])))^m*(a + b/Sqrt[c*x^2])^
(3/2)*Hypergeometric2F1[3/2, 2 + m, 5/2, 1 + b/(a*Sqrt[c*x^2])])/
(3*a^2*d*Sqrt[c*x^2])
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a+\frac{b}{\sqrt{cx^2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x)**m*(a+b/(c*x**2)**(1/2))**(1/2),x)
```

```
[Out] Integral((d*x)**m*sqrt(a + b/sqrt(c*x**2)), x)
```

Mathematica [A] time = 0.100161, size = 81, normalized size = 0.93

$$\frac{2x(dx)^m\sqrt{a+\frac{b}{\sqrt{cx^2}}}\,{}_2F_1\left(-\frac{1}{2},m+\frac{1}{2};m+\frac{3}{2};-\frac{a\sqrt{cx^2}}{b}\right)}{(2m+1)\sqrt{\frac{a\sqrt{cx^2}}{b}+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(d*x)^m*Sqrt[a + b/Sqrt[c*x^2]],x]
```

```
[Out] (2*x*(d*x)^m*Sqrt[a + b/Sqrt[c*x^2]]*Hypergeometric2F1[-1/2, 1/2
+ m, 3/2 + m, -((a*Sqrt[c*x^2])/b)])/((1 + 2*m)*Sqrt[1 + (a*Sqrt[
c*x^2])/b])
```

Maple [F] time = 0.061, size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a + b\frac{1}{\sqrt{cx^2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x)^m*(a+b/(c*x^2)^(1/2))^(1/2),x)
```

```
[Out] int((d*x)^m*(a+b/(c*x^2)^(1/2))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a + \frac{b}{\sqrt{cx^2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m*sqrt(a + b/sqrt(c*x^2)),x, algorithm="maxima")
```

```
[Out] integrate((d*x)^m*sqrt(a + b/sqrt(c*x^2)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left((dx)^m \sqrt{\frac{\sqrt{cx^2}a + b}{\sqrt{cx^2}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m*sqrt(a + b/sqrt(c*x^2)),x, algorithm="fricas")
```

```
[Out] integral((d*x)^m*sqrt((sqrt(c*x^2)*a + b)/sqrt(c*x^2)), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a + \frac{b}{\sqrt{cx^2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)**m*(a+b/(c*x**2)**(1/2))**(1/2),x)
```

```
[Out] Integral((d*x)**m*sqrt(a + b/sqrt(c*x**2)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a + \frac{b}{\sqrt{cx^2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m*sqrt(a + b/sqrt(c*x^2)),x, algorithm="giac")

[Out] integrate((d*x)^m*sqrt(a + b/sqrt(c*x^2)), x)
```

3.2951 $\int (dx)^m \sqrt{a+\frac{b}{(cx^2)^{3/2}}}\,dx$

Optimal. Leaf size=90

$$\frac{(dx)^{m+1}\sqrt{a+\frac{b}{(cx^2)^{3/2}}}\,{}_2F_1\left(-\frac{1}{2},\frac{1}{3}(-m-1);\frac{2-m}{3};-\frac{b}{a(cx^2)^{3/2}}\right)}{d(m+1)\sqrt{\frac{b}{a(cx^2)^{3/2}}+1}}$$

```
[Out] ((d*x)^(1 + m)*Sqrt[a + b/(c*x^2)^(3/2)]*Hypergeometric2F1[-1/2,
(-1 - m)/3, (2 - m)/3, -(b/(a*(c*x^2)^(3/2)))])/(d*(1 + m)*Sqrt[1
 + b/(a*(c*x^2)^(3/2))])
```

Rubi [A] time = 0.216331, antiderivative size = 90, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174

$$\frac{(dx)^{m+1}\sqrt{a+\frac{b}{(cx^2)^{3/2}}}\,{}_2F_1\left(-\frac{1}{2},\frac{1}{3}(-m-1);\frac{2-m}{3};-\frac{b}{a(cx^2)^{3/2}}\right)}{d(m+1)\sqrt{\frac{b}{a(cx^2)^{3/2}}+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[(d*x)^m*Sqrt[a + b/(c*x^2)^(3/2)],x]
```

```
[Out] ((d*x)^(1 + m)*Sqrt[a + b/(c*x^2)^(3/2)]*Hypergeometric2F1[-1/2,
(-1 - m)/3, (2 - m)/3, -(b/(a*(c*x^2)^(3/2)))])/(d*(1 + m)*Sqrt[1
 + b/(a*(c*x^2)^(3/2))])
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m\sqrt{a+\frac{b}{(cx^2)^{\frac{3}{2}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x)**m*(a+b/(c*x**2)**(3/2))**(1/2),x)
```

```
[Out] Integral((d*x)**m*sqrt(a + b/(c*x**2)**(3/2)), x)
```

Mathematica [A] time = 0.0697227, size = 0, normalized size = 0.

$$\int (dx)^m\sqrt{a+\frac{b}{(cx^2)^{3/2}}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(d*x)^m*Sqrt[a + b/(c*x^2)^(3/2)],x]
```

```
[Out] Integrate[(d*x)^m*Sqrt[a + b/(c*x^2)^(3/2)], x]
```

Maple [F] time = 0.067, size = 0, normalized size = 0.

$$\int (dx)^m\sqrt{a+b\left(cx^2\right)^{-\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x)^m*(a+b/(c*x^2)^(3/2))^(1/2),x)
```

```
[Out] int((d*x)^m*(a+b/(c*x^2)^(3/2))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a + \frac{b}{(cx^2)^{\frac{3}{2}}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m*sqrt(a + b/(c*x^2)^(3/2)),x, algorithm="maxima")
```

```
[Out] integrate((d*x)^m*sqrt(a + b/(c*x^2)^(3/2)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left((dx)^m \sqrt{\frac{\sqrt{cx^2}acx^2 + b}{\sqrt{cx^2}cx^2}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m*sqrt(a + b/(c*x^2)^(3/2)),x, algorithm="fricas")
```

```
[Out] integral((d*x)^m*sqrt((sqrt(c*x^2)*a*c*x^2 + b)/(sqrt(c*x^2)*c*x^
2)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)**m*(a+b/(c*x**2)**(3/2))**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a + \frac{b}{(cx^2)^{\frac{3}{2}}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m*sqrt(a + b/(c*x^2)^(3/2)),x, algorithm="giac")
```

```
[Out] integrate((d*x)^m*sqrt(a + b/(c*x^2)^(3/2)), x)
```

3.2952 $\int \frac{1}{1+(x^3)^{2/3}} dx$

Optimal. Leaf size=17

$$\frac{x\tan^{-1}\left(\sqrt[3]{x^3}\right)}{\sqrt[3]{x^3}}$$

```
[Out] (x*ArcTan[(x^3)^(1/3)])/(x^3)^(1/3)
```

Rubi [A] time = 0.0124582, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$

$$\frac{x\tan^{-1}\left(\sqrt[3]{x^3}\right)}{\sqrt[3]{x^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[(1 + (x^3)^(2/3))^(-1),x]

[Out] (x*ArcTan[(x^3)^(1/3)])/(x^3)^(1/3)
```

Rubi in Sympy [A] time = 1.13289, size = 15, normalized size = 0.88

$$\frac{x\,\text{atan}\left(\sqrt[3]{x^3}\right)}{\sqrt[3]{x^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(1+(x**3)**(2/3)),x)

[Out] x*atan((x**3)**(1/3))/(x**3)**(1/3)
```

Mathematica [A] time = 0.0295114, size = 0, normalized size = 0.

$$\int \frac{1}{1+(x^3)^{2/3}} dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(1 + (x^3)^(2/3))^(-1),x]

[Out] Integrate[(1 + (x^3)^(2/3))^(-1), x]
```

Maple [A] time = 0.053, size = 14, normalized size = 0.8

$$x\arctan\left(\sqrt[3]{x^3}\right)\frac{1}{\sqrt[3]{x^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(1+(x^3)^(2/3)),x)
```

```
[Out] x*arctan((x^3)^(1/3))/(x^3)^(1/3)
```

Maxima [A] time = 1.51243, size = 3, normalized size = 0.18

$$\arctan(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((x^3)^(2/3) + 1),x, algorithm="maxima")
```

```
[Out] arctan(x)
```

Fricas [A] time = 0.20932, size = 8, normalized size = 0.47

$$\arctan\left(\left(x^3\right)^{\frac{1}{3}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((x^3)^(2/3) + 1),x, algorithm="fricas")
```

```
[Out] arctan((x^3)^(1/3))
```

Sympy [A] time = 0.159552, size = 2, normalized size = 0.12

$$\operatorname{atan}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(1+(x**3)**(2/3)),x)
```

```
[Out] atan(x)
```

GIAC/XCAS [A] time = 0.215818, size = 3, normalized size = 0.18

$$\arctan(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((x^3)^(2/3) + 1),x, algorithm="giac")
```

```
[Out] arctan(x)
```

3.2953 $\int x^5\sqrt{a+b\sqrt{cx^3}}\,dx$

Optimal. Leaf size=116

$$-\frac{4a^3\left(a+b\sqrt{cx^3}\right)^{3/2}}{9b^4c^2}+\frac{4a^2\left(a+b\sqrt{cx^3}\right)^{5/2}}{5b^4c^2}+\frac{4\left(a+b\sqrt{cx^3}\right)^{9/2}}{27b^4c^2}-\frac{4a\left(a+b\sqrt{cx^3}\right)^{7/2}}{7b^4c^2}$$

```
[Out] (-4*a^3*(a + b*Sqrt[c*x^3])^(3/2))/(9*b^4*c^2) + (4*a^2*(a + b*Sq
rt[c*x^3])^(5/2))/(5*b^4*c^2) - (4*a*(a + b*Sqrt[c*x^3])^(7/2))/(
7*b^4*c^2) + (4*(a + b*Sqrt[c*x^3])^(9/2))/(27*b^4*c^2)
```

Rubi [A] time = 0.196311, antiderivative size = 116, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$-\frac{4a^3\left(a+b\sqrt{cx^3}\right)^{3/2}}{9b^4c^2}+\frac{4a^2\left(a+b\sqrt{cx^3}\right)^{5/2}}{5b^4c^2}+\frac{4\left(a+b\sqrt{cx^3}\right)^{9/2}}{27b^4c^2}-\frac{4a\left(a+b\sqrt{cx^3}\right)^{7/2}}{7b^4c^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^5*Sqrt[a + b*Sqrt[c*x^3]],x]
```

```
[Out] (-4*a^3*(a + b*Sqrt[c*x^3])^(3/2))/(9*b^4*c^2) + (4*a^2*(a + b*Sq
rt[c*x^3])^(5/2))/(5*b^4*c^2) - (4*a*(a + b*Sqrt[c*x^3])^(7/2))/(
7*b^4*c^2) + (4*(a + b*Sqrt[c*x^3])^(9/2))/(27*b^4*c^2)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^5\sqrt{a+b\sqrt{cx^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**5*(a+b*(c*x**3)**(1/2))**(1/2),x)
```

```
[Out] Integral(x**5*sqrt(a + b*sqrt(c*x**3)), x)
```

Mathematica [A] time = 0.0540071, size = 86, normalized size = 0.74

$$\frac{4\sqrt{a+b\sqrt{cx^3}}\left(-16a^4+8a^3b\sqrt{cx^3}-6a^2b^2cx^3+5ab^3\left(cx^3\right)^{3/2}+35b^4c^2x^6\right)}{945b^4c^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^5*Sqrt[a + b*Sqrt[c*x^3]],x]
```

```
[Out] (4*Sqrt[a + b*Sqrt[c*x^3]]*(-16*a^4 - 6*a^2*b^2*c*x^3 + 35*b^4*c^
2*x^6 + 8*a^3*b*Sqrt[c*x^3] + 5*a*b^3*(c*x^3)^(3/2)))/(945*b^4*c^
2)
```

Maple [A] time = 0.192, size = 103, normalized size = 0.9

$$\frac{4}{945\,c^2b^4}\sqrt{a+b\sqrt{cx^3}}\left(35\,c^2x^6b^4\left(cx^3\right)^{3/2}+5\,ax^9c^3b^3+8\,a^3x^6c^2b-6\,a^2cx^3b^2\left(cx^3\right)^{3/2}-16\,a^4\left(cx^3\right)^{3/2}\right)\left(cx^3\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^5*(a+b*(c*x^3)^(1/2))^(1/2),x)
```

```
[Out] 4/945/c^2*(a+b*(c*x^3)^(1/2))^(1/2)*(35*c^2*x^6*b^4*(c*x^3)^(3/2)
+5*a*x^9*c^3*b^3+8*a^3*x^6*c^2*b-6*a^2*c*x^3*b^2*(c*x^3)^(3/2)-16
*a^4*(c*x^3)^(3/2))/b^4/(c*x^3)^(3/2)
```

Maxima [A] time = 1.36675, size = 115, normalized size = 0.99

$$\frac{4\left(\frac{35\left(\sqrt{cx^3}b+a\right)^{\frac{9}{2}}}{b^4}-\frac{135\left(\sqrt{cx^3}b+a\right)^{\frac{7}{2}}a}{b^4}+\frac{189\left(\sqrt{cx^3}b+a\right)^{\frac{5}{2}}a^2}{b^4}-\frac{105\left(\sqrt{cx^3}b+a\right)^{\frac{3}{2}}a^3}{b^4}\right)}{945\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^3)*b + a)*x^5,x, algorithm="maxima")
```

```
[Out] 4/945*(35*(sqrt(c*x^3)*b + a)^(9/2)/b^4 - 135*(sqrt(c*x^3)*b + a)
^(7/2)*a/b^4 + 189*(sqrt(c*x^3)*b + a)^(5/2)*a^2/b^4 - 105*(sqrt(
c*x^3)*b + a)^(3/2)*a^3/b^4)/c^2
```

Fricas [A] time = 0.347878, size = 101, normalized size = 0.87

$$\frac{4\left(35\,b^4c^2x^6-6\,a^2b^2cx^3-16\,a^4+\left(5\,ab^3cx^3+8\,a^3b\right)\sqrt{cx^3}\right)\sqrt{\sqrt{cx^3}b+a}}{945\,b^4c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^3)*b + a)*x^5,x, algorithm="fricas")
```

```
[Out] 4/945*(35*b^4*c^2*x^6 - 6*a^2*b^2*c*x^3 - 16*a^4 + (5*a*b^3*c*x^3
 + 8*a^3*b)*sqrt(c*x^3))*sqrt(sqrt(c*x^3)*b + a)/(b^4*c^2)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^5\sqrt{a+b\sqrt{cx^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**5*(a+b*(c*x**3)**(1/2))**(1/2),x)
```

```
[Out] Integral(x**5*sqrt(a + b*sqrt(c*x**3)), x)
```

GIAC/XCAS [A] time = 0.222413, size = 155, normalized size = 1.34

$$\frac{4\left(\frac{16\,\sqrt{ac}a^4}{b^4c}-\frac{105\left(\sqrt{cx}bcx+ac\right)^{\frac{3}{2}}a^3c^3-189\left(\sqrt{cx}bcx+ac\right)^{\frac{5}{2}}a^2c^2+135\left(\sqrt{cx}bcx+ac\right)^{\frac{7}{2}}ac-35\left(\sqrt{cx}bcx+ac\right)^{\frac{9}{2}}}{b^4c^5}\right)|c|}{945\,c^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^3)*b + a)*x^5,x, algorithm="giac")
```

```
[Out] 4/945*(16*sqrt(a*c)*a^4/(b^4*c) - (105*(sqrt(c*x)*b*c*x + a*c)^(3
/2)*a^3*c^3 - 189*(sqrt(c*x)*b*c*x + a*c)^(5/2)*a^2*c^2 + 135*(sq
rt(c*x)*b*c*x + a*c)^(7/2)*a*c - 35*(sqrt(c*x)*b*c*x + a*c)^(9/2)
)/(b^4*c^5))*abs(c)/c^(5/2)
```

3.2954 $\int x^2\sqrt{a+b\sqrt{cx^3}}\,dx$

Optimal. Leaf size=56

$$\frac{4\left(a+b\sqrt{cx^3}\right)^{5/2}}{15b^2c}-\frac{4a\left(a+b\sqrt{cx^3}\right)^{3/2}}{9b^2c}$$

```
[Out] (-4*a*(a + b*Sqrt[c*x^3])^(3/2))/(9*b^2*c) + (4*(a + b*Sqrt[c*x^3
])^(5/2))/(15*b^2*c)
```

Rubi [A] time = 0.0859186, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$\frac{4\left(a+b\sqrt{cx^3}\right)^{5/2}}{15b^2c}-\frac{4a\left(a+b\sqrt{cx^3}\right)^{3/2}}{9b^2c}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2*Sqrt[a + b*Sqrt[c*x^3]],x]
```

```
[Out] (-4*a*(a + b*Sqrt[c*x^3])^(3/2))/(9*b^2*c) + (4*(a + b*Sqrt[c*x^3
])^(5/2))/(15*b^2*c)
```

Rubi in Sympy [A] time = 8.4167, size = 48, normalized size = 0.86

$$-\frac{4a\left(a+b\sqrt{cx^3}\right)^{\frac{3}{2}}}{9b^2c}+\frac{4\left(a+b\sqrt{cx^3}\right)^{\frac{5}{2}}}{15b^2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(a+b*(c*x**3)**(1/2))**(1/2),x)
```

```
[Out] -4*a*(a + b*sqrt(c*x**3))**(3/2)/(9*b**2*c) + 4*(a + b*sqrt(c*x**
3))**(5/2)/(15*b**2*c)
```

Mathematica [A] time = 0.0294877, size = 54, normalized size = 0.96

$$\frac{4\sqrt{a+b\sqrt{cx^3}}\left(-2a^2+ab\sqrt{cx^3}+3b^2cx^3\right)}{45b^2c}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2*Sqrt[a + b*Sqrt[c*x^3]],x]
```

```
[Out] (4*Sqrt[a + b*Sqrt[c*x^3]]*(-2*a^2 + 3*b^2*c*x^3 + a*b*Sqrt[c*x^3
]))/(45*b^2*c)
```

Maple [A] time = 0.171, size = 65, normalized size = 1.2

$$\frac{4}{45\,b^2c}\sqrt{a+b\sqrt{cx^3}}\left(3\,cx^3b^2\sqrt{cx^3}+ax^3cb-2\,a^2\sqrt{cx^3}\right)\frac{1}{\sqrt{cx^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^2*(a+b*(c*x^3)^(1/2))^(1/2),x)
```

```
[Out] 4/45/c*(a+b*(c*x^3)^(1/2))^(1/2)*(3*c*x^3*b^2*(c*x^3)^(1/2)+a*x^3
*c*b-2*a^2*(c*x^3)^(1/2))/b^2/(c*x^3)^(1/2)
```

Maxima [A] time = 1.34639, size = 58, normalized size = 1.04

$$\frac{4\left(\frac{3\left(\sqrt{cx^3}b+a\right)^{\frac{5}{2}}}{b^2}-\frac{5\left(\sqrt{cx^3}b+a\right)^{\frac{3}{2}}a}{b^2}\right)}{45\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(sqrt(c*x^3)*b + a)*x^2,x, algorithm="maxima")
```

```
[Out] 4/45*(3*(sqrt(c*x^3)*b + a)^(5/2)/b^2 - 5*(sqrt(c*x^3)*b + a)^(3/
2)*a/b^2)/c
```

Fricas [A] time = 0.300414, size = 62, normalized size = 1.11

$$\frac{4\left(3\,b^2cx^3+\sqrt{cx^3}ab-2\,a^2\right)\sqrt{\sqrt{cx^3}b+a}}{45\,b^2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(sqrt(c*x^3)*b + a)*x^2,x, algorithm="fricas")
```

```
[Out] 4/45*(3*b^2*c*x^3 + sqrt(c*x^3)*a*b - 2*a^2)*sqrt(sqrt(c*x^3)*b +
 a)/(b^2*c)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^2\sqrt{a+b\sqrt{cx^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**2*(a+b*(c*x**3)**(1/2))**(1/2),x)
```

```
[Out] Integral(x**2*sqrt(a + b*sqrt(c*x**3)), x)
```

GIAC/XCAS [A] time = 0.221095, size = 89, normalized size = 1.59

$$\frac{4\left(\frac{2\sqrt{ac}a^2}{b^2}-\frac{5\left(\sqrt{cx}bcx+ac\right)^{\frac{3}{2}}ac-3\left(\sqrt{cx}bcx+ac\right)^{\frac{5}{2}}}{b^2c^2}\right)|c|}{45\,c^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(sqrt(c*x^3)*b + a)*x^2,x, algorithm="giac")
```

```
[Out] 4/45*(2*sqrt(a*c)*a^2/b^2 - (5*(sqrt(c*x)*b*c*x + a*c)^(3/2)*a*c
- 3*(sqrt(c*x)*b*c*x + a*c)^(5/2))/(b^2*c^2))*abs(c)/c^(5/2)
```

3.2955 $\int \frac{\sqrt{a+b\sqrt{cx^3}}}{x} dx$

Optimal. Leaf size=55

$$\frac{4}{3}\sqrt{a+b\sqrt{cx^3}}-\frac{4}{3}\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{cx^3}}}{\sqrt{a}}\right)$$

```
[Out] (4*Sqrt[a + b*Sqrt[c*x^3]])/3 - (4*Sqrt[a]*ArcTanh[Sqrt[a + b*Sqr
t[c*x^3]]/Sqrt[a]])/3
```

Rubi [A] time = 0.105369, antiderivative size = 55, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238

$$\frac{4}{3}\sqrt{a+b\sqrt{cx^3}}-\frac{4}{3}\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{cx^3}}}{\sqrt{a}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[c*x^3]]/x,x]
```

```
[Out] (4*Sqrt[a + b*Sqrt[c*x^3]])/3 - (4*Sqrt[a]*ArcTanh[Sqrt[a + b*Sqr
t[c*x^3]]/Sqrt[a]])/3
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\sqrt{cx^3}}}{x} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x**3)**(1/2))**(1/2)/x,x)
```

```
[Out] Integral(sqrt(a + b*sqrt(c*x**3))/x, x)
```

Mathematica [A] time = 0.0336827, size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\sqrt{cx^3}}}{x} dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[Sqrt[a + b*Sqrt[c*x^3]]/x,x]
```

```
[Out] Integrate[Sqrt[a + b*Sqrt[c*x^3]]/x, x]
```

Maple [A] time = 0.171, size = 40, normalized size = 0.7

$$-\frac{4}{3}Artanh\left(1\sqrt{a+b\sqrt{cx^3}}\frac{1}{\sqrt{a}}\right)\sqrt{a}+\frac{4}{3}\sqrt{a+b\sqrt{cx^3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^3)^(1/2))^(1/2)/x,x)
```

```
[Out] -4/3*arctanh((a+b*(c*x^3)^(1/2))^(1/2)/a^(1/2))*a^(1/2)+4/3*(a+b*
(c*x^3)^(1/2))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^3)*b + a)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^3)*b + a)/x,x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + b\sqrt{cx^3}}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**3)**(1/2))**(1/2)/x,x)
```

```
[Out] Integral(sqrt(a + b*sqrt(c*x**3))/x, x)
```

GIAC/XCAS [A] time = 0.223011, size = 124, normalized size = 2.25

$$\frac{4\left(\frac{ac\arctan\left(\frac{\sqrt{\sqrt{cx}bcx+ac}}{\sqrt{-ac}}\right)}{\sqrt{-ac}} + \sqrt{\sqrt{cx}bcx + ac} - \frac{ac\arctan\left(\frac{\sqrt{ac}}{\sqrt{-ac}}\right) + \sqrt{ac}\sqrt{-ac}}{\sqrt{-ac}}\right)|c|}{3\,c^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^3)*b + a)/x,x, algorithm="giac")
```

```
[Out] 4/3*(a*c*arctan(sqrt(sqrt(c*x)*b*c*x + a*c)/sqrt(-a*c))/sqrt(-a*c
) + sqrt(sqrt(c*x)*b*c*x + a*c) - (a*c*arctan(sqrt(a*c)/sqrt(-a*c
)) + sqrt(a*c)*sqrt(-a*c))/sqrt(-a*c))*abs(c)/c^(3/2)
```

3.2956 $\int \frac{\sqrt{a+b\sqrt{cx^3}}}{x^4} dx$

Optimal. Leaf size=97

$$\frac{b^2c\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{cx^3}}}{\sqrt{a}}\right)}{6a^{3/2}} - \frac{bc\sqrt{a+b\sqrt{cx^3}}}{6a\sqrt{cx^3}} - \frac{\sqrt{a+b\sqrt{cx^3}}}{3x^3}$$

```
[Out] -Sqrt[a + b*Sqrt[c*x^3]]/(3*x^3) - (b*c*Sqrt[a + b*Sqrt[c*x^3]])/
(6*a*Sqrt[c*x^3]) + (b^2*c*ArcTanh[Sqrt[a + b*Sqrt[c*x^3]]/Sqrt[a
]])/(6*a^(3/2))
```

Rubi [A] time = 0.155149, antiderivative size = 97, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$

$$\frac{b^2c\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{cx^3}}}{\sqrt{a}}\right)}{6a^{3/2}} - \frac{bc\sqrt{a+b\sqrt{cx^3}}}{6a\sqrt{cx^3}} - \frac{\sqrt{a+b\sqrt{cx^3}}}{3x^3}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[c*x^3]]/x^4,x]
```

```
[Out] -Sqrt[a + b*Sqrt[c*x^3]]/(3*x^3) - (b*c*Sqrt[a + b*Sqrt[c*x^3]])/
(6*a*Sqrt[c*x^3]) + (b^2*c*ArcTanh[Sqrt[a + b*Sqrt[c*x^3]]/Sqrt[a
]])/(6*a^(3/2))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\sqrt{cx^3}}}{x^4} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x**3)**(1/2))**(1/2)/x**4,x)
```

```
[Out] Integral(sqrt(a + b*sqrt(c*x**3))/x**4, x)
```

Mathematica [A] time = 0.0334027, size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\sqrt{cx^3}}}{x^4} dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[Sqrt[a + b*Sqrt[c*x^3]]/x^4,x]
```

```
[Out] Integrate[Sqrt[a + b*Sqrt[c*x^3]]/x^4, x]
```

Maple [A] time = 0.181, size = 81, normalized size = 0.8

$$-\frac{1}{6\,x^3}\left(-b^2 Artanh\left(1\sqrt{a+b\sqrt{cx^3}}\frac{1}{\sqrt{a}}\right)cx^3a+\sqrt{cx^3}b\sqrt{a+b\sqrt{cx^3}}a^{\frac{3}{2}}+2\sqrt{a+b\sqrt{cx^3}}a^{5/2}\right)a^{-\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^3)^(1/2))^(1/2)/x^4,x)
```

```
[Out] -1/6*(-b^2*arctanh((a+b*(c*x^3)^(1/2))^(1/2)/a^(1/2))*c*x^3*a+(c*
x^3)^(1/2)*b*(a+b*(c*x^3)^(1/2))^(1/2)*a^(3/2)+2*(a+b*(c*x^3)^(1/
2))^(1/2)*a^(5/2))/x^3/a^(5/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^3)*b + a)/x^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^3)*b + a)/x^4,x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + b\sqrt{cx^3}}}{x^4}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**3)**(1/2))**(1/2)/x**4,x)
```

```
[Out] Integral(sqrt(a + b*sqrt(c*x**3))/x**4, x)
```

GIAC/XCAS [A] time = 0.242669, size = 127, normalized size = 1.31

$$-\frac{1}{6}\,b^2c^{\frac{3}{2}}\left(\frac{\arctan\left(\frac{\sqrt{\sqrt{cx}bcx+ac}}{\sqrt{-ac}}\right)}{\sqrt{-ac}ac}+\frac{\sqrt{\sqrt{cx}bcx+ac}\,ac+\left(\sqrt{cx}bcx+ac\right)^{\frac{3}{2}}}{ab^2c^4x^3}\right)|c|$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^3)*b + a)/x^4,x, algorithm="giac")
```

```
[Out] -1/6*b^2*c^(3/2)*(arctan(sqrt(sqrt(c*x)*b*c*x + a*c)/sqrt(-a*c))/
(sqrt(-a*c)*a*c) + (sqrt(sqrt(c*x)*b*c*x + a*c)*a*c + (sqrt(c*x)*
b*c*x + a*c)^(3/2))/(a*b^2*c^4*x^3))*abs(c)
```

3.2957 $\int x\sqrt{a+b\sqrt{cx^3}}\,dx$

Optimal. Leaf size=400

$$-\frac{8\,3^{3/4}\sqrt{2+\sqrt{3}}a^2\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+b^{2/3}\sqrt[3]{c}x}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)^2}}F\left(\sin^{-1}\left(\frac{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{55b^{4/3}c^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)^2}}\sqrt{a+b\sqrt{cx^3}}}+\frac{12ax^2\sqrt{a+b\sqrt{cx^3}}}{55b\sqrt{cx^3}}+\frac{4}{11}x^2\sqrt{a+b\sqrt{cx^3}}$$

```
[Out] (4*x^2*Sqrt[a + b*Sqrt[c*x^3]])/11 + (12*a*x^2*Sqrt[a + b*Sqrt[c*
x^3]])/(55*b*Sqrt[c*x^3]) - (8*3^(3/4)*Sqrt[2 + Sqrt[3]]*a^2*(a^(
1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])*Sqrt[(a^(2/3) + b^(2/3)
*c^(1/3)*x - (a^(1/3)*b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])/((1 + Sqr
t[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])^2]*EllipticF[A
rcSin[((1 - Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])
/((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])], -7
 - 4*Sqrt[3]])/(55*b^(4/3)*c^(2/3)*Sqrt[(a^(1/3)*(a^(1/3) + (b^(1
/3)*c^(2/3)*x^2)/Sqrt[c*x^3]))/((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*
c^(2/3)*x^2)/Sqrt[c*x^3])^2]*Sqrt[a + b*Sqrt[c*x^3]])
```

Rubi [A] time = 0.645475, antiderivative size = 400, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263

$$-\frac{8\,3^{3/4}\sqrt{2+\sqrt{3}}a^2\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+b^{2/3}\sqrt[3]{c}x}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)^2}}F\left(\sin^{-1}\left(\frac{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{55b^{4/3}c^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)^2}}\sqrt{a+b\sqrt{cx^3}}}+\frac{12ax^2\sqrt{a+b\sqrt{cx^3}}}{55b\sqrt{cx^3}}+\frac{4}{11}x^2\sqrt{a+b\sqrt{cx^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[x*Sqrt[a + b*Sqrt[c*x^3]],x]
```

```
[Out] (4*x^2*Sqrt[a + b*Sqrt[c*x^3]])/11 + (12*a*x^2*Sqrt[a + b*Sqrt[c*
x^3]])/(55*b*Sqrt[c*x^3]) - (8*3^(3/4)*Sqrt[2 + Sqrt[3]]*a^2*(a^(
1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])*Sqrt[(a^(2/3) + b^(2/3)
*c^(1/3)*x - (a^(1/3)*b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])/((1 + Sqr
t[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])^2]*EllipticF[A
rcSin[((1 - Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])
/((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])], -7
 - 4*Sqrt[3]])/(55*b^(4/3)*c^(2/3)*Sqrt[(a^(1/3)*(a^(1/3) + (b^(1
/3)*c^(2/3)*x^2)/Sqrt[c*x^3]))/((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*
c^(2/3)*x^2)/Sqrt[c*x^3])^2]*Sqrt[a + b*Sqrt[c*x^3]])
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x\sqrt{a+b\sqrt{cx^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(a+b*(c*x**3)**(1/2))**(1/2),x)
```

```
[Out] Integral(x*sqrt(a + b*sqrt(c*x**3)), x)
```

Mathematica [A] time = 0.0440149, size = 0, normalized size = 0.

$$\int x\sqrt{a+b\sqrt{cx^3}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[x*Sqrt[a + b*Sqrt[c*x^3]],x]
```

```
[Out] Integrate[x*Sqrt[a + b*Sqrt[c*x^3]], x]
```

Maple [A] time = 0.238, size = 350, normalized size = 0.9

$$\frac{4}{55\,b^2c}\left(ia^2\sqrt{3}\sqrt[3]{-acb^2}\sqrt{2}\sqrt{\frac{-i\sqrt{3}}{x}\left(i\sqrt{3}x\sqrt[3]{-acb^2}-2\,b\sqrt{cx^3}-\sqrt[3]{-acb^2}x\right)\frac{1}{\sqrt[3]{-acb^2}}}\sqrt{\frac{1}{x\left(i\sqrt{3}-3\right)}\left(b\sqrt{cx^3}-\sqrt[3]{-acb^2}x\right)\frac{1}{\sqrt[3]{-a}}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(a+b*(c*x^3)^(1/2))^(1/2),x)
```

```
[Out] 4/55*(I*a^2*3^(1/2)*(-a*c*b^2)^(1/3)*2^(1/2)*(-I*(I*3^(1/2)*x*(-a
*c*b^2)^(1/3)-2*b*(c*x^3)^(1/2)-(-a*c*b^2)^(1/3)*x)*3^(1/2)/(-a*c
*b^2)^(1/3)/x)^(1/2)*((b*(c*x^3)^(1/2)-(-a*c*b^2)^(1/3)*x)/x/(-a*
c*b^2)^(1/3)/(I*3^(1/2)-3))^(1/2)*(-I*(I*3^(1/2)*x*(-a*c*b^2)^(1/
3)+2*b*(c*x^3)^(1/2)+(-a*c*b^2)^(1/3)*x)*3^(1/2)/(-a*c*b^2)^(1/3)
/x)^(1/2)*EllipticF(1/6*3^(1/2)*2^(1/2)*(-I*(I*3^(1/2)*x*(-a*c*b^
2)^(1/3)-2*b*(c*x^3)^(1/2)-(-a*c*b^2)^(1/3)*x)*3^(1/2)/(-a*c*b^2)
^(1/3)/x)^(1/2),2^(1/2)*(I*3^(1/2)/(I*3^(1/2)-3))^(1/2))*(c*x^3)^
(1/2)+5*c^2*x^5*b^3+8*(c*x^3)^(1/2)*x^2*a*b^2*c+3*x^2*a^2*b*c)/c/
b^2/(c*x^3)^(1/2)/(a+b*(c*x^3)^(1/2))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\sqrt{\sqrt{cx^3}b+a}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^3)*b + a)*x,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(sqrt(c*x^3)*b + a)*x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{\sqrt{cx^3}b+a}x, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^3)*b + a)*x,x, algorithm="fricas")

[Out] integral(sqrt(sqrt(c*x^3)*b + a)*x, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x\sqrt{a+b\sqrt{cx^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(a+b*(c*x**3)**(1/2))**(1/2),x)

[Out] Integral(x*sqrt(a + b*sqrt(c*x**3)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{\sqrt{cx^3}b+a}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^3)*b + a)*x,x, algorithm="giac")

[Out] integrate(sqrt(sqrt(c*x^3)*b + a)*x, x)
```

3.2958 $\int \frac{\sqrt{a+b\sqrt{cx^3}}}{x^2}\,dx$

Optimal. Leaf size=355

$$\frac{3^{3/4}\sqrt{2+\sqrt{3}}\,b^{2/3}\sqrt[3]{c}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+b^{2/3}\sqrt[3]{c}x}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)^2}}\,F\left(\sin^{-1}\left(\frac{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)^2}}\sqrt{a+b\sqrt{cx^3}}}-\frac{\sqrt{a+b\sqrt{cx^3}}}{x}$$

```
[Out] -(Sqrt[a + b*Sqrt[c*x^3]]/x) + (3^(3/4)*Sqrt[2 + Sqrt[3]]*b^(2/3)
*c^(1/3)*(a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])*Sqrt[(a^(2
/3) + b^(2/3)*c^(1/3)*x - (a^(1/3)*b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^
3])/((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])^2
]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)
/Sqrt[c*x^3])/((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt
[c*x^3])], -7 - 4*Sqrt[3]])/(Sqrt[(a^(1/3)*(a^(1/3) + (b^(1/3)*c^
(2/3)*x^2)/Sqrt[c*x^3]))/((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3
)*x^2)/Sqrt[c*x^3])^2]*Sqrt[a + b*Sqrt[c*x^3]])
```

Rubi [A] time = 0.442541, antiderivative size = 355, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.19$

$$\frac{3^{3/4}\sqrt{2+\sqrt{3}}\,b^{2/3}\sqrt[3]{c}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+b^{2/3}\sqrt[3]{c}x}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)^2}}\,F\left(\sin^{-1}\left(\frac{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)^2}}\sqrt{a+b\sqrt{cx^3}}}-\frac{\sqrt{a+b\sqrt{cx^3}}}{x}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[c*x^3]]/x^2,x]
```

```
[Out] -(Sqrt[a + b*Sqrt[c*x^3]]/x) + (3^(3/4)*Sqrt[2 + Sqrt[3]]*b^(2/3)
*c^(1/3)*(a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])*Sqrt[(a^(2
/3) + b^(2/3)*c^(1/3)*x - (a^(1/3)*b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^
3])/((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])^2
]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)
/Sqrt[c*x^3])/((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt
[c*x^3])], -7 - 4*Sqrt[3]])/(Sqrt[(a^(1/3)*(a^(1/3) + (b^(1/3)*c^
(2/3)*x^2)/Sqrt[c*x^3]))/((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3
)*x^2)/Sqrt[c*x^3])^2]*Sqrt[a + b*Sqrt[c*x^3]])
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\sqrt{cx^3}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x**3)**(1/2))**(1/2)/x**2,x)
```

```
[Out] Integral(sqrt(a + b*sqrt(c*x**3))/x**2, x)
```

Mathematica [A] time = 0.0325349, size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\sqrt{cx^3}}}{x^2}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[Sqrt[a + b*Sqrt[c*x^3]]/x^2,x]
```

```
[Out] Integrate[Sqrt[a + b*Sqrt[c*x^3]]/x^2, x]
```

Maple [A] time = 0.177, size = 306, normalized size = 0.9

$$-\frac{1}{2x}\left(i\sqrt{3}\sqrt[3]{-acb^2}\sqrt{2}\sqrt{\frac{-i\sqrt{3}}{x}\left(i\sqrt{3}x\sqrt[3]{-acb^2}-2\,b\sqrt{cx^3}-\sqrt[3]{-acb^2}x\right)\frac{1}{\sqrt[3]{-acb^2}}}\sqrt{\frac{1}{x\left(i\sqrt{3}-3\right)}\left(b\sqrt{cx^3}-\sqrt[3]{-acb^2}x\right)\frac{1}{\sqrt[3]{-acb^2}}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^3)^(1/2))^(1/2)/x^2,x)
```

```
[Out] -1/2*(I*3^(1/2)*(-a*c*b^2)^(1/3)*2^(1/2)*(-I*(I*3^(1/2)*x*(-a*c*b
^2)^(1/3)-2*b*(c*x^3)^(1/2)-(-a*c*b^2)^(1/3)*x)*3^(1/2)/(-a*c*b^2
)^(1/3)/x)^(1/2)*((b*(c*x^3)^(1/2)-(-a*c*b^2)^(1/3)*x)/x/(-a*c*b^
2)^(1/3)/(I*3^(1/2)-3))^(1/2)*(-I*(I*3^(1/2)*x*(-a*c*b^2)^(1/3)+2
*b*(c*x^3)^(1/2)+(-a*c*b^2)^(1/3)*x)*3^(1/2)/(-a*c*b^2)^(1/3)/x)^
(1/2)*EllipticF(1/6*3^(1/2)*2^(1/2)*(-I*(I*3^(1/2)*x*(-a*c*b^2)^(
1/3)-2*b*(c*x^3)^(1/2)-(-a*c*b^2)^(1/3)*x)*3^(1/2)/(-a*c*b^2)^(1/
3)/x)^(1/2),2^(1/2)*(I*3^(1/2)/(I*3^(1/2)-3))^(1/2))*x+2*a+2*b*(c
*x^3)^(1/2))/x/(a+b*(c*x^3)^(1/2))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{\sqrt{cx^3}b+a}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^3)*b + a)/x^2,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(sqrt(c*x^3)*b + a)/x^2, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\sqrt{\sqrt{cx^3}b+a}}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^3)*b + a)/x^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(sqrt(c*x^3)*b + a)/x^2, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + b\sqrt{cx^3}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**3)**(1/2))**(1/2)/x**2,x)
```

```
[Out] Integral(sqrt(a + b*sqrt(c*x**3))/x**2, x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{\sqrt{cx^3}b + a}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^3)*b + a)/x^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(sqrt(c*x^3)*b + a)/x^2, x)
```

3.2959 $\int \frac{\sqrt{a+b\sqrt{cx^3}}}{x^5}\,dx$

Optimal. Leaf size=434

$$\frac{21b^2c\sqrt{a+b\sqrt{cx^3}}}{160a^2x}+\frac{7\,3^{3/4}\sqrt{2+\sqrt{3}}b^{8/3}c^{4/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+b^{2/3}\sqrt[3]{c}x}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)^2}}F\left(\sin^{-1}\left(\frac{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{160a^2\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)^2}}\sqrt{a+b\sqrt{cx^3}}}-\frac{3bc^3x^5\sqrt{a+b\sqrt{cx^3}}}{40a\left(cx^3\right)^{5/2}}-\frac{\sqrt{a+b\sqrt{cx^3}}}{4x^4}$$

```
[Out] -Sqrt[a + b*Sqrt[c*x^3]]/(4*x^4) + (21*b^2*c*Sqrt[a + b*Sqrt[c*x^
3]])/(160*a^2*x) - (3*b*c^3*x^5*Sqrt[a + b*Sqrt[c*x^3]])/(40*a*(c
*x^3)^(5/2)) + (7*3^(3/4)*Sqrt[2 + Sqrt[3]]*b^(8/3)*c^(4/3)*(a^(1
/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])*Sqrt[(a^(2/3) + b^(2/3)*
c^(1/3)*x - (a^(1/3)*b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])/((1 + Sqrt
[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])^2]*EllipticF[Ar
cSin[((1 - Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])/
((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])], -7
- 4*Sqrt[3]])/(160*a^2*Sqrt[(a^(1/3)*(a^(1/3) + (b^(1/3)*c^(2/3)*
x^2)/Sqrt[c*x^3]))/((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)
/Sqrt[c*x^3])^2]*Sqrt[a + b*Sqrt[c*x^3]])
```

Rubi [A] time = 0.676885, antiderivative size = 434, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238

$$\frac{21b^2c\sqrt{a+b\sqrt{cx^3}}}{160a^2x}+\frac{7\,3^{3/4}\sqrt{2+\sqrt{3}}b^{8/3}c^{4/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+b^{2/3}\sqrt[3]{c}x}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)^2}}F\left(\sin^{-1}\left(\frac{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{160a^2\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)^2}}\sqrt{a+b\sqrt{cx^3}}}-\frac{3bc^3x^5\sqrt{a+b\sqrt{cx^3}}}{40a\left(cx^3\right)^{5/2}}-\frac{\sqrt{a+b\sqrt{cx^3}}}{4x^4}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[c*x^3]]/x^5,x]
```


```
[Out] -Sqrt[a + b*Sqrt[c*x^3]]/(4*x^4) + (21*b^2*c*Sqrt[a + b*Sqrt[c*x^
3]])/(160*a^2*x) - (3*b*c^3*x^5*Sqrt[a + b*Sqrt[c*x^3]])/(40*a*(c
*x^3)^(5/2)) + (7*3^(3/4)*Sqrt[2 + Sqrt[3]]*b^(8/3)*c^(4/3)*(a^(1
/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])*Sqrt[(a^(2/3) + b^(2/3)*
c^(1/3)*x - (a^(1/3)*b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])/((1 + Sqrt
[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])^2]*EllipticF[Ar
cSin[((1 - Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])/
((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])], -7
- 4*Sqrt[3]])/(160*a^2*Sqrt[(a^(1/3)*(a^(1/3) + (b^(1/3)*c^(2/3)*
x^2)/Sqrt[c*x^3]))/((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)
/Sqrt[c*x^3])^2]*Sqrt[a + b*Sqrt[c*x^3]])
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + b\sqrt{cx^3}}}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x**3)**(1/2))**(1/2)/x**5,x)
```

```
[Out] Integral(sqrt(a + b*sqrt(c*x**3))/x**5, x)
```

Mathematica [A] time = 0.0317759, size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + b\sqrt{cx^3}}}{x^5}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[Sqrt[a + b*Sqrt[c*x^3]]/x^5,x]
```

```
[Out] Integrate[Sqrt[a + b*Sqrt[c*x^3]]/x^5, x]
```

Maple [A] time = 0.188, size = 346, normalized size = 0.8

$$-\frac{1}{320\,x^4a^2}\left(7\,ib^2\sqrt{3}\sqrt[3]{-acb^2}\sqrt{2}\sqrt{\frac{-i\sqrt{3}}{x}\left(i\sqrt{3}x\sqrt[3]{-acb^2}-2\,b\sqrt{cx^3}-\sqrt[3]{-acb^2}x\right)\frac{1}{\sqrt[3]{-acb^2}}}\sqrt{\frac{1}{x\left(i\sqrt{3}-3\right)}\left(b\sqrt{cx^3}-\sqrt[3]{-acb^2}x\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^3)^(1/2))^(1/2)/x^5,x)
```

```
[Out] -1/320*(7*I*b^2*3^(1/2)*(-a*c*b^2)^(1/3)*2^(1/2)*(-I*(I*3^(1/2)*x
*(-a*c*b^2)^(1/3)-2*b*(c*x^3)^(1/2)-(-a*c*b^2)^(1/3)*x)*3^(1/2)/(
-a*c*b^2)^(1/3)/x)^(1/2)*((b*(c*x^3)^(1/2)-(-a*c*b^2)^(1/3)*x)/x/
(-a*c*b^2)^(1/3)/(I*3^(1/2)-3))^(1/2)*(-I*(I*3^(1/2)*x*(-a*c*b^2)
^(1/3)+2*b*(c*x^3)^(1/2)+(-a*c*b^2)^(1/3)*x)*3^(1/2)/(-a*c*b^2)^(
1/3)/x)^(1/2)*EllipticF(1/6*3^(1/2)*2^(1/2)*(-I*(I*3^(1/2)*x*(-a*
c*b^2)^(1/3)-2*b*(c*x^3)^(1/2)-(-a*c*b^2)^(1/3)*x)*3^(1/2)/(-a*c*
b^2)^(1/3)/x)^(1/2),2^(1/2)*(I*3^(1/2)/(I*3^(1/2)-3))^(1/2))*c*x^
4-42*(c*x^3)^(1/2)*x^3*b^3*c-18*x^3*a*b^2*c+104*(c*x^3)^(1/2)*a^2
*b+80*a^3)/x^4/a^2/(a+b*(c*x^3)^(1/2))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{\sqrt{cx^3}b + a}}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^3)*b + a)/x^5,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(sqrt(c*x^3)*b + a)/x^5, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{\sqrt{cx^3}b + a}}{x^5}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^3)*b + a)/x^5,x, algorithm="fricas")
```

```
[Out] integral(sqrt(sqrt(c*x^3)*b + a)/x^5, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + b\sqrt{cx^3}}}{x^5}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**3)**(1/2))**(1/2)/x**5,x)
```

```
[Out] Integral(sqrt(a + b*sqrt(c*x**3))/x**5, x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{\sqrt{cx^3}b + a}}{x^5}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^3)*b + a)/x^5,x, algorithm="giac")
```

```
[Out] integrate(sqrt(sqrt(c*x^3)*b + a)/x^5, x)
```

3.2960 $\int x^3\sqrt{a+b\sqrt{cx^3}}\,dx$

Optimal. Leaf size=843

$$\frac{4}{19}\sqrt{a+b\sqrt{cx^3}}x^4+\frac{12a\sqrt{cx^3}\sqrt{a+b\sqrt{cx^3}}x}{247bc}-\frac{120a^2\sqrt{a+b\sqrt{cx^3}}x}{1729b^2c}$$

$$-\frac{240\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{10/3}\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\sqrt[3]{a}\right)\sqrt{\frac{-\frac{\sqrt[3]{a}\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+b^{2/3}\sqrt[3]{c}x+a^{2/3}}{\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1+\sqrt{3}\right)\sqrt[3]{a}\right)^2}}E\left(\sin^{-1}\left(\frac{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{1729b^{8/3}c^{4/3}\sqrt{\frac{\sqrt[3]{a}\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\sqrt[3]{a}\right)}{\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1+\sqrt{3}\right)\sqrt[3]{a}\right)^2}}\sqrt{a+b\sqrt{cx^3}}}$$

$$+\frac{160\sqrt{2}3^{3/4}a^{10/3}\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\sqrt[3]{a}\right)\sqrt{\frac{-\frac{\sqrt[3]{a}\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+b^{2/3}\sqrt[3]{c}x+a^{2/3}}{\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1+\sqrt{3}\right)\sqrt[3]{a}\right)^2}}F\left(\sin^{-1}\left(\frac{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{1729b^{8/3}c^{4/3}\sqrt{\frac{\sqrt[3]{a}\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\sqrt[3]{a}\right)}{\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1+\sqrt{3}\right)\sqrt[3]{a}\right)^2}}\sqrt{a+b\sqrt{cx^3}}}$$

$$+\frac{480a^3\sqrt{a+b\sqrt{cx^3}}}{1729b^{8/3}c^{4/3}\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1+\sqrt{3}\right)\sqrt[3]{a}\right)}$$

```
[Out] (-120*a^2*x*Sqrt[a + b*Sqrt[c*x^3]])/(1729*b^2*c) + (4*x^4*Sqrt[a
 + b*Sqrt[c*x^3]])/19 + (12*a*x*Sqrt[c*x^3]*Sqrt[a + b*Sqrt[c*x^3
]])/(247*b*c) + (480*a^3*Sqrt[a + b*Sqrt[c*x^3]])/(1729*b^(8/3)*c
^(4/3)*((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3]
)) - (240*3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(10/3)*(a^(1/3) + (b^(1/3)*
c^(2/3)*x^2)/Sqrt[c*x^3])*Sqrt[(a^(2/3) + b^(2/3)*c^(1/3)*x - (a^
(1/3)*b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])/((1 + Sqrt[3])*a^(1/3) +
(b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])^2]*EllipticE[ArcSin[((1 - Sqrt
[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])/((1 + Sqrt[3])*
a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])], -7 - 4*Sqrt[3]])/(
1729*b^(8/3)*c^(4/3)*Sqrt[(a^(1/3)*(a^(1/3) + (b^(1/3)*c^(2/3)*x^
2)/Sqrt[c*x^3]))/((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/S
qrt[c*x^3])^2]*Sqrt[a + b*Sqrt[c*x^3]]) + (160*Sqrt[2]*3^(3/4)*a^
(10/3)*(a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])*Sqrt[(a^(2/3
) + b^(2/3)*c^(1/3)*x - (a^(1/3)*b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3]
)/((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])^2]*
EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/S
qrt[c*x^3])/((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c
*x^3])], -7 - 4*Sqrt[3]])/(1729*b^(8/3)*c^(4/3)*Sqrt[(a^(1/3)*(a^
(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3]))/((1 + Sqrt[3])*a^(1/3
) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])^2]*Sqrt[a + b*Sqrt[c*x^3]]
)
```

Rubi [A] time = 1.50679, antiderivative size = 843, normalized size of antiderivative = 1., number of

steps used = 8, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$

$$\frac{4}{19}\sqrt{a+b\sqrt{cx^3}}x^4+\frac{12a\sqrt{cx^3}\sqrt{a+b\sqrt{cx^3}}x}{247bc}-\frac{120a^2\sqrt{a+b\sqrt{cx^3}}x}{1729b^2c}$$
$$-\frac{240\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{10/3}\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\sqrt[3]{a}\right)\sqrt{\frac{-\frac{\sqrt[3]{a}\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+b^{2/3}\sqrt[3]{c}x+a^{2/3}}{\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+(1+\sqrt{3})\sqrt[3]{a}\right)^2}}E\left(\sin^{-1}\left(\frac{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+(1-\sqrt{3})\sqrt[3]{a}}{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+(1+\sqrt{3})\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{1729b^{8/3}c^{4/3}\sqrt{\frac{\sqrt[3]{a}\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\sqrt[3]{a}\right)}{\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+(1+\sqrt{3})\sqrt[3]{a}\right)^2}}\sqrt{a+b\sqrt{cx^3}}}$$
$$+\frac{160\sqrt{2}3^{3/4}a^{10/3}\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\sqrt[3]{a}\right)\sqrt{\frac{-\frac{\sqrt[3]{a}\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+b^{2/3}\sqrt[3]{c}x+a^{2/3}}{\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+(1+\sqrt{3})\sqrt[3]{a}\right)^2}}F\left(\sin^{-1}\left(\frac{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+(1-\sqrt{3})\sqrt[3]{a}}{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+(1+\sqrt{3})\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{1729b^{8/3}c^{4/3}\sqrt{\frac{\sqrt[3]{a}\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\sqrt[3]{a}\right)}{\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+(1+\sqrt{3})\sqrt[3]{a}\right)^2}}\sqrt{a+b\sqrt{cx^3}}}$$
$$+\frac{480a^3\sqrt{a+b\sqrt{cx^3}}}{1729b^{8/3}c^{4/3}\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+(1+\sqrt{3})\sqrt[3]{a}\right)}$$

Warning: Unable to verify antiderivative.

```
[In]  Int[x^3*Sqrt[a + b*Sqrt[c*x^3]],x]
```

```
[Out] (-120*a^2*x*Sqrt[a + b*Sqrt[c*x^3]])/(1729*b^2*c) + (4*x^4*Sqrt[a
 + b*Sqrt[c*x^3]])/19 + (12*a*x*Sqrt[c*x^3]*Sqrt[a + b*Sqrt[c*x^3
]])/(247*b*c) + (480*a^3*Sqrt[a + b*Sqrt[c*x^3]])/(1729*b^(8/3)*c
^(4/3)*((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3]
)) - (240*3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(10/3)*(a^(1/3) + (b^(1/3)*
c^(2/3)*x^2)/Sqrt[c*x^3])*Sqrt[(a^(2/3) + b^(2/3)*c^(1/3)*x - (a^
(1/3)*b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])/((1 + Sqrt[3])*a^(1/3) +
(b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])^2]*EllipticE[ArcSin[((1 - Sqrt
[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])/((1 + Sqrt[3])*
a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])], -7 - 4*Sqrt[3]])/(
1729*b^(8/3)*c^(4/3)*Sqrt[(a^(1/3)*(a^(1/3) + (b^(1/3)*c^(2/3)*x^
2)/Sqrt[c*x^3]))/((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/S
qrt[c*x^3])^2]*Sqrt[a + b*Sqrt[c*x^3]]) + (160*Sqrt[2]*3^(3/4)*a^
(10/3)*(a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])*Sqrt[(a^(2/3
) + b^(2/3)*c^(1/3)*x - (a^(1/3)*b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3]
)/((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])^2]*
EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/S
qrt[c*x^3])/((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c
*x^3])], -7 - 4*Sqrt[3]])/(1729*b^(8/3)*c^(4/3)*Sqrt[(a^(1/3)*(a^
(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3]))/((1 + Sqrt[3])*a^(1/3
) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])^2]*Sqrt[a + b*Sqrt[c*x^3]]
)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^3\sqrt{a+b\sqrt{cx^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3*(a+b*(c*x**3)**(1/2))**(1/2),x)
```

```
[Out] Integral(x**3*sqrt(a + b*sqrt(c*x**3)), x)
```

Mathematica [A] time = 0.0420275, size = 0, normalized size = 0.

$$\int x^3\sqrt{a+b\sqrt{cx^3}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[x^3*Sqrt[a + b*Sqrt[c*x^3]],x]
```

```
[Out] Integrate[x^3*Sqrt[a + b*Sqrt[c*x^3]], x]
```

Maple [A] time = 0.177, size = 932, normalized size = 1.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3*(a+b*(c*x^3)^(1/2))^(1/2),x)
```

```
[Out] 4/1729/c^2/x^2*(30*I*(-I*(I*3^(1/2)*x*(-a*c*b^2)^(1/3)-2*b*(c*x^3
)^(1/2)-(-a*c*b^2)^(1/3)*x)*3^(1/2)/(-a*c*b^2)^(1/3)/x)^(1/2)*((b
*(c*x^3)^(1/2)-(-a*c*b^2)^(1/3)*x)/x/(-a*c*b^2)^(1/3)/(I*3^(1/2)-
3))^(1/2)*(-I*(I*3^(1/2)*x*(-a*c*b^2)^(1/3)+2*b*(c*x^3)^(1/2)+(-a
*c*b^2)^(1/3)*x)*3^(1/2)/(-a*c*b^2)^(1/3)/x)^(1/2)*EllipticE(1/6*
3^(1/2)*2^(1/2)*(-I*(I*3^(1/2)*x*(-a*c*b^2)^(1/3)-2*b*(c*x^3)^(1/
2)-(-a*c*b^2)^(1/3)*x)*3^(1/2)/(-a*c*b^2)^(1/3)/x)^(1/2),2^(1/2)*
(I*3^(1/2)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*x^2*2^(1/2)*(-a*c*b^2)^(
2/3)*a^3-20*I*(-I*(I*3^(1/2)*x*(-a*c*b^2)^(1/3)-2*b*(c*x^3)^(1/2)
-(-a*c*b^2)^(1/3)*x)*3^(1/2)/(-a*c*b^2)^(1/3)/x)^(1/2)*((b*(c*x^3
)^(1/2)-(-a*c*b^2)^(1/3)*x)/x/(-a*c*b^2)^(1/3)/(I*3^(1/2)-3))^(1/
2)*(-I*(I*3^(1/2)*x*(-a*c*b^2)^(1/3)+2*b*(c*x^3)^(1/2)+(-a*c*b^2)
^(1/3)*x)*3^(1/2)/(-a*c*b^2)^(1/3)/x)^(1/2)*EllipticF(1/6*3^(1/2)
*2^(1/2)*(-I*(I*3^(1/2)*x*(-a*c*b^2)^(1/3)-2*b*(c*x^3)^(1/2)-(-a*
c*b^2)^(1/3)*x)*3^(1/2)/(-a*c*b^2)^(1/3)/x)^(1/2),2^(1/2)*(I*3^(1
/2)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*x^2*2^(1/2)*(-a*c*b^2)^(2/3)*a^
3+91*(c*x^3)^(1/2)*x^6*b^5*c^2+112*x^6*a*b^4*c^2+30*(-I*(I*3^(1/2
)*x*(-a*c*b^2)^(1/3)-2*b*(c*x^3)^(1/2)-(-a*c*b^2)^(1/3)*x)*3^(1/2
)/(-a*c*b^2)^(1/3)/x)^(1/2)*((b*(c*x^3)^(1/2)-(-a*c*b^2)^(1/3)*x)
/x/(-a*c*b^2)^(1/3)/(I*3^(1/2)-3))^(1/2)*(-I*(I*3^(1/2)*x*(-a*c*b
^2)^(1/3)+2*b*(c*x^3)^(1/2)+(-a*c*b^2)^(1/3)*x)*3^(1/2)/(-a*c*b^2
)^(1/3)/x)^(1/2)*EllipticE(1/6*3^(1/2)*2^(1/2)*(-I*(I*3^(1/2)*x*(
-a*c*b^2)^(1/3)-2*b*(c*x^3)^(1/2)-(-a*c*b^2)^(1/3)*x)*3^(1/2)/(-a
*c*b^2)^(1/3)/x)^(1/2),2^(1/2)*(I*3^(1/2)/(I*3^(1/2)-3))^(1/2))*x
^2*2^(1/2)*(-a*c*b^2)^(2/3)*a^3-30*(c*x^3)^(1/2)*x^3*a^2*b^3*c-30
*x^3*a^3*b^2*c+21*(c*x^3)^(3/2)*a^2*b^3)/b^4/(a+b*(c*x^3)^(1/2))^
(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{\sqrt{cx^3}b + a}x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^3)*b + a)*x^3,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(sqrt(c*x^3)*b + a)*x^3, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{\sqrt{cx^3}b + a}x^3, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^3)*b + a)*x^3,x, algorithm="fricas")
```

```
[Out] integral(sqrt(sqrt(c*x^3)*b + a)*x^3, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^3\sqrt{a+b\sqrt{cx^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(a+b*(c*x**3)**(1/2))**(1/2),x)
```

```
[Out] Integral(x**3*sqrt(a + b*sqrt(c*x**3)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{\sqrt{cx^3}b+a}x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^3)*b + a)*x^3,x, algorithm="giac")
```

```
[Out] integrate(sqrt(sqrt(c*x^3)*b + a)*x^3, x)
```

3.2961 $\int \sqrt{a+b\sqrt{cx^3}}\,dx$

Optimal. Leaf size=770

$$\frac{4\sqrt{2}3^{3/4}a^{4/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+b^{2/3}\sqrt[3]{c}x}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)^2}}F\left(\sin^{-1}\left(\frac{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{7b^{2/3}\sqrt[3]{c}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)^2}}\sqrt{a+b\sqrt{cx^3}}}$$
$$-\frac{6\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{4/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+b^{2/3}\sqrt[3]{c}x}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)^2}}E\left(\sin^{-1}\left(\frac{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{7b^{2/3}\sqrt[3]{c}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)^2}}\sqrt{a+b\sqrt{cx^3}}}$$
$$+\frac{12a\sqrt{a+b\sqrt{cx^3}}}{7b^{2/3}\sqrt[3]{c}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)}+\frac{4}{7}x\sqrt{a+b\sqrt{cx^3}}$$

```
[Out] (4*x*Sqrt[a + b*Sqrt[c*x^3]])/7 + (12*a*Sqrt[a + b*Sqrt[c*x^3]])/
(7*b^(2/3)*c^(1/3)*((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)
/Sqrt[c*x^3])) - (6*3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(4/3)*(a^(1/3) +
(b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])*Sqrt[(a^(2/3) + b^(2/3)*c^(1/3
)*x - (a^(1/3)*b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])/((1 + Sqrt[3])*a
^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])^2]*EllipticE[ArcSin[(
(1 - Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])/((1 +
Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])], -7 - 4*Sq
rt[3]])/(7*b^(2/3)*c^(1/3)*Sqrt[(a^(1/3)*(a^(1/3) + (b^(1/3)*c^(2
/3)*x^2)/Sqrt[c*x^3]))/((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*
x^2)/Sqrt[c*x^3])^2]*Sqrt[a + b*Sqrt[c*x^3]]) + (4*Sqrt[2]*3^(3/4
)*a^(4/3)*(a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])*Sqrt[(a^(
2/3) + b^(2/3)*c^(1/3)*x - (a^(1/3)*b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x
^3])/((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])^
2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2
)/Sqrt[c*x^3])/((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqr
t[c*x^3])], -7 - 4*Sqrt[3]])/(7*b^(2/3)*c^(1/3)*Sqrt[(a^(1/3)*(a^
(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3]))/((1 + Sqrt[3])*a^(1/3
) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])^2]*Sqrt[a + b*Sqrt[c*x^3]]
)
```

Rubi [A] time = 1.04694, antiderivative size = 770, normalized size of antiderivative = 1., number of

steps used = 6, number of rules used = 6, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.353

$$\frac{4\sqrt{2}3^{3/4}a^{4/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+b^{2/3}\sqrt[3]{c}x}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)^2}}F\left(\sin^{-1}\left(\frac{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{7b^{2/3}\sqrt[3]{c}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)^2}}\sqrt{a+b\sqrt{cx^3}}}$$

$$-\frac{6\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{4/3}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)\sqrt{\frac{a^{2/3}-\frac{\sqrt[3]{a}\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+b^{2/3}\sqrt[3]{c}x}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)^2}}E\left(\sin^{-1}\left(\frac{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)}{7b^{2/3}\sqrt[3]{c}\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)^2}}\sqrt{a+b\sqrt{cx^3}}}$$

$$+\frac{12a\sqrt{a+b\sqrt{cx^3}}}{7b^{2/3}\sqrt[3]{c}\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}\right)}+\frac{4}{7}x\sqrt{a+b\sqrt{cx^3}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[c*x^3]],x]
```

```
[Out] (4*x*Sqrt[a + b*Sqrt[c*x^3]])/7 + (12*a*Sqrt[a + b*Sqrt[c*x^3]])/
(7*b^(2/3)*c^(1/3)*((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)
/Sqrt[c*x^3])) - (6*3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(4/3)*(a^(1/3) +
(b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])*Sqrt[(a^(2/3) + b^(2/3)*c^(1/3
)*x - (a^(1/3)*b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])/((1 + Sqrt[3])*a
^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])^2]*EllipticE[ArcSin[(
(1 - Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])/((1 +
Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])], -7 - 4*Sq
rt[3]])/(7*b^(2/3)*c^(1/3)*Sqrt[(a^(1/3)*(a^(1/3) + (b^(1/3)*c^(2
/3)*x^2)/Sqrt[c*x^3]))/((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*
x^2)/Sqrt[c*x^3])^2]*Sqrt[a + b*Sqrt[c*x^3]]) + (4*Sqrt[2]*3^(3/4
)*a^(4/3)*(a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])*Sqrt[(a^(
2/3) + b^(2/3)*c^(1/3)*x - (a^(1/3)*b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x
^3])/((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])^
2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2
)/Sqrt[c*x^3])/((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqr
t[c*x^3])], -7 - 4*Sqrt[3]])/(7*b^(2/3)*c^(1/3)*Sqrt[(a^(1/3)*(a^
(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3]))/((1 + Sqrt[3])*a^(1/3
) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])^2]*Sqrt[a + b*Sqrt[c*x^3]]
)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\sqrt{a+b\sqrt{cx^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x**3)**(1/2))**(1/2),x)
```

```
[Out] Integral(sqrt(a + b*sqrt(c*x**3)), x)
```

Mathematica [A] time = 0.0126361, size = 0, normalized size = 0.

$$\int\sqrt{a+b\sqrt{cx^3}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[Sqrt[a + b*Sqrt[c*x^3]],x]
```

```
[Out] Integrate[Sqrt[a + b*Sqrt[c*x^3]], x]
```

Maple [A] time = 0.173, size = 860, normalized size = 1.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^3)^(1/2))^(1/2),x)
```

```
[Out] 1/7/c*(3*I*((b*(c*x^3)^(1/2)-(-a*c*b^2)^(1/3)*x)/x/(-a*c*b^2)^(1/
3)/(I*3^(1/2)-3))^(1/2)*(-I*(I*3^(1/2)*x*(-a*c*b^2)^(1/3)+2*b*(c*
x^3)^(1/2)+(-a*c*b^2)^(1/3)*x)*3^(1/2)/(-a*c*b^2)^(1/3)/x)^(1/2)*
EllipticE(1/6*3^(1/2)*2^(1/2)*(-I*(I*3^(1/2)*x*(-a*c*b^2)^(1/3)-2
*b*(c*x^3)^(1/2)-(-a*c*b^2)^(1/3)*x)*3^(1/2)/(-a*c*b^2)^(1/3)/x)^
(1/2),2^(1/2)*(I*3^(1/2)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*2^(1/2)*(-
I*(I*3^(1/2)*x*(-a*c*b^2)^(1/3)-2*b*(c*x^3)^(1/2)-(-a*c*b^2)^(1/3
)*x)*3^(1/2)/(-a*c*b^2)^(1/3)/x)^(1/2)*(-a*c*b^2)^(2/3)*a-2*I*((b
*(c*x^3)^(1/2)-(-a*c*b^2)^(1/3)*x)/x/(-a*c*b^2)^(1/3)/(I*3^(1/2)-
3))^(1/2)*(-I*(I*3^(1/2)*x*(-a*c*b^2)^(1/3)+2*b*(c*x^3)^(1/2)+(-a
*c*b^2)^(1/3)*x)*3^(1/2)/(-a*c*b^2)^(1/3)/x)^(1/2)*EllipticF(1/6*
3^(1/2)*2^(1/2)*(-I*(I*3^(1/2)*x*(-a*c*b^2)^(1/3)-2*b*(c*x^3)^(1/
2)-(-a*c*b^2)^(1/3)*x)*3^(1/2)/(-a*c*b^2)^(1/3)/x)^(1/2),2^(1/2)*
(I*3^(1/2)/(I*3^(1/2)-3))^(1/2))*3^(1/2)*2^(1/2)*(-I*(I*3^(1/2)*x
*(-a*c*b^2)^(1/3)-2*b*(c*x^3)^(1/2)-(-a*c*b^2)^(1/3)*x)*3^(1/2)/(
-a*c*b^2)^(1/3)/x)^(1/2)*(-a*c*b^2)^(2/3)*a+3*((b*(c*x^3)^(1/2)-(
-a*c*b^2)^(1/3)*x)/x/(-a*c*b^2)^(1/3)/(I*3^(1/2)-3))^(1/2)*(-I*(I
*3^(1/2)*x*(-a*c*b^2)^(1/3)+2*b*(c*x^3)^(1/2)+(-a*c*b^2)^(1/3)*x)
*3^(1/2)/(-a*c*b^2)^(1/3)/x)^(1/2)*EllipticE(1/6*3^(1/2)*2^(1/2)*
(-I*(I*3^(1/2)*x*(-a*c*b^2)^(1/3)-2*b*(c*x^3)^(1/2)-(-a*c*b^2)^(1
/3)*x)*3^(1/2)/(-a*c*b^2)^(1/3)/x)^(1/2),2^(1/2)*(I*3^(1/2)/(I*3^
(1/2)-3))^(1/2))*2^(1/2)*(-I*(I*3^(1/2)*x*(-a*c*b^2)^(1/3)-2*b*(c
*x^3)^(1/2)-(-a*c*b^2)^(1/3)*x)*3^(1/2)/(-a*c*b^2)^(1/3)/x)^(1/2)
*(-a*c*b^2)^(2/3)*a+4*(c*x^3)^(1/2)*x*b^3*c+4*x*a*b^2*c)/b^2/(a+b
*(c*x^3)^(1/2))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{\sqrt{cx^3}b + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^3)*b + a),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(sqrt(c*x^3)*b + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{\sqrt{cx^3}b + a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^3)*b + a),x, algorithm="fricas")
```

```
[Out] integral(sqrt(sqrt(c*x^3)*b + a), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{a + b\sqrt{cx^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**3)**(1/2))**(1/2),x)
```

```
[Out] Integral(sqrt(a + b*sqrt(c*x**3)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{\sqrt{cx^3}b + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^3)*b + a),x, algorithm="giac")
```

```
[Out] integrate(sqrt(sqrt(c*x^3)*b + a), x)
```

3.2962 $\int \frac{\sqrt{a+b\sqrt{cx^3}}}{x^3}\,dx$

Optimal. Leaf size=810

$$-\frac{3\sqrt[4]{3}\sqrt{2-\sqrt{3}}c^{2/3}\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\sqrt[3]{a}\right)\sqrt{\frac{-\frac{\sqrt[3]{a}\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+b^{2/3}\sqrt[3]{c}x+a^{2/3}}{\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1+\sqrt{3}\right)\sqrt[3]{a}\right)^2}}E\left(\sin^{-1}\left(\frac{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)b^{4/3}}{8a^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\sqrt[3]{a}\right)}{\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1+\sqrt{3}\right)\sqrt[3]{a}\right)^2}}\sqrt{a+b\sqrt{cx^3}}}$$
$$+\frac{3^{3/4}c^{2/3}\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\sqrt[3]{a}\right)\sqrt{\frac{-\frac{\sqrt[3]{a}\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+b^{2/3}\sqrt[3]{c}x+a^{2/3}}{\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1+\sqrt{3}\right)\sqrt[3]{a}\right)^2}}F\left(\sin^{-1}\left(\frac{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)b^{4/3}}{2\sqrt{2}a^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\sqrt[3]{a}\right)}{\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1+\sqrt{3}\right)\sqrt[3]{a}\right)^2}}\sqrt{a+b\sqrt{cx^3}}}$$
$$+\frac{3c^{2/3}\sqrt{a+b\sqrt{cx^3}}b^{4/3}}{4a\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1+\sqrt{3}\right)\sqrt[3]{a}\right)}-\frac{3cx\sqrt{a+b\sqrt{cx^3}}b}{4a\sqrt{cx^3}}-\frac{\sqrt{a+b\sqrt{cx^3}}}{2x^2}$$

```
[Out] -Sqrt[a + b*Sqrt[c*x^3]]/(2*x^2) - (3*b*c*x*Sqrt[a + b*Sqrt[c*x^3
]])/(4*a*Sqrt[c*x^3]) + (3*b^(4/3)*c^(2/3)*Sqrt[a + b*Sqrt[c*x^3]
])/(4*a*((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3
])) - (3*3^(1/4)*Sqrt[2 - Sqrt[3]]*b^(4/3)*c^(2/3)*(a^(1/3) + (b^
(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])*Sqrt[(a^(2/3) + b^(2/3)*c^(1/3)*x
 - (a^(1/3)*b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])/((1 + Sqrt[3])*a^(1
/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])^2]*EllipticE[ArcSin[((1
- Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])/((1 + Sqr
t[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])], -7 - 4*Sqrt[
3]])/(8*a^(2/3)*Sqrt[(a^(1/3)*(a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sq
rt[c*x^3]))/((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c
*x^3])^2]*Sqrt[a + b*Sqrt[c*x^3]]) + (3^(3/4)*b^(4/3)*c^(2/3)*(a^
(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])*Sqrt[(a^(2/3) + b^(2/3
)*c^(1/3)*x - (a^(1/3)*b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])/((1 + Sq
rt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])^2]*EllipticF[
ArcSin[((1 - Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3]
)/((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])], -
7 - 4*Sqrt[3]])/(2*Sqrt[2]*a^(2/3)*Sqrt[(a^(1/3)*(a^(1/3) + (b^(1
/3)*c^(2/3)*x^2)/Sqrt[c*x^3]))/((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*
c^(2/3)*x^2)/Sqrt[c*x^3])^2]*Sqrt[a + b*Sqrt[c*x^3]])
```

Rubi [A] time = 1.06614, antiderivative size = 810, normalized size of antiderivative = 1., number of

steps used = 7, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$

$$-\frac{3\sqrt[4]{3}\sqrt{2-\sqrt{3}}c^{2/3}\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\sqrt[3]{a}\right)\sqrt{\frac{-\frac{\sqrt[3]{a}\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+b^{2/3}\sqrt[3]{c}x+a^{2/3}}{\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1+\sqrt{3}\right)\sqrt[3]{a}\right)^2}}E\left(\sin^{-1}\left(\frac{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)b^{4/3}}{8a^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\sqrt[3]{a}\right)}{\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1+\sqrt{3}\right)\sqrt[3]{a}\right)^2}}\sqrt{a+b\sqrt{cx^3}}}$$
$$+\frac{3^{3/4}c^{2/3}\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\sqrt[3]{a}\right)\sqrt{\frac{-\frac{\sqrt[3]{a}\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+b^{2/3}\sqrt[3]{c}x+a^{2/3}}{\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1+\sqrt{3}\right)\sqrt[3]{a}\right)^2}}F\left(\sin^{-1}\left(\frac{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)|-7-4\sqrt{3}\right)b^{4/3}}{2\sqrt{2}a^{2/3}\sqrt{\frac{\sqrt[3]{a}\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\sqrt[3]{a}\right)}{\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1+\sqrt{3}\right)\sqrt[3]{a}\right)^2}}\sqrt{a+b\sqrt{cx^3}}}$$
$$+\frac{3c^{2/3}\sqrt{a+b\sqrt{cx^3}}b^{4/3}}{4a\left(\frac{\sqrt[3]{b}c^{2/3}x^2}{\sqrt{cx^3}}+\left(1+\sqrt{3}\right)\sqrt[3]{a}\right)}-\frac{3cx\sqrt{a+b\sqrt{cx^3}}b}{4a\sqrt{cx^3}}-\frac{\sqrt{a+b\sqrt{cx^3}}}{2x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[c*x^3]]/x^3,x]
```

```
[Out] -Sqrt[a + b*Sqrt[c*x^3]]/(2*x^2) - (3*b*c*x*Sqrt[a + b*Sqrt[c*x^3
]])/(4*a*Sqrt[c*x^3]) + (3*b^(4/3)*c^(2/3)*Sqrt[a + b*Sqrt[c*x^3]
])/(4*a*((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3
])) - (3*3^(1/4)*Sqrt[2 - Sqrt[3]]*b^(4/3)*c^(2/3)*(a^(1/3) + (b^
(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])*Sqrt[(a^(2/3) + b^(2/3)*c^(1/3)*x
 - (a^(1/3)*b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])/((1 + Sqrt[3])*a^(1
/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])^2]*EllipticE[ArcSin[((1
- Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])/((1 + Sqr
t[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])], -7 - 4*Sqrt[
3]])/(8*a^(2/3)*Sqrt[(a^(1/3)*(a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sq
rt[c*x^3]))/((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c
*x^3])^2]*Sqrt[a + b*Sqrt[c*x^3]]) + (3^(3/4)*b^(4/3)*c^(2/3)*(a^
(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])*Sqrt[(a^(2/3) + b^(2/3
)*c^(1/3)*x - (a^(1/3)*b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])/((1 + Sq
rt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])^2]*EllipticF[
ArcSin[((1 - Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3]
)/((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*c^(2/3)*x^2)/Sqrt[c*x^3])], -
7 - 4*Sqrt[3]])/(2*Sqrt[2]*a^(2/3)*Sqrt[(a^(1/3)*(a^(1/3) + (b^(1
/3)*c^(2/3)*x^2)/Sqrt[c*x^3]))/((1 + Sqrt[3])*a^(1/3) + (b^(1/3)*
c^(2/3)*x^2)/Sqrt[c*x^3])^2]*Sqrt[a + b*Sqrt[c*x^3]])
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\sqrt{cx^3}}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x**3)**(1/2))**(1/2)/x**3,x)
```

```
[Out] Integral(sqrt(a + b*sqrt(c*x**3))/x**3, x)
```

Mathematica [A] time = 0.0326453, size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\sqrt{cx^3}}}{x^3}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[Sqrt[a + b*Sqrt[c*x^3]]/x^3,x]

[Out] Integrate[Sqrt[a + b*Sqrt[c*x^3]]/x^3, x]
```

Maple [A] time = 0.183, size = 869, normalized size = 1.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^3)^(1/2))^(1/2)/x^3,x)

[Out] 1/16*(3*I*(-I*(I*3^(1/2)*x*(-a*c*b^2)^(1/3)-2*b*(c*x^3)^(1/2)-(-a
*c*b^2)^(1/3)*x)*3^(1/2)/(-a*c*b^2)^(1/3)/x)^(1/2)*((b*(c*x^3)^(1
/2)-(-a*c*b^2)^(1/3)*x)/x/(-a*c*b^2)^(1/3)/(I*3^(1/2)-3))^(1/2)*(
-I*(I*3^(1/2)*x*(-a*c*b^2)^(1/3)+2*b*(c*x^3)^(1/2)+(-a*c*b^2)^(1/
3)*x)*3^(1/2)/(-a*c*b^2)^(1/3)/x)^(1/2)*EllipticE(1/6*3^(1/2)*2^(
1/2)*(-I*(I*3^(1/2)*x*(-a*c*b^2)^(1/3)-2*b*(c*x^3)^(1/2)-(-a*c*b^
2)^(1/3)*x)*3^(1/2)/(-a*c*b^2)^(1/3)/x)^(1/2),2^(1/2)*(I*3^(1/2)/
(I*3^(1/2)-3))^(1/2))*3^(1/2)*2^(1/2)*(-a*c*b^2)^(2/3)*x^2-2*I*(-
I*(I*3^(1/2)*x*(-a*c*b^2)^(1/3)-2*b*(c*x^3)^(1/2)-(-a*c*b^2)^(1/3
)*x)*3^(1/2)/(-a*c*b^2)^(1/3)/x)^(1/2)*((b*(c*x^3)^(1/2)-(-a*c*b^
2)^(1/3)*x)/x/(-a*c*b^2)^(1/3)/(I*3^(1/2)-3))^(1/2)*(-I*(I*3^(1/2
)*x*(-a*c*b^2)^(1/3)+2*b*(c*x^3)^(1/2)+(-a*c*b^2)^(1/3)*x)*3^(1/2
)/(-a*c*b^2)^(1/3)/x)^(1/2)*EllipticF(1/6*3^(1/2)*2^(1/2)*(-I*(I*
3^(1/2)*x*(-a*c*b^2)^(1/3)-2*b*(c*x^3)^(1/2)-(-a*c*b^2)^(1/3)*x)*
3^(1/2)/(-a*c*b^2)^(1/3)/x)^(1/2),2^(1/2)*(I*3^(1/2)/(I*3^(1/2)-3
))^(1/2))*3^(1/2)*2^(1/2)*(-a*c*b^2)^(2/3)*x^2+3*(-I*(I*3^(1/2)*x
*(-a*c*b^2)^(1/3)-2*b*(c*x^3)^(1/2)-(-a*c*b^2)^(1/3)*x)*3^(1/2)/(
-a*c*b^2)^(1/3)/x)^(1/2)*((b*(c*x^3)^(1/2)-(-a*c*b^2)^(1/3)*x)/x/
(-a*c*b^2)^(1/3)/(I*3^(1/2)-3))^(1/2)*(-I*(I*3^(1/2)*x*(-a*c*b^2)
^(1/3)+2*b*(c*x^3)^(1/2)+(-a*c*b^2)^(1/3)*x)*3^(1/2)/(-a*c*b^2)^(
1/3)/x)^(1/2)*EllipticE(1/6*3^(1/2)*2^(1/2)*(-I*(I*3^(1/2)*x*(-a*
c*b^2)^(1/3)-2*b*(c*x^3)^(1/2)-(-a*c*b^2)^(1/3)*x)*3^(1/2)/(-a*c*
b^2)^(1/3)/x)^(1/2),2^(1/2)*(I*3^(1/2)/(I*3^(1/2)-3))^(1/2))*2^(1
/2)*(-a*c*b^2)^(2/3)*x^2-12*x^3*b^2*c-20*(c*x^3)^(1/2)*a*b-8*a^2)
/x^2/a/(a+b*(c*x^3)^(1/2))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{\sqrt{cx^3}b + a}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^3)*b + a)/x^3,x, algorithm="maxima")

[Out] integrate(sqrt(sqrt(c*x^3)*b + a)/x^3, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{\sqrt{cx^3}b + a}}{x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^3)*b + a)/x^3,x, algorithm="fricas")
```

```
[Out] integral(sqrt(sqrt(c*x^3)*b + a)/x^3, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + b\sqrt{cx^3}}}{x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**3)**(1/2))**(1/2)/x**3,x)
```

```
[Out] Integral(sqrt(a + b*sqrt(c*x**3))/x**3, x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{\sqrt{cx^3}b + a}}{x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^3)*b + a)/x^3,x, algorithm="giac")
```

```
[Out] integrate(sqrt(sqrt(c*x^3)*b + a)/x^3, x)
```

3.2963 $\int x^{17}\sqrt{a+b\left(cx^3\right)^{3/2}}\,dx$

Optimal. Leaf size=116

$$-\frac{4a^3\left(a+b\left(cx^3\right)^{3/2}\right)^{3/2}}{27b^4c^6}+\frac{4a^2\left(a+b\left(cx^3\right)^{3/2}\right)^{5/2}}{15b^4c^6}+\frac{4\left(a+b\left(cx^3\right)^{3/2}\right)^{9/2}}{81b^4c^6}-\frac{4a\left(a+b\left(cx^3\right)^{3/2}\right)^{7/2}}{21b^4c^6}$$

```
[Out] (-4*a^3*(a + b*(c*x^3)^(3/2))^(3/2))/(27*b^4*c^6) + (4*a^2*(a + b
*(c*x^3)^(3/2))^(5/2))/(15*b^4*c^6) - (4*a*(a + b*(c*x^3)^(3/2))^
(7/2))/(21*b^4*c^6) + (4*(a + b*(c*x^3)^(3/2))^(9/2))/(81*b^4*c^6
)
```

Rubi [A] time = 0.16921, antiderivative size = 116, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$-\frac{4a^3\left(a+b\left(cx^3\right)^{3/2}\right)^{3/2}}{27b^4c^6}+\frac{4a^2\left(a+b\left(cx^3\right)^{3/2}\right)^{5/2}}{15b^4c^6}+\frac{4\left(a+b\left(cx^3\right)^{3/2}\right)^{9/2}}{81b^4c^6}-\frac{4a\left(a+b\left(cx^3\right)^{3/2}\right)^{7/2}}{21b^4c^6}$$

Antiderivative was successfully verified.

```
[In]  Int[x^17*Sqrt[a + b*(c*x^3)^(3/2)],x]
```

```
[Out] (-4*a^3*(a + b*(c*x^3)^(3/2))^(3/2))/(27*b^4*c^6) + (4*a^2*(a + b
*(c*x^3)^(3/2))^(5/2))/(15*b^4*c^6) - (4*a*(a + b*(c*x^3)^(3/2))^
(7/2))/(21*b^4*c^6) + (4*(a + b*(c*x^3)^(3/2))^(9/2))/(81*b^4*c^6
)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^{17}\sqrt{a+b\left(cx^3\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**17*(a+b*(c*x**3)**(3/2))**(1/2),x)
```

```
[Out] Integral(x**17*sqrt(a + b*(c*x**3)**(3/2)), x)
```

Mathematica [A] time = 0.105557, size = 0, normalized size = 0.

$$\int x^{17}\sqrt{a+b\left(cx^3\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[x^17*Sqrt[a + b*(c*x^3)^(3/2)],x]
```

```
[Out] Integrate[x^17*Sqrt[a + b*(c*x^3)^(3/2)], x]
```

Maple [F] time = 0.073, size = 0, normalized size = 0.

$$\int x^{17}\sqrt{a+b\left(cx^3\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^17*(a+b*(c*x^3)^(3/2))^(1/2),x)
```

```
[Out] int(x^17*(a+b*(c*x^3)^(3/2))^(1/2),x)
```

Maxima [A] time = 1.34232, size = 115, normalized size = 0.99

$$\frac{4\left(\frac{35\left(\left(cx^3\right)^{\frac{3}{2}}b+a\right)^{\frac{9}{2}}}{b^4}-\frac{135\left(\left(cx^3\right)^{\frac{3}{2}}b+a\right)^{\frac{7}{2}}a}{b^4}+\frac{189\left(\left(cx^3\right)^{\frac{3}{2}}b+a\right)^{\frac{5}{2}}a^2}{b^4}-\frac{105\left(\left(cx^3\right)^{\frac{3}{2}}b+a\right)^{\frac{3}{2}}a^3}{b^4}\right)}{2835\,c^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^3)^(3/2)*b + a)*x^17,x, algorithm="maxima")
```

```
[Out] 4/2835*(35*((c*x^3)^(3/2)*b + a)^(9/2)/b^4 - 135*((c*x^3)^(3/2)*b
 + a)^(7/2)*a/b^4 + 189*((c*x^3)^(3/2)*b + a)^(5/2)*a^2/b^4 - 105
*((c*x^3)^(3/2)*b + a)^(3/2)*a^3/b^4)/c^6
```

Fricas [A] time = 2.30362, size = 117, normalized size = 1.01

$$\frac{4\left(35\,b^4c^6x^{18}-6\,a^2b^2c^3x^9-16\,a^4+\left(5\,ab^3c^4x^{12}+8\,a^3bcx^3\right)\sqrt{cx^3}\right)\sqrt{\sqrt{cx^3}bcx^3+a}}{2835\,b^4c^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^3)^(3/2)*b + a)*x^17,x, algorithm="fricas")
```

```
[Out] 4/2835*(35*b^4*c^6*x^18 - 6*a^2*b^2*c^3*x^9 - 16*a^4 + (5*a*b^3*c
^4*x^12 + 8*a^3*b*c*x^3)*sqrt(c*x^3))*sqrt(sqrt(c*x^3)*b*c*x^3 +
a)/(b^4*c^6)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**17*(a+b*(c*x**3)**(3/2))**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.222591, size = 193, normalized size = 1.66

$$\frac{4\left(\frac{16\sqrt{ac^3}a^4}{b^4c^5}-\frac{105\left(\sqrt{cx}bc^4x^4+ac^3\right)^{\frac{3}{2}}a^3c^9-189\left(\sqrt{cx}bc^4x^4+ac^3\right)^{\frac{5}{2}}a^2c^6+135\left(\sqrt{cx}bc^4x^4+ac^3\right)^{\frac{7}{2}}ac^3-35\left(\sqrt{cx}bc^4x^4+ac^3\right)^{\frac{9}{2}}}{b^4c^{17}}\right)|c|}{2835\,c^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^3)^(3/2)*b + a)*x^17,x, algorithm="giac")
```

```
[Out] 4/2835*(16*sqrt(a*c^3)*a^4/(b^4*c^5) - (105*(sqrt(c*x)*b*c^4*x^4
+ a*c^3)^(3/2)*a^3*c^9 - 189*(sqrt(c*x)*b*c^4*x^4 + a*c^3)^(5/2)*
a^2*c^6 + 135*(sqrt(c*x)*b*c^4*x^4 + a*c^3)^(7/2)*a*c^3 - 35*(sqr
t(c*x)*b*c^4*x^4 + a*c^3)^(9/2))/(b^4*c^17))*abs(c)/c^(7/2)
```

3.2964 $\int x^8 \sqrt{a+b\left(cx^3\right)^{3/2}}\,dx$

Optimal. Leaf size=56

$$\frac{4\left(a+b\left(cx^3\right)^{3/2}\right)^{5/2}}{45b^2c^3}-\frac{4a\left(a+b\left(cx^3\right)^{3/2}\right)^{3/2}}{27b^2c^3}$$

```
[Out] (-4*a*(a + b*(c*x^3)^(3/2))^(3/2))/(27*b^2*c^3) + (4*(a + b*(c*x^
3)^(3/2))^(5/2))/(45*b^2*c^3)
```

Rubi [A] time = 0.0977529, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$\frac{4\left(a+b\left(cx^3\right)^{3/2}\right)^{5/2}}{45b^2c^3}-\frac{4a\left(a+b\left(cx^3\right)^{3/2}\right)^{3/2}}{27b^2c^3}$$

Antiderivative was successfully verified.

```
[In]  Int[x^8*Sqrt[a + b*(c*x^3)^(3/2)],x]
```

```
[Out] (-4*a*(a + b*(c*x^3)^(3/2))^(3/2))/(27*b^2*c^3) + (4*(a + b*(c*x^
3)^(3/2))^(5/2))/(45*b^2*c^3)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^8 \sqrt{a+b\left(cx^3\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**8*(a+b*(c*x**3)**(3/2))**(1/2),x)
```

```
[Out] Integral(x**8*sqrt(a + b*(c*x**3)**(3/2)), x)
```

Mathematica [A] time = 0.0888599, size = 0, normalized size = 0.

$$\int x^8 \sqrt{a+b\left(cx^3\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[x^8*Sqrt[a + b*(c*x^3)^(3/2)],x]
```

```
[Out] Integrate[x^8*Sqrt[a + b*(c*x^3)^(3/2)], x]
```

Maple [F] time = 0.064, size = 0, normalized size = 0.

$$\int x^8 \sqrt{a+b\left(cx^3\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^8*(a+b*(c*x^3)^(3/2))^(1/2),x)

[Out] int(x^8*(a+b*(c*x^3)^(3/2))^(1/2),x)
```

Maxima [A] time = 1.39793, size = 58, normalized size = 1.04

$$\frac{4\left(\frac{3\left(\left(cx^3\right)^{\frac{3}{2}}b+a\right)^{\frac{5}{2}}}{b^2}-\frac{5\left(\left(cx^3\right)^{\frac{3}{2}}b+a\right)^{\frac{3}{2}}a}{b^2}\right)}{135\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^3)^(3/2)*b + a)*x^8,x, algorithm="maxima")

[Out] 4/135*(3*((c*x^3)^(3/2)*b + a)^(5/2)/b^2 - 5*((c*x^3)^(3/2)*b + a
)^(3/2)*a/b^2)/c^3
```

Fricas [A] time = 1.25408, size = 76, normalized size = 1.36

$$\frac{4\left(3\,b^2c^3x^9+\sqrt{cx^3}abcx^3-2\,a^2\right)\sqrt{\sqrt{cx^3}bcx^3+a}}{135\,b^2c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^3)^(3/2)*b + a)*x^8,x, algorithm="fricas")

[Out] 4/135*(3*b^2*c^3*x^9 + sqrt(c*x^3)*a*b*c*x^3 - 2*a^2)*sqrt(sqrt(c
*x^3)*b*c*x^3 + a)/(b^2*c^3)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^8\sqrt{a+b\left(cx^3\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**8*(a+b*(c*x**3)**(3/2))**(1/2),x)

[Out] Integral(x**8*sqrt(a + b*(c*x**3)**(3/2)), x)
```

GIAC/XCAS [A] time = 0.222156, size = 115, normalized size = 2.05

$$\frac{4\left(\frac{2\sqrt{ac^3}a^2}{b^2c^2}-\frac{5\left(\sqrt{cx}bc^4x^4+ac^3\right)^{\frac{3}{2}}ac^3-3\left(\sqrt{cx}bc^4x^4+ac^3\right)^{\frac{5}{2}}}{b^2c^8}\right)|c|}{135\,c^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^3)^(3/2)*b + a)*x^8,x, algorithm="giac")

[Out] 4/135*(2*sqrt(a*c^3)*a^2/(b^2*c^2) - (5*(sqrt(c*x)*b*c^4*x^4 + a*
c^3)^(3/2)*a*c^3 - 3*(sqrt(c*x)*b*c^4*x^4 + a*c^3)^(5/2))/(b^2*c^
8))*abs(c)/c^(7/2)
```

3.2965 $\int \frac{\sqrt{a+b(cx^3)^{3/2}}}{x} dx$

Optimal. Leaf size=55

$$\frac{4}{9}\sqrt{a+b\left(cx^3\right)^{3/2}}-\frac{4}{9}\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+b\left(cx^3\right)^{3/2}}}{\sqrt{a}}\right)$$

```
[Out] (4*Sqrt[a + b*(c*x^3)^(3/2)])/9 - (4*Sqrt[a]*ArcTanh[Sqrt[a + b*(
c*x^3)^(3/2)]/Sqrt[a]])/9
```

Rubi [A] time = 0.0977762, antiderivative size = 55, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238

$$\frac{4}{9}\sqrt{a+b\left(cx^3\right)^{3/2}}-\frac{4}{9}\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+b\left(cx^3\right)^{3/2}}}{\sqrt{a}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*(c*x^3)^(3/2)]/x,x]
```

```
[Out] (4*Sqrt[a + b*(c*x^3)^(3/2)])/9 - (4*Sqrt[a]*ArcTanh[Sqrt[a + b*(
c*x^3)^(3/2)]/Sqrt[a]])/9
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\left(cx^3\right)^{\frac{3}{2}}}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x**3)**(3/2))**(1/2)/x,x)
```

```
[Out] Integral(sqrt(a + b*(c*x**3)**(3/2))/x, x)
```

Mathematica [A] time = 0.0472468, size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\left(cx^3\right)^{3/2}}}{x}\, dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[Sqrt[a + b*(c*x^3)^(3/2)]/x,x]
```

```
[Out] Integrate[Sqrt[a + b*(c*x^3)^(3/2)]/x, x]
```

Maple [F] time = 0.065, size = 0, normalized size = 0.

$$\int \frac{1}{x}\sqrt{a+b\left(cx^3\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^3)^(3/2))^(1/2)/x,x)
```

```
[Out] int((a+b*(c*x^3)^(3/2))^(1/2)/x,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^3)^(3/2)*b + a)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^3)^(3/2)*b + a)/x,x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + b\left(cx^{3}\right)^{\frac{3}{2}}}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**3)**(3/2))**(1/2)/x,x)
```

```
[Out] Integral(sqrt(a + b*(c*x**3)**(3/2))/x, x)
```

GIAC/XCAS [A] time = 0.22673, size = 159, normalized size = 2.89

$$\frac{4\left(\frac{ac^{2}\arctan\left(\frac{\sqrt{\sqrt{cx}bc^{4}x^{4}+ac^{3}}}{\sqrt{-ac}c}\right)}{\sqrt{-ac}} + \sqrt{\sqrt{cx}bc^{4}x^{4} + ac^{3}} - \frac{ac^{2}\arctan\left(\frac{\sqrt{ac^{3}}}{\sqrt{-ac}c}\right)+\sqrt{ac^{3}}\sqrt{-ac}}{\sqrt{-ac}}\right)|c|}{9\,c^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^3)^(3/2)*b + a)/x,x, algorithm="giac")
```

```
[Out] 4/9*(a*c^2*arctan(sqrt(sqrt(c*x)*b*c^4*x^4 + a*c^3)/(sqrt(-a*c)*c
))/sqrt(-a*c) + sqrt(sqrt(c*x)*b*c^4*x^4 + a*c^3) - (a*c^2*arctan
(sqrt(a*c^3)/(sqrt(-a*c)*c)) + sqrt(a*c^3)*sqrt(-a*c))/sqrt(-a*c)
)*abs(c)/c^(5/2)
```

3.2966 $\int \frac{\sqrt{a+b(cx^3)^{3/2}}}{x^{10}}\,dx$

Optimal. Leaf size=101

$$\frac{b^2c^3\tanh^{-1}\left(\frac{\sqrt{a+b(cx^3)^{3/2}}}{\sqrt{a}}\right)}{18a^{3/2}}-\frac{bc^3\sqrt{a+b\,(cx^3)^{3/2}}}{18a\,(cx^3)^{3/2}}-\frac{\sqrt{a+b\,(cx^3)^{3/2}}}{9x^9}$$

```
[Out] -Sqrt[a + b*(c*x^3)^(3/2)]/(9*x^9) - (b*c^3*Sqrt[a + b*(c*x^3)^(3
/2)])/(18*a*(c*x^3)^(3/2)) + (b^2*c^3*ArcTanh[Sqrt[a + b*(c*x^3)^
(3/2)]/Sqrt[a]])/(18*a^(3/2))
```

Rubi [A] time = 0.142428, antiderivative size = 104, normalized size of antiderivative = 1.03, number of steps used = 6, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286

$$\frac{b^2c^3\tanh^{-1}\left(\frac{\sqrt{a+b(cx^3)^{3/2}}}{\sqrt{a}}\right)}{18a^{3/2}}-\frac{bc^6x^9\sqrt{a+b\,(cx^3)^{3/2}}}{18a\,(cx^3)^{9/2}}-\frac{\sqrt{a+b\,(cx^3)^{3/2}}}{9x^9}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*(c*x^3)^(3/2)]/x^10,x]
```

```
[Out] -Sqrt[a + b*(c*x^3)^(3/2)]/(9*x^9) - (b*c^6*x^9*Sqrt[a + b*(c*x^3
)^(3/2)])/(18*a*(c*x^3)^(9/2)) + (b^2*c^3*ArcTanh[Sqrt[a + b*(c*x
^3)^(3/2)]/Sqrt[a]])/(18*a^(3/2))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\,(cx^3)^{\frac{3}{2}}}}{x^{10}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x**3)**(3/2))**(1/2)/x**10,x)
```

```
[Out] Integral(sqrt(a + b*(c*x**3)**(3/2))/x**10, x)
```

Mathematica [A] time = 0.0436025, size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\,(cx^3)^{3/2}}}{x^{10}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[Sqrt[a + b*(c*x^3)^(3/2)]/x^10,x]
```

```
[Out] Integrate[Sqrt[a + b*(c*x^3)^(3/2)]/x^10, x]
```

Maple [F] time = 0.067, size = 0, normalized size = 0.

$$\int \frac{1}{x^{10}}\sqrt{a+b\,(cx^3)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^3)^(3/2))^(1/2)/x^10,x)
```

```
[Out] int((a+b*(c*x^3)^(3/2))^(1/2)/x^10,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^3)^(3/2)*b + a)/x^10,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^3)^(3/2)*b + a)/x^10,x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + b\left(cx^{3}\right)^{\frac{3}{2}}}}{x^{10}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**3)**(3/2))**(1/2)/x**10,x)
```

```
[Out] Integral(sqrt(a + b*(c*x**3)**(3/2))/x**10, x)
```

GIAC/XCAS [A] time = 0.740945, size = 158, normalized size = 1.56

$$-\frac{1}{18}\, b^{2} c^{\frac{13}{2}} \left(\frac{\arctan\left(\frac{\sqrt{\sqrt{cx}bc^{4}x^{4}+ac^{3}}}{\sqrt{-ac}c}\right)}{\sqrt{-ac}ac^{4}} + \frac{\sqrt{\sqrt{cx}bc^{4}x^{4} + ac^{3}}ac^{3} + \left(\sqrt{cx}bc^{4}x^{4} + ac^{3}\right)^{\frac{3}{2}}}{ab^{2}c^{12}x^{9}} \right) |c|$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^3)^(3/2)*b + a)/x^10,x, algorithm="giac")
```

```
[Out] -1/18*b^2*c^(13/2)*(arctan(sqrt(sqrt(c*x)*b*c^4*x^4 + a*c^3)/(sqr
t(-a*c)*c))/(sqrt(-a*c)*a*c^4) + (sqrt(sqrt(c*x)*b*c^4*x^4 + a*c^
3)*a*c^3 + (sqrt(c*x)*b*c^4*x^4 + a*c^3)^(3/2))/(a*b^2*c^12*x^9))
*abs(c)
```

3.2967 $\int x^2\sqrt{a+b\left(cx^3\right)^{3/2}}\,dx$

Optimal. Leaf size=642

$$\frac{4\sqrt{2}a^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^3}\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^3}+b^{2/3}cx^3}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^3}\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}\sqrt{cx^3}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}\sqrt{cx^3}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{7\sqrt[4]{3}b^{2/3}c\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^3}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^3}\right)^2}}\sqrt{a+b\left(cx^3\right)^{3/2}}}-\frac{2\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^3}\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^3}+b^{2/3}cx^3}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^3}\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}\sqrt{cx^3}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}\sqrt{cx^3}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{7b^{2/3}c\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^3}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^3}\right)^2}}\sqrt{a+b\left(cx^3\right)^{3/2}}}+\frac{4a\sqrt{a+b\left(cx^3\right)^{3/2}}}{7b^{2/3}c\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^3}\right)}+\frac{4}{21}x^3\sqrt{a+b\left(cx^3\right)^{3/2}}$$

```
[Out] (4*x^3*Sqrt[a + b*(c*x^3)^(3/2)])/21 + (4*a*Sqrt[a + b*(c*x^3)^(3
/2)])/(7*b^(2/3)*c*((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^3]))
 - (2*3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(4/3)*(a^(1/3) + b^(1/3)*Sqrt[c
*x^3])*Sqrt[(a^(2/3) + b^(2/3)*c*x^3 - a^(1/3)*b^(1/3)*Sqrt[c*x^3
])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^3])^2]*EllipticE[Arc
Sin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^3])/((1 + Sqrt[3])*
a^(1/3) + b^(1/3)*Sqrt[c*x^3])], -7 - 4*Sqrt[3]])/(7*b^(2/3)*c*Sq
rt[(a^(1/3)*(a^(1/3) + b^(1/3)*Sqrt[c*x^3]))/((1 + Sqrt[3])*a^(1/
3) + b^(1/3)*Sqrt[c*x^3])^2]*Sqrt[a + b*(c*x^3)^(3/2)]) + (4*Sqrt
[2]*a^(4/3)*(a^(1/3) + b^(1/3)*Sqrt[c*x^3])*Sqrt[(a^(2/3) + b^(2/
3)*c*x^3 - a^(1/3)*b^(1/3)*Sqrt[c*x^3])/((1 + Sqrt[3])*a^(1/3) +
b^(1/3)*Sqrt[c*x^3])^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) +
 b^(1/3)*Sqrt[c*x^3])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^3
])], -7 - 4*Sqrt[3]])/(7*3^(1/4)*b^(2/3)*c*Sqrt[(a^(1/3)*(a^(1/3)
 + b^(1/3)*Sqrt[c*x^3]))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*
x^3])^2]*Sqrt[a + b*(c*x^3)^(3/2)])
```

Rubi [A] time = 0.935807, antiderivative size = 642, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$

$$\frac{4\sqrt{2}a^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^3}\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^3}+b^{2/3}cx^3}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^3}\right)^2}}F\left(\sin^{-1}\left(\frac{\sqrt[3]{b}\sqrt{cx^3}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}\sqrt{cx^3}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{7\sqrt[4]{3}b^{2/3}c\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^3}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^3}\right)^2}}\sqrt{a+b\left(cx^3\right)^{3/2}}}-\frac{2\sqrt[4]{3}\sqrt{2-\sqrt{3}}a^{4/3}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^3}\right)\sqrt{\frac{a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^3}+b^{2/3}cx^3}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^3}\right)^2}}E\left(\sin^{-1}\left(\frac{\sqrt[3]{b}\sqrt{cx^3}+\left(1-\sqrt{3}\right)\sqrt[3]{a}}{\sqrt[3]{b}\sqrt{cx^3}+\left(1+\sqrt{3}\right)\sqrt[3]{a}}\right)\middle|-7-4\sqrt{3}\right)}{7b^{2/3}c\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^3}\right)}{\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^3}\right)^2}}\sqrt{a+b\left(cx^3\right)^{3/2}}}+\frac{4a\sqrt{a+b\left(cx^3\right)^{3/2}}}{7b^{2/3}c\left(\left(1+\sqrt{3}\right)\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^3}\right)}+\frac{4}{21}x^3\sqrt{a+b\left(cx^3\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*Sqrt[a + b*(c*x^3)^(3/2)],x]
```

```
[Out] (4*x^3*Sqrt[a + b*(c*x^3)^(3/2)])/21 + (4*a*Sqrt[a + b*(c*x^3)^(3
/2)])/(7*b^(2/3)*c*((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^3]))
 - (2*3^(1/4)*Sqrt[2 - Sqrt[3]]*a^(4/3)*(a^(1/3) + b^(1/3)*Sqrt[c
*x^3])*Sqrt[(a^(2/3) + b^(2/3)*c*x^3 - a^(1/3)*b^(1/3)*Sqrt[c*x^3
])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^3])^2]*EllipticE[Arc
Sin[((1 - Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^3])/((1 + Sqrt[3])*
a^(1/3) + b^(1/3)*Sqrt[c*x^3])], -7 - 4*Sqrt[3]])/(7*b^(2/3)*c*Sq
rt[(a^(1/3)*(a^(1/3) + b^(1/3)*Sqrt[c*x^3]))/((1 + Sqrt[3])*a^(1/
3) + b^(1/3)*Sqrt[c*x^3])^2]*Sqrt[a + b*(c*x^3)^(3/2)]) + (4*Sqrt
[2]*a^(4/3)*(a^(1/3) + b^(1/3)*Sqrt[c*x^3])*Sqrt[(a^(2/3) + b^(2/
3)*c*x^3 - a^(1/3)*b^(1/3)*Sqrt[c*x^3])/((1 + Sqrt[3])*a^(1/3) +
b^(1/3)*Sqrt[c*x^3])^2]*EllipticF[ArcSin[((1 - Sqrt[3])*a^(1/3) +
 b^(1/3)*Sqrt[c*x^3])/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*x^3
])], -7 - 4*Sqrt[3]])/(7*3^(1/4)*b^(2/3)*c*Sqrt[(a^(1/3)*(a^(1/3)
 + b^(1/3)*Sqrt[c*x^3]))/((1 + Sqrt[3])*a^(1/3) + b^(1/3)*Sqrt[c*
x^3])^2]*Sqrt[a + b*(c*x^3)^(3/2)])
```

Rubi in Sympy [A] time = 53.6134, size = 561, normalized size = 0.87

$$-\frac{2\sqrt[4]{3}a^{\frac{4}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^3}+b^{\frac{2}{3}}cx^3}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^3}\right)^2}}\sqrt{-\sqrt{3}+2}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^3}\right)E\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^3}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^3}}\right)\middle|-7-4\sqrt{3}\right)}{7b^{\frac{2}{3}}c\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^3}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^3}\right)^2}}\sqrt{a+b\left(cx^3\right)^{\frac{3}{2}}}}+\frac{4\sqrt{2}\cdot 3^{\frac{3}{4}}a^{\frac{4}{3}}\sqrt{\frac{a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}\sqrt{cx^3}+b^{\frac{2}{3}}cx^3}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^3}\right)^2}}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^3}\right)F\left(\operatorname{asin}\left(\frac{-\sqrt[3]{a}\left(-1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^3}}{\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^3}}\right)\middle|-7-4\sqrt{3}\right)}{21b^{\frac{2}{3}}c\sqrt{\frac{\sqrt[3]{a}\left(\sqrt[3]{a}+\sqrt[3]{b}\sqrt{cx^3}\right)}{\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^3}\right)^2}}\sqrt{a+b\left(cx^3\right)^{\frac{3}{2}}}}+\frac{4a\sqrt{a+b\left(cx^3\right)^{\frac{3}{2}}}}{7b^{\frac{2}{3}}c\left(\sqrt[3]{a}\left(1+\sqrt{3}\right)+\sqrt[3]{b}\sqrt{cx^3}\right)}+\frac{4x^3\sqrt{a+b\left(cx^3\right)^{\frac{3}{2}}}}{21}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(a+b*(c*x**3)**(3/2))**(1/2),x)
```

```
[Out] -2*3**(1/4)*a**(4/3)*sqrt((a**(2/3) - a**(1/3)*b**(1/3)*sqrt(c*x*
*3) + b**(2/3)*c*x**3)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c*
x**3))**2)*sqrt(-sqrt(3) + 2)*(a**(1/3) + b**(1/3)*sqrt(c*x**3))*
elliptic_e(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)*sqrt(c*x**3)
)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c*x**3))), -7 - 4*sqrt(
3))/(7*b**(2/3)*c*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*sqrt(c*x**3)
)/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c*x**3))**2)*sqrt(a + b
*(c*x**3)**(3/2))) + 4*sqrt(2)*3**(3/4)*a**(4/3)*sqrt((a**(2/3) -
 a**(1/3)*b**(1/3)*sqrt(c*x**3) + b**(2/3)*c*x**3)/(a**(1/3)*(1 +
 sqrt(3)) + b**(1/3)*sqrt(c*x**3))**2)*(a**(1/3) + b**(1/3)*sqrt(
c*x**3))*elliptic_f(asin((-a**(1/3)*(-1 + sqrt(3)) + b**(1/3)*sqr
t(c*x**3))/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c*x**3))), -7
- 4*sqrt(3))/(21*b**(2/3)*c*sqrt(a**(1/3)*(a**(1/3) + b**(1/3)*sq
rt(c*x**3))/(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c*x**3))**2)*
sqrt(a + b*(c*x**3)**(3/2))) + 4*a*sqrt(a + b*(c*x**3)**(3/2))/(7
*b**(2/3)*c*(a**(1/3)*(1 + sqrt(3)) + b**(1/3)*sqrt(c*x**3))) + 4
*x**3*sqrt(a + b*(c*x**3)**(3/2))/21
```

Mathematica [C] time = 0.142015, size = 89, normalized size = 0.14

$$\frac{x^3\left(3a\sqrt{\frac{a+b\left(cx^3\right)^{3/2}}{a}}\,{}_2F_1\left(\frac{1}{2},\frac{2}{3};\frac{5}{3};-\frac{b\left(cx^3\right)^{3/2}}{a}\right)+4\left(a+b\left(cx^3\right)^{3/2}\right)\right)}{21\sqrt{a+b\left(cx^3\right)^{3/2}}}$$

Antiderivative was successfully verified.

```
[In]   Integrate[x^2*Sqrt[a + b*(c*x^3)^(3/2)],x]
```

```
[Out] (x^3*(4*(a + b*(c*x^3)^(3/2)) + 3*a*Sqrt[(a + b*(c*x^3)^(3/2))/a]
*Hypergeometric2F1[1/2, 2/3, 5/3, -((b*(c*x^3)^(3/2))/a)]))/(21*S
qrt[a + b*(c*x^3)^(3/2)])
```

Maple [A] time = 0.02, size = 495, normalized size = 0.8

$$\frac{1}{3c}\left(\frac{4cx^3}{7}\sqrt{a+b\left(cx^3\right)^{\frac{3}{2}}}-\frac{\frac{4i}{7}a\sqrt{3}}{b}\sqrt[3]{-ab^2}\sqrt{i\sqrt{3}b\left(\sqrt{cx^3}+\frac{1}{2b}\sqrt[3]{-ab^2}-\frac{\frac{i}{2}\sqrt{3}}{b}\sqrt[3]{-ab^2}\right)\frac{1}{\sqrt[3]{-ab^2}}}\sqrt{1\left(\sqrt{cx^3}-\frac{1}{b}\sqrt[3]{-ab^2}\right)\left(-\frac{3}{2b}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^2*(a+b*(c*x^3)^(3/2))^(1/2),x)
```

```
[Out] 1/3/c*(4/7*c*x^3*(a+b*(c*x^3)^(3/2))^(1/2)-4/7*I*a*3^(1/2)/b*(-a*
b^2)^(1/3)*(I*((c*x^3)^(1/2)+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b
*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)*(((c*x^3)^(1/2)-
1/b*(-a*b^2)^(1/3))/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^
2)^(1/3)))^(1/2)*(-I*((c*x^3)^(1/2)+1/2/b*(-a*b^2)^(1/3)+1/2*I*3^
(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2)/(a+b*(c*x
^3)^(3/2))^(1/2)*((-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)
^(1/3))*EllipticE(1/3*3^(1/2)*(I*((c*x^3)^(1/2)+1/2/b*(-a*b^2)^(1
/3)-1/2*I*3^(1/2)/b*(-a*b^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/
2),(I*3^(1/2)/b*(-a*b^2)^(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/
2)/b*(-a*b^2)^(1/3)))^(1/2))+1/b*(-a*b^2)^(1/3)*EllipticF(1/3*3^(
1/2)*(I*((c*x^3)^(1/2)+1/2/b*(-a*b^2)^(1/3)-1/2*I*3^(1/2)/b*(-a*b
^2)^(1/3))*3^(1/2)*b/(-a*b^2)^(1/3))^(1/2),(I*3^(1/2)/b*(-a*b^2)^
(1/3)/(-3/2/b*(-a*b^2)^(1/3)+1/2*I*3^(1/2)/b*(-a*b^2)^(1/3)))^(1/
2))))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{\left(cx^3\right)^{\frac{3}{2}}b+a}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt((c*x^3)^(3/2)*b + a)*x^2,x, algorithm="maxima")
```

```
[Out] integrate(sqrt((c*x^3)^(3/2)*b + a)*x^2, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{\sqrt{cx^3}bcx^3+a}x^2, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt((c*x^3)^(3/2)*b + a)*x^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(sqrt(c*x^3)*b*c*x^3 + a)*x^2, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^2\sqrt{a+b\left(cx^3\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(a+b*(c*x**3)**(3/2))**(1/2),x)
```

```
[Out] Integral(x**2*sqrt(a + b*(c*x**3)**(3/2)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{\left(cx^3\right)^{\frac{3}{2}}b+a}\,x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^3)^(3/2)*b + a)*x^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt((c*x^3)^(3/2)*b + a)*x^2, x)
```

3.2968 $\int x^9 \sqrt{a+b\left(cx^3\right)^{3/2}}\,dx$

Optimal. Leaf size=170

$$\frac{792a^3x\sqrt{\frac{b(cx^3)^{3/2}}{a}+1}\,{}_2F_1\left(\frac{2}{9},\frac{1}{2};\frac{11}{9};-\frac{b\left(cx^3\right)^{3/2}}{a}\right)}{19747b^2c^3\sqrt{a+b\left(cx^3\right)^{3/2}}}-\frac{792a^2x\sqrt{a+b\left(cx^3\right)^{3/2}}}{19747b^2c^3}+\frac{36ax\left(cx^3\right)^{3/2}\sqrt{a+b\left(cx^3\right)^{3/2}}}{1519bc^3}+\frac{4}{49}x^{10}\sqrt{a+b\left(cx^3\right)^{3/2}}$$

```
[Out] (-792*a^2*x*Sqrt[a + b*(c*x^3)^(3/2)])/(19747*b^2*c^3) + (4*x^10*
Sqrt[a + b*(c*x^3)^(3/2)])/49 + (36*a*x*(c*x^3)^(3/2)*Sqrt[a + b*
(c*x^3)^(3/2)])/(1519*b*c^3) + (792*a^3*x*Sqrt[1 + (b*(c*x^3)^(3/
2))/a]*Hypergeometric2F1[2/9, 1/2, 11/9, -((b*(c*x^3)^(3/2))/a)])
/(19747*b^2*c^3*Sqrt[a + b*(c*x^3)^(3/2)])
```

Rubi [A] time = 0.315746, antiderivative size = 170, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$

$$\frac{792a^3x\sqrt{\frac{b(cx^3)^{3/2}}{a}+1}\,{}_2F_1\left(\frac{2}{9},\frac{1}{2};\frac{11}{9};-\frac{b\left(cx^3\right)^{3/2}}{a}\right)}{19747b^2c^3\sqrt{a+b\left(cx^3\right)^{3/2}}}-\frac{792a^2x\sqrt{a+b\left(cx^3\right)^{3/2}}}{19747b^2c^3}+\frac{36ax\left(cx^3\right)^{3/2}\sqrt{a+b\left(cx^3\right)^{3/2}}}{1519bc^3}+\frac{4}{49}x^{10}\sqrt{a+b\left(cx^3\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^9*Sqrt[a + b*(c*x^3)^(3/2)],x]
```

```
[Out] (-792*a^2*x*Sqrt[a + b*(c*x^3)^(3/2)])/(19747*b^2*c^3) + (4*x^10*
Sqrt[a + b*(c*x^3)^(3/2)])/49 + (36*a*x*(c*x^3)^(3/2)*Sqrt[a + b*
(c*x^3)^(3/2)])/(1519*b*c^3) + (792*a^3*x*Sqrt[1 + (b*(c*x^3)^(3/
2))/a]*Hypergeometric2F1[2/9, 1/2, 11/9, -((b*(c*x^3)^(3/2))/a)])
/(19747*b^2*c^3*Sqrt[a + b*(c*x^3)^(3/2)])
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^9\sqrt{a+b\left(cx^3\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**9*(a+b*(c*x**3)**(3/2))**(1/2),x)
```

```
[Out] Integral(x**9*sqrt(a + b*(c*x**3)**(3/2)), x)
```

Mathematica [A] time = 0.0540448, size = 0, normalized size = 0.

$$\int x^9\sqrt{a+b\left(cx^3\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[x^9*Sqrt[a + b*(c*x^3)^(3/2)],x]
```

```
[Out] Integrate[x^9*Sqrt[a + b*(c*x^3)^(3/2)], x]
```

Maple [F] time = 0.066, size = 0, normalized size = 0.

$$\int x^9\sqrt{a+b\left(cx^3\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^9*(a+b*(c*x^3)^(3/2))^(1/2),x)
```

```
[Out] int(x^9*(a+b*(c*x^3)^(3/2))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{\left(cx^3\right)^{\frac{3}{2}}b+a}x^9\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^3)^(3/2)*b + a)*x^9,x, algorithm="maxima")
```

```
[Out] integrate(sqrt((c*x^3)^(3/2)*b + a)*x^9, x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^3)^(3/2)*b + a)*x^9,x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^9\sqrt{a+b\left(cx^3\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**9*(a+b*(c*x**3)**(3/2))**(1/2),x)
```

```
[Out] Integral(x**9*sqrt(a + b*(c*x**3)**(3/2)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{\left(cx^3\right)^{\frac{3}{2}}b+a}x^9\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^3)^(3/2)*b + a)*x^9,x, algorithm="giac")

[Out] integrate(sqrt((c*x^3)^(3/2)*b + a)*x^9, x)
```

3.2969 $\int \sqrt{a+b\left(cx^3\right)^{3/2}}\,dx$

Optimal. Leaf size=91

$$\frac{9ax\sqrt{\frac{b(cx^3)^{3/2}}{a}+1}\,{}_2F_1\left(\frac{2}{9},\frac{1}{2};\frac{11}{9};-\frac{b(cx^3)^{3/2}}{a}\right)}{13\sqrt{a+b\left(cx^3\right)^{3/2}}}+\frac{4}{13}x\sqrt{a+b\left(cx^3\right)^{3/2}}$$

```
[Out] (4*x*Sqrt[a + b*(c*x^3)^(3/2)])/13 + (9*a*x*Sqrt[1 + (b*(c*x^3)^(
3/2))/a]*Hypergeometric2F1[2/9, 1/2, 11/9, -((b*(c*x^3)^(3/2))/a)
])/(13*Sqrt[a + b*(c*x^3)^(3/2)])
```

Rubi [A] time = 0.123822, antiderivative size = 91, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.294

$$\frac{9ax\sqrt{\frac{b(cx^3)^{3/2}}{a}+1}\,{}_2F_1\left(\frac{2}{9},\frac{1}{2};\frac{11}{9};-\frac{b(cx^3)^{3/2}}{a}\right)}{13\sqrt{a+b\left(cx^3\right)^{3/2}}}+\frac{4}{13}x\sqrt{a+b\left(cx^3\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*(c*x^3)^(3/2)],x]
```

```
[Out] (4*x*Sqrt[a + b*(c*x^3)^(3/2)])/13 + (9*a*x*Sqrt[1 + (b*(c*x^3)^(
3/2))/a]*Hypergeometric2F1[2/9, 1/2, 11/9, -((b*(c*x^3)^(3/2))/a)
])/(13*Sqrt[a + b*(c*x^3)^(3/2)])
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{a+b\left(cx^3\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x**3)**(3/2))**(1/2),x)
```

```
[Out] Integral(sqrt(a + b*(c*x**3)**(3/2)), x)
```

Mathematica [A] time = 0.0158161, size = 0, normalized size = 0.

$$\int \sqrt{a+b\left(cx^3\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[Sqrt[a + b*(c*x^3)^(3/2)],x]
```

```
[Out] Integrate[Sqrt[a + b*(c*x^3)^(3/2)], x]
```

Maple [F] time = 0.065, size = 0, normalized size = 0.

$$\int \sqrt{a+b\left(cx^3\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^3)^(3/2))^(1/2),x)
```

```
[Out] int((a+b*(c*x^3)^(3/2))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{(cx^3)^{\frac{3}{2}} b + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^3)^(3/2)*b + a),x, algorithm="maxima")
```

```
[Out] integrate(sqrt((c*x^3)^(3/2)*b + a), x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^3)^(3/2)*b + a),x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{a + b (cx^3)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**3)**(3/2))**(1/2),x)
```

```
[Out] Integral(sqrt(a + b*(c*x**3)**(3/2)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{(cx^3)^{\frac{3}{2}} b + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^3)^(3/2)*b + a),x, algorithm="giac")
```

```
[Out] integrate(sqrt((c*x^3)^(3/2)*b + a), x)
```

3.2970 $\int \frac{\sqrt{a+b(cx^3)^{3/2}}}{x^9}\,dx$

Optimal. Leaf size=139

$$-\frac{45b^2c^3x\sqrt{\frac{b(cx^3)^{3/2}}{a}+1}\,{}_2F_1\left(\frac{2}{9},\frac{1}{2};\frac{11}{9};-\frac{b(cx^3)^{3/2}}{a}\right)}{448a\sqrt{a+b\,(cx^3)^{3/2}}}-\frac{9bc^3x\sqrt{a+b\,(cx^3)^{3/2}}}{112a\,(cx^3)^{3/2}}-\frac{\sqrt{a+b\,(cx^3)^{3/2}}}{8x^8}$$

```
[Out] -Sqrt[a + b*(c*x^3)^(3/2)]/(8*x^8) - (9*b*c^3*x*Sqrt[a + b*(c*x^3
)^(3/2)])/(112*a*(c*x^3)^(3/2)) - (45*b^2*c^3*x*Sqrt[1 + (b*(c*x^
3)^(3/2))/a]*Hypergeometric2F1[2/9, 1/2, 11/9, -((b*(c*x^3)^(3/2)
)/a)])/(448*a*Sqrt[a + b*(c*x^3)^(3/2)])
```

Rubi [A] time = 0.216143, antiderivative size = 141, normalized size of antiderivative = 1.01, number of steps used = 6, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286

$$-\frac{45b^2c^3x\sqrt{\frac{b(cx^3)^{3/2}}{a}+1}\,{}_2F_1\left(\frac{2}{9},\frac{1}{2};\frac{11}{9};-\frac{b(cx^3)^{3/2}}{a}\right)}{448a\sqrt{a+b\,(cx^3)^{3/2}}}-\frac{9bc^5x^7\sqrt{a+b\,(cx^3)^{3/2}}}{112a\,(cx^3)^{7/2}}-\frac{\sqrt{a+b\,(cx^3)^{3/2}}}{8x^8}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*(c*x^3)^(3/2)]/x^9,x]
```

```
[Out] -Sqrt[a + b*(c*x^3)^(3/2)]/(8*x^8) - (9*b*c^5*x^7*Sqrt[a + b*(c*x
^3)^(3/2)])/(112*a*(c*x^3)^(7/2)) - (45*b^2*c^3*x*Sqrt[1 + (b*(c*
x^3)^(3/2))/a]*Hypergeometric2F1[2/9, 1/2, 11/9, -((b*(c*x^3)^(3/
2))/a)])/(448*a*Sqrt[a + b*(c*x^3)^(3/2)])
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\,(cx^3)^{\frac{3}{2}}}}{x^9}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x**3)**(3/2))**(1/2)/x**9,x)
```

```
[Out] Integral(sqrt(a + b*(c*x**3)**(3/2))/x**9, x)
```

Mathematica [A] time = 0.043311, size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\,(cx^3)^{3/2}}}{x^9}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[Sqrt[a + b*(c*x^3)^(3/2)]/x^9,x]
```

```
[Out] Integrate[Sqrt[a + b*(c*x^3)^(3/2)]/x^9, x]
```

Maple [F] time = 0.072, size = 0, normalized size = 0.

$$\int \frac{1}{x^9}\sqrt{a+b\left(c x^3\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^3)^(3/2))^(1/2)/x^9,x)

[Out] int((a+b*(c*x^3)^(3/2))^(1/2)/x^9,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{\left(c x^3\right)^{\frac{3}{2}} b + a}}{x^9}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^3)^(3/2)*b + a)/x^9,x, algorithm="maxima")

[Out] integrate(sqrt((c*x^3)^(3/2)*b + a)/x^9, x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^3)^(3/2)*b + a)/x^9,x, algorithm="fricas")

[Out] Timed out
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + b\left(c x^3\right)^{\frac{3}{2}}}}{x^9}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**3)**(3/2))**(1/2)/x**9,x)

[Out] Integral(sqrt(a + b*(c*x**3)**(3/2))/x**9, x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{\left(c x^3\right)^{\frac{3}{2}} b + a}}{x^9}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^3)^(3/2)*b + a)/x^9,x, algorithm="giac")

[Out] integrate(sqrt((c*x^3)^(3/2)*b + a)/x^9, x)
```

3.2971 $\int (dx)^m \sqrt{a+b\left(cx^3\right)^{3/2}}\,dx$

Optimal. Leaf size=84

$$\frac{x(dx)^m\sqrt{a+b\left(cx^3\right)^{3/2}}\,{}_2F_1\left(-\frac{1}{2},\frac{2(m+1)}{9};\frac{2(m+1)}{9}+1;-\frac{b\left(cx^3\right)^{3/2}}{a}\right)}{(m+1)\sqrt{\frac{b\left(cx^3\right)^{3/2}}{a}+1}}$$

```
[Out] (x*(d*x)^m*Sqrt[a + b*(c*x^3)^(3/2)]*Hypergeometric2F1[-1/2, (2*(
1 + m))/9, 1 + (2*(1 + m))/9, -((b*(c*x^3)^(3/2))/a)])/((1 + m)*S
qrt[1 + (b*(c*x^3)^(3/2))/a])
```

Rubi [A] time = 0.164872, antiderivative size = 84, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217

$$\frac{x(dx)^m\sqrt{a+b\left(cx^3\right)^{3/2}}\,{}_2F_1\left(-\frac{1}{2},\frac{2(m+1)}{9};\frac{2(m+1)}{9}+1;-\frac{b\left(cx^3\right)^{3/2}}{a}\right)}{(m+1)\sqrt{\frac{b\left(cx^3\right)^{3/2}}{a}+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[(d*x)^m*Sqrt[a + b*(c*x^3)^(3/2)],x]
```

```
[Out] (x*(d*x)^m*Sqrt[a + b*(c*x^3)^(3/2)]*Hypergeometric2F1[-1/2, (2*(
1 + m))/9, 1 + (2*(1 + m))/9, -((b*(c*x^3)^(3/2))/a)])/((1 + m)*S
qrt[1 + (b*(c*x^3)^(3/2))/a])
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a+b\left(cx^3\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x)**m*(a+b*(c*x**3)**(3/2))**(1/2),x)
```

```
[Out] Integral((d*x)**m*sqrt(a + b*(c*x**3)**(3/2)), x)
```

Mathematica [A] time = 0.0492214, size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a+b\left(cx^3\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(d*x)^m*Sqrt[a + b*(c*x^3)^(3/2)],x]
```

```
[Out] Integrate[(d*x)^m*Sqrt[a + b*(c*x^3)^(3/2)], x]
```

Maple [F] time = 0.051, size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a+b\left(cx^3\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x)^m*(a+b*(c*x^3)^(3/2))^(1/2),x)

[Out] int((d*x)^m*(a+b*(c*x^3)^(3/2))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{(cx^3)^{\frac{3}{2}} b + a} (dx)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^3)^(3/2)*b + a)*(d*x)^m,x, algorithm="maxima")

[Out] integrate(sqrt((c*x^3)^(3/2)*b + a)*(d*x)^m, x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^3)^(3/2)*b + a)*(d*x)^m,x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a + b (cx^3)^{\frac{3}{2}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)**m*(a+b*(c*x**3)**(3/2))**(1/2),x)

[Out] Integral((d*x)**m*sqrt(a + b*(c*x**3)**(3/2)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{(cx^3)^{\frac{3}{2}} b + a} (dx)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((c*x^3)^(3/2)*b + a)*(d*x)^m,x, algorithm="giac")

[Out] integrate(sqrt((c*x^3)^(3/2)*b + a)*(d*x)^m, x)
```

3.2972 $\int (dx)^m \sqrt{a+b\sqrt{cx^3}}\,dx$

Optimal. Leaf size=84

$$\frac{x(dx)^m \sqrt{a+b\sqrt{cx^3}}\,{}_2F_1\left(-\frac{1}{2},\frac{2(m+1)}{3};\frac{1}{3}(2m+5);-\frac{b\sqrt{cx^3}}{a}\right)}{(m+1)\sqrt{\frac{b\sqrt{cx^3}}{a}+1}}$$

```
[Out] (x*(d*x)^m*Sqrt[a + b*Sqrt[c*x^3]]*Hypergeometric2F1[-1/2, (2*(1
+ m))/3, (5 + 2*m)/3, -((b*Sqrt[c*x^3])/a)])/((1 + m)*Sqrt[1 + (b
*Sqrt[c*x^3])/a])
```

Rubi [A] time = 0.1712, antiderivative size = 84, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217

$$\frac{x(dx)^m \sqrt{a+b\sqrt{cx^3}}\,{}_2F_1\left(-\frac{1}{2},\frac{2(m+1)}{3};\frac{1}{3}(2m+5);-\frac{b\sqrt{cx^3}}{a}\right)}{(m+1)\sqrt{\frac{b\sqrt{cx^3}}{a}+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[(d*x)^m*Sqrt[a + b*Sqrt[c*x^3]],x]
```

```
[Out] (x*(d*x)^m*Sqrt[a + b*Sqrt[c*x^3]]*Hypergeometric2F1[-1/2, (2*(1
+ m))/3, (5 + 2*m)/3, -((b*Sqrt[c*x^3])/a)])/((1 + m)*Sqrt[1 + (b
*Sqrt[c*x^3])/a])
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a+b\sqrt{cx^3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x)**m*(a+b*(c*x**3)**(1/2))**(1/2),x)
```

```
[Out] Integral((d*x)**m*sqrt(a + b*sqrt(c*x**3)), x)
```

Mathematica [A] time = 0.0665177, size = 84, normalized size = 1.

$$\frac{x(dx)^m \sqrt{a+b\sqrt{cx^3}}\,{}_2F_1\left(-\frac{1}{2},\frac{2(m+1)}{3};\frac{1}{3}(2m+5);-\frac{b\sqrt{cx^3}}{a}\right)}{(m+1)\sqrt{\frac{b\sqrt{cx^3}}{a}+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(d*x)^m*Sqrt[a + b*Sqrt[c*x^3]],x]
```

```
[Out] (x*(d*x)^m*Sqrt[a + b*Sqrt[c*x^3]]*Hypergeometric2F1[-1/2, (2*(1
+ m))/3, (5 + 2*m)/3, -((b*Sqrt[c*x^3])/a)])/((1 + m)*Sqrt[1 + (b
*Sqrt[c*x^3])/a])
```

Maple [F] time = 0.053, size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a + b\sqrt{cx^3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x)^m*(a+b*(c*x^3)^(1/2))^(1/2),x)

[Out] int((d*x)^m*(a+b*(c*x^3)^(1/2))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{\sqrt{cx^3}b + a}\,(dx)^m\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^3)*b + a)*(d*x)^m,x, algorithm="maxima")

[Out] integrate(sqrt(sqrt(c*x^3)*b + a)*(d*x)^m, x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^3)*b + a)*(d*x)^m,x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a + b\sqrt{cx^3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)**m*(a+b*(c*x**3)**(1/2))**(1/2),x)

[Out] Integral((d*x)**m*sqrt(a + b*sqrt(c*x**3)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{\sqrt{cx^3}b + a}\,(dx)^m\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(sqrt(c*x^3)*b + a)*(d*x)^m,x, algorithm="giac")

[Out] integrate(sqrt(sqrt(c*x^3)*b + a)*(d*x)^m, x)
```

3.2973 $\int (dx)^m \sqrt{a+\frac{b}{\sqrt{cx^3}}}\,dx$

Optimal. Leaf size=84

$$\frac{x(dx)^m\sqrt{a+\frac{b}{\sqrt{cx^3}}}\,{}_2F_1\left(-\frac{1}{2},-\frac{2}{3}(m+1);\frac{1}{3}(1-2m);-\frac{b}{a\sqrt{cx^3}}\right)}{(m+1)\sqrt{\frac{b}{a\sqrt{cx^3}}+1}}$$

```
[Out] (x*(d*x)^m*Sqrt[a + b/Sqrt[c*x^3]]*Hypergeometric2F1[-1/2, (-2*(1
 + m))/3, (1 - 2*m)/3, -(b/(a*Sqrt[c*x^3]))])/((1 + m)*Sqrt[1 + b
/(a*Sqrt[c*x^3])])
```

Rubi [A] time = 0.300232, antiderivative size = 84, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261

$$\frac{x(dx)^m\sqrt{a+\frac{b}{\sqrt{cx^3}}}\,{}_2F_1\left(-\frac{1}{2},-\frac{2}{3}(m+1);\frac{1}{3}(1-2m);-\frac{b}{a\sqrt{cx^3}}\right)}{(m+1)\sqrt{\frac{b}{a\sqrt{cx^3}}+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[(d*x)^m*Sqrt[a + b/Sqrt[c*x^3]],x]
```

```
[Out] (x*(d*x)^m*Sqrt[a + b/Sqrt[c*x^3]]*Hypergeometric2F1[-1/2, (-2*(1
 + m))/3, (1 - 2*m)/3, -(b/(a*Sqrt[c*x^3]))])/((1 + m)*Sqrt[1 + b
/(a*Sqrt[c*x^3])])
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a+\frac{b}{\sqrt{cx^3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x)**m*(a+b/(c*x**3)**(1/2))**(1/2),x)
```

```
[Out] Integral((d*x)**m*sqrt(a + b/sqrt(c*x**3)), x)
```

Mathematica [A] time = 0.107233, size = 89, normalized size = 1.06

$$\frac{4x(dx)^m\sqrt{a+\frac{b}{\sqrt{cx^3}}}\,{}_2F_1\left(-\frac{1}{2},\frac{2m}{3}+\frac{1}{6};\frac{2m}{3}+\frac{7}{6};-\frac{a\sqrt{cx^3}}{b}\right)}{(4m+1)\sqrt{\frac{a\sqrt{cx^3}}{b}+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(d*x)^m*Sqrt[a + b/Sqrt[c*x^3]],x]
```

```
[Out] (4*x*(d*x)^m*Sqrt[a + b/Sqrt[c*x^3]]*Hypergeometric2F1[-1/2, 1/6
+ (2*m)/3, 7/6 + (2*m)/3, -((a*Sqrt[c*x^3])/b)])/((1 + 4*m)*Sqrt[
1 + (a*Sqrt[c*x^3])/b])
```

Maple [F] time = 0.067, size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a + b\frac{1}{\sqrt{cx^3}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x)^m*(a+b/(c*x^3)^(1/2))^(1/2),x)

[Out] int((d*x)^m*(a+b/(c*x^3)^(1/2))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a + \frac{b}{\sqrt{cx^3}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m*sqrt(a + b/sqrt(c*x^3)),x, algorithm="maxima")

[Out] integrate((d*x)^m*sqrt(a + b/sqrt(c*x^3)), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m*sqrt(a + b/sqrt(c*x^3)),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a + \frac{b}{\sqrt{cx^3}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)**m*(a+b/(c*x**3)**(1/2))**(1/2),x)

[Out] Integral((d*x)**m*sqrt(a + b/sqrt(c*x**3)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a + \frac{b}{\sqrt{cx^3}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m*sqrt(a + b/sqrt(c*x^3)),x, algorithm="giac")

[Out] integrate((d*x)^m*sqrt(a + b/sqrt(c*x^3)), x)
```

3.2974 $\int (dx)^m \sqrt{a+\frac{b}{(cx^3)^{3/2}}}\,dx$

Optimal. Leaf size=102

$$\frac{x(dx)^m\sqrt{a+\frac{bc^3x^9}{(cx^3)^{9/2}}}\,{}_2F_1\left(-\frac{1}{2},-\frac{2}{9}(m+1);\frac{1}{9}(7-2m);-\frac{bc^3x^9}{a(cx^3)^{9/2}}\right)}{(m+1)\sqrt{\frac{bc^3x^9}{a(cx^3)^{9/2}}+1}}$$

```
[Out] (x*(d*x)^m*Sqrt[a + (b*c^3*x^9)/(c*x^3)^(9/2)]*Hypergeometric2F1[
-1/2, (-2*(1 + m))/9, (7 - 2*m)/9, -((b*c^3*x^9)/(a*(c*x^3)^(9/2)
))])/((1 + m)*Sqrt[1 + (b*c^3*x^9)/(a*(c*x^3)^(9/2))])
```

Rubi [A] time = 0.306082, antiderivative size = 102, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.261$

$$\frac{x(dx)^m\sqrt{a+\frac{bc^3x^9}{(cx^3)^{9/2}}}\,{}_2F_1\left(-\frac{1}{2},-\frac{2}{9}(m+1);\frac{1}{9}(7-2m);-\frac{bc^3x^9}{a(cx^3)^{9/2}}\right)}{(m+1)\sqrt{\frac{bc^3x^9}{a(cx^3)^{9/2}}+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[(d*x)^m*Sqrt[a + b/(c*x^3)^(3/2)],x]
```

```
[Out] (x*(d*x)^m*Sqrt[a + (b*c^3*x^9)/(c*x^3)^(9/2)]*Hypergeometric2F1[
-1/2, (-2*(1 + m))/9, (7 - 2*m)/9, -((b*c^3*x^9)/(a*(c*x^3)^(9/2)
))])/((1 + m)*Sqrt[1 + (b*c^3*x^9)/(a*(c*x^3)^(9/2))])
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m\sqrt{a+\frac{b}{(cx^3)^{\frac{3}{2}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x)**m*(a+b/(c*x**3)**(3/2))**(1/2),x)
```

```
[Out] Integral((d*x)**m*sqrt(a + b/(c*x**3)**(3/2)), x)
```

Mathematica [A] time = 0.0721971, size = 0, normalized size = 0.

$$\int (dx)^m\sqrt{a+\frac{b}{(cx^3)^{3/2}}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(d*x)^m*Sqrt[a + b/(c*x^3)^(3/2)],x]
```

```
[Out] Integrate[(d*x)^m*Sqrt[a + b/(c*x^3)^(3/2)], x]
```

Maple [F] time = 0.067, size = 0, normalized size = 0.

$$\int (dx)^m\sqrt{a+b\left(cx^3\right)^{-\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x)^m*(a+b/(c*x^3)^(3/2))^(1/2),x)
```

```
[Out] int((d*x)^m*(a+b/(c*x^3)^(3/2))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a + \frac{b}{(cx^3)^{\frac{3}{2}}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m*sqrt(a + b/(c*x^3)^(3/2)),x, algorithm="maxima")
```

```
[Out] integrate((d*x)^m*sqrt(a + b/(c*x^3)^(3/2)), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m*sqrt(a + b/(c*x^3)^(3/2)),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)**m*(a+b/(c*x**3)**(3/2))**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a + \frac{b}{(cx^3)^{\frac{3}{2}}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m*sqrt(a + b/(c*x^3)^(3/2)),x, algorithm="giac")
```

```
[Out] integrate((d*x)^m*sqrt(a + b/(c*x^3)^(3/2)), x)
```

3.2975 $\int \sqrt{a+b\sqrt{\frac{c}{x}}}x\,dx$

Optimal. Leaf size=169

$$-\frac{5b^4c^2\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{\frac{c}{x}}}}{\sqrt{a}}\right)}{32a^{7/2}}+\frac{5b^3c^2\sqrt{a+b\sqrt{\frac{c}{x}}}}{32a^3\sqrt{\frac{c}{x}}}-\frac{5b^2cx\sqrt{a+b\sqrt{\frac{c}{x}}}}{48a^2}+\frac{bc^2\sqrt{a+b\sqrt{\frac{c}{x}}}}{12a\left(\frac{c}{x}\right)^{3/2}}+\frac{1}{2}x^2\sqrt{a+b\sqrt{\frac{c}{x}}}$$

```
[Out] (b*c^2*Sqrt[a + b*Sqrt[c/x]])/(12*a*(c/x)^(3/2)) + (5*b^3*c^2*Sqr
t[a + b*Sqrt[c/x]])/(32*a^3*Sqrt[c/x]) - (5*b^2*c*Sqrt[a + b*Sqrt
[c/x]]*x)/(48*a^2) + (Sqrt[a + b*Sqrt[c/x]]*x^2)/2 - (5*b^4*c^2*A
rcTanh[Sqrt[a + b*Sqrt[c/x]]/Sqrt[a]])/(32*a^(7/2))
```

Rubi [A] time = 0.242404, antiderivative size = 172, normalized size of antiderivative = 1.02, number of steps used = 8, number of rules used = 6, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.316

$$-\frac{5b^4c^2\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{\frac{c}{x}}}}{\sqrt{a}}\right)}{32a^{7/2}}+\frac{5b^3c^2\sqrt{a+b\sqrt{\frac{c}{x}}}}{32a^3\sqrt{\frac{c}{x}}}-\frac{5b^2cx\sqrt{a+b\sqrt{\frac{c}{x}}}}{48a^2}+\frac{bx^3\left(\frac{c}{x}\right)^{3/2}\sqrt{a+b\sqrt{\frac{c}{x}}}}{12ac}+\frac{1}{2}x^2\sqrt{a+b\sqrt{\frac{c}{x}}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[c/x]]*x,x]
```

```
[Out] (5*b^3*c^2*Sqrt[a + b*Sqrt[c/x]])/(32*a^3*Sqrt[c/x]) - (5*b^2*c*S
qrt[a + b*Sqrt[c/x]]*x)/(48*a^2) + (Sqrt[a + b*Sqrt[c/x]]*x^2)/2
+ (b*Sqrt[a + b*Sqrt[c/x]]*(c/x)^(3/2)*x^3)/(12*a*c) - (5*b^4*c^2
*ArcTanh[Sqrt[a + b*Sqrt[c/x]]/Sqrt[a]])/(32*a^(7/2))
```

Rubi in Sympy [A] time = 24.0723, size = 143, normalized size = 0.85

$$\frac{x^2\sqrt{a+b\sqrt{\frac{c}{x}}}}{2}+\frac{bc^2\sqrt{a+b\sqrt{\frac{c}{x}}}}{12a\left(\frac{c}{x}\right)^{\frac{3}{2}}}-\frac{5b^2cx\sqrt{a+b\sqrt{\frac{c}{x}}}}{48a^2}+\frac{5b^3c^2\sqrt{a+b\sqrt{\frac{c}{x}}}}{32a^3\sqrt{\frac{c}{x}}}-\frac{5b^4c^2\operatorname{atanh}\left(\frac{\sqrt{a+b\sqrt{\frac{c}{x}}}}{\sqrt{a}}\right)}{32a^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(a+b*(c/x)**(1/2))**(1/2),x)
```

```
[Out] x**2*sqrt(a + b*sqrt(c/x))/2 + b*c**2*sqrt(a + b*sqrt(c/x))/(12*a
*(c/x)**(3/2)) - 5*b**2*c*x*sqrt(a + b*sqrt(c/x))/(48*a**2) + 5*b
**3*c**2*sqrt(a + b*sqrt(c/x))/(32*a**3*sqrt(c/x)) - 5*b**4*c**2*
atanh(sqrt(a + b*sqrt(c/x))/sqrt(a))/(32*a**(7/2))
```

Mathematica [A] time = 0.185862, size = 111, normalized size = 0.66

$$\frac{\sqrt{a}x\sqrt{a+b\sqrt{\frac{c}{x}}}\left(48a^3x+8a^2bx\sqrt{\frac{c}{x}}-10ab^2c+15b^3c\sqrt{\frac{c}{x}}\right)-15b^4c^2\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{\frac{c}{x}}}}{\sqrt{a}}\right)}{96a^{7/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b*Sqrt[c/x]]*x,x]
```

```
[Out] (Sqrt[a]*Sqrt[a + b*Sqrt[c/x]]*x*(-10*a*b^2*c + 15*b^3*c*Sqrt[c/x
] + 48*a^3*x + 8*a^2*b*Sqrt[c/x]*x) - 15*b^4*c^2*ArcTanh[Sqrt[a +
 b*Sqrt[c/x]]/Sqrt[a]])/(96*a^(7/2))
```

Maple [A] time = 0.039, size = 211, normalized size = 1.3

$$-\frac{1}{192}\sqrt{a+b\sqrt{\frac{c}{x}}}\sqrt{x}\left(-30\,a^{3/2}\sqrt{ax+b\sqrt{\frac{c}{x}}x}\left(\frac{c}{x}\right)^{3/2}x^{3/2}b^{3}-96\sqrt{x}\left(ax+b\sqrt{\frac{c}{x}}x\right)^{3/2}a^{7/2}+80\,a^{5/2}\left(ax+b\sqrt{\frac{c}{x}}x\right)^{3/2}\sqrt{\frac{c}{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(a+b*(c/x)^(1/2))^(1/2),x)
```

```
[Out] -1/192*(a+b*(c/x)^(1/2))^(1/2)*x^(1/2)*(-30*a^(3/2)*(a*x+b*(c/x)^
(1/2)*x)^(1/2)*(c/x)^(3/2)*x^(3/2)*b^3-96*x^(1/2)*(a*x+b*(c/x)^(1
/2)*x)^(3/2)*a^(7/2)+80*a^(5/2)*(a*x+b*(c/x)^(1/2)*x)^(3/2)*(c/x)
^(1/2)*x^(1/2)*b-60*a^(5/2)*(a*x+b*(c/x)^(1/2)*x)^(1/2)*c*x^(1/2)
*b^2+15*ln(1/2*(b*(c/x)^(1/2)*x^(1/2)+2*(a*x+b*(c/x)^(1/2)*x)^(1/
2)*a^(1/2)+2*a*x^(1/2))/a^(1/2))*c^2*a*b^4)/(x*(a+b*(c/x)^(1/2)))
^(1/2)/a^(9/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(c/x) + a)*x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.304663, size = 1, normalized size = 0.01

$$\left[\frac{15\,b^{4}c^{2}\log\left(\frac{\left(b\sqrt{\frac{c}{x}}+2\,a\right)\sqrt{a}-2\sqrt{b\sqrt{\frac{c}{x}}+a}\,a}{\sqrt{\frac{c}{x}}}\right)-2\left(10\,ab^{2}cx-48\,a^{3}x^{2}-\left(15\,b^{3}cx+8\,a^{2}bx^{2}\right)\sqrt{\frac{c}{x}}\right)\sqrt{b\sqrt{\frac{c}{x}}+a}\sqrt{a}}{192\,a^{\frac{7}{2}}},\ \frac{15\,b^{4}c^{2}\arctan\left(-\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(c/x) + a)*x,x, algorithm="fricas")
```

```
[Out] [1/192*(15*b^4*c^2*log(((b*sqrt(c/x) + 2*a)*sqrt(a) - 2*sqrt(b*sq
rt(c/x) + a)*a)/sqrt(c/x)) - 2*(10*a*b^2*c*x - 48*a^3*x^2 - (15*b
^3*c*x + 8*a^2*b*x^2)*sqrt(c/x))*sqrt(b*sqrt(c/x) + a)*sqrt(a))/a
^(7/2), 1/96*(15*b^4*c^2*arctan(a/(sqrt(b*sqrt(c/x) + a)*sqrt(-a)
)) + ((15*b^3*c*x + 8*a^2*b*x^2)*sqrt(-a)*sqrt(c/x) - 2*(5*a*b^2*
c*x - 24*a^3*x^2)*sqrt(-a))*sqrt(b*sqrt(c/x) + a))/(sqrt(-a)*a^3)
]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x\sqrt{a+b\sqrt{\frac{c}{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(a+b*(c/x)**(1/2))**(1/2),x)
```

```
[Out] Integral(x*sqrt(a + b*sqrt(c/x)), x)
```

GIAC/XCAS [F(-1)]   time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(c/x) + a)*x,x, algorithm="giac")
```

```
[Out] Timed out
```

3.2976 $\int \sqrt{a+b\sqrt{\frac{c}{x}}}\,dx$

Optimal. Leaf size=92

$$-\frac{b^2c\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{\frac{c}{x}}}}{\sqrt{a}}\right)}{2a^{3/2}}+\frac{bc\sqrt{a+b\sqrt{\frac{c}{x}}}}{2a\sqrt{\frac{c}{x}}}+x\sqrt{a+b\sqrt{\frac{c}{x}}}$$

```
[Out] (b*c*Sqrt[a + b*Sqrt[c/x]])/(2*a*Sqrt[c/x]) + Sqrt[a + b*Sqrt[c/x
]]*x - (b^2*c*ArcTanh[Sqrt[a + b*Sqrt[c/x]]/Sqrt[a]])/(2*a^(3/2))
```

Rubi [A] time = 0.112581, antiderivative size = 92, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.353$

$$-\frac{b^2c\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{\frac{c}{x}}}}{\sqrt{a}}\right)}{2a^{3/2}}+\frac{bc\sqrt{a+b\sqrt{\frac{c}{x}}}}{2a\sqrt{\frac{c}{x}}}+x\sqrt{a+b\sqrt{\frac{c}{x}}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[c/x]],x]
```

```
[Out] (b*c*Sqrt[a + b*Sqrt[c/x]])/(2*a*Sqrt[c/x]) + Sqrt[a + b*Sqrt[c/x
]]*x - (b^2*c*ArcTanh[Sqrt[a + b*Sqrt[c/x]]/Sqrt[a]])/(2*a^(3/2))
```

Rubi in Sympy [A] time = 11.6816, size = 73, normalized size = 0.79

$$x\sqrt{a+b\sqrt{\frac{c}{x}}}+\frac{bc\sqrt{a+b\sqrt{\frac{c}{x}}}}{2a\sqrt{\frac{c}{x}}}-\frac{b^2c\,\mathrm{atanh}\left(\frac{\sqrt{a+b\sqrt{\frac{c}{x}}}}{\sqrt{a}}\right)}{2a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c/x)**(1/2))**(1/2),x)
```

```
[Out] x*sqrt(a + b*sqrt(c/x)) + b*c*sqrt(a + b*sqrt(c/x))/(2*a*sqrt(c/x
)) - b**2*c*atanh(sqrt(a + b*sqrt(c/x))/sqrt(a))/(2*a**(3/2))
```

Mathematica [A] time = 0.105072, size = 79, normalized size = 0.86

$$\frac{\sqrt{a}x\sqrt{a+b\sqrt{\frac{c}{x}}}\left(2a+b\sqrt{\frac{c}{x}}\right)-b^2c\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{\frac{c}{x}}}}{\sqrt{a}}\right)}{2a^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b*Sqrt[c/x]],x]
```

```
[Out] (Sqrt[a]*Sqrt[a + b*Sqrt[c/x]]*(2*a + b*Sqrt[c/x])*x - b^2*c*ArcT
anh[Sqrt[a + b*Sqrt[c/x]]/Sqrt[a]])/(2*a^(3/2))
```

Maple [B] time = 0.031, size = 147, normalized size = 1.6

$$\frac{1}{4}\sqrt{a+b\sqrt{\frac{c}{x}}}\,\sqrt{x}\left(2\,a^{3/2}\sqrt{ax+b\sqrt{\frac{c}{x}}x}\sqrt{\frac{c}{x}}\sqrt{x}b-b^2c\ln\left(\frac{1}{2}\left(b\sqrt{\frac{c}{x}}\sqrt{x}+2\sqrt{ax+b\sqrt{\frac{c}{x}}x}\sqrt{a}+2\,a\sqrt{x}\right)\frac{1}{\sqrt{a}}\right)a+4\,a^{5/2}\sqrt{ax+}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c/x)^(1/2))^(1/2),x)
```

```
[Out] 1/4*(a+b*(c/x)^(1/2))^(1/2)*x^(1/2)*(2*a^(3/2)*(a*x+b*(c/x)^(1/2)
*x)^(1/2)*(c/x)^(1/2)*x^(1/2)*b-b^2*c*ln(1/2*(b*(c/x)^(1/2)*x^(1/
2)+2*(a*x+b*(c/x)^(1/2)*x)^(1/2)*a^(1/2)+2*a*x^(1/2))/a^(1/2))*a+
4*a^(5/2)*(a*x+b*(c/x)^(1/2)*x)^(1/2)*x^(1/2))/(x*(a+b*(c/x)^(1/2
)))^(1/2)/a^(5/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(c/x) + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.291769, size = 1, normalized size = 0.01

$$\left[\frac{b^2c\log\left(\frac{\left(b\sqrt{\frac{c}{x}}+2\,a\right)\sqrt{a}-2\,\sqrt{b\sqrt{\frac{c}{x}}+a}a}{\sqrt{\frac{c}{x}}}\right)+2\left(bx\sqrt{\frac{c}{x}}+2\,ax\right)\sqrt{b\sqrt{\frac{c}{x}}+a}\sqrt{a}}{4\,a^{\frac{3}{2}}},\ \frac{b^2c\arctan\left(\frac{a}{\sqrt{b\sqrt{\frac{c}{x}}+a}\sqrt{-a}}\right)+\left(\sqrt{-a}bx\sqrt{\frac{c}{x}}+2\,\sqrt{-a}ax\right)}{2\,\sqrt{-a}a}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(c/x) + a),x, algorithm="fricas")
```

```
[Out] [1/4*(b^2*c*log(((b*sqrt(c/x) + 2*a)*sqrt(a) - 2*sqrt(b*sqrt(c/x)
 + a)*a)/sqrt(c/x)) + 2*(b*x*sqrt(c/x) + 2*a*x)*sqrt(b*sqrt(c/x)
+ a)*sqrt(a))/a^(3/2), 1/2*(b^2*c*arctan(a/(sqrt(b*sqrt(c/x) + a)
*sqrt(-a))) + (sqrt(-a)*b*x*sqrt(c/x) + 2*sqrt(-a)*a*x)*sqrt(b*sq
rt(c/x) + a))/(sqrt(-a)*a)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\sqrt{a+b\sqrt{\frac{c}{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c/x)**(1/2))**(1/2),x)
```

```
[Out] Integral(sqrt(a + b*sqrt(c/x)), x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(c/x) + a),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError
```

3.2977 $\int \frac{\sqrt{a+b\sqrt{\frac{c}{x}}}}{x}\,dx$

Optimal. Leaf size=51

$$4\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{\frac{c}{x}}}}{\sqrt{a}}\right)-4\sqrt{a+b\sqrt{\frac{c}{x}}}$$

```
[Out] -4*Sqrt[a + b*Sqrt[c/x]] + 4*Sqrt[a]*ArcTanh[Sqrt[a + b*Sqrt[c/x]
]/Sqrt[a]]
```

Rubi [A] time = 0.09835, antiderivative size = 51, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238

$$4\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{\frac{c}{x}}}}{\sqrt{a}}\right)-4\sqrt{a+b\sqrt{\frac{c}{x}}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[c/x]]/x,x]
```

```
[Out] -4*Sqrt[a + b*Sqrt[c/x]] + 4*Sqrt[a]*ArcTanh[Sqrt[a + b*Sqrt[c/x]
]/Sqrt[a]]
```

Rubi in Sympy [A] time = 9.12758, size = 41, normalized size = 0.8

$$4\sqrt{a}\,\mathrm{atanh}\left(\frac{\sqrt{a+b\sqrt{\frac{c}{x}}}}{\sqrt{a}}\right)-4\sqrt{a+b\sqrt{\frac{c}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c/x)**(1/2))**(1/2)/x,x)
```

```
[Out] 4*sqrt(a)*atanh(sqrt(a + b*sqrt(c/x))/sqrt(a)) - 4*sqrt(a + b*sqr
t(c/x))
```

Mathematica [A] time = 0.0458404, size = 52, normalized size = 1.02

$$4\left(\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{\frac{c}{x}}}}{\sqrt{a}}\right)-\sqrt{a+b\sqrt{\frac{c}{x}}}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b*Sqrt[c/x]]/x,x]
```

```
[Out] 4*(-Sqrt[a + b*Sqrt[c/x]] + Sqrt[a]*ArcTanh[Sqrt[a + b*Sqrt[c/x]]
/Sqrt[a]])
```

Maple [B] time = 0.032, size = 150, normalized size = 2.9

$$2\frac{1}{bx\sqrt{a}}\sqrt{a+b\sqrt{\frac{c}{x}}}\left(\ln\left(1/2\frac{1}{\sqrt{a}}\left(b\sqrt{\frac{c}{x}}\sqrt{x}+2\sqrt{ax+b\sqrt{\frac{c}{x}}x}\sqrt{a}+2a\sqrt{x}\right)\right)\sqrt{\frac{c}{x}}x^{3/2}ab+2a^{3/2}\sqrt{ax+b\sqrt{\frac{c}{x}}x}x-2\left(ax+b\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c/x)^(1/2))^(1/2)/x,x)
```

```
[Out] 2*(a+b*(c/x)^(1/2))^(1/2)*(ln(1/2*(b*(c/x)^(1/2)*x^(1/2)+2*(a*x+b
*(c/x)^(1/2)*x)^(1/2)*a^(1/2)+2*a*x^(1/2))/a^(1/2))*(c/x)^(1/2)*x
^(3/2)*a*b+2*a^(3/2)*(a*x+b*(c/x)^(1/2)*x)^(1/2)*x-2*(a*x+b*(c/x)
^(1/2)*x)^(3/2)*a^(1/2))/x/(x*(a+b*(c/x)^(1/2)))^(1/2)/b/(c/x)^(1
/2)/a^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(c/x) + a)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.266474, size = 1, normalized size = 0.02

$$\left[2\sqrt{a}\log\left(\frac{b\sqrt{\frac{c}{x}}+2\sqrt{b\sqrt{\frac{c}{x}}+a}\sqrt{a}+2a}{\sqrt{\frac{c}{x}}}\right)-4\sqrt{b\sqrt{\frac{c}{x}}+a}, 4\sqrt{-a}\arctan\left(\frac{\sqrt{b\sqrt{\frac{c}{x}}+a}}{\sqrt{-a}}\right)-4\sqrt{b\sqrt{\frac{c}{x}}+a}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(c/x) + a)/x,x, algorithm="fricas")
```

```
[Out] [2*sqrt(a)*log((b*sqrt(c/x) + 2*sqrt(b*sqrt(c/x) + a)*sqrt(a) + 2
*a)/sqrt(c/x)) - 4*sqrt(b*sqrt(c/x) + a), 4*sqrt(-a)*arctan(sqrt(
b*sqrt(c/x) + a)/sqrt(-a)) - 4*sqrt(b*sqrt(c/x) + a)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\sqrt{a+b\sqrt{\frac{c}{x}}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c/x)**(1/2))**(1/2)/x,x)
```

```
[Out] Integral(sqrt(a + b*sqrt(c/x))/x, x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(c/x) + a)/x,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError
```

3.2978 $\int \frac{\sqrt{a+b\sqrt{\frac{c}{x}}}}{x^2}\,dx$

Optimal. Leaf size=56

$$\frac{4a\left(a+b\sqrt{\frac{c}{x}}\right)^{3/2}}{3b^2c}-\frac{4\left(a+b\sqrt{\frac{c}{x}}\right)^{5/2}}{5b^2c}$$

```
[Out] (4*a*(a + b*Sqrt[c/x])^(3/2))/(3*b^2*c) - (4*(a + b*Sqrt[c/x])^(5
/2))/(5*b^2*c)
```

Rubi [A] time = 0.095529, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$\frac{4a\left(a+b\sqrt{\frac{c}{x}}\right)^{3/2}}{3b^2c}-\frac{4\left(a+b\sqrt{\frac{c}{x}}\right)^{5/2}}{5b^2c}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[c/x]]/x^2,x]
```

```
[Out] (4*a*(a + b*Sqrt[c/x])^(3/2))/(3*b^2*c) - (4*(a + b*Sqrt[c/x])^(5
/2))/(5*b^2*c)
```

Rubi in Sympy [A] time = 9.95141, size = 44, normalized size = 0.79

$$\frac{4a\left(a+b\sqrt{\frac{c}{x}}\right)^{\frac{3}{2}}}{3b^2c}-\frac{4\left(a+b\sqrt{\frac{c}{x}}\right)^{\frac{5}{2}}}{5b^2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c/x)**(1/2))**(1/2)/x**2,x)
```

```
[Out] 4*a*(a + b*sqrt(c/x))**(3/2)/(3*b**2*c) - 4*(a + b*sqrt(c/x))**(5
/2)/(5*b**2*c)
```

Mathematica [A] time = 0.0434579, size = 43, normalized size = 0.77

$$\frac{4\left(2a-3b\sqrt{\frac{c}{x}}\right)\left(a+b\sqrt{\frac{c}{x}}\right)^{3/2}}{15b^2c}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b*Sqrt[c/x]]/x^2,x]
```

```
[Out] (4*(2*a - 3*b*Sqrt[c/x])*(a + b*Sqrt[c/x])^(3/2))/(15*b^2*c)
```

Maple [A] time = 0.03, size = 70, normalized size = 1.3

$$-\frac{4}{15\,cxb^2}\sqrt{a+b\sqrt{\frac{c}{x}}}\left(ax+b\sqrt{\frac{c}{x}}x\right)^{\frac{3}{2}}\left(3\,b\sqrt{\frac{c}{x}}-2\,a\right)\frac{1}{\sqrt{x\left(a+b\sqrt{\frac{c}{x}}\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c/x)^(1/2))^(1/2)/x^2,x)
```

```
[Out] -4/15*(a+b*(c/x)^(1/2))^(1/2)*(a*x+b*(c/x)^(1/2)*x)^(3/2)/x/c*(3*
b*(c/x)^(1/2)-2*a)/(x*(a+b*(c/x)^(1/2)))^(1/2)/b^2
```

Maxima [A] time = 1.33199, size = 58, normalized size = 1.04

$$-\frac{4\left(\frac{3\left(b\sqrt{\frac{c}{x}}+a\right)^{\frac{5}{2}}}{b^2}-\frac{5\left(b\sqrt{\frac{c}{x}}+a\right)^{\frac{3}{2}}a}{b^2}\right)}{15\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(c/x) + a)/x^2,x, algorithm="maxima")
```

```
[Out] -4/15*(3*(b*sqrt(c/x) + a)^(5/2)/b^2 - 5*(b*sqrt(c/x) + a)^(3/2)*
a/b^2)/c
```

Fricas [A] time = 0.249477, size = 65, normalized size = 1.16

$$-\frac{4\left(abx\sqrt{\frac{c}{x}}+3\,b^2c-2\,a^2x\right)\sqrt{b\sqrt{\frac{c}{x}}+a}}{15\,b^2cx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(c/x) + a)/x^2,x, algorithm="fricas")
```

```
[Out] -4/15*(a*b*x*sqrt(c/x) + 3*b^2*c - 2*a^2*x)*sqrt(b*sqrt(c/x) + a)
/(b^2*c*x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\sqrt{a+b\sqrt{\frac{c}{x}}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c/x)**(1/2))**(1/2)/x**2,x)
```

```
[Out] Integral(sqrt(a + b*sqrt(c/x))/x**2, x)
```

GIAC/XCAS [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(c/x) + a)/x^2,x, algorithm="giac")
```

```
[Out] Timed out
```

3.2979 $\int \frac{\sqrt{a+b\sqrt{\frac{c}{x}}}}{x^3}\,dx$

Optimal. Leaf size=116

$$\frac{4a^3\left(a+b\sqrt{\frac{c}{x}}\right)^{3/2}}{3b^4c^2}-\frac{12a^2\left(a+b\sqrt{\frac{c}{x}}\right)^{5/2}}{5b^4c^2}-\frac{4\left(a+b\sqrt{\frac{c}{x}}\right)^{9/2}}{9b^4c^2}+\frac{12a\left(a+b\sqrt{\frac{c}{x}}\right)^{7/2}}{7b^4c^2}$$

```
[Out] (4*a^3*(a + b*Sqrt[c/x])^(3/2))/(3*b^4*c^2) - (12*a^2*(a + b*Sqrt
[c/x])^(5/2))/(5*b^4*c^2) + (12*a*(a + b*Sqrt[c/x])^(7/2))/(7*b^4
*c^2) - (4*(a + b*Sqrt[c/x])^(9/2))/(9*b^4*c^2)
```

Rubi [A] time = 0.164548, antiderivative size = 116, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$\frac{4a^3\left(a+b\sqrt{\frac{c}{x}}\right)^{3/2}}{3b^4c^2}-\frac{12a^2\left(a+b\sqrt{\frac{c}{x}}\right)^{5/2}}{5b^4c^2}-\frac{4\left(a+b\sqrt{\frac{c}{x}}\right)^{9/2}}{9b^4c^2}+\frac{12a\left(a+b\sqrt{\frac{c}{x}}\right)^{7/2}}{7b^4c^2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[c/x]]/x^3,x]
```

```
[Out] (4*a^3*(a + b*Sqrt[c/x])^(3/2))/(3*b^4*c^2) - (12*a^2*(a + b*Sqrt
[c/x])^(5/2))/(5*b^4*c^2) + (12*a*(a + b*Sqrt[c/x])^(7/2))/(7*b^4
*c^2) - (4*(a + b*Sqrt[c/x])^(9/2))/(9*b^4*c^2)
```

Rubi in Sympy [A] time = 20.2083, size = 102, normalized size = 0.88

$$\frac{4a^3\left(a+b\sqrt{\frac{c}{x}}\right)^{\frac{3}{2}}}{3b^4c^2}-\frac{12a^2\left(a+b\sqrt{\frac{c}{x}}\right)^{\frac{5}{2}}}{5b^4c^2}+\frac{12a\left(a+b\sqrt{\frac{c}{x}}\right)^{\frac{7}{2}}}{7b^4c^2}-\frac{4\left(a+b\sqrt{\frac{c}{x}}\right)^{\frac{9}{2}}}{9b^4c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c/x)**(1/2))**(1/2)/x**3,x)
```

```
[Out] 4*a**3*(a + b*sqrt(c/x))**(3/2)/(3*b**4*c**2) - 12*a**2*(a + b*sq
rt(c/x))**(5/2)/(5*b**4*c**2) + 12*a*(a + b*sqrt(c/x))**(7/2)/(7*
b**4*c**2) - 4*(a + b*sqrt(c/x))**(9/2)/(9*b**4*c**2)
```

Mathematica [A] time = 0.0565637, size = 75, normalized size = 0.65

$$\frac{4\left(a+b\sqrt{\frac{c}{x}}\right)^{3/2}\left(16a^3x-24a^2bx\sqrt{\frac{c}{x}}+30ab^2c-35b^3c\sqrt{\frac{c}{x}}\right)}{315b^4c^2x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b*Sqrt[c/x]]/x^3,x]
```

```
[Out] (4*(a + b*Sqrt[c/x])^(3/2)*(30*a*b^2*c - 35*b^3*c*Sqrt[c/x] + 16*
a^3*x - 24*a^2*b*Sqrt[c/x]*x))/(315*b^4*c^2*x)
```

Maple [A] time = 0.03, size = 97, normalized size = 0.8

$$-\frac{4}{315\,x^{2}c^{2}b^{4}}\sqrt{a+b\sqrt{\frac{c}{x}}}\left(ax+b\sqrt{\frac{c}{x}}x\right)^{\frac{3}{2}}\left(35\,x\left(\frac{c}{x}\right)^{3/2}b^{3}+24\,x\sqrt{\frac{c}{x}}a^{2}b-16\,a^{3}x-30\,acb^{2}\right)\frac{1}{\sqrt{x\left(a+b\sqrt{\frac{c}{x}}\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c/x)^(1/2))^(1/2)/x^3,x)
```

```
[Out] -4/315*(a+b*(c/x)^(1/2))^(1/2)*(a*x+b*(c/x)^(1/2)*x)^(3/2)/x^2/c^
2*(35*x*(c/x)^(3/2)*b^3+24*x*(c/x)^(1/2)*a^2*b-16*a^3*x-30*a*c*b^
2)/(x*(a+b*(c/x)^(1/2)))^(1/2)/b^4
```

Maxima [A] time = 1.42676, size = 115, normalized size = 0.99

$$-\frac{4\left(\frac{35\left(b\sqrt{\frac{c}{x}}+a\right)^{\frac{9}{2}}}{b^{4}}-\frac{135\left(b\sqrt{\frac{c}{x}}+a\right)^{\frac{7}{2}}a}{b^{4}}+\frac{189\left(b\sqrt{\frac{c}{x}}+a\right)^{\frac{5}{2}}a^{2}}{b^{4}}-\frac{105\left(b\sqrt{\frac{c}{x}}+a\right)^{\frac{3}{2}}a^{3}}{b^{4}}\right)}{315\,c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(c/x) + a)/x^3,x, algorithm="maxima")
```

```
[Out] -4/315*(35*(b*sqrt(c/x) + a)^(9/2)/b^4 - 135*(b*sqrt(c/x) + a)^(7
/2)*a/b^4 + 189*(b*sqrt(c/x) + a)^(5/2)*a^2/b^4 - 105*(b*sqrt(c/x
) + a)^(3/2)*a^3/b^4)/c^2
```

Fricas [A] time = 0.255793, size = 104, normalized size = 0.9

$$-\frac{4\left(35\,b^{4}c^{2}-6\,a^{2}b^{2}cx-16\,a^{4}x^{2}+\left(5\,ab^{3}cx+8\,a^{3}bx^{2}\right)\sqrt{\frac{c}{x}}\right)\sqrt{b\sqrt{\frac{c}{x}}+a}}{315\,b^{4}c^{2}x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(c/x) + a)/x^3,x, algorithm="fricas")
```

```
[Out] -4/315*(35*b^4*c^2 - 6*a^2*b^2*c*x - 16*a^4*x^2 + (5*a*b^3*c*x +
8*a^3*b*x^2)*sqrt(c/x))*sqrt(b*sqrt(c/x) + a)/(b^4*c^2*x^2)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\sqrt{a+b\sqrt{\frac{c}{x}}}}{x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c/x)**(1/2))**(1/2)/x**3,x)
```

```
[Out] Integral(sqrt(a + b*sqrt(c/x))/x**3, x)
```

GIAC/XCAS [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(c/x) + a)/x^3,x, algorithm="giac")

[Out] Timed out
```

3.2980 $\int \frac{\sqrt{a+b\sqrt{\frac{c}{x}}}}{x^4}\,dx$

Optimal. Leaf size=174

$$\frac{4a^5\left(a+b\sqrt{\frac{c}{x}}\right)^{3/2}}{3b^6c^3}-\frac{4a^4\left(a+b\sqrt{\frac{c}{x}}\right)^{5/2}}{b^6c^3}+\frac{40a^3\left(a+b\sqrt{\frac{c}{x}}\right)^{7/2}}{7b^6c^3}-\frac{40a^2\left(a+b\sqrt{\frac{c}{x}}\right)^{9/2}}{9b^6c^3}-\frac{4\left(a+b\sqrt{\frac{c}{x}}\right)^{13/2}}{13b^6c^3}+\frac{20a\left(a+b\sqrt{\frac{c}{x}}\right)^{11/2}}{11b^6c^3}$$

```
[Out] (4*a^5*(a + b*Sqrt[c/x])^(3/2))/(3*b^6*c^3) - (4*a^4*(a + b*Sqrt[
c/x])^(5/2))/(b^6*c^3) + (40*a^3*(a + b*Sqrt[c/x])^(7/2))/(7*b^6*
c^3) - (40*a^2*(a + b*Sqrt[c/x])^(9/2))/(9*b^6*c^3) + (20*a*(a +
b*Sqrt[c/x])^(11/2))/(11*b^6*c^3) - (4*(a + b*Sqrt[c/x])^(13/2))/
(13*b^6*c^3)
```

Rubi [A] time = 0.231799, antiderivative size = 174, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$\frac{4a^5\left(a+b\sqrt{\frac{c}{x}}\right)^{3/2}}{3b^6c^3}-\frac{4a^4\left(a+b\sqrt{\frac{c}{x}}\right)^{5/2}}{b^6c^3}+\frac{40a^3\left(a+b\sqrt{\frac{c}{x}}\right)^{7/2}}{7b^6c^3}-\frac{40a^2\left(a+b\sqrt{\frac{c}{x}}\right)^{9/2}}{9b^6c^3}-\frac{4\left(a+b\sqrt{\frac{c}{x}}\right)^{13/2}}{13b^6c^3}+\frac{20a\left(a+b\sqrt{\frac{c}{x}}\right)^{11/2}}{11b^6c^3}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[c/x]]/x^4,x]
```

```
[Out] (4*a^5*(a + b*Sqrt[c/x])^(3/2))/(3*b^6*c^3) - (4*a^4*(a + b*Sqrt[
c/x])^(5/2))/(b^6*c^3) + (40*a^3*(a + b*Sqrt[c/x])^(7/2))/(7*b^6*
c^3) - (40*a^2*(a + b*Sqrt[c/x])^(9/2))/(9*b^6*c^3) + (20*a*(a +
b*Sqrt[c/x])^(11/2))/(11*b^6*c^3) - (4*(a + b*Sqrt[c/x])^(13/2))/
(13*b^6*c^3)
```

Rubi in Sympy [A] time = 30.0696, size = 155, normalized size = 0.89

$$\frac{4a^5\left(a+b\sqrt{\frac{c}{x}}\right)^{\frac{3}{2}}}{3b^6c^3}-\frac{4a^4\left(a+b\sqrt{\frac{c}{x}}\right)^{\frac{5}{2}}}{b^6c^3}+\frac{40a^3\left(a+b\sqrt{\frac{c}{x}}\right)^{\frac{7}{2}}}{7b^6c^3}-\frac{40a^2\left(a+b\sqrt{\frac{c}{x}}\right)^{\frac{9}{2}}}{9b^6c^3}+\frac{20a\left(a+b\sqrt{\frac{c}{x}}\right)^{\frac{11}{2}}}{11b^6c^3}-\frac{4\left(a+b\sqrt{\frac{c}{x}}\right)^{\frac{13}{2}}}{13b^6c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c/x)**(1/2))**(1/2)/x**4,x)
```

```
[Out] 4*a**5*(a + b*sqrt(c/x))**(3/2)/(3*b**6*c**3) - 4*a**4*(a + b*sqr
t(c/x))**(5/2)/(b**6*c**3) + 40*a**3*(a + b*sqrt(c/x))**(7/2)/(7*
b**6*c**3) - 40*a**2*(a + b*sqrt(c/x))**(9/2)/(9*b**6*c**3) + 20*
a*(a + b*sqrt(c/x))**(11/2)/(11*b**6*c**3) - 4*(a + b*sqrt(c/x))*
*(13/2)/(13*b**6*c**3)
```

Mathematica [A] time = 0.0731644, size = 111, normalized size = 0.64

$$\frac{4\left(a+b\sqrt{\frac{c}{x}}\right)^{3/2}\left(256a^5x^2-384a^4bx^2\sqrt{\frac{c}{x}}+480a^3b^2cx-560a^2b^3cx\sqrt{\frac{c}{x}}+630ab^4c^2-693b^5cx\left(\frac{c}{x}\right)^{3/2}\right)}{9009b^6c^3x^2}$$

Antiderivative was successfully verified.

```
[In]   Integrate[Sqrt[a + b*Sqrt[c/x]]/x^4,x]
```

```
[Out] (4*(a + b*Sqrt[c/x])^(3/2)*(630*a*b^4*c^2 + 480*a^3*b^2*c*x - 560
*a^2*b^3*c*Sqrt[c/x]*x - 693*b^5*c*(c/x)^(3/2)*x + 256*a^5*x^2 -
384*a^4*b*Sqrt[c/x]*x^2))/(9009*b^6*c^3*x^2)
```

Maple [A]   time = 0.031, size = 133, normalized size = 0.8

$$-\frac{4}{9009\,x^3c^3b^6}\sqrt{a+b\sqrt{\frac{c}{x}}}\left(ax+b\sqrt{\frac{c}{x}}x\right)^{\frac{3}{2}}\left(693\,x^2\left(\frac{c}{x}\right)^{5/2}b^5+560\,x^2\left(\frac{c}{x}\right)^{3/2}a^2b^3+384\,x^2\sqrt{\frac{c}{x}}a^4b-256\,a^5x^2-480\,xca^3b^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((a+b*(c/x)^(1/2))^(1/2)/x^4,x)
```

```
[Out] -4/9009*(a+b*(c/x)^(1/2))^(1/2)*(a*x+b*(c/x)^(1/2)*x)^(3/2)/x^3/c
^3*(693*x^2*(c/x)^(5/2)*b^5+560*x^2*(c/x)^(3/2)*a^2*b^3+384*x^2*(
c/x)^(1/2)*a^4*b-256*a^5*x^2-480*x*c*a^3*b^2-630*c^2*a*b^4)/(x*(a
+b*(c/x)^(1/2)))^(1/2)/b^6
```

Maxima [A]   time = 1.34587, size = 171, normalized size = 0.98

$$-\frac{4\left(\frac{693\left(b\sqrt{\frac{c}{x}}+a\right)^{\frac{13}{2}}}{b^6}-\frac{4095\left(b\sqrt{\frac{c}{x}}+a\right)^{\frac{11}{2}}a}{b^6}+\frac{10010\left(b\sqrt{\frac{c}{x}}+a\right)^{\frac{9}{2}}a^2}{b^6}-\frac{12870\left(b\sqrt{\frac{c}{x}}+a\right)^{\frac{7}{2}}a^3}{b^6}+\frac{9009\left(b\sqrt{\frac{c}{x}}+a\right)^{\frac{5}{2}}a^4}{b^6}-\frac{3003\left(b\sqrt{\frac{c}{x}}+a\right)^{\frac{3}{2}}a^5}{b^6}\right)}{9009\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(b*sqrt(c/x) + a)/x^4,x, algorithm="maxima")
```

```
[Out] -4/9009*(693*(b*sqrt(c/x) + a)^(13/2)/b^6 - 4095*(b*sqrt(c/x) + a
)^(11/2)*a/b^6 + 10010*(b*sqrt(c/x) + a)^(9/2)*a^2/b^6 - 12870*(b
*sqrt(c/x) + a)^(7/2)*a^3/b^6 + 9009*(b*sqrt(c/x) + a)^(5/2)*a^4/
b^6 - 3003*(b*sqrt(c/x) + a)^(3/2)*a^5/b^6)/c^3
```

Fricas [A]   time = 0.252676, size = 142, normalized size = 0.82

$$-\frac{4\left(693\,b^6c^3-70\,a^2b^4c^2x-96\,a^4b^2cx^2-256\,a^6x^3+\left(63\,ab^5c^2x+80\,a^3b^3cx^2+128\,a^5bx^3\right)\sqrt{\frac{c}{x}}\right)\sqrt{b\sqrt{\frac{c}{x}}+a}}{9009\,b^6c^3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(b*sqrt(c/x) + a)/x^4,x, algorithm="fricas")
```

```
[Out] -4/9009*(693*b^6*c^3 - 70*a^2*b^4*c^2*x - 96*a^4*b^2*c*x^2 - 256*
a^6*x^3 + (63*a*b^5*c^2*x + 80*a^3*b^3*c*x^2 + 128*a^5*b*x^3)*sqr
t(c/x))*sqrt(b*sqrt(c/x) + a)/(b^6*c^3*x^3)
```

Sympy [F]   time = 0., size = 0, normalized size = 0.

$$\int\frac{\sqrt{a+b\sqrt{\frac{c}{x}}}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c/x)**(1/2))**(1/2)/x**4,x)
```

```
[Out] Integral(sqrt(a + b*sqrt(c/x))/x**4, x)
```

GIAC/XCAS [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(c/x) + a)/x^4,x, algorithm="giac")
```

```
[Out] Timed out
```

3.2981 $\int \frac{x}{\sqrt{a+b\sqrt{\frac{c}{x}}}}\,dx$

Optimal. Leaf size=172

$$\frac{35b^4c^2\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{\frac{c}{x}}}}{\sqrt{a}}\right)}{32a^{9/2}}-\frac{35b^3c^2\sqrt{a+b\sqrt{\frac{c}{x}}}}{32a^4\sqrt{\frac{c}{x}}}+\frac{35b^2cx\sqrt{a+b\sqrt{\frac{c}{x}}}}{48a^3}-\frac{7bc^2\sqrt{a+b\sqrt{\frac{c}{x}}}}{12a^2\left(\frac{c}{x}\right)^{3/2}}+\frac{x^2\sqrt{a+b\sqrt{\frac{c}{x}}}}{2a}$$

```
[Out] (-7*b*c^2*Sqrt[a + b*Sqrt[c/x]])/(12*a^2*(c/x)^(3/2)) - (35*b^3*c
^2*Sqrt[a + b*Sqrt[c/x]])/(32*a^4*Sqrt[c/x]) + (35*b^2*c*Sqrt[a +
 b*Sqrt[c/x]]*x)/(48*a^3) + (Sqrt[a + b*Sqrt[c/x]]*x^2)/(2*a) + (
35*b^4*c^2*ArcTanh[Sqrt[a + b*Sqrt[c/x]]/Sqrt[a]])/(32*a^(9/2))
```

Rubi [A] time = 0.235741, antiderivative size = 175, normalized size of antiderivative = 1.02, number of steps used = 8, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263

$$\frac{35b^4c^2\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{\frac{c}{x}}}}{\sqrt{a}}\right)}{32a^{9/2}}-\frac{35b^3c^2\sqrt{a+b\sqrt{\frac{c}{x}}}}{32a^4\sqrt{\frac{c}{x}}}+\frac{35b^2cx\sqrt{a+b\sqrt{\frac{c}{x}}}}{48a^3}-\frac{7bx^3\left(\frac{c}{x}\right)^{3/2}\sqrt{a+b\sqrt{\frac{c}{x}}}}{12a^2c}+\frac{x^2\sqrt{a+b\sqrt{\frac{c}{x}}}}{2a}$$

Antiderivative was successfully verified.

```
[In]  Int[x/Sqrt[a + b*Sqrt[c/x]],x]
```

```
[Out] (-35*b^3*c^2*Sqrt[a + b*Sqrt[c/x]])/(32*a^4*Sqrt[c/x]) + (35*b^2*
c*Sqrt[a + b*Sqrt[c/x]]*x)/(48*a^3) + (Sqrt[a + b*Sqrt[c/x]]*x^2)
/(2*a) - (7*b*Sqrt[a + b*Sqrt[c/x]]*(c/x)^(3/2)*x^3)/(12*a^2*c) +
 (35*b^4*c^2*ArcTanh[Sqrt[a + b*Sqrt[c/x]]/Sqrt[a]])/(32*a^(9/2))
```

Rubi in Sympy [A] time = 25.588, size = 148, normalized size = 0.86

$$\frac{x^2\sqrt{a+b\sqrt{\frac{c}{x}}}}{2a}-\frac{7bc^2\sqrt{a+b\sqrt{\frac{c}{x}}}}{12a^2\left(\frac{c}{x}\right)^{\frac{3}{2}}}+\frac{35b^2cx\sqrt{a+b\sqrt{\frac{c}{x}}}}{48a^3}-\frac{35b^3c^2\sqrt{a+b\sqrt{\frac{c}{x}}}}{32a^4\sqrt{\frac{c}{x}}}+\frac{35b^4c^2\,\text{atanh}\left(\frac{\sqrt{a+b\sqrt{\frac{c}{x}}}}{\sqrt{a}}\right)}{32a^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b*(c/x)**(1/2))**(1/2),x)
```

```
[Out] x**2*sqrt(a + b*sqrt(c/x))/(2*a) - 7*b*c**2*sqrt(a + b*sqrt(c/x))
/(12*a**2*(c/x)**(3/2)) + 35*b**2*c*x*sqrt(a + b*sqrt(c/x))/(48*a
**3) - 35*b**3*c**2*sqrt(a + b*sqrt(c/x))/(32*a**4*sqrt(c/x)) + 3
5*b**4*c**2*atanh(sqrt(a + b*sqrt(c/x))/sqrt(a))/(32*a**(9/2))
```

Mathematica [A] time = 0.209333, size = 126, normalized size = 0.73

$$\frac{35b^4c^2\tanh^{-1}\left(\frac{\sqrt{a}}{\sqrt{a+b\sqrt{\frac{c}{x}}}}\right)}{32a^{9/2}}+\frac{48a^4x^2-8a^3bx^2\sqrt{\frac{c}{x}}+14a^2b^2cx-35ab^3cx\sqrt{\frac{c}{x}}-105b^4c^2}{96a^4\sqrt{a+b\sqrt{\frac{c}{x}}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x/Sqrt[a + b*Sqrt[c/x]],x]
```

```
[Out] (-105*b^4*c^2 + 14*a^2*b^2*c*x - 35*a*b^3*c*Sqrt[c/x]*x + 48*a^4*
x^2 - 8*a^3*b*Sqrt[c/x]*x^2)/(96*a^4*Sqrt[a + b*Sqrt[c/x]]) + (35
*b^4*c^2*ArcTanh[Sqrt[a]/Sqrt[a + b*Sqrt[c/x]]])/(32*a^(9/2))
```

Maple [B] time = 0.062, size = 302, normalized size = 1.8

$$\frac{1}{192}\sqrt{a+b\sqrt{\frac{c}{x}}}\sqrt{x}\left(174\,b^{3}\left(\frac{c}{x}\right)^{3/2}x^{3/2}\sqrt{ax+b\sqrt{\frac{c}{x}}xa^{9/2}}-384\,b^{3}\left(\frac{c}{x}\right)^{3/2}x^{3/2}\sqrt{x\left(a+b\sqrt{\frac{c}{x}}\right)}a^{9/2}+348\,b^{2}c\sqrt{x}\sqrt{ax+b\sqrt{}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+b*(c/x)^(1/2))^(1/2),x)
```

```
[Out] 1/192*(a+b*(c/x)^(1/2))^(1/2)*x^(1/2)*(174*b^3*(c/x)^(3/2)*x^(3/2
)*(a*x+b*(c/x)^(1/2)*x)^(1/2)*a^(9/2)-384*b^3*(c/x)^(3/2)*x^(3/2)
*(x*(a+b*(c/x)^(1/2)))^(1/2)*a^(9/2)+348*b^2*c*x^(1/2)*(a*x+b*(c/
x)^(1/2)*x)^(1/2)*a^(11/2)+96*x^(1/2)*(a*x+b*(c/x)^(1/2)*x)^(3/2)
*a^(13/2)-208*b*(c/x)^(1/2)*x^(1/2)*(a*x+b*(c/x)^(1/2)*x)^(3/2)*a
^(11/2)-87*b^4*c^2*ln(1/2*(b*(c/x)^(1/2)*x^(1/2)+2*(a*x+b*(c/x)^(
1/2)*x)^(1/2)*a^(1/2)+2*a*x^(1/2))/a^(1/2))*a^4+192*b^4*c^2*ln(1/
2*(b*(c/x)^(1/2)*x^(1/2)+2*(x*(a+b*(c/x)^(1/2)))^(1/2)*a^(1/2)+2*
a*x^(1/2))/a^(1/2))*a^4)/(x*(a+b*(c/x)^(1/2)))^(1/2)/a^(17/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(b*sqrt(c/x) + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.259712, size = 1, normalized size = 0.01

$$\left[\frac{105\,b^{4}c^{2}\log\left(\frac{\left(b\sqrt{\frac{c}{x}}+2\,a\right)\sqrt{a}+2\,\sqrt{b\sqrt{\frac{c}{x}}+a}a}{\sqrt{\frac{c}{x}}}\right)+2\left(70\,ab^{2}cx+48\,a^{3}x^{2}-7\left(15\,b^{3}cx+8\,a^{2}bx^{2}\right)\sqrt{\frac{c}{x}}\right)\sqrt{b\sqrt{\frac{c}{x}}+a}\sqrt{a}}{192\,a^{\frac{9}{2}}},\right.$$
$$\left.-\frac{105\,b^{4}c^{2}\arctan\left(\frac{a}{\sqrt{b\sqrt{\frac{c}{x}}+a}\sqrt{-a}}\right)+\left(7\left(15\,b^{3}cx+8\,a^{2}bx^{2}\right)\sqrt{-a}\sqrt{\frac{c}{x}}-2\left(35\,ab^{2}cx+24\,a^{3}x^{2}\right)\sqrt{-a}\right)\sqrt{b\sqrt{\frac{c}{x}}+a}}{96\,\sqrt{-a}a^{4}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(b*sqrt(c/x) + a),x, algorithm="fricas")
```

```
[Out] [1/192*(105*b^4*c^2*log(((b*sqrt(c/x) + 2*a)*sqrt(a) + 2*sqrt(b*s
qrt(c/x) + a)*a)/sqrt(c/x)) + 2*(70*a*b^2*c*x + 48*a^3*x^2 - 7*(1
5*b^3*c*x + 8*a^2*b*x^2)*sqrt(c/x))*sqrt(b*sqrt(c/x) + a)*sqrt(a)
)/a^(9/2), -1/96*(105*b^4*c^2*arctan(a/(sqrt(b*sqrt(c/x) + a)*sqr
```

```
t(-a))) + (7*(15*b^3*c*x + 8*a^2*b*x^2)*sqrt(-a)*sqrt(c/x) - 2*(3
5*a*b^2*c*x + 24*a^3*x^2)*sqrt(-a))*sqrt(b*sqrt(c/x) + a))/(sqrt(
-a)*a^4)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt{a+b\sqrt{\frac{c}{x}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b*(c/x)**(1/2))**(1/2),x)

[Out] Integral(x/sqrt(a + b*sqrt(c/x)), x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(b*sqrt(c/x) + a),x, algorithm="giac")

[Out] Exception raised: TypeError
```

3.2982 $\int \frac{1}{\sqrt{a+b\sqrt{\frac{c}{x}}}}\,dx$

Optimal. Leaf size=95

$$\frac{3b^2c\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{\frac{c}{x}}}}{\sqrt{a}}\right)}{2a^{5/2}}-\frac{3bc\sqrt{a+b\sqrt{\frac{c}{x}}}}{2a^2\sqrt{\frac{c}{x}}}+\frac{x\sqrt{a+b\sqrt{\frac{c}{x}}}}{a}$$

```
[Out] (-3*b*c*Sqrt[a + b*Sqrt[c/x]])/(2*a^2*Sqrt[c/x]) + (Sqrt[a + b*Sq
rt[c/x]]*x)/a + (3*b^2*c*ArcTanh[Sqrt[a + b*Sqrt[c/x]]/Sqrt[a]])/
(2*a^(5/2))
```

Rubi [A] time = 0.10965, antiderivative size = 95, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.294

$$\frac{3b^2c\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{\frac{c}{x}}}}{\sqrt{a}}\right)}{2a^{5/2}}-\frac{3bc\sqrt{a+b\sqrt{\frac{c}{x}}}}{2a^2\sqrt{\frac{c}{x}}}+\frac{x\sqrt{a+b\sqrt{\frac{c}{x}}}}{a}$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[a + b*Sqrt[c/x]],x]
```

```
[Out] (-3*b*c*Sqrt[a + b*Sqrt[c/x]])/(2*a^2*Sqrt[c/x]) + (Sqrt[a + b*Sq
rt[c/x]]*x)/a + (3*b^2*c*ArcTanh[Sqrt[a + b*Sqrt[c/x]]/Sqrt[a]])/
(2*a^(5/2))
```

Rubi in Sympy [A] time = 12.088, size = 80, normalized size = 0.84

$$\frac{x\sqrt{a+b\sqrt{\frac{c}{x}}}}{a}-\frac{3bc\sqrt{a+b\sqrt{\frac{c}{x}}}}{2a^2\sqrt{\frac{c}{x}}}+\frac{3b^2c\,\mathrm{atanh}\left(\frac{\sqrt{a+b\sqrt{\frac{c}{x}}}}{\sqrt{a}}\right)}{2a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*(c/x)**(1/2))**(1/2),x)
```

```
[Out] x*sqrt(a + b*sqrt(c/x))/a - 3*b*c*sqrt(a + b*sqrt(c/x))/(2*a**2*s
qrt(c/x)) + 3*b**2*c*atanh(sqrt(a + b*sqrt(c/x))/sqrt(a))/(2*a**(
5/2))
```

Mathematica [A] time = 0.167126, size = 89, normalized size = 0.94

$$\frac{3b^2c\tanh^{-1}\left(\frac{\sqrt{a}}{\sqrt{a+b\sqrt{\frac{c}{x}}}}\right)}{2a^{5/2}}+\frac{2a^2x-abx\sqrt{\frac{c}{x}}-3b^2c}{2a^2\sqrt{a+b\sqrt{\frac{c}{x}}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/Sqrt[a + b*Sqrt[c/x]],x]
```

```
[Out] (-3*b^2*c + 2*a^2*x - a*b*Sqrt[c/x]*x)/(2*a^2*Sqrt[a + b*Sqrt[c/x
]]) + (3*b^2*c*ArcTanh[Sqrt[a]/Sqrt[a + b*Sqrt[c/x]]])/(2*a^(5/2)
)
```

Maple [B] time = 0.054, size = 233, normalized size = 2.5

$$-\frac{1}{4}\sqrt{a+b\sqrt{\frac{c}{x}}}\sqrt{x}\left(8\,b\sqrt{\frac{c}{x}}\sqrt{x}\sqrt{x\left(a+b\sqrt{\frac{c}{x}}\right)}a^{5/2}-4\sqrt{ax+b\sqrt{\frac{c}{x}}x}\sqrt{x}a^{7/2}-2\sqrt{ax+b\sqrt{\frac{c}{x}}xb}\sqrt{\frac{c}{x}}\sqrt{x}a^{5/2}+b^{2}c\ln\left(\frac{1}{2}\left(b\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*(c/x)^(1/2))^(1/2),x)
```

```
[Out] -1/4*(a+b*(c/x)^(1/2))^(1/2)*x^(1/2)*(8*b*(c/x)^(1/2)*x^(1/2)*(x*
(a+b*(c/x)^(1/2)))^(1/2)*a^(5/2)-4*(a*x+b*(c/x)^(1/2)*x)^(1/2)*x^
(1/2)*a^(7/2)-2*(a*x+b*(c/x)^(1/2)*x)^(1/2)*b*(c/x)^(1/2)*x^(1/2)
*a^(5/2)+b^2*c*ln(1/2*(b*(c/x)^(1/2)*x^(1/2)+2*(a*x+b*(c/x)^(1/2)
*x)^(1/2)*a^(1/2)+2*a*x^(1/2))/a^(1/2))*a^2-4*b^2*c*ln(1/2*(b*(c/
x)^(1/2)*x^(1/2)+2*(x*(a+b*(c/x)^(1/2)))^(1/2)*a^(1/2)+2*a*x^(1/2
))/a^(1/2))*a^2)/(x*(a+b*(c/x)^(1/2)))^(1/2)/a^(9/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*sqrt(c/x) + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.260911, size = 1, normalized size = 0.01

$$\left[\frac{3\,b^{2}c\log\left(\frac{\left(b\sqrt{\frac{c}{x}}+2\,a\right)\sqrt{a}+2\sqrt{b\sqrt{\frac{c}{x}}+a}a}{\sqrt{\frac{c}{x}}}\right)-2\left(3\,bx\sqrt{\frac{c}{x}}-2\,ax\right)\sqrt{b\sqrt{\frac{c}{x}}+a}\sqrt{a}}{4\,a^{\frac{5}{2}}},\; -\frac{3\,b^{2}c\arctan\left(\frac{a}{\sqrt{b\sqrt{\frac{c}{x}}+a}\sqrt{-a}}\right)+\left(3\sqrt{-a}bx\sqrt{\frac{c}{x}}-2\sqrt{-a}ax\right)\sqrt{b\sqrt{\frac{c}{x}}+a}}{2\sqrt{-a}a^{2}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*sqrt(c/x) + a),x, algorithm="fricas")
```

```
[Out] [1/4*(3*b^2*c*log(((b*sqrt(c/x) + 2*a)*sqrt(a) + 2*sqrt(b*sqrt(c/
x) + a)*a)/sqrt(c/x)) - 2*(3*b*x*sqrt(c/x) - 2*a*x)*sqrt(b*sqrt(c
/x) + a)*sqrt(a))/a^(5/2), -1/2*(3*b^2*c*arctan(a/(sqrt(b*sqrt(c/
x) + a)*sqrt(-a))) + (3*sqrt(-a)*b*x*sqrt(c/x) - 2*sqrt(-a)*a*x)*
sqrt(b*sqrt(c/x) + a))/(sqrt(-a)*a^2)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a+b\sqrt{\frac{c}{x}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*(c/x)**(1/2))**(1/2),x)
```

```
[Out] Integral(1/sqrt(a + b*sqrt(c/x)), x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*sqrt(c/x) + a),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError
```

3.2983 $\int \frac{1}{\sqrt{a+b\sqrt{\frac{c}{x}}}\,x}\,dx$

Optimal. Leaf size=31

$$\frac{4\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{\frac{c}{x}}}}{\sqrt{a}}\right)}{\sqrt{a}}$$

```
[Out] (4*ArcTanh[Sqrt[a + b*Sqrt[c/x]]/Sqrt[a]])/Sqrt[a]
```

Rubi [A] time = 0.0778016, antiderivative size = 31, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.19

$$\frac{4\tanh^{-1}\left(\frac{\sqrt{a+b\sqrt{\frac{c}{x}}}}{\sqrt{a}}\right)}{\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b*Sqrt[c/x]]*x),x]

[Out] (4*ArcTanh[Sqrt[a + b*Sqrt[c/x]]/Sqrt[a]])/Sqrt[a]
```

Rubi in Sympy [A] time = 7.68235, size = 26, normalized size = 0.84

$$\frac{4\,\mathrm{atanh}\left(\frac{\sqrt{a+b\sqrt{\frac{c}{x}}}}{\sqrt{a}}\right)}{\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(a+b*(c/x)**(1/2))**(1/2),x)

[Out] 4*atanh(sqrt(a + b*sqrt(c/x))/sqrt(a))/sqrt(a)
```

Mathematica [A] time = 0.0604787, size = 31, normalized size = 1.

$$\frac{4\tanh^{-1}\left(\frac{\sqrt{a}}{\sqrt{a+b\sqrt{\frac{c}{x}}}}\right)}{\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b*Sqrt[c/x]]*x),x]

[Out] (4*ArcTanh[Sqrt[a]/Sqrt[a + b*Sqrt[c/x]]])/Sqrt[a]
```

Maple [B] time = 0.059, size = 200, normalized size = 6.5

$$\frac{1}{b}\sqrt{a+b\sqrt{\frac{c}{x}}}\left(\ln\left(\frac{1}{2}\left(b\sqrt{\frac{c}{x}}\sqrt{x}+2\sqrt{ax+b\sqrt{\frac{c}{x}}x}\sqrt{a}+2a\sqrt{x}\right)\frac{1}{\sqrt{a}}\right)b\sqrt{\frac{c}{x}}\sqrt{x}+\ln\left(\frac{1}{2}\left(b\sqrt{\frac{c}{x}}\sqrt{x}+2\sqrt{x\left(a+b\sqrt{\frac{c}{x}}\right)}\sqrt{a}+2a\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(a+b*(c/x)^(1/2))^(1/2),x)
```

```
[Out] (a+b*(c/x)^(1/2))^(1/2)*(ln(1/2*(b*(c/x)^(1/2)*x^(1/2)+2*(a*x+b*(
c/x)^(1/2)*x)^(1/2)*a^(1/2)+2*a*x^(1/2))/a^(1/2))*b*(c/x)^(1/2)*x
^(1/2)+ln(1/2*(b*(c/x)^(1/2)*x^(1/2)+2*(x*(a+b*(c/x)^(1/2)))^(1/2
)*a^(1/2)+2*a*x^(1/2))/a^(1/2))*b*(c/x)^(1/2)*x^(1/2)+2*(a*x+b*(c
/x)^(1/2)*x)^(1/2)*a^(1/2)-2*(x*(a+b*(c/x)^(1/2)))^(1/2)*a^(1/2))
/(x*(a+b*(c/x)^(1/2)))^(1/2)/b/(c/x)^(1/2)/a^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*sqrt(c/x) + a)*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.262137, size = 1, normalized size = 0.03

$$\left[\frac{2\log\left(\frac{\left(b\sqrt{\frac{c}{x}}+2\,a\right)\sqrt{a}+2\,\sqrt{b\sqrt{\frac{c}{x}}+a}\,a}{\sqrt{\frac{c}{x}}}\right)}{\sqrt{a}}, -\frac{4\arctan\left(\frac{a}{\sqrt{b\sqrt{\frac{c}{x}}+a}\,\sqrt{-a}}\right)}{\sqrt{-a}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*sqrt(c/x) + a)*x),x, algorithm="fricas")
```

```
[Out] [2*log(((b*sqrt(c/x) + 2*a)*sqrt(a) + 2*sqrt(b*sqrt(c/x) + a)*a)/
sqrt(c/x))/sqrt(a), -4*arctan(a/(sqrt(b*sqrt(c/x) + a)*sqrt(-a)))
/sqrt(-a)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{x\sqrt{a+b\sqrt{\frac{c}{x}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(a+b*(c/x)**(1/2))**(1/2),x)
```

```
[Out] Integral(1/(x*sqrt(a + b*sqrt(c/x))), x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*sqrt(c/x) + a)*x),x, algorithm="giac")

[Out] Exception raised: TypeError
```

3.2984 $\int \frac{1}{\sqrt{a+b\sqrt{\frac{c}{x}}}x^2}\,dx$

Optimal. Leaf size=54

$$\frac{4a\sqrt{a+b\sqrt{\frac{c}{x}}}}{b^2c}-\frac{4\left(a+b\sqrt{\frac{c}{x}}\right)^{3/2}}{3b^2c}$$

```
[Out] (4*a*Sqrt[a + b*Sqrt[c/x]])/(b^2*c) - (4*(a + b*Sqrt[c/x])^(3/2))
/(3*b^2*c)
```

Rubi [A] time = 0.0964886, antiderivative size = 54, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$\frac{4a\sqrt{a+b\sqrt{\frac{c}{x}}}}{b^2c}-\frac{4\left(a+b\sqrt{\frac{c}{x}}\right)^{3/2}}{3b^2c}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b*Sqrt[c/x]]*x^2),x]
```

```
[Out] (4*a*Sqrt[a + b*Sqrt[c/x]])/(b^2*c) - (4*(a + b*Sqrt[c/x])^(3/2))
/(3*b^2*c)
```

Rubi in Sympy [A] time = 9.8593, size = 42, normalized size = 0.78

$$\frac{4a\sqrt{a+b\sqrt{\frac{c}{x}}}}{b^2c}-\frac{4\left(a+b\sqrt{\frac{c}{x}}\right)^{\frac{3}{2}}}{3b^2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(a+b*(c/x)**(1/2))**(1/2),x)
```

```
[Out] 4*a*sqrt(a + b*sqrt(c/x))/(b**2*c) - 4*(a + b*sqrt(c/x))**(3/2)/(
3*b**2*c)
```

Mathematica [A] time = 0.0764967, size = 42, normalized size = 0.78

$$-\frac{4\left(b\sqrt{\frac{c}{x}}-2a\right)\sqrt{a+b\sqrt{\frac{c}{x}}}}{3b^2c}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b*Sqrt[c/x]]*x^2),x]
```

```
[Out] (-4*(-2*a + b*Sqrt[c/x])*Sqrt[a + b*Sqrt[c/x]])/(3*b^2*c)
```

Maple [C] time = 0.069, size = 266, normalized size = 4.9

$$-\frac{1}{3\,b^3}\sqrt{a+b\sqrt{\frac{c}{x}}}\left(3\,a^{3/2}\sqrt{\frac{c}{x}}\ln\left(1/2\,\frac{1}{\sqrt{a}}\left(b\sqrt{\frac{c}{x}}\sqrt{x}+2\,\sqrt{ax+b\sqrt{\frac{c}{x}}x}\sqrt{a}+2\,a\sqrt{x}\right)\right)x^2b-3\,a^{3/2}\sqrt{\frac{c}{x}}\ln\left(1/2\,\frac{1}{\sqrt{a}}\left(b\sqrt{\frac{c}{x}}\sqrt{x}\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(a+b*(c/x)^(1/2))^(1/2),x)
```

```
[Out] -1/3*(a+b*(c/x)^(1/2))^(1/2)*(3*a^(3/2)*(c/x)^(1/2)*ln(1/2*(b*(c/
x)^(1/2)*x^(1/2)+2*(a*x+b*(c/x)^(1/2)*x)^(1/2)*a^(1/2)+2*a*x^(1/2
))/a^(1/2))*x^2*b-3*a^(3/2)*(c/x)^(1/2)*ln(1/2*(b*(c/x)^(1/2)*x^(
1/2)+2*(x*(a+b*(c/x)^(1/2)))^(1/2)*a^(1/2)+2*a*x^(1/2))/a^(1/2))*
x^2*b+6*x^(3/2)*(a*x+b*(c/x)^(1/2)*x)^(1/2)*a^2+6*x^(3/2)*(x*(a+b
*(c/x)^(1/2)))^(1/2)*a^2+4*x^(1/2)*(c/x)^(1/2)*(a*x+b*(c/x)^(1/2)
*x)^(3/2)*b-12*x^(1/2)*(a*x+b*(c/x)^(1/2)*x)^(3/2)*a)/x^(5/2)/(x*
(a+b*(c/x)^(1/2)))^(1/2)/b^3/(c/x)^(3/2)
```

Maxima [A] time = 1.34064, size = 57, normalized size = 1.06

$$-\frac{4\left(\frac{\left(b\sqrt{\frac{c}{x}}+a\right)^{\frac{3}{2}}}{b^2}-\frac{3\sqrt{b\sqrt{\frac{c}{x}}+a}\,a}{b^2}\right)}{3\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*sqrt(c/x) + a)*x^2),x, algorithm="maxima")
```

```
[Out] -4/3*((b*sqrt(c/x) + a)^(3/2)/b^2 - 3*sqrt(b*sqrt(c/x) + a)*a/b^2
)/c
```

Fricas [A] time = 0.255511, size = 46, normalized size = 0.85

$$-\frac{4\sqrt{b\sqrt{\frac{c}{x}}+a}\left(b\sqrt{\frac{c}{x}}-2\,a\right)}{3\,b^2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*sqrt(c/x) + a)*x^2),x, algorithm="fricas")
```

```
[Out] -4/3*sqrt(b*sqrt(c/x) + a)*(b*sqrt(c/x) - 2*a)/(b^2*c)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{x^2\sqrt{a+b\sqrt{\frac{c}{x}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(a+b*(c/x)**(1/2))**(1/2),x)
```

```
[Out] Integral(1/(x**2*sqrt(a + b*sqrt(c/x))), x)
```

GIAC/XCAS [A] time = 0.224926, size = 51, normalized size = 0.94

$$-\frac{4\left(\left(b\sqrt{\frac{c}{x}}+a\right)^{\frac{3}{2}}-3\sqrt{b\sqrt{\frac{c}{x}}+a}\,a\right)}{3\,b^2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*sqrt(c/x) + a)*x^2),x, algorithm="giac")
```

```
[Out] -4/3*((b*sqrt(c/x) + a)^(3/2) - 3*sqrt(b*sqrt(c/x) + a)*a)/(b^2*c
)
```

3.2985 $\int \frac{1}{\sqrt{a+b\sqrt{\frac{c}{x}}}x^3}\,dx$

Optimal. Leaf size=112

$$\frac{4a^3\sqrt{a+b\sqrt{\frac{c}{x}}}}{b^4c^2}-\frac{4a^2\left(a+b\sqrt{\frac{c}{x}}\right)^{3/2}}{b^4c^2}-\frac{4\left(a+b\sqrt{\frac{c}{x}}\right)^{7/2}}{7b^4c^2}+\frac{12a\left(a+b\sqrt{\frac{c}{x}}\right)^{5/2}}{5b^4c^2}$$

```
[Out] (4*a^3*Sqrt[a + b*Sqrt[c/x]])/(b^4*c^2) - (4*a^2*(a + b*Sqrt[c/x]
)^(3/2))/(b^4*c^2) + (12*a*(a + b*Sqrt[c/x])^(5/2))/(5*b^4*c^2) -
 (4*(a + b*Sqrt[c/x])^(7/2))/(7*b^4*c^2)
```

Rubi [A] time = 0.162345, antiderivative size = 112, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$\frac{4a^3\sqrt{a+b\sqrt{\frac{c}{x}}}}{b^4c^2}-\frac{4a^2\left(a+b\sqrt{\frac{c}{x}}\right)^{3/2}}{b^4c^2}-\frac{4\left(a+b\sqrt{\frac{c}{x}}\right)^{7/2}}{7b^4c^2}+\frac{12a\left(a+b\sqrt{\frac{c}{x}}\right)^{5/2}}{5b^4c^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b*Sqrt[c/x]]*x^3),x]
```

```
[Out] (4*a^3*Sqrt[a + b*Sqrt[c/x]])/(b^4*c^2) - (4*a^2*(a + b*Sqrt[c/x]
)^(3/2))/(b^4*c^2) + (12*a*(a + b*Sqrt[c/x])^(5/2))/(5*b^4*c^2) -
 (4*(a + b*Sqrt[c/x])^(7/2))/(7*b^4*c^2)
```

Rubi in Sympy [A] time = 20.1825, size = 99, normalized size = 0.88

$$\frac{4a^3\sqrt{a+b\sqrt{\frac{c}{x}}}}{b^4c^2}-\frac{4a^2\left(a+b\sqrt{\frac{c}{x}}\right)^{\frac{3}{2}}}{b^4c^2}+\frac{12a\left(a+b\sqrt{\frac{c}{x}}\right)^{\frac{5}{2}}}{5b^4c^2}-\frac{4\left(a+b\sqrt{\frac{c}{x}}\right)^{\frac{7}{2}}}{7b^4c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(a+b*(c/x)**(1/2))**(1/2),x)
```

```
[Out] 4*a**3*sqrt(a + b*sqrt(c/x))/(b**4*c**2) - 4*a**2*(a + b*sqrt(c/x
))**(3/2)/(b**4*c**2) + 12*a*(a + b*sqrt(c/x))**(5/2)/(5*b**4*c**
2) - 4*(a + b*sqrt(c/x))**(7/2)/(7*b**4*c**2)
```

Mathematica [A] time = 0.094426, size = 75, normalized size = 0.67

$$\frac{4\sqrt{a+b\sqrt{\frac{c}{x}}}\left(16a^3x-8a^2bx\sqrt{\frac{c}{x}}+6ab^2c-5b^3c\sqrt{\frac{c}{x}}\right)}{35b^4c^2x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b*Sqrt[c/x]]*x^3),x]
```

```
[Out] (4*Sqrt[a + b*Sqrt[c/x]]*(6*a*b^2*c - 5*b^3*c*Sqrt[c/x] + 16*a^3*
x - 8*a^2*b*Sqrt[c/x]*x))/(35*b^4*c^2*x)
```

Maple [C] time = 0.07, size = 328, normalized size = 2.9

$$\frac{1}{35 b^5}\sqrt{a+b\sqrt{\frac{c}{x}}}\left(35 a^{7/2}\sqrt{\frac{c}{x}}\ln\left(1/2\frac{1}{\sqrt{a}}\left(b\sqrt{\frac{c}{x}}\sqrt{x}+2\sqrt{x\left(a+b\sqrt{\frac{c}{x}}\right)}\sqrt{a}+2a\sqrt{x}\right)\right)x^3b-35 a^{7/2}\sqrt{\frac{c}{x}}\ln\left(1/2\frac{1}{\sqrt{a}}\left(b\sqrt{\frac{c}{x}}\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(a+b*(c/x)^(1/2))^(1/2),x)
```

```
[Out] 1/35*(a+b*(c/x)^(1/2))^(1/2)*(35*a^(7/2)*(c/x)^(1/2)*ln(1/2*(b*(c
/x)^(1/2)*x^(1/2)+2*(x*(a+b*(c/x)^(1/2)))^(1/2)*a^(1/2)+2*a*x^(1/
2))/a^(1/2))*x^3*b-35*a^(7/2)*(c/x)^(1/2)*ln(1/2*(b*(c/x)^(1/2)*x
^(1/2)+2*(a*x+b*(c/x)^(1/2)*x)^(1/2)*a^(1/2)+2*a*x^(1/2))/a^(1/2)
)*x^3*b-20*x^(3/2)*(c/x)^(3/2)*(a*x+b*(c/x)^(1/2)*x)^(3/2)*b^3-70
*x^(5/2)*(x*(a+b*(c/x)^(1/2)))^(1/2)*a^4-70*x^(5/2)*(a*x+b*(c/x)^
(1/2)*x)^(1/2)*a^4-76*x^(3/2)*(c/x)^(1/2)*(a*x+b*(c/x)^(1/2)*x)^(
3/2)*a^2*b+140*x^(3/2)*(a*x+b*(c/x)^(1/2)*x)^(3/2)*a^3+44*x^(1/2)
*(a*x+b*(c/x)^(1/2)*x)^(3/2)*a*b^2*c)/x^(9/2)/(x*(a+b*(c/x)^(1/2)
))^(1/2)/b^5/(c/x)^(5/2)
```

Maxima [A] time = 1.34328, size = 115, normalized size = 1.03

$$-\frac{4\left(\frac{5\left(b\sqrt{\frac{c}{x}}+a\right)^{\frac{7}{2}}}{b^4}-\frac{21\left(b\sqrt{\frac{c}{x}}+a\right)^{\frac{5}{2}}a}{b^4}+\frac{35\left(b\sqrt{\frac{c}{x}}+a\right)^{\frac{3}{2}}a^2}{b^4}-\frac{35\sqrt{b\sqrt{\frac{c}{x}}+a}\,a^3}{b^4}\right)}{35 c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*sqrt(c/x) + a)*x^3),x, algorithm="maxima")
```

```
[Out] -4/35*(5*(b*sqrt(c/x) + a)^(7/2)/b^4 - 21*(b*sqrt(c/x) + a)^(5/2)
*a/b^4 + 35*(b*sqrt(c/x) + a)^(3/2)*a^2/b^4 - 35*sqrt(b*sqrt(c/x)
 + a)*a^3/b^4)/c^2
```

Fricas [A] time = 0.249943, size = 82, normalized size = 0.73

$$\frac{4\left(6 ab^2c+16 a^3x-\left(5 b^3c+8 a^2bx\right)\sqrt{\frac{c}{x}}\right)\sqrt{b\sqrt{\frac{c}{x}}+a}}{35 b^4c^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*sqrt(c/x) + a)*x^3),x, algorithm="fricas")
```

```
[Out] 4/35*(6*a*b^2*c + 16*a^3*x - (5*b^3*c + 8*a^2*b*x)*sqrt(c/x))*sqr
t(b*sqrt(c/x) + a)/(b^4*c^2*x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{x^3\sqrt{a+b\sqrt{\frac{c}{x}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(a+b*(c/x)**(1/2))**(1/2),x)
```

```
[Out] Integral(1/(x**3*sqrt(a + b*sqrt(c/x))), x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*sqrt(c/x) + a)*x^3),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError
```

3.2986 $\int \frac{1}{\sqrt{a+b\sqrt{\frac{c}{x}}}\,x^4}\,dx$

Optimal. Leaf size=172

$$\frac{4a^5\sqrt{a+b\sqrt{\frac{c}{x}}}}{b^6c^3}-\frac{20a^4\left(a+b\sqrt{\frac{c}{x}}\right)^{3/2}}{3b^6c^3}+\frac{8a^3\left(a+b\sqrt{\frac{c}{x}}\right)^{5/2}}{b^6c^3}-\frac{40a^2\left(a+b\sqrt{\frac{c}{x}}\right)^{7/2}}{7b^6c^3}-\frac{4\left(a+b\sqrt{\frac{c}{x}}\right)^{11/2}}{11b^6c^3}+\frac{20a\left(a+b\sqrt{\frac{c}{x}}\right)^{9/2}}{9b^6c^3}$$

```
[Out] (4*a^5*Sqrt[a + b*Sqrt[c/x]])/(b^6*c^3) - (20*a^4*(a + b*Sqrt[c/x
])^(3/2))/(3*b^6*c^3) + (8*a^3*(a + b*Sqrt[c/x])^(5/2))/(b^6*c^3)
 - (40*a^2*(a + b*Sqrt[c/x])^(7/2))/(7*b^6*c^3) + (20*a*(a + b*Sq
rt[c/x])^(9/2))/(9*b^6*c^3) - (4*(a + b*Sqrt[c/x])^(11/2))/(11*b^
6*c^3)
```

Rubi [A] time = 0.223686, antiderivative size = 172, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143

$$\frac{4a^5\sqrt{a+b\sqrt{\frac{c}{x}}}}{b^6c^3}-\frac{20a^4\left(a+b\sqrt{\frac{c}{x}}\right)^{3/2}}{3b^6c^3}+\frac{8a^3\left(a+b\sqrt{\frac{c}{x}}\right)^{5/2}}{b^6c^3}-\frac{40a^2\left(a+b\sqrt{\frac{c}{x}}\right)^{7/2}}{7b^6c^3}-\frac{4\left(a+b\sqrt{\frac{c}{x}}\right)^{11/2}}{11b^6c^3}+\frac{20a\left(a+b\sqrt{\frac{c}{x}}\right)^{9/2}}{9b^6c^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b*Sqrt[c/x]]*x^4),x]
```

```
[Out] (4*a^5*Sqrt[a + b*Sqrt[c/x]])/(b^6*c^3) - (20*a^4*(a + b*Sqrt[c/x
])^(3/2))/(3*b^6*c^3) + (8*a^3*(a + b*Sqrt[c/x])^(5/2))/(b^6*c^3)
 - (40*a^2*(a + b*Sqrt[c/x])^(7/2))/(7*b^6*c^3) + (20*a*(a + b*Sq
rt[c/x])^(9/2))/(9*b^6*c^3) - (4*(a + b*Sqrt[c/x])^(11/2))/(11*b^
6*c^3)
```

Rubi in Sympy [A] time = 29.6582, size = 153, normalized size = 0.89

$$\frac{4a^5\sqrt{a+b\sqrt{\frac{c}{x}}}}{b^6c^3}-\frac{20a^4\left(a+b\sqrt{\frac{c}{x}}\right)^{\frac{3}{2}}}{3b^6c^3}+\frac{8a^3\left(a+b\sqrt{\frac{c}{x}}\right)^{\frac{5}{2}}}{b^6c^3}-\frac{40a^2\left(a+b\sqrt{\frac{c}{x}}\right)^{\frac{7}{2}}}{7b^6c^3}+\frac{20a\left(a+b\sqrt{\frac{c}{x}}\right)^{\frac{9}{2}}}{9b^6c^3}-\frac{4\left(a+b\sqrt{\frac{c}{x}}\right)^{\frac{11}{2}}}{11b^6c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(a+b*(c/x)**(1/2))**(1/2),x)
```

```
[Out] 4*a**5*sqrt(a + b*sqrt(c/x))/(b**6*c**3) - 20*a**4*(a + b*sqrt(c/
x))**(3/2)/(3*b**6*c**3) + 8*a**3*(a + b*sqrt(c/x))**(5/2)/(b**6*
c**3) - 40*a**2*(a + b*sqrt(c/x))**(7/2)/(7*b**6*c**3) + 20*a*(a
+ b*sqrt(c/x))**(9/2)/(9*b**6*c**3) - 4*(a + b*sqrt(c/x))**(11/2)
/(11*b**6*c**3)
```

Mathematica [A] time = 0.120352, size = 111, normalized size = 0.65

$$\frac{4\sqrt{a+b\sqrt{\frac{c}{x}}}\left(256a^5x^2-128a^4bx^2\sqrt{\frac{c}{x}}+96a^3b^2cx-80a^2b^3cx\sqrt{\frac{c}{x}}+70ab^4c^2-63b^5cx\left(\frac{c}{x}\right)^{3/2}\right)}{693b^6c^3x^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b*Sqrt[c/x]]*x^4),x]
```

```
[Out] (4*Sqrt[a + b*Sqrt[c/x]]*(70*a*b^4*c^2 + 96*a^3*b^2*c*x - 80*a^2*
b^3*c*Sqrt[c/x]*x - 63*b^5*c*(c/x)^(3/2)*x + 256*a^5*x^2 - 128*a^
4*b*Sqrt[c/x]*x^2))/(693*b^6*c^3*x^2)
```

Maple [C] time = 0.072, size = 392, normalized size = 2.3

$$-\frac{1}{693\,b^7}\sqrt{a+b\sqrt{\frac{c}{x}}}\left(693\,\ln\left(1/2\,\frac{1}{\sqrt{a}}\left(b\sqrt{\frac{c}{x}}\sqrt{x}+2\,\sqrt{ax+b\sqrt{\frac{c}{x}}x}\sqrt{a}+2\,a\sqrt{x}\right)\right)a^{11/2}\sqrt{\frac{c}{x}}x^4b-693\,\ln\left(1/2\,\frac{1}{\sqrt{a}}\left(b\sqrt{\frac{c}{x}}\sqrt{x}\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(a+b*(c/x)^(1/2))^(1/2),x)
```

```
[Out] -1/693*(a+b*(c/x)^(1/2))^(1/2)*(693*ln(1/2*(b*(c/x)^(1/2)*x^(1/2)
+2*(a*x+b*(c/x)^(1/2)*x)^(1/2)*a^(1/2)+2*a*x^(1/2))/a^(1/2))*a^(1
1/2)*(c/x)^(1/2)*x^4*b-693*ln(1/2*(b*(c/x)^(1/2)*x^(1/2)+2*(x*(a+
b*(c/x)^(1/2)))^(1/2)*a^(1/2)+2*a*x^(1/2))/a^(1/2))*a^(11/2)*(c/x
)^(1/2)*x^4*b+252*(a*x+b*(c/x)^(1/2)*x)^(3/2)*x^(5/2)*(c/x)^(5/2)
*b^5+852*(a*x+b*(c/x)^(1/2)*x)^(3/2)*x^(5/2)*(c/x)^(3/2)*a^2*b^3+
1748*(a*x+b*(c/x)^(1/2)*x)^(3/2)*x^(5/2)*(c/x)^(1/2)*a^4*b+1386*(
a*x+b*(c/x)^(1/2)*x)^(1/2)*x^(7/2)*a^6+1386*(x*(a+b*(c/x)^(1/2)))
^(1/2)*x^(7/2)*a^6-2772*(a*x+b*(c/x)^(1/2)*x)^(3/2)*x^(5/2)*a^5-1
236*(a*x+b*(c/x)^(1/2)*x)^(3/2)*x^(3/2)*a^3*b^2*c-532*(a*x+b*(c/x
)^(1/2)*x)^(3/2)*x^(1/2)*a*b^4*c^2)/x^(13/2)/(x*(a+b*(c/x)^(1/2))
)^(1/2)/b^7/(c/x)^(7/2)
```

Maxima [A] time = 1.33538, size = 171, normalized size = 0.99

$$-\frac{4\left(\frac{63\left(b\sqrt{\frac{c}{x}}+a\right)^{\frac{11}{2}}}{b^6}-\frac{385\left(b\sqrt{\frac{c}{x}}+a\right)^{\frac{9}{2}}a}{b^6}+\frac{990\left(b\sqrt{\frac{c}{x}}+a\right)^{\frac{7}{2}}a^2}{b^6}-\frac{1386\left(b\sqrt{\frac{c}{x}}+a\right)^{\frac{5}{2}}a^3}{b^6}+\frac{1155\left(b\sqrt{\frac{c}{x}}+a\right)^{\frac{3}{2}}a^4}{b^6}-\frac{693\sqrt{b\sqrt{\frac{c}{x}}+a}\,a^5}{b^6}\right)}{693\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*sqrt(c/x) + a)*x^4),x, algorithm="maxima")
```

```
[Out] -4/693*(63*(b*sqrt(c/x) + a)^(11/2)/b^6 - 385*(b*sqrt(c/x) + a)^(
9/2)*a/b^6 + 990*(b*sqrt(c/x) + a)^(7/2)*a^2/b^6 - 1386*(b*sqrt(c
/x) + a)^(5/2)*a^3/b^6 + 1155*(b*sqrt(c/x) + a)^(3/2)*a^4/b^6 - 6
93*sqrt(b*sqrt(c/x) + a)*a^5/b^6)/c^3
```

Fricas [A] time = 0.247496, size = 120, normalized size = 0.7

$$\frac{4\left(70\,ab^4c^2+96\,a^3b^2cx+256\,a^5x^2-\left(63\,b^5c^2+80\,a^2b^3cx+128\,a^4bx^2\right)\sqrt{\frac{c}{x}}\right)\sqrt{b\sqrt{\frac{c}{x}}+a}}{693\,b^6c^3x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*sqrt(c/x) + a)*x^4),x, algorithm="fricas")
```

```
[Out] 4/693*(70*a*b^4*c^2 + 96*a^3*b^2*c*x + 256*a^5*x^2 - (63*b^5*c^2
+ 80*a^2*b^3*c*x + 128*a^4*b*x^2)*sqrt(c/x))*sqrt(b*sqrt(c/x) + a
```

```
)/(b^6*c^3*x^2)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{x^4\sqrt{a+b\sqrt{\frac{c}{x}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**4/(a+b*(c/x)**(1/2))**(1/2),x)

[Out] Integral(1/(x**4*sqrt(a + b*sqrt(c/x))), x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*sqrt(c/x) + a)*x^4),x, algorithm="giac")

[Out] Exception raised: TypeError
```

3.2987 $\int \frac{1}{\sqrt{1+\sqrt{\frac{1}{x}}}}\,dx$

Optimal. Leaf size=58

$$\sqrt{\sqrt{\frac{1}{x}}+1}x-\frac{3\sqrt{\sqrt{\frac{1}{x}}+1}}{2\sqrt{\frac{1}{x}}}+\frac{3}{2}\tanh^{-1}\left(\sqrt{\sqrt{\frac{1}{x}}+1}\right)$$

```
[Out] (-3*Sqrt[1 + Sqrt[x^(-1)]])/(2*Sqrt[x^(-1)]) + Sqrt[1 + Sqrt[x^(-
1)]]*x + (3*ArcTanh[Sqrt[1 + Sqrt[x^(-1)]]])/2
```

Rubi [A] time = 0.0437874, antiderivative size = 58, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385

$$\sqrt{\sqrt{\frac{1}{x}}+1}x-\frac{3\sqrt{\sqrt{\frac{1}{x}}+1}}{2\sqrt{\frac{1}{x}}}+\frac{3}{2}\tanh^{-1}\left(\sqrt{\sqrt{\frac{1}{x}}+1}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[1 + Sqrt[x^(-1)]],x]
```

```
[Out] (-3*Sqrt[1 + Sqrt[x^(-1)]])/(2*Sqrt[x^(-1)]) + Sqrt[1 + Sqrt[x^(-
1)]]*x + (3*ArcTanh[Sqrt[1 + Sqrt[x^(-1)]]])/2
```

Rubi in Sympy [A] time = 4.84675, size = 51, normalized size = 0.88

$$x\sqrt{\sqrt{\frac{1}{x}}+1}-\frac{3\sqrt{\sqrt{\frac{1}{x}}+1}}{2\sqrt{\frac{1}{x}}}+\frac{3\,\mathrm{atanh}\left(\sqrt{\sqrt{\frac{1}{x}}+1}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(1+(1/x)**(1/2))**(1/2),x)
```

```
[Out] x*sqrt(sqrt(1/x) + 1) - 3*sqrt(sqrt(1/x) + 1)/(2*sqrt(1/x)) + 3*a
tanh(sqrt(sqrt(1/x) + 1))/2
```

Mathematica [A] time = 0.22486, size = 70, normalized size = 1.21

$$\frac{1}{4}\left(2\left(2-3\sqrt{\frac{1}{x}}\right)\sqrt{\sqrt{\frac{1}{x}}+1}x-3\log\left(1-\frac{1}{\sqrt{\sqrt{\frac{1}{x}}+1}}\right)+3\log\left(\frac{1}{\sqrt{\sqrt{\frac{1}{x}}+1}}+1\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/Sqrt[1 + Sqrt[x^(-1)]],x]
```

```
[Out] (2*(2 - 3*Sqrt[x^(-1)])*Sqrt[1 + Sqrt[x^(-1)]]*x - 3*Log[1 - 1/Sq
rt[1 + Sqrt[x^(-1)]]] + 3*Log[1 + 1/Sqrt[1 + Sqrt[x^(-1)]]])/4
```

Maple [B] time = 0.036, size = 92, normalized size = 1.6

$$-\frac{1}{4}\sqrt{1+\sqrt{x^{-1}}}\sqrt{x}\left(6\sqrt{x^{-1}}\sqrt{x}\sqrt{\sqrt{x^{-1}}x+x}-4\sqrt{\sqrt{x^{-1}}x+x}\sqrt{x}-3\ln\left(1/2\sqrt{x^{-1}}\sqrt{x}+\sqrt{x}+\sqrt{\sqrt{x^{-1}}x+x}\right)\right)\frac{1}{\sqrt{x\left(1+\sqrt{x^{-1}}\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/(1+(1/x)^(1/2))^(1/2),x)
```

```
[Out] -1/4*(1+(1/x)^(1/2))^(1/2)*x^(1/2)*(6*(1/x)^(1/2)*x^(1/2)*((1/x)^
(1/2)*x+x)^(1/2)-4*((1/x)^(1/2)*x+x)^(1/2)*x^(1/2)-3*ln(1/2*(1/x)
^(1/2)*x^(1/2)+x^(1/2)+((1/x)^(1/2)*x+x)^(1/2)))/(x*(1+(1/x)^(1/2
)))^(1/2)
```

Maxima [A] time = 1.36032, size = 84, normalized size = 1.45

$$-\frac{3\left(\frac{1}{\sqrt{x}}+1\right)^{\frac{3}{2}}-5\sqrt{\frac{1}{\sqrt{x}}+1}}{2\left(\left(\frac{1}{\sqrt{x}}+1\right)^{2}-\frac{2}{\sqrt{x}}-1\right)}+\frac{3}{4}\log\left(\sqrt{\frac{1}{\sqrt{x}}+1}+1\right)-\frac{3}{4}\log\left(\sqrt{\frac{1}{\sqrt{x}}+1}-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/sqrt(1/sqrt(x) + 1),x, algorithm="maxima")
```

```
[Out] -1/2*(3*(1/sqrt(x) + 1)^(3/2) - 5*sqrt(1/sqrt(x) + 1))/((1/sqrt(x
) + 1)^2 - 2/sqrt(x) - 1) + 3/4*log(sqrt(1/sqrt(x) + 1) + 1) - 3/
4*log(sqrt(1/sqrt(x) + 1) - 1)
```

Fricas [A] time = 0.230017, size = 89, normalized size = 1.53

$$\frac{2\left(2x^{\frac{3}{2}}-3x\right)\sqrt{\frac{\sqrt{x}+1}{\sqrt{x}}}+3\sqrt{x}\log\left(\sqrt{\frac{\sqrt{x}+1}{\sqrt{x}}}+1\right)-3\sqrt{x}\log\left(\sqrt{\frac{\sqrt{x}+1}{\sqrt{x}}}-1\right)}{4\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/sqrt(1/sqrt(x) + 1),x, algorithm="fricas")
```

```
[Out] 1/4*(2*(2*x^(3/2) - 3*x)*sqrt((sqrt(x) + 1)/sqrt(x)) + 3*sqrt(x)*
log(sqrt((sqrt(x) + 1)/sqrt(x)) + 1) - 3*sqrt(x)*log(sqrt((sqrt(x
) + 1)/sqrt(x)) - 1))/sqrt(x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\sqrt{\sqrt{\frac{1}{x}}+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(1+(1/x)**(1/2))**(1/2),x)
```

```
[Out] Integral(1/sqrt(sqrt(1/x) + 1), x)
```

GIAC/XCAS [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(1/sqrt(x) + 1),x, algorithm="giac")
```

```
[Out] Timed out
```

3.2988 $\int \sqrt{a+b\left(\frac{c}{x}\right)^{3/2}}(dx)^m\,dx$

Optimal. Leaf size=102

$$\frac{x(dx)^m\sqrt{a+\frac{bc^3}{x^3\left(\frac{c}{x}\right)^{3/2}}}\,{}_2F_1\left(-\frac{1}{2},-\frac{2}{3}(m+1);\frac{1}{3}(1-2m);-\frac{bc^3}{a\left(\frac{c}{x}\right)^{3/2}x^3}\right)}{(m+1)\sqrt{\frac{bc^3}{ax^3\left(\frac{c}{x}\right)^{3/2}}+1}}$$

```
[Out] (Sqrt[a + (b*c^3)/((c/x)^(3/2)*x^3)]*x*(d*x)^m*Hypergeometric2F1[
-1/2, (-2*(1 + m))/3, (1 - 2*m)/3, -((b*c^3)/(a*(c/x)^(3/2)*x^3))
])/((1 + m)*Sqrt[1 + (b*c^3)/(a*(c/x)^(3/2)*x^3)])
```

Rubi [A] time = 0.262212, antiderivative size = 102, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261

$$\frac{x(dx)^m\sqrt{a+\frac{bc^3}{x^3\left(\frac{c}{x}\right)^{3/2}}}\,{}_2F_1\left(-\frac{1}{2},-\frac{2}{3}(m+1);\frac{1}{3}(1-2m);-\frac{bc^3}{a\left(\frac{c}{x}\right)^{3/2}x^3}\right)}{(m+1)\sqrt{\frac{bc^3}{ax^3\left(\frac{c}{x}\right)^{3/2}}+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*(c/x)^(3/2)]*(d*x)^m,x]
```

```
[Out] (Sqrt[a + (b*c^3)/((c/x)^(3/2)*x^3)]*x*(d*x)^m*Hypergeometric2F1[
-1/2, (-2*(1 + m))/3, (1 - 2*m)/3, -((b*c^3)/(a*(c/x)^(3/2)*x^3))
])/((1 + m)*Sqrt[1 + (b*c^3)/(a*(c/x)^(3/2)*x^3)])
```

Rubi in Sympy [A] time = 13.9894, size = 83, normalized size = 0.81

$$\frac{c\left(\frac{c}{x}\right)^m\left(\frac{c}{x}\right)^{-m-1}(dx)^m\sqrt{a+b\left(\frac{c}{x}\right)^{\frac{3}{2}}}\,{}_2F_1\left(\begin{matrix}-\frac{1}{2},-\frac{2m}{3}-\frac{2}{3}\\ -\frac{2m}{3}+\frac{1}{3}\end{matrix}\middle|-\frac{b\left(\frac{c}{x}\right)^{\frac{3}{2}}}{a}\right)}{\sqrt{1+\frac{b\left(\frac{c}{x}\right)^{\frac{3}{2}}}{a}}\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x)**m*(a+b*(c/x)**(3/2))**(1/2),x)
```

```
[Out] c*(c/x)**m*(c/x)**(-m - 1)*(d*x)**m*sqrt(a + b*(c/x)**(3/2))*hype
r((-1/2, -2*m/3 - 2/3), (-2*m/3 + 1/3,), -b*(c/x)**(3/2)/a)/(sqrt
(1 + b*(c/x)**(3/2)/a)*(m + 1))
```

Mathematica [A] time = 0.106825, size = 0, normalized size = 0.

$$\int \sqrt{a+b\left(\frac{c}{x}\right)^{3/2}}(dx)^m\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[Sqrt[a + b*(c/x)^(3/2)]*(d*x)^m,x]
```

```
[Out] Integrate[Sqrt[a + b*(c/x)^(3/2)]*(d*x)^m, x]
```

Maple [F] time = 0.061, size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a+b\left(\frac{c}{x}\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x)^m*(a+b*(c/x)^(3/2))^(1/2),x)

[Out] int((d*x)^m*(a+b*(c/x)^(3/2))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{b\left(\frac{c}{x}\right)^{\frac{3}{2}}+a}\,(dx)^m\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*(c/x)^(3/2) + a)*(d*x)^m,x, algorithm="maxima")

[Out] integrate(sqrt(b*(c/x)^(3/2) + a)*(d*x)^m, x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*(c/x)^(3/2) + a)*(d*x)^m,x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a+b\left(\frac{c}{x}\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)**m*(a+b*(c/x)**(3/2))**(1/2),x)

[Out] Integral((d*x)**m*sqrt(a + b*(c/x)**(3/2)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{b\left(\frac{c}{x}\right)^{\frac{3}{2}}+a}\,(dx)^m\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*(c/x)^(3/2) + a)*(d*x)^m,x, algorithm="giac")

[Out] integrate(sqrt(b*(c/x)^(3/2) + a)*(d*x)^m, x)
```

3.2989 $\int \sqrt{a+b\sqrt{\frac{c}{x}}}(dx)^m\,dx$

Optimal. Leaf size=60

$$\frac{4x^{m+1}\left(a+b\sqrt{\frac{c}{x}}\right)^{3/2}\,{}_2F_1\left(1,\frac{1}{2}(-4m-1);\frac{5}{2};\frac{a+b\sqrt{\frac{c}{x}}}{a}\right)}{3a}$$

```
[Out] (4*(a + b*Sqrt[c/x])^(3/2)*x^(1 + m)*Hypergeometric2F1[1, (-1 - 4
*m)/2, 5/2, (a + b*Sqrt[c/x])/a])/(3*a)
```

Rubi [A] time = 0.221122, antiderivative size = 80, normalized size of antiderivative = 1.33, number of steps used = 6, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261

$$\frac{4b^2c(dx)^m\left(a+b\sqrt{\frac{c}{x}}\right)^{3/2}\left(-\frac{b\sqrt{\frac{c}{x}}}{a}\right)^{2m}\,{}_2F_1\left(\frac{3}{2},2m+3;\frac{5}{2};\frac{\sqrt{\frac{c}{x}}b}{a}+1\right)}{3a^3}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[c/x]]*(d*x)^m,x]
```

```
[Out] (4*b^2*c*(a + b*Sqrt[c/x])^(3/2)*(-((b*Sqrt[c/x])/a))^(2*m)*(d*x)
^m*Hypergeometric2F1[3/2, 3 + 2*m, 5/2, 1 + (b*Sqrt[c/x])/a])/(3*
a^3)
```

Rubi in Sympy [A] time = 15.8198, size = 65, normalized size = 1.08

$$\frac{4b^2c\,(dx)^m\left(-\frac{b\sqrt{\frac{c}{x}}}{a}\right)^{2m}\left(a+b\sqrt{\frac{c}{x}}\right)^{\frac{3}{2}}\,{}_2F_1\left(\begin{matrix}2m+3,\frac{3}{2}\\ \frac{5}{2}\end{matrix}\middle|1+\frac{b\sqrt{\frac{c}{x}}}{a}\right)}{3a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x)**m*(a+b*(c/x)**(1/2))**(1/2),x)
```

```
[Out] 4*b**2*c*(d*x)**m*(-b*sqrt(c/x)/a)**(2*m)*(a + b*sqrt(c/x))**(3/2
)*hyper((2*m + 3, 3/2), (5/2,), 1 + b*sqrt(c/x)/a)/(3*a**3)
```

Mathematica [A] time = 0.068796, size = 78, normalized size = 1.3

$$\frac{x(dx)^m\sqrt{a+b\sqrt{\frac{c}{x}}}\,{}_2F_1\left(-\frac{1}{2},-2(m+1);-2m-1;-\frac{b\sqrt{\frac{c}{x}}}{a}\right)}{(m+1)\sqrt{\frac{b\sqrt{\frac{c}{x}}}{a}+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b*Sqrt[c/x]]*(d*x)^m,x]
```

```
[Out] (Sqrt[a + b*Sqrt[c/x]]*x*(d*x)^m*Hypergeometric2F1[-1/2, -2*(1 +
m), -1 - 2*m, -((b*Sqrt[c/x])/a)])/((1 + m)*Sqrt[1 + (b*Sqrt[c/x]
)/a])
```

Maple [F] time = 0.056, size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a+b\sqrt{\frac{c}{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x)^m*(a+b*(c/x)^(1/2))^(1/2),x)

[Out] int((d*x)^m*(a+b*(c/x)^(1/2))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{b\sqrt{\frac{c}{x}}+a}\,(dx)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(c/x) + a)*(d*x)^m,x, algorithm="maxima")

[Out] integrate(sqrt(b*sqrt(c/x) + a)*(d*x)^m, x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(c/x) + a)*(d*x)^m,x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a+b\sqrt{\frac{c}{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)**m*(a+b*(c/x)**(1/2))**(1/2),x)

[Out] Integral((d*x)**m*sqrt(a + b*sqrt(c/x)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{b\sqrt{\frac{c}{x}}+a}\,(dx)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(c/x) + a)*(d*x)^m,x, algorithm="giac")

[Out] integrate(sqrt(b*sqrt(c/x) + a)*(d*x)^m, x)
```

3.2990 $\int \sqrt{a+\frac{b}{\sqrt{\frac{c}{x}}}}(dx)^m\,dx$

Optimal. Leaf size=78

$$-\frac{4ac(dx)^m\left(a+\frac{b}{\sqrt{\frac{c}{x}}}\right)^{3/2}\left(-\frac{b}{a\sqrt{\frac{c}{x}}}\right)^{-2m}{}_2F_1\left(\frac{3}{2},-2m-1;\frac{5}{2};\frac{b}{a\sqrt{\frac{c}{x}}}+1\right)}{3b^2}$$

```
[Out] (-4*a*c*(a + b/Sqrt[c/x])^(3/2)*(d*x)^m*Hypergeometric2F1[3/2, -1
 - 2*m, 5/2, 1 + b/(a*Sqrt[c/x])])/(3*b^2*(-(b/(a*Sqrt[c/x])))^(2
*m))
```

Rubi [A] time = 0.205803, antiderivative size = 78, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217

$$-\frac{4ac(dx)^m\left(a+\frac{b}{\sqrt{\frac{c}{x}}}\right)^{3/2}\left(-\frac{b}{a\sqrt{\frac{c}{x}}}\right)^{-2m}{}_2F_1\left(\frac{3}{2},-2m-1;\frac{5}{2};\frac{b}{a\sqrt{\frac{c}{x}}}+1\right)}{3b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/Sqrt[c/x]]*(d*x)^m,x]
```

```
[Out] (-4*a*c*(a + b/Sqrt[c/x])^(3/2)*(d*x)^m*Hypergeometric2F1[3/2, -1
 - 2*m, 5/2, 1 + b/(a*Sqrt[c/x])])/(3*b^2*(-(b/(a*Sqrt[c/x])))^(2
*m))
```

Rubi in Sympy [A] time = 17.9298, size = 85, normalized size = 1.09

$$-\frac{4ac\left(\frac{c}{x}\right)^{-m-\frac{3}{2}}\left(\frac{c}{x}\right)^{m+\frac{3}{2}}(dx)^m\left(-\frac{b}{a\sqrt{\frac{c}{x}}}\right)^{-2m}\left(a+\frac{b}{\sqrt{\frac{c}{x}}}\right)^{\frac{3}{2}}{}_2F_1\left(\begin{matrix}-2m-1,\frac{3}{2}\\ \frac{5}{2}\end{matrix}\middle|1+\frac{b}{a\sqrt{\frac{c}{x}}}\right)}{3b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x)**m*(a+b/(c/x)**(1/2))**(1/2),x)
```

```
[Out] -4*a*c*(c/x)**(-m - 3/2)*(c/x)**(m + 3/2)*(d*x)**m*(-b/(a*sqrt(c/
x)))**(-2*m)*(a + b/sqrt(c/x))**(3/2)*hyper((-2*m - 1, 3/2), (5/2
,), 1 + b/(a*sqrt(c/x)))/(3*b**2)
```

Mathematica [A] time = 0.0985244, size = 85, normalized size = 1.09

$$\frac{4x(dx)^m\sqrt{a+\frac{b}{\sqrt{\frac{c}{x}}}}\,{}_2F_1\left(-\frac{1}{2},-2m-\frac{5}{2};-2m-\frac{3}{2};-\frac{a\sqrt{\frac{c}{x}}}{b}\right)}{(4m+5)\sqrt{\frac{a\sqrt{\frac{c}{x}}}{b}+1}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b/Sqrt[c/x]]*(d*x)^m,x]
```

```
[Out] (4*Sqrt[a + b/Sqrt[c/x]]*x*(d*x)^m*Hypergeometric2F1[-1/2, -5/2 -
 2*m, -3/2 - 2*m, -((a*Sqrt[c/x])/b)])/((5 + 4*m)*Sqrt[1 + (a*Sqr
t[c/x])/b])
```

Maple [F] time = 0.068, size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a + b\frac{1}{\sqrt{\frac{c}{x}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x)^m*(a+b/(c/x)^(1/2))^(1/2),x)

[Out] int((d*x)^m*(a+b/(c/x)^(1/2))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a + \frac{b}{\sqrt{\frac{c}{x}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m*sqrt(a + b/sqrt(c/x)),x, algorithm="maxima")

[Out] integrate((d*x)^m*sqrt(a + b/sqrt(c/x)), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m*sqrt(a + b/sqrt(c/x)),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a + \frac{b}{\sqrt{\frac{c}{x}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)**m*(a+b/(c/x)**(1/2))**(1/2),x)

[Out] Integral((d*x)**m*sqrt(a + b/sqrt(c/x)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a + \frac{b}{\sqrt{\frac{c}{x}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m*sqrt(a + b/sqrt(c/x)),x, algorithm="giac")

[Out] integrate((d*x)^m*sqrt(a + b/sqrt(c/x)), x)
```

3.2991 $\int \sqrt{a+\frac{b}{\left(\frac{c}{x}\right)^{3/2}}}(dx)^m\,dx$

Optimal. Leaf size=102

$$\frac{x(dx)^m\sqrt{a+\frac{bx^3\left(\frac{c}{x}\right)^{3/2}}{c^3}}\,{}_2F_1\left(-\frac{1}{2},\frac{2(m+1)}{3};\frac{1}{3}(2m+5);-\frac{b\left(\frac{c}{x}\right)^{3/2}x^3}{ac^3}\right)}{(m+1)\sqrt{\frac{bx^3\left(\frac{c}{x}\right)^{3/2}}{ac^3}+1}}$$

```
[Out] (x*(d*x)^m*Sqrt[a + (b*(c/x)^(3/2)*x^3)/c^3]*Hypergeometric2F1[-1
/2, (2*(1 + m))/3, (5 + 2*m)/3, -((b*(c/x)^(3/2)*x^3)/(a*c^3))])/
((1 + m)*Sqrt[1 + (b*(c/x)^(3/2)*x^3)/(a*c^3)])
```

Rubi [A] time = 0.240272, antiderivative size = 102, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217

$$\frac{x(dx)^m\sqrt{a+\frac{bx^3\left(\frac{c}{x}\right)^{3/2}}{c^3}}\,{}_2F_1\left(-\frac{1}{2},\frac{2(m+1)}{3};\frac{1}{3}(2m+5);-\frac{b\left(\frac{c}{x}\right)^{3/2}x^3}{ac^3}\right)}{(m+1)\sqrt{\frac{bx^3\left(\frac{c}{x}\right)^{3/2}}{ac^3}+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b/(c/x)^(3/2)]*(d*x)^m,x]
```

```
[Out] (x*(d*x)^m*Sqrt[a + (b*(c/x)^(3/2)*x^3)/c^3]*Hypergeometric2F1[-1
/2, (2*(1 + m))/3, (5 + 2*m)/3, -((b*(c/x)^(3/2)*x^3)/(a*c^3))])/
((1 + m)*Sqrt[1 + (b*(c/x)^(3/2)*x^3)/(a*c^3)])
```

Rubi in Sympy [A] time = 17.8125, size = 100, normalized size = 0.98

$$\frac{c\left(\frac{c}{x}\right)^m\left(\frac{c}{x}\right)^{-m-\frac{3}{2}}\left(\frac{c}{x}\right)^{-m-1}\left(\frac{c}{x}\right)^{m+\frac{3}{2}}(dx)^m\sqrt{a+\frac{b}{\left(\frac{c}{x}\right)^{\frac{3}{2}}}}\,{}_2F_1\left(\begin{matrix}-\frac{1}{2},\frac{2m}{3}+\frac{2}{3}\\ \frac{2m}{3}+\frac{5}{3}\end{matrix}\middle|-\frac{b}{a\left(\frac{c}{x}\right)^{\frac{3}{2}}}\right)}{\sqrt{1+\frac{b}{a\left(\frac{c}{x}\right)^{\frac{3}{2}}}}(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x)**m*(a+b/(c/x)**(3/2))**(1/2),x)
```

```
[Out] c*(c/x)**m*(c/x)**(-m - 3/2)*(c/x)**(-m - 1)*(c/x)**(m + 3/2)*(d*
x)**m*sqrt(a + b/(c/x)**(3/2))*hyper((-1/2, 2*m/3 + 2/3), (2*m/3
+ 5/3,), -b/(a*(c/x)**(3/2)))/(sqrt(1 + b/(a*(c/x)**(3/2)))*(m +
1))
```

Mathematica [A] time = 0.116193, size = 0, normalized size = 0.

$$\int\sqrt{a+\frac{b}{\left(\frac{c}{x}\right)^{3/2}}}(dx)^m\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[Sqrt[a + b/(c/x)^(3/2)]*(d*x)^m,x]
```

```
[Out] Integrate[Sqrt[a + b/(c/x)^(3/2)]*(d*x)^m, x]
```

Maple [F] time = 0.068, size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a + b\left(\frac{c}{x}\right)^{-\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x)^m*(a+b/(c/x)^(3/2))^(1/2),x)

[Out] int((d*x)^m*(a+b/(c/x)^(3/2))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a + \frac{b}{\left(\frac{c}{x}\right)^{\frac{3}{2}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m*sqrt(a + b/(c/x)^(3/2)),x, algorithm="maxima")

[Out] integrate((d*x)^m*sqrt(a + b/(c/x)^(3/2)), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m*sqrt(a + b/(c/x)^(3/2)),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)**m*(a+b/(c/x)**(3/2))**(1/2),x)

[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m \sqrt{a + \frac{b}{\left(\frac{c}{x}\right)^{\frac{3}{2}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m*sqrt(a + b/(c/x)^(3/2)),x, algorithm="giac")

[Out] integrate((d*x)^m*sqrt(a + b/(c/x)^(3/2)), x)
```

3.2992 $\int \frac{(dx)^m}{\sqrt{a+b\left(\frac{c}{x}\right)^{3/2}}}\,dx$

Optimal. Leaf size=102

$$\frac{x(dx)^m\sqrt{\frac{bc^3}{ax^3\left(\frac{c}{x}\right)^{3/2}}+1}\,{}_2F_1\left(\frac{1}{2},-\frac{2}{3}(m+1);\frac{1}{3}(1-2m);-\frac{bc^3}{a\left(\frac{c}{x}\right)^{3/2}x^3}\right)}{(m+1)\sqrt{a+\frac{bc^3}{x^3\left(\frac{c}{x}\right)^{3/2}}}}$$

```
[Out] (Sqrt[1 + (b*c^3)/(a*(c/x)^(3/2)*x^3)]*x*(d*x)^m*Hypergeometric2F
1[1/2, (-2*(1 + m))/3, (1 - 2*m)/3, -((b*c^3)/(a*(c/x)^(3/2)*x^3)
)])/((1 + m)*Sqrt[a + (b*c^3)/((c/x)^(3/2)*x^3)])
```

Rubi [A] time = 0.267048, antiderivative size = 102, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261

$$\frac{x(dx)^m\sqrt{\frac{bc^3}{ax^3\left(\frac{c}{x}\right)^{3/2}}+1}\,{}_2F_1\left(\frac{1}{2},-\frac{2}{3}(m+1);\frac{1}{3}(1-2m);-\frac{bc^3}{a\left(\frac{c}{x}\right)^{3/2}x^3}\right)}{(m+1)\sqrt{a+\frac{bc^3}{x^3\left(\frac{c}{x}\right)^{3/2}}}}$$

Antiderivative was successfully verified.

```
[In]  Int[(d*x)^m/Sqrt[a + b*(c/x)^(3/2)],x]
```

```
[Out] (Sqrt[1 + (b*c^3)/(a*(c/x)^(3/2)*x^3)]*x*(d*x)^m*Hypergeometric2F
1[1/2, (-2*(1 + m))/3, (1 - 2*m)/3, -((b*c^3)/(a*(c/x)^(3/2)*x^3)
)])/((1 + m)*Sqrt[a + (b*c^3)/((c/x)^(3/2)*x^3)])
```

Rubi in Sympy [A] time = 15.5861, size = 83, normalized size = 0.81

$$\frac{c\left(\frac{c}{x}\right)^m\left(\frac{c}{x}\right)^{-m-1}(dx)^m\sqrt{a+b\left(\frac{c}{x}\right)^{\frac{3}{2}}}\,{}_2F_1\left(\begin{matrix}\frac{1}{2},-\frac{2m}{3}-\frac{2}{3}\\-\frac{2m}{3}+\frac{1}{3}\end{matrix}\middle|-\frac{b\left(\frac{c}{x}\right)^{\frac{3}{2}}}{a}\right)}{a\sqrt{1+\frac{b\left(\frac{c}{x}\right)^{\frac{3}{2}}}{a}}\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x)**m/(a+b*(c/x)**(3/2))**(1/2),x)
```

```
[Out] c*(c/x)**m*(c/x)**(-m - 1)*(d*x)**m*sqrt(a + b*(c/x)**(3/2))*hype
r((1/2, -2*m/3 - 2/3), (-2*m/3 + 1/3,), -b*(c/x)**(3/2)/a)/(a*sqr
t(1 + b*(c/x)**(3/2)/a)*(m + 1))
```

Mathematica [A] time = 0.177508, size = 0, normalized size = 0.

$$\int \frac{(dx)^m}{\sqrt{a+b\left(\frac{c}{x}\right)^{3/2}}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(d*x)^m/Sqrt[a + b*(c/x)^(3/2)],x]
```

```
[Out] Integrate[(d*x)^m/Sqrt[a + b*(c/x)^(3/2)], x]
```

Maple [F] time = 0.058, size = 0, normalized size = 0.

$$\int (dx)^m \frac{1}{\sqrt{a + b\left(\frac{c}{x}\right)^{\frac{3}{2}}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x)^m/(a+b*(c/x)^(3/2))^(1/2),x)

[Out] int((d*x)^m/(a+b*(c/x)^(3/2))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx)^m}{\sqrt{b\left(\frac{c}{x}\right)^{\frac{3}{2}} + a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m/sqrt(b*(c/x)^(3/2) + a),x, algorithm="maxima")

[Out] integrate((d*x)^m/sqrt(b*(c/x)^(3/2) + a), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m/sqrt(b*(c/x)^(3/2) + a),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx)^m}{\sqrt{a + b\left(\frac{c}{x}\right)^{\frac{3}{2}}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)**m/(a+b*(c/x)**(3/2))**(1/2),x)

[Out] Integral((d*x)**m/sqrt(a + b*(c/x)**(3/2)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx)^m}{\sqrt{b\left(\frac{c}{x}\right)^{\frac{3}{2}} + a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m/sqrt(b*(c/x)^(3/2) + a),x, algorithm="giac")

[Out] integrate((d*x)^m/sqrt(b*(c/x)^(3/2) + a), x)
```

3.2993 $\int \frac{(dx)^m}{\sqrt{a+b\sqrt{\frac{c}{x}}}}\,dx$

Optimal. Leaf size=58

$$\frac{4x^{m+1}\sqrt{a+b\sqrt{\frac{c}{x}}}\,{}_2F_1\left(1,\frac{1}{2}(-4m-3);\frac{3}{2};\frac{a+b\sqrt{\frac{c}{x}}}{a}\right)}{a}$$

```
[Out] (4*Sqrt[a + b*Sqrt[c/x]]*x^(1 + m)*Hypergeometric2F1[1, (-3 - 4*m
)/2, 3/2, (a + b*Sqrt[c/x])/a])/a
```

Rubi [A] time = 0.220988, antiderivative size = 78, normalized size of antiderivative = 1.34, number of steps used = 6, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261

$$\frac{4b^2c(dx)^m\sqrt{a+b\sqrt{\frac{c}{x}}}\left(-\frac{b\sqrt{\frac{c}{x}}}{a}\right)^{2m}{}_2F_1\left(\frac{1}{2},2m+3;\frac{3}{2};\frac{\sqrt{\frac{c}{x}}b}{a}+1\right)}{a^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(d*x)^m/Sqrt[a + b*Sqrt[c/x]],x]
```

```
[Out] (4*b^2*c*Sqrt[a + b*Sqrt[c/x]]*(-((b*Sqrt[c/x])/a))^(2*m)*(d*x)^m
*Hypergeometric2F1[1/2, 3 + 2*m, 3/2, 1 + (b*Sqrt[c/x])/a])/a^3
```

Rubi in Sympy [A] time = 16.0678, size = 63, normalized size = 1.09

$$\frac{4b^2c\,(dx)^m\left(-\frac{b\sqrt{\frac{c}{x}}}{a}\right)^{2m}\sqrt{a+b\sqrt{\frac{c}{x}}}\,{}_2F_1\left(\begin{matrix}2m+3,\frac{1}{2}\\\frac{3}{2}\end{matrix}\middle|1+\frac{b\sqrt{\frac{c}{x}}}{a}\right)}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x)**m/(a+b*(c/x)**(1/2))**(1/2),x)
```

```
[Out] 4*b**2*c*(d*x)**m*(-b*sqrt(c/x)/a)**(2*m)*sqrt(a + b*sqrt(c/x))*h
yper((2*m + 3, 1/2), (3/2,), 1 + b*sqrt(c/x)/a)/a**3
```

Mathematica [A] time = 0.288671, size = 96, normalized size = 1.66

$$\frac{4b^2c(dx)^m\left(1-\frac{a}{a+b\sqrt{\frac{c}{x}}}\right)^{2m}{}_2F_1\left(2m+\frac{5}{2},2m+3;2m+\frac{7}{2};\frac{a}{a+b\sqrt{\frac{c}{x}}}\right)}{(4m+5)\left(a+b\sqrt{\frac{c}{x}}\right)^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(d*x)^m/Sqrt[a + b*Sqrt[c/x]],x]
```

```
[Out] (4*b^2*c*(1 - a/(a + b*Sqrt[c/x]))^(2*m)*(d*x)^m*Hypergeometric2F
1[5/2 + 2*m, 3 + 2*m, 7/2 + 2*m, a/(a + b*Sqrt[c/x])])/((5 + 4*m)
*(a + b*Sqrt[c/x])^(5/2))
```

Maple [F] time = 0.056, size = 0, normalized size = 0.

$$\int (dx)^m \frac{1}{\sqrt{a+b\sqrt{\frac{c}{x}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x)^m/(a+b*(c/x)^(1/2))^(1/2),x)

[Out] int((d*x)^m/(a+b*(c/x)^(1/2))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx)^m}{\sqrt{b\sqrt{\frac{c}{x}}+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m/sqrt(b*sqrt(c/x) + a),x, algorithm="maxima")

[Out] integrate((d*x)^m/sqrt(b*sqrt(c/x) + a), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m/sqrt(b*sqrt(c/x) + a),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx)^m}{\sqrt{a+b\sqrt{\frac{c}{x}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)**m/(a+b*(c/x)**(1/2))**(1/2),x)

[Out] Integral((d*x)**m/sqrt(a + b*sqrt(c/x)), x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m/sqrt(b*sqrt(c/x) + a),x, algorithm="giac")

[Out] Exception raised: TypeError
```

3.2994 $\int \frac{(dx)^m}{\sqrt{a+\frac{b}{\sqrt{\frac{c}{x}}}}}\,dx$

Optimal. Leaf size=76

$$-\frac{4ac(dx)^m\sqrt{a+\frac{b}{\sqrt{\frac{c}{x}}}}\left(-\frac{b}{a\sqrt{\frac{c}{x}}}\right)^{-2m}{}_2F_1\left(\frac{1}{2},-2m-1;\frac{3}{2};\frac{b}{a\sqrt{\frac{c}{x}}}+1\right)}{b^2}$$

```
[Out] (-4*a*c*Sqrt[a + b/Sqrt[c/x]]*(d*x)^m*Hypergeometric2F1[1/2, -1 -
 2*m, 3/2, 1 + b/(a*Sqrt[c/x])])/(b^2*(-(b/(a*Sqrt[c/x])))^(2*m))
```

Rubi [A] time = 0.205763, antiderivative size = 76, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217

$$-\frac{4ac(dx)^m\sqrt{a+\frac{b}{\sqrt{\frac{c}{x}}}}\left(-\frac{b}{a\sqrt{\frac{c}{x}}}\right)^{-2m}{}_2F_1\left(\frac{1}{2},-2m-1;\frac{3}{2};\frac{b}{a\sqrt{\frac{c}{x}}}+1\right)}{b^2}$$

Antiderivative was successfully verified.

```
[In] Int[(d*x)^m/Sqrt[a + b/Sqrt[c/x]],x]
```

```
[Out] (-4*a*c*Sqrt[a + b/Sqrt[c/x]]*(d*x)^m*Hypergeometric2F1[1/2, -1 -
 2*m, 3/2, 1 + b/(a*Sqrt[c/x])])/(b^2*(-(b/(a*Sqrt[c/x])))^(2*m))
```

Rubi in Sympy [A] time = 28.0008, size = 83, normalized size = 1.09

$$-\frac{4ac\left(\frac{c}{x}\right)^{-m-\frac{3}{2}}\left(\frac{c}{x}\right)^{m+\frac{3}{2}}(dx)^m\left(-\frac{b}{a\sqrt{\frac{c}{x}}}\right)^{-2m}\sqrt{a+\frac{b}{\sqrt{\frac{c}{x}}}}\,{}_2F_1\left(\begin{matrix}-2m-1,\frac{1}{2}\\ \frac{3}{2}\end{matrix}\middle|1+\frac{b}{a\sqrt{\frac{c}{x}}}\right)}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((d*x)**m/(a+b/(c/x)**(1/2))**(1/2),x)
```

```
[Out] -4*a*c*(c/x)**(-m - 3/2)*(c/x)**(m + 3/2)*(d*x)**m*(-b/(a*sqrt(c/
x)))**(-2*m)*sqrt(a + b/sqrt(c/x))*hyper((-2*m - 1, 1/2), (3/2,),
 1 + b/(a*sqrt(c/x)))/b**2
```

Mathematica [A] time = 0.57146, size = 116, normalized size = 1.53

$$\frac{a^2c(dx)^m\left(\frac{a\sqrt{\frac{c}{x}}}{a\sqrt{\frac{c}{x}}+b}\right)^{2m-\frac{1}{2}}{}_2F_1\left(2m+2,2m+\frac{5}{2};2m+3;\frac{b}{\sqrt{\frac{c}{x}}a+b}\right)}{(m+1)\sqrt{a+\frac{b}{\sqrt{\frac{c}{x}}}}\left(a\sqrt{\frac{c}{x}}+b\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*x)^m/Sqrt[a + b/Sqrt[c/x]],x]
```

```
[Out] (a^2*c*((a*Sqrt[c/x])/(b + a*Sqrt[c/x]))^(-1/2 + 2*m)*(d*x)^m*Hyp
ergeometric2F1[2 + 2*m, 5/2 + 2*m, 3 + 2*m, b/(b + a*Sqrt[c/x])])
/((1 + m)*Sqrt[a + b/Sqrt[c/x]]*(b + a*Sqrt[c/x])^2)
```

Maple [F] time = 0.06, size = 0, normalized size = 0.

$$\int (dx)^m \frac{1}{\sqrt{a+b\frac{1}{\sqrt{\frac{c}{x}}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x)^m/(a+b/(c/x)^(1/2))^(1/2),x)

[Out] int((d*x)^m/(a+b/(c/x)^(1/2))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx)^m}{\sqrt{a+\frac{b}{\sqrt{\frac{c}{x}}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m/sqrt(a + b/sqrt(c/x)),x, algorithm="maxima")

[Out] integrate((d*x)^m/sqrt(a + b/sqrt(c/x)), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m/sqrt(a + b/sqrt(c/x)),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx)^m}{\sqrt{a+\frac{b}{\sqrt{\frac{c}{x}}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)**m/(a+b/(c/x)**(1/2))**(1/2),x)

[Out] Integral((d*x)**m/sqrt(a + b/sqrt(c/x)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx)^m}{\sqrt{a+\frac{b}{\sqrt{\frac{c}{x}}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m/sqrt(a + b/sqrt(c/x)),x, algorithm="giac")

[Out] integrate((d*x)^m/sqrt(a + b/sqrt(c/x)), x)
```

3.2995 $\int \frac{(dx)^m}{\sqrt{a+\frac{b}{\left(\frac{c}{x}\right)^{3/2}}}}\,dx$

Optimal. Leaf size=102

$$\frac{x(dx)^m\sqrt{\frac{bx^3\left(\frac{c}{x}\right)^{3/2}}{ac^3}+1}\,{}_2F_1\left(\frac{1}{2},\frac{2(m+1)}{3};\frac{1}{3}(2m+5);-\frac{b\left(\frac{c}{x}\right)^{3/2}x^3}{ac^3}\right)}{(m+1)\sqrt{a+\frac{bx^3\left(\frac{c}{x}\right)^{3/2}}{c^3}}}$$

```
[Out] (x*(d*x)^m*Sqrt[1 + (b*(c/x)^(3/2)*x^3)/(a*c^3)]*Hypergeometric2F
1[1/2, (2*(1 + m))/3, (5 + 2*m)/3, -((b*(c/x)^(3/2)*x^3)/(a*c^3))
])/((1 + m)*Sqrt[a + (b*(c/x)^(3/2)*x^3)/c^3])
```

Rubi [A] time = 0.226867, antiderivative size = 102, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.217$

$$\frac{x(dx)^m\sqrt{\frac{bx^3\left(\frac{c}{x}\right)^{3/2}}{ac^3}+1}\,{}_2F_1\left(\frac{1}{2},\frac{2(m+1)}{3};\frac{1}{3}(2m+5);-\frac{b\left(\frac{c}{x}\right)^{3/2}x^3}{ac^3}\right)}{(m+1)\sqrt{a+\frac{bx^3\left(\frac{c}{x}\right)^{3/2}}{c^3}}}$$

Antiderivative was successfully verified.

```
[In]  Int[(d*x)^m/Sqrt[a + b/(c/x)^(3/2)],x]
```

```
[Out] (x*(d*x)^m*Sqrt[1 + (b*(c/x)^(3/2)*x^3)/(a*c^3)]*Hypergeometric2F
1[1/2, (2*(1 + m))/3, (5 + 2*m)/3, -((b*(c/x)^(3/2)*x^3)/(a*c^3))
])/((1 + m)*Sqrt[a + (b*(c/x)^(3/2)*x^3)/c^3])
```

Rubi in Sympy [A] time = 20.7032, size = 100, normalized size = 0.98

$$\frac{c\left(\frac{c}{x}\right)^{m}\left(\frac{c}{x}\right)^{-m-\frac{3}{2}}\left(\frac{c}{x}\right)^{-m-1}\left(\frac{c}{x}\right)^{m+\frac{3}{2}}(dx)^m\sqrt{a+\frac{b}{\left(\frac{c}{x}\right)^{\frac{3}{2}}}}\,{}_2F_1\left(\begin{matrix}\frac{1}{2},\frac{2m}{3}+\frac{2}{3}\\\frac{2m}{3}+\frac{5}{3}\end{matrix}\middle|-\frac{b}{a\left(\frac{c}{x}\right)^{\frac{3}{2}}}\right)}{a\sqrt{1+\frac{b}{a\left(\frac{c}{x}\right)^{\frac{3}{2}}}}(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x)**m/(a+b/(c/x)**(3/2))**(1/2),x)
```

```
[Out] c*(c/x)**m*(c/x)**(-m - 3/2)*(c/x)**(-m - 1)*(c/x)**(m + 3/2)*(d*
x)**m*sqrt(a + b/(c/x)**(3/2))*hyper((1/2, 2*m/3 + 2/3), (2*m/3 +
 5/3,), -b/(a*(c/x)**(3/2)))/(a*sqrt(1 + b/(a*(c/x)**(3/2)))*(m +
 1))
```

Mathematica [A] time = 0.221906, size = 0, normalized size = 0.

$$\int \frac{(dx)^m}{\sqrt{a+\frac{b}{\left(\frac{c}{x}\right)^{3/2}}}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(d*x)^m/Sqrt[a + b/(c/x)^(3/2)],x]

[Out] Integrate[(d*x)^m/Sqrt[a + b/(c/x)^(3/2)], x]
```

Maple [F] time = 0.061, size = 0, normalized size = 0.

$$\int (dx)^m \frac{1}{\sqrt{a+b\left(\frac{c}{x}\right)^{-\frac{3}{2}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x)^m/(a+b/(c/x)^(3/2))^(1/2),x)

[Out] int((d*x)^m/(a+b/(c/x)^(3/2))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx)^m}{\sqrt{a+\frac{b}{\left(\frac{c}{x}\right)^{\frac{3}{2}}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m/sqrt(a + b/(c/x)^(3/2)),x, algorithm="maxima")

[Out] integrate((d*x)^m/sqrt(a + b/(c/x)^(3/2)), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m/sqrt(a + b/(c/x)^(3/2)),x, algorithm="fricas")

[Out] Exception raised: TypeError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx)^m}{\sqrt{a+\frac{b}{\left(\frac{c}{x}\right)^{\frac{3}{2}}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)**m/(a+b/(c/x)**(3/2))**(1/2),x)

[Out] Integral((d*x)**m/sqrt(a + b/(c/x)**(3/2)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dx)^m}{\sqrt{a + \frac{b}{\left(\frac{c}{x}\right)^{\frac{3}{2}}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)^m/sqrt(a + b/(c/x)^(3/2)),x, algorithm="giac")

[Out] integrate((d*x)^m/sqrt(a + b/(c/x)^(3/2)), x)
```

3.2996 $\int \left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)\,dx$

Optimal. Leaf size=19

$$ax+\frac{1}{2}bx\left(cx^n\right)^{\frac{1}{n}}$$

```
[Out] a*x + (b*x*(c*x^n)^n^(-1))/2
```

Rubi [A] time = 0.0147688, antiderivative size = 19, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$ax+\frac{1}{2}bx\left(cx^n\right)^{\frac{1}{n}}$$

Antiderivative was successfully verified.

```
[In]  Int[a + b*(c*x^n)^n^(-1),x]

[Out] a*x + (b*x*(c*x^n)^n^(-1))/2
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{b\left(cx^n\right)^{\frac{1}{n}}\int x\,dx}{x}+\int a\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(a+b*(c*x**n)**(1/n),x)

[Out] b*(c*x**n)**(1/n)*Integral(x, x)/x + Integral(a, x)
```

Mathematica [A] time = 0.00965197, size = 19, normalized size = 1.

$$ax+\frac{1}{2}bx\left(cx^n\right)^{\frac{1}{n}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[a + b*(c*x^n)^n^(-1),x]

[Out] a*x + (b*x*(c*x^n)^n^(-1))/2
```

Maple [A] time = 0.029, size = 22, normalized size = 1.2

$$ax+\frac{bx}{2}\mathrm{e}^{\frac{\ln\left(c\mathrm{e}^{n\ln(x)}\right)}{n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(a+b*(c*x^n)^(1/n),x)

[Out] a*x+1/2*x*b*exp(1/n*ln(c*exp(n*ln(x))))
```

Maxima [A] time = 1.42433, size = 20, normalized size = 1.05

$$\frac{1}{2}\,bc^{\left(\frac{1}{n}\right)}x^2 + ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^n)^(1/n)*b + a,x, algorithm="maxima")

[Out] 1/2*b*c^(1/n)*x^2 + a*x
```

Fricas [A] time = 0.232505, size = 20, normalized size = 1.05

$$\frac{1}{2}\,bc^{\left(\frac{1}{n}\right)}x^2 + ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^n)^(1/n)*b + a,x, algorithm="fricas")

[Out] 1/2*b*c^(1/n)*x^2 + a*x
```

Sympy [A] time = 0.614183, size = 19, normalized size = 1.

$$ax + \frac{bc^{\frac{1}{n}}x\,(x^n)^{\frac{1}{n}}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(a+b*(c*x**n)**(1/n),x)

[Out] a*x + b*c**(1/n)*x*(x**n)**(1/n)/2
```

GIAC/XCAS [A] time = 0.225456, size = 23, normalized size = 1.21

$$\frac{1}{2}\,bx^2e^{\left(\frac{\ln(c)}{n}\right)} + ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^n)^(1/n)*b + a,x, algorithm="giac")

[Out] 1/2*b*x^2*e^(ln(c)/n) + a*x
```

3.2997 $\int \left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^2 dx$

Optimal. Leaf size=34

$$\frac{x\left(cx^n\right)^{-1/n}\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^3}{3b}$$

```
[Out] (x*(a + b*(c*x^n)^n^(-1))^3)/(3*b*(c*x^n)^n^(-1))
```

Rubi [A] time = 0.0217195, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{x\left(cx^n\right)^{-1/n}\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^3}{3b}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(c*x^n)^n^(-1))^2,x]
```

```
[Out] (x*(a + b*(c*x^n)^n^(-1))^3)/(3*b*(c*x^n)^n^(-1))
```

Rubi in Sympy [A] time = 2.30416, size = 26, normalized size = 0.76

$$\frac{x\left(cx^n\right)^{-\frac{1}{n}}\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^3}{3b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x**n)**(1/n))**2,x)
```

```
[Out] x*(c*x**n)**(-1/n)*(a + b*(c*x**n)**(1/n))**3/(3*b)
```

Mathematica [A] time = 0.0239098, size = 34, normalized size = 1.

$$\frac{x\left(cx^n\right)^{-1/n}\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^3}{3b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(c*x^n)^n^(-1))^2,x]
```

```
[Out] (x*(a + b*(c*x^n)^n^(-1))^3)/(3*b*(c*x^n)^n^(-1))
```

Maple [F] time = 0.043, size = 0, normalized size = 0.

$$\int \left(a+b\sqrt[n]{cx^n}\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^n)^(1/n))^2,x)
```

```
[Out] int((a+b*(c*x^n)^(1/n))^2,x)
```

Maxima [A] time = 1.42503, size = 43, normalized size = 1.26

$$\frac{1}{3}\,b^2c^{\frac{2}{n}}x^3 + abc^{\left(\frac{1}{n}\right)}x^2 + a^2x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^2,x, algorithm="maxima")
```

```
[Out] 1/3*b^2*c^(2/n)*x^3 + a*b*c^(1/n)*x^2 + a^2*x
```

Fricas [A] time = 0.233443, size = 43, normalized size = 1.26

$$\frac{1}{3}\,b^2c^{\frac{2}{n}}x^3 + abc^{\left(\frac{1}{n}\right)}x^2 + a^2x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^2,x, algorithm="fricas")
```

```
[Out] 1/3*b^2*c^(2/n)*x^3 + a*b*c^(1/n)*x^2 + a^2*x
```

Sympy [A] time = 1.19122, size = 39, normalized size = 1.15

$$a^2x + abc^{\frac{1}{n}}x\left(x^n\right)^{\frac{1}{n}} + \frac{b^2c^{\frac{2}{n}}x\left(x^n\right)^{\frac{2}{n}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**n)**(1/n))**2,x)
```

```
[Out] a**2*x + a*b*c**(1/n)*x*(x**n)**(1/n) + b**2*c**(2/n)*x*(x**n)**(
2/n)/3
```

GIAC/XCAS [A] time = 0.227086, size = 47, normalized size = 1.38

$$\frac{1}{3}\,b^2x^3e^{\left(\frac{2\ln(c)}{n}\right)} + abx^2e^{\left(\frac{\ln(c)}{n}\right)} + a^2x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^2,x, algorithm="giac")
```

```
[Out] 1/3*b^2*x^3*e^(2*ln(c)/n) + a*b*x^2*e^(ln(c)/n) + a^2*x
```

3.2998 $\int \left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^3 dx$

Optimal. Leaf size=34

$$\frac{x\left(cx^n\right)^{-1/n}\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^4}{4b}$$

```
[Out] (x*(a + b*(c*x^n)^n^(-1))^4)/(4*b*(c*x^n)^n^(-1))
```

Rubi [A] time = 0.0216235, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{x\left(cx^n\right)^{-1/n}\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^4}{4b}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(c*x^n)^n^(-1))^3,x]

[Out] (x*(a + b*(c*x^n)^n^(-1))^4)/(4*b*(c*x^n)^n^(-1))
```

Rubi in Sympy [A] time = 2.29812, size = 26, normalized size = 0.76

$$\frac{x\left(cx^n\right)^{-\frac{1}{n}}\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^4}{4b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x**n)**(1/n))**3,x)

[Out] x*(c*x**n)**(-1/n)*(a + b*(c*x**n)**(1/n))**4/(4*b)
```

Mathematica [A] time = 0.0171997, size = 34, normalized size = 1.

$$\frac{x\left(cx^n\right)^{-1/n}\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^4}{4b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(c*x^n)^n^(-1))^3,x]

[Out] (x*(a + b*(c*x^n)^n^(-1))^4)/(4*b*(c*x^n)^n^(-1))
```

Maple [F] time = 0.038, size = 0, normalized size = 0.

$$\int \left(a+b\sqrt[n]{cx^n}\right)^3 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^n)^(1/n))^3,x)
```

```
[Out] int((a+b*(c*x^n)^(1/n))^3,x)
```

Maxima [A] time = 1.45539, size = 68, normalized size = 2.

$$\frac{1}{4}\,b^{3}c^{\frac{3}{n}}x^{4} + ab^{2}c^{\frac{2}{n}}x^{3} + \frac{3}{2}\,a^{2}bc^{\left(\frac{1}{n}\right)}x^{2} + a^{3}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^3,x, algorithm="maxima")
```

```
[Out] 1/4*b^3*c^(3/n)*x^4 + a*b^2*c^(2/n)*x^3 + 3/2*a^2*b*c^(1/n)*x^2 +
 a^3*x
```

Fricas [A] time = 0.252329, size = 68, normalized size = 2.

$$\frac{1}{4}\,b^{3}c^{\frac{3}{n}}x^{4} + ab^{2}c^{\frac{2}{n}}x^{3} + \frac{3}{2}\,a^{2}bc^{\left(\frac{1}{n}\right)}x^{2} + a^{3}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^3,x, algorithm="fricas")
```

```
[Out] 1/4*b^3*c^(3/n)*x^4 + a*b^2*c^(2/n)*x^3 + 3/2*a^2*b*c^(1/n)*x^2 +
 a^3*x
```

Sympy [A] time = 2.28096, size = 63, normalized size = 1.85

$$a^{3}x + \frac{3a^{2}bc^{\frac{1}{n}}x\left(x^{n}\right)^{\frac{1}{n}}}{2} + ab^{2}c^{\frac{2}{n}}x\left(x^{n}\right)^{\frac{2}{n}} + \frac{b^{3}c^{\frac{3}{n}}x\left(x^{n}\right)^{\frac{3}{n}}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**n)**(1/n))**3,x)
```

```
[Out] a**3*x + 3*a**2*b*c**(1/n)*x*(x**n)**(1/n)/2 + a*b**2*c**(2/n)*x*
(x**n)**(2/n) + b**3*c**(3/n)*x*(x**n)**(3/n)/4
```

GIAC/XCAS [A] time = 0.230625, size = 73, normalized size = 2.15

$$\frac{1}{4}\,b^{3}x^{4}e^{\left(\frac{3\ln(c)}{n}\right)} + ab^{2}x^{3}e^{\left(\frac{2\ln(c)}{n}\right)} + \frac{3}{2}\,a^{2}bx^{2}e^{\left(\frac{\ln(c)}{n}\right)} + a^{3}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^3,x, algorithm="giac")
```

```
[Out] 1/4*b^3*x^4*e^(3*ln(c)/n) + a*b^2*x^3*e^(2*ln(c)/n) + 3/2*a^2*b*x
^2*e^(ln(c)/n) + a^3*x
```

3.2999 $\int \frac{x^3}{a+b(cx^n)^{\frac{1}{n}}}\,dx$

Optimal. Leaf size=101

$$-\frac{a^3x^4(cx^n)^{-4/n}\log\left(a+b(cx^n)^{\frac{1}{n}}\right)}{b^4}+\frac{a^2x^4(cx^n)^{-3/n}}{b^3}-\frac{ax^4(cx^n)^{-2/n}}{2b^2}+\frac{x^4(cx^n)^{-1/n}}{3b}$$

```
[Out] (a^2*x^4)/(b^3*(c*x^n)^(3/n)) - (a*x^4)/(2*b^2*(c*x^n)^(2/n)) + x
^4/(3*b*(c*x^n)^n^(-1)) - (a^3*x^4*Log[a + b*(c*x^n)^n^(-1)])/(b^
4*(c*x^n)^(4/n))
```

Rubi [A] time = 0.0918268, antiderivative size = 101, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$-\frac{a^3x^4(cx^n)^{-4/n}\log\left(a+b(cx^n)^{\frac{1}{n}}\right)}{b^4}+\frac{a^2x^4(cx^n)^{-3/n}}{b^3}-\frac{ax^4(cx^n)^{-2/n}}{2b^2}+\frac{x^4(cx^n)^{-1/n}}{3b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(a + b*(c*x^n)^n^(-1)),x]
```

```
[Out] (a^2*x^4)/(b^3*(c*x^n)^(3/n)) - (a*x^4)/(2*b^2*(c*x^n)^(2/n)) + x
^4/(3*b*(c*x^n)^n^(-1)) - (a^3*x^4*Log[a + b*(c*x^n)^n^(-1)])/(b^
4*(c*x^n)^(4/n))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^3x^4(cx^n)^{-\frac{4}{n}}\log\left(a+b(cx^n)^{\frac{1}{n}}\right)}{b^4}-\frac{ax^4(cx^n)^{-\frac{4}{n}}\int^{(cx^n)^{\frac{1}{n}}}x\,dx}{b^2}+\frac{x^4(cx^n)^{-\frac{1}{n}}}{3b}+\frac{x^4(cx^n)^{-\frac{4}{n}}\int^{(cx^n)^{\frac{1}{n}}}a^2\,dx}{b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(a+b*(c*x**n)**(1/n)),x)
```

```
[Out] -a**3*x**4*(c*x**n)**(-4/n)*log(a + b*(c*x**n)**(1/n))/b**4 - a*x
**4*(c*x**n)**(-4/n)*Integral(x, (x, (c*x**n)**(1/n)))/b**2 + x**
4*(c*x**n)**(-1/n)/(3*b) + x**4*(c*x**n)**(-4/n)*Integral(a**2, (
x, (c*x**n)**(1/n)))/b**3
```

Mathematica [A] time = 4.82499, size = 0, normalized size = 0.

$$\int \frac{x^3}{a+b(cx^n)^{\frac{1}{n}}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[x^3/(a + b*(c*x^n)^n^(-1)),x]
```

```
[Out] Integrate[x^3/(a + b*(c*x^n)^n^(-1)), x]
```

Maple [C] time = 0.279, size = 553, normalized size = 5.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x^3/(a+b*(c*x^n)^(1/n)),x)
```

```
[Out] 1/(c^(1/n))^3/b^3*a^2*x*exp(-3/2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^
2-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I
*Pi*csgn(I*c)*csgn(I*c*x^n)^2-2*n*ln(x)+2*ln(x^n))/n)+1/3/(c^(1/n
))/b*x^3*exp(-1/2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x
^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*c
sgn(I*c*x^n)^2-2*n*ln(x)+2*ln(x^n))/n)-1/2*a/(c^(1/n))^2/b^2*x^2*
exp(-(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*csgn(I*c)
*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(I*c*x^n)^
2-2*n*ln(x)+2*ln(x^n))/n)-1/(c^(1/n))^4/b^4*a^3*ln(b*exp(1/2*(-I*
Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)+I*Pi*csgn(I*x^n)*csgn(I*c*
x^n)^2+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-I*Pi*csgn(I*c*x^n)^3+2*ln(c
)+2*ln(x^n)-2*n*ln(x))/n)*x+a)*exp(-2*(I*Pi*csgn(I*x^n)*csgn(I*c*
x^n)^2-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n
)^3+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-2*n*ln(x)+2*ln(x^n))/n)
```

Maxima [A] time = 22.5987, size = 99, normalized size = 0.98

$$-\frac{a^3c^{-\frac{4}{n}}\log\left(bc^{\left(\frac{1}{n}\right)}x+a\right)}{b^4}+\frac{\left(2\,b^2c^{\frac{2}{n}}x^3-3\,abc^{\left(\frac{1}{n}\right)}x^2+6\,a^2x\right)c^{-\frac{3}{n}}}{6\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^3/((c*x^n)^(1/n)*b + a),x, algorithm="maxima")
```

```
[Out] -a^3*c^(-4/n)*log(b*c^(1/n)*x + a)/b^4 + 1/6*(2*b^2*c^(2/n)*x^3 -
 3*a*b*c^(1/n)*x^2 + 6*a^2*x)*c^(-3/n)/b^3
```

Fricas [A] time = 0.256682, size = 100, normalized size = 0.99

$$\frac{2\,b^3c^{\frac{3}{n}}x^3-3\,ab^2c^{\frac{2}{n}}x^2+6\,a^2bc^{\left(\frac{1}{n}\right)}x-6\,a^3\log\left(bc^{\left(\frac{1}{n}\right)}x+a\right)}{6\,b^4c^{\frac{4}{n}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x^3/((c*x^n)^(1/n)*b + a),x, algorithm="fricas")
```

```
[Out] 1/6*(2*b^3*c^(3/n)*x^3 - 3*a*b^2*c^(2/n)*x^2 + 6*a^2*b*c^(1/n)*x
- 6*a^3*log(b*c^(1/n)*x + a))/(b^4*c^(4/n))
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{a+b\,(cx^n)^{\frac{1}{n}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x**3/(a+b*(c*x**n)**(1/n)),x)
```

```
[Out] Integral(x**3/(a + b*(c*x**n)**(1/n)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{(cx^n)^{\left(\frac{1}{n}\right)}b + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/((c*x^n)^(1/n)*b + a),x, algorithm="giac")

[Out] integrate(x^3/((c*x^n)^(1/n)*b + a), x)
```

3.3000 $\int \frac{x^2}{a+b(cx^n)^{\frac{1}{n}}}\,dx$

Optimal. Leaf size=77

$$\frac{a^2x^3(cx^n)^{-3/n}\log\left(a+b(cx^n)^{\frac{1}{n}}\right)}{b^3}-\frac{ax^3(cx^n)^{-2/n}}{b^2}+\frac{x^3(cx^n)^{-1/n}}{2b}$$

```
[Out] -((a*x^3)/(b^2*(c*x^n)^(2/n))) + x^3/(2*b*(c*x^n)^n^(-1)) + (a^2*
x^3*Log[a + b*(c*x^n)^n^(-1)])/(b^3*(c*x^n)^(3/n))
```

Rubi [A] time = 0.0705028, antiderivative size = 77, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$\frac{a^2x^3(cx^n)^{-3/n}\log\left(a+b(cx^n)^{\frac{1}{n}}\right)}{b^3}-\frac{ax^3(cx^n)^{-2/n}}{b^2}+\frac{x^3(cx^n)^{-1/n}}{2b}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b*(c*x^n)^n^(-1)),x]
```

```
[Out] -((a*x^3)/(b^2*(c*x^n)^(2/n))) + x^3/(2*b*(c*x^n)^n^(-1)) + (a^2*
x^3*Log[a + b*(c*x^n)^n^(-1)])/(b^3*(c*x^n)^(3/n))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^2x^3(cx^n)^{-\frac{3}{n}}\log\left(a+b(cx^n)^{\frac{1}{n}}\right)}{b^3}+\frac{x^3(cx^n)^{-\frac{3}{n}}\int^{(cx^n)^{\frac{1}{n}}}x\,dx}{b}-\frac{x^3(cx^n)^{-\frac{3}{n}}\int^{(cx^n)^{\frac{1}{n}}}a\,dx}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b*(c*x**n)**(1/n)),x)
```

```
[Out] a**2*x**3*(c*x**n)**(-3/n)*log(a + b*(c*x**n)**(1/n))/b**3 + x**3
*(c*x**n)**(-3/n)*Integral(x, (x, (c*x**n)**(1/n)))/b - x**3*(c*x
**n)**(-3/n)*Integral(a, (x, (c*x**n)**(1/n)))/b**2
```

Mathematica [A] time = 4.74079, size = 0, normalized size = 0.

$$\int \frac{x^2}{a+b(cx^n)^{\frac{1}{n}}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[x^2/(a + b*(c*x^n)^n^(-1)),x]
```

```
[Out] Integrate[x^2/(a + b*(c*x^n)^n^(-1)), x]
```

Maple [C] time = 0.099, size = 439, normalized size = 5.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(a+b*(c*x^n)^(1/n)),x)
```

```
[Out] 1/2/(c^(1/n))/b*x^2*exp(-1/2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*
Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*
csgn(I*c)*csgn(I*c*x^n)^2-2*n*ln(x)+2*ln(x^n))/n)-1/(c^(1/n))^2/b
^2*a*x*exp(-(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*cs
gn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(I*
c*x^n)^2-2*n*ln(x)+2*ln(x^n))/n)+1/(c^(1/n))^3/b^3*a^2*ln(b*exp(1
/2*(-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)+I*Pi*csgn(I*x^n)*cs
gn(I*c*x^n)^2+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-I*Pi*csgn(I*c*x^n)^3
+2*ln(c)+2*ln(x^n)-2*n*ln(x))/n)*x+a)*exp(-3/2*(I*Pi*csgn(I*x^n)*
csgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csg
n(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-2*n*ln(x)+2*ln(x^n))/
n)
```

Maxima [A] time = 23.0289, size = 72, normalized size = 0.94

$$\frac{a^2c^{-\frac{3}{n}}\log\left(bc^{\left(\frac{1}{n}\right)}x+a\right)}{b^3}+\frac{\left(bc^{\left(\frac{1}{n}\right)}x^2-2\,ax\right)c^{-\frac{2}{n}}}{2\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/((c*x^n)^(1/n)*b + a),x, algorithm="maxima")
```

```
[Out] a^2*c^(-3/n)*log(b*c^(1/n)*x + a)/b^3 + 1/2*(b*c^(1/n)*x^2 - 2*a*
x)*c^(-2/n)/b^2
```

Fricas [A] time = 0.255823, size = 74, normalized size = 0.96

$$\frac{b^2c^{\frac{2}{n}}x^2-2\,abc^{\left(\frac{1}{n}\right)}x+2\,a^2\log\left(bc^{\left(\frac{1}{n}\right)}x+a\right)}{2\,b^3c^{\frac{3}{n}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/((c*x^n)^(1/n)*b + a),x, algorithm="fricas")
```

```
[Out] 1/2*(b^2*c^(2/n)*x^2 - 2*a*b*c^(1/n)*x + 2*a^2*log(b*c^(1/n)*x +
a))/(b^3*c^(3/n))
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^2}{a+b\,(cx^n)^{\frac{1}{n}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b*(c*x**n)**(1/n)),x)
```

```
[Out] Integral(x**2/(a + b*(c*x**n)**(1/n)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^2}{(cx^n)^{\left(\frac{1}{n}\right)}\,b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/((c*x^n)^(1/n)*b + a),x, algorithm="giac")
```

```
[Out] integrate(x^2/((c*x^n)^(1/n)*b + a), x)
```

3.3001 $\int \frac{x}{a+b(cx^n)^{\frac{1}{n}}}\,dx$

Optimal. Leaf size=53

$$\frac{x^2 (cx^n)^{-1/n}}{b}-\frac{ax^2 (cx^n)^{-2/n} \log \left(a+b (cx^n)^{\frac{1}{n}}\right)}{b^2}$$

```
[Out] x^2/(b*(c*x^n)^n^(-1)) - (a*x^2*Log[a + b*(c*x^n)^n^(-1)])/(b^2*(
c*x^n)^(2/n))
```

Rubi [A] time = 0.0493574, antiderivative size = 53, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{x^2 (cx^n)^{-1/n}}{b}-\frac{ax^2 (cx^n)^{-2/n} \log \left(a+b (cx^n)^{\frac{1}{n}}\right)}{b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b*(c*x^n)^n^(-1)),x]
```

```
[Out] x^2/(b*(c*x^n)^n^(-1)) - (a*x^2*Log[a + b*(c*x^n)^n^(-1)])/(b^2*(
c*x^n)^(2/n))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{ax^2 (cx^n)^{-\frac{2}{n}} \log \left(a+b (cx^n)^{\frac{1}{n}}\right)}{b^2}+x^2 (cx^n)^{-\frac{2}{n}} \int^{(cx^n)^{\frac{1}{n}}} \frac{1}{b}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b*(c*x**n)**(1/n)),x)
```

```
[Out] -a*x**2*(c*x**n)**(-2/n)*log(a + b*(c*x**n)**(1/n))/b**2 + x**2*(
c*x**n)**(-2/n)*Integral(1/b, (x, (c*x**n)**(1/n)))
```

Mathematica [A] time = 4.64948, size = 0, normalized size = 0.

$$\int \frac{x}{a+b (cx^n)^{\frac{1}{n}}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[x/(a + b*(c*x^n)^n^(-1)),x]
```

```
[Out] Integrate[x/(a + b*(c*x^n)^n^(-1)), x]
```

Maple [C] time = 0.084, size = 325, normalized size = 6.1

$$\frac{x}{\sqrt[n]{c}b}e^{-\frac{i\pi\,\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2-i\,\mathrm{csgn}(ix^n)\mathrm{csgn}(icx^n)\pi\,\mathrm{csgn}(ic)-i(\mathrm{csgn}(icx^n))^3\pi+i\pi\,\mathrm{csgn}(ic)(\mathrm{csgn}(icx^n))^2-2n\ln(x)+2\ln(x^n)}{2n}}$$
$$-\frac{a}{\left(\sqrt[n]{c}\right)^2 b^2}\ln\left(be^{\frac{-i\pi\,\mathrm{csgn}(ix^n)\mathrm{csgn}(ic)\mathrm{csgn}(icx^n)+i\pi\,\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2+i\pi\,\mathrm{csgn}(ic)(\mathrm{csgn}(icx^n))^2-i(\mathrm{csgn}(icx^n))^3\pi+2\ln(c)+2\ln(x^n)-2n\ln(x)}{2n}}x+a\right)e^{-\frac{i\pi\,\mathrm{csgn}(ix^n}{}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x/(a+b*(c*x^n)^(1/n)),x)
```

```
[Out] 1/(c^(1/n))/b*x*exp(-1/2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*c
sgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn
(I*c)*csgn(I*c*x^n)^2-2*n*ln(x)+2*ln(x^n))/n)-1/(c^(1/n))^2/b^2*a
*ln(b*exp(1/2*(-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)+I*Pi*csg
n(I*x^n)*csgn(I*c*x^n)^2+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-I*Pi*csgn
(I*c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(x))/n)*x+a)*exp(-(I*Pi*csgn(
I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)-I
*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-2*n*ln(x)+2*ln
(x^n))/n)
```

Maxima [A] time = 22.6675, size = 50, normalized size = 0.94

$$\frac{c^{-\frac{1}{n}}x}{b} - \frac{ac^{-\frac{2}{n}}\log\left(bc^{\left(\frac{1}{n}\right)}x + a\right)}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/((c*x^n)^(1/n)*b + a),x, algorithm="maxima")
```

```
[Out] c^(-1/n)*x/b - a*c^(-2/n)*log(b*c^(1/n)*x + a)/b^2
```

Fricas [A] time = 0.253974, size = 49, normalized size = 0.92

$$\frac{bc^{\left(\frac{1}{n}\right)}x - a\log\left(bc^{\left(\frac{1}{n}\right)}x + a\right)}{b^2c^{\frac{2}{n}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/((c*x^n)^(1/n)*b + a),x, algorithm="fricas")
```

```
[Out] (b*c^(1/n)*x - a*log(b*c^(1/n)*x + a))/(b^2*c^(2/n))
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{a + b\left(cx^n\right)^{\frac{1}{n}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/(a+b*(c*x**n)**(1/n)),x)
```

```
[Out] Integral(x/(a + b*(c*x**n)**(1/n)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\left(cx^n\right)^{\left(\frac{1}{n}\right)}b + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/((c*x^n)^(1/n)*b + a),x, algorithm="giac")

[Out] integrate(x/((c*x^n)^(1/n)*b + a), x)
```

3.3002 $\int \frac{1}{a+b(cx^n)^{\frac{1}{n}}}\,dx$

Optimal. Leaf size=30

$$\frac{x\,(cx^n)^{-1/n}\log\left(a+b\,(cx^n)^{\frac{1}{n}}\right)}{b}$$

```
[Out] (x*Log[a + b*(c*x^n)^n^(-1)])/(b*(c*x^n)^n^(-1))
```

Rubi [A] time = 0.0192271, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{x\,(cx^n)^{-1/n}\log\left(a+b\,(cx^n)^{\frac{1}{n}}\right)}{b}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(c*x^n)^n^(-1))^(-1),x]
```

```
[Out] (x*Log[a + b*(c*x^n)^n^(-1)])/(b*(c*x^n)^n^(-1))
```

Rubi in Sympy [A] time = 2.27477, size = 24, normalized size = 0.8

$$\frac{x\,(cx^n)^{-\frac{1}{n}}\log\left(a+b\,(cx^n)^{\frac{1}{n}}\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*(c*x**n)**(1/n)),x)
```

```
[Out] x*(c*x**n)**(-1/n)*log(a + b*(c*x**n)**(1/n))/b
```

Mathematica [A] time = 0.00714554, size = 30, normalized size = 1.

$$\frac{x\,(cx^n)^{-1/n}\log\left(a+b\,(cx^n)^{\frac{1}{n}}\right)}{b}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(c*x^n)^n^(-1))^(-1),x]
```

```
[Out] (x*Log[a + b*(c*x^n)^n^(-1)])/(b*(c*x^n)^n^(-1))
```

Maple [C] time = 0.097, size = 214, normalized size = 7.1

$$\frac{1}{\sqrt[n]{c}b}\ln\left(be^{\frac{-i\pi\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(ic)\mathrm{csgn}(icx^n)+i\pi\,\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2+i\pi\,\mathrm{csgn}(ic)(\mathrm{csgn}(icx^n))^2-i(\mathrm{csgn}(icx^n))^3\pi+2\ln(c)+2\ln(x^n)-2n\ln(x)}{2n}}x+a\right)e^{-\frac{i\pi\,\mathrm{csgn}(ix^n)(\mathrm{csgn}(ic}{}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*(c*x^n)^(1/n)),x)
```

```
[Out] 1/(c^(1/n))/b*ln(b*exp(1/2*(-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*
x^n)+I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*csgn(I*c)*csgn(I*c*x^n
)^2-I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(x))/n)*x+a)*exp
(-1/2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*csgn(I*c
)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(I*c*x^n)
^2-2*n*ln(x)+2*ln(x^n))/n)
```

Maxima [A] time = 22.2525, size = 30, normalized size = 1.

$$\frac{c^{-\frac{1}{n}} \log\left(bc^{\left(\frac{1}{n}\right)} x + a\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^n)^(1/n)*b + a),x, algorithm="maxima")
```

```
[Out] c^(-1/n)*log(b*c^(1/n)*x + a)/b
```

Fricas [A] time = 0.252587, size = 30, normalized size = 1.

$$\frac{\log\left(bc^{\left(\frac{1}{n}\right)} x + a\right)}{bc^{\left(\frac{1}{n}\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^n)^(1/n)*b + a),x, algorithm="fricas")
```

```
[Out] log(b*c^(1/n)*x + a)/(b*c^(1/n))
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{a + b\left(cx^{n}\right)^{\frac{1}{n}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*(c*x**n)**(1/n)),x)
```

```
[Out] Integral(1/(a + b*(c*x**n)**(1/n)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(cx^{n}\right)^{\left(\frac{1}{n}\right)} b + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^n)^(1/n)*b + a),x, algorithm="giac")
```

```
[Out] integrate(1/((c*x^n)^(1/n)*b + a), x)
```

3.3003 $\int \frac{1}{x\left(a+b(cx^n)^{\frac{1}{n}}\right)}\,dx$

Optimal. Leaf size=26

$$\frac{\log(x)}{a}-\frac{\log\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)}{a}$$

```
[Out] Log[x]/a - Log[a + b*(c*x^n)^n^(-1)]/a
```

Rubi [A] time = 0.0308096, antiderivative size = 26, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.21

$$\frac{\log(x)}{a}-\frac{\log\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)}{a}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a + b*(c*x^n)^n^(-1))),x]

[Out] Log[x]/a - Log[a + b*(c*x^n)^n^(-1)]/a
```

Rubi in Sympy [A] time = 6.01996, size = 26, normalized size = 1.

$$\frac{\log\left(\left(cx^n\right)^{\frac{1}{n}}\right)}{a}-\frac{\log\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(a+b*(c*x**n)**(1/n)),x)

[Out] log((c*x**n)**(1/n))/a - log(a + b*(c*x**n)**(1/n))/a
```

Mathematica [A] time = 0.0965878, size = 23, normalized size = 0.88

$$\frac{\log(x)-\log\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)}{a}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a + b*(c*x^n)^n^(-1))),x]

[Out] (Log[x] - Log[a + b*(c*x^n)^n^(-1)])/a
```

Maple [A] time = 0.015, size = 35, normalized size = 1.4

$$\frac{\ln\left(\sqrt[n]{cx^n}\right)}{a}-\frac{\ln\left(a+b\sqrt[n]{cx^n}\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(a+b*(c*x^n)^(1/n)),x)
```

```
[Out] 1/a*ln((c*x^n)^(1/n))-ln(a+b*(c*x^n)^(1/n))/a
```

Maxima [A] time = 1.48653, size = 54, normalized size = 2.08

$$-\frac{\log\left(\frac{\left(bc^{\left(\frac{1}{n}\right)}(x^n)^{\left(\frac{1}{n}\right)}+a\right)c^{-\frac{1}{n}}}{b}\right)}{a}+\frac{\log(x)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((c*x^n)^(1/n)*b + a)*x),x, algorithm="maxima")
```

```
[Out] -log((b*c^(1/n)*(x^n)^(1/n) + a)*c^(-1/n)/b)/a + log(x)/a
```

Fricas [A] time = 0.233238, size = 28, normalized size = 1.08

$$-\frac{\log\left(bc^{\left(\frac{1}{n}\right)}x+a\right)-\log(x)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((c*x^n)^(1/n)*b + a)*x),x, algorithm="fricas")
```

```
[Out] -(log(b*c^(1/n)*x + a) - log(x))/a
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RecursionError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(a+b*(c*x**n)**(1/n)),x)
```

```
[Out] Exception raised: RecursionError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\left((cx^n)^{\left(\frac{1}{n}\right)}b+a\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((c*x^n)^(1/n)*b + a)*x),x, algorithm="giac")
```

```
[Out] integrate(1/(((c*x^n)^(1/n)*b + a)*x), x)
```

3.3004 $\int \frac{1}{x^2\left(a+b(cx^n)^{\frac{1}{n}}\right)}\,dx$

Optimal. Leaf size=60

$$-\frac{b\log(x)\,(cx^n)^{\frac{1}{n}}}{a^2x}+\frac{b\,(cx^n)^{\frac{1}{n}}\log\left(a+b\,(cx^n)^{\frac{1}{n}}\right)}{a^2x}-\frac{1}{ax}$$

```
[Out] -(1/(a*x)) - (b*(c*x^n)^n^(-1)*Log[x])/(a^2*x) + (b*(c*x^n)^n^(-1
)*Log[a + b*(c*x^n)^n^(-1)])/(a^2*x)
```

Rubi [A] time = 0.0615283, antiderivative size = 60, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$-\frac{b\log(x)\,(cx^n)^{\frac{1}{n}}}{a^2x}+\frac{b\,(cx^n)^{\frac{1}{n}}\log\left(a+b\,(cx^n)^{\frac{1}{n}}\right)}{a^2x}-\frac{1}{ax}$$

Antiderivative was successfully verified.

```
[In] Int[1/(x^2*(a + b*(c*x^n)^n^(-1))),x]
```

```
[Out] -(1/(a*x)) - (b*(c*x^n)^n^(-1)*Log[x])/(a^2*x) + (b*(c*x^n)^n^(-1
)*Log[a + b*(c*x^n)^n^(-1)])/(a^2*x)
```

Rubi in Sympy [A] time = 9.70763, size = 58, normalized size = 0.97

$$-\frac{1}{ax}-\frac{b\,(cx^n)^{\frac{1}{n}}\log\left((cx^n)^{\frac{1}{n}}\right)}{a^2x}+\frac{b\,(cx^n)^{\frac{1}{n}}\log\left(a+b\,(cx^n)^{\frac{1}{n}}\right)}{a^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/x**2/(a+b*(c*x**n)**(1/n)),x)
```

```
[Out] -1/(a*x) - b*(c*x**n)**(1/n)*log((c*x**n)**(1/n))/(a**2*x) + b*(c
*x**n)**(1/n)*log(a + b*(c*x**n)**(1/n))/(a**2*x)
```

Mathematica [A] time = 4.7746, size = 0, normalized size = 0.

$$\int \frac{1}{x^2\left(a+b\,(cx^n)^{\frac{1}{n}}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*(a + b*(c*x^n)^n^(-1))),x]
```

```
[Out] Integrate[1/(x^2*(a + b*(c*x^n)^n^(-1))), x]
```

Maple [C] time = 0.096, size = 331, normalized size = 5.5

$$-\frac{1}{ax}$$
$$+\frac{\sqrt[n]{c}b}{a^2}\ln\left(be^{\frac{-i\pi\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(ic)\mathrm{csgn}(icx^n)+i\pi\,\mathrm{csgn}(ix^n)\,(\mathrm{csgn}(icx^n))^2+i\pi\,\mathrm{csgn}(ic)(\mathrm{csgn}(icx^n))^2-i\pi\,(\mathrm{csgn}(icx^n))^3+2\ln(c)+2\ln(x^n)-2n\ln(x)}{2n}}x+a\right)e^{\frac{i\pi\,\mathrm{csgn}(ix^n)\,(\mathrm{csgn}(ic}{}}$$
$$-\frac{\sqrt[n]{c}b\ln(x)}{a^2}e^{\frac{i\pi\,\mathrm{csgn}(ix^n)\,(\mathrm{csgn}(icx^n))^2-i\pi\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(ic)\mathrm{csgn}(icx^n)-i\pi\,(\mathrm{csgn}(icx^n))^3+i\pi\,\mathrm{csgn}(ic)(\mathrm{csgn}(icx^n))^2-2n\ln(x)+2\ln(x^n)}{2n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(a+b*(c*x^n)^(1/n)),x)
```

```
[Out] -1/a/x+1/a^2*c^(1/n)*b*ln(b*exp(1/2*(-I*Pi*csgn(I*x^n)*csgn(I*c)*
csgn(I*c*x^n)+I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*csgn(I*c)*csg
n(I*c*x^n)^2-I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(x))/n)
*x+a)*exp(1/2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*
csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(
I*c*x^n)^2-2*n*ln(x)+2*ln(x^n))/n)-1/a^2*c^(1/n)*b*ln(x)*exp(1/2*
(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn
(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-2*n
*ln(x)+2*ln(x^n))/n)
```

Maxima [A] time = 21.9054, size = 45, normalized size = 0.75

$$\frac{bc^{\left(\frac{1}{n}\right)}\log\left(bc^{\left(\frac{1}{n}\right)} + \frac{a}{x}\right)}{a^2} - \frac{1}{ax}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((c*x^n)^(1/n)*b + a)*x^2),x, algorithm="maxima")
```

```
[Out] b*c^(1/n)*log(b*c^(1/n) + a/x)/a^2 - 1/(a*x)
```

Fricas [A] time = 0.237059, size = 55, normalized size = 0.92

$$\frac{bc^{\left(\frac{1}{n}\right)}x\log\left(bc^{\left(\frac{1}{n}\right)}x + a\right) - bc^{\left(\frac{1}{n}\right)}x\log\left(x\right) - a}{a^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((c*x^n)^(1/n)*b + a)*x^2),x, algorithm="fricas")
```

```
[Out] (b*c^(1/n)*x*log(b*c^(1/n)*x + a) - b*c^(1/n)*x*log(x) - a)/(a^2*
x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{x^2\left(a + b\left(cx^n\right)^{\frac{1}{n}}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(a+b*(c*x**n)**(1/n)),x)
```

```
[Out] Integral(1/(x**2*(a + b*(c*x**n)**(1/n))), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(\left(cx^n\right)^{\left(\frac{1}{n}\right)}b + a\right)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((c*x^n)^(1/n)*b + a)*x^2),x, algorithm="giac")

[Out] integrate(1/(((c*x^n)^(1/n)*b + a)*x^2), x)
```

3.3005 $\int \frac{1}{x^3\left(a+b(cx^n)^{\frac{1}{n}}\right)}\,dx$

Optimal. Leaf size=87

$$\frac{b^2\log(x)\,(cx^n)^{2/n}}{a^3x^2}-\frac{b^2\,(cx^n)^{2/n}\log\left(a+b\,(cx^n)^{\frac{1}{n}}\right)}{a^3x^2}+\frac{b\,(cx^n)^{\frac{1}{n}}}{a^2x^2}-\frac{1}{2ax^2}$$

```
[Out] -1/(2*a*x^2) + (b*(c*x^n)^n^(-1))/(a^2*x^2) + (b^2*(c*x^n)^(2/n)*
Log[x])/(a^3*x^2) - (b^2*(c*x^n)^(2/n)*Log[a + b*(c*x^n)^n^(-1)])
/(a^3*x^2)
```

Rubi [A] time = 0.0769668, antiderivative size = 87, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$\frac{b^2\log(x)\,(cx^n)^{2/n}}{a^3x^2}-\frac{b^2\,(cx^n)^{2/n}\log\left(a+b\,(cx^n)^{\frac{1}{n}}\right)}{a^3x^2}+\frac{b\,(cx^n)^{\frac{1}{n}}}{a^2x^2}-\frac{1}{2ax^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(a + b*(c*x^n)^n^(-1))),x]
```

```
[Out] -1/(2*a*x^2) + (b*(c*x^n)^n^(-1))/(a^2*x^2) + (b^2*(c*x^n)^(2/n)*
Log[x])/(a^3*x^2) - (b^2*(c*x^n)^(2/n)*Log[a + b*(c*x^n)^n^(-1)])
/(a^3*x^2)
```

Rubi in Sympy [A] time = 12.5294, size = 85, normalized size = 0.98

$$-\frac{1}{2ax^2}+\frac{b\,(cx^n)^{\frac{1}{n}}}{a^2x^2}+\frac{b^2\,(cx^n)^{\frac{2}{n}}\log\left((cx^n)^{\frac{1}{n}}\right)}{a^3x^2}-\frac{b^2\,(cx^n)^{\frac{2}{n}}\log\left(a+b\,(cx^n)^{\frac{1}{n}}\right)}{a^3x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(a+b*(c*x**n)**(1/n)),x)
```

```
[Out] -1/(2*a*x**2) + b*(c*x**n)**(1/n)/(a**2*x**2) + b**2*(c*x**n)**(2
/n)*log((c*x**n)**(1/n))/(a**3*x**2) - b**2*(c*x**n)**(2/n)*log(a
 + b*(c*x**n)**(1/n))/(a**3*x**2)
```

Mathematica [A] time = 4.7998, size = 0, normalized size = 0.

$$\int \frac{1}{x^3\left(a+b\,(cx^n)^{\frac{1}{n}}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[1/(x^3*(a + b*(c*x^n)^n^(-1))),x]
```

```
[Out] Integrate[1/(x^3*(a + b*(c*x^n)^n^(-1))), x]
```

Maple [C] time = 0.1, size = 446, normalized size = 5.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/x^3/(a+b*(c*x^n)^(1/n)),x)
```

```
[Out] (1/a^2*c^(1/n)*b*x*exp(1/2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi
*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*cs
gn(I*c)*csgn(I*c*x^n)^2-2*n*ln(x)+2*ln(x^n))/n)-1/2/a)/x^2+1/a^3*
(c^(1/n))^2*b^2*ln(x)*exp((I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*
csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csg
n(I*c)*csgn(I*c*x^n)^2-2*n*ln(x)+2*ln(x^n))/n)-1/a^3*(c^(1/n))^2*
b^2*ln(b*exp(1/2*(-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)+I*Pi*
csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-I*Pi*c
sgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(x))/n)*x+a)*exp((I*Pi*csg
n(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)
-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-2*n*ln(x)+2*
ln(x^n))/n)
```

Maxima [A] time = 22.0393, size = 86, normalized size = 0.99

$$-\frac{b^2 c^{\frac{2}{n}} \log\left(bc^{\left(\frac{1}{n}\right)}x + a\right)}{a^3} + \frac{b^2 c^{\frac{2}{n}} \log(x)}{a^3} + \frac{2\,bc^{\left(\frac{1}{n}\right)}x - a}{2\,a^2 x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(((c*x^n)^(1/n)*b + a)*x^3),x, algorithm="maxima")
```

```
[Out] -b^2*c^(2/n)*log(b*c^(1/n)*x + a)/a^3 + b^2*c^(2/n)*log(x)/a^3 +
1/2*(2*b*c^(1/n)*x - a)/(a^2*x^2)
```

Fricas [A] time = 0.237146, size = 88, normalized size = 1.01

$$-\frac{2\,b^2 c^{\frac{2}{n}} x^2 \log\left(bc^{\left(\frac{1}{n}\right)}x + a\right) - 2\,b^2 c^{\frac{2}{n}} x^2 \log(x) - 2\,abc^{\left(\frac{1}{n}\right)}x + a^2}{2\,a^3 x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(((c*x^n)^(1/n)*b + a)*x^3),x, algorithm="fricas")
```

```
[Out] -1/2*(2*b^2*c^(2/n)*x^2*log(b*c^(1/n)*x + a) - 2*b^2*c^(2/n)*x^2*
log(x) - 2*a*b*c^(1/n)*x + a^2)/(a^3*x^2)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{x^3\left(a + b\left(cx^n\right)^{\frac{1}{n}}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/x**3/(a+b*(c*x**n)**(1/n)),x)
```

```
[Out] Integral(1/(x**3*(a + b*(c*x**n)**(1/n))), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(\left(cx^n\right)^{\left(\frac{1}{n}\right)}b + a\right)x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((c*x^n)^(1/n)*b + a)*x^3),x, algorithm="giac")
```

```
[Out] integrate(1/(((c*x^n)^(1/n)*b + a)*x^3), x)
```

3.3006 $\int \frac{x^3}{\left(a+b(cx^n)^{\frac{1}{n}}\right)^2}\,dx$

Optimal. Leaf size=114

$$\frac{a^3x^4\,(cx^n)^{-4/n}}{b^4\left(a+b\,(cx^n)^{\frac{1}{n}}\right)}+\frac{3a^2x^4\,(cx^n)^{-4/n}\log\left(a+b\,(cx^n)^{\frac{1}{n}}\right)}{b^4}-\frac{2ax^4\,(cx^n)^{-3/n}}{b^3}+\frac{x^4\,(cx^n)^{-2/n}}{2b^2}$$

```
[Out] (-2*a*x^4)/(b^3*(c*x^n)^(3/n)) + x^4/(2*b^2*(c*x^n)^(2/n)) + (a^3
*x^4)/(b^4*(c*x^n)^(4/n)*(a + b*(c*x^n)^n^(-1))) + (3*a^2*x^4*Log
[a + b*(c*x^n)^n^(-1)])/(b^4*(c*x^n)^(4/n))
```

Rubi [A] time = 0.103353, antiderivative size = 114, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$\frac{a^3x^4\,(cx^n)^{-4/n}}{b^4\left(a+b\,(cx^n)^{\frac{1}{n}}\right)}+\frac{3a^2x^4\,(cx^n)^{-4/n}\log\left(a+b\,(cx^n)^{\frac{1}{n}}\right)}{b^4}-\frac{2ax^4\,(cx^n)^{-3/n}}{b^3}+\frac{x^4\,(cx^n)^{-2/n}}{2b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3/(a + b*(c*x^n)^n^(-1))^2,x]
```

```
[Out] (-2*a*x^4)/(b^3*(c*x^n)^(3/n)) + x^4/(2*b^2*(c*x^n)^(2/n)) + (a^3
*x^4)/(b^4*(c*x^n)^(4/n)*(a + b*(c*x^n)^n^(-1))) + (3*a^2*x^4*Log
[a + b*(c*x^n)^n^(-1)])/(b^4*(c*x^n)^(4/n))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^3x^4\,(cx^n)^{-\frac{4}{n}}}{b^4\left(a+b\,(cx^n)^{\frac{1}{n}}\right)}+\frac{3a^2x^4\,(cx^n)^{-\frac{4}{n}}\log\left(a+b\,(cx^n)^{\frac{1}{n}}\right)}{b^4}-\frac{2ax^4\,(cx^n)^{-\frac{3}{n}}}{b^3}+\frac{x^4\,(cx^n)^{-\frac{4}{n}}\int^{(cx^n)^{\frac{1}{n}}}x\,dx}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3/(a+b*(c*x**n)**(1/n))**2,x)
```

```
[Out] a**3*x**4*(c*x**n)**(-4/n)/(b**4*(a + b*(c*x**n)**(1/n))) + 3*a**
2*x**4*(c*x**n)**(-4/n)*log(a + b*(c*x**n)**(1/n))/b**4 - 2*a*x**
4*(c*x**n)**(-3/n)/b**3 + x**4*(c*x**n)**(-4/n)*Integral(x, (x, (
c*x**n)**(1/n)))/b**2
```

Mathematica [A] time = 4.38211, size = 0, normalized size = 0.

$$\int \frac{x^3}{\left(a+b\,(cx^n)^{\frac{1}{n}}\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[x^3/(a + b*(c*x^n)^n^(-1))^2,x]
```

```
[Out] Integrate[x^3/(a + b*(c*x^n)^n^(-1))^2, x]
```

Maple [C] time = 0.06, size = 662, normalized size = 5.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3/(a+b*(c*x^n)^(1/n))^2,x)
```

```
[Out] x^4/a/(a+b*exp(1/2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*
x^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*
csgn(I*c*x^n)^2+2*ln(c)+2*ln(x^n))/n))-3*a/(c^(1/n))^3/b^3*x*exp(
-3/2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*csgn(I*c)
*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(I*c*x^n)^
2-2*n*ln(x)+2*ln(x^n))/n)-1/a/(c^(1/n))/b*x^3*exp(-1/2*(I*Pi*csgn
(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)-
I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-2*n*ln(x)+2*l
n(x^n))/n)+3/2/(c^(1/n))^2/b^2*x^2*exp(-(I*Pi*csgn(I*x^n)*csgn(I*
c*x^n)^2-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x
^n)^3+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-2*n*ln(x)+2*ln(x^n))/n)+3*a^
2/(c^(1/n))^4/b^4*ln(b*exp(1/2*(-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(
I*c*x^n)+I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*csgn(I*c)*csgn(I*c
*x^n)^2-I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(x))/n)*x+a)
*exp(-2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*csgn(I
*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(I*c*x^
n)^2-2*n*ln(x)+2*ln(x^n))/n)
```

Maxima [A] time = 22.7162, size = 136, normalized size = 1.19

$$\frac{x^4}{abc^{\left(\frac{1}{n}\right)}(x^n)^{\left(\frac{1}{n}\right)} + a^2} + \frac{3\,a^2c^{-\frac{4}{n}}\log\left(bc^{\left(\frac{1}{n}\right)}x + a\right)}{b^4} - \frac{\left(2\,b^2c^{\frac{2}{n}}x^3 - 3\,abc^{\left(\frac{1}{n}\right)}x^2 + 6\,a^2x\right)c^{-\frac{3}{n}}}{2\,ab^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/((c*x^n)^(1/n)*b + a)^2,x, algorithm="maxima")
```

```
[Out] x^4/(a*b*c^(1/n)*(x^n)^(1/n) + a^2) + 3*a^2*c^(-4/n)*log(b*c^(1/n
)*x + a)/b^4 - 1/2*(2*b^2*c^(2/n)*x^3 - 3*a*b*c^(1/n)*x^2 + 6*a^2
*x)*c^(-3/n)/(a*b^3)
```

Fricas [A] time = 0.232186, size = 142, normalized size = 1.25

$$\frac{b^3c^{\frac{3}{n}}x^3 - 3\,ab^2c^{\frac{2}{n}}x^2 - 4\,a^2bc^{\left(\frac{1}{n}\right)}x + 2\,a^3 + 6\left(a^2bc^{\left(\frac{1}{n}\right)}x + a^3\right)\log\left(bc^{\left(\frac{1}{n}\right)}x + a\right)}{2\left(b^5c^{\frac{5}{n}}x + ab^4c^{\frac{4}{n}}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/((c*x^n)^(1/n)*b + a)^2,x, algorithm="fricas")
```

```
[Out] 1/2*(b^3*c^(3/n)*x^3 - 3*a*b^2*c^(2/n)*x^2 - 4*a^2*b*c^(1/n)*x +
2*a^3 + 6*(a^2*b*c^(1/n)*x + a^3)*log(b*c^(1/n)*x + a))/(b^5*c^(5
/n)*x + a*b^4*c^(4/n))
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{\left(a + b\left(cx^n\right)^{\frac{1}{n}}\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3/(a+b*(c*x**n)**(1/n))**2,x)

[Out] Integral(x**3/(a + b*(c*x**n)**(1/n))**2, x)
```

GIAC/XCAS [F]   time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3}{\left((cx^n)^{\left(\frac{1}{n}\right)}b + a\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^3/((c*x^n)^(1/n)*b + a)^2,x, algorithm="giac")

[Out] integrate(x^3/((c*x^n)^(1/n)*b + a)^2, x)
```

3.3007 $\int \frac{x^2}{\left(a+b(cx^n)^{\frac{1}{n}}\right)^2}\,dx$

Optimal. Leaf size=90

$$-\frac{a^2x^3\left(cx^n\right)^{-3/n}}{b^3\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)}-\frac{2ax^3\left(cx^n\right)^{-3/n}\log\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)}{b^3}+\frac{x^3\left(cx^n\right)^{-2/n}}{b^2}$$

```
[Out] x^3/(b^2*(c*x^n)^(2/n)) - (a^2*x^3)/(b^3*(c*x^n)^(3/n)*(a + b*(c*
x^n)^n^(-1))) - (2*a*x^3*Log[a + b*(c*x^n)^n^(-1)])/(b^3*(c*x^n)^
(3/n))
```

Rubi [A] time = 0.0826087, antiderivative size = 90, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$-\frac{a^2x^3\left(cx^n\right)^{-3/n}}{b^3\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)}-\frac{2ax^3\left(cx^n\right)^{-3/n}\log\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)}{b^3}+\frac{x^3\left(cx^n\right)^{-2/n}}{b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/(a + b*(c*x^n)^n^(-1))^2,x]
```

```
[Out] x^3/(b^2*(c*x^n)^(2/n)) - (a^2*x^3)/(b^3*(c*x^n)^(3/n)*(a + b*(c*
x^n)^n^(-1))) - (2*a*x^3*Log[a + b*(c*x^n)^n^(-1)])/(b^3*(c*x^n)^
(3/n))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{a^2x^3\left(cx^n\right)^{-\frac{3}{n}}}{b^3\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)}-\frac{2ax^3\left(cx^n\right)^{-\frac{3}{n}}\log\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)}{b^3}+x^3\left(cx^n\right)^{-\frac{3}{n}}\int^{\left(cx^n\right)^{\frac{1}{n}}}\frac{1}{b^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2/(a+b*(c*x**n)**(1/n))**2,x)
```

```
[Out] -a**2*x**3*(c*x**n)**(-3/n)/(b**3*(a + b*(c*x**n)**(1/n))) - 2*a*
x**3*(c*x**n)**(-3/n)*log(a + b*(c*x**n)**(1/n))/b**3 + x**3*(c*x
**n)**(-3/n)*Integral(b**(-2), (x, (c*x**n)**(1/n)))
```

Mathematica [A] time = 4.35264, size = 0, normalized size = 0.

$$\int \frac{x^2}{\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[x^2/(a + b*(c*x^n)^n^(-1))^2,x]
```

```
[Out] Integrate[x^2/(a + b*(c*x^n)^n^(-1))^2, x]
```

Maple [C] time = 0.051, size = 548, normalized size = 6.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2/(a+b*(c*x^n)^(1/n))^2,x)
```

```
[Out] x^3/a/(a+b*exp(1/2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*
x^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*
csgn(I*c*x^n)^2+2*ln(c)+2*ln(x^n))/n))-1/a/(c^(1/n))/b*x^2*exp(-1
/2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*csgn(I*c)*c
sgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-
2*n*ln(x)+2*ln(x^n))/n)+2/(c^(1/n))^2/b^2*x*exp(-(I*Pi*csgn(I*x^n
)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*c
sgn(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-2*n*ln(x)+2*ln(x^n)
)/n)-2*a/(c^(1/n))^3/b^3*ln(b*exp(1/2*(-I*Pi*csgn(I*x^n)*csgn(I*c
)*csgn(I*c*x^n)+I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*csgn(I*c)*c
sgn(I*c*x^n)^2-I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(x))/
n)*x+a)*exp(-3/2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^
n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*cs
gn(I*c*x^n)^2-2*n*ln(x)+2*ln(x^n))/n)
```

Maxima [A] time = 22.8601, size = 108, normalized size = 1.2

$$\frac{x^3}{abc^{\left(\frac{1}{n}\right)}(x^n)^{\left(\frac{1}{n}\right)} + a^2} - \frac{2\,ac^{-\frac{3}{n}}\log\left(bc^{\left(\frac{1}{n}\right)}x + a\right)}{b^3} - \frac{\left(bc^{\left(\frac{1}{n}\right)}x^2 - 2\,ax\right)c^{-\frac{2}{n}}}{ab^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/((c*x^n)^(1/n)*b + a)^2,x, algorithm="maxima")
```

```
[Out] x^3/(a*b*c^(1/n)*(x^n)^(1/n) + a^2) - 2*a*c^(-3/n)*log(b*c^(1/n)*
x + a)/b^3 - (b*c^(1/n)*x^2 - 2*a*x)*c^(-2/n)/(a*b^2)
```

Fricas [A] time = 0.230757, size = 112, normalized size = 1.24

$$\frac{b^2c^{\frac{2}{n}}x^2 + abc^{\left(\frac{1}{n}\right)}x - a^2 - 2\left(abc^{\left(\frac{1}{n}\right)}x + a^2\right)\log\left(bc^{\left(\frac{1}{n}\right)}x + a\right)}{b^4c^{\frac{4}{n}}x + ab^3c^{\frac{3}{n}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/((c*x^n)^(1/n)*b + a)^2,x, algorithm="fricas")
```

```
[Out] (b^2*c^(2/n)*x^2 + a*b*c^(1/n)*x - a^2 - 2*(a*b*c^(1/n)*x + a^2)*
log(b*c^(1/n)*x + a))/(b^4*c^(4/n)*x + a*b^3*c^(3/n))
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\left(a + b\left(cx^n\right)^{\frac{1}{n}}\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+b*(c*x**n)**(1/n))**2,x)
```

```
[Out] Integral(x**2/(a + b*(c*x**n)**(1/n))**2, x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\left((cx^n)^{\left(\frac{1}{n}\right)} b + a\right)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/((c*x^n)^(1/n)*b + a)^2,x, algorithm="giac")
```

```
[Out] integrate(x^2/((c*x^n)^(1/n)*b + a)^2, x)
```

3.3008 $\int \frac{x}{\left(a+b(cx^n)^{\frac{1}{n}}\right)^2} dx$

Optimal. Leaf size=67

$$\frac{ax^2(cx^n)^{-2/n}}{b^2\left(a+b(cx^n)^{\frac{1}{n}}\right)}+\frac{x^2(cx^n)^{-2/n}\log\left(a+b(cx^n)^{\frac{1}{n}}\right)}{b^2}$$

```
[Out] (a*x^2)/(b^2*(c*x^n)^(2/n)*(a + b*(c*x^n)^n^(-1))) + (x^2*Log[a +
 b*(c*x^n)^n^(-1)])/(b^2*(c*x^n)^(2/n))
```

Rubi [A] time = 0.0601779, antiderivative size = 67, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{ax^2(cx^n)^{-2/n}}{b^2\left(a+b(cx^n)^{\frac{1}{n}}\right)}+\frac{x^2(cx^n)^{-2/n}\log\left(a+b(cx^n)^{\frac{1}{n}}\right)}{b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[x/(a + b*(c*x^n)^n^(-1))^2,x]
```

```
[Out] (a*x^2)/(b^2*(c*x^n)^(2/n)*(a + b*(c*x^n)^n^(-1))) + (x^2*Log[a +
 b*(c*x^n)^n^(-1)])/(b^2*(c*x^n)^(2/n))
```

Rubi in Sympy [A] time = 8.60182, size = 56, normalized size = 0.84

$$\frac{ax^2(cx^n)^{-\frac{2}{n}}}{b^2\left(a+b(cx^n)^{\frac{1}{n}}\right)}+\frac{x^2(cx^n)^{-\frac{2}{n}}\log\left(a+b(cx^n)^{\frac{1}{n}}\right)}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+b*(c*x**n)**(1/n))**2,x)
```

```
[Out] a*x**2*(c*x**n)**(-2/n)/(b**2*(a + b*(c*x**n)**(1/n))) + x**2*(c*
x**n)**(-2/n)*log(a + b*(c*x**n)**(1/n))/b**2
```

Mathematica [A] time = 4.19184, size = 0, normalized size = 0.

$$\int \frac{x}{\left(a+b(cx^n)^{\frac{1}{n}}\right)^2} dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[x/(a + b*(c*x^n)^n^(-1))^2,x]
```

```
[Out] Integrate[x/(a + b*(c*x^n)^n^(-1))^2, x]
```

Maple [C] time = 0.052, size = 435, normalized size = 6.5

$$\frac{x^2}{a}\left(a+b\,\mathrm{e}^{\frac{i\pi\,\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2-i\pi\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(ic)\mathrm{csgn}(icx^n)-i\pi\,(\mathrm{csgn}(icx^n))^3+i\pi\,\mathrm{csgn}(ic)(\mathrm{csgn}(icx^n))^2+2\ln(c)+2\ln(x^n)}{2n}}\right)^{-1}$$
$$-\frac{x}{a\sqrt[n]{c}b}\mathrm{e}^{-\frac{i\pi\,\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2-i\pi\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(ic)\mathrm{csgn}(icx^n)-i\pi\,(\mathrm{csgn}(icx^n))^3+i\pi\,\mathrm{csgn}(ic)(\mathrm{csgn}(icx^n))^2-2n\ln(x)+2\ln(x^n)}{2n}}$$
$$+\frac{1}{\left(\sqrt[n]{c}\right)^2b^2}\ln\left(b\,\mathrm{e}^{\frac{-i\pi\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(ic)\mathrm{csgn}(icx^n)+i\pi\,\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2+i\pi\,\mathrm{csgn}(ic)(\mathrm{csgn}(icx^n))^2-i\pi\,(\mathrm{csgn}(icx^n))^3+2\ln(c)+2\ln(x^n)-2n\ln(x)}{2n}}x+a\right)\mathrm{e}^{-\frac{i\pi\,\mathrm{csgn}(ix^n}{}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(x/(a+b*(c*x^n)^(1/n))^2,x)
```

```
[Out] x^2/a/(a+b*exp(1/2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*
x^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*
csgn(I*c*x^n)^2+2*ln(c)+2*ln(x^n))/n))-1/a/(c^(1/n))/b*x*exp(-1/2
*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*csgn(I*c)*csg
n(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-2*
n*ln(x)+2*ln(x^n))/n)+1/(c^(1/n))^2/b^2*ln(b*exp(1/2*(-I*Pi*csgn(
I*x^n)*csgn(I*c)*csgn(I*c*x^n)+I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I
*Pi*csgn(I*c)*csgn(I*c*x^n)^2-I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x
^n)-2*n*ln(x))/n)*x+a)*exp(-(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*P
i*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*c
sgn(I*c)*csgn(I*c*x^n)^2-2*n*ln(x)+2*ln(x^n))/n)
```

Maxima [A] time = 22.4892, size = 86, normalized size = 1.28

$$\frac{x^2}{abc^{\left(\frac{1}{n}\right)}(x^n)^{\left(\frac{1}{n}\right)}+a^2}-\frac{c^{-\frac{1}{n}}x}{ab}+\frac{c^{-\frac{2}{n}}\log\left(bc^{\left(\frac{1}{n}\right)}x+a\right)}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/((c*x^n)^(1/n)*b + a)^2,x, algorithm="maxima")
```

```
[Out] x^2/(a*b*c^(1/n)*(x^n)^(1/n) + a^2) - c^(-1/n)*x/(a*b) + c^(-2/n)
*log(b*c^(1/n)*x + a)/b^2
```

Fricas [A] time = 0.22947, size = 70, normalized size = 1.04

$$\frac{\left(bc^{\left(\frac{1}{n}\right)}x+a\right)\log\left(bc^{\left(\frac{1}{n}\right)}x+a\right)+a}{b^3c^{\frac{3}{n}}x+ab^2c^{\frac{2}{n}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(x/((c*x^n)^(1/n)*b + a)^2,x, algorithm="fricas")
```

```
[Out] ((b*c^(1/n)*x + a)*log(b*c^(1/n)*x + a) + a)/(b^3*c^(3/n)*x + a*b
^2*c^(2/n))
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x}{\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+b*(c*x**n)**(1/n))**2,x)

[Out] Integral(x/(a + b*(c*x**n)**(1/n))**2, x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\left((cx^n)^{\left(\frac{1}{n}\right)}b + a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/((c*x^n)^(1/n)*b + a)^2,x, algorithm="giac")

[Out] integrate(x/((c*x^n)^(1/n)*b + a)^2, x)
```

3.3009 $\int \frac{1}{\left(a+b(cx^n)^{\frac{1}{n}}\right)^2} \, dx$

Optimal. Leaf size=20

$$\frac{x}{a^2 + ab\left(cx^n\right)^{\frac{1}{n}}}$$

```
[Out] x/(a^2 + a*b*(c*x^n)^n^(-1))
```

Rubi [A] time = 0.0213441, antiderivative size = 32, normalized size of antiderivative = 1.6, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{x\left(cx^n\right)^{-1/n}}{b\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(c*x^n)^n^(-1))^(-2),x]

[Out] -(x/(b*(c*x^n)^n^(-1)*(a + b*(c*x^n)^n^(-1))))
```

Rubi in Sympy [A] time = 2.32961, size = 24, normalized size = 1.2

$$-\frac{x\left(cx^n\right)^{-\frac{1}{n}}}{b\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*(c*x**n)**(1/n))**2,x)

[Out] -x*(c*x**n)**(-1/n)/(b*(a + b*(c*x**n)**(1/n)))
```

Mathematica [A] time = 0.0214296, size = 33, normalized size = 1.65

$$-\frac{x\left(cx^n\right)^{-1/n}}{ab+b^2\left(cx^n\right)^{\frac{1}{n}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(c*x^n)^n^(-1))^(-2),x]

[Out] -(x/((c*x^n)^n^(-1)*(a*b + b^2*(c*x^n)^n^(-1))))
```

Maple [C] time = 0.037, size = 107, normalized size = 5.4

$$\frac{x}{a}\left(a+be^{\frac{i\pi\,\mathrm{csgn}\left(ix^n\right)\left(\mathrm{csgn}\left(icx^n\right)\right)^2-i\pi\,\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(ic\right)\mathrm{csgn}\left(icx^n\right)-i\pi\left(\mathrm{csgn}\left(icx^n\right)\right)^3+i\pi\,\mathrm{csgn}\left(ic\right)\left(\mathrm{csgn}\left(icx^n\right)\right)^2+2\ln\left(c\right)+2\ln\left(x^n\right)}{2n}}\right)^{-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*(c*x^n)^(1/n))^2,x)
```

```
[Out] x/a/(a+b*exp(1/2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^
n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*cs
gn(I*c*x^n)^2+2*ln(c)+2*ln(x^n))/n))
```

Maxima [A] time = 1.36733, size = 31, normalized size = 1.55

$$\frac{x}{abc^{\left(\frac{1}{n}\right)}(x^n)^{\left(\frac{1}{n}\right)} + a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^(-2),x, algorithm="maxima")
```

```
[Out] x/(a*b*c^(1/n)*(x^n)^(1/n) + a^2)
```

Fricas [A] time = 0.232289, size = 34, normalized size = 1.7

$$-\frac{1}{b^2c^{\frac{2}{n}}x + abc^{\left(\frac{1}{n}\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^(-2),x, algorithm="fricas")
```

```
[Out] -1/(b^2*c^(2/n)*x + a*b*c^(1/n))
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RecursionError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*(c*x**n)**(1/n))**2,x)
```

```
[Out] Exception raised: RecursionError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left((cx^n)^{\left(\frac{1}{n}\right)}\, b + a\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^(-2),x, algorithm="giac")
```

```
[Out] integrate(((c*x^n)^(1/n)*b + a)^(-2), x)
```

3.3010 $\int \frac{1}{x\left(a+b(cx^n)^{\frac{1}{n}}\right)^2}\,dx$

Optimal. Leaf size=45

$$-\frac{\log\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)}{a^2}+\frac{\log(x)}{a^2}+\frac{1}{a\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)}$$

```
[Out] 1/(a*(a + b*(c*x^n)^n^(-1))) + Log[x]/a^2 - Log[a + b*(c*x^n)^n^(
-1)]/a^2
```

Rubi [A] time = 0.0539213, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$-\frac{\log\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)}{a^2}+\frac{\log(x)}{a^2}+\frac{1}{a\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x*(a + b*(c*x^n)^n^(-1))^2),x]
```

```
[Out] 1/(a*(a + b*(c*x^n)^n^(-1))) + Log[x]/a^2 - Log[a + b*(c*x^n)^n^(
-1)]/a^2
```

Rubi in Sympy [A] time = 8.57037, size = 44, normalized size = 0.98

$$\frac{1}{a\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)}+\frac{\log\left(\left(cx^n\right)^{\frac{1}{n}}\right)}{a^2}-\frac{\log\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(a+b*(c*x**n)**(1/n))**2,x)
```

```
[Out] 1/(a*(a + b*(c*x**n)**(1/n))) + log((c*x**n)**(1/n))/a**2 - log(a
 + b*(c*x**n)**(1/n))/a**2
```

Mathematica [A] time = 0.10613, size = 40, normalized size = 0.89

$$\frac{\frac{a}{a+b(cx^n)^{\frac{1}{n}}}-\log\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)+\log(x)}{a^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(x*(a + b*(c*x^n)^n^(-1))^2),x]
```

```
[Out] (a/(a + b*(c*x^n)^n^(-1)) + Log[x] - Log[a + b*(c*x^n)^n^(-1)])/a
^2
```

Maple [A] time = 0.003, size = 54, normalized size = 1.2

$$\frac{\ln\left(\sqrt[n]{cx^n}\right)}{a^2}-\frac{\ln\left(a+b\sqrt[n]{cx^n}\right)}{a^2}+\frac{1}{a\left(a+b\sqrt[n]{cx^n}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(a+b*(c*x^n)^(1/n))^2,x)
```

```
[Out] 1/a^2*ln((c*x^n)^(1/n))-ln(a+b*(c*x^n)^(1/n))/a^2+1/a/(a+b*(c*x^n
)^(1/n))
```

Maxima [A] time = 1.37171, size = 82, normalized size = 1.82

$$\frac{1}{abc^{\left(\frac{1}{n}\right)}(x^n)^{\left(\frac{1}{n}\right)}+a^2}-\frac{\log\left(\frac{\left(bc^{\left(\frac{1}{n}\right)}(x^n)^{\left(\frac{1}{n}\right)}+a\right)c^{-\frac{1}{n}}}{b}\right)}{a^2}+\frac{\log(x)}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((((c*x^n)^(1/n)*b + a)^2*x),x, algorithm="maxima")
```

```
[Out] 1/(a*b*c^(1/n)*(x^n)^(1/n) + a^2) - log((b*c^(1/n)*(x^n)^(1/n) +
a)*c^(-1/n)/b)/a^2 + log(x)/a^2
```

Fricas [A] time = 0.237304, size = 77, normalized size = 1.71

$$\frac{bc^{\left(\frac{1}{n}\right)}x\log(x)-\left(bc^{\left(\frac{1}{n}\right)}x+a\right)\log\left(bc^{\left(\frac{1}{n}\right)}x+a\right)+a\log(x)+a}{a^2bc^{\left(\frac{1}{n}\right)}x+a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((((c*x^n)^(1/n)*b + a)^2*x),x, algorithm="fricas")
```

```
[Out] (b*c^(1/n)*x*log(x) - (b*c^(1/n)*x + a)*log(b*c^(1/n)*x + a) + a*
log(x) + a)/(a^2*b*c^(1/n)*x + a^3)
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RecursionError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(a+b*(c*x**n)**(1/n))**2,x)
```

```
[Out] Exception raised: RecursionError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left((cx^n)^{\left(\frac{1}{n}\right)}b+a\right)^2x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((((c*x^n)^(1/n)*b + a)^2*x),x, algorithm="giac")

[Out] integrate(1/((((c*x^n)^(1/n)*b + a)^2*x), x)
```

3.3011 $\int \frac{1}{x^2\left(a+b(cx^n)^{\frac{1}{n}}\right)^2}\,dx$

Optimal. Leaf size=94

$$-\frac{2b\log(x)\left(cx^n\right)^{\frac{1}{n}}}{a^3x}+\frac{2b\left(cx^n\right)^{\frac{1}{n}}\log\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)}{a^3x}-\frac{b\left(cx^n\right)^{\frac{1}{n}}}{a^2x\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)}-\frac{1}{a^2x}$$

```
[Out] -(1/(a^2*x)) - (b*(c*x^n)^n^(-1))/(a^2*x*(a + b*(c*x^n)^n^(-1)))
- (2*b*(c*x^n)^n^(-1)*Log[x])/(a^3*x) + (2*b*(c*x^n)^n^(-1)*Log[a
 + b*(c*x^n)^n^(-1)])/(a^3*x)
```

Rubi [A] time = 0.0894864, antiderivative size = 94, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$-\frac{2b\log(x)\left(cx^n\right)^{\frac{1}{n}}}{a^3x}+\frac{2b\left(cx^n\right)^{\frac{1}{n}}\log\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)}{a^3x}-\frac{b\left(cx^n\right)^{\frac{1}{n}}}{a^2x\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)}-\frac{1}{a^2x}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^2*(a + b*(c*x^n)^n^(-1))^2),x]
```

```
[Out] -(1/(a^2*x)) - (b*(c*x^n)^n^(-1))/(a^2*x*(a + b*(c*x^n)^n^(-1)))
- (2*b*(c*x^n)^n^(-1)*Log[x])/(a^3*x) + (2*b*(c*x^n)^n^(-1)*Log[a
 + b*(c*x^n)^n^(-1)])/(a^3*x)
```

Rubi in Sympy [A] time = 12.8394, size = 90, normalized size = 0.96

$$-\frac{b\left(cx^n\right)^{\frac{1}{n}}}{a^2x\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)}-\frac{1}{a^2x}-\frac{2b\left(cx^n\right)^{\frac{1}{n}}\log\left(\left(cx^n\right)^{\frac{1}{n}}\right)}{a^3x}+\frac{2b\left(cx^n\right)^{\frac{1}{n}}\log\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)}{a^3x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(a+b*(c*x**n)**(1/n))**2,x)
```

```
[Out] -b*(c*x**n)**(1/n)/(a**2*x*(a + b*(c*x**n)**(1/n))) - 1/(a**2*x)
- 2*b*(c*x**n)**(1/n)*log((c*x**n)**(1/n))/(a**3*x) + 2*b*(c*x**n
)**(1/n)*log(a + b*(c*x**n)**(1/n))/(a**3*x)
```

Mathematica [A] time = 4.33256, size = 0, normalized size = 0.

$$\int \frac{1}{x^2\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[1/(x^2*(a + b*(c*x^n)^n^(-1))^2),x]
```

```
[Out] Integrate[1/(x^2*(a + b*(c*x^n)^n^(-1))^2), x]
```

Maple [C] time = 0.048, size = 440, normalized size = 4.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(a+b*(c*x^n)^(1/n))^2,x)
```

```
[Out] 1/a/x/(a+b*exp(1/2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*
x^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*
csgn(I*c*x^n)^2+2*ln(c)+2*ln(x^n))/n))-2/a^2/x+2/a^3*c^(1/n)*b*ln
(b*exp(1/2*(-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)+I*Pi*csgn(I
*x^n)*csgn(I*c*x^n)^2+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-I*Pi*csgn(I*
c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(x))/n)*x+a)*exp(1/2*(I*Pi*csgn(
I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)-I
*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-2*n*ln(x)+2*ln
(x^n))/n)-2/a^3*c^(1/n)*b*ln(x)*exp(1/2*(I*Pi*csgn(I*x^n)*csgn(I*
c*x^n)^2-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x
^n)^3+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-2*n*ln(x)+2*ln(x^n))/n)
```

Maxima [A] time = 21.9765, size = 78, normalized size = 0.83

$$\frac{2\,bc^{\left(\frac{1}{n}\right)}\log\left(bc^{\left(\frac{1}{n}\right)}+\frac{a}{x}\right)}{a^3}+\frac{1}{abc^{\left(\frac{1}{n}\right)}x(x^n)^{\left(\frac{1}{n}\right)}+a^2x}-\frac{2}{a^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((c*x^n)^(1/n)*b + a)^2*x^2),x, algorithm="maxima")
```

```
[Out] 2*b*c^(1/n)*log(b*c^(1/n) + a/x)/a^3 + 1/(a*b*c^(1/n)*x*(x^n)^(1/
n) + a^2*x) - 2/(a^2*x)
```

Fricas [A] time = 0.236604, size = 134, normalized size = 1.43

$$-\frac{2\,b^2c^{\frac{2}{n}}x^2\log(x)+a^2+2\,(abx\log(x)+abx)c^{\left(\frac{1}{n}\right)}-2\left(b^2c^{\frac{2}{n}}x^2+abc^{\left(\frac{1}{n}\right)}x\right)\log\left(bc^{\left(\frac{1}{n}\right)}x+a\right)}{a^3bc^{\left(\frac{1}{n}\right)}x^2+a^4x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((c*x^n)^(1/n)*b + a)^2*x^2),x, algorithm="fricas")
```

```
[Out] -(2*b^2*c^(2/n)*x^2*log(x) + a^2 + 2*(a*b*x*log(x) + a*b*x)*c^(1/
n) - 2*(b^2*c^(2/n)*x^2 + a*b*c^(1/n)*x)*log(b*c^(1/n)*x + a))/(a
^3*b*c^(1/n)*x^2 + a^4*x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{x^2\left(a+b\,(cx^n)^{\frac{1}{n}}\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(a+b*(c*x**n)**(1/n))**2,x)
```

```
[Out] Integral(1/(x**2*(a + b*(c*x**n)**(1/n))**2), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left((cx^n)^{\left(\frac{1}{n}\right)}b + a\right)^2 x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((((c*x^n)^(1/n)*b + a)^2*x^2),x, algorithm="giac")

[Out] integrate(1/((((c*x^n)^(1/n)*b + a)^2*x^2), x)
```

3.3012 $\int \frac{1}{x^3\left(a+b(cx^n)^{\frac{1}{n}}\right)^2}\,dx$

Optimal. Leaf size=125

$$\frac{3b^2\log(x)\left(cx^n\right)^{2/n}}{a^4x^2}-\frac{3b^2\left(cx^n\right)^{2/n}\log\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)}{a^4x^2}+\frac{b^2\left(cx^n\right)^{2/n}}{a^3x^2\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)}+\frac{2b\left(cx^n\right)^{\frac{1}{n}}}{a^3x^2}-\frac{1}{2a^2x^2}$$

```
[Out] -1/(2*a^2*x^2) + (2*b*(c*x^n)^n^(-1))/(a^3*x^2) + (b^2*(c*x^n)^(2
/n))/(a^3*x^2*(a + b*(c*x^n)^n^(-1))) + (3*b^2*(c*x^n)^(2/n)*Log[
x])/(a^4*x^2) - (3*b^2*(c*x^n)^(2/n)*Log[a + b*(c*x^n)^n^(-1)])/(
a^4*x^2)
```

Rubi [A] time = 0.113569, antiderivative size = 125, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$\frac{3b^2\log(x)\left(cx^n\right)^{2/n}}{a^4x^2}-\frac{3b^2\left(cx^n\right)^{2/n}\log\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)}{a^4x^2}+\frac{b^2\left(cx^n\right)^{2/n}}{a^3x^2\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)}+\frac{2b\left(cx^n\right)^{\frac{1}{n}}}{a^3x^2}-\frac{1}{2a^2x^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(x^3*(a + b*(c*x^n)^n^(-1))^2),x]
```

```
[Out] -1/(2*a^2*x^2) + (2*b*(c*x^n)^n^(-1))/(a^3*x^2) + (b^2*(c*x^n)^(2
/n))/(a^3*x^2*(a + b*(c*x^n)^n^(-1))) + (3*b^2*(c*x^n)^(2/n)*Log[
x])/(a^4*x^2) - (3*b^2*(c*x^n)^(2/n)*Log[a + b*(c*x^n)^n^(-1)])/(
a^4*x^2)
```

Rubi in Sympy [A] time = 16.5913, size = 122, normalized size = 0.98

$$-\frac{1}{2a^2x^2}+\frac{b^2\left(cx^n\right)^{\frac{2}{n}}}{a^3x^2\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)}+\frac{2b\left(cx^n\right)^{\frac{1}{n}}}{a^3x^2}+\frac{3b^2\left(cx^n\right)^{\frac{2}{n}}\log\left(\left(cx^n\right)^{\frac{1}{n}}\right)}{a^4x^2}-\frac{3b^2\left(cx^n\right)^{\frac{2}{n}}\log\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)}{a^4x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(a+b*(c*x**n)**(1/n))**2,x)
```

```
[Out] -1/(2*a**2*x**2) + b**2*(c*x**n)**(2/n)/(a**3*x**2*(a + b*(c*x**n
)**(1/n))) + 2*b*(c*x**n)**(1/n)/(a**3*x**2) + 3*b**2*(c*x**n)**(
2/n)*log((c*x**n)**(1/n))/(a**4*x**2) - 3*b**2*(c*x**n)**(2/n)*lo
g(a + b*(c*x**n)**(1/n))/(a**4*x**2)
```

Mathematica [A] time = 4.36541, size = 0, normalized size = 0.

$$\int \frac{1}{x^3\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[1/(x^3*(a + b*(c*x^n)^n^(-1))^2),x]
```

```
[Out] Integrate[1/(x^3*(a + b*(c*x^n)^n^(-1))^2), x]
```

Maple [C] time = 0.051, size = 556, normalized size = 4.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^3/(a+b*(c*x^n)^(1/n))^2,x)
```

```
[Out] 1/a/x^2/(a+b*exp(1/2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(
I*x^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c
)*csgn(I*c*x^n)^2+2*ln(c)+2*ln(x^n))/n))+3/a^3/x*c^(1/n)*b*exp(1/
2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*csgn(I*c)*cs
gn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-2
*n*ln(x)+2*ln(x^n))/n)-3/2/a^2/x^2+3/a^4*(c^(1/n))^2*b^2*ln(x)*ex
p((I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*csgn(I*c)*cs
gn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-2
*n*ln(x)+2*ln(x^n))/n)-3/a^4*(c^(1/n))^2*b^2*ln(b*exp(1/2*(-I*Pi*
csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)+I*Pi*csgn(I*x^n)*csgn(I*c*x^n
)^2+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2
*ln(x^n)-2*n*ln(x))/n)*x+a)*exp((I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2
-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*
Pi*csgn(I*c)*csgn(I*c*x^n)^2-2*n*ln(x)+2*ln(x^n))/n)
```

Maxima [A] time = 22.1929, size = 126, normalized size = 1.01

$$-\frac{3\,b^2c^{\frac{2}{n}}\log\left(bc^{\left(\frac{1}{n}\right)}x+a\right)}{a^4}+\frac{3\,b^2c^{\frac{2}{n}}\log\left(x\right)}{a^4}+\frac{1}{abc^{\left(\frac{1}{n}\right)}x^2(x^n)^{\left(\frac{1}{n}\right)}+a^2x^2}+\frac{3\left(2\,bc^{\left(\frac{1}{n}\right)}x-a\right)}{2\,a^3x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((c*x^n)^(1/n)*b + a)^2*x^3),x, algorithm="maxima")
```

```
[Out] -3*b^2*c^(2/n)*log(b*c^(1/n)*x + a)/a^4 + 3*b^2*c^(2/n)*log(x)/a^
4 + 1/(a*b*c^(1/n)*x^2*(x^n)^(1/n) + a^2*x^2) + 3/2*(2*b*c^(1/n)*
x - a)/(a^3*x^2)
```

Fricas [A] time = 0.237625, size = 177, normalized size = 1.42

$$\frac{6\,b^3c^{\frac{3}{n}}x^3\log\left(x\right)+3\,a^2bc^{\left(\frac{1}{n}\right)}x-a^3+6\left(ab^2x^2\log\left(x\right)+ab^2x^2\right)c^{\frac{2}{n}}-6\left(b^3c^{\frac{3}{n}}x^3+ab^2c^{\frac{2}{n}}x^2\right)\log\left(bc^{\left(\frac{1}{n}\right)}x+a\right)}{2\left(a^4bc^{\left(\frac{1}{n}\right)}x^3+a^5x^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(((c*x^n)^(1/n)*b + a)^2*x^3),x, algorithm="fricas")
```

```
[Out] 1/2*(6*b^3*c^(3/n)*x^3*log(x) + 3*a^2*b*c^(1/n)*x - a^3 + 6*(a*b^
2*x^2*log(x) + a*b^2*x^2)*c^(2/n) - 6*(b^3*c^(3/n)*x^3 + a*b^2*c^
(2/n)*x^2)*log(b*c^(1/n)*x + a))/(a^4*b*c^(1/n)*x^3 + a^5*x^2)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{x^3\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(a+b*(c*x**n)**(1/n))**2,x)
```

```
[Out] Integral(1/(x**3*(a + b*(c*x**n)**(1/n))**2), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left((cx^n)^{\left(\frac{1}{n}\right)}b + a\right)^2 x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(((c*x^n)^(1/n)*b + a)^2*x^3),x, algorithm="giac")
```

```
[Out] integrate(1/(((c*x^n)^(1/n)*b + a)^2*x^3), x)
```

3.3013 $\int \frac{1}{\left(a+b(cx^n)^{\frac{1}{n}}\right)^3} dx$

Optimal. Leaf size=34

$$-\frac{x\,(cx^n)^{-1/n}}{2b\left(a+b\,(cx^n)^{\frac{1}{n}}\right)^2}$$

```
[Out] -x/(2*b*(c*x^n)^n^(-1)*(a + b*(c*x^n)^n^(-1))^2)
```

Rubi [A] time = 0.0212443, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{x\,(cx^n)^{-1/n}}{2b\left(a+b\,(cx^n)^{\frac{1}{n}}\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(c*x^n)^n^(-1))^(-3),x]

[Out] -x/(2*b*(c*x^n)^n^(-1)*(a + b*(c*x^n)^n^(-1))^2)
```

Rubi in Sympy [A] time = 2.28924, size = 27, normalized size = 0.79

$$-\frac{x\,(cx^n)^{-\frac{1}{n}}}{2b\left(a+b\,(cx^n)^{\frac{1}{n}}\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*(c*x**n)**(1/n))**3,x)

[Out] -x*(c*x**n)**(-1/n)/(2*b*(a + b*(c*x**n)**(1/n))**2)
```

Mathematica [A] time = 0.0212443, size = 34, normalized size = 1.

$$-\frac{x\,(cx^n)^{-1/n}}{2b\left(a+b\,(cx^n)^{\frac{1}{n}}\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(c*x^n)^n^(-1))^(-3),x]

[Out] -x/(2*b*(c*x^n)^n^(-1)*(a + b*(c*x^n)^n^(-1))^2)
```

Maple [C] time = 0.041, size = 209, normalized size = 6.2

$$\frac{x}{2\,a^2}\left(b\mathrm{e}^{\frac{i\pi\,\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2-i\pi\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(ic)\mathrm{csgn}(icx^n)-i\pi\,(\mathrm{csgn}(icx^n))^3+i\pi\,\mathrm{csgn}(ic)(\mathrm{csgn}(icx^n))^2+2\,\ln(c)+2\,\ln(x^n)}{2\,n}}+2\,a\right)\left(a+b\mathrm{e}^{\frac{i\pi\,\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2-}{}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*(c*x^n)^(1/n))^3,x)
```

```
[Out] 1/2*x*(b*exp(1/2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^
n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*cs
gn(I*c*x^n)^2+2*ln(c)+2*ln(x^n))/n)+2*a)/a^2/(a+b*exp(1/2*(I*Pi*c
sgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^
n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2+2*ln(c)+2*
ln(x^n))/n))^2
```

Maxima [A] time = 1.41803, size = 93, normalized size = 2.74

$$\frac{bc^{\left(\frac{1}{n}\right)}x(x^n)^{\left(\frac{1}{n}\right)} + 2\,ax}{2\left(a^2b^2c^{\frac{2}{n}}(x^n)^{\frac{2}{n}} + 2\,a^3bc^{\left(\frac{1}{n}\right)}(x^n)^{\left(\frac{1}{n}\right)} + a^4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^(-3),x, algorithm="maxima")
```

```
[Out] 1/2*(b*c^(1/n)*x*(x^n)^(1/n) + 2*a*x)/(a^2*b^2*c^(2/n)*(x^n)^(2/n
) + 2*a^3*b*c^(1/n)*(x^n)^(1/n) + a^4)
```

Fricas [A] time = 0.232197, size = 58, normalized size = 1.71

$$-\frac{1}{2\left(b^3c^{\frac{3}{n}}x^2 + 2\,ab^2c^{\frac{2}{n}}x + a^2bc^{\left(\frac{1}{n}\right)}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^(-3),x, algorithm="fricas")
```

```
[Out] -1/2/(b^3*c^(3/n)*x^2 + 2*a*b^2*c^(2/n)*x + a^2*b*c^(1/n))
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RecursionError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*(c*x**n)**(1/n))**3,x)
```

```
[Out] Exception raised: RecursionError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left((cx^n)^{\left(\frac{1}{n}\right)}b + a\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^(-3),x, algorithm="giac")
```

```
[Out] integrate(((c*x^n)^(1/n)*b + a)^(-3), x)
```

3.3014 $\int \frac{x}{\left(1+(x^n)^{\frac{1}{n}}\right)^2} dx$

Optimal. Leaf size=48

$$\frac{x^2 (x^n)^{-2/n}}{(x^n)^{\frac{1}{n}} + 1} + x^2 (x^n)^{-2/n} \log\left((x^n)^{\frac{1}{n}} + 1\right)$$

```
[Out] x^2/((x^n)^(2/n)*(1 + (x^n)^n^(-1))) + (x^2*Log[1 + (x^n)^n^(-1)]
)/(x^n)^(2/n)
```

Rubi [A] time = 0.0304985, antiderivative size = 48, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{x^2 (x^n)^{-2/n}}{(x^n)^{\frac{1}{n}} + 1} + x^2 (x^n)^{-2/n} \log\left((x^n)^{\frac{1}{n}} + 1\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x/(1 + (x^n)^n^(-1))^2,x]

[Out] x^2/((x^n)^(2/n)*(1 + (x^n)^n^(-1))) + (x^2*Log[1 + (x^n)^n^(-1)]
)/(x^n)^(2/n)
```

Rubi in Sympy [A] time = 4.29697, size = 37, normalized size = 0.77

$$x^2 (x^n)^{-\frac{2}{n}} \log\left((x^n)^{\frac{1}{n}} + 1\right) + \frac{x^2 (x^n)^{-\frac{2}{n}}}{(x^n)^{\frac{1}{n}} + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(1+(x**n)**(1/n))**2,x)

[Out] x**2*(x**n)**(-2/n)*log((x**n)**(1/n) + 1) + x**2*(x**n)**(-2/n)/
((x**n)**(1/n) + 1)
```

Mathematica [A] time = 2.12276, size = 0, normalized size = 0.

$$\int \frac{x}{\left(1 + (x^n)^{\frac{1}{n}}\right)^2} dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[x/(1 + (x^n)^n^(-1))^2,x]

[Out] Integrate[x/(1 + (x^n)^n^(-1))^2, x]
```

Maple [A] time = 0.058, size = 76, normalized size = 1.6

$$\frac{x^2}{1 + \sqrt[n]{x^n}} - e^{\frac{n\ln(x)-\ln(x^n)}{n}} x + e^{2\frac{n\ln(x)-\ln(x^n)}{n}} \ln\left(1 + e^{-\frac{n\ln(x)-\ln(x^n)}{n}} x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(1+(x^n)^(1/n))^2,x)

[Out] x^2/(1+(x^n)^(1/n))-exp((n*ln(x)-ln(x^n))/n)*x+exp(2*(n*ln(x)-ln(
x^n))/n)*ln(1+exp(-(n*ln(x)-ln(x^n))/n)*x)
```

Maxima [A] time = 22.1823, size = 31, normalized size = 0.65

$$-x + \frac{x^2}{(x^n)^{\left(\frac{1}{n}\right)} + 1} + \log(x + 1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/((x^n)^(1/n) + 1)^2,x, algorithm="maxima")

[Out] -x + x^2/((x^n)^(1/n) + 1) + log(x + 1)
```

Fricas [A] time = 0.222028, size = 22, normalized size = 0.46

$$\frac{(x + 1)\log(x + 1) + 1}{x + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/((x^n)^(1/n) + 1)^2,x, algorithm="fricas")

[Out] ((x + 1)*log(x + 1) + 1)/(x + 1)
```

Sympy [A] time = 0.135808, size = 19, normalized size = 0.4

$$\log\left((x^n)^{\frac{1}{n}} + 1\right) + \frac{1}{(x^n)^{\frac{1}{n}} + 1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(1+(x**n)**(1/n))**2,x)

[Out] log((x**n)**(1/n) + 1) + 1/((x**n)**(1/n) + 1)
```

GIAC/XCAS [A] time = 0.224262, size = 15, normalized size = 0.31

$$\frac{1}{x + 1} + \ln(|x + 1|)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/((x^n)^(1/n) + 1)^2,x, algorithm="giac")

[Out] 1/(x + 1) + ln(abs(x + 1))
```

3.3015 $\int x^3 \left(a+b (c x^n)^{\frac{1}{n}}\right)^p \, dx$

Optimal. Leaf size=171

$$-\frac{a^3 x^4 (c x^n)^{-4/n} \left(a+b (c x^n)^{\frac{1}{n}}\right)^{p+1}}{b^4 (p+1)}+\frac{3 a^2 x^4 (c x^n)^{-4/n} \left(a+b (c x^n)^{\frac{1}{n}}\right)^{p+2}}{b^4 (p+2)}-\frac{3 a x^4 (c x^n)^{-4/n} \left(a+b (c x^n)^{\frac{1}{n}}\right)^{p+3}}{b^4 (p+3)}+\frac{x^4 (c x^n)^{-4/n} \left(a+b (c x^n)^{\frac{1}{n}}\right)^{p+4}}{b^4 (p+4)}$$

```
[Out] -((a^3*x^4*(a + b*(c*x^n)^n^(-1))^(1 + p))/(b^4*(1 + p)*(c*x^n)^(
4/n))) + (3*a^2*x^4*(a + b*(c*x^n)^n^(-1))^(2 + p))/(b^4*(2 + p)*
(c*x^n)^(4/n)) - (3*a*x^4*(a + b*(c*x^n)^n^(-1))^(3 + p))/(b^4*(3
 + p)*(c*x^n)^(4/n)) + (x^4*(a + b*(c*x^n)^n^(-1))^(4 + p))/(b^4*
(4 + p)*(c*x^n)^(4/n))
```

Rubi [A] time = 0.146232, antiderivative size = 171, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$-\frac{a^3 x^4 (c x^n)^{-4/n} \left(a+b (c x^n)^{\frac{1}{n}}\right)^{p+1}}{b^4 (p+1)}+\frac{3 a^2 x^4 (c x^n)^{-4/n} \left(a+b (c x^n)^{\frac{1}{n}}\right)^{p+2}}{b^4 (p+2)}-\frac{3 a x^4 (c x^n)^{-4/n} \left(a+b (c x^n)^{\frac{1}{n}}\right)^{p+3}}{b^4 (p+3)}+\frac{x^4 (c x^n)^{-4/n} \left(a+b (c x^n)^{\frac{1}{n}}\right)^{p+4}}{b^4 (p+4)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^3*(a + b*(c*x^n)^n^(-1))^p,x]
```

```
[Out] -((a^3*x^4*(a + b*(c*x^n)^n^(-1))^(1 + p))/(b^4*(1 + p)*(c*x^n)^(
4/n))) + (3*a^2*x^4*(a + b*(c*x^n)^n^(-1))^(2 + p))/(b^4*(2 + p)*
(c*x^n)^(4/n)) - (3*a*x^4*(a + b*(c*x^n)^n^(-1))^(3 + p))/(b^4*(3
 + p)*(c*x^n)^(4/n)) + (x^4*(a + b*(c*x^n)^n^(-1))^(4 + p))/(b^4*
(4 + p)*(c*x^n)^(4/n))
```

Rubi in Sympy [A] time = 25.4345, size = 146, normalized size = 0.85

$$-\frac{a^3 x^4 (c x^n)^{-\frac{4}{n}} \left(a+b (c x^n)^{\frac{1}{n}}\right)^{p+1}}{b^4 (p+1)}+\frac{3 a^2 x^4 (c x^n)^{-\frac{4}{n}} \left(a+b (c x^n)^{\frac{1}{n}}\right)^{p+2}}{b^4 (p+2)}-\frac{3 a x^4 (c x^n)^{-\frac{4}{n}} \left(a+b (c x^n)^{\frac{1}{n}}\right)^{p+3}}{b^4 (p+3)}+\frac{x^4 (c x^n)^{-\frac{4}{n}} \left(a+b (c x^n)^{\frac{1}{n}}\right)^{p+4}}{b^4 (p+4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**3*(a+b*(c*x**n)**(1/n))**p,x)
```

```
[Out] -a**3*x**4*(c*x**n)**(-4/n)*(a + b*(c*x**n)**(1/n))**(p + 1)/(b**
4*(p + 1)) + 3*a**2*x**4*(c*x**n)**(-4/n)*(a + b*(c*x**n)**(1/n))
**(p + 2)/(b**4*(p + 2)) - 3*a*x**4*(c*x**n)**(-4/n)*(a + b*(c*x*
*n)**(1/n))**(p + 3)/(b**4*(p + 3)) + x**4*(c*x**n)**(-4/n)*(a +
b*(c*x**n)**(1/n))**(p + 4)/(b**4*(p + 4))
```

Mathematica [A] time = 0.442841, size = 263, normalized size = 1.54

$$\frac{x^4 (cx^n)^{-4/n} \left(a+b(cx^n)^{\frac{1}{n}}\right)^p \left(\frac{b(cx^n)^{\frac{1}{n}}}{a}+1\right)^{-p} \left(-6a^4\left(\left(\frac{b(cx^n)^{\frac{1}{n}}}{a}+1\right)^p-1\right)+6a^3bp(cx^n)^{\frac{1}{n}}\left(\frac{b(cx^n)^{\frac{1}{n}}}{a}+1\right)^p-3a^2b^2p(p+1)\right.}{b^4(p+1)(p+2)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^3*(a + b*(c*x^n)^n^(-1))^p,x]
```

```
[Out] (x^4*(a + b*(c*x^n)^n^(-1))^p*(6*a^3*b*p*(c*x^n)^n^(-1)*(1 + (b*(
c*x^n)^n^(-1))/a)^p - 3*a^2*b^2*p*(1 + p)*(c*x^n)^(2/n)*(1 + (b*(
c*x^n)^n^(-1))/a)^p + a*b^3*p*(2 + 3*p + p^2)*(c*x^n)^(3/n)*(1 +
(b*(c*x^n)^n^(-1))/a)^p + b^4*(6 + 11*p + 6*p^2 + p^3)*(c*x^n)^(4
/n)*(1 + (b*(c*x^n)^n^(-1))/a)^p - 6*a^4*(-1 + (1 + (b*(c*x^n)^n^
(-1))/a)^p)))/(b^4*(1 + p)*(2 + p)*(3 + p)*(4 + p)*(c*x^n)^(4/n)*
(1 + (b*(c*x^n)^n^(-1))/a)^p)
```

Maple [C] time = 0.593, size = 2923, normalized size = 17.1

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^3*(a+b*(c*x^n)^(1/n))^p,x)
```

```
[Out] x^4/(1+p)*(b*exp(1/2*(-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)+I
*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-I*
Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(x))/n)*x+a)^p+x^3/(c^
(1/n))/b/(1+p)*a*(b*exp(1/2*(-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c
*x^n)+I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*csgn(I*c)*csgn(I*c*x^
n)^2-I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(x))/n)*x+a)^p*
exp(-1/2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*csgn(
I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(I*c*x
^n)^2-2*n*ln(x)+2*ln(x^n))/n)-3/(1+p)^2*(b*exp(1/2*(-I*Pi*csgn(I*
x^n)*csgn(I*c)*csgn(I*c*x^n)+I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*P
i*csgn(I*c)*csgn(I*c*x^n)^2-I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n
)-2*n*ln(x))/n)*x+a)^(1+p)/b*exp(-1/2*(-I*Pi*csgn(I*x^n)*csgn(I*c
)*csgn(I*c*x^n)+I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*csgn(I*c)*c
sgn(I*c*x^n)^2-I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(x))/
n)*x^3+9/(1+p)^2/b/(c^(1/n))/(4+p)*x^3*(b*exp(1/2*(-I*Pi*csgn(I*x
^n)*csgn(I*c)*csgn(I*c*x^n)+I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi
*csgn(I*c)*csgn(I*c*x^n)^2-I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n)
-2*n*ln(x))/n)*x+a)^(1+p)*exp(-1/2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n
)^2-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3
+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-2*n*ln(x)+2*ln(x^n))/n)+9/(1+p)^2
/b^2/(c^(1/n))^2*a/(3+p)/(4+p)*x^2*(b*exp(1/2*(-I*Pi*csgn(I*x^n)*
csgn(I*c)*csgn(I*c*x^n)+I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*csg
n(I*c)*csgn(I*c*x^n)^2-I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n
*ln(x))/n)*x+a)^(1+p)*exp(-(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi
*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*cs
gn(I*c)*csgn(I*c*x^n)^2-2*n*ln(x)+2*ln(x^n))/n)+9/(1+p)^2/b^2/(c^
(1/n))^2*a/(3+p)/(4+p)*x^2*(b*exp(1/2*(-I*Pi*csgn(I*x^n)*csgn(I*c
)*csgn(I*c*x^n)+I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*csgn(I*c)*c
sgn(I*c*x^n)^2-I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(x))/
n)*x+a)^(1+p)*p*exp(-(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(
I*x^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c
)*csgn(I*c*x^n)^2-2*n*ln(x)+2*ln(x^n))/n)+18/(1+p)^2/b^4/(3+p)/(c
^(1/n))^4/(2+p)*a^3/(4+p)*(b*exp(1/2*(-I*Pi*csgn(I*x^n)*csgn(I*c)
*csgn(I*c*x^n)+I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*csgn(I*c)*cs
gn(I*c*x^n)^2-I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(x))/n
)*x+a)^(1+p)*exp(-2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I
*x^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)
*csgn(I*c*x^n)^2-2*n*ln(x)+2*ln(x^n))/n)-18/(1+p)^2/b^3/(c^(1/n))
^3*a^2/(3+p)/(2+p)/(4+p)*x*(b*exp(1/2*(-I*Pi*csgn(I*x^n)*csgn(I*c
)*csgn(I*c*x^n)+I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*csgn(I*c)*c
sgn(I*c*x^n)^2-I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(x))/
```

```
n)*x+a)^(1+p)*exp(-3/2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csg
n(I*x^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I
*c)*csgn(I*c*x^n)^2-2*n*ln(x)+2*ln(x^n))/n)-18/(1+p)^2/b^3/(c^(1/
n))^3*a^2/(3+p)/(2+p)/(4+p)*x*(b*exp(1/2*(-I*Pi*csgn(I*x^n)*csgn(
I*c)*csgn(I*c*x^n)+I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*csgn(I*c
)*csgn(I*c*x^n)^2-I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(x
))/n)*x+a)^(1+p)*p*exp(-3/2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*P
i*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*c
sgn(I*c)*csgn(I*c*x^n)^2-2*n*ln(x)+2*ln(x^n))/n)-3/(c^(1/n))/b/(1
+p)*a/(3+p)*x^3*(b*exp(1/2*(-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*
x^n)+I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*csgn(I*c)*csgn(I*c*x^n
)^2-I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(x))/n)*x+a)^p*e
xp(-1/2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*csgn(I
*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(I*c*x^
n)^2-2*n*ln(x)+2*ln(x^n))/n)-3/(c^(1/n))^2/b^2/(1+p)*a^2*p/(2+p)/
(3+p)*x^2*(b*exp(1/2*(-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)+I
*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-I*
Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(x))/n)*x+a)^p*exp(-(I
*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I
*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-2*n*l
n(x)+2*ln(x^n))/n)-6/(c^(1/n))^4/b^4/(1+p)^2*a^4/(2+p)/(3+p)*(b*e
xp(1/2*(-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)+I*Pi*csgn(I*x^n
)*csgn(I*c*x^n)^2+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-I*Pi*csgn(I*c*x^
n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(x))/n)*x+a)^p*exp(-2*(I*Pi*csgn(I*x
^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi
*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-2*n*ln(x)+2*ln(x^
n))/n)+6/(1+p)^2/b^3/(c^(1/n))^3*a^3/(2+p)/(3+p)*p*x*(b*exp(1/2*(
-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)+I*Pi*csgn(I*x^n)*csgn(I
*c*x^n)^2+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-I*Pi*csgn(I*c*x^n)^3+2*l
n(c)+2*ln(x^n)-2*n*ln(x))/n)*x+a)^p*exp(-3/2*(I*Pi*csgn(I*x^n)*cs
gn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(
I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-2*n*ln(x)+2*ln(x^n))/n)
```

Maxima [A] time = 1.80074, size = 188, normalized size = 1.1

$$\frac{\left(\left(p^3+6\,p^2+11\,p+6\right)b^4c^{\frac{4}{n}}x^4+\left(p^3+3\,p^2+2\,p\right)ab^3c^{\frac{3}{n}}x^3-3\left(p^2+p\right)a^2b^2c^{\frac{2}{n}}x^2+6\,a^3bc^{\left(\frac{1}{n}\right)}px-6\,a^4\right)\left(bc^{\left(\frac{1}{n}\right)}x+a\right)^pc^{-\frac{4}{n}}}{(p^4+10\,p^3+35\,p^2+50\,p+24)b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^p*x^3,x, algorithm="maxima")
```

```
[Out] ((p^3 + 6*p^2 + 11*p + 6)*b^4*c^(4/n)*x^4 + (p^3 + 3*p^2 + 2*p)*a
*b^3*c^(3/n)*x^3 - 3*(p^2 + p)*a^2*b^2*c^(2/n)*x^2 + 6*a^3*b*c^(1
/n)*p*x - 6*a^4)*(b*c^(1/n)*x + a)^p*c^(-4/n)/((p^4 + 10*p^3 + 35
*p^2 + 50*p + 24)*b^4)
```

Fricas [A] time = 0.239772, size = 247, normalized size = 1.44

$$\frac{\left(6\,a^3bc^{\left(\frac{1}{n}\right)}px+\left(b^4p^3+6\,b^4p^2+11\,b^4p+6\,b^4\right)c^{\frac{4}{n}}x^4+\left(ab^3p^3+3\,ab^3p^2+2\,ab^3p\right)c^{\frac{3}{n}}x^3-6\,a^4-3\left(a^2b^2p^2+a^2b^2p\right)c^{\frac{2}{n}}x^2\right)(b}{(b^4p^4+10\,b^4p^3+35\,b^4p^2+50\,b^4p+24\,b^4)c^{\frac{4}{n}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^p*x^3,x, algorithm="fricas")
```

```
[Out] (6*a^3*b*c^(1/n)*p*x + (b^4*p^3 + 6*b^4*p^2 + 11*b^4*p + 6*b^4)*c
^(4/n)*x^4 + (a*b^3*p^3 + 3*a*b^3*p^2 + 2*a*b^3*p)*c^(3/n)*x^3 -
6*a^4 - 3*(a^2*b^2*p^2 + a^2*b^2*p)*c^(2/n)*x^2)*(b*c^(1/n)*x + a
)^p/((b^4*p^4 + 10*b^4*p^3 + 35*b^4*p^2 + 50*b^4*p + 24*b^4)*c^(4
/n))
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^3 \left(a + b\,(cx^n)^{\frac{1}{n}}\right)^p\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**3*(a+b*(c*x**n)**(1/n))**p,x)
```

```
[Out] Integral(x**3*(a + b*(c*x**n)**(1/n))**p, x)
```

GIAC/XCAS [A] time = 23.7683, size = 599, normalized size = 3.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^p*x^3,x, algorithm="giac")
```

```
[Out] (b^4*p^3*x^4*e^(p*ln(b*x*e^(ln(c)/n) + a) + 4*ln(c)/n) + 6*b^4*p^
2*x^4*e^(p*ln(b*x*e^(ln(c)/n) + a) + 4*ln(c)/n) + a*b^3*p^3*x^3*e
^(p*ln(b*x*e^(ln(c)/n) + a) + 3*ln(c)/n) + 11*b^4*p*x^4*e^(p*ln(b
*x*e^(ln(c)/n) + a) + 4*ln(c)/n) + 3*a*b^3*p^2*x^3*e^(p*ln(b*x*e^
(ln(c)/n) + a) + 3*ln(c)/n) + 6*b^4*x^4*e^(p*ln(b*x*e^(ln(c)/n) +
 a) + 4*ln(c)/n) + 2*a*b^3*p*x^3*e^(p*ln(b*x*e^(ln(c)/n) + a) + 3
*ln(c)/n) - 3*a^2*b^2*p^2*x^2*e^(p*ln(b*x*e^(ln(c)/n) + a) + 2*ln
(c)/n) - 3*a^2*b^2*p*x^2*e^(p*ln(b*x*e^(ln(c)/n) + a) + 2*ln(c)/n
) + 6*a^3*b*p*x*e^(p*ln(b*x*e^(ln(c)/n) + a) + ln(c)/n) - 6*a^4*e
^(p*ln(b*x*e^(ln(c)/n) + a)))/(b^4*p^4*e^(4*ln(c)/n) + 10*b^4*p^3
*e^(4*ln(c)/n) + 35*b^4*p^2*e^(4*ln(c)/n) + 50*b^4*p*e^(4*ln(c)/n
) + 24*b^4*e^(4*ln(c)/n))
```

3.3016 $\int x^2 \left(a+b \left(c x^n\right)^{\frac{1}{n}}\right)^p \, dx$

Optimal. Leaf size=126

$$\frac{a^2 x^3 \left(c x^n\right)^{-3/n} \left(a+b \left(c x^n\right)^{\frac{1}{n}}\right)^{p+1}}{b^3 (p+1)}-\frac{2 a x^3 \left(c x^n\right)^{-3/n} \left(a+b \left(c x^n\right)^{\frac{1}{n}}\right)^{p+2}}{b^3 (p+2)}+\frac{x^3 \left(c x^n\right)^{-3/n} \left(a+b \left(c x^n\right)^{\frac{1}{n}}\right)^{p+3}}{b^3 (p+3)}$$

```
[Out] (a^2*x^3*(a + b*(c*x^n)^n^(-1))^(1 + p))/(b^3*(1 + p)*(c*x^n)^(3/
n)) - (2*a*x^3*(a + b*(c*x^n)^n^(-1))^(2 + p))/(b^3*(2 + p)*(c*x^
n)^(3/n)) + (x^3*(a + b*(c*x^n)^n^(-1))^(3 + p))/(b^3*(3 + p)*(c*
x^n)^(3/n))
```

Rubi [A] time = 0.104915, antiderivative size = 126, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$\frac{a^2 x^3 \left(c x^n\right)^{-3/n} \left(a+b \left(c x^n\right)^{\frac{1}{n}}\right)^{p+1}}{b^3 (p+1)}-\frac{2 a x^3 \left(c x^n\right)^{-3/n} \left(a+b \left(c x^n\right)^{\frac{1}{n}}\right)^{p+2}}{b^3 (p+2)}+\frac{x^3 \left(c x^n\right)^{-3/n} \left(a+b \left(c x^n\right)^{\frac{1}{n}}\right)^{p+3}}{b^3 (p+3)}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2*(a + b*(c*x^n)^n^(-1))^p,x]
```

```
[Out] (a^2*x^3*(a + b*(c*x^n)^n^(-1))^(1 + p))/(b^3*(1 + p)*(c*x^n)^(3/
n)) - (2*a*x^3*(a + b*(c*x^n)^n^(-1))^(2 + p))/(b^3*(2 + p)*(c*x^
n)^(3/n)) + (x^3*(a + b*(c*x^n)^n^(-1))^(3 + p))/(b^3*(3 + p)*(c*
x^n)^(3/n))
```

Rubi in Sympy [A] time = 18.5395, size = 107, normalized size = 0.85

$$\frac{a^2 x^3 \left(c x^n\right)^{-\frac{3}{n}} \left(a+b \left(c x^n\right)^{\frac{1}{n}}\right)^{p+1}}{b^3 \left(p+1\right)}-\frac{2 a x^3 \left(c x^n\right)^{-\frac{3}{n}} \left(a+b \left(c x^n\right)^{\frac{1}{n}}\right)^{p+2}}{b^3 \left(p+2\right)}+\frac{x^3 \left(c x^n\right)^{-\frac{3}{n}} \left(a+b \left(c x^n\right)^{\frac{1}{n}}\right)^{p+3}}{b^3 \left(p+3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(a+b*(c*x**n)**(1/n))**p,x)
```

```
[Out] a**2*x**3*(c*x**n)**(-3/n)*(a + b*(c*x**n)**(1/n))**(p + 1)/(b**3
*(p + 1)) - 2*a*x**3*(c*x**n)**(-3/n)*(a + b*(c*x**n)**(1/n))**(p
 + 2)/(b**3*(p + 2)) + x**3*(c*x**n)**(-3/n)*(a + b*(c*x**n)**(1/
n))**(p + 3)/(b**3*(p + 3))
```

Mathematica [A] time = 0.355206, size = 207, normalized size = 1.64

$$\frac{x^3 \left(c x^n\right)^{-3/n} \left(a+b \left(c x^n\right)^{\frac{1}{n}}\right)^p \left(\frac{b\left(c x^n\right)^{\frac{1}{n}}}{a}+1\right)^{-p} \left(2 a^3 \left(\left(\frac{b\left(c x^n\right)^{\frac{1}{n}}}{a}+1\right)^p-1\right)-2 a^2 b p \left(c x^n\right)^{\frac{1}{n}} \left(\frac{b\left(c x^n\right)^{\frac{1}{n}}}{a}+1\right)^p+b^3 \left(p^2+3 p+2\right)\right.}{b^3 (p+1)(p+2)(p+3)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2*(a + b*(c*x^n)^n^(-1))^p,x]
```

```
[Out] (x^3*(a + b*(c*x^n)^n^(-1))^p*(-2*a^2*b*p*(c*x^n)^n^(-1)*(1 + (b*
(c*x^n)^n^(-1))/a)^p + a*b^2*p*(1 + p)*(c*x^n)^(2/n)*(1 + (b*(c*x
^n)^n^(-1))/a)^p + b^3*(2 + 3*p + p^2)*(c*x^n)^(3/n)*(1 + (b*(c*x
```

```
^n)^n^(-1))/a)^p + 2*a^3*(-1 + (1 + (b*(c*x^n)^n^(-1))/a)^p)))/(b
^3*(1 + p)*(2 + p)*(3 + p)*(c*x^n)^(3/n)*(1 + (b*(c*x^n)^n^(-1))/
a)^p)
```

Maple [C] time = 140.953, size = 2258, normalized size = 17.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*(c*x^n)^(1/n))^p,x)
```

```
[Out] 1/(1+p)*x^3*(b*exp(1/2*(-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)
+I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-
I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(x))/n)*x+a)^p+1/(c^
(1/n))/b/(1+p)*a*(b*exp(1/2*(-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c
*x^n)+I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*csgn(I*c)*csgn(I*c*x^
n)^2-I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(x))/n)*x+a)^p*
x^2*exp(-1/2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*c
sgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(I
*c*x^n)^2-2*n*ln(x)+2*ln(x^n))/n)-2/(1+p)^2*(b*exp(1/2*(-I*Pi*csg
n(I*x^n)*csgn(I*c)*csgn(I*c*x^n)+I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2
+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln
(x^n)-2*n*ln(x))/n)*x+a)^(1+p)/b*exp(-1/2*(-I*Pi*csgn(I*x^n)*csgn
(I*c)*csgn(I*c*x^n)+I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*csgn(I*
c)*csgn(I*c*x^n)^2-I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(
x))/n)*x^2+4/(1+p)^2/b/(c^(1/n))/(3+p)*x^2*(b*exp(1/2*(-I*Pi*csgn
(I*x^n)*csgn(I*c)*csgn(I*c*x^n)+I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+
I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(
x^n)-2*n*ln(x))/n)*x+a)^(1+p)*exp(-1/2*(I*Pi*csgn(I*x^n)*csgn(I*c
*x^n)^2-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^
n)^3+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-2*n*ln(x)+2*ln(x^n))/n)+4/(1+
p)^2/b^2/(c^(1/n))^2*a/(2+p)/(3+p)*x*(b*exp(1/2*(-I*Pi*csgn(I*x^n
)*csgn(I*c)*csgn(I*c*x^n)+I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*c
sgn(I*c)*csgn(I*c*x^n)^2-I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n)-2
*n*ln(x))/n)*x+a)^(1+p)*exp(-(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*
Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*
csgn(I*c)*csgn(I*c*x^n)^2-2*n*ln(x)+2*ln(x^n))/n)+4/(1+p)^2/b^2/(
c^(1/n))^2*a/(2+p)/(3+p)*x*(b*exp(1/2*(-I*Pi*csgn(I*x^n)*csgn(I*c
)*csgn(I*c*x^n)+I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*csgn(I*c)*c
sgn(I*c*x^n)^2-I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(x))/
n)*x+a)^(1+p)*p*exp(-(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(
I*x^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c
)*csgn(I*c*x^n)^2-2*n*ln(x)+2*ln(x^n))/n)-4/(1+p)^2/b^3/(2+p)/(c^
(1/n))^3*a^2/(3+p)*(b*exp(1/2*(-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I
*c*x^n)+I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*csgn(I*c)*csgn(I*c*
x^n)^2-I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(x))/n)*x+a)^
(1+p)*exp(-3/2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)
*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn
(I*c*x^n)^2-2*n*ln(x)+2*ln(x^n))/n)-2/(c^(1/n))/b/(1+p)^2*a*x^3/(
(x^n)^(1/n))*(b*c^(1/n)*(x^n)^(1/n)*exp(1/2*I*Pi*csgn(I*c*x^n)*(c
sgn(I*c*x^n)-csgn(I*c))*(-csgn(I*c*x^n)+csgn(I*x^n))/n)+a)^p*exp(
-1/2*I*Pi*csgn(I*c*x^n)*(csgn(I*c*x^n)-csgn(I*c))*(-csgn(I*c*x^n)
+csgn(I*x^n))/n)-2/(c^(1/n))^2/b^2/(1+p)^2*a^2*x^3/((x^n)^(1/n))^
2*(b*c^(1/n)*(x^n)^(1/n)*exp(1/2*I*Pi*csgn(I*c*x^n)*(csgn(I*c*x^n
)-csgn(I*c))*(-csgn(I*c*x^n)+csgn(I*x^n))/n)+a)^p*exp(-I*Pi*csgn(
I*c*x^n)*(csgn(I*c*x^n)-csgn(I*c))*(-csgn(I*c*x^n)+csgn(I*x^n))/n
)+2/(c^(1/n))/b/(1+p)^2*a*x^3/((x^n)^(1/n))/(2+p)*(b*c^(1/n)*(x^n
)^(1/n)*exp(1/2*I*Pi*csgn(I*c*x^n)*(csgn(I*c*x^n)-csgn(I*c))*(-cs
gn(I*c*x^n)+csgn(I*x^n))/n)+a)^p*exp(-1/2*I*Pi*csgn(I*c*x^n)*(csg
n(I*c*x^n)-csgn(I*c))*(-csgn(I*c*x^n)+csgn(I*x^n))/n)+4/(c^(1/n))
^2/b^2/(1+p)^2*a^2*x^3/((x^n)^(1/n))^2/(2+p)*(b*c^(1/n)*(x^n)^(1/
n)*exp(1/2*I*Pi*csgn(I*c*x^n)*(csgn(I*c*x^n)-csgn(I*c))*(-csgn(I*
c*x^n)+csgn(I*x^n))/n)+a)^p*exp(-I*Pi*csgn(I*c*x^n)*(csgn(I*c*x^n
)-csgn(I*c))*(-csgn(I*c*x^n)+csgn(I*x^n))/n)+2/(c^(1/n))^3/b^3/(1
+p)^2*a^3*x^3/((x^n)^(1/n))^3/(2+p)*(b*c^(1/n)*(x^n)^(1/n)*exp(1/
2*I*Pi*csgn(I*c*x^n)*(csgn(I*c*x^n)-csgn(I*c))*(-csgn(I*c*x^n)+cs
gn(I*x^n))/n)+a)^p*exp(-3/2*I*Pi*csgn(I*c*x^n)*(csgn(I*c*x^n)-csg
n(I*c))*(-csgn(I*c*x^n)+csgn(I*x^n))/n)
```

Maxima [A] time = 7.56487, size = 134, normalized size = 1.06

$$\frac{\left(\left(p^2+3\,p+2\right)b^3c^{\frac{3}{n}}x^3+\left(p^2+p\right)ab^2c^{\frac{2}{n}}x^2-2\,a^2bc^{\left(\frac{1}{n}\right)}px+2\,a^3\right)\left(bc^{\left(\frac{1}{n}\right)}x+a\right)^pc^{-\frac{3}{n}}}{(p^3+6\,p^2+11\,p+6)b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^p*x^2,x, algorithm="maxima")
```

```
[Out] ((p^2 + 3*p + 2)*b^3*c^(3/n)*x^3 + (p^2 + p)*a*b^2*c^(2/n)*x^2 -
2*a^2*b*c^(1/n)*p*x + 2*a^3)*(b*c^(1/n)*x + a)^p*c^(-3/n)/((p^3 +
 6*p^2 + 11*p + 6)*b^3)
```

Fricas [A] time = 0.239885, size = 174, normalized size = 1.38

$$-\frac{\left(2\,a^2bc^{\left(\frac{1}{n}\right)}px-\left(b^3p^2+3\,b^3p+2\,b^3\right)c^{\frac{3}{n}}x^3-\left(ab^2p^2+ab^2p\right)c^{\frac{2}{n}}x^2-2\,a^3\right)\left(bc^{\left(\frac{1}{n}\right)}x+a\right)^p}{(b^3p^3+6\,b^3p^2+11\,b^3p+6\,b^3)c^{\frac{3}{n}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^p*x^2,x, algorithm="fricas")
```

```
[Out] -(2*a^2*b*c^(1/n)*p*x - (b^3*p^2 + 3*b^3*p + 2*b^3)*c^(3/n)*x^3 -
 (a*b^2*p^2 + a*b^2*p)*c^(2/n)*x^2 - 2*a^3)*(b*c^(1/n)*x + a)^p/(
(b^3*p^3 + 6*b^3*p^2 + 11*b^3*p + 6*b^3)*c^(3/n))
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^2\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^p\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(a+b*(c*x**n)**(1/n))**p,x)
```

```
[Out] Integral(x**2*(a + b*(c*x**n)**(1/n))**p, x)
```

GIAC/XCAS [A] time = 23.5303, size = 381, normalized size = 3.02

$$\frac{b^3p^2x^3e^{\left(p\ln\left(bxe^{\left(\frac{\ln(c)}{n}\right)}+a\right)+\frac{3\ln(c)}{n}\right)}+3\,b^3px^3e^{\left(p\ln\left(bxe^{\left(\frac{\ln(c)}{n}\right)}+a\right)+\frac{3\ln(c)}{n}\right)}+ab^2p^2x^2e^{\left(p\ln\left(bxe^{\left(\frac{\ln(c)}{n}\right)}+a\right)+\frac{2\ln(c)}{n}\right)}+2\,b^3x^3e^{\left(p\ln\left(bxe^{\left(\frac{\ln(c)}{n}\right)}+a\right)}}{b^3p^3e^{\left(\frac{3\ln(c)}{n}\right)}+6\,b^3p^2e^{\left(\frac{3\ln(c)}{n}\right)}+11\,b^3pe^{\left(\frac{3\ln(c}{n}\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^p*x^2,x, algorithm="giac")
```

```
[Out] (b^3*p^2*x^3*e^(p*ln(b*x*e^(ln(c)/n) + a) + 3*ln(c)/n) + 3*b^3*p*
x^3*e^(p*ln(b*x*e^(ln(c)/n) + a) + 3*ln(c)/n) + a*b^2*p^2*x^2*e^(
p*ln(b*x*e^(ln(c)/n) + a) + 2*ln(c)/n) + 2*b^3*x^3*e^(p*ln(b*x*e^
(ln(c)/n) + a) + 3*ln(c)/n) + a*b^2*p*x^2*e^(p*ln(b*x*e^(ln(c)/n)
 + a) + 2*ln(c)/n) - 2*a^2*b*p*x*e^(p*ln(b*x*e^(ln(c)/n) + a) + l
n(c)/n) + 2*a^3*e^(p*ln(b*x*e^(ln(c)/n) + a)))/(b^3*p^3*e^(3*ln(c
)/n) + 6*b^3*p^2*e^(3*ln(c)/n) + 11*b^3*p*e^(3*ln(c)/n) + 6*b^3*e
^(3*ln(c)/n))
```

3.3017 $\int x\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^p\,dx$

Optimal. Leaf size=83

$$\frac{x^2\left(cx^n\right)^{-2/n}\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^{p+2}}{b^2(p+2)}-\frac{ax^2\left(cx^n\right)^{-2/n}\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^{p+1}}{b^2(p+1)}$$

```
[Out] -((a*x^2*(a + b*(c*x^n)^n^(-1))^(1 + p))/(b^2*(1 + p)*(c*x^n)^(2/
n))) + (x^2*(a + b*(c*x^n)^n^(-1))^(2 + p))/(b^2*(2 + p)*(c*x^n)^
(2/n))
```

Rubi [A] time = 0.0694753, antiderivative size = 83, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{x^2\left(cx^n\right)^{-2/n}\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^{p+2}}{b^2(p+2)}-\frac{ax^2\left(cx^n\right)^{-2/n}\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^{p+1}}{b^2(p+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[x*(a + b*(c*x^n)^n^(-1))^p,x]
```

```
[Out] -((a*x^2*(a + b*(c*x^n)^n^(-1))^(1 + p))/(b^2*(1 + p)*(c*x^n)^(2/
n))) + (x^2*(a + b*(c*x^n)^n^(-1))^(2 + p))/(b^2*(2 + p)*(c*x^n)^
(2/n))
```

Rubi in Sympy [A] time = 11.3773, size = 68, normalized size = 0.82

$$-\frac{ax^2\left(cx^n\right)^{-\frac{2}{n}}\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^{p+1}}{b^2\left(p+1\right)}+\frac{x^2\left(cx^n\right)^{-\frac{2}{n}}\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^{p+2}}{b^2\left(p+2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(a+b*(c*x**n)**(1/n))**p,x)
```

```
[Out] -a*x**2*(c*x**n)**(-2/n)*(a + b*(c*x**n)**(1/n))**(p + 1)/(b**2*(
p + 1)) + x**2*(c*x**n)**(-2/n)*(a + b*(c*x**n)**(1/n))**(p + 2)/
(b**2*(p + 2))
```

Mathematica [A] time = 0.211161, size = 156, normalized size = 1.88

$$\frac{x^2\left(cx^n\right)^{-2/n}\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^p\left(\frac{b\left(cx^n\right)^{\frac{1}{n}}}{a}+1\right)^{-p}\left(-a^2\left(\left(\frac{b\left(cx^n\right)^{\frac{1}{n}}}{a}+1\right)^p-1\right)+b^2(p+1)\left(cx^n\right)^{2/n}\left(\frac{b\left(cx^n\right)^{\frac{1}{n}}}{a}+1\right)^p+abp\left(cx^n\right)^{\frac{1}{n}}}{b^2(p+1)(p+2)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[x*(a + b*(c*x^n)^n^(-1))^p,x]
```

```
[Out] (x^2*(a + b*(c*x^n)^n^(-1))^p*(a*b*p*(c*x^n)^n^(-1)*(1 + (b*(c*x^
n)^n^(-1))/a)^p + b^2*(1 + p)*(c*x^n)^(2/n)*(1 + (b*(c*x^n)^n^(-1
))/a)^p - a^2*(-1 + (1 + (b*(c*x^n)^n^(-1))/a)^p)))/(b^2*(1 + p)*
(2 + p)*(c*x^n)^(2/n)*(1 + (b*(c*x^n)^n^(-1))/a)^p)
```

Maple [C] time = 0.244, size = 1007, normalized size = 12.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(a+b*(c*x^n)^(1/n))^p,x)
```

```
[Out] 1/(1+p)*x^2*(b*exp(1/2*(-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)
+I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-
I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(x))/n)*x+a)^p+1/(c^
(1/n))/b/(1+p)*a*(b*exp(1/2*(-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c
*x^n)+I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*csgn(I*c)*csgn(I*c*x^
n)^2-I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(x))/n)*x+a)^p*
x*exp(-1/2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*csg
n(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(I*c
*x^n)^2-2*n*ln(x)+2*ln(x^n))/n)-1/(1+p)^2*(b*exp(1/2*(-I*Pi*csgn(
I*x^n)*csgn(I*c)*csgn(I*c*x^n)+I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I
*Pi*csgn(I*c)*csgn(I*c*x^n)^2-I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x
^n)-2*n*ln(x))/n)*x+a)^(1+p)/b*exp(-1/2*(-I*Pi*csgn(I*x^n)*csgn(I
*c)*csgn(I*c*x^n)+I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*csgn(I*c)
*csgn(I*c*x^n)^2-I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(x)
)/n)*x+1/(1+p)^2/b^2*exp(-(-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x
^n)+I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*csgn(I*c)*csgn(I*c*x^n)
^2-I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(x))/n)*(b*exp(1/
2*(-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)+I*Pi*csgn(I*x^n)*csg
n(I*c*x^n)^2+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-I*Pi*csgn(I*c*x^n)^3+
2*ln(c)+2*ln(x^n)-2*n*ln(x))/n)*x+a)^(2+p)/(2+p)-1/(c^(1/n))/b^2/
(1+p)^2*a*(b*exp(1/2*(-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)+I
*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-I*
Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(x))/n)*x+a)^(1+p)*exp
(-(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*csgn(I*c)*cs
gn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-2
*n*ln(x)+ln(c)+2*ln(x^n))/n)
```

Maxima [A] time = 1.82564, size = 89, normalized size = 1.07

$$\frac{\left(b^2c^{\frac{2}{n}}(p+1)x^2+abc^{\left(\frac{1}{n}\right)}px-a^2\right)\left(bc^{\left(\frac{1}{n}\right)}x+a\right)^pc^{-\frac{2}{n}}}{(p^2+3p+2)b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^p*x,x, algorithm="maxima")
```

```
[Out] (b^2*c^(2/n)*(p + 1)*x^2 + a*b*c^(1/n)*p*x - a^2)*(b*c^(1/n)*x +
a)^p*c^(-2/n)/((p^2 + 3*p + 2)*b^2)
```

Fricas [A] time = 0.241639, size = 107, normalized size = 1.29

$$\frac{\left(abc^{\left(\frac{1}{n}\right)}px+\left(b^2p+b^2\right)c^{\frac{2}{n}}x^2-a^2\right)\left(bc^{\left(\frac{1}{n}\right)}x+a\right)^p}{(b^2p^2+3\,b^2p+2\,b^2)c^{\frac{2}{n}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^p*x,x, algorithm="fricas")
```

```
[Out] (a*b*c^(1/n)*p*x + (b^2*p + b^2)*c^(2/n)*x^2 - a^2)*(b*c^(1/n)*x
+ a)^p/((b^2*p^2 + 3*b^2*p + 2*b^2)*c^(2/n))
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x\left(a+b\left(cx^{n}\right)^{\frac{1}{n}}\right)^{p}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(a+b*(c*x**n)**(1/n))**p,x)
```

```
[Out] Integral(x*(a + b*(c*x**n)**(1/n))**p, x)
```

GIAC/XCAS [A] time = 23.3805, size = 215, normalized size = 2.59

$$\frac{b^{2}px^{2}e^{\left(p\ln\left(bxe^{\left(\frac{\ln(c)}{n}\right)}+a\right)+\frac{2\ln(c)}{n}\right)}+b^{2}x^{2}e^{\left(p\ln\left(bxe^{\left(\frac{\ln(c)}{n}\right)}+a\right)+\frac{2\ln(c)}{n}\right)}+abpxe^{\left(p\ln\left(bxe^{\left(\frac{\ln(c)}{n}\right)}+a\right)+\frac{\ln(c)}{n}\right)}-a^{2}e^{\left(p\ln\left(bxe^{\left(\frac{\ln(c)}{n}\right)}+a\right)\right)}}{b^{2}p^{2}e^{\left(\frac{2\ln(c)}{n}\right)}+3\,b^{2}pe^{\left(\frac{2\ln(c)}{n}\right)}+2\,b^{2}e^{\left(\frac{2\ln(c)}{n}\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^p*x,x, algorithm="giac")
```

```
[Out] (b^2*p*x^2*e^(p*ln(b*x*e^(ln(c)/n) + a) + 2*ln(c)/n) + b^2*x^2*e^
(p*ln(b*x*e^(ln(c)/n) + a) + 2*ln(c)/n) + a*b*p*x*e^(p*ln(b*x*e^(
ln(c)/n) + a) + ln(c)/n) - a^2*e^(p*ln(b*x*e^(ln(c)/n) + a)))/(b^
2*p^2*e^(2*ln(c)/n) + 3*b^2*p*e^(2*ln(c)/n) + 2*b^2*e^(2*ln(c)/n)
)
```

3.3018 $\int \left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^p\,dx$

Optimal. Leaf size=38

$$\frac{x\left(cx^n\right)^{-1/n}\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^{p+1}}{b(p+1)}$$

```
[Out] (x*(a + b*(c*x^n)^n^(-1))^(1 + p))/(b*(1 + p)*(c*x^n)^n^(-1))
```

Rubi [A] time = 0.0278667, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{x\left(cx^n\right)^{-1/n}\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^{p+1}}{b(p+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(c*x^n)^n^(-1))^p,x]

[Out] (x*(a + b*(c*x^n)^n^(-1))^(1 + p))/(b*(1 + p)*(c*x^n)^n^(-1))
```

Rubi in Sympy [A] time = 3.14208, size = 29, normalized size = 0.76

$$\frac{x\left(cx^n\right)^{-\frac{1}{n}}\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^{p+1}}{b\left(p+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x**n)**(1/n))**p,x)

[Out] x*(c*x**n)**(-1/n)*(a + b*(c*x**n)**(1/n))**(p + 1)/(b*(p + 1))
```

Mathematica [A] time = 0.192924, size = 64, normalized size = 1.68

$$\frac{x\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^p\left(\frac{a(cx^n)^{-1/n}\left(1-\left(\frac{b(cx^n)^{\frac{1}{n}}}{a}+1\right)^{-p}\right)}{b}+1\right)}{p+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(c*x^n)^n^(-1))^p,x]

[Out] (x*(a + b*(c*x^n)^n^(-1))^p*(1 + (a*(1 - (1 + (b*(c*x^n)^n^(-1))/
a)^(-p)))/(b*(c*x^n)^n^(-1))))/(1 + p)
```

Maple [C] time = 0.192, size = 336, normalized size = 8.8

$$\frac{x}{1+p}\left(be^{\frac{-i\pi\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(ic)\mathrm{csgn}(icx^n)+i\pi\,\mathrm{csgn}(ix^n)\,(\mathrm{csgn}(icx^n))^2+i\pi\,\mathrm{csgn}(ic)(\mathrm{csgn}(icx^n))^2-i\pi\,(\mathrm{csgn}(icx^n))^3+2\ln(c)+2\ln(x^n)-2n\ln(x)}{2n}}x+a\right)^p$$
$$+\frac{a}{\sqrt[n]{c}b\,(1+p)}\left(be^{\frac{-i\pi\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(ic)\mathrm{csgn}(icx^n)+i\pi\,\mathrm{csgn}(ix^n)\,(\mathrm{csgn}(icx^n))^2+i\pi\,\mathrm{csgn}(ic)(\mathrm{csgn}(icx^n))^2-i\pi\,(\mathrm{csgn}(icx^n))^3+2\ln(c)+2\ln(x^n)-2n\ln(x)}{2n}}x+a\right)^p e^{-\frac{i\pi\,\mathrm{csgn}(ix}{}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^n)^(1/n))^p,x)
```

```
[Out] 1/(1+p)*x*(b*exp(1/2*(-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)+I
*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-I*
Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(x))/n)*x+a)^p+1/(c^(1
/n))/b/(1+p)*a*(b*exp(1/2*(-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x
^n)+I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*csgn(I*c)*csgn(I*c*x^n)
^2-I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(x))/n)*x+a)^p*ex
p(-1/2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*csgn(I*
c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(I*c*x^n
)^2-2*n*ln(x)+2*ln(x^n))/n)
```

Maxima [A] time = 1.84947, size = 51, normalized size = 1.34

$$\frac{\left(bc^{\left(\frac{1}{n}\right)}x+a\right)\left(bc^{\left(\frac{1}{n}\right)}x+a\right)^{p}c^{-\frac{1}{n}}}{b(p+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^p,x, algorithm="maxima")
```

```
[Out] (b*c^(1/n)*x + a)*(b*c^(1/n)*x + a)^p*c^(-1/n)/(b*(p + 1))
```

Fricas [A] time = 0.263128, size = 50, normalized size = 1.32

$$\frac{\left(bc^{\left(\frac{1}{n}\right)}x+a\right)\left(bc^{\left(\frac{1}{n}\right)}x+a\right)^{p}}{(bp+b)c^{\left(\frac{1}{n}\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^p,x, algorithm="fricas")
```

```
[Out] (b*c^(1/n)*x + a)*(b*c^(1/n)*x + a)^p/((b*p + b)*c^(1/n))
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\left(a+b\left(cx^{n}\right)^{\frac{1}{n}}\right)^{p}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**n)**(1/n))**p,x)
```

```
[Out] Integral((a + b*(c*x**n)**(1/n))**p, x)
```

GIAC/XCAS [A] time = 11.9381, size = 92, normalized size = 2.42

$$\frac{bxe^{\left(p\ln\left(bxe^{\left(\frac{\ln(c)}{n}\right)}+a\right)+\frac{\ln(c)}{n}\right)}+ae^{\left(p\ln\left(bxe^{\left(\frac{\ln(c)}{n}\right)}+a\right)\right)}}{bpe^{\left(\frac{\ln(c)}{n}\right)}+be^{\left(\frac{\ln(c)}{n}\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^p,x, algorithm="giac")
```

```
[Out] (b*x*e^(p*ln(b*x*e^(ln(c)/n) + a) + ln(c)/n) + a*e^(p*ln(b*x*e^(l
n(c)/n) + a)))/(b*p*e^(ln(c)/n) + b*e^(ln(c)/n))
```

3.3019 $\int \frac{\left(a+b(cx^n)^{\frac{1}{n}}\right)^p}{x}\,dx$

Optimal. Leaf size=51

$$-\frac{\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^{p+1} {}_2F_1\left(1,p+1;p+2;\frac{b(cx^n)^{\frac{1}{n}}}{a}+1\right)}{a(p+1)}$$

[Out] -(((a + b*(c*x^n)^n^(-1))^(1 + p)*Hypergeometric2F1[1, 1 + p, 2 + p, 1 + (b*(c*x^n)^n^(-1))/a])/(a*(1 + p)))

Rubi [A] time = 0.0440034, antiderivative size = 51, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$-\frac{\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^{p+1} {}_2F_1\left(1,p+1;p+2;\frac{b(cx^n)^{\frac{1}{n}}}{a}+1\right)}{a(p+1)}$$

Antiderivative was successfully verified.

[In] Int[(a + b*(c*x^n)^n^(-1))^p/x,x]

[Out] -(((a + b*(c*x^n)^n^(-1))^(1 + p)*Hypergeometric2F1[1, 1 + p, 2 + p, 1 + (b*(c*x^n)^n^(-1))/a])/(a*(1 + p)))

Rubi in Sympy [A] time = 5.53312, size = 39, normalized size = 0.76

$$-\frac{\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^{p+1} {}_2F_1\left(\begin{matrix}1,p+1\\p+2\end{matrix}\middle|1+\frac{b(cx^n)^{\frac{1}{n}}}{a}\right)}{a\left(p+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((a+b*(c*x**n)**(1/n))**p/x,x)

[Out] -(a + b*(c*x**n)**(1/n))**(p + 1)*hyper((1, p + 1), (p + 2,), 1 + b*(c*x**n)**(1/n)/a)/(a*(p + 1))

Mathematica [A] time = 0.117152, size = 70, normalized size = 1.37

$$\frac{\left(\frac{a(cx^n)^{-1/n}}{b}+1\right)^{-p}\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^p {}_2F_1\left(-p,-p;1-p;-\frac{a(cx^n)^{-1/n}}{b}\right)}{p}$$

Antiderivative was successfully verified.

[In] Integrate[(a + b*(c*x^n)^n^(-1))^p/x,x]

[Out] ((a + b*(c*x^n)^n^(-1))^p*Hypergeometric2F1[-p, -p, 1 - p, -(a/(b*(c*x^n)^n^(-1)))])/(p*(1 + a/(b*(c*x^n)^n^(-1)))^p)

Maple [F] time = 0.429, size = 0, normalized size = 0.

$$\int \frac{\left(a+b\sqrt[n]{cx^n}\right)^p}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^n)^(1/n))^p/x,x)
```

```
[Out] int((a+b*(c*x^n)^(1/n))^p/x,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left((cx^n)^{\left(\frac{1}{n}\right)} b + a\right)^p}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^p/x,x, algorithm="maxima")
```

```
[Out] integrate(((c*x^n)^(1/n)*b + a)^p/x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left((cx^n)^{\left(\frac{1}{n}\right)} b + a\right)^p}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^p/x,x, algorithm="fricas")
```

```
[Out] integral(((c*x^n)^(1/n)*b + a)^p/x, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(a + b\,(cx^n)^{\frac{1}{n}}\right)^p}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**n)**(1/n))**p/x,x)
```

```
[Out] Integral((a + b*(c*x**n)**(1/n))**p/x, x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left((cx^n)^{\left(\frac{1}{n}\right)} b + a\right)^p}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^p/x,x, algorithm="giac")
```

```
[Out] integrate(((c*x^n)^(1/n)*b + a)^p/x, x)
```

3.3020 $\int \frac{\left(a+b(cx^n)^{\frac{1}{n}}\right)^p}{x^2}\,dx$

Optimal. Leaf size=63

$$\frac{b\,(cx^n)^{\frac{1}{n}}\left(a+b\,(cx^n)^{\frac{1}{n}}\right)^{p+1}\,{}_2F_1\left(2,p+1;p+2;\frac{b(cx^n)^{\frac{1}{n}}}{a}+1\right)}{a^2(p+1)x}$$

```
[Out] (b*(c*x^n)^n^(-1)*(a + b*(c*x^n)^n^(-1))^(1 + p)*Hypergeometric2F
1[2, 1 + p, 2 + p, 1 + (b*(c*x^n)^n^(-1))/a])/(a^2*(1 + p)*x)
```

Rubi [A] time = 0.0564332, antiderivative size = 63, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105

$$\frac{b\,(cx^n)^{\frac{1}{n}}\left(a+b\,(cx^n)^{\frac{1}{n}}\right)^{p+1}\,{}_2F_1\left(2,p+1;p+2;\frac{b(cx^n)^{\frac{1}{n}}}{a}+1\right)}{a^2(p+1)x}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(c*x^n)^n^(-1))^p/x^2,x]
```

```
[Out] (b*(c*x^n)^n^(-1)*(a + b*(c*x^n)^n^(-1))^(1 + p)*Hypergeometric2F
1[2, 1 + p, 2 + p, 1 + (b*(c*x^n)^n^(-1))/a])/(a^2*(1 + p)*x)
```

Rubi in Sympy [A] time = 6.91521, size = 51, normalized size = 0.81

$$\frac{b\,(cx^n)^{\frac{1}{n}}\left(a+b\,(cx^n)^{\frac{1}{n}}\right)^{p+1}\,{}_2F_1\left(\begin{matrix}2,p+1\\p+2\end{matrix}\middle|1+\frac{b(cx^n)^{\frac{1}{n}}}{a}\right)}{a^2x\,(p+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x**n)**(1/n))**p/x**2,x)
```

```
[Out] b*(c*x**n)**(1/n)*(a + b*(c*x**n)**(1/n))**(p + 1)*hyper((2, p +
1), (p + 2,), 1 + b*(c*x**n)**(1/n)/a)/(a**2*x*(p + 1))
```

Mathematica [A] time = 0.111656, size = 77, normalized size = 1.22

$$\frac{\left(\frac{a(cx^n)^{-1/n}}{b}+1\right)^{-p}\left(a+b\,(cx^n)^{\frac{1}{n}}\right)^p\,{}_2F_1\left(1-p,-p;2-p;-\frac{a(cx^n)^{-1/n}}{b}\right)}{(p-1)x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(c*x^n)^n^(-1))^p/x^2,x]
```

```
[Out] ((a + b*(c*x^n)^n^(-1))^p*Hypergeometric2F1[1 - p, -p, 2 - p, -(a
/(b*(c*x^n)^n^(-1)))])/((-1 + p)*x*(1 + a/(b*(c*x^n)^n^(-1)))^p)
```

Maple [F] time = 0.334, size = 0, normalized size = 0.

$$\int \frac{\left(a+b\sqrt[n]{cx^n}\right)^p}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^n)^(1/n))^p/x^2,x)
```

```
[Out] int((a+b*(c*x^n)^(1/n))^p/x^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left((cx^n)^{\left(\frac{1}{n}\right)}\,b + a\right)^p}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^p/x^2,x, algorithm="maxima")
```

```
[Out] integrate(((c*x^n)^(1/n)*b + a)^p/x^2, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left((cx^n)^{\left(\frac{1}{n}\right)}\,b + a\right)^p}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^p/x^2,x, algorithm="fricas")
```

```
[Out] integral(((c*x^n)^(1/n)*b + a)^p/x^2, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(a + b\,(cx^n)^{\frac{1}{n}}\right)^p}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**n)**(1/n))**p/x**2,x)
```

```
[Out] Integral((a + b*(c*x**n)**(1/n))**p/x**2, x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left((cx^n)^{\left(\frac{1}{n}\right)}\,b + a\right)^p}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^p/x^2,x, algorithm="giac")
```

```
[Out] integrate(((c*x^n)^(1/n)*b + a)^p/x^2, x)
```

3.3021 $\int \left(a+b\left(cx^n\right)^{2/n}\right)^3 dx$

Optimal. Leaf size=62

$$a^3x+a^2bx\left(cx^n\right)^{2/n}+\frac{3}{5}ab^2x\left(cx^n\right)^{4/n}+\frac{1}{7}b^3x\left(cx^n\right)^{6/n}$$

```
[Out] a^3*x + a^2*b*x*(c*x^n)^(2/n) + (3*a*b^2*x*(c*x^n)^(4/n))/5 + (b^
3*x*(c*x^n)^(6/n))/7
```

Rubi [A] time = 0.0507829, antiderivative size = 62, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$a^3x+a^2bx\left(cx^n\right)^{2/n}+\frac{3}{5}ab^2x\left(cx^n\right)^{4/n}+\frac{1}{7}b^3x\left(cx^n\right)^{6/n}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(c*x^n)^(2/n))^3,x]
```

```
[Out] a^3*x + a^2*b*x*(c*x^n)^(2/n) + (3*a*b^2*x*(c*x^n)^(4/n))/5 + (b^
3*x*(c*x^n)^(6/n))/7
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$a^2bx\left(cx^n\right)^{\frac{2}{n}}+\frac{3ab^2x\left(cx^n\right)^{\frac{4}{n}}}{5}+\frac{b^3x\left(cx^n\right)^{\frac{6}{n}}}{7}+x\left(cx^n\right)^{-\frac{1}{n}}\int^{\left(cx^n\right)^{\frac{1}{n}}}a^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x**n)**(2/n))**3,x)
```

```
[Out] a**2*b*x*(c*x**n)**(2/n) + 3*a*b**2*x*(c*x**n)**(4/n)/5 + b**3*x*
(c*x**n)**(6/n)/7 + x*(c*x**n)**(-1/n)*Integral(a**3, (x, (c*x**n
)**(1/n)))
```

Mathematica [A] time = 0.213451, size = 62, normalized size = 1.

$$a^3x+a^2bx\left(cx^n\right)^{2/n}+\frac{3}{5}ab^2x\left(cx^n\right)^{4/n}+\frac{1}{7}b^3x\left(cx^n\right)^{6/n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(c*x^n)^(2/n))^3,x]
```

```
[Out] a^3*x + a^2*b*x*(c*x^n)^(2/n) + (3*a*b^2*x*(c*x^n)^(4/n))/5 + (b^
3*x*(c*x^n)^(6/n))/7
```

Maple [F] time = 0.042, size = 0, normalized size = 0.

$$\int \left(a+b\left(cx^n\right)^{2n^{-1}}\right)^3 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^n)^(2/n))^3,x)
```

```
[Out] int((a+b*(c*x^n)^(2/n))^3,x)
```

Maxima [A] time = 1.4868, size = 70, normalized size = 1.13

$$\frac{1}{7}b^3c^{\frac{6}{n}}x^7 + \frac{3}{5}ab^2c^{\frac{4}{n}}x^5 + a^2bc^{\frac{2}{n}}x^3 + a^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(2/n)*b + a)^3,x, algorithm="maxima")
```

```
[Out] 1/7*b^3*c^(6/n)*x^7 + 3/5*a*b^2*c^(4/n)*x^5 + a^2*b*c^(2/n)*x^3 +
 a^3*x
```

Fricas [A] time = 0.234977, size = 70, normalized size = 1.13

$$\frac{1}{7}b^3c^{\frac{6}{n}}x^7 + \frac{3}{5}ab^2c^{\frac{4}{n}}x^5 + a^2bc^{\frac{2}{n}}x^3 + a^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(2/n)*b + a)^3,x, algorithm="fricas")
```

```
[Out] 1/7*b^3*c^(6/n)*x^7 + 3/5*a*b^2*c^(4/n)*x^5 + a^2*b*c^(2/n)*x^3 +
 a^3*x
```

Sympy [A] time = 2.32689, size = 63, normalized size = 1.02

$$a^3x + a^2bc^{\frac{2}{n}}x\left(x^n\right)^{\frac{2}{n}} + \frac{3ab^2c^{\frac{4}{n}}x\left(x^n\right)^{\frac{4}{n}}}{5} + \frac{b^3c^{\frac{6}{n}}x\left(x^n\right)^{\frac{6}{n}}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**n)**(2/n))**3,x)
```

```
[Out] a**3*x + a**2*b*c**(2/n)*x*(x**n)**(2/n) + 3*a*b**2*c**(4/n)*x*(x
**n)**(4/n)/5 + b**3*c**(6/n)*x*(x**n)**(6/n)/7
```

GIAC/XCAS [A] time = 0.236137, size = 74, normalized size = 1.19

$$\frac{1}{7}b^3x^7e^{\left(\frac{6\ln(c)}{n}\right)} + \frac{3}{5}ab^2x^5e^{\left(\frac{4\ln(c)}{n}\right)} + a^2bx^3e^{\left(\frac{2\ln(c)}{n}\right)} + a^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(2/n)*b + a)^3,x, algorithm="giac")
```

```
[Out] 1/7*b^3*x^7*e^(6*ln(c)/n) + 3/5*a*b^2*x^5*e^(4*ln(c)/n) + a^2*b*x
^3*e^(2*ln(c)/n) + a^3*x
```

3.3022 $\int \left(a+b\left(cx^n\right)^{2/n}\right)^2 dx$

Optimal. Leaf size=43

$$a^2x+\frac{2}{3}abx\left(cx^n\right)^{2/n}+\frac{1}{5}b^2x\left(cx^n\right)^{4/n}$$

```
[Out] a^2*x + (2*a*b*x*(c*x^n)^(2/n))/3 + (b^2*x*(c*x^n)^(4/n))/5
```

Rubi [A] time = 0.0352567, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$a^2x+\frac{2}{3}abx\left(cx^n\right)^{2/n}+\frac{1}{5}b^2x\left(cx^n\right)^{4/n}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(c*x^n)^(2/n))^2,x]
```

```
[Out] a^2*x + (2*a*b*x*(c*x^n)^(2/n))/3 + (b^2*x*(c*x^n)^(4/n))/5
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{2abx\left(cx^n\right)^{\frac{2}{n}}}{3}+\frac{b^2x\left(cx^n\right)^{\frac{4}{n}}}{5}+x\left(cx^n\right)^{-\frac{1}{n}}\int^{\left(cx^n\right)^{\frac{1}{n}}}a^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x**n)**(2/n))**2,x)
```

```
[Out] 2*a*b*x*(c*x**n)**(2/n)/3 + b**2*x*(c*x**n)**(4/n)/5 + x*(c*x**n)
**(-1/n)*Integral(a**2, (x, (c*x**n)**(1/n)))
```

Mathematica [A] time = 0.12235, size = 43, normalized size = 1.

$$a^2x+\frac{2}{3}abx\left(cx^n\right)^{2/n}+\frac{1}{5}b^2x\left(cx^n\right)^{4/n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(c*x^n)^(2/n))^2,x]
```

```
[Out] a^2*x + (2*a*b*x*(c*x^n)^(2/n))/3 + (b^2*x*(c*x^n)^(4/n))/5
```

Maple [F] time = 0.04, size = 0, normalized size = 0.

$$\int \left(a+b\left(cx^n\right)^{2\,n^{-1}}\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^n)^(2/n))^2,x)
```

```
[Out] int((a+b*(c*x^n)^(2/n))^2,x)
```

Maxima [A] time = 1.4317, size = 47, normalized size = 1.09

$$\frac{1}{5}\,b^{2}c^{\frac{4}{n}}x^{5} + \frac{2}{3}\,abc^{\frac{2}{n}}x^{3} + a^{2}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(2/n)*b + a)^2,x, algorithm="maxima")
```

```
[Out] 1/5*b^2*c^(4/n)*x^5 + 2/3*a*b*c^(2/n)*x^3 + a^2*x
```

Fricas [A] time = 0.226743, size = 47, normalized size = 1.09

$$\frac{1}{5}\,b^{2}c^{\frac{4}{n}}x^{5} + \frac{2}{3}\,abc^{\frac{2}{n}}x^{3} + a^{2}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(2/n)*b + a)^2,x, algorithm="fricas")
```

```
[Out] 1/5*b^2*c^(4/n)*x^5 + 2/3*a*b*c^(2/n)*x^3 + a^2*x
```

Sympy [A] time = 1.24234, size = 42, normalized size = 0.98

$$a^{2}x + \frac{2abc^{\frac{2}{n}}x\left(x^{n}\right)^{\frac{2}{n}}}{3} + \frac{b^{2}c^{\frac{4}{n}}x\left(x^{n}\right)^{\frac{4}{n}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**n)**(2/n))**2,x)
```

```
[Out] a**2*x + 2*a*b*c**(2/n)*x*(x**n)**(2/n)/3 + b**2*c**(4/n)*x*(x**n
)**(4/n)/5
```

GIAC/XCAS [A] time = 0.224011, size = 50, normalized size = 1.16

$$\frac{1}{5}\,b^{2}x^{5}e^{\left(\frac{4\,\ln\left(c\right)}{n}\right)} + \frac{2}{3}\,abx^{3}e^{\left(\frac{2\,\ln\left(c\right)}{n}\right)} + a^{2}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(2/n)*b + a)^2,x, algorithm="giac")
```

```
[Out] 1/5*b^2*x^5*e^(4*ln(c)/n) + 2/3*a*b*x^3*e^(2*ln(c)/n) + a^2*x
```

3.3023 $\int \left(a+b\left(cx^n\right)^{2/n}\right)\,dx$

Optimal. Leaf size=21

$$ax+\frac{1}{3}bx\left(cx^n\right)^{2/n}$$

```
[Out] a*x + (b*x*(c*x^n)^(2/n))/3
```

Rubi [A] time = 0.0152194, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$ax+\frac{1}{3}bx\left(cx^n\right)^{2/n}$$

Antiderivative was successfully verified.

```
[In]  Int[a + b*(c*x^n)^(2/n),x]

[Out] a*x + (b*x*(c*x^n)^(2/n))/3
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{bx\left(cx^n\right)^{\frac{2}{n}}}{3}+\int a\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(a+b*(c*x**n)**(2/n),x)

[Out] b*x*(c*x**n)**(2/n)/3 + Integral(a, x)
```

Mathematica [A] time = 0.00339694, size = 21, normalized size = 1.

$$ax+\frac{1}{3}bx\left(cx^n\right)^{2/n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[a + b*(c*x^n)^(2/n),x]

[Out] a*x + (b*x*(c*x^n)^(2/n))/3
```

Maple [A] time = 0.029, size = 23, normalized size = 1.1

$$ax+\frac{bx}{3}\mathrm{e}^{2\,\frac{\ln\left(c\mathrm{e}^{n\ln(x)}\right)}{n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(a+b*(c*x^n)^(2/n),x)

[Out] a*x+1/3*x*b*exp(2/n*ln(c*exp(n*ln(x))))
```

Maxima [A] time = 1.41796, size = 23, normalized size = 1.1

$$\frac{1}{3}\,bc^{\frac{2}{n}}x^{3} + ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^n)^(2/n)*b + a,x, algorithm="maxima")
```

```
[Out] 1/3*b*c^(2/n)*x^3 + a*x
```

Fricas [A] time = 0.232092, size = 23, normalized size = 1.1

$$\frac{1}{3}\,bc^{\frac{2}{n}}x^{3} + ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^n)^(2/n)*b + a,x, algorithm="fricas")
```

```
[Out] 1/3*b*c^(2/n)*x^3 + a*x
```

Sympy [A] time = 0.607316, size = 19, normalized size = 0.9

$$ax + \frac{bc^{\frac{2}{n}}x\left(x^{n}\right)^{\frac{2}{n}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(a+b*(c*x**n)**(2/n),x)
```

```
[Out] a*x + b*c**(2/n)*x*(x**n)**(2/n)/3
```

GIAC/XCAS [A] time = 0.220826, size = 24, normalized size = 1.14

$$\frac{1}{3}\,bx^{3}e^{\left(\frac{2\ln(c)}{n}\right)} + ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^n)^(2/n)*b + a,x, algorithm="giac")
```

```
[Out] 1/3*b*x^3*e^(2*ln(c)/n) + a*x
```

3.3024 $\int \frac{1}{a+b(cx^n)^{2/n}}\,dx$

Optimal. Leaf size=44

$$\frac{x\,(cx^n)^{-1/n}\tan^{-1}\left(\frac{\sqrt{b}(cx^n)^{\frac{1}{n}}}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}}$$

```
[Out] (x*ArcTan[(Sqrt[b]*(c*x^n)^n^(-1))/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*(c*
x^n)^n^(-1))
```

Rubi [A] time = 0.0307916, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$\frac{x\,(cx^n)^{-1/n}\tan^{-1}\left(\frac{\sqrt{b}(cx^n)^{\frac{1}{n}}}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*(c*x^n)^(2/n))^(-1),x]
```

```
[Out] (x*ArcTan[(Sqrt[b]*(c*x^n)^n^(-1))/Sqrt[a]])/(Sqrt[a]*Sqrt[b]*(c*
x^n)^n^(-1))
```

Rubi in Sympy [A] time = 3.99883, size = 39, normalized size = 0.89

$$\frac{x\,(cx^n)^{-\frac{1}{n}}\operatorname{atan}\left(\frac{\sqrt{b}(cx^n)^{\frac{1}{n}}}{\sqrt{a}}\right)}{\sqrt{a}\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(a+b*(c*x**n)**(2/n)),x)
```

```
[Out] x*(c*x**n)**(-1/n)*atan(sqrt(b)*(c*x**n)**(1/n)/sqrt(a))/(sqrt(a)
*sqrt(b))
```

Mathematica [A] time = 4.6918, size = 0, normalized size = 0.

$$\int \frac{1}{a+b\,(cx^n)^{2/n}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*(c*x^n)^(2/n))^(-1),x]
```

```
[Out] Integrate[(a + b*(c*x^n)^(2/n))^(-1), x]
```

Maple [F] time = 0.185, size = 0, normalized size = 0.

$$\int \left(a+b\,(cx^n)^{2\,n^{-1}}\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*(c*x^n)^(2/n)),x)
```

```
[Out] int(1/(a+b*(c*x^n)^(2/n)),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^n)^(2/n)*b + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.242305, size = 1, normalized size = 0.02

$$\left[\frac{\log\left(\frac{2\,abc^{\frac{2}{n}}x+\left(bc^{\frac{2}{n}}x^2-a\right)\sqrt{-abc^{\frac{2}{n}}}}{bc^{\frac{2}{n}}x^2+a}\right)}{2\sqrt{-abc^{\frac{2}{n}}}},\ \frac{\arctan\left(\frac{\sqrt{abc^{\frac{2}{n}}}\,x}{a}\right)}{\sqrt{abc^{\frac{2}{n}}}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^n)^(2/n)*b + a),x, algorithm="fricas")
```

```
[Out] [1/2*log((2*a*b*c^(2/n)*x + (b*c^(2/n)*x^2 - a)*sqrt(-a*b*c^(2/n)
))/(b*c^(2/n)*x^2 + a))/sqrt(-a*b*c^(2/n)), arctan(sqrt(a*b*c^(2/
n))*x/a)/sqrt(a*b*c^(2/n))]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{a+b\left(cx^n\right)^{\frac{2}{n}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*(c*x**n)**(2/n)),x)
```

```
[Out] Integral(1/(a + b*(c*x**n)**(2/n)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(cx^n\right)^{\frac{2}{n}}b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^n)^(2/n)*b + a),x, algorithm="giac")
```

```
[Out] integrate(1/((c*x^n)^(2/n)*b + a), x)
```

3.3025 $\int \frac{1}{\left(a+b(cx^n)^{2/n}\right)^2} dx$

Optimal. Leaf size=73

$$\frac{x (cx^n)^{-1/n} \tan^{-1}\left(\frac{\sqrt{b}(cx^n)^{\frac{1}{n}}}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}}+\frac{x}{2a\left(a+b(cx^n)^{2/n}\right)}$$

```
[Out] x/(2*a*(a + b*(c*x^n)^(2/n))) + (x*ArcTan[(Sqrt[b]*(c*x^n)^n^(-1)
)/Sqrt[a]])/(2*a^(3/2)*Sqrt[b]*(c*x^n)^n^(-1))
```

Rubi [A] time = 0.0548553, antiderivative size = 73, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176

$$\frac{x (cx^n)^{-1/n} \tan^{-1}\left(\frac{\sqrt{b}(cx^n)^{\frac{1}{n}}}{\sqrt{a}}\right)}{2a^{3/2}\sqrt{b}}+\frac{x}{2a\left(a+b(cx^n)^{2/n}\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(c*x^n)^(2/n))^(-2),x]
```

```
[Out] x/(2*a*(a + b*(c*x^n)^(2/n))) + (x*ArcTan[(Sqrt[b]*(c*x^n)^n^(-1)
)/Sqrt[a]])/(2*a^(3/2)*Sqrt[b]*(c*x^n)^n^(-1))
```

Rubi in Sympy [A] time = 6.00033, size = 58, normalized size = 0.79

$$\frac{x}{2a\left(a+b(cx^n)^{\frac{2}{n}}\right)}+\frac{x (cx^n)^{-\frac{1}{n}} \operatorname{atan}\left(\frac{\sqrt{b}(cx^n)^{\frac{1}{n}}}{\sqrt{a}}\right)}{2a^{\frac{3}{2}}\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*(c*x**n)**(2/n))**2,x)
```

```
[Out] x/(2*a*(a + b*(c*x**n)**(2/n))) + x*(c*x**n)**(-1/n)*atan(sqrt(b)
*(c*x**n)**(1/n)/sqrt(a))/(2*a**(3/2)*sqrt(b))
```

Mathematica [A] time = 4.2524, size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+b(cx^n)^{2/n}\right)^2} dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(a + b*(c*x^n)^(2/n))^(-2),x]
```

```
[Out] Integrate[(a + b*(c*x^n)^(2/n))^(-2), x]
```

Maple [F] time = 0.58, size = 0, normalized size = 0.

$$\int \left(a+b \left(c x^{n}\right)^{2 n^{-1}}\right)^{-2}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*(c*x^n)^(2/n))^2,x)

[Out] int(1/(a+b*(c*x^n)^(2/n))^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(2/n)*b + a)^(-2),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [A] time = 0.258476, size = 1, normalized size = 0.01

$$\left[\frac{\left(bc^{\frac{2}{n}}x^2+a\right)\log\left(\frac{2\,abc^{\frac{2}{n}}x+\left(bc^{\frac{2}{n}}x^2-a\right)\sqrt{-abc^{\frac{2}{n}}}}{bc^{\frac{2}{n}}x^2+a}\right)+2\sqrt{-abc^{\frac{2}{n}}}\,x}{4\left(abc^{\frac{2}{n}}x^2+a^2\right)\sqrt{-abc^{\frac{2}{n}}}},\ \frac{\left(bc^{\frac{2}{n}}x^2+a\right)\arctan\left(\frac{\sqrt{abc^{\frac{2}{n}}}\,x}{a}\right)+\sqrt{abc^{\frac{2}{n}}}\,x}{2\left(abc^{\frac{2}{n}}x^2+a^2\right)\sqrt{abc^{\frac{2}{n}}}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(2/n)*b + a)^(-2),x, algorithm="fricas")

[Out] [1/4*((b*c^(2/n)*x^2 + a)*log((2*a*b*c^(2/n)*x + (b*c^(2/n)*x^2 -
 a)*sqrt(-a*b*c^(2/n)))/(b*c^(2/n)*x^2 + a)) + 2*sqrt(-a*b*c^(2/n
))*x)/((a*b*c^(2/n)*x^2 + a^2)*sqrt(-a*b*c^(2/n))), 1/2*((b*c^(2/
n)*x^2 + a)*arctan(sqrt(a*b*c^(2/n))*x/a) + sqrt(a*b*c^(2/n))*x)/
((a*b*c^(2/n)*x^2 + a^2)*sqrt(a*b*c^(2/n)))]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+b\left(cx^{n}\right)^{\frac{2}{n}}\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*(c*x**n)**(2/n))**2,x)

[Out] Integral((a + b*(c*x**n)**(2/n))**(-2), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(\left(cx^{n}\right)^{\frac{2}{n}}b+a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(2/n)*b + a)^(-2),x, algorithm="giac")

[Out] integrate(((c*x^n)^(2/n)*b + a)^(-2), x)
```

3.3026 $\int \frac{1}{\left(a+b(cx^n)^{2/n}\right)^3} dx$

Optimal. Leaf size=98

$$\frac{3x\left(cx^n\right)^{-1/n}\tan^{-1}\left(\frac{\sqrt{b}\left(cx^n\right)^{\frac{1}{n}}}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}}+\frac{3x}{8a^2\left(a+b\left(cx^n\right)^{2/n}\right)}+\frac{x}{4a\left(a+b\left(cx^n\right)^{2/n}\right)^2}$$

```
[Out] x/(4*a*(a + b*(c*x^n)^(2/n))^2) + (3*x)/(8*a^2*(a + b*(c*x^n)^(2/
n))) + (3*x*ArcTan[(Sqrt[b]*(c*x^n)^n^(-1))/Sqrt[a]])/(8*a^(5/2)*
Sqrt[b]*(c*x^n)^n^(-1))
```

Rubi [A] time = 0.0709716, antiderivative size = 98, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176

$$\frac{3x\left(cx^n\right)^{-1/n}\tan^{-1}\left(\frac{\sqrt{b}\left(cx^n\right)^{\frac{1}{n}}}{\sqrt{a}}\right)}{8a^{5/2}\sqrt{b}}+\frac{3x}{8a^2\left(a+b\left(cx^n\right)^{2/n}\right)}+\frac{x}{4a\left(a+b\left(cx^n\right)^{2/n}\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(c*x^n)^(2/n))^(-3),x]
```

```
[Out] x/(4*a*(a + b*(c*x^n)^(2/n))^2) + (3*x)/(8*a^2*(a + b*(c*x^n)^(2/
n))) + (3*x*ArcTan[(Sqrt[b]*(c*x^n)^n^(-1))/Sqrt[a]])/(8*a^(5/2)*
Sqrt[b]*(c*x^n)^n^(-1))
```

Rubi in Sympy [A] time = 8.313, size = 82, normalized size = 0.84

$$\frac{x}{4a\left(a+b\left(cx^n\right)^{\frac{2}{n}}\right)^2}+\frac{3x}{8a^2\left(a+b\left(cx^n\right)^{\frac{2}{n}}\right)}+\frac{3x\left(cx^n\right)^{-\frac{1}{n}}\operatorname{atan}\left(\frac{\sqrt{b}\left(cx^n\right)^{\frac{1}{n}}}{\sqrt{a}}\right)}{8a^{\frac{5}{2}}\sqrt{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*(c*x**n)**(2/n))**3,x)
```

```
[Out] x/(4*a*(a + b*(c*x**n)**(2/n))**2) + 3*x/(8*a**2*(a + b*(c*x**n)*
*(2/n))) + 3*x*(c*x**n)**(-1/n)*atan(sqrt(b)*(c*x**n)**(1/n)/sqrt
(a))/(8*a**(5/2)*sqrt(b))
```

Mathematica [A] time = 4.40314, size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+b\left(cx^n\right)^{2/n}\right)^3} dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(a + b*(c*x^n)^(2/n))^(-3),x]
```

```
[Out] Integrate[(a + b*(c*x^n)^(2/n))^(-3), x]
```

Maple [F] time = 0.044, size = 0, normalized size = 0.

$$\int \left(a + b\,(c x^{n})^{2\,n^{-1}}\right)^{-3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*(c*x^n)^(2/n))^3,x)

[Out] int(1/(a+b*(c*x^n)^(2/n))^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(2/n)*b + a)^(-3),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [A] time = 0.265094, size = 1, normalized size = 0.01

$$\left[\frac{3\left(b^{2} c^{\frac{4}{n}} x^{4} + 2\,a b c^{\frac{2}{n}} x^{2} + a^{2}\right) \log\left(\frac{2\,a b c^{\frac{2}{n}} x + \left(b c^{\frac{2}{n}} x^{2} - a\right) \sqrt{-a b c^{\frac{2}{n}}}}{b c^{\frac{2}{n}} x^{2} + a}\right) + 2\left(3\,b c^{\frac{2}{n}} x^{3} + 5\,a x\right) \sqrt{-a b c^{\frac{2}{n}}}}{16\left(a^{2} b^{2} c^{\frac{4}{n}} x^{4} + 2\,a^{3} b c^{\frac{2}{n}} x^{2} + a^{4}\right) \sqrt{-a b c^{\frac{2}{n}}}}, \frac{3\left(b^{2} c^{\frac{4}{n}} x^{4} + 2\,a b c^{\frac{2}{n}} x^{2} + a^{2}\right) a}{8\left(a^{2} b^{2} c^{\frac{4}{n}} x^{4}\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(2/n)*b + a)^(-3),x, algorithm="fricas")

[Out] [1/16*(3*(b^2*c^(4/n)*x^4 + 2*a*b*c^(2/n)*x^2 + a^2)*log((2*a*b*c
^(2/n)*x + (b*c^(2/n)*x^2 - a)*sqrt(-a*b*c^(2/n)))/(b*c^(2/n)*x^2
 + a)) + 2*(3*b*c^(2/n)*x^3 + 5*a*x)*sqrt(-a*b*c^(2/n)))/((a^2*b^
2*c^(4/n)*x^4 + 2*a^3*b*c^(2/n)*x^2 + a^4)*sqrt(-a*b*c^(2/n))), 1
/8*(3*(b^2*c^(4/n)*x^4 + 2*a*b*c^(2/n)*x^2 + a^2)*arctan(sqrt(a*b
*c^(2/n))*x/a) + (3*b*c^(2/n)*x^3 + 5*a*x)*sqrt(a*b*c^(2/n)))/((a
^2*b^2*c^(4/n)*x^4 + 2*a^3*b*c^(2/n)*x^2 + a^4)*sqrt(a*b*c^(2/n))
)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a + b\,(c x^{n})^{\frac{2}{n}}\right)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*(c*x**n)**(2/n))**3,x)

[Out] Integral((a + b*(c*x**n)**(2/n))**(-3), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left((cx^n)^{\frac{2}{n}}b + a\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((((c*x^n)^(2/n)*b + a)^(-3),x, algorithm="giac")
```

```
[Out] integrate((((c*x^n)^(2/n)*b + a)^(-3), x)
```

3.3027 $\int \frac{1}{1+4\sqrt{x^4}}\,dx$

Optimal. Leaf size=22

$$\frac{x\tan^{-1}\left(2\sqrt[4]{x^4}\right)}{2\sqrt[4]{x^4}}$$

```
[Out] (x*ArcTan[2*(x^4)^(1/4)])/(2*(x^4)^(1/4))
```

Rubi [A] time = 0.0133759, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{x\tan^{-1}\left(2\sqrt[4]{x^4}\right)}{2\sqrt[4]{x^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[(1 + 4*Sqrt[x^4])^(-1),x]

[Out] (x*ArcTan[2*(x^4)^(1/4)])/(2*(x^4)^(1/4))
```

Rubi in Sympy [A] time = 1.25802, size = 19, normalized size = 0.86

$$\frac{x\operatorname{atan}\left(2\sqrt[4]{x^4}\right)}{2\sqrt[4]{x^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(1+4*(x**4)**(1/2)),x)

[Out] x*atan(2*(x**4)**(1/4))/(2*(x**4)**(1/4))
```

Mathematica [A] time = 0.0406807, size = 0, normalized size = 0.

$$\int \frac{1}{1+4\sqrt{x^4}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(1 + 4*Sqrt[x^4])^(-1),x]

[Out] Integrate[(1 + 4*Sqrt[x^4])^(-1), x]
```

Maple [A] time = 0.013, size = 29, normalized size = 1.3

$$\frac{1}{2}\arctan\left(2\sqrt{\frac{\sqrt{x^4}}{x^2}}x\right)\frac{1}{\sqrt{\frac{1}{x^2}\sqrt{x^4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(1+4*(x^4)^(1/2)),x)

[Out] 1/2/((x^4)^(1/2)/x^2)^(1/2)*arctan(2*((x^4)^(1/2)/x^2)^(1/2)*x)
```

Maxima [A] time = 1.59791, size = 8, normalized size = 0.36

$$\frac{1}{2}\arctan\left(2x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(4*sqrt(x^4) + 1),x, algorithm="maxima")

[Out] 1/2*arctan(2*x)
```

Fricas [A] time = 0.23709, size = 8, normalized size = 0.36

$$\frac{1}{2}\arctan\left(2x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(4*sqrt(x^4) + 1),x, algorithm="fricas")

[Out] 1/2*arctan(2*x)
```

Sympy [A] time = 0.18316, size = 5, normalized size = 0.23

$$\frac{\operatorname{atan}\left(2x\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(1+4*(x**4)**(1/2)),x)

[Out] atan(2*x)/2
```

GIAC/XCAS [A] time = 0.210987, size = 8, normalized size = 0.36

$$\frac{1}{2}\arctan\left(2x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(4*sqrt(x^4) + 1),x, algorithm="giac")

[Out] 1/2*arctan(2*x)
```

3.3028 $\int \frac{1}{1-4\sqrt{x^4}}\,dx$

Optimal. Leaf size=22

$$\frac{x\tanh^{-1}\left(2\sqrt[4]{x^4}\right)}{2\sqrt[4]{x^4}}$$

```
[Out] (x*ArcTanh[2*(x^4)^(1/4)])/(2*(x^4)^(1/4))
```

Rubi [A] time = 0.0115792, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{x\tanh^{-1}\left(2\sqrt[4]{x^4}\right)}{2\sqrt[4]{x^4}}$$

Antiderivative was successfully verified.

```
[In]  Int[(1 - 4*Sqrt[x^4])^(-1),x]

[Out] (x*ArcTanh[2*(x^4)^(1/4)])/(2*(x^4)^(1/4))
```

Rubi in Sympy [A] time = 1.28666, size = 19, normalized size = 0.86

$$\frac{x\,\mathrm{atanh}\left(2\sqrt[4]{x^4}\right)}{2\sqrt[4]{x^4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(1-4*(x**4)**(1/2)),x)

[Out] x*atanh(2*(x**4)**(1/4))/(2*(x**4)**(1/4))
```

Mathematica [A] time = 0.0336869, size = 0, normalized size = 0.

$$\int \frac{1}{1-4\sqrt{x^4}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(1 - 4*Sqrt[x^4])^(-1),x]

[Out] Integrate[(1 - 4*Sqrt[x^4])^(-1), x]
```

Maple [A] time = 0.007, size = 29, normalized size = 1.3

$$\frac{1}{2}\mathit{Artanh}\left(2\sqrt{\frac{\sqrt{x^4}}{x^2}}x\right)\frac{1}{\sqrt{\frac{1}{x^2}\sqrt{x^4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(1-4*(x^4)^(1/2)),x)

[Out] 1/2/((x^4)^(1/2)/x^2)^(1/2)*arctanh(2*((x^4)^(1/2)/x^2)^(1/2)*x)
```

Maxima [A] time = 1.36199, size = 23, normalized size = 1.05

$$\frac{1}{4}\log\left(2x+1\right)-\frac{1}{4}\log\left(2x-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(4*sqrt(x^4) - 1),x, algorithm="maxima")

[Out] 1/4*log(2*x + 1) - 1/4*log(2*x - 1)
```

Fricas [A] time = 0.245985, size = 23, normalized size = 1.05

$$\frac{1}{4}\log\left(2x+1\right)-\frac{1}{4}\log\left(2x-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(4*sqrt(x^4) - 1),x, algorithm="fricas")

[Out] 1/4*log(2*x + 1) - 1/4*log(2*x - 1)
```

Sympy [A] time = 0.188317, size = 15, normalized size = 0.68

$$-\frac{\log\left(x-\frac{1}{2}\right)}{4}+\frac{\log\left(x+\frac{1}{2}\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(1-4*(x**4)**(1/2)),x)

[Out] -log(x - 1/2)/4 + log(x + 1/2)/4
```

GIAC/XCAS [A] time = 0.215656, size = 20, normalized size = 0.91

$$\frac{1}{4}\ln\left(\left|x+\frac{1}{2}\right|\right)-\frac{1}{4}\ln\left(\left|x-\frac{1}{2}\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(4*sqrt(x^4) - 1),x, algorithm="giac")

[Out] 1/4*ln(abs(x + 1/2)) - 1/4*ln(abs(x - 1/2))
```

3.3029 $\int \frac{1}{1+4\sqrt[3]{x^6}}\,dx$

Optimal. Leaf size=22

$$\frac{x\tan^{-1}\left(2\sqrt[6]{x^6}\right)}{2\sqrt[6]{x^6}}$$

[Out] (x*ArcTan[2*(x^6)^(1/6)])/(2*(x^6)^(1/6))

Rubi [A] time = 0.0140665, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{x\tan^{-1}\left(2\sqrt[6]{x^6}\right)}{2\sqrt[6]{x^6}}$$

Antiderivative was successfully verified.

[In] Int[(1 + 4*(x^6)^(1/3))^(-1),x]

[Out] (x*ArcTan[2*(x^6)^(1/6)])/(2*(x^6)^(1/6))

Rubi in Sympy [A] time = 1.25537, size = 19, normalized size = 0.86

$$\frac{x\,\mathrm{atan}\left(2\sqrt[6]{x^6}\right)}{2\sqrt[6]{x^6}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(1/(1+4*(x**6)**(1/3)),x)

[Out] x*atan(2*(x**6)**(1/6))/(2*(x**6)**(1/6))

Mathematica [C] time = 0.174093, size = 142, normalized size = 6.45

$$\frac{2x\left(x^6\right)^{2/3}B_{-64x^6}\left(\frac{5}{6},0\right)-2x\sqrt[3]{-x^{12}}B_{-64x^6}\left(\frac{1}{2},0\right)+\left(-x^6\right)^{5/6}\left(-\sqrt{3}\log\left(4x^2-2\sqrt{3}x+1\right)+\sqrt{3}\log\left(4x^2+2\sqrt{3}x+1\right)-2\tan\right.}{24\left(-x^6\right)^{5/6}}$$

Warning: Unable to verify antiderivative.

[In] Integrate[(1 + 4*(x^6)^(1/3))^(-1),x]

[Out] (-2*x*(-x^12)^(1/3)*Beta[-64*x^6, 1/2, 0] + 2*x*(x^6)^(2/3)*Beta[
-64*x^6, 5/6, 0] + (-x^6)^(5/6)*(-2*ArcTan[Sqrt[3] - 4*x] + 4*Arc
Tan[2*x] + 2*ArcTan[Sqrt[3] + 4*x] - Sqrt[3]*Log[1 - 2*Sqrt[3]*x
+ 4*x^2] + Sqrt[3]*Log[1 + 2*Sqrt[3]*x + 4*x^2]))/(24*(-x^6)^(5/6
))

Maple [A] time = 0.091, size = 17, normalized size = 0.8

$$\frac{x}{2}\arctan\left(2\sqrt[6]{x^6}\right)\frac{1}{\sqrt[6]{x^6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(1+4*(x^6)^(1/3)),x)
```

```
[Out] 1/2*x*arctan(2*(x^6)^(1/6))/(x^6)^(1/6)
```

Maxima [A] time = 1.53686, size = 8, normalized size = 0.36

$$\frac{1}{2}\arctan(2x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(4*(x^6)^(1/3) + 1),x, algorithm="maxima")
```

```
[Out] 1/2*arctan(2*x)
```

Fricas [A] time = 0.23834, size = 8, normalized size = 0.36

$$\frac{1}{2}\arctan(2x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(4*(x^6)^(1/3) + 1),x, algorithm="fricas")
```

```
[Out] 1/2*arctan(2*x)
```

Sympy [A] time = 0.176389, size = 5, normalized size = 0.23

$$\frac{\operatorname{atan}(2x)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(1+4*(x**6)**(1/3)),x)
```

```
[Out] atan(2*x)/2
```

GIAC/XCAS [A] time = 0.213025, size = 8, normalized size = 0.36

$$\frac{1}{2}\arctan(2x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(4*(x^6)^(1/3) + 1),x, algorithm="giac")
```

```
[Out] 1/2*arctan(2*x)
```

3.3030 $\int \frac{1}{1-4\sqrt[3]{x^6}}\,dx$

Optimal. Leaf size=22

$$\frac{x\tanh^{-1}\left(2\sqrt[6]{x^6}\right)}{2\sqrt[6]{x^6}}$$

```
[Out] (x*ArcTanh[2*(x^6)^(1/6)])/(2*(x^6)^(1/6))
```

Rubi [A] time = 0.0113293, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{x\tanh^{-1}\left(2\sqrt[6]{x^6}\right)}{2\sqrt[6]{x^6}}$$

Antiderivative was successfully verified.

```
[In] Int[(1 - 4*(x^6)^(1/3))^(-1),x]

[Out] (x*ArcTanh[2*(x^6)^(1/6)])/(2*(x^6)^(1/6))
```

Rubi in Sympy [A] time = 1.25759, size = 19, normalized size = 0.86

$$\frac{x\,\mathrm{atanh}\left(2\sqrt[6]{x^6}\right)}{2\sqrt[6]{x^6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(1-4*(x**6)**(1/3)),x)

[Out] x*atanh(2*(x**6)**(1/6))/(2*(x**6)**(1/6))
```

Mathematica [C] time = 0.17318, size = 123, normalized size = 5.59

$$\frac{1}{24}\left(\frac{2xB_{64x^6}\left(\frac{1}{2},0\right)}{\sqrt[6]{x^6}}+\frac{2xB_{64x^6}\left(\frac{5}{6},0\right)}{\sqrt[6]{x^6}}-\log\left(4x^2-2x+1\right)+\log\left(4x^2+2x+1\right)-2\log(1-2x)+2\log(2x+1)+2\sqrt{3}\tan^{-1}\left(\frac{4x-1}{\sqrt{3}}\right)+2\sqrt{3}\tan^{-1}\left(\frac{4x+1}{\sqrt{3}}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(1 - 4*(x^6)^(1/3))^(-1),x]

[Out] (2*Sqrt[3]*ArcTan[(-1 + 4*x)/Sqrt[3]] + 2*Sqrt[3]*ArcTan[(1 + 4*x
)/Sqrt[3]] + (2*x*Beta[64*x^6, 1/2, 0])/(x^6)^(1/6) + (2*x*Beta[6
4*x^6, 5/6, 0])/(x^6)^(1/6) - 2*Log[1 - 2*x] + 2*Log[1 + 2*x] - L
og[1 - 2*x + 4*x^2] + Log[1 + 2*x + 4*x^2])/24
```

Maple [A] time = 0.079, size = 17, normalized size = 0.8

$$\frac{x}{2}\mathit{Artanh}\left(2\sqrt[6]{x^6}\right)\frac{1}{\sqrt[6]{x^6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(1-4*(x^6)^(1/3)),x)
```

```
[Out] 1/2*x*arctanh(2*(x^6)^(1/6))/(x^6)^(1/6)
```

Maxima [A] time = 1.33761, size = 23, normalized size = 1.05

$$\frac{1}{4}\,\log\left(2\,x+1\right)-\frac{1}{4}\,\log\left(2\,x-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(4*(x^6)^(1/3) - 1),x, algorithm="maxima")
```

```
[Out] 1/4*log(2*x + 1) - 1/4*log(2*x - 1)
```

Fricas [A] time = 0.241611, size = 23, normalized size = 1.05

$$\frac{1}{4}\,\log\left(2\,x+1\right)-\frac{1}{4}\,\log\left(2\,x-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(4*(x^6)^(1/3) - 1),x, algorithm="fricas")
```

```
[Out] 1/4*log(2*x + 1) - 1/4*log(2*x - 1)
```

Sympy [A] time = 0.174726, size = 15, normalized size = 0.68

$$-\frac{\log\left(x-\frac{1}{2}\right)}{4}+\frac{\log\left(x+\frac{1}{2}\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(1-4*(x**6)**(1/3)),x)
```

```
[Out] -log(x - 1/2)/4 + log(x + 1/2)/4
```

GIAC/XCAS [A] time = 0.213384, size = 20, normalized size = 0.91

$$\frac{1}{4}\ln\left(\left|x+\frac{1}{2}\right|\right)-\frac{1}{4}\ln\left(\left|x-\frac{1}{2}\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(4*(x^6)^(1/3) - 1),x, algorithm="giac")
```

```
[Out] 1/4*ln(abs(x + 1/2)) - 1/4*ln(abs(x - 1/2))
```

3.3031 $\int \frac{1}{1+4(x^{2n})^{\frac{1}{n}}}\,dx$

Optimal. Leaf size=34

$$\frac{1}{2}x\left(x^{2n}\right)^{-\frac{1}{2}/n}\tan^{-1}\left(2\left(x^{2n}\right)^{\frac{1}{2}/n}\right)$$

```
[Out] (x*ArcTan[2*(x^(2*n))^(1/(2*n))])/(2*(x^(2*n))^(1/(2*n)))
```

Rubi [A] time = 0.0159857, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{1}{2}x\left(x^{2n}\right)^{-\frac{1}{2}/n}\tan^{-1}\left(2\left(x^{2n}\right)^{\frac{1}{2}/n}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[(1 + 4*(x^(2*n))^n^(-1))^(-1),x]

[Out] (x*ArcTan[2*(x^(2*n))^(1/(2*n))])/(2*(x^(2*n))^(1/(2*n)))
```

Rubi in Sympy [A] time = 1.56992, size = 26, normalized size = 0.76

$$\frac{x\left(x^{2n}\right)^{-\frac{1}{2n}}\operatorname{atan}\left(2\left(x^{2n}\right)^{\frac{1}{2n}}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(1+4*(x**(2*n))**(1/n)),x)

[Out] x*(x**(2*n))**(-1/(2*n))*atan(2*(x**(2*n))**(1/(2*n)))/2
```

Mathematica [A] time = 2.17893, size = 0, normalized size = 0.

$$\int \frac{1}{1+4\left(x^{2n}\right)^{\frac{1}{n}}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(1 + 4*(x^(2*n))^n^(-1))^(-1),x]

[Out] Integrate[(1 + 4*(x^(2*n))^n^(-1))^(-1), x]
```

Maple [A] time = 0.107, size = 29, normalized size = 0.9

$$\frac{x}{2}\left(x^{2\,n}\right)^{-\frac{1}{2n}}\arctan\left(2\,\left(x^{2\,n}\right)^{1/2\,n^{-1}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(1+4*(x^(2*n))^(1/n)),x)

[Out] 1/2*x*(x^(2*n))^(-1/2/n)*arctan(2*(x^(2*n))^(1/2/n))
```

Maxima [A] time = 22.419, size = 8, normalized size = 0.24

$$\frac{1}{2} \arctan(2x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(4*(x^(2*n))^(1/n) + 1),x, algorithm="maxima")
```

```
[Out] 1/2*arctan(2*x)
```

Fricas [A] time = 0.249771, size = 8, normalized size = 0.24

$$\frac{1}{2} \arctan(2x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(4*(x^(2*n))^(1/n) + 1),x, algorithm="fricas")
```

```
[Out] 1/2*arctan(2*x)
```

Sympy [A] time = 0.174254, size = 5, normalized size = 0.15

$$\frac{\operatorname{atan}(2x)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(1+4*(x**(2*n))**(1/n)),x)
```

```
[Out] atan(2*x)/2
```

GIAC/XCAS [A] time = 0.216322, size = 8, normalized size = 0.24

$$\frac{1}{2} \arctan(2x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(4*(x^(2*n))^(1/n) + 1),x, algorithm="giac")
```

```
[Out] 1/2*arctan(2*x)
```

3.3032 $\int \frac{1}{1-4(x^{2n})^{\frac{1}{n}}}\,dx$

Optimal. Leaf size=34

$$\frac{1}{2}x\left(x^{2n}\right)^{-\frac{1}{2}/n}\tanh^{-1}\left(2\left(x^{2n}\right)^{\frac{1}{2}/n}\right)$$

```
[Out] (x*ArcTanh[2*(x^(2*n))^(1/(2*n))])/(2*(x^(2*n))^(1/(2*n)))
```

Rubi [A] time = 0.0153499, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{1}{2}x\left(x^{2n}\right)^{-\frac{1}{2}/n}\tanh^{-1}\left(2\left(x^{2n}\right)^{\frac{1}{2}/n}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[(1 - 4*(x^(2*n))^n^(-1))^(-1),x]

[Out] (x*ArcTanh[2*(x^(2*n))^(1/(2*n))])/(2*(x^(2*n))^(1/(2*n)))
```

Rubi in Sympy [A] time = 1.58741, size = 26, normalized size = 0.76

$$\frac{x\left(x^{2n}\right)^{-\frac{1}{2n}}\operatorname{atanh}\left(2\left(x^{2n}\right)^{\frac{1}{2n}}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(1-4*(x**(2*n))**(1/n)),x)

[Out] x*(x**(2*n))**(-1/(2*n))*atanh(2*(x**(2*n))**(1/(2*n)))/2
```

Mathematica [A] time = 2.16826, size = 0, normalized size = 0.

$$\int \frac{1}{1-4\left(x^{2n}\right)^{\frac{1}{n}}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(1 - 4*(x^(2*n))^n^(-1))^(-1),x]

[Out] Integrate[(1 - 4*(x^(2*n))^n^(-1))^(-1), x]
```

Maple [A] time = 0.099, size = 29, normalized size = 0.9

$$\frac{x}{2}\left(x^{2n}\right)^{-\frac{1}{2n}}\mathit{Artanh}\left(2\left(x^{2n}\right)^{1/2n^{-1}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(1-4*(x^(2*n))^(1/n)),x)

[Out] 1/2*x*(x^(2*n))^(-1/2/n)*arctanh(2*(x^(2*n))^(1/2/n))
```

Maxima [A] time = 33.7958, size = 31, normalized size = 0.91

$$\frac{1}{4}\,\log\left(4\,(x^n)^{\left(\frac{1}{n}\right)} + 2\right) - \frac{1}{4}\,\log\left(4\,x - 2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(4*(x^(2*n))^(1/n) - 1),x, algorithm="maxima")
```

```
[Out] 1/4*log(4*(x^n)^(1/n) + 2) - 1/4*log(4*x - 2)
```

Fricas [A] time = 0.253853, size = 23, normalized size = 0.68

$$\frac{1}{4}\,\log\left(2\,x + 1\right) - \frac{1}{4}\,\log\left(2\,x - 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(4*(x^(2*n))^(1/n) - 1),x, algorithm="fricas")
```

```
[Out] 1/4*log(2*x + 1) - 1/4*log(2*x - 1)
```

Sympy [A] time = 0.180874, size = 15, normalized size = 0.44

$$-\frac{\log\left(x - \frac{1}{2}\right)}{4} + \frac{\log\left(x + \frac{1}{2}\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(1-4*(x**(2*n))**(1/n)),x)
```

```
[Out] -log(x - 1/2)/4 + log(x + 1/2)/4
```

GIAC/XCAS [A] time = 0.216162, size = 20, normalized size = 0.59

$$\frac{1}{4}\,\ln\left(\left|x + \frac{1}{2}\right|\right) - \frac{1}{4}\,\ln\left(\left|x - \frac{1}{2}\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(-1/(4*(x^(2*n))^(1/n) - 1),x, algorithm="giac")
```

```
[Out] 1/4*ln(abs(x + 1/2)) - 1/4*ln(abs(x - 1/2))
```

3.3033 $\int \left(a+b\left(cx^n\right)^{3/n}\right)^3 dx$

Optimal. Leaf size=65

$$a^3x+\frac{3}{4}a^2bx\left(cx^n\right)^{3/n}+\frac{3}{7}ab^2x\left(cx^n\right)^{6/n}+\frac{1}{10}b^3x\left(cx^n\right)^{9/n}$$

```
[Out] a^3*x + (3*a^2*b*x*(c*x^n)^(3/n))/4 + (3*a*b^2*x*(c*x^n)^(6/n))/7
 + (b^3*x*(c*x^n)^(9/n))/10
```

Rubi [A] time = 0.0517521, antiderivative size = 65, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$a^3x+\frac{3}{4}a^2bx\left(cx^n\right)^{3/n}+\frac{3}{7}ab^2x\left(cx^n\right)^{6/n}+\frac{1}{10}b^3x\left(cx^n\right)^{9/n}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(c*x^n)^(3/n))^3,x]
```

```
[Out] a^3*x + (3*a^2*b*x*(c*x^n)^(3/n))/4 + (3*a*b^2*x*(c*x^n)^(6/n))/7
 + (b^3*x*(c*x^n)^(9/n))/10
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{3a^2bx\left(cx^n\right)^{\frac{3}{n}}}{4}+\frac{3ab^2x\left(cx^n\right)^{\frac{6}{n}}}{7}+\frac{b^3x\left(cx^n\right)^{\frac{9}{n}}}{10}+x\left(cx^n\right)^{-\frac{1}{n}}\int^{\left(cx^n\right)^{\frac{1}{n}}}a^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x**n)**(3/n))**3,x)
```

```
[Out] 3*a**2*b*x*(c*x**n)**(3/n)/4 + 3*a*b**2*x*(c*x**n)**(6/n)/7 + b**
3*x*(c*x**n)**(9/n)/10 + x*(c*x**n)**(-1/n)*Integral(a**3, (x, (c
*x**n)**(1/n)))
```

Mathematica [A] time = 0.210039, size = 65, normalized size = 1.

$$a^3x+\frac{3}{4}a^2bx\left(cx^n\right)^{3/n}+\frac{3}{7}ab^2x\left(cx^n\right)^{6/n}+\frac{1}{10}b^3x\left(cx^n\right)^{9/n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(c*x^n)^(3/n))^3,x]
```

```
[Out] a^3*x + (3*a^2*b*x*(c*x^n)^(3/n))/4 + (3*a*b^2*x*(c*x^n)^(6/n))/7
 + (b^3*x*(c*x^n)^(9/n))/10
```

Maple [F] time = 0.043, size = 0, normalized size = 0.

$$\int \left(a+b\left(cx^n\right)^{3\,n^{-1}}\right)^3 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^n)^(3/n))^3,x)
```

```
[Out] int((a+b*(c*x^n)^(3/n))^3,x)
```

Maxima [A] time = 1.50232, size = 72, normalized size = 1.11

$$\frac{1}{10}\,b^3c^{\frac{9}{n}}x^{10}+\frac{3}{7}\,ab^2c^{\frac{6}{n}}x^7+\frac{3}{4}\,a^2bc^{\frac{3}{n}}x^4+a^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(3/n)*b + a)^3,x, algorithm="maxima")
```

```
[Out] 1/10*b^3*c^(9/n)*x^10 + 3/7*a*b^2*c^(6/n)*x^7 + 3/4*a^2*b*c^(3/n)
*x^4 + a^3*x
```

Fricas [A] time = 0.249848, size = 72, normalized size = 1.11

$$\frac{1}{10}\,b^3c^{\frac{9}{n}}x^{10}+\frac{3}{7}\,ab^2c^{\frac{6}{n}}x^7+\frac{3}{4}\,a^2bc^{\frac{3}{n}}x^4+a^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(3/n)*b + a)^3,x, algorithm="fricas")
```

```
[Out] 1/10*b^3*c^(9/n)*x^10 + 3/7*a*b^2*c^(6/n)*x^7 + 3/4*a^2*b*c^(3/n)
*x^4 + a^3*x
```

Sympy [A] time = 2.34324, size = 66, normalized size = 1.02

$$a^3x+\frac{3a^2bc^{\frac{3}{n}}x\,(x^n)^{\frac{3}{n}}}{4}+\frac{3ab^2c^{\frac{6}{n}}x\,(x^n)^{\frac{6}{n}}}{7}+\frac{b^3c^{\frac{9}{n}}x\,(x^n)^{\frac{9}{n}}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**n)**(3/n))**3,x)
```

```
[Out] a**3*x + 3*a**2*b*c**(3/n)*x*(x**n)**(3/n)/4 + 3*a*b**2*c**(6/n)*
x*(x**n)**(6/n)/7 + b**3*c**(9/n)*x*(x**n)**(9/n)/10
```

GIAC/XCAS [A] time = 0.224421, size = 76, normalized size = 1.17

$$\frac{1}{10}\,b^3x^{10}e^{\left(\frac{9\ln(c)}{n}\right)}+\frac{3}{7}\,ab^2x^7e^{\left(\frac{6\ln(c)}{n}\right)}+\frac{3}{4}\,a^2bx^4e^{\left(\frac{3\ln(c)}{n}\right)}+a^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(3/n)*b + a)^3,x, algorithm="giac")
```

```
[Out] 1/10*b^3*x^10*e^(9*ln(c)/n) + 3/7*a*b^2*x^7*e^(6*ln(c)/n) + 3/4*a
^2*b*x^4*e^(3*ln(c)/n) + a^3*x
```

3.3034 $\int \left(a+b\left(cx^n\right)^{3/n}\right)^2\,dx$

Optimal. Leaf size=43

$$a^2x+\frac{1}{2}abx\left(cx^n\right)^{3/n}+\frac{1}{7}b^2x\left(cx^n\right)^{6/n}$$

```
[Out] a^2*x + (a*b*x*(c*x^n)^(3/n))/2 + (b^2*x*(c*x^n)^(6/n))/7
```

Rubi [A] time = 0.0351556, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118

$$a^2x+\frac{1}{2}abx\left(cx^n\right)^{3/n}+\frac{1}{7}b^2x\left(cx^n\right)^{6/n}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(c*x^n)^(3/n))^2,x]
```

```
[Out] a^2*x + (a*b*x*(c*x^n)^(3/n))/2 + (b^2*x*(c*x^n)^(6/n))/7
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{abx\left(cx^n\right)^{\frac{3}{n}}}{2}+\frac{b^2x\left(cx^n\right)^{\frac{6}{n}}}{7}+x\left(cx^n\right)^{-\frac{1}{n}}\int^{\left(cx^n\right)^{\frac{1}{n}}}a^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x**n)**(3/n))**2,x)
```

```
[Out] a*b*x*(c*x**n)**(3/n)/2 + b**2*x*(c*x**n)**(6/n)/7 + x*(c*x**n)**
(-1/n)*Integral(a**2, (x, (c*x**n)**(1/n)))
```

Mathematica [A] time = 0.124356, size = 43, normalized size = 1.

$$a^2x+\frac{1}{2}abx\left(cx^n\right)^{3/n}+\frac{1}{7}b^2x\left(cx^n\right)^{6/n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(c*x^n)^(3/n))^2,x]
```

```
[Out] a^2*x + (a*b*x*(c*x^n)^(3/n))/2 + (b^2*x*(c*x^n)^(6/n))/7
```

Maple [F] time = 0.039, size = 0, normalized size = 0.

$$\int \left(a+b\left(cx^n\right)^{3\,n^{-1}}\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^n)^(3/n))^2,x)
```

```
[Out] int((a+b*(c*x^n)^(3/n))^2,x)
```

Maxima [A] time = 1.44237, size = 47, normalized size = 1.09

$$\frac{1}{7}\,b^{2}c^{\frac{6}{n}}x^{7}+\frac{1}{2}\,abc^{\frac{3}{n}}x^{4}+a^{2}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(3/n)*b + a)^2,x, algorithm="maxima")
```

```
[Out] 1/7*b^2*c^(6/n)*x^7 + 1/2*a*b*c^(3/n)*x^4 + a^2*x
```

Fricas [A] time = 0.247586, size = 47, normalized size = 1.09

$$\frac{1}{7}\,b^{2}c^{\frac{6}{n}}x^{7}+\frac{1}{2}\,abc^{\frac{3}{n}}x^{4}+a^{2}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(3/n)*b + a)^2,x, algorithm="fricas")
```

```
[Out] 1/7*b^2*c^(6/n)*x^7 + 1/2*a*b*c^(3/n)*x^4 + a^2*x
```

Sympy [A] time = 1.24158, size = 41, normalized size = 0.95

$$a^{2}x+\frac{abc^{\frac{3}{n}}x\left(x^{n}\right)^{\frac{3}{n}}}{2}+\frac{b^{2}c^{\frac{6}{n}}x\left(x^{n}\right)^{\frac{6}{n}}}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**n)**(3/n))**2,x)
```

```
[Out] a**2*x + a*b*c**(3/n)*x*(x**n)**(3/n)/2 + b**2*c**(6/n)*x*(x**n)*
*(6/n)/7
```

GIAC/XCAS [A] time = 0.222746, size = 50, normalized size = 1.16

$$\frac{1}{7}\,b^{2}x^{7}e^{\left(\frac{6\ln\left(c\right)}{n}\right)}+\frac{1}{2}\,abx^{4}e^{\left(\frac{3\ln\left(c\right)}{n}\right)}+a^{2}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(3/n)*b + a)^2,x, algorithm="giac")
```

```
[Out] 1/7*b^2*x^7*e^(6*ln(c)/n) + 1/2*a*b*x^4*e^(3*ln(c)/n) + a^2*x
```

3.3035 $\int \left(a+b\left(cx^n\right)^{3/n}\right)\,dx$

Optimal. Leaf size=21

$$ax+\frac{1}{4}bx\left(cx^n\right)^{3/n}$$

```
[Out] a*x + (b*x*(c*x^n)^(3/n))/4
```

Rubi [A] time = 0.0149781, antiderivative size = 21, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$ax+\frac{1}{4}bx\left(cx^n\right)^{3/n}$$

Antiderivative was successfully verified.

```
[In]  Int[a + b*(c*x^n)^(3/n),x]

[Out] a*x + (b*x*(c*x^n)^(3/n))/4
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{bx\left(cx^n\right)^{\frac{3}{n}}}{4}+\int a\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(a+b*(c*x**n)**(3/n),x)

[Out] b*x*(c*x**n)**(3/n)/4 + Integral(a, x)
```

Mathematica [A] time = 0.00307024, size = 21, normalized size = 1.

$$ax+\frac{1}{4}bx\left(cx^n\right)^{3/n}$$

Antiderivative was successfully verified.

```
[In]  Integrate[a + b*(c*x^n)^(3/n),x]

[Out] a*x + (b*x*(c*x^n)^(3/n))/4
```

Maple [A] time = 0.03, size = 23, normalized size = 1.1

$$ax+\frac{bx}{4}e^{3\,\frac{\ln\left(ce^{n\ln(x)}\right)}{n}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(a+b*(c*x^n)^(3/n),x)

[Out] a*x+1/4*x*b*exp(3/n*ln(c*exp(n*ln(x))))
```

Maxima [A] time = 1.41058, size = 23, normalized size = 1.1

$$\frac{1}{4}bc^{\frac{3}{n}}x^4 + ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^n)^(3/n)*b + a,x, algorithm="maxima")
```

```
[Out] 1/4*b*c^(3/n)*x^4 + a*x
```

Fricas [A] time = 0.233707, size = 23, normalized size = 1.1

$$\frac{1}{4}bc^{\frac{3}{n}}x^4 + ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^n)^(3/n)*b + a,x, algorithm="fricas")
```

```
[Out] 1/4*b*c^(3/n)*x^4 + a*x
```

Sympy [A] time = 0.617653, size = 19, normalized size = 0.9

$$ax + \frac{bc^{\frac{3}{n}}x\left(x^n\right)^{\frac{3}{n}}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(a+b*(c*x**n)**(3/n),x)
```

```
[Out] a*x + b*c**(3/n)*x*(x**n)**(3/n)/4
```

GIAC/XCAS [A] time = 0.21822, size = 24, normalized size = 1.14

$$\frac{1}{4}bx^4e^{\left(\frac{3\ln(c)}{n}\right)} + ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^n)^(3/n)*b + a,x, algorithm="giac")
```

```
[Out] 1/4*b*x^4*e^(3*ln(c)/n) + a*x
```

3.3036 $\int \frac{1}{a+b(cx^n)^{3/n}}\,dx$

Optimal. Leaf size=183

$$-\frac{x\left(cx^n\right)^{-1/n}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}\left(cx^n\right)^{\frac{1}{n}}+b^{2/3}\left(cx^n\right)^{2/n}\right)}{6a^{2/3}\sqrt[3]{b}}+\frac{x\left(cx^n\right)^{-1/n}\log\left(\sqrt[3]{a}+\sqrt[3]{b}\left(cx^n\right)^{\frac{1}{n}}\right)}{3a^{2/3}\sqrt[3]{b}}-\frac{x\left(cx^n\right)^{-1/n}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}\left(cx^n\right)^{\frac{1}{n}}}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}a^{2/3}\sqrt[3]{b}}$$

```
[Out] -((x*ArcTan[(a^(1/3) - 2*b^(1/3)*(c*x^n)^n^(-1))/(Sqrt[3]*a^(1/3)
)])/(Sqrt[3]*a^(2/3)*b^(1/3)*(c*x^n)^n^(-1))) + (x*Log[a^(1/3) +
b^(1/3)*(c*x^n)^n^(-1)])/(3*a^(2/3)*b^(1/3)*(c*x^n)^n^(-1)) - (x*
Log[a^(2/3) - a^(1/3)*b^(1/3)*(c*x^n)^n^(-1) + b^(2/3)*(c*x^n)^(2
/n)])/(6*a^(2/3)*b^(1/3)*(c*x^n)^n^(-1))
```

Rubi [A] time = 0.170534, antiderivative size = 183, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.412

$$-\frac{x\left(cx^n\right)^{-1/n}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}\left(cx^n\right)^{\frac{1}{n}}+b^{2/3}\left(cx^n\right)^{2/n}\right)}{6a^{2/3}\sqrt[3]{b}}+\frac{x\left(cx^n\right)^{-1/n}\log\left(\sqrt[3]{a}+\sqrt[3]{b}\left(cx^n\right)^{\frac{1}{n}}\right)}{3a^{2/3}\sqrt[3]{b}}-\frac{x\left(cx^n\right)^{-1/n}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}\left(cx^n\right)^{\frac{1}{n}}}{\sqrt{3}\sqrt[3]{a}}\right)}{\sqrt{3}a^{2/3}\sqrt[3]{b}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(c*x^n)^(3/n))^(-1),x]
```

```
[Out] -((x*ArcTan[(a^(1/3) - 2*b^(1/3)*(c*x^n)^n^(-1))/(Sqrt[3]*a^(1/3)
)])/(Sqrt[3]*a^(2/3)*b^(1/3)*(c*x^n)^n^(-1))) + (x*Log[a^(1/3) +
b^(1/3)*(c*x^n)^n^(-1)])/(3*a^(2/3)*b^(1/3)*(c*x^n)^n^(-1)) - (x*
Log[a^(2/3) - a^(1/3)*b^(1/3)*(c*x^n)^n^(-1) + b^(2/3)*(c*x^n)^(2
/n)])/(6*a^(2/3)*b^(1/3)*(c*x^n)^n^(-1))
```

Rubi in Sympy [A] time = 28.9547, size = 165, normalized size = 0.9

$$\frac{x\left(cx^n\right)^{-\frac{1}{n}}\log\left(\sqrt[3]{a}+\sqrt[3]{b}\left(cx^n\right)^{\frac{1}{n}}\right)}{3a^{\frac{2}{3}}\sqrt[3]{b}}-\frac{x\left(cx^n\right)^{-\frac{1}{n}}\log\left(a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}\left(cx^n\right)^{\frac{1}{n}}+b^{\frac{2}{3}}\left(cx^n\right)^{\frac{2}{n}}\right)}{6a^{\frac{2}{3}}\sqrt[3]{b}}-\frac{\sqrt{3}x\left(cx^n\right)^{-\frac{1}{n}}\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}-\frac{2\sqrt[3]{b}\left(cx^n\right)^{\frac{1}{n}}}{3}\right)}{\sqrt[3]{a}}\right)}{3a^{\frac{2}{3}}\sqrt[3]{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*(c*x**n)**(3/n)),x)
```

```
[Out] x*(c*x**n)**(-1/n)*log(a**(1/3) + b**(1/3)*(c*x**n)**(1/n))/(3*a*
*(2/3)*b**(1/3)) - x*(c*x**n)**(-1/n)*log(a**(2/3) - a**(1/3)*b**
(1/3)*(c*x**n)**(1/n) + b**(2/3)*(c*x**n)**(2/n))/(6*a**(2/3)*b**
(1/3)) - sqrt(3)*x*(c*x**n)**(-1/n)*atan(sqrt(3)*(a**(1/3)/3 - 2*
b**(1/3)*(c*x**n)**(1/n)/3)/a**(1/3))/(3*a**(2/3)*b**(1/3))
```

Mathematica [A] time = 4.69656, size = 0, normalized size = 0.

$$\int \frac{1}{a + b\left(cx^n\right)^{3/n}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(a + b*(c*x^n)^(3/n))^(-1),x]
```

```
[Out] Integrate[(a + b*(c*x^n)^(3/n))^(-1), x]
```

Maple [F] time = 0.203, size = 0, normalized size = 0.

$$\int \left(a + b\left(cx^n\right)^{3\,n^{-1}}\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*(c*x^n)^(3/n)),x)
```

```
[Out] int(1/(a+b*(c*x^n)^(3/n)),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^n)^(3/n)*b + a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.237283, size = 167, normalized size = 0.91

$$-\frac{\sqrt{3}\left(\sqrt{3}\log\left(\left(a^2bc^{\frac{3}{n}}\right)^{\frac{2}{3}}x^2 - \left(a^2bc^{\frac{3}{n}}\right)^{\frac{1}{3}}ax + a^2\right) - 2\sqrt{3}\log\left(\left(a^2bc^{\frac{3}{n}}\right)^{\frac{1}{3}}x + a\right) - 6\arctan\left(\frac{2\sqrt{3}\left(a^2bc^{\frac{3}{n}}\right)^{\frac{1}{3}}x - \sqrt{3}a}{3a}\right)\right)}{18\left(a^2bc^{\frac{3}{n}}\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^n)^(3/n)*b + a),x, algorithm="fricas")
```

```
[Out] -1/18*sqrt(3)*(sqrt(3)*log((a^2*b*c^(3/n))^(2/3)*x^2 - (a^2*b*c^(
3/n))^(1/3)*a*x + a^2) - 2*sqrt(3)*log((a^2*b*c^(3/n))^(1/3)*x +
a) - 6*arctan(1/3*(2*sqrt(3)*(a^2*b*c^(3/n))^(1/3)*x - sqrt(3)*a)
/a))/(a^2*b*c^(3/n))^(1/3)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{a + b\left(cx^n\right)^{\frac{3}{n}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*(c*x**n)**(3/n)),x)
```

```
[Out] Integral(1/(a + b*(c*x**n)**(3/n)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(cx^n)^{\frac{3}{n}}b + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((c*x^n)^(3/n)*b + a),x, algorithm="giac")
```

```
[Out] integrate(1/((c*x^n)^(3/n)*b + a), x)
```

3.3037 $\int \frac{1}{\left(a+b(cx^n)^{3/n}\right)^2} dx$

Optimal. Leaf size=210

$$-\frac{x(cx^n)^{-1/n}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(cx^n)^{\frac{1}{n}}+b^{2/3}(cx^n)^{2/n}\right)}{9a^{5/3}\sqrt[3]{b}}+\frac{2x(cx^n)^{-1/n}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(cx^n)^{\frac{1}{n}}\right)}{9a^{5/3}\sqrt[3]{b}}-\frac{2x(cx^n)^{-1/n}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(cx^n)^{\frac{1}{n}}}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{5/3}\sqrt[3]{b}}+\frac{x}{3a\left(a+b(cx^n)^{3/n}\right)}$$

```
[Out] x/(3*a*(a + b*(c*x^n)^(3/n))) - (2*x*ArcTan[(a^(1/3) - 2*b^(1/3)*
(c*x^n)^n^(-1))/(Sqrt[3]*a^(1/3))])/(3*Sqrt[3]*a^(5/3)*b^(1/3)*(c
*x^n)^n^(-1)) + (2*x*Log[a^(1/3) + b^(1/3)*(c*x^n)^n^(-1)])/(9*a^
(5/3)*b^(1/3)*(c*x^n)^n^(-1)) - (x*Log[a^(2/3) - a^(1/3)*b^(1/3)*
(c*x^n)^n^(-1) + b^(2/3)*(c*x^n)^(2/n)])/(9*a^(5/3)*b^(1/3)*(c*x^
n)^n^(-1))
```

Rubi [A] time = 0.191393, antiderivative size = 210, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.471

$$-\frac{x(cx^n)^{-1/n}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}(cx^n)^{\frac{1}{n}}+b^{2/3}(cx^n)^{2/n}\right)}{9a^{5/3}\sqrt[3]{b}}+\frac{2x(cx^n)^{-1/n}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(cx^n)^{\frac{1}{n}}\right)}{9a^{5/3}\sqrt[3]{b}}-\frac{2x(cx^n)^{-1/n}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(cx^n)^{\frac{1}{n}}}{\sqrt{3}\sqrt[3]{a}}\right)}{3\sqrt{3}a^{5/3}\sqrt[3]{b}}+\frac{x}{3a\left(a+b(cx^n)^{3/n}\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(c*x^n)^(3/n))^(-2),x]
```

```
[Out] x/(3*a*(a + b*(c*x^n)^(3/n))) - (2*x*ArcTan[(a^(1/3) - 2*b^(1/3)*
(c*x^n)^n^(-1))/(Sqrt[3]*a^(1/3))])/(3*Sqrt[3]*a^(5/3)*b^(1/3)*(c
*x^n)^n^(-1)) + (2*x*Log[a^(1/3) + b^(1/3)*(c*x^n)^n^(-1)])/(9*a^
(5/3)*b^(1/3)*(c*x^n)^n^(-1)) - (x*Log[a^(2/3) - a^(1/3)*b^(1/3)*
(c*x^n)^n^(-1) + b^(2/3)*(c*x^n)^(2/n)])/(9*a^(5/3)*b^(1/3)*(c*x^
n)^n^(-1))
```

Rubi in Sympy [A] time = 32.9159, size = 185, normalized size = 0.88

$$\frac{x}{3a\left(a+b(cx^n)^{\frac{3}{n}}\right)}+\frac{2x(cx^n)^{-\frac{1}{n}}\log\left(\sqrt[3]{a}+\sqrt[3]{b}(cx^n)^{\frac{1}{n}}\right)}{9a^{\frac{5}{3}}\sqrt[3]{b}}-\frac{x(cx^n)^{-\frac{1}{n}}\log\left(a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}(cx^n)^{\frac{1}{n}}+b^{\frac{2}{3}}(cx^n)^{\frac{2}{n}}\right)}{9a^{\frac{5}{3}}\sqrt[3]{b}}-\frac{2\sqrt{3}x(cx^n)^{-\frac{1}{n}}\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}-\frac{2\sqrt[3]{b}(cx^n)^{\frac{1}{n}}}{3}\right)}{\sqrt[3]{a}}\right)}{9a^{\frac{5}{3}}\sqrt[3]{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*(c*x**n)**(3/n))**2,x)
```

```
[Out] x/(3*a*(a + b*(c*x**n)**(3/n))) + 2*x*(c*x**n)**(-1/n)*log(a**(1/
3) + b**(1/3)*(c*x**n)**(1/n))/(9*a**(5/3)*b**(1/3)) - x*(c*x**n)
**(-1/n)*log(a**(2/3) - a**(1/3)*b**(1/3)*(c*x**n)**(1/n) + b**(2
```

```
/3)*(c*x**n)**(2/n))/(9*a**(5/3)*b**(1/3)) - 2*sqrt(3)*x*(c*x**n)
**(-1/n)*atan(sqrt(3)*(a**(1/3)/3 - 2*b**(1/3)*(c*x**n)**(1/n)/3)
/a**(1/3))/(9*a**(5/3)*b**(1/3))
```

Mathematica [A] time = 4.26296, size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+b\left(cx^n\right)^{3/n}\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(a + b*(c*x^n)^(3/n))^(-2),x]
```

```
[Out] Integrate[(a + b*(c*x^n)^(3/n))^(-2), x]
```

Maple [F] time = 0.658, size = 0, normalized size = 0.

$$\int \left(a+b\left(cx^n\right)^{3n^{-1}}\right)^{-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*(c*x^n)^(3/n))^2,x)
```

```
[Out] int(1/(a+b*(c*x^n)^(3/n))^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(3/n)*b + a)^(-2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.238991, size = 294, normalized size = 1.4

$$\frac{6\left(bc^{\frac{3}{n}}x^3+a\right)\arctan\left(\frac{2\sqrt{3}\left(a^2bc^{\frac{3}{n}}\right)^{\frac{1}{3}}x-\sqrt{3}a}{3a}\right)-\left(\sqrt{3}bc^{\frac{3}{n}}x^3+\sqrt{3}a\right)\log\left(\left(a^2bc^{\frac{3}{n}}\right)^{\frac{2}{3}}x^2-\left(a^2bc^{\frac{3}{n}}\right)^{\frac{1}{3}}ax+a^2\right)+2\left(\sqrt{3}bc^{\frac{3}{n}}x^3+\sqrt{3}a\right)\log\left(\left(a^2bc^{\frac{3}{n}}\right)^{\frac{1}{3}}x+a\right)+3\sqrt{3}\left(a^2bc^{\frac{3}{n}}\right)^{\frac{1}{3}}x}{9\left(\sqrt{3}abc^{\frac{3}{n}}x^3+\sqrt{3}a^2\right)\left(a^2bc^{\frac{3}{n}}\right)^{\frac{1}{3}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(3/n)*b + a)^(-2),x, algorithm="fricas")
```

```
[Out] 1/9*(6*(b*c^(3/n)*x^3 + a)*arctan(1/3*(2*sqrt(3)*(a^2*b*c^(3/n))^
(1/3)*x - sqrt(3)*a)/a) - (sqrt(3)*b*c^(3/n)*x^3 + sqrt(3)*a)*log
((a^2*b*c^(3/n))^(2/3)*x^2 - (a^2*b*c^(3/n))^(1/3)*a*x + a^2) + 2
*(sqrt(3)*b*c^(3/n)*x^3 + sqrt(3)*a)*log((a^2*b*c^(3/n))^(1/3)*x
+ a) + 3*sqrt(3)*(a^2*b*c^(3/n))^(1/3)*x)/((sqrt(3)*a*b*c^(3/n)*x
^3 + sqrt(3)*a^2)*(a^2*b*c^(3/n))^(1/3))
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a + b\left(cx^n\right)^{\frac{3}{n}}\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*(c*x**n)**(3/n))**2,x)
```

```
[Out] Integral((a + b*(c*x**n)**(3/n))**(-2), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(\left(cx^n\right)^{\frac{3}{n}}b + a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(3/n)*b + a)^(-2),x, algorithm="giac")
```

```
[Out] integrate(((c*x^n)^(3/n)*b + a)^(-2), x)
```

3.3038 $\int \frac{1}{\left(a+b(cx^n)^{3/n}\right)^3}\,dx$

Optimal. Leaf size=235

$$-\frac{5x\left(cx^n\right)^{-1/n}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}\left(cx^n\right)^{\frac{1}{n}}+b^{2/3}\left(cx^n\right)^{2/n}\right)}{54a^{8/3}\sqrt[3]{b}}+\frac{5x\left(cx^n\right)^{-1/n}\log\left(\sqrt[3]{a}+\sqrt[3]{b}\left(cx^n\right)^{\frac{1}{n}}\right)}{27a^{8/3}\sqrt[3]{b}}-\frac{5x\left(cx^n\right)^{-1/n}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(cx^n)^{\frac{1}{n}}}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{8/3}\sqrt[3]{b}}+\frac{5x}{18a^2\left(a+b\left(cx^n\right)^{3/n}\right)}+\frac{x}{6a\left(a+b\left(cx^n\right)^{3/n}\right)^2}$$

```
[Out] x/(6*a*(a + b*(c*x^n)^(3/n))^2) + (5*x)/(18*a^2*(a + b*(c*x^n)^(3
/n))) - (5*x*ArcTan[(a^(1/3) - 2*b^(1/3)*(c*x^n)^n^(-1))/(Sqrt[3]
*a^(1/3))])/(9*Sqrt[3]*a^(8/3)*b^(1/3)*(c*x^n)^n^(-1)) + (5*x*Log
[a^(1/3) + b^(1/3)*(c*x^n)^n^(-1)])/(27*a^(8/3)*b^(1/3)*(c*x^n)^n
^(-1)) - (5*x*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c*x^n)^n^(-1) + b^(2
/3)*(c*x^n)^(2/n)])/(54*a^(8/3)*b^(1/3)*(c*x^n)^n^(-1))
```

Rubi [A] time = 0.220745, antiderivative size = 235, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 8, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.471

$$-\frac{5x\left(cx^n\right)^{-1/n}\log\left(a^{2/3}-\sqrt[3]{a}\sqrt[3]{b}\left(cx^n\right)^{\frac{1}{n}}+b^{2/3}\left(cx^n\right)^{2/n}\right)}{54a^{8/3}\sqrt[3]{b}}+\frac{5x\left(cx^n\right)^{-1/n}\log\left(\sqrt[3]{a}+\sqrt[3]{b}\left(cx^n\right)^{\frac{1}{n}}\right)}{27a^{8/3}\sqrt[3]{b}}-\frac{5x\left(cx^n\right)^{-1/n}\tan^{-1}\left(\frac{\sqrt[3]{a}-2\sqrt[3]{b}(cx^n)^{\frac{1}{n}}}{\sqrt{3}\sqrt[3]{a}}\right)}{9\sqrt{3}a^{8/3}\sqrt[3]{b}}+\frac{5x}{18a^2\left(a+b\left(cx^n\right)^{3/n}\right)}+\frac{x}{6a\left(a+b\left(cx^n\right)^{3/n}\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(c*x^n)^(3/n))^(-3),x]
```


```
[Out] x/(6*a*(a + b*(c*x^n)^(3/n))^2) + (5*x)/(18*a^2*(a + b*(c*x^n)^(3
/n))) - (5*x*ArcTan[(a^(1/3) - 2*b^(1/3)*(c*x^n)^n^(-1))/(Sqrt[3]
*a^(1/3))])/(9*Sqrt[3]*a^(8/3)*b^(1/3)*(c*x^n)^n^(-1)) + (5*x*Log
[a^(1/3) + b^(1/3)*(c*x^n)^n^(-1)])/(27*a^(8/3)*b^(1/3)*(c*x^n)^n
^(-1)) - (5*x*Log[a^(2/3) - a^(1/3)*b^(1/3)*(c*x^n)^n^(-1) + b^(2
/3)*(c*x^n)^(2/n)])/(54*a^(8/3)*b^(1/3)*(c*x^n)^n^(-1))
```

Rubi in Sympy [A] time = 37.2975, size = 209, normalized size = 0.89

$$\frac{x}{6a\left(a+b\left(cx^n\right)^{\frac{3}{n}}\right)^2}+\frac{5x}{18a^2\left(a+b\left(cx^n\right)^{\frac{3}{n}}\right)}+\frac{5x\left(cx^n\right)^{-\frac{1}{n}}\log\left(\sqrt[3]{a}+\sqrt[3]{b}\left(cx^n\right)^{\frac{1}{n}}\right)}{27a^{\frac{8}{3}}\sqrt[3]{b}}-\frac{5x\left(cx^n\right)^{-\frac{1}{n}}\log\left(a^{\frac{2}{3}}-\sqrt[3]{a}\sqrt[3]{b}\left(cx^n\right)^{\frac{1}{n}}+b^{\frac{2}{3}}\left(cx^n\right)^{\frac{2}{n}}\right)}{54a^{\frac{8}{3}}\sqrt[3]{b}}-\frac{5\sqrt{3}x\left(cx^n\right)^{-\frac{1}{n}}\operatorname{atan}\left(\frac{\sqrt{3}\left(\frac{\sqrt[3]{a}}{3}-\frac{2\sqrt[3]{b}(cx^n)^{\frac{1}{n}}}{3}\right)}{\sqrt[3]{a}}\right)}{27a^{\frac{8}{3}}\sqrt[3]{b}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*(c*x**n)**(3/n))**3,x)
```

```
[Out] x/(6*a*(a + b*(c*x**n)**(3/n))**2) + 5*x/(18*a**2*(a + b*(c*x**n)
**(3/n))) + 5*x*(c*x**n)**(-1/n)*log(a**(1/3) + b**(1/3)*(c*x**n)
```

```
**(1/n))/(27*a**(8/3)*b**(1/3)) - 5*x*(c*x**n)**(-1/n)*log(a**(2/
3) - a**(1/3)*b**(1/3)*(c*x**n)**(1/n) + b**(2/3)*(c*x**n)**(2/n)
)/(54*a**(8/3)*b**(1/3)) - 5*sqrt(3)*x*(c*x**n)**(-1/n)*atan(sqrt
(3)*(a**(1/3)/3 - 2*b**(1/3)*(c*x**n)**(1/n)/3)/a**(1/3))/(27*a**
(8/3)*b**(1/3))
```

Mathematica [A] time = 4.36864, size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+b\left(cx^n\right)^{3/n}\right)^3}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(a + b*(c*x^n)^(3/n))^(-3),x]

[Out] Integrate[(a + b*(c*x^n)^(3/n))^(-3), x]
```

Maple [F] time = 0.045, size = 0, normalized size = 0.

$$\int \left(a+b\left(cx^n\right)^{3\,n^{-1}}\right)^{-3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*(c*x^n)^(3/n))^3,x)

[Out] int(1/(a+b*(c*x^n)^(3/n))^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(3/n)*b + a)^(-3),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [A] time = 0.238946, size = 433, normalized size = 1.84

$$\frac{30\left(b^2c^{\frac{6}{n}}x^6+2\,abc^{\frac{3}{n}}x^3+a^2\right)\arctan\left(\frac{2\sqrt{3}\left(a^2bc^{\frac{3}{n}}\right)^{\frac{1}{3}}x-\sqrt{3}a}{3\,a}\right)-5\left(\sqrt{3}b^2c^{\frac{6}{n}}x^6+2\sqrt{3}abc^{\frac{3}{n}}x^3+\sqrt{3}a^2\right)\log\left(\left(a^2bc^{\frac{3}{n}}\right)^{\frac{2}{3}}x^2-\left(a^2b\right.\right.}{54\left(\sqrt{3}a^2b^2c^{\frac{6}{n}}x^6+2\sqrt{3}a^3bc^{\frac{3}{n}}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(3/n)*b + a)^(-3),x, algorithm="fricas")

[Out] 1/54*(30*(b^2*c^(6/n)*x^6 + 2*a*b*c^(3/n)*x^3 + a^2)*arctan(1/3*(
2*sqrt(3)*(a^2*b*c^(3/n))^(1/3)*x - sqrt(3)*a)/a) - 5*(sqrt(3)*b^
2*c^(6/n)*x^6 + 2*sqrt(3)*a*b*c^(3/n)*x^3 + sqrt(3)*a^2)*log((a^2
*b*c^(3/n))^(2/3)*x^2 - (a^2*b*c^(3/n))^(1/3)*a*x + a^2) + 10*(sq
```

```
rt(3)*b^2*c^(6/n)*x^6 + 2*sqrt(3)*a*b*c^(3/n)*x^3 + sqrt(3)*a^2)*
log((a^2*b*c^(3/n))^(1/3)*x + a) + 3*(5*sqrt(3)*b*c^(3/n)*x^4 + 8
*sqrt(3)*a*x)*(a^2*b*c^(3/n))^(1/3))/((sqrt(3)*a^2*b^2*c^(6/n)*x^
6 + 2*sqrt(3)*a^3*b*c^(3/n)*x^3 + sqrt(3)*a^4)*(a^2*b*c^(3/n))^(1
/3))
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(a+b\left(cx^{n}\right)^{\frac{3}{n}}\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*(c*x**n)**(3/n))**3,x)
```

```
[Out] Integral((a + b*(c*x**n)**(3/n))**(-3), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(\left(cx^{n}\right)^{\frac{3}{n}}b+a\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(3/n)*b + a)^(-3),x, algorithm="giac")
```

```
[Out] integrate(((c*x^n)^(3/n)*b + a)^(-3), x)
```

3.3039 $\int (dx)^m (a+b(cx^q)^n)^p \, dx$

Optimal. Leaf size=86

$$\frac{(dx)^{m+1}(a+b(cx^q)^n)^p\left(\frac{b(cx^q)^n}{a}+1\right)^{-p}{}_2F_1\left(-p,\frac{m+1}{nq};\frac{m+1}{nq}+1;-\frac{b(cx^q)^n}{a}\right)}{d(m+1)}$$

```
[Out] ((d*x)^(1 + m)*(a + b*(c*x^q)^n)^p*Hypergeometric2F1[-p, (1 + m)/
(n*q), 1 + (1 + m)/(n*q), -((b*(c*x^q)^n)/a)])/(d*(1 + m)*(1 + (b
*(c*x^q)^n)/a)^p)
```

Rubi [A] time = 0.108517, antiderivative size = 86, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158

$$\frac{(dx)^{m+1}(a+b(cx^q)^n)^p\left(\frac{b(cx^q)^n}{a}+1\right)^{-p}{}_2F_1\left(-p,\frac{m+1}{nq};\frac{m+1}{nq}+1;-\frac{b(cx^q)^n}{a}\right)}{d(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(d*x)^m*(a + b*(c*x^q)^n)^p,x]
```

```
[Out] ((d*x)^(1 + m)*(a + b*(c*x^q)^n)^p*Hypergeometric2F1[-p, (1 + m)/
(n*q), 1 + (1 + m)/(n*q), -((b*(c*x^q)^n)/a)])/(d*(1 + m)*(1 + (b
*(c*x^q)^n)/a)^p)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (dx)^m \left(a+b(cx^q)^n\right)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x)**m*(a+b*(c*x**q)**n)**p,x)
```

```
[Out] Integral((d*x)**m*(a + b*(c*x**q)**n)**p, x)
```

Mathematica [A] time = 0.15789, size = 82, normalized size = 0.95

$$\frac{x(dx)^m(a+b(cx^q)^n)^p\left(\frac{b(cx^q)^n}{a}+1\right)^{-p}{}_2F_1\left(-p,\frac{m+1}{nq};\frac{m+1}{nq}+1;-\frac{b(cx^q)^n}{a}\right)}{m+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(d*x)^m*(a + b*(c*x^q)^n)^p,x]
```

```
[Out] (x*(d*x)^m*(a + b*(c*x^q)^n)^p*Hypergeometric2F1[-p, (1 + m)/(n*q
), 1 + (1 + m)/(n*q), -((b*(c*x^q)^n)/a)])/((1 + m)*(1 + (b*(c*x^
q)^n)/a)^p)
```

Maple [F] time = 2.078, size = 0, normalized size = 0.

$$\int (dx)^m \left(a+b(cx^q)^n\right)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x)^m*(a+b*(c*x^q)^n)^p,x)
```

```
[Out] int((d*x)^m*(a+b*(c*x^q)^n)^p,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left((cx^q)^n b + a \right)^p (dx)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^q)^n*b + a)^p*(d*x)^m,x, algorithm="maxima")
```

```
[Out] integrate(((c*x^q)^n*b + a)^p*(d*x)^m, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left((cx^q)^n b + a \right)^p (dx)^m , x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^q)^n*b + a)^p*(d*x)^m,x, algorithm="fricas")
```

```
[Out] integral(((c*x^q)^n*b + a)^p*(d*x)^m, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x)**m*(a+b*(c*x**q)**n)**p,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left((cx^q)^n b + a \right)^p (dx)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^q)^n*b + a)^p*(d*x)^m,x, algorithm="giac")
```

```
[Out] integrate(((c*x^q)^n*b + a)^p*(d*x)^m, x)
```

3.3040 $\int x^2 (a+b(cx^q)^n)^p \, dx$

Optimal. Leaf size=73

$$\frac{1}{3}x^3 \left(a+b\left(cx^q\right)^n\right)^p \left(\frac{b\left(cx^q\right)^n}{a}+1\right)^{-p} {}_2F_1\left(-p,\frac{3}{nq};1+\frac{3}{nq};-\frac{b\left(cx^q\right)^n}{a}\right)$$

```
[Out] (x^3*(a + b*(c*x^q)^n)^p*Hypergeometric2F1[-p, 3/(n*q), 1 + 3/(n*
q), -((b*(c*x^q)^n)/a)])/(3*(1 + (b*(c*x^q)^n)/a)^p)
```

Rubi [A] time = 0.0767556, antiderivative size = 73, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176

$$\frac{1}{3}x^3 \left(a+b\left(cx^q\right)^n\right)^p \left(\frac{b\left(cx^q\right)^n}{a}+1\right)^{-p} {}_2F_1\left(-p,\frac{3}{nq};1+\frac{3}{nq};-\frac{b\left(cx^q\right)^n}{a}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x^2*(a + b*(c*x^q)^n)^p,x]
```

```
[Out] (x^3*(a + b*(c*x^q)^n)^p*Hypergeometric2F1[-p, 3/(n*q), 1 + 3/(n*
q), -((b*(c*x^q)^n)/a)])/(3*(1 + (b*(c*x^q)^n)/a)^p)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^2 \left(a+b\left(cx^q\right)^n\right)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(a+b*(c*x**q)**n)**p,x)
```

```
[Out] Integral(x**2*(a + b*(c*x**q)**n)**p, x)
```

Mathematica [A] time = 0.0938475, size = 73, normalized size = 1.

$$\frac{1}{3}x^3 \left(a+b\left(cx^q\right)^n\right)^p \left(\frac{b\left(cx^q\right)^n}{a}+1\right)^{-p} {}_2F_1\left(-p,\frac{3}{nq};1+\frac{3}{nq};-\frac{b\left(cx^q\right)^n}{a}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x^2*(a + b*(c*x^q)^n)^p,x]
```

```
[Out] (x^3*(a + b*(c*x^q)^n)^p*Hypergeometric2F1[-p, 3/(n*q), 1 + 3/(n*
q), -((b*(c*x^q)^n)/a)])/(3*(1 + (b*(c*x^q)^n)/a)^p)
```

Maple [F] time = 0.468, size = 0, normalized size = 0.

$$\int x^2 \left(a+b\left(cx^q\right)^n\right)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(a+b*(c*x^q)^n)^p,x)
```

```
[Out] int(x^2*(a+b*(c*x^q)^n)^p,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(\left(cx^q\right)^n b + a\right)^p x^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((c*x^q)^n*b + a)^p*x^2,x, algorithm="maxima")
```

```
[Out] integrate(((c*x^q)^n*b + a)^p*x^2, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(\left(cx^q\right)^n b + a\right)^p x^2, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((c*x^q)^n*b + a)^p*x^2,x, algorithm="fricas")
```

```
[Out] integral(((c*x^q)^n*b + a)^p*x^2, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^2 \left(a + b \left(cx^q\right)^n\right)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*(c*x**q)**n)**p,x)
```

```
[Out] Integral(x**2*(a + b*(c*x**q)**n)**p, x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(\left(cx^q\right)^n b + a\right)^p x^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((c*x^q)^n*b + a)^p*x^2,x, algorithm="giac")
```

```
[Out] integrate(((c*x^q)^n*b + a)^p*x^2, x)
```

3.3041 $\int x (a + b (cx^q)^n)^p \, dx$

Optimal. Leaf size=73

$$\frac{1}{2}x^2 \left(a+b\left(cx^q\right)^n\right)^p \left(\frac{b\left(cx^q\right)^n}{a}+1\right)^{-p} {}_2F_1\left(-p,\frac{2}{nq};1+\frac{2}{nq};-\frac{b\left(cx^q\right)^n}{a}\right)$$

```
[Out] (x^2*(a + b*(c*x^q)^n)^p*Hypergeometric2F1[-p, 2/(n*q), 1 + 2/(n*
q), -((b*(c*x^q)^n)/a)])/(2*(1 + (b*(c*x^q)^n)/a)^p)
```

Rubi [A] time = 0.0671424, antiderivative size = 73, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{1}{2}x^2 \left(a+b\left(cx^q\right)^n\right)^p \left(\frac{b\left(cx^q\right)^n}{a}+1\right)^{-p} {}_2F_1\left(-p,\frac{2}{nq};1+\frac{2}{nq};-\frac{b\left(cx^q\right)^n}{a}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[x*(a + b*(c*x^q)^n)^p,x]
```

```
[Out] (x^2*(a + b*(c*x^q)^n)^p*Hypergeometric2F1[-p, 2/(n*q), 1 + 2/(n*
q), -((b*(c*x^q)^n)/a)])/(2*(1 + (b*(c*x^q)^n)/a)^p)
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x \left(a+b\left(cx^q\right)^n\right)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(a+b*(c*x**q)**n)**p,x)
```

```
[Out] Integral(x*(a + b*(c*x**q)**n)**p, x)
```

Mathematica [A] time = 0.0895389, size = 73, normalized size = 1.

$$\frac{1}{2}x^2 \left(a+b\left(cx^q\right)^n\right)^p \left(\frac{b\left(cx^q\right)^n}{a}+1\right)^{-p} {}_2F_1\left(-p,\frac{2}{nq};1+\frac{2}{nq};-\frac{b\left(cx^q\right)^n}{a}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[x*(a + b*(c*x^q)^n)^p,x]
```

```
[Out] (x^2*(a + b*(c*x^q)^n)^p*Hypergeometric2F1[-p, 2/(n*q), 1 + 2/(n*
q), -((b*(c*x^q)^n)/a)])/(2*(1 + (b*(c*x^q)^n)/a)^p)
```

Maple [F] time = 0.338, size = 0, normalized size = 0.

$$\int x \left(a+b\left(cx^q\right)^n\right)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(a+b*(c*x^q)^n)^p,x)
```

```
[Out] int(x*(a+b*(c*x^q)^n)^p,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int ((cx^q)^n b + a)^p x \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^q)^n*b + a)^p*x,x, algorithm="maxima")
```

```
[Out] integrate(((c*x^q)^n*b + a)^p*x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(((cx^q)^n b + a)^p x, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^q)^n*b + a)^p*x,x, algorithm="fricas")
```

```
[Out] integral(((c*x^q)^n*b + a)^p*x, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x \left(a + b (cx^q)^n\right)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(a+b*(c*x**q)**n)**p,x)
```

```
[Out] Integral(x*(a + b*(c*x**q)**n)**p, x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int ((cx^q)^n b + a)^p x \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^q)^n*b + a)^p*x,x, algorithm="giac")
```

```
[Out] integrate(((c*x^q)^n*b + a)^p*x, x)
```

3.3042 $\int (a+b(cx^q)^n)^p \, dx$

Optimal. Leaf size=66

$$x\left(a+b\left(cx^q\right)^n\right)^p\left(\frac{b\left(cx^q\right)^n}{a}+1\right)^{-p} {}_2F_1\left(-p,\frac{1}{nq};1+\frac{1}{nq};-\frac{b\left(cx^q\right)^n}{a}\right)$$

```
[Out] (x*(a + b*(c*x^q)^n)^p*Hypergeometric2F1[-p, 1/(n*q), 1 + 1/(n*q)
, -((b*(c*x^q)^n)/a)])/(1 + (b*(c*x^q)^n)/a)^p
```

Rubi [A] time = 0.0492252, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$x\left(a+b\left(cx^q\right)^n\right)^p\left(\frac{b\left(cx^q\right)^n}{a}+1\right)^{-p} {}_2F_1\left(-p,\frac{1}{nq};1+\frac{1}{nq};-\frac{b\left(cx^q\right)^n}{a}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(c*x^q)^n)^p,x]
```

```
[Out] (x*(a + b*(c*x^q)^n)^p*Hypergeometric2F1[-p, 1/(n*q), 1 + 1/(n*q)
, -((b*(c*x^q)^n)/a)])/(1 + (b*(c*x^q)^n)/a)^p
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \left(a+b\left(cx^q\right)^n\right)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x**q)**n)**p,x)
```

```
[Out] Integral((a + b*(c*x**q)**n)**p, x)
```

Mathematica [A] time = 0.079094, size = 66, normalized size = 1.

$$x\left(a+b\left(cx^q\right)^n\right)^p\left(\frac{b\left(cx^q\right)^n}{a}+1\right)^{-p} {}_2F_1\left(-p,\frac{1}{nq};1+\frac{1}{nq};-\frac{b\left(cx^q\right)^n}{a}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(c*x^q)^n)^p,x]
```

```
[Out] (x*(a + b*(c*x^q)^n)^p*Hypergeometric2F1[-p, 1/(n*q), 1 + 1/(n*q)
, -((b*(c*x^q)^n)/a)])/(1 + (b*(c*x^q)^n)/a)^p
```

Maple [F] time = 0.233, size = 0, normalized size = 0.

$$\int \left(a+b\left(cx^q\right)^n\right)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^q)^n)^p,x)
```

```
[Out] int((a+b*(c*x^q)^n)^p,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int ((cx^q)^n b + a)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^q)^n*b + a)^p,x, algorithm="maxima")
```

```
[Out] integrate(((c*x^q)^n*b + a)^p, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(((cx^q)^n b + a)^p, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^q)^n*b + a)^p,x, algorithm="fricas")
```

```
[Out] integral(((c*x^q)^n*b + a)^p, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \left(a + b (cx^q)^n\right)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**q)**n)**p,x)
```

```
[Out] Integral((a + b*(c*x**q)**n)**p, x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int ((cx^q)^n b + a)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^q)^n*b + a)^p,x, algorithm="giac")
```

```
[Out] integrate(((c*x^q)^n*b + a)^p, x)
```

3.3043 $\int \frac{(a+b(cx^q)^n)^p}{x}\,dx$

Optimal. Leaf size=53

$$-\frac{(a+b\,(cx^q)^n)^{p+1}\,{}_2F_1\left(1,p+1;p+2;\frac{b(cx^q)^n}{a}+1\right)}{an(p+1)q}$$

```
[Out] -(((a + b*(c*x^q)^n)^(1 + p)*Hypergeometric2F1[1, 1 + p, 2 + p, 1
 + (b*(c*x^q)^n)/a])/(a*n*(1 + p)*q))
```

Rubi [A] time = 0.0841715, antiderivative size = 53, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176

$$-\frac{(a+b\,(cx^q)^n)^{p+1}\,{}_2F_1\left(1,p+1;p+2;\frac{b(cx^q)^n}{a}+1\right)}{an(p+1)q}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(c*x^q)^n)^p/x,x]
```

```
[Out] -(((a + b*(c*x^q)^n)^(1 + p)*Hypergeometric2F1[1, 1 + p, 2 + p, 1
 + (b*(c*x^q)^n)/a])/(a*n*(1 + p)*q))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a+b\,(cx^q)^n)^p}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x**q)**n)**p/x,x)
```

```
[Out] Integral((a + b*(c*x**q)**n)**p/x, x)
```

Mathematica [A] time = 0.104769, size = 70, normalized size = 1.32

$$\frac{\left(\frac{a(cx^q)^{-n}}{b}+1\right)^{-p}(a+b\,(cx^q)^n)^p\,{}_2F_1\left(-p,-p;1-p;-\frac{a(cx^q)^{-n}}{b}\right)}{npq}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(c*x^q)^n)^p/x,x]
```

```
[Out] ((a + b*(c*x^q)^n)^p*Hypergeometric2F1[-p, -p, 1 - p, -(a/(b*(c*x
^q)^n))])/(n*p*q*(1 + a/(b*(c*x^q)^n))^p)
```

Maple [F] time = 0.472, size = 0, normalized size = 0.

$$\int \frac{(a+b\,(cx^q)^n)^p}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^q)^n)^p/x,x)
```

```
[Out] int((a+b*(c*x^q)^n)^p/x,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{((cx^q)^n b + a)^p}{x} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^q)^n*b + a)^p/x,x, algorithm="maxima")
```

```
[Out] integrate(((c*x^q)^n*b + a)^p/x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{((cx^q)^n b + a)^p}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^q)^n*b + a)^p/x,x, algorithm="fricas")
```

```
[Out] integral(((c*x^q)^n*b + a)^p/x, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a + b (cx^q)^n)^p}{x} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**q)**n)**p/x,x)
```

```
[Out] Integral((a + b*(c*x**q)**n)**p/x, x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{((cx^q)^n b + a)^p}{x} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^q)^n*b + a)^p/x,x, algorithm="giac")
```

```
[Out] integrate(((c*x^q)^n*b + a)^p/x, x)
```

3.3044 $\int \frac{(a+b(cx^q)^n)^p}{x^2} dx$

Optimal. Leaf size=71

$$-\frac{(a+b(cx^q)^n)^p\left(\frac{b(cx^q)^n}{a}+1\right)^{-p} {}_2F_1\left(-p,-\frac{1}{nq};1-\frac{1}{nq};-\frac{b(cx^q)^n}{a}\right)}{x}$$

```
[Out] -(((a + b*(c*x^q)^n)^p*Hypergeometric2F1[-p, -(1/(n*q)), 1 - 1/(n
*q), -((b*(c*x^q)^n)/a)])/(x*(1 + (b*(c*x^q)^n)/a)^p))
```

Rubi [A] time = 0.0747531, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176

$$-\frac{(a+b(cx^q)^n)^p\left(\frac{b(cx^q)^n}{a}+1\right)^{-p} {}_2F_1\left(-p,-\frac{1}{nq};1-\frac{1}{nq};-\frac{b(cx^q)^n}{a}\right)}{x}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*(c*x^q)^n)^p/x^2,x]
```

```
[Out] -(((a + b*(c*x^q)^n)^p*Hypergeometric2F1[-p, -(1/(n*q)), 1 - 1/(n
*q), -((b*(c*x^q)^n)/a)])/(x*(1 + (b*(c*x^q)^n)/a)^p))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a+b(cx^q)^n)^p}{x^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*(c*x**q)**n)**p/x**2,x)
```

```
[Out] Integral((a + b*(c*x**q)**n)**p/x**2, x)
```

Mathematica [A] time = 0.0928376, size = 71, normalized size = 1.

$$-\frac{(a+b(cx^q)^n)^p\left(\frac{b(cx^q)^n}{a}+1\right)^{-p} {}_2F_1\left(-p,-\frac{1}{nq};1-\frac{1}{nq};-\frac{b(cx^q)^n}{a}\right)}{x}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*(c*x^q)^n)^p/x^2,x]
```

```
[Out] -(((a + b*(c*x^q)^n)^p*Hypergeometric2F1[-p, -(1/(n*q)), 1 - 1/(n
*q), -((b*(c*x^q)^n)/a)])/(x*(1 + (b*(c*x^q)^n)/a)^p))
```

Maple [F] time = 0.332, size = 0, normalized size = 0.

$$\int \frac{(a+b(cx^q)^n)^p}{x^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*(c*x^q)^n)^p/x^2,x)
```

```
[Out] int((a+b*(c*x^q)^n)^p/x^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{((cx^q)^n b + a)^p}{x^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^q)^n*b + a)^p/x^2,x, algorithm="maxima")
```

```
[Out] integrate(((c*x^q)^n*b + a)^p/x^2, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{((cx^q)^n b + a)^p}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^q)^n*b + a)^p/x^2,x, algorithm="fricas")
```

```
[Out] integral(((c*x^q)^n*b + a)^p/x^2, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a + b (cx^q)^n)^p}{x^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+b*(c*x**q)**n)**p/x**2,x)
```

```
[Out] Integral((a + b*(c*x**q)**n)**p/x**2, x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{((cx^q)^n b + a)^p}{x^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^q)^n*b + a)^p/x^2,x, algorithm="giac")
```

```
[Out] integrate(((c*x^q)^n*b + a)^p/x^2, x)
```

3.3045 $\int \sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}x^m\,dx$

Optimal. Leaf size=230

$$\frac{x^{m+1}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}F_1\left(-2(m+1);-\frac{1}{2},-\frac{1}{2};-2m-1;-\frac{2c\sqrt{\frac{d}{x}}}{\sqrt{d}\left(b\sqrt{d}-\sqrt{b^2d-4ac}\right)},-\frac{2c\sqrt{\frac{d}{x}}}{\sqrt{d}\left(\sqrt{d}b+\sqrt{b^2d-4ac}\right)}\right)}{(m+1)\sqrt{\frac{2c\sqrt{\frac{d}{x}}}{\sqrt{d}\left(b\sqrt{d}-\sqrt{b^2d-4ac}\right)}+1}\sqrt{\frac{2c\sqrt{\frac{d}{x}}}{\sqrt{d}\left(\sqrt{b^2d-4ac}+b\sqrt{d}\right)}+1}}$$

```
[Out] (Sqrt[a + b*Sqrt[d/x] + c/x]*x^(1 + m)*AppellF1[-2*(1 + m), -1/2,
 -1/2, -1 - 2*m, (-2*c*Sqrt[d/x])/(Sqrt[d]*(b*Sqrt[d] - Sqrt[-4*a
*c + b^2*d])), (-2*c*Sqrt[d/x])/(Sqrt[d]*(b*Sqrt[d] + Sqrt[-4*a*c
 + b^2*d]))])/((1 + m)*Sqrt[1 + (2*c*Sqrt[d/x])/(Sqrt[d]*(b*Sqrt[
d] - Sqrt[-4*a*c + b^2*d]))]*Sqrt[1 + (2*c*Sqrt[d/x])/(Sqrt[d]*(b
*Sqrt[d] + Sqrt[-4*a*c + b^2*d]))])
```

Rubi [A] time = 1.56698, antiderivative size = 230, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$

$$\frac{x^{m+1}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}F_1\left(-2(m+1);-\frac{1}{2},-\frac{1}{2};-2m-1;-\frac{2c\sqrt{\frac{d}{x}}}{\sqrt{d}\left(b\sqrt{d}-\sqrt{b^2d-4ac}\right)},-\frac{2c\sqrt{\frac{d}{x}}}{\sqrt{d}\left(\sqrt{d}b+\sqrt{b^2d-4ac}\right)}\right)}{(m+1)\sqrt{\frac{2c\sqrt{\frac{d}{x}}}{\sqrt{d}\left(b\sqrt{d}-\sqrt{b^2d-4ac}\right)}+1}\sqrt{\frac{2c\sqrt{\frac{d}{x}}}{\sqrt{d}\left(\sqrt{b^2d-4ac}+b\sqrt{d}\right)}+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[d/x] + c/x]*x^m,x]
```

```
[Out] (Sqrt[a + b*Sqrt[d/x] + c/x]*x^(1 + m)*AppellF1[-2*(1 + m), -1/2,
 -1/2, -1 - 2*m, (-2*c*Sqrt[d/x])/(Sqrt[d]*(b*Sqrt[d] - Sqrt[-4*a
*c + b^2*d])), (-2*c*Sqrt[d/x])/(Sqrt[d]*(b*Sqrt[d] + Sqrt[-4*a*c
 + b^2*d]))])/((1 + m)*Sqrt[1 + (2*c*Sqrt[d/x])/(Sqrt[d]*(b*Sqrt[
d] - Sqrt[-4*a*c + b^2*d]))]*Sqrt[1 + (2*c*Sqrt[d/x])/(Sqrt[d]*(b
*Sqrt[d] + Sqrt[-4*a*c + b^2*d]))])
```

Rubi in Sympy [A] time = 75.9263, size = 211, normalized size = 0.92

$$\frac{dx^m\left(\frac{d}{x}\right)^m\left(\frac{d}{x}\right)^{-m-1}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\,\mathrm{appellf_1}\left(-2m-2,-\frac{1}{2},-\frac{1}{2},-2m-1,-\frac{2c\sqrt{\frac{d}{x}}}{\sqrt{d}\left(b\sqrt{d}-\sqrt{-4ac+b^2d}\right)},-\frac{2c\sqrt{\frac{d}{x}}}{\sqrt{d}\left(b\sqrt{d}+\sqrt{-4ac+b^2d}\right)}\right)}{(m+1)\sqrt{\frac{2c\sqrt{\frac{d}{x}}}{\sqrt{d}\left(b\sqrt{d}-\sqrt{-4ac+b^2d}\right)}+1}\sqrt{\frac{2c\sqrt{\frac{d}{x}}}{\sqrt{d}\left(b\sqrt{d}+\sqrt{-4ac+b^2d}\right)}+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m*(a+c/x+b*(d/x)**(1/2))**(1/2),x)
```

```
[Out] d*x**m*(d/x)**m*(d/x)**(-m - 1)*sqrt(a + b*sqrt(d/x) + c/x)*appel
lf1(-2*m - 2, -1/2, -1/2, -2*m - 1, -2*c*sqrt(d/x)/(sqrt(d)*(b*sq
rt(d) - sqrt(-4*a*c + b**2*d))), -2*c*sqrt(d/x)/(sqrt(d)*(b*sqrt(
d) + sqrt(-4*a*c + b**2*d))))/((m + 1)*sqrt(2*c*sqrt(d/x)/(sqrt(d
)*(b*sqrt(d) - sqrt(-4*a*c + b**2*d))) + 1)*sqrt(2*c*sqrt(d/x)/(s
qrt(d)*(b*sqrt(d) + sqrt(-4*a*c + b**2*d))) + 1))
```

Mathematica [A] time = 0.114251, size = 0, normalized size = 0.

$$\int \sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}x^m\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[Sqrt[a + b*Sqrt[d/x] + c/x]*x^m,x]
```

```
[Out] Integrate[Sqrt[a + b*Sqrt[d/x] + c/x]*x^m, x]
```

Maple [F] time = 0.028, size = 0, normalized size = 0.

$$\int x^m\sqrt{a+\frac{c}{x}+b\sqrt{\frac{d}{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m*(a+c/x+b*(d/x)^(1/2))^(1/2),x)
```

```
[Out] int(x^m*(a+c/x+b*(d/x)^(1/2))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{b\sqrt{\frac{d}{x}}+a+\frac{c}{x}}x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(d/x) + a + c/x)*x^m,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*sqrt(d/x) + a + c/x)*x^m, x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(d/x) + a + c/x)*x^m,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^m\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m*(a+c/x+b*(d/x)**(1/2))**(1/2),x)
```

```
[Out] Integral(x**m*sqrt(a + b*sqrt(d/x) + c/x), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{b\sqrt{\frac{d}{x}} + a + \frac{c}{x}}x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(d/x) + a + c/x)*x^m,x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*sqrt(d/x) + a + c/x)*x^m, x)
```

3.3046 $\int \sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\,x^2\,dx$

Optimal. Leaf size=333

$$\frac{7bd^2(28ac-15b^2d)\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{480a^4\left(\frac{d}{x}\right)^{3/2}}-\frac{x^2(20ac-21b^2d)\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{80a^3}-\frac{3bd^3\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{10a^2\left(\frac{d}{x}\right)^{5/2}}+\frac{(4ac-b^2d)(16a^2c^2-56ab^2cd+21b^4d^2)\tanh^{-1}\left(\frac{2a+b\sqrt{\frac{d}{x}}}{2\sqrt{a}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{512a^{11/2}}+\frac{x(16a^2c^2-56ab^2cd+21b^4d^2)\left(2a+b\sqrt{\frac{d}{x}}\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{256a^5}+\frac{x^3\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{3a}$$

```
[Out] (-3*b*d^3*(a + b*Sqrt[d/x] + c/x)^(3/2))/(10*a^2*(d/x)^(5/2)) + (
7*b*d^2*(28*a*c - 15*b^2*d)*(a + b*Sqrt[d/x] + c/x)^(3/2))/(480*a
^4*(d/x)^(3/2)) + ((16*a^2*c^2 - 56*a*b^2*c*d + 21*b^4*d^2)*(2*a
+ b*Sqrt[d/x])*Sqrt[a + b*Sqrt[d/x] + c/x]*x)/(256*a^5) - ((20*a*
c - 21*b^2*d)*(a + b*Sqrt[d/x] + c/x)^(3/2)*x^2)/(80*a^3) + ((a +
 b*Sqrt[d/x] + c/x)^(3/2)*x^3)/(3*a) + ((4*a*c - b^2*d)*(16*a^2*c
^2 - 56*a*b^2*c*d + 21*b^4*d^2)*ArcTanh[(2*a + b*Sqrt[d/x])/(2*Sq
rt[a]*Sqrt[a + b*Sqrt[d/x] + c/x])])/(512*a^(11/2))
```

Rubi [A] time = 1.44905, antiderivative size = 333, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 8, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{7bd^2(28ac-15b^2d)\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{480a^4\left(\frac{d}{x}\right)^{3/2}}-\frac{x^2(20ac-21b^2d)\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{80a^3}-\frac{3bd^3\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{10a^2\left(\frac{d}{x}\right)^{5/2}}+\frac{(4ac-b^2d)(16a^2c^2-56ab^2cd+21b^4d^2)\tanh^{-1}\left(\frac{2a+b\sqrt{\frac{d}{x}}}{2\sqrt{a}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{512a^{11/2}}+\frac{x(16a^2c^2-56ab^2cd+21b^4d^2)\left(2a+b\sqrt{\frac{d}{x}}\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{256a^5}+\frac{x^3\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{3a}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[d/x] + c/x]*x^2,x]
```


```
[Out] (-3*b*d^3*(a + b*Sqrt[d/x] + c/x)^(3/2))/(10*a^2*(d/x)^(5/2)) + (
7*b*d^2*(28*a*c - 15*b^2*d)*(a + b*Sqrt[d/x] + c/x)^(3/2))/(480*a
^4*(d/x)^(3/2)) + ((16*a^2*c^2 - 56*a*b^2*c*d + 21*b^4*d^2)*(2*a
+ b*Sqrt[d/x])*Sqrt[a + b*Sqrt[d/x] + c/x]*x)/(256*a^5) - ((20*a*
c - 21*b^2*d)*(a + b*Sqrt[d/x] + c/x)^(3/2)*x^2)/(80*a^3) + ((a +
 b*Sqrt[d/x] + c/x)^(3/2)*x^3)/(3*a) + ((4*a*c - b^2*d)*(16*a^2*c
^2 - 56*a*b^2*c*d + 21*b^4*d^2)*ArcTanh[(2*a + b*Sqrt[d/x])/(2*Sq
rt[a]*Sqrt[a + b*Sqrt[d/x] + c/x])])/(512*a^(11/2))
```

Rubi in Sympy [A] time = 112.808, size = 287, normalized size = 0.86

$$\frac{x^3\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{\frac{3}{2}}}{3a}-\frac{3bd^3\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{\frac{3}{2}}}{10a^2\left(\frac{d}{x}\right)^{\frac{5}{2}}}-\frac{x^2\left(20ac-21b^2d\right)\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{\frac{3}{2}}}{80a^3}+\frac{7bd^2\left(28ac-15b^2d\right)\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{\frac{3}{2}}}{480a^4\left(\frac{d}{x}\right)^{\frac{3}{2}}}+\frac{x\left(2a+b\sqrt{\frac{d}{x}}\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\left(16a^2c^2-56ab^2cd+21b^4d^2\right)}{256a^5}+\frac{\left(4ac-b^2d\right)\left(16a^2c^2-56ab^2cd+21b^4d^2\right)\operatorname{atanh}\left(\frac{2a+b\sqrt{\frac{d}{x}}}{2\sqrt{a}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{512a^{\frac{11}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**2*(a+c/x+b*(d/x)**(1/2))**(1/2),x)
```

```
[Out] x**3*(a + b*sqrt(d/x) + c/x)**(3/2)/(3*a) - 3*b*d**3*(a + b*sqrt(
d/x) + c/x)**(3/2)/(10*a**2*(d/x)**(5/2)) - x**2*(20*a*c - 21*b**
2*d)*(a + b*sqrt(d/x) + c/x)**(3/2)/(80*a**3) + 7*b*d**2*(28*a*c
- 15*b**2*d)*(a + b*sqrt(d/x) + c/x)**(3/2)/(480*a**4*(d/x)**(3/2
)) + x*(2*a + b*sqrt(d/x))*sqrt(a + b*sqrt(d/x) + c/x)*(16*a**2*c
**2 - 56*a*b**2*c*d + 21*b**4*d**2)/(256*a**5) + (4*a*c - b**2*d)
*(16*a**2*c**2 - 56*a*b**2*c*d + 21*b**4*d**2)*atanh((2*a + b*sqr
t(d/x))/(2*sqrt(a)*sqrt(a + b*sqrt(d/x) + c/x)))/(512*a**(11/2))
```

Mathematica [A] time = 0.094889, size = 0, normalized size = 0.

$$\int \sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}x^2\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[Sqrt[a + b*Sqrt[d/x] + c/x]*x^2,x]
```

```
[Out] Integrate[Sqrt[a + b*Sqrt[d/x] + c/x]*x^2, x]
```

Maple [B] time = 0.041, size = 655, normalized size = 2.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^2*(a+c/x+b*(d/x)^(1/2))^(1/2),x)
```

```
[Out] 1/7680*((b*(d/x)^(1/2)*x+a*x+c)/x)^(1/2)*x^(1/2)*(630*a^(3/2)*(b*
(d/x)^(1/2)*x+a*x+c)^(1/2)*(d/x)^(5/2)*x^(5/2)*b^5+2560*x^(3/2)*(
b*(d/x)^(1/2)*x+a*x+c)^(3/2)*a^(11/2)-2304*a^(9/2)*(b*(d/x)^(1/2)
*x+a*x+c)^(3/2)*(d/x)^(1/2)*x^(3/2)*b-1680*a^(5/2)*(b*(d/x)^(1/2)
*x+a*x+c)^(3/2)*(d/x)^(3/2)*x^(3/2)*b^3+1260*a^(5/2)*(b*(d/x)^(1/
2)*x+a*x+c)^(1/2)*d^2*x^(1/2)*b^4-315*ln(1/2*(b*(d/x)^(1/2)*x^(1/
2)+2*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*a^(1/2)+2*a*x^(1/2))/a^(1/2))*
d^3*a*b^6+2016*a^(7/2)*(b*(d/x)^(1/2)*x+a*x+c)^(3/2)*d*x^(1/2)*b^
```

```
2-1680*a^(5/2)*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*(d/x)^(3/2)*x^(3/2)*
b^3*c-3360*a^(7/2)*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*d*x^(1/2)*b^2*c-
1920*a^(9/2)*(b*(d/x)^(1/2)*x+a*x+c)^(3/2)*x^(1/2)*c+3136*a^(7/2)
*(b*(d/x)^(1/2)*x+a*x+c)^(3/2)*(d/x)^(1/2)*x^(1/2)*b*c+2100*ln(1/
2*(b*(d/x)^(1/2)*x^(1/2)+2*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*a^(1/2)+
2*a*x^(1/2))/a^(1/2))*d^2*a^2*b^4*c+960*a^(9/2)*(b*(d/x)^(1/2)*x+
a*x+c)^(1/2)*x^(1/2)*c^2+480*a^(7/2)*(b*(d/x)^(1/2)*x+a*x+c)^(1/2
)*(d/x)^(1/2)*x^(1/2)*b*c^2-3600*ln(1/2*(b*(d/x)^(1/2)*x^(1/2)+2*
(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*a^(1/2)+2*a*x^(1/2))/a^(1/2))*d*a^3
*b^2*c^2+960*ln(1/2*(b*(d/x)^(1/2)*x^(1/2)+2*(b*(d/x)^(1/2)*x+a*x
+c)^(1/2)*a^(1/2)+2*a*x^(1/2))/a^(1/2))*a^4*c^3)/(b*(d/x)^(1/2)*x
+a*x+c)^(1/2)/a^(13/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{b\sqrt{\frac{d}{x}} + a + \frac{c}{x}}x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(d/x) + a + c/x)*x^2,x, algorithm="maxima")

[Out] integrate(sqrt(b*sqrt(d/x) + a + c/x)*x^2, x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(d/x) + a + c/x)*x^2,x, algorithm="fricas")

[Out] Timed out
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^2\sqrt{a + b\sqrt{\frac{d}{x}} + \frac{c}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2*(a+c/x+b*(d/x)**(1/2))**(1/2),x)

[Out] Integral(x**2*sqrt(a + b*sqrt(d/x) + c/x), x)
```

GIAC/XCAS [A] time = 0.339219, size = 558, normalized size = 1.68

$$\frac{1}{7680}\left(2\sqrt{b\sqrt{d}\sqrt{x} + ax + c}\left(2\left(4\left(2\left(8\sqrt{x}\left(\frac{b\sqrt{d}}{a} + 10\sqrt{x}\right) - \frac{9a^3b^2d - 20a^4c}{a^5}\right)\sqrt{x} + \frac{21a^2b^3d^{\frac{3}{2}} - 68a^3bc\sqrt{d}}{a^5}\right)\sqrt{x} - \frac{105ab^4}{}\right.\right.\right.\right.$$

$$-\frac{\left(315b^6d^3\ln\left(\left|-b\sqrt{d} + 2\sqrt{a}\sqrt{c}\right|\right) - 2100ab^4cd^2\ln\left(\left|-b\sqrt{d} + 2\sqrt{a}\sqrt{c}\right|\right) + 630\sqrt{a}b^5\sqrt{c}d^{\frac{5}{2}} + 3600a^2b^2c^2d\ln\left(\left|-b\sqrt{d} + 2\sqrt{a}\sqrt{}\right.\right.\right.}{7680a^{\frac{11}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(d/x) + a + c/x)*x^2,x, algorithm="giac")
```

```
[Out] 1/7680*(2*sqrt(b*sqrt(d)*sqrt(x) + a*x + c)*(2*(4*(2*(8*sqrt(x)*(
b*sqrt(d)/a + 10*sqrt(x)) - (9*a^3*b^2*d - 20*a^4*c)/a^5)*sqrt(x)
 + (21*a^2*b^3*d^(3/2) - 68*a^3*b*c*sqrt(d))/a^5)*sqrt(x) - (105*
a*b^4*d^2 - 448*a^2*b^2*c*d + 240*a^3*c^2)/a^5)*sqrt(x) + (315*b^
5*d^(5/2) - 1680*a*b^3*c*d^(3/2) + 1808*a^2*b*c^2*sqrt(d))/a^5) +
 15*(21*b^6*d^3 - 140*a*b^4*c*d^2 + 240*a^2*b^2*c^2*d - 64*a^3*c^
3)*ln(abs(-b*sqrt(d) - 2*sqrt(a)*(sqrt(a)*sqrt(x) - sqrt(b*sqrt(d
)*sqrt(x) + a*x + c))))/a^(11/2))*sign(x) - 1/7680*(315*b^6*d^3*l
n(abs(-b*sqrt(d) + 2*sqrt(a)*sqrt(c))) - 2100*a*b^4*c*d^2*ln(abs(
-b*sqrt(d) + 2*sqrt(a)*sqrt(c))) + 630*sqrt(a)*b^5*sqrt(c)*d^(5/2
) + 3600*a^2*b^2*c^2*d*ln(abs(-b*sqrt(d) + 2*sqrt(a)*sqrt(c))) -
3360*a^(3/2)*b^3*c^(3/2)*d^(3/2) - 960*a^3*c^3*ln(abs(-b*sqrt(d)
+ 2*sqrt(a)*sqrt(c))) + 3616*a^(5/2)*b*c^(5/2)*sqrt(d))*sign(x)/a
^(11/2)
```

3.3047 $\int \sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}x\,dx$

Optimal. Leaf size=209

$$-\frac{(4ac-5b^2d)(4ac-b^2d)\tanh^{-1}\left(\frac{2a+b\sqrt{\frac{d}{x}}}{2\sqrt{a}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{64a^{7/2}}-\frac{x(4ac-5b^2d)\left(2a+b\sqrt{\frac{d}{x}}\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{32a^3}-\frac{5bd^2\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{12a^2\left(\frac{d}{x}\right)^{3/2}}+\frac{x^2\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{2a}$$

```
[Out] (-5*b*d^2*(a + b*Sqrt[d/x] + c/x)^(3/2))/(12*a^2*(d/x)^(3/2)) - (
(4*a*c - 5*b^2*d)*(2*a + b*Sqrt[d/x])*Sqrt[a + b*Sqrt[d/x] + c/x]
*x)/(32*a^3) + ((a + b*Sqrt[d/x] + c/x)^(3/2)*x^2)/(2*a) - ((4*a*
c - 5*b^2*d)*(4*a*c - b^2*d)*ArcTanh[(2*a + b*Sqrt[d/x])/(2*Sqrt[
a]*Sqrt[a + b*Sqrt[d/x] + c/x])])/(64*a^(7/2))
```

Rubi [A] time = 0.691702, antiderivative size = 209, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.292

$$-\frac{(4ac-5b^2d)(4ac-b^2d)\tanh^{-1}\left(\frac{2a+b\sqrt{\frac{d}{x}}}{2\sqrt{a}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{64a^{7/2}}-\frac{x(4ac-5b^2d)\left(2a+b\sqrt{\frac{d}{x}}\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{32a^3}-\frac{5bd^2\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{12a^2\left(\frac{d}{x}\right)^{3/2}}+\frac{x^2\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{2a}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[d/x] + c/x]*x,x]
```

```
[Out] (-5*b*d^2*(a + b*Sqrt[d/x] + c/x)^(3/2))/(12*a^2*(d/x)^(3/2)) - (
(4*a*c - 5*b^2*d)*(2*a + b*Sqrt[d/x])*Sqrt[a + b*Sqrt[d/x] + c/x]
*x)/(32*a^3) + ((a + b*Sqrt[d/x] + c/x)^(3/2)*x^2)/(2*a) - ((4*a*
c - 5*b^2*d)*(4*a*c - b^2*d)*ArcTanh[(2*a + b*Sqrt[d/x])/(2*Sqrt[
a]*Sqrt[a + b*Sqrt[d/x] + c/x])])/(64*a^(7/2))
```

Rubi in Sympy [A] time = 49.0968, size = 172, normalized size = 0.82

$$\frac{x^2\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{\frac{3}{2}}}{2a}-\frac{5bd^2\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{\frac{3}{2}}}{12a^2\left(\frac{d}{x}\right)^{\frac{3}{2}}}-\frac{x\left(2a+b\sqrt{\frac{d}{x}}\right)(4ac-5b^2d)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{32a^3}-\frac{(4ac-5b^2d)(4ac-b^2d)\operatorname{atanh}\left(\frac{2a+b\sqrt{\frac{d}{x}}}{2\sqrt{a}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{64a^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(a+c/x+b*(d/x)**(1/2))**(1/2),x)
```

```
[Out] x**2*(a + b*sqrt(d/x) + c/x)**(3/2)/(2*a) - 5*b*d**2*(a + b*sqrt(
d/x) + c/x)**(3/2)/(12*a**2*(d/x)**(3/2)) - x*(2*a + b*sqrt(d/x))
```

```
*(4*a*c - 5*b**2*d)*sqrt(a + b*sqrt(d/x) + c/x)/(32*a**3) - (4*a*
c - 5*b**2*d)*(4*a*c - b**2*d)*atanh((2*a + b*sqrt(d/x))/(2*sqrt(
a)*sqrt(a + b*sqrt(d/x) + c/x)))/(64*a**(7/2))
```

Mathematica [A] time = 0.188334, size = 0, normalized size = 0.

$$\int \sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}x\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[Sqrt[a + b*Sqrt[d/x] + c/x]*x,x]
```

```
[Out] Integrate[Sqrt[a + b*Sqrt[d/x] + c/x]*x, x]
```

Maple [B] time = 0.038, size = 398, normalized size = 1.9

$$\frac{1}{192}\sqrt{\frac{1}{x}\left(b\sqrt{\frac{d}{x}}x+ax+c\right)}\sqrt{x}\left(30\,a^{3/2}\sqrt{b\sqrt{\frac{d}{x}}x+ax+c}\left(\frac{d}{x}\right)^{3/2}x^{3/2}b^{3}+60\,a^{5/2}\sqrt{b\sqrt{\frac{d}{x}}x+ax+c}d\sqrt{x}b^{2}-15\,\ln\left(1/2\,\frac{1}{\sqrt{a}}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x*(a+c/x+b*(d/x)^(1/2))^(1/2),x)
```

```
[Out] 1/192*((b*(d/x)^(1/2)*x+a*x+c)/x)^(1/2)*x^(1/2)*(30*a^(3/2)*(b*(d
/x)^(1/2)*x+a*x+c)^(1/2)*(d/x)^(3/2)*x^(3/2)*b^3+60*a^(5/2)*(b*(d
/x)^(1/2)*x+a*x+c)^(1/2)*d*x^(1/2)*b^2-15*ln(1/2*(b*(d/x)^(1/2)*x
^(1/2)+2*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*a^(1/2)+2*a*x^(1/2))/a^(1/
2))*d^2*a*b^4+96*x^(1/2)*(b*(d/x)^(1/2)*x+a*x+c)^(3/2)*a^(7/2)-80
*a^(5/2)*(b*(d/x)^(1/2)*x+a*x+c)^(3/2)*(d/x)^(1/2)*x^(1/2)*b-48*a
^(7/2)*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*x^(1/2)*c-24*a^(5/2)*(b*(d/x
)^(1/2)*x+a*x+c)^(1/2)*(d/x)^(1/2)*x^(1/2)*b*c+72*ln(1/2*(b*(d/x)
^(1/2)*x^(1/2)+2*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*a^(1/2)+2*a*x^(1/2
))/a^(1/2))*d*a^2*b^2*c-48*ln(1/2*(b*(d/x)^(1/2)*x^(1/2)+2*(b*(d/
x)^(1/2)*x+a*x+c)^(1/2)*a^(1/2)+2*a*x^(1/2))/a^(1/2))*a^3*c^2)/(b
*(d/x)^(1/2)*x+a*x+c)^(1/2)/a^(9/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{b\sqrt{\frac{d}{x}}+a+\frac{c}{x}}x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(d/x) + a + c/x)*x,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*sqrt(d/x) + a + c/x)*x, x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(d/x) + a + c/x)*x,x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(a+c/x+b*(d/x)**(1/2))**(1/2),x)
```

```
[Out] Integral(x*sqrt(a + b*sqrt(d/x) + c/x), x)
```

GIAC/XCAS [A] time = 0.332584, size = 360, normalized size = 1.72

$$\frac{1}{192}\left(2\sqrt{b\sqrt{d}\sqrt{x}+ax+c}\left(2\left(4\sqrt{x}\left(\frac{b\sqrt{d}}{a}+6\sqrt{x}\right)-\frac{5\,ab^2d-12\,a^2c}{a^3}\right)\sqrt{x}+\frac{15\,b^3d^{\frac{3}{2}}-52\,abc\sqrt{d}}{a^3}\right)+\frac{3\left(5\,b^4d^2-24\,ab^2cd+\right.}{}\right.$$

$$-\frac{\left(15\,b^4d^2\ln\left(\left|-b\sqrt{d}+2\,\sqrt{a}\sqrt{c}\right|\right)-72\,ab^2cd\ln\left(\left|-b\sqrt{d}+2\,\sqrt{a}\sqrt{c}\right|\right)+30\,\sqrt{a}b^3\sqrt{c}d^{\frac{3}{2}}+48\,a^2c^2\ln\left(\left|-b\sqrt{d}+2\,\sqrt{a}\sqrt{c}\right|\right)-104\,a\right.}{192\,a^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(d/x) + a + c/x)*x,x, algorithm="giac")
```

```
[Out] 1/192*(2*sqrt(b*sqrt(d)*sqrt(x) + a*x + c)*(2*(4*sqrt(x)*(b*sqrt(
d)/a + 6*sqrt(x)) - (5*a*b^2*d - 12*a^2*c)/a^3)*sqrt(x) + (15*b^3
*d^(3/2) - 52*a*b*c*sqrt(d))/a^3) + 3*(5*b^4*d^2 - 24*a*b^2*c*d +
 16*a^2*c^2)*ln(abs(-b*sqrt(d) - 2*sqrt(a)*(sqrt(a)*sqrt(x) - sqr
t(b*sqrt(d)*sqrt(x) + a*x + c))))/a^(7/2))*sign(x) - 1/192*(15*b^
4*d^2*ln(abs(-b*sqrt(d) + 2*sqrt(a)*sqrt(c))) - 72*a*b^2*c*d*ln(a
bs(-b*sqrt(d) + 2*sqrt(a)*sqrt(c))) + 30*sqrt(a)*b^3*sqrt(c)*d^(3
/2) + 48*a^2*c^2*ln(abs(-b*sqrt(d) + 2*sqrt(a)*sqrt(c))) - 104*a^
(3/2)*b*c^(3/2)*sqrt(d))*sign(x)/a^(7/2)
```

3.3048 $\int \sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\,dx$

Optimal. Leaf size=113

$$\frac{(4ac-b^2d)\tanh^{-1}\left(\frac{2a+b\sqrt{\frac{d}{x}}}{2\sqrt{a}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{4a^{3/2}}+\frac{x\left(2a+b\sqrt{\frac{d}{x}}\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{2a}$$

```
[Out] ((2*a + b*Sqrt[d/x])*Sqrt[a + b*Sqrt[d/x] + c/x]*x)/(2*a) + ((4*a
*c - b^2*d)*ArcTanh[(2*a + b*Sqrt[d/x])/(2*Sqrt[a]*Sqrt[a + b*Sqr
t[d/x] + c/x])])/(4*a^(3/2))
```

Rubi [A] time = 0.285122, antiderivative size = 113, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.227

$$\frac{(4ac-b^2d)\tanh^{-1}\left(\frac{2a+b\sqrt{\frac{d}{x}}}{2\sqrt{a}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{4a^{3/2}}+\frac{x\left(2a+b\sqrt{\frac{d}{x}}\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{2a}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[d/x] + c/x],x]
```

```
[Out] ((2*a + b*Sqrt[d/x])*Sqrt[a + b*Sqrt[d/x] + c/x]*x)/(2*a) + ((4*a
*c - b^2*d)*ArcTanh[(2*a + b*Sqrt[d/x])/(2*Sqrt[a]*Sqrt[a + b*Sqr
t[d/x] + c/x])])/(4*a^(3/2))
```

Rubi in Sympy [A] time = 23.7626, size = 87, normalized size = 0.77

$$\frac{x\left(2a+b\sqrt{\frac{d}{x}}\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{2a}+\frac{(4ac-b^2d)\,\operatorname{atanh}\left(\frac{2a+b\sqrt{\frac{d}{x}}}{2\sqrt{a}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{4a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+c/x+b*(d/x)**(1/2))**(1/2),x)
```

```
[Out] x*(2*a + b*sqrt(d/x))*sqrt(a + b*sqrt(d/x) + c/x)/(2*a) + (4*a*c
- b**2*d)*atanh((2*a + b*sqrt(d/x))/(2*sqrt(a)*sqrt(a + b*sqrt(d/
x) + c/x)))/(4*a**(3/2))
```

Mathematica [A] time = 0.0939902, size = 0, normalized size = 0.

$$\int \sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[Sqrt[a + b*Sqrt[d/x] + c/x],x]
```

```
[Out] Integrate[Sqrt[a + b*Sqrt[d/x] + c/x], x]
```

Maple [B] time = 0.039, size = 213, normalized size = 1.9

$$\frac{1}{4}\sqrt{\frac{1}{x}\left(b\sqrt{\frac{d}{x}}x+ax+c\right)}\sqrt{x}\left(2\,a^{3/2}\sqrt{b\sqrt{\frac{d}{x}}x+ax+c}\sqrt{\frac{d}{x}}\sqrt{x}b-\ln\left(\frac{1}{2}\left(b\sqrt{\frac{d}{x}}\sqrt{x}+2\sqrt{b\sqrt{\frac{d}{x}}x+ax+c}\sqrt{a}+2\,a\sqrt{x}\right)\frac{1}{\sqrt{a}}\right)dc$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+c/x+b*(d/x)^(1/2))^(1/2),x)
```

```
[Out] 1/4*((b*(d/x)^(1/2)*x+a*x+c)/x)^(1/2)*x^(1/2)*(2*a^(3/2)*(b*(d/x)
^(1/2)*x+a*x+c)^(1/2)*(d/x)^(1/2)*x^(1/2)*b-ln(1/2*(b*(d/x)^(1/2)
*x^(1/2)+2*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*a^(1/2)+2*a*x^(1/2))/a^(
1/2))*d*a*b^2+4*a^(5/2)*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*x^(1/2)+4*l
n(1/2*(b*(d/x)^(1/2)*x^(1/2)+2*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*a^(1
/2)+2*a*x^(1/2))/a^(1/2))*a^2*c)/(b*(d/x)^(1/2)*x+a*x+c)^(1/2)/a^
(5/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\sqrt{b\sqrt{\frac{d}{x}}+a+\frac{c}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(d/x) + a + c/x),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*sqrt(d/x) + a + c/x), x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(d/x) + a + c/x),x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+c/x+b*(d/x)**(1/2))**(1/2),x)
```

```
[Out] Integral(sqrt(a + b*sqrt(d/x) + c/x), x)
```

GIAC/XCAS [A] time = 0.50475, size = 221, normalized size = 1.96

$$\frac{\left(2\sqrt{adx+\sqrt{dx}bd+cd}\left(\frac{bd}{a}+2\sqrt{dx}\right)+\frac{(b^2d^2-4\,acd)\ln\left(\left|-bd-2\left(\sqrt{dx}\sqrt{a}-\sqrt{adx+\sqrt{dx}bd+cd}\right)\sqrt{a}\right|\right)}{a^{\frac{3}{2}}}\right)\mathrm{sign}\,(x)}{4\,d}-\frac{\left(b^2d\ln\left(\left|-bd+2\sqrt{cd}\sqrt{a}\right|\right)-4\,ac\ln\left(\left|-bd+2\sqrt{cd}\sqrt{a}\right|\right)+2\sqrt{cd}\sqrt{a}b\right)\mathrm{sign}\,(x)}{4\,a^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(d/x) + a + c/x),x, algorithm="giac")
```

```
[Out] 1/4*(2*sqrt(a*d*x + sqrt(d*x)*b*d + c*d)*(b*d/a + 2*sqrt(d*x)) +
(b^2*d^2 - 4*a*c*d)*ln(abs(-b*d - 2*(sqrt(d*x)*sqrt(a) - sqrt(a*d
*x + sqrt(d*x)*b*d + c*d))*sqrt(a)))/a^(3/2))*sign(x)/d - 1/4*(b^
2*d*ln(abs(-b*d + 2*sqrt(c*d)*sqrt(a))) - 4*a*c*ln(abs(-b*d + 2*s
qrt(c*d)*sqrt(a))) + 2*sqrt(c*d)*sqrt(a)*b)*sign(x)/a^(3/2)
```

3.3049 $\int \frac{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{x}\,dx$

Optimal. Leaf size=145

$$-2\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}+2\sqrt{a}\tanh^{-1}\left(\frac{2a+b\sqrt{\frac{d}{x}}}{2\sqrt{a}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)-\frac{b\sqrt{d}\tanh^{-1}\left(\frac{bd+2c\sqrt{\frac{d}{x}}}{2\sqrt{c}\sqrt{d}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{\sqrt{c}}$$

```
[Out] -2*Sqrt[a + b*Sqrt[d/x] + c/x] + 2*Sqrt[a]*ArcTanh[(2*a + b*Sqrt[
d/x])/(2*Sqrt[a]*Sqrt[a + b*Sqrt[d/x] + c/x])] - (b*Sqrt[d]*ArcTa
nh[(b*d + 2*c*Sqrt[d/x])/(2*Sqrt[c]*Sqrt[d]*Sqrt[a + b*Sqrt[d/x]
+ c/x])])/Sqrt[c]
```

Rubi [A] time = 0.528261, antiderivative size = 145, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.269

$$-2\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}+2\sqrt{a}\tanh^{-1}\left(\frac{2a+b\sqrt{\frac{d}{x}}}{2\sqrt{a}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)-\frac{b\sqrt{d}\tanh^{-1}\left(\frac{bd+2c\sqrt{\frac{d}{x}}}{2\sqrt{c}\sqrt{d}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{\sqrt{c}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[d/x] + c/x]/x,x]
```

```
[Out] -2*Sqrt[a + b*Sqrt[d/x] + c/x] + 2*Sqrt[a]*ArcTanh[(2*a + b*Sqrt[
d/x])/(2*Sqrt[a]*Sqrt[a + b*Sqrt[d/x] + c/x])] - (b*Sqrt[d]*ArcTa
nh[(b*d + 2*c*Sqrt[d/x])/(2*Sqrt[c]*Sqrt[d]*Sqrt[a + b*Sqrt[d/x]
+ c/x])])/Sqrt[c]
```

Rubi in Sympy [A] time = 39.4534, size = 117, normalized size = 0.81

$$2\sqrt{a}\,\text{atanh}\left(\frac{2a+b\sqrt{\frac{d}{x}}}{2\sqrt{a}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)-\frac{b\sqrt{d}\,\text{atanh}\left(\frac{bd+2c\sqrt{\frac{d}{x}}}{2\sqrt{c}\sqrt{d}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{\sqrt{c}}-2\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+c/x+b*(d/x)**(1/2))**(1/2)/x,x)
```

```
[Out] 2*sqrt(a)*atanh((2*a + b*sqrt(d/x))/(2*sqrt(a)*sqrt(a + b*sqrt(d/
x) + c/x))) - b*sqrt(d)*atanh((b*d + 2*c*sqrt(d/x))/(2*sqrt(c)*sq
rt(d)*sqrt(a + b*sqrt(d/x) + c/x)))/sqrt(c) - 2*sqrt(a + b*sqrt(d
/x) + c/x)
```

Mathematica [A] time = 0.0779955, size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{x}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[Sqrt[a + b*Sqrt[d/x] + c/x]/x,x]
```

```
[Out] Integrate[Sqrt[a + b*Sqrt[d/x] + c/x]/x, x]
```

Maple [B] time = 0.038, size = 237, normalized size = 1.6

$$-\frac{1}{c}\sqrt{\frac{1}{x}\left(b\sqrt{\frac{d}{x}}x+ax+c\right)}\left(a^{\frac{3}{2}}\ln\left(1\left(2c+b\sqrt{\frac{d}{x}}x+2\sqrt{c}\sqrt{b\sqrt{\frac{d}{x}}x+ax+c}\right)\frac{1}{\sqrt{x}}\right)\sqrt{c}\sqrt{\frac{d}{x}}xb-2a^{5/2}\sqrt{b\sqrt{\frac{d}{x}}x+ax+cx-2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+c/x+b*(d/x)^(1/2))^(1/2)/x,x)
```

```
[Out] -((b*(d/x)^(1/2)*x+a*x+c)/x)^(1/2)*(a^(3/2)*ln((2*c+b*(d/x)^(1/2)
*x+2*c^(1/2)*(b*(d/x)^(1/2)*x+a*x+c)^(1/2))/x^(1/2))*c^(1/2)*(d/x
)^(1/2)*x*b-2*a^(5/2)*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*x-2*a^(3/2)*(
b*(d/x)^(1/2)*x+a*x+c)^(1/2)*(d/x)^(1/2)*x*b+2*(b*(d/x)^(1/2)*x+a
*x+c)^(3/2)*a^(3/2)-2*ln(1/2*(b*(d/x)^(1/2)*x^(1/2)+2*(b*(d/x)^(1
/2)*x+a*x+c)^(1/2)*a^(1/2)+2*a*x^(1/2))/a^(1/2))*x^(1/2)*a^2*c)/(
b*(d/x)^(1/2)*x+a*x+c)^(1/2)/c/a^(3/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{b\sqrt{\frac{d}{x}} + a + \frac{c}{x}}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(d/x) + a + c/x)/x,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*sqrt(d/x) + a + c/x)/x, x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(d/x) + a + c/x)/x,x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + b\sqrt{\frac{d}{x}} + \frac{c}{x}}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+c/x+b*(d/x)**(1/2))**(1/2)/x,x)

[Out] Integral(sqrt(a + b*sqrt(d/x) + c/x)/x, x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(d/x) + a + c/x)/x,x, algorithm="giac")

[Out] Exception raised: TypeError
```

3.3050 $\int \frac{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{x^2}\,dx$

Optimal. Leaf size=155

$$\frac{b\sqrt{d}\left(4ac-b^2d\right)\tanh^{-1}\left(\frac{bd+2c\sqrt{\frac{d}{x}}}{2\sqrt{c}\sqrt{d}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{8c^{5/2}}+\frac{b\left(bd+2c\sqrt{\frac{d}{x}}\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{4c^2}-\frac{2\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{3c}$$

```
[Out] (b*(b*d + 2*c*Sqrt[d/x])*Sqrt[a + b*Sqrt[d/x] + c/x])/(4*c^2) - (
2*(a + b*Sqrt[d/x] + c/x)^(3/2))/(3*c) + (b*Sqrt[d]*(4*a*c - b^2*
d)*ArcTanh[(b*d + 2*c*Sqrt[d/x])/(2*Sqrt[c]*Sqrt[d]*Sqrt[a + b*Sq
rt[d/x] + c/x])])/(8*c^(5/2))
```

Rubi [A] time = 0.33331, antiderivative size = 155, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$\frac{b\sqrt{d}\left(4ac-b^2d\right)\tanh^{-1}\left(\frac{bd+2c\sqrt{\frac{d}{x}}}{2\sqrt{c}\sqrt{d}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{8c^{5/2}}+\frac{b\left(bd+2c\sqrt{\frac{d}{x}}\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{4c^2}-\frac{2\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{3c}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[d/x] + c/x]/x^2,x]
```

```
[Out] (b*(b*d + 2*c*Sqrt[d/x])*Sqrt[a + b*Sqrt[d/x] + c/x])/(4*c^2) - (
2*(a + b*Sqrt[d/x] + c/x)^(3/2))/(3*c) + (b*Sqrt[d]*(4*a*c - b^2*
d)*ArcTanh[(b*d + 2*c*Sqrt[d/x])/(2*Sqrt[c]*Sqrt[d]*Sqrt[a + b*Sq
rt[d/x] + c/x])])/(8*c^(5/2))
```

Rubi in Sympy [A] time = 26.9829, size = 126, normalized size = 0.81

$$\frac{b\left(bd+2c\sqrt{\frac{d}{x}}\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{4c^2}+\frac{b\sqrt{d}\left(4ac-b^2d\right)\operatorname{atanh}\left(\frac{bd+2c\sqrt{\frac{d}{x}}}{2\sqrt{c}\sqrt{d}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{8c^{\frac{5}{2}}}-\frac{2\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{\frac{3}{2}}}{3c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+c/x+b*(d/x)**(1/2))**(1/2)/x**2,x)
```

```
[Out] b*(b*d + 2*c*sqrt(d/x))*sqrt(a + b*sqrt(d/x) + c/x)/(4*c**2) + b*
sqrt(d)*(4*a*c - b**2*d)*atanh((b*d + 2*c*sqrt(d/x))/(2*sqrt(c)*s
qrt(d)*sqrt(a + b*sqrt(d/x) + c/x)))/(8*c**(5/2)) - 2*(a + b*sqrt
(d/x) + c/x)**(3/2)/(3*c)
```

Mathematica [A] time = 0.0706302, size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{x^2}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[Sqrt[a + b*Sqrt[d/x] + c/x]/x^2,x]
```

```
[Out] Integrate[Sqrt[a + b*Sqrt[d/x] + c/x]/x^2, x]
```

Maple [B] time = 0.039, size = 331, normalized size = 2.1

$$-\frac{1}{24\,x c^3}\sqrt{\frac{1}{x}\left(b\sqrt{\frac{d}{x}}x+ax+c\right)}\left(3\ln\left(\frac{1}{\sqrt{x}}\left(2\,c+b\sqrt{\frac{d}{x}}x+2\,\sqrt{c}\sqrt{b\sqrt{\frac{d}{x}}x+ax+c}\right)\right)\sqrt{c}\left(\frac{d}{x}\right)^{3/2}x^3b^3-6\,\sqrt{b\sqrt{\frac{d}{x}}x+ax+c}\,\Bigl(\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+c/x+b*(d/x)^(1/2))^(1/2)/x^2,x)
```

```
[Out] -1/24*((b*(d/x)^(1/2)*x+a*x+c)/x)^(1/2)*(3*ln((2*c+b*(d/x)^(1/2)*
x+2*c^(1/2)*(b*(d/x)^(1/2)*x+a*x+c)^(1/2))/x^(1/2))*c^(1/2)*(d/x)
^(3/2)*x^3*b^3-6*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*(d/x)^(3/2)*x^3*b^
3-12*a*ln((2*c+b*(d/x)^(1/2)*x+2*c^(1/2)*(b*(d/x)^(1/2)*x+a*x+c)^
(1/2))/x^(1/2))*c^(3/2)*(d/x)^(1/2)*x^2*b-6*a*(b*(d/x)^(1/2)*x+a*
x+c)^(1/2)*d*x^2*b^2+6*(b*(d/x)^(1/2)*x+a*x+c)^(3/2)*d*x*b^2+12*a
*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*(d/x)^(1/2)*x^2*b*c-12*(b*(d/x)^(1
/2)*x+a*x+c)^(3/2)*(d/x)^(1/2)*x*b*c+16*(b*(d/x)^(1/2)*x+a*x+c)^(
3/2)*c^2)/x/(b*(d/x)^(1/2)*x+a*x+c)^(1/2)/c^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{b\sqrt{\frac{d}{x}}+a+\frac{c}{x}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(d/x) + a + c/x)/x^2,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*sqrt(d/x) + a + c/x)/x^2, x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(d/x) + a + c/x)/x^2,x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+c/x+b*(d/x)**(1/2))**(1/2)/x**2,x)
```

```
[Out] Integral(sqrt(a + b*sqrt(d/x) + c/x)/x**2, x)
```

GIAC/XCAS [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(d/x) + a + c/x)/x^2,x, algorithm="giac")
```

```
[Out] Timed out
```

3.3051 $\int \frac{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{x^3}\,dx$

Optimal. Leaf size=233

$$-\frac{b\sqrt{d}\left(12ac-7b^2d\right)\left(4ac-b^2d\right)\tanh^{-1}\left(\frac{bd+2c\sqrt{\frac{d}{x}}}{2\sqrt{c}\sqrt{d}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{128c^{9/2}}-\frac{b\left(12ac-7b^2d\right)\left(bd+2c\sqrt{\frac{d}{x}}\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{64c^4}+\frac{\left(32ac-35b^2d+42bc\sqrt{\frac{d}{x}}\right)\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{120c^3}-\frac{2\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{5cx}$$

```
[Out] -(b*(12*a*c - 7*b^2*d)*(b*d + 2*c*Sqrt[d/x])*Sqrt[a + b*Sqrt[d/x]
 + c/x])/(64*c^4) + ((32*a*c - 35*b^2*d + 42*b*c*Sqrt[d/x])*(a +
b*Sqrt[d/x] + c/x)^(3/2))/(120*c^3) - (2*(a + b*Sqrt[d/x] + c/x)^
(3/2))/(5*c*x) - (b*Sqrt[d]*(12*a*c - 7*b^2*d)*(4*a*c - b^2*d)*Ar
cTanh[(b*d + 2*c*Sqrt[d/x])/(2*Sqrt[c]*Sqrt[d]*Sqrt[a + b*Sqrt[d/
x] + c/x])])/(128*c^(9/2))
```

Rubi [A] time = 0.669855, antiderivative size = 233, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.269

$$-\frac{b\sqrt{d}\left(12ac-7b^2d\right)\left(4ac-b^2d\right)\tanh^{-1}\left(\frac{bd+2c\sqrt{\frac{d}{x}}}{2\sqrt{c}\sqrt{d}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{128c^{9/2}}-\frac{b\left(12ac-7b^2d\right)\left(bd+2c\sqrt{\frac{d}{x}}\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{64c^4}+\frac{\left(32ac-35b^2d+42bc\sqrt{\frac{d}{x}}\right)\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{120c^3}-\frac{2\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{5cx}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[d/x] + c/x]/x^3,x]
```

```
[Out] -(b*(12*a*c - 7*b^2*d)*(b*d + 2*c*Sqrt[d/x])*Sqrt[a + b*Sqrt[d/x]
 + c/x])/(64*c^4) + ((32*a*c - 35*b^2*d + 42*b*c*Sqrt[d/x])*(a +
b*Sqrt[d/x] + c/x)^(3/2))/(120*c^3) - (2*(a + b*Sqrt[d/x] + c/x)^
(3/2))/(5*c*x) - (b*Sqrt[d]*(12*a*c - 7*b^2*d)*(4*a*c - b^2*d)*Ar
cTanh[(b*d + 2*c*Sqrt[d/x])/(2*Sqrt[c]*Sqrt[d]*Sqrt[a + b*Sqrt[d/
x] + c/x])])/(128*c^(9/2))
```

Rubi in Sympy [A] time = 47.7811, size = 201, normalized size = 0.86

$$-\frac{b\left(12ac-7b^2d\right)\left(bd+2c\sqrt{\frac{d}{x}}\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{64c^4}-\frac{b\sqrt{d}\left(4ac-b^2d\right)\left(12ac-7b^2d\right)\operatorname{atanh}\left(\frac{bd+2c\sqrt{\frac{d}{x}}}{2\sqrt{c}\sqrt{d}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{128c^{\frac{9}{2}}}-\frac{2\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{\frac{3}{2}}}{5cx}+\frac{\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{\frac{3}{2}}\left(8ac-\frac{35b^2d}{4}+\frac{21bc\sqrt{\frac{d}{x}}}{2}\right)}{30c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate((a+c/x+b*(d/x)**(1/2))**(1/2)/x**3,x)
```

```
[Out] -b*(12*a*c - 7*b**2*d)*(b*d + 2*c*sqrt(d/x))*sqrt(a + b*sqrt(d/x)
 + c/x)/(64*c**4) - b*sqrt(d)*(4*a*c - b**2*d)*(12*a*c - 7*b**2*d
)*atanh((b*d + 2*c*sqrt(d/x))/(2*sqrt(c)*sqrt(d)*sqrt(a + b*sqrt(
d/x) + c/x)))/(128*c**(9/2)) - 2*(a + b*sqrt(d/x) + c/x)**(3/2)/(
5*c*x) + (a + b*sqrt(d/x) + c/x)**(3/2)*(8*a*c - 35*b**2*d/4 + 21
*b*c*sqrt(d/x)/2)/(30*c**3)
```

Mathematica [A]   time = 0.0745, size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + b\sqrt{\frac{d}{x}} + \frac{c}{x}}}{x^3}\, dx$$

Verification is Not applicable to the result.

```
[In]   Integrate[Sqrt[a + b*Sqrt[d/x] + c/x]/x^3,x]
```

```
[Out] Integrate[Sqrt[a + b*Sqrt[d/x] + c/x]/x^3, x]
```

Maple [B]   time = 0.04, size = 615, normalized size = 2.6

$$-\frac{1}{1920\, x^2 c^5}\sqrt{\frac{1}{x}\left(b\sqrt{\frac{d}{x}}x + ax + c\right)}\left(105\, \ln\left(\frac{1}{\sqrt{x}}\left(2\,c + b\sqrt{\frac{d}{x}}x + 2\,\sqrt{c}\sqrt{b\sqrt{\frac{d}{x}}x + ax + c}\right)\right)\sqrt{c}\left(\frac{d}{x}\right)^{5/2} x^5 b^5 - 210\,\sqrt{b\sqrt{\frac{d}{x}}x +}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((a+c/x+b*(d/x)^(1/2))^(1/2)/x^3,x)
```

```
[Out] -1/1920*((b*(d/x)^(1/2)*x+a*x+c)/x)^(1/2)*(105*ln((2*c+b*(d/x)^(1
/2)*x+2*c^(1/2)*(b*(d/x)^(1/2)*x+a*x+c)^(1/2))/x^(1/2))*c^(1/2)*(
d/x)^(5/2)*x^5*b^5-210*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*(d/x)^(5/2)*
x^5*b^5-600*a*ln((2*c+b*(d/x)^(1/2)*x+2*c^(1/2)*(b*(d/x)^(1/2)*x+
a*x+c)^(1/2))/x^(1/2))*c^(3/2)*(d/x)^(3/2)*x^4*b^3-210*a*(b*(d/x)
^(1/2)*x+a*x+c)^(1/2)*d^2*x^3*b^4+720*a^2*ln((2*c+b*(d/x)^(1/2)*x
+2*c^(1/2)*(b*(d/x)^(1/2)*x+a*x+c)^(1/2))/x^(1/2))*c^(5/2)*(d/x)^
(1/2)*x^3*b+780*a*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*(d/x)^(3/2)*x^4*b
^3*c+360*a^2*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*d*x^3*b^2*c+210*(b*(d/
x)^(1/2)*x+a*x+c)^(3/2)*d^2*x^2*b^4-420*(b*(d/x)^(1/2)*x+a*x+c)^(
3/2)*(d/x)^(3/2)*x^3*b^3*c-720*a^2*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*
(d/x)^(1/2)*x^3*b*c^2-360*a*(b*(d/x)^(1/2)*x+a*x+c)^(3/2)*d*x^2*b
^2*c+720*a*(b*(d/x)^(1/2)*x+a*x+c)^(3/2)*(d/x)^(1/2)*x^2*b*c^2+56
0*(b*(d/x)^(1/2)*x+a*x+c)^(3/2)*d*x*b^2*c^2-512*a*(b*(d/x)^(1/2)*
x+a*x+c)^(3/2)*x*c^3-672*(b*(d/x)^(1/2)*x+a*x+c)^(3/2)*(d/x)^(1/2
)*x*b*c^3+768*(b*(d/x)^(1/2)*x+a*x+c)^(3/2)*c^4)/x^2/(b*(d/x)^(1/
2)*x+a*x+c)^(1/2)/c^5
```

Maxima [F]   time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{b\sqrt{\frac{d}{x}} + a + \frac{c}{x}}}{x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(d/x) + a + c/x)/x^3,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*sqrt(d/x) + a + c/x)/x^3, x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(d/x) + a + c/x)/x^3,x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + b\sqrt{\frac{d}{x}} + \frac{c}{x}}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+c/x+b*(d/x)**(1/2))**(1/2)/x**3,x)
```

```
[Out] Integral(sqrt(a + b*sqrt(d/x) + c/x)/x**3, x)
```

GIAC/XCAS [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(d/x) + a + c/x)/x^3,x, algorithm="giac")
```

```
[Out] Timed out
```

3.3052 $\int \frac{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{x^4}\,dx$

Optimal. Leaf size=371

$$\frac{b\sqrt{d}\left(4ac-b^2d\right)\left(80a^2c^2-120ab^2cd+33b^4d^2\right)\tanh^{-1}\left(\frac{bd+2c\sqrt{\frac{d}{x}}}{2\sqrt{c}\sqrt{d}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{1024c^{13/2}}+\frac{b\left(80a^2c^2-120ab^2cd+33b^4d^2\right)\left(bd+2c\sqrt{\frac{d}{x}}\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{512c^6}-\frac{\left(1024a^2c^2+18bc\sqrt{\frac{d}{x}}\left(148ac-77b^2d\right)-3276ab^2cd+1155b^4d^2\right)\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{6720c^5}+\frac{\left(32ac-33b^2d\right)\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{140c^3x}+\frac{11b\left(\frac{d}{x}\right)^{3/2}\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{42c^2d}-\frac{2\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{7cx^2}$$

```
[Out] (b*(80*a^2*c^2 - 120*a*b^2*c*d + 33*b^4*d^2)*(b*d + 2*c*Sqrt[d/x]
)*Sqrt[a + b*Sqrt[d/x] + c/x])/(512*c^6) - ((1024*a^2*c^2 - 3276*
a*b^2*c*d + 1155*b^4*d^2 + 18*b*c*(148*a*c - 77*b^2*d)*Sqrt[d/x])
*(a + b*Sqrt[d/x] + c/x)^(3/2))/(6720*c^5) + (11*b*(a + b*Sqrt[d/
x] + c/x)^(3/2)*(d/x)^(3/2))/(42*c^2*d) - (2*(a + b*Sqrt[d/x] + c
/x)^(3/2))/(7*c*x^2) + ((32*a*c - 33*b^2*d)*(a + b*Sqrt[d/x] + c/
x)^(3/2))/(140*c^3*x) + (b*Sqrt[d]*(4*a*c - b^2*d)*(80*a^2*c^2 -
120*a*b^2*c*d + 33*b^4*d^2)*ArcTanh[(b*d + 2*c*Sqrt[d/x])/(2*Sqrt
[c]*Sqrt[d]*Sqrt[a + b*Sqrt[d/x] + c/x])])/(1024*c^(13/2))
```

Rubi [A] time = 1.58708, antiderivative size = 371, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 8, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308

$$\frac{b\sqrt{d}\left(4ac-b^2d\right)\left(80a^2c^2-120ab^2cd+33b^4d^2\right)\tanh^{-1}\left(\frac{bd+2c\sqrt{\frac{d}{x}}}{2\sqrt{c}\sqrt{d}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{1024c^{13/2}}+\frac{b\left(80a^2c^2-120ab^2cd+33b^4d^2\right)\left(bd+2c\sqrt{\frac{d}{x}}\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{512c^6}-\frac{\left(1024a^2c^2+18bc\sqrt{\frac{d}{x}}\left(148ac-77b^2d\right)-3276ab^2cd+1155b^4d^2\right)\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{6720c^5}+\frac{\left(32ac-33b^2d\right)\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{140c^3x}+\frac{11b\left(\frac{d}{x}\right)^{3/2}\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{42c^2d}-\frac{2\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{3/2}}{7cx^2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*Sqrt[d/x] + c/x]/x^4,x]
```


```
[Out] (b*(80*a^2*c^2 - 120*a*b^2*c*d + 33*b^4*d^2)*(b*d + 2*c*Sqrt[d/x]
)*Sqrt[a + b*Sqrt[d/x] + c/x])/(512*c^6) - ((1024*a^2*c^2 - 3276*
a*b^2*c*d + 1155*b^4*d^2 + 18*b*c*(148*a*c - 77*b^2*d)*Sqrt[d/x])
*(a + b*Sqrt[d/x] + c/x)^(3/2))/(6720*c^5) + (11*b*(a + b*Sqrt[d/
x] + c/x)^(3/2)*(d/x)^(3/2))/(42*c^2*d) - (2*(a + b*Sqrt[d/x] + c
/x)^(3/2))/(7*c*x^2) + ((32*a*c - 33*b^2*d)*(a + b*Sqrt[d/x] + c/
x)^(3/2))/(140*c^3*x) + (b*Sqrt[d]*(4*a*c - b^2*d)*(80*a^2*c^2 -
120*a*b^2*c*d + 33*b^4*d^2)*ArcTanh[(b*d + 2*c*Sqrt[d/x])/(2*Sqrt
[c]*Sqrt[d]*Sqrt[a + b*Sqrt[d/x] + c/x])])/(1024*c^(13/2))
```

Rubi in Sympy [A] time = 109.339, size = 332, normalized size = 0.89

$$\frac{11b\left(\frac{d}{x}\right)^{\frac{3}{2}}\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{\frac{3}{2}}}{42c^2d}+\frac{b\left(bd+2c\sqrt{\frac{d}{x}}\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\left(80a^2c^2-120ab^2cd+33b^4d^2\right)}{512c^6}$$
$$+\frac{b\sqrt{d}\left(4ac-b^2d\right)\left(80a^2c^2-120ab^2cd+33b^4d^2\right)\operatorname{atanh}\left(\frac{bd+2c\sqrt{\frac{d}{x}}}{2\sqrt{c}\sqrt{d}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{1024c^{\frac{13}{2}}}$$
$$-\frac{2\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{\frac{3}{2}}}{7cx^2}+\frac{\left(32ac-33b^2d\right)\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{\frac{3}{2}}}{140c^3x}$$
$$-\frac{\left(a+b\sqrt{\frac{d}{x}}+\frac{c}{x}\right)^{\frac{3}{2}}\left(192a^2c^2-\frac{2457ab^2cd}{4}+\frac{3465b^4d^2}{16}+\frac{27bc\sqrt{\frac{d}{x}}\left(148ac-77b^2d\right)}{8}\right)}{1260c^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate((a+c/x+b*(d/x)**(1/2))**(1/2)/x**4,x)
```

```
[Out] 11*b*(d/x)**(3/2)*(a + b*sqrt(d/x) + c/x)**(3/2)/(42*c**2*d) + b*
(b*d + 2*c*sqrt(d/x))*sqrt(a + b*sqrt(d/x) + c/x)*(80*a**2*c**2 -
 120*a*b**2*c*d + 33*b**4*d**2)/(512*c**6) + b*sqrt(d)*(4*a*c - b
**2*d)*(80*a**2*c**2 - 120*a*b**2*c*d + 33*b**4*d**2)*atanh((b*d
+ 2*c*sqrt(d/x))/(2*sqrt(c)*sqrt(d)*sqrt(a + b*sqrt(d/x) + c/x)))
/(1024*c**(13/2)) - 2*(a + b*sqrt(d/x) + c/x)**(3/2)/(7*c*x**2) +
 (32*a*c - 33*b**2*d)*(a + b*sqrt(d/x) + c/x)**(3/2)/(140*c**3*x)
 - (a + b*sqrt(d/x) + c/x)**(3/2)*(192*a**2*c**2 - 2457*a*b**2*c*
d/4 + 3465*b**4*d**2/16 + 27*b*c*sqrt(d/x)*(148*a*c - 77*b**2*d)/
8)/(1260*c**5)
```

Mathematica [A] time = 0.07649, size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{x^4}\,dx$$

Verification is Not applicable to the result.

```
[In]   Integrate[Sqrt[a + b*Sqrt[d/x] + c/x]/x^4,x]
```

```
[Out] Integrate[Sqrt[a + b*Sqrt[d/x] + c/x]/x^4, x]
```

Maple [B] time = 0.046, size = 979, normalized size = 2.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((a+c/x+b*(d/x)^(1/2))^(1/2)/x^4,x)
```

```
[Out] 1/107520*((b*(d/x)^(1/2)*x+a*x+c)/x)^(1/2)*(-39060*a*(b*(d/x)^(1/
2)*x+a*x+c)^(1/2)*(d/x)^(5/2)*x^6*b^5*c+33600*a^3*ln((2*c+b*(d/x)
^(1/2)*x+2*c^(1/2)*(b*(d/x)^(1/2)*x+a*x+c)^(1/2))/x^(1/2))*c^(7/2
)*(d/x)^(1/2)*x^4*b+67200*a^2*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*(d/x)
^(3/2)*x^5*b^3*c^2-25200*a^2*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*d^2*x^
4*b^4*c+16800*a^3*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*d*x^4*b^2*c^2+252
00*a*(b*(d/x)^(1/2)*x+a*x+c)^(3/2)*d^2*x^3*b^4*c-16800*a^2*(b*(d/
x)^(1/2)*x+a*x+c)^(3/2)*d*x^3*b^2*c^2+52416*a*(b*(d/x)^(1/2)*x+a*
```

```
x+c)^(3/2)*d*x^2*b^2*c^3-42624*a*(b*(d/x)^(1/2)*x+a*x+c)^(3/2)*(d
/x)^(1/2)*x^2*b*c^4+26460*a*ln((2*c+b*(d/x)^(1/2)*x+2*c^(1/2)*(b*
(d/x)^(1/2)*x+a*x+c)^(1/2))/x^(1/2))*c^(3/2)*(d/x)^(5/2)*x^6*b^5-
58800*a^2*ln((2*c+b*(d/x)^(1/2)*x+2*c^(1/2)*(b*(d/x)^(1/2)*x+a*x+
c)^(1/2))/x^(1/2))*c^(5/2)*(d/x)^(3/2)*x^5*b^3-50400*a*(b*(d/x)^(
1/2)*x+a*x+c)^(3/2)*(d/x)^(3/2)*x^4*b^3*c^2-33600*a^3*(b*(d/x)^(1
/2)*x+a*x+c)^(1/2)*(d/x)^(1/2)*x^4*b*c^3+33600*a^2*(b*(d/x)^(1/2)
*x+a*x+c)^(3/2)*(d/x)^(1/2)*x^3*b*c^3-16384*a^2*(b*(d/x)^(1/2)*x+
a*x+c)^(3/2)*x^2*c^4+24576*a*(b*(d/x)^(1/2)*x+a*x+c)^(3/2)*x*c^5-
6930*(b*(d/x)^(1/2)*x+a*x+c)^(3/2)*d^3*x^3*b^6+6930*(b*(d/x)^(1/2
)*x+a*x+c)^(1/2)*(d/x)^(7/2)*x^7*b^7-3465*ln((2*c+b*(d/x)^(1/2)*x
+2*c^(1/2)*(b*(d/x)^(1/2)*x+a*x+c)^(1/2))/x^(1/2))*c^(1/2)*(d/x)^
(7/2)*x^7*b^7+13860*(b*(d/x)^(1/2)*x+a*x+c)^(3/2)*(d/x)^(5/2)*x^5
*b^5*c+22176*(b*(d/x)^(1/2)*x+a*x+c)^(3/2)*(d/x)^(3/2)*x^3*b^3*c^
3+6930*a*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*d^3*x^4*b^6-18480*(b*(d/x)
^(1/2)*x+a*x+c)^(3/2)*d^2*x^2*b^4*c^2-25344*(b*(d/x)^(1/2)*x+a*x+
c)^(3/2)*d*x*b^2*c^4+28160*(b*(d/x)^(1/2)*x+a*x+c)^(3/2)*(d/x)^(1
/2)*x*b*c^5-30720*(b*(d/x)^(1/2)*x+a*x+c)^(3/2)*c^6)/x^3/(b*(d/x)
^(1/2)*x+a*x+c)^(1/2)/c^7
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{b\sqrt{\frac{d}{x}} + a + \frac{c}{x}}}{x^4}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(d/x) + a + c/x)/x^4,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*sqrt(d/x) + a + c/x)/x^4, x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(d/x) + a + c/x)/x^4,x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + b\sqrt{\frac{d}{x}} + \frac{c}{x}}}{x^4}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((a+c/x+b*(d/x)**(1/2))**(1/2)/x**4,x)
```

```
[Out] Integral(sqrt(a + b*sqrt(d/x) + c/x)/x**4, x)
```

GIAC/XCAS [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(b*sqrt(d/x) + a + c/x)/x^4,x, algorithm="giac")
```

```
[Out] Timed out
```

3.3053 $\int \frac{x^m}{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\,dx$

Optimal. Leaf size=230

$$\frac{x^{m+1}\sqrt{\frac{2c\sqrt{\frac{d}{x}}}{\sqrt{d}\left(b\sqrt{d}-\sqrt{b^2d-4ac}\right)}+1}\sqrt{\frac{2c\sqrt{\frac{d}{x}}}{\sqrt{d}\left(\sqrt{b^2d-4ac}+b\sqrt{d}\right)}+1}F_1\left(-2(m+1);\frac{1}{2},\frac{1}{2};-2m-1;-\frac{2c\sqrt{\frac{d}{x}}}{\sqrt{d}\left(b\sqrt{d}-\sqrt{b^2d-4ac}\right)},-\frac{2c\sqrt{\frac{d}{x}}}{\sqrt{d}\left(\sqrt{d}b+\sqrt{b^2d-4ac}\right)}\right.}{(m+1)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}$$

```
[Out] (Sqrt[1 + (2*c*Sqrt[d/x])/(Sqrt[d]*(b*Sqrt[d] - Sqrt[-4*a*c + b^2
*d]))]*Sqrt[1 + (2*c*Sqrt[d/x])/(Sqrt[d]*(b*Sqrt[d] + Sqrt[-4*a*c
 + b^2*d]))]*x^(1 + m)*AppellF1[-2*(1 + m), 1/2, 1/2, -1 - 2*m, (
-2*c*Sqrt[d/x])/(Sqrt[d]*(b*Sqrt[d] - Sqrt[-4*a*c + b^2*d])), (-2
*c*Sqrt[d/x])/(Sqrt[d]*(b*Sqrt[d] + Sqrt[-4*a*c + b^2*d]))])/((1
+ m)*Sqrt[a + b*Sqrt[d/x] + c/x])
```

Rubi [A] time = 1.32099, antiderivative size = 230, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{x^{m+1}\sqrt{\frac{2c\sqrt{\frac{d}{x}}}{\sqrt{d}\left(b\sqrt{d}-\sqrt{b^2d-4ac}\right)}+1}\sqrt{\frac{2c\sqrt{\frac{d}{x}}}{\sqrt{d}\left(\sqrt{b^2d-4ac}+b\sqrt{d}\right)}+1}F_1\left(-2(m+1);\frac{1}{2},\frac{1}{2};-2m-1;-\frac{2c\sqrt{\frac{d}{x}}}{\sqrt{d}\left(b\sqrt{d}-\sqrt{b^2d-4ac}\right)},-\frac{2c\sqrt{\frac{d}{x}}}{\sqrt{d}\left(\sqrt{d}b+\sqrt{b^2d-4ac}\right)}\right.}{(m+1)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}$$

Antiderivative was successfully verified.

```
[In]  Int[x^m/Sqrt[a + b*Sqrt[d/x] + c/x],x]
```

```
[Out] (Sqrt[1 + (2*c*Sqrt[d/x])/(Sqrt[d]*(b*Sqrt[d] - Sqrt[-4*a*c + b^2
*d]))]*Sqrt[1 + (2*c*Sqrt[d/x])/(Sqrt[d]*(b*Sqrt[d] + Sqrt[-4*a*c
 + b^2*d]))]*x^(1 + m)*AppellF1[-2*(1 + m), 1/2, 1/2, -1 - 2*m, (
-2*c*Sqrt[d/x])/(Sqrt[d]*(b*Sqrt[d] - Sqrt[-4*a*c + b^2*d])), (-2
*c*Sqrt[d/x])/(Sqrt[d]*(b*Sqrt[d] + Sqrt[-4*a*c + b^2*d]))])/((1
+ m)*Sqrt[a + b*Sqrt[d/x] + c/x])
```

Rubi in Sympy [A] time = 78.1134, size = 207, normalized size = 0.9

$$\frac{dx^m\left(\frac{d}{x}\right)^m\left(\frac{d}{x}\right)^{-m-1}\sqrt{\frac{2c\sqrt{\frac{d}{x}}}{\sqrt{d}\left(b\sqrt{d}-\sqrt{-4ac+b^2d}\right)}+1}\sqrt{\frac{2c\sqrt{\frac{d}{x}}}{\sqrt{d}\left(b\sqrt{d}+\sqrt{-4ac+b^2d}\right)}+1}\,\mathrm{appellf}_1\left(-2m-2,\frac{1}{2},\frac{1}{2},-2m-1,-\frac{2c\sqrt{\frac{d}{x}}}{\sqrt{d}\left(b\sqrt{d}-\sqrt{-4ac+b\right.}}\right.}{(m+1)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x**m/(a+c/x+b*(d/x)**(1/2))**(1/2),x)
```

```
[Out] d*x**m*(d/x)**m*(d/x)**(-m - 1)*sqrt(2*c*sqrt(d/x)/(sqrt(d)*(b*sq
rt(d) - sqrt(-4*a*c + b**2*d))) + 1)*sqrt(2*c*sqrt(d/x)/(sqrt(d)*
(b*sqrt(d) + sqrt(-4*a*c + b**2*d))) + 1)*appellf1(-2*m - 2, 1/2,
 1/2, -2*m - 1, -2*c*sqrt(d/x)/(sqrt(d)*(b*sqrt(d) - sqrt(-4*a*c
+ b**2*d))), -2*c*sqrt(d/x)/(sqrt(d)*(b*sqrt(d) + sqrt(-4*a*c + b
**2*d))))/((m + 1)*sqrt(a + b*sqrt(d/x) + c/x))
```

Mathematica [A] time = 0.249975, size = 0, normalized size = 0.

$$\int \frac{x^m}{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[x^m/Sqrt[a + b*Sqrt[d/x] + c/x],x]
```

```
[Out] Integrate[x^m/Sqrt[a + b*Sqrt[d/x] + c/x], x]
```

Maple [F] time = 0.017, size = 0, normalized size = 0.

$$\int x^m \frac{1}{\sqrt{a+\frac{c}{x}+b\sqrt{\frac{d}{x}}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x^m/(a+c/x+b*(d/x)^(1/2))^(1/2),x)
```

```
[Out] int(x^m/(a+c/x+b*(d/x)^(1/2))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{\sqrt{b\sqrt{\frac{d}{x}}+a+\frac{c}{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/sqrt(b*sqrt(d/x) + a + c/x),x, algorithm="maxima")
```

```
[Out] integrate(x^m/sqrt(b*sqrt(d/x) + a + c/x), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/sqrt(b*sqrt(d/x) + a + c/x),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**m/(a+c/x+b*(d/x)**(1/2))**(1/2),x)
```

```
[Out] Integral(x**m/sqrt(a + b*sqrt(d/x) + c/x), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^m}{\sqrt{b\sqrt{\frac{d}{x}} + a + \frac{c}{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^m/sqrt(b*sqrt(d/x) + a + c/x),x, algorithm="giac")
```

```
[Out] integrate(x^m/sqrt(b*sqrt(d/x) + a + c/x), x)
```

3.3054 $\int \frac{x^2}{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\,dx$

Optimal. Leaf size=386

$$\frac{bd^2\left(156ac-77b^2d\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{160a^4\left(\frac{d}{x}\right)^{3/2}}-\frac{x^2\left(100ac-99b^2d\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{240a^3}-\frac{11bd^3\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{30a^2\left(\frac{d}{x}\right)^{5/2}}-\frac{7bd\left(528a^2c^2-680ab^2cd+165b^4d^2\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{1280a^6\sqrt{\frac{d}{x}}}+\frac{x\left(400a^2c^2-1176ab^2cd+385b^4d^2\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{640a^5}-\frac{\left(320a^3c^3-1680a^2b^2c^2d+1260ab^4cd^2-231b^6d^3\right)\tanh^{-1}\left(\frac{2a+b\sqrt{\frac{d}{x}}}{2\sqrt{a}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{512a^{13/2}}+\frac{x^3\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{3a}$$

```
[Out] (-11*b*d^3*Sqrt[a + b*Sqrt[d/x] + c/x])/(30*a^2*(d/x)^(5/2)) + (b
*d^2*(156*a*c - 77*b^2*d)*Sqrt[a + b*Sqrt[d/x] + c/x])/(160*a^4*(
d/x)^(3/2)) - (7*b*d*(528*a^2*c^2 - 680*a*b^2*c*d + 165*b^4*d^2)*
Sqrt[a + b*Sqrt[d/x] + c/x])/(1280*a^6*Sqrt[d/x]) + ((400*a^2*c^2
 - 1176*a*b^2*c*d + 385*b^4*d^2)*Sqrt[a + b*Sqrt[d/x] + c/x]*x)/(
640*a^5) - ((100*a*c - 99*b^2*d)*Sqrt[a + b*Sqrt[d/x] + c/x]*x^2)
/(240*a^3) + (Sqrt[a + b*Sqrt[d/x] + c/x]*x^3)/(3*a) - ((320*a^3*
c^3 - 1680*a^2*b^2*c^2*d + 1260*a*b^4*c*d^2 - 231*b^6*d^3)*ArcTan
h[(2*a + b*Sqrt[d/x])/(2*Sqrt[a]*Sqrt[a + b*Sqrt[d/x] + c/x])])/(
512*a^(13/2))
```

Rubi [A] time = 1.87481, antiderivative size = 386, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 7, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.269$

$$\frac{bd^2\left(156ac-77b^2d\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{160a^4\left(\frac{d}{x}\right)^{3/2}}-\frac{x^2\left(100ac-99b^2d\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{240a^3}-\frac{11bd^3\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{30a^2\left(\frac{d}{x}\right)^{5/2}}-\frac{7bd\left(528a^2c^2-680ab^2cd+165b^4d^2\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{1280a^6\sqrt{\frac{d}{x}}}+\frac{x\left(400a^2c^2-1176ab^2cd+385b^4d^2\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{640a^5}-\frac{\left(320a^3c^3-1680a^2b^2c^2d+1260ab^4cd^2-231b^6d^3\right)\tanh^{-1}\left(\frac{2a+b\sqrt{\frac{d}{x}}}{2\sqrt{a}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{512a^{13/2}}+\frac{x^3\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{3a}$$

Antiderivative was successfully verified.

```
[In]  Int[x^2/Sqrt[a + b*Sqrt[d/x] + c/x],x]
```

```
[Out] (-11*b*d^3*Sqrt[a + b*Sqrt[d/x] + c/x])/(30*a^2*(d/x)^(5/2)) + (b
*d^2*(156*a*c - 77*b^2*d)*Sqrt[a + b*Sqrt[d/x] + c/x])/(160*a^4*(
d/x)^(3/2)) - (7*b*d*(528*a^2*c^2 - 680*a*b^2*c*d + 165*b^4*d^2)*
Sqrt[a + b*Sqrt[d/x] + c/x])/(1280*a^6*Sqrt[d/x]) + ((400*a^2*c^2
 - 1176*a*b^2*c*d + 385*b^4*d^2)*Sqrt[a + b*Sqrt[d/x] + c/x]*x)/(
640*a^5) - ((100*a*c - 99*b^2*d)*Sqrt[a + b*Sqrt[d/x] + c/x]*x^2)
/(240*a^3) + (Sqrt[a + b*Sqrt[d/x] + c/x]*x^3)/(3*a) - ((320*a^3*
c^3 - 1680*a^2*b^2*c^2*d + 1260*a*b^4*c*d^2 - 231*b^6*d^3)*ArcTan
h[(2*a + b*Sqrt[d/x])/(2*Sqrt[a]*Sqrt[a + b*Sqrt[d/x] + c/x])])/(
512*a^(13/2))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(x**2/(a+c/x+b*(d/x)**(1/2))**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.348088, size = 0, normalized size = 0.

$$\int \frac{x^2}{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2/Sqrt[a + b*Sqrt[d/x] + c/x],x]
```

```
[Out] Integrate[x^2/Sqrt[a + b*Sqrt[d/x] + c/x], x]
```

Maple [A] time = 0.049, size = 655, normalized size = 1.7

$$\frac{1}{7680}\sqrt{\frac{1}{x}\left(b\sqrt{\frac{d}{x}}x+ax+c\right)}\sqrt{x}\left(2560\,x^{5/2}\sqrt{b\sqrt{\frac{d}{x}}x+ax+c}\,a^{13/2}-2816\,a^{11/2}\sqrt{b\sqrt{\frac{d}{x}}x+ax+c}\sqrt{\frac{d}{x}}x^{5/2}b-3696\,a^{7/2}\sqrt{b\sqrt{}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a+c/x+b*(d/x)^(1/2))^(1/2),x)
```

```
[Out] 1/7680*((b*(d/x)^(1/2)*x+a*x+c)/x)^(1/2)*x^(1/2)*(2560*x^(5/2)*(b
*(d/x)^(1/2)*x+a*x+c)^(1/2)*a^(13/2)-2816*a^(11/2)*(b*(d/x)^(1/2)
*x+a*x+c)^(1/2)*(d/x)^(1/2)*x^(5/2)*b-3696*a^(7/2)*(b*(d/x)^(1/2)
*x+a*x+c)^(1/2)*(d/x)^(3/2)*x^(5/2)*b^3-6930*a^(3/2)*(b*(d/x)^(1/
2)*x+a*x+c)^(1/2)*(d/x)^(5/2)*x^(5/2)*b^5+3168*a^(9/2)*(b*(d/x)^(
1/2)*x+a*x+c)^(1/2)*d*x^(3/2)*b^2+4620*a^(5/2)*(b*(d/x)^(1/2)*x+a
*x+c)^(1/2)*d^2*x^(1/2)*b^4+3465*ln(1/2*(b*(d/x)^(1/2)*x^(1/2)+2*
(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*a^(1/2)+2*a*x^(1/2))/a^(1/2))*d^3*a
*b^6-3200*a^(11/2)*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*x^(3/2)*c+7488*a
^(9/2)*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*(d/x)^(1/2)*x^(3/2)*b*c+2856
0*a^(5/2)*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*(d/x)^(3/2)*x^(3/2)*b^3*c
-14112*a^(7/2)*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*d*x^(1/2)*b^2*c-1890
0*ln(1/2*(b*(d/x)^(1/2)*x^(1/2)+2*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*a
^(1/2)+2*a*x^(1/2))/a^(1/2))*d^2*a^2*b^4*c+4800*a^(9/2)*(b*(d/x)^
(1/2)*x+a*x+c)^(1/2)*x^(1/2)*c^2-22176*a^(7/2)*(b*(d/x)^(1/2)*x+a
```

```
*x+c)^(1/2)*(d/x)^(1/2)*x^(1/2)*b*c^2+25200*ln(1/2*(b*(d/x)^(1/2)
*x^(1/2)+2*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*a^(1/2)+2*a*x^(1/2))/a^(
1/2))*d*a^3*b^2*c^2-4800*ln(1/2*(b*(d/x)^(1/2)*x^(1/2)+2*(b*(d/x)
^(1/2)*x+a*x+c)^(1/2)*a^(1/2)+2*a*x^(1/2))/a^(1/2))*a^4*c^3)/(b*(
d/x)^(1/2)*x+a*x+c)^(1/2)/a^(15/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\sqrt{b\sqrt{\frac{d}{x}} + a + \frac{c}{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(b*sqrt(d/x) + a + c/x),x, algorithm="maxima")

[Out] integrate(x^2/sqrt(b*sqrt(d/x) + a + c/x), x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(b*sqrt(d/x) + a + c/x),x, algorithm="fricas")

[Out] Timed out
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\sqrt{a + b\sqrt{\frac{d}{x}} + \frac{c}{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x**2/(a+c/x+b*(d/x)**(1/2))**(1/2),x)

[Out] Integral(x**2/sqrt(a + b*sqrt(d/x) + c/x), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{\sqrt{b\sqrt{\frac{d}{x}} + a + \frac{c}{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x^2/sqrt(b*sqrt(d/x) + a + c/x),x, algorithm="giac")

[Out] integrate(x^2/sqrt(b*sqrt(d/x) + a + c/x), x)
```

3.3055 $\int \frac{x}{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\,dx$

Optimal. Leaf size=248

$$\frac{5bd\left(44ac-21b^2d\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{96a^4\sqrt{\frac{d}{x}}}-\frac{x\left(36ac-35b^2d\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{48a^3}-\frac{7bd^2\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{12a^2\left(\frac{d}{x}\right)^{3/2}}+\frac{\left(48a^2c^2-120ab^2cd+35b^4d^2\right)\tanh^{-1}\left(\frac{2a+b\sqrt{\frac{d}{x}}}{2\sqrt{a}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{64a^{9/2}}+\frac{x^2\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{2a}$$

```
[Out] (-7*b*d^2*Sqrt[a + b*Sqrt[d/x] + c/x])/(12*a^2*(d/x)^(3/2)) + (5*
b*d*(44*a*c - 21*b^2*d)*Sqrt[a + b*Sqrt[d/x] + c/x])/(96*a^4*Sqrt
[d/x]) - ((36*a*c - 35*b^2*d)*Sqrt[a + b*Sqrt[d/x] + c/x]*x)/(48*
a^3) + (Sqrt[a + b*Sqrt[d/x] + c/x]*x^2)/(2*a) + ((48*a^2*c^2 - 1
20*a*b^2*c*d + 35*b^4*d^2)*ArcTanh[(2*a + b*Sqrt[d/x])/(2*Sqrt[a]
*Sqrt[a + b*Sqrt[d/x] + c/x])])/(64*a^(9/2))
```

Rubi [A] time = 1.13854, antiderivative size = 248, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.292

$$\frac{5bd\left(44ac-21b^2d\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{96a^4\sqrt{\frac{d}{x}}}-\frac{x\left(36ac-35b^2d\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{48a^3}-\frac{7bd^2\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{12a^2\left(\frac{d}{x}\right)^{3/2}}+\frac{\left(48a^2c^2-120ab^2cd+35b^4d^2\right)\tanh^{-1}\left(\frac{2a+b\sqrt{\frac{d}{x}}}{2\sqrt{a}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{64a^{9/2}}+\frac{x^2\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{2a}$$

Antiderivative was successfully verified.

```
[In]  Int[x/Sqrt[a + b*Sqrt[d/x] + c/x],x]
```

```
[Out] (-7*b*d^2*Sqrt[a + b*Sqrt[d/x] + c/x])/(12*a^2*(d/x)^(3/2)) + (5*
b*d*(44*a*c - 21*b^2*d)*Sqrt[a + b*Sqrt[d/x] + c/x])/(96*a^4*Sqrt
[d/x]) - ((36*a*c - 35*b^2*d)*Sqrt[a + b*Sqrt[d/x] + c/x]*x)/(48*
a^3) + (Sqrt[a + b*Sqrt[d/x] + c/x]*x^2)/(2*a) + ((48*a^2*c^2 - 1
20*a*b^2*c*d + 35*b^4*d^2)*ArcTanh[(2*a + b*Sqrt[d/x])/(2*Sqrt[a]
*Sqrt[a + b*Sqrt[d/x] + c/x])])/(64*a^(9/2))
```

Rubi in Sympy [A] time = 90.942, size = 211, normalized size = 0.85

$$\frac{x^2\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{2a}-\frac{7bd^2\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{12a^2\left(\frac{d}{x}\right)^{\frac{3}{2}}}-\frac{x\left(36ac-35b^2d\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{48a^3}+\frac{5bd\left(44ac-21b^2d\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{96a^4\sqrt{\frac{d}{x}}}+\frac{\left(48a^2c^2-120ab^2cd+35b^4d^2\right)\operatorname{atanh}\left(\frac{2a+b\sqrt{\frac{d}{x}}}{2\sqrt{a}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{64a^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x/(a+c/x+b*(d/x)**(1/2))**(1/2),x)
```

```
[Out] x**2*sqrt(a + b*sqrt(d/x) + c/x)/(2*a) - 7*b*d**2*sqrt(a + b*sqrt
(d/x) + c/x)/(12*a**2*(d/x)**(3/2)) - x*(36*a*c - 35*b**2*d)*sqrt
(a + b*sqrt(d/x) + c/x)/(48*a**3) + 5*b*d*(44*a*c - 21*b**2*d)*sq
rt(a + b*sqrt(d/x) + c/x)/(96*a**4*sqrt(d/x)) + (48*a**2*c**2 - 1
20*a*b**2*c*d + 35*b**4*d**2)*atanh((2*a + b*sqrt(d/x))/(2*sqrt(a
)*sqrt(a + b*sqrt(d/x) + c/x)))/(64*a**(9/2))
```

Mathematica [A] time = 0.252667, size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt{a + b\sqrt{\frac{d}{x}} + \frac{c}{x}}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[x/Sqrt[a + b*Sqrt[d/x] + c/x],x]
```

```
[Out] Integrate[x/Sqrt[a + b*Sqrt[d/x] + c/x], x]
```

Maple [A] time = 0.046, size = 398, normalized size = 1.6

$$\frac{1}{192}\sqrt{\frac{1}{x}\left(b\sqrt{\frac{d}{x}}x + ax + c\right)}\sqrt{x}\left(105\ln\left(1/2\frac{1}{\sqrt{a}}\left(b\sqrt{\frac{d}{x}}\sqrt{x} + 2\sqrt{b\sqrt{\frac{d}{x}}x + ax + c}\sqrt{a} + 2a\sqrt{x}\right)\right)d^2ab^4 - 210a^{3/2}\sqrt{b\sqrt{\frac{d}{x}}x + \right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(x/(a+c/x+b*(d/x)^(1/2))^(1/2),x)
```

```
[Out] 1/192*((b*(d/x)^(1/2)*x+a*x+c)/x)^(1/2)*x^(1/2)*(105*ln(1/2*(b*(d
/x)^(1/2)*x^(1/2)+2*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*a^(1/2)+2*a*x^(
1/2))/a^(1/2))*d^2*a*b^4-210*a^(3/2)*(b*(d/x)^(1/2)*x+a*x+c)^(1/2
)*(d/x)^(3/2)*x^(3/2)*b^3+140*a^(5/2)*(b*(d/x)^(1/2)*x+a*x+c)^(1/
2)*d*x^(1/2)*b^2-112*a^(7/2)*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*(d/x)^
(1/2)*x^(3/2)*b-360*ln(1/2*(b*(d/x)^(1/2)*x^(1/2)+2*(b*(d/x)^(1/2
)*x+a*x+c)^(1/2)*a^(1/2)+2*a*x^(1/2))/a^(1/2))*d*a^2*b^2*c+96*x^(
3/2)*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*a^(9/2)+440*a^(5/2)*(b*(d/x)^(
1/2)*x+a*x+c)^(1/2)*(d/x)^(1/2)*x^(1/2)*b*c-144*a^(7/2)*(b*(d/x)^
(1/2)*x+a*x+c)^(1/2)*x^(1/2)*c+144*ln(1/2*(b*(d/x)^(1/2)*x^(1/2)+
2*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*a^(1/2)+2*a*x^(1/2))/a^(1/2))*a^3
*c^2)/(b*(d/x)^(1/2)*x+a*x+c)^(1/2)/a^(11/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt{b\sqrt{\frac{d}{x}} + a + \frac{c}{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(b*sqrt(d/x) + a + c/x),x, algorithm="maxima")
```

```
[Out] integrate(x/sqrt(b*sqrt(d/x) + a + c/x), x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(b*sqrt(d/x) + a + c/x),x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt{a + b\sqrt{\frac{d}{x}} + \frac{c}{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/(a+c/x+b*(d/x)**(1/2))**(1/2),x)
```

```
[Out] Integral(x/sqrt(a + b*sqrt(d/x) + c/x), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{\sqrt{b\sqrt{\frac{d}{x}} + a + \frac{c}{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x/sqrt(b*sqrt(d/x) + a + c/x),x, algorithm="giac")
```

```
[Out] integrate(x/sqrt(b*sqrt(d/x) + a + c/x), x)
```

3.3056 $\int \frac{1}{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\,dx$

Optimal. Leaf size=135

$$-\frac{(4ac-3b^2d)\tanh^{-1}\left(\frac{2a+b\sqrt{\frac{d}{x}}}{2\sqrt{a}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{4a^{5/2}}-\frac{3bd\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{2a^2\sqrt{\frac{d}{x}}}+\frac{x\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{a}$$

```
[Out] (-3*b*d*Sqrt[a + b*Sqrt[d/x] + c/x])/(2*a^2*Sqrt[d/x]) + (Sqrt[a
+ b*Sqrt[d/x] + c/x]*x)/a - ((4*a*c - 3*b^2*d)*ArcTanh[(2*a + b*S
qrt[d/x])/(2*Sqrt[a]*Sqrt[a + b*Sqrt[d/x] + c/x])])/(4*a^(5/2))
```

Rubi [A] time = 0.485129, antiderivative size = 135, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273

$$-\frac{(4ac-3b^2d)\tanh^{-1}\left(\frac{2a+b\sqrt{\frac{d}{x}}}{2\sqrt{a}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{4a^{5/2}}-\frac{3bd\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{2a^2\sqrt{\frac{d}{x}}}+\frac{x\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{a}$$

Antiderivative was successfully verified.

```
[In]  Int[1/Sqrt[a + b*Sqrt[d/x] + c/x],x]
```

```
[Out] (-3*b*d*Sqrt[a + b*Sqrt[d/x] + c/x])/(2*a^2*Sqrt[d/x]) + (Sqrt[a
+ b*Sqrt[d/x] + c/x]*x)/a - ((4*a*c - 3*b^2*d)*ArcTanh[(2*a + b*S
qrt[d/x])/(2*Sqrt[a]*Sqrt[a + b*Sqrt[d/x] + c/x])])/(4*a^(5/2))
```

Rubi in Sympy [A] time = 34.4416, size = 109, normalized size = 0.81

$$\frac{x\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{a}-\frac{3bd\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{2a^2\sqrt{\frac{d}{x}}}-\frac{(4ac-3b^2d)\,\operatorname{atanh}\left(\frac{2a+b\sqrt{\frac{d}{x}}}{2\sqrt{a}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{4a^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+c/x+b*(d/x)**(1/2))**(1/2),x)
```

```
[Out] x*sqrt(a + b*sqrt(d/x) + c/x)/a - 3*b*d*sqrt(a + b*sqrt(d/x) + c/
x)/(2*a**2*sqrt(d/x)) - (4*a*c - 3*b**2*d)*atanh((2*a + b*sqrt(d/
x))/(2*sqrt(a)*sqrt(a + b*sqrt(d/x) + c/x)))/(4*a**(5/2))
```

Mathematica [A] time = 0.355117, size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[1/Sqrt[a + b*Sqrt[d/x] + c/x],x]
```

```
[Out] Integrate[1/Sqrt[a + b*Sqrt[d/x] + c/x], x]
```

Maple [A] time = 0.043, size = 213, normalized size = 1.6

$$\frac{1}{4}\sqrt{\frac{1}{x}\left(b\sqrt{\frac{d}{x}}x+ax+c\right)}\sqrt{x}\left(4\,a^{5/2}\sqrt{b\sqrt{\frac{d}{x}}x+ax+c}\sqrt{x}-6\,a^{3/2}\sqrt{b\sqrt{\frac{d}{x}}x+ax+c}\sqrt{\frac{d}{x}}\sqrt{x}b+3\,\ln\left(1/2\,\frac{1}{\sqrt{a}}\left(b\sqrt{\frac{d}{x}}\sqrt{x}+2\,\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+c/x+b*(d/x)^(1/2))^(1/2),x)
```

```
[Out] 1/4*((b*(d/x)^(1/2)*x+a*x+c)/x)^(1/2)*x^(1/2)*(4*a^(5/2)*(b*(d/x)
^(1/2)*x+a*x+c)^(1/2)*x^(1/2)-6*a^(3/2)*(b*(d/x)^(1/2)*x+a*x+c)^(
1/2)*(d/x)^(1/2)*x^(1/2)*b+3*ln(1/2*(b*(d/x)^(1/2)*x^(1/2)+2*(b*(
d/x)^(1/2)*x+a*x+c)^(1/2)*a^(1/2)+2*a*x^(1/2))/a^(1/2))*d*a*b^2-4
*ln(1/2*(b*(d/x)^(1/2)*x^(1/2)+2*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*a^
(1/2)+2*a*x^(1/2))/a^(1/2))*a^2*c)/(b*(d/x)^(1/2)*x+a*x+c)^(1/2)/
a^(7/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{b\sqrt{\frac{d}{x}}+a+\frac{c}{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*sqrt(d/x) + a + c/x),x, algorithm="maxima")
```

```
[Out] integrate(1/sqrt(b*sqrt(d/x) + a + c/x), x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*sqrt(d/x) + a + c/x),x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+c/x+b*(d/x)**(1/2))**(1/2),x)
```

```
[Out] Integral(1/sqrt(a + b*sqrt(d/x) + c/x), x)
```

GIAC/XCAS [A] time = 0.505475, size = 232, normalized size = 1.72

$$\frac{\left(3\,b^2d\ln\left(\left|-bd+2\,\sqrt{cd}\sqrt{a}\right|\right)-4\,ac\ln\left(\left|-bd+2\,\sqrt{cd}\sqrt{a}\right|\right)+6\,\sqrt{cd}\sqrt{a}b\right)\mathrm{sign}\left(x\right)}{4\,a^{\frac{5}{2}}}-\frac{2\,\sqrt{adx+\sqrt{dx}bd+cd}\left(\frac{3\,bd}{a^2}-\frac{2\,\sqrt{dx}}{a}\right)+\frac{\left(3\,b^2d^2-4\,acd\right)\ln\left(\left|-bd-2\,\left(\sqrt{dx}\sqrt{a}-\sqrt{adx+\sqrt{dx}bd+cd}\right)\sqrt{a}\right|\right)}{a^{\frac{5}{2}}}}{4\,d\mathrm{sign}\left(x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/sqrt(b*sqrt(d/x) + a + c/x),x, algorithm="giac")
```

```
[Out] 1/4*(3*b^2*d*ln(abs(-b*d + 2*sqrt(c*d)*sqrt(a))) - 4*a*c*ln(abs(-
b*d + 2*sqrt(c*d)*sqrt(a))) + 6*sqrt(c*d)*sqrt(a)*b)*sign(x)/a^(5
/2) - 1/4*(2*sqrt(a*d*x + sqrt(d*x)*b*d + c*d)*(3*b*d/a^2 - 2*sqr
t(d*x)/a) + (3*b^2*d^2 - 4*a*c*d)*ln(abs(-b*d - 2*(sqrt(d*x)*sqrt
(a) - sqrt(a*d*x + sqrt(d*x)*b*d + c*d))*sqrt(a)))/a^(5/2))/(d*si
gn(x))
```

3.3057 $\int \frac{1}{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}x}\,dx$

Optimal. Leaf size=54

$$\frac{2\tanh^{-1}\left(\frac{2a+b\sqrt{\frac{d}{x}}}{2\sqrt{a}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{\sqrt{a}}$$

```
[Out] (2*ArcTanh[(2*a + b*Sqrt[d/x])/(2*Sqrt[a]*Sqrt[a + b*Sqrt[d/x] +
c/x])])/Sqrt[a]
```

Rubi [A] time = 0.203508, antiderivative size = 54, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154

$$\frac{2\tanh^{-1}\left(\frac{2a+b\sqrt{\frac{d}{x}}}{2\sqrt{a}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b*Sqrt[d/x] + c/x]*x),x]
```

```
[Out] (2*ArcTanh[(2*a + b*Sqrt[d/x])/(2*Sqrt[a]*Sqrt[a + b*Sqrt[d/x] +
c/x])])/Sqrt[a]
```

Rubi in Sympy [A] time = 16.3472, size = 42, normalized size = 0.78

$$\frac{2\,\text{atanh}\left(\frac{2a+b\sqrt{\frac{d}{x}}}{2\sqrt{a}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x/(a+c/x+b*(d/x)**(1/2))**(1/2),x)
```

```
[Out] 2*atanh((2*a + b*sqrt(d/x))/(2*sqrt(a)*sqrt(a + b*sqrt(d/x) + c/x
)))/sqrt(a)
```

Mathematica [A] time = 0.302518, size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}x}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[1/(Sqrt[a + b*Sqrt[d/x] + c/x]*x),x]
```

```
[Out] Integrate[1/(Sqrt[a + b*Sqrt[d/x] + c/x]*x), x]
```

Maple [B] time = 0.044, size = 94, normalized size = 1.7

$$2\frac{\sqrt{x}}{\sqrt{a}}\sqrt{\frac{1}{x}\left(b\sqrt{\frac{d}{x}}x+ax+c\right)}\ln\left(1/2\frac{1}{\sqrt{a}}\left(b\sqrt{\frac{d}{x}}\sqrt{x}+2\sqrt{b\sqrt{\frac{d}{x}}x+ax+c}\sqrt{a}+2a\sqrt{x}\right)\right)\frac{1}{\sqrt{b\sqrt{\frac{d}{x}}x+ax+c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x/(a+c/x+b*(d/x)^(1/2))^(1/2),x)
```

```
[Out] 2*((b*(d/x)^(1/2)*x+a*x+c)/x)^(1/2)*x^(1/2)/(b*(d/x)^(1/2)*x+a*x+
c)^(1/2)*ln(1/2*(b*(d/x)^(1/2)*x^(1/2)+2*(b*(d/x)^(1/2)*x+a*x+c)^
(1/2)*a^(1/2)+2*a*x^(1/2))/a^(1/2))/a^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{b\sqrt{\frac{d}{x}}+a+\frac{c}{x}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*sqrt(d/x) + a + c/x)*x),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(b*sqrt(d/x) + a + c/x)*x), x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*sqrt(d/x) + a + c/x)*x),x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{x\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x/(a+c/x+b*(d/x)**(1/2))**(1/2),x)
```

```
[Out] Integral(1/(x*sqrt(a + b*sqrt(d/x) + c/x)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{b\sqrt{\frac{d}{x}}+a+\frac{c}{x}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*sqrt(d/x) + a + c/x)*x),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(b*sqrt(d/x) + a + c/x)*x), x)
```

3.3058 $\int \frac{1}{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}x^2}\,dx$

Optimal. Leaf size=93

$$\frac{b\sqrt{d}\tanh^{-1}\left(\frac{bd+2c\sqrt{\frac{d}{x}}}{2\sqrt{c}\sqrt{d}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{c^{3/2}}-\frac{2\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{c}$$

```
[Out] (-2*Sqrt[a + b*Sqrt[d/x] + c/x])/c + (b*Sqrt[d]*ArcTanh[(b*d + 2*
c*Sqrt[d/x])/(2*Sqrt[c]*Sqrt[d]*Sqrt[a + b*Sqrt[d/x] + c/x])])/c^
(3/2)
```

Rubi [A] time = 0.227829, antiderivative size = 93, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192

$$\frac{b\sqrt{d}\tanh^{-1}\left(\frac{bd+2c\sqrt{\frac{d}{x}}}{2\sqrt{c}\sqrt{d}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{c^{3/2}}-\frac{2\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{c}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b*Sqrt[d/x] + c/x]*x^2),x]
```

```
[Out] (-2*Sqrt[a + b*Sqrt[d/x] + c/x])/c + (b*Sqrt[d]*ArcTanh[(b*d + 2*
c*Sqrt[d/x])/(2*Sqrt[c]*Sqrt[d]*Sqrt[a + b*Sqrt[d/x] + c/x])])/c^
(3/2)
```

Rubi in Sympy [A] time = 19.6278, size = 75, normalized size = 0.81

$$\frac{b\sqrt{d}\,\mathrm{atanh}\left(\frac{bd+2c\sqrt{\frac{d}{x}}}{2\sqrt{c}\sqrt{d}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{c^{\frac{3}{2}}}-\frac{2\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**2/(a+c/x+b*(d/x)**(1/2))**(1/2),x)
```

```
[Out] b*sqrt(d)*atanh((b*d + 2*c*sqrt(d/x))/(2*sqrt(c)*sqrt(d)*sqrt(a +
 b*sqrt(d/x) + c/x)))/c**(3/2) - 2*sqrt(a + b*sqrt(d/x) + c/x)/c
```

Mathematica [A] time = 0.174704, size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}x^2}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[1/(Sqrt[a + b*Sqrt[d/x] + c/x]*x^2),x]
```

```
[Out] Integrate[1/(Sqrt[a + b*Sqrt[d/x] + c/x]*x^2), x]
```

Maple [A] time = 0.045, size = 118, normalized size = 1.3

$$1\sqrt{\frac{1}{x}\left(b\sqrt{\frac{d}{x}}x+ax+c\right)}\left(b\sqrt{\frac{d}{x}}x\ln\left(1\left(2c+b\sqrt{\frac{d}{x}}x+2\sqrt{c}\sqrt{b\sqrt{\frac{d}{x}}x+ax+c}\right)\frac{1}{\sqrt{x}}\right)c-2\sqrt{b\sqrt{\frac{d}{x}}x+ax+c}c^{3/2}\right)\frac{1}{\sqrt{b\sqrt{\frac{d}{x}}x+}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^2/(a+c/x+b*(d/x)^(1/2))^(1/2),x)
```

```
[Out] ((b*(d/x)^(1/2)*x+a*x+c)/x)^(1/2)*(b*(d/x)^(1/2)*x*ln((2*c+b*(d/x
)^(1/2)*x+2*c^(1/2)*(b*(d/x)^(1/2)*x+a*x+c)^(1/2))/x^(1/2))*c-2*(
b*(d/x)^(1/2)*x+a*x+c)^(1/2)*c^(3/2))/(b*(d/x)^(1/2)*x+a*x+c)^(1/
2)/c^(5/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{b\sqrt{\frac{d}{x}}+a+\frac{c}{x}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*sqrt(d/x) + a + c/x)*x^2),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(b*sqrt(d/x) + a + c/x)*x^2), x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*sqrt(d/x) + a + c/x)*x^2),x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{x^2\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**2/(a+c/x+b*(d/x)**(1/2))**(1/2),x)
```

```
[Out] Integral(1/(x**2*sqrt(a + b*sqrt(d/x) + c/x)), x)
```

GIAC/XCAS [A] time = 0.457892, size = 123, normalized size = 1.32

$$-\frac{\left(\frac{bd\ln\left(\left|-bd-2\sqrt{c}\left(\sqrt{c}\sqrt{\frac{d}{x}}-\sqrt{bd\sqrt{\frac{d}{x}}+ad+\frac{cd}{x}}\right)\right|\right)}{c^{\frac{3}{2}}}+\frac{2\sqrt{bd\sqrt{\frac{d}{x}}+ad+\frac{cd}{x}}}{c}\right)\sqrt{d}}{|d|}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*sqrt(d/x) + a + c/x)*x^2),x, algorithm="giac")
```

```
[Out] -(b*d*ln(abs(-b*d - 2*sqrt(c)*(sqrt(c)*sqrt(d/x) - sqrt(b*d*sqrt(
d/x) + a*d + c*d/x))))/c^(3/2) + 2*sqrt(b*d*sqrt(d/x) + a*d + c*d
/x)/c)*sqrt(d)/abs(d)
```

3.3059 $\int \frac{1}{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}x^3}\,dx$

Optimal. Leaf size=165

$$-\frac{b\sqrt{d}\left(12ac-5b^2d\right)\tanh^{-1}\left(\frac{bd+2c\sqrt{\frac{d}{x}}}{2\sqrt{c}\sqrt{d}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{8c^{7/2}}+\frac{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\left(16ac-15b^2d+10bc\sqrt{\frac{d}{x}}\right)}{12c^3}-\frac{2\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{3cx}$$

```
[Out] ((16*a*c - 15*b^2*d + 10*b*c*Sqrt[d/x])*Sqrt[a + b*Sqrt[d/x] + c/
x])/(12*c^3) - (2*Sqrt[a + b*Sqrt[d/x] + c/x])/(3*c*x) - (b*Sqrt[
d]*(12*a*c - 5*b^2*d)*ArcTanh[(b*d + 2*c*Sqrt[d/x])/(2*Sqrt[c]*Sq
rt[d]*Sqrt[a + b*Sqrt[d/x] + c/x])])/(8*c^(7/2))
```

Rubi [A] time = 0.509205, antiderivative size = 165, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231

$$-\frac{b\sqrt{d}\left(12ac-5b^2d\right)\tanh^{-1}\left(\frac{bd+2c\sqrt{\frac{d}{x}}}{2\sqrt{c}\sqrt{d}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{8c^{7/2}}+\frac{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\left(16ac-15b^2d+10bc\sqrt{\frac{d}{x}}\right)}{12c^3}-\frac{2\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{3cx}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b*Sqrt[d/x] + c/x]*x^3),x]
```

```
[Out] ((16*a*c - 15*b^2*d + 10*b*c*Sqrt[d/x])*Sqrt[a + b*Sqrt[d/x] + c/
x])/(12*c^3) - (2*Sqrt[a + b*Sqrt[d/x] + c/x])/(3*c*x) - (b*Sqrt[
d]*(12*a*c - 5*b^2*d)*ArcTanh[(b*d + 2*c*Sqrt[d/x])/(2*Sqrt[c]*Sq
rt[d]*Sqrt[a + b*Sqrt[d/x] + c/x])])/(8*c^(7/2))
```

Rubi in Sympy [A] time = 38.2803, size = 141, normalized size = 0.85

$$-\frac{b\sqrt{d}\left(12ac-5b^2d\right)\operatorname{atanh}\left(\frac{bd+2c\sqrt{\frac{d}{x}}}{2\sqrt{c}\sqrt{d}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{8c^{\frac{7}{2}}}-\frac{2\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{3cx}+\frac{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\left(4ac-\frac{15b^2d}{4}+\frac{5bc\sqrt{\frac{d}{x}}}{2}\right)}{3c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**3/(a+c/x+b*(d/x)**(1/2))**(1/2),x)
```

```
[Out] -b*sqrt(d)*(12*a*c - 5*b**2*d)*atanh((b*d + 2*c*sqrt(d/x))/(2*sqr
t(c)*sqrt(d)*sqrt(a + b*sqrt(d/x) + c/x)))/(8*c**(7/2)) - 2*sqrt(
a + b*sqrt(d/x) + c/x)/(3*c*x) + sqrt(a + b*sqrt(d/x) + c/x)*(4*a
*c - 15*b**2*d/4 + 5*b*c*sqrt(d/x)/2)/(3*c**3)
```

Mathematica [A] time = 0.203212, size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}x^3}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[1/(Sqrt[a + b*Sqrt[d/x] + c/x]*x^3),x]
```

```
[Out] Integrate[1/(Sqrt[a + b*Sqrt[d/x] + c/x]*x^3), x]
```

Maple [A] time = 0.045, size = 267, normalized size = 1.6

$$\frac{1}{24\,x}\sqrt{\frac{1}{x}\left(b\sqrt{\frac{d}{x}}x+ax+c\right)}\left(15\,\ln\left(\frac{1}{\sqrt{x}}\left(2\,c+b\sqrt{\frac{d}{x}}x+2\,\sqrt{c}\sqrt{b\sqrt{\frac{d}{x}}x+ax+c}\right)\right)\left(\frac{d}{x}\right)^{3/2}x^3b^3c-30\,\sqrt{b\sqrt{\frac{d}{x}}x+ax+c}dc^{3/2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^3/(a+c/x+b*(d/x)^(1/2))^(1/2),x)
```

```
[Out] 1/24*((b*(d/x)^(1/2)*x+a*x+c)/x)^(1/2)/x*(15*ln((2*c+b*(d/x)^(1/2
)*x+2*c^(1/2)*(b*(d/x)^(1/2)*x+a*x+c)^(1/2))/x^(1/2))*(d/x)^(3/2)
*x^3*b^3*c-30*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*d*c^(3/2)*x*b^2-36*ln
((2*c+b*(d/x)^(1/2)*x+2*c^(1/2)*(b*(d/x)^(1/2)*x+a*x+c)^(1/2))/x^
(1/2))*(d/x)^(1/2)*x^2*a*b*c^2+20*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*c
^(5/2)*(d/x)^(1/2)*x*b+32*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*c^(5/2)*x
*a-16*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*c^(7/2))/(b*(d/x)^(1/2)*x+a*x
+c)^(1/2)/c^(9/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{b\sqrt{\frac{d}{x}}+a+\frac{c}{x}}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*sqrt(d/x) + a + c/x)*x^3),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(b*sqrt(d/x) + a + c/x)*x^3), x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*sqrt(d/x) + a + c/x)*x^3),x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{x^3\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/x**3/(a+c/x+b*(d/x)**(1/2))**(1/2),x)

[Out] Integral(1/(x**3*sqrt(a + b*sqrt(d/x) + c/x)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{b\sqrt{\frac{d}{x}} + a + \frac{c}{x}}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(b*sqrt(d/x) + a + c/x)*x^3),x, algorithm="giac")

[Out] integrate(1/(sqrt(b*sqrt(d/x) + a + c/x)*x^3), x)
```

3.3060 $\int \frac{1}{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\,x^4}\,dx$

Optimal. Leaf size=289

$$\frac{b\sqrt{d}\left(240a^2c^2-280ab^2cd+63b^4d^2\right)\tanh^{-1}\left(\frac{bd+2c\sqrt{\frac{d}{x}}}{2\sqrt{c}\sqrt{d}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{128c^{11/2}} - \frac{\left(1024a^2c^2+14bc\sqrt{\frac{d}{x}}\left(92ac-45b^2d\right)-2940ab^2cd+945b^4d^2\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{960c^5} + \frac{\left(64ac-63b^2d\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{120c^3x} + \frac{9b\left(\frac{d}{x}\right)^{3/2}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{20c^2d} - \frac{2\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{5cx^2}$$

```
[Out] -((1024*a^2*c^2 - 2940*a*b^2*c*d + 945*b^4*d^2 + 14*b*c*(92*a*c -
 45*b^2*d)*Sqrt[d/x])*Sqrt[a + b*Sqrt[d/x] + c/x])/(960*c^5) + (9
*b*Sqrt[a + b*Sqrt[d/x] + c/x]*(d/x)^(3/2))/(20*c^2*d) - (2*Sqrt[
a + b*Sqrt[d/x] + c/x])/(5*c*x^2) + ((64*a*c - 63*b^2*d)*Sqrt[a +
 b*Sqrt[d/x] + c/x])/(120*c^3*x) + (b*Sqrt[d]*(240*a^2*c^2 - 280*
a*b^2*c*d + 63*b^4*d^2)*ArcTanh[(b*d + 2*c*Sqrt[d/x])/(2*Sqrt[c]*
Sqrt[d]*Sqrt[a + b*Sqrt[d/x] + c/x])])/(128*c^(11/2))
```

Rubi [A] time = 1.32597, antiderivative size = 289, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.269

$$\frac{b\sqrt{d}\left(240a^2c^2-280ab^2cd+63b^4d^2\right)\tanh^{-1}\left(\frac{bd+2c\sqrt{\frac{d}{x}}}{2\sqrt{c}\sqrt{d}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{128c^{11/2}} - \frac{\left(1024a^2c^2+14bc\sqrt{\frac{d}{x}}\left(92ac-45b^2d\right)-2940ab^2cd+945b^4d^2\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{960c^5} + \frac{\left(64ac-63b^2d\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{120c^3x} + \frac{9b\left(\frac{d}{x}\right)^{3/2}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{20c^2d} - \frac{2\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{5cx^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b*Sqrt[d/x] + c/x]*x^4),x]
```


```
[Out] -((1024*a^2*c^2 - 2940*a*b^2*c*d + 945*b^4*d^2 + 14*b*c*(92*a*c -
 45*b^2*d)*Sqrt[d/x])*Sqrt[a + b*Sqrt[d/x] + c/x])/(960*c^5) + (9
*b*Sqrt[a + b*Sqrt[d/x] + c/x]*(d/x)^(3/2))/(20*c^2*d) - (2*Sqrt[
a + b*Sqrt[d/x] + c/x])/(5*c*x^2) + ((64*a*c - 63*b^2*d)*Sqrt[a +
 b*Sqrt[d/x] + c/x])/(120*c^3*x) + (b*Sqrt[d]*(240*a^2*c^2 - 280*
a*b^2*c*d + 63*b^4*d^2)*ArcTanh[(b*d + 2*c*Sqrt[d/x])/(2*Sqrt[c]*
Sqrt[d]*Sqrt[a + b*Sqrt[d/x] + c/x])])/(128*c^(11/2))
```

Rubi in Sympy [A] time = 95.5762, size = 257, normalized size = 0.89

$$\frac{9b\left(\frac{d}{x}\right)^{\frac{3}{2}}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{20c^2d}+\frac{b\sqrt{d}\left(240a^2c^2-280ab^2cd+63b^4d^2\right)\operatorname{atanh}\left(\frac{bd+2c\sqrt{\frac{d}{x}}}{2\sqrt{c}\sqrt{d}\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}\right)}{128c^{\frac{11}{2}}}-\frac{2\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{5cx^2}+\frac{\left(64ac-63b^2d\right)\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}}{120c^3x}-\frac{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}\left(64a^2c^2-\frac{735ab^2cd}{4}+\frac{945b^4d^2}{16}+\frac{7bc\sqrt{\frac{d}{x}}(92ac-45b^2d)}{8}\right)}{60c^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/x**4/(a+c/x+b*(d/x)**(1/2))**(1/2),x)
```

```
[Out] 9*b*(d/x)**(3/2)*sqrt(a + b*sqrt(d/x) + c/x)/(20*c**2*d) + b*sqrt
(d)*(240*a**2*c**2 - 280*a*b**2*c*d + 63*b**4*d**2)*atanh((b*d +
2*c*sqrt(d/x))/(2*sqrt(c)*sqrt(d)*sqrt(a + b*sqrt(d/x) + c/x)))/(
128*c**(11/2)) - 2*sqrt(a + b*sqrt(d/x) + c/x)/(5*c*x**2) + (64*a
*c - 63*b**2*d)*sqrt(a + b*sqrt(d/x) + c/x)/(120*c**3*x) - sqrt(a
 + b*sqrt(d/x) + c/x)*(64*a**2*c**2 - 735*a*b**2*c*d/4 + 945*b**4
*d**2/16 + 7*b*c*sqrt(d/x)*(92*a*c - 45*b**2*d)/8)/(60*c**5)
```

Mathematica [A] time = 0.22737, size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{a+b\sqrt{\frac{d}{x}}+\frac{c}{x}}x^4}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[1/(Sqrt[a + b*Sqrt[d/x] + c/x]*x^4),x]
```

```
[Out] Integrate[1/(Sqrt[a + b*Sqrt[d/x] + c/x]*x^4), x]
```

Maple [A] time = 0.046, size = 487, normalized size = 1.7

$$\frac{1}{1920\,x^2}\sqrt{\frac{1}{x}\left(b\sqrt{\frac{d}{x}}x+ax+c\right)}\left(945\,\ln\left(\frac{1}{\sqrt{x}}\left(2\,c+b\sqrt{\frac{d}{x}}x+2\,\sqrt{c}\sqrt{b\sqrt{\frac{d}{x}}x+ax+c}\right)\right)\left(\frac{d}{x}\right)^{5/2}x^5b^5c-1890\sqrt{b\sqrt{\frac{d}{x}}x+ax+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/x^4/(a+c/x+b*(d/x)^(1/2))^(1/2),x)
```

```
[Out] 1/1920*((b*(d/x)^(1/2)*x+a*x+c)/x)^(1/2)/x^2*(945*ln((2*c+b*(d/x)
^(1/2)*x+2*c^(1/2)*(b*(d/x)^(1/2)*x+a*x+c)^(1/2))/x^(1/2))*(d/x)^
(5/2)*x^5*b^5*c-1890*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*d^2*c^(3/2)*x^
2*b^4-4200*ln((2*c+b*(d/x)^(1/2)*x+2*c^(1/2)*(b*(d/x)^(1/2)*x+a*x
+c)^(1/2))/x^(1/2))*(d/x)^(3/2)*x^4*a*b^3*c^2+1260*(b*(d/x)^(1/2)
*x+a*x+c)^(1/2)*c^(5/2)*(d/x)^(3/2)*x^3*b^3+5880*(b*(d/x)^(1/2)*x
+a*x+c)^(1/2)*d*c^(5/2)*x^2*a*b^2+3600*ln((2*c+b*(d/x)^(1/2)*x+2*
c^(1/2)*(b*(d/x)^(1/2)*x+a*x+c)^(1/2))/x^(1/2))*(d/x)^(1/2)*x^3*a
^2*b*c^3-1008*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*d*c^(7/2)*x*b^2-2576*
(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*c^(7/2)*(d/x)^(1/2)*x^2*a*b-2048*(b
*(d/x)^(1/2)*x+a*x+c)^(1/2)*c^(7/2)*x^2*a^2+864*(b*(d/x)^(1/2)*x+
a*x+c)^(1/2)*c^(9/2)*(d/x)^(1/2)*x*b+1024*(b*(d/x)^(1/2)*x+a*x+c)
```

```
^(1/2)*c^(9/2)*x*a-768*(b*(d/x)^(1/2)*x+a*x+c)^(1/2)*c^(11/2))/(b
*(d/x)^(1/2)*x+a*x+c)^(1/2)/c^(13/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{b\sqrt{\frac{d}{x}} + a + \frac{c}{x}}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(b*sqrt(d/x) + a + c/x)*x^4),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(b*sqrt(d/x) + a + c/x)*x^4), x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(b*sqrt(d/x) + a + c/x)*x^4),x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{x^4\sqrt{a + b\sqrt{\frac{d}{x}} + \frac{c}{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**4/(a+c/x+b*(d/x)**(1/2))**(1/2),x)
```

```
[Out] Integral(1/(x**4*sqrt(a + b*sqrt(d/x) + c/x)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{b\sqrt{\frac{d}{x}} + a + \frac{c}{x}}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(b*sqrt(d/x) + a + c/x)*x^4),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(b*sqrt(d/x) + a + c/x)*x^4), x)
```

3.3061 $\int \sqrt{\sqrt{\frac{1}{x}}+\frac{1}{x}}\,dx$

Optimal. Leaf size=26

$$\frac{4\left(\sqrt{\frac{1}{x}}+\frac{1}{x}\right)^{3/2}}{3\left(\frac{1}{x}\right)^{3/2}}$$

```
[Out] (4*(Sqrt[x^(-1)] + x^(-1))^(3/2))/(3*(x^(-1))^(3/2))
```

Rubi [A] time = 0.0429081, antiderivative size = 26, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{4\left(\sqrt{\frac{1}{x}}+\frac{1}{x}\right)^{3/2}}{3\left(\frac{1}{x}\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[Sqrt[x^(-1)] + x^(-1)],x]

[Out] (4*(Sqrt[x^(-1)] + x^(-1))^(3/2))/(3*(x^(-1))^(3/2))
```

Rubi in Sympy [A] time = 5.27735, size = 22, normalized size = 0.85

$$\frac{4\left(\sqrt{\frac{1}{x}}+\frac{1}{x}\right)^{\frac{3}{2}}}{3\left(\frac{1}{x}\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((1/x+(1/x)**(1/2))**(1/2),x)

[Out] 4*(sqrt(1/x) + 1/x)**(3/2)/(3*(1/x)**(3/2))
```

Mathematica [A] time = 0.0444018, size = 0, normalized size = 0.

$$\int \sqrt{\sqrt{\frac{1}{x}}+\frac{1}{x}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[Sqrt[Sqrt[x^(-1)] + x^(-1)],x]

[Out] Integrate[Sqrt[Sqrt[x^(-1)] + x^(-1)], x]
```

Maple [A] time = 0.029, size = 32, normalized size = 1.2

$$\frac{4}{3}\sqrt{\frac{1}{x}\left(\sqrt{x^{-1}}x+1\right)}\left(\sqrt{x^{-1}}x+1\right)\frac{1}{\sqrt{x^{-1}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((1/x+(1/x)^(1/2))^(1/2),x)
```

```
[Out] 4/3*(((1/x)^(1/2)*x+1)/x)^(1/2)*((1/x)^(1/2)*x+1)/(1/x)^(1/2)
```

Maxima [A] time = 1.37492, size = 12, normalized size = 0.46

$$\frac{4}{3}\left(\sqrt{x}+1\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(1/sqrt(x) + 1/x),x, algorithm="maxima")
```

```
[Out] 4/3*(sqrt(x) + 1)^(3/2)
```

Fricas [A] time = 0.243532, size = 28, normalized size = 1.08

$$\frac{4\left(x^{\frac{3}{2}}+x\right)\sqrt{\frac{x+\sqrt{x}}{x^{\frac{3}{2}}}}}{3\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(1/sqrt(x) + 1/x),x, algorithm="fricas")
```

```
[Out] 4/3*(x^(3/2) + x)*sqrt((x + sqrt(x))/x^(3/2))/sqrt(x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\sqrt{\sqrt{\frac{1}{x}}+\frac{1}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((1/x+(1/x)**(1/2))**(1/2),x)
```

```
[Out] Integral(sqrt(sqrt(1/x) + 1/x), x)
```

GIAC/XCAS [A] time = 0.213938, size = 15, normalized size = 0.58

$$\frac{4}{3}\left(\sqrt{x}+1\right)^{\frac{3}{2}}-\frac{4}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(1/sqrt(x) + 1/x),x, algorithm="giac")
```

```
[Out] 4/3*(sqrt(x) + 1)^(3/2) - 4/3
```

3.3062 $\int \sqrt{2+\sqrt{\frac{1}{x}}+\frac{1}{x}}\,dx$

Optimal. Leaf size=75

$$\frac{1}{4}\left(\sqrt{\frac{1}{x}}+4\right)\sqrt{\sqrt{\frac{1}{x}}+\frac{1}{x}+2}\,x+\frac{7\tanh^{-1}\left(\frac{\sqrt{\frac{1}{x}}+4}{2\sqrt{2}\sqrt{\sqrt{\frac{1}{x}}+\frac{1}{x}+2}}\right)}{8\sqrt{2}}$$

```
[Out] ((4 + Sqrt[x^(-1)])*Sqrt[2 + Sqrt[x^(-1)] + x^(-1)]*x)/4 + (7*Arc
Tanh[(4 + Sqrt[x^(-1)])/(2*Sqrt[2]*Sqrt[2 + Sqrt[x^(-1)] + x^(-1)
])])/(8*Sqrt[2])
```

Rubi [A] time = 0.0890058, antiderivative size = 75, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312

$$\frac{1}{4}\left(\sqrt{\frac{1}{x}}+4\right)\sqrt{\sqrt{\frac{1}{x}}+\frac{1}{x}+2}\,x+\frac{7\tanh^{-1}\left(\frac{\sqrt{\frac{1}{x}}+4}{2\sqrt{2}\sqrt{\sqrt{\frac{1}{x}}+\frac{1}{x}+2}}\right)}{8\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[2 + Sqrt[x^(-1)] + x^(-1)],x]
```

```
[Out] ((4 + Sqrt[x^(-1)])*Sqrt[2 + Sqrt[x^(-1)] + x^(-1)]*x)/4 + (7*Arc
Tanh[(4 + Sqrt[x^(-1)])/(2*Sqrt[2]*Sqrt[2 + Sqrt[x^(-1)] + x^(-1)
])])/(8*Sqrt[2])
```

Rubi in Sympy [A] time = 9.35362, size = 66, normalized size = 0.88

$$\frac{x\left(\sqrt{\frac{1}{x}}+4\right)\sqrt{\sqrt{\frac{1}{x}}+2+\frac{1}{x}}}{4}+\frac{7\sqrt{2}\operatorname{atanh}\left(\frac{\sqrt{2}\left(\sqrt{\frac{1}{x}}+4\right)}{4\sqrt{\sqrt{\frac{1}{x}}+2+\frac{1}{x}}}\right)}{16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2+1/x+(1/x)**(1/2))**(1/2),x)
```

```
[Out] x*(sqrt(1/x) + 4)*sqrt(sqrt(1/x) + 2 + 1/x)/4 + 7*sqrt(2)*atanh(s
qrt(2)*(sqrt(1/x) + 4)/(4*sqrt(sqrt(1/x) + 2 + 1/x)))/16
```

Mathematica [A] time = 1.63907, size = 0, normalized size = 0.

$$\int \sqrt{2+\sqrt{\frac{1}{x}}+\frac{1}{x}}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[Sqrt[2 + Sqrt[x^(-1)] + x^(-1)],x]
```

```
[Out] Integrate[Sqrt[2 + Sqrt[x^(-1)] + x^(-1)], x]
```

Maple [B] time = 0.034, size = 123, normalized size = 1.6

$$\frac{1}{16}\sqrt{\frac{1}{x}\left(\sqrt{x^{-1}}x+2x+1\right)}\sqrt{x}\left(4\sqrt{\sqrt{x^{-1}}x+2x+1}\sqrt{x^{-1}}\sqrt{x}+16\sqrt{\sqrt{x^{-1}}x+2x+1}\sqrt{x}+7\ln\left(1/4\sqrt{2}\sqrt{x^{-1}}\sqrt{x}+\sqrt{x}\sqrt{2}+\sqrt{\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((2+1/x+(1/x)^(1/2))^(1/2),x)
```

```
[Out] 1/16*(((1/x)^(1/2)*x+2*x+1)/x)^(1/2)*x^(1/2)*(4*((1/x)^(1/2)*x+2*
x+1)^(1/2)*(1/x)^(1/2)*x^(1/2)+16*((1/x)^(1/2)*x+2*x+1)^(1/2)*x^(
1/2)+7*ln(1/4*2^(1/2)*(1/x)^(1/2)*x^(1/2)+x^(1/2)*2^(1/2)+((1/x)^
(1/2)*x+2*x+1)^(1/2))*2^(1/2))/((1/x)^(1/2)*x+2*x+1)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\sqrt{\frac{1}{\sqrt{x}}+\frac{1}{x}+2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(1/sqrt(x) + 1/x + 2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(1/sqrt(x) + 1/x + 2), x)
```

Fricas [A] time = 1.51762, size = 171, normalized size = 2.28

$$\frac{\sqrt{2}\left(8\left(4\sqrt{2}x^{\frac{3}{2}}+\sqrt{2}x\right)\sqrt{\frac{(2x+1)\sqrt{x}+x}{x^{\frac{3}{2}}}}+7\sqrt{x}\log\left(-\frac{\sqrt{2}(2048x^2+1664x+113)\sqrt{x}+64\sqrt{2}(32x^2+9x)+16\left(96x^2+4\left(32x^2+13x\right)\sqrt{x}+9x\right)\sqrt{\frac{(2x+1)\sqrt{x}+x}{x^{\frac{3}{2}}}}}{\sqrt{x}}\right.\right.}{64\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(sqrt(1/sqrt(x) + 1/x + 2),x, algorithm="fricas")
```

```
[Out] 1/64*sqrt(2)*(8*(4*sqrt(2)*x^(3/2) + sqrt(2)*x)*sqrt(((2*x + 1)*s
qrt(x) + x)/x^(3/2)) + 7*sqrt(x)*log(-(sqrt(2)*(2048*x^2 + 1664*x
 + 113)*sqrt(x) + 64*sqrt(2)*(32*x^2 + 9*x) + 16*(96*x^2 + 4*(32*
x^2 + 13*x)*sqrt(x) + 9*x)*sqrt(((2*x + 1)*sqrt(x) + x)/x^(3/2))
/sqrt(x)))/sqrt(x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\sqrt{\sqrt{\frac{1}{x}}+2+\frac{1}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((2+1/x+(1/x)**(1/2))**(1/2),x)
```

```
[Out] Integral(sqrt(sqrt(1/x) + 2 + 1/x), x)
```

GIAC/XCAS [A] time = 0.222735, size = 100, normalized size = 1.33

$$-\frac{1}{16}\sqrt{2}\left(2\sqrt{2}-7\ln\left(2\sqrt{2}-1\right)\right)+\frac{1}{4}\sqrt{2x+\sqrt{x}+1}(4\sqrt{x}+1)-\frac{7}{16}\sqrt{2}\ln\left(-2\sqrt{2}\left(\sqrt{2}\sqrt{x}-\sqrt{2x+\sqrt{x}+1}\right)-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(1/sqrt(x) + 1/x + 2),x, algorithm="giac")
```

```
[Out] -1/16*sqrt(2)*(2*sqrt(2) - 7*ln(2*sqrt(2) - 1)) + 1/4*sqrt(2*x +
sqrt(x) + 1)*(4*sqrt(x) + 1) - 7/16*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2
)*sqrt(x) - sqrt(2*x + sqrt(x) + 1)) - 1)
```

3.3063 $\int (cx^n)^{\frac{1}{n}} \left(a + b (cx^n)^{\frac{1}{n}}\right)^p \, dx$

Optimal. Leaf size=79

$$\frac{x (cx^n)^{-1/n} \left(a + b (cx^n)^{\frac{1}{n}}\right)^{p+2}}{b^2(p+2)} - \frac{ax (cx^n)^{-1/n} \left(a + b (cx^n)^{\frac{1}{n}}\right)^{p+1}}{b^2(p+1)}$$

```
[Out] -((a*x*(a + b*(c*x^n)^n^(-1))^(1 + p))/(b^2*(1 + p)*(c*x^n)^n^(-1
))) + (x*(a + b*(c*x^n)^n^(-1))^(2 + p))/(b^2*(2 + p)*(c*x^n)^n^(
-1))
```

Rubi [A] time = 0.0875262, antiderivative size = 79, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.12

$$\frac{x (cx^n)^{-1/n} \left(a + b (cx^n)^{\frac{1}{n}}\right)^{p+2}}{b^2(p+2)} - \frac{ax (cx^n)^{-1/n} \left(a + b (cx^n)^{\frac{1}{n}}\right)^{p+1}}{b^2(p+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x^n)^n^(-1)*(a + b*(c*x^n)^n^(-1))^p,x]
```

```
[Out] -((a*x*(a + b*(c*x^n)^n^(-1))^(1 + p))/(b^2*(1 + p)*(c*x^n)^n^(-1
))) + (x*(a + b*(c*x^n)^n^(-1))^(2 + p))/(b^2*(2 + p)*(c*x^n)^n^(
-1))
```

Rubi in Sympy [A] time = 21.9106, size = 65, normalized size = 0.82

$$-\frac{ax (cx^n)^{-\frac{1}{n}} \left(a + b (cx^n)^{\frac{1}{n}}\right)^{p+1}}{b^2 (p+1)} + \frac{x (cx^n)^{-\frac{1}{n}} \left(a + b (cx^n)^{\frac{1}{n}}\right)^{p+2}}{b^2 (p+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**n)**(1/n)*(a+b*(c*x**n)**(1/n))**p,x)
```

```
[Out] -a*x*(c*x**n)**(-1/n)*(a + b*(c*x**n)**(1/n))**(p + 1)/(b**2*(p +
 1)) + x*(c*x**n)**(-1/n)*(a + b*(c*x**n)**(1/n))**(p + 2)/(b**2*
(p + 2))
```

Mathematica [A] time = 0.263018, size = 88, normalized size = 1.11

$$\frac{x \left(a + b (cx^n)^{\frac{1}{n}}\right)^p \left(a^2 (cx^n)^{-1/n} \left(\left(\frac{b(cx^n)^{\frac{1}{n}}}{a} + 1\right)^{-p} - 1\right) + abp + b^2(p+1) (cx^n)^{\frac{1}{n}}\right)}{b^2(p+1)(p+2)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x^n)^n^(-1)*(a + b*(c*x^n)^n^(-1))^p,x]
```

```
[Out] (x*(a + b*(c*x^n)^n^(-1))^p*(a*b*p + b^2*(1 + p)*(c*x^n)^n^(-1) +
 (a^2*(-1 + (1 + (b*(c*x^n)^n^(-1))/a)^(-p)))/(c*x^n)^n^(-1)))/(b
^2*(1 + p)*(2 + p))
```

Maple [C] time = 0.421, size = 571, normalized size = 7.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^n)^(1/n)*(a+b*(c*x^n)^(1/n))^p,x)
```

```
[Out] a*p/b/(2+p)/(1+p)*x*(b*exp(1/2*(-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(
I*c*x^n)+I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*csgn(I*c)*csgn(I*c
*x^n)^2-I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(x))/n)*x+a)
^p+c^(1/n)/(2+p)*x^2*(b*exp(1/2*(-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn
(I*c*x^n)+I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*csgn(I*c)*csgn(I*
c*x^n)^2-I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(x))/n)*x+a
)^p*exp(1/2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*cs
gn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(I*
c*x^n)^2-2*n*ln(x)+2*ln(x^n))/n)-1/(c^(1/n))/b^2/(1+p)/(2+p)*a^2*
(b*exp(1/2*(-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)+I*Pi*csgn(I
*x^n)*csgn(I*c*x^n)^2+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-I*Pi*csgn(I*
c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(x))/n)*x+a)^p*exp(-1/2*(I*Pi*cs
gn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n
)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-2*n*ln(x)+2
*ln(x^n))/n)
```

Maxima [A] time = 1.77188, size = 89, normalized size = 1.13

$$\frac{\left(b^2c^{\frac{2}{n}}(p+1)x^2+abc^{\left(\frac{1}{n}\right)}px-a^2\right)\left(bc^{\left(\frac{1}{n}\right)}x+a\right)^pc^{-\frac{1}{n}}}{(p^2+3\,p+2)b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^p*(c*x^n)^(1/n),x, algorithm="maxima")
```

```
[Out] (b^2*c^(2/n)*(p + 1)*x^2 + a*b*c^(1/n)*p*x - a^2)*(b*c^(1/n)*x +
a)^p*c^(-1/n)/((p^2 + 3*p + 2)*b^2)
```

Fricas [A] time = 0.226544, size = 104, normalized size = 1.32

$$\frac{\left(abc^{\left(\frac{1}{n}\right)}px+\left(b^2p+b^2\right)c^{\frac{2}{n}}x^2-a^2\right)\left(bc^{\left(\frac{1}{n}\right)}x+a\right)^p}{(b^2p^2+3\,b^2p+2\,b^2)c^{\left(\frac{1}{n}\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^p*(c*x^n)^(1/n),x, algorithm="fricas")
```

```
[Out] (a*b*c^(1/n)*p*x + (b^2*p + b^2)*c^(2/n)*x^2 - a^2)*(b*c^(1/n)*x
+ a)^p/((b^2*p^2 + 3*b^2*p + 2*b^2)*c^(1/n))
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (cx^n)^{\frac{1}{n}}\left(a+b\,(cx^n)^{\frac{1}{n}}\right)^p\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**n)**(1/n)*(a+b*(c*x**n)**(1/n))**p,x)
```

```
[Out] Integral((c*x**n)**(1/n)*(a + b*(c*x**n)**(1/n))**p, x)
```

GIAC/XCAS [A] time = 23.3487, size = 211, normalized size = 2.67

$$\frac{b^2px^2e^{\left(p\ln\left(bxe^{\left(\frac{\ln(c)}{n}\right)}+a\right)+\frac{2\ln(c)}{n}\right)} + b^2x^2e^{\left(p\ln\left(bxe^{\left(\frac{\ln(c)}{n}\right)}+a\right)+\frac{2\ln(c)}{n}\right)} + abpxe^{\left(p\ln\left(bxe^{\left(\frac{\ln(c)}{n}\right)}+a\right)+\frac{\ln(c)}{n}\right)} - a^2e^{\left(p\ln\left(bxe^{\left(\frac{\ln(c)}{n}\right)}+a\right)\right)}}{b^2p^2e^{\left(\frac{\ln(c)}{n}\right)} + 3\,b^2pe^{\left(\frac{\ln(c)}{n}\right)} + 2\,b^2e^{\left(\frac{\ln(c)}{n}\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((c*x^n)^(1/n)*b + a)^p*(c*x^n)^(1/n),x, algorithm="giac")
```

```
[Out] (b^2*p*x^2*e^(p*ln(b*x*e^(ln(c)/n) + a) + 2*ln(c)/n) + b^2*x^2*e^
(p*ln(b*x*e^(ln(c)/n) + a) + 2*ln(c)/n) + a*b*p*x*e^(p*ln(b*x*e^(
ln(c)/n) + a) + ln(c)/n) - a^2*e^(p*ln(b*x*e^(ln(c)/n) + a)))/(b^
2*p^2*e^(ln(c)/n) + 3*b^2*p*e^(ln(c)/n) + 2*b^2*e^(ln(c)/n))
```

3.3064 $\int (cx^n)^{\frac{1}{n}} \left(a + b (cx^n)^{\frac{1}{n}}\right)^3 dx$

Optimal. Leaf size=70

$$\frac{x (cx^n)^{-1/n} \left(a + b (cx^n)^{\frac{1}{n}}\right)^5}{5b^2} - \frac{ax (cx^n)^{-1/n} \left(a + b (cx^n)^{\frac{1}{n}}\right)^4}{4b^2}$$

```
[Out] -(a*x*(a + b*(c*x^n)^n^(-1))^4)/(4*b^2*(c*x^n)^n^(-1)) + (x*(a +
b*(c*x^n)^n^(-1))^5)/(5*b^2*(c*x^n)^n^(-1))
```

Rubi [A] time = 0.0689983, antiderivative size = 70, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.12$

$$\frac{x (cx^n)^{-1/n} \left(a + b (cx^n)^{\frac{1}{n}}\right)^5}{5b^2} - \frac{ax (cx^n)^{-1/n} \left(a + b (cx^n)^{\frac{1}{n}}\right)^4}{4b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x^n)^n^(-1)*(a + b*(c*x^n)^n^(-1))^3,x]
```

```
[Out] -(a*x*(a + b*(c*x^n)^n^(-1))^4)/(4*b^2*(c*x^n)^n^(-1)) + (x*(a +
b*(c*x^n)^n^(-1))^5)/(5*b^2*(c*x^n)^n^(-1))
```

Rubi in Sympy [A] time = 18.4884, size = 58, normalized size = 0.83

$$-\frac{ax (cx^n)^{-\frac{1}{n}} \left(a + b (cx^n)^{\frac{1}{n}}\right)^4}{4b^2} + \frac{x (cx^n)^{-\frac{1}{n}} \left(a + b (cx^n)^{\frac{1}{n}}\right)^5}{5b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**n)**(1/n)*(a+b*(c*x**n)**(1/n))**3,x)
```

```
[Out] -a*x*(c*x**n)**(-1/n)*(a + b*(c*x**n)**(1/n))**4/(4*b**2) + x*(c*
x**n)**(-1/n)*(a + b*(c*x**n)**(1/n))**5/(5*b**2)
```

Mathematica [A] time = 0.209742, size = 68, normalized size = 0.97

$$\frac{1}{20} x (cx^n)^{\frac{1}{n}} \left(10a^3 + 20a^2 b (cx^n)^{\frac{1}{n}} + 15ab^2 (cx^n)^{2/n} + 4b^3 (cx^n)^{3/n}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x^n)^n^(-1)*(a + b*(c*x^n)^n^(-1))^3,x]
```

```
[Out] (x*(c*x^n)^n^(-1)*(10*a^3 + 20*a^2*b*(c*x^n)^n^(-1) + 15*a*b^2*(c
*x^n)^(2/n) + 4*b^3*(c*x^n)^(3/n)))/20
```

Maple [F] time = 0.042, size = 0, normalized size = 0.

$$\int \sqrt[n]{cx^n} \left(a + b \sqrt[n]{cx^n}\right)^3 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^n)^(1/n)*(a+b*(c*x^n)^(1/n))^3,x)
```

```
[Out] int((c*x^n)^(1/n)*(a+b*(c*x^n)^(1/n))^3,x)
```

Maxima [A] time = 1.51231, size = 81, normalized size = 1.16

$$\frac{1}{5}\,b^3c^{\frac{4}{n}}x^5 + \frac{3}{4}\,ab^2c^{\frac{3}{n}}x^4 + a^2bc^{\frac{2}{n}}x^3 + \frac{1}{2}\,a^3c^{\left(\frac{1}{n}\right)}x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((c*x^n)^(1/n)*b + a)^3*(c*x^n)^(1/n),x, algorithm="maxima")
```

```
[Out] 1/5*b^3*c^(4/n)*x^5 + 3/4*a*b^2*c^(3/n)*x^4 + a^2*b*c^(2/n)*x^3 +
 1/2*a^3*c^(1/n)*x^2
```

Fricas [A] time = 0.217041, size = 81, normalized size = 1.16

$$\frac{1}{5}\,b^3c^{\frac{4}{n}}x^5 + \frac{3}{4}\,ab^2c^{\frac{3}{n}}x^4 + a^2bc^{\frac{2}{n}}x^3 + \frac{1}{2}\,a^3c^{\left(\frac{1}{n}\right)}x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((c*x^n)^(1/n)*b + a)^3*(c*x^n)^(1/n),x, algorithm="fricas")
```

```
[Out] 1/5*b^3*c^(4/n)*x^5 + 3/4*a*b^2*c^(3/n)*x^4 + a^2*b*c^(2/n)*x^3 +
 1/2*a^3*c^(1/n)*x^2
```

Sympy [A] time = 4.4127, size = 76, normalized size = 1.09

$$\frac{a^3c^{\frac{1}{n}}x\,(x^n)^{\frac{1}{n}}}{2} + a^2bc^{\frac{2}{n}}x\,(x^n)^{\frac{2}{n}} + \frac{3ab^2c^{\frac{3}{n}}x\,(x^n)^{\frac{3}{n}}}{4} + \frac{b^3c^{\frac{4}{n}}x\,(x^n)^{\frac{4}{n}}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**n)**(1/n)*(a+b*(c*x**n)**(1/n))**3,x)
```

```
[Out] a**3*c**(1/n)*x*(x**n)**(1/n)/2 + a**2*b*c**(2/n)*x*(x**n)**(2/n)
 + 3*a*b**2*c**(3/n)*x*(x**n)**(3/n)/4 + b**3*c**(4/n)*x*(x**n)**
(4/n)/5
```

GIAC/XCAS [A] time = 0.245762, size = 88, normalized size = 1.26

$$\frac{1}{5}\,b^3x^5e^{\left(\frac{4\ln(c)}{n}\right)} + \frac{3}{4}\,ab^2x^4e^{\left(\frac{3\ln(c)}{n}\right)} + a^2bx^3e^{\left(\frac{2\ln(c)}{n}\right)} + \frac{1}{2}\,a^3x^2e^{\left(\frac{\ln(c)}{n}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((c*x^n)^(1/n)*b + a)^3*(c*x^n)^(1/n),x, algorithm="giac")
```

```
[Out] 1/5*b^3*x^5*e^(4*ln(c)/n) + 3/4*a*b^2*x^4*e^(3*ln(c)/n) + a^2*b*x
^3*e^(2*ln(c)/n) + 1/2*a^3*x^2*e^(ln(c)/n)
```

3.3065 $\int (cx^n)^{\frac{1}{n}} \left(a + b (cx^n)^{\frac{1}{n}}\right)^2 dx$

Optimal. Leaf size=55

$$\frac{1}{2}a^2x(cx^n)^{\frac{1}{n}} + \frac{2}{3}abx(cx^n)^{2/n} + \frac{1}{4}b^2x(cx^n)^{3/n}$$

```
[Out] (a^2*x*(c*x^n)^n^(-1))/2 + (2*a*b*x*(c*x^n)^(2/n))/3 + (b^2*x*(c*
x^n)^(3/n))/4
```

Rubi [A] time = 0.058905, antiderivative size = 55, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.12$

$$\frac{1}{2}a^2x(cx^n)^{\frac{1}{n}} + \frac{2}{3}abx(cx^n)^{2/n} + \frac{1}{4}b^2x(cx^n)^{3/n}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x^n)^n^(-1)*(a + b*(c*x^n)^n^(-1))^2,x]
```

```
[Out] (a^2*x*(c*x^n)^n^(-1))/2 + (2*a*b*x*(c*x^n)^(2/n))/3 + (b^2*x*(c*
x^n)^(3/n))/4
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$a^2x(cx^n)^{-\frac{1}{n}} \int^{(cx^n)^{\frac{1}{n}}} x\,dx + \frac{2abx(cx^n)^{\frac{2}{n}}}{3} + \frac{b^2x(cx^n)^{\frac{3}{n}}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**n)**(1/n)*(a+b*(c*x**n)**(1/n))**2,x)
```

```
[Out] a**2*x*(c*x**n)**(-1/n)*Integral(x, (x, (c*x**n)**(1/n))) + 2*a*b
*x*(c*x**n)**(2/n)/3 + b**2*x*(c*x**n)**(3/n)/4
```

Mathematica [A] time = 0.125991, size = 49, normalized size = 0.89

$$\frac{1}{12}x(cx^n)^{\frac{1}{n}}\left(6a^2 + 8ab(cx^n)^{\frac{1}{n}} + 3b^2(cx^n)^{2/n}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x^n)^n^(-1)*(a + b*(c*x^n)^n^(-1))^2,x]
```

```
[Out] (x*(c*x^n)^n^(-1)*(6*a^2 + 8*a*b*(c*x^n)^n^(-1) + 3*b^2*(c*x^n)^(
2/n)))/12
```

Maple [F] time = 0.04, size = 0, normalized size = 0.

$$\int \sqrt[n]{cx^n}\left(a + b\sqrt[n]{cx^n}\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^n)^(1/n)*(a+b*(c*x^n)^(1/n))^2,x)
```

```
[Out] int((c*x^n)^(1/n)*(a+b*(c*x^n)^(1/n))^2,x)
```

Maxima [A] time = 1.47739, size = 58, normalized size = 1.05

$$\frac{1}{4}\,b^2c^{\frac{3}{n}}x^4+\frac{2}{3}\,abc^{\frac{2}{n}}x^3+\frac{1}{2}\,a^2c^{\left(\frac{1}{n}\right)}x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^2*(c*x^n)^(1/n),x, algorithm="maxima")
```

```
[Out] 1/4*b^2*c^(3/n)*x^4 + 2/3*a*b*c^(2/n)*x^3 + 1/2*a^2*c^(1/n)*x^2
```

Fricas [A] time = 0.216965, size = 58, normalized size = 1.05

$$\frac{1}{4}\,b^2c^{\frac{3}{n}}x^4+\frac{2}{3}\,abc^{\frac{2}{n}}x^3+\frac{1}{2}\,a^2c^{\left(\frac{1}{n}\right)}x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^2*(c*x^n)^(1/n),x, algorithm="fricas")
```

```
[Out] 1/4*b^2*c^(3/n)*x^4 + 2/3*a*b*c^(2/n)*x^3 + 1/2*a^2*c^(1/n)*x^2
```

Sympy [A] time = 2.25347, size = 56, normalized size = 1.02

$$\frac{a^2c^{\frac{1}{n}}x\left(x^n\right)^{\frac{1}{n}}}{2}+\frac{2abc^{\frac{2}{n}}x\left(x^n\right)^{\frac{2}{n}}}{3}+\frac{b^2c^{\frac{3}{n}}x\left(x^n\right)^{\frac{3}{n}}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**n)**(1/n)*(a+b*(c*x**n)**(1/n))**2,x)
```

```
[Out] a**2*c**(1/n)*x*(x**n)**(1/n)/2 + 2*a*b*c**(2/n)*x*(x**n)**(2/n)/
3 + b**2*c**(3/n)*x*(x**n)**(3/n)/4
```

GIAC/XCAS [A] time = 0.226952, size = 63, normalized size = 1.15

$$\frac{1}{4}\,b^2x^4e^{\left(\frac{3\ln(c)}{n}\right)}+\frac{2}{3}\,abx^3e^{\left(\frac{2\ln(c)}{n}\right)}+\frac{1}{2}\,a^2x^2e^{\left(\frac{\ln(c)}{n}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)^2*(c*x^n)^(1/n),x, algorithm="giac")
```

```
[Out] 1/4*b^2*x^4*e^(3*ln(c)/n) + 2/3*a*b*x^3*e^(2*ln(c)/n) + 1/2*a^2*x
^2*e^(ln(c)/n)
```

3.3066 $\int (cx^n)^{\frac{1}{n}} \left(a + b (cx^n)^{\frac{1}{n}}\right) dx$

Optimal. Leaf size=33

$$\frac{1}{2}ax(cx^n)^{\frac{1}{n}} + \frac{1}{3}bx(cx^n)^{2/n}$$

```
[Out] (a*x*(c*x^n)^n^(-1))/2 + (b*x*(c*x^n)^(2/n))/3
```

Rubi [A] time = 0.0308211, antiderivative size = 33, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.13

$$\frac{1}{2}ax(cx^n)^{\frac{1}{n}} + \frac{1}{3}bx(cx^n)^{2/n}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x^n)^n^(-1)*(a + b*(c*x^n)^n^(-1)),x]
```

```
[Out] (a*x*(c*x^n)^n^(-1))/2 + (b*x*(c*x^n)^(2/n))/3
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$ax(cx^n)^{-\frac{1}{n}} \int^{(cx^n)^{\frac{1}{n}}} x\,dx + \frac{bx(cx^n)^{\frac{2}{n}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**n)**(1/n)*(a+b*(c*x**n)**(1/n)),x)
```

```
[Out] a*x*(c*x**n)**(-1/n)*Integral(x, (x, (c*x**n)**(1/n))) + b*x*(c*x
**n)**(2/n)/3
```

Mathematica [A] time = 0.0574741, size = 30, normalized size = 0.91

$$\frac{1}{6}x(cx^n)^{\frac{1}{n}}\left(3a + 2b(cx^n)^{\frac{1}{n}}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x^n)^n^(-1)*(a + b*(c*x^n)^n^(-1)),x]
```

```
[Out] (x*(c*x^n)^n^(-1)*(3*a + 2*b*(c*x^n)^n^(-1)))/6
```

Maple [F] time = 0.026, size = 0, normalized size = 0.

$$\int \sqrt[n]{cx^n}\left(a + b\sqrt[n]{cx^n}\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^n)^(1/n)*(a+b*(c*x^n)^(1/n)),x)
```

```
[Out] int((c*x^n)^(1/n)*(a+b*(c*x^n)^(1/n)),x)
```

Maxima [A] time = 1.50243, size = 34, normalized size = 1.03

$$\frac{1}{3}\,bc^{\frac{2}{n}}x^3 + \frac{1}{2}\,ac^{\left(\frac{1}{n}\right)}x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((c*x^n)^(1/n)*b + a)*(c*x^n)^(1/n),x, algorithm="maxima")
```

```
[Out] 1/3*b*c^(2/n)*x^3 + 1/2*a*c^(1/n)*x^2
```

Fricas [A] time = 0.215891, size = 34, normalized size = 1.03

$$\frac{1}{3}\,bc^{\frac{2}{n}}x^3 + \frac{1}{2}\,ac^{\left(\frac{1}{n}\right)}x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(((c*x^n)^(1/n)*b + a)*(c*x^n)^(1/n),x, algorithm="fricas")
```

```
[Out] 1/3*b*c^(2/n)*x^3 + 1/2*a*c^(1/n)*x^2
```

Sympy [A] time = 1.16224, size = 32, normalized size = 0.97

$$\frac{ac^{\frac{1}{n}}x\left(x^n\right)^{\frac{1}{n}}}{2} + \frac{bc^{\frac{2}{n}}x\left(x^n\right)^{\frac{2}{n}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**n)**(1/n)*(a+b*(c*x**n)**(1/n)),x)
```

```
[Out] a*c**(1/n)*x*(x**n)**(1/n)/2 + b*c**(2/n)*x*(x**n)**(2/n)/3
```

GIAC/XCAS [A] time = 0.221561, size = 38, normalized size = 1.15

$$\frac{1}{3}\,bx^3e^{\left(\frac{2\ln(c)}{n}\right)} + \frac{1}{2}\,ax^2e^{\left(\frac{\ln(c)}{n}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((c*x^n)^(1/n)*b + a)*(c*x^n)^(1/n),x, algorithm="giac")
```

```
[Out] 1/3*b*x^3*e^(2*ln(c)/n) + 1/2*a*x^2*e^(ln(c)/n)
```

3.3067 $\int \frac{(cx^n)^{\frac{1}{n}}}{a+b(cx^n)^{\frac{1}{n}}} \, dx$

Optimal. Leaf size=38

$$\frac{x}{b} - \frac{ax\,(cx^n)^{-1/n}\log\left(a + b\,(cx^n)^{\frac{1}{n}}\right)}{b^2}$$

```
[Out] x/b - (a*x*Log[a + b*(c*x^n)^n^(-1)])/(b^2*(c*x^n)^n^(-1))
```

Rubi [A] time = 0.0555695, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.12$

$$\frac{x}{b} - \frac{ax\,(cx^n)^{-1/n}\log\left(a + b\,(cx^n)^{\frac{1}{n}}\right)}{b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x^n)^n^(-1)/(a + b*(c*x^n)^n^(-1)),x]
```

```
[Out] x/b - (a*x*Log[a + b*(c*x^n)^n^(-1)])/(b^2*(c*x^n)^n^(-1))
```

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{ax\,(cx^n)^{-\frac{1}{n}}\log\left(a + b\,(cx^n)^{\frac{1}{n}}\right)}{b^2} + x\,(cx^n)^{-\frac{1}{n}} \int^{(cx^n)^{\frac{1}{n}}} \frac{1}{b}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**n)**(1/n)/(a+b*(c*x**n)**(1/n)),x)
```

```
[Out] -a*x*(c*x**n)**(-1/n)*log(a + b*(c*x**n)**(1/n))/b**2 + x*(c*x**n
)**(-1/n)*Integral(1/b, (x, (c*x**n)**(1/n)))
```

Mathematica [A] time = 4.18747, size = 0, normalized size = 0.

$$\int \frac{(cx^n)^{\frac{1}{n}}}{a + b\,(cx^n)^{\frac{1}{n}}}\, dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(c*x^n)^n^(-1)/(a + b*(c*x^n)^n^(-1)),x]
```

```
[Out] Integrate[(c*x^n)^n^(-1)/(a + b*(c*x^n)^n^(-1)), x]
```

Maple [C] time = 0.058, size = 222, normalized size = 5.8

$$\frac{x}{b}$$
$$-\frac{a}{b^2\sqrt[n]{c}}\ln\left(b\mathrm{e}^{\frac{-i\pi\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(ic)\mathrm{csgn}(icx^n)+i\pi\,\mathrm{csgn}(ix^n)\,(\mathrm{csgn}(icx^n))^2+i\pi\,\mathrm{csgn}(ic)(\mathrm{csgn}(icx^n))^2-i\pi\,(\mathrm{csgn}(icx^n))^3+2\ln(c)+2\ln(x^n)-2n\ln(x)}{2n}}x + a\right)\mathrm{e}^{-\frac{i\pi\,\mathrm{csgn}(ix^n)\,(\mathrm{csg}}{}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^n)^(1/n)/(a+b*(c*x^n)^(1/n)),x)
```

```
[Out] x/b-a/b^2/(c^(1/n))*ln(b*exp(1/2*(-I*Pi*csgn(I*x^n)*csgn(I*c)*csg
n(I*c*x^n)+I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*csgn(I*c)*csgn(I
*c*x^n)^2-I*Pi*csgn(I*c*x^n)^3+2*ln(c)+2*ln(x^n)-2*n*ln(x))/n)*x+
a)*exp(-1/2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*cs
gn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(I*
c*x^n)^2-2*n*ln(x)+2*ln(x^n))/n)
```

Maxima [A] time = 22.8551, size = 46, normalized size = 1.21

$$-\frac{ac^{-\frac{1}{n}}\log\left(b^2c^{\left(\frac{1}{n}\right)}x+ab\right)}{b^2}+\frac{x}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^n)^(1/n)/((c*x^n)^(1/n)*b + a),x, algorithm="maxima")
```

```
[Out] -a*c^(-1/n)*log(b^2*c^(1/n)*x + a*b)/b^2 + x/b
```

Fricas [A] time = 0.219818, size = 46, normalized size = 1.21

$$\frac{bc^{\left(\frac{1}{n}\right)}x-a\log\left(bc^{\left(\frac{1}{n}\right)}x+a\right)}{b^2c^{\left(\frac{1}{n}\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^n)^(1/n)/((c*x^n)^(1/n)*b + a),x, algorithm="fricas")
```

```
[Out] (b*c^(1/n)*x - a*log(b*c^(1/n)*x + a))/(b^2*c^(1/n))
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{(cx^n)^{\frac{1}{n}}}{a+b\,(cx^n)^{\frac{1}{n}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**n)**(1/n)/(a+b*(c*x**n)**(1/n)),x)
```

```
[Out] Integral((c*x**n)**(1/n)/(a + b*(c*x**n)**(1/n)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{(cx^n)^{\left(\frac{1}{n}\right)}}{(cx^n)^{\left(\frac{1}{n}\right)}\,b+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^n)^(1/n)/((c*x^n)^(1/n)*b + a),x, algorithm="giac")
```

```
[Out] integrate((c*x^n)^(1/n)/((c*x^n)^(1/n)*b + a), x)
```

3.3068 $\int \frac{(cx^n)^{\frac{1}{n}}}{\left(a+b(cx^n)^{\frac{1}{n}}\right)^2} dx$

Optimal. Leaf size=63

$$\frac{ax\,(cx^n)^{-1/n}}{b^2\left(a+b\,(cx^n)^{\frac{1}{n}}\right)}+\frac{x\,(cx^n)^{-1/n}\log\left(a+b\,(cx^n)^{\frac{1}{n}}\right)}{b^2}$$

```
[Out] (a*x)/(b^2*(c*x^n)^n^(-1)*(a + b*(c*x^n)^n^(-1))) + (x*Log[a + b*
(c*x^n)^n^(-1)])/(b^2*(c*x^n)^n^(-1))
```

Rubi [A] time = 0.0704411, antiderivative size = 63, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.12

$$\frac{ax\,(cx^n)^{-1/n}}{b^2\left(a+b\,(cx^n)^{\frac{1}{n}}\right)}+\frac{x\,(cx^n)^{-1/n}\log\left(a+b\,(cx^n)^{\frac{1}{n}}\right)}{b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x^n)^n^(-1)/(a + b*(c*x^n)^n^(-1))^2,x]
```

```
[Out] (a*x)/(b^2*(c*x^n)^n^(-1)*(a + b*(c*x^n)^n^(-1))) + (x*Log[a + b*
(c*x^n)^n^(-1)])/(b^2*(c*x^n)^n^(-1))
```

Rubi in Sympy [A] time = 18.004, size = 53, normalized size = 0.84

$$\frac{ax\,(cx^n)^{-\frac{1}{n}}}{b^2\left(a+b\,(cx^n)^{\frac{1}{n}}\right)}+\frac{x\,(cx^n)^{-\frac{1}{n}}\log\left(a+b\,(cx^n)^{\frac{1}{n}}\right)}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**n)**(1/n)/(a+b*(c*x**n)**(1/n))**2,x)
```

```
[Out] a*x*(c*x**n)**(-1/n)/(b**2*(a + b*(c*x**n)**(1/n))) + x*(c*x**n)*
*(-1/n)*log(a + b*(c*x**n)**(1/n))/b**2
```

Mathematica [A] time = 4.19963, size = 0, normalized size = 0.

$$\int \frac{(cx^n)^{\frac{1}{n}}}{\left(a+b\,(cx^n)^{\frac{1}{n}}\right)^2} dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[(c*x^n)^n^(-1)/(a + b*(c*x^n)^n^(-1))^2,x]
```

```
[Out] Integrate[(c*x^n)^n^(-1)/(a + b*(c*x^n)^n^(-1))^2, x]
```

Maple [C] time = 0.047, size = 322, normalized size = 5.1

$$-\frac{x}{b}\left(a+b\,\mathrm{e}^{\frac{i\pi\,\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2-i\pi\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(ic)\mathrm{csgn}(icx^n)-i\pi(\mathrm{csgn}(icx^n))^3+i\pi\,\mathrm{csgn}(ic)(\mathrm{csgn}(icx^n))^2+2\ln(c)+2\ln(x^n)}{2n}}\right)^{-1}$$
$$+\frac{1}{b^2\sqrt[n]{c}}\ln\left(b\,\mathrm{e}^{\frac{-i\pi\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(ic)\mathrm{csgn}(icx^n)+i\pi\,\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2+i\pi\,\mathrm{csgn}(ic)(\mathrm{csgn}(icx^n))^2-i\pi(\mathrm{csgn}(icx^n))^3+2\ln(c)+2\ln(x^n)-2n\ln(x)}{2n}}x+a\right)\mathrm{e}^{-\frac{i\pi\,\mathrm{csgn}(ix^n)(\mathrm{csgn}}{}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^n)^(1/n)/(a+b*(c*x^n)^(1/n))^2,x)
```

```
[Out] -x/b/(a+b*exp(1/2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x
^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*c
sgn(I*c*x^n)^2+2*ln(c)+2*ln(x^n))/n))+1/b^2/(c^(1/n))*ln(b*exp(1/
2*(-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)+I*Pi*csgn(I*x^n)*csg
n(I*c*x^n)^2+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-I*Pi*csgn(I*c*x^n)^3+
2*ln(c)+2*ln(x^n)-2*n*ln(x))/n)*x+a)*exp(-1/2*(I*Pi*csgn(I*x^n)*c
sgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn
(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2-2*n*ln(x)+2*ln(x^n))/n
)
```

Maxima [A] time = 23.7521, size = 70, normalized size = 1.11

$$-\frac{x}{b^2c^{\left(\frac{1}{n}\right)}(x^n)^{\left(\frac{1}{n}\right)}+ab}+\frac{c^{-\frac{1}{n}}\log\left(b^2c^{\left(\frac{1}{n}\right)}x+ab\right)}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^n)^(1/n)/((c*x^n)^(1/n)*b + a)^2,x, algorithm="maxima")
```

```
[Out] -x/(b^2*c^(1/n)*(x^n)^(1/n) + a*b) + c^(-1/n)*log(b^2*c^(1/n)*x +
 a*b)/b^2
```

Fricas [A] time = 0.219076, size = 68, normalized size = 1.08

$$\frac{\left(bc^{\left(\frac{1}{n}\right)}x+a\right)\log\left(bc^{\left(\frac{1}{n}\right)}x+a\right)+a}{b^3c^{\frac{2}{n}}x+ab^2c^{\left(\frac{1}{n}\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^n)^(1/n)/((c*x^n)^(1/n)*b + a)^2,x, algorithm="fricas")
```

```
[Out] ((b*c^(1/n)*x + a)*log(b*c^(1/n)*x + a) + a)/(b^3*c^(2/n)*x + a*b
^2*c^(1/n))
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{(cx^n)^{\frac{1}{n}}}{\left(a+b\,(cx^n)^{\frac{1}{n}}\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**n)**(1/n)/(a+b*(c*x**n)**(1/n))**2,x)
```

```
[Out] Integral((c*x**n)**(1/n)/(a + b*(c*x**n)**(1/n))**2, x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx^n)^{\left(\frac{1}{n}\right)}}{\left((cx^n)^{\left(\frac{1}{n}\right)}b + a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*x^n)^(1/n)/((c*x^n)^(1/n)*b + a)^2,x, algorithm="giac")
```

```
[Out] integrate((c*x^n)^(1/n)/((c*x^n)^(1/n)*b + a)^2, x)
```

3.3069 $\int \frac{(cx^n)^{\frac{1}{n}}}{\left(a+b(cx^n)^{\frac{1}{n}}\right)^3}\,dx$

Optimal. Leaf size=32

$$\frac{x\,(cx^n)^{\frac{1}{n}}}{2a\left(a+b\,(cx^n)^{\frac{1}{n}}\right)^2}$$

```
[Out] (x*(c*x^n)^n^(-1))/(2*a*(a + b*(c*x^n)^n^(-1))^2)
```

Rubi [A] time = 0.0355623, antiderivative size = 32, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.12

$$\frac{x\,(cx^n)^{\frac{1}{n}}}{2a\left(a+b\,(cx^n)^{\frac{1}{n}}\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x^n)^n^(-1)/(a + b*(c*x^n)^n^(-1))^3,x]
```

```
[Out] (x*(c*x^n)^n^(-1))/(2*a*(a + b*(c*x^n)^n^(-1))^2)
```

Rubi in Sympy [A] time = 12.4883, size = 26, normalized size = 0.81

$$\frac{x\,(cx^n)^{\frac{1}{n}}}{2a\left(a+b\,(cx^n)^{\frac{1}{n}}\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**n)**(1/n)/(a+b*(c*x**n)**(1/n))**3,x)
```

```
[Out] x*(c*x**n)**(1/n)/(2*a*(a + b*(c*x**n)**(1/n))**2)
```

Mathematica [A] time = 0.0875845, size = 32, normalized size = 1.

$$\frac{x\,(cx^n)^{\frac{1}{n}}}{2a\left(a+b\,(cx^n)^{\frac{1}{n}}\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x^n)^n^(-1)/(a + b*(c*x^n)^n^(-1))^3,x]
```

```
[Out] (x*(c*x^n)^n^(-1))/(2*a*(a + b*(c*x^n)^n^(-1))^2)
```

Maple [C] time = 0.042, size = 203, normalized size = 6.3

$$\frac{x}{2\,a}\mathrm{e}^{\frac{i\pi\,\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2-i\pi\,\mathrm{csgn}(ix^n)\mathrm{csgn}(ic)\mathrm{csgn}(icx^n)-i\pi\,(\mathrm{csgn}(icx^n))^3+i\pi\,\mathrm{csgn}(ic)(\mathrm{csgn}(icx^n))^2+2\ln(c)+2\ln(x^n)}{2n}}\left(a+b\mathrm{e}^{\frac{i\pi\,\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2-i\pi\,\mathrm{csgn}(ix^n)\,\mathrm{csg}}{}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^n)^(1/n)/(a+b*(c*x^n)^(1/n))^3,x)
```

```
[Out] 1/2*x*exp(1/2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*
csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(
I*c*x^n)^2+2*ln(c)+2*ln(x^n))/n)/a/(a+b*exp(1/2*(I*Pi*csgn(I*x^n)
*csgn(I*c*x^n)^2-I*Pi*csgn(I*x^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*cs
gn(I*c*x^n)^3+I*Pi*csgn(I*c)*csgn(I*c*x^n)^2+2*ln(c)+2*ln(x^n))/n
))^2
```

Maxima [A] time = 1.44334, size = 81, normalized size = 2.53

$$\frac{c^{\left(\frac{1}{n}\right)} x (x^n)^{\left(\frac{1}{n}\right)}}{2 \left(ab^2 c^{\frac{2}{n}} (x^n)^{\frac{2}{n}} + 2\,a^2 b c^{\left(\frac{1}{n}\right)} (x^n)^{\left(\frac{1}{n}\right)} + a^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*x^n)^(1/n)/((c*x^n)^(1/n)*b + a)^3,x, algorithm="maxima")
```

```
[Out] 1/2*c^(1/n)*x*(x^n)^(1/n)/(a*b^2*c^(2/n)*(x^n)^(2/n) + 2*a^2*b*c^
(1/n)*(x^n)^(1/n) + a^3)
```

Fricas [A] time = 0.218446, size = 76, normalized size = 2.38

$$-\frac{2\,bc^{\left(\frac{1}{n}\right)} x + a}{2 \left(b^4 c^{\frac{3}{n}} x^2 + 2\,ab^3 c^{\frac{2}{n}} x + a^2 b^2 c^{\left(\frac{1}{n}\right)}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*x^n)^(1/n)/((c*x^n)^(1/n)*b + a)^3,x, algorithm="fricas")
```

```
[Out] -1/2*(2*b*c^(1/n)*x + a)/(b^4*c^(3/n)*x^2 + 2*a*b^3*c^(2/n)*x + a
^2*b^2*c^(1/n))
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RecursionError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**n)**(1/n)/(a+b*(c*x**n)**(1/n))**3,x)
```

```
[Out] Exception raised: RecursionError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx^n)^{\left(\frac{1}{n}\right)}}{\left((cx^n)^{\left(\frac{1}{n}\right)} b + a\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*x^n)^(1/n)/((c*x^n)^(1/n)*b + a)^3,x, algorithm="giac")
```

```
[Out] integrate((c*x^n)^(1/n)/((c*x^n)^(1/n)*b + a)^3, x)
```

3.3070 $\int \frac{(cx^n)^{\frac{1}{n}}}{\left(a+b(cx^n)^{\frac{1}{n}}\right)^4}\,dx$

Optimal. Leaf size=70

$$\frac{ax\,(cx^n)^{-1/n}}{3b^2\left(a+b\,(cx^n)^{\frac{1}{n}}\right)^3}-\frac{x\,(cx^n)^{-1/n}}{2b^2\left(a+b\,(cx^n)^{\frac{1}{n}}\right)^2}$$

```
[Out] (a*x)/(3*b^2*(c*x^n)^n^(-1)*(a + b*(c*x^n)^n^(-1))^3) - x/(2*b^2*
(c*x^n)^n^(-1)*(a + b*(c*x^n)^n^(-1))^2)
```

Rubi [A] time = 0.0759947, antiderivative size = 70, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.12

$$\frac{ax\,(cx^n)^{-1/n}}{3b^2\left(a+b\,(cx^n)^{\frac{1}{n}}\right)^3}-\frac{x\,(cx^n)^{-1/n}}{2b^2\left(a+b\,(cx^n)^{\frac{1}{n}}\right)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(c*x^n)^n^(-1)/(a + b*(c*x^n)^n^(-1))^4,x]
```

```
[Out] (a*x)/(3*b^2*(c*x^n)^n^(-1)*(a + b*(c*x^n)^n^(-1))^3) - x/(2*b^2*
(c*x^n)^n^(-1)*(a + b*(c*x^n)^n^(-1))^2)
```

Rubi in Sympy [A] time = 18.0886, size = 58, normalized size = 0.83

$$\frac{ax\,(cx^n)^{-\frac{1}{n}}}{3b^2\left(a+b\,(cx^n)^{\frac{1}{n}}\right)^3}-\frac{x\,(cx^n)^{-\frac{1}{n}}}{2b^2\left(a+b\,(cx^n)^{\frac{1}{n}}\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((c*x**n)**(1/n)/(a+b*(c*x**n)**(1/n))**4,x)
```

```
[Out] a*x*(c*x**n)**(-1/n)/(3*b**2*(a + b*(c*x**n)**(1/n))**3) - x*(c*x
**n)**(-1/n)/(2*b**2*(a + b*(c*x**n)**(1/n))**2)
```

Mathematica [A] time = 0.144542, size = 47, normalized size = 0.67

$$\frac{x\,(cx^n)^{\frac{1}{n}}\left(3a+b\,(cx^n)^{\frac{1}{n}}\right)}{6a^2\left(a+b\,(cx^n)^{\frac{1}{n}}\right)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*x^n)^n^(-1)/(a + b*(c*x^n)^n^(-1))^4,x]
```

```
[Out] (x*(c*x^n)^n^(-1)*(3*a + b*(c*x^n)^n^(-1)))/(6*a^2*(a + b*(c*x^n)
^n^(-1))^3)
```

Maple [C] time = 99.751, size = 242, normalized size = 3.5

$$\frac{x}{6\,a^2}\left(\left(\sqrt[n]{c}\right)^2\left(\sqrt[n]{x^n}\right)^2 b e^{\frac{i\pi\,\mathrm{csgn}(icx^n)\left(\mathrm{csgn}(icx^n)-\mathrm{csgn}(ic)\right)\left(-\mathrm{csgn}(icx^n)+\mathrm{csgn}(ix^n)\right)}{n}}+3\sqrt[n]{c}\sqrt[n]{x^n}\,a e^{\frac{i/2\pi\,\mathrm{csgn}(icx^n)\left(\mathrm{csgn}(icx^n)-\mathrm{csgn}(ic)\right)\left(-\mathrm{csgn}(icx^n)+\mathrm{csgn}(ix^n)\right)}{n}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^n)^(1/n)/(a+b*(c*x^n)^(1/n))^4,x)
```

```
[Out] 1/6*x/a^2/(a+b*exp(1/2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csg
n(I*x^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I
*c)*csgn(I*c*x^n)^2+2*ln(c)+2*ln(x^n))/n))^3*((c^(1/n))^2*((x^n)^
(1/n))^2*b*exp(I*Pi*csgn(I*c*x^n)*(csgn(I*c*x^n)-csgn(I*c))*(-csg
n(I*c*x^n)+csgn(I*x^n))/n)+3*c^(1/n)*(x^n)^(1/n)*a*exp(1/2*I*Pi*c
sgn(I*c*x^n)*(csgn(I*c*x^n)-csgn(I*c))*(-csgn(I*c*x^n)+csgn(I*x^n
))/n))
```

Maxima [A] time = 1.39182, size = 147, normalized size = 2.1

$$\frac{bc^{\frac{2}{n}}x(x^n)^{\frac{2}{n}} + 3\,ac^{\left(\frac{1}{n}\right)}x(x^n)^{\left(\frac{1}{n}\right)}}{6\left(a^2b^3c^{\frac{3}{n}}(x^n)^{\frac{3}{n}} + 3\,a^3b^2c^{\frac{2}{n}}(x^n)^{\frac{2}{n}} + 3\,a^4bc^{\left(\frac{1}{n}\right)}(x^n)^{\left(\frac{1}{n}\right)} + a^5\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^n)^(1/n)/((c*x^n)^(1/n)*b + a)^4,x, algorithm="maxima")
```

```
[Out] 1/6*(b*c^(2/n)*x*(x^n)^(2/n) + 3*a*c^(1/n)*x*(x^n)^(1/n))/(a^2*b^
3*c^(3/n)*(x^n)^(3/n) + 3*a^3*b^2*c^(2/n)*(x^n)^(2/n) + 3*a^4*b*c
^(1/n)*(x^n)^(1/n) + a^5)
```

Fricas [A] time = 0.217647, size = 100, normalized size = 1.43

$$-\frac{3\,bc^{\left(\frac{1}{n}\right)}x + a}{6\left(b^5c^{\frac{4}{n}}x^3 + 3\,ab^4c^{\frac{3}{n}}x^2 + 3\,a^2b^3c^{\frac{2}{n}}x + a^3b^2c^{\left(\frac{1}{n}\right)}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^n)^(1/n)/((c*x^n)^(1/n)*b + a)^4,x, algorithm="fricas")
```

```
[Out] -1/6*(3*b*c^(1/n)*x + a)/(b^5*c^(4/n)*x^3 + 3*a*b^4*c^(3/n)*x^2 +
 3*a^2*b^3*c^(2/n)*x + a^3*b^2*c^(1/n))
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RecursionError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**n)**(1/n)/(a+b*(c*x**n)**(1/n))**4,x)
```

```
[Out] Exception raised: RecursionError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx^n)^{\left(\frac{1}{n}\right)}}{\left((cx^n)^{\left(\frac{1}{n}\right)}b + a\right)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*x^n)^(1/n)/((c*x^n)^(1/n)*b + a)^4,x, algorithm="giac")

[Out] integrate((c*x^n)^(1/n)/((c*x^n)^(1/n)*b + a)^4, x)
```

3.3071 $\int \frac{(cx^n)^{\frac{1}{n}}}{\left(a+b(cx^n)^{\frac{1}{n}}\right)^5}\,dx$

Optimal. Leaf size=70

$$\frac{ax\left(cx^n\right)^{-1/n}}{4b^2\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^4}-\frac{x\left(cx^n\right)^{-1/n}}{3b^2\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^3}$$

```
[Out] (a*x)/(4*b^2*(c*x^n)^n^(-1)*(a + b*(c*x^n)^n^(-1))^4) - x/(3*b^2*
(c*x^n)^n^(-1)*(a + b*(c*x^n)^n^(-1))^3)
```

Rubi [A] time = 0.076499, antiderivative size = 70, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.12

$$\frac{ax\left(cx^n\right)^{-1/n}}{4b^2\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^4}-\frac{x\left(cx^n\right)^{-1/n}}{3b^2\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(c*x^n)^n^(-1)/(a + b*(c*x^n)^n^(-1))^5,x]
```

```
[Out] (a*x)/(4*b^2*(c*x^n)^n^(-1)*(a + b*(c*x^n)^n^(-1))^4) - x/(3*b^2*
(c*x^n)^n^(-1)*(a + b*(c*x^n)^n^(-1))^3)
```

Rubi in Sympy [A] time = 17.9434, size = 58, normalized size = 0.83

$$\frac{ax\left(cx^n\right)^{-\frac{1}{n}}}{4b^2\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^4}-\frac{x\left(cx^n\right)^{-\frac{1}{n}}}{3b^2\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**n)**(1/n)/(a+b*(c*x**n)**(1/n))**5,x)
```

```
[Out] a*x*(c*x**n)**(-1/n)/(4*b**2*(a + b*(c*x**n)**(1/n))**4) - x*(c*x
**n)**(-1/n)/(3*b**2*(a + b*(c*x**n)**(1/n))**3)
```

Mathematica [A] time = 0.227877, size = 66, normalized size = 0.94

$$\frac{x\left(cx^n\right)^{\frac{1}{n}}\left(6a^2+4ab\left(cx^n\right)^{\frac{1}{n}}+b^2\left(cx^n\right)^{2/n}\right)}{12a^3\left(a+b\left(cx^n\right)^{\frac{1}{n}}\right)^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c*x^n)^n^(-1)/(a + b*(c*x^n)^n^(-1))^5,x]
```

```
[Out] (x*(c*x^n)^n^(-1)*(6*a^2 + 4*a*b*(c*x^n)^n^(-1) + b^2*(c*x^n)^(2/
n)))/(12*a^3*(a + b*(c*x^n)^n^(-1))^4)
```

Maple [C] time = 0.079, size = 316, normalized size = 4.5

$$\frac{x}{12\,a^3}\left(\left(\sqrt[n]{c}\right)^3\left(\sqrt[n]{x^n}\right)^3b^2\mathrm{e}^{\frac{\frac{3i}{2}\pi\,\mathrm{csgn}(icx^n)(\mathrm{csgn}(icx^n)-\mathrm{csgn}(ic))(-\mathrm{csgn}(icx^n)+\mathrm{csgn}(ix^n))}{n}}+4\left(\sqrt[n]{c}\right)^2\left(\sqrt[n]{x^n}\right)^2ab\mathrm{e}^{\frac{i\pi\,\mathrm{csgn}(icx^n)(\mathrm{csgn}(icx^n)-\mathrm{csgn}(ic))(-\mathrm{csgn}(ic}{n}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^n)^(1/n)/(a+b*(c*x^n)^(1/n))^5,x)
```

```
[Out] 1/12*x/(a+b*exp(1/2*(I*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*csgn(I
*x^n)*csgn(I*c)*csgn(I*c*x^n)-I*Pi*csgn(I*c*x^n)^3+I*Pi*csgn(I*c)
*csgn(I*c*x^n)^2+2*ln(c)+2*ln(x^n))/n))^4/a^3*((c^(1/n))^3*((x^n)
^(1/n))^3*b^2*exp(3/2*I*Pi*csgn(I*c*x^n)*(csgn(I*c*x^n)-csgn(I*c)
)*(-csgn(I*c*x^n)+csgn(I*x^n))/n)+4*(c^(1/n))^2*((x^n)^(1/n))^2*a
*b*exp(I*Pi*csgn(I*c*x^n)*(csgn(I*c*x^n)-csgn(I*c))*(-csgn(I*c*x^
n)+csgn(I*x^n))/n)+6*c^(1/n)*(x^n)^(1/n)*a^2*exp(1/2*I*Pi*csgn(I*
c*x^n)*(csgn(I*c*x^n)-csgn(I*c))*(-csgn(I*c*x^n)+csgn(I*x^n))/n))
```

Maxima [A] time = 1.39939, size = 213, normalized size = 3.04

$$\frac{b^2 c^{\frac{3}{n}} x (x^n)^{\frac{3}{n}} + 4\,abc^{\frac{2}{n}} x (x^n)^{\frac{2}{n}} + 6\,a^2 c^{\left(\frac{1}{n}\right)} x (x^n)^{\left(\frac{1}{n}\right)}}{12\left(a^3 b^4 c^{\frac{4}{n}} (x^n)^{\frac{4}{n}} + 4\,a^4 b^3 c^{\frac{3}{n}} (x^n)^{\frac{3}{n}} + 6\,a^5 b^2 c^{\frac{2}{n}} (x^n)^{\frac{2}{n}} + 4\,a^6 bc^{\left(\frac{1}{n}\right)} (x^n)^{\left(\frac{1}{n}\right)} + a^7\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*x^n)^(1/n)/((c*x^n)^(1/n)*b + a)^5,x, algorithm="maxima")
```

```
[Out] 1/12*(b^2*c^(3/n)*x*(x^n)^(3/n) + 4*a*b*c^(2/n)*x*(x^n)^(2/n) + 6
*a^2*c^(1/n)*x*(x^n)^(1/n))/(a^3*b^4*c^(4/n)*(x^n)^(4/n) + 4*a^4*
b^3*c^(3/n)*(x^n)^(3/n) + 6*a^5*b^2*c^(2/n)*(x^n)^(2/n) + 4*a^6*b
*c^(1/n)*(x^n)^(1/n) + a^7)
```

Fricas [A] time = 0.218151, size = 124, normalized size = 1.77

$$-\frac{4\,bc^{\left(\frac{1}{n}\right)} x + a}{12\left(b^6 c^{\frac{5}{n}} x^4 + 4\,ab^5 c^{\frac{4}{n}} x^3 + 6\,a^2 b^4 c^{\frac{3}{n}} x^2 + 4\,a^3 b^3 c^{\frac{2}{n}} x + a^4 b^2 c^{\left(\frac{1}{n}\right)}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*x^n)^(1/n)/((c*x^n)^(1/n)*b + a)^5,x, algorithm="fricas")
```

```
[Out] -1/12*(4*b*c^(1/n)*x + a)/(b^6*c^(5/n)*x^4 + 4*a*b^5*c^(4/n)*x^3
+ 6*a^2*b^4*c^(3/n)*x^2 + 4*a^3*b^3*c^(2/n)*x + a^4*b^2*c^(1/n))
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RecursionError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**n)**(1/n)/(a+b*(c*x**n)**(1/n))**5,x)
```

```
[Out] Exception raised: RecursionError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(cx^n)^{\left(\frac{1}{n}\right)}}{\left((cx^n)^{\left(\frac{1}{n}\right)} b + a\right)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^n)^(1/n)/((c*x^n)^(1/n)*b + a)^5,x, algorithm="giac")
```

```
[Out] integrate((c*x^n)^(1/n)/((c*x^n)^(1/n)*b + a)^5, x)
```

4 Listing of Grading functions

The following are the current version of the grading functions used for grading the quality of the antiderivative with reference to the optimal antiderivative included in the test suite.

There is a version for Mathematica/Rubi followed by one for Maple. The following are links to the source code.

The following are the listing of the above functions.

```
(* Original version thanks to Albert Rich emailed on 03/21/2017 *)
(* ::Package:: *)
(* ::Subsection:: *)
(*GradeAntiderivative[result,optimal]*)

(* ::Text:: *)
(*If result and optimal are mathematical expressions, *)
(*         GradeAntiderivative[result,optimal] returns*)
(*  "F" if the result fails to integrate an expression that*)
(*      is integrable*)
(*  "C" if result involves higher level functions than necessary*)
(*  "B" if result is more than twice the size of the optimal*)
(*      antiderivative*)
(*  "A" if result can be considered optimal*)

GradeAntiderivative[result_,optimal_] :=
  If[ExpnType[result]<=ExpnType[optimal],
    If[FreeQ[result,Complex] || Not[FreeQ[optimal,Complex]],
      If[LeafCount[result]<=2*LeafCount[optimal],
        "A",
      "B"],
    "C"],
  If[FreeQ[result,Integrate] && FreeQ[result,Int],
    "C",
  "F"]]

(* ::Text:: *)
(*The following summarizes the type number assigned an *)
(*expression based on the functions it involves*)
(*1 = rational function*)
(*2 = algebraic function*)
(*3 = elementary function*)
(*4 = special function*)
(*5 = hyperpergeometric function*)
(*6 = appell function*)
(*7 = rootsum function*)
(*8 = integrate function*)
(*9 = unknown function*)
```

```
ExpnType[expn_] :=
  If[AtomQ[expn], 1,
  If[ListQ[expn],
    Max[Map[ExpnType,expn]],
  If[Head[expn]===Power,
    If[IntegerQ[expn[[2]]],
      ExpnType[expn[[1]]],
    If[Head[expn[[2]]]===Rational,
      If[IntegerQ[expn[[1]]] || Head[expn[[1]]]===Rational,1,
      Max[ExpnType[expn[[1]]],2]],
    Max[ExpnType[expn[[1]]],ExpnType[expn[[2]]],3]]],
  If[Head[expn]===Plus || Head[expn]===Times,
    Max[ExpnType[First[expn]],ExpnType[Rest[expn]]],
  If[ElementaryFunctionQ[Head[expn]],
    Max[3,ExpnType[expn[[1]]]],
  If[SpecialFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],4]],
  If[HypergeometricFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],5]],
  If[AppellFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],6]],
  If[Head[expn]===RootSum,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
  If[Head[expn]===Integrate || Head[expn]===Int,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],8]],
  9]]]]]]]]]]
```

```
ElementaryFunctionQ[func_] :=
  MemberQ[{
        Exp,Log,
        Sin,Cos,Tan,Cot,Sec,Csc,
        ArcSin,ArcCos,ArcTan,ArcCot,ArcSec,ArcCsc,
        Sinh,Cosh,Tanh,Coth,Sech,Csch,
        ArcSinh,ArcCosh,ArcTanh,ArcCoth,ArcSech,ArcCsch
},func]

SpecialFunctionQ[func_] :=
  MemberQ[{
        Erf, Erfc, Erfi,
        FresnelS, FresnelC,
        ExpIntegralE, ExpIntegralEi, LogIntegral,
        SinIntegral, CosIntegral, SinhIntegral, CoshIntegral,
        Gamma, LogGamma, PolyGamma,
        Zeta, PolyLog, ProductLog,
        EllipticF, EllipticE, EllipticPi
},func]
HypergeometricFunctionQ[func_] := MemberQ[{Hypergeometric1F1,Hypergeometric2F1,HypergeometricPFQ},func]
AppellFunctionQ[func_] := MemberQ[{AppellF1},func]
```

```
# File: GradeAntiderivative.mpl Original version thanks to Albert Rich emailed on 03/21/2017
#Nasser 03/22/2017  Use Maple leaf count instead since buildin
#Nasser 03/23/2017  missing 'ln' for ElementaryFunctionQ added
#Nasser 03/24/2017  corrected the check for complex result
#Nasser 10/27/2017  check for leafsize and do not call ExpnType()
#                   if leaf size is "too large". Set at 500,000
GradeAntiderivative := proc(result,optimal)
local leaf_count_result, leaf_count_optimal,ExpnType_result,ExpnType_optimal;

      leaf_count_result:=leafcount(result);
      #do NOT call ExpnType() if leaf size is too large. Recursion problem
      if leaf_count_result > 500000 then
          return "B";
      fi;

      leaf_count_optimal:=leafcount(optimal);

      ExpnType_result:=ExpnType(result);
      ExpnType_optimal:=ExpnType(optimal);
  #This check below actually is not needed, since I only call this grading only for
  #passed integrals. i.e. I check for "F" before calling this.

  if not type(result,freeof('int')) then
     return "F";
  end if;

  if ExpnType_result<=ExpnType_optimal then
      if is_contains_complex(result) then
         if is_contains_complex(optimal) then
            #both result and optimal complex
            if leaf_count_result<=2*leaf_count_optimal then
               return "A";
            else
               return "B";
            end if
         else #result contains complex but optimal is not
            return "C";
         end if
      else # result do not contain complex
           # this assumes optimal do not as well
         if leaf_count_result<=2*leaf_count_optimal then
            return "A";
         else
            return "B";
         end if
      end if
  else #ExpnType(result) > ExpnType(optimal)
      return "C";
  end if
end proc:
```

```
# is_contains_complex(result) takes expressions and returns true if it contains "I"
#Nasser 032417
is_contains_complex:= proc(expression)
  return (has(expression,I));
end proc:

ExpnType := proc(expn)
  if type(expn,'atomic') then
    1
  elif type(expn,'list') then
    apply(max,map(ExpnType,expn))
  elif type(expn,'sqrt') then
    if type(op(1,expn),'rational') then
      1 else
    max(2,ExpnType(op(1,expn)))
    end if
  elif type(expn,'`^`') then
    if type(op(2,expn),'integer') then
      ExpnType(op(1,expn))
    elif type(op(2,expn),'rational') then
      if type(op(1,expn),'rational') then
        1 else
      max(2,ExpnType(op(1,expn))) end if else
    max(3,ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    end if
  elif type(expn,'`+`') or type(expn,'`*`') then
    max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
  elif ElementaryFunctionQ(op(0,expn)) then
    max(3,ExpnType(op(1,expn)))
  elif SpecialFunctionQ(op(0,expn)) then
    max(4,apply(max,map(ExpnType,[op(expn)])))
  elif HypergeometricFunctionQ(op(0,expn)) then
    max(5,apply(max,map(ExpnType,[op(expn)])))
  elif AppellFunctionQ(op(0,expn)) then
    max(6,apply(max,map(ExpnType,[op(expn)])))
  elif op(0,expn)='int' or op(0,expn)='integrate' then
    max(8,apply(max,map(ExpnType,[op(expn)]))) else
  9
  end if
end proc:
```

```
ElementaryFunctionQ := proc(func)
  member(func,[exp,log,ln, sin,cos,tan,cot,sec,csc,
        arcsin,arccos,arctan,arccot,arcsec,arccsc,
        sinh,cosh,tanh,coth,sech,csch,
        arcsinh,arccosh,arctanh,arccoth,arcsech,arccsch])
end proc:

SpecialFunctionQ := proc(func)
  member(func,[erf,erfc,erfi,FresnelS,FresnelC,Ei,Ei,Li,Si,Ci,Shi,Chi,
        GAMMA,lnGAMMA,Psi,Zeta,polylog,LambertW,
        EllipticF,EllipticE,EllipticPi])
end proc:

HypergeometricFunctionQ := proc(func)
  member(func,[Hypergeometric1F1,hypergeom,HypergeometricPFQ])
end proc:
AppellFunctionQ := proc(func)
  member(func,[AppellF1])
end proc:

# u is a sum or product.  rest(u) returns all but the first term or factor of u.
rest := proc(u) local v;
  if nops(u)=2 then
    op(2,u) else
  apply(op(0,u),op(2..nops(u),u))
  end if
end proc:
#leafcount(u) returns the number of nodes in u.
#Nasser 3/23/17  Replaced by build-in leafCount from package in Maple
leafcount := proc(u)
   MmaTranslator[Mma][LeafCount](u);
end proc:
```